

CHAPTER 3 DESCRIPTION OF COMPONENTS AND ASSEMBLY

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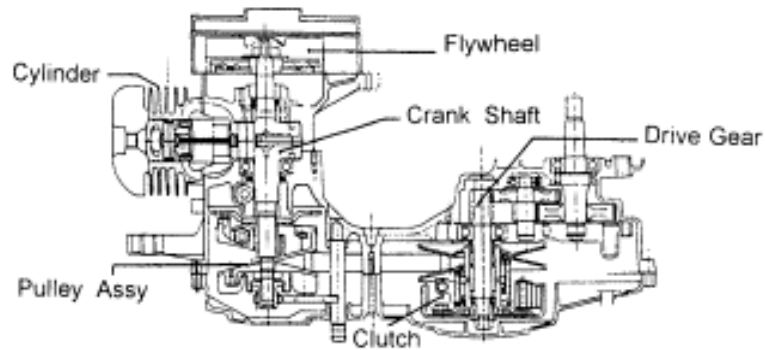
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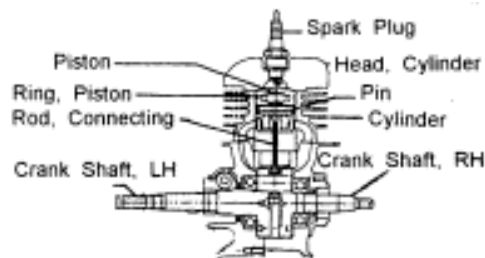
3-1 ENGINE



3-1-1 Combustion & Air Inlet-Outlet System

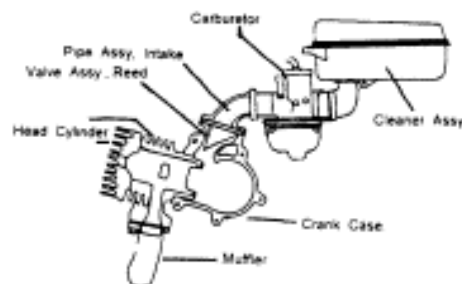
1. Combustion System

- A. Cylinder Head: made of aluminum alloy, the combustion chamber.
- B. Spark Plug: NGK BP6HS, BP7HS, BP7HS-10, BPR6HS, BPR7HS, differ with each Type.
- C. Cylinder: made of cast iron, with one exhaust port and five scavenging ports.
- D. Piston: made of high silicon aluminum alloy.
- E. Piston Ring: including first and second rings, and the expander ring installed in the inner side of 2nd ring. (FOR 50C.C.) Two Piston Rings (FOR 90C.C.)
- F. Con-Rod: with needle bearing on both big end and small end.
- G. Bearing: with a ball bearing on each left and right hand side.



2. Air In-Take & Exhaust System

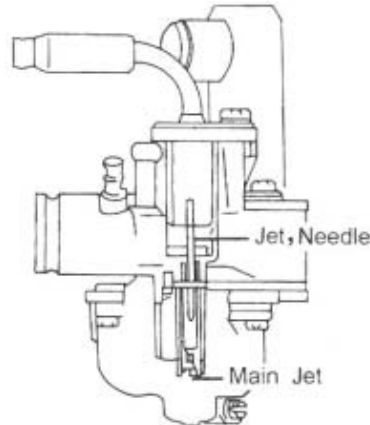
- A. Air Filter: with pre-filter and filter to eliminate dust and dirt.
- B. Carburetor: VM13 Auto-Choke type (or PHVA 10, PHVA I2, PHVA16 etc.)
- C. Reed Valve: with steel single reed and locked into the inner side of air in- take pipe.
- D. Crank Case: made of aluminum alloy.
- E. Muffler: with sound-absorbed fiberglass and expansion chamber.



3-1-2 Carburetor

1. Idle Jet:

When scooter idling, gasoline will pass through idle jet and mix with air and go into the crankcase. When the throttle handle opens, the piston valve and needle jet are elevated to let gasoline pass through the main jet and mix with air and go into the crankcase



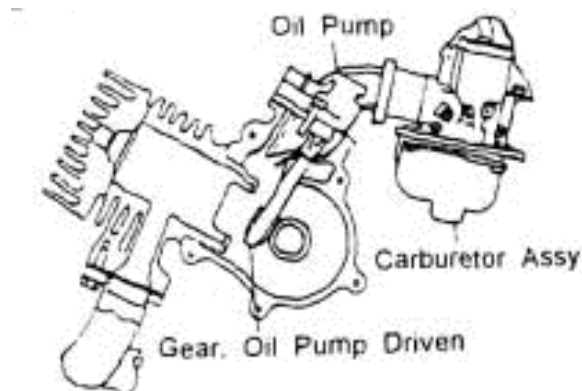
2. Auto-Choke:

The body of Carburetor is equipped with PTC Heater to-start the Choke Plunger. Part of the electricity made by Fly-wheel Magneto is used on PTC Heater, which heats the Ceramic plate. The heat then expands the Thermo- Wax to start the Starter-Plunger to activate the Auto-Choke in warm condition. The path is in closed condition then. In cold condition, the Thermo-Wax will contract according to the temperature, so the Choke- Plunger is in open condition.

3-1-3 Lubrication & Cooling System

1. Lubrication of Engine:

- A. The Pump Gear is driven by the Screw Crank Shaft to rotate the Plunger valve of oil-Pump and send the lubricating oil into the Crank to completely mix with the carbureted air and then go into the Combustion Chamber.

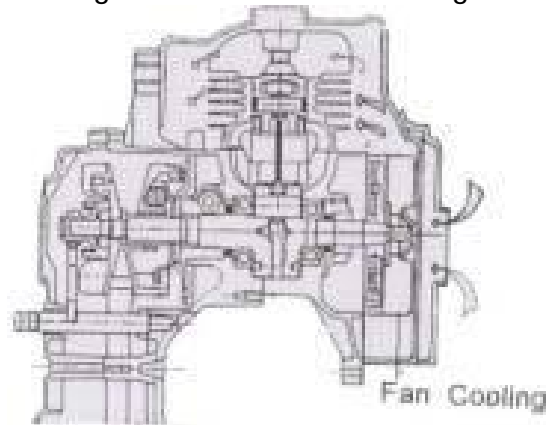


B. Oil-Pump: Double outlets type,

The Injection Volume Increased by The Revolutions of Crankshaft and The Opening of Throttle.



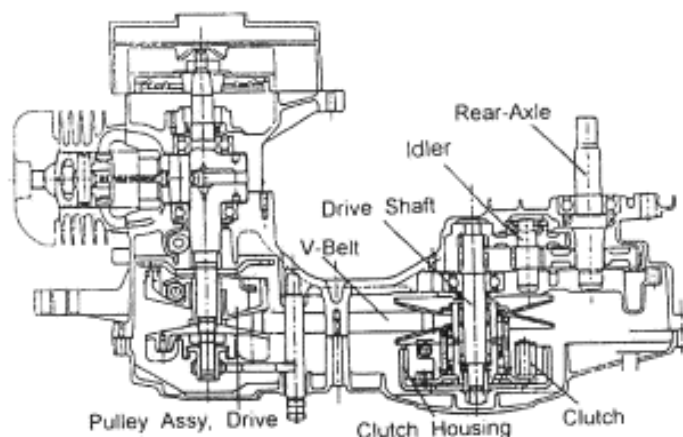
C. Forced Air-Cooled Engine: In order to achieve the stable cooling both when the vehicle is moving and parked, it is covered with air guide from the Cooling Fan to the Cylinder Head. The outside air is imported into the Cylinder Head and Cylinder by the Cooling-Fan on the Flywheel Magneto to achieve the cooling effect.



3-2 TRANSMISSION MECHANISM

3-2-1 Path of Power Transmission:

The torque of Crank-Shaft from Drive Face to Belt Driven Face Clutch Shoe Clutch Housing Drive Shaft, through Idle Gear in Mission Chamber Turning Speed reduced by Final-Gear and Power transmitted to Rear-Axle Shaft to move Rear Wheel.



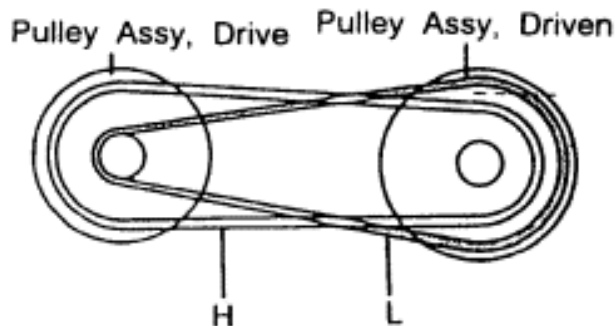
3-2-2 Belt Automatic Continuous Variable Transmission:

The Transmission is the combination of automatic centrifugal clutch and V-Belt continuous variable transmission, which makes the Pulley of both Drive Ends and Driven Ends move toward the shaft center to alter V-Belt contact pitch circle to change the transmission ratio automatically.

Due to the increasing revolution speed of Engine, the pitch circle on the Drive Pulley is enlarged by centrifugal force and pushed out of the Belt to lengthen the radius of pitch circle.

The Belt at Driven Pulley Face is forced to move to the center of shaft to decrease the radius of pitch circle, and pushed by the spring to transfer the power.

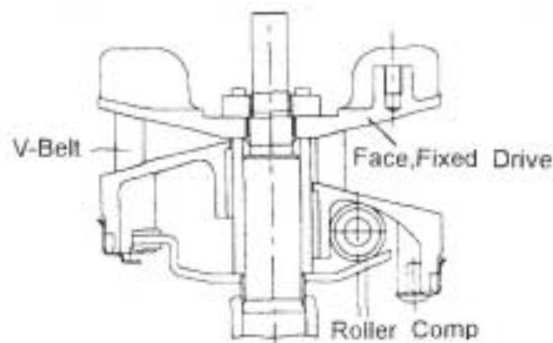
The transmission ratio is therefore altered by the alteration of pitch circle's radius.



1. V-Belt :

Made of rubber fiber, resistant to heat, pressure and abrasion.

The inner side of the Belt is toothed.



2. Drive Pulley :

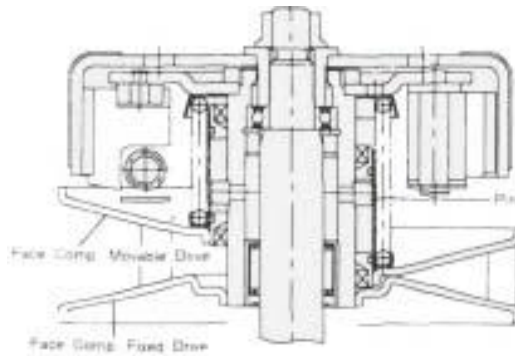
A. Due to the increasing revolution speed of Engine, the Roller in the Movable Drive Face is expanded by the centrifugal force to move the Movable Drive Face and squeeze and press V-Belt to enlarge its turning radius.

B. Fan is installed on the exterior of Fixed Drive Face to moderate the rise of temperature in the Clutch-Cover.

3. Driven Pulley:

A. Because the revolving radius of V-Belt at the Drive End is enlarged, the Face Comp Movable Drive is squeezed out by the V-Belt at the Driven End to shorten the revolving radius.

B. There is a Torque Cam on the Movable Drive Face.



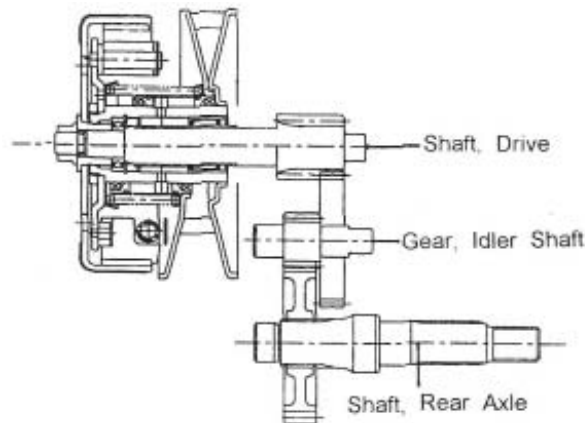
C. Torque Cam is loaded from outside. When the outside load is higher than the engine's output, the Pulley of fixed shaft and Belt slip to make the Movable Drive Face move along the inner side of Cam and compensate to increase to high torque (toward to low speed) and make the engine maintain smooth running with original revolution.

4. Running Curve:

- A. During general speeding, continuous variable transmission is achieved smoothly along with its speed.
- B. During quick speeding, because the torque cam begins to act, the quick transformation can be achieved in high speed.
- C. After the transmission, the scooter speed can also rise according to the ratio with the rise of revolving speed of Engine.

3-2-3 Reducing Gear

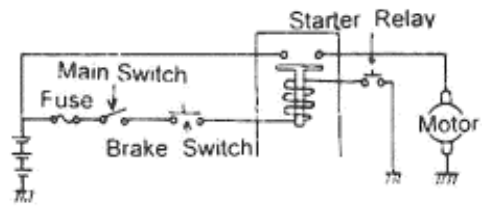
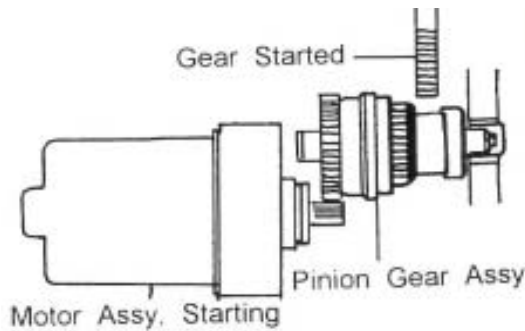
The power received by the Drive Shaft will be transmitted by the speed reduction of two sets of Gear to Rear Axle Shaft.



3-2-4 Starting Mechanism:

The starting mechanism includes

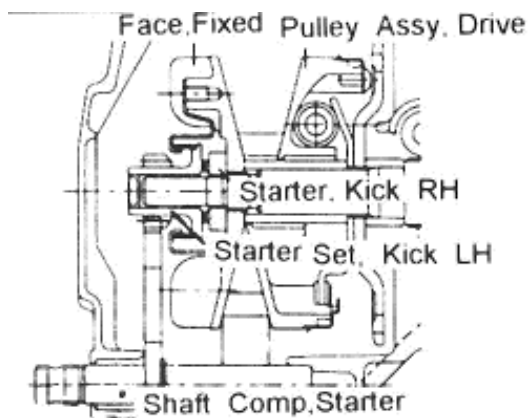
- 1. Electric Self-Starter :
 - A. Starting Motor of BENDIX type. With Safety Starting Mechanism.
 - B. The Starting Motor can act only when the Front- Brake or Rear-Brake is applied.
 - C. Starting Motor is installed at the front bottom of Crank Case.



- D. Starting Motor Relay is installed in the inner side of the Front Leg- Shield.
- E. Starter Switch is installed on the Right-Hand Handle. Starter Motor revolves to activate Pinion Gear Assy. to fly out of the Pinion-Gear and connect with the Starter Gear.

2. Kick starter:

- A. To start the scooter by kicking, the center Stand has to be erected and the Brake-Lever has to be under brake condition.
- B. When the Kick-Starter Lever is kicked; the umbrella type gear of Starter Shaft will drive the right hand kick-starter to revolve the crankshaft to start the engine.
- C. After the Engine is started; the Ratchet of the Left-kick Starter will stop the power transmission to the Kick-Starter Driven Gear.
- D. When the Kick-Starter Lever is released; the Kick Starter Gear will remove from Kick- Starter Driven Gear and go back to its original place.



3-3 ELECTRIC SYSTEM

3-3-1 Ignition & Charging Device

1. Ignition Device:

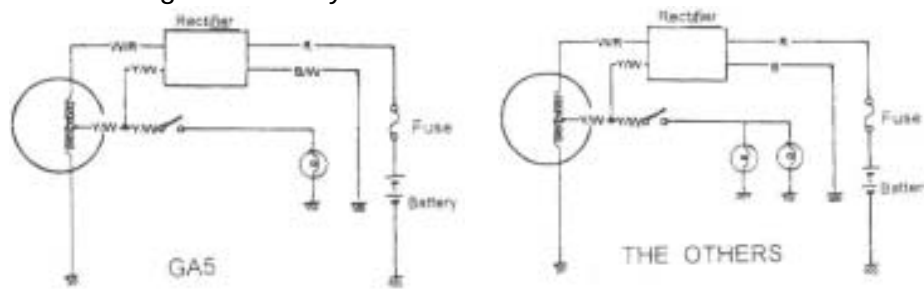
CDI Unit of two ignitions per revolution is adopted. The ignition Lead is:

183/4,000rpm (OLD)

153/4,000rpm (NEW)

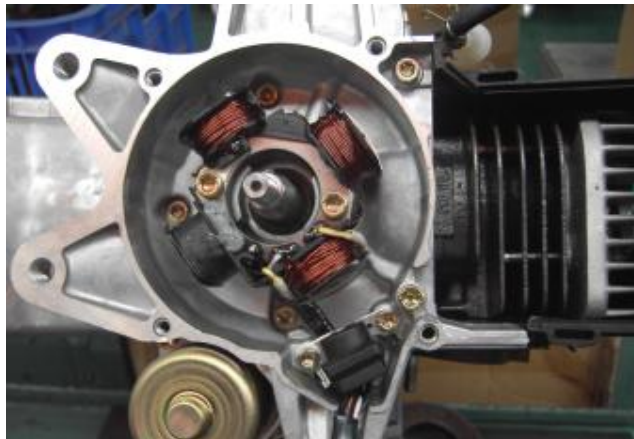
2. Charging Device:

Power is given by flywheel magneto. The voltage is controlled by voltage regulator. Power is charged to battery.



A. Flywheel Magneto:

Flywheel (rotor) includes four poles, crossed N poles and S poles. The stator consists of one high-tension ignition coil and three low-tension coils for charging and lighting to create change of magnetic field by rotating the flywheel to generate electricity.



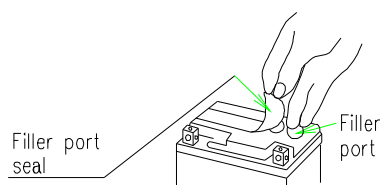
B. Battery: The Battery has two types of Water-adding and Sealed dry.

1. Battery Caution:

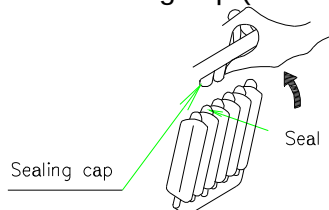
1. The electrolyte contains sulphuric acid is poisonous. avoid to contact with eye, skin and clothes. Immediately wash with abundant water and call a doctor at once in case of contact with the eyes or skin. Immediately drink beaten eggs or vegetable oil, call a doctor at once in case of drink.
2. Batteries release explosive gases, prohibit to closed to sparks, flames or cigarettes.
3. When charging or using the battery in a closed location, make sure that ventilation is good.
4. Keep off children hands.

2. Instruction for Filling Electrolyte (For Sealed Dry Battery)

1. Getting the battery ready. Place the battery on stable, flat spot. Remove the filler port seal.



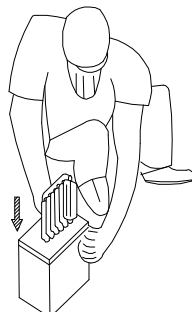
2. Getting the electrolyte container ready. Take the electrolyte container out of the plastic bag. Remove the sealing cap (used as sealing strip later off the container.



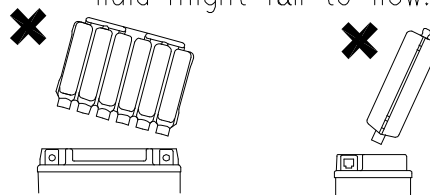
Note: Don't peel off the seal, nor prick a hole with something pointed.



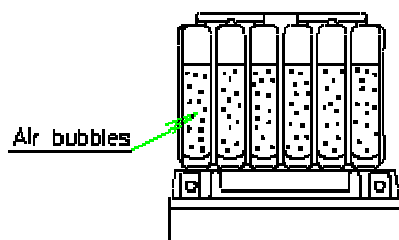
3. Filling the battery. Hold the electrolyte container up side down. Place the container up right on the battery, matching the 6 seals with the filler ports. Now force the container down until the seals break, and the fluid will flow down.



Note: Set the container upright, not tilted. Otherwise the fluid might fail to flow.

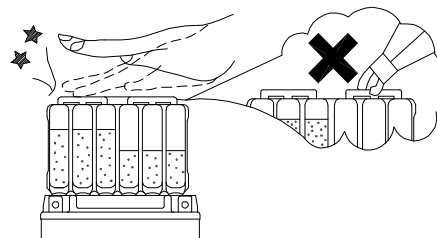


4. Checking the fluid running Make sure air bubbles are floating in the acid in all 6 chambers (2 connectors) at least 1 chamber. Leave the container as is for over 20 minutes.



Note: If any compartments mains full tap its bottom 2 or 3 times never lift off the container.

4-1



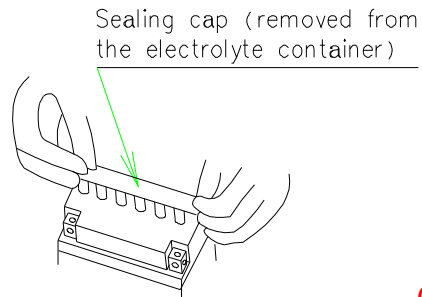
Do not use pincers to cut the chambers.

4-2

5. Taking away the container be sure that all the fluid has flown down. T p the

bottom of the container and gently take the empty container away.

6. Attaching the sealing cap. Fit the sealing cap tightly on the filler ports. (Press it down to the top level of the battery.)

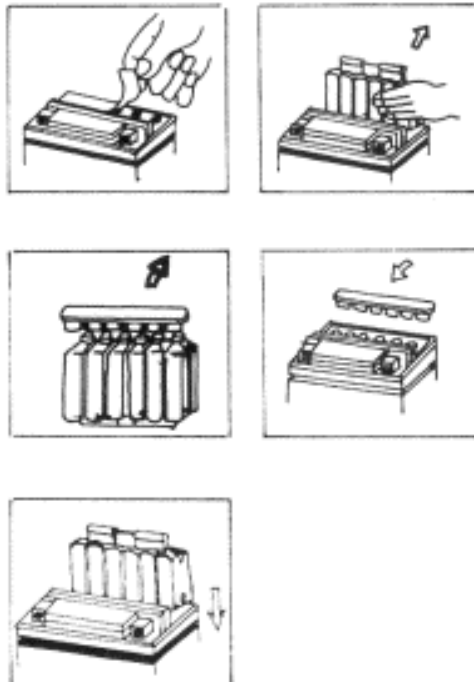


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CAUTIONS : Remove battery from vehicle before filling acid. Install bolts nuts after filling acid.

3. Instruction for Filling Electrolyte (For Water-adding Free Battery)

1. Remove the Aluminum Seal on the filling hole of battery.
2. Remove the cover bar and battery sealing bolt.
3. Insert the filling hole of electrolyte container into the filling hole of battery. Try not to spillage it.
4. There are three pipes on each side. Tap the bottom of container lightly when the electrolyte bubbles. Pulling it out will be unnecessary.
5. Remove the container from the battery after all electrolyte is filled into battery.
6. Insert the fixing plug in the filling hole of battery and press the fixing plug until it is not higher than the top of cover.



Note: The battery is completely ready to use, thus do not remove the Aluminum Seal on the closed filling hole until it is to be used. Electrolyte, except those specified, is absolutely forbidden. While filling the electrolyte, only regulated volume of electrolyte can be adopted. The seal plug should not be removed after the electrolyte is added.

4. THE PROCEDURE OF USING NEW BATTERY (FOR WATER-ADDING BATTERY)

1. Use the open long plastics tube to instead of the L-Type closed rubber tube; adjacent to the "+" pole of the battery.
2. Cut off the tip of the electrolyte's bottle, and put on the open rubber tube. Take off the fixing plugs on the battery.
3. Pour the electrolyte into battery carefully to reach the upper level and the density must be 1.28/20°C
4. The battery must be stay to decrease the temperature of the electrolyte to under 35°C. Then begin to charge.
5. Lay the battery for 30 minutes, if battery stay long time, it must recharge again also according to the table. (see item 5)

Time interval after made	Within 3 months	After			within 1 year	Above 1 year
Charging time	Unnecessary to charge. Pour electrolyte into battery. Lay 30 minutes, then begin to use.	3 months	6 months	10 months	40 hours	60 hours
		10 hours	20 hours	30 hours		

6. Connect the black lead to the "-" pole of battery and red to "+" pole put the battery to the location and clamp the rubber band.
7. For the connected plastics long tube to the air vent hole of battery, the other end of the tube must be setted through into the square hole in the plastic leg shield rightly to discharge the erosive air or sulfuric acid to avoid eroding the body. The tube must be without plugging or straight bending to avoid exploding.

CAUTION:

It's important to use open long tube to instead of close short tube to assure normal output of gas to prohibited of exploding.

5. BATTERY MAINTENANCE: (FOR WATER-ADDING BATTERY)

1. Use the same key of main switch to turn right or left to open inner box lid, then disconnect the battery band and take out the battery, finally take off cable.
2. Checking electrolyte, add distilled water to refill and adjust to upper level; in case of adding distilled water frequently, checking the over- charging of the battery: No voltage indicated on the terminal or no action on rectifier, means short on the

battery, the voltage will higher than normal, and the life will shorten.

3. Inspect charged condition:

Add electrolyte to the upper level and check by battery hyprometer (as attached drawing). The density of charged battery must be 1.26~1.28 (above 20), if the density below 1.2/20, it means fully dis-charged and must be recharged; The battery must be checked electrolyte level density and the voltage after charging.

6. RECHARGING OF THE BATTERY

To Take off the fixing plugs of the battery before charging. Use 1/10 current intensity of the capacity to recharge the battery about 15-20 hours at normal condition; connect "+" pole of the battery to "+" pole of the charger, and "-" with "-".

CAUTION:

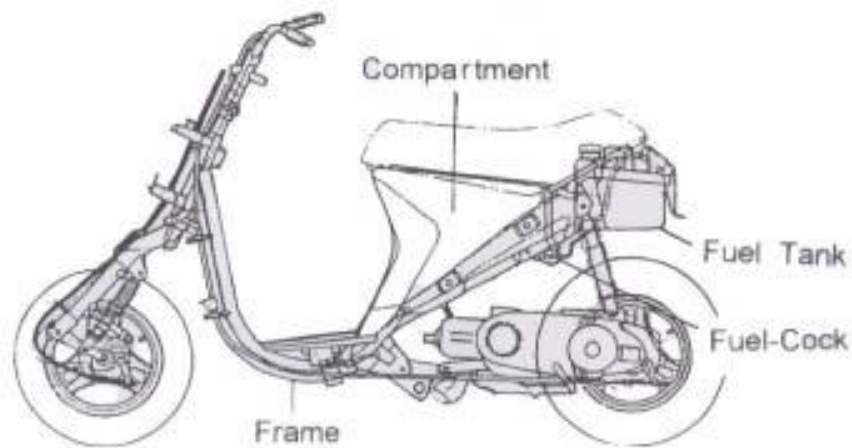
1. Keep the battery away from flames, sparks, and cigarettes.
2. If the temperature of the electrolyte is higher than 45, it must to change to half of the current intensity or stop to charge until decrease to get under 35.
3. After charging the battery, adjusting the electrolyte to upper level and recharge 1-2 hours again, then put into the fixing plugs, washing and protect with Vaseline.
4. Disassemble the "-" pole terminal at first before taking out the battery from scooter, begin to assemble the "+" pole terminal reversal.
5. If it couldn't reach to 12v, after charging the battery for 15-20 hours, it's necessary to replace new battery.

7. REGULAR MAINTENANCE OF THE BATTERY

1. Keep the battery clean and dry.
2. Protect the terminals with vaseline.
3. It can reduce the time to 5-6 hours to charge battery at urgent case.
4. Don't use fuse which above standard, otherwise it'll cause broken of scooter or even firing 10A(GA5),7A(THE OTHERS)
5. It must to charge before using new battery (If necessary stated on table of ITEM 3) to keep the maximum performance, if don't charging adequately or the electrolyte under the low level, it may cause broken before normal life.
6. Tap or drinking water contain mineral will reduce the battery's life, it must to use distilled water. (For Water- Adding battery)
- 7 If scooter is stay a long time, it required charged periodically, otherwise it'll fully discharged by itself above three months.

3-4 BODY

3-4-1 Frame & Fuel and Oil System



1. Frame:

- A. Steel pipe and steel sheet are adopted to compose reinforced frame.
- B. A compartment as Personal space for Helmet is set in the Frame center.

2. Fuel Tank

- A. Fuel Tank is made of plastic or steel including electric Fuel-Level-guage.
- B. When the Fuel Gauge is in the E-Line, there is about 1L of preserved fuel.

3. Oil-Tank(BH1-F) :

Oil Tank is made of plastic, including electric Fuel-Level-guage, with the capacity of 1.3L.

When the red indicating lamp of Oil Level is lit, there is about 300 c.c. preserved oil.

FOR
THE OTHERS

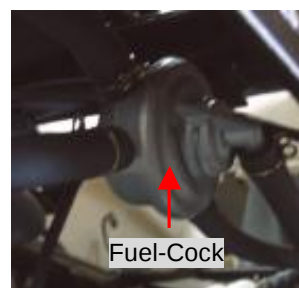


FOR
BH/BR/BK TYPE



4. Fuel-Cock:

Automatic Cock of negative pressure model.



3-4-2 Compartment and Seat

1. Compartment:

- A. Located in the center of scooter body, there is a Personal Space for helmet and other, etc.
- B. The maximum load capacity of compartment is 10kg.
- C. Please don't store precious or easy-to-break articles in the compartment without any protection.
- D. The Seat has to be locked. If the Seat is not locked during riding, it will affect the safety and even cause injury.
- E. Please pay attention not to let fuel or oil drop into the compartment.
- F. The cover of the compartment can be cleaned with vacuum cleaner.
It can also be washed and put back after dried.
(Please do not wash with volatile fluid, such as gasoline.)
- G. The seat is controlled by the seat lock on the side.
The seat is about 710mm (GF) and 800mm (GI) high from the ground.

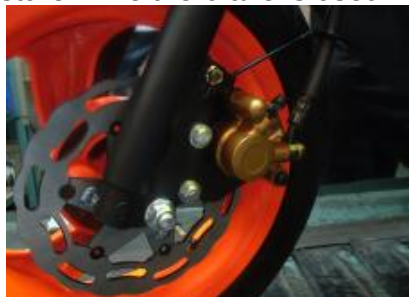
2. Helmet Holder:

There is a Helmet Holder at the position of Seat Hinge. open the Seat to hook or unhook Helmet.

3-4.3 Front & Rear Suspension System

1. Front-Fork:

- A. Front Fork of Internal Damper Type Including Aluminum Tube with internal Spring Hydraulic Buffer on RH and LH side each.
- B. Brake Con-rod and Bracket of Brake Lining are equipped between Front Fork and Disc Brake. Resistant Torque occurs toward the revolving direction when acting brake. The Torque will become the force to push Front-Fork up by using connection Rod. Therefore, the sink of Front-Fork is stopped and decreases the change of sitting gesture while the brake is used.



2. Rear-Suspension:

- A. Swing-Arm Suspension Mechanism is composed of single telescopic absorber between the crankcase and scooter body.
- B. Rear Axle Movable by telescopic shock absorber.

3-4-4 Brake System

1. Front Brake: (Disc Brake)

Hydraulic disc brake includes disc brake disc, brake caliper, brake oil hose, and master cylinder with oil level manhole.

It is operated manually by pulling the front brake on the right hand handle-lever.

