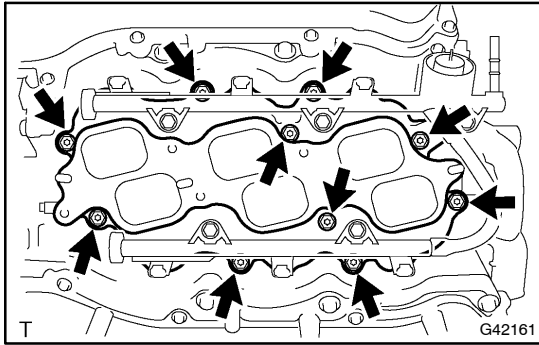


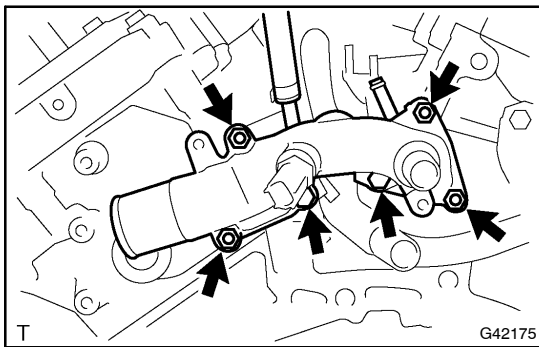
REPLACEMENT

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.2



4. REMOVE INTAKE MANIFOLD

- (a) Uniformly loosen and remove the 6 bolts and 4 nuts, intake manifold and 2 gaskets.



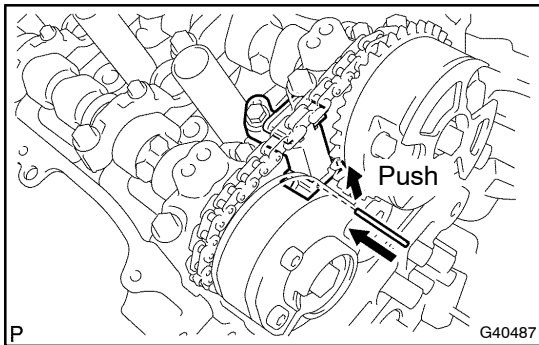
5. REMOVE WATER OUTLET

- (a) Remove the 2 bolts, 4 nuts, water outlet and 2 gaskets.
- (b) Remove the O-ring from the water outlet pipe.

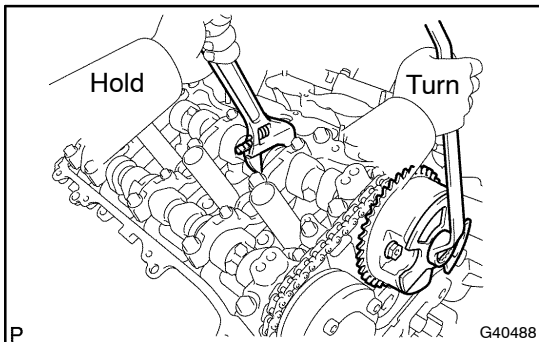
6. REMOVE CAMSHAFT TIMING GEARS AND NO.2 CHAIN (RH BANK)

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.



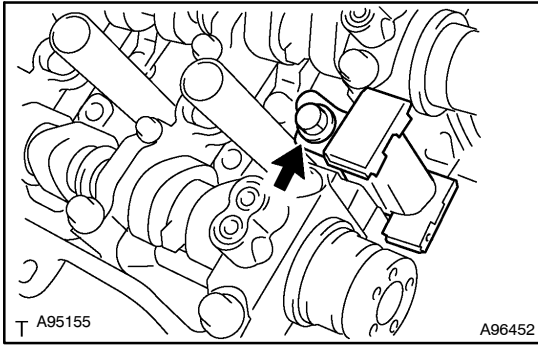
- (a) While raising the chain tensioner No.2, insert a pin of $\phi 1.0$ mm (0.039 in.) into the hole to fix it.



- (b) Hold each hexagonal portion of the camshaft and No.2 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.

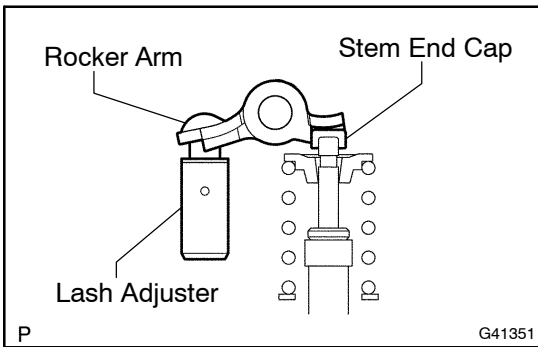


7. REMOVE CHAIN TENSIONER ASSY NO.2

- (a) Remove the bolt and chain tensioner No.2.

8. REMOVE CAMSHAFTS (SEE PAGE 14-157)

9. REMOVE CAMSHAFT HOUSING SUB-ASSY RH (SEE PAGE 14-157)



10. REMOVE VALVE ROCKER ARM SUB-ASSY NO.1

HINT:

Make sure the removed parts are returned to the same places they were removed from.

11. REMOVE VALVE LASH ADJUSTER ASSY

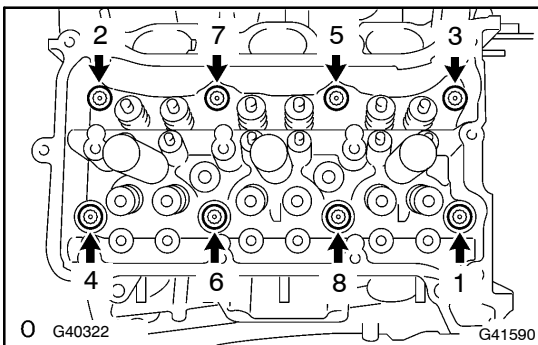
HINT:

Make sure the removed parts are returned to the same places they were removed from.

12. REMOVE VALVE STEM CAP

HINT:

Make sure the removed parts are returned to the same places they were removed from.



13. REMOVE CYLINDER HEAD SUB-ASSY

- (a) 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.

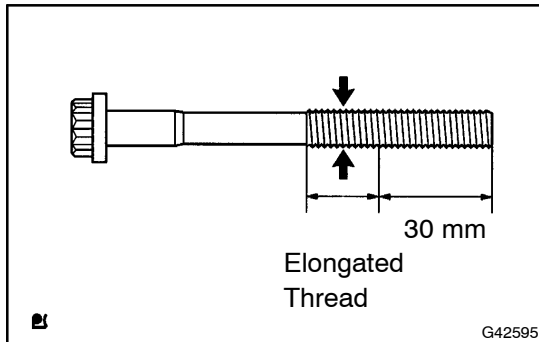
NOTICE:

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

- (b) 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.

14. REMOVE CYLINDER HEAD GASKET**15. INSPECT CYLINDER HEAD SET BOLT**

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

HINT:

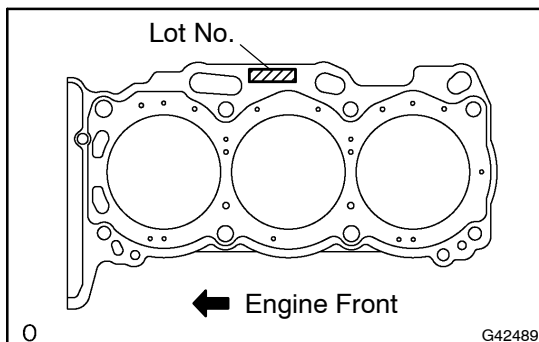
If a visual check reveals no excessively thin areas, check the center of the bolt (see illustration) and find the area that has the lowest diameter.

16. INSTALL CYLINDER HEAD GASKET

- (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:

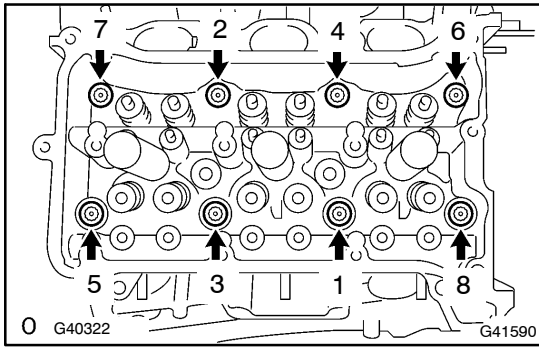
- **Be careful of the installation direction.**
- **Place the cylinder head carefully in order not to damage the gasket with the bottom part of the head.**

**17. INSTALL CYLINDER HEAD SUB-ASSY**

- (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.



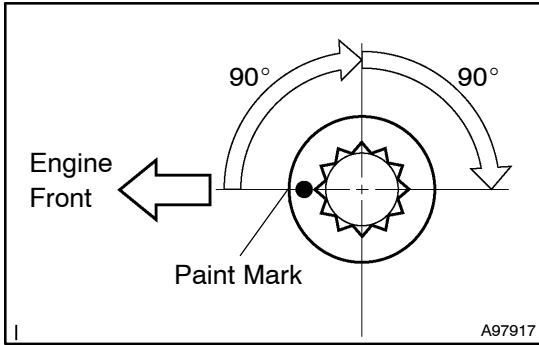
- (3) Using several steps, tighten each bolt uniformly with a 10 mm bi-hexagon wrench in the sequence as shown in the illustration.

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

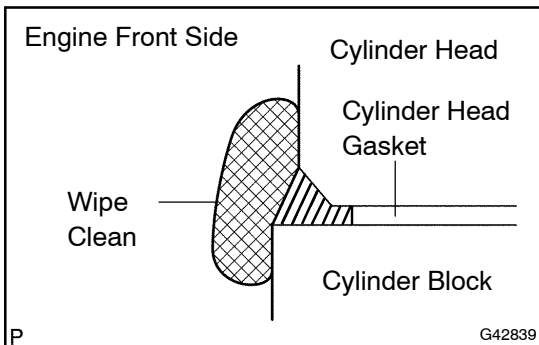
If any one of the cylinder head bolts does not meet the torque specification, replace the cylinder head bolt.

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 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.



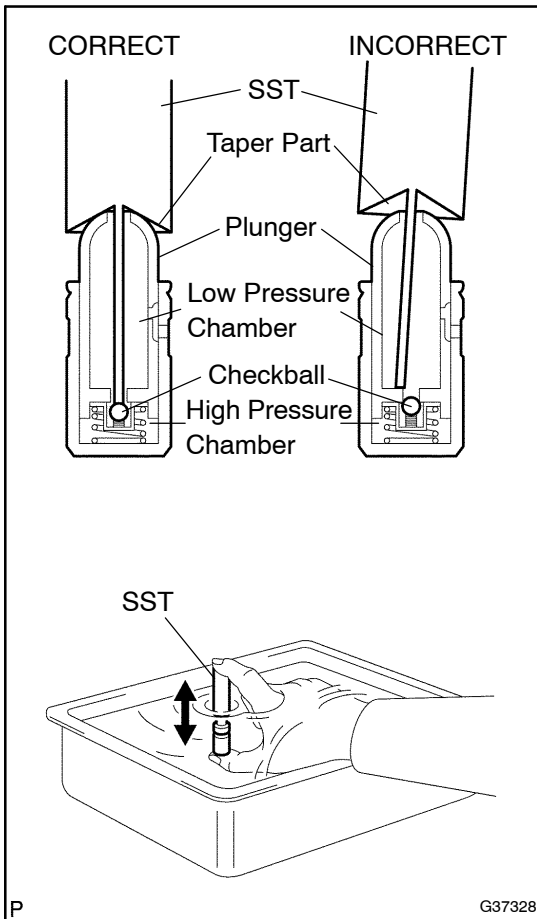
- (c) Seal packing will seep out on the engine front side. Thoroughly wipe clean any seal packing.

18. INSTALL VALVE STEM CAP

- (a) Apply clean engine oil to the valve stem tip, and install the valve stem cap.

NOTICE:

Install the cap to the same place it was removed from.

**19. INSTALL VALVE LASH ADJUSTER ASSY****NOTICE:**

- **Keep the lash adjuster free from dirt and foreign objects.**
 - **Always use clean engine oil.**
- (a) Place the lash adjuster into a container full of engine oil.
 - (b) Insert SST's tip into the lash adjuster's plunger and use the tip to press down on the checkball inside the plunger. SST 09276-75010
 - (c) Squeeze the SST and lash adjuster together to move the plunger up and down 5 to 6 times.
 - (d) Check the movement of the plunger and bleed air.

OK: Plunger moves up and down.

NOTICE:

When bleeding high-pressure air from the compression chamber, make sure that the tip of the SST is actually pressing the checkball as shown in the illustration. If the checkball is not pressed, air will not bleed.

- (e) After bleeding air, remove the SST. Then quickly and firmly press the plunger with a finger.

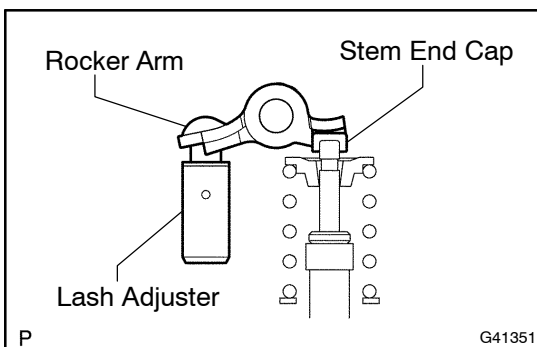
OK: Plunger is very difficult to move.

If the result is not as specified, replace the lash adjuster.

- (f) Install the lash adjuster.

NOTICE:

Install the lash adjuster at the same place it was removed from.

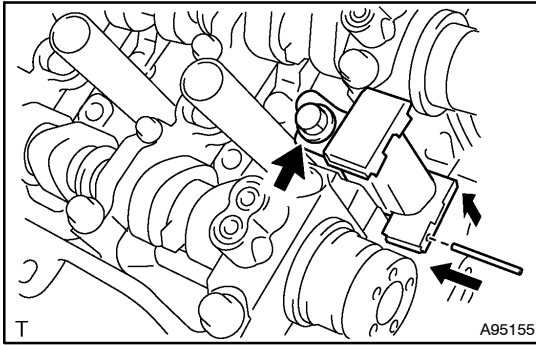
**20. INSTALL VALVE ROCKER ARM SUB-ASSY NO.1**

- (a) Apply clean engine oil to the valve lash adjuster tip and valve stem cap surface.
- (b) Make sure that the valve rocker arm is installed as shown in the illustration.

NOTICE:

Install the valve stem cap and valve rocker arm at the same places they were removed from.

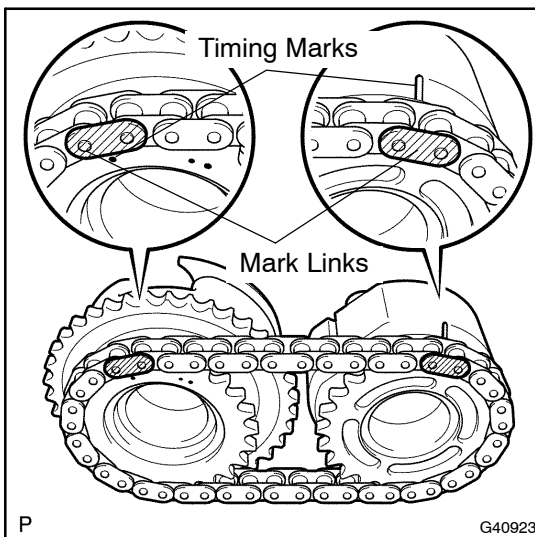
21. INSTALL CAMSHAFT HOUSING SUB-ASSY RH (SEE PAGE 14-157)**22. INSTALL CAMSHAFTS (SEE PAGE 14-157)**

**23. INSTALL CHAIN TENSIONER ASSY NO.2**

- (a) Install the chain tensioner No.2 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.

24. INSTALL CAMSHAFT TIMING GEARS AND NO.2 CHAIN (RH BANK)**NOTICE:**

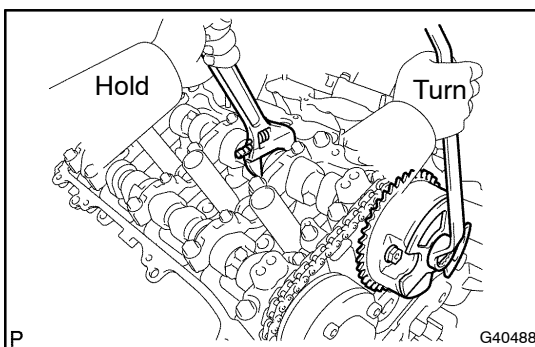
As the thrust clearance of the camshaft is small, the camshaft must be kept level while it is being installed. If the camshaft is not kept level, the portion of the cylinder head which receives the shaft thrust may crack or be damaged, causing the camshaft to be seized or to be broken. To avoid this,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



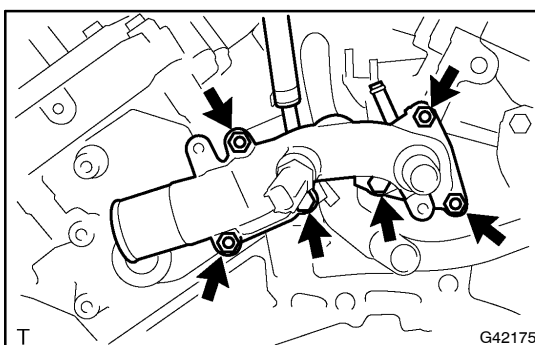
- (a) Align the mark links (yellow) with the timing marks of the camshaft timing gears as shown in the illustration.
- (b) Apply a small amount of engine oil to the bolt threads and bolt-seating surface.
- (c) Align the knock pin of the camshaft with the pin hole of the camshaft timing gear. Install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

NOTICE:

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

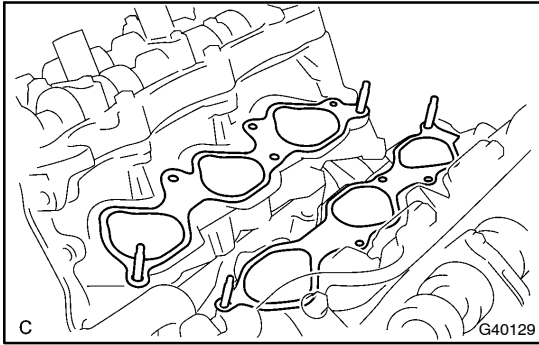


- (d) Hold the hexagonal portion of the camshaft with a wrench, and tighten the 2 bolts.
Torque: 100 N·m (1,020 kgf·cm, 74 ft·lbf)
- (e) Remove the pin from the tensioner.

**25. INSTALL WATER OUTLET**

- (a) Install a new O-ring to the water outlet pipe.
- (b) Install 2 new gaskets and water outlet with the 2 bolts and 4 nuts.

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

**26. INSTALL INTAKE MANIFOLD**

- (a) Set a new gasket on each cylinder head.

NOTICE:

- **Align the port holes of the gasket and cylinder head.**
- **Be careful of the installation direction.**

- (b) Set the intake manifold on the cylinder heads.

- (c) Install and tighten the 10 bolts uniformly in several steps.

Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)

27. INSTALL CHAIN VIBRATION DAMPER NO.2**28. INSTALL CHAIN SUB-ASSY (SEE PAGE 14-142)****29. INSTALL ENGINE ASSEMBLY WITH TRANSAXLE (SEE PAGE 14-21)**