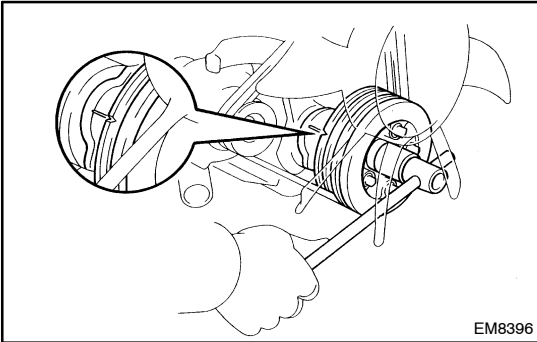


VALVE CLEARANCE (1HZ, 1HD-T) INSPECTION

EM0W0-01

1. REMOVE INTAKE PIPE ASSEMBLY
(See page EM-48)
2. REMOVE CYLINDER HEAD COVER
(See page EM-77)

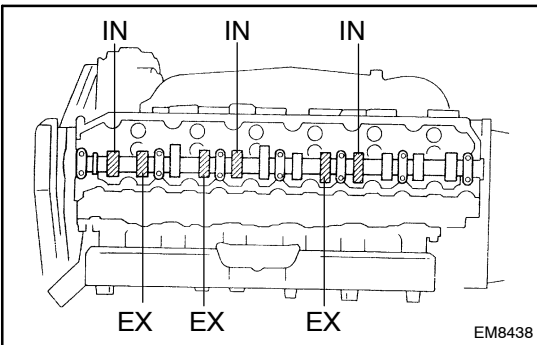


EM8396

3. SET NO.1 CYLINDER TO TDC/COMPRESSION

- (a) Turn crankshaft pulley clockwise, and align its groove with the timing gear cover groove.
- (b) Check that the valve lifters on the No.1 cylinder are loose and valve lifters on the No.6 cylinder are tight.

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



EM8438

4. 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 out of specification valve clearance measurements. They will be used later to determine the required replacement adjusting shim.

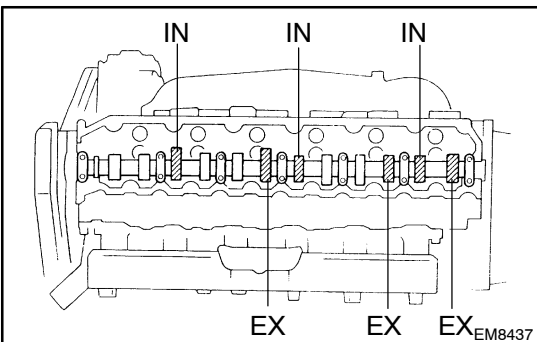
Valve clearance (Cold):

Intake

0.15 – 0.25 mm (0.006 – 0.010 in.)

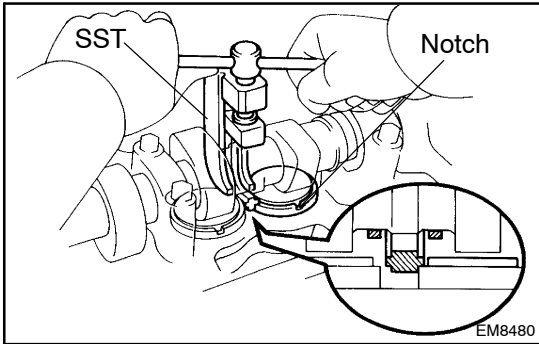
Exhaust

0.35 – 0.45 mm (0.014 – 0.018 in.)



EM8437

- (b) Turn the crankshaft one revolution (360°) and align the mark as above (See step 3).
- (c) Check only the valves indicated in the illustration. Measure the valve clearance (See step 3).

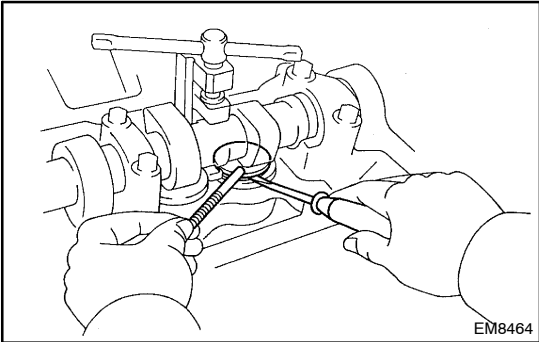


- (d) Remove the adjusting shim.
- Turn the crankshaft to position the cam lobe of the camshaft on the adjusting valve upward.
 - Using SST press down the valve lifter.

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HINT:

Before pressing down the valve lifter position the notch on the exhaust manifold side.



- Remove the adjusting shim with a small screwdriver and magnetic finger.
- (e) Determine the replacement adjusting shim size by using following (Formula or Charts).

- Using a micrometer measure the thickness of the removed shim.
- Calculate the thickness of the new shim so the valve clearance comes within specified valve.

T..... Thickness of used shim

A..... Measured valve clearance

N..... Thickness of new shim

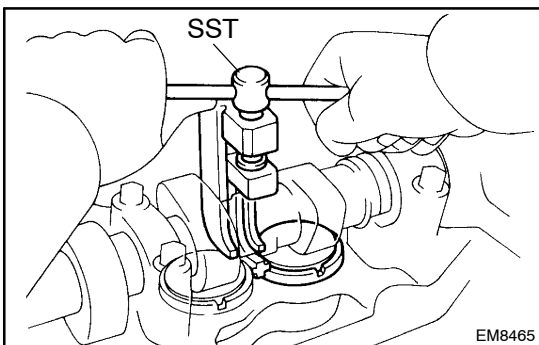
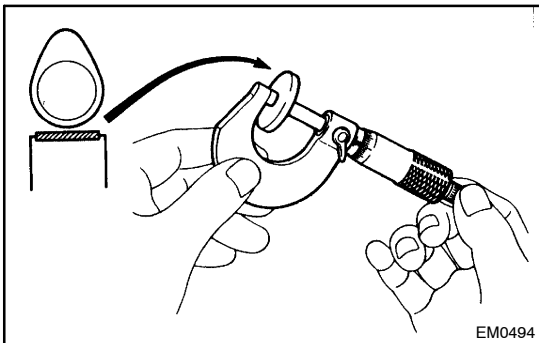
Intake $N = T + (A - 0.20 \text{ mm} [0.008 \text{ in.}])$

Exhaust $N = T + (A - 0.40 \text{ mm} [0.016 \text{ in.}])$

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

HINT:

Shims are available in twenty sizes in increments of 0.05 mm (0.0020 in.) from 2.35 mm (0.0925 in.) to 3.30 mm (0.1299 in.)



- (f) Install a new adjusting shim.
- Place a new adjusting shim on the valve lifter.
 - Remove SST.

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- (g) Recheck the valve clearance.

5. REINSTALL CYLINDER HEAD COVER

(See page EM-66)

6. REINSTALL INTAKE PIPE ASSEMBLY

(See page EM-66)

Adjusting Shim Selection Using Chart (Intake)

Measured clearance mm (in.)	Installed shim thickness mm (in.)		New shim thickness mm (in.)	
	Shim No.	Thickness	Shim No.	Thickness
0.000 - 0.020 (0.0000 - 0.0008)	709	2.340 (0.0821)	45	2.85 (0.1122)
0.021 - 0.040 (0.0008 - 0.0016)	709	2.360 (0.0925)	46	2.90 (0.1142)
0.041 - 0.060 (0.0016 - 0.0024)	709	2.380 (0.0937)	47	2.95 (0.1161)
0.061 - 0.080 (0.0024 - 0.0031)	709	2.400 (0.0945)	48	3.00 (0.1181)
0.081 - 0.100 (0.0032 - 0.0039)	709	2.420 (0.0953)	49	3.05 (0.1201)
0.101 - 0.120 (0.0040 - 0.0047)	709	2.440 (0.0961)	50	3.10 (0.1220)
0.121 - 0.140 (0.0048 - 0.0055)	709	2.450 (0.0965)	51	3.120 (0.1228)
0.141 - 0.149 (0.0056 - 0.0059)	709	2.480 (0.0976)	52	3.140 (0.1238)
0.150 - 0.250 (0.0059 - 0.0098)	709	2.500 (0.0984)	53	3.150 (0.1240)
0.251 - 0.280 (0.0099 - 0.0102)	704	2.520 (0.0992)	54	3.180 (0.1252)
0.281 - 0.290 (0.0103 - 0.0110)	704	2.540 (0.1000)	55	3.200 (0.1260)
0.291 - 0.300 (0.0111 - 0.0118)	710	2.550 (0.1004)	56	3.220 (0.1268)
0.301 - 0.320 (0.0119 - 0.0128)	710	2.560 (0.1008)	57	3.240 (0.1276)
0.321 - 0.340 (0.0128 - 0.0134)	710	2.580 (0.1016)	58	3.250 (0.1280)
0.341 - 0.360 (0.0134 - 0.0142)	710	2.600 (0.1024)	59	3.260 (0.1283)
0.361 - 0.380 (0.0142 - 0.0150)	710	2.620 (0.1031)	60	3.280 (0.1291)
0.381 - 0.400 (0.0150 - 0.0157)	710	2.640 (0.1039)	61	3.300 (0.1299)
0.401 - 0.420 (0.0158 - 0.0165)	710	2.650 (0.1043)		
0.421 - 0.440 (0.0166 - 0.0173)	710	2.660 (0.1047)		
0.441 - 0.460 (0.0174 - 0.0181)	710	2.680 (0.1055)		
0.461 - 0.480 (0.0181 - 0.0189)	710	2.700 (0.1063)		
0.481 - 0.500 (0.0189 - 0.0197)	710	2.720 (0.1071)		
0.501 - 0.520 (0.0197 - 0.0205)	710	2.740 (0.1079)		
0.521 - 0.540 (0.0205 - 0.0213)	710	2.760 (0.1087)		
0.541 - 0.560 (0.0213 - 0.0220)	710	2.780 (0.1094)		
0.561 - 0.580 (0.0221 - 0.0228)	710	2.800 (0.1102)		
0.581 - 0.600 (0.0229 - 0.0236)	710	2.820 (0.1110)		
0.601 - 0.620 (0.0237 - 0.0244)	710	2.840 (0.1118)		
0.621 - 0.640 (0.0244 - 0.0252)	710	2.850 (0.1122)		
0.641 - 0.660 (0.0252 - 0.0260)	710	2.860 (0.1126)		
0.661 - 0.680 (0.0260 - 0.0268)	710	2.880 (0.1134)		
0.681 - 0.700 (0.0268 - 0.0276)	710	2.900 (0.1142)		
0.701 - 0.720 (0.0276 - 0.0283)	710	2.920 (0.1150)		
0.721 - 0.740 (0.0284 - 0.0291)	710	2.940 (0.1157)		
0.741 - 0.760 (0.0292 - 0.0299)	710	2.950 (0.1161)		
0.761 - 0.780 (0.0300 - 0.0307)	710	2.960 (0.1165)		
0.781 - 0.800 (0.0307 - 0.0315)	710	2.980 (0.1173)		
0.801 - 0.820 (0.0315 - 0.0323)	710	3.000 (0.1181)		
0.821 - 0.840 (0.0323 - 0.0331)	710	3.020 (0.1189)		
0.841 - 0.860 (0.0331 - 0.0339)	710	3.040 (0.1197)		
0.861 - 0.880 (0.0339 - 0.0346)	710	3.050 (0.1201)		
0.881 - 0.900 (0.0347 - 0.0354)	710	3.060 (0.1205)		
0.901 - 0.920 (0.0355 - 0.0362)	710	3.080 (0.1213)		
0.921 - 0.940 (0.0363 - 0.0370)	710	3.100 (0.1220)		
0.941 - 0.960 (0.0370 - 0.0378)	710	3.120 (0.1228)		
0.961 - 0.980 (0.0378 - 0.0386)	710	3.140 (0.1238)		
0.981 - 1.000 (0.0386 - 0.0394)	710	3.150 (0.1240)		
1.001 - 1.020 (0.0394 - 0.0402)	710	3.160 (0.1244)		
1.021 - 1.040 (0.0402 - 0.0409)	710	3.180 (0.1252)		
1.041 - 1.060 (0.0410 - 0.0417)	710	3.200 (0.1260)		
1.061 - 1.080 (0.0418 - 0.0425)	710	3.220 (0.1268)		
1.081 - 1.100 (0.0426 - 0.0433)	710	3.240 (0.1276)		
1.101 - 1.120 (0.0433 - 0.0441)	710	3.250 (0.1280)		
1.121 - 1.140 (0.0441 - 0.0448)	710	3.260 (0.1283)		
1.141 - 1.160 (0.0448 - 0.0457)	710	3.280 (0.1291)		
1.161 - 1.180 (0.0457 - 0.0465)	710	3.300 (0.1299)		
1.181 - 1.200 (0.0465 - 0.0472)	710			
1.201 - 1.210 (0.0473 - 0.0478)	710			

New shim thickness mm (in.)			
Shim No.	Thickness	Shim No.	Thickness
709	2.35 (0.0925)	45	2.85 (0.1122)
704	2.40 (0.0945)	21	2.90 (0.1142)
710	2.45 (0.0965)	46	2.95 (0.1161)
01	2.50 (0.0984)	26	3.00 (0.1181)
42	2.55 (0.1004)	47	3.05 (0.1201)
06	2.60 (0.1024)	31	3.10 (0.1220)
43	2.65 (0.1043)	48	3.15 (0.1240)
11	2.70 (0.1063)	36	3.20 (0.1260)
44	2.75 (0.1083)	49	3.25 (0.1280)
16	2.80 (0.1102)	41	3.30 (0.1299)

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

EXAMPLE: The 2.800 mm (0.1102 in.)

Intake valve clearance (Cold):
0.15 – 0.25 mm (0.006 – 0.010 in.)

EXAMPLE: The 2.800 mm (0.1102 in.) shim is installed and the measured clearance is 0.300 mm (0.0118 in.). Replace the 2.800 mm (0.1102 in.) shim with a No. 21 shim.

Adjusting Shim Selection Using Chart (Exhaust)

Measured clearance mm (in.)	Installed shim thickness mm (in.)	
	mm (in.)	mm (in.)
0.000 - 0.020 (0.0000 - 0.0008)	2.340 (0.0921)	2.360 (0.0929)
0.021 - 0.040 (0.0008 - 0.0016)	2.360 (0.0929)	2.380 (0.0937)
0.041 - 0.060 (0.0016 - 0.0024)	2.380 (0.0937)	2.400 (0.0945)
0.061 - 0.080 (0.0024 - 0.0031)	2.400 (0.0945)	2.420 (0.0953)
0.081 - 0.100 (0.0032 - 0.0039)	2.420 (0.0953)	2.440 (0.0961)
0.101 - 0.120 (0.0040 - 0.0047)	2.440 (0.0961)	2.460 (0.0969)
0.121 - 0.140 (0.0048 - 0.0055)	2.460 (0.0969)	2.480 (0.0976)
0.141 - 0.160 (0.0056 - 0.0063)	2.480 (0.0976)	2.500 (0.0984)
0.161 - 0.180 (0.0063 - 0.0071)	2.500 (0.0984)	2.520 (0.0992)
0.181 - 0.200 (0.0071 - 0.0079)	2.520 (0.0992)	2.540 (0.1000)
0.201 - 0.220 (0.0079 - 0.0087)	2.540 (0.1000)	2.560 (0.1008)
0.221 - 0.240 (0.0087 - 0.0094)	2.560 (0.1008)	2.580 (0.1016)
0.241 - 0.260 (0.0095 - 0.0102)	2.580 (0.1016)	2.600 (0.1024)
0.261 - 0.280 (0.0103 - 0.0110)	2.600 (0.1024)	2.620 (0.1031)
0.281 - 0.300 (0.0111 - 0.0118)	2.620 (0.1031)	2.640 (0.1039)
0.301 - 0.320 (0.0119 - 0.0126)	2.640 (0.1039)	2.660 (0.1047)
0.321 - 0.340 (0.0126 - 0.0134)	2.660 (0.1047)	2.680 (0.1055)
0.341 - 0.360 (0.0134 - 0.0141)	2.680 (0.1055)	2.700 (0.1063)
0.361 - 0.380 (0.0142 - 0.0149)	2.700 (0.1063)	2.720 (0.1071)
0.381 - 0.400 (0.0149 - 0.0156)	2.720 (0.1071)	2.740 (0.1079)
0.401 - 0.420 (0.0157 - 0.0164)	2.740 (0.1079)	2.760 (0.1087)
0.421 - 0.440 (0.0165 - 0.0172)	2.760 (0.1087)	2.780 (0.1094)
0.441 - 0.460 (0.0173 - 0.0180)	2.780 (0.1094)	2.800 (0.1102)
0.461 - 0.480 (0.0181 - 0.0188)	2.800 (0.1102)	2.820 (0.1110)
0.481 - 0.500 (0.0189 - 0.0197)	2.820 (0.1110)	2.840 (0.1118)
0.501 - 0.520 (0.0197 - 0.0205)	2.840 (0.1118)	2.860 (0.1126)
0.521 - 0.540 (0.0205 - 0.0213)	2.860 (0.1126)	2.880 (0.1134)
0.541 - 0.560 (0.0213 - 0.0222)	2.880 (0.1134)	2.900 (0.1142)
0.561 - 0.580 (0.0221 - 0.0228)	2.900 (0.1142)	2.920 (0.1150)
0.581 - 0.600 (0.0229 - 0.0236)	2.920 (0.1150)	2.940 (0.1157)
0.601 - 0.620 (0.0237 - 0.0244)	2.940 (0.1157)	2.960 (0.1165)
0.621 - 0.640 (0.0244 - 0.0252)	2.960 (0.1165)	2.980 (0.1173)
0.641 - 0.660 (0.0252 - 0.0260)	2.980 (0.1173)	3.000 (0.1181)
0.661 - 0.680 (0.0260 - 0.0268)	3.000 (0.1181)	3.020 (0.1189)
0.681 - 0.700 (0.0268 - 0.0276)	3.020 (0.1189)	3.040 (0.1197)
0.701 - 0.720 (0.0276 - 0.0283)	3.040 (0.1197)	3.060 (0.1205)
0.721 - 0.740 (0.0284 - 0.0291)	3.060 (0.1205)	3.080 (0.1213)
0.741 - 0.760 (0.0292 - 0.0299)	3.080 (0.1213)	3.100 (0.1220)
0.761 - 0.780 (0.0300 - 0.0307)	3.100 (0.1220)	3.120 (0.1228)
0.781 - 0.800 (0.0307 - 0.0315)	3.120 (0.1228)	3.140 (0.1236)
0.801 - 0.820 (0.0315 - 0.0323)	3.140 (0.1236)	3.160 (0.1244)
0.821 - 0.840 (0.0323 - 0.0331)	3.160 (0.1244)	3.180 (0.1252)
0.841 - 0.860 (0.0331 - 0.0339)	3.180 (0.1252)	3.200 (0.1260)
0.861 - 0.880 (0.0339 - 0.0346)	3.200 (0.1260)	3.220 (0.1268)
0.881 - 0.900 (0.0347 - 0.0354)	3.220 (0.1268)	3.240 (0.1276)
0.901 - 0.920 (0.0355 - 0.0362)	3.240 (0.1276)	3.260 (0.1284)
0.921 - 0.940 (0.0363 - 0.0370)	3.260 (0.1284)	3.280 (0.1292)
0.941 - 0.960 (0.0370 - 0.0378)	3.280 (0.1292)	3.300 (0.1299)
0.961 - 0.980 (0.0378 - 0.0386)	3.300 (0.1299)	
0.981 - 1.000 (0.0386 - 0.0394)		
1.001 - 1.020 (0.0394 - 0.0402)		
1.021 - 1.040 (0.0402 - 0.0409)		
1.041 - 1.060 (0.0410 - 0.0417)		
1.061 - 1.080 (0.0418 - 0.0425)		
1.081 - 1.100 (0.0426 - 0.0433)		

Exhaust valve clearance (Cold):
 0.35 – 0.45 mm (0.014 – 0.018 in.)

EXAMPLE: The 2.800 mm (0.1102 in.) shim is installed and the measured clearance is 0.300 mm (0.0118 in.). Replace the 2.800 mm (0.1102 in.) shim with a No. 11 shim.