

VALVE CLEARANCE INSPECTION

EM091-02

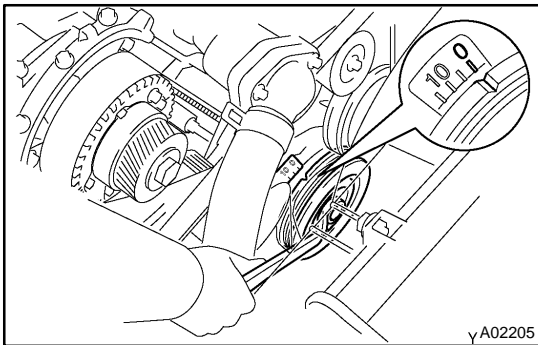
HINT:

Inspect and adjust the valve clearance when the engine is cold.

1. **DRAIN ENGINE COOLANT**
2. **REMOVE BATTERY CLAMP COVER**
3. **REMOVE AIR CLEANER INLET**
4. **REMOVE V-BANK COVER**
5. **REMOVE AIR CLEANER AND INTAKE AIR CONNECTOR ASSEMBLY**
6. **REMOVE NO.3 TIMING BELT COVERS**
(See page [EM-15](#))
7. **REMOVE IGNITION COILS** (See page [IG-7](#))
8. **REMOVE RH CYLINDER HEAD COVER**

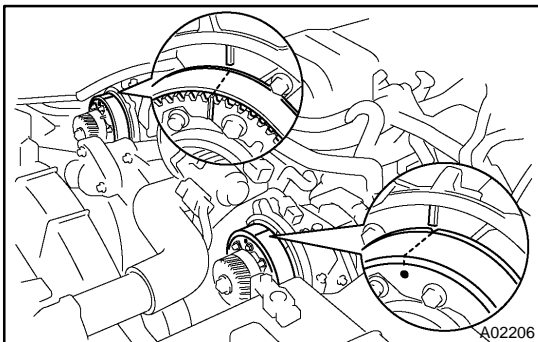
Remove the 9 bolts, 9 seal washers and cylinder head cover.

9. **REMOVE LH CYLINDER HEAD COVER**
 - (a) Remove the oil dipstick for the transmission.
 - (b) Disconnect the PCV hose.
 - (c) Disconnect the engine wire clamp from the wire bracket on the delivery pipe.
 - (d) Remove the 9 bolts, 9 seal washers and cylinder head cover.

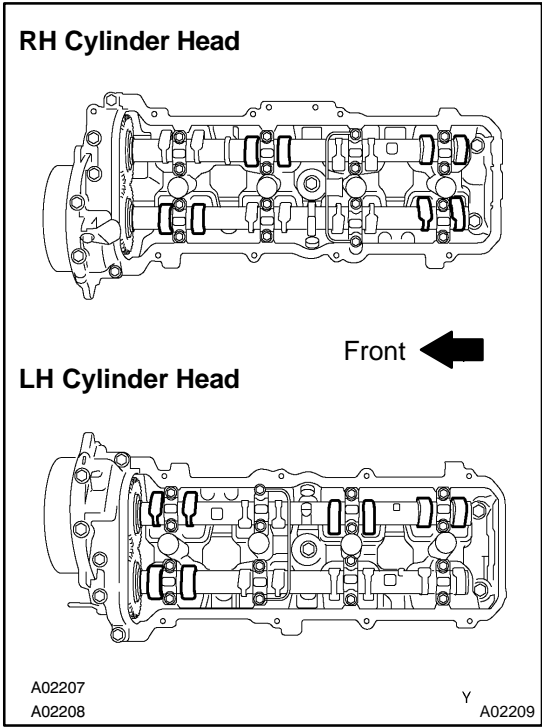


10. SET NO.1 CYLINDER TO TDC/COMPRESSION

- (a) Turn the crankshaft pulley, and align its groove with timing mark "0" of the No.1 timing belt cover.



- (b) Check that the timing marks of the camshaft timing pulleys and timing belt rear plates are aligned.
If not, turn the crankshaft 1 revolution (360°) and align the mark as above.

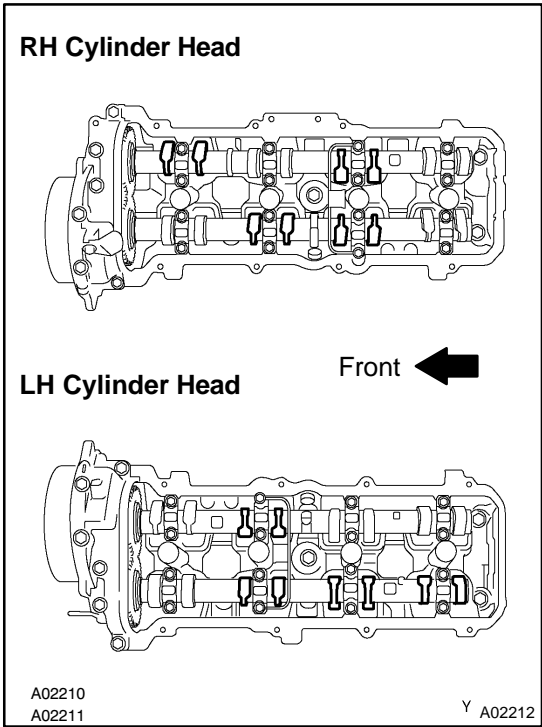


11. INSPECT VALVE CLEARANCE

- (a) Check only the valves indicated.
 - Using a feeler gauge, measure the clearance between the valve lifter and camshaft.
 - Record the out-of-specification valve clearance measurements. They will be used later to determine the required replacement adjusting shim.

Valve clearance (Cold):

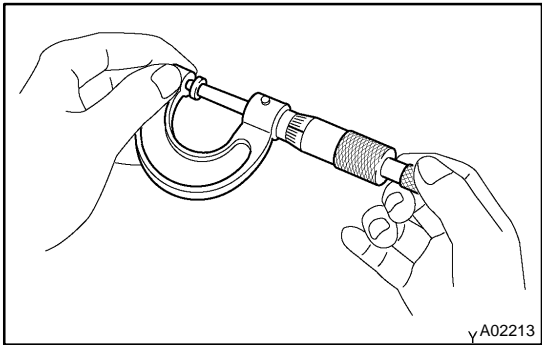
| | |
|---------|------------------------------------|
| Intake | 0.15 – 0.25 mm (0.006 – 0.010 in.) |
| Exhaust | 0.25 – 0.35 mm (0.010 – 0.014 in.) |



- (b) Turn the crankshaft 1 revolution (360°) and align the mark as above. (See procedure in step 10)
- (c) Check only the valves indicated as shown. Measure the valve clearance. (See procedure in step (a))

12. ADJUST VALVE CLEARANCE

- (a) Remove the timing belt. (See page [EM-15](#))
- (b) Remove the camshafts. (See page [EM-34](#))
- (c) Remove the valve lifter and adjusting shim.



- (d) Determine the replacement adjusting shim size according to these Formula or Charts:
 - Using a micrometer, measure the thickness of the removed shim.
 - Calculate the thickness of a new shim so that the valve clearance comes within the specified value.

T Thickness of removed shim
A Measured valve clearance
N Thickness of new shim

Intake:

$$N = T + (A - 0.20 \text{ mm (0.008 in.)})$$

Exhaust:

$$N = T + (A - 0.30 \text{ mm (0.012 in.)})$$

- Select a new shim with a thickness as close as possible to the calculated value.

HINT:

Shims are available in 41 increments of 0.020 mm (0.0008 in.), from 2.00 mm (0.0787 in.) to 2.80 mm (0.1102 in.).

- (e) Place a new adjusting shim on the valve.
- (f) Place the valve lifter.
- (g) Reinstall the camshafts. (See page [EM-58](#))
- (h) Reinstall the timing belt. (See page [EM-22](#))
- (i) Recheck the valve clearance.

13. REINSTALL CYLINDER HEAD COVERS**14. REINSTALL IGNITION COILS****15. REINSTALL NO.3 TIMING BELT COVERS**

(See page [EM-22](#))

16. REINSTALL AIR CLEANER AND INTAKE AIR CONNECTOR ASSEMBLY**17. REFILL WITH ENGINE COOLANT****18. START ENGINE AND CHECK FOR LEAKS****19. RECHECK ENGINE COOLANT LEVEL****20. REINSTALL V-BANK COVER****21. REINSTALL AIR CLEANER INLET****22. REINSTALL BATTERY CLAMP COVER**

| New shim thickness | | | | mm (in.) | |
|--------------------|----------------|----------|----------------|----------|----------------|
| Shim No. | Thickness | Shim No. | Thickness | Shim No. | Thickness |
| 00 | 2.000 (0.0787) | 28 | 2.280 (0.0898) | 56 | 2.560 (0.1008) |
| 02 | 2.020 (0.0795) | 30 | 2.300 (0.0906) | 58 | 2.580 (0.1016) |
| 04 | 2.040 (0.0803) | 32 | 2.320 (0.0913) | 60 | 2.600 (0.1024) |
| 06 | 2.060 (0.0811) | 34 | 2.340 (0.0921) | 62 | 2.620 (0.1031) |
| 08 | 2.080 (0.0819) | 36 | 2.360 (0.0929) | 64 | 2.640 (0.1039) |
| 10 | 2.100 (0.0827) | 38 | 2.380 (0.0937) | 66 | 2.660 (0.1047) |
| 12 | 2.120 (0.0835) | 40 | 2.400 (0.0945) | 68 | 2.680 (0.1055) |
| 14 | 2.140 (0.0843) | 42 | 2.420 (0.0953) | 70 | 2.700 (0.1063) |
| 16 | 2.160 (0.0850) | 44 | 2.440 (0.0961) | 72 | 2.720 (0.1071) |
| 18 | 2.180 (0.0858) | 46 | 2.460 (0.0969) | 74 | 2.740 (0.1079) |
| 20 | 2.200 (0.0866) | 48 | 2.480 (0.0976) | 76 | 2.760 (0.1087) |
| 22 | 2.220 (0.0874) | 50 | 2.500 (0.0984) | 78 | 2.780 (0.1094) |
| 24 | 2.240 (0.0882) | 52 | 2.520 (0.0992) | 80 | 2.800 (0.1102) |
| 26 | 2.260 (0.0890) | 54 | 2.540 (0.1000) | | |

Exhaust valve clearance (Cold):
0.25 – 0.35 mm (0.010 – 0.014 in.)

The 2.300 mm (0.0906 in.) shim is installed, and the measured clearance is 0.440 mm (0.0173 in.). Replace the 2.300 mm (0.0906 in.) shim with a No. 44 shim.

| New shim thickness | | | | mm (in.) | |
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| Shim No. | Thickness | Shim No. | Thickness | Shim No. | Thickness |
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| 02 | 2.020 (0.0795) | 30 | 2.300 (0.0906) | 58 | 2.580 (0.1016) |
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