VALVE CLEARANCE

INSPECTION

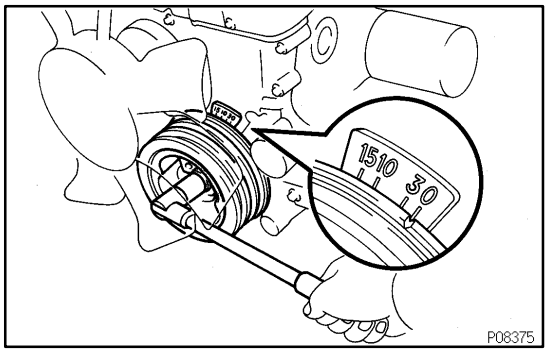
EM1FZ–01

HINT:

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

1. DRAIN ENGINE COOLANT

2. REMOVE THROTTLE BODY (See page SF–41)



3. DISCONNECT ENGINE WIRE AND HEATER VALVE FROM COWL PANEL

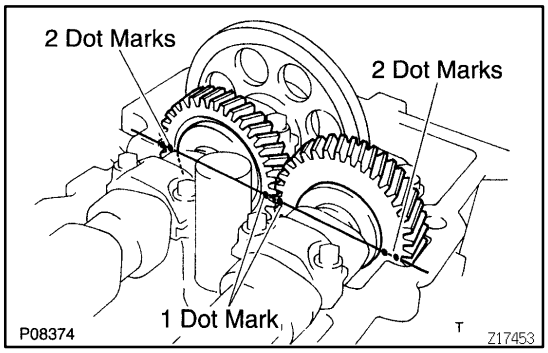
4. DISCONNECT HIGH–TENSION CORDS FROM SPARK PLUGS (See page IG–1)

5. REMOVE CYLINDER HEAD COVER

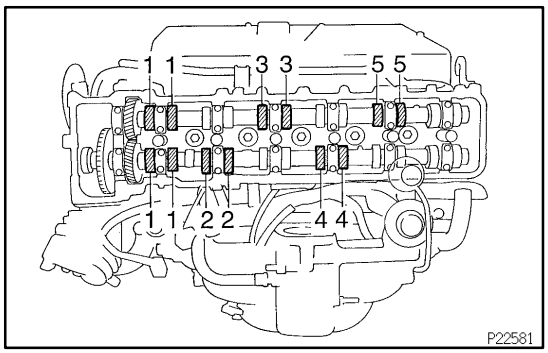
Remove the 13 bolts, cylinder head cover and gasket.

6. SET NO.1 CYLINDER TO TDC/COMPRESSION

(a) Turn the crankshaft pulley, and align its groove with the timing mark ”0” of 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.

- Using a thickness 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.

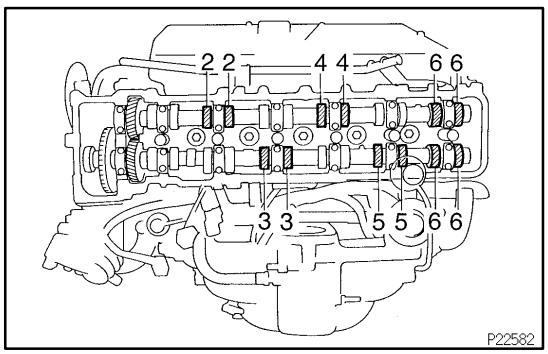
Valve clearance (Cold):

Intake

0.15 – 0.25 mm (0.006 – 0.010 in.)

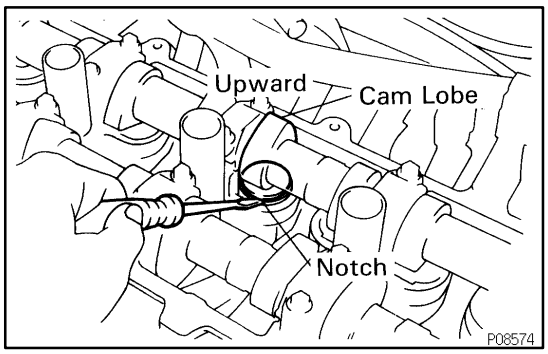
Exhaust

0.25 – 0.35 mm (0.010 – 0.014 in.)



(b) Turn the crankshaft pulley 1 revolution (360˚) and align the 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) above)

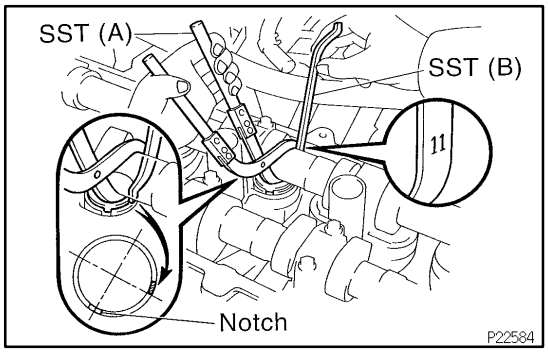


8. ADJUST VALVE CLEARANCE

(a) Remove the adjusting shim.

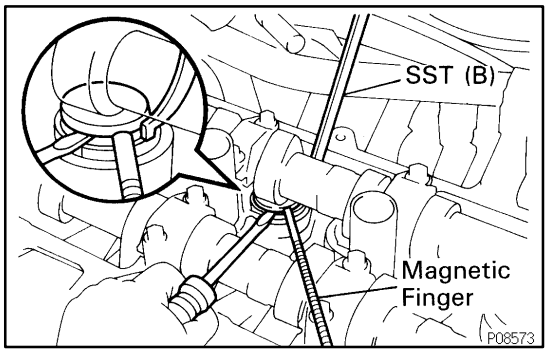
- Turn the crankshaft to position the cam lobe of the camshaft on the adjusting valve upward.
- Position the notch of the valve lifter toward the spark plug side.
- Using SST (A), press down the valve lifter and place SST (B) between the camshaft and valve lifter flange. Remove SST (A).

SST 09248–06020, 09248–55050 (09248–05510)

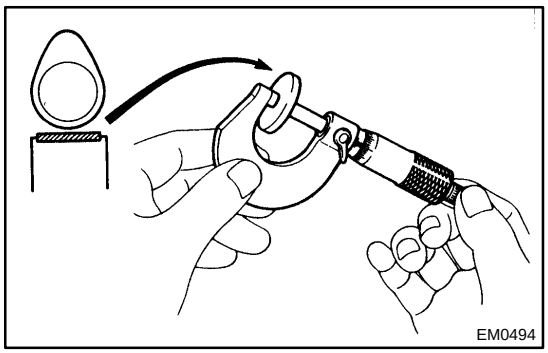


HINT:

- Apply SST (B) at slight angle on the side marked with ”11”, 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 shallowly from the outside of the cylinder head, at a slight angle.



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



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

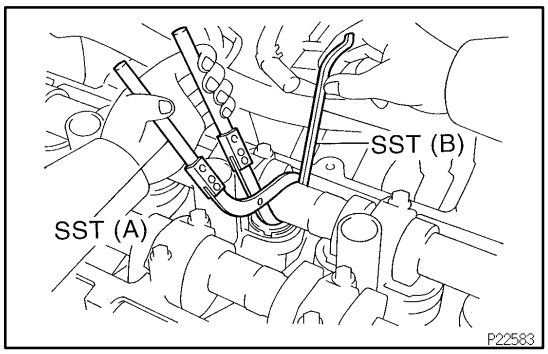
- Using a micrometer, measure the thickness of the removed shim.
- Calculate the thickness of a new shim so that the valve clearance comes within specified value.

T ..... Thickness of removed 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 value.

HINT:
Shims are available in 17 sized 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.
- Place a new adjusting shim on the valve lifter.
- Using SST (A), press down the valve lifter and remove SST (B).

SST 09248–06020, 09248–55050 (09248–05510)

(d) Recheck the valve clearance.
(e) Remove the distributor (See page IG–9).
(f) Remove the camshafts (See page EM–25).
(g) Remove the adjusting shim.
(h) Determine the replacement adjusting shim size (See step 8 (b) above).
(i) Place a new adjusting shim on the valve lifters.
(j) Install the camshafts (See page EM–50).
(k) Recheck the valve clearance.
(l) Install the distributor (See page IG–10).

9. REINSTALL CYLINDER HEAD COVER
10. RECONNECT HIGH–TENSION CORDS TO SPARK PLUGS (See page IG–1)
11. RECONNECT HEATER VALVE AND ENGINE WIRE TO COWL PANEL
12. REINSTALL THROTTLE BODY (See page SF–44)
13. REFILL RADIATOR WITH ENGINE COOLANT
14. CHECK AND ADJUST IGNITION TIMING (See page EM–9)

Adjusting Shim Selection Chart (Intake)

Installed shim thickness mm (in.) / Measured clearance mm (in.)	2.500 (0.0984)	2.520 (0.0992)	2.540 (0.1000)	2.550 (0.1004)	2.560 (0.1008)	2.580 (0.1016)	2.600 (0.1024)	2.620 (0.1031)	2.640 (0.1039)	2.650 (0.1043)	2.660 (0.1047)	2.680 (0.1055)	2.700 (0.1063)	2.710 (0.1067)	2.720 (0.1071)	2.730 (0.1075)	2.740 (0.1079)	2.750 (0.1083)	2.760 (0.1087)	2.770 (0.1091)	2.780 (0.1094)	2.790 (0.1098)	2.800 (0.1102)	2.810 (0.1106)	2.820 (0.1110)	2.830 (0.1114)	2.840 (0.1118)	2.850 (0.1122)	2.860 (0.1126)	2.870 (0.1130)	2.880 (0.1134)	2.890 (0.1138)	2.900 (0.1142)	2.910 (0.1146)	2.920 (0.1150)	2.930 (0.1154)	2.940 (0.1157)	2.950 (0.1161)	2.960 (0.1166)	2.970 (0.1169)	2.980 (0.1173)	2.990 (0.1177)	3.000 (0.1181)	3.010 (0.1185)	3.020 (0.1189)	3.030 (0.1193)	3.040 (0.1197)	3.050 (0.1201)	3.060 (0.1205)	3.070 (0.1209)	3.080 (0.1213)	3.090 (0.1217)	3.100 (0.1220)	3.120 (0.1228)	3.140 (0.1236)	3.150 (0.1240)	3.160 (0.1244)	3.180 (0.1252)	3.200 (0.1260)	3.220 (0.1268)	3.240 (0.1276)	3.250 (0.1280)	3.260 (0.1283)	3.280 (0.1291)	3.300 (0.1299)
0.000 – 0.030 (0.0000 – 0.0012)										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	7	7	7	7	7	8	8	8	8	8	9	9	9	9	9	10	10	10	11	11	11	12	12	12	13	13	13
0.031 – 0.050 (0.0012 – 0.0020)								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	6	7	7	7	7	7	8	8	8	8	8	9	9	9	9	9	10	10	10	11	11	11	11	12	12	13	13	13	13	14
0.051 – 0.070 (0.0020 – 0.0028)							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	10	10	10	10	11	11	11	11	12	12	13	13	13	13	14	14
0.071 – 0.090 (0.0028 – 0.0035)						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	10	10	10	10	10	11	11	11	12	12	12	13	13	13	14	14	14	15
0.091 – 0.110 (0.0036 – 0.0043)					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	9	9	9	9	9	10	10	10	10	10	11	11	11	11	12	12	12	13	13	13	14	14	14	15	15
0.111 – 0.130 (0.0044 – 0.0051)			1	1	1	1	1	2	2	2	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	10	10	10	11	11	11	11	11	12	12	12	13	13	13	14	14	14	15	15	15
0.131 – 0.149 (0.0052 – 0.0059)		1	1	1	1	1	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	10	10	10	10	10	11	11	11	11	11	12	12	12	13	13	13	13	14	14	15	15	15	15	16
0.150 – 0.250 (0.0059 – 0.0098)																																																																	
0.251 – 0.270 (0.0099 – 0.0106)	2	3	3	3	3	4	4	5	5	5	5	6	6	6	7	7	7	7	7	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	14	14	14	14	15	15	15	15	16	16	17	17	17	17	17	
0.271 – 0.290 (0.0107 – 0.0114)	3	3	3	4	4	4	5	5	5	6	6	6	7	7	7	7	7	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	14	14	14	14	14	15	15	15	16	16	16	17	17	17	17	17		
0.291 – 0.310 (0.0115 – 0.0122)	3	3	4	4	4	5	5	5	6	6	6	7	7	7	7	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	14	14	14	14	14	15	15	15	15	16	16	16	17	17	17	17				
0.311 – 0.330 (0.0122 – 0.0130)	3	4	4	4	5	5	5	6	6	6	7	7	7	8	8	8	8	8	8	9	9	9	9	10	10	10	10	10	11	11	11	11	11	12	12	12	12	12	13	13	13	13	13	14	14	14	14	14	15	15	15	15	16	16	16	16	17	17	17	17					
0.331 – 0.350 (0.0130 – 0.0138)	4	4	5	5	5	5	6	6	7	7	7	7	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	14	14	14	14	14	15	15	15	15	15	16	16	16	16	17	17	17	17						
0.351 – 0.370 (0.0138 – 0.0146)	4	5	5	5	5	6	6	7	7	7	7	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	14	14	14	14	14	15	15	15	15	15	16	16	16	16	17	17	17	17	17							
0.371 – 0.390 (0.0146 – 0.0154)	5	5	5	6	6	6	7	7	7	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	14	14	14	14	14	15	15	15	15	15	16	16	16	16	16	17	17	17	17	17								
0.391 – 0.410 (0.0154 – 0.0161)	5	5	6	6	6	7	7	7	8	8	8	9	9	9	9	10	10	10	10	10	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	16	16	16	16	16	17	17	17	17	17										
0.411 – 0.430 (0.0162 – 0.0169)	5	6	6	6	7	7	7	8	8	8	9	9	9	10	10	10	10	10	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	16	16	16	16	16	17	17	17	17	17	17											
0.431 – 0.450 (0.0170 – 0.0177)	6	6	7	7	7	7	8	8	9	9	9	9	10	10	10	10	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	16	16	16	16	16	17	17	17	17	17	17	17												
0.451 – 0.470 (0.0178 – 0.0185)	6	7	7	7	7	8	8	9	9	9	9	10	10	10	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	16	16	16	16	16	17	17	17	17	17	17	17														
0.471 – 0.490 (0.0178 – 0.0193)	7	7	7	8	8	8	9	9	9	10	10	10	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	16	16	16	16	16	17	17	17	17	17	17	17																
0.491 – 0.510 (0.0193 – 0.0201)	7	7	8	8	8	9	9	9	10	10	10	11	11	11	11	12	12	12	12	12	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																		
0.511 – 0.530 (0.0201 – 0.0209)	8	8	8	8	9	9	9	10	10	10	11	11	11	12	12	12	12	12	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																				
0.531 – 0.550 (0.0209 – 0.0217)	8	8	9	9	9	9	10	10	11	11	11	11	12	12	12	12	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																						
0.551 – 0.570 (0.0217 – 0.0224)	8	9	9	9	9	10	10	11	11	11	11	12	12	12	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																								
0.571 – 0.590 (0.0225 – 0.0232)	9	9	9	10	10	10	11	11	11	12	12	12	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																										
0.591 – 0.610 (0.0233 – 0.0240)	9	9	10	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																												
0.611 – 0.630 (0.0241 – 0.0248)	10	10	10	10	11	11	11	12	12	12	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																														
0.631 – 0.650 (0.0248 – 0.0256)	10	10	11	11	11	11	12	12	13	13	13	13	14	14	14	14	15	15	15	15	15	16	16	16	16	16	17	17	17	17	17	17	17																																
0.651 – 0.670 (0.0256 – 0.0264)	10	11	11	11	11	12	12	13	13	13	13	14	14	14	15	15	15	15	15	16	16	16	16	16	17	17	17	17	17	17	17																																		
0.671 – 0.690 (0.0264 – 0.0272)	11	11	11	11	12	12	13	13	13	14	14	14	15	15	15	15	15	16	16	16	16	16	17	17	17	17	17	17	17																																				
0.691 – 0.710 (0.0272 – 0.0280)	11	11	12	12	12	13	13	13	14	14	14	15	15	15	15	16	16	16	16	16	17	17	17	17	17	17	17																																						
0.711 – 0.730 (0.0280 – 0.0287)	12	12	12	12	13	13	13	14	14	14	15	15	15	16	16	16	16	16	17	17	17	17	17	17	17																																								
0.731 – 0.750 (0.0288 – 0.0295)	12	12	13	13	13	13	14	14	15	15	15	15	16	16	16	16	17	17	17	17	17	17	17																																										
0.751 – 0.770 (0.0296 – 0.0303)	12	13	13	13	13	14	14	15	15	15	15	16	16	16	16	17	17	17	17	17	17																																												
0.771 – 0.790 (0.0304 – 0.0311)	13	13	13	13	14	14	15	15	15	16	16	16	17	17	17	17	17	17	17																																														
0.791 – 0.810 (0.0311 – 0.0319)	13	13	14	14	14	15	15	15	16	16	16	17	17	17	17	17	17																																																
0.811 – 0.830 (0.0319 – 0.0327)	14	14	14	14	15	15	15	16	16	16	17	17	17	17	17																																																		
0.831 – 0.850 (0.0327 – 0.0335)	14	14	15	15	15	15	16	16	17	17	17	17	17																																																			
0.851 – 0.870 (0.0335 – 0.0343)	14	15	15	15	15	16	16	17	17	17	17	17																																																				
0.871 – 0.890 (0.0343 – 0.0350)	15	15	15	15	16	16	17	17	17	17	17																																																					
0.891 – 0.910 (0.0351 – 0.0358)	15	15	16	16	16	17	17	17	17																																																								
0.911 – 0.930 (0.0359 – 0.0366)	16	16	16	16	17	17	17	17																																																										
0.931 – 0.950 (0.0367 – 0.0374)	16	16	17	17	17	17	17																																																										
0.951 – 0.970 (0.0374 – 0.0382)	16	17	17	17	17	17																																																											
0.971 – 0.990 (0.0382 – 0.0390)	17	17	17	17																																																														
0.991 – 1.010 (0.0390 – 0.0398)	17	17	17																																																															
1.011 – 1.030 (0.0398 – 0.0406)	17	17																																																																
1.031 – 1.050 (0.0406 – 0.0413)	17																																																																	

V00831

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 0.440 mm (0.0173 in.). Replace the 2.800 mm (0.1102 in.) shim with a No. 12 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 imprinterd on the face.

Adjusting Shim Selection Chart (Intake)

Measured clearance mm (in.) / Installed shim thickness mm (in.)	2.500 (0.0984)	2.520 (0.0992)	2.540 (0.1000)	2.550 (0.1004)	2.560 (0.1008)	2.580 (0.1016)	2.600 (0.1024)	2.620 (0.1031)	2.640 (0.1039)	2.650 (0.1043)	2.660 (0.1047)	2.680 (0.1055)	2.700 (0.1063)	2.710 (0.1067)	2.720 (0.1071)	2.730 (0.1075)	2.740 (0.1079)	2.750 (0.1083)	2.760 (0.1087)	2.770 (0.1091)	2.780 (0.1094)	2.790 (0.1098)	2.800 (0.1102)	2.810 (0.1106)	2.820 (0.1110)	2.830 (0.1114)	2.840 (0.1118)	2.850 (0.1122)	2.860 (0.1126)	2.870 (0.1130)
0.000 – 0.030 (0.0000 – 0.0012)																		1	1	1	1	1	1	1	2	2	2	2	2	3
0.031 – 0.050 (0.0012 – 0.0020)															1	1	1	1	1	1	1	2	2	2	2	2	3	3	3	3
0.051 – 0.070 (0.0020 – 0.0028)													1	1	1	1	1	1	1	2	2	2	2	2	3	3	3	3	3	4
0.071 – 0.090 (0.0028 – 0.0035)												1	1	1	1	1	1	2	2	2	2	2	3	3	3	3	3	4	4	4
0.091 – 0.110 (0.0036 – 0.0043)											1	1	1	1	1	2	2	2	2	2	3	3	3	3	3	4	4	4	4	4
0.111 – 0.130 (0.0044 – 0.0051)									1	1	1	1	1	2	2	2	2	2	3	3	3	3	3	4	4	4	4	4	5	5
0.131 – 0.150 (0.0052 – 0.0059)								1	1	1	1	1	2	2	2	2	3	3	3	3	3	4	4	4	4	4	5	5	5	5
0.151 – 0.170 (0.0059 – 0.0067)							1	1	1	1	1	2	2	2	3	3	3	3	3	4	4	4	4	4	5	5	5	5	5	6
0.171 – 0.190 (0.0067 – 0.0075)						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
0.191 – 0.210 (0.0075 – 0.0083)					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
0.211 – 0.230 (0.0083 – 0.0091)			1	1	1	1	1	2	2	2	3	3	4	4	4	4	4	4	5	5	5	5	5	6	6	6	6	6	7	7
0.231 – 0.249 (0.0091 – 0.0098)		1	1	1	1	1	2	2	3	3	3	3	4	4	4	4	5	5	5	5	5	6	6	6	6	6	7	7	7	7
0.250 – 0.350 (0.0098 – 0.0138)																														
0.351 – 0.370 (0.0138 – 0.0146)	2	3	3	3	3	4	4	5	5	5	5	6	6	6	7	7	7	7	7	8	8	8	8	8	9	9	9	9	9	10
0.371 – 0.390 (0.0146 – 0.0154)	3	3	3	4	4	4	5	5	5	6	6	6	7	7	7	7	7	8	8	8	8	8	9	9	9	9	9	10	10	10
0.391 – 0.410 (0.0154 – 0.0161)	3	3	4	4	4	5	5	5	6	6	6	7	7	7	7	8	8	8	8	8	9	9	9	9	9	10	10	10	10	10
0.411 – 0.430 (0.0162 – 0.0169)	3	4	4	4	5	5	5	6	6	6	7	7	7	8	8	8	8	8	9	9	9	9	9	10	10	10	10	10	11	11
0.431 – 0.450 (0.0170 – 0.0177)	4	4	5	5	5	5	6	6	7	7	7	7	8	8	8	8	9	9	9	9	9	10	10	10	10	10	11	11	11	11
0.451 – 0.470 (0.0178 – 0.0185)	4	5	5	5	5	6	6	7	7	7	7	8	8	8	9	9	9	9	9	10	10	10	10	10	11	11	11	11	11	12
0.471 – 0.490 (0.0185 – 0.0193)	5	5	5	6	6	6	7	7	7	8	8	8	9	9	9	9	9	10	10	10	10	10	11	11	11	11	11	12	12	12
0.491 – 0.510 (0.0193 – 0.0201)	5	5	6	6	6	7	7	7	8	8	8	9	9	9	9	10	10	10	10	10	11	11	11	11	11	12	12	12	12	12
0.511 – 0.530 (0.0201 – 0.0209)	5	6	6	6	7	7	7	8	8	8	9	9	9	10	10	10	10	10	11	11	11	11	11	12	12	12	12	12	13	13
0.531 – 0.550 (0.0209 – 0.0217)	6	6	7	7	7	7	8	8	9	9	9	9	10	10	10	10	11	11	11	11	11	12	12	12	12	12	13	13	13	13
0.551 – 0.570 (0.0217 – 0.0224)	6	7	7	7	7	8	8	9	9	9	9	10	10	10	11	11	11	11	11	12	12	12	12	12	13	13	13	13	13	14
0.571 – 0.590 (0.0225 – 0.0232)	7	7	7	8	8	8	9	9	9	10	10	10	11	11	11	11	11	12	12	12	12	12	13	13	13	13	13	14	14	14
0.591 – 0.610 (0.0233 – 0.0240)	7	7	8	8	8	9	9	9	10	10	10	11	11	11	11	12	12	12	12	12	13	13	13	13	13	14	14	14	14	14
0.611 – 0.630 (0.0241 – 0.0248)	7	8	8	8	9	9	9	10	10	10	11	11	11	12	12	12	12	12	13	13	13	13	13	14	14	14	14	14	15	15
0.631 – 0.650 (0.0248 – 0.0256)	8	8	9	9	9	9	10	10	11	11	11	11	12	12	12	12	13	13	13	13	13	14	14	14	14	14	15	15	15	15
0.651 – 0.670 (0.0256 – 0.0264)	8	9	9	9	9	10	10	11	11	11	11	12	12	12	13	13	13	13	13	14	14	14	14	14	15	15	15	15	15	16
0.671 – 0.690 (0.0264 – 0.0272)	9	9	9	10	10	10	11	11	11	12	12	12	13	13	13	13	13	14	14	14	14	14	15	15	15	15	15	16	16	16
0.691 – 0.710 (0.0272 – 0.0280)	9	9	10	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
0.711 – 0.730 (0.0280 – 0.0287)	9	10	10	10	11	11	11	12	12	12	13	13	13	14	14	14	14	14	15	15	15	15	15	16	16	16	16	16	17	17
0.731 – 0.750 (0.0288 – 0.0295)	10	10	11	11	11	11	12	12	13	13	13	13	14	14	14	14	15	15	15	15	15	16	16	16	16	16	17	17	17	17
0.751 – 0.770 (0.0296 – 0.0303)	10	11	11	11	11	12	12	13	13	13	13	14	14	14	15	15	15	15	15	16	16	16	16	16	17	17	17	17	17	17
0.771 – 0.790 (0.0304 – 0.0311)	11	11	11	12	12	12	13	13	13	14	14	14	14	15	15	15	15	16	16	16	16	16	17	17	17	17	17	17	17	
0.791 – 0.810 (0.0311 – 0.0319)	11	11	12	12	12	13	13	13	14	14	14	15	15	15	15	16	16	16	16	16	17	17	17	17	17	17	17			
0.811 – 0.830 (0.0319 – 0.0327)	11	12	12	12	13	13	13	14	14	14	15	15	15	16	16	16	16	16	17	17	17	17	17	17	17					
0.831 – 0.850 (0.0327 – 0.0335)	12	12	13	13	13	13	14	14	15	15	15	15	16	16	16	16	17	17	17	17	17	17	17							
0.851 – 0.870 (0.0335 – 0.0343)	12	13	13	13	13	14	14	15	15	15	15	16	16	16	17	17	17	17	17	17	17									
0.871 – 0.890 (0.0343 – 0.0350)	13	13	13	14	14	14	15	15	15	16	16	16	16	17	17	17	17	17	17											
0.891 – 0.910 (0.0351 – 0.0358)	13	13	14	14	14	15	15	15	16	16	16	17	17	17	17	17	17													
0.911 – 0.930 (0.0359 – 0.0366)	13	14	14	14	15	15	15	16	16	16	17	17	17	17	17															
0.931 – 0.950 (0.0367 – 0.0374)	14	14	15	15	15	15	16	16	17	17	17	17	17																	
0.951 – 0.970 (0.0374 – 0.0382)	14	15	15	15	15	16	16	17	17	17	17	17																		
0.971 – 0.990 (0.0382 – 0.0390)	15	15	15	16	16	16	17	17	17	17	17																			
0.991 – 1.010 (0.0390 – 0.0398)	15	15	16	16	16	17	17	17	17																					
1.011 – 1.030 (0.0398 – 0.0406)	15	16	16	16	17	17	17	17																						
1.031 – 1.050 (0.0406 – 0.0413)	16	16	17	17	17	17	17																							
1.051 – 1.070 (0.0414 – 0.0421)	16	17	17	17	17	17																								
1.071 – 1.090 (0.0422 – 0.0429)	17	17	17	17	17																									
1.091 – 1.110 (0.0430 – 0.0437)	17	17	17																											
1.111 – 1.130 (0.0437 – 0.0445)	17	17																												
1.131 – 1.150 (0.0445 – 0.0413)	17																													

Measured clearance mm (in.) / Installed shim thickness mm (in.)	2.880 (0.1134)	2.890 (0.1138)	2.900 (0.1142)	2.910 (0.1146)	2.920 (0.1150)	2.930 (0.1154)	2.940 (0.1157)	2.950 (0.1161)	2.960 (0.1166)	2.970 (0.1169)	2.980 (0.1173)	2.990 (0.1177)	3.000 (0.1181)	3.010 (0.1185)	3.020 (0.1189)	3.030 (0.1193)	3.040 (0.1197)	3.050 (0.1201)	3.060 (0.1205)	3.070 (0.1209)	3.080 (0.1213)	3.090 (0.1217)	3.100 (0.1220)	3.120 (0.1228)	3.140 (0.1236)	3.150 (0.1240)	3.160 (0.1244)	3.180 (0.1252)	3.200 (0.1260)	3.220 (0.1268)	3.240 (0.1276)	3.250 (0.1280)	3.260 (0.1283)	3.280 (0.1291)	3.300 (0.1299)
0.000 – 0.030 (0.0000 – 0.0012)	3	3	3	3	4	4	4	4	4	5	5	5	5	5	6	6	6	6	6	7	7	7	7	8	8	8	8	9	9	10	10	10	10	11	11
0.031 – 0.050 (0.0012 – 0.0020)	3	4	4	4	4	4	5	5	5	5	5	6	6	6	6	6	7	7	7	7	7	8	8	8	9	9	9	9	10	10	11	11	11	11	12
0.051 – 0.070 (0.0020 – 0.0028)	4	4	4	4	5	5	5	5	5	6	6	6	6	6	7	7	7	7	7	8	8	8	8	9	9	9	9	10	10	11	11	11	11	12	12
0.071 – 0.090 (0.0028 – 0.0035)	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	10	10	10	11	11	11	12	12	12	13
0.091 – 0.110 (0.0036 – 0.0043)	5	5	5	5	5	6	6	6	6	6	7	7	7	7	7	8	8	8	8	8	9	9	9	9	10	10	10	11	11	11	12	12	12	13	13
0.111 – 0.130 (0.0044 – 0.0051)	5	5	5	6	6	6	6	6	7	7	7	7	7	8	8	8	8	8	9	9	9	9	10	10	10	10	11	11	11	12	12	12	13	13	13
0.131 – 0.150 (0.0052 – 0.0059)	5	6	6	6	6	6	7	7	7	7	7	8	8	8	8	8	9	9	9	9	9	10	10	10	11	11	11	11	12	12	13	13	13	13	14
0.151 – 0.170 (0.0059 – 0.0067)	6	6	6	6	7	7	7	7	7	8	8	8	8	8	9	9	9	9	9	10	10	10	10	11	11	11	11	12	12	13	13	13	13	14	14
0.171 – 0.190 (0.0067 – 0.0075)	6	6	7	7	7	7	7	8	8	8	8	8	9	9	9	9	9	10	10	10	10	10	11	11	11	12	12	12	13	13	13	14	14	14	15
0.191 – 0.210 (0.0075 – 0.0083)	7	7	7	7	7	8	8	8	8	8	9	9	9	9	9	10	10	10	10	11	11	11	11	11	12	12	12	13	13	13	14	14	14	15	15
0.211 – 0.230 (0.0083 – 0.0091)	7	7	7	8	8	8	8	8	9	9	9	9	9	10	10	10	10	10	11	11	11	11	12	12	12	12	13	13	13	14	14	14	15	15	15
0.231 – 0.249 (0.0091 – 0.0098)	7	8	8	8	8	8	9	9	9	9	9	10	10	10	10	10	11	11	11	11	11	12	12	12	13	13	13	13	14	14	15	15	15	15	16
0.250 – 0.350 (0.0098 – 0.0138)																																			
0.351 – 0.370 (0.0138 – 0.0146)	10	10	10	10	11	11	11	11	11	12	12	12	12	12	13	13	13	13	13	14	14	14	14	14	15	15	15	16	16	17	17	17	17	17	
0.371 – 0.390 (0.0146 – 0.0154)	10	10	11	11	11	11	11	12	12	12	12	12	13	13	13	13	13	14	14	14	14	14	15	15	15	16	16	16	17	17	17	17	17		
0.391 – 0.410 (0.0154 – 0.0161)	11	11	11	11	11	12	12	12	12	12	13	13	13	13	13	14	14	14	14	14	15	15	15	15	16	16	16	17	17	17	17				
0.411 – 0.430 (0.0162 – 0.0169)	11	11	11	12	12	12	12	12	13	13	13	13	13	14	14	14	14	14	15	15	15	15	15	16	16	16	17	17	17	17					
0.431 – 0.450 (0.0170 – 0.0177)	11	12	12	12	12	12	13	13	13	13	13	14	14	14	14	14	15	15	15	15	15	16	16	16	17	17	17	17	17						
0.451 – 0.470 (0.0178 – 0.0185)	12	12	12	12	13	13	13	13	13	14	14	14	14	14	15	15	15	15	15	16	16	16	16	17	17	17	17	17							
0.471 – 0.490 (0.0185 – 0.0193)	12	12	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								
0.491 – 0.510 (0.0193 – 0.0201)	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										
0.511 – 0.530 (0.0201 – 0.0209)	13	13	13	14	14	14	14	14	15	15	15	15	15	16	16	16	16	16	17	17	17	17	17	17											
0.531 – 0.550 (0.0209 – 0.0217)	13	14	14	14	14	14	15	15	15	15	15	16	16	16	16	16	17	17	17	17	17	17	17												
0.551 – 0.570 (0.0217 – 0.0224)	14	14	14	14	15	15	15	15	15	16	16	16	16	16	17	17	17	17	17	17	17														
0.571 – 0.590 (0.0225 – 0.0232)	14	14	15	15	15	15	15	16	16	16	16	16	17	17	17	17	17	17	17																
0.591 – 0.610 (0.0233 – 0.0240)	15	15	15	15	15	16	16	16	16	16	17	17	17	17	17	17	17																		
0.611 – 0.630 (0.0241 – 0.0248)	15	15	15	16	16	16	16	16	17	17	17	17	17	17	17																				
0.631 – 0.650 (0.0248 – 0.0256)	15	16	16	16	16	16	17	17	17	17	17	17	17																						
0.651 – 0.670 (0.0256 – 0.0264)	16	16	16	16	17	17	17	17	17	17	17																								
0.671 – 0.690 (0.0264 – 0.0272)	16	16	17	17	17	17	17	17	17																										
0.691 – 0.710 (0.0272 – 0.0280)	17	17	17	17	17	17	17																												
0.711 – 0.730 (0.0280 – 0.0287)	17	17	17	17	17																														
0.731 – 0.750 (0.0288 – 0.0295)	17	17	17																																
0.751 – 0.770 (0.0296 – 0.0303)	17																																		
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 – 0.0413)																																			

V00832

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 0.440 mm (0.0173 in.). Replace the 2.800 mm (0.1102 in.) shim with a 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.