S-Stage KIT Instruction manual

Product number	01-05-5096 (D-TYPE)

Adaptation model	Monkey R / RT (AB22-1000017～)

Thank you very much for purchasing our products.
Thank you so you will comply with the following matters at the time of use.Before installation, please check your always kit contents.
If there is a point of notice event, Please contact us the dealer of purchase.

◎ If the description, such as photos or Illustration different with this part.

Caution about Fuel

As this S-Stage Kit is so designed to achieve a higher compression ratio than stock engines, always use the high-octane gasoline.
In case regular gasoline is used, unusual combustion will take place, and the engine cannot achieve its original performance.
Moreover, it is highly likely that the piston will be damaged, leading to a serious failure of the motorcycle. Before installing this Kit, make sure that no regular gasoline remains in the fuel tank. In case regular gasoline is remaining in the fuel tank, do replace it with high-octane gasoline.

Caution about Spark Plugs

Be sure to replace a spark plug with a C8HSA (NGK) or U24FS-U (DENSO). If a resistor plug is originally used, replace the spark plug with a CR8HSA (NGK) or U24FSR-U (DENSO). Choose and use a right spark plug with the right number, depending on the degree of burning of the spark-plug electrode section.

☆ Please read carefully before use ☆

◎ 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 this Instruction Manual.
◎ 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.
◎ If you make modifications to any product supplied here, we shall be held free from any guarantee of the product.
◎ You are requested not to contact us about the combination of our products with other manufacturers'.
◎ Please note that this Kit is designed for exclusive use in the above-mentioned compatible models with the specified frame numbers only and that it cannot be mounted on any other models.
◎ For installation, please prepare suitable tools and work with reference to the installation instructions with enough care. Besides, this Instruction Manual and genuine service manuals are prepared for those who have acquired basic skills and knowledge. We, therefore, recommend those who are technically inexperienced or without sufficient tools to ask a technically-reliable specialist shop for the installation work.
◎ Bolts, nuts, and dowel pins will be reused. However, be sure not to use the worn-down or severely-damaged ones, which please do replace with new ones.
◎ If you use a stock carburetor, do not remove an air cleaner box or air cleaner elements. If you change the carburetors, please do the setting to match various conditions. Disregarding these instructions will result in engine troubles and serious accidents.
◎ Be sure to always use unleaded high-octane gasoline.

～ feature ～

○ Now kit is available from us which can bore up to 88cc with a normal 55cc cylinder head installed. Thus, with this kit you can enjoy the feeling of a heavy engine. We have developed this kit as a street youth kit which you can assemble as easily as a plastic model and with which you can study the engine structure.

⚠ Caution When the handling of ignoring this display, property damage and human shows the assumption of what injury.

■ Always try to drive your motorcycle at legal speed, abiding by the laws.
■ Work only when the engine and muffler are cool. (Otherwise, you will get burned.)
■ Do the installation with right tools. (Otherwise, breakage of parts or injuries to you may take place.)
■ 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.)
■ As some products and frames have sharp edges or protruding portions, please work with your hands protected.
(Otherwise, you will suffer injuries.)
■ Before riding, always check every hardware like screws for slack. If you find slack ones, screw them securely up to the specified torque.
(Otherwise, improper tightening may cause parts to come off.)
※ As for the cylinder head among others, please be sure to tighten it up to the specified torque.
■ Always use new gaskets and packings. And check those parts, to be reused, for wear and damage. If you find worn or damaged parts, replace them with new ones.

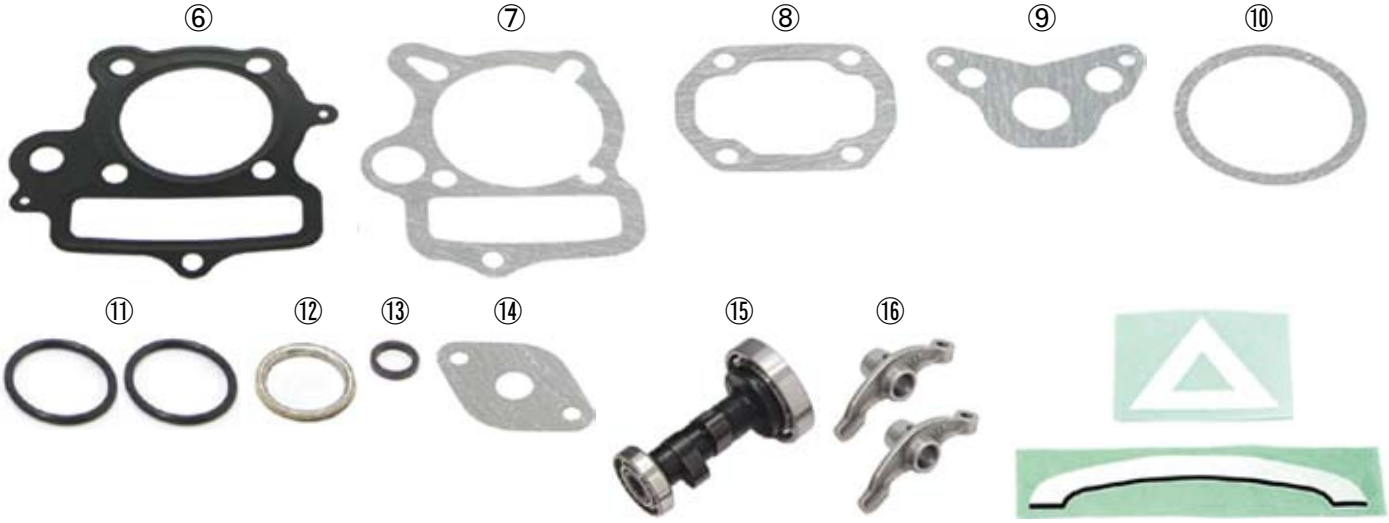
⚠ Warning When the handling of ignoring this display people died, shows the contents of the serious injury possibility is assumed.

■ 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.)
■ When you notice something unusual with your motorcycle while riding, immediately stop riding and park your motorcycle in a safe place to check what has gone wrong. (Otherwise, the malfunction could lead 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.)
■ Carry out inspection and maintenance of your motorcycle correctly according to the instructions and guidelines in the instruction and service manuals.(Improper inspection or maintenance could lead to accidents.)
■ If you find damaged parts when inspecting or 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 accidents.)
■ 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.)

◎ Please note. Performance up, the design change, the product and the price in the cost up, etc. are subject to change without 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.
◎ Keep this manual stored until this product is discarded.

SPECIAL PARTS TAKEGAWA
CONTACT Address : 3-5-16 Nishikiorihigashi Tondabayashi Osaka JAPAN
TEL: +81-721-25-1357 FAX:+81-721-24-5059 e-mail:english@takegawa.co.jp URL http://www.takegawa.co.jp
Please contact with your name and country name provided. (Only English please)

01-02-517
Piston Kit

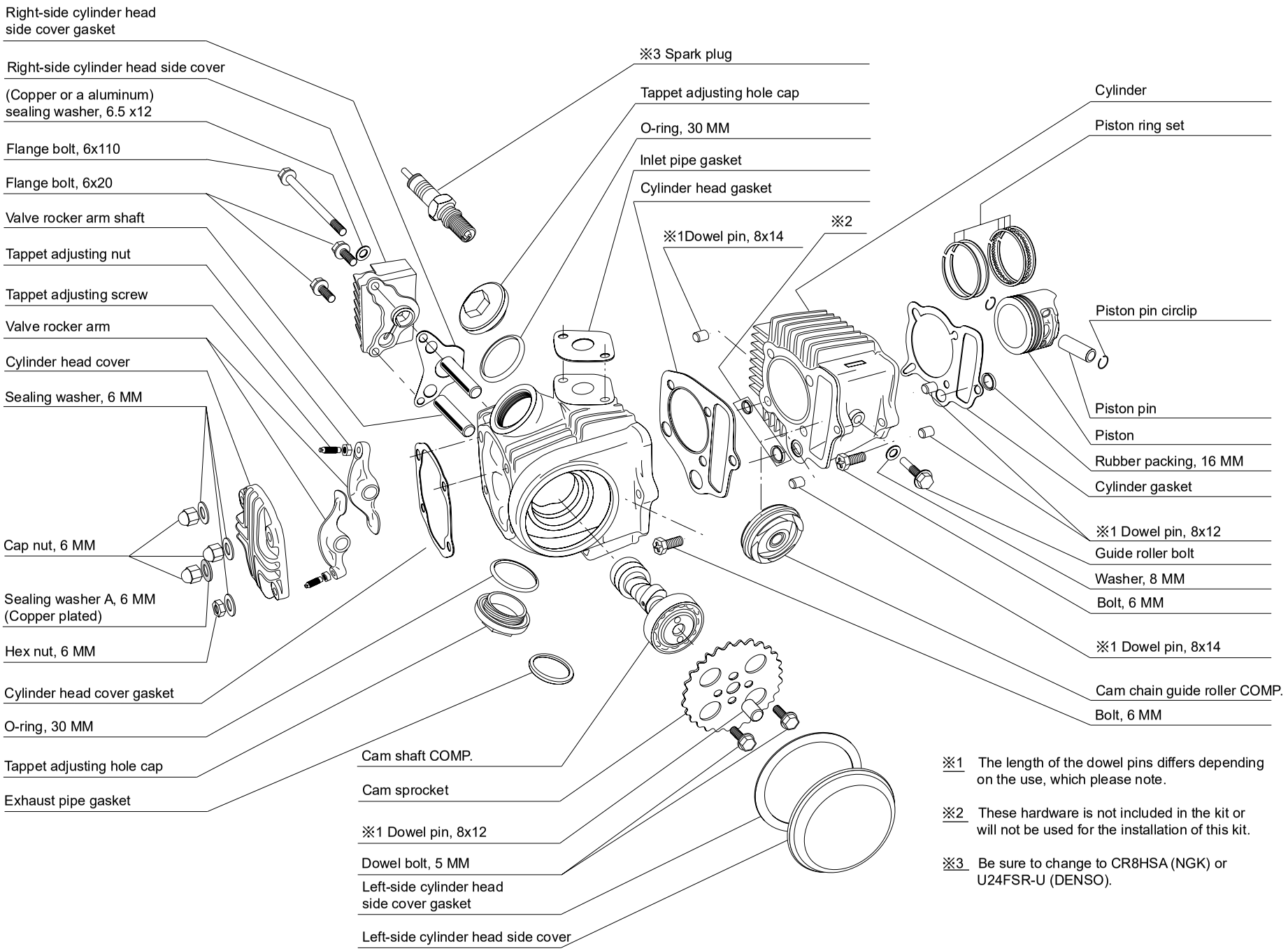


Number	Product content	Quantity	Item Number
1	Piston	1	00-01-0014 (with ③pin)
2	Piston ring set	1	01-15-014
3	Piston pin, 13x36	1	00-01-0091 (with ④clip)
4	Piston pin circlip	2	00-01-0003 (6 pcs)
5	Cylinder	1	01-01-0241H
6	Head gasket	1	00-00-1147
7	Cylinder gasket	1	00-01-0067 (2 pcs)
8	Head cover gasket	1	00-01-0156 (2 pcs)
9	Right side cover gasket	1	00-01-0157 (2 pcs)
10	Left side cover gasket	1	00-01-0158 (2 pcs)
11	Tappet cap O-ring	2	00-01-0034 (4 pcs)
12	Exhaust pipe gasket	1	00-01-0064 (2 pcs)
13	Rubber packing	1	00-01-0066 (2 pcs)
14	Inlet pipe gasket	1	00-03-0009 (3 pcs)
15	Camshaft	1	01-08-0009
16	Rocker arm	2	00-01-0341

※Please order in the repair parts are always repair part number.
If it is not the part number order, you may not be able to order.
Please be forewarned.
It should be noted, In the case of parts that can not be separately shipment, please order a set part number.

About bolts:

- Usually, counterclockwise rotation loosens the bolts and nuts, and clockwise rotation tightens them.
- When tightening a screw, at first finger-tighten it as tight as you can, without using a tool.
- To loosen a tightened screw means turning it three or four times counterclockwise, and to remove it means turning it around counterclockwise until it comes off.
- To tighten a screw means to tighten it to keep it from getting loose. However, the bolts may break when overtightened, or may get loose or come off because of the vehicle's vibrations when tightened too loosely. The numeric value as a guide at which a screw will not break or get loose when tightened is the specified torque. And the numeric value varies among the size of the bolts.
- If you do not have a torque wrench, please try to tighten a screw as tight as possible to the extent that the screw will not break or get loose, though we can not take any responsibility for the screw's breakage or getting loose. In case you do not use a torque wrench, you need to judge, only by intuition or using experience, the degree of tightening power with which the screw will break or get loose.



※1 The length of the dowel pins differs depending on the use, which please note.

※2 These hardware is not included in the kit or will not be used for the installation of this kit.

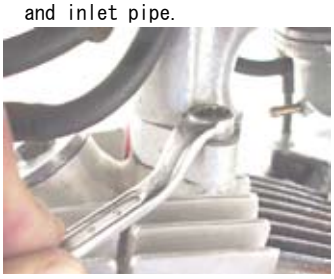
※3 Be sure to change to CR8HSA (NGK) or U24FSR-U (DENSO).

■ Mounting procedure ※Please refer to the Genuine Service Manual for detailed mounting methods and specified torques that are not specifically described.

○ Remove a carburetor:

◇ Turn off a fuel cock.

◇ Remove two bolts by turning them counterclockwise which are holding a cylinder head and inlet pipe.



○ Remove an exhaust pipe:

◇ Remove a seat-mounting nut at the back of the rear side of the seat by rotating it coun terclockwise, and dismount the seat.

◇ Loosen a muffler joint bolt by rotating it counterclockwise.

◇ Remove a bolt holding the muffler by rotating it counterclockwise.

◇ Take off the muffler from the exhaust pipe.

◇ Remove the bolt, which is mounting the exhaust pipe on the frame, by turning it counterclockwise. Keep the packings between frame and exhaust pipe for future reuse.

◇ Remove two nuts which are holding the exhaust pie to the cylinder head by rotating them counterclockwise.

◇ Take off the exhaust pipe from the frame.

○ Remove a front fender:

◇ Detach four bolts on the front fender by rotating them counterclockwise to remove the front fender.

○ Remove a spark plug:

◇ Detach a plug cap from the plug by pulling it out. Be sure to hold the cap in pulling it out.

◇ Remove the plug by turning it counterclockwise with an in-vehicle plug wrench.

○ Remove a left side cover of cylinder head:

◇ The left-side cover will become separated when a hex bolt in the middle of the cylinder-head right side cover is removed. In case the left-side cover cannot be detached by so doing, screw in the hex bolt by a few threads, and strike the bolt head with a hammer lightly. Then the bolt will get separated.

○ Remove a left-side cover of the crankcase:

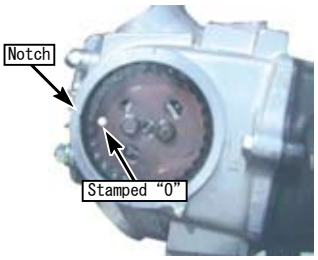
◇ Remove three bolts which are holding a crankcase left-side cover by turning them counterclockwise.

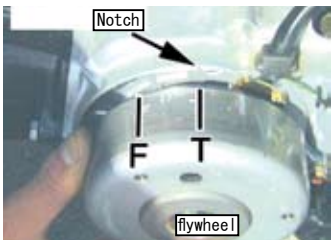
○ Remove two tappet caps:

◇ Remove two tappet caps by turning them counterclockwise.

○ Remove a camsprocket:

◇ Turn the flywheel counterclockwise so a “T” mark on the flywheel and “O” mark on the cam sprocket align with their own notches.





◇ Holding the flywheel, remove three hex bolts on the cam sprocket by turning them counterclockwise.

◇ Prise the cam sprocket open with a small-sized flat tip screwdriver to remove it from the camshaft.

◇ Detach the cam chain from the cam sprocket, and take out the cam sprocket.

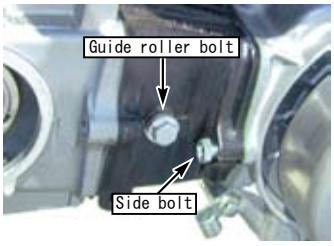
◇ Detach a dowel pin fixed in the center of the camshaft.

○ Detach a cylinder head side bolt:

◇ Remove the side bolt on the cylinder head, which holds the cylinder head and cylinder, by turning it counterclockwise.

■ Mounting procedure ※Please refer to the Genuine Service Manual for detailed mounting methods and specified torques that are not specifically described.

◇ Turn counterclockwise a guide roller bolt on the cylinder and a side bolt between the cylinder and crankcase to loosen those bolts.



○ Remove the cylinder head cover:

◇ Remove four nuts, which hold the cylinder-head cover, by turning them alternately, diagonally, and counterclockwise.
◇ Remove four washers beneath the nuts.

◇ Remove the head cover. (If it does not come off easily, strike it lightly with a plastic hammer, and it will come off.) If some gaskets remain on the cylinder head, wipe them off completely with a scraper or a cutter.

○ Remove the cylinder head:

◇ Remove the cylinder head from the cylinder by pulling the head away from the cylinder. (If it does not come off easily, strike the cylinder head lightly with a plastic hammer, and it will come off.)

◇ Remove the cylinder head.
◇ Keep the removed two dowel pins for reuse.

○ Remove the cylinder:

◇ Remove the loosened guide roller bolt and cylinder side bolt by turning them counterclockwise.

◇ Pull out the cylinder. (If it is hard to pull it out, hit the cylinder lightly with a plastic hammer.)

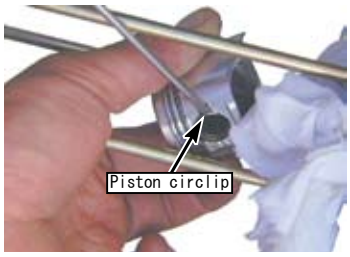
◇ While removing the cylinder, the cam chain guide roller will come out, which please remove.

◇ After taking out the piston, take out the cylinder forward.

○ Remove the piston:

◇ Plug the cylinder hole in the crankcase and cam chain with a waste cloth so as never to let the dirt, dust or hardware into the cylinder hole and cam chain.

◇ Remove one of the two piston circlips. You can remove it by prising it open with a screwdriver tip being placed on the notch in the piston pin hole.

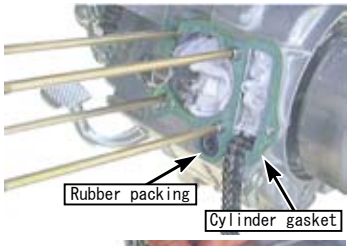


◇ Remove the piston pin in the direction where the piston circlip is not attached. You can easily remove the piston pin by pressing it with a flat tip screwdriver from the direction where a piston circlip is attached.

◇ Remove the piston.

○ Remove a cylinder gasket, rubber packing and dowel pin:

◇ In case you cannot remove all the gaskets completely, rasp or wipe them off with a scraper or something else, exercising great caution not to scratch the crankcase. In case the crankcase center gaskets squeeze out into the cylinder base or cylinder hole, cut them off. Never let any dirt or hardware drop into the crankcase.



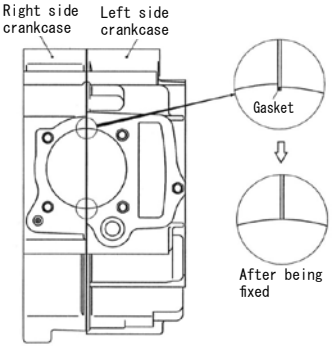
◇ Cut off the gasket, if any, squeezing out into the section pointed by a finger as shown in the picture.

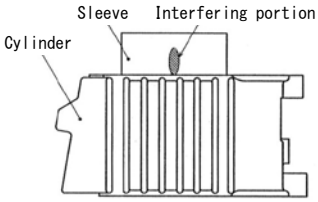
◎ Cautions for installing aluminum cylinder

◇ In fixing the cylinder onto the crankcase, in some cases there is interference in the sleeve hole in the crankcase mating surface, circled portions, the shaded area of the cylinder sleeve, and inside of the crankcase, because the right and left crankcases are not meshing correctly. Since the continued use of such crankcase will lead to sleeve deformation and engine troubles, do not fail to check the crankcase for the interference, and correct the interference, if any.

◎ Tips on how to fix the interference

1. Cover the crankcase securely with a waste cloth so the shavings will not get into it.
2. Rasp the higher mating surface of the crankcases till it becomes level with the lower one.
3. After scraping, remove the cloth with enough care so any chip will not get into the case.
4. After removing the waste cloth, stuff up the crankcase opening with a clean waste cloth.
5. After the installation of the Kit, idle away the engine for a few minutes, and replace the engine oil with new one without delay. And there is nothing more to do.



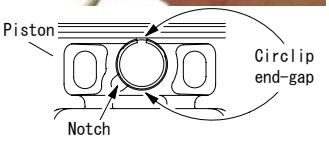


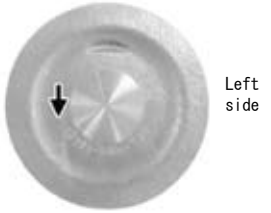
■ Mounting procedure ※Please refer to the Genuine Service Manual for detailed mounting methods and specified torques that are not specifically described.

● Installation of S-Stage Kit

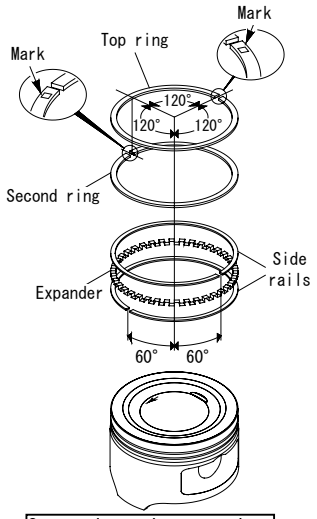
○ Assemble and install a piston

◇Fix a supplied piston pin circlip securely to the grooves for circlip on one side of the piston.
At this time, attach the piston pin clip, do not align the end gap with the piston cut out.

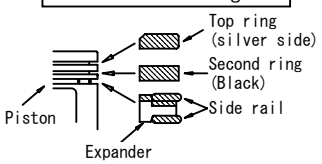




◇You can rather easily install the piston pin circlip bypressing it with a screwdriver, but taking care not to damage the piston with the screwdriver.
◇Apply engine oil to the piston-ring grooves, and fix piston rings in the order of an oil ring expander, lower oil ring side rail, upper oil ring side rail, second ring and top ring.
◇Arrange the positions of piston ring-end gaps so they mesh with each other.



Stamped on the top ring and the second ring.



Pay attention to the cross section as well

◇Put the oil ring expander.

◇Put the lower oil ring side rail.

◇Put the upper oil ring side rail.

◇Insert the second ring with the mark side facing up.

◇Insert the top ring with the mark side facing up.

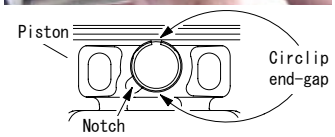
◇Apply engine oil to the piston pin and con' rod, and install the piston pin.

◇Fix the piston so the arrow on the piston head faces downward, or to the exhaust side.

Exhaust side

◇It will also be an easy way of installing the piston to first insert the piston pin about one third into the piston.

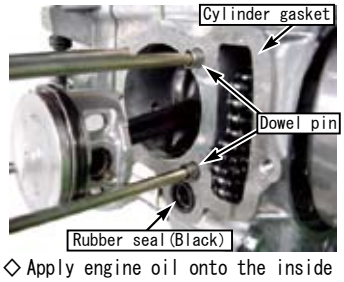
◇Fix securely the supplied piston pin circlip to the circlip groove. At this time, attach the piston pin clip, do not align the end gap with the piston cut out.



◇You can rather easily install the piston pin circlip by pressing it with a screwdriver, but taking care not to damage the piston with the screwdriver.
※Do the work carefully as, in some cases, the circlip comes off flying while you are pressing it inside.
◇Remove the plugged waste cloth.

○ Installation of cylinder

◇Degrease the cylinder and crankcase for base gasket surface with parts cleaner etc.
◇Make sure 2 dowel pins B(L:12 mm) are attached, and install cylinder gasket with 1 o-ring (black).



◇Apply engine oil onto the inside of the supplied cylinder and spread the oil evenly with fingers.

◇Insert the cylinder.

◇Fit in the cylinder, taking care so that the piston ring-end gaps do not get out of position.

◇Once the ring has been placed inside the cylinder, pass the cam chain through the cylinder, and fix the cylinder into the crankcase.

◇Pulling the cam chain, fix the guide roller.

◇Press in the guide roller so the center of the guide roller and the guide-roller bolt hole on the cylinder just mesh together. Install the sealing washer and guide roller bolt.
(Finger-tighten it only for now.)

◇Attach the cylinder side bolt.
(Fasten it only finger tight for now at this point.)

■ Mounting procedure ※Please refer to the Genuine Service Manual for detailed mounting methods and specified torques that are not specifically described.

○ Change of camshaft:

◇ Loosen the tappet nuts and bolts on the rocker arm installed in the cylinder head. At the time the tappet nuts are loosened, detach the tappet bolts together with nuts.

◇ Press in an 8mm bolt into the rocker arm shaft, and pull the shaft out to take out the rocker arm.

◇ Install the cam-sprocket bolt into the camshaft.
The camshaft will come out when you pull it out or strike its head lightly with a plastic hammer. Turning the camshaft, detach it. Do not pull it out by force.

◇ Install the supplied camshaft in the reverse order of removal. Apply clean engine oil to the camshaft and camshaft bearing. Even if you cannot easily fix the camshaft, fix it manually without striking it with a hammer.

◇ Apply clean engine oil to the rocker arm shaft, and install the supplied rocker arm to the cylinder head.

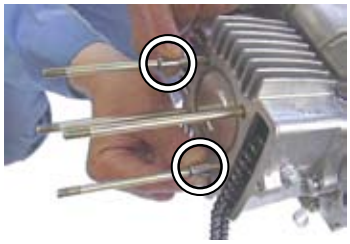
◇ Install the dowel pin on a stock cam to the supplied cam.

◇ Tighten the tappet screw on the rocker arm by turning it clockwise.

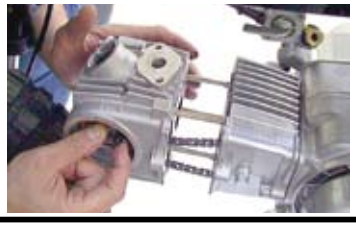
○ Installation of cylinder head:

◇ With thinner, degrease the cylinder head surface and upper surface of the cylinder.

◇ Install the dowel pin to the cylinder and then place the head gaskets on the cylinder.



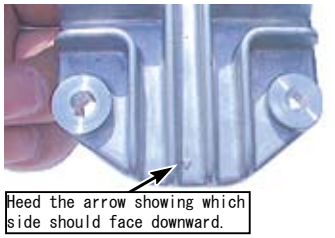
◇ Passing the cam chain through the cylinder head, install the cam chain.



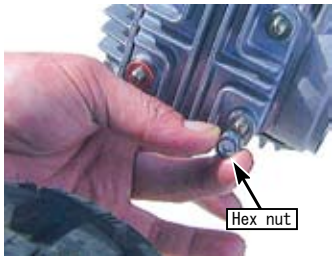
◇ Stick the screwdriver through the cam chain into a middle hole on the camshaft so the cam chain will hang down on the screwdriver just in case the chain comes off.

◇ Attach the cylinder-head-cover gasket and head cover.

◇ The arrow should face downward.



◇ Install the head-cover washers and the nuts.
(Attach a copper washer and three iron washers at the lower left, and a hex nut and three cap nuts at the lower right, when the engine is viewed from the front.)



◇ Tighten up the head nuts evenly. (In case a torque wrench is not available, tighten them diagonally, securely and inch by inch.)

⚠ Note: Be sure that you protect specified torque.
Head nut
Torque : 12N・m (1.2kgf・m)

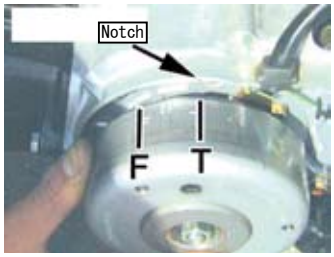
◇ Attach a head-side bolt. Then, tighten fully the guide roller bolt and the cylinder side bolt which were temporarily tightened beforehand.

⚠ Note: Be sure that you protect specified torque.
Guide roller bolt
Torque : 10N・m (1.0kgf・m)
lower and upper side bolt
Torque : 10N・m (1.0kgf・m)

■ Mounting procedure ※Please refer to the Genuine Service Manual for detailed mounting methods and specified torques that are not specifically described.

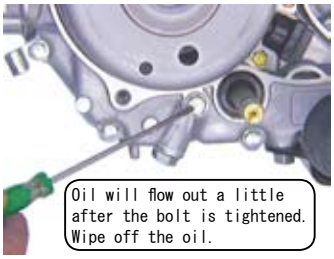
○ Installation of camsprocket:

◇ Align the "T" mark on the flywheel with the notch on the crankcase.



◇ Set the shaft so the cam top faces the piston when the cam sprocket bolt hole is turned toward the notch on the cylinder head. This arrangement places the cam shaft at TDC (Top Dead Center) on the compression stroke.

※ In installing the optional cam, please refer to its instruction manual.



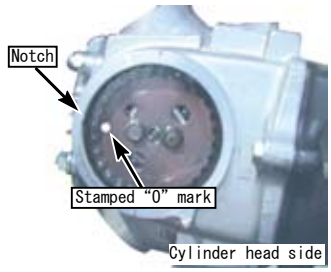
◇ Remove a hex bolt next to the change-pedal shaft, and the tensioner which is tightening the cam chain will slacken, making it easier to install the cam chain.
After fixing the cam sprocket, attach the bolt.
While attaching the cam sprocket to the cam chain, install the cam chain so the "O" mark on the cam sprocket and the notch on the cylinder head mesh together.
Then, attach the cam sprocket to the camshaft.

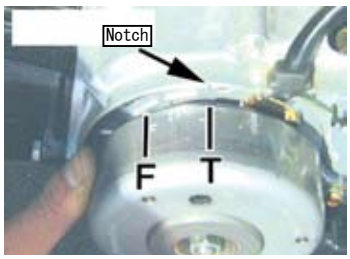
◇ Holding the flywheel, tighten up two cam sprocket bolts.

⚠ Note: Be sure that you protect specified torque.
Cam sprocket bolt
Torque : 9N・m (0.9kgf・m)

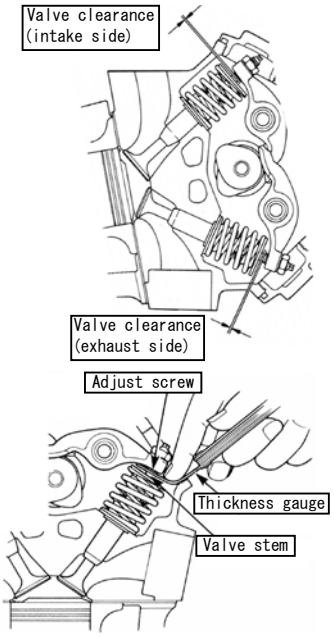
○ Valve timing adjustment and tappet adjustment:

◇ Turn the cam shaft and flywheel until the "O" mark on the cam shaft and the "T" mark on the flywheel mesh with each notch. Though the flywheel will not stop right at the required position because the magnet force repels each other, it is all right if "O" and "T" marks mesh with each notch at the same time after the installation of the cam sprocket.





◇ While tightening a rocker arm's adjust screw, tighten the adjust nut to the extent that a 0.05mm thickness gauge, placed between the adjust screw and the valve stem end, can be pulled out with only a little resistance.
If you have no idea of the proper resistance in pulling out the 0.05mm thickness gauge, then prepare a 0.07mm and 0.03mm thickness gauges. When the 0.07mm gauge won't go in between the space but the 0.03mm gauge goes in quite loosely, this means that roughly 0.05mm clearance is secured.
Set the space at 0.05mm both for intake and exhaust.



◇ After adjusting the tappet, turn the flywheel counterclockwise twice by hand, and then, align the "T" and "O" marks with each other.

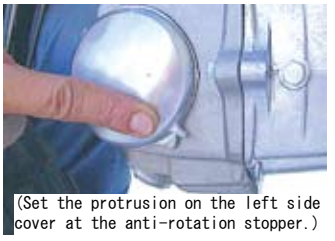
◇ Check if there is any change in the tappet clearance.
If the clearance has not changed, there is no need to readjust it. However, in case there is a change, readjust the clearance.

◇ Install two tappet caps.

⚠ Note: Be sure that you protect specified torque.
Tappet cap
Torque : 12N・m (1.2kgf・m)

○ Installation of left side cylinder head cover:

◇ Attach a left side cylinder head cover gasket and left side cover.
(Set the anti-rotation stopper of the left side cover to prevent it from turning to the left when the bolt is being tightened.)


(Set the protrusion on the left side cover at the anti-rotation stopper.)

◇ Tighten up a hex nut, as indicated by an arrow in the photo at the bottom left, on the right side of the cylinder head.

⚠ Note: Be sure that you protect specified torque.
Hex bolt
Torque : 12N・m (1.2kgf・m)

■ Mounting procedure ※Please refer to the Genuine Service Manual for detailed mounting methods and specified torques that are not specifically described.

○ Installation of spark plug:

◇ Install the plug with either an in-vehicle tool or plug wrench.

⚠ Note: Be sure that you protect specified torque.
Plug
Torque : 11N・m (1.1kgf・m)

◇ Attach the plug cap to the plug.

○ Installation of exhaust pipe:

a. Passing the exhaust pipe through the frame, put the pipe into the cylinder head, and tighten two nuts loosely for now.

b. Fix the exhaust pipe onto the frame with a bolt loosely for now. For this installation, place beforehand packings between frame and exhaust pipe.

c. Put the muffler into the exhaust pipe, and install the muffler onto frame with a bolt loosely for now.

◇ Tighten securely the loosely-tightened hardware and the muffler joining bolt.

⚠ Note: Be sure that you protect specified torque.
a. Nut
Torque : 12N・m (1.2kgf・m)
b. c. Bolt
Torque : 22N・m (2.2kgf・m)
Muffler joint bolt
Torque : 22N・m (2.2kgf・m)

◇ Hang the tab on the seat onto the tank and frame, and install the seat with nuts, putting the bolt into the frame hole.

⚠ Note: Be sure that you protect specified torque.
Nut
Torque : 12N・m (1.2kgf・m)

○ Installation of carburetor:

◇ Check that an O-ring is present on the inlet pipe.

◇ Install the inlet pipe onto the cylinder head with two bolts.

⚠ Note: Be sure that you protect specified torque.
Bolt
Torque : 10N・m (1.0kgf・m)

○ Installation of left side crankcase cover:

◇ Install three bolts to hold a left side crankcase cover.

⚠ Note: Be sure that you protect specified torque.
Bolt
Torque : 10N・m (1.0kgf・m)

○ Installation of front fender:

◇ Attach the front fender with four bolts.

⚠ Note: Be sure that you protect specified torque.
Bolt
Torque : 10N・m (1.0kgf・m)

○ Checking:

◇ Check all the way from engine to underbody for slack in parts like bolts.
◇ Turn on the cock and warm up the engine for about five minutes.