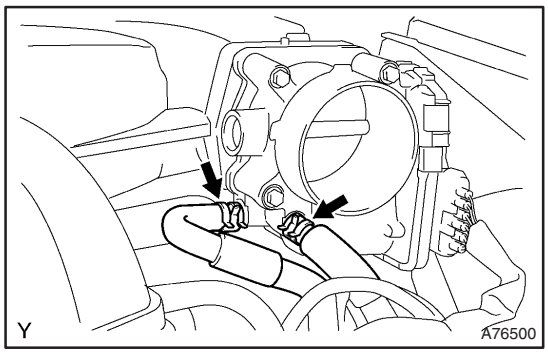
1415Y–04

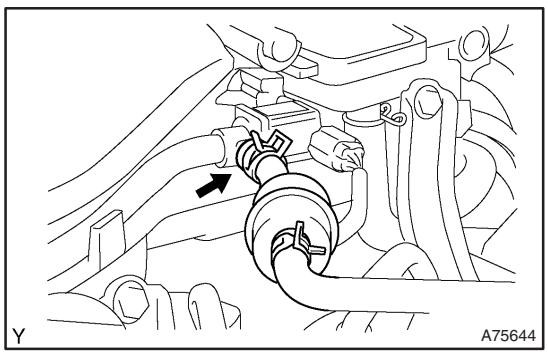
REPLACEMENT

1. DRAIN ENGINE COOLANT (SEE PAGE 16–19)
2. REMOVE V–BANK COVER (SEE PUB. NO. RM1017E, PAGE 10–7)
3. DISCONNECT VENTILATION HOSE NO.2 (SEE PUB. NO. RM1017E, PAGE 10–7)
4. REMOVE AIR CLEANER ASSY (SEE PUB. NO. RM1017E, PAGE 10–7)

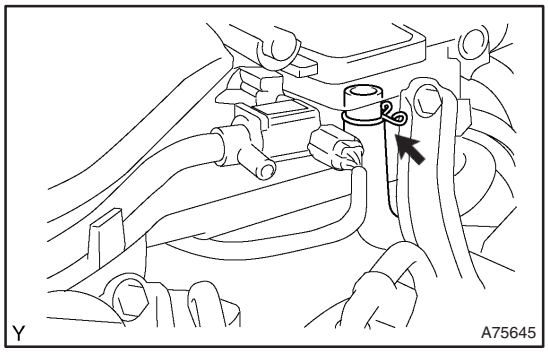


5. REMOVE INTAKE AIR SURGE TANK

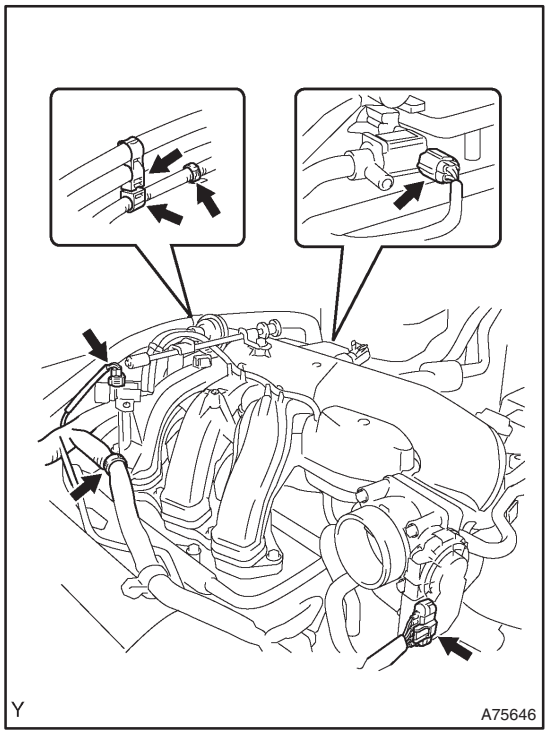
(a) Disconnect the 2 water by–pass hoses.



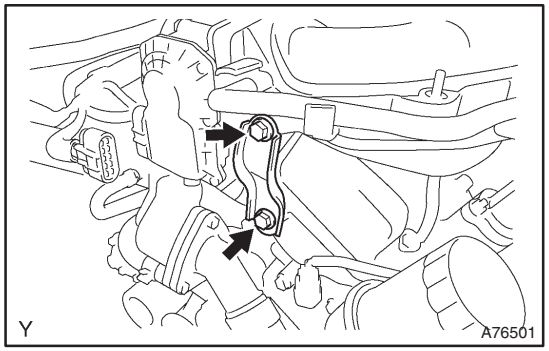
(b) Disconnect the fuel vapor feed hose.



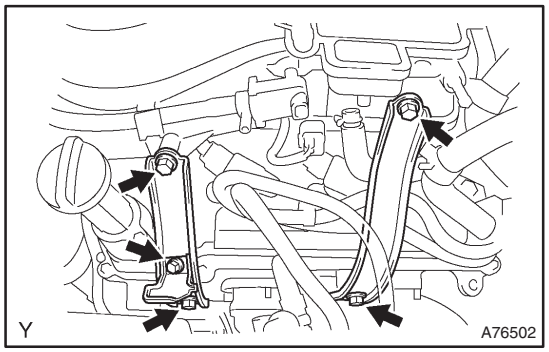
(c) Disconnect the ventilation hose.



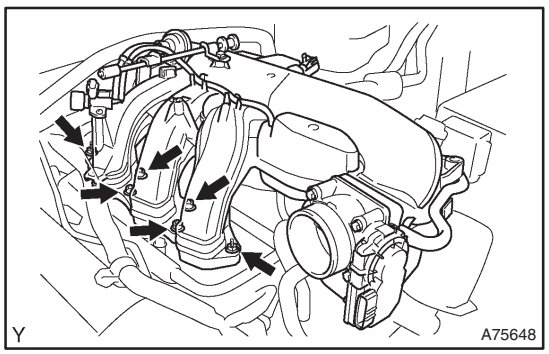
(d) Disconnect the 2 VSV connectors.
(e) Disconnect the throttle body w/ motor connector.
(f) Separate the 3 wire harness clamps and hose clamp.



(g) Remove the 2 bolts and throttle body bracket.

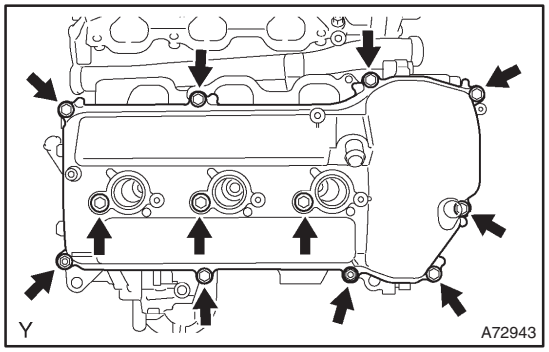


(h) Remove the bolt and oil baffle plate.
(i) Remove the 4 bolts and 2 surge tank stays.



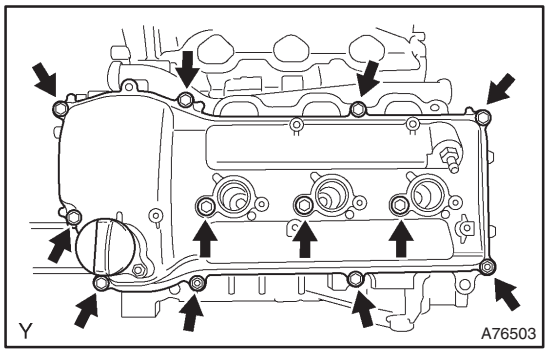
(j) Remove the 2 nuts.
(k) Using a socket hexagon wrench 8, remove the 4 bolts, intake air surge tank and gasket.

6. REMOVE IGNITION COIL ASSY



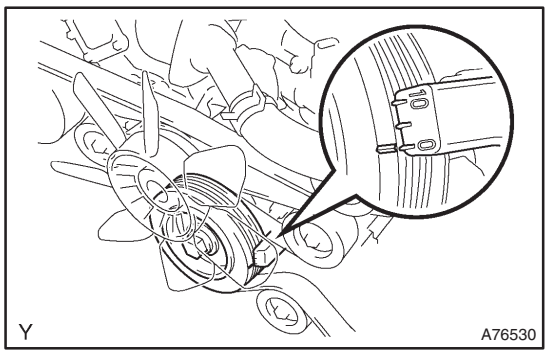
7. REMOVE CYLINDER HEAD COVER SUB–ASSY RH

(a) Remove the 10 bolts, 3 seal washers, 2 nuts, cylinder head cover and gasket.



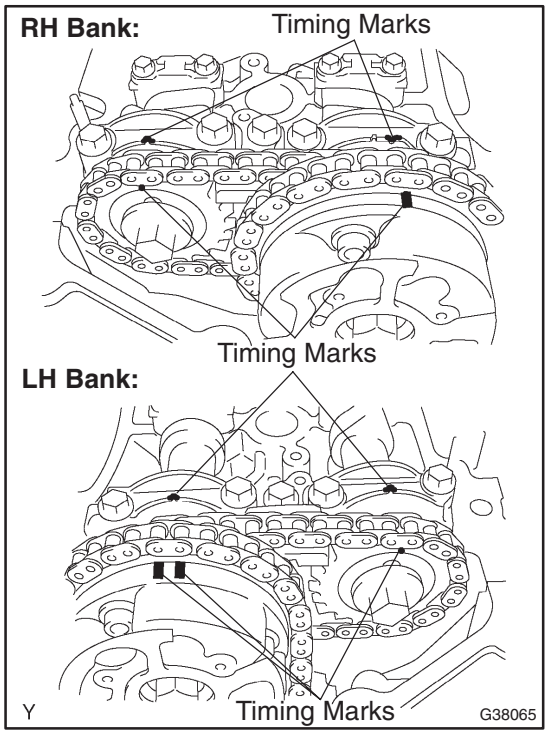
8. REMOVE CYLINDER HEAD COVER SUB–ASSY LH

(a) Remove the 10 bolts, 3 seal washers, 2 nuts, cylinder head cover and gasket.



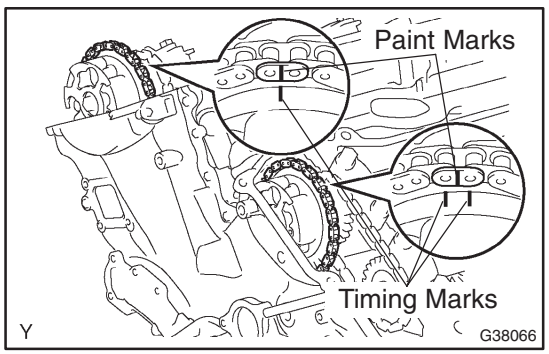
9. SET NO. 1 CYLINDER TO TDC/COMPRESSION

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



(b) Check that the timing marks of the camshaft timing gears are aligned with the timing marks of the bearing caps as shown in the illustration.

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

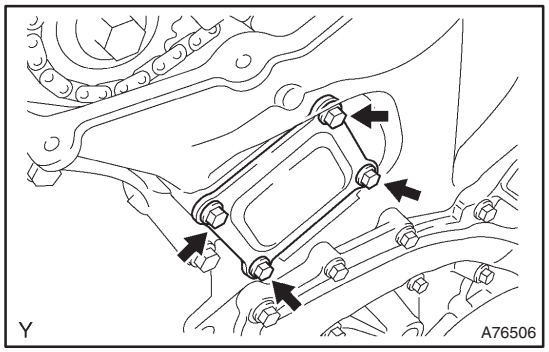


(c) Place paint marks on the No.1 chain links that correspond with the timing marks of the camshaft timing gears.

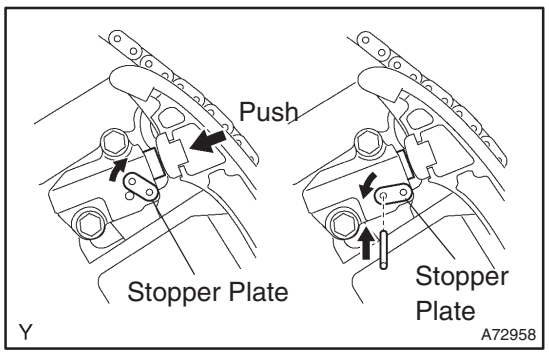
10. REMOVE CHAIN TENSIONER ASSY NO.1

NOTICE:

- **Never rotate the crankshaft with the chain tensioner removed.**
- **When rotating the camshaft with the timing chain removed, rotate the crankshaft counterclockwise 40° from the TDC first.**



(a) Remove the 4 bolts, timing chain cover plate and gasket.



(b) While turning the stopper plate of the tensioner clockwise, push in the plunger of the chain tensioner as shown in the illustration.

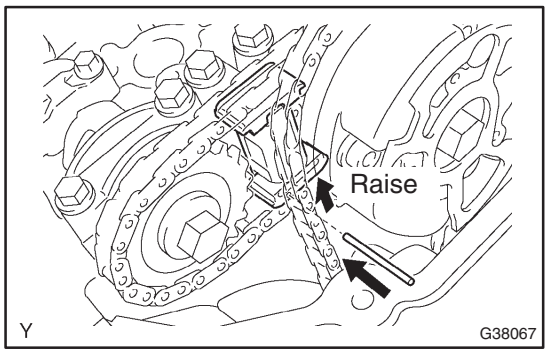
(c) While turning the stopper plate of the tensioner counterclockwise, insert a bar of ϕ3.5 mm (0.138 in.) into the holes on the stopper plate and tensioner to fix the stopper plate.

(d) Remove the 2 bolts and chain tensioner.

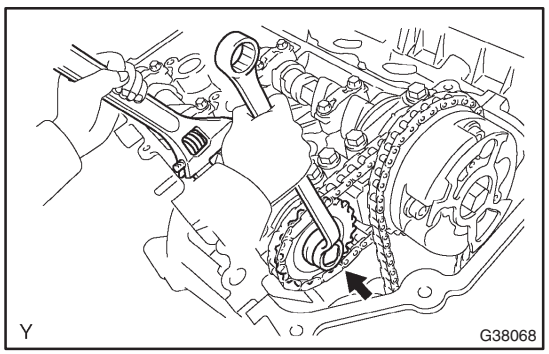
11. REMOVE NO.2 CAMSHAFT

NOTICE:

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



(a) While raising the chain tensioner No.2, insert a pin of ϕ1.0 mm (0.039 in.) into the hole to fix it.

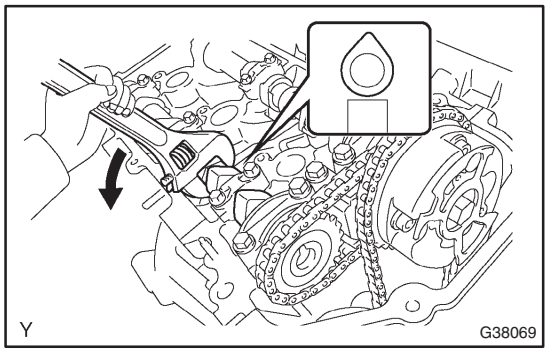


(b) Hold the hexagonal portion of the No.2 camshaft with a wrench, and remove the camshaft timing gear set bolt.

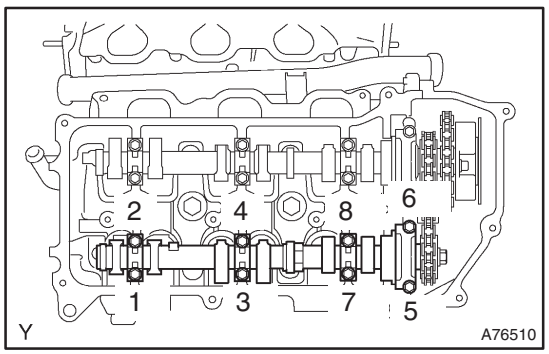
NOTICE:

Be careful not to damage the cylinder head and valve lifter with the wrench.

(c) Separate the camshaft timing gear from the No.2 camshaft.

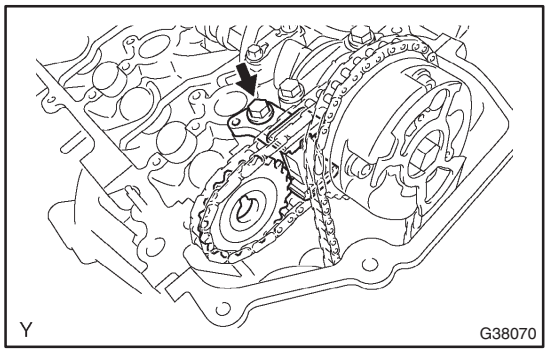


(d) Rotate the camshaft counterclockwise using a wrench so that the cam lobes of No.1 cylinder face upward as shown in the illustration.



(e) Using several steps, loosen and remove the 8 bearing cap bolts uniformly in the sequence as shown in the illustration.

(f) Remove the 4 bearing caps and No.2 camshaft.



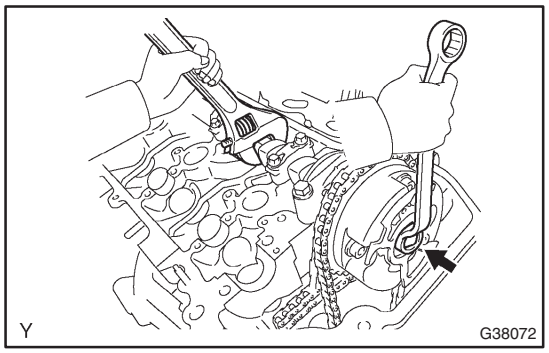
12. REMOVE CHAIN TENSIONER ASSY NO.2

(a) Remove the chain tensioner No.2 bolt, and then remove the chain tensioner No.2 and camshaft timing gear.

13. REMOVE CAMSHAFT

NOTICE:

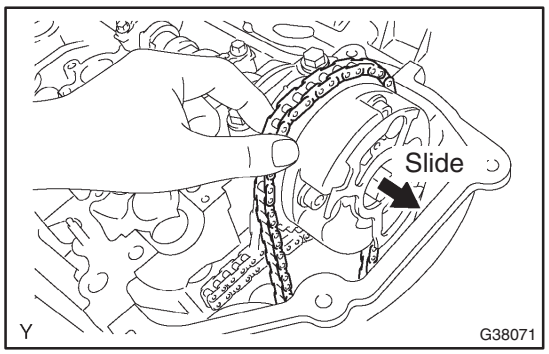
As the thrust clearance of the camshaft is small, the camshaft must be kept level while it is being removed. If the camshaft is not kept level, the portion of the cylinder head which receives the shaft thrust may crack or be damaged, causing the camshaft to seize or break. To avoid this, the following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



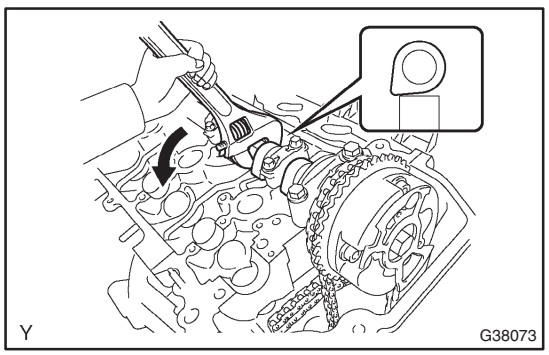
(a) Hold the hexagonal portion of the No.1 camshaft with a wrench, and loosen the camshaft timing gear set bolt.

NOTICE:

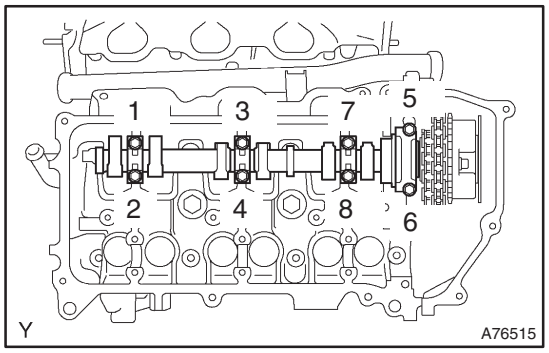
- **Be careful not to damage the cylinder head and valve lifter with the wrench.**
- **Do not disassemble the camshaft timing gear assembly.**



(b) Slide the camshaft timing gear and separate the No.1 chain from the camshaft timing gear.

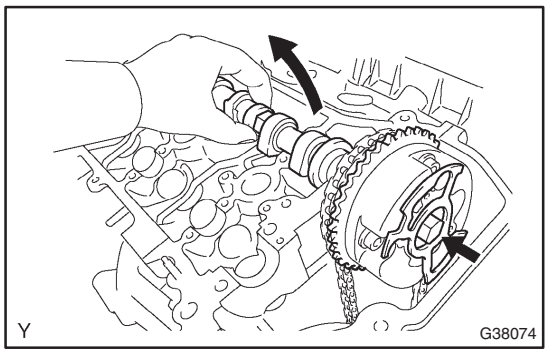


(c) Rotate the No.1 camshaft counterclockwise using a wrench so that the cam lobes of No.1 cylinder face downward as shown in the illustration.

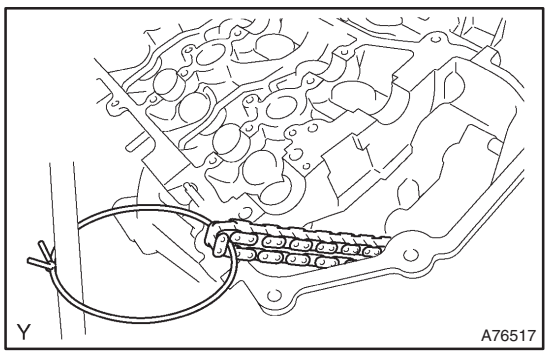


(d) Using several steps, loosen and remove the 8 bearing cap bolts in the sequence as shown in the illustration.

(e) Remove the 4 bearing caps.



(f) Remove the camshaft timing gear set bolt with the No.1 camshaft lifted up, and then remove the No.1 camshaft and camshaft timing gear w/ No.2 chain.



(g) Tie the No.1 chain with a string as shown in the illustration.

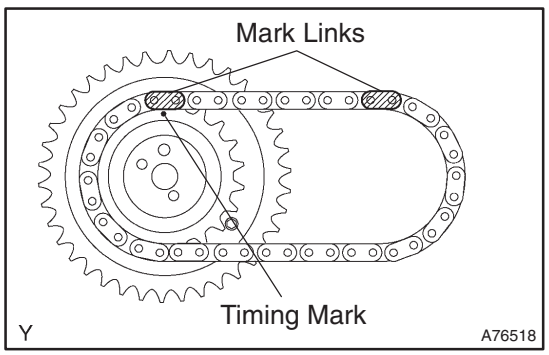
NOTICE:

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

14. INSTALL CAMSHAFT

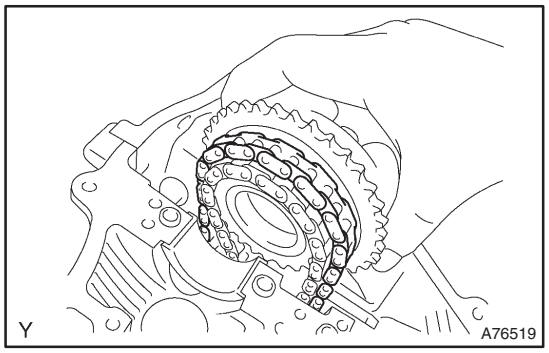
NOTICE:

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

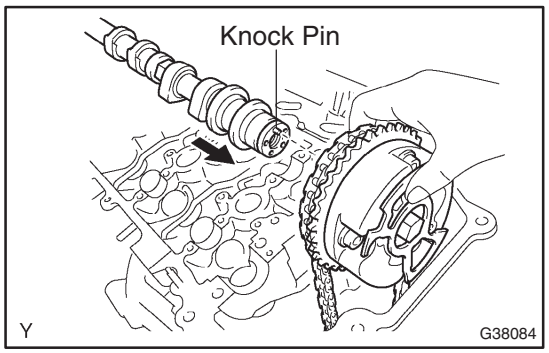


(a) Align the mark link (yellow) with the timing mark (1–dot mark) of the camshaft timing gear as shown in the illustration.

(b) Apply new engine oil to the thrust portions and journals of the camshafts.

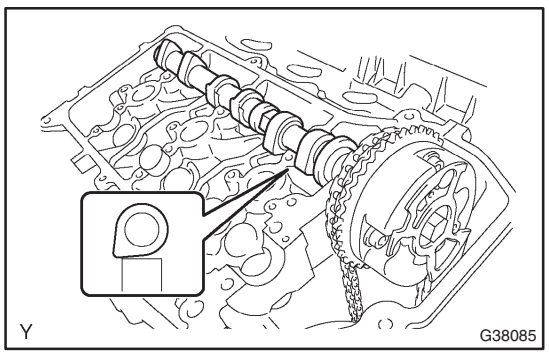


(c) Temporarily put the No.1 chain on the No.2 chain of the camshaft timing gear.

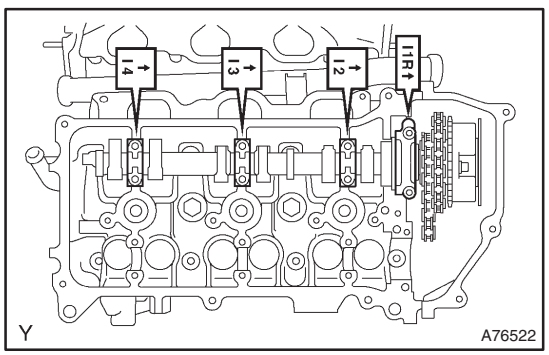


(d) Align the knock pin hole of the camshaft timing gear with the knock pin of the No.1 camshaft, and insert the No.1 camshaft into the camshaft timing gear.

(e) Temporarily install the camshaft timing gear set bolt.

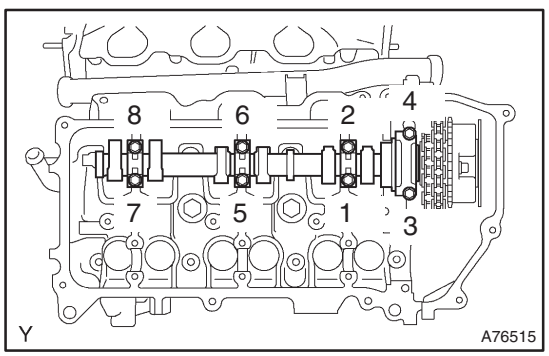


(f) Set the No.1 camshaft onto the RH cylinder head with the cam lobes of the No.1 cylinder facing downward as shown in the illustration.



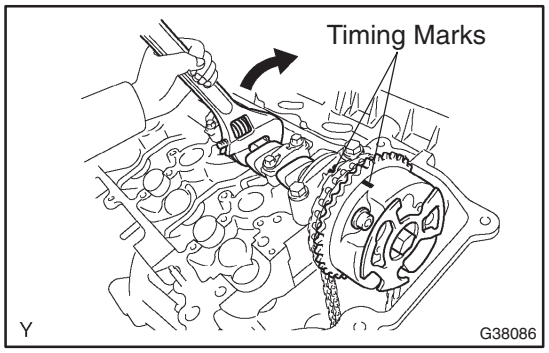
(g) Install the 4 bearing caps in their proper locations.

(h) Apply a light coat of engine oil to the threads and under the heads of the bearing cap bolts.

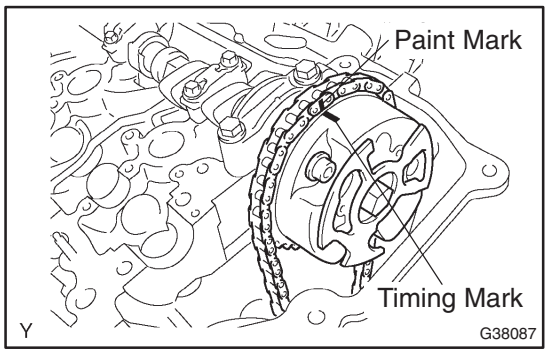


(i) Using several steps, install and tighten the 8 bearing cap bolts uniformly in the sequence as shown in the illustration.

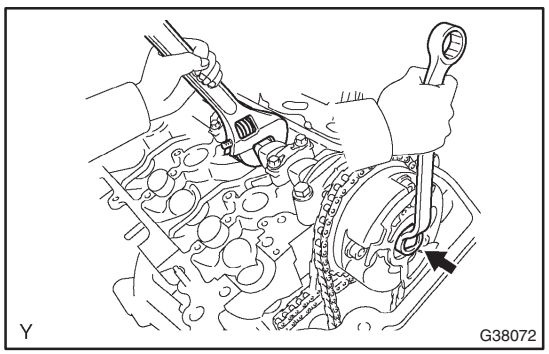
Torque:
9.0 N·m (92 kgf·cm, 80 in.·lbf) for 10 mm (0.39 in.) head
24 N·m (245 kgf·cm, 18 ft·lbf) for 12 mm (0.47 in.) head



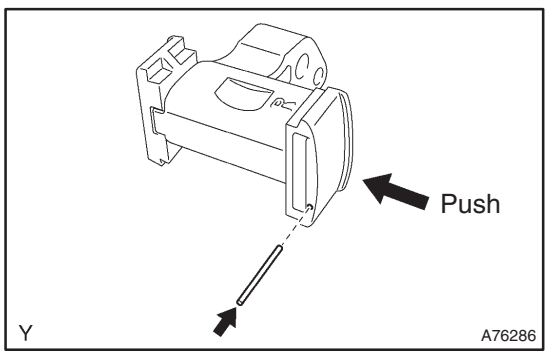
(j) Rotate the No.1 camshaft clockwise using a wrench so that the timing mark of the camshaft timing gear is aligned with the timing mark of the camshaft bearing cap.



(k) Align the paint mark of the No.1 chain with the timing mark of the camshaft timing gear.

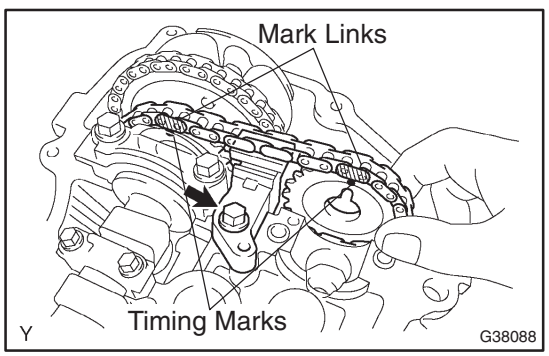


(l) Hold the hexagonal portion of the No.1 camshaft with a wrench, and tighten the camshaft timing gear set bolt.
Torque: 100 N·m (1,020 kgf·cm, 74 ft·lbf)



15. INSTALL CHAIN TENSIONER ASSY NO.2

(a) While pushing in the tensioner, insert a pin of ϕ1.0 mm (0.039 in.) into the hole to fix it.



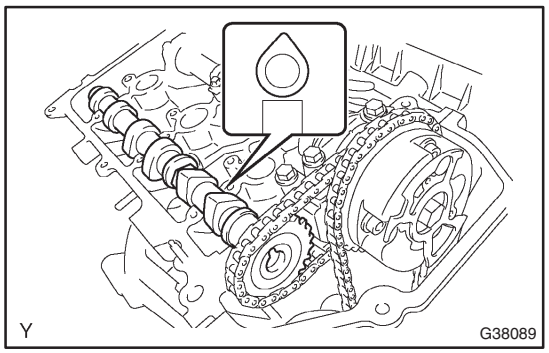
(b) Temporarily install the camshaft timing gear and chain tensioner No.2 and align the mark links (yellow) with the timing marks (1–dot mark) of the camshaft timing gears.

(c) Tighten the chain tensioner No.2 bolt.
Torque: 19 N·m (194 kgf·cm, 14 ft·lbf)

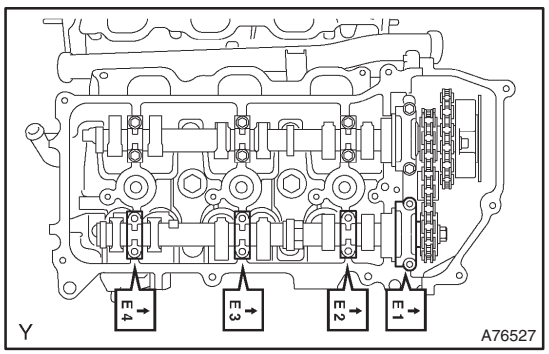
16. INSTALL NO.2 CAMSHAFT

NOTICE:

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

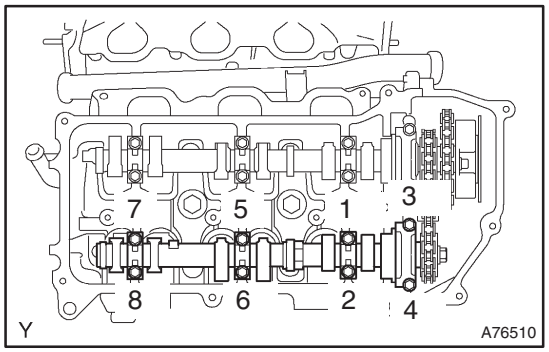


(a) Set the No.2 camshaft onto the RH cylinder head with the cam lobes of No.1 cylinder facing upward as shown in the illustration.



(b) Install the 4 bearing caps in their proper locations.

(c) Apply a light coat of engine oil to the threads and under the heads of the bearing cap bolts.

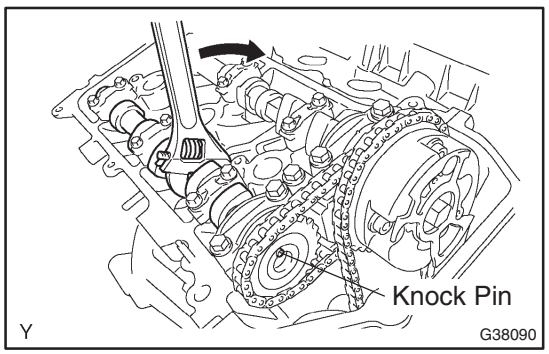


(d) Using several steps, install and tighten the 8 bearing cap bolts uniformly in the sequence as shown in the illustration.

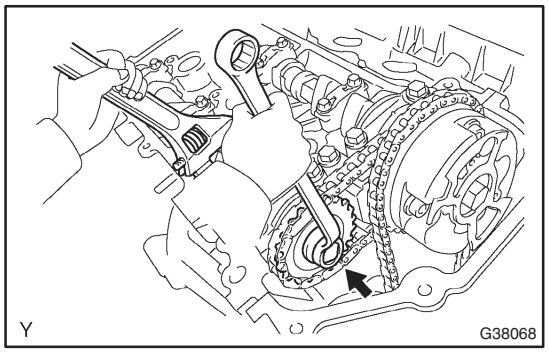
Torque:

9.0 N·m (92 kgf·cm, 80 in.·lbf) for 10 mm (0.39 in.) head

24 N·m (245 kgf·cm, 18 ft·lbf) for 12 mm (0.47 in.) head

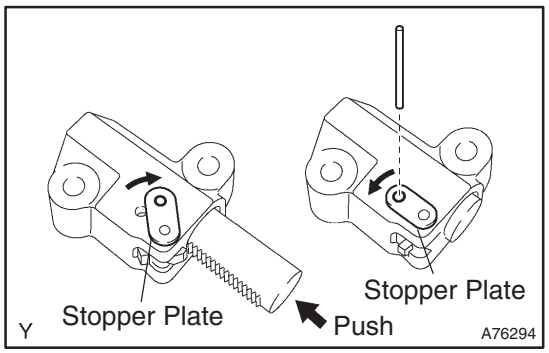


(e) Rotate the No.2 camshaft clockwise using a wrench so that the knock pin of the No.2 camshaft is aligned with the knock pin hole of the camshaft timing gear.



(f) Hold the hexagonal portion of the No.2 camshaft with a wrench, and install the camshaft timing gear set bolt.
Torque: 100 N·m (1,020 kgf·cm, 74 ft·lbf)

(g) Remove the pin from the chain tensioner No.2.



17. INSTALL CHAIN TENSIONER ASSY NO.1

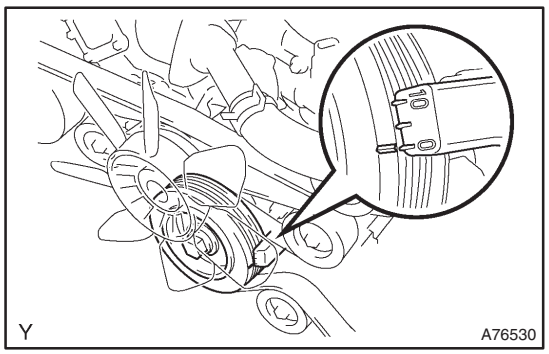
(a) While turning the stopper plate of the tensioner clockwise, push in the plunger of the tensioner as shown in the illustration.

(b) While turning the stopper plate of the tensioner counterclockwise, insert a bar of ϕ3.5 mm (0.138 in.) into the holes on the stopper plate and tensioner to fix the stopper plate.

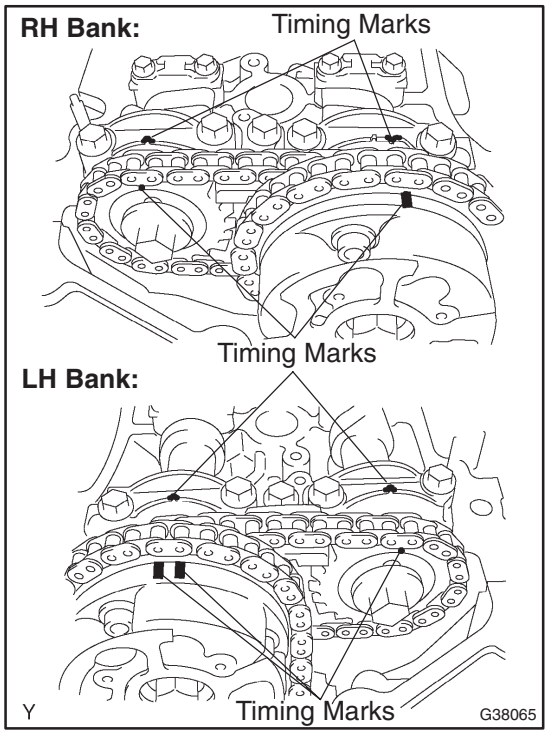
(c) Install the chain tensioner with the 2 bolts.
Torque: 10 N·m (102 kgf·cm, 7 ft·lbf)

(d) Remove the bar from the chain tensioner.

(e) Install a new gasket and the timing chain cover plate with the 4 bolts.
Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)



(f) Turn the crankshaft pulley 2 complete revolutions slowly, and align the notch with the timing mark ”0” of the timing chain cover.



(g) Check that the timing marks of the camshaft timing gears are aligned with the timing marks of the bearing cap as shown in the illustration.

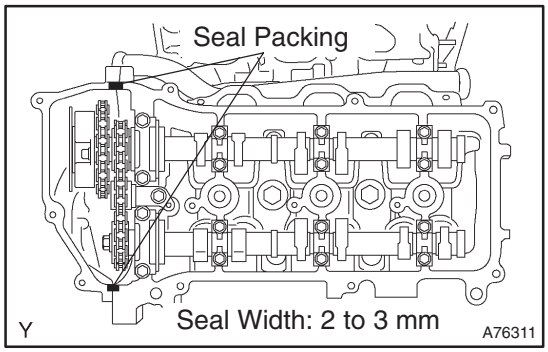
18. SET NO. 1 CYLINDER TO TDC/COMPRESSION (SEE PAGE 14–127)

19. INSPECT VALVE CLEARANCE (SEE PAGE 14–91)

20. ADJUST VALVE CLEARANCE (SEE PAGE 14–91)

21. INSTALL CYLINDER HEAD COVER SUB–ASSY LH

(a) Remove any old packing (FIPG) material and be careful not to drop any oil on the contact surfaces of the cylinder head, timing chain cover and cylinder head cover.



(b) Apply a continuous bead of seal packing (diameter: 2 to 3 mm (0.08 to 0.12 in.)) to the cylinder head and timing chain cover as shown in the illustration.

Seal packing: Part No. 08826–00080 or equivalent

NOTICE:

Install the cylinder head cover within 3 minutes after applying seal packing. After installing it, cylinder head cover bolts and nuts must be tightened within 15 minutes. Otherwise the seal packing must be removed and reapplied.

(c) Install the seal washers to the bolts.

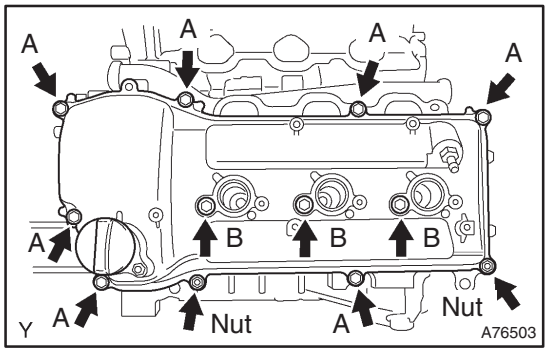
(d) Install the cylinder head cover with the 10 bolts and 2 nuts. Tighten the bolts and nuts uniformly in several steps.

Torque:

10 N·m (102 kgf·cm, 7 ft·lbf) for bolt A

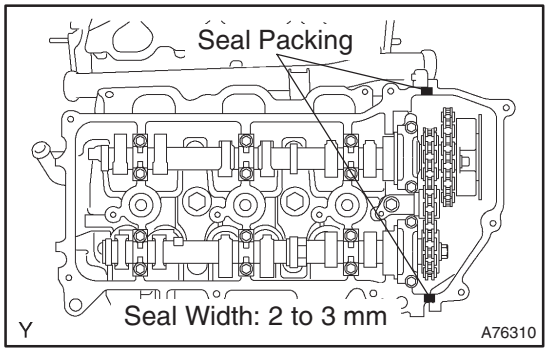
9.0 N·m (92 kgf·cm, 80 in.·lbf) for bolt B

9.0 N·m (92 kgf·cm, 80 in.·lbf) for nut



22. INSTALL CYLINDER HEAD COVER SUB–ASSY RH

(a) Remove any old packing (FIPG) material and be careful not to drop any oil on the contact surfaces of the cylinder head, timing chain cover and cylinder head cover.



(b) Apply a continuous bead of seal packing (diameter: 2 to 3 mm (0.08 to 0.12 in.)) to the cylinder head and timing chain cover as shown in the illustration.

Seal packing: Part No. 08826–00080 or equivalent

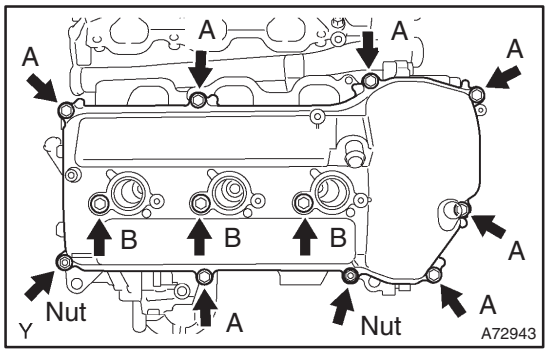
NOTICE:

Install the cylinder head cover within 3 minutes after applying seal packing. After installing it, cylinder head cover bolts and nuts must be tightened within 15 minutes. Otherwise the seal packing must be removed and reapplied.

(c) Install the seal washers to the bolts.

(d) Install the cylinder head cover with the 10 bolts and 2 nuts. Tighten the bolts and nuts uniformly in several steps.

Torque:
10 N·m (102 kgf·cm, 7 ft·lbf) for bolt A
9.0 N·m (92 kgf·cm, 80 in.·lbf) for bolt B
9.0 N·m (92 kgf·cm, 80 in.·lbf) for nut



23. INSTALL IGNITION COIL ASSY
Torque: 10 N·m (102 kgf·cm, 7 ft·lbf)

24. INSTALL INTAKE AIR SURGE TANK

(a) Install a new gasket to the intake air surge tank.

(b) Using the socket hexagon wrench 8, install the intake air surge tank with the 4 bolts.
Torque: 28 N·m (286 kgf·cm, 21 ft·lbf)

(c) Install the 2 intake air surge tank nuts.
Torque: 28 N·m (286 kgf·cm, 21 ft·lbf)

(d) Install the 2 surge tank stays with the 4 bolts.
Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)

(e) Install the oil baffle plate with the bolt.
Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)

(f) Install the throttle body bracket with the 2 bolts.
Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)

(g) Install the 3 wire harness clamps and hose clamp.

(h) Connect the throttle body w/ motor connector.

(i) Connect the 2 VSV connectors.

(j) Connect the ventilation hose.

(k) Connect the fuel vapor feed hose.

(l) Connect the 2 water by–pass hoses.

25. INSTALL AIR CLEANER ASSY (SEE PUB. NO. RM1017E, PAGE 10–7)

26. CONNECT VENTILATION HOSE NO.2 (SEE PUB. NO. RM1017E, PAGE 10–7)

27. ADD ENGINE COOLANT (SEE PAGE 16–19)

28. CHECK FOR ENGINE COOLANT LEAKS (SEE PAGE 16–17)

29. INSTALL V–BANK COVER

(a) Install the V–bank cover with the 2 nuts.
Torque: 7.5 N·m (76 kgf·cm, 66 in.·lbf)

30. INSPECT IGNITION TIMING (SEE PUB. NO. RM1017E, PAGE 14–1)
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