

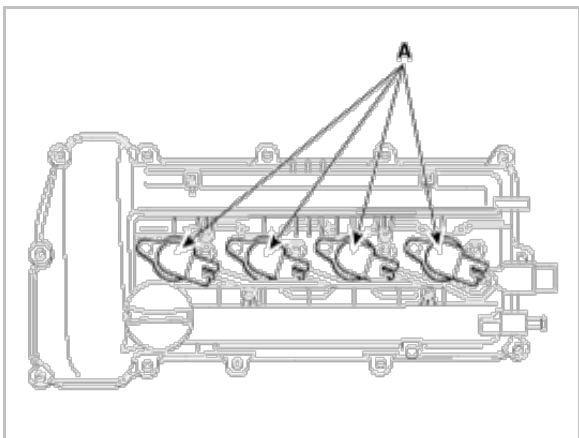


Compression Pressure Inspection

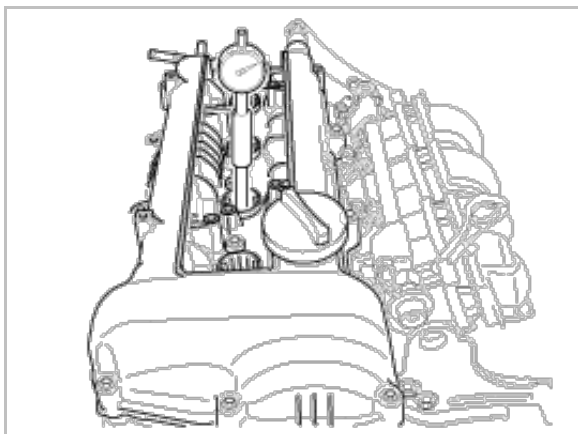
NOTE

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

1. Make sure the oil in the crankcase is of the correct viscosity and at the correct level and that the battery is correctly charged. Operate the vehicle until the engine is at normal operating temperature. Turn the ignition switch to the OFF position.
2. Remove the engine center cover.
3. Remove the ignition coil (A).



4. Remove the spark plugs.
Using a 16mm plug wrench, remove the 4 spark plugs.
5. Check the cylinder compression pressure.
(1) Insert a compression gauge into the spark plug hole.



- (2) Set the throttle plate in the wide-open position.
- (3) While cranking the engine, measure the compression pressure.

NOTE

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

- (4) Repeat step 1) through 3) for each cylinder.

NOTE

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

Compression pressure

Standard : 1225.83kPa (12.5kg/cm², 177.79psi) (200~250 rpm)

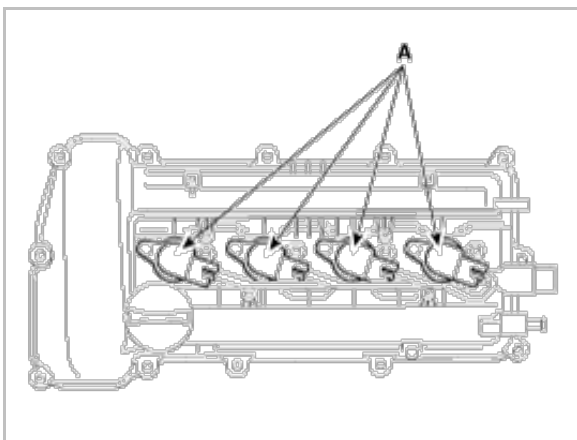
Minimum : 1078.73kPa (11.0kg/cm², 156.46psi)

Difference between each cylinder :

98kPa (1.0kg/cm², 14psi) or less

- (5) If the cylinder compression in one or more cylinders is low, pour a small amount of engine oil into the cylinder through the spark plug hole and repeat step 1) through 3) for cylinders with low compression.
- A. If adding oil helps the compression, it is likely that the piston rings and/or cylinder bore are worn or damaged.
 - B. If pressure stays low, a valve may be sticking or seating is improper, or there may be leakage past the gasket.

6. Install the spark plugs.
7. Install the ignition coil (A).



8. Install the engine center cover.

Tightening torque :

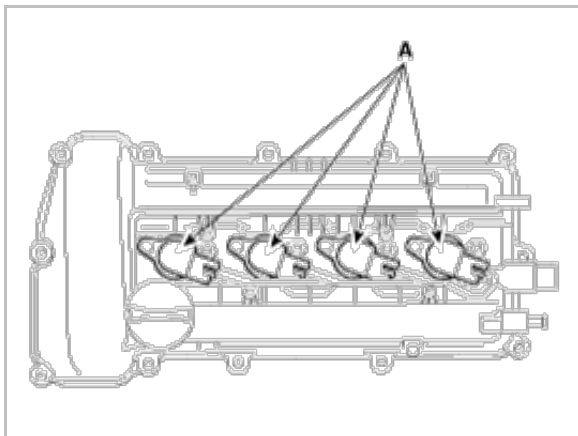
7.8 ~ 11.8N.m (0.8 ~ 1.2kgf.m, 5.8 ~ 8.7lb-ft)

Valve Clearance Inspection And Adjustment

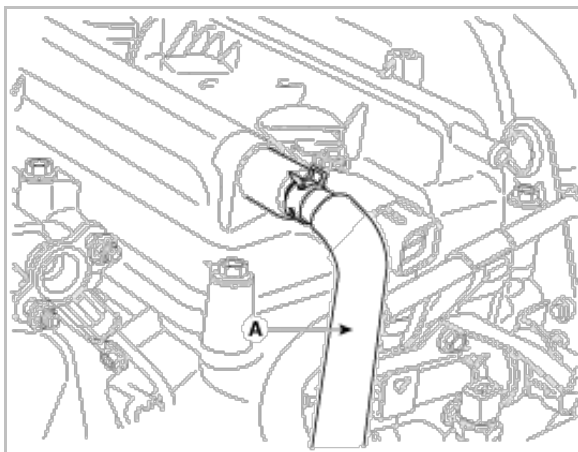
NOTE

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.

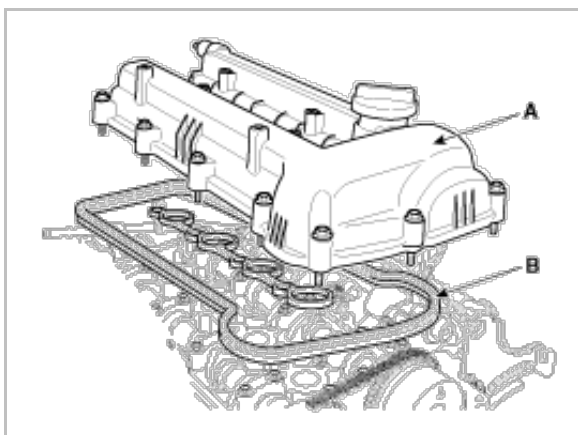
1. Remove the engine center cover.
2. Remove the cylinder head cover.
 - (1) Disconnect the ignition coil (A).



(2) Disconnect the P.C.V hose (A).



(3) Loosen the cylinder head cover bolts and then remove the cover (A).

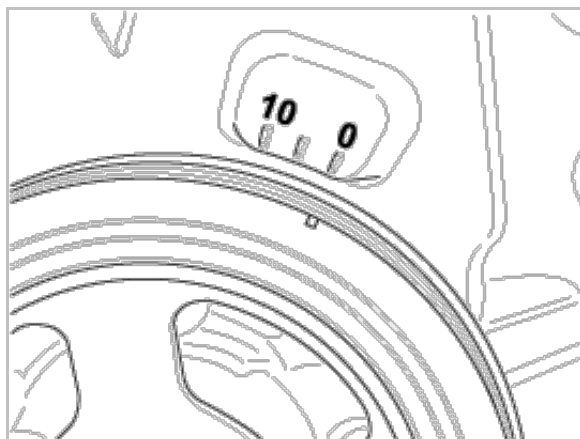


CAUTION

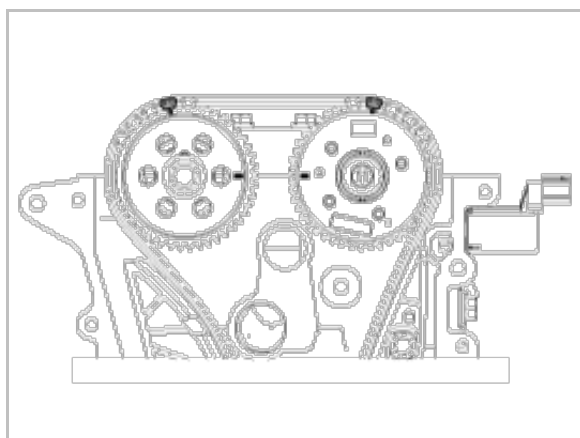
Do not reuse the disassembled gasket.

3. Set No.1 cylinder to TDC/compression.

(1) Turn the crankshaft pulley and align its groove with the timing mark of the timing chain cover.



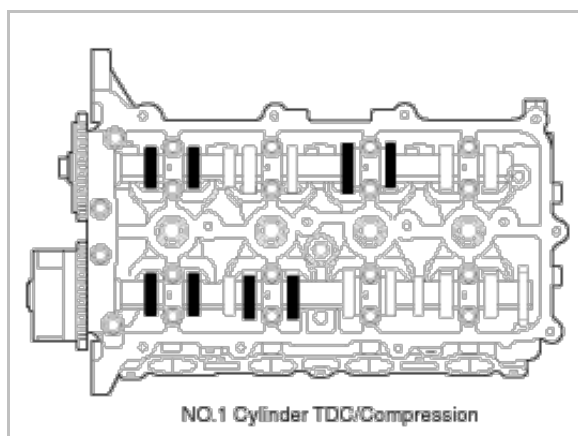
- (2) Check that the marks of the camshaft timing sprockets are in straight line on the cylinder head surface as shown in the illustration. If not, turn the crankshaft one revolution (360°).



4. Inspect the valve clearance.

- (1) Check only the intake valves of the 1st and 2nd cylinders and exhaust valves of the 1st and 3rd cylinders for their clearance.

A. Using a thickness gauge, measure the clearance between the tappet and the base circle of camshaft.



- B. Record the out-of-specification valve clearance measurements. They will be used later to determine the required tappet for adjusting.

Valve clearance specification (Engine coolant temperature : 20°C [68°F])

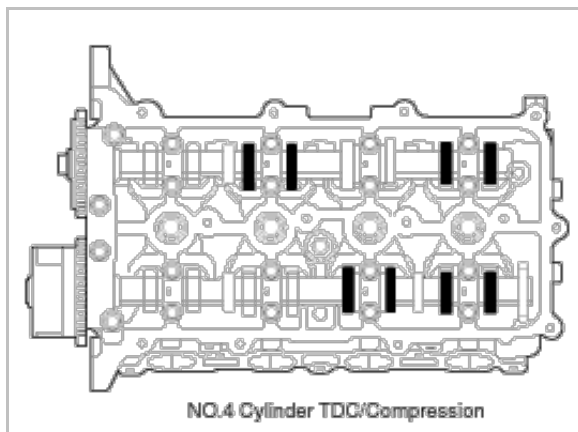
Limit

Intake : 0.17 ~ 0.23mm (0.0067 ~ 0.0091in.)

Exhaust : 0.22 ~ 0.28mm (0.0087 ~ 0.0110in.)

- (2) Turn the crankshaft pulley one revolution (clockwise 360°) and align its groove with timing mark of the timing chain cover.

- (3) Check the intake valves of the 3rd and 4th cylinders and exhaust valves of the 2nd and 4th cylinders for their clearance.



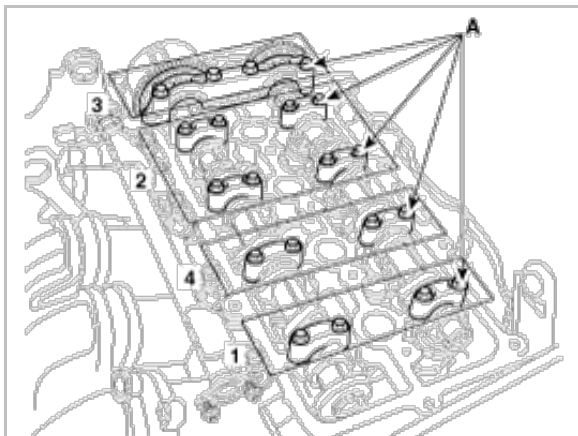
5. Adjust the intake and exhaust valve clearance.

- (1) Set the No.1 cylinder to the TDC/compression position.
- (2) Put paint marks on the timing chain links (2 places) that meet with the timing marks of the intake, exhaust camshaft sprockets.
- (3) Remove the exhaust camshaft sprocket bolt.
- (4) Remove the service hole bolt of the timing chain cover.

CAUTION

The bolt must not be reused once it has been assembled.

- (5) Insert a thin rod in the service hole of the timing chain cover and release the ratchet.
- (6) Remove the exhaust camshaft sprocket.
- (7) Remove the camshaft bearing caps (A) with the order below.



- (8) Remove the exhaust camshaft.
- (9) Remove the intake camshaft and CVVT module.

CAUTION

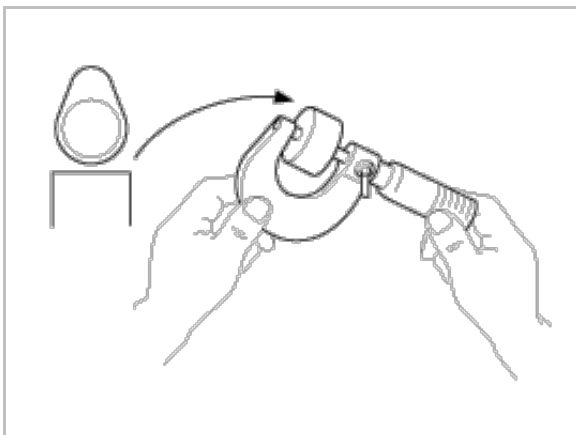
When disconnecting the timing chain from the camshaft timing sprocket, hold the timing chain.

- (10) Tie a timing chain with a string.

CAUTION

Be careful not to drop anything inside timing chain cover.

- (11) Measure the thickness of the removed tappet using a micrometer.



- (12) Calculate the thickness of a new tappet so that the valve clearance comes within the specified value.

Valve clearance (Engine coolant temperature : 20°C)

T : Thickness of removed tappet

A : Measured valve clearance

N : Thickness of new tappet

Intake : $N = T + [A - 0.20\text{mm}(0.0079\text{in.})]$

Exhaust : $N = T + [A - 0.25\text{mm}(0.0098\text{in.})]$

- (13) Select a new tappet with a thickness as close as possible to the calculated value.

NOTE

Shims are available in 41 size increments of 0.015mm (0.0006in.) from 3.00mm (0.118in.) to 3.600mm (0.1417in.)

- (14) Place a new tappet on the cylinder head.
 (15) Hold the timing chain, and place the intake camshaft and CVVT module assembly.
 (16) Align the matchmarks on the timing chain and camshaft timing sprocket.
 (17) Install the exhaust camshaft.
 (18) Install the exhaust camshaft sprocket.

Tightening torque :

63.7 ~ 73.5N.m (6.5 ~ 7.5kgf.m, 47.0 ~ 54.2lb-ft)

- (19) Install the camshaft bearing caps with the order below.

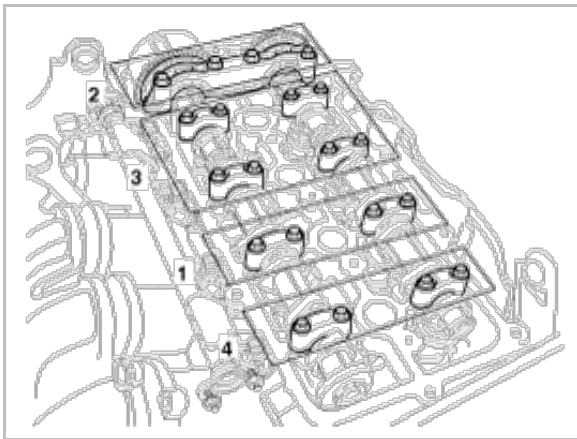
Tightening torque :

M6 bolts :

11.8 ~ 13.7N.m (1.2 ~ 1.4kgf.m, 8.7 ~ 10.1lb-ft)

M8 bolts :

18.6 ~ 22.6N.m (1.9 ~ 2.3kgf.m, 13.7 ~ 16.6lb-ft)



(20) Install the service hole bolt.

Tightening torque :

11.8 ~ 14.7N.m (1.2 ~ 1.5kgf.m, 8.7 ~ 10.8lb-ft)

(21) Turn the crankshaft two turns in the operating direction(clockwise) and realign crankshaft sprocket and camshaft sprocket timing marks.

(22) Recheck the valve clearance.

Valve clearance (Engine coolant temperature : 20°C)

[Specification]

Intake : 0.17 ~ 0.23mm (0.0067 ~ 0.0091in.)

Exhaust : 0.22 ~ 0.28mm (0.0087 ~ 0.0110in.)
