



Instruction Manual for High-Compression Forged Piston Kit (67)

Item No. : 0 1 - 0 2 - 0 9 1 9
Applicable to : CRF150F (Up to '05 models)

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

~ Features ~

This piston kit is to bore up a stock cylinder by a boring process, using a stock cylinder head. Besides, this kit can be used as repair parts for our product Item No. 01-05-0101.

A 67mm forged piston in this kit enlarges the displacement volume from 156.8cc to 174.5cc, and the specially designed shape of the piston top increases the compression ratio to 11.5:1.

If used together with out TAKEGAWA's MIKUNI VM26 carburetor kit and / or a cam shaft, your motorcycle will be rendered more powerful.

~ For Proper Use and Safety's Sake ~

! Caution about fuel to use !

This product is so designed to achieve a higher compression ratio than stock engines. As for the fuel, high-octane gasoline should always be used. In case regular gasoline is used, abnormal 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 a motorcycle. Before installing, 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 a spark plug !

Be sure to replace a spark plug with a hot type spark plug DPR9EA-9 (NGK) or the one with a higher thermal value. Subsequently, choose and use a right spark plug with the right level, depending on the degree of burning of the spark plug electrode section.

- 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 responsibility or compensation whatsoever for any glitch in parts other than ours if the glitch takes place after installation and use of this product.
- If you make alterations to the product outside our factory, we shall be held free from any guarantee of the product.
- You are kindly requested not to contact us about the combination of our products with other manufacturers'.
- This product is designed for exclusive use in the above-mentioned type of motorcycle only. Please take note that this product cannot be mounted on other types of motorcycles.
- Installation of this product requires engine removal and mounting. Please prepare and refer to a HONDA genuine parts service manual in order to perform installation work properly.
- Prepare right tools for the work, and do the work following the installation procedures. Besides, this instruction manual, as well as a HONDA genuine parts service manual, is prepared for persons who have acquired basic skills and knowledge in tuning. We recommend those who are technically inexperienced or without enough tools to contact a technically reliable specialist shop for the work.
- Carry out shakedown without fail.
- The installation of this product increases the heat release value of the engine, caused by the increase in power. Therefore, this is inadequate for the long-time high-load driving.
- Bolts, nuts, and dowel pins will be reused. However, be sure to replace worn-down or severely-damaged ones with new ones.
- Installation of this kit requires boring processing of a stock cylinder. Please contact a technically reliable specialist shop handling internal combustion on a motorcycle specialist shop nearby, or contact us direct.

! CAUTION

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

- Work only when the engine and the muffler are cool. (Otherwise, you will burn yourself.)
- 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.)
- Always replace a damaged or worn-down sealing washer, gasket or O-ring with a new one. (Otherwise, oil will leak, causing a trouble.)
- As some products and frames have sharp-pointed or protruding portions, please work with your hands protected. (Otherwise, you will suffer injuries.)
- 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.)
- Before doing work, place the motorcycle on level ground to stabilize the position of your motorcycle for safety's sake. (Otherwise, your motorcycle could fall down and injure you while you are working.)

! WARNINGS

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

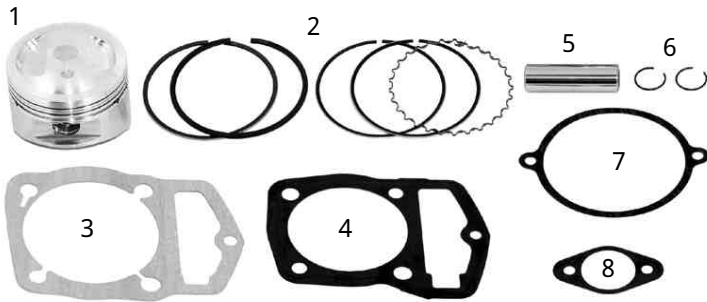
- Always drive the engine in a well-ventilated place, and do not switch the engine on in an airtight place. (Otherwise, you will suffer from carbon monoxide poisoning.)
- When you notice something abnormal with your motorcycle while riding down a road, stop riding immediately and park your motorcycle in a safe place. (Otherwise, the abnormality could lead to an accident.)

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

A defective product which we acknowledge is caused by product materials or defect in manufacturing will be repaired or replaced with a new one, if and when a claim is filed with us within one (1) month of your purchase. However, replacing of parts shall be made at users' expenses. And we shall be held free from responsibility for any defect caused by improper installation or use.

You are requested to keep this instruction manual until you discard this product.

~ Kit Contents ~



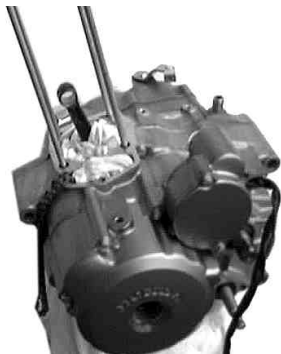
No.	Parts Name	Qty
1	Piston	1
2	Piston ring set	1
3	Cylinder head gasket	1
4	Cylinder gasket	1
5	Wrist pin	1
6	Wrist pin circlips	2
7	Cam sprocket cover base gasket	1
8	Tensioner lifter gasket	1

~ Installation Procedures ~

○ The replacement of a cylinder and piston requires the removal of the engine from a motorcycle body.

At the time of engine installation and removal, stabilize the vehicle securely with a maintenance stand or the like for safety's sake.

- With reference to the service manual, remove the engine from the body. Then remove a cylinder head, a starter motor, a cylinder and a piston. Brush up and clean the fitting plane for a cylinder in the crank case, and the fitting planes for a cylinder and cylinder head with a scraper or the like.
- Do boring processing on the cylinder. Set the piston clearance at 4/100 ~ 6/100.



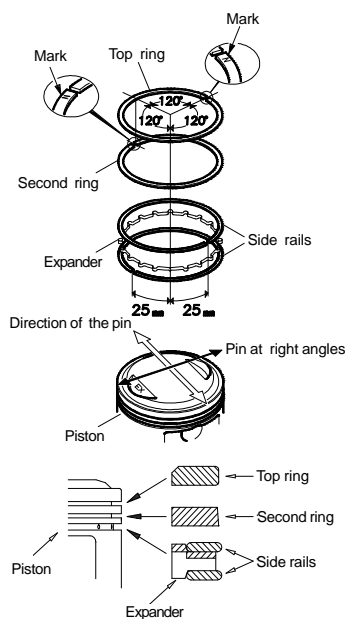
- Install piston rings to the piston. On the one surfaces of the tope ring and the second ring, there is an inscribed letter for each. Install them as the letters face up referring to the figure below. Sides do not matter for side rails.
- Be careful not to give scratches to the piston or to damage the rings.



- Set the "EX" mark at the top of the piston to face the exhaust side. And apply engine oil to the wrist pin, pin hole in the piston, and crank shaft tip. Then fix a wrist pin. Fix the kit's wrist pin clips; do not let their end gaps meet with the notches on the wrist pin holes.

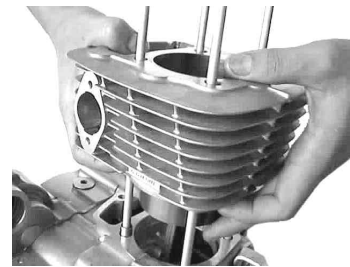


- Apply engine oil to the piston rings, and check that the rings rotate smoothly. Every piston ring end gap must not be placed in the same direction as the wrist pin or at right angles to the wrist pin, and space the ring end gaps 120 degrees apart. (See the figure on the right.)

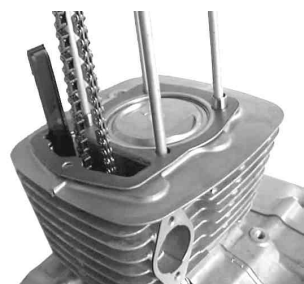


Cross section diagram

- Degrease the cylinder-fitting plane on the crank case, and fix dowel pins and a kit's cylinder gasket. Apply engine oil to the entire inner side of the cylinder, and install the cylinder while compressing the piston rings with fingers.

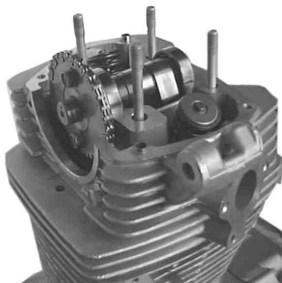


- Degrease cylinder's mating surface, and attach a chain guide, dowel pins, and kit's cylinder head gasket, and then install the cylinder head. Attach washers, and install and tighten cylinder head bolts to the specified torque of **10N · m (1.0kgf · m)**.

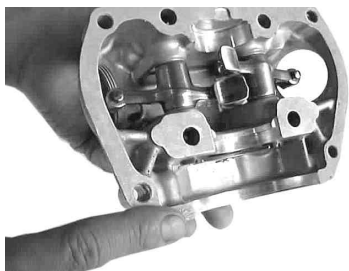


- Remove a crank shaft hole cap and timing hole cap. Rotate the crank shaft counterclockwise and set a "T" mark on the flywheel, which can be seen through the timing hole cap, at an alignment mark, and check that it is at compression top dead center.

- 8 . Apply engine oil to the bearings of the camshaft, and fix the camshaft to the cylinderhead with the cam top facing downward. After attaching the cam chain to the cam sprocket, align the mark-off lines on the cam sprocket with the mating surface of the cylinder head cover, and tighten cam sprocket bolts to the specified torque of **12N · m (1.2kgf · m)**.



- 9 . Attach dowel pins and an oil hole plug to the cylinder head, apply liquid gasket to the mating surface of the cylinder head cover, and install it to the cylinder head.



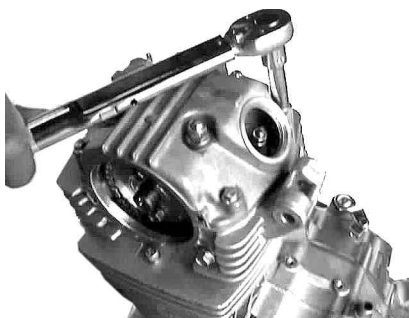
- 10 . Apply engine oil to the threaded part and seating face of cylinder head cover nuts. And attach new 8mm sealing washers, and tighten them. Attach cylinder head cover bolts and washers, and fix cylinder head bolts.

Tighten the following parts to the following specified torque:

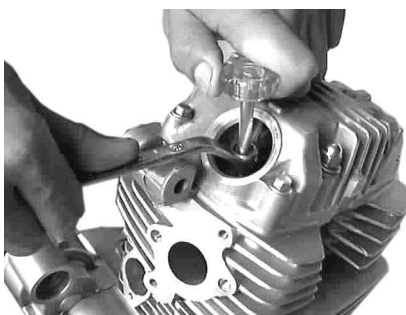
Cylinder head side cover nuts
: **27N · m (2.8kgf · m)**

Cylinder head cover bolts
: **12N · m (1.2kgf · m)**

Tighten cylinder head cover nuts first. Tighten cylinder head cover nuts and cylinder head cover bolts diagonally in a few steps.



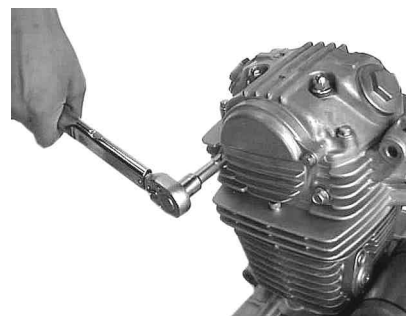
- 11 . Set a "T" mark on the flywheel, which can be seen through the timing hole cap, at an alignment mark, and check that it is at compression top dead center. Insert a thickness gauge between the valve adjust screw and the valve stem to set the valve clearance at 0.10 mm at both intake and exhaust sides. Then holding the adjust screw, tighten the lock nut to the specified torque, **14N · m (1.4kgf · m)**. Check the tappet hole cap for the damage on the O-ring and check how the cap is fixed, and apply engine oil to the O-ring. Then, tighten the tappet hole cap, crank shaft hole cap, and the timing hole cap to the specified torque of **15N · m (1.5kgf · m)**, **8N · m (0.8kgf · m)** and **10N · m (1.0kgf · m)**, respectively.



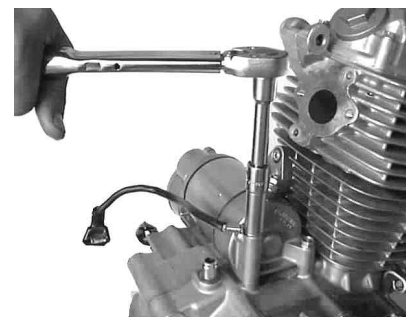
- 12 . After removing a sealing screw and an O-ring on the cam chain tensioner, turn it clockwise with a screwdriver. Then place a new gasket with the tensioner rod being pulled in, and fit the tensioner into the cylinder. Tighten a cam chain tensioner socket bolt together with an attached sealing washer to the specified torque of **12N · m (1.2kgf · m)**. Then install and tighten a cam chain tensioner ring screw together with an attached O-ring to the specified torque of **4N · m (0.4kgf · m)**.



- 13 . Check the condition of an O-ring of the cam sprocket cover, and fix it together with a kit's cam sprocket base gasket. Install the cam sprocket cover on the cylinder head and tighten bolts to the specified torque **10N · m (1.0kgf · m)**.



- 14 . Check the condition of an O-ring of the starter motor, apply engine oil to the O-ring, and fix it. Temporarily fix the starter motor with a bolt. As an earth cable will be tightened with this bolt together with the said starter motor, so fully tighten the bolt when you mount the engine to the body. Apply engine oil to the starter reduction gear and the sliding surface of the gear shaft, and install them. Then check the condition of the O-ring, install a starter reduction gear cover coated with engine oil, and tighten the bolt to the specified torque of **10N · m (1.0kgf · m)**.



- 15 . With reference to the service manual, mount the engine to the body. Start the engine in a safe place with great care, and check that there is no abnormal sound from the engine.

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