サービスマニュアル

HONDA

Engine maintenance

E07A

91-5

E07A型（6000001～　）

Introduction

This service manual describes maintenance procedures for the Honda E07A engine. Please refer to the E07A engine-equipped vehicle service manual, chassis maintenance, for details on engine removal and installation, engine electrical equipment, fuel, and emission control.

This service manual is based on the E07A engine as of May 1991. Please note that the illustrations may differ from the actual engine due to changes in specifications.

May 1991

Honda motor industry stock company

Maintenance Materials Division

Maintenance information

1

Precautions for work

General

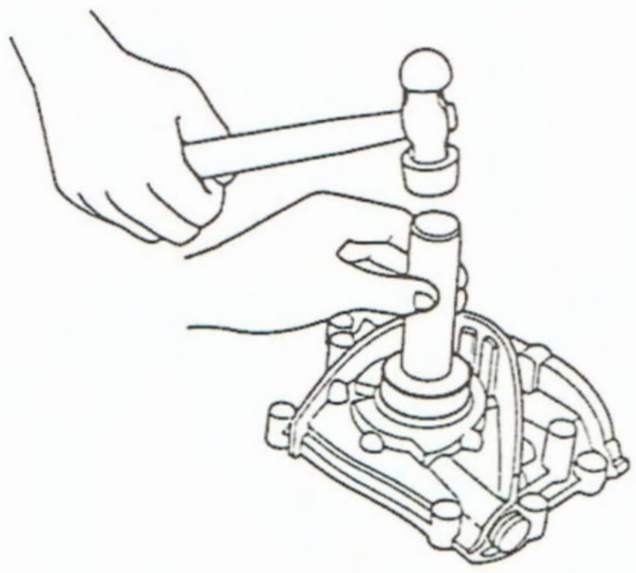
● work safely.

● Carry out correct work for removal and disassembly.

- At the same time as confirming the location of the problem, investigate the cause, and after determining whether it is necessary to remove or disassemble, carry out the work according to the procedure indicated in the manual.
- **When dismantling or disassembling, first check the correct assembly condition before starting.**
- **Each time you remove a part, inspect it for any deformation, damage, scratches, etc.**
- When disassembling parts that have a large number of parts, similar parts, or parts that are the same on both sides, organize them so that they will not be mixed up during assembly.

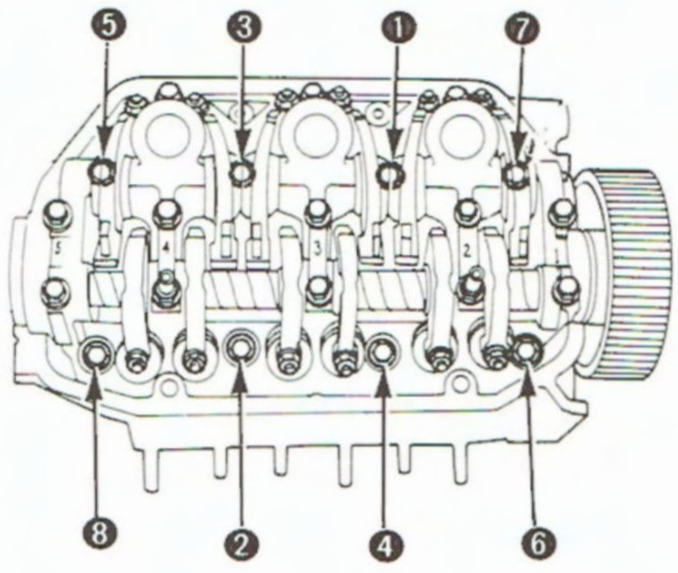
● Be sure to use special tools for any work that requires them.

- **Substituting other tools for work may result in damage to parts or injury, so be sure to use special tools for work that instructs you to do so.**



● About tightening torque

- Bolts, nuts, and screws should be tightened diagonally from inside to outside with the specified tightening torque, from the largest to the smallest diameter.



● About replacement parts

- Gaskets, packing O-rings, self-locking nacottes, etc. should be replaced with new ones when disassembling.

● About parts

- **Always use genuine Honda parts or recommended parts for parts and oils.**
- **Parts to be reused shall be inspected and measured in detail as necessary.**

● About oils and fats

- **When assembling and installing, apply the specified oil to the specified locations.**
- Thoroughly clean and wash each part to be reused.

● **Be sure to use the designated liquid packing 1216 where the use of liquid packing is specified.**

Follow the instruction manual for the liquid packing. Before application

- **Clean the liquid packing surface.**

Note **Do not damage the packing surface.**

- Degrease the packing surface.

when applied

- **Apply the liquid packing evenly to the packing surface.**
- **Apply the oil to the center of the packing, and around the bolt to the inside to prevent oil from leaking.**
- Liquid packing should be applied to one of the surfaces without internal threads.

After application

- **Do not assemble if left for 20 minutes or more after application.If left unattended, remove and reapply.**
- **Oil should be added 30 minutes or more after assembly.**

● About rubber and tubes

- **Do not allow gasoline or oil to adhere to rubber or tubes, as this may cause deterioration.**

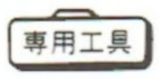
● After assembly, be sure to check the tightening, operation, piping condition, and clamp position of each part.

symbol mark

The symbols below indicate precautions and work methods throughout this manual.

: About oil application

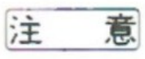
: **Applying grease**



: Use of specialized tools

: Important notes

: dangerous work



: important work

①、②、③、……
❶、❷、❸、……

: Indicate decomposition order

Torque: Tighten with the specified torque

Abbreviations

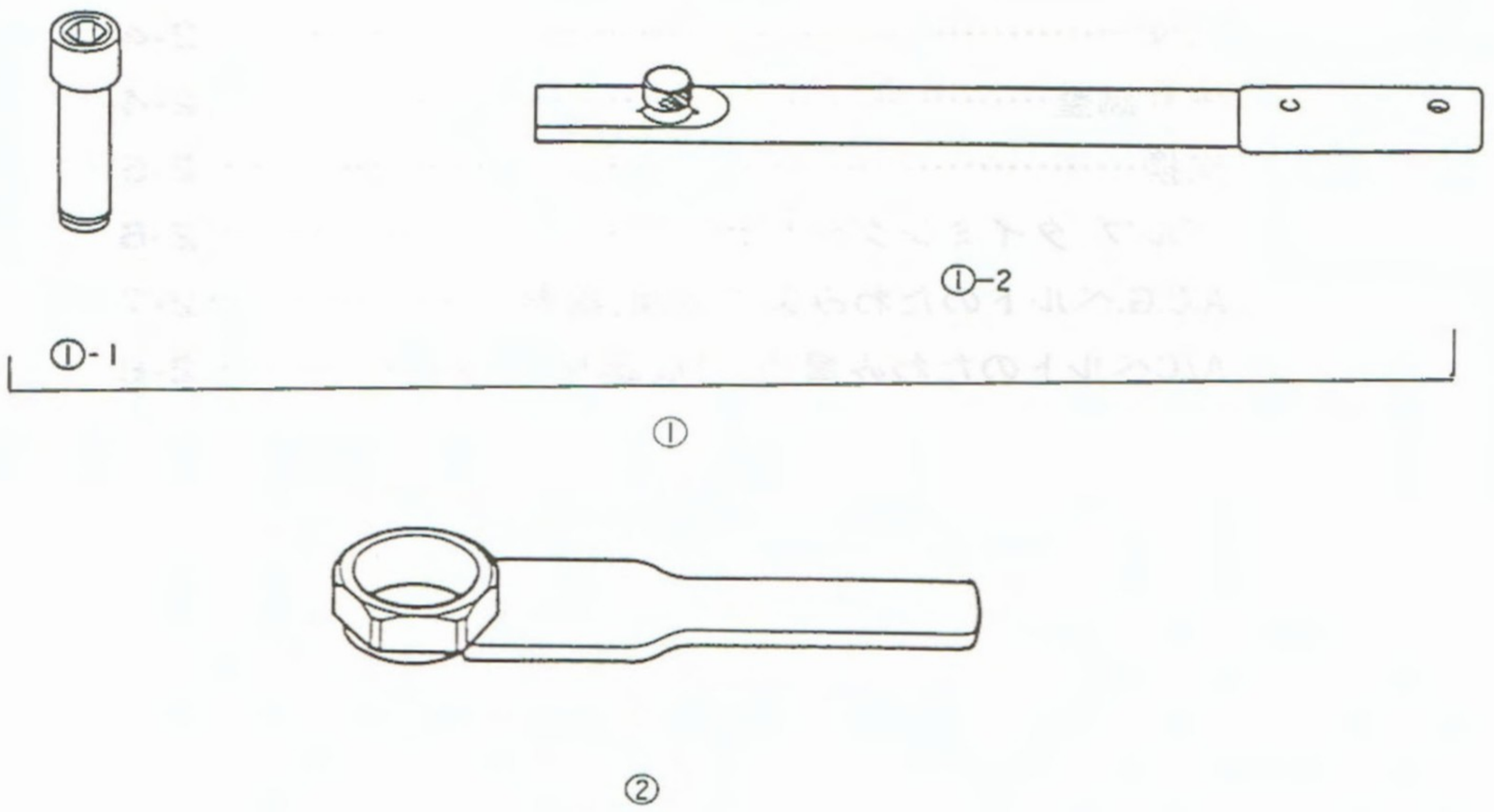
The following abbreviations are used throughout this manual.

Abbreviations	
connecting rod	connecting rod
torque	tightening torque
A.C.G.	A.C. Generator
A/C	air conditioner
Assy.	assembly
ATT.	attachment
EACV	electronic air control valve
EX	Exhaust
IN	intake
L.	left
PGR-FI	Programmed fuel injection
R.	right
SW	switch

Timing belt

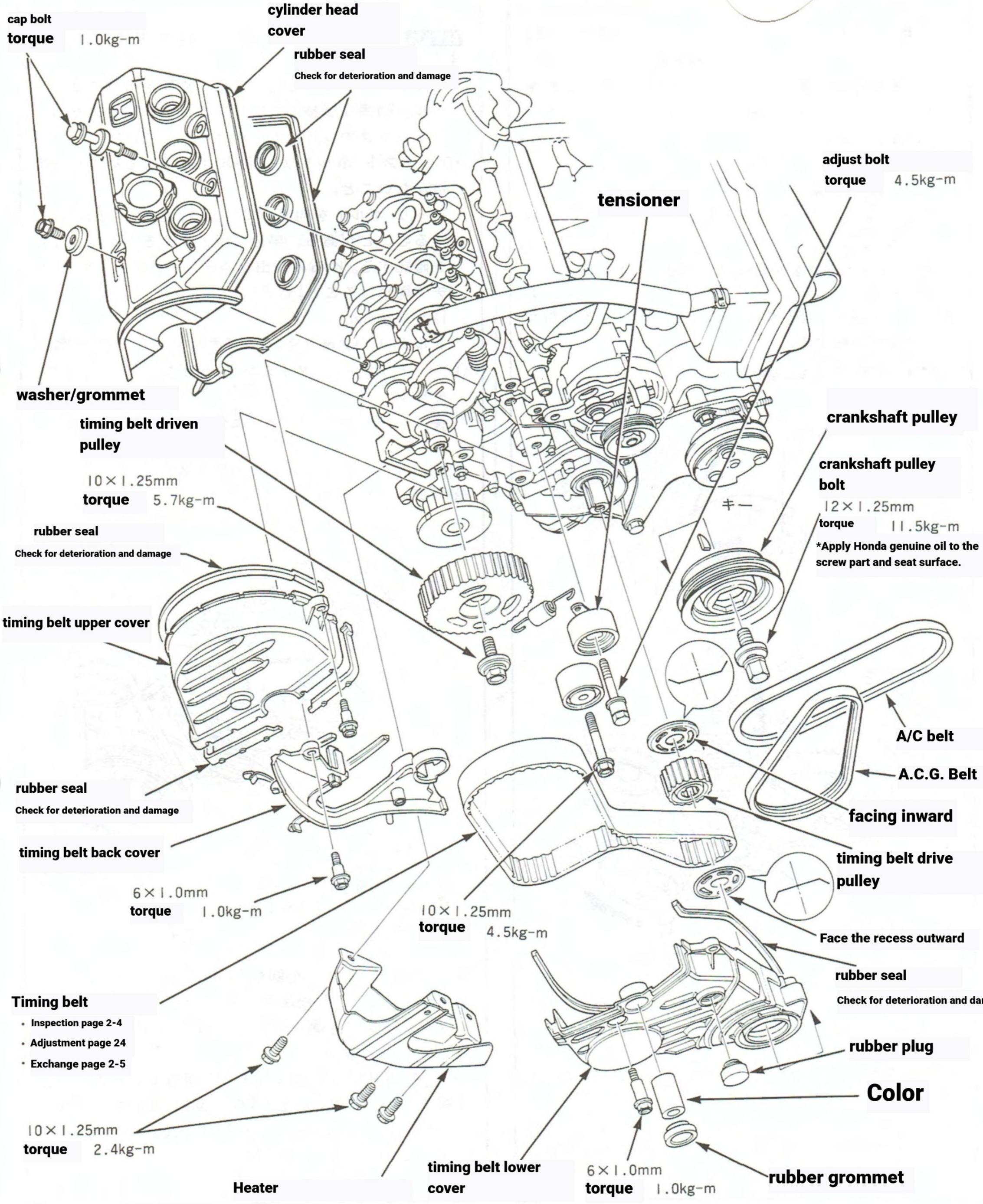
Specialized tool

No.	tool number	Tool name	remarks
①	07JAB-0010000	crank pulley holder set	
①-1	07JAA-0010100	socket wrench 17mm	
①-2	07JAB-0010200	handle	
②	07JAB-0010400	Pulley holder attachment HEX 50mm	



Timing belt

Development view



Timing belt

inspection

CAUTION The pulley bolt has a right-hand thread. When inspecting, use the bolt as shown in the illustration and rotate it counterclockwise, so it may become loose. Finally, check that the bolt is not loose. must be tightened with a torque wrench.

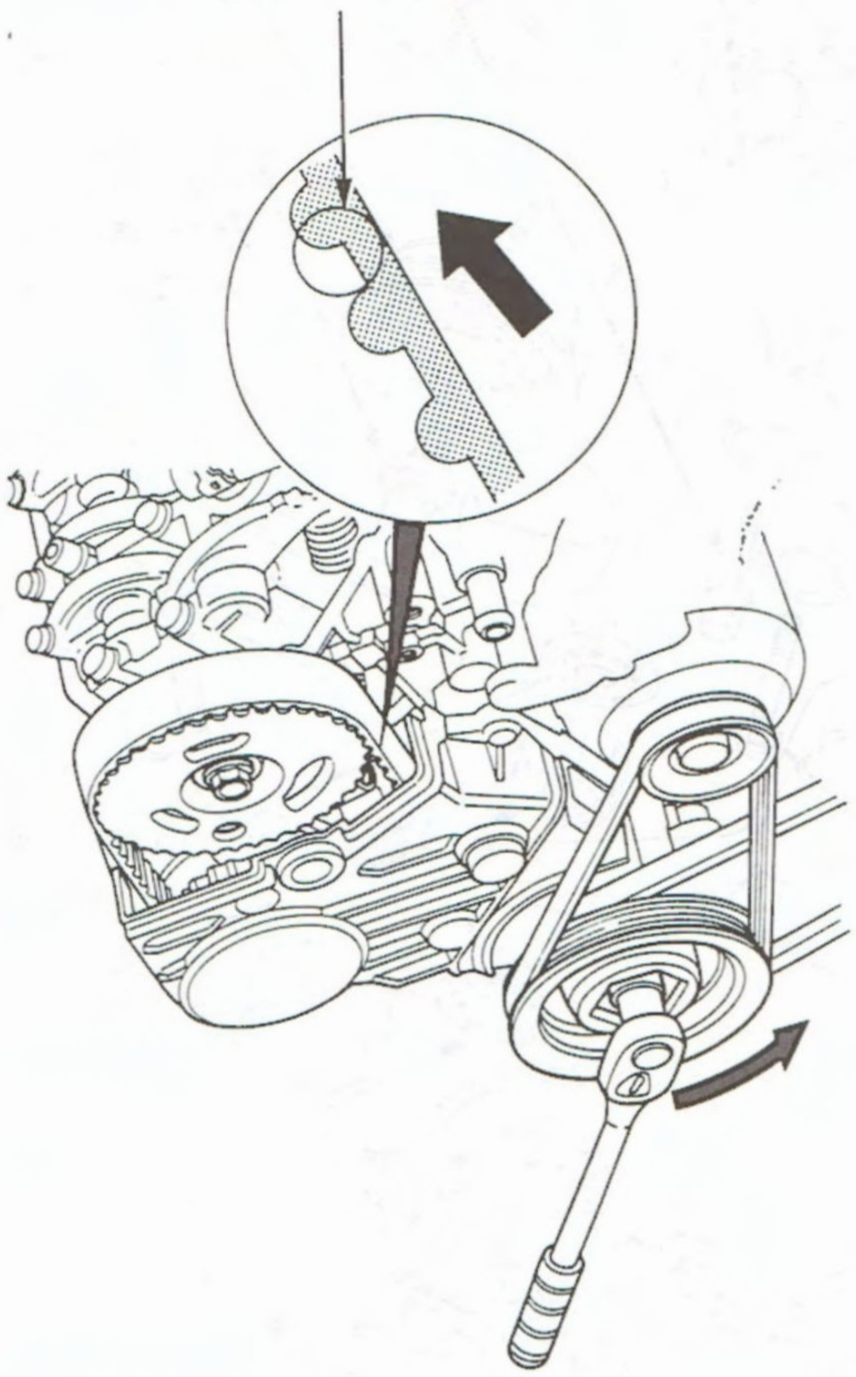
12×1.25mm
torque 11.5kg-m

①**Remove the head cover and timing belt. Upper cover**
***Be careful not to allow engine oil to adhere to the belt.**

②**Inspect the entire belt for damage, wear, and adhesion of engine oil or other oils.**

✻**The inspection is performed while rotating the pulley.**

- **Pay special attention to damage and wear of this part**



③**Replace the timing belt if it is damaged or worn.**

④**If oil such as engine oil is found to adhere to the belt, replace the belt after cleaning areas other than the belt.**

tension adjustment

Note **Adjustments should be made when the engine is cold (38°C or less).**

motive

- **Check before adjusting the belt tension.**
- **The belt tension is adjusted automatically by the spring, so do not apply any force other than inside the spring.**
- **Do not remove the adjustment bolt, just loosen it by 1/6 turn (60°).**
- **Since the pulley bolt is used and turned counterclockwise, it may loosen.**

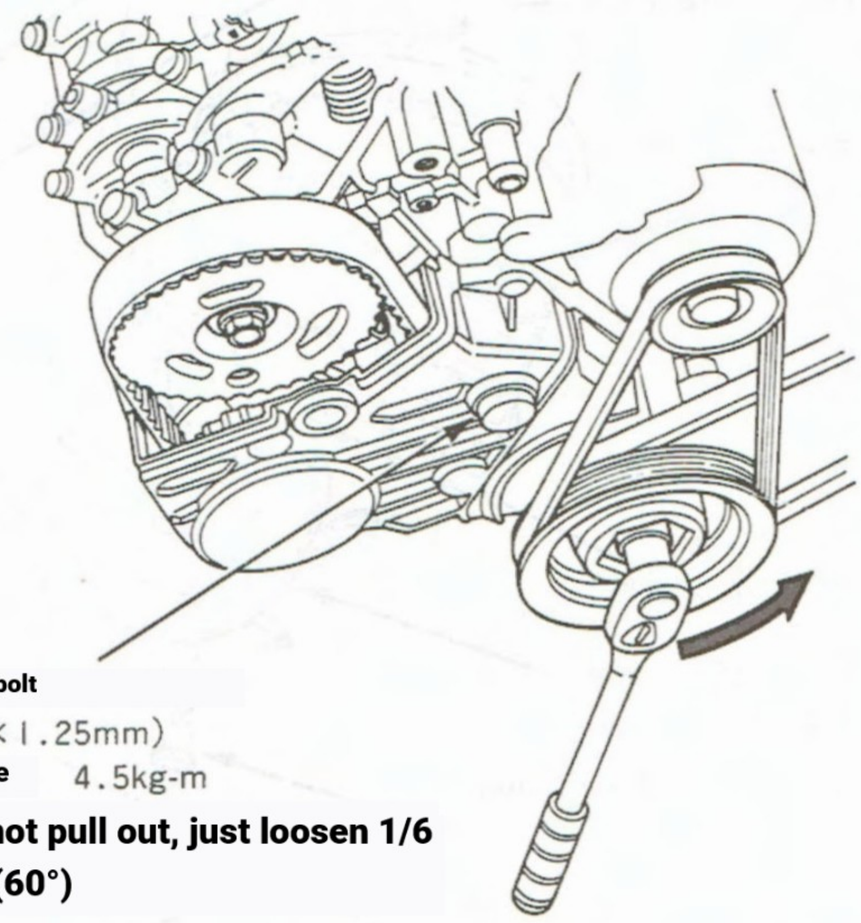
12×1.25mm
torque 11.5kg-m

①**Remove the head cover and timing belt upper cover.**

*** Be careful not to let engine oil adhere to the belt.**

②**Set No.1 cylinder to compression top dead center.**

③**Loosen the adjustment bolt.**



adjust bolt
(10×1.25mm)
torque 4.5kg-m
***Do not pull out, just loosen 1/6 turn (60°)**

④**Turn the crankshaft five times in the direction of rotation (align the punch mark with the upper surface of the cylinder head) by the number of teeth of the timing belt driven pulley and stop.**

CAUTION Do not rotate the cylinder in the reverse direction even if it has been turned more than 5 threads.

⑤**Tighten the adjustment bolt.**

exchange

When doing this in-vehicle, refer to the chassis maintenance section for the vehicle in which it is installed.

① Remove the O2 sensor coupler, harness clamp and breather hose.

② Loosen the A.C.G. adjust nut and remove the A.C.G. belt.

③ Remove the exhaust temperature sensor from the catalytic converter and remove the timing belt cover heat insulator.

④ Remove the side mount bracket.

⑤ Remove the plug cap and cord.

⑥ Remove the cylinder head cover and remove the timing belt cover.

*Removing the injector coupler makes it easier to remove the cylinder head cover.

⑦ Remove the timing belt lower cover.

⑧ Loosen the adjustment bolt 1/6 turn (60°) and fix the adjustment pulley on the loose side.

⑨ Replace the timing belt.

⑩ Installation is done in the reverse order of removal, but the important points are described below.

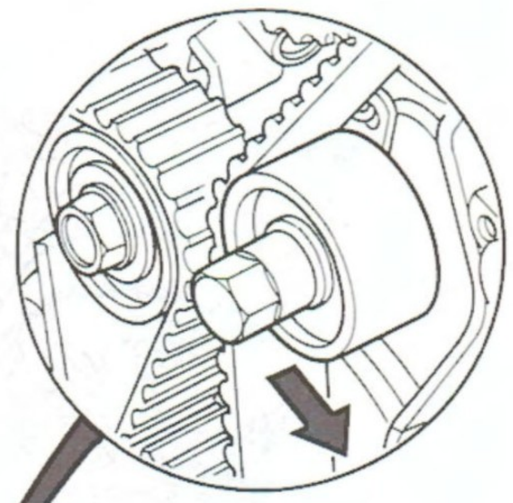
⑪ Adjust the valve timing before installation (page 2-6).

⑫ After replacement, adjust the tension of the timing belt (page 2-4).

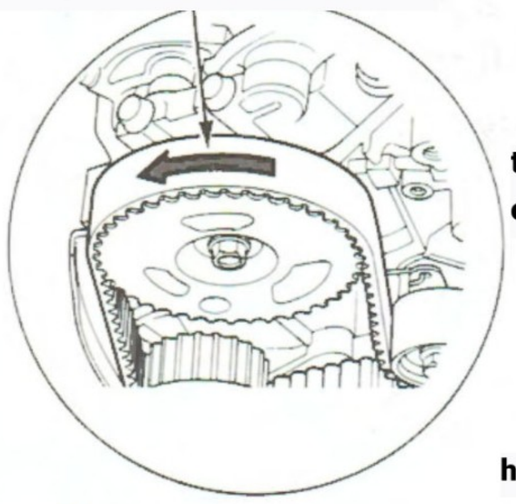
⑬ Adjust the A.C.G. belt and A/C belt tension (pages 2-7, 8).

timing belt bolt adjust

10×1.25mm
torque 4.5kg-m
* Do not pull out, just loosen 1/6 turn (60°).



*If the belt is to be reused, mark the direction of rotation arrow on the outside of the belt before removing it.



rubber seal

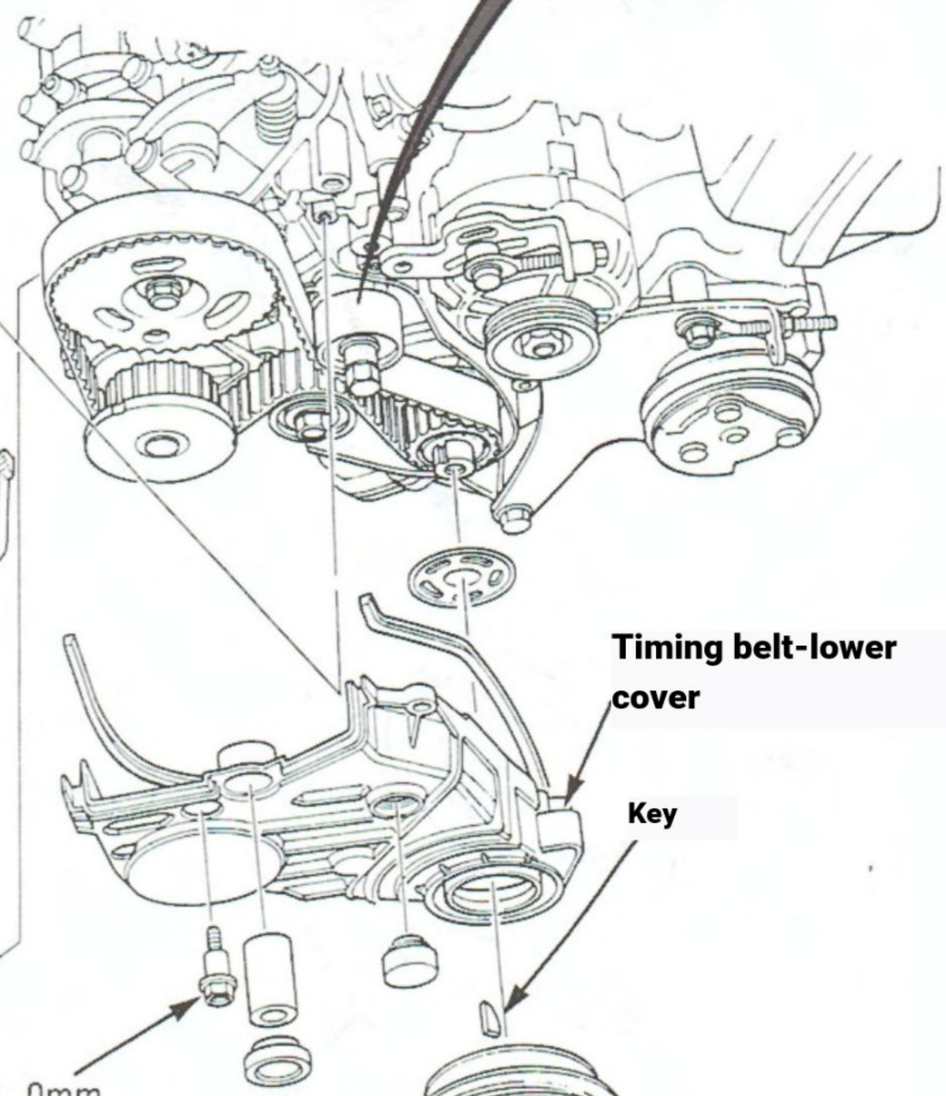
timing belt upper cover

6×1.0mm
torque 1.0kg-m

heat insulator

10×1.25mm
torque 2.4kg-m

6×1.0mm
torque 1.0kg-m



Timing belt-lower cover

Key

crankshaft pulley

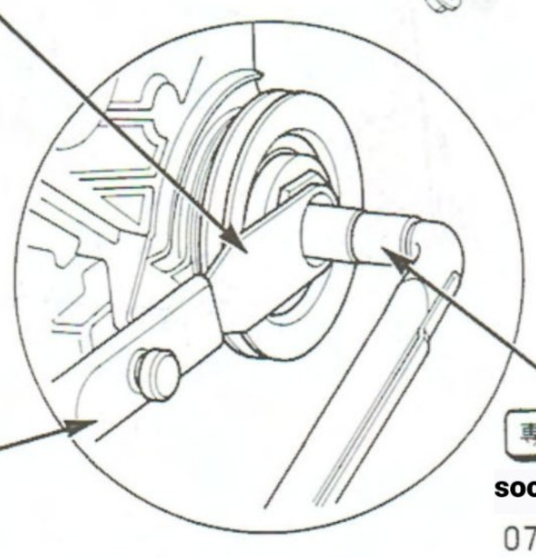
crankshaft pulley bolt

12×1.25mm
torque 11.5kg-m
*Apply Honda genuine oil to the screw part and seat surface.

A/C belt

A.C.G. Belt

専用工具
pulley holder
Attachment HEX 50mm
07JAB-0010400



専用工具
handle
07JAB-0010200

専用工具
socket wrench 17mm
07JAA-0010100

Timing belt

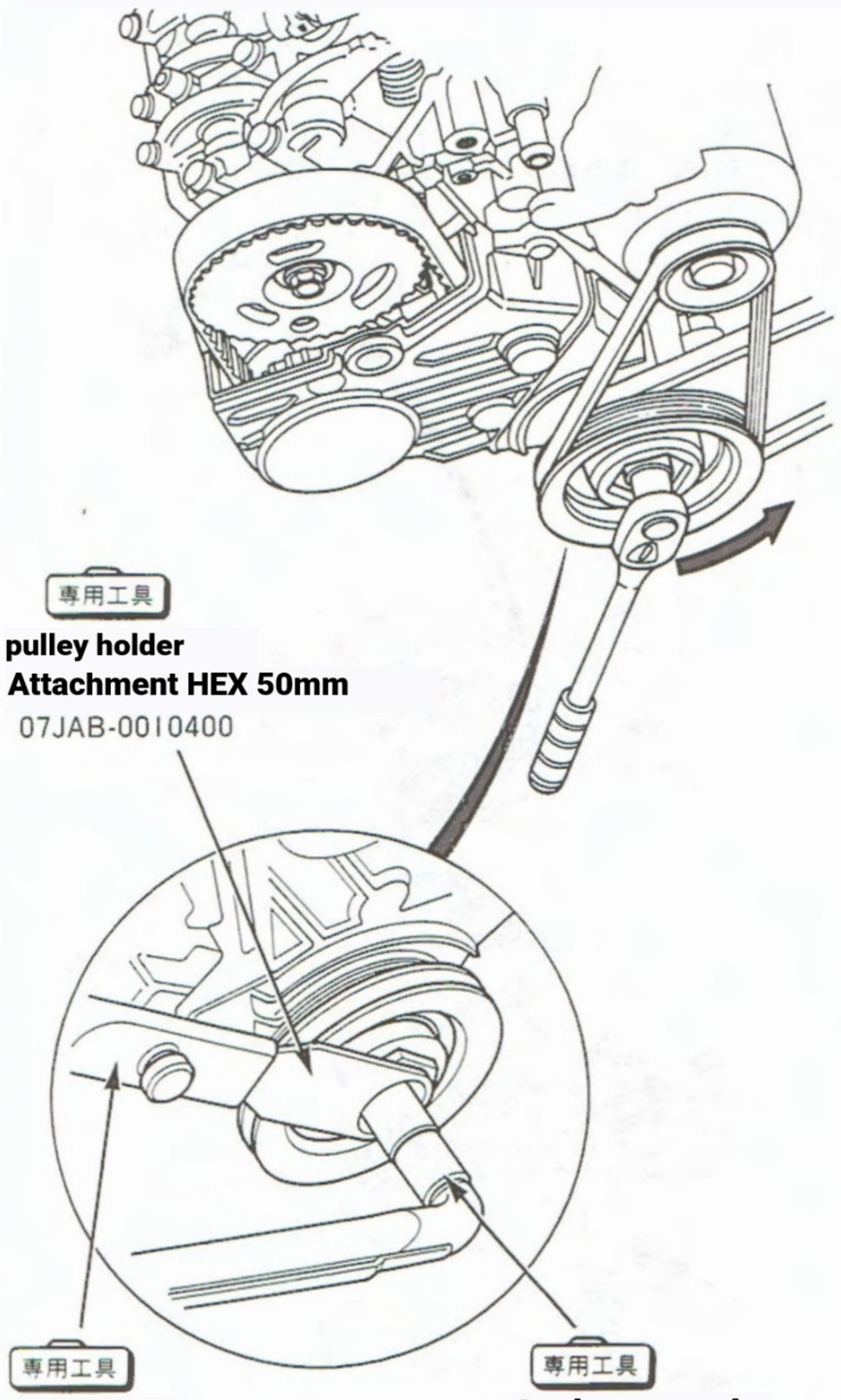
valve timing adjustment

①Remove the cylinder head cover.

②Remove the timing belt upper cover.

③Rotate the crankshaft and align the TDC mark on the flywheel with the alignment mark.

* The inspection hole is located at the joint with the transmission case. Remove the rubber plug and peek from the top to fit.

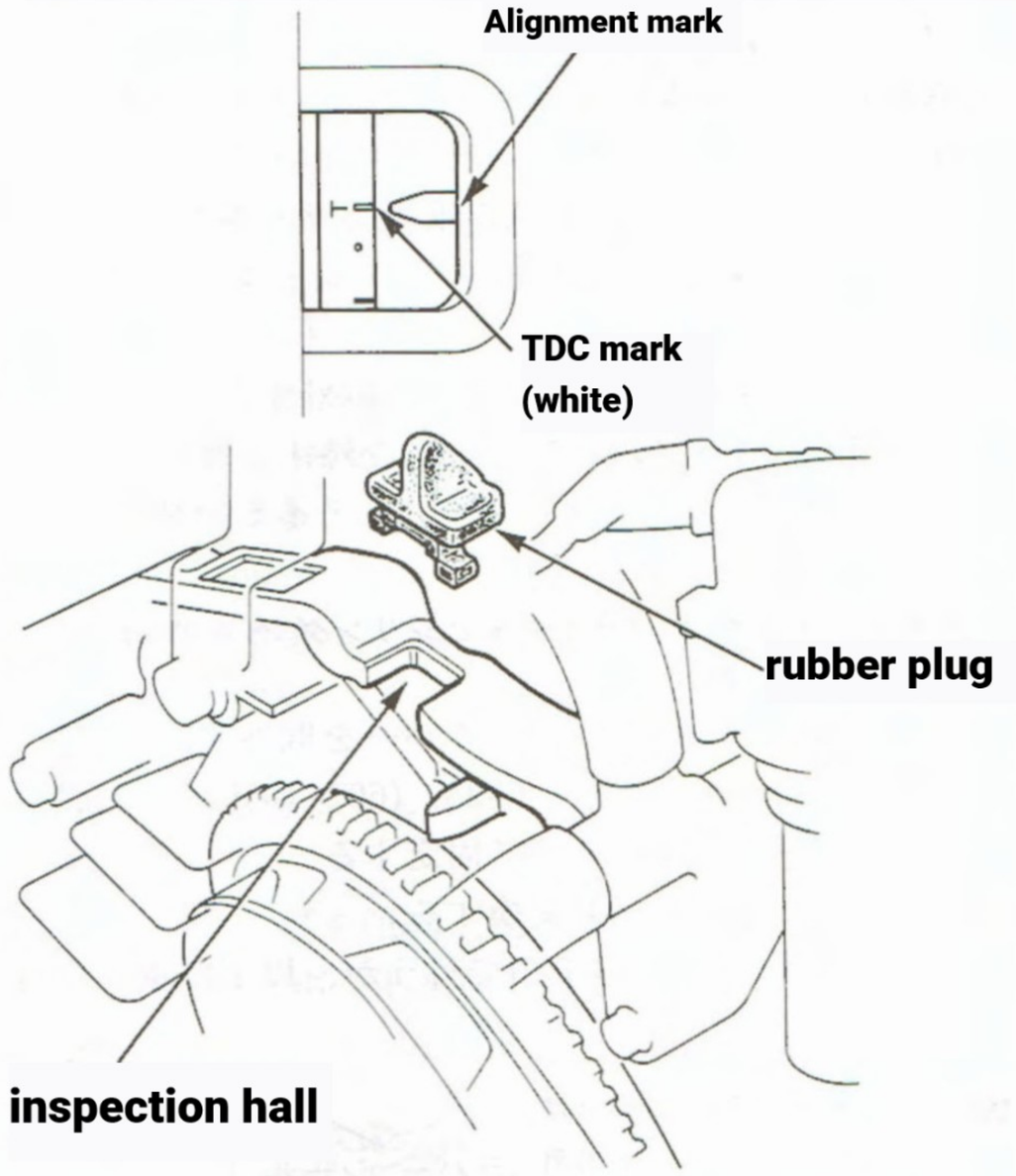


CAUTION The pulley bolt has a right-hand thread. When inspecting, use the bolt as shown in the illustration and rotate it counterclockwise, so it may loosen. Finally, check that the bolt is not loose. , Tighten with a torque wrench using the special tool pulley holder.

12×1.25mm

torque 11.5kg-m

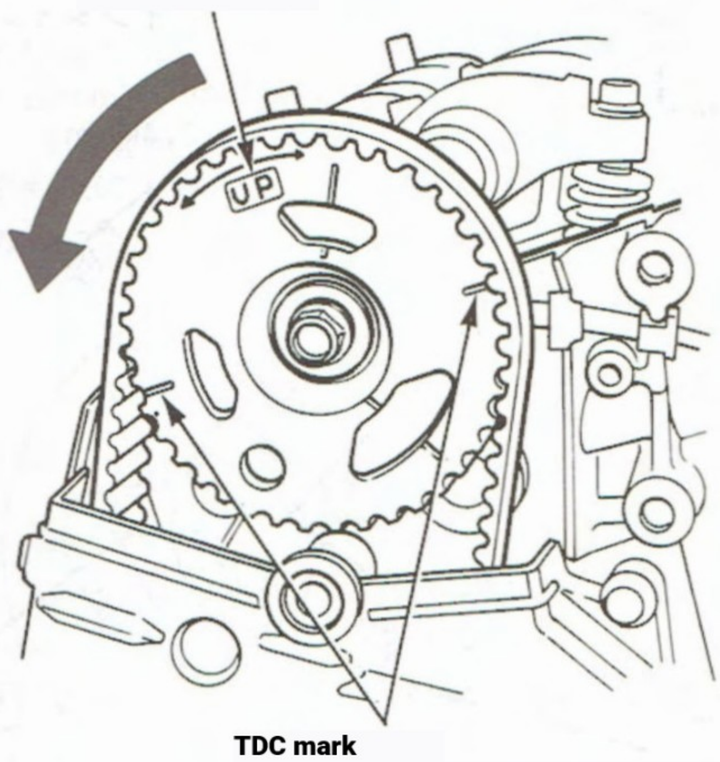
No.1 Crankshaft position at cylinder compression top dead center <flywheel>



④Check that the timing belt pulley is at top dead center.

⑤If the position of the timing belt driven pulley is not aligned with the top dead center position, remove the timing belt, align the pulleys as shown in the figure below, and install the timing belt.

. For details on installing and removing the timing belt, refer to Replacement on page 25.



A.C.G. Belt

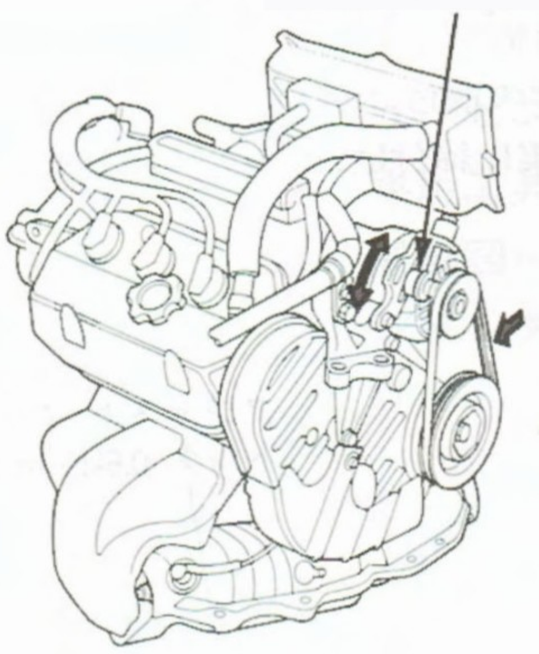
Deflection check and adjustment

*** This is the standard value at the time of inspection. When replacing with a new product, after adjusting the initial tension, run the engine for about 5 minutes and check again to confirm that the standard value is met.**

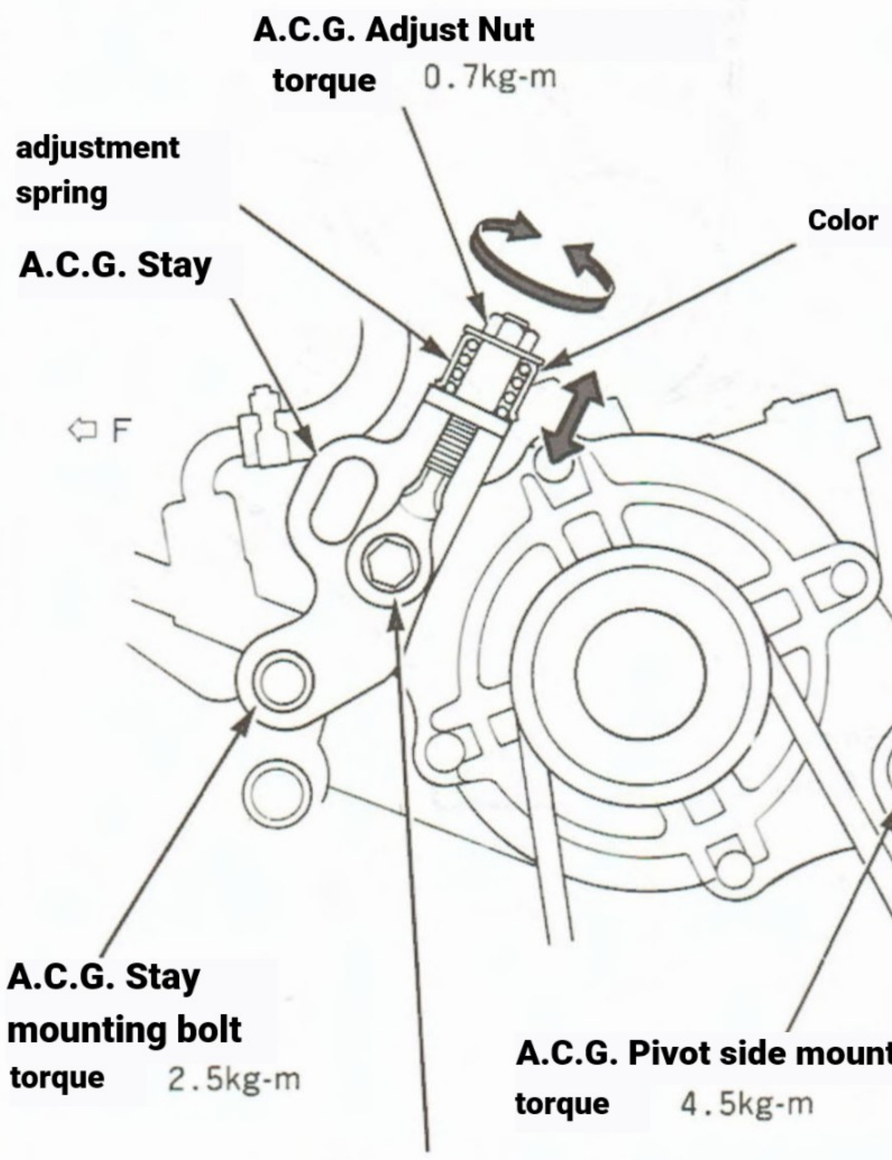
① A.C.G. Check belt tension.

Deflection Standard value: 6.5-8.0 (at inspection)

- **As shown in the figure, measure the deflection of the belt when the center between the pulleys is pressed with a force of about 10kg.**



② Adjustments are made if the values are outside the standard values.

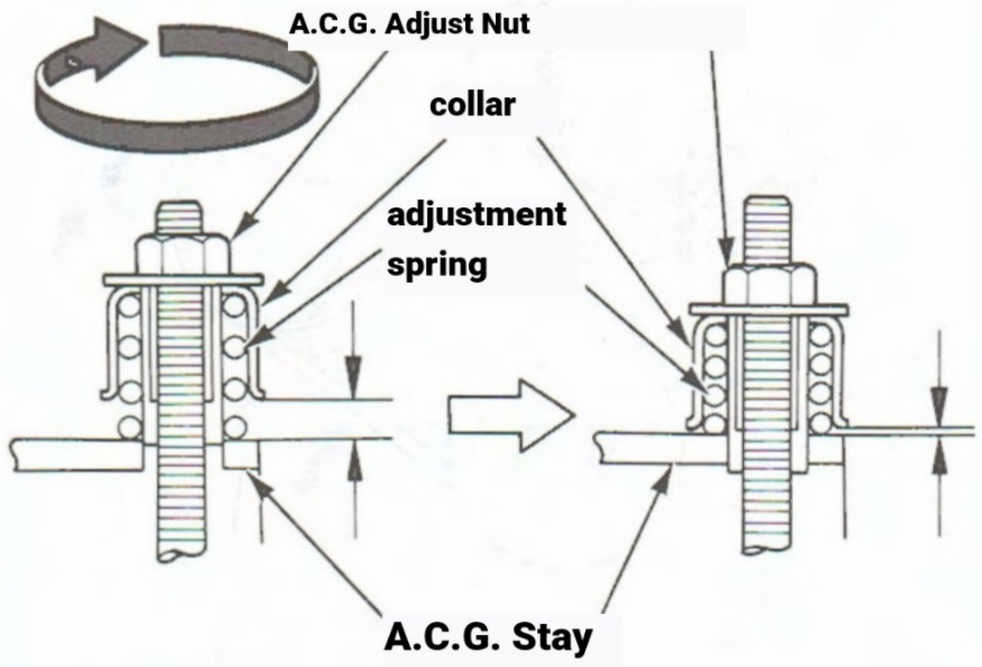


CAUTION The A.C.G. belt uses a spring tension adjustment method, so it is not checked with a belt tension gauge.

③ Loosen the A.C.G. pivot side mounting bolt, A.C.G. stay mounting bolt, and A.C.G. adjustment lock bolt by about 1/4 turn (90°).

***Be careful not to loosen it too much, otherwise you will not be able to make an accurate adjustment.**

④ Tighten the A.C.G. adjust nut, and adjust so that the clearance between the bottom surface of the collar and the seat surface of the stay is the standard value as shown in the figure below.



Clearance Reference value : 1.0mm

⑤ Tighten the A.C.G. adjust lock bolt, A.C.G. stay mounting bolt, and A.C.G. pivot side mounting bolt in order to the specified torque.

⑥ Check the clearance again (readjust if it is outside the standard value).

⑦ A.C.G. Tighten the adjustment nut to the specified torque.

***By tightening the A.C.G. adjusting nut, the gap between the collar and stay is eliminated (prevents loosening of the adjusting nut).**

torque 0.7kg-m

⑧ Recheck the belt tension.

A/C belt

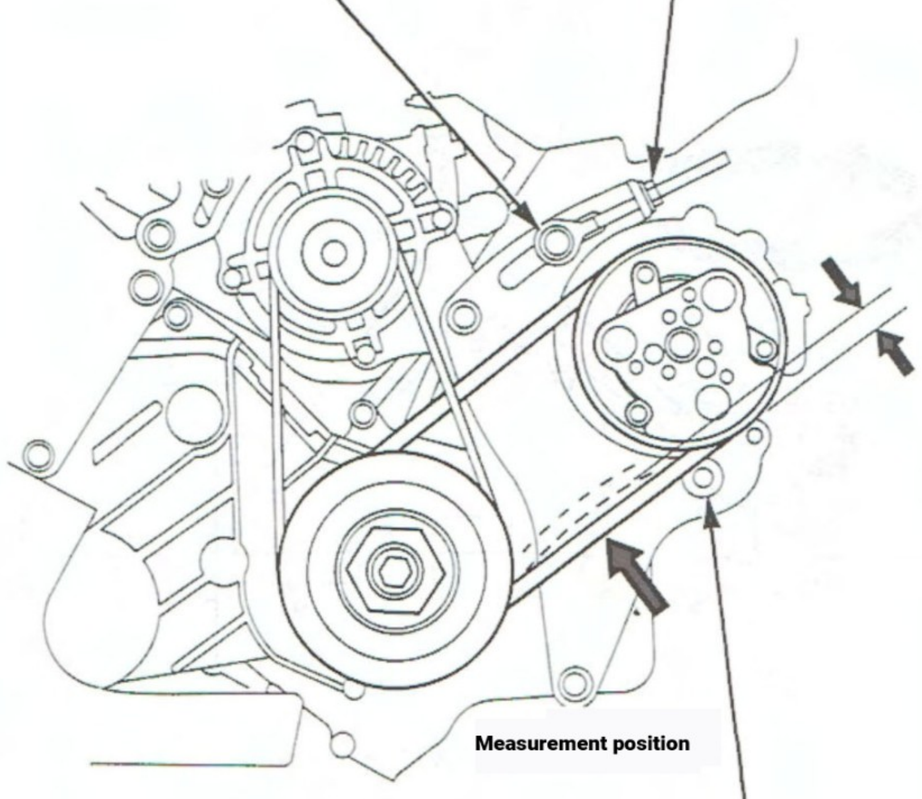
Deflection check and adjustment

✻ The inspection is performed after removing the splash shield.

①Check A/C belt tension

Amount of deflection : 6.5－8.0mm (During inspection)
4.5－5.5mm (when new)

・As shown in the figure, measure the deflection of the belt when the center between the pulleys is pressed with a force of about 10kg.



* Tighten the nut on the back side

Inspection method with belt tension gauge

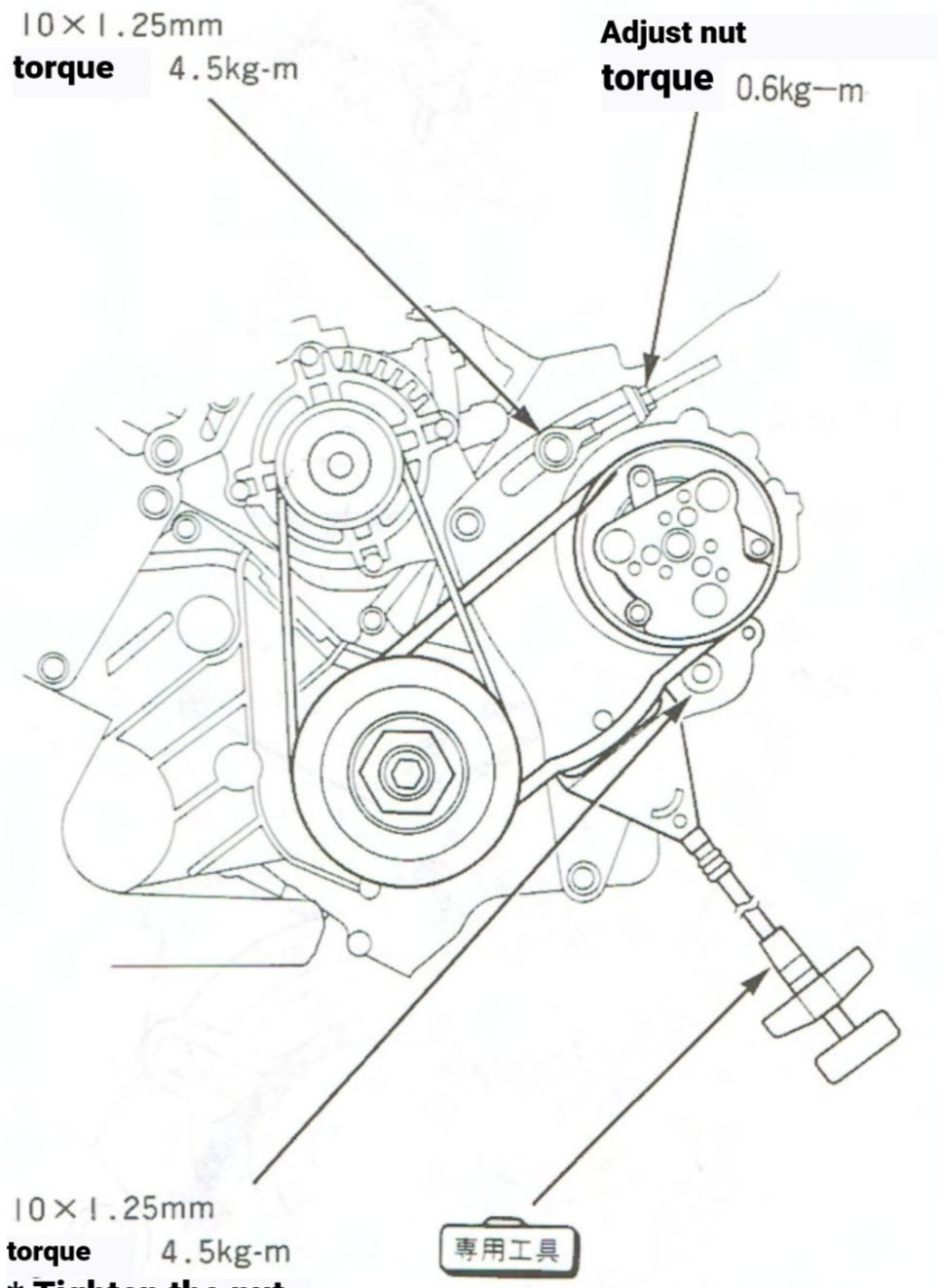
Tension reference value : 32－45kg (During inspection)
55－70kg (when new)

・Install the belt tension gauge as shown in the figure and measure the tension.

*Refer to the instruction manual for how to use the gauge.

①If the value is outside the standard values, loosen the A/C compressor mounting bolts/nuts and mounting bolts, and adjust the tension with the adjustment nut.

③Securely tighten the A/C compressor mounting bolts/nuts and adjustment bolts, and recheck the belt tension.



* Tighten the nut on the back side

belt tension gauge
07JGG-0010100

cylinder head, valve train

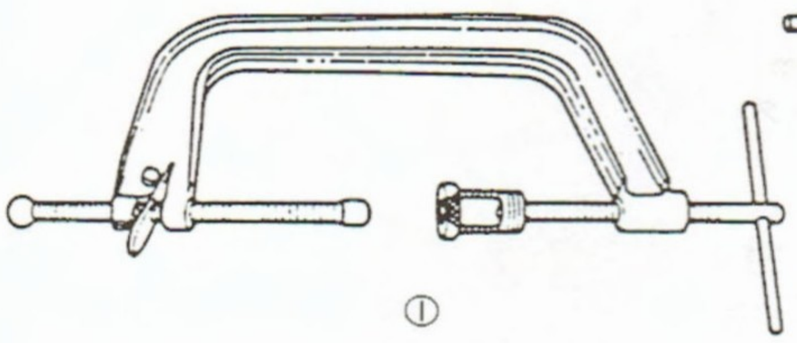
service data

Unit: mm unless otherwise stated.

Part name	item		Standard value	limit value
compression	pressure 〔kg/cm²〕		14.0－250	9.5－250
cylinder	Distortion between cylinder head and cylinder block mating surface		—	0.05
	height		94.25－94.35	—
camshaft	Axial backlash		0.05－0.15	0.50
	oil clearance		0.050－0.089	0.15
	shake		0.015	0.03
	cam height	IN	35.733	—
		EX	34.568	—
valve	Valve clearance (cold)	IN	0.13－0.17	—
		EX	0.23－0.27	—
	Stem outer diameter	IN	5.48－5.49	5.45
		EX	5.45－5.46	5.42
	Clearance between stem and guide	IN	0.02－0.05	0.08
		EX	0.05－0.08	0.11
valve seat	Sheet finish width	IN	0.85－1.15	1.60
		EX	1.05－1.35	1.80
	Sinking of valve seat (mounting height)	IN	45.76－46.24	46.49
		EX	43.26－43.74	43.99
valve spring	free length	IN	45.07	—
		EX	46.84	—
valve guide	valve guide inner diameter	IN, EX Both	5.51－5.53	5.55
rocker arm	Clearance between rocker arm and rocker arm shaft	IN	0.017－0.050	0.08
		EX	0.018－0.054	0.08

Specialized tool

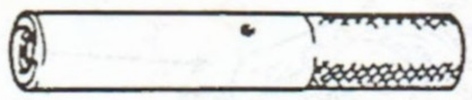
No.	tool number	Equipment name	remarks
①	07757—0010000	valve spring compressor	
②	07742—0010100	Valve guide driver 5.5mm	
③	07HAD—PJ70200	valve stem installer	
④	07HAH—PJ70100	Valve guide reamer 5.5mm	
⑤	07JAA—PN40100	tappet adjustment wrench	



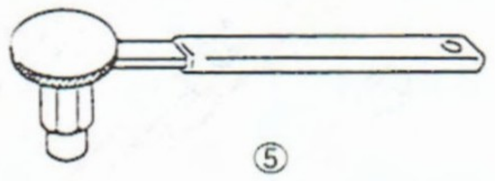
①

②

④



③



⑤

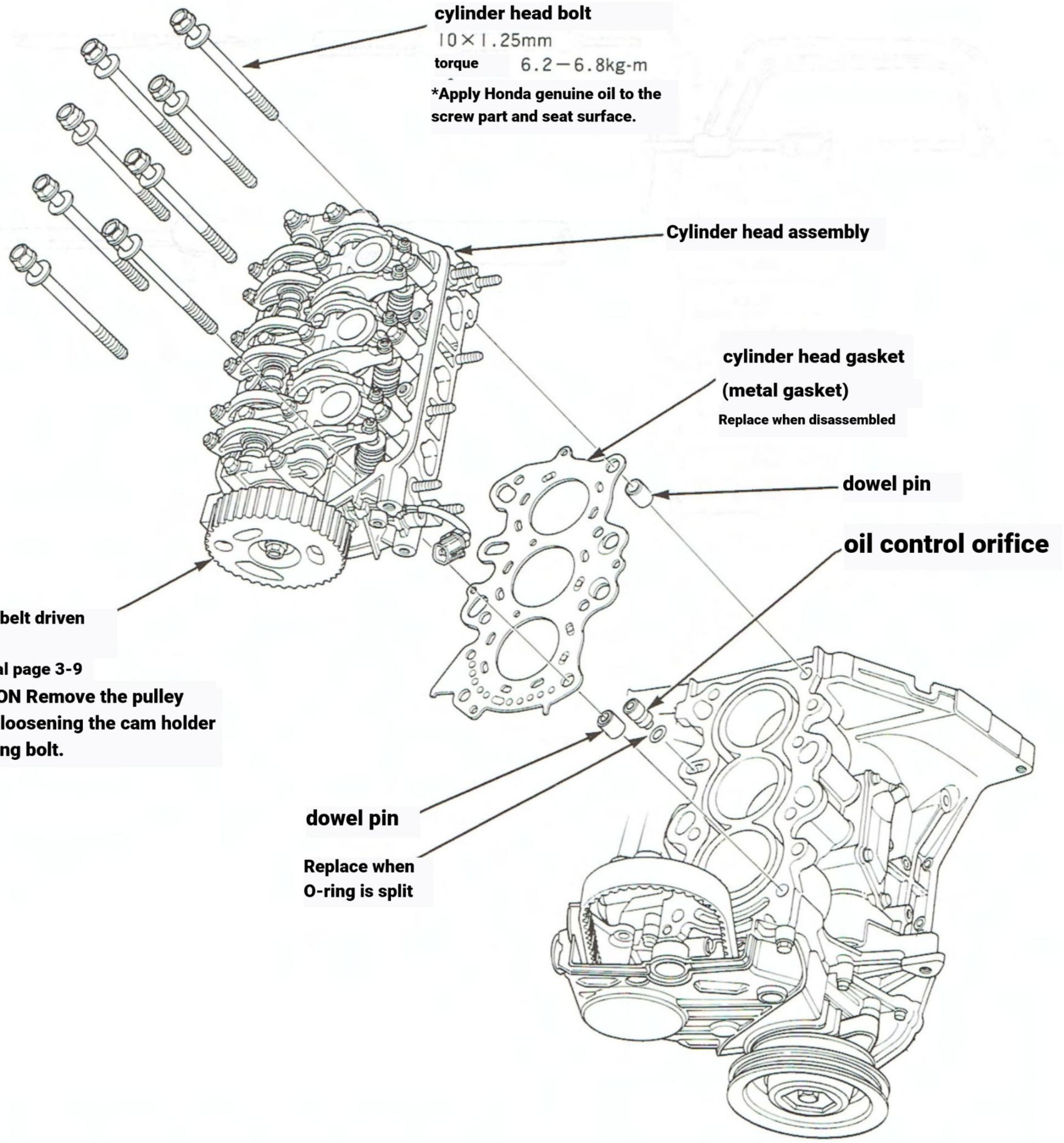
cylinder head, valve train

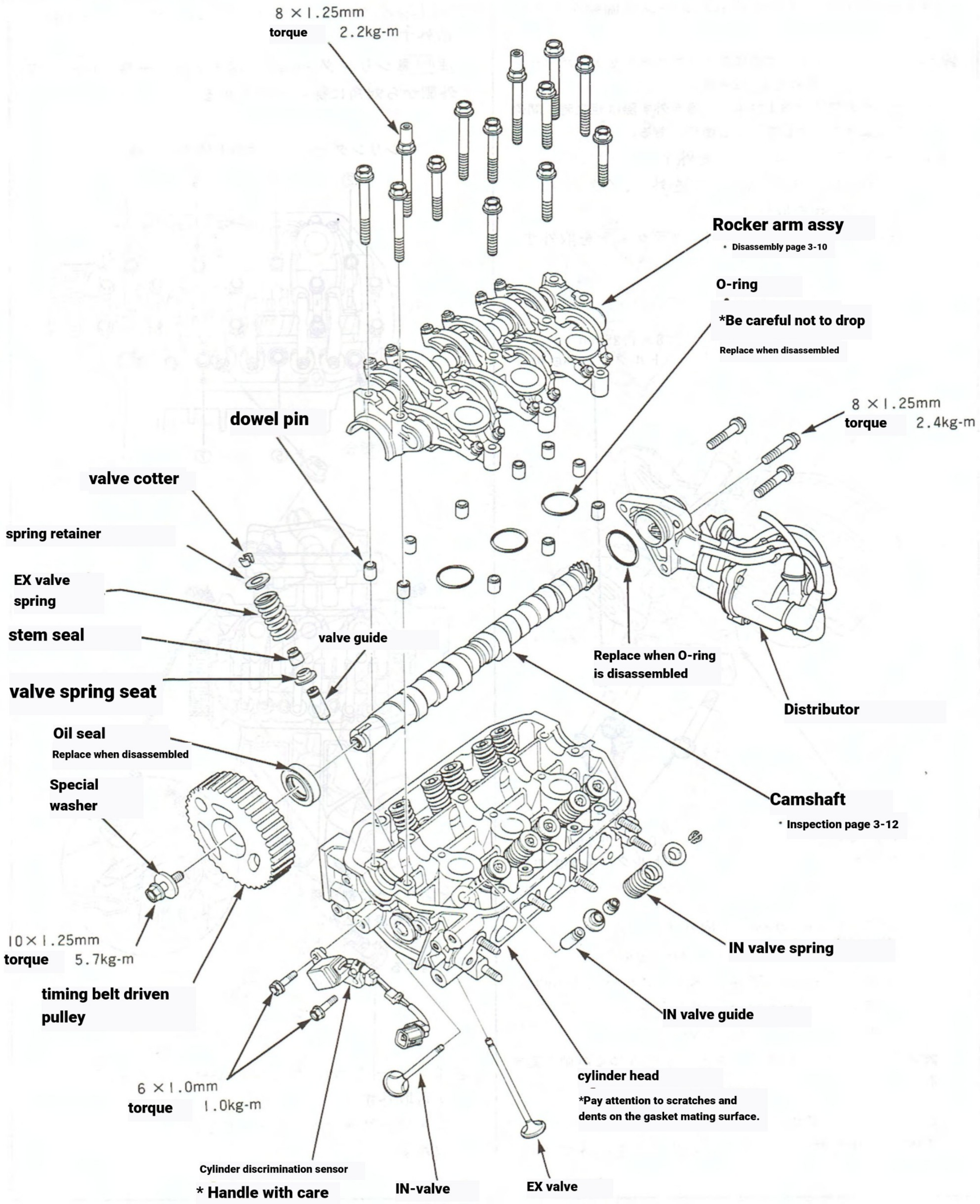
Development view

Note

- Be sure to remove the cylinder head when the engine is cool to avoid distortion due to heat.
- Since a metal gasket is used, handle it carefully so as not to bend it.
- Be careful not to scratch or dent the mating surfaces of the cylinder and cylinder head gaskets.

✻
- Before removing the cylinder head, align No.1 cylinder to compression top dead center (page 2-6).
- When removing the sensor wires and hoses, it is convenient to mark them so that they are not assembled incorrectly.
- Always use new O-rings and gaskets when disassembling.




8 × 1.25mm
torque 2.2kg-m
Rocker arm assy
• Disassembly page 3-10
O-ring
*Be careful not to drop
Replace when disassembled
8 × 1.25mm
torque 2.4kg-m
dowel pin
valve cotter
spring retainer
EX valve spring
stem seal
valve guide
valve spring seat
Oil seal
Replace when disassembled
Replace when O-ring is disassembled
Distributor
Special washer
Camshaft
• Inspection page 3-12
10 × 1.25mm
torque 5.7kg-m
timing belt driven pulley
IN valve spring
IN valve guide
6 × 1.0mm
torque 1.0kg-m
cylinder head
*Pay attention to scratches and dents on the gasket mating surface.
Cylinder discrimination sensor
* Handle with care
IN-valve
EX valve

cylinder head

Removal

- If you are going to do it in-vehicle, please refer to the chassis maintenance section for the equipped vehicle.

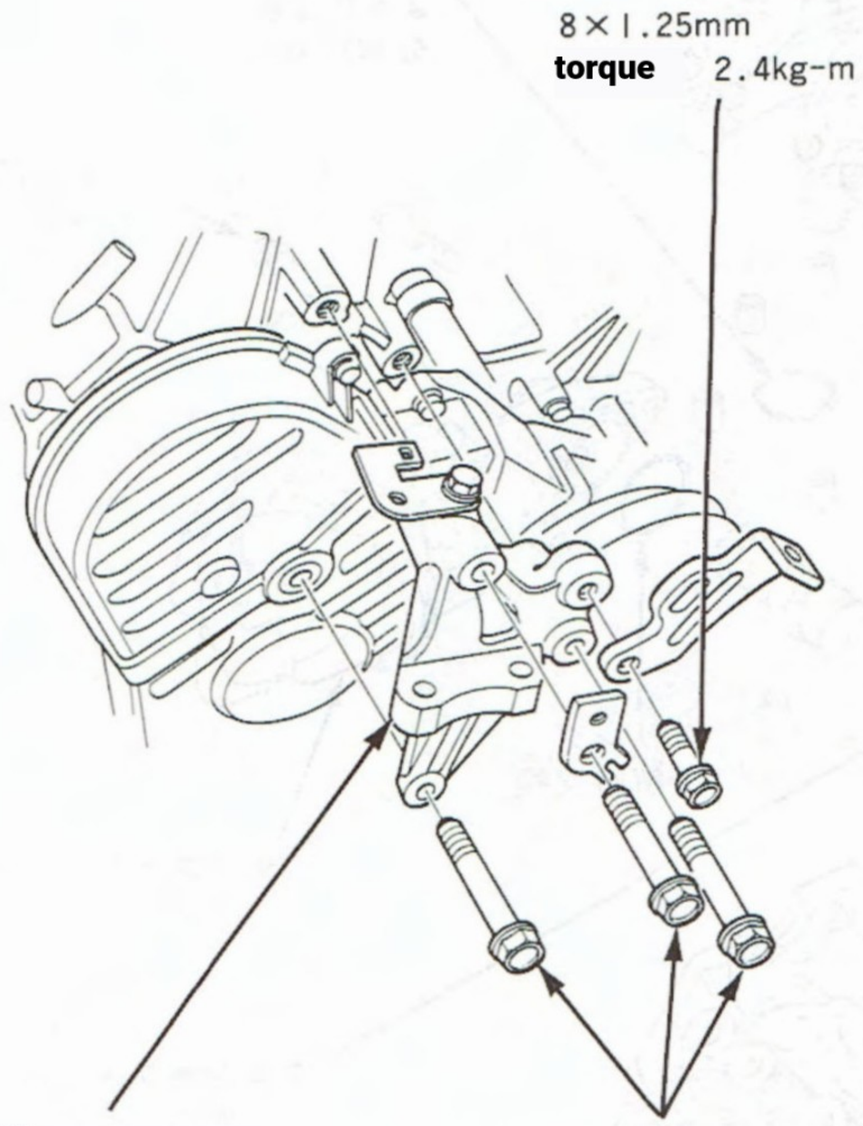
✻ - Align the slide wheel with the top dead center mark (T mark) before removing the cylinder head (page 2-6).

- When removing wires and hoses for each sensor, it is convenient to mark them so that they are not mistaken during assembly.

① Remove the spark plug cap.

② Remove the distributor cap and remove the ignition. Code Assy

③ Remove the engine left side mount bracket.



L. Side mount bracket

④ Remove the cylinder head cover.

⑤ Remove the timing belt upper cover.

⑥ Loosen the timing belt adjustment bolt 1/6 turn (60°) and remove the timing belt from the driven pulley.

*Fix the timing belt adjustment pulley on the slack side.

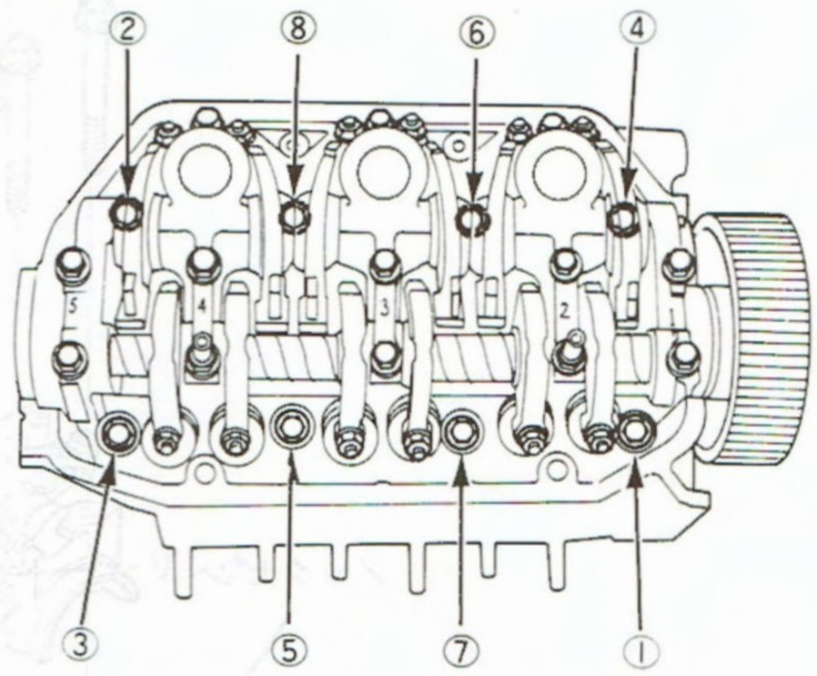
⑦ Remove the bypass hose from the IN manifold.

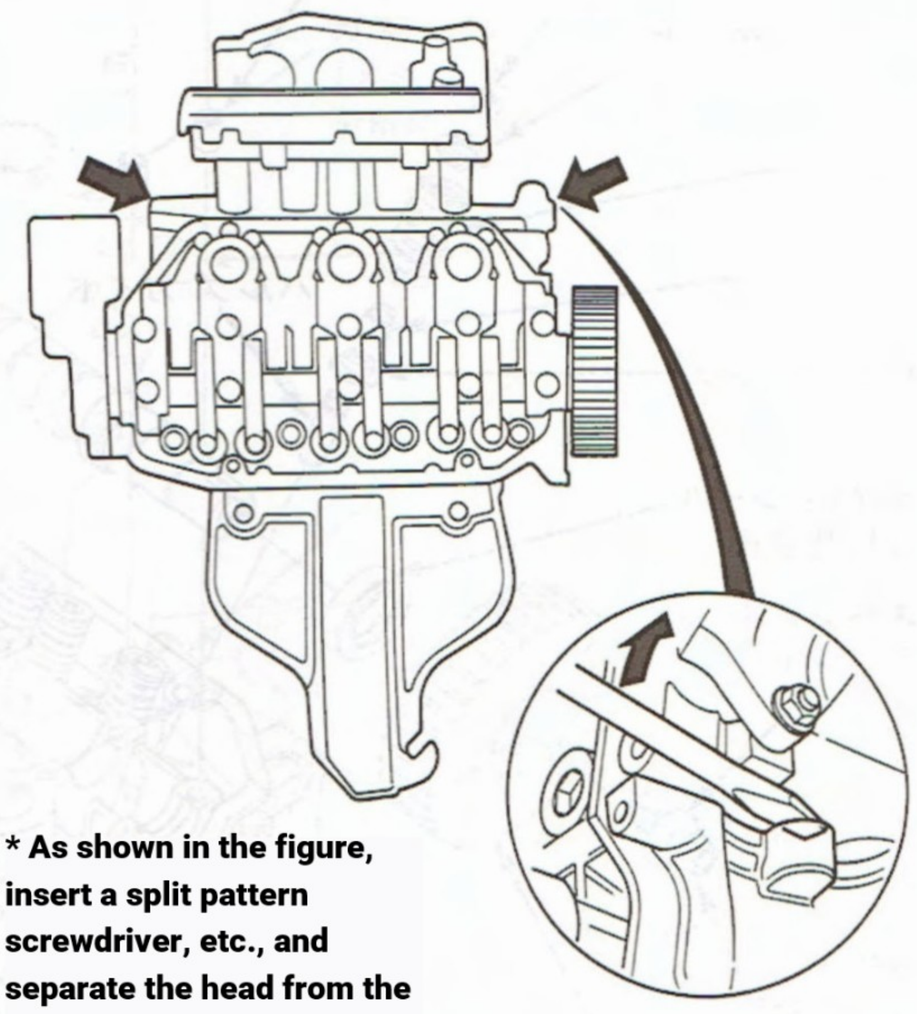
⑧ Remove the TW sensor and thermo unit coupler.

⑨ Remove the cylinder head bolts and remove the cylinder head.

CAUTION Do not loosen the cylinder head bolts all at once, but gradually loosen them diagonally from the outside.

Sequence for loosening cylinder head bolts





* As shown in the figure, insert a split pattern screwdriver, etc., and separate the head from the block.

⑩ Remove the intake manifold assembly from the cylinder head.

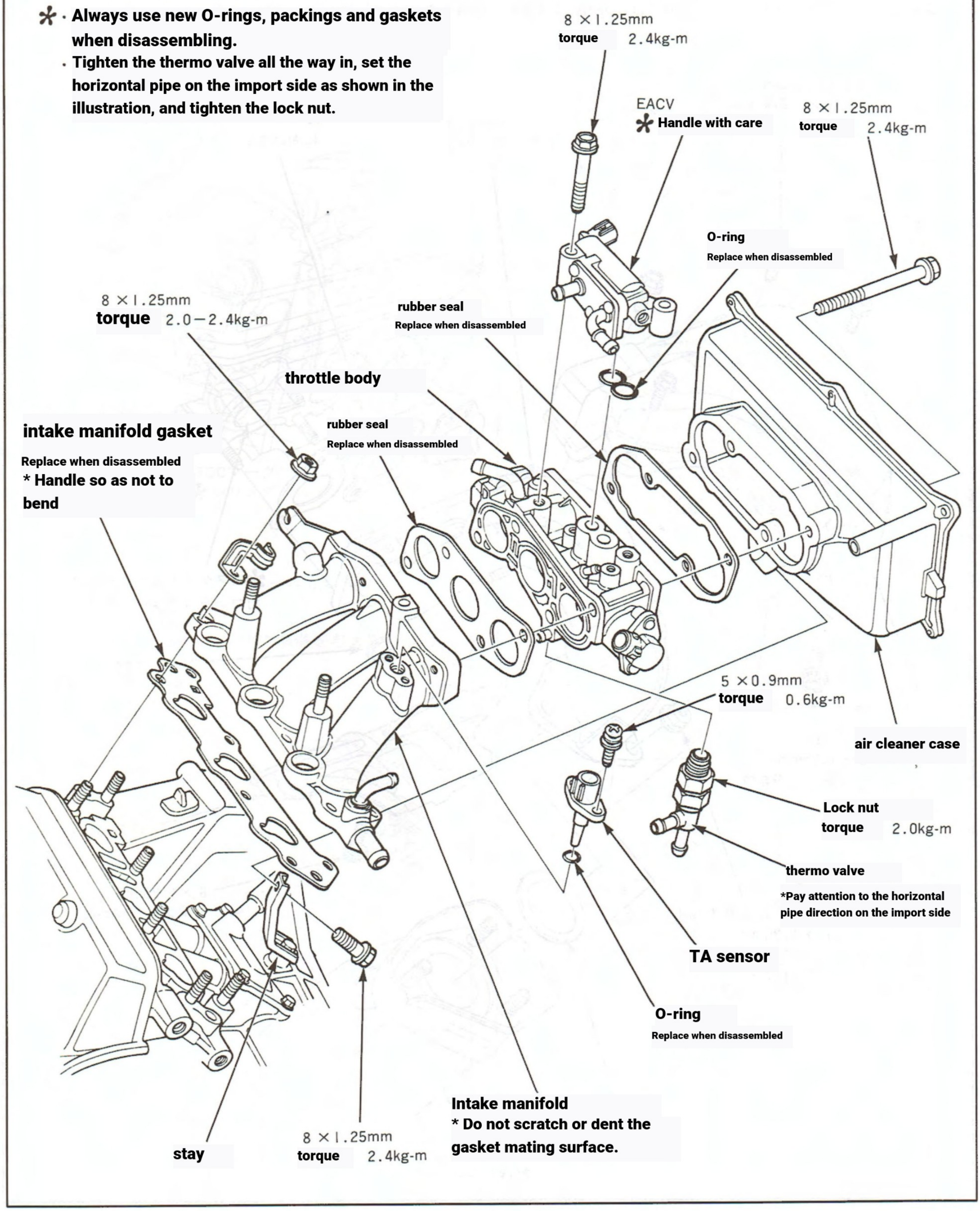
⑪ Remove the exhaust manifold from the cylinder head.

Intake manifold

exchange

✻ · **Always use new O-rings, packings and gaskets when disassembling.**

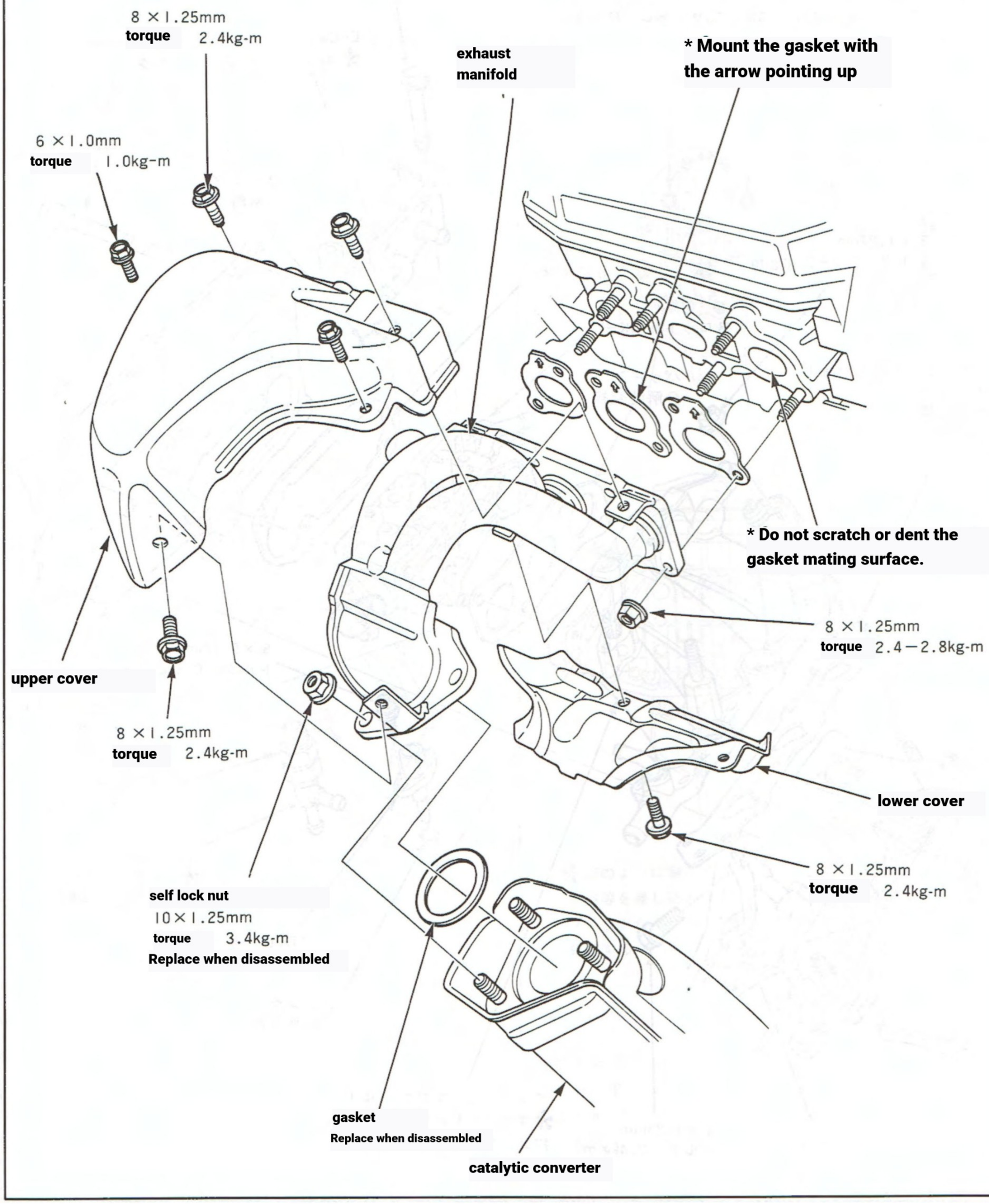
· **Tighten the thermo valve all the way in, set the horizontal pipe on the import side as shown in the illustration, and tighten the lock nut.**



exhaust manifold

exchange

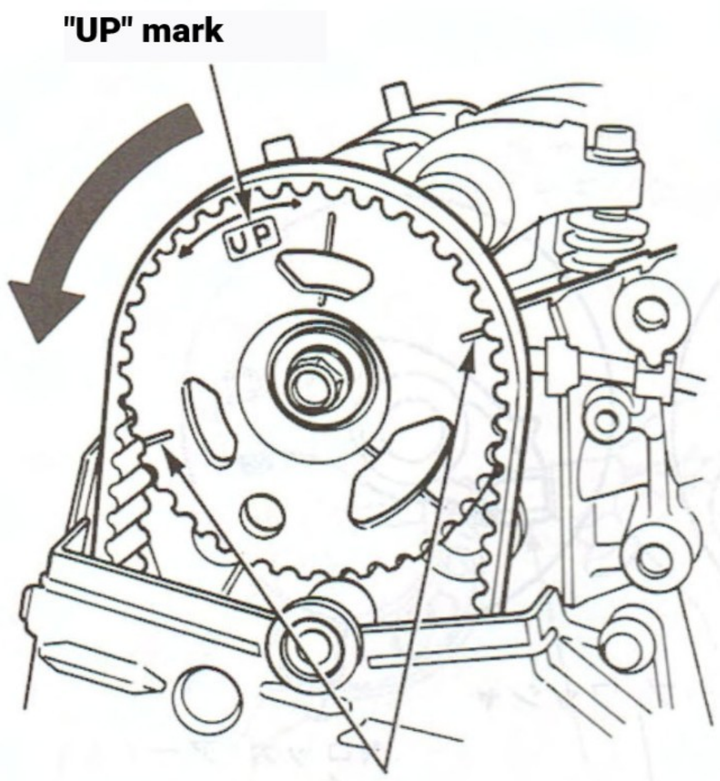
✻ Always use new self-locking nuts and gaskets when disassembling.



timing belt driven pulley

exchange

***Before removing the timing belt driven pulley, move No.1 cylinder to compression top dead center.**

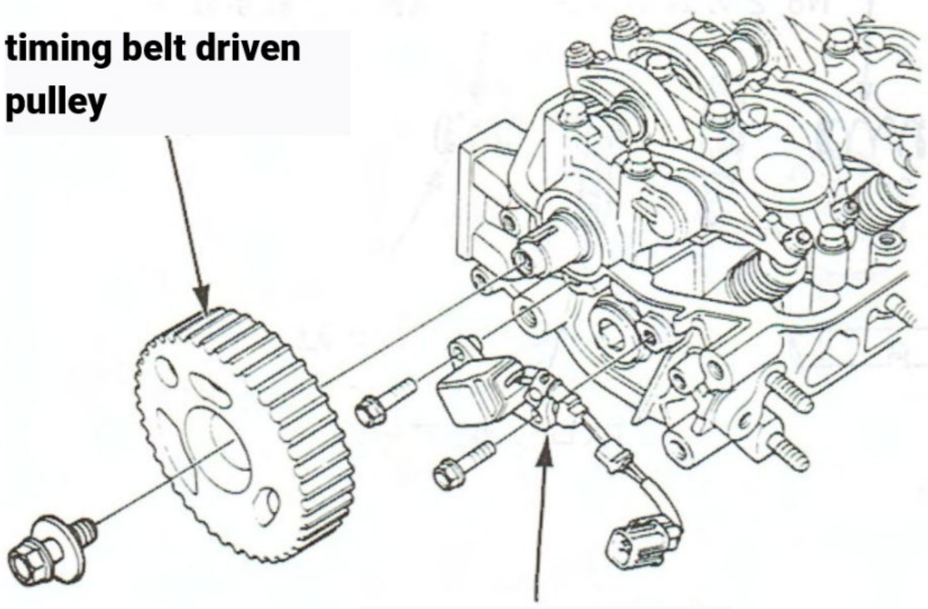


TDC mark

* Align with the top surface of the cylinder head

Remove the timing belt driven pulley and remove the cylinder discrimination sensor.

CAUTION Handle with care so as not to damage the cylinder discrimination sensor.



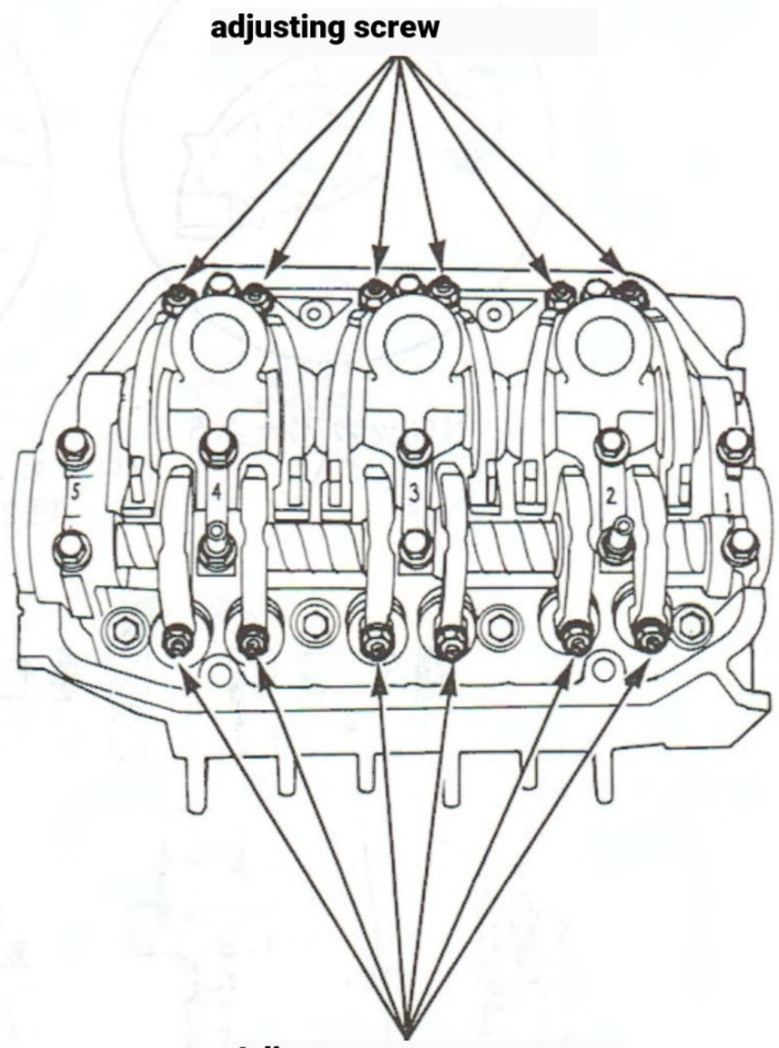
Rocker arm assembly.

Removal

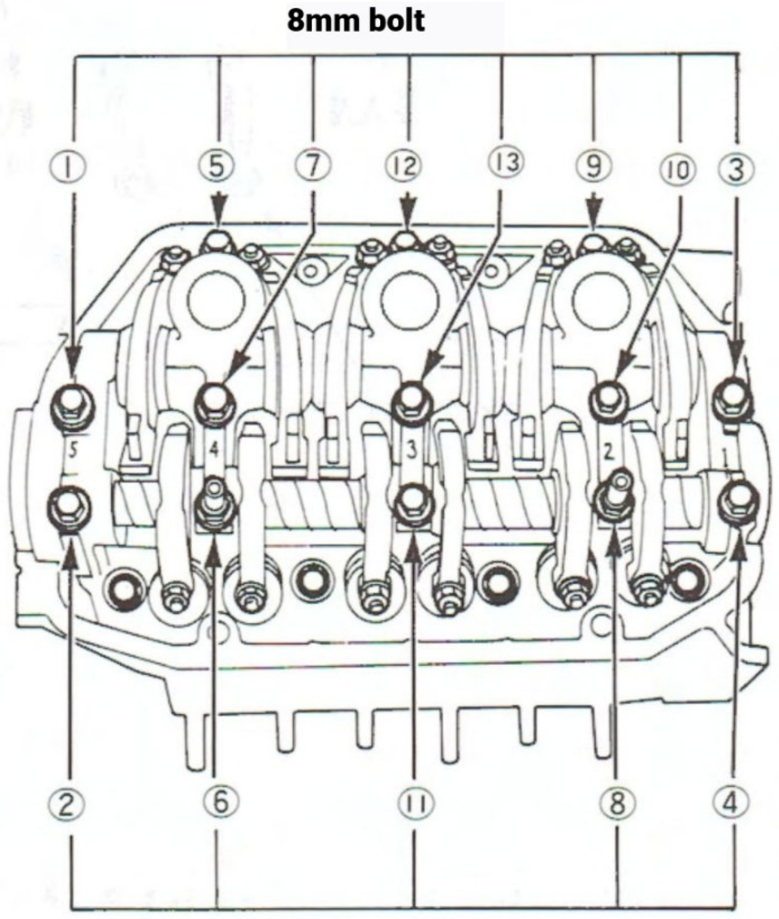
Loosen the adjustment screw and remove the rocker arm assembly.

Note

- **Before removing, check the installation position of each part, and install them in the same position when installing.**
- **Do not loosen the mounting bolts all at once, but loosen them in steps from the outside to the inside.**
- **Leave the bolt in and remove it from the head.**



Adjust screw

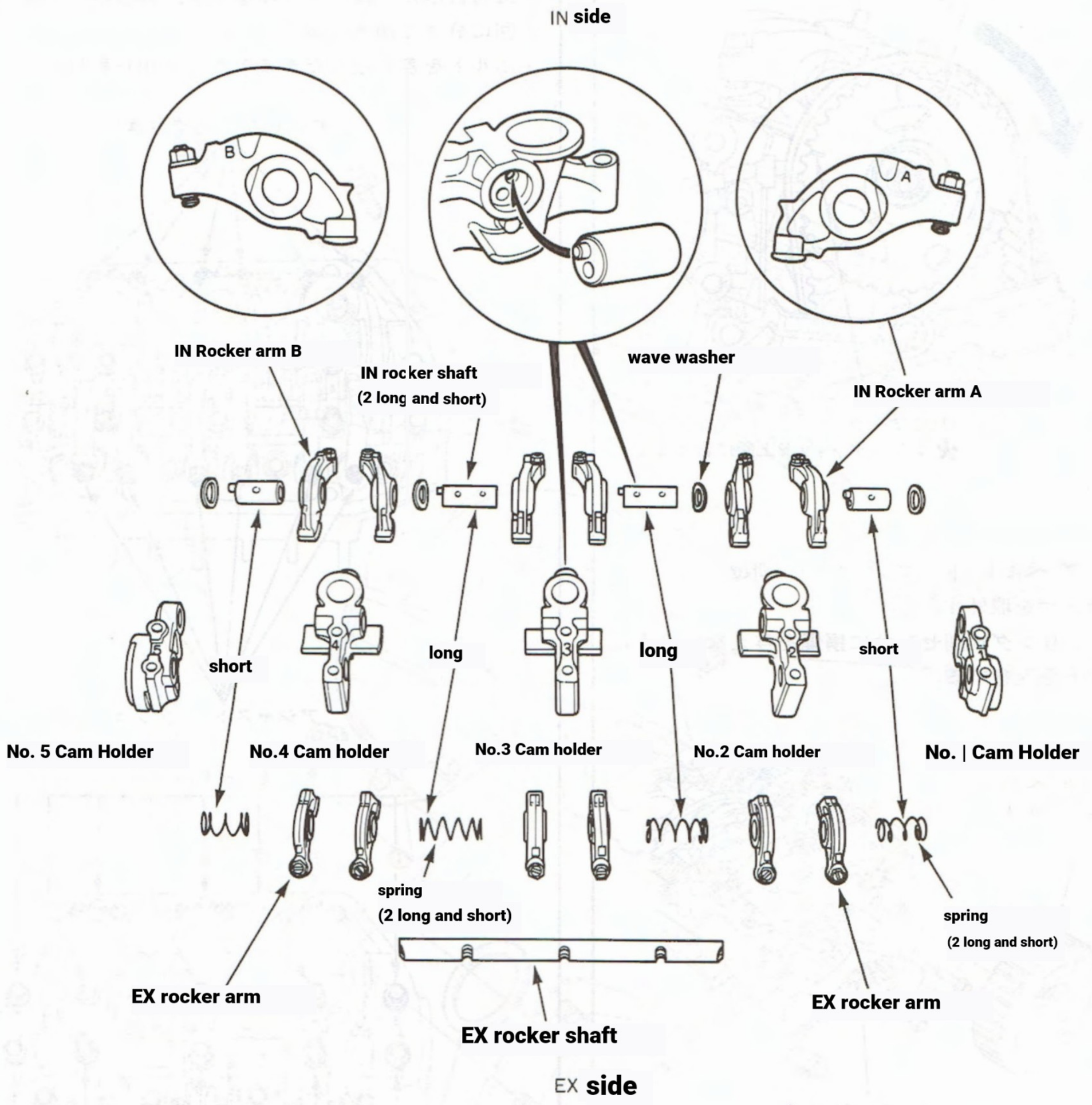


8mm bolt

Rocker arm assembly.

-Disassembly

CAUTION Before disassembling, check the mounting position of each part, and mount them in the same position when reassembling.



* When removing the rocker arm assembly from the head or installing it on the head, insert the bolt into the camshaft holder.

inspection

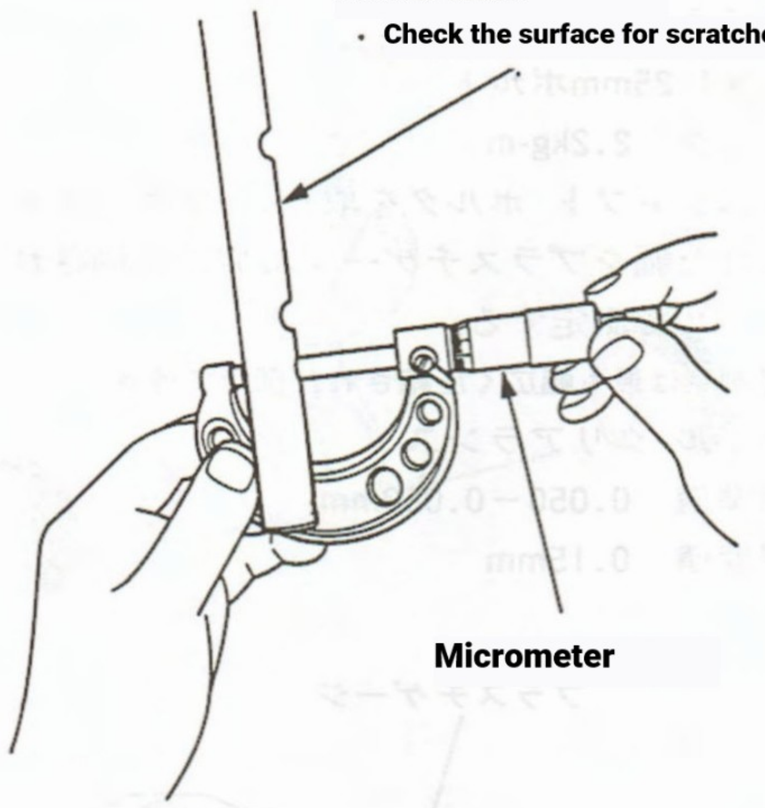
. **Measurements are taken on each intake and exhaust rocker shaft and rocker arm.**

① **Measure the outer diameter of the rocker shaft.**

- Measure the rotating part of the rocker arm.
- Inspect rotating parts for damage.

rocker shaft

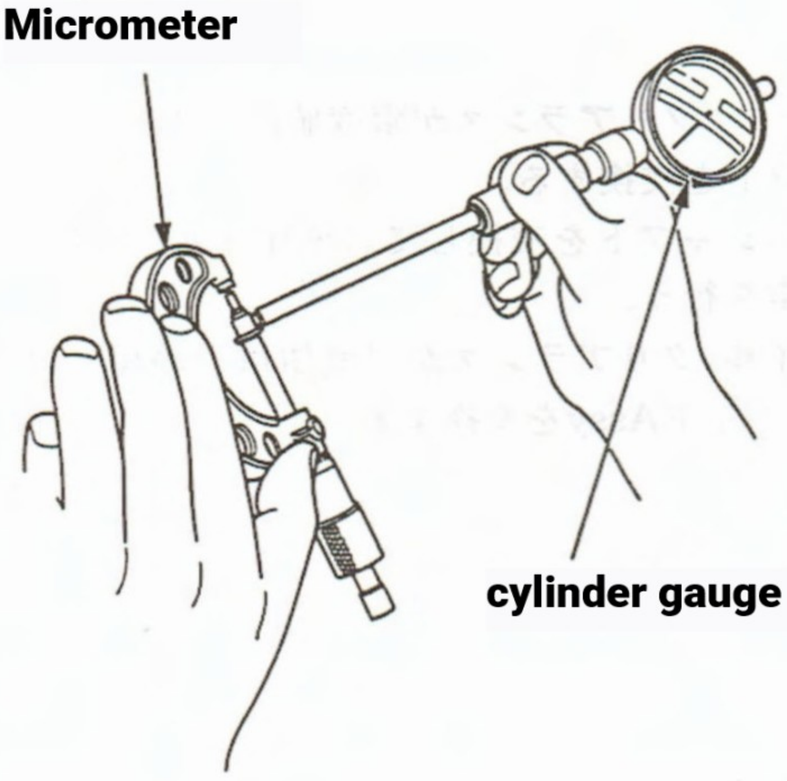
- Check the surface for scratches



Micrometer

② **Set the cylinder gauge to the outer diameter of the rocker shaft.**

Micrometer



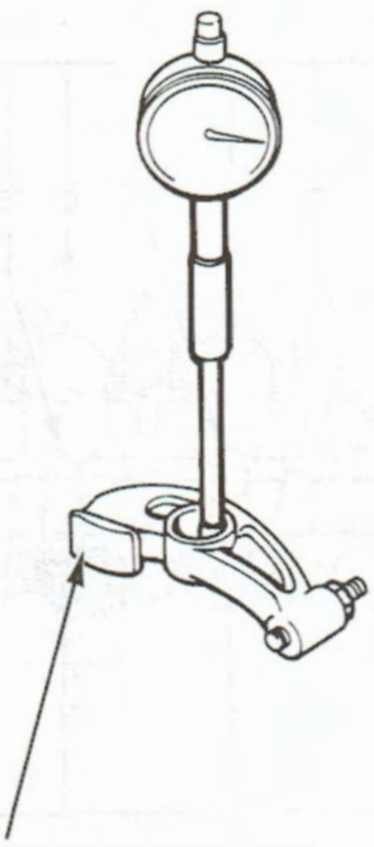
cylinder gauge

③ **Measure the rocker arm and inner diameter.**

④ **Inspect the contact surface of the camshaft for wear and damage.**

Clearance between rocker arm and shaft

limit ③—①＝0.08mm



- Check the contact surface of the cam

. **All rocker arms should be inspected.**
—**If it exceeds the limit, replace the rocker arm or shaft.**

camshaft

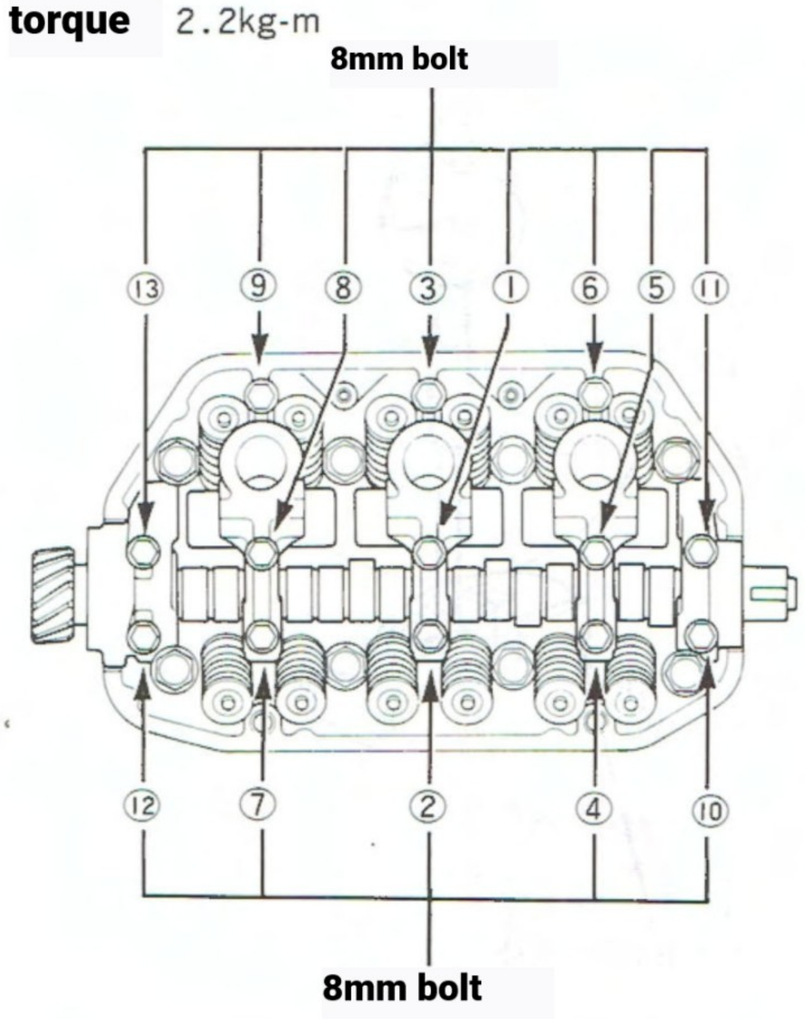
- inspection

①Place the camshaft on the cylinder head, install the camshaft holder and tighten to the specified torque.

Note Tightening should be done evenly in several steps from the center to the outside.

8 ×1.25mm

torque 2.2kg-m

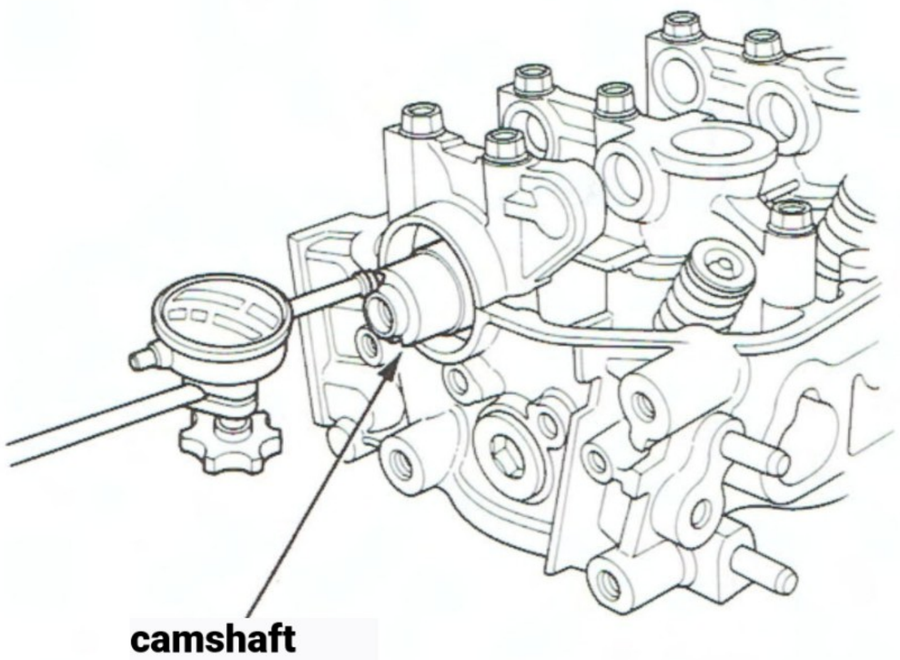


②Check the axial play of the camshaft.

Axial play of the camshaft

Standard value : 0.05—0.15mm

limit : 0.50mm



③Remove the camshaft holder and inspect the camshaft oil clearance.

④Cut a plastigauge to the axial length of the journal and place it on each journal portion of the camshaft.

⑤Install the camshaft holder and tighten it to the specified torque.

Note Tightening should be done evenly in several steps from the center to the outside.

8 ×1.25mmボルト

torque 2.2kg-m

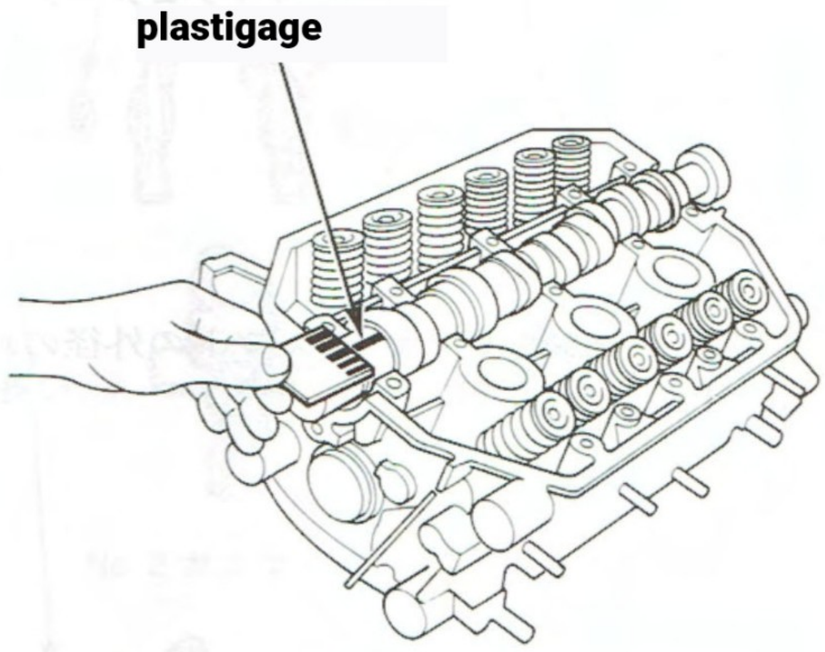
Remove the camshaft holder and measure the collapsed width of the plastigauge using the scale printed on the plastigage bag.

✻Measurements are taken at the point of widest compression.

oil clearance

Standard value 0.050—0.089mm

limit 0.15mm



⑥If the oil clearance exceeds the limit, replace the camshaft.

⑦Replace the camshaft and measure the oil clearance again.

⑧If the oil clearance exceeds the limit, replace the cylinder head assembly.

⑨ Check camshaft for bend.

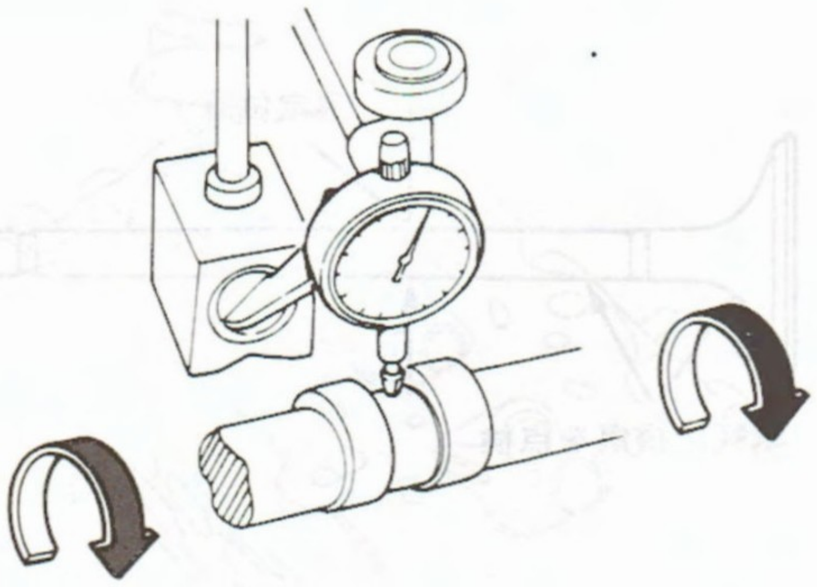
✻ · The journals on both ends are supported by V-blocks.

· Measure while rotating the camshaft.

camshaft runout

Standard value 0.015mm

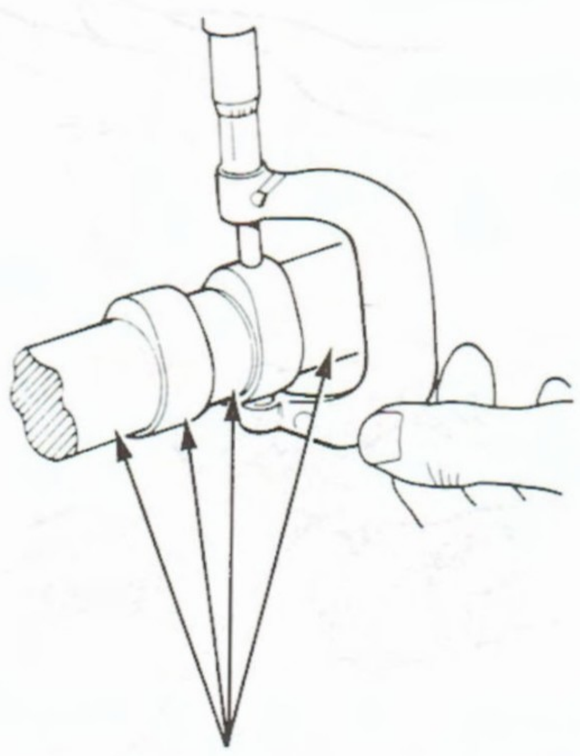
limit 0.030mm



⑩ Check the wear of the cam surface of the cam shaft. Cam height

Intake standard value 35.733mm

Exhaust standard value 34.568mm



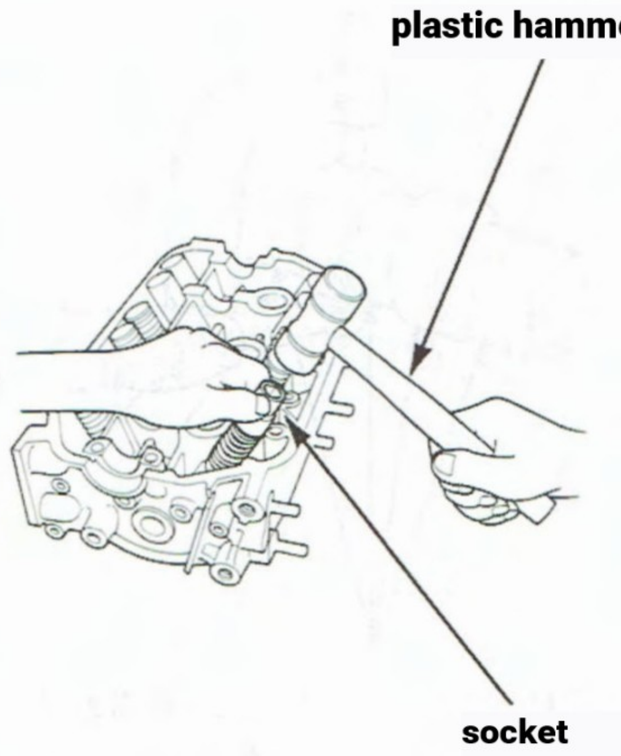
Check for wear and damage, and replace the camshaft if any abnormality is found.

Remove and inspect

CAUTION Prior to disassembly, mark the valves, springs, and other related parts for each cylinder, store them in an organized manner, and install them in the same position when reassembling.

① **Using a socket that matches the diameter of the valve retainer, lightly tap the retainer to remove the cotter from the retainer.**

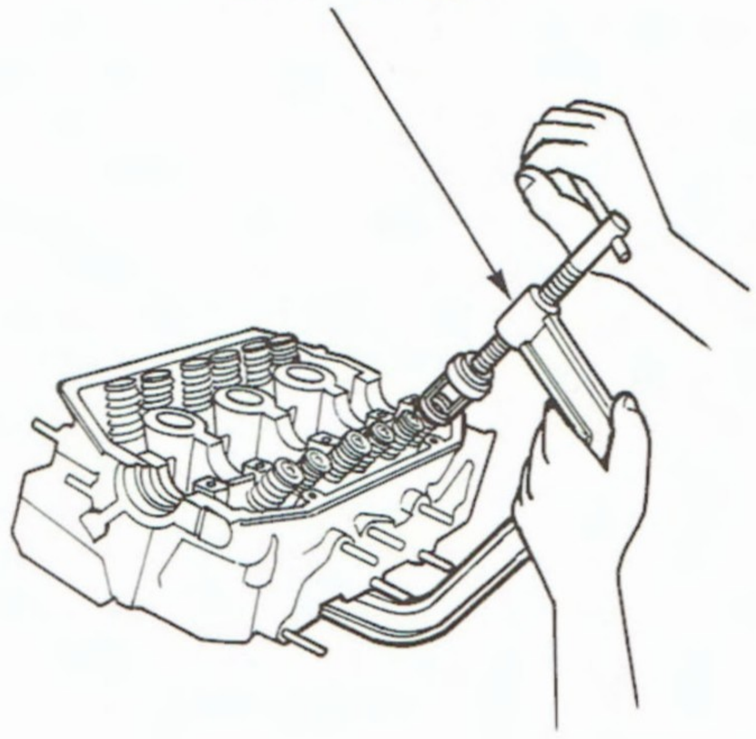
CAUTION At this time, hit the valve stem end vertically, and be careful not to bend the valve.



② **Attach the special tool and remove the valve cotter.**

専用工具

valve spring compressor
07757—0010000

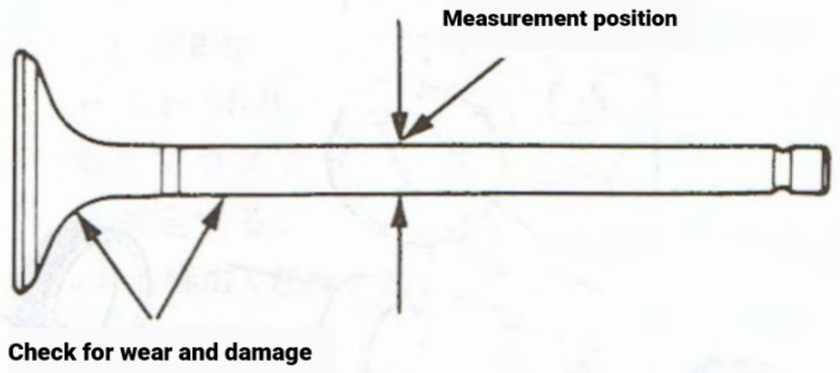


③ **Remove the special tool to remove the valve retainer spring and valve.**

④ **Check the valve stem outer diameter.**

IN valve stem outer diameter

Standard value	5.48—5.49mm
limit	5.45mm



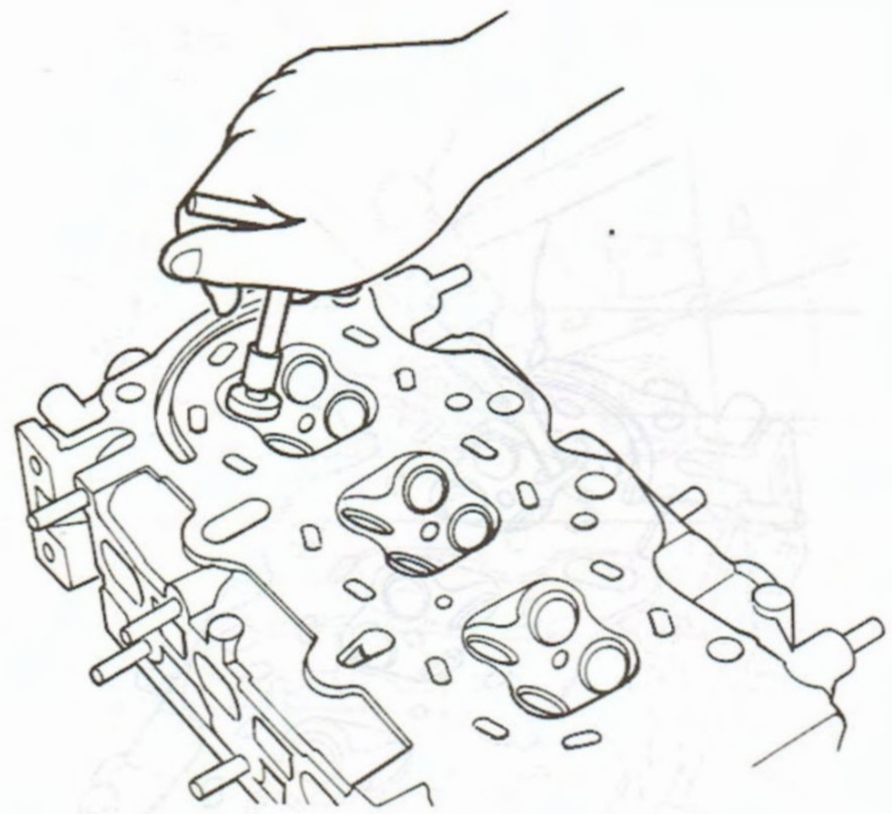
EX valve stem outer diameter

Standard value	5.45—5.46mm
limit	5.42mm

valve seat

fix

- If the contact width of the valve seat is uneven or exceeds the limit, correct it with a valve seat cutter.
- **Refer to the instruction manual for the valve seat cutter for how to correct it.**



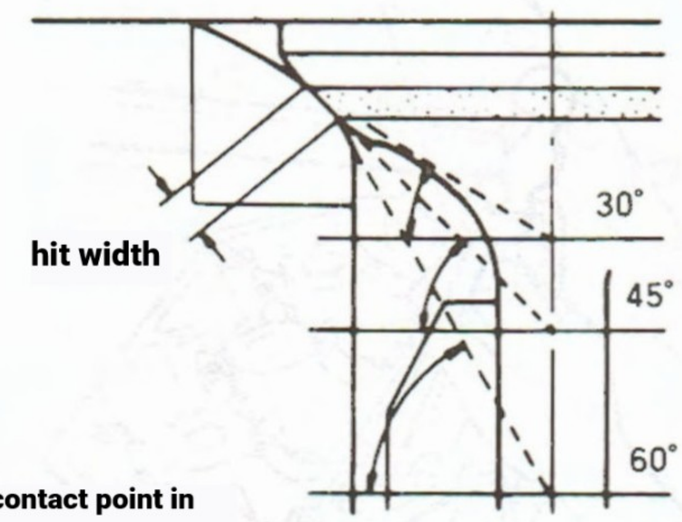
Contact width of valve seat

intake

Standard value	0.85 — 1.15mm
limit	1.60mm

Exhaust

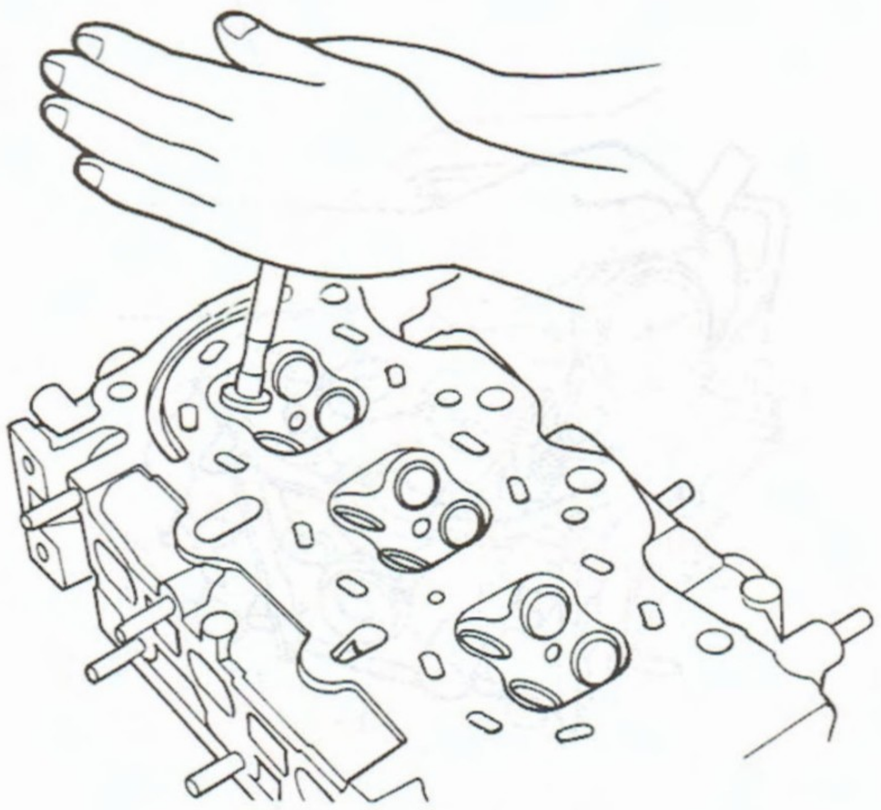
Standard value	1.05 — 1.35mm
limit	1.80mm



hit width

*Place the contact point in the center of the valve and seat.

- After adjusting the valve seat to the proper contact width, if necessary, apply a compound evenly to the valve face surface, rub it with a valve trumpet, and check the contact with Komyotan.
- **Be careful not to let the compound get into the stem and valve guide during the rubbing process.**



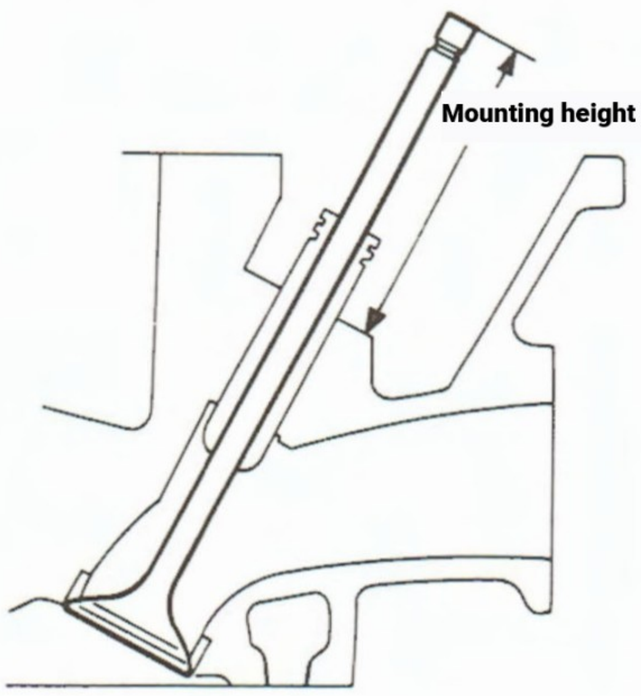
Check the valve seat for sinking.

IN valve mounting height

Standard value	45.76 — 46.24mm
limit	46.49mm

EX valve mounting height

Standard value	43.26 — 43.74mm
limit	43.99mm



valve guide

Valve guide and valve stem clearance check

IN valve guide and valve stem clearance

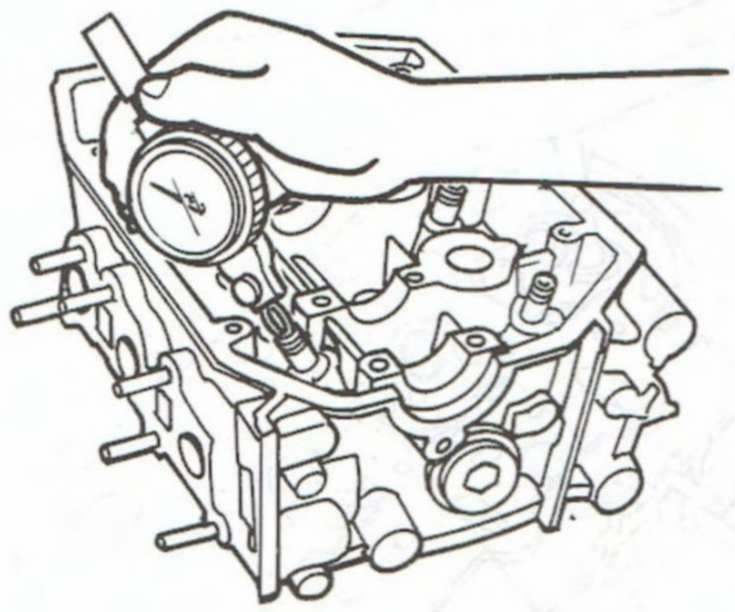
Standard value 0.02—0.05mm

limit 0.08mm

EX valve guide and valve stem clearance

Standard value 0.05—0.08mm

limit 0.11mm



IN valve guide inner diameter

Standard value 5.51—5.53mm

limit 5.55mm

EX valve guide inner diameter

Standard value 5.51—5.53mm

limit 5.55mm

—**If the value exceeds the limit, replace the valve and valve guide as a set.**

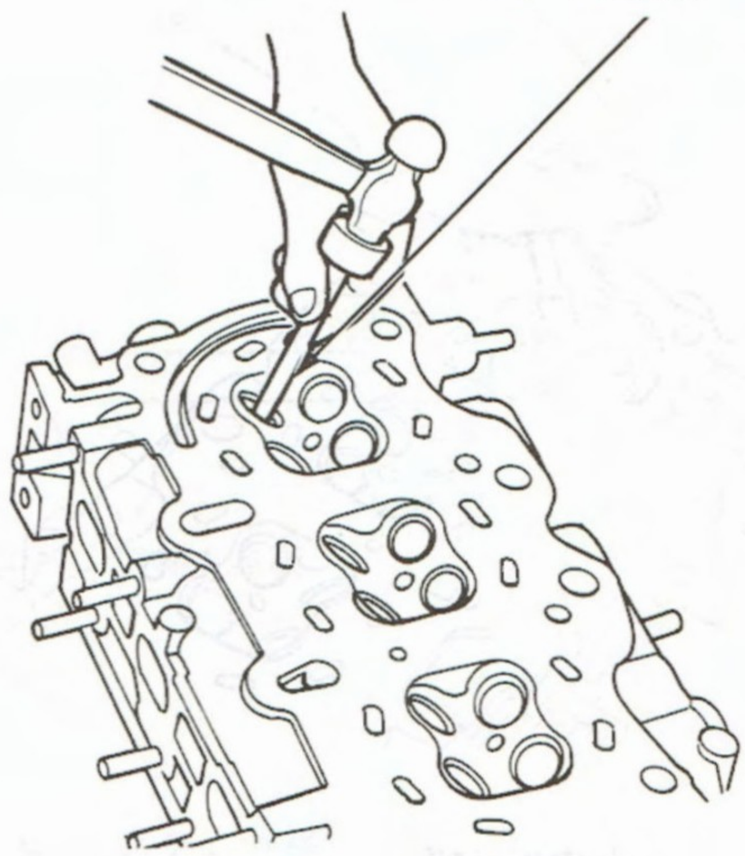
exchange

Caution Always punch the valve guide from the combustion chamber side.

専用工具

valve guide driver

07742—0010100



Valve guide protrusion length

intake 16.0mm

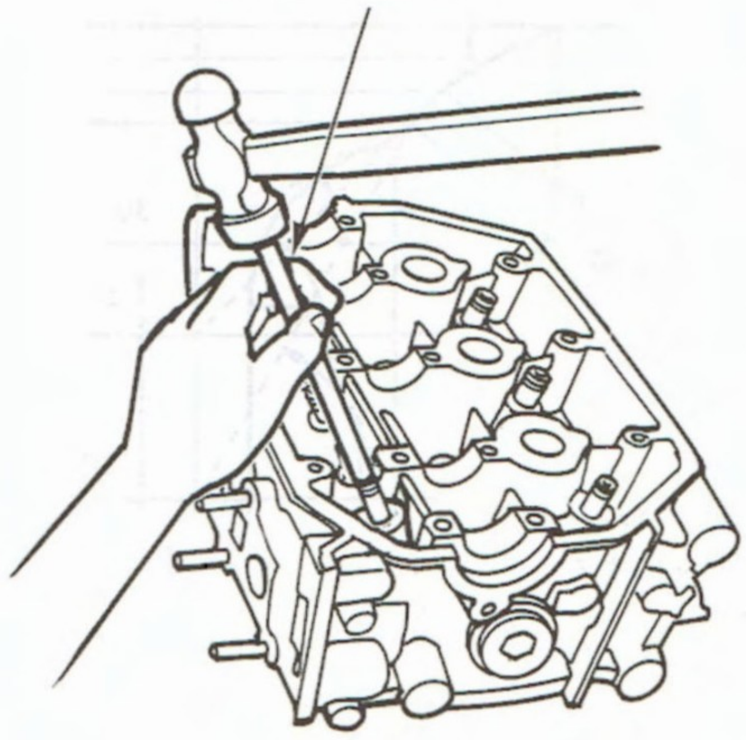
Exhaust 16.0mm

***When driving the valve guide, measure the length of protrusion and perform it in 2 to 3 steps to set the length of protrusion accurately.**

専用工具

valve guide driver

07742—0010100



CAUTION After driving the valve guide, be sure to correct the reamer.

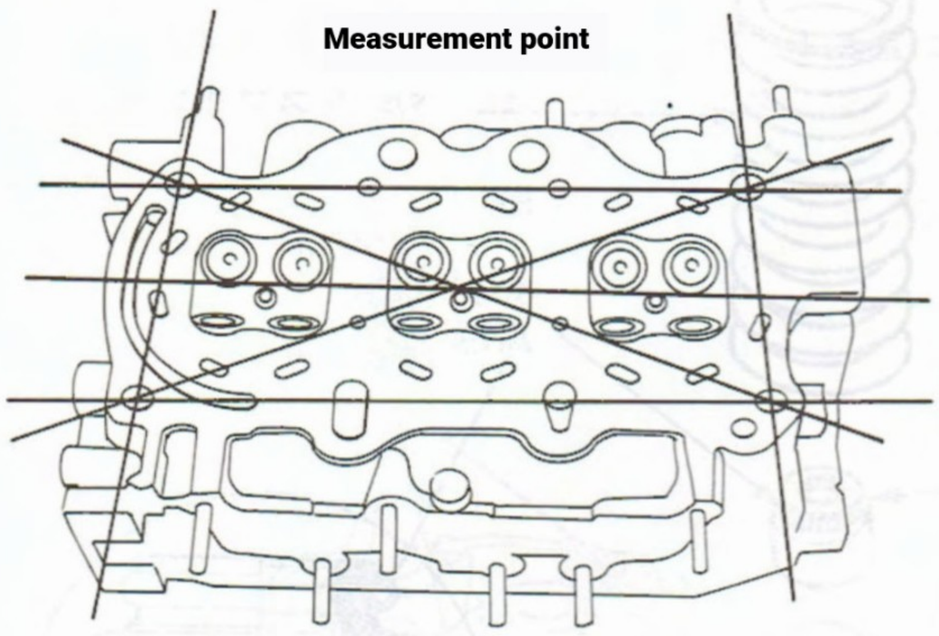
cylinder head

inspection

CAUTION Take care not to scratch or dent the mating surface of the cylinder head gasket.

Distortion of the mating surfaces of the cylinder head and cylinder block

limit 0.05mm

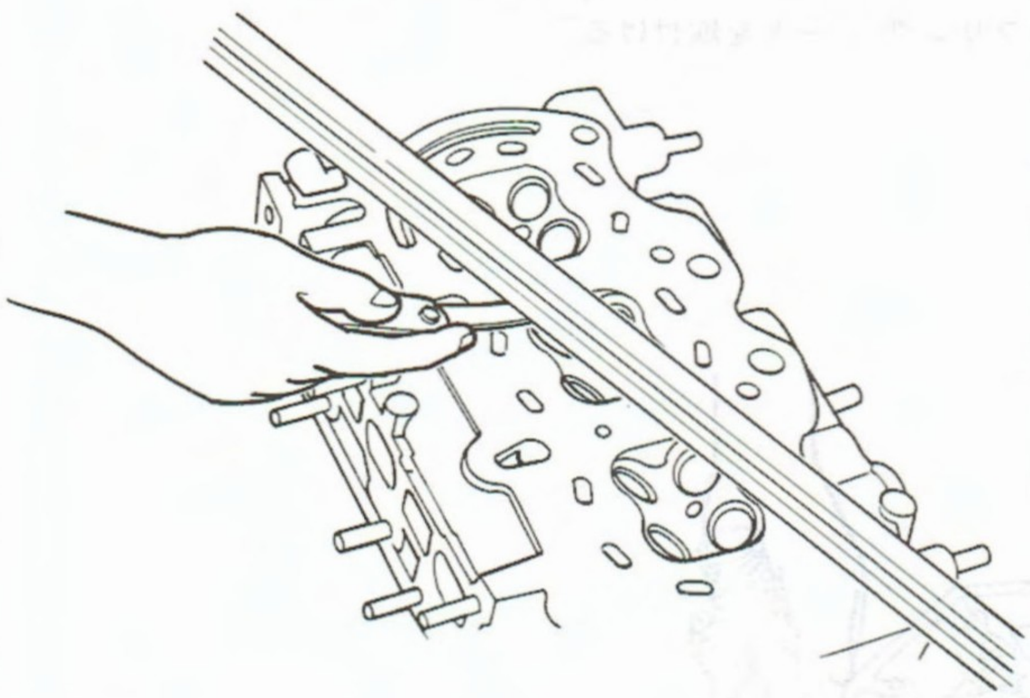


If the limit value is exceeded, correct it.

However, this must be done within the height limits of the cylinder head.

height of cylinder head

Standard value 94.25—94.35mm



How to fix

The surface plate is coated with Komyotan, the distorted parts are clarified, and the distorted parts are polished with a fine-grained oil stone while rotating them in a figure-eight shape, or corrected by machining.

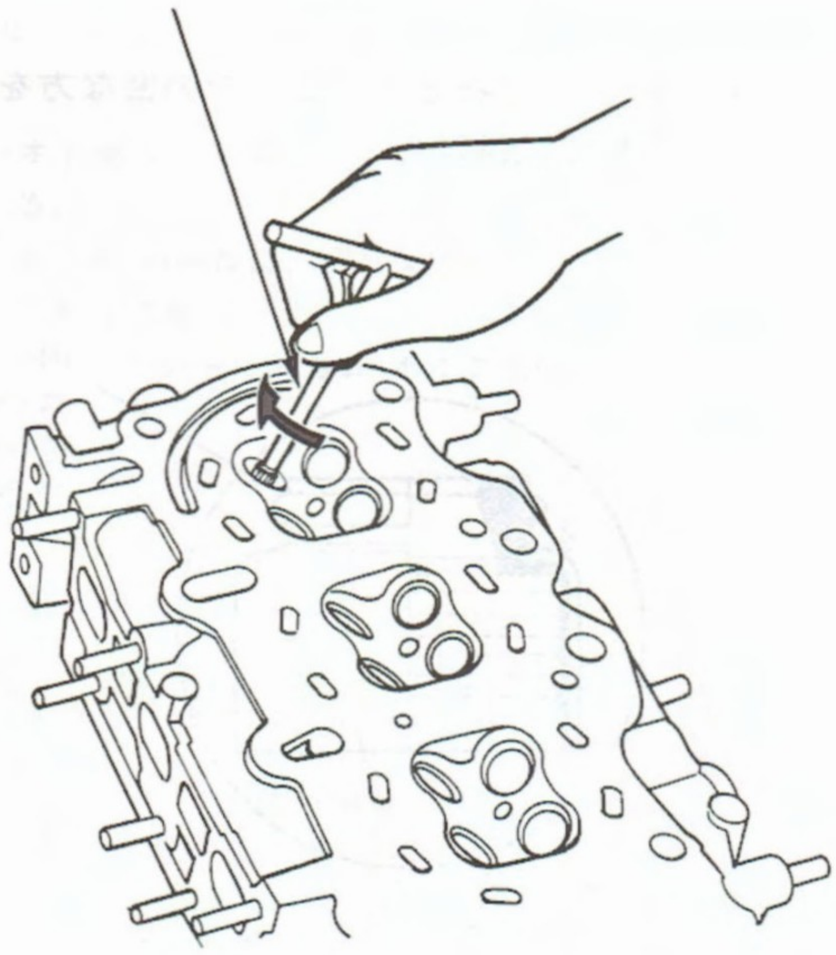
reaming

CAUTION Rotate the reamer in the right direction only. Do not insert or pull out the reamer while it is stopped. See page 3-16 for measuring the clearance between the valve guide and the stem.

専用工具

valve guide reamer

07HAH—PJ70100



VALVE STEM SEAL, SPRING

Mounting

CAUTION Be careful not to assemble the valve springs and stem seals incorrectly, as their IN and EX are different (identify the valve springs by the color of the paint, and the stem seals by the color of the spring).

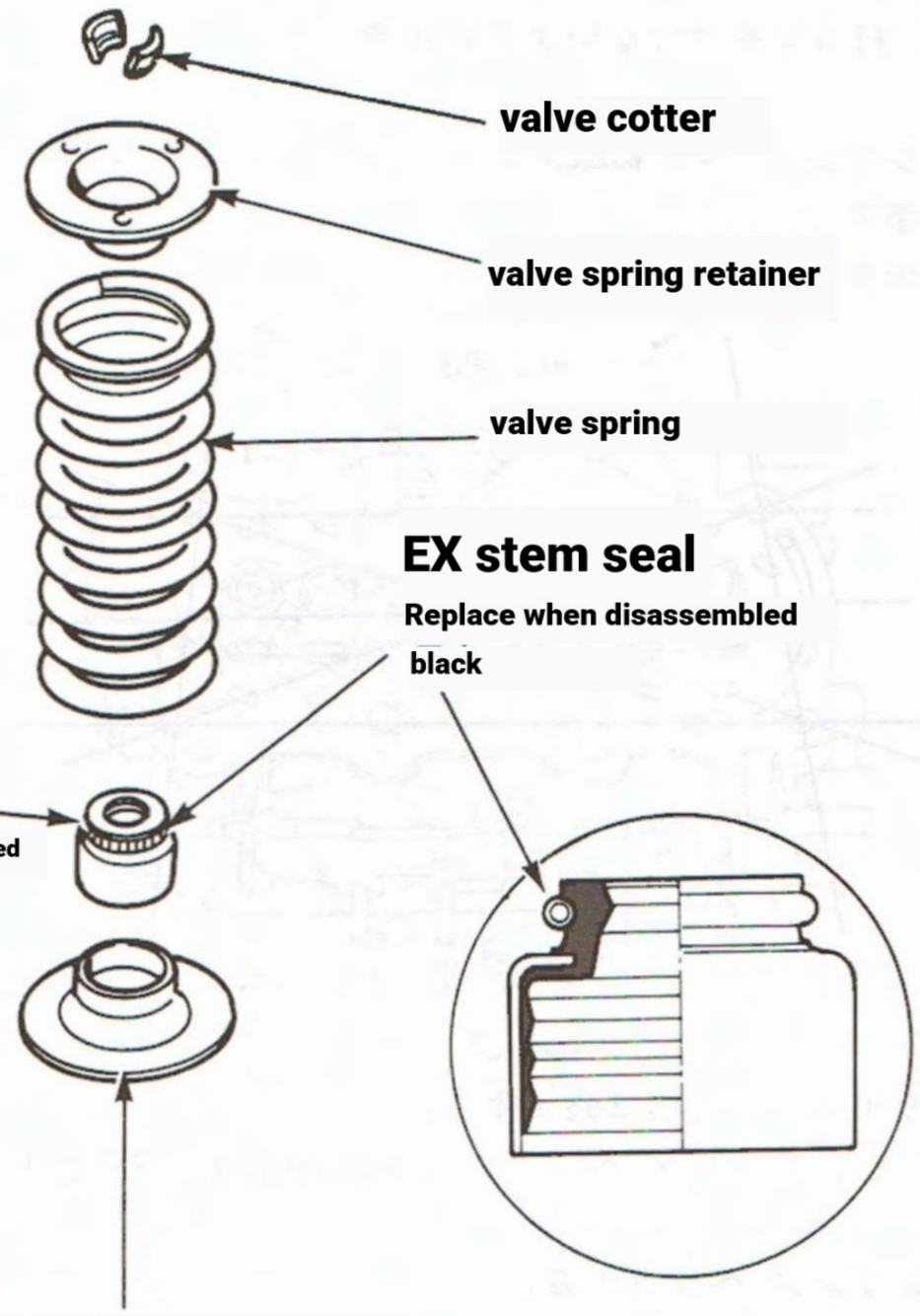
- valve spring color

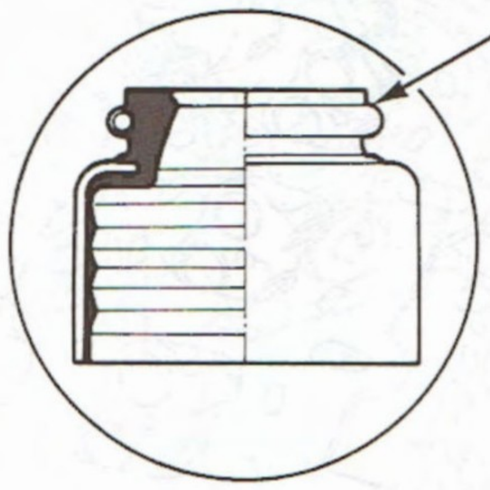
  (Painted on the coarser pitch)

  intake blue

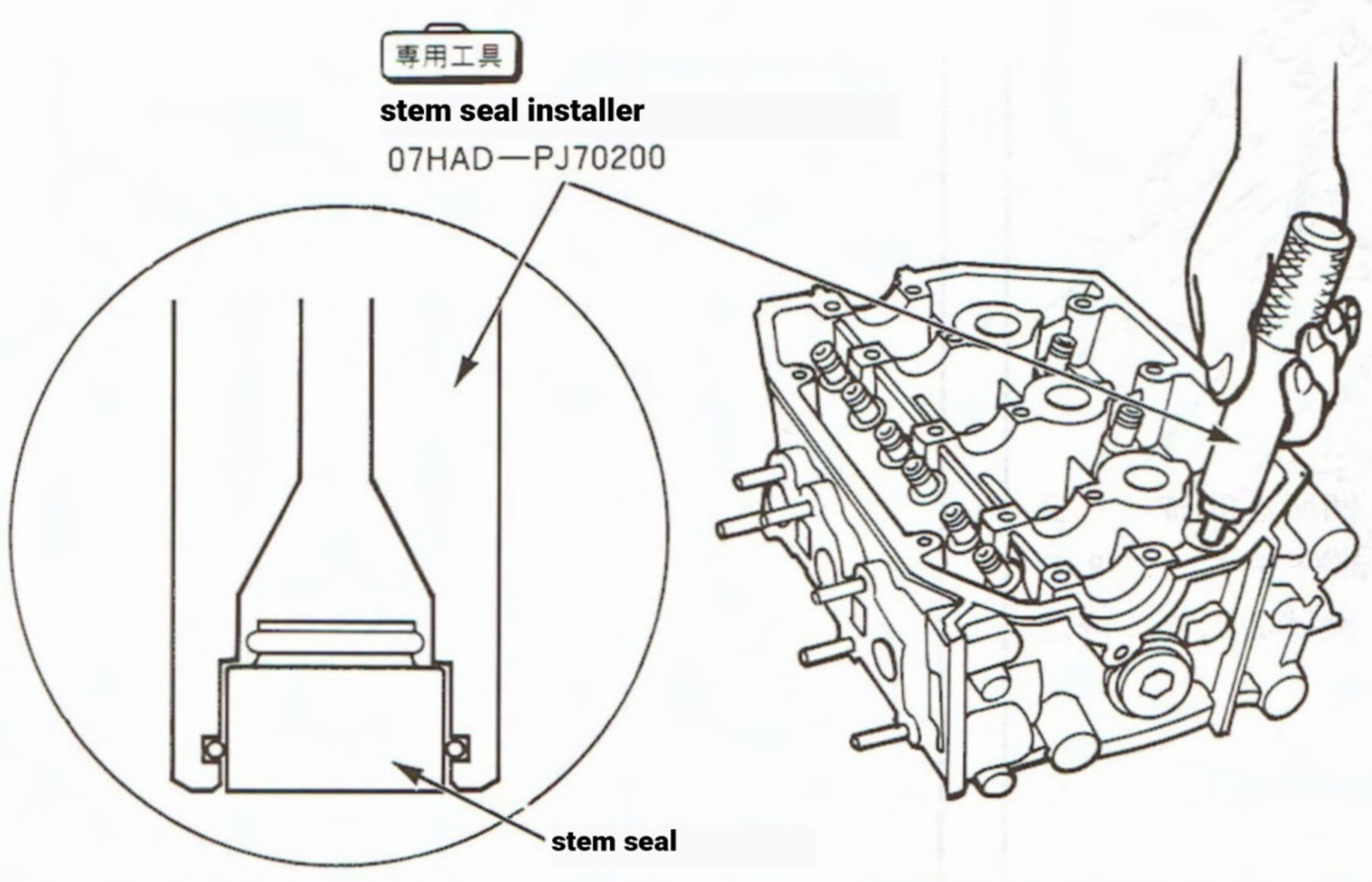
  exhaust yellow

Note: Since the pitch is unequal, the side with the denser pitch should be installed on the valve seat side.





- Insert the stem seal into the special tool and push it into the valve guide by hand.
- Press vertically against the valve guide.

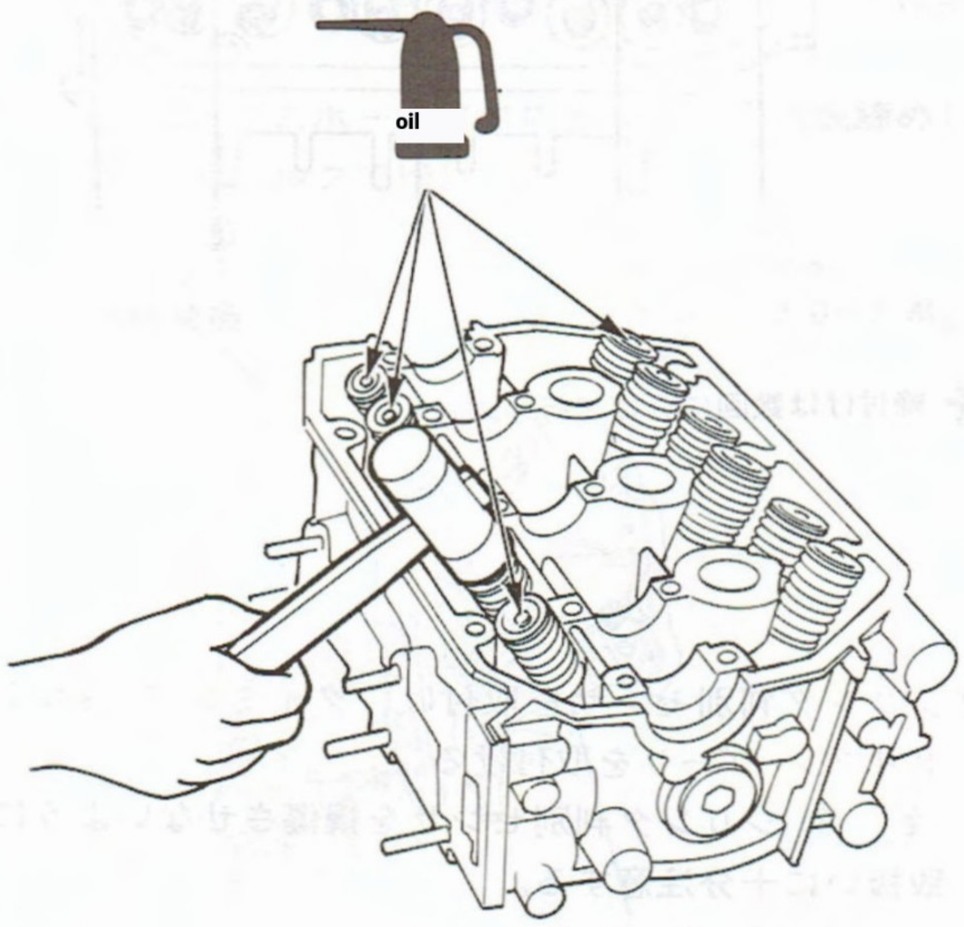


Valve installation

CAUTION When assembling the valve, apply oil to the stem, insert it into the guide, and check that it moves up and down lightly before assembling the spring.

***After installing the valve, lightly tap the end of the valve stem with a plastic hammer 2-3 times to make the valve and cotter fit together better.**

Note: At this time, strike the valve stem end perpendicularly, and be careful not to bend the valve.



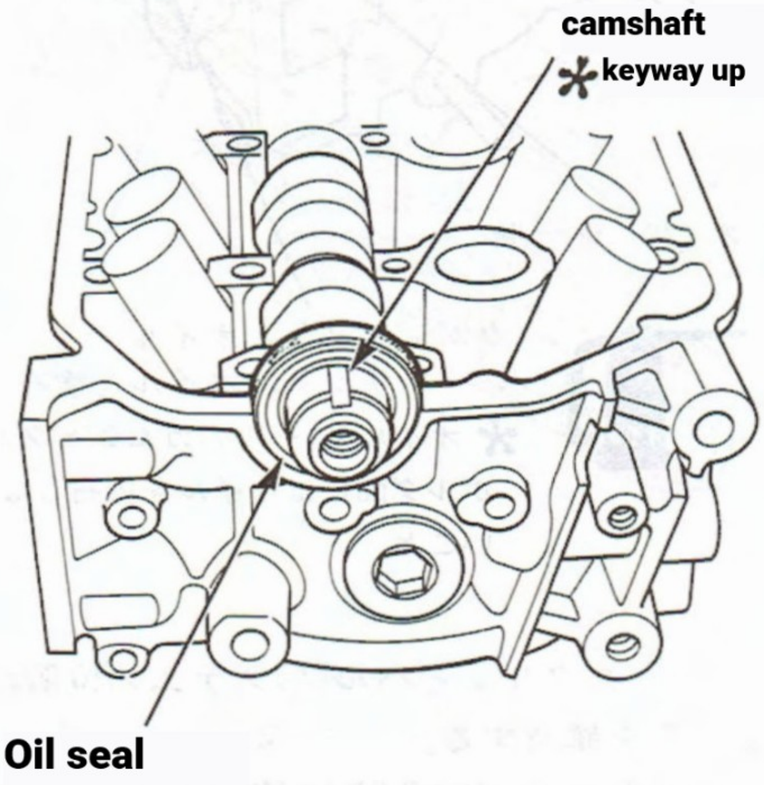
Rocker arm assembly, camshaft oil seal

Mounting

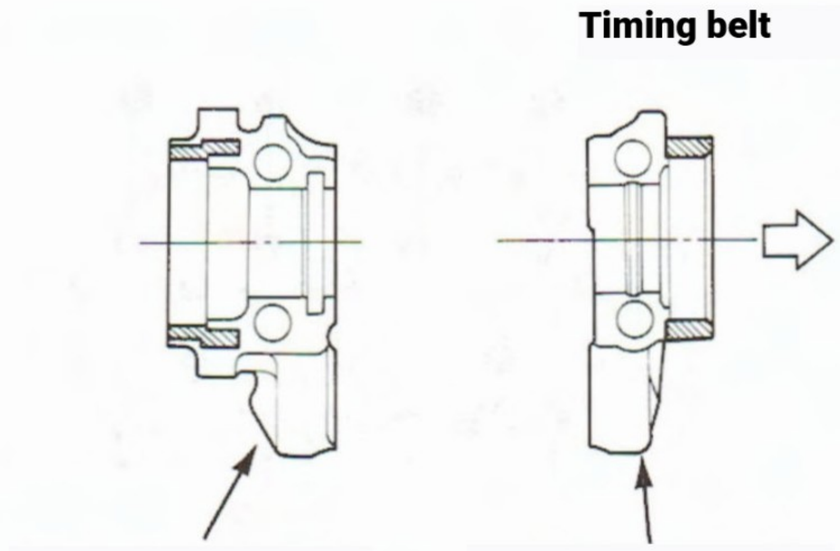
* · **Before installing the rocker arm assembly, loosen the rocker arm adjusting screw and lock nut, and pull up the adjusting screw.**
· **Install the rocker arm assembly while leaving the bolt in the camshaft holder.**
· **Keep the keyway of the camshaft facing up (No.1 cylinder should be at compression top dead center).**

① Install the camshaft and camshaft oil seal to the cylinder head.

* · **Install the oil seal with the spring side inside.**
· **Install the oil seal in the correct position so that it does not fall over.**
· **Do not apply oil to the cam holder surface of the oil seal.**



② Apply Honda genuine liquid packing 1216 to the head mating surfaces of the No.1 and No.5 camshaft holders, and install the rocker arm assembly.

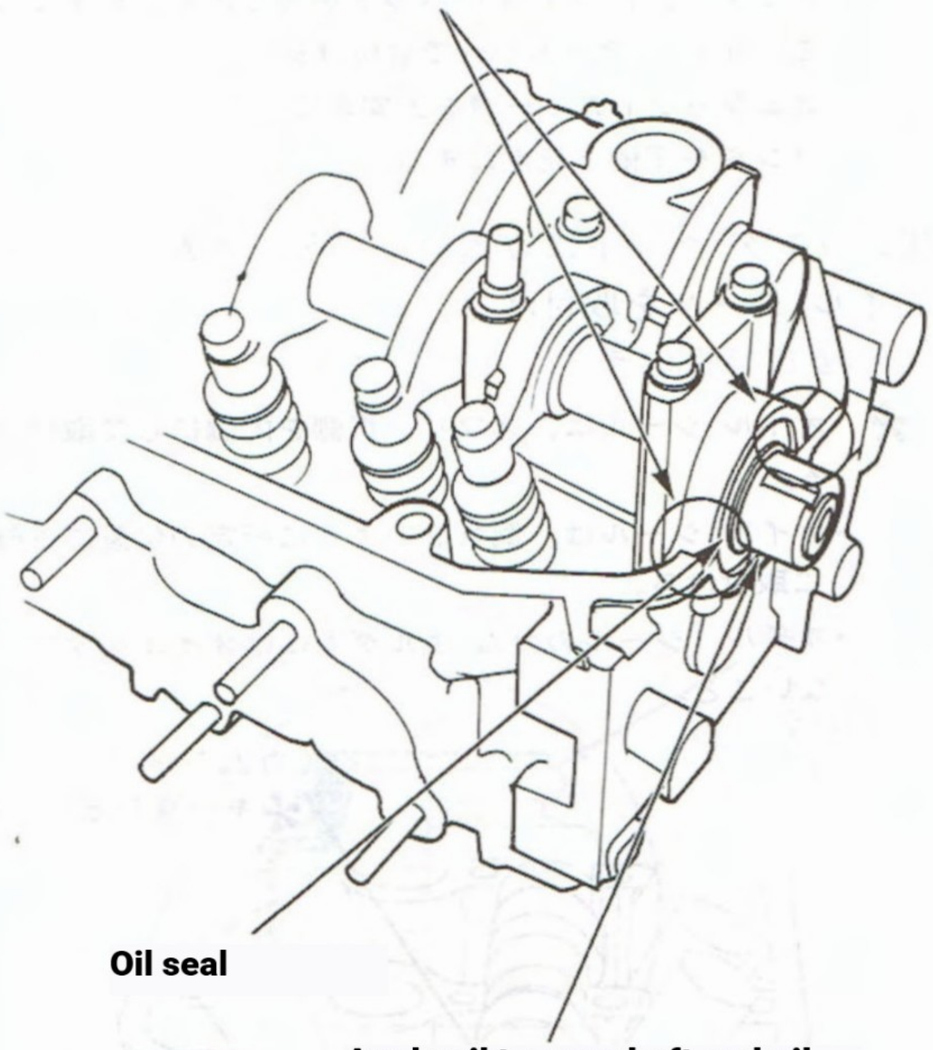


Rocker arm assembly, camshaft oil seal

-Installation

③ **Temporarily tighten the camshaft holder diagonally.**

✻ **Apply Honda genuine liquid packing 1216**



Oil seal

Apply oil to camshaft and oil seal lip

*** Do not apply oil to the camshaft holder surface of the oil seal.**

④ **Make sure the adjustment screw and valve stem are aligned.**

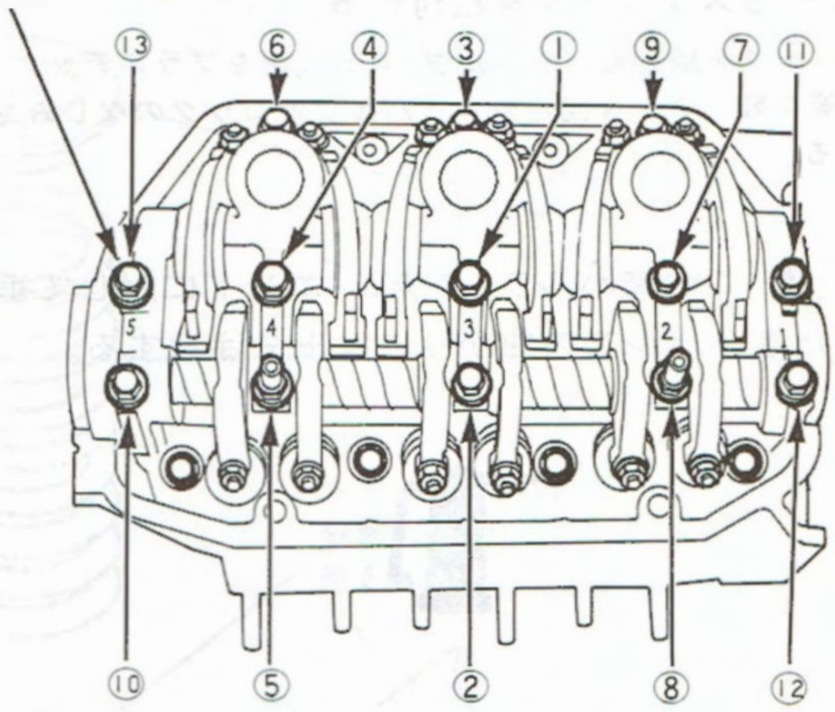
⑤ **Tighten the camshaft holder diagonally.**

***Take care when tightening the camshaft, as it may bend if the adjustment screw and valve stem are misaligned.**

Camshaft holder tightening bolt

8 × 1.25mm

torque 2.2kg-m



✻ **Tighten in several steps.**

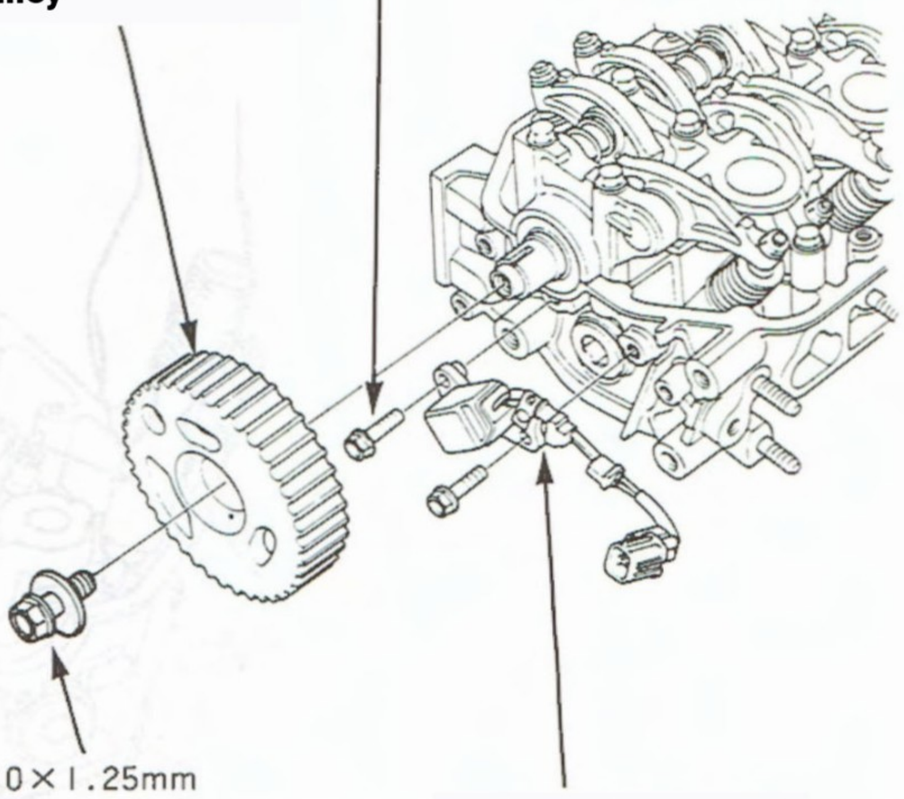
⑥ **Install the cylinder discrimination sensor and the timing belt driven pulley.**

CAUTION Handle with care so as not to damage the cylinder discrimination sensor.

6 × 1.0mm

torque 1.0kg-m

timing belt driven pulley



10 × 1.25mm

torque 5.7kg-m

Cylinder discrimination sensor

cylinder head

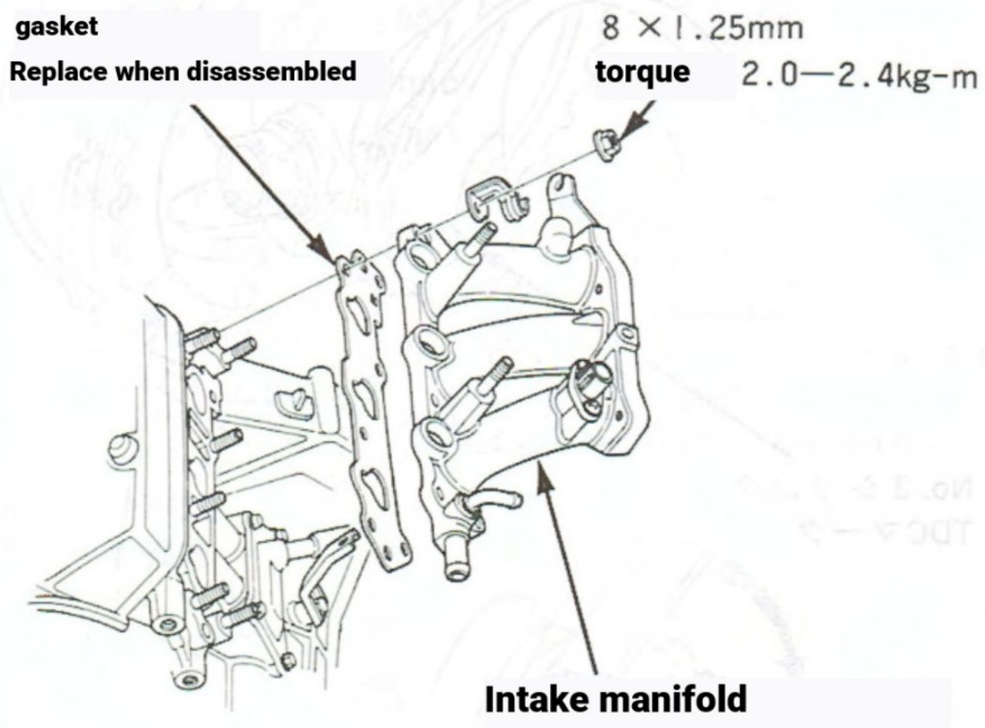
- Mounting

① Installation is performed in the reverse order of removal, but the main points are described below.

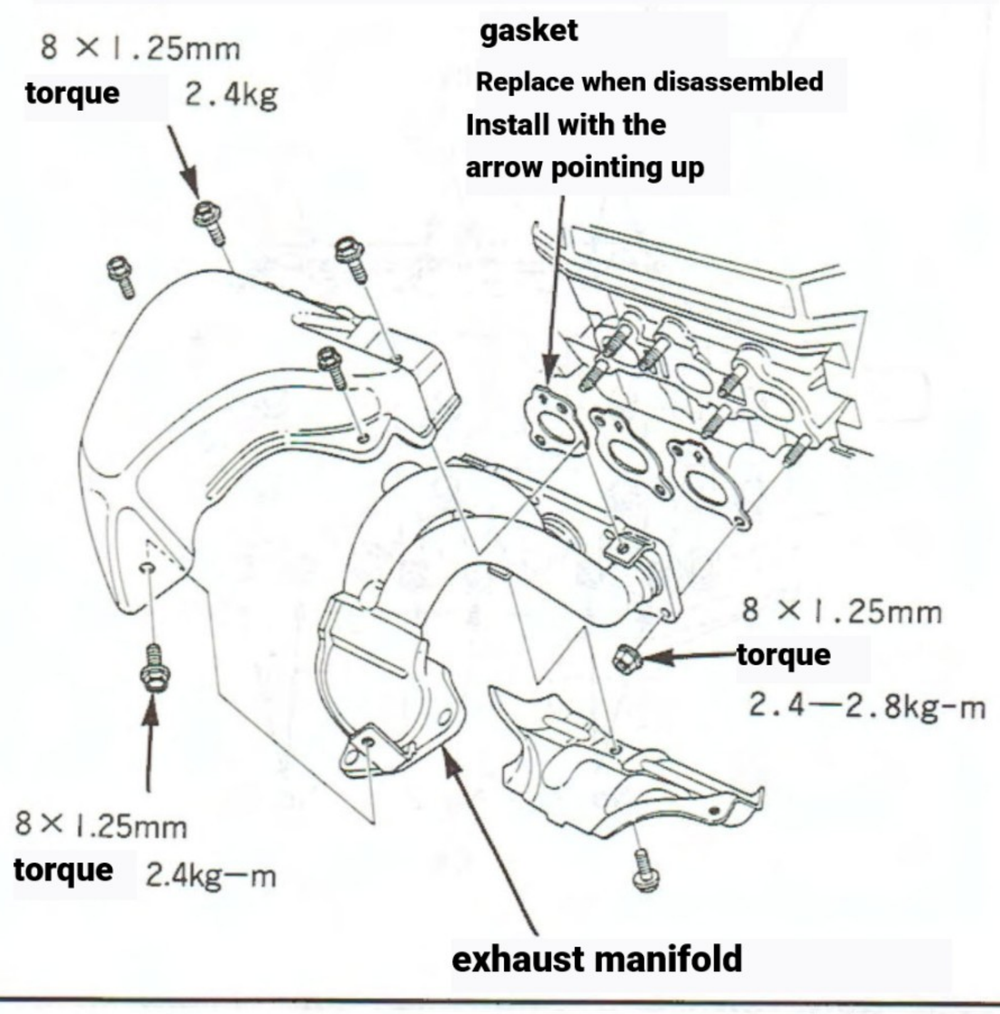
✻
- Always use new head gaskets, manifolds, and gaskets when disassembling.
- Keep the mounting surfaces of the cylinder head and cylinder clean.
- Set the camshaft (driven pulley) to top dead center and the crankshaft to No.1 top dead center.
- Be careful not to allow foreign matter to enter the gasket gap.
- Be careful not to scratch or dent the gaskets of the cylinder head and cylinder.

② **Install the intake manifold to the cylinder head.**

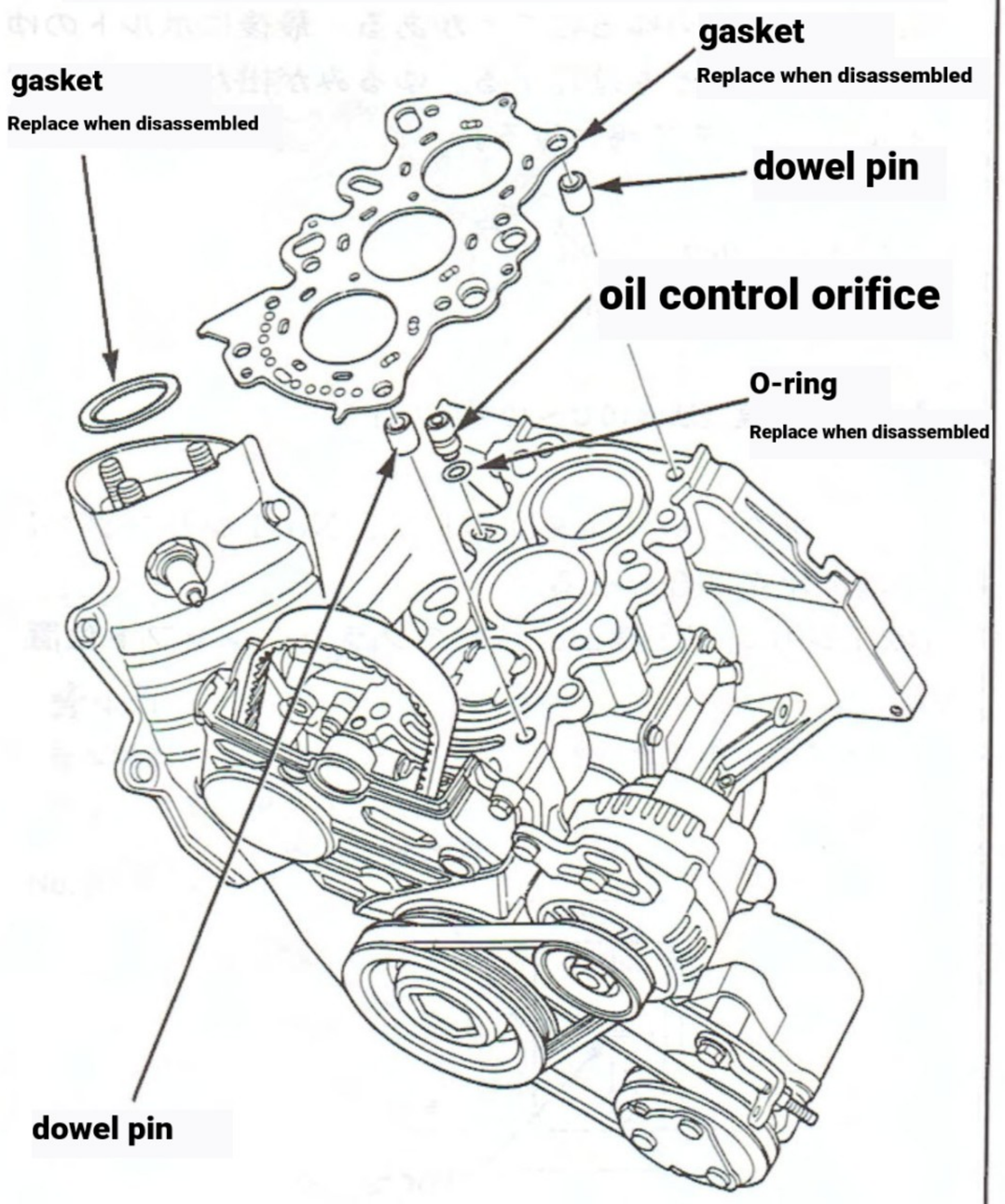
CAUTION Temporarily tighten the manifold from the inside to the outside, and then tighten to the specified torque.



③ **Install the exhaust manifold to the cylinder head.**



④ **Install the cylinder head gasket, dowel pin, and oil control orifice on the cylinder.**

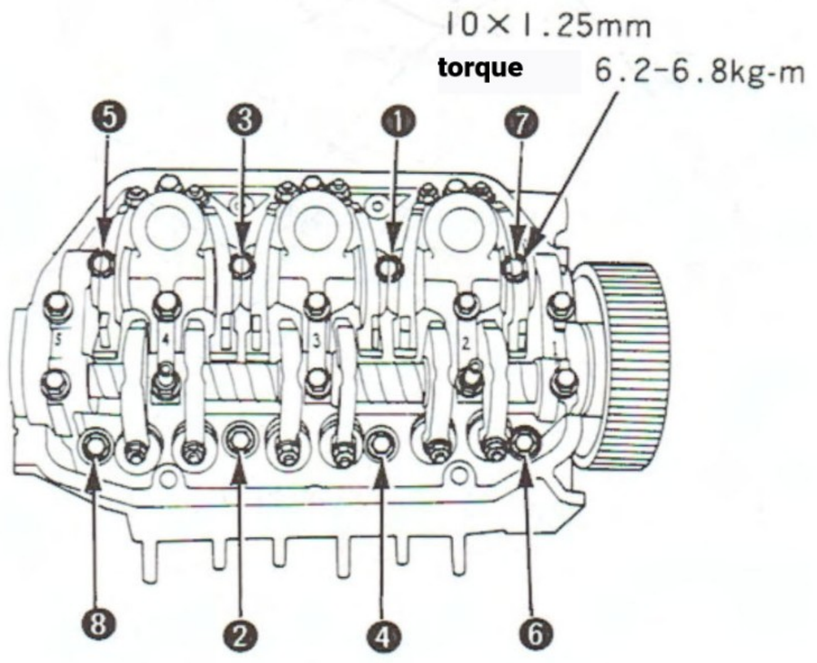


⑤ **Install the cylinder head.**

CAUTION Temporarily tighten the cylinder head diagonally from the inside to the outside, and then tighten to the specified torque.

✻ Apply genuine holder oil to the screw surface and washer seat surface.

Head bolt tightening order



valve clearance

adjustment

CAUTION The crankshaft pulley bolt has a right-hand thread. During inspection, use the pulley bolt and turn it counterclockwise, so it may loosen. Tighten with a torque wrench.

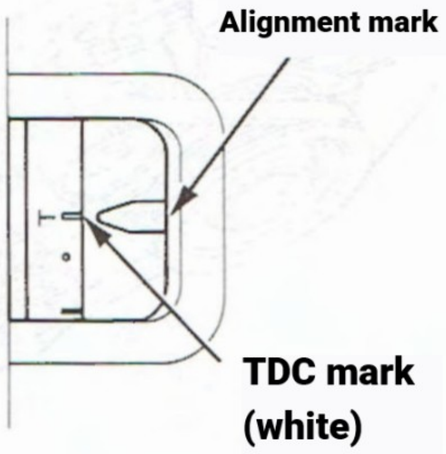
12×1.25mm
torque 11.5kg-m

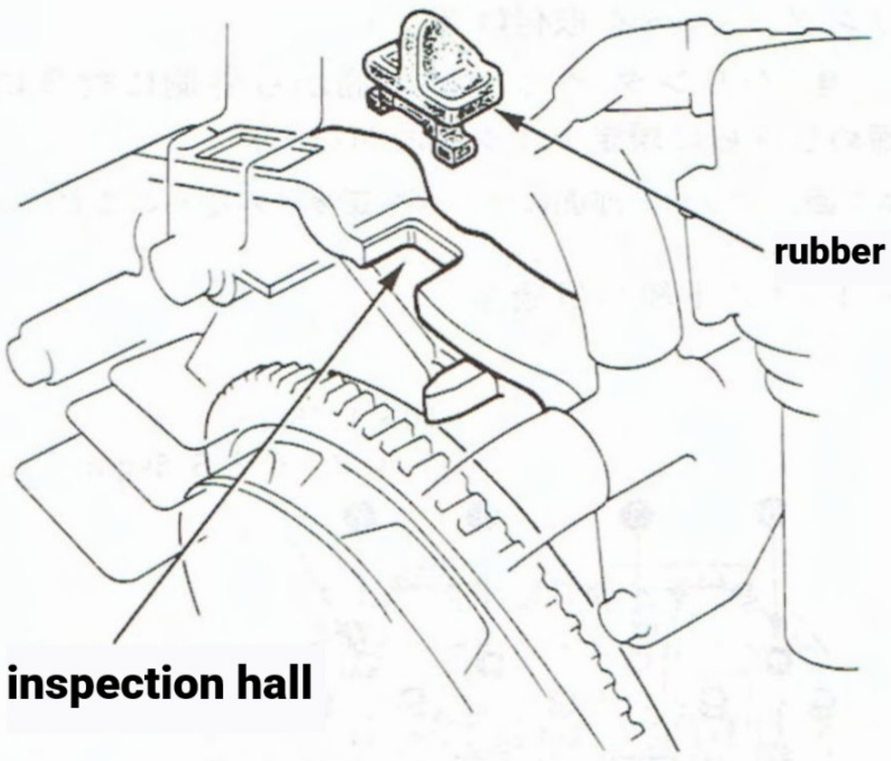
✻ **Adjustments are made at room temperature (oil temperature 10°C to 40°C).**

① **Rotate the crankshaft to align it with the compression top dead center of the No.1 cylinder.**

No.1 Crankshaft position at cylinder compression top dead center

<Flywheel>

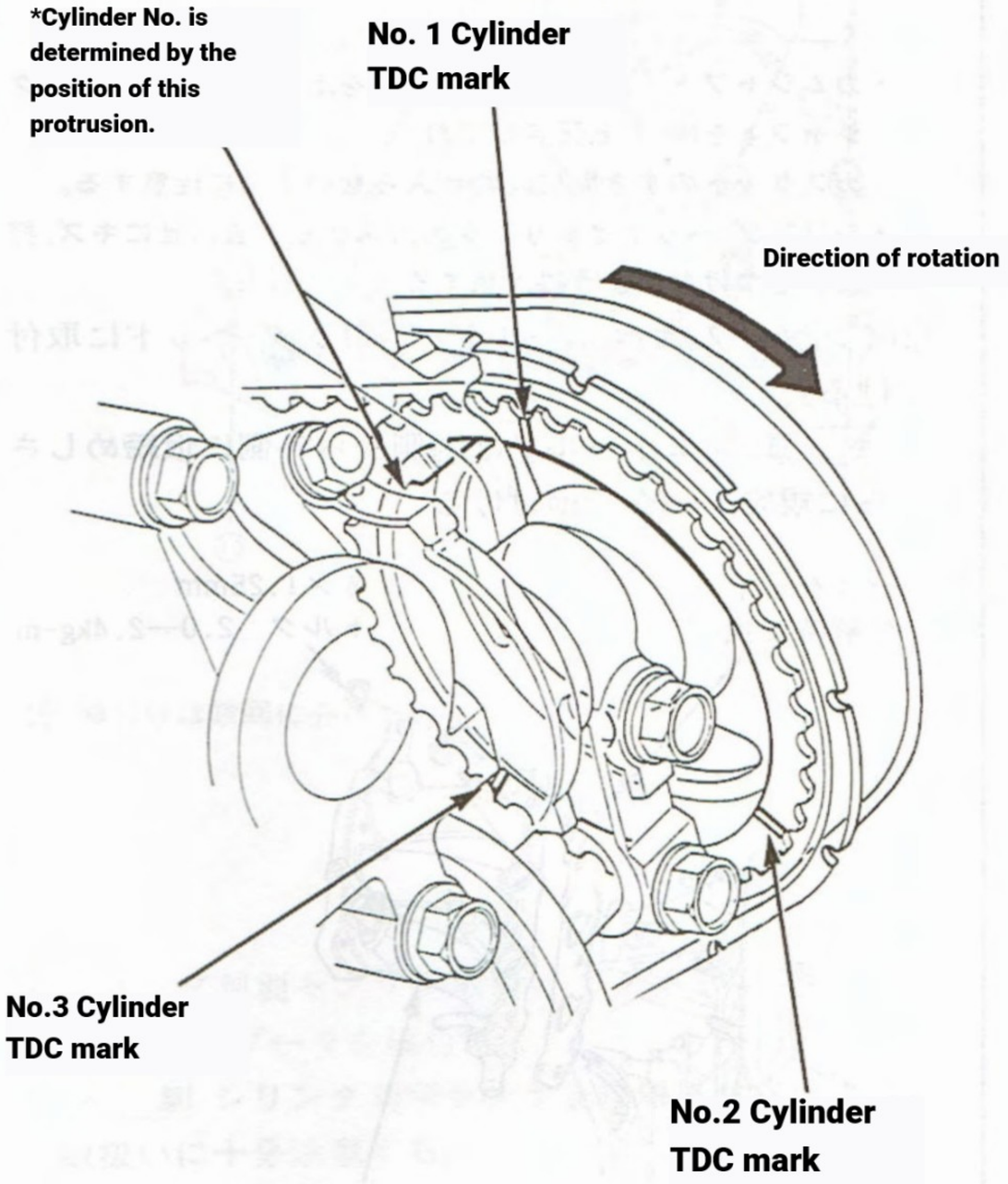


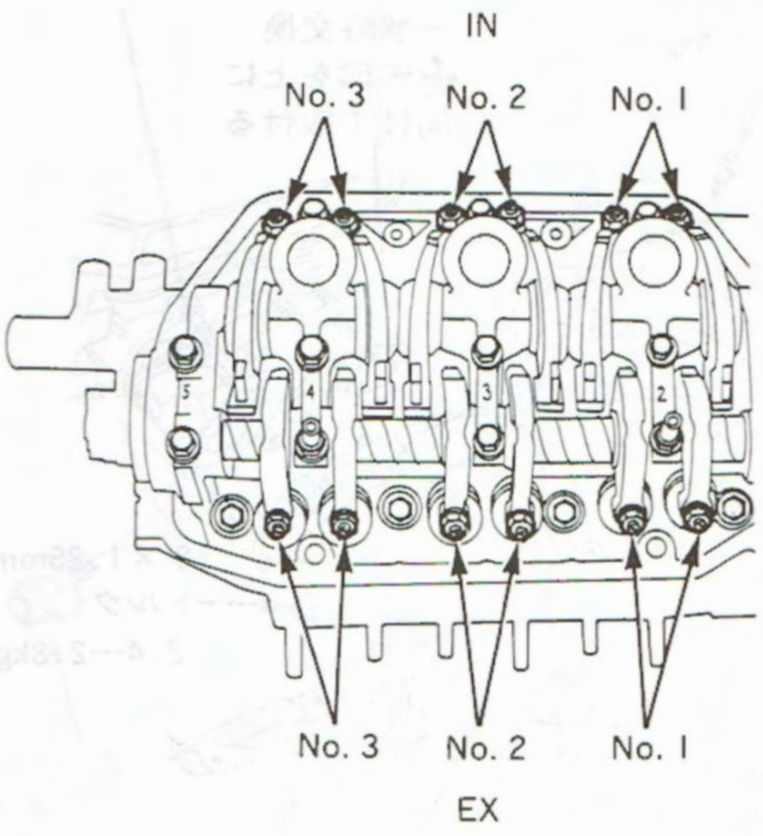


② **Remove the cylinder head cover.**

③ **Check that the No.1 cylinder is at the compression top dead center.**

***Looking at the cam pulley from the back side, the TDC mark on the No.1 cylinder must be aligned with the top surface of the cylinder head.**





④Install the special tool as shown in the illustration, loosen the lock nut on the rocker arm adjusting screw, and turn the adjusting screw to adjust.

✻ • Apply engine oil to the bearing surface of the adjustment nut and the contact surface of the rocker arm.

• Adjust in order of No.1, No.3 and No.2 cylinders.

Note: This is an aluminum rocker arm, so over tightening (overtorque) is strictly prohibited.

Lock nut

7 ×0.75mm

torque 1.4kg-m

IN clearance (cold)

Standard value 0.13—0.17mm

EX clearance (cold)

Standard value 0.23—0.27mm

専用工具

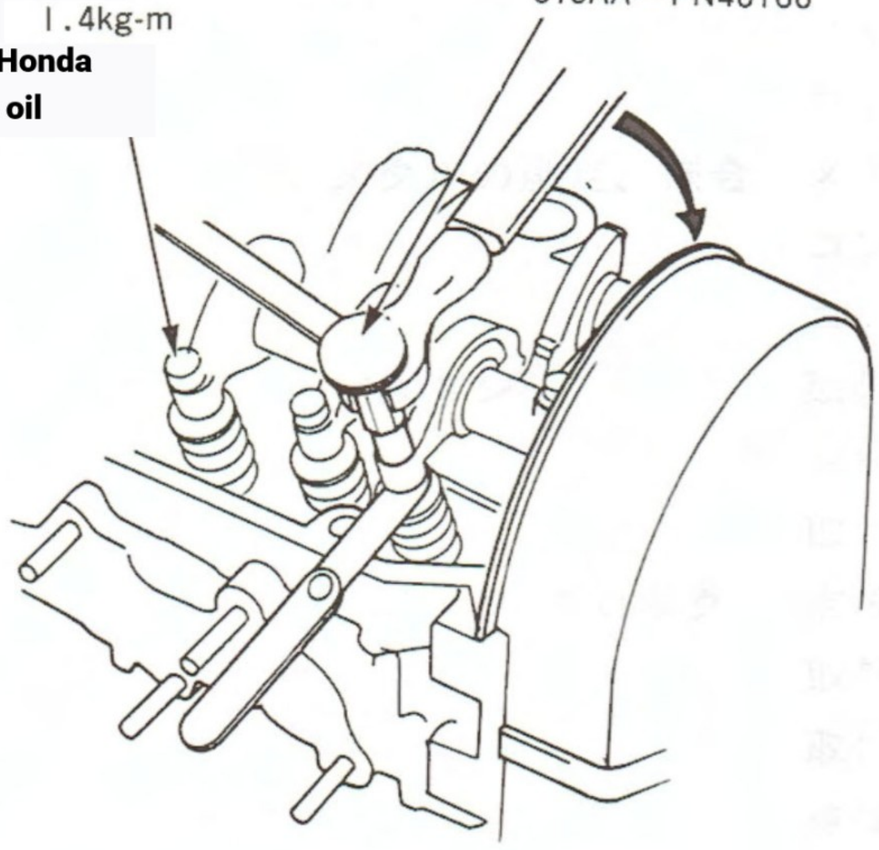
tappet adjustment wrench

07JAA—PN40100

Lock nut (7 ×0.75mm)

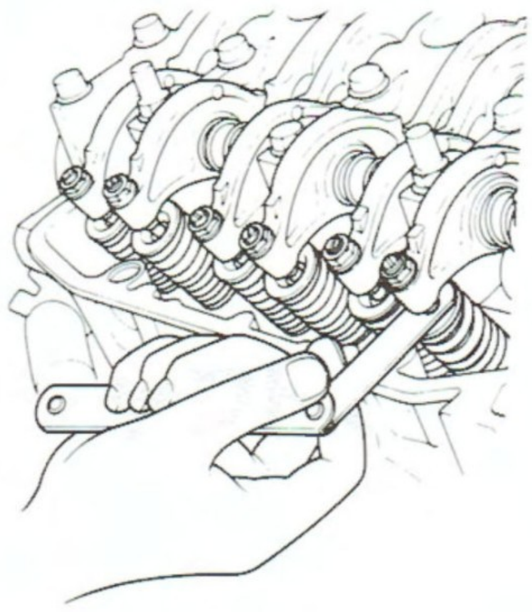
torque 1.4kg-m

*** Apply Honda genuine oil**



⑤Tighten the lock nut and measure the clearance again with the thickness gauge.

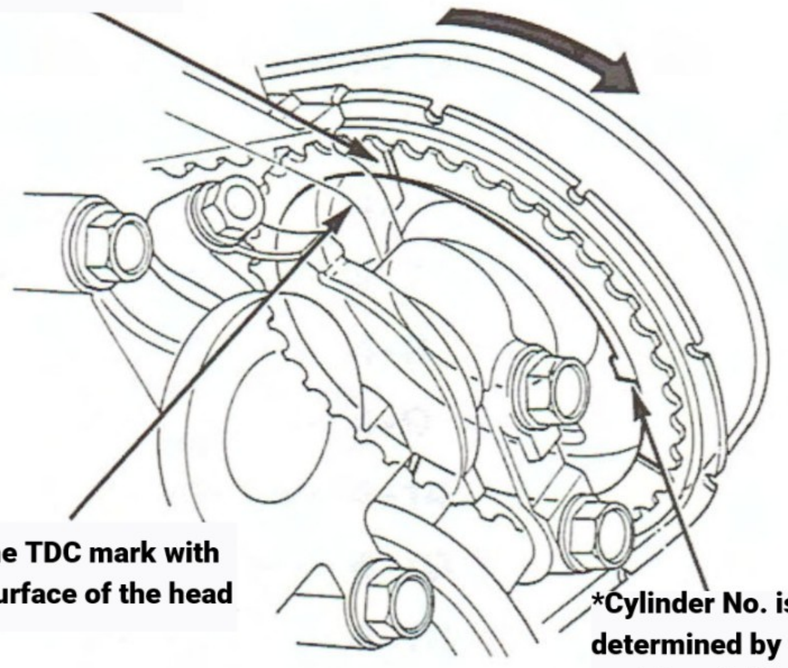
CAUTION Always use a torque wrench to tighten the lock nut.



⑥At the compression top dead center of each cylinder, adjust the clearance of the ISN valve EX valve.

*** Compression top dead center of No.3 cylinder is the position where the crankshaft is rotated counterclockwise 240° (120° by cam pulley) from No.1 cylinder compression top dead center.**

No. 3 TDC mark

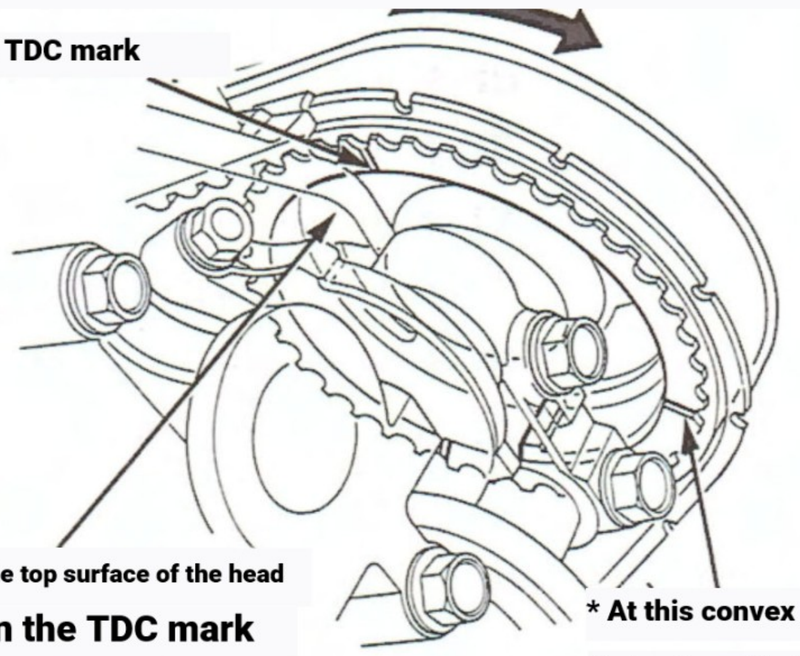


*** Align the TDC mark with the top surface of the head**

***Cylinder No. is determined by the position of this protrusion.**

***The No.2 cylinder compression top dead center is the position where the crankshaft is rotated 240° counterclockwise from the No.3 cylinder compression top dead center (120° with the cam pulley).**

No.2 TDC mark



***On the top surface of the head**

Align the TDC mark

*** At this convex position**

Judge the cylinder number

Piston, Crankshaft, Cylinder

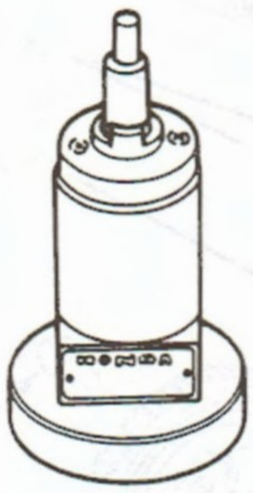
service data

Unit: mm unless otherwise specified.

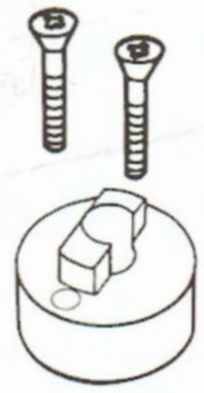
part name	item		Standard value	limit
cylinder	Distortion of the mating surfaces of the cylinder block and cylinder head		0.07 or less	0.10
	inner diameter		66.00—66.02	66.07
	Upper and lower inner diameter difference		—	0.05
	Cylinder expansion limit		—	0.5
piston	Outer diameter of the skirt part 13 mm at the lower part of the skirt		65.98—65.99	65.98
	Clearance with cylinder		0.010—0.040	0.04
	Ring groove width	Top	1.035—1.045	1.06
		second	1.225—1.235	1.25
		oil	2.805—2.825	2.85
piston ring	Clearance between piston groove	Top	0.040—0.065	0.13
		second	0.035—0.060	0.13
	Measurement of joint clearance	Top	0.15—0.30	0.60
		second	0.30—0.45	0.60
		oil	0.2—0.5	0.60
piston pin	outer diameter		15.994—16.000	—
	Clearance between piston pin and piston pin hole		0.010—0.022	—
connecting rod	Press fit allowance with piston pin		0.013—0.036	—
	Piston pin hole diameter		15.964—15.981	—
	Large end axial play		0.15—0.30	0.40
	Parallelism between big end and small end		0.12/100 or more	0.15/100
Crankshaft	journal diameter		39.976—40.000	—
	Cylindricity (Taper)		0.0025 or less	0.01
	pin diameter		35.976—36.000	—
	Roundness		0.0025 or less	0.01
	axial play		0.10—0.35	0.45
	shake		0.15 or less	0.03
oil clearance	journal oil clearance	No. 1、No. 4 journal	0.016—0.032	0.05
		No. 2、No. 3 journal	0.020—0.038	0.05
	pin oil clearance		0.020—0.038	0.05

Specialized tool

No.	tool number	Tool name	remarks
①	07973—6570500	piston base	
②	07973—6570600	piston base spring	
③	07JAF—PN40101	piston base head	
④	07973—SA70100	Tribapin insert attachment	
⑤	07973—SA70200	Adjustable insert attachment	
⑥	07LAF—PZ10200	pilot color	
⑦	07947—6790200	oil seal driver attachment	Crankshaft (clutch side)
⑧	07947—6340000	oil seal driver	Crankshaft (Pulley side)
⑨	07749—0010000	Driver handle A	07949—6110000も使用可

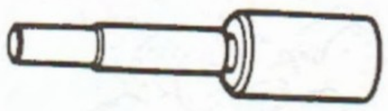


① ②

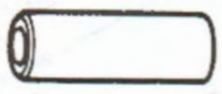


③

④



⑤



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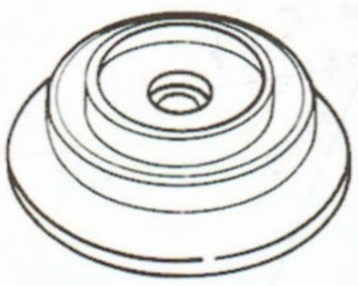
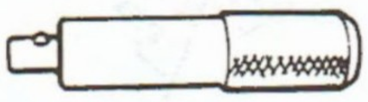


⑦

⑧



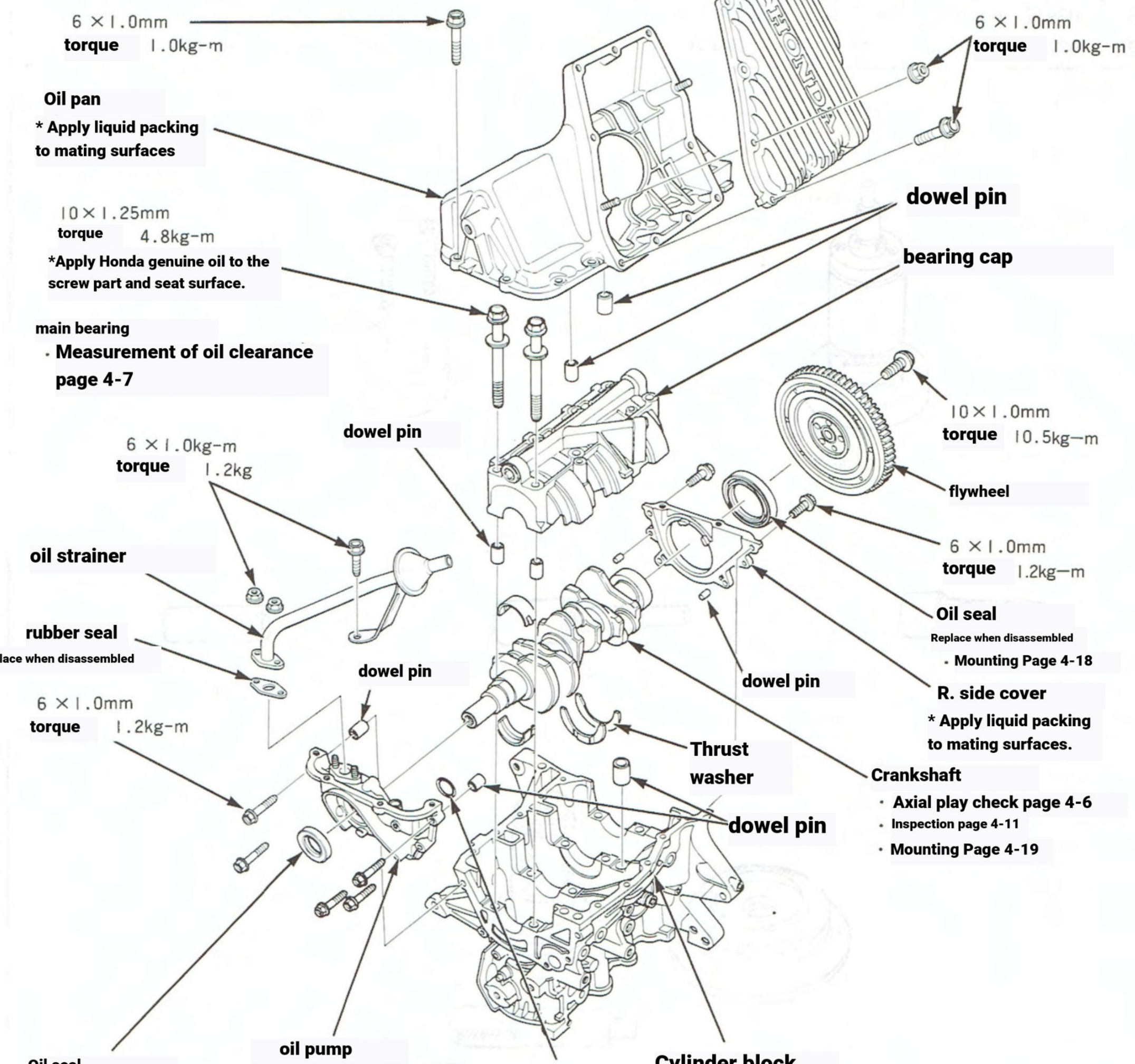
⑨

Piston, Crankshaft, Cylinder

Development view

Note

- For new bearings, use the bearing fitting table as a guide, and be sure to measure and check the oil clearance.
- Thrust washers should be adjusted with shims, and scraping work should not be performed.
- The liquid packing uses Honda genuine liquid packing 1216.



When installing, apply oil to all sliding parts.

piston ring
- Exchange page 4-17
- Inspection page 4-16
- Abutment alignment page 4-18

piston pin
- Removal page 4-14
- Mounting page 4-15
- Inspection page 4-15

piston
- Removal page 4-10
- Inspection page 4-12
- Mounting Page 4-19

connecting rod
- Check for axial play Page 4-6
- Mating page 4-12
- Inspection page 4-15

connecting rod bearing
- Oil clearance check page 4-7
- Mating page 4-9

Cylinder block
- Inspection page 4-13

connecting rod cap

cap nut
(8 ×0.75mm)
torque 3.2kg-m

connecting rod

Axial play check

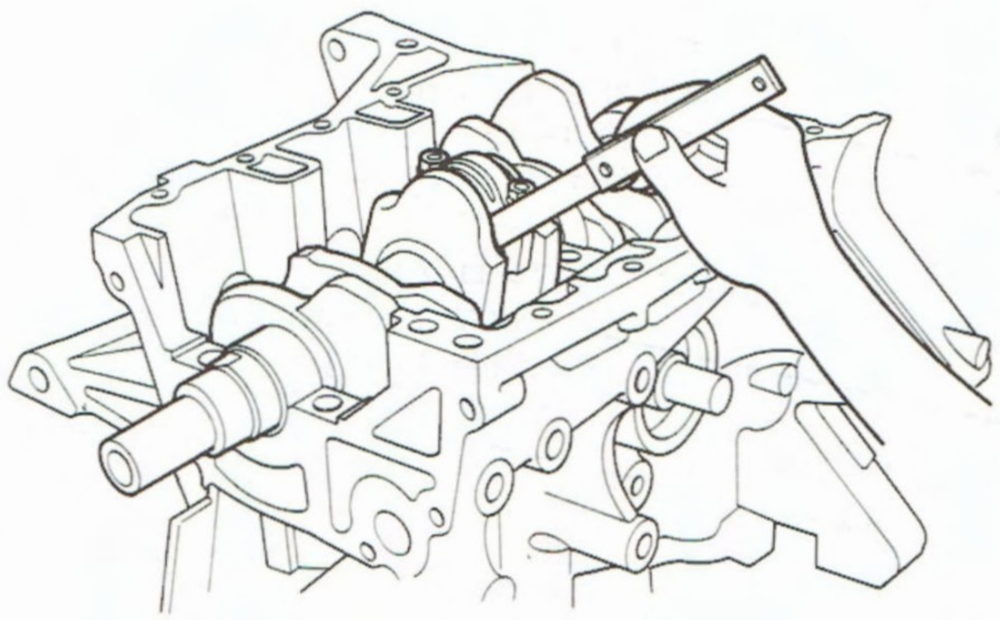
✻ Tighten the connecting rod cap nut to the specified torque.

torque 3.2kg-m

Conrod big end play in the axial direction

Standard value 0.15—0.30mm

limit 0.40mm



If the value exceeds the limit, replace the connecting rod. If the value is still above the limit, replace the crankshaft.

Crankshaft

Axial play check

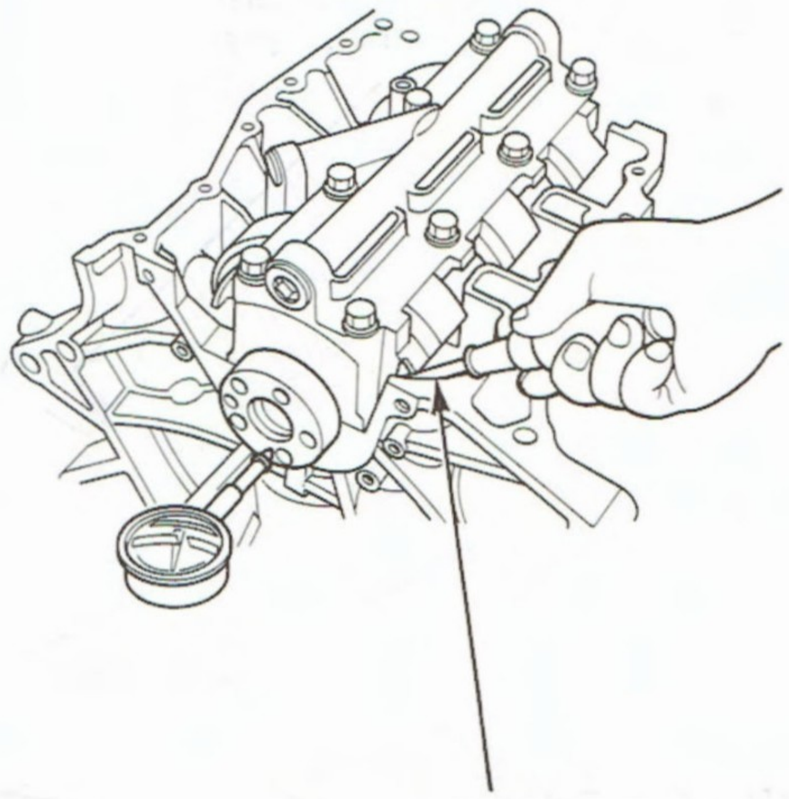
*Tighten the main bearing cap bolt to the specified torque.

torque 4.8kg-m

crankshaft axial play

Standard value 0.10—0.35mm

limit 0.45mm



press firmly on both

If the value exceeds the limit, check the thrust washer and crankshaft thrust surface, and select a thrust washer for use.

CAUTION Do not change the thickness of the thrust washer by adjusting it with shims or scraping it.

Precautions for metal selection and oil clearance measurement

- Use the bearing fitting table as a guide, and be sure to measure and check the oil clearance.
- Since the metal sliding surface is made of lead alloy, do not allow foreign matter to enter.
- **Align the claws of the case or cap and set the metal completely.**
- The journals and pins must not be polished (because they have undergone a special surface treatment).
- Accurate cap tightening sequence and tightening torque.
- When assembling metal parts, apply engine oil or molybdenum disulfide to the surface before assembling.
- After tightening the crank bearing cap and connecting rod cap, be sure to confirm that they rotate lightly and smoothly by hand.
- **After assembly, idling the engine for 10 to 20 minutes to warm it up.**

Measuring oil clearance

main bearing

Note

- Be sure to measure in the axial direction.
- Tighten evenly diagonally from the center without rotating the crankshaft.

① Install the bearing and cap, tighten to the specified torque, and remove the cap bearing.

② Cut the plastigauge to length and place it on top of the crankshaft journal.

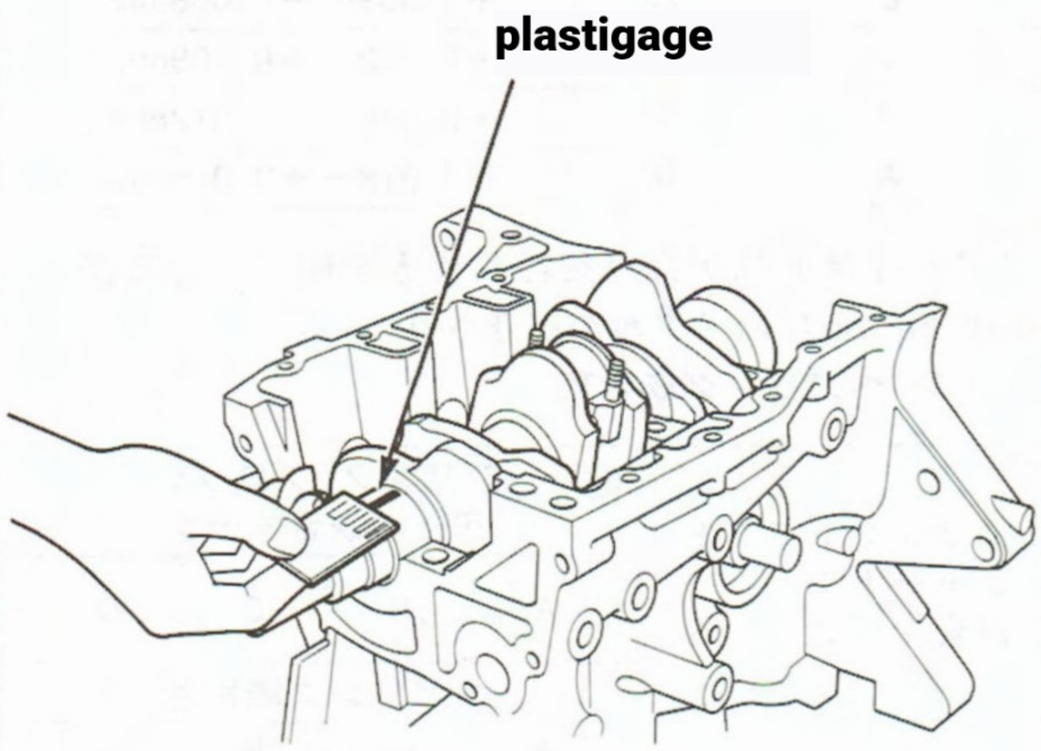
③ Tighten the cap to the specified torque.

Specified torque 4.8kg-m

④ Remove the cap and measure the width of the plastigauge crushed with the scale printed on the plastigage bag.

journal oil clearance

Standard value	No.1、No.4 journal	0.016—0.032mm
	No.2、No.3 journal	0.020—0.038mm
limit	0.05mm	



⑤ If the value is above the limit, check the cylinder block for enlargement and journal wear. If there are no abnormalities, replace the main bearing with an undersized bearing according to the main bearing identification table and measure the oil clearance again.

connecting rod bearing

Note

- Be sure to measure in the axial direction.
- Tighten the connecting rod cap evenly without turning the crankshaft.

① Install the bearing and cap, and remove the tightening cap and bearing with the specified torque.

② Cut a plastigage lengthwise and place it over the crankshaft pin.

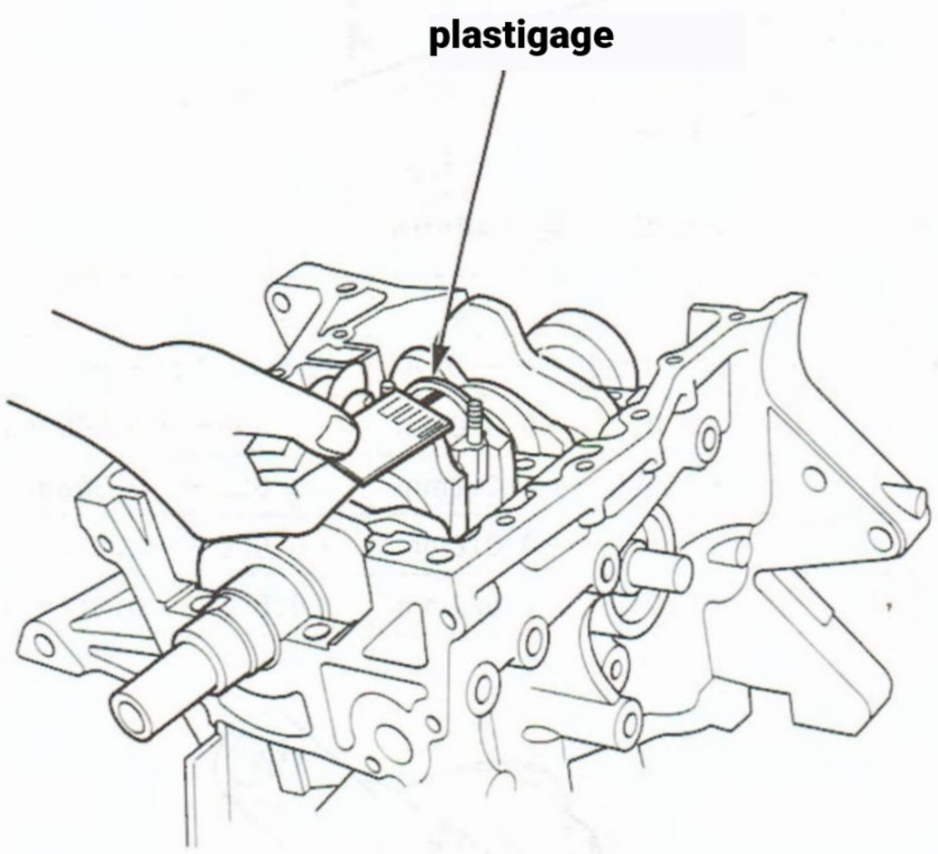
③ Tighten the cap to the specified torque.

Specified torque 3.2kg-m

④ Remove the cap and measure the width of the plastigauge crushed with the scale printed on the plastigage bag.

pin oil clearance

Standard value	0.020—0.038mm
limit	0.05mm



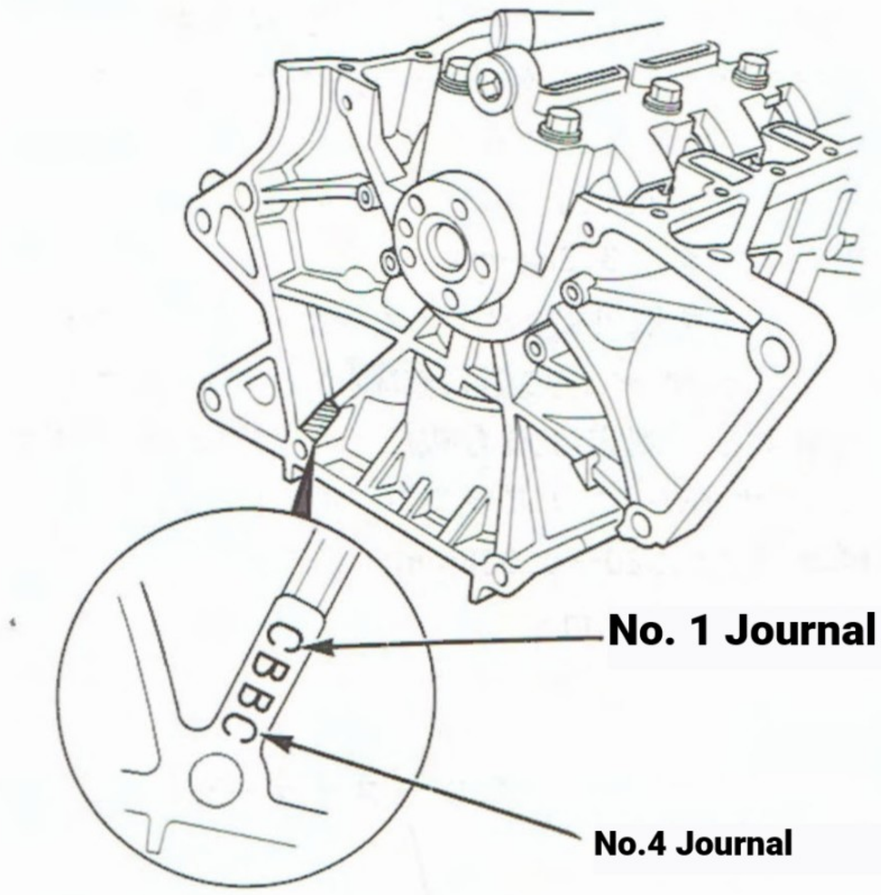
⑤ If the value exceeds the limit, check the connecting rod for enlargement and pin wear. If there are no abnormalities, replace the bearing with an undersized bearing according to the connecting rod bearing identification table and measure the oil clearance again.

Metal selection, mating

main bearing

Note

- When replacing the main bearing, check the fitting mark on the crankshaft journal and the fitting mark on the cylinder block hole diameter, and select from the fitting table.
- Install the selected bearing and measure the axial oil clearance.

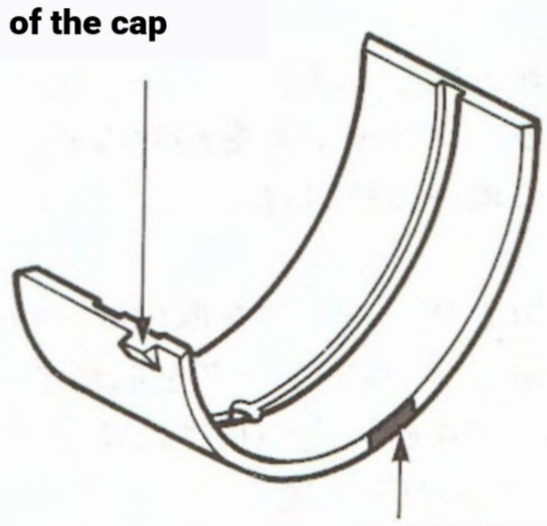


cylinder block hole diameter (44mm)

mating mark	tolerance	
	No.2, No.3 Journal	No.1, No.4 Journal
A	+0.000—+0.006mm	−0.006—+0.000mm
B	+0.006—+0.012mm	+0.000—+0.006mm
C	+0.012—+0.018mm	+0.006—+0.012mm
D	+0.018—+0.024mm	+0.012—+0.018mm

Location of crankshaft journal mating mark

* Align this protrusion with the groove of the cap



Identification table

Bearing center thickness 2.0mm

mark	identification color	tolerance
G	red	0.000—−0.003mm
F	pink	+0.003— 0.000mm
E	yellow	+0.006—+0.003mm
D	green	+0.009—+0.006mm
C	brown	+0.012—+0.009mm
B	black	+0.015—+0.012mm
A	blue	+0.018—+0.015mm

Metals are identified by color in the order of blue, black, brown, green, yellow, pink, red, and metals with a tolerance of 0.003mm are available.

Main bearing mating chart

Crankshaft journal mating mark	Mating mark for cylinder block bore diameter			
	A	B	C	D
	Bearing identification color			
1	red	pink	yellow	green
2	pink	yellow	green	brown
3	yellow	green	brown	black
4	green	brown	Black	blue

The oil clearance takes into account the expansion of the housing due to a crash.

The oil clearance is preselected so that the No.1 journal is 0.016-0.032mm, and the No.2 and No.3 journals are 0.020-0.038mm.

CAUTION Do not use this fitting table alone, but be sure to measure the oil clearance.

connecting rod bearing

Note

- When replacing the connecting rod bearing, check the fitting mark on the crankshaft pin and the fitting mark on the connecting rod and select from the fitting table.
- Install the selected bearing and measure the axial oil clearance.

Connecting rod bearing mating table

Mating Marks on Crankshaft Pins	Connecting rod mating mark			
	1	2	3	4
	Bearing identification table			
A	red	pink	yellow	green
B	pink	yellow	green	brown
C	yellow	green	brown	black
D	green	brown	black	blue

The oil clearance takes into account the expansion of the connecting rod due to a crash. The oil clearance is pre-selected to be 0.020-0.038mm.

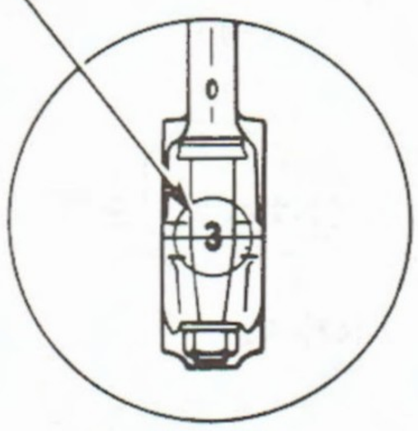
identification color

Bearing center thickness 1.5mm

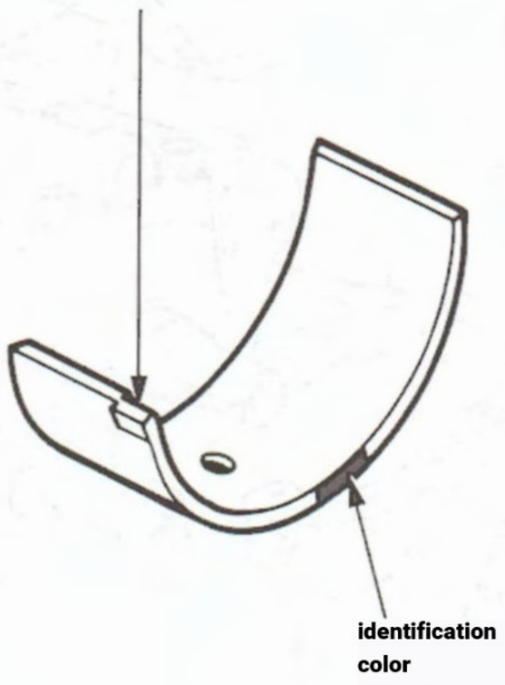
mark	identification color	tolerance
G	red	−0.005— −0.008mm
F	pink	−0.002— −0.005mm
E	yellow	+0.001— −0.002mm
D	green	+0.004— +0.001mm
C	brown	+0.007— +0.004mm
B	black	+0.010— +0.007mm
A	blue	+0.013— +0.010mm

The metals are identified by color, in the order of blue, black, brown, green, yellow, pink, and red, with a tolerance of 0.003mm.

Location of mating mark on connecting rod bearing



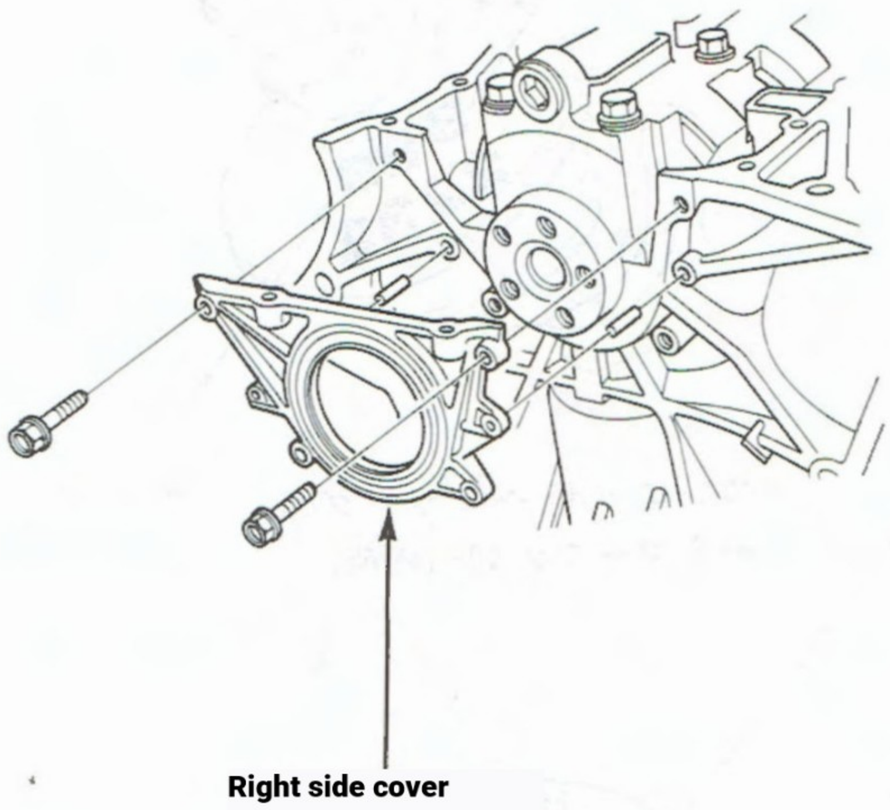
*** Align this protrusion with the groove of the cap**



Piston, Crankshaft, Cylinder

Removal of crankshaft and piston

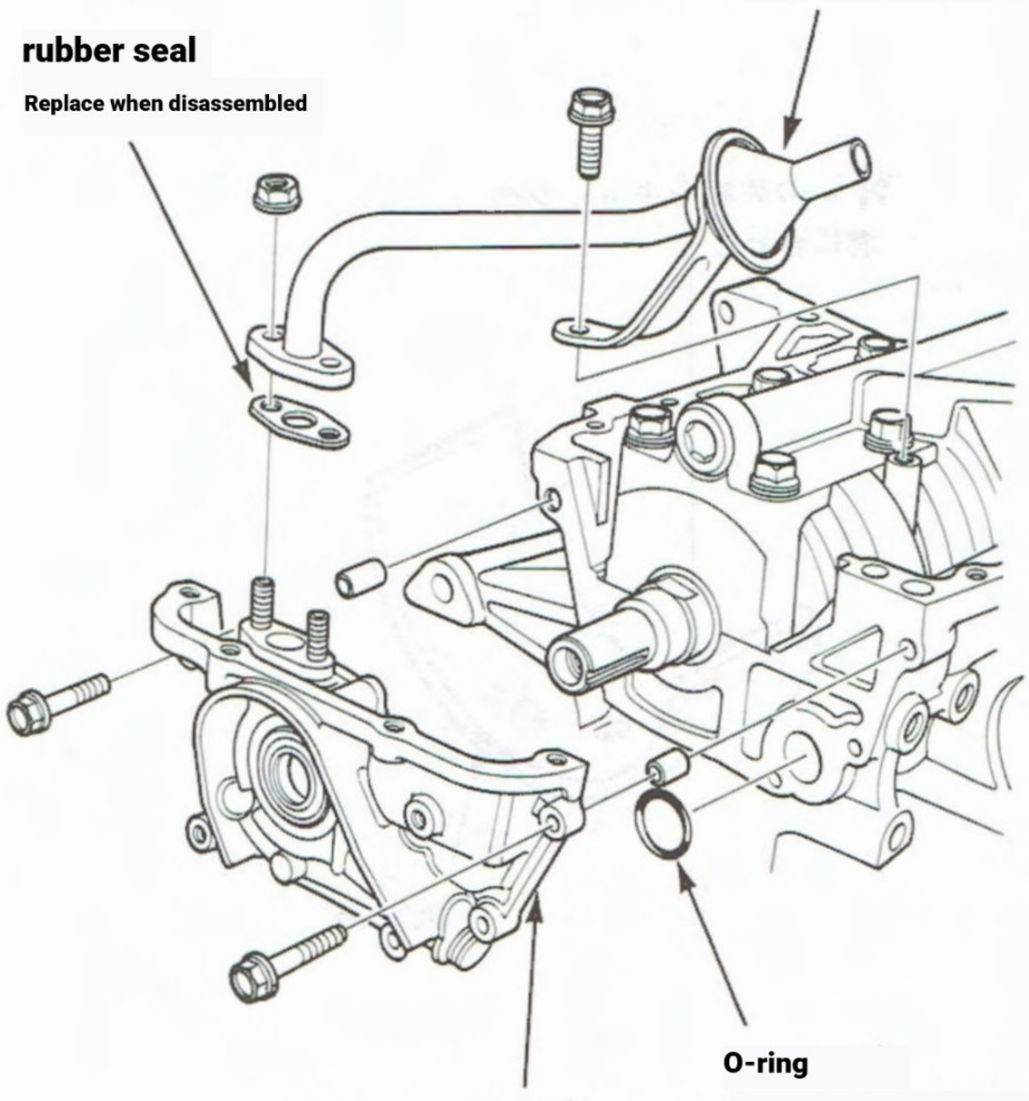
① Remove the right side cover.



Right side cover

②Remove the oil strainer mounting bolt and remove the oil strainer.

③Remove the oil pump assembly.



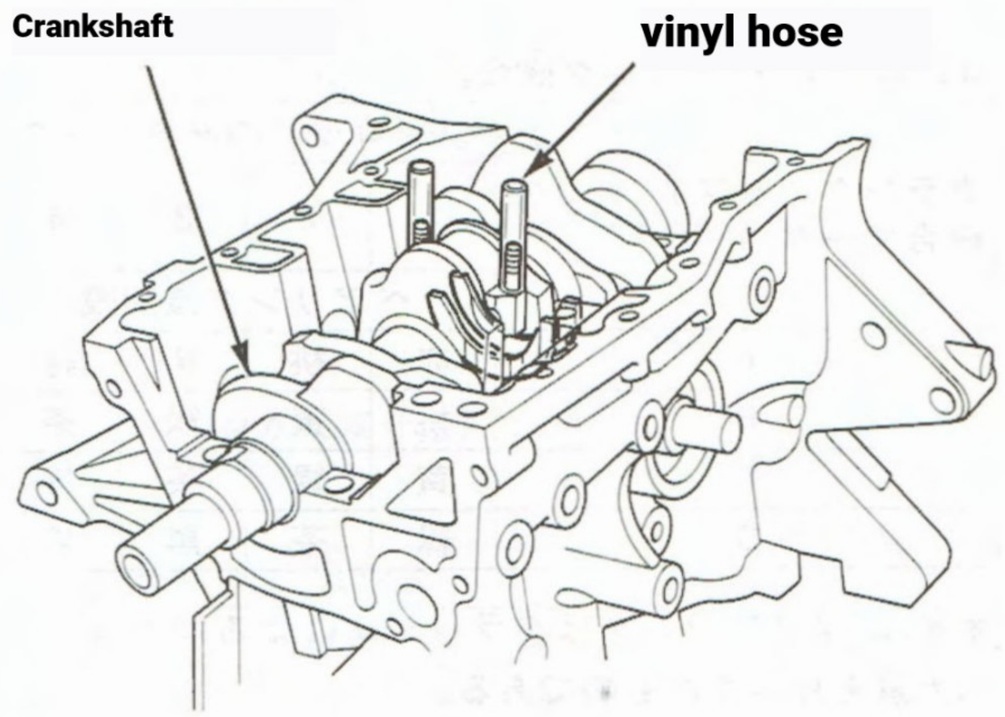
Oil pump assembly.

④Remove the bearing cap.

⑤ Remove the connecting rod cap.

⑥Remove the crankshaft without damaging the journal or pin.

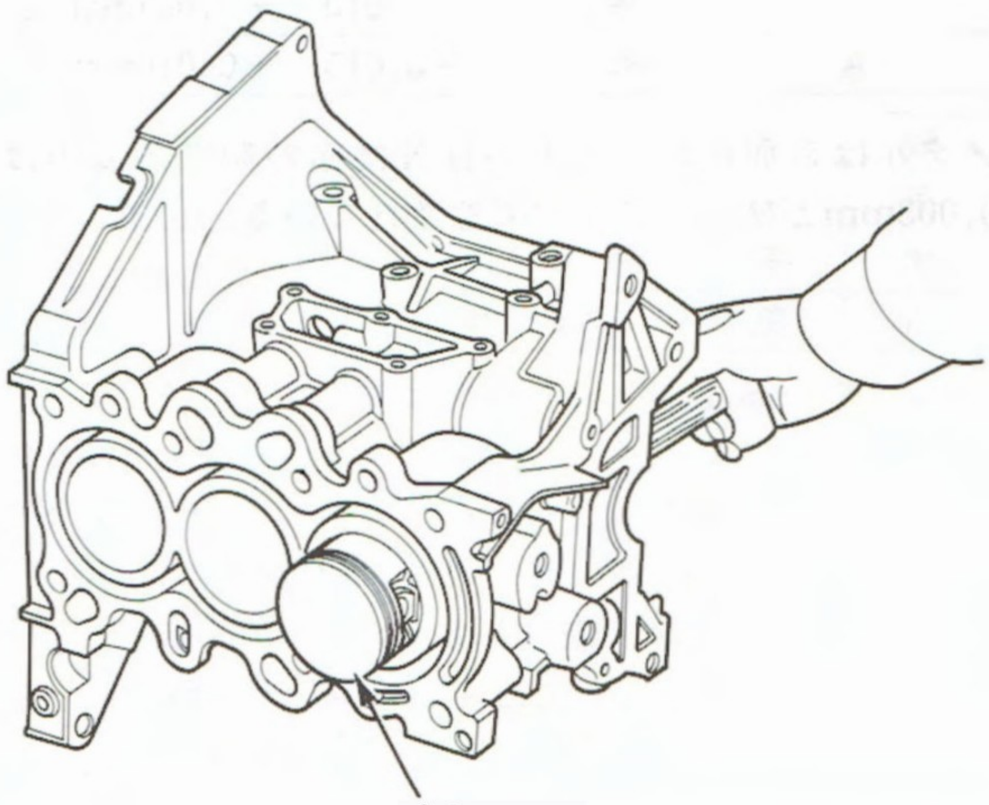
*Attach a vinyl hose, etc., to the connecting rod bolt to prevent the crankshaft, cylinder, etc. from being scratched.



⑦Use a hammer handle to push the piston out of the cylinder.

Note

- Be careful not to damage the cylinder with the connecting rod.
- Before removing the piston, remove the carbon from the top surface of the cylinder.
- Attach the cylinder number to the piston head before removing the piston, and attach the cylinder number to the same position when installing.
- Handle the gasket mating surface so as not to scratch or dent it.



Crankshaft

-inspection

①Measure roundness.

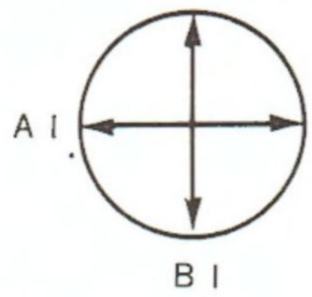
②Measure taper (cylindricity).

Roundness

Roundness is measured at points A1 and B1 on each crankshaft journal and outside diameter.

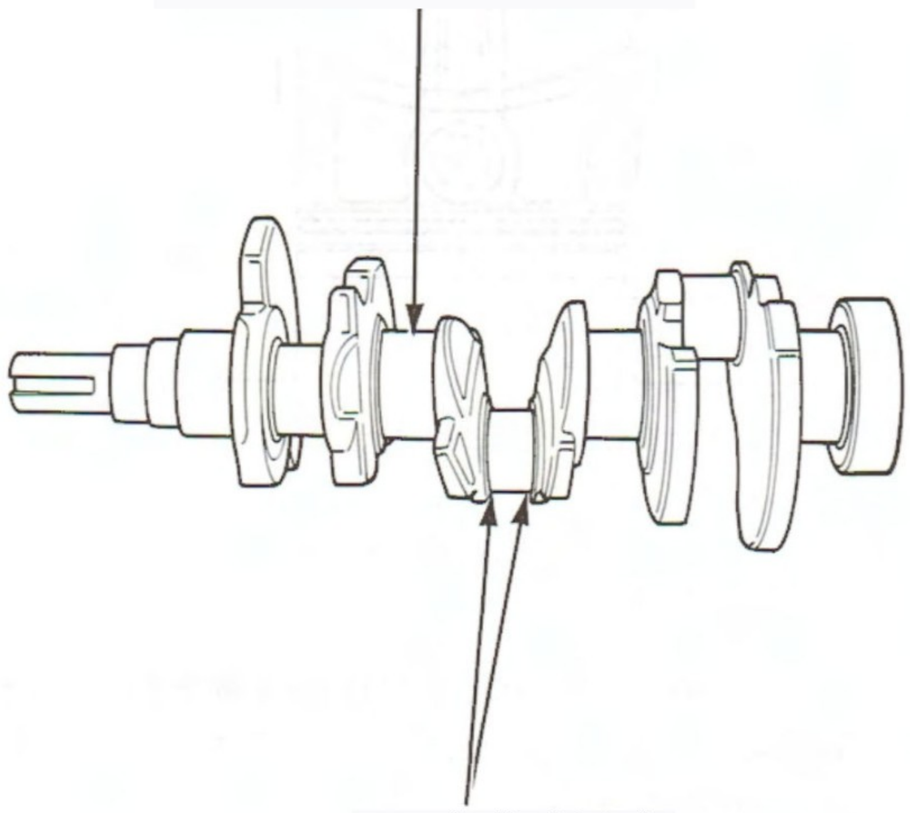
Roundness is the difference between A1 and B1

Standard value	0.0025mm	Less than
limit	0.0100mm	



Roundness

Measure the center of the journal.



taper (cylindricity)

Measure both ends of the journal

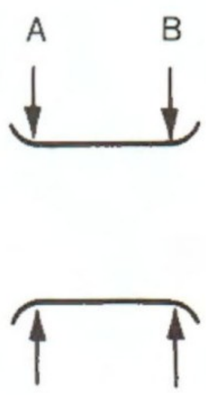
taper (cylindricity)

Taper is measured at points A and B on the outer diameter of each crankshaft journal and pin.

Difference between tapers A and B

Standard value	0.0025mm	Less than
limit	0.0100mm	

Taper



③ Inspect and clean the oil hole.

④ Inspect the keyway and threads.

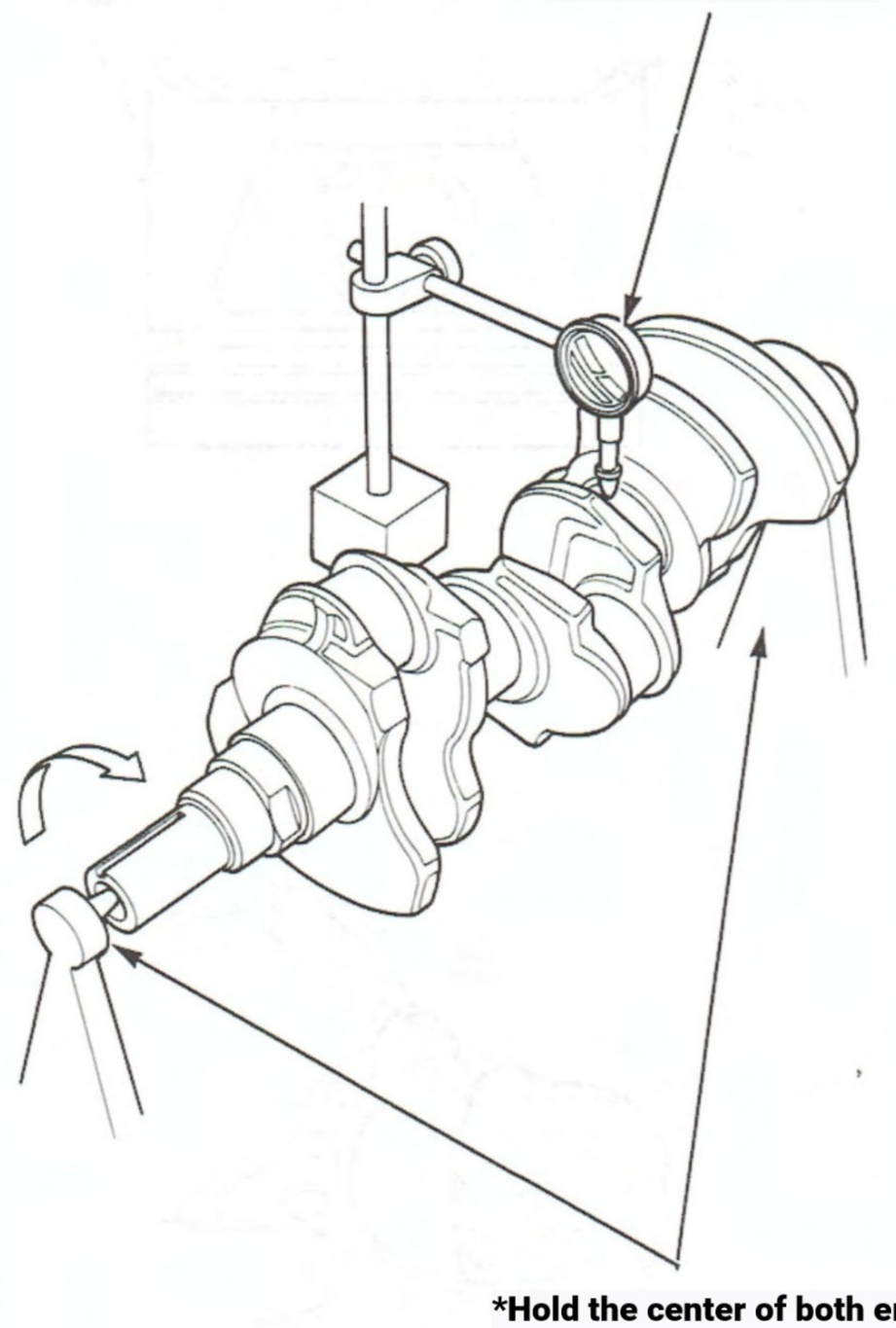
⑤ Inspect each journal for run-out of the crankshaft.

Note: Deflection is 1/2 of the gauge's maximum indicated value.

Standard value	0.015mm	Less than
limit	0.030mm	

Dial gauge

✻ Rotate and measure



***Hold the center of both ends or place the journals on both ends on the V-bronic.**

piston

inspection

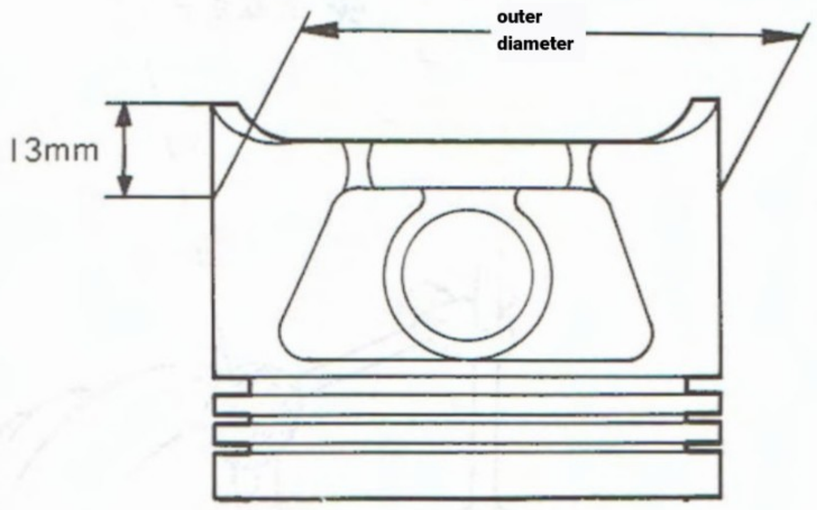
①Inspect the piston for cracks and damage.

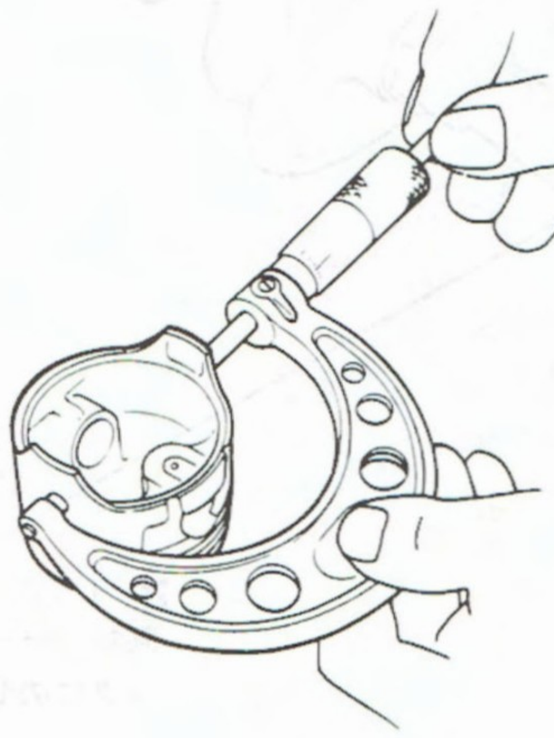
②Measure the outer diameter at a position 13 mm from the bottom of the piston skirt.

Outer diameter of piston skirt

Standard value 65.98—65.99mm

limit 65.97mm



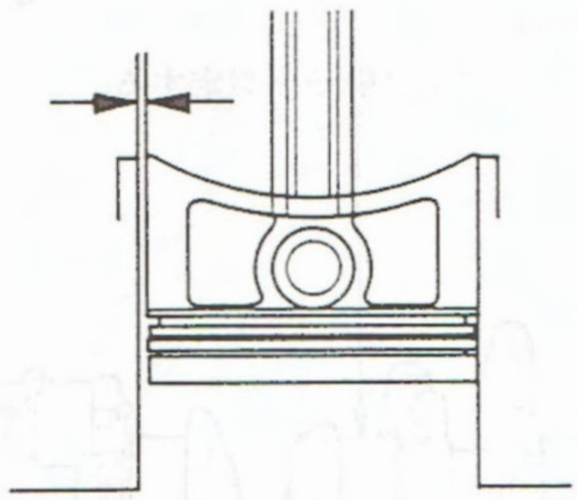


③Calculate the difference between the cylinder inner diameter measurement (page 4-13) and the piston skirt outer diameter.

Clearance between piston and cylinder

Standard value : 0.02—0.04mm

limit : 0.08mm



—If the value is close to or exceeds the limit, check the piston or cylinder for large scratches.

—If the piston or cylinder is damaged, bore the cylinder to its expansion limit and use an oversized piston and piston rings.

oversize piston

0.25 66.23—66.24mm

0.50 66.48—66.49mm

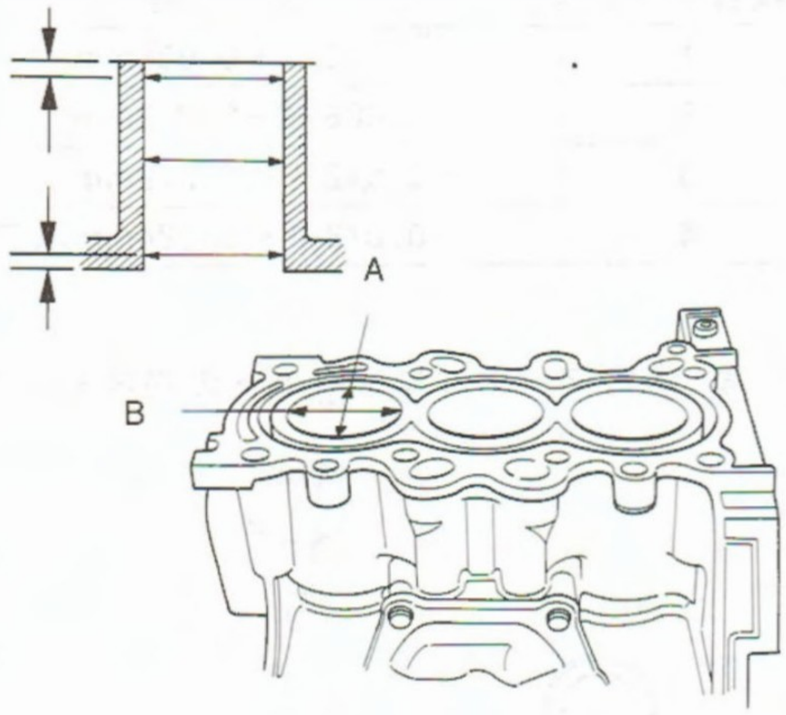
Cylinder block

inspection

CAUTION Be careful not to scratch or dent the mating surface of the gasket.

①Measure the wear and taper of the cylinder block bore.

②Measure in the A and B directions at three points: top, middle, and bottom.



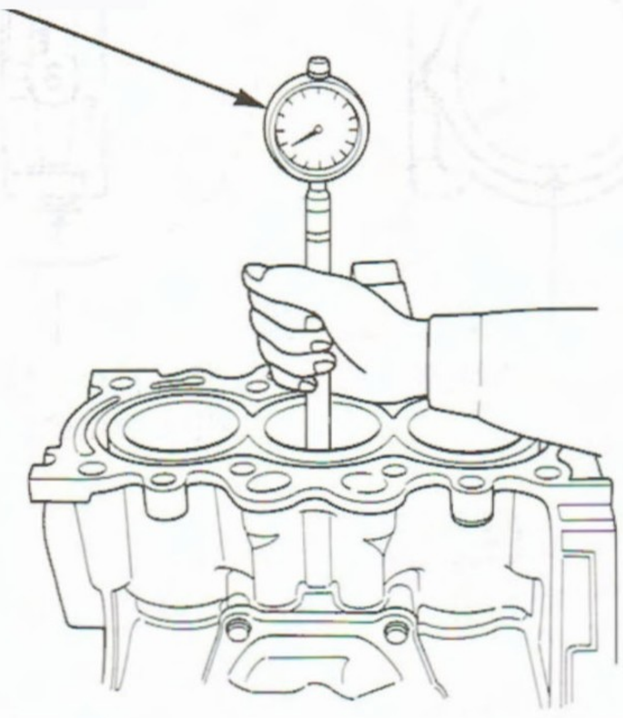
Cylinder block inner diameter

Standard value	66.00—66.02mm
limit	66.07mm

Upper and lower inner diameter difference

limit	0.05mm

cylinder gauge



③If the value exceeds the limit, bore the cylinder up to the expansion limit and use an oversized piston and piston ring.

Cylinder expansion limit

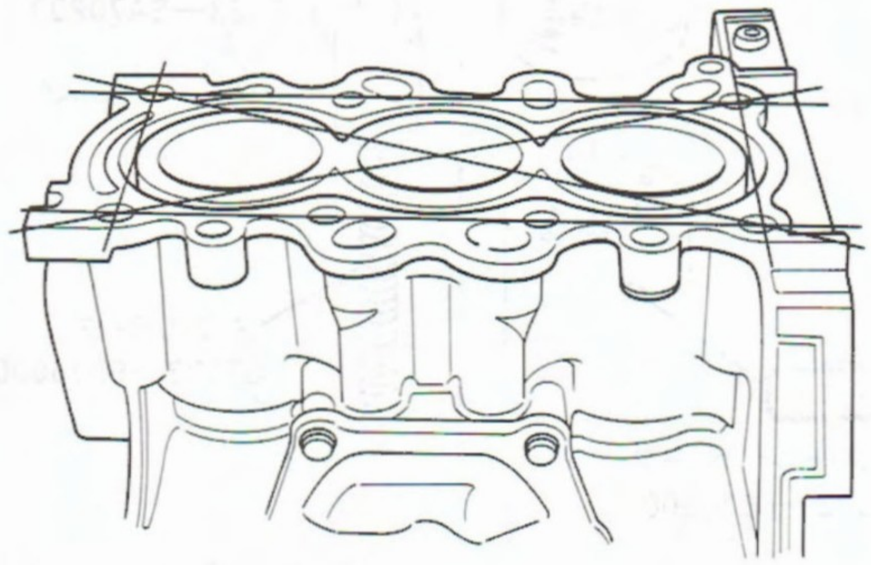
limit	0.5mm

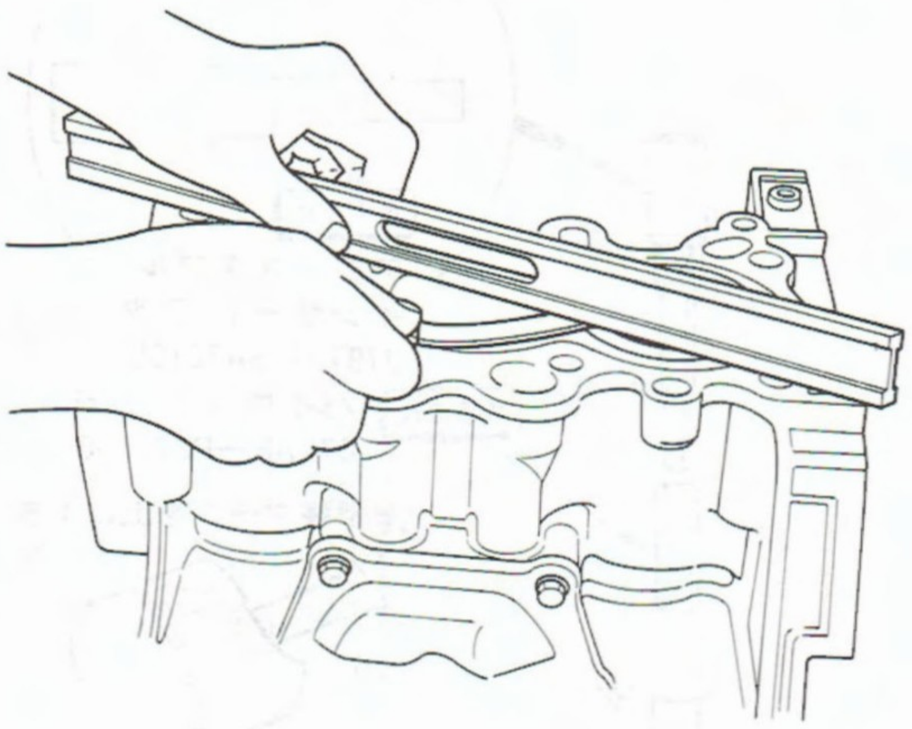
CAUTION Be careful not to scratch or dent the mating surface of the gasket.

Distortion of cylinder block

Standard value	0.07mm Less than
limit	0.10mm

Measurement point





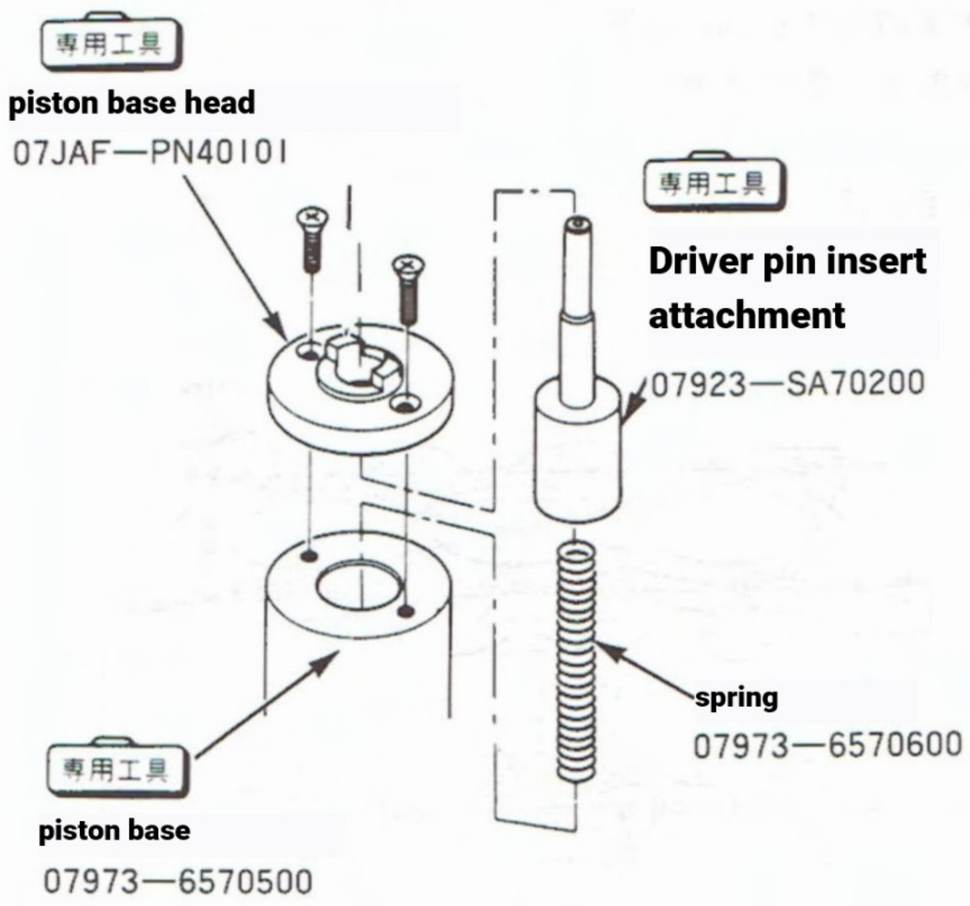
—If it exceeds the limit value, correct it.

piston pin

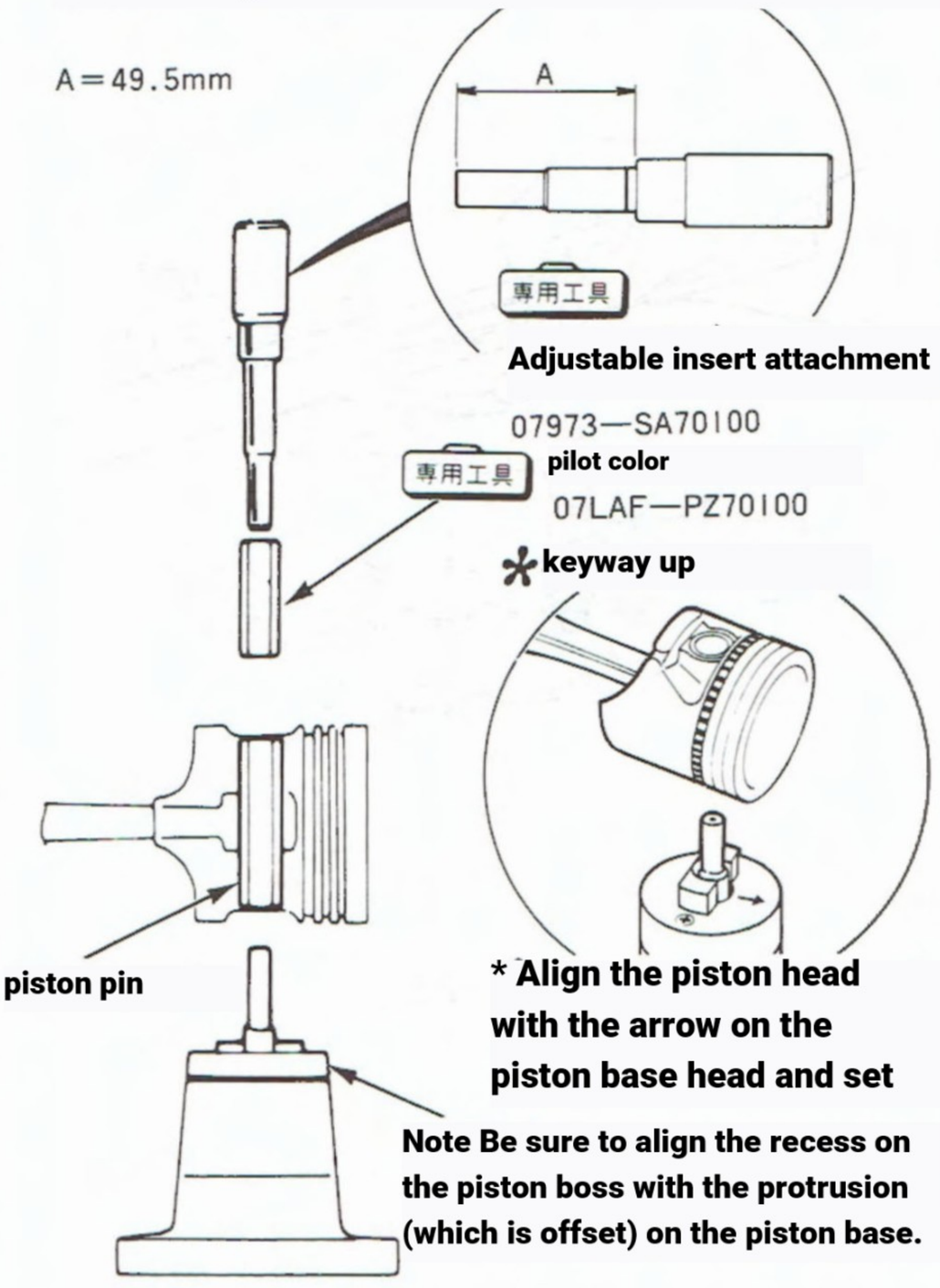
Removal

CAUTION Use a special tool and a hydraulic press to remove and install the piston pin.

①Replace the driver pin insert attachment and the piston base head on the base of the dedicated tool.



②Align the A part of the adjustable insert attachment with the following dimensions.



Note Be sure to align the recess on the piston boss with the protrusion (which is offset) on the piston base.

Metal selection and mating

connecting rod

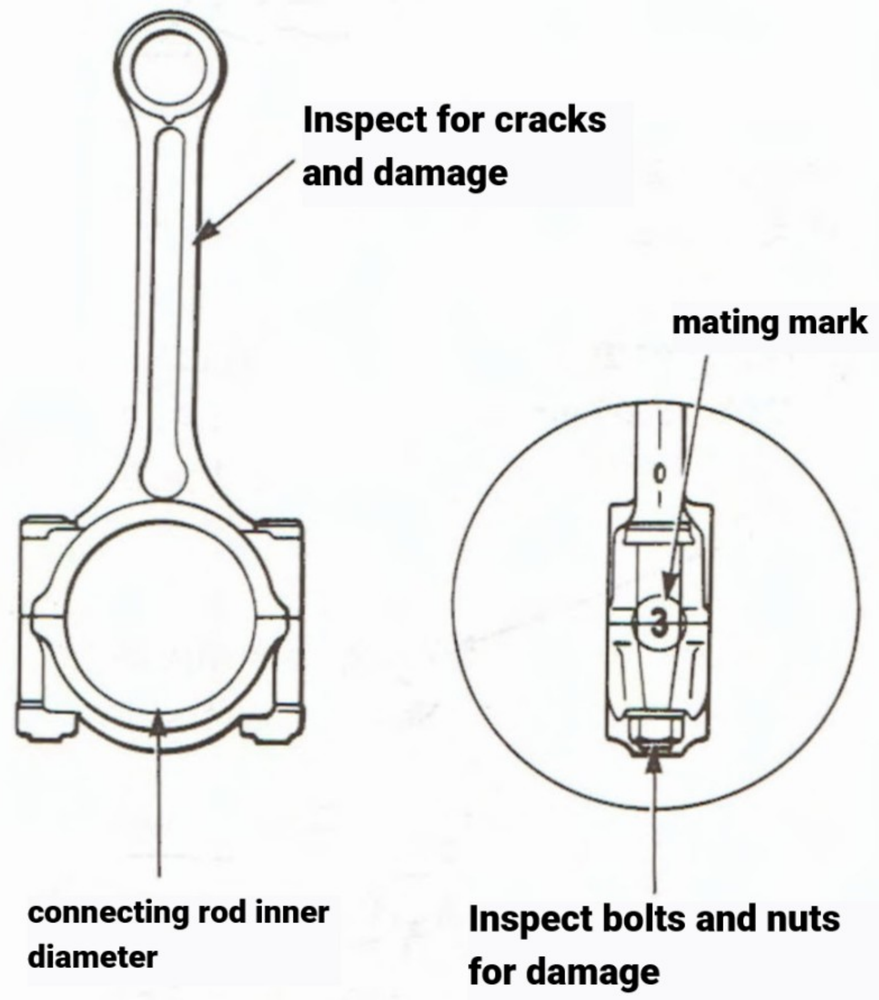
Connecting rod big end inner diameter

Each connecting rod is marked with a number that indicates its inner diameter.You can install 1, 2, 3, or any combination on your engine.

inner diameter of connecting rod Hole diameter: 39mm

mating mark	tolerance
1	0—＋0.006mm
2	＋0.006—＋0.012mm
3	＋0.012—＋0.018mm
4	＋0.018—＋0.024mm以下

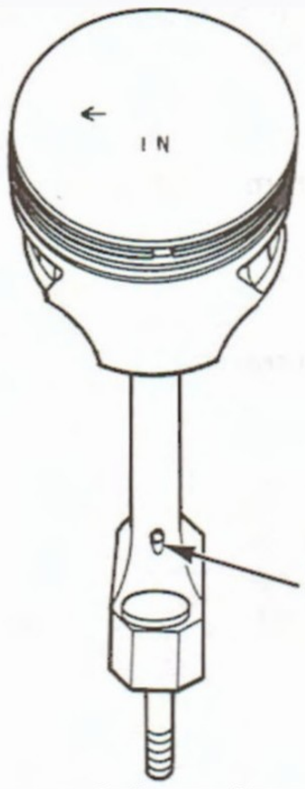
Note: The mating mark indicates the inner diameter of the connecting rod.



piston pin

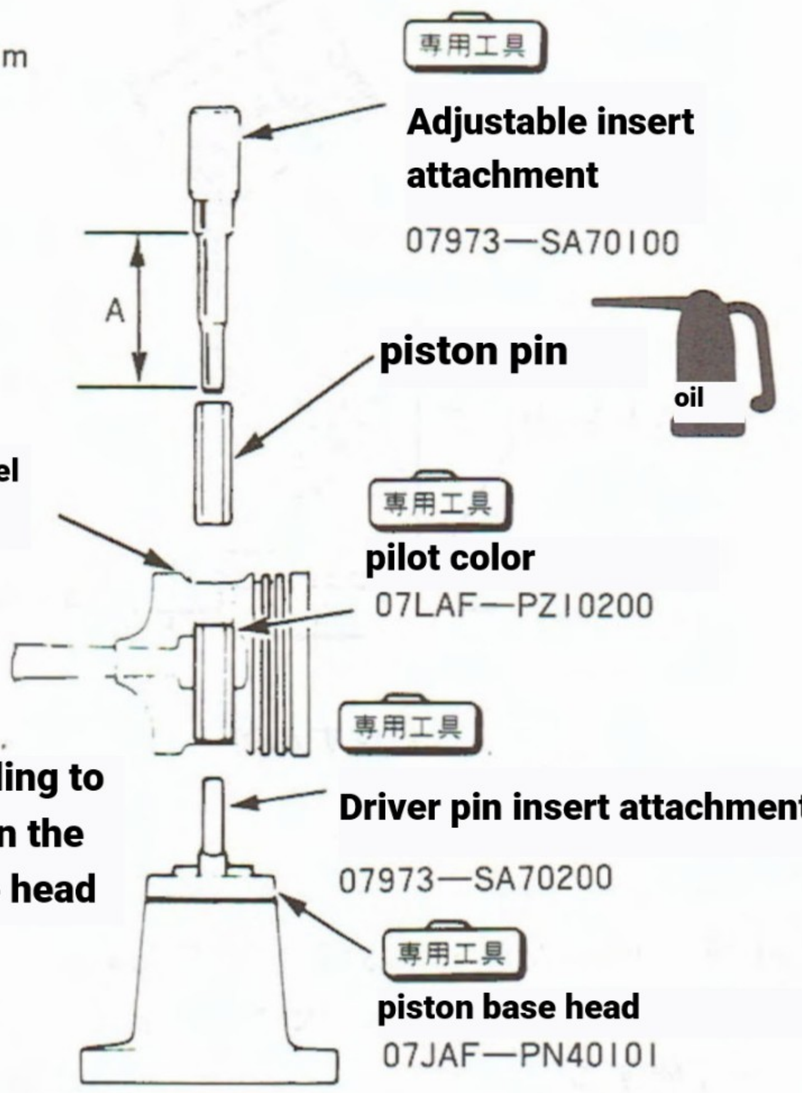
Mounting

CAUTION Use a special tool and a hydraulic press to remove and install the piston pin. "←" should be on the left side of the connecting rod oil jet hole.



Align the A part of the adjustable insert attachment with the following dimensions.

A = 49.5mm



Note

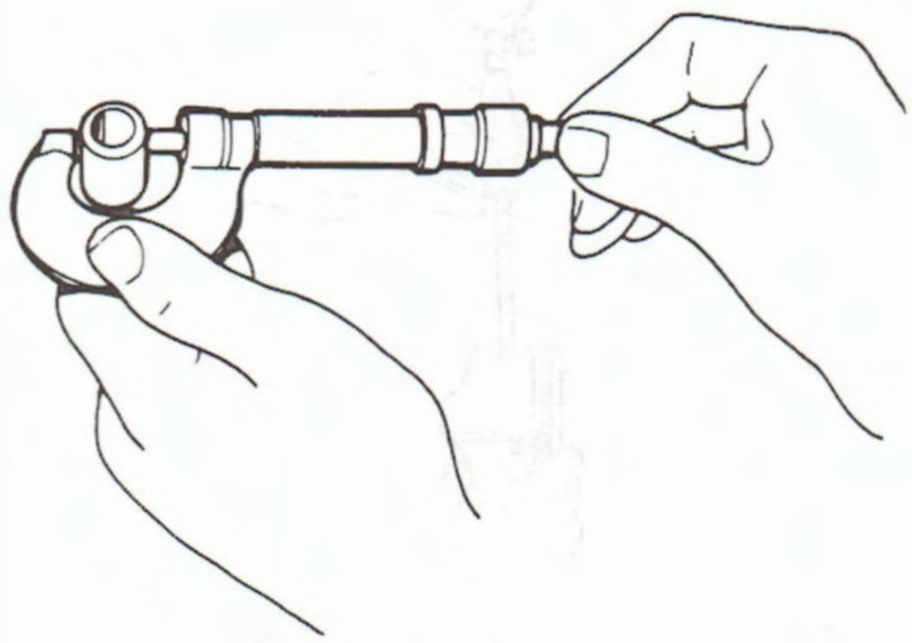
- The special tool above is used by replacing it with the base of the special tool 07973-6570500 (page 4-14).
- Be sure to align the concave portion of the piston boss with the convex portion (offset) of the piston base head.
- When installing the piston to the cylinder block, install the connecting rod oil jet hole on the IN side.

inspection

①Measure the outer diameter of the piston pin.

Outer diameter of piston pin

Standard value 15.994—16.000mm

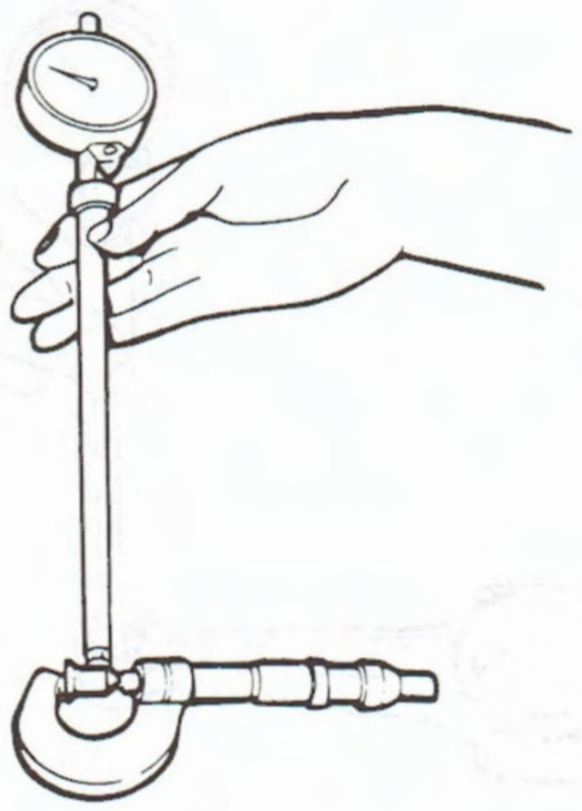


oversize piston pin

oversize 15.997—16.003mm

Oversized pistons have a blue mark on the end face.

②Match the cylinder gauge to the outer diameter of the piston pin.



piston pin

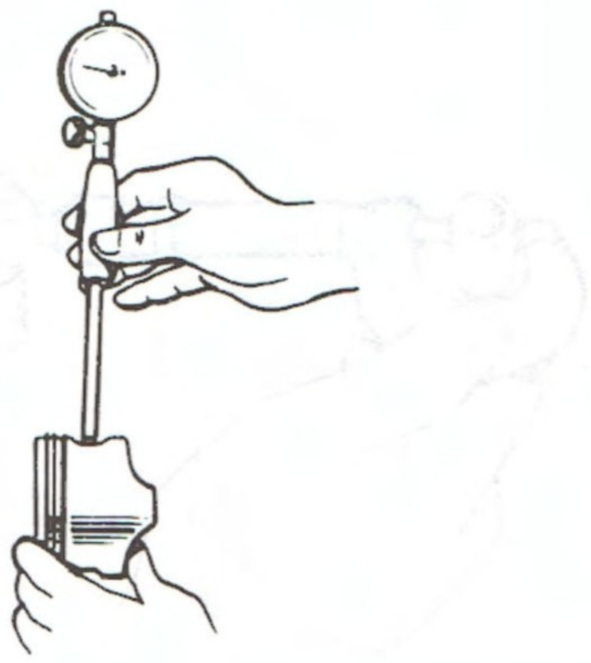
inspection

③Measure the piston pin hole clearance.

Clearance between piston pin and piston

Standard value 0.007—0.019mm

Check piston distortion and cracks

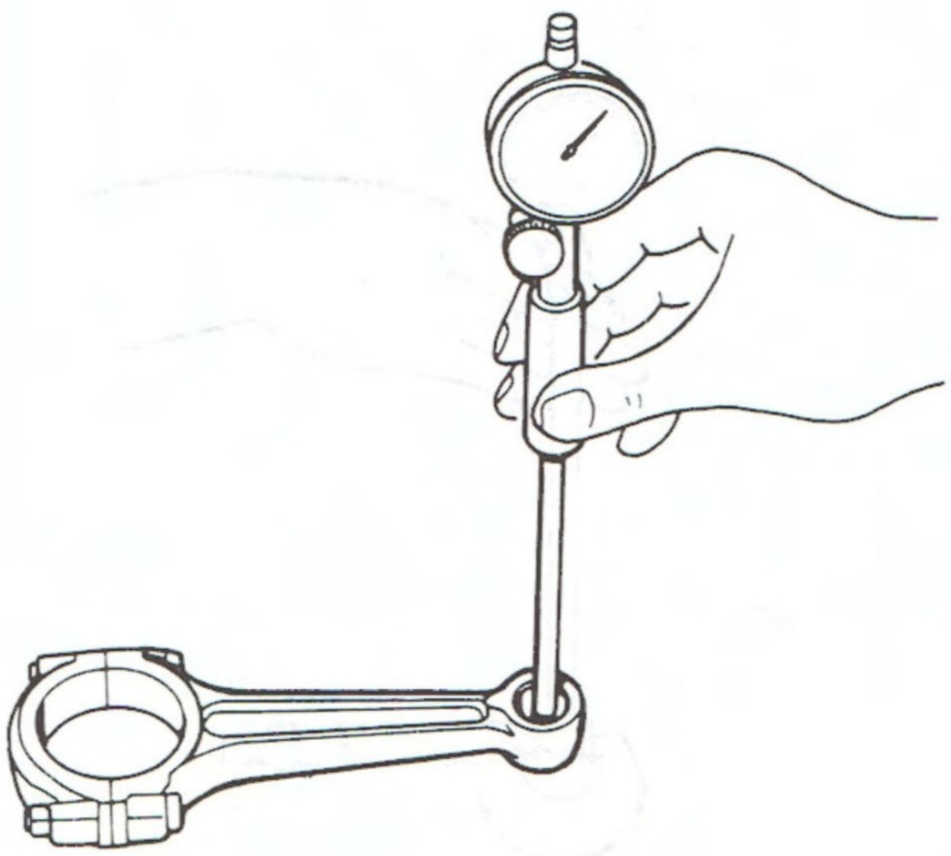


—If it exceeds the limit, measure again to see if the clearance can be secured with an oversized piston pin.

④Measure the press-fit allowance of the connecting rod piston pin hole.

Press-fit allowance for connecting rod and piston pin

Standard value 0.013—0.036mm



piston ring

Measurement of joint clearance

Note: Measure at the bottom of the cylinder (15-20mm from the bottom).

*When inserting the ring into the cylinder block, push it in with the piston head so that the piston ring is horizontal.

top ring

Standard value 0.15—0.30mm

limit 0.60mm

second ring

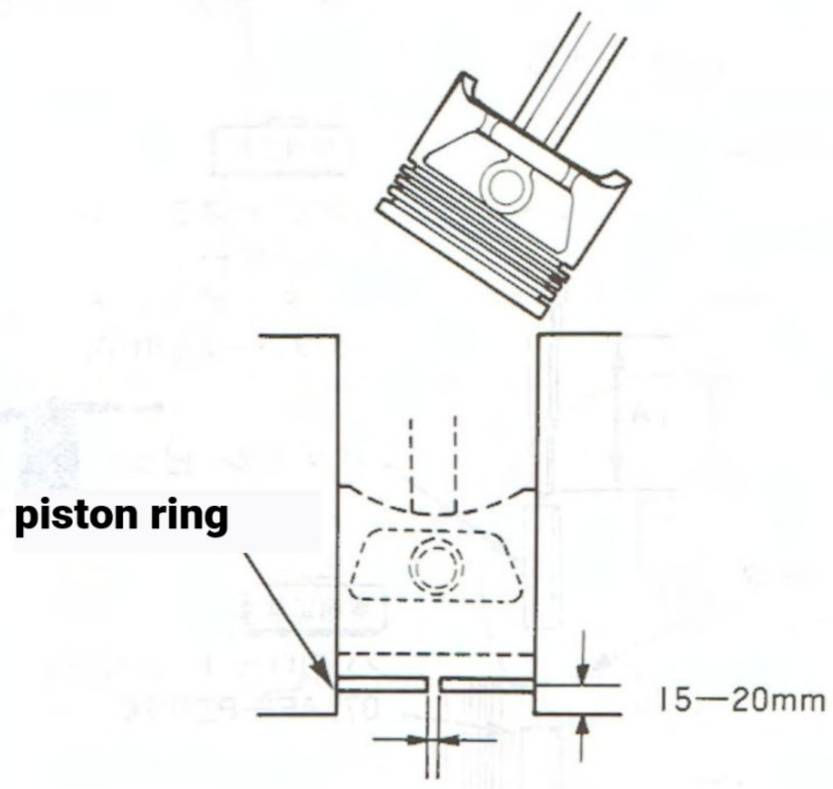
Standard value 0.30—0.45mm

limit 0.60mm

Oil ring (spacer)

Standard value 0.20—0.50mm

limit 0.60mm



Abutment clearance

If the joint clearance is too large, install a new piston ring and measure again. Next, check the inside diameter of the cylinder block.

oversize piston ring

oversize 0.25mm : 66.25mm

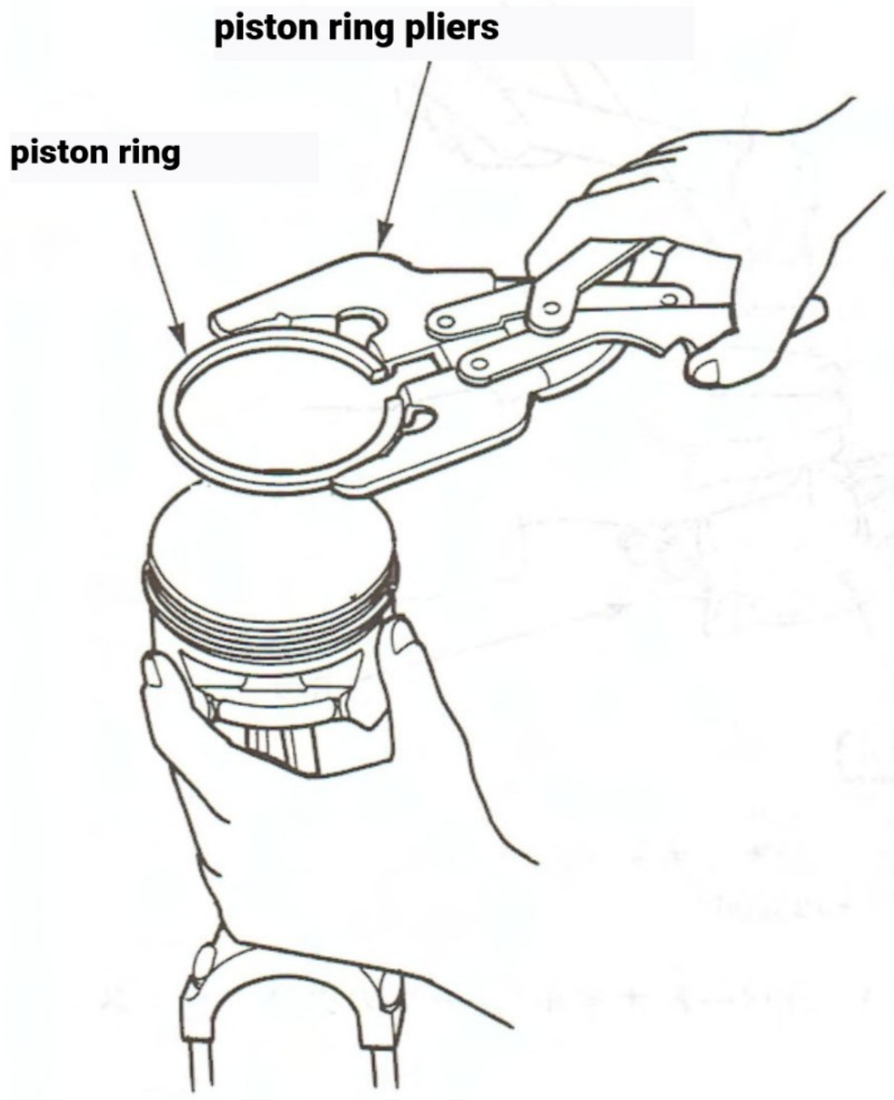
0.50mm : 66.50mm

Rings other than the oil ring are marked to indicate oversize, and the spacer for the oil ring is marked with blue for 0.25mm and red for 0.50mm.

exchange

Note

- Clean the piston rings thoroughly before installing the piston rings.
- Since the second ring is made of cast iron, it may break if excessive force is applied, so be careful when handling it.
- Arrange the removed rings for each piston.



Inspection of ring groove clearance

top ring

Standard value	0.035—0.060mm
limit	0.13mm

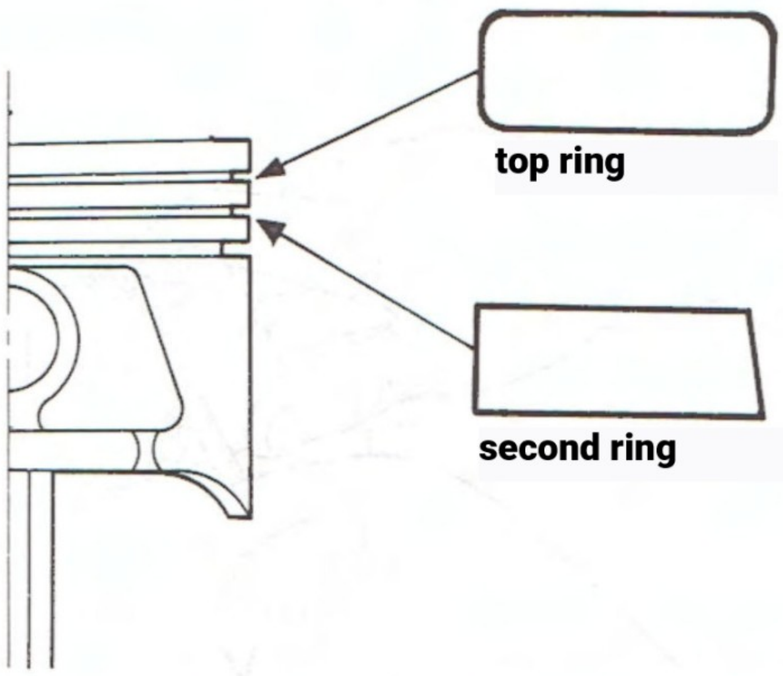
second ring

Standard value	0.030—0.055mm
limit	0.13mm

piston ring

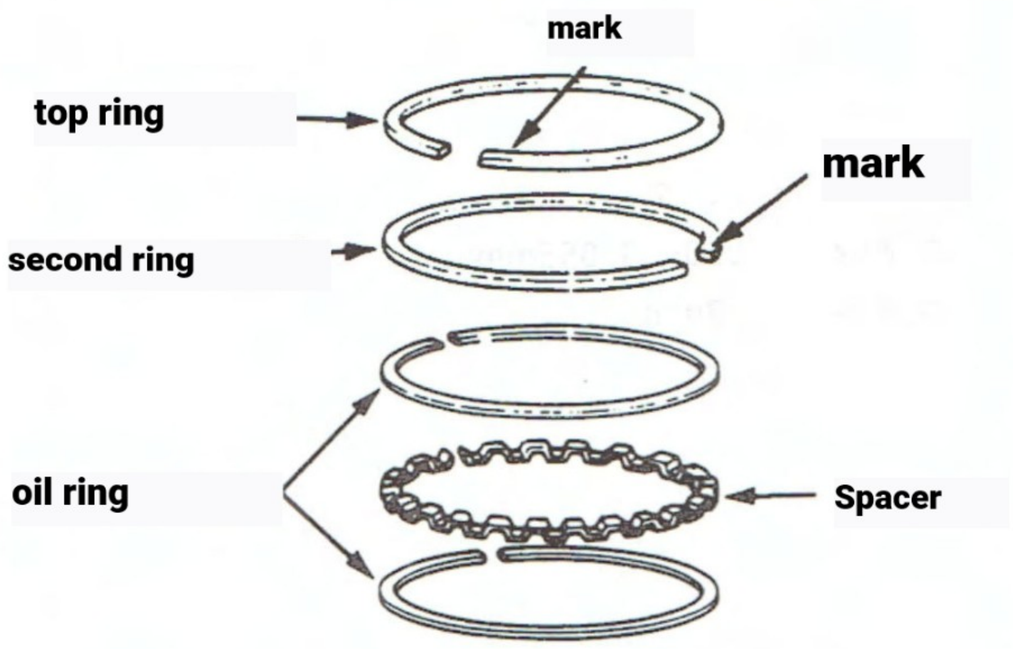
abutment alignment

① **Install the piston rings (page 4-17). Identify the top and second rings by the markings (TOP, 2ND) and check that they are in the correct ring grooves.**

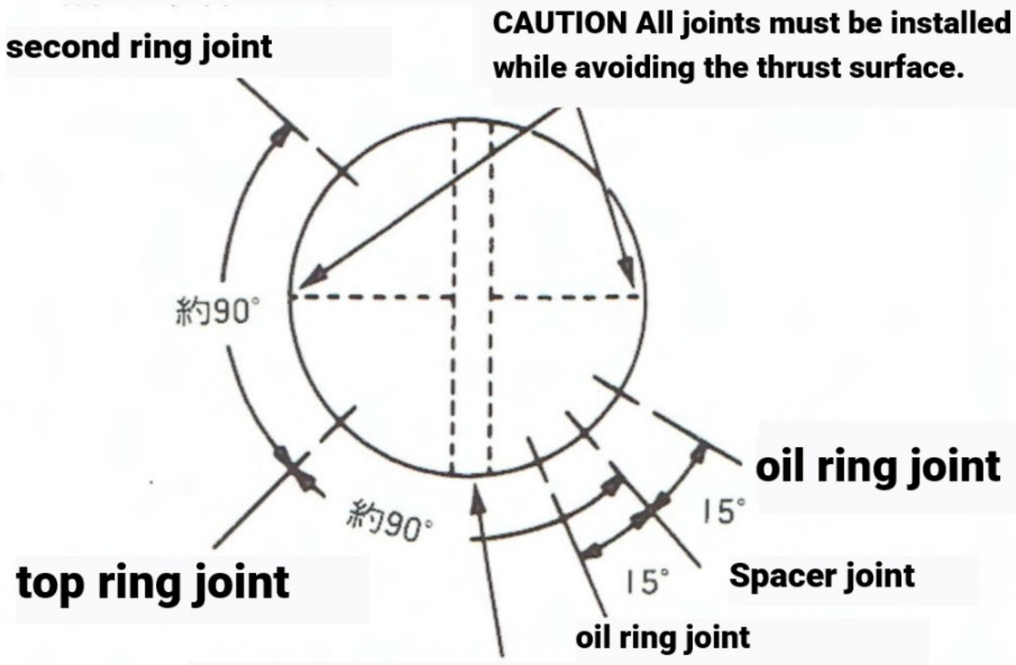


② **After installing each piston ring on the piston, turn it by hand to check that it moves lightly and does not get stuck.**

③ **Assemble the piston ring with the mark facing up.**



④ **The joints of each piston ring are installed at intervals of 120° or 180°.**



Oil seal

-Installation

✻ • **Drive the oil seal straight in so that it is flush with the outer surface of the R side cover.**

• **Install the oil seal with the part number on the outside.**

R. Side cover:

oil seal driver attachment

07947—6790200

R. Side cover and oil seal clearance:

✻ **See page 5-10 for oil pump oil seal installation.**

piston, crankshaft

Mounting

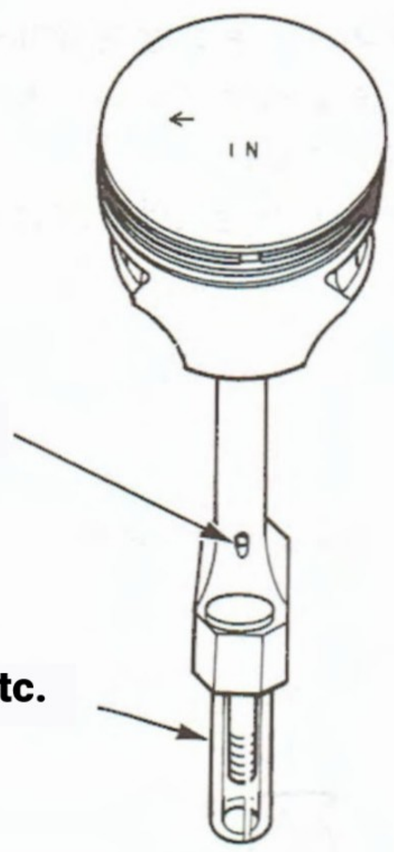
Apply oil to the inner surface of the piston ring groove and cylinder wall

*Attach a vinyl hose or the like to the connecting rod bolt to prevent the crankshaft, cylinder, etc. from being scratched.

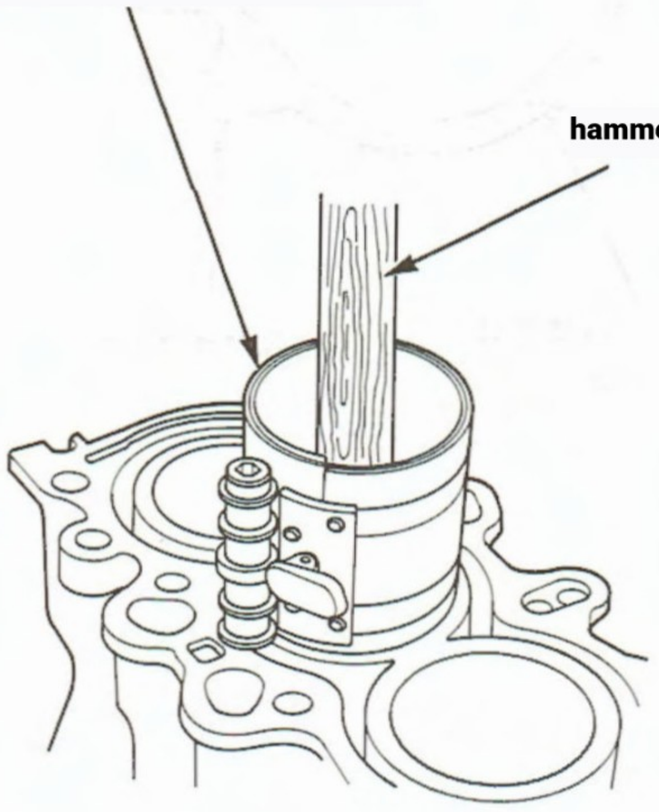
CAUTION Install the piston before installing the crankshaft.

①With the "←" mark toward the timing belt, gently push the piston head into the cylinder block with a handle of a hammer, etc.

←Timing belt side



Piston slider (commercially available)

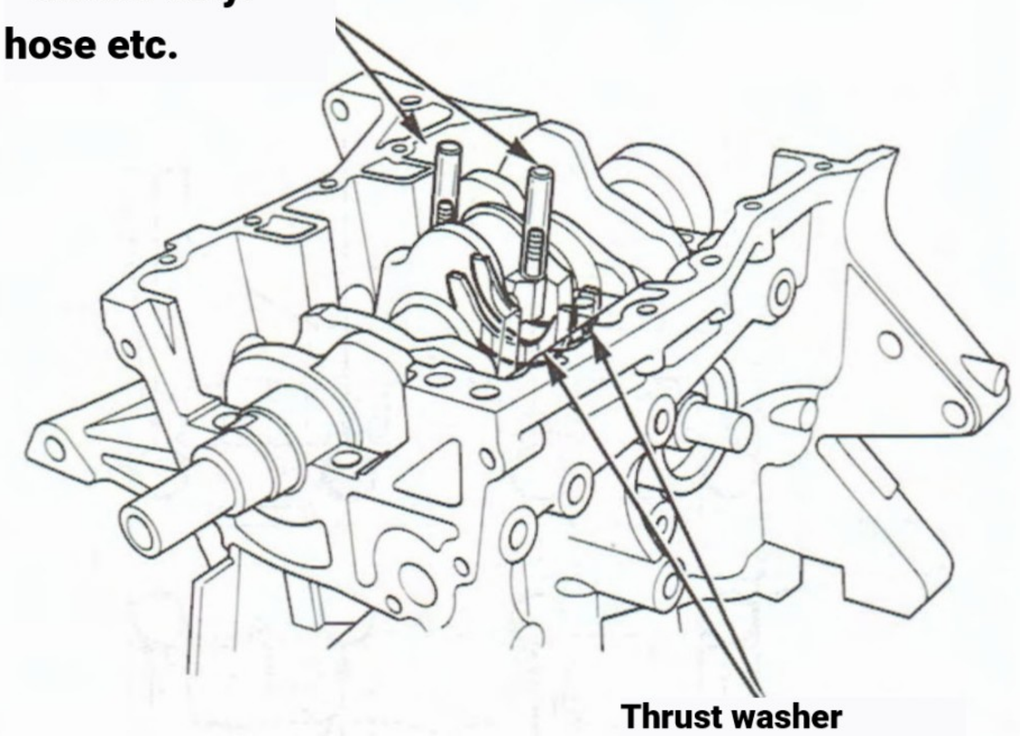


②Install the crankshaft.

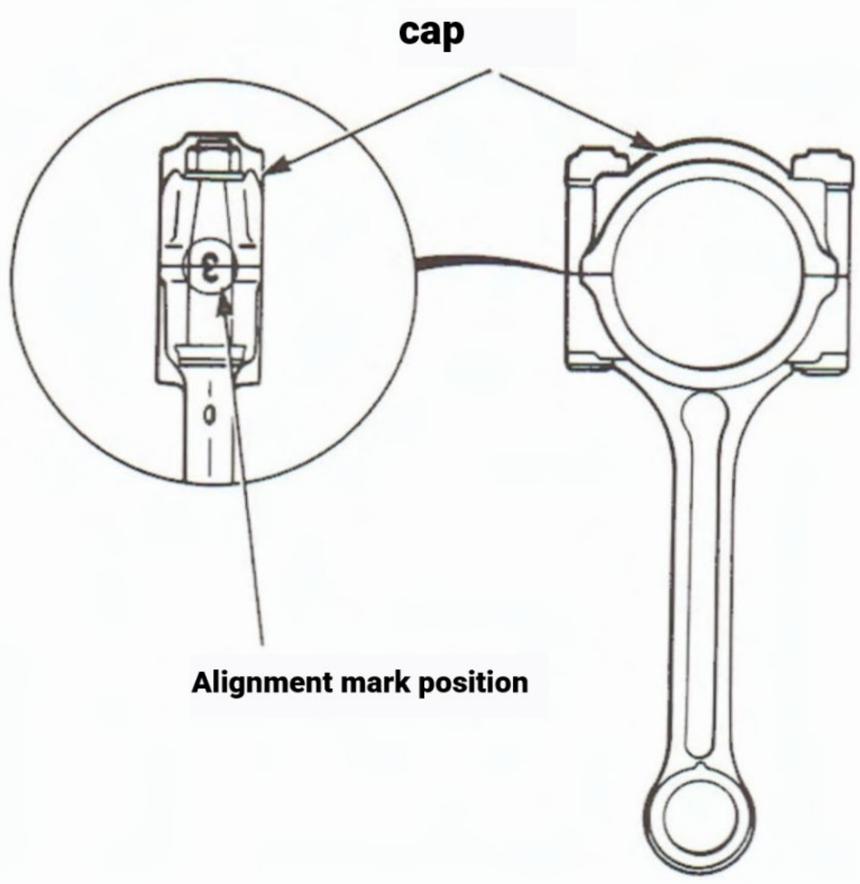
*Attach vinyl hoses, etc., to the connecting rod bolts so as not to scratch the crankshaft, etc.

- Align the crankshaft with the No. 1 connecting rod and temporarily tighten the cap. Rotate the crankshaft to align with the No. 2 connecting rod, then with the No. 3 connecting rod, and temporarily tighten the connecting rod caps.

* Install vinyl hose etc.



- Install the thrust washers on the No.3 journal with the grooved side facing outward.
- Apply engine oil or molybdenum disulfide to the metal surface before assembly.
- When assembling the connecting rod cap, align the mating marks so that the direction is correct.



-Installation

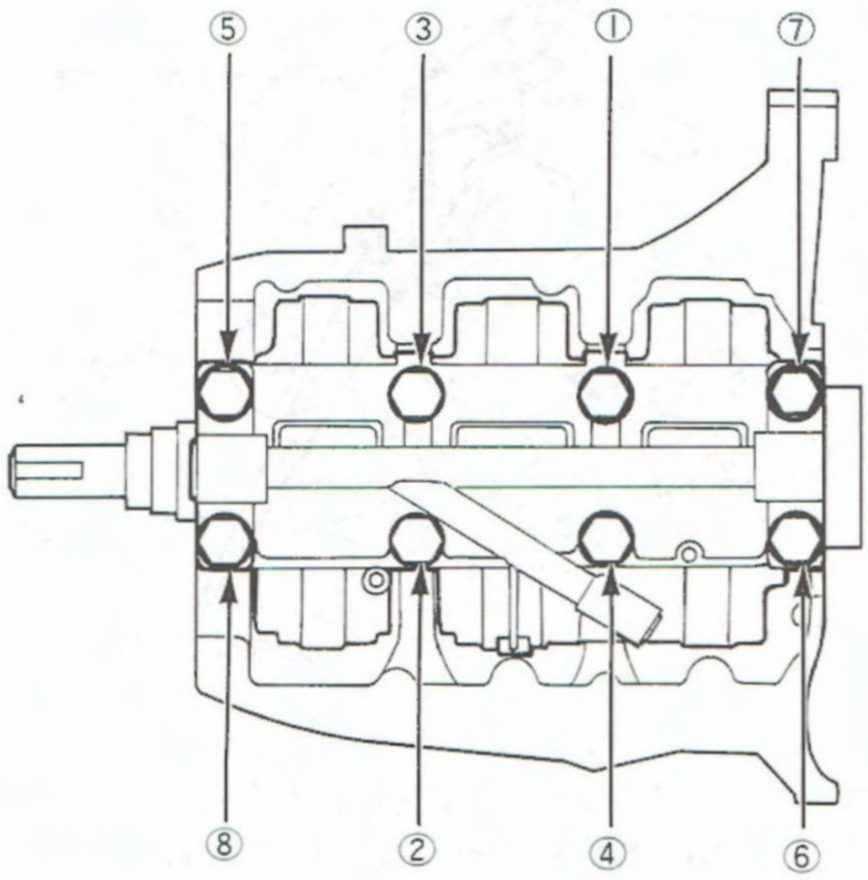
③Tighten the connecting rod cap nuts for each cylinder to the specified torque.

torque : 3.2kg-m

④Install the main bearing cap, apply Honda genuine oil to the bolt thread surface and bearing surface, and tighten diagonally from the inside to the outside.

torque : 4.8kg-m

Main bearing cap bolt tightening order

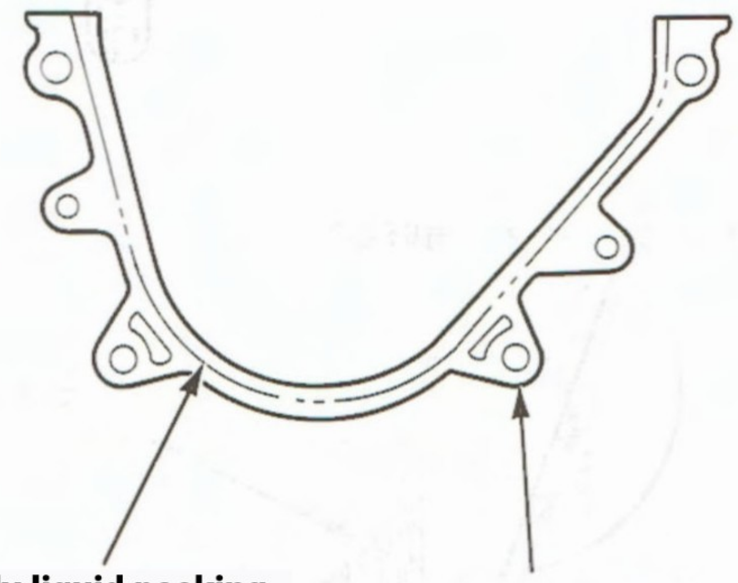


⑤Apply liquid packing Honda genuine 1216 to the mating surface of the right side cover with the cylinder block, and attach it to the cylinder block.

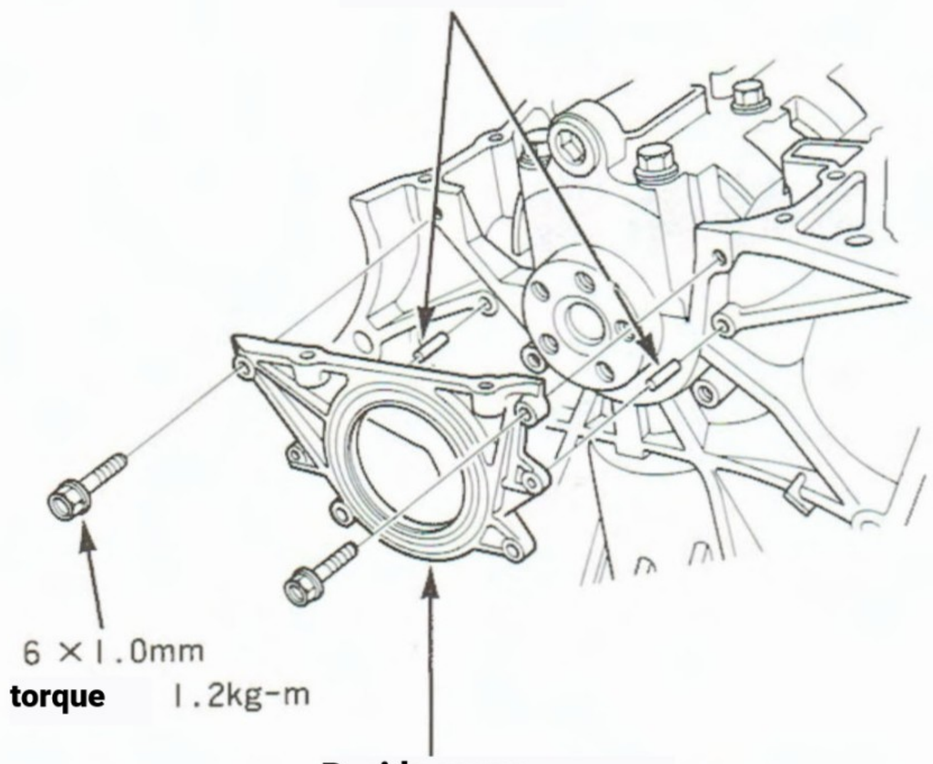
Note

- For the liquid packing, Honda genuine liquid packing 1216 is used.
- Remove old liquid packing and oil from the packing surface.
- The application position should be the center of the sealing surface.
- Apply oil to the entire circumference of the bolt hole to prevent oil from leaking.
- Do not allow liquid packing to enter the O-ring groove.
- If the product is left for more than 20 minutes after applying the liquid packing, do not reassemble it.
- Wait 30 minutes after assembly before adding oil.

Liquid packing application line



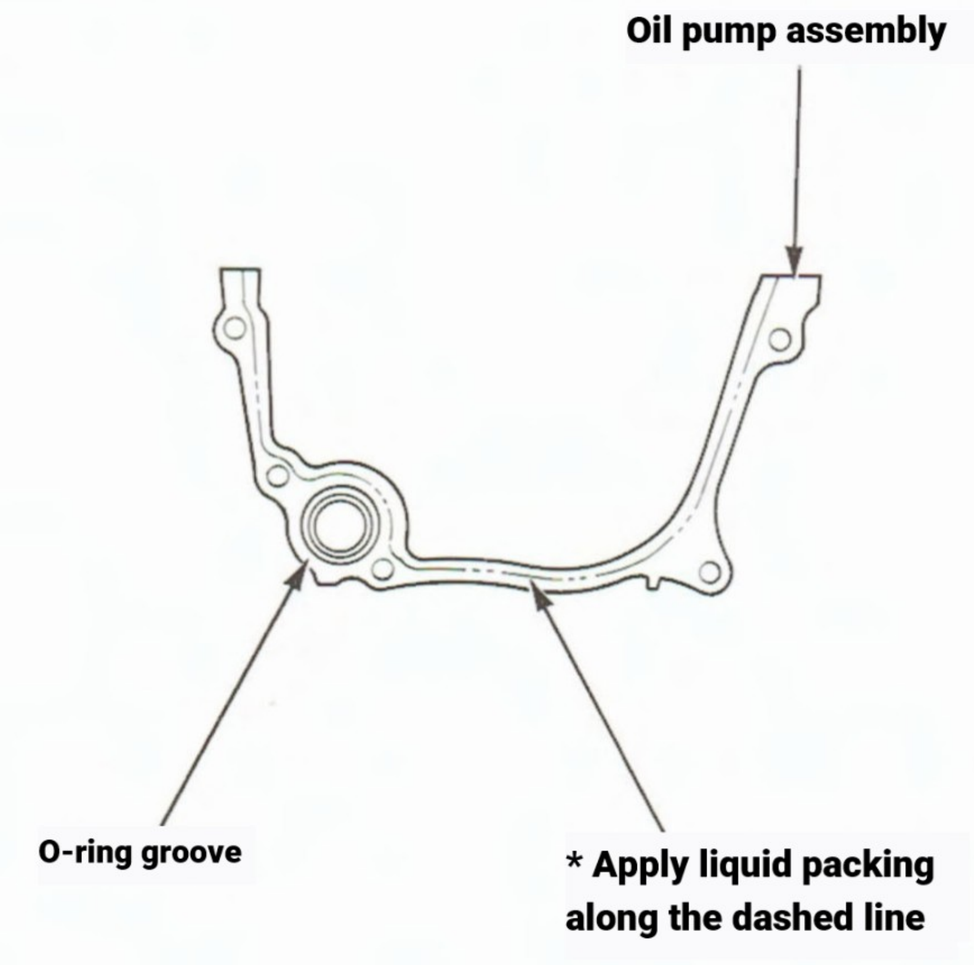
✻ Install the dowel pins (2) at the specified positions.



*Honda genuine liquid packing 1216 is applied to the mating surface of the block.

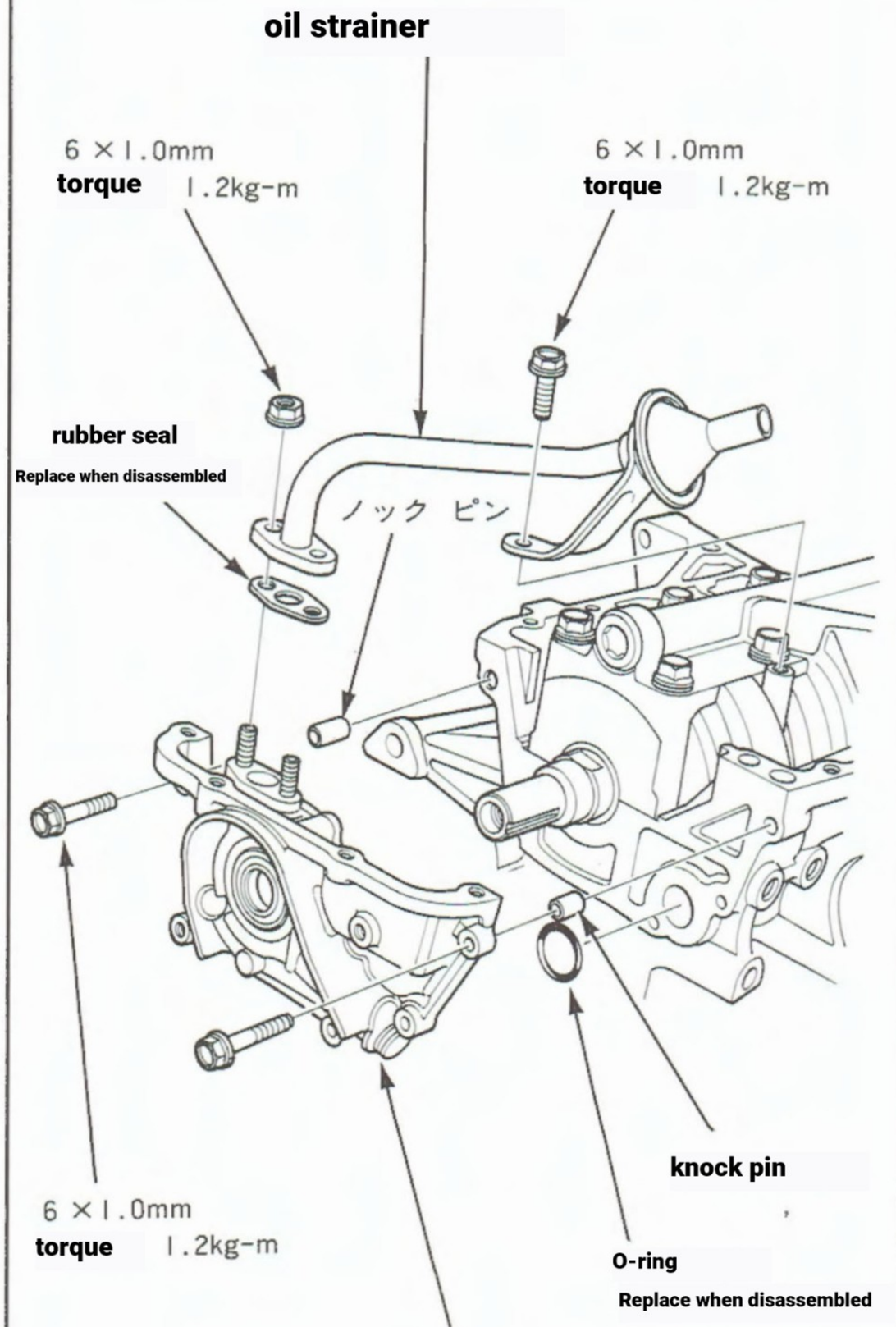
⑥ Apply genuine liquid packing 1216 to the mating surface of the oil pump assembly with the cylinder block, and install it to the cylinder block.

✻ Do not allow liquid packing to enter the O-ring groove.



✻ · Dowel pins (x2) Install the O-ring in place

· Always use a new O-ring.



⑦ Install the oil strainer.

✻ Always use new packing.

Lubrication device

Service data, special tools

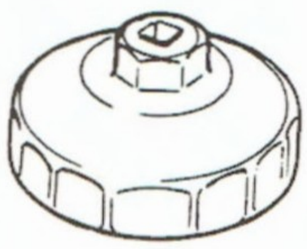
Service data

Unit : mm unless otherwise specified.

Part name	item		Standard value	limit value
Recommended oil	Honda Genuine Oil Ultra U (APISE grade for 4-cycle 4-wheel vehicles, 10W-30) or Honda Genuine Oil Ultra GX (APISF grade for 4-cycle 4-wheel vehicles, 10W-30)	oil quantity 〔ℓ〕	Disassembly time: 3.0 exchange time: 2.7 (when changing oil and oil filter at the same time) 2.5 (when changing oil)	
oil pump	structure		Trochoidal	—
	Rated oil feed rate 〔ℓ/min—rpm〕		25—6,000	—
	Inner and outer tip clearance		0.14	0.20
	Outer and body diameter clearance		0.100—0.175	0.20
	Side clearance		0.03—0.08	0.15
	structure between rotor and body		plunger type	
Relief valve	adjusting hydraulic pressure 〔kg/cm²〕	80°C idle	0.7 or more	
		80℃ 3,000 rpm 時	3.5 or higher	

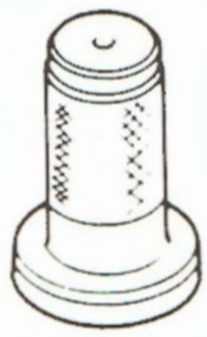
Specialized tool

No.	tool number	Tool name	remarks
①	07HAA—PJ70100	oil filter socket	oil filter replacement
②	07406—0030000	oil pressure gauge attachment	hydraulic measurement
③	07947—6340000	oil seal driver	Crankshaft (Pulley side)



①

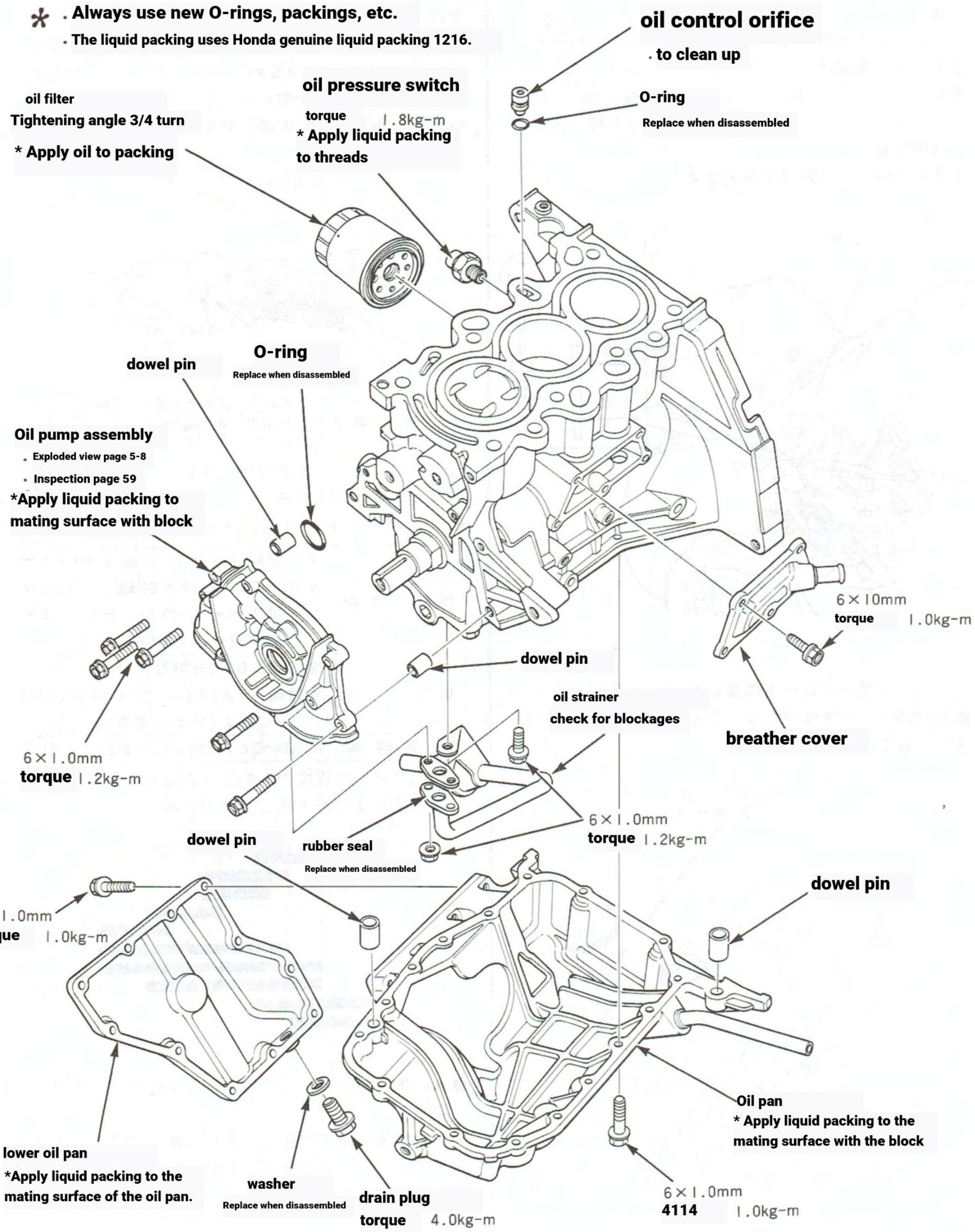
②



③

Lubricator

Development view



engine oil

Inspection, replacement

inspection

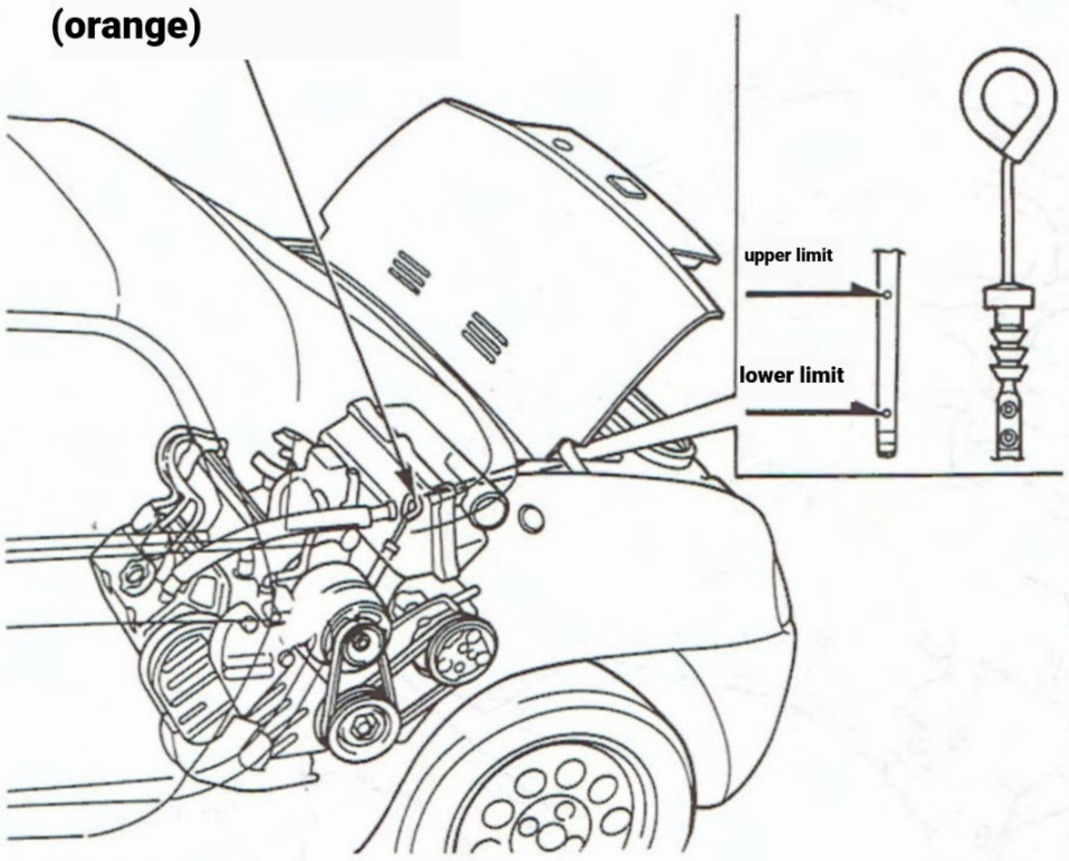
①Do this on a level surface without starting the engine.

②open the trunk.

③Pull out the level gauge and check the amount and dirt.

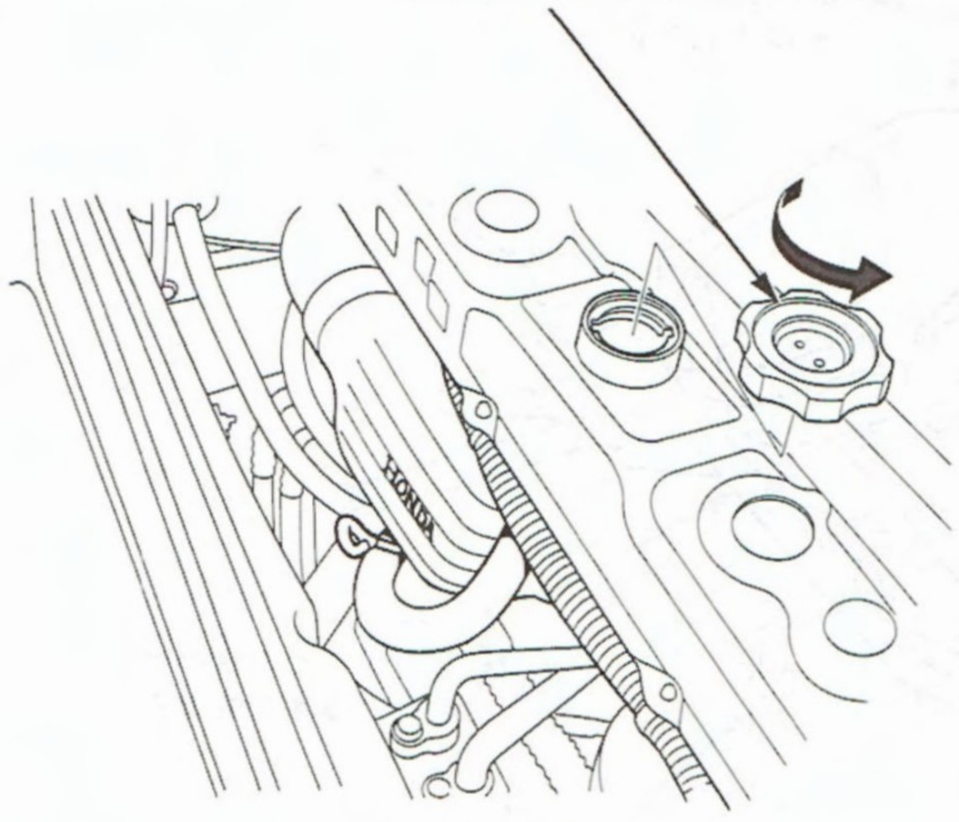
④At the lower limit, replenish to the upper limit.

Oil level gauge
(orange)



CAUTION Do not mix different brands or grades of oil, or use low-quality oil.

engine oil filler cap

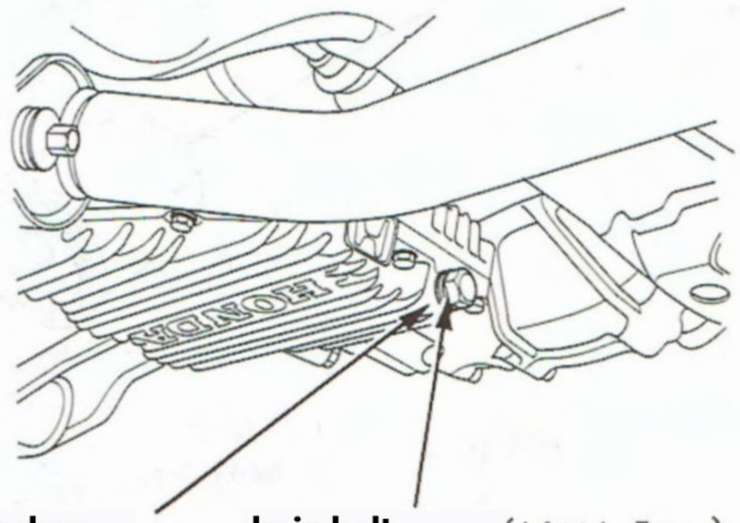


exchange

①Warm up the engine. After warming up, stop the engine.

②Loosen the drain bolt and drain the engine oil.

CAUTION Be careful not to loosen the drain bolt while the engine is hot, as the oil temperature will be high and you may get burned easily.



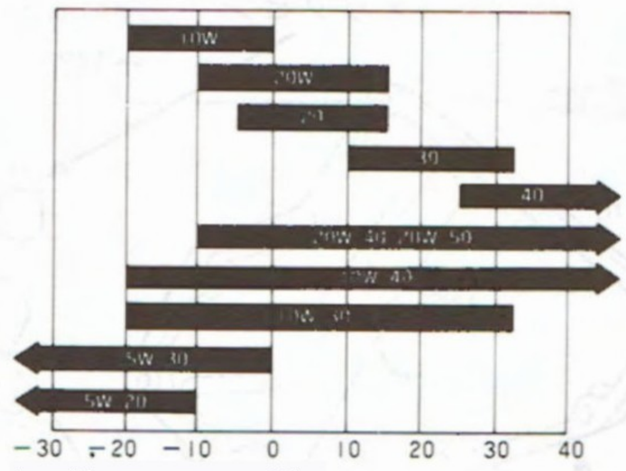
washer — drain bolt (14×1.5mm)
Replace when removed — torque 4.0kg-m

③Install a new washer, tighten the drain bolt, and add recommended oil.

✻Fill in from the oil inlet on the cylinder head cover.

Recommended oil	Honda genuine oil Ultra U (API SE grade for 4-cycle four-wheel vehicles), or Honda genuine oil Ultra GX (API SF grade for 4-cycle four-wheel vehicles)
specified amount	全容量3.0ℓ (During disassembly maintenance) 交換時2.7ℓ (when changing oil and filter) 2.5ℓ (when changing oil)
Time for replacement	Every 10,000km or every 6 months, whichever comes first

Based on the table below, use the amount of oil appropriate for the temperature, taking into consideration the amount of oil to be used until the next oil change.



(outside temperature °C)

●Under the following conditions, the oil deteriorates more quickly, so replace it as soon as possible.

- Frequent driving on unpaved roads Use in cold climates
- Frequent use while idling
- Repeated short-distance driving Use as towing.

oil filter

exchange

Time for replacement	20,000 km 8

①Oil filter socket (special tool) Remove the oil filter.

②Apply a thin layer of oil to the new oil filter packing.

*Check the oil filter seat and threads for dents and damage.

③Rotate the oil filter by hand until the packing is seated.

④After the packing is seated, use the oil filter socket (dedicated tool) to retighten it at the specified rotation angle.

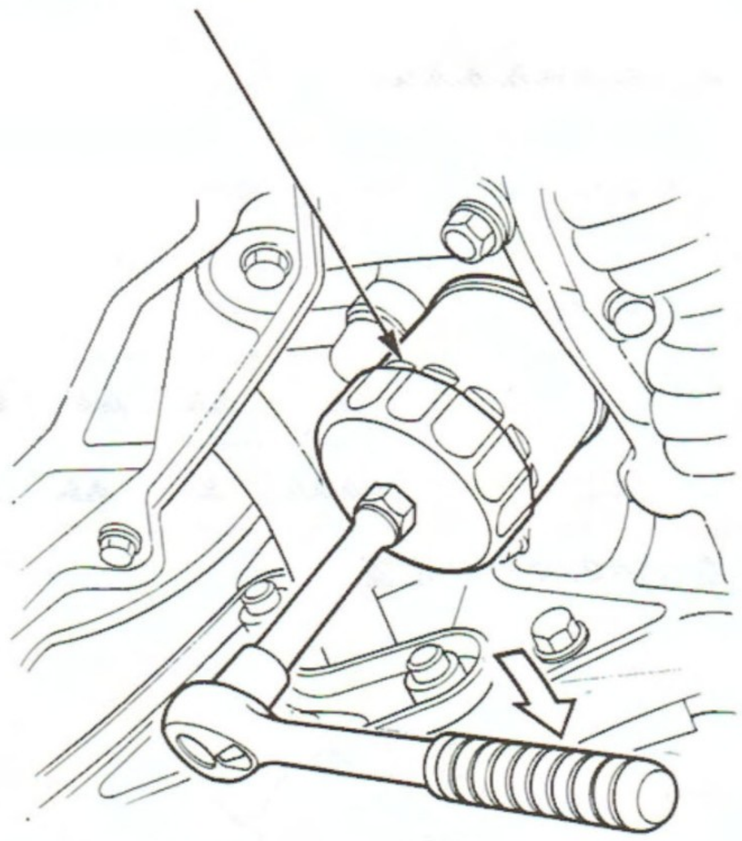
Specified rotation angle: 3/4 rotation

CAUTION When installing the oil filter, be sure to use the special tool or the cap tool that comes with the oil filter, and work securely at the specified rotation angle. It may cause damage to the engine (problems such as oil leakage).

Inspect for cracks and damage

専用工具

oil filter socket
07HAA-PJ70100



• The tightening method for the specified rotation angle is described on pages 5-6.

oil filter

exchange

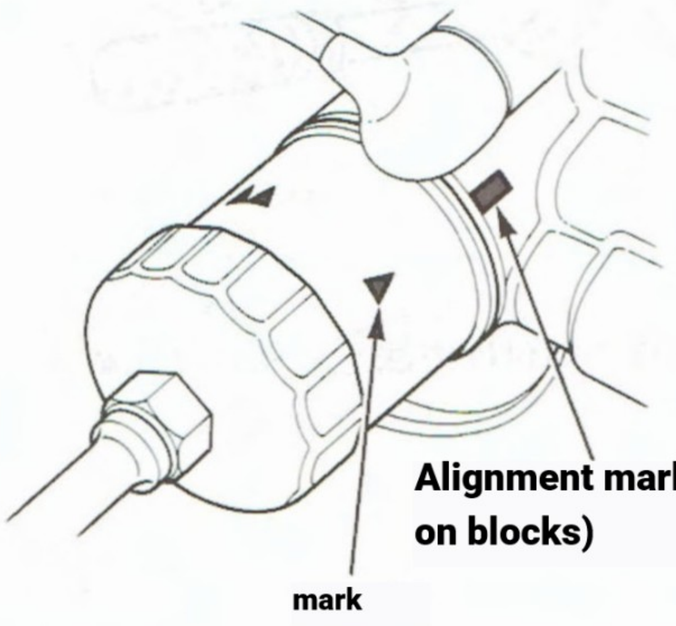
Tightening method for specified rotation angle

<Example>

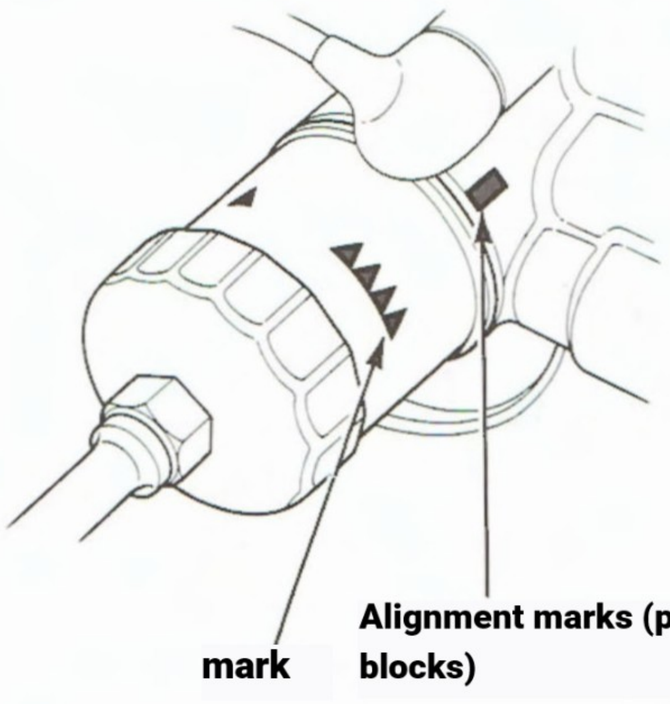
- ▲▲▲▲ marks are printed around the oil filter, dividing the circumference into 4 equal parts as shown in the figure. Tighten it by rotating it clockwise three turns.

Mark when packing is seated	▲	▲▲	▲▲▲	▲▲▲▲
Mark after 3/4 turn tightening	▲▲▲▲	▲	▲▲	▲▲▲

Mark position when packing is seated



Mark position when tightening is completed



⑤After tightening, pour in the specified amount of engine oil, run the engine for at least 3 minutes, and check that there is no oil leakage.

oil pressure

measurement

*The pressure gauge is a commercially available meter (full scale 7-10kg/cm²) and uses a PT 1/8 - 19 tpi

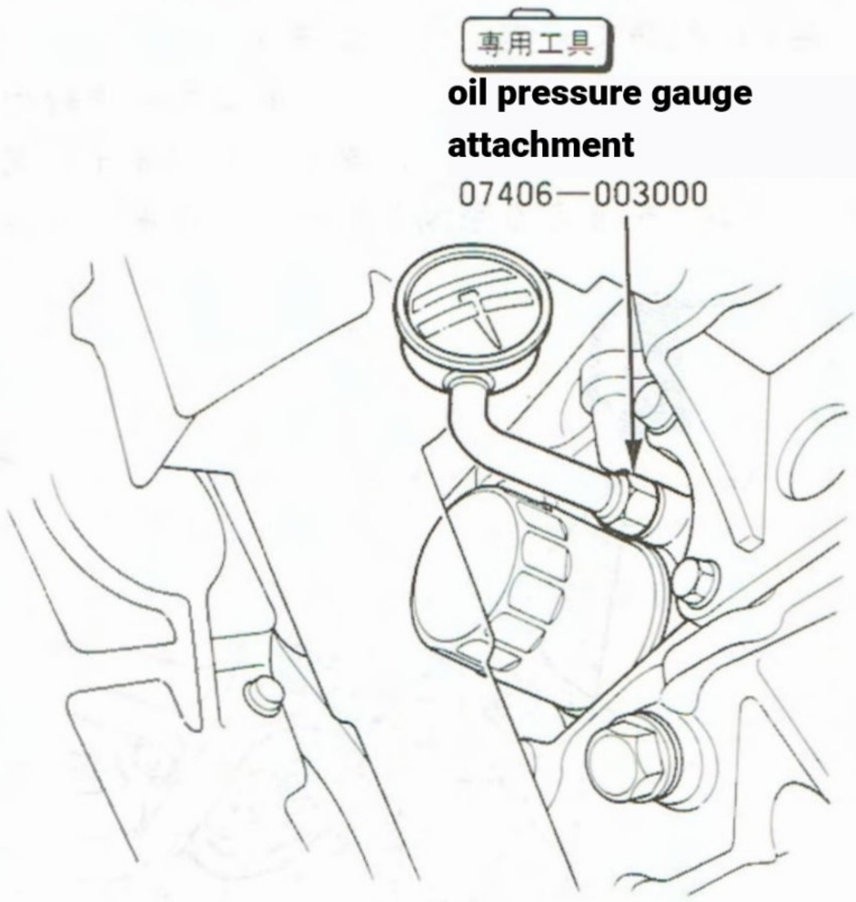
①Install the engine tachometer.
②Remove the oil pressure switch and install the pressure gauge.
③Let the engine run until the radiator fan runs twice.

④After the radiator fan has run twice, measure the oil pressure.

Hydraulic pressure (after warming up)

when idling : 0.7kg/cm² that's all

3,000rpm時 : 3.5kg/cm² that's all



⑤Apply Honda genuine liquid packing 1216 to the flange side half of the screw part of the oil pressure switch and install it.

torque 1.8kg-m

oil pump

Removal

① Remove the timing belt (page 2-5).

② Remove the special bolt and remove the crankshaft pulley and timing belt driven pulley (page 2-3).

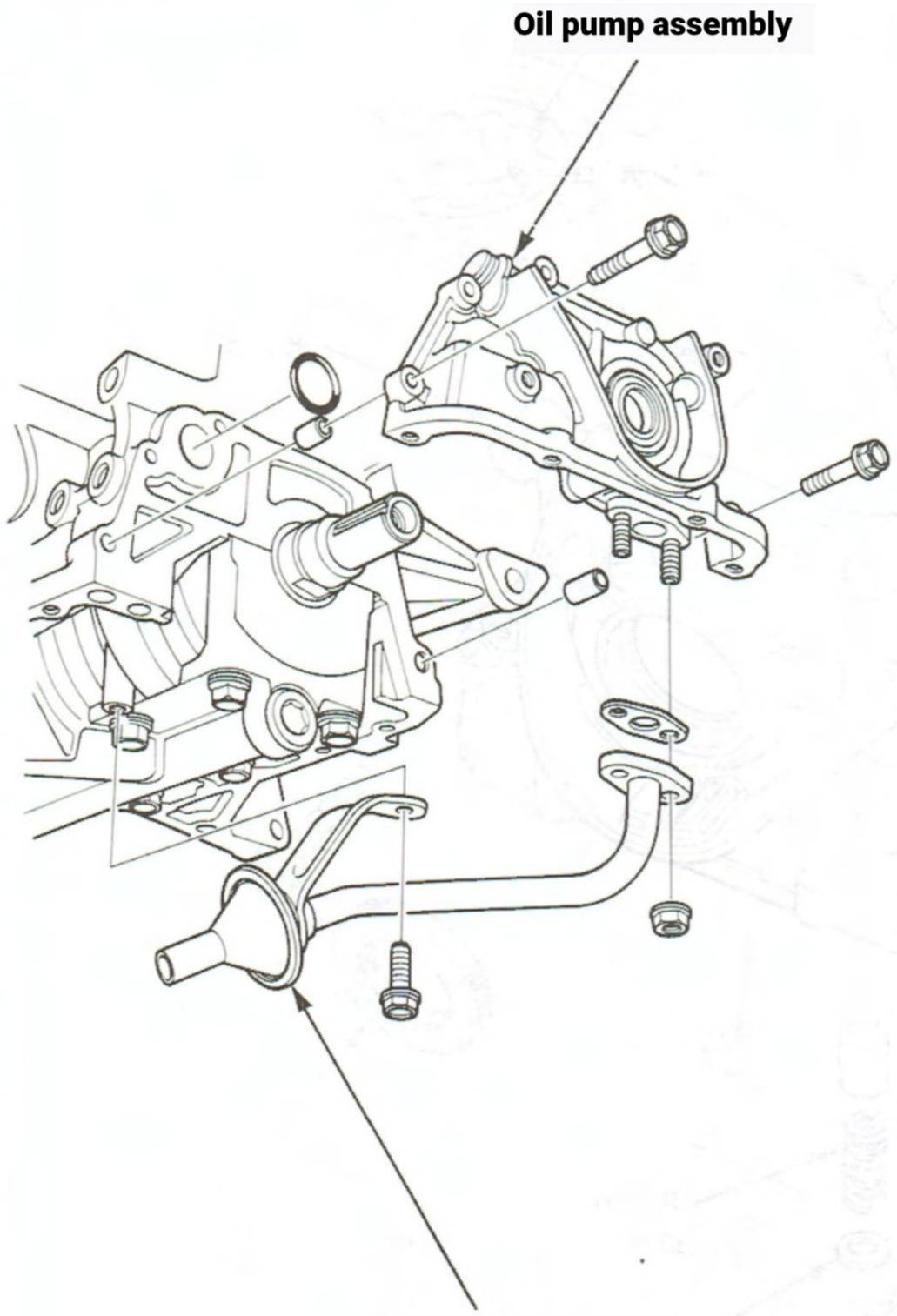
③ Remove the timing belt idle pulley and remove the back cover (page 2-3).

④ Remove the lower oil pan.

⑤ Remove the oil pan.

⑥ Remove the oil strainer.

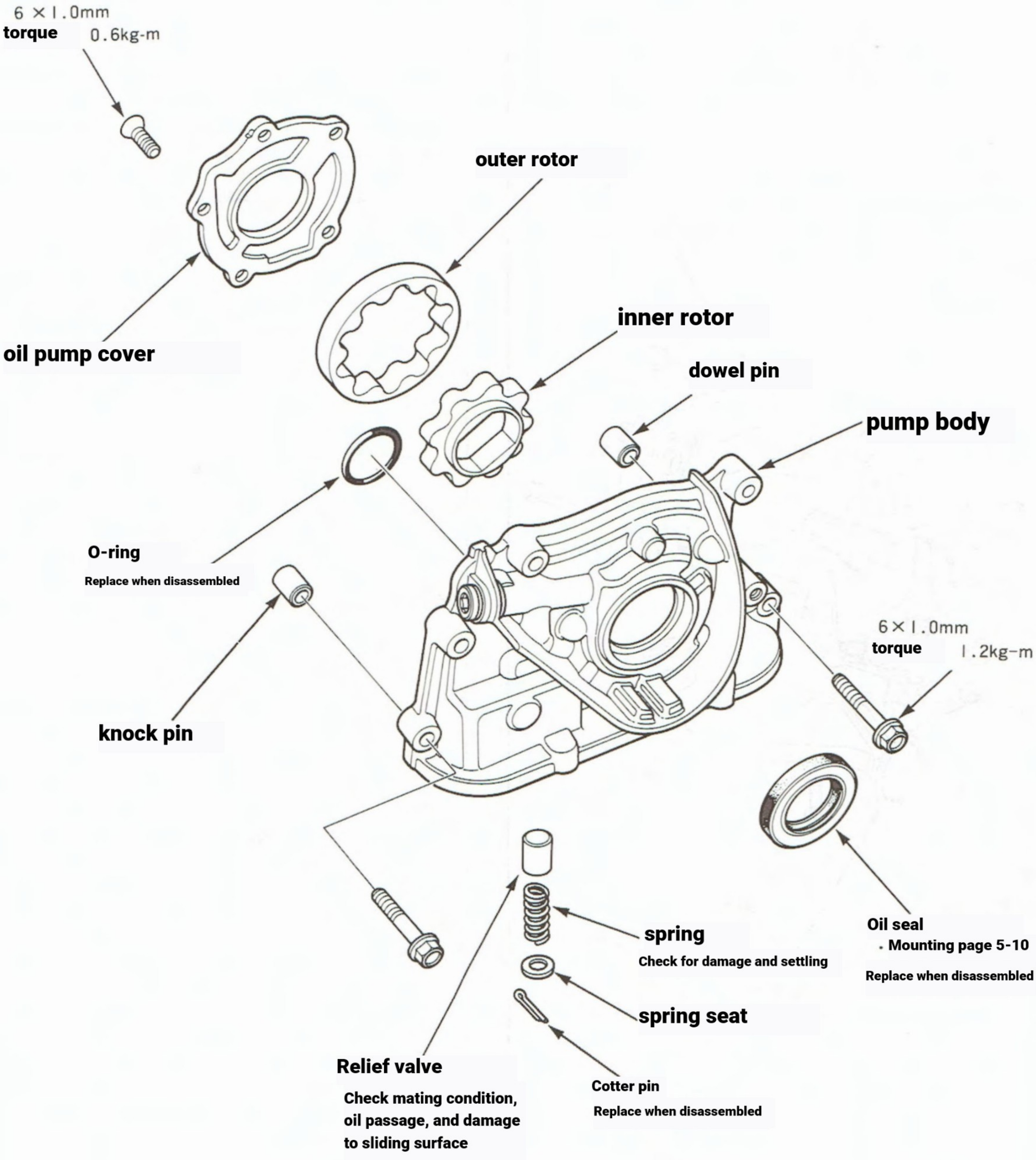
⑦ Remove the oil pump tightening bolt and remove the oil pump assembly.



oil pump

Disassembly

✻ • Install the rotor in the same direction as when it was disassembled.
- After installation, check that the rotor moves smoothly in the assembled state.
- Replace the O-ring and oil seal with new ones.



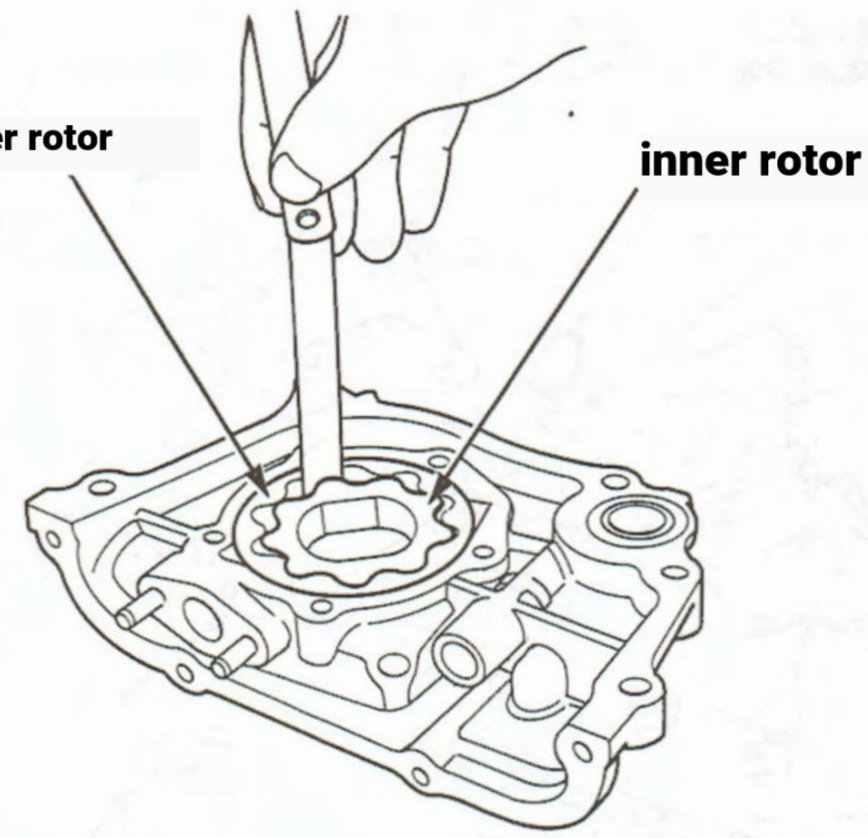
-inspection

✻**Remove the oil pump cover.Inner rotor and outer rotor chips**

clearance

Standard value 0.14mm

limit 0.20mm

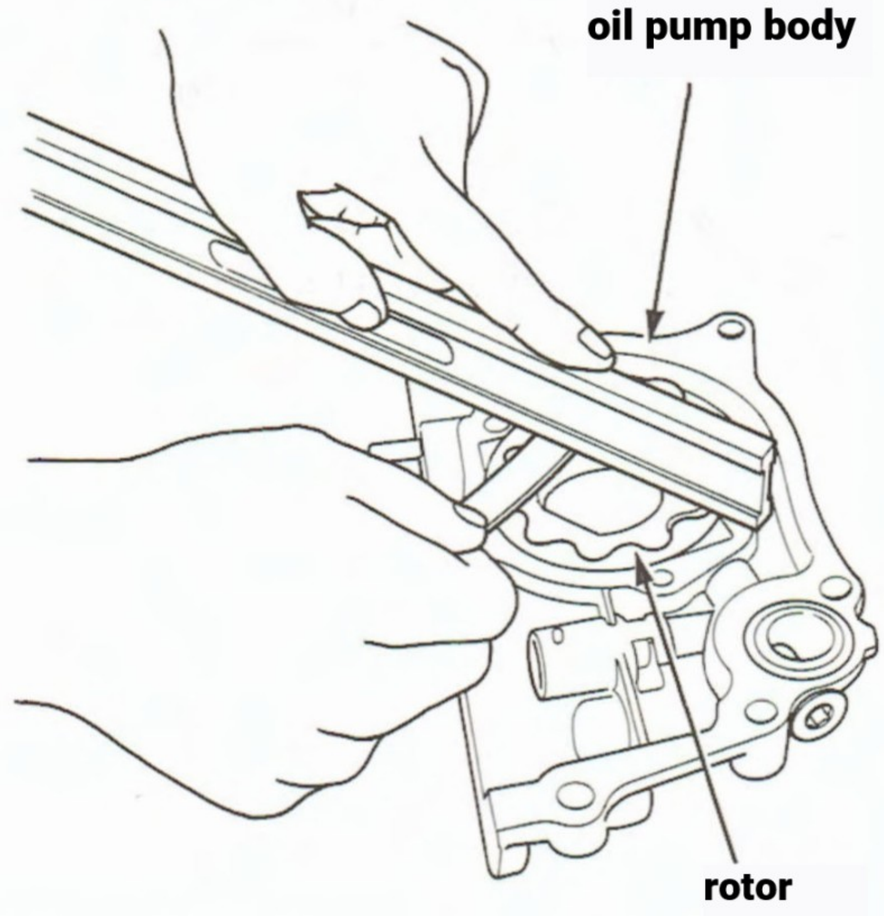


—**If the value exceeds the limit, replace as a set.**

Side clearance between rotor and body

Standard value 0.03—0.88mm

limit 0.15mm

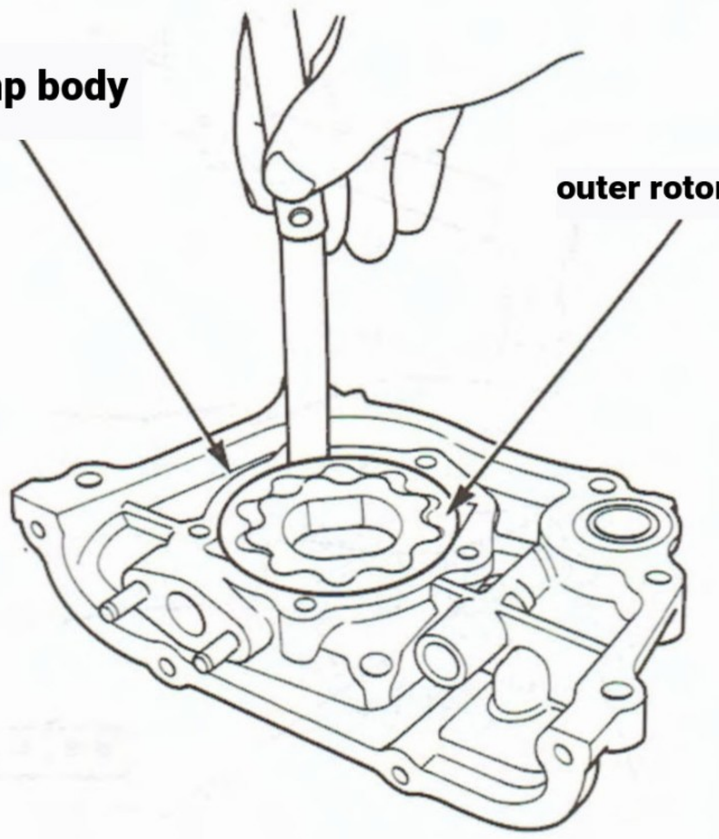


_**If it exceeds the limit, replace the rotor set or pump body.**

Outer rotor and body diameter clearance

Standard value 0.100—0.175mm

limit 0.20mm



_**If it exceeds the limit, replace the rotor set or pump body.**

oil pump

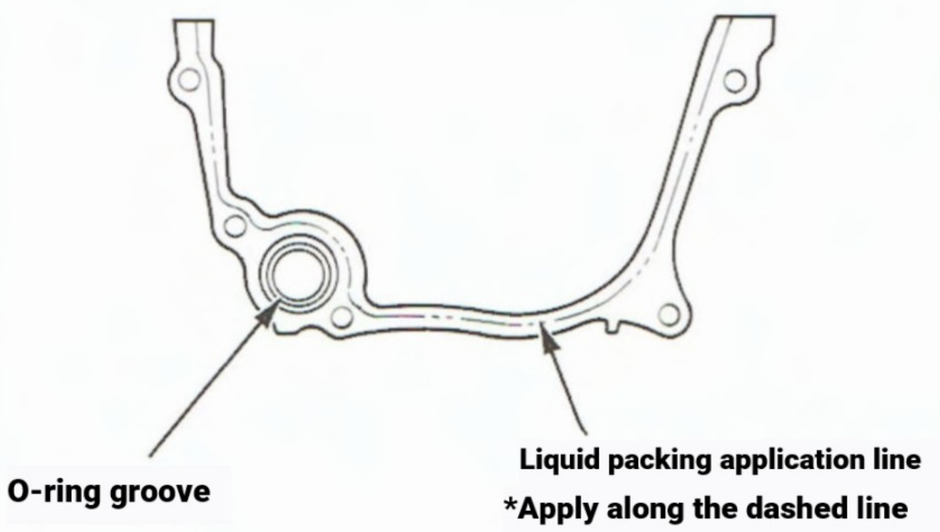
-Installation

① **Firmly press-fit the oil seal with a special tool.**

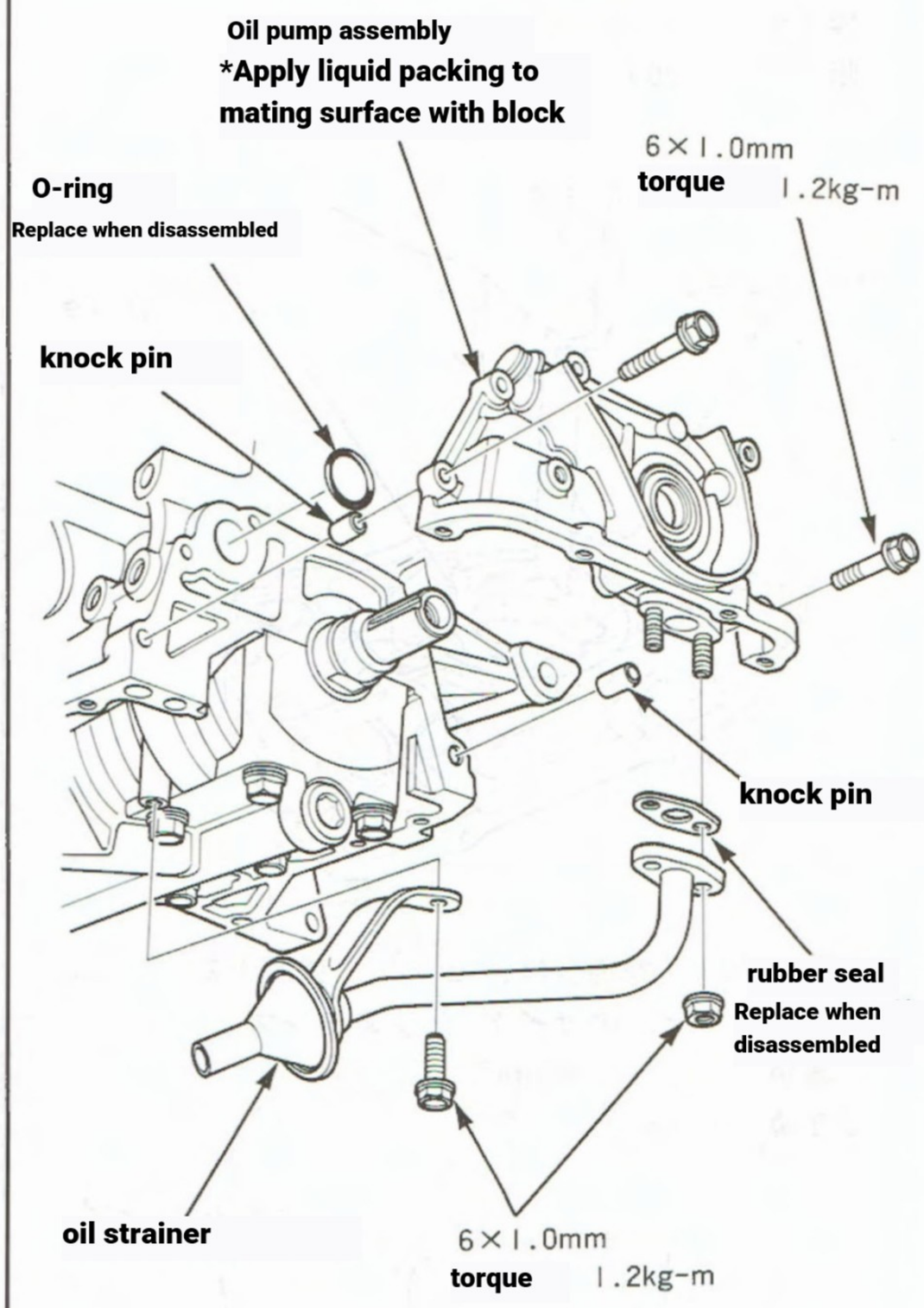
✻ **Install the oil seal with the part number on the outside.**

② **Install two dowel pins and a new O-ring on the oil pump.**

- **Use Honda genuine liquid packing 1216.**
- **The surface of the packing must be cleaned of dirt and oil.**
- **The application position should be as shown in the figure below.**
- **Apply oil to the inside of the bolt holes to prevent oil leakage.**
- **Do not put liquid packing in the O-ring groove.**
- **If the product is left for 20 minutes or more after applying the liquid packing, do not assemble it.**
- **Apply oil 30 minutes after assembly.**



③ **Apply Honda genuine liquid packing 1216 to the cylinder block mating surface of the oil pump assembly.**



④ **Attach the oil pump assembly to the cylinder block.**

⑤ **Install the oil strainer.**

engine cooling

service data

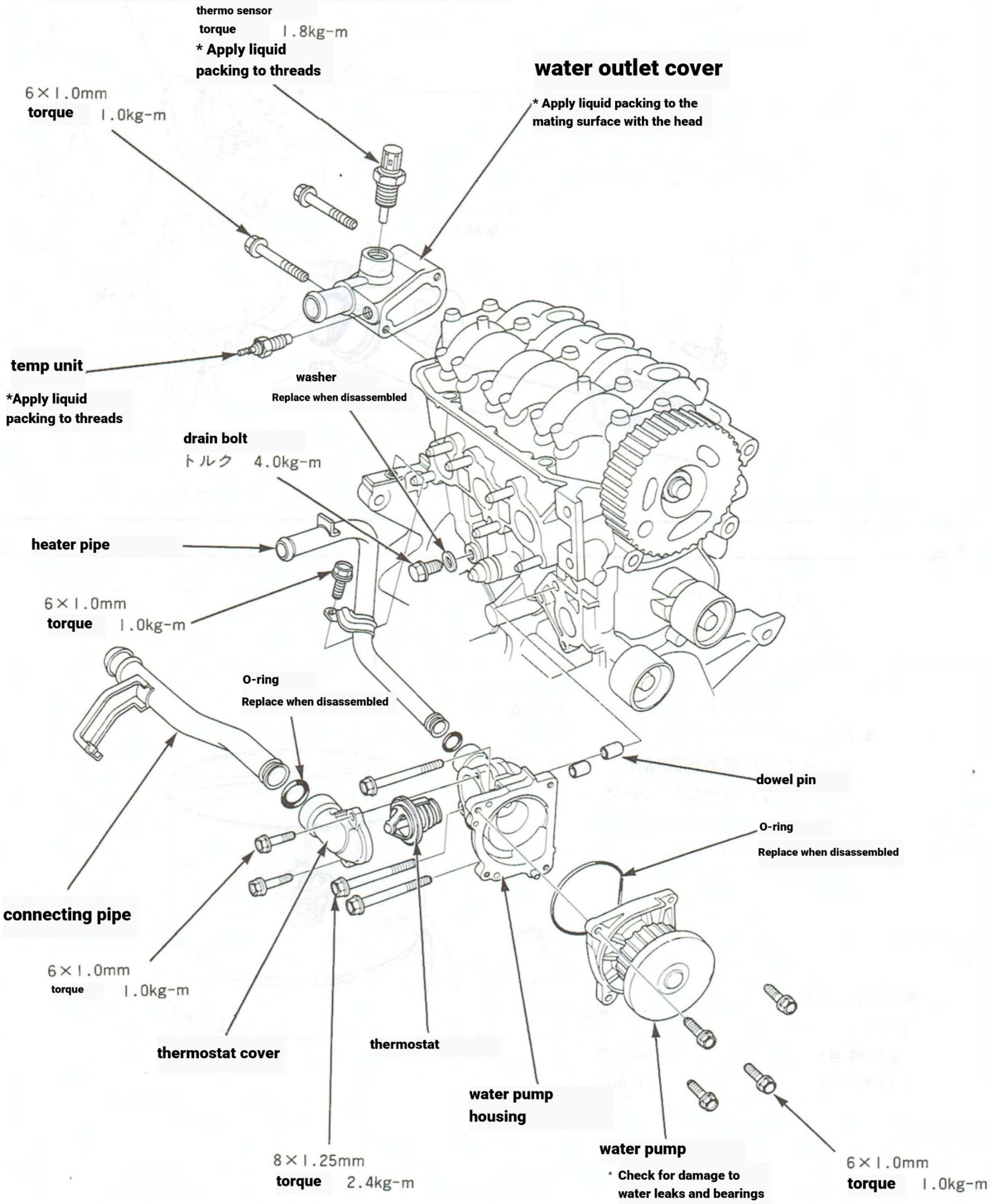
Unit: mm unless otherwise stated.

part name	item	Standard value
thermostat	Opening start temperature [°C] (at 0.35mm lift)	76—79
	Full open temperature [°C]	87.5
	Lift amount at full open	8 or more
water pump	water supply 〔ℓ/min-rpm〕	70—8,000

engine cooling

Development view

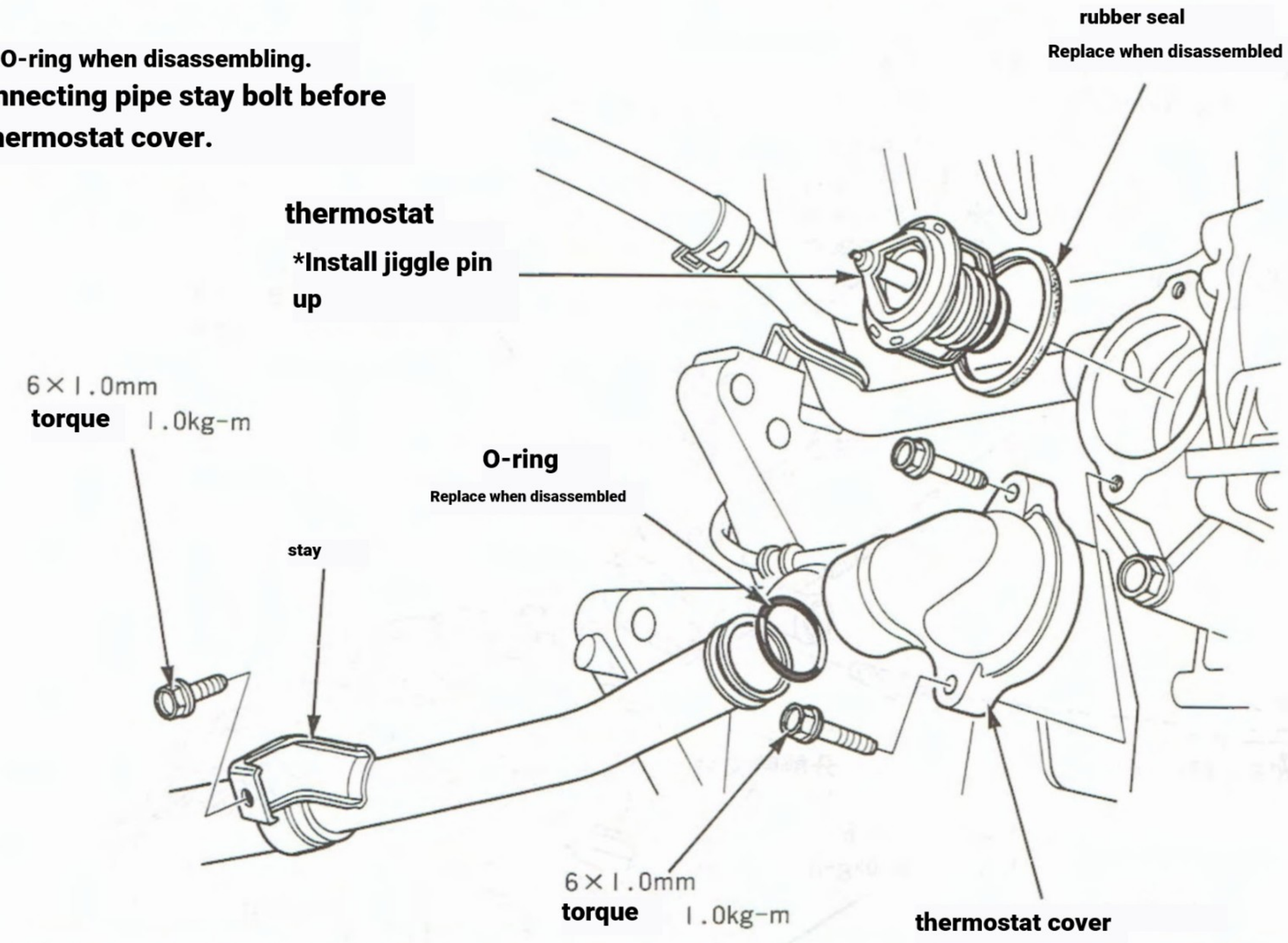
- Always use a new O-ring.
- The liquid packing uses Honda genuine liquid packing 1216.



thermostat

-exchange

✻ . Always use a new O-ring when disassembling.
. Remove the connecting pipe stay bolt before removing the thermostat cover.



inspection

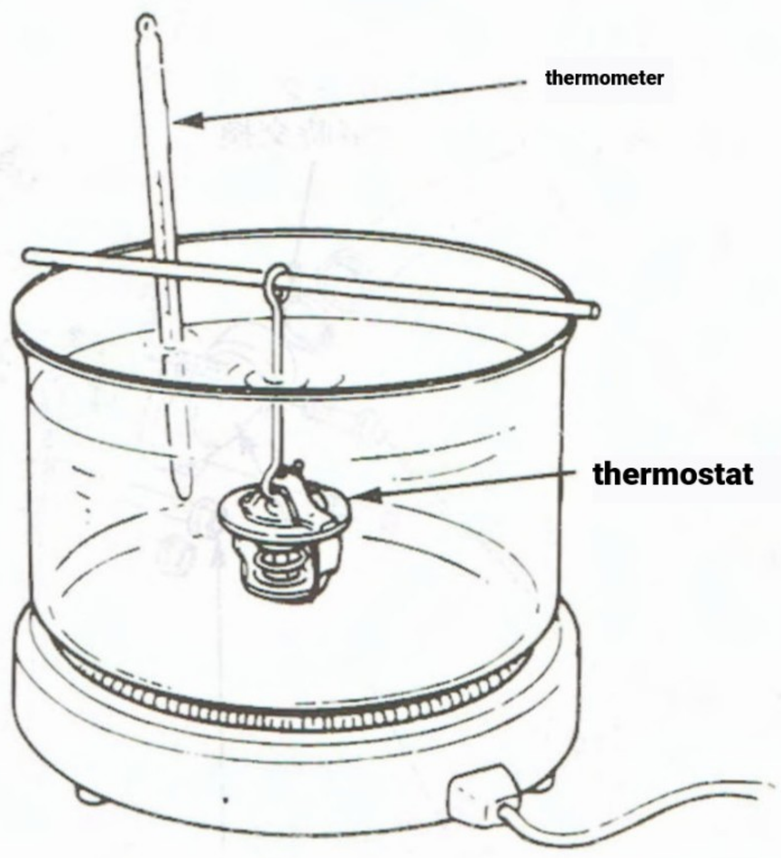
① Put the thermostat in the water.

② Heat the water, gradually increase the water temperature, and measure the valve opening temperature.

Note

- If the thermostat is open even a little at room temperature, replace it.
- The thermostat has a small sensing area and a time delay, so the valve opening lift is measured after maintaining the temperature at around 93°C for about 5 minutes.

✻ Do not let the thermostat touch the bottom of the container directly.



thermostat

opening temperature (at 0.35mm lift)	76—79°C
Full open temperature	87.5°C
Lift when fully open	8 mm or more

water pump

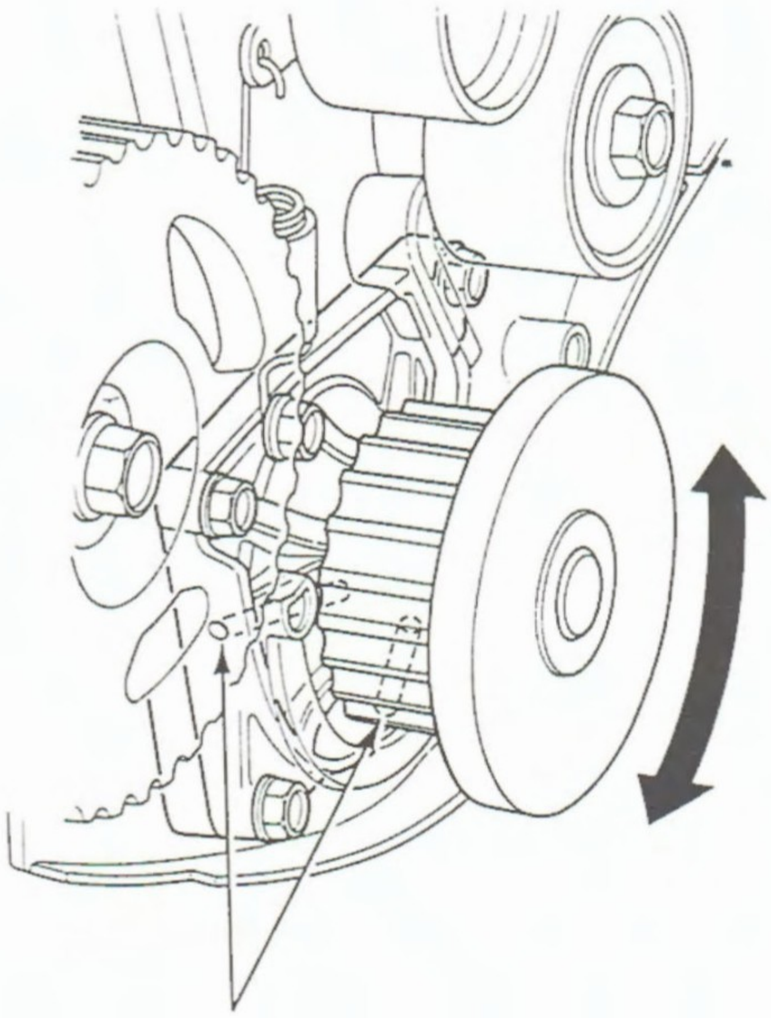
inspection

①Remove the timing belt (page 2-5).

②Make sure that the water pump pulley rotates smoothly.

③Make sure there are no leaks from the water pump.

CAUTION A small amount of water may come out of the bleed hole, but this is normal.



bleed hole

exchange

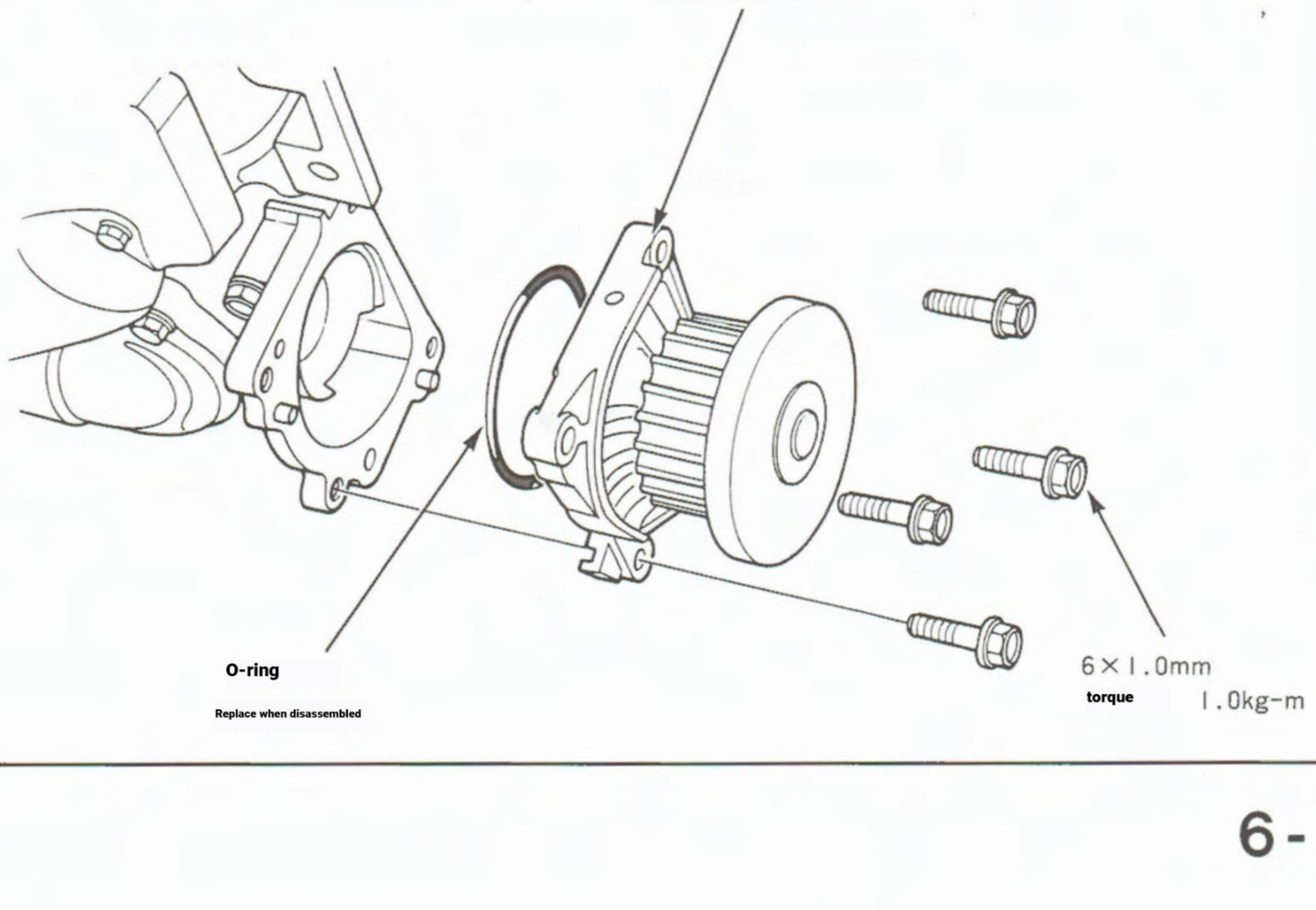
①Remove the timing belt (page 2-5).

②Remove the timing belt idler pulley.

③Remove the timing belt back cover.

④Remove 4 bolts and replace the water pump.

⑤Install and remove in reverse order.



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Excellent

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