

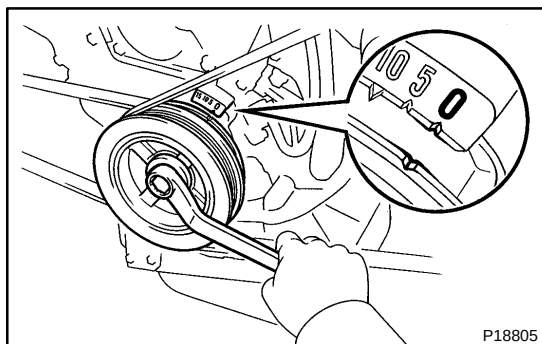
VALVE CLEARANCE INSPECTION

HINT:

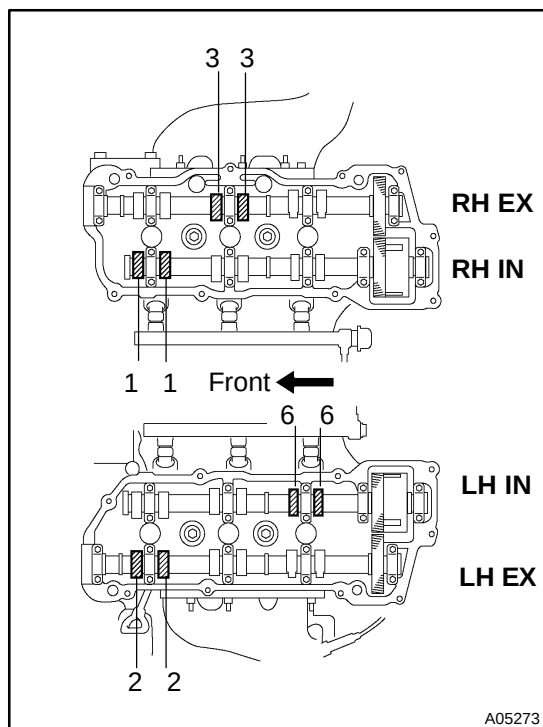
Inspect and adjust the valve clearance when the engine is cold.

1. **REMOVE OUTER FR COWL TOP PANEL ASSEMBLY**
(See page [EM-76](#))
2. **REMOVE RH FENDER APRON SEAL**
3. **DRAIN ENGINE COOLANT**
4. **REMOVE V-BANK COVER**
 - (a) Using a 5 mm hexagon wrench, remove the 2 nuts.
 - (b) Disconnect the 2 clips, and remove the cover.
5. **REMOVE AIR INTAKE CHAMBER ASSEMBLY** (See page [EM-33](#))
6. **REMOVE IGNITION COILS**
7. **DISCONNECT RADIATOR HOSE FROM WATER OUT-LET**
8. **REMOVE CYLINDER HEAD COVERS** (See page [EM-33](#))
9. **SET NO.1 CYLINDER TO TDC/COMPRESSION**
 - (a) Turn the crankshaft pulley, and align its groove with the timing mark "0" of the No.1 timing belt cover.
 - (b) Check that the valve lifters on the No.1 (IN and EX) are loose.

If not, turn the crankshaft 1 revolution (360°) and align the mark as above.



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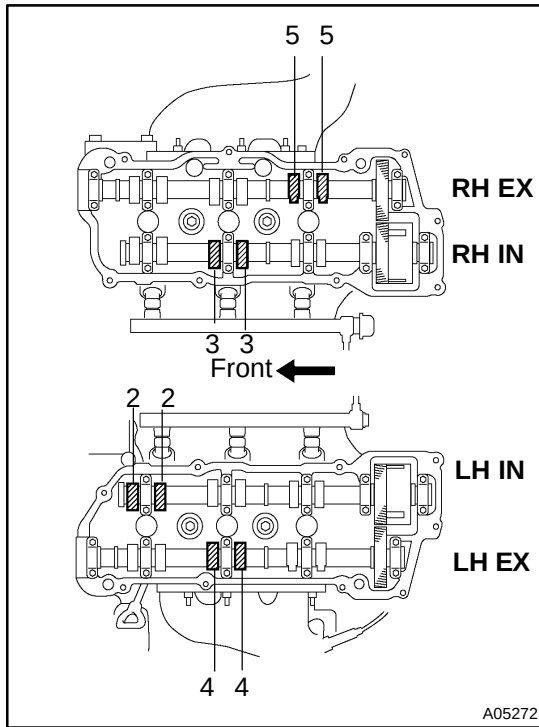
10. INSPECT VALVE CLEARANCE

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

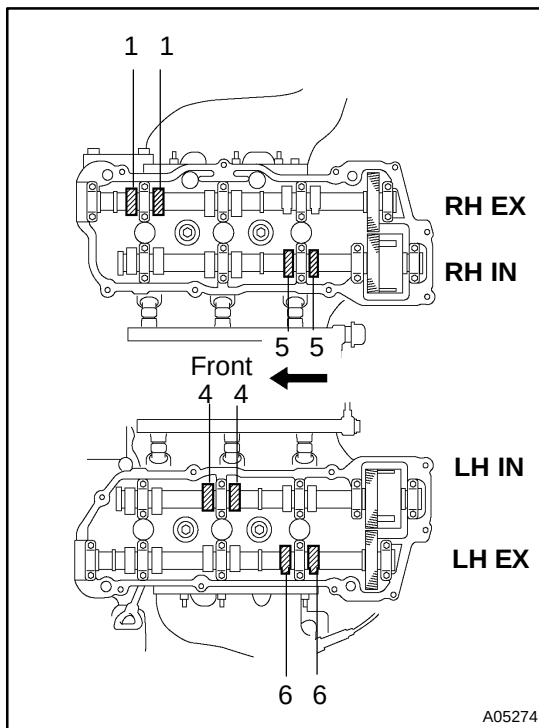
Valve clearance (Cold):

Intake: 0.15 - 0.25 mm (0.006 - 0.010 in.)

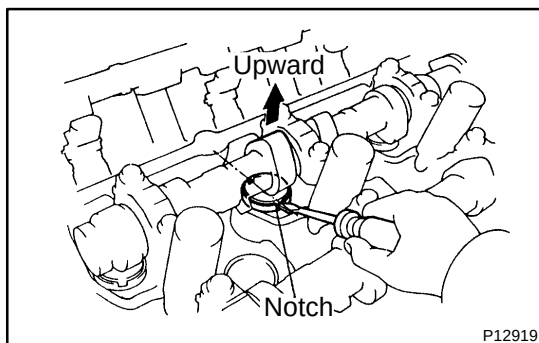
Exhaust 0.25 - 0.35 mm (0.010 - 0.014 in.)



- (b) Turn the crankshaft $\frac{2}{3}$ of a revolution (240°), and check only the valves indicated in the illustration. Measure the valve clearance (See procedure step (a)).

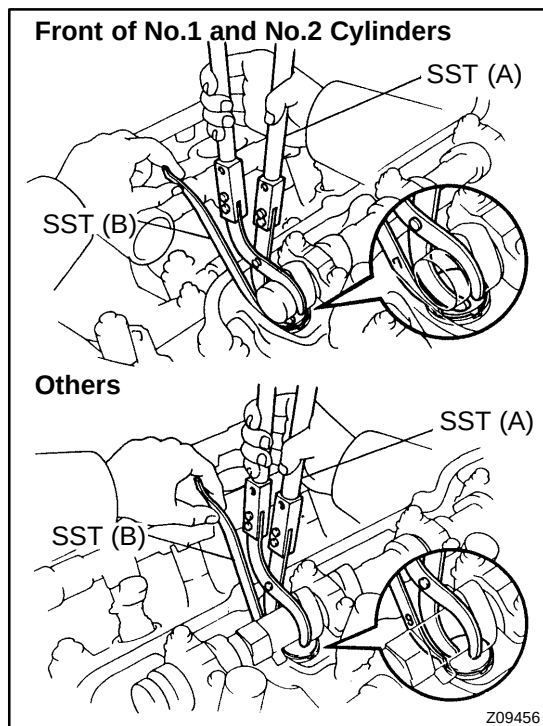


- (c) Turn the crankshaft a further $\frac{2}{3}$ of a revolution (240°), and check only the valves indicated in the illustration. Measure the valve clearance (See procedure step (a)).



11. ADJUST VALVE CLEARANCE

- (a) Remove the adjusting shim.
- (1) Turn the camshaft so that the cam lobe for the valve to be adjusted faces up.
 - (2) Turn the valve lifter with a screwdriver so that the notches are perpendicular to the camshaft.

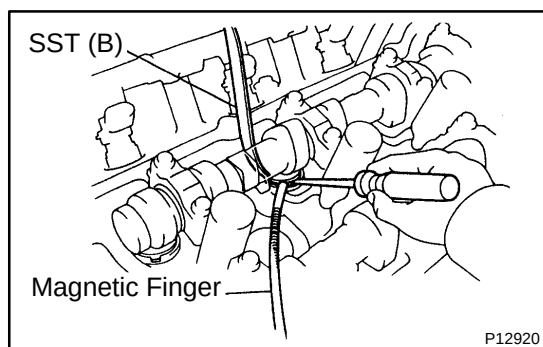


- (3) Using SST (A), press down the valve lifter and place SST (B) between the camshaft and valve lifter. Remove SST (A).

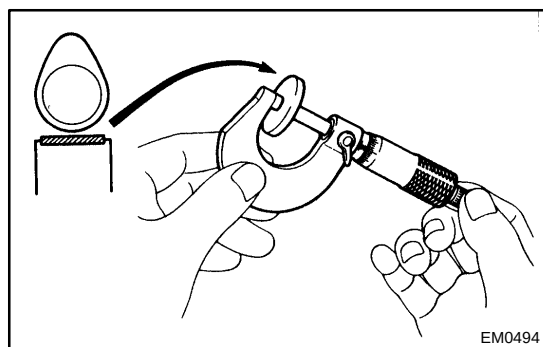
SST 09248-55040 (09248-05410, 09248-05420)

HINT:

- Apply SST (B) at a slight angle on the side marked with "9" or "7", at the position shown in the illustration.
- When SST (B) is inserted too deeply, it will get pinched by the shim. To prevent it from being stuck, insert it gently from the intake side, at a slight angle.



- Using a small screwdriver and magnetic finger, remove the adjusting shim.



- (b) Determine the replacement adjusting shim size according to these Formula or Charts:

- (1) Using a micrometer, measure the thickness of the removed shim.
- (2) Calculate the thickness of a new shim so the valve clearance comes within the specified value.

T Thickness of used shim

A Measured valve clearance

N Thickness of new shim

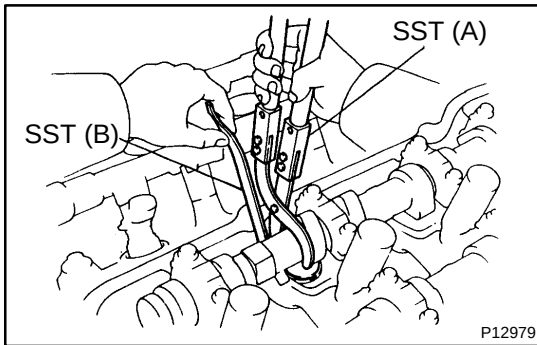
Intake: $N = T + (A - 0.20 \text{ mm (0.008 in.)})$

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

- (3) Select a new shim with a thickness as close as possible to the calculated values.

HINT:

Shims are available in 17 sizes in increments of 0.050 mm (0.0020 in.), from 2.500 mm (0.0984 in.) to 3.300 mm (0.1299 in.).



- (c) Install a new adjusting shim.
- Place a new adjusting shim on the valve lifter, with imprinted numbers facing down.
 - Press down the valve lifter with SST (A), and remove SST (B).

SST 09248-55040 (09248-05410, 09248-05420)

- (d) Recheck the valve clearance.

12. REINSTALL CYLINDER HEAD COVERS (See page [EM-60](#))

13. CONNECT RADIATOR HOSE TO WATER OUTLET

14. REINSTALL IGNITION COILS

15. REINSTALL AIR INTAKE CHAMBER ASSEMBLY (See page [EM-60](#))

16. INSTALL V-BANK COVER

17. REFILL WITH ENGINE COOLANT

18. START ENGINE AND CHECK FOR LEAKS

19. REINSTALL RH FENDER APRON SEAL

20. REINSTALL OUTER FR COWL TOP PANEL ASSEMBLY (See page [EM-82](#))

2001 SIENNA (RM787U)

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HINT: New shims have the thickness in millimeters imprinted on the face.

Adjusting Shim Selection Chart (Exhaust)

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Exhaust valve clearance (Cold):

0.25 - 0.35 mm (0.010 - 0.014 in.)

EXAMPLE: The 2.800 mm (0.1102 in.) shim is installed, and the measured clearance is 0.450 mm (0.0177 in.). Replace the 2.800 mm (0.1102 in.) shim with a new No.10 shim.

HINT: New shims have the thickness in millimeters imprinted on the face.