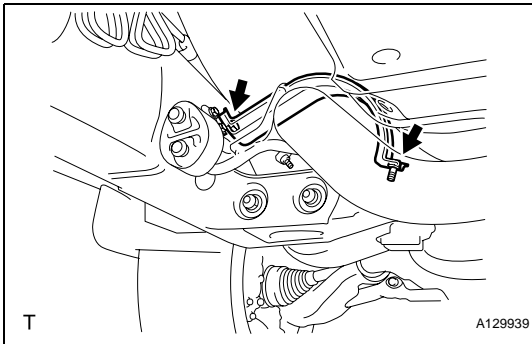


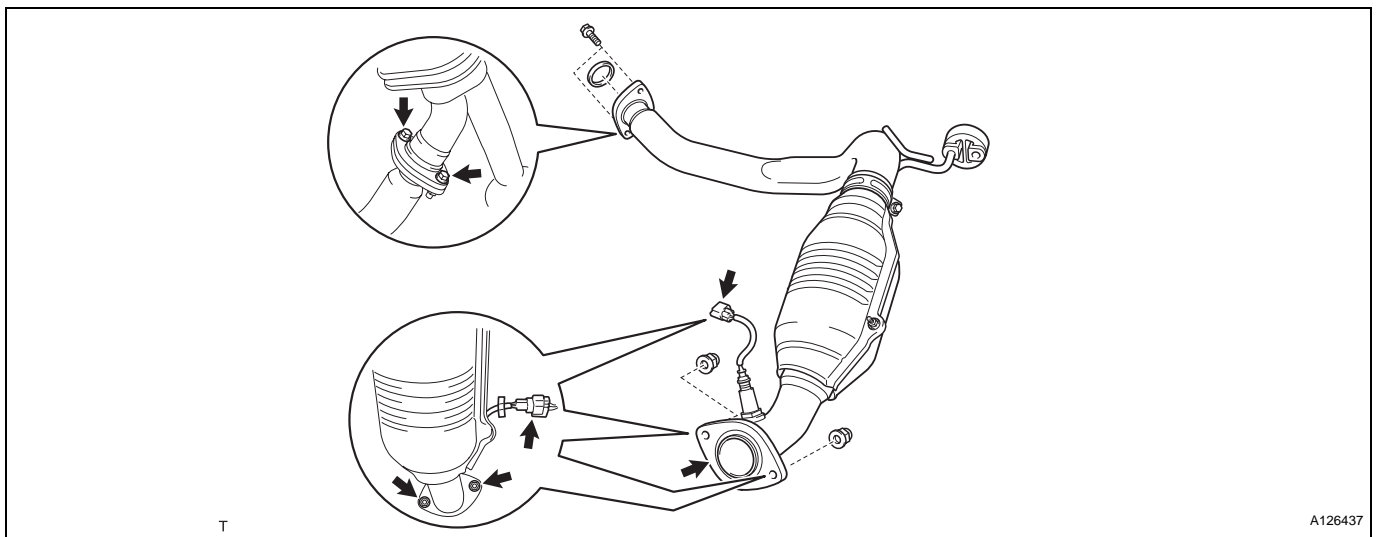
## REMOVAL

1. **DISCHARGE FUEL SYSTEM PRESSURE**  
(See page [FU-1](#))
2. **REMOVE CHAIN SUB-ASSEMBLY**  
Refer to the procedures up to "REMOVE CHAIN SUB-ASSEMBLY" (See page [EM-22](#)).
3. **REMOVE NO. 1 COOL AIR INLET**  
(a) Remove the 2 bolts and the No. 1 cool air inlet.
4. **REMOVE EXHAUST PIPE STOPPER BRACKET (for 4WD)**  
(a) Remove the 2 bolts, then remove the exhaust pipe stopper bracket.
5. **REMOVE NO. 2 FRONT EXHAUST PIPE ASSEMBLY**



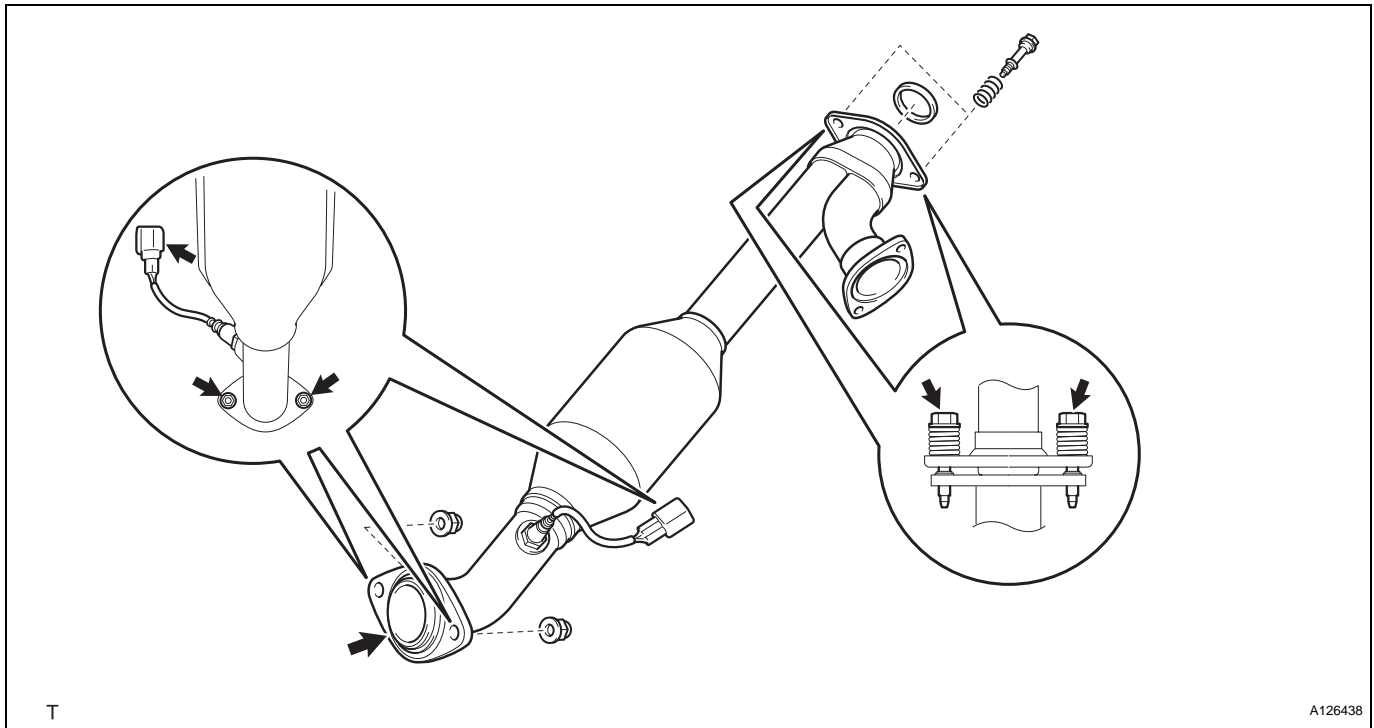
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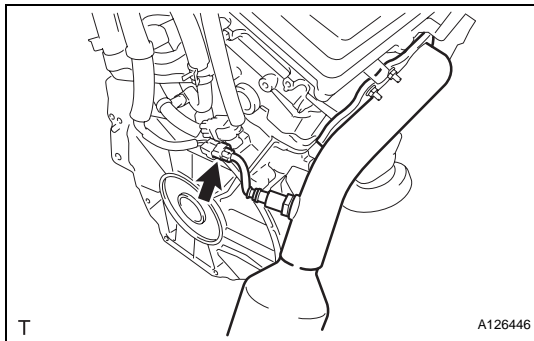
- (a) Disconnect the oxygen sensor connector.
- (b) Remove the 2 bolts and 2 nuts.
- (c) Disengage the support and remove the front exhaust pipe and 2 gaskets.

**6. REMOVE FRONT EXHAUST PIPE ASSEMBLY**

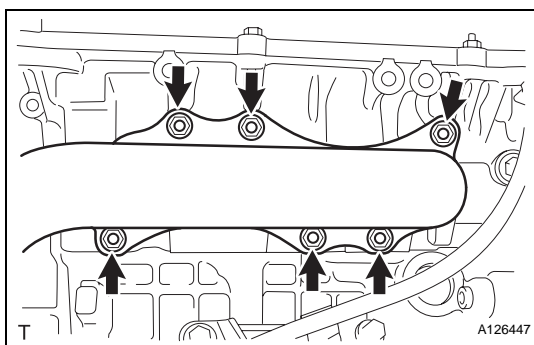
- (a) Disconnect the oxygen sensor connector.
- (b) Remove the 2 bolts, 2 springs and 2 nuts, then separate the front exhaust pipe from the exhaust manifold RH.

**7. REMOVE MANIFOLD STAY**

- (a) Remove the 3 bolts and manifold stay.

**8. REMOVE EXHAUST MANIFOLD SUB-ASSEMBLY RH**

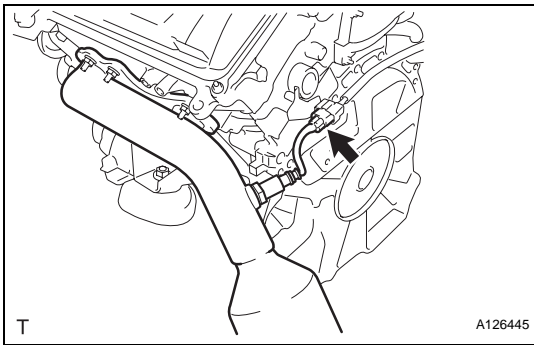
- (a) Disconnect the air fuel ratio sensor connector.



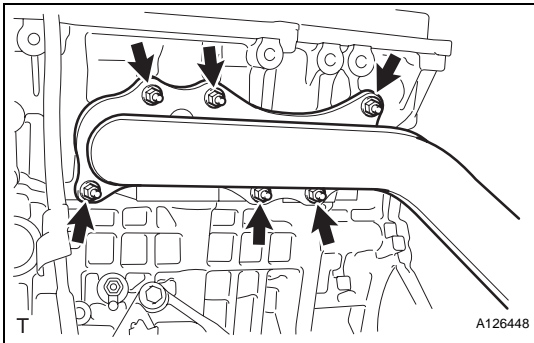
- (b) Remove the 6 nuts and exhaust manifold.
- (c) Remove the gasket.

**9. REMOVE NO. 2 MANIFOLD STAY**

- (a) Remove the 3 bolts and the No. 2 manifold stay.

**10. REMOVE EXHAUST MANIFOLD SUB-ASSEMBLY LH**

- (a) Disconnect the air fuel ratio sensor connector.



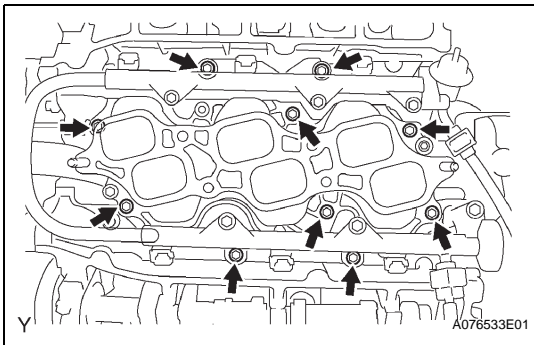
- (b) Remove the 6 nuts and the exhaust manifold.

- (c) Remove the gasket.

**11. DISCONNECT NO. 1 FUEL PIPE SUB-ASSEMBLY**  
(See page [FU-13](#))**12. DISCONNECT NO. 2 FUEL PIPE SUB-ASSEMBLY**  
(See page [FU-14](#))**13. REMOVE INTAKE MANIFOLD**

- (a) Disconnect the 6 fuel injector connectors.

- (b) Remove the 10 bolts, then remove the intake manifold and gasket.

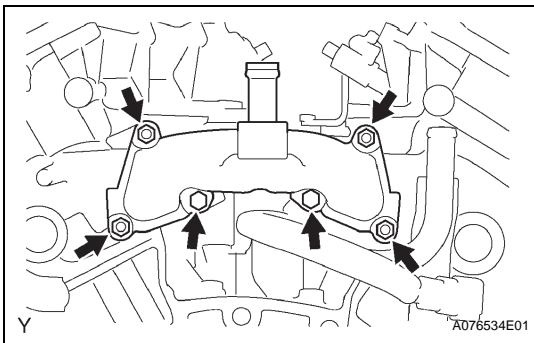
**14. REMOVE WATER BY-PASS JOINT RR**

- (a) Disconnect the engine coolant temperature sensor connector.

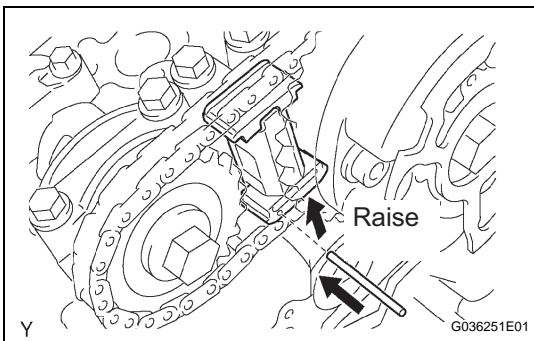
- (b) Disconnect the heater hose.

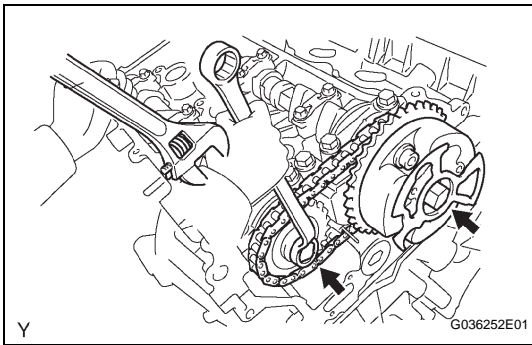
- (c) Remove the 2 bolts and 4 nuts, then remove the water by-pass joint RR and 2 gaskets.

- (d) Remove the O-ring from the water outlet hose.

**15. REMOVE CAMSHAFT TIMING GEARS AND NO. 2 CHAIN (for Bank 1)**

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





- (b) Hold the hexagonal portion of the camshaft with a wrench.

**NOTICE:**

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

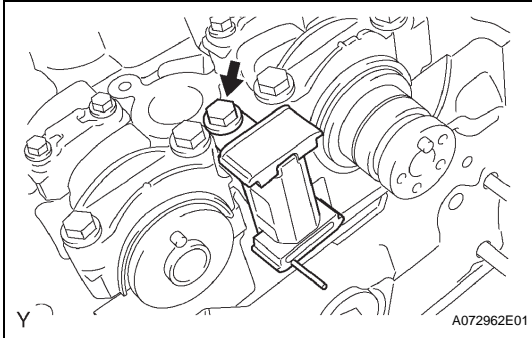
- (c) Remove the 2 bolts, then remove the camshaft timing gear, camshaft timing gear assembly and No. 2 timing chain.

**NOTICE:**

**Do not disassemble the camshaft timing gear assembly.**

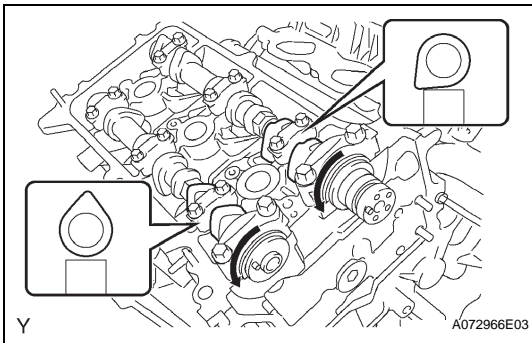
**16. REMOVE NO. 2 CHAIN TENSIONER ASSEMBLY**

- (a) Remove the bolt, then remove the No. 2 chain tensioner.

**17. REMOVE CAMSHAFTS (for Bank 1)****NOTICE:**

**Keep the camshaft level while it is being removed. The camshaft thrust clearance is very small and failing to keep it level could crack or damage the cylinder head journal surface, which receives the thrust force. This could subsequently lead the camshaft to seize or break. Perform the following steps to avoid such problems.**

- (a) Rotate the camshafts counterclockwise using a wrench so that the cam lobes of No. 1 cylinder face in the directions shown in the illustration.

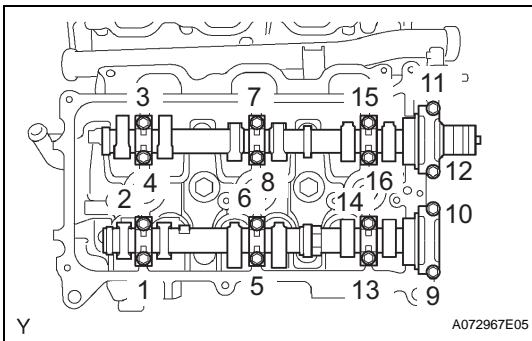


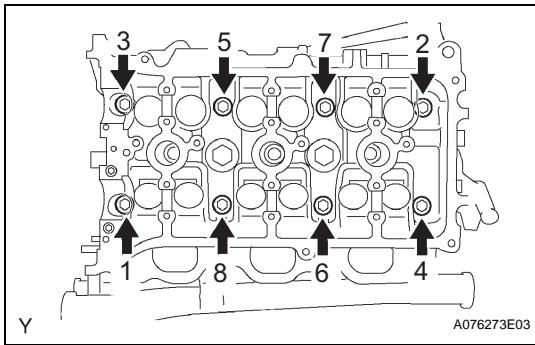
- (b) Using several steps, loosen and remove the 16 bearing cap bolts uniformly in the sequence shown in the illustration.

- (c) Remove the 8 bearing caps and 2 camshafts.

**18. REMOVE NO. 2 CAMSHAFT BEARING****19. REMOVE CYLINDER HEAD SUB-ASSEMBLY**

- (a) Remove the bolt and separate the ground cable.

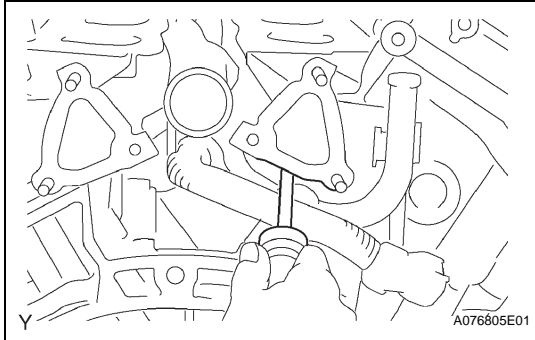




- (b) Using several steps, loosen the 8 cylinder head bolts on the cylinder head uniformly with a 10 mm bi-hexagon wrench in the sequence shown in the illustration. Remove the 8 cylinder head bolts and 8 plate washers.

**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 wrong order.

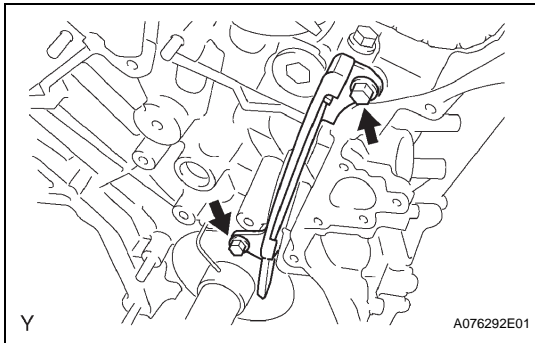


- (c) Lift the cylinder head from the dowels on the cylinder block, and place the cylinder head on wooden blocks on a bench.

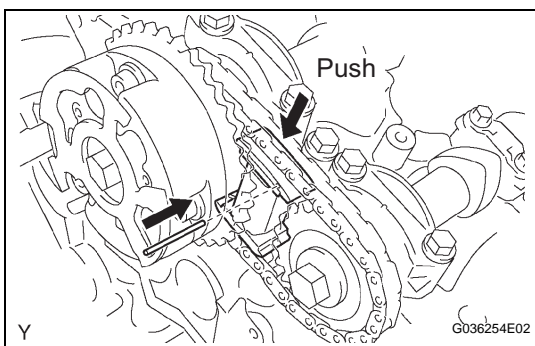
**NOTICE:**

**Be careful not to drop the plate washers into the cylinder head.**

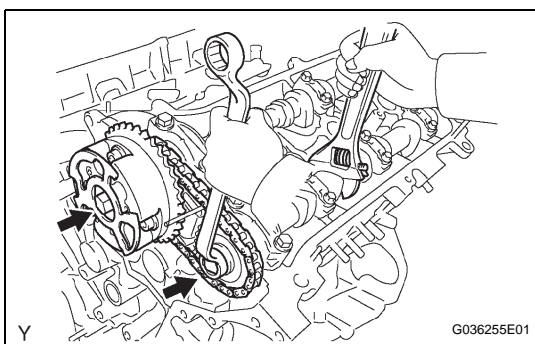
If the cylinder head is difficult to lift off, pry between the cylinder head and cylinder block with a screwdriver.

**20. REMOVE CYLINDER HEAD GASKET****21. REMOVE NO. 1 CHAIN VIBRATION DAMPER**

- (a) Remove the 2 bolts, then remove the No. 1 chain vibration damper.

**22. REMOVE CAMSHAFT TIMING GEARS AND NO. 2 CHAIN (for Bank 2)**

- (a) While pushing down the No. 2 chain tensioner, insert a pin of  $\phi$  10 mm (0.039 in.) into the hole to fix it.



- (b) Hold the hexagonal portion of the camshaft with a wrench.

**NOTICE:**

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

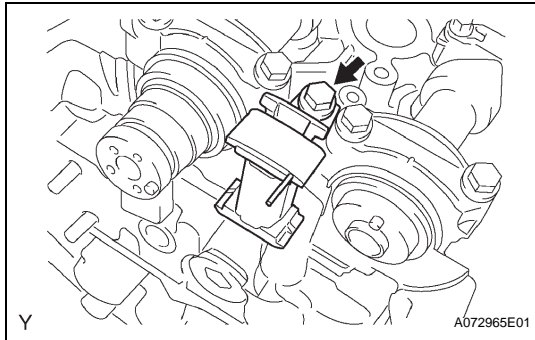
- (c) Remove the 2 bolts, then remove the camshaft timing gear, camshaft timing gear assembly and No. 2 timing chain.

**NOTICE:**

**Do not disassemble the camshaft timing gear assembly.**

**23. REMOVE NO. 3 CHAIN TENSIONER ASSEMBLY**

- (a) Remove the bolt, then remove the No. 3 chain tensioner.

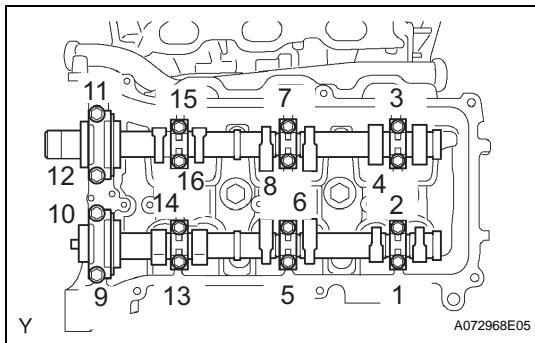
**24. REMOVE CAMSHAFTS (for Bank 2)****NOTICE:**

**Keep the camshaft level while it is being removed. The camshaft thrust clearance is very small and failing to keep it level could crack or damage the cylinder head journal surface, which receives the thrust force. This could subsequently lead the camshaft to seize or break. Perform the following steps to avoid such problems.**

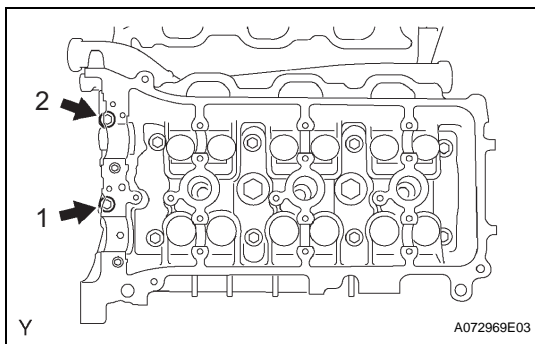
- (a) Using several steps, loosen and remove the 16 bearing cap bolts uniformly in the sequence shown in the illustration.  
 (b) Remove the 8 bearing caps and 2 camshafts.

**25. REMOVE CYLINDER HEAD LH**

- (a) Remove the bolt, then separate the ground cable.  
 (b) Remove the bolt, then separate the air fuel ratio connector bracket.



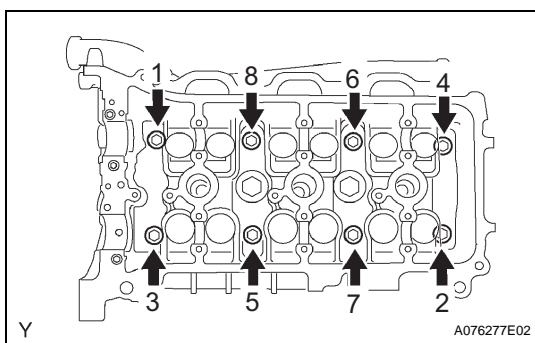
- (c) Using several steps, remove the 2 cylinder head bolts from the cylinder head in the sequence shown in the illustration.

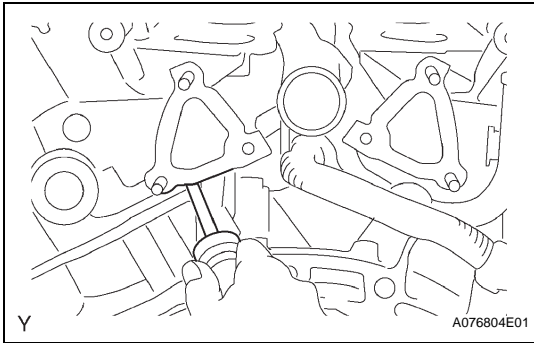


- (d) Using several steps, uniformly loosen the 8 cylinder head bolts on the cylinder head with a 10 mm bi-hexagon wrench in the sequence shown in the illustration. Remove the 8 cylinder head bolts and 8 plate washers.

**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 wrong order.**





- (e) 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 drop the plate washers into the cylinder head.**

If the cylinder head is difficult to remove, pry between the cylinder head and cylinder block with a screwdriver.

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