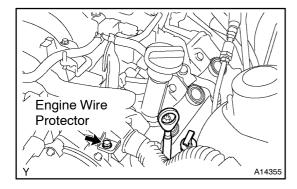
VALVE CLEARANCE INSPECTION

EM0DS-03

HINT:

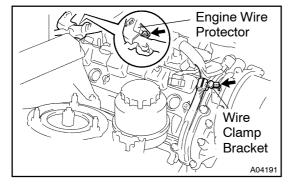
Inspect and adjust the valve clearance when the engine is cold.

- REMOVE V-BANK COVER AND ENGINE ROOM SIDE COVERS
- 2. REMOVE INTAKE AIR CONNECTOR PIPE
- 3. REMOVE IGNITION COILS



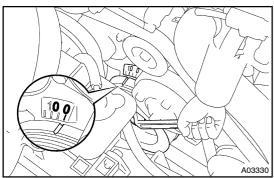
4. REMOVE LH CYLINDER HEAD COVER

- (a) Remove the bolt, and pull out the oil dipstick and guide for the engine.
- (b) Remove the bolt, and pull out the oil dipstick and guide for the transmission.
- (c) Disconnect the PCV valve on the PCV hose from the cylinder head cover.
- (d) Disconnect the 2 hoses for the EVAP from the line tubes.
- (e) Disconnect the wire clamp from the wire bracket on the cylinder head cover.
- (f) Remove the bolt, and disconnect the hose bracket for the EVAP from the cylinder head cover.
- (g) Remove the bolt, and disconnect the engine wire protector from the camshaft bearing cap.
- (h) Remove the 9 bolts, 9 seal washers and cylinder head cover.



5. REMOVE RH CYLINDER HEAD COVER

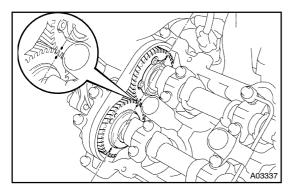
- (a) Remove the bolt, and disconnect the wire clamp bracket from the camshaft bearing cap.
- (b) Remove the bolt, and disconnect the engine wire protector from the cylinder head.
- (c) Remove the 9 bolts, 9 seal washers and cylinder head cover.



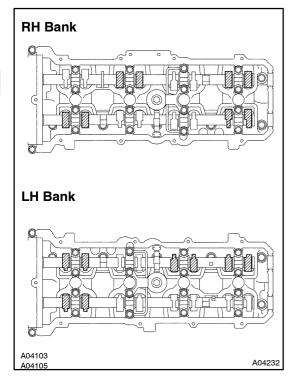
6. SET NO.1 CYLINDER TO TDC/COMPRESSION

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

LEXUS LS430 (RM792E)



(b) Check that the timing marks (1 dot mark) of the intake and exhaust camshaft gears on the LH bank are aligned.
 If not, turn the crankshaft 1 revolution (360°) and align the mark as above.

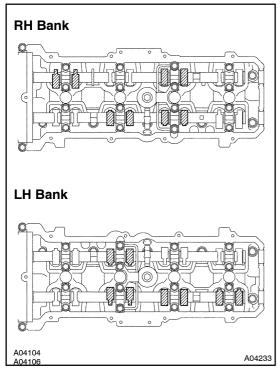


7. INSPECT VALVE CLEARANCE

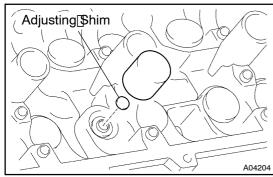
- (a) Check only the valves indicated.
 - (1) Using a feeler gauge, measure the clearance between the valve lifter and camshaft.
 - (2) Record the out-of-specification valve clearance measurements. They will be used later to determine the required replacement adjusting shim.

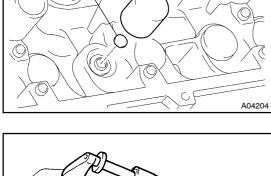
Valve clearance (Cold):

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 1 revolution (360°) and align the mark as above (See procedure in step 9).
- (c) Check only the valves indicated as shown. Measure the valve clearance (See procedure in step (a)).



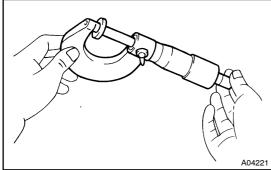


8.∏ ADJUST VALVE CLEARANCE

- (a) Disconnect the timing belt from the camshaft timing bulleys[See]page[EM-18]]
- (b) Remove The camshafts (See page EM-40).
- (c) Remove the valve fifter and adjusting shim.

NOTICE:

when removing the valve lifter.



- (d) ☐ Determine The Teplacement adjusting \$\frac{1}{2}\text{ bin }\frac{1}{2}\text{ coording} to these Formula or Charts:
 - (1) Using a micrometer, measure the thickness of the removed \$him.
 - (2) Calculate the thickness of a hew shim so that the valverclearancercomes within the specified value.

T[].....[Thickness[of[removed[shim]

N∏......∏Thickness of new shim

Intake	N = T ⊞ [[A -[]0.20[]nm[[0.008[]n.))
Exhaust	N = T

(3) Select a few 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.)]]o[2.80[mm[0.11[02[in.).

- (e) Reinstall hew adjusting shim to the spring retainer.
- Reinstall the valve lifter.
- (g) Reinstall The camshafts (See page EM-65).
- Reconnect the timing belt to the camshaft timing pulleys (See page EM-26).
- Recheck the valve clearance. (i)
- **REINSTALL CYLINDER HEAD COVERS**
- 10. ☐ REINSTALL ☐ GNITION COILS (See page G-6)
- 11. REINSTALL INTAKE AIR CONNECTOR PIPE
- 12. **REINSTALL V-BANK COVER**

	(1701 (0.1063) (1701 (0.107) (1701 (0.1087) (1701 (0.1087)	26 26 28 28 28 30 30 32 32 32 34 34 36 36 38 38 40 40 42 44 46 48 50 52 54	28 30 30 32 32 32 34 34 36 36 38 38 40 40 42 42 44 44 46 48 50 52 54 56 58 60 62 30 32 32 34 34 36 36 38 38 40 40 42 42 44 44 46 46 50 52 54 56 58 60 62 64	32 32 34 34 36 36 38 38 40 40 42 42 44 44 46 46 48 48 50 52 54 56 58 60 62 64 66 68	34 34 36 36 38 38 40 40 42 42 44 44 46 46 48 48 50 50 52 54 56 58 60 62 64	36 36 38 38 40 40 42 42 42 44 44 46 46 48 48 8 50 50 52 52 54 56 58 60 62 64 66 68 70 38 38 40 40 42 42 44 46 46 48 48 50 50 52 54 54 56 58 60 62 64 66 68 70 72	50 50 52 52 54 54 54 56 56 58 58 60 60 62 62 64 64 66 66 68 70 72 74 76 78 80 80 80 55 52 54 54 56 56 58 58 60 60 62 62 64 66 66 68 68 70 72 74 76 78 80 80 80	54 56 56 58 58 58 60 60 62 62 64 64 66 66 68 68 70 70 72 74 76 78 80 80	56 56 58 58 60 60 62 62 62 64 66 66 68 68 70 72 72 74 76 78 80	58 58 60 60 62 62 64 64 66 66 68 68 70 70 72 72 74 74 76 78 80 80 80 60 60 62 62 64 64 66 68 68 68 70 70 72 72 74 74 76 78 80 80 80	62 62 64 64 66 66 68 68 70 70 72 72 74 74 76 76 78 78 80 80 80	64 66 66 68 68 70 70 72 72 74 74 76 76 78 78 80	66 66 68 68 70 70 72 72 74 74 76 76 76 78 80 80 80 80 80 80 80 68 68 68 70 70 72 72 74 74 76 78 78 80 80 80 80 80 80	70 70 72 72 74 74 76 78 78 80 80 80 80 80 80	72 74 74 76 76 78 78 80 80 80 80	74 76 76 78 78 80 80 80	78 78 80 80 80 80 80 80 80 80 80 80 80 80 80	80 80 80 80 80	80 80 80 80 80	3	1					New shim thickness mm (in.)	Shim No. Thickness Shim No. Thickness Shim No.	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)	40 2.400 (0.0945) 68	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)
Adjusting Shim Selection Chart (In	2.000 (0.0787) 2.020 (0.0953) 2.020 (0.0953) 2.020 (0.0953) 2.020 (0.0953) 2.020 (0.0953) 2.020 (0.0953) 2.020 (0.0953) 2.020 (0.0953) 2.020 (0.0953) 2.020 (0.0953) 2.030	00 00 00 02 02 04 04 06 06 08 08 08 10 10 12 12 14 14 16 16 16 18 18 20 20 22 22 24	00 00 02 04 06 06 08 08 10 10 12 12 14 14 16 16 18 18 20 22 22 24 24 26 26 28 28 00 02 04 06 08 08 10 10 12 12 14 14 16 16 18 18 20 20 22 22 24 24 26 26 28 28	00 00 02 04 06 08 10 10 12 12 14 14 16 16 18 18 20 20 22 22 24 24 26 26 28 28 30 30	00 00 00 00 02 04 06 08 10 12 12 14 14 16 16 18 18 20 20 22 22 24 24 26 26 28 28 30 30 32 32	0.111-0.130 (0.0044-0.0051) 00 00 00 00 00 00 00 00 00 00 12 04 06 08 10 12 14 14 16 16 18 18 20 20 22 22 22 24 24 26 26 28 28 39 30 32 32 34 34 34 34 34 00 00 00 00 00 00 00 10 10 10 10 10 10	0.251-0.270 (0.0099-0.0106) 06 08 10 12 14 16 18 20 22 24 26 28 28 30 30 32 32 34 34 36 36 38 38 39 40 40 40 40 40 44 46 46	10 12 14 16 18 20 22 24 26 28 30 32 32 34 34 36 38 38 40 40 42 42 44 44 46 48 48 50 50 52 52	12 14 16 18 20 22 24 26 28 30 32 34 34 36 36 38 38 40 40 42 42 44 44 46 46 8 8 8 50 50 52 52 54 55 55 54 54	0.331 -0.350 (0.0130 -0.0138) 14 16 18 20 22 24 26 28 30 32 34 36 36 38 38 40 40 42 42 44 44 46 46 48 48 35 50 50 52 32 54 54 56 56 55 50 55 55 57 50 56 55 55 56 55 56 55 56 55 56 55 56 56	18 20 22 24 26 28 30 32 34 36 38 40 40 42 42 44 44 46 46 48 48 50 50 52 52 54 54 56 56 56 58 58 60 60	20 22 24 26 28 30 32 34 36 38 40 42 42 44 44 46 46 48 48 50 50 52 52 54 56 56 56 56 56 60 60 62	0.411-0.430 (0.010-20.010-2) 22 24 25 28 30 30 30 30 41 42 30 41 44 44 45 46 18 30 50 52 52 54 55 56 56 56 56 56 56 64 66 60 0.411-0.430 (0.010-200.010-20.010-20.010-20.010-20.010-20.010-20.010-20.010-20.010-20.010-20.010-20.010-20.010-20.010-20.	26 28 30 32 34 36 38 40 42 44 46 48 48 50 50 52 52 54 54 56 56 58 58 60 60 62 62 64 64 66 66 68 68	28 30 32 34 36 38 40 42 44 46 48 50 50 52 52 54 54 56 56 58 58 60 60 62 62 64 64 66 66 68 68 68 70 70	30 32 34 36 38 40 42 44 46 48 50 52 52 54 54 56 56 58 58 60 60 62 62 64 64 66 66 68 68 70 70 72 72	0.531 - 0.530 (0.0201- 0.02017) 343 343 343 444 345 445 64 84 84 84 85 08 85 88 80 80 80 82 82 84 84 86 86 80 88 87 70 72 72 72 74 74 77 75 85 85 85 85 85 85 85 85 85 85 85 85 85	36 38 40 42 44 46 48 50 52 54 56 58 58 60 60 62 62 64 64 66 66 68 68 70 70 72 72 74 74 76 76 78 78	62 62 64 64 66 66 68 68 70 70 72 72 74 74 76 76 78 78 80 80 80 64 64 66 68 68 70 70 72 74 74 76 76 78 80 80 80	42 44 46 48 50 52 54 56 58 60 62 64 64 66 66 68 68 70 70 72 72 74 74 76 76 78 78 80 80 80 80 80 80	44 46 48 50 52 54 56 58 60 62 64 66 66 68 68 70 70 72 72 74 74 76 76 76 78 78 80 80 80	0.651-0.670 (0.0256-0.0264) 46 48 50 52 54 56 58 60 62 64 66 68 68 70 70 72 72 74 74 76 76 78 78 80 80 80 80 80 80 80 80 80 0 0 80 0 0 0.054-0.0572) 48 50 52 54 56 58 60 62 64 66 68 70 70 72 72 74 74 76 76 78 78 80 80 80 80 80 80 80	50 52 54 56 58 60 62 64 66 68 70 72 72 74 74 76 76 78 78 80 80 80	0.711-0.730 (0.0280-0.0287) 52 54 56 58 60 62 64 66 68 70 72 74 76 76 78 78 80 80 80 80 80 80 80	56 58 60 62 64 66 68 70 72 74 76 78 78 80 80 80 80	0.771 – 0.790 (.0304 – 0.031) 581 00 0 2 16 4 6 6 8 170 1 2 1 1 7 16 1 8 8 0 8 10 8 0 8 10 8 0 8 0 8 0 8 0 8	62 64 66 68 70 72 74 76 78 80 80 80 80 80	64 66 68 70 72 74 76 78	0.837 - 0.287 (0.0235 - 0.0235) TO [27 47 67 80 80 80 80 80 80 80 8	70 72 74 76 78 80 80 80	0.911 - 0.930 (0.0359 - 0.0368) 72 7 4 7 7 7 8 18 0 8 0 8 0 8 0 8 0 8 0 8 0 8 0 8 0	76 78 80 80 80	78 80	0.391~1.010 (0.0390~0.0406) 80 80 80 80 80 80 80 80 80 80 80 80 80	EXAMP	

2.760 (0.1087) 2.780 (0.1094)

92

2.500 (0.0976) 2.520 (0.0992)

52 28

2.220 (0.0874) 2.240 (0.0882)

and the measured clearance is 0.440 mm (0.0173 in.). Replace the 2.300 mm (0.0906 in.) shim with a No. 54 shim.

The 2.300 mm (0.0906 in.) shim is installed,

22 28 48 46

2.800 (0.1102)

80

2.540 (0.1000)

54

2.260 (0.0890)

24 56

2.720 (0.1071) 2.740 (0.1079)

72 74

2.440 (0.0961) 2.460 (0.0969)

2.160 (0.0850) 2.180 (0.0858) 2.200 (0.0866)

	(1701.0) 027.2 (1701.0) 047.3 (1801.0) 047.2 (2011.0) 087.2 (2011.0) 008.2	46 48 50	46 48 50 52 54 48 50 52 54 56	52 54 56	52 54 56 58 60 54 56 58 60 62	58 60 62	58 60 62 64 66 60 62 64 66	64 66 68		66 68 70 72 74	78	80 80	80 80	00	_													mm (in.)	Thickness	2.560 (0.1008)	2.580 (0.1016)	2.600 (0.1024)	2.620 (0.1031)	2.640 (0.1039)	2.660 (0.1047)	2.680 (0.1055)	2.700 (0.1063)	2.720 (0.1071)	2.740 (0.1079)	2.760 (0.1087)	2.780 (0.1094)	2.800 (0.1102)	
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	2.600 (0.1031) 2.620 (0.1031) 2.640 (0.1039)	34 36	34 36 38 36 38 40	40 42	40 42 44 42 44 46	46 48	46 48 50	52 54	54 56	54 56 58	66 68 70	70 72	70 72 74	76 78	76 78 80	80 80	80 80 80	00 00	2]										Sh	(868)	(906	13)	321)	(626	337)	945)	(853)	(196	(696	(926	984)	992)	() ()
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Shim Selection Chart (Exhaust)	(\$2,00,0049) (\$2,00,0054) (\$2,430,00,0054)	14	16 16 18 18 18 20	20 20 22	22 22 24 24 24 26	26 26	28 28 30		34	36 36	48 48 50	50 50	52 52 54	56 56	58 58	9	62	66 66 68	68 68	70 70 72		74 74 76	78 87 87	08 08 08		08 08	08												alled,	and the measured clearance is 0.440 mm	9060		
art (E	2.390 (0.0947) 2.390 (0.0945) 2.400 (0.0945)	10	12 14 14 14 16 16	16 18 18	18 20 20	24	24 26 26		30 32 32		44 46 46	48	48 50 50	54		-	9	20 20 00	99	89 89 99	68 70 70	70 72 72	74 74 74	76 78 78		80	80 80 80 80	23											sinst	0.44(0) Mr		
n Ch	2.350 (0.0929) 2.350 (0.0929) 2.370 (0.0933)	80 80	12 12 14	14	16 16 18	20 22	2 22 24		28 28 30	30 35	42 42 44	46	46 46 48	50 52		54 54 56	56 58	28 28 60	62 64	64 64 66	89 99	68 68 70	2/0/0	76	76 76 78	78 80	80 80	80 80	<u> </u>						old):	4 in)	<u></u>	:	shim	ice is	300 n	Ξ.	
ectio	2.330 (0.0917) (1Se0.0) 046.S	04 06	10 08	12 12	16 14	18 18	20 20 2	24 24 2	26 26	28 28	40 40	42 42 4	44 44	48 48	20	52 52	54 54	00 20 20 20 20 20 20 20 20 20 20 20 20 2	09 09	62 62	64 64	99 99	20 02 02	72 72	74 74 7	76 76	78 78	80 80	80 80						Ce (C				6 in.)	earar	the 2.	4 shii	
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Shim	(0.0894) (0.0894) (0.0908) (0.0908)	00 00	02 02 04 04 04 06	06 06 08	10 10 12	12 14	14 14 16 16 16 18	18 20	20 20 22	22	34 34 36	36 38	38 38 40	44	44 46	46 48		50 50 57	54 56	56 56 58	28 60	60 62	64 64 66	99 99	68 68 70	202	72 72 74	76 76 78	08 87 87	80 80	8	5 1			Ve C) m m) E E	easur). Reg	itha	
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	2.020 (0.0795) 2.040 (0.0803) 2.040 (0.0803)					-	2	00 00	00 00 00	00	10 12	12 14	12 14 16	18 20	20 22	24	22 24 26	27 00 27 00	30 32	32 34	34 36	36 38	36 38 40	42 44	44 46	46 48		52 54	52 54 56 54 56 58	8 8	58 60 62	64 66	64 66 68	70 72	72 74	72 74 76	78 80	80 80	80 80 80 80	80			
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	Installed shim thickness mm (in.)	00-0.0012)	0.031-0.050 (0.0012-0.0020)	0.071-0.090 (0.0028-0.0035)	0.091-0.110 (0.0036-0.0043)	0.131-0.150 (0.0052-0.0059)	0.151-0.170 (0.0059-0.0067)	0.191-0.210 (0.0075-0.0083)	0.211-0.230 (0.0083-0.0091)	0.250-0.350 (0.0091-0.0098)	18-0.0146)	0.371-0.390 (0.0146-0.0154)	0.391-0.410 (0.0154-0.0161)	70-0.0103)	0.451-0.470 (0.0178-0.0185)	0.471-0.490 (0.0185-0.0193)	0.491-0.510 (0.0193-0.0201)	0-0.0209)	0.551-0.570 (0.0217-0.0224)	5-0.0232)	0.591-0.610 (0.0233-0.0240)	0.611-0.630 (0.0241-0.0248)	0.631 -0.650 (0.0248-0.0256)	0.671-0.690 (0.0264-0.0272)	72-0.0280)	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)	0.831-0.850 (0.0327-0.0335)	0.851-0.870 (0.0335-0.0343)	0.891-0.910 (0.0351-0.0358)	0.911-0.930 (0.0359-0.0366)	0.951-0.950 (0.036/-0.03/4)	0.971-0.990 (0.0382-0.0390)	0.991-1.010 (0.0390-0.0398)	1.031-1.050 (0.0406-0.0413)	4-0.0421)	1.071-1.090 (0.0422-0.0429)	1.111-1.130 (0.0437-0.0445)	15-0.0453)		
	ulled shim the	0.000-0.030 (0.0000	050 (0.001) 070 (0.002	390 (0.002	110 (0.003	150 (0.005	170 (0.00E	210 (0.007	230 (0.008	249 (0.00g 350 (0.009	370 (0.013	390 (0.014	410 (0.015	150 (0.017	170 (0.017	190 (0.018	510 (0.018	330 (0.02C	570 (0.021	590 (0.022	310 (0.023	530 (0.024	270 (0.024	390 (0.026	710 (0.027	730 (0.028	750 (0.028	790 (0.030	330 (0.031	350 (0.032	870 (0.035	310 (0.035	930 (0.03£	370 (0.037	390 (0.038	010 (0.035	750 (0.040	070 (0.0414	110 (0.043	130 (0.043	150 (0.044		
	Installed shim Measured clearance	0.000-0.0	0.031-0.0	0.071-0.0	0.091-0.	0.131-0	0.151-0	0.191-0.2	0.211-0.	0.231-0.	0.351-0.	0.371-0.	0.391-0.	0.411-0.	0.451-0.	0.471-0.4	0.491-0.	0.511-0.	0.551-0.	0.571-0.	0.591-0.t	0.611-0.0	0.631-0.	0.671-0.6	0.691-0.	0.711-0.	0.731-0.	0.771-0.7	0.791-0.	0.831-0.8	0.851-0.8	0.891-0.8	0.911-0.	0.951-0.5	0.971-0.8	0.991-1.0	1.031-1.0	1.051-1.0	1.071-1.	1,111-1.	1.131-1.		