



Instruction Manual for **SUPER HEAD 4VALVE / Cylinder Kit**

For exclusive use with TAKEGAWA Super Head 4VALVE

Item No.: 0 1 - 0 4 - 0 1 1 9 (125 cc)
0 1 - 0 4 - 0 1 1 8 (138 cc)

- Thank you for purchasing one of TAKEGAWA products.
- This is a piston and a cylinder set for exclusive use with TAKEGAWA Super Head 4VALVE. Please strictly follow the instructions to install and use the kit.
- As this aluminum casting cylinder can be used with our stick thermosensor, you can measure temperature of the cylinder with our optional meter.
- The sleeve of this cylinder is one-piece aluminum construction with the cylinder and is ceramic chrome plated. It allows this aluminum sleeve to increase more durability and more wear-resistant than cast iron sleeve, and to decrease the piston clearance and friction loss. The piston is a lightweight design, and molybdenum coating is applied on the piston skirt in order to better break-in.

Please note: Illustrations and photos may vary from the actual hardware.

Please read the following before installation.

! Points to notice about sounds !

After installing this product, in some cases a cooling fin in the cylinder may resonate, making a noise. In this case, as a measure, fix a damper included in the kit to the cooling fin of the cylinder.

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.

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

If you make modifications to the products, we shall be held free from any guarantee of the products.

This kit is for exclusive use with TAKEGAWA Super Head 4VALVE.

A cylinder included in this kit may interfere with crankcases depending on individual differences of the stock crankcases. If there is interference, the crankcase needs some modifications.

When you modify the stock crankcase, you need removal or disassembly of engine and crankcase. Be sure to see KAWASAKI's genuine service manual and work properly. When installing, you need new gaskets. Please purchase them separately.

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.



Caution

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

- This product is designed for exclusive use with off highway or closed road. NEVER use on public roads. Please drive safely and follow the local traffic law.
- Work only when the engine and the exhaust system are cool to avoid burns.
- Prepare appropriate tools and work properly to avoid the breakage of parts or injuries.
- As some products and frames have sharp edges or protruding portions, work with your hands protected to avoid injuries.



Warning

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

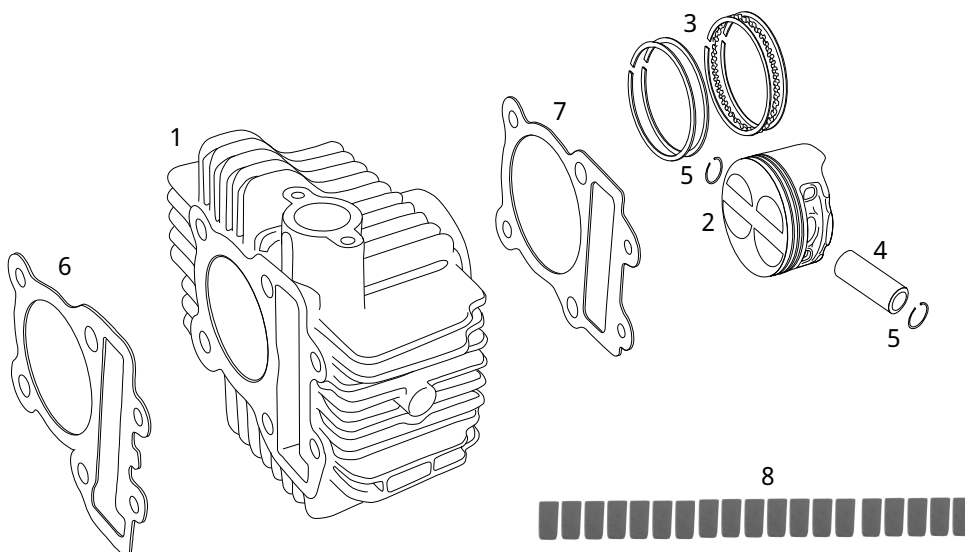
- Those who are technically unskilled or inexperienced are required not to do the work. (Improper installation because of insufficient skill and knowledge could lead to parts breakage and subsequently to accidents.)
- Always use new piston pin circlips, gaskets, seals and the like. Worn or damaged ones may cause accidents because of breakage of these parts.
- Before working, place the motorcycle on level ground to stabilize its position for safety to avoid the motorcycle overturning.
- If you find damaged parts when inspecting or performing maintenance of your motorcycle, do not use these parts, and replace them with new ones. (The continued use of these damaged parts could lead to accidents.)
- 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.)
- Before riding, always check such parts as screws for loose. If you find loose ones, screw them securely up to the specified torque to avoid parts coming off.
- When you notice something abnormal with your motorcycle while riding, stop riding immediately and park your motorcycle in a safe place to avoid an accident.
- 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.)
- 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 accidents.)
- Never use parts other than those specified by us. (Or, the unspecified parts may break, leading to accidents.)
- Tighten parts securely using a torque wrench to the specified torque. (Otherwise, bolts and nuts may break or come off, causing accidents.)
- Since vaporized accumulation of gasoline is quite dangerous, work in a well-ventilated place. (It is at the high risk of explosion.)
- Be sure to always use premium unleaded petrol. (Otherwise, troubles such as knocking of an engine may cause accidents.)

The product 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 products with other manufacturers' products unspecified by us.

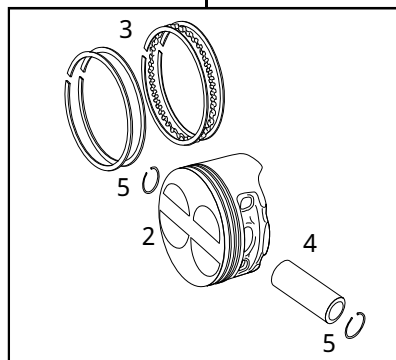
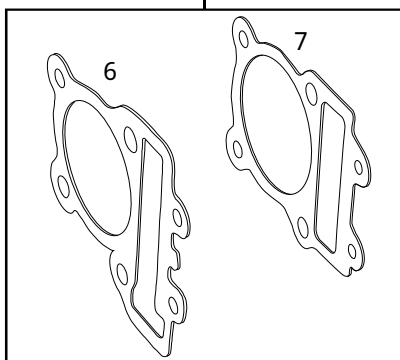
Please retain this Instruction Manual for future reference.

~ Kit Contents ~



Gasket set
01-13-0102 (125cc)
01-13-0103 (138cc)

Piston kit
01-02-0142 (125cc)
01-02-0143 (138cc)



No.	Part Name	Qty	Repair Parts Item No.	in packs of
1	Aluminum cylinder	1	125cc 01-01-0101	1
			138cc 01-01-0291	1
2	Piston	1	125cc 13108-KFS-T00	1
			138cc 13110-KFS-T00	1
3	Piston ring set (top, 2nd, oil)	1	125cc 01-15-020	1
			138cc 01-15-023	1
4	Piston pin	1	13111-GEF-T01	1
5	Piston pin circlip	2	00-01-0003	6
6	Cylinder head gasket	1	_____	1
7	Cylinder gasket	1	_____	1
8	Cylinder damper B	19	00-01-0031	10

Please order repair parts with the Repair Part Item No.
Without the repair part item No., we may not be able to accept your orders.
Some parts are only available as a set.
In this case, please order them with the set number.

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>

~ Installation Procedures ~

- ⚠ **Caution: Always be sure to tighten parts to the specified torque using a torque wrench.**
- ⚠ **Notice: The unskilled or those without proper knowledge are requested not to do the installation work.**

Installation of this kit requires, in some cases, engine removal and crankcase disassembly. Please prepare and refer to a genuine service manual to do the proper installation work.

According to the service manual, demount the engine from the frame and disassemble it.

A crankcase may interfere with a cylinder sleeve depending on individual differences of the crankcases. If there is interference, the crankcase needs processing.

Setting the cylinder in place with a dowel pin, attach it to the crankcase, and check for the interference with the crankcases.

In case there is interference, see where the cylinder interferes with the crankcases.

Referring to the service manual, disassemble the crankcases, and scrape the interfering part with a file or a hand grinder but bit by bit not to over-scrape the portion.

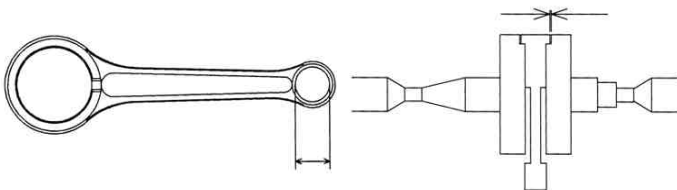
In scraping, be careful not to let the cutting chips and shavings into bearings and other parts. After the processing of the crankcases, clean them.

After disassembling the crankcases, check every component referring to the service manual.

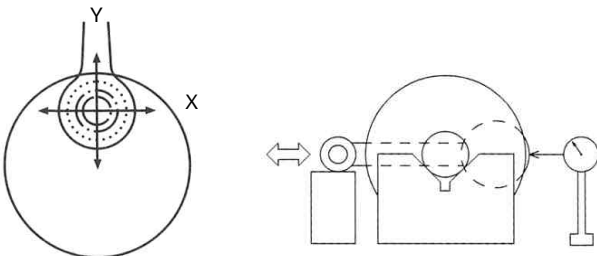
⚠ **Caution: Do inspection of every component and replacement of consumables, with utmost care.**

Inspection of Crank Shaft

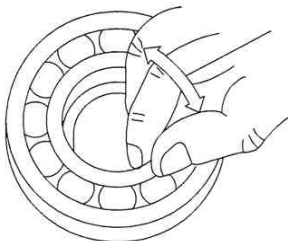
- Measure the internal diameter at the small end of the con'rod.
If larger than 13.05 mm, replace it.
- Measure the clearance at the big end of the con'rod in the axial direction.
If larger than 0.4mm, replace it.



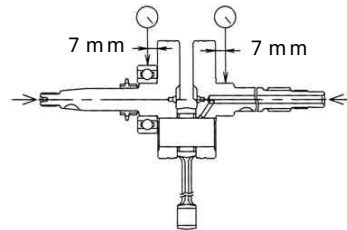
- Measure the misalignment at two points at the big end of the con'rod at right angles to the shaft as shown in the figure on the right.
If larger than 0.07mm, replace it.



- Measure the misalignment on the journal bearing of the crank shaft.
Shaft direction: If larger than 0.10 mm, replace it.
Bearing direction: If larger than 0.05 mm, replace it.



- Measure the deflection of the crank shaft.
If larger than 0.08 mm, replace it.

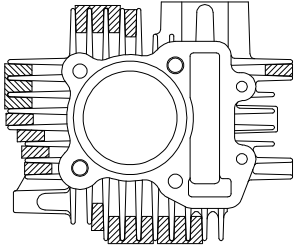


- o Assemble the crankcase referring to the service manual.

~ Cylinder Installation Procedures ~

Securely fix cylinder dampers B, included in the kit, between the cylinder cooling fins until they hit a dead end as shown in the figure below.

(This installation is aimed at reducing a resonant sound from a cylinder cooling fin.)



Attach a piston pin circlip to one of two pin holes on the piston.



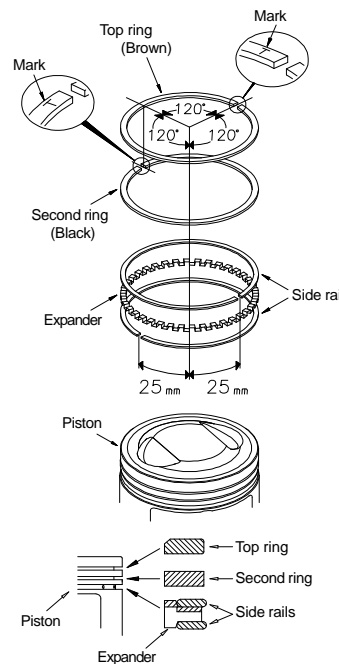
Attach the piston pin circlip so the ring end gap does not meet with the notch on the piston pin hole, and it should be either on the top or at the bottom of the piston as illustrated in the fig. 1 below.



End gaps

Air-blow the piston rings and the piston pin, and check for jamming of any foreign material by these parts.

Apply engine oil to grooves for piston rings, and, with reference to the figure below, fix piston rings and arrange the location of piston ring end gaps.



Apply molybdenum solution to the piston pin and the holes on the connecting rod small end.



Attach the piston to the connecting rod with an arrow on the piston in the direction of the exhaust side.



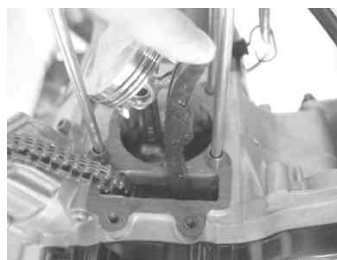
Plug the sleeve hole and the cam chain hole on the crankcase with a clean cloth, and fix a piston pin circlip.



Remove the cloth used to plug holes. Thoroughly degrease the cylinder base of the crankcase, and fit a dowel pin into the dowel pin hole.



Fix a cylinder gasket of the kit into the cylinder base of the crankcase.



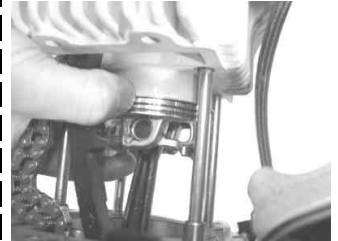
Apply engine oil to the entire inner surface of the aluminum cylinder bore.



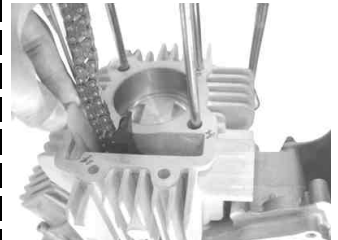
Put the aluminum cylinder into the stud bolt, and attach the cylinder, compressing the piston rings.

Be careful not to move the piston ring gaps out of position.

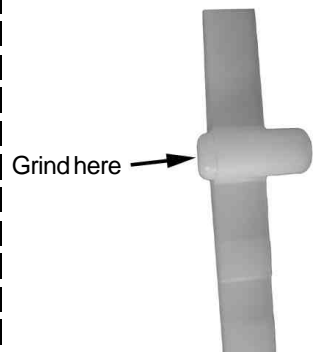
Caution: Do the work with care not to damage the piston rings.



Attach the cam chain guide to the cylinder.



Installing the chain guide on cylinder, the chain guide may not reach at the bottom of the groove. In that case, you need a modification as the photo shown below to install the chain guide properly.



Grind here

Install the cylinder head with reference to the instruction manual.

Owner's Manual

WARNING

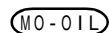
Since this cylinder manual is prepared for those who have acquired basic skills and knowledge in tuning, those who are technically unskilled or inexperienced are required not to do the work.

Reference Value List for Cylinder Maintenance

Item			Stock	Service limit	Remarks
Cylinder	Distortion			0.05 mm	Replace
	Internal diameter	56	56.000 ~ 56.015 mm	56.10 mm	Replace
		59	59.000 ~ 59.015 mm	59.10 mm	Replace
Piston	External diameter (7.5 mm from the hem of a skirt) (7.5 mm from the hem of a skirt)	56	55.965 ~ 55.985 mm	55.92 mm	Replace
		59	58.965 ~ 58.985 mm	58.92 mm	Replace
	Internal diameter of a pin hole		13.002 ~ 13.008 mm	13.03 mm	Replace
	External diameter of a piston pin		12.994 ~ 13.000 mm	12.98 mm	Replace
Piston ring end gap size		Top	0.15 ~ 0.38 mm	0.50 mm	Replace
		2nd	0.20 ~ 0.45 mm	0.50 mm	Replace
		Oil	0.20 ~ 0.70 mm	0.90 mm	Replace
Clearance between cylinder and piston				0.12 mm	Replace
Clearance between piston and pin			0.002 ~ 0.014 mm	0.05 mm	Replace

Torque unit

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



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.



This mark shows those parts to be replaced with every overhaul.

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



Engine oil mark

Apply engine oil where so indicated.

Owner's Manual

Inspection of Cylinder

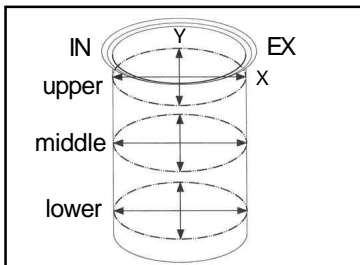
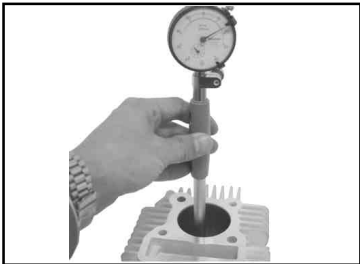
- Check the inside of cylinder for wear and damage.
- Measure the internal diameters of the cylinder bore at 6 positions; at the piston pin angle and at the right angle to it (X-Y) each at upper, middle and lower parts of the cylinder bore.

Treat the largest value as its internal diameter.

If larger than 56.10mm at 56, replace it.

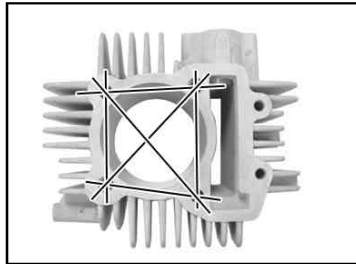
If larger than 59.10mm at 59, replace it.

Calculate the clearance between a cylinder and a piston.



- Check the top surface of the cylinder for scratches and damages.
- Check the cylinder top surface for distortion with a straight edge and thickness gauge.

Service limit: If the distortion is more than 0.05 mm, replace the cylinder.



Inspection of Piston

- Clear the piston of the remaining carbon residue.
- Fit a piston ring into the piston, and measure the clearance between the piston ring and ring groove with a thickness gauge.

If larger than 0.17mm, replace it.



- Check the piston for damages.
- Measure the external diameter of the piston at the specified place at the bottom edge of the piston skirt at the right angle to the piston holes.

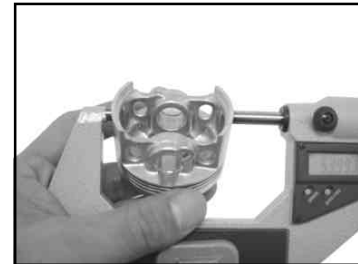
If smaller than 55.92mm at 56, replace it.

If smaller than 58.92mm at 59, replace it.

Figure out the clearance between cylinder and piston.

Inspect that the clearance is within the standard value specified in the specification list.

If not, change the piston with a new one.

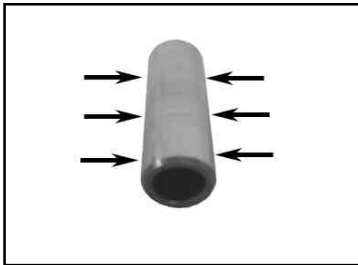


Owner's Manual

- Measure the internal diameter of the piston pin hole.
If larger than 13.03mm, replace it.



- Measure the external diameter of the piston pin.
Piston pin service limit : If it is below 12.98 mm,
replace the piston pin.



- Calculate the clearance between the piston and the piston pin.

Inspection of Piston Ring

- Press down a piston ring into the piston with the piston head, and measure the clearance of the ring-end gap at the horizontal position with a thickness gauge.
Top and 2nd : If larger than 0.5mm, replace them.
Oil : If larger than 0.9mm, replace it.

