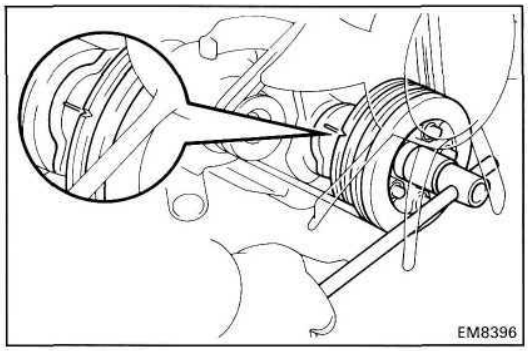
ADJUSTMENT OF VALVE CLEARANCE

HINT: Adjust the valve clearance while the engine is cold.

1. REMOVE INTAKE PIPE
(See step 6 on page EM-34)

2. REMOVE CYLINDER HEAD COVER
(See step 7 on page EM-35)



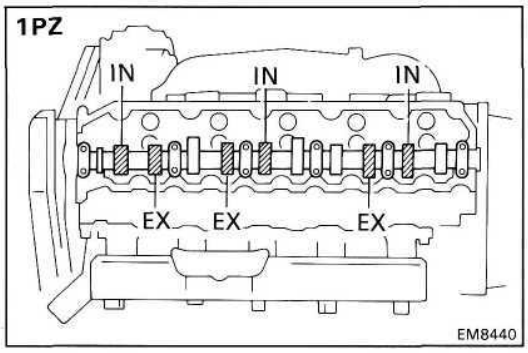
3. SET NO.1 CYLINDER TO TDC/COMPRESSION

(a) Turn the crankshaft pulley clockwise, and align its groove with the timing gear cover groove.

(b) (1PZ)
Check that the valve lifters on the No.1 cylinder are loose and exhaust valve lifter on the No.5 cylinder is tight.

(c) (1 HZ and 1HD-T)
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.



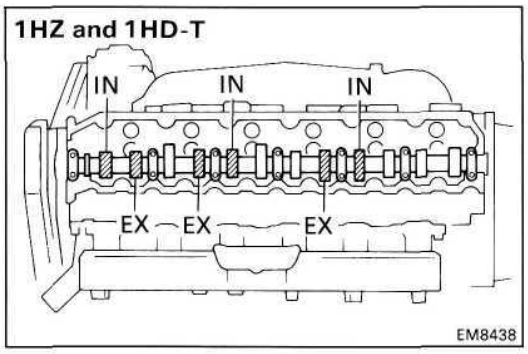
4. ADJUST VALVE CLEARANCE

(a) Check only those valves indicated in the illustration.

- Using a thickness gauge, measure the clearance between the valve lifter and camshaft.
- Record the valve clearance measurements which are out of specification. They will be used later to determine the required replacement adjusting shim.

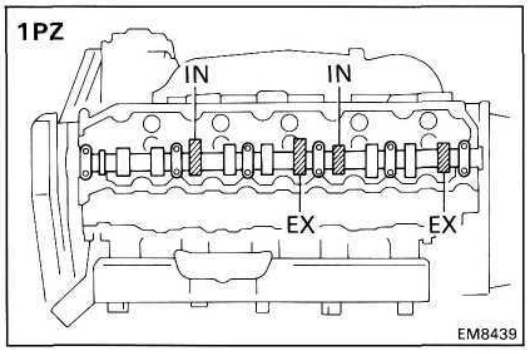
Valve clearance (Cold):

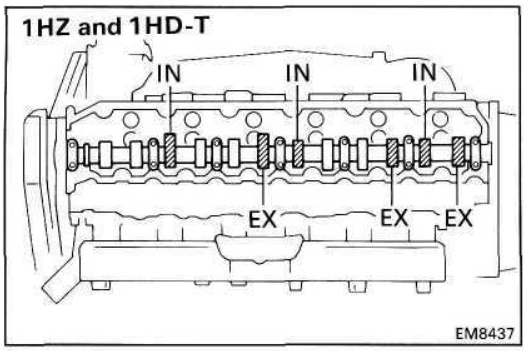
Intake	**0.15-0.25 mm (0.006-0.010 in.)**
Exhaust	**0.35-0.45 mm (0.014-0.018 in.)**

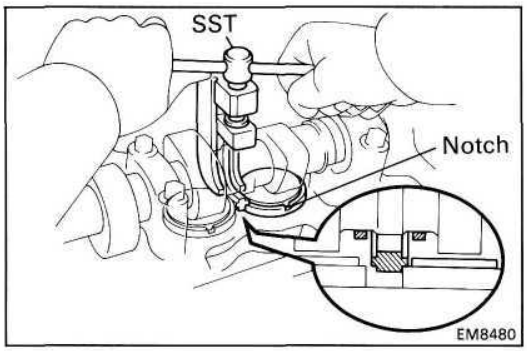


(b) Turn the crankshaft one revolution (360°), and align the mark as above (See procedure step 3).

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





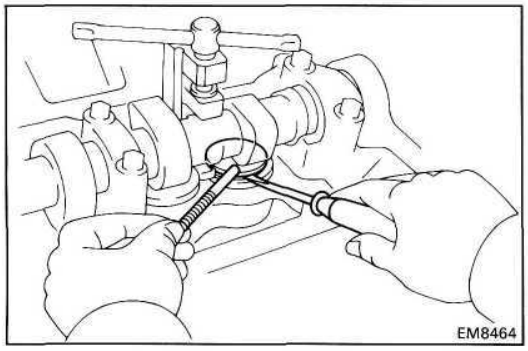


(d) Remove the adjusting shim.

- Turn the crankshaft to position the cam lobe of the camshaft on the adjusting valve upward.
- Using SST, press down the valve lifter.

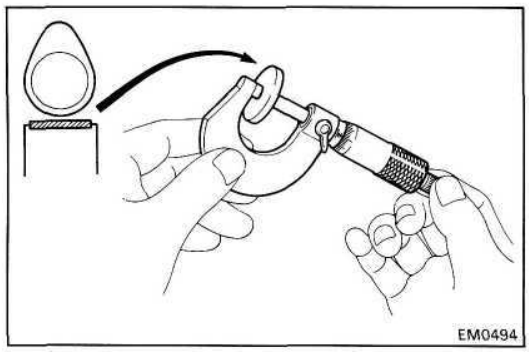
SST 09248-64011

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):



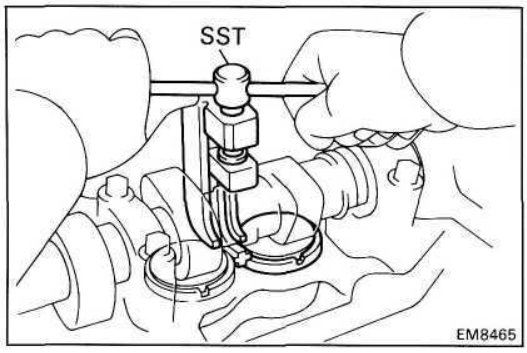
- Using a micrometer, measure the thickness of the removed shim.
- Calculate the thickness of the new shim so the valve clearance comes within specified value.

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-0.40 mm (0.016 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.

SST 09248-64011

(g) Recheck the valve clearance.

5. REINSTALL CYLINDER HEAD COVER
(See step 2 on page EM-38)

6. REINSTALL INTAKE PIPE
(See step 3 on page EM-38)

Adjusting Shim Selection Using Chart (Intake)

Measured clearance mm (in.) \ Installed shim thickness mm (in.)	2.340 (0.0921)	2.350 (0.0925)	2.360 (0.0929)	2.380 (0.0937)	2.400 (0.0945)	2.420 (0.0953)	2.440 (0.0961)	2.450 (0.0965)	2.460 (0.0969)	2.480 (0.0976)	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)	2.720 (0.1071)	2.740 (0.1079)	2.750 (0.1083)	2.760 (0.1087)	2.780 (0.1094)	2.800 (0.1102)	2.820 (0.1110)	2.840 (0.1118)	2.850 (0.1122)	2.860 (0.1126)	2.880 (0.1134)	2.900 (0.1142)	2.920 (0.1150)	2.940 (0.1157)	2.950 (0.1161)	2.960 (0.1165)	2.980 (0.1173)	3.000 (0.1181)	3.020 (0.1189)	3.040 (0.1197)	3.050 (0.1201)	3.060 (0.1205)	3.080 (0.1213)	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 – 0.020 (0.0000 – 0.0008)											709	709	709	709	709	704	704	710	710	710	710	01	01	42	42	42	42	06	06	43	43	43	43	11	11	44	44	44	44	16	16	45	45	45	45	21	21	46	46	46	46	26	26	47	47	47	47	31	31
0.021 – 0.040 (0.0008 – 0.0016)										709	709	709	709	704	704	704	710	710	710	01	01	01	42	42	42	06	06	06	43	43	43	11	11	11	44	44	44	16	16	16	45	45	45	21	21	21	46	46	46	26	26	26	47	47	47	31	31	31	48
0.041 – 0.060 (0.0016 – 0.0024)									709	709	709	709	704	704	704	710	710	710	01	01	01	42	42	42	06	06	06	43	43	43	11	11	11	44	44	44	16	16	16	45	45	45	21	21	21	46	46	46	26	26	26	47	47	47	31	31	31	48	48
0.061 – 0.080 (0.0024 – 0.0031)							709	709	709	709	709	704	704	704	710	710	710	01	01	01	42	42	42	06	06	06	43	43	43	11	11	11	44	44	44	16	16	16	45	45	45	21	21	21	46	46	46	26	26	26	47	47	47	31	31	31	48	48	48
0.081 – 0.100 (0.0032 – 0.0039)						709	709	709	709	709	704	704	710	710	710	710	01	01	42	42	42	42	06	06	43	43	43	43	11	11	44	44	44	44	16	16	45	45	45	45	21	21	46	46	46	46	26	26	47	47	47	47	31	31	48	48	48	48	36
0.101 – 0.120 (0.0040 – 0.0047)					709	709	709	709	709	704	704	710	710	710	710	01	01	42	42	42	42	06	06	43	43	43	43	11	11	44	44	44	44	16	16	45	45	45	45	21	21	46	46	46	46	26	26	47	47	47	47	31	31	48	48	48	48	36	36
0.121 – 0.140 (0.0048 – 0.0055)				709	709	709	709	704	704	704	710	710	710	01	01	01	42	42	42	06	06	06	43	43	43	11	11	11	44	44	44	16	16	16	45	45	45	21	21	21	46	46	46	26	26	26	47	47	47	31	31	31	48	48	48	36	36	36	49
0.141 – 0.149 (0.0056 – 0.0059)			709	709	709	709	704	704	704	704	710	710	01	01	01	01	42	42	06	06	06	06	43	43	11	11	11	11	44	44	16	16	16	16	45	45	21	21	21	21	46	46	26	26	26	26	47	47	31	31	31	31	48	48	36	36	36	36	49
0.150 – 0.250 (0.0059 – 0.0098)																																																											
0.251 – 0.260 (0.0099 – 0.0102)	704	704	704	710	710	710	01	01	01	42	42	42	06	06	06	43	43	43	11	11	11	44	44	44	16	16	16	45	45	45	21	21	21	46	46	46	26	26	26	47	47	47	31	31	31	48	48	48	36	36	36	49	49	49	41	41	41	41	
0.261 – 0.280 (0.0103 – 0.0110)	704	704	710	710	710	01	01	01	42	42	42	06	06	06	43	43	43	11	11	11	44	44	44	16	16	16	45	45	45	21	21	21	46	46	46	26	26	26	47	47	47	31	31	31	48	48	48	36	36	36	49	49	49	41	41	41	41		
0.281 – 0.300 (0.0111 – 0.0118)	710	710	710	710	01	01	42	42	42	42	06	06	43	43	43	43	11	11	44	44	44	44	16	16	45	45	45	45	21	21	46	46	46	46	26	26	47	47	47	47	31	31	48	48	48	48	36	36	49	49	49	49	41	41	41	41			
0.301 – 0.320 (0.0119 – 0.0126)	710	710	710	01	01	42	42	42	42	06	06	43	43	43	43	11	11	44	44	44	44	16	16	45	45	45	45	21	21	46	46	46	46	26	26	47	47	47	47	31	31	48	48	48	48	36	36	49	49	49	49	41	41	41					
0.321 – 0.340 (0.0126 – 0.0134)	710	01	01	01	42	42	42	06	06	06	43	43	43	11	11	11	44	44	44	16	16	16	45	45	45	21	21	21	46	46	46	26	26	26	47	47	47	31	31	31	48	48	48	36	36	36	49	49	49	41	41	41	41						
0.341 – 0.360 (0.0134 – 0.0142)	01	01	01	42	42	42	06	06	06	43	43	43	11	11	11	44	44	44	16	16	16	45	45	45	21	21	21	46	46	46	26	26	26	47	47	47	31	31	31	48	48	48	36	36	36	49	49	49	41	41	41	41							
0.361 – 0.380 (0.0142 – 0.0150)	01	01	42	42	42	06	06	06	43	43	43	11	11	11	44	44	44	16	16	16	45	45	45	21	21	21	46	46	46	26	26	26	47	47	47	31	31	31	48	48	48	36	36	36	49	49	49	41	41	41	41								
0.381 – 0.400 (0.0150 – 0.0157)	42	42	42	42	06	06	43	43	43	43	11	11	44	44	44	44	16	16	45	45	45	45	21	21	46	46	46	46	26	26	47	47	47	47	31	31	48	48	48	48	36	36	49	49	49	49	41	41	41	41
0.401 – 0.420 (0.0158 – 0.0165)	42	42	42	06	06	43	43	43	43	11	11	44	44	44	44	16	16	45	45	45	45	21	21	46	46	46	46	26	26	47	47	47	47	31	31	48	48	48	48	36	36	49	49	49	49	41	41	41
0.421 – 0.440 (0.0166 – 0.0173)	42	06	06	06	43	43	43	11	11	11	44	44	44	16	16	16	45	45	45	21	21	21	46	46	46	26	26	26	47	47	47	31	31	31	48	48	48	36	36	36	49	49	49	41	41	41	41
0.441 – 0.460 (0.0174 – 0.0181)	06	06	06	43	43	43	11	11	11	44	44	44	16	16	16	45	45	45	21	21	21	46	46	46	26	26	26	47	47	47	31	31	31	48	48	48	36	36	36	49	49	49	41	41	41	41
0.461 – 0.480 (0.0181 – 0.0189)	06	06	43	43	43	11	11	11	44	44	44	16	16	16	45	45	45	21	21	21	46	46	46	26	26	26	47	47	47	31	31	31	48	48	48	36	36	36	49	49	49	41	41	41	41
0.481 – 0.500 (0.0189 – 0.0197)	43	43	43	43	11	11	44	44	44	44	16	16	45	45	45	45	21	21	46	46	46	46	26	26	47	47	47	47	31	31	48	48	48	48	36	36	49	49	49	49	41	41	41	41
0.501 – 0.520 (0.0197 – 0.0205)	43	43	43	11	11	44	44	44	44	16	16	45	45	45	45	21	21	46	46	46	46	26	26	47	47	47	47	31	31	48	48	48	48	36	36	49	49	49	49	41	41	41
0.521 – 0.540 (0.0205 – 0.0213)	43	11	11	11	44	44	44	16	16	16	45	45	45	21	21	21	46	46	46	26	26	26	47	47	47	31	31	31	48	48	48	36	36	36	49	49	49	41	41	41	41
0.541 – 0.560 (0.0213 – 0.0220)	11	11	11	44	44	44	16	16	16	45	45	45	21	21	21	46	46	46	26	26	26	47	47	47	31	31	31	48	48	48	36	36	36	49	49	49	41	41	41	41
0.561 – 0.580 (0.0221 – 0.0228)	11	11	44	44	44	16	16	16	45	45	45	21	21	21	46	46	46	26	26	26	47	47	47	31	31	31	48	48	48	36	36	36	49	49	49	41	41	41	41
0.581 – 0.600 (0.0229 – 0.0236)	44	44	44	44	16	16	45	45	45	45	21	21	46	46	46	46	26	26	47	47	47	47	31	31	48	48	48	48	36	36	49	49	49	49	41	41	41	41
0.601 – 0.620 (0.0237 – 0.0244)	44	44	44	16	16	45	45	45	45	21	21	46	46	46	46	26	26	47	47	47	47	31	31	48	48	48	48	36	36	49	49	49	49	41	41	41
0.621 – 0.640 (0.0244 – 0.0252)	44	16	16	16	45	45	45	21	21	21	46	46	46	26	26	26	47	47	47	31	31	31	48	48	48	36	36	36	49	49	49	41	41	41	41
0.641 – 0.660 (0.0252 – 0.0260)	16	16	16	45	45	45	21	21	21	46	46	46	26	26	26	47	47	47	31	31	31	48	48	48	36	36	36	49	49	49	41	41	41	41
0.661 – 0.680 (0.0260 – 0.0268)	16	16	45	45	45	21	21	21	46	46	46	26	26	26	47	47	47	31	31	31	48	48	48	36	36	36	49	49	49	41	41	41	41
0.681 – 0.700 (0.0268 – 0.0276)	45	45	45	45	21	21	46	46	46	46	26	26	47	47	47	47	31	31	48	48	48	48	36	36	49	49	49	49	41	41	41	41
0.701 – 0.720 (0.0276 – 0.0283)	45	45	45	21	21	46	46	46	46	26	26	47	47	47	47	31	31	48	48	48	48	36	36	49	49	49	49	41	41	41
0.721 – 0.740 (0.0284 – 0.0291)	45	21	21	21	46	46	46	26	26	26	47	47	47	31	31	31	48	48	48	36	36	36	49	49	49	41	41	41	41
0.741 – 0.760 (0.0292 – 0.0299)	21	21	21	46	46	46	26	26	26	47	47	47	31	31	31	48	48	48	36	36	36	49	49	49	41	41	41	41
0.761 – 0.780 (0.0300 – 0.0307)	21	21	46	46	46	26	26	26	47	47	47	31	31	31	48	48	48	36	36	36	49	49	49	41	41	41	41
0.781 – 0.800 (0.0307 – 0.0315)	46	46	46	46	26	26	47	47	47	47	31	31	48	48	48	48	36	36	49	49	49	49	41	41	41	41
0.801 – 0.820 (0.0315 – 0.0323)	46	46	46	26	26	47	47	47	47	31	31	48	48	48	48	36	36	49	49	49	49	41	41	41
0.821 – 0.840 (0.0323 – 0.0331)	46	26	26	26	47	47	47	31	31	31	48	48	48	36	36	36	49	49	49	41	41	41	41
0.841 – 0.860 (0.0331 – 0.0339)	26	26	26	47	47	47	31	31	31	48	48	48	36	36	36	49	49	49	41	41	41	41
0.861 – 0.880 (0.0339 – 0.0346)	26	26	47	47	47	31	31	31	48	48	48	36	36	36	49	49	49	41	41	41	41
0.881 – 0.900 (0.0347 – 0.0354)	47	47	47	47	31	31	48	48	48	48	36	36	49	49	49	49	41	41	41	41
0.901 – 0.920 (0.0355 – 0.0362)	47	47	47	31	31	48	48	48	48	36	36	49	49	49	49	41	41	41
0.921 – 0.940 (0.0363 – 0.0370)	47	31	31	31	48	48	48	36	36	36	49	49	49	41	41	41	41
0.941 – 0.960 (0.0370 – 0.0378)	31	31	31	48	48	48	36	36	36	49	49	49	41	41	41	41
0.961 – 0.980 (0.0378 – 0.0386)	31	31	48	48	48	36	36	36	49	49	49	41	41	41	41
0.981 – 1.000 (0.0386 – 0.0394)	48	48	48	48	36	36	49	49	49	49	41	41	41	41
1.001 – 1.020 (0.0394 – 0.0402)	48	48	48	36	36	49	49	49	49	41	41	41
1.021 – 1.040 (0.0402 – 0.0409)	48	36	36	36	49	49	49	41	41	41	41
1.041 – 1.060 (0.0410 – 0.0417)	36	36	36	49	49	49	41	41	41	41
1.061 – 1.080 (0.0418 – 0.0425)	36	36	49	49	49	41	41	41	41
1.081 – 1.100 (0.0426 – 0.0433)	49	49	49	49	41	41	41	41
1.101 – 1.120 (0.0433 – 0.0441)	49	49	49	41	41	41
1.121 – 1.140 (0.0441 – 0.0449)	49	41	41	41	41
1.141 – 1.160 (0.0449 – 0.0457)	41	41	41	41
1.161 – 1.180 (0.0457 – 0.0465)	41	41	41
1.181 – 1.200 (0.0465 – 0.0472)	41	41
1.201 – 1.210 (0.0473 – 0.0476)	41

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.) 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.) | 2.340 (0.0921) | 2.350 (0.0925) | 2.360 (0.0929) | 2.380 (0.0937) | 2.400 (0.0945) | 2.420 (0.0953) | 2.440 (0.0961) | 2.450 (0.0965) | 2.460 (0.0969) | 2.480 (0.0976) | 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) | 2.720 (0.1071) | 2.740 (0.1079) | 2.750 (0.1083) | 2.760 (0.1087) | 2.780 (0.1094) | 2.800 (0.1102) | 2.820 (0.1110) | 2.840 (0.1118) | 2.850 (0.1122) | 2.860 (0.1126) | 2.880 (0.1134) | 2.900 (0.1142) | 2.920 (0.1150) | 2.940 (0.1157) | 2.950 (0.1161) | 2.960 (0.1165) | 2.980 (0.1173) | 3.000 (0.1181) | 3.020 (0.1189) | 3.040 (0.1197) | 3.050 (0.1201) | 3.060 (0.1205) | 3.080 (0.1213) | 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) |
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