Motorcycle Service and Maintenance Manual

Superlight125/150

FEB.2006

If you have any problems can not fnd the solution in this manual, please fell free to contact with:

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Our engineer are very glad to give you the necessary assistance and help.

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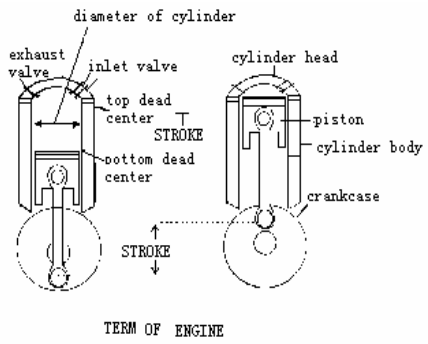
A

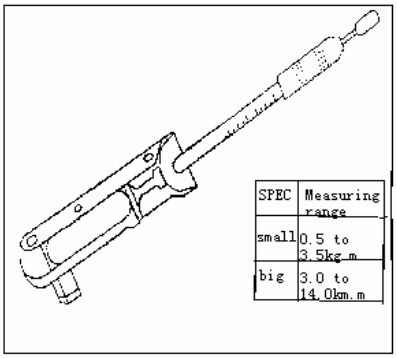
GENERAL INFORMATION

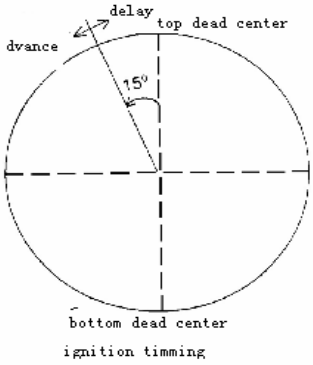
BASIC TREMS OF ENGINE

A. DEAD CENTER



TERM OF ENGINE





ignition timming

THE DEAD CENTER IS THE TWO LIMITED POLES OF POSITON, WHICH PISTON MOVES IN LINE UP AND DOWN POSITION.

THE TOP DEAD CENTER－WHICH IS FAREAT AWAY FROM THE ROTATION CENTER OF CRANKSHAFT.

THE BOTTOM DEAD CENTER－WHICH IS NEAREST AWAY FROM THE ROTATION CENTER OF CRANKSHAFT.

B. THE DIAMETER OF THE CYLINDER

THE INNER DIAMETER OF THE CYLINDER IS CALLED CYLINDER DIAMETER.

C. STROKE

THE STROKE IS CALLED THE LENGTH OF PISTON WALKING PATH.

ONE STROKE IS THAT PISTON MOVE FROM THE TOP DEAD CENTER TO THE BOTTOM DEAD CENTER.

D. THE WORKING VOLUME OF THE CYLINDER

THE SPACE VOLUME OF PISTON WORKING PATH WHICH THE PISTON MOVE FROM THE TOP DEAD CENTER TO THE

BOTTOM DEAD CENTER IS CALLED THE WORKING VOLUNE OF THE CYLINDER.

USUALLY THE UNIT OF CYLINDER WORKING VOLUME IS CC(CM^3). SUCH AS 75CC, 125CC, AND CHANGE ALONG WITH THE ENGINE MODEL CHANGE.

E. TORQUE

TORQUE IS THE FORCE OF WHIRLING ROTATING. WHEN WE LOOSEN OR SCREW NUTS/ SCREWS, WE PUT THE TORQUE ON IT.

IN ORDER TO DRIVE THE WHEELS, THE ENGINE PUT THE TORQUE ON THE WHEELS; APPLY LARGER FORCE WHEN CLIMBING SLOPE.

THE TORQUE IS EQUAL THAT THE FORCE MULTIPLIES THE ARM OF FORCE.

THE UNIT OF TORQUE IS KILOGRAM POWER/METER.

F. IGNITION TIMING

IN ORDER TO CONTROL THE BURNING OF BURNING ROOM, IGNITION IS TIMING.

THE IGNITION TIMING OF THE ENGINE QJ162FMJ CHANGE AS FOLLOW:

WHEN 'F' IS AT 1400RMP, THE TOP DEAD CENTER

ADVANCES 15°.

WHEN "II" IS AT 4000RMP, THE TOP DEAD CENTER

ADVANCES 35°.

Engine cycle

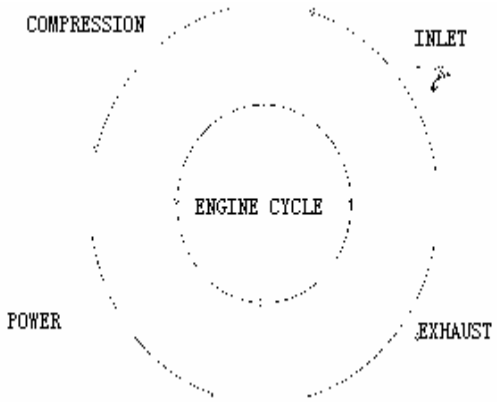
ANY FOUR-STROKE ENGINE HAS FOUR STROKES; THE FOUR STROKES CONSIST OF ONE CYCLE.

1.INLET: AIR-FUEL MIXTURE GOES INTO CYLINDER.

2.COMPRESSION: AIR-FUEL MIXTURE AIR COMPRESSED IN CYLINDER.

3.POWER: WHEN STARTING THE ENGINE, GAS BURNS AND EXPANDS, PUSH THE PISTON MOVING DOWN, THROUGH CONNECTING ROD BRING ALONG THE CRANKSHAFT TO OUTPUT MECHANICAL ENERGY.

4.EXHAUST: THE EXHAUST GAS IS EXPELLED FROM THE CYLINDER



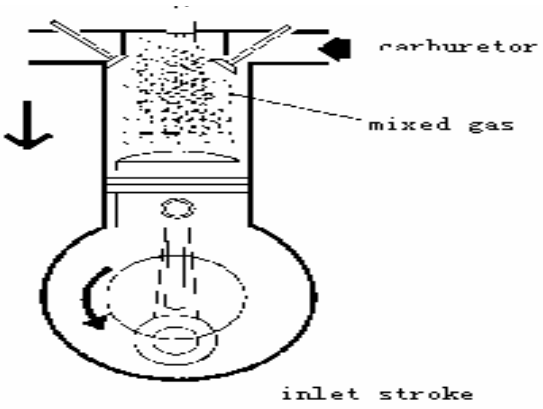
THE WORKING CYCLE OF FOUR-STROKE ENGINE

A. INLET STROKE

1.THE CRANKSHAFT TURNS CLOCKWISE. DIRECTION

2.THE CRANKSHAFT BRING ALONG THE POSTION MOVING DOWN THROUGH CONNECTING ROD.

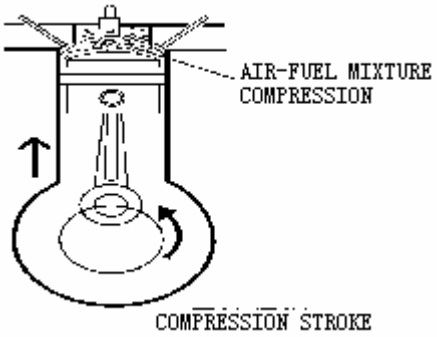
3.WHEN PISTON MOVES FROM THE TOP DEAD CENTER TO THE BOTTOM CENTER, THE INLET VALVE OPENS, AND AIR-FUEL MIXTURE GOES INTO CYLINDER.



B. COMPRESSION STROKE

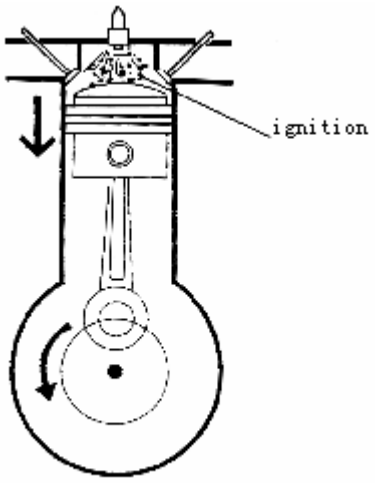
1.THE CRANKSHAFT REVOLVES CONTINUALLY, BRING ALONG THE PISTON TO MOVE FROM THE TOP DEAD CENTER TO THE BOTTOM DEAD CENTER.

2.AIR-FUEL MIXTURE IS COMPRESSED INTO THE NARROW SPACE OF THE CYLINDER HEAD AND PISTON DEAD CENTER, WHICH IS CALLED COMBUSTION CHAMBER.



C. POWER STROKE

1.SPARK PLUG LIGHTS COMPRESSED AIR-FUEL
MIXTURE.
2.THE MIXTURE OF AIR-FUEL BURNING CAUSE THE MUTATION OF TEMPERATURE AND PRESSURE OF THE COMBUSTION CHAMBER
AS THE BURNING GAS EXPANDS.
3.THE FORCE WORKING ON THE PISTON PASSES
ON TO THE CRANKSHAFT THROUGH CONNECTING ROD, AND ACCELERATE THE MOVING OF CRANKSHAFT. BURNING GAS EXPANDS AND SUPPLIES POWER TO ENGINE.



power stroke

D. EXHAUST STROKE

1.WHEN THE PISTON IS PUSHED TO THE BOTTOM OF ITS STROKE BY BURNING GAS, THE EXHAUST VALVE OPENS.
2.ROTATE CRANKSHAFT BECAUSE OF INERTIA, AND PUSH PISTON TO MOVE UPTO THE CYLINDER HEAD.
3.ALONG WITH PISTON TOWARDS CYLINDER COVER MOVING, BURNING GAS IS PUSHED OUT BY THE EXHAUST VALVE.
WHEN PISTON ARRIVE AT THE TOP OF STROKE, THE EXHAUST VALVE CLOSES.
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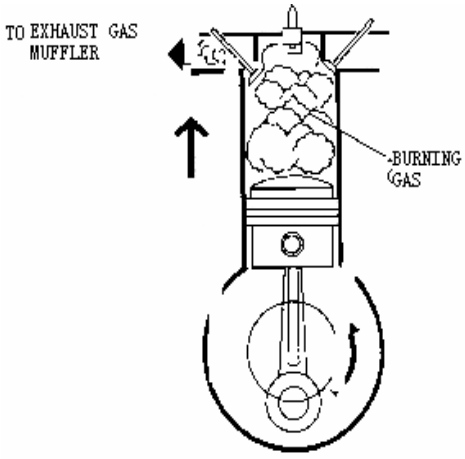


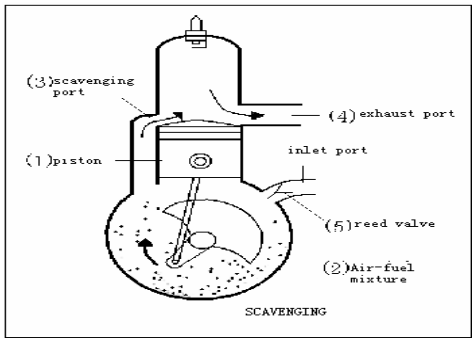
exhaust stroke

Working cycle of two-stroke engine

A: Scavenging

Piston (1) move downward and press the mixed gas in the crankcase (2), and this movement will go on, air intake open, and from here (intake (3)), mixed gases enter cylinder.

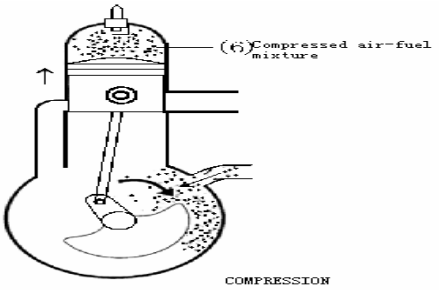
Note: the compression that mixed gases being compressed in crankshaft case is primary compression, and in cylinder is second compression.



B: Compression

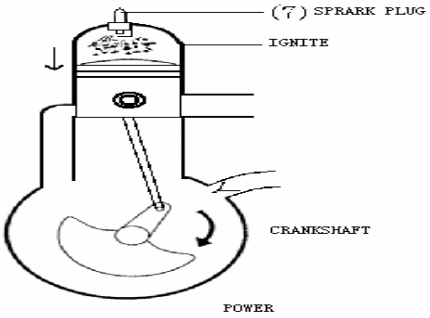
Piston move upward, and intake and exhaust port closing, at the same time, mixed gases in the cylinder are compressed.

When piston moves upward, the compression in the crankcase became lower, reed valve opens, and new mixed gases enter into crankcase.



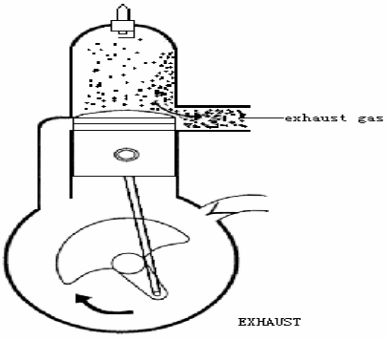
C: Power

Spark plug (7) ignites mixed gases compressed in cylinder, gases will expand due to burning, and produce great pressure to push piston move downward. As a result, mechanism energy is output by connecting rod ‘s effect to crank shaft.



D: exhaust

When piston continually moves downward, exhaust gate open, exhaust gas flows out, and the air pressure becomes lower, and at some point, air intake opens, new mixed gases enters into cylinder.



In the two-stroke working circulation, there are processes being finished at the same time. For example:

1. Intake gas and exhaust gas
2. When the gas in the cylinder is compressed, new mixed gases enter into crankshaft case
3. At the same time of compression stroke, mixed gases and gas in the crankshaft case are also compressed.

Warning

Don’t use the tool that is easy to be damaged, it may hurt you

Warning

Gasoline is easy to burn, at some situation, it may lead to explode, don’t smoke or produce spark.

Warning

Keep floor clean and neat, avoid oil overflowing to floor, it may hurt you

Warning

Don’t start engine in the place where air can’t flow well, since harmful gases may be produced by engine.

Warning

Don’t use dry brush to clean some parts such as brake hub. This may make you inhale asbestos and lead to cancer.

Warning

There is vitriol in the battery, protect your eye, skin and cloth, once you contact it, use water to clean, and to see doctor.

Battery should be put in the place, which children can’t contact

Warning

Cooperate with your company and guarantee each other’s security.

Warning

Avoid brake liquid contacting eyes, once happen, use water to clean and see a doctor

Don’t contact brake liquid for a long time

Avoid brake liquid splash into painting matter

Don’t use superfluous liquid, which is exposed in the air, because brake liquid absorb water from atmosphere and damage its character.

Service rules

1. Please use KEEWAY genuine parts, and use accommodating lubrication in pointed place
2. Use special or universal tool.
3. When reassembling, use new sealed washer, o ring, oil seal , clip, and pin, etc.
4. Use metric bolt and nut
5. When assembling bolt and nut , firstly tighten big diameter or central bolt and nut. Secondly tighten bolt and nut with diagonal
6. After assembly, check bolt’s and nut’s tightening degree with torque wrench, check if parts can move freely.
7. Before measuring, oil and dirt should be removed; when assembly, make parts lubricated by lubrication.
8. When parts are removed and need be reserved for a long time, please put some lubrication on the surface so that it won’t be rusted.

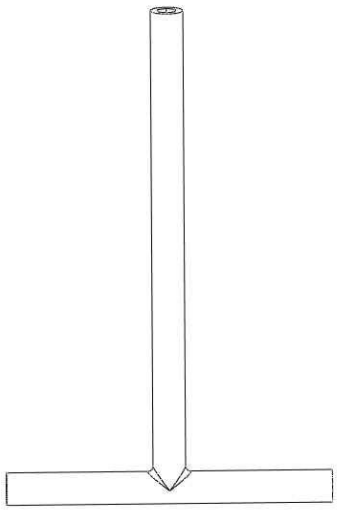
B

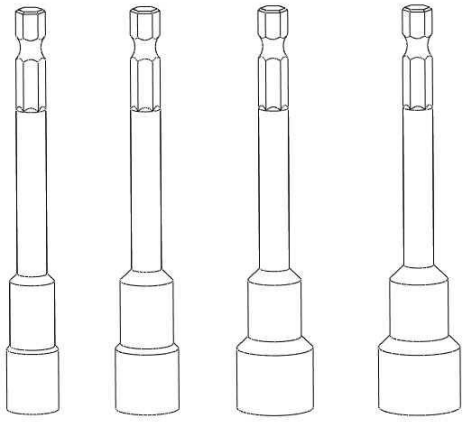
PRODUCT

TOOLS LIST

NECESSARY TOOLS TO DISASSEMBLE AND INSTALL ENGINE AS FOLLOWS：

CODE	TOOLS CODE	PURPOSE
1	T01	“T”SHAPE GUIE CYLINDER
2	T02	GUIDE CYLINDER TOOLS（8、10、12、13）
3	T03	SCREWED ROD FOR FLY WHEEL DISASSEMBLAGE
4	T04	TOOLS TO DISASSEMBLE VALVE SPRING
5	T05	DISASSEMBLING TOOLS FOR OIL DRAINAGE
6	T06	CYLINDER PRESSURE GAUGE
7	T07	DISASSEMBLING TOOL FOR PISTON PIN
8	T08	SOCKET FOR DISMOUNTING SPARK PLUGS
9	T09	ELECTRIC TOOL FOR DISASSEMBLING LOCKING BOLT OF FLY WHEEL
10	T10	GUIDE CYLINDER FOR DISASSEMBLING VALVES
11	T11	“十”SHAPE TOOL
12	T12	GUIDE CYLINDER FOR FLYIWHEEL LOCKING BOLT





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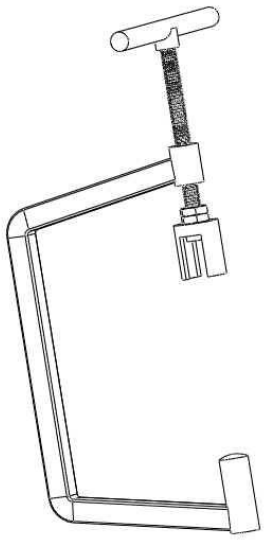
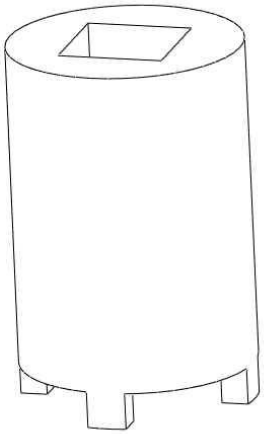
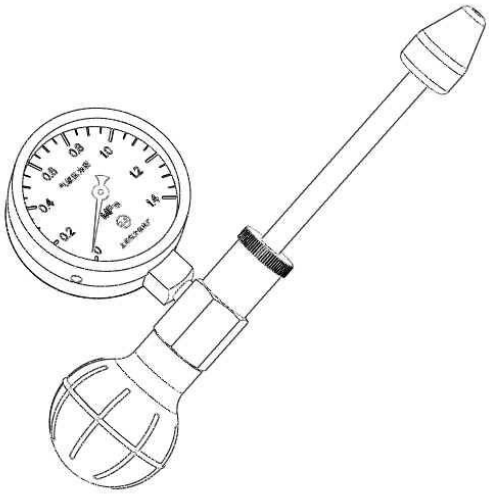
 ③	 ④
	

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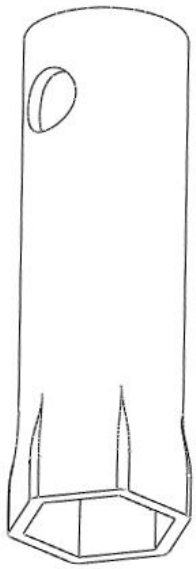

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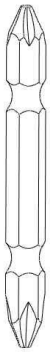
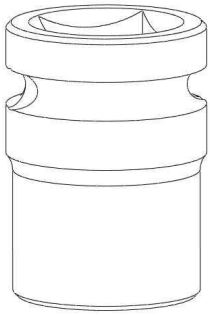




SPECIAL TORQUE VOLUME

SPECIAL TORQUE VOLUME OF SOME FIXUP TOOLS ARE THE FOLLOWS AS REFERENCE:

CODE	NAME	QUANTITY	TORQUE
	CYLINDER INSTALLATION		
1	BOLT FOR THE TOP OF CYLINDER HEAD COVER	1	8-10N•M
2	LOCKING BOLT AT CYLINDER HEAD COVER	3	10-12N•M
3	ARM BRACKET LOCKING BOLT	3	25-28N•M
4	LOCKING BOLT FOR CYLINDER HEAD AND PUSH ROD BOARD	4	25-28N•M
5	CAM FOLLOWER SHAFT FIXING BOLT	1	20-25N•M
6	CYLINDER LOCKING BOLT	2	10-12N•M
7	SPARK PLUG	1	15-26N•M
8	LOCKING BOLT OF CARBURETOR CONNECTER	2	10-12N•M
	CRANKCASE INSTALLATION		
1	TWO HEAD BOLT OF CRANKCASE AND CYLINDERHEAD	4	20-22N•M
2	MOTOR FIXUP BOLT	2	10-12N•M
3	LOCKING BOLT OF GEAR HOUSING HEAD OF ELECTRIC STARTING	3	10-12N•M
4	LEFT HEAD LOCKING BOLT	9	10-12N•M
5	LEFT HEAD TIMING BOLT	1	5-9N•M
6	LEFT HEAD MAGNETO BOLT	1	10-12N•M
7	BOLT OF MAGNETO PICK UP	2	5-9N•M
8	LOCKING BOLT OF MAGNETO	3	5-9N•M
9	LOCKING BOLT OF FIY WHEEL	1	40-45N•M
10	LOCKING BOLT OF STAR GEAR	3	20-22N•M
11	STAR GEAR DRIVE TEETH	1	10-12N•M
12	CAMSHAFT FIXUP BOLT	1	8-10N•M
13	RIGHT HEAD M5 SCREW	1	5-9N•M
14	CRANKCASE RIGHT HEAD LOCKING BOLT	11	10-12N•M
15	LOCKING NUT OF OIL FILTER ROTERY HEAD	3	3-6N•M
16	LOCKING NUT OF OIL FILTER ROTERY	1	40-50N•M
17	LOCKING BOLT OF OIL PUMP BODY	2	6-8N•M
18	LOCKING BOLT OF OIL PUMP	2	6-8N•M
19	LOCKING BOLT OF CLUTCH PLATE	4	10-12N•M
20	LOCKING BOLT OF CLUTCH BRACKET	1	10-12N•M
21	BOLT OF SHIFT SPEED CAM SHAFT	1	10-12N•M
22	SHIFT SPEED ORIENTATION	1	10-12N•M
23	SPEED POSITION INDICATION	2	2-4N•M
24	LEAKAGE SCREW	1	45-55N•M
25	OIL FILTER ELEMENT	1	45-55N•M
26	SHAFT PUSH BRACKET	1	10-12N•M
27	LOCKING BOLT OF LEAD BOARD OF LEFT CRANKCASE	1	10-12N•M
28	M6X95 SCREW OF LEFT CRANKCASE	1	10-12N•M
29	LOCKING BOLT LEFT CRANKCASE	1	10-12N•M
30	LOCKING BOLT OF CRANKCASE	8	10-12N•M

IMPORTANT PARTS

DETAIL INFORMATION OF IMPORTANT PARTS：

DOWEL PIN-10NOS.

S.NO.	Size (mm)	Qty.	Description	Location
1	10Φx20	2	CYLINDER HEAD AND BODY	Engine
2	10Φx14	2	CRANKCASE AND CYLINDER	Engine
3	10Φx14	2	LEFT AND RIGHT CRANKCASE	Engine
4	10Φx14.5	2	LEFT CRANKCASE AND RIGHT FRONT HEAD	Engine
5	8Φx14	2	RIGHT CRANKCASE AND RIGHT HEAD	Engine

O-RING 16NOS.

S.NO.	Size (mm)	Qty.	Description	Location
1	10Φx1.6	2	GUIDE PIPE OF INLET AND EXHAUST VALVE	Engine
2	10Φx1.6	2	SHAFT OF CYLINDER	Engine
3	17Φx2.5	1	CAM SHAFT	Engine
4	6.8Φx1.9	1	CLUTCH LEVEL	Engine
5	18Φx3.5	1	FUEL QUANTITY MEASURE	Engine
6	35Φx3	1	SPRING HEAD OF OIL FILTER	Engine
7	20Φx2.5	1	SHAFT OF CAM GEAR	Engine
8	13Φx2.5	1	PUSH FRAME OF SHAFT	Engine
9	13.8Φx2.5	1	BOLT OF LEFT FRONT HEAD	Engine
10	28Φx2.65	1	MAGNETO BOLT OF LEFT FRONT HEAD	Engine
12	63Φx3	1	GEAR HOUSE HEAD OF ELECTRIC START	Engine
13	9.4Φx2.4	1	HEAD OF OIL PUMP	Engine
14	26502470	1	START MOTOR	

OIL SEAL- 5NOS.

S.NO.	Size (mm)	Qty.	Description	Location
1	14x28x7	1	SHIFT SPEED CASE - LEFT CRANKCASE	Engine
2	20x34x7	1	SUBSIDIARY SHAFT-LEFT CRANKCASE	Engine
3	34x50x7	1	CRANKSHAFT-LEFT CRANKCASE	Engine
4	6x15x7	1	GEAR SHAFT OF TURNING SPEED METER-RIGHT HEAD	Engine
5	16x28x7	1	START SHAFT OF ANTI CLASH-RIGHT HEAD	Engine

BEARING

S.NO.	Code	Qty.	Description	Location
1	6006	1	START GEAR OF MAIN SHAFT-RIGHT CRANKCASE	Engine
2	6204	1	MAIN SHAFT-LEFT TANK	Engine
3	6202	1	SUBSIDIARY SHAFT-LEFT TANK	Engine
4	HK101410	1	ELECTRIC START IDLE GEAR-LEFT FRONT HEAD	Engine
5	HK101410	2	ELECTRIC START GEAR SHAFT-ELECTRICSTART GEAR	Engine
6	63/28V4	1	LEFT CRANKSHAFT-LEFT TANK	Engine
7	63/28P53	1	RIGHT CRANKSHAFT-RIGHT TANK	Engine
8	30x38x15.8	1	CRANKSHAFT PIN-CONNECTING LEVEL OF CRANKSHAFT	Engine
9	6001	1	SHAFT COVER OF CLUTCH APART-CLUTCH APART PLATE	Engine

PIN SHAFT- 3NOS.

S.NO.	Size (mm)	Qty.	Description	Location
1	2Φx16	1	CLUTCH APART LEVEL	Engine
2	4Φx12	1	CAM SHAFT	Engine
3	4Φx10	1	SHIFTER SPEED HUB	Engine

WASHERS- 9NOS

S.NO.	Gasket	Type	Qty.	Location
1	CYLINDER HEAD COVER	RUBBER	1	Engine
2	CYLINDER HEAD	STEEL	1	Engine
3	CYLINDER	ANTI-OIL ASBESTOS RUBBER	1	Engine
4	CRANKCASE	ANTI-OIL ASBESTOS RUBBER	1	Engine
5	CRANKCASE RIGHT HEAD	ANTI-OIL ASBESTOS RUBBER	1	Engine
6	CRABKCASE LEFT FRONT HEAD	ANTI-OIL ASBESTOS RUBBER	1	Engine
7	CARBURETOR HEAT INSULATION	ANTI-OIL ASBESTOS RUBBER	1	Engine
8	OIL FILTER ROTARY HEAD	ANTI-OIL ASBESTOS RUBBER	1	Engine
9	OIL PUMP HEAD	PAPER	1	Engine

	SPEED-DOWN RATIO	MAIN SHAFT		SUBSIDIARY SHAFT	
		GEAR	GEAR NUMBER	GEAR	GEAR NUMBER
FIRST SPEED	2.769	M_1	13	C_1	36
SECOND SPEED	1.882	M_2	17	C_2	32
THIRD SPEED	1.400	M_3	20	C_3	28
FOURTH SPEED	1.130	M_4	23	C_4	26
FIFTH SPEED	0.960	M_5	25	C_5	24

INFORMATION OF SHAFT AND GEAR

INFORMATION OF SHAFT AND GEAR

CODE	GEAR	GEAR NUMBER	POSITION
1	OIL PUMP DRIVE GEAR	18	ENGINE
2	OIL PUMP GEAR	39	ENGINE
3	DRIVE GEAR	18	ENGINE
4	CLUTCH HOUSING GEAR	78	ENGINE
5	FOOT STARTER GEAR	29	ENGINE
6	STARTER IDLE WHEEL	29	ENGINE
7	STARTER GEAR SET	19	ENGINE
8	STAR HOUSING GEAR	57	ENGINE
9	ELECTRIC DRIVE GEAR	9	ENGINE
10	ELECTRIC STARTER GEAR	62/18	ENGINE
11	ELECTRIC STARTER IDLE GEAR	14/16	ENGINE
12	TIMING GEAR DRIVE GEAR	22	ENGINE
13	CAMSHAFT TIMING GEAR	44	ENGINE

CHAIN GEAR INFORMATION

CODE	GEAR	GEAR NUMBER	POSITION
1	DRIVE SPROCKET	17	ENGINE
2	REAR SPROCKET	41	MOTORCYCLE

CHAIN

CODE	CHAIN	NUMBER	POSITION
1	DRIVE CHAIN	128	MOTORCYCLE

NON-DIRECTIONAL SPARE PARTS OF ENGINE

Read the following instruction carefully and assure spare parts installed in right position, otherwise it may damage engine seriously.

1. Principal axis (6006/P6, 6202) , countershaft bearing (6204/P6) -bearing seal side are installed in the "left" / "right" side of crankcase.
2. The first gear level of countershaft is towards right crankcase and the second gear level of countershaft is towards right crankcase
3. "Left" and "right" shifter yoke-size larger end, outward bending end is kicking starter shaft.
4. "Middle" shifter yoke-size larger end, outwards bending end is towards crankshaft.
5. Driver gear - big converse angle is towards right crankshaft.
6. Oil cleaner washer concave end, locknut surface is towards right crankcase.
7. Convex angle of oil pump cover is dead against the point mark of oil pump retainer.
8. Oil filter element surface end is towards left crankcase.
9. The first ring is white piston ring; the second is black piston ring. When installing, 1、3 ring hatch is towards exhaust port, 2、4 ring hatch is towards inlet port.
10. "IN" mark on piston is towards carburetor.
11. Valve spring-little section end is towards valve guiding pipe.
12. Camshaft - timing mark is outward.
13. Drive sprocket side with "YP" mark is outward.

When you fasten bearings, you should keep identify mark easily read without disassembling bears.

a. Principal axis bearing 6006/P6 is in the right crankcase, and bearing 6202 is in the left crankcase.
b. Countershaft bearing 6204/P6 is in the left crankcase.
c. Clutch bearing 6001 is in the releasing disc of clutch.

DISASSEMBLY AND INSTALLATION OF ENGINE

DISASSEMBLY ORDER：

Unscrew discharging oil screw, drain engine oil

↓

Disassemble front left and right decorating board, left and right cover, big seat

↓

Shut off fuel tank switch, remove inlet oil tube

↓

Remove connecting wires of oil tank, oil gauge

↓

Remove throttle cable and clutch cable

↓

Remove output wires of magneto, starter motor wires, high coil

↓

Remove front right footrest assy. (1) and brake pedal (2) and left footrest assy. (3) and gearshift shaft assy. (4)

↓

Remove right rear footrest assy.

↓

Shut off the joint of air cleaner and carburetor

↓

Remove muffle

↓

Remove left cover of engine (7)

↓

Remove transmission chain lock slice, release chain from sprocket away

↓

Remove top hanging board of engine (8)

↓

Remove front hang board of engine (9)

↓

Remove fixing bolt of the tail part of engine

↓

Put down engine

INSTALLATION ORDER：

Engine assy.

↓

Fixing bolt of the tail part of engine

↓

Front hanging board of engine (9)

↓

Top hanging board of engine (8)

↓

Install chain

↓

Left cover of engine (7)

↓

Install muffle (6)

↓

Connect air filter with carburetor

↓

Install right rear footrest assy.

↓

Install braking pedal assy. (2) and front right footrest assy. (10), gears shaft (4) and front left footrest assy. (3)

↓

Connect output wires of magneto, starter motor wires, high pressure coil

↓

Install throttle cable and clutch cable assy.

↓

Connect wires of oil tank and install fuel tank

↓

Connect oil pipe

↓

Install front left and right decorating board, left and right cover and big seat

ATTENTION：

Engine oil: 1.1L for installation; 1 L for replacement

1. Make fuel tank switch in “ON” position, and then start engine, check whether abnormal vibration or noise happens, check if engine lubricates.
2. Method for checking oil:
   a) Pull out staff gauge of oil, and wipe it with clean cloth.
   b) Insert staff gauge to inspect oil level. If oil level is the lowest position, add oil.
   c) Warm up engine for five minutes, then cool it for three minutes, check oil level, if the level is below its lowest position, add oil.
   d) Oil level should be kept between lowest position and highest position.
4. Before disassembling engine, loose pivot shaft nut, after installation, fasten the nut.

FASTEN TORQUE:

Pivot shaft：75N.M

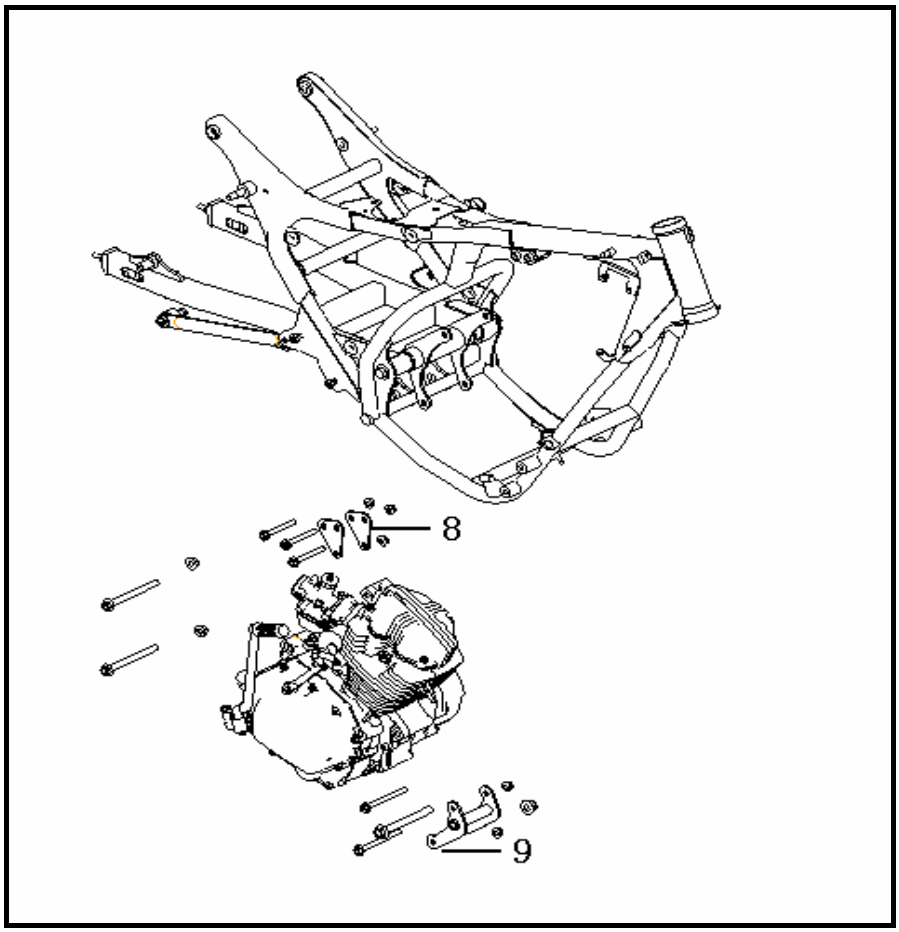
Rear fixing bolt of engine: (M10): 40N.M

Front fixing bolt of engine: (M8): 25N.M

Front fixing bolt of engine (M12): 60N.M

Fixing bolt for engine: 25N.M

Gearshift shaft bolt: 10N.M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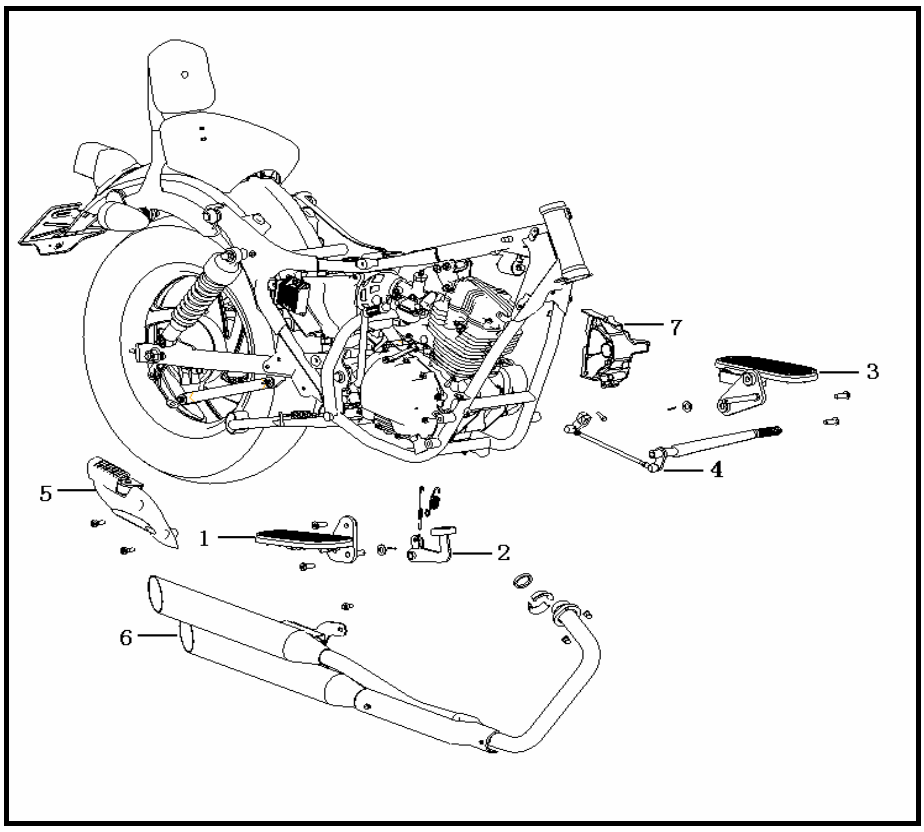

7
3
4
5
1
6
2
6

Engine assembly

DISASSEMBLY

Cylinder head cover/rubber gasket
↓
Rocker arm bracket assy.
↓
Pushrod/pushrod guide board
↓
Cylinder head/cylinder head washer/dowel
↓
Crankcase left head/left head gasket/dowel
↓
Spring retainer/piston pin/piston
↓
Crankcase left head/left head gasket/dowel
↓
Crankcase right head/right head gasket/dowel
↓
Outside parts of right crankcase
↓
Outside parts of left crankcase
↓
Left crankcase/crankcase gasket/dowel
↓
Inside parts of left crankcase
↓
Inside parts of right crankcase

ASSEMBLY

Left crankcase/crankcase gasket/dowel
↓
Inside parts of left crankcase
↓
Left and right crankcase
↓
outside parts of left crankcase
↓
outside parts of right crankcase
↓
Crankcase right head/right head gasket/dowel
↓
Crankcase left head/left head gasket/dowel
↓
Spring retainer/piston pin/piston
↓
Crankcase left head/left head gasket/dowel
↓
Cylinder head/cylinder head washer/pin dowel
↓
Pushrod/pushrod guide board
↓
Rocker arm bracket assy.
↓
Cylinder head cover/rubber gasket

ATTENTION：

1、 Clean engine parts before assembling. During assembling lubricate them, and then fasten bolt according to the recommended torque number.

2、 While assembling engine, pay more attention to unilateral fixed parts. After reassembling engine, start and check oil path lubricating system.

CYLINDER HEAD ASSEMBLY

DISASSEMBIY

Cylinder head cover (3)/rubber gasket (4)

↓

Rocker arm bracket assy. (6)

↓

Pushrod body (9)/pushrod guide board (8)

↓

Cylinder head comp. (10)

ASSEMBLY

Cylinder head comp.

↓

Pushrod body (9)/pushrod fixing board (8)

↓

Rocker arm bracket assy. (6)

↓

Cylinder head cover (3)/rubber gasket (4)

ATTENTION:

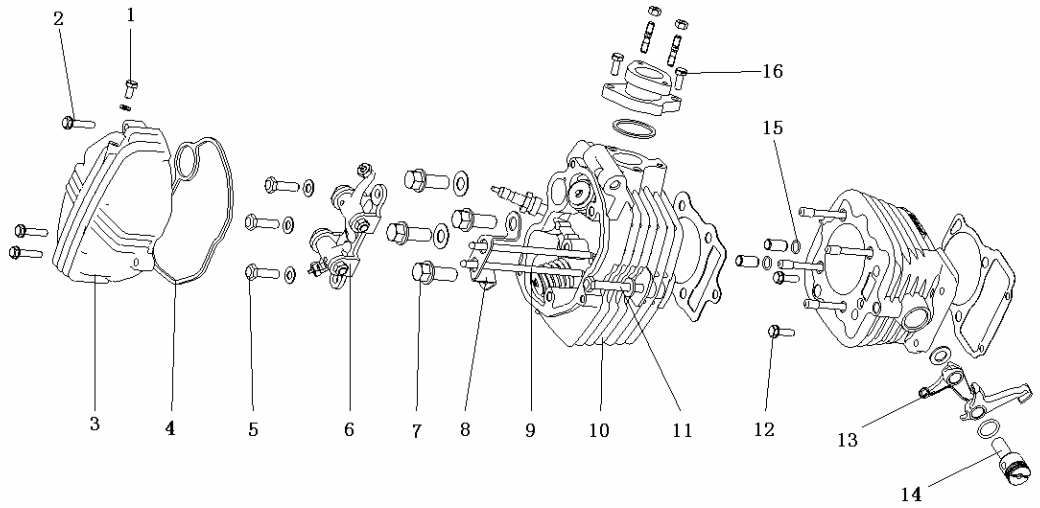
1、 While installing cam follower (13), turn cam follower by hand, it should turn freely and without block, but not too loose. Axial clearance between shafts should not too large or too small.

2、 While installing cam follower shaft (14), do not knock on cam follower shaft by hammer, and press it into the hole by hand.

3、 Do not forget to install O-ring position in the position of cylinder dowel pin.

4、 Push rod bottom end should put through cam follower. Arm should turn freely. Push rod ball should aim at top rocker arm. Push rod and the bracket should not collide.

5、 Clearance of inlet and exhaust valve in cooling is 0.06~0.08mm.



TORQUE VOLUME:

1、 Bolt of cylinder head cover top end（1）	8-10N•M
2、 Three lock bolts of cylinder head cover（2）	10-12N•M
3、 Three lock bolts of arm bracket combination（5）	25-28N•M
4、 Four bolts of cylinder head and push rod fixing board（7）	25-28N•M
5、 Cam follower shaft fixing bolt（11）	20-25N•M
6、 Two locking bolt of cylinder（12）	10-12N•M
7、 Two locking bolt of carburetor connecting end （16）	10-12N•M

CYLINDER HEAD ASSEMBLY

DISASSEMBLY

VALVE CLIP LOCK（13）/VALVE SPRING PLATE（12）

↓

VALVE OUTSIDE SPRING（11）

↓

VALVE INSIDE SPRING（10）

↓

CLIP SPRING（9）/SEAL RING OF VALVE STEM（8）

↓

INSIDE WASHER OF VALVE SPRING（6）/ OUTSIDE WASHE（7）

↓

INLET VALVE (2)/EXHAUST VALVE (3)

ASSEMBLY

INLET VALVE（2）/EXHAUST VALVE（3）

↓

INSIDE WASHER OF VALVE SPRING（6）/OUTSIDE WASHE（7）

↓

LOCK SPRING（9）/ SEAL RING OF VALVE STEM（8）

↓

VALVE INSIDE SPRING（10）

↓

VALVE OUTSIDE SPRING(11)

↓

ALVE CLIP LOCK（13）/ VALVE SPRING PLATE (12)

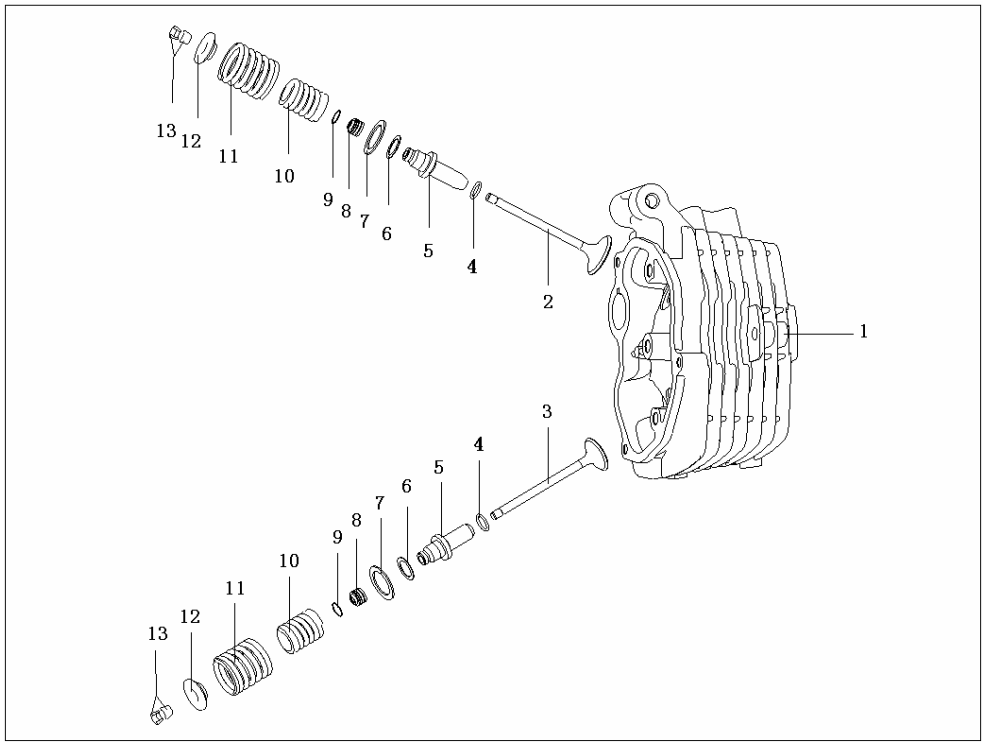
ATTENTION：

1、 They should be skived before installing inlet and exhaust valve. While skiving, please spread skiving cream evenly. Inlet, exhaust valve and valve seat ring are even, not too high or too low, and clean them.

2、 While installing valve, spread a little installing scream on inlet and exhaust valve stem. After valves have been installed, they should turn freely and without block.

3、 Sealing ends of inside and outside spring of valve are installed down.

4、 Make experiment for the leak of inlet and exhaust valve. Input coal oil into inlet and exhaust pipe for more five second, and no leak for valve cable.



Disassembly

First ring

↓

Second ring

↓

Slice ring, oil ring（一）

↓

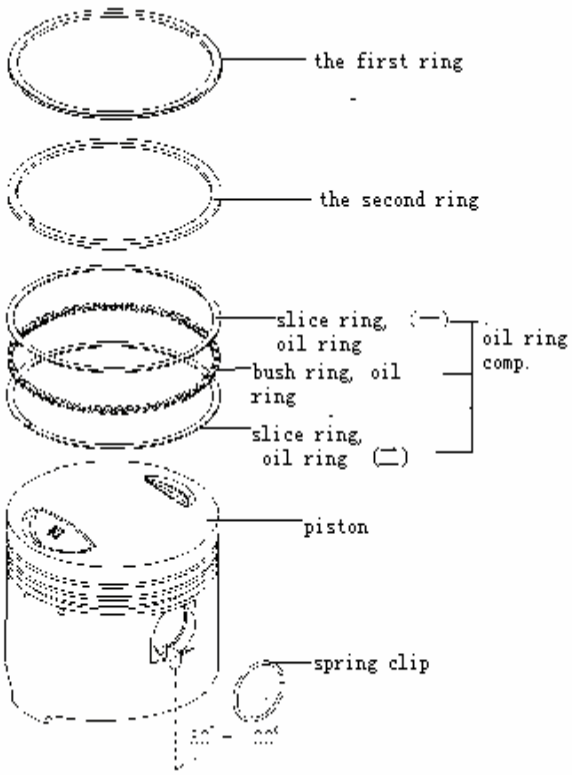
Slice ring, oil ring (二)

↓

Bush ring, oil ring

↓

Piston



Assembly: the assembly sequence is essentially the reverse of removal.

Attention:

1. The first ring is white and the second ring is black.
2. The side with English word is upwards.
3. Never replace the position of the first ring and the second ring.
4. Word “IN” is towards inlet port, the hatch of the first ring, oil ring slice ring (一) is towards exhaust port . and the opening of the second ring ,oil ring slice ring(二) is towards inlet port.
5. Spring clip gap is 80-100° against groove gap.

ITEM		NUMBER
Hatch clearance when working	First ring	0.15—0.3mm
	Second ring	0.1—0.3mm
	Slice ring, oil ring	0.2—0.3mm
The clearance between piston ring and ring groove	First ring`	0.035---0.065mm
	Second ring	0.02—0.05mm

Left crankcase cover assy.

Removal:

Left crankcase cover assy.

- Screw (11)
- Start gear cover (10)
- O-ring (9)
- Gasket (8)

Roll needle bearing (7)

- starting gear shaft (6)
- Roll needle bearing (4)
- Magneto cover cap (12)
- O-ring (13)

Timing bolt (1)

- O-ring (2)
- screw (14)
- left crankcase cover
- trigger assy.

Torque value:

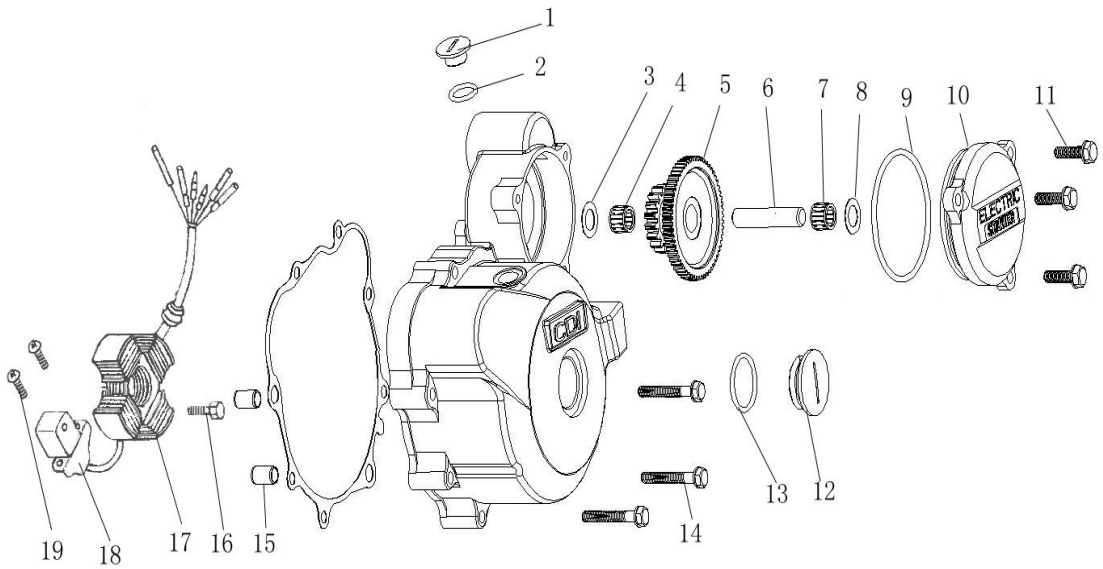
Coil screw (16)	6N.M
Left cover screw (14)	11N.M
Magneto bolt (12)	11N.M
Timing bolt (1)	7N.M
Trigger screw (19)	6N.M
Start gear cover screw (11)	7N.M

Installation: the installation sequence is essentially the reverse of removal.

Attention:

1: left crankcase cover should be assembled finally in the procedure of engine installation.

2:don’t miss to install O-ring.



RIGHT CRANKCASE SPARE PARTS

REMOVAL:

Separating stem (28) → Separating bush (26) → Bearing (25) → Clip circle → Clutch assy.

clip circle (29) → spring, shift gear plate → plate, gear shift (31) → clip circle ((35) → Stopper gasket → Returning spring → Gearshift shaft assy.

bolt (6) → oil pump cover → oil pump axle (4) → oil pump screw (2) → oil pump assy.

Bolt → Gearshift stopper → Spring stopper (19) → Bolt (18) → Plate, gear shift cam (17) → Pin (16)

screw (13) → oil filter rotor cover assy. → oil filter rotor cover (11) → nut → washer → oil filter rotor cover assy.

Torque value:

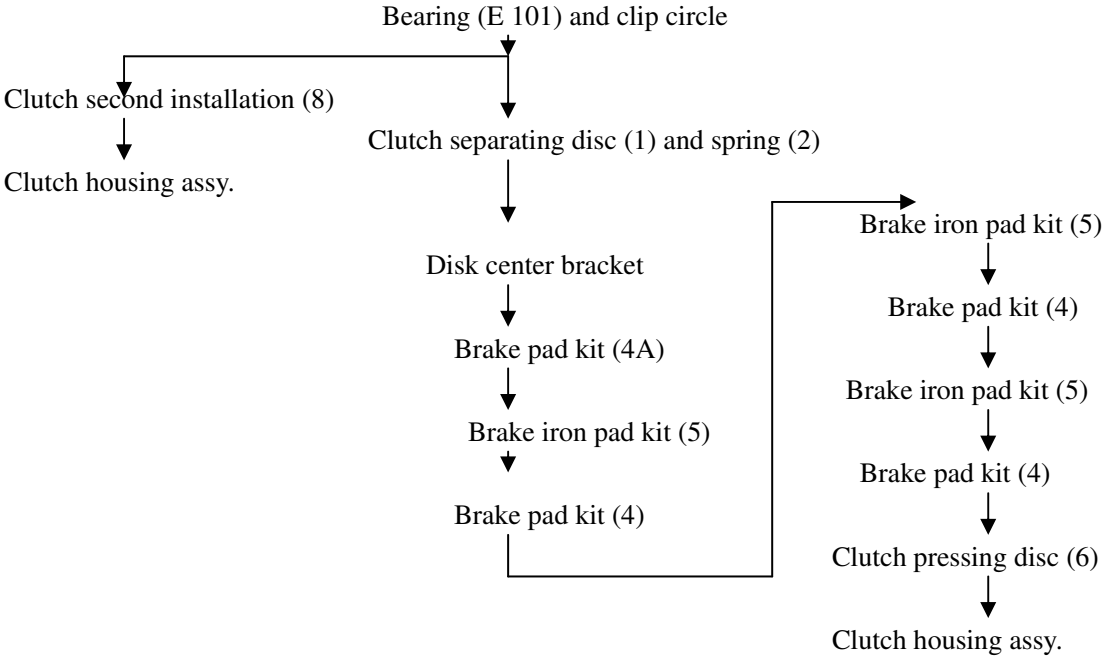
Oil pump bolt	7N.M	Bolt, shift gear cam	11N.M
Screw, oil pump	7N.M	Bolt (18)	11N.M
Nut, filter rotor	45N.M		

Attention:

1. Driving gear in oil pump should turn flexible.
2. Gearshift shifter yoke should be assembled properly, and it should be easy to shift gears.
3. Clutch has certain axial clearance, and it can work unilaterally.
4. Convex side of gasket (9) is upwards.
5. The side with reverse angle is assembled downwards.

Clutch assembly

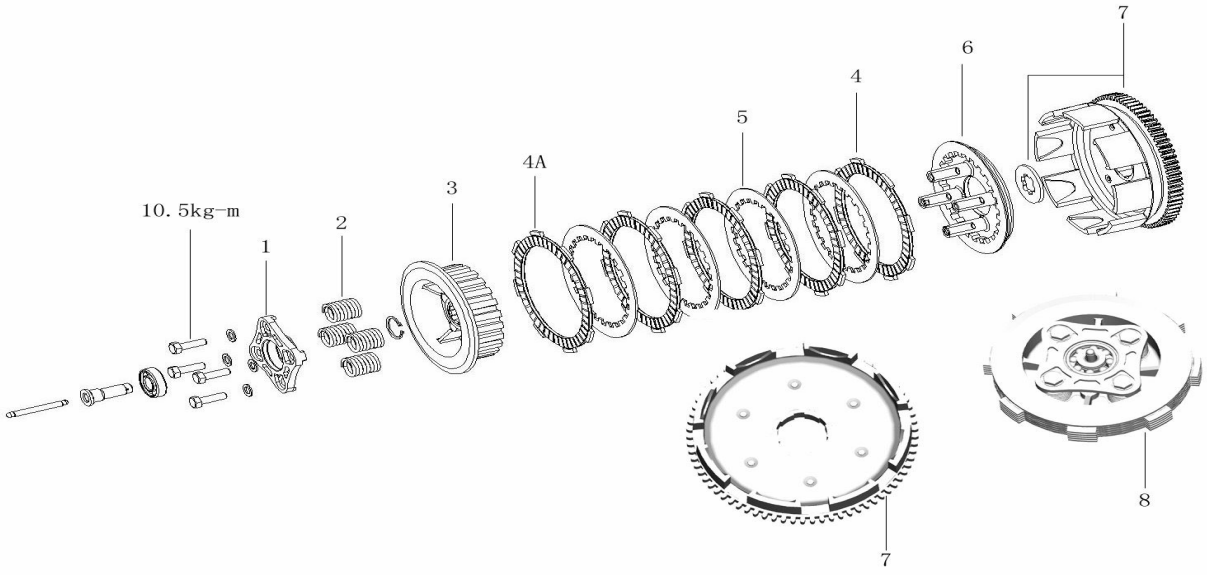
Removal



The installation sequence is essentially the reverse of removal.

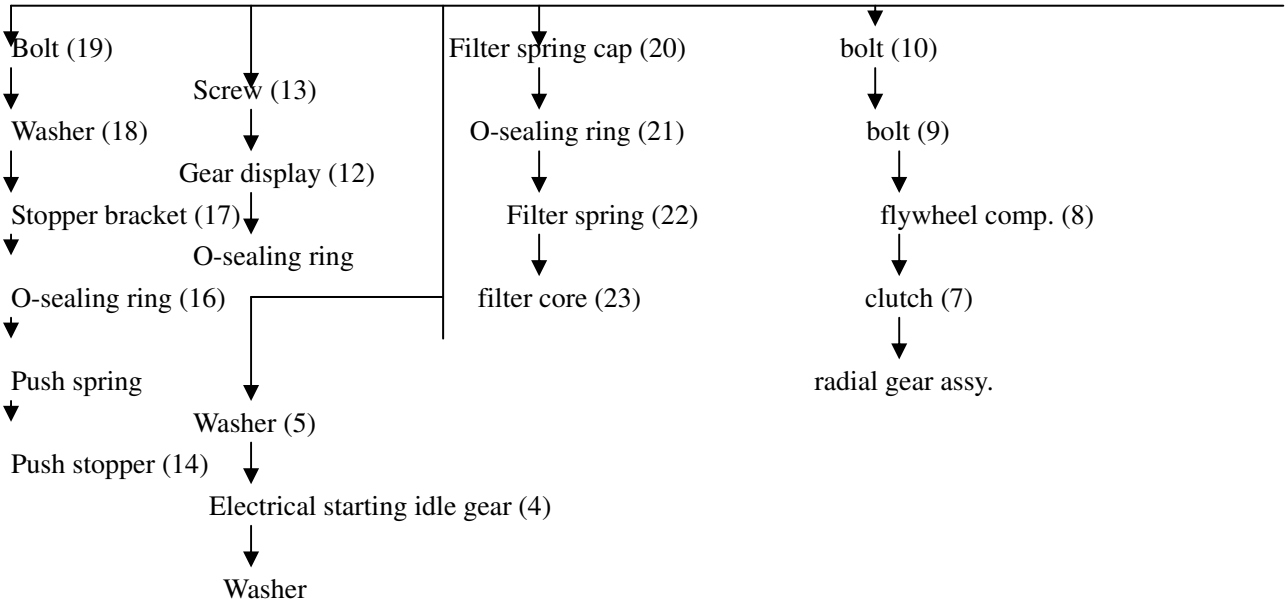
Attention:

1. Before assembling brake pad kit and brake iron pad kit, soak them in oil.
2. Firstly put the brake pad kit (4A) on the clutch pressing plate, then put brake iron pad kit (5), and then install them following hereafter fig.
3. Tighten clutch separating disc locknut with 10-20kg-m toque fork.



Left crankcase spare parts

Removal:



Installation: the installation sequence is essentially the reverse of removal.

Attention:

1. The end with signal '△ " on gearshift display is downwards.
2. Daub star gear bracket and electrical start idle gear with some engine oil when assembling them, it should turn freely.
3. Impurity can't go into flywheel.
4. Don't miss O-sealing ring.
5. Stopper incline should be towards bracket hatch, and stopper should have a good spring when it is pushed by hand.

Torque value

Bolt (10)	42N.M
Bolt (9)	23N.M
Display screw (13)	3N.M
Stopper bolt	11N.M
Spring cap (20)	42N.M

Crankcase installation

Removal:

Crankcase assy.

Right crankcase assy. (2)

Refer to the next page

left crankcase assy. (1)

Principal axial bearing (3)

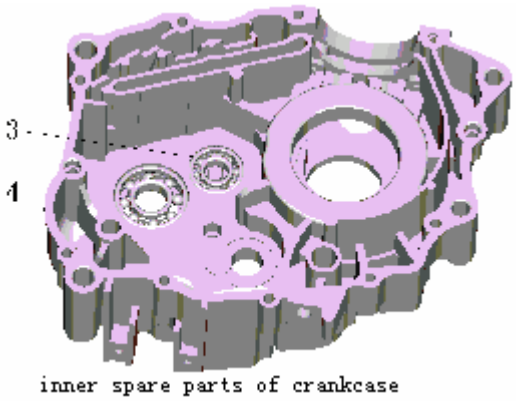
countershaft bearing (4)

Left crankcase

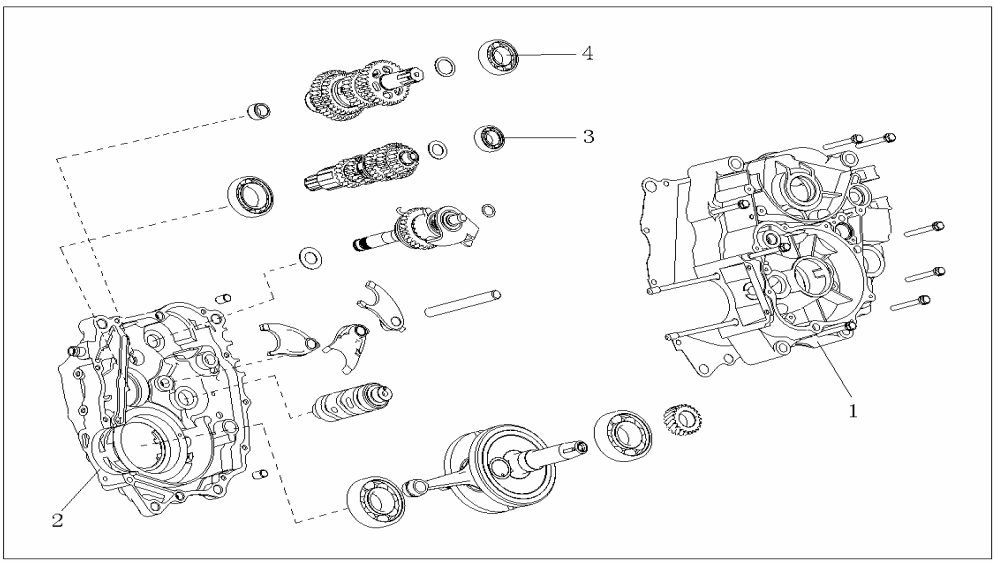
Installation: the installation sequence is essentially the reverse of removal.

Attention:

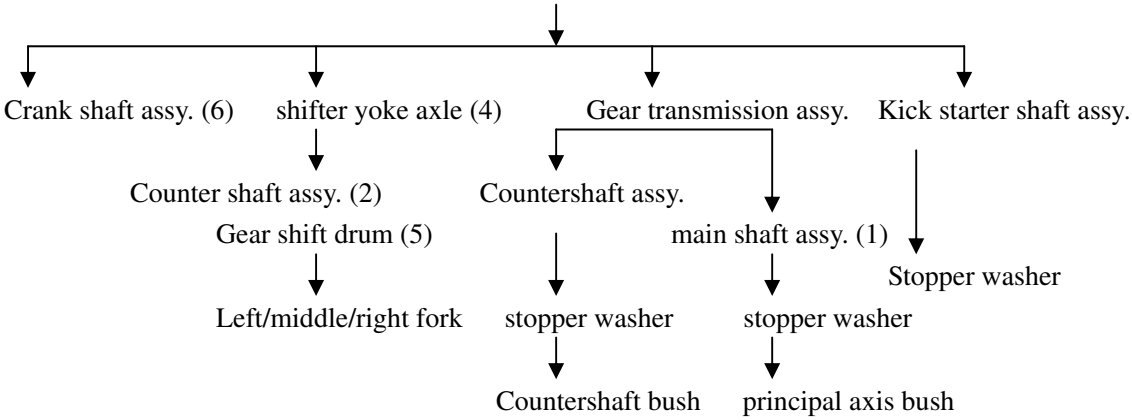
1. Don't use metal tool to unclench the crankcase to remove it, otherwise the crankcase can be damaged. You can use mallet or plastic tool to strike the edge of left crankcase.
2. About right the inner spare parts of crankcase, you can refer to the next page.
3. Use new orientation pin, crankcase washer and oil seal to reinstall crankcase.
4. When assembling pressing bearing in the left crankcase, add little oil on the outside circle of the bearing, keep bearing mark towards crankcase outside to install it.
5. When assembling, raze superfluous washer with knife, which can't drop into crankcase.
6. When closing left crankcase and right crankcase, it may be difficult to keep start shaft dead against the hole of the axial of left crankcase. Commonly you can shift down start shaft to install the left and right crankcase.
7. When assembling bolt, prefix it, then tighten it. And torque value: 10-12N.M



inner spare parts of crankcase



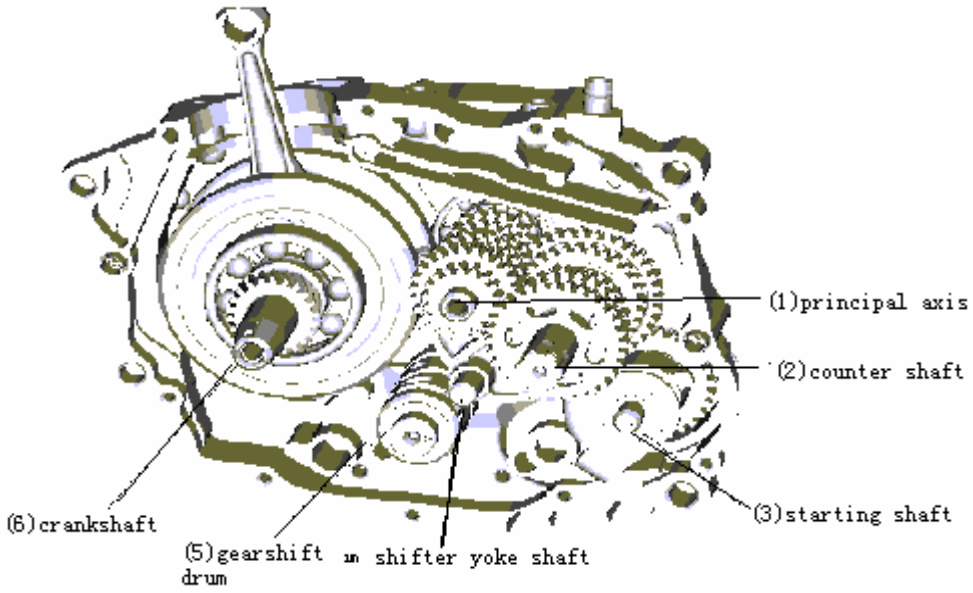
INNER SPARE PARTS OF RIGHT CRANKCASE



Installation: the installation sequence is essentially the reverse of removal.

Attention:

1. Assembling procedure in theory: firstly assemble kicking start axle assy., secondly principal axis and countershaft, then right, middle and left fork, gear shift drum and shifter yoke axis, finally assemble crankshaft assy.
2. When assembling principal axis bearing, smear outer circle of the bearings some engine oil, and pressure should be proper. When assembling counter shaft bush, also daub the outer circle with little oil, and keep the hatch dead against oil hole of crankcase.
3. When assembling start shaft, returning spring end should be inserted into crankcase hole, guiding slice and crankcase limiting groove mesh well.
4. Install principal axis and counter shaft at the same time, smear counter shaft head with a little oil, and principal axis and countershaft turn freely. In the assembling procedure, don't miss the gasket in the bottom of crankcase.
5. Assemble right shifter yoke in the guiding groove of the third gear C3 of countershaft, middle shifter yoke in the guiding groove of fourth gear M4 of principal axis, and left shifter yoke in the guiding groove of the fifth gear C5 of countershaft, and keep the big arc side of left and right shifter yoke alongside of kicking starter shaft, the big arc side of middle shifter yoke alongside of crankshaft.
6. Keep the end of crankshaft with principal gears upwards to assemble crankshaft into the hole of crankshaft. Shake it in every direction to be assembled properly, when crankshaft turn freely, and no block.



Assemble kicking starter shaft

Remove from mandrel end

Stopper gasket (1) and kicking starter shaft bush (2)

↓

Kicking starter spring (3)

↓

Kicking starter spring retainer circle (4)

Remove from mandrel end

Stopper gasket (12mm) (6) and clip circle (16mm) (7)

↓

Ratchet guiding board (8) and starting spring retainer circle (9)

↓

Starting ratchet spring (10)

↓

Stopper washer (16mm)(11)

↓

Kick starting ratchet (12)

↓

Spring clip circle (20mm) (13) and stopper washer (20mm)(14)

↓

Kicking starter gear (15)

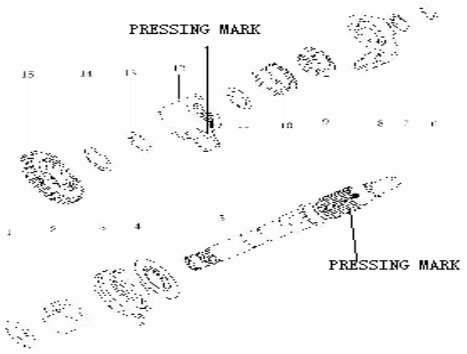
↓

Kicking starter shaft (5)

Assembly: the assembly sequence is essentially the reverse of removal.

Attention items:

1. When assembling foot-starting ratchet, keep pressing mark on the ratchet and the mark on kicking starter shaft at the same level, otherwise noise from ratchet will be produced when engine works.
2. When assembling ratchet-guiding slice, make its upper small arm (inflexed) can be stopped by the small arm of kicking starter ratchet.
3. Checking the free sliding of ratchet on kicking starter shaft.



Assemble gearshift shaft

Removing from mandrel end

Gearshift shaft assembly
↓
Stopper washer (14mm)(2)
↓
Clip circle (14mm)(1)
↓
Stopper washer (14mm)(2)
↓
Gearshift shaft returning spring (3)

Installation: the installation sequence is essentially the reverse of removal.

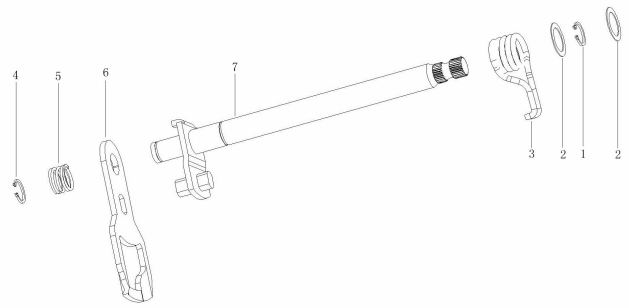
Removing from shift-gear board end

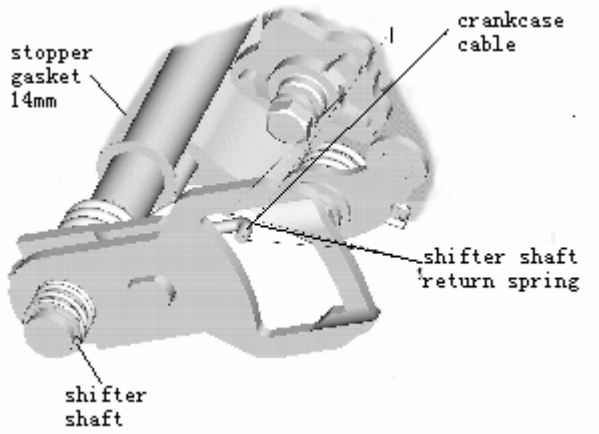
Assembling gearshift shaft → clip circle (12mm)(4) → gearshift board spring (5) → gearshift board (6) → gearshift shaft assy. (7)

Assembly: the assembly sequence is essentially the reverse of removal.

Attention items:

1. When assembling gearshift board, keep convex end towards mandrel end
2. When assembling gearshift mandrel, install 14mm stopper washer.
3. Ensure returning spring fixed at the cable of crankcase.





Counter shaft assembling

Remove from gear end:

Stopper washer 20mm(1)⟶The second gear of countershaft⟶ The fifth gear of countershaft (24)⟶ counter shaft

Removing from crankcase end:

Stopper washer 15mm(2)⟶starting idler gear (29) and bushing (3)⟶stopper washer (16.5mm)(4) ⟶
The first gear of countershaft (36T) and the first gear bushing of countershaft (3) ⟶stopper washer 16.5mm (4) ⟶ the third gear of countershaft (28T)⟶clip circle (5) ⟶Spline gasket (6)⟶
The fourth gear of counter shaft (26T)⟶countershaft.

Assembly: the assembly sequence is essentially the reverse of removal.

Attention:

1. Before assembling, lubricate all gear bushing, and the lubricated oil holes should be dead against the lubricated oil hole on the counter shaft.
2. The surface end of the fourth gear of countershaft is towards sprocket end.
3. Spline gasket should cline to the convex end of the fourth gear of countershaft.
4. The bracket end of the third gear of counter shaft should be towards sprocket end, and convex end towards crankcase end.
5. The surface end of the first gear of counter shaft should be towards gear case end.
6. The bushing end of the fifth gear of countershaft should be towards the crankcase end, and the convex end towards sprocket end.
7. The surface end of the second gear is towards sprocket end.
8. The thickness is different for the third gear, the fourth gear and fifth gear.
9. There are four lubricating oil holes in outer diameter of countershaft.

Assembling principal axis

Removing from crankcase

Stopper washer 15mm(7)⟶the second gear of principal axis (17T)⟶ the fifth gear of principal axis (25T) ⟶
Spline washer (6)⟶clip circle (5)⟶ the fourth gear of principal axis (23T) ⟶clip circle (5) ⟶
Spline washer (6)⟶the third gear of principal axis (20) ⟶ principal axis.

Assembly: the assembly sequence is essentially the reverse of removal.

Attention:

1: before assembling, lubricate all gear bushing, and the lubricated oil holes should be dead against the oil hole on the countershaft.

2: the gear end on the starting gear assy. should cline to the first gear of principal axis (13T).

3: the convex end of the third gear of principal axis is outside.

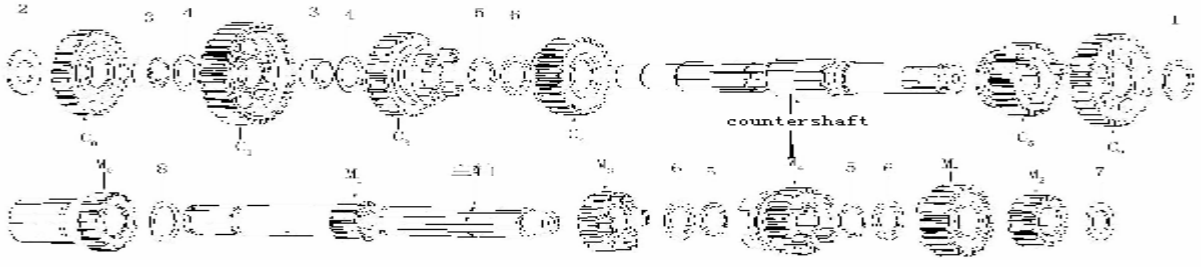
4:spline washer should be under clip circle and cling to the third gear of principal axis.

5: The bracket end of the fourth gear of principal axis is towards the third gear, and the convex end outside.

6:the convex end of the fifth gear of principal axis is towards inside, and the surface towards outside.

7: it is necessary to keep clip circle fixed in the groove of principal axis.

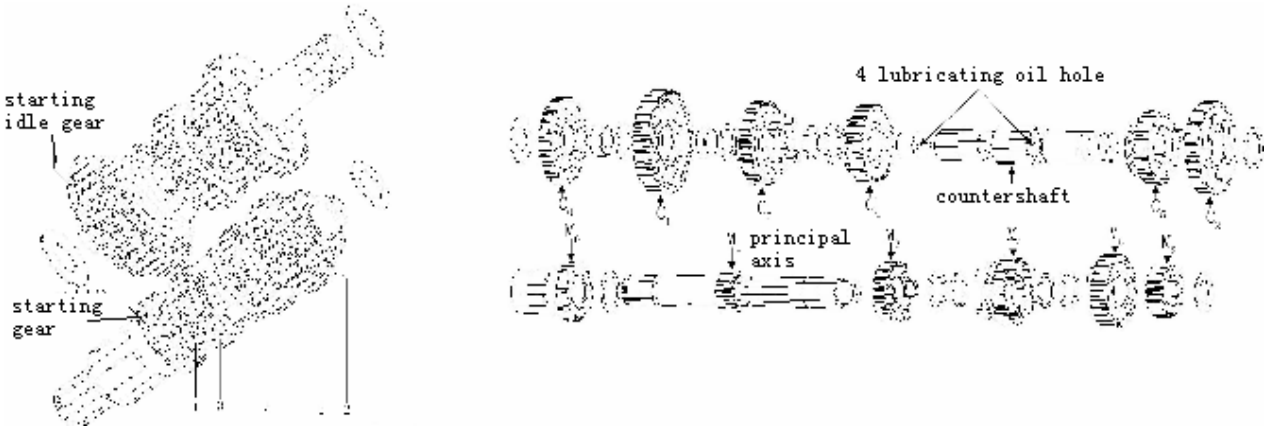
8: when assembling, pay attention to the difference between the third gear of principal axis and the fifth gear, although they have similar appearance, they have different code number.



Gear transmission chain

The gear case with five gearshifts

Item	Gear				
	The first gear	The third gear	The fourth gear	The fifth gear	The second gear
Principal axis	13T Fix	20T Free	23T Fix &Slide	25T Free	17T Fix
Countershaft	36T Free	28T Fix &Slide	26T Free	24T Fix &Slide	32T Free
Shifter yoke		'R' (C3)	'C' (M4)	'L' (C5)	



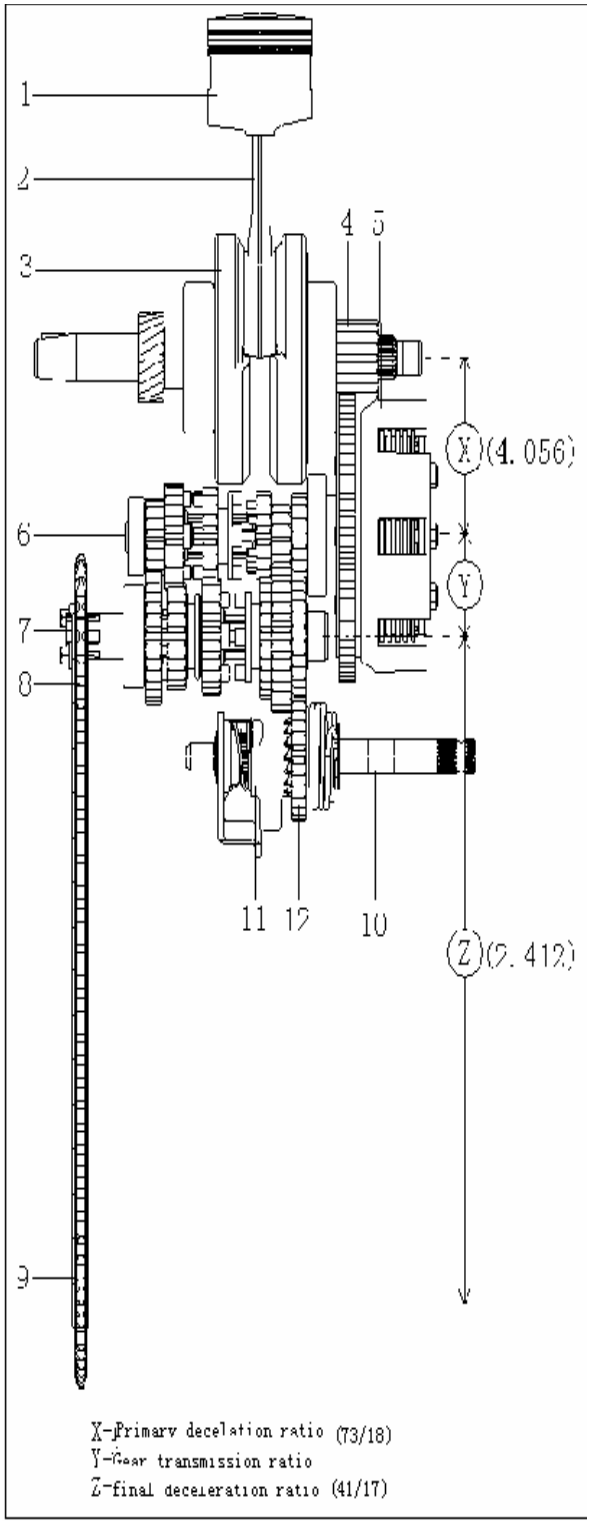
Gear power flow chart

Position	Power transmission	Output	Shifter yoke
The first gear	M1---C1—C3	COUNTERSHAFT	R
The second gear	M2---C2—C5	COUNTERSHAFT	L
The third gear	M4—M3—C3	COUNTERSHAFT	C
The fourth gear	M4—C4—C3	COUNTERSHAFT	R
The fifth gear	M4—M5—C5	COUNTERSHAFT	C
Neutral	M1—C1, M2—C2, M3—C3, M4—C4, M5—C5	No power	

POWER TRANSMISSION CHART

From engine

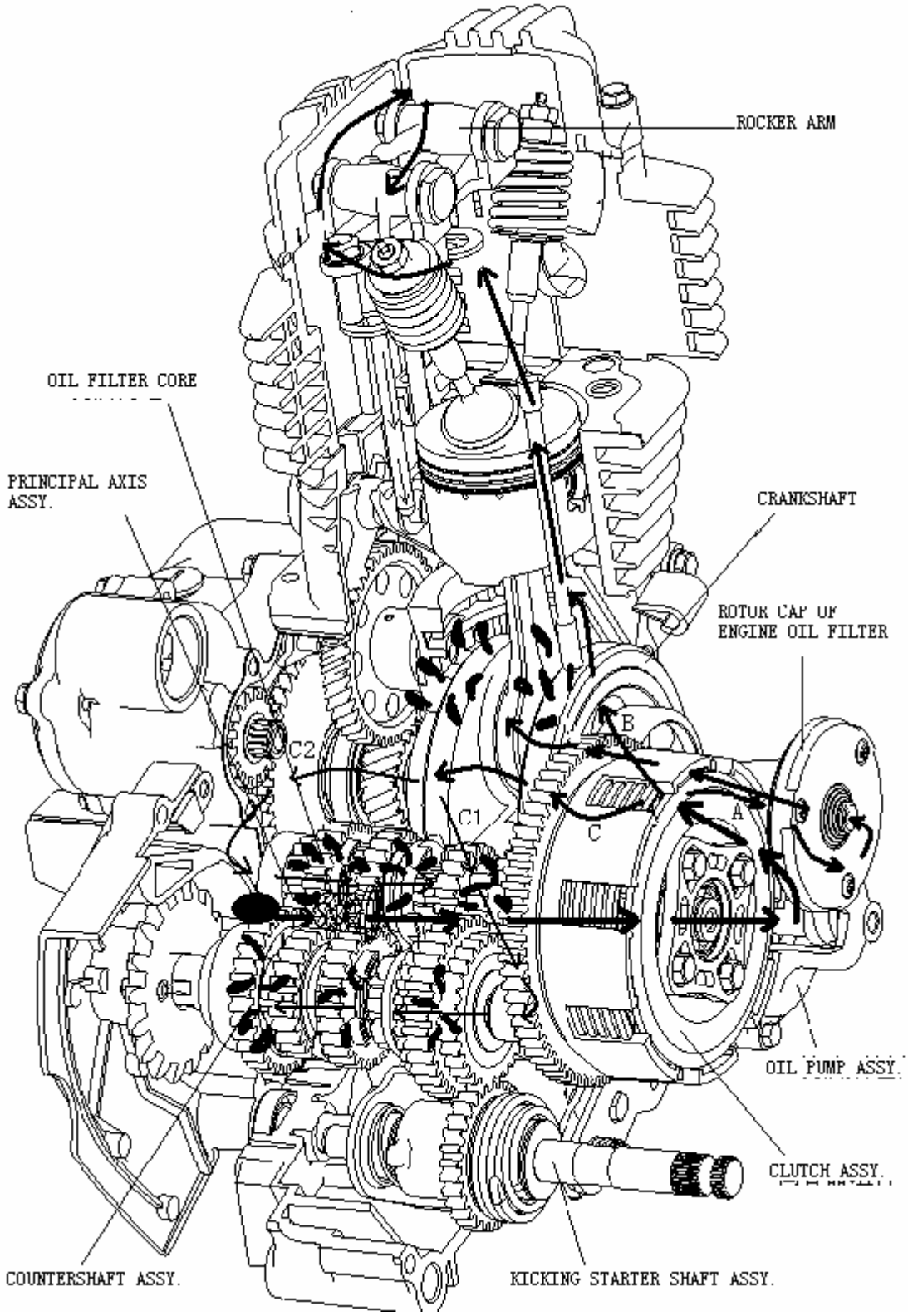
Piston (1)
↓
Connecting rod (2)
↓
Crankshaft (3)
↓
Main transmission gear (18T)(4)
↓
Clutch housing (73T)(5)
↓
Disc clutch brake
↓
Clutch pressing board
↓
Clutch center assy.
↓
Principal axis (6)
↓
Gear
↓
Counter shaft (7)
↓
Driving sprocket (17T)(8)
↓
Driving chain/rear wheel sprocket (41T)(9)



From kicking starter

Kicking starter
↓
Kicking starter shaft (10)
↓
Kicking starter ratchet (11)
↓
Kicking starter small gear (12)
↓
Countershaft gear
↓
Principal axis gear → principal gear → clutch center → clutch pressing board → disc clutch brake → Clutch housing (5) → main transmission gear (4) → crankshaft(3) → connecting rod (2) → piston (1)

Lubricating system



Lubricate

Here are main functions for engine oil.

1、 Lubricate……reduce friction with metal

2、 Cooling……prevent too hot

3、 Anti-dust……prevent rusting

4、 Clear……prevent deposit and clear carbon deposit

5、 Seal intermediate……seal combustion chamber

6、 Anti-abrasion……prolong accessory's life span

There are modes of wet groove, splash, pressure to lubricate engine.

Engine oil cycle

Oil pump assembled in right crankcase absorbs oil through main gears on right crankshaft. Oil in crankcase is filtrated through the oil filter core of left crankcase, then flows across oil pump rotor where produces large pressure, and then the oil is squashed into oil path of side cavity of right crankcase , where oil is detached into three roads to lubricate engine:：

A：On the first road, oil goes into the oil road of right crankcase cover, then flows across vitta of filter rotor cover assy., and then goes into oil filter rotor cover, flows out of rotor cover, then flows into the hole of right crankshaft axes, then oil hole of crankcase axes core and reaches to connecting big rod, where lubricates the big rod and crankpin. Finally oil flows back crankcase.

B：On the second road, oil goes into small oil hole in the side of right crankcase double-head bolt hole, then goes up along double-head bolt hole and flows into oil path hole of cylinder head cover, oil splashes out from the two oil holes on cylinder head cover, and lubricates rocker arm and rocker shaft, then flows back crankcase along two pushing lever hole.

C：On the third road, oil passes through small hole on right crankcase and flows into side oil cavity on right crankcase, after Oil reaches here, and then oil road becomes two roads to lubricate principal axis and countershaft.：

C1：On the first spur track, oil passes through the oil path on right crankcase to reach bush for right crankcase countershaft, flow across small hole of bush, then goes into axial hole of countershaft and through several small holes of countershaft where lubricates gears. Finally oil flows back crankcase.

C2：On the second spur track, oil goes into oil path on left crankcase to reach bearing of left crankcase principal axis, then flows into axial hole of principal shaft and through several small holes on principal axis, where lubricates gears of principal axis. Finally oil flows back crankcase.

For some part of crankshaft is dipped in oil, when crankshaft rotates at high speed, oil may splash around, some oil lubricates piston skirted and cylinder arm, and other oil splashes on piston lumen and passes across small holes on piston and connecting small rod, where lubricates connecting small hole and piston pin.

For clutch assy., kicking starter assy., gearshift organ assy. etc., a small proportion or the whole is dipped in engine oil to lubricate.

Valve clearance setting

Engine is in cooling:

1、 Remove magneto's bolt

2、 Remove timing bolt

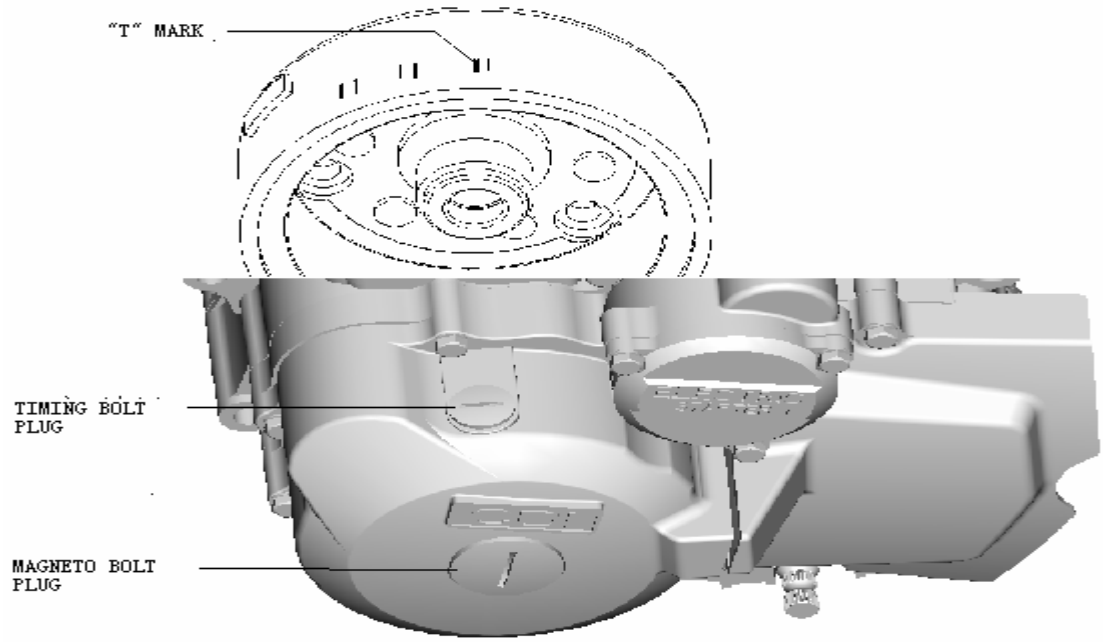
3、 Remove cylinder head cover

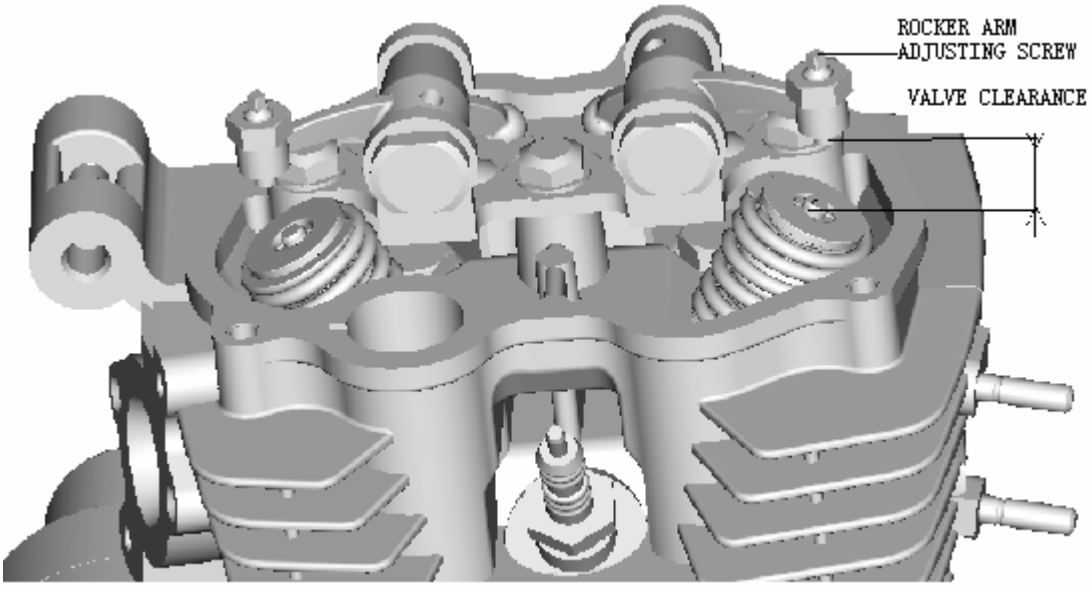
4、 Keep the mark "T" on the fly wheel dead against the timing bolt hole

5、 Check valve clearance, if the data is beyond the normal rule, then adjust rocker arm adjusting screw, after readjusting it, check if engine work normally.

Inlet valve clearance: 0.06-0.08mm

Exhaust valve clearance: 0.06-0.08mm

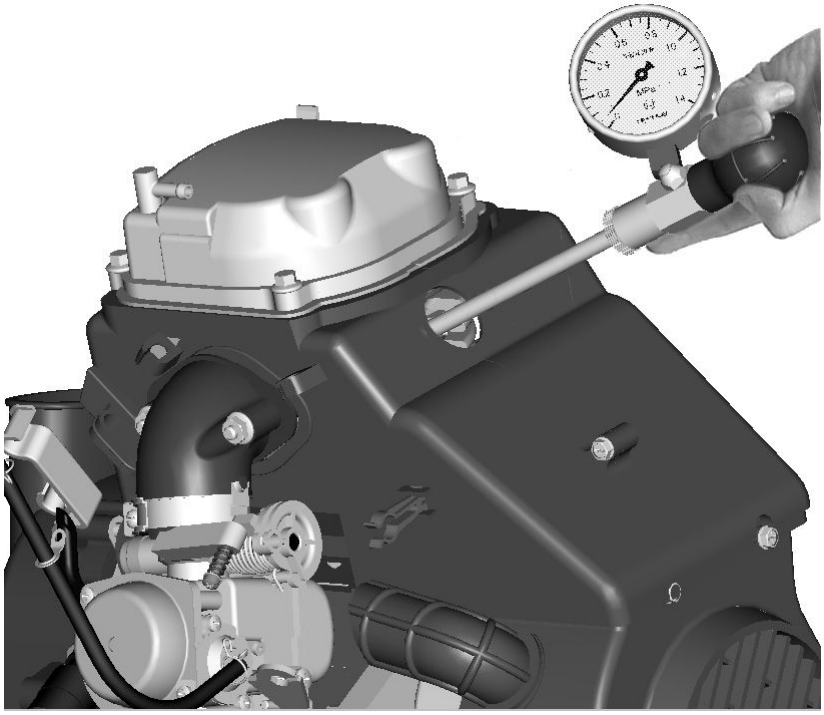




Measure the pressure in engine cylinder

STEP 1：

1. Start engine until temperature reaches its requirement.；
2. Remove spark plug and join pressure gauge.；
3. Inspect the following switches：
   (a) Fuel switch is in "OFF" position.；
   (b) Ignition switch is in "OFF" position；
4. Play up throttle completely, start engine for several times (6-8 times)）；
5. Note reading, and do the above steps three times and calculate their average value as actual compression pressure, which should be 10±2Kg/cm^2。



STEP 2：

When the pressure of cylinder is below 10Kg/cm^2， install spark plug, restart and warm up engine, remove spark plug and drop several drops of oil in combustion chamber, do another inspection with manometer following as STEP ONE.

● If the pressure in cylinder increases, you have to inspect:

a. If cylinder is abraded；
b. If piston/ring is abraded；
c. If there is scratch or block for cylinder/piston；
d. If piston is blocked completely in piston groove.

●if the pressure in cylinder doesn't increase, inspect：

a. If valve clearance is correct；
b. If cylinder head screw is fastened too tight or loosened；
c. If valve holder is abraded；
d. If valve is curved；
e. If valve timing is correct；
f. If cylinder head gasket is abraded.

STEP 3：

When the pressure in cylinder is over 12Kg/cm^2， clear deposited carbon in cylinder head, piston, and combustion chamber, at the same time inspect the displacement.

SOME IMPORTANT STANDARD SIZE (ENGINE)

CYLINDER HEAD/VALVE

ITEM			STANDARD	
CYLINDER PRESSURE			10.0±2.0 kg • cm^2	
Height of cam vane			32.85±0.06 mm	
Valve clearance		INLET	0.06~0.08 mm	
		EXHAUST	0.06~0.08 mm	
VALVE			A	B
	Valve stem	INLET	5.435~5.440mm	5.440~5.445 mm
		EXHAUST	5.435~5.440mm	5.440~5.445 mm
	Valve stem	INLET	5.475~5.480mm	5.480~5.485 mm
		EXHAUST	5.475~5.480mm	5.480~5.485 mm
	The clearance between valve stem and valve guide stem	INLET	0.035~0.045mm	0.035~0.045 mm
		EXHAUST	0.035~0.045mm	0.035~0.045 mm
Natural distance of spring		INNER SPRING	33.5 mm	
		OUTER SPRING	40.9 mm	

CYLINDER/PISTON

ITEM			STAANDARD	
			A	B
Cylinder, piston	Inner diameter of cylinder		62.000~62.005 mm	62.005~62.010 mm
	Diameter of piston		61.965~61.970 mm	61.970~61.975 mm
	Clearance between piston and cylinder		0.03~0.04 mm	0.03~0.04 mm
PISTON PIN	The hole of piston pin		15.002~15.005 mm	15.005~15.008 mm
	Piston pin		14.994~14.997 mm	14.997~15.000 mm
PISTON RING	The clearance between piston ring and groove	The first ring	0.035~0.065 mm	
		The second ring	0.02~0.05 mm	
	The clearance of piston ring hatch	The first ring	0.15~0.3 mm	
		The second ring	0.1~0.3 mm	
		Oil ring	0.2~0.3 mm	

CLUTCH

ITEM		STANDARD
CLUTCH	Free distance of spring	35.0~35.6 mm/7.5 rounds
	Thickness of brake pad kit	2.8~3.0 mm
	Free stoke	10~20 mm

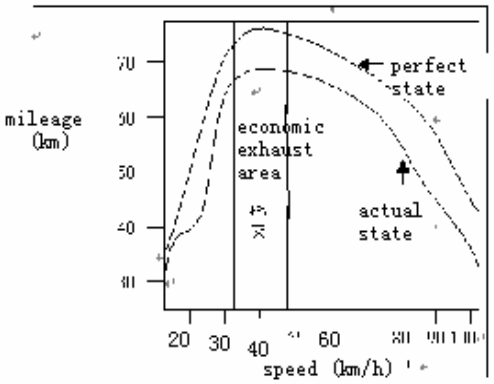
Air cleaner assy.

Clean the filter core of air cleaner

1. Remove air cleaner cap
2. Wash the filter core of air cleaner in clean lotion oil, and then let the filter core completely dry.
3. Dip the filter core of air cleaner in clean gear oil, then squeeze out redundant oil.
4. Reassemble various parts in the reverse of removal.

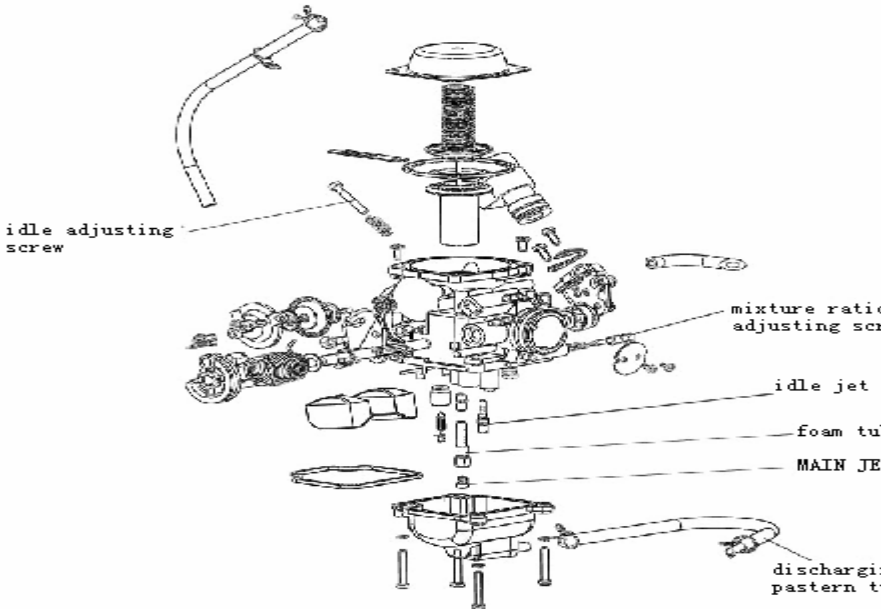
CARBURETOR ASSY.

FUEL EXHAUST CURVE



for each engine, at economic exhaustion speed, the ratio of air-fue is the same of the ratio of max inlet air-max fuel volume.

Manufacturer	CHINA KEEWAY
Model	Flat inhale
Diameter of throat tube	PZ27A 27mm
Main nozzle	#155
Idle nozzle	#21
Mixture ratio screw rounds	extrude 1.5±0.5 turnout
Height of floater	$12^{1}/_{2}$±1mm



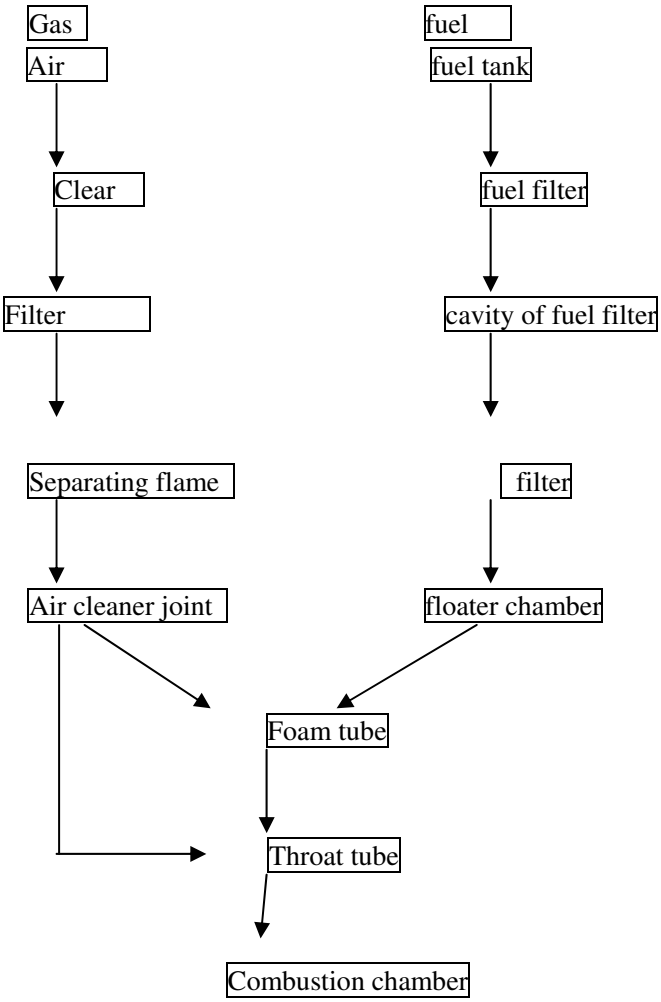
Mixture air (air- fuel) system

MIXED GAS OIL ROAD：

Fuel flows out of tank for its own weight and across inlet oil switch, at last goes into carburetor. In this process, fuel is filtrated three times (first of all fuel is filtrated when it passes through netty nylon tube before going into fuel filter, secondly fuel goes through the cavity of fuel filter, finally fuel is filtrated when it passes through the filter installed between inlet oil switch and carburetor).

Air cleaner is installed in the left side of motorcycle. Fuel and clean air are mixed into mixed fog gas, which is controlled by inlet port and camshaft rocker arm, and then goes into combustion chamber.

Mixed gas forms and its flowing table



Air-fuel ratio:

Start: 7-8 ： 1

Idle speed: 10-12:1

Slow speed: 12-14:1

Moderate speed: 15-17:1

High speed: 13-15:1

Oil route of carburetor:

Mainly including 6 kinds of mixed gas oil route

1. The inlet oil route

2. The condensing oil route

3. Idle speed oil route

4. Slow speed oil route

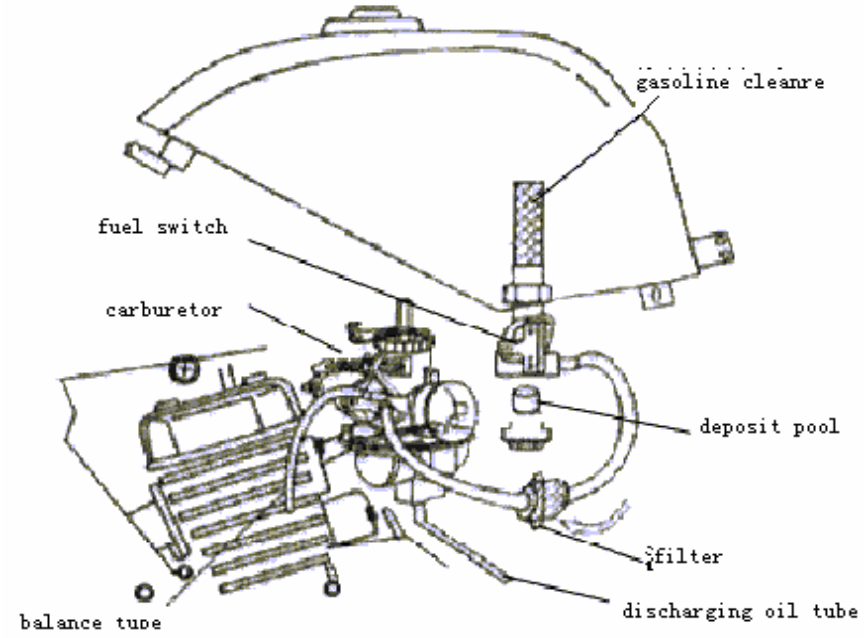
5. Moderate speed oil route

6. High speed oil route

Carburetor working principle

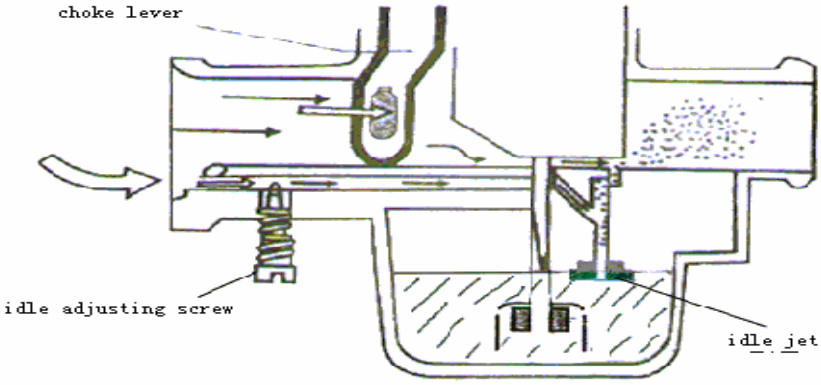
1. Inlet oil road

Fuel flows into floater chamber of carburetor for its own weight, which communicates with atmosphere for balance tube of carburetor that guarantees pressure in floater chamber is the same as atmospheric pressure. Floater goes up along with oil level, when oil level raise certain high, the floater drives needle valve to shut off inlet oil path.， which may avoid that fuel overflows from carburetor. In reverse, when fuel goes down, floater drives needle valve to go down, needle valve opens, and then fuel is supplied into floater chamber of carburetor.



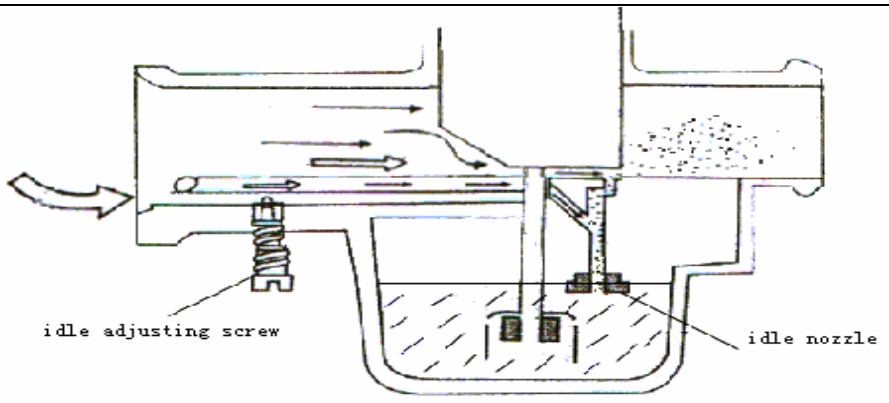
2. Condensing oil road

When engine starts, electronic valve (electric condense valve) open, one part of fuel passes through condensing nozzle hole and goes into throat tube, for this mixed gas becomes thick and reaches flammable. After starting, electric condensing valve oil needle extends gradually until condensing path is shut off, here engine performs in economic mixture gas.



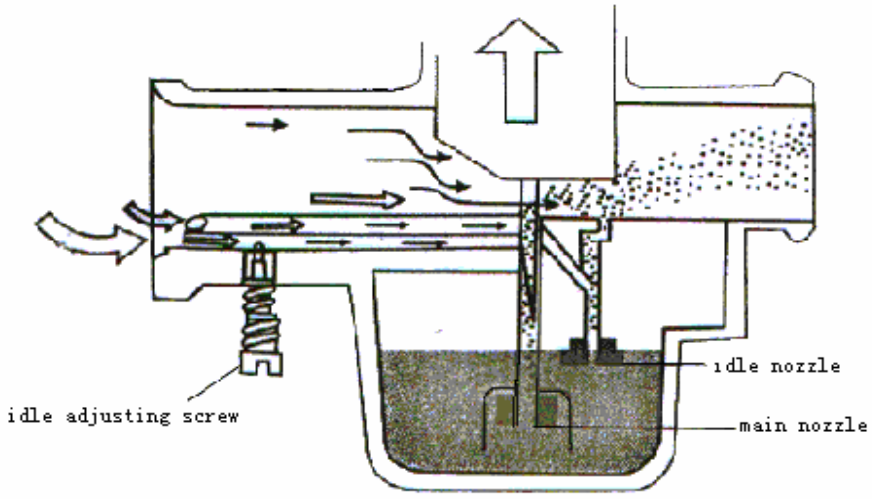
3. Idle speed

After engine starts, slowly condensing path is shut off, mixed gas becomes thin (the ratio of air to fuel becomes big), fuel flows through idle jet, then transition hole, finally is imbibed into throat tube. Other part of fuel passes through mixture ratio little hole, then is imbibed into throat tube, the thickness of this part of fuel can be adjusted through mixture ratio screw.



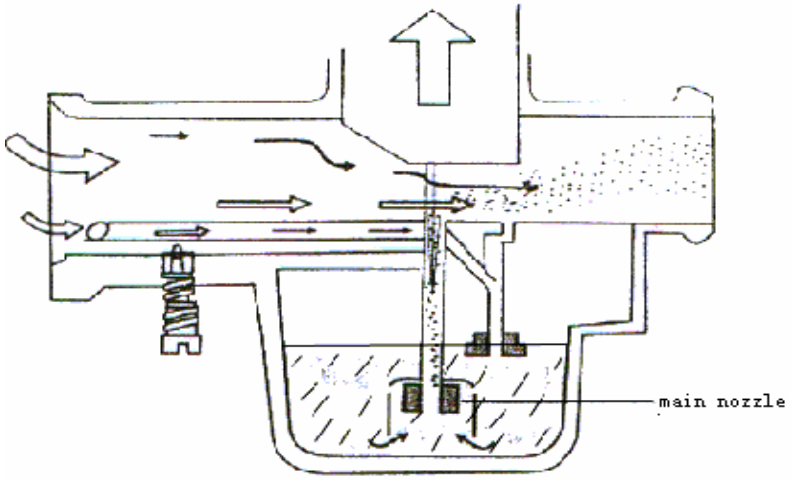
4. Slow speed

Slow idle speed fuel system and main fuel system supply mixed gas at the same time, when one part of uprising stopper brings along oil needle up and produce negative pressure on main nozzle hole, then absorb out mixed gas. Mixed gas becomes more and more and supply engine



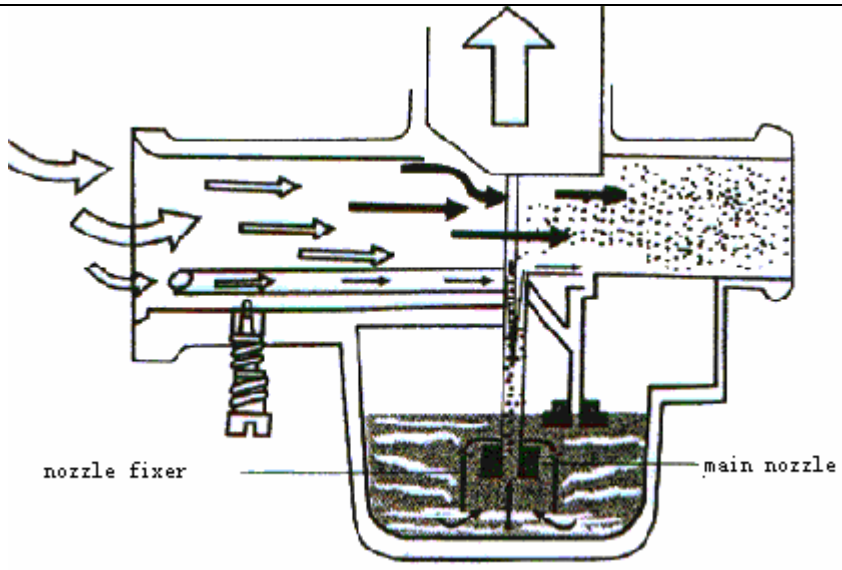
5. Middle speed （economic exhaust speed）

Along with acceleration, mixed gas is only supplied through main fuel system, in this process, idle speed oil system does not supply mixed gas for there is negative pressure distributed on throat tube. Firstly, air flows across air jet (copper canal) and atomizes with fuel in foam tube, then is atomized for another time in throat tube. At economic exhaust speed, air is most and consume is lest.



6. High speed

Accelerate it until stopper rises up completely, engine rotates at high speed, which drives velocity of airflow in throat tube and generates great negative pressure in main nozzle hole, and more mixed gas is absorbed out.



Carburetor removal and installation

Removal：

1. Remove rear seat of motorcycle;
2. Turn fuel witch on " OFF" position；
3. Pull out inlet oil paste tube with jaw；
4. loose clamp ring between carburetor and air cleaner；
5. Pull out the stopper at the tail of discharging oil paste tube, spill fuel in floater chamber into another box.；
6. loose the screw for jointing carburetor and engine and take out carburetor；
7. unscrew upper cover and pull out throttle needle valve, spring and cable；
8. loose throttle cable；
9. Remove oil tube.

INSTALLATION：

The installation sequence is essentially the reverse of removal.

NOTICE：

Guarantee carburetor is installed correctly and oil does not leak out.

CARBURETOR ASSY.

STEPS FOR REMOVAL：

1、 Unscrew upper cover, take out stopper spring and stopper assy.；
2、 Unscrew oil needle compaction cap, take out oil needle and oil needle spring；
3、 Unscrew mixture ratio adjusting screw, spring, gasket and seal ring；
4、 Unscrew idle speed adjusting screw and spring；
5、 Remove the three screws for under shell；
6、 In turn take out floater pin, floater and needle valve；
7、 Remove main jet, foam tube and main nozzle in turn；
8、unscrew idle speed jet；
9、clean various accessories of carburetor with gasoline, and then blow it with high pressure atmosphere.

NOTICE：

1、 In the process of removing other accessories in floater chamber, first of all remove floater and needle valve to ensure floater is not damaged；
2、 To preserve main nozzle, remove it from one side of stopper hole.

STEPS FOR INSTALLATION：

1、 After confirm inner hole of idle speed jet and horizontal hole are smooth, screw idle speed jet；
2、 Install main jet in main nozzle hole (the end of smaller diameter against main nozzle hole)；
3、 After confirm the horizontal hole of foam tube is smooth, screw foam tube；
4、 Screw main jet hole；
5、 Assemble needle valve with floater into needle seat, needle valve pothook is hang on floater tongue；
6、 Assemble floater pin in floater pin seat, floater pin threads into floater pin seat and floater in order；
7、 Inspect if height of floater is 12.5±1mm， adjust floater tongue if it is not；
8、 Assemble under shell correctly；
9、 Respectively assemble idle speed adjusting screw, spring, mixture ratio adjusting screw and spring, gasket, seal ring correctly (reverse mixture ratio 1-2 round after it has been assembled correctly)；
10、install electric condensing valve assy. And blocking wind valve assy. in order；
11、install oil needle, spring, oil needle compaction cap in order；
12、install stopper assy., Stopper spring, upper cover correctly and inspect if stop moves freely.

STEPS FOR ADJUSTING CARBURETOR：

Install carburetor in engine, and then adjust it as the following steps:

1、 Start and warm up engine for about three seconds so that engine rotates at normal driving temperature;

2、 Adjust idle speed adjusting screw so that engine rotates at 1400rpm；

3、 Screw mixture ratio adjusting screw into bottom, the strength is not too weight；

4、 Now engine shuts off (if it doesn't shut off, inspect if gas leaks out of the joint of air cleaner and if screw is tight, inspect if the inlet port of air cleaner is blocked)；

5、 Screw mixture ratio adjusting screw back for one round；

6、 Restart engine, adjust idle speed adjusting screw to be 2000-2500rpm；

7、 Slowly adjust mixture ratio screw（anticlockwise）until engine rotates at the highest speed（screw mixture ratio screw back for less than 3 rounds)；

8、 Readjust idle speed adjusting screw so that engine rotates at 1400±100rpm；

9、Play throttle to accelerate rotating, inspect if its rotating speed is stable；

10、measure exhaust and compare it to standard volume.

NOTICE：

1、 Adjust mixture ratio screw properly not too tight, never energize too much, otherwise it may damage mixture ratio screw head even break the adjusting screw；

2、 If engine is adjusted to be too slow rotating speed, engine may be off, in reverse, engine may consume too much fuel.

WARNING：

After engine rotates normally at idle speed for some time, turn throttle completely, then loose throttle handlebar completely, at this time if idle speed changes, it means that throttle cable has not been adjusted well. So before measure engine, pay special attention to corresponding adjustment.

SPECIFY TIGHTENING TORQUE

NO.	ITEM	QTY.	TIGHTENING TORQUE
	FRONT WHEEL/FRONT DISC BRAKE		
1	NUT, FRONT AXLE	1	80 N.M
2	BOLT, DISC BRAKE	6	
3	BOLT	2	
4	DISCHARGING OIL MOUTH		
5	COLLAR		
6	MOUNTING BOLT, PIPE		
7			
8			
	HANDLEBAR		
1	SCREW, UPPR HANDLE RETAINER	4	25N.M
2	BOLT, LOWER HANDLE RETAINER	2	4N.M
3	MOUNTING BOLT, DISC BRAKE LEVER	1	
4	MOUNTING BOLT, RIGHT HANDLE RETAINER	2	
	FRONT FORK		
1	FIXING BOLT, UPPER CONNECTING BOARD	2	25N.M
2	FIXING BOLT, LOWER CONNECTING BOARD	2	25N.M
3	PRESS NUT	1	
4	FIXING BOLT, RIGHT HANDLE SEAT COVER	1	40N.M
5			
6			
7			
	REAR WHEEL/REAR SHOCK ABSORBER		
1	REAR WHEEL AXLE	1	105N.M
2	BOLT, REAR BRAKE ROCKER ARM	1	6N.M
3	FIXING BOLT, SPROCKET	4	40N.M
4	FIXING NUT, SHOCK ABSORBER UPPER PART	2	40N.M
5	FIXING BOLT, SHOCK ABSORBER LOWER PART	2	25N.M
6			
7			
8			

CHAIN COVER、REAR WHEEEL ASSY、SPROCKET

DISASSEMBLY STEPS：

CHAIN COVER（1）

↓

REAR BRAKE ADJUSTING NUT,CONNECTING PIN、ADJUSTING SPRING

↓

PIN（7）、NUT（6）、WASHER（5）、RUBBER WASHER（4）、MOUNTING BUSH（3）、FIXING BOLT（2）

↓

NUT,REAR WHEEL AXLE（9）

↓

REAR WHEEL AXLE（8）

↓

BUSH,LH（11）、BUSH,RH（10）

↓

Rear wheel, rear hub cap and sprocket

↓

Rear wheel hub cap

↓

SPROCKET（12）

CLIP（14）、MOUNTING PLATE,SPROCKET（13）

↓

OIL SEAL（15）

↓

CILP（16）

↓

BEARING, RH6303（17）

↓

CENTER BUSH（18）

↓

BEARING, LH6303（17）

MOUNTING STEPS：

BEARING6303,LH（17）

↓

CENTER BUSHING（18）

↓

BEARING 6303, RH（17）

↓

CLIP（16）

↓

OIL SEAL（15）

↓

MOUNTING PLATE, SPROCKET （13）AND CLIP（14）

↓

SPROCKET（12）

REAR WHEEL HUB CAP

↓

REAR WHEEL, REAR HUB CAP AND SPROCKET

↓

BUSH, LH（10）AND BUSH, RH(11)

↓

REAR WHEELAXLE（8）

↓

NUT, REAR WHEEL AXLE（9）

↓

Connecting rod fixing (2), connecting rod mounting bushing (3), rubber gasket (4), gasket (5), nut (6), hatch pin (7)

↓

ADJUSTING NUT FOR REAR BRAKE, CONNECTING PIN、ADJUSTING SPRING

↓

CHAIN COVER

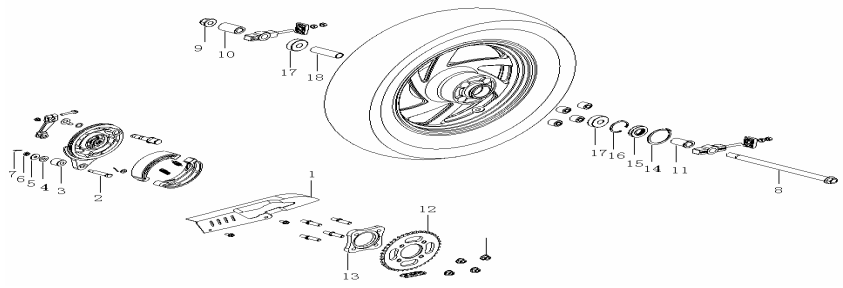
NOTICE：

1. THE DIRECTION OF CHAIN LOCKPIECE IS CONTRAY WITH ITS SPORT DIRECTION;
2. CLEAN THE CHAIN BEFORE ADJUSTING ITS DEGREE OF NUTATION
3. FIX THE NUT OF CHAIN ADJUSTOR AFTER ADJUST THE DEGREE OF NUTATION OF CHAIN 10~20MM;
4. MAKE THE MOUNTING MARKER AIM AT THE ONE OF BRAKE CAMSHAFT;
5. MAKE THE REMARK PIECE OF ABRASION AIM AT THE ABSORBER REMARK OF REAR WHEEL AXLE COVER
6. ADJUST THE REAR BRAKE STEP 20-30mm.

TIGHTENING TORQUE：

FIXING NUT, SPROCKET：40N.M

REAR WHEEL：105N.M



REAR ROCKER ARM ASSY.

DISASSEMBLY SEQUENCE:

RIGHT REAR FOOTREST ASSY. AND MUFFLER ASSY.

↓

CHAIN GUARD, SPROCKET, REAR WHEEL

↓

REAR SHOCK ABSORBER (LOWER PART BOLT)

↓

NUT, PIVOT AXLE (4)

↓

PIVOT AXLE (1)

↓

REAR ROCKER ARM ASSY ANDCHAIN COVER ASSY.

↓

CHAIN COVER (3), BOLT (7), WASHER (8)

↓

HATCH PIN (13), NUT (12), WASHER (11), RUBBER WASHER (10), FIXING BOLT (9)

↓

CONNECTING ROD (6)

↓

BUSH ASSY, REAR ROCKER ARM (2)

↓

REAR ROCKER ARM (5)

ASSEMBLY SEQUENCE:

REAR ROCKER ARM (5)

↓

BUSHING ASSY., REAR ROCKER ARM (2)

↓

CONNECTING ROD (6)

↓

HATCH PIN (13), NUT (12), WASHER (11), RUBBER WASHER (10), FIXING BOLT (9)

↓

CHAIN COVER (3), BOLT (7), WASHER (8)

↓

REAR ROCKER ARM ASSY. AND CHAIN COVER

↓

PIVOT AXLE (1)

↓

PIVOT AXLE NUT (4), CONNECING ROD

↓

REAR SHOCK ABSORBER (BOTTOM NUT)

↓

CHAIN COVER, SPROCKET, REAR WHEEL

↓

MUFFLER ASSY, RIGHT REAR FOOTREST

NOTICE:

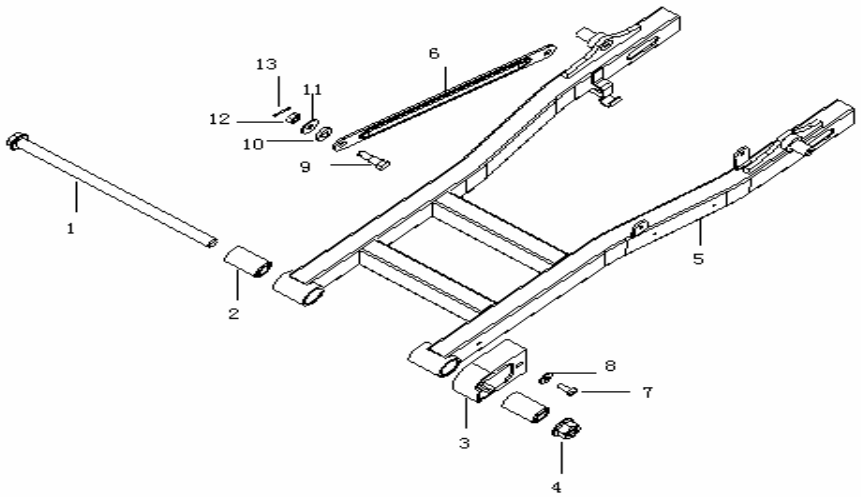
1. CHECK THE SWING OF REAR ROCKER ARM WHEN REASSEMBLE IT.
2. DAUB THE PIVOT AXLE WITH LUBRICATION.

FIXING TORQUE:

PIVOT AXLE：75N.m

BOTTOM BOLT OF REAR SHOCK ABSORBER：25N.M

REAR WHEEL AXLE：105N.M



FRONT WHEEL ASSY.

Disassembly sequence:

Odometer wiring assy.

↓

Front wheel axle (1), nut M14X1.5 (2)

↓

Anti-dust ring, Left bushing, front wheel (3)

↓

Gear seat, odometer (4)

↓

Disc brake (5), bolt for disc brake (6)

↓

Oil seal (7)

↓

Left bearing, front wheel6302-2RS (8)

↓

Center bushing (9), bush (10)

↓

Right bearing, front wheel6302-2RS (12)

↓

Front wheel (13)

Assembly sequence：

Front wheel (13)

↓

Right bearing, front wheel6302-2RS (12)

↓

Center bushing (9), bushing (10)

↓

Left bearing, front wheel6302-2RS (8)

↓

Oil seal (7)

↓

Brake disc (5), bolt for brake disc (6)

↓

Gear seat, odometer (4)

↓

Left bearing, front wheel (3)

↓

Front wheel axle (1), nutM14X1.5 (2)

↓

Odometer wiring

Notice：

a. There is no free distance to adjust for front brake lever.

b. Be sure to loosen disc brake lever before remove front wheel and front disc brake caliper.

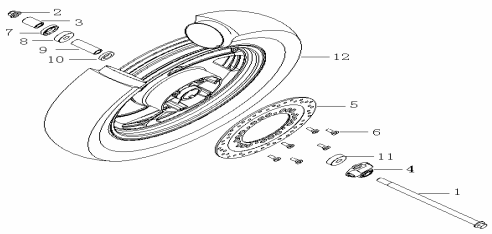
c. Disassemble brake disc before disassemble front wheel bearing.

d. Make brake disc in the center of brake pieces when fixing front wheel and brake disc caliper assy.

Fixing torque：

Front wheel axle：80 N.M

Bolt for brake disc：25 N.m



Front shock absorber

disassembly:

Bolt (1)

↓

O-seal ring (2)

↓

Adjusting pipe (3)

↓

Washer (4)

↓

Shock absorber spring (5)

↓

Anti-dust gasket assy. (12)

↓

ring (13)

↓

piston rod (7)

↓

screw (19) and washer (18)

↓

Inner pose assy. (9)

↓

Oil seal assy. (14)

↓

oil seal gasket (15)

↓

indirect bush (16)

↓

lower indirect bush (10)

↓

Piston pole/piston ring (6)

↓

Cushion spring (8)

↓

Outer pose assy.

↓

aluminum outer pose (17)

↓

cushion prick (11)

Assembly:

Put the piston ring into piston rod

↓

Put the cushion spring into piston rod

↓

Put all above parts into inner tube assy.

↓

Put cushion prick into piston rod

↓

assemble all above. assy into aluminium outer tube

↓

Fixing screw (washer) and fixing torque is 20 N.m

↓

Guiding bush

↓

Oil seal washer

↓

Oil seal assy.

↓

Oil seal stopper ring

↓

Anti-dust gasket assy.

↓

Refill oil with shock absorber: 240±2ml

↓

Shock absorber spring

Make seal ring up

↓

Washer

↓

Adjusting pipe

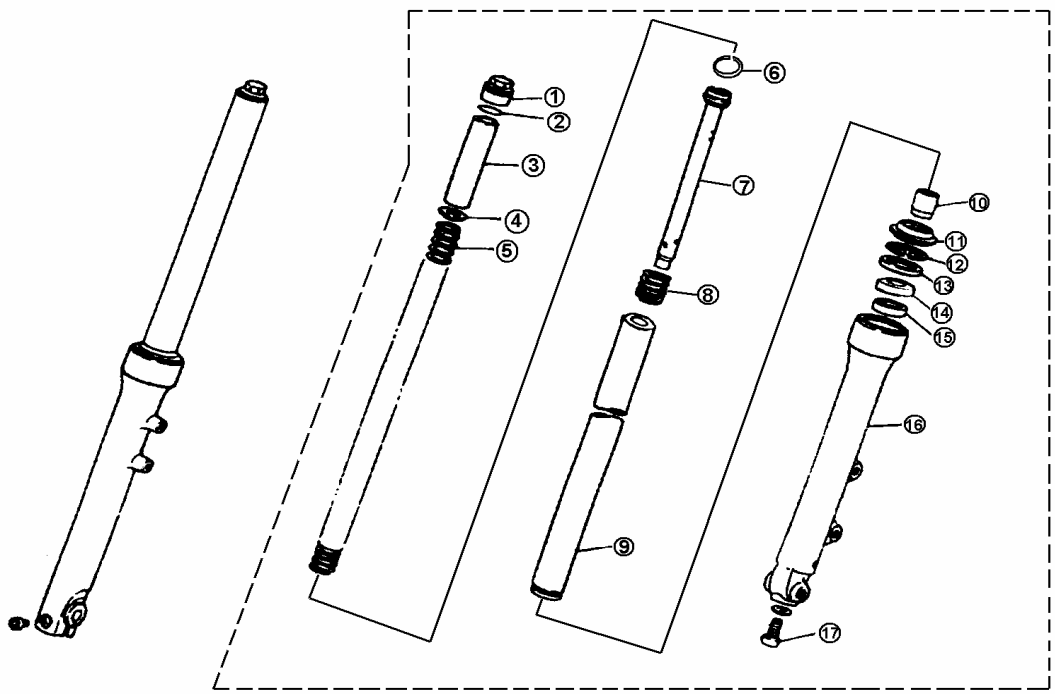
↓

O-seal ring

↓

Bolt

Fixing torque: 23 N.m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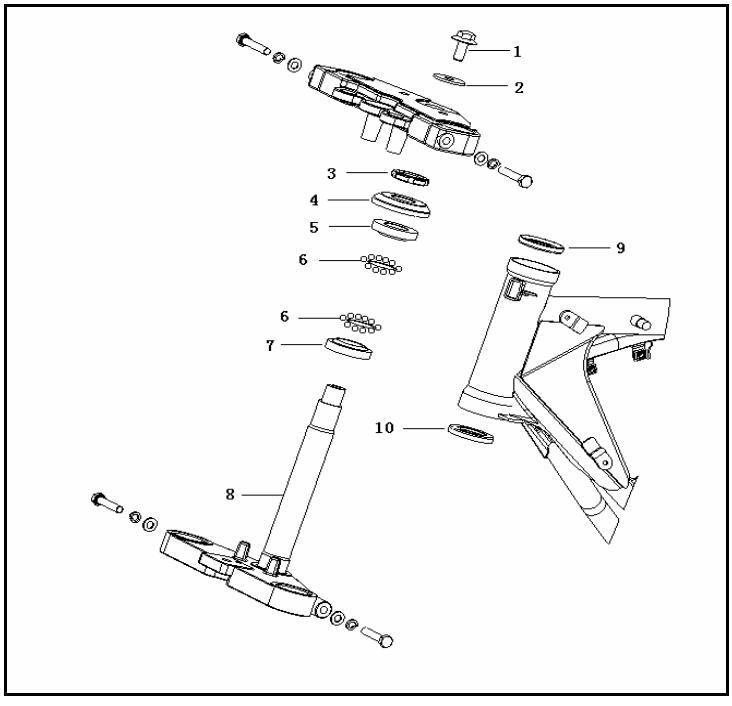
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Working principle for front absorber

STRUCTURE:

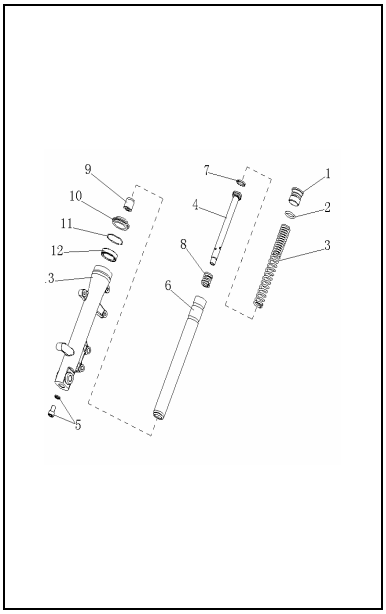


FIG. 2

See fig. 2, which is front absorber structure. Through controlling organ and handlebar two front shock absorbers (one pair) are connected with front assembling tube of frame, which absorb shock relying on the liquid damping which results from flexibility of absorber spring, air compression and relative movement of inner tube and outer tube.

The performance of front absorber is just like one kind of flexing movement, that is to say, relative movement of inner tube (6) and outer tube (3). As a result of stroke inner tube fixing in outer tube **Compression stroke**turns its position. Outer tube is made up of upper oil pressure cavity and lower oil pressure cavity, piston lever head with piston ring performs tightly with the top end of inner tube, buffer bush is assembled in inner tube assy., which is to seal upper cavity. Buffer prick is fixed in the bottom of outer tube, buffer prick is fixed in the bottom of outer tube, which cum piston lever compose lower cavity. When compression stroke is over, buffer prick and inner tube form oil lock, which prevent inner tube from stroking the bottom of outer tube, damping strength which results from the two small damping holes in the processes of recover stroke. Anti-dust ring assy. (10) fixed on the top of outer tube is to prevent drip, dust etc. from going into tube, otherwise these dust may damage oil seal ring assy. (12) or outer surface of inner tube. Oil seal assy. (12) fixed in the bottom of outer tube is to prevent oil from leaking out.

When bearing load on the top of front absorber, inner tube moves down (that is to say, inner tube goes into outer tube), or when front wheel strikes on ground, outer tube moves up, in the process of compression, the damping spring and air are compressed in inner tube. At the same time the capacity of upper cavity increases, which reduces pressure between piston lever and outer tube. For fall of capacity between piston lever and outer tube oil flows into upper cavity, and as a result of the fall of capacity of lower cavity, damping oil goes up into upper cavity without damp through buffer bush, and compressed oil passes through big damp hole into piston lever inner hole and main cavity chamber without damp until inner tube moves to buffer prick. When compression stroke completes, the clearance between bush and buffer prick in inner tube assy. is near zero, in this way damping strength may slow down flowing speed of damping oil. Finally oil lock forms and compression stroke is over.

Comeback stroke

In the comeback stroke, compressed damping spring extends to push inner tube back from its bottom, when inner tube moves away, the pressure in upper cavity rises up for the capacity of upper cavity degrades, which forces that damping oil flows into main cavity or lower cavity only through two small damp hole of piston lever (for damping oil cannot flow back directly through original single direction valve). The two small damping holes limit that damping oil flows into inner tube and produces damping strength in the process of comeback stroke. When comeback stroke completes, buffer spring and the two small damping hole go on limiting comeback, when buffer bush goes up, the two small damping hole may be sealed father, then the capacity of upper cavity decreases, finally oil lock forms and comeback stroke completes.

Damping strength of from absorber directly relies on the quantity of oil. Bad effect ---freeze may happen if used oil quantity or viscidity is too high. Bad effect －soft may happen if used quantity or viscidity is too low.

It is recommended to use OIL N46 or equivalent engine oil.

Replacing period: per ten thousand kilometers or below one year.

Controlling system

Remove sequence：

Remove front fender

↓

Remove front wheel

↓

Remove disc brake

↓

Remove clutch cable and throttle cable assy.

↓

Remove headlight

↓

Remove front decoration light and horn

↓

Remove front decoration light mounting bracket and horn mounting bracket

↓

Remove headlight housing and the wiring in headlight housing

↓

Handlebar parts

↓

Handle fixing bolt (1), top gasket (2)

↓

Remove meter, front turning light, upper connecting board

↓

Groove nut (3), anti-dust cover (4), upper bearing upper steel ball (5)

↓

Under connecting board assy., front shock absorber assy.

↓

Upper and under steel ball (6)

↓

Under bearing under steel bowl (7)

↓

Under connecting board assy. (8)

↓

Upper bearing under steel bowl (9) and under bearing upper steel bowl (10)

Install sequence：

Upper bearing under steel bowl (9) and under bearing upper steel bolw (10)

↓

Upper and under steel ball (6)

↓

Under connecting board assy. (8)

↓

Under baring under steel bowl (7)

↓

Upper bearing upper steel bowl (5), anti-dust cover (4) and groove nut (3)

↓

Meter, front turning light and upper connecting board

↓

Upper gasket (2), handle fixing bolt (1)

↓

Fixing upper and under connecting board bolt

↓

Install handlebar part

↓

Install headlight housing and connect various electric connector parts

↓

Install front decoration light bracket and horn bracket

↓

Install front decoration light and horn

↓

Install headlight

↓

Install clutch cable and throttle cable

↓

Install disc brake

↓

Install front wheel

↓

Install front fender

Notice：

1. Wash turning bearing and other installed parts, and daub bearing with proper lubrication to reinstall it.
2. If steel balls are damaged, replace all steel balls.
3. After adjusting it, check axial clearance and radial clearance.

Fixing torque：

Upper connecting board fixing bolt: 25N.M

Under connecting board bolt：55N.M

Handle mounting bolt：70N.M

Handlebar fixing bolt：25N.M

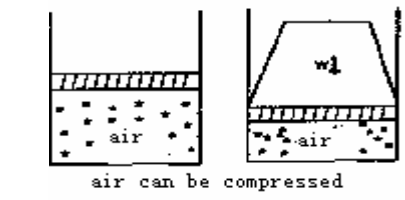
Disc brake system

Liquid pressure brake (disc)

Brake principle: liquid cannot be compressed, so strength can be transmitted through liquid medium.

Cylinder: When bearing on brake lever, cylinder stopper moves along pressuring direction, stopper squeezes braking liquid in cylinder, pressed braking liquid transfers pressure to caliper through braking hose. When there is no pressure on braking lever, stopper turns back for bearing on rebound from prick spring.

When releasing braking lever, for the spring of sealing ring of caliper, oil stopper turns back, at the same time when wheel rotates, brake disc knocks at braking shod in the two side, which makes brake shoes turn back (see fig.)



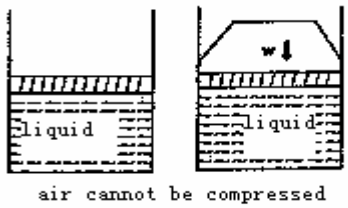
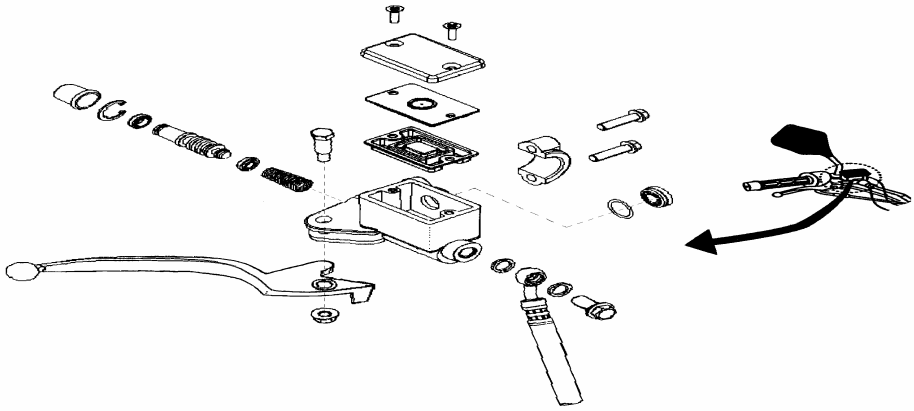
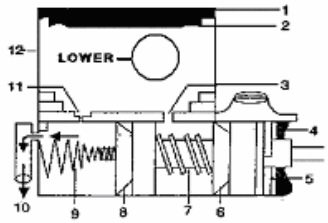


fig. 5





1. oil cap 5. clip ring 9. tension spring
2. oil gasket 6. bowl 10. Outlet oil hole
3. inlet oil hole 7. stopper 11. supplement hole
4. stopper anti-dust cover 8. bowl 12. oil pump

Fig. 6

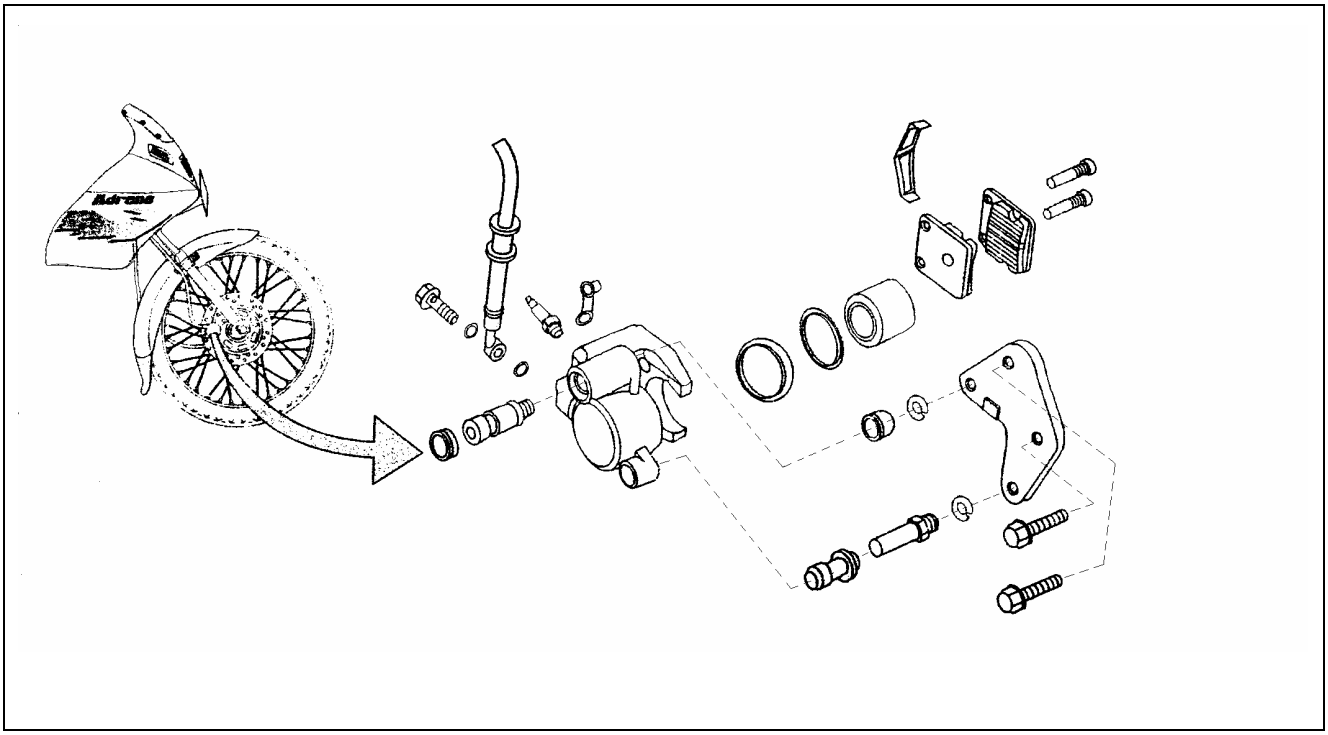


Fig. 7

Caliper assy.

1. Anti-valveanti-dust cover
2. Inlet oil bolt
3. Braking liquid path
4. Caliper
1. Oil stopper
2. Long guiding axle
7. Oil stopper seal ring
8. Oil stopper anti-dust ring
9. Connecting board
10. Braking disc

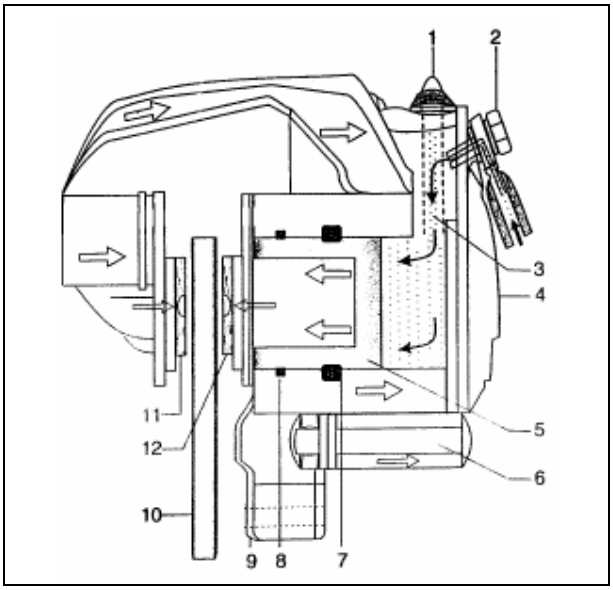


FIG. 8

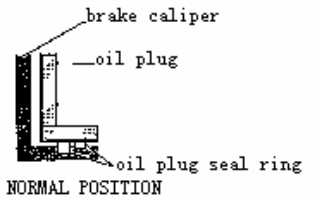


FIG. 9

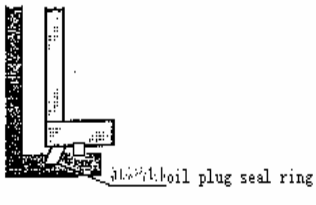


FIG. 10

Liquid pressure arrester (brake) inspection	
NOTICES: 1. Don’ t touch arrester for long time. 2. Once braking liquid splash eyes, wash eyes with cold water and see a doctor. 3. Never let braking liquid splash painting part, otherwise paint may fall off. Wipe it with wet cloth if it happens. 4. Never wash liquid pressure arrester parts with mineral oil, like coal oil, gasoline, disel oil and so on. Be sure to use sealed braking liquid to wash it. 5 . Never use mineral oil or lubrication to lubricateteh inner parts of liquid pressure arrester. 6. For it is easy for braking liquid to absorb moisture, to ensure braking capability, it had better replace braking liquid per year. 7.Reinstall it at once after liquid pressure arrester parts are removed. 8. It is forbidden to wipe brake pad kits with sand paper, for sand paper includes hard grain, which may damage brake disc. 9. It is forbidden to rub caliper and inner hole of oil cylinder to avoid that some impurity of cotton leaves in the surface of inner hole. 10. Be sure to use new oil stopper seal and seal gasket and so on. Oil cylinder assy. removal: 1. Remove handle lever screw and left handle lever. 2. Take down stopper anti-dust cover. 3. Remove spring clip ring. 4. Remove stopper assy. The installation sequence of oil cylinder is essentially the reverse of removal. Notice：Lubricate the surface of stopper peel bowl, and then install it into the hole of oil cylinder. Caliper assy. removal: Place the open end of braking hose into container and draw out braking liquid carefully. (1) Remove inlet oil bolt and seal gasket.	(2) Cut off braking hose. Put the throat hose of open into container, and then draw out braking liquid. (3) Disassemble bolt, braking caliper assy., brake shoe, and brake shoe spring. (4) Disassemble oil stopper, oil stopper anti-dustcover and square seal ring. Removal steps are the following: ① insufflate compressed air into braking hose joint, push oil stopper from braking caliper. Never try to prize oil stopper, otherwise it may damage oil stopper. It had better cover oil stopper with cloth to avoid that caliper springs out of caliper, which may result in injury. ② Disassemble oil stopper seal part and anti-dustcover. Notice: when disassembling oil stopper seal parts and anti-dust cover, never damage the surface of inner hole of braking caliper. The installing sequence is essentially the reverse of removal. Notice：Lubricate oil stopper sealing anti-dust parts with braking liquid, and then insert oil stopper into braking caliper slowly. Exhausting air steps: 1. Add proper braking liquid in oil reservoir. 2.Assemble oil reservoir gasket carefully to avoid that any braking liquid splash or oil overflows 3. Connect clear plastic pipe with braking caliper exhaust port valve closely, and put the other end of the pipe in container. 4. Slowly start brake lever for several times. Pull the lever back to keep it on some position. 5. Unscrew exhaust port and operate brake lever In its limit position. 6. When brake lever is in its limit position, screw exhaust port, and then release the lever. 7. Do step (4) to step (6) again and again until air bubble disappears from system. 8. Add proper braking liquid.

Important size of vehicle body

Front wheel/shock absorber/controlling system

Item		Standard
Tire pressure	Driver	175KPa
	Driver and passenger	175KPa
Free distance of clutch rocker arm		10-20mm

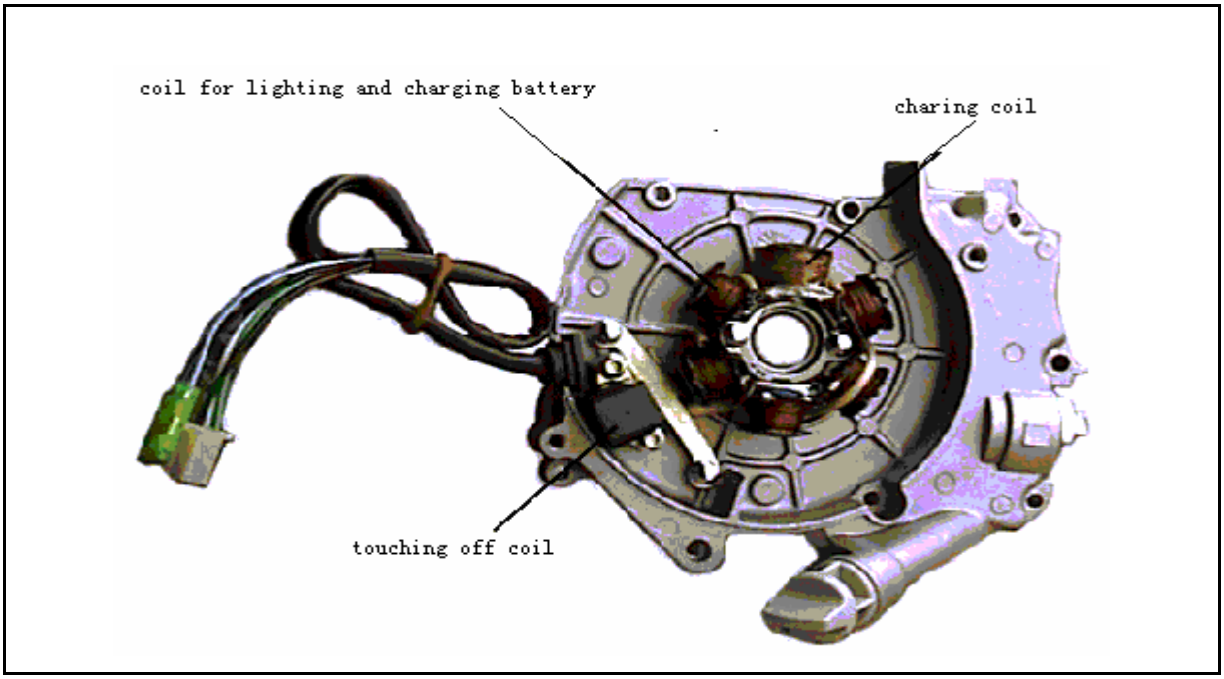
DISC BRAKE SYSTEM

Item	Standard
The appointed disc brake oil	DOT3 or DOT4
The manufacture of the disc brake oil	
The thickness of the brake shoe	6MM
The thickness of brake plate	4MM

REAR WHEEL

Item		Standard
Tire pressure	Driver	200KPa
	Driver and passenger	225KPa
Free distance of rear brake pedal		20MM
The diameter of the rear brake hub		140MM
The thickness of the rear brake pad kit		4MM

Magneto motor（ACG）



Structure：

Magnet motor is made up of stator and rotor.

The tube of stator coil: star connection.

Stator installation：

Six coils of stator: five ones are lighting/charging coils, one is charging coil.

Touching off coil and stator are fixed on the right crankcase cover.

Charging and touching off coils of CDI parts are to ignite.

The electricity emitted from lighting coil passed through rectifier to be light, and electricity emitted from battery charging coil passes through rectifier to charge.

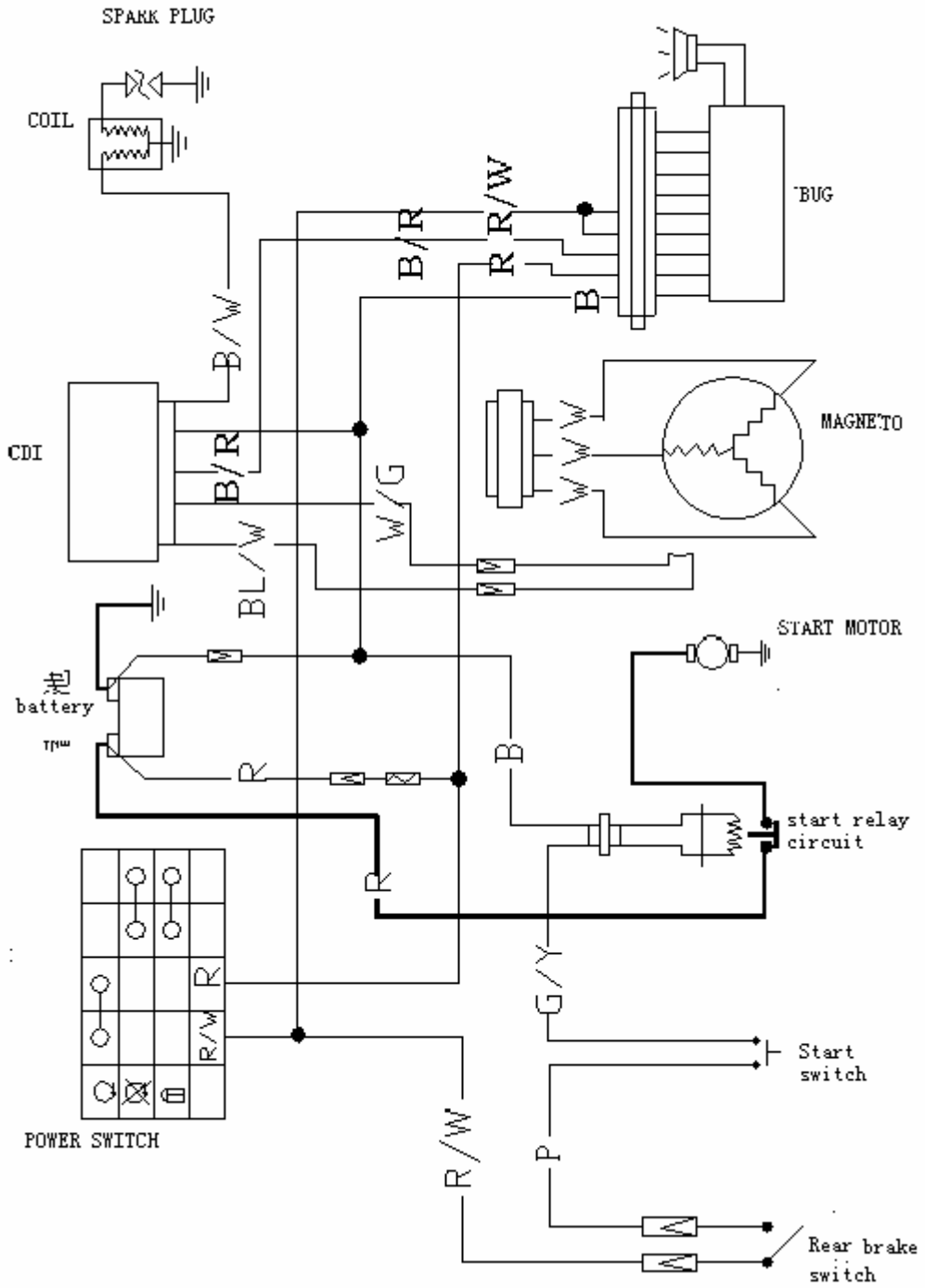
Color code of lead of magnet motor and resistances of various coils are the following table

Code.	Coil type	Resistance	Wire color
1.	Charge wire	300~500	Red-black
2.	Pick up coil	180~220 at 20° C	Blue-white/green-white
3.	Illuminate battery wire	<2 <2	Blue Blue

Notices：Measure for all resistance refers to ground wire (black)

- Oil groove type of magnet motor assy.
- Charging coil is one part of stator.
- There is no stator slice (capacitor) in stator assy., which is installed on the left crankcase cover.
- The structure of stator includes two assembling holes.

ELECTIRC WIRING DIAGRAM



CDI part testing

FOR any fault about ignition system, you may inspect

Various parts following hereinafter processes step by step.

1. Spark plug:

After clean spark plug in special cleaner, inspect spark plug

And try to drive vehicle, replace it if fault happens

- short circuit
- electrode is abraded
- insulator is damaged

2. spark plug cap (pin):

Inspect if resistance is near 5.0KΩ, and replace it if not.

3. composite switch

green/white at 20℃,

inspect its continuity of black/white and black lead end of

Ignition switch with multimeter, replace it if it doesn't with a 1.5 voltage the following requirements in the table and green/white leads, use

Switch position	state
"OFF"	connection
"LOCK"	connection
"ON"	disconnection

4. ignition coil:

there is sole ground wire for motorcycle (black).

A. Inspect the resistance of secondary coil of

green and yellow/black lead ends, it should be below 1.0Ω, otherwise replace ignition coil.

b. inspect the resistance of secondary coil between ignition coil and ground: should be -7.5 ±1KQ, and including 5 KQ resistance of series-sound disturbing suppresser, replace ignition coil if resistance is not that.

5. touching off coil:

a. inspect resistance between blue/white and

and see if the resistance ranges between 300 and 500Ω, otherwise replace the touching off coil.

b. remove spark plug, and then connect L.E.D. between blue/white

Kicking starter to rotate magnet motor, LED may flash. Otherwise replace touching off coil/

Ignition timing test

1. Remove the viewing cap of ignition timing hole.

2. Connect timing light following as the specifications from manufacturer(stroboscope).

3. Start engine and aim timing light at ignition mark on flywheel of magnet motor.

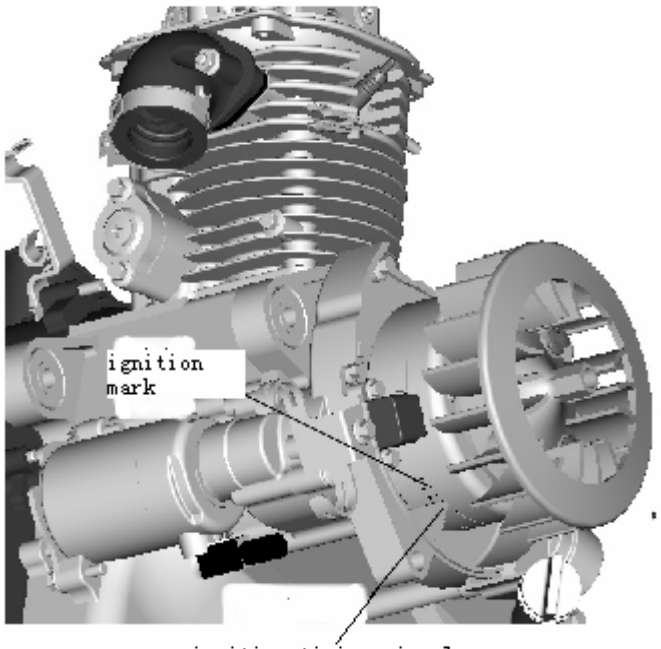
•during idle speed

Ignition mark “F” is right against “I” mark on timing viewing hole, and ignate it at 13º ahead of top dead center at 1400RPM (see tachometer).

•during speedup

High speed mark “II” is right against mark “I” on timing viewing hole, ignite it at 28º ahead of top dead center at 4000RPM.

If ignition timing is not correct, replace CDI, and then inspect new one.



Battery

Proportion	Usually the full battery is 1.220~1.240 Charge condition Use the hydrometer to check battery
Warning	When demolishing, first negative pole，anode second. If the battery is corroded by sulfur. Please exchange it. If the button of the battery has too much precipitate, please exchange it.
Charge	When the worn battery proportion is less than 1.220, please charge. And according to the electrolysis water temperature adjust properly.
Charge electric current	For 2.5AHl: no less than 0.25A. For 7.0AH: no less than 0.7A.
Charge time	The new battery8-12time/the old one 12-14time
Warning	Before charging, screw out the cap; use the battery far from fire. Open the source switch before charging. It is forbidden to recharge when electrolysis water temperature is over 45℃. Don't charge quickly.
Installation	Connect anode first, second connect negative pole.
Capacity of battery	12V 2.5AH
Battery charger is recommended	Make: ELAK, type：C1/48
Suggest using water hydrometer	Make: THIMSON, Type: 108
Note:	1. Add the battery to the upper limit with distilled water. (Avoid using acidity water to add old battery.) 2. Charging the full new battery when it is on the low temperature. 3. Insure ventilate tube is not stop up/winding, and it is easy and smooth. 4. If the motor is not used for a long time. Please charge the battery first, after contact the anode to the motorcycle (Remove the negative pole).

Battery debugging sequence

Remove the battery from the motor. Fix the anode to the red wire, and fix the negative pole to the black wire. Check the battery voltaic, usual situation is 12~14.5v. Press the adjusting machine push-button and read the voltaic machine, battery voltaic is not less than 9v. This means that the battery can finish it's fixing. Check every battery's water proportion, every battery proportion is not less than 1.220. When you charge battery, you must remove the adjustment. Press as follows kind to diagnose miss:

Battery revocation: if the battery's voltage is less than the 9.5v, and have one or more battery proportion is not less than 1.220.

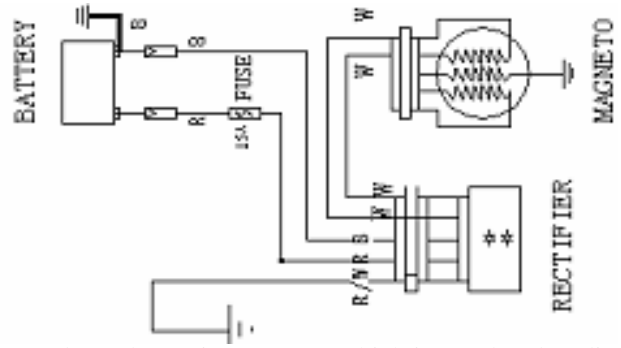
Turn on the circuit: don't charge battery quickly.

If the above state happens, replace battery.

Recommended battery debugger: made by ELAK; BCT7 type.

Warning: if the battery is broken, please check charge circuit diagram before replace it.

Charge circuit debugging



The MAGENCO produce alternating current, which is regulated to direct current, charged automatically according to its situation, and adjustor is connected parallel with circuit diagram, which is called "parallel fixing adjustor".

This route can be connected to the direct current and ampere, use the good battery to start the engine. Adjustment output as follows:

（1）Battery charge current is between 0.6~2A.

(2)The engine speed is between 5000， and the front lamp is on.

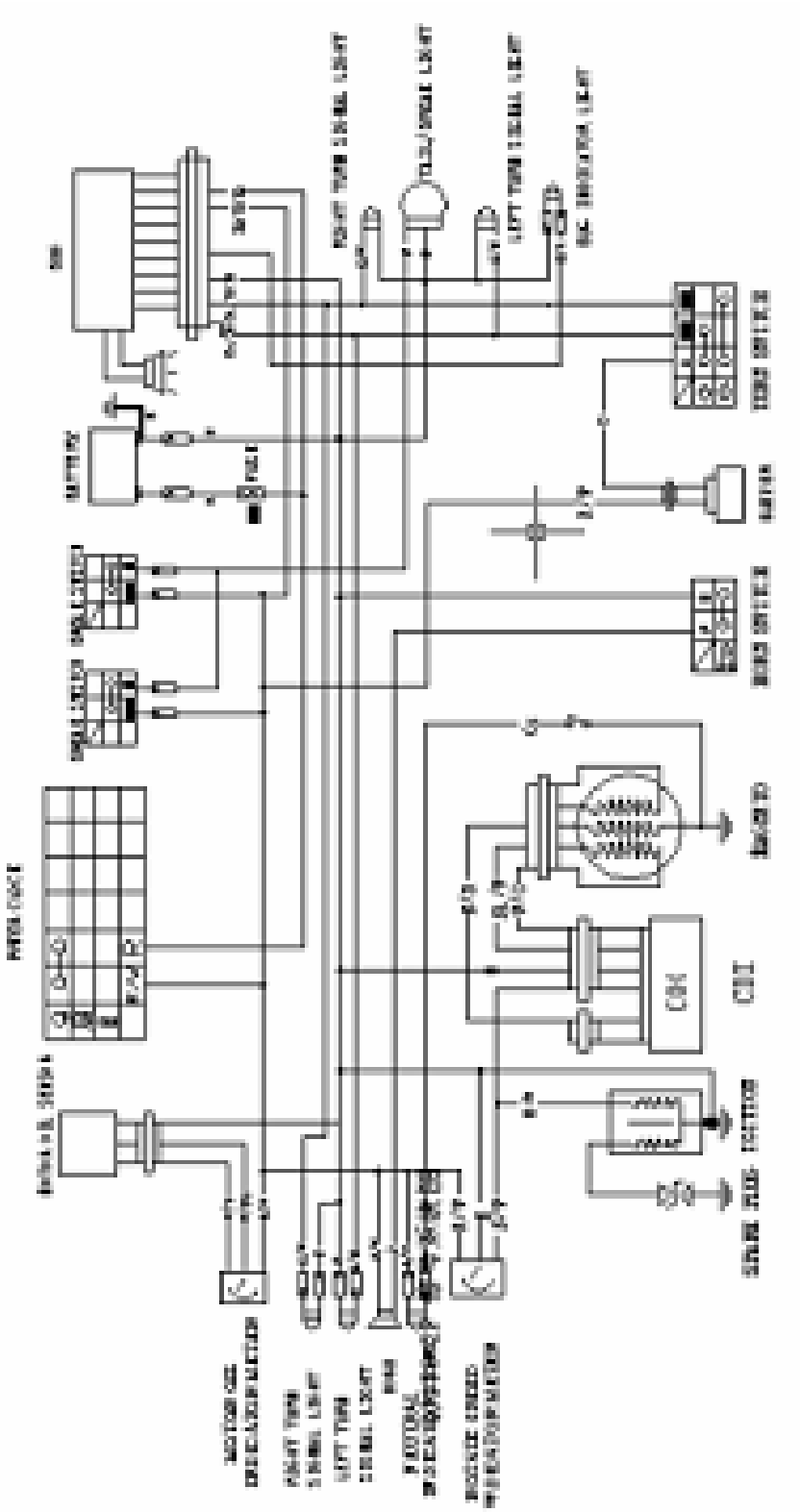
(3) The battery's charge voltage should be more than 11.5v when you fix it.

Note: if the output current is less than 0.6A, or more than 2A, please exchange a new adjustment. And check it again.

Note: put the amperometer series connection to the positive pole of battery to test the direct current.

Put the voltammeter parallel connection to the positive pole of battery or negative pole to test the direct current.

SIGNAL SYSTEM CIRCUIT DIAGRAM



Various bulbs removal and replacement

（headlight, flasher and meter light）

headlight removal：

Headlight

⇩

Leg shied

⇩

Headlight holder

⇩

Remove headlight bulb-12V，35W/35W×2（by unscrewing fixing screw）

（adjust focus through adjusting nut）

⇩

remove and install position light-12V，3.4W

headlight installation：

The installation sequence is the reverse of removal ，and adjust the focus of headlight

Flasher bulb：

Flasher switch

⇩

Remove and replace bulb-12V，10 W

Meter removal：

Remove front cover of handlebar

⇩

Remove connector of headlight

⇩

Take out flasher from its retainer and remove connecting line

⇩

Remove fixing screw

⇩

Front board, back board

⇩

Remove rotating meter and the core of odometer

⇩

Replace bulb（including high beam, turning signal light, fuel gauge, meter indicator light）

Meter installation：

The installation sequence is essentially the reverse of removal, and adjusts the focus of headlight.

Electronic components inspection procedure

Inspect the continuity of the following electronic switch with millimeter

Main switch

Front/rear brake switch

Horn switch

Starting switch

Overtaking caution switch

	red	red/white	black	ink green
on	●	●		
off				

	orange	greeb/black	green/white
on	●	●	
off			

MAIN ELECTRICAL COMPONENTS SPECIFICATION

Requirements for main electric parts specification

Item			Specification
Battery	Capacity		12V-2.5AH(KS)/7AH(KS)
	specific gravity(27℃)	Condition for full charge	1.220-1.240<1.220
	Charging current		0.25A/0.7A
	Charging time		8-12 hours
Battery charger	Capacity		114W at 5000rpm
	ignition coil resistance(20℃/68°f)	Between black wiring and black/white wiring	<=2∩
	Lamp cable	Yellow and green/white	<=2∩

Adjust the output of Regulator:

Adjust voltage to be below 14.5v for lighting circuit;

Adjust charging voltage of battery DC to be over 11.5v;

Adjust charging current of battery DC to be 0.6-2A(at 5000RPM).

C

OTHERS

1. Inspection before delivery

It is very important for each vehicle do thorough inspection before delivery. Please do the following procedures and send main information to dealer.

1. Wash vehicle body with warm scour and brush, and then rinse it with compressed air. Wash paint with water, and then wipe it with flix or soft cloth (never with soap, bleaching powder or super-high pressure air).
2. Inspect the light of paint, glaze paint if necessary.
3. Inspect the degree of tightness of exposed bolt and nut, including bolts for carburetor, cylinder head cover and engine etc.
4. Warm up engine, and then inspect engine oil, add some oil if necessary.
5. Inspect air pressure of tire, and correct it if necessary.
6. Install battery.
7. Inspect the clearance of spark plug, and adjust it if necessary.
8. Inspect whole electrical system, the capability of control switch.
9. Inspect throttle cable and rear brake cable.
10. Inspect and adjust idle speed if necessary.
11. Inspect if disc brake system and rear brake rocker arm is reliable, and adjust them if necessary.
12. Inspect the level of braking liquid in brake cylinder, and add liquid if necessary.
13. Inspect the performance capability of front and rear shock absorber.
14. Inspect if front and rear wheels are on the same line, and inspect if tire turns freely.
15. Try to drive vehicle.
16. Inspect if engine oil or fuel leaks out, correct it if necessary.
17. Inspect speedometer and odometer.
18. Inspect if engine oil or fuel leaks out, and add them if necessary.
19. Inspect performance of all locks.
20. Inspect and adjust headlight.

Periodic maintenance

It is necessary to do inspecting, checking, lubricating and regulated maintenance according to the following instructions.

I：check, wash, adjust, lubricate or replace if necessary C：wash R：replace A：adjust L：Lubricate

NO.	ITEM	Maintenance mileage (reading of odometer)(NOTE 1)				REMARK
		1000Km	4000Km	8000Km	12000Km	
1	Fuel path*		I	I	I	
2	Fuel cleaner*		C	C	C	
3	Throttle handlebar*		I	I	I	
4	Air cleaner		C	C	C	Remark 2
5	Spark plug		I	R	R	
6	Valve clearance*	I	I	I	I	
7	Engine oil	I	Per 5000Km:R			
8	Oil filter net*				C	
9	Carburetor idle*	I	I	I	I	
10	Driving chain	Per 1000Km：I, L, A				Remark 3
11	Battery		I	I	I	Remark 3
12	Braking shoke abrasion		I	I	I	
13	Brake system	I	I	I	I	
14	Front brake liquid pressure oil tube*	I	I	I	I	
		Replace it per 4 years				
15	Front brake liquid*	I	I	I	I	
		Replace it per 2 years				
16	Stop light switch*		I	I	I	
17	Spotlight adjustment*		I	I	I	
18	Clutch device	I	I	I	I	
19	Shock absorber system*		I	I	I	
20	Bolt, nut, pin*	I		I		Remark 3
21	Wheel, rim**	I	I	I	I	Remark 3
22	Turning node bearing**	I			I	
23						
24						
25						

* only sales department do the examining and repairing：

** For this entire item, it is recommended that sales department do the examining and repairing.

note：

1. If the reading of odometer exceeds this number, do repairing and examining againg according to this table.
2. Do the examining and repairing more frequently when driving in dusty area.
3. Do more maintenance to prolong vehicle when driving in accidental ground.

Permit and forbid

Permit

i. Use special tool to remove and install bearing

ii. Use special tool to install oil seal

iii. Keep the free clearance between braking levers and throttle handlebar,

Between braking rocker arm and throttle handlebar.

iv. Use recommended lubrication on appointed lubricating parts.

v. Replace whole set of taper rolling bearing of front fork if necessary.

vi. Yellow marks of tires must be dead against valve port.

vii. Ensure there are no jam-up, crispation, and distortion, and keep all oil hoses smooth.

viii. When installing disc brake caliper, ensure brake disc between braking shoes.

ix. Keep tire with normal air pressure.

Forbid

1. It is forbidden to operate front disc braking lever when removing disc or caliper.
2. Never place front disc on ground. Otherwise disc may be damaged.
3. When brake shoe or brake pad kit is abraded to its mark level, never go on using it.
4. Never add disc brake oil to brake cylinder exceeding the position of "UPPER LEVEL".
5. Never polish disc with sand paper.
6. It is forbidden to reuse hatch pin, seal ring, paper gasket etc.
7. Never start vehicle without muffler.

Driving posture

How to drive is good driving posture?

1. Be useful to get necessary correct information for driver.
2. Keep driver and vehicle incorporate.
3. Allow driver to finish various operation freely.

For a good driver he/she muse have the above three conditions.

Each driver can practice "seven points" in head. Although for each driver's shape and motorcycle type, driving postures are slight different, the "seven points" principles are coherent.

Seven point requirements for driving posture:

1. Eye: pay attention to going and coming vehicles
2. Shoulder: don't be too nervous and keep it soft and natural.
3. Elbow: put two elbows on natural position and a little close to body. Keep upper part of body relaxation.
4. Hand: grasp the middle part of handlebar gently
5. Hip: sit in the position, which doesn't disturb control direction and braking. relax hip and slightly bend forward.
6. Knee: relax knees.
7. Feet: put tiptoes forward and feet on footboard.

The basic principle of driving posture is that hands, knee, feet, and hip is placed in proper position.

Effective braking

1. Loosen throttle handlebar and put right hand on disc brake lever.
2. Grasp rear brake lever with left hand, at the same time with right hand hold disc brake lever.
3. If suddenly grasp front disc brake lever, front wheel may be blocked and results in turnover.
4. To get efficient braking capability, use front and rear brake at the same time. But be sure to avoid use front disc brake when turning.
5. When braking vehicle, front absorber is compressed, rear wheel goes up, which ensures easy to brake.
6. Driver must keep correct posture to driver vehicle forward.
7. When vehicle stops, put feet on ground and front absorber, rear absorber turn back.

Examine and repair for fault

• Engine doesn't start or difficult to start

(inspect if ignition switch is in "ON" position) possible cause

1. unscrew discharging fuel screw for carburetor and inspect if fuel flows into carburetor → fuel doesn't flow into
- -fuel switch has been turned off
- -there is not fuel in fuel tank
- -Fuel filter is blocked
- -fuel hose is blocked
- -Carburetor floater or needle is blocked
- -Ventilating hole on fuel tank cover is blocked

Fuel flows into carburetor

↓

2. do ignition testing → spark is a little weaker or cannot ignite
- -something is wrong with spark plug
- -there is carbon deposit on spark plug
- -Spark plug and coil are cut off or short circuit exists for them

Ignition is good

↓

- -ignition switch is wrong
- -Wiring connection of ignition system is not well or open circuit, short circuit happens.
- -CDI is wrong
- -Charging coil is wrong
- -Touching off coil is wrong

3. use correct start mode to start engine → Engine starts but stops soon
- -Idle mixture ratio screw is not adjusted correctly
- -Carburetor is blocked
- -Ignition advances or delays
- -Mixed gas is too thin or thick

Engine cannot start

↓

4. Remove and inspect spark plug → Spark plug is moist
- -carburetor choke is shut too tight
- -Fuel leaks out from carburetor
- -Mixed gas is too thick
- -There is too much dust on air cleaner
- -Fuel flows into combustion chamber

Spark plug is dry

↓

5. Measure air pressure in cylinder → air pressure is too low
- -valve seat mesh is not correct
- -valve clearance is too small
- -opening time of valve delays
- -Cylinder and piston are abraded
- -Cylinder head gasket is damaged
- -Valve is blocked
- -Ignition advances or delays

Air pressure is normal

↓

6. Pull choke to start

• Engine power is not enough — Possible cause

1. leave wheel from ground and rotate it → **Wheel cannot rotate freely**
- -braking resistance

-Wheel bearing is abraded or damaged

Wheel can rotate freely -Wheel bearing need lubricate

-Driving chain is too tight

↓

2. inspect the pressure of tire **pressure is too low** → -tire leaks out.

- Tire valve is wrong.

Pressure is normal

↓

3. inspect if carburetor is blocked. **BLOCK** → -carburetor has not been maintained fully.

No block

↓

4. Slightly speed up engine **speedup is not enough for engine** → mixed air is too thick or too thin.

-Air cleaner is blocked

Engine speeds up normally -the supplement of fuel is not enough.

- Ventilating hole of fuel tank cap is blocked

-muffler is blocked

↓

5. disassemble and inspect spark plug **"flooded" or there is carbon deposit** → spark plug has not been maintained fully

-The heat range of used spark plug is not correct

The state is well

↓

6. disassemble oil gauge and inspect oil level and its quality **not good** → Oil level is too high.

-Oil level is too low

State is good -engine oil is polluted

↓

7. inspect ignition time **not correct** → -something wrong with ignition

-Something wrong with touching of coil

Correct -touching off coil is assembled incorrectly

↓

8. inspect if clutch skids **clutch skids** → -clutch spring is too loose

-Clutch braking pad kit is abraded

Clutch doesn't skid -strap is abraded

↓

9. inspect if engine is too hot **engine is too hot** → -there is carbon deposit in combustion chamber

-use wrong trademark fuel/oil

Engine is normal -clutch skids

-Mixed air is too thin

-Engine oil is too less

10. inspect the pressure of cylinder **pressure is too low** → - valve mesh is not correct

-Valve clearance is too small

Pressure is normal

-cylinder abrades piston ring
-Cylinder head gasket is damaged
-Providing gas position is not correct

11. disassemble cylinder head and inspect its lubrication **Distribution mechanism doesn't lubricate well** → oil path is blocked
-Something is wrong with oil pump
-oil filter or filtering paper is blocked

Good lubricating

12. speedup or high-speed engine clashes → -there is carbon deposit in combustion chamber
-Use wrong trademark fuel
-cylinder and piston are abraded
-Mixed air is too thin
-Ignition time advances
-Something wrong with ignition equip

No clash

• capability is not good at idle speed or low speed

1. inspect ignition time and valve clearance. Not corrects → -something wrong with ignition coil.
-Something wrong with the adjustment of valve clearance.
-ignition coil is not assembled correctly.

Correct

2. inspect adjusting screw of mixed air of carburetor not correct → -mixed air is too thin
-Mixed air is too thick

Correct

3. inspect carburetor gasket/seal gasket → -fixing bolt looses or heat insulation machine leaks out air
-Incorrect installation
- Heat insulation body of carburetor is damaged

4. ignition test **Faint spark or discontinuous leaping spark** → -something wrong with spark plug
-Spark plug is flooded
-something wrong with ignition
-Wrong with charging or touching off coil
-Something wrong with ignition coil
-Spark plug and coil cut off or short circuit happens for them
-Ignition system doesn't connect well

Ignition is normal

5. inspect if carburetor is blocked **Blocked** → -oil path of carburetor is blocked
- Carburetor nozzle is blocked

Not blocked

• Performance is not good at high speed possible cause

1. Inspect ignition not correct → -Ignition is fault

-Contact coil is fault

Correct ↓ -Contact coil is not installed correctly

2. oil tube of carburetor is cut off Fuel is choked → -fuel in tank is not enough
-Oil tube is blocked

Fuel is smooth -filter is blocked
-Filter web is blocked

-Ventilated hole of fuel tank cap is blocked

↓

3. Inspect if carburetor nozzle is blocked BLOCKED → Carburetor jet is blocked

NOT BLOCKED ↓

4. Inspect if valve setting is in correct position not correct → -Timing chain is not installed correctly

Correct ↓

5. Inspect valve spring too loose → -Valve spring is fault

Normal

• Controlling system is bad

1. If turning is difficult → -turning bearing adjust nut is too tight
-Turning node bearing is damaged

2. If on wheel swings → -Wheel bearing moves too much
-Rim is bended
-Sprocket wheel is loosened or bended
-Rocker arm bushing nut is too loose
-Rocker arm bushing is damaged too much
-Bracket is bended

3. If motorcycle inclines to one side → Front and rear wheels are not adjusted well
-Fork or controlling stem is bended
-Rocker arm or bracket is bended
-Front or rear shock absorber is not stable or oil leaks out.

•Fuel system

Engine can’t start

- lack oil for carburetor
- Filter is blocked
- oil hose is blocked
- ventilating hole of fuel tank is blocked
- oil level is not correct
- float valve is clipped
- fuel exhausts too much
- air cleaner is blocked
- oil leaks out for carburetor
- fuel loses is inefficient/polluted

mixed gas is too thin

- floater lever is too low
- oil hose is blocked
- input oil hose is blocked/distorted
- throttle is wrong
- fuel hole is blocked
- adjustment of carburetor is not correct

Mixed gas is too thick

- floater lever is too high
- emulsification equip is blocked
- air cleaner filter core is blocked
- oil leaks out from carburetor
- adjustment for carburetor is not correct

Air pressure in cylinder is too slow to start engine or difficult to start it.

Valve

- adjustment of valve is not correct
- valve is ablated or distorted
- valve timing is not correct
- valve spring is ruptured
- valve spring is loose

Cylinder head

- cylinder head is distorted or ruptured
- cylinder or piston is wrong

Pressure is too high, engine is too high or engine knock at cylinder

- there is carbon deposit on cylinder head or its top

cylinder head gives out smoke

- valve lever oil seal is damaged
- cylinder, piston or piston ring is wrong

it sounds abnormal for cylinder head

- valve adjustment is not correct
- valve is blocked or valve spring is ruptured

•cylinder**/piston**

- **air pressure of cylinder is low or not stable**
- cylinder or piston ring is abraded

Smoke is too much

- piston ring is not assembled correctly.
- piston or cylinder cliff is scratched

Too hot

- there is carbon deposit in combustion chamber or piston

Clash or abnormal noise

- piston and cylinder are abraded -
- carbon deposit exists.

•clutch/shift gears

Clutch

Scooter skids difficultly at idle speed

- adjustment for cluch is not correct
- brake pad kit of clutch is distorted
- clutch locknut is too loose
- acentric mass spring is damaged

Clutch skids at speedup

- adjustment for clutch is not correct
- clutch braking pad kit is abraded
- Acentric mass spring of clutch is wrong
- Acentric disc of clutch is abraded

difficult of shift gears

- acentric rolling pole of driving disc is abraded
- driven disc compression spring is damaged
- sliding bearing of driven wheel disc is damaged
- strap is damaged

vehicle skids for kicking starter

- the mark for kicking starter gears/transition gears is wrong
- spring for kicking starter is not stable
- start timing is not correct
- kicking start/transition gears are damaged or abraded

•front wheel/drum brake/shock absorber/driving

Front wheel swings

- rim or wheel bearing is distorted
- wheel bearing is abraded
- spoke is loose or crooked
- some thing with tires
- wheel declines too much
- odometer gear is wrong

Brake is soft

-The level of braking liquid is too low

-There is foam for disc braking system

-Oil leaks out

-Piston seal ring of disc braking caliper is aging

-Brake shoe/brake dis is abraded

-Stopper/oil stopper is abraded

Brake is hard/the tension of braking lever is slow

-Oil path is blocked

-Caliper doesn't work normal

-Braking disc is distorted

-Replacement spring of handle lever is damaged

Rear wheel jumps/ swings

-Rear wheel bearing is damaged

-Tires are bad

-Rim is distorted

-Rear axle is loose

-Nut for rear axle is loose

-Rear rocker arm bush is abraded

-Adjustment for chain is not correct

-The capability of braking is not good

-Adjustment for rear braking is not correct

-Braking shoe is abraded

-Oil dirty exists on braking shoe

-Braking cam is abraded

-Braking hub is abraded

-Spine mesh of braking rocker is not correct

-Touching position of braking shoe and braking cam is abraded

Electrical fault

lighting/battery charging system | **battery has no electricity**

- short circuit happens for wire
- no electrolyte in battery storage
- battery discharge completely
- relay is wrong
- main fuse is connected completely or cuts off
- ignition switch is wrong
- battery charging coil is wrong

Voltage is low

- charging is not enough for battery
- electrolyte is not enough
- discharge happens for battery
- charging system is wrong
- it is not connected well

Turnoff

- something is wrong with the connection of battery cable
- something is wrong with charging system
- the connection of starting system is wrong
- ignition switch is wrong or short circuit happens
- short circuit happens for lighting system or its connection is wrong

Fault for charging system

- lead or connector is wrong: Turnoff or short circuit.
- rectifier is wrong
- (ACG) is wrong

Bulb is burnt

- connecting lead is loose or short circuit happens
- rectifying adjuster is wrong

Charging coil for bulb/battery is wrong

Headlight is dark

- grounding is not good
- rectifying adjuster is wrong
- charging coil for bulb/battery is wrong

•electrical starting system

Starting motor doesn' t rotate

- fuse breaks off
- cable of starting motor is loose

Battery voltage

- inspect continuity of broken circuit relay
- broken circuit relay is wrong

Continuity is abnormal

- touching of starting button is wrong
- clutch switch is wrong

Starting motor rotates but its speed is slow

- proportion of battery electrolyte is low
- circuit impedance is too high
- starting motor agglutinates

Starting motor rotates but engine doesn't rotates

- starting unilateral clutch is wrong
- starting gears are wrong
- starting chain or starting sprocket is wrong

Both starting motor and engine can rotate but engine can't start

- something is wrong with ignition system
- engine fault-compression ratio is too low
- spark plug is wrong

note: When ignition switch is in open position
And clutch is released, press starting button, staring motor works.