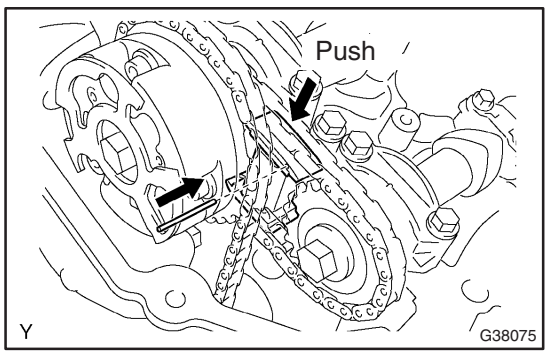
REPLACEMENT

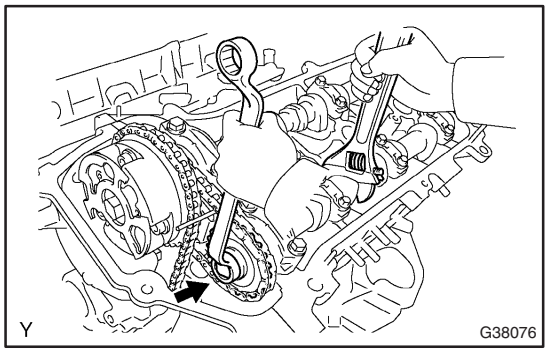
1. DRAIN ENGINE COOLANT (SEE PAGE 16–19)
2. REMOVE V–BANK COVER (SEE PUB. NO. RM1017E, PAGE 10–7)
3. DISCONNECT VENTILATION HOSE NO.2 (SEE PUB. NO. RM1017E, PAGE 10–7)
4. REMOVE AIR CLEANER ASSY (SEE PUB. NO. RM1017E, PAGE 10–7)
5. REMOVE INTAKE AIR SURGE TANK (SEE PAGE 14–141)
6. REMOVE IGNITION COIL ASSY
7. REMOVE CYLINDER HEAD COVER SUB–ASSY RH (SEE PAGE 14–141)
8. REMOVE CYLINDER HEAD COVER SUB–ASSY LH (SEE PAGE 14–141)
9. SET NO. 1 CYLINDER TO TDC/COMPRESSION (SEE PAGE 14–127)
10. REMOVE CHAIN TENSIONER ASSY NO.1 (SEE PAGE 14–127)
11. REMOVE NO.4 CAMSHAFT SUB–ASSY

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 pushing down the chain tensioner No.3, insert a pin of ϕ1.0 mm (0.039 in.) into the hole to fix it.

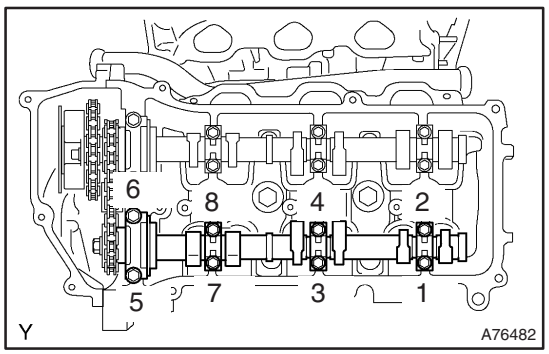


(b) Hold the hexagonal portion of the No.4 camshaft with a wrench, and remove the camshaft timing gear set bolt.

NOTICE:

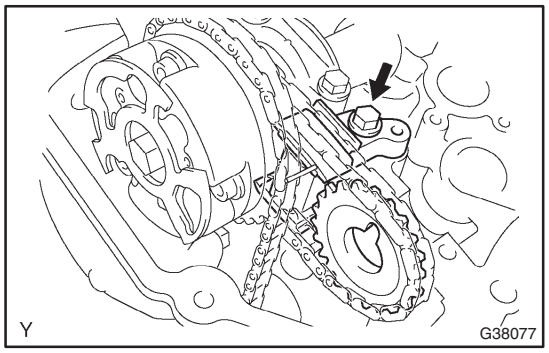
Be careful not to damage the cylinder head and valve lifter with the wrench.

(c) Separate the camshaft timing gear from the No.4 camshaft.



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

(e) Remove the 4 bearing caps and No.4 camshaft.



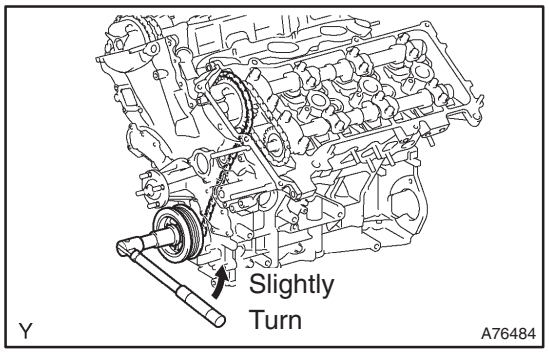
12. REMOVE CHAIN TENSIONER ASSY NO.3

(a) Remove the chain tensioner No.3 bolt, and then remove the chain tensioner No.3 and camshaft timing gear.

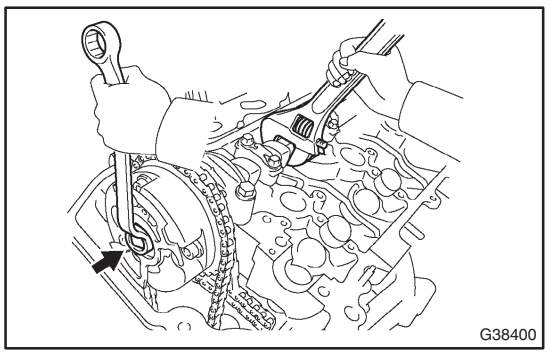
13. REMOVE NO.3 CAMSHAFT SUB–ASSY

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.



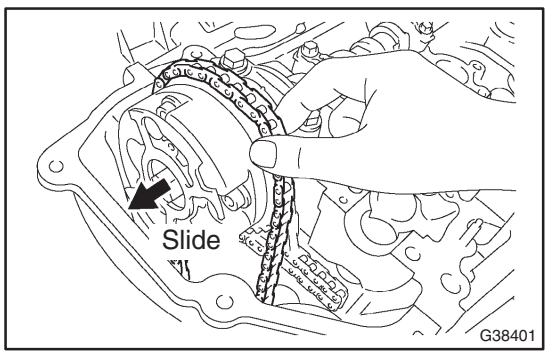
(a) Release the chain tension between the camshaft timing gear (LH bank) and crankshaft timing gear by turning the crankshaft pulley counterclockwise slightly.



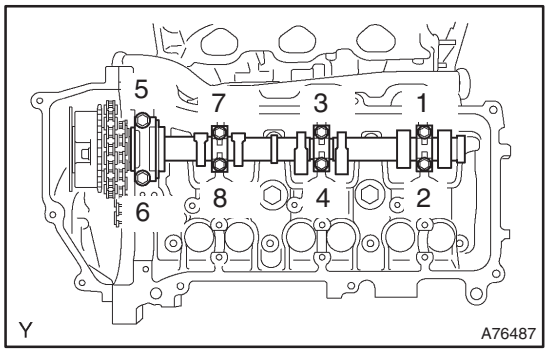
(b) Hold the hexagonal portion of the No.3 camshaft with a wrench, and loosen the camshaft timing gear set bolt.

NOTICE:

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

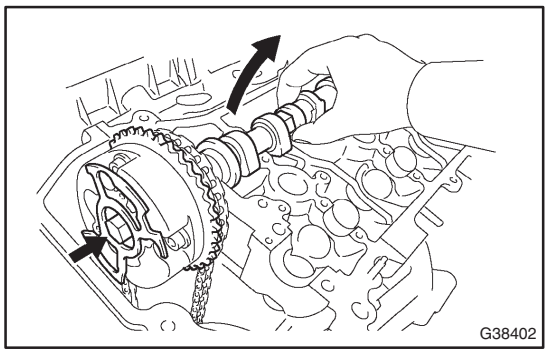


(c) Slide the camshaft timing gear and separate the No.1 chain from the camshaft timing gear.

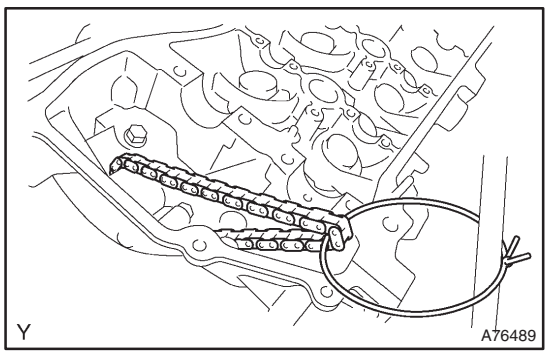


(d) Using several steps, loosen and remove the 8 bearing cap bolts uniformly in the sequence as shown in the illustration.

(e) Remove the 4 bearing caps.



(f) Remove the camshaft timing gear set bolt with the No.3 camshaft lifted up, and then remove the No.3 camshaft and camshaft timing gear w/ No.2 chain.



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

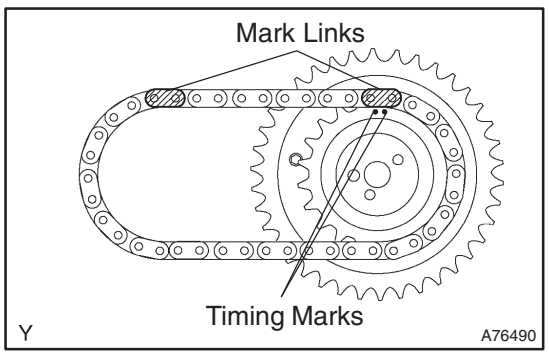
NOTICE:

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

14. INSTALL NO.3 CAMSHAFT SUB–ASSY

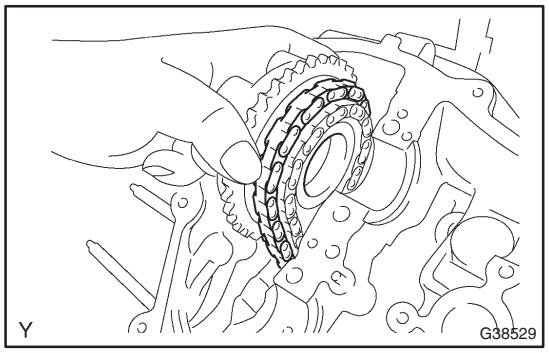
NOTICE:

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.

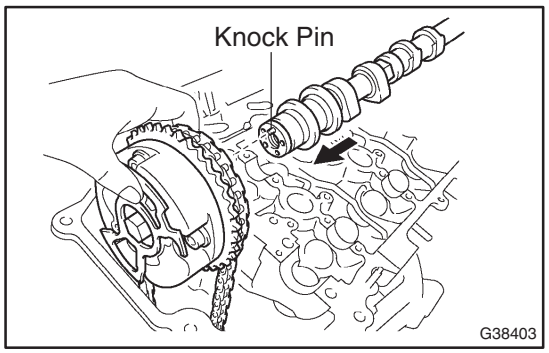


(a) Align the mark link (yellow) with the timing mark (2–dot mark) of the camshaft timing gear as shown in the illustration.

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

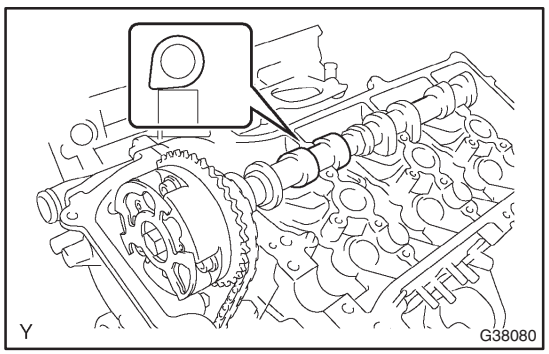


(c) Temporarily put the No.1 chain on the No.2 chain of the camshaft timing gear.

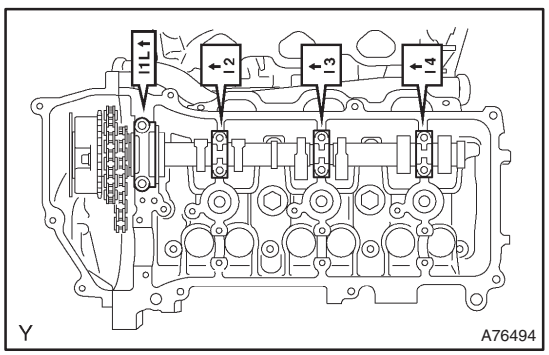


(d) Align the knock pin hole of the camshaft timing gear with the knock pin of the No.3 camshaft, and insert the No.3 camshaft into the camshaft timing gear.

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

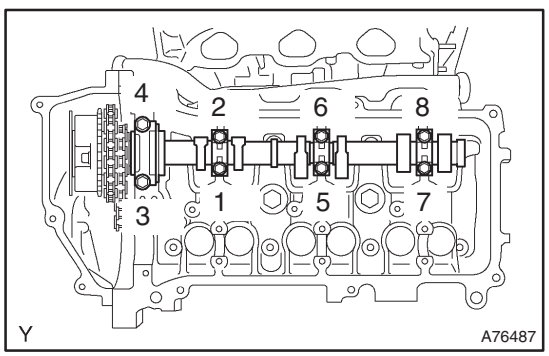


(f) Set the No.3 camshaft onto the LH cylinder head with the cam lobes of the No.2 cylinder facing downward as shown in the illustration.



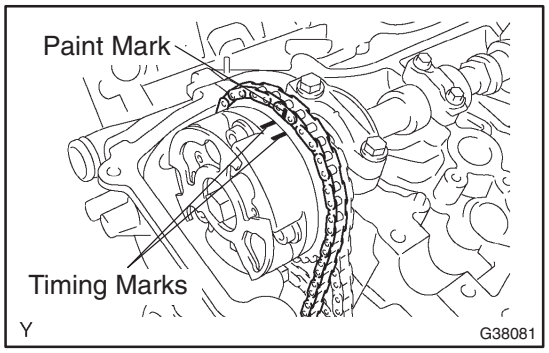
(g) Install the 4 bearing caps in their proper locations.

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

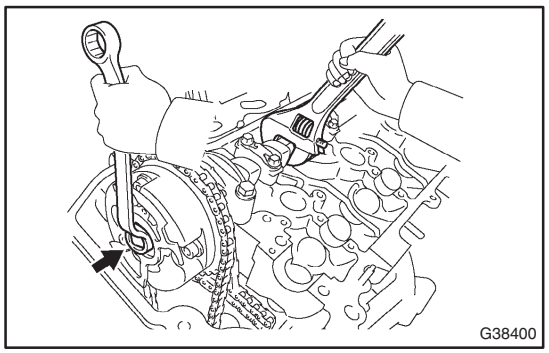


(i) Using several steps, install and tighten the 8 bearing cap bolts uniformly in the sequence as shown in the illustration.

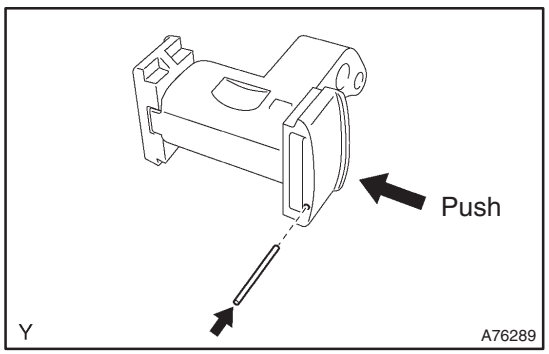
Torque:
9.0 N·m (92 kgf·cm, 80 in.·lbf) for 10 mm (0.39 in.) head
24 N·m (245 kgf·cm, 18 ft·lbf) for 12 mm (0.47 in.) head



(j) Set the paint mark of the No.1 chain between the timing marks of the camshaft timing gear.

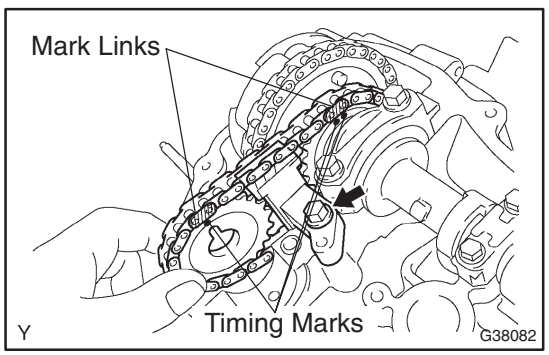


(k) Hold the hexagonal portion of the No.3 camshaft with a wrench, and tighten the camshaft timing gear set bolt.
Torque: 100 N·m (1,020 kgf·cm, 74 ft·lbf)



15. INSTALL CHAIN TENSIONER ASSY NO.3

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



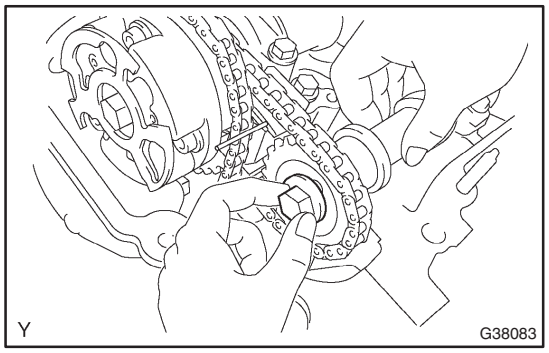
(b) Temporarily install the camshaft timing gear and chain tensioner No.3 and align the mark links (yellow) with the timing marks (1–dot mark and 2–dot mark) of the camshaft timing gears.

(c) Tighten the chain tensioner No.3 bolt.
Torque: 19 N·m (194 kgf·cm, 14 ft·lbf)

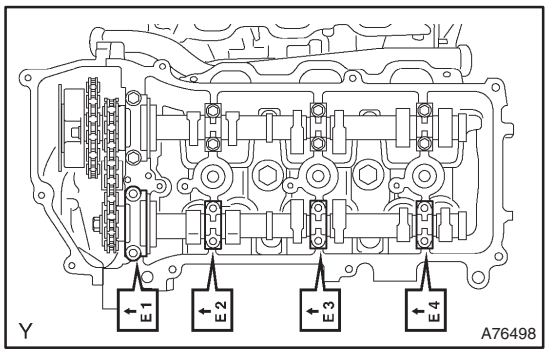
16. INSTALL NO.4 CAMSHAFT SUB–ASSY

NOTICE:

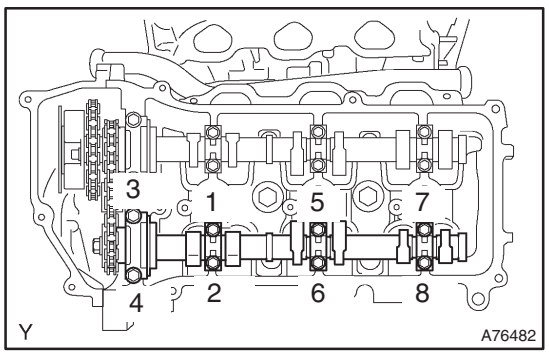
As the thrust clearance of the camshaft is small, the camshaft must be kept level while it is being installed. If the camshaft is not kept level, the portion of the cylinder head which receives the shaft thrust may crack or be damaged, causing the camshaft to seize or break. To avoid this, the following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



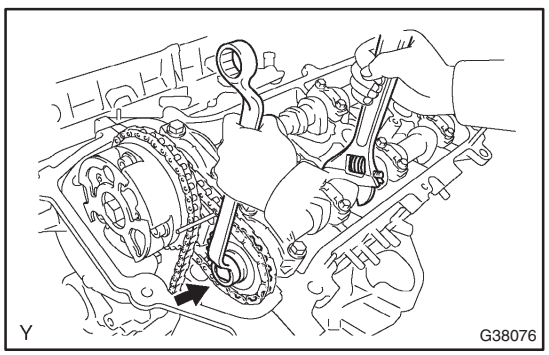
(a) Align the knock pin hole of the camshaft timing gear with the knock pin of the No.4 camshaft, and insert the No.4 camshaft into the camshaft timing gear.
(b) Temporarily install the camshaft timing gear set bolt.



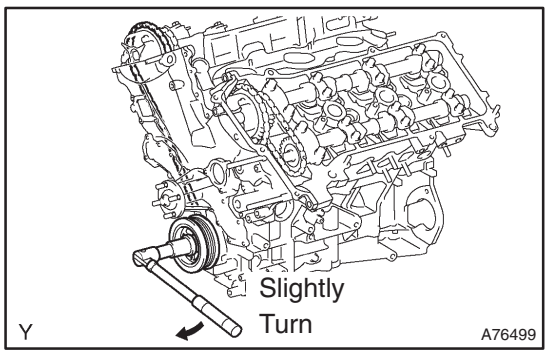
(c) Install the 4 bearing caps in their proper locations.
(d) Apply a light coat of engine oil to the threads of the bearing cap bolts.



(e) 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



(f) Hold the hexagonal portion of the No.4 camshaft with a wrench, and tighten 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.3.



(h) Release the chain tension between the camshaft timing gear (RH bank) and crankshaft timing gear by turning the crankshaft pulley clockwise slightly.

17. INSTALL CHAIN TENSIONER ASSY NO.1 (SEE PAGE 14–127)
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 (SEE PAGE 14–141)
22. INSTALL CYLINDER HEAD COVER SUB–ASSY RH (SEE PAGE 14–141)
23. INSTALL IGNITION COIL ASSY
Torque: 10 N·m (102 kgf·cm, 7 ft·lbf)
24. INSTALL INTAKE AIR SURGE TANK (SEE PAGE 14–141)
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)
SST 09843–18040