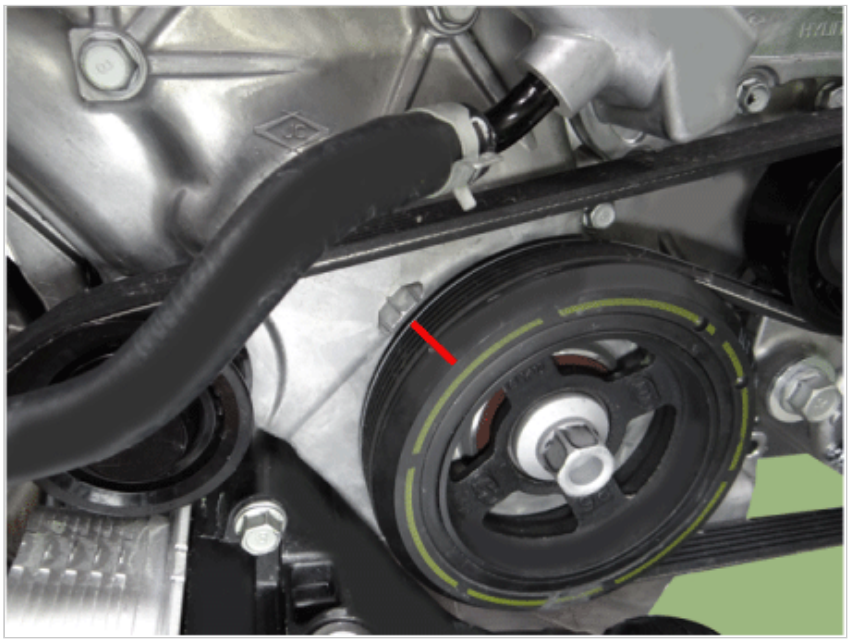
Valve Clearance Inspection and Adjustment

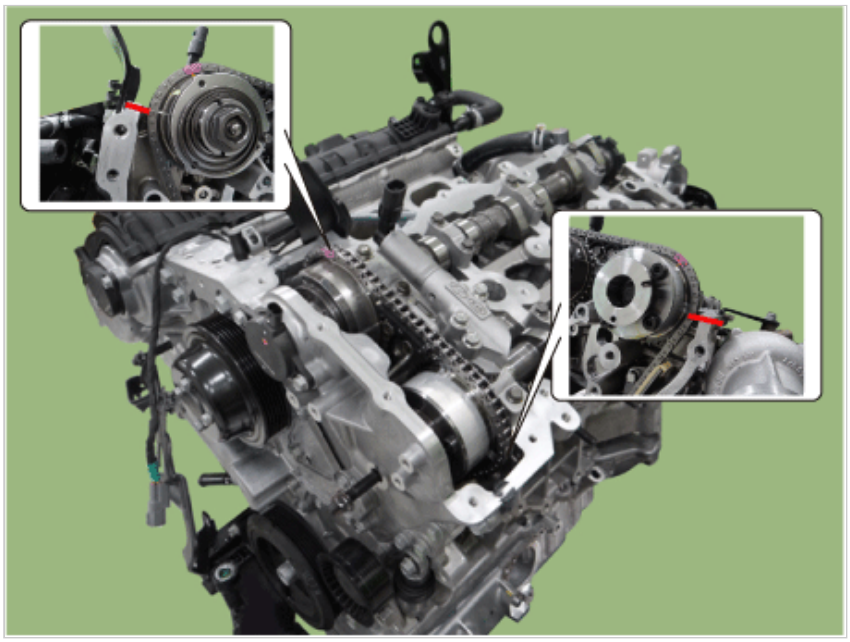
NOTICE

Inspect and adjust the valve clearance with engine cold (engine coolant temperature: 20°C(68°F)) and cylinder head installed to the cylinder block.

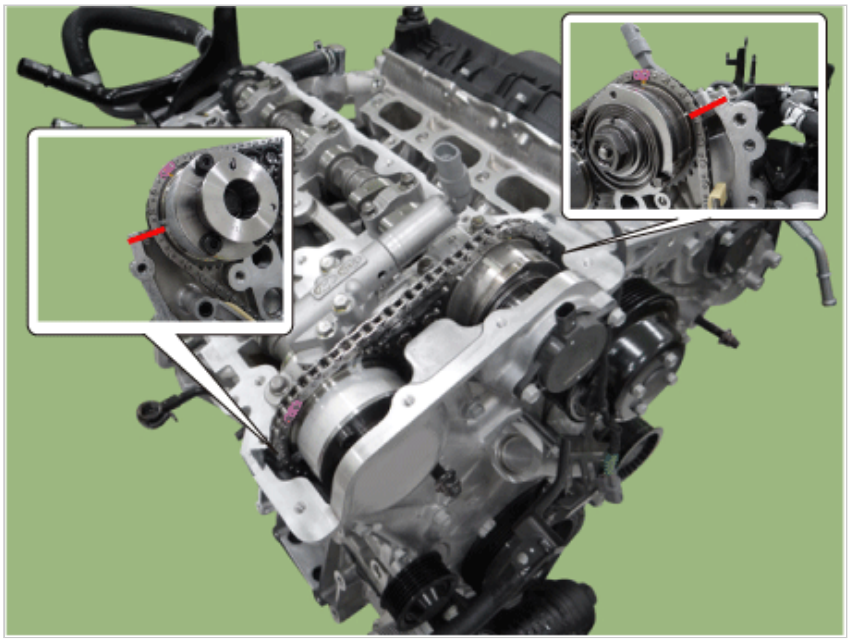
1. Remove the surge tank.
   (Refer to Intake and Exhaust System - "Surge Tank")
2. Remove the cylinder head cover.
   (Refer to Cylinder Head Assembly - "Cylinder Head Cover")
3. Set No.1 cylinder to TDC/compression.
   (1) Turn the crankshaft pulley clockwise and align its groove with timing mark of the timing chain cover.



   (2) Check that the marks of the intake and exhaust CVVT sprockets are in straight line on the cylinder head surface.
   If not turn the crankshaft damper pulley clockwise one revolution (360°).
   [LH]



   [RH]

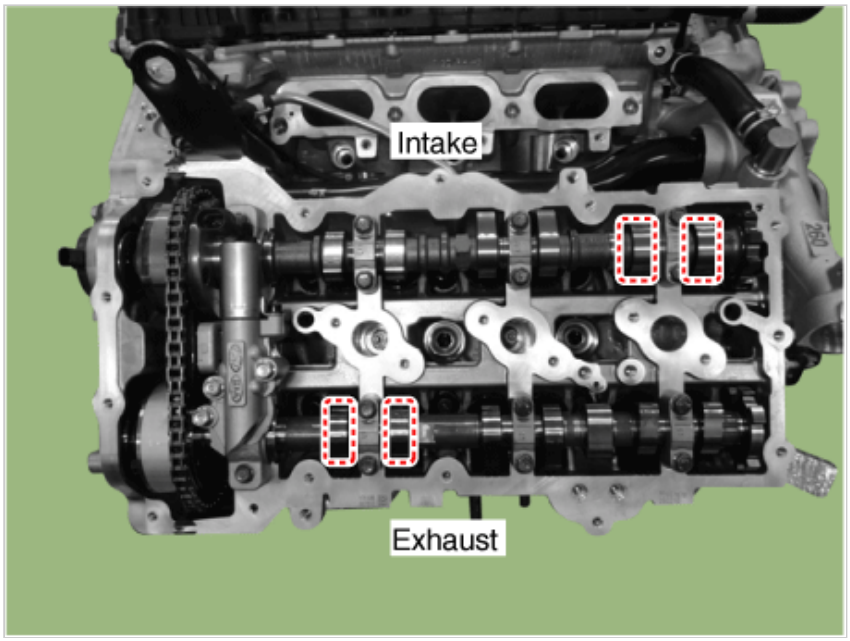


NOTICE

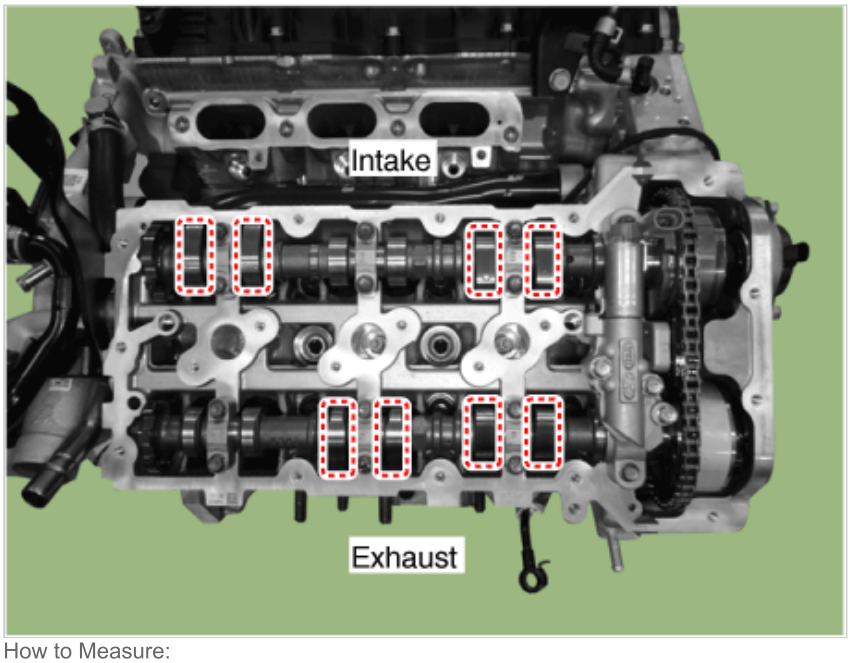
Do not rotate engine counterclockwise.

4. Inspect the valve clearance.
   (1) With No.1 cylinder at TDC, inspect clearances only for the valves shown below.

[LH]



[RH]



How to Measure:

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 replacement adjusting tappet.

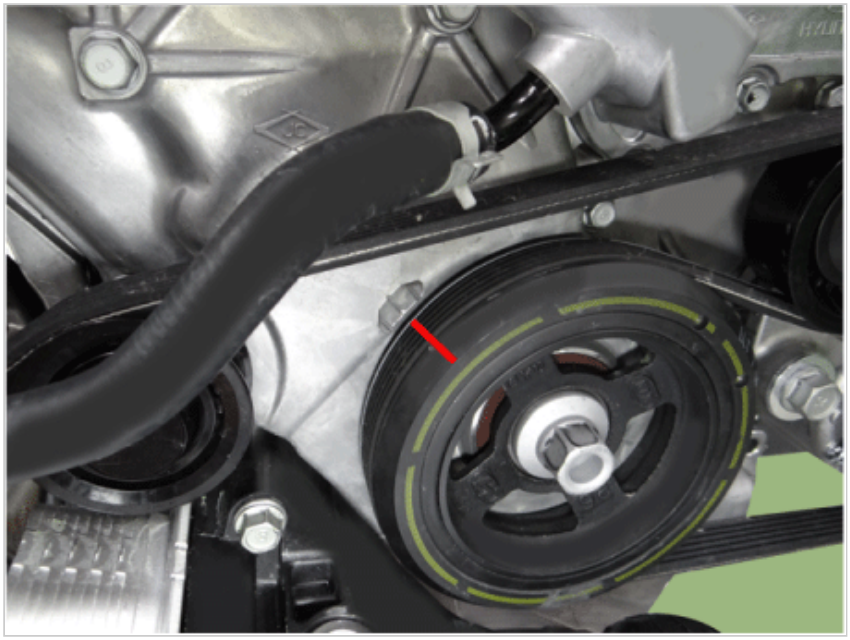
Valve clearance (Engine coolant temperature : 20°C [68°F])

[Specification]

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

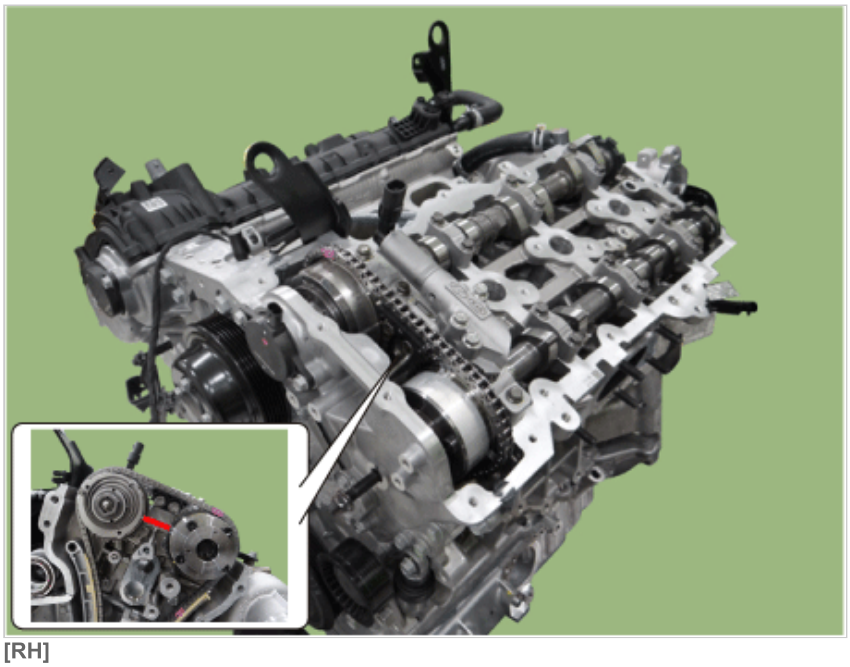
Exhaust : 0.32 - 0.38 mm (0.0126 - 0.0150 in.)

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

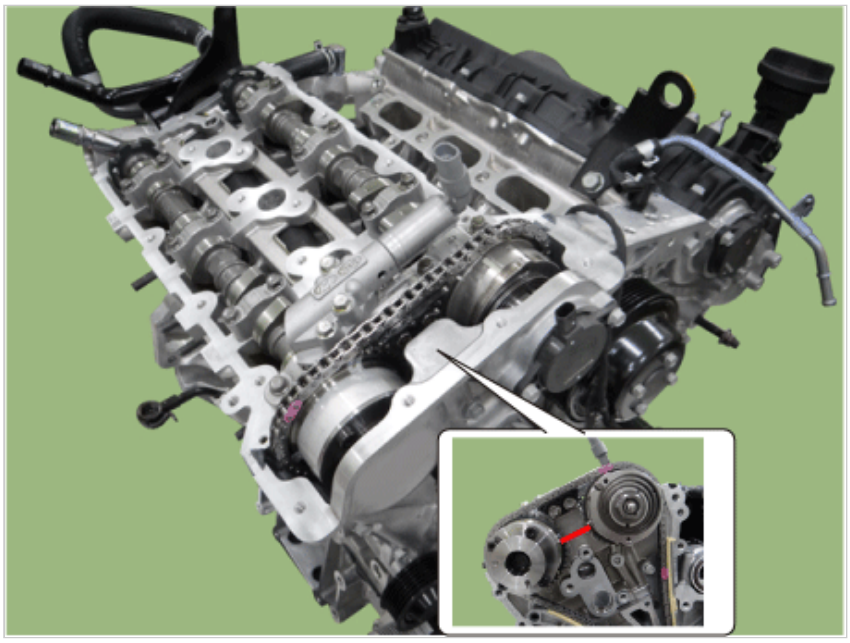


(3) Check that the marks of the intake and exhaust CVVT sprockets are in straight line on the cylinder head surface.
If not turn the crankshaft damper pulley clockwise one revolution (360°).

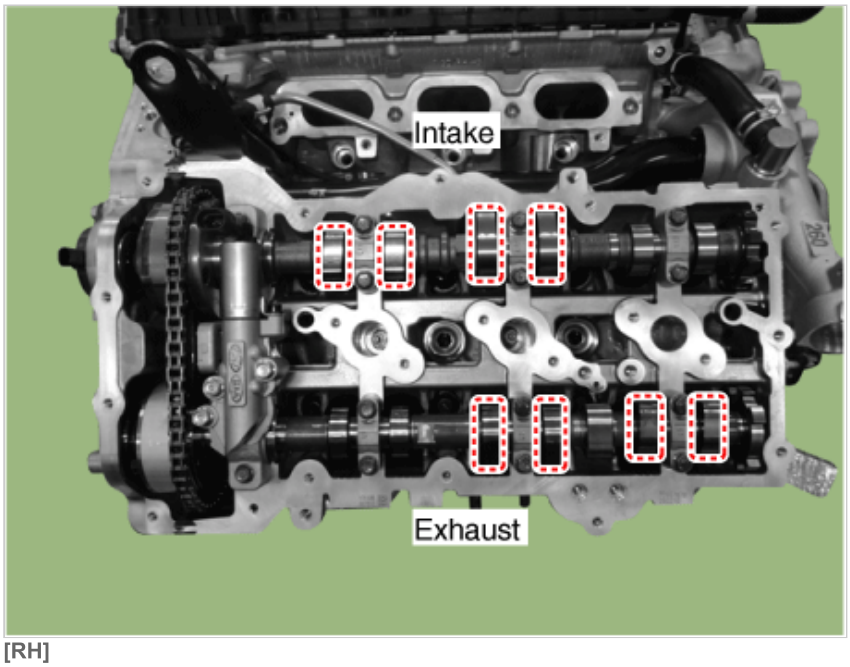
[LH]



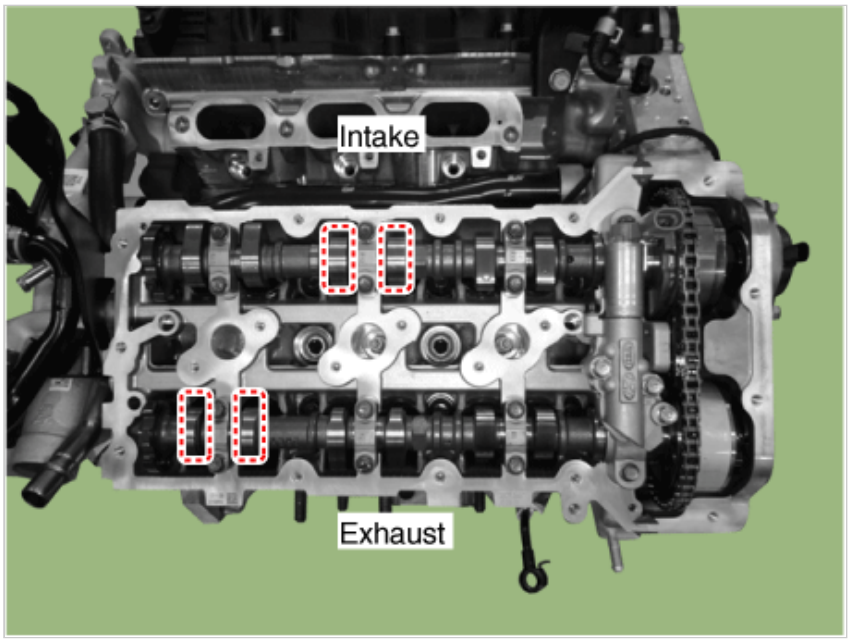
[RH]



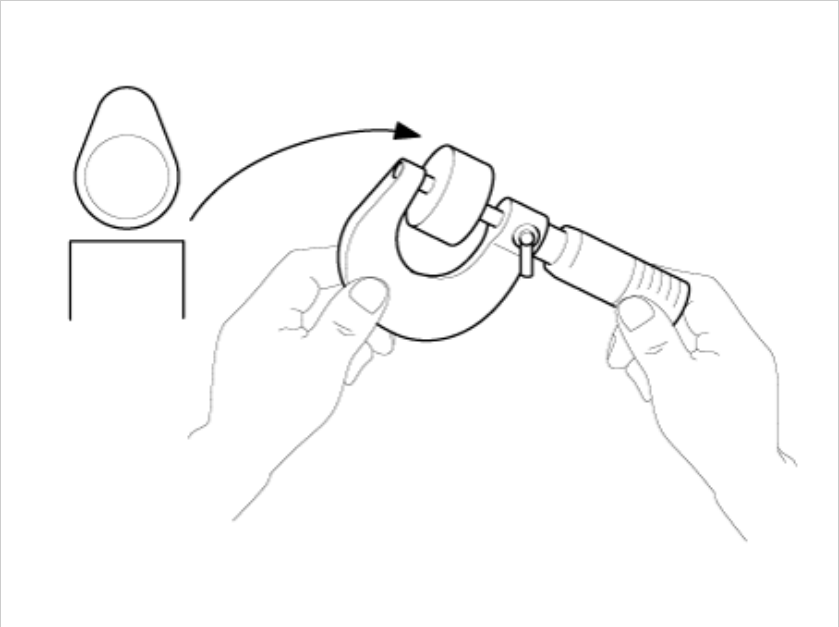
(4) With the No.4 cylinder at TDC, inspect clearances only for the valves shown in diagram below. (Refer to procedure step 1.)
[LH]



[RH]



5. Adjust the intake and exhaust valve clearance.
   (1) Set the No.1 cylinder to the TDC/compression.
   (2) Remove the CVVT & Camshaft assembly.
   (Refer to Cylinder Head Assembly - "CVVT & Camshaft")
   (3) Remove the tappets.
   (4) Measure the thickness of the removed tappet using a micrometer.



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

T : Thickness of removed tappet
A : Measured valve clearance
N : Thickness of new tappet
Intake :N = T + [A - 0.20 mm (0.0079 in.)]
Exhaust :N = T + [A - 0.35 mm (0.0138 in.)]

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

> **NOTICE**
> Shims are available in 41 size increments of 0.015 mm (0.0006 in.) from 3.00 mm (0.1181 in.) to 3.60 mm (0.1417 in.).

(7) Place a new tappet on the cylinder head.

> **NOTICE**
> Apply engine oil around and on top of selected tappet.

(8) Install the CVVT & Camshaft assembly.
(Refer to Cylinder Head Assembly - "CVVT & Camshaft")

(9) Install the timing chain.
(Refer to Timing System - "Timing Chain")

(10) Recheck the valve clearance.

Valve clearance (Engine coolant temperature : 20°C [68°F])
[Specification]
Intake : 0.17 - 0.23 mm (0.0067 - 0.0090 in.)
Exhaust : 0.32 - 0.38 mm (0.0126 - 0.0150 in.)