

Engine Complete KIT : Spec.SUPER HEAD + R

(146 cc)

SUPER HEAD + R -146

6-Speed

SPL- Clutch

Titanium valve spring retainer & Adjusting nut (O / P)

Item No. : 0 1 0 0 9 0 0 6

Compatible models

Ape100 : HC07-1000001 ~

: HC13-1000001 ~

XR100 Motard : HD13-1000001 ~

Thank you for purchasing our Complete Engine.

This engine is one of our Engine Complete Series which we have designed and produced by using with years of our experienced product development and manufacturing know-how.

We are proud of that we guarantee customer satisfaction with such a lightweight and high power engine.

Before installing and using this product, please check the contents of the kit, read this installation instructions carefully and understand them completely.

Important Notice

- 1 . Please Note: Illustrations and photos may vary from actual hardware.
- 2 . The service and repair information contained in this manual is intended for use by qualified, professional technicians. Any person who does not have sufficient technique, knowledge, proper tools and equipment will never work. Be sure to ask specialty shops or professional mechanics.
Poor technique and lack of knowledge may cause the maintenance problems or damage parts.
- 3 . This product is intended for use ONLY in closed racing course. Never use this product on public roads.
- 4 . This kit is compatible with the above mentioned compatible models ONLY. Note: Do Not use this product for other models than listed above.
- 5 . Please note that mainly because of improvement in performance, design change, and cost increase, the product specifications and prices are subject to change without prior notice. We shall be held free and harmless from any and all liabilities or claims for any defects of the parts / the product after installation, and use, and/or any other products/parts.
- 6 . We do NOT accept any claims due to the parts for racing use only. Except, any requests for the return or repair of goods purchased from TAKEGAWA must be made within one month of receipt of goods against defects in workmanship and/or materials originally caused by ONLY our failure. No returns or repairs will be accepted after one month. However, we DO NOT accept our products which are NOT installed in the right way and/or DO NOT used properly.
We are not responsible for any expenses for repair or replacements.
NOTE: When you use for racing, we shall be held free and harmless from any and all claims.
- 7 . These instructions should be retained along with this product.
- 8 . This complete engine uses optional titanium valve spring retainer on the head. It is approx 30% lighter than conventional steel retainer. However it is less durable than the steel. Require maintenance more frequently.

Read all instructions first before starting the installation.

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

While working on this product, be sure to proceed with the proper work in accordance with the instructions.

Be sure to prepare the genuine service manual of the compatible models and work as instructed. The service and repair information contained in this installation instructions and the genuine service manual are intended for use by qualified, professional technicians.

Be sure that any person who attempts service or repairs without the proper experiences, tools and equipment ask specialty shops or professional mechanics.


We shall be held free and harmless from any and all liabilities or claims for any defects of the parts/the product after installation, and use, and/or any other products/parts.

Do not use other manufacture's ignition parts, or it will cause the failure.

The necessary parts for this kit should be all TAKEGAWA-recommended parts. Always use our recommended parts.

Use TAKEGAWA-recommended fuel and engine oil.

Do not keep engine running in idle position for long period of time. It exceeds engine temperature, which cause the damage of the engine.

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

- This Kit is designed for closed course competition purposes only. So please do not drive on a public road after the installation of this Kit.
- Before starting the installation, make sure the engine and muffler are cool at below 35 degrees Celsius. (Otherwise, you will burn you.)
- Prepare right tools for the work. (Otherwise, the installation with improper tools could cause breakage of parts or injuries to you.)
- As some products and frames have sharp edges or protruding portions, please work with your hands protected. (Otherwise, you will suffer injuries.)
- Always use new gaskets, seals and the like. The continued use of the worn or damaged ones will cause engine trouble.

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

- Those who are technically unskilled or inexperienced are required not to do the work. (Improper installation because of insufficient skill or knowledge could lead to parts breakage and subsequently to accidents.)
- Before doing work, place the motorcycle on level ground to secure your motorcycle 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 on the engine 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. (Otherwise it may cause a fire.)
- Tighten to a specified torque using a torque wrench. (Otherwise, improper tightening may cause the bolts or nuts to get damaged or come off, leading to accidents.)
- 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 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.)
- When you notice something abnormal 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.)
- Carry out inspection and maintenance of your motorcycle correctly according to the instructions and guidelines in the service manuals. (Use TAKEGAWA-recommended fuel and engine oil.)
- Fuel must always be high-octane gasoline. (Otherwise, troubles such as engine knocking may cause accidents.)
- When driving a bike, a driver must always wear a helmet securely. Otherwise, the driver is likely to be subject to death or serious injury in an accident.

Features

Use of Roller Rocker Arm:

We have used roller bearings in the slipper instead of a conventional slipper type rocker arm. The use of the roller bearings helps to reduce friction and makes possible the smooth and constant tight grip on a cam profile at all revolutions from low-speed to high-speed.

Besides, the increased weight through the use of roller bearings is counterbalanced through the use of an aluminum-forged rocker arm.

Consequently, the higher power output and sustainability on high power have been realized.

Use of Big Valve:

Valve diameter Intake : 28.5mm / Exhaust : 23.5mm which generates great horsepower with large valve and best valve angle brings high combustion efficiency.

3 Kinds of Option Cam:

Camshafts are available in three types - SR-25 / SR-30 / SR-35. You can change the camshaft to suit for your purpose and riding style such as street and dirt.

The hollow camshaft

The oil passage at the center of camshaft leads oil to cam sprocket. Then the oil from the center of cam sprocket will be injected to lube the cam chain by spinning force. Also, camshaft has oil jet outlets. Oil will be injected from cam surfaces on the way to cam sprocket so that the cooling and lubrication will be achieved effectively.

Use of Plated Cylinder:

The cylinders are made from all aluminum ceramic plated cylinders with large fin with forged piston, which are super in durability, gas-tightness and heat transfer.

Use of Oil Jet:

The cylinder has oil jet. It injects the oil from cylinder sleeve to inside wall of cylinder, behind the piston and the small end of connecting rod directly; the lubrication and cooling of engine will work efficiently.

Use of Wet Multiple-Disk Clutch:

The 6 disc's Heavy-duty Clutch kits to avoid clutch slipping caused by high-powered engine. This clutch cover has oil outlets to oil cooler and optional Thermo unit can be installed on the clutch cover. (Patented)

Use of close ratio transmission:

Standard equipped special 6 speed close ratio transmission can transfer the high-power to the road in any condition the turns and straightway.

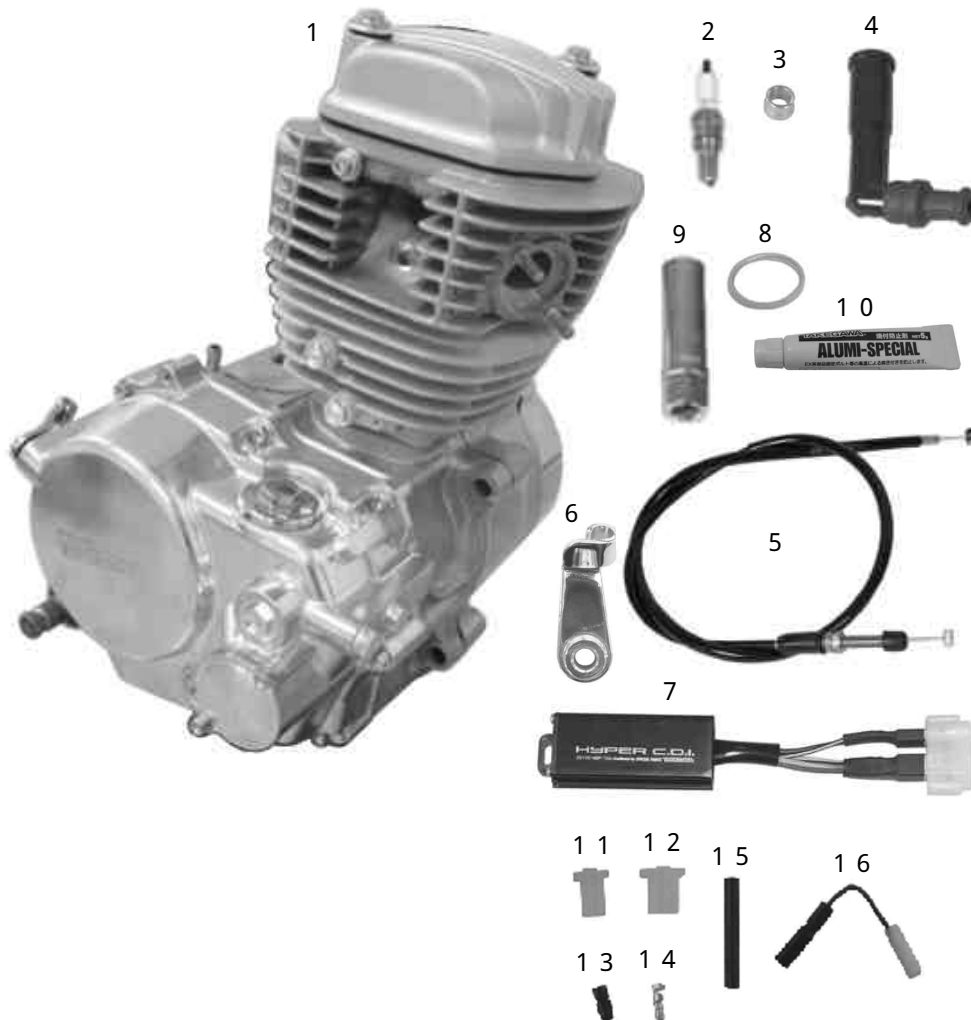
Use of Lightweight Outer Rotor ACG

SS outer rotor also equipped as standard. It is narrowed about 80%(110mm 88mm) and weight-reduced about 50% (1065g 536g) to leave inertia force. You can also change the ignition timing by rotate base plate. Adjustable range : BTDC 27-43, (50cc stock/27,100cc stock/30)

Optional parts: Adoption of the titanium valve spring retainers and adjustment nut

Adopted the titanium alloy valve spring retainers and titanium alloy tappet adjustment nut. 30% more lighter weight than that steel valves, activates valve accurate at high rpm range. Further, the surface of the valve spring retainers are subjected to special treatment, and abrasion resistance has been improved.

~ Kit contains ~



No.	Part Name	Qty	Repair Part Item No.	In packs of
1	Engine COMP.	1	_____	
2	Spark plug, ER8EH	1	NGK-ER8EH	1
3	Plug sleeve	1	12351-KN4-T10	1
4	Spark plug cap	1	30700-DSM-t00	1
5	Clutch cable COMP., 900 mm	1	00-02-0158	1
6	Clutch cable receiver	1	50135-GN1-T00	1
7	Hyper CDI	1	05-03-0005	1
8	Exhaust pipe gasket	1	00-01-0027	2
9	Plug socket, 13 mm	1	00-00-0247	1
10	Alumi special (5 g)	1	00-01-0001	1
11	Copular (2pin /male)	1	00-00-0345	3
12	Copular (3pin/male)	1	00-00-0346	3
13	Sleeve	1	00-00-0347	5
14	Plug	1	00-00-0348	5
15	Shrink tube	1	00-00-0349	3
16	Stator wiring	1	32100-KTK-T00	1

Please order repair parts with the Repair Part Item No. Without the repair part item NO., we may not be able to accept your orders.

Some parts are only available as a set. In this case, please order them with the set number.

Main Reference Value

Type	4-cycle gasoline
Displacement	146.3cc
Number of cylinder and arrangement	Vertical single cylinder
Cooling method	Air-cooling
Valve train	Chain drive and SOHC
Chamber design	Dome
Bore and Stroke	62mm x 48.5mm
Compression ratio	13.4 : 1
Camshaft type	SR-30
Valve timing:	(1mm lift)
Intake open	30 ° BTDC
closed	60 ° ABDC
Exhaust open	55 ° BBDC
closed	25 ° ATDC
Lubricating method	Combined use of force feed system & splash lubrication system
Pump type	Trochoid type
Capacity	1.01 liter
Fuel to be used	High-octane gasoline (research method: over 97 octane value)
Ignition system	CDI ignition
Spark plug	NGK-ER8EH
Starting method	Primary kickstarter system
Power transmission	
Clutch	Wet multi-disk
Operating mode	Mechanical
Transmission	
Type	Constant mesh, 6-speed return
Gear ratio	
1st speed	2.642 (14 / 37)
2nd speed	2.000 (17 / 34)
3rd speed	1.631 (19 / 31)
4th speed	1.380 (21 / 29)
5th speed	1.173 (23 / 27)
6th speed	1.040 (25 / 26)
rear-wheel-drive mechanism	
Type	Chain drive

Inspect and Adjust

Items	Frequency	Refer to page
Clean and Inspect Spark Plug	Every 200km	P-C1
Inspect Valve Clearance	Every 500 ~ 600km	P-C2,C3
Change Engine Oil	Every 1000 ~ 2000km	P-C1
Adjust and Inspect Carburetor	Each time	Depend on Carburetor type
Replace Oil Filter	Every 1500 ~ 2000km	P-C2
Adjust Clutch Cable	Every 250km	P-C2
Inspect Clutch Friction Disc	Every 1000km	See Service Manual
Inspect Piston and Piston Ring	Every 1000km	See Service Manual
Inspect Piston Pin	Every 2000km	See Service Manual
Inspect Crankshaft	Every 1000km	See Service Manual
Inspect Cylinder Head and Cylinder	Every 2500km	See Service Manual
Inspect Crankcase	Every 2000km	See Service Manual

Maintenance period in the table is a guideline. You might need to work more frequently depending on the motorcycle usage or condition.

We recommend more frequently maintenance than the maintenance period.

~ Precautions of Use ~

About the specifications of motorcycle to equip

Carburetor mount of this engine kit designed differ than that stock engine. You need to have our carburetor kit for this engine. Please refer optional parts list (page D)

Compatible Specifications Data Chart		
Carburetor	Stock (Inapplicable) × Need to modified	Takawaga 's Keihin PE28 (See P-D)
Exhaust system	Stock (Inapplicable) × Need to modified	Need modified exhaust. (See P-D)
Oil catch tank	Need to Install	Equipped as necessary (See P-D)
Oil cooler	—————→	We recommend to use it according to the heat increase. (See P-D)
Drive / Driven sprocket	Stock (Inapplicable) × Spec Modification	Final Gear Ratio 2.5 ~ 2.06 (for 12-inch) (See P-D)

About fuel:

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

For use engine oil

Engine oil, please use the recommended engine oil.

Recommended : Select a viscosity at ambient temperature and use applications based on the Honda genuine

Ultra G2 or S9 (for 4-cycle motorcycles) SAE10W-30.

If you use equivalent, should meet these conditions.

- API classification SF, SG or, SG class or higher or equivalent
- JASO standard : MA,MB
- SAE standard : Please use viscosity oil in accordance with outside air temperature.

See table of oil suction procedure page.

Note) engine oil, please use the recommended engine oil. Depending on the type of engine oil, there is what is included additives, etc., when used with such engine oil, in the worst case not only adversely affect engine, possibility of engine failure in parts broken.

About oil cooler:

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

When you use breather kit (optional) always equip oil catch can at the same time.

Due to large displacement engine, blow- by gas volume may increase. Larger capacity catch can are highly recommended. (approx 500 cc)

About upper limit of revolution:

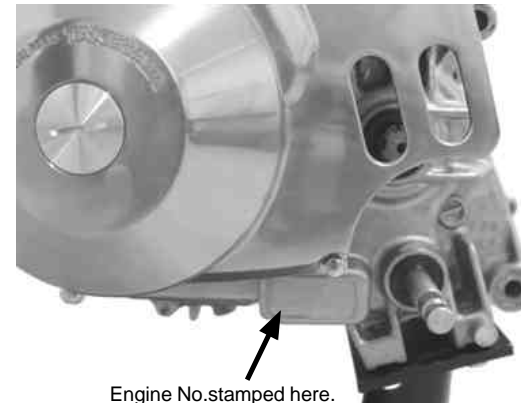
The upper limit of revolutions varies depending on the installed camshaft and other factors. Please install a revolution counter to make sure that you drive the engine at revolutions below the upper limit, referring to the Camshaft Comparison Data List.

Take note that engine racing and sudden acceleration, particularly in the 1st or 2nd gear, tend to exceed the upper limit of revolutions.

Over revolutions will result in nonsmooth revolutions of the engine, not only adversely affecting the engine life, but also possibly breaking the engine in the worst case.

An Engine NO. (Serial No.) is stamped on this engine as identification.

Please specify your Engine NO. when ordering repair part or contacting us.



Engine No. stamped here.
149P-100**

About optional cam shaft:

The following camshafts compatible with this kit are available from us. Referring to the list below, please select a camshaft to match the use, for your great riding pleasure.

You can choose one as an optional part if it matches your bike after confirming the specifications.

SR-25 cam shaft	01-08-0447	Option
SR-30 cam shaft	01-08-0446	146cc
SR-35 cam shaft	01-08-0445	Option

About the descriptions of camshafts and numbers

The bigger the numbers of XX/YY are, the wider the durations are. With these camshafts, the output power will produce more to high rpm range.

While the smaller the numbers are, the narrower the durations are. With these camshafts, the output power will produce more to low-to-mid rpm range. The output features are different from each size.

When purchasing our optional camshafts, please choose the camshaft to suit your riding purpose referring to the camshaft data chart.

Also, the engine output will vary significantly depending on the used exhaust system, length of inlet pipe, carburetor diameter, compression ratio, ignition timing, fuel or the natural phenomenon such as ambient temperatures or atmospheric pressure.

(See P-D)

SPECIAL PARTS TAKEGAWA Co.,Ltd.

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

~ Installation Instructions ~

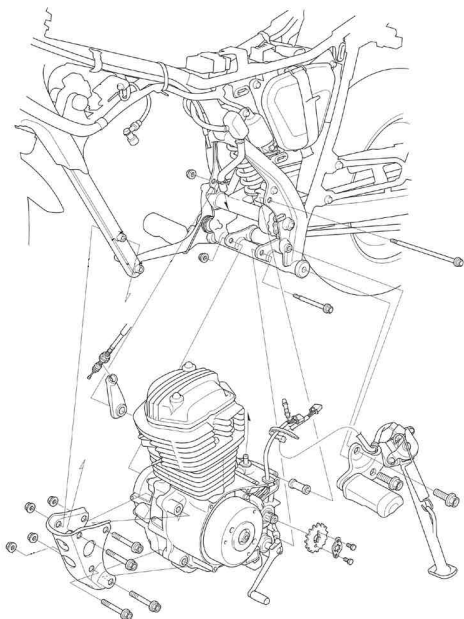
Before starting the installation, please prepare the relative service manual and necessary tools for the motorcycle.

And prepare necessary optional parts as well. For details, please see the attached sheets.

CAUTION: This installation instructions are for the models which this complete engine can be equipped.

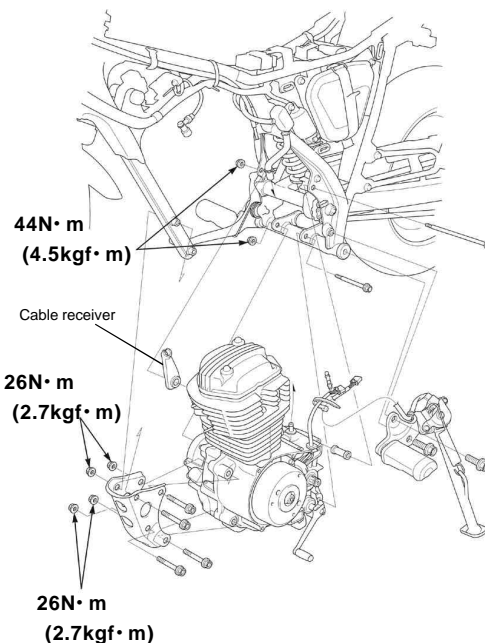
Remove the engine

Remove the engine and carburetor from the motorcycle referring to the service manual of your vehicle.



Installation of engine

Replace clutch cable receiver (included) and set to the frame.



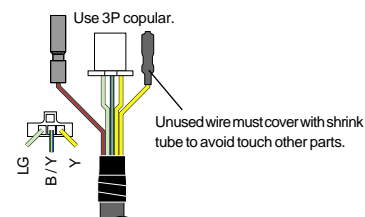
⚠ Caution : Be sure to follow the specified torque.

Connect ACG

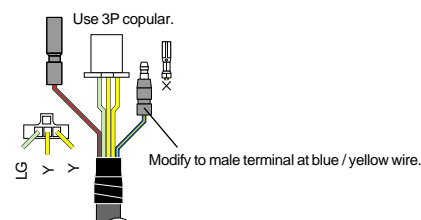
Replace the CDI with the supplied CDI referring to the service manual of your vehicle.

May need to modify wiring diagram to match the main wire harness. Need.

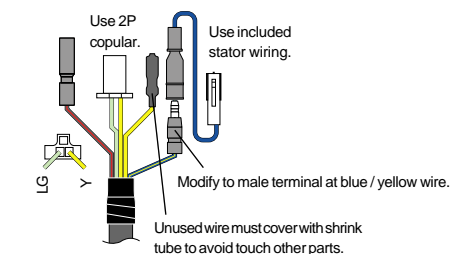
Ape100 : HC07-1000001 ~ 1599999



Ape100 : HC07-1600001 ~
: HC13-1000001 ~



XR100Motard : HD13-1000001 ~



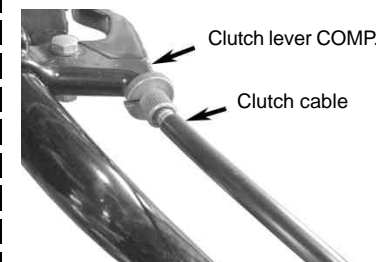
LG : Light Green

B : Blue

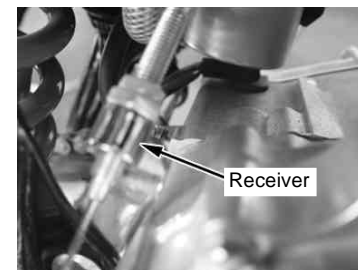
Y : Yellow

Installation of clutch cable:

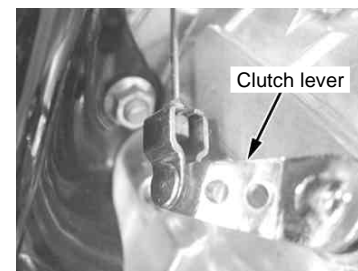
Attach a clutch cable to the clutch lever, and route the cable to the clutch cable receiver, being careful not to stretch it too tight.



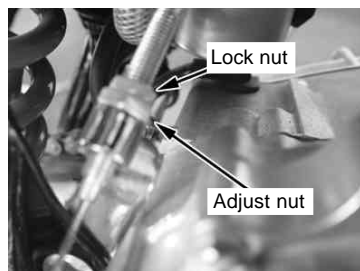
Attach the cable at cable receiver.



Install clutch cable.

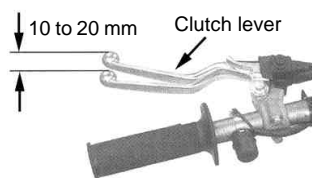


Adjust clutch cable and tight lock nut.



Clutch free play :

10 to 20 mm at the clutch lever end



Inspection:

With the engine turned off, shift the transmission to the first gear. Then, check that the rear wheel rotates when you move the machine, squeezing the clutch lever, and that the rear wheel does not rotate when you have released the clutch lever.

Installation of carburetor:

Read installation manual for carburetor.

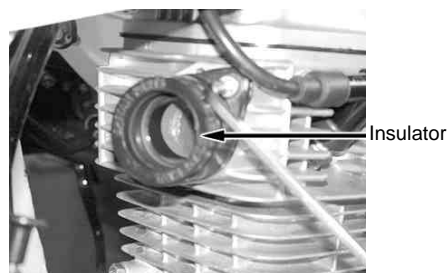
Route the supplied throttle cable along the frame just like the stock throttle cable was routed.

Pass the throttle cable through the lower throttle housing, and connect the inner cable to the throttle pipe.

And attach the throttle housing to the steering handle. Apply grease to the rubbing surface of the throttle pipe, cable end and the cable taking-up portion on the pipe.

Install insulator rubber to the cylinder head.

⚠ Caution : Be sure to follow the specified torque.
Torque: 10 N · m(1.0 kgf · m)



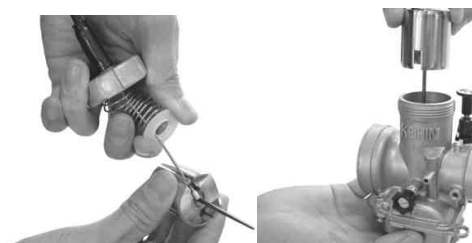
In the case of PE28:

Start jetting as MJ#110 and SJ#35.

Detach a top cover of the supplied carburetor, and pull out the spring and throttle valve.

Pass the inner cable of the throttle cable through the carburetor top cover and then through the spring.

And compressing the spring, fix the top cover and all to the throttle valve. Fix the throttle valve to the carburetor by aligning a notch on the throttle valve with the throttle stop screw.

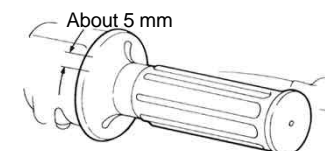


Insert the carburetor into the insulator, and fasten them with a clamp band.



Adjust the free play at the throttle grip to be about 5 mm by turning the adjuster of the throttle cable.

Follow the instructions of your throttle cable to adjust the free play.



Snap the throttle a few times to make sure that the throttle moves smoothly without sticking and that the throttle valve is fully open. And check that the throttle has free play even when a steering handle is turned all the way to the right or to the left.

Insert a fuel tube and fasten it with a tube clip.

Open the fuel cock and check for oil leaks.

Dispose of the blow-by gas from the crankcase by yourself.

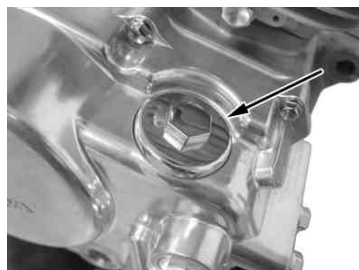
(Some races and regulations stipulate the blow-by gas disposal.)

To return blow-by, please connect to air filter.

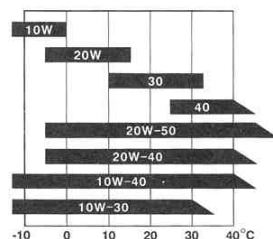
(See Optional parts chart on P-D1)

Engine oil

Remove the cap and add 1010cc of engine oil.



Referring to the chart below, choose the engine oil whose viscosity matches the region and outside temperature.



Install the oil inlet cap.

Install a kick starter arm.

⚠ Caution : Be sure to follow the specified torque.



Torque: 20N·m (2.0kgf·m)

Installation of drive chain

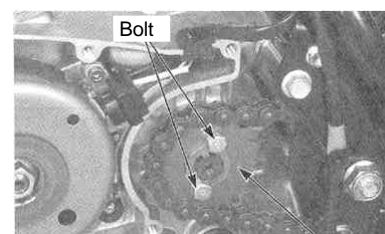
Remove generator cover.



Install the drive sprocket and drive chain.

⚠ Caution : Be sure to follow the specified torque.

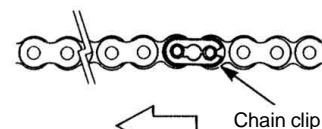
Torque: 12 ~ 15N·m (1.2 ~ 1.5 kgf·m)



Drive sprocket

Install the drive chain referring to a genuine service manual or instruction manual for the relative rear fork.

⚠ Warning : Do follow the instructions in the service manual.



Chain clip
In the direction of the chain's movement

Install the exhaust system

Attach a supplied exhaust pipe gasket to the exhaust port.



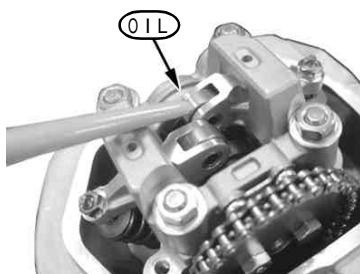
Install an exhaust muffler according to the installation instructions of the relative exhaust muffler.

⚠ Caution : Always read installation manual before work.

Remove cylinder head cover.



Put some engine oil to the cylinder head.



Install cylinder head cover to the specified torque.

⚠ Caution : Be sure to follow the specified torque.
Torque: 12 N · m(1.2 kgf · m)

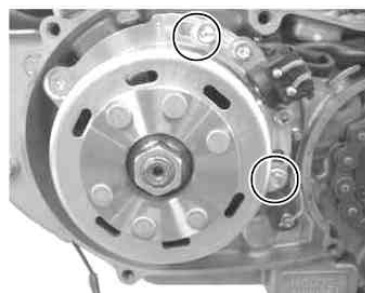
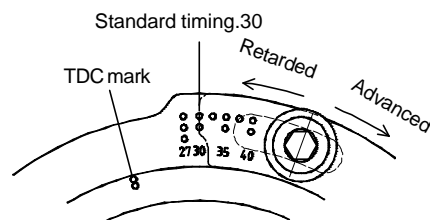


Replace the spark plug. (Kit included)



Loose the coil bracket screw and set the timing mark to the 30. Tighten screw to the specified torque.

⚠ Caution : Be sure to follow the specified torque.
Torque: 10 N · m(1.0 kgf · m)



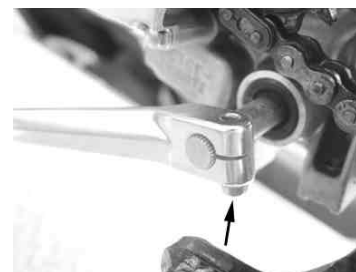
Install generator cover.

⚠ Caution : Be sure to follow the specified torque.
Torque: 10 N · m(1.0 kgf · m)



Install change pedal.

⚠ Caution : Be sure to follow the specified torque.
Torque: 10 N · m(1.0 kgf · m)

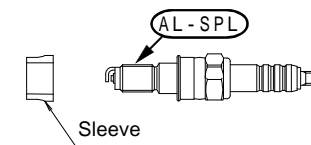


Start engine

Check that the ignition key and gas cock are turned off.

Keep kicking the starter for a while till the engine oil circulates all around the engine.

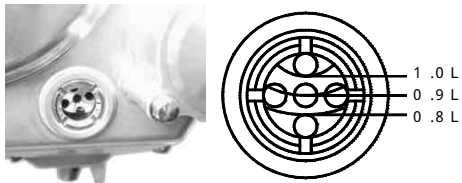
Install spark plug with sleeve. Apply "alumi special" paste.



⚠ Caution : Be sure to follow the specified torque.

Attach the plug cap to the spark plug.
Thoroughly wipe off dirt and dust on the engine.
Turn on the gasoline cock and the ignition key. Pull a choke lever to start the engine. Gradually loosen your grip on the lever, and warm up the engine till the revolution becomes smooth. And then return the lever fully back to its original location.
If the engine does not run idle after warming-up, or it runs idle at high revolutions, adjust the revolutions with the throttle stop screw.

Stop the engine once.
Wait for a few minutes and keep the motorcycle level to the ground, and then check the oil amount with oil level gauge on right crankcase.
Always keep the oil to the specified level.
(Use the same grade and brand oil.)



Check for malfunctions such as unusual sounds.
If no malfunction is detected, do the setting of the carburetor.
(See the attached sheet)

⚠ Warning : Be sure to do the work in a well-ventilated place.

After the adjustment or setting, carry out a shakedown about 30 to 50 km, and check the valve clearance again.
IN : 0.08 mm
EX: 0.08 mm

⚠ Caution : Be sure to do the work when the engine is cool.

Carry out again a shakedown up to about 50 to 100 km.
After the shakedown, check for malfunctions such as unusual noises or blow-by gas.
(If there is any malfunction, disassemble the engine again to check each part.)
Be sure to proceed the inspection referring to the Owner's Manual. (Purchase the owner's manual if necessary.)

⚠ Caution: Never reuse parts which are not suitable for reuse.

⚠ Warning: Those who are technically unskilled or inexperienced are required not to do the work.

About Optional Clutch Parts:

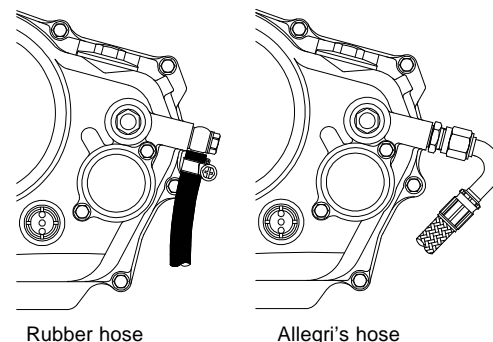
(Installation of thermo unit)

After removing a thermostat hole cap, install the thermo unit.
For details, see the Instruction Manual for the thermo unit.
The thermo unit alone does not function.

(Oil Cooler Installation)

In case a thermo unit is to be installed:

1. Install a thermo unit.
2. Unfasten two oil plug bolts, and install an adapter suitable for the kind of hose you will use.
Then connect the hose.
Please see the instruction manual for the thermo unit.
Please see the instruction manuals for the oil cooler kit and the adapter.



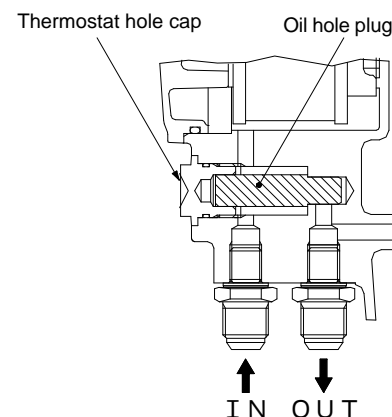
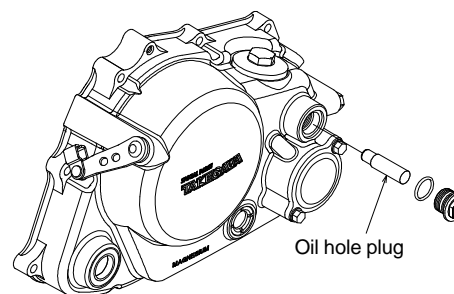
⚠ **Caution : NEVER install a thermo unit or an oil hole plug if you do not connect an oil hose to the clutch cover. There is a possibility that the engine is damaged due to the oil passage blockage.**

In the case of not installing the thermo unit

1. Detach the thermostat hole cap, and fit an oil hole plug (option) into the oil hole.
2. Apply engine oil to the O-rings of the thermostat hole cap, and tighten the hole cap to the specified torque.

⚠ Caution : Be sure to follow the specified torque.
Torque: 13 N · m(1.3 kgf · m)

3. Unfasten two oil plug bolts, and fit an adaptor to match the hose to be used. And connect the hose.
For details, see the Instruction Manuals for an Oil Cooler Kit and an Adaptor.



In case an oil cooler is not installed:

NEVER install a thermo unit or an oil hole plug.
And in case the thermo unit and / or an oil hole plug is installed, DO be sure to remove it or them.

⚠ **Caution : There is a possibility that the engine is damaged because the oil passage will be blocked when the thermo unit or an oil hole plug is installed.**

~ Inspections and Adjustments ~

⚠ CAUTION

Be sure to use a torque wrench and strictly keep the specified torque.

⚠ WARNING

The inspections and adjustments are intended for use by qualified professional mechanics. Be sure that any person who does not have the proper technique, experiences and knowledge will never work.

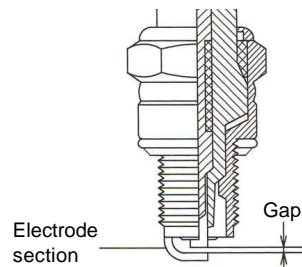
Spark plug:

Detach a plug cap, and then a spark plug with a plug wrench.



With a wire brush or a plug cleaner, clear the plug electrode section of the accumulated residues.

Check the plug gap with a thickness gauge. And when the gap deviates from the benchmark, adjust it by bending the electrode section.



Gap

Benchmark : 0.6 ~ 0.7 mm

Check if the electrode section is worn out, corroded or burnt-out, or its insulator is damaged. When necessary, change the spark plug.

Check whether the spark plug in use is the one with the right heat value, considering the driving situation and purpose. If the plug seems to be over-burnt, change it with a super plug with a one-step higher heat value.

Standard

- NGK : ER8EH
- DENSO : U24FSR-U

Plug with high thermal value

- NGK : ER9EH

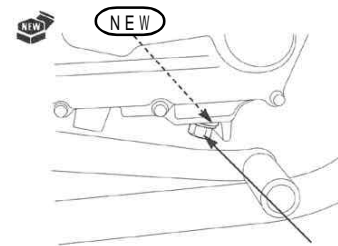
Install spark plug with sleeve. Apply "alumi special" paste.

⚠ Caution : Be sure to follow the specified torque.

Oil Change:

Warm up the engine within a few minutes to normal operating temperature.

Prepare an oil container under the drain bolt. And drain the oil while the engine is warm.

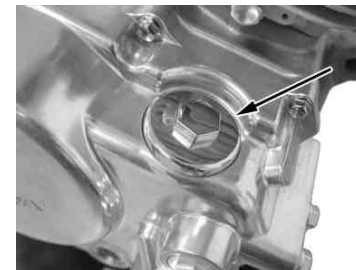


Tight drain bolt with sealing washer to the specified torque.

⚠ Caution : Be sure to follow the specified torque.

Torque: 25 N · m(2.5 kgf · m)

Remove the cap of oil inlet and add 900cc of engine oil.



Add the engine oil in the specified amount.

Recommended oil:

SAE 10W - 40 20W - 50

API class, SF grade engine oil

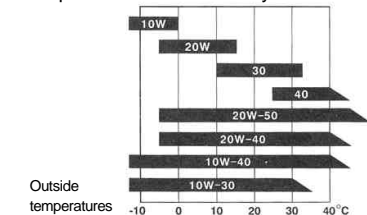
Oil amount:

When oil change ONLY :900cc

When rebuilt the engine :1010cc

Referring to the chart below, choose the engine oil whose viscosity matches the region and outside temperature.

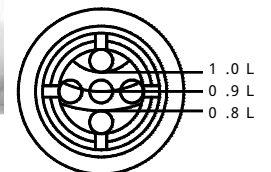
Relationship between temperatures and viscosity



Install the oil inlet cap.

Warm up the engine within a few minutes to normal operating temperature.

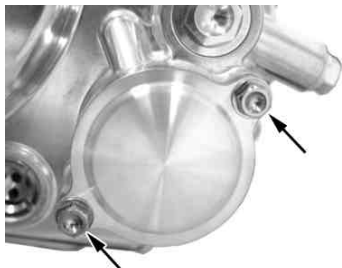
Stop the engine once. Wait for a few minutes and keep the motorcycle level to the ground, and then check the oil amount with oil level gauge on right crankcase.



Always keep the oil to the specified level. (Use the same grade and brand oil.)

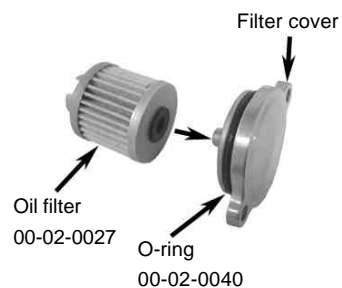
Change of Oil filters:

Unfasten two bolts on the oil filter cover, and detach the oil filter cover, oil filter and oil filter spring.

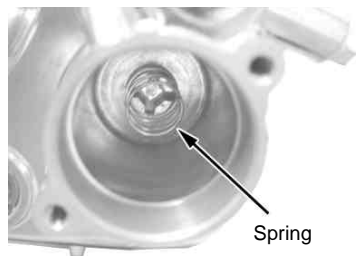


Check the O-ring in an oil filter cover, and change it when necessary.

Attach a new oil filter to the filter cover.

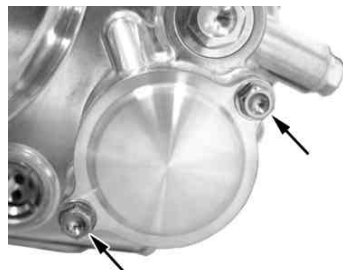


Place the oil filter spring at the protrusion on the right side crankcase cover.



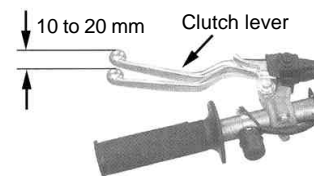
Apply a thin coat of engine oil to the O-ring on the oil filter cover, attach an oil filter and oil filter cover, and tighten two bolts to the specified torque.

⚠ Caution : Be sure to follow the specified torque.
Torque: 10 N · m (1.0 kgf · m)

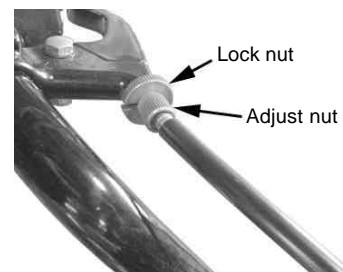


Adjust the Clutch Cable

Inspect the free play of clutch lever.



Turn the adjust nut of clutch holder and adjust the free play of clutch lever.



If you cannot adjust the free play with the lever holder, adjust it with the adjust nut of receiver.



Tighten the lock nuts on clutch lever and clutch cable respectively.

Adjust the Valve Clearance

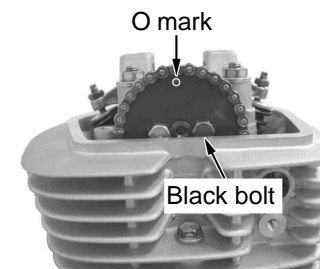
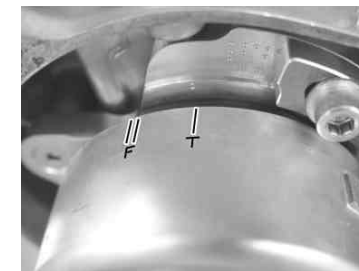
Remove cylinder head cover.



Remove the generator cover (by unfastening the five bolts).



Turn the flywheel and adjust to the top dead center (TDC).



Adjust valve clearance. (Use feeler gauge)

IN : 0.08 ~ 0.03 (when cold)

EX : 0.08 ~ 0.03 (when cold)



Adjust and check the valve clearance of all four valves by inserting a feeler gauge between the adjusting screw and the rocker arm.

IN : 0.08 ~ 0.03 (when cold)

EX : 0.08 ~ 0.03 (when cold)



Tighten the adjust nut to the specified torque.

⚠ Caution : Be sure to follow the specified torque.

Torque: 10 N · m(1.0 kgf · m)



Install cylinder head cover to the specified torque.

⚠ Caution : Be sure to follow the specified torque.

Torque: 12 N · m(1.2 kgf · m)



Re-install the generator cover and tighten to the specified torque.

⚠ Caution : Be sure to follow the specified torque.

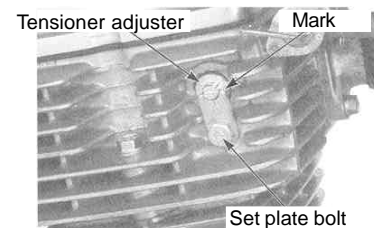
Torque: 10 N · m(1.0 kgf · m)



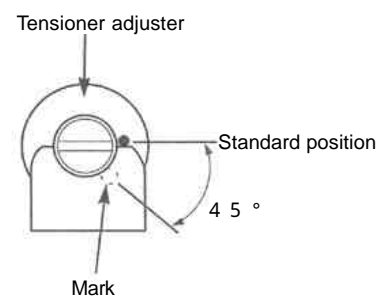
Adjust cam chain

Warm up engine.

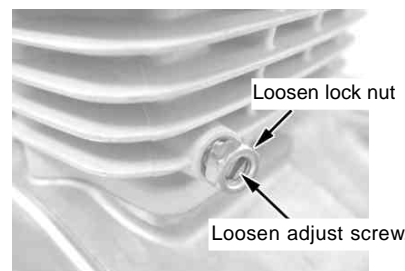
Loose cam chain adjuster set plate screw.



Set the adjuster 45 degree lower than standard position as shown below.



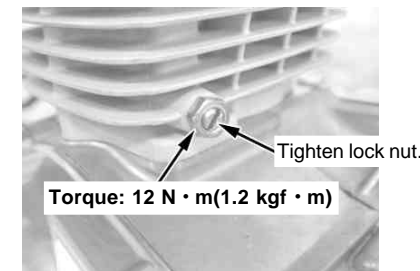
Loosen the lock nut and adjusting bolt. The cam chain adjuster sets automatically when the adjusting bolt is loosened.



When tightening the lock nut, hold the adjusting bolt to prevent it from turning with the lock nut.

⚠ Caution : Be sure to follow the specified torque.

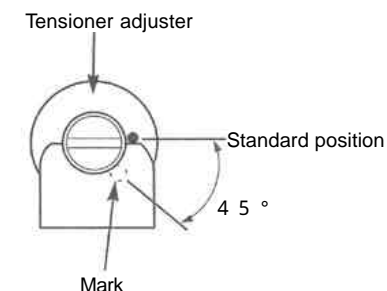
Torque: 12 N · m(1.2 kgf · m)



Set the adjuster 45 degree lower than standard position as shown below.

⚠ Caution : Be sure to follow the specified torque.

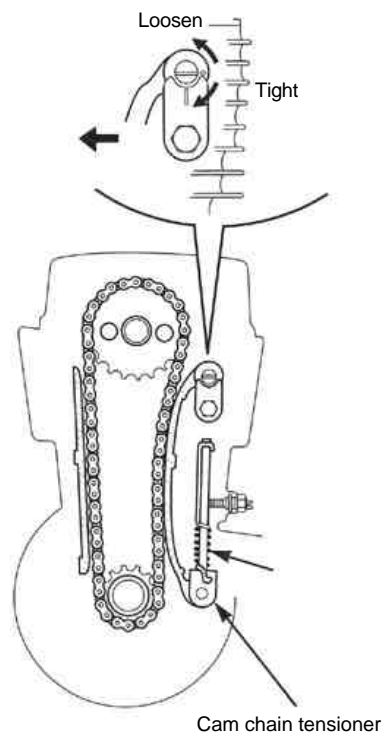
Torque: 10 N · m(1.0 kgf · m)



Start engine and check the noise of cam chain, if sounds too tight lose set plate and loosen the adjusting bolt to the counter clockwise. Then tighten set plate to the specified torque.

⚠ Caution : Be sure to follow the specified torque.

Torque: 10 N · m(1.0 kgf · m)



How to Set the Carburetor

- When the carburetor does not match the engine and the engine fails, the engine failures are caused by either too dense or too lean air-fuel mixture.
- The engine failure symptoms for the engine are as follows:

When the air-fuel mixture is too dense:	When the air-fuel mixture is too lean:
<ul style="list-style-type: none"> • The explosion sound with a dull thud continues intermittently. • The engine malfunctions further if you use the choke. • The engine malfunctions when you warm it up. • The engine works well if the cleaner is detached. • The motorcycle belches dense (or, black) exhaust gas. • The plug smolders, getting blackened. 	<ul style="list-style-type: none"> • The engine overheats somewhat. • The engine starts working well If you use the choke,. • The engine does not accelerate well. (No smooth acceleration) • Revolutions change, generating weak power. • The plug burns white.

Set the carburetor only after warming up the engine, and then test-drive. And use a plug with the right heat value.

Do the setting in the following manner, studying at what throttle opening position the engine starts failing.

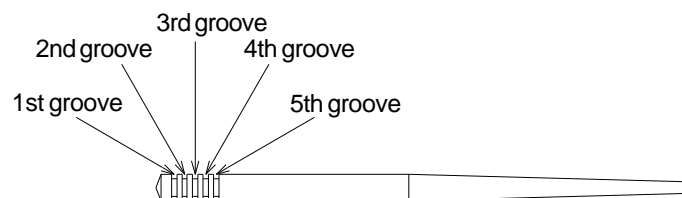
Jet needle (Throttle position at 1/4 - 3/4)

Whether or not the engine revolution is in proportion to the throttle operation

- When the acceleration is not smooth or even, make the air-fuel mixture dense.
- Make the air-fuel mixture lean when the engine revolution goes up heavily and belches black gas.

The mixture ratio at this throttle position can be adjusted by the location of E-ring in the grooves.

The air-fuel mixture becomes dense as the location of the E-ring moves down from the 1st to the 5th groove.



Main jet (The throttle position at 3/4 - 4/4)

The air-fuel mixture ratio at this throttle position can be adjusted by changing the number of the main jet. The larger the main jet numbers, the denser the mixture ratio becomes.

In view of the engine and muffler specifications, select the most appropriate main jet to get the highest revolutions.

Pilot jet (First of all, please adjust the air screw.)

- In case you have given more than three turns to the air screw to tighten it, use a pilot jet with a small number.
 - If you have tighten the air screw (clockwise) to the full, use a pilot jet with a larger number.
- Check whether you have made a right choice of the pilot jet by seeing if the engine starts up revolving smoothly from the idling to running at slow speed.
- When the engine revolves up unevenly, the pilot jet number is too small. (At idle)
 - When the motorcycle belches black exhaust gas and produces heavy exhaust sound, the pilot jet number is too big. (At idle)
 - After replacing the pilot jet, you need to readjust the airscrew.

Air screw

The air screw adjusts the air mass flow at the time of engine's revolving at slow speed. (At idling)

- Give the air screw a right turn The air-fuel mixture gets dense.
- Give the air screw a left turn The air-fuel mixture gets lean.

Loosen the tightened air screw back to the 1.5-turn position. And then from this position, give to the airscrew a right or left turn of 1/4 to 1/2 till the engine revolves at the highest speed.

Loosen the idle stop screw till you get the steady idling revolutions. And once again adjust the position of the airscrew to get the highest revolutions.

On how the barometric pressure, temperatures and humidity affect the setting:

- At highlands or at high altitudes, the barometric pressure and air density go down and the air gets into the carburetor in less amounts.
This makes the air-fuel mixture dense which was adjusted at low altitudes.
- Under the weather conditions with very low temperatures, the air density increases, which makes the air-fuel mixture lean.
- Under the rainy and humid weather conditions, the air density decreases, which makes the air-fuel mixture dense.

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.

This manual should be retained for future reference.

PE28 Carburetor

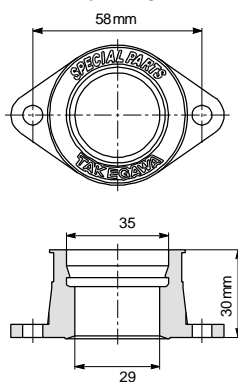
Item Nos	Product Names
00-03-0137	Slow jet, 35
00-03-0138	Slow jet, 38
00-03-0139	Slow jet, 40
00-03-0140	Slow jet, 42
00-03-0141	Slow jet, 45
00-03-0142	Slow jet, 48
00-03-0143	Slow jet, 50
00-03-0144	Slow jet, 52
00-03-0145	Slow jet, 55
00-03-0146	Slow jet, 58
00-03-0147	Slow jet, 60
00-03-0148	Slow jet, 62
00-03-0149	Slow jet, 65
00-03-0150	Slow jet, 70



03-03-027

Insulator

for PE28



00-03-0211

Involute throttle set



Outer length: 710 mm

09-02-0230 (Black anodized)

09-02-0232 (Gray metallic anodized)

Outer length: 810 mm

09-02-0231 (Black anodized)

09-02-0233 (Gray metallic anodized)

Big bore carburetor kit



03-05-0192 (w / high flow air filter)

03-05-0191 (w / standard air filter)

Air filter



03-01-1056 (Standard air filter)

03-01-1059 (High flow air filter)

Standard high throttle set

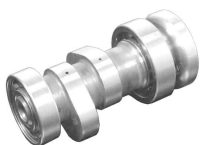


09-02-0222 (710 mm in outer length)

09-02-0221 (810 mm in outer length)

For more information, please refer to our parts catalog, or log onto our Web site at
URL <http://www.takegawa.co.jp>

Cam shaft



- 01-08-0445 : SR-25 cam shaft
 01-08-0446 : SR-30 cam shaft
 01-08-0447 : SR-35 cam shaft

You can chose from 3 type of camshaft to match your riding style and purpose.

Racing C.D.I. Magnet Kit



05-02-0723

Excellent startup performance because of ignition at low revolution. (Excellent start-up by a kick starter)
 Ignition timing adjustable at up to 24 degrees,
 Integral ignition coil with built-in CDI unit,
 Fully-covered stator coil to protect the ignition coil,
 Weight saving:
 58 rotor: 329 g
 Stator, including cords: 383 g
 Ignition coil, including cords: 370 g
 "ROSSA" (red) as proof of high performance
 No charging functions

Clutch lever assembly



- 02-01-028 (black)
 02-01-0282 (silver)

Quick lever ASSY.



02-01-0601

Steel Drive Sprocket



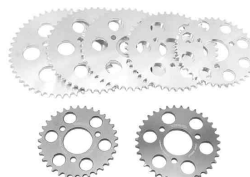
- 02-05-01 (12T Standard)
 02-05-02 (13T Standard)
 02-05-03 (14T Standard)



- 02-05-041 (15T Racing)
 02-05-051 (16T Racing)

Driven Sprocket

- Ape100 : HC13-1000001 ~
 XR100Motard : HD13-1000001 ~



- | | |
|-----------------|------------------|
| Aluminum | Steel |
| 02-07-38 (45T) | 02-07-3402 (31T) |
| 02-07-39 (47T) | 02-07-3403 (33T) |
| | 02-07-3401 (35T) |

Steel Driven Sprocket

- Ape100 : HC07-1000001 ~



- | | |
|----------------|----------------|
| 02-07-18 (31T) | 02-07-04 (38T) |
| 02-07-01 (33T) | 02-07-05 (41T) |
| 02-07-02 (35T) | 02-07-06 (42T) |
| 02-07-03 (36T) | 02-07-07 (43T) |

Gear Ratio (Final)

Drive \ Driven	23T	24T	25T	26T	27T	28T	29T	30T	31T	32T	33T	34T	35T	36T
12T	1.91	2.00	2.08	2.17	2.25	2.33	2.42	2.50	2.58	2.67	2.75	2.83	2.92	3.00
13T	1.76	1.84	1.92	2.00	2.08	2.15	2.23	2.31	2.38	2.46	2.54	2.62	2.69	2.77
14T	1.64	1.71	1.79	1.86	1.93	2.00	2.07	2.14	2.21	2.29	2.36	2.43	2.50	2.57
15T	1.53	1.60	1.67	1.73	1.80	1.87	1.93	2.00	2.07	2.13	2.20	2.27	2.33	2.40
16T	1.43	1.50	1.56	1.62	1.68	1.75	1.81	1.87	1.93	2.00	2.06	2.12	2.18	2.25

For more information, please refer to our parts catalog, or log onto our Web site at
 URL <http://www.takegawa.co.jp>

Oil cooler

Compact cool

The oil "Compact Cool" is designed more compact compared to our current oil cooler and the best for mini motorcycles such as Monkey / Gorilla. The oil passage is our Standard Type and the corrugated louver fins are incorporated. This cooler body has an oil cooler plate and guard as standard equipments. In addition, the bracket mounting is integrated with the oil cooler plate so that you can use the oil outlet upside down as well.



3-Fin 4-Line AW
00-07-0055



4-Fin 5-Line AW
00-07-0008

Thermostat

Only for wet-type clutch cover



02-01-5052

Unusually quick response to temperature change is realized through the use of shape-memory alloy.

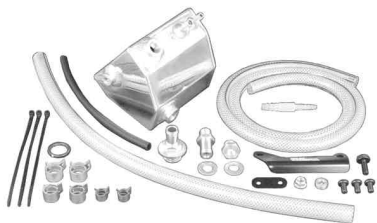
A relief passage can be secured via bias spring even when the oil pressure has increased because of the clogged oil cooler.

At the time of low oil temperatures, oil does not flow out to the oil cooler because the thermo unit valve closes, but it flows back to the filter through the bypass passage. When the oil temperatures rises to more than 70 degrees, the valve opens to let the oil flow to the oil cooler. Thus, the thermo unit serves to prevent the overcooling and to keep the oil at a fixed temperature.

For more information, please refer to our parts catalog, or log onto our Web site at
URL <http://www.takegawa.co.jp>

Oil catch tank

(Box type with separator)



09-04-0854

Tank capacity : 530 cc

(Box type with separator)



09-04-0852

Tank capacity : 516 cc

Exhaust system



BOMBER L exhaust system

04-02-2583

For more information, please refer to our parts catalog, or log onto our Web site at
URL <http://www.takegawa.co.jp>

Important

If you got a kickback at the engine start, the engine will be get damaged.

In the worst case, it would be broken.

In order to prevent an engine kickback, please start the engine by following step.

Lightly press down the kick pedal and find the position that become heavier.

Put it back to the first position when become heavier.

Keep your foot on the kick pedal, and press it to the bottom quickly at a stretch **while keeping the throttle grip at fully closed.**

To open the throttle at the engine start is one of the major causes to occur the kickback.

If engine doesn't start, please try several times.

If it still cannot be started, there should be other cause.

<Caution>

If the engine is broken by the kickback, high repair cost will be charged.

SPECIAL PARTS TAKEGAWA Co.,Ltd.

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