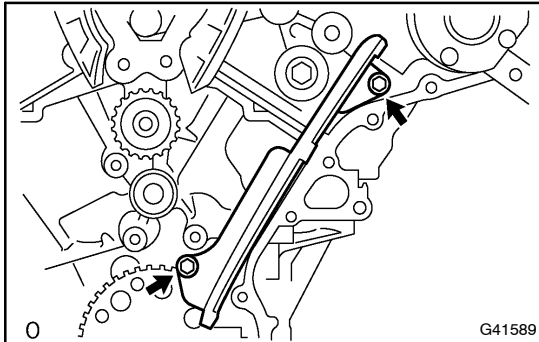


## REPLACEMENT

1. REMOVE ENGINE ASSEMBLY WITH TRANSAXLE (SEE PAGE 14-21)
2. REMOVE CHAIN SUB-ASSY (SEE PAGE 14-142)



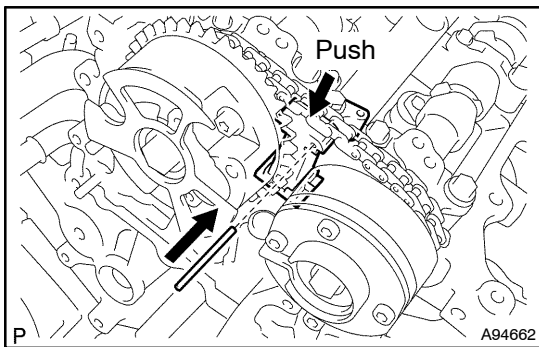
3. REMOVE CHAIN VIBRATION DAMPER NO.1
  - (a) Remove the 2 bolts and chain vibration damper No.1.

4. REMOVE CHAIN VIBRATION DAMPER NO.2
5. REMOVE INTAKE MANIFOLD (SEE PAGE 14-188)
6. REMOVE WATER OUTLET (SEE PAGE 14-188)

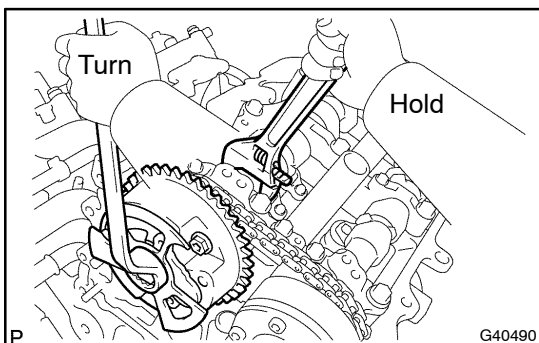
7. REMOVE CAMSHAFT TIMING GEARS AND NO.2 CHAIN (LH BANK)

### 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 be seized or to be broken. To avoid this, the following steps should be carried out.



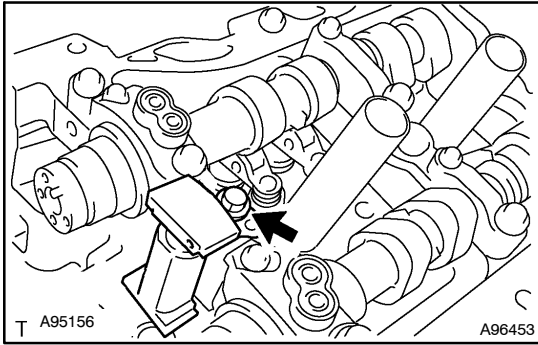
- (a) While pushing down the chain tensioner No.3, insert a pin of  $\phi 1.0$  mm (0.039 in.) into the hole to fix it.



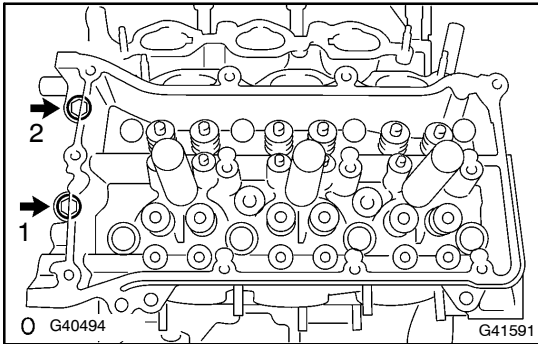
- (b) Hold each hexagonal portion of the No.3 camshaft and No.4 camshaft with a wrench, and remove the camshaft timing gear set bolt.

### NOTICE:

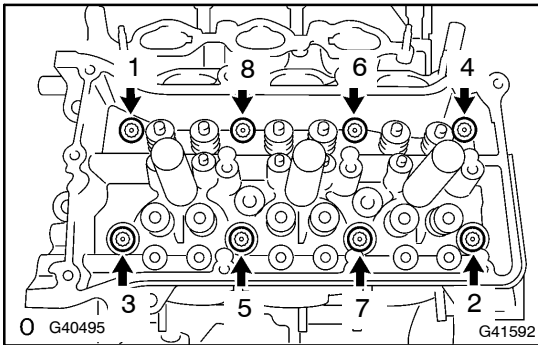
- Be careful not to damage the cylinder head with the wrench.
  - Do not disassemble the camshaft timing gear assembly.
- (c) Separate the camshaft timing gears with the No.2 chain sub-assy.

**8. REMOVE CHAIN TENSIONER ASSY NO.3**

- (a) Remove the bolt and chain tensioner No.3.

**9. REMOVE CAMSHAFTS (SEE PAGE 14-175)****10. REMOVE CAMSHAFT HOUSING SUB-ASSY LH (SEE PAGE 14-175)****11. REMOVE VALVE ROCKER ARM SUB-ASSY NO.1 (SEE PAGE 14-188)****12. REMOVE VALVE LASH ADJUSTER ASSY****13. REMOVE VALVE STEM CAP****14. REMOVE CYLINDER HEAD LH**

- (a) Using several steps, remove the 2 cylinder head bolts on the cylinder head in the sequence as shown in the illustration.



- (b) Using several steps, loosen the 8 cylinder head bolts on the cylinder head uniformly with a 10 mm bi-hexagon wrench in the sequence as shown in the illustration. Remove the 8 cylinder head bolts and plate washers.

**NOTICE:**

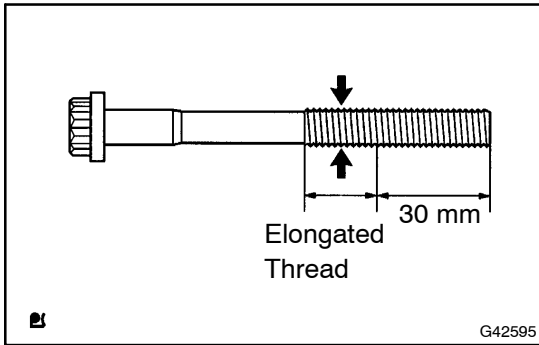
- **Be careful not to drop the plate washers into the cylinder head.**
- **Cylinder head warpage or cracking could result from removing the bolts in the incorrect order.**

- (c) Lift the cylinder head from the dowels on the cylinder block, and place the cylinder head on wooden blocks on a bench.

**NOTICE:**

**Be careful not to damage the contact surfaces of the cylinder head and cylinder block.**

**15. REMOVE CYLINDER HEAD GASKET NO.2**



**16. INSPECT CYLINDER HEAD SET BOLT**

- (a) Using vernier calipers, measure the thread outside diameter of the bolt.

**Standard outside diameter:**

**10.85 to 11.00 mm (0.4272 to 0.4331 in.)**

**Minimum outside diameter:**

**10.7 mm (0.421 in.)**

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

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

- (b) Place the cylinder head gasket on the cylinder block surface with the Lot No. stamp upper side facing upward.

**NOTICE:**

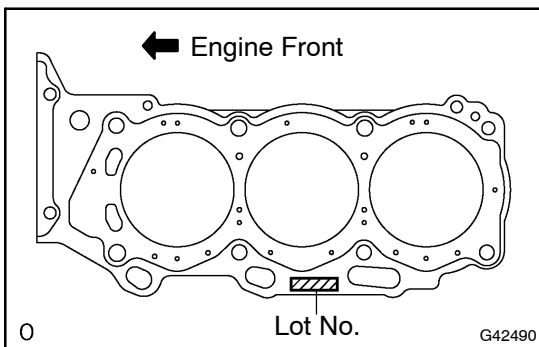
- **Be careful of the installation direction.**
- **Place the cylinder head carefully in order not to damage the gasket with the bottom part of the head.**

**18. INSTALL CYLINDER HEAD LH**

- (a) Place the cylinder head on the cylinder head gasket.
- (b) Install the 8 cylinder head bolts.

**HINT:**

- The cylinder head bolts are tightened in 2 steps (steps (3) and (5)).
  - If any cylinder head bolt is broken or deformed, replace it.
- (1) Apply a light coat of engine oil to the threads of the cylinder head bolts.
  - (2) Install the plate washer to the cylinder head bolt.



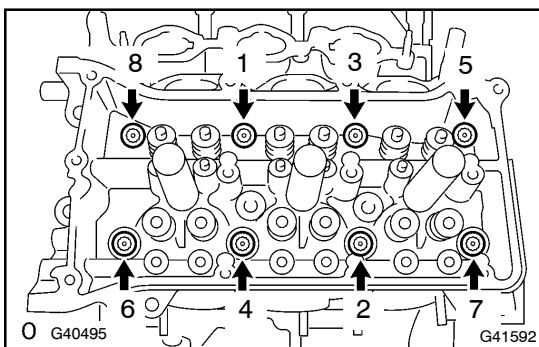
- (3) Using several steps, tighten each bolt uniformly with a 10 mm bi-hexagon wrench in the sequence as shown in the illustration.

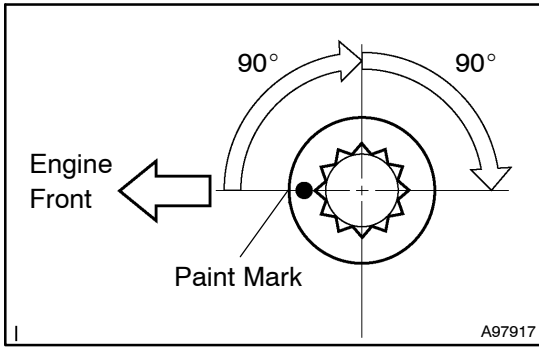
**Torque: 36 N·m (367 kgf·cm, 27 ft·lbf)**

If any one of the cylinder head bolts does not meet the torque specification, replace the cylinder head bolt.

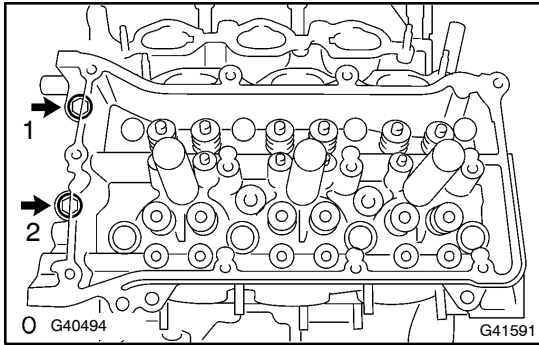
**NOTICE:**

**Do not drop the washers into the cylinder head.**





- (4) Mark the front side of each cylinder head bolt with paint.
- (5) Tighten the cylinder head bolts by another 90° as shown in the illustration.
- (6) Tighten the cylinder head bolts by an additional 90°.
- (7) Check that the painted marks are now at 180° opposite to the engine front.

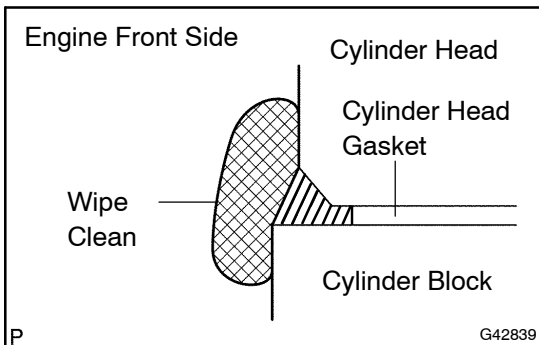


- (c) Install the 2 cylinder head bolts.
  - (1) Apply a light coat of engine oil to the threads of the cylinder head bolts.
  - (2) Using several steps, install and tighten the 2 cylinder head bolts uniformly in the sequence as shown in the illustration.

**Torque: 30 N·m (306 kgf·cm, 22 ft.lbf)**

**NOTICE:**

**Do not use the tightening procedure for a plastic region bolt when tightening bolts 1 and 2 shown in the illustration.**



- (d) Seal packing will seep out on the engine front side. Thoroughly wipe clean any seal packing.

**19. INSTALL VALVE STEM CAP**

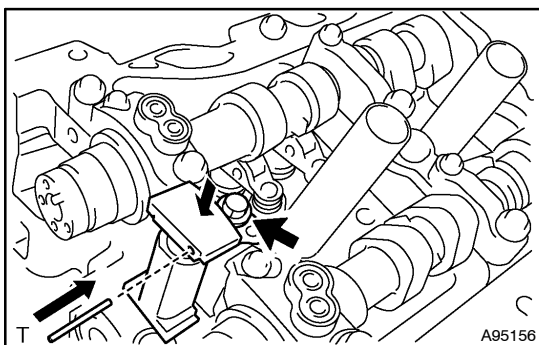
**20. INSTALL VALVE LASH ADJUSTER ASSY (SEE PAGE 14-188)**

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**21. INSTALL VALVE ROCKER ARM SUB-ASSY NO.1 (SEE PAGE 14-188)**

**22. INSTALL CAMSHAFT HOUSING SUB-ASSY LH (SEE PAGE 14-175)**

**23. INSTALL CAMSHAFTS (SEE PAGE 14-175)**



**24. INSTALL CHAIN TENSIONER ASSY NO.3**

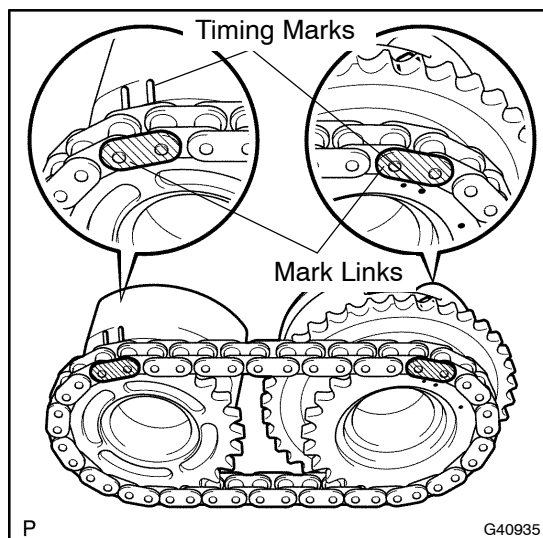
- (a) Install the chain tensioner No.3 with the bolt.
 

**Torque: 21 N·m (214 kgf·cm, 15 ft.lbf)**
- (b) While pushing in the tensioner, insert a pin of  $\phi 1.0$  mm (0.039 in.) into the hole to fix it.

## 25. INSTALL CAMSHAFT TIMING GEARS AND NO.2 CHAIN (LH BANK)

### NOTICE:

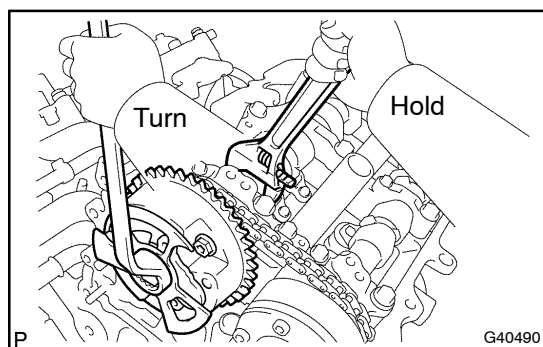
As the thrust clearance of the camshaft is small, the camshaft must be kept level while it is being installed. If the camshaft is not kept level, the portion of the cylinder head which receives the shaft thrust may crack or be damaged, causing the camshaft to be seized or to be broken. To avoid this,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



- Align the mark links (yellow) with the timing marks of the camshaft timing gears as shown in the illustration.
- Apply a small amount of engine oil to the bolt threads and bolt-seating surface.
- Align the knock pin of the camshaft with the pin hole of the camshaft timing gear. Install the camshaft timing gear and camshaft timing exhaust gear LH with the No.2 chain installed.

### NOTICE:

Do not push the camshaft timing gear assembly to the camshaft forcibly when installing it.

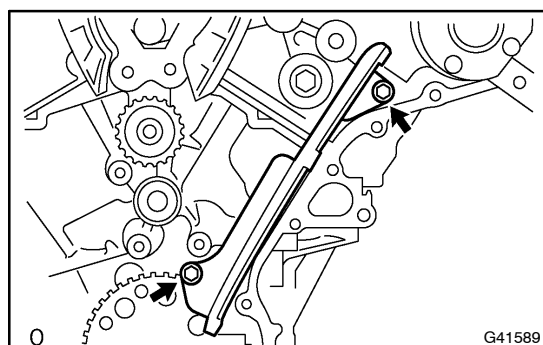


- Hold the hexagonal portion of the camshaft with a wrench, and tighten the 2 bolts.  
**Torque: 100 N·m (1,020 kgf·cm, 74 ft·lbf)**
- Remove the pin from the tensioner.

## 26. INSTALL WATER OUTLET (SEE PAGE 14-188)

## 27. INSTALL INTAKE MANIFOLD (SEE PAGE 14-188)

## 28. INSTALL CHAIN VIBRATION DAMPER NO.2



## 29. INSTALL CHAIN VIBRATION DAMPER NO.1

- Install the chain vibration damper No.1 with the 2 bolts.  
**Torque: 23 N·m (229 kgf·cm, 17 ft·lbf)**

30. INSTALL CHAIN SUB-ASSY (SEE PAGE [14-142](#))
31. INSTALL ENGINE ASSEMBLY WITH TRANSAXLE (SEE PAGE [14-21](#))