

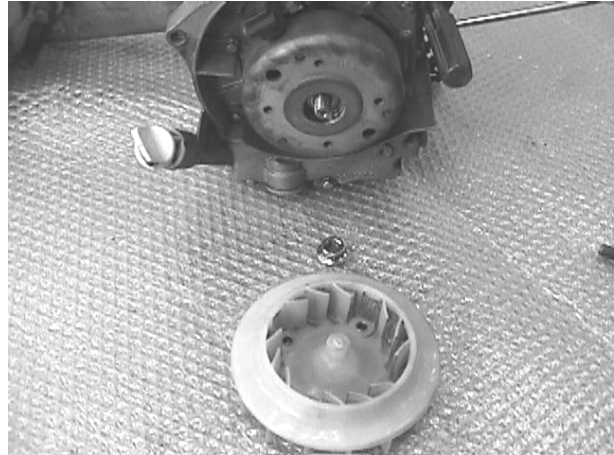
4-Stroke engine Dismantling, Maintaining, Repairing and assembling operation

- (1) Lubrication system
- (2) Engine dismantling
- (3) Install Engine
- (4) Drive pulley, starter, clutch, driven pulley
- (5) Cylinder head and valve
- (6) Cylinder and piston
- (7) AC generator
- (8) Final transmission mechanism
- (9) Crankcase, crank shaft
- (10) Carburetor

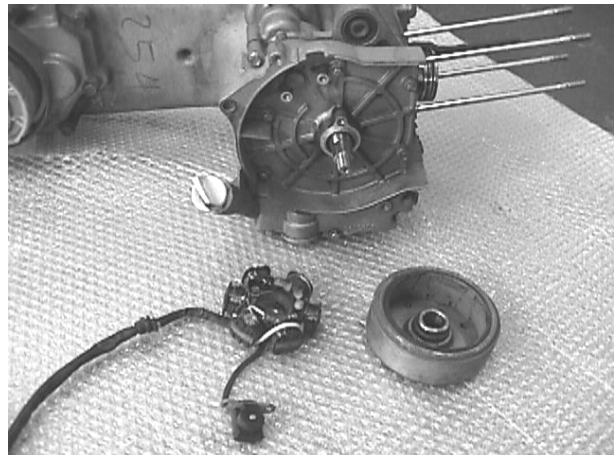
(1)Lubrication System

■ Oil Pump Dismantling

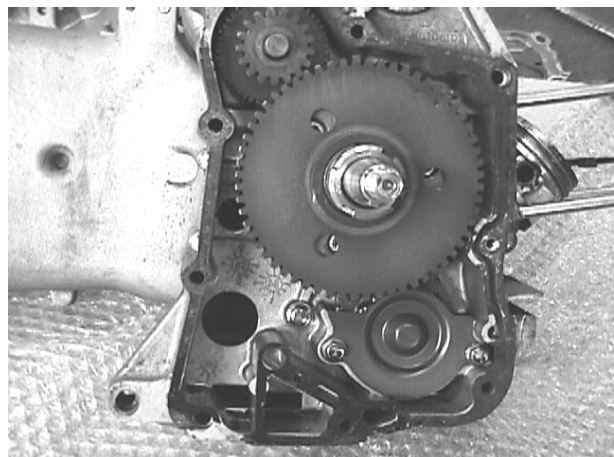
- 1.Remove the muffler.
- 2.Remove the AC flywheel magneto.



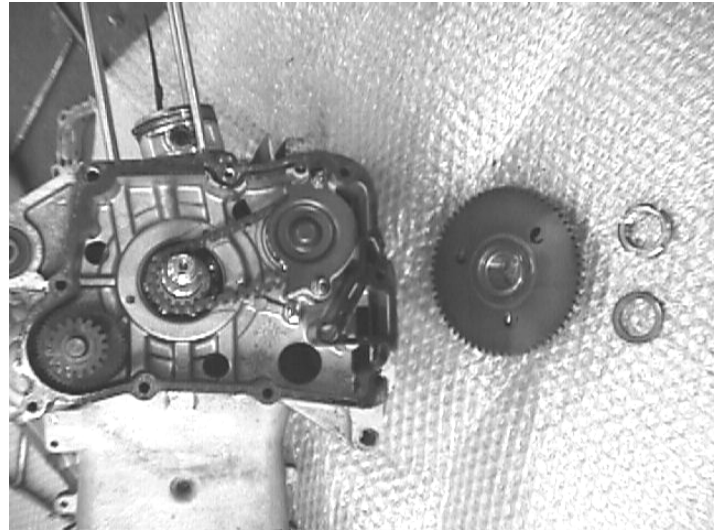
- 3.Remove the AC generator coil.
- 4.Take off the locking bolts of the right crankcase cover.
- 5.Remove the crankcase cover



- 6.Remove the washer, lock pin
- 7.Remove starter reduction gear and the starting clutch.
- 8.Remove oil pump separate plate by taking off the 2 bolts.

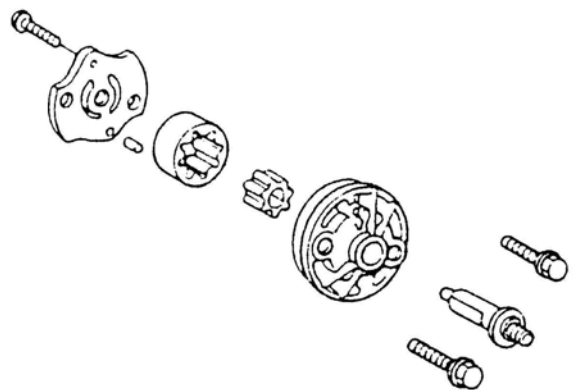


9. Remove the bolts from oil pump driving gear
10. Take off the driving gear and chain.
11. Remove the oil pump by taking off the locking bolt of the oil pump.



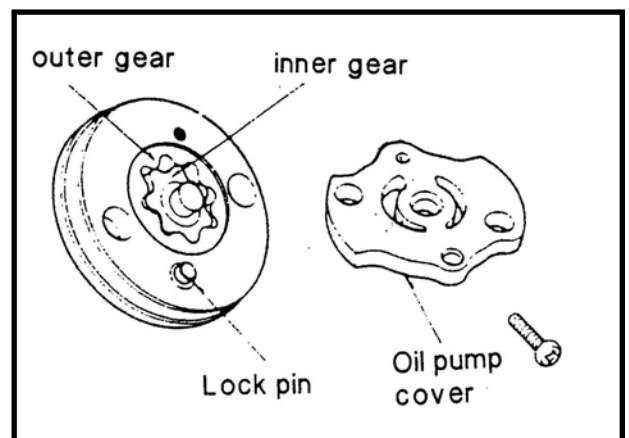
■ Oil pump Assembly

1. Install the inner and outer of the oil pump.
2. Install the oil pump shaft.



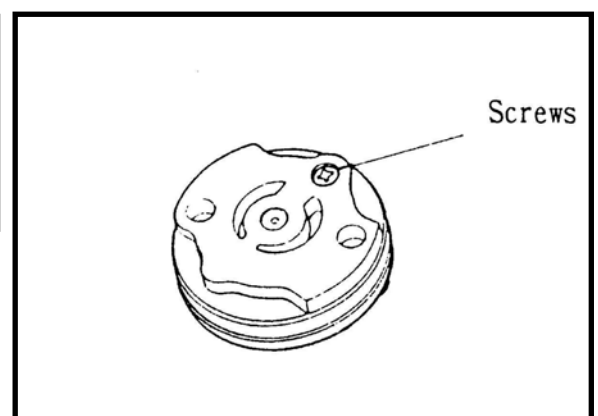
Note:
The notch of the oil pump shaft should comply With the notch of the inner gear.

3. Install the lock pin.
4. Match the lock pin hole to the pump cover and install the oil pump cover.
5. Put on the screws and tighten them.
6. After installing, turn the shaft lightly to assure installation.
7. Place the oil pump into the crankcase.



Note:
When installing, the arrow on the oil pump body should be pointed upwards. Then fill in the recommended oil before the installation.

8. Tighten the oil pump after installation.



Measurement data

item		Standard Value	Limit of use
		(mm)	(mm)
Oil pump	Clearance between the inner gear And outer gear	-	0.12
	Clearance between the outer gear And oil pump body	0.045-0.10	0.12
	Clearance between gear end and Oil pump body	0.045-0.10	0.12

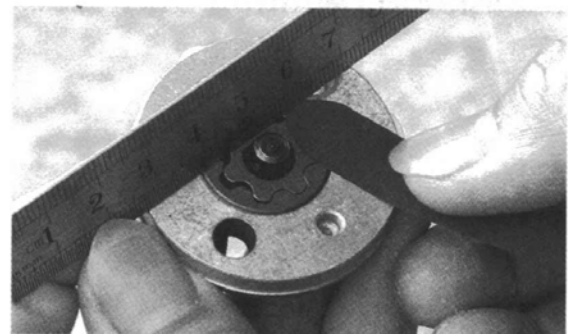
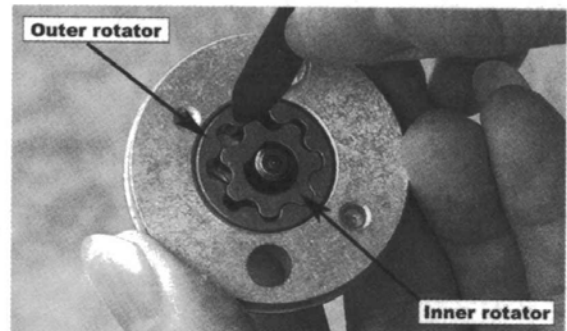
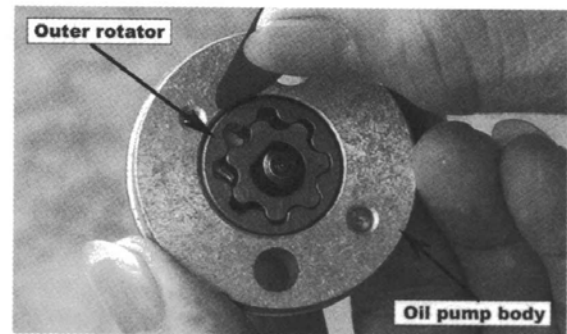
Troubleshooting

Reduction in fuel oil volume

- a. Natural consumption
- b Leakage of fuel
- c. Piston loop seizes, or improperly installation
- d. Worn out of valve's oil seal

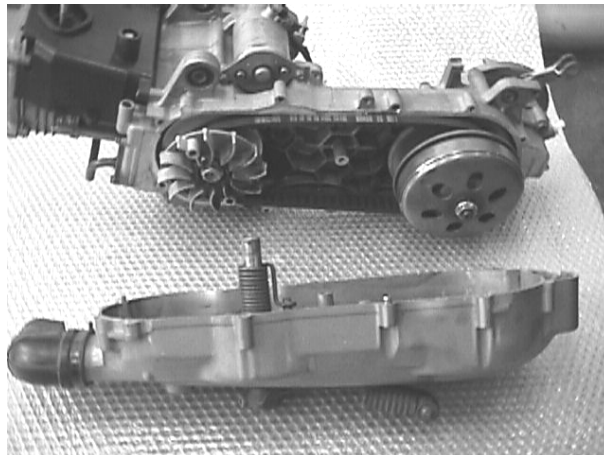
Engine burning-out

- a. Zero or too low oil pressure
- b. Blockage in oil route
- c. Did not use the fuel oil recommended

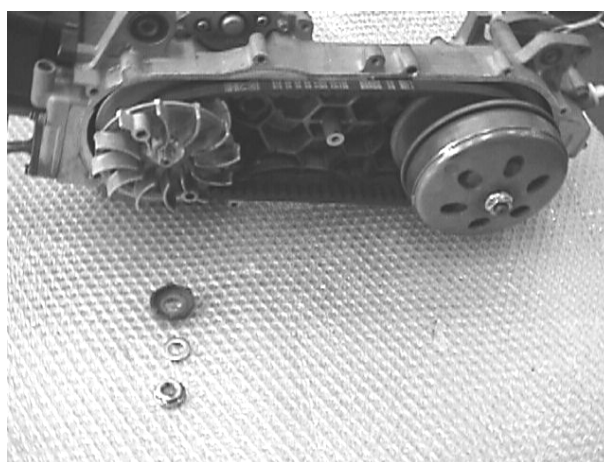


(C)Driving Pulley

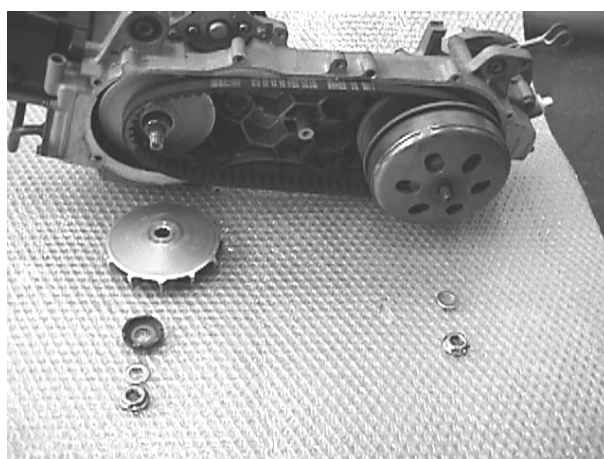
1. Take off the screws of left cover, remove the left cover.



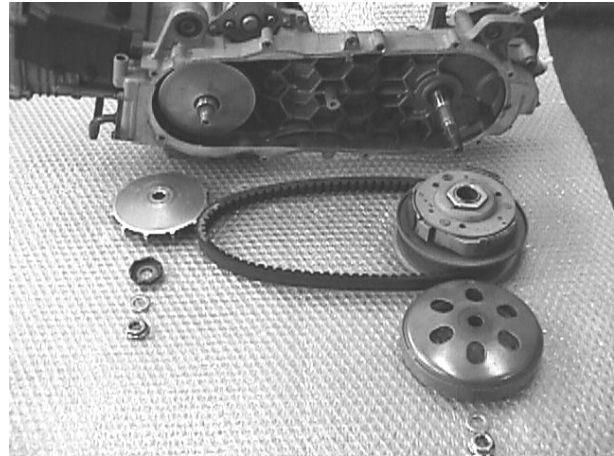
2. Remove the lock nuts of driving Plate and the nuts of Starter gear And clutch.



3. Take off the ramp plate, Belt and clutch.



4. Take off the boss and driving plate.



5. Continuous Various Transmission engagement speed inspection

- Connect an electric tachometer.
- Seated on the motorcycle with on level ground, increase the engine's speed slowly and notice the RPM at which the motorcycle begins to move forward.

Specified Engagement RPM : 3100 ± 300 rpm

6. Clutch "LOCK-UP" inspection

- Apply the rear brake as firm as possible
- Briefly open the throttle fully and notice the maximum engine RPM sustained during the test cycle.

Specified Clutch "LOCK-UP" RPM : 5200 ± 400 rpm

5.To assemble the driving pulley, reverse the whole procedure.

Locking torque:

1.Nut of driving pulley M12: 4.0-5.5kg/m.

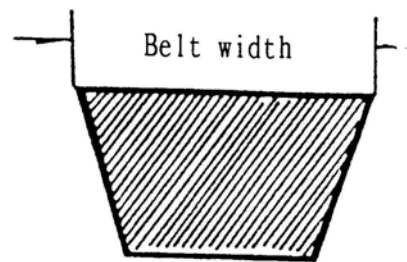
2.Locking nut of clutch M12: 4.0-5.5kg/m

6.Checking driving belt

(1)check driving belt is cracked or not
rubber and fiber is loosened or not
also check if they are extraordinary
worn out.

(2)driving belt width:

limit of use :change it below 19mm



7.Disassemble slide driving plate set.

(1)Remove bush of slide driving plate.

(2)Remove screw, and disassemble the
cover of slide driving plate.

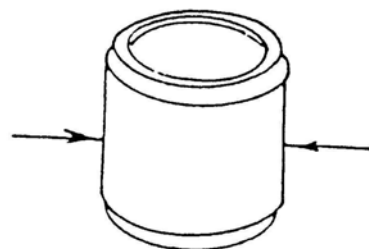
(3)Remove ramp plate.

(4)Remove weight roller.

8.Checlomg

(1)Check the wearing condition of
weight roller.

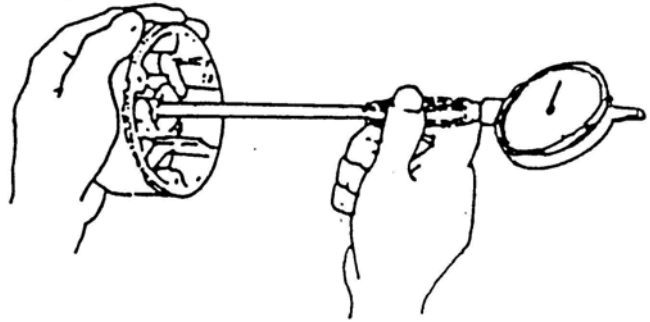
Limit of use : change it below 17.4mm



Check the wearing condition

(2)Check gasket inner dia of

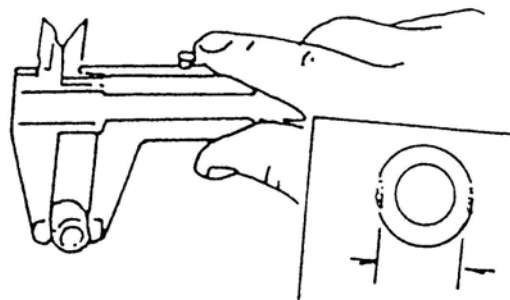
slide driving plate: limit
of use : change it over 24.1mm.



(3)Check the driving pulley
surface wearing condition.

(4)Check the outer diameter of the
contact surface of the movable
driving plate.

limit of use : change it
below 23.94mm.

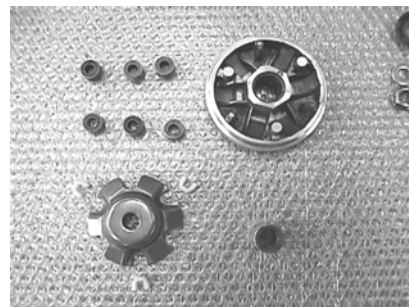


9.Assemble the slide driving plate.

(1)Clean up the inside surface of slide
driving plate, then assemble the
roller.

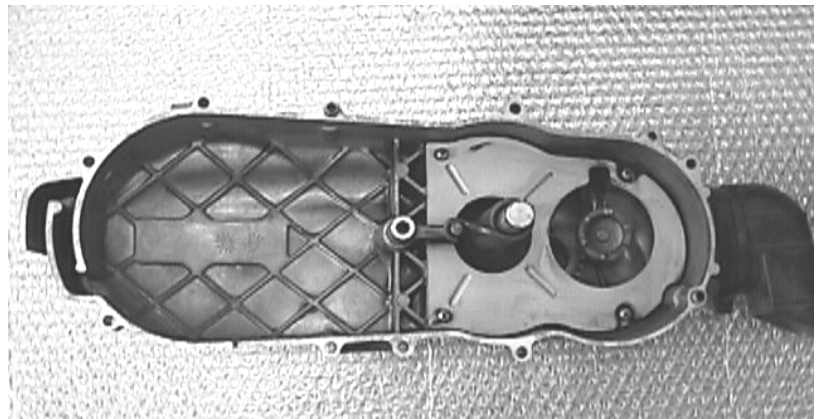
(2)Assemble the ramp plate.

(3)Other procedure refers to the
opposite procedure of
disassembling.



D. Starter dismantle (only for carburetor model)

1. Dismantle left crankcase cover
2. Remove hexagon nut, then remove the starter lever.
3. Remove five screw of separated plate.
4. Remove start spring from start returning position.
5. Remove driven gear comp. of kick starter.
6. Remove the retaining C-type Ring.
7. Remove spindle comp. of kick starter.



8. Checking starter
 - a. Check the wearing condition of the outer diameter of spindle comp and the inner diameter of bush and gear.
 - b. Check the wearing condition of shaft of driven gear comp. Gear sets and ratchet.
9. Assembling the starter

Assemble the starter follows the.
Opposite procedure of dismantling.
Locking torque : M6: 1.0~1.2kg/m.

Note:

- ① Make sure one end of the torsion spring is hooked on the groove of driven gear, and another end of torsion spring is hooked on the pole of inside of left crankcase.
- ② Put some grease in every shaft and gear sets before assembly.

E. Clutch driven pulley

1. Dismantling the clutch

- a. Remove left crankcase cover.
- b. Remove driving plate.
- c. Remove driving belt.
- d. Remove locking nut, then remove clutch.

2. Assemble the clutch : follows the opposite procedure of dismantling.

Locking torque:

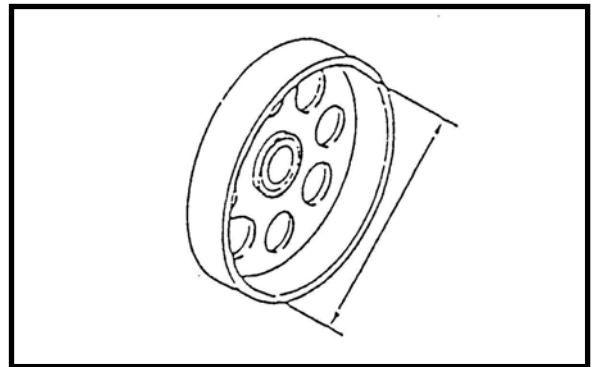
M12: 4.0~5.5kg.m

3. Checking clutch: dismantling tool

a. Check clutch driving face.

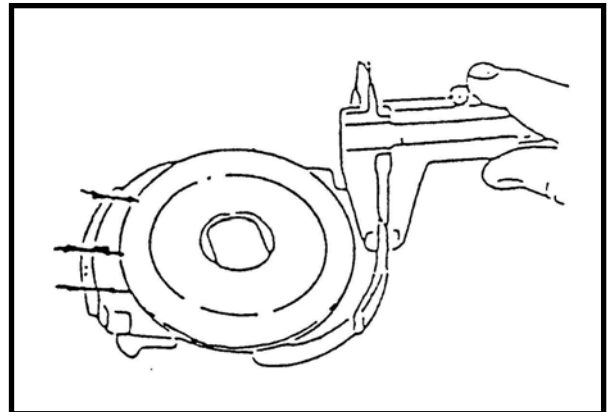
Check clutch cover about its wearing condition
And inner diameter measurement.

- limit of use: change it above 125.5mm



b. Check clutch lining wearing condition and Measure the lining thickness.

- limit of use : change it below 1.5mm.



c. Check driving spring free length.

Standard: 151mm

Limit of usage:

Change it below 127 mm

d. Check wearing condition of driving plate sets. And measure outer diameter.

● limit of use: change it above 33.95mm.

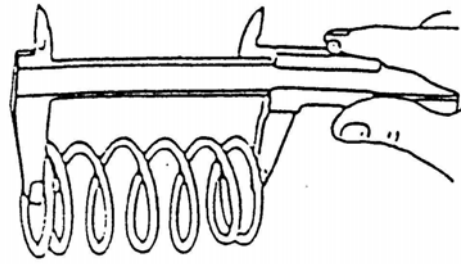
e. Check wearing condition of slide driven plate.

And measure its Inner diameter.

● limit of use : change it above 34.00mm.

f. Check is there any wearing occur to the ditch

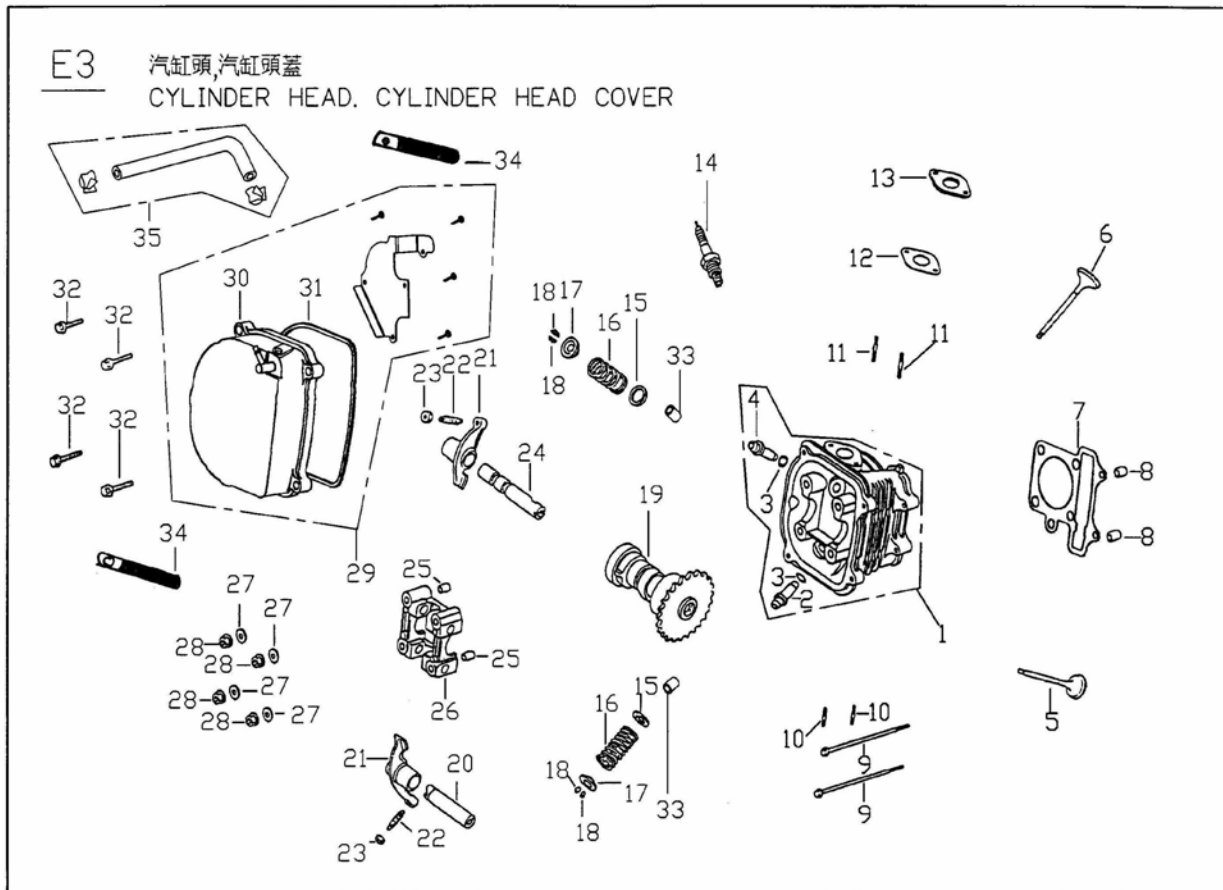
g. Check wearing condition of oil seal, if necessary, change a new one.



Cylinder head and valve

A.Troubleshooting

B.The operation data information



1	HEAD COMP. CYLINDER	19	"CAM,SHAFT ASSY."
2	"GUIDE,EXH VALVE "	20	"SHAFT,EX.ROCKER ARM"
3	O-RING	21	VALVE RXKER ARM
4	"GUIDE,IN VALVE "	22	SCREW TOPPED ADJUSTER
5	VALVE EXHAUST	23	HEXAGON NUT
6	VALVE INLET	24	"SHAFT,EX.ROCKER ARM "
7	GASKET HEAD CYL.	25	LOCK PIN
8	LOCK PIN (D10*14L)	26	CAMSHAFT HOLDER
9	HEXAGON FLANGE BOLT	27	PLAIN WASHER
10	STUD BOLT	28	HEXAGON FLANGE NUT
11	STUD BOLT	29	CYL.HEAD COVER COMP.
12	INSULATOR CARB GASKET	30	CYL.HEAD COVER
13	INSULATOR CARB	31	"PACKING,CYL. HEAD COVER "
14	IGNITION PLUG	32	HEXAGON FLANGE BOLT
15	PLAIN WASHER	33	VALVE SEAL
16	"SPRING,VALVE "	34	CLIP
17	RETAIER VALVE SPRING	35	TUBE CYL. COMP.

A. Troubleshooting.

If the cylinder head is malfunctioned, usually it can tell from the measurement of the Compression pressure or from the noise that comes from the upper part of the engine.

1. Unsmooth idle speed

- Compression pressure is too low.

2. Insufficient compression pressure.

- Poor adjustment of valve clearance
- Valve being burned out or bent
- Valve timing is not correct
- Valve spring is damaged.
- Poor sealing of valve base.
- Leakage in Cylinder head gasket.
- Cylinder head twisted or cracked.
- Spark plug is not properly installed.

3. Compression pressure is too high.

- There is too much carbon accumulated in the combustion chamber.

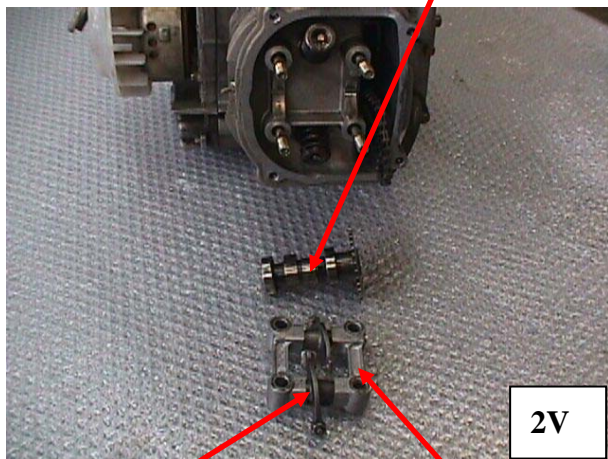
4. There is white fume coming out from the exhaust pipe.

- The valve stem or valve guide pipe is worn out.
- Valve stem's oil seal is damaged.

5. Abnormal noise

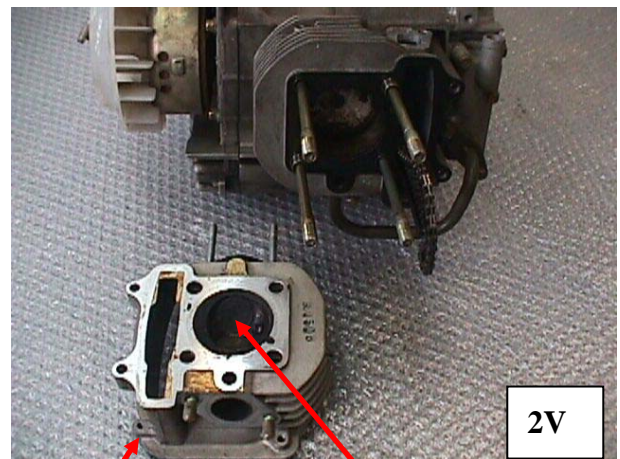
- Poor adjustment of valve clearance
- Valve burned or damaged spring
- Camshaft is worn out.
- Chain adjuster is worn out.
- Camshaft, valve rocker arm is worn out.

Cam shaft assy.



Rocker arm

holder



cylinder head

valves

B. The operation data information (125cc)

1. Engine models(BF125/BF2-125/PA100/PA125/CS125/I-charge 125)

Description		Standard Value (mm)	Limit of use (mm)
Clearance between adjuster tapped Screw and valve stem (Before warm up)	IN & EX	0.08	
Compression pressure(throttle open full)		12kg/750rpm	
Height of the cam's convex part	IN	26.3	25.9
	EX	26.3	25.9
Inner diameter of rocker arm shaft	IN & EX	10.000~10.015	10.10
Outer diameter of rocker arm shaft	IN & EX	9.972~9.987	9.91
Valve base angle	IN	1.0	1.8
	EX	1.0	1.8
Outer diameter of valve stem	IN	4.900~4.975	4.900
	EX	4.955~4.970	4.955
Inner diameter of valve guide	IN	5.000~5.012	5.30
	EX	5.000~5.012	5.30
Clearance between valve stem and Valve guide	IN	0.010~0.037	0.08
	EX	0.030~0.057	0.10

2. Engine models(M2-150-2V / CP150)

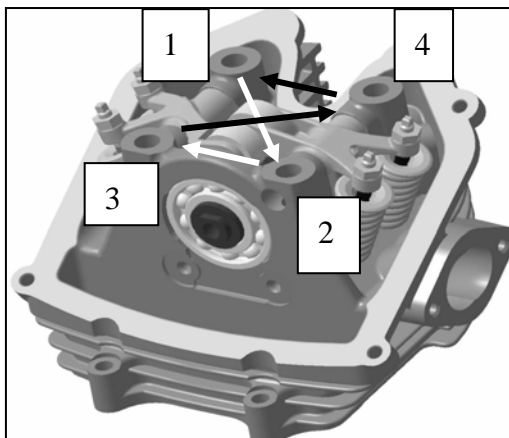
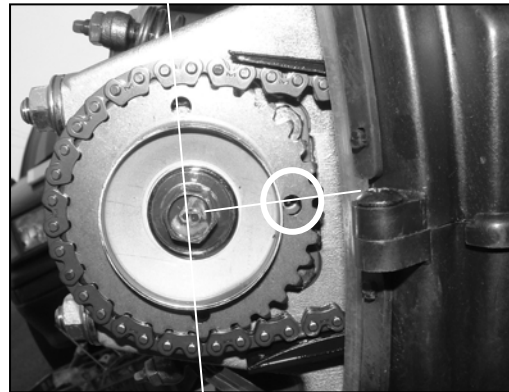
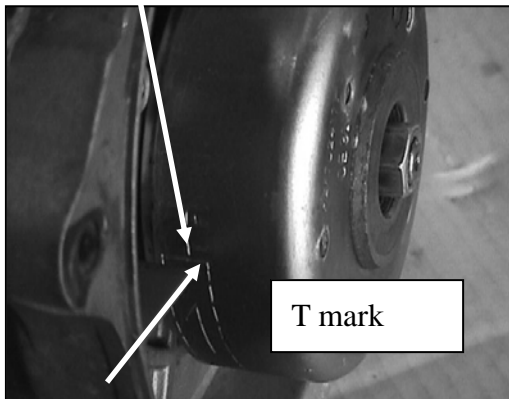
Description		Standard Value (mm)	Limit of use (mm)
Clearance between adjuster tapped Screw and valve stem (Before warm up)	IN & EX	0.08	
Compression pressure(throttle open full)		11kg/650rpm	
Height of the cam's convex part	IN	26.625	26.230
	EX	26.530	26.130
Inner diameter of rocker arm shaft	IN & EX	10.000~10.015	10.10
Outer diameter of rocker arm shaft	IN & EX	9.972~9.987	9.91
Valve base angle	IN	1.0	1.8
	EX	1.0	1.8
Outer diameter of valve stem	IN	4.900~4.975	4.900
	EX	4.955~4.970	4.955
Inner diameter of valve guide	IN	5.000~5.012	5.30
	EX	5.000~5.012	5.30
Clearance between valve stem and Valve guide	IN	0.010~0.037	0.080
	EX	0.030~0.057	0.100

C.Dismantling and installing the Cam shaft(BF-150/BF2-150)

- 1.Take off the left cover.
- 2.Remove the intake pipe from the Cylinder head cover.
- 3.Take off the 4 bolts of the cylinder head cover and take off the cylinder head cover.
- 4.Turn the flywheel clockwise and let the "T" mark on the flywheel point to the crankcase mark and make the round hole on the cam chain gear point downupwards.

This is the upper dead point of compression.

- 5.Loosen and take off the bolt of cam shaft sprocket.
- 6.Remove the cam sprocket gear from the cam chain.
- 7.Remove the cam shaft.
8. When tighten the 4 nuts of the cylinder head, you shall obey the figure shown procedure, and the tighten torque is 2.0 kg-m.



3. Engine models(BF-150/BF2-150/M2-150-4V)

Description		Standard Value (mm)	Limit of use (mm)
Clearance between adjuster tapped Screw and valve stem (Before warm up)	IN & EX	0.08	
Compression pressure(throttle open full)		12kg/650rpm	
Height of the cam's convex part	IN	34.945	34.940
	EX	34.339	34.330
Inner diameter of rocker arm shaft	IN & EX	10.000~10.015	10.020
Outer diameter of rocker arm shaft	IN & EX	9.972~9.987	9.965
Valve base angle	IN	1.0	1.8
	EX	1.0	1.8
Outer diameter of valve stem	IN	4.975~4.990	4.970
	EX	4.975~4.990	4.970
Inner diameter of valve guide	IN	5.065~5.080	5.090
	EX	5.065~5.080	5.090
Clearance between valve stem and Valve guide	IN	0.075~0.105	0.115
	EX	0.075~0.105	0.115
Free length of valve spring	IN & EX	37.70~38.3	_____

(6)Cylinder and piston

A.Trouble shooting

B.The Operation notice

C.Data

D.Dismaniling cylinder, piston

E.Installing cylinder, piston

A. Troubleshooting.

a. Compression pressure is too low, difficult to start engine and engine running unsmoothly.

1. Cylinder head gasket cracked
2. Spark plug is not well locked
3. Piston ring worn out or cracked
4. Cylinder, piston worn out.
5. Reed valve is out of order.

b. Compression pressure is too high; Engine overheating; abnormal noise.

1. piston tip has too much carbon accumulated.

c. Abnormal piston noise

1. Cylinder and piston worn out.
2. Piston pin hole or Piston pin worn out.
3. Connecting rod small end or bearing worn out.

d. Abnormal piston or cylinder noise

1. Piston ring worn out or cracked
2. Cylinder worn out or cracked

B. The operation notice

1. Clean before operation to avoid particles dropping into the engine.
2. The contact surface of gasket must be clean.
3. Dismantle cylinder and cylinder head by screw driver. Do not injure the contact surface.
4. Cylinder inner surface and piston outer face can't be injured. Contact Surface should lubricate by specified oil.



C1.Data (125CC)

Part name /description		Standard value	Limit of use	
		(mm)	(mm)	
Cylinder	Bore	51.490~51.510	51.60	
	Curve	-	0.005	
	Cylindricity	-	0.005	
	Roundness	-	0.005	
Piston/ Piston ring	Clearance b/w Piston and Piston ring	1st ring	0.03~0.07	0.10
		2 nd ring	0.02~0.06	0.10
	Clearance of cutting section	1st ring	0.15~0.35	0.50
		2 nd ring	0.15~0.35	0.50
		side ring	0.2~0.8	-
	Piston outer diameter	51.460~51.480	51.40	
	Measuring location of piston outer dia.	Down to 7mm from the piston skirt	-	
	Clearance b/w piston and cylinder	0.025~0.035	0.10	
Piston pin hole inner dia	13.022~13.013	13.045		
Piston pin outer diameter		12.996~13.00	12.96	
Clearance between piston and piston pin		0.02~0.017	0.025	
Connecting rod small end inner dia		13.015~13.028	13.060	

C2.Data (150CC)

Part name /description		Standard value (mm)	Limit of use (mm)	
Cylinder	Bore	57.490~57.510	57.600	
	Curve	-	0.005	
	Cylindricity	-	0.005	
	Roundness	-	0.005	
Piston/ Piston ring	Clearance b/w Piston and Piston ring	1st ring	0.03~0.07	0.10
		2 nd ring	0.02~0.06	0.10
	Clearance of cutting section	1st ring	0.10~0.25	0.50
		2 nd ring	0.10~0.25	0.50
		side ring	0.2~0.7	---
	Piston outer diameter	57.470~57.490	57.400	
	Measuring location of piston outer dia.	Down to 5 mm from the piston skirt	---	
	Clearance b/w piston and cylinder	0.025~0.035	0.10	
	Piston pin hole inner dia	15.006~15.012	15.030	
Piston pin outer diameter	14.990~14.992	14.96		
Clearance between piston and piston pin	0.020~0.017	0.025		
Connecting rod small end inner dia	15.010~15.028	15.060		

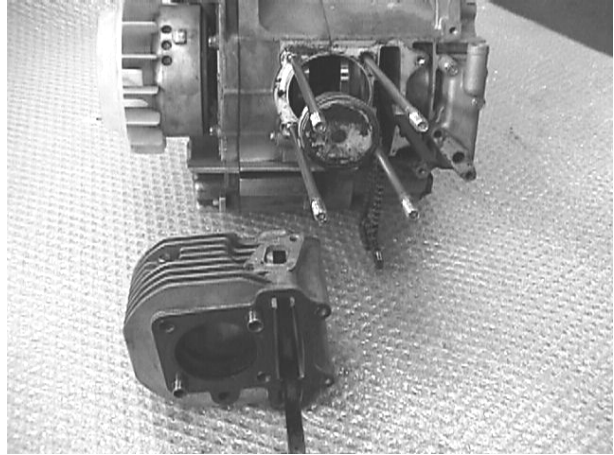
D. Dismantling

a. Dismantling Cylinder

1. Remove the cylinder head.
2. Remove 2 bolts, then the camshaft chain adjuster
3. Remove CAM chain guide.
4. Remove cylinder.
5. Remove the cylinder gasket, lock pin

and

clean the gasket on the cylinder.



b. Dismantling piston

1. Remove the piston pin clip.

NOTICE:

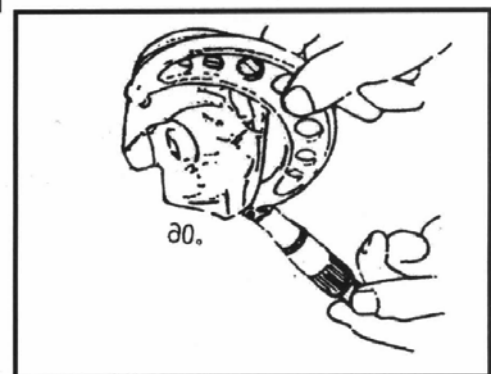
Don't drop the clip into the crankcase.

2. Remove the piston pin and take off the piston.
3. Check piston, piston pin, piston ring.
4. Remove the piston ring

NOTICE: NOTICE:

Don't make piston ring worn out or damaged

5. Clean the carbon in the groove of the piston ring.



c. PISTON OUTER DIA MEASUREMENT:

1. Measuring location:

Perpendicular to the piston pin hole, down to
7mm(125CC), or 5mm(150CC) from the piston skirt.

Limit of use : change it when less than 51.4mm.(125CC)
Limit of use : change it when less than 57.4mm.(150CC)

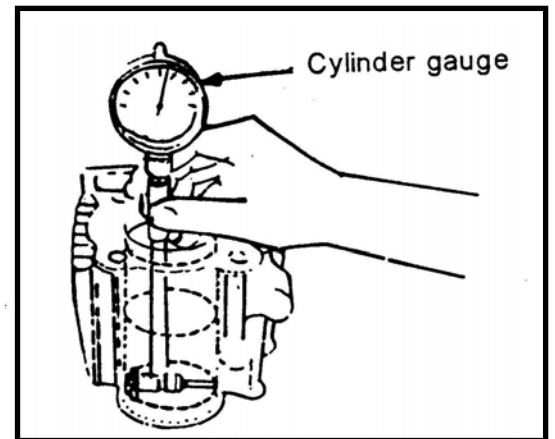
2. The clearance between the piston and piston pin:

Limit of use : change it when above 0.005m.

3. Checking any wearing, damage inside the cylinder.

Vertical to piston pin, and in X-Y direction to
measure cylinder bore from the upper, middle and
lower location.

Limit of use : Change it when above 51.6mm.(125CC)
57.6mm(150CC)



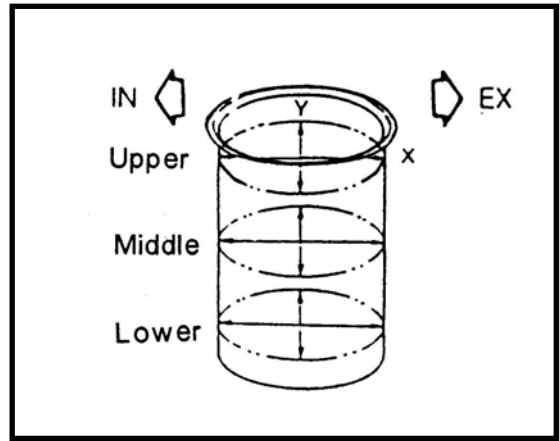
4. The maximum clearance between the cylinder and piston pin.

Limit of use : Change it when above 0.1mm.

5.The difference between the X and y is the roundness.

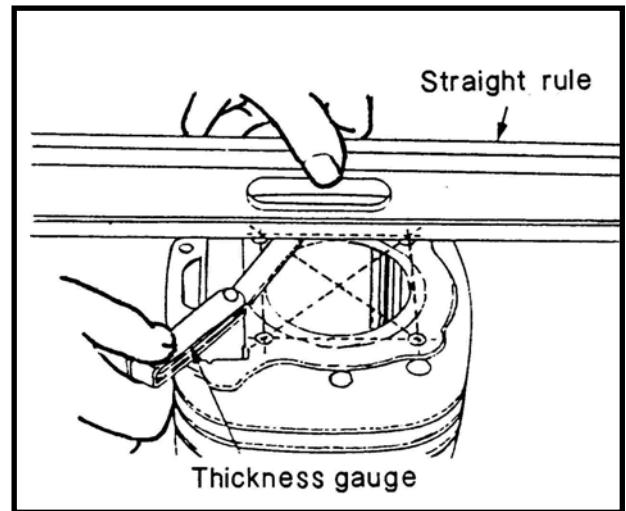
6.The cylindrility is the max value of the difference between the upper, Middle and lower position of the inner dia in X or Y direction.

Limit of use : Roundness:change it when above 0.005mm.
Cylindrility:change it when above 0.005mm.



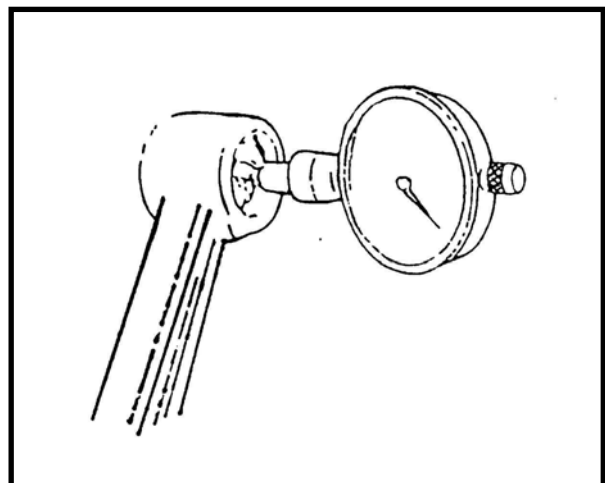
d.Checking the flatness of cylinder contact surface.

Limit of use : change it when above 0.05mm.



e.Connecting rod small end inner diameter measurement.

Limit of use : change a new one when above 13.06mm.(125CC)
15.06mm.(150CC)



E. Installing Cylinder and piston

a. Installing piston and piston rings

1. Lubricate the piston rings by motor oil.

NOTICE:

- a. Be careful not to scratch the piston and not to break the piston ring.
- b. The mark (on the ring) should be upward when installing.
- c. after installing, the ring should be smoothly rotated.

2. Clean up the residual gasket on the crankcase.

NOTICE:

Do not drop other objects into the crankcase.

3. Assemble the piston, piston pin and piston pin clip.

NOTICE:

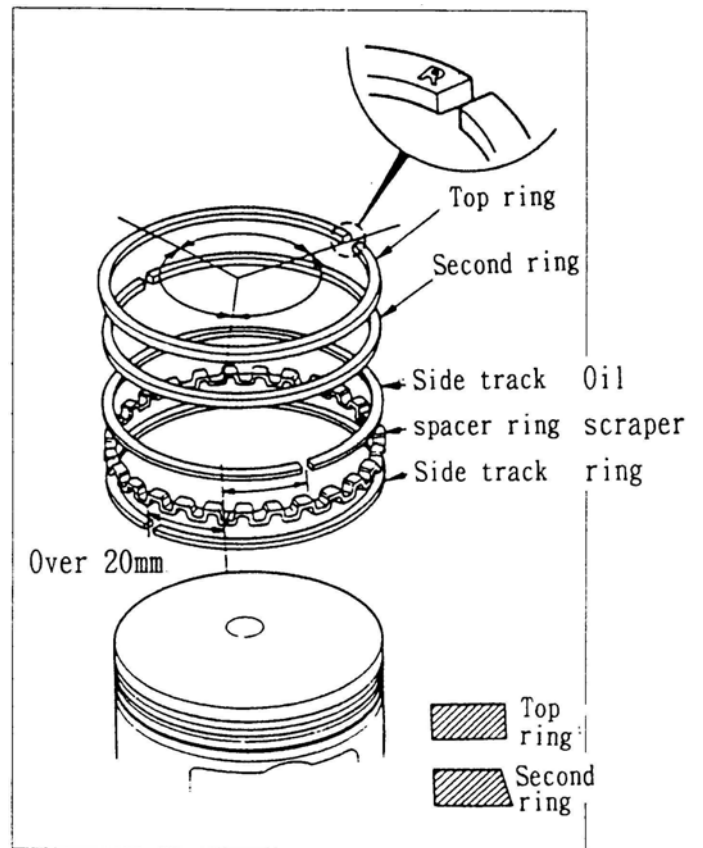
- a. The mark "IN" on the piston tip should face to the INLET side.
- b. Do not drop the piston pin clip into the crankcase and to clog the crankcase with rags.

b. Installing piston

1. Fix the lock pin and gasket on the crankcase.
2. Lubricate the Cylinder inner surface, piston and piston rings by Motor Oil.
3. Install the piston ring into the cylinder carefully.

NOTICE:

- a. The piston ring cannot be damaged or cracked.
- b. The cutting section of three rings must be arranged at intervals of 120°



Final transmission mechanism

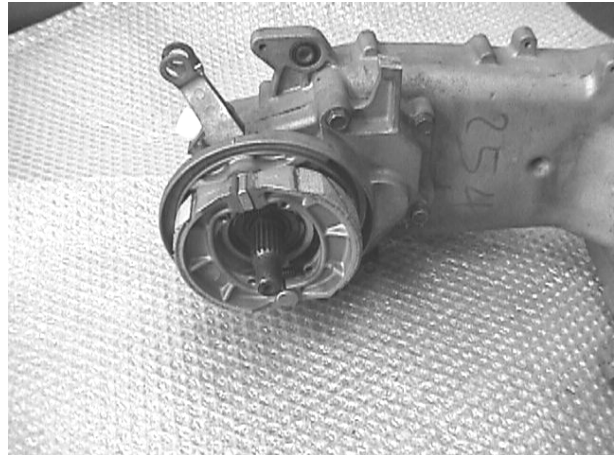
- A. Troubleshooting.
- B. Dismantle the final transmission mechanism.
- C. Check the final transmission mechanism.
- D. Assemble the final transmission mechanism.

A. Troubleshooting

- Engine can be started, but the vehicle doesn't move.
 - 1.Gear worn-out or cracked.
 - 2.Gear burnt out.
 - Noise occur when running.
 - 1.Gear worn out, burnt or gear surface.
 - 2.Bearing worn out of loosen.
 - Oil leakage
 - 1.Too much oil
 - 2.Seal worn out or damaged.

B. Disassemble the final transmission mechanism:

1.Remove the rear wheel.

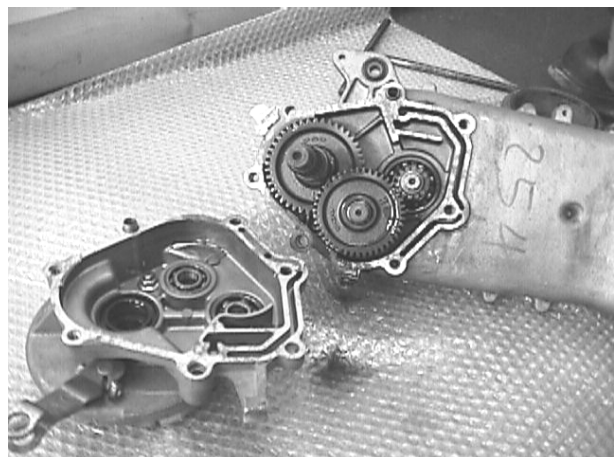


2.Drain the oil in the gear box.



3.Remove the bolt in the gear box cover.

Take off the gear box.



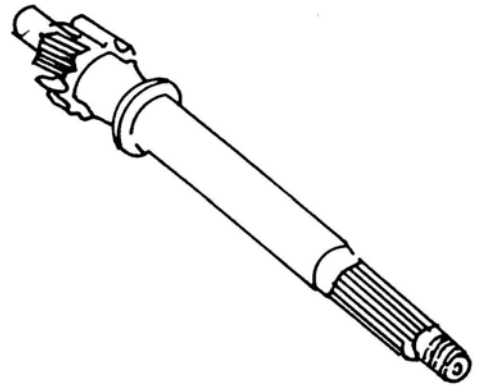
3.Remove the final reduction gear
And idle gear.

5.Clean up the gear box.

C. Check the final transmission mechanism

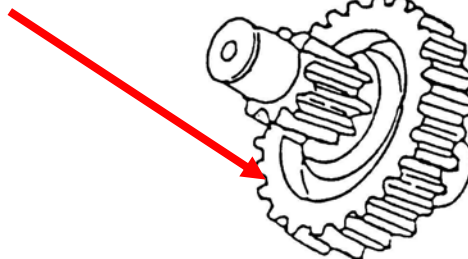
1.Check the wearing condition of driving shaft and gears.

Gear teeth number: 14 T (125CC) ; 15 T (150CC)

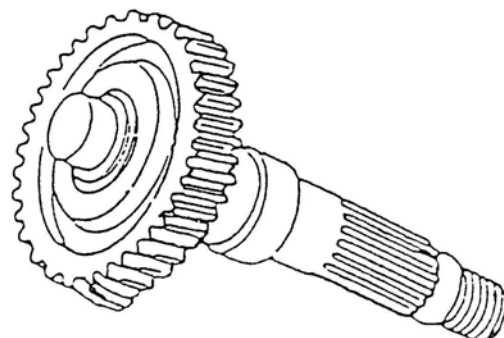


2.Check the wearing condition of idle gear shaft
and idle gears.

Gear teeth number 43 T (125CC) ;
 42 T (150CC)



3.Check the wearing condition of the final
reduction gear.



4. Check the wearing condition of the oil seal and bearing.

D. Assemble the final transmission mechanism, please follow the opposite procedure of disassembling. After locking the drain bolt, refill 90cc of gear oil SAE90.

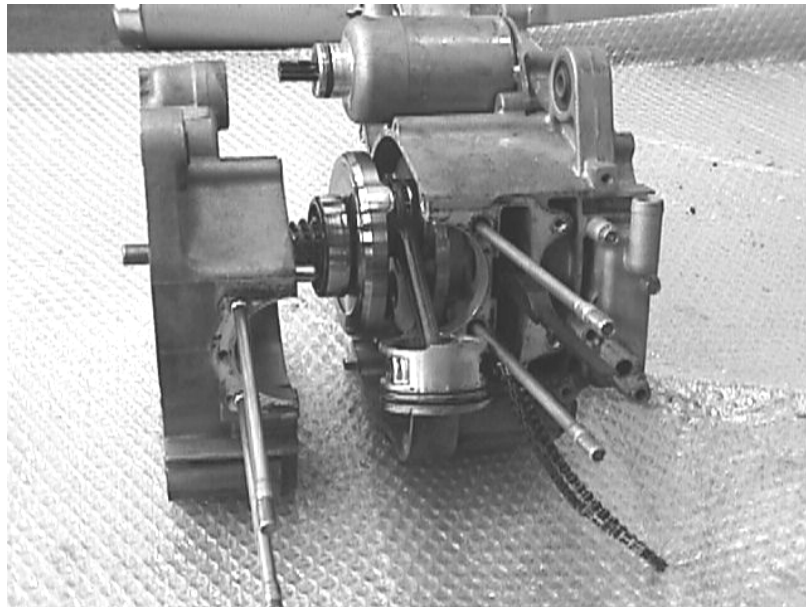
Locking torque:	M6: 1.0~1.2kg/M
	M10: 3.5~4.0kg/M
Drain bolt:	M8: 1.8kg/M

(9)Crankcase, Crankshaft:

- A. Disassembling diagram.
- B. Troubleshooting.
- C. Data
- D. Remove crankcase and crankshaft.
- E. Check crankshaft.
- F. Assemble the crankcase.

A. Disassembling diagram

Torque: 1.0~1.2kg-m



B. Troubleshooting

Engine noise:

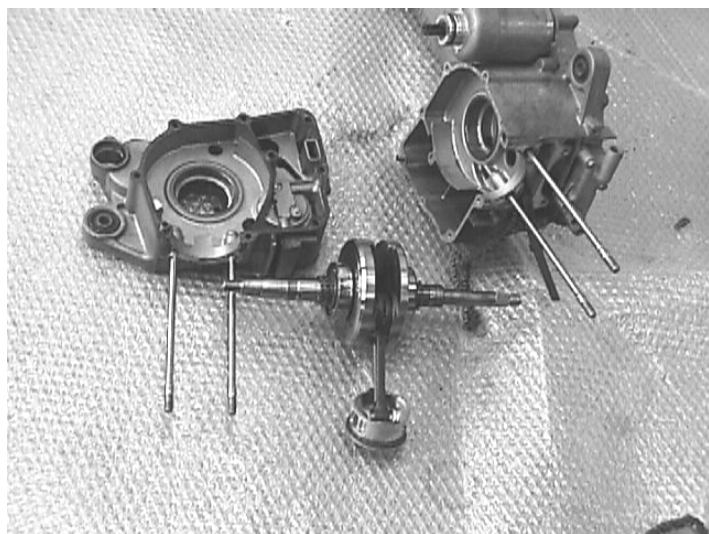
- 1.The bearing of final transmission mechanism is loosen.
- 2.Crank pin of bearing is slack.
- 3.The bearing of gear box is loosen.

C.Data

Item	Standard value(mm)	Limit of use.(mm)
Clearance of connecting rod big end axle direction	0.10~0.35	0.55
Clearance of connecting rod big end vertical direction.	-	0.04
Swingness of the crank shaft journal.	0.03	0.10

D. Remove the crankcase and crankshaft by the following procedures:

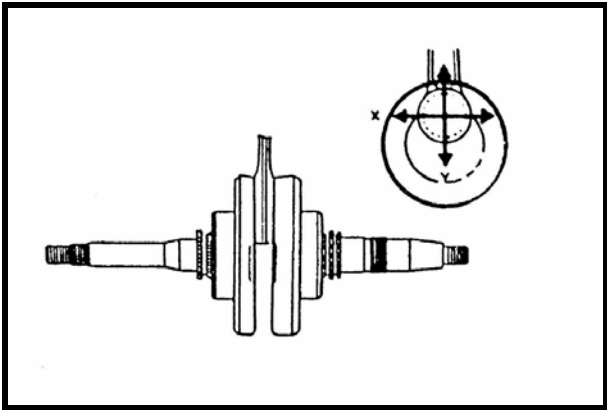
- 1.Remove the engine.
- 2.Remove the muffler.
- 3.The carburetor.
- 4.Engine corer.
- 5.Cylinder head.
- 6.Cylinder.
- 7.The driving plate.
- 8.AC flywheel magneto.
- 9.The starter clutch.
- 10.Oil pump.
- 11.Bolts of left/right crankcase.



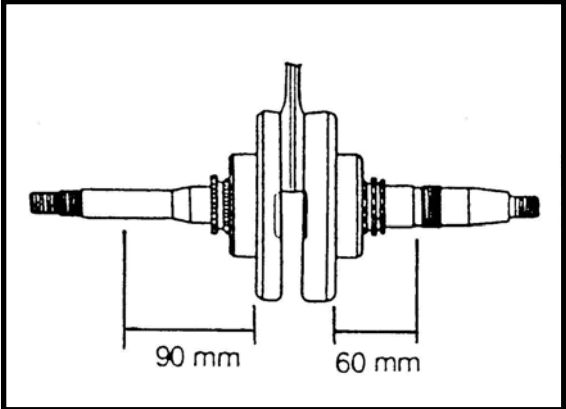
E. Check crankshaft

1. Measure the difference of the connecting rod big end between the X and Y

Limit of use : replace it when above 0.04mm.



2. Measure the swing ness of the crankshaft journal.

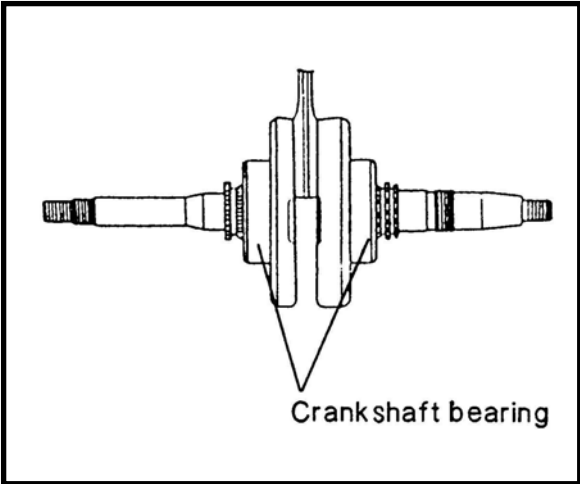


Limit of use	
A	B
Change it when above 0.1mm	Change it when above 0.1mm

A

B

3. Check the looseness of crankshaft bearing.
If it is loosen, replace to a new one.



F.Assemble crankcase:

- 1.assemble crankcase according to the opposite procedure of disassembling.
- 2.The locking torque of bolts and nuts are described in previous chapter please refer.

(10)Carburetor:

- A.General theory
- B.Troubleshooting.
- C.Dismantling the carburetor.
- D.Dismantling the float and nozzle.

CARBURETOR SPECIFICATIONS:

ITEM	SPECIFICATION	SPECIFICATION
Model	125 cc	150 cc
Carburetor type	KEIHIN CVK24	KEIHIN CVK24
Bore size	24mm	24 mm
I.D. NO	013	046
Idle r/min	1700 ± 100	1700 ± 100
Float height	18.0 ± 0.5 mm	18.0 ± 0.5 mm
Main jet	#102	#102
Jet needle	4HGGN	4HLGL
Needle jet	P-O	P-O
Pilot jet	#35	#35
Pilot screw (PRE-OPENING)	2 1/4 turns out	1 1/ 2 turns out

(A) General theory

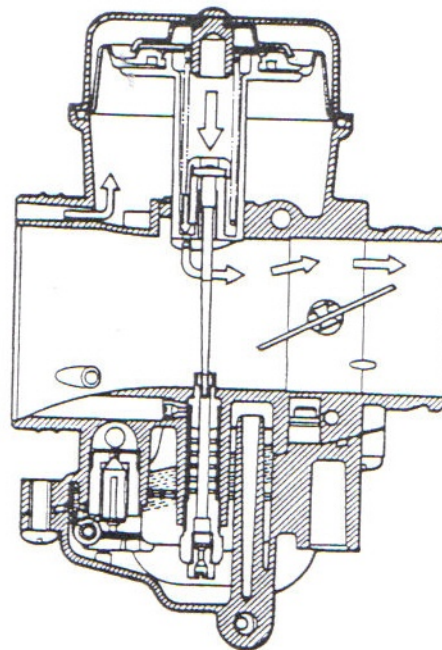
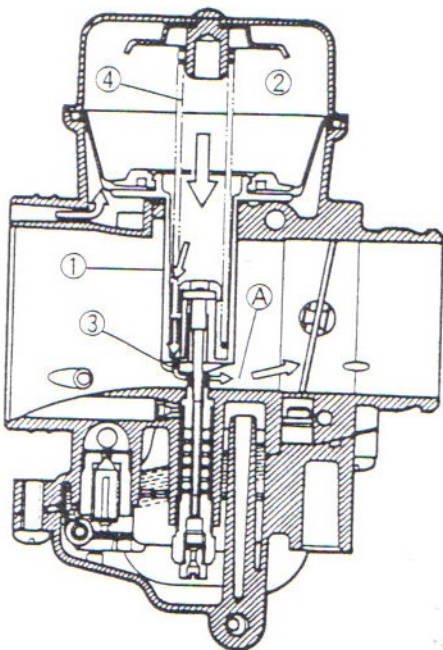
DIAPHRAGM AND PISTON OPERATION

The carburetor is a variable-venturi type, whose venturi cross sectional area is increased or decreased automatically by the piston valve ①. The piston valve moves according to the negative pressure present on the downstream side of the venturi [A]. Negative pressure is admitted into the diaphragm chamber ② through an orifice ③ provided in the piston valve ①.

Rising negative pressure overcomes the spring ④ force, causing the piston valve ① to rise into the diaphragm chamber and prevent the air velocity from increasing. Thus, air velocity in the venturi passage is kept relatively constant for improved fuel atomization and precise air/fuel mixture.

LOWER POSITION OF THE PISTON VALVE

UPPER POSITION OF THE PISTON VALVE



NEGATIVE PRESSURE →

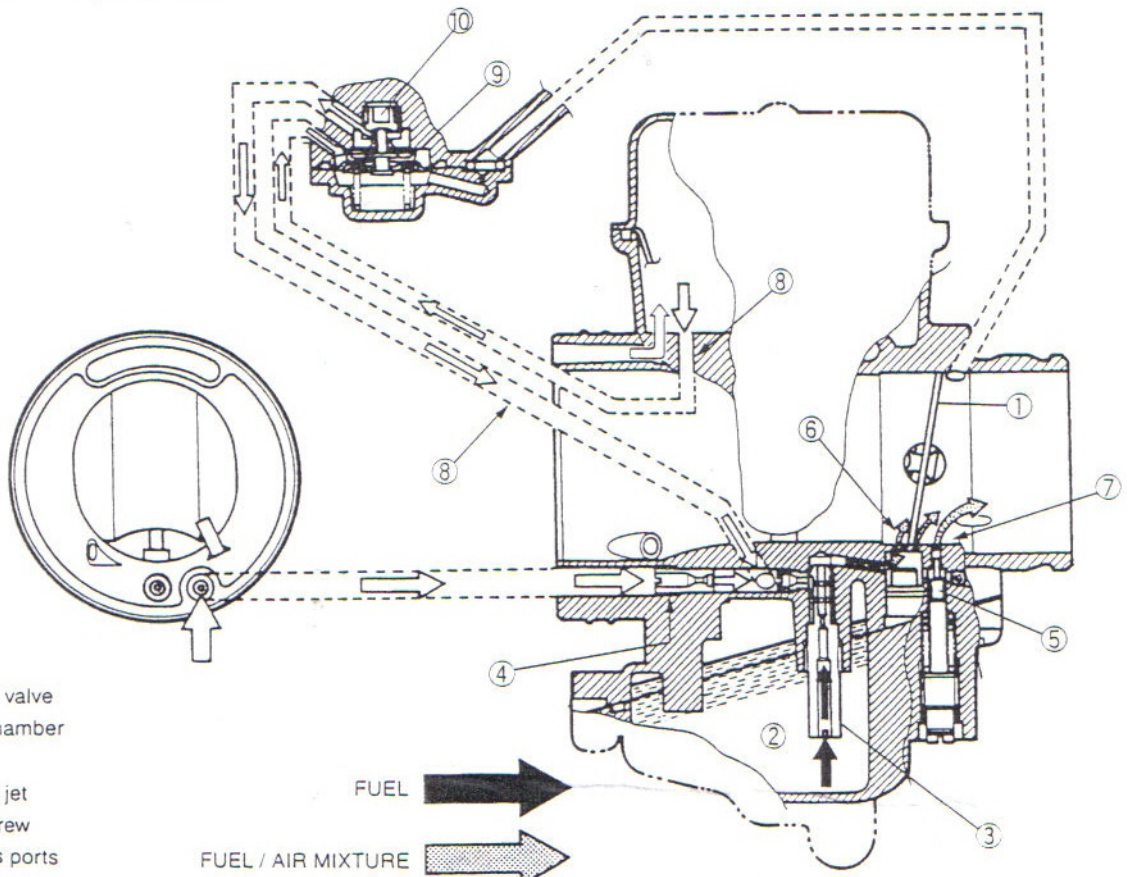
SLOW SYSTEM

This system supplies fuel during engine operation when the throttle valve ① is closed or slightly opened. The fuel from the float chamber ② is metered by the pilot jet ③ where it mixes with air coming in through the pilot air jet ④. This mixture, rich with fuel, then goes up through the pilot passage to the pilot screw ⑤. Part of the mixture is discharged into the main bore through bypass ports ⑥. The mixture is metered by the pilot screw ⑤ and sprayed into the main bore through the pilot outlet port ⑦.

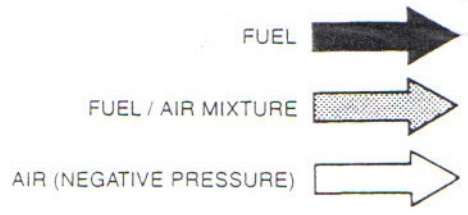
COASTING ENRICHMENT SYSTEM

The coasting enrichment system is included in the slow system. At the normal running operation, joining of the air from upper part of the carburetor inlet side to pilot air passage ⑧ which obtains proper fuel/air mixture ratio. But if the throttle valve is closed suddenly, a large negative pressure generated in the cylinder which is applied to the diaphragm ⑨. The valve ⑩ which interlocks with the diaphragm ⑨ closes an air passage ⑧, thus, the fuel/air mixture ratio by controlling air flow in the pilot circuit.

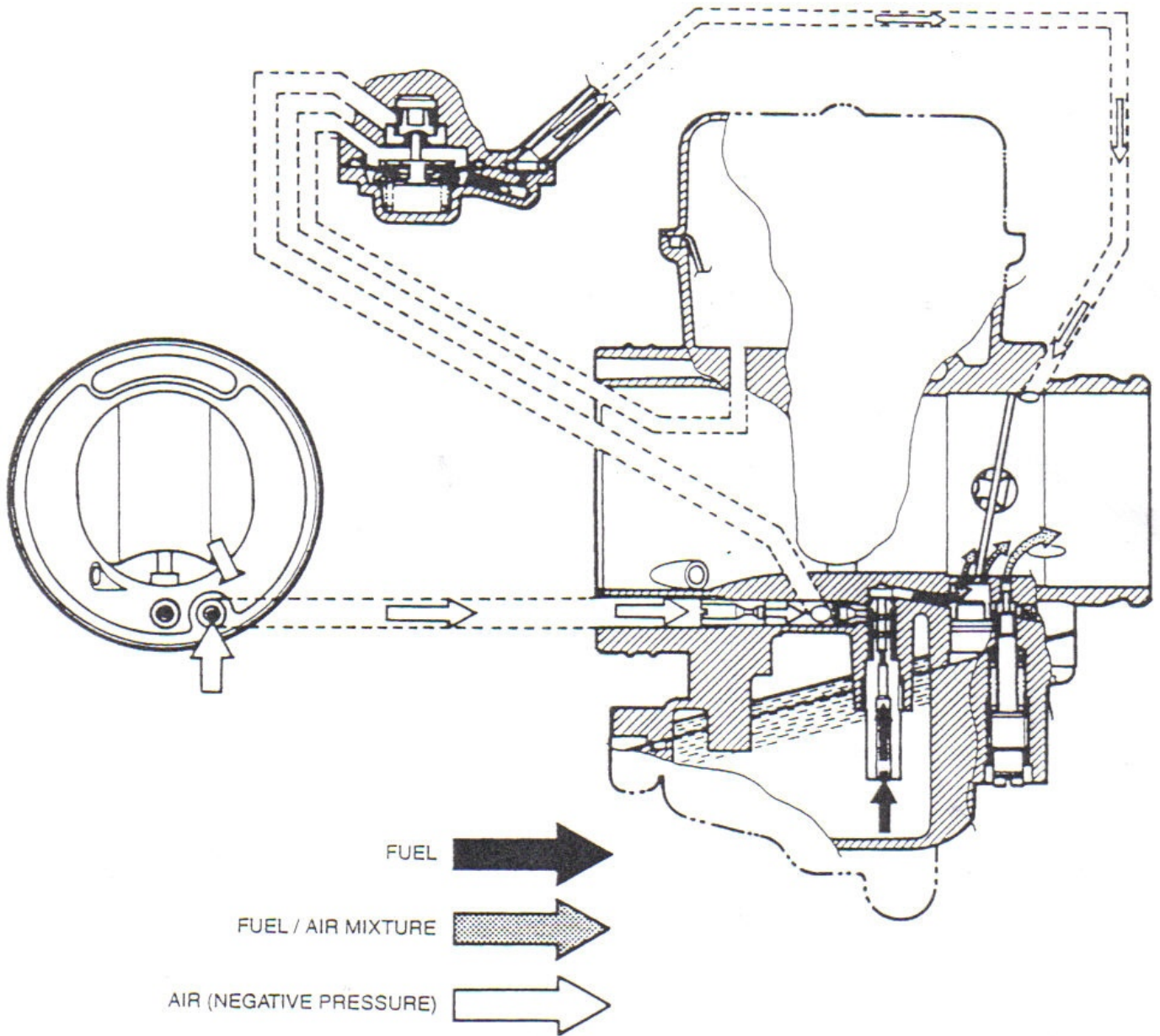
(NORMAL CONDITION)



- ① Throttle valve
- ② Float chamber
- ③ Pilot jet
- ④ Pilot air jet
- ⑤ Pilot screw
- ⑥ By pass ports
- ⑦ Pilot outlet
- ⑧ Pilot air passage
- ⑨ Diaphragm
- ⑩ Valve



(LARGE NEGATIVE PRESSURE GENERATED CONDITION)



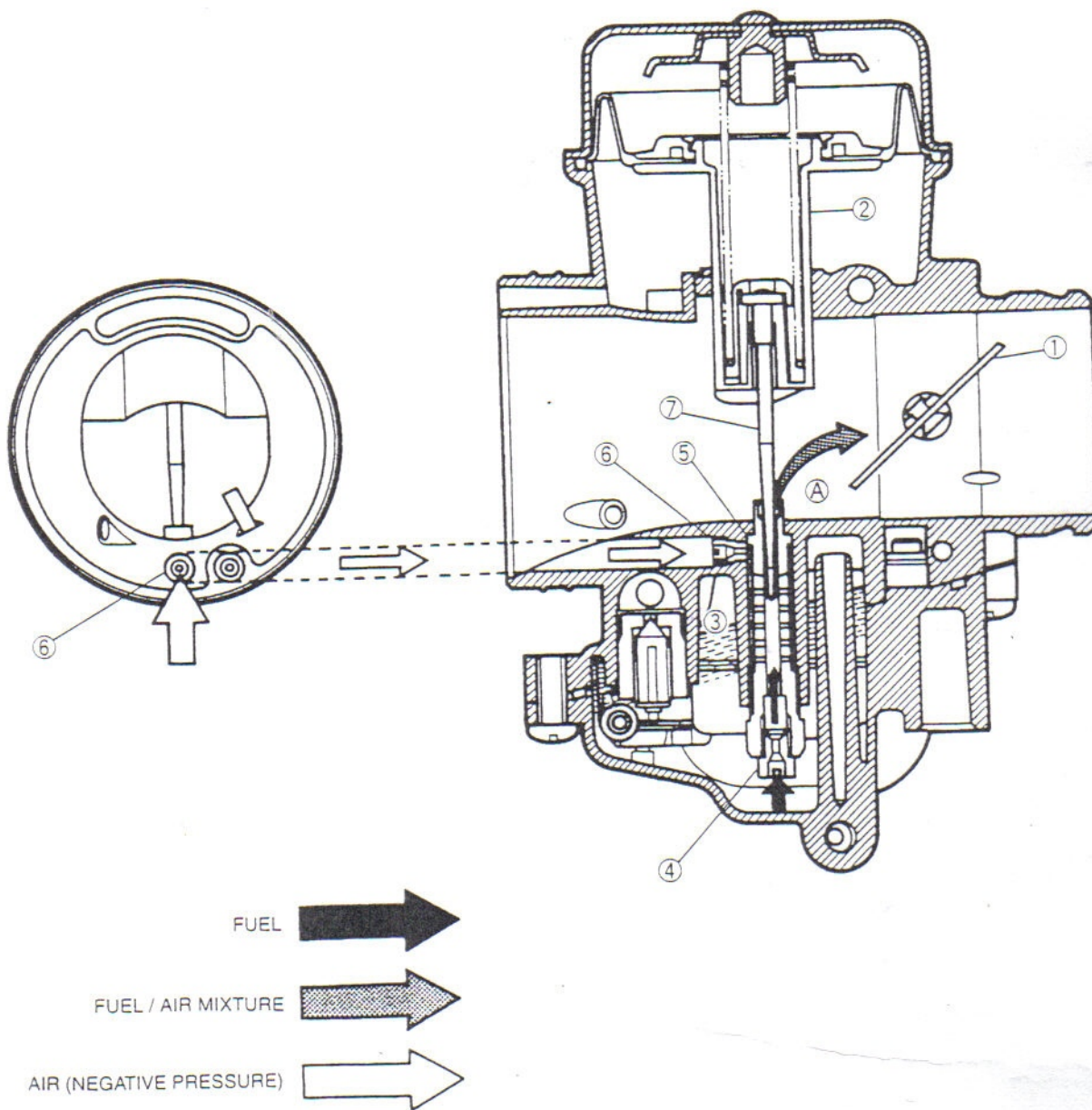
MAIN SYSTEM

As the throttle valve ① is opened, engine speed rises and negative pressure in the venturi **A** increases. This causes the piston valve ② to move upward.

The fuel in the float chamber ③ is metered by the main jet ④. The metered fuel enters the needle jet ⑤, mixes with the air admitted through the main air jet ⑥ and forms an emulsion.

The emulsified fuel then passes through the clearance between the needle jet ⑤ and jet needle ⑦ and is discharged into the venturi **A**, where it meets the main air stream being drawn by the engine.

Mixture proportioning is accomplished in the needle jet ⑤. The clearance through which the emulsified fuel must flow ultimately depends on throttle position.



AUTO-ENRICHENER (AUTO-CHOKE) SYSTEM

The automatic enrichener (automatic choke) device consists of the PTC heater **A**, the thermo-wax **B** and the plunger/needle ①. When the thermo-wax **B** is cold, the plunger/needle ① moves upward, Fuel is drawn into the enrichener circuit from the float chamber ②.

Enrichener jet ③ meters this fuel, which then flows into fuel pipe ④ and mixes with the air coming From the upper part of the float chamber ⑤. The mixture, rich in fuel content, reaches upper part of The fuel pipe and mixes again with the air coming through a passage extending from main bore ⑥.

The two succesive mixings of fuel with air are such that proper fuel/air mixture for starting is produced when the mixture is sprayed out through outlet port ⑦ into the main bore.

NOTE:

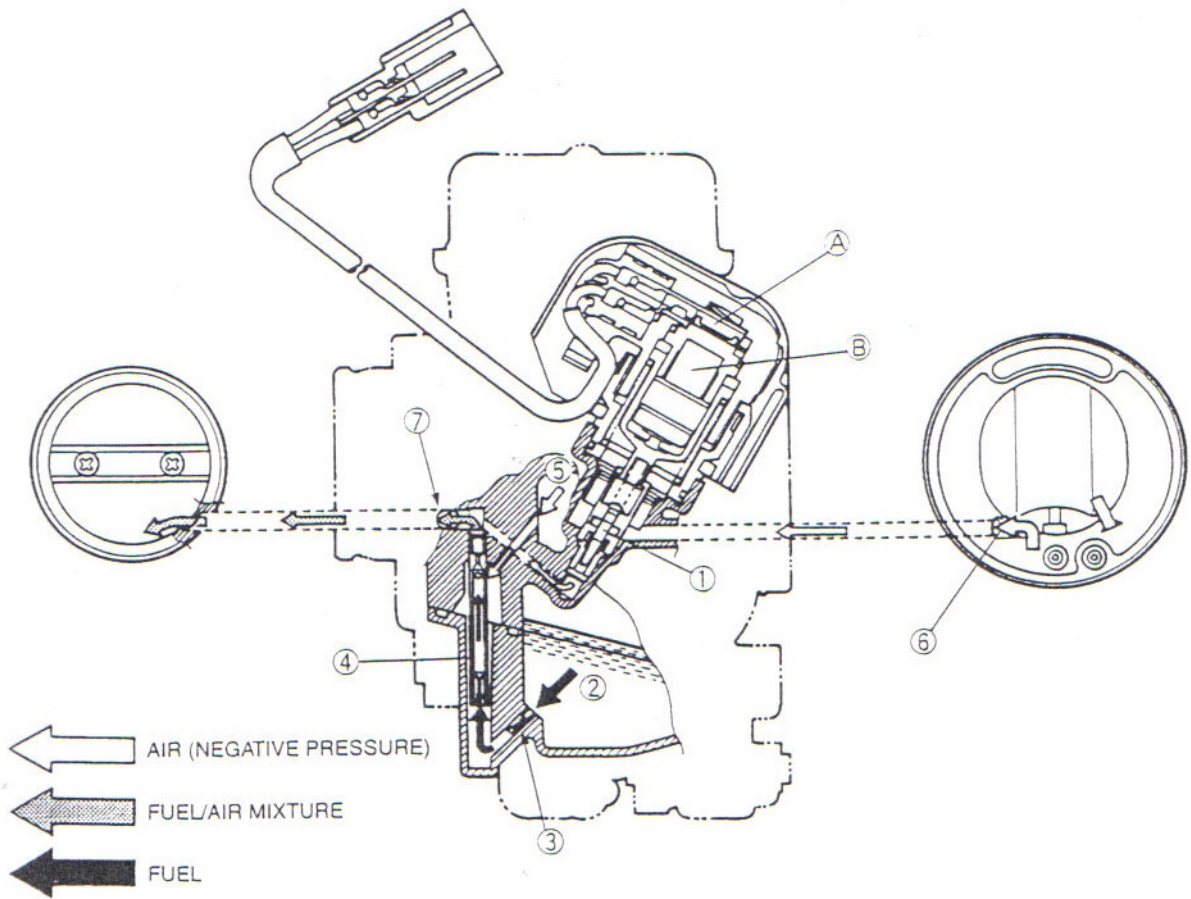
An enrichener is operated almost the same way as a choke.

When the engine is cold:

The automatic enrichener passage is always open as the thermo-wax remains atomospheric temperature.

When the engine is started:

According to the PTC heater temperature, the thermo-wax gradually expands and closes enrichener passage by the needle of the plunger.



AIR (NEGATIVE PRESSURE)
 FUEL/AIR MIXTURE
 FUEL

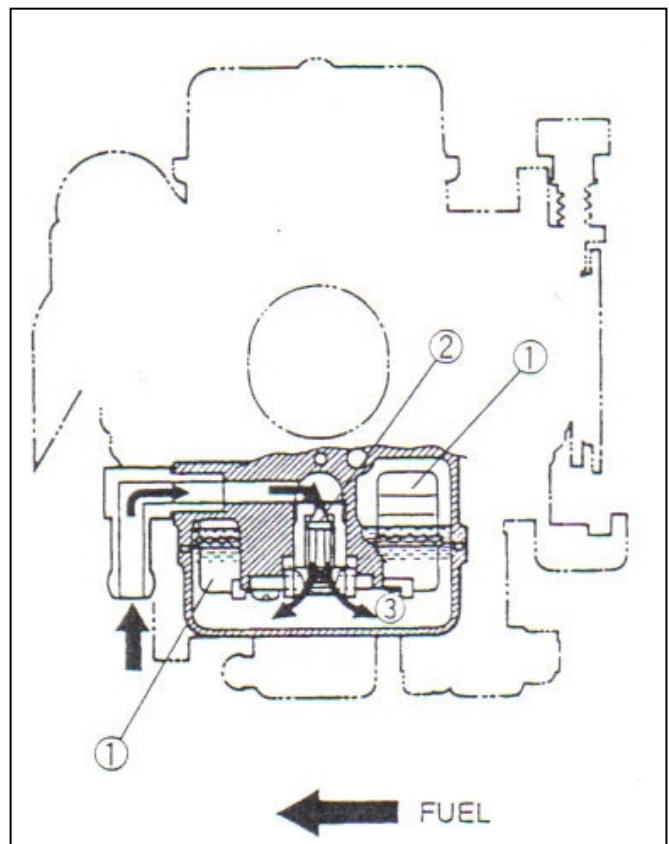
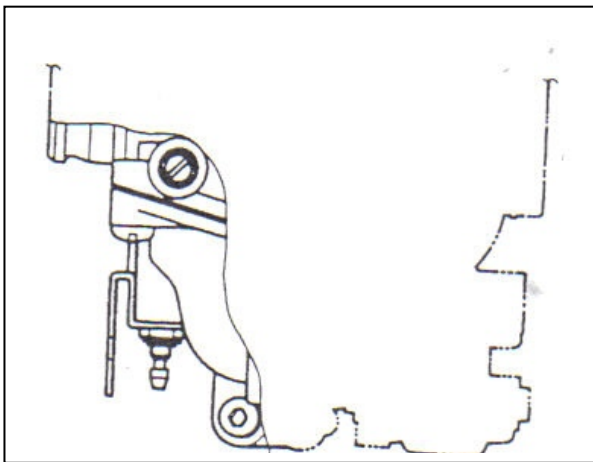
A
 B
 1
 2
 3
 4
 5
 6
 7

FLOAT SYSTEM

The float ① and needle valve ② work in conjunction with one another. As the float chamber ③, the float ① rises and the needle valve ② pushes up against the valve seat. When this occurs, no fuel enters the float chamber ③.

As the fuel level falls, the float ① lowers and the needle valve ② unseats itself; admitting fuel into the float chamber ③.

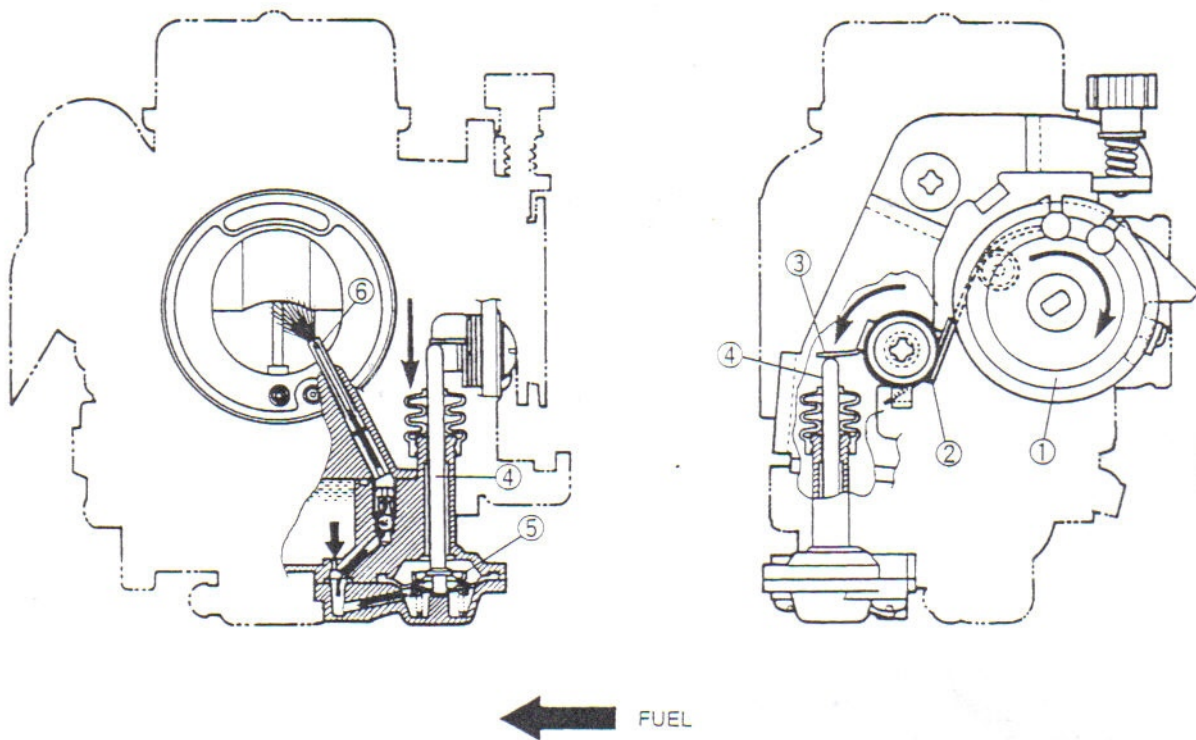
In this manner, the needle valve ② admits and shuts off fuel to maintain the appropriate fuel level inside the float chamber ③.



ACCELERATOR PUMP SYSTEM

This system works only when the rider opens throttle grip quickly as pump send the necessary amount of fuel to the carburetor bore for correcting fuel/air mixture ratio. When the rider open the throttle grip quickly, the intaken air volume becomes large and air velocity at the bottom of the throttle valve (piston valve) is slow and sucking volume of fuel is less.

The throttle valve lever ① pulls lever ② with the cable, and lever ③ turns and pushes rod ④. The rod ④ pushes plunger ⑤. This plunger pushes out the fuel through outlet pipe ⑥, spraying fuel into the main bore.

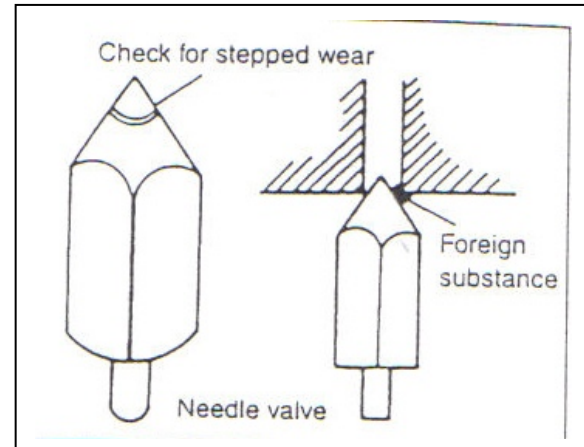


INSPECTION

Check the following parts for damage and clogging.

- * Pilot jet
- * Main jet
- * Main air jet
- * Pilot air jet No.1 & No.2
- * Needle jet holder
- * Float
- * Jet needle
- * Piston valve
- * Starter jet
- * Gaskets and O-rings
- * Pilot outlet and bypass
- * Coasting enrichment valve
- * Needle valve
- * Valve seat

if any abnormal condition is found, wash the part clean. If damage or clogging is found, replace the part with a new one.



CARBURETOR CLEANING

!WARNING

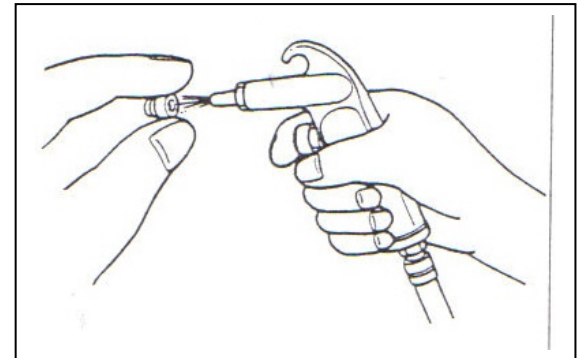
Some carburetor cleaning chemicals, especially diptype soaking solutions, are very corrosive and must be handled carefully. Always follow the chemical manufacturer's instructions on proper use, handling and storage.

- Clean all jets with a spray-type carburetor cleaner and dry them using compressed air.
- Clean all circuits of the carburetor thoroughly-not just the perceived problem area. Clean the circuits in the carburetor body with a spray-type cleaner and allow each circuit to soak, if necessary, to loosen dirt and varnish. Blow the body dry using compressed air.

!CAUTION

Do not use a wire to clean the jets or passageways. A wire can damage the jets and passageways, if the components cannot be cleaned with a spray cleaner it may be necessary to use a dip-type cleaning solution and allow them to soak. Always follow The chemical manufacturer's instructions for proper use and cleaning of the carburetor components.

- after cleaning, reassemble the carburetor with new seals and gaskets.



AUTO-ENRICHENER INSPECTION

- Disconnect the lead wire coupler①.
- Remove the cover②.
- Connect the positive \oplus terminal of a 12V battery to Yellow/white lead and the negative \ominus terminal to Black/White.
- Check that the auto-enrichener section ③ (PTC heater built-in area) is heated in 5 minutes after the battery has been connected.

NOTE:

To inspect the function, check for change of temperature from the cold condition.

!CAUTION

Do not attempt to disassemble the auto-enrichener for the purpose of checking temperature.

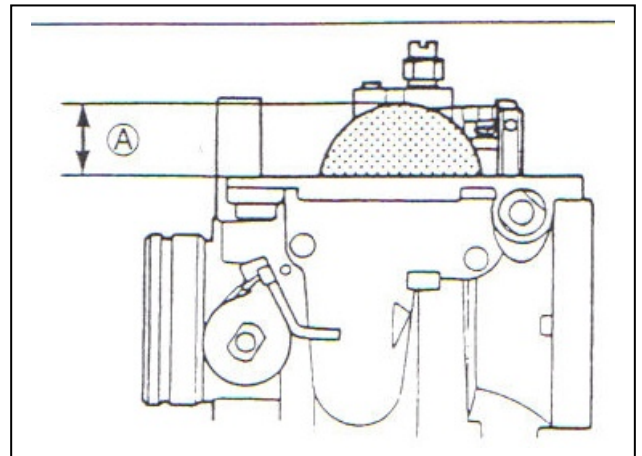
FLOAT HEIGHT ADJUSTMENT

To check the float height, turn the carburetor upside down. Measure the float height \bar{A} while the float arm is just contacting the needle valve using vernier calipers.

Bend the tongue as necessary to bring the float height \bar{A}

To the specified level.

Float height \bar{A} : $20.8 \pm 1.0\text{mm}$



(B) Troubleshooting

● Difficult to start

- 1.No sparking in spark plug.
- 2.Compression pressure too low.
- 3.No fuel in the carburetor
 - air cleaner blocked
 - oil pipe blocked
 - bad adjustment of the fuel level
 - float valve is jell

● Mixed air too dilute

- 1.Main jet blocked
- 2.Float valve blocked
- 3.Fuel level too low
- 4.Fuel system blocked
- 5.Second air sucked into intake system
- 6.Bad vacuums during piston movement
- 7.Throttle valve malfunction

● Too much fuel in the engine

- 1.Air cleaner blocked
- 2.Mixed air is too dilute in the idle system

● Sparking unsteady while increasing speed

- 1.Ignition system malfunction.
- 2.Air mixture is too dilute

● Difficult to start, Ignition off, Unstable idling

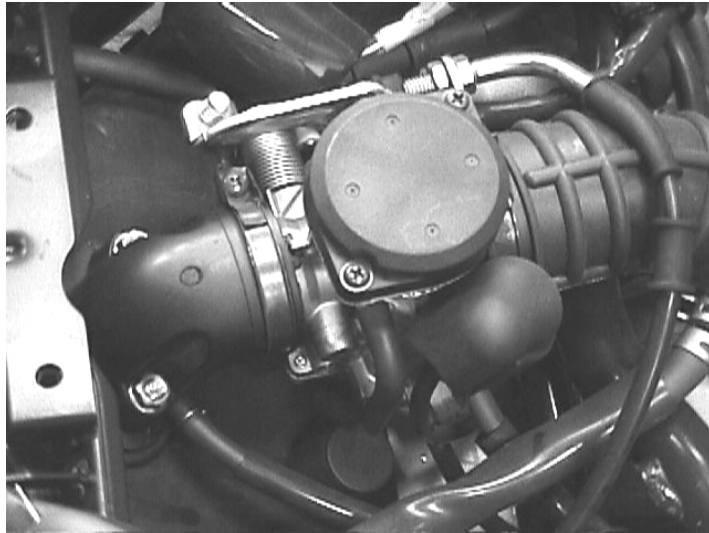
- 1.Fuel system blocked
- 2.Ignition system malfunction
- 3.Air mixture is too dilute or too thick
- 4.Fuel deterioration
- 5.Second air sucked into intake system.
- 6.Bad idle adjustment
- 7.Bad fuel volume adjustment
- 8.Idle system or fueling system blocked
- 9.Bad adjustment of fuel level

● Mixture air too thick

- 1.Auto choke system malfunction
- 2.Float valve malfunction
- 3.Fuel level is too high
- 4.Air route blocked
- 5.Dirty air cleaner
- 6.Fuel overwhelming in carburetor

(C)Dismantling the carburetor

- 1.Remove the auto starter connector.
- 2.Remove the throttle cable, then the fuel pipe from the carburetor.



- 3.Remove the screws on the intake manifold.
- 4.Unscrew the fixing belt on the connecting pipe.
- 5.Remove the carburetor.

Assembling the carburetor

To assemble the carburetor, please follow the reversed procedures of the dismantling and do the following adjustment after installation is finished:

- Adjust the throttle cable
- Idle adjustment

Adjustment of fuel volume adjusting screws

Note :Fuel volume adjusting screws have been set up properly before sale thus there is no need for self-adjustment. However, when dismantling, a record of the turning loop has to be kept for future assembling purpose. Put up the center stand while adjustment.

- 1.After the engine is warm up, adjust the stopping screw throttle of throttle valve to the standard rpm.
Idle rpm $1,700 \pm 100$ rpm
- 2.Adjust the fuel volume adjusting screws to the highest stable rotation.
This rotation value is the optimum setting of throttle
- 3.Fuel up for several times, make sure that the idle rpm is within the standard rpm.
Repeat the above procedure if the idle rpm is unstable.

(D)The float nozzle

1.Dismantling

- Remove the screws to take off the float chamber.
- Remove the float, the float pin, and float valve.

2.Checking

- Check the float valve, valve base to see whether it is blocked or damaged.
- Check the float valve, valve base surface if sectional worn out or dirty.

△Note:

When the valve is too dirty or severely worn-not, the Valve base will not close completely thus will result In increasing of fuel level and fuel leakage problem. A new replacement is needed.

- Remove the main jet, needle jet base, needle jet, slow jet and fuel adjusting screws.

△Note:

- Avoid any damage on the jets and the fuel adjusting screws.
- Before dismantling, record the number of turning loops.
- No screwing-in movement by force to avoid any damages.

- Use the detergent solution to clean the jets. Fuel adjusting
After cleaning off the blockage and the dirt, screw
blow dry by compressed air.

Note:

Remove the vacuum and air-interrupt valve for Cleaning.

3.Assembling

- Assemble the slow jet, needle jet, main jet and fuel adjusting screws.

●Notice

Record the number of turning loops before dismantling

- Assemble the float valve, float and float pin.

4.Checking fuel level

△Notice

- Check after the checking on the float valve and the float is done.
- Put the float gauge on the float chamber perpendicularly to the main jet for measurement.

