

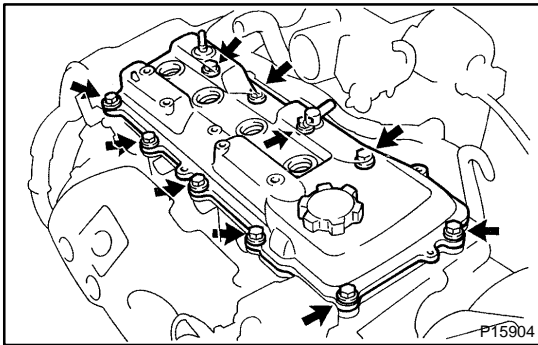
# VALVE CLEARANCE INSPECTION

EM02K-06

## HINT:

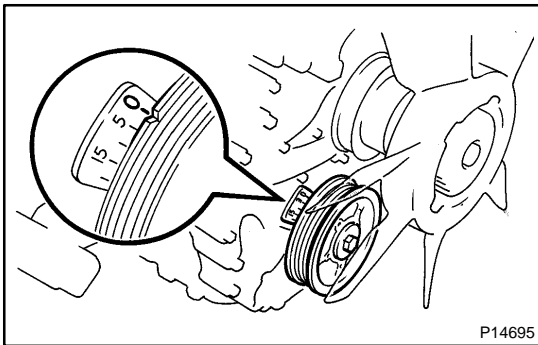
Inspect and adjust the valve clearance when the engine is cold.

1. **REMOVE INTAKE AIR CONNECTOR** (See page [EM-34](#))
2. **REMOVE PCV HOSES**
3. **REMOVE IGNITION COILS (WITH IGNITER)**
4. **DISCONNECT ENGINE WIRE**
  - (a) w/ A/C:  
Disconnect the A/C compressor connector.
  - (b) Disconnect the oil pressure sensor connector.
  - (c) Disconnect the ECT sender gauge connector.
  - (d) Disconnect the 4 engine wire clamps and engine wire.



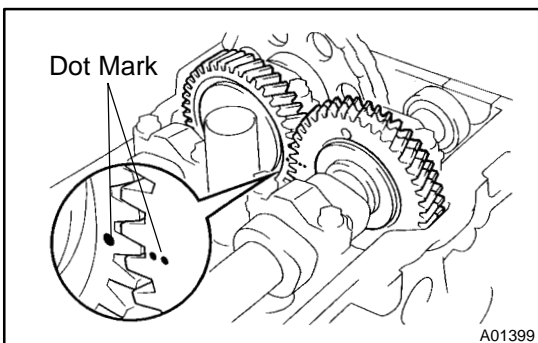
## 5. REMOVE CYLINDER HEAD COVER

Remove the 10 bolts, 10 seal washers, cylinder head cover and gasket.

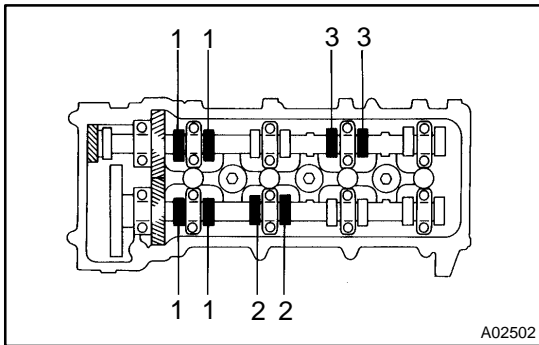


## 6. SET NO.1 CYLINDER TO TDC/COMPRESSION

- (a) Turn the crankshaft pulley clockwise and align its groove with the "0" mark on the timing chain cover.



- (b) Check that the timing marks (1 and 2 dots) of the camshaft drive and driven gears are in straight line on the cylinder head surface as shown in the illustration. If not, turn the crankshaft 1 revolution (360°) and align the marks as above.

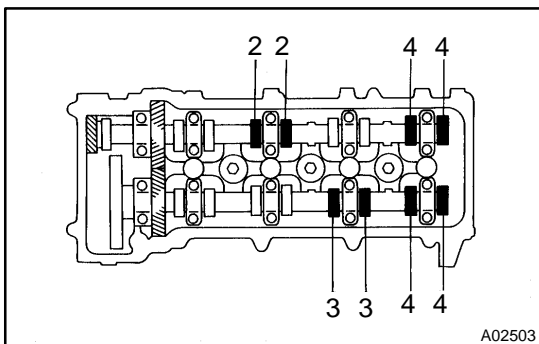


## 7. INSPECT VALVE CLEARANCE

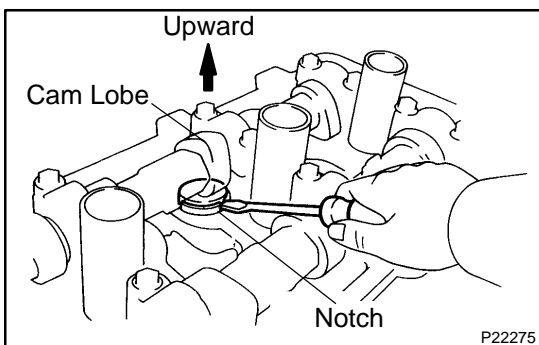
- (a) Check only the valves indicated.
- (1) Using a feeler gauge, measure the clearance between the valve lifter and camshaft.
  - (2) Record the out-of-specification valve clearance measurements. They will be used later to determine the required replacement adjusting shim.

### 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 pulley 1 revolution (360°) and align its groove with timing mark "0" of the timing chain cover.
- (c) Check only the valves indicated as shown. Measure the valve clearance (See procedure in step (a)).



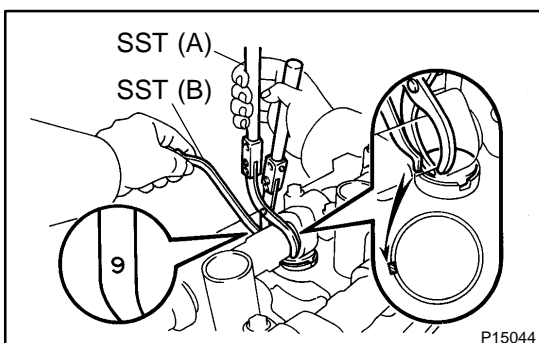
## 8. ADJUST VALVE CLEARANCE

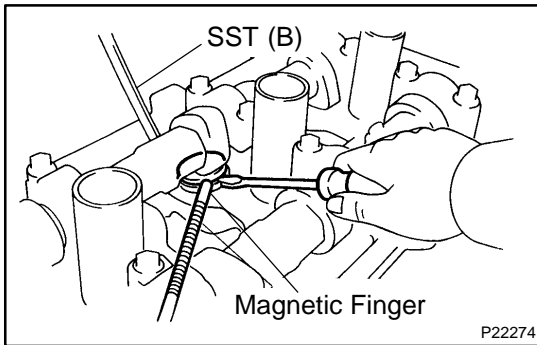
- (a) Remove the adjusting shim.
- (1) Turn the crankshaft to position the cam lobe of the camshaft on the adjusting valve upward.
  - (2) Position the notch of the valve lifter toward the spark plug side.
- (3) Using SST (A), press down the valve lifter and place SST (B) between the camshaft and valve lifter flange. Remove SST (A).

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

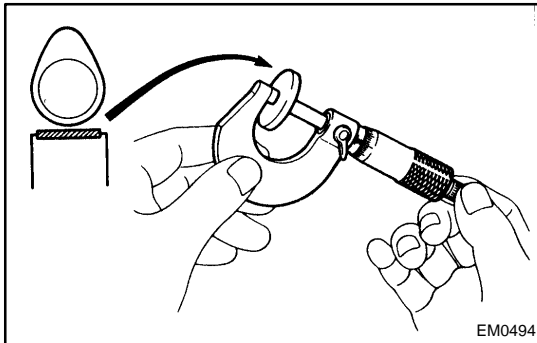
### HINT:

Apply SST (B) at slight angle on the side marked with "9", at the position shown in the illustration.





- (4) Remove the adjusting shim with a small screwdriver and magnetic finger.



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

- (1) Using a micrometer, measure the thickness of the removed shim.
- (2) 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

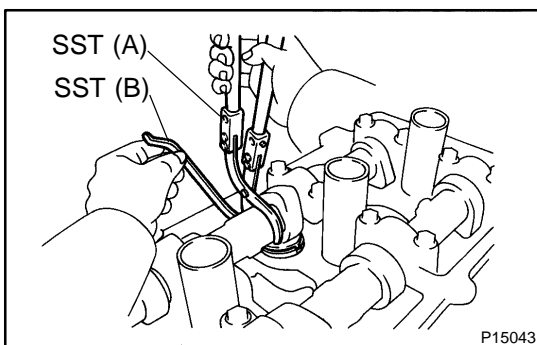
**Intake:**  $N = T + (A - 0.20 \text{ mm (0.008 in.)})$

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

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

**HINT:**

Shims are available in 17 sizes in increments of 0.05 mm (0.0020 in.), from 2.50 mm (0.0984 in.) to 3.30 mm (0.1299 in.).



- (c) Install a new adjusting shim.
- (1) Place a new adjusting shim on the valve lifter.
  - (2) Using SST (A), press down the valve lifter and remove SST (B).

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

- (d) Recheck the valve clearance.

**9. REINSTALL CYLINDER HEAD COVER**

**10. RECONNECT ENGINE WIRE**

**11. REINSTALL HIGH-TENSION CORDS TO SPARK-PLUGS**

**12. REINSTALL PCV HOSES**

**13. REINSTALL INTAKE AIR CONNECTOR (See page EM-57)**



## Adjusting Shim Selection Chart (Exhaust)

Installed shim thickness mm (in.)																				
	Measured clearance mm (in.)																			
0.000 – 0.030 (0.0000 – 0.0012)																				
0.031 – 0.050 (0.0012 – 0.0020)																				
0.051 – 0.070 (0.0020 – 0.0028)																				
0.071 – 0.090 (0.0028 – 0.0035)																				
0.091 – 0.110 (0.0036 – 0.0043)																				
0.111 – 0.130 (0.0044 – 0.0051)																				
0.131 – 0.150 (0.0052 – 0.0059)																				
0.151 – 0.170 (0.0059 – 0.0067)																				
0.171 – 0.190 (0.0067 – 0.0075)																				
0.191 – 0.210 (0.0075 – 0.0083)																				
0.211 – 0.230 (0.0083 – 0.0091)																				
0.231 – 0.249 (0.0091 – 0.0098)																				
0.250 – 0.350 (0.0098 – 0.0138)																				
0.351 – 0.370 (0.0138 – 0.0146)																				
0.371 – 0.390 (0.0146 – 0.0154)																				
0.391 – 0.410 (0.0154 – 0.0161)																				
0.411 – 0.430 (0.0162 – 0.0169)																				
0.431 – 0.450 (0.0170 – 0.0177)																				
0.451 – 0.470 (0.0178 – 0.0185)																				
0.471 – 0.490 (0.0185 – 0.0193)																				
0.491 – 0.510 (0.0193 – 0.0201)																				
0.511 – 0.530 (0.0201 – 0.0209)																				
0.531 – 0.550 (0.0209 – 0.0217)																				
0.551 – 0.570 (0.0217 – 0.0224)																				
0.571 – 0.590 (0.0225 – 0.0232)																				
0.591 – 0.610 (0.0233 – 0.0240)																				
0.611 – 0.630 (0.0241 – 0.0248)																				
0.631 – 0.650 (0.0248 – 0.0256)																				
0.651 – 0.670 (0.0256 – 0.0264)																				
0.671 – 0.690 (0.0264 – 0.0272)																				
0.691 – 0.710 (0.0272 – 0.0280)																				
0.711 – 0.730 (0.0280 – 0.0287)																				
0.731 – 0.750 (0.0288 – 0.0295)																				
0.751 – 0.770 (0.0296 – 0.0303)																				
0.771 – 0.790 (0.0304 – 0.0311)																				
0.791 – 0.810 (0.0311 – 0.0319)																				
0.811 – 0.830 (0.0319 – 0.0327)																				
0.831 – 0.850 (0.0327 – 0.0335)																				
0.851 – 0.870 (0.0335 – 0.0343)																				
0.871 – 0.890 (0.0343 – 0.0350)																				
0.891 – 0.910 (0.0351 – 0.0358)																				
0.911 – 0.930 (0.0359 – 0.0366)																				
0.931 – 0.950 (0.0367 – 0.0374)																				
0.951 – 0.970 (0.0374 – 0.0382)																				
0.971 – 0.990 (0.0382 – 0.0390)																				
0.991 – 1.010 (0.0390 – 0.0398)																				
1.011 – 1.030 (0.0398 – 0.0406)																				
1.031 – 1.050 (0.0406 – 0.0413)																				
1.051 – 1.070 (0.0414 – 0.0421)																				
1.071 – 1.090 (0.0422 – 0.0429)																				
1.091 – 1.110 (0.0430 – 0.0437)																				
1.111 – 1.130 (0.0437 – 0.0445)																				
1.131 – 1.150 (0.0445 – 0.0453)																				

**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 0.440 mm  
 (0.0173 in.). Replace the 2.800 mm  
 (0.1102 in.) shim with a new No.10 shim.

New shim thickness mm (in.)			
Shim No.	Thickness	Shim No.	Thickness
1	2.500 (0.0984)	10	2.950 (0.1161)
2	2.550 (0.1004)	11	3.000 (0.1181)
3	2.600 (0.1024)	12	3.050 (0.1201)
4	2.650 (0.1043)	13	3.100 (0.1220)
5	2.700 (0.1063)	14	3.150 (0.1240)
6	2.750 (0.1083)	15	3.200 (0.1260)
7	2.800 (0.1102)	16	3.250 (0.1280)
8	2.850 (0.1122)	17	3.300 (0.1299)
9	2.900 (0.1142)		

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