



Super head+R Kit Instruction Manual

Item No. : 0 1 - 0 3 - 8 1 0 3

Fits : Lifan 1P52FM1-2B10 engine only

- Thank you for purchasing one of our TAKEGAWA's products. Please strictly follow the following instructions in installing and using the products.
- Before fitting the products, please be sure to check the contents of the kit. Should you have any questions about the products, please kindly contact your dealer.

~ Features ~

- This cylinder head is a completely and newly designed one with an enlarged top diameter and a reduced stem diameter of both the intake and exhaust valves, and with a new valve angle of nip and port shape. We have incorporated roller bearings into the slipper of a valve rocker arm. And the use of the forged-aluminum rocker arm works to offset the increased weight by employing the roller bearings. Consequently, the power output has successfully increased at the high-speed range of operation as a synergistic effect.

It is difficult to dismantle and replace the camshaft of a standard cylinder head, with the cylinder head being installed. However, with this Kit, the cam shaft can be detached without removing the rocker arm, with the bearings on the oil line of the cam shaft on the cylinder head. Therefore, this makes it easy to change the camshaft even when the engine is being mounted on the motorcycle. Moreover, the new incorporation of the automatic decompression function into the camshaft makes it easy to press down on the kick starter arm to the end, reducing strain on the kick shaft or gear.

Please read the following carefully before starting installation

Please note that, in some cases, the illustrations and photos may vary from the actual hardware.

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

This product is for exclusive use with the above-mentioned suitable engine only, and cannot be installed with any bore up kit other than the one for exclusive use with this Kit.

This instruction manual is prepared with those in mind who have basic skills and knowledge. Therefore, we recommend those who have never installed the motorcycle parts or those who do not have sufficient tools to ask a technically-reliable specialist shop for the work.

We shall be held free from any kind of warranty whatsoever of products other than this product if the glitch takes place on the other products than this one after the installation and use of this product.

You are kindly requested not to contact us about the combination of our products with other manufacturers'.

A serial number is engraved on the cylinder head. You may be requested to inform us of the number when ordering parts.

Bolts, and nuts will be reused. However, be sure to replace worn-down or severely-damaged ones with new ones.

Never use liquid packing. It may plug the oil passage, and in the worst case break the engine.

Be sure to always use premium unleaded petrol. And make sure to check what kind of gasoline is remaining in the fuel tank. Whenever regular gasoline is left in the fuel tank, always replace it with high-octane gasoline.

Determine the heat value of a spark plug depending on how much it is burnt. In vehicles originally with a resistor plug, use a resistor plug.

Note that the inner rotor as ignition system to be used should be a TAKEGAWA-made rotor only. The use of the supplied ignition system coming with the engine may place load on the crankshaft, resulting in its breakage. No test data by us is available on the combined use of this kit and ignition system of other manufacturers'. Do NOT use, therefore, any ignition system made by other manufacturers to avoid technical troubles.

Please install an oil cooler when necessary.

Engine oil must be API SF or higher class, such as SAE 10W-40 / 15W-50, which are our recommendations.

Change the sprocket with the one which meets the output and specifications.

If you have purchased this kit only to use as a cylinder head, this kit alone does not function. If you have not purchased "our special engine parts," please purchase them.

This kit is compatible with only those engine parts recommended by us. So, please replace the engine parts not recommended by us with those of our recommendations.

Since this kit is designed and developed for driving in closed races, do not use the kit for running on public roads.

Jump-Starting and Sudden Acceleration

Idling, sudden acceleration, and sudden engine braking will put a heavy load on the engine, which please note may result in crank shaft damage and engine breakage in the worst case.

Please be informed that, mainly because of improvement in performance, design changes, and cost increase, the product specifications and prices are subject to change without prior notice.

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. This manual should be retained for future reference.



Caution

The following show the envisioned possibility of injuries to human bodies or property damages as a result of disregarding the following cautions.

- Since this kit is designed and developed for driving in closed races, do not use the kit for running on public roads.
- Work only when the engine and muffler are cool at below 35 degrees Celsius. Otherwise, you will burn yourself.
- Prepare right tools for the work. (Otherwise, improper work could cause breakage of parts or injuries to yourself.)
- As some products and frames have sharp edges or protruding portions, please work with utmost care. (Otherwise, you will suffer injuries.)
- Always use new gasket and packing. (The worn or damaged parts may cause the engine troubles.)

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, secure the motorcycle 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 the engine on 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. (It may cause a fire.)
- Always use a torque wrench to screw bolts and nuts tight and securely to the specified torque.
(Improper torque could cause these parts to get damaged or fall off.)
- Never use the parts unspecified by us. (This may lead to parts breakage and consequent accidents.)
- If you find damaged parts when checking and performing maintenance, 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 accidents.)
- When you notice something abnormal with your motorcycle while riding down a road, stop riding immediately and park your motorcycle in a safe place. (Otherwise, the abnormality could lead to an accident.)
- Before riding, always check every section for slack in parts like screws. If you find slack ones, screw them securely up to the specified torque.
(Or improper torque may cause parts to come off.)
- Check or perform maintenance of parts correctly according to the procedures in the instruction manual or a service manual.
(Improper checking or maintenance could lead to an accident.)
- Always use high-octane gasoline. (Otherwise, troubles such as engine knocking may cause accidents.)

• Cautions before riding:

About fuel:

Whenever regular gasoline is remaining in the fuel tank, always replace it with high-octane gasoline.

After the installation of this kit, the genuine clutch is likely to slip. Install our Heavy-Duty Clutch Kit.

About change of a sprocket:

The installation of this kit will increase the power of your vehicle. So the use of a stock sprocket will result in severe wears of parts because of too low gear, not only adversely affecting the engine life, but also breaking the engine in the worst case. Therefore, please change the sprockets with the high-gear one.

This kit alone does not function.

Purchase the bore up kit to go with this kit, (except when you have purchased a full kit.)

• Others:

Oil cooler:

The installation of this kit increases the heat release value of the engine, set off by the increase in power. For a long-time and high load running, we recommend you to install an oil cooler kit which keeps oil at appropriate temperatures and prevents such troubles as oil film shortage at high temperatures.

• About camshaft:

If you have purchased a cylinder head kit, a special camshaft is needed separately. Camshafts with a few kinds of profiles are available from us to meet different uses and engine displacement. Even if you have purchased a full kit, you can study to use them as an optional extra in addition to camshafts included in the full kit.

• The inspection cap and breather cap are packed in this kit. The breather cap must be used definitely together with the oil catch tank.

• Revolution

The upper limit of revolutions varies depending on the camshaft used and other factors. Be sure to install a tachometer to always ride your motorcycle at below the specified highest engine revolutions. Take note that idling and sudden acceleration in the 1st and the 2nd gears particularly tend to exceed the upper limit of revolutions. Over revolutions will result in nonsmooth revolutions of the engine, not only adversely affecting the engine life, but also breaking the engine in the worst case.

• Valve spring retainer

This Super Head comes with a titanium valve spring retainer as a standard equipment. We have succeeded in developing and making the supplied titanium valve spring retainer lighter than a steel retainer by about 30 percent. Besides, we have treated the coating to the surface which has surface hardness of more than HV1500. This coating has improved the levels of wear resistance on the conventional coating.

However, when it comes to durability, this retainer lags behind the steel retainer. So check and perform maintenance periodically of parts for damage and wear. Always replace damaged or worn parts with new ones.

We, however, would recommend those who attach importance to durability to equip a steel valve spring retainer.

Valve spring retainer of steel

Item No.: 00-01-0078

- A serial number is punched on the cylinder head just for the sake of administration. You may be requested to inform us of the number when ordering repair parts.

In case you are not able to order parts because you do not have the repair parts numbers or for other reasons, please place an order in the following way.

Make a note of the number punched on the left side of the cylinder head.

A head No. (CSM-00***) is punched here.

Head No. - CSM-00001

Example of how to order → Super head kit, repair
head No.-CSM-00001 → Intake valve
Qty: 1 piece



A head No. (CSM-00***) is punched here

• Engine parts of our recommendations:

This kit is only compatible with those engine parts recommended by us. So, please replace the parts not of our recommendations with those of our recommendations.

Parts of our recommendations		
Ignition system	C.D.I. Magnet Kit (Inner rotor)	05-02-0511
Clutch	Special clutch kit (w/clutch cover)	02-01-0010
	Heavy-Duty Clutch Kit (5-Disk)	02-01-0008
Carburetor	KEIHIN PE28 carburetor kit	03-03-027 (single article)
	MIKUNI VM26 carburetor kit	03-03-0321 (single article)
Manifold	Manifold kit	03-02-2564
Cam chain	High-duty cam chain kit	01-14-0003

For the installation of a carburetor, a rubber insulator needs to be arranged separately.

Rubber insulator of 00-03-0211 for KEIHIN PE28

Rubber insulator of 00-03-0210 for MIKUNI VM26

• About optional camshafts

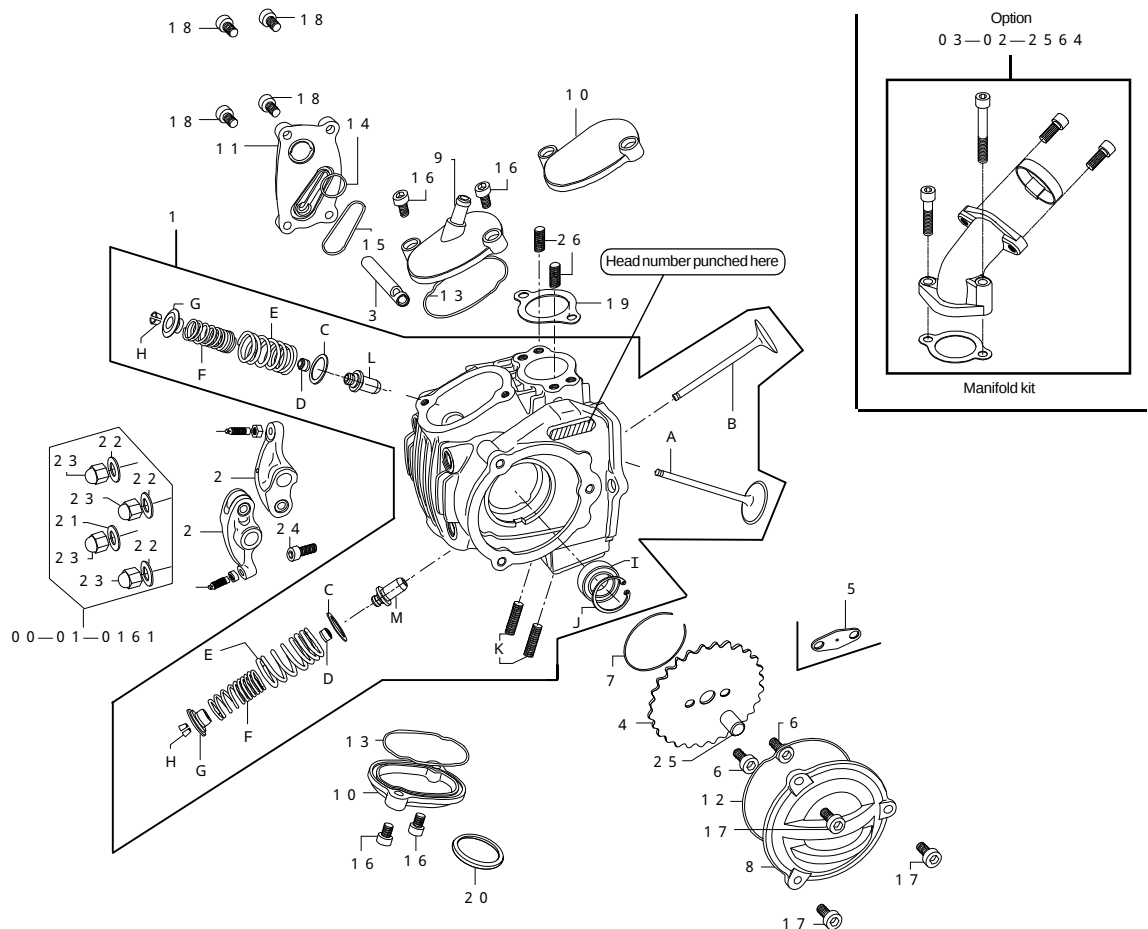
- The following camshafts compatible with this Kit are available. Choose a camshaft to match your usage for your great riding pleasure.

S-12D camshaft	01-08-0101	option
S-1D5 camshaft	01-08-0102	Packed with bore up kit
S-20D camshaft	01-08-0103	option
S-25D camshaft	01-08-0104	option
S-30D camshaft	01-08-0105	option
S-35D camshaft	01-08-0106	option

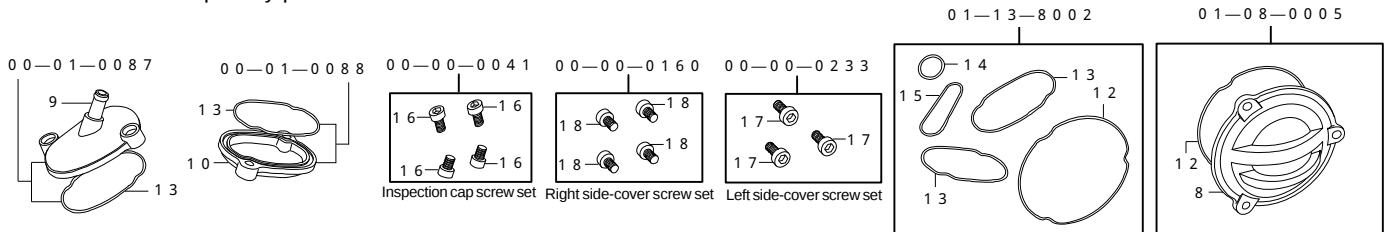
- Part of the model names of our camshafts are indicated in numbers. To cite an example, the larger the number in S- ○ ○ , the wider the camshaft profile operating angle. And the smaller the number, the narrower the profile operating angle. In general, the wide-angle profile is a high-speed rotation type, and the narrow-angle profile is a slow-speed rotation type.

As various factors like the engine displacement, engine specifications and usage, etc. have to be taken into account in choosing the cam profile, choose an appropriate camshaft to meet your usage.

~ Kit Contents ~



Please note that in ordering repair parts, be sure to quote the Repair Part Item No. Otherwise, we may not be able to accept your orders. There are some parts, however, for which we are not in a position to accept your order in just the quantity to be used. In this case, please take them in the quantity packed.



No.	Parts Name	Qty	Repair parts No.	in packs of
1	Cylinder head COMP.	1	SP/H-CSM-T000	1
2	Rocker arm COMP.	2	14431-SPH-T00	1
3	Rocker arm shaft	1	14451-CSM-T00	1
4	Cam sprocket	1	00-01-0079	1
5	Cam gear washer	1	00-01-0022 (with a bolt)	1
6	Cap screw 5x12	2	00-00-0066	4
7	Cam shaft circlip	1	00-01-0081	3
8	Left side-cover	1	11134-SPH-T10	1
9	Breather cap	1		
10	Inspection cap	2		
11	Right side-cover	1	11121-SPH-T01	1
12	Left side-cover O-ring	1		3
13	Inspection cap O-ring	2		3
14	O-ring 15 mm	1	01-13-8002	6
15	Right side-cover O-ring	1		3

No.	Parts Name	Qty	Repair parts No.	in packs of
16	Cap screw 5x15 (SUS)	4	00-00-0041	4
17	Cap screw 5x10 (SUS)	3	00-00-0233	3
18	Cap screw 5x12 (SUS)	4	00-00-0160	4
19	Manifold gasket	1	00-03-0009	3
20	Exhaust pipe gasket	1	00-01-0064	2
21	Copper sealing washer	1		1
22	Sealing washer	3	00-00-0161	3
23	Cap nut 7 mm	4		4
24	Cap screw 6x18	1	00-00-0156	4
25	Dowel pin 8x12	1	00-00-0153	2
26	Socket set screw 6x15	2	00-00-0162	2
	Alumi Special (the heat-resistant lubricating agent)(5 g)	1	00-01-0001	1
Tool	Hex wrench 3 mm	1		
Tool	Hex wrench 4 mm	1		
Tool	Hex wrench 5 mm	1		

Symbol	Parts Name	Qty	Repair parts No.	in packs of
A	Intake valve	1	14711-SSM-T00	1
B	Exhaust valve	1	14721-4SM-T01	1
C	Valve spring outer seat	2	00-01-0002	2
D	Valve stem seal	2	00-01-0015	2
E	Valve spring (outer)	2		2
F	Valve spring (inner)	2	01-12-0101	2
G	Valve spring retainer	2	01-12-084	2

Symbol	Parts Name	Qty	Repair parts No.	in packs of
H	Valve cotter	4	00-01-0018	4
I	Radial ball bearing	2		1
J	C-shaped ring	1	00-01-0084	1
K	Stud bolt 6x32	2	00-01-0085	2
L	Over-sized valve guide, IN	1	00-01-0083	1
M	Over-sized valve guide, OUT	1	00-01-0086	1

Item No. marked with an is not used when an automatic decompression camshaft is to be installed.

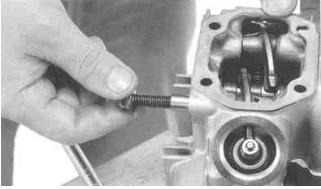
SPECIAL PARTS TAKEGAWA Co., Ltd.

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

~ Cylinder Head Installation Procedures ~

This Cylinder Head Installation Procedures are prepared on the premise of using and adjusting a standard flywheel. Before riding, however, be sure to replace the ignition system with the recommended one. And after you have changed the ignition system to the recommended one, do the installation work using a timing protractor, or a circular protractor of 00-01-0062.

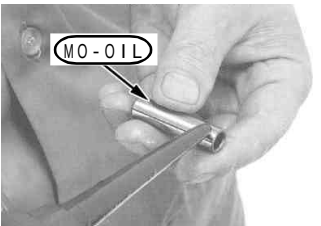
- Remove the rocker arm shaft of a standard cylinder head, and an adjusting bolt and an adjusting nut on the rocker arm.



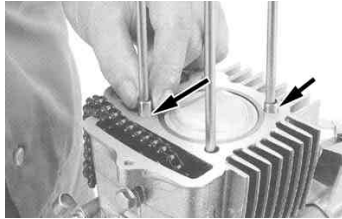
- If you find the removed adjust bolt & / or adjust nut damaged, replace it / them with (a) new one(s).
- Apply engine oil to the removed adjusting bolts, and fix these bolts to rocker arms of the kit.



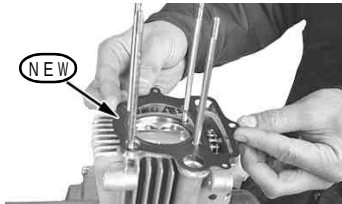
- Fix the rocker arms to the Super Head. Apply molybdenum solution to the original rocker arm shaft, and fix it on the exhaust side. Apply molybdenum solution to a rocker arm shaft of the kit as well, and fix it with its slit part pointing to the cam chain side.



- Fix 8x14 dowel pins of the kit into the dowel pin holes on the cylinder.



- Thoroughly degrease the upper surface of the cylinder.
- Install the head gaskets.



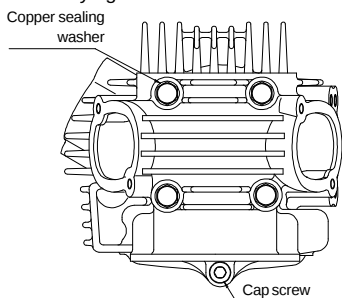
- Set the piston at the top dead center position, and install the cylinder head.



- Fix the cam chain so it will not fall into the crankcase.



- After applying Alumi Special a little to the threaded part of the cylinder head stud bolts, fix a copper washer of the kit to the lower-left part (oil line) and washers of the kit to other parts. Then fix four cap nuts of the kit and 6x18 cap screws as indicated in the figure below, and loosely tighten them.



- Tighten nuts on the stud bolt diagonally to the specified torque in a few steps.

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

T : 12N · m (1.2kgf · m)



- Tighten the side bolt on the cylinder side and the cap screws on the cylinder head side to the specified torque.

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

T : 12N · m (1.2kgf · m)

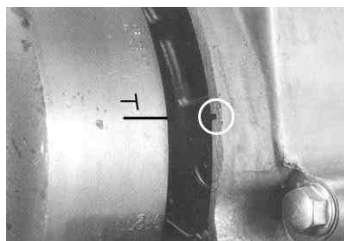


- Tighten a cam chain guide roller of the cylinder to the specified torque.

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

T : 10N · m (1.0kgf · m)

- Align a "T" mark on the flywheel with an alignment mark on the crankcase. Then set the piston at TDC (Top Dead Center).



And at this point, set the piston at TDC (Top Dead Center), using a timing protractor (or, a circular protractor of 00-01-0062) when our recommended C.D.I. magnet (= inner rotor) is installed.

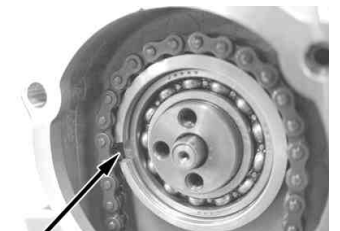
- Apply engine oil to a bearing on the camshaft COMP., which please fit to a cylinder head. And put a provided 8x12 dowel pin into the center hole in the camshaft.



Dowel pin 8 x 12

NOTE : The supplied dowel pin will not be used in case a dowel pin is pressed into your camshaft.

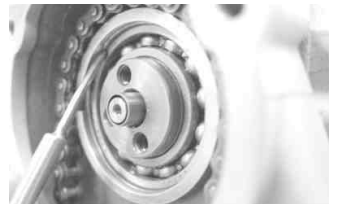
- Fix a cam shaft circlip of the kit, and fix the cam shaft. At this stage, set the location of ring end gap of the circlip not to meet the notch on the cylinder head cam hole.



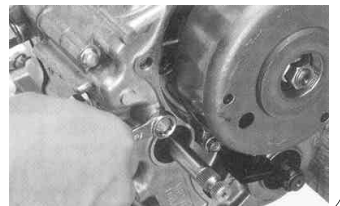
Notch

- Check that the circlip is right in the circlip groove.

⚠Warning : Do the checking without fail.

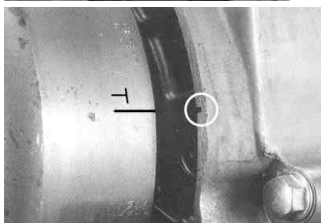
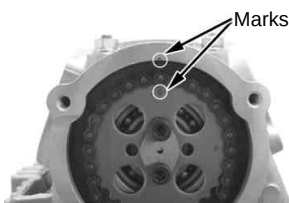


- Remove the side bolt on the cam chain tensioner.



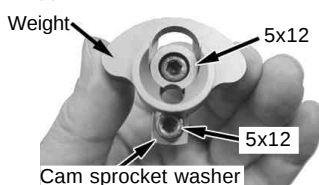
• When installing a camshaft without an automatic decompression:

- Attach the cam chain to the cam sprocket, and fix them with a cam sprocket plate and two 5x12 (black) cap screws included in the kit.
(At this point, apply Alumi Special a little to the threaded parts of the cap screws.) Then align the "T" mark on the flywheel with the alignment mark on the crankcase, and align an "O" mark on the cam sprocket with the alignment mark on the cylinder head.

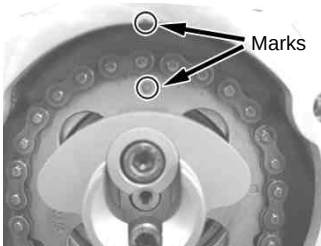


• When installing an automatic decompression cam shaft:

- Set a cam sprocket washer through a weight, and set two black 5x12 cap screws into upper and lower holes.



- Attach the camchain to the cam sprocket. And place the weight to face the "O" mark and install it with two black 5x12 cap screws.
(At this time, apply a thin coat of Alumi Special, the heat-resistant lubricating agent, to the thread of the cap screw.) Then, align the "T" mark on the flywheel with the alignment mark on the crankcase, aligning the "O" mark on the cam sprocket with the alignment mark on the cylinder head.



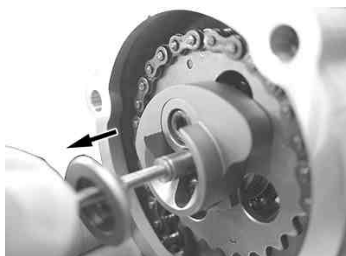
- Holding the crank, tighten the cap screws, which are attached to fix the cam sprocket, to the specified torque.

△CAUTION: Be sure to tighten to the specified torque.

T : 10N · m (1.0kgf · m)



- Check that the "T" mark on the flywheel is still aligned with the "O" mark on the cam sprocket.
- Pass a 6mm snap ring and a plate into a thumb screw supplied in the Camshaft Kit, attach it to the shaft tip of the camshaft comp. and pull the shaft toward you.



- Attach a snap ring in the shaft groove.

△NOTE : Do not expand the snap ring more than necessary.

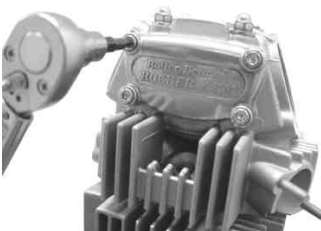
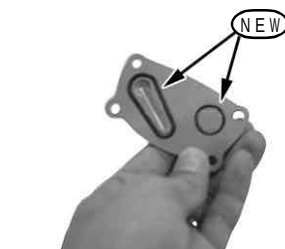
△WARNING : Always use a new snap ring at any time, and do not reuse it.



- Apply engine oil a little to two kinds of O-rings for the right side cover, and fix them to the right side cover. Then tighten them with 5x12 cap screws of the kit to the specified torque.

△CAUTION: Be sure to tighten to the specified torque.

T : 6N · m (0.6kgf · m)



- Check that the "T" mark on the flywheel is aligning with an alignment mark on the crankcase.

- Adjust the valve clearance with an adjust screw.

IN : 0.05 ~ 0.08 (when cold)

OUT : 0.05 ~ 0.08 (when cold)



• When installing an automatic decompression cam shaft:

- Adjust the valve clearance on the EX side with the shaft of the camshaft being pulled toward you so that the decompression function can be deactivated.



- Tighten the adjusting nut to the specified torque.

△CAUTION: Be sure to tighten to the specified torque.

T : 10N · m (1.0kgf · m)



- Unfasten the thumb screw.

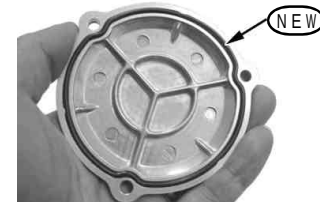


- Apply engine oil a little to a left-side-cover O-ring of the kit, and fix it to the left side cover. Then fix them to the cylinder head with two 5x15 cap screws and with a 5x10 cap screw of the kit and tighten them to the specified torque. (Be careful of the location of screws.)

△CAUTION: Screws must be used at the specified positions only.

△CAUTION: Be sure to tighten to the specified torque.

T : 6N · m (0.6kgf · m)

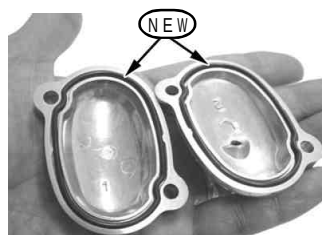


- After applying engine oil a little to an O-ring on the inspection cap of the kit, attach the O-ring to the inspection cap, and fix the inspection cap with 5x15 cap screw of the kit, and tighten up the screw to the specified torque.

- In case a breather cap is used:
- Apply engine oil a little to insection cap O-rings of the kit, and fix them to the breather cap and the inspection cap. Then fix and tighten the breather cap on the intake side and the inspection cap on the exhaust side with 5x15 cap screws of the kit to the specified torque.

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

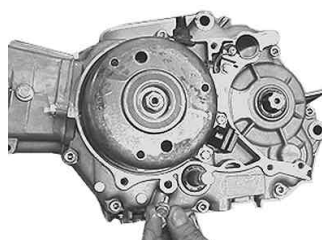
T : 6N • m (0.6kgf • m)



- Pour engine oil from the side bolt hole in the cam chain tensioner, and tighten the side bolt.

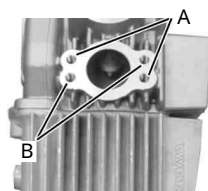
⚠CAUTION: Be sure to tighten to the specified torque.

T : 8N • m (0.8kgf • m)

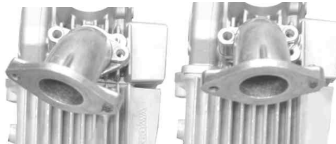


- Mount the engine onto the frame.

- About the installation of the manifold:
Depending on where on the cylinder head to install the manifold, you can change its direction. Choose the suitable direction to match your motorcycle.
When the manifold is installed in the opposite direction of the travel, a heat shield panel is required.



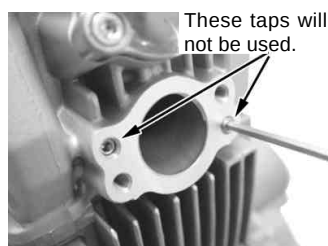
In the case of A In the case of B



- Set the socket set screw on the tap, which is not used in installing the manifold.

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

T : 5N • m (0.5kgf • m)

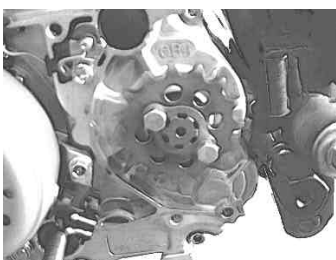


- Following the instruction manual for the relative carburetor, install the carburetor.

- Install the drive sprocket.

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

T : 12N • m (1.2kgf • m)



• **Installation of ignition system:**
For the installation of the inner rotor, see the Instruction Manual.

- Install the generator cover.

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

**T : 7 ~ 11N • m
(0.7 ~ 1.1kgf • m)**



- Add the engine oil to the level, which is specified by the Instruction Manual for the Clutch Kit.
- Attach the drive chain.

Engine Starting

- Make sure that the engine stop switch is turned on and the gas cock is turned off.

- Continue kicking the starter for a while to circulate the engine oil all around the engine.

- Install the spark plug. Apply Alumi Special a little to the threaded part of the plug, and fix it.

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



Our recommended plugs

NGK : C R 8 H S A

Thermal value

DENSO : U 24 F S R—U

Thermal value

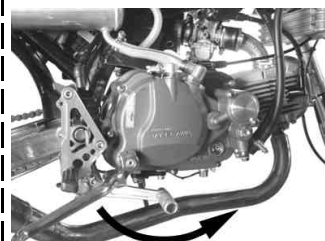
- Attach the plug cap to the spark plug.
- Wipe off the dirt and dust on the engine.
- Turning the gas cock on and turning off the engine stop switch, start the engine.

⚠WARNING: Work only in a well-ventilated place.

• When installing an automatic decompression cam shaft:

For starting the engine, keep the sufficient stroke of the kickstarter arm.

Adjust the angle at which to install the kickstarter arm, and start the engine, keeping the sufficient stroke.



Take the sufficient stroke amount.

- Check for any abnormality such as an abnormal sound.

- If nothing abnormal is detected, carry out a shakedown for about 30 to 50 km, and check the valve clearance again.

⚠CAUTION: Work only when the engine and the muffler are cool.

- Carry out a shakedown again for about 100 to 150 km.

- After the shakedown, double-check for any abnormality such as an abnormal sound and blow-by gas.

(If any abnormality is detected, disassemble the engine again and check each section.)

⚠WARNING: Never re-use parts which cannot be re-used.

Owner's Manual

WARNING

Since this cylinder head manual is prepared for those who have acquired basic skills and knowledge in tuning, those who are technically unskilled or inexperienced are required not to do the work.

- After the disassembly of the hardware and a cylinder head, clean them before the inspection and measuring. And then, blow them with compressed air, and dry them well.
- Engine oil for lubricating the camshaft will be supplied through the oil passage in the cylinder head. Clean the oil passage before assembling the cylinder head.
- After the disassembly of hardware, put a mark on the hardware so they can be reinstalled correctly to their original position.

Reference Value List for Cylinder Head Maintenance

Items	Standard	Service Limit	Remarks
Valve clearance (intake)	0.05 ~ 0.08mm (when cold)	—	
(exhaust)	0.05 ~ 0.08mm (when cold)	—	
Cylinder head distortion	—	0.05mm	Replace
Inside diameter of valve rocker arm	10.000 ~ 10.015mm	10.05mm	Replace
Outside diameter of rocker arm shaft (intake / exhaust)()	9.978 ~ 9.987mm	9.92mm	Replace
Clearance between a rocker arm and a shaft	0.013 ~ 0.037mm	0.10mm	Replace
Inside diameter of valve guide (intake)	4.500 ~ 4.512mm	4.56mm	Replace the guide or the head
(exhaust)	4.500 ~ 4.512mm	4.57mm	Replace the guide or the head
Outside diameter of valve stem (intake)	4.475 ~ 4.490mm	4.42mm	Replace
(exhaust)	4.460 ~ 4.475mm	4.40mm	Replace
Clearance between a valve stem and a guide (intake)	0.01 ~ 0.037mm	—	
(exhaust)	0.025 ~ 0.052mm	—	
Valve seat contact width (Intake)	0.8 ~ 1.0mm	1.5mm	Modify or replace the head
(exhaust)	1.0 ~ 1.2mm	1.7mm	Modify or replace the head
Free length of valve spring (outer)	34.8mm	33mm	Replace
(inner)	30mm	28.5mm	Replace
Valve spring retainer (intake / exhaust)	—	coating peeling	Replace Check once every 500km

○ Special tool : Valve spring compressor set of Item No. 00-01-1005

○ Torque unit

1 kgf · m = 9.80665 N · m (=newton meter)

(MO-OIL) ○ This mark shows molybdenum solution.

This solution is a mixture of molybdenum grease and engine oil (in the ratio of 1:1).

Apply molybdenum solution or assembly paste to the portions where it is indicated that molybdenum solution needs to be applied.

(NEW) ○ This mark shows those parts to be replaced with every overhaul.

Do not fail to replace these parts every time they are overhauled.

(AL-SPL) ○ This mark means Alumi Special (heat-resistant lubricating agent).

• Alumi Special = heat-resistant lubricating paste and grease which prevent galling from high temperatures and heavy loading, and adhesion.
(Purpose: good for those parts which get hot like a spark plug and exhaust manifold.)

Never apply this to any parts other than the specified parts.

As the rocker arm shaft on the EX side is a standard one, the above-listed standard values of the shaft should be used only as a guide.

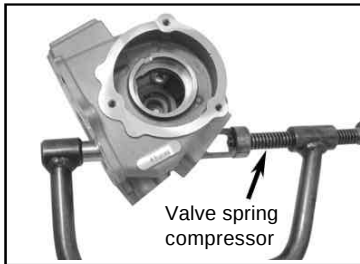
Owner's Manual

• Splitting of Valve

- Compress the valve spring, using a valve spring compressor.

⚠ NOTE : Never compress it more than necessary.

Special tool: Valve spring compressor set of item No. 00-01-1005

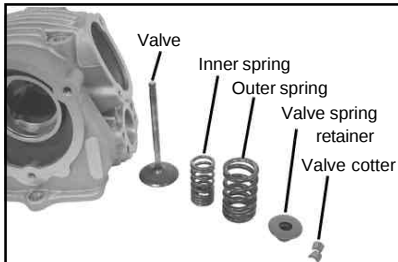


• Removal of Valve Cotter

Use a magnet to remove the cotter if it does not come off easily.

- Remove first the valve spring compressor, and then the following parts:

- Valve spring retainer
- Valve spring (Inner & Outer)
- Valve



⚠ NOTE : If the valve is damaged at its end, do not remove it forcibly, but rectify the end first before removing it.

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.

Service Limit IN : 4.42 mm

EX: 4.40 mm

Replace the bent, baked or damaged valves with new ones.



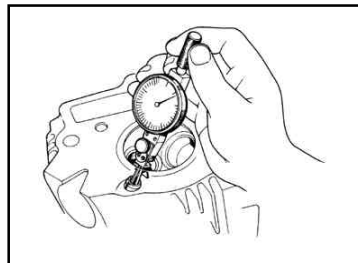
Inspection of the Valve Guide.

- Measure the inner diameter of the valve guide.

Service Limit IN : 4.42 mm

EX: 4.40 mm

Replace the valve guide or cylinder head if the valve guide is scratched or damaged.



Outer diameter of the valve stem subtracted from the inner diameter of valve guide is a guide clearance.

Service Limit IN : 0.09 mm

EX: 0.12 mm

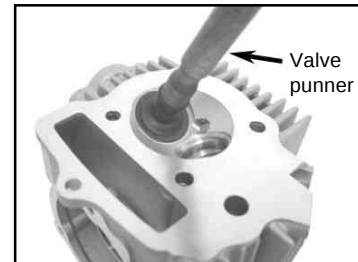
Inspection of Valve Seat

- Remove carbon sediment in the cylinder head combustion chamber and valve.
- Dissolve red lead primer with oil or the like, and apply it to the valve face evenly.

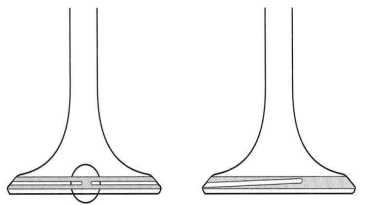


- Strike the valve once and lightly with a valve punner, and rotate it.

- 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.

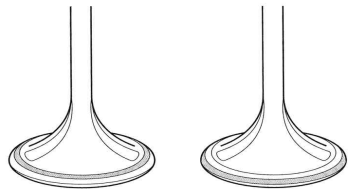


Owner's Manual



Scratch on the seat

Uneven seat width



Contacting at a low position

Contacting at a high position



Service Limit:

Need to be fixed when the service limit at IN is more than 1.5 mm and when the service limit at EX is more than 1.7 mm.

- If there is a scratch on the valve seat, modify the seat.
- If the contact width is wide, narrow, in a high or low position, modify the seat.
- Ask a specialist shop in internal combustion or TAKEGAWA for the modification work.

Inspection of Rocker Arm:

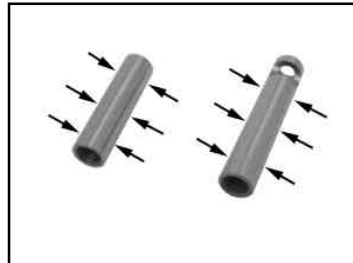
- Check the rocker arms for scratches, damages and jamming. And check if the bearing rotates smoothly.
- Measure the internal diameter of the rocker arms.
- Unfasten an adjust bolt, and check it for scratches. If it is scratched, change it with a new one.



Service limit : If the inner diameter is bigger than 10.05 mm, replace the rocker arm.

Inspection of Rocker Arm Shaft

- Check the rocker arm shaft for bending, scratches, and damages.
 - Measure the external diameter of the rocker arm shaft.
- Service limit : If the external diameter is smaller than 9.92 mm, replace it.

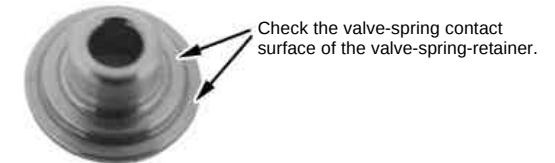


Outer diameter of the rocker arm shaft subtracted from the inner diameter of rocker arm is a clearance.

Service limit : If the clearance is bigger than 0.1 mm, replace the rocker arm shaft.

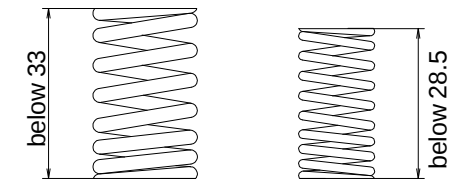
Inspection of Valve Spring Retainer

- Check the valve-spring contact surface of the valve spring retainer for the peeling or damage.
- Replace it with a new one if its coating is peeled off or is damaged.



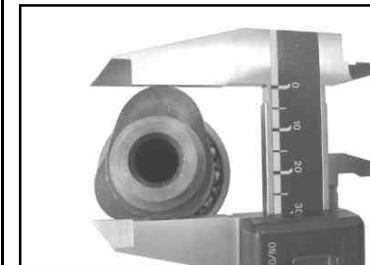
Inspection of Valve Spring

- Check the valve springs for scratches and damages.
 - Measure the free length of the valve springs.
- Outer : If the length is below 33, replace them.
Inner : If the length is below 28.5, replace them.



Inspection of Camshaft

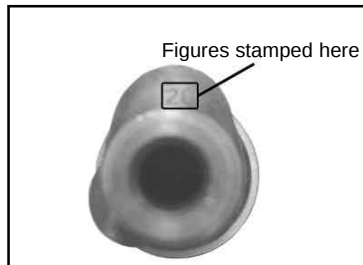
- Check the camshaft for scratches, cracks, and damages.
- Measure the height of each cam top.



Owner's Manual

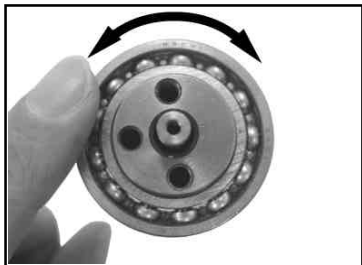
Kinds of Camshafts	IN	EX	
S-12	Below 28.8	Below 28.8	Replace
S-15	Below 28.8	Below 28.8	Replace
S-20	Below 29.0	Below 28.8	Replace
S-25	Below 29.1	Below 28.8	Replace
S-30	Below 29.43	Below 29.03	Replace
S-35	Below 29.43	Below 29.03	Replace

- A kind of the camshaft is stamped on the cam top. When you have forgotten the kind of the camshaft, see the stamped figures.



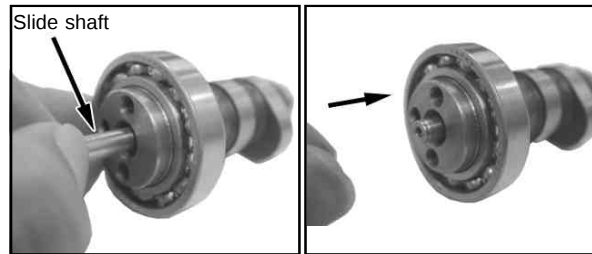
Inspection of the Camshaft Bearing

- Rotate the outer race of the bearings with fingers. If the outer race does not rotate smoothly or if it is rickety, replace either the ball bearing or cam shaft.

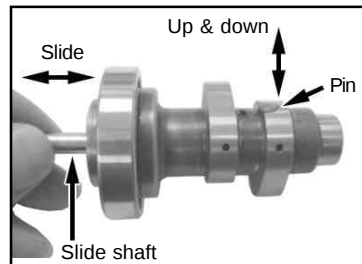


• In the case of automatic decompression camshaft:

Pull the slide shaft of the camshaft center. And compress the spring in the shaft, and release the shaft. Then, check if the slide shaft slides smoothly and slides back to its original position. If the slide shaft does not slide smoothly or the tension is not on the spring of the slide shaft, change the camshaft.

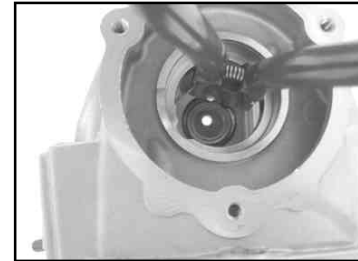


- Slide the slide shaft, and check if the decompression pin moves up and down on the EX side cam. If the pin does not move up and down when you slide the shaft, or the shaft does not slide because it has become stuck, then change the cam shaft.

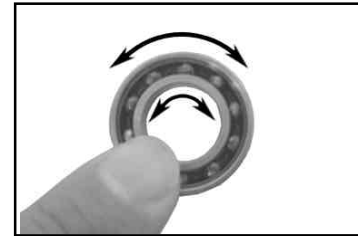


Inspection of the bearing

- Take out the C-shaped ring from the cylinder head and remove the ball bearing.

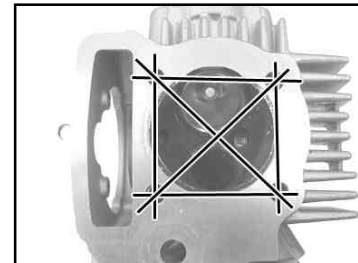


- Rotate the bearing race with fingers. If it does not rotate smoothly or if it is rickety, replace the bearing.



Inspection of Cylinder Head

- Check the spark plug hole and valve hole for the cracks in the vicinity. Check the cylinder head for distortion with a straight edge and thickness gauge.

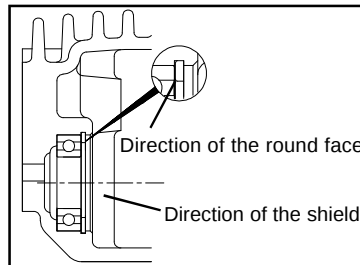


Service limit: If the distortion is over 0.05 mm, rectify or replace the cylinder head.

Owner's Manual

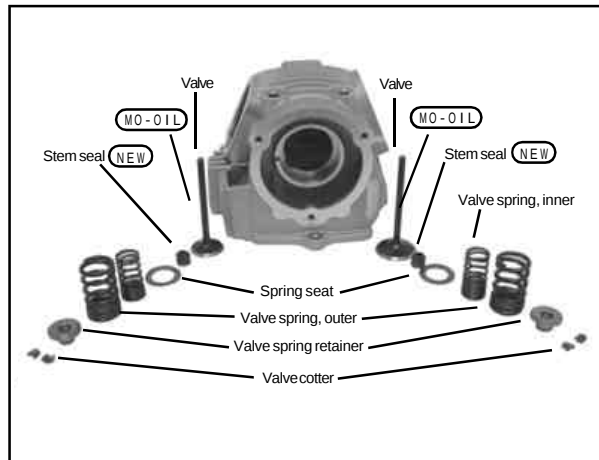
Installation of Bearing

- Install the bearing to the cylinder head with the shield facing the camshaft.
- Install the C-shaped ring with its round portion facing the bearing.



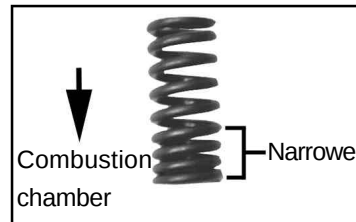
• Valve Assembly:

- Install valve spring seats and new valve stem seals.
- Apply molybdenum solution to the sliding surfaces of the valve stems, and fit the valves into the valve guides, rotating valves slowly with care not to damage the stem seals.



- To the head, attach the valve spring, with a narrowly-pitch side pointing to the combustion chamber.

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



- Compress the valve spring with a valve spring compressor. And apply a thin coat of grease to valve cotters, and install them.

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



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

⚠ CAUTION : Be careful not to damage the valves.



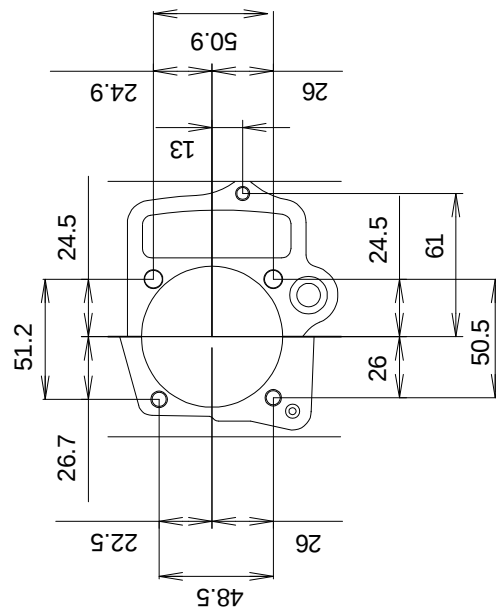
Cylinder Head Kit (01-03-8103) Cylinder Kit (01-04-8001)

Compatible engine sizes

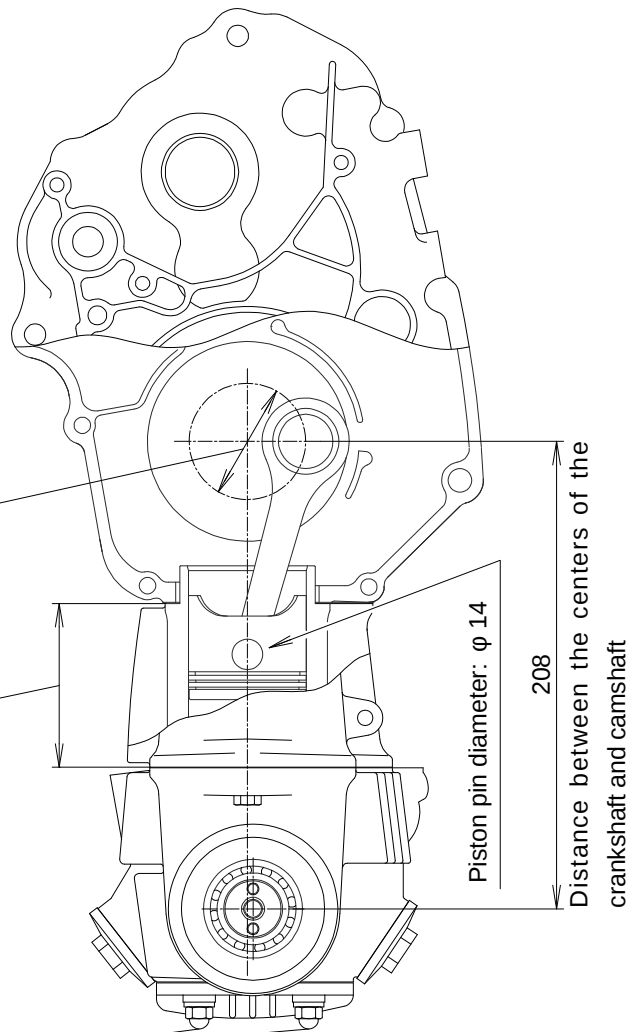
Stroke: 55.5

Cylinder height: 78.1 ~ 78.2

Stud bolt: M7



Location of the stud-bolt threaded screw hole
in the crankcase



Engine sizes

Sizes in mm

About the engine interior

The number of cam chain links: 90 links

Cam sprocket on the cylinder head: 32T

Cam sprocket on the crankshaft: 16T

If your engine satisfies all these figures, it is compatible with this product.