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CF150-A Service Manual

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FORWORD

This manual introduces CF150-A maintenance information, disassembly procedure, check & adjustment methods, troubleshooting and technical specifications. There are illustrations, drawing to guide your operations.

Chapter 1 mainly introduces general operation information, tools, vehicle structure and basic specifications.

Chapter 2 mainly introduces check & adjustment methods and how to do vehicle maintenance.

Chapter 3 mainly introduces disassembly, installation, adjustment, maintenance and trouble-shooting information.

CFMOTO reserves right to make improvements and modifications to the products without prior notice. Overhaul and maintenance should be done according to actual condition of vehicle.

Zhejiang CFMOTO Power Co., Ltd.

April. 2011

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Conversion table

Item	Example	Conversion
Pressure	200 kPa(2.00kgf/cm^2) 33kPa (250mmHg)	1kgf/cm^2=98.0665kPa 1kpa=1000Pa 1mmHg=133.322Pa=0.133322kPs
Torque	18N.m(1.8kgf-m)	1kgf.m=9.80665N.m
Volume	419ml	1ml=1cm^3=1cc 1l=1000cm^3
Force	12N(1.2kgf)	1kgf=9.80665N

1 Maintenance information (Chassis)

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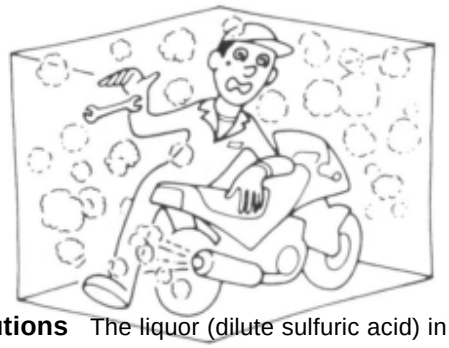
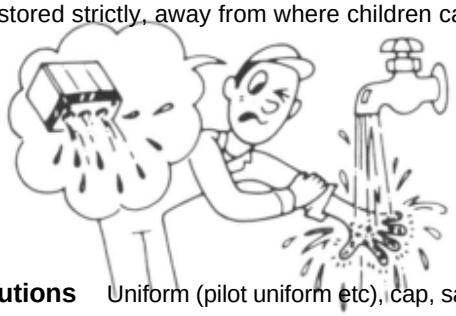
Notes during operation

Cautions Exhaust contains toxic ingredients. Do not run the engine in closed places or places with poor ventilation for a long time.

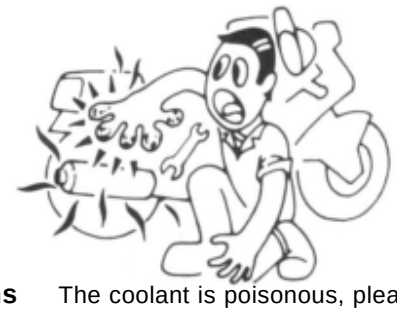


Cautions The liquor (dilute sulfuric acid) in Battery is strong corrosive; it may burn the skin and blind the eyes when it contacts them. In case of contact, please wash it with a great deal of clear water immediately, and receive medical treatment in hospital. Besides, please also wash it by a great deal of clear when it contacts the clothes, for avoiding skin burn. The Battery and Battery liquor must be stored strictly, away from where children can touch.



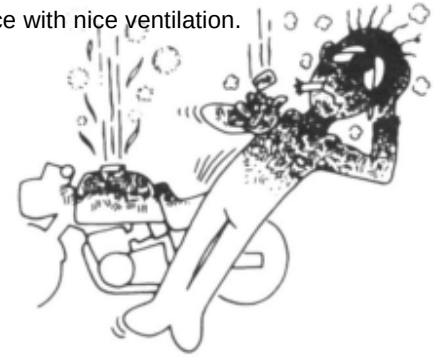
Cautions Uniform (pilot uniform etc), cap, safety boots suitable for the operation must be worn, and the safety articles such as dustproof goggles, dustproof respirator and gloves shall be worn for protection when necessary.

Cautions When the engine just stops, the temperature of engine, muffler is still high; please do not touch them with bare hands, for avoiding burn. Please wear uniform with long sleeves as well as gloves when maintaining.



Cautions The coolant is poisonous, please do not drink it, do not let it contact the skin, eyes neither clothes. In case it contacts the skin or clothes, please suds it immediately. When it contacts the eyes, please wash it thoroughly with a great deal of clear water immediately, and receive medical treatment in hospital. In case the coolant is drunk by mistake, please try to vomit it out, and receive medical treatment immediately after gargling. The coolant must be stored strictly, away from where children can touch.

Cautions: No smoking or naked fire is allowed at the operation site, for the gasoline is combustible. Not only flames, but electric sparks shall be avoided. Besides, the vapored gasoline is explosive, please operate it in the place with nice ventilation.



Cautions The Battery may produce combustible and explosive hydrogen when it is being charged. So it may explode if there is flame or electric spark. So please charge it in the place with nice ventilation.

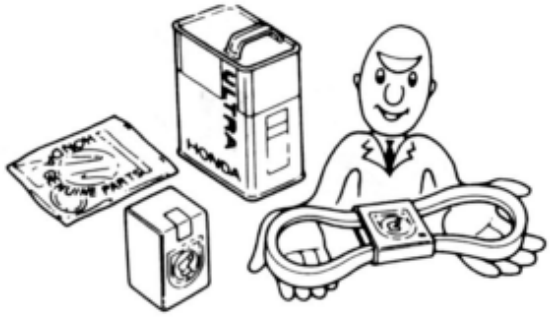
Cautions do not let the turning or movable pieces such as rear wheel, clutch etc clip your hands or clothes when maintaining.

Cautions The asbestos dust on the brake drum is carcinogenic is breathed in. Do not clean off the dust with compressed air. Use cleaning detergent to avoid dust proliferation.

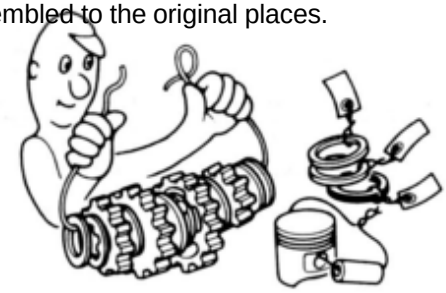
Cautions The personnel shall make them be aware of each other from time to time when operating, for safety confirmation.

Cautions to disassembly, assembly

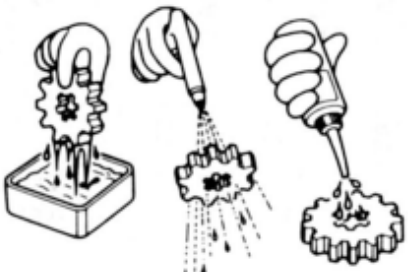
The parts, lubricant and grease must adopt the pure parts of Chunfeng Brand or recommendation.



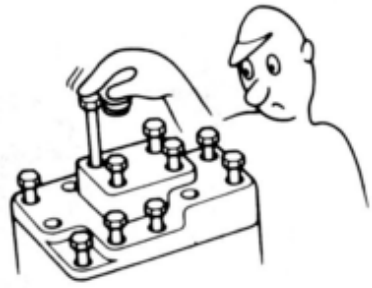
The parts of each system shall be arranged and stored separately, so that the parts can be assembled to the original places.



The parts shall be washed and the cleanser shall be blown away by compressed air prior to determination when they are disassembled and inspected. The working surface shall be lubricated before assembly.



Insert and arrange the bolts one by one and make sure the insertion volume of each bolt is equal before inserting them, when the bolt length is unidentified.



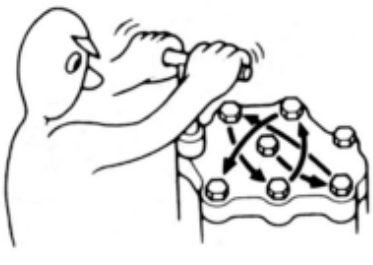
Please clean the dirt, dusts on the vehicle before maintenance.

The gasket, O-ring, piston pin retainer and split pin must be renewed after disassembly.

The elastic retainer will deform if it is opened too wide upon disassembly, then it will easily fall off when assembled again. Please do not use the elastic retainer that is already loose and without elasticity.

Inspect the necessary sites upon disassembly, measure the relevant data, so that the original status can be resumed after assembly.

The fasteners such as bolts, nuts and screws shall be pre-fastened, and then be fastened on the diagonal according to regulated fastening torque in the principle of from big to small, from inside to outside.



The rubber parts shall be checked whether they are aged upon disassembly, renew them in advance when necessary. Besides, try not to make volatile oil, grease etc attach on the rubber parts, for they are not resistant to corrosion of gasoline or kerosene.

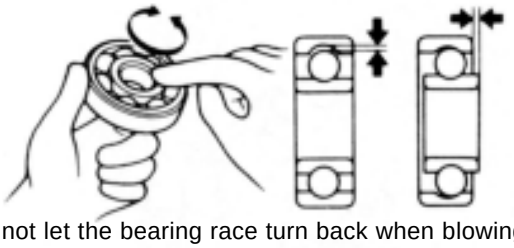
Proper special tools must be applied to the operations which require special tools

The inside or outside track of ball bearing shall be turned manually, for confirming the flexibility and smoothness of turning.

The parts that are loose axially or radially shall be renewed.

The parts that are unsmooth shall be washed with oil, and the parts that are not repaired after washing shall be renewed (the dual-side dustproof type cannot be washed)

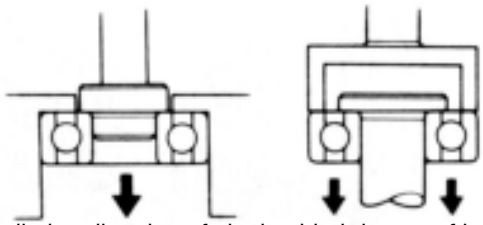
Press it into the machine or axis, and the bearing shall be renewed if the pressed part is not tight enough.



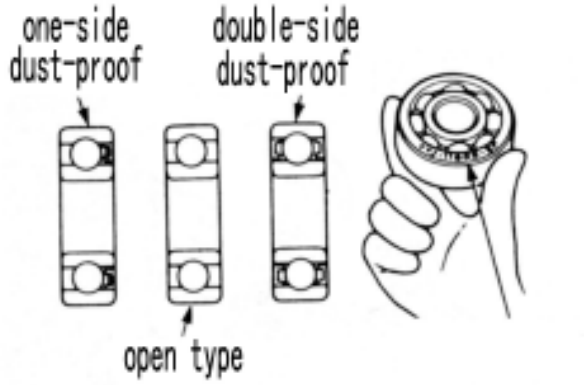
Do not let the bearing race turn back when blowing the ball bearing by compressed air after washing. If the bearing race turns back, its high back turning speed will be beyond the limit that may result in damage of bearing. The bearing shall be lubricated with engine oil or grease before assembly.

The recommended lubricating grease must be applied or injected in the appointed positions.

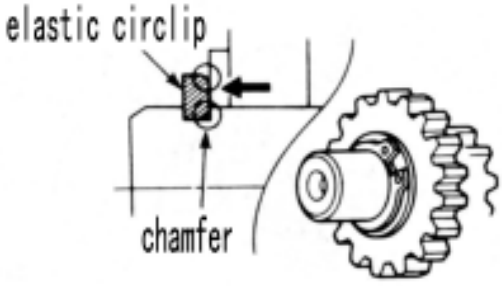
When disassembling the pressed ball bearing, the disassembled bearing must not be used again if the balls are forced for disassembly.



The installation direction of single-sided dustproof bearing shall be paid attention to upon disassembly. The surface of open-type or dual-side dustproof bearing that is with the sign of manufacturer, dimensions shall face outside upon installation.

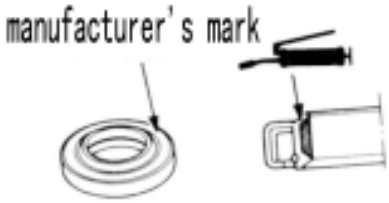


The side with chamfer shall face the impact direction when installing the circlip. The circlip that is loose already or without elasticity shall not be used again. Rotate the circlip after assembly, for confirming that it is installed in the groove properly.

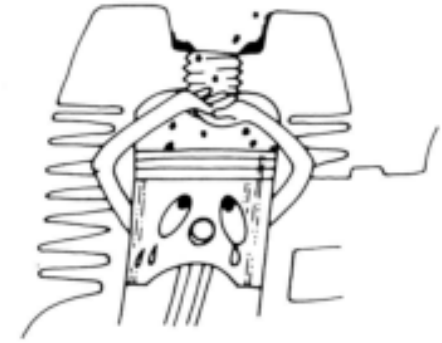


Each fastening part must be inspected whether they are tightened and work well after assembly.

Install oil seal with the side of manufacturer's mark outward.
.do not fold or scratch the oil seal lip.
.apply grease to the oil seal lip before assembling.



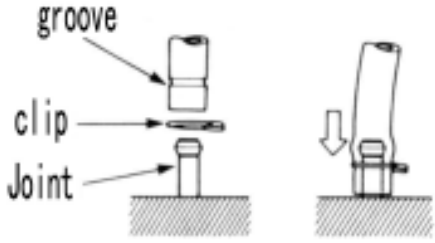
Do not mix mud or dust into engine or the hydraulic brake system.



Do not twist or bend the cables too much.Distorted or damaged cables may cause poor operation.

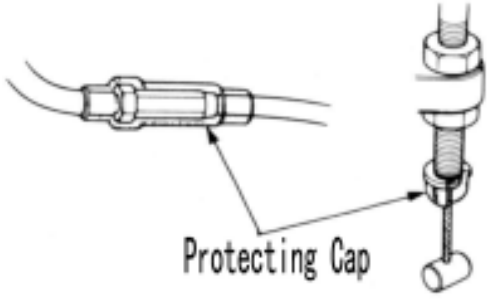
Brake fluid and coolant may damage coating, plastic and rubber parts. Flush these parts with water if splashed.

When installing pipes, insert the pipe till the end. Fit the pipe clip, if any, into the groove. Replace the pipes or hoses that cannot be tightened.



Clean the gaskets and washers of the engine cases before assembling. Remove the scratches on the contact surfaces by polishing evenly with an oilstone.

When assembling the parts of protection caps, insert the caps to the grooves, if any.

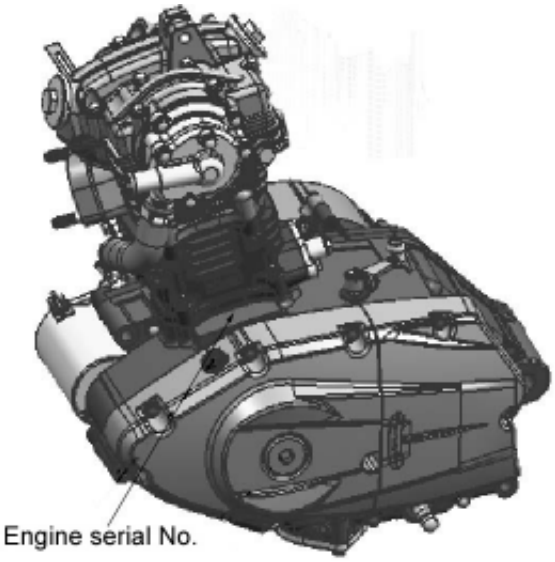


Location of VIN No. and Engine No.

Model: CF150-A

VIN No.: LCEPDKL2XXXXXXX

Engine serial No.:157MJ-2A



Main specifications

Item			Specifications
Model name and type			Leader CF150-A
Length			2040mm
Width			750mm
Height			1070mm
Wheel base			1280mm
Engine model			157MJ-2A
Displacement			144.9ml
Fuel grade (Octane)			90# or above
Gross weight			128kg
Passengers			2 persons(including driver)
Load capacity			150kg
Tire specifications		F/W	2.75-18 42P
		R/W	3.25-18 52P
Min. ground clearance			170mm
Min. turn radius			4.2m
Steering device	Turn angle	Right	42°
		Left	42°
Brake system		Front	Disc
		Rear	Drum
Suspension system	Suspension type	Front wheel	Telescopic fork
		Rear wheel	Swingarm
Frame type			Steel tube and plate

Item		Standard
Fuel supply system	Fuel capacity	15L
	Fuel switch	Flow rate: ≥430mL/min
	Carburetor	Type: CPZ27
	Idle speed	1500±150r/min

Maintenance data

Front wheel

Item			Standard value	Service limit
Front wheel	Bending of front wheel shaft		—	0.2mm
	Rim run-out	Longitudal	0.8mm	2.0mm
		Horizontal	0.8mm	2.0mm
	Tire	Remaining groove	—	1.6mm
		Air pressure	175kPa（1.75kgf / cm^2）	—

Rear wheel

Item			Standard value	Service limit
Rear wheel	Rim run-out	Longitudal	0.8mm	2.0mm
		Horizontal	0.8mm	2.0mm
	Tire	Remaining groove	—	1.6mm
		Air pressure	Single person: 200kPa（2.0kgf / cm^2）	—
			Double person: 225kPa（2.25kgf / cm^2）	—

Brake system

Item		Standard value	Service limit
Front brake	Free play of front brake	10－20mm	—
	Brake disc wear	4mm	3mm
Rear brake	Free play of rear brake	10－20mm	—
	Brake drum wear	Standard diameter：130mm	132mm

Lights, Dashboard, Switchs

Item		Standard value
Fuse	Main	20A
	Auxiliary	10A
Lights and bulb	Headlight（Hi / Lo）	12V-35W/35W
	Position light	12V-5W
	Brake light / Tail light	12V-21W/5W
	Turn light	12V-10W×4
	Dashboard light	12V-2W×2、12V-3W×2
	Turn indicator light	12V-2W×2
	High-beam indicator light	12V-2W
	Gearshift indicator light	12V-2W×5
	Neutral indicator light	12V-2W
	Water temp. alarm light	12V-2W

Tightening torque

Item	Torque N·m(kgf·m)	Item	Torque N·m(kgf·m)
5mm Bolt、Nut	5（0.5）	5mm Screw	4（0.4）
6mm Bolt、Nut	10（1.0）	6mm Screw	9（0.9）
8mm Bolt、Nut	22（2.2）	8mm Screw	25（2.5）
10mm Bolt、Nut	34（3.5）	6mmSH Bolt with flange	12（1.2）
12mm Bolt、Nut	54（5.5）	6mm Bolt and nut with flange	26（2.7）
		8mm Bolt and nut with flange	39（4.0）
		10mm Bolt and nut with flange	

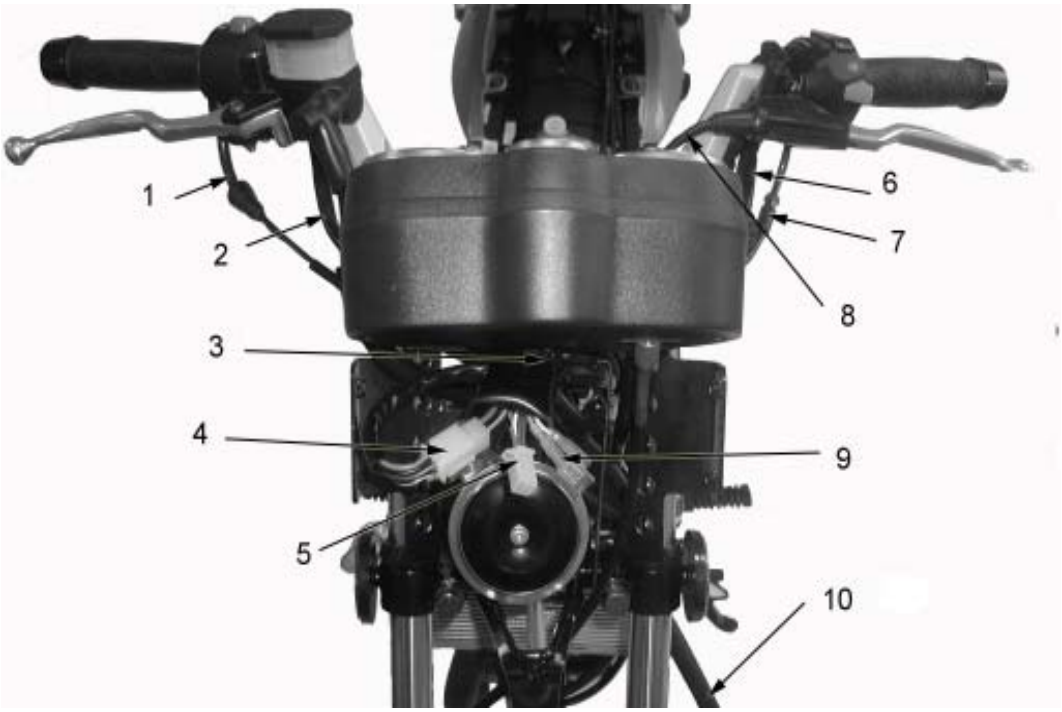
Please apply standard torque to tighten if torque value is not decribed at below table
Note: 1. Coat engine oil on threads and contact surface of bolts and nuts.
2. Replace new one if self-locking bolt is removed.

Item	Pcs	Diameter（mm）	Tightening torque N·m（kgf·m）	Remarks
Disassembly of engine				
Mounting bolt, engine suspention	8	8	30（3.1）	
Nut, engine suspension shaft	1	14	100（10.1）	
Front wheel, front suspension, steering system	1	10	40（4.1）	
Nut, steering column	4	8	20（2.1）	
Screw, handlebar	1	12	65（10.1）	
Nut, front wheel shaft	2	8	20（2.1）	
Upper Bolt, shock absorber	2	10	40（4.1）	
Lower bolt, shock absorber				
Rear wheel, rear suspension				
Nut, rear wheel shaft	1	14	100（10.1）	
Upper Bolt, shock absorber	2	10	40（4.1）	
Lower bolt, shock absorber	2	10	40（4.1）	
Retainer nut, rear brake	1	8	20（2.1）	
Brake system				
Mounting bolt, front brake disc	4	8	30（3.1）	
Mounting bolt, front brake caliper	2	8	30（3.1）	
Muffler				
Nut, exhaust pipe	2	8	26（2.7）	
Bolt, exhaust muffler	1	10	40（4.1）	

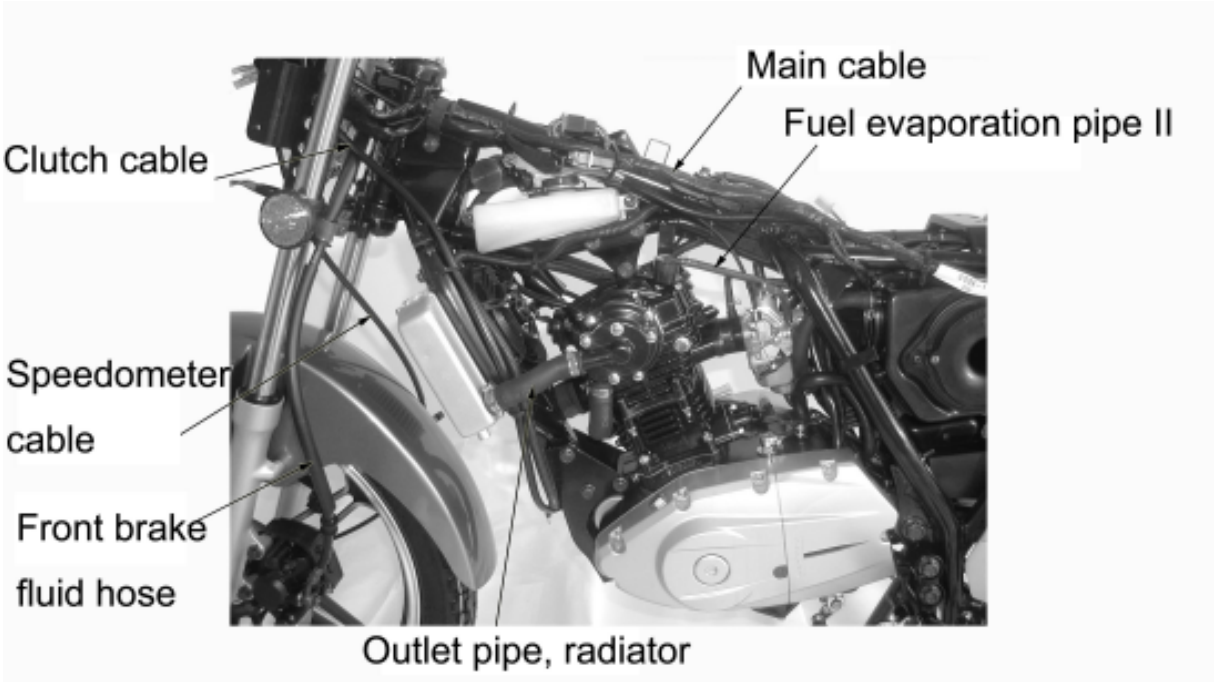
Lubricant grease & sealant

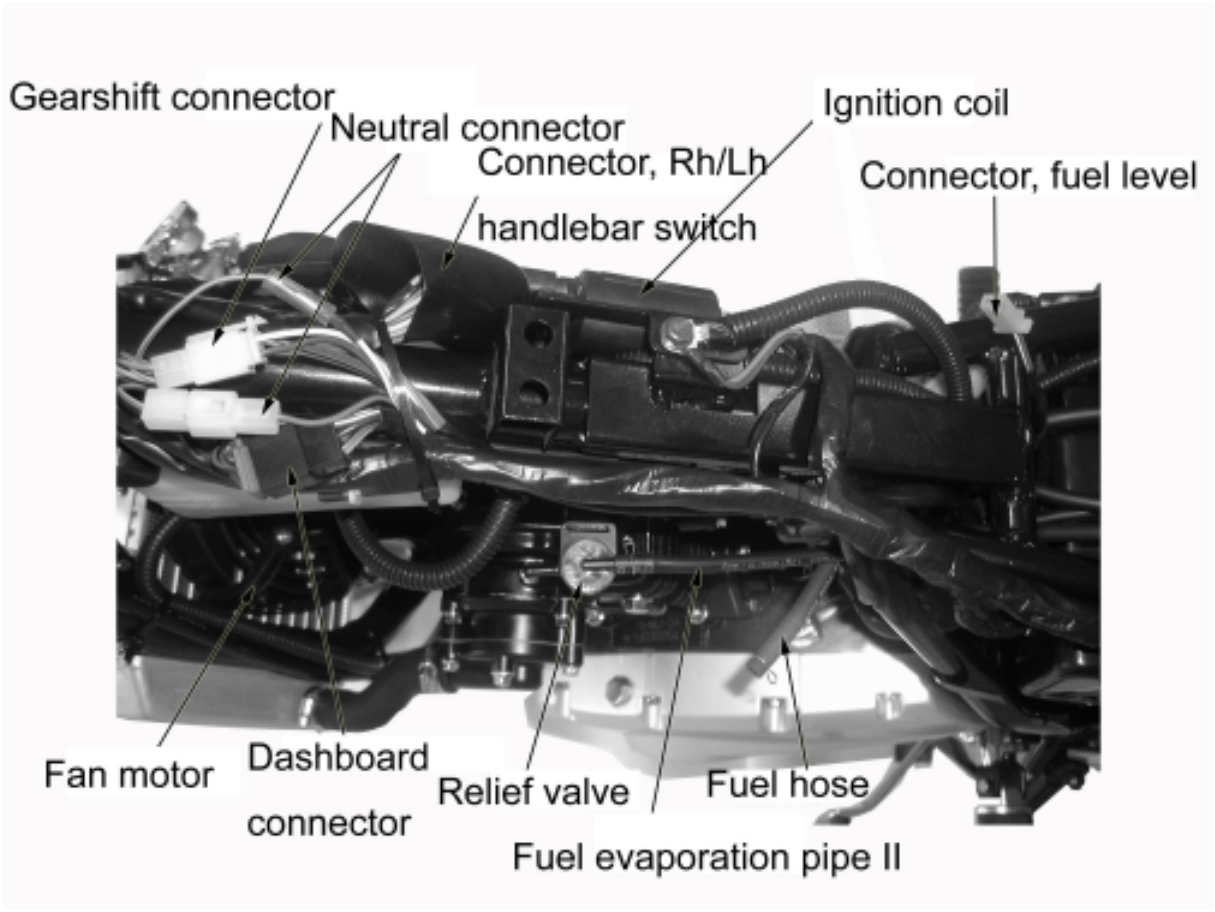
Coating area	Oil or Grease
Race, steering tube Lips of dustproof seal, front wheel Rotation area, rear brake suspension arm shaft Connections of dashboard cable Connections of throttle cable and choke cable Throttle and choke Rotation area, rear left footrest Rotation area, rear right footrest Roration area, side stand Bushing, rear swing arm Gear, counter Shaft, main stand	Multi-purpose grease
Nut threads and contact surface, rear wheel shaft	Engine oil
Lips of dustproof seal, front shock absorber	Shock absorber oil #5
Inner round surface, handlebar	Engine oil

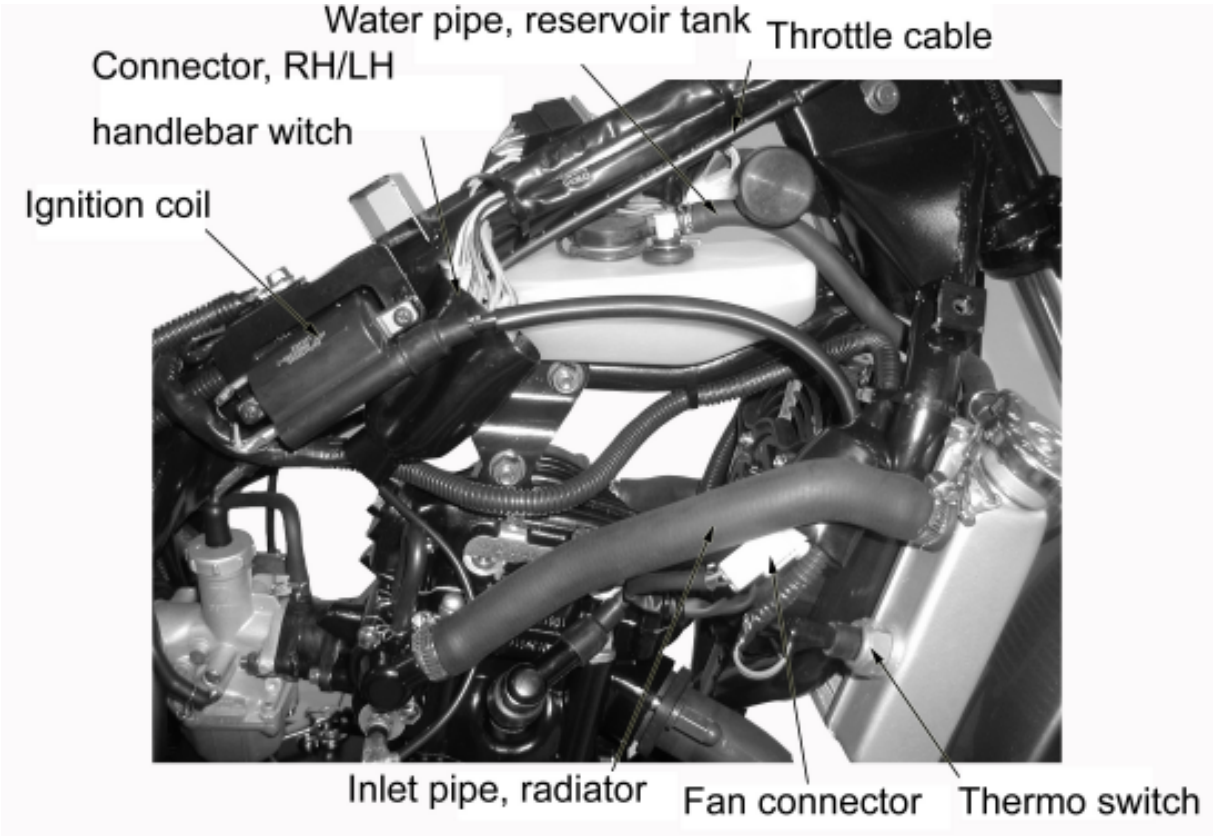
Diagram of cables,pipes and wiring

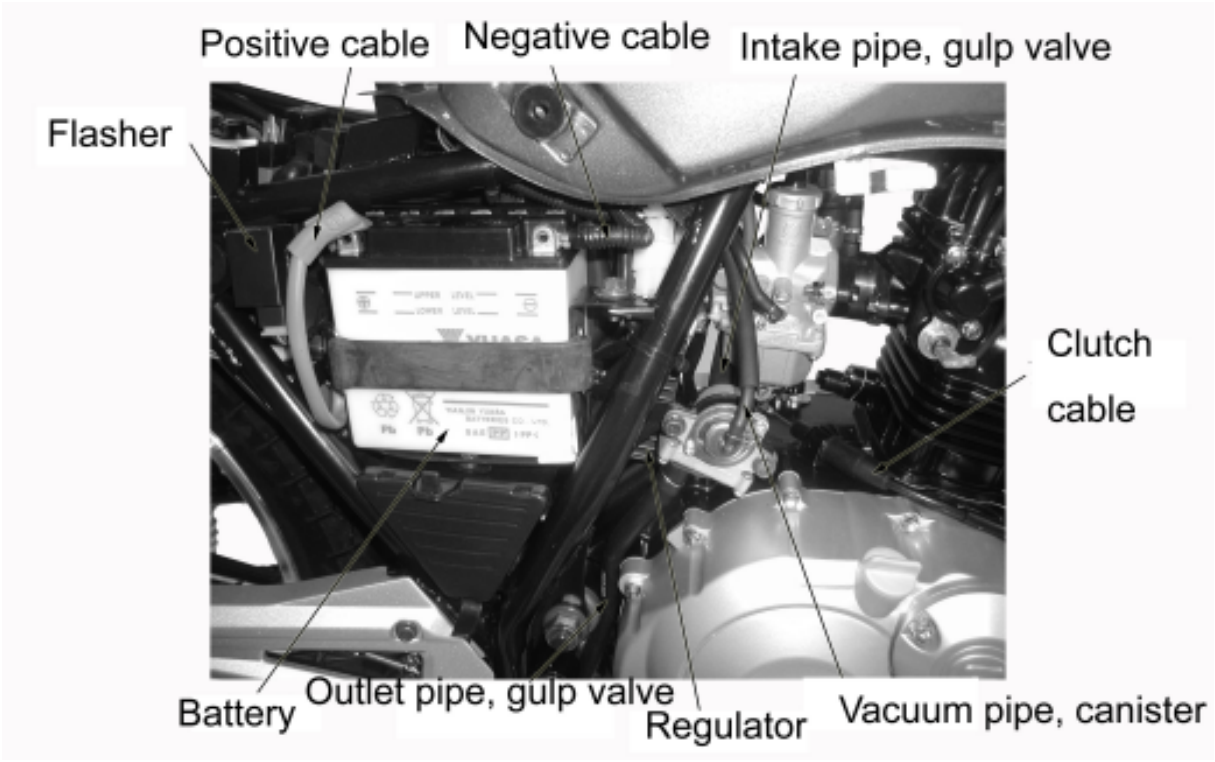


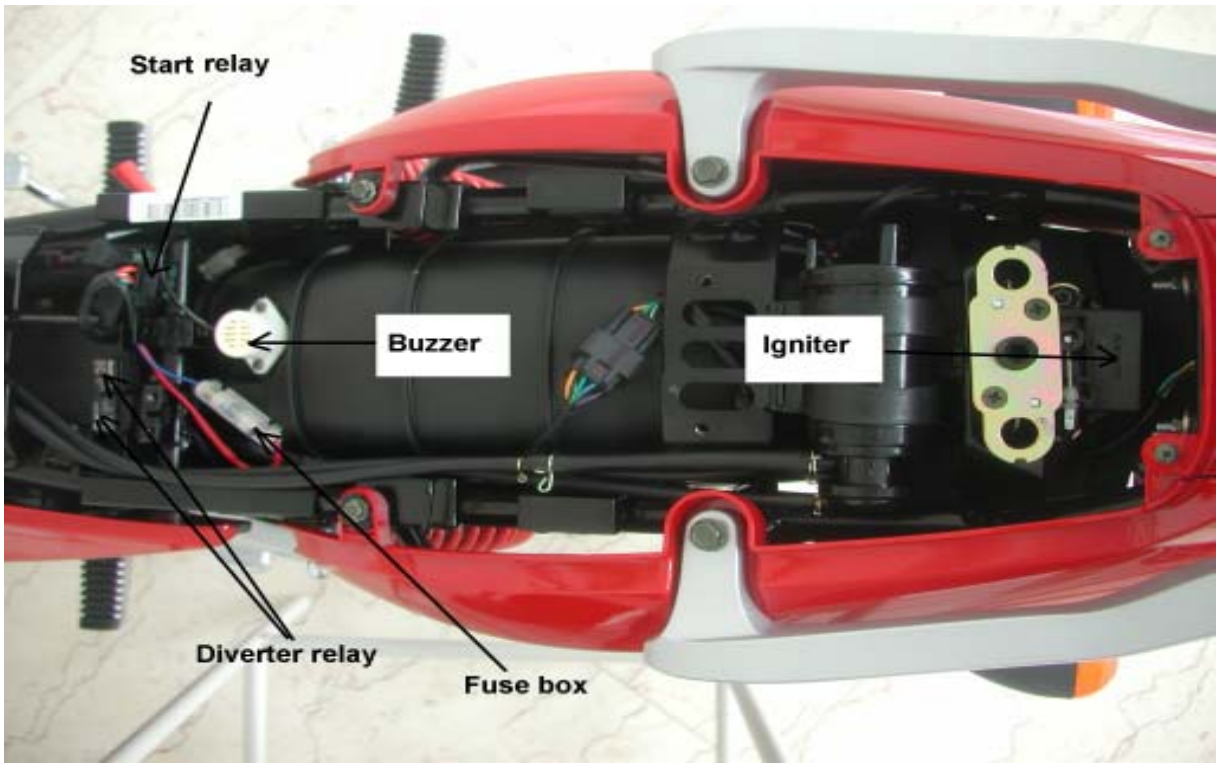
1.Throttle cable 2.Harness,handlbar switch(RH) 3.harness dashboard
4.Ignition switch connector 5.Headlight connector 6.Harness,handlbar switch(LH)
7.Choke cable 8.Clutch cable 9.Turn light(L/R)10.Front brake hose

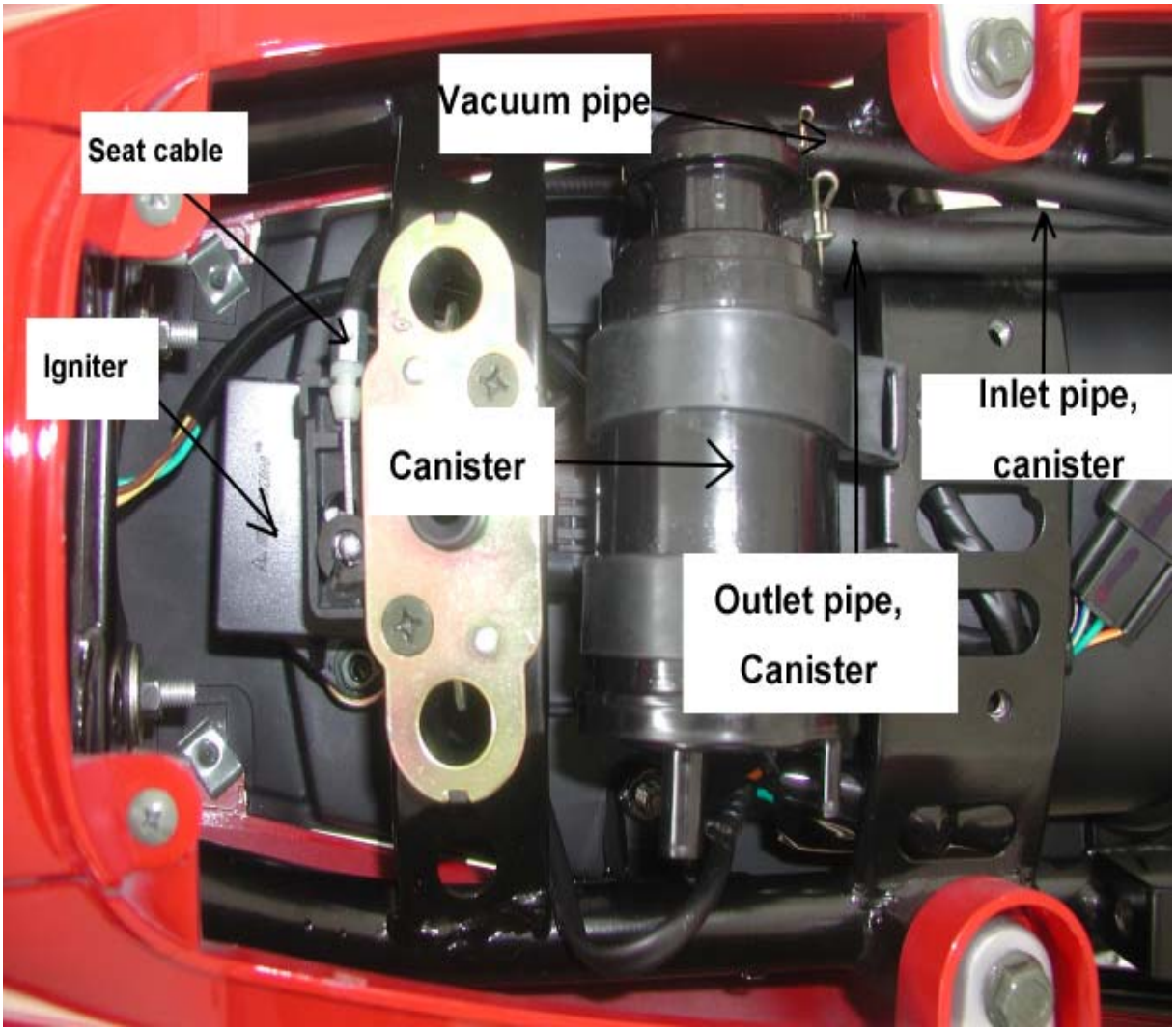


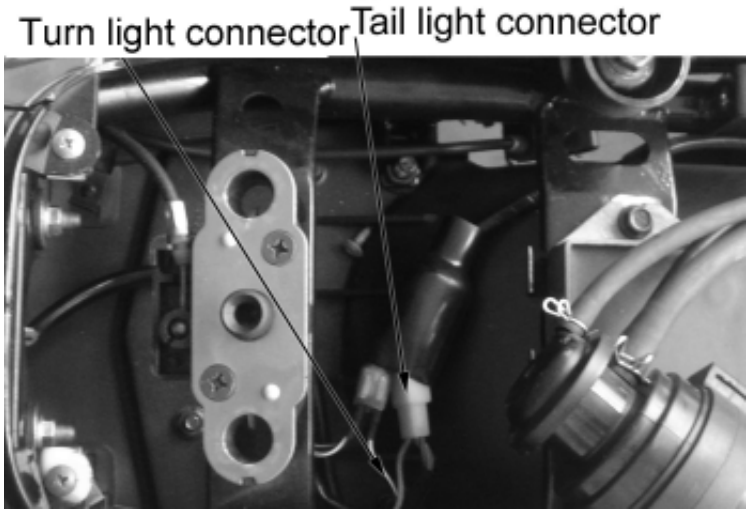

Gearshift connector
Neutral connector
Connector, Rh/Lh
handlebar switch
Ignition coil
Connector, fuel level
Fan motor
Dashboard connector
Relief valve
Fuel hose
Fuel evaporation pipe II


Water pipe, reservoir tank
Throttle cable
Connector, RH/LH
handlebar witch
Ignition coil
Inlet pipe, radiator
Fan connector
Thermo switch


Positive cable
Negative cable
Intake pipe, gulp valve
Flasher
Clutch cable
Battery
Outlet pipe, gulp valve
Regulator
Vacuum pipe, canister


Start relay
Buzzer
Igniter
Diverter relay
Fuse box


Vacuum pipe
Seat cable
Igniter
Canister
Inlet pipe,
canister
Outlet pipe,
Canister


Turn light connector
Tail light connector

Maintenance information

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General precautions

Caution： Proper repair and maintenance is very important not only to worker's safety, but also to engine reliability and safety.

1.The personnel shall make them be aware of each other from time to time when operating, for safety confirmation.

2.·Exhaust contains toxic ingredients. Do not run the engine in closed places or places with poor ventilation for a long time.

3. ·No smoking or naked fire is allowed at the operation site, for the gasoline is combustible. Not only flames, but electric sparks shall be avoided. Besides, the vapored gasoline is explosive, please operate it in the place with nice ventilation.

4. ·Do not use gasoline to wash or clean components or parts

·5. When the engine just stops, the temperature of engine, muffler is still high; please do not touch them with bare hands, for avoiding burn. Please wear uniform with long sleeves as well as gloves when maintaining.

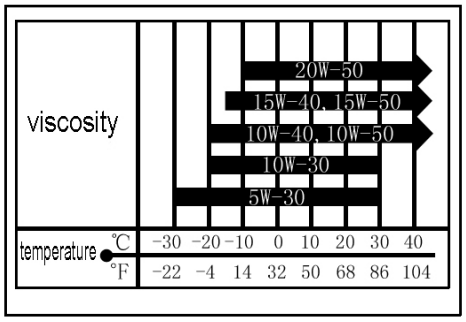
· 6. In case fuel, lubricant system, cooling system or exhaust system has been repaired or maintained, it's necessary to inspect its marking line or any leakage.

·7. Place engine oil, coolant or waste components with proper way to protect environment.

Notes：

1.The parts, lubricant and grease must adopt the genuine parts of CFMOTO or recommendation.
2.·The parts of each system shall be arranged and stored separately, so that the parts can be assembled to the original places.
3. ·Proper special tools must be applied to the operations which require special tools
4. Please clean the dirt, dusts on the vehicle before maintenance.
5. The recommended lubricating grease must be applied or injected in the appointed positions.
6. The fasteners such as bolts, nuts and screws shall be pre-fastened, and then be fastened on the diagonal according to regulated fastening torque in the principle of from big to small, from inside to outside.
7. When bolts tightened by required torque with wrench, if there're grease or oil on bolt threads and screws, must clean it before assembly.
8. The parts shall be washed and the cleanser shall be blown away by compressed air prior to determination when they are disassembled and inspected. The working surface shall be lubricated before assembly.
9. Inspect the necessary sites upon disassembly, measure the relevant data, so that the original status can be resumed after assembly.
10. The gasket, O-ring, piston pin retainer and split pin must be renewed after disassembly.

Introduction of fuel, engine oil and coolant



Fuel： Octane 90# or above, unleaded

Engine oil： Oil type (SAE10W－40)

Oil grade :API (SF or SG)

If above-mentioned oil is unavailable, please choose as right picture shows according to temperature.

Coolant： Coolant is anti-corrosive and anti-rust and freezing point should be 5? lower than lowest surrounding temperature.

Recommended coolant:- 35℃, anti-frozen, anti-corrosive and high-boiling point

Warning !: Engine coolant is toxic, do NOT drink. Keep out of reach of children and store carefully.

Caution： Do not mix other brand coolant to use.

Engine break-in

There're many moving parts inside engine, such as piston, piston ring, cylinder, gears and so on. It's very important to break-in during initial drive. Break-in can make moving components match each other better, contact better and adjust clearance to guarantee engine better performance and reliability.

Recommended break-in period is 1000Km.

Notes for break-in：

1、Turn throttle slowly step by step after start engine. Do not turn faster and slower.

2、Try to drive on a good road, do not drive in up and down road for long time.

3、Keep oil path smooth.

4、Try to avoid sudden acceleration or high RPM with no-load condition.

5、Do regular repair and maintenance during break-in period. Remove it if any troulbes occur.

6、After break-in, please change engine oil, adjust electode of spark plug and valves clearance, inspect oil path, and clean carbon deposit on head of piston and cylinder head if needed. Do a complete engine inspect and maintenance according to service manual before normal driving.

0～500km: Do not run engine at ⩾50% throttle position;do not change speed frequently; do not run engine at a fixed throttle position; Avoid sudden acceleration; Turn throttle slowly.

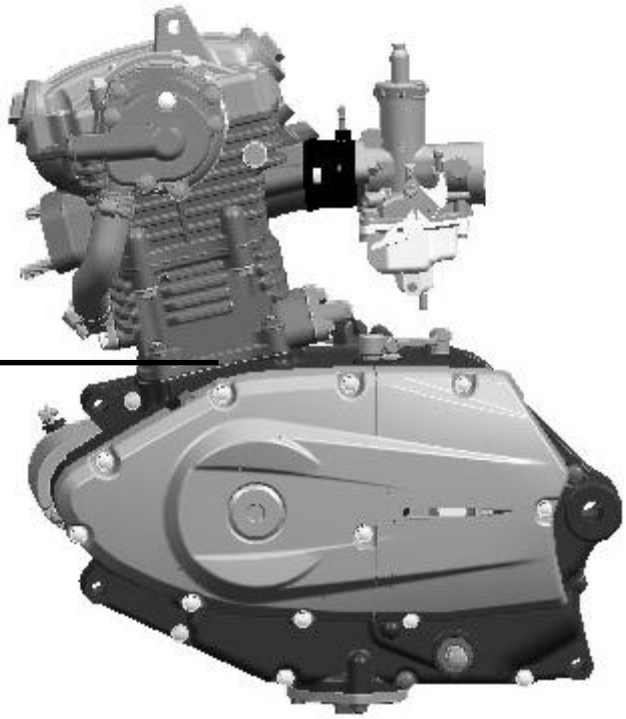
500～1000km： Do not run engine at ⩾75% throttle position for long time.

Attenion： ·Do regular repair and maintenance during break-in period, if any troubles, please remove it immediately.

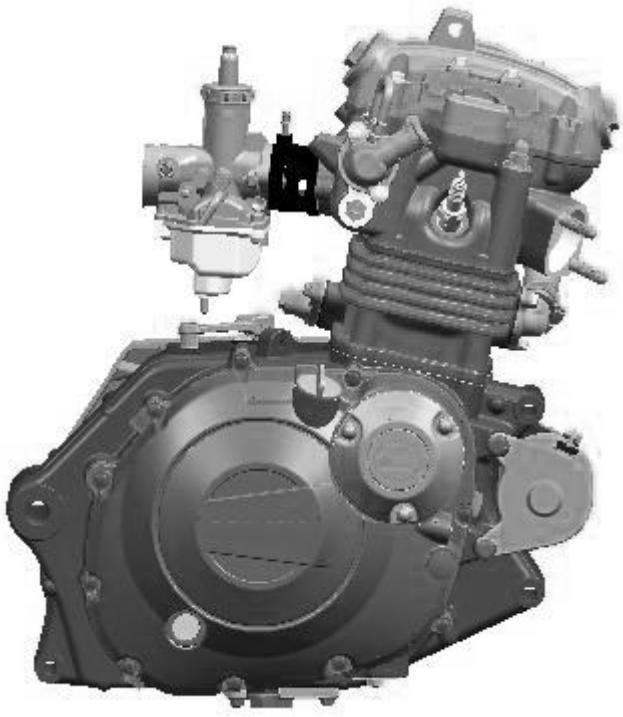
·After break-in, do a complete maintenance and drive normally.

Location of Engine serial Number

Left side view



Right side view



Engine technical specifications

Item No.	Item				Specifications
1	Engine type				Single cylinder, 4-stroke,water-cooled, 2 valves and SOHC
2	Bore×Stroke				57mm×56.8mm
3	Displacement				144.9ml
4	Compression ratio				9.8：1
5	Idle speed				1500±150r/min
6	Starting mode				Carburetor
7	Electric system	Ignition type			CDI
		Spark plug & gap			CR9EP/0.8-0.9mm
		Flywheel			3-phase AC (rotor and stator)
8	Combustion system	Type			Triangular
		Air filter			Sponge element
		Gasoline			RQ-90
9	Valves system	Valve type			SOHC/ Chain drive
10	Lubrication system	Type			Pressure splash
		Oil pump			Rotor drive
		Filter element			Full-flow paper element
		Oil grade			SAE10W－40/SF
11	Cooling system	Cooling type			Close-loop recycle cooling
		Coolant type			-35？ anti-freezing and anti-corrosive
12	Transmission system	Clutch type			Wet and multi-disc manual clutch
		Transimission type			Constant mesh
		Number of gears shift			5 gears
		Type and order of gear shifting			Mechanical reciprocating /1-0-2-3-4-5-4-3-2-0-1
		Transimission ratio	Primary ratio		3.471
			Secondary ratio	1 gear	3
				2 gear	1.857
				3 gear	1.368
				4 gear	1.143
				5 gear	0.957
13	Dimension				L×W×H（mm）：386×311×439
14	Net weight				27.5kg
15	Drive mode				Chain drive
16	Rotation direction of output shaft				Anti-clockwise from left side view when goes forward

Service data

Valves & cylinder head **(mm)**

Item	Standard data		Service data	Remarks
Dia. Of valve stem	IN.	27.5	—	
	EX.	24	—	
Valve clearance (cold engine)	IN.	0.06-0.08	—	
	EX.	0.1-0.13	—	
Clearance between valve guide bush and valve stem	IN.	0.01-0.037	—	
	EX.	0.03-0.057	—	
Inner dia. Of valve guide bush	IN. & EX	5-5.012	—	
Outer dia. Of valve stem	IN.	4.975-4.990	—	
	EX.	4.955-4.970	—	
Run-out of valve stem	IN. & EX	0.03	0.05	
Length of valve stem end	IN. & EX	5.3-5.5/4.8-5.0	4.8/4.3	
Thickness of valve head	IN. & EX	0.5/0.8	—	
Seal run-out of valve head	IN. & EX	0.03	—	
Seal width of valve seat	IN. & EX	0.9-1.1	—	
Free length of valve spring	Inner spring	32.54	31	
	Outer spring	34.98	32.5	
Elasticity of valve spring	Inner spring	33.7-44..3N when compressed to 26.78mm	—	
	Outer spring	88.6-104N when compressed to 29.78mm	—	
Height of cam.	IN.	33.67	—	
	EX	33.314	—	
Clearance between outer dia. Of camshaft and camshaft hole	φ22	0.032-0.066	0.150	
Outer dia. Of camshaft	φ22	21.959-21.980	—	
Inner dia. Of camshaft hole	φ22	22.012-22.025	—	
Run-out of camshaft	0.008		—	
Dia. Of rocker arm shaft	IN. & EX	11.977-11.995	—	
Inner dia. Of rocker arm shaft hole	IN. & EX	12-12.018	—	
Flatness of contact surface of cylinder head	0.03		—	
Flatness of contact surface of cylinder head cover	0.03		—	

Cylinder/Piston/Piston ring/Crankshaft (mm)

Item	Standard data		Service date	Remarks
Cylinder pressure	1200kPa		—	
Clearance between piston and cylinder	0.02-0.04		—	
Dia. Of piston shirt	56.97-56.99 7mm away from piston skirt end where measured		—	
Inner dia. Of cylinder	57-57.019		—	
Flatness of cylinder contact surface	0.02		—	
Free open cut of piston ring	1-ring	R ≈7	—	
	2-ring	R ≈7	—	
Close clearance of piston ring	1-ring	0.15-0.25	—	
	2-ring	0.15-0.25	—	
Clearance between piston ring and piston groove	1-ring	0.015-0.05	—	
	2-ring	0.015-0.05	—	
Thickness of piston ring	1-ring	0.97-0.99	—	
	2-ring	0.97-0.99	—	
Width of piston groove	1-ring	1.005-1.02	—	
	2-ring	1.005-1.02	—	
	Oil ring	1.86-1.96	—	
Inner dia. Of piston pin hole	15.002-15.008		—	
Outer dia. Of piston pin	14.994-15.000		—	
Inner dia. Of connecting rod small end	15.006-15.014		—	
Clearance of connecting rod big end	0.15-0.45		—	
Thickness of connecting rod big end	15.95-16.00		—	
Run-out of crankshaft	0.04		—	

Lubricating system

Item	Standard data		Service data	Remarks
Clearance between oil pump inner rotor and outer rotor	0.08mm-0.15mm		—	
Clearance between oil pump outer rotor and hole of oil pump body	0.15mm-0.193mm		—	
Oil pressure	10-30kPa when at 3000r/min		—	
Oil type	SAE10W－40，API Sf or SG		—	
Oil capacity	When change oil	1200ml	—	
	When replace oil filter	1250ml	—	
	When engine overhaul	1450ml	—	

Clutch+Transimission **(mm)**

Item		Standard value	Service limit	Remarks
Drive disc of clutch		2.9-3.1	2.8	
Number of drive disc		5		
Driven disc of clutch		1.5-1.6	—	
Distortion of driven disc			0.10	
Number of driven disc		4		
Free length of clutch spring		30.4-31.6	29.5	
Numer of spring		5		
Adjustment of clutch screw		Finish rotation of screw and return circle of 1/4-1/2		
Thickness of gear slot	No. 1 and No. 2 gear	5-5.15	—	
	No. 3 gear	5.5-5.65	—	
Thickness of gear shifter fork	No. 1 and No. 2 gear	4.8-4.9	—	
	No. 3 gear	5.3-5.4	—	

Cooling system **(mm)**

Item	Standard value		Limit value	Remarks
Temperature of thermostat opening	68-74℃		—	
Travel of thermostat valve	When 95℃, 3.5-4.5mm		—	
Pressure of radiator cover opening	108kPa		—	
Alarming switch of water temperature	Type	0030-022600		
	Temperature when Switch “ON”	116℃~120℃		
	Temperature when Switch “OFF”	116℃~112℃		
	Resistance （when 25℃）	⩾1MΩ		
Coolant type	-30℃ anti-freezing and anti-corrosive and high-boiling point		—	

Air intake system

Item	Standard data	Remarks
Carburetor type	CPZ27	
Choke size (mm)	ø24	
Idle speed（r/min）	1500 ±150	

Electric system

Item		Standard data	Remarks
Spark plug	Type	CR9EP	
	Gap	0.8-0.9	
Charicteristic of spark plug		＞8mm，1 Mpa	
Resistance of ignition coil	Primary	4±0.2 Ω	
	Secondary	15±10 kΩ	
Resistance of flywheel coil	Pick-up	110±11 Ω	
Voltage with no-load of flywheel （cold engine）		＞50V(AC)，5000 r/min	
Max. power of flywheel		140W，6000 r/min	
Voltage of regulator		13.5V-15.0V ， 5000 r/min	
Peak voltage of primary ignition coil		12V	
Peak voltage of pick-up coil		＞1.5V	
Resistance of starter relay		3Ω-5Ω	

157MJ-2A Engine tightening torque table

Item	Qty	Dia. Of thread（mm）	Torque （N.m）	Remarks
Bolt, crankcase	12	M6	10～12	
Bolt, oil pump	3	M6	10～12	
Bolt plug, oil view hole	1	M12×1.25	18～25	
Bolt cover, front left side cover	1	M26×1.5	28～32	
Bolt, tensioner plate	1	M8	18～25	
Bolt, overriding clutch	3	M8	28～32	Apply locking glues
Nut, flywheel	1	M10	65～75	Apply locking glues
Nut, crankshaft	1	M16×1.5（L）	85～95	
Nut, clutch	1	M16	55～65	Apply locking glues
Bolt, flywheel stator	3	M6	16～20	Apply locking glues
Bolt, pick-up	2	M5	10～12	
Drain bolt, crankcase	1	M14×1.25	25～30	
Retainer bolt, crankcase	1	M14×1.25	25～30	
Bolt, oil pass of right side cover	1	M14×1.25	25～30	
Bolt, water pump	1	M6	10～12	
Stud L (connecting crankcase)	2	YM8	7～11	
Stud R (connecting crankcase)	2	YM8	7～11	
Nut, cylinder head	4	M8	28～32	
Switch, water temperature	1	R1/8	8～10	Apply locking glues
Spark plug	1		17～19	
Stud, exhaust	2	M8	25～30	
Bolt, timing sprocket	2	M6-10.9	15～18	Apply locking glues
Adjustable Nut, valve clrearance	2	M6×0.75	10～12	
Other bolts, screws and nuts		M5	6～8	
		M6	10～12	
		M8	18～25	

157MJ-2A Engine repair tools

Meauring gauges				
Item	Tool Name	Specification	Purposes	Remarks
1	Vernier caliper	0-150mm	Measure length and width.	
2	Micrometer	0-25mm	Measure outer diameter of rocker shaft, valve stem and camshaft.	
3	Dial indicator	25-50mm	Measure Max. lift travel of camshaft	
4	Dial indicator	75-100mm	Measure size of piston skirt	
5	Inside caliper		Measure cylinder inner diameter	
6	Internal quick caliper	10-34mm	Measure inner diameter of rocker, piston pin hole and small end hole of connecting rod	
7	Dial indicator	1/100	Measure run-out	
8	Knife-edge Steel Ruler		Measure surface flatness	
9	Feeler gauge		Measure surface flatness and adjust valve clrearance	
10	Plastigauge		Measure clearance	
11	Spring balance		Measure spring elasticity	
12	Tachometer		Measure engine RPM	
13	Cylinder pressure gauge	0-2MPa	Measure cylinder pressure	
14	Oil pressure gauge		Measure oil pressure	
15	Barometer		Measure open pressure of radiator cap	
16	Ohmmeter		Measure resistance and voltage	
17	Amperemeter		Measure current/switch “ON” or “OFF”	
18	Thermometer		Meaure coolant temperature	
19	Ignition timing light		Check ignition timing	
20	Torquemeasuring wrench	One set	Measure tightening torque	
Common and auxiliary tools				
22	Alcohol burner		Heating	
23	Megnetic stand		Install dial indicator	
24	Flat plate		Help for measurement	
25	V-block		Measure vibration	
26	Tweezers		Install valve clips	
27	Circlip pliers		Remove and install circlips	
28	Nipper pliers		Remove and install circlips	
29	Shock starter		Remove cross bolts	
30	Straight screwdriver			
31	Cross screwdriver		Remove cross screws	
32	Wrench sleeves	One set	Remove bolts and nuts	
33	Internal hexagonal wrench			

Special tools

Item No.	Tool name	Specifications	Purpose	Remarks
1	Special wrench for spark plug		Remove/install spark plug	
2	Rotation stopper wrench for clutch		Remove/install nut of clutch or nut of crankshaft	
3	Remover for piston pin		Remove piston pin	
4	Puller for flywheel rotor		Remove flywheel rotor	
5	Compression tool for valve spring		Remove/install valve spring	
6	Grinder for valve		Grind valve	
7	Install tool for bearing	One set	Install bearing and oil seal	
8	Remove tool for bearing	One set	Remove bearing	
9	Remove tool for oil seal		Remove oil seal	
10	Stopper wrench for flywheel		Remove flywheel	

Engine lubricating materials and other materials

There are lubricants (such as oil), grease (butter) , coolant, sealant and glues.

Item	Specifications	Applied areas	Remarks
Engine oil	Grade: SAE15W-40 Or API: SF or SG	Moving parts inside cylinder Moving parts inside crankcase Moving parts inside cylinder head Lubricating diagram please see page 4-11 Oil grade please see page 1-17	Oil Capacity 1200m L（Change oil） 1250 m L（Replace oil filter） 1450 m L（Engine overhaul）
Lubricant oil with molybdenum		Piston pin, valve stem, valve seal, camshaft	
Grease/butter	#3 grease with MoS_2 lithium	Seal lips, o-ring and other rubber seals, bearing	
Coolant	-35℃anti-freezing, anti-corrosive and high-boiling point	Cooling system	Volume defined by radiator
Sealants		Contact surface between crankcase, cylinder and cylinder head	
Locking glues of screw		Some screw or bolt threads	

Overhaul information.....2-1
Seat，rear rack.....2-2
Front protective cover(LH&RH)、side cover(LH&RH).... 2-3
Fuel tank 2-4
Top cover of tail Light 2-5
Rear license bracket、rear flector、rear mudguard.....2-6
Front fenderchain cover.....2-7
Lock seat,helmet lock.....2-8
Headlight cover.....2-9
Muffler,(L/R)triangular panel.....2-10
Cable,plastic parts.....2-11

Overhaul information

Caution

Gasoline is highly flammable, therefore smoke and fire are strictly forbidden in the work place. Special attention should also be paid to sparks. Gasoline may also be explosive when it is vaporized, so operation should be done in a well-ventilated place.
Remove and Install muffler after it is fully cold.

1.This chapter here introduce operation of disassemble and assemble for cover material muffler and fuel tank .
2.Hoses, cables and wiring should be routed properly.
3.Replace the gasket with a new one after muffler is removed.
4.After muffler is installed, check if there is any exhaust leakage.

Tightening torque

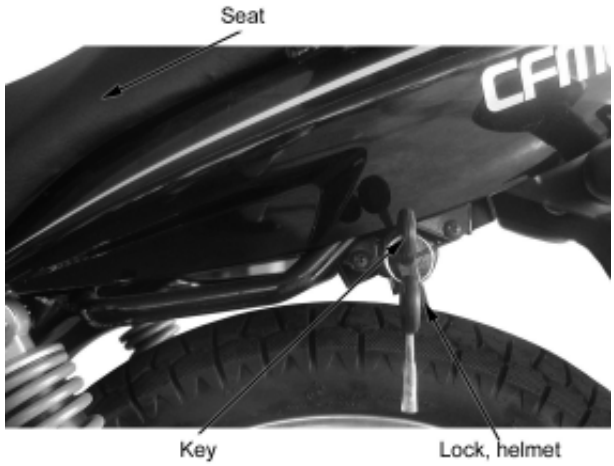
Bolt of tailight/brake light cover	1.8N.m(0.18kgf.m)
Bolt of turning light cover	1.8N.m(0.18kgf.m)

Trouble shooting

Too big noise of muffler
1.Muffler breakage
2.Exhaust gas leakage

Not powerful
1.Muffler deformation
2.Exhaust gas leakage
3.Muffler blocked

Seat



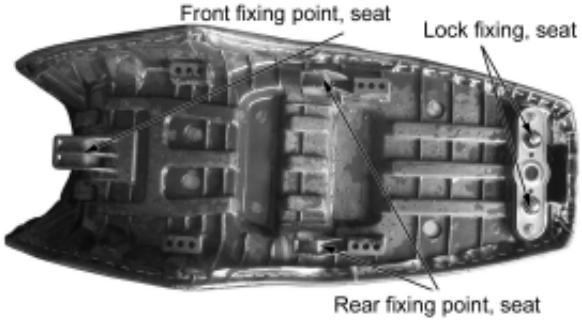
Remove

Inset key to helmat lock

Turning the key 90 degrees in clockwise ,while seat is broken away from seat lock ,pull out seat.

Installation

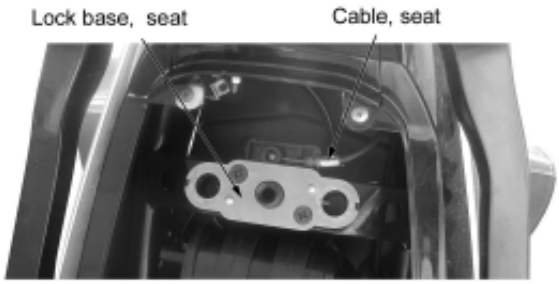
Reverse the removal procedures for installation.



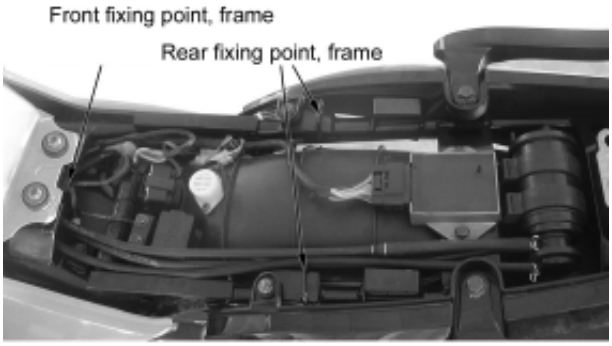
Caution

Make sure there is no deviation of

the seat by shaking it after installation .



Rear rack

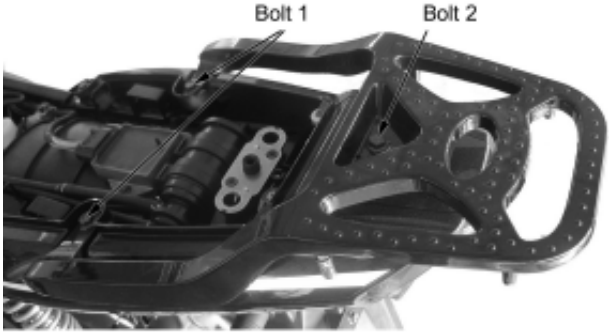


Remove

--two bolt 1

--one bolt 2

Remove rear rack



Installation

Reverse the removal procedures for installation.

Left,Right front protect cover

Remove

--2 bolt

Pull along protect cover,until break away from hanger of fuel tank ,then renmove left¡¢right front protect cover .

Installation

Reverse the removal procedure for installation .

Caution

Adjusting front cover in perfect position before installation.

Middle guard board(left)

Remove

Remove seat

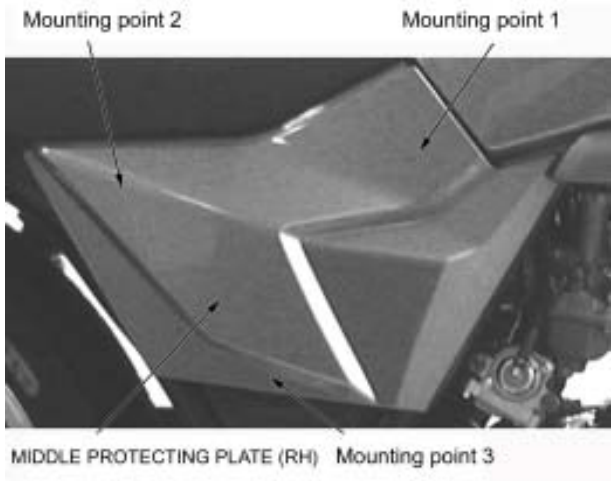
Opening fix point 1

Opening fix point 2

Pull back,up left middle guard board, until break away from fix point 3,then remove left middle guard board.

Installation

Reverse the removal procedures for installation.



Middle guard board(right)

Remove

Remove seat

Opening fix point 1

Opening fix point 2

Pull back,up right middle guard board, until break away from fix point 3,then remove right middle guard board.

Installation

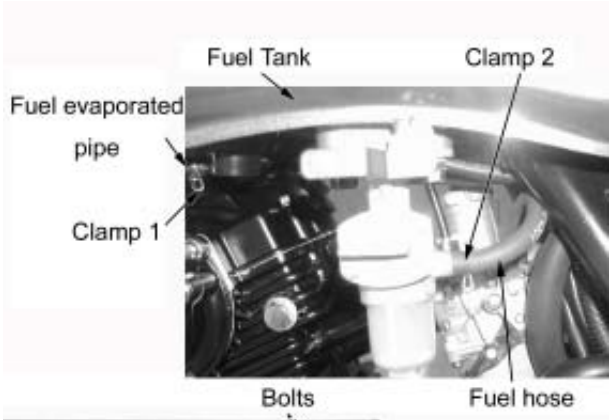
Reverse the removal procedure for installation.

Fuel tank

Remove

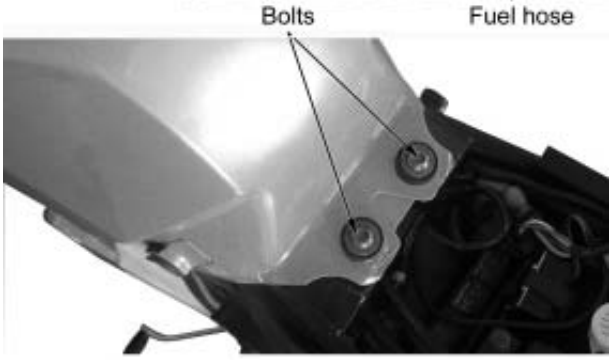
Remove seat,left&right front protect cover , left&right middle guard board

Loosen 2 hoops and remove fuel oil steam pipe I and oil pipe.



Caution

Make sure fuel switch off before removing oil pipe.

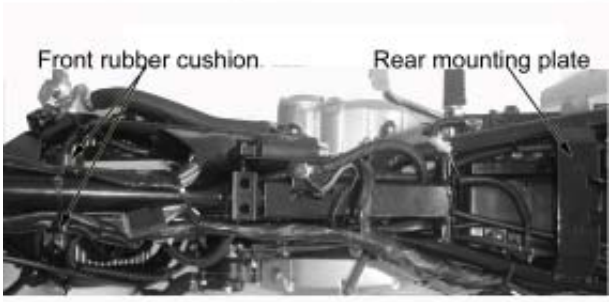


Loosen 2 bolts

Pull back fuel tank,until front supporter of fuel tank is broken away from cushion rubbermat, then lift front part of fuel tank up 30 degrees, util it breaks away from frame.

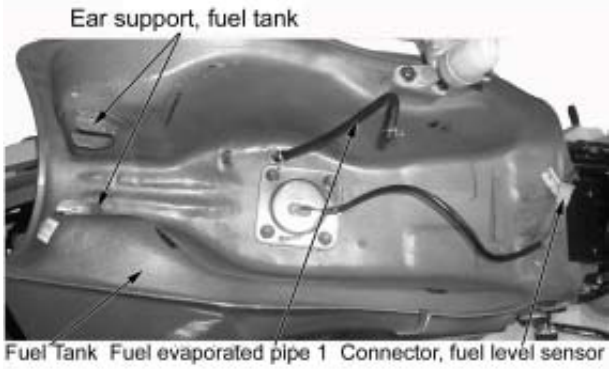
Remove connection of oil line sensor

Remove fuel tank



Installation

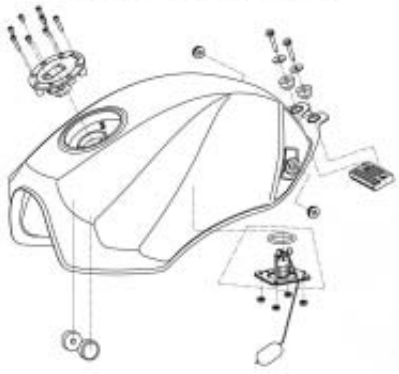
Reverse the removal procedures for installation.



Caution

Fixing connectors of fuel level sensor ,fuel evaporated pipe and fuel pipe before fixing fuel tank

Exploded view, fuel tank



FUEL TANK exploded view

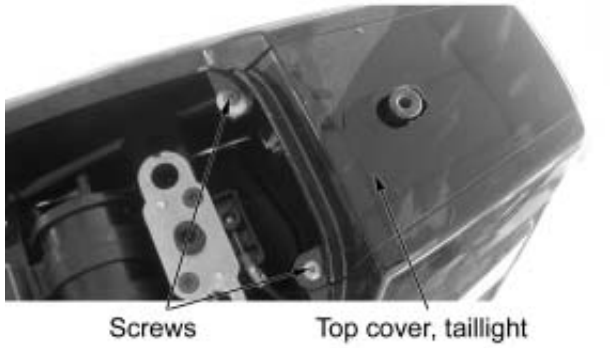
Top cover ,tail light

Remove

Remov seat,rear rack

Loosen tapping screw,pulling back tail light top cover

Remove top cover of tail light



Installation

Reverse the removal procedures for installation.

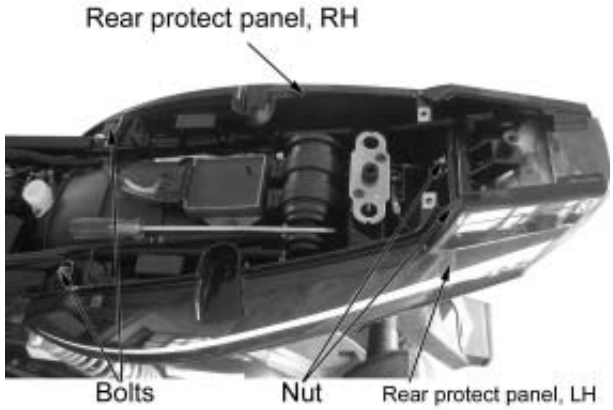
Backpalte(LH&RH)

Remove

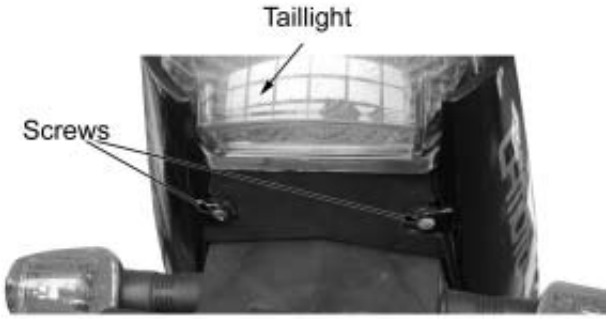
Remove seat,rear rack

Remove top cover of tail light

Loosen 2 bolts &2 nuts



Loosen 2 tapping screws



Pull back backplate(L&R)and tail light

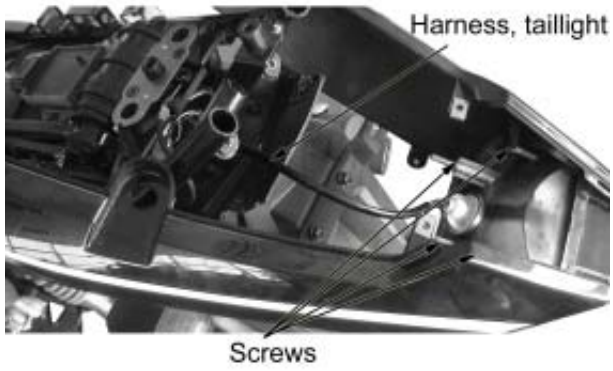
Pull up connector of tail light cable

Loosen 4 tapping screws

Remove backplate(L&R)

Installation

Reverse the removal procedures for installation.



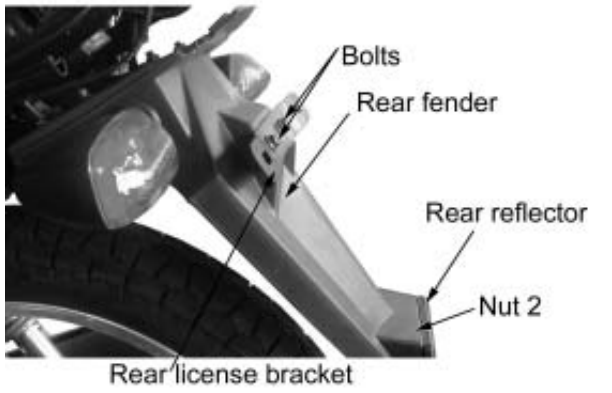
Rear license bracket&rear reflector&rear fender

Remove

Remove seat,rack,top coverof tail light and backplate(L&R) in turn.

Loosen 2 bolts (fix nut 1 at the back of fender with spanner),remove rear license bracket

Loosen nut 2,remove rear reflector



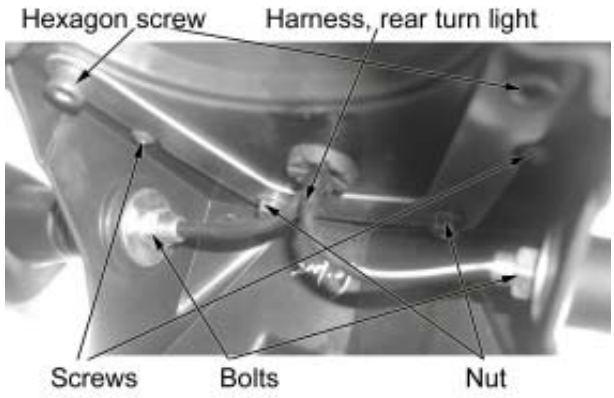
Loosen 2 screws

Loosen 2 bolts

Loosen 2 screws

Pull up connector of rear turn light cable

Remove rear fender



Installation

Reverse the removal procedure for installation.

Rear innerfender

Remove

Remove seat,rack,top cover of tail light and backplate(L&R) in turn .

rear fender

Loosen 2 bolts

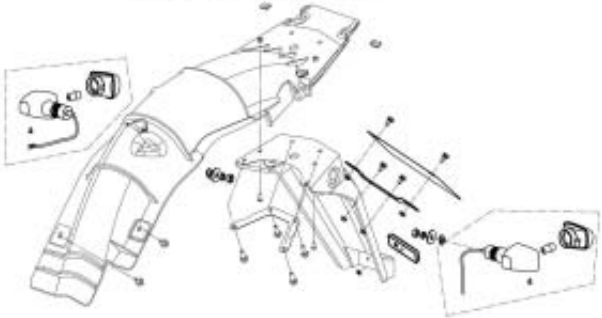
Remove rear innerfender

Installation

Reverse the removal procedures for installation.

FENDER exploded view (R)

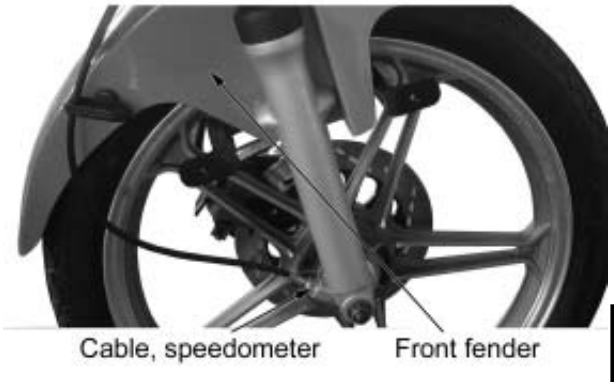
Exploded view, fender



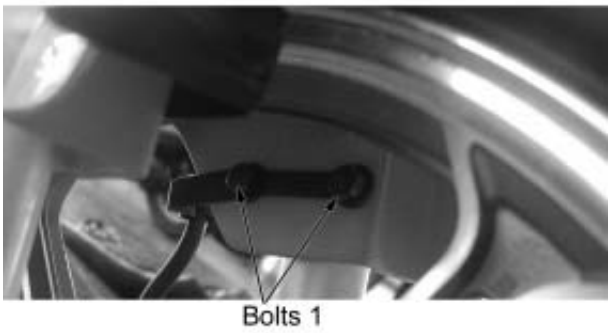
Front fender

Remove

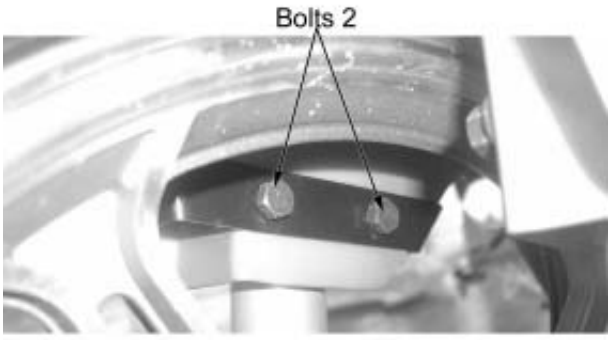
Loosen threaded sleeve(arrows of flexible shaft ,autometer),remove flexible shaft of autometer



Loosen 2 bolts 1 at left inboard of front fender



Loosen 2 bolts 2 at right inboard of front fender remove front fender



Installation

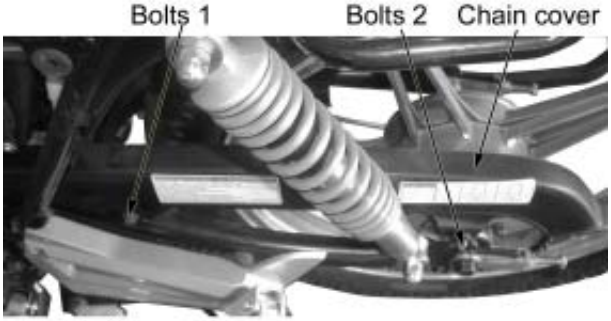
Reverse the removal procedures for installation.

Cover of chain

Loosen botl 1

Loosen botl 2

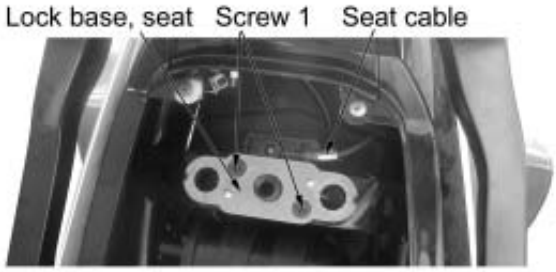
Pull it up ,remove chain cover



Installation

Reverse the removal procedures for installation.

lock bracket of seat, helmet lock

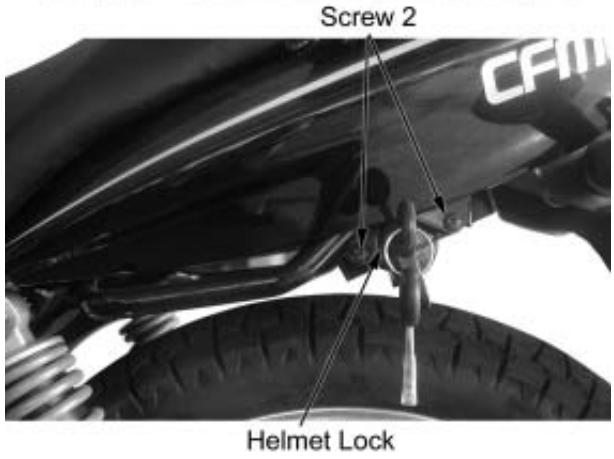


Remove

Loosen 2 screw 1

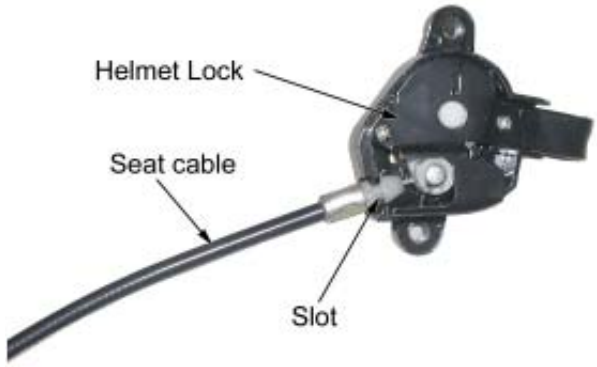
Remove lock bracket

Remove dragline of seat



Loosen screw 2

Remove helmet lock

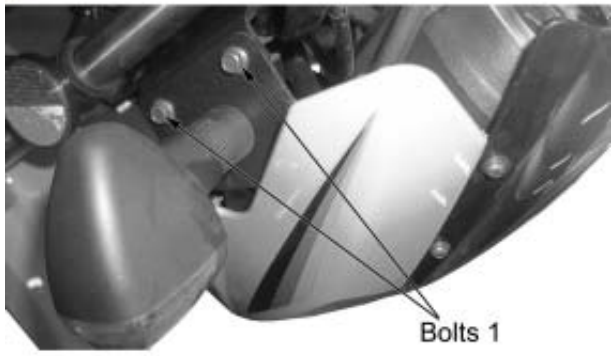


Pull up dragline of seat

Remove the dragline and lock of helmet

Installation

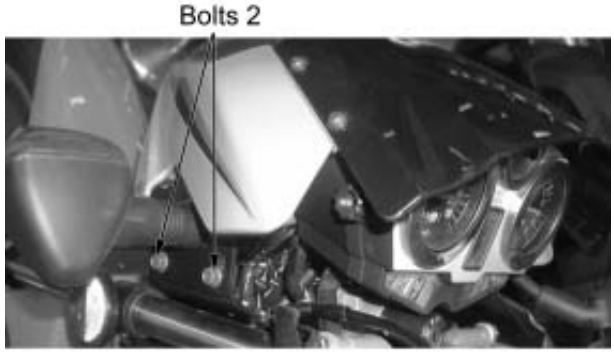
Reverse the removal procedure for installation.



Large shade comp.

Remove

Loosen 2 bolts 1

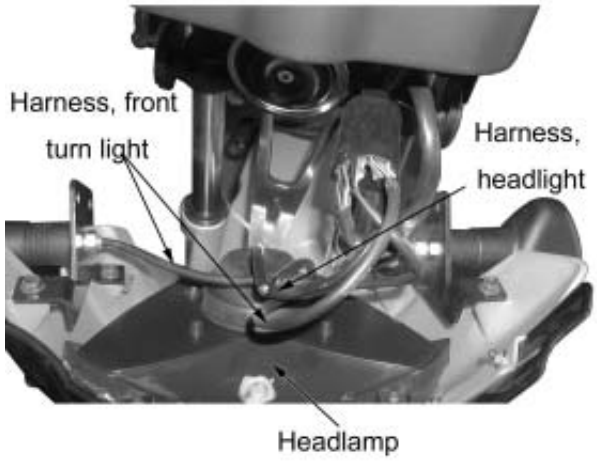


Loosen 2 bolts 2

Loosen 1 bolt 3

Pull up connector of front turn light cable and connector of head light cable

Remove large shade comp.



Installation

Reverse the removal procedures for installation.

Headlight coverRemove

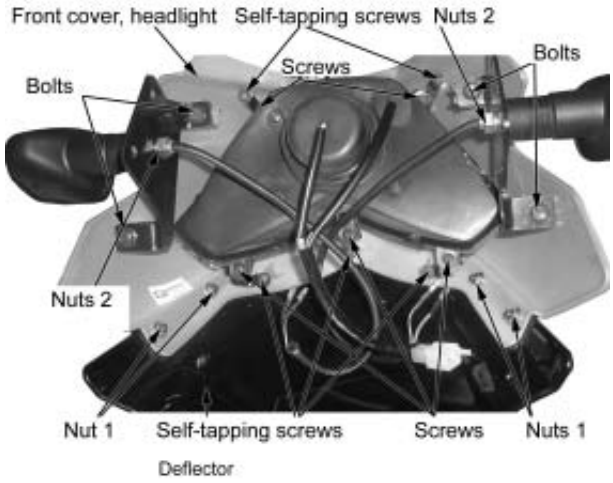
Remove headlight cover

Loosen 4 bolt ,remove front turn light

Loosen 5 tapping screw,5 screw ,remove head light

Loosen 4 nut 1,renmove air deflector and front cover of Headlight

Lloosen nut 2,remove front turn light

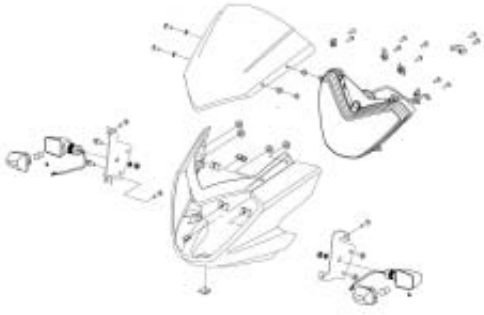


Installation

Reverse the removal procedures for installation.

LARGE SHADE COMP. exploded view (R)

Exploded view, headlight

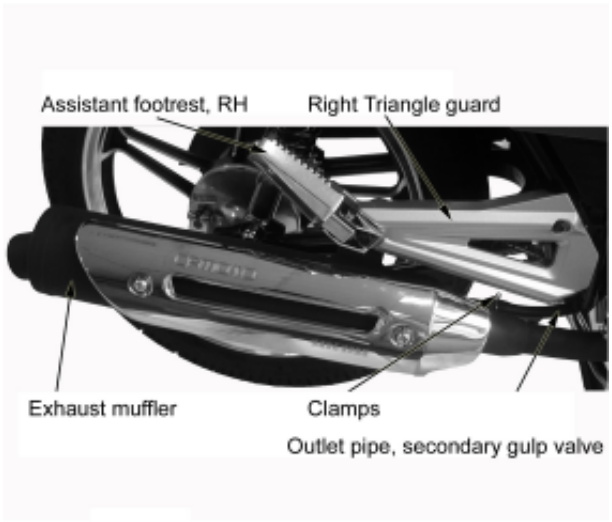


Muffler ,Triangular shield(R)

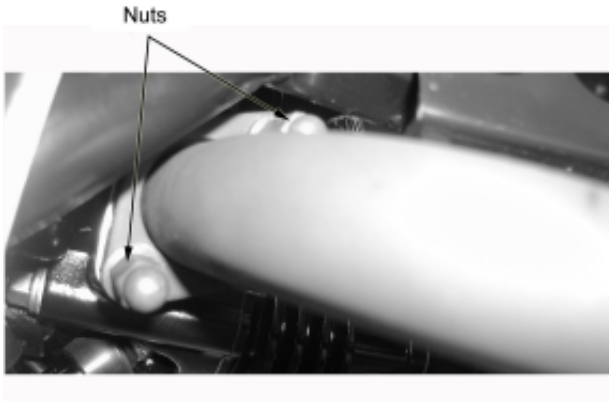
Remove

Remove clip

Remove outlet pipe of gulp valve

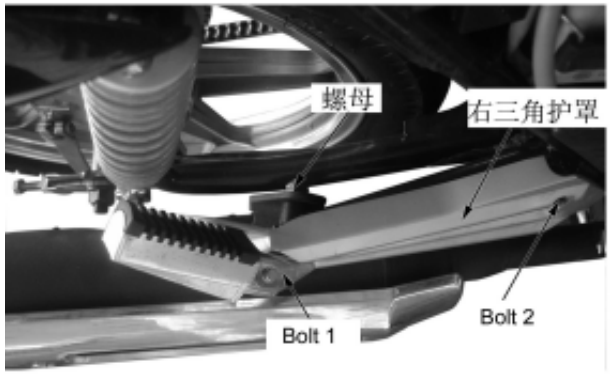


Remove 2 bolts in muffler



Loosen bolt 1 and nut ,remove muffler

Loosen bolt 2,remove triangular shield(R)



Installation

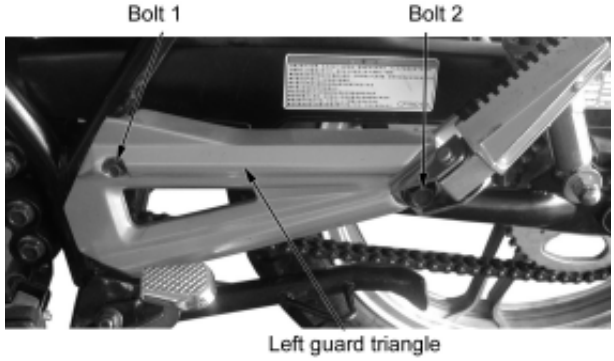
Reverse the removal procedure for installation.

triangular shield (LH)

Lloosen bolt 1

Loosen bolt 2

Remove triangular shield(LH)



Installation

Reverse the removal procedures for installation.

Cable

Remove

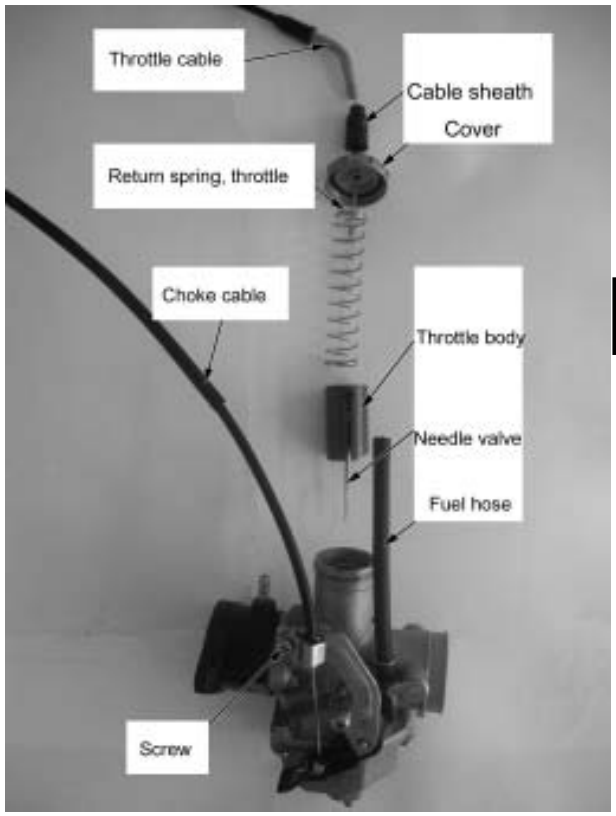
Loosen screw

Remove connector of choke cable out of carburetor,then can remove choke cable

Remove top cover

Press spring of throttle valve

Remove throttle cable out of throttle valve,then can Remove throttle cable



Installation

Reverse the removal procedures for installation.

Attention

You must assemble throttle cable as shown on the assembly

Make sure to protect needle vavle

Layout of Main parts

Maintenance information.....3-1
Periodical replacing parts chart.....3-2
Fuel switch, throttle cable, chain.....3-3
Air filter.....3-4
Rear drum brake, clutch, brake fluid.....3-5
Suspension, bolt, nut, tire.....3-6
Front & rear axle, steering column.....3-6

Maintenance information

Note:

- It is forbidden to run the engine for long time in closed place or place without nice ventilation, because the tail gas contains poisonous elements such as carbon monoxide (CO) etc.
- When the engine just stops, the temperature of muffler and engine is still high; they will burn the skin if they touch it. Uniform with long sleeves and gloves must be worn for operation when overhaul is necessary while the engine just stops.
- Gasoline is easily combustible, so no smoking or naked fire is allowed at the operation site. Not only flames, but also electric sparks shall be avoided. Besides, the vapoured gasoline is explosive, please operate it in the place with nice ventilation.
- Please be cautious that do not let the turning pieces such as driving system etc as well as movable pieces clip your hands or clothes.

Note:

The vehicle must be placed in an even and stable place, raise the vehicle properly with the main support of the vehicle or maintenance bracket.

Periodical replacing parts chart

This motorcycle must do periodical maintenance regularly. Keep motorcycle be clean before doing maintenance.

Timely Inspect, Clean, Adjust, Lubricate or Replace Mark: "I"; Clean: "C"; Replace:"R"; Lubricate:"L"

Without * mark item: user do maintenance by himself. Or go to CFMOTO maintenance station to do maintenance.

With * mark item: do maintenance by CFMOTO maintenance technical person. If user has special tool, replacement parts or maintenance knowledge, he can do maintenance by himself.

With ** mark item: In order to ensure vehicle driving safety, only CFMOTO maintenance technical person do maintenance.

Remark 1：When driving this motorcycle in dust area, maintenance period show must be cut short.

Remark 2：Kilometers on odometer are over the maximal number, periodical maintenance must be done as regulated kilometers as the chart.

Frequency / Irem	Interval	Kilometers(km)（Remark 2）				
		1000km	4000km	8000km	12000km	Remark
*fuel tank, fuel switch, fuel pipe	Daily	Timely maintain or replace, when damage, age or blocking				
*fuel throttle		I	I	I	I	before use
*carburetor & idle		I	I	I	I	
Air filter & element	Remark 1	C	C	R	C	
Spark plug		I	I	R	I	
Engine lubrication oil	New motorcycle must replace, when kilometers on odometer 300km、600km、1000km. After former maintenance, do replacement each 1500 km					
Lubrication oil filter	Annual C	C	C	C	R	
Driving chain, sprocket	Remark 1	each 500km: I、L				
*brake pad		each 1000km: I、R				
**brake fluid		every 2 years: R				
**front & rear brake system	Remark 3	I	I	I	I	before use
*Switch		I	I	I	I	before use
*light, horn		I	I	I	I	before use
*battery	Monthly	I	I	I	I	
Fuse or overload protector		I	I	I	I	
Connecting wire		I	I	I	I	
**throttle adjustment	Remark 3	I	I	I	I	
*clutch		I	I	I	I	before use
*suspension system		I	I	I	I	
*strengthen nut and bolt		I	I	I	I	before use
*wheel		I	I	I	I	before use
**steering column bearing	Remark 3	I	I	I	I	
** engine inspection	Remark 3	I	I	I	I	

Remark 3：Only CFMOTO maintenance Technical person do maintenance and adjustment.

Fuel switch

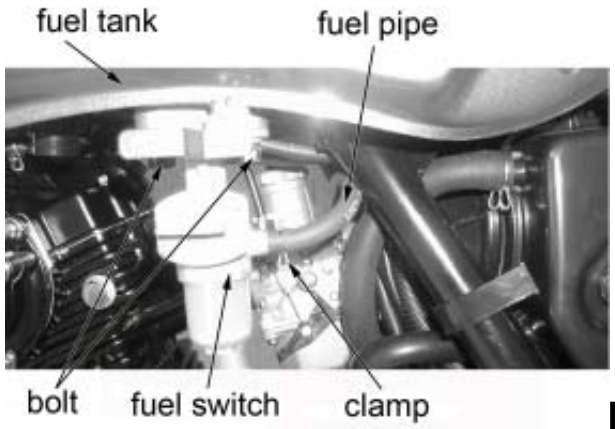
Check the oil pipe for any aging or damage.

In case of any aging or damage with the fuel pipes, replace with new ones.

Check if there is cracks or bending with the vacuum tube.

Replace it with a new one.

Torque:2.5N.m



Warning:

No smoking and fire

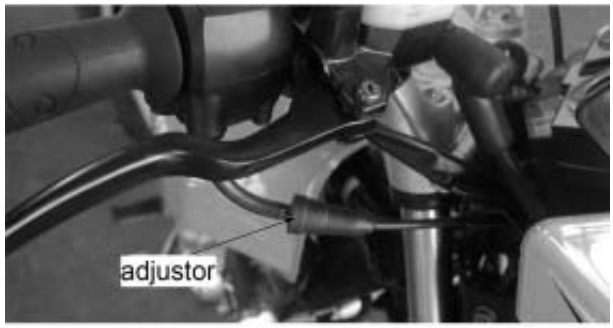
Throttle cable

Turn the throttle handle, and check if it can turn smoothly.

Check the outer clearance of throttle cable.

clearance:2-6mm

Turn adjustor to adjust throttle cable clearance



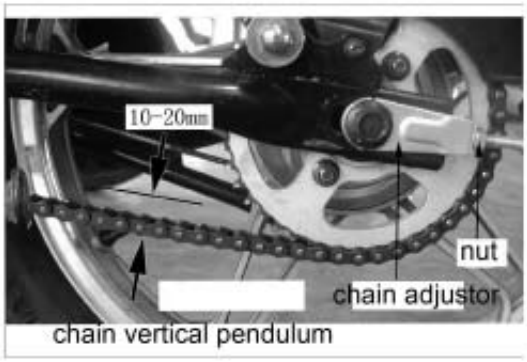
Chain

Inspect transmission chain slackness

slackness:10-20mm

Chain adjustment:

1. loose nut of rear axle
2. loose nut of chain adjustor, adjust left and right chain adjustors to same scale
3. turn rear wheel, check chain slackness
4. fasten adjustort nut, and then fasten rear axle nut

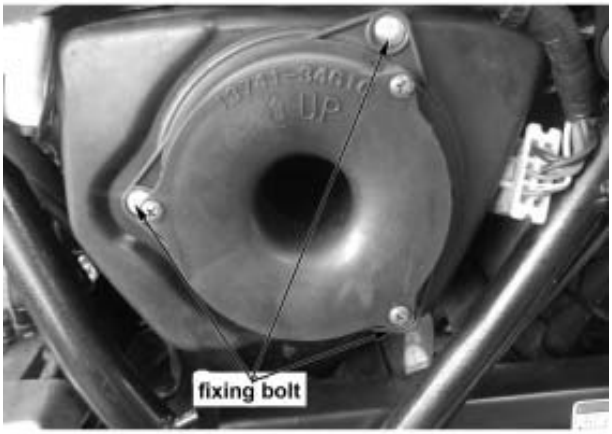


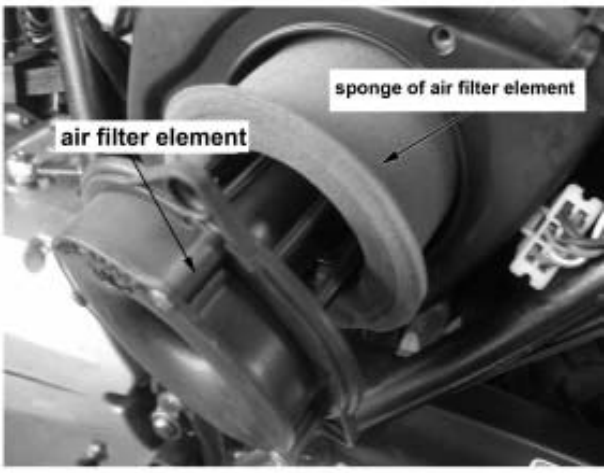
Caution:

After chain adjustment, must inspect clearance of brake pedal.

Air filter

Remove 3 fixing bolts
Take out air filter element
Take out and inspect sponge from air filter element:
1. If damaged, replace
2. If dusty or dirty, clean





Rear drum brake

When step rear brake pedal, mark needle point the limit. It prove that brake shoes have weared completely. Replace new brake shoes timely.

Brake clearance

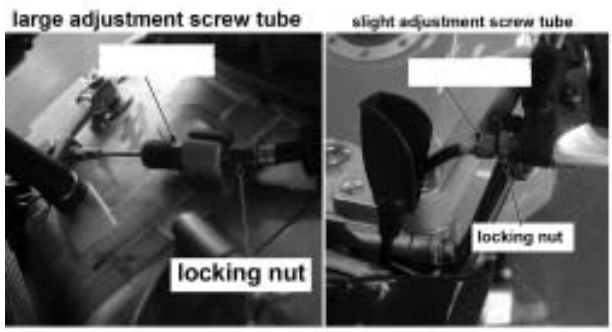
Front(hand) brake clearance:10-20mm

Rear(foot) brake clearance: 10-20mm

Clutch

check clutch clearance:10-20mm

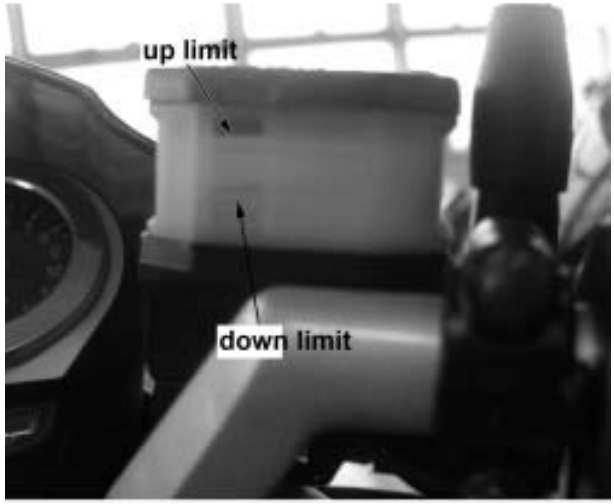
1. large adjustment: loose locking nut, turn large adjustment screw tube and adjust clearance.
2. slight adjustment: loose locking nut, turn slight adjustment crew tube and adjust clearance



Brake fluid

keep steering handle straight, insepect brake fluid level of up brake pump and ensure the level between up limit and down limit.

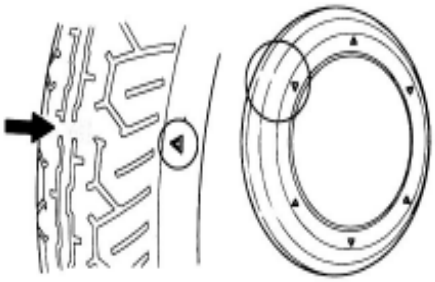
Appointed brake fluid:DOT3 or DOT4 brake fluid



Front suspension

Hold tight the front brake lever, press the front suspension up and down several times.

Check front shock absorber for oil leakage, damage or looseness of the fastening parts.



Rear suspension

Press rear suspension up and dowm and check if rear shock absorbers have big play and every part has abnormal noise or loosen connection

press rear wheel and move it side to side. And check if rear hanging pivot has abnormal noise or loosen connection

pressure under	1 rider			2 riders		
cool condition	kpa	kgf/cm²	psi	kpa	kgf/cm²	psi
front tire	175	1.75	25	175	1.75	25
rear tire	200	2.00	29	225	2.25	33
size	front tire			rear tire		
	2.75-18 42p			3.25-18 52p		

Bolt, Nut

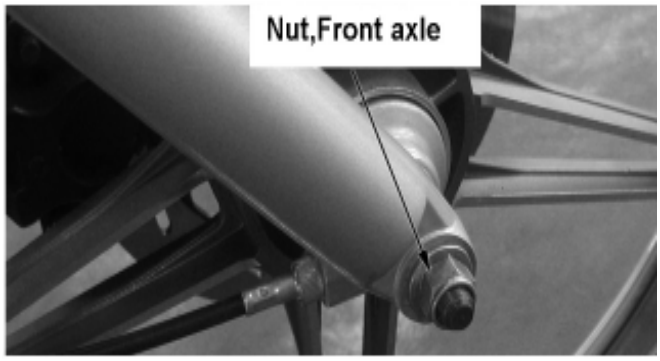
Check if bolts or nuts loosen. If loosen, tighten it as appointed torque.

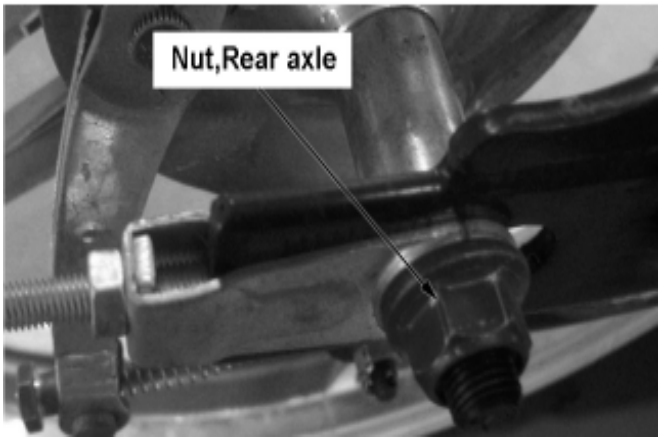
Tire

Inspect tire and check if it has crack or damage

Check the abradability of tire. If the abradability reach the maximum(triangle), replace tire.

Check the tire pressure as right picture as right illustration regulation.





Caution:

check tire pressure when tires are cooled.

Front & Rear axle

check if front axle loose. If loose, tighten it as appointed tourque.

Front axle nut tourque: 60-80N .m

check if rear axle loose. If loose, tighten it as appointed tourque.

Rear axle nut tourque: 80-100N .m

Steering handle

Move steering handle side to side. and check if wires have interference

Trun front wheel, check if front wheel has interference. If front wheel does not move side to side smoothly, check if steering axle tighten or not

Inspection and Adjustment

Inspection Period..... 3-8
Inspectionn and Adjustment process.....3-9
Valve clearance..... 3-9
Engine idling..... 3-10
Spark plug..... 3-10
Air filter..... 3-11
Lubrication system inspection..... 3-12
Cooling system inspection..... 3-14
Cylinder pressure inspection..... 3-15
Engine oil pressure inspection..... 3-16

Inspection period confirmation

It is regular work for engine inspection. Also it is important for normalized maintain and inspection in order to keep well performance, reliable work, economic and durability. It is inspection period for 157MJ-2A as following list.

Note: it is made in the normal situation. Shorten inspection period base on badly situation.

Period / Item	Vehicle odometer	First 200km	Every 2000km	Every 2000km	Remarks
	engine working hours	First 20 hours	Every 40 hours	Every 80 hours	
Valve clearance		I	---	I	Inlet:0.06—0.08 Outlet:0.10—0.13
Idling		I	I	I	1500±150r/min
Spark plug		---	---	I	Without carbon deposit and electrode gap 0.8—0.9mm
		Replace it as every 6000km			
Air filter		---	I	C	Replace it as every 2000km.
Clutch		---	---	I	
Engine oil filter		R	---	R	
Engine oil Replace		R	---	R	
Water volume		I	I	I	
Water pipe		I	I	I	
Cooling liquid change		Replace it as every two years			

I--- Inspection. Adjustment. Replace if necessary.

R---Replace

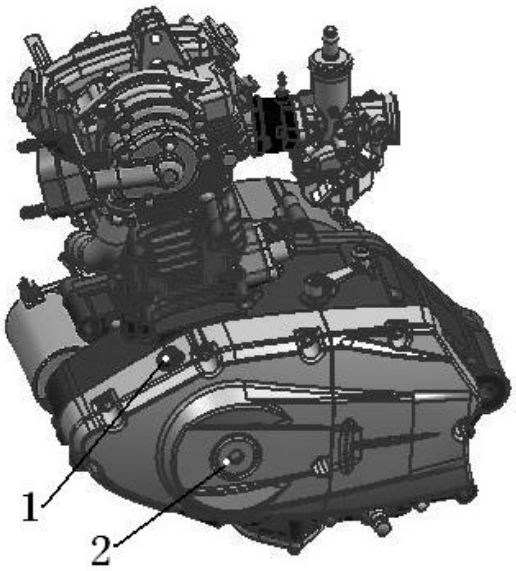
C---- Cleaning

Inspection and Adjustment-process

Introduce detail inspection information base on above item list.

Valve clearance

First inspection for every forty hours after twenty hours running in.hereafter,check one time every forty hours or every 1000km.Must to inspect after remove cylinder cover.



Big noise if big valve clearance,power decrease if small valve clearance.Check valve clearance based on inspection period. if necessary,need to adjust it .Procedures as follows:

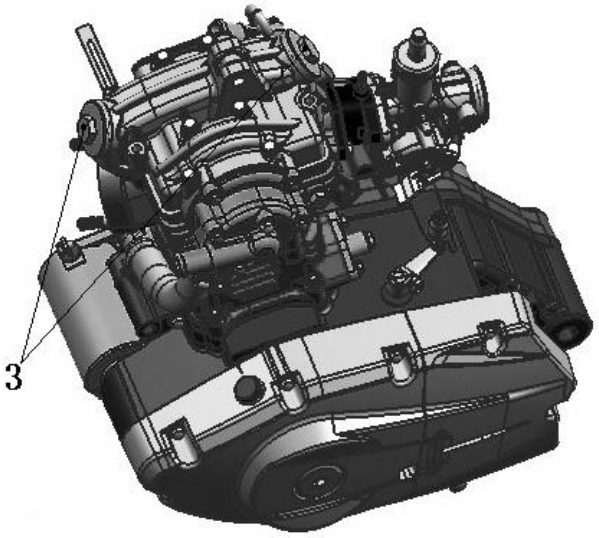
- Remove oilet plug screw 1.
- Remove the bolt of front cover(left)2.
- Remove valve cage cover 3.
- Turn crankshaft through the screw hold of the front cover(left) ,then,adjust the TDC reticle of the flywheel of magnetor to aim at the reticle of up oiletof front cover(left).
- Check the clearance between valve bottom and the adjustable bolt of rocker .

Valve clearance

Cold state of engine
Intake valve:0.06-0.08
exhaust valve:0.10-0.13

Attention:Inspection and adjustment of valve clearance should proceed in the cold state of engine,and in the TDC of pistion by filler gauge.

If valve clearance exceed specified valve,adjust it in the prescribed limit by special tools. Process: loosen adjustable bolt and nut.



Loosen the adjustable bolt and nut of valve clearance, the filler gauge mat between the top of valve (intake valve:0.07mm thickness,exhaust valve:0.12mm) and adjustable valve bolt.tighten the valve adjustable bolt, make slight contact with filler gauge,tighten bolt and nut.

●Pull out the filler gauge and recheck the valve clearance as prescribed limit.otherwise, readjust the valve clearance conformance to requirement.

Valve adjustalbe bolt fastening torque：
10-12N.m

Attention:fasten bolt after fully adjust it.

● Assemble the valve cover 3,bolt cover 2 and oilet bolt 1.

Tool: screwdriver,filter guage.

Engine Idle

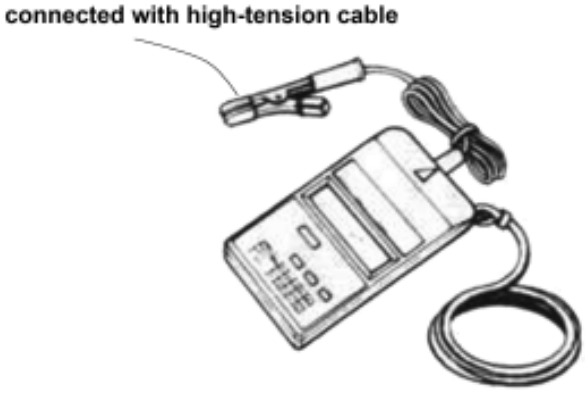
First inspection after 20 hours opeation.then, check one time after every 40 hours or every 1000km.

●Starting engine to fully warming.then,check the engine idling during in 1350r/min-1650r/min by tachometer.

Engine idling:1350r/min-1650r/min

Note:Adjust engine idling after engine warming.

Tool:Tachometer



Spark plug

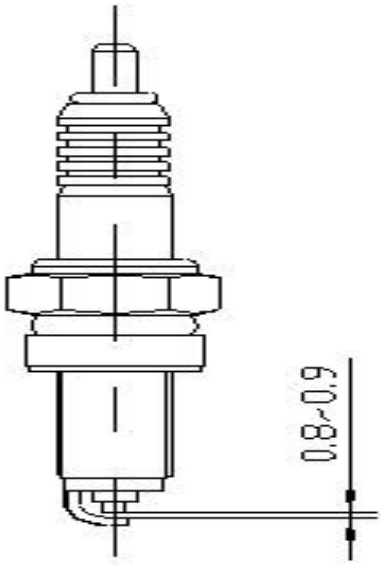
First inspection after 20 hours operated.then, Check one time for every 80 hours or 2000km. change it for every 6000km.

●Remove spark plug by special tools.

Spark plug Spec:CR9EP

●Spark plug inspection:if electrode excessive damage.Insulator breakage or thread damage.change spark plug as new one.

Check carbon deposition of spark plug.if necessay,clear it by proper tools.
Spark plug clearance:check clearance by filler gauge,if exceed limit,adjust it.



Spark plug clearance:0.8-0.9mm

Note

Check thread and extend distance of spark plug after assembled if replace the spark plug. if short.carbon deposition will be faced,even damage the engine.

●Spark plug installation

Note

Tighten the spark plug by hand avoid to damage the thread of cylinder head.then,tighten the spark plug by special tools.
Spark plug tighten torque:17-19N¡¤m

Tool: Spark plug wrench,fitler gauge

Air filter

Check it every 2000km, clean and change it if necessary.

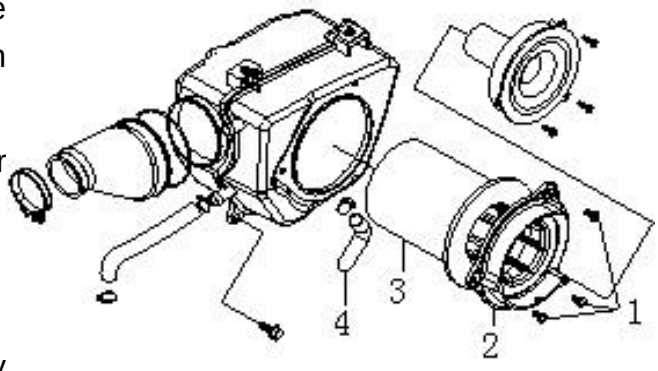
if air filter jamed,less air into,power decrease for engine,high fuel consumption. inspection and clean air filler as follows:

●Loosen bolt 1.remove air inflow seat of air filter 2.

●Take the filter element 3 from 2 .

Clean the filter.

Compress filter to wiping enough water by hand.



Note:Don't warp and damage the filter

Soakage the filter 3 by engine oil.proper crush out enough engine oil and keep filter 3 as slight oiling.

Warning:Don't clean filter by gasoline and low flash point of solvent cleaning

●Check filter of air filter whether it is damaged,if damaged,change the filter.

Note:Keep clean for filter during operation.

Quicken damage if without filter,dirty filter or damanged for working.Frequently clean the filter if working in the dirty situation.

●Check the air inlet,if dust in it,clean it by cleanout fluid.

●Check the oil storage pipe 4,if with oil.clear the oil after take off strap and oil pipe.

1Install the air filter as contrary process.to be sure it is reliably for seal and filter element fixed.

Accessories:cleanout fluid,SAE30 or SAE10W/40 engine oil.

Tool:cross screwdriver,cleaning utensil.

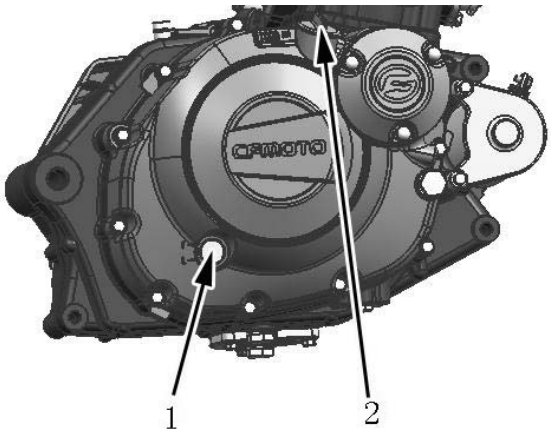
Lubrication system inspection.

Change the engine oil and oil filter after 1000km.Check oil volume for every 1000km, Change engine oil and oil filter for every 3000km.

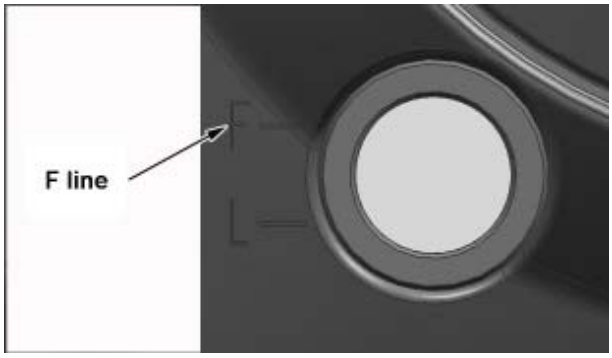
Engine oil volume inspection.

●Horizontal position for engine
(Main stand to support the vehicle.)

●Oil height should keep same level with F line by oil level window.



1.oil level window 2.plug screw of oil filler



●If without engine oil,loosen the bolt 2,add engine oil.keep oil as same level with F line.

Engine Oil:SAE10W/40 SF or SG

Note: Lay engine at horizontal position.

Change engine oil and filter

●Put up vehicle by main stand;

●Engine prewarming by starting.

●Remove oil drain bolt;

●Quickly release all oil before engine cooled;

●Remove three nuts 1 of filter cover 2,remove "O "seal ring 3,filter pressure spring 4,paper filter 5,,from the right side cover 6.

●Change the paper filter 5.put peristome to engine and install it on the right side cover.6.

●Check "O "seal ring before install filter cover 2,whether it is damaged for "O "seal ring 3, filter pressure spring 4 whether it is short shipped,

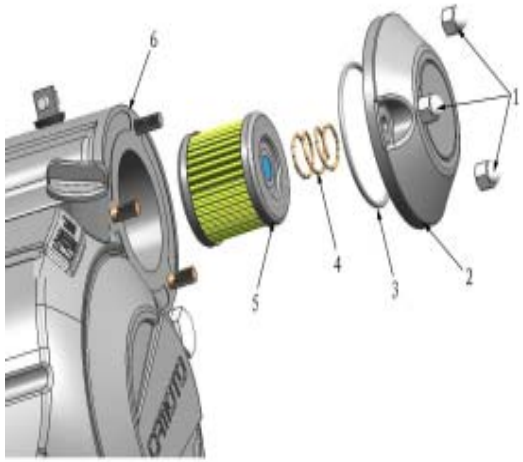
●Install filter cover and tighten nut,but don't more tighten.

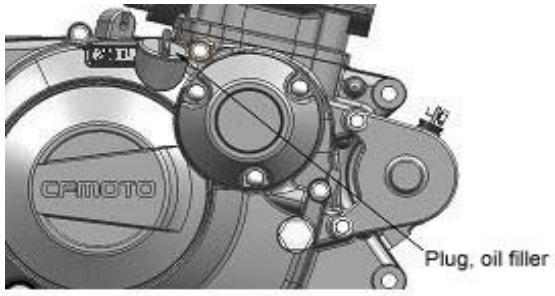
●Tighten up the oil outlet bolt,screw out plug screw of oil filler.

●Fill 1000ml engine oil by oil filler.

●Tighten up plug screw of oil filler.running several seconds while engine starting.

●Check oil level after engine stopped one minute,keep oil level in "F"if its low"F",fill little to "F".Oil volume total 1250ml.





Note:Engine oil should change while heat engine.change oil filter,meanwhile change engine oil.

Engine oil change volume

Only engine oil change: 1.2L

Meanwhile,change oil filter: 1.25L

Engine overhaul: 1.45L

Cooling system inspection

●Check radiator,subsidiary water tank.,clamp situation,leaking situation of cooling liquid,if damaged,change it as new parts.

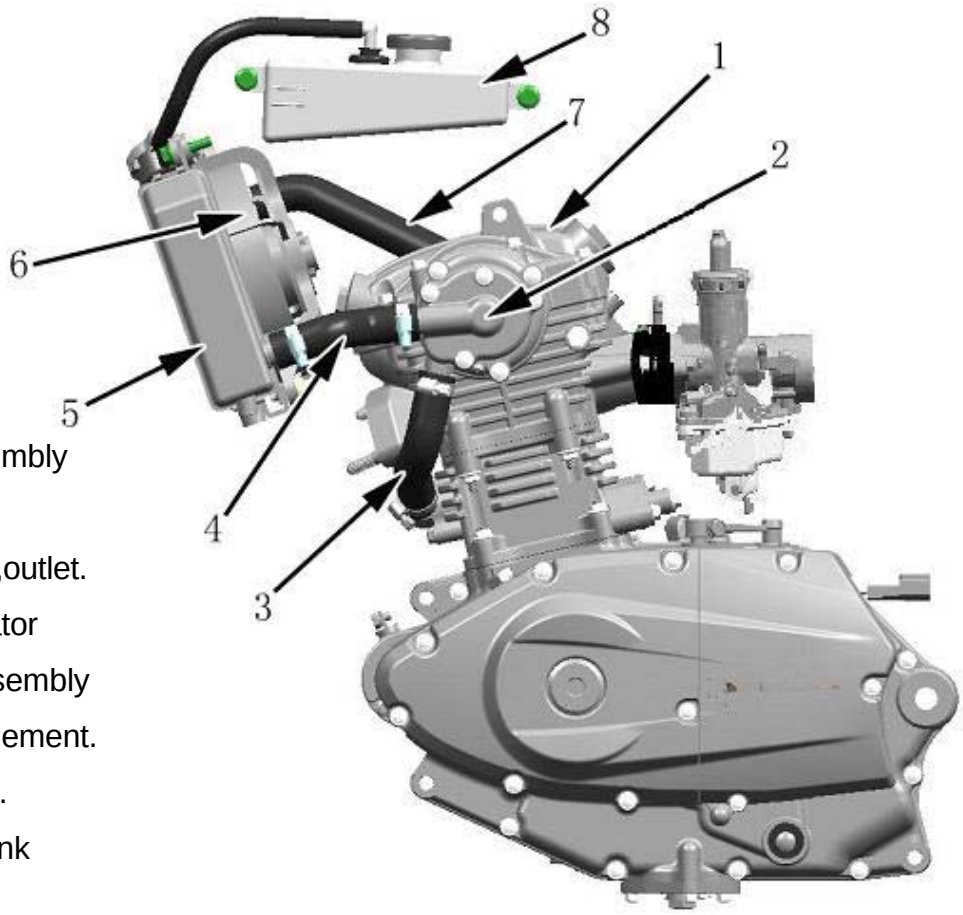
¡ñcheck cooling liquid by observe the height of cooling liquid and up&down scribed line. if below it,fill cooling liquid untill the top level.meanwhile,open the radiator cover,fill cooling liquied into radiator.

Warning:

●Don't open the radiator cover if engine is not cooled,otherwise,you will damaged by water vapor and scalding cooling liquid.

●Cooling liquid is poisonous,don't drink it,don't adhere to skin and eyes.just in case,wash it by water at once,even,go to hospital to treat in time.

●Take care of cooling liquid.Must keep it in the safe place that child couldn't take it.



1.Engine assembly
2.Water pump
3.Water pump,outlet.
4.Outlet,Radiator
5.Radiator assembly
6.Fan motor element.
7.Inlet,radiator.
8.Reservoir tank

Cylinder pressure inspection

It is important indicator for cylinder pressure in cylinder that reflect the stand or fall of engine.must to be checked the cylinder pressure.

Cylinder pressure:1200kPa

Some reasons as follows if lower cylinder pressure.

●Cylinder overworn

●Piston or piston ring scuffing.

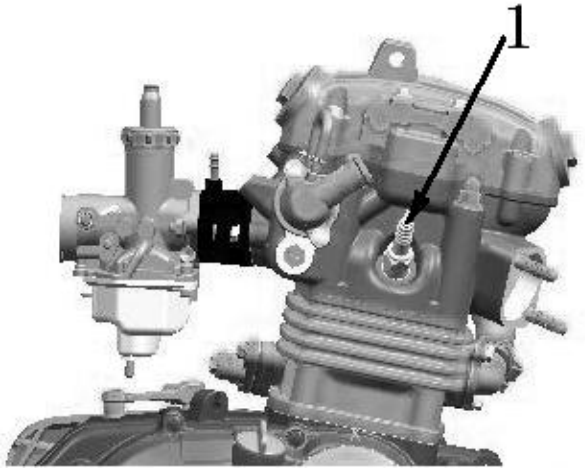
●Piston ring block in the piston ring slot.

●Not strictly closed for valve seat.

●Cylinder head gasket damaged or other defects.

Note:check above situations if lower cylinder pressure.

Note:Cylinder cover bolt whether it is tighten base on special torque,Valve clearance whether it is proper adjusted before check the cylinder pressure..

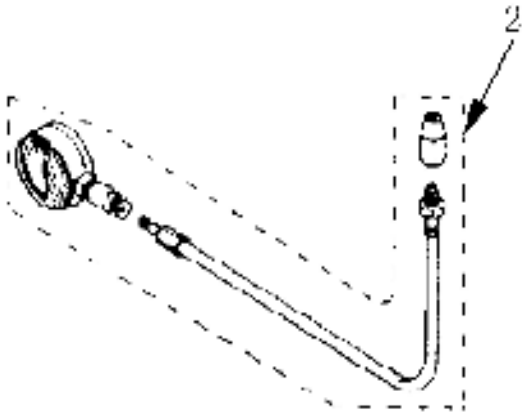


●Warm up engine before inspection

●Confirm that it is fully-powered battery.

●Remove spark plug 1

Install cylinder pressure meter 2 below spark plug hole and tighten nut.



●Keep open full for damper.

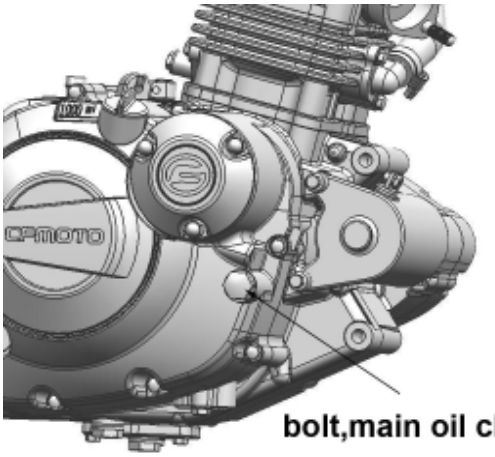
●Turning several seconds after engine started, record the full-scale reading of cylinder pressure.

Tool:cylinder pressure meter,
connector seat.

Engine oil pressure inspection

Engine oil pressure is important indicator to show stand of fall for engine working.

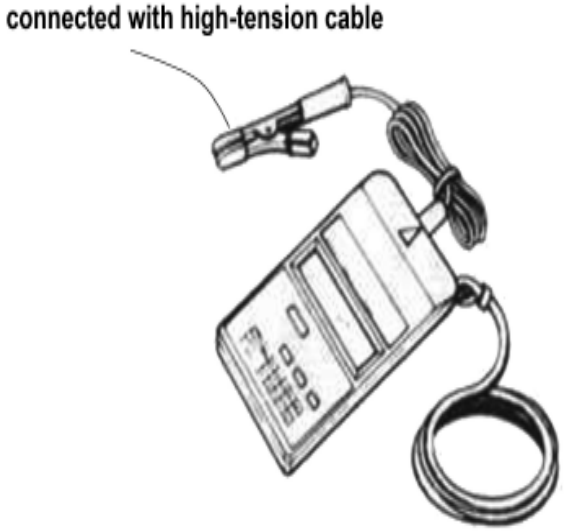
Engine oil pressure:9.8~29.4kPa in 3000r/min



Abnormal situation will be caused dut to Higher or lower engine oil pressure

- ●Too Lower engine oil pressure.
- ●Oil pipe leakage
- ●Oil pump defects.
- ●Above-mentioned combination.

- ●High engine oil pressure.
- ●Engine oile viscosity too high.
- ●Blocking of vitta.
- ●Blocking of oil filter
- ●Above-mentioned combination.



Engine oil pressure inspection process:

●Remove main vitta bolt.

contect tachometer and ignition coil

●Install fuel pressure gauge and contacter seat into main vitta hole.

●Warm up engine as follows

Summer: 10 minutes as 2000r/min

Winter: 20 minutes as 2000r/min

Increase engine speed to 3000r/min after engine warmed,then record the oil pressure reading.

●Apply tighten glue on the bolt of main oil pipe,then tighten the bolt into the screw hole base on special torque.

Tighten torque:23N.m

Tool: Oil gauge, tachometer

Cooling and Lubrication System

Cooling system drawing 4-2
Engine coolant 4-3
Inspection of coolant density 4-3
Inspection and cleaning of Radiator and hose 4-4
Inspection of Fan COMP 4-5
Insepction of Water Temp. Alarm Swith 4-6
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Water Pump 4-7
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Assemble and Install Water Pump 4-10
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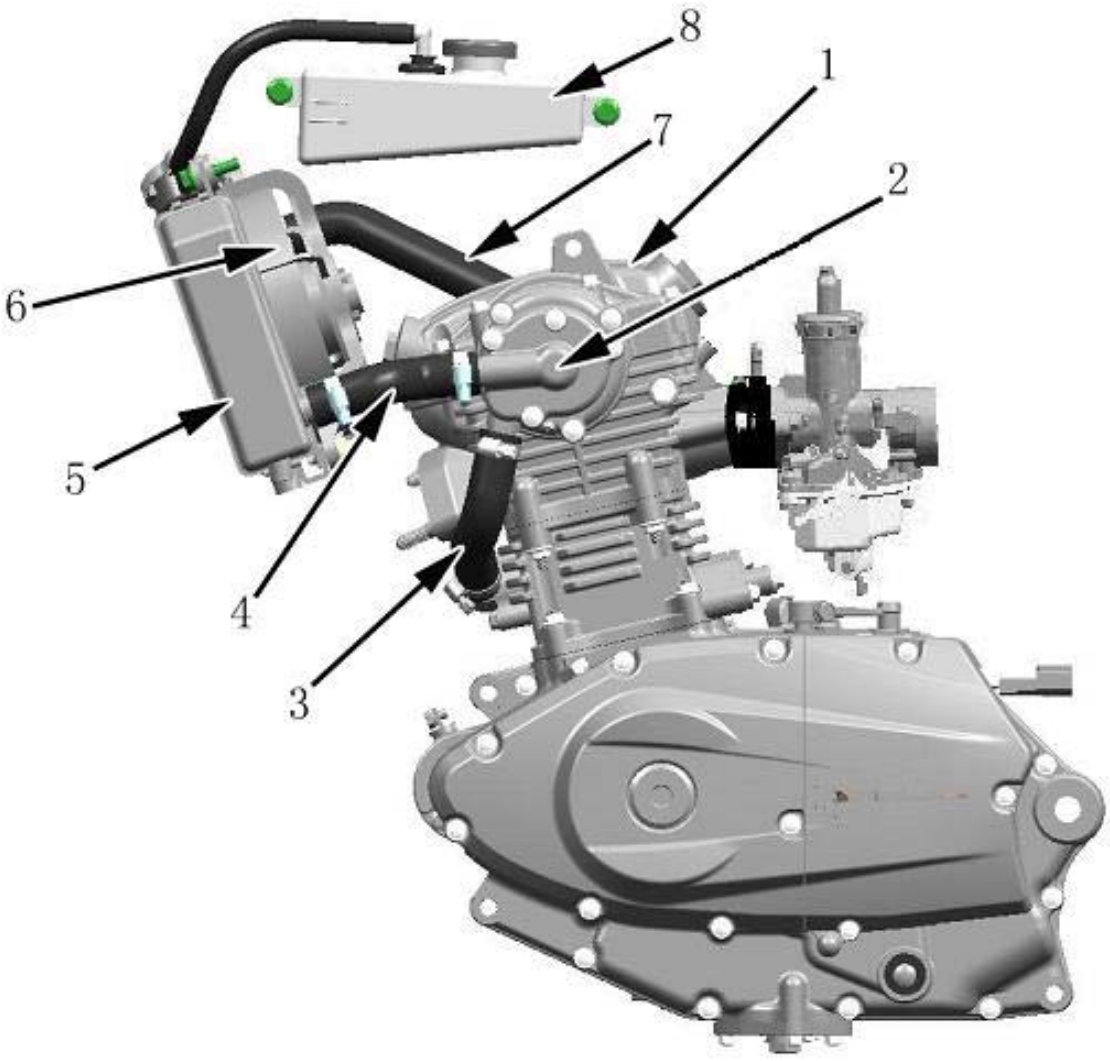
Inspection of Oil Pump 4-12

157MJ-2A engine cooling system

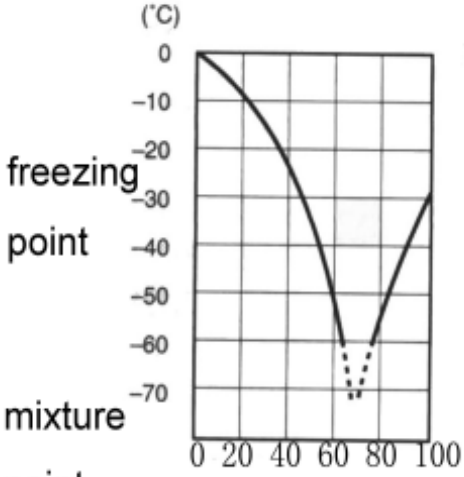


1. Engine COMP.
2. Water Pump COMP.
3. Outlet hose of Water pump
4. Outlet hose of Radiator
5. Radiator Assy
6. Fan Comp.
7. Inlet hose of Radiator
8. Reservoir COMP.

Engine Coolant

●Coolant used in cooling system is mixture of 50% distilled water and 50% ethylene glycol antifreeze. This mixture ratio provides optimized corrosion resistance and fine heat production.Coolant will protect t cooling system from freezing at temperature above -30 degrees,celsius.Mixing ratio of coolant should be increased to 55% or 60% according to the figure on the right.

mixture ratio	freezing point
50%	-30℃
55%	-40℃
60%	-55℃



Warning!

●Use high quality ethylene glycol base antifreeze mixed with distilled water.Never mix alcohol base antifreeze or other different brands of antifreeze

●The ratio of mixture should not be more than 60% or less than 50%

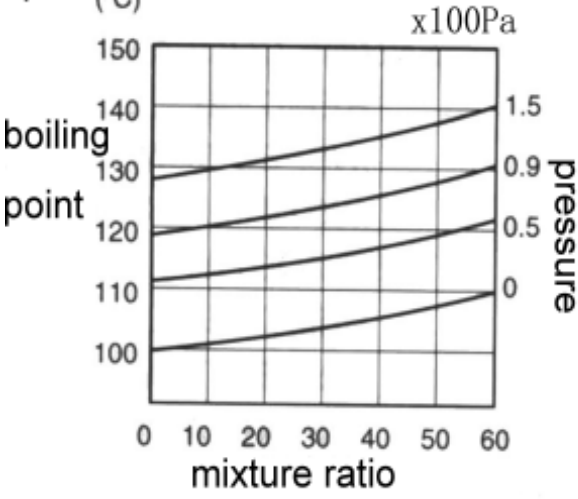
●Do not use anti-leak additive

Warning!

●NEVER open radiator cap when engine is still hot. Or you may be injured by scalding fluid or steam;

●Coolant is harmful.DO NOT swallow or stain your skin or eyes with coolant.In case of the above,flush with plenty of water and consult a doctor if necessary;

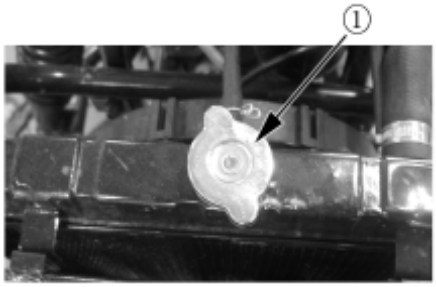
●Keep coolant away from reach of children



Inspection of Cooling Cycle

●Remove radiator cap1 and connect tester2

NEVER open radiator cap when engine is still hot to avoid hurt by scalding fluid or steam;



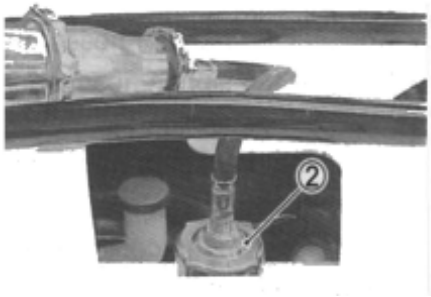
●Apply pressure 105kPa and hold for 10 seconds.

●If pressure drops in 10 seconds,which indicates leakage in cooling cycle.In this case,check the complete system and replace parts when leakage found.

Warning!

●When removing tester,put a rag on radiator filler to prevent splash of coolant

●DO NOT allow testing pressure to exceed radiator cap response pressure.



Inspection and Clean of Radiator and Water Hoses

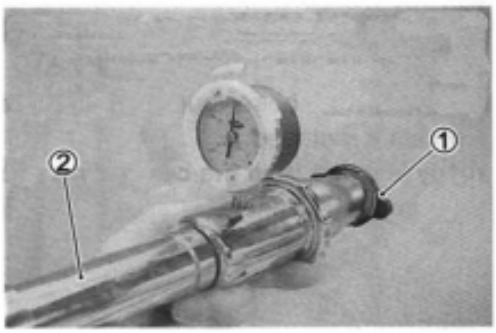
Inspection of Radiator

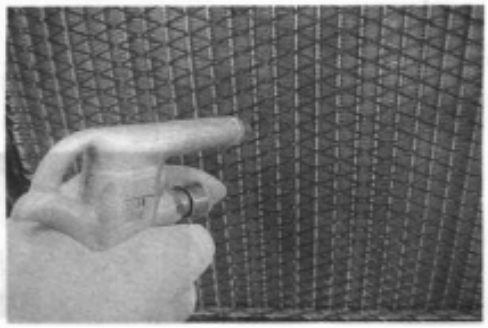
●Remove radiator cap1

●Connect radiator cap to barometer2

●Slowly apply pressure to 93.3~122.7kPa and check if the cap can hold the pressure for at least 10 seconds

● If the cap can not meet the pressure requirement,repalce with new one.

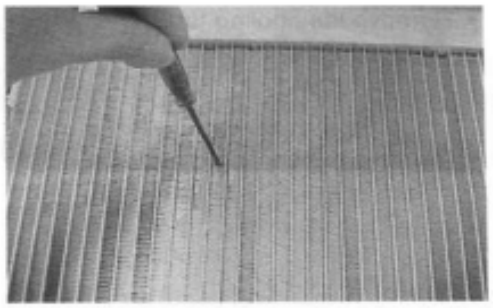




Radiator Cap Opening Pressure:
Standard:93.3~122.9kPa
Tool:Barometer

Inspection and Clean of Radiator

●Remove dirt or trash from radiator with compressed air



●Repair radiator fins with a small screwdriver

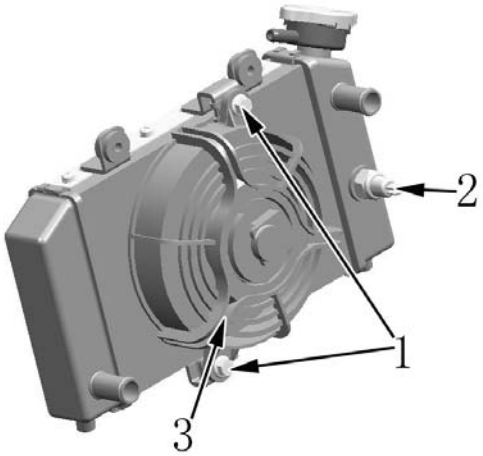
Inspection of Waterhoses

●Check radiator hoses for leakage or damage.If any,replace with new one.

●Check water hose clamps.Replace with new one if any looseness found.

●After inspection and clean of radiator and hoses, check coolant level.Fill coolant if necessary

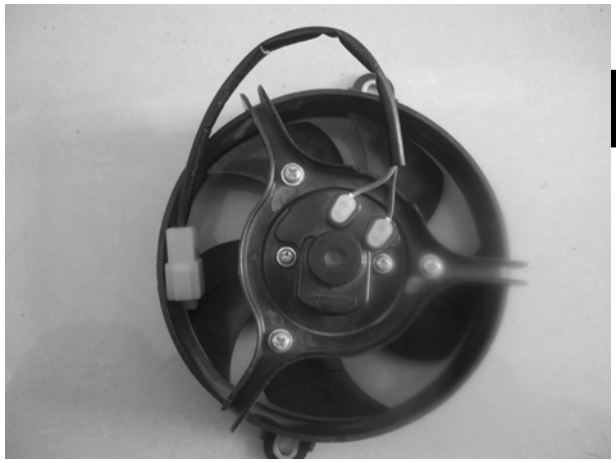
Inspection of Fan Motor



●Release 2 bolts from Fan Motor with socket spanner 1.remove Fan motor from radiator 3 and Thermoswitch 2

●Turn the vanes to check if they can turn smoothly

●Check fan motor as the right chart: battery :12 volts ,motor runs at full speed with ampere not more then 3A indicating in ammeter.If the motor does not work of the ampere exceeds the limit, replace the motor.



●Installation:Apply a little thread locker to the bolts and tighten to the specified torque .

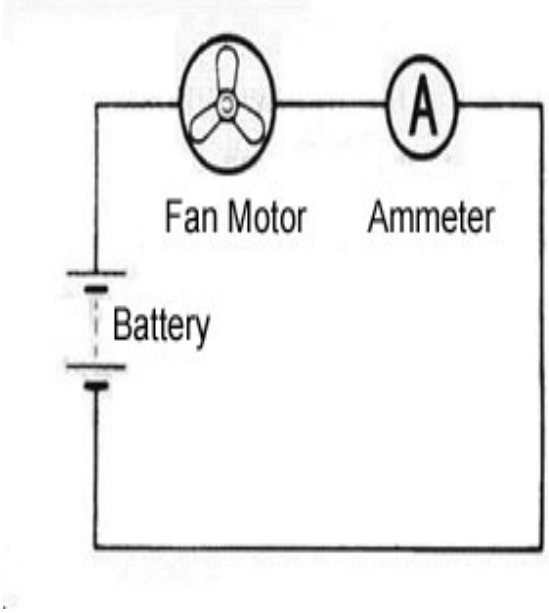
Fan Motor Blot Tightening Torque:10N.m

Inspection of Thermoswitch

●Remove thermoswitch

●Test thermoswit opening and closing temperature as illustrated on the right ,place thermoswitch “1” in a vessel with engine oil above and alcohol burner.

●Heat engine oil to raise temperature slowly and take the reading from thermometer “2” when opening and closing thermoswithch



Tool :Ammeter

Thermoswitch operating Temperature:

(OFF-ON):Approx.88degrees(C)

(ON-OFF):Approx.82degrees(C)

Note:

●Avoid sharp impact on thermoswitch.

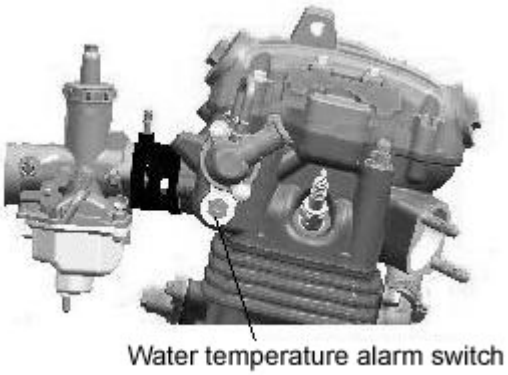
●Avoid contact of the thermoswitch with thermometer or vessel.

●Installation: Change a new O-ring and tighten thermoswitch to the specified torque:

Thermoswitch Tightening Torque:17N.m

●Check coolant level after installation of thermoswitch, Fill coolant if necessary.

Inspection of Water Temp.Alarm switch

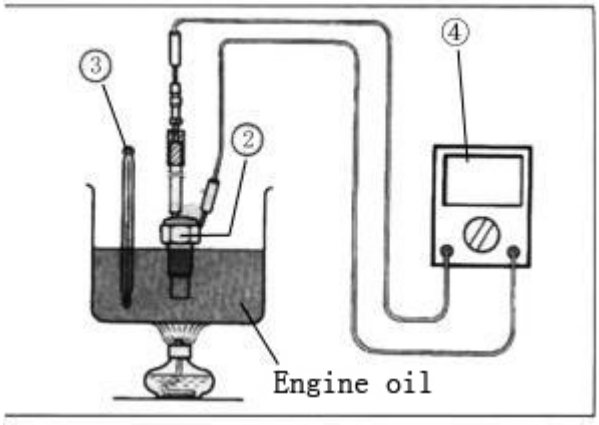


●Remove **Water Temp.Alarm switch**

●Check the resistance of **Water Temp.Alarm switch** as illustrated on the right,Place **Water Temp.Alarm switch** "2"in a vessel with engine oil above an alcohol burner.

●Heat engine oil to raise temperature slowly and take the reading from thermometer when it's opening and closing.

Tool:ohmmeter ,thermometer.

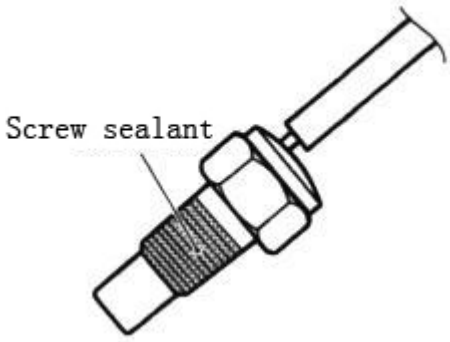


opening and closing table

model	1P52MI-A-022600
ON. Temp.	116℃~120℃
OFF. Temp	116℃~112℃
Resistance (25℃)	≥ 1MΩ

●Installation:Apply a little thread locker before assembling it to the cylinder head by tightening to the specified torque.

Torque :10N. m

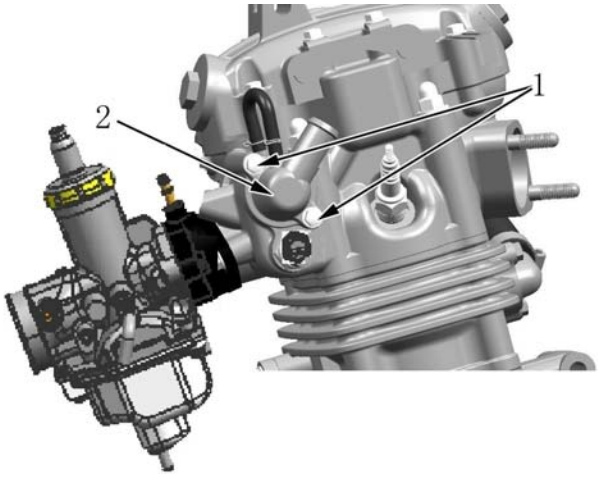


Note

●Avoid sharp impact on water temp. Switch

●Avoid contact of water temp. Switch with thermometer or vessel

●After installation ,check the coolant level, fill coolant if necessary.



Inspection of Thermostat

●remove 2bolts"1" from Thermostat cover Assy.

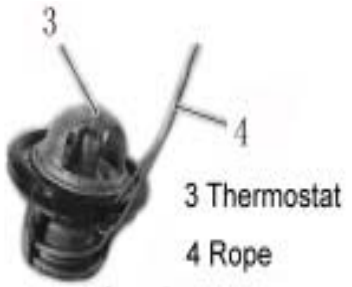
●Remove thermostat cover"2"

●Remove thermostat

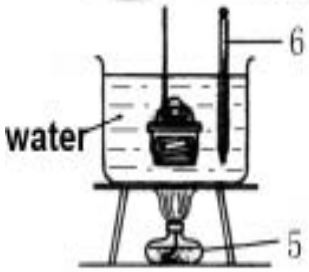
●check the thermostat pellet “3”if any broken ,replace it.

●test thermostat as the following steps:

1.Pass a string through thermostat flange as illustrated on the right



2. Immerse thermostat in a beaker with water. Make sure thermostat is in the suspensed position without contact to the beaker.
Heat water with an alcohol burner and observe the temp. rise on the thermometer.

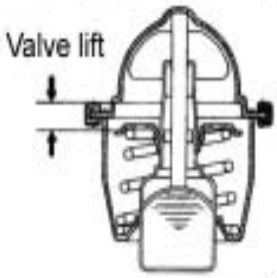


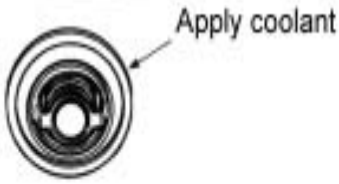
5 Spirit lamp 6 Thermometer

3. Take temperature reading from thermometer when thermostat valve opens
Thermostat Valve Opening Temp. :68-74℃;

4. Keep heating water to specified degree, thermostat valve should have been lifted by 3.5-4.5mm;

standard of thermostat valve lift:
water temp.95℃, lift is:3.5-4.5mm





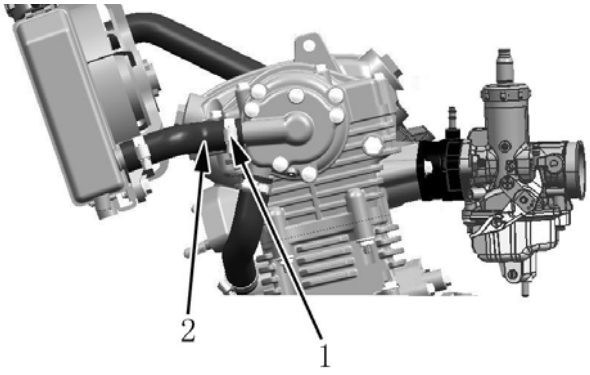
5. If eigher of thermotat opening temperature or thermostat valve lift does not reach the standards, replace it .

●Installation:Reverse the removal procedures for installation

Apply coolant to the rubber seal of thermostat before assembling to the mounting hole.
Tighten to the specified torque to install thermostat cover.
Tightening Torques:10N/m

Water Pump

Removal and Disassembly



●Release hose clamp 1remove hose 2 to drain coolant.

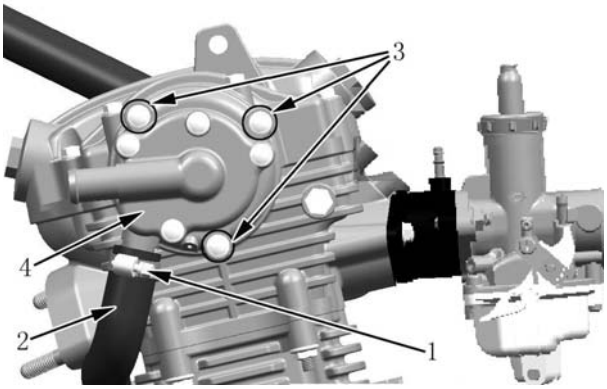
Note

Before draining coolant,check water pump for oil or coolant leakage.In case of oil leakage, check water pump oil seal, O-ring, In case of coolant leakage , check water seal .

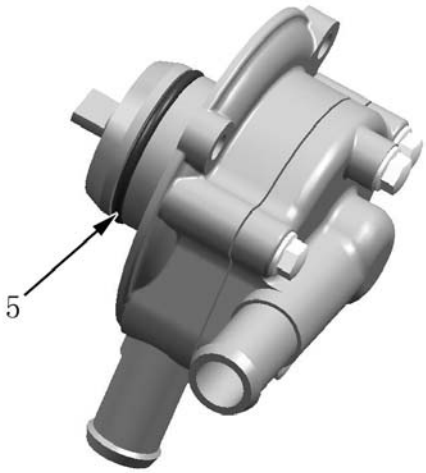
●Release clamp”1”remove water hose “2”

●Remove bolts”3”of water pump

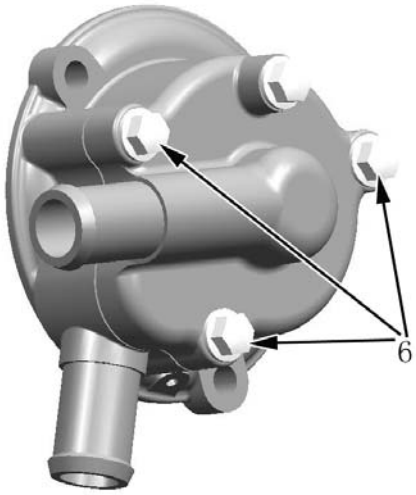
●Remove Water Pump”4”



●Remove O-Ring”5” and checking,replace a new one if broken.



●Release water pump cover screws”6”

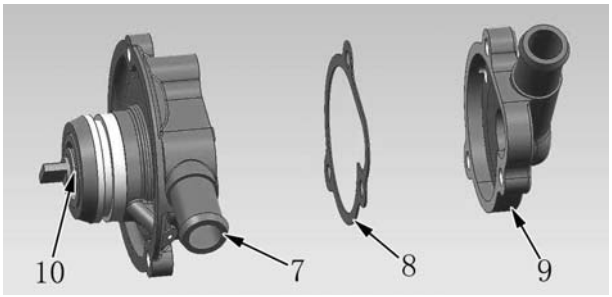


●Remove water pump gasket”8” and cover”9” from water pump body”7”,check the gasket ,replace a new one if broken.

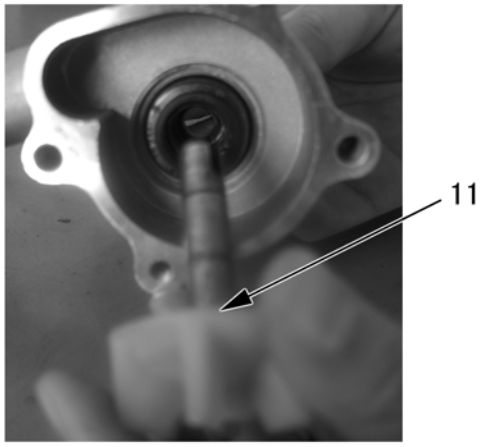
●**Note**

It should be clean up the contact surface of water pump body and cover ,in order to affect the sealing of gasket.

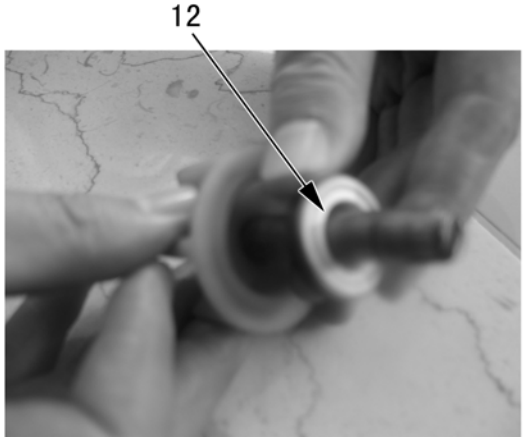
●Release shaft clip “10” which on the water pump shaft with Circlip pliers.



Note:shaft clipmust replaced with new one after disassemble.



●Remove Water Pump Impeller Assy.11;



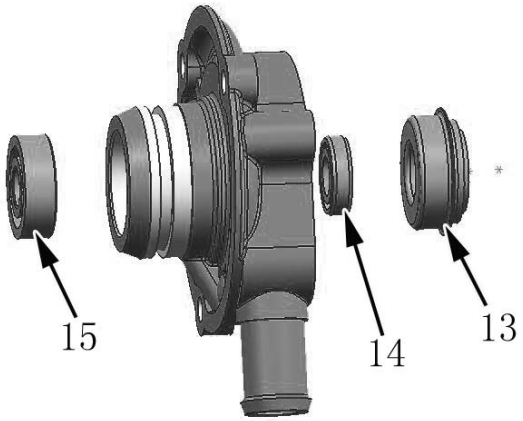
●Remove moving ring seal “12” from impeller.

●Remove stationary ring “13” with special tool.

Note: stationary ring does not need to be removed if no abnormal condition

●Remove oil seal with special tool “14”

Note: Oil seal does not need to be removed if no abnormal condition



●Inspect bearing of water pump if it can work well. In case any problems like blocked, replace it. When do replacement, use bearing puller tool to remove bearing

Note: shaft must be replaced with a new one after disassembly.

Inspection of Water Pump

Bearing：

●Check bearing clearance by hand while it is still in the water pump body.

●Turn inner race of bearing to check for abnormal noise and smooth rotation.

●Repalce bearing if any abnormal condition

Stationary Seal Ring:

●Carefully check stationary seal for damage, especially the seal face.

●IN case of damage or leakage,replace the stationary seal ring,if necessary ,replace moving seal ring.

Moving seal Ring:

●Carefully check Moving seal for damage, especially the seal face;

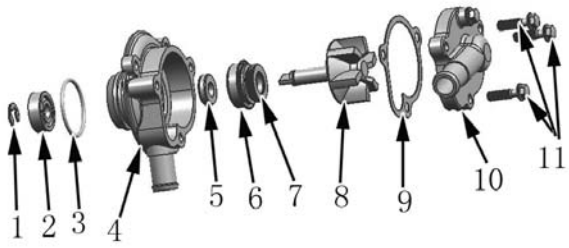
Water Pump Body：

●Check the joint surface of water pump body with bearing and seal ,if damage, replace it .

Water Pump Impeller:

●Check impeller and shaft,if damage,replace with new impeller.

●Check O-ring carfully,if it's damaged,replace it with a new one.



Assembly and installation of water pump

●Install Oil seal 5into water pump 4 with special tool.

●Install Stationary Seal 6 into water pump 4 with special tool.

Note: Apply sealant to side "A " of stationary seal.

●Install bearing 2 into water pump 4.

●Install moving seal 7 on the impeller 8.

Note:side "A"Moving seal is outward.

●Apply grease to impeller shaft

●Install impeller shaft which installed Stationary Seal to water pump body

●Install new ring to water pump shaft 1

●Install new gasket 9 to water pump body

●Install water pump cover 10 and tighten the bolts 11 and bleed bolt

●check impeller for smooth turning

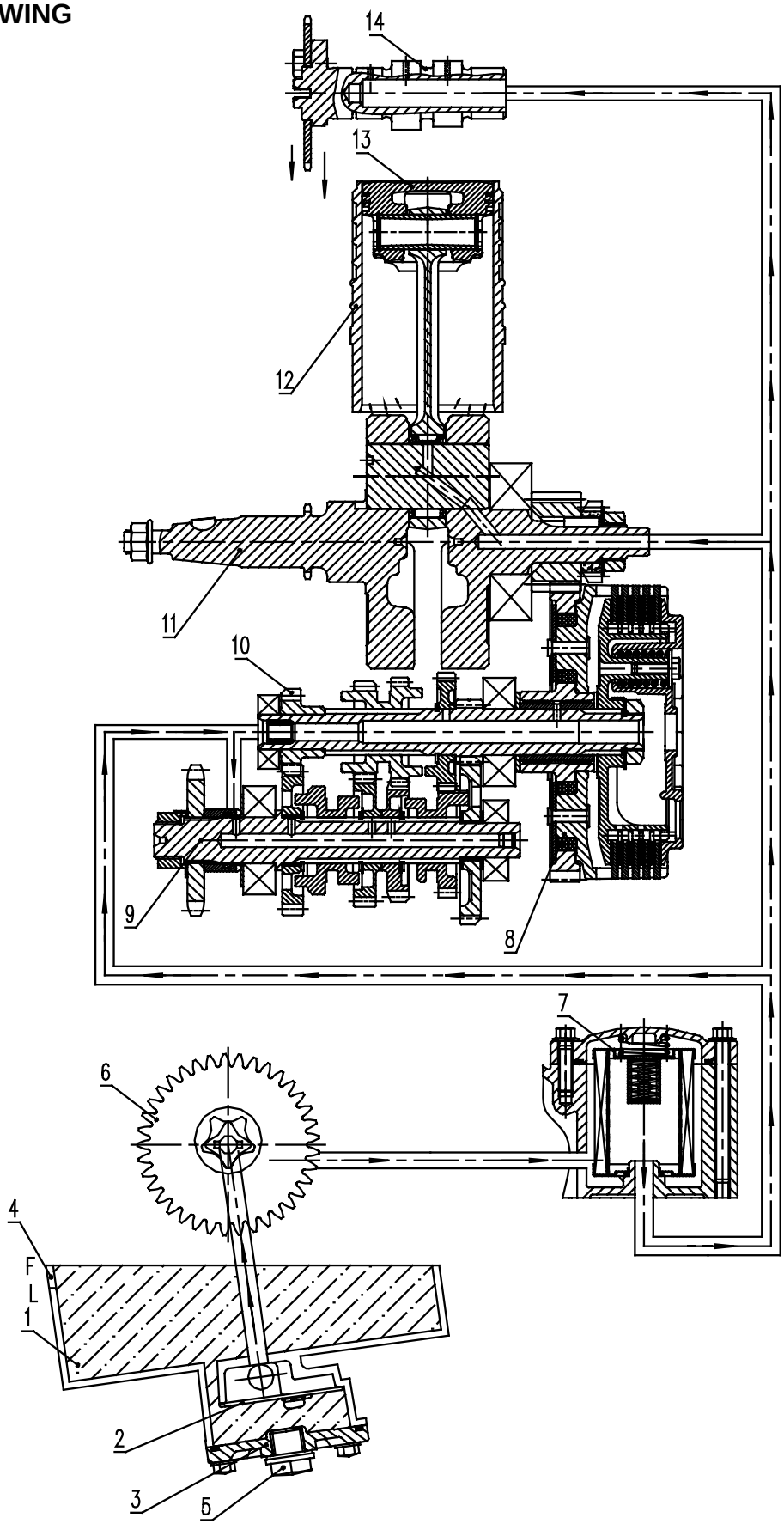
●Install new O-ring

Note:Apply engine Oil to the O-ring when install water Pump.

●Install water pump and joint waterhoses

Lubricant system drawing

157MJ-2A ENGINE LUBRICANT SYSTEM DRAWING



●Schematic diagram of engine lubrication system

1.crankcase oil tray 2.engine oil screen 3.Oil Strainer Cover
4.Oil Level Mirror 5.Oil drain plug 6.Oil Pump Assy
7.Oil Fiter Assy. 8.Clutch 9.Countershaft 10.Mainshaft 11.Crankshaft
12.Cylinder Assy. 13.Piston 14.Camshaft

●Engine lubrication system:most of parts inside engine which run at high speed,like piston, Crankshaft,Camshaft all need great lubrication,the good lubrication is the base of the good condition of engine working.

157MJ-2A engine is used pressure and splash lubrication system,Apply special engine oil for 4-Stroke engine,Engine Oil is not only used for lubrication,but also for clean rustproof,sealing and cooling.

Inspection of Lubrication system

(see page3-12)

Inspection of engine oil pump

(see page 5-3)

Engine removal, inspection and assembly

△Page location

Location	PARTS	REMOVAL	INSPECTION	ASSEMBLY	REMARK
Engine outside	CARBURETOR	5-2	—	5-38	
	WATER PUMP	5-2	—	5-37	
↓	LEFT SIDE COVER	5-2	—	5-38	
	MAIN CHAIN	5-2	—	5-38	
ENGINE	GEAR TOUCHER	5-2	—	5-38	
LEFT	DUAL GEAR CHAIN	5-2	—	5-38	
↓	STARTOR MOTOR	5-3	—	5-37	
	OIL FILTER COVER AND PAPER ELEMENT	5-3	—	5-34	
ENGINE	RIGHT SIDE COVER	5-3	—	5-33	
↓	OIL PUMP SECONDARY GEAR	5-3	—	5-32	
	OIL PUMP MAIN GEAR	5-3	—	5-32	
	CLUTCH	5-3	5-23	5-32	
	OIL PUMP	5-3	—	5-32	
ENGINE HEAD	TIMING SPROCKET TENSIONER	5-4	—	5-37	
	SPARK PLUG	5-4	—	5-17	
↓	CYLINDER HEAD&COVER	5-4	5-10	5-36	
	CAMSHAFT	5-4	5-17	5-36	
	MAGNETO ROTOR	5-5	—	5-37	
	MAIN CHAIN	5-5	5-28	5-37	
	CYLINDER COVER	5-6	5-11	5-35	
	CYLINDER BODY	5-6	5-19	5-35	
	TIMING SPROCKET	5-7	—	5-36	
	PISTON	5-7	5-20	5-34	
CRANKSHAFT	GEARSHIFT ROD	5-7	5-27	5-31	
	CAMSHAFT CHAIN	5-7	—	5-31	
	FILTER COVER	5-8	—	5-31	
	RIGHT CRANKSHAFT	5-8	—	5-30	
	GEAR BOX,FORK,MAIN SHAFT	5-8	5-25	5-29	
	CRANKSHAFT	5-9	5-22	5-29	

REMARK: ARROW MEANS REMOVAL PROCEDURES AND PROCEDURE IS REVERSE FOR ASSEMBLY.

Engine removal

Preparations

●Prepare a plate for parts;

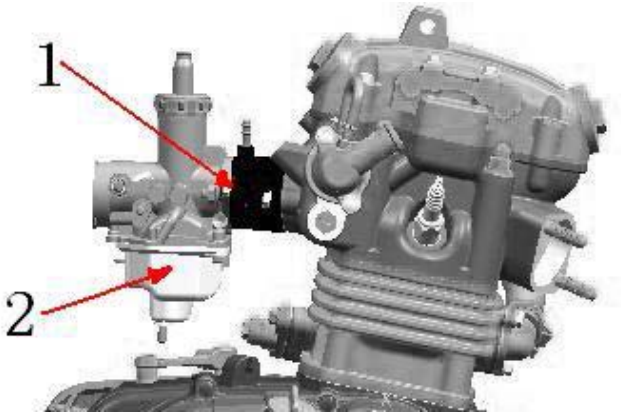
●Prepare tools;

●Drain all oil and coolant;

Engine outside

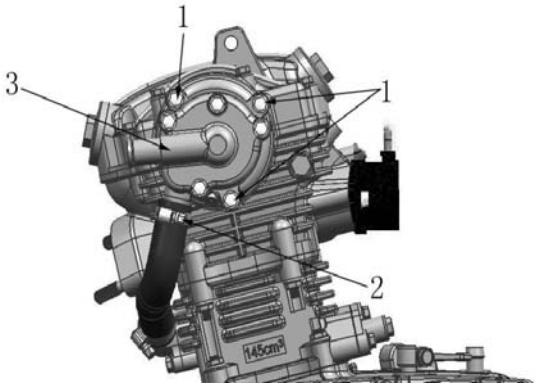
Carburetor

●Loosen two bolts 1, and remove carburetor 2.



Water pump

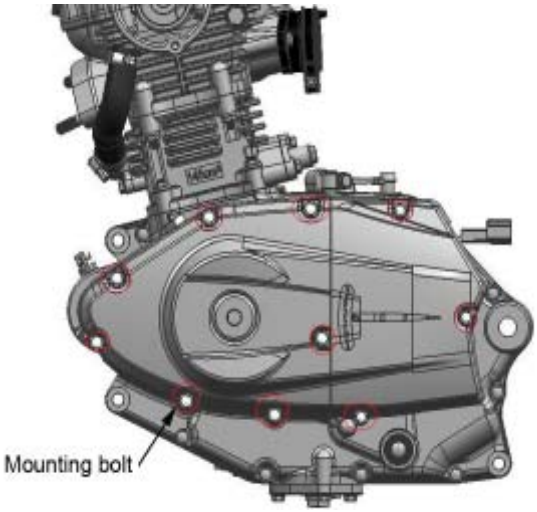
● Loosen clamp 2,remove water pipe connection, loosen 3 pieces of bolt 1, and take out water pump.



Engine left side

Left side cover

Remove 10 pieces of assembly bolts on left side cover and remove left rear cover, left front cover and left front mat.



Main drive chain

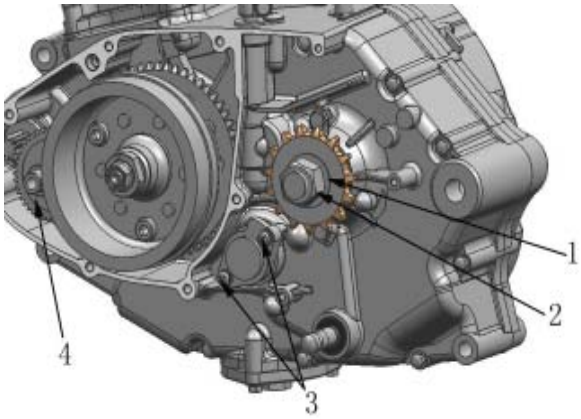
Loosen bolt 2, and remove main drive chain;

Gear contactor

Use a screwdriver to loosen two pieces of bolts 3, and remove gear contactor

DUAL GEAR

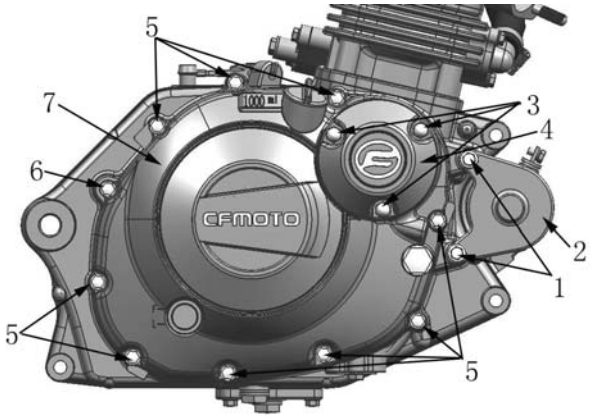
Take out dual gear axle and remove duel gear 4.



Engine right side

Starting motor

Loosen two pieces of bolt 1 and remove starting motor 2.



Oil filter cover and element:

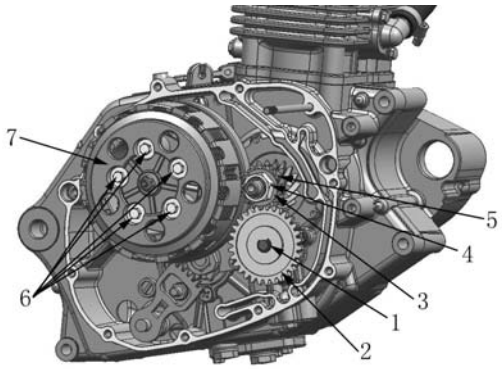
Loosen 3 pieces of assembly bolts 3, and remove filter cover 4 then element and other parts;

Right side cover

Loosen right side cover bolts 5 & 6, remove right side cover 7 and right side cover mat.

Driven gear oil pump

Use special tool to remove clamp 1 and then remove driven gear 2;



Main gear oil pump

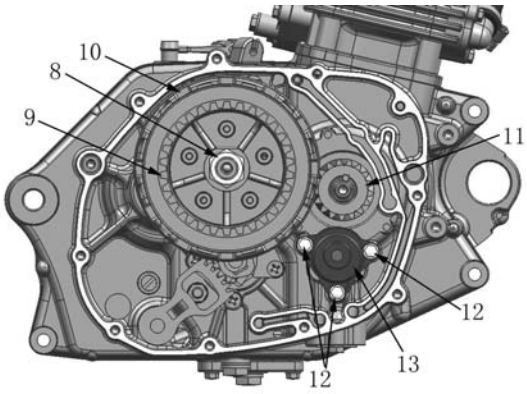
Use chisel to loosen bolt 4 and remove main gear 5;

Clutch

●Loosen 5 pieces of bolt 6 and remove clutch plate 7, then take out clutch main plate and driven plate;

●Loosen clutch tightening bolt 8, remove 9 and clutch gear 10 and then other parts;

●Take out clutch main driven gear 11.



Oil pump

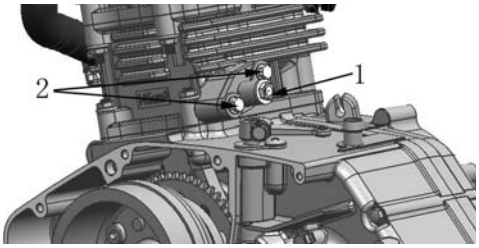
●Loosen 3 pieces of bolt 12, and then remove oil pump 13.

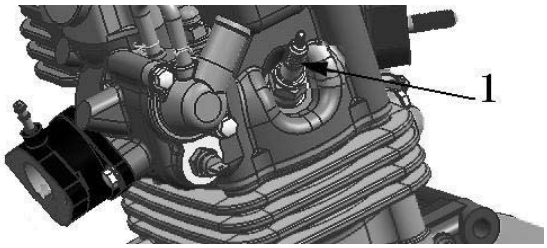
Engine head

Timing sprocket tensoioner

●Remove bolt 1 and take out tensioner spring;

●Remove tensioner bolt and then the tensioner.





Spark plug

●Use a special tool to remove spark plug 1.

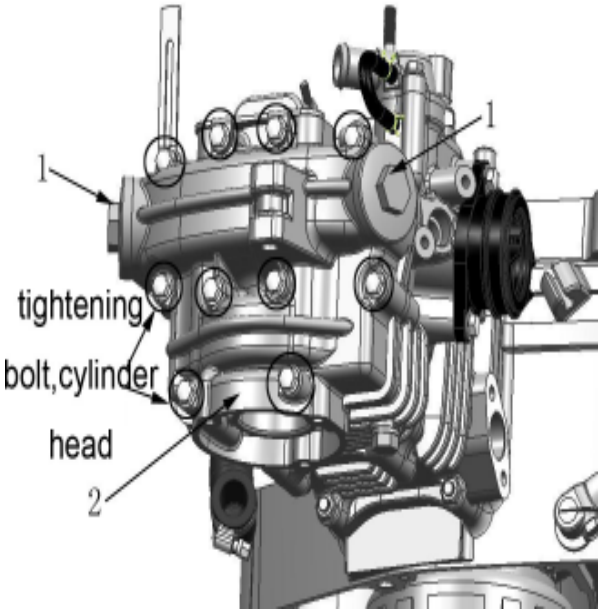
Cylinder cover

●Remove valve room cover 1;

●Remove cover bolt;

●Remove cylinder cover;

●Remove cylinder cover pin.



Note:Do not let dowel pin fall into crankcase.

Camshaft

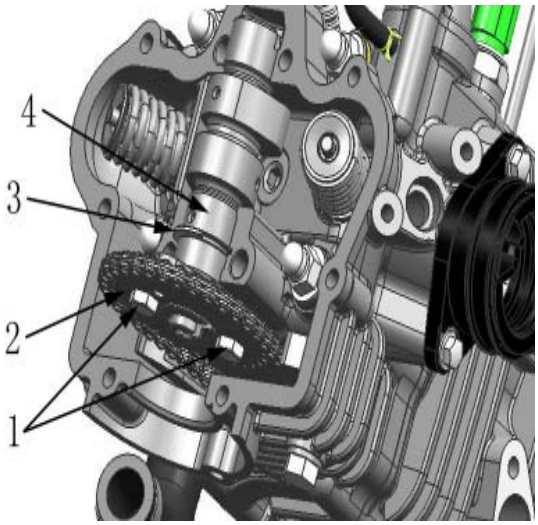
●Remove timing sprocket bolt 1;

●Remove camshaft spacer 3;

●Remove timing sprocket 2 from camshaft;

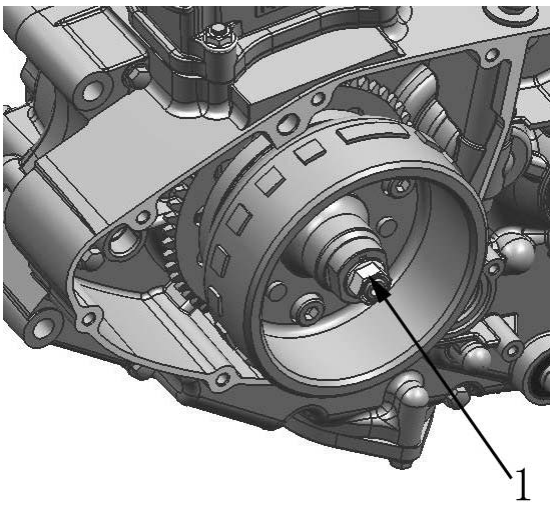
●Take out camshaft 1;

Note:Do not let spacer fall into crankcase. Hook the timing sprocket during removal to avoid drom into crankcase.



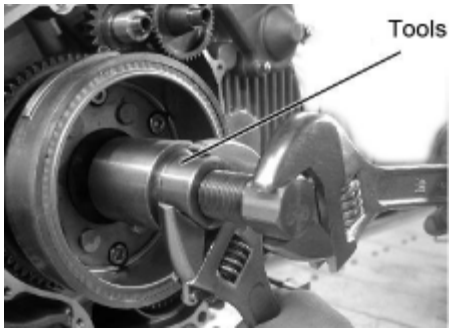
MAGNETO ROTOR

●Remove tightening bolt 1;



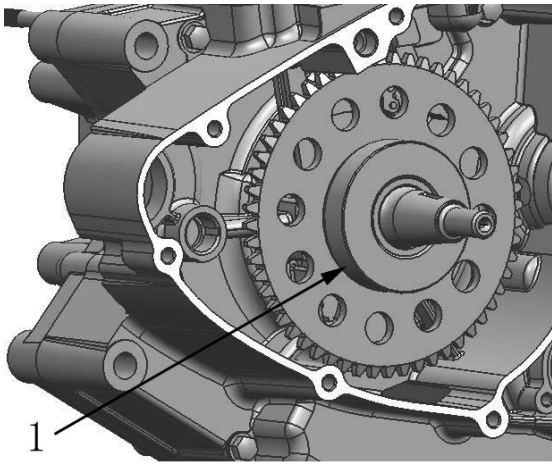
●Use tool to fix on the outer thread and remove the rotor and get off the woodruf key.

Tool: Rotor puller



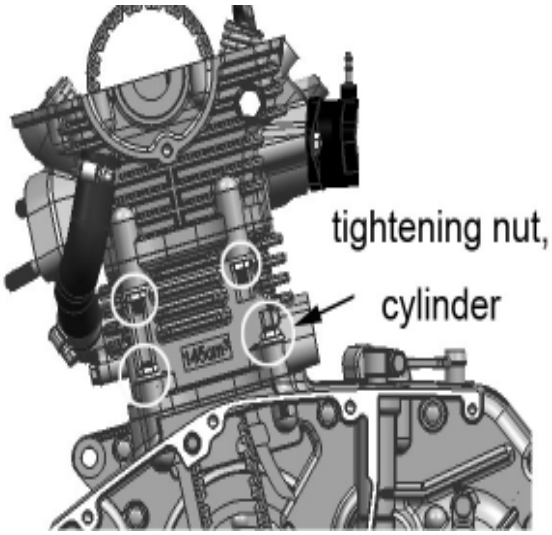
Main gear

●Remove the main gear.



Cylinder tightening bolt

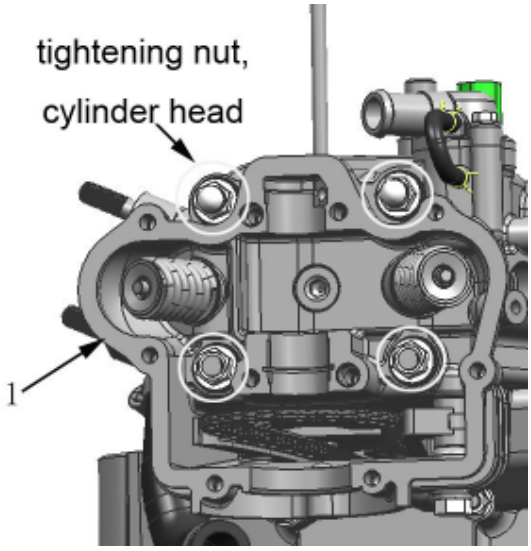
●Loosen 4 pieces of tightening bolts.



Cylinder head

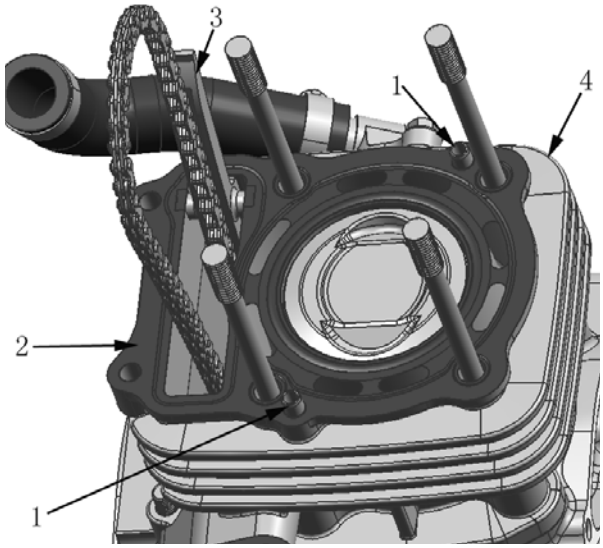
●Loosen 4 pieces of cylinder cover bolts and copper mat.

●Remove cylinder cover 1.



Cylinder body

●Remove pin 1;
●Remove gasket 2;
●Remove timing chain guide;
●Remove cylinder 4;

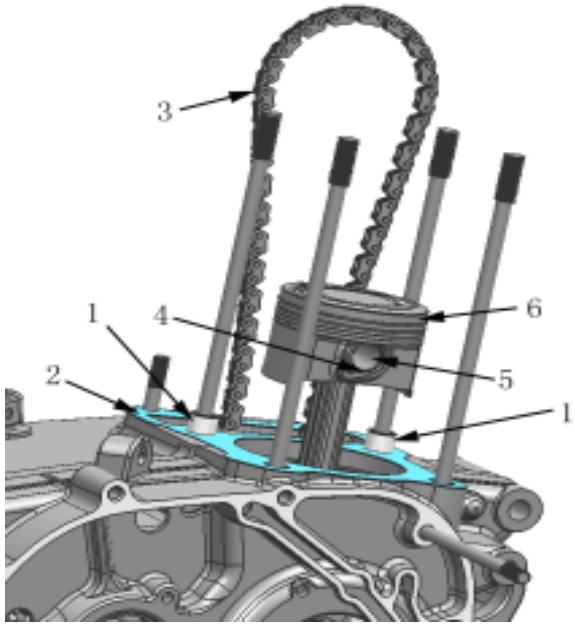


Timing chain

●Remove dowel pin;

●Remove gasket 2;

●Remove timing chain;



Piston

●Use clipper to remove piston pin 4;

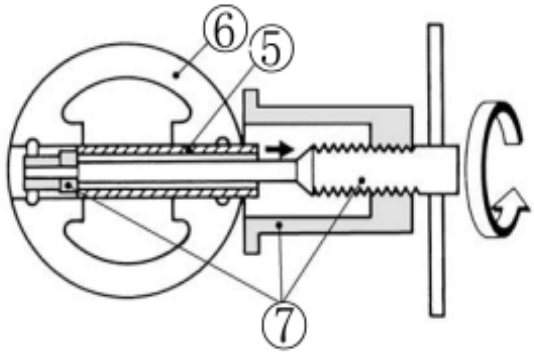
●Remove pistion pin 5;

●Remove piston.

Note:

●Keep order with cylinder during piston assembly;

●During piston removal, clear pin or groove surface, and use too to remove piston if necessary. Do not use knock out the piston with hammer

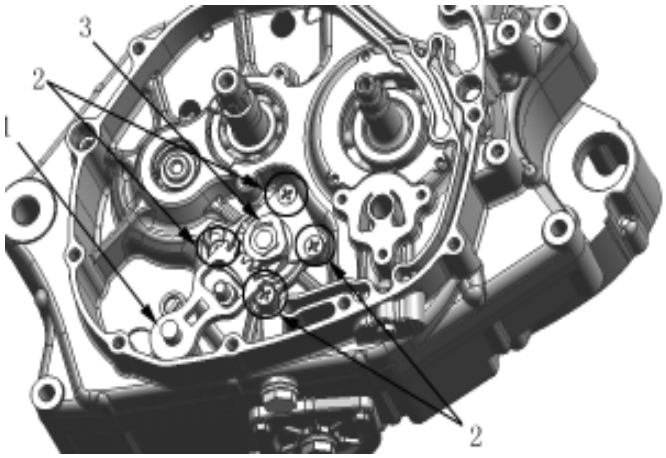


Tool:Piston pin removal tool

Engine crankcase

Gearshift rod unit

●Remove gearshift rod unit 1;



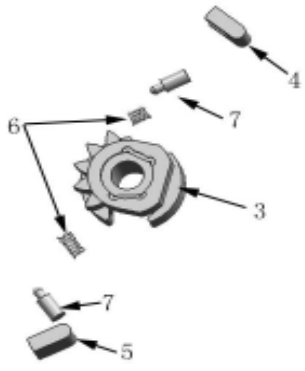
Gearshift camshaft driven gear

●Use a screwdriver to loosen 4 pieces of bolts 2;

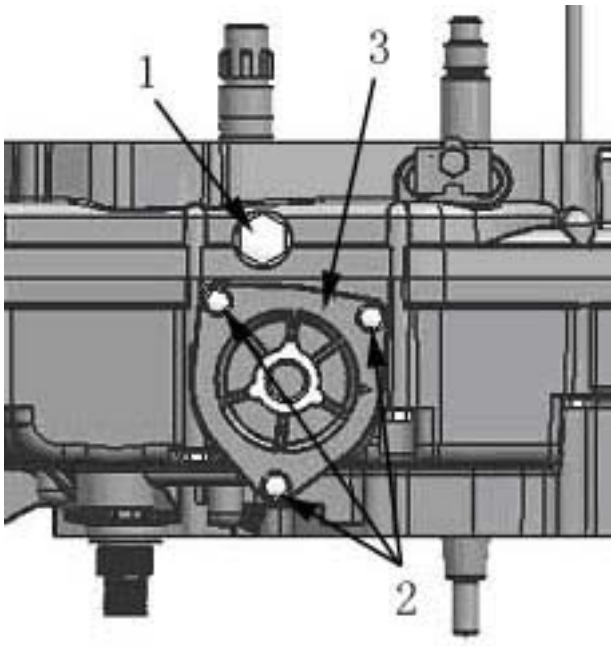
●Remove gearshift camshaft driver gear

Note:

During removal of driven gear 3, do not loosen 4 and 5, spring 6 and pin 7.



●Loosen bolt 1 and take out spacer pin spring and neutral spacer pin.

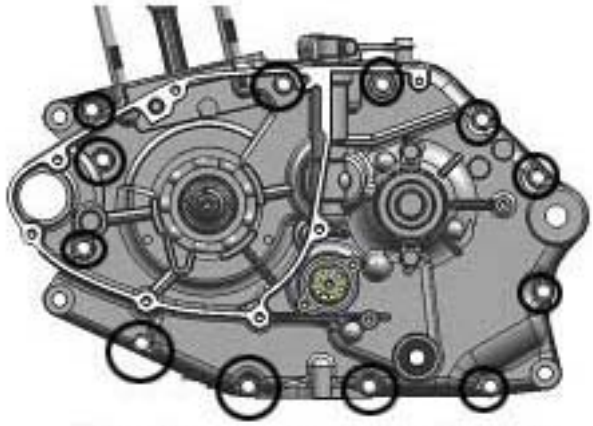


Filter element cover

●Loosen 3 pieces of bolts 2;
●Remove cover 3.

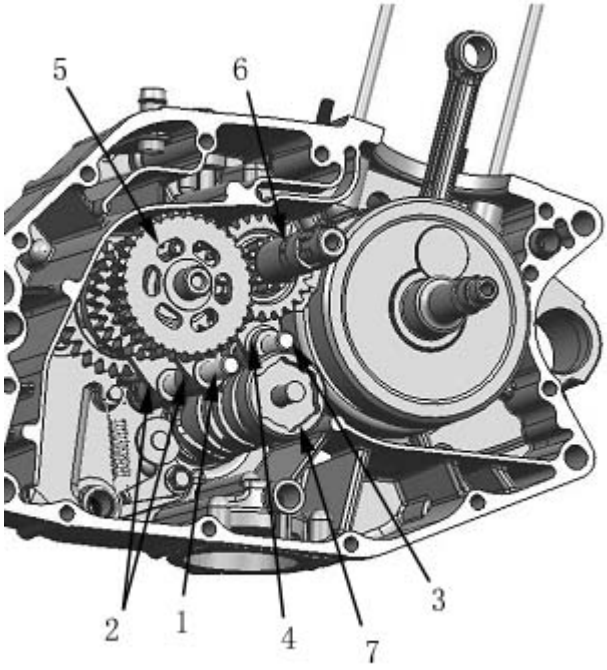
Right crankcase

●Loosen bolts on crankcase;
●Put left crankcase downwards and right one upward, use tool to separate left and right crankcases, then remove right crankcase.



Gearbox,shifting fork axle and shifting fork,main and driven axle

●Remove shifting fork axle 1;
●Remove shiting fork 2;
●Remove shifting fork axle 3;
●Remove shiting fork 4;
●Remove main gear 6 and driven gear 5;
●Remove gearbox.



Crankshaft

●Use tool to separate crankshaft from left crankcase;

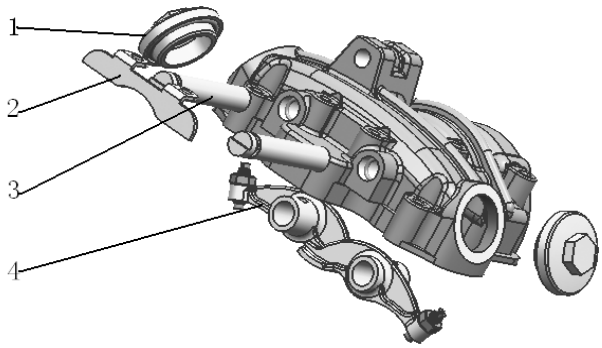
Tool: Crankshaft separating tool

Engine parts inspection

Cylinder head cover

Disassembly

Warning:during disassembly, make sure each part position so assembly can be made just same as done in factory.

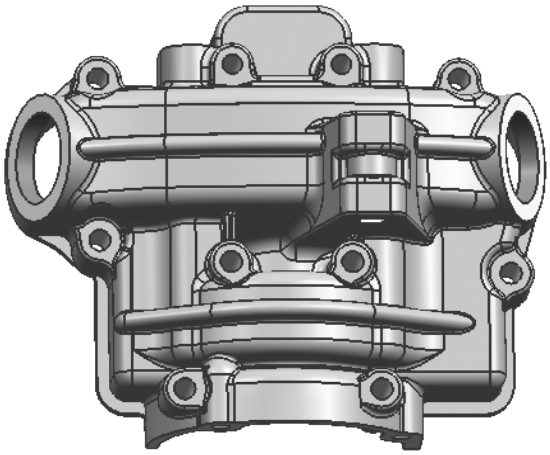


●Remove 2 valve covers;
●Disassemble spacer 2;
●Disassemble two rocker arms 2;
●Disassemble two rocker arms 4.

Cylinder cover surface

Clean glue on cylinder cover and put it plain, use a feeler gauge to check surface situation.

Touching surface of cylinder cover



Limit:0.05mm

Tool: feeler gauge.

Replace with new parts if limit is exceeded.

Note:Cylinder head and cover are an assy,and should be replaced as a set.

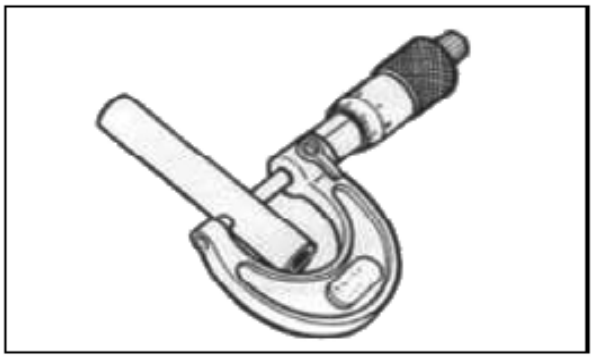
Rocker arm

●Use a micrometer to measure external diameter.

External diameter:Rocker arm(air inlet and outlet)

Standard：11.977~11.995mm

Tool: Micrometer (0~ 25mm)

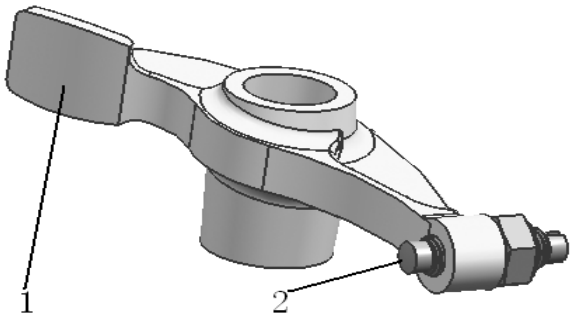


Rocker arm

●During valve rocker arm, check also surface 1 and adjustment bolt for wearing ;

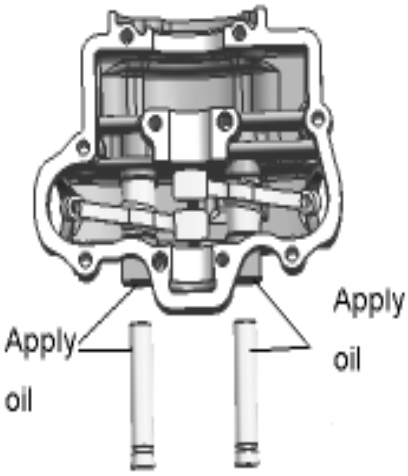
●Valve rocker arm inner diameter:standard：12.000¡«12.018mm

Tool:Innter diameter gauge



Assembly

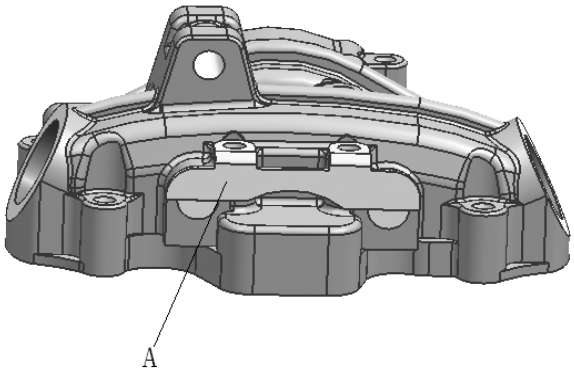
●Coat rocker inner hole and rocker arm with oil and assemble rocker arm as illustrated.



●Install rocker arm O-ring, make sure rocker arm surface in line with spacer position A.

Note:

Replace O-ring for every rocker arm inspection

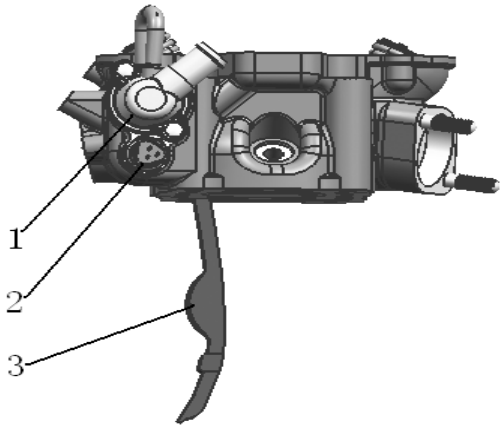


Cylinder cover

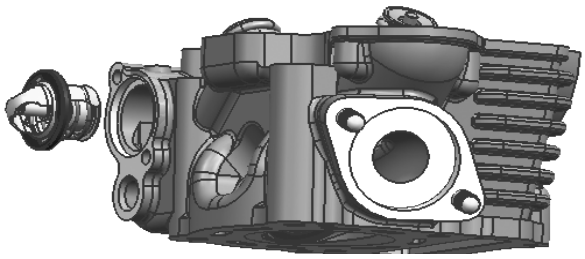
Disassembly

●Remove air inlet pipe.

●Remove thermostat cover 1, water temperature sensor 2 and chain tensioner 3.

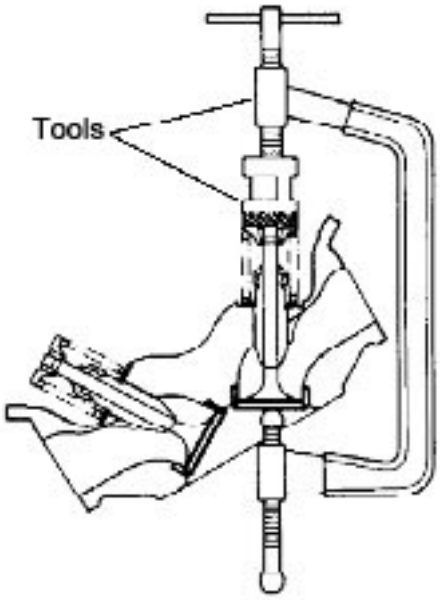


●Take out thermostat;



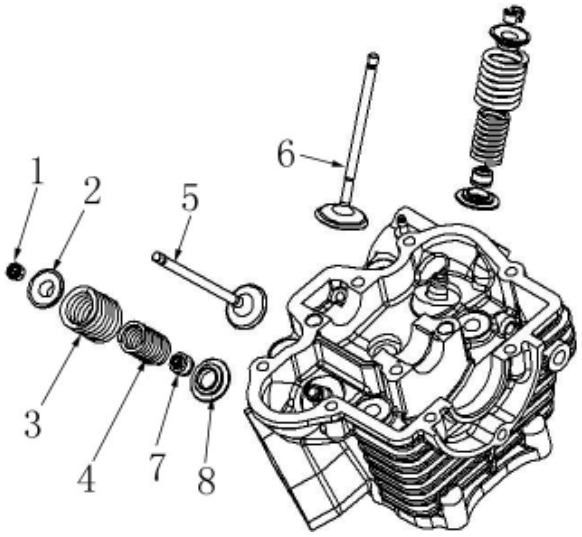
●Use a special tool to compress valve spring and then remove clamp 1.

Tool: Valve compress tool.



●Take out valve spring upper seat 2 and then outer spring 3 and inner spring 4.

●Remove outlet valve 5 and inlet 6；

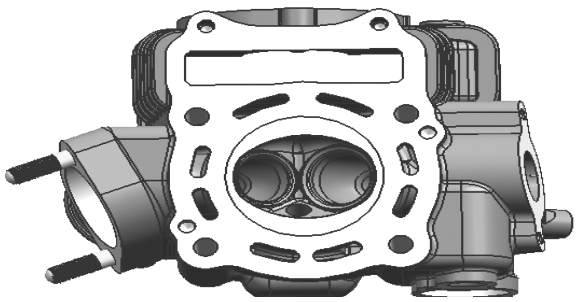


●Take out sealing 7.

●Remove seat valve spring.

Cylinder deformation

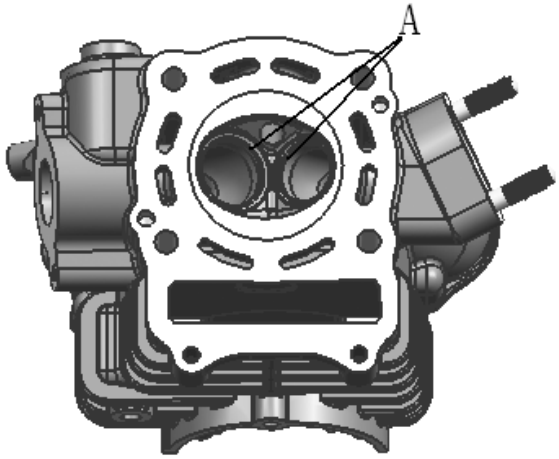
●Clear burning room and touching surface.



●Use gauge to measure cylinder head and touching deformation.Replace cylinder head cover if necessary.

Cylinder head deforming limit：0.03㎜

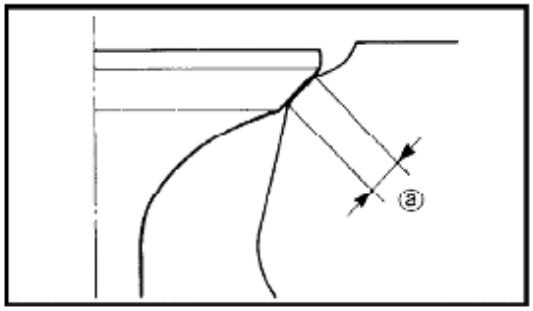
Tool: Feel gauge, kinfe feeler；



Valve width：

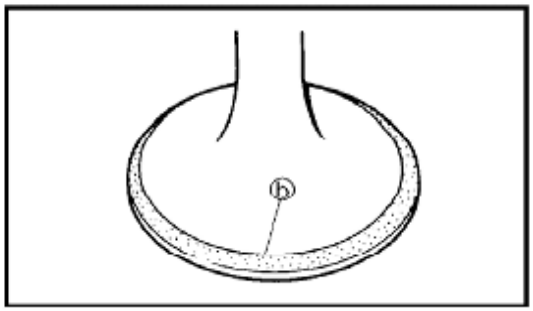
●Coat a layer of color on A and then insert valve and turn gently,in order to get clear trace use tool to fix valve head.

●Coating trace on valve head must be continuous and strip width must be within follow limit. Repair if nenessary.



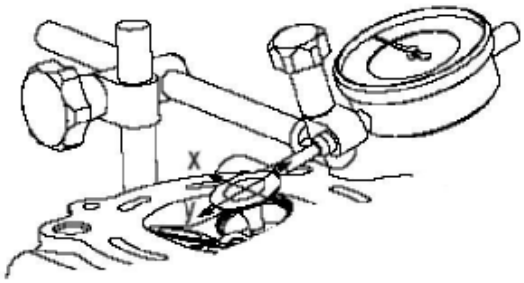
Standard valve seat width.：0.9-1.1mm

Tool:Valve repair.



Valve step and guide bushing composition.

●Raise valve seat 10 mm higher from valve, and use micrometer gauge to measure the deviation at X and Y vertical position.Replace valve or cylinder if limit is exceeded.



Deviation limit（Valve intake and exhaust）£°0.25mm

Tools:Micrometer gauge and magnetic clock seat.

External diameter of valve stem

●Measure with a micrometergauge

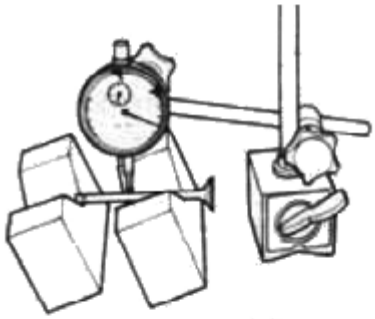
Valve intake 4.975-4.990mm

Valve exhaust 4.955-4.970mm

Tool:Micrometer gauge (0-25mm)

Valve stem jump

●As illustrated,use a V-shape to support valve, use a micrometer to measure the jump.

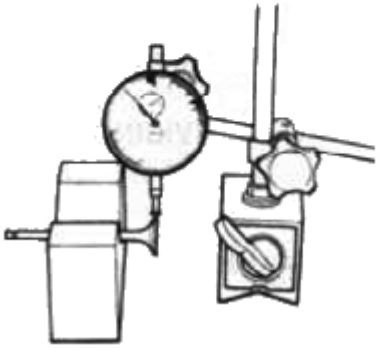


Tool:micrometer and V-shape support

Valve head jump

●As illustrated,use a micrometer gauge to meausre valve head jump. If the jump is over limit,replace valve.

Limit:0.03mm.

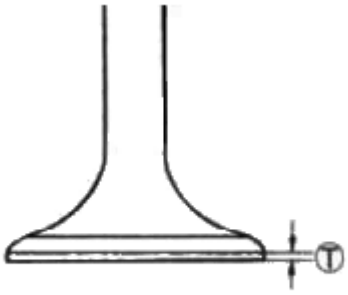


Tool:Megnetic clock seat, micrometer gauge (1/100)and V-shape seat.

Valve head surface wearing

●Check wearing of every valve head surface, replace a new valve in case of wearing or damage.Measure valve head width T, if valve head depth is smaller than limit,replace valve.

Valve head limit:0.5mm

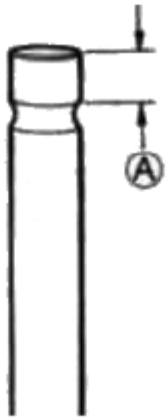


Tool:Feeler gauge

Valve step end status

●Check valve step end surface for corrosion and wearing. If A is less than the limit,repair it.

Valve stem length limit:4.5mm

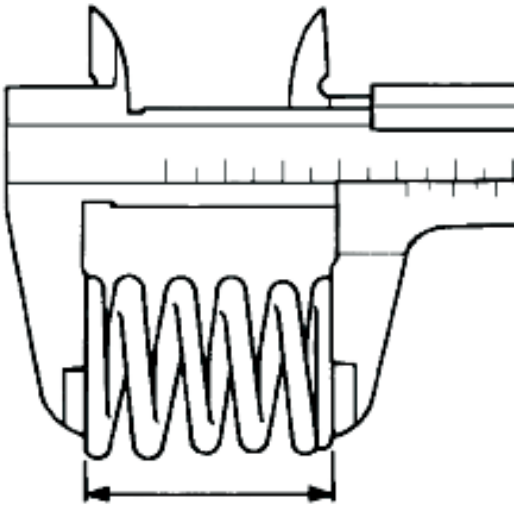


Tool:feeler gauge;

Valve spring

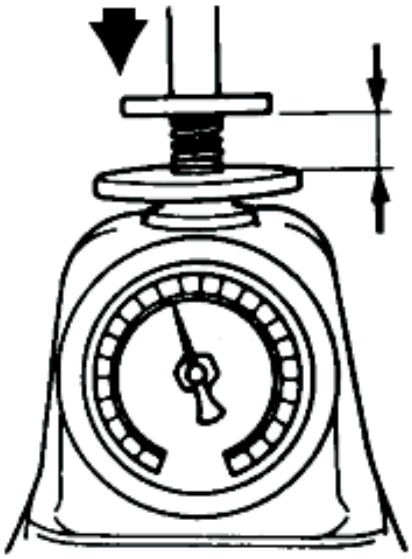
Valve spring is for sealing between valve and valve seat. Loss of spring power will cause engine power output and lead to valve mechanic nosie.

●Measure free travel and replace spring if limit is below limit.

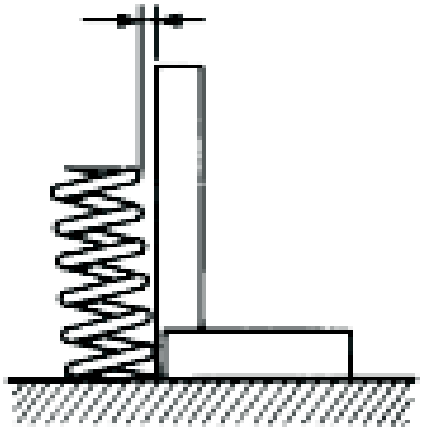


Valve spring length limit (valve intake and valve exhaust):31mm
Valve external spring free travel limit (valve intake and valve exhaust):32.5mm

Tool:Feeler gauge.



●Measure power of compressed spring and replace standard limit of inner spring of valve if the spring power out of limit.
Compressed from 26.8mmto 33.7N-44.3N
Valve external standard(valve intake and exhaust):
Compress to 29.8mm is 88.6N-104N
Tool: Spring balance



●Measure spring leaning,and replace spring in case of leaning out of limit.

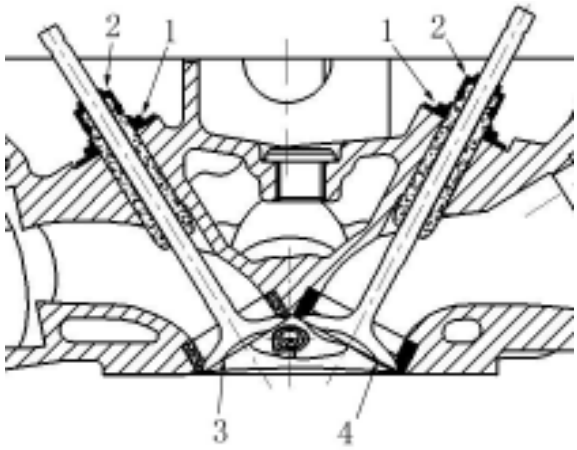
Spring leaning limit: 2°

Cylinder head assembly

●Install all valve spring seat 1;

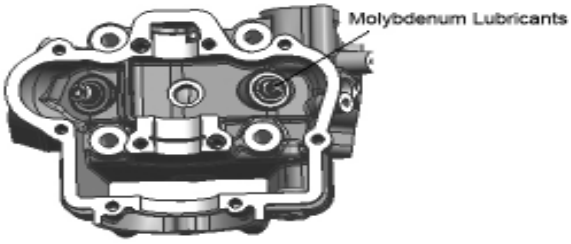
●Coat every valve step sealing with lubricant and then install valve cap end.

Material:molybdenum lubricant



Warning: Valve step sealing can not be re-used.

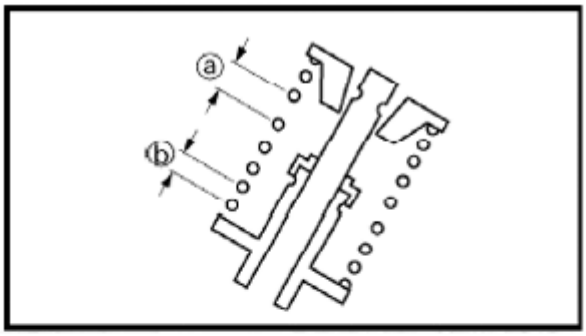
●Insert valve 3 and 4, coat a layer of molybdenum lubricant on valve step round surface

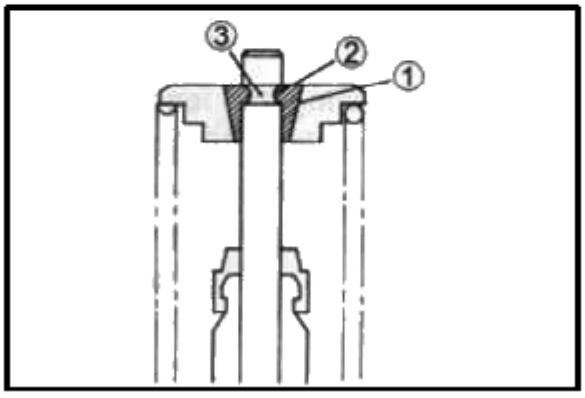


Warning: Do not damage sealing of valve step during valve installation

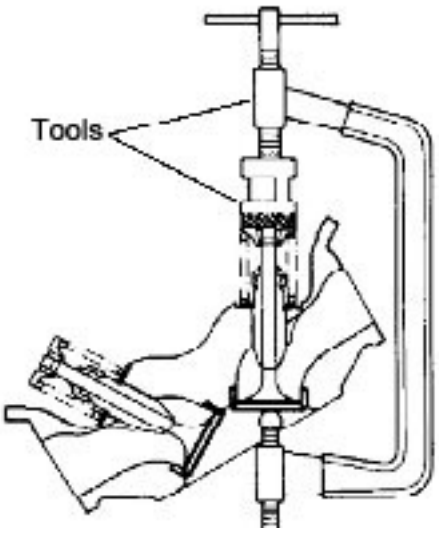
●Install valve inner and external spring, little end 6 close to cylinder head and big end with mark upwards.

●Place valve spring upper seat2 and compress spring with special tool. Put two valve clamps1 at 3£-and then release compressed tool.



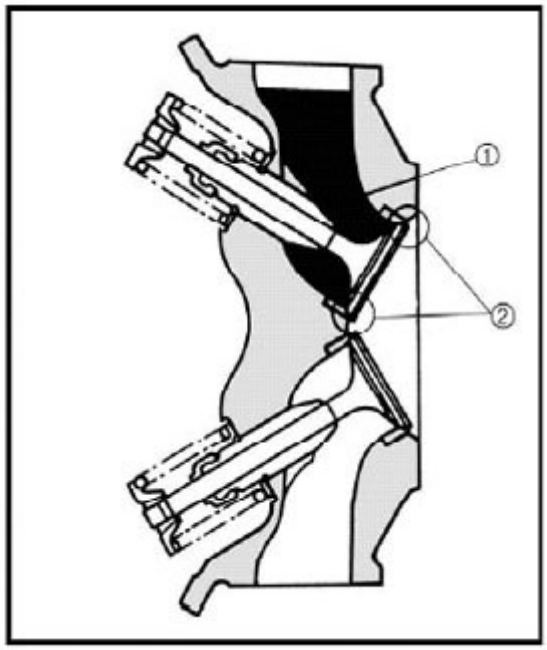


Note:Use a hammer slightly knocks at valve end, and make sure valve clamp is already fixed in valve groove.



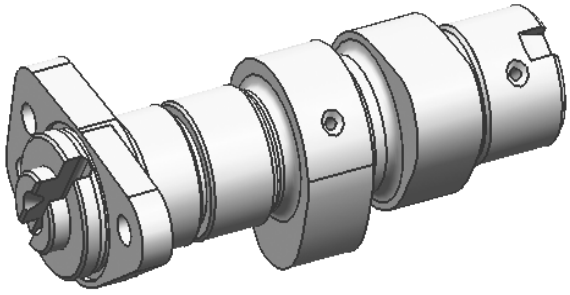
Tool: Valve spring compressed tool, and tweezers.

●Check sealing of cylinder cover:inject cleaning liquid into air inlet ¢Ù and air outlet and stop for a while,check valve seat ¢Ú for leak.



●Install spark plug and water sensor,thermostat and thermostat kit and cylinder cover related parts.

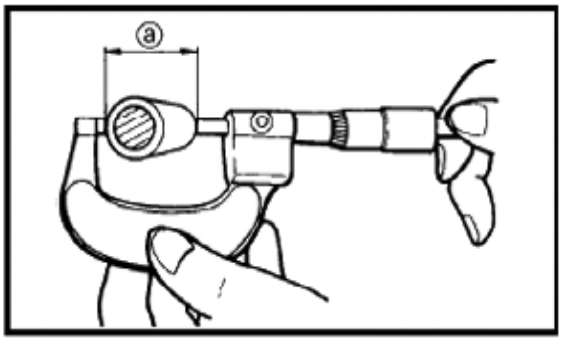
Camshaft



●In case of abnormal noise or vibration or power output too low from engine cylinder cover,lift of camshaft or assembly must be checked. Wearing of camshaft will also lead to mentioned breakdown.

●Wearing of camshaft

Wearing of camshaft will defect valve performance and lower engine power output.Wearing of inlet and outlet limit uses a to clarify. And use a micrometer gauge for measurement. Replace camshaft in case over wearing;



The limit of camshaft travel

Inlet camshaft：5.6695mm

Valve exhaust camshaft：5.314mm

Tool: Micrometer gauge (0-25mm)

●Camshaft bearing wearing

During cam shaft assembly , measure clearance between camshaft and bearing hole tojudge if the cleearance is within the limit.

Camshaft work-out clearance limit:0.15mm

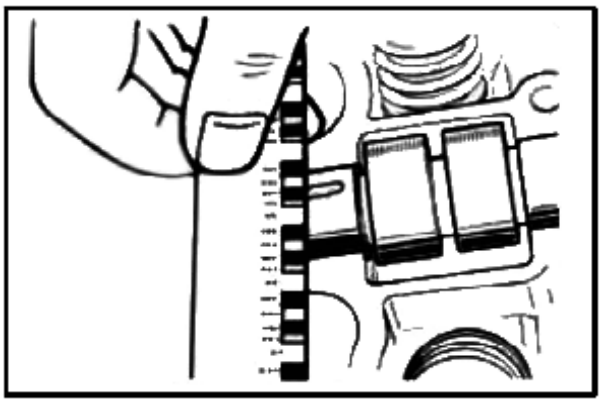
Measurement method:

●Clean cylinder head and cover.

●Put plastic clearance gauge external surface of camshaft touching position and then assemble it with cylinder head cover;

●Install cylinder head cover and tighten bolt with proper torque

●Disassemble cylinder cover and then read data on the gauge.

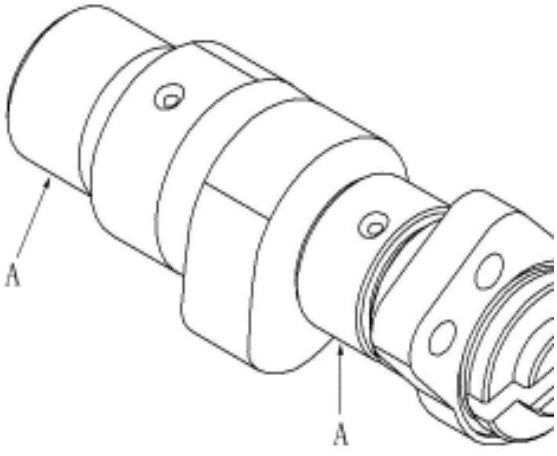


Tool: Plastic clerance gauge.

Tool:Plastic gauge

Note:Do not turn camshaft during plastic gauge assembly.

If oil clerance exceeds the limit, measure diameter of camshaft, replace camshaft in case of over limit or replace cylinder head and head cover.



●Camshaft assembly external diameter

Use a micrometer gauge to measure external diameter A on camshaft assembly position and replace camshaft in case of exceeding limit.

Standard A limit：

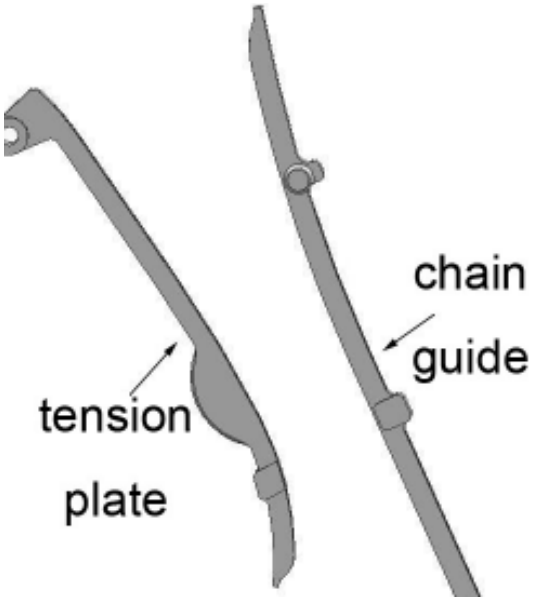
21.959mm-21.98mm

Tool:micrometer gauge (0-25mm)

TENSIONER SET, CHAIN,GUIDE CHAIN.

●Inspection

Check touching surface for wearing and damage, replace if necessary.

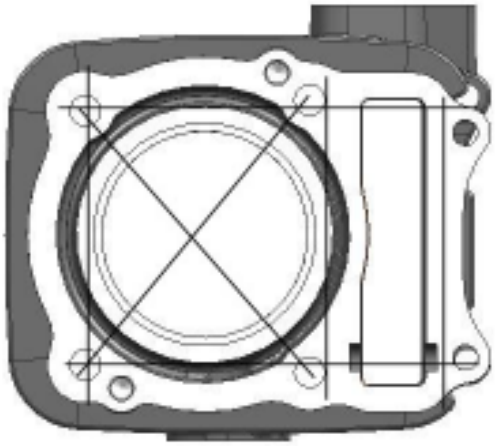


Cylinder body:

Cylinder body deformation:

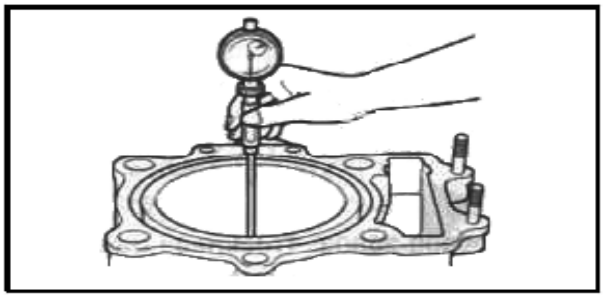
● Use a knife straight ege and a feeler gauge to inspect 7 points and read the limitdata and replace cylinder body if limit is exceeded.

Limit: 0.02mm



Tool:knife straight edge and feeler gauge.

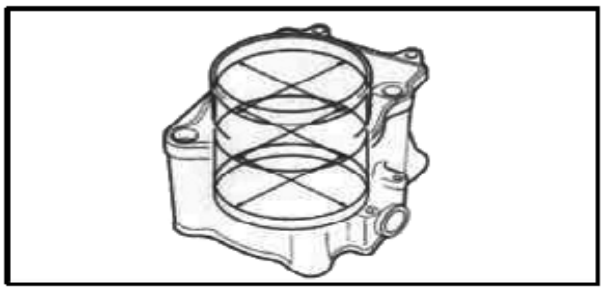
Cylinder body inner diameter inspection.



●Check cylinder inner surface for scratch, or any other damage and replace new parts if necessary；

●Measure inner diameter with spotted three points, upper position,middle position and bottom position, in vertical position between each two points;

Cylinder body inner standard limit：57-57.019mm

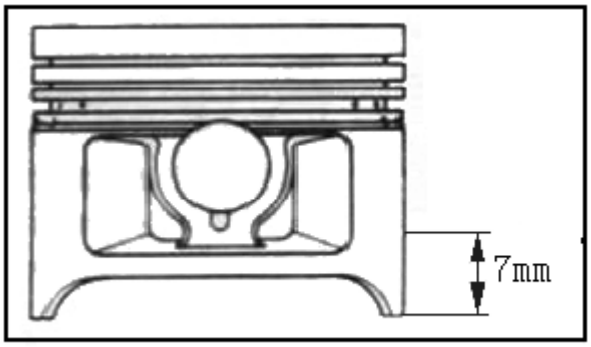


Tool:Cylinder body inner diameter gauge.

Piston：

Piston diameter.

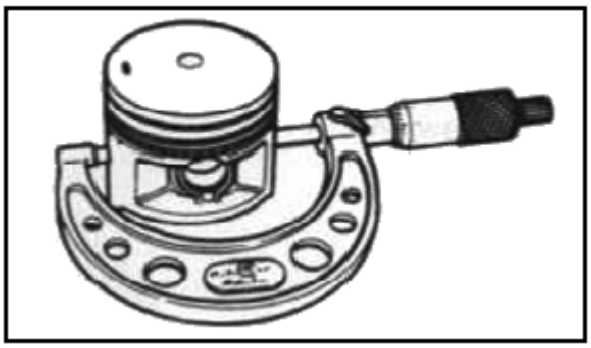
Use a micrometer gauge to measured diameter at position 7mm. Replace piston in case of lower limit



Piston external standard：56.97-56.99mm
External diameter limit：56.94mm

Tool:Micrometer gauge(50-75mm)

Measure clearace between piston and cylinder body based on above measurement. Repalce cylinder or piston or both if clearance is exceeding 0.15mm.

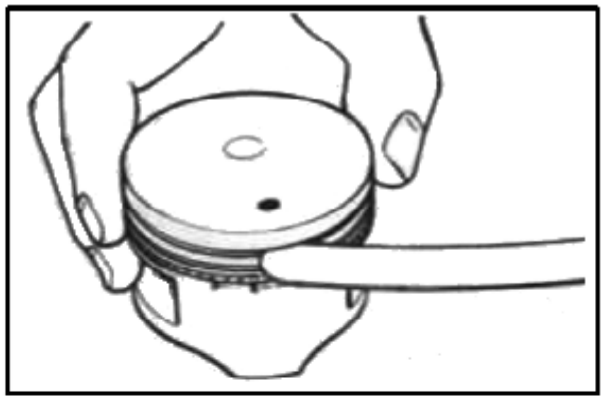


Piston groove clearance

Use a feeler gauge to measure clerance between ring 1 and 2. And replace piston and piston rings in case clearance exceeds the limit.

First ring：0.15mm

Second ring： 0.13mm

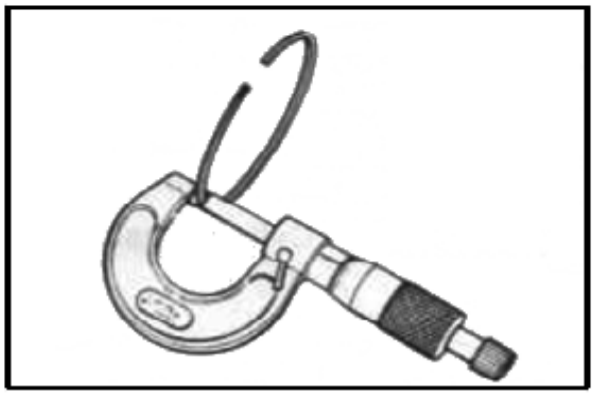


Piston groove width standard:

First ring：1.005-1.02mm

Second ring： 1.005-1.02mm

Oil ring： 2.005-2.02mm



Piston ring thickness standard:

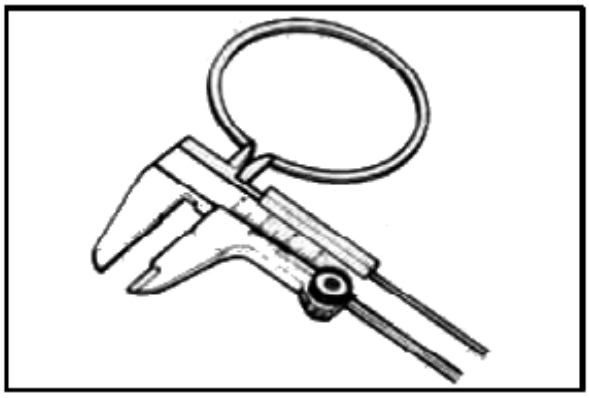
First ring：0.970-0.990mm

Second ring： 0.970-0.990mm

Tool; Feeler gauge
Micrometer gauge (0-25mm)

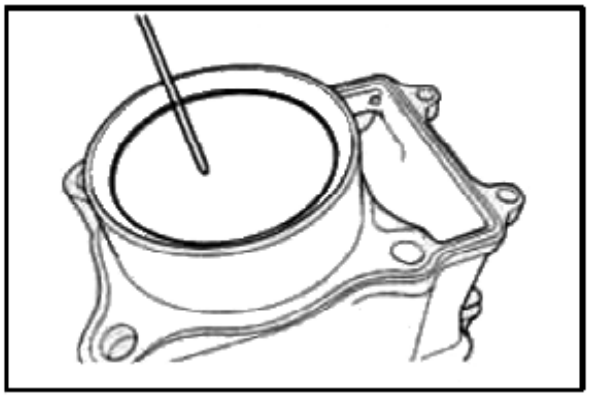
Piston free open and working open

Before piston ring assembly,use feelergauge to measure free open of each ring and then install pinton on cylinder body. Then measure working open of each ring, replace piston ring in case of incorrect limit.



First ring：7.5mm
Second ring：7.5mm

Piston ring working open limit:

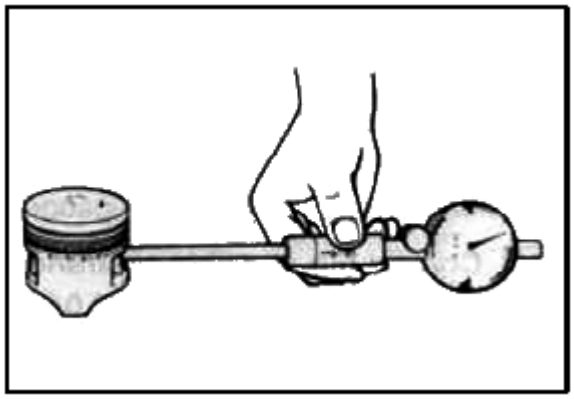


First ring：0.25mm
Second ring：0.25mm

Tool:vernier cliper and feeler gauge

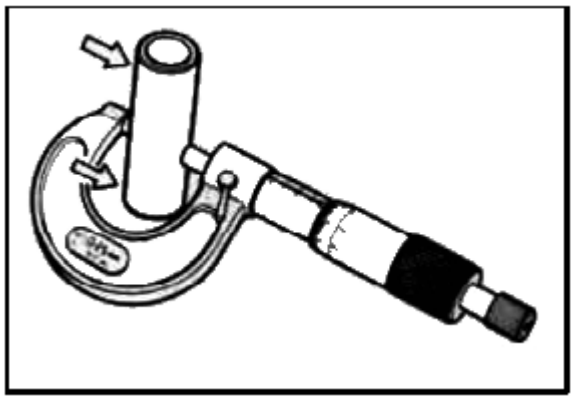
Piston pin and pin hole

●Measure piston pin hole inner diameter with a inner micrometer gauge, and mesaure external diameter with micrometer gauge. Replace piston and piston pin in case limit is exceeded.



Piston pin hole limit：15.030mm

●Use a micrometer gauge to measure external diameter at three points.

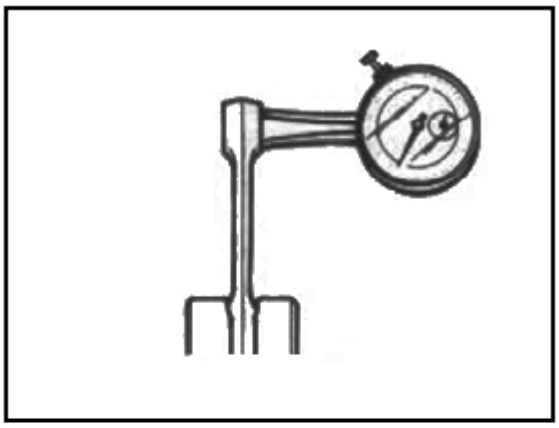


Piston pin external diameter limit: 14.980mm

Tool:Micrometer gauge (0-25mm)

Crankshaft

Crankshaft little end innerdiameter

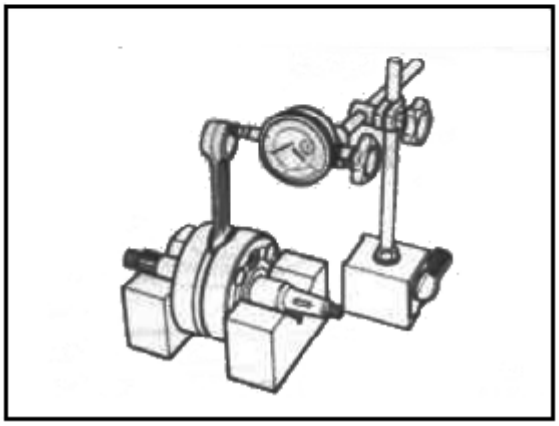


● Replace crankshaft in case limit is exceeded.

Little end limit ： 15.014mm

Tool:percentile scale (0-18mm)

Crankshaft beat

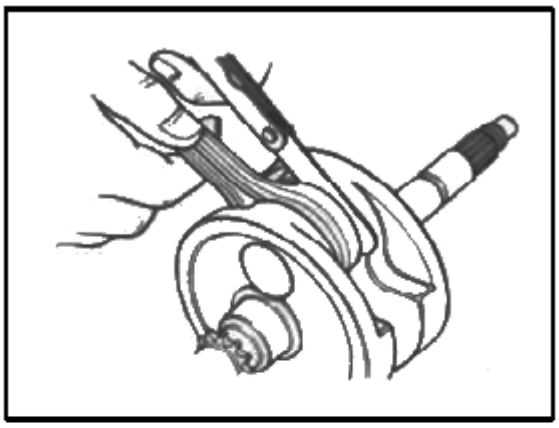


●Crankshaft big end wearing can be checked by checking little end beat.

Beat limit of little end :3mm .

Tool: percentile scale, magneto seat and V-shape seat.

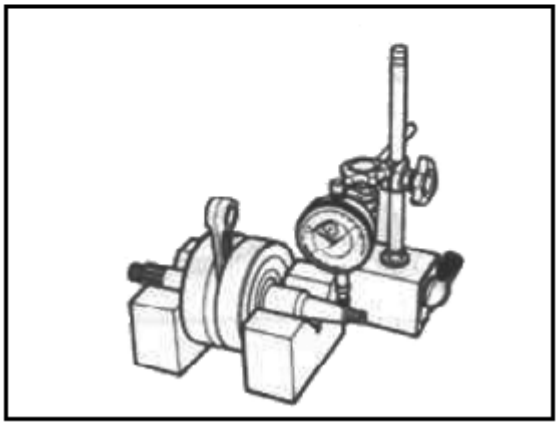
Crankshaft big end side clearance:



●Push big end to another end and use feeler gauge to measure clearance£¨Standard:0.10-0.45mm, limit:1.00mm);replace crank-case if clearance is exceeding limit

Tool: Feeler gauge

Crankshaft jump



●As illustrated, put crankshaft on V-shape support,turn slowly and use percentile scale to measure jump, replace or repair crankshaft if jump exceeds limit

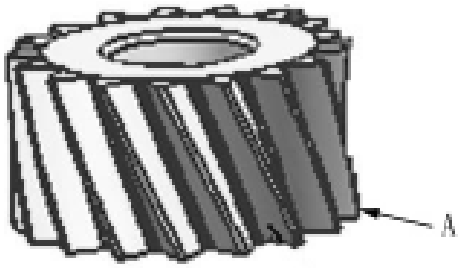
Jump limit:0.04mm

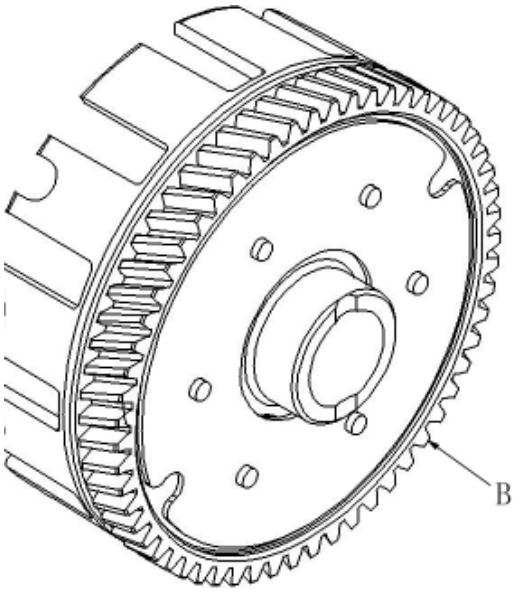
Tool:Percentile gauge, magneto seat and V-shape support

Clutch

Primary clutch:

●Check bearing teeth and replace bearing A in case of wearing or damage.





Secondary cltuch

●Inner rubber wearing will cause movement or noise between bearing and clutch. Replace secondary B in case of serious movement

●Replace two bearings in case of wearing or damage.

●Replace two bearings in case of abnormal noise.

FRICTION DISC, CLUTCH

●Use feeler gauge to measure clutch disc thickness and replace friction disc clutch in case limit is exceeded.

Thickness standard:2.9-3.1mm

Limit:2.8mm

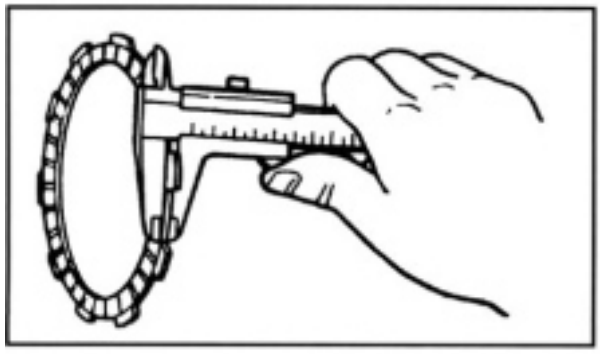
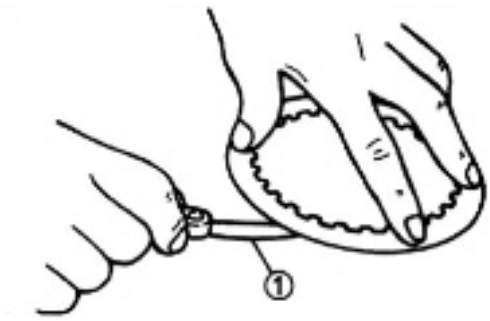


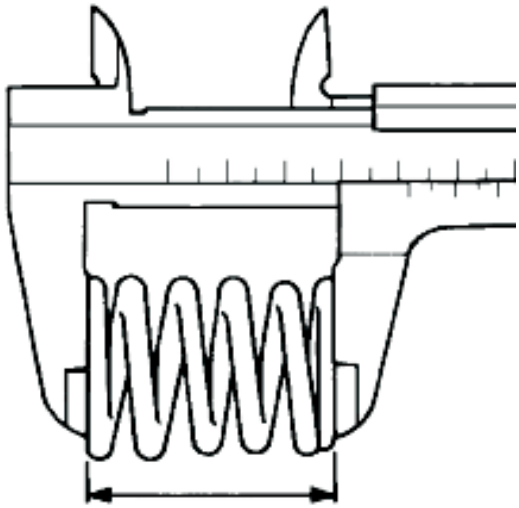
Plate clutch

●Use plain panel and thickess gauge1 to measure deforming data (Limit 0.1mm), replace clutch plate if measurement exceeds limit.



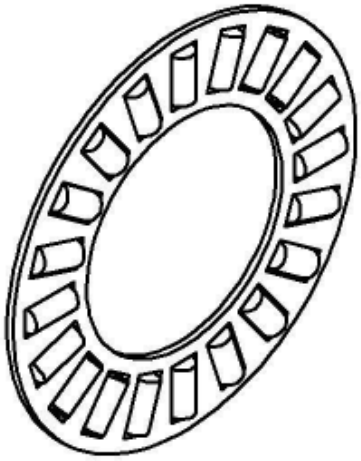
Clutch spring

●Measure free travel of each spring with a feeler gauge(Limit:29.5mm) Replace all springs in case any length of spring is below limit.



THRUST BEARING & BRACKET,CLUTCH

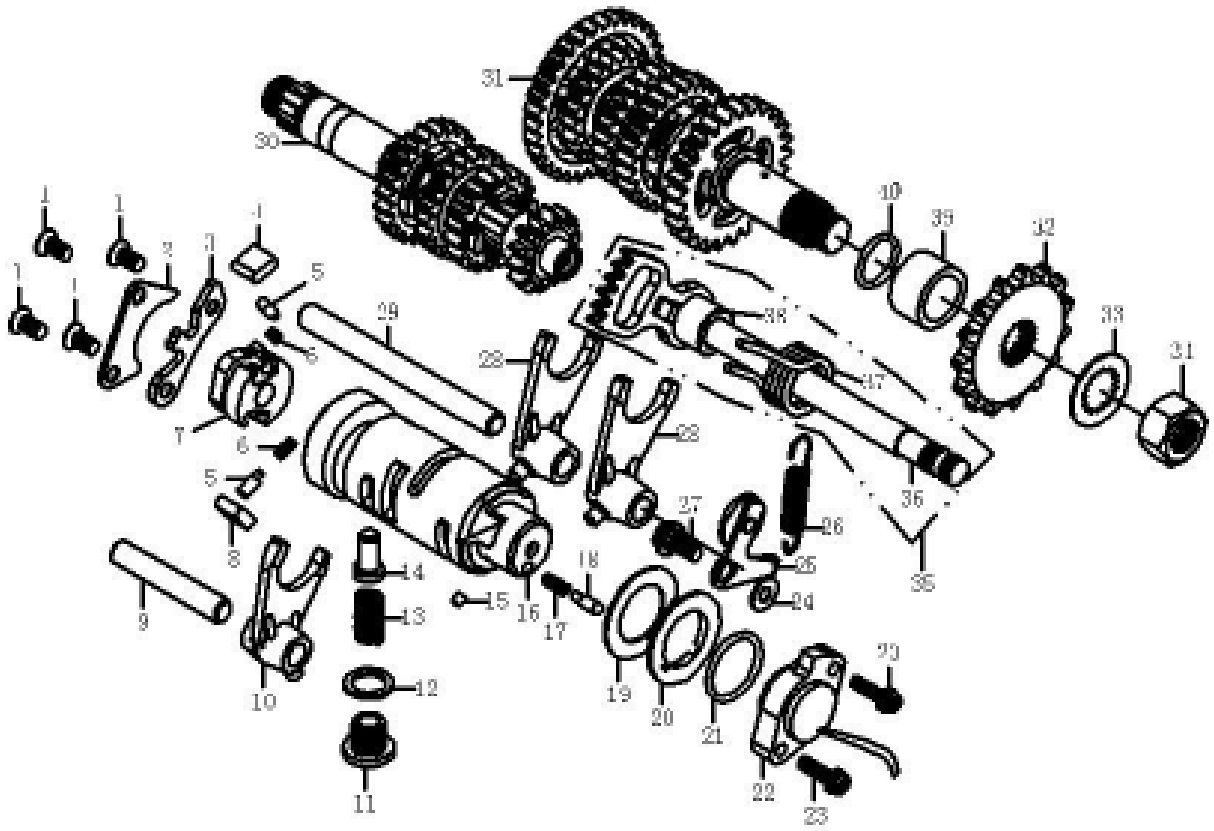
●Check THRUST BEARING & BRACKET, CLUTCH for abnormal status, such as broken, wearing or damage, and replace if necessary.



Crankcase bearing.

●Feel clearance of crankshaft bearing inside, and check for noise or smooth turn with hand, replace bearing if necessary.

GEARSHIFTING



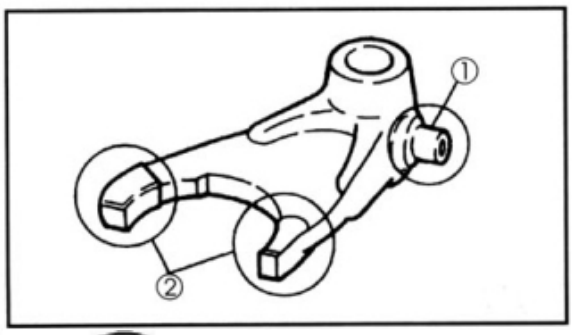
PART NO.	PART NAME	P/N	PART NAME
1	SCREW M6×12	21	O-RING 26.2×2.4
2	RATCHETPLATE,GEAR SHIFT	22	SWITCHSEAT,GEAR POSITION
3	CAMSHAFT GUIDE, GEAR SHIFT	23	SCREW M5×20
4	RIGHT RATCHET	24	WASHER 6
5	RATCHET PIN, GEAR SHIFT	25	LIMIT, GEAR SHIFT DRUM
6	RATCHET SPRING	26	DOWEL SPRING, GEAR SHIFT
7	DRIVEN GEAR, GEAR SHIFT DRUM	27	BOLT
8	LEFT RATCHET	28	SHIFT FORK
9	CENTER SHAFT, SHIFT FORK	29	SHAFT, SHIFT FORK
10	SHIFT FORK (CENTER)	30	MAIN SHAFT
11	BOLT M14×1.25×12	31	COUNTERSHAFT
12	WASHER 14	32	DRIVE CHAIN SPROCKET
13	DOWEL SPRING, NUETRAL GEAR	33	LOCK WASHER, CHAIN SPROCKET
14	STOP PIN, NUETRAL GEAR	34	NUT M16×1.5
15	PIN 4X6	35	ROD ASSY, GEAR SHIFT
16	HUB, GEAR SHIFT DRUM	36	ROD, GEAR SHIFT
17	CONTACT SPRING	37	RETURN SPRING
18	SWITCH CONTACT, GEAR POSITION	38	SHAFT COLLAR
19	WASHER 25×40×1	39	BUSH,DRIVECHAINSPROCKET
20	DOWEL PLATE, GEAR SHIFT DRUM	40	O-RING

Fork

●Check position 1

● Check position2

Repalce in case of scrach, bending or damage.

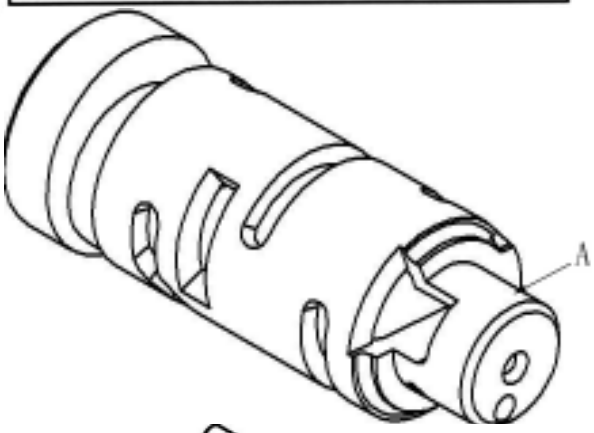


HUB, GEAR SHIFT DRUM

●Check groove of HUB, GEAR SHIFT DRUM

●Check position A of HUB, GEAR SHIFT DRUM

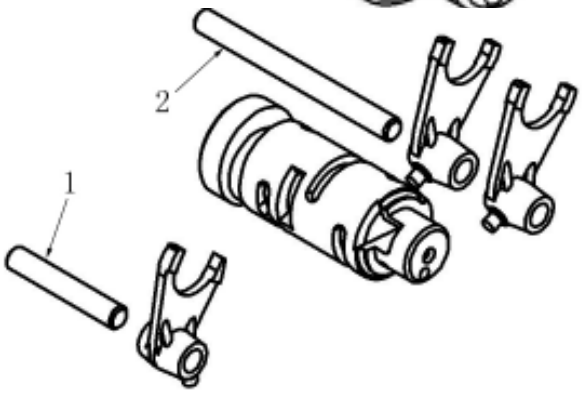
Replace in case of wearing or damage



Shift fork

●ICheck shift fork and 2

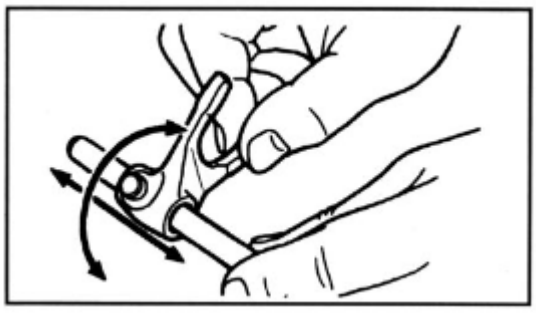
Replace in case scrach, wearing or damage.



●Shift fork inspection:

In case not smooth, replace shift fork.

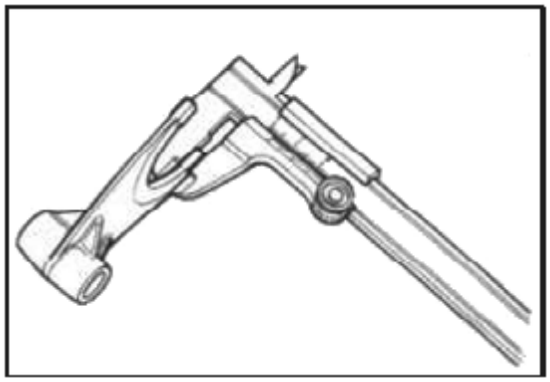
Note: Do not try to repair deformed shiftfork.



●Use a slide caliper to measure thicknes of shift fork composition.

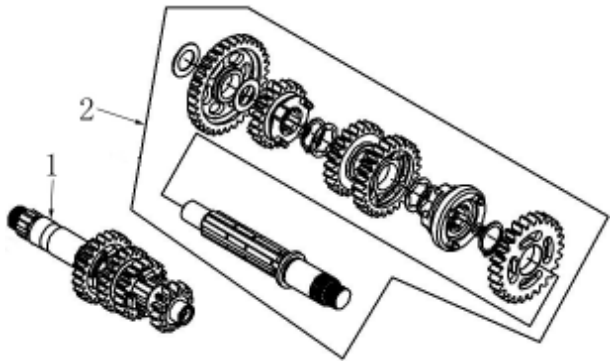
Shift fork thickness standard:4.80-4.90mm

Fork(Middle)standard:5.30-5.40mm



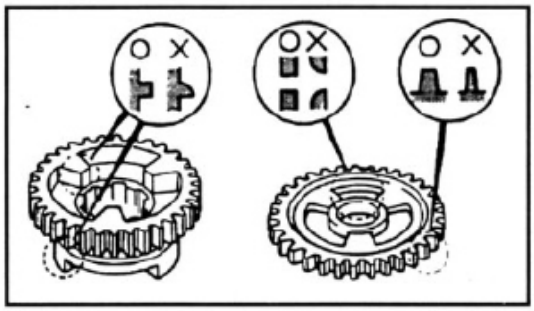
Main,secondary shaft

●Check main shaft 1 and secondary shaft 2. Replace set in case of deforming, wearing or damage.



●Check bearing teeth

Replace bearing in case of blue points, wearing or damage.



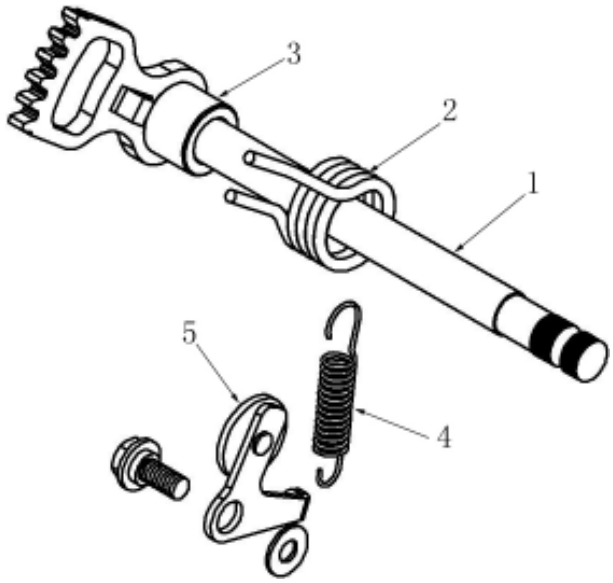
Replace in case of wearing, crack or misplacement.

Shift rod

●Check 1 and replce in case of deforming, wearing or damage.

Back spring

●Check spring 2 and replace in case of damage, deforming.



Shaft collar

Check shaft collar 3 and replacein case of damage or wearing.

DOWEL SPRING, GEAR SHIFT

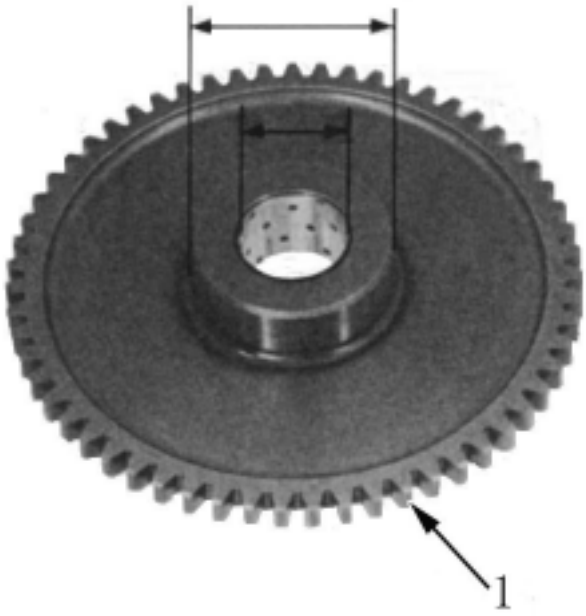
●Check DOWEL SPRING, GEAR SHIFT 4 and replace in case of wearing or damage.

Gearshift unit camshaft location structure.

●Check gearshift camshaft location structure 5 and replace in case of damage, wearing.

Starting driven bearing, dual gear and dual shaft axle.

Inspection

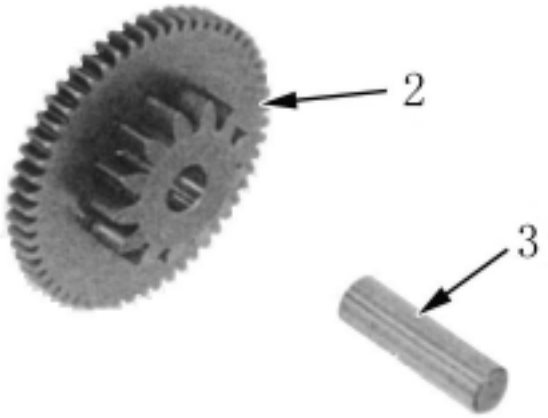


1. Inspection driven bearing 1 for wearing or damage.
2. Measure inner and external diameter s of driven bearing 1.

Limit:

Inner;replace if over 22.10mm

External;replace if below 54.15mm



1. Check dual bearing 2 for wearing or damage;
2. Check dual gear shaft axle 3 for wearing or damage.

Overriding clutch

Inspection

1. Check working status of overriding cltuch after installing starting driven gear onto over-riding clutch as illustrated.
2. Hold flywheel, and status is good if starting driven gear turns smoothly anti-clockwise.

Engine assembly

Assemble engine in reverse procedures of assembly removal.and pay attention to following points:

1.Clean related parts;

2.Every parts should be checked without no damage.

3.Lubricate parts before assembly;

4.Oil lips and O-ring should be lubricated.

Crankcase assembly

Left crankcase

1. Clean oil and sealing glue on crankcase sealing surface;

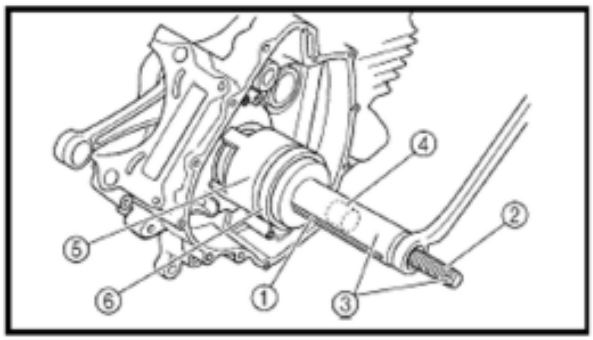
2. Lubricate oil seal lip;

Crankshaft rod

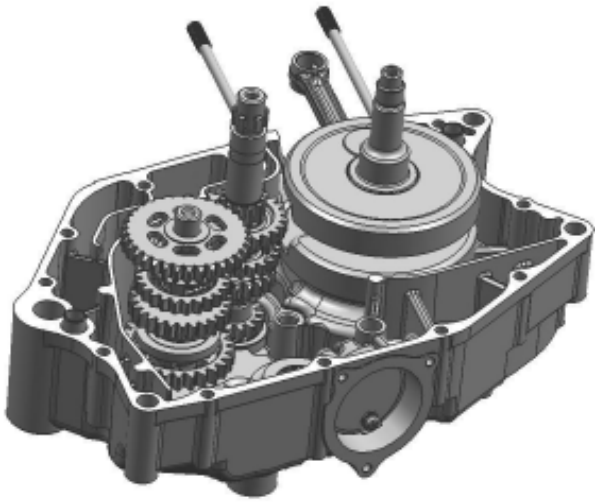
1. Use tool to pull rod into left crankcase

Note:

2. Do not let crankshaft by plastic hammer fall into crankcase, tool must be used to keep left and right crankcase in same concentric.



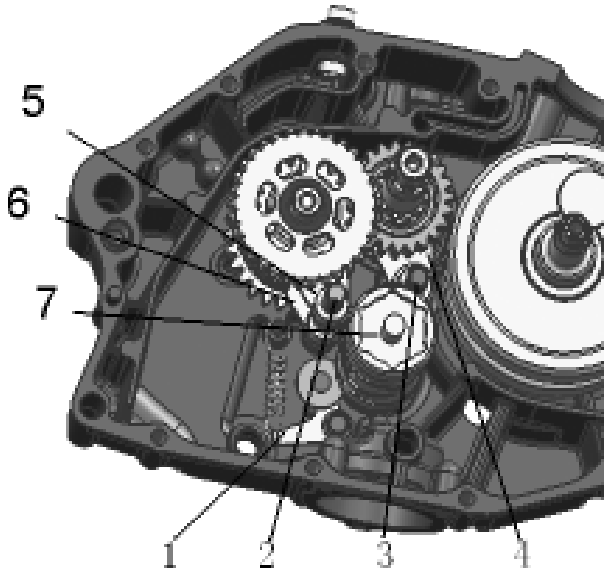
Tool: Crankshaft assembly tool.



Main, counter shaft

Assemble main, counter shaft as illustrated.

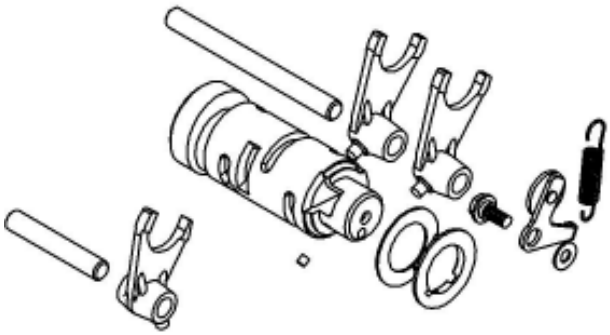
HUB, GEAR SHIFT DRUM AND SHIFT FORK

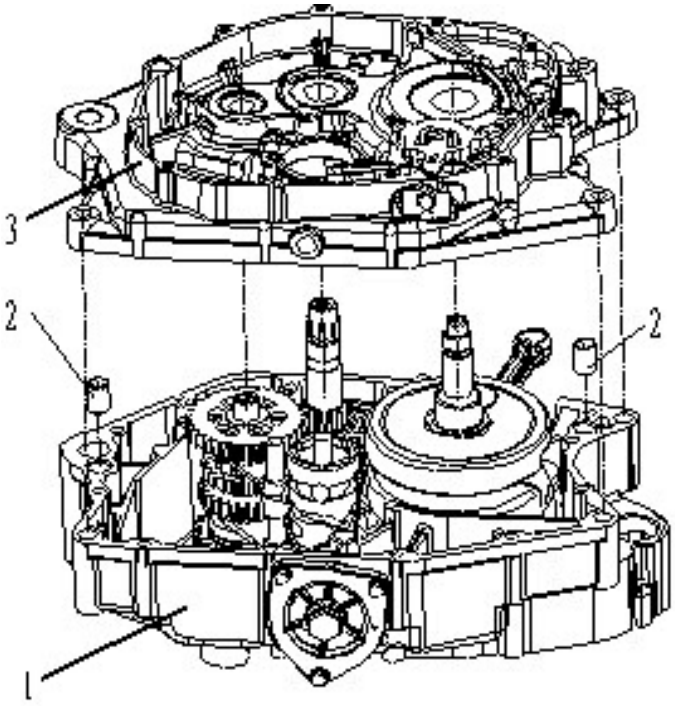


1. Assemble gear shft drum hub 1 ont crankcase;
2. Install same two shift froks in correct pos tion and then install guide bar 3;
3. Install shift 4 in correct position and then ir stall guide bar 5;
4. Install gear shift camshaft location structur 6;
5. Instll gearshift location spring 7;
6. Coat oil on surface of related parts;
7. Check if every bearing of each gear is work- ing smoothly.

Note:Related parts must be cleaned and no foreign matters or metallic fragments on surface.

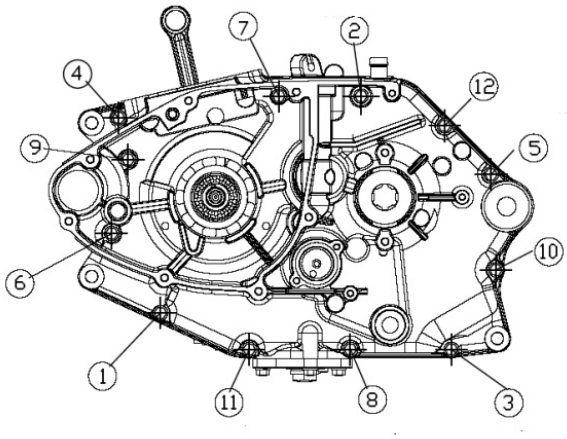
HUB, GEAR SHIFT DRUM AND SHIFT FORK DRAWING





1. Coat left crankcase 1 with sealing glue and install two pins 2 into location holes. Rake crankcase3 and press properly left and right crankcases.

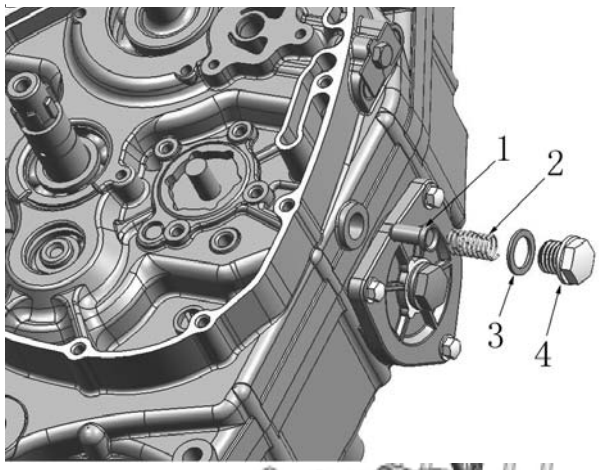
2. Install assembly bolts and tighten bolts two or three times as illustrated.
Torque :10N.m



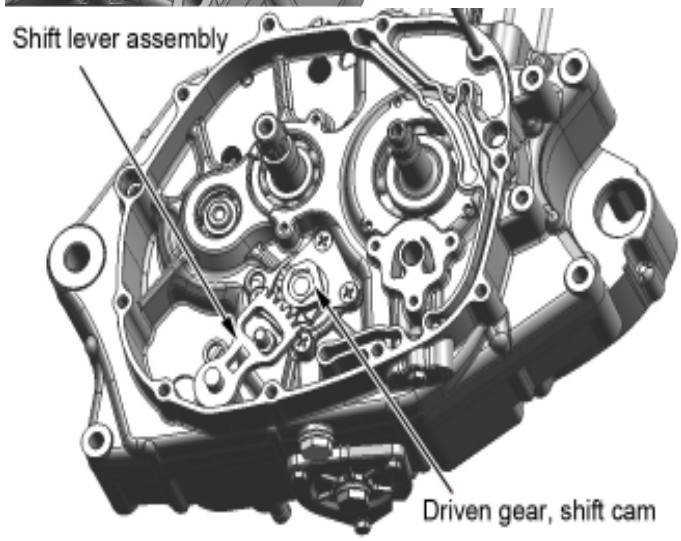
Neutral gear stop pin and filter cover

1.Install stop pin and stop spring 2, gasket and bolt 4;

Note: Do not mistake stop pin 1 assembly direction;
2.Install filter cover as illustrated;



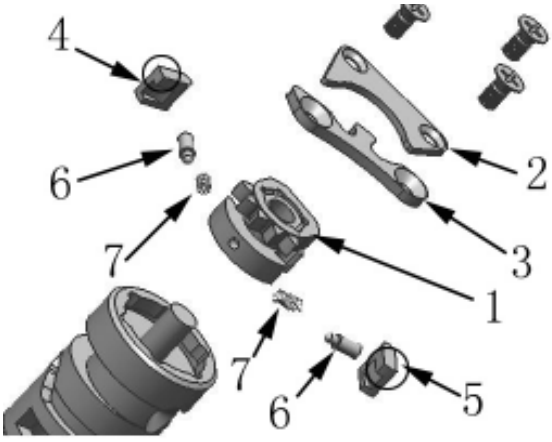
DRIVEN GEAR, GEAR SHIFT DRUM AND GEARSHIFTING
DRIVEN GEAR, GEAR SHIFT DRUM
1. Install driven gear, gear shift drum into driven bearing 1, plate 2 and camshaft guide.
Note: Assembly direction of ratchet plate, gear shift and driven gear, gear shift drum can't be wrong.



Exploded drawing for driven gear, geashift drum

1. DRIVEN GEAR, GEAR SHIFT DRUM
2. RATCHET PLATE, GEAR SHIFT
3. CAMSHAFT GUIDE, GEAR SHIFT 4. RIGHT RATCHET 5. LEFT RATCHET;6. RATCHET PIN, GEAR SHIFT;7.RATCHET SPRING

Note: Left ratchet and right ratchet can not be installd in wrong direction.
Gearshift rod



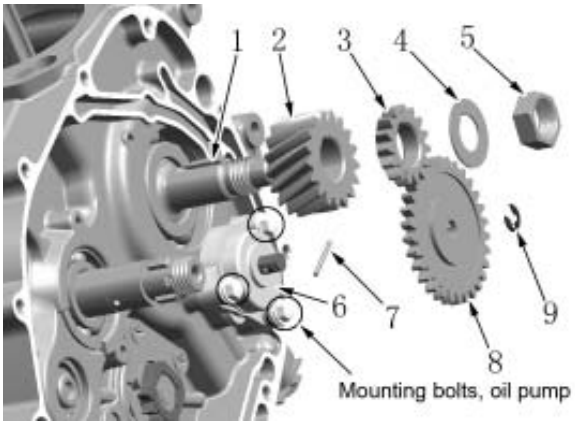
1. Install gearshift rod as illustrated;

PRIMARY DRIVE GEAR AND OIL PUMP

PRIMARY DRIVE GEAR

Put dowel 1 into crankshaft groove and install primary drive gear 2, oil pump drive gear 3, tightening bolt 4 and bolt 5(Torque：85-90N.m)

Note: Bolt 5 is with left-turning thread

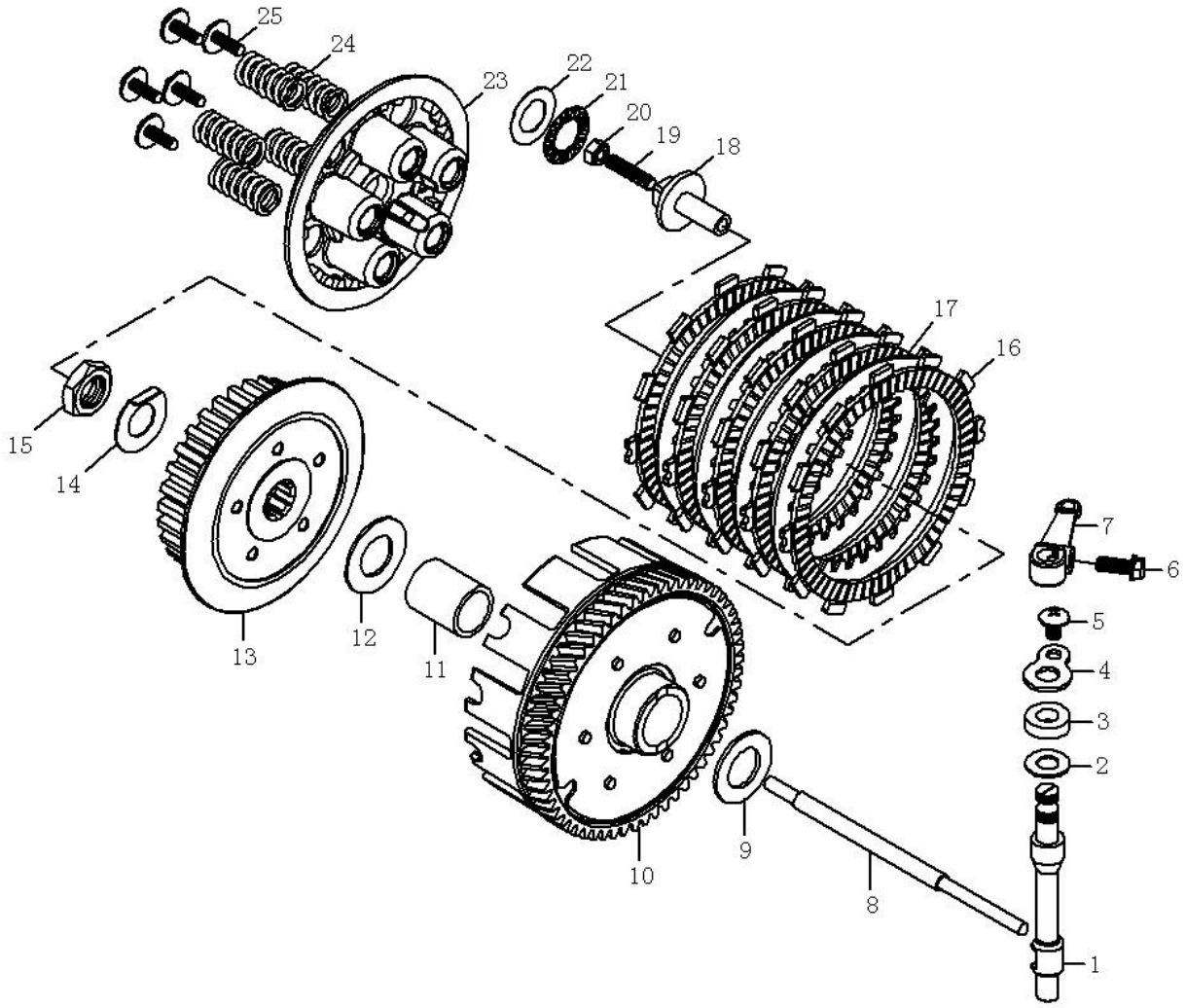


Oil pump

1. Install poil pump 6 as illustrated and tighten 3 oil pump assembly bolts;
2. Install in procedures 7, 8 and 9.

Clutch

Exploded view:



PART NO.	PART NAME	PART NO.	PART NAME
1	CAMSHAFT, CLUTCH	14	WASHER
2	WASHER 10×20×1	15	NUT
3	OIL SEAL 10×20×6	16	FRICTION DISC, CLUTCH
4	PLATE, OIL SEAL	17	PLATE, CLUTCH
5	BOLT M6×10	18	THRUST ROD, CLUTCH
6	BOLT M6×16	19	ADJUST SCREW,CLUTCH
7	SEPARATE ROCKER	20	NUT M6
8	SHAFT, CLUTCH	21	THRUST BEARING & BRACKET, CLUTCH 889102
9	WASHER20×34.5×2	22	WASHER AS152801
10	PRIMARY DRIVEN GEAR	23	PRESSURE PLATE, CLUTCH
11	BUSHING, PRIMARY DRIVEN GEAR	24	SPRING,CLUTCH
12	DAJUST WASHER 20	25	BOLT COMP. M5X16
13	HUB, CLUTCH	26	

Install clutch as illustrated;

Note:

1. Camshaft assembly groove shold be facing right right crankcase.
2. Coat 11 with oil before assembly;
3. Install part 8 longer end into main shaft facing left crankcase.

Clutch bolt adjustment

1. Loosen bolt 20 and install adjustment bolt 19 to touch slightly with clutch shaft
2. Remove clutch adjustment bolt 1/4-1/2 and tighten tightening bolt 20.

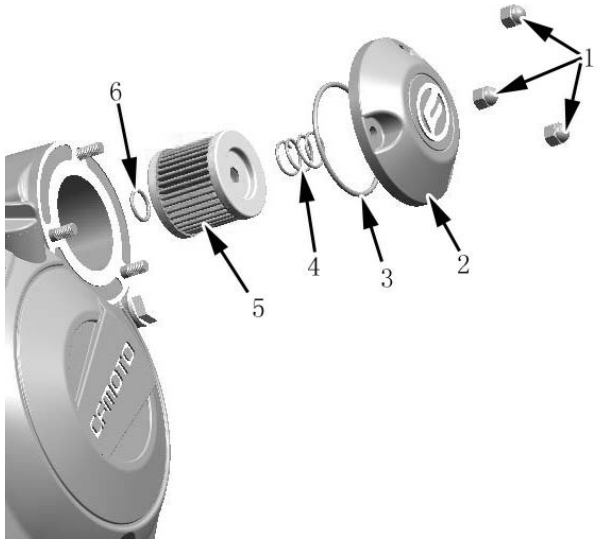
Right side cover

Install right side cover as illustrated;

Note:Washer 6 and right side cover pater must be new parts to avoid oil leak;

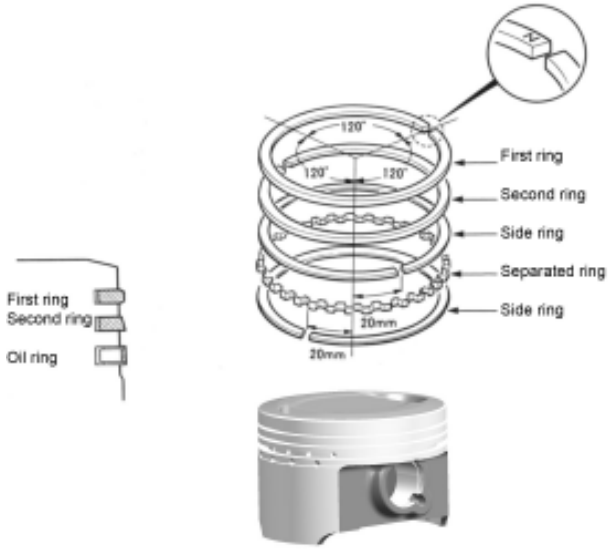
Paper element

1. Check O-ring and gasket 6 and replace if necessary;
2. Clean paper element and replace if necessary;
3. Install O-ring, gasket 6, paper element 5, element spring 4 and O-ring 3, filter cover 2 and bolt 1 in order;



Piston ring assembly

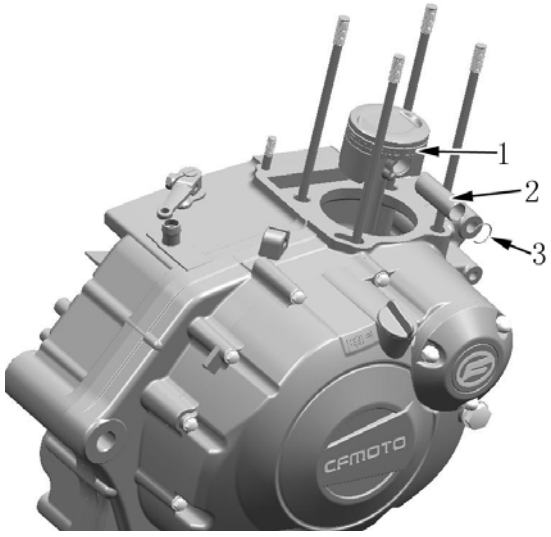
1. Install piston ring onto piston;
2. Coat pistons rings with oil;
3. Do not damage piston;
4. Put piston ring with mark upside;
5. After assembly, make sure piston ring can turn freely and make first ring open mouth facing air inlet.



Piston installaton

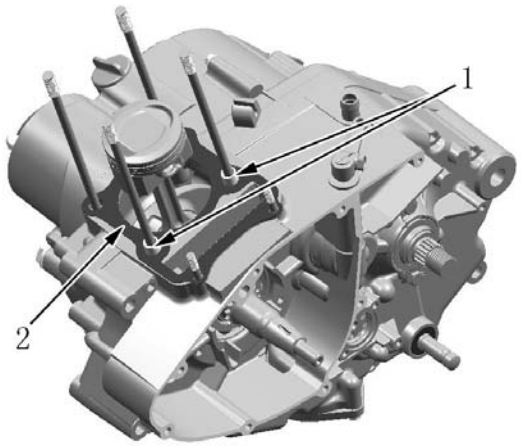
1. Install piston 1, piston pin 2 and dowel pin 3.

2. Put piston end with arrow mark towards to exhuast port.

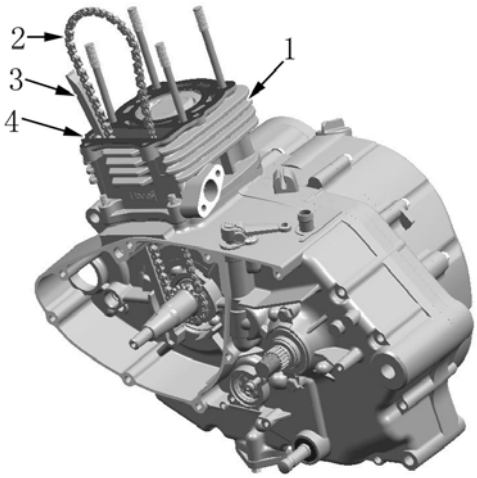


Cylinder body

1.Install dowel pin 1 and new cylinder body gasket 2.

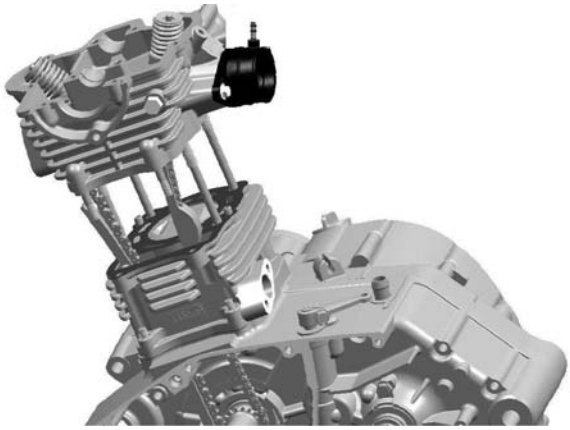


2. Coat cylinder inner surface, piston and piston ring with clean engine oil;
3. Press piston ring, and install piston into cylinder 1 and then install cyliner onto crankcase;
Note: Do not damage piston or piston ring; Note piston ring open not facing piston pin with angle of 120 degrees.
1. Install timing chain sprocket 2;
2. Install guide chain 3;
3. Intall dowel pin and new cylinder gasket 4;
4. Turn crankcase, make piston to to stop point.



Cylinder cover

Install cylinder cover as illustrated.



Camshaft assembly and cylinder head tightening

1. Install camshaft 1;

2. Install sprocket onto timing chain and install timing chain sprocket on to camshaft.

Make sure marking line of timing chain in paralle with cylinder cover connection surface;

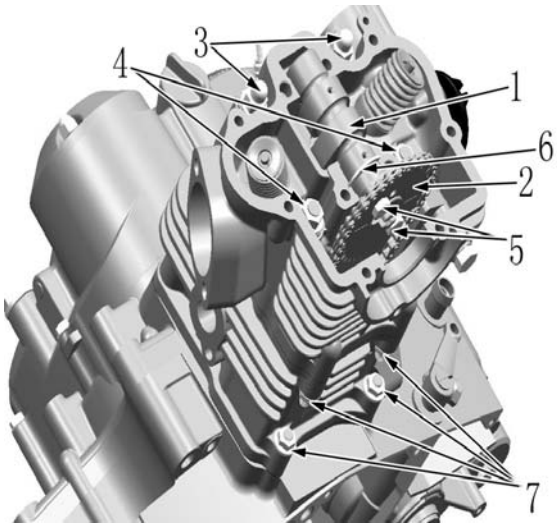
Note:Do not turn crankshaft during above operation

1. Tighten cylinder cover bolt 3 and bolt 4, note that position for both is right and do not miss gasket;

2. Tighten camshaft timing chain sprocket bolt 5;

3. Install camshaft location washer;

4. Tighten 4 pieces of bolt 7;



Cylinder head cover

1. Clean oil on surface between cylinder head cover and cylinder head;

2. Install dowel pins onto cylinder head;

3. Coat sealing glue on cylinder head cover connection surface;

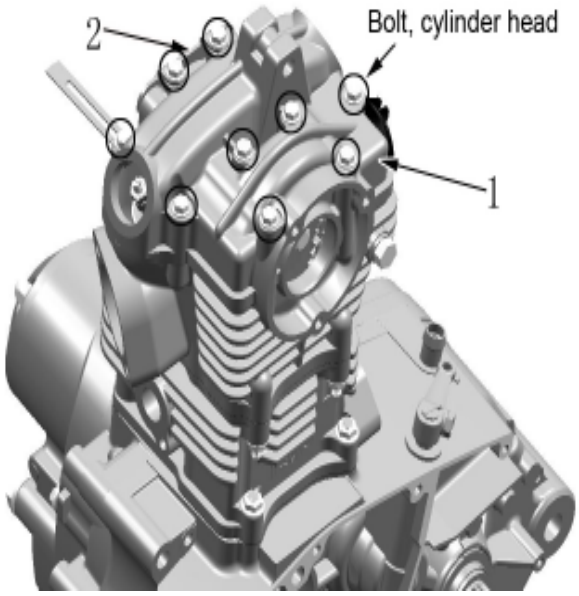
4. Install cylinder head cover 1 as illustraton;

5. Install two cover bolts onto rockerarm dowel plate hole and then install onto cylinder head cover;

6. Install rest bolts;

Note:Tightn cylinder head cover bolts two or three times(Torque:10-12N.m);

7. Instal other assembly bolts;



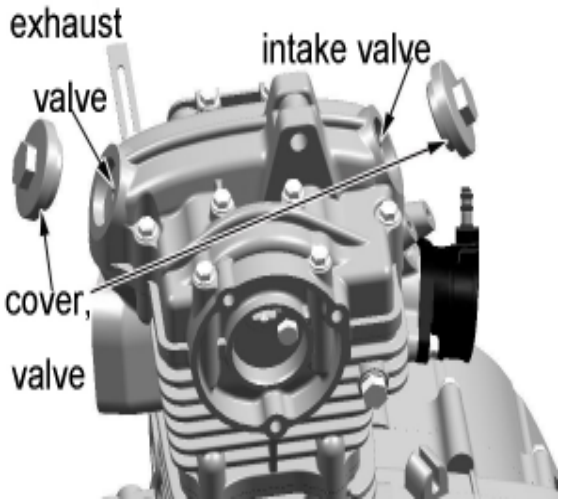
Valve clearance adjustment

1. Turn crankshaft and make pstion to stop point. Adjust air intake and exhaust valve and tighten clearance adjustment bolts.

Air inlet clearance:0.06-0.08mm

Exhaust valve clerance:0.10-0.13mm

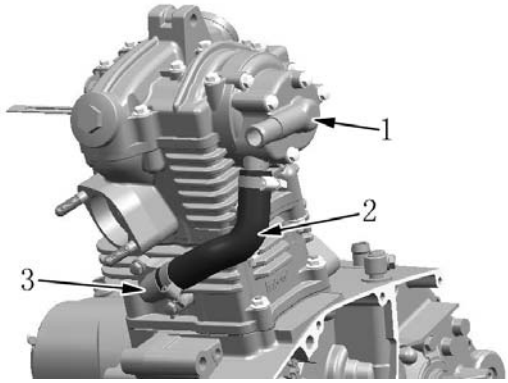
2. Intall valve room cover.



Water pump

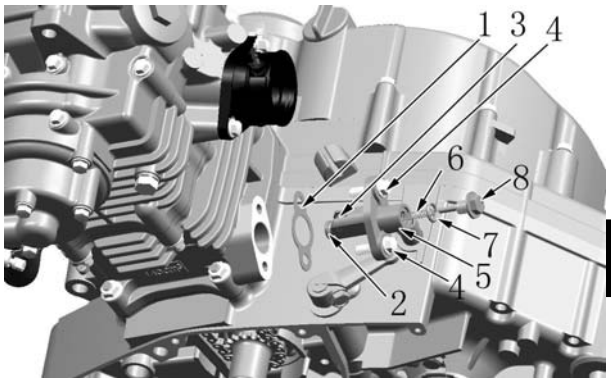
1. Install water pump 1 as illustrated;
2. Intall water pipe joint 3;
3. Install water outlet pipe;

Do not forget to assemly O-ring during water inlet pipe assembly;



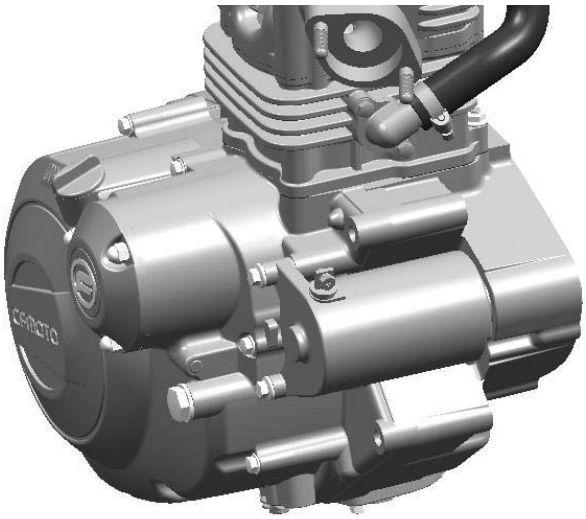
Tensioner

1. Remove bolt 8;
2. Press lock stop seat 2 and tensioner to bottom as illustrated;
3. Install new tensioner 1 and then tighten bolt 4;
4. Install tensioner spring 6, O-ring 7 and tighten bolt 8.



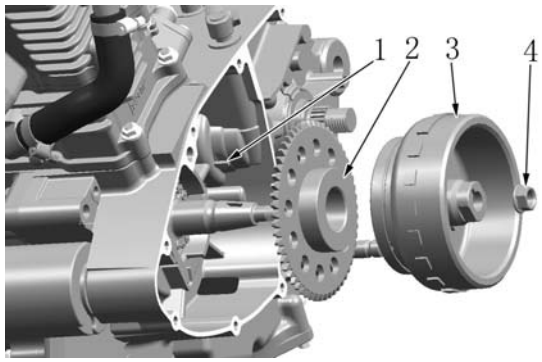
Starting motor

Install starting motor as illustrated



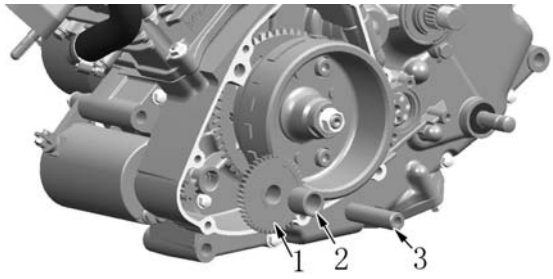
Starting gear and magneto rotor

1. Put 1 into grrove;
2. Install starting gear 1 onto crankshaft;
3. Install magneto rotor;
4. Coat thread glue on crankshaft and then tighten bolt 4.



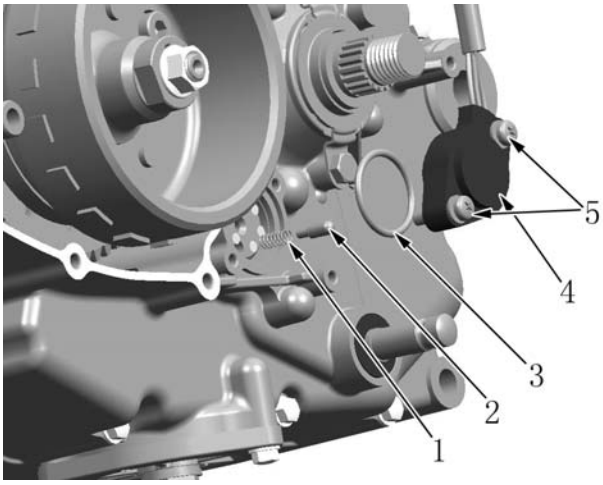
Dual gear

Install dual gear 1, axle sleeve 2 and dual gear axle 3.



Gear connector

1. Install spring 1 into gearsift durm hub;
2. Install gear contact into hole of the hub;
3. Install O-ring 3 and gear contact terminal 4 and tighten bolt 5.

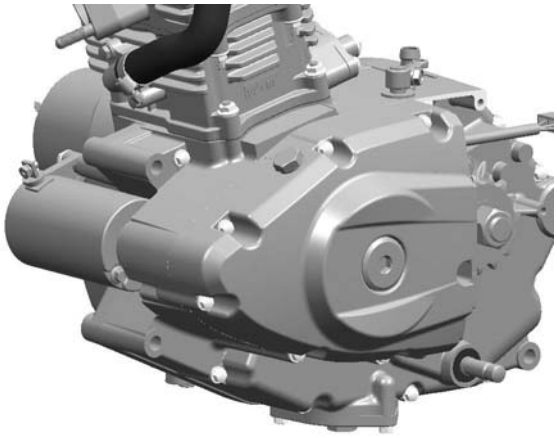


Front side cover and drive chain;

1. Install dowel pin into left crankscase pin hole;
2. Install new left side cover gasket onto left crankcase;
3. Install front left cover onto left crankcase;

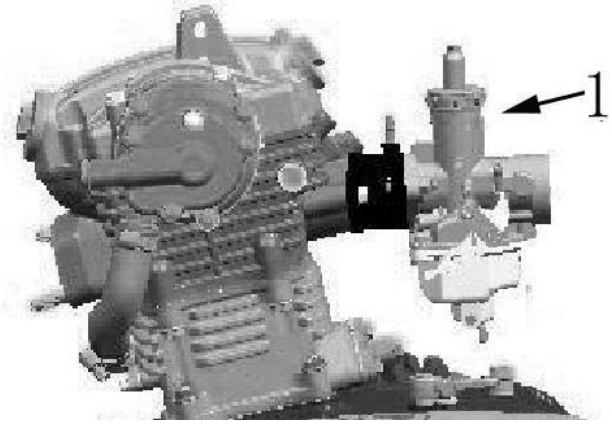
Note: Gasket must be clean and withou foreign fragments. Dowel pin must not be hit

Install drive chain sprocket;



Carburetor

Install carburetor as illustrated.



Overhaul Information 6-1
Disassembly of Engine 6-2
Engine Installation 6-4

Overhaul Information

Operation Cautions:

-It requires an engine bench and coolant tube when installing and disassembling engine. Do not damage frame, engine body, bolts and cables,etc.

-Following operation doesn't require engine removed from vehicle.

Tightening Torque:

Engine suspension tightening nut: M8: 20-30N.m M10: 30-40N.m
Rear arm shaft tightening nut: 80-100N.m
Rear wheel axle tightening nut: 80-100N.m

Disassembly of Engine

Remove:

-Seat

Front protection cover(LH&RH)

-Middle protection plate(LH&RH)

Fuel tank

-Air pipe,fuel pipe water pipe and cables connected with engine

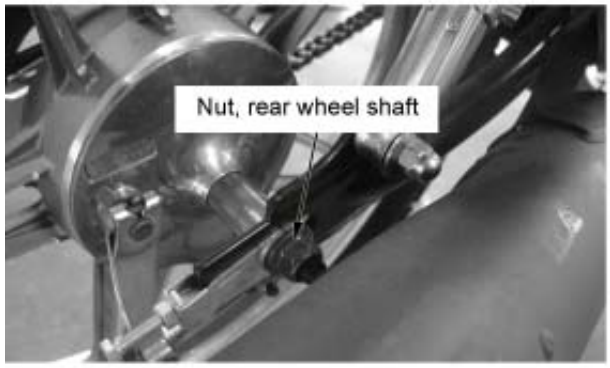
-Wirings connected with engine

-Muffler

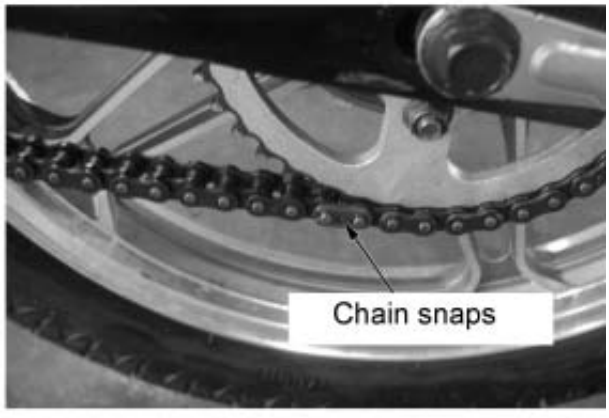
-2 water pipe clamps,drain coolant.

Remove ignition coil high tension cap from spark plug.

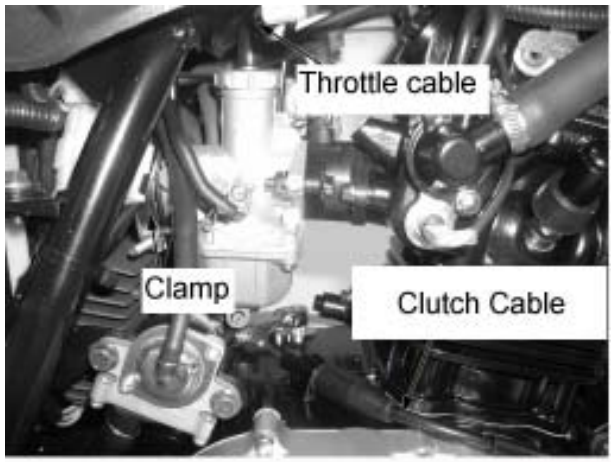
Loosen rear wheel shaft nut



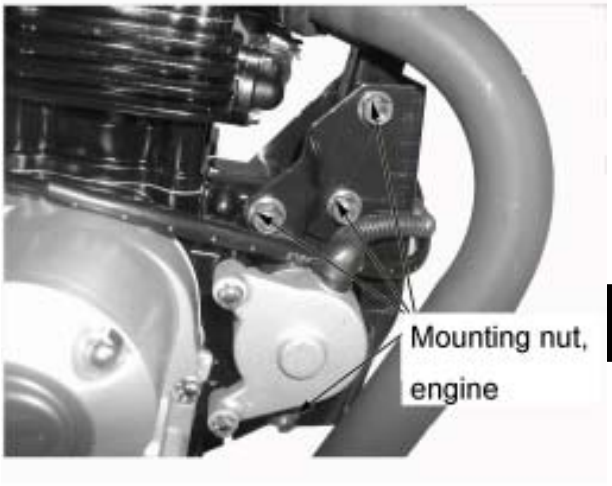
Loosen chain snaps with pliers and remove chain



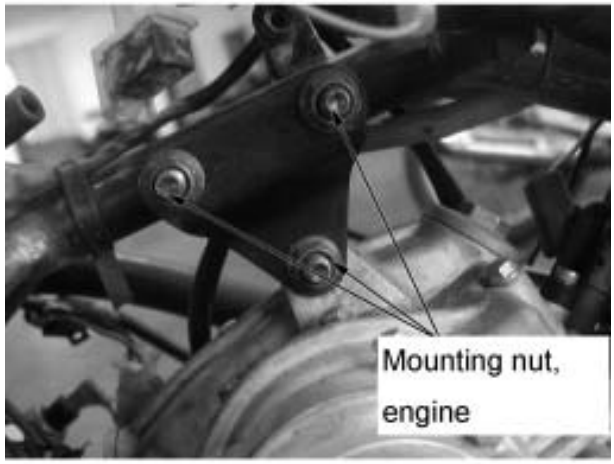
Loosen:
-Clamp to seperate carburetor and air filter.
-Clutch cable and throttle cable



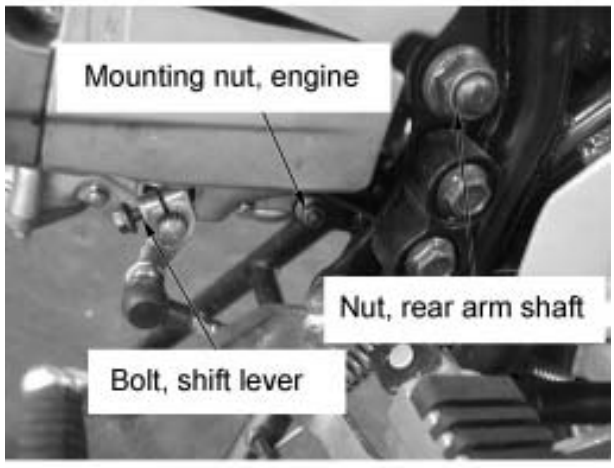
Loosen 4 pcs engine mounting nut



Loosen 3 pcs engine mounting nut



Loosen:
-gear shift rod bolt
-1pc engine mounting nut
-rear arm shaft nut
Remove engine



Engine installation

Note:

Do not damage bolt thread, wirings and flexibale cables,etc.when connecting engine with frame,

Make sure gear shift rod installed to a comfortable position for usage,

Use recommended coolant,drain out air in engine cooling pipe.

Check clutch and chain free clearance after installation.

Reverse the disassembly procedure for engine instalation.

Carefully install engine to the original position by jack or other tools to support engine.

Add coolant before fuel tank installation. (refer to Chapter 4)

Overhaul information 7-1
Troubleshooting 7-2
Handle bar 7-3
Front wheel 7-6
Front shock absorber 7-9
Steering column 7-10
Front brake 7-12

Overhaul Information

Note

1. **Securely support the scooter when overhauling front wheel and suspension system.**

2. **Do not overexert on the wheel. Avoid any damage to the wheels.**

3. **When removing tire, use the special tire lever and rim protector.**

Overhaul Standard

Item			Standard	Service limit
Front wheel	Camber of front wheel shaft		—	0.2mm
	Rim run-out	Longitudal	0.8mm	2.0mm
		Horizontal	0.8mm	2.0mm
	Tire	Groove left	—	1.6mm
		Air presure	175kPa（1.75kgf / cm^2）	—
Front brake	Free play of brake lever		10－20mm	—

Tightening Torque

Mounting nut, steering bar	10-14 N.m
Nut, front wheel shaft	60-80N .m
Upper fixing nut, front shock absorber	20-30 N .m
Lower fixing bolt, front shock absorber	30-40 N .m

Troubleshooting

Heavy steering(steering too tight

·Upper thread is over tightened.
·Steering bearing is damaged or worn out.
·Inner & outer bearing seats are damaged,
worn out or stepped.
·Steering column is distorted
·Tire pressure is too low.
·Worn tire

Loosened Handlebar

·Front right and left shock absorbers are not matched.
·Front shock absorbers are distorted
·Front wheel shaft is distorted,
wrong assembly of front wheel

Front wheel wobbles

·Deformed rim
·Faulty wheel bearing
·Faulty tire
·Improper tightening of wheel shaft

Front suspension too soft

· Loosened spring,front shock absorber
· oil insufficiency,front shock absorber

Front suspension too hard

· improper oil,front shock absorber
· front shock absorber deformed
· oil channel blocked,front shock absorber

Abnormal noise with Front absorber

·slipping parts distorted
·oil insufficiency,front shock absorber
·outer oil seal broken
·steering bearing worn out
·oil insufficiency,counter gear

Spongy brake lever

· air enter into brake system
· brake oil level too low
· oil leakage in brake system

Poor brake

· dirty brake disc
· brake disc unparalle with wheels

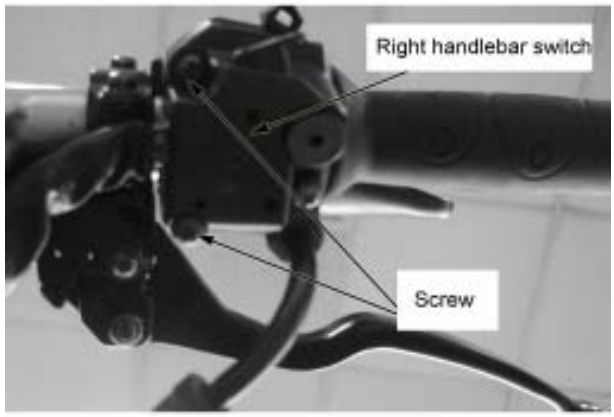
Abnormal noise with disc brake

· dirty brake disc
· eccentri disc brake disc
· disc brake pump wrong assembly
· brake disc unparalle with wheels

Steering bar

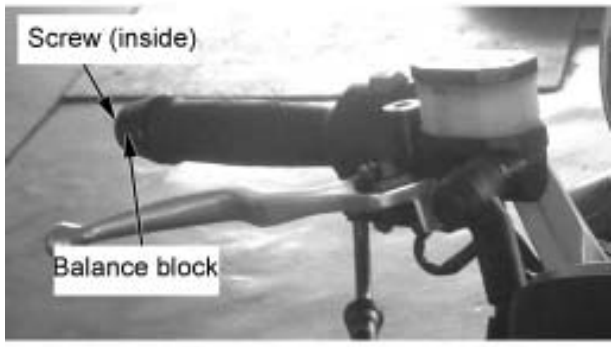
Disassembly

Remove 2 pcs mounting nut, right handlebar switch

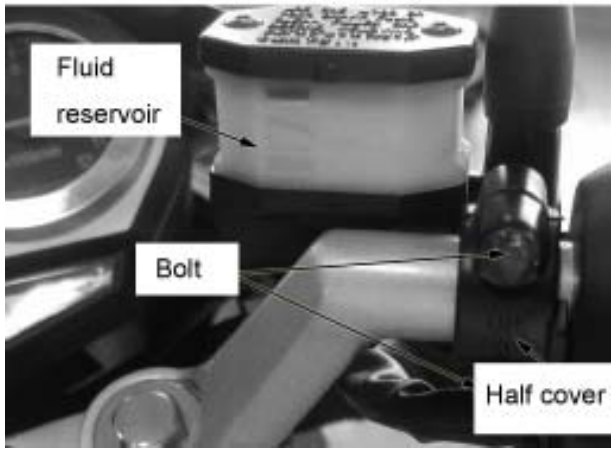


Remove throttle cable and throttle grip,
remove right handlebar switch

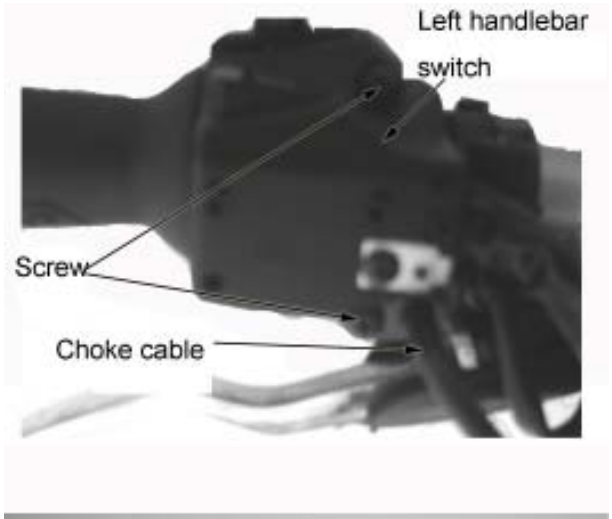
Loosen fixing screw, balance block,
remove balance block and throttle grip.



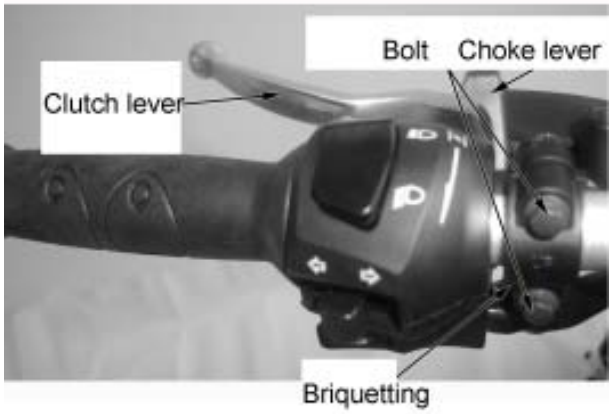
Loosen 2pcs half cover bolt, fluid reservoir,
remove fluid reservoir



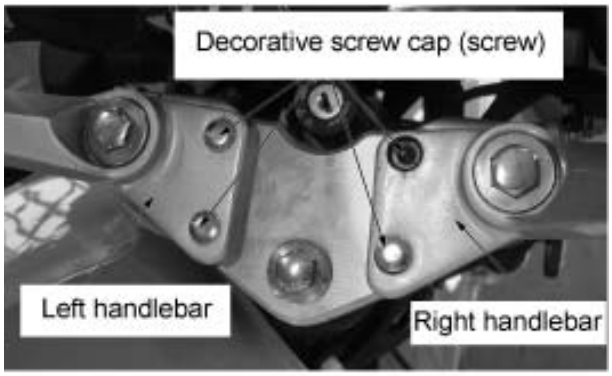
Loosen 2 pcs mounting screw,
Seperate choke cable and choke lever,
remove left handlebar switch



Loosen 2 pcs briquetting bolt,clutch lever,
remove clutch lever

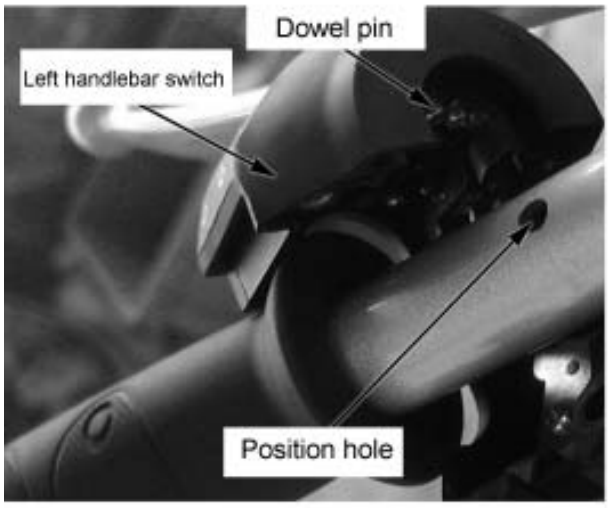


Loosen 4pcs decorative screw cap(disposable items) with straight screwdriver,remove 4 pcs fixing screw and left handlebar.



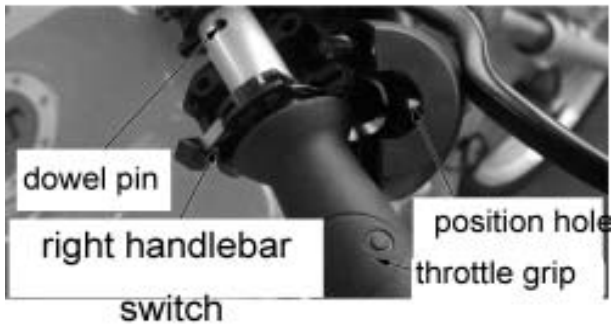
Installation
reverse the disassembly procedure for installation.

Insert dowel pin into position hole when assembling left handlebar.



When assembling right handlebar switch, insert throttle grip into right handlebar, install throttle cable.

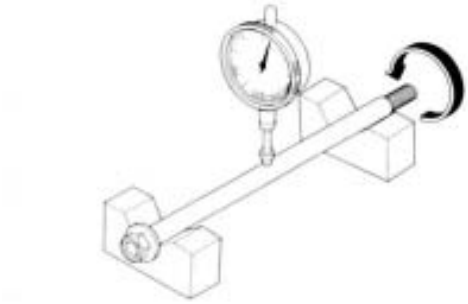
Insert dowel pin into position hole, assemble right handlebar.



Front Wheel

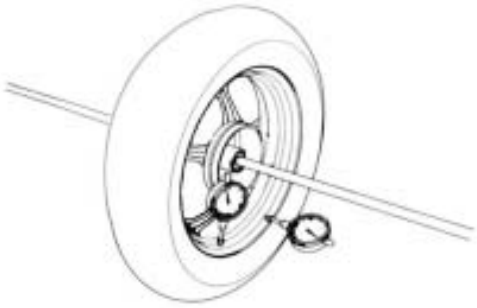
Support main stand,put a jack under engine or put a heavy thing on rack, raise front wheel.
Loosen
-cable, speedometer
-nut, front wheel shaft
Remove
-front wheel shaft
-front wheel

Front wheel shaft inspection
Put front wheel shaft on V block,
check curvature.
service limit: >0.2mm ¡ úreplace

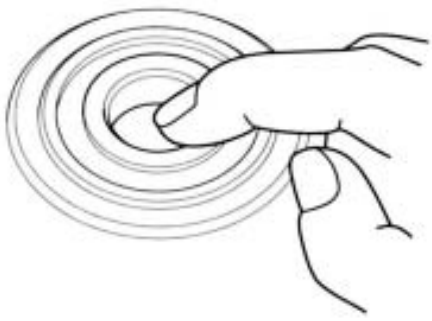


Front rim inspection

Put front wheel on turntable, turn wheel to check wheel beating with dial indicator..
Service limit:
Axial direction: 2.0mm
Radial direction: 2.0mm

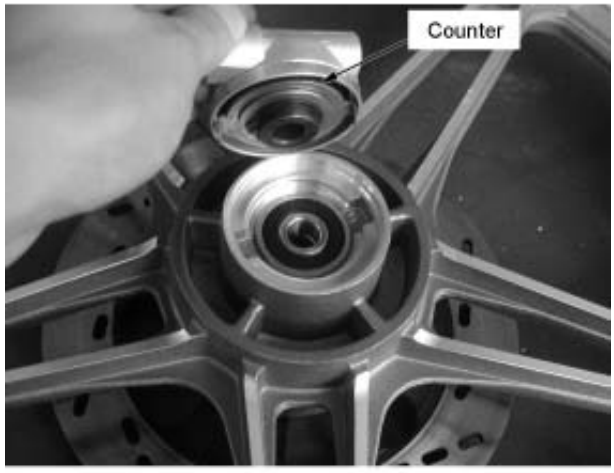


Check wheel bearing for looseness; turn bearing inner ring to check for flexible rotation; Check if any looseness when assembled on rim.
If any above problem, replace with a new bearing.

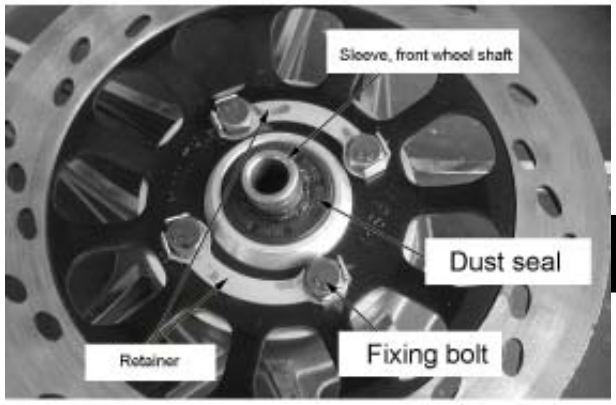


Disassembly

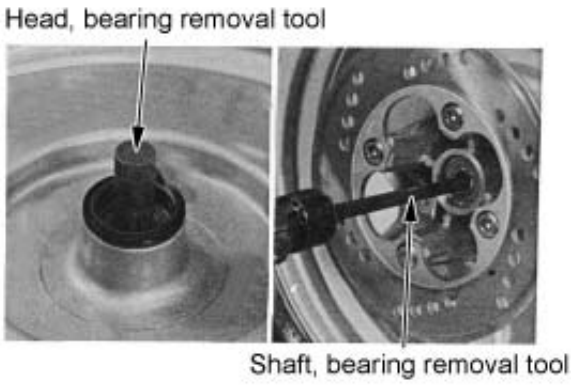
Remove counter from right side of front wheel



Remove:
-sleeve, front wheel shaft
-4pcs fising bolt
-brake disc
-front disc brake disc
-dust seal
thickness service llimit, front disc brake disc: 3mm



Push out wheel bearing and wheel shaft sleeve



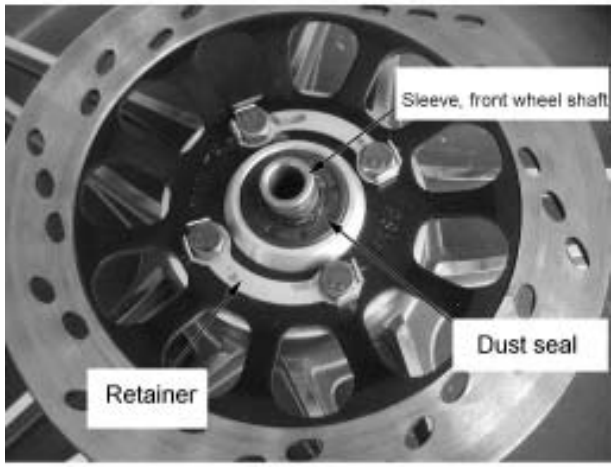
Installation

Apply grease to bearing inner ring,
press fitting bearing and shaft sleeve.

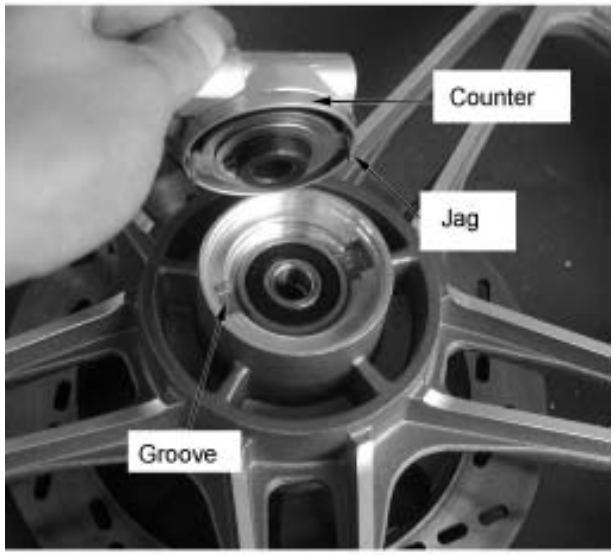
NOTE

Press fitting right bearing,front wheel before left breaing.

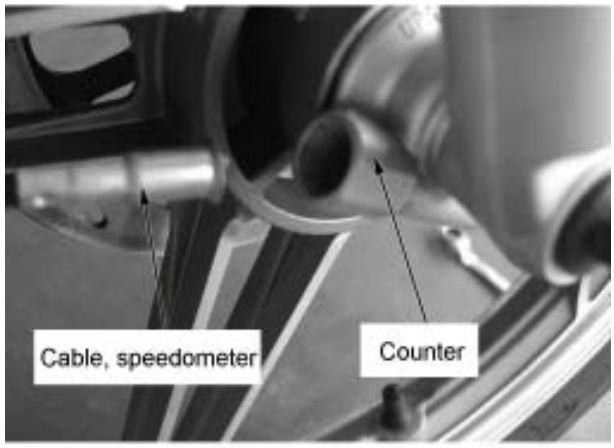
Install front brake disc,lock up bolt with retainer,
apply grease to dust seal before intalling to
brake disc side of front wheel,
install sleeve, front wheel shaft.



Install counter to wheel,
set jag into groove.



Install front wheel to front shock absorber,
insert front wheel shaft from left to right
with nut,install speedometer cable to
counter through cable clip.
UP in counter points to lock nut,front wheel
shaft in shock absorber direction.
tightening nut£¬front wheel shaft£º60-80N¡¤m



NOTE

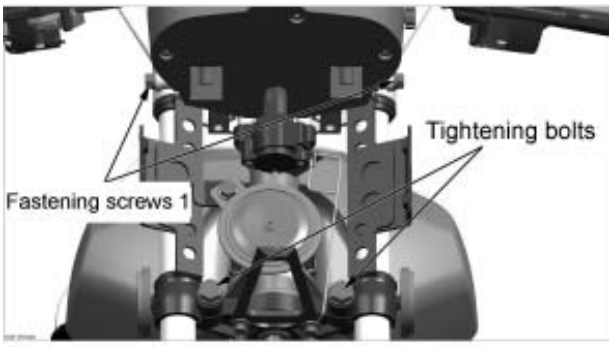
Make sure cable is in line with counter when assembling cable, speedometer..

Front shock absorber

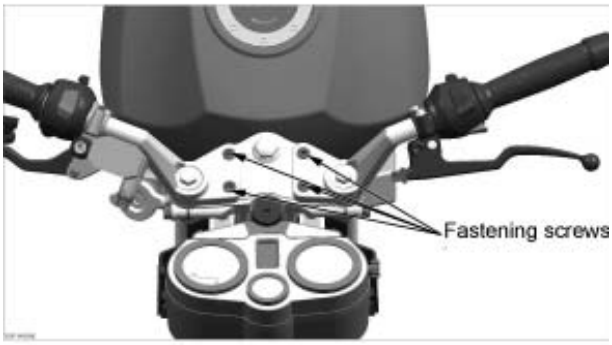
Remove

front fender-(2-7)
big light cover-(¨2-8)
front wheel-(7-6)

Loosen
-2 pcs fixing bolt
-2pcs fixing screw 1



Loosen 4 pcs fixing screw, remove handlebar(LH&RH).
Loosen 2 pcs fixing bolt, brake disc



Remove front shock absorber(LH&RH).

NOTE

Do not put the shock absorber upside down in case of oil leakage from inner absorber.

Inspection:

Oil leakage, aged or damaged oil seal −Replace

Installation

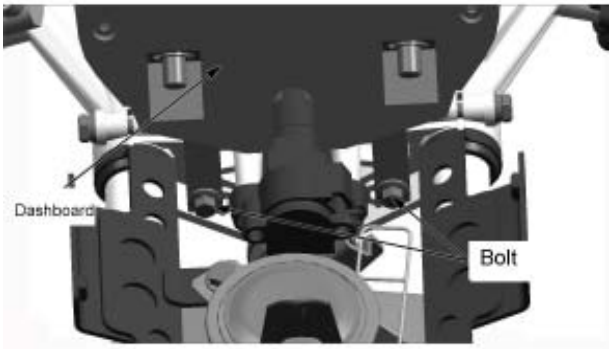
Reverse removal procedure for installation.
Set brake hose into brake clipper, apply thread glue to fixing bolt,brake disc, tightening torque:30-40N .m

Fastening screw 1: 20-30N .m
Fixing bolt: 30-40 N .m
Fastening screw: 10-14N .m

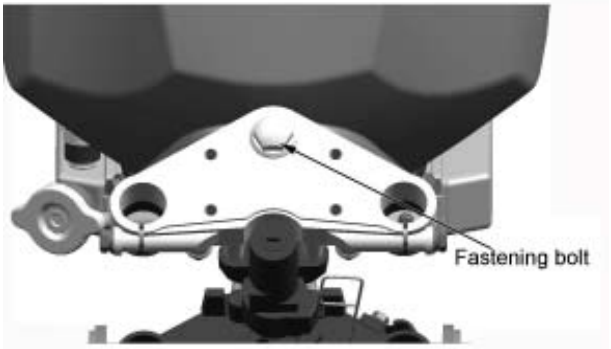
Steering Column

Remove:

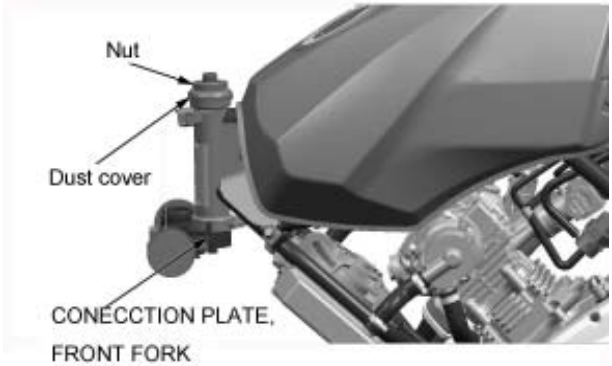
front fender-(2-7)
big light cover-(2-8)
front wheel-(7-6)
handlebar (LH&RH)-(7-9)
front shock absorber-(7-9)
2 pcs bolt, loosen dashboard



Loosen fixing bolt



Loosen nut with wrench, remove dust cover and lower joint plate, front fork.
Remove circlip, upper bearing, top and bottom ball.



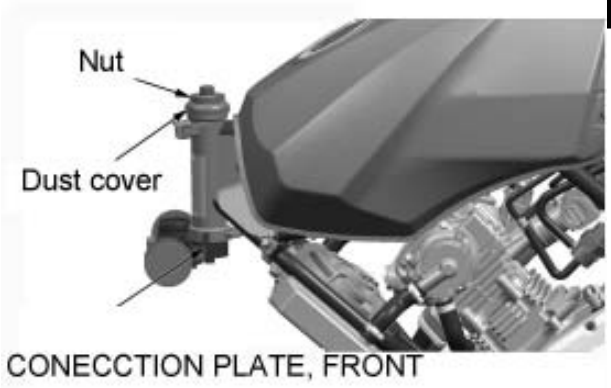
Remove top and bottom bearing race with impact tool.

Installation

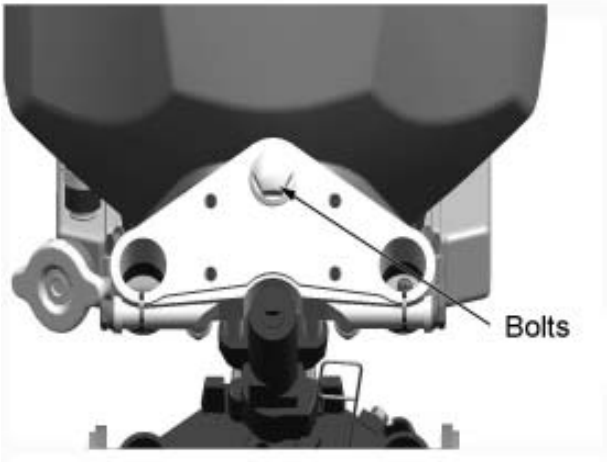
Put bottom ball into lower joint plate, front fork.

Install top and bottom bearing race to frame riser with impact tool, apply enough grease.
Put top ball into top bearing race.

Install lower joint plate to frame riser,
insert top bearing race and dust cover.
Lock up lower jont plate with nut, adjust tightness to proper position(standard:plate do not move up and down, flexible move left and right)
lock up nut tightening torque:60-90N .m



Install upper joint plate, lock up with bolt,
tightening torque:60-90N .m
Install:
-dashboared
-front shock absorber,handlebar(LH&RH)
-front wheel
-big light cover
-front fender



Front Brake

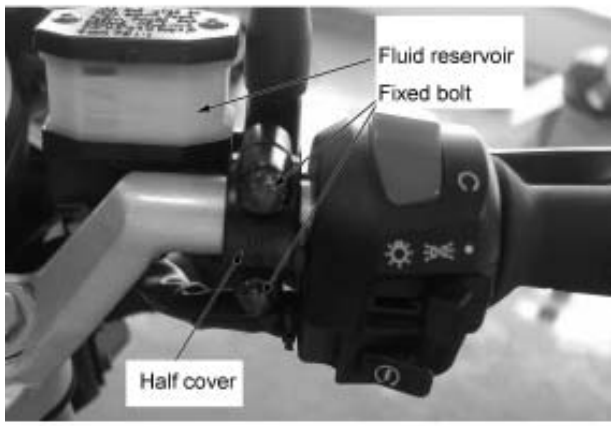
Fluid Reservoir Removal

Remove:

-rear vire mirror(RH)

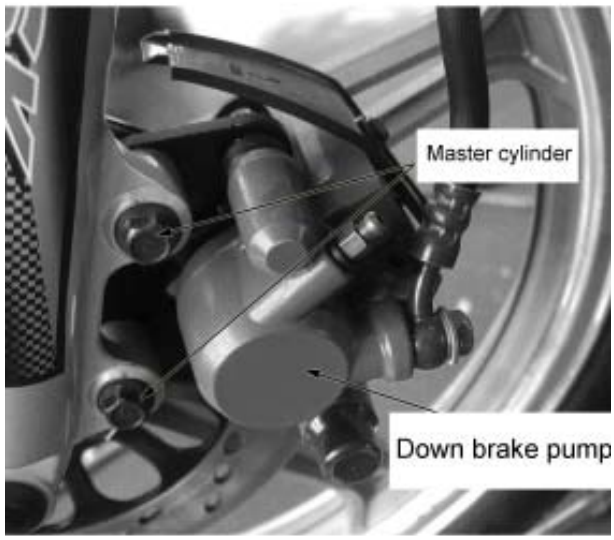
-2 pcs fixing bolt

Seperate fluid reservoir from right handlebar, do not remove fluid reservoir from right handlebar without changing hydraulic brake.



Master Cylinder Removal

Remove 2 pcs fixing bolt, remove master cylinder from front shock absorber(LH)



Installation

Reverse removal procedure for installation of fluid reservoir and master cylinder.

NOTE

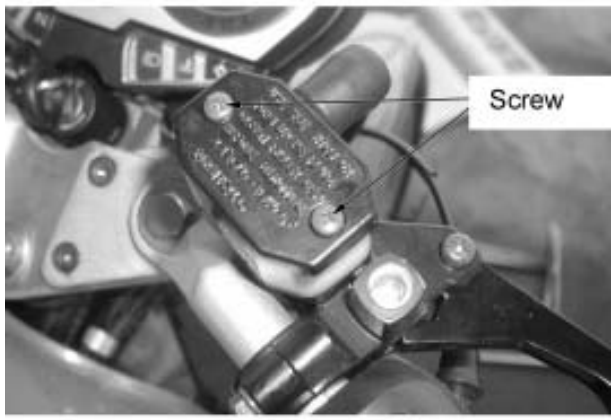
1.Do bot hang brake pump on brake hose.

2.Remove master cylinder first before fluid reservoir; install fluid reservoir first before master cylinder, do not reverse the procedure in case air enter into hydraulic system.

3.Do not pinch front brake lever after removal of brake pump.

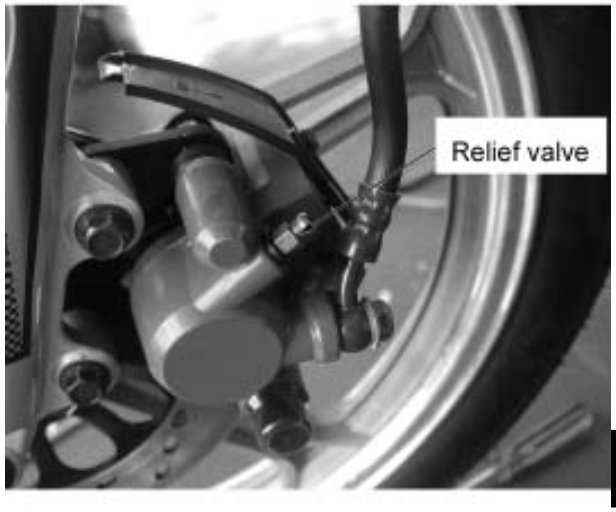
Replace brake Fluid, drain out air

Support main stand on flat ground, correct handlebar.
remove2 pcs fixing screw, fluid cup cover



NOTE

Cover coating and plastic parts with cloth to avoid brake fluid.



Connect a transparent hose with relief valve, master cylinder, loosen relief valve.
Suck out brake oil with injection tu

Brake Fluid Injection

Connect a transparent hose and injection tube with relief valve, master cylinder, loosen relief valve.

Inject brake oil into fluid cup,suck out air with injection tube until no air in the hose, lock up relief valve.

NOTE

1.Oil level in fluid cup should keep at least half when sucking in case of sucking in air.
2.Use recommended brake oil(DOT3 or DOT4 non-petroleum base brake fluid)

Drain out Air

Connect a transparent hose with relief valve, pinch front brake lever without loosening, openn relief valve to drain air, repeat several times until no air.

NOTE

Oil level should keep at least half when draining air .

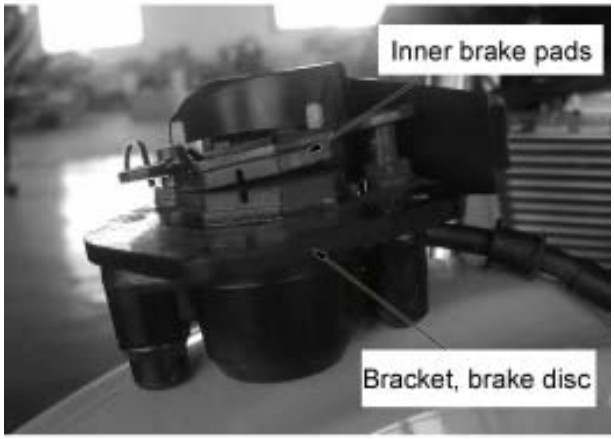
Brake Disc/Front

Brake Disc

Replace

Remove brake disc

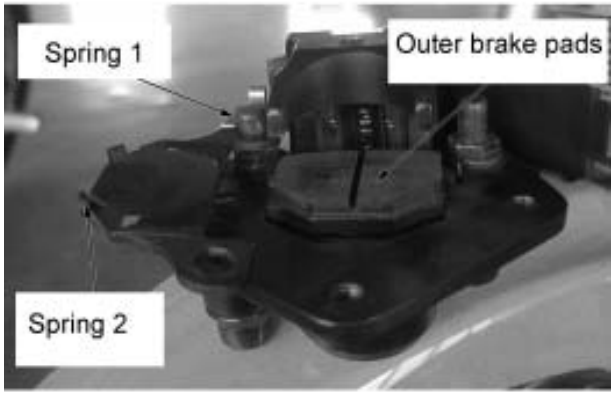
Pres bracket, brake disc until inner pads can be get as illustrated.



Remove outer brake pads after getting inner brake pads.

Remove spring 1 and 2.

Install new inner and outer brake pads by reversing the procedure for removal.



NOTE

Brake disc must be adjustmented after installing before usage.

Measure Brake Disc Thickness

Measure brake disc thickness with micrometer or calliper. Replace with a new one if over serviec limit.

Service limit: 3mm

Overhaul information.....8-1
Troubleshooting.....8-2
Rear Wheel.....8-3
Rear arm & Rear brake.....8-5

Overhaul info

Note

Securely support the scooter when overhauling the front wheel and suspension system.

1.Assemble the fender driving chain, make gap to the opposite way from the wheel.

2.Adjust the driving chain, double confirm the brake if need to do adjustment accordinglly.

Overhaul standard

Item			Standard	Service limit
Rear wheel	Camber of rear wheel shaft		—	0.2mm
	Rim run-out	Longitudal	—	2.0mm
		Horizontal	—	2.0mm
	Tire pressure		Single person：200kPa（2.0kgf/cm²）	—
			Two person：225kPa（2.25kgf/cm²）	
Rear brake	Thickness of rear brake shoes		4mm	2mm

Tightening torque

Mounting nut, REAR ARM	80-100N.m
Fixing bolt/nut, Front shock absorber	35-45 N.m
Nut, front wheel axle	80-100N.m

Troubleshooting

Heavy steering

1. Warped rim
2. Improper tightening of wheel axle
3. Faulty tire
4. Improper tightening nut of wheel axle
5. Improper tightening nut of rear arm

Rear suspension is too soft

1. Weakened shock absorber
2. Rear absorber oil leakage
3. Improper rear absorber adjustment

Rear absorber is too hard

1. Improper rear absorber adjustment
2. Air pressure of tires is too high.

Abnormal noise with rear absorber

1. Rear shock absorber is bended.
2. Loosening of tightening parts of rear shock absorber
3. Damping lack of oil

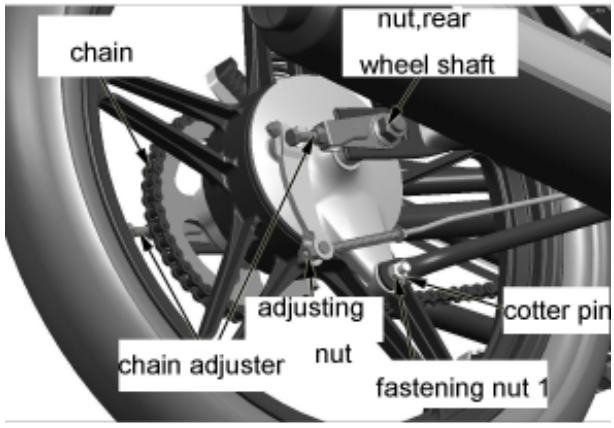
Poor Brake

1. Improper brake adjustment
2. Stained or damaged brake disc
3. Worn brake shoe
4. brake shoes assembled imporperly
5. Worn axle arm

Rear wheel

Removal

Support the frame with jack, lift the front wheel, remove
rear wheel chain adjusting nut.



Remove:

COTTER PIN . nut 1

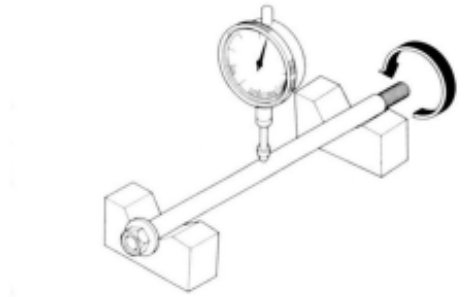
Rear wheel axle nut, take out rear wheel axle

Front wheel

Inspection

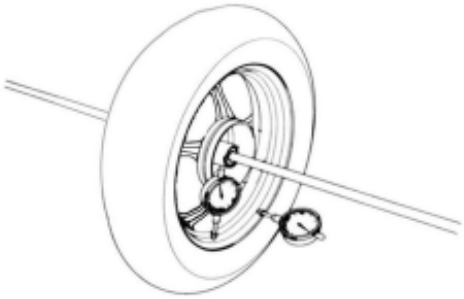
Wheel axle

Set axle on a V block, measure axle vibration with centesimal gauge.



Service Limit: 0.2mm

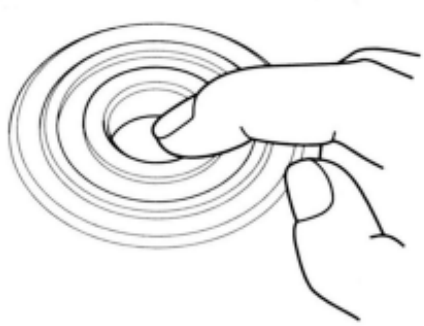
Set rear wheel on the rotating stage,
check the rims vibration



Service Limit:

Horizontal:2.0mm

Vertical :2.0mm

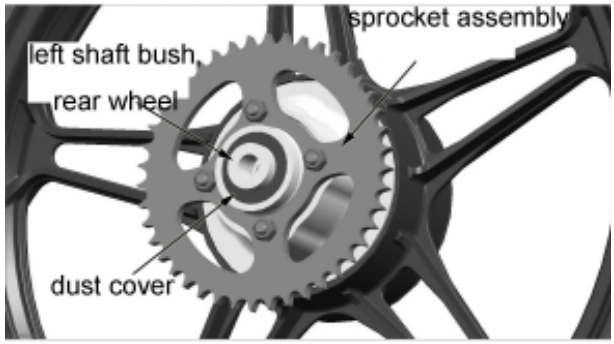


Check rear axle clearance,
to change if too big clearance

Check rear chain wheel, to replace if worn

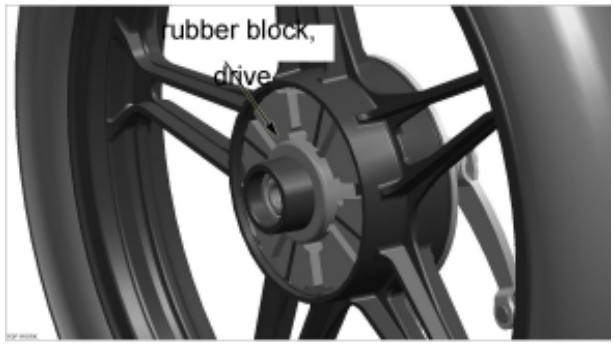
Check driving chain,to replace if necessary

Dissemble rear wheel



Remove **SHAFT SLEEVE,REAR WHEEL (LH)**
Remove dust boot
Remove chain comp.Remove **RUBBER CUSHION**, check if there is any looseness or worn to replace in time.

Remove rear brake comp.



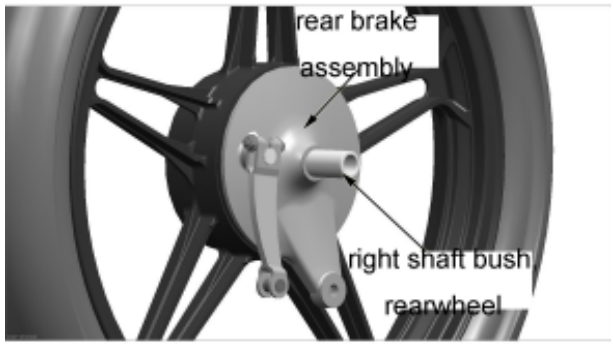
Use special tool to disemble rear wheel axle (LH&RH)

Assemble

Follow the opposite way of dissemble when Assemble rear wheel

Use butter when assemble dust boot

Rear wheel axle nut：80-100N.m



Note;
Assemble the rear axle bearing first, then press the rear axle to assemble

Rear Arm

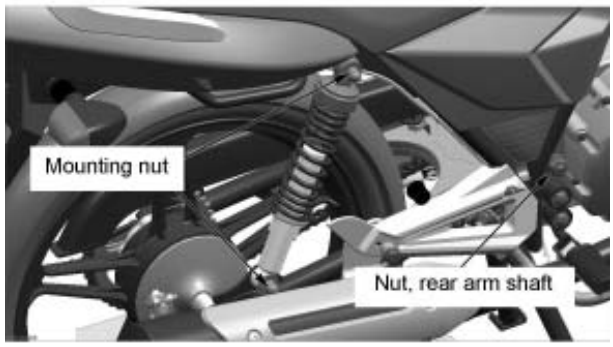
Disassembly

Remove

Rear wheel-(8-3)

Loose 2 nuts, remove rear right absorber

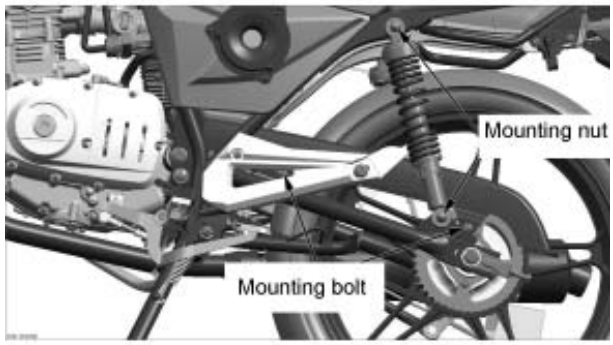
Loose rear armer nut



Loosen the 2 bolts, remove chain protector

Loosen the 2 bolts, rear (LH) shock absorber

Remove SHAFT, REAR ARM, disemble rear arm



Assemble

Follow the opposite way of dissembly when asemble

Rear brake

INSPECTION

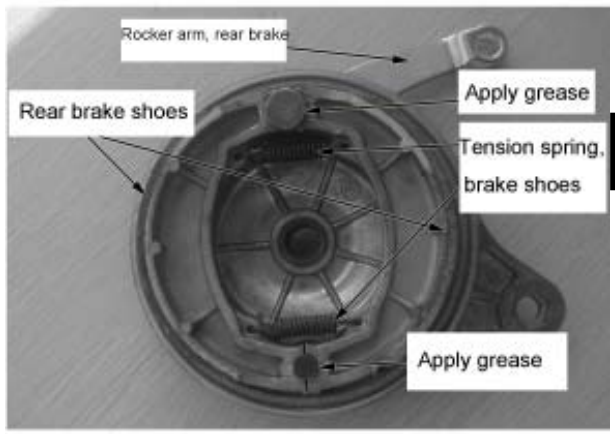
Check thickness of rear brake shoes

Using limit: to replace when below 2.00mm

Dissembly

Remove spring, brake shoe and rear brake shoes

Loosen brake rocker arm nut, remove rocker arm, indicator and O ring, remove rocker arm axle.



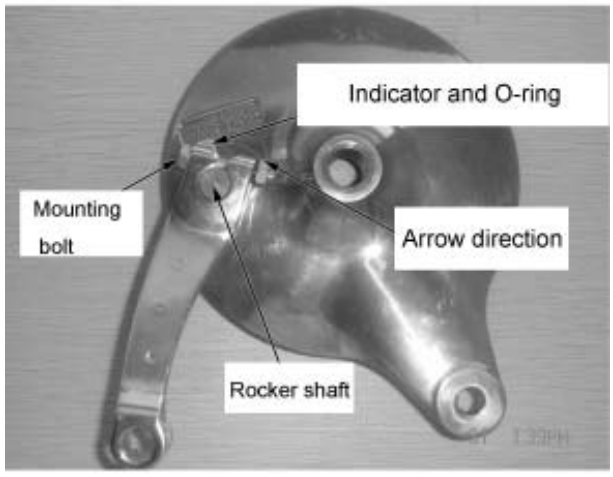
Installation

Spread with butter on oil groove of the rear brake rocker arm and on picture indicating part.

Arrow on the indicator alignment with arrow on the picture to install.Install rear brake rocker arm, fasten with bolts

To install brake shoes into hole of rear brake shoes (spring to install properly)

Cover the brake drum(spring position inside)



Note

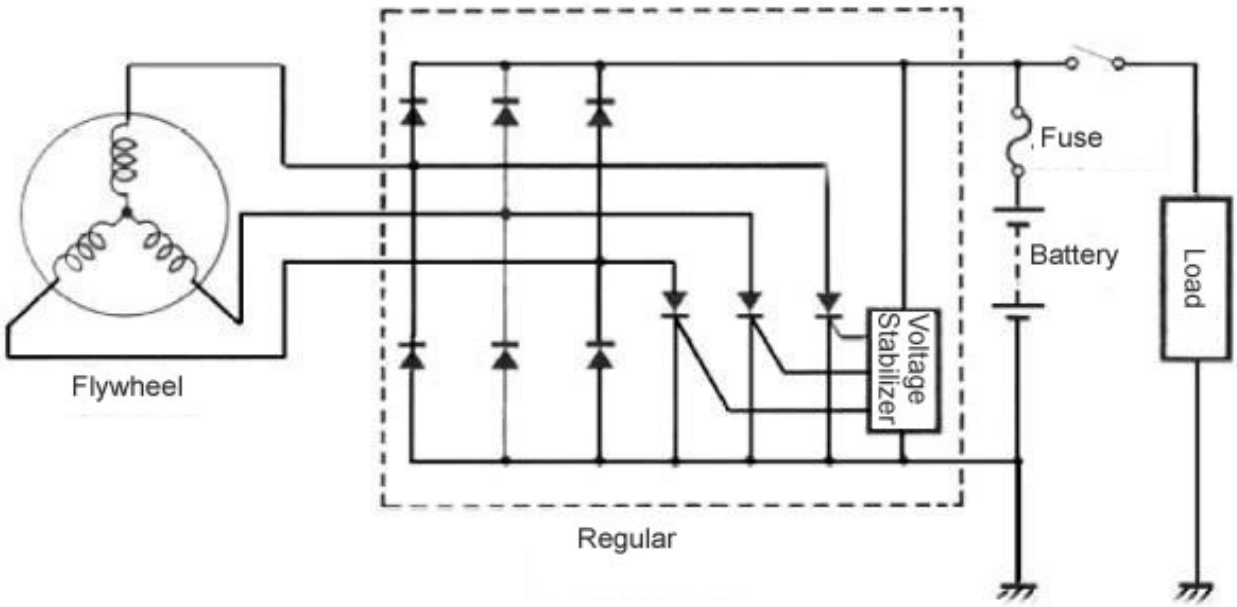
Installed rear wheel, check driving chain, rear wheel position, brake drum and brake pedal clearance .

Electric Apparatuses

Charging system..... 9-1
Electrical Starting system 9-4
Ignition system 9-6

Charging System

Charging Diagram

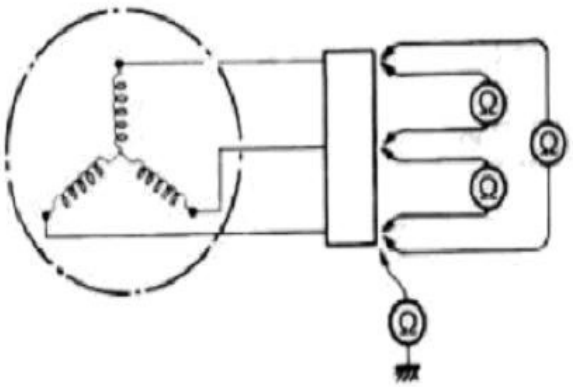


Magneto Coil Resistance

1. Measure the resistance of 3-Phase Magneto Stator Coil
2. If the resistance is out of specified range, please replace a new stator.
3. Check insulation of stator coil and stator center.

Turn Multimeter on **1X10 Ω** range

Megneto Coil Resistance: **0.8 ± 0.1 Ω**
(Yellow-Yellow)
Insulation Resistance: **∞ Ω**
(**Yellow-Ground**)



Performance of Magneto without load

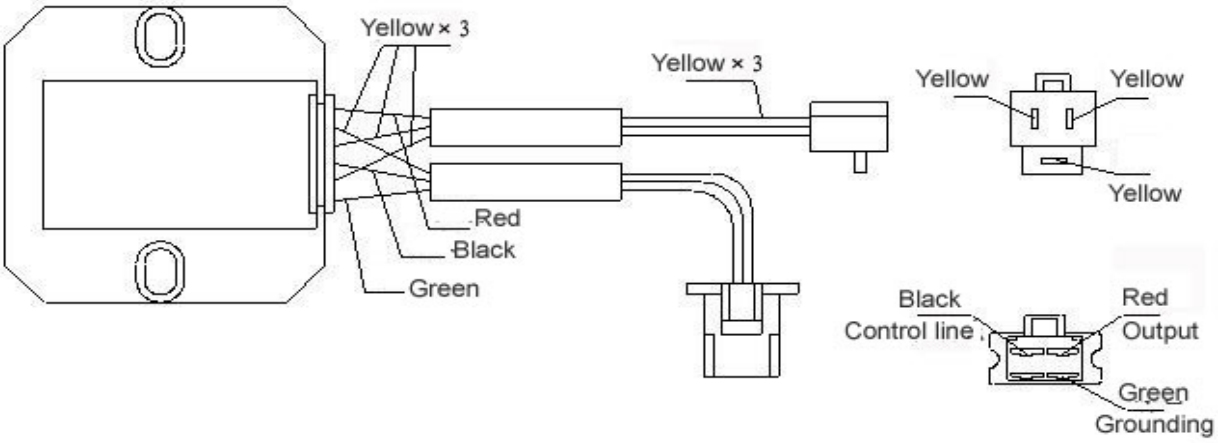
1. Start the engine and keep it at 5000r/min
   Measure the Voltage among 3 output lines of Magneto Stator Coil by Multimeter.
2. If the voltage is lower than specified votage rate, please replace a new magneto.

Turn Multimeter on AC Votage range.

The Votage rate of Coil when magneto is without load

>50V(AC Voltage) at5000r/min

Regulator



Measure resistances among connecting line ends by multimeter(See below Picture). If one value is out of specified range. Please replace a new one.

Turn Meltimeter on Diode

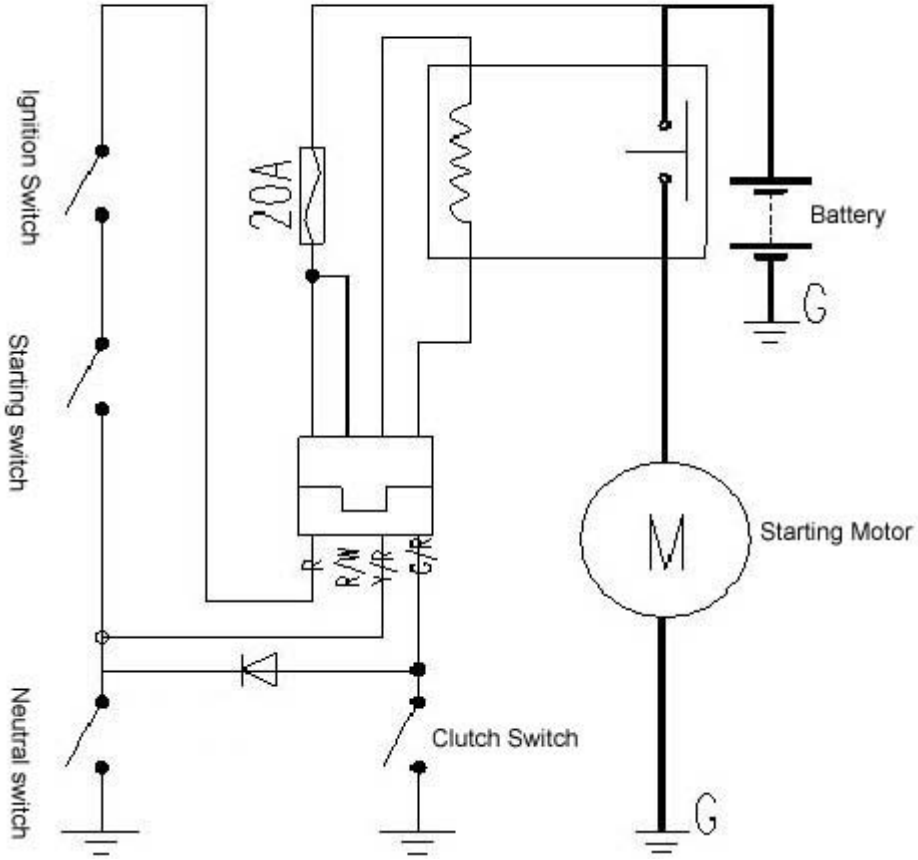
Caution:
When Multimeter probe is unconnceted, Multimeter voltage is below than 1.4V, Please replace Multimeter Battery.

When Engine gets started and battery is fully charged, if the voltage between red line and green line is more than 15V or less than 12V, please replace it with a new one.
(Engine at 5000rpm)

Black ⊖ \ Red ⊕	Yellow	Yellow	Yellow	Green	Red	Black
Yellow		∞	∞	400–500	∞	∞
Yellow	∞		∞	400–500	∞	∞
Yellow	∞	∞		400–500	∞	∞
Green	∞	∞	∞		∞	∞
Red	400–500	400–500	400–500	750–850		∞
Black	∞	∞	∞	∞	∞	

Starting system

Starting system Diagram



Starting Motor

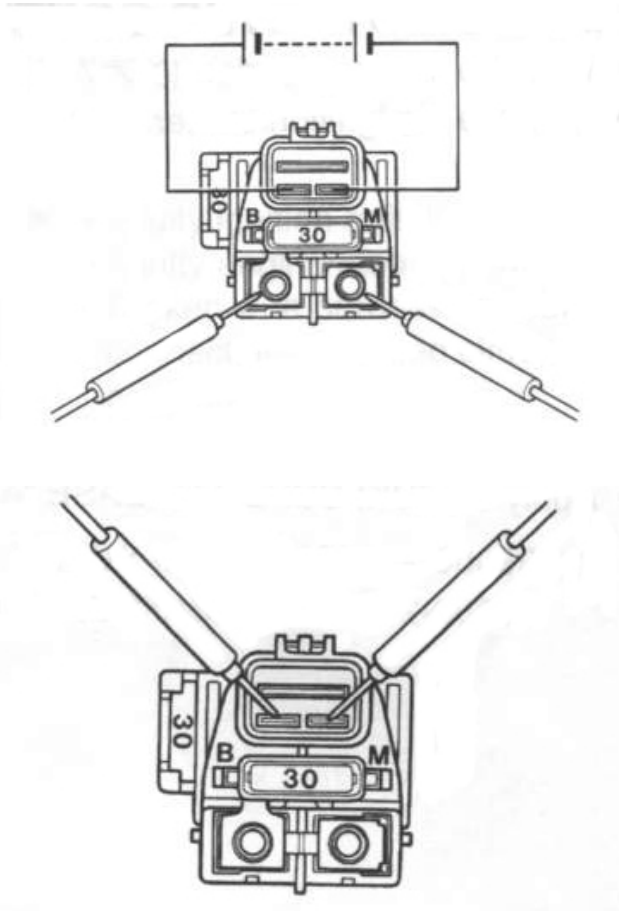
Starter Relay

1. Load 12V voltage between the anode and cathode of Starter Relay Coil, and use multimeter to check 2 connections are well connected or not.
2. If Start Relay connections tick, 2 connections are connected.
3. Unload 12V voltage on coil, and the 2connections disconnect.
4. If the above 2 conditions happen, Starter Relay is ok.

Turn Multimeter on Diode

Caution:
Load Votage on Starter Relay Should not exceed 2 minutes, otherwise, it may cause relay overheated and coil blown.

5. Measure resistance of starter relay by Mutimeter, if resistance is out of specified range, please replace it with a new one.
6. Turn Mulitimeter on **1X10 Ω** range
Resistance of Auxiliary Starter relay Coil**:3-5 Ω**



Caution when starting engine

7.Connect the lines according to circuit diagram.

8.Check whether parts are connected properly before starting.

9.Check air circulation system.

10.Check fuel system.

If blocked, clean clogged parts and ensure smooth fuel system.

If leakage, try to reconnect the leaked parts and ensure leakless fuel system.

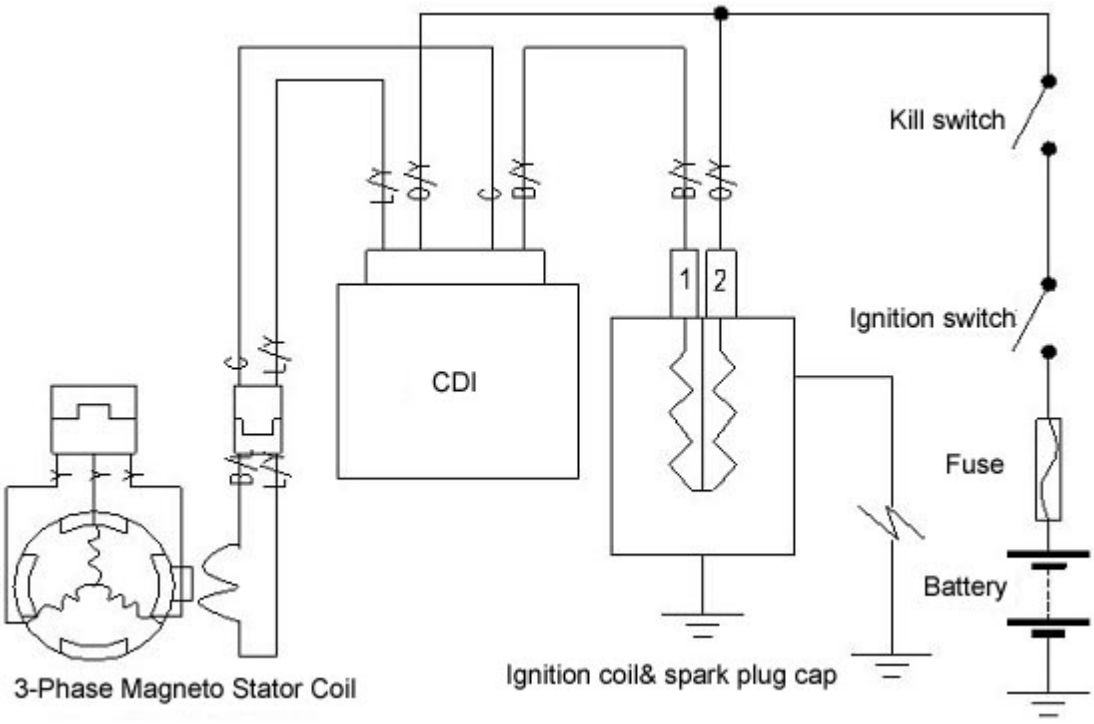
11.Release throttle and turn off ignition swtich. Push starting switch with 3-5 seconds.

12.After starting engine, warm up engine , check idle speed after it's stable.

Idle speed:1350-1650rpm

Ignition system

Ignition system Diagram



Ignition coil

Ignition coil primary voltage

1.Keep spark plug in the cylinder head, install qualified spark plug on the spark plug cap and earth the engine.

2. Measure the primary voltage of Ignition coil by multimeter.

3.Connect multimeter and peak value voltage adapter as follow:

+ Probe: Green Downlead/Ground

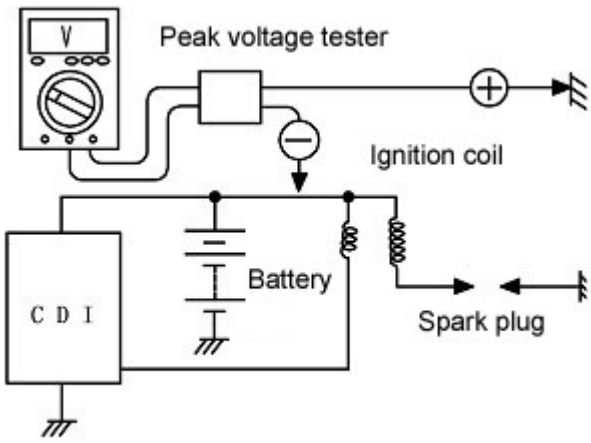
- Probe: Black/Yello Downlead

Notice:

Confirm the voltage of battery 12V

Downlead of Ignition coil is connected.

Refer to User Guide when using Multimeter and Peak value voltage adapter



4. Turn the gear at Neutral, and Turn the ignition switch at ¡°ON¡±Run the engine few seconds by pushing startig buttin, and measure Peak value of Pick-up Coil.

5. Repeat few times to get the highest peak value. Turn Mulitimeter to AC.

Ignition coil primary Peak value 12V

Warnning

When measuring the voltage, do not touch the terminal with finger to avoid electric shock.

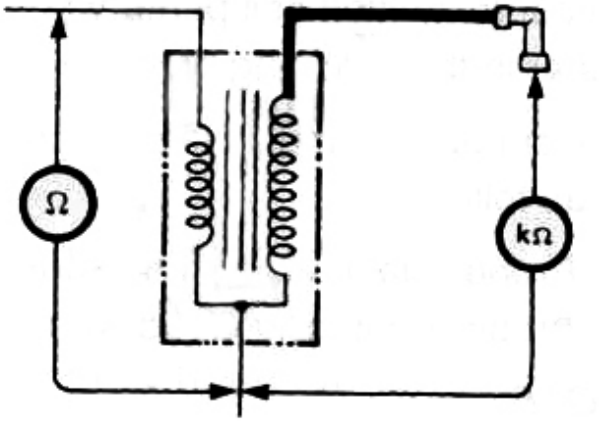
6. Refer to Troubleshooting and check all the items when the measured value is lower than the specified value.

Ignition coil resistance

1. Disconnect ignition coil downlead and spark plug cap, take out ignition coil

2. Measure primary resistance and secondary resistance by Multimeter. The resistance value of Ignition coil should be in the range of Multimeter.

Set the multimeter at Ω



Ignition coil resistance

Secondary coil resistance: 3.8-4.2 Ω

(Connecter-frame earth wire)

Secondary coil resistance: 5-25 kΩ

(Connecter-Spark plug cap)

Voltage of Pick-up Coil Peak value

3. Refer to User Guide when using Peak value voltage adapter:

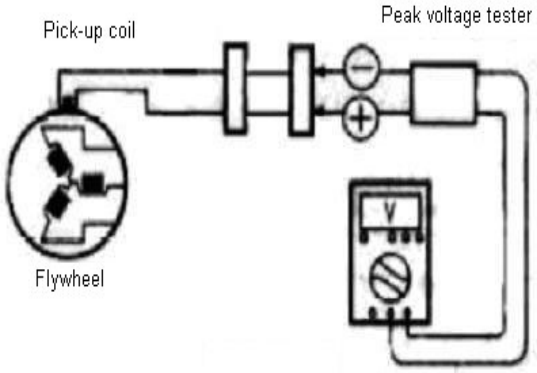
4. Connect Multimeter and Peak value voltage adapter as shown in pictures on the righ

+ Probe:Green Downlead

- Probe: Blue Downlead

Notice:

Please check the User Guide when using Mulitimeter and Peak value voltage adapter.



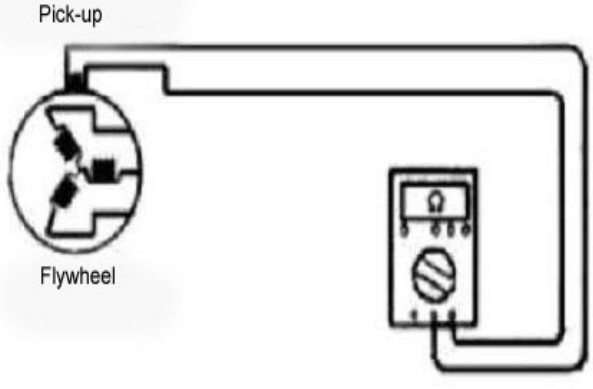
5. Turn the gear at Neutral, and Turn the ignition switch at "ON".

6.Run the engine few seconds by pushing startig buttin, and measure Peak value of Pick-up Coil.

7. Repeat few times to get the highest peak value. Turn Mulitimeter to AC

Voltage of Pick-up Coil Peak value ≥ 1.5V

8. If Voltage is out the range of adapter, replace a new one



Pick-up Coil Resistance

Set the multimeter at 1 × 100 Ω

Pick-up Coil Resistance: 99-121 Ω

9.Replace a new one in case resistance is not the same as above.

Overhaul information.....10-1
Troubleshooting.....10-2
Bulb replacement.....10-3
Odometer Bulb.....10-3
Ignition switch 10-4
Brake light switch.....10-5
Handlebar switch.....10-5
Electrical horn..... 10-5
Fuel sensor.....10-6

Overhaul information

Notice

1.Headlight bulb has larger power and the temperature is very high when it is turned on. Do not touch it immediately after it is just turned off. Operation should be done when the bulb is cooled down.

2.The temperature of headlight is quite high when turned on. Replacing with bare hand or stained glove will cause oil stains on the glass cover which may form heat points and cause deformation of glass face and damage to bulb.

3.Pay attention to the following points when replacing the bulb.

£-Do not replace the bulb when it is turned on. Keep ignition switch in the “OFF”position, and replace after the bulb is cooled down.

£-Replace the bulb with hands in clean gloves.

4.Clean the glass with a piece of clean cloth dipped in alcohol in case of any oil stains on the surface.

5.If the Inspection has to be done with battery, check if the battery is normal.

6.Inspection of switches can be done without removing the switches from the vehicle.

7.After the inspecting and overhauling of each part, routing of cables and wires should pass through the proper positions.

Overhaul standard

Items		Standard
Fuse	Main	20A
	Auxiliary	10A
Light、bulb	Headlamp（Hi / Lo）	12V-35/35W
	Position light	12V-5W
	Brake light / Taillight	12V-21W /5W
	Turning light	12V-10W×4
	Odometer Bulb	12V-2W×2、12V-3W×2
	Turning indicator	12V-2W×2
	High beam indicator	12V-2W
	Gear indicator	12V-2W×5
	Neutral indicator	12V-2W

Troubleshooting

Head light cannot turn on.

Hi/Lo beam can not be transfered.

1.Fuse blown

2.Switch damaged

3.Bulb burnt

4.Dead battery

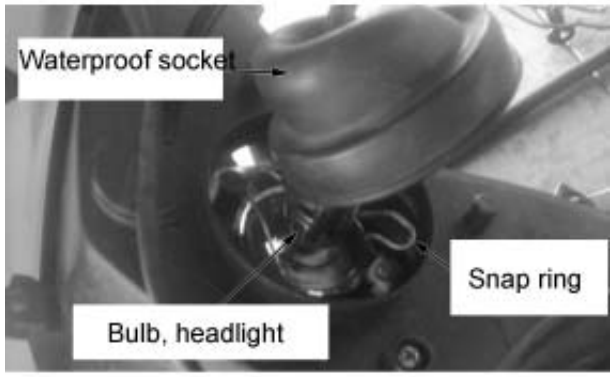
5.Poor connections

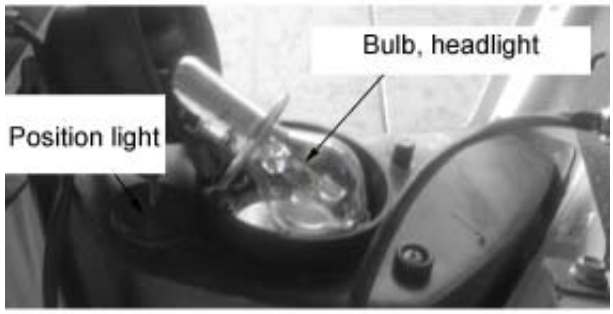
Replacing bulb

Head light bulb

Notice

Headlight bulb has larger power and the temperature is very high when it is turned on. Do not touch it after it is just turned off. Operation should be done when the bulb is cooled down.
Remove handlebar front cover-(2-8)
Remove waterproof cover, push the Jump sring
Remove headlight bulb
Remove position bulb
Inspect the bulb. replace the bulb with a new one if it was damaged
Position Bulb specification:12V 5W
Headlight Bulb specification:12V 35/35W



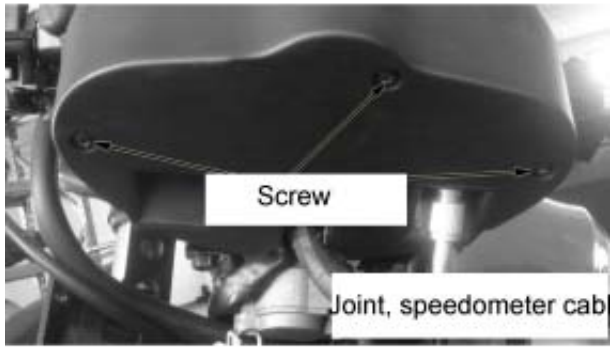


Installation

Reverse the removal procedure for installation.

Odometer Bulb

Remove handlebar front cover-(2-8)
Remove the connecter of flexible cable for odometer.
Loosen 3 pieces of screw. Remove the rear cover of odometer.
Remove odometer bulb,
Replace with a new bulb if it was damaged



Installation

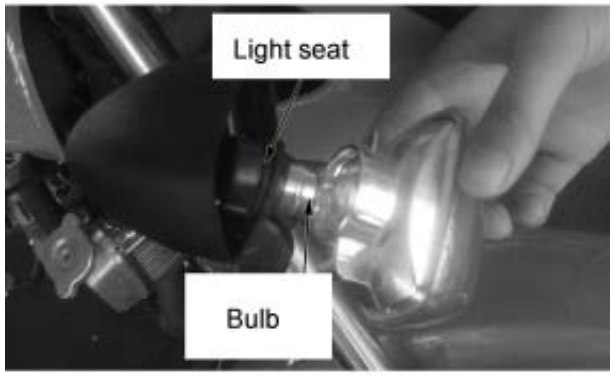
Reverse the removal procedure for installation.

Turnning light

Remove the screws
Take out the ligh seat,remove the bulb.
Replace with a new bulb if it was damaged
Bulb specification:12V R10W

Installation

Reverse the removal procedures for installation.

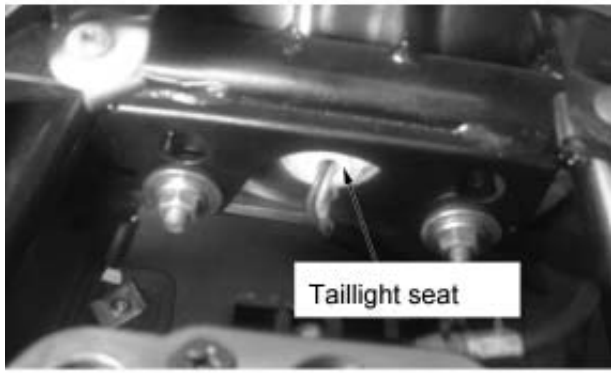


Brake light/Tail light bulb

Remove

Remove the seat.

Unscrew the tail light holder



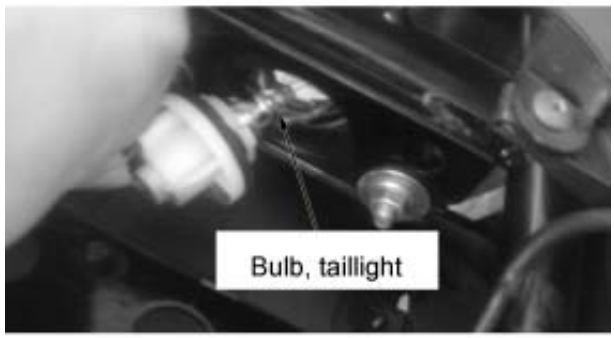
Take out the bulb of Tail light.

Replace the bulb with a new one if it was damaged.

Bulb specification:12V P21/5W

Installation

Reverse the removal procedure for installation.



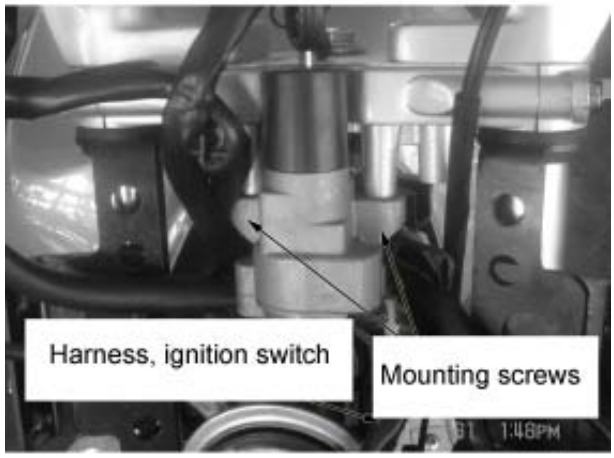
Ignition Switch

Remove

Remove the 2 pieces of screw.

Take off the ignition switch lock.

Color / Gear	Brown	Brown/White	Green	Black/White	Red	Black
ON	●	●			●	●
OFF			●	●		
LOCK			●	●		
P	●				●	



Front brake light switch

Disassemble front brake switch wire, inspect the connection of wire.

Apply the front brake: brake light works

Release the brake: brake light doesn't work

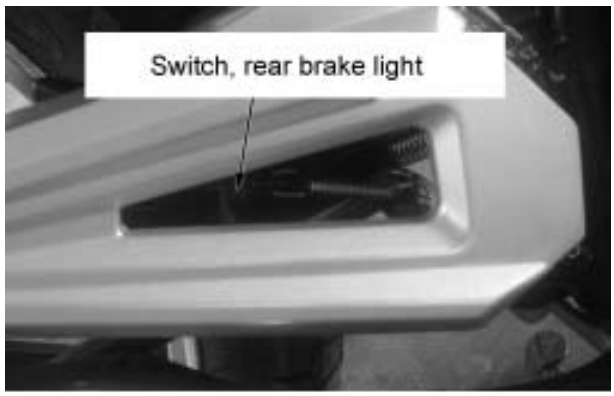
Rear brake switch

Disassemble rear brake switch wire, inspect the connection of wire.

Inspection

Push brake pedal：rear brake light works.

Release brake pedal：rear brake light doesn't work.

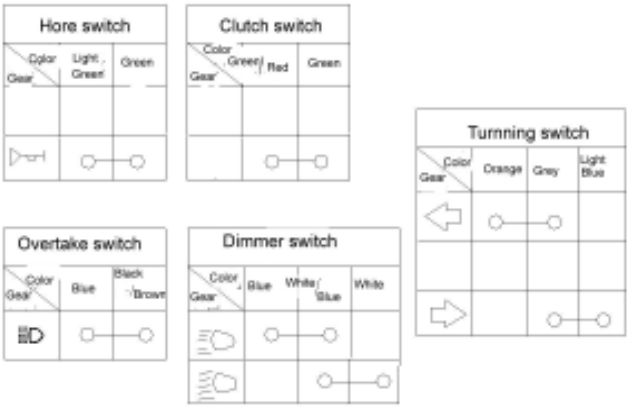


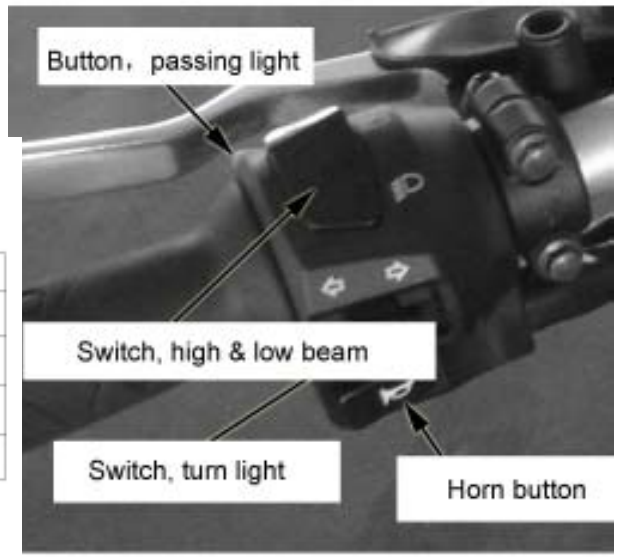
Left handlebar switch

Remove fuel tank-(2-4)

Disassemble the connection of left handlebar switch harness-(1-12)

Check according to the following table if the coupler terminals are connected.





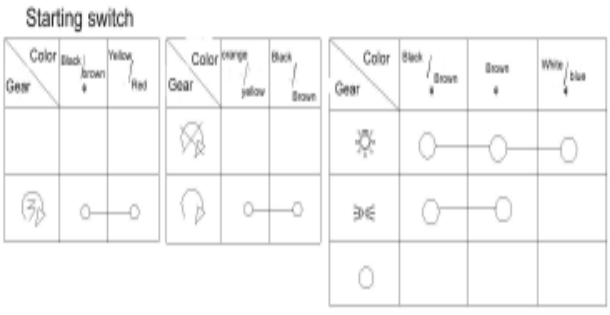
Right handlebar switch

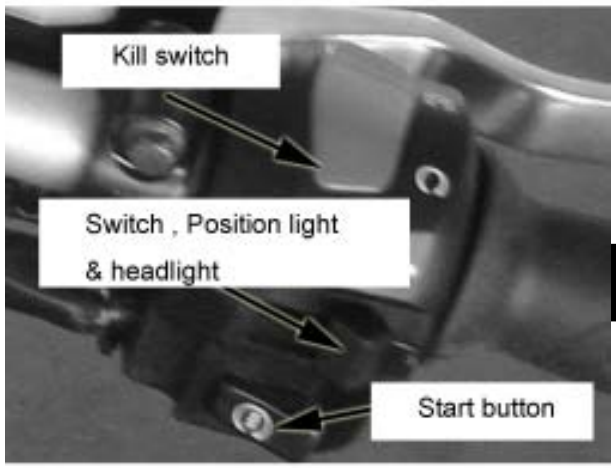
Remove fuel tank-(2-4)

Disassemble connecter ofright handlebar switch harness-(1-12)

Check according to the following diagram if the coupler

terminals are connected.



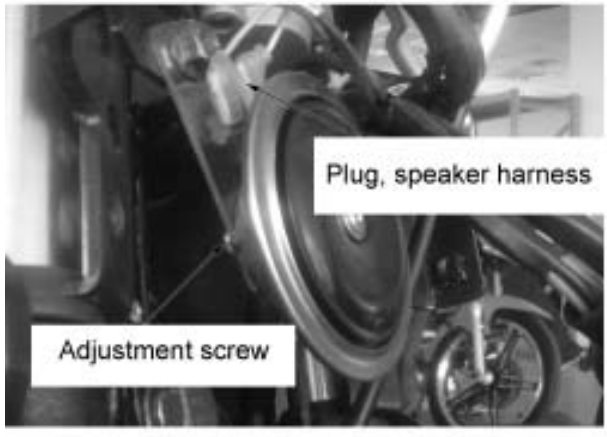


Horn

Connected with a fully charged 12V battery and check if the horn can make sounds.

if dumb, replace the horn with a new one.

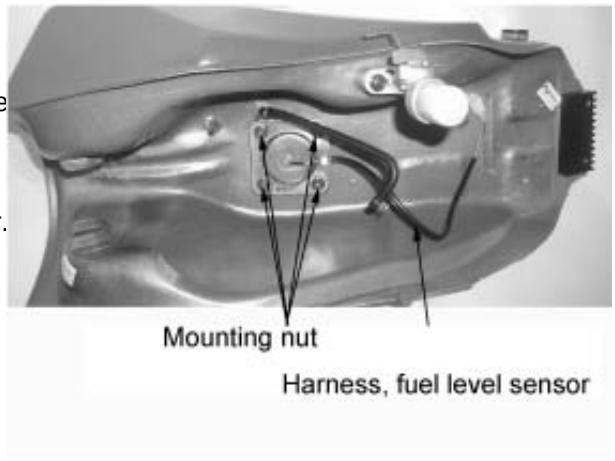
If it sounds bad, turn the adjusting screw to adjust the sound quality .



Fuel sensor

Disassembly

Remove the seat-(2-2)
Remove the front protective cover and middle protective cover-(2-3)
Remove the fuel tank-(2-4)
Remoce the 4 pieces of nut and take out the fuel sensor.

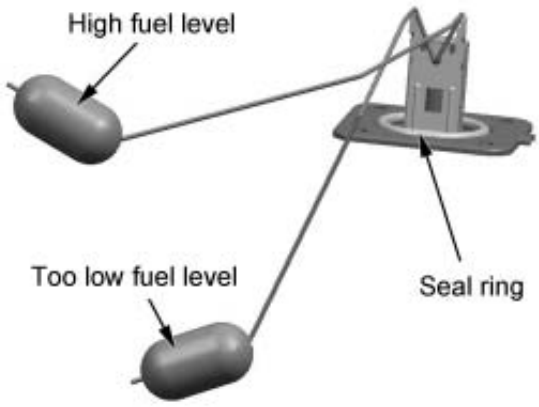


Notice

Remove the fuel sensor fixing plate with a flat screwdriver by turning it counter clockwise and remove fuel sensor.

Inspection

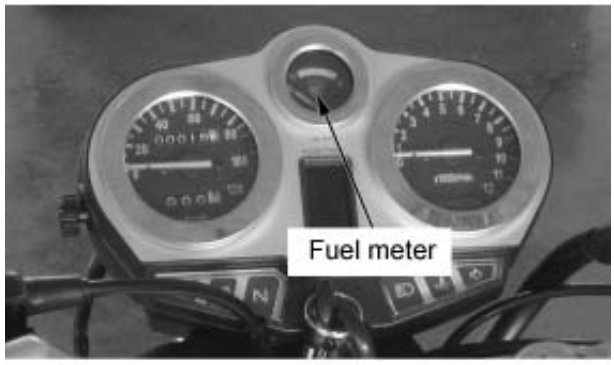
Please replace the new seal of fuel sensor if it is buckled, damaged or sclerotic.
Inspect high-low pole of fuel sensor's resistance.
Resistance:high:4-10 Ω
low:90-100 Ω



Connect Fuel sensor harness with main cable.
Turn on Ignition switch.
Swing the floater slowly, and check the needle on the oil gauge.
If the needle can not reach F or E point, please replace new oil gauge.
If the needle swings instability, please replace new fuel sensor.

Installation

Reverse the removal procedures for installation.



Caution:

Install the fuel sensor properly into fuel tank hole.
There should be no fuel leakage.

Carburetor

Overhaul information.....11-2

Trouble shooting.....11-2

Carburetor disassembly/assembly.....11-3

Overhaul information

Caution

Note

Gasoline is highly flammable, therefore smoke and fire are strictly forbidden in the work place. Special attention should also be paid to sparks. Gasoline may also be explosive when it is vaporized, so operation should be done in a well-ventilated place.

1. Do not over twist or bend the cables. The twisted cables may cause poor operation.
2. To prevent impurities from entering into the engine after the carburetor is removed, cover the engine air intake opening with a piece of cloth or packing tape.

Overhail Info

Starting Failure

1. Too much fuel in the engine
   —air filter blocked
   —air circulation is not right
2. No fuel in carburetor
   —fuel filter clogged
   —fuel pipe clogged

Difficult Starting, Unstable Idle Speed

1. Air circulation is not right
2. Fuel system clogged
3. Ignition system doesn't work properly
4. Hole of fuel tank cap clogged

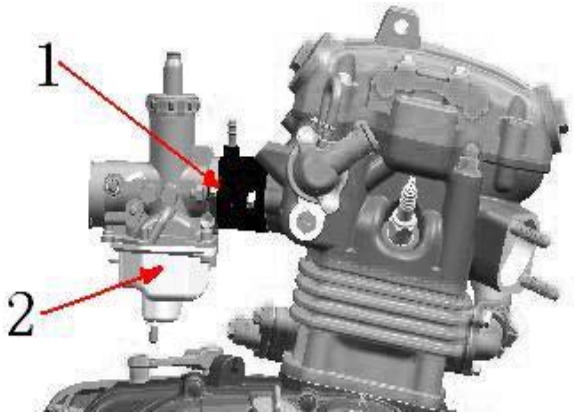
Stall when accelerating

Ignition system doesn't function properly

Carburetor removal

Carburetor

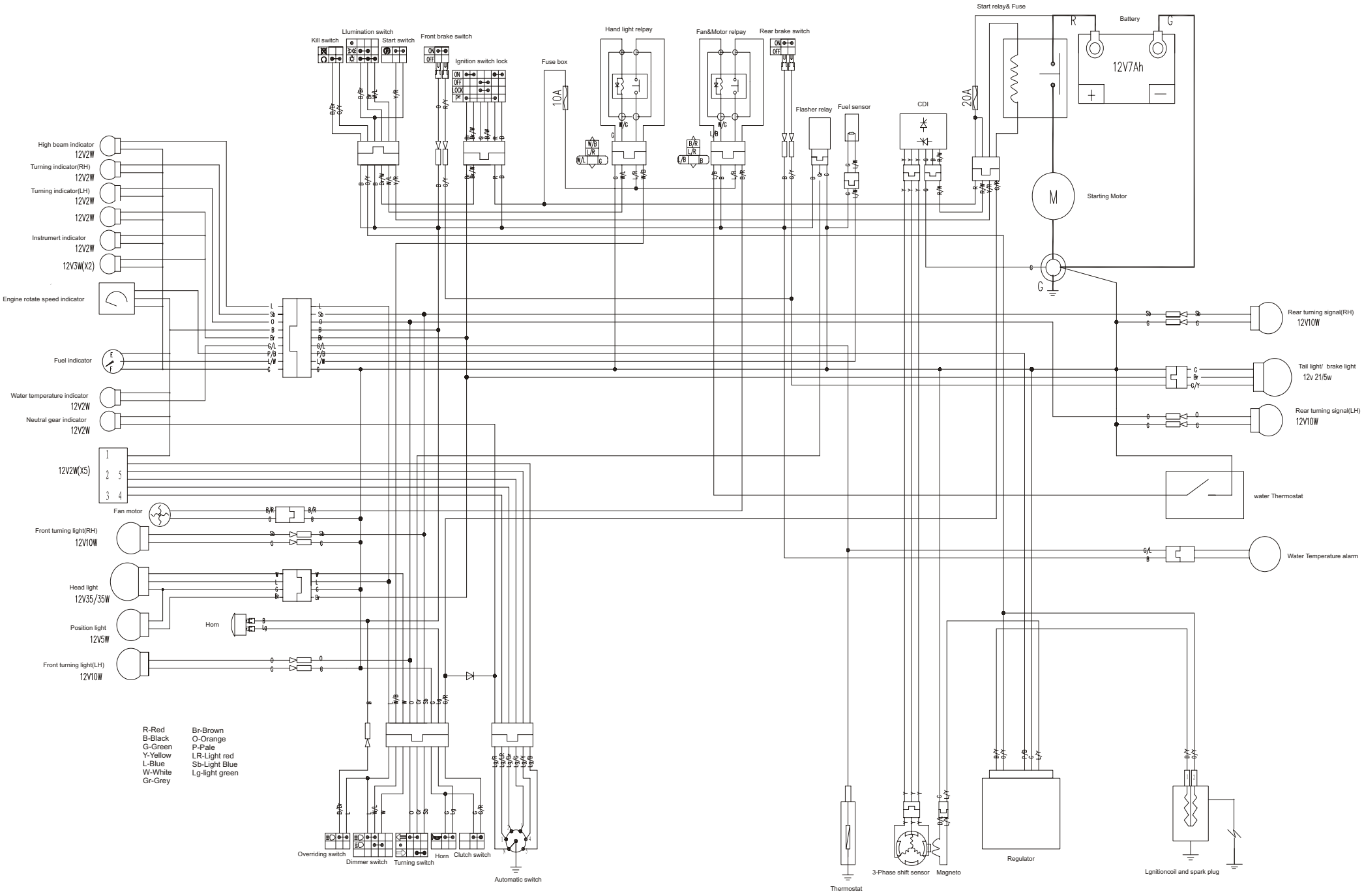
Unscrew two blolts 1, remove carburetor 2



Carburetor Assembly

Reverse the removal procedures for assembly

(17) Electric diagram



Troubleshooting

Engine 13-2
Carburetor..... 13-5
Cooling system/Radiator..... 13-6
Ignition system..... 13-6

1. Engine part

Troubles	Possible causes	Countermeasures
Cannot start or difficult to start	**Cylinder pressure too low**	
	1.Cylinder wear	Replace
	2.Piston ring wear	Replace
	3.Air leakage of cylinder gasket	Replace
	4.Valve stem wear or unsuitable valve seat	Replace or repair
	5.Spark plug loosen	Tighten
	6.Starting motor rotate too slowly	Check electric parts
	7.Improper valve timing	Adjust
	8.Improper valve clearance	Adjust
	Spark plug cannot ignite or weak ignition	
	1. Improper spark plug clearance	Replace or adjust
	2. Spark plug dirty or wet	Clean and dry or repair
	3. Defect ignition coil	Replace
	4. Pick up short circuit or open circuit	Replace
	5. Defect flywheel	Replace
	6. CDI defect	Replace
	Insufficient fuel inside carburetor	
	1.Breather hole blocked	Clean or Replace
	2. Fuel switch failure or blocked	Clean or Replace
	3. Valve needle failure	Replace
	4. Fuel tank blocked	Replace
	5. Carburetor blocked	Clean or Replace
	Gear not in Nuetral position	Shift to N postion
No idle speed or unstable speed	1. Improper valve clearance	Replace
	2. Unsuitalbe valve seat	Replace or repair
	3. Defective valve	Replace
	4. Rocker or rocker arm wear	Replace
	5. Dirty spark plug	Replace
	6. Incorrect valve clearance	Replace or adjust
	7. Ignition coil failure	Replace
	8. CDI failure	Replace
	9. Flywheel failure	Replace
	10. Fuel level unsuitable of float chamber	Adjust height of float
	11. Injector blocked of carburetor	Clean
	12. Fuel switch failure	Replace
	13. Improper position of idle screw	Adjust

Troubles	Possible causes	Solutions
High RPM unstable	1. Valve spring getting weak	Replace
	2. Camshaft wear	Replace
	3. Spark plug dirty	Clean or Replace
	4. Spark plug gap too narrow	Adjust or Replace
	5. Valve timing incorrect	Adjust
	6. Ignition coil failure	Replace
	7. Float too low	Adjust height of float
	8. Air filter too dirty	Clean or Replace
	9. Fuel blocked inside carburetor	Clean
	10. Fuel switch failure	Replace
Blue or black exhaust gas	1. Engine oil too much	Check oil level and drain
	2. Piston ring wear	Replace
	3. Valve wear	Replace
	4. Cylinder wear or scraped	Replace
	5. Valve stem wear	Replace
	6. Oil seal of valve stem damaged	Replace
Power not enough	1. Valve clearance improper	Adjust
	2. Valve spring getting weak	Replace
	3. Valve timing incorrect	Adjust
	4. Cylinder wear	Replace
	5. Piston ring wear	Replace
	6. Improper valve seat	Replace or repair
	7. Spark plug dirty	Clean or replace
	8. Improper spark plug gap	Clean or replace
	9. Injector of Carb. blocked	Clean or replace
	10. Improper float level	Adjust float level
	11. Air filter too dirty	Clean or replace
	12. Rocker arm or Camshaft wear	Replace
	13. Air leakage of inlet pipe	Tighten or replace
	14. Engine oil too much	Check oil level and change
Engine overheating	1. Carbon deposit on piston head	Clean
	2. Engine oil too less or too much	Check and add or drain
	3. Fuel hose blocked	Clean
	4. Float level too low	Adjust float level
	5. Air leakage of inlet pipe	Tighten or replace
	6. Unsuitable engine oil	Change oil
	7. Cooling system failure(See13-6)	

Troubles	Possible causes	Solutions
Engine abnormal noise	**Valve abnormal noise**	
	1. Valve clearance too big	Adjust
	2. Valve spring worn or damaged	Replace
	3.Rocker arm or camshaft worn	Replace
	Piston abnormal noise	
	1. Piston worn	Replace
	2. Cylinder worn	Replace
	3. Carbon deposit inside combustion chamber	Clean
	4. Piston pin or pin hole worn	Replace
	5. Piston ring or groove worn	Replace
	Timing chain abnormal noise	
	1. Chain stretched out	Replace chain and sprocket
	2. Chain sprocket worn	Replace chain and sprocket
	3. Tensioner failure	Repair or replace
	Clutch abnormal noise	
	1. Clutch gear worn or damaged	Replace clutch gear
	2. Cushion rubber aging or damaged	Replace clutch gear
	Crankshaft abnormal noise	
	1. Bearing noise	Replace
	2. Crankshaft pin bearing worn	Replace
	3. Clearance too big	Replace
	Transmission abnormal noise	
	1. Gear worn or damaged	Replace
	2. Main shaft or countershaft worn	Replace
	3. Bearing worn	Replace
	4. Bush worn	Replace
Clutch slippery	1. Clutch drive disc worn	Replace
	2. Clutch driven disc worn or damaged	Replace
	3. Clutch spring getting weak	Replace

Troubles	Possible causes	Solutions
Gear shift not smooth or locked	1. Gear damaged	Replace
	2. Shift fork bent	Replace
	3. Shift drum worn	Replace
	4.Improper shift lever	Adjust

2. Carburetor

Troubles	Possible causes	Solutions
Hard to start	1. Injector blocked	Clean
	2. Injector chanel blocked	Clean
	3.Leakage of joint	Tighten,adjust or replace oil seal
	4. Choke opened fully	Close or Tune choke
Idle or low RPM unstable	1. Air intake pipe blocked	Clean
	2. By-pass air pipe blocked	Clean
	3. Choke opened fully	Close or Tune choke
	4. Unsuitable idle screw torque	Adjust
	5. Float level improper	Adjust
	6. Injector blocked	Clean
High RPM unstable	1. Injector blocked	Clean
	2. Main jet blocked	Clean
	3.Needle valve blocked	Clean
	4. Choke closed fully	Clean
	5. Fuel filter blocked	Clean or replace
	6. Float level improper	Adjust
Overflow or fuel level fluctuation	1. Needle valve worn or damaged	Replace
	2. Needle valve spring damaged	Replace
	3. Float work failure	Adjust or Replace
	4. Needle valve dirty or blocked	Clean

3. Cooling system/Radiator

Troubles	Possible causes	Solutions
Engine overheating	1. Radiator or water hose blocked	Clean
	2. Air bubble inside cooling system	Remove bubble and add coolant
	3. Water pump failure	Check and replace
	4. Bad quality coolant	Replace
	5. Thermostat failure	Replace
	6. Fan motor or thermo switch failure	Check and replace
Coolant temp. too low	1. Fan motor or thermo switch failure	Replace
	2. Thermostat failure	Replace

4. Ignition system

Troubles	Possible causes	Solutions
No spark or too weak spark	1. CDI failure	Check and replace
	2. Spark plug failure	Check and replace
	3. Flywheel failure	Check and replace
	4. Battery voltage insufficient	Check and replace
	5. Ignition coil failure	Check and replace
	6. Pick-up failure	Check and replace

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