VENTO MOTORCYCLES

Motorcycle division

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Design and Development Dept.

VENTO

MOTORCYCLES

U.S.A.

Phantom R4i Service

&

Maintenance Manual

VENTO MOTORCYCLES

FORWARD

This service manual contains an introductory description *On VENTO* Phantom R4i, and procedures for its Inspection/service and overhaul of its main components. Other information's considered as generally known is not included.

Read GENERAL INFORMATION section to familiarize yourself with outline of the vehicle and MAINTENANCE and other sections to use as a guide for proper inspection and service. This manual will help you know the vehicle better so that you can assure your customers of your optimum and quick service.
The *VENTO* Phantom R4i has following features such as:

- V-belt drive automatic transmission
- Fan air-cooling system
- CDI Ignition system
- Auto Ignition system
- Alarm System
- Remote start system

►Illustrations in this manual are used to show the Basic principles of operation and work procedures.

►This manual contains an introductory description on *VENTO*, Phantom R4i scooter and procedures for Inspection/Service and overhaul of its main Components. This Manual is intended those who have enough knowledge and skills for servicing of *VENTO* vehicles. Without such knowledge and skills should not attempt servicing by relying on this manual only. Instead please contact your nearly authorized *VENTO service* center.

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CHAPTER 1

GENERAL INFORMATION

CONTENTS

MODEL IDENTIFICATION

TYPE & IDENTIFICATION

FRAME NUMBER

FRAME NUMBER is Engraving on the steel tube of frame as shown in figure.

1

ENGINE NUMBER

ENGINE NUMBER is Engraving on side of the Crankcase as Shown in figure.

2

Both FRAME NUBER AND ENGINE NUMBER are designed especially for registration your scooter and for spare parts order.

FUEL AND ENGINE OIL RECOMMENDATION

Be sure to use specified fuel and engine oil.

Some specifications are as follows:

FUEL

- Gasoline should be Unleaded, the octane number must be 85 ~95 or more.

ENGINE OIL

For engine lubrication, use specified high quality SAE10W-40 or SAE 10W-50 engine oil.

GEAR OIL

Use high quality, all-purpose SAE 90 Gear oil for this scooter.

BREAK-IN PROCEDURES

During manufacture only the best possible materials are used and all machined parts are finished to a very high standard but it is still necessary to allow the moving parts to ***"BREK-IN"*** before subjecting the engine to maximum stresses. The future performance and reliability of the engine depends on the care and restraint during its early life.

General requirements are as follows

Limit break-in speed

At the first **1000 Kms (**630 miles, mileage use throttle opening less than 1/2.

Up to **1600 Kms**□1000 miles□□mileage□use throttle opening less than 3/4.

- Upon reaching an odometer reading of 1600 Kms (1000 miles) you can operate the motorcycle to full throttle operation.
- Do not maintain constant engine speed for on extended time period during any portion of the **"*BREAK-IN"*** period, try to vary the throttle position.

PRECAUTIONS AND GENERAL INSTRUCTIONS

GENERAL PRECAUTIONS:

WARNING

- Proper service and repair procedures are important for the safety of the service mechanic and the reliability of the vehicle.
- When two or more persons are working together, pay attention to the safety of each other.
- When it is necessary to run the engine indoors, make sure that the exhaust gas is forced outwards and ventilation should be proper.
- When working with toxic or flammable materials, make sure that the area you work in is well ventilated and that you follow all off the material manufacturer's instructions.
- Don't use gasoline as a cleaning agent.
- After servicing the motorcycle check all lines i.e. fuel, oil and brake lines for leaks.
- Whenever you remove Oil seals, Gaskets, packings, O-rings, Locking washers, Cotter pins, Circlips, and certain other parts as specified, be sure to replace them with ones. Also before installing these new parts be sure to remove any left out material from the mating surfaces.
- Never reuse a circlip, when installing a new circlip, take care not to expand the end gap larger than required to slip the circlip the shaft. After installing a circlip, always ensure that it is completely seated in its groove and securely fitted.
- Do not use self- locking nuts a few times over.
- If parts replacement is necessary, replace the parts with ***VENTO*** Genuine parts or their equivalent.
- When removing parts that are to be reused, keep them arranged in an orderly manner so that they may be reinstall in proper order and orientation.
- Always use special tools when required.
- Always use specified lubricant, bond& sealant.
- While removing the battery, disconnect the ***Negative terminal / Cable*** first then ***Positive terminal / Cable*** and when reconnecting the battery, connect the ***Positive terminal / Cable*** first then ***Negative terminal / Cable.***
- During Service to electrical parts, if no need of battery powers then please disconnect the ***Negative terminal / Cable*** of the battery.
- During tightening of Cylinder head and crank case bolts and nuts start with larger diameter and ending with smaller diameter, from inside to outside diagonally, with the specified tightening torque values.
- After reassembly, recheck parts for tightness and operation.

REPLACEMENT COMPONENTS

Be sure to use genuine *VENTO* spare parts or their equivalent. Genuine *VENTO* components are high quality parts, which are designed specially for *VENTO* vehicles.

CAUTION

Scooter/motorcycle may damage by using non genuine parts or parts that is not equivalent to

VENTO parts and will be affecting performance also.

SPECIFICATIONS

	DESCRIPTION	PARAMETER
VEHICLE	Overall length	1950mm
	Overall width	675mm
	Overall height	1130mm
	Wheelbase	1375mm
	Minimum ground clearance	115mm
	Dry weight	115Kg
ENGINE	Type	4-Stroke Air Cooled
	Cylinder	Single Cylinder
	BoreXStroke	52.4X57.8
	Displacement	124.6 cc
	Compression Ratio	10.3:1
	Valve	Two Valve
	Engine oil capacity	0.9L
	Oil Grade	SAE10W/40 or SAE 10W/50
	Lubricating system	Pressure &splash type lubrication
	Oil pump style	Rotor type
	Air cleaner	
	Cylinder pressure	10.0±2.0 Kg /Cm^2
	Inlet port open	3^0BTDC
	Close	30^0ABDC
	Exhaust open	30^0BBDC
	Close	5^0ATDC
	Tappet Clearance	
	Inlet valve	0.03~0.05mm
	Exhaust valve	0.05~0.06mm
	Idle speed	1400±100rpm
	Max. Torque	8.3N.m@6500rpm
	Max. Output power	6.32KW@7500rpm
	Starting system	Electric& by kick
	Dry weight of engine	26kg

ITEM	PARAMETER	SPECIFICATION
MAGNETO	Ignition system	CDI
	Ignition timing 'F' mark	13° BTDC @1400RPM
	'II Full advance	28° BTDC@ 4000 RPM
	Magneto output	114W@4000RPM
	Spark plug	C7HSA
	Spark plug gap	0.6~0.7mm
	Fuse	8A
	Horn	100dB
	Battery	12V - 6Ah/YUASA/YTX7A-BS

LIGHT	Headlight (high beam/Low beam)	12V 18W/18W×2
	Taillight/brake light	12V 15W/5W
	Turning signal light	12V 10W×2 Front & Rear
	Head light Indicator	12V 3 W×2
	Turn Signal Indicator	12V 1.7WX2
	High beam indicator	12V 1.7WX2
	Alarm indicator light	LED

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ITEM	PARAMETER	SPECIFICATION
DRIVING SYSTEM	Clutch system Transmission system Primary gear reduction Gear ratio First Second Max speed	Dry shoe Automatic CVT 10.86~2.64 2.8(42/15) 3.077(40/13) 85±5km/h

CARBURETOR	Model code Piston Dia Main jet Slow running jet Idle speed air adjusting screw Float height Jet needle position from top	PD24J 24mm #191 #19 Inside1 $\frac{1}{2} \pm \frac{1}{2}$ rounds 15±1mm 3rd Groove	

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SUSPENSION	Front Shock absorber	Liquid pressure type (compressibility 130 mm)
	Rear shock absorber	Liquid pressure type (compressibility 75mm)
	Front wheel specification	130/60-13
	Rear wheel specification	130/60-13
	Tire pressure front	32 PSI
	Tire pressure rear	32 PSI
	Front brake	Disc Type
	Rear brake	Drum Type
	Fuel tank capacity	6.0 Liter
	Engine Oil capacity	1.0 Liter

CHAPTER 2

PERIODIC MAINTENANCE AND SERVICE

- Periodic maintenance and service schedule
- Storage Battery
- Spark Plug
- Air Cleaner
- Special Tools
- Specified Torque Values

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PERIODIC MAINTENANCE AND SERVICE SCHEDULE

The chart below lists the recommended intervals for all the required periodic service work necessary to keep the motorcycle operating at peak performance and economy. Mileages are expressed in terms of Kilometer, Miles and time for your convenience.

Note: More frequent servicing may be performed on motorcycles that are used under bad road condition.

PERIODIC MAINTENANCE CHART

Interval						
	Miles	630	3780	7560	11340	15120
	Kilometer	1000	6000	12000	18000	24000
	Months.	2	12	24	36	48
Storage battery		I	I	I	I	I
Cylinder head nut and exhaust pipe bolt		T	T	T	T	T
Cylinder head and cylinder		—	C	C	C	C
Spark plug		—	C	R	C	R
Air cleaner		Inspect & Clean every 3000 Kms (1890 miles) Replace every 12000 Kms(1750 Miles)				
Idle speed (rpm)		I	I	I	I	I
Throttle cable play		I	I	I	I	I
Oil pump		I	I	I	I	I
Gear oil		I	—	R	—	R
Fuel line		I	I	I	I	I
		Replace every 4 years				
Brake		I	I	I	I	I
Brake hose		I	I	I	I	I
		Replace every 4 years				
Brake fluid		I	I	I	I	I
		Replace every 2 years				
Steering		I	I	I	I	I
Front fork		I	I	I	I	I
Rear shock absorber		I	I	I	I	I
Tire		I	I	I	I	I
Vehicle body bolts and nuts		T	T	T	T	T

Note:

- ***I=inspect□ clean□ adjust□ lubricate□ or replace if necessary□***

A=adjust□ C=clean□ R=replace□ T=tighten

STORAGE BATTERY

BATTERY INSPECTION AND CHECKING PROCEDURE

Inspect at initially 1000Kms□630 miles□2 months□□and every 6000 Kms□3780 miles□12 months□

► Open the cover as shown in picture, and then remove the battery from the battery box.

► ***Disconnect Negative terminal / Cable*** first then ***Positive terminal / Cable*** of Battery.

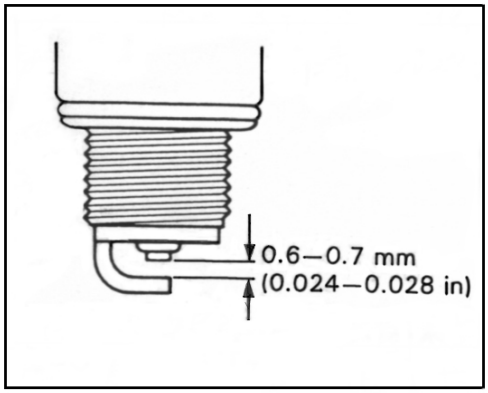
►Measure the voltage between the +ve and –ve terminal of Battery, charge the Battery if the voltage is below the specified limit.

SPARK PLUG

Neglecting the spark plug maintenance eventually leads to difficult starting and poor performance. If the spark plug is used for a long time, the electrode gradually burns away and carbon builds up along the inside part. In accordance with the periodic table, the plug should be removed for inspection, cleaning and to reset the gap.

- Carbon deposits on the spark plug will prevent good sparking and cause misfiring. Clean the carbon deposits periodically.
- ***CARBON DEPOSIT***

  Check to see the carbon deposit on the Spark Plug. If the carbon is deposited, remove it with a spark plug cleaner machine or carefully using a tool with a pointed end.
- Check to see the worn out or burnt condition of the electrodes. If it is extremely worn or burnt, replace the plug and also replace the plug if it has a broken insulator, damaged thread etc.



Thickness gauge

Spark plug gap□0.6~0.7 mm (0.024-0.028 inch)

Check the spark plug for burnt condition. If abnormal replace the

- Tighten the spark plug to the specified torque.

Spark plug
Tightening torque: 15-18N.m

NOTE:

- ***To check the spark plug, first make sure that the fuel used is unleaded gasoline.***
- ***Confirm the Specification, thread size and reach while replacing the spark plug.***

AIR CLEANER

Clean every 3000 Kms□1890 miles□Replace every 12000 Kms (1750 Miles)

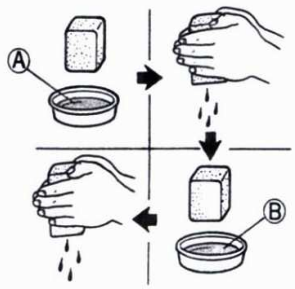
If the air cleaner is clogged with dust, Air Intake resistance will be increased with a result decrease in power output and will be increase in fuel consumption. Check and clean the filter element in the following manner.

- Remove clamp and screw & take out air cleaner.
- Unscrew tapping screw & remove air cleaner cover
- Fill a washing pan of a proper size with Non-flammable cleaning solvent.
- Put the air Cleaner element in the cleaning solvent and wash properly.
- Squeeze the cleaning solvent out of the washed element
  By pressing it between the palms of both hands, do not twist
  or wring the air cleaner element or it will develop tears.
- Immerse cleaned filter element in CCI or CCI Super oil and Squeeze the oil out of the element leaving it slightly wet with oil. Fit the element to the Air cleaner case properly
- Install Air cleaner in the reverse order of removal.

CAUTION□

- Before and during the cleaning operation, inspect the core for tears. A torn filter element must be replaced with new one.
- ***Be sure to position the filter element snugly and correctly□So that no incoming air will bypass it. Remember, rapid wear of piston rings and cylinder bore is often caused by a defective or poorly fitted filter element.***

A- Non-flammable cleaning solvent (Kerosene)
B- CCI OR CCI Super oil or SAE 80 or90 Gear oil.

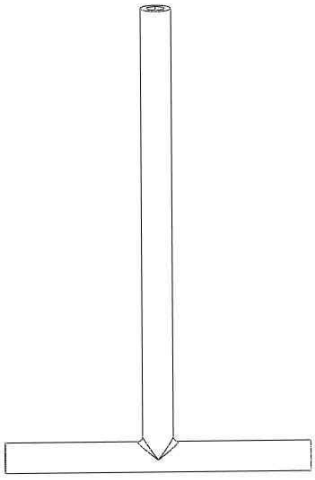


Air cleaner

SPECIAL TOOLS LIST

NECESSARY TOOLS TO DISASSEMBLE AND INSTALL MOTORCYCLE ENGINE AS FOLLOWS□

CODE	TOOLS CODE	PURPOSE
1	T01	"T"SHAPE TAPPET ADJUSTING TOOL
2	T02	GUIDE CYLINDER TOOLS□8,10,12,13□
3	T03	TOOL FOR FLY WHEEL DISASSEMBLY
4	T04	TOOLS TO DISASSEMBLE VALVE SPRING
5	T05	DISASSEMBLING TOOLS FOR OIL DRAINAGE
6	T06	COMPRESSION PRESSURE GAUGE
7	T07	DISASSEMBLING TOOL FOR PISTON PIN
8	T08	SPARK PLUG SOCKET
9	T09	ELECTRIC TOOL FOR OPENING OF FLY WHEEL BOLT
10	T10	CULTCH CLAMP



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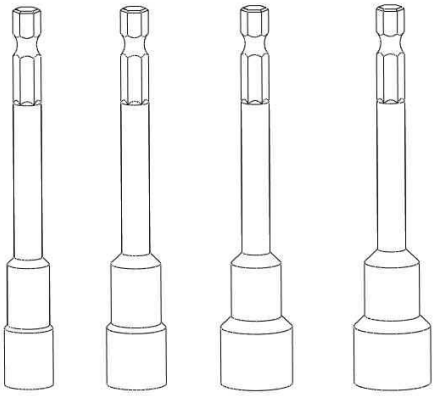

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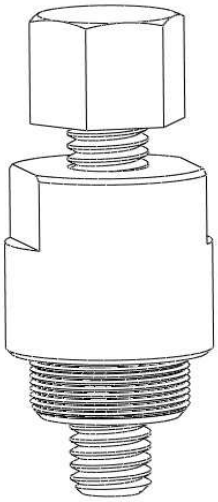

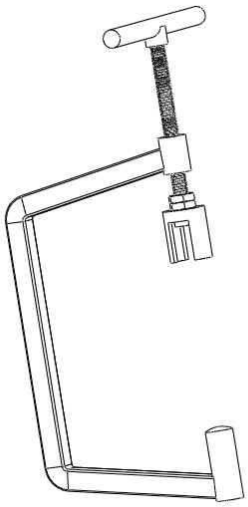

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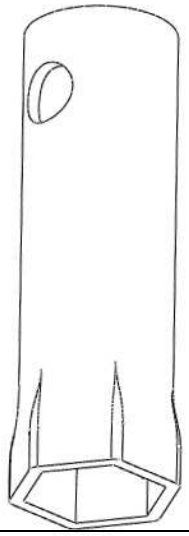

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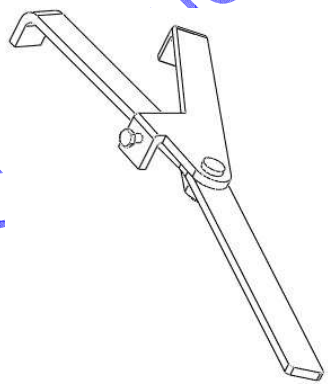
⑨ 	⑩ 

SPECIFIED TORQUE VALUES

IT IS IMPORTANT FOR THE COMPONENTS / FASTENERS TO BE TIGHTEED AS PER SPECIFIED TORQUE

NO.	NA ME	QTY	TORQUE

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1	Tapping screw for fan cover assy.	2	1-3NM
2	Screw for fan cover assy.	2	10-12NM
3	Tapping screw for top and bottom guide fan cover	3	1-3NM
4	Screw for top and bottom guide fan cover	1	10-12NM
5	Tapping screw and nut for ventilating air chamber of cylinder head cover	3	1-3NM
6	Bolt for cylinder head cover	4	10-12NM
7	Nut for double head blot on cam fixing holder	4	22-25NM
8	Nut for chain guide	1	10-12NM
9	Screw for chain adjustor	2	10-12NM
10	Bolt for cylinder head	2	10-12NM
11	Bolt for cylinder	1	10-12NM
12	Spark plug	1	10-15 NM
13	Double head bolt for cylinder head inlet port	2	10-12NM
14	Double head bolt for cylinder head exhaust port	2	10-12NM
15	Nut for carburetor joint pipe	2	10-12NM
16	Screw for cooling fan	4	10-12NM
17	Screw for flywheel	1	45-55NM
18	Nut for magnet Assay	2	6-8NM
19	Screw for pick up coil	2	10-12NM
20	Nut for right crankcase cover	9	10-12NM
21	Oil filter cover cap	1	55-60NM
22	Nut for oil pump	2	10-12NM
23	Nut for oil pump sprocket	1	8-10NM
24	Nut for oil pump	2	10-12NM
25	Nut for oil pump cover	1	1-3NM
26	Screw for starting-clutch	1	35-40NM
27	Screw for super starting clutch outside	3	10-12NM
28	Bolt for right crankcase	2	10-12NM
29	Double head bolt for left and right crankcase	4	22-25NM
30	Fixing bolt for self start motor	2	10-12NM
31	Bolt for left crankcase cover and wiring harness	11	10-12NM
32	Tapping screw for ventilating guide board of left crankcase cover	4	3-6NM
33	Nut for drive disc	1	45-55NM
34	Nut for driven disc	1	45-55NM
35	Nut for driven disc clutch	1	55-60NM
36	Nut for press-board of kick starter	1	10-12NM
37	Bolt for transmission case cover	5	10-12NM
38	Bolt for transmission case cover	2	22-25NM
39	Nut for oil hole of left crank shaft.	1	40-45NM
40	Nut for position shaft of left crank shaft	1	22-25NM

CHAPTER 3

ENGINE

DETAIL INFORMATION OF IMPORTANT PARTS

O RINGS —7 NOS.

S.NO.	Size (mm)	Qty.	Description	Location
1	9Φx1.6	2	Inlet and exhaust valve guide	Engine
2	13.7Φx1.5	1	Chain guide	Engine
3	9.5Φx1.5	1	Chain adjustor	Engine
4	18Φx3.5	1	Oil Level gauge	Engine
5	30.5Φx3	1	Filter spring cap	Engine
6	40.7Φx1.9	2	Driven wheel disc	Engine
7	27Φx2	1	Inlet seat	Engine

OIL SEALS—4 Nos.

S.NO.	Size (mm)	Qty.	Description	Location
1	20x32x6	1	Output shaft---gearbox cover	Engine
2	27x42x7	1	Output shaft—left crankcase	Engine
3	20x29x6	1	Crank—left crankcase	Engine
4	19.8x30x5	1	Crank—right cover	Engine

BEARING—13NOS

S.NO.	Code	Qty.	Description	Location
1	6203	1	Output shaft—gearbox cover	Engine

2	6202	1	Middle shaft—gearbox cover	Engine
3	6204	1	Output shaft—gearbox cover	Engine
4	6004	1	Output shaft—left Crank case	Engine
5	6002	1	Middle shaft—left Crank case	Engine
6	6301	1	Output shaft—left Crank case	Engine
7	TM-SCD4ASSCS12	1	Left crank—left Crank case	Engine
8	TM-SCD4ASSCS12	1	Right crank—right Crank case	Engine
8	K28x33x14	1	Crank pin—crank connecting big end	Engine
9	K28x32x17	1	Clutch hub—clutch gear	Engine
10	6902NSE28 x15x7	1	Driven disc—output shaft	Engine
11	HK20 x29x18RS	1	Driven disc—output shaft	Engine
12	6002	2	Camshaft— Holder	Engine

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PIN SHAFT—2NOS

S.NO.	Size (mm)	Qty.	Description	Location
1	5Φx6	1	Starter clutch	Engine
2	4Φx6.5	1	Oil pump	Engine

GASKET— 7 NOS.

S.NO.	Gasket	Type	Qty.	Location
1	Cylinder head cover	Anti-Oil Asbestos Rubber	1	Engine
2	Cylinder head	Steel	1	Engine
3	Cylinder body	Anti-Oil Asbestos Rubber	1	Engine
4	Crankcase	Anti-Oil Asbestos Rubber	1	Engine
5	Right crankcase cover	Anti-Oil Asbestos Rubber	1	Engine
6	Left crankcase cover	Anti-Oil Asbestos Rubber	1	Engine
7	Chain adjuster	Anti-Oil Asbestos Rubber	1	Engine

NO.	GEAR	No teeth	POSITION
1	Kick starter gear	38	Engine
2	Kick starter transition small gear	13	Engine
3	Kick starter transition big gear	49	Engine
4	Crank kick starter driven gear	20	Engine
5	Starting motor drive gear	9	Engine
6	Electric starter transition gear	49/17	Engine
7	Clutch gear	60	Engine

Gear Ratio	Gear	No teeth	Gear	No teeth
2.8	A_1	15	A_2	42
3.077	B_1	13	B_2	40

SPROCKET INFORMATION

No.	**Sprocket wheel**	No teeth	**POSITION**
1	Right crank oil pump driver sprocket wheel	18	Engine
2	Oil pump sprocket wheel	22	Engine
3	Left crank shaft drive sprocket	17	Engine
4	Cam shaft sprocket	34	Engine

UNIDIRECTIONAL FITMENT OF ENGINE PARTS

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

1. All marks of the following parts should be towards combined surface of left crankcase and transmission case ►Output shaft of left crankcase, middle shaft, output shaft bearing 6004,6002,6301, and output shaft of transmission case, middle shaft, output shaft bearing 6203,6202,6204.

2. The side of driven wheel disc rolling needle bearing with mark needs to be toward seeable direction, and the side of ball bearing with mark needs to be towards clip.

3. The convex side of the gasket between drive wheel disc and driven wheel disc is towards locknut.

4. The side of kick-starter gear and transition gear with mark is towards left cover.

5. Chain guide groove should be towards chain, and column rod of chain guide part is not higher than the surface of cylinder.

6. White piston ring is the first one, black piston ring is the second one; groove of 1st and 3rd ring towards exhaust port, groove of ring 2 and ring 4 are towards inlet port; the side with English letter is towards the top of piston.

7. “IN” mark on piston should be towards carburetor side.

8. Valve spring (dense end) is towards valve guide.

9. The side of camshaft bearing 6002 with mark should be towards cam.

10. The side of oil pump with letters is towards outside.

11. The side of left and right crankcase bush with “W” mark is towards the reverse of combined surface of left and right crankcase.

ENGINE DISASSEMBLY AND ASSEMBLY

DISASSEMBLY

Guide-fan cover/ fan cover/carburetor

↓

Left crankcase cover/gasket

↓

Outside part of left crankcase motor

↓

Chain adjustor /cylinder head cover transmission gear

↓

Camshaft holder/cam

↓

Cylinder cover/gasket/pin

↓

Cylinder/gasket/pin

↓

Spring clip/piston pin/piston

↓

Cooling Fan /flywheel/ Stator coil

↓

Right crankcase cover/oil filter/oil gauge

↓

Right crankcase outside

↓

Start motor/left and right crankcase/crank

↓

Gearbox

↓

Left crankcase/gearbox cover

ASSEMBLY

Left crankcase assy./gearbox assy.

↓

gearbox

↓

Crankshaft/left and right crank case/Starter

↓

Oil pump/starter-clutch/electric start

↓

Right crankcase cover/oil filter/oil gauge

↓

Stator coil/flywheel/cooling fan

↓

Piston/piston pin/circlip

↓

cylinder/gasket/ dowel pin

↓

cylinder cover/gasket/ dowel pin

↓

Cam/camshaft holder

↓

Chain adjustor/cylinder head cover

↓

Left crankcase outside assy.

↓

Left crankcase cover/gasket/ dowel pin

↓

Guide fan cover/fan cover/carburetor

NOTE:

- Before installation, wash engine parts, and lubricate, refer to recommended torque value for tightening fasteners.
- Pay special attention to single direction fixing accessories.
- Start and inspect oil circulation /lubrication system after assembly the engine.

ENGINE COWL ASSEMBLY

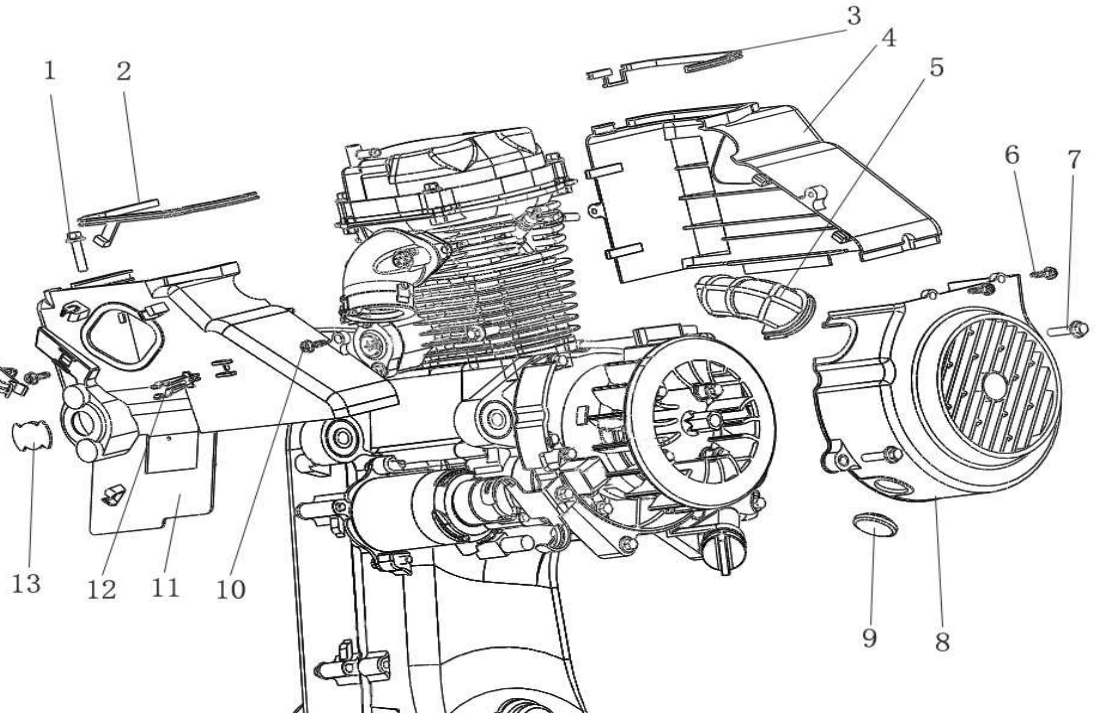
Disassembly

Screw (10)
↓
Bolt (1)
↓
Top cowling
↓
Bottom cowling
↓
Top cowling
Seal gasket (2)
↓
Bottom cowling seal gasket (3)
↓
Coil clip (12)
↓
Cover (13)

Screw (6)
↓
Bolt (7)
↓
Fan cover assy. (8)
↓
Cover (9)
↓
Cooling pipe (5)

Specified torque value	
Fan cover screw(6)	2NM
Fan cover bolt (7)	11NM
Guide fan cover screw (10)	2NM
Guide fan cover bolt (1)	11NM

- ***Assembly sequence is just reverse of disassembly***



ENGINE REMOVAL AND INSTALLATION

Disassembly

Cylinder head cover

↓

Right against mark “T” on magneto

↓

(The bottom of exhaust port)

↓

Timing chain tensioner

↓

Cam shaft holder assy./cam shaft chain

↓

Cam shaft holder assy. / cam shaft fixer assy.

↓

Cylinder head assy.

↓

correct timing

same level as

Valve lock clip/valve spring holder

Inlet exhaust valve spring□

□Use special tool T04□

↓

Inlet valve, exhaust valve

↓

Valve oil seal assy.

↓

Rocker shaft

↓

Cylinder head

Assembly

Cylinder head

↓

Exhaust& Inlet valve oil seals assy./gasket

↓

Inlet & exhaust valve spring/spring holder/lock clip

↓

Cylinder head assy.

↓

Cam shaft chain/cam shaft holder assy.

↓

Cam shaft assay and cam shaft holder assy.

↓

Right against mark “T” on magneto rotor and mark on sprocket (keep timing marking on the joint surface of cylinder head)

↓

Timing chain tensioner(adjust)

↓

Adjust specified valve clearance

►**Inlet valve clearance: 0.03~0.05mm**

► **Exhaust valve clearance: 0.05~0.06mm**

Specified Torque value

1. Cylinder head cover fixing bolt	10~12N·M
2. Chain Tensioner bolt and fixing bolt	10~12 N·M
3. Cam shaft holder nut	22~25 N·M
4. Inlet pipe locknut	10~12 N·M
5. Timing bolt	10~12 N·M

CAM SHAFT HOLDER ASSEMBLY

DISASSEMBLY

CAM SHAFT HOLDER & CAM SHAFT ASSY.

↓

CAM SHAFT HOLDER

↓

ROCKER SHAFT□2□

↓

POLE,SPRING□15□

GASKET□3□AND ROCKER□4□

↓

STOPPER BOARD□5□

↓

AXIS□6□AND BUSH□7□

↓

MASS□8□AND SPRING□9□

↓

CAM SHAF HOLDER □10□

↓

CAM SHAFT ASSY.

↓

CAM SHAFT SPROCKET11□

↓

CAM SHAFT RIGHT BEARING□12□CAM SHAFT LEFT BEARING

↓

AUTO REDUCTOR OUTSIDE CIRCLE□14□ BEARING,□13□

↓

GASKET□16□AND CAM SHAFT□17□

ASSEMBLY

ATMOLYSIS SHAFT RIGHT BEARING□12□

↓

ADJUSTING GASKET□16□

↓

AUTO REDUCTOR OUT CIRCLE□14□ AND ROLLING

↓

ATMOLYSIS SHAFT AND LEFT BEARING□13□

↓

ATMOLYSIS SHAFT SPROCKET ASSY.□11□

↓

ATMOLYSIS SHAFT ASSY.

↓

ATMOLYSIS SHAFT SUPPORTER□10□

↓

AXES□6□BUSH□7□MASS□8□AND SPING□9□

↓

STOPPER BOARD□5□

↓

ROCKER□4□AND GASKET□3□

↓

ROCKER SHAFT(2)

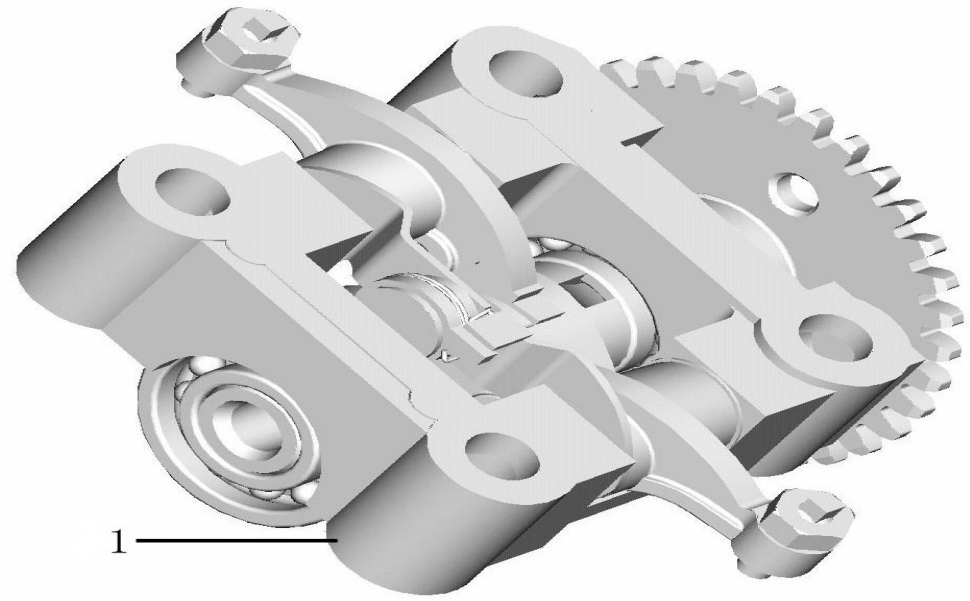
↓

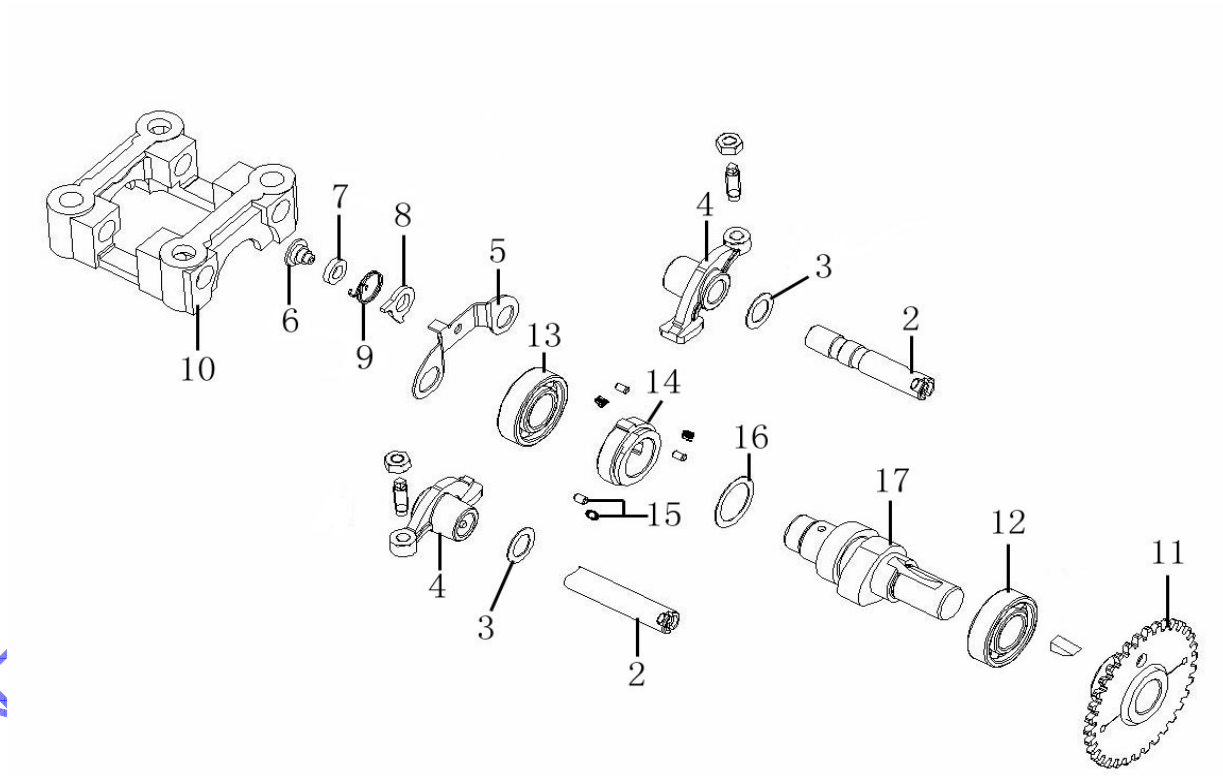
ATMOLYSIS SHAFT FIXER ASSY.

↓

ATMOLYSIS SHAFT FIXER AND ATMOLYSIS SHAFT

NOTE : When installing rocker shaft, remember to assemble rocker with lubrication, and keep groove of center rocker shaft on the same level as the hole of rocker seat.



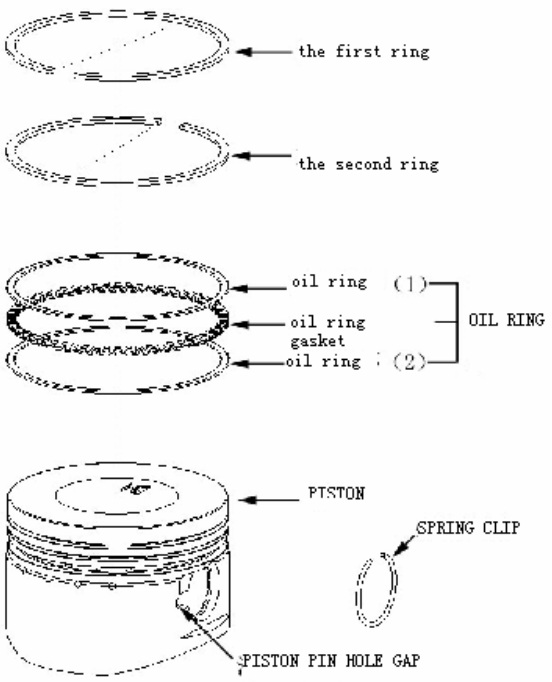


VENTO MOTORCYCLES

PISTON INSTALLATION

REMOVAL:

THE FIRST RING
↓
THE SECOND RING
↓
OIL RING □□□
↓
OIL RING□□□
↓
OIL RING GASKET
↓
PISTON



INSTALLATION:

The installation sequence is just reverse of removal.

NOTE:

- The first ring is white ring, and the second ring is black one.
- The sides of the first ring and the second one with English Letters are up.
- Letter “IN” is towards inlet port, and the first ring is dead against oil ring slice (□).
- Never make mistake in positioning the first ring and the second ring.
- Keep exhaust port, the second ring, oil ring slice(□).
- The gap of spring clip is 80º-100º against the gap of groove.

LEFT CRANKCASE COVER INSTALLATION

REMOVAL

Left crankcase cover assy.

Brake cable clip (1) main stand stopping holder ventilation pipe clip (3) throttle cable holder (4)

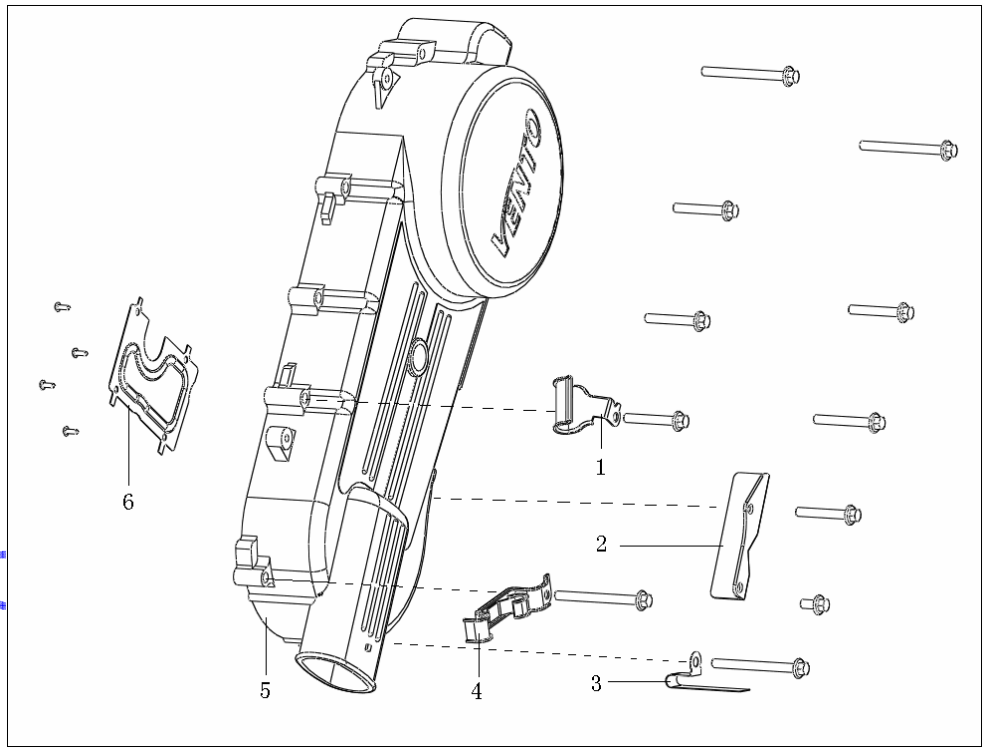
Left crankcase cover (5)

Guide board (6)

INSTALLATION: The installation sequence is just reverse of the removal

NOTICE:

1. When installing ventilation board, respectively of 4 tapping screws, with specified torque 3-6N.M, and tighten the board plate with same tool, then respectively cover tapping screw head.
2. When installing left crankcase cover, tap it to its proper position with wooden hammer or plastic hammer not with metal hammer to avoid damaging the face of crankcase & crankcase cover.
3. Brake cable clip (1), main stand stopper holder (2), ventilated clip (3), throttle-fixing stand (4) must be positioned correctly.
4. Tighten all the bolts diagonally with specified torque10-12N.M.



VENTO MOTORCYCLES

RIGHT CRANKCASE COVER ACCESSORIES

REMOVAL:

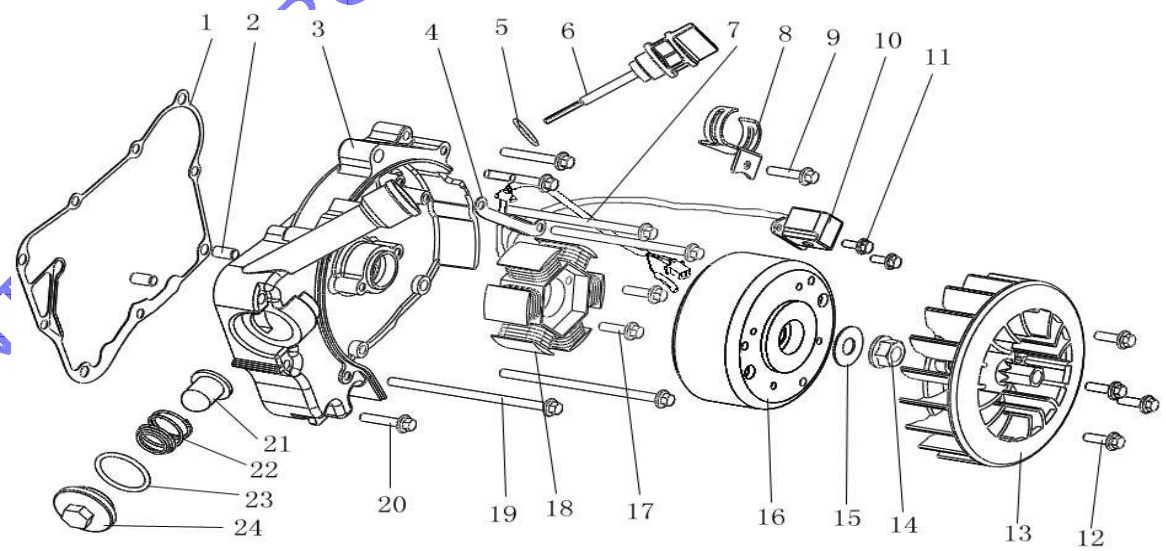
Screw (12)
↓
Fan assy.(13)
↓
Nut (14)
↓
Gasket (15)
↓
Flywheel (16)
↓
Screw (11)
↓
Pickup assy. (10)
↓
Bolt (7)
↓
Cable holder (4)

Oil filter screw cap (24)
↓
O-ring (23)
↓
Spring (22)
↓
Filter assy. (21)
↓
Oil gauge (6)
↓
Seal (5)
↓
Other bolts
↓
Right crankcase end cover (3)
↓

Specified Torque Value	
Nut (14)	50N.M
Magnet motor bolt (17)	7N.M
Fan bolt (12)	11N.M
Trigger screw (11)	6N.M
Oil filter screw cap (24)	57N.M
Other bolts for right crankcase cover	11N.M

INSTALLATION□The installation sequence is just reverse of removal.

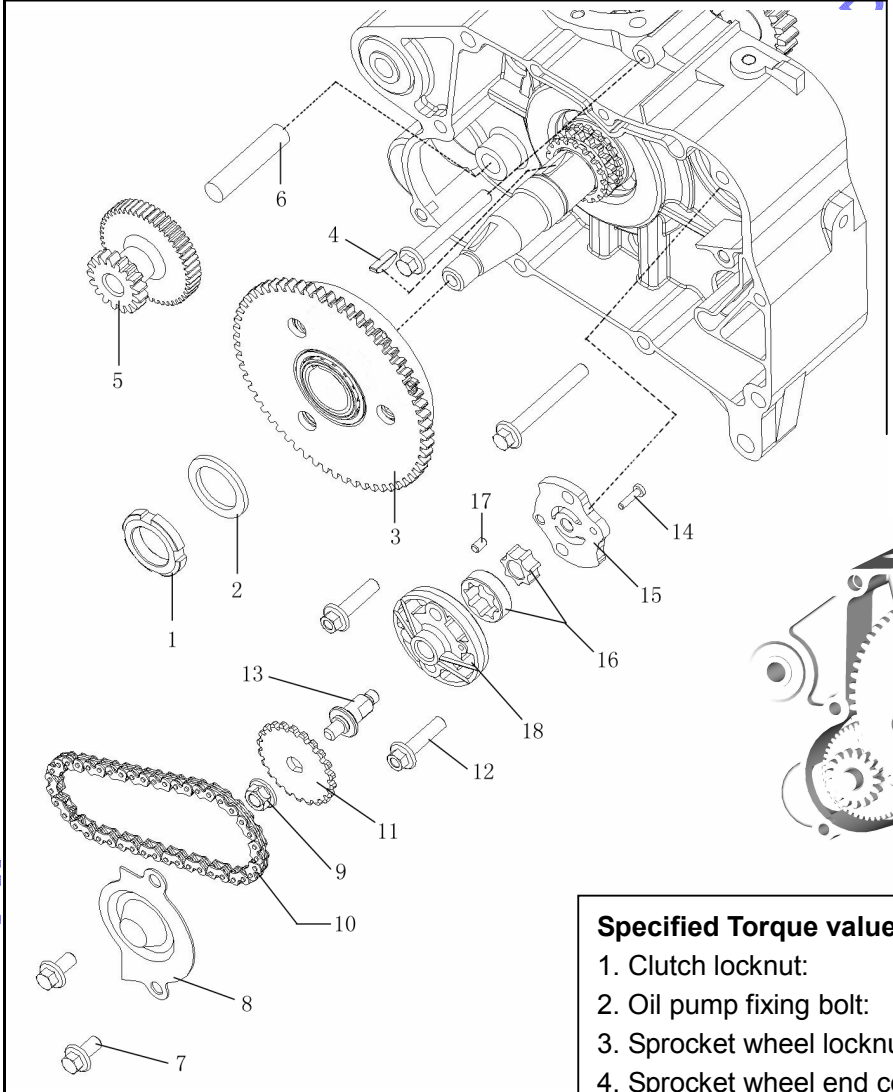
NOTICE□1. The clearance between flywheel trigger and pickup is 0.5±0.2mm.
2. Check specified clearance between flywheel trigger and pickup.

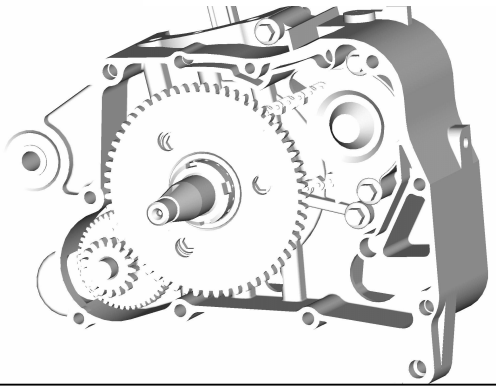


RIGHT CRANK CASE ACCESSORIES

REMOVAL

- Locknut□1□ (special tool□ T05□)
- Gasket□2□
- Start clutch complete (3□
- Half round plate□4□
- Electric start transition gears□5□
- Electric start transition gear shaft□6□
- Bolt□7□
- Oil pump sprocket end cover□8□
- Nut□9□
- Oil pump chain (10)
- Oil pump sprocket wheel□11□
- Bolt□12□
- Special Screw □13□
- screw□14□
- Oil pump cover□15□
- Rotor□16□
- Pin□17□
- Oil pump cover□18□





Specified Torque value	
1. Clutch locknut:	35~40N.M
2. Oil pump fixing bolt:	10~12 N.M
3. Sprocket wheel locknut:	10~12 N.M
4. Sprocket wheel end cover bolt:	8~10 N.M

LEFT CRANKCASE ACCESSORIES INSTALLATION

REMOVAL

NUT□8□Washer□7□Drive Impeller□6□
↓
Nut□15□CVT nut washer□14□Centric disc□13□
↓
V –Belt (16□Driven wheel disc assy.□12□
↓
Pin□2□Gasket□1□
↓
Bush□5□Drive wheel assy.□4□
↓
Starter driven gear□3□
↓
Starter spring plate□11□
↓
Kick starting gear assy. (10) Starting gear sector assy.□9□

INSTALLATION

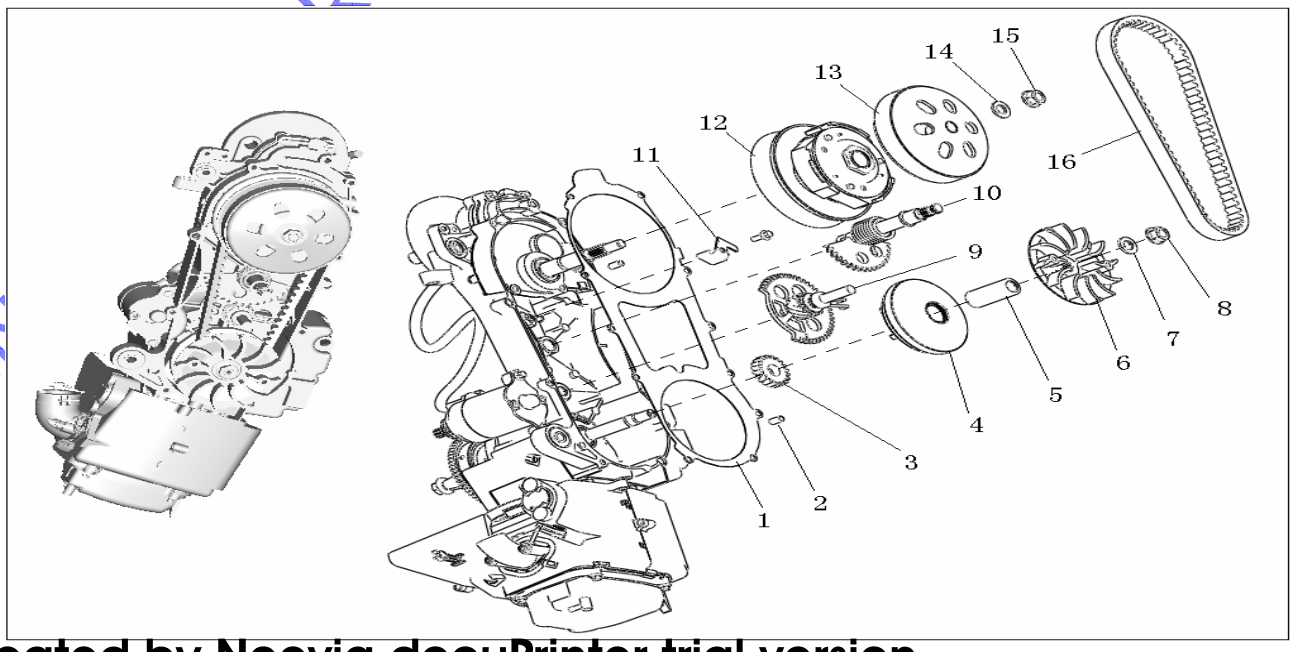
Starting gear sector assy.□9□Kick starting gear assy.□10□
↓
Starter spring plate□11□
↓
Starter driven gear□3□
↓
Drive wheel assy.□4□Bush□5□
↓
Pin (2) Gasket□1□
↓
Drive Impeller□6□Washer□7□Nut□8□
↓
V-Belt□16□Driven wheel disc assy.□12□
↓
Centric disc□13□Washer□14□Nut□15□

NOTE

►When installing starter gear wheel and kick start gear assy. Assemble with little grease; keep arrow mark on transmission gear dead against crankshaft, align kick start gear dead against marking point on transmission gear, carefully pull kick start shaft spring to correct position with special tool, be careful that spring doesn't turn back; position starting spring correctly and tighten the nut with specified torque **10~12NM.**

►When installing V-Belt, rotate driven wheel assy anticlockwise install V-Belt into groove of driven wheel , then cover driving impeller groove with V- Belt and install driven wheel assy. into input axes, and then assemble centric disc, dish washer and nut.

►Finally, tighten lock nut (15)and nut□8□with specified torque **45~55NM**□and then release driven wheel disc freely. Assembled bush slides freely and convex side of washer□7□and washer□14□should towards out side.



CRANKCASE INSTALLATION

REMOVAL

Bolt□1□
↓
Right crankcase assy.□2□
↓
Pin□7□Gasket□3□
↓
Crankshaft assy.□4□
↓
Timing chain□6□
↓
Left crankcase assy.□8□
↓
Oil seal□5□

INSTALLATION

Left crankcase assy.□8□
↓
Chain□6□
↓
Crankshaft assy.□4□
↓
Pin□7□/gasket□3□
↓
Right crankcase assy.□2□
↓
Bolt□1□
↓
Oil seal (5)

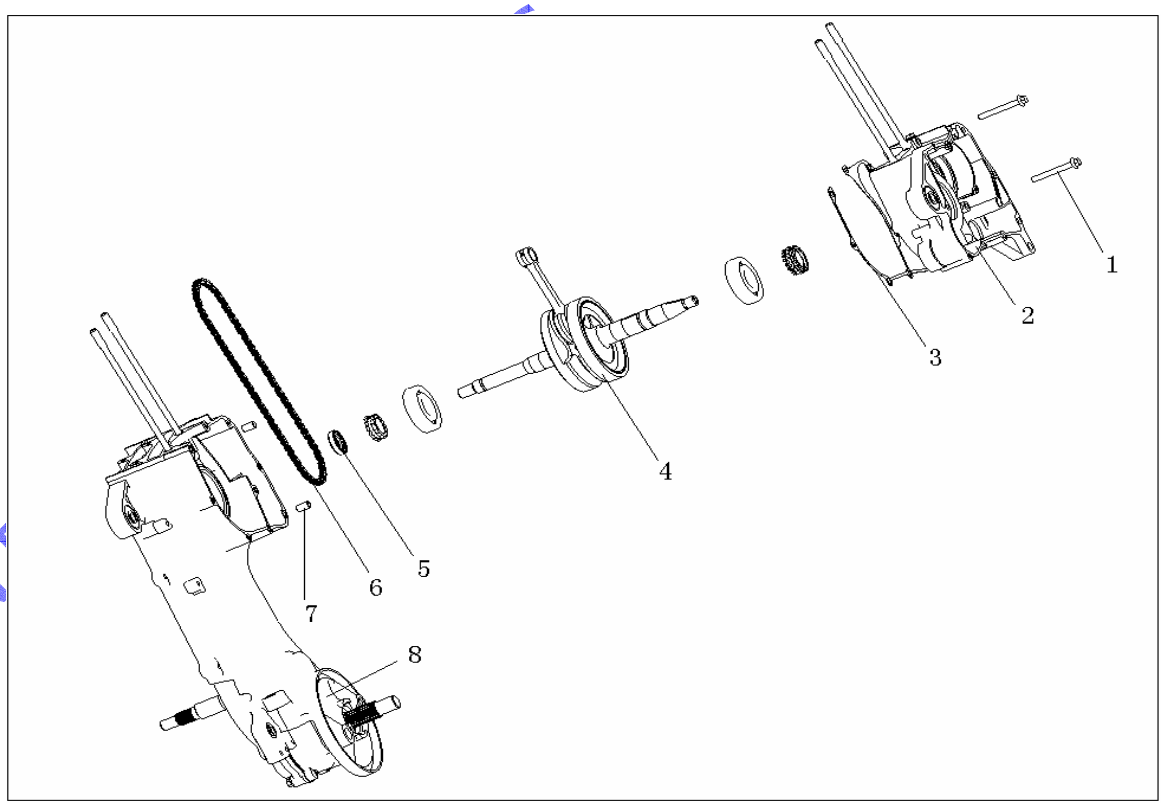
NOTICE□

►When installing crankshaft, remember to apply left crankcase bearing with some little oil, and then vertically put the oil into bearing hole, assemble timing chain with crankshaft gear; check crankshaft/ connecting rod should be rotate freely, and feel that axial clearance exists for connecting rod big end.

►It is permitted to disassemble or assemble left and right crankcase with wooden hammer or plastic hammer, but never with metal hammer, otherwise crankcase will damaged.

► Check Crankshaft/ connecting rod should turn freely after assembling the crank case, without block

► Tighten the crankcase with bolt with specified torque□10~12 NM .



TRANSMISSION CASE INSTALLATION

REMOVAL

Transmission case assy.

Left crankcase assy.□1□ Transmission case cover assy.□2□

Middle shaft assy.□4□output shaft assy.□5□ Input shaft bearing input shaft (3) middle shaft bearing output shaft bearing

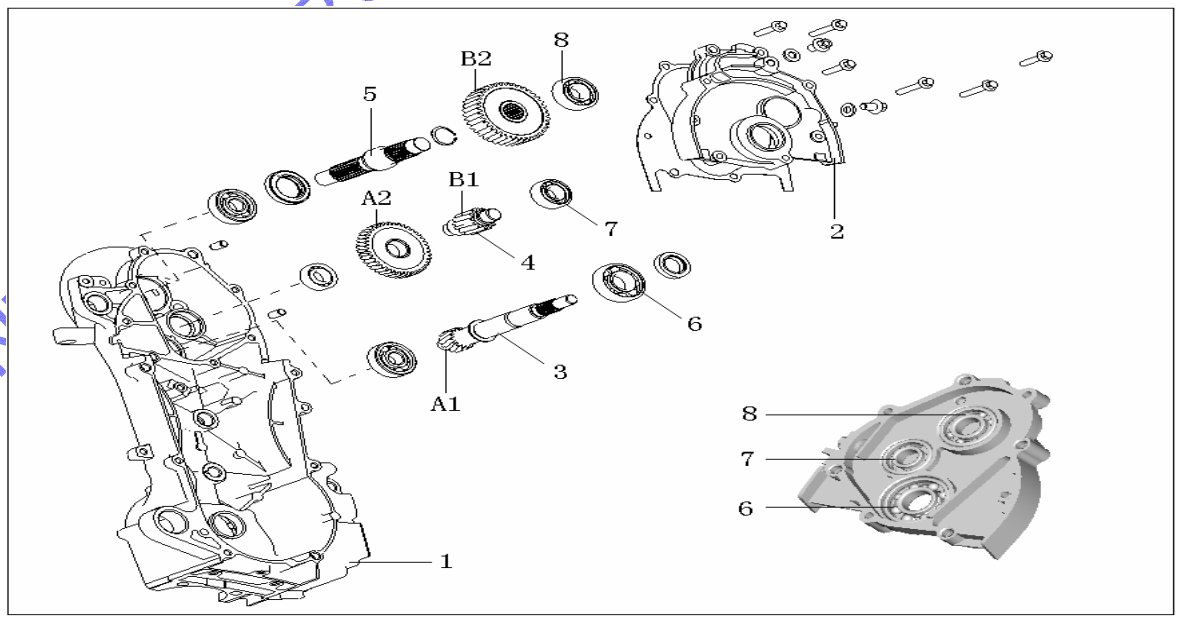
Middle shaft bearing Output shaft oil seal and bearing Input shaft oil seal and bearing

INSTALLATION□The installation sequence is just reverse of the removal.

NOTE:

- Check Correct position of each bearing, the mark of bearing should be outside and its rotation should be freely, without any obstruction.
- During assembly of oil seal, should be apply little oil, don't damage the oil seal.
- Various gears should be positioned properly and should be turn freely.
- To assemble 6 Bolts, first of all pre-fasten pin bolt, tighten various bolts, with specified torque 10~12NM.
- The specified torque 2 oil bolts is 22~25 NM.

Gears	A1	A2	B1	B2
Gears qty.	15T	42T	13T	40T
Gear Ratio	2.8		3.077	



CLUTCHSHOE/MOVABLE DRIVEN FACE

REMOVAL

Driven wheel disc assy.
↓
Clutch disc□1□
↓
Nut□2□
↓
Clutch driving board assy.□3□
↓
Spring holder bush□4□
↓
Compression spring□5□

spring bush (6)
↓
fixing axes□13□/sliding pin□12□
↓
seal□7□/driven step less shifting disc□9□
↓
rolling needle bearing□16□
↓
clip circle (5)/ball bearing□14□
↓
rear transmission main disc□11□

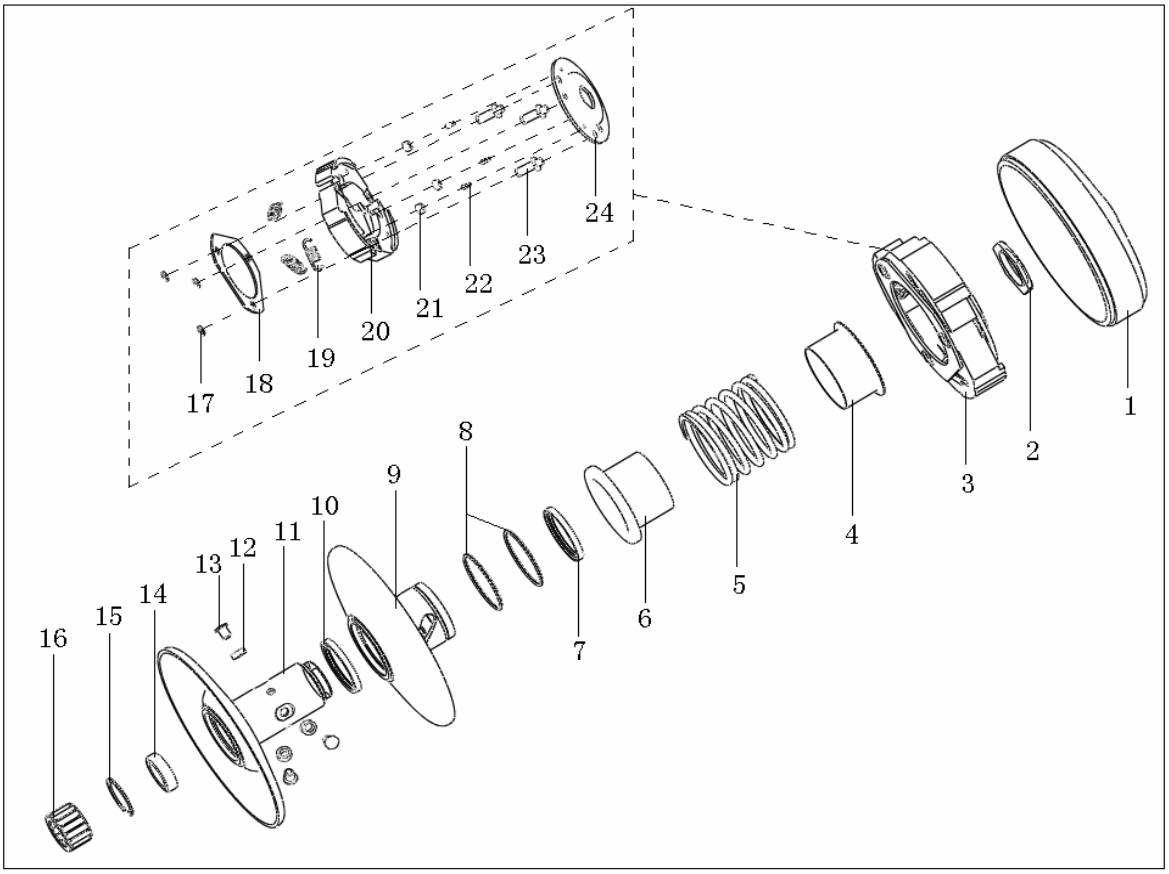
DISASSEMBLY

clip circle□17□
↓
clutch side board□18□
↓
spring□19□/clutch mass□20□
↓
damper rubber□21□
↓
limiter□22□/pin shaft□23□
↓
driving board bottom holder□24□

ASSEMBLY: The assembly sequence is just reverse of removal.

NOTE:

- When reinstalling clutch driving board assy., be sure to use new limiter and pin shaft, and ensure stable connection.
- When installing ball bearing and roller needle bearing, use some lubrication to ensure free turning, without sticky, and then use circlip (15) in proper position.
- Before installing driven step less shifting disc, cover the driven step less disc with 2 O-rings (8) and assemble seal (l0).



KICK SHAFT ASSEMBLY

REMOVAL

Kick start shaft assy.

↓

Bush□6□

↓

Bush□1□

↓

Gasket□2□

↓

Spring□3□

↓

Pin□5□

↓

Kick start shaft□4□

INSTALLATION□

The installation sequence is the reverse of removal.

NOTICE□

- Daub bush□1□with proper lubrication to install it.
- Daub shaft end with proper lubrication to install bush□6□.
- Be sure to install pin proper tightly.

TRANSMISSION GEAR SHAFT ASSEMBLY

REMOVAL

Transition gear shaft assy.

↓

Fixing pin□6□

↓

Adjustment gasket□4□

↓

Transition gear assy.□3□□including□5□□

↓

Tension spring□2□

↓

Transition gear shaft□1□

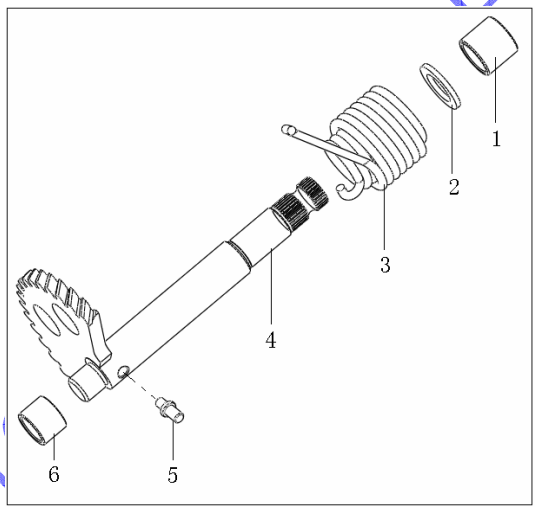
↓

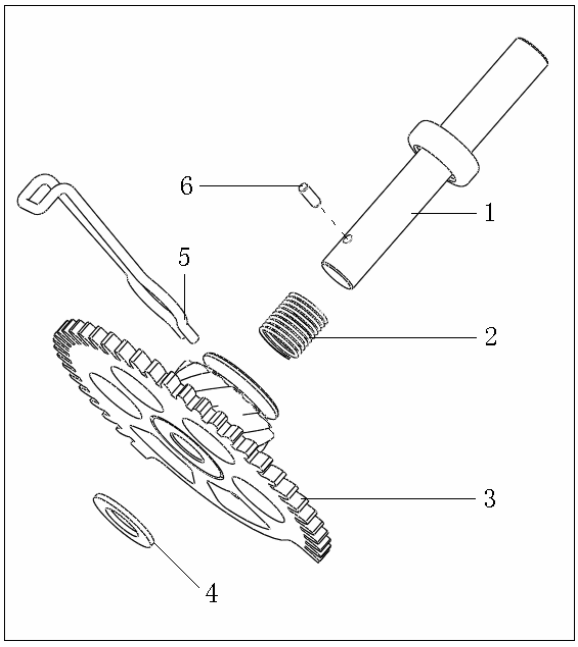
Clip □5□

Installation□The installation sequence is the reverse of remc

Notice:

- Before installing transition gear, install clip (5) in transmission gear groove.
- Transmission gear can turn back well.



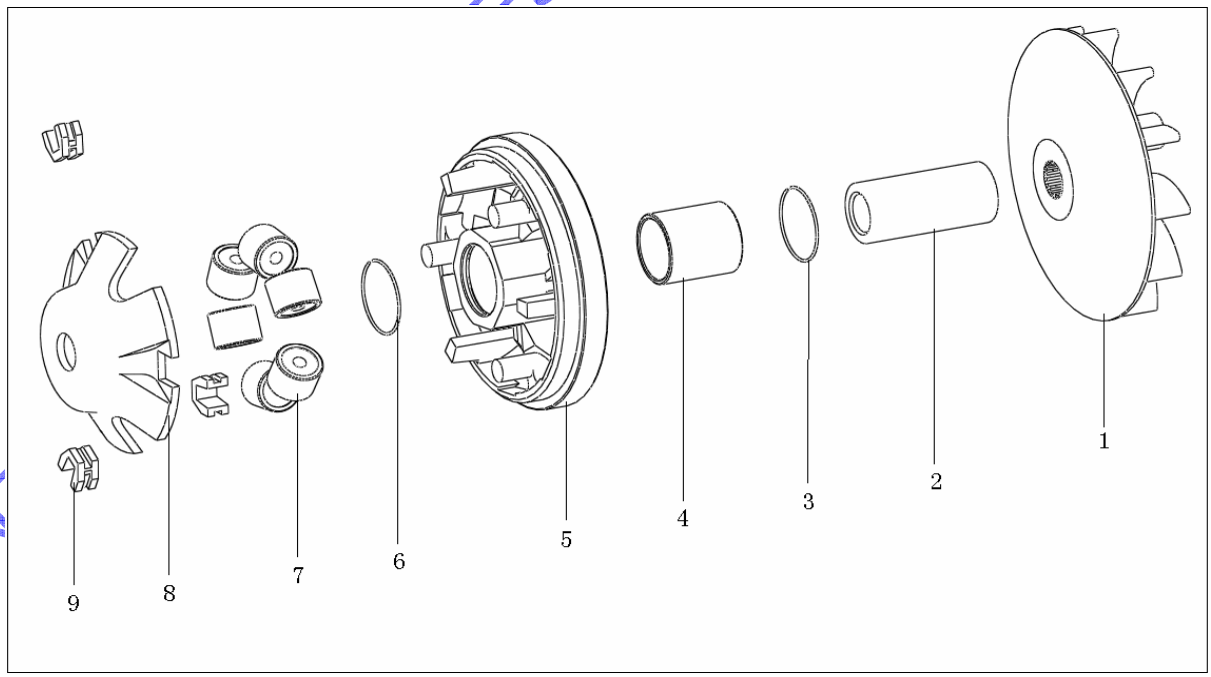


MOVABLE DRIVE FACE

REMOVAL	INSTALLATION
Face fixed drive□1□	Face movable drive□5□
Bush□2□	Washer □6□
Plate Drive□8□	Steel bush (4)
Cushion gasket□9□	Washer □3□
Roller □7□	Roller □7□
Washer□3□	Cushion gasket□9□
Bush□4□	Plate Drive □8□
Washer□6□	Bush□2□
Face movable drive□5□	Face fixed drive □1□

NOTE:

- Before installing part (8), insert 3 cushion gaskets into (8).
- Bush□2□should be slide freely.



SUPER CLUTCH INSTALLATION

REMOVAL

Clutch gear comp.□1□

↓

Rolling needle bearing□2□

↓

Screw M6□3□

↓

Clutch hub□4□

↓

Pin□5□

↓

Rolling pole□6□spring bush□7□and spring□8□

↓

Clutch outside circle rubber□9□

↓

Spring seat□10□

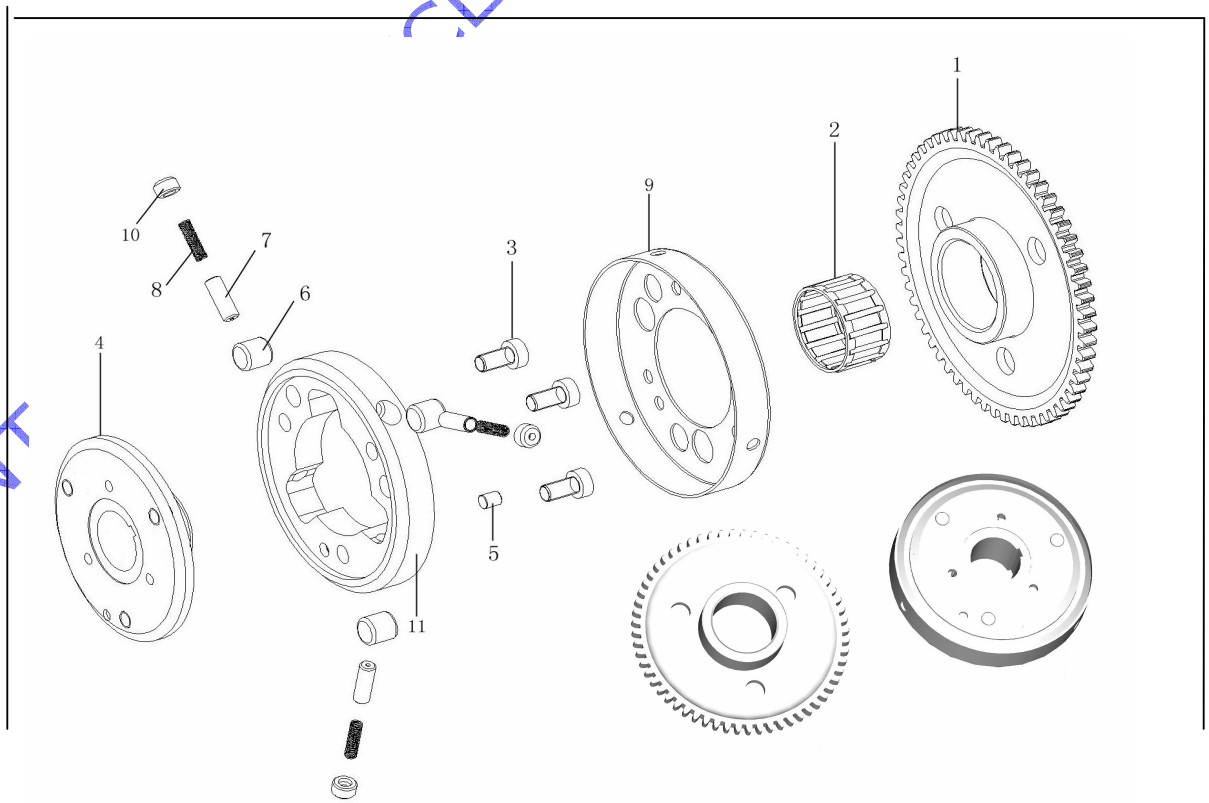
↓

Clutch side circle□11□

Installation□The installation sequence is just reverse of removal.

NOTE :

- Should not be loose clutch side cover, screw M6 and spring seat after installation.
- Clutch gear should turn only one direction.



POWER TRANSMISSION

From kick start

Kicking start shaft

↓

Kicking start axes (5)

↓

Start gear

↓

Transition little gear

↓

Transition big gear

↓

Crank start driven gear

↓

Crank (11)

From engine

Piston (1)

↓

Connecting rod (2)

↓

Crank (11)

↓

Driving disc

↓

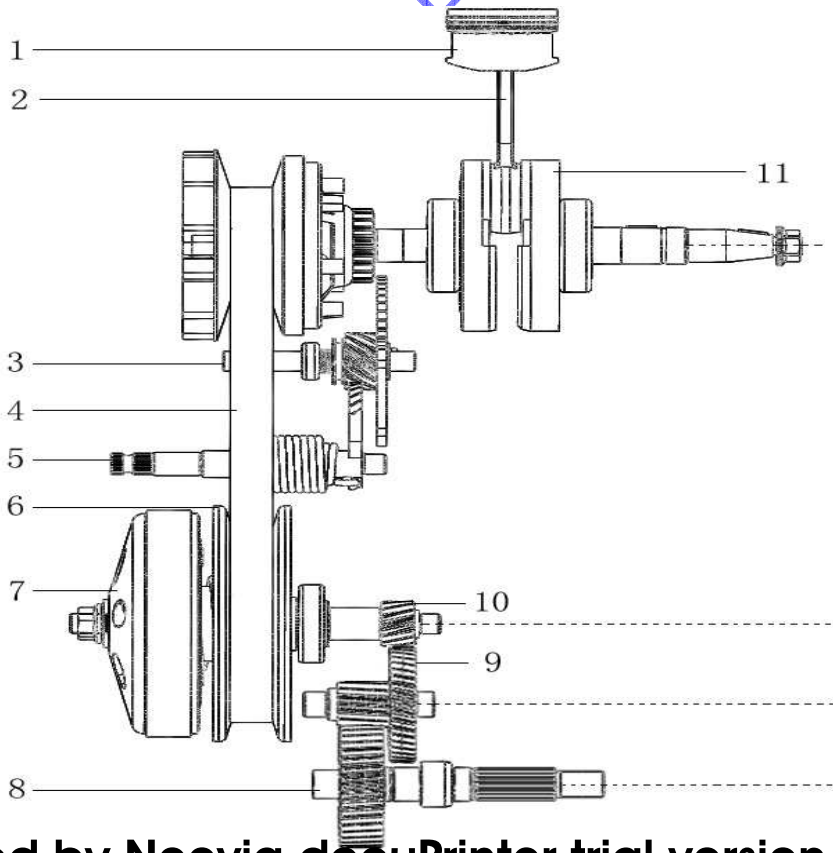
Driven disc (6)

↓

Clutch (7)

↓

Gearbox input axes



X□Reduction Ratio

Y□Primary Reduction Ratio □15/42□

Z□Secondary Reduction Ratio□13/40□

LUBRICATION

THE ENGINE OIL PERFORMS THE FOLLOWING FUNCTIONS

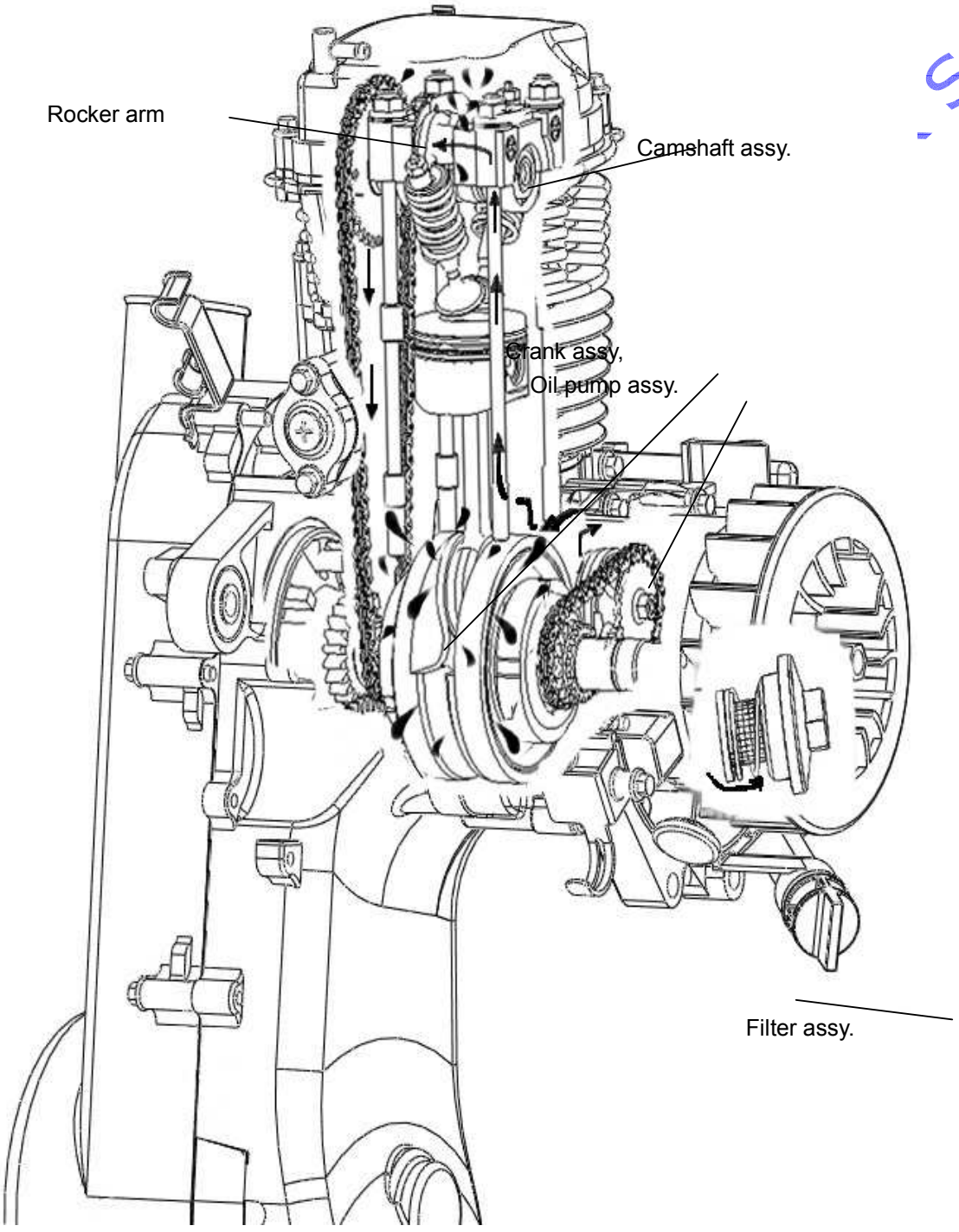
- **LUBRICATION** → Prevents friction, metal to metal contact.
- **COOLING** → Prevents overheating.
- **ANTI RUST** → Prevents Corrosion.
- **CLEANING** → Prevents sludge formation, remove carbon particles.
- **SEALING AGENT** → Seals combustion chamber.
- **ANTI - WEAR** → Improves the life of moving components.

The type of lubrication used in the engine of motorcycle is known as wet sump, splash & Pressure feed lubrication.

ENGINE OIL CIRCULATION

Oil pump assembled in right crankcase sucks oil through main gears on right crankshaft. Oil in crankcase is filtered through the oil filter core of left crankcase, and then flows across oil pump rotor where produces large pressure & filtered oil is pumped in three different routes.

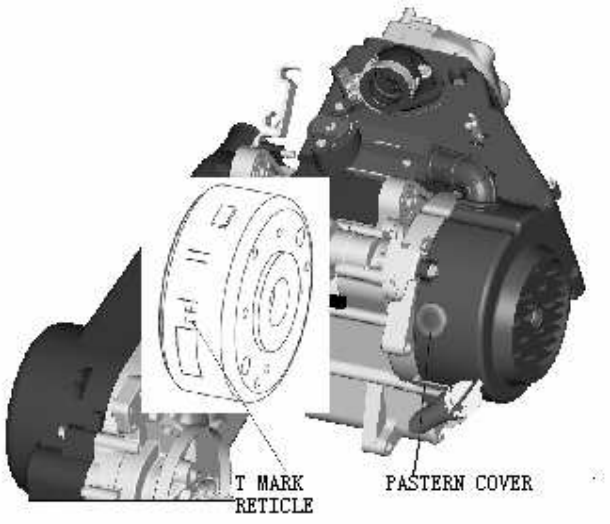
LUBRICATION DIAGRAM

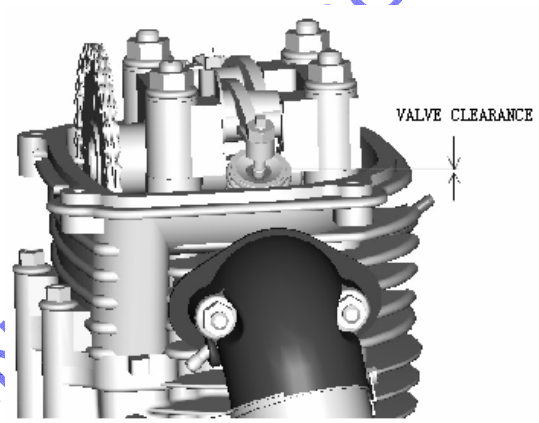


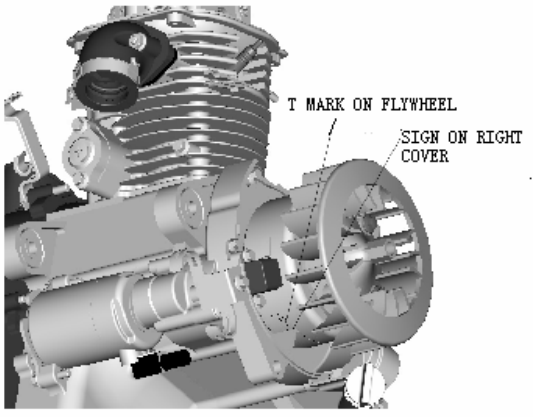
VALVE CLEARANCE ADJUSTMENT PROCEDURE

Engine in cool condition

- Remove cylinder head cover.
- Remove fan cover.
- Keep “T” mark on flywheel to the same line with the mark on right crankcase cover.
- Ensure timing mark of cam sprocket in the same line with joint surface of cylinder head cover.
- Check the clearance of Inlet valve and Exhaust valve,
- Inlet valve□0.03~0.05mm□Exhaust valve□0.05~0.06mm□If clearance is not at the specified limit, then adjust Tappet clearance to the specified limit.



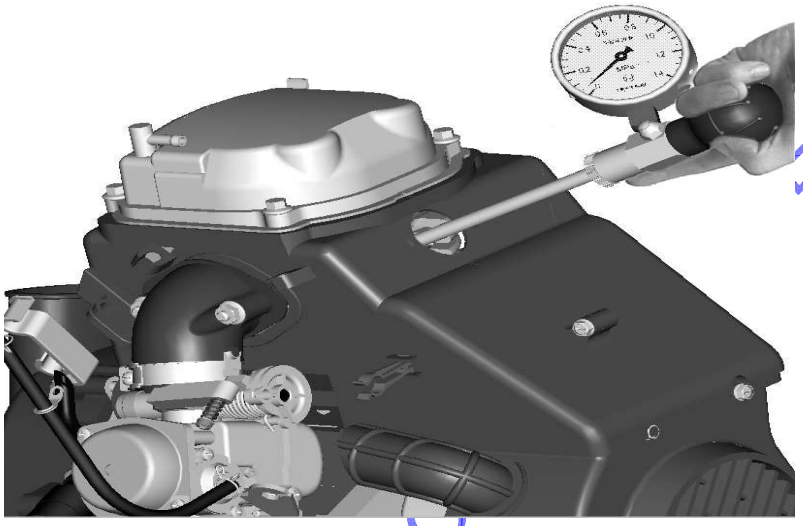




COMPRESSION TEST

TESTING PROCEDURE

STEP -1



1□ Warming up the engine to normal running temperature (hot condition).

2□ Remove spark plug and connect compression pressure gauge.

3□ Ensure that

(a) Fuel switch/cock is in "OFF" position.

(b) Ignition switch is in "OFF"position.

4□ Accelerate throttle to "FULL" condition & then kick several times (6 to 8 times).

5□ Note down reading, and repeat the above process three times and calculate their average value as actual compression pressure.

6□ The specified Compression pressure of engine is 10±2Kg/cm^2.

STEP- 2

When the compression pressure is below 10Kg/cm^2□then refit the spark plug & start and warm up the Engine again.

@ Remove spark plug and put few drops of engine oil inside the combustion chamber.

@ Connect Compression gauge & repeat above said procedure as explained in STEP-1.

- **If the Compression pressure reading increases, then check for following.**
  - a□ Worn out cylinder.
  - b□ Worn out piston / piston rings.
  - c□ Scoring / Seizure of cylinder / piston.
  - d□ Piston ring jammed in groove.
- **If the Compression pressure does not increase then check for following.**
  - a□ Incorrect Valve / Tappet clearance.
  - b□ Improper torque of cam holder nuts or cylinder head bolts.
  - c□ Valve seat damage or Valve leakage.
  - d□ Valve is bend.
  - e□ Improper Valve Timing.
  - f□ Cylinder head warp age.
  - g□ Blown out cylinder head gasket.

STEP- 3

- Incase compression pressure is more than 12 Kg/Cm2. Then engine requires Decarbonisation of cylinder head / (combustion chamber) & piston. Also check for smoky exhaust.

Cylinder head/valve

ITEM			STANDARD
CYLINDER PRESSURE			12±1kg/cm^2
Valve clearance		Inlet	0.03~0.05mm
		Exhaust	0.05~0.06mm
Cam shaft cam lobe height		Inlet	26.72±0.05
		Exhaust	26.68±0.05
Valve	Stem OD	Inlet	4.970~4.980 mm
		Exhaust	4.955~4.965 mm
	Stem ID	Inlet	5.000~5.012mm
		Exhaust	5.000~5.012mm
	The clearance between valve stem and valve guide.	Inlet	0.020~0.042mm
		Exhaust	0.035~0.057mm
Spring free length		Inner Spring	32.8mm
		Outer Spring	35.55mm

Cylinder / Piston

			A	B
Cylinder, piston	Inner diameter of cylinder(Bore)		52.400~52.405mm	52.405~52.410 mm
	Diameter of piston		52.370~52.375mm	52.375~52.380mm
	Clearance between piston and cylinder		0.025~0.035mm	0.025~0.035mm
Piston pin	Piston pin OD		15.002~15.005mm	15.005~15.008mm
	Piston pin ID		14.997~15.000mm	15.000~15.003mm
Piston ring	Clearance between piston ring and groove	The first ring	0.013-0.045mm	
		The second ring	0.013-0.045mm	
	Clearance between piston ring and hatch	The first ring	0.1-0.2mm	
		The second ring	0.1-0.2mm	
		Oil ring	0.3-0.4mm	

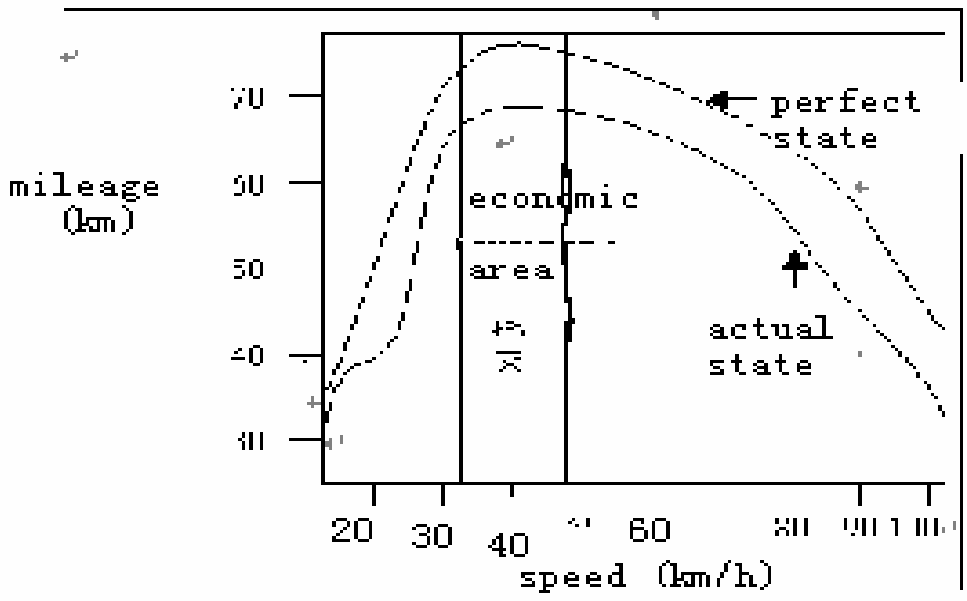
CHAPTER 4

AIR FUEL SYSTEM

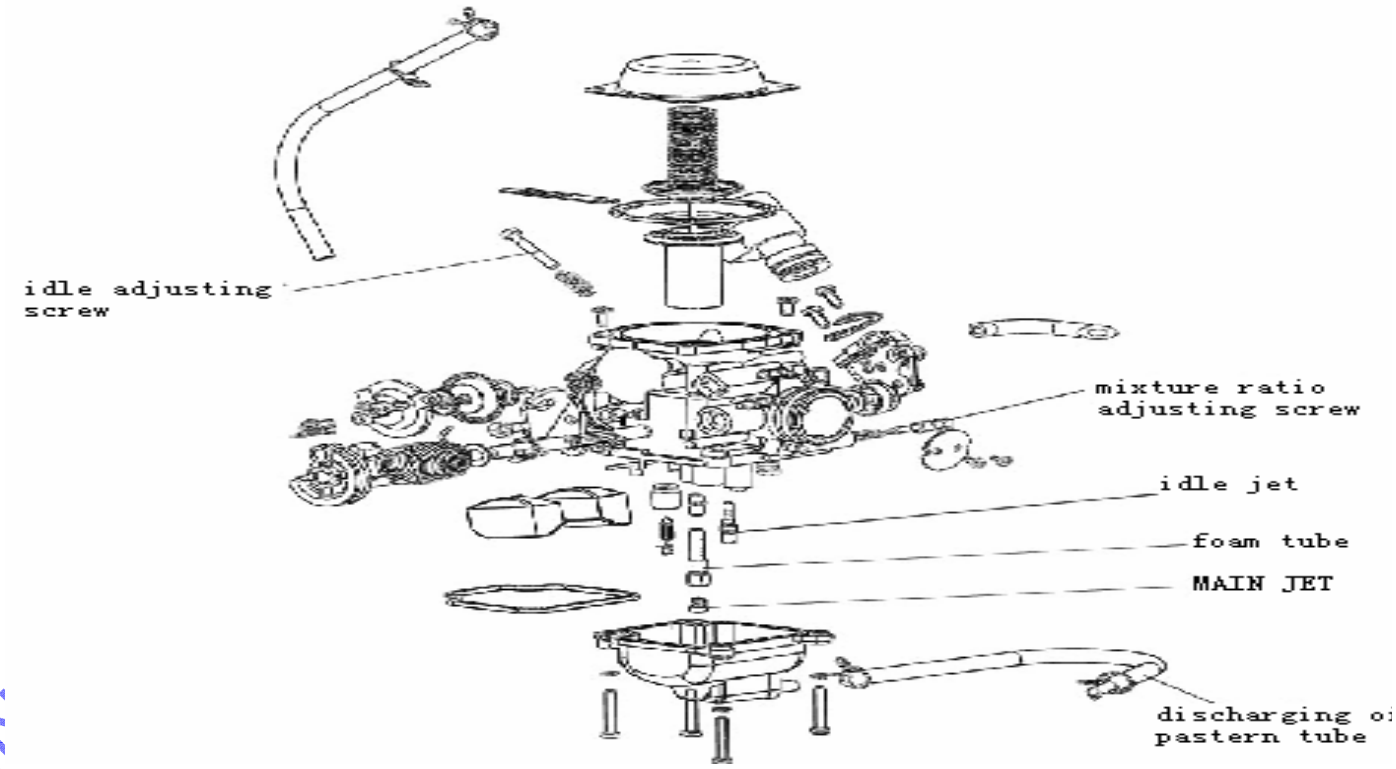
Carburetor specification

Type	CV
Model	PD24J
Piston dia	24mm
Main jet	191
Slow jet	19
Mixture screw	1.5±0.5 turnout
Needle position	3rd groove from top
Float height	15±1mm

FUEL CONSUMPTION CURVE



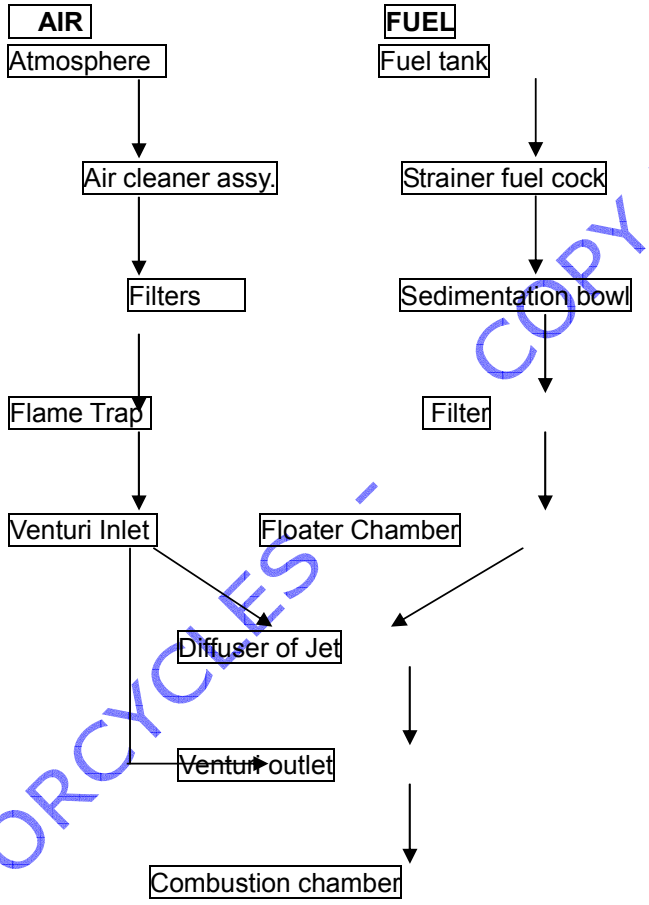
In economy speed range the air fuel mixture ratio consist air with minimum fuel as per engine requirements.



AIR-FUEL FLOW CIRCUIT

Fuel is being supplied to the carburetor from fuel tank by gravity feeding controlled fuel cock assy. Air filter box is fitted on the left side of the motorcycle. Fuel gets atomized and mixes with clean air in right proportion in the carburetor and then air fuel mixture is supplied to the combustion chamber of the engine. In engine this air fuel mixture is controlled by the intake valve and camshaft rocker arm mechanism.

AIR- FUEL FLOW CHART



AIR FUEL MIXTURE RATIO:

Starting 7~8: 1

Idling speed 10~12: 1

Slow speed 12~14: 1

Medium speed 15~17: 1

High speed: 13-15:1

CARBURETTOR CIRCUITS:

The Phantom R4i Scooter has 6 main circuits

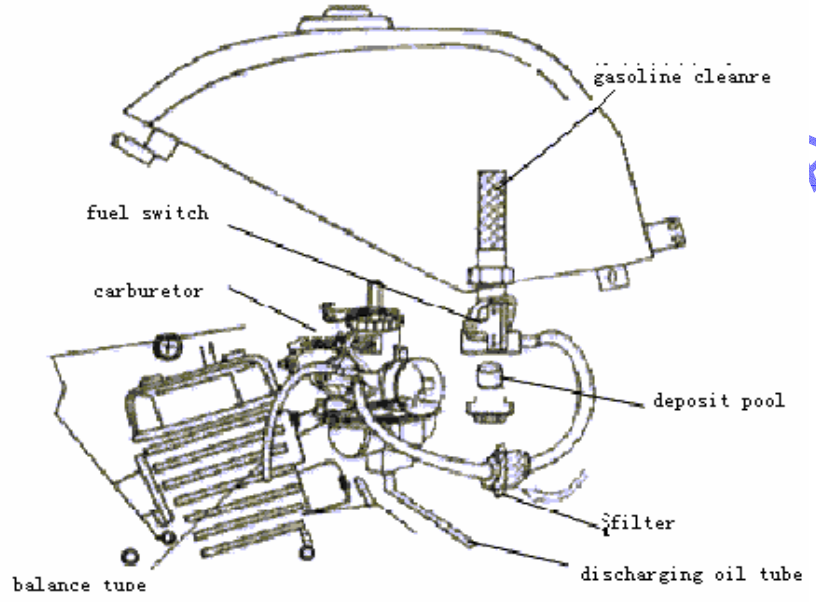
1. **Fuel Intake circuit**
2. **Choke circuit**
3. **Idling speed circuit**
4. **Slow speed circuit**
5. **Medium speed circuit**
6. **High speed circuit**

CARBURETOR CIRCUITS

1. FUEL INTAKE CIRCUIT:

From fuel tank fuel comes into float chamber of carburetor by gravity feed. Separate vent is provided at LH side of carburetor body to maintain inside atmospheric pressure. When fuel starts filling the float chamber, float rises up words along with the float pin and after a certain level it stops further flow of fuel. Adjust float height $12^{1}/_{2}$±1mm.

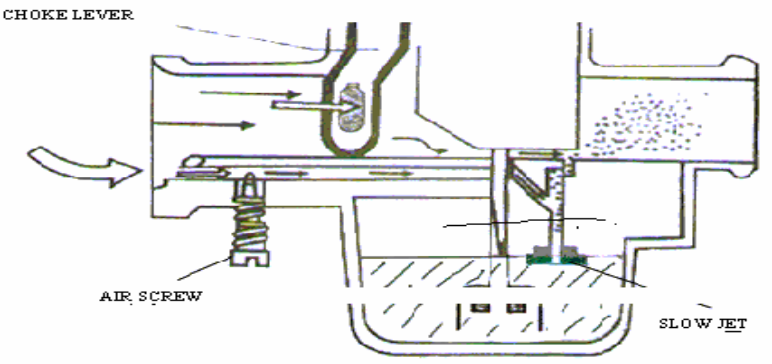
This avoids overflow of Carburetor.



2. CHOKE CIRCUIT:

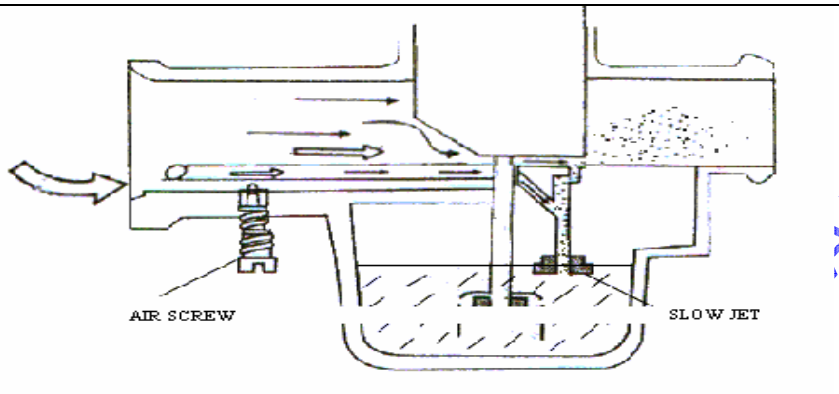
Choke is provided for easy starting, since it requires rich mixture. Hence choke knob is being operated from the carburetor. Due to this an air stopper (Butterfly valve) comes on the way to the venturi (Air filter side) of the carburetor, thus reducing the amount of air being mixed with fuel. Excessive fuel is being sucked from the slow jet and less quantity of air enters from the choke valve and from the small opening below the throttle valve.

When the motorcycle engine starts, a spring loaded window is provided in the choke actuating lever itself so as provide in the choke actuating knob itself so as provide extra air as required to run the engine in rich mixture.



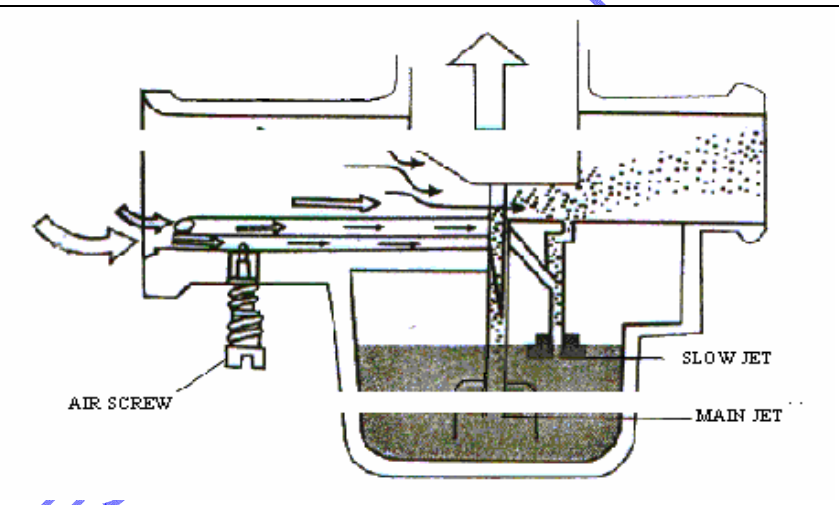
3. IDLING CIRCUIT:

After starting operation choke is released, more air starts flowing thru the venturi. From slow jet fuel is sucked due to venturi effect. A separate passage from the air filter side is coming at the diffuser of the slow jet for the atomization of fuel in slow jet. This atomized fuel is sucked into the venturi as started above from the slow jet (As shown in figure). The amount of air for atomization is regulated by air screw located at bottom side of the carburetor body.



4. SLOW SPEEDCIRUIT

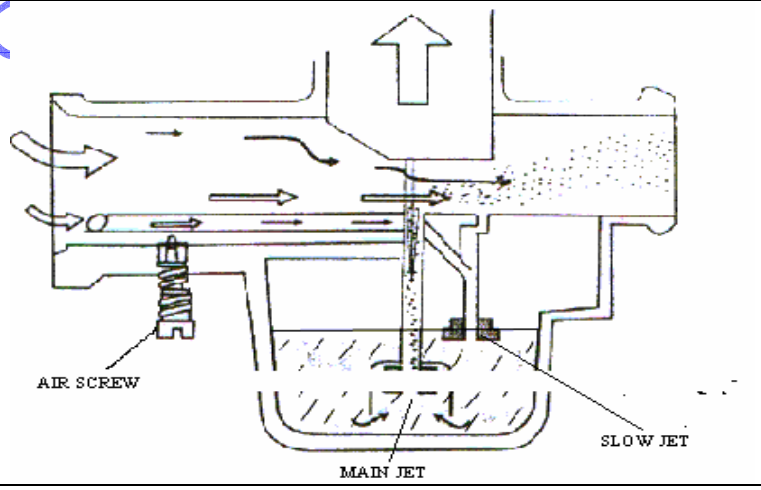
Slow speed requires very less acceleration. Air fuel mixture is being supplied by slow jet and also from main jet. This is due to partial opening of throttle valve, lifts needle jet upwards. Hence some quantity of air fuel mixture coming out from main jet diffuser also mixes along with slow jet mixture to increase the mixture quantity as required by engine.



5.MEDIUM SPEED CIRCUIT

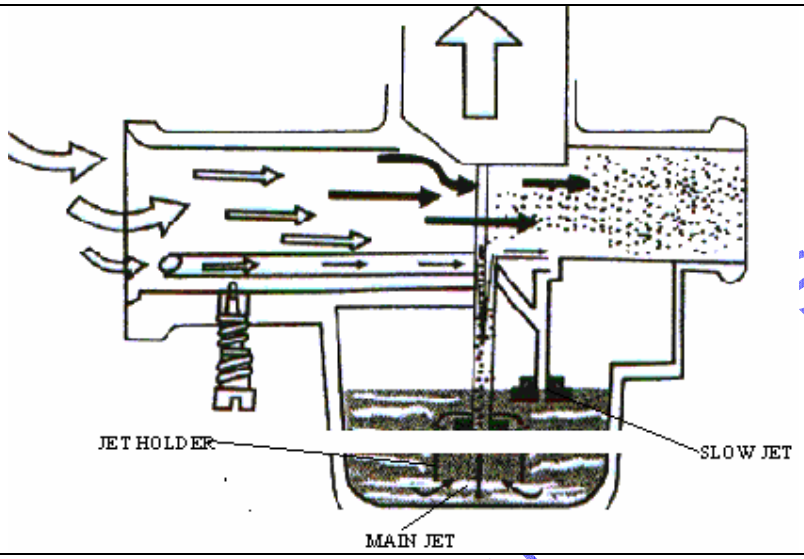
(Economy speed range)

Further acceleration the air fuel mixture supplied to engine only from main jet. During this slow jet stops supplying air fuel mixture due to venturi effect. Hence air is drawn to main jet through metered air jet (Brass tube) for better mixing of fuel with air in the main jet diffuser. Main jet started supplying air fuel mixture in economy range i.e. more air with less quantity of fuel as per engine requirement.



6.HIGH SPEED CIRCUIT

During acceleration the throttle valve (piston) is fully raised, more air is being supplied due to higher velocity. Hence pressure drops at the opening of throttle jet needle. Where as more fuel is sucked from the main jet due to tapperness of jet needle. A jet holder is provided to the main jet to avoid fuel flow strain (turbulence) effect in the float chamber created during the very high speed to diffuser (As shown in the figure)



CARBURETOR REMOVAL & INSTALLATION

REMOVAL:

1. Remove rear seat of motorcycle.
2. Turn fuel switch “OFF” position.
3. Disconnect fuel pipe from carburetor by pressing clip.
4. Loosen the clamp over air cleaner connecting tube (Air duct).
5. Drain the fuel from carburetor float chamber in a separate pan loosening drains screw.
6. Remove spark plug wire (HT lead) along with suppressor cap from the spark plug.
7. Remove insulator-mounting bolts (2 Nos.)
8. Pull out the carburetor assy. Along with insulator from air duct to the LH side.
9. Open the carburetor top cap, pull out the throttle valve along with needle, clip, spring & throttle cable.
10. Remove the overflow/drain pipe.

INSTALLATION:

FOLLOW THE REVERSE ORDER OF REMOVAL

NOTE:

- After installation check for any fuel leakage from the carburetor or fuel line.
- Check for the throttle smooth movement; if necessary adjust throttle grip free play 2 to 4 mm.

CARBURETTOR ASSEMBLY

DISASSEMBLY PROCEDURE FOR CARBURETTOR CLEANING:

- Remove the throttle valve from the accelerator cable by compressing the spring up from the seat in long slit. Remove the tip of the cable from the slot of the valve.
- Remove the jet needle from the throttle valve along with clip and plate.
- Remove the airscrew with spring.
- Remove the Idling screw with spring.
- Remove the float chamber by unscrewing three screws.
- Pull out the float arm pin to remove the float.
- Remove the main jet along with jet holder and needle.
- Remove the slow jet.
- Now clean all the carburetor components and apply compressed dry air in all passages (galleries)

NOTE:

- Don’t remove clip from the jet needle groove.
- Ensure that float and float valve is being removed before carrying out any other jobs on carburetor. So that these components will not get damage.

ASSEMBLY PROCEDURE OF CARBURETTOR:

1. Screw the slow jet (Ensure that all holes are clearly visible on the slow jet body).
2. Fix needle jet from main jet hole (Ensure that the smaller dia face towards carburetor body hole).
1. Tighten the needle jet holder (Ensure that all holes clearly visible on the needle jet holder body).
2. Screw the main jet along with jet holder.
3. Insert the float arm pin through the pivot and the float.
4. Check float height (Specified 12.5±1mm) □if necessary then adjust.
5. Fix the float chamber.
9. Fix idle screw and airscrew along with spring (Initial airscrew setting one and half turn out).
6. Insert the jet needle along with clip and plate into the throttle valve (Ensure that needle lock clip is in 3rd Groove position from top).
7. Connect the throttle valve to the accelerator cable first compress the spring into the cap, Insert the tip of the cable through the slot in the throttle valve base and fix cable in long slit rest position.
8. Align the groove on the side of the throttle valve with the guide pin in the carburetor body. Check for its smooth movement.
9. Tighten the top cap over carburetor body.

CARBURETOR TUNING OR ADJUSTMENT PROCEDURE

After installation the carburetor in the engine as per above said procedure, follow the following steps:

1. Warming up the engine to the normal running temperature.
2. Adjust Idling speed to 1400 RPM by throttle stop (Idle) screw.
3. Turn the airscrew all the way inside until seats lightly in the carburetor body.
1. If engine stops then… OK (Incase does not stop, check for air leakage from insulator "O" ring and rectify).
2. Readjust air screw position to ¾ turns out.
3. Start the engine and increase the Idling speed by turning the Idle (stop) screw in anticlockwise direction, till the engine speed increases to the range of 2000 to 2500 RPM.
4. Open the air screw outwards (anticlockwise) slowly till engine RPM increases to the peak/highest speed position while setting. Now stop adjusting air screw (Maximum recommended air screw opening position 1¾ turns out).
5. Readjust Idling speed to 1400±100 RPM by the throttle stop screw & ensure that exhaust emission Carbon Monoxide CO % 1.5 to 2.0 %.
6. After adjusting Idling speed, check for its stability/flat spot/missing if any, by accelerating few times. Repeat above said steps until engine speed increases smoothly.

NOTE:

- Do not apply force or over tight the air screw. Damage may occur incase the air screw is being tightened against the air screw seat.
- Incase the Idling speed is too low engine will stop; if it is too high will cause fuel consumption.

WARNING

While running engine in Idling speed turn the handle bar to the extreme left or right hand side, if any change in idling speed noticed, the accelerator cable may be wrongly routed or improperly adjusted. Correct the same before test ride.

CHAPTER 5

CHASSIS

INSTALLATION OF VEHICLE BODY

Specified Torque Value

NO.	ITEM	QTY.	TORQUE
	FRONT WHEEL/FRONT ABSORBER		
1	Front wheel axis locknut	1	55-62Nm
2	Fixing bolt between front absorber and support under connecting board assy.	4	37-44N.m
3	Fixing bolt for disc brake and front absorber	2	22-29N.m
	Handlebar		
1	Fixing bolt for handlebar and supporting under connecting board	1	37-44N.m
	Frame		
1	Fixing bolt for frame and engine bracket	2	37-44N.m
2	Fixing bolt for frame and rear absorber	2	37-44N.m
	Rear wheel/rear absorber		
1	Rear wheel locknut	1	100-130Nm
2	Fixing bolt for left, rear absorber and engine	1	22-29N.m
3	Fixing bolt for right, rear absorber and muffler connecting board	1	22-29N.m
	Engine		
1	Fixing bolt for engine and muffler	2	22-29N.m
2	Fixing bolt for engine and engine bracket	1	37-44N.m

FRONT WHEEL ASSEMBLY

Disassembly

Locknut□13□

↓

Front wheel centre bolt□6□

↓

Front wheel left bush□7□Gear seat assy.

↓

Front wheel assy.

↓

Front wheel, seal ring(8□

↓

Tire□1□Rim assy.

↓

Rim□4□Front wheel bush□5□

↓

Bearing□9□valve (3□ valve cap□2□

↓

Speedometer gear (11), Gear set oil seal□10□, gear seat□12□

Assembly

Speedometer gear□11□Gear seat oil seal(10), gear seat□12□

↓

Rim□4□front wheel middle bush□5□,

↓

bearing□9□, valve □3□, valve cap□2□

↓

Tire□1□Rim assy.

↓

Front wheel, seal ring (8)

↓

Front wheel assy.

↓

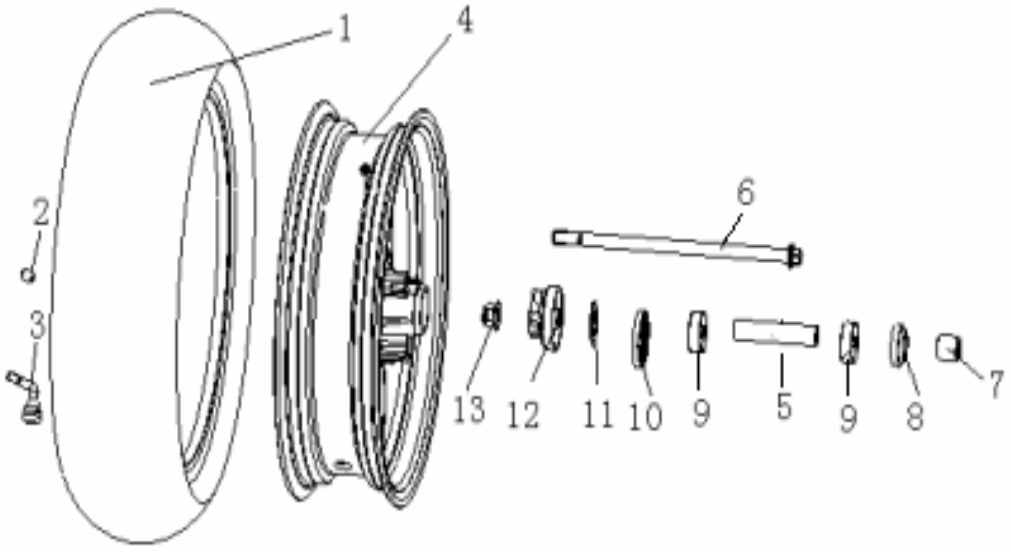
front wheel left bush□7□, gear seat assy.

↓

front wheel centre bolt□6□

↓

locknut□13□



REAR WHEEL ASSEMBLY

Disassembly

Rear wheel assy.

↓

Tire□1□Rear rim assy.

↓

Brake shoe assy.□11□

↓

Brake shoe pulling spring□4□

↓

Brake tension spring□10□

↓

Anti-dust cover (7)

↓

Anti-dust assembling board (8)

↓

Bolt M6X35 (6)

↓

Rear braking rocker arm (9)

↓

Seal ring (13)

↓

Rear brake camshaft (5)

↓

Rear rim□12□Valve □3□,valve cap □2□

Assembly

Rear rim□12□Valve□3□valve cap□2□

↓

Rear brake camshaft (5)

↓

Seal ring (13)

↓

Rear brake rocker arm (9)

↓

Bolt M6X35 (6)

↓

Anti-dust assembling board (8)

↓

Anti-dust cover (7)

↓

Brake tension spring□10□

↓

Brake shoe pulling spring□4□

↓

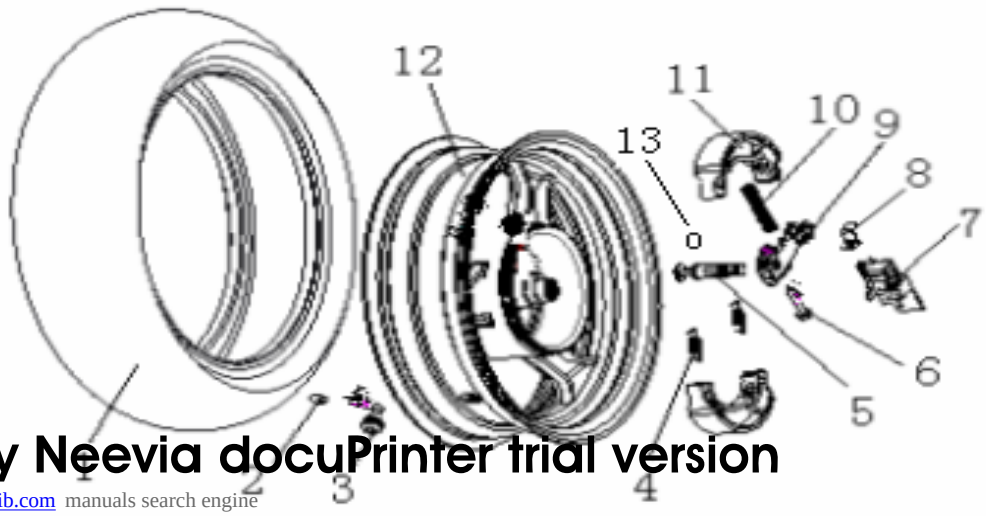
Brake shoe assy.□11□

↓

Tire (1), Rear rim

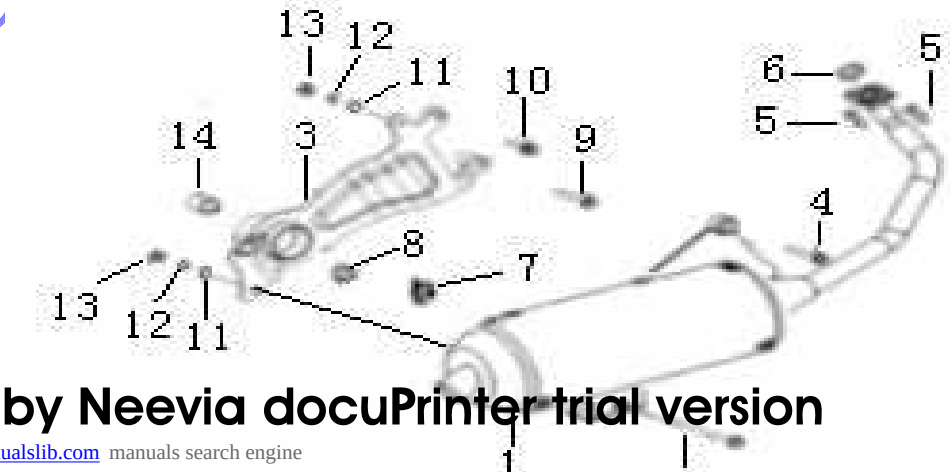
↓

Rear wheel assy.



MUFFLER ASSEMBLY

Disassembly	Assembly
Nut M8□13□Flat washerφ8□11□Spring washerφ8□12□, ↓ Bolt M8X125□2□,bolt M8X40□4□ ↓ Special nut□5□ ↓ Exhaust pipe assy.□1□ ↓ Exhaust pipe bush□6□ ↓ Bolt M8X35□10□, bolt M8X55□9□ ↓ Nut M16X1.5□7□ ↓ Outside orientation bush□8□ ↓ Muffler connecting board□3□ ↓ Inner orientation bush□14□	Inner orientation bush□14□ ↓ Muffler connecting board□3□ ↓ Outside orientation bush□8□ ↓ Nut M16X1.5□7□ ↓ Bolt M8X35□10□,bolt M8X55□9□ ↓ Exhaust pipe bush□6□ ↓ Exhaust pipe assy.□1□ ↓ Special nut□5□ ↓ Bolt M8X125□2□, bolt M8X40□4□ ↓ Flat gasket φ8□11□, spring gasketφ8□12□, nut M8□13□



FRONT FORK ASSEMBLY

Disassembly

Nut M10X125X50□10□

↓

Front left absorber assy.□9□, front right absorber assy.□8□

↓

Special locknut□1□

↓

Anti dust spring assy □2□

↓

Upper steel bowl □3□

↓

Upper steel ball□4□

↓

Under connecting support assy.□7□

↓

Taper roller bearing (6)

↓

Upper steel bowl holder□5□

↓

Under steel bowl holder□11□

↓

Frame assy.□12□

Assembly

Frame assy.□12□

↓

Under steel bowl holder□11□

↓

Upper steel bowl holder□5□

↓

Taper roller bearing (6)

↓

Under connecting support assy.□7□

↓

Upper steel ball assy.□4□

↓

Upper steel bowl □3□

↓

Anti dust spring assy □2□

↓

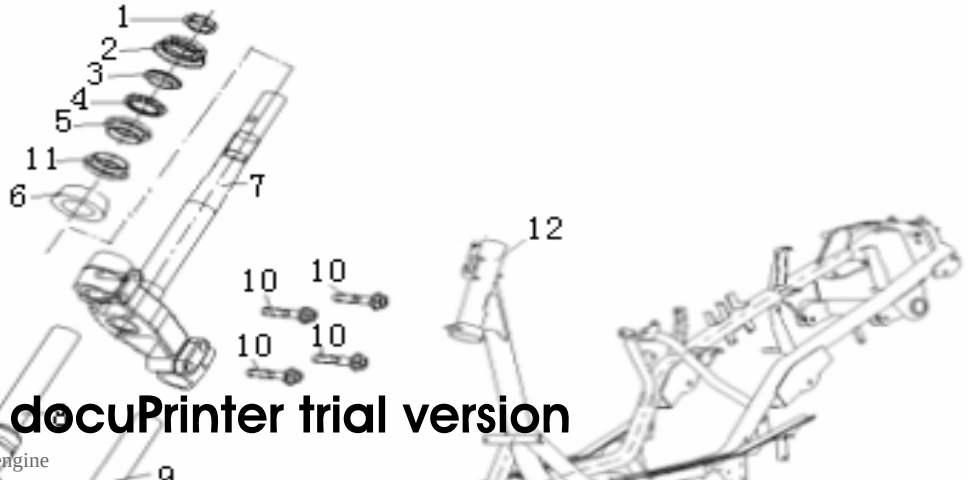
Special locknut □1□

↓

Front left absorber assy.□9□, front right absorber assy.□8 □

↓

Bolt M10X125X50□10□



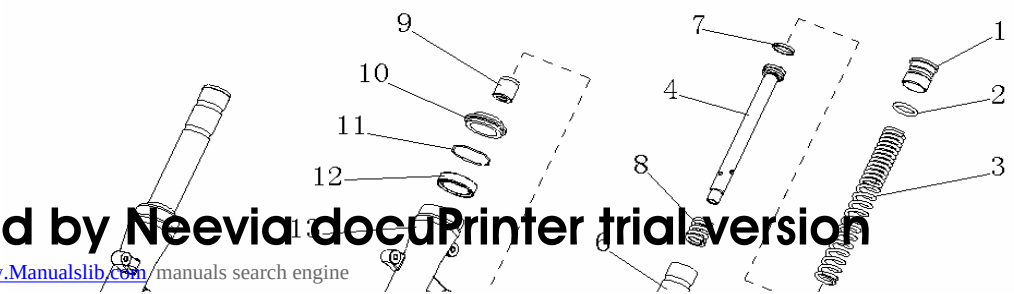
FRONT SHOCK ABSORBER

Disassembly

Bolt (1)
↓
O-seal ring (2)
↓
Absorber spring (3)
↓
Piston lever□4□
↓
Screw (5) and gasket
↓
Inner tube assy. (6)
↓
Piston lever/piston ring (7)
↓
Buffer spring (8)
↓
Outer tube assy.
↓
Anti-dust ring assy.□10□
↓
Oil seal stopper ring□11□
↓
Oil seal assy.□12□
↓
Aluminum outer tube□13□
↓
Buffer prick□9□

Assembly

Install piston ring into piston lever
↓
Install buffer spring into piston lever
↓
Install above assy. into inner tube assy.
↓
Cover piston lever with buffer prick bush
↓
Install above accessories into aluminum outer tube
↓
Tighten screw□gasket□
(Fixing torque is 20 Nm)
↓
Oil seal assy.
↓
Oil seal stopper ring
↓
Anti-dust ring assy.
↓
Add oil for absorber
(100±2 ml)
↓
Buffer spring seal
↓
O-seal ring
↓
Bolt
Fixing torque is 23 Nm



HYDRAULIC BRAKE DISC SYSTEM

Hydraulic brakes operating principle:

It is operating on the principle that the liquid is not compressible, so the force and motion can be transmitted Through a liquid media.

MASTER CYLINDER:

As the brake lever is pressed, the master cylinder piston moves forward, as it crosses the inlet port the piston starts pressurizing the brake fluid in the master cylinder. The pressurized brake fluid gets transferred to the caliper through the brake hose.

As the brake lever released, the piston return spring forces the piston to return to its original position. As the brake fluid from the caliper returns slowly, a negative pressure is being created between the secondary and primary brake seals. This causes the collapse of the primary brake seal, which in turns allows brake fluid to flow to master cylinder through compensating port to counter the negative pressure. As the brake fluid returns from the caliper, the excess amount of brake fluid drawn from master cylinder.

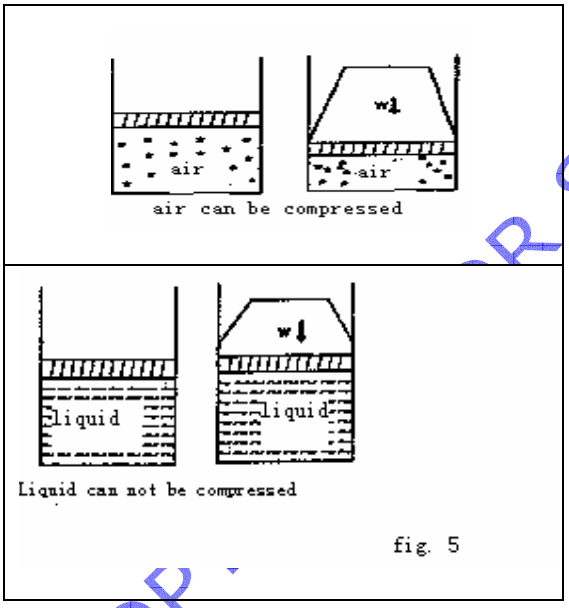
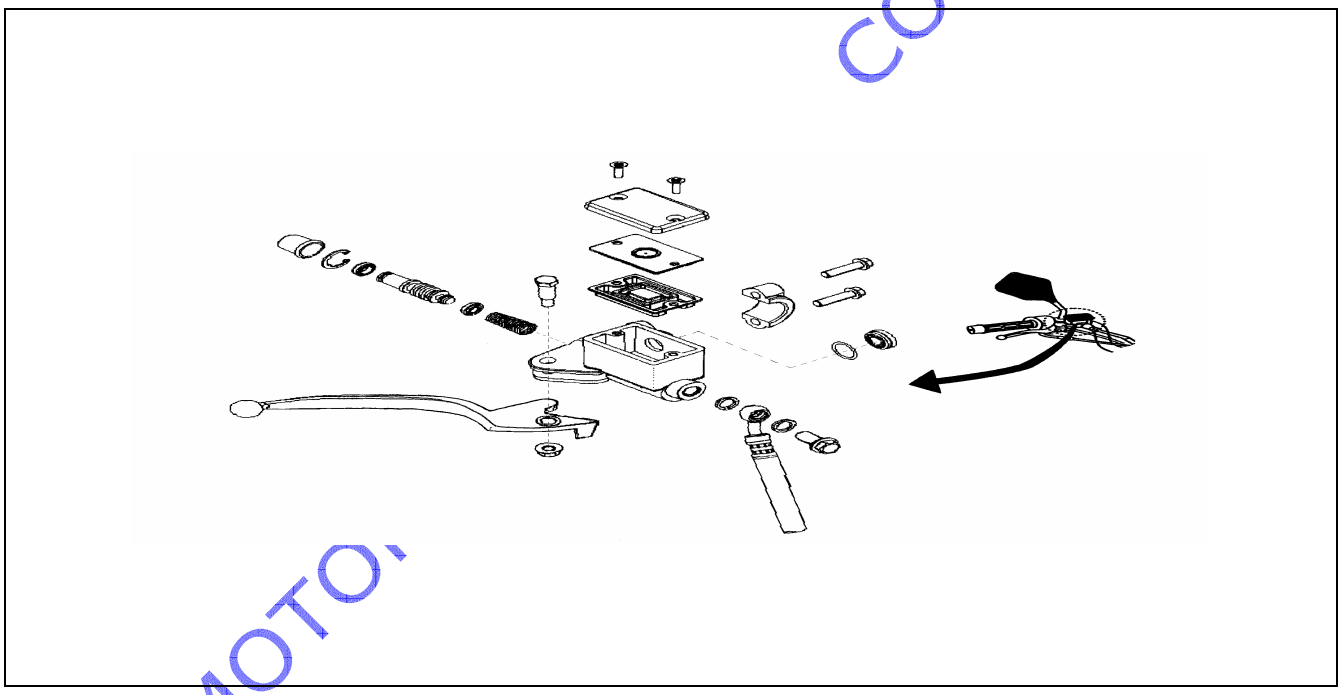
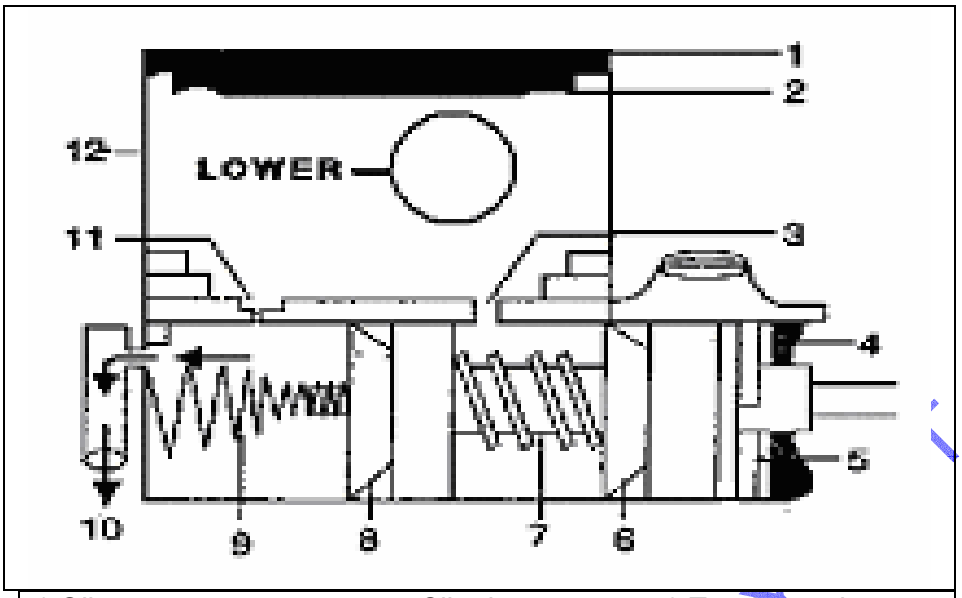


fig. 5

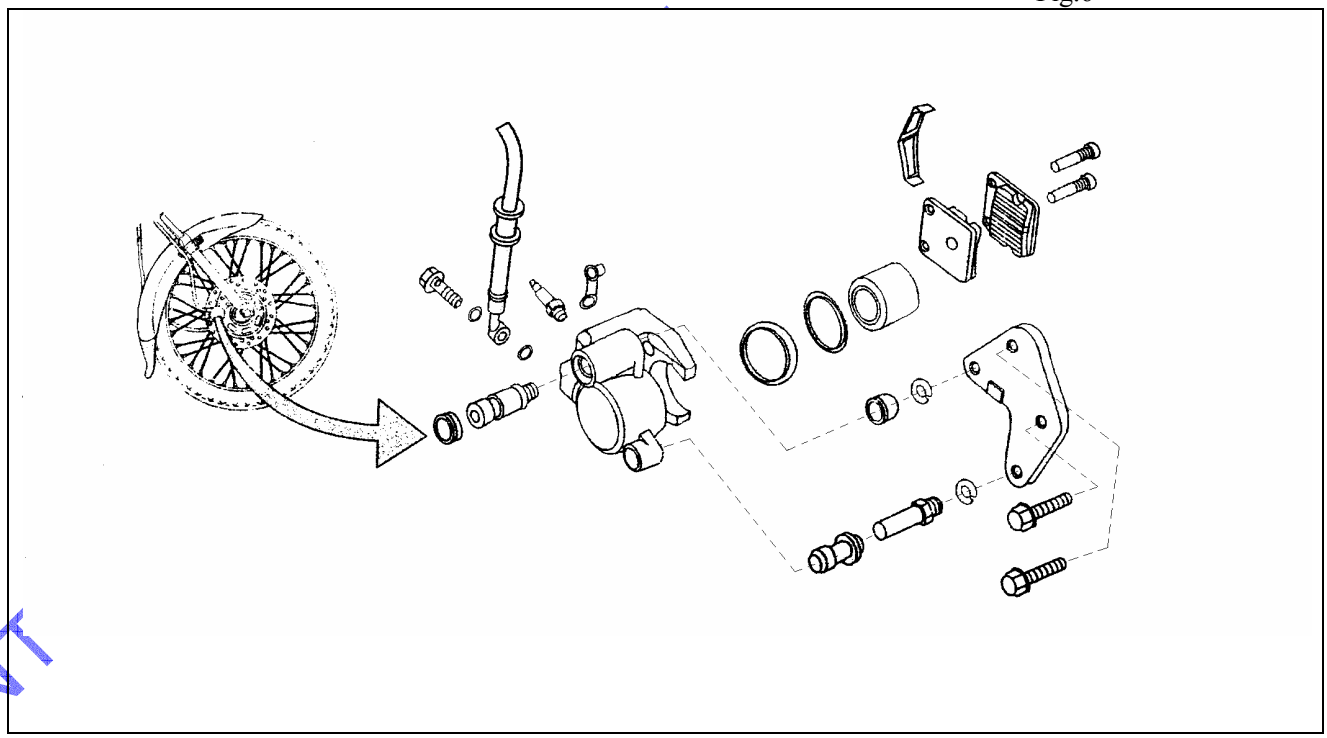




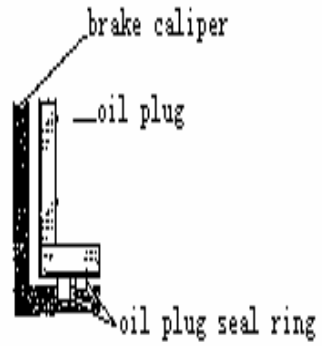
1.Oil cap	5.Clip ring	9.Tension spring
2.Oil gasket	6.Bowl	10.Outlet oil hole
3.Inlet oil hole	7.Stopper	11.Supplement hole
4. Stopper anti-dust cover	8. Bowl	12.Master cylinder

MASTER CYLINDER ASSY.

Fig.6



DISC BRAKE CALIPER ASSY.



NORMAL POSITION

OVERHAULING PROCEDURE OF DISC BRAKE

GENERAL INSTRUCTION:

1□Never handle brake fluid by bare hands for a longer time

2□If brake fluid comes in contact with eyes, wash eyes with cold water and consult a doctor immediately.

3□Never allow brake fluid to come in contact with any painted parts as it peels off paint. If it happens, wipe immediately with damp cloth/wash with water.

4□Never clean any hydraulic brake parts with any mineral oil based cleaner i.e. Kerosene, petrol, or diesel etc. Always clean all the hydraulic brake parts only with fresh brake fluid.

5□Never lubricate any components of hydraulic system with mineral base oil or grease.

6□As the brake fluid is hygroscopic (absorbs moisture from atmosphere) by nature, it is better to replace the brake fluid once in a year (After man soon season), for optimum performance.

7□Whenever any hydraulic brake components are disconnected perform bleeding operation thoroughly at reassembly.

8□Do not polish brake pads with sand paper, as hard particles deposited in the lining may damage steel disc.

9□Do not use cotton cloth to wipe master cylinder bore, as rind from cloth will remain in cylinder bore surface.

10□Always use new rubber seals, boots, washers & circlip.

OVERHAUL OF MASTER CYLINDER;

1□ Remove handle lever screw and left handle lever.

2□ Take out stopper anti-dust cover.

3□ Remove circlip.

4□ Remove piston assy.

Assemble the master cylinder parts in reverse order of disassembly sequence.

NOTE**:** Apply brake fluid on master cylinder piston seals & then insert into the master cylinder body.

OVERHAULING OF DISC BRAKE CALIPER

1. Disconnect the brake hose from caliper and collect the brake fluid, and plug the hole.
2. Loosen the mounting bolts of caliper assay and take out.
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:
5. Connect air pressure hose at inlet of the calliper and apply air pressure, so calliper piston will come out slowly.

Assemble the disc brake caliper parts in reverse order of disassembly order.

BLEEDING OPERATION

1□Fill brake fluid reservoir, with fresh recommended brake fluid (DOT-3 OR DOT-4) up to UPPER LEVEL.

2. Operate brake lever several times to build the hydraulic pressure in the brake system, keep a watch on the brake fluid level in the reservoir.

3□Attach a transparent plastic tube to the bleeder valve.

4□Hold the brake lever in applied position, and loosen the bleeder valve, along with brake fluid air bubbles will come out through the tube. Tighten the bleeder valve and then release the brake lever. This sequence ensures that no fresh air enters into the system.

5.Repeat the operation as per above step, till the clear flow of brake fluid comes out through the transparent tube in between, if required, fill the reservoir with brake fluid up to “UPPER LEVEL” mark again.

Front wheel/ absorber/ control

Description		STANDARD
Tire air pressure	Driver	32 PSI
	Driver and passenger	32 PSI
Free distance of front absorber spring		130MM

Disc brake system

Description	STANDARD
Specified disc brake oil	DOT3 or DOT4
The thickness of the brake shoe	6MM
The thickness of brake plate	4MM

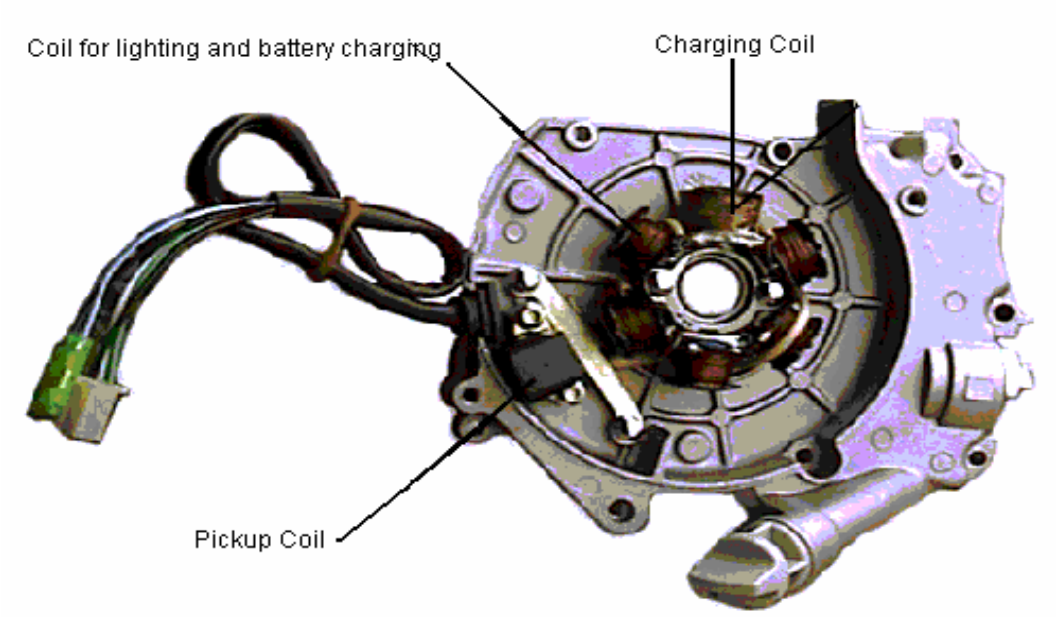
Rear wheel

Description		STANDARD
Tire air pressure	Driver	32 PSI
	Driver and passenger	32 PSI
The free play of brake lever		20MM
Diameter of rear brake hub		130MM
The thickness of the rear brake pad kit		4 mm

CHAPTER 6

ELECTRICAL

MAGNETO ASSY



CONSTRUCTION:

Magneto assembly consists of a stator & rotor Assy.

Type of stator coils construction: -- star connection.

STATOR ASSEMBLY:

- Six coils of stator: Seven coils for light/battery charging & one coil for charging purpose.
- Pick- up coil & stator assembly is externally mounted on crank case RHcover.
- CDI unit charging and pick-up coil are used for ignition purpose.
- Lighting coil & battery charging coil wire connections goes to Regulator cum Rectifier for lighting & battery charging purpose.

Magneto wire color code & various coil resistance values are as follows:

S.NO.	COIL DESCRIPTION	RESISTANCE VALUE	WIRE COLOR CODE
1.	CHARGING COIL	300~500 Ω	Red and black
2.	PICK-UP COIL	200±20Ω AT 20ºC	Blue and white/green and white
3.	Lighting battery charging coil	LESS THAN 2 OHMS LESS THAN 2 OHMS	Green, red, white and black/black

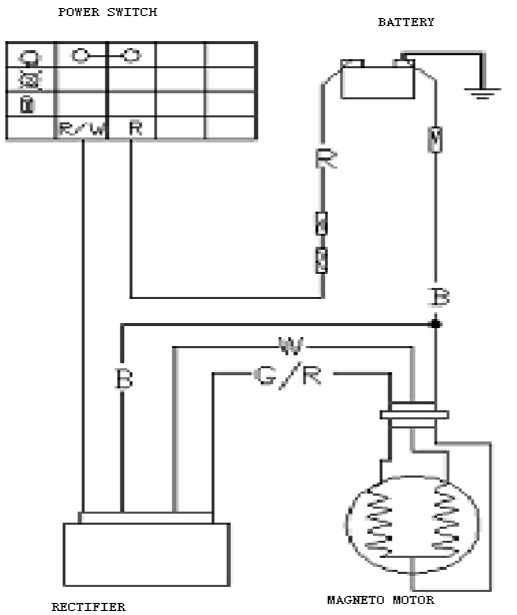
NOTE: All the resistance value are measured with reference to ground wire (Black)

BATTERY TESTING PROCEDURE

Remove the battery from the Motorcycle/Scooter. Connect the battery on load tester ensuring Red lead of tester to (+ve) and Black lead to (-ve) terminal of battery .Check the terminal voltage of battery. It should be 12~14.5 Volts. Press the push button on the tester and watch the voltmeter reading on load. The battery voltage should not drop down less than 9 volts; this indicates that the battery is perfect to take load of self-starter motor. Check the specific gravity of each cell should not be less than 1.220.Put the battery on charge, if required and carry out load test.

- **Diagnose the nature of failure as under:**
- **BATTERY CELL DEAD TEST:** On load if battery voltage is found less than 9.5Volt and one or more cell shows specific gravity less than 1.220 then change the battery.
- **OPEN CIRCUIT:** During the charging of battery does not pickup the charge. In any of the above case, replace the battery.
- **RECOMDED BATTERY LOAD TESTER: MAKE—ELAK, MODEL: ---BCT7**
- **CAUTION: During Inspection, if the battery on the vehicle is found defective, before replacing with a new battery, it is important to check the battery charging circuit.**

BATTERY CHARGING CIRCUIT TEST



The MAGNETO generated AC current, which is rectified into DC current by Voltage Regulator .It is automatically charging the battery depending upon condition of the battery, load and engine rpm. Regulator is connected in parallel to the circuit. Hence this type of system is called “PARALLEL LOAD REGULATOR”.

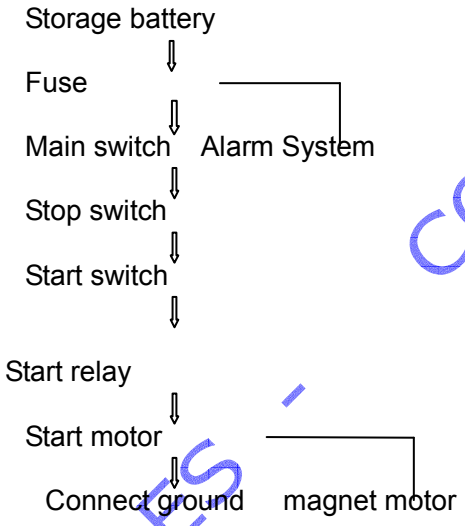
Connect DC Voltmeter and DC Ammeter, start the engine with fully charged good battery. The Voltage Regulator output is as follows.

- Battery charging current range in between 0.6 Amp to 2Amp.
- The engine speed @ 5000 rpm with headlamp on condition.
- Battery terminal charging voltage > 11.5 V at any load condition (depending upon the condition of battery)

NOTE 1
Incase charging output is less than 0.6 Amp or more than 2.0Amp then replace the Voltage Regulator with new one and recheck.
NOTE 2
AMMETER: -----Series connection inline with positive battery wire to measure DC –Amp.
VOLTMETER: ---Parallel connection between positive & negative terminal of the battery to measure DC-Volts.

Electrical starting power flow chart

Circuit process



ELECTRONIC IGNITION COMPONENTS TEST

For any ignition problems, always check the components as per the following procedure.

1. **SPARK PLUG:**

Check spark plug after cleaning in "Spark plug cleaning and testing Machine" replace if ……

- SHORT
- WORN OUT ELECTRODE
- INSULATOR BROKEN

2. **SUPPRESSOR CAP (SPARK PLUG CAP)**

Check the resistance of suppressor cap by multimeter, if 5.0 K.ohms approx, otherwise replace it.

3. COMBINATION SWITCH:

Check the continuity by multimeter.

4. H.T.COIL:

Mobike H.T. coil has separate ground terminal (Black)

- Check primary coil resistance between green and yellow/black wire terminal, if less than 1.0 ohms, otherwise replace H.T. coil.
- Check secondary coil resistance between H.T. cable and earth wire it should be 7.5±1K.ohms,in total includes 5.0 K.ohms series resistance of the suppressor cap, otherwise replace H.T. coil.

5. PICK UP COIL:

- Check for its resistance value across blue-white and green-white wire it should be 150 to 300 ohms at 20□ otherwise replace pick up coil.
- Remove spark plug & then connect a L.E.D. of 1.5 volts across blue-white and green-white wire, kick the start lever to rotate magneto, L.E.D. should flash, otherwise replace the pick-up coil.

6. C.D.I. UNIT TEST:

- Connect the defective C.D.I. in place of O.K. mobike C.D.I. where C.D.I. already working satisfactory.If mobike starts easily, then unit is good, otherwise replace the C.D.I.unit.
- Check for functioning of ignition timing auto advance by timing light, otherwise replace C.D.I.unit (As shown in figure)

IGNITION TIMING TEST

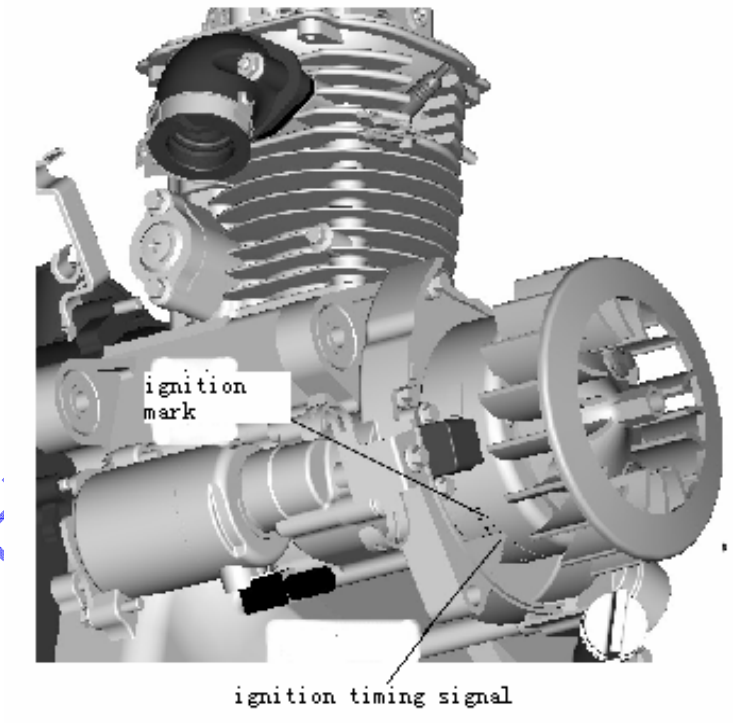
1. Remove the ignition timing inspection hole cap.
2. Connect the timing light (Stroboscope).
3. Start the engine and aim the timing light at ignition mark on the magneto fly wheel (As shown in figure).

•During idling speed

Ignition mark “F” align with “I” mark of timing inspection hole i.e., 13º before TDC @1400 RPM (See Tachometer).

•During Acceleration

“II”FULL ADVANCE index mark align with“I”mark of timing inspection hole i.e. 28º before TDC @ 4000 RPM.If the ignition timing is not correct, replace CDI, and then check with new one.



HEAD LIGHT INDICATOR & METER LIGHT

HEAD LIGHT DISASSEMBLY

Remove front cover

⇩

Headlight

⇩

Leg shied

⇩

Remove headlight bulb-12V□18W/18W×2□by unscrewing fixing screw□

□adjust focus through adjusting nut□

⇩

remove and install night small light-12V□3 W×2

HEAD LIGHT ASSEMBLY

The assembly sequence is the reverse of disassembly.

INDICATOR BULB

Remove Indicator

⇩

Remove and replace bulb-12V10 W

SPEEDOMETER DISASSEMBLY

Remove front cover of handlebar

⇩

Remove connector of headlight

⇩

Take out flasher from its retainer and remove connector

⇩

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□

SPEEDOMETER ASSEMBLY

The assembly sequence is the reverse of disassembly.

MAIN ELECTRICAL COMPONENTS SPECIFICATION

SOME IMPORTANT SPECIFICATION-ELECTRICAL

BATTERY CHARGING SYSTEM

ITEM			SPECIFICATION
Battery	Capacity		12Volt-6Ah/YTX7A-BS/YUASA
	Specific gravity at (27□)	Fully charged Needs charging	1.220~1.240 Below 1.220
	Charging current		0.6 Amp
	Charging time		8-12 hours
Battery charger	Capacity		114W at 5000rpm
	Battery charging coil resistance at (20□/68°f)	Between Black and Black-White wiring	Less than 2 Ohms
	Lamp cable	Yellow and Green-White	Less than 2 Ohms
VOLTAGE REGULATOR OUTPUT:			
	Regulated voltage for lighting circuit <14.5Volt		
	Rectified DC voltage for battery charging > 11.5 Volt		
	Rectified DC voltage for battery charging 0.6 to 2.0 Amp at 5000 RPM		

PRE-DEIVERY INSPECTION (P.D.I.)

It is very important to check every Motorcycle/Scooter to a thorough P.D.I. before delivery. Please do the following procedures and send main information to dealer.

1. Wash the vehicle with mild automobile detergents & clean vehicle externally with brush & blow dry with compressed air. For painted parts clean with water & wipe dry with chamois leather or soft cloth (Do not wash motorcycle under excessive water pressure & soap or bleaching powder.)
2. Check & carry out paint touch-up, if required.
3. Check proper fastening of all external nuts and bolts including that of carburettor mounting. Cylinder head cover, engine mounting bolts, Rear & Front wheel axle nut.
4. Install/Connect charged battery, connect breather tube properly & ensure proper routing. Follow strictly instruction for initial charging of battery.
5. After warming up the engine open timing whole inspection cap & then check oil splash for lubrication.
6. Check & correct tyre pressure if required.
7. Check spark plug gap & adjust if required, and refit properly.
8. Check proper functioning of all electrical, electronic system and control switches.
9. Check proper functioning of accelerator cable and choke.
10. Check and adjust Idling speed, if required.
11. Check front brake lever & rear brake lever for efficient working & proper adjustments.
12. Check brake lever free play and adjust if required.
13. Check brake fluid level in the master cylinder and top up with specified brake fluid if required.
14. Check proper functioning of front and rear suspension.
15. Check wheels for proper alignment, free rotation and proper tightening.
16. Tests drive the motorcycle for proper balancing and adjust steering movement, if required.
17. Check and adjust head light focussing if required.
18. Check proper functioning of Speedometer, Odometer and Tachometer.
19. Check for any oil/fuel leakage, rectify it if required.

PDI CHECK POINTS

Check proper functioning of all electrical switches

Check Speedometer & Odometer& Digital clock

Check turn signals for proper functioning

Ensure to install first fully charged battery then start the motorcycle.

Check brake lever free play 10-20 mm

Check throttle grip free play 2-4mm

Check tire pressure 2.25Kg/cm2 (32PSI)

Check proper fitment of Spark plug / Suppressor cap

Check brake oil level

Check tire pressure 2.25Kg/cm2 (32PSI)

Check torque of engine mounting bolts

Check and adjust Idling Speed (1400±100)

Check engine oil level

CHAPTER 7

TROUBLE SHOOTING

ENGINE

Complaint	Symptom and possible causes	Remedy
Engine does not start, or is hard to start.	**Compression too low**	
	1. Excessively worn cylinder or piston & piston rings.	Replace.
	2. Sticky piston rings in groove.	Repair or replace.
	3. Compression leaks from the joint in crankcase, cylinder or cylinder head.	Repair or replace.
	4. Damaged or leaks of valve.	Repair or replace.
	5. Spark plug too loose or poor seating.	Retighten
	6. Worn-out cylinder bore.	Replace or rebore.
	7. Too slowly starter cranking starter motor	See electrical section.
	Plug not sparking	
	1. Damaged spark plug or suppressor cap.	Replace.
	2. Dirty or fouled spark plug.	Replace.
	3. Defective CDI & ignition coil unit or stator coil.	Clean.
	4. Open or short in high-tension cord.	Replace.
	5. Defective ignition switch.	Replace.
	No fuel reaching to the carburetor	Replace
	1. Clogged hole in the fuel tank cap.	
	2. Clogged or defective fuel cock.	Clean or replace.
	3. Defective carburetor float valve.	Clean or replace.
	4. Clogged fuel hose or defective vacuum hose.	Replace.
		Clean or replace.
Engine not starts easily.	1. Carbon deposited on the spark plug.	Clean.
	2. Defective CDI & ignition coil unit.	Replace.
	3. Clogged fuel hose.	Clean.
	4. Clogged jets in carburetor.	Clean.
	5. Clogged exhaust pipe.	Clean.
Noisy engine.	**Noise appears to come from piston**	
	1. Piston or cylinder worn-out.	Replace.
	2. Combustion chamber fouled with carbon.	Clean.
	3. Piston pin, bearing or piston pin bore worn.	Replace.

	4. Piston rings or ring grooves worn. **Noise seems to come from crankshaft** 1. Worn or burnt crankshaft bearings. 2. Worn or burnt conrod big-end bearings. 3. Due to wear rattling bearings. 4. Too large thrust clearance. **Excessive valve chatter** 1. Too large valve clearance 2. Weakened or broken valve springs 3. Worn rocker arm or cam surface 4. Worn and burnt camshaft journal **Noise seems to come from Timing chain** 1. Stretched chain. 2. Worn sprocket 3. Chain tensioner not working **Noise seems to come from clutch** 1. worn or slipping drive belt 2. Worn rollers in the movable drive face **Noise seems to come from transmission.** 1. Gears worn or rubbing. 2. Badly worn splines. 3. Worn or damaged bearing of drive shaft or rear axle shaft.	Replace. Replace. Replace. Replace. Replace. Adjust. Replace. Replace. Replace. Replace. Replace. Replace &repair. Replace. Replace. Replace. Replace. Replace.
Slipping clutch	1. Worn or damaged clutch shoes. 2. Worn clutch housing. 3. Weakened clutch shoe springs. 4. Worn or slipping drive belt	Replace. Replace. Replace. Replace.
Engine idles poorly.	1. Excessively worn cylinder or piston rings. 2. Sticky piston rings in grooves. 3. Compression leaks from crankshaft oil seal or valves. 4. Spark plug gaps too wide. 5. Defective CDI & ignition coil unit. 6. Defective magneto stator coil. 7. Float-chamber fuel level out of adjustment in carburetor. 8. Clogged jets in carburetor. 9. Worn rocker arm or cam surface	Replace. Replace or clean. Replace. Adjust or replace. Replace. Replace. Replace. Clean or adjust. Replace. Replace.

Complaint	Symptom and possible causes	Remedy

Engine runs poorly in high-speed range.	1. Excessively worn cylinder or piston rings. 2. Sticky piston ring in grooves. 3. Spark plug gaps too less. 4. Ignition not advanced sufficiently due to poorly working CDI & ignition coil unit. 5. Defective magneto stator coil. 6. Float-chamber fuel level too low. 7. Clogged air cleaner element. 8. Clogged fuel hose, resulting in inadequate fuel supply to carburetor. 9. Clogged fuel cock vacuum pipe. 10. Weakened valve springs. 11. Worn camshaft. 12. Valve Timing out of adjustment. 13. Too wide spark plug gap. 14. Defective Ignition coil 15. Defective Pickup coil or CDI 16. Too low float chamber fuel level	Replace. Replace or clean. Adjust. Replace. Replace. Adjust or replace. Clean. Clean and prime. Clean. Replace. Replace. Adjust. Adjust. Replace CDI unit. Replace. Adjust.
Dirty or heavy exhaust smoke.	1. Too much engine oil in the engine 2. Defective Valve and seals 3. Worn-out valve guide/seals/leaks of valves 4. Weakened valve springs. 5. Worn piston rings or cylinder 6. Worn Valves or stems 7. Worn oil rings side rails	Check with Oil level gauge, drain excessive oil Check & Replace. Check & Replace. Replace. Replace. Replace. Replace.
Engine lacks power.	1. Excessively worn cylinder or piston rings. 2. Sticky piston ring in grooves. 3. Compression leaks from valves & gaskets. 4. Spark plug gaps incorrect. 5. Clogged air cleaner element. 6. Float-chamber fuel level out of adjustment. 7. Fouled spark plug, 8. Sucking air from intake pipe. 9. Slipping or worn V-belt. 10. Damaged/worn rollers in the movable drive face. 11. Weak movable driven face spring. 12. Too rich fuel/air mixture due to defective starter system.	Replace. Replace. Replace & repair. Adjust or replace. Clean. Adjust or replace. Clean. Clean or replace the gaskets. Replace. Replace. Replace. Replace.
Engine over heats.	1. Heavy carbon deposits on piston crown. 2. Defective oil pump or clogged oil circuit. 3. Fuel level too low in float chamber. 4. Air leakage from intake pipe. 5. Not enough oil in the engine 6. Used incorrect engine oil	Clean. Replace and clean. Adjust or replace. Retighten/replace gaskets. Add specified oil. Change & use specified

	7. Use of incorrect spark plug. 8. Clogged exhaust pipe/muffler. 9. Clogged air intake with dust	oil Change & use specified. Clean or replace. Clean

CARBURETOR

Complaint	Symptom and possible causes	Remedy
Trouble with starting.	1. Starter jet is clogged. 2. Air leaking from a joint between starter body and carburetor. 3. Air leaking from carburetor's joint or vacuum hose joint. 4. Starter plunger is not operating properly. 5. Clogged fuel pipe 6. Clogged enrichner (choke) or air cleaner	Clean. Check starter body and carburetor for tightness, and replace gasket. Check and replace. Check and replace. Clean. Check and clean.
Idling or low-speed troubles.	1. Pilot jet, pilot air jet are clogged or loose. 2. Air leaking from carburetor's joint, vacuum pipe joint, or starter. 3. Pilot outlet is clogged. 4. Starter plunger is not fully close.	Check and clean. Check and replace. Check and clean. Check and replace.

Complaint	*Symptom and possible causes*	*Remedy*
Medium- or high-speed trouble.	1. Main jet or main air jet is clogged. 2. Needle jet is clogged. 3. Fuel level is improperly set. 4. Throttle valve is not operating properly. 7. Fuel filter is clogged. 8. Defective fuel tap	Check and clean. Check and clean. Check and replace. Check throttle valve for operation. Check and clean. Replace.
Overflow and fuel level fluctuations.	1. Needle valve is worn or damaged. 2. Spring in needle valve is broken. 3. Float is not working properly. 4. Foreign material has adhered to needle valve. 5. Fuel level is too high or low.	Replace. Replace. Check and adjust. Clean. Adjust float height.

ELECTRICAL

Complaint	*Symptom and possible causes*	*Remedy*
No sparking or poor sparking.	1. Defective CDI & ignition coil unit. 2. Defective spark plug. 3. Defective magneto stator coil. 4. Loose connection of lead wire. 5. Defective pick-up coil	Replace. Replace. Replace. Connect/tighten. Replace.
Spark plug soon becomes fouled with carbon.	1. Mixture too rich. 2. Idling speed too high. 3. Incorrect gasoline. 4. Dirty element in air cleaner. 5. Spark plug loose. 6. Too cold spark plugs	Adjust carburetor. Adjust carburetor. Change & use specified gasoline. Clean. Check & retighten. Replace with hot type plugs.
Spark plugs become fouled too soon	1. Worn piston rings. 2. Worn piston or cylinder. 3. Excessive clearance of valve stems in valve guides. 4. Worn stem oil seals.	Replace. Replace. Replace. Replace.
Spark plug electrodes overheat or burn.	1. Spark plug too hot. 2. Overheated the engines 3. Loose spark plugs. 4. Too lean mixture. 5. Not enough engine lubricating oil.	Replace with specified cold plugs. Tune up. Retighten. Adjust carburetor. Check oil pump.
Magneto does not charge the battery.	1. Open or short in lead wires, or loose lead connections. 2. Shorted, grounded or open magneto coil. 3. Shorted or open regulator/rectifier.	Repair or retighten. Replace. Replace.
Magneto charge, but charging rate is below the specifications.	1. Lead wires tend to get shorted or open-circuited or loosely connected at terminal. 2. Grounded or open-circuited stator coils of magneto. 3. Defective regulator/rectifier. 4. Defective cell plates in the battery,	Repair or retighten. Replace. Replace. Replace the battery.
Magneto overcharges.	1. Internal short-circuit in the battery. 2. Resistor element in the regulator/rectifier damaged or defective. 3. Regulator/rectifier unit poorly grounded.	Replace the battery. Replace. Clean and tighten ground connection.

Complaint	*Symptom and possible causes*	Remedy
Unstable charging.	1. Defective regulator/rectifier. 2. Lead wire insulation frayed due to vibration, resulting in intermittent shorting. 3. Magneto coil internally shorted.	Replace. Replace. Replace.
Starter button is not effective.	1. Run down Battery. 2. Defective switch contacts. 3. Brushes not seating properly on commutator in starter motor. 4. Defective starter relay. 5. Defective starter pinion gears 6. Defective front or rear brake lights switch circuit.	Repair or replace. Replace. Repair or replace. Replace. Replace. Repair or replace.

BATTERY

Complaint	Symptom and possible causes	Remedy
Battery runs down quickly.	1. The charging system is not correct.	Check the magneto and regulator/rectifier circuit connections, and make necessary adjustments to obtain specified charging operation.
	2. Cell plates have lost much of their active material as a result of over-charging.	Replace the battery, and correct the charging system.
	3. A short-circuit condition exists within the battery due to excessive accumulation of sediments caused by the incorrect electrolyte.	Replace the battery.
	4. Battery is too old.	Replace the battery.
Reversed battery polarity.	1. The battery has been connected the wrong way round in the system, so that it is being charged in the reverse direction.	Replace the battery and be sure to connect the battery properly.

Battery discharges too rapidly.	1. Dirty container top and sides. 2. Battery is too old.	Clean. Replace.
"Sulfation"acidic White powdery substance or spots on surface of cells	1.Cracked battery case 2.Battery has left in a run-down condition for a long time.	Replace the battery. Replace the battery.
Battery "Sulfation"	1. Too low or high charging rate.(When battery is not in use should be checked at least once a month to avoid **"Sulfation".** 2. Left unused the battery for too long in cold climate.	Replace the battery. Replace the battery if badly "Sulfated".

CHASSIS

Complaint	Symptom and possible causes	Remedy
Heavy steering	1. Steering stem nut over tightened. 2. Broken bearing/ball/race in steering stem. 3. Distorted steering stem. 4. Not enough pressure in tires.	Adjust. Replace. Replace. Adjust tire pressure.
Wobbly handlebars.	1. Loss of balance between right and left front suspension. 2. Distorted front axle or crooked tire. 3. Distorted front fork	Replace. Replace. Repair or replace.
Wobbly front wheel.	1. Distorted wheel rim. 2. Worn front wheel bearings. 3. Defective or incorrect tire. 4. Loose axle nut. 5. Loose nuts on the rear shock absorber. 6. Worn engine mounting bushing. 7. Loose nuts or bolts for engine mounting.	Replace. Replace. Replace. Retighten. Retighten. Replace. Tighten.
Front suspension too soft.	1. Weakened springs. 2. Not enough oil in the fork,	Replace. Replenish.
Front suspension too stiff.	1. Too viscous fork oil. 2. Too much fork oil.	Replace. Drain excess oil.
Noisy front suspension.	1. Not enough fork oil. 2. Loose nuts/nuts on suspension.	Replenish. Retighten.
Wobbly rear wheel.	1. Distorted wheel rim. 2. Defective or incorrect tire. 3. Loose nuts on the rear shock absorber. 4. Worn engine mounting bushing.	Replace. Replace. Retighten.

	5. Loose nuts or bolts for engine mounting. 6. Worn rear wheel bearing.	Replace. Retighten. Replace.
Rear suspension too soft.	1. Weakened shock absorber spring. 2. Oil leaks from rear shock absorber.	Replace. Replace.
Noisy rear suspension.	1. Loose nuts on shock absorber, 2. Worn engine mounting bushing. 3. Loose bolts on shock absorber	Retighten. Replace. Retighten.

BRAKES

Complaint	***Symptom and possible causes***	***Remedy***
Insufficient brake power.	1. Leakage of brake fluid from hydraulic system. 2. Worn pads. 3. Oil adhesion on engaging surface of pads. 4. Worn disc. 5. Air entered into hydraulic system. 6. Worn shoe. 7. Friction surfaces of shoes are dirty with oil. 8. Excessively worn drum. 9. Too much brake lever play.	Repair or replace. Replace. Clean disc and pads. Replace. Bleed air. Replace. Replace. Replace. Replace. Adjust.

Brake squeaking.	1. Carbon adhesion on pad surface. 2. Tilted pad. 3. Damaged wheel bearing. 4. Worn pad or disc. 5. Foreign material entered into brake fluid. 6. Clogged return port of master cylinder. 7. Brake shoe surface glazed. 8. Loose front-wheel axle or rear-wheel axle nut. 9. Worn shoe.	Repair surface with sandpaper. Modify pad fitting or replace. Replace. Replace. Replace brake fluid. Disassemble and clean master cylinder. Repair surface with sandpaper, Tighten to specified torque. Replace.
Excessive brake lever stroke.	1. Air entered into hydraulic system. 2. Insufficient brake fluid. 3. Improper quality of brake fluid. 4. Worn brake cam lever. 5. Excessively worn shoes and/or drum.	Bleed air Replenish fluid to specified level & bleed air. Replace with specified fluid. Replace Replace
Leakage of brake fluid.	1. Insufficient tightening of connection joints. 2. Cracked hose. 3. Worn piston seal.	Tighten to specified torque. Replace. Replace piston and/or cup.