Twin Spark Super head+R Kit Instruction Manual

Item No. : **01－03－8201**

Applicable models and frame Nos

Monkey	: Z50J-2000001～	CRF50F	: AE03-1400001～
	: AB27-1000001～	XR50R	: AE03-1000001～
Gorilla	: Z50J-2500001～		
	: AB27-1000001～		

・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 ～

○ As both the single CDI unit and twin ignition coil are used, a sub-plug has been added to the existing Super Head +R. Thus, this Kit helps to burn the unburned gas at the opposite side of the original plug. With this Kit, almost complete combustion can be realized and the engine can be more powerful in the whole speed range. In particular, power characteristics in the high-speed range of operation of the engine can be improved. Furthermore, the incorporation of automatic decompression into the camshaft makes it easier to start the engine, reducing the load placed on the kick shaft and gears.

Safety Precautions for Use

O This kit is for exclusive use in motorcycles with 12v stock ignition system and stock electric components. This kit is installable onto bikes with a TAKEGAWA-made hyper-CDI as well. Please note, however, that this kit is not installable onto bikes working on 6v, or with inner rotor CDI, or with an ignition system of other manufacturers'.
O This cylinder head kit is for exclusive use with an engine equipped with our TAKEGAWA-made Bore Up Kit or Bore Stroke Up Kit. This Kit is not so designed at all to be used in combination with other manufacturers' products.
O This kit cannot be used in a bike equipped with a stock muffler, up-type muffler, or right-pointing carburetor.
O Please be informed that the Twin Spark Head Piston isn't compatible with a conventional Super Head+R Piston.
O Please never apply liquid packing or the like to the provided metallic cylinder head gasket. Install it just as it is.
O A sub plug comes with this kit, but a main spark plug isn't included with this kit. So, please purchase an extra-cost main spark plug of heat value to meet the engine specifications.
○ Installation of this kit requires processing of a crankcase, except when the SCUT cylinder is used. As the crankcase is bored, the durability of the crankcase will decrease, consequently leading to damages of the crankcase in some cases, which please note.

Safety precautions to observe when using the tachometer:

The tachometers which can be used with this Twin Spark Super Head are as per the list on the right. Any other electric tachometers won't operate properly.

Fitting tachometers:

- **Super Multi LCD Meter : 009-01-0901**
- **LCD Speedo- & Tacho-meter Kit : 009-01-331**
  : 009-01-332
  : 009-01-0042
- **Large LCD Speedo- & Tacho-meter : 009-05-0141**
- **Medium LCD tachometer**

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 kit is designed for exclusive use in the above-mentioned applicable models of motorcycles and frame numbers, and for exclusive use in motorcycles equipped with a bore-up and bore-stroke exclusively for this kit as well. Therefore, please take note that this kit cannot be mounted on other applicable models of motorcycles, or motorcycles not equipped with bore-up, etc exclusively for this kit.
◎ Installation of this product requires removal and reinstallation of an engine, and disassembly of a clutch. Please prepare HONDA's genuine service manual for the above-mentioned applicable models, and work with enough care following instructions in the service manual. Besides, this instruction manual, as well as HONDA's service manual, is prepared for those who have acquired basic skill and knowledge in tuning. We recommend those who are technically inexperienced or without right tools to ask a technically-trustworthy specialist shop to do 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.
◎ If you make alterations to the products, we shall be held free from any guarantee of the products.
◎ 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 nats 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.
◎ Never use this kit on the point-ignition system motorcycle.
◎ Please be informed that what we can safely say is that the ignition system of this kit is compatible with ours and stock ignition systems, because no data is available with us on the compatibility with other ignition systems. Therefore, please never use other ignition systems, which may cause technical troubles.
◎ As the stock clutch cannot be used, a centrifugal filter gets unavailable. Therefore, install an oil filter outside.
◎ 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.
◎ This kit cannot be used alone if you have purchased a cylinder head kit. If you have not purchased "our special engine parts", please purchase special parts with reference to the attached "Reference data on bore- & stroke-up kit."
◎ 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.

May./21/ 08

⚠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 motorcyle in a safe place. (Otherwise, the abnormaility 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.)

◎ 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.

●Cautions before riding:

① About fuel:
Whenever regular gasoline is remaining in the fuel tank, always replace it with high-octane gasoline.

②With this kit installation, a centrifugal filter will be lost. So, please install a dry-type clutch with an external oil filter or a special clutch.

③ 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-geared one.

This kit cannot function on its own. Referring to the attached sheet, please purchase a bore-stroke-up kit for exclusive use with this kit. This does not apply if you have purchaed a full kit.)

● Others:

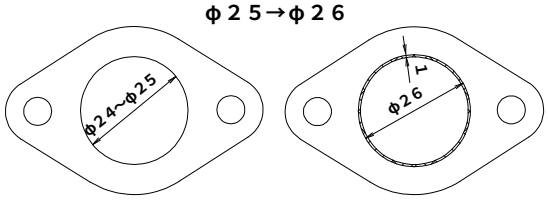
Oil cooler:

◇ The installaiton 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.

Carburetor manifold:

◇ On a manifold, compatible with R-Stage & Super Head, with a port diameter of φ24～φ25 on the side of an inlet pipe, there will be bumps because of the difference in diameter between the cylinder head and the manifold. Enlarging the manifold's port diameter on the manifold side will provide you with smoother output characteristics.

φ25→φ26



●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 inclued in the full kit. For more information, please refer to enclosed paper.

● An inspection cap and a breather cap are included in this kit. In case you use a breather cap, please use an oil catch tank at the same time.

●Revolution

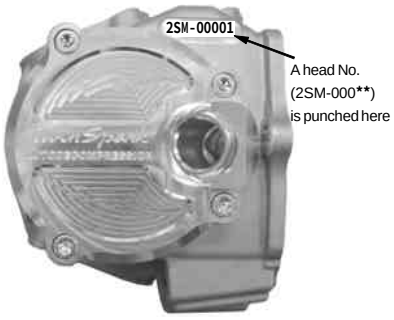
◇Upper limt of revolutions varies depending on the installed cam shafts, etc. Referring to the camshaft comparison graph on page A'3, install a revolution counter to make sure that you drive the engine at revolutions below the upper limit.

◇Take note that idling and sudden acceleration in the 1st and the 2nd gears particularly tend to exceed the upper limit of revultions. 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.
HONDA offers a valve spring retainer (Item No. 14771-MR8-000) compatible with this Kit.

●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. (2SM-000***)is punched here.
Head No. - 2SM-00001
Example of how to order → Super head kit, repair
head No.-2SM-00001 → Intake valve
Qty: 1 piece

● For those who have purchased a cylinder head alone, selection sets are available to meet your combination demand for engine displacement, etc. Please study the required contents of the kit, referring to “Reference data on bore & stroke-up kit” on enclosed paper.
Please contact your dealer for more details about the kit or enquiries.

●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			
Clutch	Special clutch kit		
	Dry-type clutch kit		
Ignition system	Stock C.D.I.		
	Hyper C.D.I.		07-02-15
	C.D.I. magnet		05-02-052
Carburetor	Keihin PE28 carburetor kit	MONKEY	03-05-0981
		MONKEY-R	03-05-095
	Mikuni VM26 carburetor kit	MONKEY MONKEY-R	03-05-0484
		CRF50F XR50R	03-05-3245
Oil pump	Super oil pump kit		01-16-0051
Cam chain (Only in case of a cylinder head kit)	High-duty cam chain kit	124cc	01-14-003
Oil catch tank (Only for the Monkey/Gorilla) (Only in case a head breather cap is used.)	Oil catch return tank kit		09-04-031
	Oil catch tank kit		09-04-032

●About optional camshafts

○The following camshafts compatible with this Kit are available from us. Referring to the below-mentioned output graphics, please select a camshaft to match your usage and engine displacement for your great riding pleasure.

S-12D camshaft	01-08-0101	option
S-15D camshaft	01-08-0102	option
S-20D camshaft	01-08-0103	(Included for bore stroke-up for the Moneky / Gorilla (124)
S-25D camshaft	01-08-0104	option
S-30D camshaft	01-08-0105	option
S-35D camshaft	01-08-0106	option

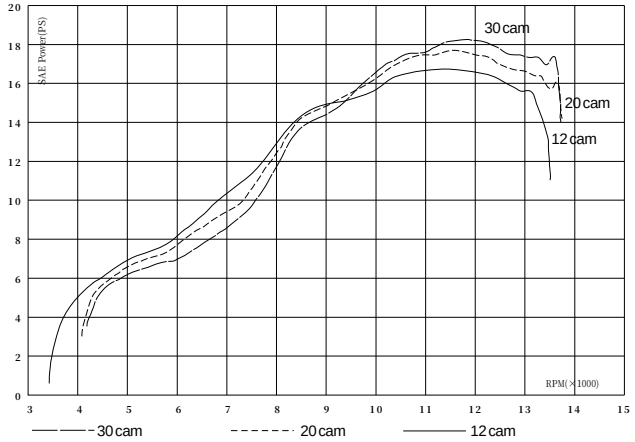
○Part of the model names of our camshafts are indicated in numbers. To cite an example, the larger the number in S-○○, the wider the camshaft profile operating angle. And the smaller the number, the narrower the profile operating angle. In general, the wide-angle profile is a high-speed rotation type, and the narrow-angle profile is a slow-speed rotation type.
However, various factors like the engine displacement, specifications, usage, etc have to be taken into account in selecting the camprofile. So, referring to the list just as a guideline, select an appropriate camshaft to meet the usage.

☆Camshaft comparison data list

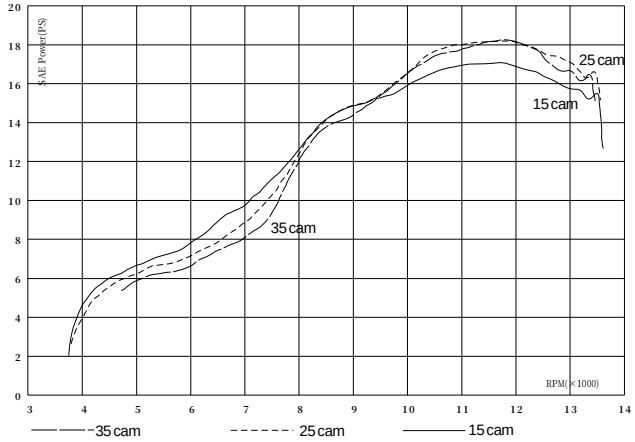
Note: As these are the data measured on a Dyno Jet, the data differ from the actual driving. Please refer to them just for a reference. The engine power varies significantly depending on the temperatures.

● 124 cc

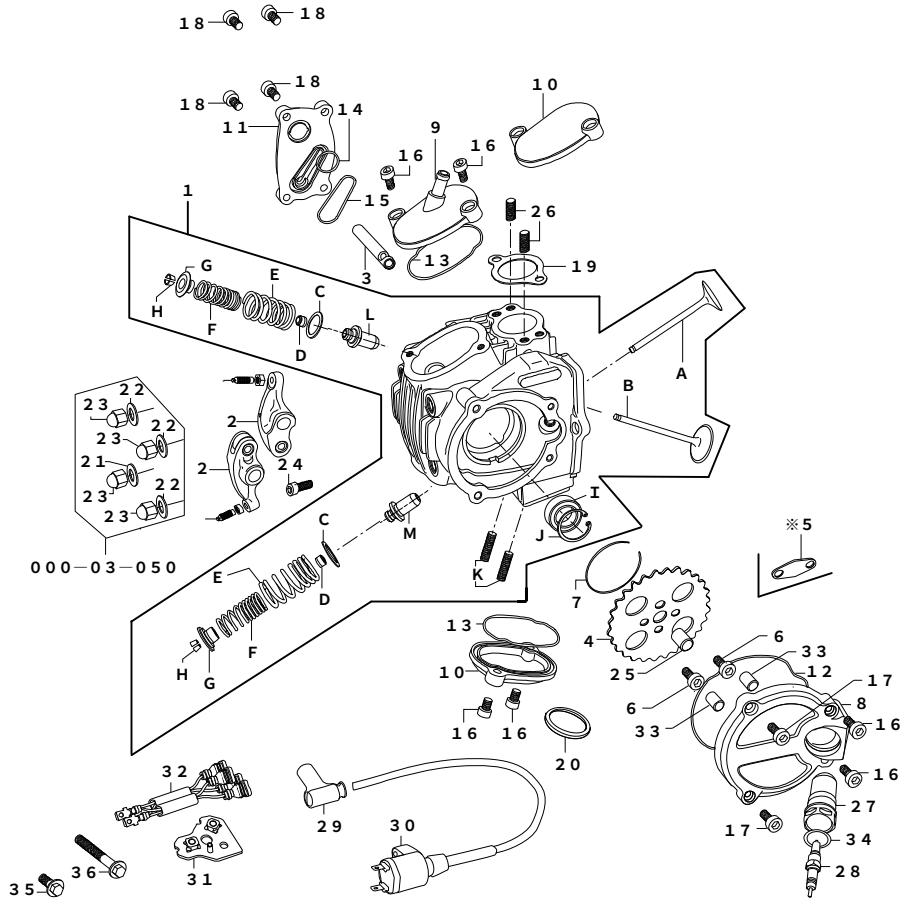
Test Vehicle : MONKEY 54X54 124 cc Carburetor : KEIHIN PE28 Exhaust : Racing Muffler



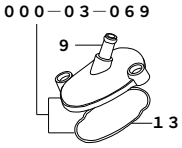
Test Vehicle : MONKEY 54X54 124 cc Carburetor : KEIHIN PE28 Exhaust : Racing Muffler

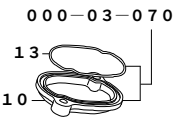


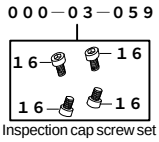
～Kit Contents～



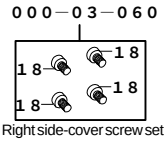
∴ Please order repair parts by indicating the numbers listed below. In some cases, we may not be able to accept your orders for a component of the assembled unit. In this case, please order the required parts in units of sets.



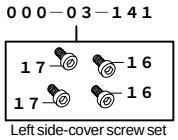




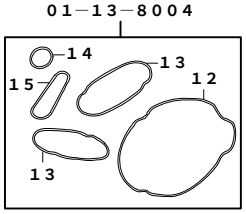
Inspection cap screw set

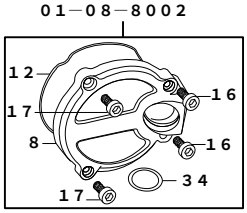


Right side-cover screw set



Left side-cover screw set





No.	Parts Name	Qty	Repair parts No.	Qty
1	Cylinder head COMP.	1	SP/H-2SM-T104	1
2	Rocker arm COMP.	2	14431-SPH-T00	1
3	Rocker arm shaft	1	14451-SPR-T00	1
4	Cam sprocket	1	000-08-003	1
※5	Cam gear washer	1	000-03-063 (with a bolt)	1
6	Cap screw M5x12	2	000-08-011 (SET)	2
7	Cam shaft circlip	1	000-08-010 (SET)	3
8	Left side-cover	1	12341-SPH-T10	1
9	Breather cap	1	000-03-069 (SET)	1
10	Inspection cap	2	000-03-070 (SET)	1
11	Right side-cover	1	11121-SPH-T01	1
12	Left side-cover O-ring	1	01-13-8004 (SET)	3
13	Inspection cap O-ring	2		3
14	O-ring S15	1		6
15	Right side-cover O-ring	1		3
16	Cap screw M5x15 (SUS)	6	000-03-059 (SET)	4
17	Cap screw M5x22 (SUS)	2	BW-00-0049 (SET)	4
18	Cap screw M5x12 (SUS)	4	000-03-060 (SET)	4
19	Manifold gasket	1	03-005-0256 (SET)	3
20	Exhaust pipe gasket	1	000-13-046 (SET)	2
21	Copper sealing washer	1	000-03-052 (SET)	2

No.	Parts Name	Qty	Repair parts No.	Qty
22	Sealing washer	3	————	
23	Cap nut M6	4	————	
24	Cap screw M6x18	1	BW-00-0008 (SET)	4
25	Dowel pin, 8x12	1	00-00-0153 (SET)	2
26	Socket set screw M6x15	2	000-03-062 (SET)	2
27	Spark plug sleeve	1	12351-SPH-T00	1
28	Spark plug	1	NGK-ER8EH	1
29	Spark plug cap	1	000-03-018	1
30	Ignition coil COMP.	1	000-03-017	1
31	Ignition coil stay COMP.	1	000-03-016	1
32	Ignition coil sub-cord	1	000-03-015	1
33	Dowel pin, 7x10	2	000-03-095 (SET)	2
34	Plug-sleeve O-ring	1	000-03-075 (SET)	3
35	Flange bolt 5x10	1	————	
36	Flange bolt 5x22	1	————	
	Insulation lock, 100mm	1	————	
	Insulation lock, 150mm	2	————	
	Alumi Special (5g)	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.	Qty
A	Intake valve	1	14711-SPH-T01-F	1
B	Exhaust valve	1	14721-SPH-T01-F	1
C	Valve spring outer seat	2	000-03-055 (SET)	2
D	Valve stem seal	2	000-03-064 (SET)	2
E	Valve spring (outer)	2	01-12-0101 (SET)	2
F	Valve spring (inner)	2		2
G	Valve spring retainer	2	01-12-084 (SET)	2

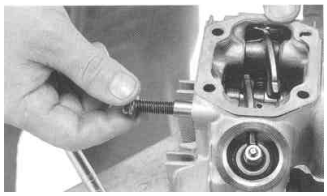
Symbol	Parts Name	Qty	Repair parts No.	Qty
H	Valve cotter	4	000-03-056 (SET)	4
I	Radial ball bearing	1	000-03-058 (SET)	1
J	C-shaped ring	1		1
K	Stud bolt 6x32	2	000-03-057 (SET)	2
L	Over-sized valve guide, IN	1	000-03-137	1
M	Over-sized valve guide, OUT	1	000-03138	1

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

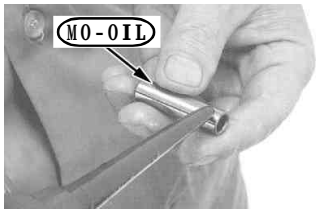
～Cylender Head Installation Procedures～

○Remove the rocker arm shaft and adjusting bolts and nuts on the original cylinder head.



○ Apply engine oil to the removed adjusting bolts, and fixthese 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.

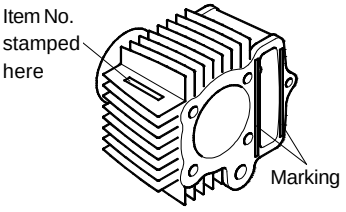


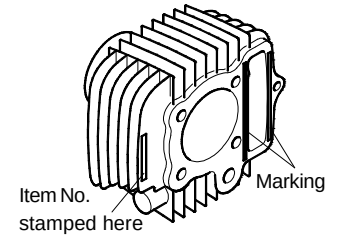
Included part for intake side

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

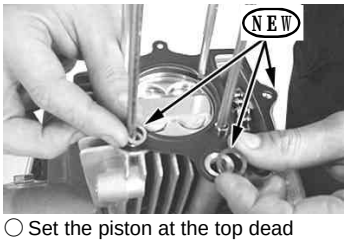
○ Thoroughly degrease the upper surface of the cylinder.
○In the case of a V, H or S (for SCUT) cylinder, attach a cylinder head gasket.

Note: These cylinders have a marking on the cylinder head surface or its Item No. is stamped on the fin side.





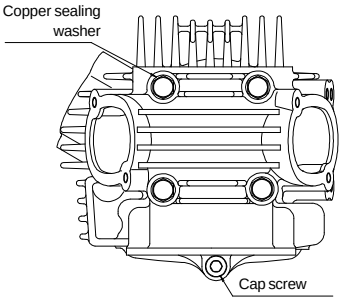
○ In the case of a cylinder with no Item No. or stamped marking or a supplied cylinder coming with a green rubber gasket, attach a cylinder head gasket, black rubber packing and green rubber gasket.



○ 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.

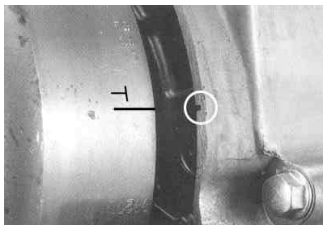


○ Tighten nuts on the stud bolt diagonally to the specified torque in a few steps.
⚠CAUTION : Be sure to tighten to the specified torque.
T : 12N • m (1.2kgf • m)

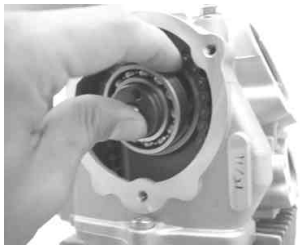
○Tighten the side bolt on the cylinder side and the cap screws on the cylinder head side to the specified torque.
⚠CAUTION : Be sure to tighten to the specified torque.
T : 12N • m (1.2kgf • m)

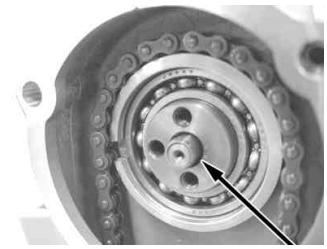
○ Tighten a cam chain guide roller of the cylinder to the specified torque.
⚠CAUTION : Be sure to tighten to the specified torque.
T : 10N • m (1.0kgf • m)

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



○ 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.

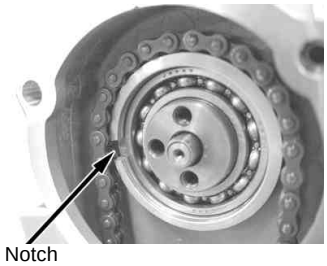




Dowel pin 8 x 12

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

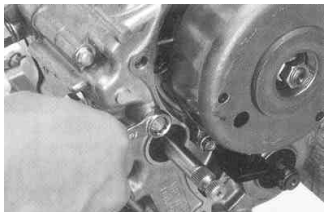
○ Fix a cam shaft circlip of the kit, and fix the cam shaft.
At this stage, set the location of ring end gap of the circlip not to meet the notch on the cylinder head cam hole.



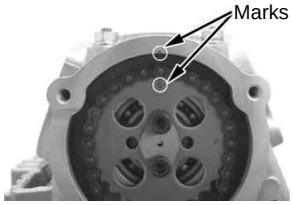
Notch

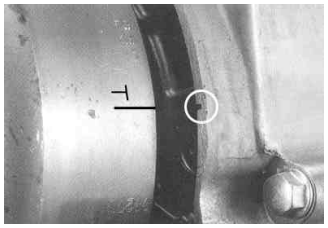
○Check that the circlip is right in the circlip groove.
⚠Warning : Do the checking without fail.

○Remove the side bolt on the cam chain tensioner.



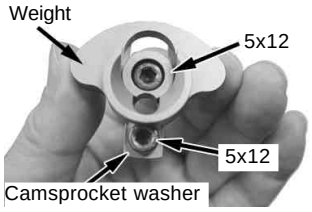
○ Attach the cam chain to the cam sprocket, and fix them with a cam sprocket plate and two 5x12 (black) cap screws included in the kit.
(At this point, apply Alumi Special a little to the threaded parts of the cap screws.)
Then align the "T" mark on the flywheel with the alignment mark on the crank case,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



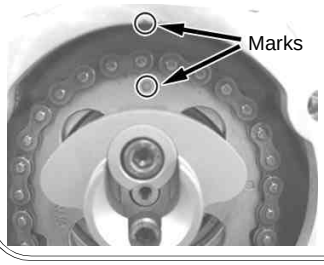


●In case you install an automatic decompression cam shaft:

○ Set a camsprocket washer through a weight, and set two black 5x12 cap screws into upper and lower holes.

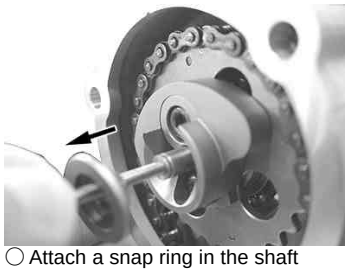


○ Attach the camchain to the cam sprocket. And place the weight to face the "O" mark and install it with two black 5x12 cap screws.
(At this time, apply a thin coat of Alumi Special, the heat-resistant lubricating agent, to the thread of the cap screw.) Then, align the "T" mark on the flywheel with the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

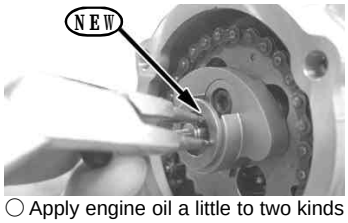


○ Holding the crank, tighten the cap screws, which are attached to fix the cam sprocket, to the specified torque.
⚠CAUTION: Be sure to tighten to the specified torque.
T : 10N • m (1.0kgf • m)

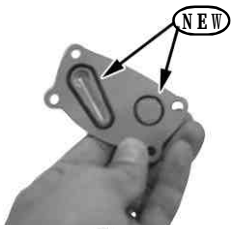
○ Check that the "T" mark on the flywheel is still aligned with the "O" mark on the cam sprocket.
○ Pass a 6mm snap ring and a plate into a hand screw supplied in the Camshaft Kit, attach it to the shaft tip of the camshaft comp. and pull the shaft toward you.

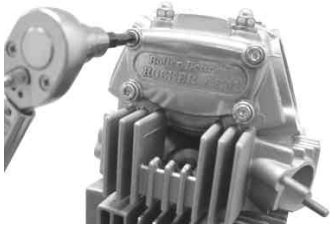


○ Attach a snap ring in the shaft groove.
⚠NOTE : Do not expant the snap ring more than necessary.
⚠WARNING : Always use a new snap ring at any time, and do not reuse it.



○ 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)

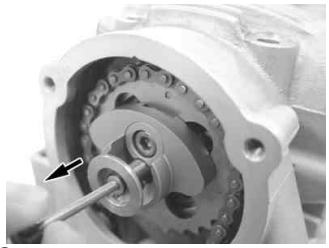




○ Check that the "T" mark on the flywheel is aligning with an alignment mark on the crankcase.
○ Adjust the valve clearance with an adjust screw.
IN : 0.05 ～ 0.08 (when cold)
OUT : 0.05 ～ 0.08 (when cold)

●In case you install an automatic decompression cam shaft:

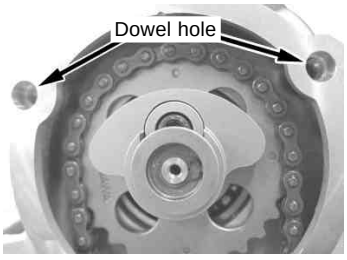
○ Adjust the valve clearance on the EX side with the shaft of the camshaft being pulled toward you so that the decompression function can be deactivated.



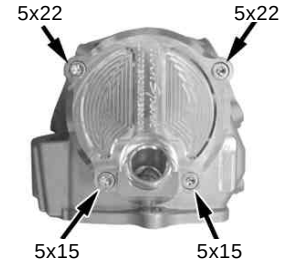
○ Tighten the adjusting nut to the specified torque.
⚠CAUTION: Be sure to tighten to the specified torque.
T : 10N • m (1.0kgf • m)

○ Unfasten the hand screw.

○ Insert the supplied 7x10 dowel pin into a dowel hole on the mounting portion of a cylinder head left side cover.

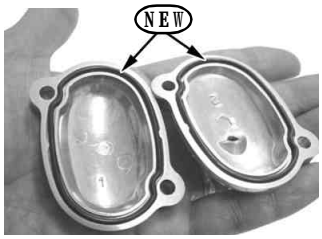


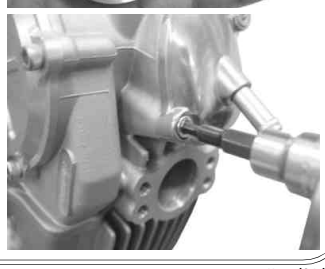
○ Apply engine oil a little to a left-side-cover O-ring of the kit, and fix it to the left side cover. Then fix them to the cylinder head with two 5x15 cap screws and with two 5x22 cap screw of the kit and tighten them to the specified torque. (Be careful of the location of screws.)
⚠CAUTION: Screws 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 M5x15 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)

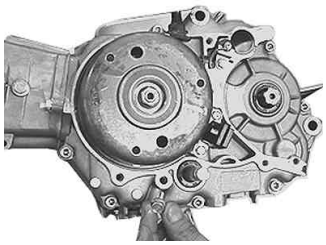




○Pour engine oil from the side bolt hole in the cam chain tensioner, and tighten the side bolt.

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

T : 8N • m (0.8kgf • m)



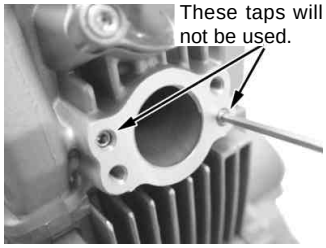
○ With reference to the service manual, mount the engine on the frame.

⚠CAUTION: Be sure to follow the instructions in the manual.

○ Install socket cap screws of the kit to two taps on the cylinder head ports which will not be used for manifold installation, and tighten them to the specified torque.

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

T : 5N • m (0.5kgf • m)

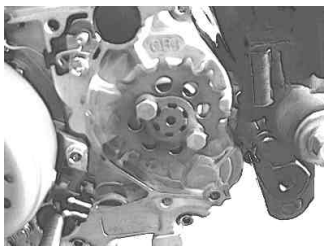


○ Following the instruction manual for the relative carburetor, install the carburetor.

○ Install the drive sprocket.

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

T : 12N • m (1.2kgf • m)



○ Install the generator cover.

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

T : 7 〜 11N • m

(0.7 〜 1.1kgf • m)

○ Add engine oil in amount specified by the clutch kit you use.

○ With reference to the service manual, attach the drive chain.

☆ In the case of a three-point support crank shaft (3B) kit, fix a generator cover according to crank-kit installation instructions.

○ In case you use a breather cap, fix a breather hose according to oil-catch-tank installation instructions.

∴ In case you use a breather cap, fix a breather hose according to oil-catch-tank installation instructions.

• Item No. for a blade hose set (1 m, with clips)
: 000-03-054

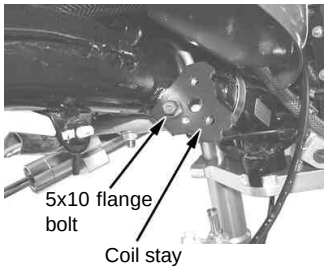
How to install an ignition coil:

○Separate a cord from the ignition coil on the vehicle, and detach the ignition coil from the frame.

○Fix the ignition coil stay to the frame with a 5x10 flange bolt, and tighten the bolt to the specified torque.

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

T : 8N • m (0.8kgf • m)

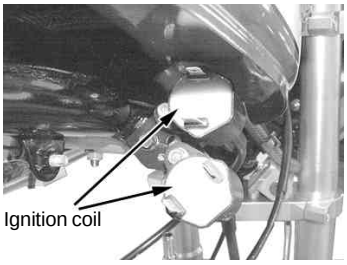


○ Fasten the provided ignition coil above the detached ignition coil, and fasten the detached ignition coil below the provided ignition coil, with a 5x22 flange bolt which please tighten to the specified torque.

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

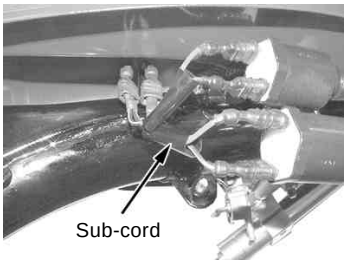
T : 8N • m (0.8kgf • m)

※ If the space between the upper ignition coil and fuel tank is small, secure the sufficient space by bending the ignition coil stay.



○Connect the sub-cord of the ignition coil to both wire harness and ignition coil.

※ Connect the coil-cord of the wire harness from above the frame pipe.



○Cut the high-tension cord of the just-connected ignition coil to the proper length, and screw in the spark plug cap.
Fix the plug cap with a 100mm insulation lock.

※Fix the plug cap so it is in the proper position when it is installed onto the spark plug.

※ Please cut off the excess portion of the insulation lock.

☆ Engine Starting ☆

○ Check that the ignition key and the fuel cock are turned OFF.

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

○ Install the spark plug at the original lace.
Apply Alumi Special a little to the threaded part of the plug, and fix it.

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

Designated plug

NGK : CR8HSA
Thermal value

DENSO : **U24FSR－U**
Thermal value

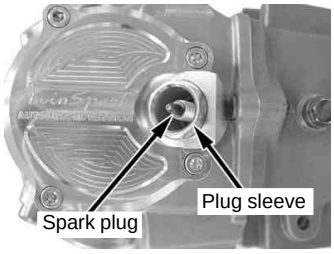
○Attach the O-ring to the spark plug sleeve. Set the spark plug so the hex portion of the spark plug aligns with the sleeves on the plug sleeve. And lightly apply the Alumi Special to the threaded portion on the plug. Slightly apply engine oil to the O-ring, and screw in the plug sleeve to the side cover of the left cylinder head. And tighten the plug sleeve to the specified torque.

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

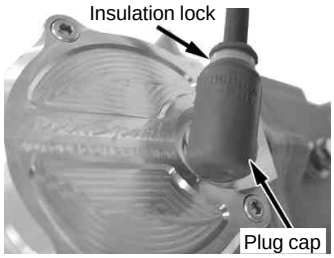
T : 10N • m (1.0kgf • m)

※ The spark plug may be twisted apart if tightened to the excessive torque.

※ Install the plug sleeve plug by screwing in the plug pulling up the sleeve, being careful that the plug is right on the groove. And also be careful that the O-ring does not get jammed.



○Fit the plug cap into the plug sleeve until the cap comes to a halt.



○ Attach the plug cap to the spark plug.

○ Wipe off the dirt and dust on the engine.

○Turn ON the fuel cock and ignition key, and start the engine.

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

○ 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.

⚠ 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	4.47mm	Replace
(exhaust)	4.460～4.475mm	4.45mm	Replace
Clearance between a valve stem and a guide (intake)	0.01～0.037mm	0.09mm	Replace the guide or the head
(exhaust)	0.025～0.052mm	0.12mm	Replace the guide or the head
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.)

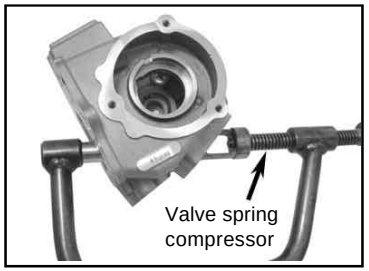
☆Never apply this to any parts other than the specified parts.

●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

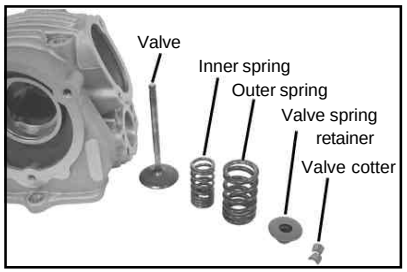
Use a magnet to remove the cotter if it does not come off easily.

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

・Valve spring retainer

・Valve spring (Inner & Outer)

・Valve



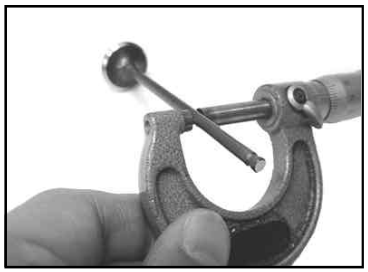
⚠NOTE : If the valve is damaged at its end, do not remove it forcibly, but rectify the end first before removing it.

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 : 4.47 mm
EX: 4.45 mm

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

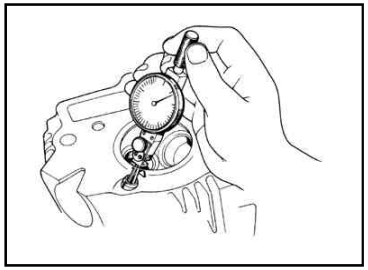


Inspection of the Valve Guide.

・Measure the inner diameter of the valve guide.

Service Limit IN : 4.56 mm
EX: 4.57 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

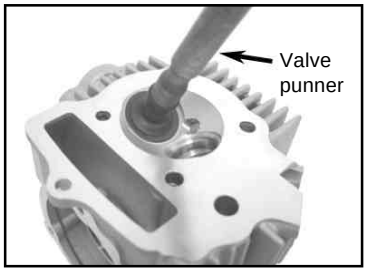
Inspection of Valve Seat

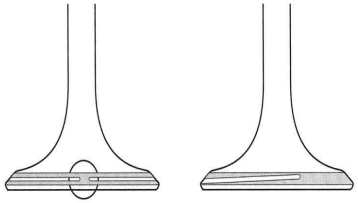
・Remove carbon sediment in the cylinder head combustion chamber and valve.

・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.

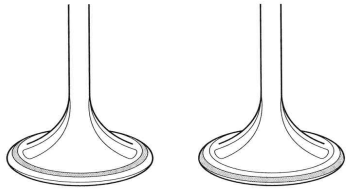
・Wipe off the red lead primer on the valve faces, and strike the valves once and lightly with the valve punner without rotating them, and check the contact surfaces for damages or scratches.





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:

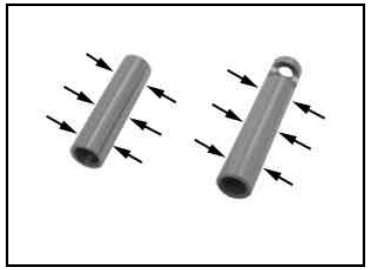
- Check the rocker arms for scratches, damages and jamming. And check if the bearing rotates smoothly.
- Measure the internal diameter of the rocker arms.
- Unfasten an adjust bolt, and check it for scratches. If it is scratched, change it with a new one.

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.

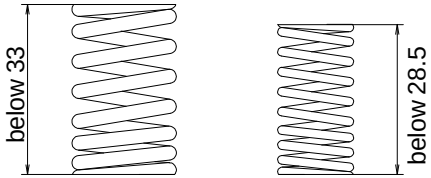
Inspection of Valve Spring Retainer

- 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

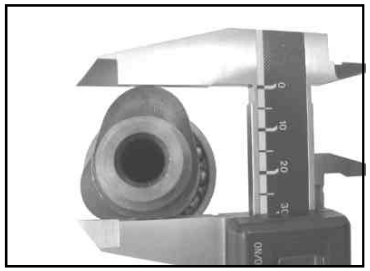
- Check the valve springs for scratches and damages.
- Measure the free length of the valve springs.

∴ Outer : If the length is below 33, replace them.
Inner : If the length is below 28.5, replace them.



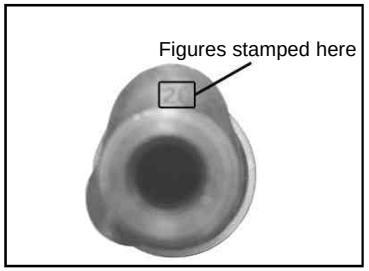
Inspection of Camshaft

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



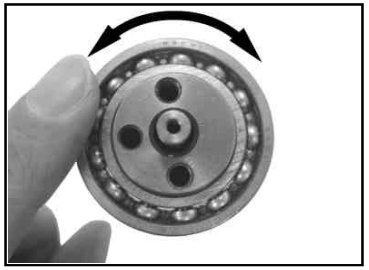
Kinds of Camshafts	IN	EX	
S-12	Below 28.8	Below 28.8	Replace
S-15	Below 28.8	Below 28.8	Replace
S-20	Below 29.0	Below 28.8	Replace
S-25	Below 29.1	Below 28.8	Replace
S-30	Below 29.43	Below 29.03	Replace
S-35	Below 29.43	Below 29.03	Replace

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



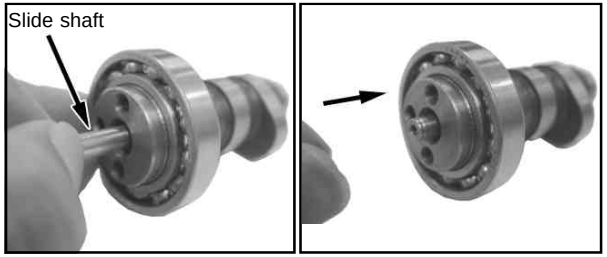
Inspection of the Camshaft Bearing

• 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.

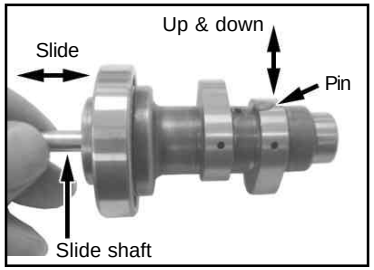


• In the case of automatic decompression camshaft:

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.

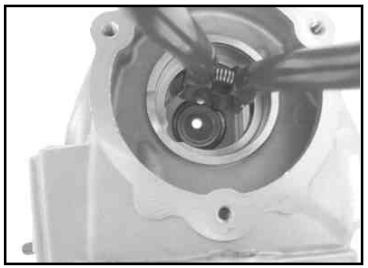


• Slide the slide shaft, and check if the decompression pin moves up and down on the EX side cam. If the pin does not move up and down when you slide the shaft, or the shaft does not slide because it has become stuck, then change the cam shaft.

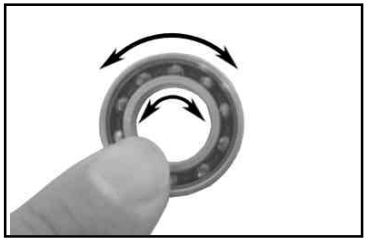


Inspection of the bearing

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

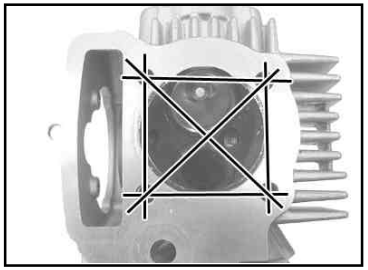


• Rotate the bearing race with fingers. If it does not rotate smoothly or if it is rickety, replace the bearing.



Inspection of Cylinder Head

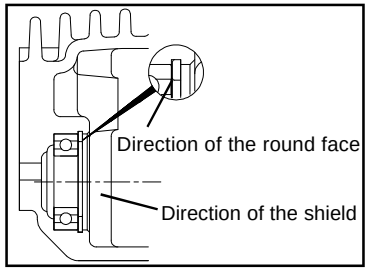
• Check the spark plug hole and valve hole for the cracks in the vicinity. Check the cylinder head for distortion with a straight edge and thickness gauge.



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

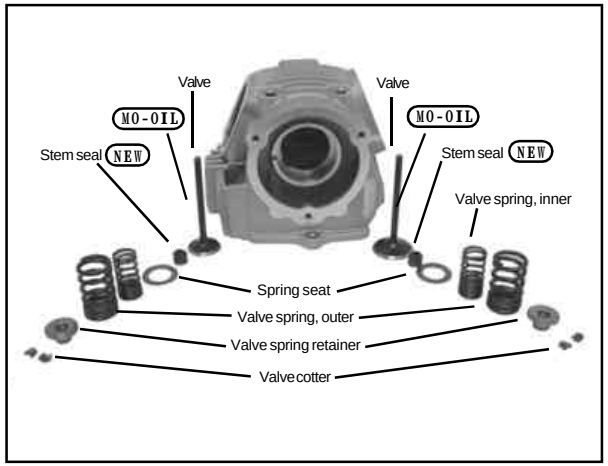
Installation of Bearing

- 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.



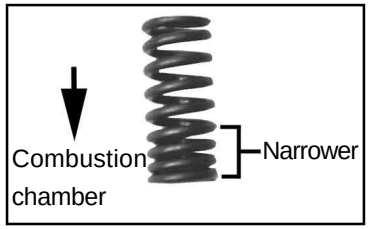
●Valve Assembly:

- 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.



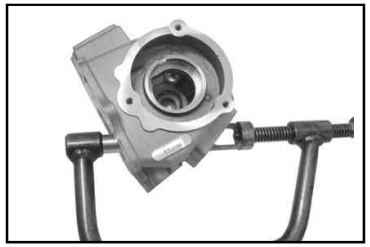
- To the head, attach the valve spring, with a narrowly-pitch side pointing to the combustion chamber.

⚠ 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.

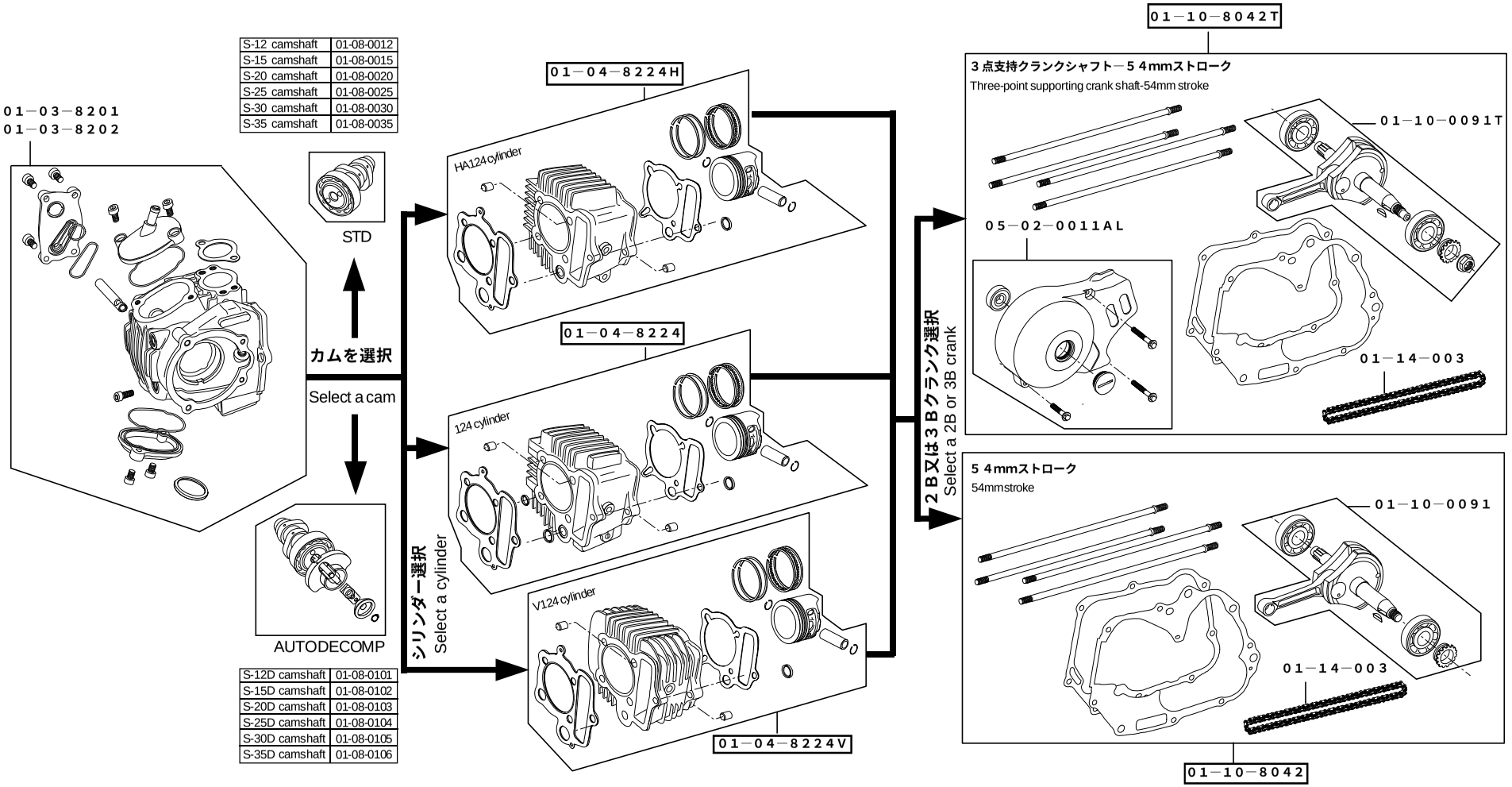


- Strike lightly the end of valve stems a few times so the valves and cotters fit together well.

⚠ CAUTION : Be careful not to damage the valves.

May./13/ 08

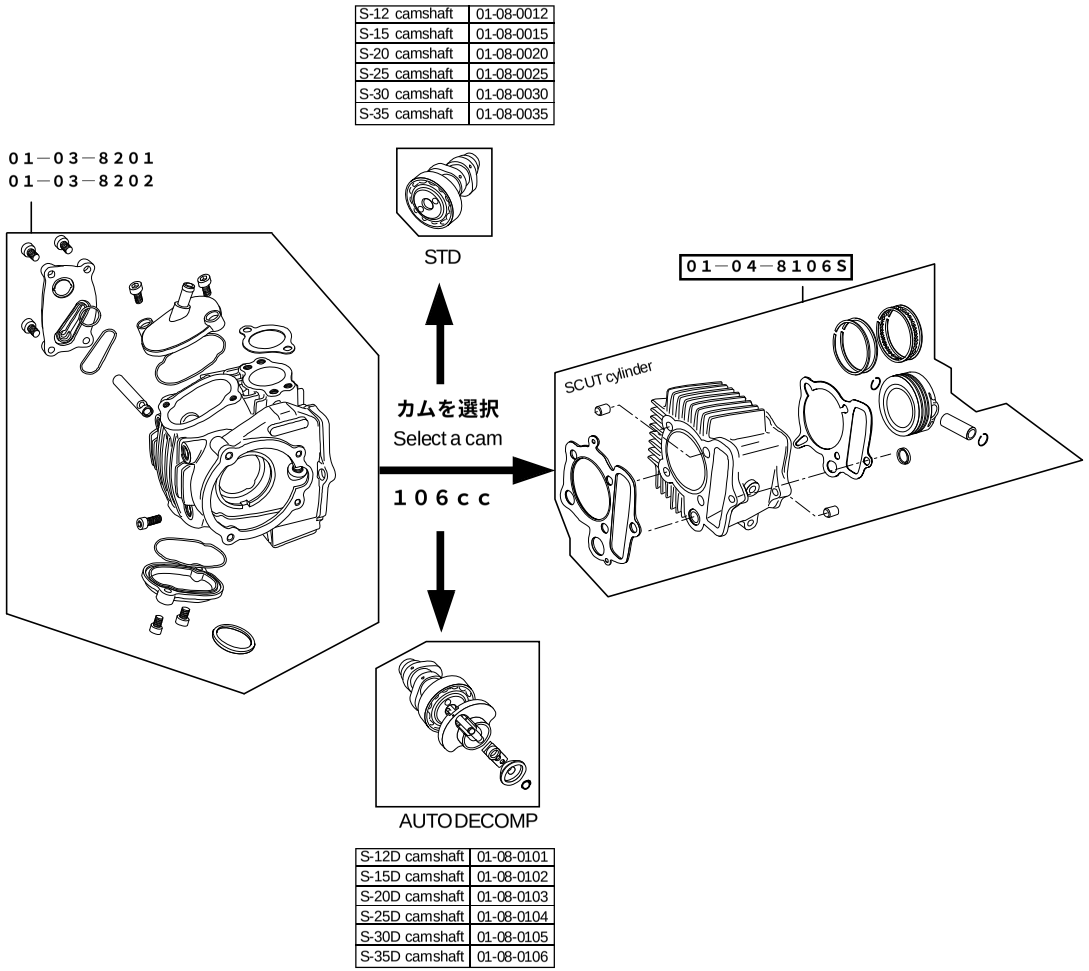
Super head +R ボア＆ストロークアップ参照表（１２４ｃｃ）
Reference data on bore- & stroke-up kit (124cc)



☆０１－０３－８２０１・０１－０３－８２０２シリンダーヘッドキットのみで購入された場合、この参照表にて専用パーツを検討して下さい。

If you have purchased a cylinder head kit only (Item No. 01-03-8201 • 01-03-8202), please study to install these special parts referring to this reference data.

Super head +R ボアアップ参照表（１０６ｃｃ）
Reference data on bore- up kit (106cc)



☆０１－０３－８２０１・０１－０３－８２０２シリンダーヘッドキットのみで購入された場合、この参照表にて専用パーツを検討して下さい。

If you have purchased a cylinder head kit only (Item No. 01-03-8201・01-03-8202), please study to install these special parts referring to this reference data.