DOHC 4-VALVE CYLINDER HEAD KIT

Item No.	: **01－03－6002**	(for 88cc & 95cc)
	: **01－03－6003**	(for 106cc & 115cc)
	: **01－03－6004**	(for 124cc)
Fitting	: Monkey, Gorilla	
Frame Nos	: Z50J-2000001～	
	: AB27-1000001～	

• Thank you for purchasing one of our TAKEGAWA's products. Please strictly follow the following instructions in installing and using the kit.
• You are required to understand the contents of this Instruction Manual by carefully reading it before installing the kit.

Please read the following before starting the installation

o This cylinder head is compatible only with those engines described in “Engine Specifications of Our Recommendation” on p. A2 and the specified motorcycles.
If there is any incompatible part, change it with a compatible one.

o In case this set is to be used in a stock crankcase, a portion of the crankcase to insert the sleeve needs processing or scraping because the crankcase and cylinder sleeve interfere with each other. For the details or more information, please contact your local motorcycle dealer.

o Change the sprocket with the one to match the output and specifications.

o The type of spark plug is different. Change the plug with the special one. And determine the heat value of a spark plug depending on how much it is burnt. (For the details, please see the attached sheet.)
In vehicles originally with a resistor plug, make sure to use a resistor plug.

o Always use a torque wrench to screw bolts and nuts tight and securely to the specified torque. (You cannot do the work without the torque wrench.)

o Please never use these kits in combination with other manufacturers’parts.

o Install a tachometer in order to always drive your motorcyle at below the specified engine revolution.

o Be sure to always use premium unleaded petrol.

o Please note that, because of the improvement to the kit, the contents of this manual or specifications will be changed without prior written notice.

o This kit is applicable only to CDI ignition-type vehicles, and is not applicable to point ignition-type vehicles. And please never use other ignition systems than TAKEGAWA’s.

o We do not take any responsibility for any accident or damage whatsoever arising from the use of the kit not in conformity with the instructions in the manual.

o We shall be held free from any guarantee or compensation whatsoever of any technical trouble caused by the combined use of our products with parts not specified by us.

o Please be informed that we shall be held harmless against any claim against us whatsoever arising out of use of the products in racing and the like.

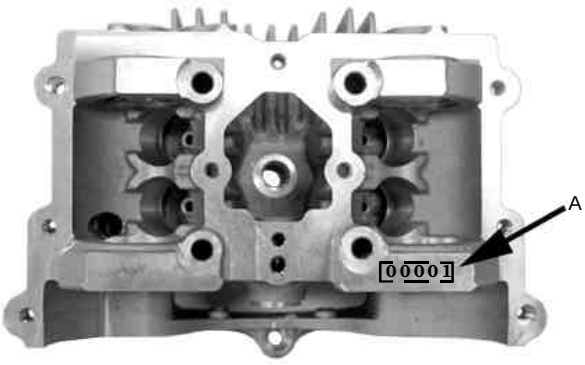
o A muffler for the Monkey or Gorilla cannot be installed.

o Please note that we shall be held harmless from any guarantee of any parts other than ours if technical trouble occurs after the installation of this kit.

o A special exhaust pipe for the exhaust muffler is available from us. Please purchase the one referring to the attached sheet.

o This kit is intended for closed course competition purposes only. So, take note that it is prohibited to drive your motorcycle on a public road after the installation of this kit.

◎ A serial number is stamped on the cylinder head.
The serial number stamped on the cylinder head is intended for us to manage the production date, production lot, and the specifications.
You may be requested in some cases to inform us of the serial number when ordering small parts.



⚠ CAUTION The following show the envisioned possibility of injuries to human bodies and property damage as a result of disregarding the following cautions.

- This kit is intended for closed course competition purposes only. So, take note that it is prohibited to drive your motorcycle on a public road after the installation of this kit. Drive your motorcycle at a legal speed, abiding by the laws.
- Make sure the engine and muffler are completely cool at below 35 degrees C before starting the installation. Otherwise, you will burn yourself.
- Do the installation with right tools. (Otherwise, breakage of parts or injuries to yourself may take place.)
- As some products and frames have sharp edges or protruding portions, please work with your hands protected. (Otherwise, you will suffer injuries.)
- Always use new gaskets, and packings. The continued use of the worn or damaged ones will cause engine trouble.

⚠ WARNING The following show the envisioned possibility of human death or serious injuries to human bodies as a result of disregarding the following cautions.

- Those who are technically unskilled or inexperienced are required not to do the work. (Improper installation because of insufficient skill and knowledge could lead to parts breakage and subsequently to accidents.)
- Before doing work, make sure your motorcycle is secure on level ground for safety's sake. (Otherwise, your motorcycle could overturn and injure you while you are working.)
- Always start the engine in a well-ventilated place, and do not turn on the engine in an airtight place. (Otherwise, you will suffer from carbon monoxide poisoning.)
- As gasoline is highly flammable, never place it close to fire. Make sure that nothing flammable is near the gasoline. Since vaporized accumulation of gasoline is at high risk of explosion, work in a well-ventilated place. (Otherwise, it may cause a fire.)
- Always use a torque wrench to screw bolts and nuts tight and securely to the specified torque. (Otherwise, these parts may get damaged or fall off, resulting in accidents.)
- If you find damaged parts when checking and performing maintenance of your motorcycle, do not use these parts any longer, and replace them with new ones. (The continued use of these damaged parts as they are could lead to an accident.)
- When you notice something abnormal with your motorcycle while riding, immediately stop riding and park your motorcyle in a safe place to check what has gone wrong. (Otherwise, the abnormality could lead to accidents.)
- Before riding, be sure to check every section for slack in parts like screws.If you find slack ones, screw them securely up to the specified torque. (Otherwise, improper tightening may cause parts to come off, leading to accidents.)
- Check or carry out maintenance of your motorcycle correctly according to the procedures in the instruction manual or service manual. (Improper checking or maintenance could lead to accidents.)
- Fuel must be high-octane gasoline. (Otherwise, troubles such as engine knocking may cause accidents.)

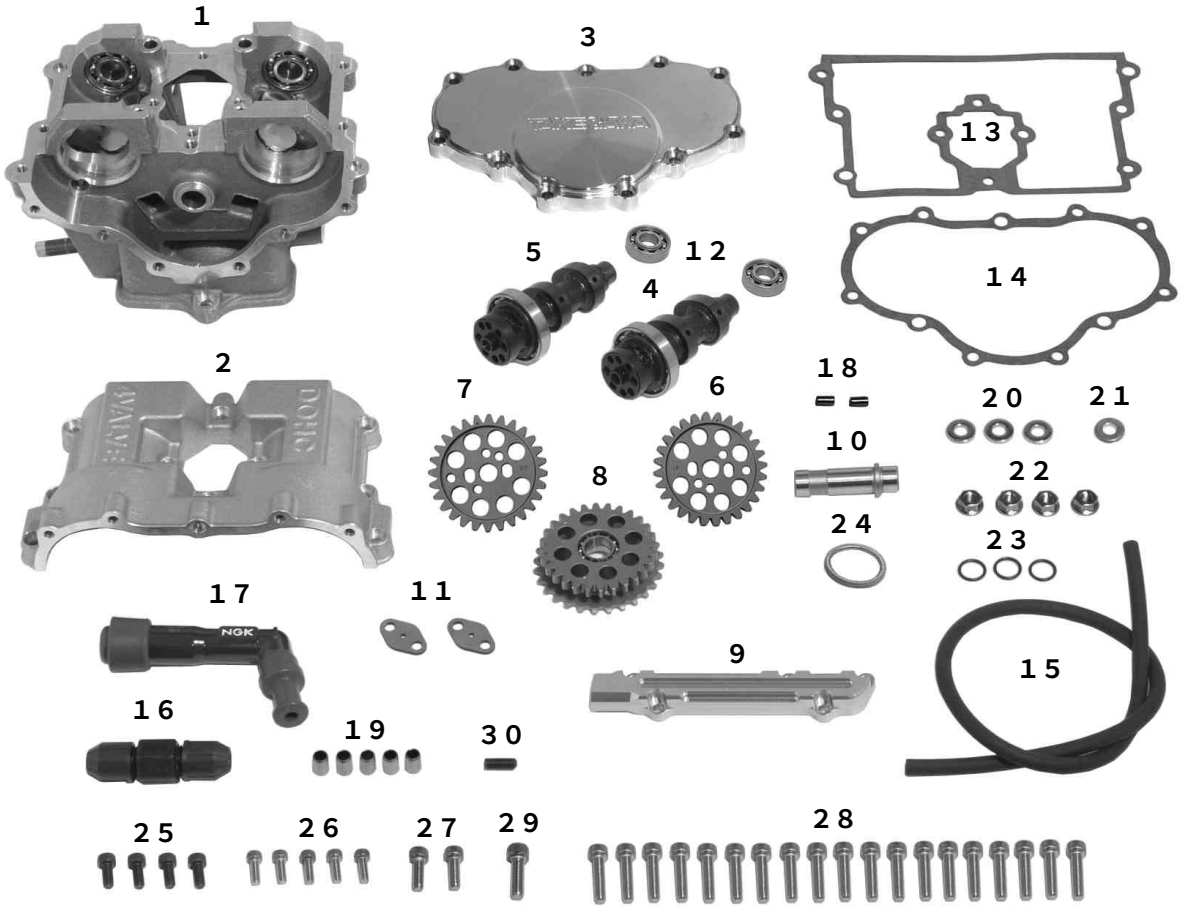
Compatibility Sheet

Front Fork							
Tires To Be Used		3.50-8	3.50-10	3.00-10	80/90-10	90/90-10	100/90-10
Standard (or, Stock) Fork		No					
φ27 Upright Fork (Gold Colored Bottom Case)	(TAKEGAWA-made)	Yes	See p.A5	Yes	Yes	Yes	Yes
φ27 Upright Fork (Silver Colored Bottom Case)	(TAKEGAWA-made)	Yes	Yes	Yes	Yes	Yes	Yes
φ27 Upright Fork for 8" (Two-Piece)	(TAKEGAWA-made)	Yes					
φ27 Upright Fork for 10" (Two-Piece)	(TAKEGAWA-made)		Yes	Yes	Yes	Yes	Yes
φ30 Upright Fork	(TAKEGAWA-made)		Yes	Yes	Yes	Yes	Yes
Inverted Fork	(TAKEGAWA-made)		No	Yes	Yes	Yes	See p.A5

About oil cooler stay:
A conventional oil cooler stay, to be attached to the frame, cannot be installed.
Please use an oil cooler kit to be attached in front of the fork, using a TAKEGAWA-made steering stem.

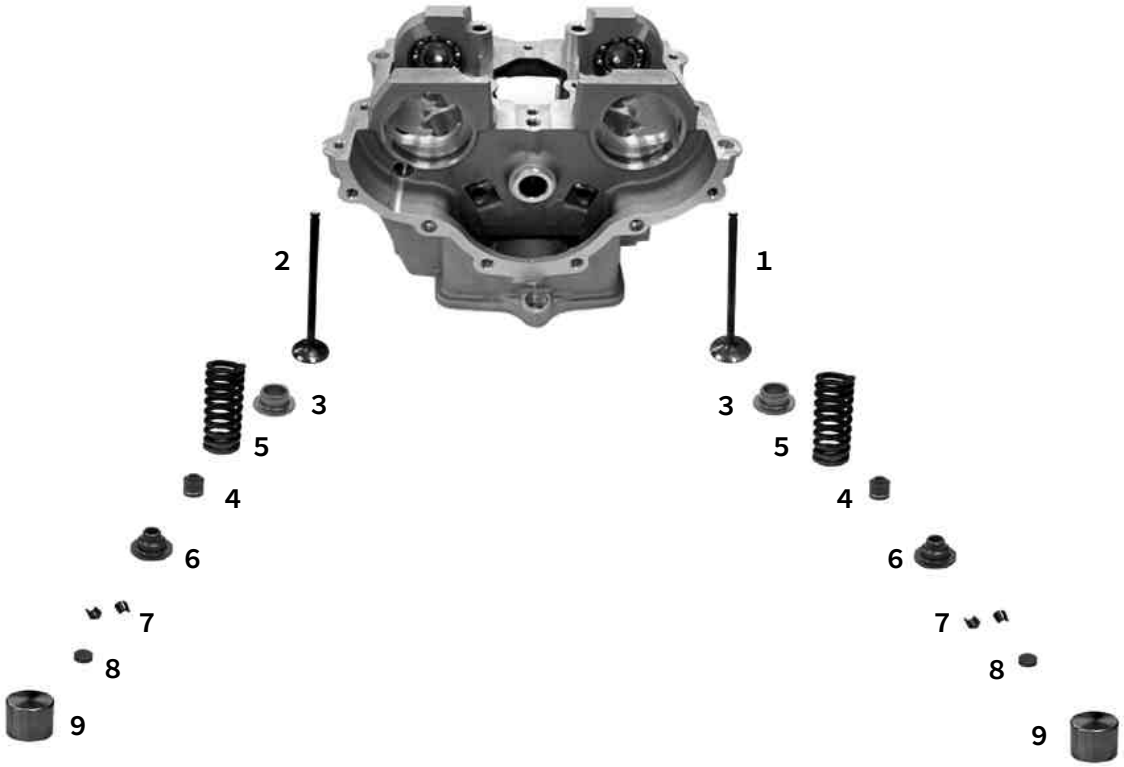
Engine Specifications of Our Recommendation	
Carburetor	KEIHIN PEφ28 (03-05-096)
	MIKUNI VMφ26 (03-05-047)
Clutch	Dry Special Clutch of TAKEGAWA make
	Wet Special Clutch of TAKEGAWA make
Oil Pump	Super Oil Pump
Ignition System	Standard Generator + Standard C.D.I.
	Standard Generator + Standard Hyper C.D.I.
	Inner-Rotar Type C.D.I. of TAKEGAWA make
Cam Chain	High-Duty Cam Chain

～Kit Contents～



No.	Part Name	Qty	No.	Part Name	Qty
1	Cylinder Head COMP.	1	17	Plug Cap	1
2	Cylinder Head Cover	1	18	4mm Dowel Pins	2
3	Cylinder Head Side Cover	1	19	7 x 10mm Dowel Pins	5
4	Camshaft (Intake)	1	20	Sealing Washers	3
5	Camshaft (Exhaust)	1	21	Sealing Washer of Copper	1
6	Cam Gear (Intake)	1	22	6mm Flange Nuts	4
7	Cam Gear (Exhaust)	1	23	S-10 O-Rings	3
8	Center Cam Gear COMP.	1	24	Exhaust Pipe Gasket	1
9	Oil Bridge	1	25	5 x 12 Socket Cap Screws	4
10	Center Cam Gear Shaft	1	26	4 x 12 Socket Cap Screws	5
11	Cam Gear Plates	2	27	5 x 15 Socket Cap Screws	2
12	Ball Bearings	2	28	5 x 22 Socket Cap Screws	19
13	Head Cover Gasket	1	29	6 x 20 Socket Cap Screw	1
14	Side Cover Gasket	1	30	6 x 15 Socket Set Screw	1
15	Ignition Cord	1		"Aluminum Special", the heat-resistant lubricating agent	1
16	Cable Joint COMP.	1			

Inner Parts of Cylinder Head



No.	Part Name	Qty
1	Intake Valves	2
2	Exhaust Valves	2
3	Valve Spring Seats	4
4	Valve Guide Stem Seals	4
5	Valve Springs	4
6	Valve Spring Retainers	4
7	Valve Cotters	8
8	Tappet Shims	4
9	Valve Lifters	4

○ Relation between Front Fork and Tire

○Upright φ27 front fork (gold colored bottom case)

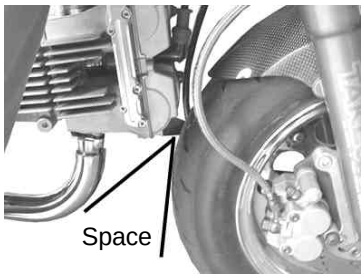
☆In case a 10"tire is used, clamp the fork and the top bridge at the very tip of the fork.

o Clamp the fork at the tip of the inner tube, but excluding the top bolt portion.

☆ In case a tire of 3.5-10 is used, the cylinder head and the tire may interfere with each other.

o Be sure to check for the interference with the fork compressed to a maximum before riding.

o In case they interfere with each other, change the tire with the smaller one.

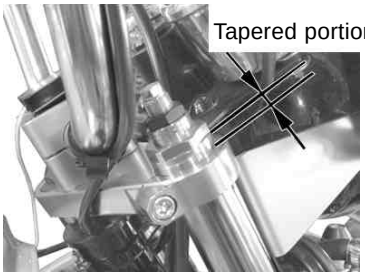


○Upright φ30 front fork, upright φ27 front fork (silver colored bottom case), and upright φ27 front fork (two-piece).

☆ Clamp the fork and the top bridge at the very tip of the fork.

o Clamp them at the tip of the straight portion of the fork inner tube, not at the tapered portion.

※ Before riding, be sure to check for the interfrence with the fork compressed to a maximum.



○Inverted front fork:

☆ Before riding, be sure to check for the interfrence with the fork compressed to a maximum. In case a tire of 3.5 - 10 and a tire of 100 / 90 - 10 is used, the cylinder head and the tire may interfere with each other at a point where the fork is compressed to a maximum.

o In case they interfere with each other, either clamp them within the range of clamping portion of the front fork where they do not interfere, or change the tire with the smaller one.

⚠ Warning

Unless you wear a helmet in position, you will be at high risk of being killed or injured in an accident.

On the bike, a driver must always wear a helmet, protective equipment and highly protective clothes.

○ Safety Precautions:

☆ About upper limit of revolution:

o As the upper limit of revolution is 12,000 rpm, drive at below this revolution. Driving above this revolution is over-revving, which not only adversely affects the engine but also damages it in the worst case.

☆ About engine oil:

o Shorten the cycle of engine oil change. And we advise you to use high-grade engine oil.
(The failure to change the oil not only adversely affects the engine but also damages it in the worst case.)

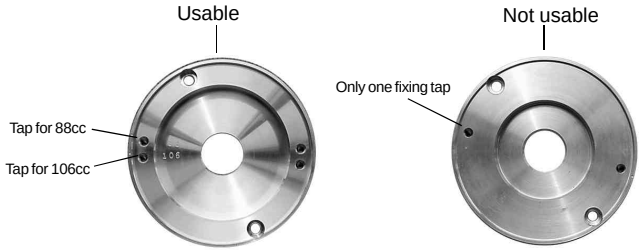
☆ About carburetor:

o Carburetor setting varies depending on the air funnel, air filter, specifications, and the natural phenomenon like barometric pressure and temperatures. So, do the setting to match these conditions.
(The wrong air-fuel ratio may damage the engine in the worst case.)

☆ About ignition system:

o Only TAKETAWA-made and standard ignition systems are compatible. Please do not use any other C.D.I. because no data is available with us for us to judge their compatibility. Moreover, some ignition systems even of TAKEGAWA make are not compatible, which please note.

• About inner rotar C.D.I.:



☆ About fuel:

o Be sure to always use premium unleaded petrol.

☆ About overhaul:

o There is no specific distances traveled before the overhaul. It is, however, advisable to check for the damages on the parts as early as possible.

◎ Please be informed that specifications, design, and prices are subject to change without prior notice.

◎ We do not accept any complaint filed with us against any technical trouble caused by the combined use of our parts with other manufacturers' parts unspecified by us.

◎ This manual should be retained for future reference.

SPECIAL PARTS TAKEGAWA
3-5-16 Nishikiorihigashi Tondabayashi
Osaka Japan
TEL : 81-721-25-1357
FAX : 81-721-24-5059
URL : http://www.takegawa.co.jp

～Installation Procedures～

⚠ **Note : Always use a torque wrench to screw parts tight and securely to the specified torque.**

⚠ **Warning : This Installation Instruction is prepared for those who have acquired basic skill and knowledge. Therefore, those who are technically inexperienced or unskilled are requested not to do the installation work.**

⚠ **Warning : Never reuse the used piston pin circlip.**

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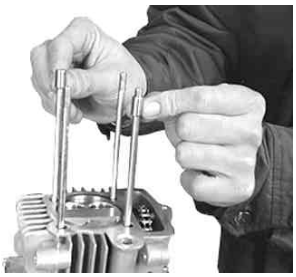
o Check the kit contents.

o Prepare necessary tools.

o Referring to the Installation Procedures for a piston cylinder kit, install the cylinder.

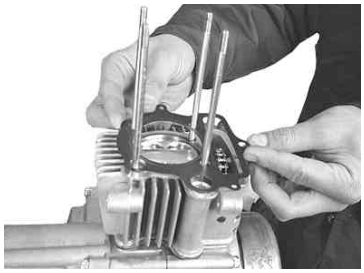
o Insert the supplied 8x14 knock pins into the cylinder.



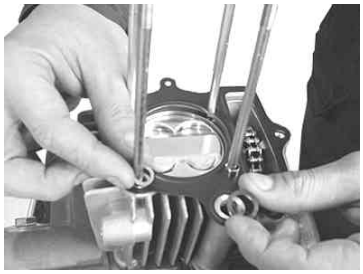
o Degrease the upper surface of the cylinder thoroughly.

⚠Note: Be careful not to scratch the upper surface of the cylinder.

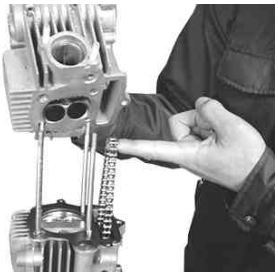
o Attach the supplied cylinder head gasket to the cylinder.



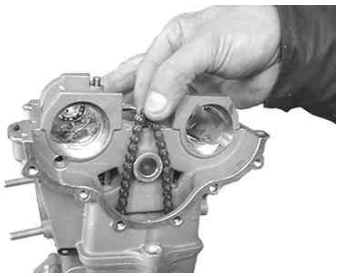
o Attach the rubber packing (green, black) to the oil lines on the cylinder surface.



o Setting the piston at TDC (Top Dead Center), attach the cylinder head.

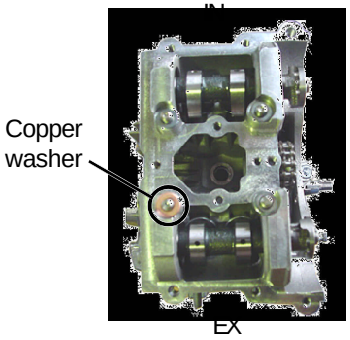


o Hold the cam chain so it does not fall into the crankcase.

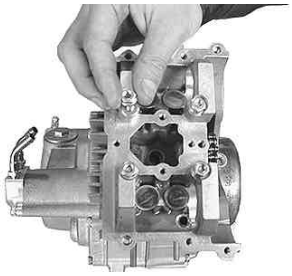


o Attach the supplied new copper sealing washer and washer.

⚠Note : Be careful where to attach the copper sealing washer.



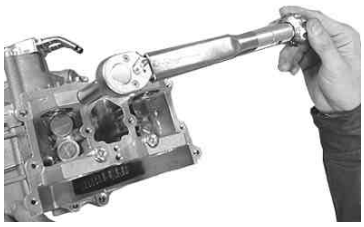
o Apply engine oil to the seating face of the threaded portion of the supplied cylinder head nut and install the cylinder head nut.



o Install the cylinder head, tightening it to the specified torque diagonally in a few steps.

⚠Note: Be sure to tighten to the specified torque.

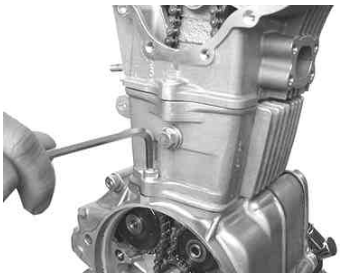
T: 12 N • m (1.2 kgf • m)



o Tighten the cylinder bolt to the specified torque.

⚠Note: Be sure to tighten to the specified torque.

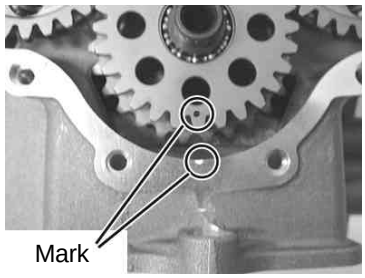
T: 12 N • m (1.2 kgf • m)



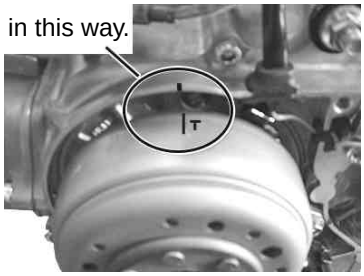
o Apply engine oil to the bearing of the supplied idle gear.

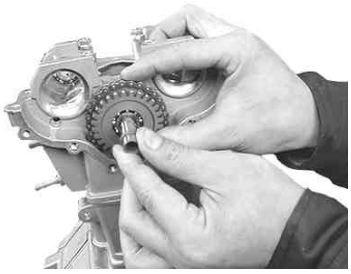
o Aligning the notch on the cylinder head with the alignment mark (small one) on the idle gear, attach the camchain to the idle gear sprocket, and install the idle gear using an idle gear shaft. At this stage, align the alignment mark on the idle gear with the notch on the cylinder head when the “T” mark on the flywheel is aligned with the alignment mark on the crankcase.

⚠Note: Don’t misunderstand the alignment mark on the idle gear.



Align in this way.

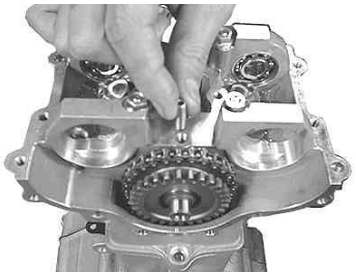


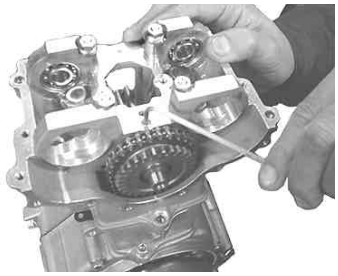


o With a supplied set screw, hold the idle gear shaft, and tighten it to the speficied torque:

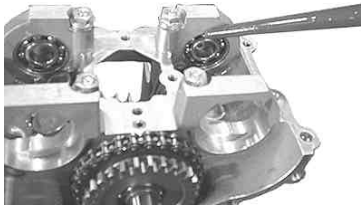
⚠Caution: Always be sure to tighten to the specified torque.

T: 8 N • m (0.8 kgf • m)

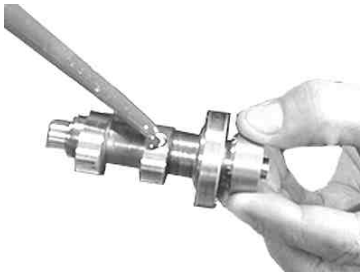




o Apply engine oil to the cylinder head and the bearing of the cam holder.



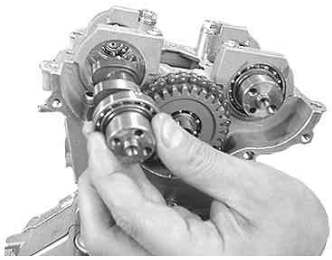
o Apply either engine oil or molybdenum disulfide solution to the slipper of the camshaft.



o Attach intake and exhaust camshafts to the cylinder head.

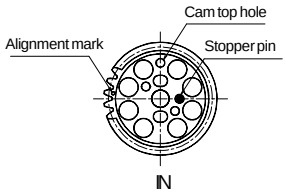
⚠Note : Don't make mistakes in selecting IN and EX camshafts.

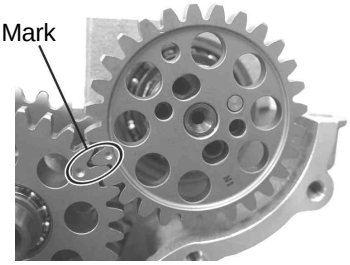
☆IN and EX marks are on the camshaft in the embossed lettering.



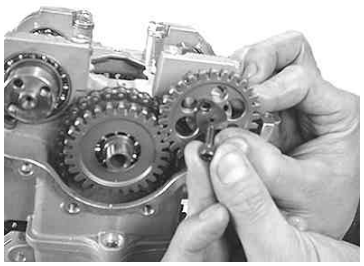
o Align the alignment mark (IN mark) on the supplied intake cam gear with the one on the idle gear. Then align the cam top with the top hole on the cam gear. (See the fig. below.) And place the supplied stopper pin right in the position shown in the figure below to insert it, and install it using the supplied cam gear plate and 5x12 cap screw.

⚠Note: Never fail to align the alignment marks.



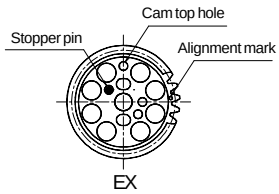


⚠Note: Be sure to fit the pin in the right position.



o Just like the intake cam gear, place the exhaust cam gear (EX marked) in the position shown in the figure below to install it.

⚠Note: Be sure to align the alignment marks.



⚠Note : Be sure to fit the pin in the right position.

o Fix the crank, and tighten the cap screw, which holds the cam gear, to the specified torque.

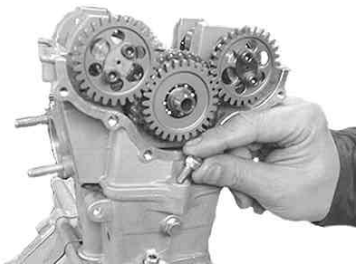
⚠Note: Be sure to tighten to the specified torque.

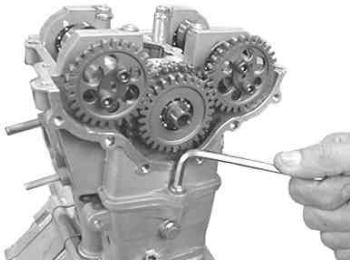
T: 10 N • m (1.0 kgf • m)

o Attach the supplied 6x20 cap screw to the side of the cylinder head, and tighten it up.

⚠Note: Be sure to tighten to the specified torque.

T: 12 N • m (1.2 kgf • m)

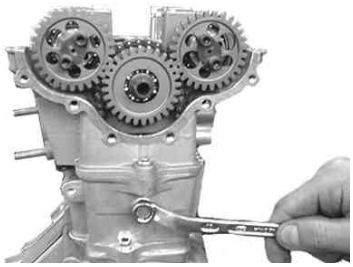




o Tighten the cam chain guide roller bolt on the cylinder to the specified torque.

⚠Note: Be sure to tighten to the specified torque.

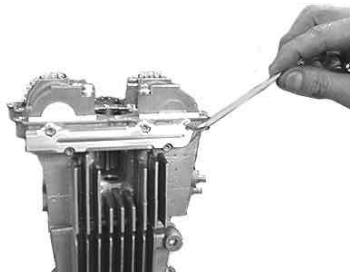
T: 10 N • m (1.0 kgf • m)



o Fit the S-10 O-ring into the groove on the supplied bridge, and apply engine oil to the O-ring. And install the bridge to the cylinder head and tighten it with the supplied 4x12 cap screw.

⚠Note: Be sure to tighten to the specified torque.

T: 4 N • m (0.4 kgf • m)



o Recheck the valve clearance with a thickness gauge.

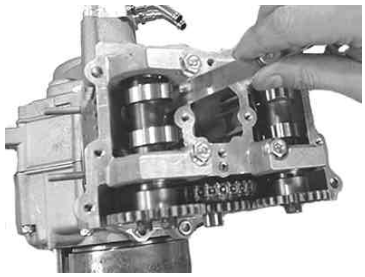
⚠Note : Remove the dust or dirt from the thickness gauge if any.

IN/EX valve clearance : 0.15 ± 0.03 mm

For 125cc:

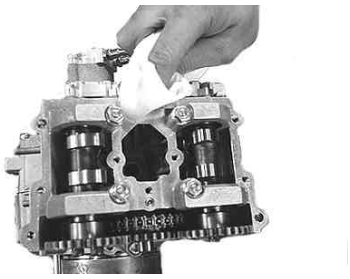
IN valve clearance : 0.15 ± 0.02

EX valve clearance : 0.15 ~ 0.2 ± 0.02

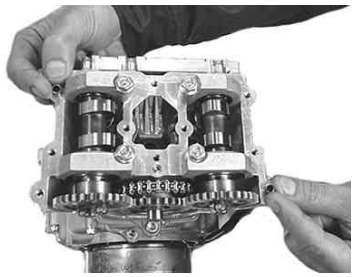


o Apply oil to the sliding surfaces of the valve lifter and cam shaft.

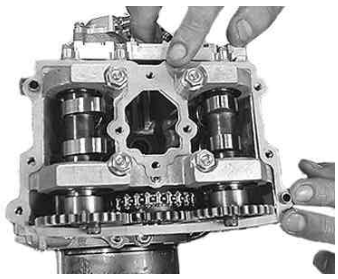
o Degrease well the head-cover mounting surface of the cylinder head.



o Insert the supplied 7x10 knock pin to the knock hole.

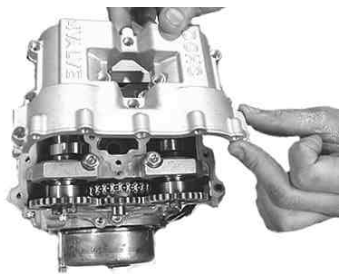


o Attach the head cover gasket.



o Cut off the sticking-out head cover gasket.

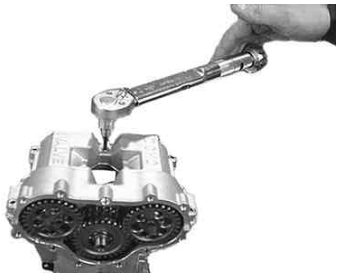
o Attach the head cover to the cylinder head.



o Lightly apply Aluminum Special, the heat-resistant lubricating agent, to the threaded portion of the 5x22 cap screw, and fix the head cover, tightening 10 cap screws diagonally in a few steps starting from the inside.

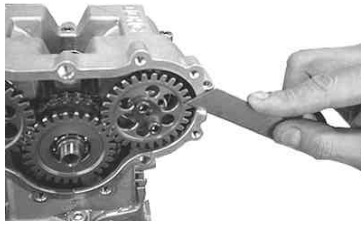
⚠Note: Be sure to tighten screws to the specified torque.

T: 6 N • m (0.6 kgf • m)



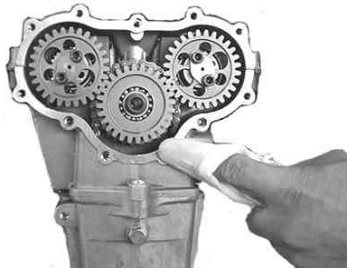
o With a cutter knife, cut off the gasket squeezing out of the cylinder head to make the surface flat.

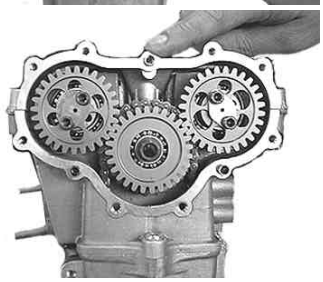
⚠Note: Be careful not to scratch the side-cover mating surface.



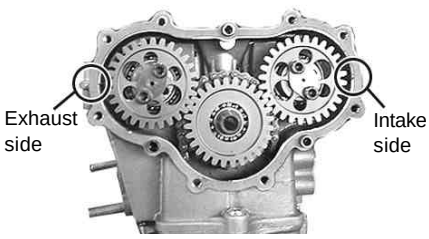
o Degrease well the side-cover mounting surface.

o Insert the 7x10 knock pin into the knock hole on the side-cover mating surface.





o Lightly apply liquid gasket to the intake and exhaust sides of the head cover gasket which was attached to the mating surfaces of the head cover and cylinder head, and then install the side cover gasket.



o Attach the side cover to the cylinder head with nine 5x22 and two 5x15 cap screws. (See the foto below.)

∴ Lightly apply “Aluminum Special”, the heat-resistant lubricating agent , to the threaded portion of the screws.

⚠Note: Be sure to fit the screws in the right positions.

o Tighten each cap screw diagonally in a few steps to the specified torque.

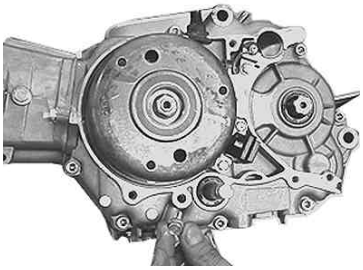
⚠Note: Be sure to tighten to the specified torque.

T: 6 N • m (0.6 kgf • m)

o Screw tight the side bolt on the cam chain tensioner.

⚠Note: Be sure to tighten to the specified torque.

T: 8 N • m (0.8 kgf • m)



o Thoroughly wipe off the oil and dirt adhering to the engine.

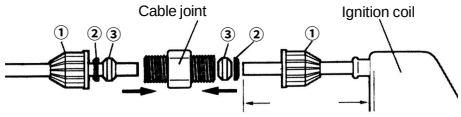
o Install the engine COMP. to the frame.

⚠Note: Be sure to tighten to the specified torque.

T: 25 N • m (2.5 kgf • m)

☆12V motorcycle:

o Here, the work needs to be done to extend the ignition cord. Cut off the ignition cord about 10 cm from the ignition coil. Cut the supplied cord at a point after fixing how to route the supplied cord, and connect the cord with a supplied cable joint in the following way.



①Screw cap
②Plastic sleeve
③Rubber sleeve

o Attach the supplied plug cap to the ignition cord.

o Lightly apply “Aluminum Special”, the heat-resistant lubricating agent, to the threaded portion of the spark plug, which please install.

⚠Note : Do not make mistakes in selecting the plugs.

⚠Note : Be sure to tighten to the specified torque.

NGK : CR[8]EH9
↑
Heat value

Denso : U[24]FER9
↑
Heat value

T: 12 N • m (1.2 kgf • m)

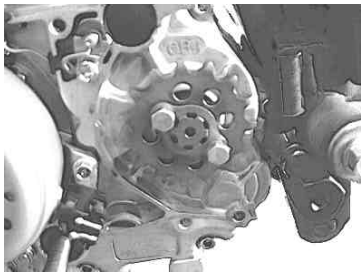
⚠Note : Determine the heat value of a spark plug depending on how much it is burnt.

o Referring to the installation manual for the carburetor kit, install the carburetor.

o Attach the drive sprocket.

⚠Note: Be sure to tighten to the specified torque.

T: 12 N • m (1.2 kgf • m)



o Install the generator cover.

⚠Note: Be sure to tighten to the specified torque.

T: 7 〜 11 N • m (0.7 〜 1.1 kgf • m)

☆ In the case of a three-point-support bearing crankshaft, referring to the installation manual for the crankshaft kit, install the generator cover.

o Referring to the installation manual for the exhaust muffler, install the exhaust muffler.

o Add engine oil as follows:
Special clutch : 850 cc
At oil change : 800 cc
Dry clutch : 800 cc
At oil change : 750 cc
◇ 10W - 40 〜 15W - 50
(Multi-grade type)

o Install the drive chain referring to the instruction manual and the service manual for rear swing arm.

☆Engine Start

o After checking that the ignition key and the gas cock are turned OFF, remove the spark plug.

o Continue kicking the starter for a while to circulate the engine oil throughout the engine.

o Reinstall the spark plug, turn ON the gasoline cock and ignition key, and start the engine.

⚠Note: Be sure to tighten to the specified torque.

⚠Warning: Do the work in a well-ventilated place.

o Check for any abonormalities like abnormal sounds.

o If nothing abnormal is detected, carry out a shakedown about 150 to 200 km.

o After the initial running-in, check for abnormalities such as abnormal sounds or blow-bye. (If there is a problem, disassemble the engine again to check each part.)

⚠Warning: Never reuse piston pin circulip.

⚠Caution:

o Bolts and nuts, which were tightened to the specified torque at the time of engine assembly, may get loosened gradually because of the repeated thermal expansion caused by heated engine. So periodically re-tighten the bolts and nuts.

⚠Note: Be sure to tighten to the specified torque.

◆Install a tachometer without fail.

☆About upper limit of revolution

o The upper limit of the engine revolution is 12,000 rpm. Please drive your motorcycle at below 12,000 rpm.

◇ Driving above this revolution is over-revving, which not only adversely affects the engine but also damages it in the worst case.)

⚠ Warning

This cylinder head manual is prepared for those who have acquired basic skill and knowledge. Therefore, those who are technically inexperienced or unskilled are requested not to do the installation work.

～Cylinder Head Manual～

○Unit of torque:

1 kgf・m = 9.80665 N・m (newtonmeter)

Reference Value List

Description			Stock Value	Service Limit
Valve Clearance		IN/EX	※0.15±0.03mm (When cold)	———
Cylinder Head Distortion			———	0.05mm
Valve Lifter	Internal Bore Diameter	IN/EX	20.010 ～ 20.026mm	20.035mm
	External Lifter Diameter	IN/EX	19.978 ～ 19.993mm	19.970mm
Valve Guide	Internal Diameter	IN/EX	3.800 ～ 3.812mm	3.89mm
Valve Stem	External Diameter	IN	3.775 ～ 3.790mm	3.7mm
		EX	3.765 ～ 3.780mm	3.7mm
Clearance between Stem and Guide		IN	0.010 ～ 0.037mm	0.04mm
		EX	0.020 ～ 0.047mm	0.05mm
Contacting Width of Valve Seat		IN	0.8 ～ 1.0mm	1.5mm
		EX	0.9 ～ 1.1mm	1.5mm
Free Length of Valve Spring		IN/EX	38mm	37.5mm

※ As for an optional cam, please refer to its instruction manual.

○ **Valve Clearance Adjustment** (Valve clearance needs adjusting when the valve seat is cut,or a valve, camshaft or valve lifter are replaced.)

◎ Place the thickness gauge between the camshaft and valve lifter to measure the clearance.

・IN/EX valve clearance : 0.15 ± 0.03 mm (when cold)

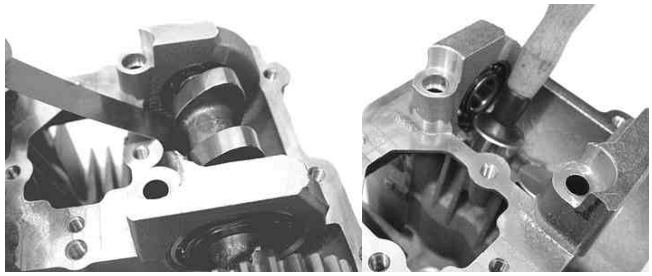
For 125cc: IN valve clearance : 0.15 ± 0.02

EX valve clearance : 0.15 ～0.2 ± 0.02

(As for an optional camshaft, please refer to its instruction manual.)

◎ Remove a camshaft, then valve lifters and shims.

・Use a valve punner or valve lap to remove valve lifters.
・When you cannot easily remove shims, use a a pair of tweezers or magnet.
・(Keep the removed lifters and shims in an orderly way so you can see where to reinstall them back.)
・Be sure to reinstall back the valve lifters at its original place.



◎ How to figure out a size of new shims:

・Wipe off oil adhering to the shims. Measure the thickness of the shims with a micrometer, and take a note of it.

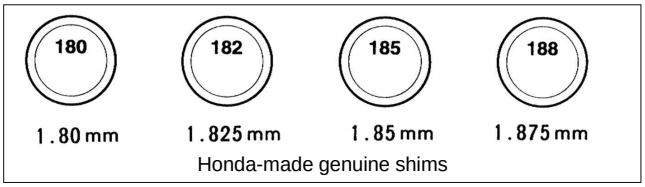
A：Thickness of the shims to be figured out
B：The valve clearance measured
C：The valve clearance to be measured
D：The thickness of the shim removed

A＝（B－C）＋D

◎The shim is set at 1.20 mm to 2.9 mm, evenly spaced at 0.025 mm apart.

☆Though the shim is available from us, a Honda's genuine one is also compatible. For its part No., please see the attached sheet.

∗Be sure to check the size of new shims with a micrometer whether or not it is correct.



Honda-made genuine shims

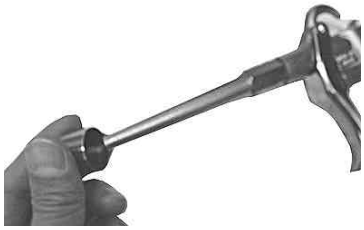
○ Valve Lifter Installation

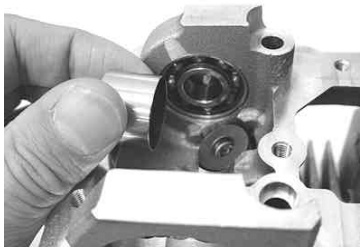
- **o** Attach the new shims to the valve spring retainer.
- **o** Degrease the valve lifter, and blow air into the shim-mounting portion of the valve lifter to clean the portion.
- **o** Apply molybdenum disulfide solution to the sliding surface of the valve lifter, and attach it.

⚠ Note : Be sure to install back the lifter in its original location.

- **o** Attach the camshaft, and check the valve clearance with the thickness gauge.

For example, you have got a right valve clearance when you can put in a thickness gauge at 0.15mm but not at 0.18mm.





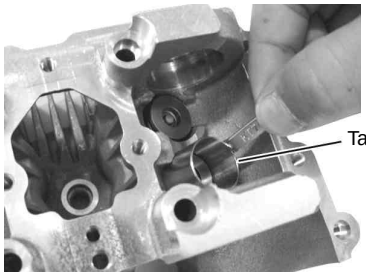
○ Valve Disassembly

- **o** Remove the valve lifters and the shims.

(Keep the removed parts in an orderly way so you can see later where to reinstall them back.)

- **o** Attach the tappet hole protector to the valve lifter bore.

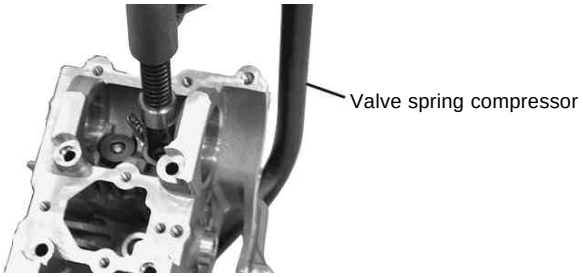
∴ A tappet hole protector is a special tool made by Honda with an item No. of 07GME-KT70100.



- **o** Compress the valve spring using a valve spring compressor.

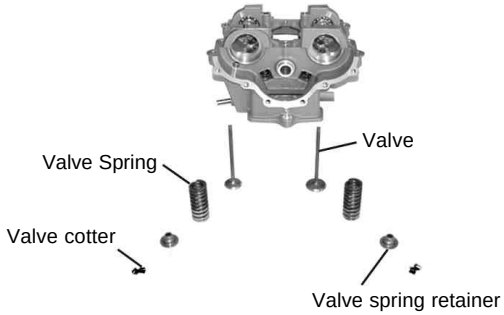
⚠ Note: Do not compress the valve spring more than necessary.

∴ A valve spring compressor is a special tool of an item No. of 00-01-071 made by TAKEGAWA.



- **o** Remove a valve cotter.

- **o** Remove first the valve spring compressor, and then the following parts:
  - Valve spring retainer
  - Valve spring
  - Valve



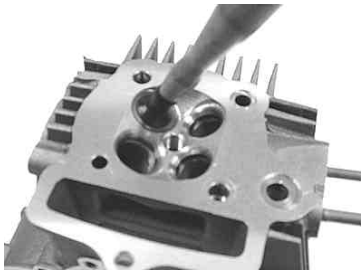
- **o** Check each valve for bending, baking, and damages.
- Measure the exterior diameter of the valve stem at the sliding
- surface of the guide with a micrometer.

(Replace bent, baked or damaged valves with new ones.)

Service Limit IN / EX 3.7 mm

○ Valve Sheet Inspection:

- **o** Remove carbon sediment in the cylinder head combustion chamber and valve.
- **o** Dissolve red lead primer with oil or the like, and apply it to the valve faces evenly.
- **o** Strike the valves once and lightly with a valve punner to rotate them.
- **o** Wipe off the red lead primer on the valve faces, and strike the valves once and lightly with the valve punner without rotating them, and check the contact surfaces for damages or scratches.
- **o** Remove the valve, and check the contact surfaces for damages or scratches.
- **o** Check the contacting width of valve seat.
  Service Limit : IN / EX 1.5 mm



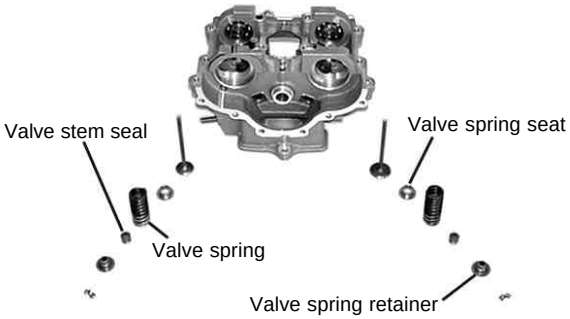
☆ If there is a scratch on the valve seat, or the contact width isn't uniform, or it is too wide or too narrow, modify the seat.

☆Ask a specialist shop in internal combustion for the modification work.

○ Valve Assembly:

- **o** If you have removed a valve spring seat and valve stem seal, install the valve spring seat and a new valve stem seal.

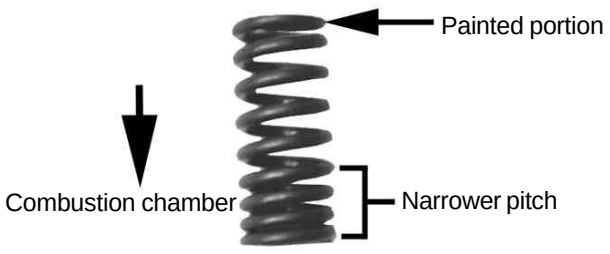
⚠ Note: In case you have removed the valve stem seal, be sure to replace it with a new one.



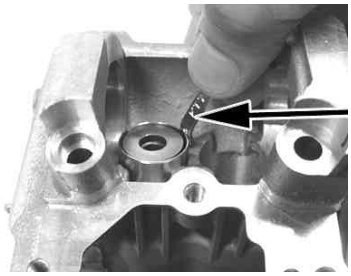
●Whenever you fix a valve to the head, be sure to apply either engine oil or molybdenum solution to the valve stem.

- **o** To the head attach the valve spring, with a narrower pitch side pointing to the combustion chamber. (Fix it with the painted portion on the upper side.)

⚠ CAUTION : Be sure to place the narrowly-pitched portion of the valve spring to face the combustion chamber side.

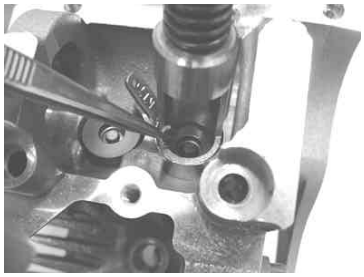


- **o** Attach the valve spring retainer.
- **o** Attach a tappet hole protector to the valve lifter bore.



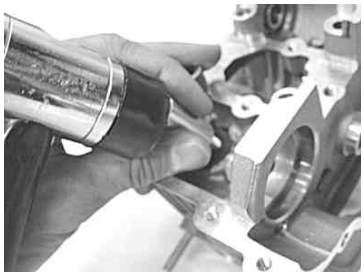
- **o** Compressing the valve springs with a valve spring compressor, attach the valve cotters.

⚠ CAUTION : Do not compress the valve springs more than necessary.



- **o** Strike lightly the tip of valve stems a few times so the valves and cotters fit together well.

⚠ CAUTION : Be careful not to damage the valves.

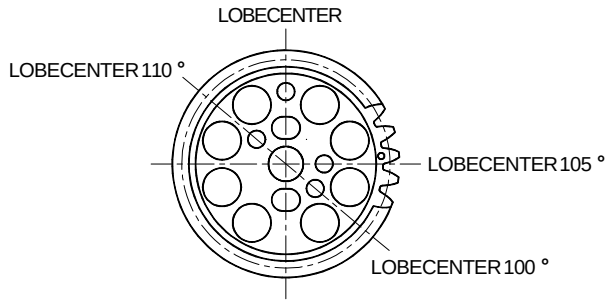


○ Positions of Cam Gear and Dowel Pin:

◎ Change of the position of a cam gear dowel pin will make it possible to change the valve timing.

o The lobecenter at each dowel pin position is as per the illustration below. However, as this is just for your reference only, figure out the exact angle with a timing protracter and dial gauge.

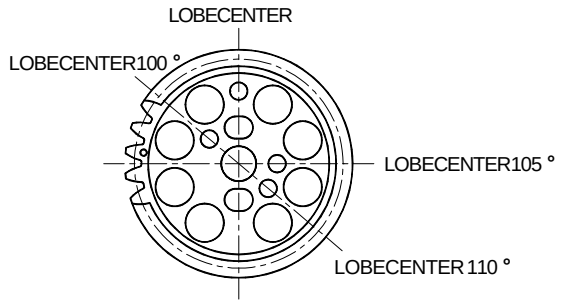
EX



Positional relationship between a dowel hole and lobecenter

Crank angle (BTDC)

IN



Positional relationship between a dowel hole and lobecenter

Crank angle (ATDC)

☆Caution:

o Shifting of the pin position from the originally pre-set position will degrade the performance. If you would change the pin position, please always try to do so without changing the cam top position as per the above illustrations.

o Those who are not familiar with the valve timing are required not to shift the position.

⚠Caution:

o When you adjust the valve timing with the head installed to the motorycle, valve lifters sometimes fall off at the time you remove the camshaft at the exhaust side. If the valve lifters have fallen off, detach the head cover, and reinstall back the shims and valve lifters at the original positions.

○ Valve Timing Adjustment:

o Set the piston at the top dead center (TDC)position.

o Attach the timing protractor to the crankshaft, and set the protractor dial at “0” and tighten the nut.
Recheck that the piston is at TDC.
(In case it is not right on the TDC, adjust it with a pointer.)
∴ Timing protractor : Item No. 00-01-0062

o Set a magnet base stand so the dial gauge is vertical to the cylinder head valve lifter surface.
At this point, pressing the dial gauge. And set the dial at “0”.
(Use a special rod so the dial gauge rod does not interfere with the camshaft)

o Rotate the crank shaft counter clock wise viewed at the left side of the engine, and read the lobecenter.

Honda-Made Genuine Shim List

Part Number	Description	Part Number	Description	Part Number	Description
14901 -KT7-000	Tappet shim (1.200)	14946 -KT7-000	Tappet shim (2.325)	14926 -KT7-013	Tappet shim (1.825)
14902 -KT7-000	Tappet shim (1.225)	14947 -KT7-000	Tappet shim (2.350)	14927 -KT7-013	Tappet shim (1.850)
14903 -KT7-000	Tappet shim (1.250)	14948 -KT7-000	Tappet shim (2.375)	14928 -KT7-013	Tappet shim (1.875)
14904 -KT7-000	Tappet shim (1.275)	14949 -KT7-000	Tappet shim (2.400)	14929 -KT7-013	Tappet shim (1.900)
14905 -KT7-000	Tappet shim (1.300)	14950 -KT7-000	Tappet shim (2.425)	14930 -KT7-013	Tappet shim (1.925)
14906 -KT7-000	Tappet shim (1.325)	14951 -KT7-000	Tappet shim (2.450)	14931 -KT7-013	Tappet shim (1.950)
14907 -KT7-000	Tappet shim (1.350)	14952 -KT7-000	Tappet shim (2.475)	14932 -KT7-013	Tappet shim (1.975)
14908 -KT7-000	Tappet shim (1.375)	14953 -KT7-000	Tappet shim (2.500)	14933 -KT7-013	Tappet shim (2.000)
14909 -KT7-000	Tappet shim (1.400)	14954 -KT7-000	Tappet shim (2.525)	14934 -KT7-013	Tappet shim (2.025)
14910 -KT7-000	Tappet shim (1.425)	14955 -KT7-000	Tappet shim (2.550)	14935 -KT7-013	Tappet shim (2.050)
14911 -KT7-000	Tappet shim (1.450)	14956 -KT7-000	Tappet shim (2.575)	14936 -KT7-013	Tappet shim (2.075)
14912 -KT7-000	Tappet shim (1.475)	14957 -KT7-000	Tappet shim (2.600)	14937 -KT7-013	Tappet shim (2.100)
14913 -KT7-000	Tappet shim (1.500)	14958 -KT7-000	Tappet shim (2.625)	14938 -KT7-013	Tappet shim (2.125)
14914 -KT7-000	Tappet shim (1.525)	14959 -KT7-000	Tappet shim (2.650)	14939 -KT7-013	Tappet shim (2.150)
14915 -KT7-000	Tappet shim (1.550)	14960 -KT7-000	Tappet shim (2.675)	14940 -KT7-013	Tappet shim (2.175)
14916 -KT7-000	Tappet shim (1.575)	14961 -KT7-000	Tappet shim (2.700)	14941 -KT7-013	Tappet shim (2.200)
14917 -KT7-000	Tappet shim (1.600)	14962 -KT7-000	Tappet shim (2.725)	14942 -KT7-013	Tappet shim (2.225)
14918 -KT7-000	Tappet shim (1.625)	14963 -KT7-000	Tappet shim (2.750)	14943 -KT7-013	Tappet shim (2.250)
14919 -KT7-000	Tappet shim (1.650)	14964 -KT7-000	Tappet shim (2.775)	14944 -KT7-013	Tappet shim (2.275)
14920 -KT7-000	Tappet shim (1.675)	14965 -KT7-000	Tappet shim (2.800)	14945 -KT7-013	Tappet shim (2.300)
14921 -KT7-000	Tappet shim (1.700)	14901 -KT7-013	Tappet shim (1.200)	14946 -KT7-013	Tappet shim (2.325)
14922 -KT7-000	Tappet shim (1.725)	14902 -KT7-013	Tappet shim (1.225)	14947 -KT7-013	Tappet shim (2.350)
14923 -KT7-000	Tappet shim (1.750)	14903 -KT7-013	Tappet shim (1.250)	14948 -KT7-013	Tappet shim (2.375)
14924 -KT7-000	Tappet shim (1.775)	14904 -KT7-013	Tappet shim (1.275)	14949 -KT7-013	Tappet shim (2.400)
14925 -KT7-000	Tappet shim (1.800)	14905 -KT7-013	Tappet shim (1.300)	14950 -KT7-013	Tappet shim (2.425)
14926 -KT7-000	Tappet shim (1.825)	14906 -KT7-013	Tappet shim (1.325)	14951 -KT7-013	Tappet shim (2.450)
14927 -KT7-000	Tappet shim (1.850)	14907 -KT7-013	Tappet shim (1.350)	14952 -KT7-013	Tappet shim (2.475)
14928 -KT7-000	Tappet shim (1.875)	14908 -KT7-013	Tappet shim (1.375)	14953 -KT7-013	Tappet shim (2.500)
14929 -KT7-000	Tappet shim (1.900)	14909 -KT7-013	Tappet shim (1.400)	14954 -KT7-013	Tappet shim (2.525)
14930 -KT7-000	Tappet shim (1.925)	14910 -KT7-013	Tappet shim (1.425)	14955 -KT7-013	Tappet shim (2.550)
14931 -KT7-000	Tappet shim (1.950)	14911 -KT7-013	Tappet shim (1.450)	14956 -KT7-013	Tappet shim (2.575)
14932 -KT7-000	Tappet shim (1.975)	14912 -KT7-013	Tappet shim (1.475)	14957 -KT7-013	Tappet shim (2.600)
14933 -KT7-000	Tappet shim (2.000)	14913 -KT7-013	Tappet shim (1.500)	14958 -KT7-013	Tappet shim (2.625)
14934 -KT7-000	Tappet shim (2.025)	14914 -KT7-013	Tappet shim (1.525)	14959 -KT7-013	Tappet shim (2.650)
14935 -KT7-000	Tappet shim (2.050)	14915 -KT7-013	Tappet shim (1.550)	14960 -KT7-013	Tappet shim (2.675)
14936 -KT7-000	Tappet shim (2.075)	14916 -KT7-013	Tappet shim (1.575)	14961 -KT7-013	Tappet shim (2.700)
14937 -KT7-000	Tappet shim (2.100)	14917 -KT7-013	Tappet shim (1.600)	14962 -KT7-013	Tappet shim (2.725)
14938 -KT7-000	Tappet shim (2.125)	14918 -KT7-013	Tappet shim (1.625)	14963 -KT7-013	Tappet shim (2.750)
14939 -KT7-000	Tappet shim (2.150)	14919 -KT7-013	Tappet shim (1.650)	14964 -KT7-013	Tappet shim (2.775)
14940 -KT7-000	Tappet shim (2.175)	14920 -KT7-013	Tappet shim (1.675)	14965 -KT7-013	Tappet shim (2.800)
14941 -KT7-000	Tappet shim (2.200)	14921 -KT7-013	Tappet shim (1.700)	14966 -KT7-013	Tappet shim (2.825)
14942 -KT7-000	Tappet shim (2.225)	14922 -KT7-013	Tappet shim (1.725)	14967 -KT7-013	Tappet shim (2.850)
14943 -KT7-000	Tappet shim (2.250)	14923 -KT7-013	Tappet shim (1.750)	14968 -KT7-013	Tappet shim (2.875)
14944 -KT7-000	Tappet shim (2.275)	14924 -KT7-013	Tappet shim (1.775)	14969 -KT7-013	Tappet shim (2.900)
14945 -KT7-000	Tappet shim (2.300)	14925 -KT7-013	Tappet shim (1.800)		