SPECIFICATIONS

Description	Specifications	Limit
General Type Number of cylinder Bore 2.0L Stroke 2.0L Total displacement 2.0L Compression ratio 2.0L Firing order 2.0L	 In-line, Double Overhead Camshaft 4 82mm 93.5mm 1975cc (120.52cu.in.) 10.1 1 - 3 - 4 - 2	
Valve timing (W/O - CVVT) Intake valve Opens (BTDC) Closes (ABDC) Exhaust valve Opens (BBDC) Closes (ATDC) **Valve timing (W/CVVT)** Intake valve Opens (ATDC) Closes (ABDC) Exhaust Opens (BTDC) Closes (ABDC)	 9° 43° 50° 6° 11° 59° 42° 6°	
Valve Valve length Intake Exhaust Stem O.D. Intake Exhaust	 114.34mm (4.5016in.) 116.8mm (4.598in.) 5.965 ~ 5.98mm (0.2348 ~ 0.2354in.) 5.950 ~ 5.965mm (0.2343 ~ 0.2348in.)	
Face angle thickness of valve head (Margin) Intake Exhaust	1.15mm (0.0452in.) 1.35mm (0.0531in.)	0.8mm (0.031in.) 1.0mm (0.039in.)

Valve stem to valve guide clearance Intake Exhaust	0.02 ~ 0.05mm (0.0008 ~ 0.0019in.) 0.035 ~ 0.065mm (0.0014 ~ 0.0026in.)	0.10mm (0.0039in.) 0.13mm (0.0051in.)
Valve guide Installed dimension O.D Intake Exhaust Service oversize	46mm (1.811in.) 54.5mm (2.146in.) 0.05, 0.25, 0.50mm (0.002, 0.010, 0.020in.) oversize	
Valve seat Width of seat contact Intake Exhaust Seat angle Oversize	1.1 ~ 1.5mm (0.043 ~ 0.059in.) 1.3 ~ 1.7mm (0.051 ~ 0.066in.) 45° 0.3, 0.6mm (0.012, 0.024in.) oversize	
Valve spring Free length Load Installed height Squarences	48.86mm (1.9236in.) 18.3kg/39mm (40.0kg/30.5mm) 39mm (1.5354in.) 1.5° or less	
Valve clearance Cold (20°C [68°F]) Intake Exhaust Hot (80°F [176°F]) : only for reterence Intake Exhaust	0.20mm (0.0079in.) 0.28mm (0.0110 in,) 0.29mm (0.0114in.) 0.34mm (0.0134in.)	0.12 ~ 0.28mm (0.0047 ~ 0.0110in.) 0.20 ~ 0.38mm (0.0079 ~ 0.0150in.)
Cylinder head Flatness of gasket surface Flatness of manifold mounting surface Oversize rework dimensions of valve seat hole Intake 0.3mm (0.012in.) O.S. 0.6mm (0.024in.) O.S. Exhaust 0.3mm (0.012in.) O.S. 0.6mm (0.024in.) O.S. Oversize rework dimensions of valve guide hole (both intake and exhaust) 0.05mm (0.002in.) O.S 0.25mm (0.010in.) O.S 0.50mm (0.020in.) O.S	Max. 0.03mm (0.0012in.) Max. 0.15mm (0.0059in.) 33.300 ~ 33.325mm (1.3110 ~ 1.3120in.) 33.600 ~ 33.625mm (1.3228 ~ 1.3238in.) 28.800 ~ 28.821mm (1.1338 ~ 1.1346in.) 29.100 ~ 29.121mm (1.1456 ~ 1.1465in.) 11.05 ~ 11.068mm (0.435 ~ 0.4357in.) 11.25 ~ 11.268mm (0.443 ~ 0.4436in.) 11.50 ~ 11.518mm (0.453 ~ 0.4535in.)	0.06mm (0.0024in.) 0.03mm (0.0012in.)

Cylinder block Cylinder bore Out-of-round and taper of cylinder bore Clearance with piston (To set limits to new parts)	 82.00 ~ 82.03mm (3.2283 ~ 3.2295in.) Less than 0.01mm (0.0004in.) 0.02 ~ 0.04mm (0.0008 ~ 0.0016in.)	
Piston O.D (To set limits to new parts) Service oversize	 81.97 ~ 82.00mm (3.2271 ~ 3.2283in.) 0.25, 0.50mm (0.010, 0.020in.) oversize	
Piston ring Side clearance No. 1 No. 2 End gap No. 1 No.2 Oil ring side rail Service oversize	 0.04 ~ 0.08mm (0.0015 ~ 0.0031in.) 0.03 ~ 0.07mm (0.0012 ~ 0.0027in.) 0.23 ~ 0.38mm (0.0090 ~ 0.0149in.) 0.33 ~ 0.48mm (0.0130 ~ 0.0189in.)0.20 ~ 0.60mm (0.0078 ~ 0.0236in.) 0.25, 0.50mm (0.010, 0.020in.) oversize	0.1mm (0.004in.) 1mm (0.039in.) 1mm (0.039in.) 1mm (0.039in.)
Connecting rod Bend Twist Connecting rod big end to crankshaft side clearance	0.05mm (0.0020in.) or less 0.1mm (0.004in.) or less 0.100 ~ 0.250mm (0.0039 ~ 0.010in.)	0.4mm (0.0157in.)
Connecting rod bearing Oil clearance (To seat limits to new parts) Undersize	0.024 ~ 0.044mm (0.0009 ~ 0.0017in.) 0.25, 0.50, 0.75mm (0.01, 0.02, 0.03in.)	
Camshaft (Non - CVVT) Cam lobe height Intake Exhaust **Camshaft (CVVT)** Cam height Intake Exhaust Journal O.D. Bearing oil clearance End play	 44.820mm (1.7646in.) 44.720mm (1.7606in.) 44.618mm (1.7566in.) 44.518mm (1.7527in.) 28mm (1.1023in.) 0.02 ~ 0.061mm (0.0008 ~ 0.0024in.) 0.1 ~ 0.2mm (0.004 ~ 0.008in.)	 44.720mm (1.7606in.) 44.620mm (1.7567in.) 44.518mm (1.7527in.) 44.418mm (1.7487in.) 0.1mm (0.0039in.)

Crankshaft Pin O.D. Journal O.D. Bend Out-of-round, taper of journal and pin End play Undersize rework dimension of pin 0.25mm (0.010in.) 0.50mm (0.020in.) 0.75mm (0.030in.) Undersize rework dimension of journal 0.25mm (0.010in.) 0.50mm (0.020in.) 0.75mm (0.030in.)	 45mm (1.77in.) 57mm (2.244in.) 0.03mm (0.0012in.) or less 0.01mm (0.0004in.) or less 0.06 ~ 0.260mm (0.0023 ~ 0.010in.) 44.725 ~ 44.740mm (1.7608 ~ 1.7614in.) 44.475 ~ 44.490mm (1.7509 ~ 1.7516in.) 44.225 ~ 44.240mm (1.7411 ~ 1.7417in.) 56.727 ~ 56.742mm (2.2333 ~ 2.2339in.) 56.477 ~ 56.492mm (2.2235 ~ 2.2240in.) 56.227 ~ 56.242mm (2.2136 ~ 2.2142in.)	0.030mm (0.0012in.)
Crankshaft bearing Oil clearance	0.028 ~ 0.046mm (0.0011 ~ 0.0018in.)	
Flywheel Runout	0.1mm (0.0039in.)	0.13mm (0.0051in.)
Cooling method	Water-cooled, pressurized. Forced circulation with electrical fan	
Coolant Quantity	6 liter (6.3U.S qts, 5.2lmp. qts)	
Radiator Type	Pressurized corrugated fin type	
Radiator cap Main valve opening pressure Vacuum valve opening pressure	83 ~ 110kpa (12 ~ 16psi, 0.83 ~ 1.1kg/cm²) -7kpa (-100psi, -0.07kg/cm²) or less	
Thermostat Type Valve opening temperature Full-opening temperature	Wax pellet type with jiggle valve 82°C (177°F) 95°C (201°F)	
Coolant pump	Centrifugal type impeller	
Drive belt Type	V-ribbed belt	
Engine coolant temperature sensor Type Resistance	Heat-sensitive thermistor type 2.31 ~ 2.59KΩ at 20°C (68°F)	

Oil pump Clearance betweem outer circumference and front case. Front case tip clearance Side clearance Inner gear Outer gear Engine oil pressure at 1,500RPM [Oil temperature is 90 to 110°C 194 to 230°F)]	0.120 ~ 0.185mm (0.0049 ~ 0.0073in.) 0.025 ~ 0.069mm (0.0009 ~ 0.0027in.) 0.04 ~ 0.085mm (0.0016 ~ 0.0033in.) 0.04 ~ 0.09mm (0.0016 ~ 0.0035in.) 245kPa (2.5kg/cm², 35.5psi)
Relief spring Free height Load	43.8mm (1.725in.) 3.7kg at 40.1mm (3.15lb/1.578in.)
Air cleaner Type Element	Dry type Unwoven cloth type
Exhaust pipe Muffler Suspension system	Expansion resonance type Rubber hangers

SERVICE STANDRDS

Standard value	
Antifreeze	Maxture ratio of anti-freeze in coolant
ETHYLENE GLYCOL BASE FOR ALUMINUM	50%

TIGHTENING TORQUE

Item	Nm	kgf.cm	lb.ft
Cylinder Block Front engine support bracket bolt and nut Front roll stopper bracket bolt Rear roll stopper bracket bolt Rear engine stopper bracket bolt	35 ~ 50 70 ~ 90 70 ~ 90 35 ~ 50	350 ~ 500 700 ~ 900 700 ~ 900 350 ~ 500	25 ~ 37 51 ~ 65 51 ~ 65 25 ~ 37
Engine Mounting Right mounting insulator (large) nut Right mounting insulator (small) nut Right mounting bracket to engine nuts and bolts Transmission mount insulator nut Transmission insulator bracket to side member bolt Rear roll stopper insulator nut Rear roll stopper bracket to center member bolts Front roll stopper insulator nut	90 ~ 110 45 ~ 60 50 ~ 65 90 ~ 110 40 ~ 50 50 ~ 65 40 ~ 50 50 ~ 65 40 ~ 50	900 ~ 1100 450 ~ 600 500 ~ 650 900 ~ 1100 400 ~ 500 500 ~ 650 400 ~ 500 500 ~ 650 400 ~ 500	65 ~ 80 33 ~ 44 36 ~ 48 65 ~ 80 30 ~ 36 36 ~ 48 30 ~ 36 36 ~ 48 30 ~ 36

Front roll stopper bracket to center member bolts.			
Main Moving			
Connecting rod cap nut	50 ~ 53	500 ~ 530	36 ~ 39
Crankshaft bearing cap bolt	27~33 + (60°~65°)	270~330 + (60°~65°)	20~24 + (60°~65°)
Fly wheel M/T bolt	120 ~ 130	1200 ~ 1300	88 ~ 95
Drive plate A/T bolt	120 ~ 130	1200 ~ 1300	88 ~ 95
Engine cover	4 ~ 6	40 ~ 60	3 ~ 4
Heat protector	15 ~ 20	150 ~ 200	11 ~15
Water pipe bracket bolts	12 ~ 15	120 ~ 150	9 ~ 11
Cooling system			
Alternator support bolt and nut	20 ~ 25	200 ~ 250	14 ~ 18
Alternator lock bolt	12 ~ 15	120 ~ 150	9 ~ 11
Alternator brance mounting bolt	20 ~ 27	200 ~ 270	15 ~ 20
Coolant pump pulley bolts	8 ~ 10	80 ~ 100	6 ~ 7
Coolant pump bolts	20 ~ 27	200 ~ 270	14 ~ 19
Coolant temperature sensor	20 ~ 40	200 ~ 400	15 ~ 30
Coolant inlet fitting nuts	15 ~ 20	150 ~ 200	11 ~ 14
Thermostat housing bolts and nuts	15 ~ 20	150 ~ 200	11 ~ 14
Lubrication system			
Oil filter	12 ~ 16	120 ~ 160	9 ~ 12
Oil pan bolts	10 ~ 12	100 ~ 120	7 ~ 9
Oil pan drain plug	40 ~ 45	400 ~ 450	30 ~33
Oil screen bolts	15 ~ 22	150 ~ 220	11 ~16
Oil pressure switch	13 ~ 15	130 ~ 150	9.7 ~11
Intake and Exhaust system			
Air cleaner body mounting bolts	8~ 10	80 ~ 100	6 ~ 7
Resonator mounting bolts	4 ~ 6	40 ~ 60	3 ~ 4
Intake manifold to cylinder head nuts and bolts	16 ~ 23	160 ~ 230	12 ~ 17
Intake manifold stay to cylinder block bolts	18 ~ 25	180 ~ 250	13 ~ 18
Throttle body to surge tank nuts	15 ~ 20	150 ~ 200	11 ~ 14
Exhaust manifold to cylinder head nuts	43 ~ 55	430 ~ 550	32 ~ 40
Exhaust manifold cover to exhaust manifold bolts	15 ~ 20	150 ~ 200	11 ~ 14
Oxygen sensor to front muffler	50 ~ 60	500 ~ 600	36 ~ 43
Oxygen sensor to exhaust manifold	50 ~ 60	500 ~ 600	36 ~ 43
Front exhaust pipe to exhaust manifold nuts	30 ~ 40	300 ~ 400	22 ~ 29
Front exhaust pipe bracket bolts	30 ~ 40	300 ~ 400	22 ~ 29
Front exhaust pipe to catalytic converter bolts	40 ~ 60	400 ~ 600	29 ~ 43
Main muffler hanger support bracket bolts	10 ~ 15	100 ~ 150	7 ~ 11

Cylinder head	25 + (60°~65°) + (60° ~65°)	250 + (60°~65°) + (60° ~65°)	18 + (60°~65°) + (60° ~65°)
Cylinder head bolts - M10	30 + (60°~65°) + (60° ~65°)	300 + (60°~65°) + (60° ~65°)	22 + (60°~65°) + (60° ~65°)
Cylinder head bolts - M12	18 ~ 25	180 ~ 250	13 ~ 18
Intake manifold nuts	43 ~ 55	430 ~ 550	32 ~ 41
Exhaust manifold nuts	8 ~ 10	80 ~ 100	6 ~ 7
Cylinder head cover bolts	14 ~ 15	140 ~ 150	10 ~ 11
Camshaft bearing cap bolts	10 ~ 12	100 ~ 120	7.3 ~ 8.8
Oil control valve bolt	41 ~ 51	410 ~ 510	30 ~ 37.6
OCV Filter	66 ~ 78	660 ~ 780	48.7~ 57.5
CVVT unit to exhaust camshaft bolt	8 ~ 10	80 ~ 100	6 ~ 7
Rear plate bolts			
Timing Belt	170 ~ 180	1700 ~ 1800	125 ~ 133
Crankshaft pulley bolt	100 ~ 120	1000 ~ 1200	74 ~ 89
Camshaft sprocket bolt	43 ~ 550	430 ~ 550	31 ~ 40
Timing belt tensioner bolts	8 ~ 10	80 ~ 100	6 ~ 7
Timing belt cover bolts	20 ~ 27	200 ~ 270	14 ~ 20
Front case bolts	43 ~ 55	430 ~ 550	31 ~ 40
Timing belt idler bolt			

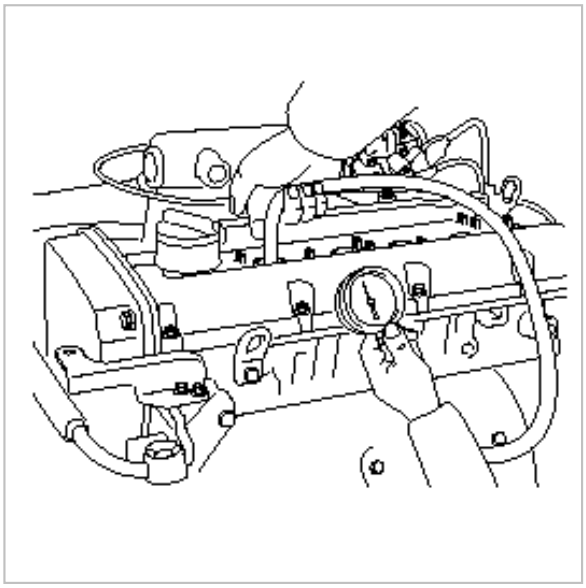
M/T : Manual Transmission
A/T : Automatic Transmission

COMPRESSION

NOTE

If the there is lack of power, excessive oil consumption or poor fuel economy, measure the compression pressure.

1. Warm up and stop engine
   Allow the engine to warm up to normal operating temperature.
2. Remove ignition coils. (see EE group - ignition)
3. Remove spark plugs.
   Using a 16mm plug wrench, remove the 4 spark plugs.
4. Check cylinder compression pressure
   A. Insert a compression gauge into the spark plug hole.



B. Fully open the throttle.

C. while cranking the engine, measure the compression pressure.

NOTE

Always use a fully charged battery to obtain engine speed of 250 rpm or more.

D. Repeat steps (a) through (c) for each cylinder.

NOTE

This measurement must be done in as short a time as possible.

E. If the cylinder compression in 1 or more cylinders is low, pour a small amount of engine oil into the cylinder through the spark plug hole and repeat steps (a) through (c) for cylinders with low compression.

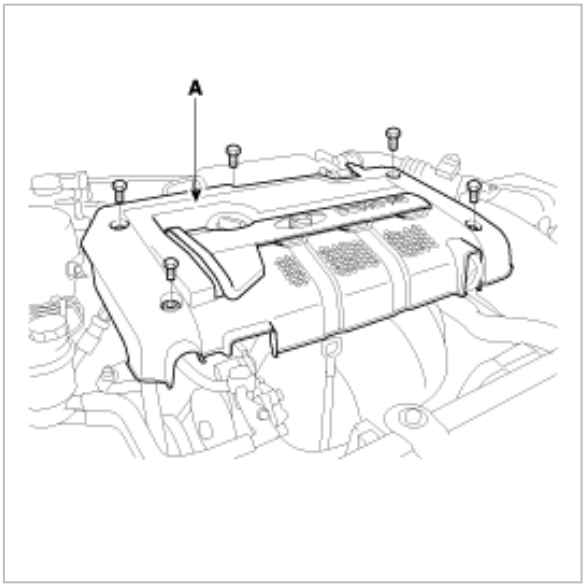
- If adding oil helps the compression, it is likely that the piston rings and/or cylinder bore are worn or damaged.
- If pressure stays low, a valve may be sticking or seating is improper, or there may be leakage past the gasket.

Reinstall spark plugs.

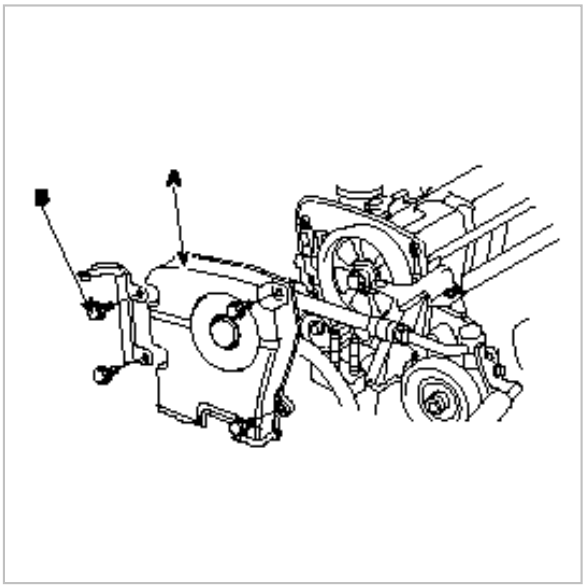
Install ignition coils. (see EE group - ignition)

Timing belt tension adjustment

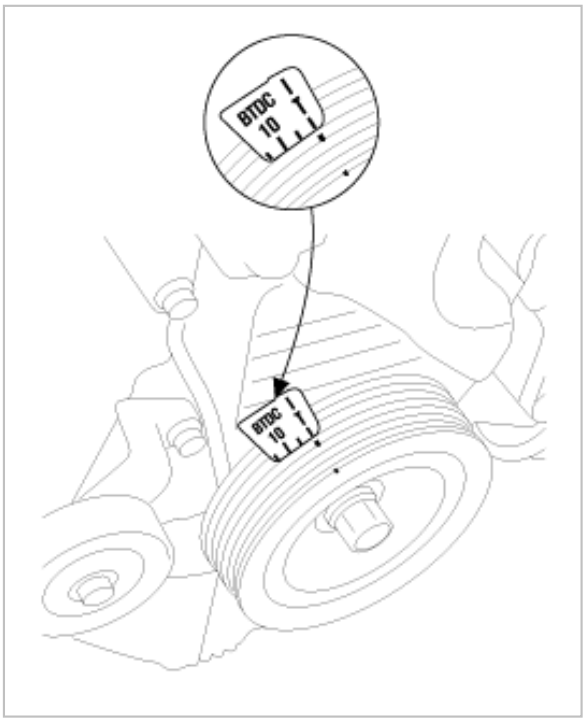
1. Remove the engine cover (A).



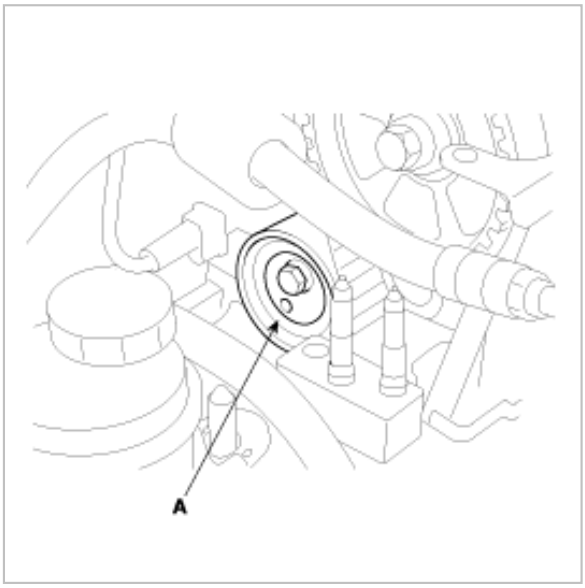
2. Remove RH front wheel.
3. Remove the 4bolts and timing belt upper cover (A).



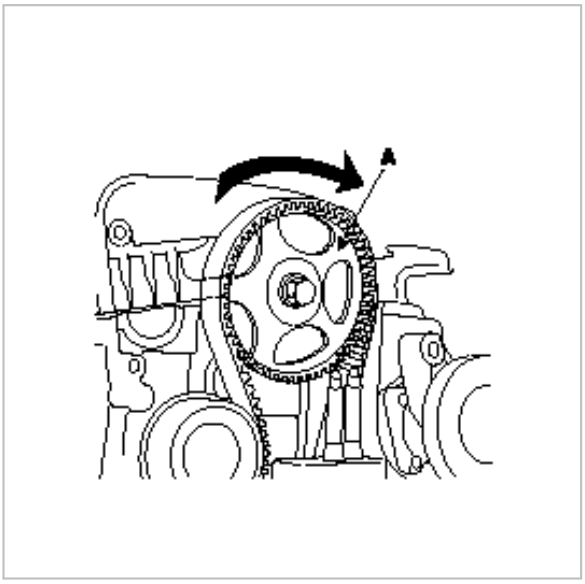
4. Turn the crankshaft pulley, and align its groove with timing mark "T" of the timing belt cover.



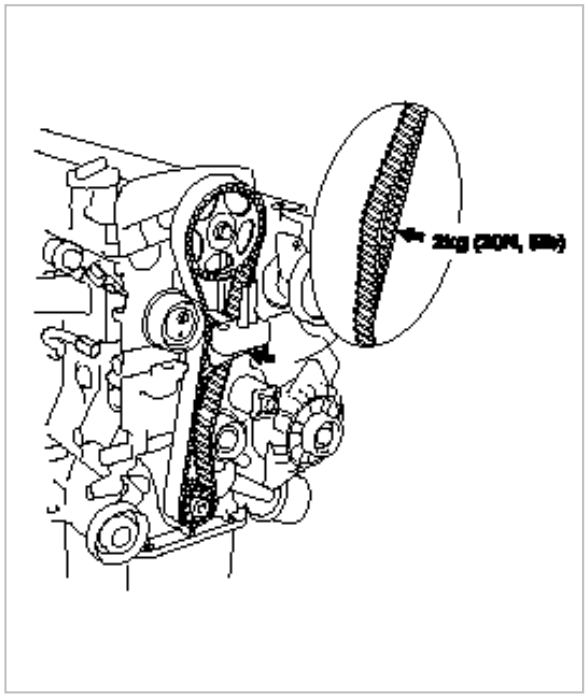
5. Temperarily loosen tensioner pulley by center bolt.



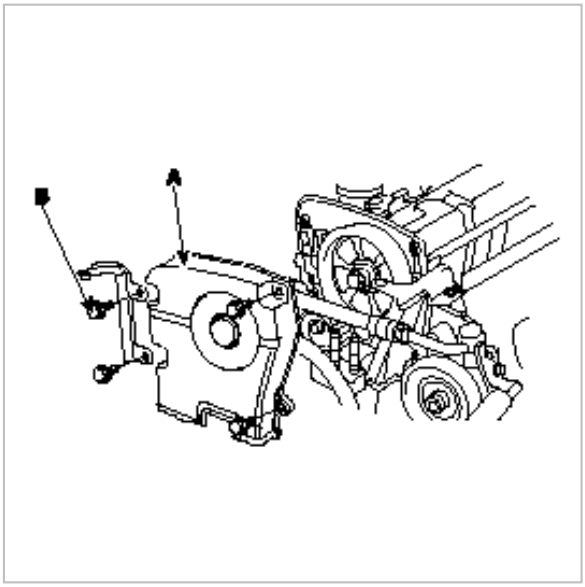
6. Timing belt tension adjusting
   (1) Rotate crankshaft in regular direction (clock wise view from front) through angle equivalent to two teeth (18°) of camshaft sprocket.



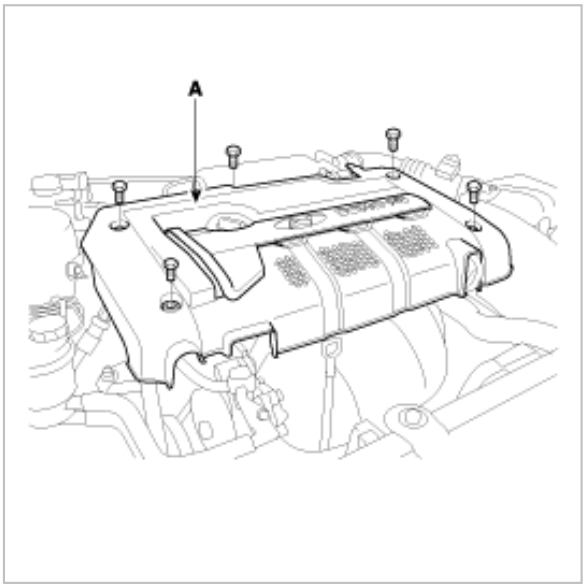
   (2) Give tension to timing belt rotating tensioner in arrow direction tool and set timing belt not to give slack to tension side.
   (3) Tightening tensioner bolt.
   (4) Recheck the belt tension, When the tension side of timing belt is pushed horizontally with a moderate force [approx. 2kg (20N, 51b)], the timing belt cog end segs in approx. 4 ~ 6mm (0.16 ~ 0.24in.)



7. Turn the crankshaft two turns in the operating direction (clockwise) and realign crankshaft sprocket and camshaft sprocket timing mark.
8. Install the timing belt upper cover with 4bolts.



9. Install RH front wheel.
10. Install engine cover with 5bolts.



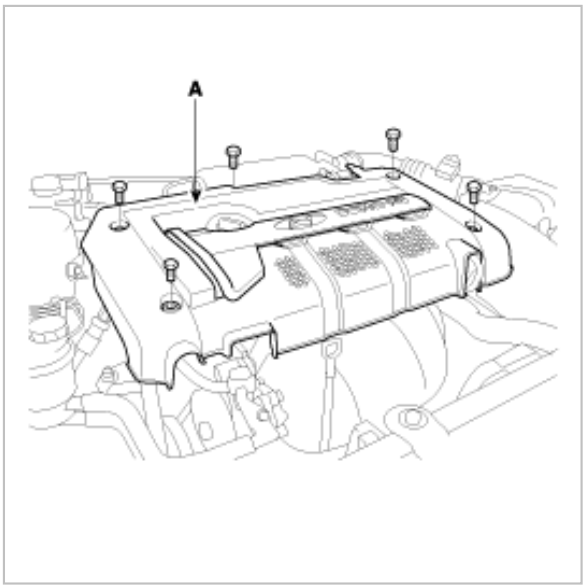
VALVE CLEARANCE INSPECTION AND ADJUSTMENT

MLA (MECHANICAL LASH ADJUSTER)

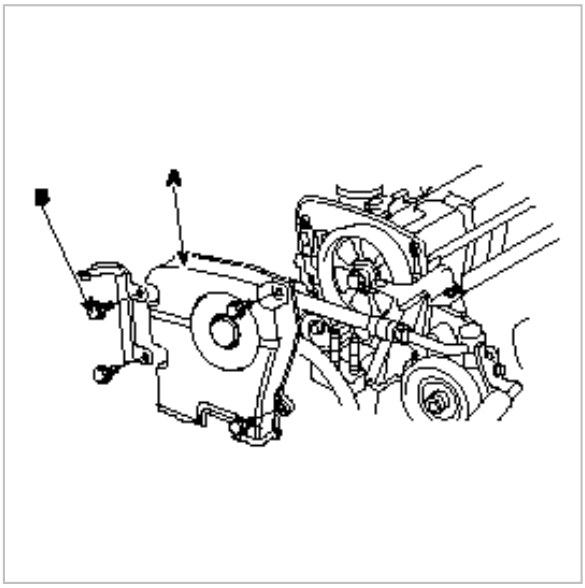
NOTE

Inspect and adjust the valve clearance when the engine is cold (Engine coolant temperature : 20°C) and cylinder head is installed on the cylinder block.

1. Remove the engine cover (A).



2. Remove the upper timing belt cover (A).



A. Loosen the upper timing cover bolts and then remove the cover.

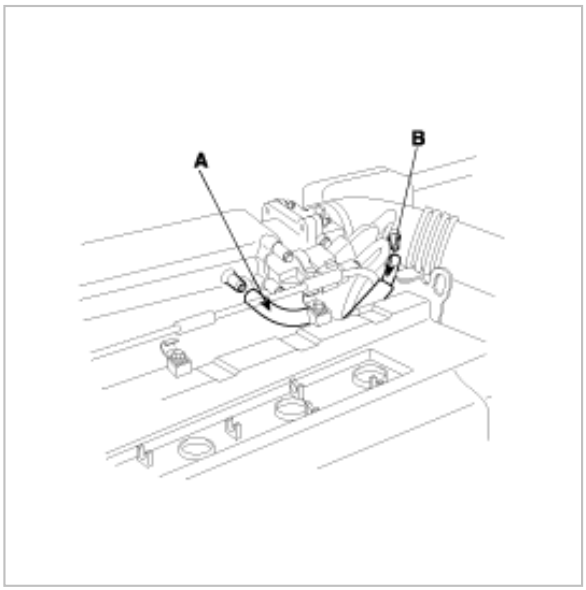
3. Remove the cylinder head cover.

A. Disconnect the spark plug cables and do not pull on the spark plug by force.

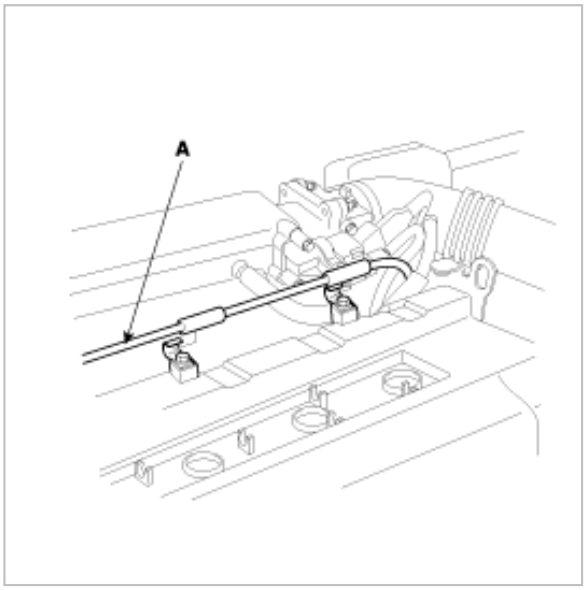
NOTE

Pulling on or bending the cables may damage the connductor inside.

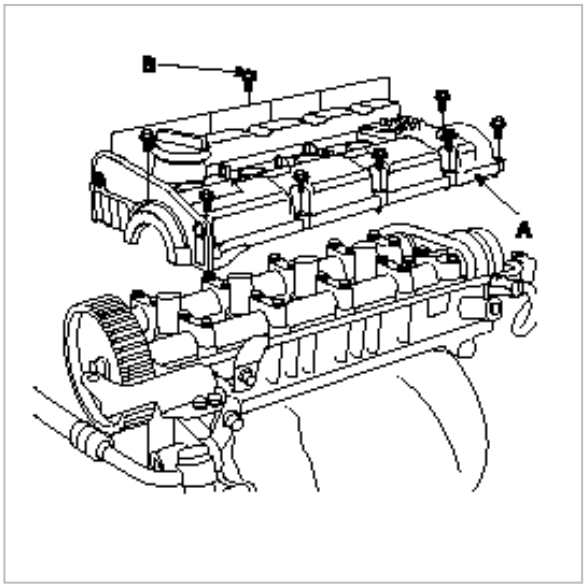
B. Disconnect the P.C.V hose (A) and the breather hose (A) from the cylinder head cover.



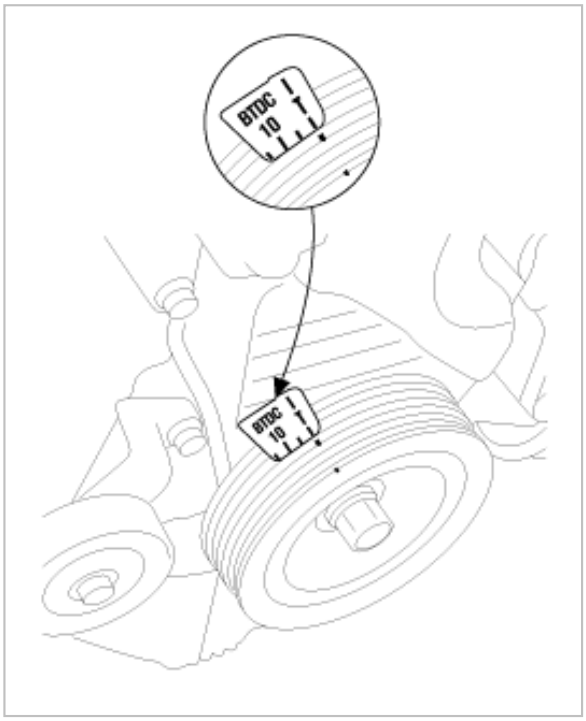
C. Disconnect the accelerater cable (A) from the cylinder head cover.



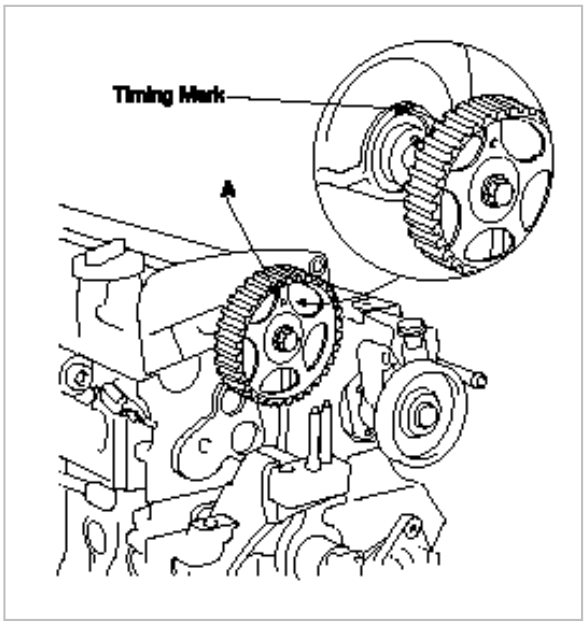
D. Loosen the cylinder head cover bolts and then remove the cover and gasket.



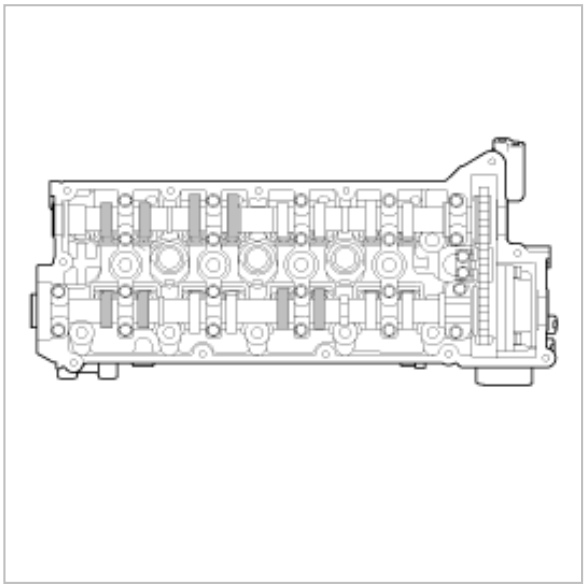
4. Set No. 1 cylinder to TDC/compression.
   A. Turn the crankshaft pulley and align its groove with the timing mark "T" of the lower timing belt cover.



B. Check that the hole of the camshaft timing pulley is aligned with the timing mark of the bearing cap.
If not, turn the crankshaft one revolution (360°)



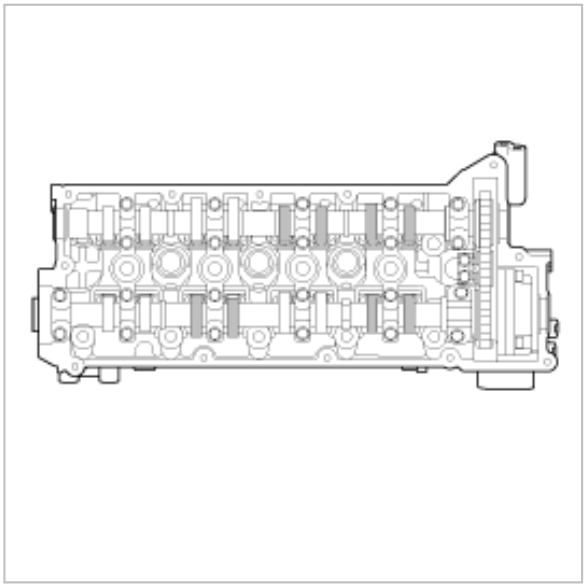
5. Inspect the valve clearance.
A. Check only the valve indicated as shown. [No. 1 cylinder : TDC/Compression] measure the valve clearance.



- Using a thickness gauge, measure the clearance between the tappet shim and the base circle of camshaft.
- Record the out-of-specification valve clearance measurements. They will be used later to determine the required replaement adjusing shim.

B. Turn the crankshaft pulley one revolution (360°) and align the groove with timing mark "T" of the lower timing belt cover.

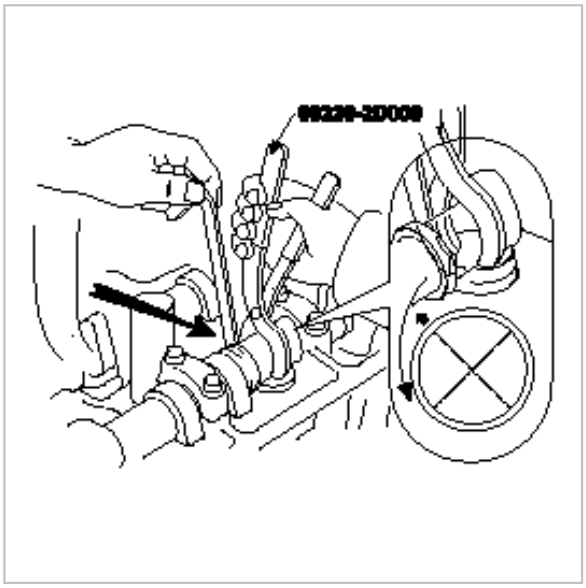
C. Check only valves indicated as shown. [NO. 4 cylinder : TDC/compression]. Measure the valve clearance. (See procedure in step 6)



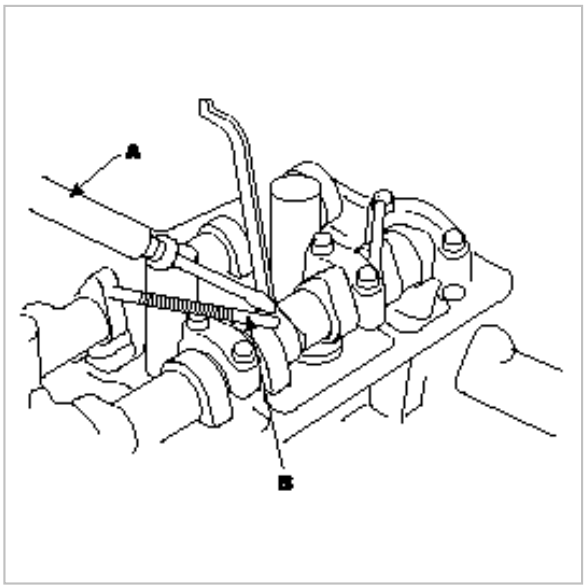
6. Adjust the intake and exhaust valve clearance.

A. Turn the crankshaft so that the cam lobe of the camshaft on the adjusting valve is upward.

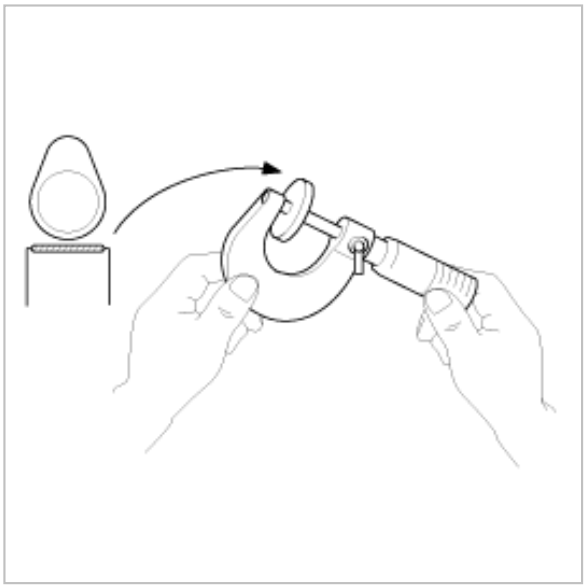
B. Using the special tool (09220 - 2D000), press down the valve lifter and place the stopper between the camshaft and valve lifter and remove the special tool.



C. Remove the adjusting shim with a small screw driver and magnet.



D. Measure the thickness of the removed shim using a micrometer.



E. Caculate the thickness of a new shim so that the valve clearance comes within the specificified value.

F. Select a new shim with a thickness as close as possible to the caculated value. [Refer to the Adjusting s hom selection chart]

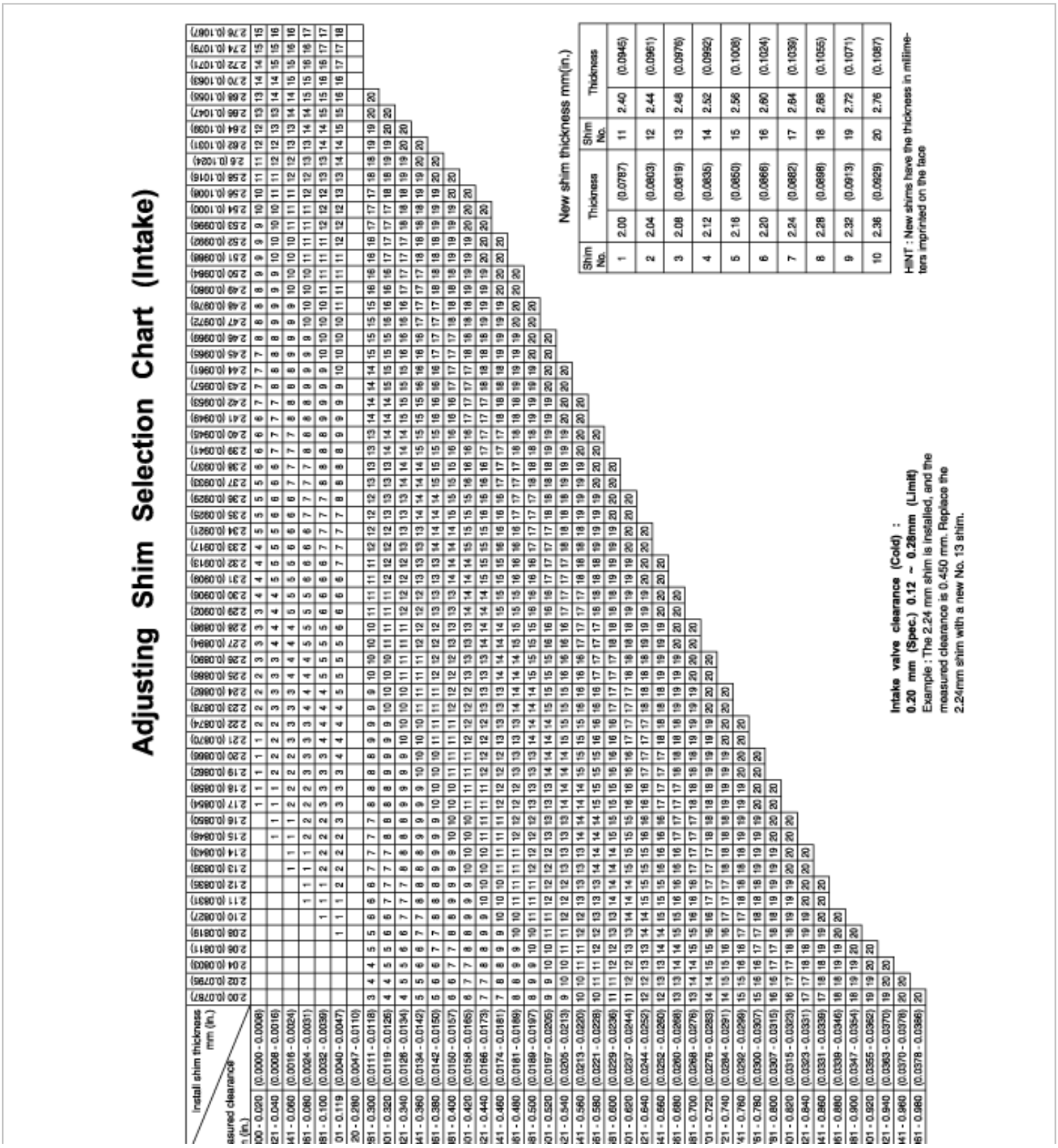
NOTE

Shims are available in 20size increments of 0.04mm (0.0016in.) from 2.00mm (0.079in.) to 2.76mm (0.1087in.)

G. Place a new adjusting shim on the valve lifter.

H. Using the special tool (09220 - 2D000), press down the valve lifter and remove the stopper.

I. Recheck the valve clearance.



Adjusting Shim Selection Chart (Exhaust)

Measured clearance mm (in.) \ Install shim thickness mm (in.)		2.00(0.0787)	2.02(0.0795)	2.04(0.0803)	2.06(0.0811)	2.08(0.0819)	2.10(0.0827)	2.11(0.0831)	2.12(0.0835)	2.13(0.0839)	2.14(0.0843)	2.15(0.0846)	2.16(0.0850)	2.17(0.0854)	2.18(0.0858)	2.19(0.0862)	2.20(0.0866)	2.21(0.0870)	2.22(0.0874)	2.23(0.0878)	2.24(0.0882)	2.25(0.0886)	2.26(0.0890)	2.27(0.0894)	2.28(0.0898)	2.29(0.0902)	2.30(0.0906)	2.31(0.0909)	2.32(0.0913)	2.33(0.0917)	2.34(0.0921)	2.35(0.0925)	2.36(0.0929)	2.37(0.0933)	2.38(0.0937)	2.39(0.0941)	2.40(0.0945)	2.41(0.0949)	2.42(0.0953)	2.43(0.0957)	2.44(0.0961)	2.45(0.0965)	2.46(0.0969)	2.47(0.0972)	2.48(0.0976)	2.49(0.0980)	2.50(0.0984)	2.51(0.0988)	2.52(0.0992)	2.53(0.0996)	2.54(0.1000)	2.56(0.1008)	2.58(0.1016)	2.60(0.1024)	2.62(0.1031)	2.64(0.1039)	2.66(0.1047)	2.68(0.1055)	2.70(0.1063)	2.72(0.1071)	2.74(0.1079)	2.76(0.1087)
0.000-0.020	(0.0000-0.0008)																					1	1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6	7	7	7	7	8	8	9	9	10	10	11	11	12	12	13	13
0.021-0.040	(0.0008-0.0016)																			1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6	7	7	7	7	8	8	8	8	9	9	10	10	11	11	12	12	13	13	14
0.041-0.060	(0.0016-0.0024)																	1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6	7	7	7	7	8	8	8	8	9	9	9	10	10	11	11	12	12	13	13	14	14
0.061-0.080	(0.0024-0.0031)															1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6	7	7	7	7	8	8	8	8	9	9	9	9	10	10	11	11	12	12	13	13	14	14	15
0.081-0.100	(0.0032-0.0039)													1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6	7	7	7	7	8	8	8	8	9	9	9	9	10	10	10	11	11	12	12	13	13	14	14	15	15
0.101-0.120	(0.0040-0.0047)											1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6	7	7	7	7	8	8	8	8	9	9	9	9	10	10	10	10	11	11	12	12	13	13	14	14	15	15	16
0.121-0.140	(0.0048-0.0055)									1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6	7	7	7	7	8	8	8	8	9	9	9	9	10	10	10	10	11	11	11	12	12	13	13	14	14	15	15	16	16
0.141-0.160	(0.0056-0.0063)							1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6	7	7	7	7	8	8	8	8	9	9	9	9	10	10	10	10	11	11	11	11	12	12	13	13	14	14	15	15	16	16	17
0.161-0.180	(0.0063-0.0071)						1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6	7	7	7	7	8	8	8	8	9	9	9	9	10	10	10	10	11	11	11	11	12	12	12	13	13	14	14	15	15	16	16	17	17
0.181-0.199	(0.0071-0.0078)					1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6	7	7	7	7	8	8	8	8	9	9	9	9	10	10	10	10	11	11	11	11	12	12	12	13	13	14	14	15	15	16	16	17	17	18
0.200-0.360	(0.0079-0.0142)																																																														
0.361-0.380	(0.0142-0.0150)	3	4	4	5	5	6	6	6	7	7	7	7	8	8	8	8	9	9	9	9	10	10	10	10	11	11	11	11	12	12	12	12	13	13	13	13	14	14	14	14	15	15	15	15	16	16	16	16	17	17	17	18	18	19	19	20	20				
0.381-0.400	(0.0150-0.0157)	4	4	5	5	6	6	7	7	7	7	8	8	8	8	9	9	9	9	10	10	10	10	11	11	11	11	12	12	12	12	13	13	13	13	14	14	14	14	15	15	15	15	16	16	16	16	17	17	17	17	18	18	19	19	20	20					
0.401-0.420	(0.0158-0.0165)	4	5	5	6	6	7	7	7	8	8	8	8	9	9	9	9	10	10	10	10	11	11	11	11	12	12	12	12	13	13	13	13	14	14	14	14	15	15	15	15	16	16	16	16	17	17	17	17	18	18	18	19	19	20	20						
0.421-0.440	(0.0166-0.0173)	5	5	6	6	7	7	8	8	8	8	9	9	9	9	10	10	10	10	11	11	11	11	12	12	12	12	13	13	13	13	14	14	14	14	15	15	15	15	16	16	16	16	17	17	17	17	18	18	18	18	19	19	20	20							
0.441-0.460	(0.0174-0.0181)	5	6	6	7	7	8	8	8	9	9	9	9	10	10	10	10	11	11	11	11	12	12	12	12	13	13	13	13	14	14	14	14	15	15	15	15	16	16	16	16	17	17	17	17	18	18	18	18	19	19	19	20	20								
0.461-0.480	(0.0181-0.0189)	6	6	7	7	8	8	9	9	9	9	10	10	10	10	11	11	11	11	12	12	12	12	13	13	13	13	14	14	14	14	15	15	15	15	16	16	16	16	17	17	17	17	18	18	18	18	19	19	19	19	20	20									
0.481-0.500	(0.0189-0.0197)	6	7	7	8	8	9	9	9	10	10	10	10	11	11	11	11	12	12	12	12	13	13	13	13	14	14	14	14	15	15	15	15	16	16	16	16	17	17	17	17	18	18	18	18	19	19	19	19	20	20	20										
0.501-0.520	(0.0197-0.0205)	7	7	8	8	9	9	10	10	10	10	11	11	11	11	12	12	12	12	13	13	13	13	14	14	14	14	15	15	15	15	16	16	16	16	17	17	17	17	18	18	18	18	19	19	19	19	20	20	20	20											
0.521-0.540	(0.0205-0.0213)	7	8	8	9	9	10	10	10	11	11	11	11	12	12	12	12	13	13	13	13	14	14	14	14	15	15	15	15	16	16	16	16	17	17	17	17	18	18	18	18	19	19	19	19	20	20	20	20													
0.541-0.560	(0.0213-0.0220)	8	8	9	9	10	10	11	11	11	11	12	12	12	12	13	13	13	13	14	14	14	14	15	15	15	15	16	16	16	16	17	17	17	17	18	18	18	18	19	19	19	19	20	20	20	20															
0.561-0.580	(0.0221-0.0228)	8	9	9	10	10	11	11	11	12	12	12	12	13	13	13	13	14	14	14	14	15	15	15	15	16	16	16	16	17	17	17	17	18	18	18	18	19	19	19	19	20	20	20	20																	
0.581-0.600	(0.0229-0.0236)	9	9	10	10	11	11	12	12	12	12	13	13	13	13	14	14	14	14	15	15	15	15	16	16	16	16	17	17	17	17	18	18	18	18	19	19	19	19	20	20	20	20																			
0.601-0.620	(0.0237-0.0244)	9	10	10	11	11	12	12	12	13	13	13	13	14	14	14	14	15	15	15	15	16	16	16	16	17	17	17	17	18	18	18	18	19	19	19	19	20	20	20	20																					
0.621-0.640	(0.0244-0.0252)	10	10	11	11	12	12	13	13	13	13	14	14	14	14	15	15	15	15	16	16	16	16	17	17	17	17	18	18	18	18	19	19	19	19	20	20	20	20																							
0.641-0.660	(0.0252-0.0260)	10	11	11	12	12	13	13	13	14	14	14	14	15	15	15	15	16	16	16	16	17	17	17	17	18	18	18	18	19	19	19	19	20	20	20	20																									
0.661-0.680	(0.0260-0.0268)	11	11	12	12	13	13	14	14	14	14	15	15	15	15	16	16	16	16	17	17	17	17	18	18	18	18	19	19	19	19	20	20	20	20																											
0.681-0.700	(0.0268-0.0276)	11	12	12	13	13	14	14	14	15	15	15	15	16	16	16	16	17	17	17	17	18	18	18	18	19	19	19	19	20	20	20	20																													
0.701-0.720	(0.0276-0.0283)	12	12	13	13	14	14	15	15	15	15	16	16	16	16	17	17	17	17	18	18	18	18	19	19	19	19	20	20	20	20																															
0.721-0.740	(0.0284-0.0291)	12	13	13	14	14	15	15	15	16	16	16	16	17	17	17	17	18	18	18	18	19	19	19	19	20	20	20	20																																	
0.741-0.760	(0.0292-0.0299)	13	13	14	14	15	15	16	16	16	16	17	17	17	17	18	18	18	18	19	19	19	19	20	20	20	20																																			
0.761-0.780	(0.0300-0.0307)	13	14	14	15	15	16	16	16	17	17	17	17	18	18	18	18	19	19	19	19	20	20	20	20																																					
0.781-0.800	(0.0307-0.0315)	14	14	15	15	16	16	17	17	17	17	18	18	18	18	19	19	19	19	20	20	20	20																																							
0.801-0.820	(0.0315-0.0323)	14	15	15	16	16	17	17	17	18	18	18	18	19	19	19	19	20	20	20	20																																									
0.821-0.840	(0.0323-0.0331)	15	15	16	16	17	17	18	18	18	18	19	19	19	19	20	20	20	20																																											
0.841-0.860	(0.0331-0.0339)	15	16	16	17	17	18	18	18	19	19	19	19	20	20	20	20																																													
0.861-0.880	(0.0339-0.0346)	16	16	17	17	18	18	19	19	19	19	20	20	20	20																																															
0.881-0.900	(0.0347-0.0354)	16	17	17	18	18	19	19	19	20	20	20	20																																																	
0.901-0.920	(0.0355-0.0362)	17	17	18	18	19	19	20	20	20	20																																																			
0.921-0.940	(0.0363-0.0370)	17	18	18	19	19	20	20	20																																																					
0.941-0.960	(0.0370-0.0378)	18	18	19	19	20	20																																																							
0.961-0.980	(0.0378-0.0386)	18	19	19	20	20																																																								
0.981-1.000	(0.0386-0.0394)	19	19	20	20																																																									
1.001-1.020	(0.0394-0.0402)	19	20	20																																																										
1.021-1.040	(0.0402-0.0409)	20	20																																																											
1.041-1.060	(0.0410-0.0417)	20																																																													

New shim thickness mm(in.)

Shim No.	Thickness		Shim No.	Thickness	
1	2.00	(0.0787)	11	2.40	(0.0945)
2	2.04	(0.0803)	12	2.44	(0.0961)
3	2.08	(0.0819)	13	2.48	(0.0976)
4	2.12	(0.0835)	14	2.52	(0.0992)
5	2.16	(0.0850)	15	2.56	(0.1008)
6	2.20	(0.0866)	16	2.60	(0.1024)
7	2.24	(0.0882)	17	2.64	(0.1039)
8	2.28	(0.0898)	18	2.68	(0.1055)
9	2.32	(0.0913)	19	2.72	(0.1071)
10	2.36	(0.0929)	20	2.76	(0.1087)

HINT : New shims have the thickness in millimeters imprinted on the face

Intake valve clearance (Cold) :
0.28 mm (Spec.), 0.20 ~ 0.38 mm (Limit)
Example : The 2.24 mm shim is installed, and the measured clearance is 0.450 mm. Replace the 2.24 mm shim with a new No. 11 shim.