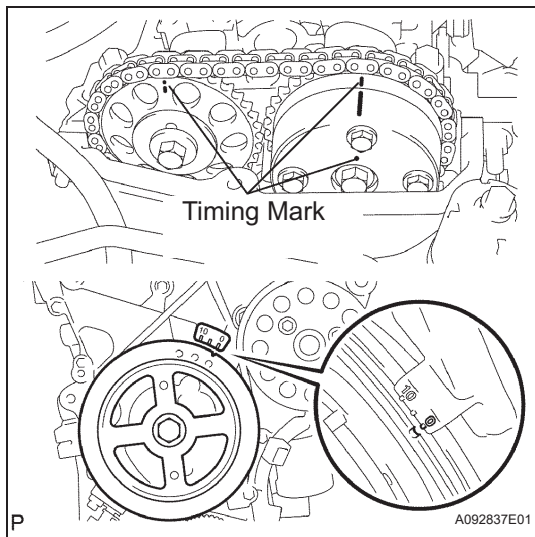


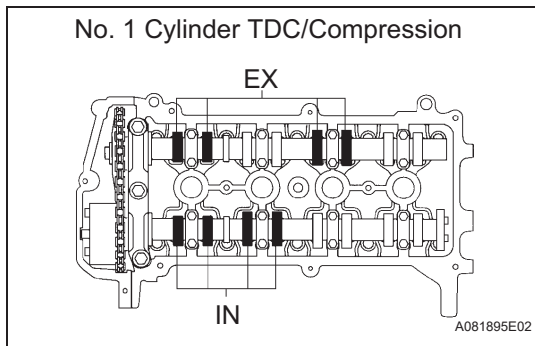
# VALVE CLEARANCE

## ADJUSTMENT

1. REMOVE REAR NO. 2 FLOOR BOARD (See page [CH-4](#))
2. REMOVE REAR DECK FLOOR BOX (See page [CH-4](#))
3. REMOVE REAR NO. 3 FLOOR BOARD (See page [CH-4](#))
4. DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL  
CAUTION:  
Wait at least 90 seconds after disconnecting the cable from the negative (-) battery terminal to prevent airbag and seat belt pretensioner activation.
5. REMOVE ENGINE UNDER COVER RH
6. REMOVE WIPER ARM HEAD CAP
7. REMOVE FRONT WIPER ARM LH (See page [WW-13](#))
8. REMOVE FRONT WIPER ARM RH (See page [WW-13](#))
9. REMOVE HOOD TO COWL TOP SEAL (See page [WW-13](#))
10. REMOVE COWL TOP VENTILATOR LOUVER LH (See page [WW-13](#))
11. REMOVE COWL TOP VENTILATOR LOUVER RH (See page [WW-13](#))
12. REMOVE WINDSHIELD WIPER LINK ASSEMBLY (See page [WW-13](#))
13. REMOVE FRONT COWL TOP PANEL OUTER (See page [FU-12](#))
14. REMOVE RADIATOR SUPPORT OPENING COVER (See page [CO-6](#))
15. REMOVE AIR CLEANER ASSEMBLY (See page [EM-28](#))
16. DISCONNECT BRAKE MASTER CYLINDER RESERVOIR (See page [EM-29](#))
17. REMOVE RESERVOIR BRACKET (See page [EM-29](#))
18. REMOVE CYLINDER HEAD COVER (See page [EM-30](#))
19. INSPECT VALVE CLEARANCE  
HINT:  
Inspect and adjust the valve clearance when the engine is cold.



- (a) Set the No. 1 cylinder to TDC/compression.
- (1) Turn the crankshaft pulley until its timing notch and timing mark 0 of the chain cover are aligned.
  - (2) Check that both timing marks on the camshaft timing sprocket and camshaft timing gear are facing upward as shown in the illustration. If not, turn the crankshaft 1 complete revolution (360°) and align the marks as above.

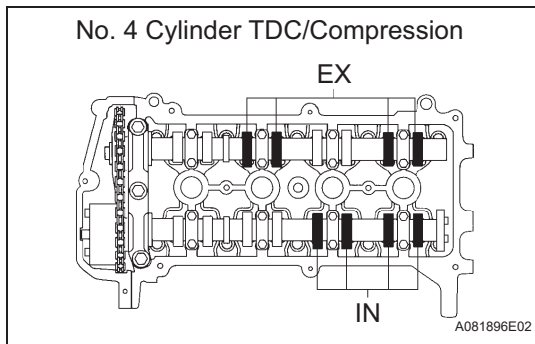


- (b) Check the valves indicated in the illustration.
- (1) Using a feeler gauge, measure the clearance between the valve lifter and camshaft.

**Standard valve clearance (Cold)**

Item	Specified Condition
Intake	0.17 to 0.23 mm (0.007 to 0.009 in.)
Exhaust	0.27 to 0.33 mm (0.011 to 0.013 in.)

- (2) Record any out-of-specification valve clearance measurements. They will be used later to determine the required replacement adjusting shim.
- (c) Turn the crankshaft 1 complete revolution until its timing notch and timing mark 0 of the chain cover are aligned.

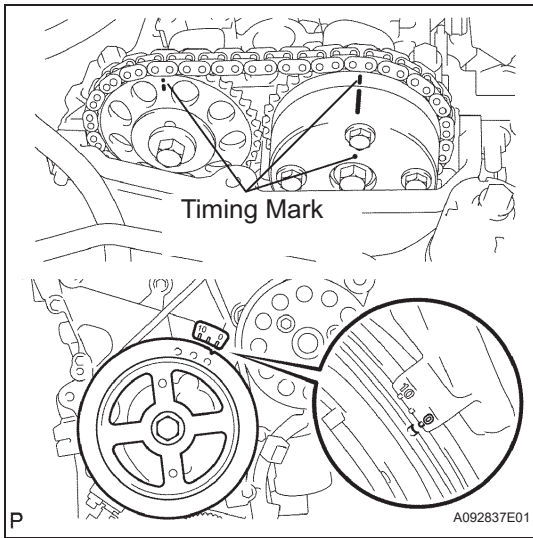


- (d) Check the valves indicated in the illustration.
- (1) Using a feeler gauge, measure the clearance between the valve lifter and camshaft.

**Standard valve clearance (Cold)**

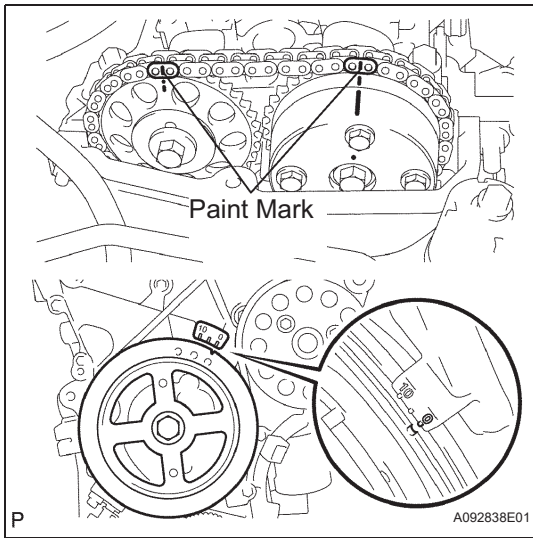
Item	Specified Condition
Intake	0.17 to 0.23 mm (0.007 to 0.009 in.)
Exhaust	0.27 to 0.33 mm (0.011 to 0.013 in.)

- (2) Record any out-of-specification valve clearance measurements. They will be used later to determine the required replacement adjusting shim.

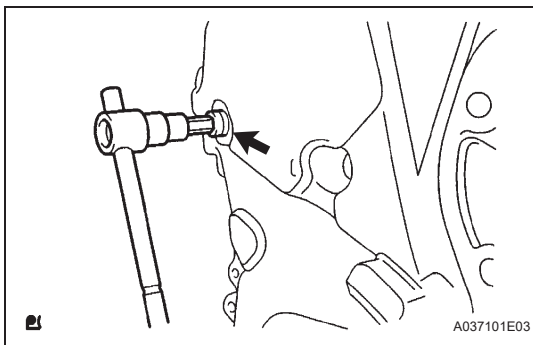


## 20. ADJUST VALVE CLEARANCE

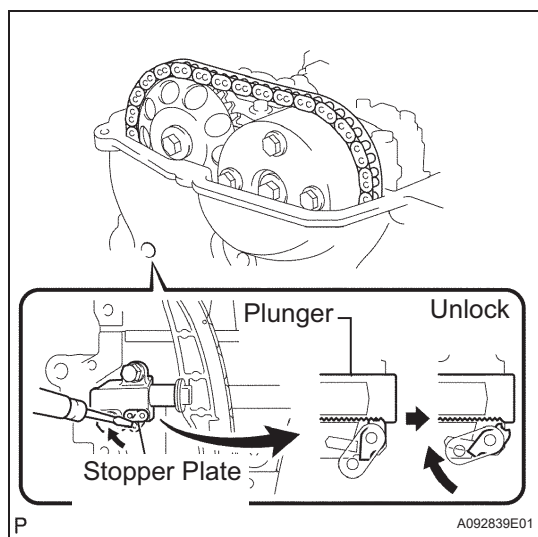
- (a) Set the No. 1 cylinder to TDC/compression.
- (1) Turn the crankshaft pulley until its timing notch and timing mark 0 of the chain cover are aligned.
  - (2) Check that both timing marks on the camshaft timing sprocket and valve timing controller assembly are facing upward as shown in the illustration.  
If not, turn the crankshaft 1 complete revolution (360°) and align the marks as above.



- (3) Put paint marks on the timing chain where the timing marks of the camshaft timing sprocket and the camshaft timing gear are located.



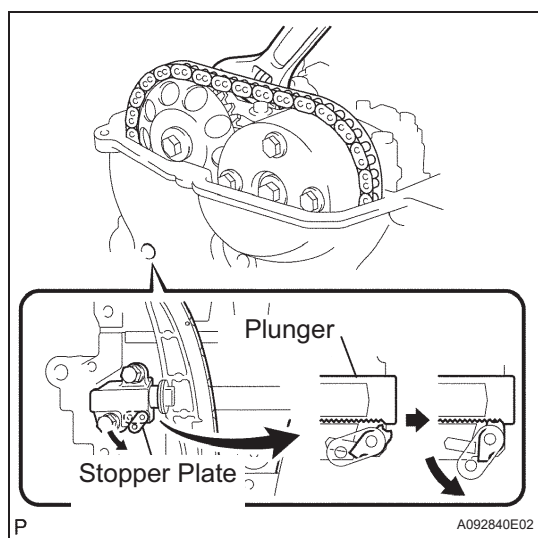
- (b) Using an 8 mm hexagon wrench, remove the screw plug.



- (c) Insert a screwdriver into the service hole of the chain tensioner to hold the stopper plate of the chain tensioner at an upward position.

HINT:

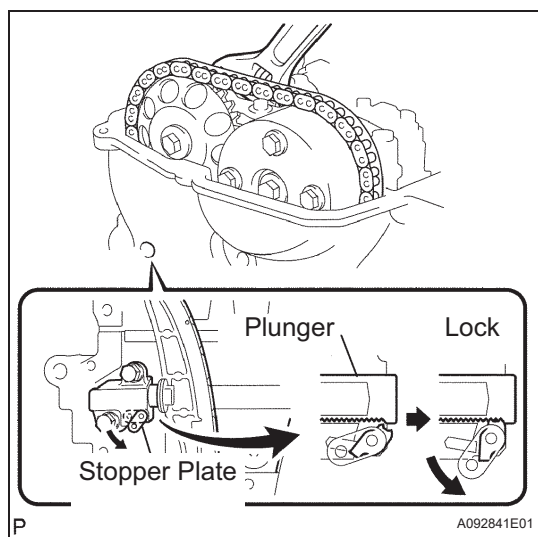
Lifting up the stopper plate of the chain tensioner unlocks the plunger.



- (d) Keeping the stopper plate of the chain tensioner lifted, slightly rotate the hexagonal lobe of the No. 2 camshaft to the right with an adjustable wrench so the plunger of the chain tensioner is pushed.

HINT:

When the camshaft No. 2 is slightly rotated to the right, the plunger is pushed.



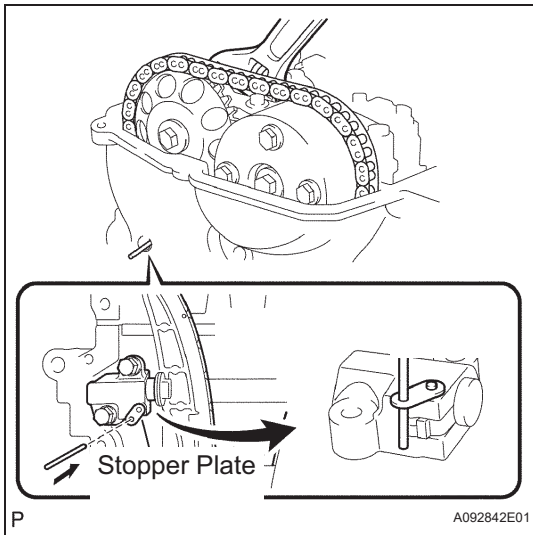
- (e) Keeping the adjustable wrench installed, remove the screwdriver with the plunger pushed.

**NOTICE:**

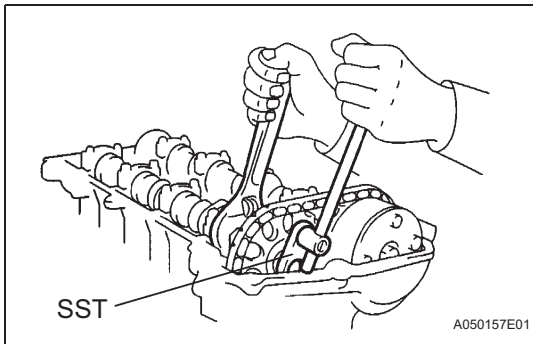
**Do not move the adjustable wrench.**

HINT:

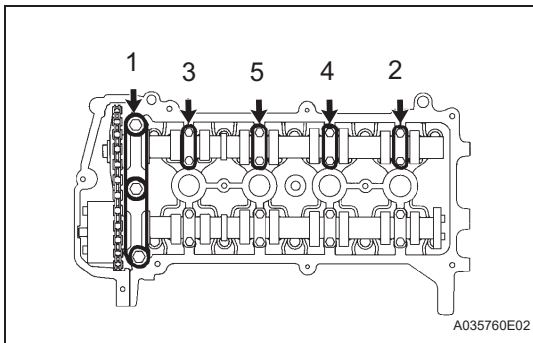
Removing the screwdriver lowers the stopper plate and locks the plunger.



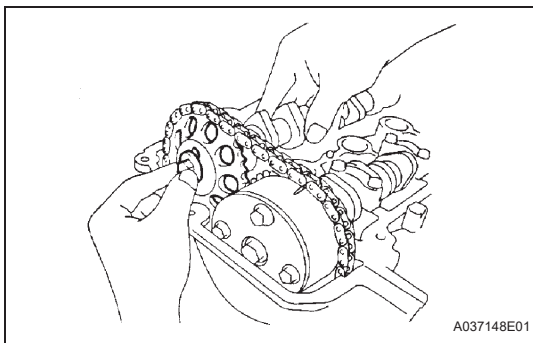
- (f) Insert a 3.0 mm (0.118 in.) diameter bar into the hole of the stopper plate with the stopper plate of the chain tensioner lowered and locked.
- HINT:**  
If a 3.0 mm (0.118 in.) diameter bar cannot be inserted into the hole of the stopper plate, rotate the No. 2 camshaft slightly to the left and right. Then a 3.0 mm (0.118 in.) diameter bar can be inserted easily.
- (g) Secure the 3.0 mm (0.118 in.) diameter bar with tape.



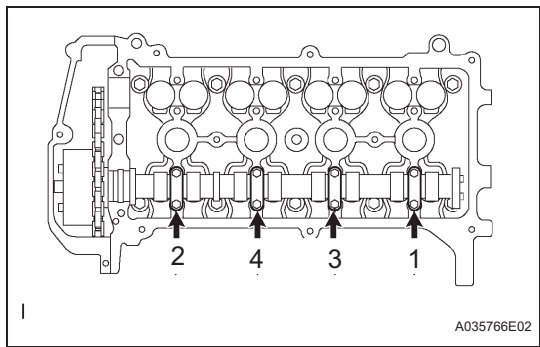
- (h) Hold the hexagonal lobe of the camshaft No. 2 with the adjustable wrench.
- (i) Using SST, loosen the bolt.
- SST 09023-38400**



- (j) Using several steps, uniformly loosen and remove the 11 bearing cap bolts in the sequence shown in the illustration. Then remove the 5 bearing caps.
- NOTICE:**  
**Loosen each bolt uniformly, keeping the camshaft level.**

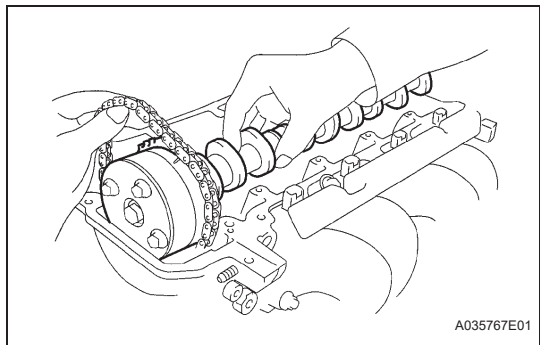


- (k) Remove the flange bolt with the No. 2 camshaft lifted up. Then detach the No. 2 camshaft and the camshaft timing sprocket.

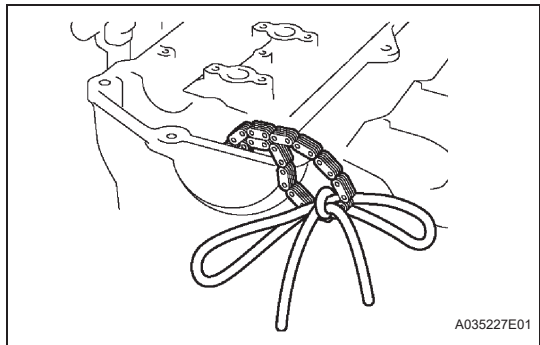


- (l) Using several steps, uniformly loosen and remove the 8 bearing cap bolts in the sequence shown in the illustration. Then remove the 4 bearing caps.

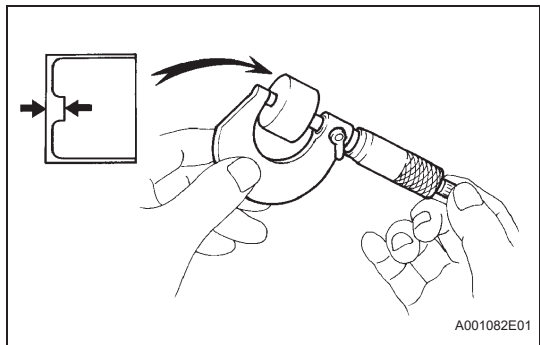
**NOTICE:**  
Loosen each bolt uniformly, keeping the camshaft level.



- (m) Hold the timing chain with one hand, and remove the camshaft and the camshaft timing gear assembly.



- (n) Tie the timing chain with a string as shown in the illustration.
- NOTICE:**  
Be careful not to drop anything inside the timing chain cover.



- (o) Remove the valve lifters.
- (p) Using a micrometer, measure the thickness of the removed lifter.
- (q) Calculate the thickness of a new lifter so that the valve clearance comes within the specified value.

A	New lifter thickness
B	Used lifter thickness
C	Measured valve clearance

**New lifter thickness**

Item	Thickness
Intake	$A = B + (C - 0.20 \text{ mm (0.008 in.)})$
Exhaust	$A = B + (C - 0.30 \text{ mm (0.012 in.)})$

- (r) Select a new lifter with the thickness as close to the calculated values as possible.
- EXAMPLE: (Intake)  
Measured valve clearance = 0.40 mm (0.0158 in.)  
 $0.40 \text{ mm (0.0158 in.)} - 0.20 \text{ mm (0.0079 in.)} = 0.20 \text{ mm (0.0079 in.)}$   
(Measured - Specification = Excess clearance)  
Used lifter measurement = 5.25 mm (0.2067 in.)

$0.20 \text{ mm (0.0079 in.)} + 5.25 \text{ mm (0.2067 in.)} = 5.45 \text{ mm (0.2146 in.)}$

(Excess clearance + Used lifter = Ideal new lifter)

Closest new lifter = 5.45 mm (0.2146 in.)

Select No. 46 lifter (5.46 mm (0.2150 in.))

HINT:

- Lifters are available in 35 sizes in increments of 0.020 mm (0.0008 in.), from 5.060 mm (0.1992 in.) to 5.740 mm (0.2260 in.).
- Refer to the New lifter thickness table below.



(1) Valve lifter selection chart (intake)

Measured Clearance mm (in.)

Installed Lifter Thickness mm (in.)

	5.060 (0.1992)	5.080 (0.2000)	5.100 (0.2008)	5.120 (0.2016)	5.140 (0.2024)	5.160 (0.2031)	5.180 (0.2039)	5.200 (0.2047)	5.210 (0.2051)	5.220 (0.2055)	5.230 (0.2059)	5.240 (0.2063)	5.250 (0.2067)	5.260 (0.2071)	5.270 (0.2075)	5.280 (0.2079)	5.290 (0.2083)	5.300 (0.2087)	5.310 (0.2091)	5.320 (0.2094)	5.330 (0.2098)	5.340 (0.2102)	5.350 (0.2106)	5.360 (0.2110)	5.370 (0.2114)	5.380 (0.2118)	5.390 (0.2122)
0.000 - 0.030 (0.0000 - 0.0012)										06	06	06	08	10	10	10	12	12	14	14	16	16	18	18	20	20	22
0.031 - 0.050 (0.0012 - 0.0020)								06	06	06	08	08	10	10	12	12	14	14	16	16	18	18	20	20	22	22	24
0.051 - 0.070 (0.0020 - 0.0028)							06	06	08	08	10	10	12	12	14	14	16	16	18	18	20	20	22	22	24	24	26
0.071 - 0.090 (0.0028 - 0.0035)						06	06	08	10	10	12	12	14	14	16	16	18	18	20	20	22	22	24	24	26	26	28
0.091 - 0.110 (0.0036 - 0.0043)				06	06	08	10	12	12	14	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30
0.111 - 0.130 (0.0044 - 0.0051)			06	06	08	10	12	14	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30	32	32
0.131 - 0.149 (0.0052 - 0.0059)		06	06	08	10	12	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30	32	32	34	34
0.150 - 0.250 (0.0059 - 0.0098)																											
0.251 - 0.270 (0.0099 - 0.0106)	12	14	16	18	20	22	24	26	28	28	30	30	32	32	34	34	36	36	38	38	40	40	42	42	44	44	46
0.271 - 0.290 (0.0107 - 0.0114)	14	16	18	20	22	24	26	28	30	30	32	32	34	34	36	36	38	38	40	40	42	42	44	44	46	46	48
0.291 - 0.310 (0.0115 - 0.0122)	16	18	20	22	24	26	28	30	32	32	34	34	36	36	38	38	40	40	42	42	44	44	46	46	48	48	50
0.311 - 0.330 (0.0122 - 0.0130)	18	20	22	24	26	28	30	32	34	34	36	36	38	38	40	40	42	42	44	44	46	46	48	48	50	50	52
0.331 - 0.350 (0.0130 - 0.0138)	20	22	24	26	28	30	32	34	36	36	38	38	40	40	42	42	44	44	46	46	48	48	50	50	52	52	54
0.351 - 0.370 (0.0138 - 0.0146)	22	24	26	28	30	32	34	36	38	38	40	40	42	42	44	44	46	46	48	48	50	50	52	52	54	54	56
0.371 - 0.390 (0.0146 - 0.0154)	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	58
0.391 - 0.410 (0.0154 - 0.0161)	26	28	30	32	34	36	38	40	42	42	44	44	46	46	48	48	50	50	52	52	54	54	56	56	58	58	60
0.411 - 0.430 (0.0162 - 0.0169)	28	30	32	34	36	38	40	42	44	44	46	46	48	48	50	50	52	52	54	54	56	56	58	58	60	60	62
0.431 - 0.450 (0.0170 - 0.0177)	30	32	34	36	38	40	42	44	46	46	48	48	50	50	52	52	54	54	56	56	58	58	60	60	62	62	64
0.451 - 0.470 (0.0178 - 0.0185)	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
0.471 - 0.490 (0.0185 - 0.0193)	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
0.491 - 0.510 (0.0193 - 0.0201)	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
0.511 - 0.530 (0.0201 - 0.0209)	38	40	42	44	46	48	50	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72
0.531 - 0.550 (0.0209 - 0.0217)	40	42	44	46	48	50	52	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74
0.551 - 0.570 (0.0217 - 0.0224)	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	74
0.571 - 0.590 (0.0225 - 0.0232)	44	46	48	50	52	54	56	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74	74	74	74
0.591 - 0.610 (0.0233 - 0.0240)	46	48	50	52	54	56	58	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74	74	74	74	74	74
0.611 - 0.630 (0.0241 - 0.0248)	48	50	52	54	56	58	60	62	64	64	66	66	68	68	70	70	72	72	74	74	74	74	74	74	74	74	74
0.631 - 0.650 (0.0248 - 0.0256)	50	52	54	56	58	60	62	64	66	66	68	68	70	70	72	72	74	74	74	74	74	74	74	74	74	74	74
0.651 - 0.670 (0.0256 - 0.0264)	52	54	56	58	60	62	64	66	68	68	70	70	72	72	74	74	74	74	74	74	74	74	74	74	74	74	74
0.671 - 0.690 (0.0264 - 0.0272)	54	56	58	60	62	64	66	68	70	70	72	72	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74
0.691 - 0.710 (0.0272 - 0.0280)	56	58	60	62	64	66	68	70	72	72	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74
0.711 - 0.730 (0.0280 - 0.0287)	58	60	62	64	66	68	70	72	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74
0.731 - 0.750 (0.0288 - 0.0295)	60	62	64	66	68	70	72	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74
0.751 - 0.770 (0.0296 - 0.0303)	62	64	66	68	70	72	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74
0.771 - 0.790 (0.0304 - 0.0311)	64	66	68	70	72	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74
0.791 - 0.810 (0.0311 - 0.0319)	66	68	70	72	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74
0.811 - 0.830 (0.0319 - 0.0327)	68	70	72	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74
0.831 - 0.850 (0.0327 - 0.0335)	70	72	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74
0.851 - 0.870 (0.0335 - 0.0343)	72	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74
0.871 - 0.890 (0.0343 - 0.0350)	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74
0.891 - 0.910 (0.0351 - 0.0358)	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74
0.911 - 0.930 (0.0359 - 0.0366)	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74



## (2) Valve lifter selection chart (intake) (continued).

Measured Clearance mm (in.)

Installed Lifter Clearance mm (in.)

	5.400 (0.2126)	5.410 (0.2130)	5.420 (0.2134)	5.430 (0.2138)	5.440 (0.2142)	5.450 (0.2146)	5.460 (0.2150)	5.470 (0.2154)	5.480 (0.2157)	5.490 (0.2161)	5.500 (0.2165)	5.510 (0.2169)	5.520 (0.2173)	5.530 (0.2177)	5.540 (0.2181)	5.550 (0.2185)	5.560 (0.2189)	5.570 (0.2193)	5.580 (0.2197)	5.590 (0.2201)	5.600 (0.2205)	5.620 (0.2213)	5.640 (0.2220)	5.660 (0.2228)	5.680 (0.2236)	5.700 (0.2244)	5.720 (0.2252)	5.740 (0.2260)
0.000 - 0.030 (0.0000 - 0.0012)	22	24	24	26	26	28	28	30	30	32	32	34	34	36	36	38	38	40	40	42	42	44	46	48	50	52	54	56
0.031 - 0.050 (0.0012 - 0.0020)	24	26	26	28	28	30	30	32	32	34	34	36	36	38	38	40	40	42	42	44	44	46	48	50	52	54	56	58
0.051 - 0.070 (0.0020 - 0.0028)	26	28	28	30	30	32	32	34	34	36	36	38	38	40	40	42	42	44	44	46	46	48	50	52	54	56	58	60
0.071 - 0.090 (0.0028 - 0.0035)	28	30	30	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
0.091 - 0.110 (0.0036 - 0.0043)	30	32	32	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
0.111 - 0.130 (0.0044 - 0.0051)	32	34	34	36	36	38	38	40	40	42	42	44	44	46	46	48	48	50	50	52	52	54	56	58	60	62	64	66
0.131 - 0.149 (0.0052 - 0.0059)	34	36	36	38	38	40	40	42	42	44	44	46	46	48	48	50	50	52	52	54	54	56	58	60	62	64	66	68
0.150 - 0.250 (0.0059 - 0.0098)																												
0.251 - 0.270 (0.0099 - 0.0106)	46	48	48	50	50	52	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	70	72	74	74	74	
0.271 - 0.290 (0.0107 - 0.0114)	48	50	50	52	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	72	74	74	74	74	
0.291 - 0.310 (0.0115 - 0.0122)	50	52	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	74	74	74	74	74	
0.311 - 0.330 (0.0122 - 0.0130)	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74	74	74	74	74	
0.331 - 0.350 (0.0130 - 0.0138)	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74	74	74	74	74	74	74	
0.351 - 0.370 (0.0138 - 0.0146)	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74	74	74	74	74	74	74	74	74	
0.371 - 0.390 (0.0146 - 0.0154)	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74	74	74	74	74	74	74	74	74	74	74	
0.391 - 0.410 (0.0154 - 0.0161)	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74	74	74	74	74	74	74	74	74	74	74	74	74	
0.411 - 0.430 (0.0162 - 0.0169)	62	64	64	66	66	68	68	70	70	72	72	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	
0.431 - 0.450 (0.0170 - 0.0177)	64	66	66	68	68	70	70	72	72	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	
0.451 - 0.470 (0.0178 - 0.0185)	66	68	68	70	70	72	72	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	
0.471 - 0.490 (0.0185 - 0.0193)	68	70	70	72	72	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	
0.491 - 0.510 (0.0193 - 0.0201)	70	72	72	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	
0.511 - 0.530 (0.0201 - 0.0209)	72	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	
0.531 - 0.550 (0.0209 - 0.0217)	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	
0.551 - 0.570 (0.0217 - 0.0224)	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	
0.571 - 0.590 (0.0225 - 0.0232)	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	

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A116734E01

## New lifter thickness

Lifter No.	Thickness	Lifter No.	Thickness	Lifter No.	Thickness
06	5.060 mm (0.1992 in.)	30	5.300 mm (0.2087 in.)	54	5.540 mm (0.2181 in.)
08	5.080 mm (0.2000 in.)	32	5.320 mm (0.2094 in.)	56	5.560 mm (0.2189 in.)

EM

Lifter No.	Thickness	Lifter No.	Thickness	Lifter No.	Thickness
10	5.100 mm (0.2008 in.)	34	5.340 mm (0.2102 in.)	58	5.580 mm (0.2197 in.)
12	5.120 mm (0.2016 in.)	36	5.360 mm (0.2110 in.)	60	5.600 mm (0.2205 in.)
14	5.140 mm (0.2024 in.)	38	5.380 mm (0.2118 in.)	62	5.620 mm (0.2213 in.)
16	5.160 mm (0.2031 in.)	40	5.400 mm (0.2126 in.)	64	5.640 mm (0.2220 in.)
18	5.180 mm (0.2039 in.)	42	5.420 mm (0.2134 in.)	66	5.660 mm (0.2228 in.)
20	5.200 mm (0.2047 in.)	44	5.440 mm (0.2142 in.)	68	5.680 mm (0.2236 in.)
22	5.220 mm (0.2055 in.)	46	5.460 mm (0.2150 in.)	70	5.700 mm (0.2244 in.)
24	5.240 mm (0.2063 in.)	48	5.480 mm (0.2157 in.)	72	5.720 mm (0.2252 in.)
26	5.260 mm (0.2071 in.)	50	5.500 mm (0.2165 in.)	74	5.740 mm (0.2260 in.)
28	5.280 mm (0.2079 in.)	52	5.520 mm (0.2173 in.)	-	-

**Standard intake valve clearance (Cold):****0.17 to 0.23 mm (0.007 to 0.009 in.)****EXAMPLE:**

A 5.250 mm (0.2067 in.) lifter is installed, and the measured clearance is 0.400 mm (0.0158 in.).

Replace the 5.250 mm (0.2067 in.) lifter with a new No. 46 lifter.

## (3) Valve lifter selection chart (exhaust).

	Measured Clearance mm (in.)																											
	Installed Lifter Thickness mm (in.)																											
	5.060 (0.1992)	5.080 (0.2000)	5.100 (0.2008)	5.120 (0.2016)	5.140 (0.2024)	5.160 (0.2031)	5.180 (0.2039)	5.200 (0.2047)	5.210 (0.2051)	5.220 (0.2055)	5.230 (0.2059)	5.240 (0.2063)	5.250 (0.2067)	5.260 (0.2071)	5.270 (0.2075)	5.280 (0.2079)	5.290 (0.2083)	5.300 (0.2087)	5.310 (0.2091)	5.320 (0.2094)	5.330 (0.2098)	5.340 (0.2102)	5.350 (0.2106)	5.360 (0.2110)	5.370 (0.2114)	5.380 (0.2118)	5.390 (0.2122)	
0.000 - 0.030 (0.0000 - 0.0012)																					06	06	08	08	10	10	12	
0.031 - 0.050 (0.0012 - 0.0020)																		06	06	06	08	08	10	10	12	12	14	
0.051 - 0.070 (0.0020 - 0.0028)																06	06	06	08	08	10	10	12	12	14	14	16	
0.071 - 0.090 (0.0028 - 0.0035)														06	06	06	08	08	10	10	12	12	14	14	16	16	18	
0.091 - 0.110 (0.0036 - 0.0043)												06	06	06	08	08	10	10	12	12	14	14	16	16	18	18	20	
0.111 - 0.130 (0.0044 - 0.0051)											06	06	08	08	10	10	12	12	14	14	16	16	18	18	20	20	22	
0.131 - 0.150 (0.0052 - 0.0059)										06	08	08	10	10	12	12	14	14	16	16	18	18	20	20	22	22	24	
0.151 - 0.170 (0.0059 - 0.0067)								06	08	08	10	10	12	12	14	14	16	16	18	18	20	20	22	22	24	24	26	
0.171 - 0.190 (0.0067 - 0.0075)						06	06	08	10	10	12	12	14	14	16	16	18	18	20	20	22	22	24	24	26	26	28	
0.191 - 0.210 (0.0075 - 0.0083)				06	06	08	10	12	12	14	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30	
0.211 - 0.230 (0.0083 - 0.0091)			06	06	08	10	12	14	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30	32	32	
0.231 - 0.249 (0.0091 - 0.0098)		06	06	08	10	12	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30	32	32	34	34	
0.250 - 0.350 (0.0098 - 0.0138)																												
0.351 - 0.370 (0.0138 - 0.0146)	12	14	16	18	20	22	24	26	28	28	30	30	32	32	34	34	36	36	38	38	40	40	42	42	44	44	46	
0.371 - 0.390 (0.0146 - 0.0154)	14	16	18	20	22	24	26	28	30	30	32	32	34	34	36	36	38	38	40	40	42	42	44	44	46	46	48	
0.391 - 0.410 (0.0154 - 0.0161)	16	18	20	22	24	26	28	30	32	32	34	34	36	36	38	38	40	40	42	42	44	44	46	46	48	48	50	
0.411 - 0.430 (0.0162 - 0.0169)	18	20	22	24	26	28	30	32	34	34	36	36	38	38	40	40	42	42	44	44	46	46	48	48	50	50	52	
0.431 - 0.450 (0.0170 - 0.0177)	20	22	24	26	28	30	32	34	36	36	38	38	40	40	42	42	44	44	46	46	48	48	50	50	52	52	54	
0.451 - 0.470 (0.0178 - 0.0185)	22	24	26	28	30	32	34	36	38	38	40	40	42	42	44	44	46	46	48	48	50	50	52	52	54	54	56	
0.471 - 0.490 (0.0185 - 0.0193)	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	58	
0.491 - 0.510 (0.0193 - 0.0201)	26	28	30	32	34	36	38	40	42	42	44	44	46	46	48	48	50	50	52	52	54	54	56	56	58	58	60	
0.511 - 0.530 (0.0201 - 0.0209)	28	30	32	34	36	38	40	42	44	44	46	46	48	48	50	50	52	52	54	54	56	56	58	58	60	60	62	
0.531 - 0.550 (0.0209 - 0.0217)	30	32	34	36	38	40	42	44	46	46	48	48	50	50	52	52	54	54	56	56	58	58	60	60	62	62	64	
0.551 - 0.570 (0.0217 - 0.0224)	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	
0.571 - 0.590 (0.0225 - 0.0232)	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	
0.591 - 0.610 (0.0233 - 0.0240)	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	
0.611 - 0.630 (0.0241 - 0.0248)	38	40	42	44	46	48	50	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	
0.631 - 0.650 (0.0248 - 0.0256)	40	42	44	46	48	50	52	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	
0.651 - 0.670 (0.0256 - 0.0264)	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	74	
0.671 - 0.690 (0.0264 - 0.0272)	44	46	48	50	52	54	56	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74	74	74	74	
0.691 - 0.710 (0.0272 - 0.0280)	46	48	50	52	54	56	58	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74	74	74	74	74	74	
0.711 - 0.730 (0.0280 - 0.0287)	48	50	52	54	56	58	60	62	64	64	66	66	68	68	70	70	72	72	74	74	74	74	74	74	74	74	74	
0.731 - 0.750 (0.0288 - 0.0295)	50	52	54	56	58	60	62	64	66	66	68	68	70	70	72	72	74	74	74	74	74	74	74	74	74	74	74	
0.751 - 0.770 (0.0296 - 0.0303)	52	54	56	58	60	62	64	66	68	68	70	70	72	72	74	74	74	74	74	74	74	74	74	74	74	74	74	
0.771 - 0.790 (0.0304 - 0.0311)	54	56	58	60	62	64	66	68	70	70	72	72	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	
0.791 - 0.810 (0.0311 - 0.0319)	56	58	60	62	64	66	68	70	72	72	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	
0.811 - 0.830 (0.0319 - 0.0327)	58	60	62	64	66	68	70	72	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	
0.831 - 0.850 (0.0327 - 0.0335)	60	62	64	66	68	70	72	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	
0.851 - 0.870 (0.0335 - 0.0343)	62	64	66	68	70	72	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	
0.871 - 0.890 (0.0343 - 0.0350)	64	66	68	70	72	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	
0.891 - 0.910 (0.0351 - 0.0358)	66	68	70	72	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	
0.911 - 0.930 (0.0359 - 0.0366)	68	70	72	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	
0.931 - 0.950 (0.0367 - 0.0374)	70	72	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	
0.951 - 0.970 (0.0374 - 0.0382)	72	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	
0.971 - 0.990 (0.0382 - 0.0390)	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	
0.991 - 1.010 (0.0390 - 0.0398)	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	
1.011 - 1.030 (0.0398 - 0.0406)	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	

## (4) Valve selection chart (exhaust) (continued).

Measured Clearance mm (in.)

Installed Lifter Clearance mm (in.)

	5.400 (0.2126)	5.410 (0.2130)	5.420 (0.2134)	5.430 (0.2138)	5.440 (0.2142)	5.450 (0.2146)	5.460 (0.2150)	5.470 (0.2154)	5.480 (0.2157)	5.490 (0.2161)	5.500 (0.2165)	5.510 (0.2169)	5.520 (0.2173)	5.530 (0.2177)	5.540 (0.2181)	5.550 (0.2185)	5.560 (0.2189)	5.570 (0.2193)	5.580 (0.2197)	5.590 (0.2201)	5.600 (0.2205)	5.620 (0.2213)	5.640 (0.2220)	5.660 (0.2228)	5.680 (0.2236)	5.700 (0.2244)	5.720 (0.2252)	5.740 (0.2260)
0.000 - 0.030 (0.0000 - 0.0012)	12	14	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30	32	32	34	36	38	40	42	44	46
0.031 - 0.050 (0.0012 - 0.0020)	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30	32	32	34	34	36	38	40	42	44	46	48
0.051 - 0.070 (0.0020 - 0.0028)	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30	32	32	34	34	36	36	38	40	42	44	46	48	50
0.071 - 0.090 (0.0028 - 0.0035)	18	20	20	22	22	24	24	26	26	28	28	30	30	32	32	34	34	36	36	38	38	40	42	44	46	48	50	52
0.091 - 0.110 (0.0036 - 0.0043)	20	22	22	24	24	26	26	28	28	30	30	32	32	34	34	36	36	38	38	40	40	42	44	46	48	50	52	54
0.111 - 0.130 (0.0044 - 0.0051)	22	24	24	26	26	28	28	30	30	32	32	34	34	36	36	38	38	40	40	42	42	44	46	48	50	52	54	56
0.131 - 0.150 (0.0052 - 0.0059)	24	26	26	28	28	30	30	32	32	34	34	36	36	38	38	40	40	42	42	44	44	46	48	50	52	54	56	58
0.151 - 0.170 (0.0059 - 0.0067)	26	28	28	30	30	32	32	34	34	36	36	38	38	40	40	42	42	44	44	46	46	48	50	52	54	56	58	60
0.171 - 0.190 (0.0067 - 0.0075)	28	30	30	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
0.191 - 0.210 (0.0075 - 0.0083)	30	32	32	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
0.211 - 0.230 (0.0083 - 0.0091)	32	34	34	36	36	38	38	40	40	42	42	44	44	46	46	48	48	50	50	52	52	54	56	58	60	62	64	66
0.231 - 0.249 (0.0091 - 0.0098)	34	36	36	38	38	40	40	42	42	44	44	46	46	48	48	50	50	52	52	54	54	56	58	60	62	64	66	68
0.250 - 0.350 (0.0098 - 0.0138)																												
0.351 - 0.370 (0.0138 - 0.0146)	46	48	48	50	50	52	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	70	72	74	74	74	
0.371 - 0.390 (0.0146 - 0.0154)	48	50	50	52	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	72	74	74	74	74	
0.391 - 0.410 (0.0154 - 0.0161)	50	52	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	74	74	74	74	74	
0.411 - 0.430 (0.0162 - 0.0169)	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74	74	74	74	74	
0.431 - 0.450 (0.0170 - 0.0177)	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74	74	74	74	74	74	74	
0.451 - 0.470 (0.0178 - 0.0185)	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74	74	74	74	74	74	74	74	74	
0.471 - 0.490 (0.0185 - 0.0193)	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74	74	74	74	74	74	74	74	74	74	74	
0.491 - 0.510 (0.0193 - 0.0201)	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74	74	74	74	74	74	74	74	74	74	74	74	74	
0.511 - 0.530 (0.0201 - 0.0209)	62	64	64	66	66	68	68	70	70	72	72	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	
0.531 - 0.550 (0.0209 - 0.0217)	64	66	66	68	68	70	70	72	72	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	
0.551 - 0.570 (0.0217 - 0.0224)	66	68	68	70	70	72	72	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	
0.571 - 0.590 (0.0225 - 0.0232)	68	70	70	72	72	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	
0.591 - 0.610 (0.0233 - 0.0240)	70	72	72	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	
0.611 - 0.630 (0.0241 - 0.0248)	72	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	
0.631 - 0.650 (0.0248 - 0.0256)	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	
0.651 - 0.670 (0.0256 - 0.0264)	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	
0.671 - 0.690 (0.0264 - 0.0272)	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	

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A116736E01

## New lifter thickness

Lifter No.	Thickness	Lifter No.	Thickness	Lifter No.	Thickness
06	5.060 mm (0.1992 in.)	30	5.300 mm (0.2087 in.)	54	5.540 mm (0.2181 in.)
08	5.080 mm (0.2000 in.)	32	5.320 mm (0.2094 in.)	56	5.560 mm (0.2189 in.)

Lifter No.	Thickness	Lifter No.	Thickness	Lifter No.	Thickness
10	5.100 mm (0.2008 in.)	34	5.340 mm (0.2102 in.)	58	5.580 mm (0.2197 in.)
12	5.120 mm (0.2016 in.)	36	5.360 mm (0.2110 in.)	60	5.600 mm (0.2205 in.)
14	5.140 mm (0.2024 in.)	38	5.380 mm (0.2118 in.)	62	5.620 mm (0.2213 in.)
16	5.160 mm (0.2031 in.)	40	5.400 mm (0.2126 in.)	64	5.640 mm (0.2220 in.)
18	5.180 mm (0.2039 in.)	42	5.420 mm (0.2134 in.)	66	5.660 mm (0.2228 in.)
20	5.200 mm (0.2047 in.)	44	5.440 mm (0.2142 in.)	68	5.680 mm (0.2236 in.)
22	5.220 mm (0.2055 in.)	46	5.460 mm (0.2150 in.)	70	5.700 mm (0.2244 in.)
24	5.240 mm (0.2063 in.)	48	5.480 mm (0.2157 in.)	72	5.720 mm (0.2252 in.)
26	5.260 mm (0.2071 in.)	50	5.500 mm (0.2165 in.)	74	5.740 mm (0.2260 in.)
28	5.280 mm (0.2079 in.)	52	5.520 mm (0.2173 in.)	-	-

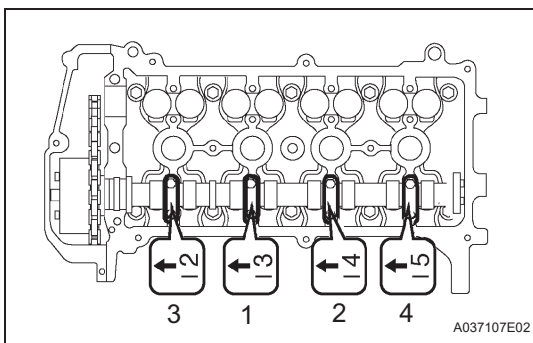
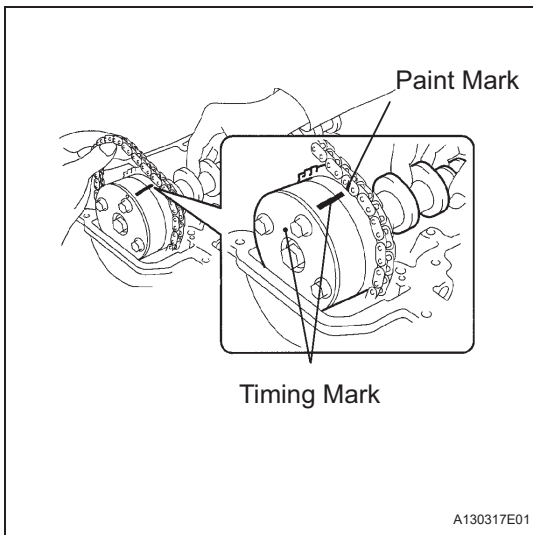
**Standard exhaust valve clearance (Cold):  
0.27 to 0.33 mm (0.011 to 0.013 in.)**

EXAMPLE:

A 5.340 mm (0.2102 in.) lifter is installed, and the measured clearance is 0.440 mm (0.0173 in.).

Replace the 5.340 mm (0.2102 in.) lifter with a new No. 48 lifter.

- (s) Reinstall the selected valve lifters.
- (t) Apply a light coat of engine oil to the camshaft journals.
- (u) Install the timing chain onto the camshaft timing gear with the paint mark and the timing mark aligned as shown in the illustration.

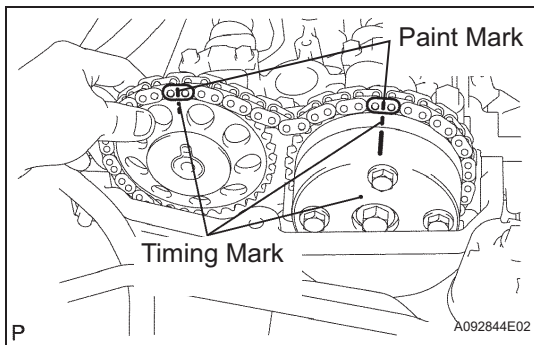


- (v) Examine the front marks and numbers, and tighten the bolts in the sequence shown in the illustration.

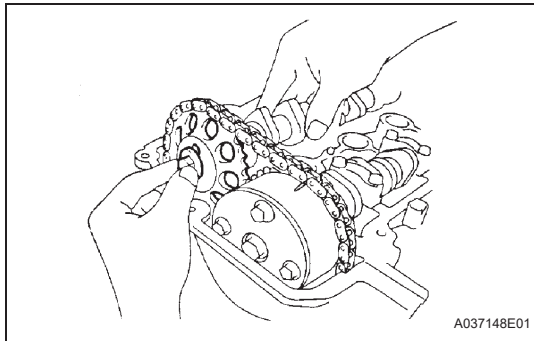
**Torque: 13 N\*m (130 kgf\*cm, 9.6 ft.\*lbf)**

**NOTICE:**

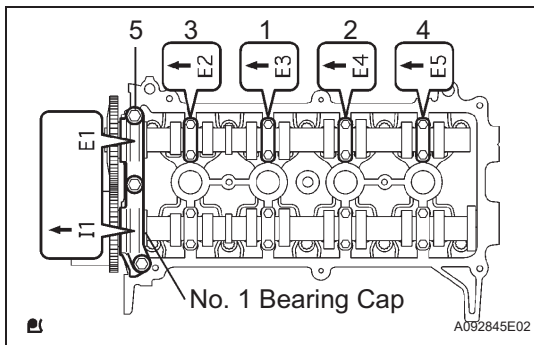
**Tighten each bolt uniformly, keeping the camshaft level.**



- (w) Hold the timing chain, and align the timing mark on the camshaft timing sprocket with the paint mark of the timing chain.



- (x) Align the alignment pin hole on the camshaft timing sprocket with the alignment pin of the camshaft, and install the sprocket into the camshaft.
- (y) Temporarily install the timing sprocket bolt.



- (z) Examine the front marks and numbers, and tighten the bolts in the sequence shown in the illustration.

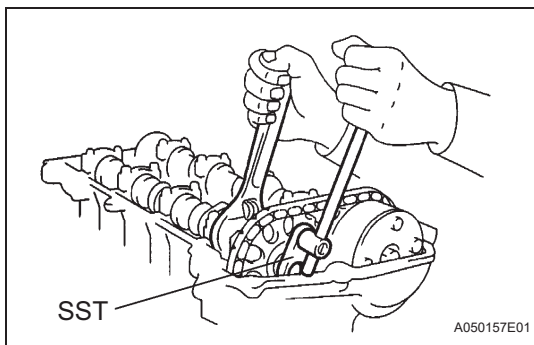
**Torque: 13 N\*m (133 kgf\*cm, 9 ft.\*lbf)**

**NOTICE:**

**Tighten each bolt uniformly, keeping the camshaft level.**

- (aa) Install the No. 1 bearing cap.

**Torque: 23 N\*m (235 kgf\*cm, 17 ft.\*lbf)**

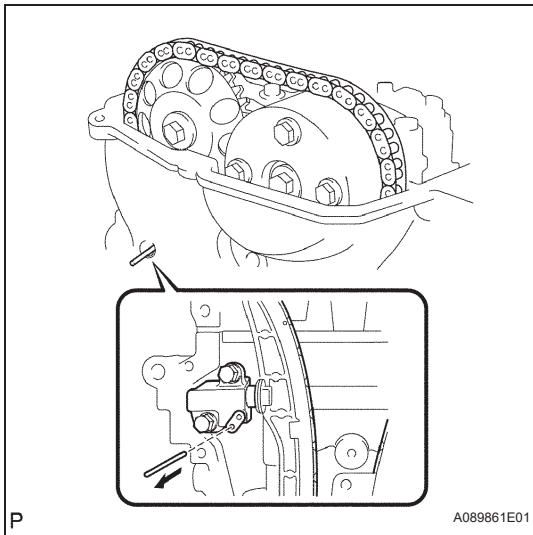


- (ab) Hold the hexagonal lobe of the No. 2 camshaft with the adjustable wrench.

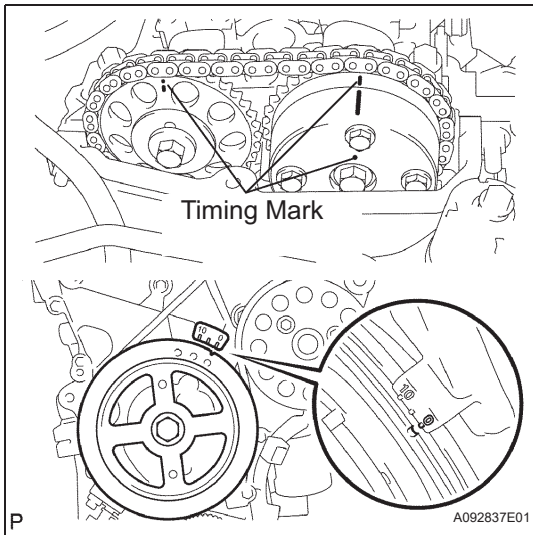
- (ac) Using SST, tighten the bolt.

**SST 09023-38400**

**Torque: 64 N\*m (653 kgf\*cm, 47 ft.\*lbf)**

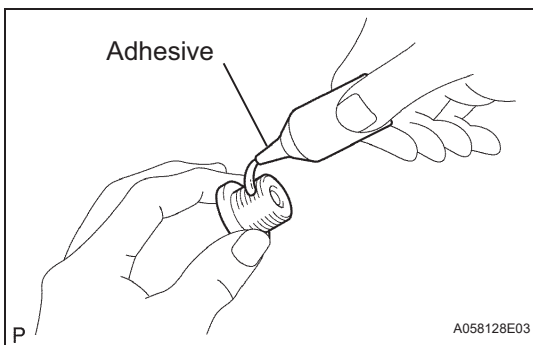


(ad) Remove the bar from the timing chain tensioner.



(ae) Turn the crankshaft pulley until its timing notch and timing mark 0 of the chain cover are aligned.

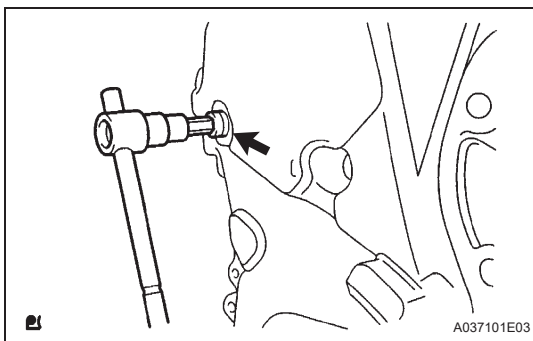
(af) Check that all the pairs of the timing marks are aligned.



(ag) Apply seal packing to 2 or 3 threads of the screw plug end.

**Seal packing:**

**Toyota Genuine Adhesive 1324, Three Bond 1324 or Equivalent**



(ah) Using an 8 mm hexagon wrench, install the screw plug.

**Torque: 15 N\*m (153 kgf\*cm, 11 ft.\*lbf)**

**21. INSTALL CYLINDER HEAD COVER (See page [EM-39](#))**

**22. INSTALL RESERVOIR BRACKET (See page [EM-40](#))**

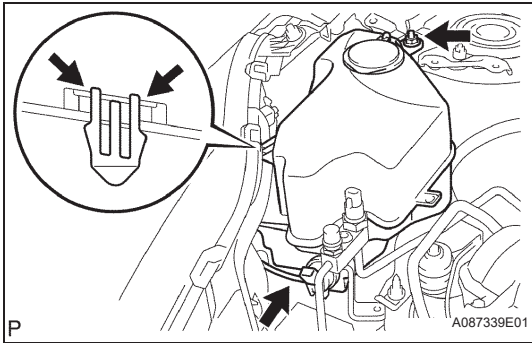
**23. INSTALL BRAKE MASTER CYLINDER RESERVOIR (See page [EM-40](#))**

**24. INSTALL AIR CLEANER ASSEMBLY (See page [EM-41](#))**



25. INSTALL FRONT COWL TOP PANEL OUTER (See page [FU-19](#))
26. INSTALL WINDSHIELD WIPER LINK ASSEMBLY (See page [WW-16](#))
27. INSTALL COWL TOP VENTILATOR LOUVER RH
28. INSTALL COWL TOP VENTILATOR LOUVER LH
29. INSTALL HOOD TO COWL TOP SEAL
30. INSTALL FRONT WIPER ARM LH (See page [WW-16](#))
31. INSTALL FRONT WIPER ARM RH (See page [WW-16](#))
32. INSTALL WIPER ARM HEAD CAP
33. CHECK ENGINE OIL LEAKS
34. INSTALL RADIATOR SUPPORT OPENING COVER (See page [CO-9](#))
35. REMOVE ENGINE UNDER COVER RH
36. CONNECT CABLE TO NEGATIVE BATTERY TERMINAL (See page [CH-7](#))
37. INSTALL REAR NO. 3 FLOOR BOARD (See page [CH-8](#))
38. INSTALL REAR DECK FLOOR BOX (See page [CH-8](#))
39. INSTALL NO. 2 REAR FLOOR BOARD (See page [CH-8](#))
40. PERFORM INITIALIZATION
  - (a) Perform initialization (see page [IN-32](#)).

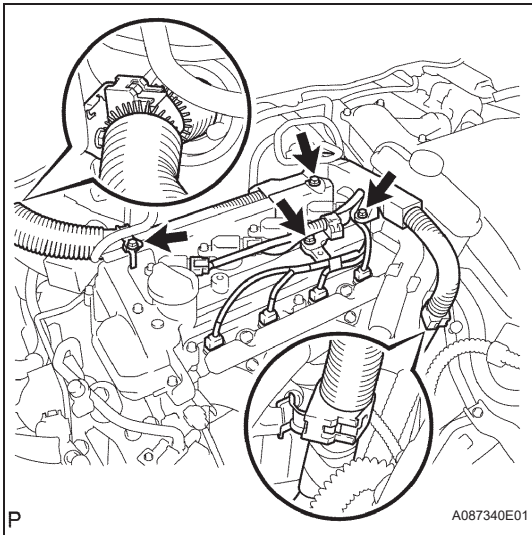
**NOTICE:**  
Certain systems need to be initialized after disconnecting and reconnecting the cable from the negative (-) battery terminal.



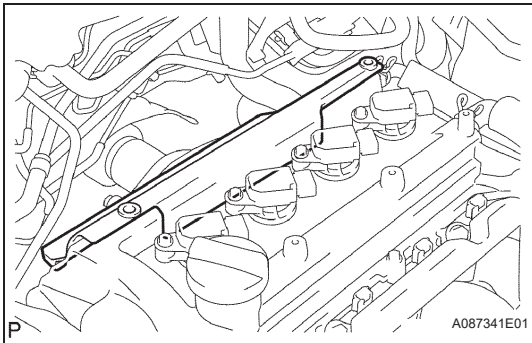
- (d) Remove the nut.
- (e) Slightly lift the headlight RH and separate the claw fitting, then remove the washer jar assembly.
- (f) Disconnect the hose from the washer jar assembly.

## 24. REMOVE CYLINDER HEAD COVER

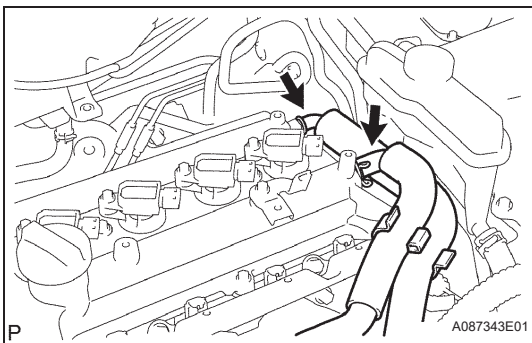
- (a) Disconnect the fuel injector connector and ignition coil connector.
- (b) Remove the 3 bolts and wire harness clamp, then disconnect the wire harness.



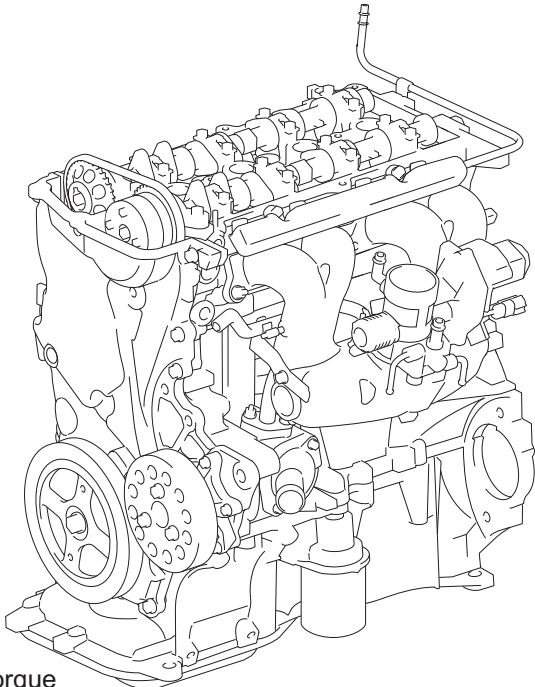
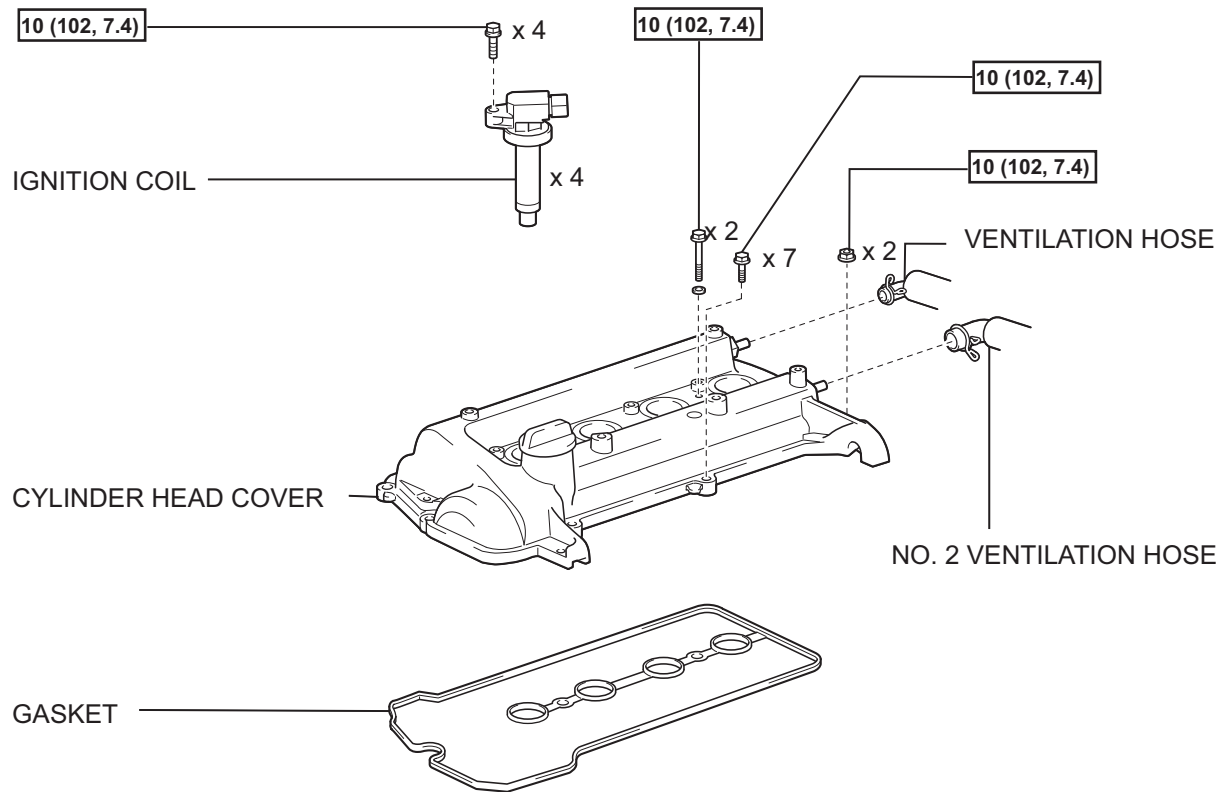
- (c) Remove the brake master cylinder reservoir cover.



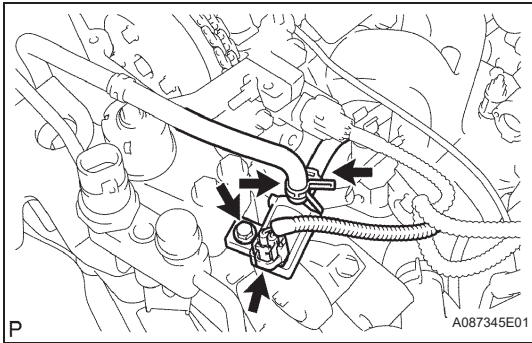
- (d) Disconnect the ventilation hose and ventilation hose No. 2.



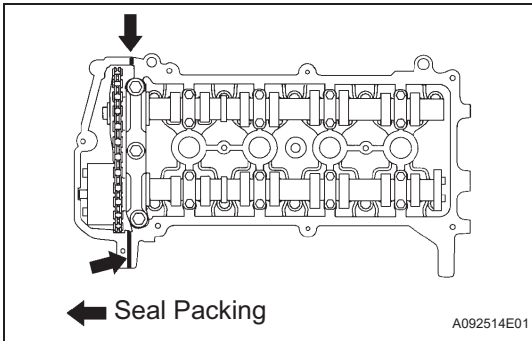
EM



**N\*m (kgf\*cm, ft.\*lbf)** : Specified torque

**13. INSTALL PURGE VSV**

- (a) Install the purge VSV with the bolt.
- (b) Connect the hose and connector.

**14. INSTALL CYLINDER HEAD COVER**

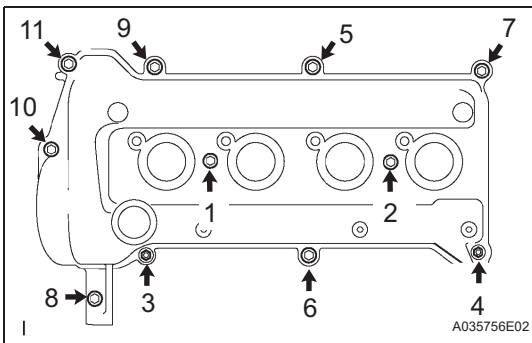
- (a) Apply seal packing to the 2 locations shown in the illustration, then install the cylinder head cover.

**Seal packing:**

**Toyota Genuine Seal Packing Black, Three Bond 1207B or Equivalent**

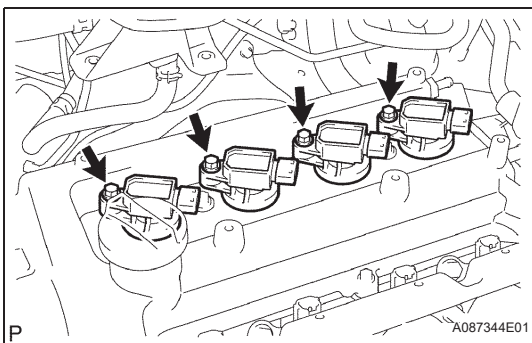
**NOTICE:**

- Remove any oil from the contact surface.
- Install the cylinder head cover within 3 minutes after applying seal packing.
- Do not start the engine within 2 hours of installing.



- (b) Install the cylinder head cover with the 9 bolts and 2 nuts.
- (c) Using several steps, tighten the bolts and nuts to the specified torque in the sequence shown in the illustration.

**Torque: 10 N\*m (102 kgf\*cm, 74 in.\*lbf)**



- (d) Install the ignition coil with the bolt.
- Torque: 9.0 N\*m (92 kgf\*cm, 80 in.\*lbf)**