# VALVE CLEARANCE ADJUSTMENT

EM0D2-07

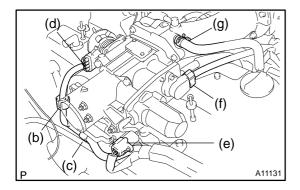
HINT:

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

1. REMOVE ENGINE COVER

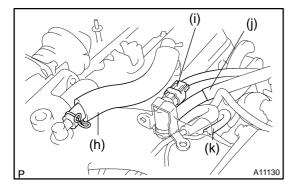
Remove the 4 nuts and engine cover.

- 2. DRAIN ENGINE COOLANT
- 3. REMOVE INTAKE AIR RESONATOR

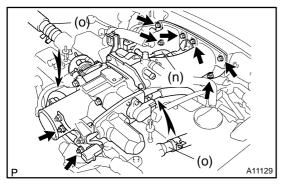


# 4. REMOVE THROTTLE BODY AND INTAKE AIR CON-NECTOR ASSEMBLY

- (a) Disconnect the accelerator cable from the throttle body.
- (b) Disconnect the engine wire clamp from the clamp bracket of the throttle body.
- (c) Disconnect the engine wire from the clamp on the throttle body bracket.
- (d) Disconnect the accelerator pedal position sensor connector.
- (e) Disconnect the throttle control motor connector.
- (f) Disconnect the throttle position sensor connector.
- (g) Disconnect the air assist hose from the intake air connector.



- (h) Disconnect the PCV hose from the intake air connector.
- (i) Disconnect the VSV connector for EVAP.
- (j) Disconnect the EVAP hose (from charcoal canister) from the VSV for EVAP.
- (k) Disconnect the vacuum hose (from No. 2 vacuum pipe) from the No. 1 vacuum pipe.



- (I) Remove the 2 nuts holding the throttle body bracket to the cylinder head.
- (m) Remove the 4 bolts and 2 nuts holding the intake air connector to the air intake chamber.
- (n) Disconnect the vacuum hose (from actuator for ACIS) from the No. 1 vacuum pipe.
- (o) Disconnect the 2 water bypass hoses from the throttle body, and remove the throttle body together with the intake air connector and gasket.

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### 5. REMOVE NO. 3 TIMING BELT COVER

Using a 5 mm hexagon wrench, remove the 4 bolts, oil filler cap, timing belt cover and gasket.

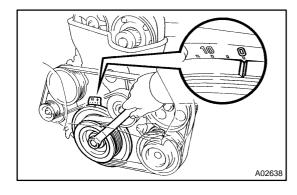
- 6. REMOVE IGNITION COILS AND HIGH-TENSION CORD SET ASSEMBLY (See page IG-7)
- 7. REMOVE SPARK PLUGS
- 8. DISCONNECT ENGINE WIRE FROM CYLINDER HEAD COVERS
- 9. REMOVE CYLINDER HEAD COVERS (See page EM-34)

### 10. 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.

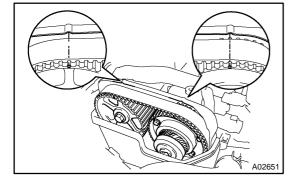
### NOTICE:

Always turn the crankshaft clockwise.



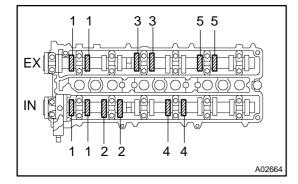
(b) Check that the timing marks of the camshaft timing pulleys are aligned with the timing marks of the No. 4 timing belt cover.

If not, turn the crankshaft 1 revolution (360°).



# 11. 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 the valve clearance measurements of those that are out of specification. They will be used later to determine the required replacement adjusting shim.

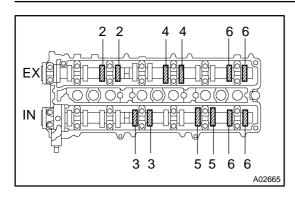


# Valve clearance (Cold):

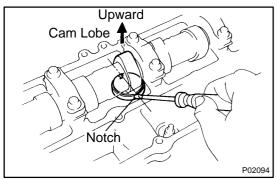
Intake	0.15 - 0.25 mm(0.006 - 0.010 in.)
Exhaust	0.25 - 0.35 mm (0.010 - 0.014 in.)

(b) Turn the crankshaft pulley 1 revolution (360°), and align the groove with the timing mark "0" of the No. 1 timing belt cover.

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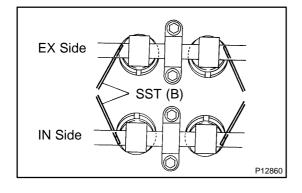


(c) Check only the valves indicated as shown. Measure the valve clearance. (See procedure in step (a))

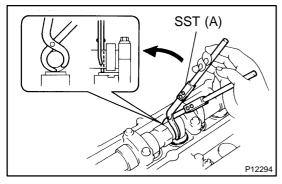


### 12. ADJUST VALVE CLEARANCE

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

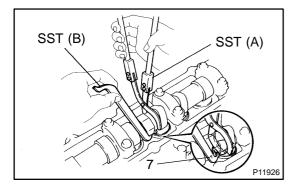


• Insert SST (B) gently from the inside as shown in the illustration.



• Using SST (A), hold the camshaft as shown in the illustration.

SST 09248-55040 (09248-05410)



SST (B) between the camshaft and valve lifter. Remove SST (A).

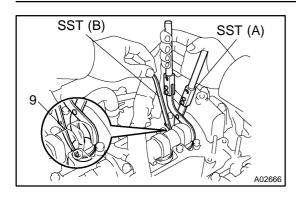
Using SST (A), press down the valve lifter and place

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

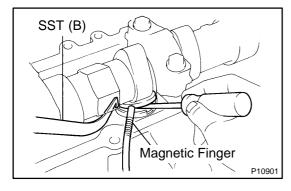
## HINT:

• Apply SST (B) at slight angle on the side marked with "7" or "9", at the position shown in the illustration.

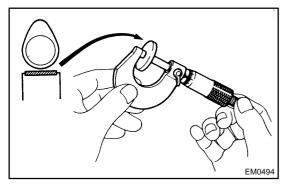
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 When the adjusting shim of the No. 1 intake side replace, remove the No. 2 or No. 3 camshaft bearing cap, and insert SST as shown in the illustration.



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



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

T ..... Thickness of used shim

A ..... Measured valve clearance

N ..... Thickness of new shim

Intake: N = T + (A - 0.20 mm (0.008 in.))Exhaust: N = T + (A - 0.30 mm (0.012 in.))

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.).

2005 LEXUS IS300 (RM1140U)

# **Adjusting Shim Selection Chart (Intake)**

Adjusting offin occorron office (make)									
Installed Shim Thickness		2200		8828					
mm (in.)	(0.0084) (0.0092) (0.0092) (0.0009) (0.	2 2 2 2	1220 1220 124 1260 1260 1270 1270 1270 1270 1270 1270 1270 127	29 29 28					
		2000		0000					
Measured Clearance	2.550 (2.	8 8 8	3.120 3.120 3.150 3.150 3.220 3.220 3.220	3.250 3.260 3.280 3.300					
mm (in.)		3 60 60 60		W W W W					
0.000 - 0.020 (0.0000 - 0.0008)	1 1 1 1 1 1 1 1 2 2 2 2 2 3 3 3 3 3 4 4 4 4 4 4 5 5 5 5 5 6 6 6 6 6 6 7 7 7 7 7 8 8 8 8	3 8 8 9	9 10 10 10 10 11 11 12 12	12 12 13 13					
0.021 - 0.040 (0.0008 - 0.0016)	1 1 1 1 1 1 1 2 2 2 2 2 3 3 3 3 3 4 4 4 4 4 5 5 5 5 5 6 6 6 6 6 6 7 7 7 7 7 8 8 8 8 8 8	3 9 9 9	10 10 10 11 11 11 12 12 12	13 13 13 14					
0.041 - 0.060 (0.0016 - 0.0024)	1 1 1 1 1 2 2 2 2 3 3 3 3 3 4 4 4 4 4 5 5 5 5 5 6 6 6 6 7 7 7 7 7 8 8 8 8 8 9 9	9 9 10	0 10 10 11 11 11 12 12 12 13	13 13 14 14					
0.061 - 0.080 (0.0024 - 0.0031)	1 1 1 1 1 2 2 2 2 3 3 3 3 3 4 4 4 4 4 5 5 5 5 6 6 6 6 6 7 7 7 7 7 8 8 8 8 8 9 9 9 8	$\overline{}$	<del></del>	<del></del>					
0.081 - 0.100 (0.0032 - 0.0039)	1 1 1 1 1 2 2 2 2 3 3 3 3 4 4 4 4 5 5 5 5 5 6 6 6 6 6 7 7 7 7 7 8 8 8 8 8 9 9 9 9 9 1								
0.101 - 0.120 (0.0040 - 0.0047)	1 1 1 1 1 2 2 2 2 3 3 3 3 3 3 4 4 4 4 4 5 5 5 5 5 6 6 6 6 6 7 7 7 7 7 8 8 8 8 8 9 9 9 9 9 10 10 1								
0.121 - 0.140 (0.0048 - 0.0055)	1 1 1 1 1 2 2 2 3 3 3 3 3 4 4 4 4 4 5 5 5 5 5 6 6 6 6 6 7 7 7 7 7 8 8 8 8 8 9 9 9 9 9 10101010101								
0.141 - 0.149 (0.0056 - 0.0059)	1 1 1 1 2 2 2 3 3 3 3 4 4 4 4 4 5 5 5 5 5 6 6 6 6 6 7 7 7 7 7 8 8 8 8 8 8 9 9 9 9 9 10101010101111	11111112	212121313131314141414	15 15 16 16					
0.150 - 0.250 (0.0059 - 0.0098)	2 3 3 3 4 4 5 5 5 5 6 6 6 6 6 7 7 7 7 7 8 8 8 8 8 9 9 9 9 9 10 10 10 10 10 10 11 11 11 11 11 12 12 12 12 12 13 13 1:	2121214	1141515151516161717	171717					
0.251 - 0.260 (0.0099 - 0.0102) 0.261 - 0.280 (0.0103 - 0.0110)	2 3 3 3 4 4 4 5 5 5 5 6 6 6 6 6 7 7 7 7 7 8 8 8 8 8 8 9 9 9 9 9 10101010101111111111								
0.281 - 0.300 (0.0111 - 0.0118)	3 3 4 4 4 4 5 5 6 6 6 6 6 7 7 7 7 7 8 8 8 8 8 9 9 9 9 9 1010 1010 1011 11 11 11 12 12 12 12 12 13 13 13 13 13 13								
0.301 - 0.320 (0.0119 - 0.0126)	3 4 4 4 4 5 5 6 6 6 6 6 7 7 7 7 7 8 8 8 8 8 8 9 9 9 9 9 1010101010101111111111								
0.321 - 0.340 (0.0126 - 0.0134)	4 4 4 5 5 5 5 6 6 6 6 7 7 7 7 7 8 8 8 8 8 8 9 9 9 9 1010101010101111111111			,					
0.341 - 0.360 (0.0134 - 0.0142)	4 4 5 5 5 6 6 6 6 7 7 7 7 8 8 8 8 8 8 9 9 9 9 9 10 10 10 10 10 11 11 11 11 11 12 12 12 12 12 12 13 13 13 13 13 13 14 14 14 14 15 1								
0.361 - 0.380 (0.0142 - 0.0150)	4 5 5 5 6 6 6 6 7 7 7 8 8 8 8 8 8 9 9 9 9 9 10 10 10 10 10 11 11 11 11 11 12 12 12 12 12 13 13 13 13 13 13 14 14 14 14 14 15 15 15 15								
0.381 - 0.400 (0.0150 - 0.0157)	5 5 6 6 6 6 7 7 8 8 8 8 8 9 9 9 9 9 10 10 10 10 10 10 11 11 11 11 11 12 12 12 12 12 12 13 13 13 13 13 13 14 14 14 14 14 14 15 15 15 15 15 16 1								
0.401 - 0.420 (0.0158 - 0.0165)	5 6 6 6 6 7 7 8 8 8 8 9 9 9 9 9 9 10 10 10 10 10 10 11 11 11 11 12 12 12 12 12 12 13 13 13 13 13 14 14 14 14 14 15 15 15 15 15 16 16 16 1	6 16 16 17	7 17 17 17						
0.421 - 0.440 (0.0166 - 0.0173)	6 6 6 7 7 7 8 8 8 9 9 9 9 9 9 10 10 10 10 10 10 11 11 11 11 11 12 12 12 12 12 12 13 13 13 13 13 13 14 14 14 14 14 14 15 15 15 15 15 15 16 16 16 16 16 16								
0.441 - 0.460 (0.0174 - 0.0181)	6 6 7 7 7 8 8 8 9 9 9 9 1010101010101111111111111								
0.461 - 0.480 (0.0181 - 0.0189)	6 7 7 7 8 8 8 9 9 9 9 10101010101011111111111121212121213131313		<u>'</u>						
0.481 - 0.500 (0.0189 - 0.0197)	7 7 8 8 8 8 9 9 101010101010101111111111111								
0.501 - 0.520 (0.0197 - 0.0205)	7 8 8 8 8 9 9 101010101011 11 11 11 11 11 12 12 12 12 12 13 13 13 13 13 14 14 14 14 14 15 15 15 15 15 15 16 16 16 16 16 16 17 17 17 17 17 17 17 17 17 17 17 17 17								
0.521 - 0.540 (0.0205 - 0.0213)	8 8 8 9 9 9 1010101011 11 11 11 11 12 12 12 12 12 12 13 13 13 13 13 13 14 14 14 14 14 15 15 15 15 15 16 16 16 16 16 17 17 17 17 17 17 17 17 17 17 17 17 17		New shin	n thickn					
0.541 - 0.560 (0.0213 - 0.0220) 0.561 - 0.580 (0.0221 - 0.0228)	8   9   9   10   10   10   11   11   12   12   12		INGW SIIII	II UIICKII					
0.581 - 0.600 (0.0221 - 0.0228)	9 9 1010101011111 121212121212131313131313141414141415 1515 1515 1616 1616 1617 1717 1717 17	Shim	1	Shim					
0.601 - 0.620 (0.0237 - 0.0244)	9 1010 1010 11 11 12 12 12 12 12 13 13 13 13 13 13 14 14 14 14 15 15 15 15 16 16 16 16 16 17 17 17 17 17 17 17 17	No.	Thickness	No.					
0.621 - 0.640 (0.0244 - 0.0252)	1010101011 11 11 12 12 12 13 13 13 13 13 13 14 14 14 14 14 15 15 15 15 15 16 16 16 16 16 17 17 17 17 17 17 17 17 17 17	140.		INO.					
0.641 - 0.660 (0.0252 - 0.0260)	10 10 11 11 11 12 12 12 13 13 13 13 14 14 14 14 14 15 15 15 15 15 16 16 16 16 16 17 17 17 17 17 17 17 17 17 17	1	2.500 (0.0984)	10					
0.661 - 0.680 (0.0260 - 0.0268)	1011 11 11 12 12 12 13 13 13 14 14 14 14 14 14 15 15 15 15 15 16 16 16 16 16 17 17 17 17 17 17 17 17	' '	2.500 (0.0304)	10					
0.681 - 0.700 (0.0268 - 0.0276)	11 11 12 12 12 12 13 13 14 14 14 14 14 14 15 15 15 15 15 15 16 16 16 16 16 17 17 17 17 17 17 17 17	2	2.550 (0.1004)	11					
0.701 - 0.720 (0.0276 - 0.0283)	11 1212121212131314141414141515151515151616161616161717171717171717								
0.721 - 0.740 (0.0284 - 0.0291)	12 12 12 13 13 14 14 14 15 15 15 15 16 16 16 16 16 17 17 17 17 17 17 17	3	2.600 (0.1024)	12					
0.741 - 0.760 (0.0292 - 0.0299)	12 12 13 13 13 14 14 14 15 15 15 15 16 16 16 16 16 17 17 17 17 17 17 17 17								
0.761 - 0.780 (0.0300 - 0.0307)	12/13/13/14/14/14/15/15/15/16/16/16/16/16/16/17/17/17/17/17/17/17/17	4	2.650 (0.1043)	13					
0.781 - 0.800 (0.0307 - 0.0315)	13 13 14 14 14 15 15 16 16 16 16 16 17 17 17 17 17 17 17   13 14 14 14 15 15 16 16 16 17 17 17 17 17 17 17 17 17 17 17 17 17		, ,	l					
0.801 - 0.820 (0.0315 - 0.0323)	1414141515151616161717171717171717171717171717	5	2.700 (0.1063)	14					
0.821 - 0.840 (0.0323 - 0.0331) 0.841 - 0.860 (0.0331 - 0.0339)	14141515151616161717171717171717171717171717		0 ==0 (0 (000)	4.5					
0.861 - 0.880 (0.0331 - 0.0339)	14/15/15/16/16/16/17/17/17/17/17	6	2.750 (0.1083)	15					
0.881 - 0.900 (0.0347 - 0.0354)	4545464646474747474747	7	2.000 (0.1102)	16					
0.901 - 0.920 (0.0355 - 0.0362)	151616161617171717 Intake valve clearance (Cold):	7	2.800 (0.1102)	16					
0.921 - 0.940 (0.0363 - 0.0370)	16 16 16 17 17 17 17  0.15 - 0.25 mm (0.006 - 0.010 in.)	8	2.850 (0.1122)	17					
0.941 - 0.960 (0.0370 - 0.0378)	16161717171717	0	2.000 (0.1122)	''					
0.961 - 0.980 (0.0378 - 0.0386)	1617171717 EXAMPLE:	9	2.900 (0.1142)						
0.981 - 1.000 (0.0386 - 0.0394)	The 2.800 mm (0.1102 in.) shim is installed, and the measured		2.000 (0.1142)	J					
1.001 - 1.020 (0.0394 - 0.0402)	$\frac{ 7 ^{17}}{ 7 }$ clearance is 0.450 mm (0.0177 in.) Replace the 2.800 mm	HINT:							
1.021 - 1.040 (0.0402 - 0.0409)	(0 1102 in ) shim with a new No. 12 shim	New s	hims have the th	nickness					

New shim thickness mm (in.)

	14CW Shiri	i tillor	11000 111111 (111
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)		

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

easured 300 mm (0.1102 in.) shim with a new No. 12 shim.

1.041 - 1.050 (0.0410 - 0.0413)

V00720

# **Adjusting Shim Selection Chart (Exhaust)**

Installed Chim Thislman	L					T			7	T					J		Ţ					)				)	)									-	_	
Installed Shim Thickness	84	(0.0992)	(0.1000)	8	8) 8	(0.1024)	31	(0.1039)	3 4	51	55	53	103	3 6	- 12	(0.10/5)	83	(0.1087)	(0.1091	(0.1094)	(0.1102)	90	(0.1110)	(0.1114)	(0.1122)	(0.1126)	(0:1130)	(0.1134)	(0.1142)	(0.1146	잂	(0.1154)	(0.1157	18	(0.1169)	(0.1173)	18	(0.1185)
mm (in.)	(0.0984	8	15	12	위유	의은	10	2 3	2  9	12	15	의	위	2  2	-   -	218	15	19	2	215	315	Ξ	Ξ	= =	15	11	Ξ	된	:15	ΙΞ	(0.11	ΞI	뒤	01	151	(0.11	0 2	<u>                                      </u>
		, 으	୧	의	ଥା	યુટ	9	ଠା	ગ	비의	19	의	ଠା	9 9	ગ	9 9	19	မြ	의	ଥା	ગાંહ	10	의	9	218	9		9 9	2  9		191	9						
Measured Clearance	2.500	12	2.540	2.550	2.560	2.600	2.620	2.640	2,660	18	8	2.690	ଥାଃ	2770	027.2	2.730	2	2.760	2.770	8 8	2,800	15	2.820	2.830	2.850	2.860	2.870	2.880	2900	2.910	2.920	2.930	2.940	2,960	2.970	2.980	3.000	3.010
mm (in.)	2.5	2.5	2.5	2.5	25	26	2.6	5.6	9 6	118	2.6	18		215	1 6	2 2	2.7	2.7	12	2.7	2 2	2.8	22	2 2	2 2	2.8	2.8	3 5	118	122	2.5	122	2 5	12	12	2 6	3 8	(m)
11111 (111.)	J		Ľ.																				Ш					$\perp$		_				1		$\perp$	Щ.	Ш
0.000 - 0.020 (0.0000 - 0.0008)	Т	Т							Т	Т		П			1	1   1	1	1	1		1   1			2 2	2 2	2			3 3				4 4		5	5 5		5
0.021 - 0.040 (0.0008 - 0.0016)	T	Т	Г			1				1				1 1	1 1	1 1	1	1	1	1 1	1 2	2	2	2 2	2 3	3	3	3 3	3 4	4	4	4	4 5	5	5	5 5	6 6	6
0.041 - 0.060 (0.0016 - 0.0024)	$^{+}$	+	T	П	$^{-}$	1	Н		$\top$	+	$\vdash$	1	1	1 1	1 1	1 1	1	1	1	2 2	2 2	2	2	3 3		3	3	4 4	4 4	4	4	5	5 5	5	5	6 6	6	6
0.061 - 0.080 (0.0024 - 0.0031)	+	+	t	H	+	+	Н	$\rightarrow$	+	1	1	1	1	1 1		1 1	1	2			2 2			3 3		4			4 4				5 5			6 6		7
	╁	+	+	Н	+	+-	Н	$\vdash$		1		-	1	1 1		1 2		2	2		3 3				4 4			4 5					6 6			6 7		7
0.081 - 0.100 (0.0032 - 0.0039)	+	+	┢	Н	$\rightarrow$	+	Н	-	<del>'   '</del>	$\overline{}$	-	-		1 2		2 2					3 3				4 4				5 5				6 6		$\overline{}$	7 7		
0.101 - 0.120 (0.0040 - 0.0047)	+	╀	⊢	$\vdash$	+	+	١.	$\rightarrow$	1 1	-	+	-				_							4	4 1	4 5	-	-		5 6			-	6 7		1	7 7	_	8
0.121 - 0.140 (0.0048 - 0.0055)	+	1	╀		+	٠,	1	1	1 1	11	1			2 2		2 2		3					4	- 4	4 5 5 5	12	5						7 7		1			8
0.141 - 0.160 (0.0056 - 0.0063)	_	1_	┺		_	1	1	1	1   1	1	2			2 2		3 3			3		4 4		4	5 5	9 5	5	5	6 6					_	-		8 8		
0.161 - 0.180 (0.0063 - 0.0071)	_	1_		Ш		1	1	1	1 2					3 3		3 3				4 4	4 4	5	5	5 :	5 5	6	6	6 6					7 7	8				9
0.181 - 0.200 (0.0071 - 0.0079)				1	1 1	1	1	2	2 2						3 3				4		5 5	5	5	5 6	6 6	6	6	6 7					8 8			8 9		
0.201 - 0.220 (0.0079 - 0.0087)			1	1	1 1		2	2	2 2		3			3 4	1 4	4 4	4				5 5			6 6		6	-	7 7								9 9		
0.221 - 0.240 (0.0087 - 0.0094)		1	1	1	1 1	2	2	2	3 3	3				4 4	1 4	4 4	5		5		5 6			6 6		-	7		7 8				8 9					
0.241 - 0.249 (0.0095 - 0.0098)		1	1	1	1 2	2 2	2	3	3 3	3	4	4	4	4 4	1 5	5 5	5	5	5	6 6	6 6	6	6	7	7 7	7	7	8 8	3 8	8	8	9	9 9	9	9	10 1	0 10	10
0.250 - 0.350 (0.0098 - 0.0138)	T	П				Т	П	П	Т	Т													Ш					$\perp$	$\perp$	$\perp$			$\perp$	┸		Щ	Ш	$\perp$
0.351 - 0.360 (0.0138 - 0.0142)	2	3	3	3	3 4	1 4	5	5	5 5	6	6	6	6	6 7	7 :	7 7	7	7	8	8 8	8 8												11 1					
0.361 - 0.380 (0.0142 - 0.0150)	2	3	3	3	4 4	1 4	5	5	5 6	6	6	6	6	7 7	7 :	7 7	7	8	8	8 8	8 8	9	9	9 9	9 9	10	10	10 1	0 10	)11	11	11	11 1	1 12	12	12 1	2 12	: 13 1
0.381 - 0.400 (0.0150 - 0.0157)	3	3	4	4	4 4	1 5	5	6	6 €	6	6	7	7	7 7	7	7 8	8	8	8	8 9	9 9	9	9	9 1	0 10	10	10	10 1	1 11	111	11]	11	12 1:	2 12	12	12 1	3 13	13 1
0.401 - 0.420 (0.0158 - 0.0165)	3	4		4	4 !	5 5			6 6			7	7	7 8	3 8	8 8	8	8	9	9 9	9 9	9	10	10 1	0 10	10	11	11 1	1 11	111	12	12	12 1:	2 12	13	13 1	3 13	13 1
0.421 - 0.440 (0.0166 - 0.0173)	4			5	_	5 6	6	-	7 7		7	7	8			8 8	9			9 9	9 10	10	10	101	0 11	11	11	11 1	1 12	2 12	12	12	12 1:	3 13	13	13 1	3 14	141
0.441 - 0.460 (0.0174 - 0.0181)	4	4	5	5		6			7 7	7	8									101	10 10	10	10	111	1 11	11	11	121	2 12	2 12	12	13	13 1:	3 13	13	14 1	4 14	141
0.461 - 0.480 (0.0181 - 0.0189)	4					6			7 8																								13 1:					
0.481 - 0.500 (0.0189 - 0.0197)		5				3 7	7	8	8 8	8 8	8	9	9	9 9	9 9	9 10	10	10	10	101	11 11	1 11	11	11 1	2 12	12	12	12 1	313	3 13	13	13	14 1	4 1 4	114	141	5 15	151
0.501 - 0.520 (0.0197 - 0.0205)	5					7 7			8 8	9	١	a	9	9 1	01	10 10	110	10	11	111	11 11	111	12	121	2 12	12	13	131	3 13	3 13	14	14	14 1	4 1 4	115	151	5 15	151
0.521 - 0.540 (0.0205 - 0.0213)	6			7																													14 1					
0.541 - 0.560 (0.0203 - 0.0213)	6	+	-	_	-		8																										15 1					
0.561 - 0.580 (0.0213 - 0.0220)	6				8 8											11 11																	15 1					
	7			0	0 1	9 0																											16 1					
0.581 - 0.600 (0.0229 - 0.0236)	7	-		0	0 1	1 9	10	10	0 1	0 11	110	11	11 1	1 1	2 1	12 12	2 1 2	12	12	12 1	12 12	212	1.4	1/1/1	414	14	15	15 1	5 15	115	16	16	16 1	6 16	17	171	7117	17/
0.601 - 0.620 (0.0237 - 0.0244)				8	8 3	9 9	10	10	1 1	1 11	11	11	121	121	<del>1</del>	12 14	212	12	12	121	13 1	111	14	14 1	4 14	15	15	15 1	5 16	16	16	16	16 1	7 1	17	171	717	, 17
0.621 - 0.640 (0.0244 - 0.0252)	8		18	9	9 3	2 10	110	10	1 1	1 11	111	40	12	12 1	211	12 14	2 1 2	13	13	1 4 1	13 14	4 1 4	14	15 1	E 15	15	15	161	616	110	16	17	17/1	711	717	171	711	, -/-
0.641 - 0.660 (0.0252 - 0.0260)	8	18	19	9	9 1	0110	110	11	1 1	1 11	12	12	12	12 1	211	13 14	3 13	13	13	14 1	14 14	114	14	15 1	5 15	16	16	16 1	6 16	117	, 13	14	17 1	711	717	17	/11/	1
0.661 - 0.680 (0.0260 - 0.0268)	8	9	19	9	1011	0110	111	11	111	2 12	112	12	12	13 1	3 1	13 1	3 1 3	14	14	14 1	14 14	115	15	151	0 10	10	10	16 1	7/1-	#:/	,;;	1/	17 1	7 1 1	7117	17		
0.681 - 0.700 (0.0268 - 0.0276)																																	17 1	/ [ [ .	ני			
0.701 - 0.720 (0.0276 - 0.0283)	9	10	10	10	10 1	1111	12	12	20	2 13	13	13	13	13 1	4 1	14 14	4 14	14	15	15 1	15 18	2115	10	101	0 10	110	1/	17 1	41	41/	#4	ш	77					
0.721 - 0.740 (0.0284 - 0.0291)																												17 1			11 /	J						
0.741 - 0.760 (0.0292 - 0.0299)			) 11	11	11 1	2 12	12	13	31	3 13	14	14	14 1	14 1	4 1	15 1	5 15	115	15	16 1	16 16	5 16	16	1/1	717	117	17	17 1	7117	4								
0.761 - 0.780 (0.0300 - 0.0307)		11	11	11	12 1	2 12	13	13	13 1	4 14	14	14	14 1	15 1	5 1	15 15	5 15	16	16	16 1	16 16	5 17	1/	1/ 1	/ 1 /	(17	1/	1/										
0.781 - 0.800 (0.0307 - 0.0315)		111														15 16										17	I											
0.801 - 0.820 (0.0315 - 0.0323)																16 16								17 1	7													
0.821 - 0.840 (0.0323 - 0.0331)																16 16							17															
0.841 - 0.860 (0.0331 - 0.0339)																17 1					17 1	7																
0.861 - 0.880 (0.0339 - 0.0346)	12	2 13	3 13	13	14 1	4 14	15	15	15 1	6 16	16	16	16	17 1	7 1	17 1	7 17	17	17	17																		
0.881 - 0.900 (0.0347 - 0.0354)	13	3 13	3 14	14	14 1	4 15	15	16	16 1	6 16	16	17	17	17 1	7 1	17 1	7 1 7	17	]																			
0.901 - 0.920 (0.0355 - 0.0362)	13	3 1 4	1 14	14	14 1	5 15	16	16	16 1	6 17	17	17	17	17 1	7 1	17 1	7																					
0.921 - 0.940 (0.0363 - 0.0370)	14	114	1 14	15	15 1	5 16	16	16	17 1	7 17	17	17	17	17 1	7		-																					
0.941 - 0.960 (0.0370 - 0.0378)	14	1 14	1 15	15	15 1	6 16	16	17	17 1	7 17	17	17	17		_																							
0.961 - 0.980 (0.0378 - 0.0386)						6 16																																
0.981 - 1.000 (0.0386 - 0.0394)						617					-	•																										
1.001 - 1.020 (0.0394 - 0.0402)	15	5 16	3116	16	161	7 17	717	17			, h	٠.		٠.	,-	٠ı.	_	ام	-	·r-	'n	^~		^-	ام	١.												
1.021 - 1.040 (0.0402 - 0.0409)	16	3 16	3 16	17	17 1	7 17	17	广								alv																						
1.041 - 1.060 (0.0410 - 0.0417)	16	316	3 1 7	17	17 1	7 17	1	•		0.	25	<b>,</b> -	0	.3	5	m	m	(	0.0	01	0	- (	0.0	1(	4 i	n.	)											
1.061 - 1.080 (0.0418 - 0.0425)					17 1		_				_		_	-	_			•			-	•		•	•		,											
1.081 - 1.100 (0.0426 - 0.0433)				17						E)	٧ <i>٨</i>		ID																									
1.101 - 1.120 (0.0433 - 0.0441)			7 17		ائن																																	
1.121 - 1.140 (0.0441 - 0.0449)		7 1 7		3						Tŀ	ne	2.	.80	00	n	nn	η (	0.	.11	02	2 i	n.)	s (	hiı	m i	is	in	sta	alle	эd	, a	an	d t	$h\epsilon$	n	nea	ası	ure
1.141 - 1.150 (0.0441 - 0.0449)	17		ı														,					,																
1.141 - 1.150 (0.0445 - 0.0453)	45	7								CIE	зa	ra	nc	æ	- 15	S (	U.4	C#	U	m	ım	((	U.(	JΊ	11	- II	1.)	ı. I	ĸе	IO:	ac	зe	th	ıe	۷.	.ŏU	<i>I</i> U	mı

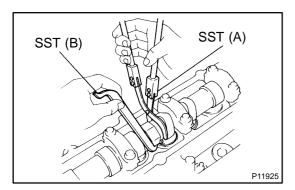
(0.1102 in.) shim with a new No. 10 shim.

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)		

# red HINT:

clearance is 0.450 mm (0.0177 in.). Replace the 2.800 mm New shims have the thickness in millimeters imprinted on the face.



- (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).

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- (d) Recheck the valve clearance.
- 13. REINSTALL CYLINDER HEAD COVERS (See page EM-53)
- 14. RECONNECT ENGINE WIRE TO CYLINDER HEAD COVERS
- 15. REINSTALL SPARK PLUGS
- 16. REINSTALL IGNITION COILS AND HIGH-TENSION CORD SET ASSEMBLY (See page IG-9)
- 17. REINSTALL NO. 3 TIMING BELT COVER
- (a) Install the gasket to the timing belt cover.
- (b) Using a 5 mm hexagon wrench, install the timing belt cover with the 4 bolts.

Torque: 8.0 N·m (80 kgf·cm, 71 in.-lbf)

- (c) Install the oil filler cap.
- 18. REINSTALL THROTTLE BODY AND INTAKE AIR CON-NECTOR ASSEMBLY
- (a) Install a new gasket to the air intake chamber.
- (b) Place the throttle body together with the intake air connector on the cylinder head.
- (c) Connect the vacuum hose (from actuator for ACIS) to the No. 1 vacuum pipe.
- (d) Connect the 2 water bypass hoses to the throttle body.
- (e) Install the 4 bolts and 2 nuts holding the intake air connector to the air intake chamber.

Torque: 28 N·m (280 kgf-cm, 21 ft-lbf)

(f) Install the 2 nuts holding the throttle body bracket to the cylinder head.

Torque: 21 N-m (210 kgf-cm, 15 ft-lbf)

- (g) Connect the air assist hose to the intake air connector.
- (h) Install the PCV hose to the intake air connector.
- (i) Install the EVAP hose (from charcoal canister) to the VSV for EVAP.
- (j) Install the vacuum hose (from No. 2 vacuum pipe) to the No. 1 vacuum pipe.
- (k) Install the throttle position sensor connector.
- (I) Install the accelerator pedal position sensor connector.
- (m) Install the throttle control motor connector.
- (n) Install the VSV connector for EVAP.
- (o) Secure the engine wire with the clamp on the throttle body bracket.
- (p) Install the engine wire clamp with the clamp bracket of the throttle body.
- (q) Connect the accelerator cable to the throttle body.
- 19. REINSTALL INTAKE AIR RESONATOR

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- **20. REINSTALL ENGINE COVER** Install the engine cover with the 4 nuts.
- 21. REFILL WITH ENGINE COOLANT
- 22. START ENGINE AND CHECK FOR LEAKS

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