

CFMOTO

CF150T-6A
CF125T-22A

Service Manual

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FOREWORD

This manual contains an introductory description of procedures for inspection, maintenance, overhaul, disassembly & assembly, removal and installation of components and parts, troubleshooting and service data together with illustrations of Glory Model CF125T-22A and CF150T-6A

Chapter 1: general service information, tools, vehicle structure and technical data.

Chapter 2: main point of inspection, adjust and maintain, repair.

Chapter 3: disassembly of parts and components, installation, overhaul and troubleshooting.

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

Chunfeng Holding Group Hangzhou
Motorcycles Manufacturing Co., Ltd
Technician Dept.
Mar. 2008

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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=0.133322kPa
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

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Operation Attention

Safety cautions

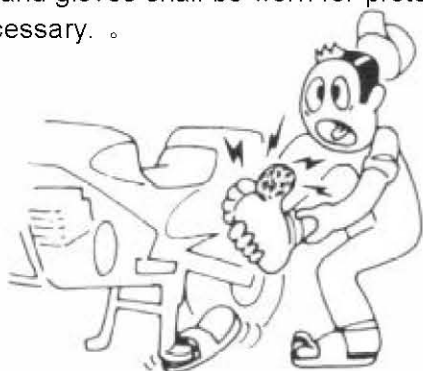
Cautions Exhaust contains toxic ingredients. Do not run the engine in closed places or places with poor ventilation for a long time.



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 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. 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,



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



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



Disassembly&installation

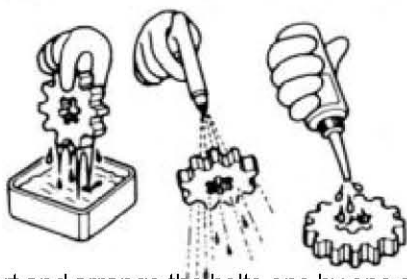
- Must use CFMOTO genuine parts or recommended parts for components, lubrication or grease.



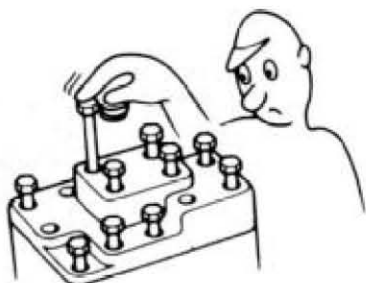
The parts of each system shall be arranged and stored separately, so that the parts can be assembled to the original places.



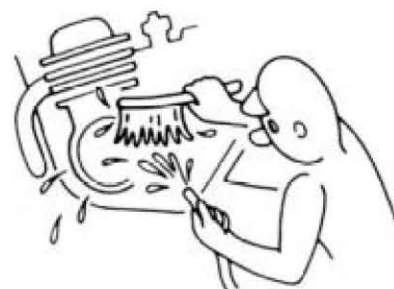
- The parts shall be washed and the cleanser shall be blown away by compressed air prior to determination when they are disassembled and inspected. The working surface shall be lubricated before assembly.



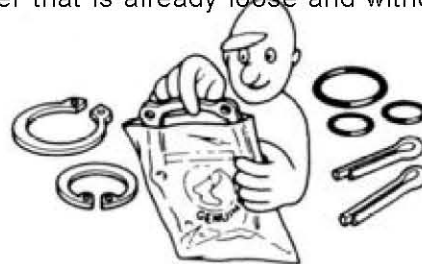
- Insert and arrange the bolts one by one and make sure the insertion volume of each bolt is equal before inserting them, when the bolt length is unidentified.



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



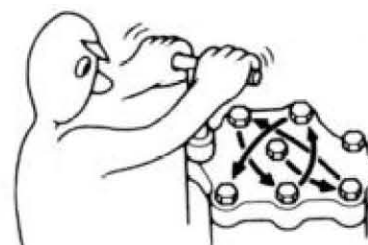
- The gasket, O-ring, piston pin retainer and split pin must be renewed after disassembly.
- The elastic retainer will deform if it is opened too wide upon disassembly, then it will easily fall off when assembled again. Please do not use the elastic retainer that is already loose and without elasticity.



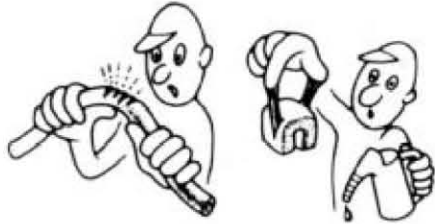
- Inspect the necessary sites upon disassembly, measure the relevant data, so that the original status can be resumed after assembly.



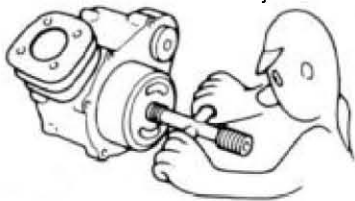
- The fasteners such as bolts, nuts and screws shall be pre-fastened, and then be fastened on the diagonal according to regulated fastening torque in the principle of from big to small, from inside to outside.



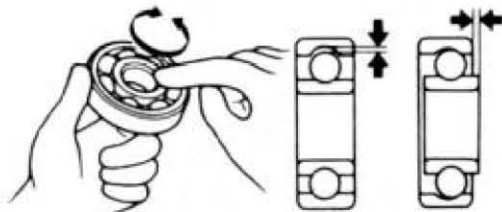
- The recommended lubricating grease must be applied or injected in the appointed positions.



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.



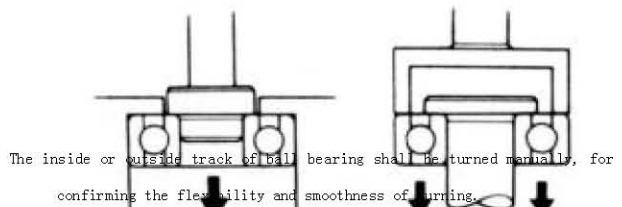
- The side with chamfer shall face the impact direction when installing the circlip. The circlip that is loose already or without elasticity shall not be used again. Rotate the circlip after assembly, for confirming that it is installed in the groove properly.



- 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 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.
Single-sided
dustproof bearing



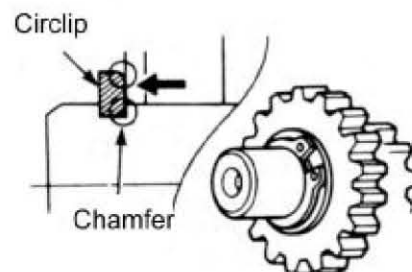
Dual-sided
dustproof bearing



Open type bearing

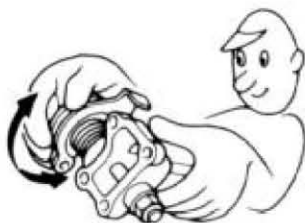


Do not let the bearing race turn back when blowing the ball bearing by compressed air after washing. If the bearing race turns back, its high back turning speed will be beyond the limit that may result in damage of bearing. The bearing shall be lubricated with engine oil or grease before assembly.



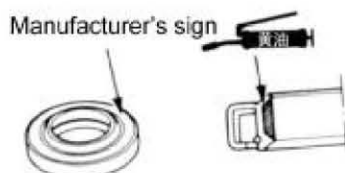
1. Maintenance

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

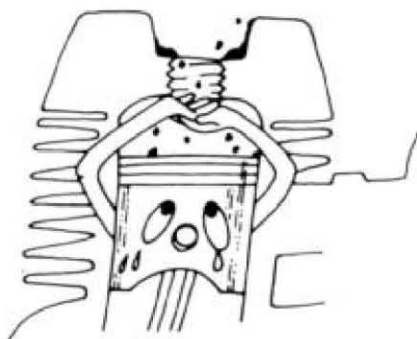


The side of oil seal with manufacturer's sign shall be installed facing outside (the direction without oil).

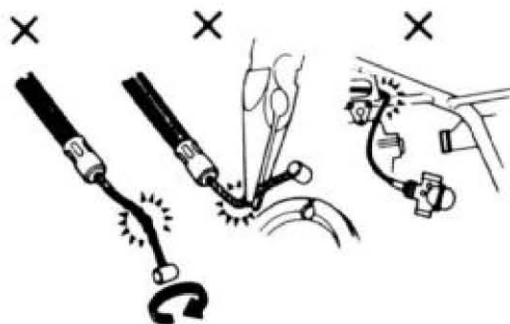
- Avoid the crimp of oil seal lip when assembling, do not let the burrs damage the oil seal lip.
- The oil seal lip shall be applied with grease before assembly.



- Avoid the entry of dusts, dirt into the engine or the oil pressure system of brake.



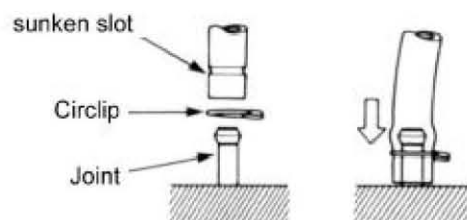
- The stayed cables shall not be over contorted or bent. Deformed or damaged stayed cables will cause malfunction or dilapidation.



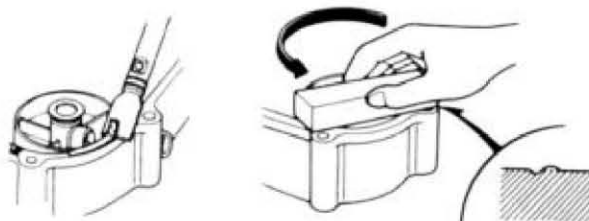
- The brake fluid and coolant may damage the application surface, plastic parts, rubber parts etc. Do not let the fluid attach to such parts. In case of attachment, wash it immediately with water.



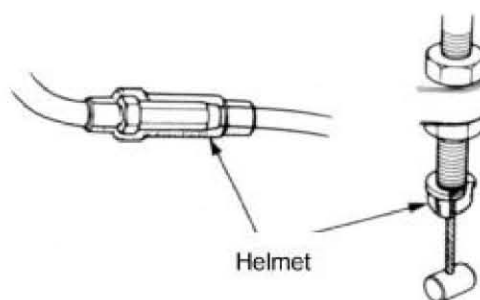
- The tube shall be inserted to the base of joint when installing the tube parts. If there is tube clip, the tube clip shall be installed in the sunken slot of tube. The tube that is without tightness upon installation shall be renewed.



- The gasket attached to the combination surface of each cabinet of engine shall be cleaned before assembly. The impact mark on the contact surface must be removed by whetstone evenly.



- When assemble the helmet type parts, the helmet must be inserted into the groove if there is groove.

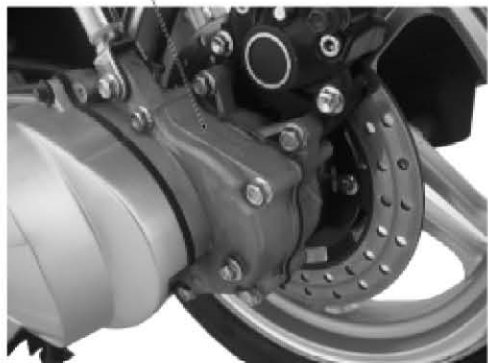


Location of Numbers

	CF150T-6A	CF125T-22A
VIN Number:	LCETDKP6~	LCETDJPM~
Egnine Number:	1P58MJ-A(2)~	1P52MI-B(2)~



Location of Engine Number



Location of VIN Number



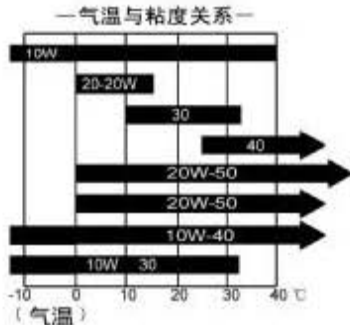
Table of Main Parameters

Item		Parameter	
Name and model		CF150T-6A / CF125T-22A	
Length		1950mm	
Width		715mm	
Height		1195mm	
Wheelbase		1320mm	
Engine model		1P58MJ-A(2) / 1P52MI-B(2)	
Total displacement		152.7ml / 124.6ml	
Fuel type		Above 93#	
Gross weight		138kg	
Number of passenger		2 Persons(Incl: Driver)	
Rated load		150kg	
Tyre specification	Front-wheel	100/80-14 M/C 48L	
	Rear wheel	120/80-14 M/C 58L	
Minimum ground Gap		130mm	
Minimum turning diameter		4500mm	
Engine	Startup mode		Electronic Starting
	Engine model		4-Stroke Gasoline Engine
	Cylinder quantity and distribution		Single-cylinder, horizontal
	Model of combustion chamber		Hemisphere
	Valve drive model		OHC Chain Drive
	Bore × Stroke		58 × 57.8mm 52.4 × 57.8mm
	Compression ratio		11 : 1 10.3 : 1
	Max. power		9.0kW/8500r/min 6.5kW/8500r/min
	Max. torque		10.8N · m/7250r/min 8.0N · m/7000r/min
	Air distribution Phase	Inlet valve	opening 0° (1mm)BTDC
			closing 30° (1mm)ABDC
		Outlet valve	opening 35° (1mm)BTDC
			closing 0° (1mm)TDC
	Lubricating method		Pressure, splashing type
	Type of lubricating oil pump		Rotor type
	Type of lubricating oil filter		Full flow filtration screen
	Cooling mode		Forcing water cooling

Item			Parameter
Air Inlet Device	Type of air cleaner		Paper filter element
	Throttle Valve	Type	BING: 7226101
		Diameter	26mm
	Idle-Air-Control Valve	Type	Siemens ABV379-008
Transmission	Clutch	Type	Dry, auto-centrifugal
		Starting mode	auto-centrifugal
	Initial Transmission	Gear Type	Bevel
		Gear ratio	3.13/3.77
	Secondary transmission	Gear Type	Bevel
		Gear ratio	3.21
	CVT	Type	V type teeth belt
		Starting mode	Automatic CVT
		Transmission Ratio range	2.500~0.800
Steering Device	Steering angle	Right	39°
		Left	39°
Brake system		Front	Hydraulic Disc brake
		Rear	Hydraulic Disc brake
Shock absorber	Suspension Type	Front	Telescopic
		Rear	Swing arm
Frame type			Tubular

Table of Maintenance

Lubricating Device

Item		Standard	Operation limit
Capacity	Replace	0.8l	—
	Full Capacity	1.0 l	—
Recommended engine oil (see the original). 		■ SAE-10W-40、20W-50 are be used exclusively for 4-stroke motorcycle Selection must be made within the following range if substitute is preferable. ■ API classification: SE or SF grade engine oil. SAE specification: select from the table at right according to the outdoor temperature.	
Oil pump rotor	Gap between external rotor and internal rotor	0.15mm	0.20mm
	The body Gap	0.15~0.23mm	0.25mm
	Gap of end face	0.05~0.10mm	0.12mm

Fuel Device

Item		Standard
Oil supply device	Capacity of fuel tank	Full Capacity: 7.5l
	Oil injector	Model: Valeo: 01F023
	Fuel pump	Voltage: DC13.5V
		Pressure: 0.25 ± 0.007 Mpa
		Flow: ≥ 35 L/h
		Current: ≤ 2.20 A
	Idle rotate speed	Safe Pressure: 0.5~0.6Mpa 1700 $\pm$ 170r/min

Coolant

Item		Standard
Coolant capacity	Full volume	0.77l
	Reservior volume	0.33l
	Standard density	50 % (rate when using original solution)
Opening pressure of water inlet cap		
Thermostat	Temp. of starting open	71 ± 3℃
	Temp. of fully-open	88℃
	Height when opening	3.5 — 4.5mm

Cylinder Head Valve			Standard	Service limit
Compression pressure of cylinder			700kPa (7.0kgf / cm ²) — 260r/min	—
Valve Clearance	IN		0.05mm	—
	EX		0.20mm	—
Deflection Degree of Cylinder Head			—	0.05mm
Camshaft	Height of cam tip	IN	30.74 — 30.86mm	30.69mm
		EX	30.33 — 30.45mm	30.28mm
Valve rocker	Inner diameter of rocker	IN/EX	10.000 — 10.015mm	10.10mm
	Outer diameter of rocker	IN/EX	9.978 — 9.987mm	9.91mm
Valve/ Valve guide cover	External diameter of valve	IN	4.975 — 4.99mm	4.965mm
		EX	4.955 — 4.97 mm	4.945mm
	Internal diameter of valve	IN	5 — 5.012mm	5.04mm
		EX	5 — 5.012mm	5.04mm
	Clearance between valve rod and guide	IN	0.01 — 0.037mm	0.075mm
		EX	0.03 — 0.057mm	0.095mm
	Thrown height of guide	IN/EX	11.9 — 12.1mm	—
	Contact width of valve seat	IN/EX	0.9 — 1.1mm	1.8mm
Valve spring	Dead length (external/inner)	IN/EX	35.0/32.3mm	33.5/30.8mm

CVT Transmission

Item		Standard	Service limit
Transmission Driving pull	Movable driven face comp.	24.007 — 24.028mm	24.07mm
	Outer diameter of driving face comp.	23.959 — 23.98mm	23.92mm
	Mass roller comp.	19.95 — 20.05mm	19.45mm
Belt width			20.7mm
Clutch driven face	Thickness of friction disc	—	2.75mm
	Inner diameter of clutch outer comp.	124.5 — 124.2mm	125mm
	Dead length of clutch spring	144 — 146mm	140mm
	Outer diameter of driven face	33.95 — 33.975mm	33.92mm
	Inner diameter of movable driven face	34.000 — 34.025mm	34.06mm

Gearbox

Item		Standard
Engine oil	Replacement	0.15l
	Disassembly	0.15l
Recommended Viscosity		SAE 15W-40/SF

Starting Motor

Item		Standard	Service limit
Starting motor	Brush length	10mm	7mm

Camshaft, Piston, Cylinder

Item			Standard (mm)		Service limit (mm)	
			CF125T-22	CF150-6		
Crankshaft	Big end of connecting rod	Axial clearance	0.16 — 0.304		0.5	
		Radial clearance	0.005 — 0.017		0.05	
	Play of crankshaft		—		0.10	
Piston	Piston installing direction		“ IN ” mark in the intake side		—	
	Outer diameter of Piston		52.37-52.39	57.97 — 57.99	52.32	57.92
	Piston pin inner diameter		15.002-15.008		15.04	
	Piston pin outer diameter		14.994 — 15.000		14.98	
	Shaft small end side inner diameter		15.016 — 15.034		15.05	
	Clearance of cylinder between piston		0.02 — 0.04		0.08	
	Clearance of piston & pin		0.002 — 0.014		0.04	
	Clearance of pin & shaft		0.016-0.040		0.06	
	Clearance Piston ring between Piston ring and groove	Piston ring (1)	0.02 — 0.044		0.07	
		Piston (2)	0.02 — 0.044		0.07	
	Piston ring end gap	Piston ring (1)	0.15 — 0.30		0.45	
		Piston (2)	0.10 — 0.25		0.45	
		Oil ring	0.2 — 0.7		0.9	
Cylinder	Installing direction, piston ring		Upper seal		—	
	Inner diameter		52.4 — 52.419	58 — 58.019	52.449	58.049
	Upper distortion		—		0.05	
	Roundness		—		—	
	Column		—		0.05	

Front Wheel

Item			Standard	Service Limit
Front wheel	Bending, front wheel shaft		—	0.2mm
	Play of wheel rim	Vertical	0.8mm	2.0mm
		Horizontal	0.8mm	2.0mm
	Tire	Groove	—	1.6mm
		Air pressure	225kPa (2.25kgf / cm ²)	—

Rear Wheel

Item			Standard	Service Limit
Rear wheel	Play of wheel rim	Vertical	0.8mm	2.0mm
		Horizontal	0.8mm	2.0mm
	Tire	Groove	—	1.6mm
		Air pressure	225kPa (2.25kgf / cm ²)	—

Brake System

Item		Standard	Service Limit
Front brake	Brake handle free travel	10—20mm	—
	Brake disc thickness	4mm	3mm
Rear brake	Brake handle free travel	10—20mm	—
	Brake disc thickness	4mm	3mm

Battery, Charging Device

Item			Standard
AC Motor	Magnetor	Type	Permanent magnet AC type
		Output	3 - phase AC
		Charging Coil Resistance(20℃)	0.2-0.3Ω
Rectifier			Three-phase mullar rectification Silicon controlled Parallel-connection regulated voltage
Battery	Capacity		12V7Ah
	Terminal Voltage	Fully Charging	12.8V
		Insufficient Charging	< 11.8V
	Charging Current/time	Standard	0.9A×5～10h
		Quick	4A×1h

Ignition

Item		Standard
Ignition		ECU
Spark Plug	Type	NGK
	Standard	DPR7EA-9
	Optional	
	Clearance	0.8—1.0mm
Ignition Timing	Max Advanced Angle	43°BTDC
Peak Voltage	Ignition Coil	=150V
	Pulse Generator	=0.8V

Lights, Dashboard, Switch, Pick-up Coil

Item		Standard
Fuse	Main	20A
	Auxiliary	10A×2 5A×2
Light, Bulb	Headlight (Hi / Lo)	12V-35/35W
	Brake Light/Tail Light	12V-21/5W
	Turning Light	12V-10W×4
	Odometer Indicator Light	12V-1.7W×3
	Turning Signal Light	3.4W-12V×2
	High Bean Indicator Light	3.4W-12V×1
	P Shift Indicator Light	3.4W-12V×1
	Trouble Indicator	1.7W-12V

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)	6mmSH Bolt with flange、	10 (1.0)
10mm Bolt、Nut	34 (3.5)	6mm Bolt with flange、Nut	12 (1.2)
12mm Bolt、Nut	54 (5.5)	8mm Bolt with flange、Nut	26 (2.7)
		10mm Bolt with flange、Nut	39 (4.0)

Please use standard torque, if without torque value mentioned below table.

1. Lubrication oil should be created on screw thread and contact surface.
2. Replace when self-locking bolts disassembled.

Type	No. of Bolt & Nut	Thread diameter (mm)	Torque N·m (kgf·m)	Remarks
Checking、adjusting				
Check Gearbox oil /drain Bolt	1	8	22 (2.2)	
Engine oil filter cover	1	36×1.5	18 (1.8)	
Drain oil, bolt	1	12×1.5	25 (2.5)	
Spark plug	1	12×1.5	18 (1.8)	
Lubricating system				
Oil pump and mounting bolt	2	6	15 (1.5)	
Screw, oil pump plate	1	3	2 (0.2)	
Cooling system				
Water drain bolt	1	6	8 (0.8)	
Water temperature sensor	1	12×1.5	13(1.3)	
Impeller, water pump	1	7	10 (1.0)	
Cylinder head/head cover				
Cylinder head cover bolt	4	8	30 (3.0)	
Cylinder compound bolt	2	6	10 (1.0)	
Timing sprocket bolt	Short2	YM8	23 (2.3)	
Tensioner spring holder bolt	Long2		23 (2.3)	
Shaft, tensioner set thread pin	2	5	9 (0.9)	
Timing sprocket bolt	1	8×1	10 (1.0)	
Tensioner spring holder bolt	1	8	13 (1.3)	
Shaft, tensioner set thread pin				
Belt CVT system				
Left side cover bolt	5	6	10 (1.0)	
Gearbox nut	1	14×1.5	59 (6.0)	
Clutch special nut	1	28	59 (6.0)	
Clutch nut	1	12×1.25	53 (5.4)	
AC Magneto motor				
AC Magneto motor nut	1	14×1.25	59 (6)	
Flange bolt for casting	8	6	12 (1.2)	
Overriding clutch inner hex bolt	3	6	18(1.8)	

Frame

1

Type	No. of Bolt & Nut	Thread diameter (mm)	Tightening torque N · m (kgf · m)	Remarks
Engine disassembly	2	10	55 (5.6)	
Engine suspension mounting bolt	1	10	55 (5.6)	
Engine suspension shaft nut				
Front wheel, Front suspension, Steering System				
Handlebar lock nut	1	25	68 (7.0)	
Steering handle mounting nut	1	10	55 (5.6)	
Front wheel axle nut	1	12	80 (8.1)	
Shock absorber mounting bolt (upper)	4	8	40 (4.1)	
Rear wheel, Rear suspension				
Rear wheel axle nut				
Shock absorber mounting bolt (upper)	1	16	140 (14.3)	
Shock absorber mounting bolt (lower)	2	10	55 (5.6)	
Shock absorber mounting bolt (lower)	2	8	30 (3.1)	
Rear fork mounting bolt	2	10	55 (5.6)	
Brake system				
Front brake disc mounting bolt	5	6	12 (1.2)	
Rear brake disc mounting screw	3	8	26 (2.7)	
Front brake caliper mounting bolt	2	8	30 (3.1)	
Rear brake caliper mounting bolt	2	8	30 (3.1)	
Muffler				
Mounting nut (Front elbow)	2	8	26 (2.7)	
Mounting bolt (Muffler barrel)	3	10	55 (5.6)	
Oxygen Sensor	1	18	60 (6)	
Other				
Screw (Taillight/brake light comp.)	2	4.2	1.8 (0.1.8)	

Special Tool

Tool name	Tool No.	Usage
Fuel system		
Adjusting tool for mixed gas screw		Adjusting mixed gas screw
Cylinder cover comp, Valve		
Valve assembly jigs	1P52MI-A-922-020000	Disassemble valve system Repair/clean the
Valve guide reamer、5mm	152MI-234-022300-34B	valve guide
Valve seat cutter		Amend the valve seat
Valve lapper、27mm (45° IN)	152MI-236-022301-27	
Valve lapper、27mm (45° EX)	152MI-236-022301-27	
Belt CVT system		
Multipurpose bracket	1P52MI-A-922-040000	Disassemble nuts, Drive face/clutch cover
Clutch spring press tool	152MI-922-070000	Disassemble nut, driven face
Deceleration system		
Drive shaft press device	152MI-921-070000	Press the drive shaft
Roller Bearing 6202	1P39MB-921-110001	Press driven shaft bearing
Roller Bearing 6201	1P39MB-921-080001	Disassemble bearing
Bearing removing combination set	1P52MI-A-922-050000	
	1P52MI-A-922-060000	Install drive shaft bearing
Roller Bearing 22X50X14	1P52MI-A-922-080000	Install final shaft bearing
Roller Bearing 6301	172MM-921-030000	
Roller Bearing 6004	1P52MI-A-921-020000	
Roller Bearing 6205	1P52MI-A-921-010000	
	1P52MI-A-921-030000	
Ac generator/starting motor		
* Rotor puller	152MI-922-030000	Disassemble stator
Front wheel, Front suspension		
Steering system	519-922-070001	Disassemble wheel bearing
Bearing remover shaft	519-922-070002	Install wheel bearing
Bearing remover head 12mm	519-922-070003	
Press tool handle A	519-922-070004	Disassemble handlebar locknut/bearing
Press tool sleeve 28X32	519-922-070005	adjusting nut
Guide tool 12mm	519-922-050001	Disassemble handlebar bearing outer ring
Locknut wrench	519-922-050002	
Handlebar bearing adjusting wrench	519-922-050000	
Bearing removing combination set	519-922-050010	Install top ball retainer
Rotor puller	519-922-050003	
Remover shaft	519-922-050004	Install bottom retainer
Remover hammer	519-922-050005	
* Handlebar bearing retainer installer		Install inner ring
A、27×40mm	519-922-050006	
Installing shaft	519-922-050007	
* Handlebar bearing retainer installer		
B、30×50mm	519-922-050008	
Installing shaft	519-922-050009	
Front fork cover, press tool		
Charging, Ignition system		
Peak voltage regulator	519-922-150000	Measure peak voltage

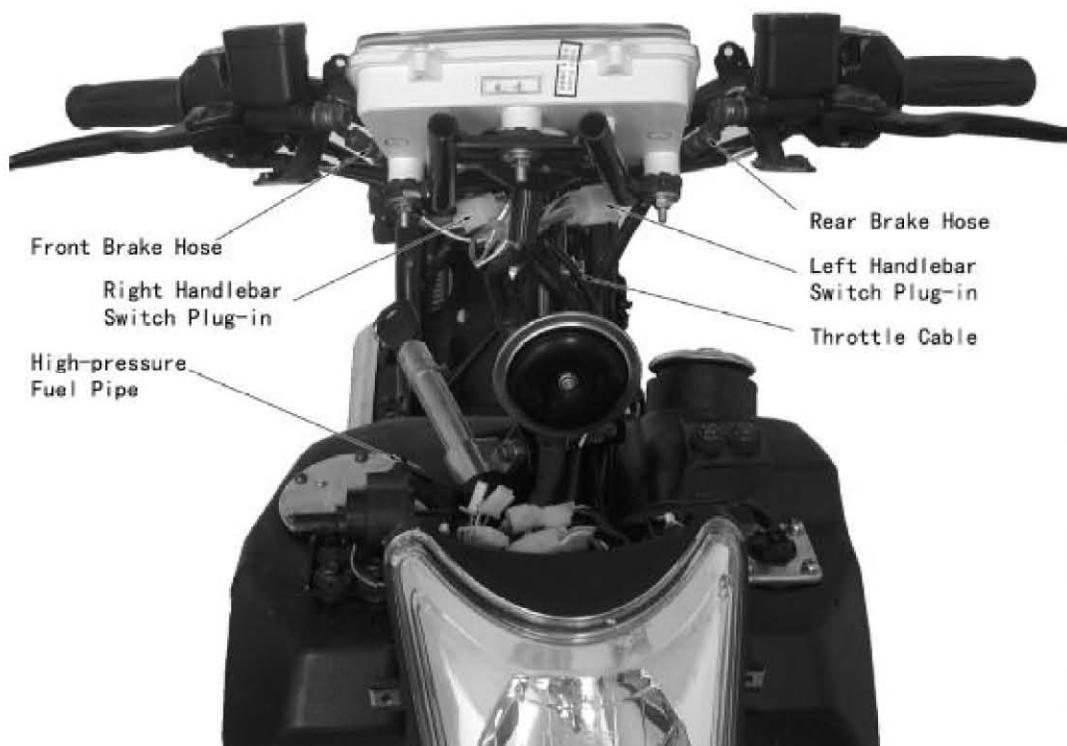
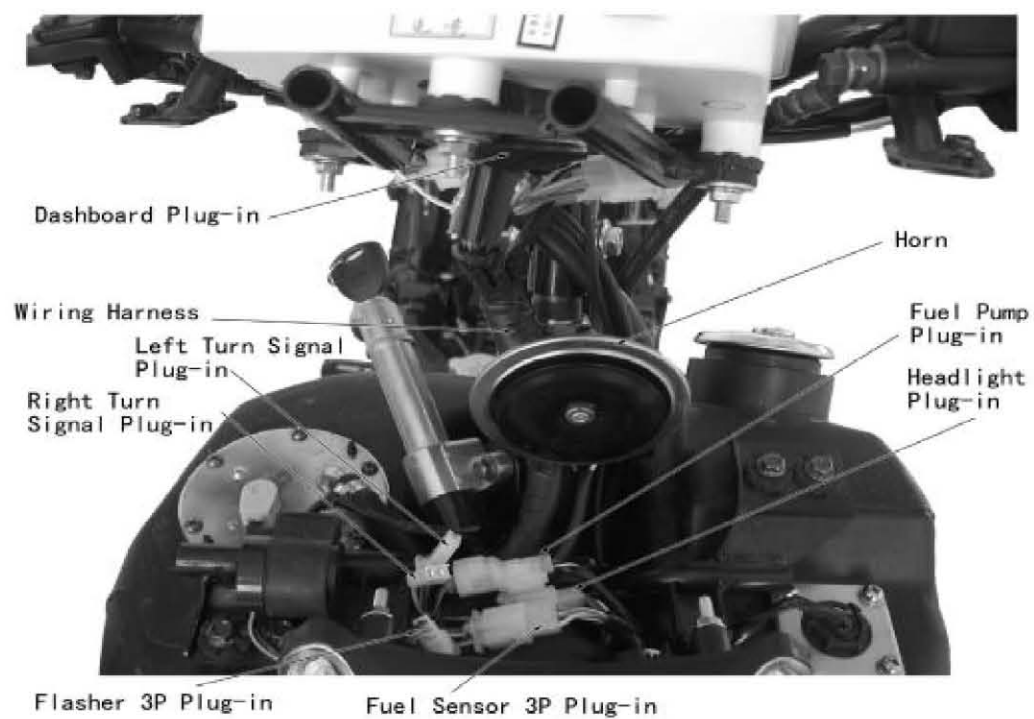
Lubricant, Sealant

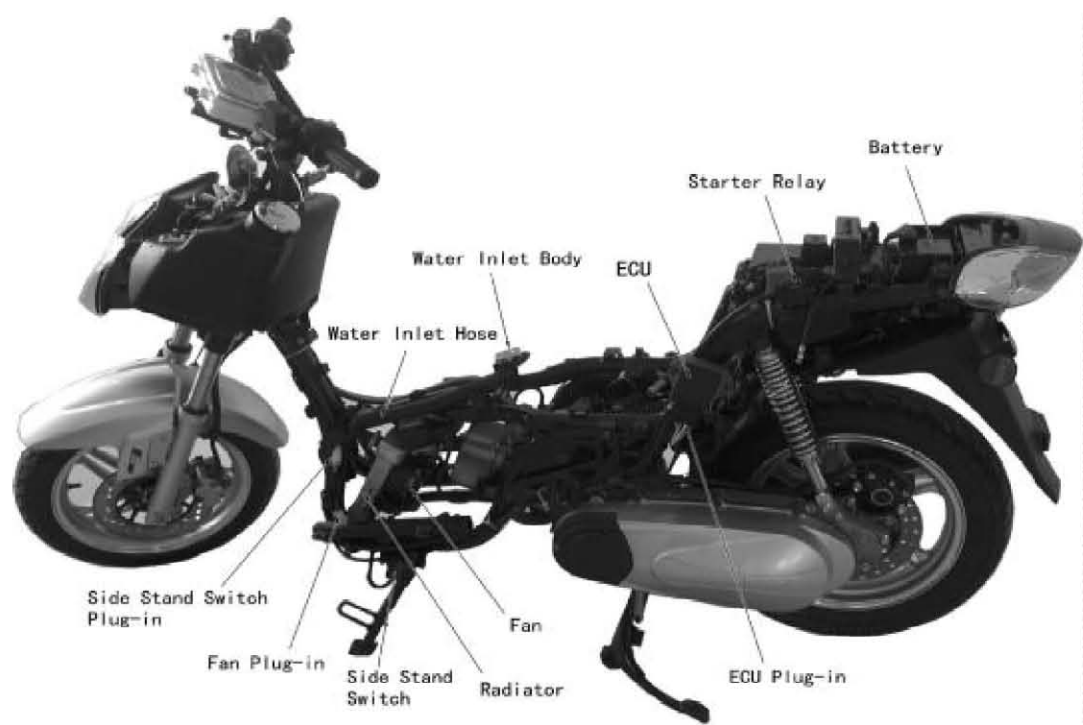
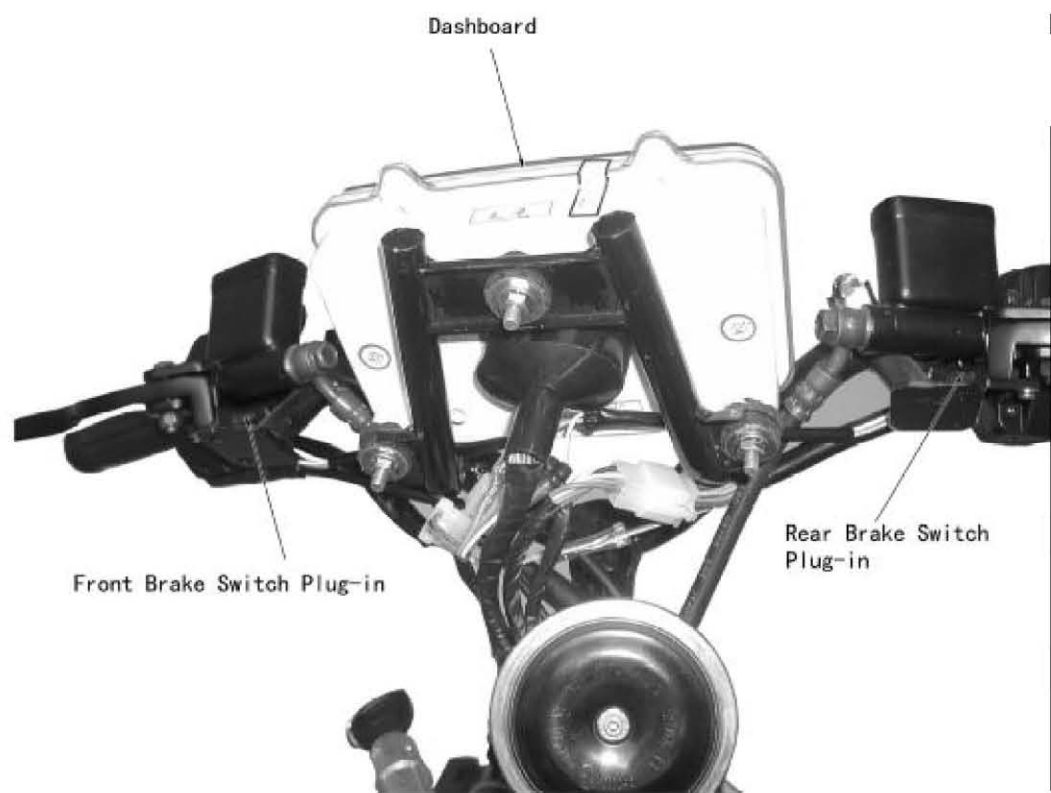
Application Areas	Notes	Grease type
Inner surface, cylinder cover Joint cone of installation, AC generator rotor Bearing/side, connection rod big end Inner side, connection rod small end Drive bearing surface, crankshaft Timing sprocket gear surface, crankshaft Driven gear teeth surface, oil pump Piston pin outside surrounding surface Piston ring groove Piston pin surface Piston ring Camshaft bearing rotating surface Timing sprocket gear surface Valve rock arm shaft surface Sprocket gear surface, oil pump Oil pump comp. Thread/joint surface, drive wheel nut Outside surrounding, oil seal and press Gear surface and shaft part, gear and gear shaft Camshaft surface and surrounding Inner surface, valve arm rock Valve rod		The special SAE standard of 4 cylinder motor: classify of 10w-40 API: SE or SF engine oil
Screw thread part, timing sprocket mounting nut		Tightening agent for screw thread
Ball bearing, driven wheel(6901UU) Needle bearing, driven wheel Movable driven groove wheel running surface, driven wheel	5.0 — 5.5 g (do not apply on driving belt)	Multi-functional Lubrication
Sealing surface, all o-rings Tightening bolt, cylinder body	Do not apply on the sharp point	Sealant

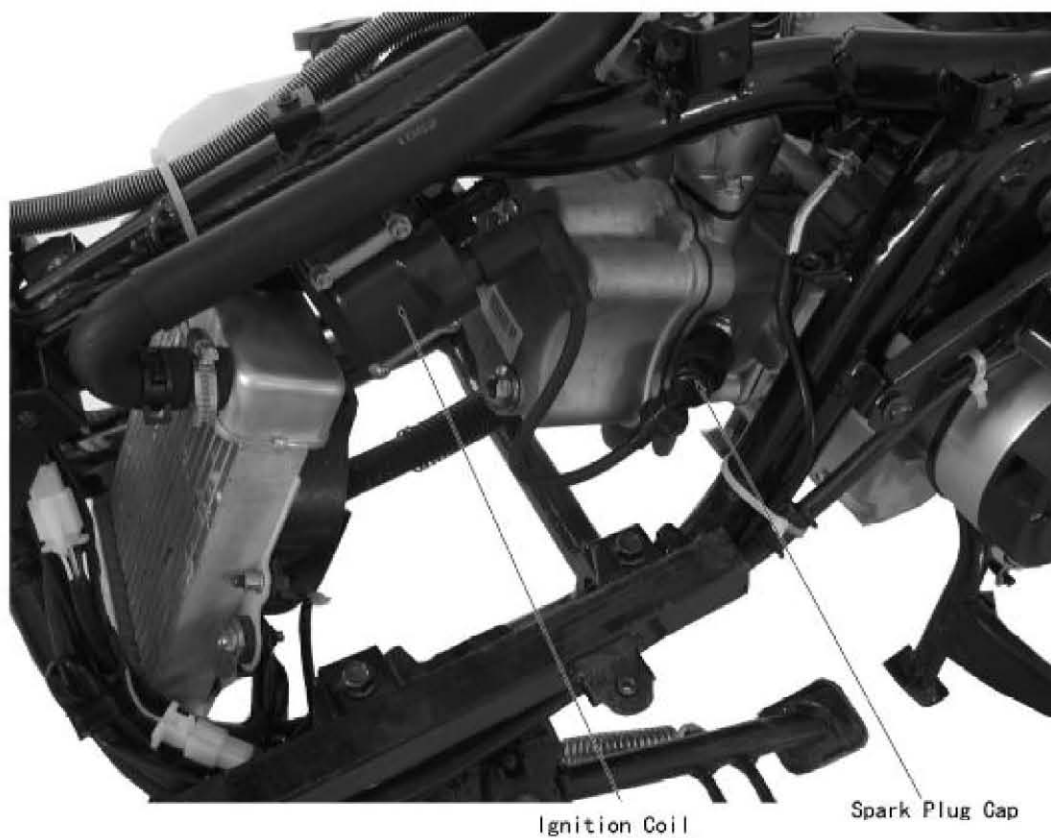
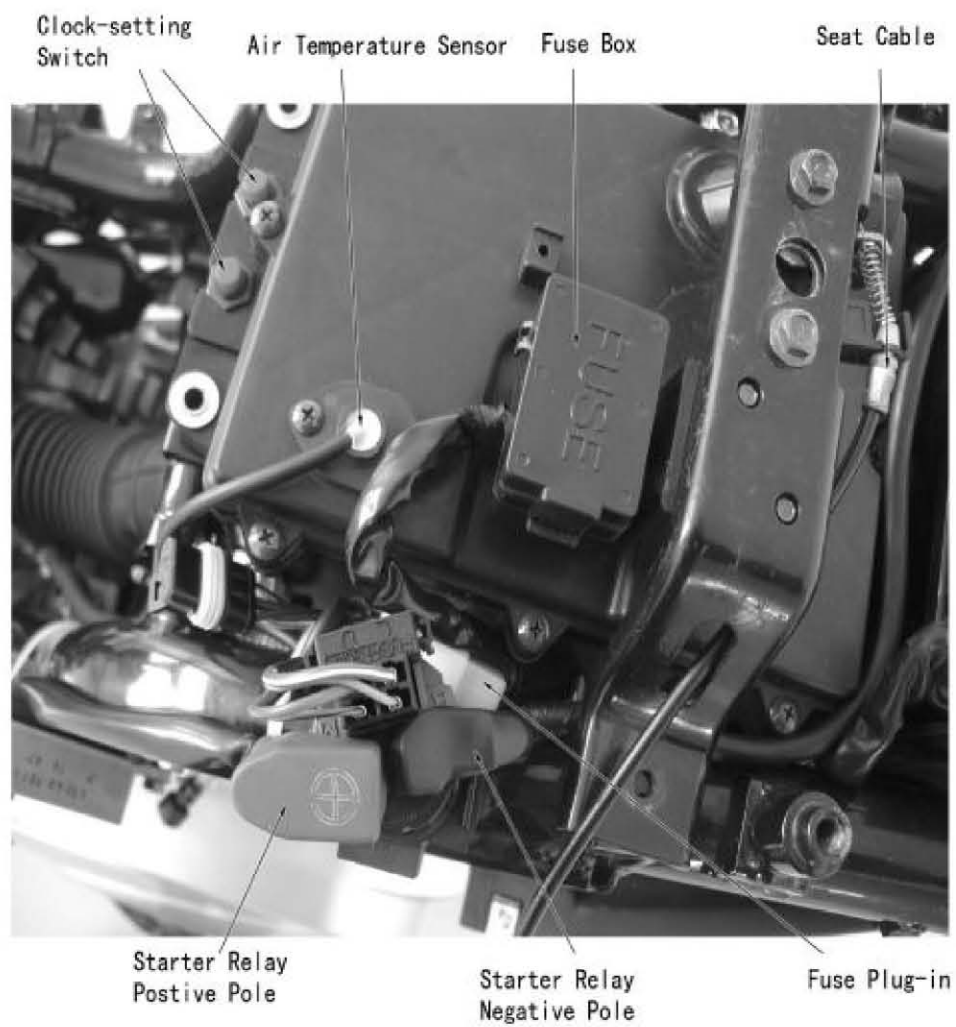
Application areas	Notes	Types
Bearing seat, motor head pipe Lip , front wheel dust-proof seal Joint, throttle cable Throttle handlebar part Pivot, rear pedal(L) Pivot, rear pedal(R) Pivot, side stand Oil seal lip, rear fork Gear surface and running part, counter gear/small gear Axle part, main stand		Multi-purpose lubrication oil
Lip, dust-proof seal, lower part of front shock-absorber		Absorber oil # 5
Inner surrounding, handle bar		Engine oil

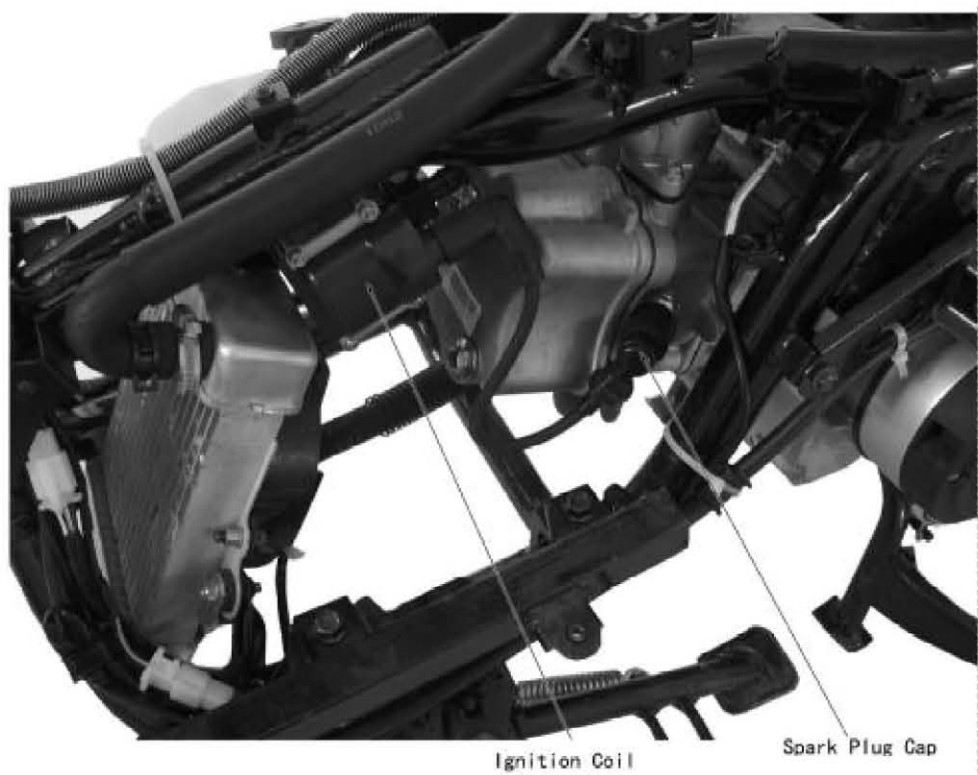
Wirings, Pipes and Cable Routing

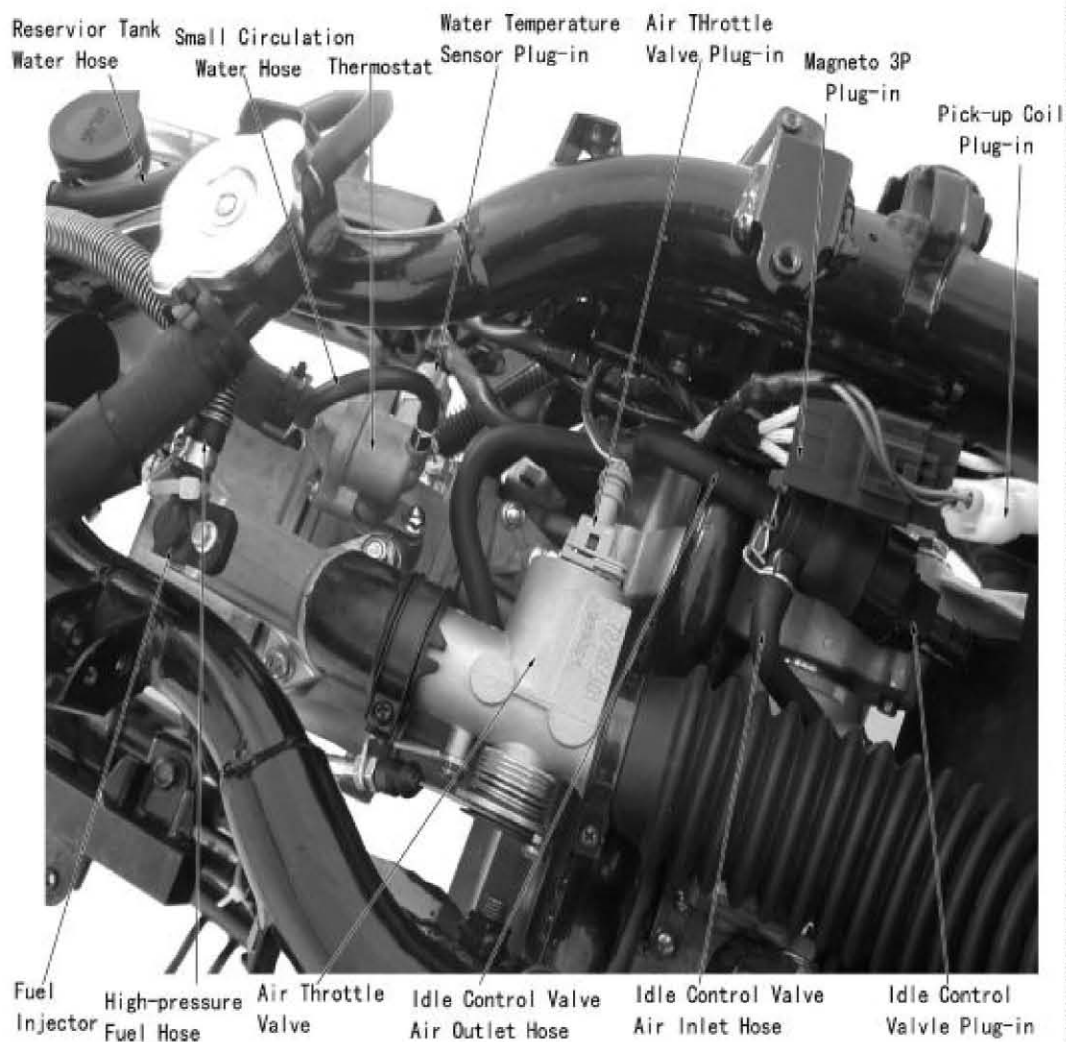
1











Crankcase Vent Hose



Start Motor Negative pole



Start Motor Positive Pole

Inclination Sensor



Oxygen Sensor

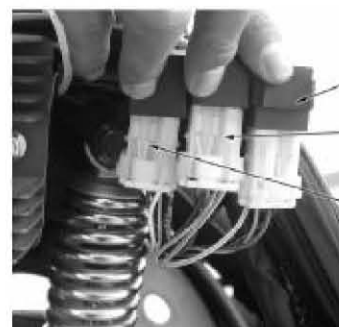
Oxygen Sensor Plug-in



Auxiliary Relay I

Auxiliary Relay II

Auxiliary Relay III

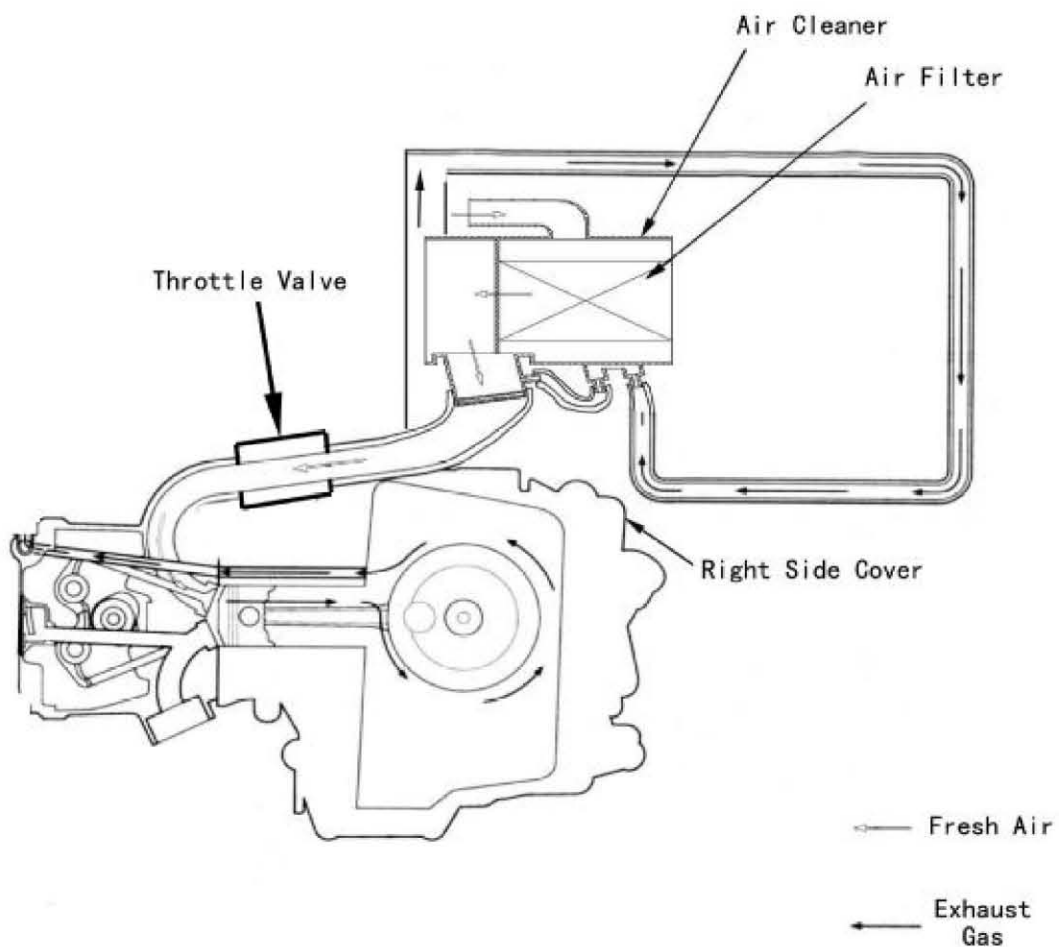


Expansion prevention device for poisonous gas Secondary Air Supply System

The device is to supply fresh air from small air cleaner to the exhaust pipe so that the not fully burnt combustible mixture continues combustion in the exhaust pipe. In this way the HC, CO and NO_x in the exhaust could be converted into harmless CO₂ and water.

To prevent the flow back of exhaust in the exhaust pipe, there is a reed valve in the exhaust air induce channel (in cylinder head cover).

The supply channel switch of exhaust air induce is controlled by a control valve through intake vacuum of the engine.



Overhaul Info.....	2-1	Front Top Cove.....	2-9
Troubleshooting.....	2-1	Fuel Tank Rear Cover, F&R Cover Dash board.....	2-10
Seat, Waterproof Cover.....	2-2	F&R Fender, Tail Light.....	2-11
Trunk, Lock Socket.....	2-3	Fuel Tank.....	2-12
Rear Rack, Docration Plate L&R.....	2-4	Muffler.....	2-13
Middle Protection Plate, Tail Light Cover Upper&Lower	2-5	Visiable Parts.....	2-14
Protection Plate L&R.....	2-6		
L&R Strip, Footrest.....	2-7		
Front Ventilation, Protection cover...	2-8		

Overhaul Info

Operation Cautions

Warning:

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.

Muffler can't be disassembled and installed until it is fully cooled.

- This chapter is on the disassembly and installation of outer parts, exhaust pipe and muffler.
- Hoses and cables should be routed properly as per the wiring drawing of cable, hose and bracing cable.
- When remove and install muffler, replace the gasket with a new one.
- When muffler is installed, check if there is any exhaust leakage.

Tightening torque

Tail light/brake light screw	1.8 N • m(0.18kgf • m)
Screw ,Rear turning indicator cover	1.8 N • m(0.18kgf • m)
Screw, Tail light cover	1.8 N • m(0.18kgf • m)

Trouble shooting

High exhaust noise

- Broken muffler
- Exhaust leakage

Insufficient power

- Distorted muffler
- Exhaust leakage
- Muffler clogged

Seat

Seat

Disassembly

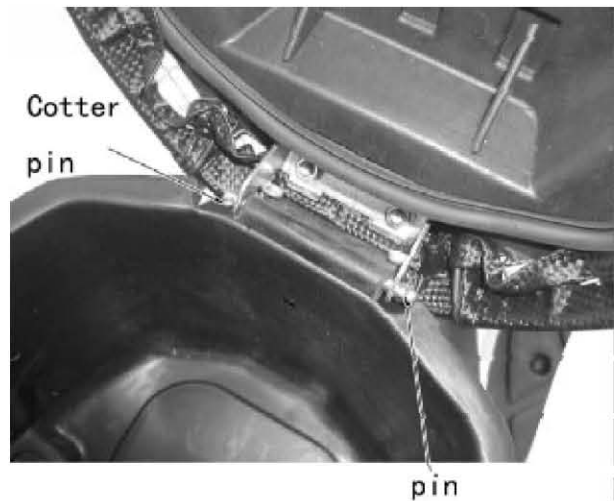
- Open the seat with ignition key
- Remove Cotter Pin and Parallel Pin
- Remove seat

Installation

Reverse the removal procedure for installation

Caution

Make sure there is no deviation of the seat by shaking it after installation.



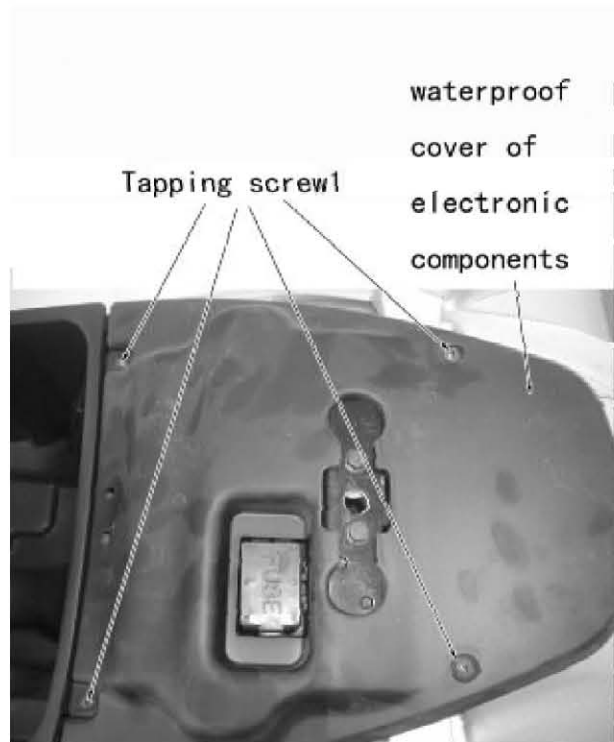
Waterproof Cover

Disassembly

- Open seat with ignition key
- Remove
 - 4 tapping screws 1
 - Waterproof Cover

Installation

Reverse the removal procedure for installation



Trunk

Removal

Remove Seat (→2-2),
Remove 6 pieces of Bolt 1,
Remove Trunk.

Installation

Reverse the removal procedure for installation



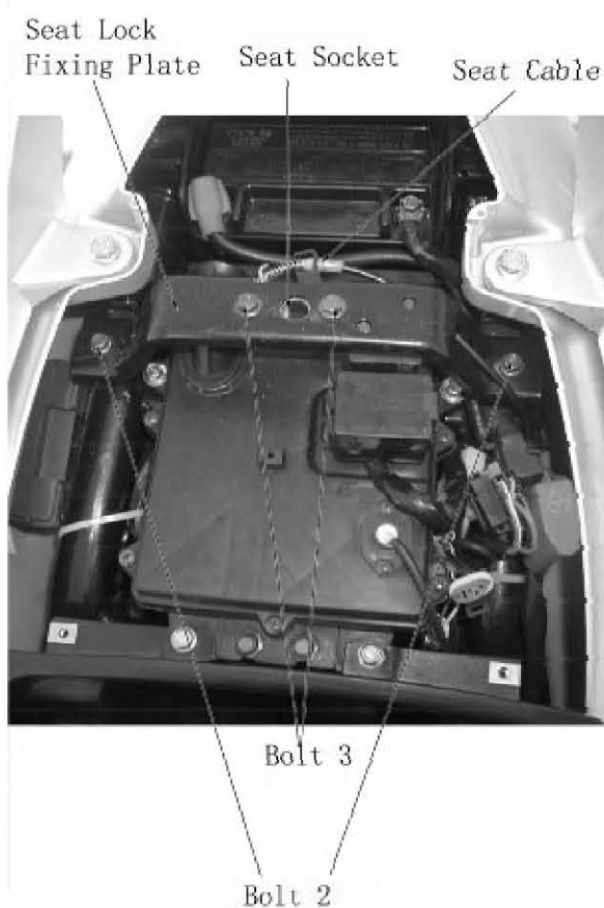
Bolt 1



Seat Socket

Remove

—Waterproof Coveplate for Electronic parts
(→2-2),
—Seat Socket Fixing Plate 2 pieces Bolt 2
—Seat Socket Fixing Plate 2 pieces Bolt 3



Bolt 3

Bolt 2

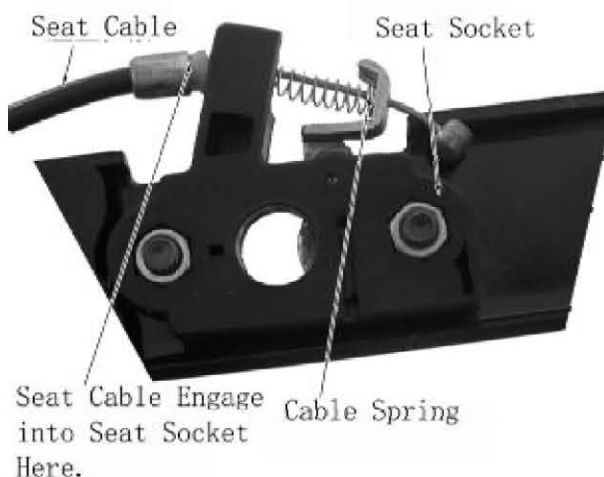
2

Installation

Reverse the removal procedure for installation

Notice:

Install Seat Cable as shown on the right.



Rear Bracket

Disassembly

Open seat with ignition

Remove

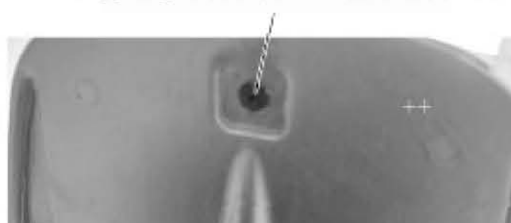
--Stapping Bolt, Rear bracket Decorating Cover

--Rear Rack Decorating Cover

--3 bolt 2

--Rear bracket

Tapping Screw, Rear Bracket Cover



Rear Bracket

Bolt 2



Installation

Reverse the removal procedure for installation.

Left Decoration Plate

Remove

--4 Bolt 3

--Left Dcoration Plate

Installation

Reverse the removal procedure for installation.



Bolt 3

Left Decoration Plate

Right Decoration Plate

Bolt 4

Right Decoration Plate

Remove

--4 Bolt 4

--Right Dcoration Plate

Installation

Reverse the removal procedure for installation.



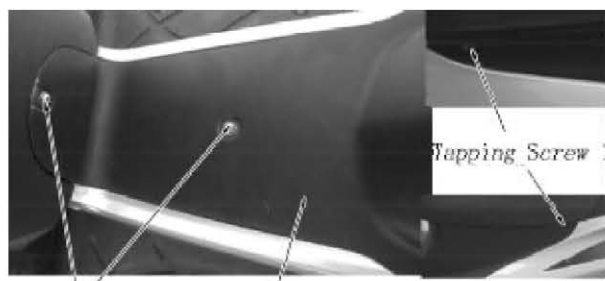
Middle Protector Plate

Disassembly

- Remove 2 Bolt 1 and 1 Stapping Bolt 1
- Remove Middle Protector Plate

Installation

Reverse the removal procedure for installation



Bolt 1

Middle Protection Plate

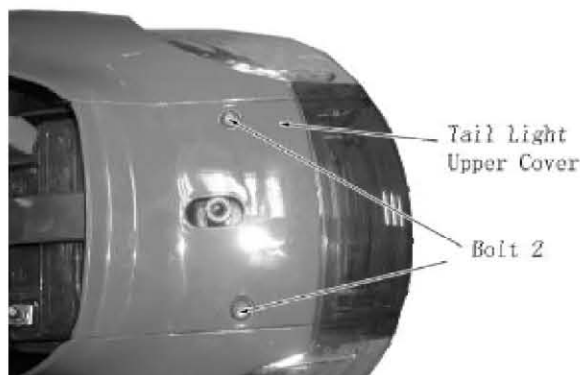
Upper Cover, Tail Light

Disassembly

- Remove 2 Bolt 2
- Remove Upper Cover, Tail Light

Installation

Reverse the removal procedure for installation.



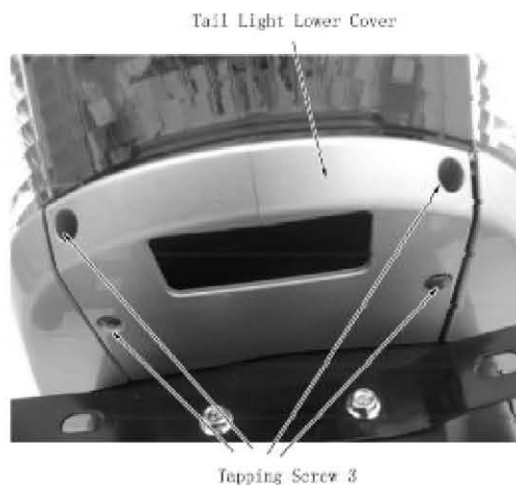
Lower Cover, Tail Light

Disassembly

- Remove
- 4 tapping screw 1
- Lower Cover, Tail Light

Installation

Reverse the removal procedure for installation.



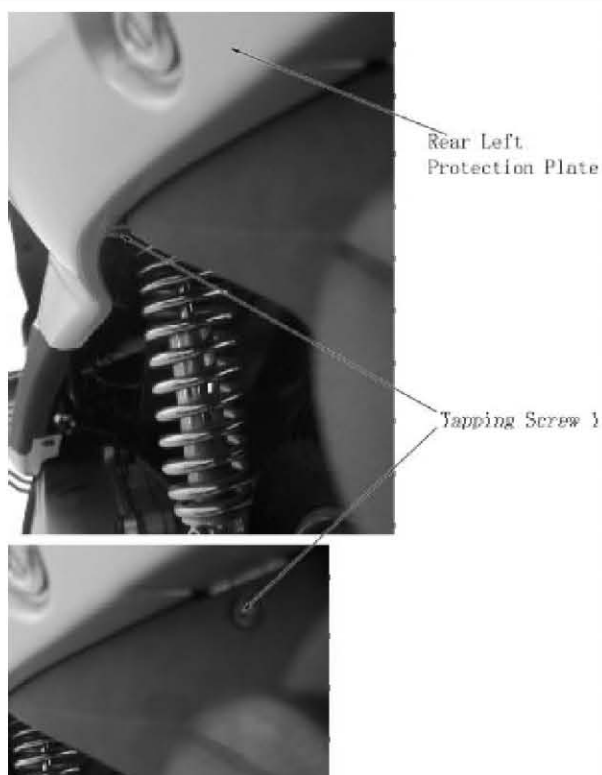
Tapping Screw 3

Left Protector Plate Disassembly

Remove

--

- Lower Cover, Tail Light (→ 2-2),
- Upper Cover, Tail Light (→ 2-2),
- ~~Storage~~ Compartment (→ 2-3),
- Seat Cable from Seat Socket (→ 2-4), A Rear Bracket (→ 2-4),
- Tapping Screw 1 connecting between Footrest Rear Left and Left Protection Plate
- Pull out Left Protection Plate from Tail Light Rubber Ring.
- Rear Left Protection Plate



Installation

Reverse the removal procedure for installation.

Rear Right Protection Plate Disassembly

Remove--

--

- Tail Light Upper and Lower Cover (→ 2-5),
- Seat (→ 2-2),
- Electronic Components Cover (→ 2-2),
- Compartment (→ 2-3),
- Rear Bracket (→ 2-4),
- Tapping Screw 2 connecting between Footrest Rear Left and Left Protection Plate
- Pull out Right Protection Plate from Tail Light Rubber Ring.
- Rear Right Protection Plate



Installation

Reverse the removal procedure for installation.

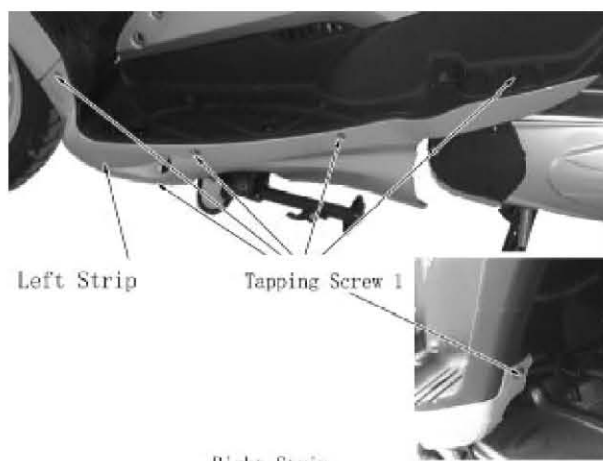
Left Strip

Remove

- 6 Tapping Screw 1
- Remove Lft Strip Driving

Installation

.Reverse the removal procedure for Installation



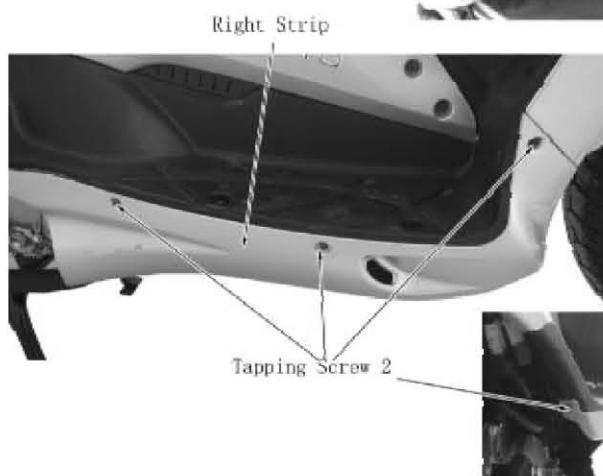
Left Strip

Disassemble

- Remove 5 tapping Screw 2
- Remove Left Strip

Installation

.Reverse the removal procedure for Installation



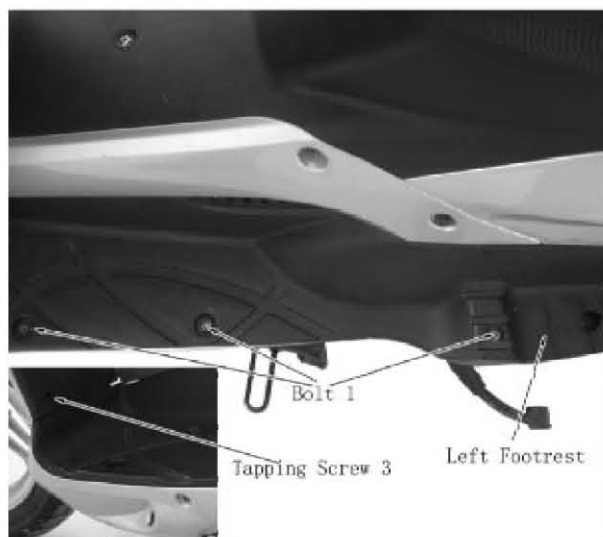
Left Footrest

Disassemble

- Remove Bolt 1
- Remove tapping screw 3
- Remove Left Footrest

Installation

.Reverse the removal procedure for Installations



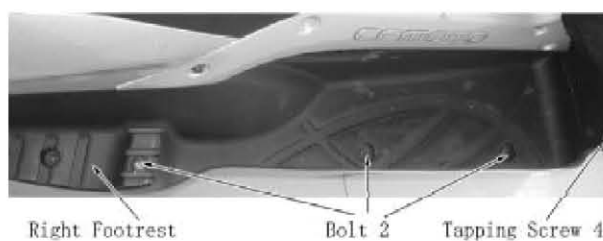
Right Footrest

Disassemble

- Remove Bolt 2
- Remove tapping screw 4
- Remove Right Footrest
- Remove Left Footrest

Installation

.Reverse the removal procedure for Installations



Front Ventilation

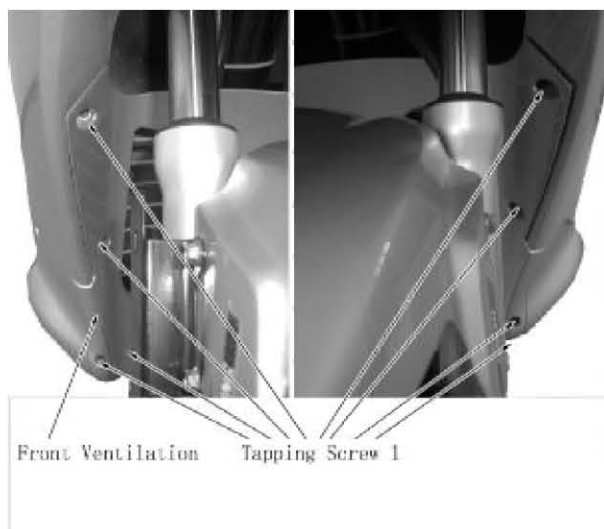
Disassembly

Remove

- Base Plate, Left and Right side Stripe, 8 tapping screw from front Top Cover
- Front Ventilation

Installation

Reverse the removal procedure for installation.



Front Protection Cover

- Remove 2 tapping screw 2 from Fuel Tank Rear Cover
- Push Front Protection Cover upwardly

Installation

Reverse the removal procedure for installation.



Tapping Screw 2



Front Top Cover

Disassembly

Remove 2 tapping Screw 1, 4 tapping screw 2 from Fuel Tank Rear Cover

Remove 1 tapping screw 3 and 2 tapping screw 4 from head light.

Pull out 2P Connector of Left&Right Turning Light

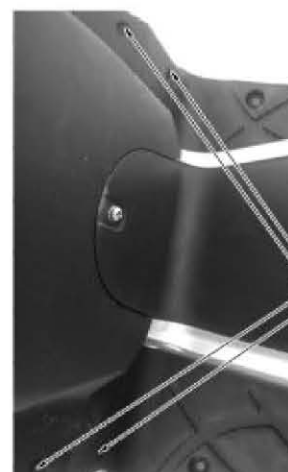
Remove Front Top Cover

Installation

Reverse the removal procedure of installation.



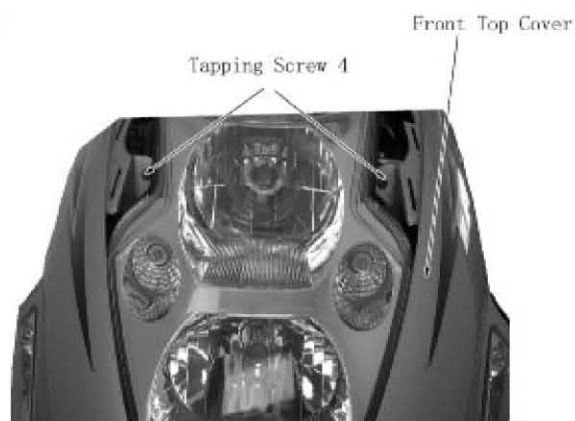
Tapping Screw 1



Tapping Screw 2



Tapping Screw 3



Tapping Screw 4

Front Top Cover

Rear Cover, Fuel Tank

Disassembly

Remove Front Protection Cover (→ 2-8),

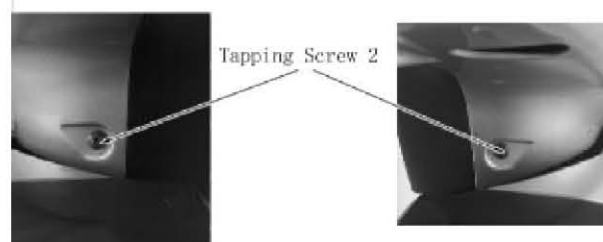
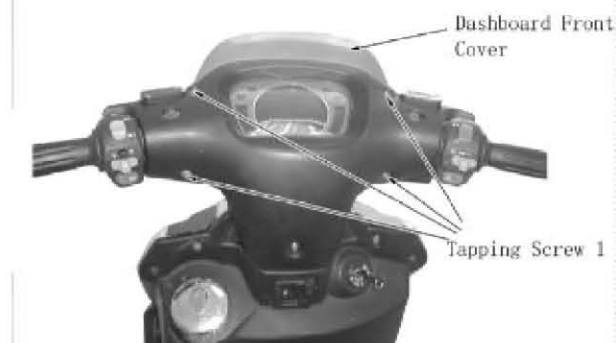
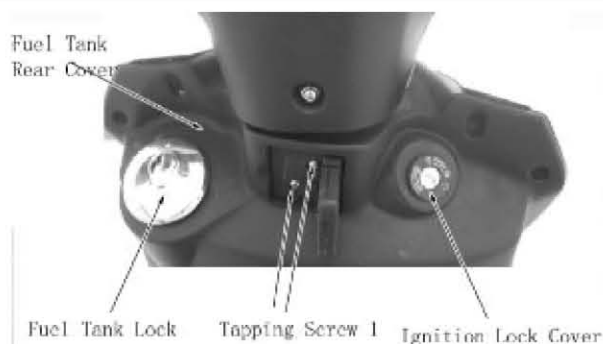
Remove Front Top Cover (→ 2-9),

Open Fuel Tank

Remove Ignition Switch Lock Seat

Remove 2 tapping Screw 1 of Luggage Hook Composition

Remove Fuel Tank Rear Cover



Front Cover, Dashboard

Remove

-4 tapping screw 1

Front Cover, Dashboard

Remove

-4 tapping screw 1

-2 tapping screw 2

-Front Dashboard Cover

Installation

Reverse the removal procedure for

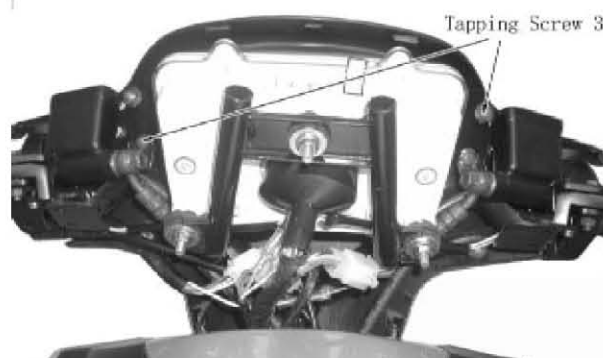
Rear Cover, Dashboard

Remove

-Front Cover Dashboard (→ 2-10),

-1 screw 1

-2 tapping screw 3



Installation

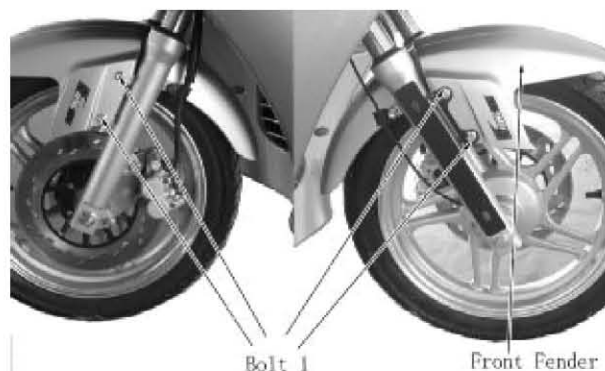
Reverse the removal procedure for installation.

Front Fender

Remove 4 Bolt 1, and remove the Front Fender

Installation

Reverse the removal procedure for installation.



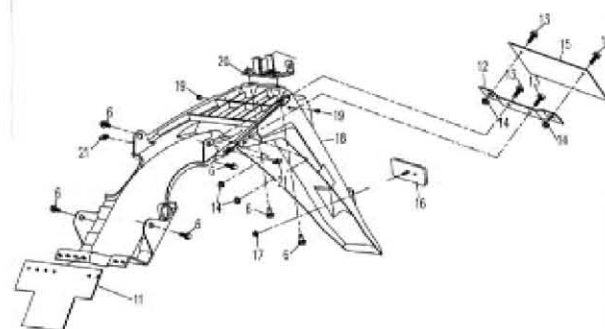
2

Rear Fender

Remove 6 Bolt 6 and remove Rear Fender

Installation

Reverse the removal procedure for installation.

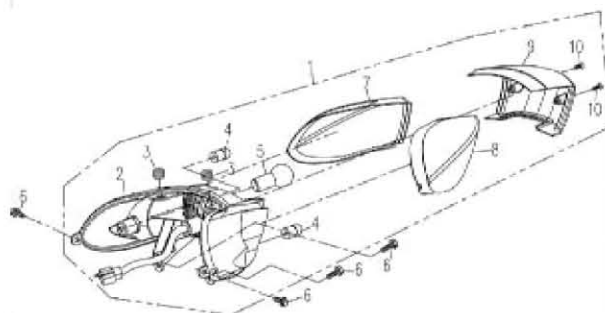


Tail Light

Remove 4 Bolt 6 and remove Tail Light

Installation

Reverse the removal procedure for installation.



CFMOTO

Fuel Tank

Disassembly

Caution:

2

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

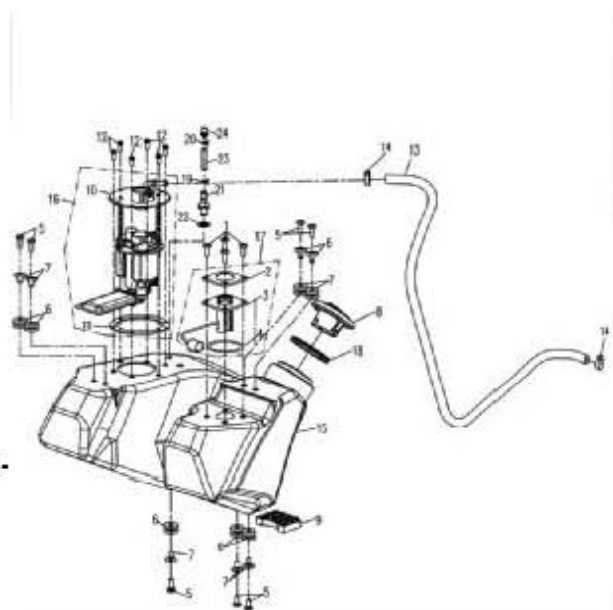
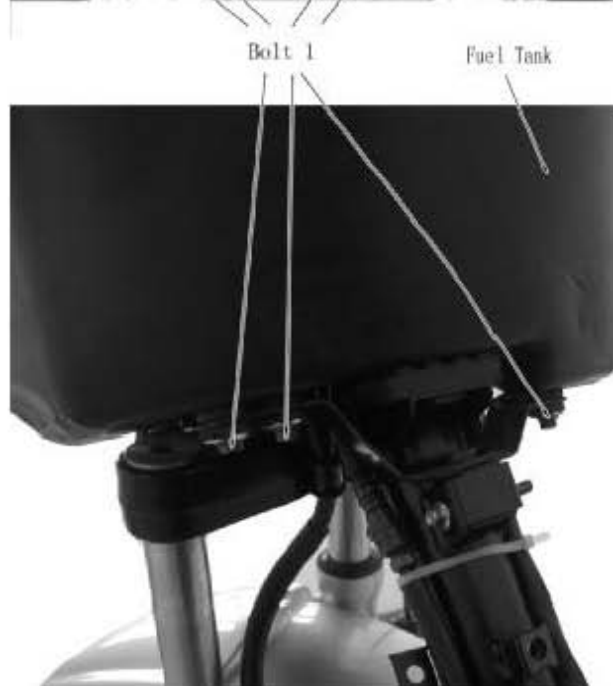
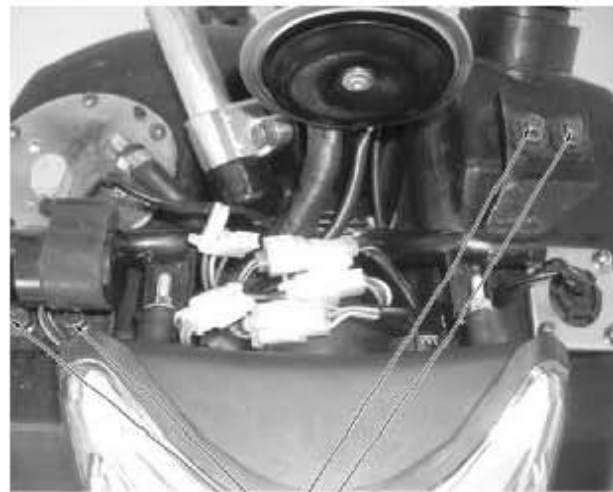
- Front Ventilation (-2-8),
- Front Protection Cover (-2-8),
- Front Top Cover (-2-9),
- Rear Fuel Tank Cover (-2-10),
- 7 Bolt 2
- 3P Connector of Fuel Sensor
- Fuel Pump Connector
- Connecting Circlip12 of Fuel Pump ($\phi 8$),
- Fuel Hose
- Fuel Tank

Installation

Reverse the removal procedure of installation.

Caution:

Do not damage main cable and hose when installing; Arrange main cable and pulling cables, hoses, pulling wiring shall be in correct position. Avoid Fuel Leakage when removing Hose Nine.



Muffler

Disassembly

Caution:

Disassemble the muffler after it is fully cooled.

Remove Bolt 14、15

Remove air temperature 16,

Remove Mufflers

Installation

Reverse the removal procedure of installation.

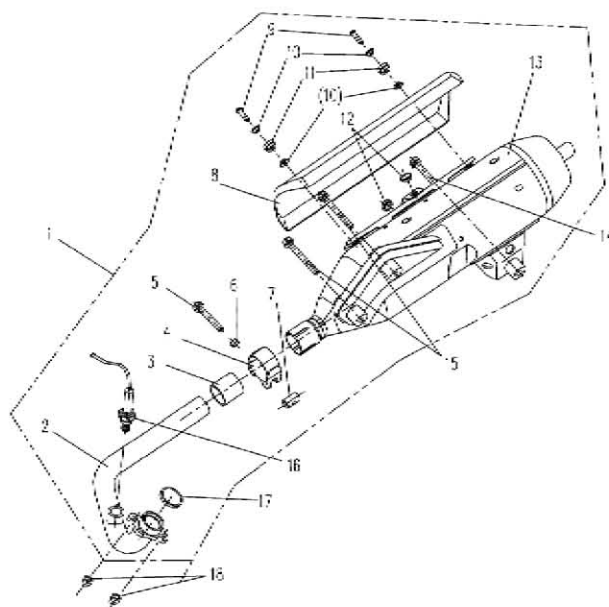
TighteningTorque:

Nuts, front elbow: $30\text{N}\cdot\text{m}(3.0\text{kgf}\cdot\text{m})$

Bolts, muffler: $40\text{N}\cdot\text{m}(40.5\text{kgf}\cdot\text{m})$

Notice:

Replace the sealing gasket when installing the muffler.



Visible Parts

2



Overhaul info.....	3-1	Ignition device.....	3-10
Replacement of parts.....	3-1	Lubricating device.....	3-11
Inspection Instruction.....	3-2	Fuel device.....	3-12
Steering column.....	3-5	Cooling device.....	3-16
Brake system.....	3-5	Exhaust gas recycling device.....	3-18
Wheel.....	3-7	Lighting device.....	3-19
Suspension system.....	3-8	Others.....	3-20
Gearbox.....	3-9		

Overhaul info

Operation Instruction

Warning

- DO NOT keep the engine running for long time in a poorly ventilated or enclosed place because of the harmful components like CO, etc, in the exhaust gas.
- The muffler and engine are still very hot when the engine is just stopped. Careless contact may cause serious burn. Be sure to wear fatigue dress with long sleeves and gloves if the work has to be done when the engine is just stopped.
- Gasoline is highly flammable, smoking is strictly forbidden in the work place. Keep alert on the electrical sparks. Besides, vaporized gasoline is highly explosive, so work should be done in a well-ventilated place.
- Be careful that your hands or clothes not get nipped by the turning or movable parts of the driving system.

Note

The vehicle should be parked on hard and level ground and supported with the main stand or a service bracket.

Periodical Replacement of Parts

Replacement intervals are dependent on year or mileage, whichever occurs first:

Item	Interval	Memo
Air filter element	Clean or replace every 2000-3000km	
Engine oil	Initial: 1000km or a month Replace every 3000km	
Coolant	Replace every year	
Gearbox oil	Replace every year	
Spark plug	Replace every 3000km	

Check & Maintenance Mode

○ : Interval

3

Check & Maintenance Item			Intervals			Standard
Part		Item	Da ily	Hal ifa yea r	Eve ry year	
Steering Device	Steering Handle	Operation Agility			○	
	Front fork	Damage			○	
		Installation status of steering coulumn			○	
		Sway of steering stud bearing			○	
Brake device	Brake lever	Play	○	○	○	Front wheel: lever end 10-20mm Rear wheel: lever end 10-20mm
		Brake efficiency	○	○	○	
	Joint rod and oil pipe	Looseness slack and damage			○	
	Hydraulic brake disk	Front and rear brake fluid level	○	○	○	Brake fluid above (LOWER) mark
		Brake disk damage and wear			○	Replace when the thickness of front or rear brake disk is less than 3mm
Driving device	Wheel & Tire	Tire pressure	○	○	○	Front wheel: 225kPa (2.25kgf/cm ²) Rear wheel: 225kPa (2.25kgf/cm ²)
		Chap and damage	○		○	
		Groove depth and abnormal wear	○		○	No wear indication on the surface of tire (the remained depth of groove should not be less than 1.6mm)
		Slack of wheel nut and shaft		○	○	
		Shake of bearing front wheel			○	
		Sway of bearing rear wheel and wheel nut			○	
Buffer device	Suspension arm	Sway of join parts and rocker arm damage			○	
	Shock absorber	Oil leakage and damage			○	
		Function			○	
Transmission system	Gearbox	Oil leakage and oil level				Remove filling bolt, and oil till oil level reaches filling hole

3 Inspection & Adjustment

3

Check & Maintenance Item			Intervals			Standard
Part		Item	Daily	Half a year	Every year	
Transmission system	Output shaft (Transmission shaft)	Slack of joint parts		○	○	
		Sway of spline			○	
Electrical device	Ignition device	Status of spark plug		○	○	Spark plug gap: 0.8—0.9mm
		Ignition timing		○	○	
	Battery	Joint status of terminal			○	
	Electrical wiring	Slack and damage of joints			○	
Engine	body	Starting abnormal noise	○		○	
		Timing chain adjustment		○	○	
		Low-speed & accelerating	○		○	
		Idle speed		○	○	1700 ± 170r/min
		exhaust		○	○	
		Filter element		○	○	
	Lubrication device	Oil leakage		○	○	
		Oil defiling and oil level	○	○	○	Dip stick type: oil level should be between the upper and lower limits
	Fuel device	Fuel leakage		○	○	
		Joint condition of carburetor			○	
		Throttle			○	Throttle handle clearance 1/8 — 1/4 circle
	Cooling device	Water level	○	○	○	
		Water leakage			○	
Anti-diffusion device for black smoke and other harmful gas	Exhaust reverting device	Damage of pipe			○	
		Cleaning of air breather		○	○	
	Anti-diffusion device for CO, etc.	Function of secondary air intake device			○	
		Damage and installation status of pipes			○	

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Check & Maintenance Item		Intervals			Standard
Part	Item	Daily	Half a year	Every year	
Lighting device and turning indicators	Function	○	○	○	
Alarm and lock device	Function			○	
Instruments	Function			○	
Exhaust pipe and muffler	Slack or damage caused by installation			○	
	Function of muffler			○	
Frame	Slack and damage			○	
Others	Lubrication & grease of frame parts			○	
Abnormal parts which can be determined when driving	Make sure if there are any abnormality with relative parts	○			

Steering Column

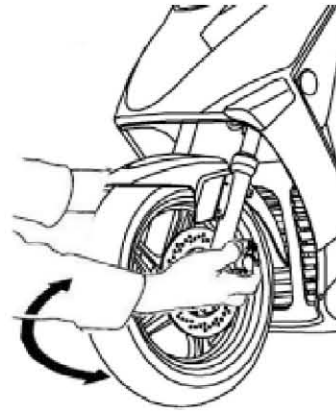
Park the scooter with main stand, lift front tire, hold the lower part of shock-absorber and shake back and forth to see if there is any sway.

In case of any sway, check if it is the problem of the steering column or other parts and then do the maintenance accordingly.

In case of sway of the steering column, tighten the locknut or disassemble the steering column for further check.

Lift the front wheel, slowly turn the handlebar left and right to see if it can turn freely.

In case there is any hindrance, check if it is from the main cable assembly or other cables. Or disassemble the steering column and check if the steering column bearing bracket is damaged.



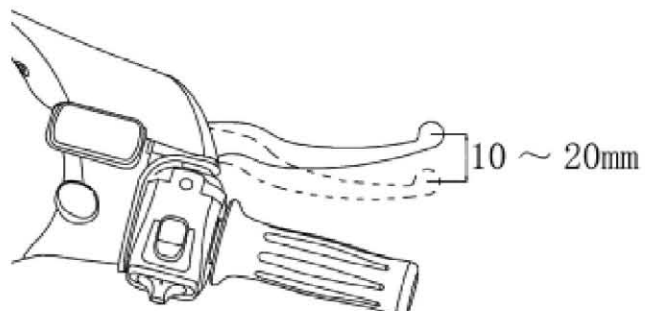
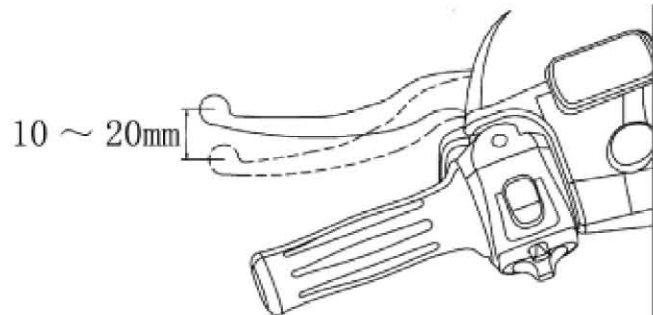
Brake system

Brake lever clearance

Operate front and rear brake lever, check brake efficiency and brake lever function.

Check play of lever ends..

Play: 10-20mm



Brake pump comp.

<Fluid level>

Check the brake fluid level

When the brake fluid level is near to the lower limit, check brake pump,

brake hoses and leakages at the joints. Remove the two mounting screws

on oil cup cap, take down the cap, add DOT3 or DOT4 brake liquid till the upper limit.

Do not mix with dust or water when adding brake fluid.

Use only the recommended brake fluid to avoid chemical reaction.

Brake fluid may cause damages to the surface of the plastic

and rubber parts. Keep the fluid away from these parts.

Slightly turn the handlebar left and right till the brake pump

comp. is in the horizontal status, then remove the oil cup cap.

Brake disk, Brake Pad

< Wear of brake Pad >

Check the brake pad from the mark as indicated.

Replace the brake pad if the wear has reached position

of wear limit trough.

Note

The brake pad must be replaced with a whole set.

Check and replacement of the brake disk.

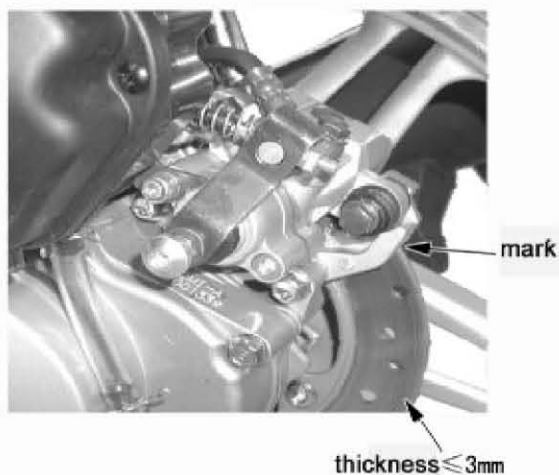
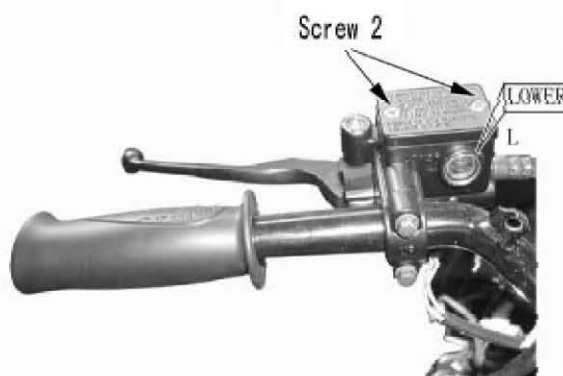
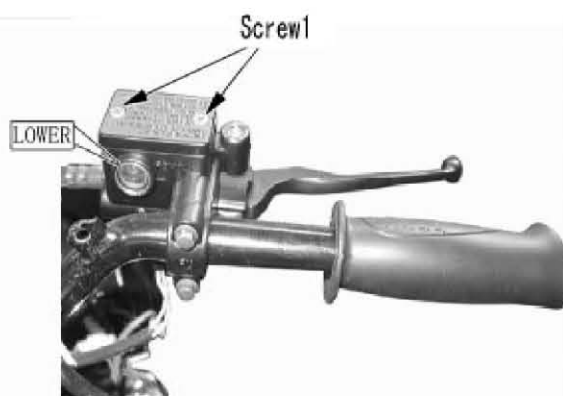
Check if there is any were or damage on the disk, when the brake disk thickness is ≥ 3 mm, replace the brake disk.

Min. limited thickness of the brake disk: 3mm

Replacement of Oil

< Replacing brake liquid>

Replace brake liquid once every year.



Wheel & Tire

Tire Pressure

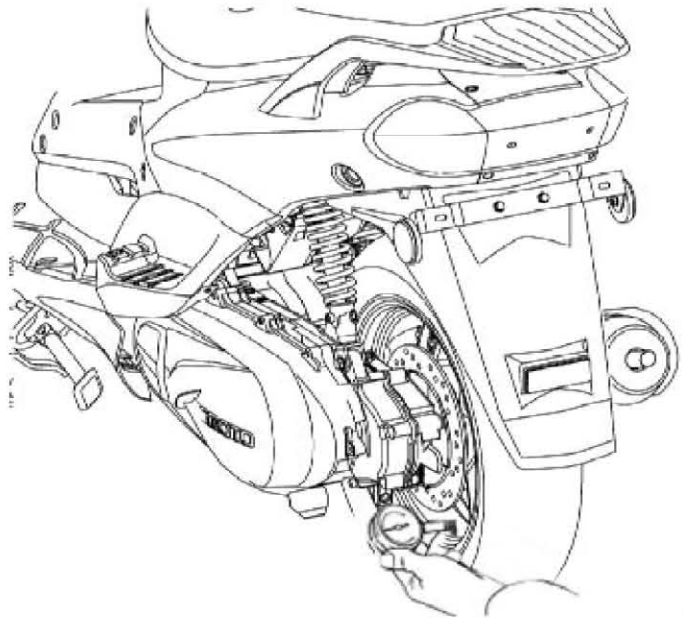
Check the tire pressure with a pressure gauge.

Note

Check tire pressure when tires are cooled.

Driving under improper tire pressure will reduce the comfort of operation and riding, and may cause deflected wear of the tires.

Tire pressure parameter:



3

Indicated pressure/tire

	Front wheel	Rear wheel
Pressure	225kPa(2.25kgf/cm ²)	225kPa(2.25kgf/cm ²)
Tire specification	100/80-14M/C48L	120/80-14M/C58L

Looseness of Wheel Nuts and Wheel Axle Nuts

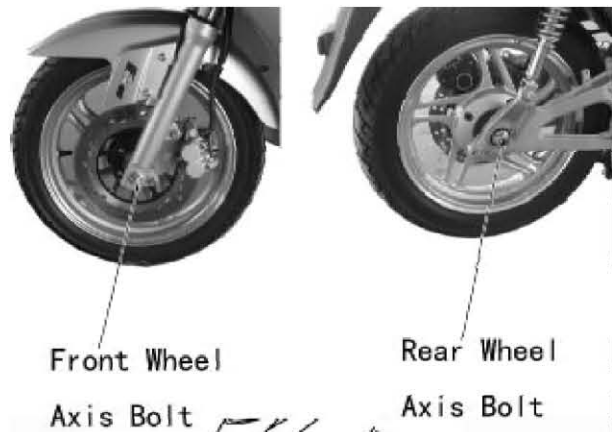
Check front and rear wheel axle nuts for looseness. Tighten in case of any looseness according to the Specified torque:

Tightening torque:

3

Front wheel axle nut: $80\text{N} \cdot \text{m}(8.2\text{kgf} \cdot \text{m})$

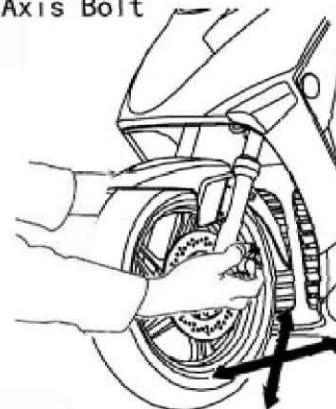
Rear wheel axle nut: $140\text{N} \cdot \text{m}(14.3\text{kgf} \cdot \text{m})$



Sway of wheel bearing

Park the scooter with the main stand, and lift the front wheel.

Turn steering handle right or left to the max position, and rock the wheel in axial direction to check if there is any sway. In case of any sway, disassemble the front wheel and check the bearing. (→13-4)



Suspension system

Front suspension

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

In case of any rocking or abnormal noise, check the front shock absorber and the steering column.

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



Rear suspension

Press the rear suspension up and down several times.

In case of any rocking or abnormal noise, check the rear shock absorber and the hanging pivot part.

Check rear shock absorber for oil leakage, damage or looseness of the tightening parts.



Rocking of the joining part

Park the scooter with main stand and rock engine up and down to check if there is damage or rocking with the cushion collar of rear suspension. Replace the cushion collar in case of any rocking.



3

Gearbox

Spot check the lubrication oil in the gearbox

Check if there is any oil leakage around the gearbox.

Park the scooter with main stand and.

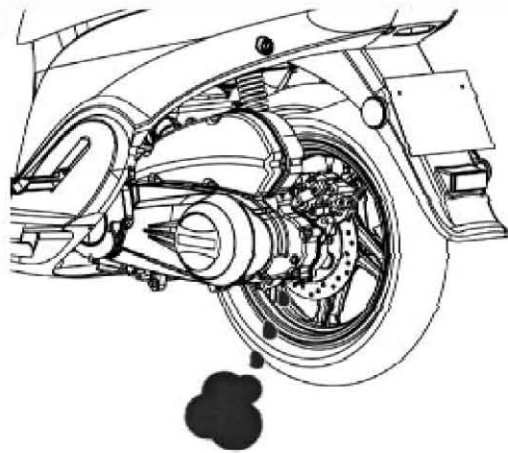
Stop the engine, remove the oil bolt and check if the oil level reaches the screw hole.

In case of lower oil level, fill oil till the lower line of the screw hole.

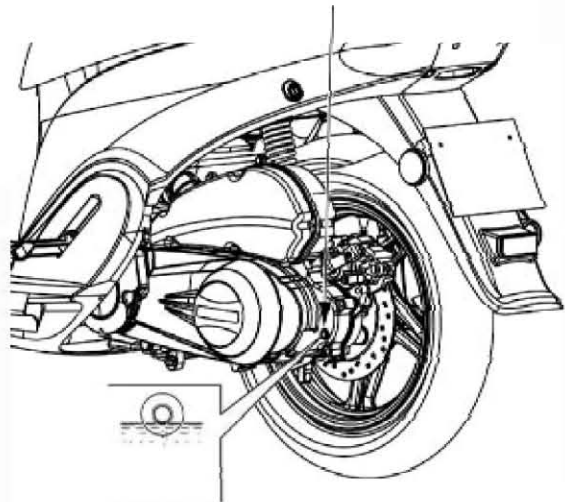
Recommended Oil: (→ 3-11)

Check gasket sealing status, assemble and tighten oil inspection bolt.

Torque: 22N • m (2.2kgf • m)



Oil Check Bolt



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Ignition Devices

Spark Plug

Remove left side panel (→ 2-4).

Remove the spark plug cap.

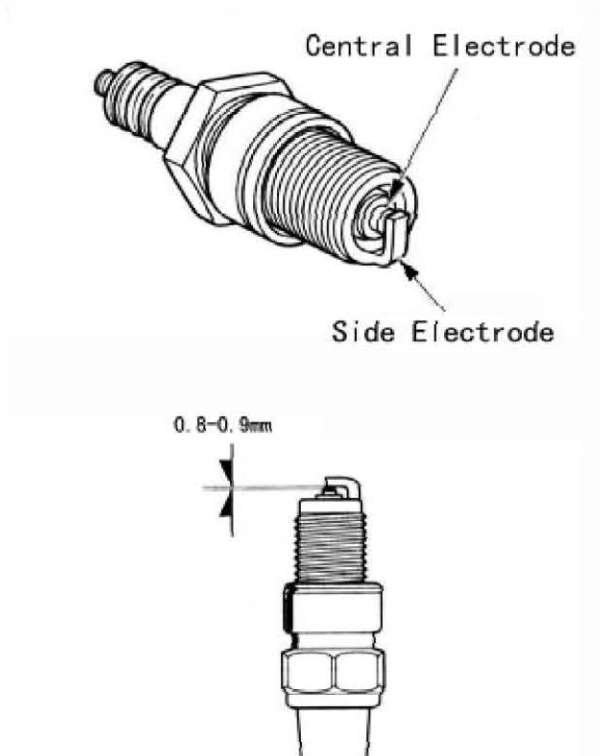
3

When removing the spark plug, clean the joint face of spark plug with compressed air to prevent dust from entering the combustion chamber.



Remove spark plug.

Check the central and side electrodes of the spark plug to see if there is any erosion, burning or damage of the insulate electromagnet. Replace the spark plug if there is burning.



Recommended spark plug

	NGK
Standard	DPR7EA-9
Optional	
Electrode gap	0.8—0.9mm

Install the spark plug.

Note

To avoid damage to the thread of spark plug hole, when installing the spark plug, revolve it into cylinder head with hand and then tighten it with a spanner.

If the spark plug is a new one, screw by one-quarter after the sealing gasket contacts the joint face.

If the spark plug is a used one, tighten it according to the recommended torque.

Torque: 18N • m(1.8kgf • m)

Install the spark plug cap.

Lubrication device

Inspection of the engine oil

Warm up the engine.

Stop the engine and remove the oil dip rod and clean it. Park the scooter on an ground.

Insert the oil dip rod (DO NOT screw in) and check engine. oil level 2-3 minutes after the engine stopped.

If oil is between the upper and lower limit, oil is sufficient.

If oil is near the lower limit, add oil till the upper limit.

Recommended engine oil:

Special engine oil for 4-stroke motorcycle:

SAE10W-40,20 W - 50,

In case of using substitutes, select from following ranges:

API classification: SE or SF type engine oil.

Note

Choose engine oil according to the viscosity-temperature chart on the right.

Install the oil dip rod, and tighten it.

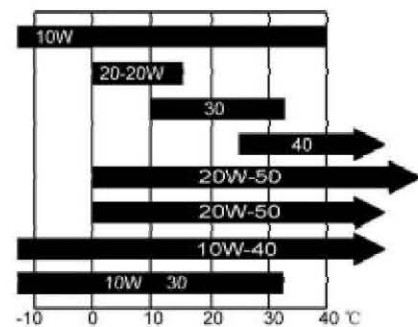
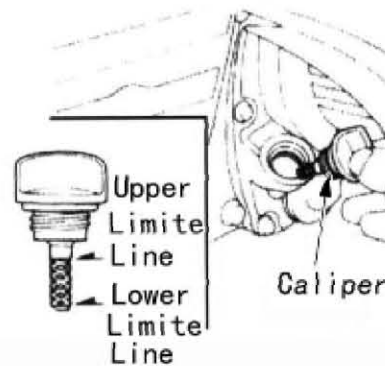
Replacing engine oil

Park the scooter with main stand.

Start engine to warm up.

Stop the engine, Remove the oil dip rod, oil drain bolt and sealing gasket, drain the oil.

Keep the scooter inclined left-side and press the start button 2~3times.



Drain Bolt

Install the cleaned drain bolt and new sealing gasket, and tighten it according to the recommended torque.

Torque: 25N • m(2.5kgf • m)

Add the recommended engine oil.

Engine oil capacity: 0.8L(for replacing)

1.0L(for disassembling)

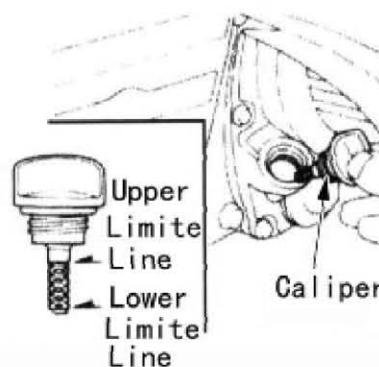


Drain Bolt Sealing
Gasket

Check the oil level with the dip rod while adding till the oil level reached the upper limit.

Install the oil dip rod, start the engine, and check if there is any oil leakage.

Stop the engine, and check oil level again.



Cleaning the oil filter screen

Drain the engine oil.

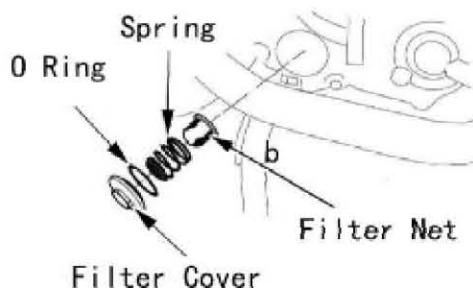
Remove the engine oil filter screen cover.

Remove the spring, filter, and wash the filter screen.

Check O-ring of filter cover, if necessary, replace with a new one.

Install filter screen and spring, tighten the engine oil filter screen cover to appointed torque.

Torque: 20N • m(2.0kgf • m)



Fuel Pump High Pressure Fuel Pipe

Fuel device

Condition of the fuel system

Check the oil pipe for any aging or damage.

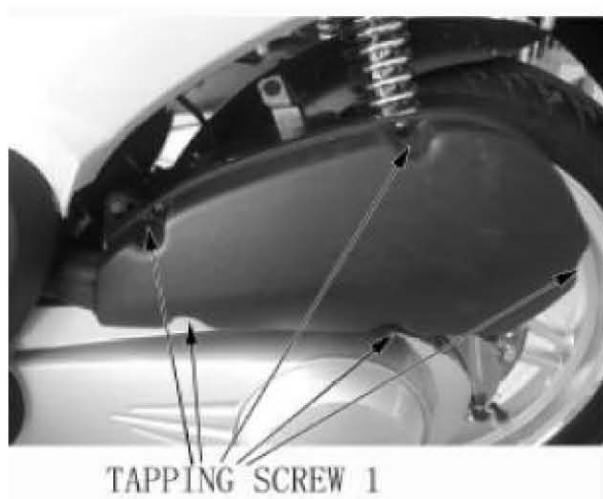
In case of any aging or damage with the fuel pipes, replace with new ones.

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

Replace with a new one, if any.

Replacement of air filter element

Remove 2 bolt 1 as shown in pictures.
Remove air box.
Remove air filter element and replace.
Reverse the removal order for installation.



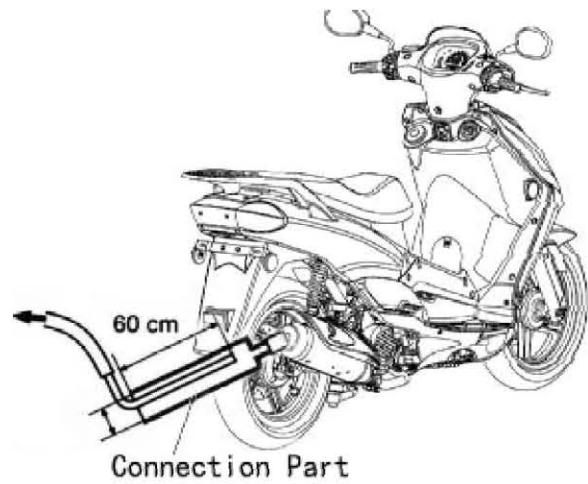
3

Idle speed inspection

RPM of Idle speed inspection: 1700 ± 170 rpm

Check Exhaust

To ensure the required insert depth of the sensor (60cm), use a connector and connect it to the muffler.

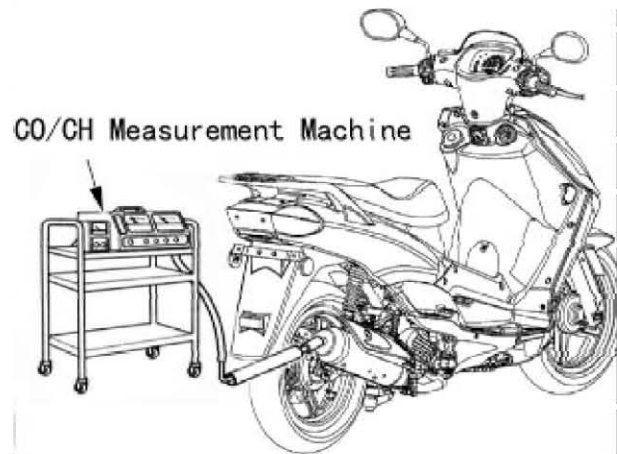


After strictly adjusting the idle speed, measure the density of CO (CO%) and HC (HC%).

CO at Idle speed: below 3.8%

HC at idle speed: below 800ppm

RPM at idle speed: 1700;±170rpm



Checking the throttle handle

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

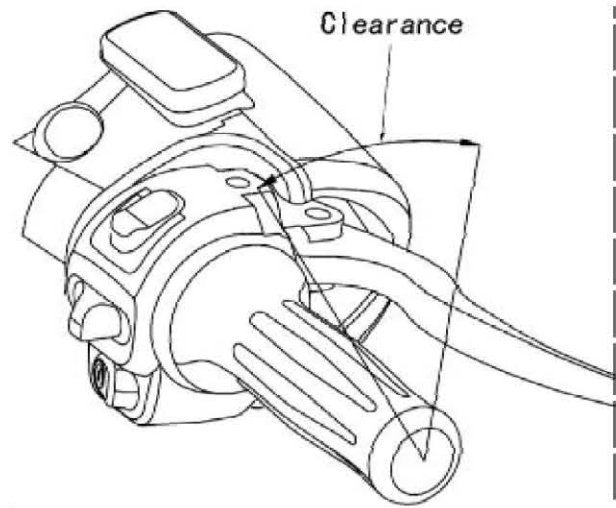
In case the turning of the throttle handle is not smooth enough, Check if there is damage with the throttle cable, or rust with the steel wire or any stickness with the throttle handle.

Check the outer clearance of throttle handle.

Clearance: 1/8~1/4 circle

Adjust the clearance when it is not within the rated range.

Remove the shield of throttle cable.



Cooling device

Caution

Check of coolant level should be done on the reservoir tank instead of the radiator.

If the radiator cover is opened while the engine is hot (over 100°C), the pressure of the cooling system will drop down and the coolant will get boiled rapidly. DO NOT open the radiator cover until the coolant temperature drops down.

- Coolant is poisonous, DO NOT drink or splash it to skin, eyes, and clothes.

- In case the coolant gets to the skin and clothes, wash with the soap immediately.

- In case the coolant gets into eyes, rinse with plenty of water and go to consult the doctor

- In case of swallowing the coolant, induce vomit and consult the doctor.

- Keep the coolant in a safe place and away from reach of children.

Coolant level

Coolant might get less due to natural evaporation, check the coolant level regularly.

caution:

- Coolant can prevent rust and resist freeze.

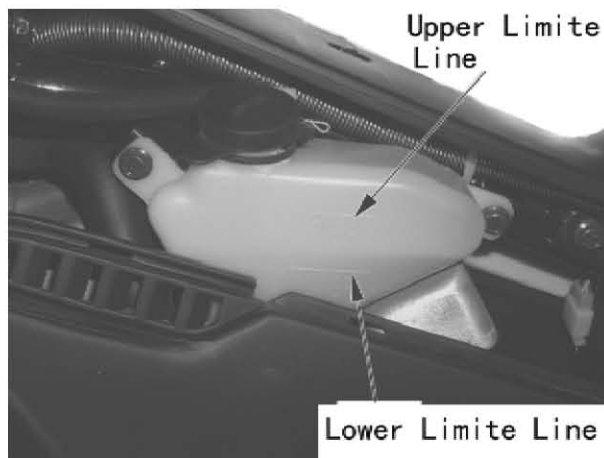
Ordinary water may cause engine rust or cracks in winter due to freezing. So coolant must be used.

- Park the vehicle properly for checking of the coolant. Inclined vehicle body will cause incorrect judging of the coolant level.

- Check the coolant after the engine is warmed up.

Start and warm up engine.

Stop the engine, park the vehicle with main stand on the even ground.



Check if the coolant level is between the upper and lower limit.

When the coolant level is below the lower limit, open right cover of front trunk and remove cap of reservoir tank. Add coolant till the upper limit (coolant or diluted original liquid).

Recommended coolant: CFMOTO coolant
Standard density: 50%(Freezing temperature of coolant varies according to the different mixture ratio. Adjust the mixture ratio according to the lowest temperature in the place where the vehicle is used.)

If the coolant reduces very fast, check if there is any leakage.

The cooling system may be mixed with air when there is no coolant in the secondary water tank and the air should be discharged before filling coolant.

Coolant Leakage

Check radiator hose, water pump, water pipes and joints for leakage.

In case of any leakage, disassemble and do further check. (Refer to Chapter 6)

Check the radiator hose for aging, damages or cracks; The rubber hose will naturally get aged after a period of service time and frequently being heated. As the aging goes on, the hose may get cracked when the cooling system is heated. Nip the hose with fingers and check if there are any tiny cracks.

In case of any abnormal, replace with a new hose.

Check the clamps of the coolant pipes.

Tighten properly in case of any looseness.

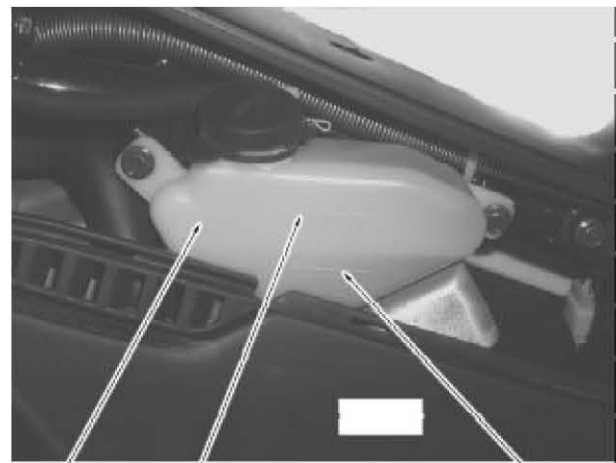
Refer to P. 6 for disassembly of the radiator.

Check the radiator fins for mud and dust block or damage.

Correct the bent fins; clean the mud with water and compressed air.

When the damaged area of the radiator fin is over 20%, replace with a new radiator. (-6)

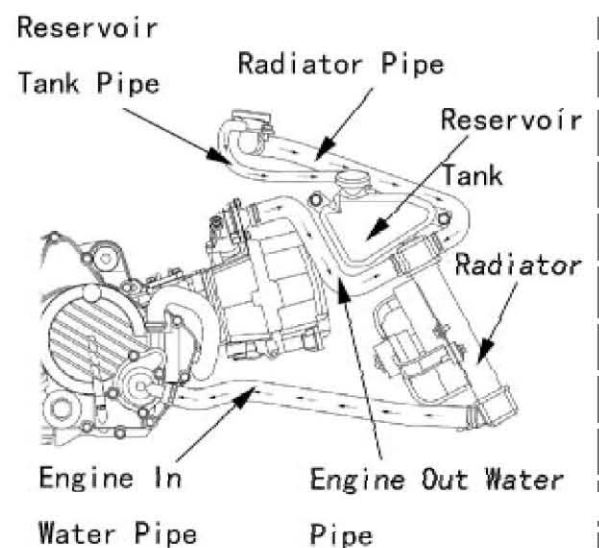
Refer to P. 6 for replacing the coolant.



Reservoir Tank Upper Limite Line Lower Limite Line



Radiator Cap



Exhaust recycling device

Check if there's any deposit in the discharge duct (at right bottom of air filter).

If there's deposit, remove the discharge plug; drain the deposit from the duct. Install the discharge plug and fix it with the clamp.

3



Hose ,
Crankcase
to Airbox

Lighting Device

Optic Axis adjustment of Front head light

Adjust Optic Axis adjustment bolt with cross banner to adjust lenght of lighting.



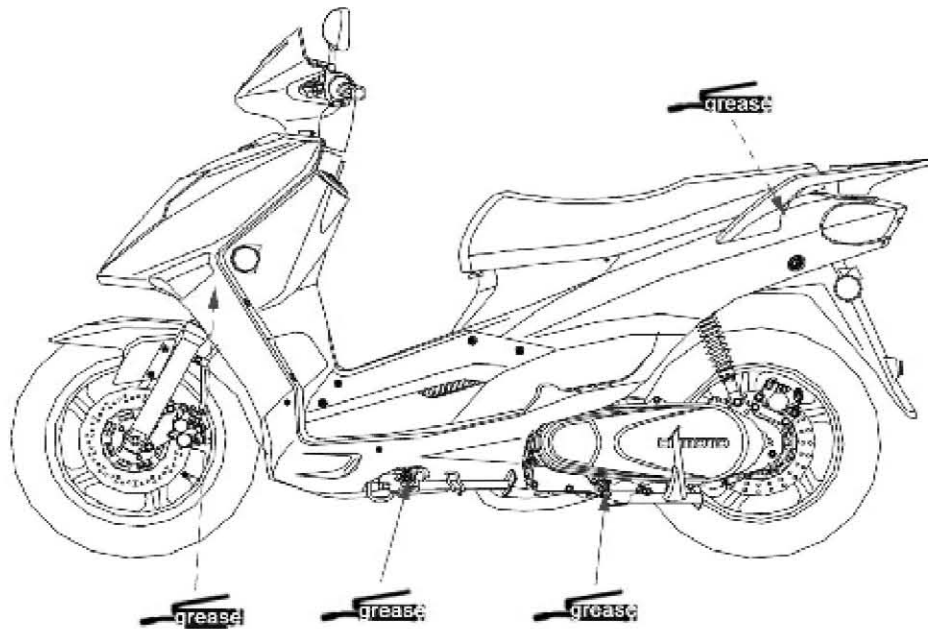
Others

Lubrication of frame parts

Turn the movable parts of vehicle body, and check the lubrication condition.

In case of any stickness, apply recommended lubrication oil or grease to the parts.

3



The dotted line means the parts which can not be seen

Overhaul info.....4-1

Troubleshooting.....4-1

Oil pump..... 4-2

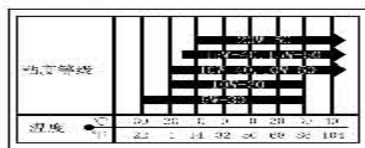
Overhaul info

Caution

- The maintenance of the oil pump should be done after disassembling the right side cover. (→11)
- When the measured values exceed the service limit, replace the oil pump.
- Do not mix impurities into the engine when disassembling the oil pump.
- Check if there is any oil leakage after installing the oil pump.

Standard

Item		Standard	Service Limit
Oil Capacity	When replacing	0.8ℓ	—
	Fuel capacity	1.0ℓ	—
Recommended oil		SAE10V-40、20V-50 Special for 4-stroke motorcycle When using substitutes, select from following range. API: SE or SF type engine oil SAE: select from left table according to external temperature.	
Oil pump rotor	Clearance of inner and outer rotors	0.07 - 0.15 mm	0.20 mm
	Body clearance	0.15 - 0.23 mm	0.25 mm
	End face clearance	0.05 - 0.10 mm	0.12 mm



Tightening torque

Bolt, oil pump body	15N•m(1.5kgf•m)
Screw, oil pump cover plate	2N•m(0.2kgf•m)
Isolation plate comp, B	10N•m(1.0kgf•m)
Isolation plate A	10N•m(1.0kgf•m)

Troubleshooting

Lower Oil Level

- .Natural Oil consuming
- .Oil leakage
- .Wearing or improper installation of piston ring
- .Wearing of valve guide or stem
- .Damaged oil seal of valve stem
- Wearing of cylinder, piston, and piston ring

Smudged Oil

- .Oil is not replaced in time
- .Wearing of piston ring
- .Mixture of oil with coolant
- .Poor sealing of water seal comp.
- .Poor sealing of cylinder gasket

Oil pump

Caution

Do not mix impurities into the engine when disassembling and installing the oil pump.

Dismounting

4

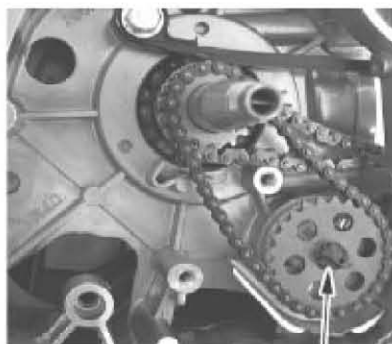
Remove:

- right side cover(→11-2)
- rotor comp, driven gear comp. (→11-3)
- Isolation plate B, oil pump comp.



Isolation plate B, oil pump comp.

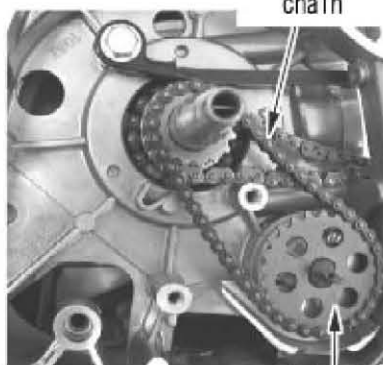
Remove shaft circlip.



Shaft circlip chain

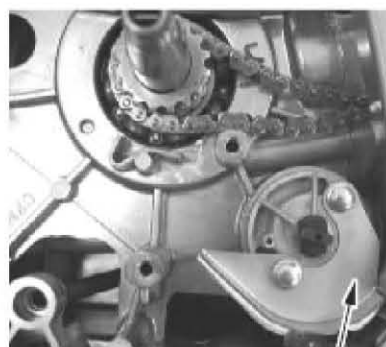
Remove sprocket and chain.

Check if there is any wear or damage with the chain.



Sprocket

Remove isolation plate A



Isolation plate A

Remove oil pump comp., and oil pump shaft.
Check oil pump comp. for any damage or wear.



4

Disassembling

Remove screw and oil pump cover plate.

Remove inner rotor and outer rotor.



Note

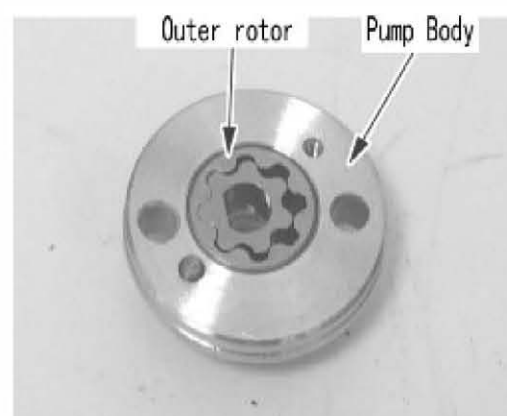
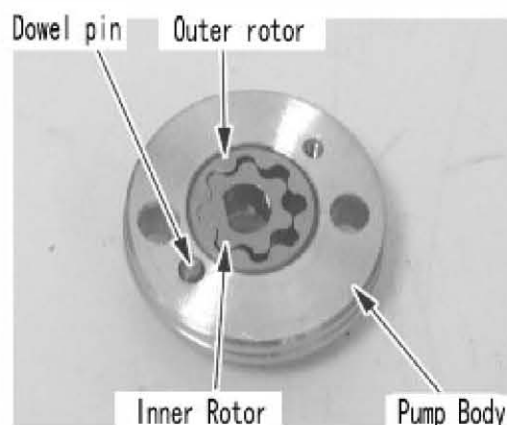
Multi spots should be measured and choose the max. measured value.

Replace the oil pump assy. if the measured values exceed the service limit

Body clearance

Measure the out diameter of oil pump outer rotor and inner diameter of pump body with a vernier caliper; the difference between the two is the clearance value.

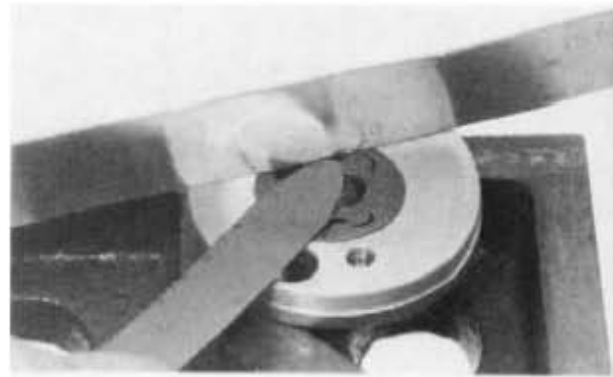
Service limit: 0.25mm



Clearance between inner and outer rotors of oil pump

Install inner rotor and outer rotor onto the oil pump body,
measure the clearance between inner rotor and outer rotor
with a plug gauge.

Service limit: 0.20mm

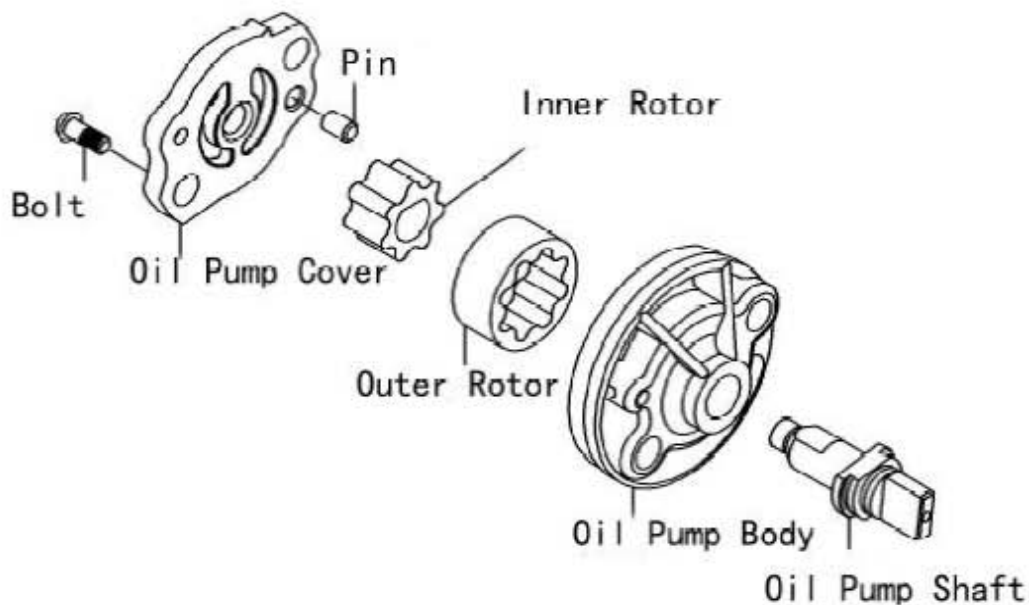


Installation of Oil Pump

End face clearance

Install inner rotor and outer rotor to the oil pump body,
measure the clearance between rotor and oil pump body with a plug gauge.

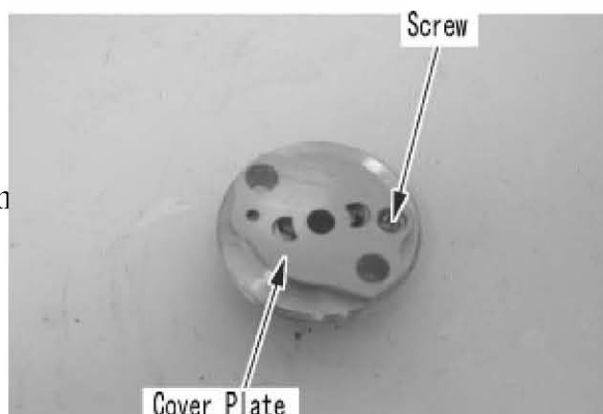
Service limit: 0.12mm



Caution

Wash clean all the parts with clean kerosene before assembly.

Install inner rotor and outer rotor to oil pump

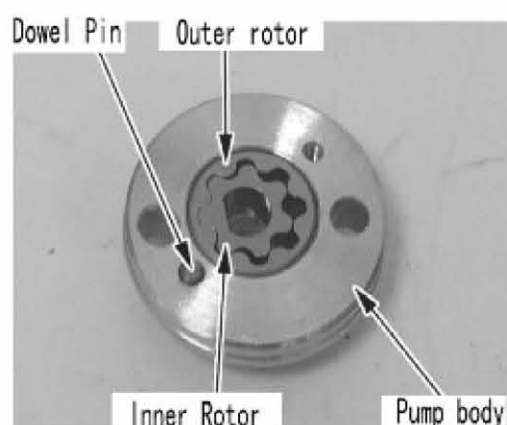


4

Install oil pump cover plate, tighten the screw according to the specified torque.

Torque: $2\text{N} \cdot \text{m}$ ($0.2\text{kgf} \cdot \text{m}$)

Pre-tighten cover plate after assembly, install pump shaft, and make sure the shaft can turn.



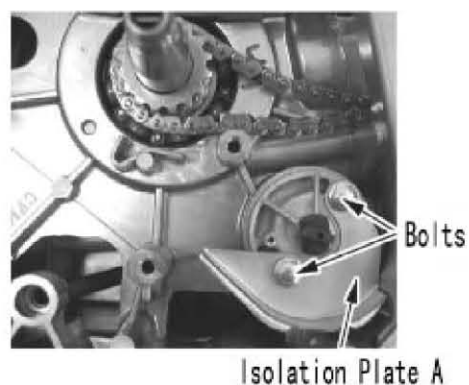
Installation

Make sure that the two mounting holes of the oil pump cover are in line with the that of the right crankcase. Or the mounting bolts won't be tightened.



Install and tighten the two bolts for oil pump cover and isolation plate A, and tighten according to the specified torque.

Torque: $10\text{N} \cdot \text{m}$ ($1.0\text{kgf} \cdot \text{m}$)

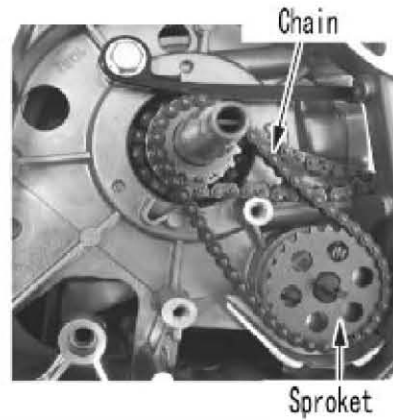


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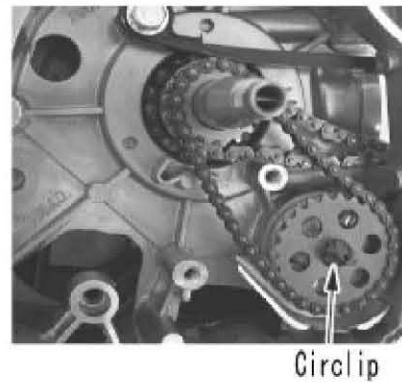
4

Install oil pump sprocket and chain.

Note: Sprocket and chain should be pro



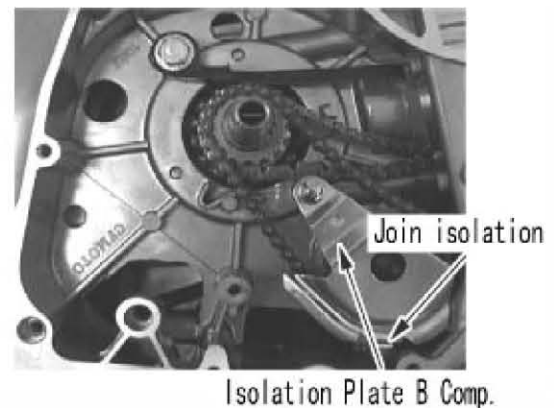
Install shaft circlip into the shaft groove.
Check if the circlip is properly installed



Join isolation plate B with isolation plate A,
tighten with bolt.

Install rotor comp, driven gear comp. (→ 1

Install right side cover. (→ 11-7)



Overhaul info.....	5-1	Fuel injector Assy Removal/Assembly	5-4
Troubleshooting.....	5-2	Idle Air control valve Disassembly/	
Fuel Pump Check.....	5-3	Installation.....	5-4
High pressure oil pipe Disassembly/		Air cleaner Disassembly/	
Installation.....	5-3	Installation.....	5-5
Throttle Valve Disassembly/		Air cleaner Breakdown.....	5-6
Installation.....	5-3		
Fuel Injector Assy Disassembly/Instal-			
lation	5-4		

Overhaul info

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.

- I Do not over twist or bend the cables. The twisted cables may cause poor operation.
- I Loose the high pressure oil pipe before disassembly, discharge the fuel in the high pressure oil pipe and put it in a container.
- I When the body of throttle valve is disassembled, the air intake shall be covered by dishcloth or tape, for avoiding the entry of other objects into the engine from the air intake side of the engine.
- I When the vehicle will be stored for more than one month, the gasoline in the high pressure oil pipe and cap of the fuel injector must be discharged. Otherwise, the gasoline will age and form colloidal elements which may block the nozzle of fuel injector, therefore the engine cannot start or the rotate speed is unstable.

Standard

	Item	Standard
Fuel tank Capacity	Full capacity	7.5L
	Fuel pressure	0.25MPa
Fuel Injector	Model	VALEO: 01F023
Body of throttle valve	Model	BING: 7226101
	Idle rotate speed	1700±170rpm
Idle Air control valve	Model	Siemens ABV379-008

Overhaul Info

Engine starting failure

- Too much fuel in the engine
 - Air filter clogged
 - Idle air pipe clogged
- No fuel in the injector
 - fuel filter clogged
 - high pressure oil pipe clogged
 - fuel injector clogged

Hard starting/shut down after starting, Unsteady idle speed

- Idle air pipe clogged
- fuel system clogged
- Ignition system not functioning properly
- Fuel tank cap clogged

No fire when accelerating

- Ignition system not functioning properly
- Incorrect Spark Plug clearance

High pressure oil pipe Disassembly

Disassemble the trunk (→ 2-3);

Loosen the strap.

Loosen the special fuel pipe clamp on fuel injector cap;

Loosen the special fuel pipe clamp on fuel tank.

Note

Use container to keep the remaining fuel from high pressure oil pipe, when loosening the special fuel pipe clamp.

Pay attention to avoid high pressure fuel splashing into eyes.

High pressure oil pipe Installation

Reverse the disassembly procedure for installation.

Use OETIKER clamp calliper to install the special fuel pipe clamp.

Throttle valve body Disassembly

Disassemble the trunk(→ 2-3)

Loosen the strap, and remove throttle valve connector.

Loosen locknut, remove adjust nut and remove the throttle cable from throttle rotory sleeve.

Disassemble idel air outlet pipe on throttle valve.

Loosen air intake connect clamp, air cleaner connect clamp, and remove throttle valve body.

Notes

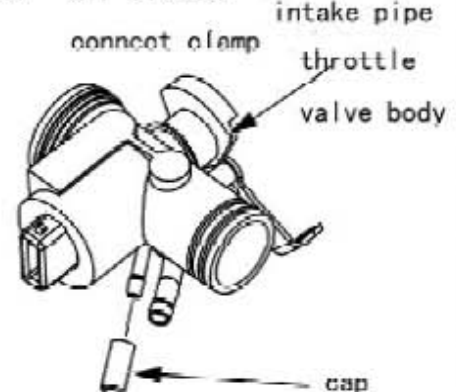
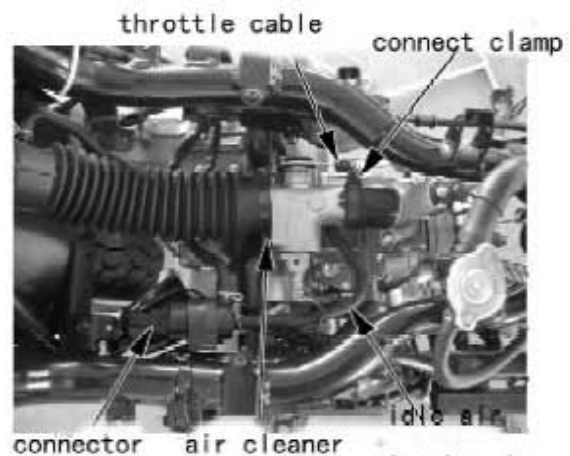
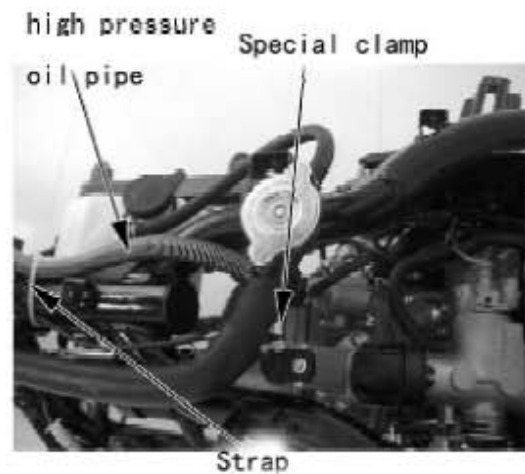
Donot adjust the bolt on throttle valve.

Donot remove the cap on throttle valve body.

Check the throttle valve body whether it is clean. Use Kerosene and pressured air to clean it if necessary.

Throttle valve body Installation

Reverse the disassembly procedure for installation.



Fuel Injector Assy Disassembly

Disassemble the trunk (→ 2-3)

Disassemble the special high pressure oil pipe clamp to connect fuel injector cap. (→ 5-3)

Remove the strap and fuel injector connector. Disassemble bolts, and remove fuel injector cap and injector.

Fuel Injector Assy Installation

Reverse the disassembly procedure for installation

Fuel Injector Assy Removal

Use thumbs of both hands to push two side of fuel injector cap snap spring, and then remove it.

Separate fuel injector cap and fuel injector.

Fuel Injector Assy Assembly

Install fuel injector cap on the fuel injector. Align the groove of fuel injector cap snap spring to edge of fuel injector cap; and press the snap spring into it.

Idle air control valve Disassembly

Disassemble the trunk (→ 2-3)

Disassemble idle intake pipe and idle outlet pipe.

Loosen the strap, disassemble idle air control valve and check idle air control valve. Check whether there is water. Use pressured air to dry the water.

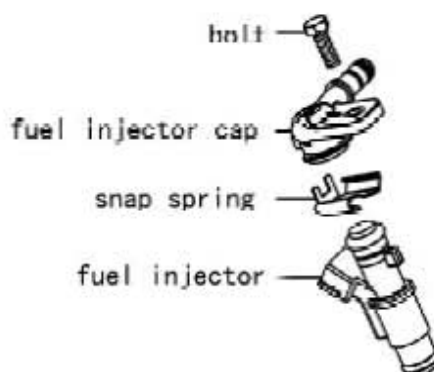
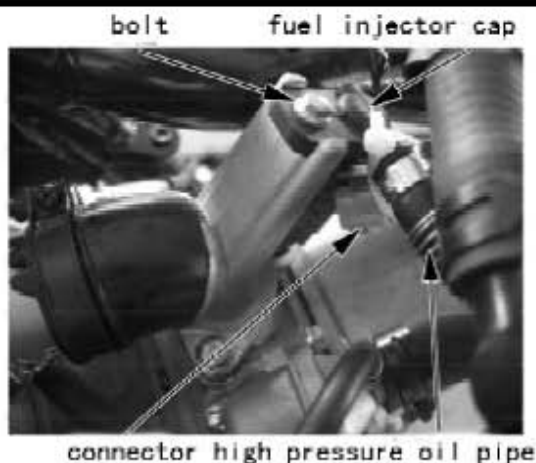
Replace it when there is abnormal noise or it does not work

Idle air control valve Installation

Reverse the disassembly procedure for installation.

Pay attention not to bend the intake and outlet pipe of idle air control valve.

Do not reverse air intake and outlet pipe.

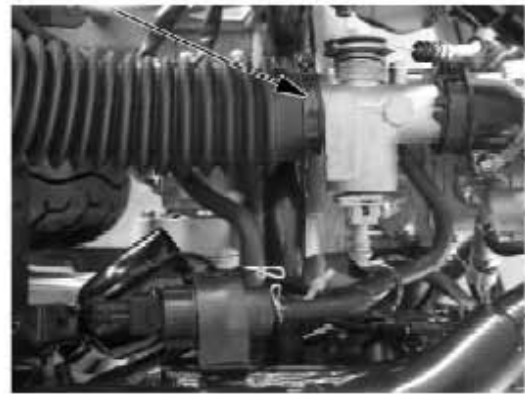


Air cleaner Disassembly

Remove trunk and maintenance cover. (→ 2-3)

Loosen air cleaner joint clamp.

air cleaner connect clamp



Remove air temperature sensor connector.
Loosen exhaust tube clamp of crankcase, and
remove vent hose of crankcase.

bolt

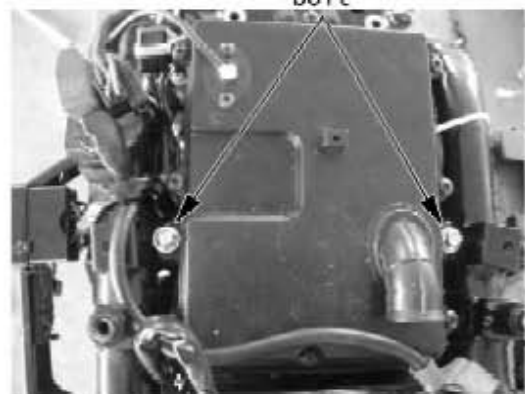


idle vent hose

idle air temperature

sensor connector

bolt



Disassemble two bolts to fix air cleaner.

Disassemble air cleaner.

Installation

Reverse the disassembly procedure for
installation.

Air cleaner Breakdown

Disassemble 8 (8pcs) screws 7 and upper cover 6.

Take out seal 5, filter element 4 and bracket 2 and 3.

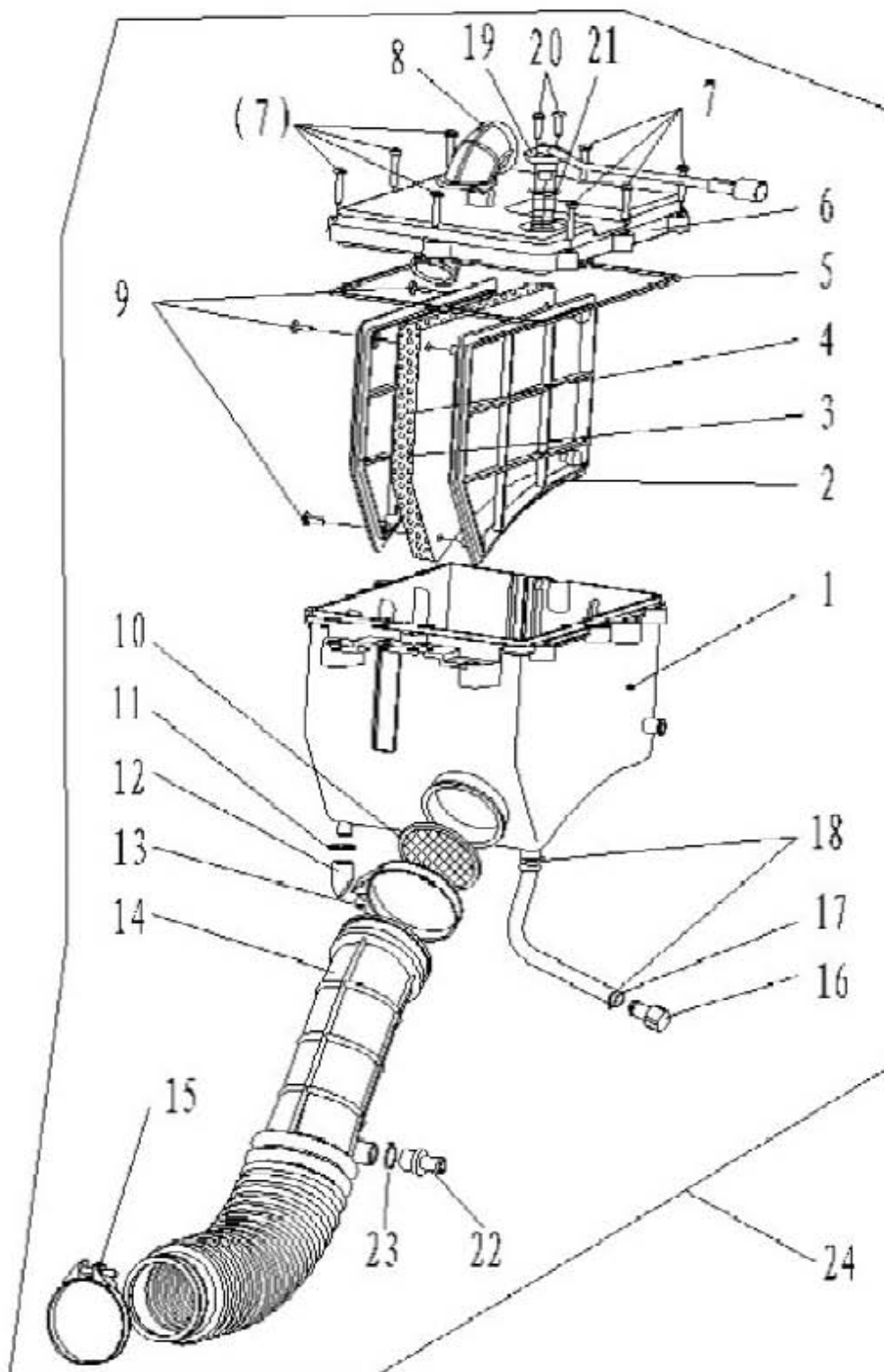
Remove screw 9 and separate filter element 4 and bracket 2 and 3.

Remove screw 20, and take out air temperature sensor 19.

Loosen clamp 18 and remove reverse tube 17.

Use air gun to clean the filter element or replace it when it is dirty.

Check air temperature sensor. Replace it when it is damaged.



Overhauling info.....6-1	Thermostat.....6-7
Trouble shooting.....6-2	Radiator..... 6-8
Performance overhauling..... 6-3	Water pump 6-8
Reservoir tank.....6-5	Cooling system drawing 6-9

Overhaul Information

Caution

. If the radiator cap is opened when the coolant temperature is above 100℃, the pressure of coolant temperature will go down and get boiled rapidly. The steam jet may cause danger and injury. Cover the cap with a piece of cloth after the coolant temperature goes down and open the cap.

. Inspection of coolant should be done after the coolant is fully cooled.

. Coolant is poisonous. Do not drink or splash it to skin, eyes or cloth.

-If coolant splashes in your eyes, thoroughly wash your eyes with water and consult a doctor.

-If coolant splashes on your clothes, quickly wash it away with water and then with soap and water.

-If coolant is swallowed, vomit immediately and see a physician.

-Store the coolant properly and keep it away from reach of children.

. The overhauling of the water pump can done without removing the engine.

. Coolant filling is carried through reservoir tank. Do not open the radiator cap except when disassembling the cooling system for filling or drainage of coolant.

. Don' t stain the painting parts with coolant. In case of any coolant stains, flush with water immediately.

. After disassembly of the cooling system, check the joints for leakage with a radiator cap tester (available in the market).

Inspection standard

Item		Standard
Coolant capacity	Full capacity	0.77L
	Reservoir tank	0.33L
	Standard density	50%
Opening pressure of radiator cap		108kpa (1.1kgf/cm ²)
Thermostat	Valve open temperature	72 ± 2℃
	Full open temperature	88℃
	Full open lift	3.5 — 4.5mm

Tightening torque

Drainage bolt, water pump: 10N • m (1.0kgf • m)

Water pump impeller: 12 N • m (1.2kgf • m) left thread

Trouble shooting

Water temperature rises too fast

- Improper radiator cap
- Air in cooling system pipe
- Malfunction of water pump
- Malfunction of thermostat (thermostat is not open)
- Clogged of radiator pipe or cooling pipe
- Coolant is not enough.

6

No rise or slow rise of water temperature.

- Malfunction of thermostat (thermostat isn' t closed)

Water leakage

- Poor water seal
- O-rings are aged, damaged or improperly sealed.
- Washers are aged, damaged or improperly sealed.
- Improper installation of pipes.
- Pipes are aged, damaged or improperly sealed.

Performance Overhaul

Inspection of coolant density

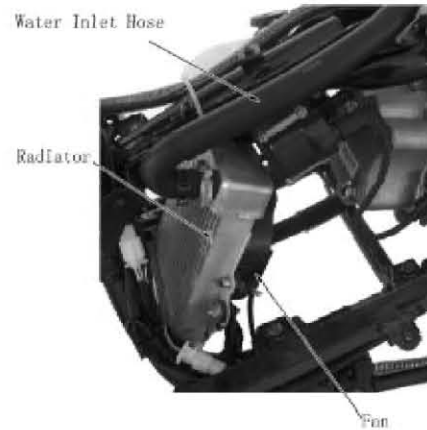
Caution:

Be sure to open the radiator cap after coolant is cooled.

Remove Front Top Cover (→ 2-9),

Remove Radiator Cap,

Check with a densimeter if the density of coolant fits the temperature of using place;
Check coolant for stains



6

Inspection of radiator cap

Caution

Be sure to open the radiator cap after coolant is cooled.

Remove Front Top Cover (→ 2-9),

Remove Radiator Cap (Refer to the upper).

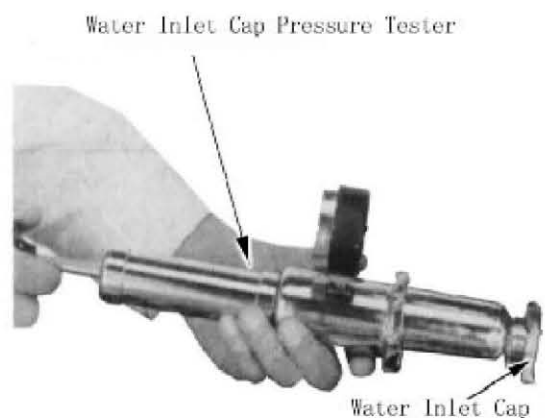
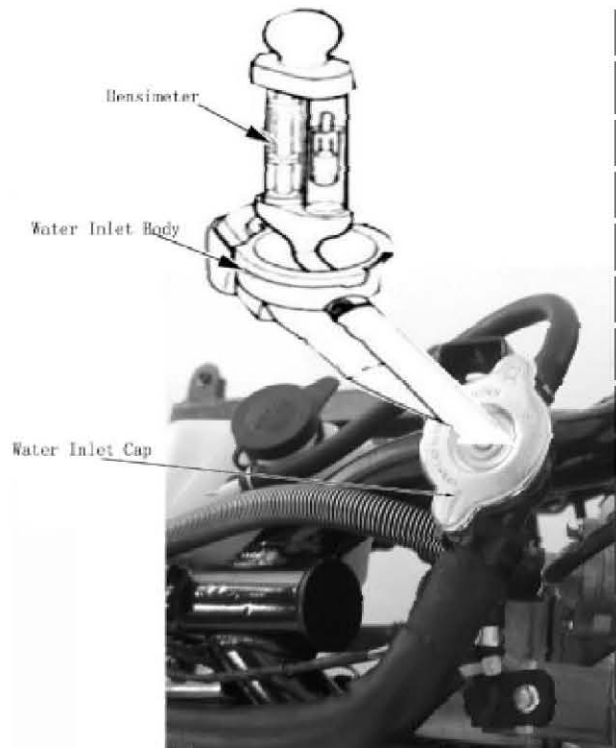
Caution

Apply water on the sealing surface of radiator cap when attaching the tester to the radiator cap.

Apply the specified pressure for 6 seconds and make sure there is no pressure drop.

Opening pressure of radiator cap:

108kpa (1.1kgf/cm²)



CFMOTO

Pressure test of radiator

Apply the specified pressure (opening pressure of radiator cap) and make sure there is no pressure drop for 6 seconds.

Radiator Cap Pressure Tester



Caution:

Do not apply pressure over the specified pressure [108kpa(1.1kgf/cm²)] or the cooling system may be damaged. In case there is any pressure leakage, check the pipe, joint parts, joints of water pump and drainage (→ 6-8).

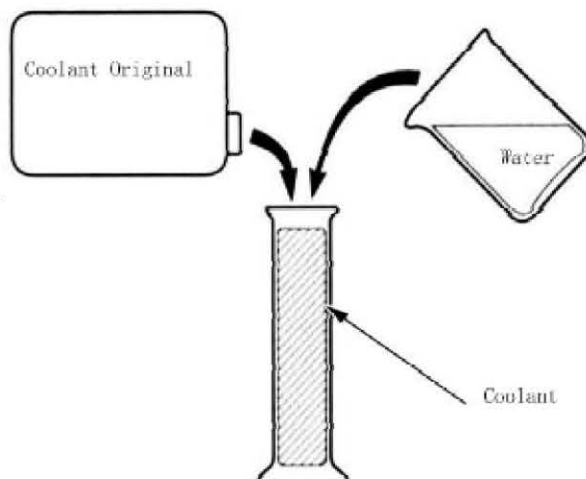
Replacement of coolant, Air Discharge Preparation of coolant.

Caution

Replacement of coolant, Air Discharge Preparation of coolant.

Caution

The coolant is poisonous. DO NOT drink or splash it to skin, eyes, and clothes.
-If coolant splashes in your eyes, thoroughly wash your eyes with water and consult a doctor.
-If coolant splashes on your clothes, quickly wash it away with water and then with soap and water.
-If coolant is swallowed, vomit immediately and see a physician.
-Store the coolant properly and keep it away from reach of children.



Caution

Mix the coolant (undiluted) with soft water according to the temperature 5°C lower than the actual lowest temperature in the area. Coolant should be made from undiluted coolant.

Standard density of coolant: 50%

Recommended coolant: CFMOTO coolant
(Direct application without having to be diluted)

Drainage of coolant

Remove the radiator cap

Caution

Open the radiator cap after the coolant is cooled down.

Radiator Cap



Remove Ride Protection Plate (→ 2-4),
Open Radiator Cap

Remove drain bolt

Remove drain bolt, seal gasket from water pump, drain coolant.
After drainage, assemble new seal gasket and drain bolt and tighten.



Drain Bolt and Sealing Gasket

6

Reservoir Tank

Remove :

- Right decoration plate(→ 2-6)
 - Two bolts 5 of reservoir tank
- Loosen Clamp 3, release joint from Water Hose 1 of reservoir tank

Remove Reservoir Tank

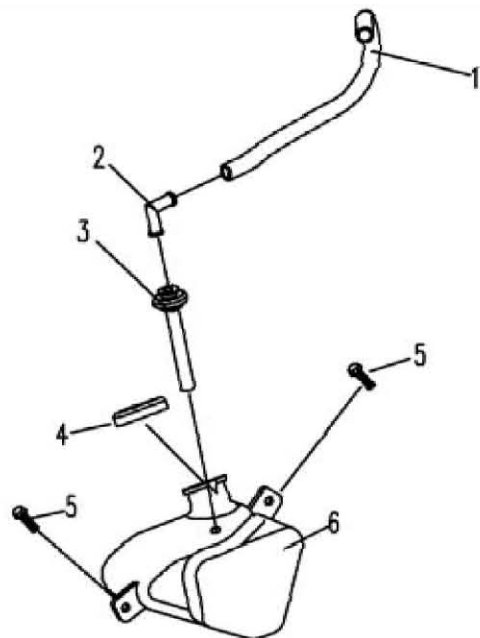
Remove Cap 4

Drain coolant of reservoir tank

Wash clean the reservoir tank

Installation

Reverse the removal procedure for installation



CFMOTO

Refilling Coolant

Open radiator cap and refill coolant from filling port. Front Trunk Comp.

6

Start the engine to discharge air from cooling system.

Check from filling port that air is fully discharged from cooling system and install the radiator cap.

Open right cover of front trunk, remove reservoir tank cap and refill coolant till the upper limit

Caution

Check coolant level when the scooter is parked with main stand on an even ground.

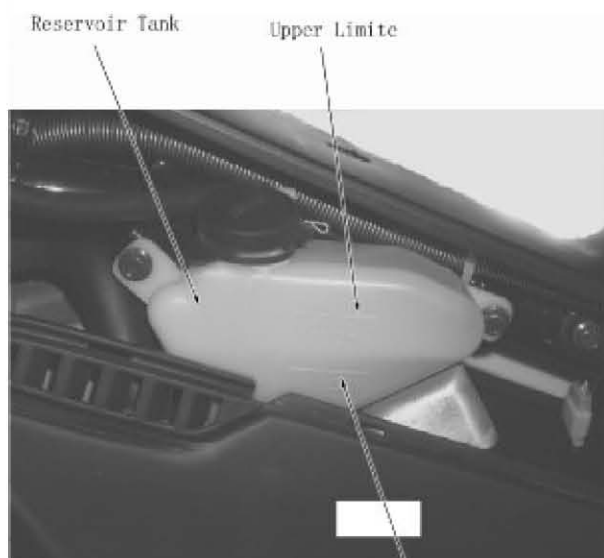
Air Discharge

Discharge the air from coolant system according to the following steps:

1. Start the engine and run it several minutes at idle speed;
2. Quickly increase throttle 3~4 times to discharge air from cooling system;
3. Refill coolant till filling port and install radiator cap;
4. Check coolant level in reservoir tank and refill till upper limit. Install reservoir tank cap.



Water Inlet Cap



Lower Limite

Thermostat

Disassembly and Installation

Caution:

Remove the radiator cap when the coolant is cooled down.



6

Remove Bolt 1

Remove Thermostat Upper Cover⁸ and Lower Cover²;

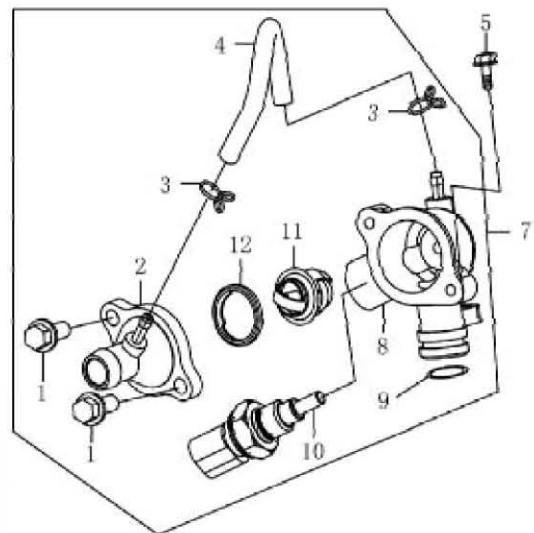
Remove Thermostat

Reverse the removal procedure for installation

Install Footrest (→2-7)

Fill in Coolant, Exhaust air (→6-4)

Install Throttle Body (→Chapter 5)



Overhaul Inspection

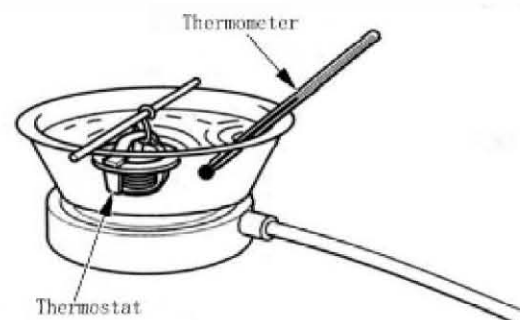
Caution:

- The thermostat must be replaced even if it is a bit open at normal temperature.
 - There is time lag due to the small temperature sensing area of the thermostat. So check the lift of the opening valve after the full open temperature is kept for about 5 minutes.
 - Keep the thermostat and thermometer from contacting the bottom of the vessel
- Put thermostat into water, keep water temperature rising slowly, and check the opening temperature of thermostat valve.

Opening temperature of thermostatic valve: $71 \pm 3^{\circ}\text{C}$

Full open lift/ Temperature: : 3.5—4.5mm / 8

Install thermostat (Refer to upper instruction)



Radiator

Caution:

Do not damage the radiator fins

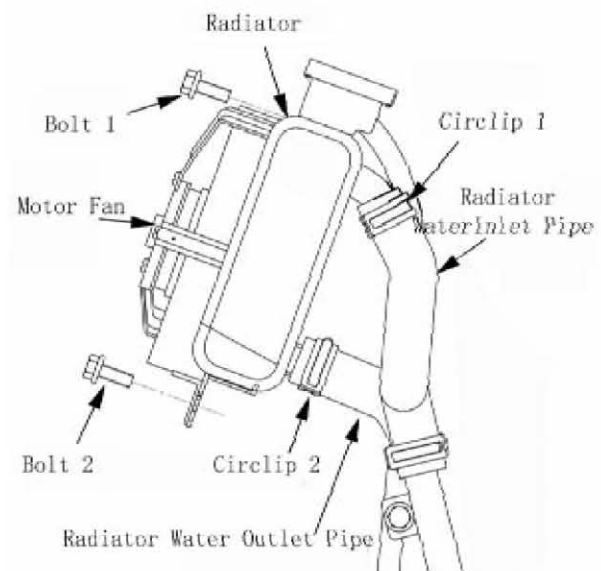
Remove

- Bolt 1, Bolt 2
- Fan Motor 2P connector, and Fan Motor
- Circlip 1 and 2
- Radiator Water Inlet and Outlet Hose
- Coolant

6

Plug out thermoswitch

Remove Radiator



Installation

Reverse the removal procedure for installation.

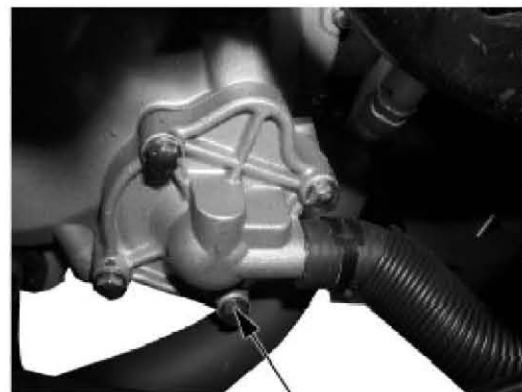
Water Pump

Overhaul

Check the drainage part at the bottom of water pump for any coolant leakage.

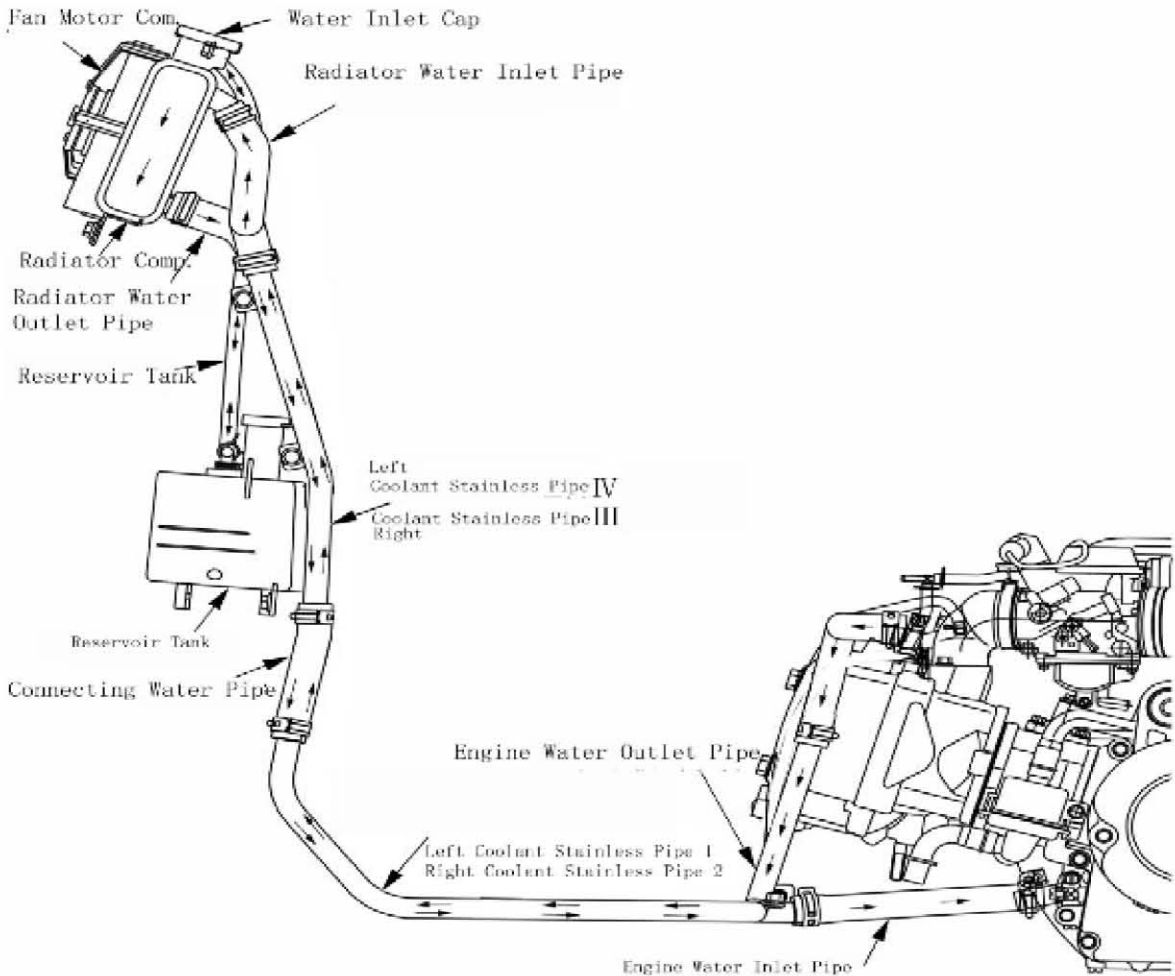
Any coolant leakage indicates the damage of water seal comp.

Replace the water seal (→ Chapter 11).



Drain Bolt, Sealing Gasket

Cooling system drawing



6

Overhauling info

Operation cautions

Securely support the scooter with jack when installing and disassembling engine.

Do not damage frame, engine body, bolts and cables.

Wrap the frame to avoid any possible damage when installing and disassembling the engine.

Following operation doesn't require that the engine removed from the vehicle.

- oil pump(→ Chapter 4)
- oil supply system, air intake system(→ Chapter 5)
- cylinder head cover, cylinder head, cylinder body, camshaft(→ Chapter 8)
- CVT system, left side cover(→ Chapter 9)
- gearbox(→ Chapter 10)
- right side cover, AC magneto, water pump(→ Chapter 11)
- piston, piston ring, piston pin(→ Chapter 12)

Following operation require that the engine removed from the vehicle.

- crankshaft(→ Chapter 12)

Tightening torque:

Engine suspension bracket bolt:	55N • m(5.6kgf • m)
Engine suspension shaft nut:	55N • m(5.6kgf • m)
Rear shock absorber mounting bolt(up):	55N • m(5.6kgf • m)
Rear shock absorber mounting bolt (down):	30N • m(3.1kgf • m)
Rear fork bolt:	55N • m(5.6kgf • m)

Disassembly of engine

Remove:

- Plastic parts(→ Chapter 2);
- Throttle valve body and air bypass valve(→ Chapter 5);
- Air cleaner(→ 5-10);

Drain coolant(→ 6-4)

Starting motor
positive terminal wire

Starting motor
negative terminal wire



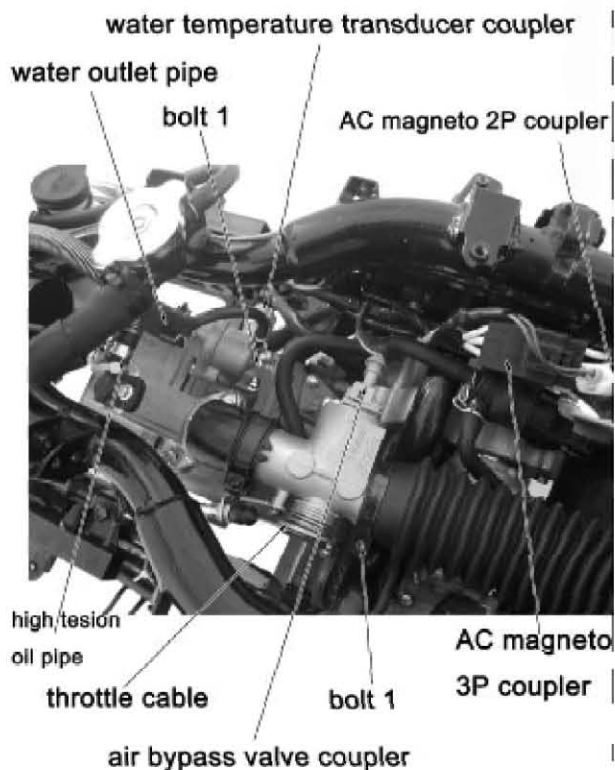
7

Remove circlip and high tension oil pipe from the injector

- Remove 3P, 2P Coupler of AC Magneto
- Loosen locking nut and remove throttle cable
- Remove circlip and water intake pipe
- Remove circlip and water outlet pipe

Remove the muffler assy. (→ 2-13)

Remove water temperature transducer coupler



Remove spark plug cap



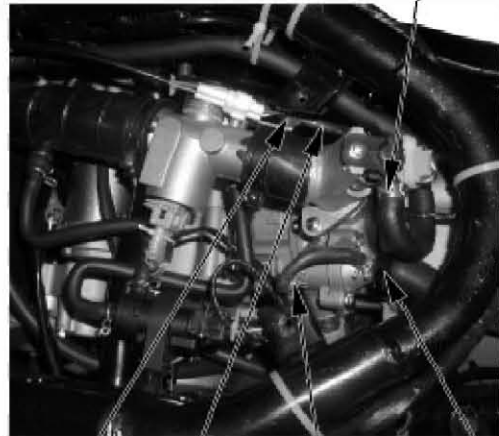
spark plug cap

7 Engine Disassembly and Installation

Remove Bolt 2, rear brake hose clip and rear brake caliper

Remove Bolt 1, loosen rear shock absorber

injector, high tension oil pipe, circlip



locking nut
throttle cable
small cycling water hose, circlip
water outlet hose, circlip



bolt 1, nut 2

bolt 3

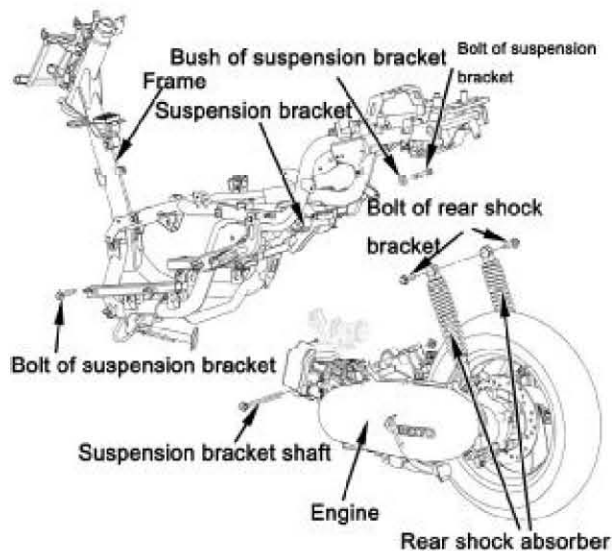
bolt 4

7

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Remove engine from frame according to following steps:

1. Remove rear shock absorber (→ 14-5)
2. Remove suspension bracket bolt and bush, and remove engine.
3. Remove engine suspension bracket shaft nut, pull out bracket shaft, and remove suspension bracket
4. Remove rear fork (→ 14-4)
5. Remove rear wheel (→ 14-3)
6. Remove main stand spring, main stand bolt and bush,
Remove main stand



7

Engine Installation

Caution

Cables and electrical wires should be routed properly according to the wiring diagram. (→ 1-19)

Assemble main stand to engine

Assemble bush, bolt, and tighten according to the specified torque.

Torque: 26N • m (2.7kgf • m)

Install main stand spring.

Caution

Apply lubricating grease to the outer surface of right and left bush of main stand.



Water intake hose clamp

Install the engine to the frame according to following steps:

1. Assemble rear wheel to engine;
2. Assemble rear fork to engine, assemble rear axle nut, rear fork bolt and tighten according to the specified torque;
3. Assemble suspension to engine and wring in the suspension shaft nut;
4. Assemble the mounting screw and bush of suspension and install engine to frame;
5. Install rear shock absorber;
6. Tighten the following bolts and nut according to the specified torque:

suspension bracket bolt:

55N • m (5.6kgf • m)

Rear shock absorber bolt(up):

55N • m (5.6kgf • m)

Rear shock absorber (down):

30N • m (3.1kgf • m)

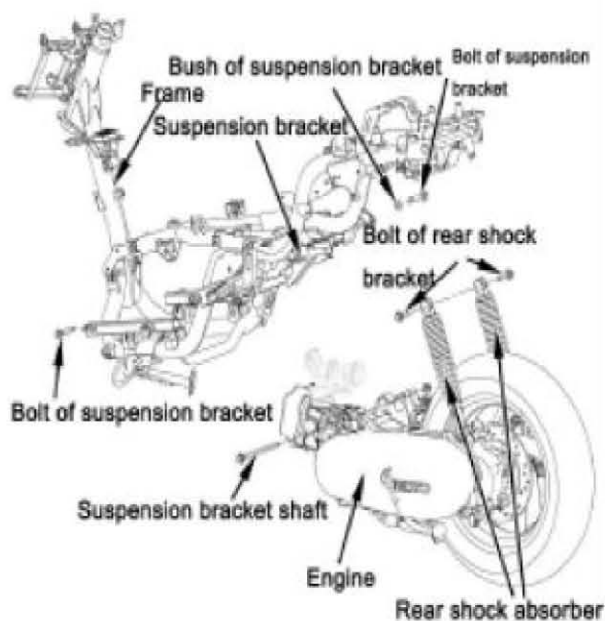
suspension shaft nut:

55N • m (5.6kgf • m)

Rear fork bolt:

55N • m (5.6kgf • m)

Rear wheel axle nut:



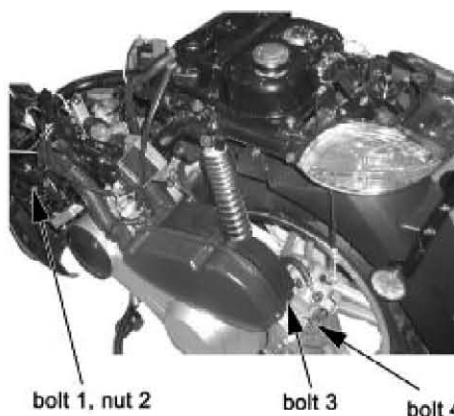
Install rear brake caliper, tighten Bolt 3 and Bolt 4 according to specified torque:

Torque: 30N·m (3.1kgf·m)

Install rear brake caliper complete, tighten Bolt 1 and Bolt 2

Caution

Rear brake hose should be routed properly and should not interfere with rear wheel, rear brake disk or other parts.



7

Install water outlet and intake hoses and small cycling water hose and tighten with proper clamps

Caution

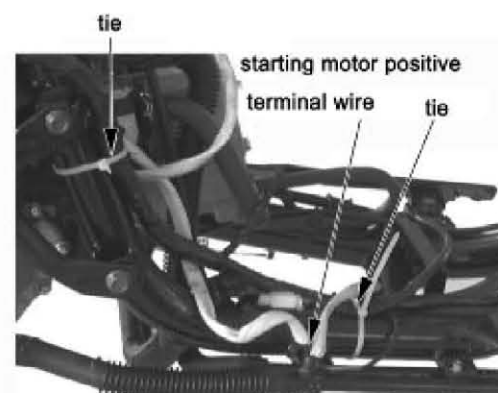
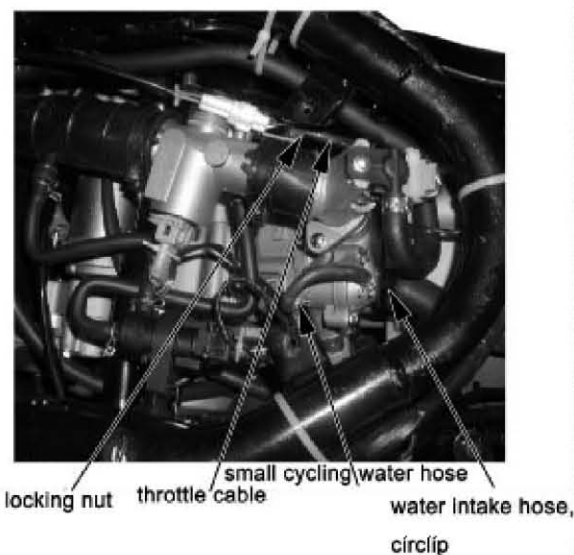
There should not be any cracks or other damages with the hoses.

There should be no leakage or seepage with the joint parts of the water hoses.

Connect throttle cable, and adjust throttle handle gap. (→ 3-15)

Lock the locknut after adjusting the gap.

Install positive and negative terminals, tighten them with ties



Install spark plug cap



Spark plug cap

Install water temperature transducer coupler

Temperature transducer coupler



Install 2P, 3P coupler of AC magneto, put 2P, 3P coupler into shield, tighten them with ties

Install:

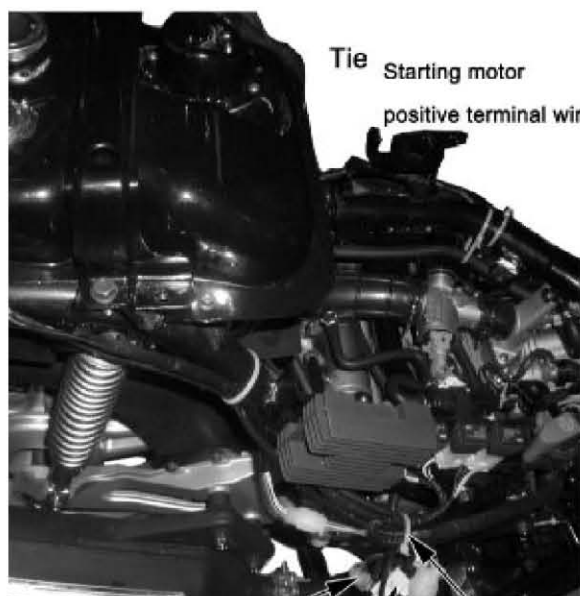
Exhaust muffler(→ 2-13)

Air Cleaner(→ Chapter 5)

Throttle valve body and air bypass valve(→ Chapter 5)

Refill coolant and discharge air(→ Chapter 6)

Plastic parts (→ Chapter 2)



AC magneto 2P coupler

AC magneto 3P coupler

Tie

Overhaul info.....	8-1	Replacement of valve guide.....	8-13
Trouble shooting.....	8-2	Inspection&correction of valve-seat ring.....	8-14
Cylinder compression pressure.....	8-3	Assembly of cylinder head.....	8-16
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Disassembly of Camshaft bracket comp.....	8-6	Installation of cylinder cover.....	8-19
Disassembly of cylinder head.....	8-9	Installation of camshaft bracket comp.....	8-20
Disassembly of cylinder body.....	8-10	Installation of cylinder cover.....	8-22
Disassembly of cylinder head.....	8-11		

Overhaul Info

Operating cautions

- Overhauling of cylinder cover, camshaft comp, camshaft bracket comp, rocker arm, cylinder head comp, and cylinder body comp. can be done without removing the engine from the frame.
- Mark the disassembled parts so as to install to the original places
- Apply lubricating oil to the camshaft journal, camshaft surface, rocker arm shaft and inner hole of rocker arm before assembling.
- Te lubricating oil to the camshaft assembly is supplied through the oil channels in cylinder body comp, cylinder head comp, and cylinder cover.
- Lubricating channels of the cylinder head cover, cylinder head comp, and cylinder body comp must be cleaned before assembling.

Operating standard

Item		Standard		Service limit	
		CF125T-22A	CF150T-6A		
Cylinder Compression pressure		700kPa (7kgf / cm ²) @260r/min		—	
Valve clearance	IN	0.05mm		—	
	EX	0.20mm		—	
Cylinder head planeness		—		0.05mm	
Camshaft	Cam top height	IN	30.74—30.86mm	30.69mm	
		EX	30.33—30.45mm	30.28mm	
Valve rock arm	Interior diameter of rocker arm hole	IN/EX	10.000—10.015mm	10.10mm	
	External diameter of rocker arm shaft	IN/EX	9.978—9.987mm	9.91mm	
Valve Valve guide	External diameter of valve stem	IN	4.975—4.990mm	4.965mm	
		EX	4.955—4.970mm	4.945mm	
	Interior diameter of valve guide sleeve	IN	5—5.012mm	5.04mm	
		EX	5—5.012mm	5.04mm	
	Gap of valve stem and valve guide	IN	0.010—0.037mm	0.075mm	
		EX	0.030—0.057mm	0.095mm	
	Driving depth of valve guide	IN/EX	11.9—12.1mm	—	
	Contact width of valve retainer	IN/EX	0.9-1.1mm	1.8mm	
Valve spring	Overhanging length(outer/inner spring)	IN/EX	35.0/32.3mm	33.5/30.8mm	
Cylinder	Interior diameter		52.4—52.419mm	58—58.019mm	52.449mm 58.049mm
	Upper surface distortion		—		0.05mm
	Roundness		—		—
	column		—		0.05mm

Tightening torque

Cylinder cover bolt	9N·m (0.9kgf·m)
cylinder head nut	30N·m (3.2kgf·m)
Timing chain bolt	9 N·m (0.9kgf·m)
Tensioner spring seat	10 N·m (1.0kgf·m)
Cylinder head bolt	10N·m (1.0kgf·m)
Tensioner bolt	10N·m (1.0kgf·m)

Troubleshooting

- Poor sealing of cylinder cover can be examined by measuring the cylinder compression pressure of judging the noise from the sealing part of cylinder cover.
- In case of starting failure or unsteady low-speed running, check if there is smoke from breather hose of crankcase, if there is smoke, it is because the piston rings are worn, broken or jammed.

Unstable idle speed

- Air Jammed of pipe bend for idle
- Air leakage at injector
- Low compression pressure
- Bad fuel supply of fuel system

Abnormal noise

- Damage or wear with cam surface of camshaft
- Improper adjustment of valve clearance
- Valve burning or damaged valve spring
- Damaged rocker arm or rocker arm shaft

Lower compression pressure

- Improper adjustment of valve clearance
- Valve burning or worn
- Improper valve timing
- Poor strength of valve spring
- Poor sealing of valve seat
- Air leakage of cylinder head seal gasket
- Distortion or cracks of cylinder head
- Improper installation of spark plug

- Chain is elongated
- Improper function of chain tensioner.

Over-high compression pressure

- Carbon deposit on piston or in combustion chamber

Blue smoke from muffler

- Damaged guide with valve stem

Cylinder compression pressure

Note

Measure the compression pressure after the engine is warmed up.

Remove Decoration plate (LH) and Footrest bore (LH). (→ Chapter 2)

Remove spark plug cap, spark plug.

Select proper compression pressure gauge; install it to cylinder head spark plug.

Full throttle

Measure compression pressure of cylinder by using electrical starting.

Note

- compression pressure gauge and its accessories must be properly installed, there should be no pressure leakage in the joint.
- electrical starting will cause overflow of battery. Do not run the starting motor for over 5 seconds continuously.

Compression pressure:

700kPa (7kgf / cm²) @260r/min

In case the compression pressure is too high, check for carbon deposit.

In case the compression pressure is too low, add a bit engine oil into the spark plug hole and measure again.

Compare the measured values, if the pressure goes up, measure the cylinder, piston and piston ring (→ 12 Chapter 12). if there is no change of pressure, check the cylinder head and valves.

- Valve leakage
- Improper adjustment of valve clearance



Adjustment of valve clearance inspection

Note

The inspection and adjustment of valve clearance should be done when the engine is in cold condition.

Remove cylinder head cover. (→8-6)

Remove left side cover. (→9-3)

Cylinder cover bolt and Washer, Cylinder head cover



Cylinder cover

Turn gearbox driving gear and keep the two parallel mark lines on the camshaft sprocket in parallel with the cylinder head machining surface and the trough of camshaft journal upwards.



Valve clearance (when engine is cold condition)

IN: 0.05mm

EX: 0.15-0.20mm

Adjustment

Loosen locknut with open wrench, and loosen valve clearance adjusting screw.

Insert ruler of desired thickness between rocker arm and valve.

Turn valve clearance adjusting screw till it contacts the ruler with a socket wrench, keep the socket wrench still and tighten the locknut with open spanner.



Rotate gearbox driving gear by two rounds and check again whether the valve clearance is in conformity with the specified standard.

Install left side cover (→ 9-20)

Install cylinder head cover. (→ 8-22)

Disassembly of cylinder cover

Remove

Seat and Trunk. (→ Chapter 2)

left, middle and right protecting plate (→ chapter 2)

left and right footrest desk. (→ Chapter 2)

Cylinder cover bolt and gasket.

cylinder cover.

Cylinder cover bolt and Cylinder head cover gasket



Cylinder head cover

dowel pin



Gasket, Cylinder cover

Note

Be careful not to damage the joint face when disassembling the cylinder cover.

Disassembly of camshaft support comp.

Remove

left side cover. (→9-3)

cylinder head cover. (→8-6)

Rotate gearbox driving gear counter clockwise and keep the mark lines on the camshaft sprocket in parallel with the machining surface of cylinder cover, and the trough of camshaft journal upwards. (→8-4)

Remove

tensioner spring seat bolt, washer and spring.
tensioner bolt, tensioner and gasket.

Note

Don't drop the bolt of timing sprocket into
loosen bolt of timing sprocket.

Remove timing sprocket.

Remove cap nut and washer.

**Drop the cooling water before loosen
cap nut and update the gasket of
cylinder cover**

Tensioner spring seat bolt

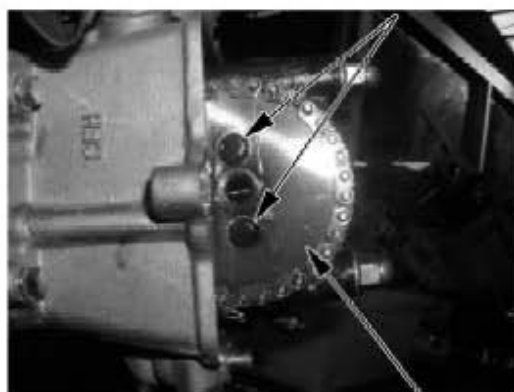


Tensioner bolt



Oil channel joint spring

bolt



Timing sprocket

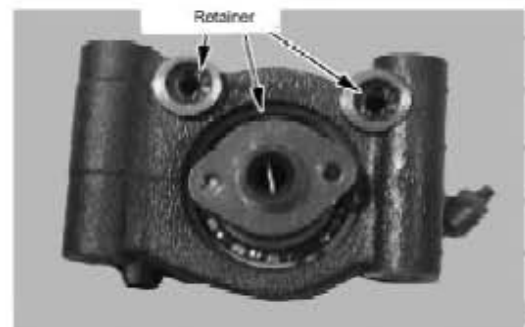


Cap nut/washer

Remove camshaft support comp.



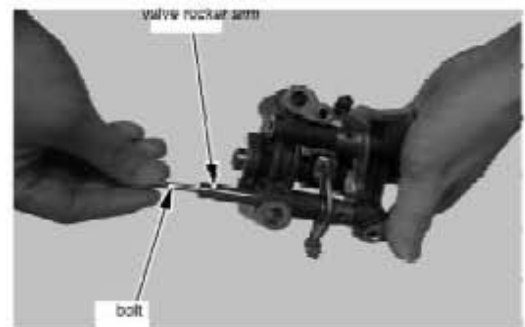
Remove three retainers in the rocker arm shaft hole and camshaft hole.



Remove valve rocker arm.

Note:

Pull out rocker arm shaft with a M5 bolt.



Disassembly of camshaft

Remove camshaft comp.



Inspection

Camshaft

Turn outer circle of bearing with a finger, check whether it can turn freely.

Replace the camshaft in case of rocking or unfree turning.

Check the cam surface for any damage or strips.

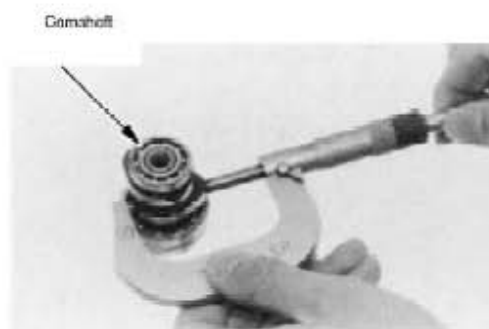
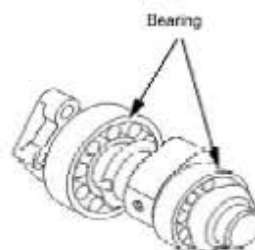
Measure cam top height with microneter.

Service limit: IN: 30.69mm

EX: 30.28mm

*Note:

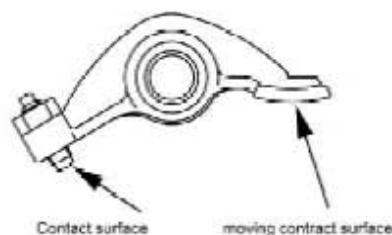
Check rocker arm when there is damage or wear with cam surface.



Rocker arm, rocker arm shaft

Check sliding part of rocker arm and joint face of valve stem for damage or wear.

In case there is damage or wear with the sliding surface of rocker arm, check cam top of camshaft.



Measure inner diameter of each rocker arm hole.

service limit: 10.10mm

Measure outer diameter of each rocker arm hole.

service limit: 9.91mm



Disassembly of cylinder head

*Note

Hook the chain with a steel wire in case it drops into cylinder body, and securely support the scooter.

Remove muffler. (→ 2-15)

Drain coolant. (→ 6-4)

Remove

Carburetor. (→ 5-3)

Cylinder head cover. (→ 8-5)

camshaft support comp. (→ 8-6)

Dowel pin.



Loosen bolt, remove injector seat comp..

Remove injector seat gasket.

Remove water temperature transducer coupler.

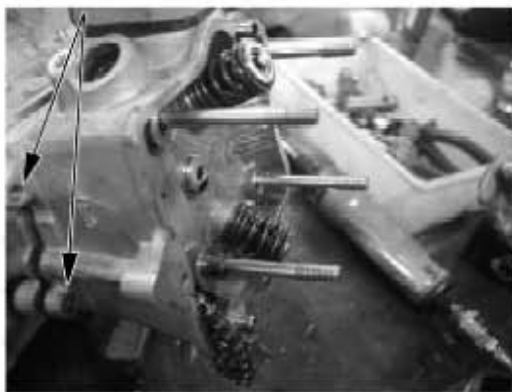
Loosen bolt, remove thermostat comp.

Remove cylinder head bolt, and fixing plate of control valve. .
Remove cylinder head comp.

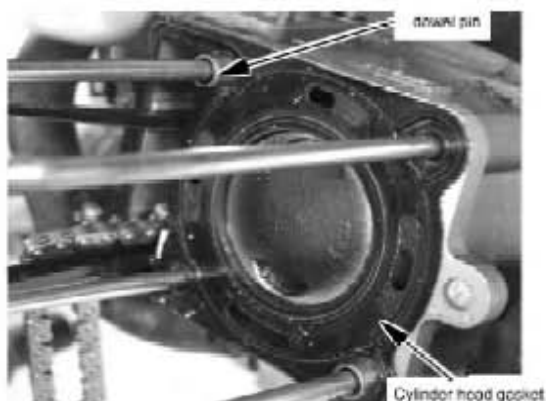
Note:

Support scooter with main stand, press rear part of scooter downwards, and remove cylinder head. .

Cylinder cover bolt and gasket



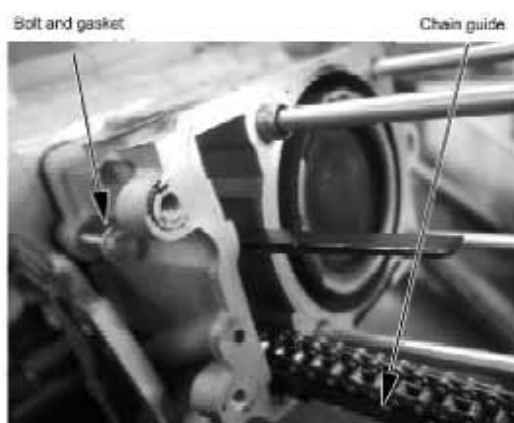
Remove cylinder head gasket and dowel pin.



Disassembly of cylinder body

Remove chain guide.

Remove bolt and washer.



Remove water inlet hose and cylinder body comp

Disassembly of cylinder head

Note

The disassembled parts should be stored separately and installed to the original places.

Take out the valve lock with spring press tool.

Warning:

To protect the strength of valve spring, just press the valve spring down to the length enough for removal of the valve lock.

Special tool:

Valve assembling tool: 1P52MI-A-922-0200C

Remove valve spring press tool, take out valve spring seat, valve spring, valve, valve stem sealing set and valve spring retainer.

The removed valve stem sealing set should not be reused.

Remove carbon deposit combustion chamber and valves.

Note:

Dip in the gasoline for easier removal of carbon deposit

Warning:

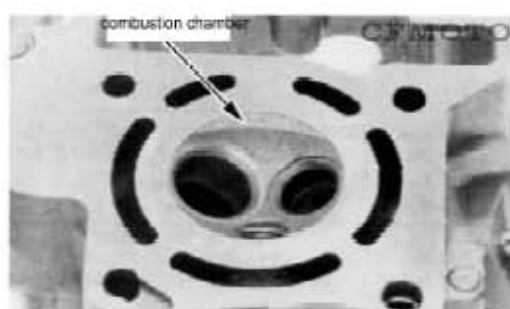
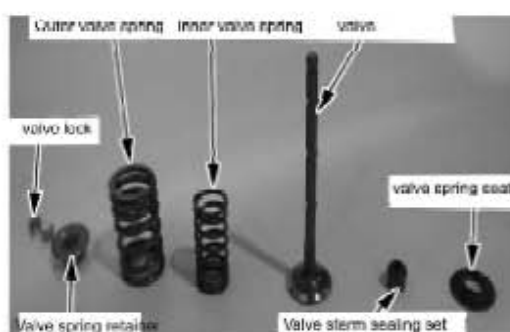
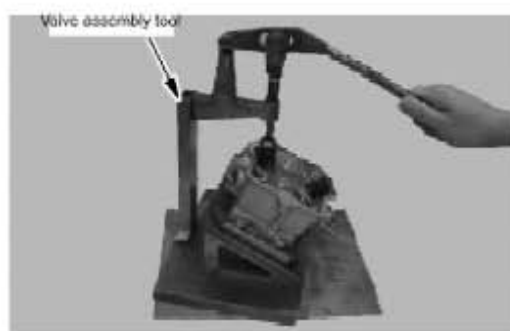
Gasoline is highly flammable, the job should be done in a well-ventilated place.

Warning:

Do not damage the joint face of cylinder and valve seat ring.

Check if there are cracks near the spark plug hole and valve seat ring.

Clean the cylinder joint face.



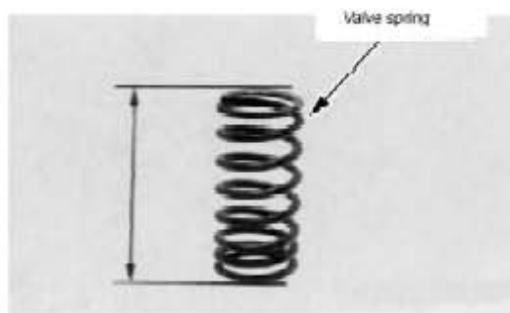
Valve spring

Check the valve spring for weakening and damage .
Measure the free length of outer valve spring.

Service limit: 33.5mm

Measure the free length of inner valve spring.

service limit: 30.8mm



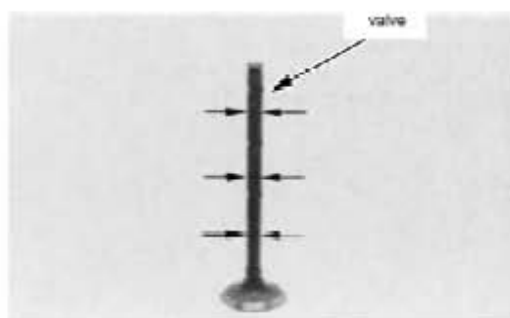
Valve spring

Valve stem

Check the valve for distortion (valve deflection),
damage and burn, and valve stem end for deflected
wear put the valve into valve guide, and check
the movement measure the outer diameter of valve
stem that is corresp to the valve guide moving
part.

Service limit: IN: 4.965mm

EX: 4.945 mm



valve

Remove the carbon deposit with reamer.

*Note

- Insert the reamer from the combustion chamber.
- Keep the reamer turning clockwise while pulling it in and out. Counter clockwise turning of reamer might cause damage to the inner surface of valve guide.

Special tool:

Valve guide reamer: 152MI-234-022300-34B

Measure inner diameter of valve guide.

service limit: IN: 5.04mm

EX: 5.04mm

Calculate the clearance between valve stem and
valve guide.

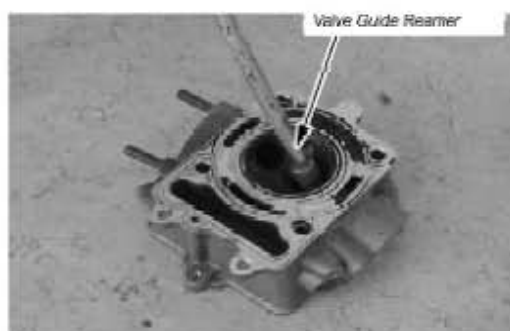
service limit: IN: 0.075mm

EX: 0.095mm

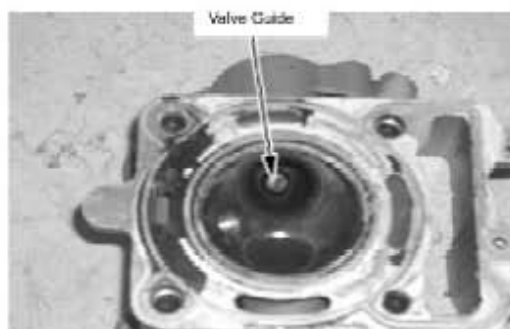
Replace the valve stem when the clearance exceeds
the service limit.

Measure valve guide inner diameter; calculate it.

Replace the valve if the clearances is out of



Valve Guide Reamer



Valve Guide

Replacing valve guide

*Caution

The valve works with valve guide as axes. Replacement of valve guide may cause poor sealing between valve and valve seat. So the valve seat should also be adjust after replacement.

Heat up the cylinder head homogeneously to 100 – 150 °C. Don't heat up part of the cylinder head with gas nozzle to avoid distortion. Don't operate with bare hand to avoid burn.

Drive the valve guide outward from the side of the combustion chamber. Do not damage cylinder joint face.

Drive new valve guide from the side of the camshaft while the cylinder head still remains warm. .

After the cylinder head is cooled, insert the reamer from combustion chamber side, and ream valve guide.

*Caution:

- Insert reamer from the combustion chamber.
- Do not deflect the reamer so as to avoid leakage of valve stem sealing or deviation from valve seat.

Wash clean the cylinder head, clean off the scraps. check and correct the contact surface of valve seat.

Special tool:

Countersink reamer, 152MI-236-022301-27

Inspection and correction of valve-seat ring

inspection

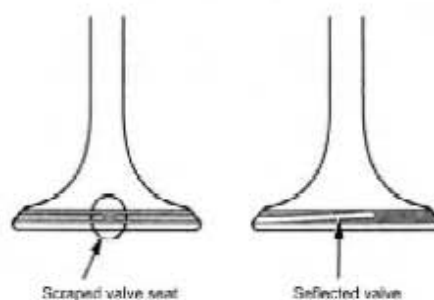
Clean the carbon deposit on the valve
Cracks or deflected wear with valve surface.
Wipe oil adhesion on the valve surface. Don't turn the valve and knock valve to inspect the seal situation.

*Note

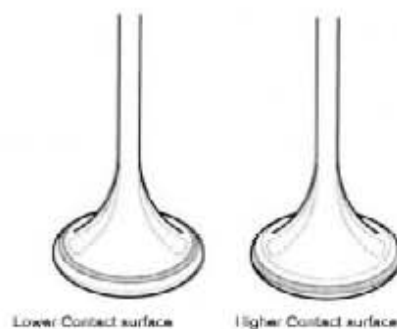
Valve can't be corrected. when there are cracks, damages or non-contacts with valve seat, replace the valve.



Remove valve; check valve seat sealing face through minum oil adhesion on the valve surface.
correct the valve seat in case of any scrapes.
if valve deflects, check clearance between valve guide and valve stem. if the clearance is not proper, replace it with a new valve guide.



When the contact surface is on the higher side of lower side, correct the valve seat reamer.

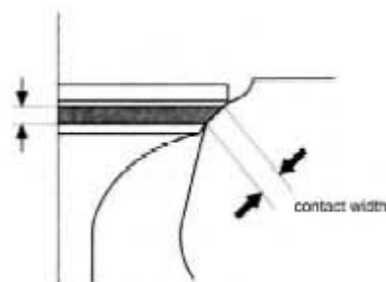


Measure seat width of valve face.

Standard: 0.9-1.1mm

Service limit: 1.8mm

In case the seal width is uneven, too wide or seat reamer.



correction

Correct with valve seat reamer.

Refer to operation manual of valve seat reamer.

Correction shall be operated with hand with a pressure of 4-5kg while cutting and turning in the same direction.

*Caution

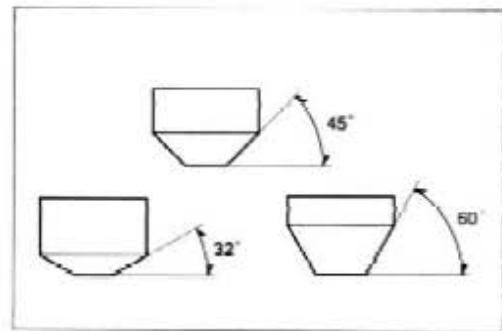
Apply lubricating oil to reamer and remove scraps while reaming.



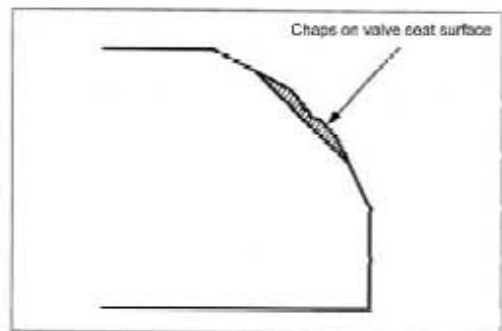
In case there are scrapes or cracks on the valve seat face, use a 45° milling cutter to remove the scrapes or cracks by lapper

Caution

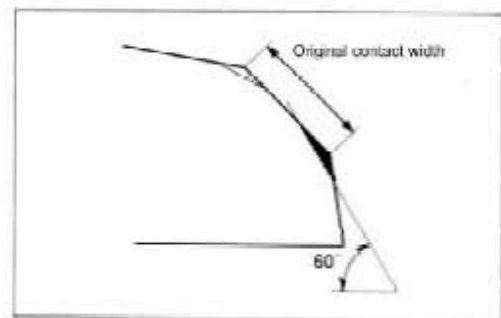
- Lapper the valve seat face when replacing with valve guide.
- Be careful not to lapper excessively



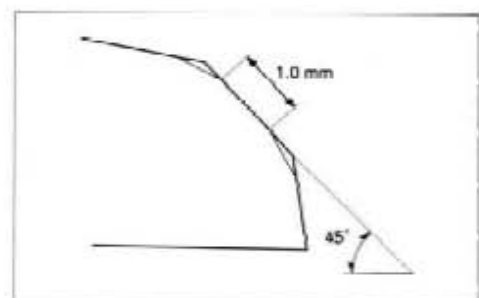
Use 32° milling cutter to correct outer side



Use 60° milling cutter to correct side face slowly.



Use 45° milling cutter to correct sealing face to the specified width.



Check again the contact of valve-seat face, in case the valve-seat face is higher, grind with a 32° milling cutter first, and then correct to the specified width with a 45° milling cutter. In case the valve-seat face is lower, grind with a 60° milling cutter, and then correct to the specified width with a 45° milling cutter.

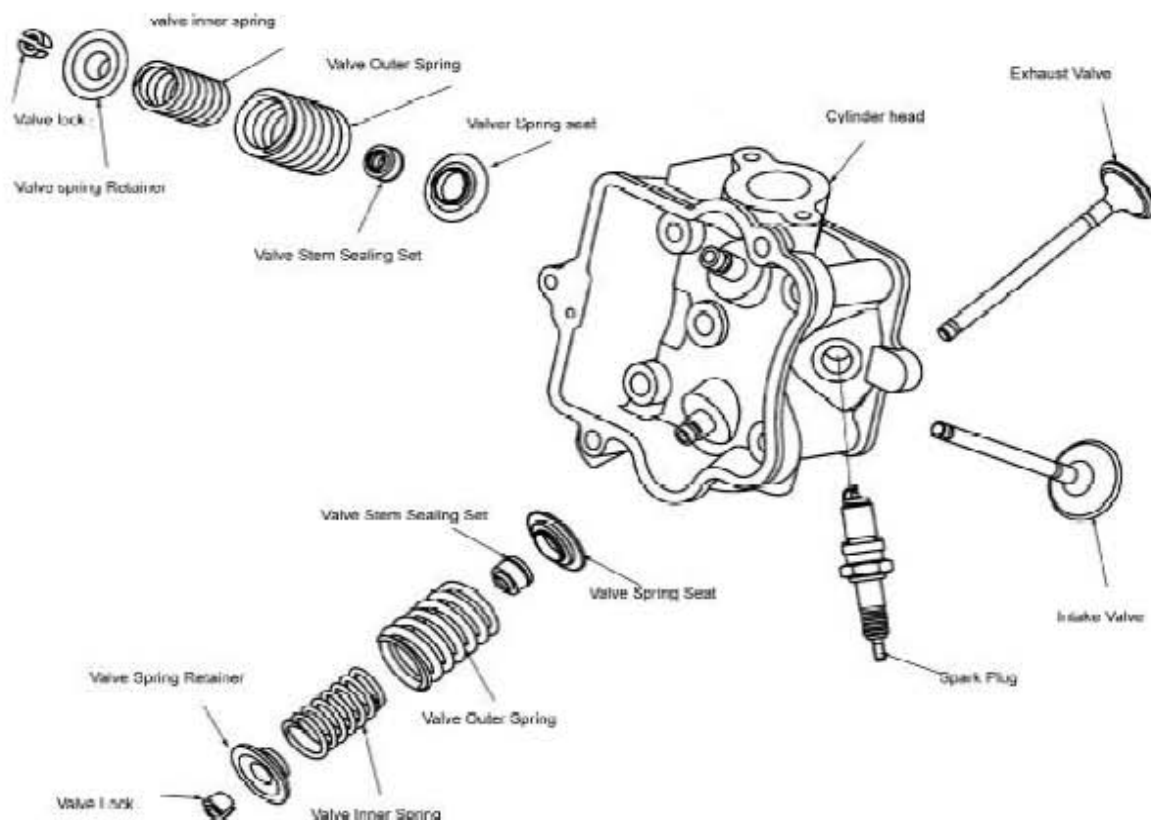
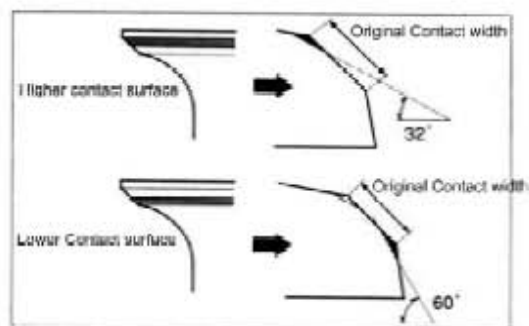
After correction, apply grinding paste evenly on the valve seat and use a hammer to adjust the valve.

Note

- slight stike the hammer while adjusting. Do not over press or turn to avoid damage to the valve seat.
- Turn the valve slightly while adjusting. Do not work on the same point to avoid deflected wear.
- keep the grinding paste from entering into the clearance between valve guide and stem.
- After adjusting, clean up cylinder head and valve.

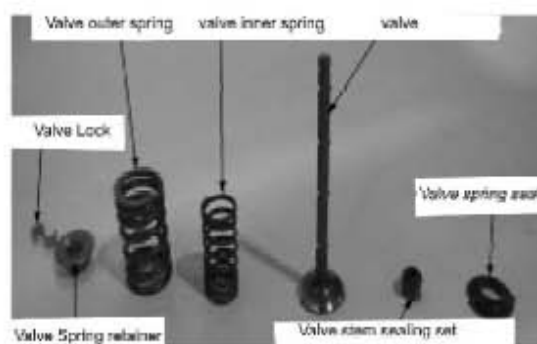
After correction, check again.

Installation of cylinder cover

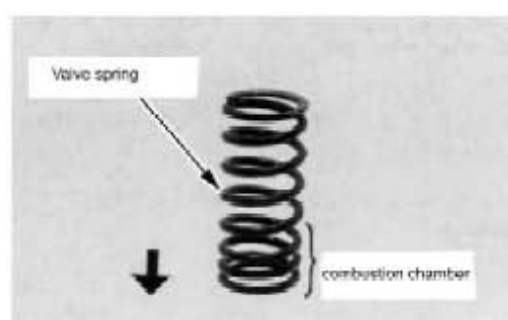


Set the lower spring seat and the new valve stem sealing set to the valve guide.

Apply molybdenum base solution or lubricant to valve stem and inner valve guide. turn the valve slowly into the valve guide. Be careful not to damage the valve stem sealing set.



Install the inner/outer springs with the small pitch end towards the combustion chamber. install the upper valve spring seat.



Press the valve springs with press tool and install the valve lock.

! Warning:

To prevent weakening of the spring, do not press the spring more than the required length.



Inspection of cylinder body

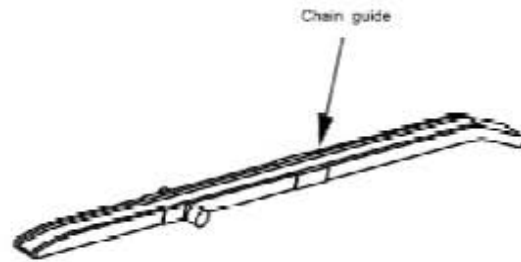
Check the damage and wear of inner cylinder. Measure the inner radius of cylinder respectively at the place of upper, medium and Bottom (6 point), along the direction of the piston pin and its vertical direction, (X-Y direction), record all the values of inner radius and take the max. value as the cylinder inner radius.

service limit: 52.449/58.049mm



Installation of cylinder

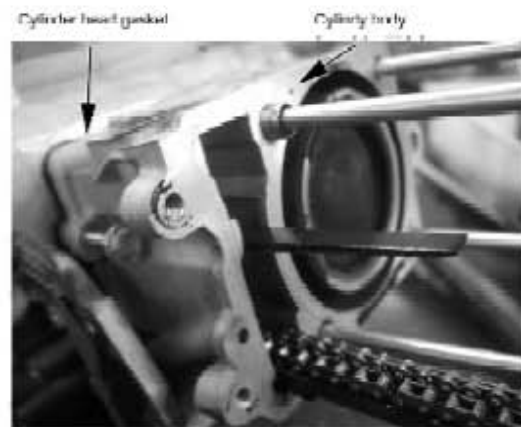
Check the chain guide for scrapes, damages or deflected wear.



Clean the stains and impurities on the joint face.

Check the cooling pipe system, oil channels and bolt holes for impurities.

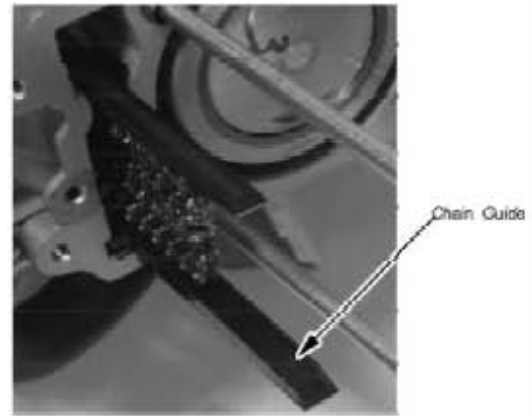
Install cylinder gasket, cylinder body, water inlet hose, dowel pin.



Set the washer to the cylinder bolt, and screw



Install the chain guide.

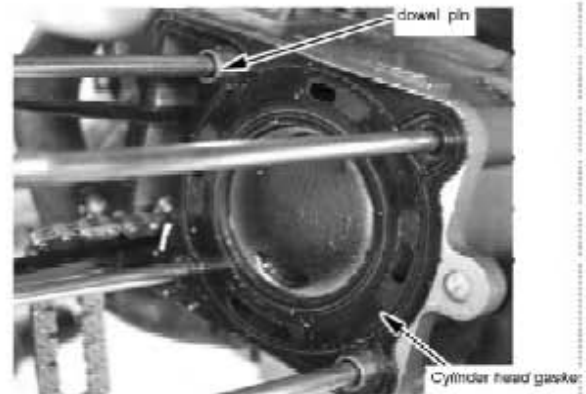


Turn the crankshaft (gearbox driving gear), till piston reaches the upper dead point. (piston surface is in parallel with the cylinder joint face).

Caution:

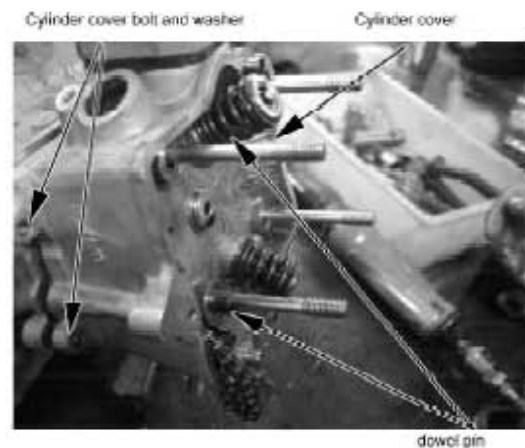
Do not turn the crankshaft in the following operation

Install cylinder head gasket and dowel pin.



Installation of cylinder head

Install cylinder head comp.
install the fixing plate of control valve, cylinder head bolt, screw it but do not tighten it.



Install the dowel pin.

Installation of camshaft bracket comp.

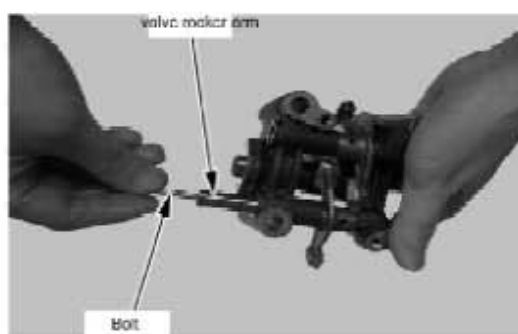
Installation of camshaft comp

Install the camshaft into camshaft support.

Apply some lubricating oil to rocker arm shaft end and insert it into rocker arm hole and rocker arm.



Install retainers to rocker arm shaft hole and camshaft retainer groove.



Apply lubricating oil to cam surface.

Install camshaft with cam top towards the crank-case side.

Press tight with the four cap nuts and washers. Tighten the cap nuts 2 or 3 times according to torque.

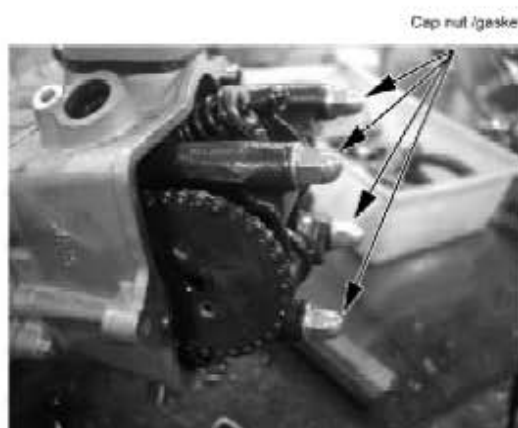
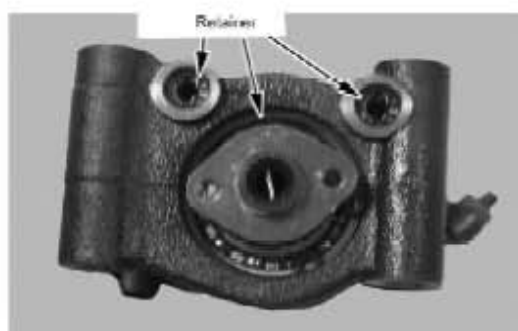
Torque: 30N•m (3.0kgf •m)

Tighten the cylinder bolt according to the specified torque

Torque: 10N•m (1.0kgf •m)

Tighten the cylinder head bolt according to the specified torque.

Torque: 10N•m (1.0kgf •m)

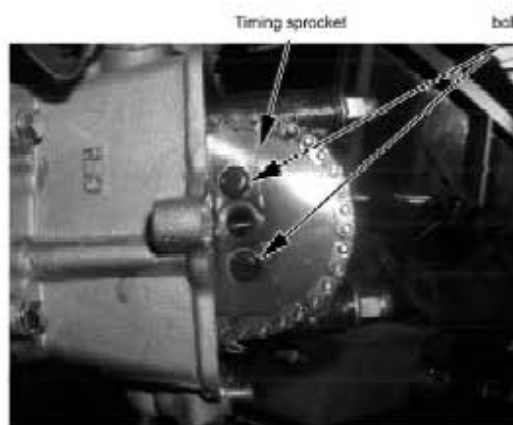


Install sprocket to camshaft, keep the mark with cylinder head surface.
Install timing chaine to the sprocket.
Install tightening bolt for camshaft sproket.

Torque: 9 N. ■ (0.9kgf. ■)

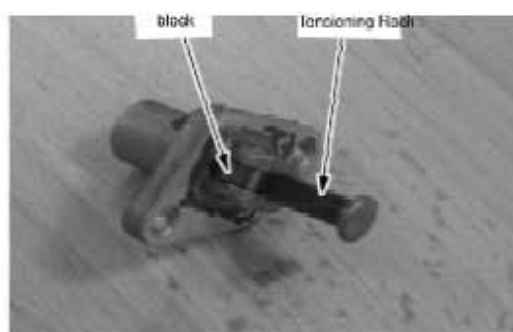
Caution:

Before adjusting the valve clearance, check if the mark on the sprocket is in parallel with cylinder head surface and the groove opening of camshaft journal is upwards.



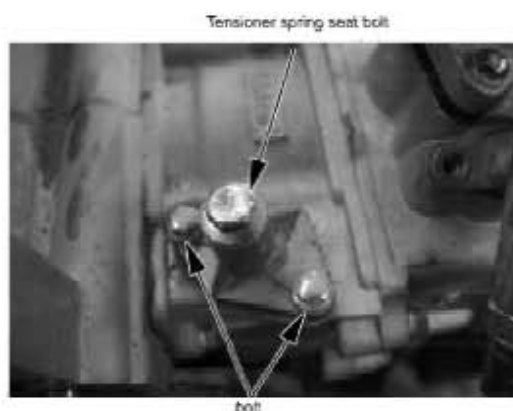
Press the block on the tensioner, and push the tensioning rack back into the tensioner. Tighten the bolt according to the specified torque.

Torque: 10. N. ■ (1.0kgf. ■)



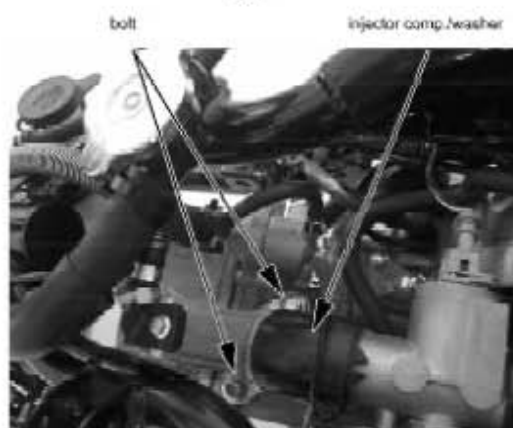
Intall the tendioner bolt and tighten it .

Torque: 10. N. ■ (1.0kgf. ■)



Install Injector gasket, Injector joint and tighten with bolt.

Install vacuum tube.



install thermostat comp.

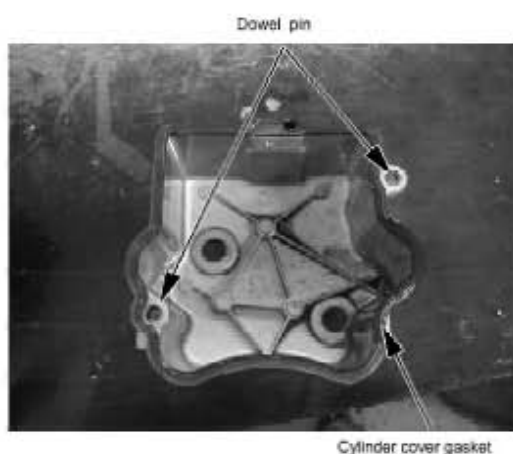


Install water temperature transducer coupler.



Installation of cylinder head cover

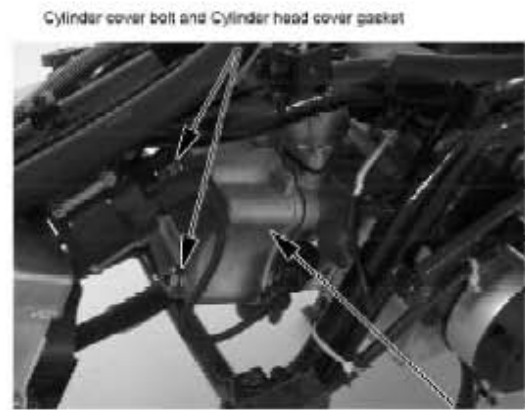
Assemble seal ring, dowel pin, seal ring for secondary air supply to the cylinder head cover.



Set the spring to the oil channel joint then insert it to the pin in the camshaft hole.



Install the assembled cylinder head cover
Install the seal washer of cover bolt.



Fill coolant and discharge air. (→ 6-5)
Install muffler. (→ 2-8)
install Throttle body. (→ 5-9)
Install left side cover. (→ 9-18)
Install plastic parts. (→ 2 Chapter)

9 Continuously variable Transmission System & Left Cover

Overhaul info.....	9-1	Removal of clutch.....	9-8
Troubleshooting.....	9-2	Disassembly of clutch.....	9-8
Disassembly of left side cover.....	9-3	Assembly of clutch.....	9-13
Removal of gearbox.....	9-4	Installation of clutch.....	9-17
Disassembly of gearbox.....	9-4		

Overhaul information

Operation caution

- Do not apply grease to the V-belt or sheave. Degrease it if there are. Or it may cause V-belt slip and decrease the transmission efficiency.
- Do not apply any lubricant grease to the primary sliding sheave and weights.
- The CVT system can be overhauled without removing engine from the scooter.
- Do not damage the joint faces.
- Keep the impurities, mud and sand from entering the engine.

Overhaul standard

Item		Standard	Service limit
Gearbox primary fixed sheave	Inner diameter of sliding sheave	24.007—24.028 mm	24.07 mm
	Outer diameter of fixed sheave collar	23.959—23.98 mm	23.92 mm
	Outer diameter of weights comp.	19.95—20.05 mm	19.45 mm
Width V-belt			20.7 mm
Secondary fixed sheave	Clutch shoe thickness	—	2.75 mm
	Inner diameter of clutch housing	124.5—124.2 mm	125 mm
	Free length of clutch spring	144—146 mm	140 mm
	Outer diameter of secondary fixed sheave	33.95—33.975 mm	33.92 mm
	Inner diameter of secondary sliding sheave	34—34.025 mm	34.06 mm

Tightening torque

Left side cover bolt	10 N·m (1.0kgf·m)
Gearbox nut	59N·m (6.0kgf·m)
Clutch nut	53 N·m (5.3kgf·m)
Special nut	88 N·m (9.0kgf·m)

Troubleshooting

When engine is running, scooter does not run

V-belt

- worn

Slider, Cam

- Worn/damaged

Clutch shoe

- Worn/damaged

Clutch spring

- Damaged

Engine stops or beats when the scooter starts to run

Clutch return spring

- Damaged

Poor speed performance**V-belt**

- worn/damaged

Clutch spring

- Weakened

Roller weight

- worn/damaged

Primary sliding sheave surface

- stained

9 Continuously variable Transmission System & Left Cover

Removal of Left Side Cover

Caution:

Do not damage the joint face.

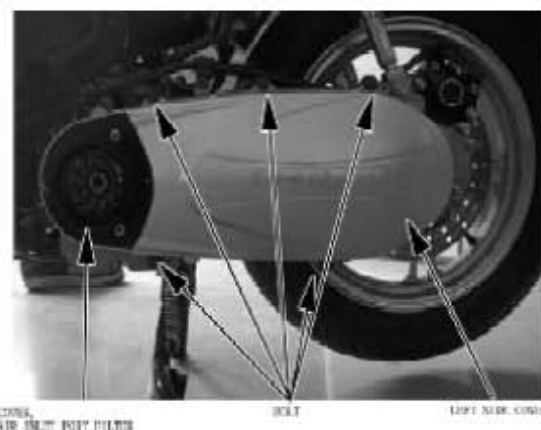
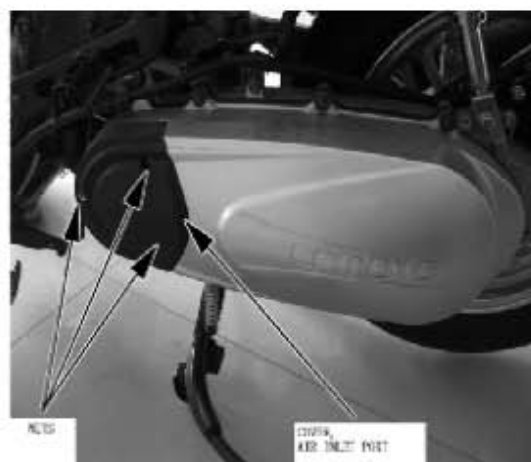
Remove left strip (→ 2-6)

Remove 3 units Hexscrew and air inlet cover

Remove the filter of air inlet cover
Clean filter with water or air, if there are dust and mud in it.

Remove 5 units bolt of left side cover

Remove left side cover

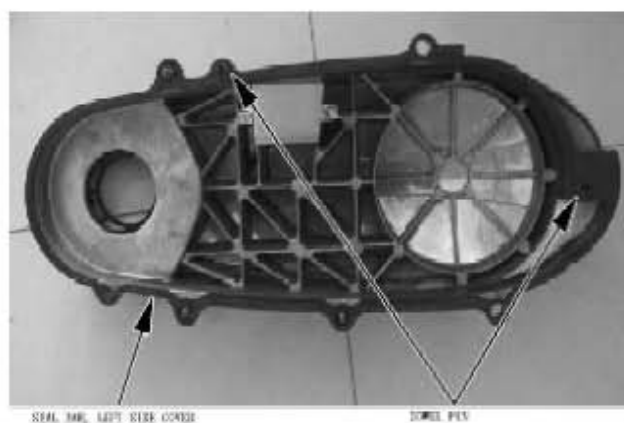


Remove sealing gasket of left side cover

Remove dowelpin

Installation:

Reverse the removal procedure for installation



Gearbox Assy.

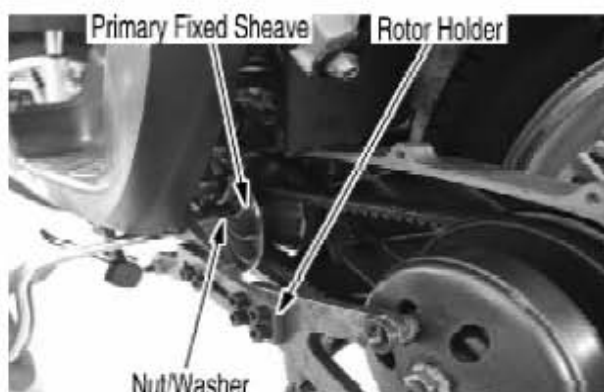
Disassembly

Remove left side cover (→9-3)

Fix the gearbox and clutch well with rotor holder, loosen the tightening nut and washer for gearbox with socket wrench.

Special tools:

Special Jig: 1P52M1-A-922-040000



Remove primary fixed sheave and V-belt.

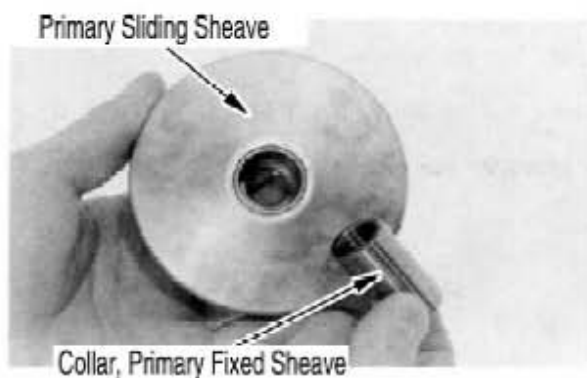


Hold the inner side of primary sliding sheave, remove sliding sheave and collar of primary fixed sheave.



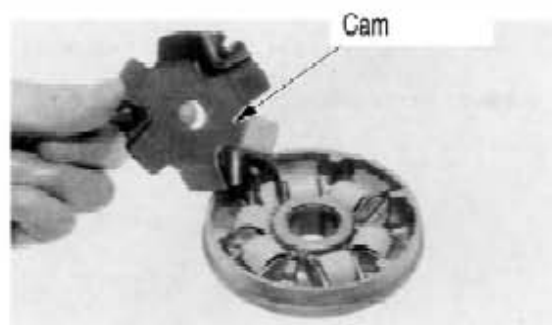
Disassembly

Remove the collar primary fixed sheave.

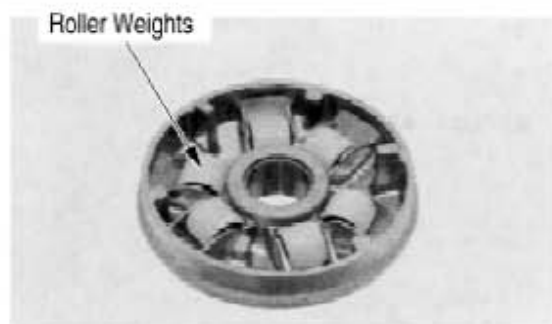


9 Continuously variable Transmission System & Left Cover

Remove cam



Remove roller weights.



9

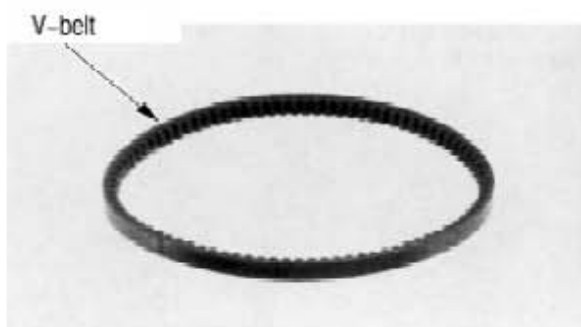
Check

V-belt

Cracks/wear/scaling/chipping

Measure the V-belt width.

Service limit: 20.7 mm

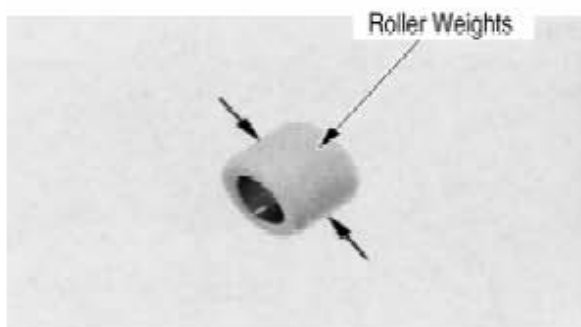


Roller weight

Wear/damage

Measure the outer diameter of roller weight.

service limit: 19.45 mm



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Primary sliding sheave

Measure inner diameter of sliding sheave.

Service limit: 24.07 mm

Check collar of fixed sheave for any wear or damage.

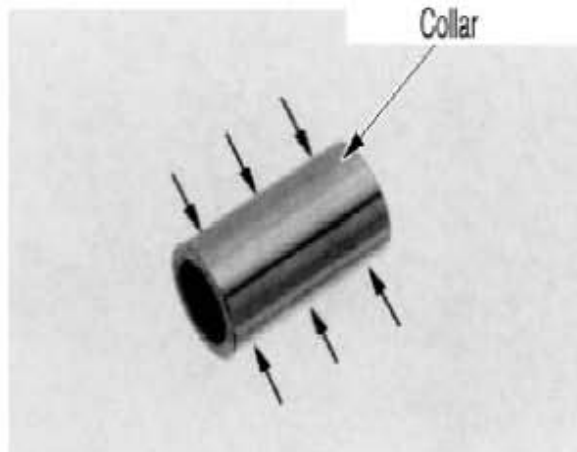
Measure the outer diameter of collar.

Service limit: 23.92 mm

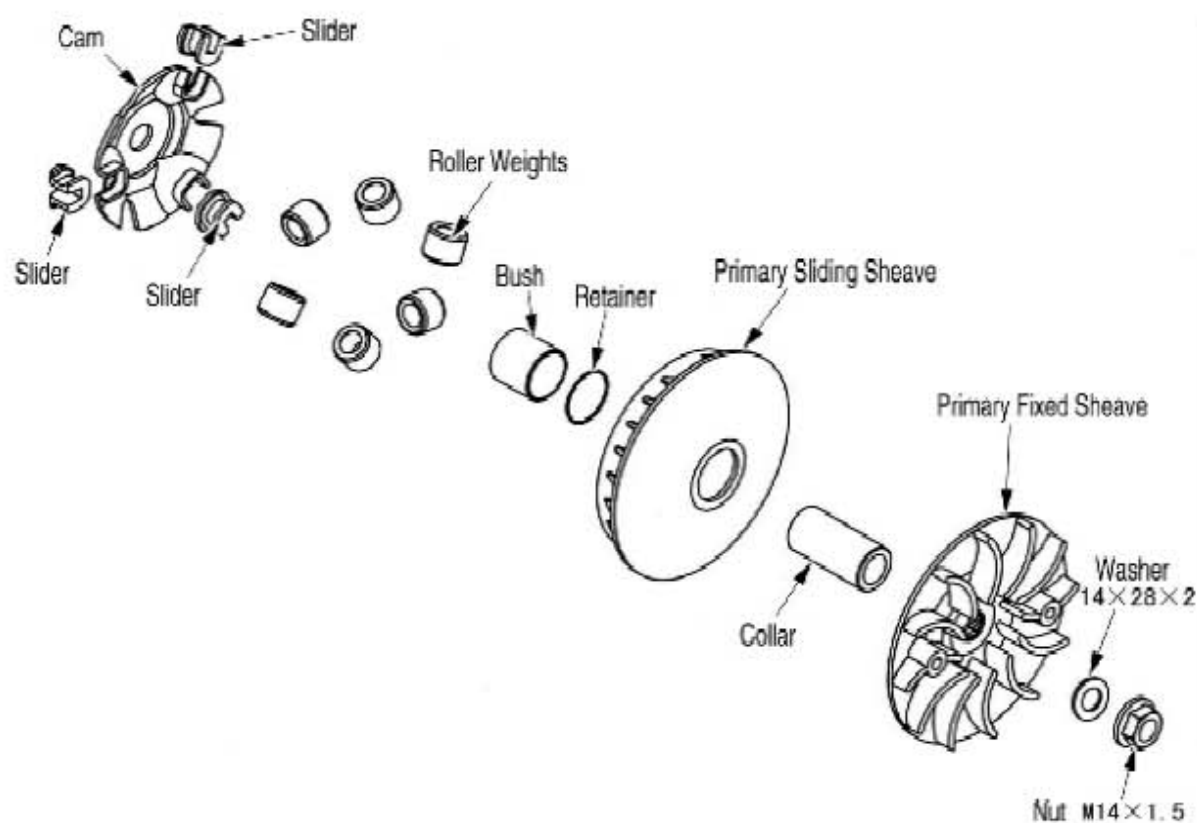
Primary Sliding Sheave



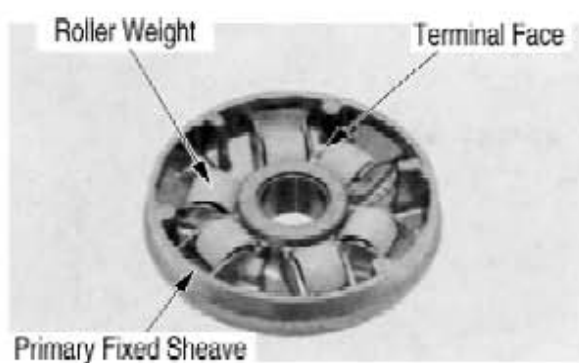
Collar



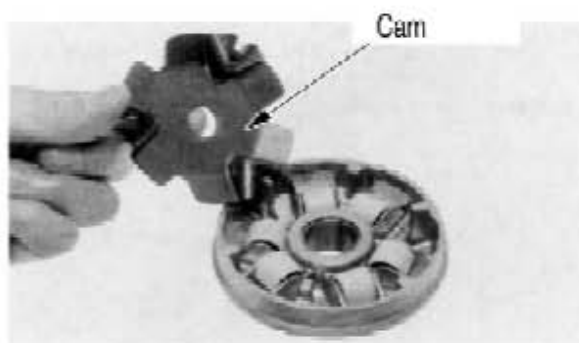
Assembly



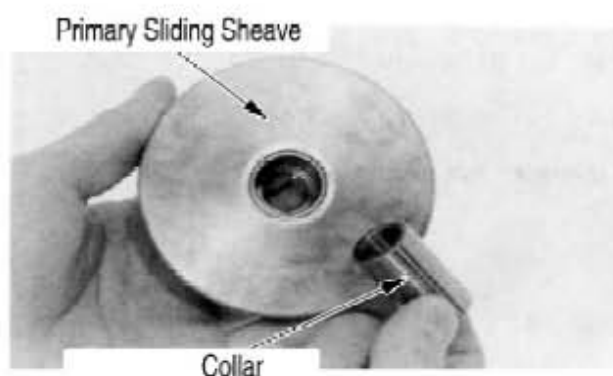
Assemble the roller weight comp. to the sliding groove of the primary sliding sheave. Keep the roller weight terminal face flush the direction as shown in the picture.



Assemble cam.



Install collar into the bush hole of primary sliding sheave.



Installation caution:

Never smear grease to the V-belt or sliding sheave.

Hold sliding sheave and install primary sliding sheave and collar of primary fixed sheave.



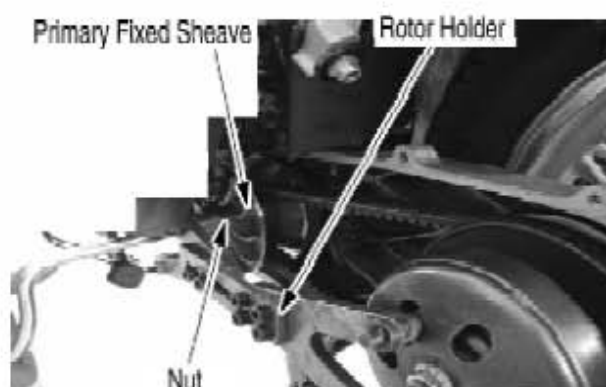
Install V-belt.



Install primary fixed sheave, washer, nut.
Apply glue to the nut and screw part of primary fixed sheave, install the nut and tighten it.

Tighten the primary sheave nut with pneumatic wrench according to the specified torque.

Torque: 59 N. ■ (6.0kgf.■)



Clutch

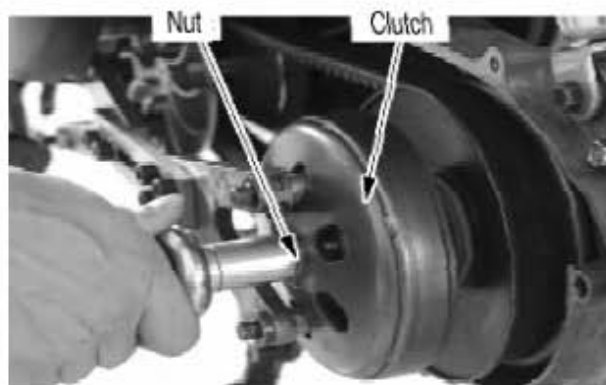
Disassembly

Remove:

- Left side cover. (→ 9-3)
- Primary fixed sheave (→ 9-5)

Hold the clutch housing with the rotor holder and remove the lock nut.

Remove Clutch



Disassembly

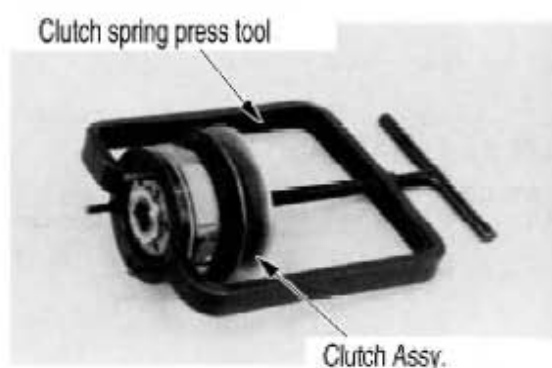
Attach the protruding part of clutch spring press tool to the hole of the secondary fixed sheave.

Caution

Do not tighten the clutch spring press tool more than the specified torque.

Special tools:

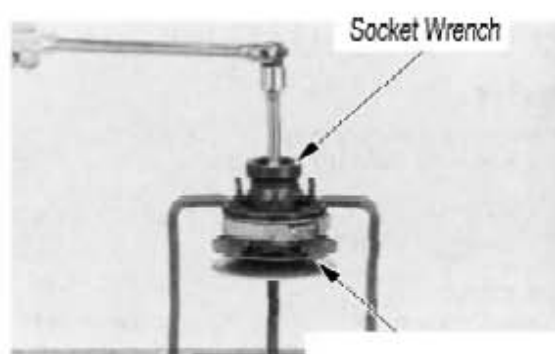
Clutch spring press tool: **152MI-922-070000**



Fix the clutch spring press tool with a plier.
Remove the nut from clutch with socket wrench.

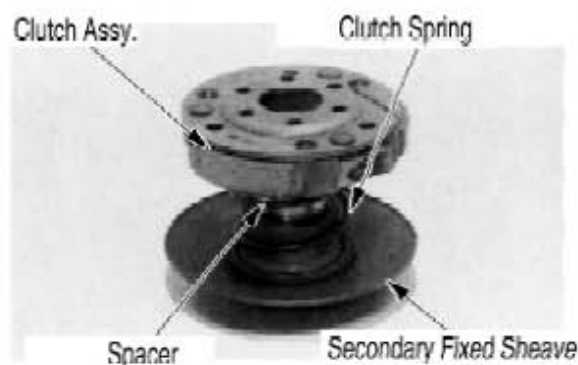
caution

Be careful the spring of clutch in order to avoid any injury



Remove the following parts from clutch spring press tool:

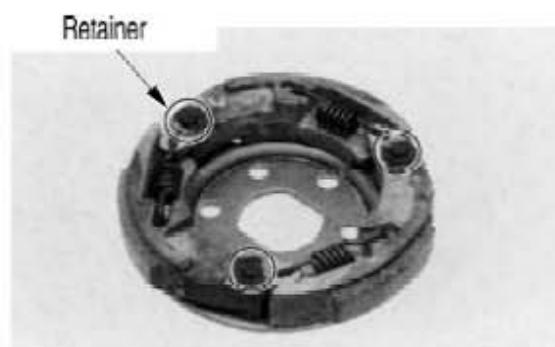
- clutch comp.
- secondary fixed sheave
- clutch spring
- spacer
- buffer washer
- plastic washer



Disassemble clutch comp. and secondary fixed sheave separately.

Disassembly of clutch comp.

Remove retainer.



Remove clutch return spring, remove centrifugal weights from secondary fixed sheave



Remove damper rubber from secondary driven sheave.

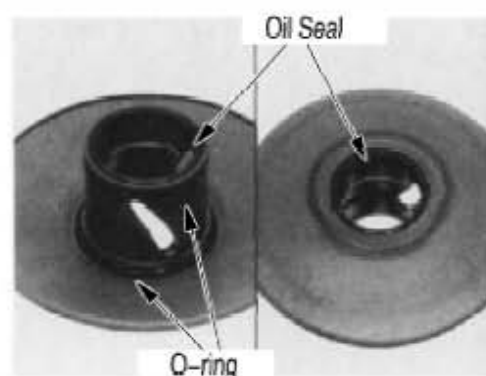
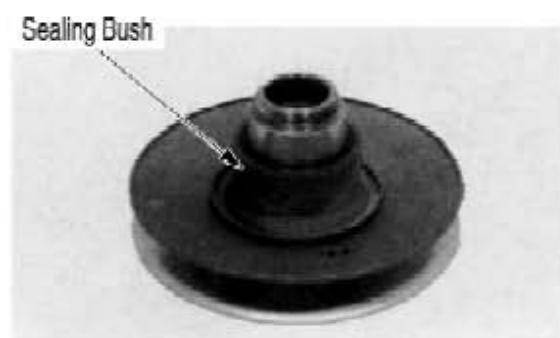
Disassembly of secondary fixed sheave

Remove sealing bush.

Remove guide pin, roller, remove secondary fixed sheave.
Check guide pin and roller for damage or wear.

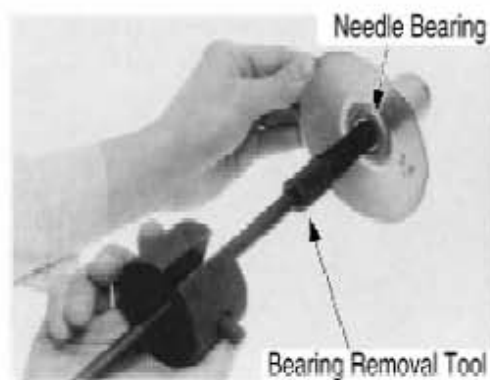
Remove oil seal and O-ring from secondary fixed sheave.
(Replace with new ones for installation)

Check the needle bearing and ball bearing of secondary fixed sheave. Replace with new ones if necessary.

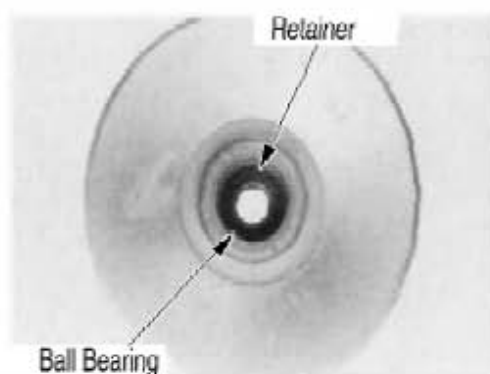


Replacement of bearing for secondary sliding sheave.

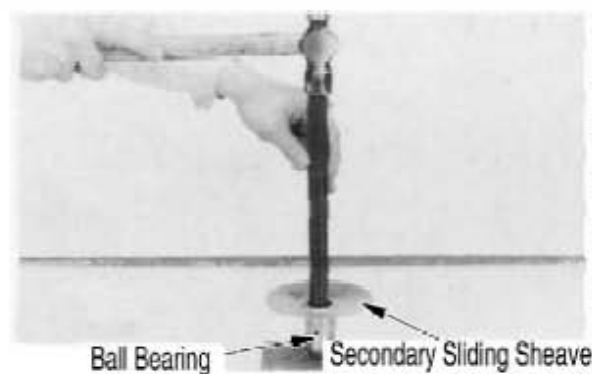
Remove the needle bearing from secondary sliding sheave with bearing removal tool.



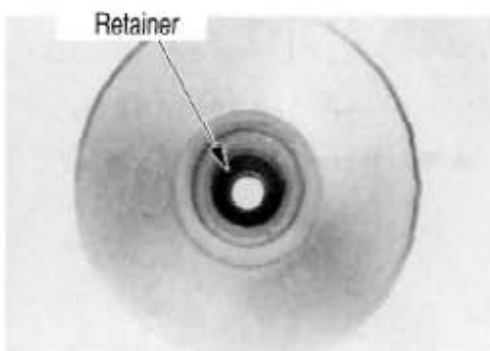
Remove retainer and ball bearing.



Apply lubricant to the new ball bearing.
Strike the ball bearing with its countermark upward into the secondary sliding sheave.



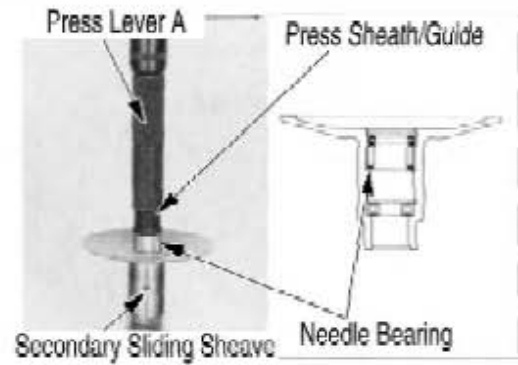
Install retainer.



Apply lubricant to the inner side of the secondary sliding sheave.

Apply lubricant to the new needle bearing.

Press the needle bearing with its countermark upwards into the secondary sliding sheave.



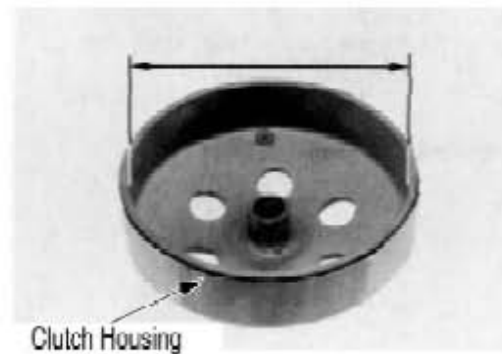
Check

Clutch housing

Check the clutch housing for wear and damage

Measure inner diameter of clutch housing

Service limit: 125 mm

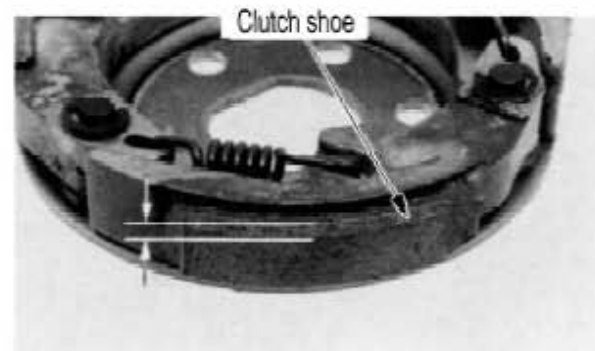


Clutch shoe

Check clutch shoe for wear and damage.

Measure the thickness of clutch shoe

Service limit: 2.75 mm

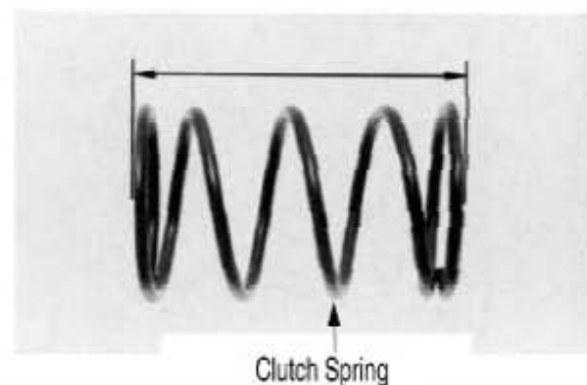


Clutch spring

Check the clutch spring for weakening or break

Measure the free length of spring.

Service limit: 140 mm

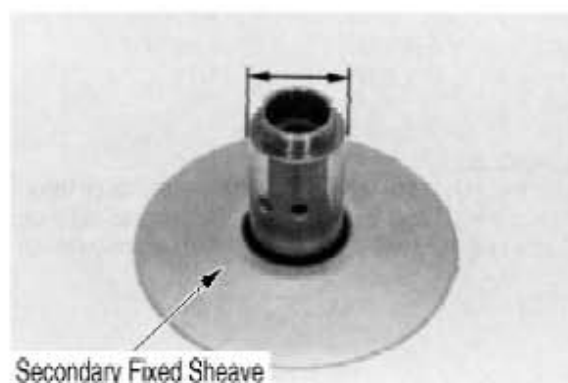


Secondary fixed sheave

Check for wear and damage.

Measure the outer diameter of collar part:

Service limit: 33.92 mm

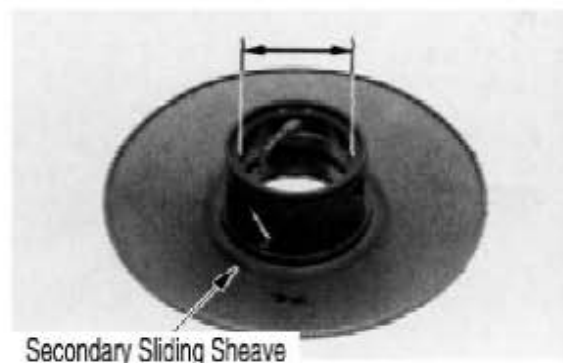


Secondary sliding sheave

Check for wear and damage.

Measure the inner diameter of collar part.

Service limit: 34.06 mm

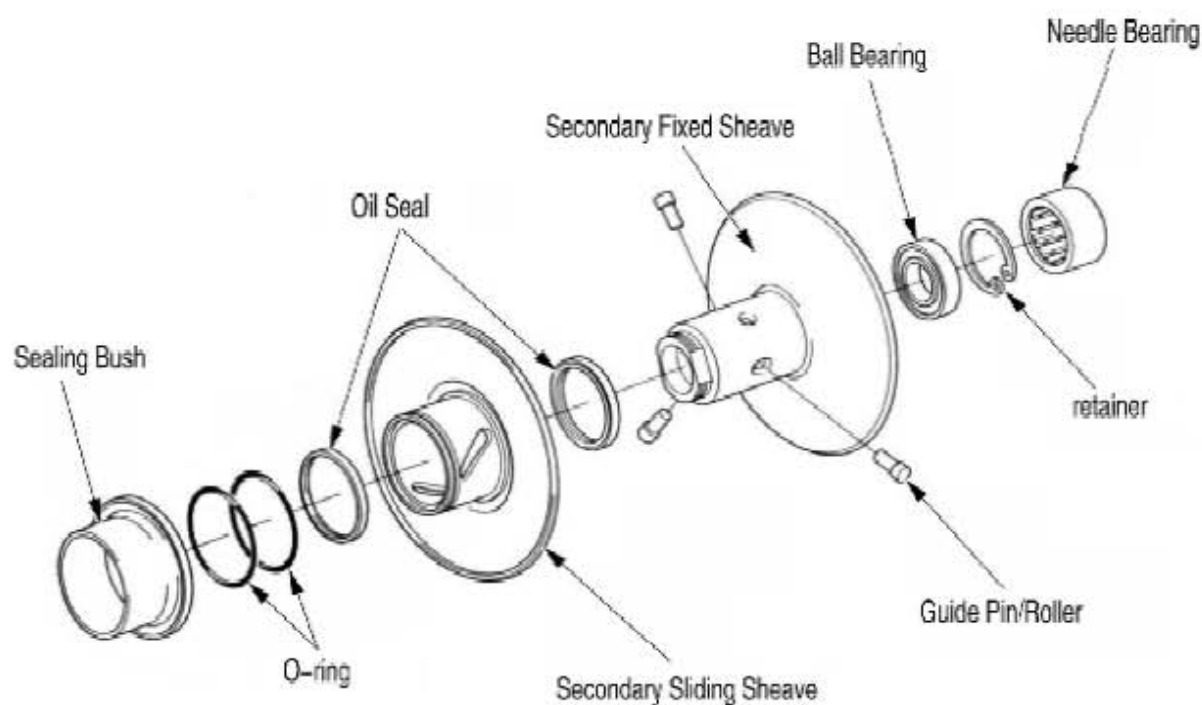


Assembly of clutch

Caution

Before assembly, degrease and clean V-belt sliding surface of secondary fixed sheave, outer side of clutch and inner side of sheave comp.

Assembly of secondary fixed sheave



Degrease and clean the V-belt sliding surface of secondary fixed sheave

Apply lubricant grease to the lip of oil seal and install the oil seal with the lip facing the inner side of secondary sliding sheave

Apply lubricant grease to the O-ring and install it to secondary sliding sheave

Apply lubricant grease to the oil seal lip and install the oil seal with the lip facing the secondary sliding sheave..

Fill adequate lithium lubricant into $\phi 34$ hole.

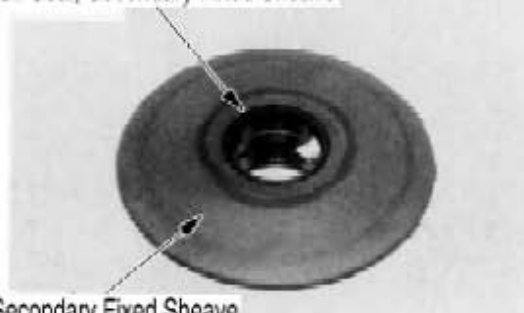
guide pin groove, needle bearing and ball bearing of secondary sliding sheave.

Install the secondary sliding sheave to secondary fixed sheave.

Apply lubricant grease to guide pin, roller before installing to secondary fixed sheave.

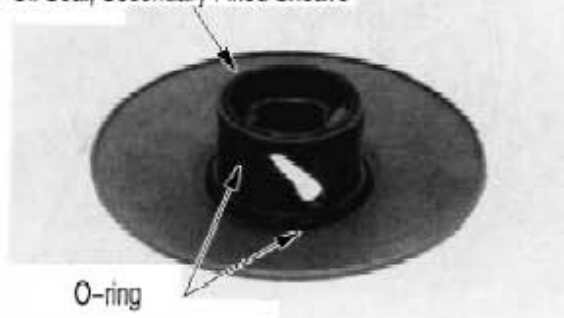
Install sealing bush

Oil Seal, Secondary Fixed Sheave



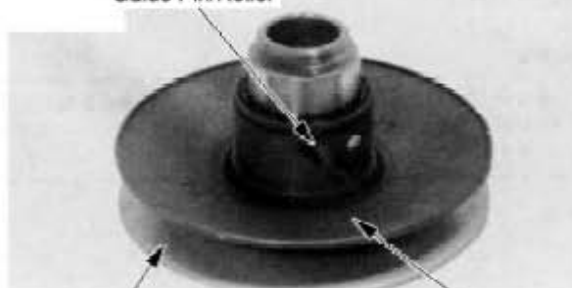
Secondary Fixed Sheave

Oil Seal, Secondary Fixed Sheave



O-ring

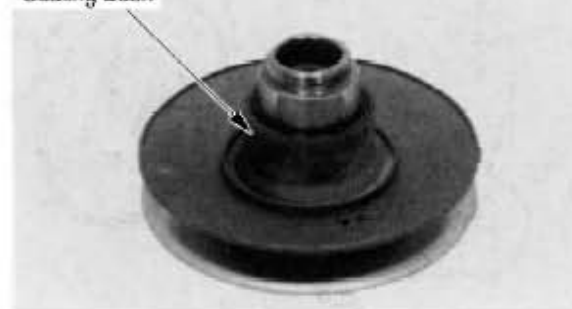
Guide Pin/Roller



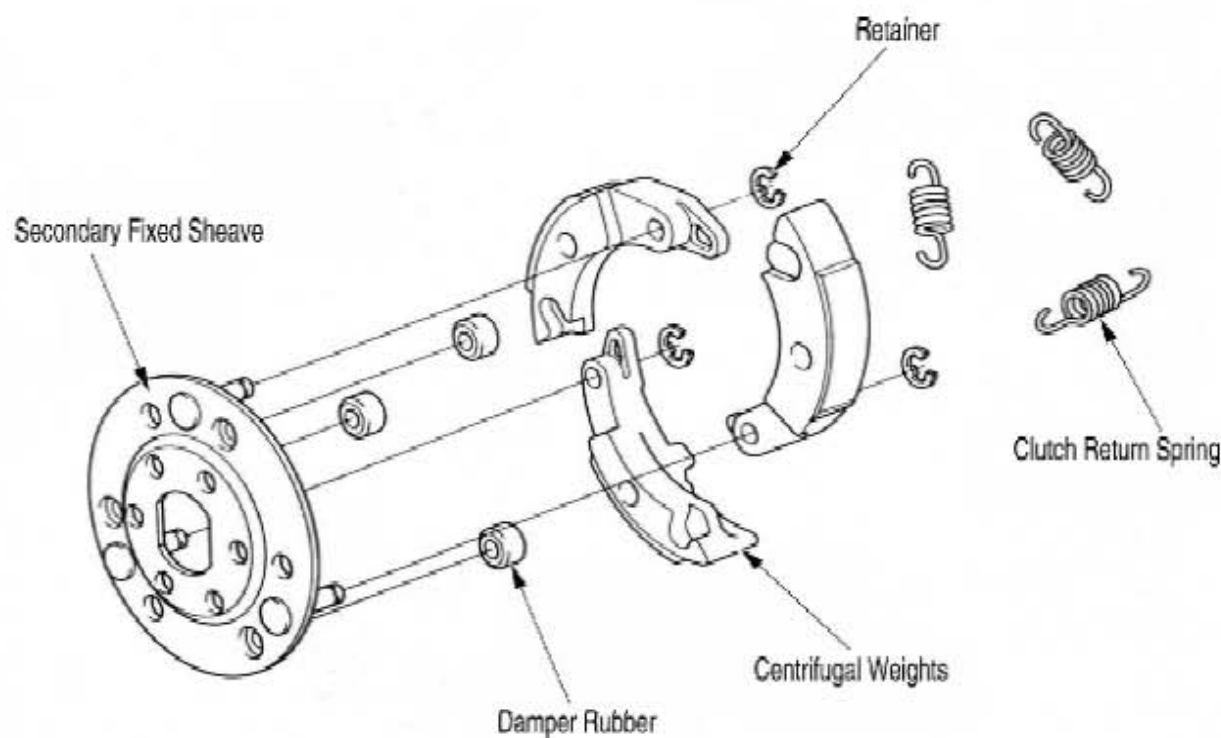
Secondary Fixed Sheave

Secondary Sliding Sheave

Sealing Bush

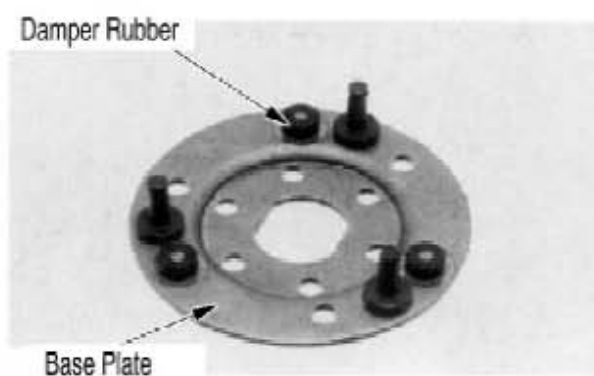


Assembly of clutch comp.

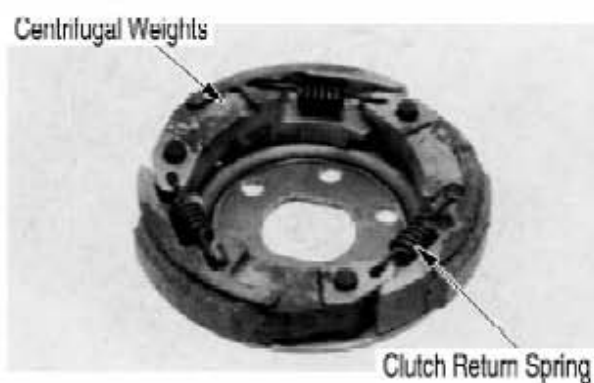


9

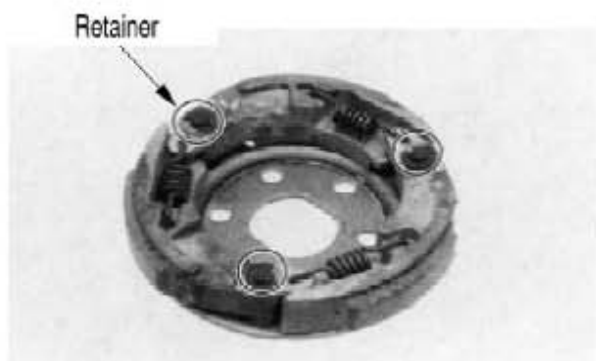
Install damper rubber to the base plate of clutch.



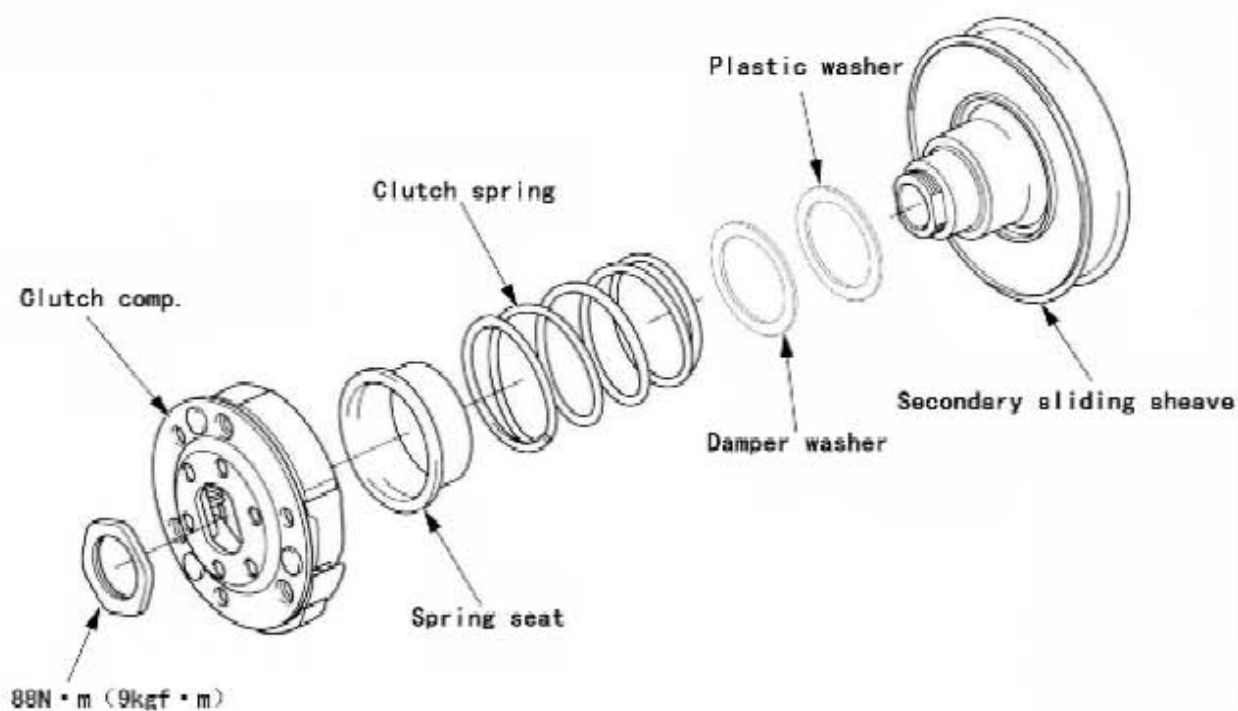
Pay attention to the install direction of clutch return spring. Install centrifugal weights and return spring.



Install retainer

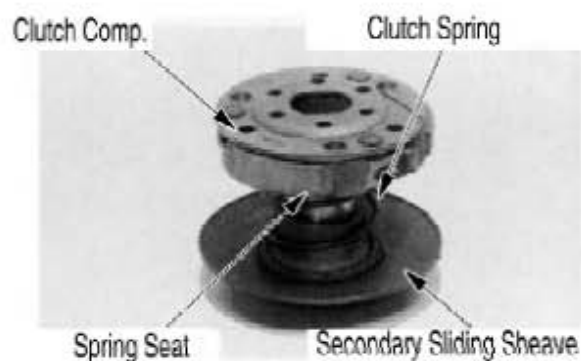


Assembly



Assemble the following parts

- Clutch comp.
- Spring Seat
- Clutch spring
- Damper washer
- Plastic washer
- Secondary sliding sheave.



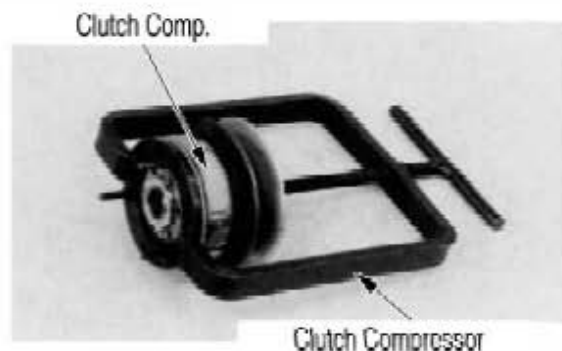
9 Continuously variable Transmission System & Left Cover

Install with the hole of secondary fixed sheave facing the protruding part of clutch spring compressor.

Caution

Do not tighten the clutch spring compressor more than the specified torque.

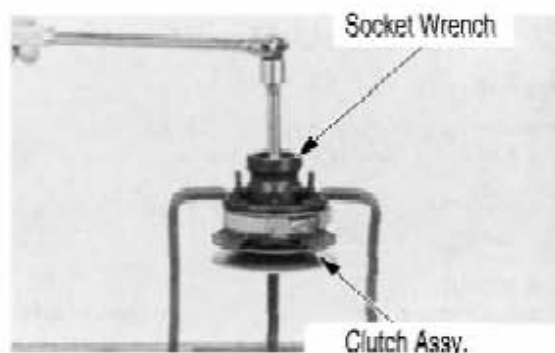
Fix the clutch spring compressor with pliers.



Install nut for secondary fixed sheave.
Tighten the clutch lock nut according to the specified torque with socket wrench.

Torque: 88 N·m (9.0kgf·m)

Remove clutch from clutch spring compressor.

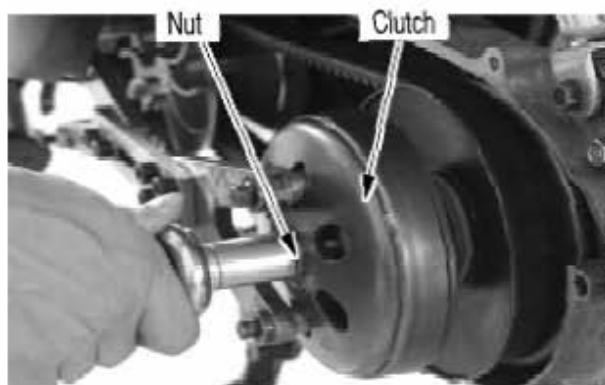


Installation of clutch

Install clutch, apply adequate glue and tighten the nut according to the specified torque.

Torque: 53 N·m (5.3kgf·m)

Install primary fixed sheave (→ 9-12)
Install left side cover (→ 9-3)
Install left strip (→ 2-6)



overhaul informaton.....	10-1	Bearing arrangement	10-4
Troubleshooting	10-1	Removal & Installation of gearbox bearing, oil seal	10-4
Disassembly of gearbox.....	10-2	Removal & Installation of left crankcase bearing, oil seal	10-6
Inspection of gearbox.....	10-3	Assembly of gearbox	10-7

Overhaul Information

Operation Caution

- Overhaul of gearbox can be done without removing the engine from scooter.
- Install the drive shaft with special tools. Fix the inner side of bearing and press it into the drive shaft.

Overhaul Standard

Items		Standard
Oil capacity	For replacing	0.15 l
	For disassembly	0.18 l
Recommended gearbox oil		SAE15W-40/SF grade

Tightening Torque

Oil check / Drain bolt	22 N·m (2.2 kgf·m)
Gearbox bolt	22 N·m (2.2 kgf·m)

10

Troubleshooting

When engine is running, the scooter doesn't run

- Gearbox system damaged
- Gearbox system ablated
- V-belt CVT system is not engaged (→ chapter 9)

Abnormal noise during running

- Wearing of gear, gear surface damaged
- Worn or loosen bearing

Oil leakage

- Excessive oil
- Worn or damaged oil seal
- Damaged gearbox sealing gasket

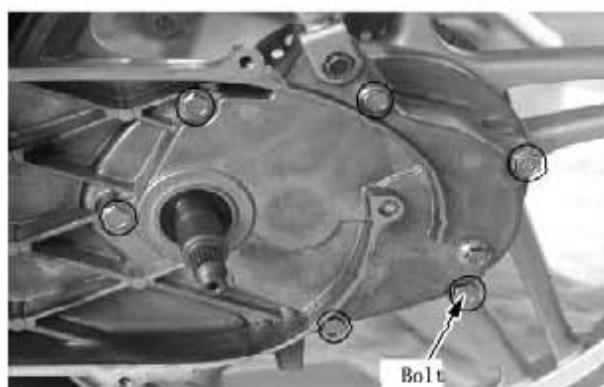
Disassembly of gearbox

Drain lubricant from gearbox (→ 3-10)

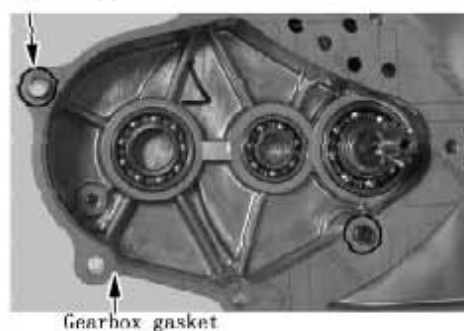
Remove:

- Rear wheel (→ 14-3)
- Clutch assy. (→ 9-8)

Remove bolt



Dowel pin



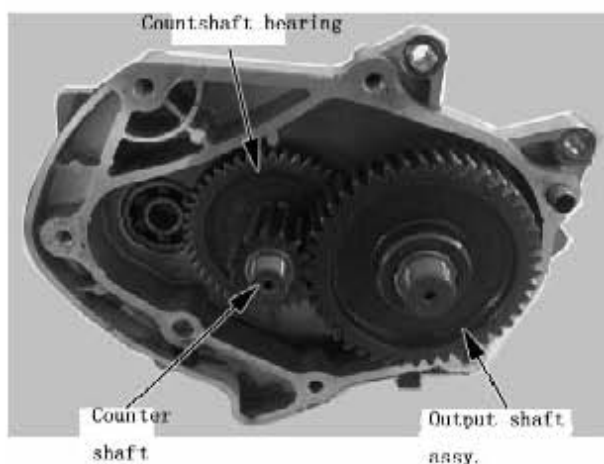
Remove gearbox.

Remove dowel pin and Gearbox sealing gasket

Wipe off the attached sealant on the joint fac

Remove final shaft comp.

Remove countershaft and gear.



Remove adjusting washer.



Disassembly of drive shaft

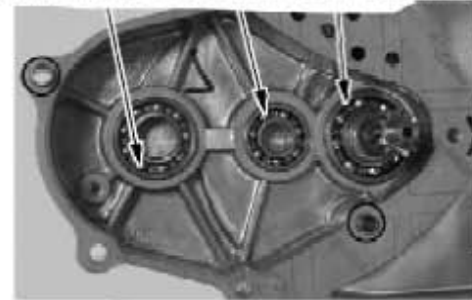
Strike the shaft end face with a wooden hammer and remove drive shaft.



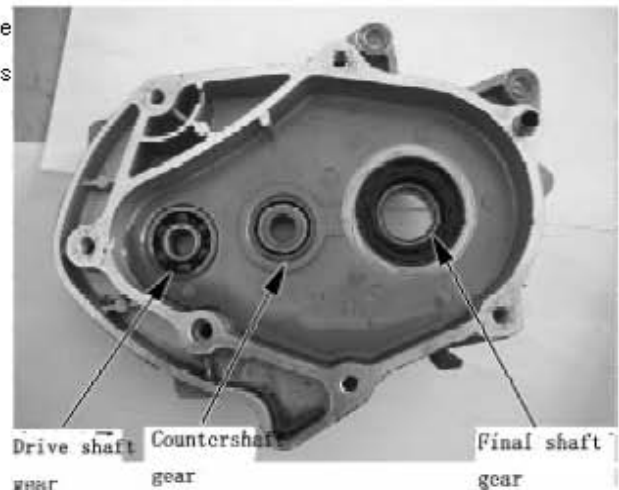
Inspection of gearbox

Turn inner ring of bearings in the gearbox and left crankcase with a finger, check whether they turn smoothly. Replace with new ones if necessary.

Finalshaft gear, countershaft gear, driveshaft gear

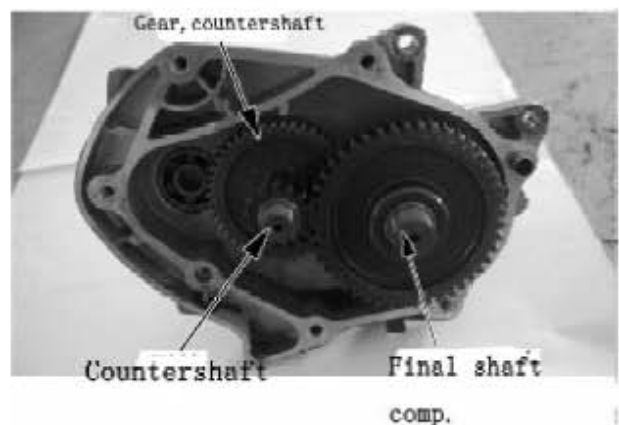


Check if there are damages or scrapes with the bearing bores in the gearbox and left crankcase.

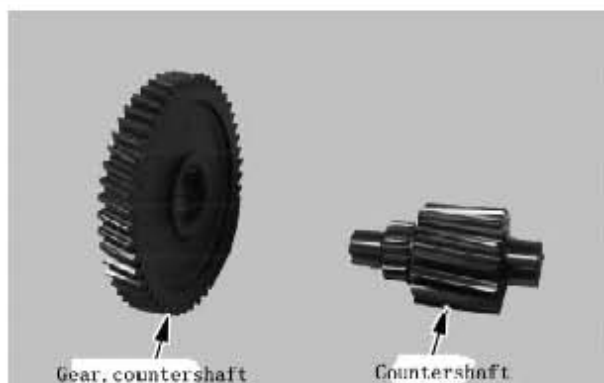


Check final shaft and bearing for wear or damage. Replace with new ones in case of any damage or wear.

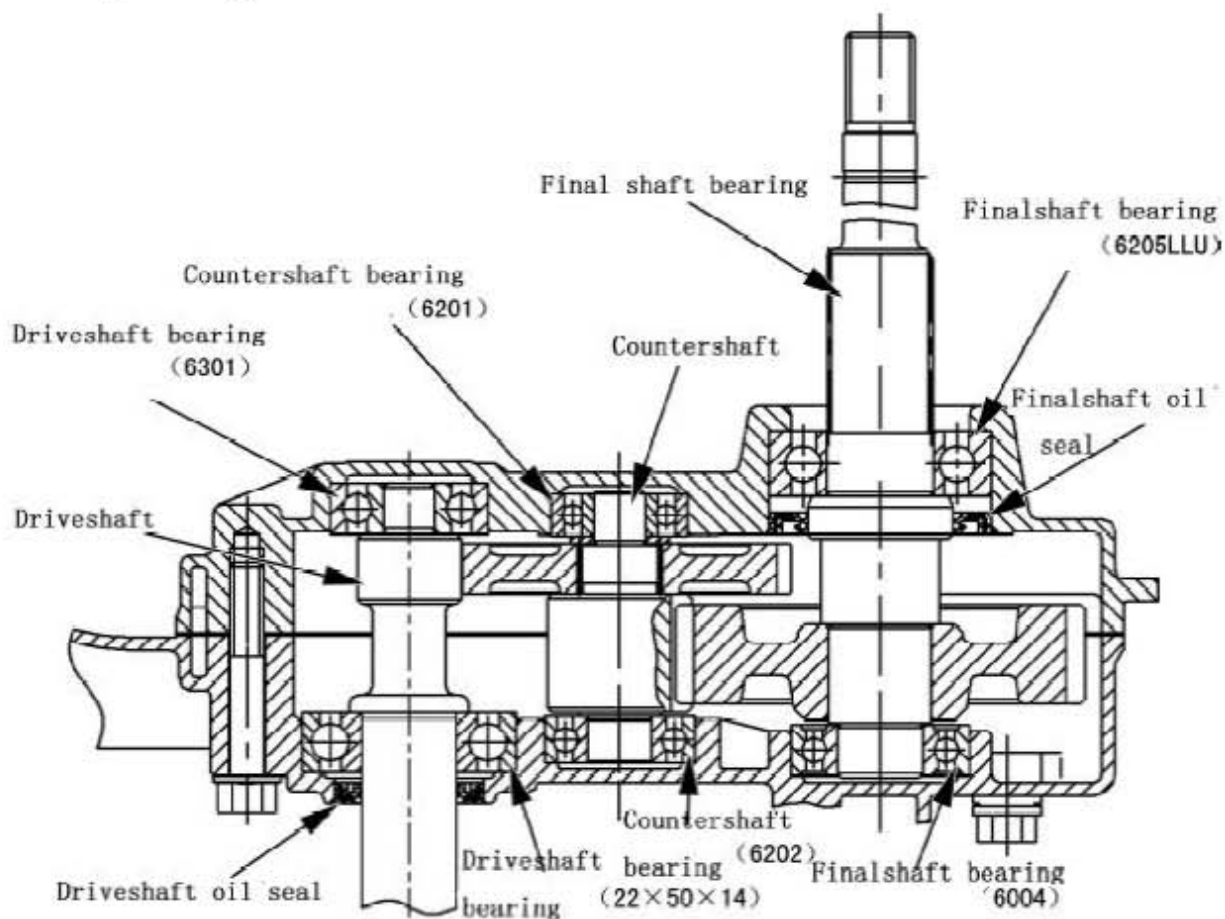
Check drive shaft and bearing for wear or damage. Replace with new ones in case of any damage or wear.



Check countershaft and bearing for wear or damage. Replace with new ones in case of any damage or wear.



Bearing arrangement



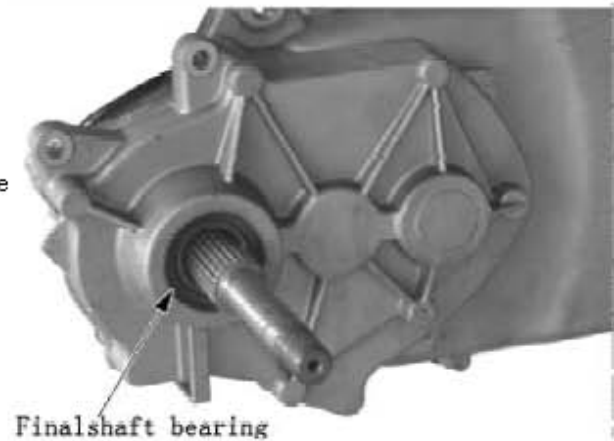
Removal and installation of gear-box bearing and oil seal

Remove the final shaft oil seal from gearbox.



Remove final shaft bearing with bearing remove

Use bearing remover and reverse the removal procedure for installation.



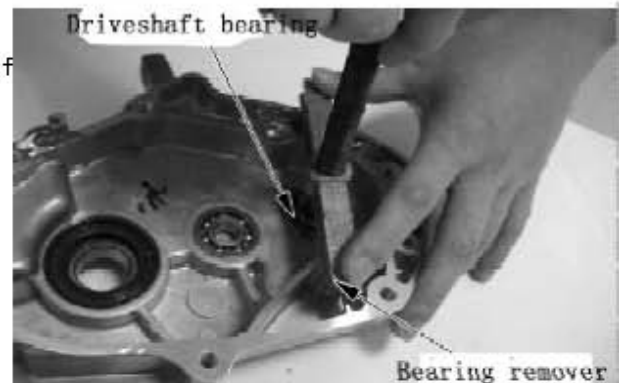
Remove the drive shaft bearing and countershaft bearing at the gearbox 担 side, with bearing remover.

Special tools

Bearing Remover: 1P52MI-A-922-050000

-060000

-080000



Press a new drive shaft bearing vertically, with its countermark side upwards, into the gearbox housing till the bottom side of bearing bore.

Repeat the above step for installation of countershaft bearing.

Apply lubricant to the new final shaft oil seal and install the oil seal with its lip side facing the gearbox side.



Caution

Keep the oil seal in parallel with end face, Do not block the leakage hole.



Removal and installation of left crankcase bearing & oil seal

Remove drive shaft oil seal.

Refer to (→10-5)for removal of left crankcase drive shaft bearing, countershaft bearing and final shaft bearing.



Driveshaft oil seal

Press a new bearing vertically, with its countermark side upwards, into the left crankcase until it is stopped.

Repeat above step for installation of bearings drive shaft, countershaft and final shaft.



Installation of drive shaft

Pull the drive shaft into left crankcase with combination sets.



Drive shaft

Crankcase collar

Apply lubricant to the new oil seal lip of drive shaft.

Install the oil seal with its lip facing the gearbox side.



Driveshaft

oil seal

Installation of gearbox

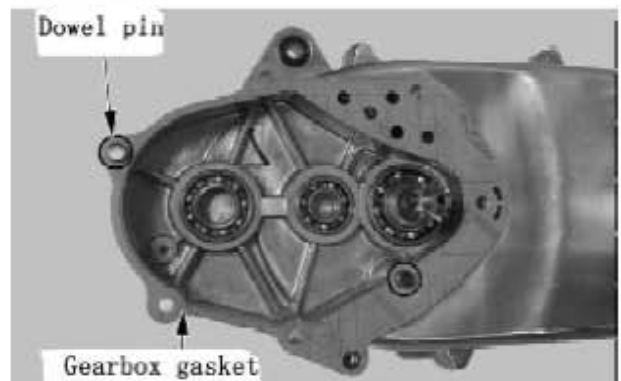
Install adjusting washer



Install countershaft gear and countershaft to make sure that adjusting washer is on the shaft.
Install final shaft.

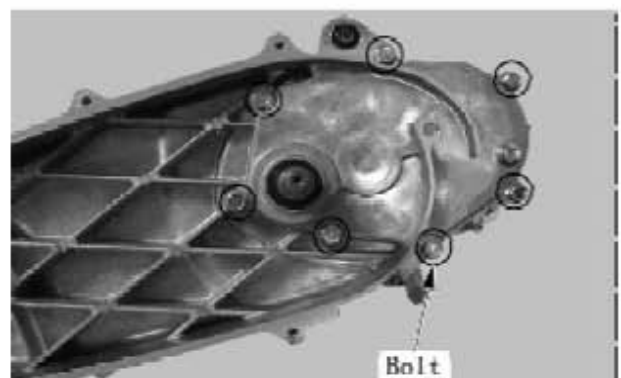


Install dowel pin.
Dip the gearbox gasket into kerosene, install the joint face of left crankcase.



Install gearbox.
Install the bolt and tighten it.
Tightening torque: 22 N • m (2.2 kgf • m)

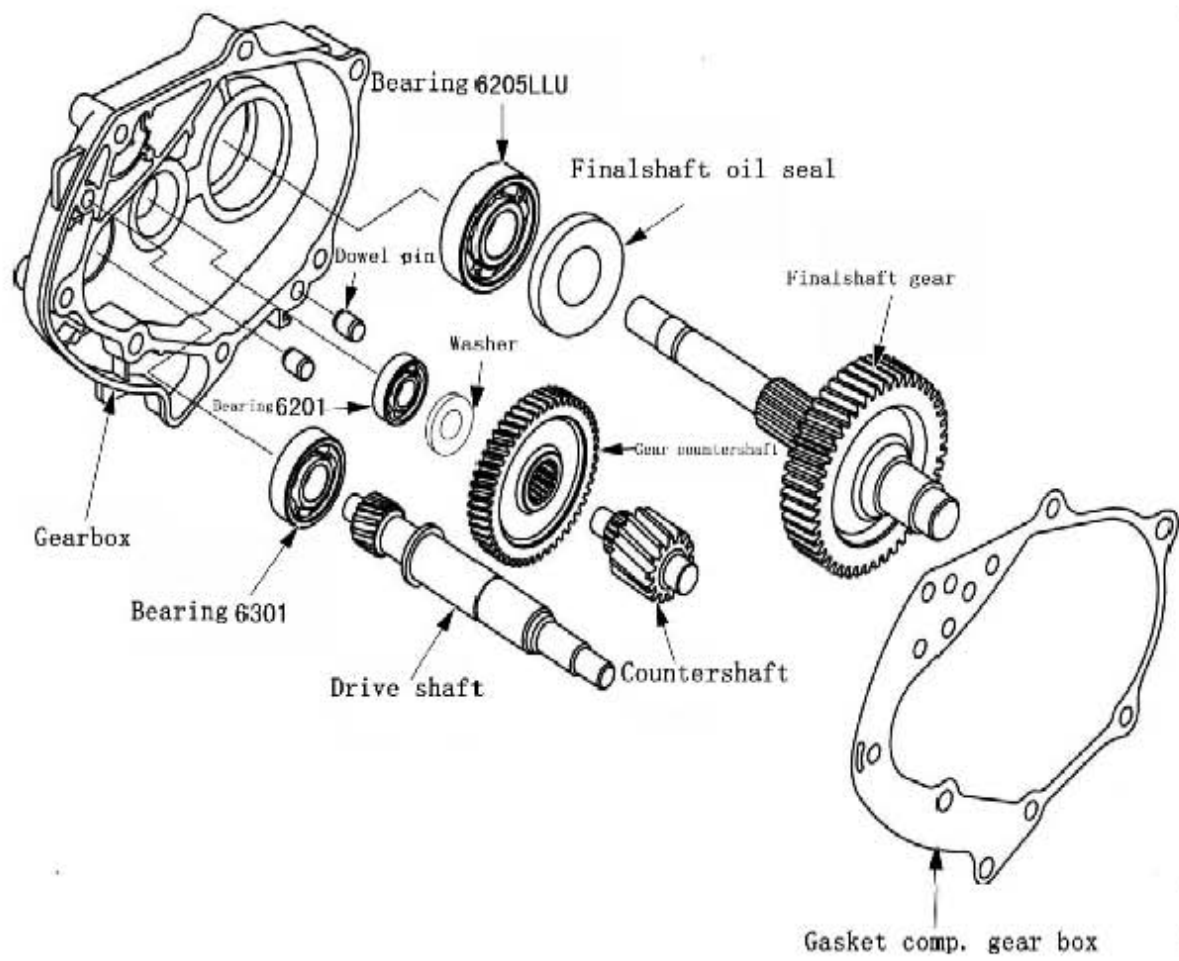
Fill gearbox oil. (→3-10)
Install the following parts:
— Clutchassy. (→9-17)
— Rear wheel (→14-3)



10

CFMOTO

Assembly drawing of gearbox



O&R information.....	11-1	Water pump installation.....	11-4
Right side cover dismantling.....	11-2	Right side cover mantling&dismantling	
Flywheel dismantling.....	11-2		11-5
Driven gear comp. dismantling.....	11-3	Stator comp. assembling.....	11-6
Stator comp.	11-3	Driven gear comp. assembling.....	11-6
		Right side cover assembling.....	11-7

O&R Information

Operation Notice

Attention

Disassemble right side cover, stator comp, flywheel comp. under cold engine.

- Right side cover' s overhauling can be done under engine on-vehicle state.
- AC magnetor's overhauling can carry on under engine on-vehicle state.
- AC magnetor's inspection carry on according to section 15.

Tightening torque

flywheel comp tightening nut	59 N · m (6.0kgf · m)
right side cover bolt	12 N · m (1.2kgf · m)
water pump cover bolt	10 N · m (1.0kgf · m)

Fault diagnosis

- magnetor fault diagnosis (→ section 15)

Right side cover dismantling

remove right side support (→ section 2)

drain the coolant (→ 6-4)

drain the crankcase lubrication (→ 3-11)

Attention

It must be in cold engine when removing the right side cover

remove water inlet hose, water outlet hose, breather hose.

remove water pump cover, dowel pin, water pump cover seal washer.

Remove right side cover bolt, take down the right side cover.

Flywheel dismantling

remove oil duct tie-in and oil duct tie-in spring.

remove dowel pin and right side seal washer.

remove dual gear and dual gear shaft.

remove nut, washer.

BREATHER PIPE PUMP WATER OUTLET PIPE



PUMP WATER INLET PIPE PUMP COVER



LEFT SIDE COVER BOLT



RIGHT SIDE COVER SEAL WASHER

GEAR COMPOUND SHAFT DOWEL PIN



NUT/WASHER

SPRING/OIL CHANNEL

Use special tool fixing the flywheel, then
dismantle the flywheel with special remover.

Special tool:

Flywheel dismantle special remover:
152MI-922-030000

ROTOR DISMANTLE SPECIAL TOOL



Driven gear dismantling

remove bolt, holding plate and driven gear.

DRIVEN GEAR ASSY

BOLT/HOLDER



Combined stator disassembling

remove combined stator and the pick up.

remove holder.

PICK UP

CIRCLIP

BOLT/WASHER



lock the water pump shaft in overleaf,
use open spanner remove water pump comp in
clockwise direction.

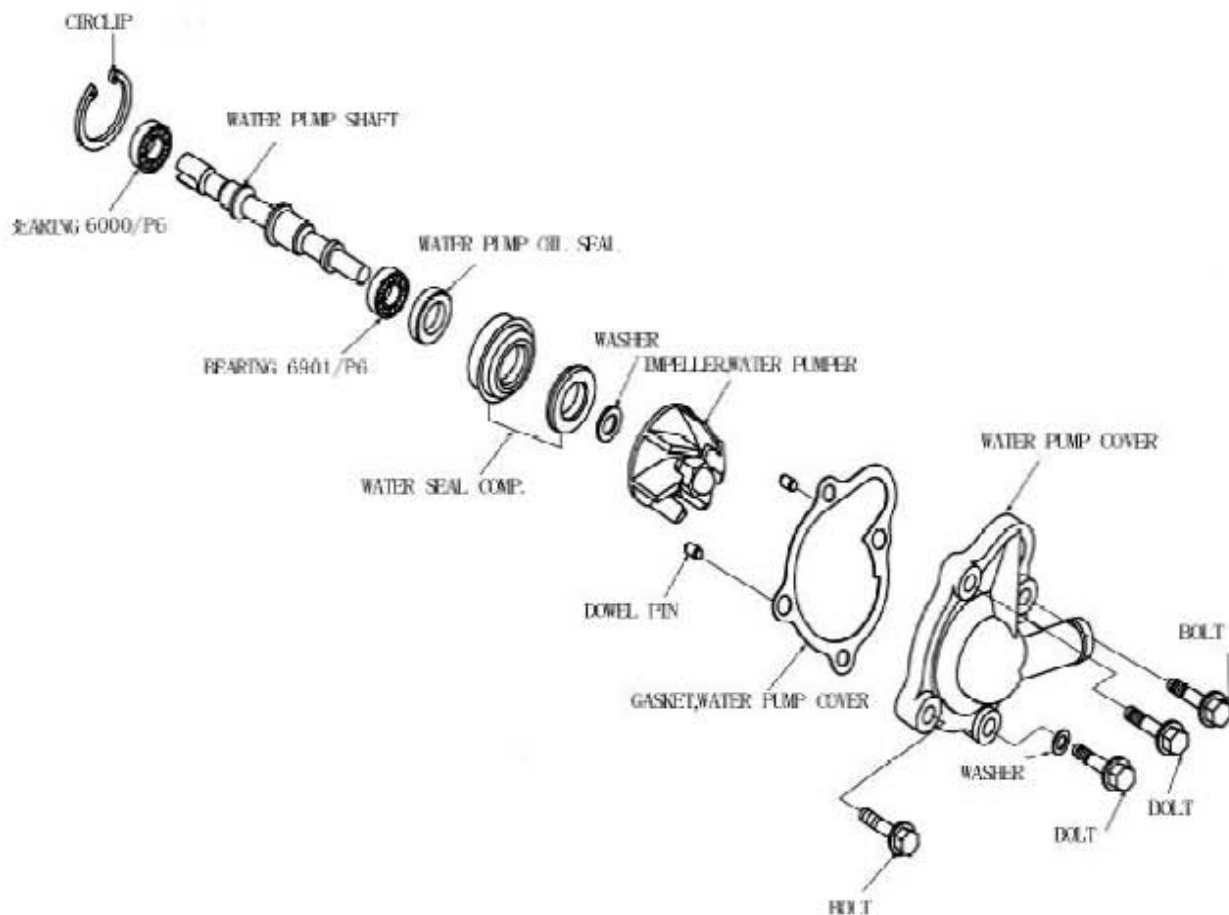
remove oil level guide, inspection plug, seal ri
remove drain bolt, washer
remove oil strain comp.

GUIDE OIL LEVEL

SEAL RING PLUG



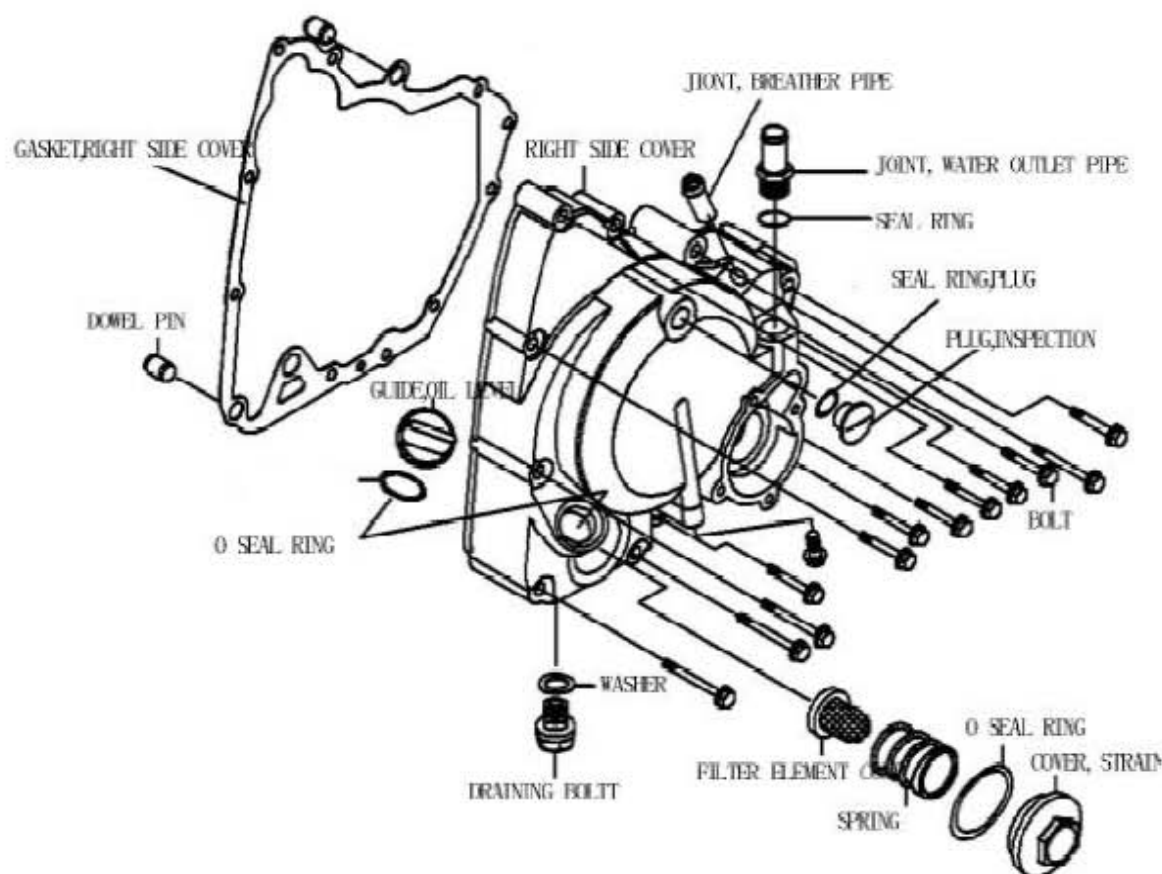
Water pump assembling



Assembling sequence

1. assemble the bearing 6901/P6 into the water pump shaft, then assemble into the right side cover's water pump shaft hole.
2. assemble bearing 6000/P6 in water pump shaft, use holder lock it.
3. coat the water pump oil seal around with cylindrical seal gum then install it in the right side cover.
4. install water seal in right side cover and compress.
5. nested the washer in the water pump shaft, then screw down the water pump impeller in the water pump shaft.

Right side cover assembling&disassembling



11

Assemble the water pump according to the press

Assemble inspection plug and seal ring plug.

Assemble oil level guide.

Assemble oil screen.

Assemble oil drain bolt and washer.



CFMOTO

Combined stator assembling

Assemble combined stator, pick up, tighten with bolt and washer.

Install in the combined stator, pick up, tight with bolt and washer.

washer bore chamfer side toward bolt.

3pcs hexagon bolt tighten torque is 15N.m.

Attention:

Combined stator, pick up wire must hold down by the lead plate. At the meantime, you must coat the screw thread with tighten gum on tightening.

Install the wire seal block in the slot.

Attention:

Seal gum is needed.

Driven gear assembling

Install driven gear in crankshaft, at the meantime, nested the holding plate in driven gear, tighten with bolt, adjust between holding plate and driven gear to avoid friction, collide.

Install in the flywheel, put the pin into crank, tighten the nut with required torque.

Attention:

check if the pin is installed in.

When assemble the flywheel you required to aim at the crankshaft semicircle key.

Torque: 59 N · m (6.0kgf · m)

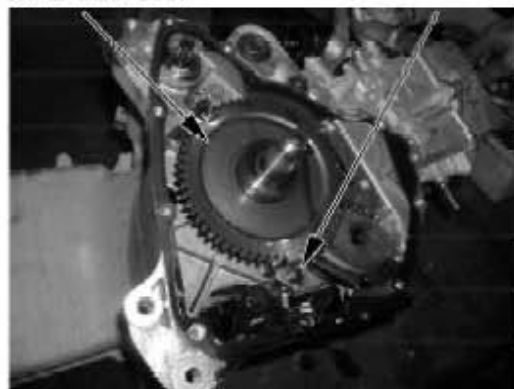
PICK UP SEAL RING/PLUG BOLT/WASHER



CLAMP SLOT



DRIVEN GEAR COMP. BOLT/HOLDER



11 RIGHT SIDE COVER, MAGNETOR, WATER PUMPER

Then install dual gear ,dual gear shaft, oil duct joint and oil duct joint spring one by one.

Install in the dowel pin, right side cover sea

Right side cover assembling

Install the right side cover,tighten the screw in 2 or 3 times on the cross.

Torque:12 N • m (1.2kgf • m)

Attention:

water pump shaft hatch and the oil pump shaft must be involution, or else,cannot be installe

Install in the dowel pin, water pump cover sea ,water pump cover one by one.
Tighten with bolt.

Attention:

Tighten 2 or 3 times on the cross, torque is

Install water inlet hose, outlet hose, breather hose.

Inject coolant (→6-6),be sure purge the air.
Inject lubricant oil into crankcase (→3-11);

Install right support.(→section 2).



12 Crankcase, Crankshaft, Piston

Overhaul information.....	12-1	Disassembly of crankcase.....	12-4
Troubleshooting.....	12-2	Inspection.....	12-5
Piston.....	12-4	Assembly of crankcase.....	12-8

Overhaul Information

Operation caution

- Inspection of crankshaft and crankcase must be done after the crankcase is disassembled. Inspection of these parts can only be done after removal of engine from scooter. (→ chapter 7)
- Following steps are required when disassembling the crankcase. Follow the relevant chapters for disassembly:
 - Engine removal (→ chapter 7)
 - Cylinder cover, cylinder head, cylinder body (→ chapter 8)
 - Left side cover, CVT system (→ chapter 9)
 - Right side cover (→ chapter 11)
 - Electrical starting system (→ chapter 17)
 - Lubricating system (→ chapter 4)
- For inspection of piston and piston ring, just remove Cylinder cover, cylinder head, cylinder body (→ chapter 8)
- Do not damage the crankcase joint face during inspection
- Do not damage the inner surface of cylinder, piston

Overhaul Standard

Item			Standard		Service limit
			CF125F-32	CF125F-4	
Crankshaft	Big end of connecting rod	Axial Clearance	0.16 – 0.304 mm		0.50 mm
			0.003 – 0.017 mm		0.05 mm
	Vibration of crankshaft		—		0.10 mm
Piston	Installation direction		* IN [™] mark towards intake side		—
	Out diameter of piston		52.37 52.39/57.97-57.99 mm	—	52.325792 mm
	Inner diameter of piston pin hole		15.002 – 15.008 mm		15.04 mm
	Outer diameter of piston pin		14.994 – 15 mm		14.98 mm
	Inner diameter of connecting end hole		15.016 15.034 mm	—	15.05 mm
	Clearance between cylinder and piston		0.02 – 0.04 mm		0.08 mm
	Clearance between piston and piston pin		0.002 – 0.014 mm		0.04 mm
	Clearance between piston and connecting rod		0.016 – 0.040 mm		0.06 mm
	Clearance between piston ring and piston groove	Piston ring (1)	0.02 – 0.044 mm		0.07 mm
		Piston ring (2)	0.02 – 0.044 mm		0.07 mm
	Piston ring gap	Piston ring (1)	0.15 – 0.30 mm		0.45 mm
		Piston ring (2)	0.10 – 0.25 mm		0.45 mm
		Oil ring	0.2 – 0.7 mm		0.9 mm
	Installation direction of piston ring		Mark upside		—

Tightening Torque

Bolt for crankcase flange	12 N·m (1.2 kgf·m)
Thread pin for chain tensioning plate	13 N·m (1.3 kgf·m)

Troubleshooting

Compression pressure is too low

- Wearing and damages of piston ring
- Wearing of cylinder and piston
- Poor sealing of cylinder head and valve. (→ chapter 8)
- Burnt, broken or jammed piston ring.

Compression pressure is too high

- Carbon deposit at piston top or in combustion chamber

Blue smoke from exhaust muffler

- Wearing of connecting rod 担 small end.
- wearing of cylinder, piston ring or piston

Abnormal knocking

- Wearing of cylinder and piston
- Improper assembly of piston ring
- Damages to outside of piston or inner surface of cylinder
- Wearing or damage of crankshaft bearing

Piston

Disassembly of piston

Refer to 12-1 for removing the relevant parts before piston disassembly.

Remove piston pin retainer



Remove piston pin and piston

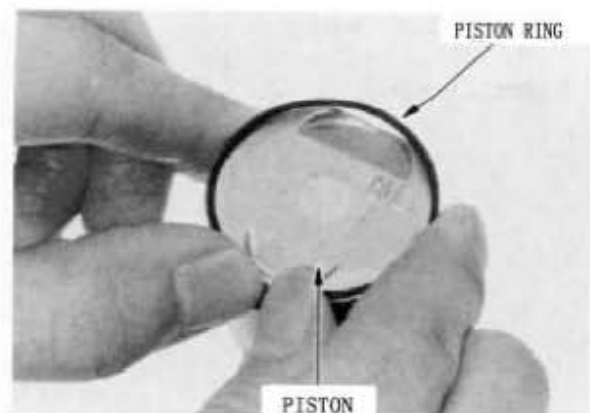


12

Expand piston ring gap and remove piston ring

Caution

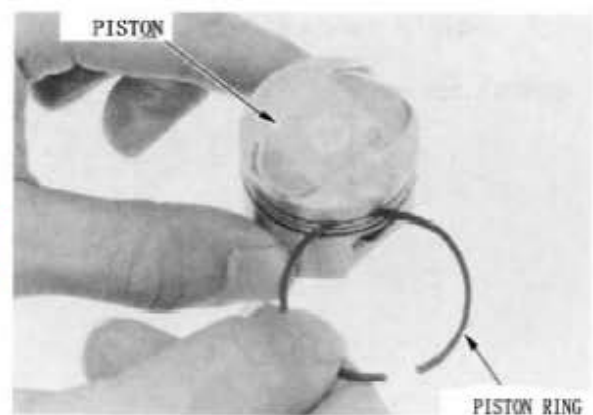
- ~~Piston ring is easy to be broken.~~
- ~~Do not expand gap too wide.~~
- ~~Keep piston ring from scraping the piston.~~



Scrape off carbon deposit from piston.
Remove carbon deposit from piston ring groove with a used piston ring.

Caution

- Do not damage piston ring groove.
- ~~Steel wire brush may damage piston ring groove, do not use it.~~



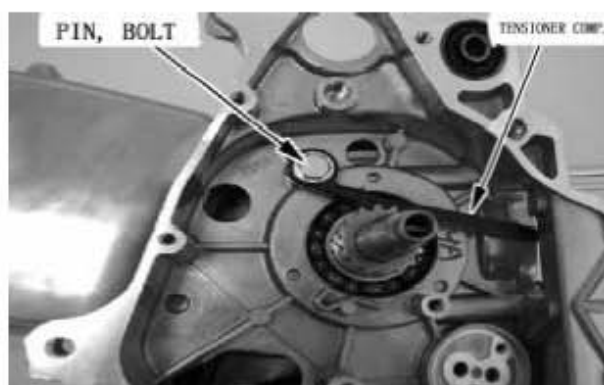
CFMOTO

Disassembly of Crankcase

Remove engine from scooter. (→ chapter 7)

Refer to 12-1 for removing the relevant parts before crankcase disassembly.

Remove thread pin and tensioning plate comp.



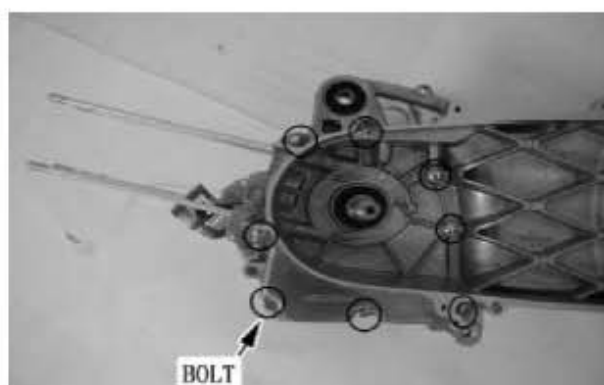
Remove crankcase bolts.

Keep the left crankcase downwards and remove right crankcase.

Caution

Do not pry crankcase joint face with screwdrivers. In case it is difficult to remove right crankcase, slightly strike convex of crankcase with plastic hammer, and slowly lift left crankcase.

Put left crankcase and crankshaft in the oven, heat up to 85°C before taking out. Slightly strike the left side of crankshaft with wooden hammer, then take crankshaft from left crankcase.



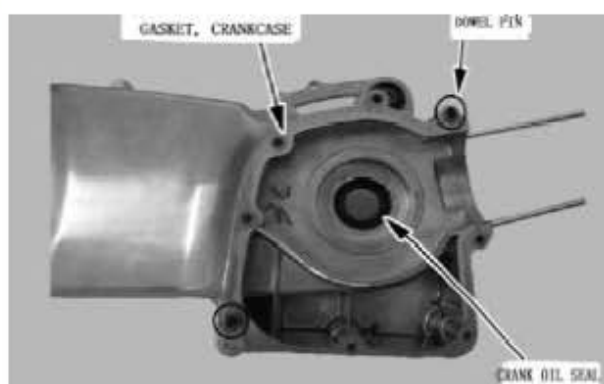
Caution

Put on heat protection gloves in case of get burnt.

Remove crankcase gasket and dowel pin.

Remove crankshaft oil seal.

Check tensioning plate for scrapes, damage or wear.

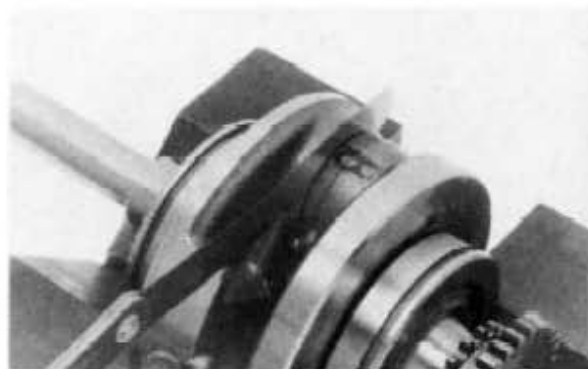


Inspection

Crankshaft

Measure side gap of big end of connecting rod.

Service limit: 0.5mm



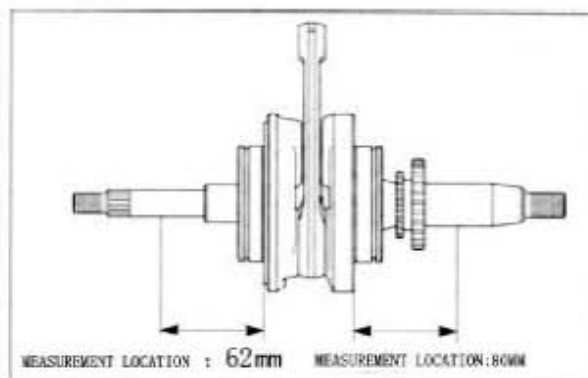
Measure radial gap of big end of connecting rod.

Service limit: 0.05mm



Measure vibration of crankshaft.

Service limit: 0.10mm



12

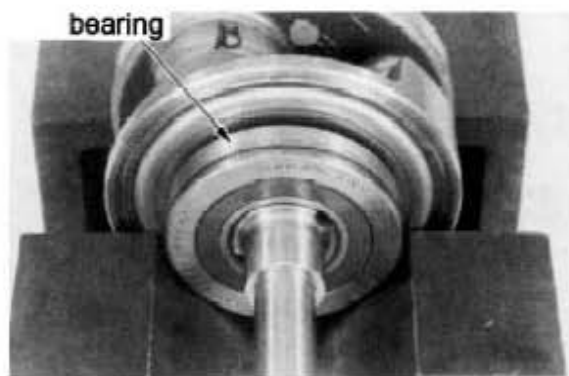
Measure inner diameter of small end of connecting rod.

Service limit: 15.05mm



CFMOTO

Turn crankshaft bearing to check if there's abnormal knocking, vibration.
If necessary, replace crankshaft.



Piston, cylinder

Check the outer surface for scrapes.

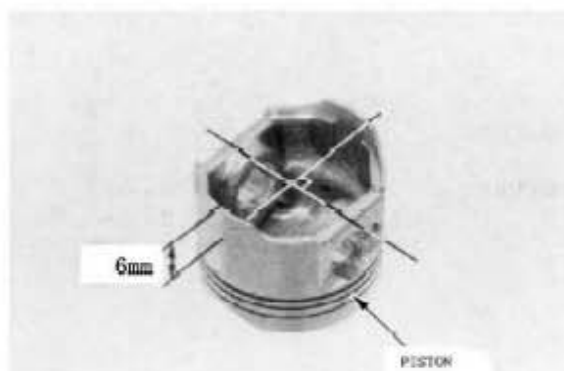
Check piston groove for wear or blockage of oil hole.

Measure outer diameter of piston at 6mm above bottom, and at the angle of 90° (right-angle) piston-pin bore.

Service limit: 52.32/57.92 mm

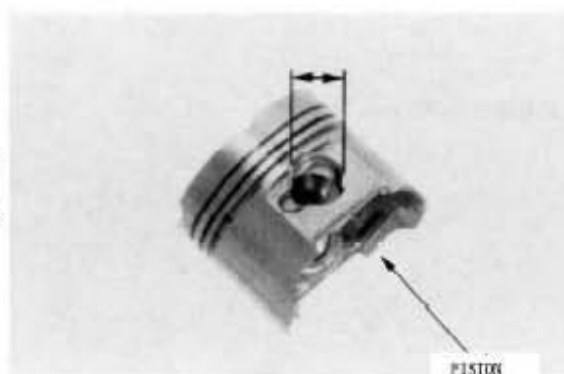
Calculate clearance between piston and cylinder. (inner diameter of cylinder: → 8-12)

Service limit: 0.08mm



Measure the piston pin aperture in the direction X and Y respectively and take the max. value as final aperture.

Service limit: 15.04mm



Measure outer diameter of piston pin at the sliding parts of piston pin and sliding part of small end of connecting rod. (total 3 points)

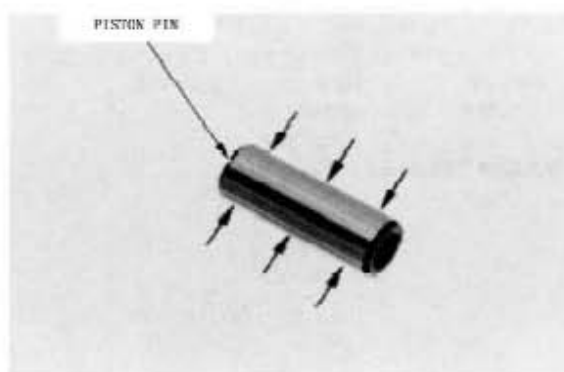
Service limit: 14.98mm

Calculate clearance between piston pin and piston-pin bore.

Service limit: 0.04mm

Calculate clearance between piston pin and small end of connecting rod.

Service limit: 0.06mm

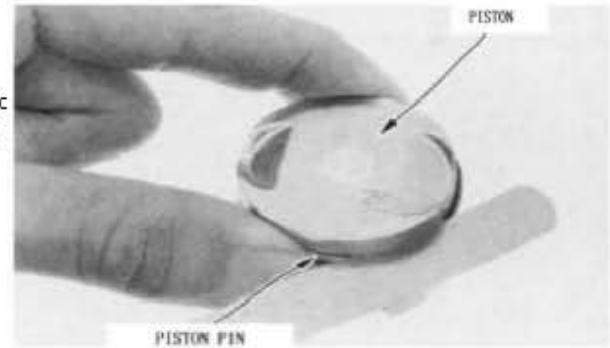


12 Crankcase, Crankshaft, Piston

Check piston ring for wear or scrapes.

Assemble piston ring into the right groove, and then press till it reaches the side face of groove. Measure the clearance between piston ring and groove with a plug ruler.

**Service limit: Top ring: 0.07 mm
2nd ring: 0.07mm**



Place piston ring horizontally into bottom of from piston top.

Measure piston ring gap with plug ruler

**Service Limit: Top ring: 0.45 mm
2nd ring: 0.45mm
Oil ring(side rails):0.9mm**



Assemble piston

Caution

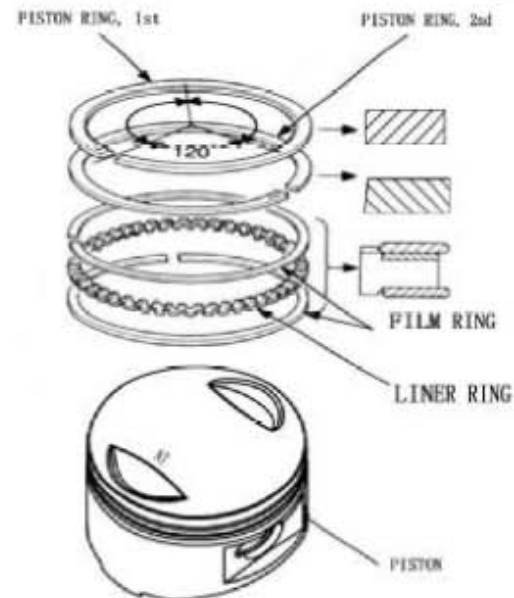
Do not damage piston ring nor piston assembling piston

Assemble piston ring onto piston, with marks to

Caution

- Top ring and 2nd cannot be interchanged
- Assemble the piston rings with Mark
- Keep the piston ring gaps staggered

After assembly, confirm piston rings can turn



Apply engine oil to small end of connecting piston pin and bore. Install piston and make sure that the 捏N? mark on piston is in the direction of valve intake when installing the crankshaft to the engine.

Install new piston pin retainer.

***Caution**

- Piston pin retainer must be firmly mounted into groove.
- Retainer end gap should be kept away from the cut of piston.



Installation of crankcase

Fix crankshaft into left crankcase immediately after crankcase heated up to 85°C in the oven. Strike crankshaft right end with wooden hammer, insuring good assembly.

Caution

Put on heat protection gloves in case of get burnt.

Apply lubricating grease to the inner lip of the new oil seal and sealant to the outer lip, install it to the left crankcase. Install dowel pin and crankcase gasket.

Assemble right crankcase

Match left and right crankcase, tighten the bolt according to the specified torque. Crankshaft should be free to turn without blockage.

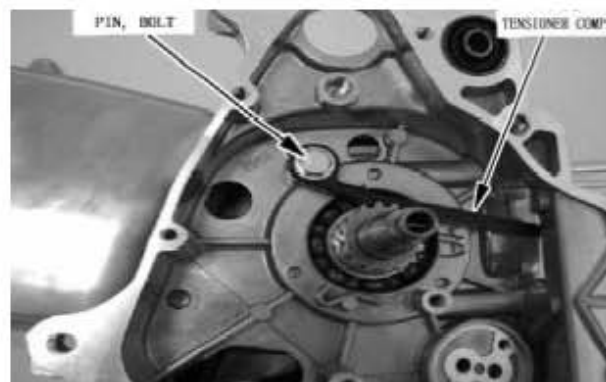
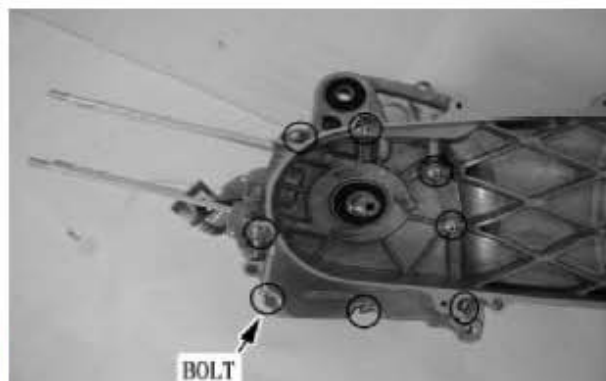
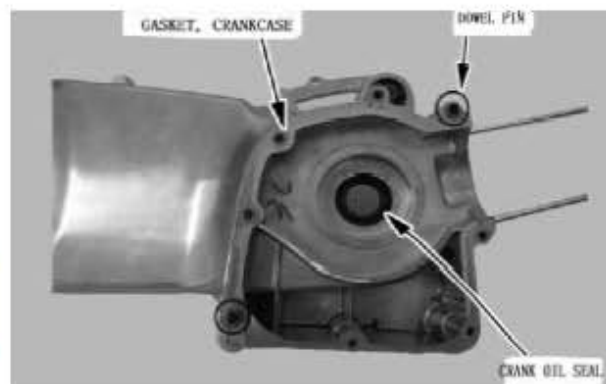
Specified torque: 12N·m (1.2kgf·m)

Caution

Tighten bolts in the flange face crossly in two or three times. Do not damage crankcase joint face while installing.

Install tensioning plate and thread pin, tighten according to specified torque

Specified torque: 13N·m (1.3kgf·m)



Installation of timing chain

Reverse the order of 12-1 for installation of engine.

13 Front wheel, braking, suspension and steering system

Overhaul information	13-1	Front shock absorber.....	13-9
Troubleshooting	13-2	Steering bar.....	13-10
Front wheel	13-3	Front fork.....	13-15

Overhaul information

Operating notes

Notes

- Securely support the scooter when overhauling the front wheel and suspension systems.
- Refer to chapter 18 for overhaul and inspection of lights, instruments and switches.
- Do not overexert on the wheel. Avoid any damage to the wheels.
- When removing tire, use the special tire lever and rim protector.

Overhaul standard

ITEMS			STANDARD	SERVICE LIMIT
Front Wheel	Front wheel axle bend		—	0.2 mm
	Vibration of wheel rim	Longitudinal	0.8 mm	2.0 mm
		Horizontal	0.8 mm	2.0 mm
	Tire	Remained Tire Thread	—	1.6 mm
		Air pressure	225 kPa (2.25 kgf / cm ²)	—
Front Brake	Free Play (Brake Lever)		10 — 20 mm	—

Tightening torque

Mounting nut, steering bar	55 N•m (5.6 kgf•m)
Nut, front wheel bearing	80 N•m (8.1 kgf•m)
Fixing bolt/nut, shock absorber	40 N•m (4.1 kgf•m)

Special tools

Shaft, bearing remover	07746-0050100
Remover head 10mm, bearing remover	07746-0050200
Handle A, press tool	00749-0010000
Press tool outer sleeve	07946-1870100
Guide tool 10mm	07746-0040100
Locknut spanner	07916-KM10000
Bearing adjusting spanner, steering column	07SMA-GBC0100
Bearing remover set,	07JAC-PH80000
Rotor puller	07JAC-PH80100
Remover shaft	07JAC-PH80200
Remover hammer	07741-0010201
Bearing seat mounting tool A 27x47mm, steering column	07YMF-GEE0100
Bearing seat mounting tool B 30x47mm, steering column	07YMF-GEE0200
Assembling tool shaft	07VMF-KZ30200

Troubleshooting**Heavy steering**

- 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

- Steering bearing is damaged, or not well tightened.
- Right and left shock absorbers are not matched.
- Front wheel axle is distorted,
- Frame is deformed
- Worn tire
- Rocking of wheel bearing
- Engine fixing part is rocking. (refer to chapter 7)

Front wheel wobbles

- Deformed rim
- Faulty wheel bearing
- Faulty tire
- Improper balance of wheel
- Improper tightening of wheel axle

Wheel cannot turn freely

- Wheel bearing is faulty.
- Front wheel axle is bended.
- Brake drag

Too soft front suspension.

- Weakened front shock absorber
- Low tire pressure

Front suspension is too hard.

- Front shock absorber is bended.
- Tire pressure too high.

Abnormal noise with Front absorber

- Faulty front shock absorber
- Loosening of tightening parts of front shock absorber

Poor brake

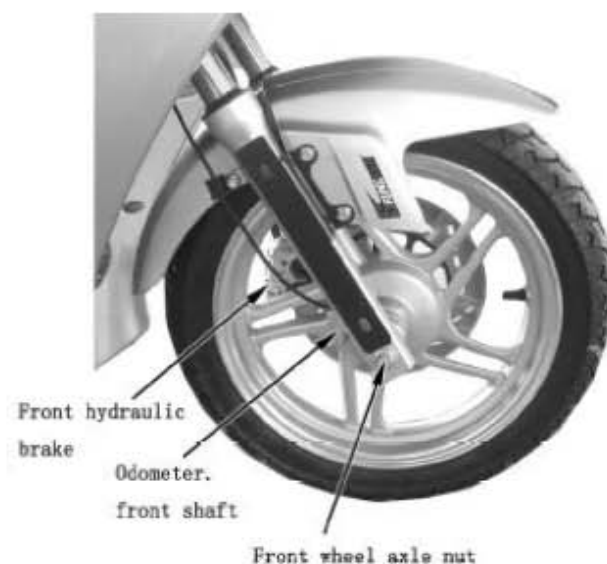
- Improper brake adjustment
- Stained or damaged brake disc.
- worn brake shoe.

13 Front wheel, braking, suspension and steering system

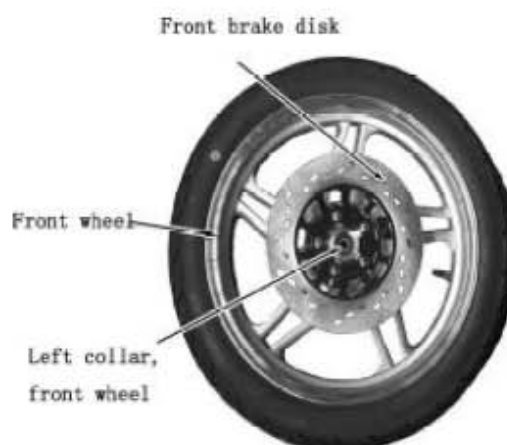
Frontwheel

Removal

Support the frame with jack, raise the front wheel, remove front wheel axle nut.



Remove front wheel axle, remove brake disk from brake calipers, remove front wheel.



Remove counter.



13

CFMOTO

Remove axle collar from front left side of wheel.

Left collar, front wheel

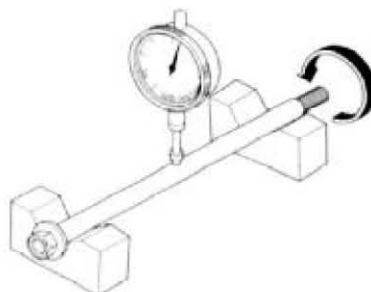


Inspection

Wheel axle

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

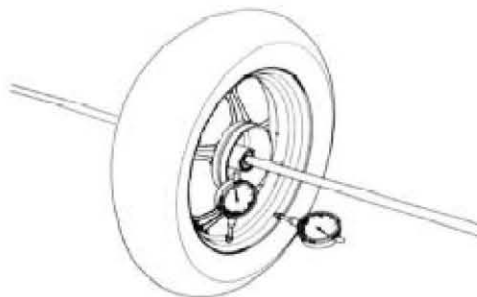
Service Limit: 0.2mm



Rim

- 13** Check the rim for damage, warpage or scrapes.
Replace with a new one, if any.

Slowly turn the wheel, and measure the tire wobble with a centesimal meter.



Service limit: Axial: 2.0mm

Radial: 2.0mm

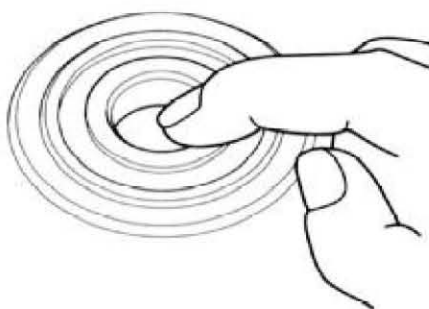
Wheel bearing

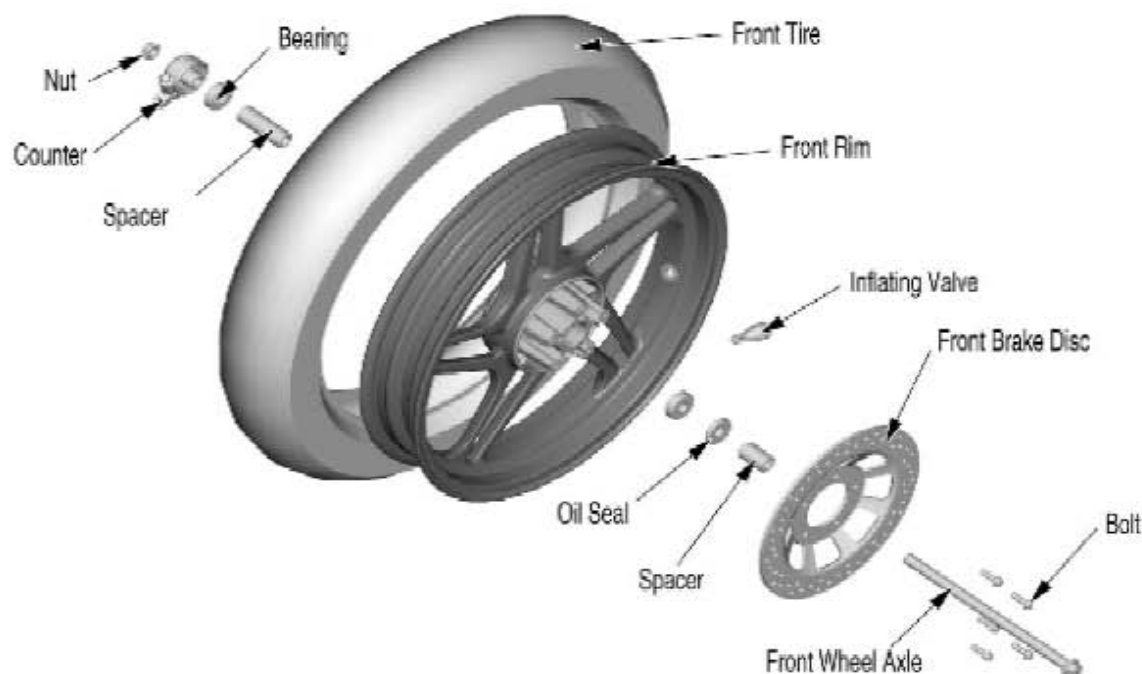
Turn the inner ring of the bearing with finger to check if it can turn smoothly, Check if there is any looseness when installed on the hub.

Replace with a new one in case it cannot turn smoothly, or with abnormal noise or any rocking.

Note:

Replace the bearings by set (L&R).





Diassembly

Remove oil seal.

Install the rem over head on the rim

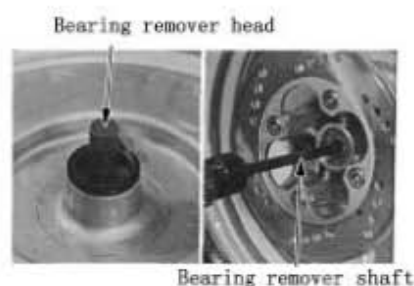
Install the bearing rem over shaft on the rem over head from the reserve side, strike in and remove the bearing.

Remove spacer.

Special tool:

Bearing rem over shaft 519-922-070001

Bearing rem over head 12mm 519-922-070002



Note:

Replace the bearings by set. Do not use the disassembled bearings.

Remove five bolts from brake disc, and remove brake disc.

Inspection

Brake disc thickness: $< 3\text{mm}$ → Replace



Bolt, Brake Disk

Remove bolt1, bolt2 and brake calipers comp.

Inspection

Brake caliper: check brake calipers for cracks or oil leakage from the tightening parts. Replace, if any.

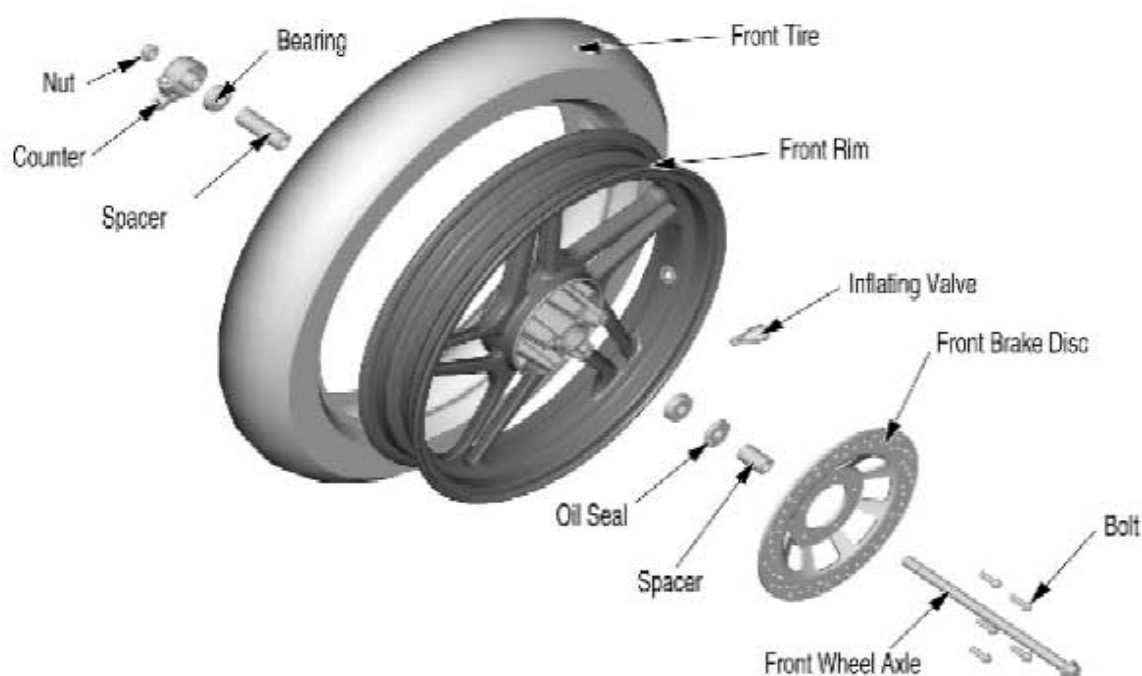
13



Front Wheel Axle Nut

Front Hydraulic Brake

Assembly



Assemble spacer

Apply lubrication grease to the running part of new bearings, press the left side bearing first.

Install spacer.

Install right side bearing.

Special tools:

Handle A ,press tool A 519-922-070003

Press tool outer sleeve 28x30 519-922-070004

Guide tool 12mm 519-922-070005



Note:

Press the bearing horizontally.

Apply grease to the protruding part of odometer gear guard ring.

Apply grease to the gearing and sliding parts of odometer gear.

Install with the groove part of odometer gear in line with the protruding part of guard ring.

Installation

Install front wheel with the brake disk in line with brake bracket.

Note

Make sure counter comp is in line with front fork block.

Install front wheel axle and tighten nut.

Tightening Torque: 80-90N·m (8.0-9.0kgf·m)



Counter

13

Install odometer flexible shaft cable to the counter comp, and tighten the small screw.

Tightening Torque: 3.0-5N·m (0.35-0.5kgf·m)



Front wheel axle nut

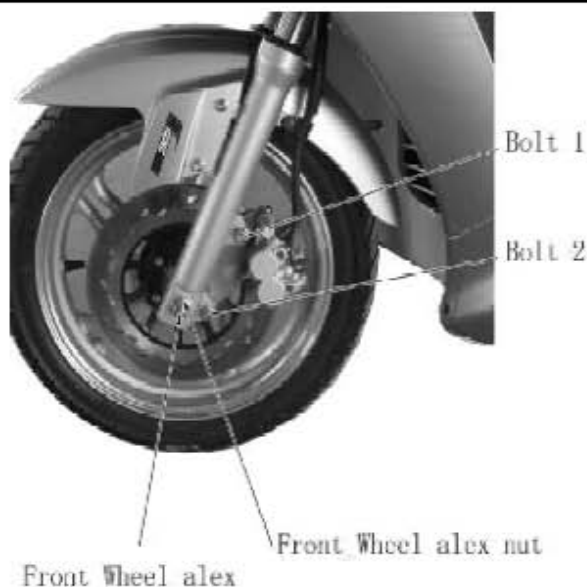
Brake disk

Front Shock Absorbers

Disassembly

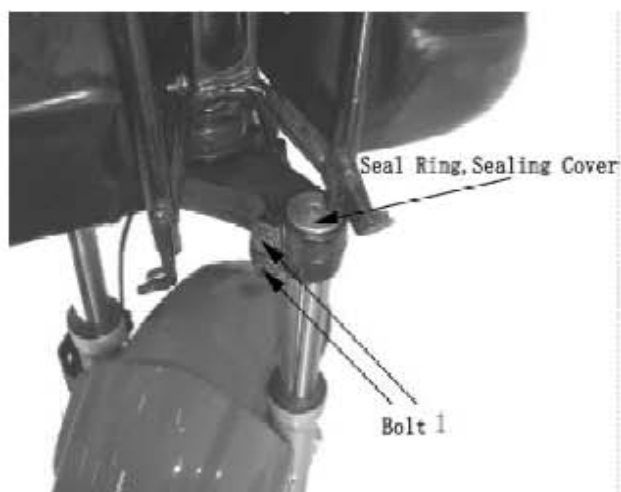
Remove:

- Front wheel (→ 13-3)
- Two Bolt 1
- Four fixing screws(L&R), sealing cover and seal ring.



Caution:

There should be no damage with the seal ring.



Remove shock absorbers

Caution:

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

Inspection:

Oil leakage, aged or damaged oil seal → Replace



Installation

Install the shock absorber.

Install the seal cover and seal ring of shock absorber.

Tighten according to the specified torque.

Tightening Torque: $50\text{N}\cdot\text{m}$ ($5.1\text{kgf}\cdot\text{m}$)

Install the tightening bolt 2 of absorber, and tighten it according specified torque.

Tightening Torque: $40\text{N}\cdot\text{m}$ ($4.1\text{kgf}\cdot\text{m}$)

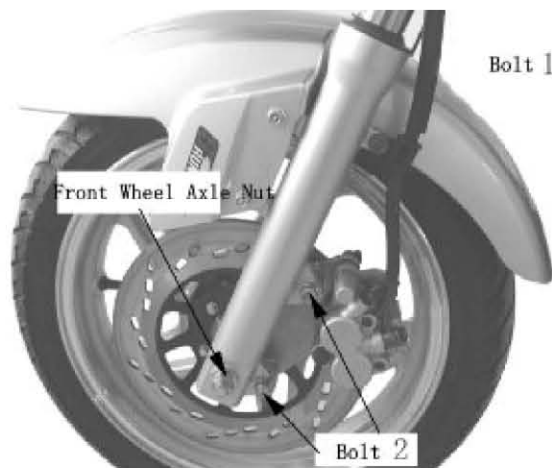
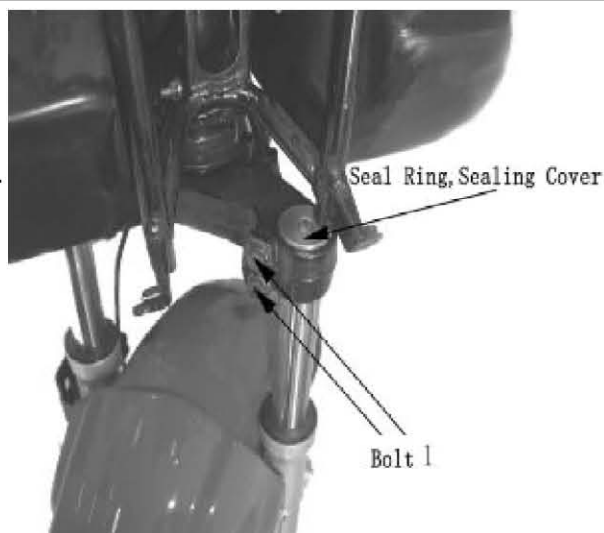
Install front wheel. (→ 13-3)

Install brake caliper comp:

Set the brake clipper on the brake disk, install bolt 2, and tighten brake clipper comp according to the specified torque.

Tightening Torque: $40\text{--}50\text{N}\cdot\text{m}$ ($4.1\text{--}5.1\text{kgf}\cdot\text{m}$)

Install bolt 1, and fix front brake hose comp.



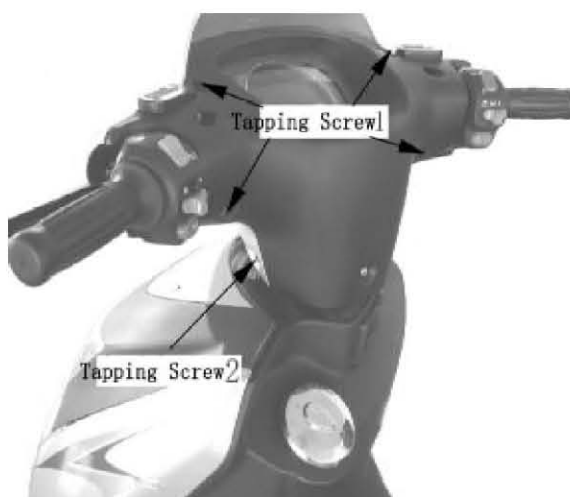
13

Handlebar

Handlebar front Cover

Remove:

- Tapping screw1 (→ 13-12)
- Screw 2 (2 pcs, L & R)
- 4P coupler of headlight
- front cover with headlight.



Installation

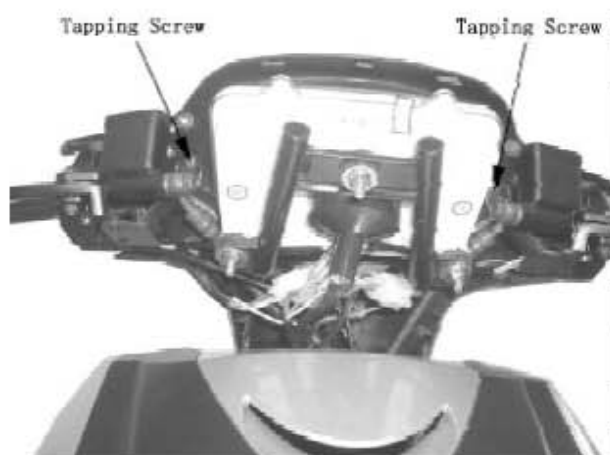
Reverse the removal procedure for installation

13 Front wheel, braking, suspension and steering system

Handlebar rear cover

Removal:

- Handlebar front cover (→ 13-10)
- Two tapping screws
- Screw 3
- Handlebar rear cover



Installation:

Reverse the removal procedure for installation.

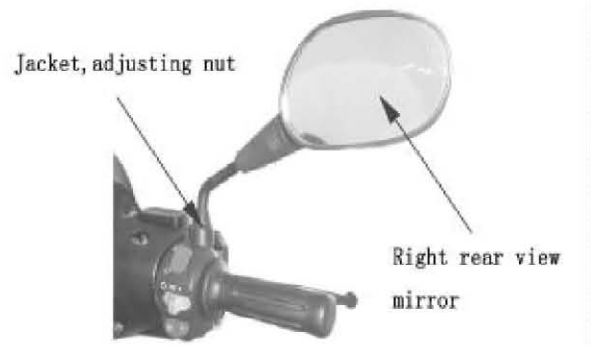


13

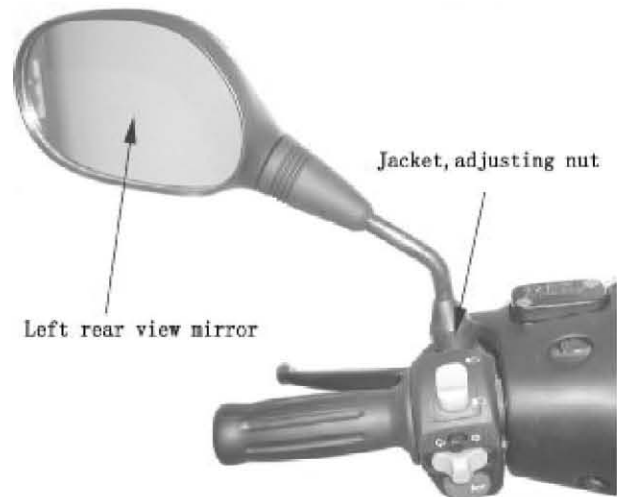
Rear View Mirror

Disassembly

Turn up jacket, loosen nut counter clock-wise, remove left rear view mirror by turning it counter clockwise.



Turn up jacket, loosen nut clock-wise, remove right rear view mirror by turning it clockwise.



13

Installation:

Reverse the removal procedure for installation

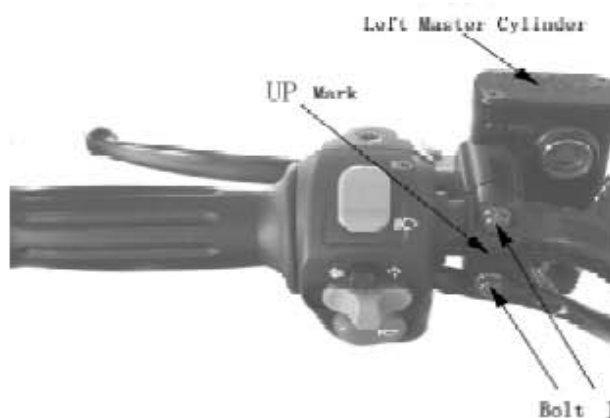
Master Cylinders

Removal:

- Rear View Mirror (→ 13-12)
- Handlebar front cover (→ 13-10)
- Handlebar rear cover (→ 13-11)
- Bolt 1,

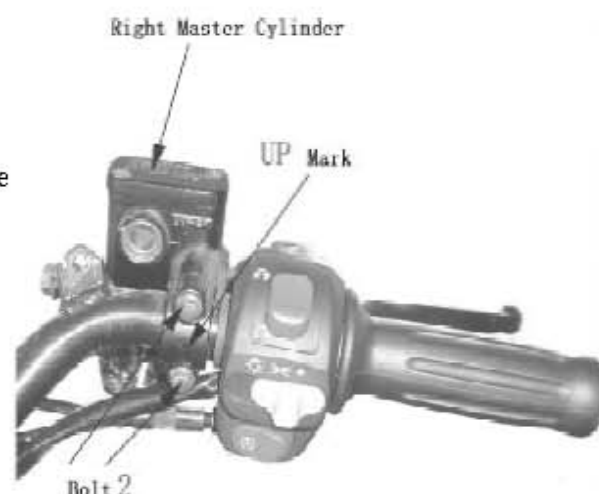
Loosen brake cable coupler,
remove left master cylinder

Refer to above for removal of right master cylinder.



Caution:

1. Do not hang the master cylinders with brake hose
 2. Maintain the master cylinders in the installation position and fix them onto the handlebar.
- Placing the master cylinders upside down may cause entrance of air into the hydraulic system.



Installation

Reverse the removal procedure for installation.

Note: Keep the UP mark of brackets upwards and install master cylinders.

Fit the bracket positioner with handlebar position hole and install bolt.



Handlebar

Removal:

- L & R rear view mirrors (→ 13-12)
- Handlebar front cover (→ 13-10)
- Handlebar rear cover (→ 13-11)
- L & R master cylinders (→ 13-13)
- Screw 3, throttle seat and cable, throttle grip
- Nut, Bolt 3

Remove Handlebar



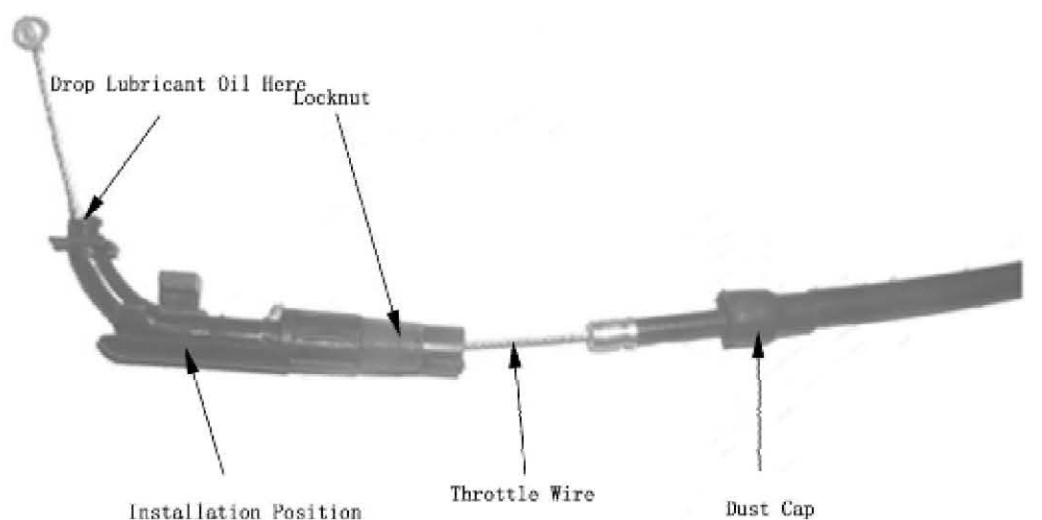
Installation

Reverse the removal procedure for installation

Caution:

1. Tightening torque for handlebar bolt: 50~60N•m
2. Main cable, throttle cable, brake hose, etc should be routed properly (→ 1-19)
3. Couplers and plugs should be plugged properly.
4. When installing throttle cable, turn open the dust cap and drop some lubricant oil along the steel wire.
Pull the steel wire back and forth for lubricating purpose and then tighten Locknut.
5. When installing throttle grip, apply lubricant grease to inner side of grip and the sliding face between throttle grip and handlebar.
6. Install rear view mirrors.

please note that the left rear view mirror is right thread
and the right rear view mirror is left thread.



13 Front wheel, braking, suspension and steering system

Front Fork

Remove:

- Front top cover (→ 2-9)
- Front Wheel (→ 13-3)
- Front Fender (→ 2-11)
- Front shock absorbers (→ 13-9)
- Handlebar (→ 13-13)
- Steering column locknut

Special tool:

Locknut spanner: 519-922-050002



Remove thrust washer.

Remove bearing retainer.

Special tool:

Steering column adjusting spanner

519-922-050002

Remove:

—Upper ball retainer

—Front fork

—Lower ball retainer



Set special tool to the frame standpipe and remove lower bearing race.

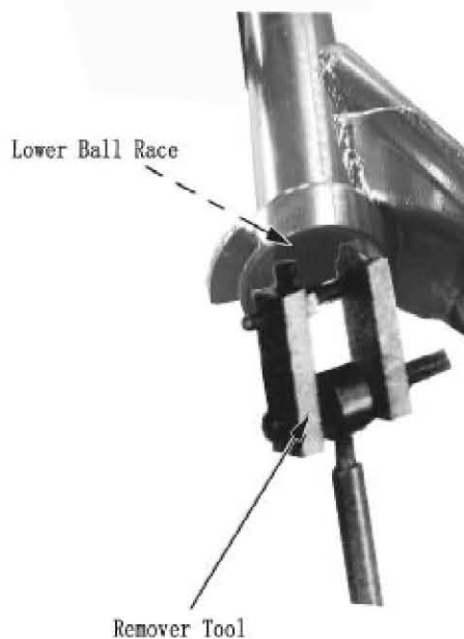
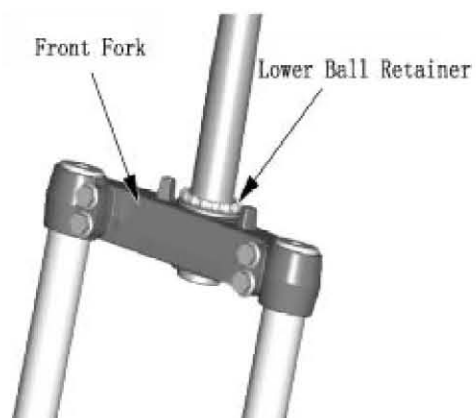
Special tool:

Bearing remover comp 519-922-050000

Rotor puller 519-922-050010

Remover shaft 519-922-050003

Remover hammer 519-922-050004



13 Front wheel, braking, suspension and steering system

Install special tool on the rectangular tube of the stand and remove upper ball race.

Special tool

Bearing remover comp 519-922-050000

Rotor puller 519-922-050010

Remover shaft 519-922-050003

Remover hammer 519-922-050004

Installation

Install new lower ball race and special tools as listed below to the steering column.

Special tools

Tool A, steering column bearing retainer

519-922-050005

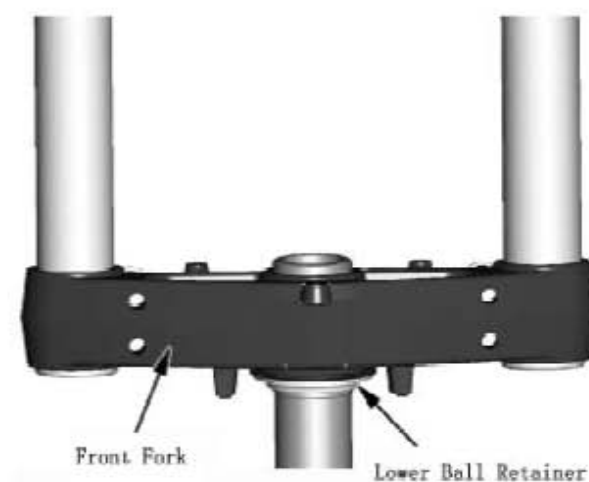
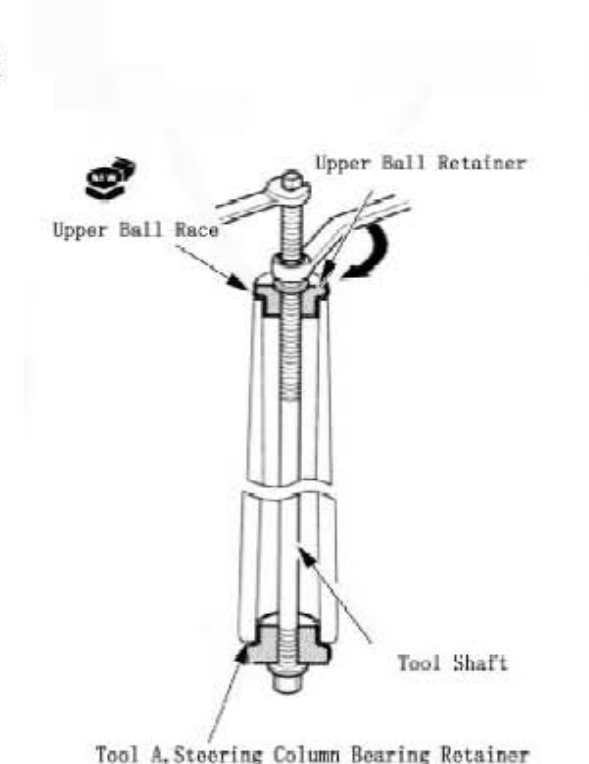
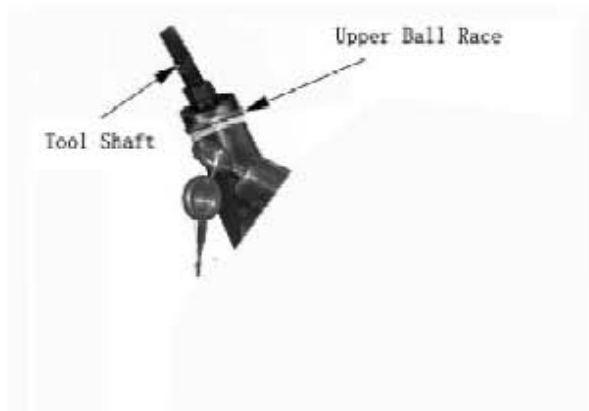
Tool shaft 519-922-050006

Tool B, steering column bearing retainer

519-922-050007

Tool shaft 519-922-050008

Hold installation tool shaft, tighten the locknut while pressing the lower ball race into steering column.



Install new upper ball race on the steering column with tools listed below:

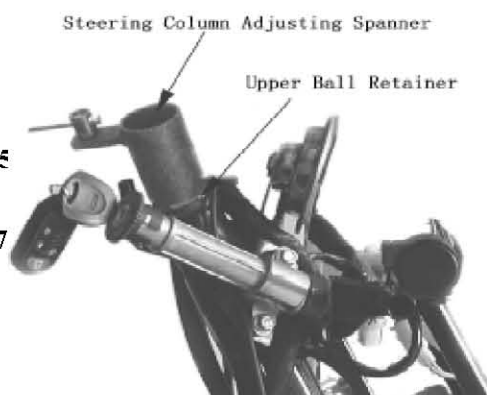
Special tools:

Tool A, steering column bearing retainer 519-922-050005

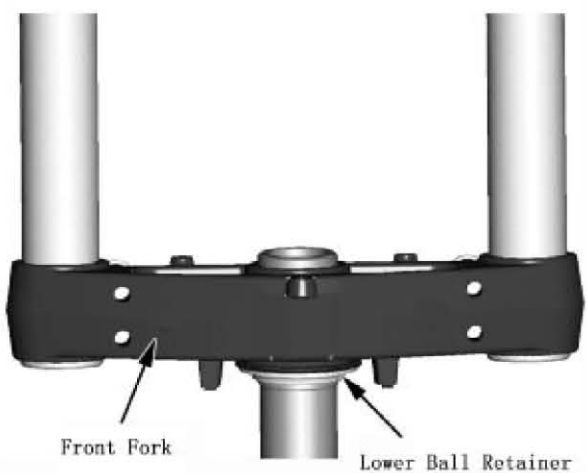
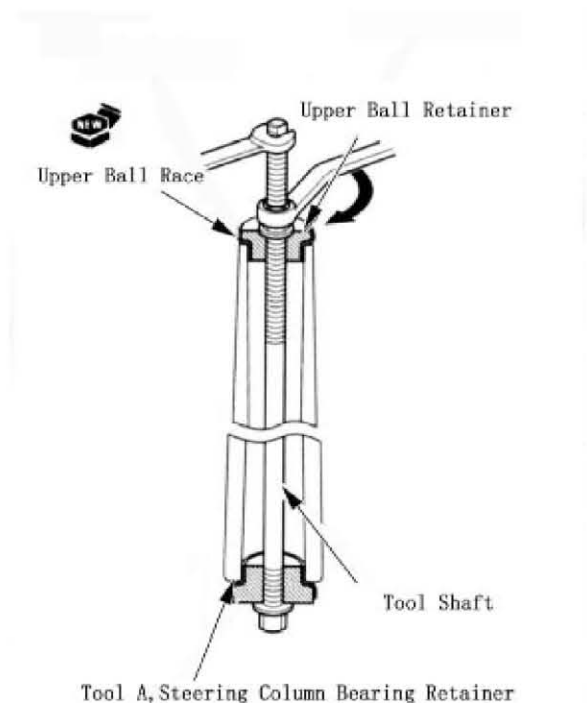
Tool shaft 519-922-050006

Tool B, steering column bearing retainer 519-922-050007

Tool shaft 519-922-050008



Hold installation tool shaft, tighten the locknut while pressing the upper ball race onto steering column.



Replacement of lower bearing retainer

Remove lower bearing retainer.

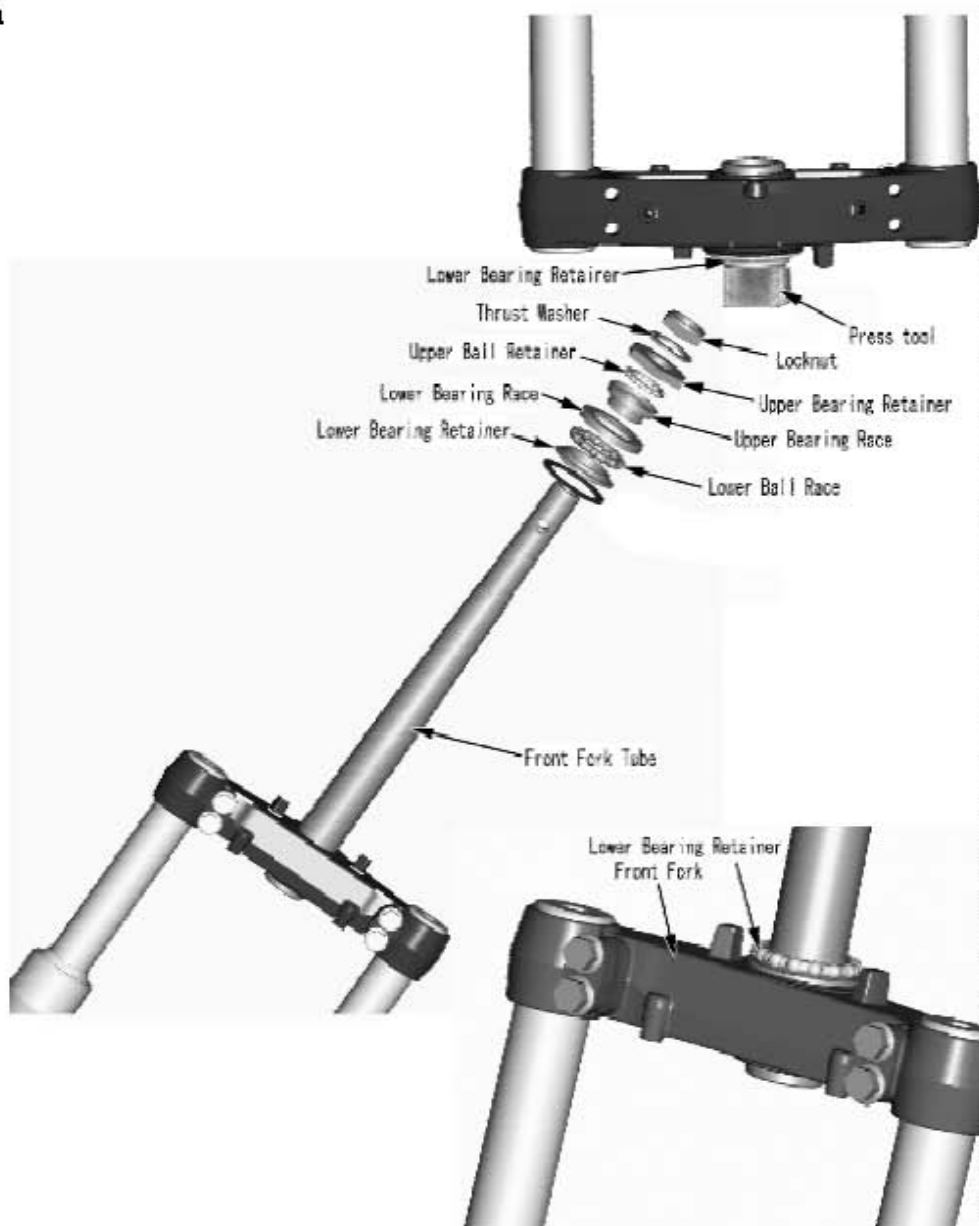
13 Front wheel, braking, suspension and steering system

Press new lower bearing retainer onto front fork with special tool and press machine.

Special tool:

Front fork cover, press tool 519-922-050009

Installation



Apply lubrication grease on new lower bearing, and then install front fork.

Applying lubrication grease on new upper bearing and install.

Install upper bearing retainer,
Tighten it according to the specified torque

Special tool

Adjusting wrench, steering column bearing:

519-922-050002

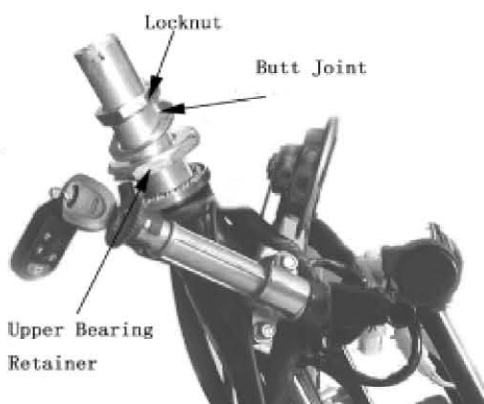
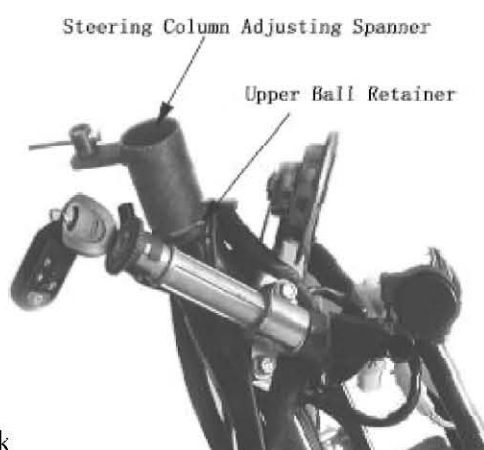
Torque: $10\text{N}\cdot\text{m}$ ($1.0\text{kgf}\cdot\text{m}$)

Turn front fork left and right several times to the block
(limit position), and make block and bearing match
well.

Loosen steering column upper bearing retainer.
Tighten upper bearing retainer with hand, then loosen
(turn back) by $1/8$ circle.

Set lock washer claw with front fork groove and
install lock washer.

Install steering column locknut.



13

Special tool

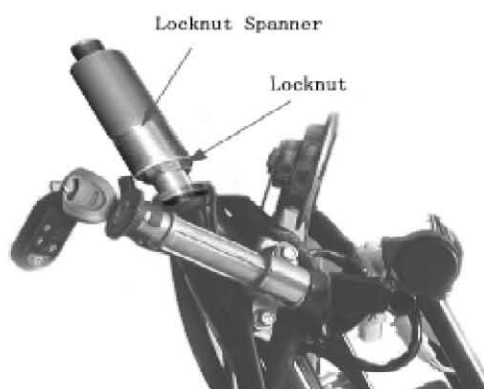
Locknut spanner 07916-KM10000

Tightening Torque: $68\text{N}\cdot\text{m}$ ($7.0\text{kgf}\cdot\text{m}$)

Turn front fork left and right several times and
make sure there is no vertical rocking motion and
the front fork can turn smoothly.

Install following spares

- Handlebar (→ 13-13)
- Front Shock absorber (→ 13-9)
- Front fender (→ 2-11)
- Front wheel (→ 13-3)
- Front top cover (→ 2-9)



14 Rear wheel, Brake, Suspension

Overhaul information.....	14-1	Rear fork	14-4
Troubleshooting	14-2	Rear shock absorber.....	14-5
Rear wheel	14-3		

Overhaul information

Operating notes

Notes

- Securely support the scooter when overhauling the rear wheel and suspension system.
- Use genuine parts of bolts and nuts for rear shock absorber.
- Do not overexert on the wheels and avoid damage to the wheels.
- When removing tire from rim, use special tire lever and rim protector to avoid damage to the rim.

Overhaul standard

Item			Standard	Limit
Rear wheel	Vibration of Wheel rim	Longitudinal	—	2.0 mm
		Horizontal	—	2.0 mm
	Tire	Remained tire thread	—	1.6 mm
		Air pressure	225 kPa (2.25 kgf / cm ²)	—
Rear brake	Free play (brake lever)		10 ~ 20 mm	—

Tightening torque

Rear wheel axle nut	140N•m (14.3kgf•m)
Shock absorber upper mounting bolt	55N•m (5.6kgf•m)
Shock absorber lower mounting bolt	30N•m (3.1kgf•m)
Rear fork mounting bolt	55N•m (5.6kgf•m)

Troubleshooting

Rear Wheel wobbles

- rim warpage.
- faulty tire.
- lower tire air pressure
- improper wheel balance
- faulty tightening of wheel axle nut.

Rear shock absorber is too soft

- weak spring.
- oil leakage with rear shock absorber

Rear shock absorber is too hard.

- bent rear shock absorber
- higher tire air pressure

Poor brake effect

- faulty brake adjustment
- Stained brake shoe or brake disk
- worn or damaged brake shoe.

Rear Wheel

Removal

Securely support the scooter with main stand.

Remove:

- Rear wheel fender (→ 2-11),
- Muffler (→ 2-13),
- Rear right shock absorber (→ 14-5),
- Rear brake caliper (→ 14-6),
- Rear fork (→ 14-4),

Remove Rear fork inner collar

Remove rear wheel.

Inspection

Rim:

Check rim for damage, deform or scrapes.

Refer to page 13 — 4, and measure the play of rim by centesimal meter.

Replace rim in case of any damage, deform or scrape

Service Limit: Axial: 2.0mm

Radial: 2.0mm

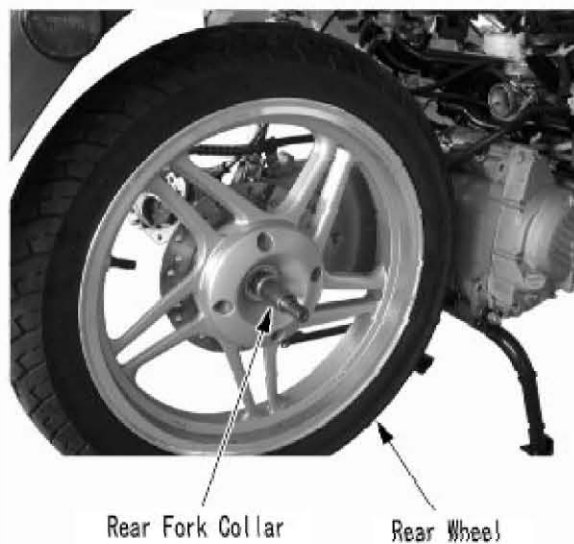
Installation

Reverse the removal procedure for installation.

Apply thread glue on the thread and joint face of rear wheel nut.

Tighten it according to specified torque.

Tightening Torque: 140N•m (14.3kgf•m)

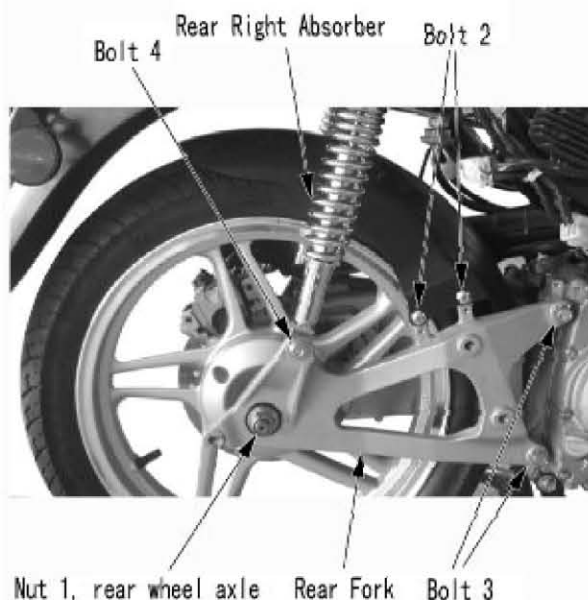


Rear Fork

Removal:

- Muffler (→ 2 - 1 3),
- Bolt 4, Rear right absorber
- Nut 1, rear wheel axle
- Bolt 2 (2 pcs)
- Bolt 3 (2 pcs)

Remove rear fork.



Disassembly of rear fork

Remove front oil seal 1, rear oil seal 6 and clamp 5.

Remove bearing 4 with special tool.

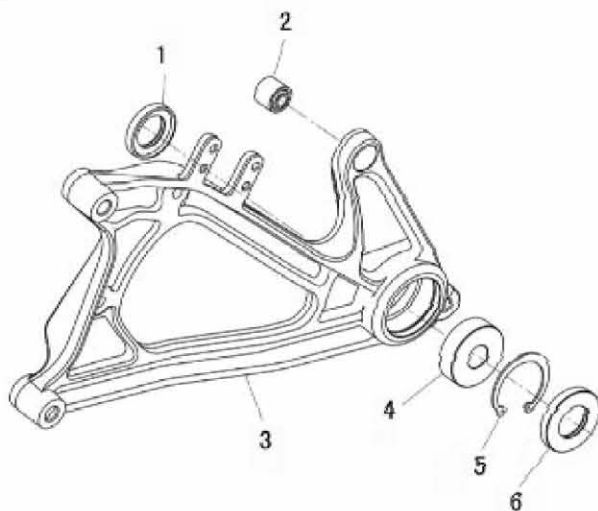
14

Inspection:

Check bearing for smooth turning and balls for damage.
Replace with a new one if any.

Installation:

Press in the bearing with special tool;
Install Clamp 5, Oil seal 1 and Oil Seal 6,
Reverse the removal procedure for installation
of rear fork.
Tighten the bolts and nuts according to the specified
torque.



Rear Shock Absorber

Rear Left Absorber

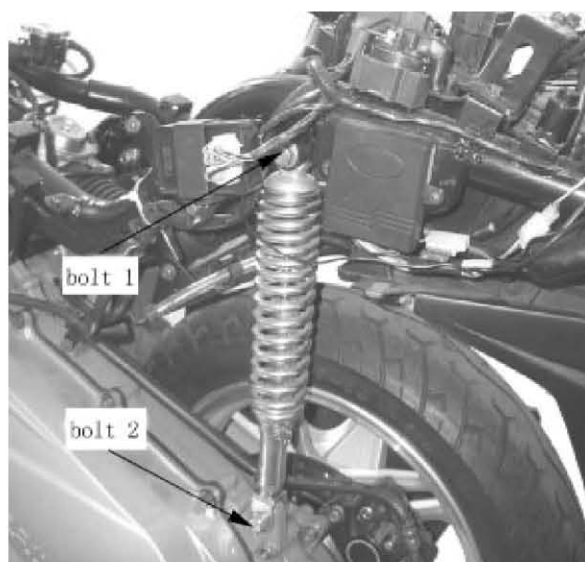
Removal:

Securely support scooter with main stand.

- Maintenance cover (2-2)
- Seat (2-2)
- Storage compartment (2-3)
- Rear bracket (2-4)
- Rear Joint plate (2-5)
- Left protecting plate (2-5)

Remove Bolt 1 and Bolt 2 of rear left absorber.

Remove rear left absorber.



Rear Right Absorber

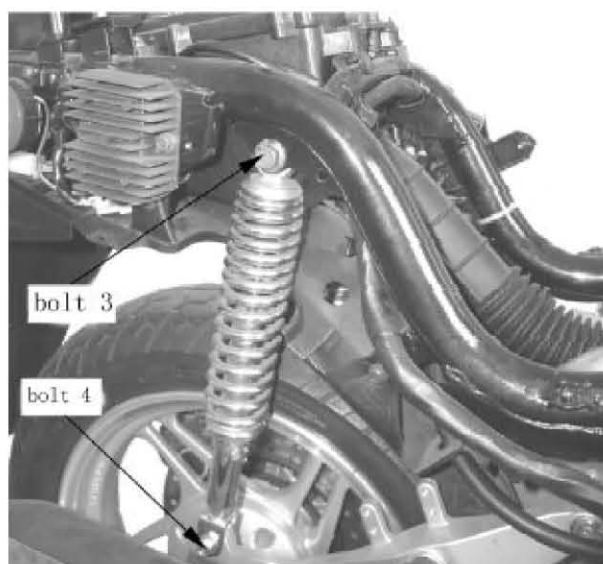
Removal:

Securely support scooter with main stand,

- Maintenance cover (2-2)
- Seat (2-2)
- Storage compartment (2-3)
- Rear bracket (2-4)
- Rear Joint plate (2-5)
- Left protecting plate (2-5)
- Right protecting plate (2-5)
- Muffler (2-13)

Remove Bolt 3 and Bolt 4 of rear right absorber.

Remove rear right absorber



Inspection

Check shock absorbers for oil leakage and rubber spacer for aging. Replace with new ones if any.

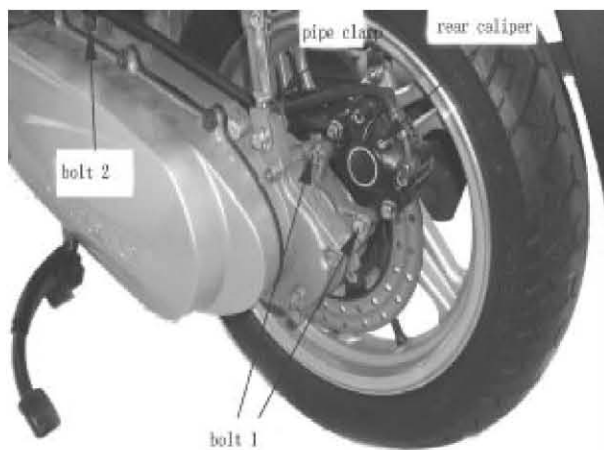
Reverse the removal procedure for installation.
Tighten the bolts according to the specified torque.

Upper fixing bolt:

Torque: 55N•m (5.6kgf•m)

Lower fixing bolt:

Torque: 30N•m (3.1kgf•m)



Rear Brake

Rear brake caliper

Removal:

Remove Bolt 2

Remove rear brake caliper.

Inspection

Check rear brake caliper for cracks, oil leakage with tightening parts.

Replace , if any.

Check brake pad for wearing and damage

(→ 3 - 6) 。



Rear Brake Disc

Inspection

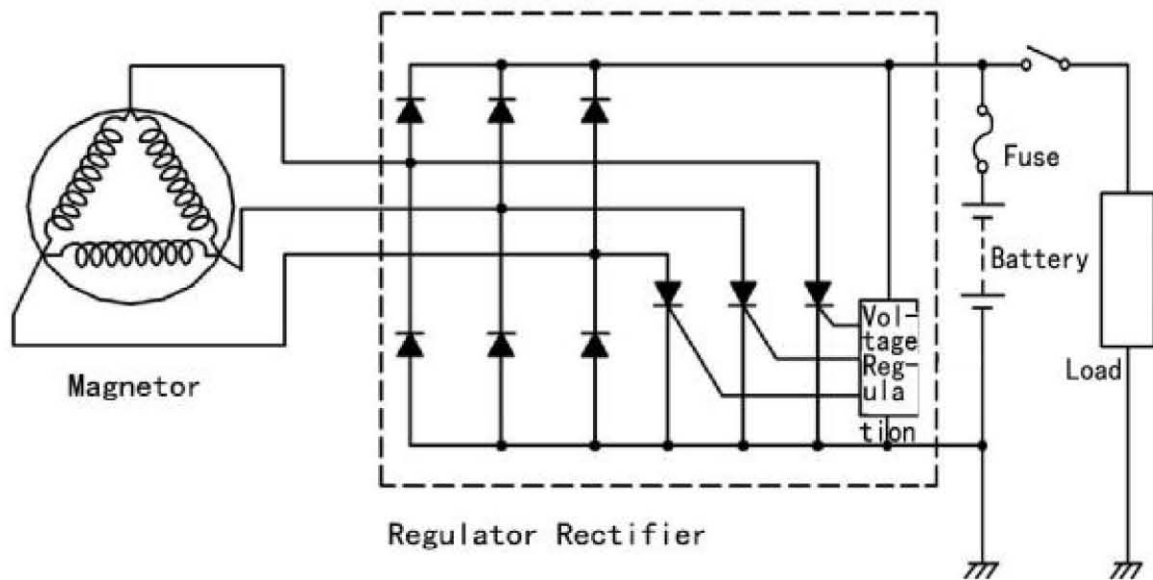
Check sliding part of disc for wearing or damage.

Replace the brake disc if the thickness is less than 3mm.

15 BATTERY, CHARGING SYSTEM

charging system configuration.....	15-1	charging system inspection.....	15-5
overhauling information.....	15-2	regulator rectifier	15-6
fault diagnosis.....	15-3	ACmagneto inspection.....	15-8
battery.....	15-4		

charge circuit diagram



specific configuration refers to
15-9

specific circuit diagram refers to
section 19 electrical diagram.

Overhauling information

Operation notice

Attention

- normally charge donot creat hydrogen, but overcharge will, so keep away from the fireworks when charging.
- electrolyte (dilute sulphuric acid) is a strong corrodent, stain on clothes, skin, eye will cause burn, blind. wash with plenty water if stained, if get into eyes, wash with plenty of water immediately and go to special hospital for treatment. electrolyte stained on clothes may touch the skin, burn the clothes itself, thus you must replace the stained clothes, wash off electrolyte.

Attention:

- electrical element can cause spark when assembling&disassembling within current, this will cause rectifier and other electrical element damage, so you must turn off the ignition switch before operation.
- you must take down battery from the body when charge, but cannot open battery fluid palate.

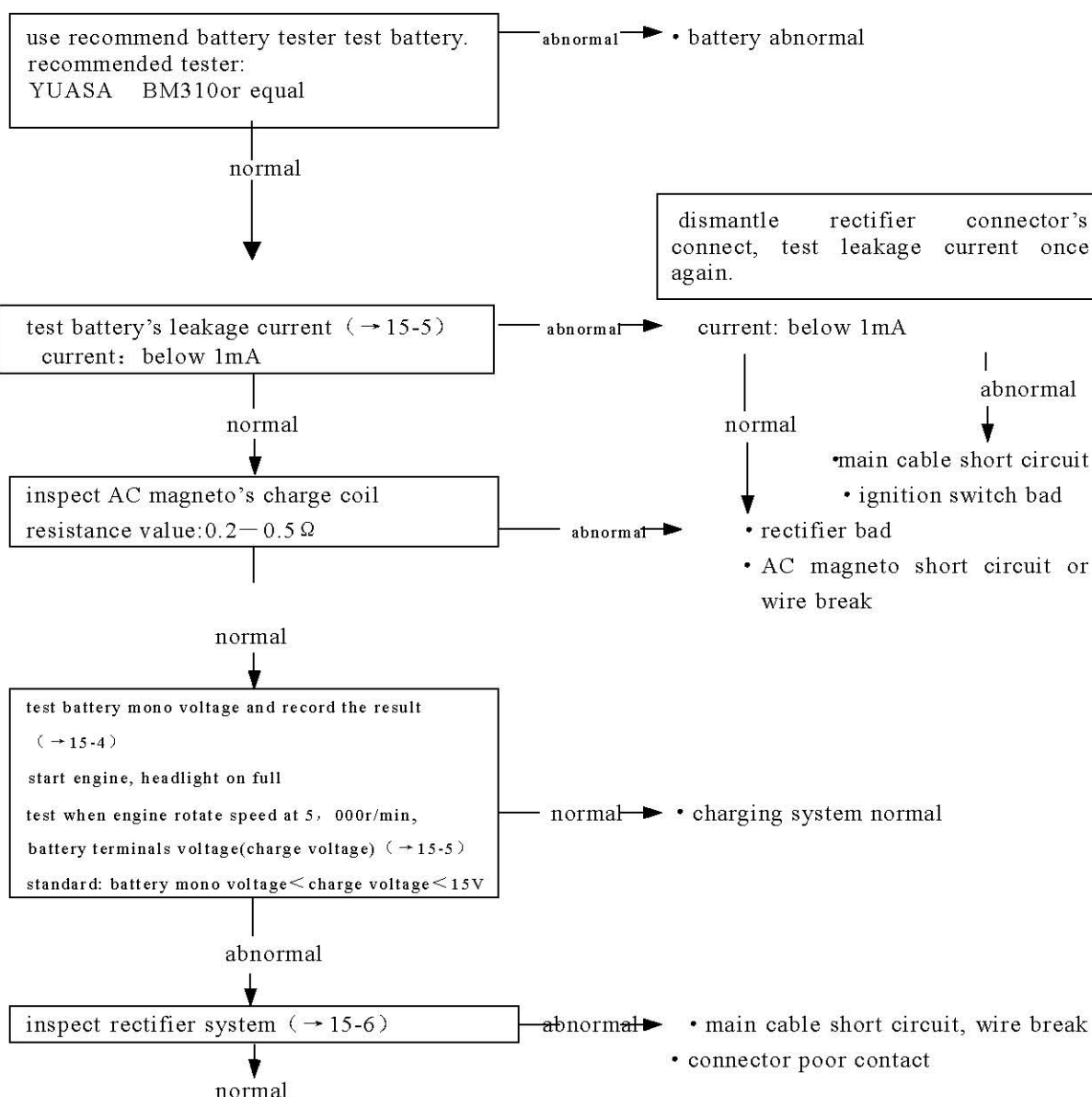
Attention:

New battery is required when the old one end of life.

- you must turn off the igniton switch before dismantle the electric elements.
- when keep the battery on the vehicle, you must remove battery cathode connecting wire.
- fast charging can cause battery short life.
- if battery repeatedly fully charge or discharge, or place for a long time, this will cause battery damage, life shortage, lower capacity. besides, even normal useage, after 2-3 yars, battery capacity also be lower. old (low capacity) battery voltage will recover after charge, but load capacity bad, new battery is needed.
- opening (terminal voltage) below 12.4V, do normal charge to terminal voltage reach 12.4V.
- charging system' s inspection should carry on according to the fault diagnosis form sequence (→ 15-3)
- charging system elements configuration refers to 15-9 diagram.
- AC magneto' s dismantling refers to section 11.
- battery inspection carry on according to the battery tester' s operation instruction.

Overhauling standard

Item			Standard
AC Magneto	type		Permanent magnet AC system
	output		Three phase current
	Charge coil resistance (20℃)		0.2 ~ 0.5 Ω
Rectifier type			Three phase circular commute, it can control parallel voltage
Battery	capacity		12V10Ah
	Leakage current		Below 1mA
	Inter terminal voltage	Fully charged	12.8V
		Undercharge	Below 11.8V
	Charge current / time	Normal	0.9A / 5 ~ 10 hour
		Fast	4A / 1h

Fault diagnosis**Battery overflow**

Battery

Disassembling

Attention

Turn the ignition switch to

“” before operation remove foot

pedal

remove maintain cover (→ 2-2)

remove bolt 1, bolt 2, remove battery fixing plate, loosen negative terminal bolt, take apart the battery negative terminal, remove post head rubber cap, remove positive post head screw, remove battery positive wire coupling.

Assembling

Assembling do according to the oppsite sequence of disassemble.

Attention

- coat post head with clear grease after assembling.
- fix the cover firmly in positive post head after assembling.

Testing

Test voltage between battery terminals, inspect testing state.

entire testing: 12.8V

short: below 11.8V

do supplementary charging when undercharge.

Attention

When do supplement charging after charge, testing voltage between the terminals should be after charge 30mins so that you can test it accurately.

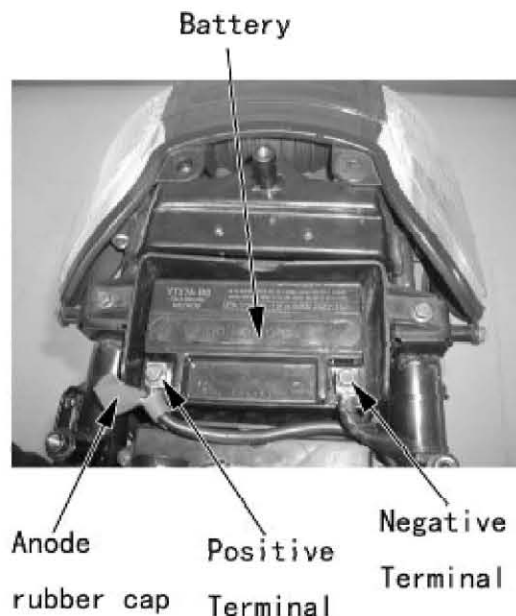
Battery charging

Attention

Normally charging donot creat hydrogen, but overcharge will produce gas, so keep away from the fireworks when charging.

Charging according to the labell for charging current and charging time.

Remove the battery (refers to above content)



connect charger' s anode to it' s positive terminal.

connect charger' s cathode to battery' s negative terminal.

charge current × time: standard: $0.9A \times 5 \sim 10$ Hour

fast: $4.0A \times 1.0$ hour

Attention

- Avoid to the battery liquid tempreture exceed $45^{\circ}C$. when higher, reduce the current as adjustment.
- fast charging will cause battery damage, life shortage, so try not to use this way of charge.

Charging system inspection

charging state inspection

remove battery (→ 15-4), fit on fully charged battery.

Turn the ignition switch to “”

After engine warm up, connect voltmeter to battery' s terminals.

Attention

- take care short circuit when testing.
- ignition switch must be turn off before disassembling&assembling or else will destroy multimeter and electric fittings.
- you required to test the battery whitch fully charged.

Headlights on full beam before start the engine. Increase engine speed slowly, when reach appointed speed, ($5,000r/min$), normally $13.5 \sim 15V$, test the voltage between terminals.



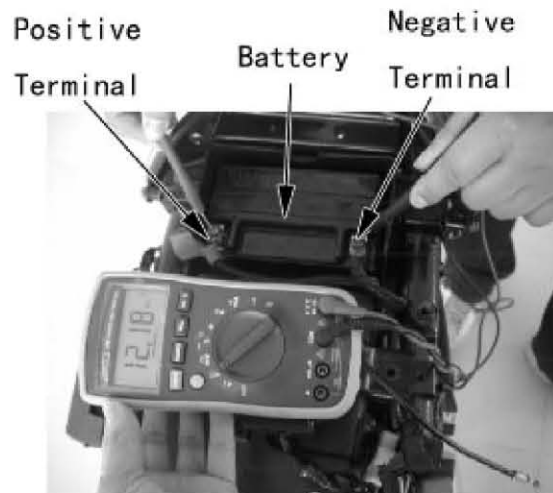
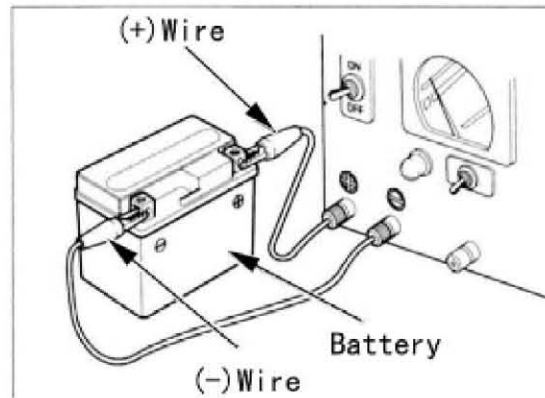
Standard:

battery mono voltage < charging voltage < $15V$ ($5,000rpm$)

Electrical leakage test

remove maintain cover (→ 2-2)

Turn ignition switch to “ ”, then remove cathode from the battery.



remove the fuse.

Take apart the connection of ECU connector

Connect amperemeter between battery negative terminal and cathode.

Testing when ignition switch at "X" s current leakage.

Attention

- when current bigger than measuring range, fuse will burn out. So measuring from wide range to small range step by step.
- when measuring current, donot turn on ignition switch, because when current too big will burn out the fuse.

Leakage current: below 1mA

when leakage current bigger than permitted value, there must be problem on loop. measuring current, meantime, removing the connector connections to find the problem.

Regulator rectifier

System check

Attention

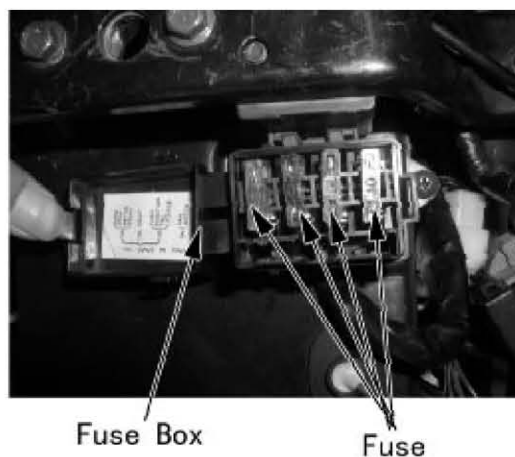
You can keep AC magneto on engine when do this test.

remove left frame cover (→ 2-5)

remove right frame cover (→ 2-5)

take down regulator rectifier (→ 15-7)

take apart regulator rectifier 2 connector' s connection.



ECU Cable conductor negative end Battery negative terminal Battery



Bolt Regulator rectifier

check if the connector terminal loose, bend, poking, drop off.

Do the following inspection between regulator's two connector's main cable:

Item	Judgment
battery wire (red) red terminal (+) groundwire	battery volt
earthwire (green)	it must be breakover between green terminal and body groundwire
charge coil	resistance between white terminals as follow: (white, white, white)
	0.1 — 0.4 Ω (20℃)
ignition switch offtrack	it must be break over between black terminal and ignition switch black wire
(black)	

Regulator rectifier 4P coninector



Regulator rectifier 3P connector

Regulator rectifier parameter

Use multimeter test resistance between cell terminals, as following form, if there is data out from the limit value, replace a new one.

Lap multimeter on diode shelve.

Attention:

When multimeter probe not connected, if the multimeter shows below 1.4V, you need to replace the multi meter battery.

		red ⊕					
black ①		white	white	white	green	red	black
	white		∞	∞	400-500	∞	∞
	white	∞		∞	400-500	∞	∞
	white	∞	∞		400-500	∞	∞
	green	∞	∞	∞		∞	∞
	red	400-500	400-500	400-500	750-850		∞
	black	∞	∞	∞	∞	∞	

AC Magneto inspection

remove left frame cover (→ 2-5)

remove right frame cover (→ 2-5)

take apart ACmagneto (yellow, yellow, yellow),
trigger coil (black/white, green) connector's
connection.

Magneto coil resistance

Measuring three phase magneto stator
coil's resistance.

If the resistance donot in regulated
range, replace a new stator coil.

Check if the stator coil and stator centre
insulate.

If it breakover or $< 1M \Omega$,

**you have to change it to a new stator
coil.**

set multimeter to $1X10 \Omega$

magneto coil resistance: $0.2-0.5 \Omega$
(yellow-yellow)

set multimeter to $1X100K \Omega$

insulating resistance: $\infty \Omega$
(yellow-地)

Magneto non-loaded performance

- start the engine and run to speed of
5000r/min

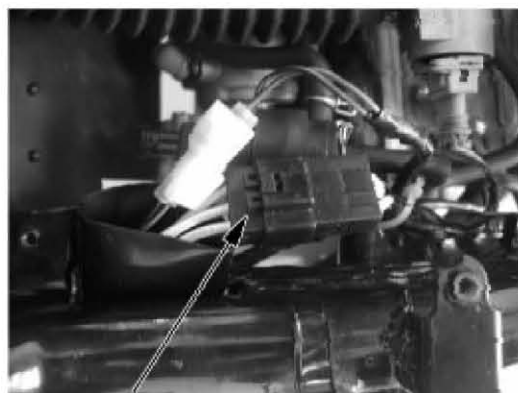
Use multimeter test magneto stator coil
three
output lines voltage.

- If measured value below regulate value,
a new magneto is needed.

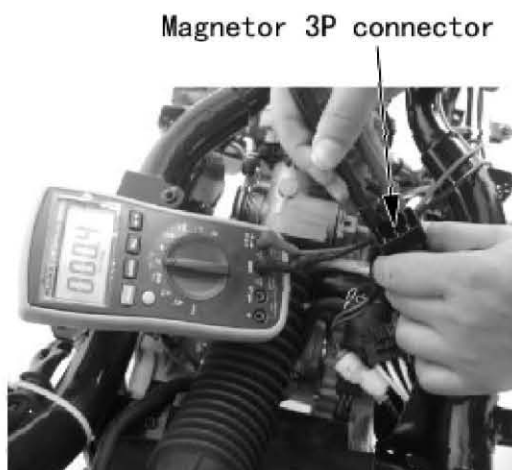
multimeter turn to alternating voltage.

Magneto non-loaded state coil loltage:

5000r/min $> 140V$ (exchange)



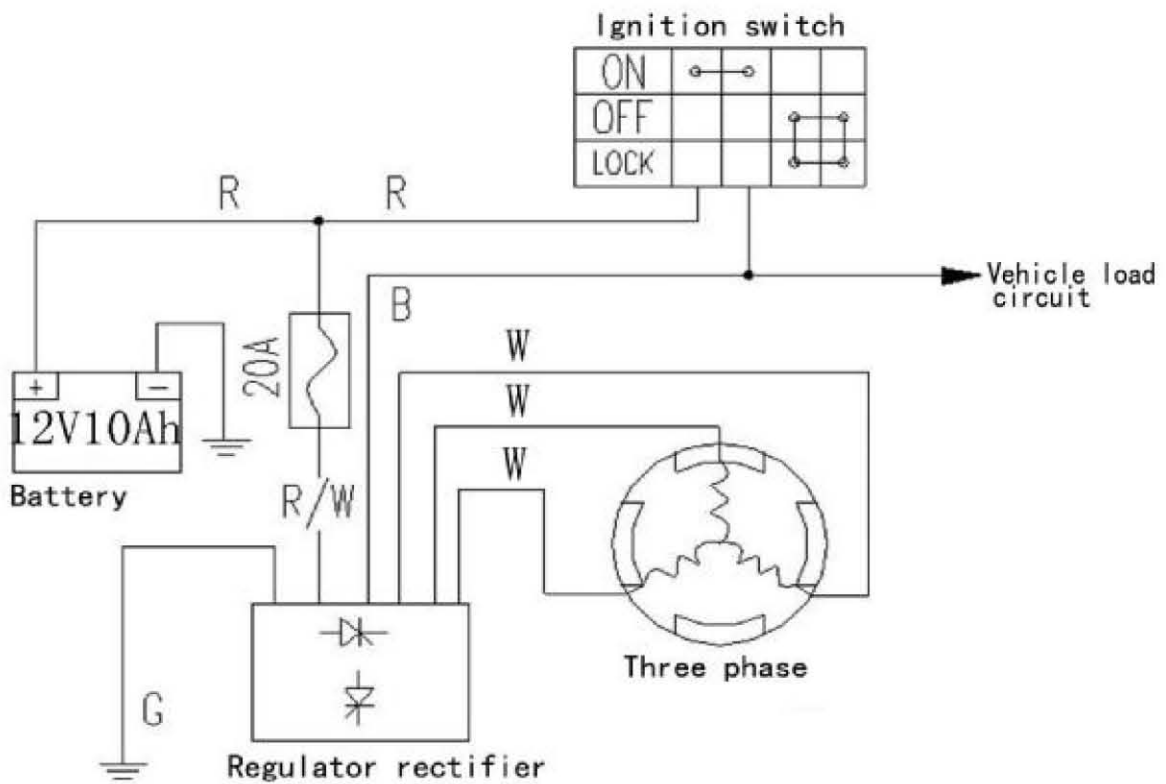
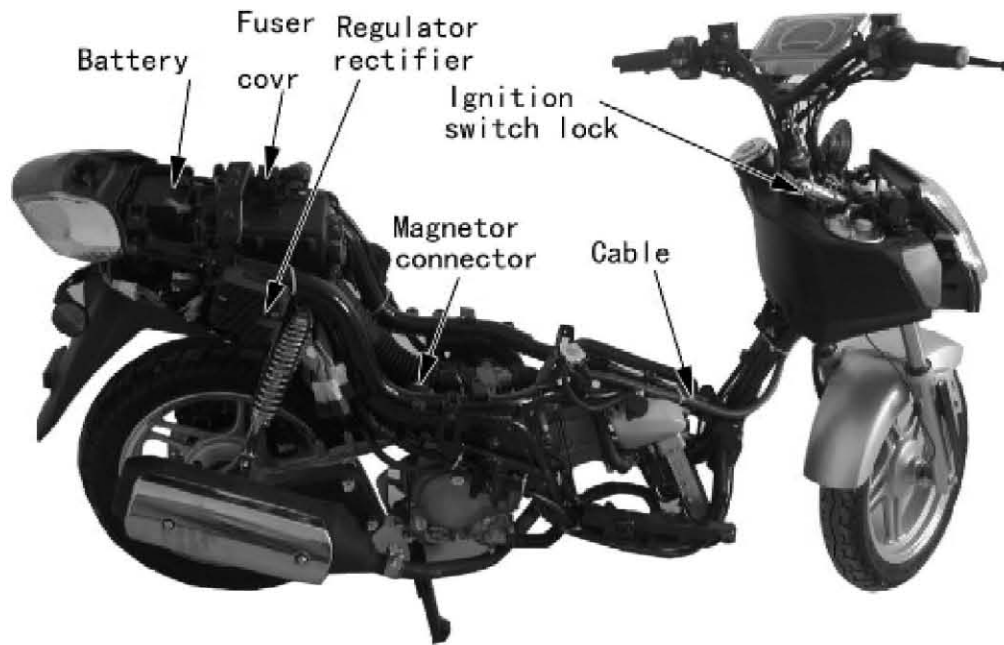
Magneto 3P connector



Magneto 3P connector



Magneto 3P connector



Specific circuit diagram refers to section 19 electrical diagram.

Overhauling.....	16-1	Trigger coil.....	16-6
Fault diagnosis.....	16-3	Ignition coil.....	16-6
Ignition system check.....	16-4	Ignition system configuration.....	16-7

Overhauling

Operation notice

Attention

Tail gas contain toxic component, forbid running enging in airtight area or in inadequate ventilation place for long time.

- ignition inspection do according to the fault diagnosis form and inspect in order.
- ignition components configuration refers to figure (→ 16-7)
- ECU electronic control unit ignition device, thus ignition system automatic adjust control unit ignition device, so ignition system adjust ignition time automatically.
- Pay close attention to ECU, fell on floor or hit strongly will cause damage. Besides, if operate connector under current, ECU will creat overvoltage so that cause ECU home loop destroy, so you must turn off ignition switch before operation.
- Ignition system fault mostly cause by connection of connector and tie-in bad, thus check if there is bad connection before inspection.
- spark plug must be the suitable thermal value, unsuitable spark plug will cause engine move difficult, engine destroy.
- Switch inspection refers to section 18.

Standard

Item		Standard
Sparking mode		ECU electronic control unit ignition
Spark plug		NGK/TORCH
	standard	DPR7EA-9/D7RTC
	choices	
	Spark gap	0.8—0.9mm
Spark time	Max advance angle	43°
Peak voltage	Ignition coil	≥ 25000V
	impulsator	≥ 1.5V

Special purpose tools:

peak voltage pick-up unit **07HGJ — 0020100**
(using together with input resistance above 10M Ω / DCV digimer.)

Fault diagnosis

• Engine start failed: firstly, use diagnosis instrument check out trouble code, then check oil channel, gas circuit, if normal, check the ignition system.

• Ignition system fault inspection: ignition have following situations:

- 1、Spark inspection: operation steps: take down spark plug, remove spark cap, move high voltage soft wire end near ground strap connection, check the spark flash, $> 8\text{mm}$ is normal and $< 5\text{mm}$ is spark weak.

If spark normal, then inspect the spark plug, you can inspect in substitution method.

spark plug abnormal have following situations : (1) spark plug moist, drown. Reason is gas mixture too dense, can try to turn off oil channel, then try times. (2) spark plug jet black, carbon deposit, reason mixture gas too thick or engine oil scurry into firebox burn engine oil. You can wash and polish to recover. (3) spark plug insulator chip and steam leakage. (4) spark plug two poles short circuit, anode and input end atresic.

- 2、Spark abnormal: fireless and fire weak.

fireless, you can check like the following ways:

(1) Inspect ignition coil, in substitution method or measuring, former one use multi-meter measuring.

① measuring primary wire resistor, normally around $0.5\ \Omega$; ② secondary primary wire resistor, normal value around 4.2K ; ③ damping resistance: normal value around 5K .

(2) ECU inspection, usually apply substitution method to check if ECU run out.

(3) Inspect ignition power source, black/yellow and ground wire (green) should have 12V voltage, if not, check from the battery anode to black/yellow terminal one by one.

(4) cable check: mainly inspect trigger signal input (connect magneto trigger's output) to output, (connect ECU terminal), ignition output, white/yellow.

(5) check switch power, when position at ignition black/white wire and green wire should be off.

For weak spark, check from the following items:

(1) inspect ECU, in substitution method.

(2) inspect ignition coil, if there is short circuit in secondary or damping resistance go bad.

Ignition system inspection

Attention

- when spark donot strike fire, check again if circuit drop off, loose, poor contact, and then measure peak voltage.
- multimeter has different types in different input impedances, thus you need to use input impedance above $10M \Omega$ /DCV digimer.

Connect peak voltage oscilloscope to the diginer.

Special tools:

peak value voltage oscilloscope 519-922-150000

(use it together with input resistance above $10M \Omega$ / DCV digimer)

Ignitong coil secondary voltage

Attention

- Measurement should be done after all the wires are correctly connected.

remove footboard (→ 2-10)

Leave spark plug in the cylinder head, install qualified spark plug on the spark plug cap and earth the engine. Open rubber cover of ignition coil, keep the ignition wire connected, and connect primary peak voltage oscillograph between primary wire terminal and frame body earthing wire.

Special Tool:

Peak Voltage Oscillograph
(Use it together with digital umltimeter available from the market with input impedance over $10M \Omega$ / DCV.)

Turn ignition switch to the ON Position , and start engine.

Ignition coil secondary voltage $\geq 25000V$

Attention:

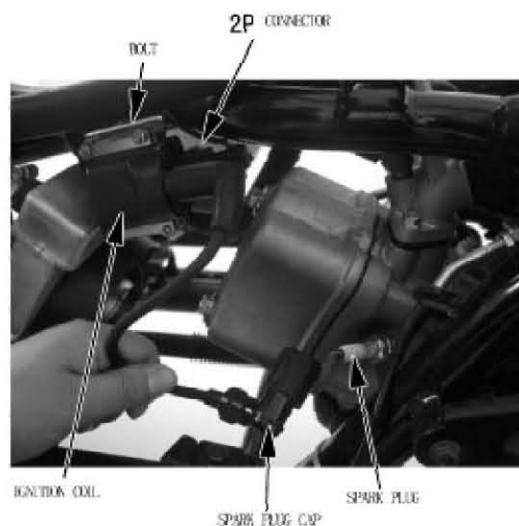
When measuring the voltage, do not touch the terminal with finger to avoid electric shock.

Measure ignition coil resistance

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

Pluck off spark plug cap from spark, dismount ignition coil.

IGNITION COIL SECONDARY OUTPUT



Measure ignition coil primary coil resistance.

Ignition coil primary coil resistance: $0.4-0.5\ \Omega$



PRIMARY COIL

Measure ignition coil secondary coil resistance:
Ignition coil secondary coil resistance: $8-19\text{k}\ \Omega$



SECONDARY COIL

Trigger

Disassembling

remove AC magneto connector joint

remove water pump inlet pipe and outlet pipe,
drain cooling water. (section 6)

remove crankcase breathing hose(section 11)

remove exhaust muffler(section 2)

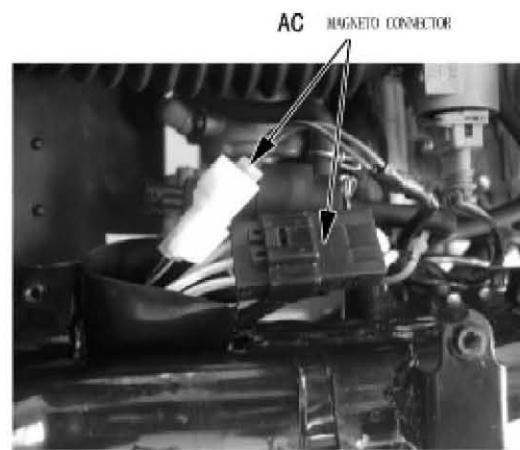
remove right side cover(section 11)

Attention

Stator is installed on the right side cover and is attached by the magnet of rotor. Be careful not to hurt the fingers when removing.

Loosen bolt, take down trigger

Loosen bolt and washer, take down AC magneto stator



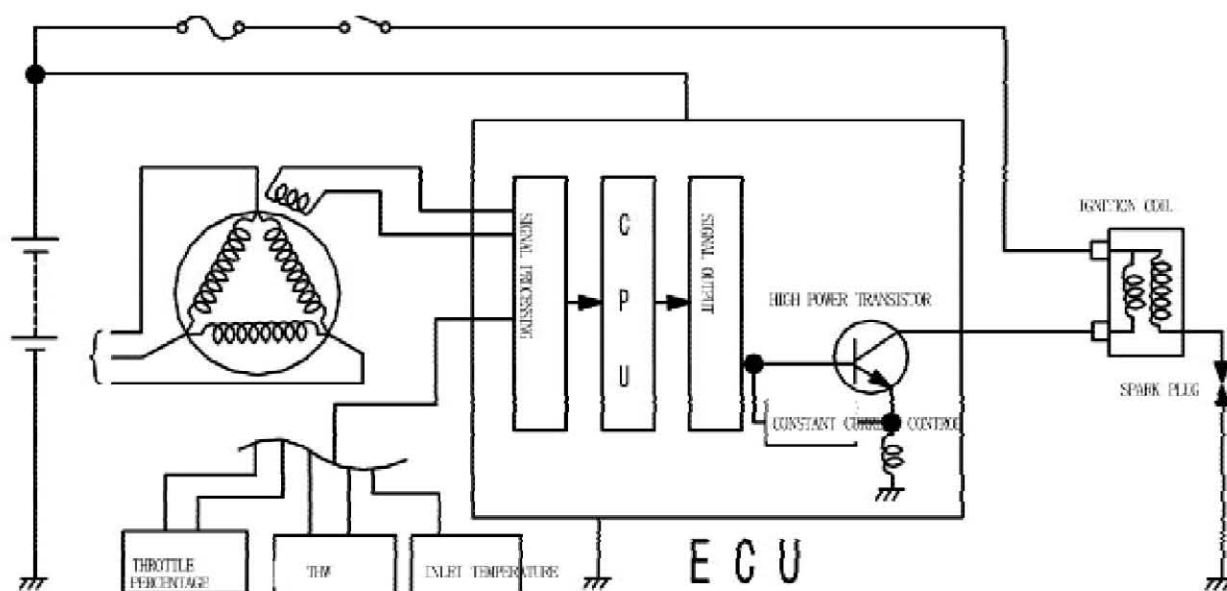
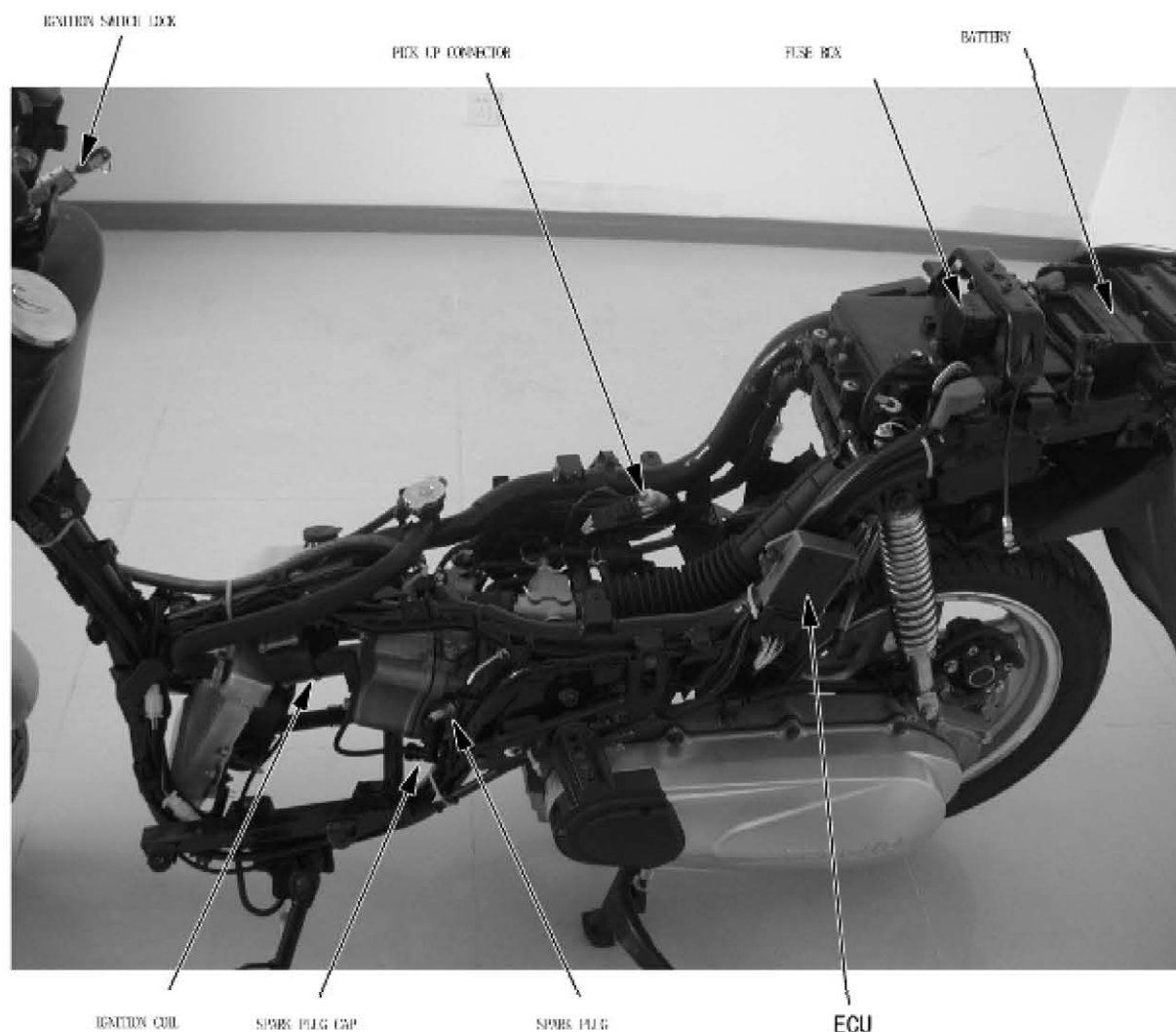
Installation

Installation do according to the opposite sequence of uninstallation.

Measure trigger resistance

remove trigger connector's connection.

Trigger resistance: 210-250 Ω



specific circuit diagram refers to
section 19 electrical schematic
~~diagram.~~

Overhaul information.....	17-1
Troubleshooting.....	17-1

Starter relay.....	17-2
Starting motor Comp.	17-2
Overriding clutch.....	17-5

Overhaul Information

Notice:

•Bundle the wires of the same color. Wires of different colors should be connected with the wires of the same color. Set color sleeve at the connection part. Couplers should be connected with those of the same colors.

Maintenance Standard

Item	Standard	Service Limit
Brush length	10mm	7mm

:
.

Troubleshooting

Starting motor does not run

- Insufficient charging of battery
- Faulty contact of starting switch
- Faulty contact of wire harness, couplers and terminal posts, and short circuit or open circuit.
- Faulty starting motor
- Faulty contact of main switch
- Faulty starter relay
- Melted fuse
- Faulty auxiliary relay

Starting motor is too weak.

- Battery Voltage is insufficient.
- Faulty contact of wire harness, couplers and terminal posts;
- Foreign matters in the motor or starting gear.

Starter Relay

Notes

- Check and confirm battery is in good status before inspection.
 - In case of faulty starting, check each brake switch and starter relay. (Chapter 16)
- Disconnect 4P coupler of starter relay and remove starter relay.

Input voltage

Keep ignition switch in the  position.

When holding front brake or rear brake, make sure there is battery voltage between light green/brown(+) and frame earthing wire.

If there are any abnormalities in the above inspection, check ignition switch, brake switch, main fuse (15A), sub-fuse (10A), side sensor. If all these items are normal, replace starter relay.

Earthing wire return circuit

Disconnect 4P coupler of starter relay and remove starter relay.

Press down starter switch to check if the green terminal of starter relay 4P coupler is well connected with frame earth wire.

If not, check the main cable for any break or short circuit.

Starter auxiliary relay

Disassembly

Remove

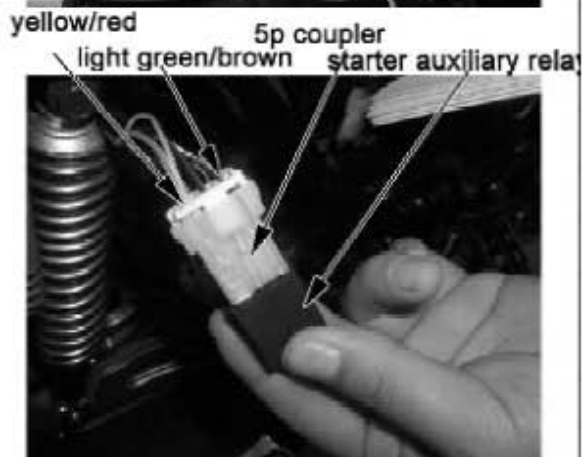
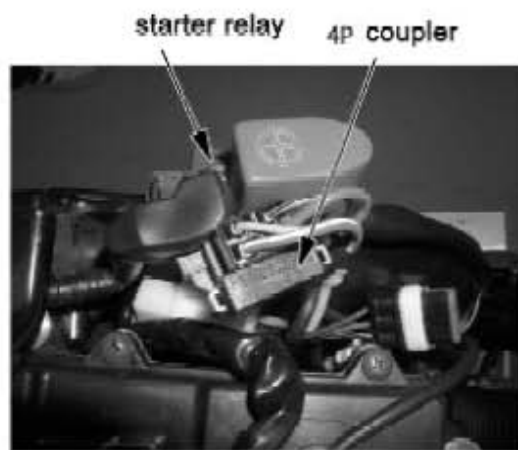
(→ Chapter 2)

Find the relay with yellow/red, light green/brown wire.

Disconnect 5P coupler of starter relay and remove starter relay.

Installation

Reverse the procedure of removal for installation.



Note:

- Check and confirm battery is in good status before inspection.
 - In case of faulty starting, check each brake switch and starter auxiliary relay. (Chapter 16). Keep ignition switch in the  position. When holding front brake or rear brake, make sure there is battery voltage between light green/brown(+) and frame earthing wire.
- If there are any abnormalities in the above inspection, check ignition switch, brake switch, main fuse (15A), sub-fuse (10A), side sensor, ECU. If all these items are normal, replace starter auxiliary relay.

Capability of starter auxiliary relay

Remove starter auxiliary relay.

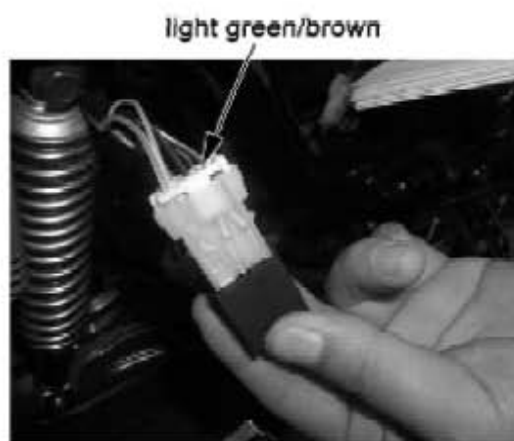
Implement 12V voltage between 2 ends of starter auxiliary relay loop, A.B should be connected. If not, replace starter auxiliary relay.

Without 12V voltage in 2 ends of starter auxiliary relay loop, A.B should not be connected. If not, replace starter auxiliary relay.

starter auxiliary relay resistance

Remove starter auxiliary relay, measure the resistance between 2 ends of starter auxiliary relay loop with multimeter.

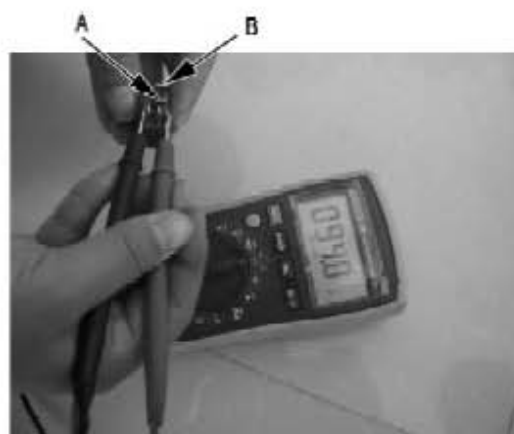
resistance value, 90-100 Ω



light green/brown



starter auxiliary relay loop



starter auxiliary relay loop



Starter motor comp.

Disassembly

Remove air filter,

Remove fixing bolt of starter motor and remove starter motor comp.

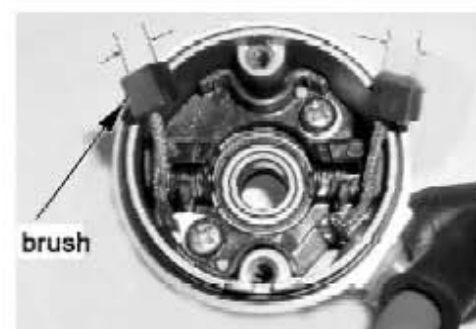
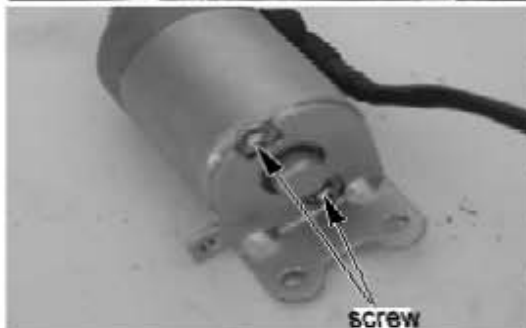
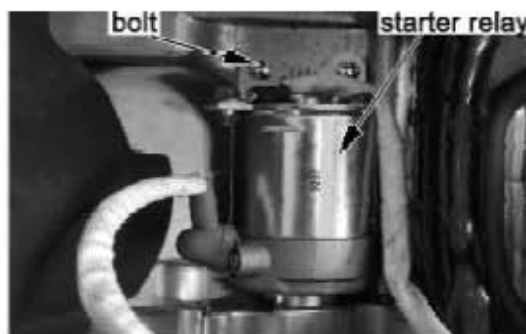
Disassembly of starter motor comp

Remove tightening screw of starter motor housing and remove motor housing and motor seat.

Inspection

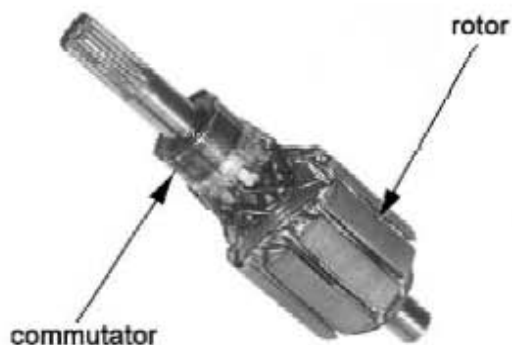
Measure brush length

Service Limit: Replace if the brush less than 7mm.



Check color of commutators.

If there color changes with more than two commutators, short circuit will be caused. Replace the rotors.



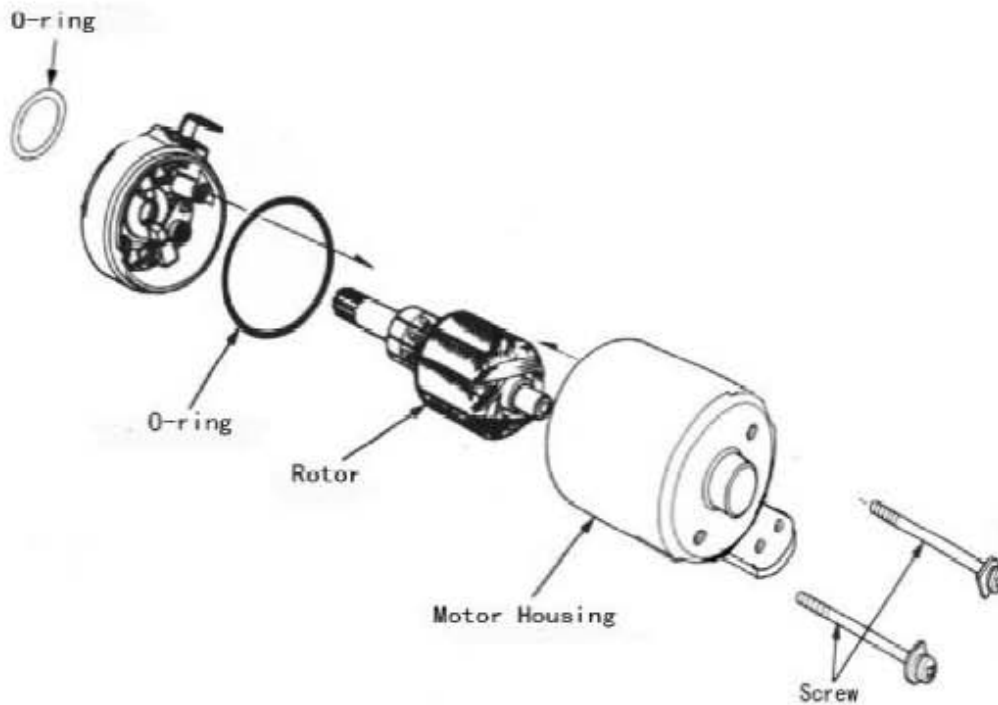
Make sure rectifier rotors are well connected.



Make sure rotor shaft is not conducted with commutators.

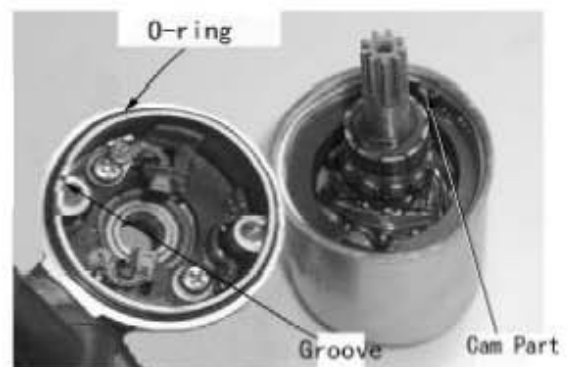


Installation



17

Set O-ring in the groove of starter motor seat.
Apply some grease on the O-ring.



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Apply some lubricant on rotor shaft ends. Install rotor into motor housing.

Press brush into the brush holder, while install brush holder on the commutator.

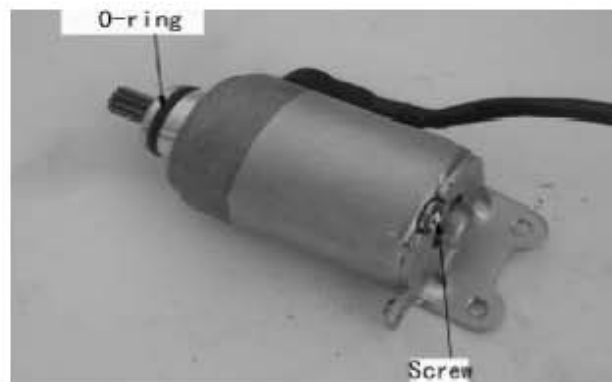
Align the cam part of motor housing with groove of motor seat.

Install motor seat in the housing.



Tighten the bolt.

Set O-ring seal into the groove of motor positioning cam shoulder.

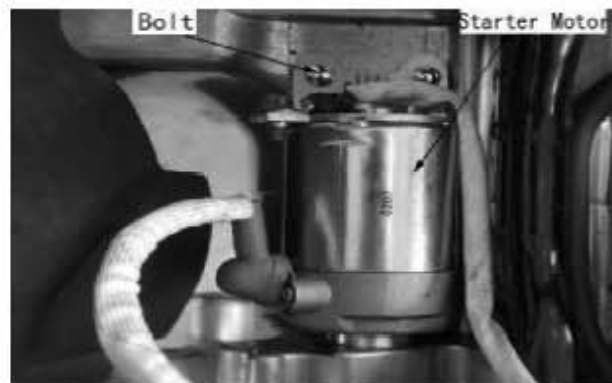


Installation

Notes

Connect the wire and confirm the rotating direction before installing the starter motor on the engine.

Reverse the removal procedure for installation.



Overriding clutch

Disassembly

Remove

- right side cover (→ 11-2)
- Dual gear and shaft. (→ 11-2)
- flywheel comp. (→ 11-3)

Remove inner hex screw of overriding clutch.

Remove roller mass and spring, check the spring, if much shorter → replace;

check roller mass, if abnormal wear → replace.



Loosen bolt, remove fixing plate and driven gear comp.

Installation

Reverse the removal procedure for installation.
Apply some lubricant on the dual gear shaft in the right case.



Tighten the three inner hex bolts of overriding clutch according to the specified torque.

Tightening Torque: 18N•m (apply some thread ti



Side sensor

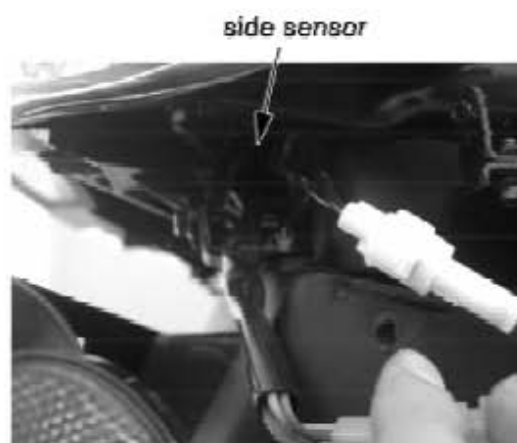
Remove:
plastic parts (→ chapter 2)
2P coupler connector.

when scooter heeling angle within $\pm 43^{\circ}$:
side sensor resistance: 60-65k Ω

when scooter heeling angle over $\pm 43^{\circ}$:
side sensor resistance: connected

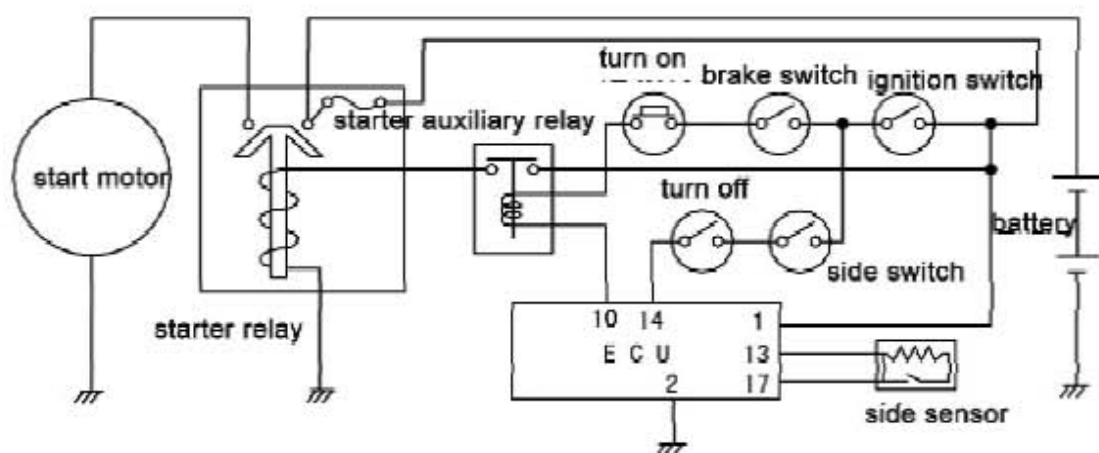
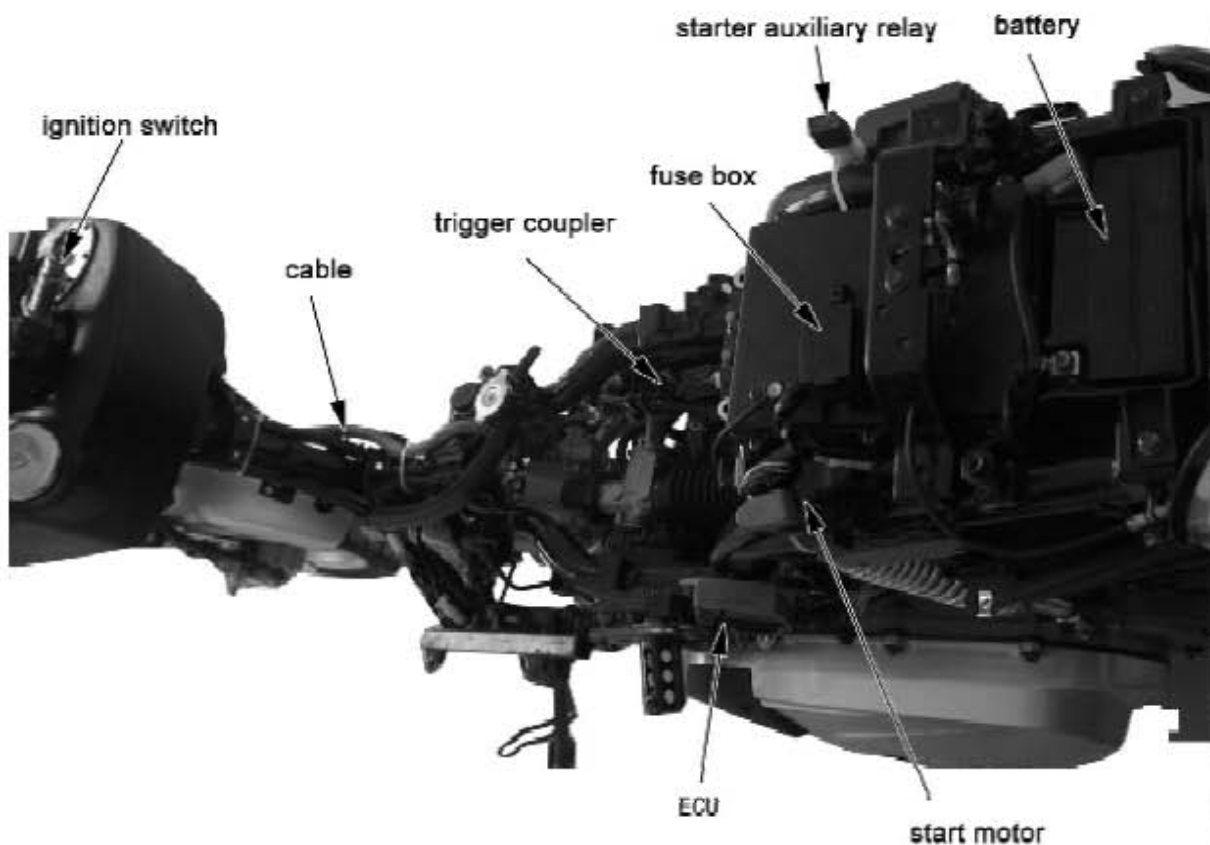
Note:

Scooter will switch off in 7s after side sensor connected. When restarting, turn off the ignition switch first, then turn on again; or else, fail to start the scooter.



2P coupler connector, side sensor





Overhaul information.....	18-1	Brake light switch.....	18-8
Troubleshooting	18-2	Electrical horn.....	18-8
Bulb replacement	18-3	Odometer	18-9
Head light	18-5	Fuel sensor	18-10
Ignition switch lock.....	18-6	Water temperature sensor	18-12
Handlebar switch	18-7		

Overhaul information

Notes on operation

Note:

- 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.
- Inspection of water temperature alarm indicator may use fire source and liquid of high temperature. Do not put flammable matters nearby and take care not to get burnt.
- 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.
- 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 position, and replace after the bulb is cooled down.
 - Replace the bulb with hands in clean gloves.
 - Clean the glass with a piece of clean cloth dipped in alcohol in case of any oil stains on the surface.
- If the Inspection has to be done with battery, check if the battery is normal.
- Inspection of switches can be done without removing the switches from the vehicle.
- After the inspecting and overhauling of each part, routing of cables and wires should pass through the proper positions.(→ 1-20)
- For removal and installation of taillight and rear turning lights, refer to chapter 2.

Overhaul standard

Items		Standard
Fuse	Main	20A
	Auxiliary	2×5A 2×10A
Light、bulb	Headlamp (Hi / Lo)	12V-35/35W
	Brake light / Taillight	12V-21/5W
	Turning indicator	12V-10W
	Speedometer light	12V-1.7W×3
	All indicators	12V-3.4W×4
	Error indicator	12V-1.7W

Troubleshooting

Head light cannot turn on

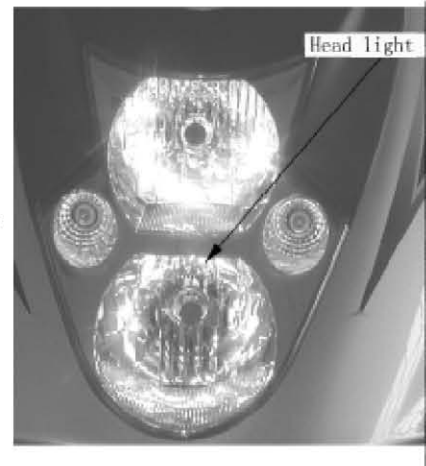
- Fuse break
- Open circuit with main cable
- Bulb burnt
- Night switch is damaged.

Replacing bulb

Head light bulb

Note

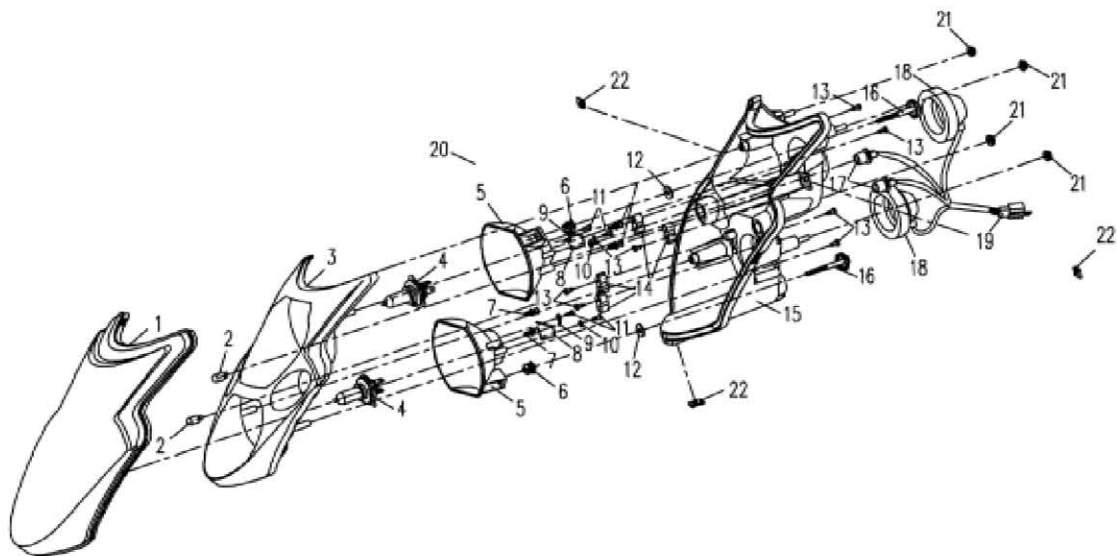
Headlight bulb has larger power and the temperature is very high when it is turned on. Do not touch it after it is just turned off. Operation should be done when the bulb is cooled down.



Remove handlebar front cover. (→ 2-9)

Disconnect headlight 4p coupler.

Remove dust-proof cap 18, head light clamp 8,



18

Note

Wear clean gloves when replacing bulb. Oil stains on the glass surface may cause break of bulb. Clean the stained surface with alcohol or amyl acetate .

Make sure that the three positioning pins of the bulb should be in line with the three positioning holes in the socket when replacing the bulb.

Bulb specification: 12V-35/35W

Reverse the removal procedure for installation.

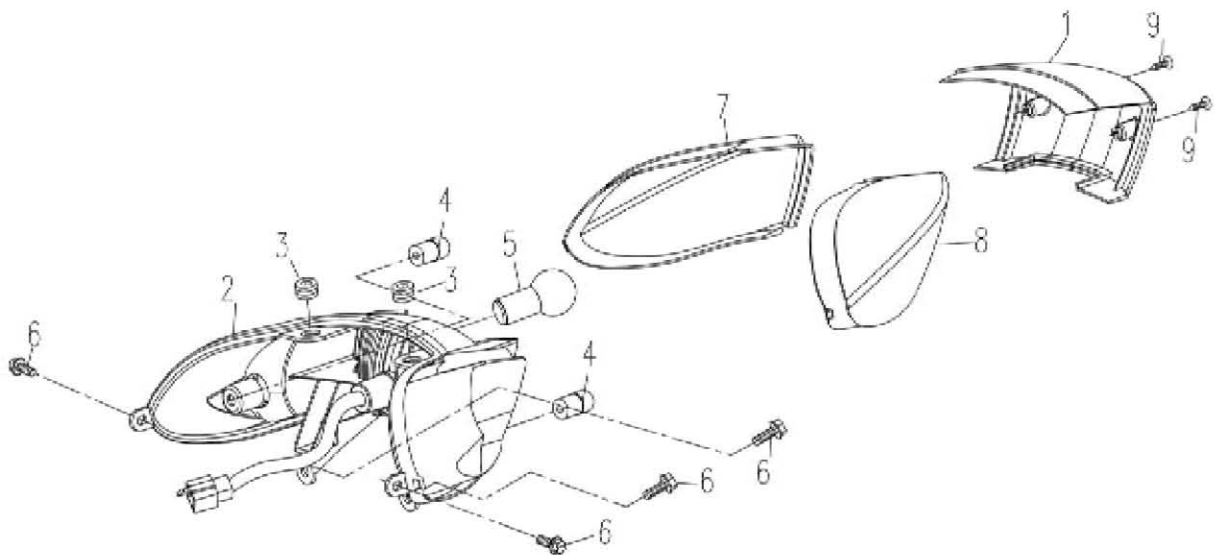
After replacing the bulb, adjust head light beam. (→ 3-19)

Inspection of headlight

Turn the light switch to "ON", turn light switch to "ON" and check if the headlight is on.

-ON: Normal

-Still off: Breaking or short circuit of main cable.



Brake light/Tail light bulb

Remove tapping screw 9, tail light cover 1

Turn brake light/tail light bulb 5 counter clockwise and remove it

Replace light/tail light bulb

Bulb Specification: 12V-21/5W

Reverse the removal procedure for installation.

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Rear turning light bulb

Remove screw 9

Remove tail light cover 1

Remove rear right turning light cover 7

Replace right bulb 4

Bulb Specification: 12-10w

Repeat above steps for replacing rear left turning light bulb 4

Bulb Specification: 12-10w

Reverse the removal procedure for installation.

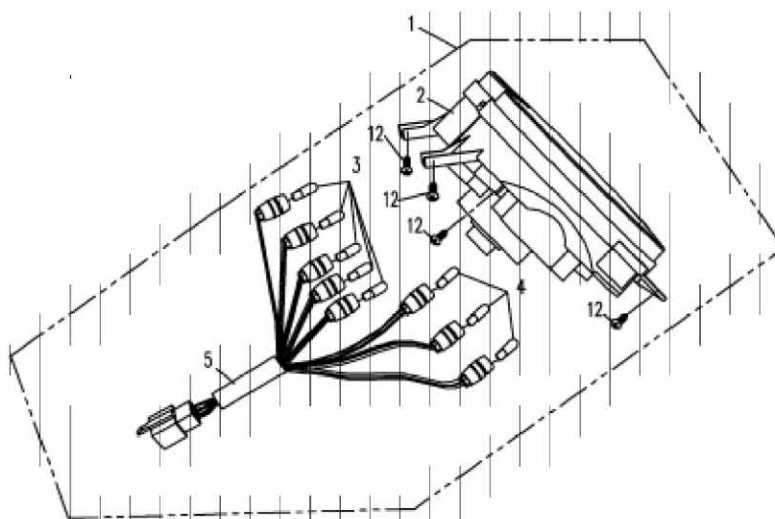
Instrument light

Remove handlebar front cover (→ 2-10),

Remove handlebar rear cover (→ 2-11),

Remove 4 selftapping bolt 1

Remove instrument.



Pull out the socket from instrument,

Replace bulb.

Bulb specification:

12V-1.7W (Illumination bulb) 3pcs

12V-1.7W (Diagnosis bulb) 1pc

12V-3.4W (Indicator bulb) 4pcs

Note

routing of cables and wires should pass through the proper positions. (→ 1-20)

Reverse the disassembly procedure for installation.

18

HEAD LIGHT

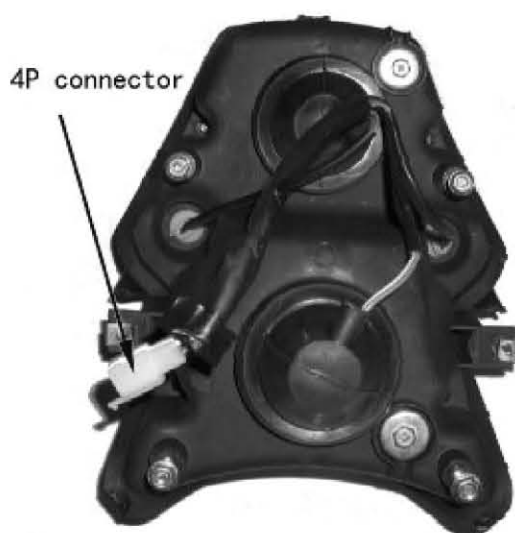
Head light Assy.

Remove front cover of handlebar (→ 2-10),

Remove the 4P-insert connector on headlight.

Remove the 4 bolts.

Remove head light



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Reverse the disassembly procedure for installation.

Note

Pay attention not to damage the main cable when installing.

After installation, adjust head light beam.
(→ 3-19).

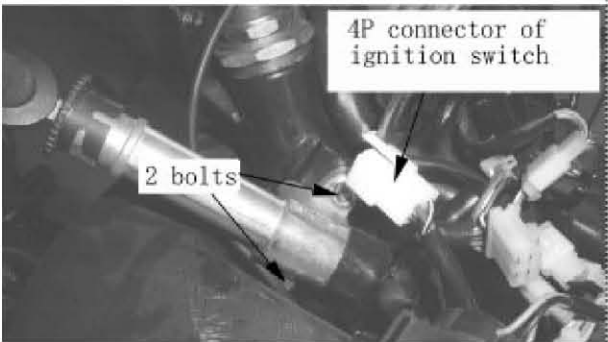
Note

routing of cables and wires should pass through the proper positions.(→ 1-20)

Ignition switch lock
Disassembly and installation

Disassemble top cover. → (2-9)

Remove 2 bolts.



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Remove the 4P connector of ignition switch.

Take out the ignition switch lock.

Reverse the disassembly procedure for installation.

Inspection

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

•—• means proper connection.

	Red	Black	B/W	Green
ON	•—•			
OFF			•—•	•—•
LOCK			•—•	•—•

Handlebar switch

Disassembly

Remove handlebar front cover (→ 2-10),
Remove handlebar rear cover (→ 2-10),
Remove each switch.

Installation

Reverse the disassembly procedure for installation.

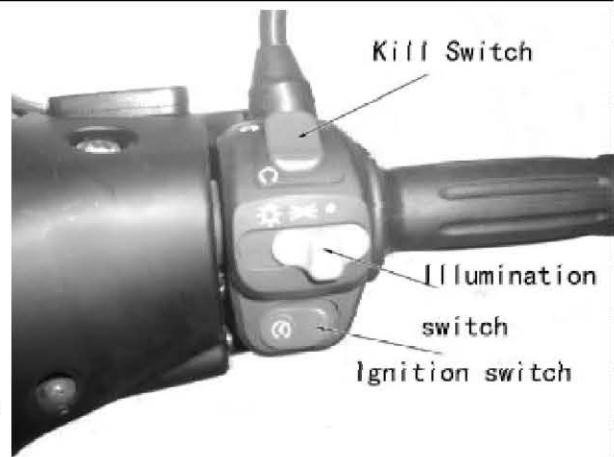
Switches should be properly coupled with corresponding couplers.

Starter Switch

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

● ---- ● means proper connection

	Y/R	G/Y
ON	● ---- ●	
OFF		



Dip switch

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

● ---- ● means proper connection

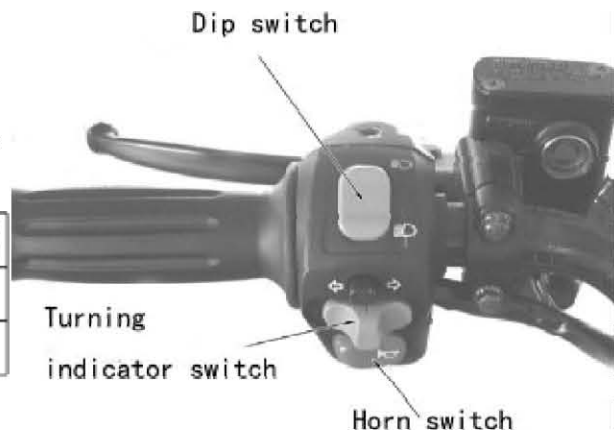
	V	V/BL	BL
☀	● ---- ●		
☀		● ---- ●	

Horn Switch

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

● ---- ● means proper connection

	Black /Brown	Light Green
ON	● ---- ●	
OFF		



Combined Switch

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

● ---- ● means proper connection

	White /Blue	Brown /Blue	Brown
●	●		
☀		● ---- ●	
☀	●	●	●

Turning Indicator Switch

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

● ---- ● means proper connection

	Orange	Gray	Light Blue
←	● ---- ●		
●			
→		● ---- ●	

Brake Light Switch

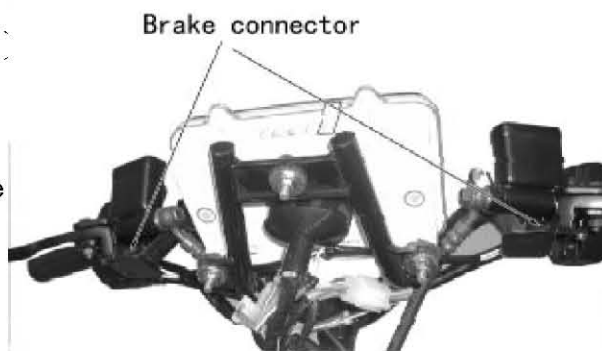
Remove handlebar front cover (→ 2-10)

Disconnect brake light switch coupler and check if the coupler terminators are connected.

Hold the brake lever—Connected.

Release the brake lever—Disconnected.

Otherwise replace with a new brake light



Horn

Inspection

Remove the front protection cover (→ 2-9)

Disconnect horn switch

Connect with a fully charged 12V battery and check if the horn sounds.

18

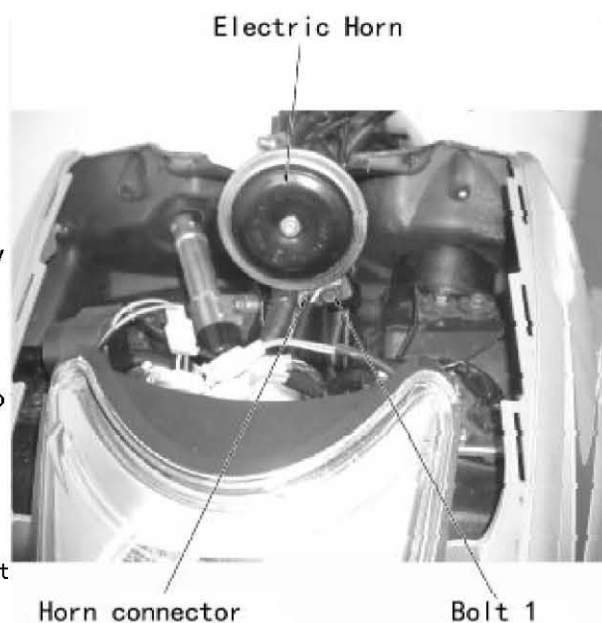
In case no hooter, replace with a new ho

Disassembly and Installation

Pull out the connector of electric horn.

Remove the electric horn bolt 1, and take out the electric horn.

Reverse the removal procedure for instal



Odometer

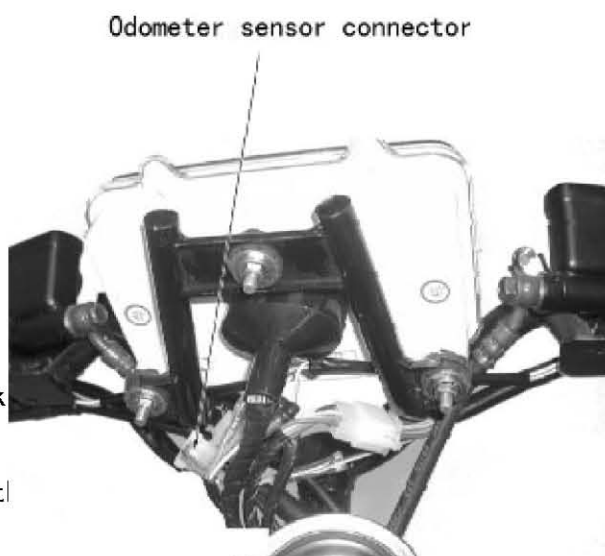
Note

Before inspection, make sure if the odometer flexible shaft comes off, breaks or Nut 2 is loosened.

Securely support front wheel with a jack

Turn the front wheel fast and check if the pointer turns.

If not, replace.



Disassembly and Installation

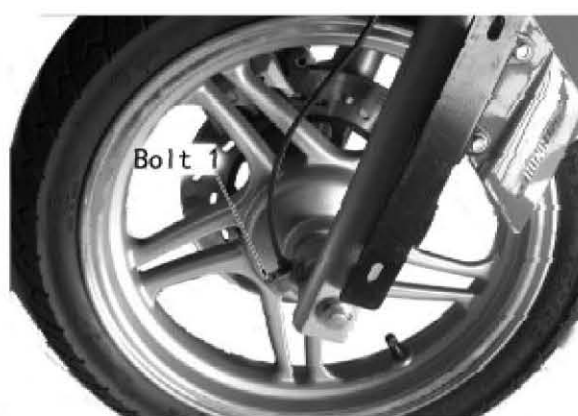
Remove handlebar front cover. (→ 2-10)

Loosen bolt on the counter and remove odometer sensor,

Reverse the disassembly procedure for installation.

Caution:

Main cables and wires shall be route



Fuel sensor

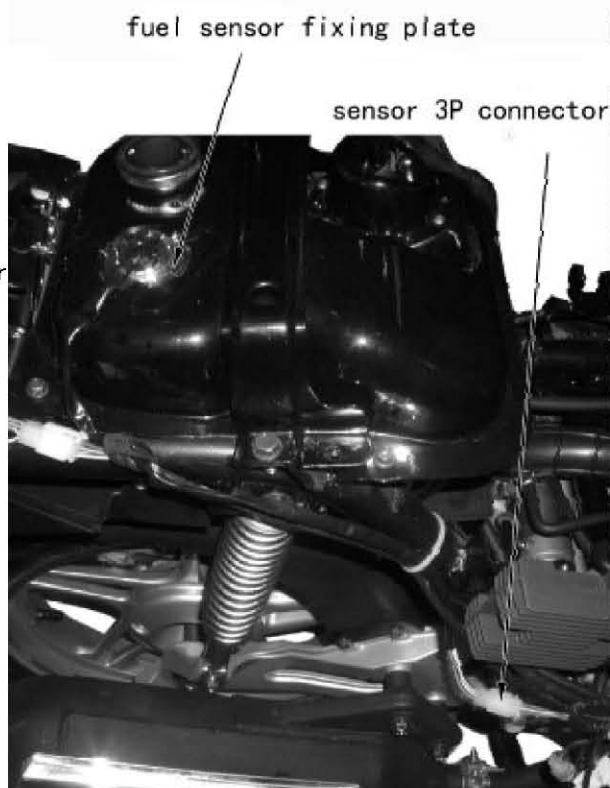
Disassembly

Remove the front protective cover (→ 2-8)

Remove front top cover (→ 2-9)

Remove bolt 1

Disassemble the connection between 3P connector and fuel sensor.



Remove fuel sensor fixing plate with a flat screwdriver by turning it counter c

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Inspection

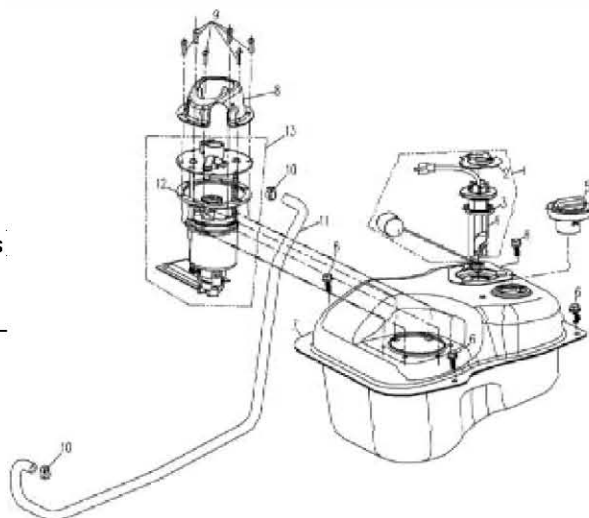
Remove fuel sensor (refer to above steps)

connect 3P-insert connector of fuel sensor

make the ignition switch at “”

Shake fuel sensor float with hand, locate position and check if it conforms to the gauge reading.

In case of non-conformity, check main cable break or short circuit, then check fuel level gauge.



Remove fuel sensor 3P coupler.

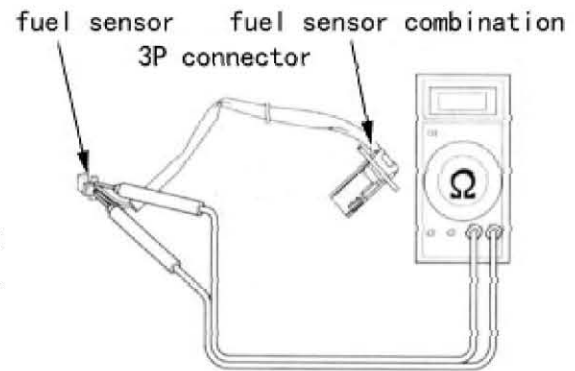
Connect multimeter between 3P coupler to
Shake float with hand and measure the
resistance of float at different position

Connection terminal: yellow/white-gr

Float position: up: $33 \pm 2 \Omega$ (20°C)

Down: $566 \pm 4 \Omega$ below (20°C)

Replace the fuel sensor in case of any p
found



Installation

Reverse the removal procedure for instal

Caution:

Install the fuel sensor properly into
fuel tank hole.

There should be no fuel leakage.

Connect the 3P-insert connector of fuel
sensor.



Inspection of Fuel Level Gauge

Switch on power supply and check if fuel
gauge functions normally.

If fuel level gauge works normally, reve
removal procedure for installation of plastic parts
and seat.

Water temperature transducer

Warning:

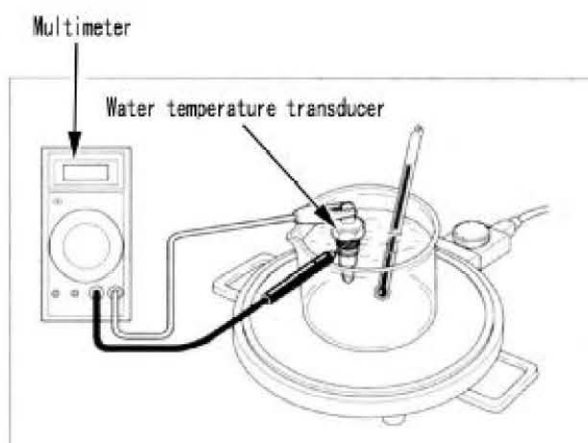
Be careful not to get scalded and do not place flammables nearby.

Note

Coolant must reach the switch thread, and the depth from vessel bottom to sensor top should be over 40mm.

Keep liquid temperature for three minute before measuring, and do not raise temperature sharply.

The thermometer should not contact the vessel bottom.



Disassembly

Remove seat (→ 2-2)

Remove trunk (→ 2-3)

Remove water temperature sensor connector,
Remove water temperature sensor.

Put the transducer into a vessel with coolant, slowly heat up the liquid and measure the transducer resistance..

18

50℃ $154 \pm 16 \Omega$

88℃ $52 \pm 4 \Omega$

100℃ $27 \pm 3 \Omega$

120℃ $16 \pm 2 \Omega$

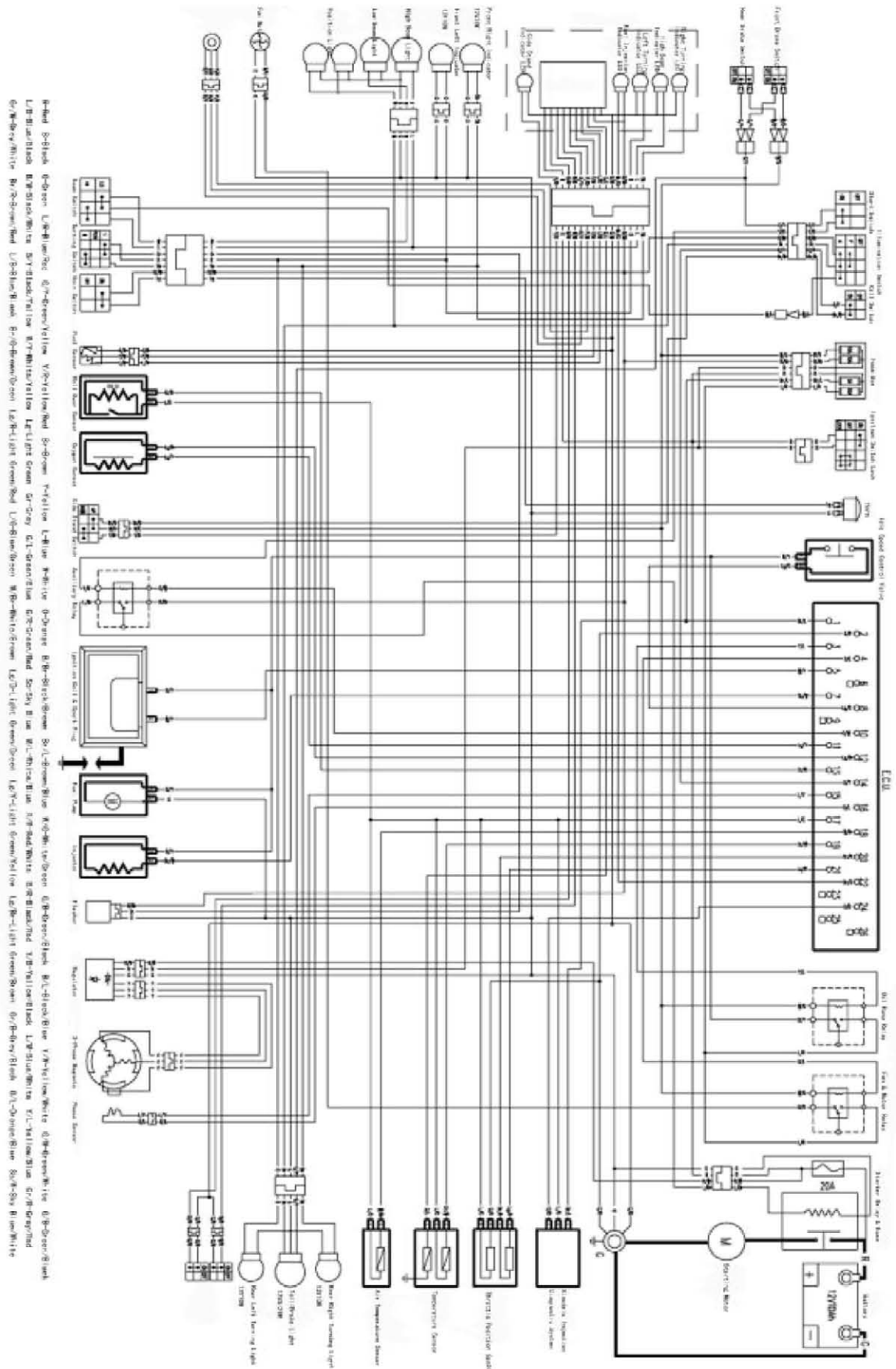
Replace the transducer if the measured resistance exceeds the above.

Installation of transducer

Connect with water temperature alarm controller

Fill coolant and discharge air.

Reverse the removal procedure for installation of storage compartment and seat.



Introduction of Electronic Injection System.....	20-1	Puffing Sound when Slowing Down the Engine.....	20-7
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1. Introduction of Electronic Injection System

1. Electronic injection system is an integrated system consisting of fuel injection and ignition.
2. Fuel is spurted directly into suction manifold by electronic injector.
3. Time of injection and ignition is controlled by trigger signal and different sensor signals.
4. Control of fuel atomization and ignition depends on the rotate speed and throttle percentage of engine.
Further adjustment depends on the following parameters:
Coolant temperature
Air inlet temperature
Ambient atmosphere pressure
5. When the engine is in cold position, the idle speed valve controls the adjustment of system idle speed. The idle speed valve is controlled by ECU, ensure the stabilization of idle speed.
6. Composition of fuel supply:
Fuel pump
Fuel filter screen
Injector
Pressure regulator
Fuel tank, oil pipe passage and others
fuel pump, fuel filter screen, pressure regulator are fixed in oil tank by brackets.
7. Composition of ignition circuit:
Ignition coil
High-pressure wiring
High-pressure cap
ECU
Spark plug and so on
ECU controls the ignition advance angle, ensuring the correct ignition.

II. Operating Notice

This chapter states the main troubleshooting in electronic injection diagnostics system and the overall engine. Refer to other chapters for troubleshooting not mentioned in this chapter.

1. Check the error records before adjusting electronic injection system.
Do not disconnect wiring and battery when checking error records.
2. The pressure of fuel supply system is 2.45 Bar. Smoking and fire are forbidden when disconnecting pipes.
Take care of the fuel splashing into eyes.
3. Disconnect wiring and battery when repairing electrical components, special requirements excluded.
4. The battery voltage must be over 12V when examining operating function.
5. Make sure the oil in oil tank is above 2 liters when starting engine, otherwise the fuel pump might be damaged.
6. Let the fuel out before driving in order to avoid oil passage clogged when the motorcycle has not been used for a long time.
7. Avoid water crushing into electrical components and cables when washing the motorcycle.
8. Pull out ECU only after switching off the power and disconnecting wiring and battery in order to avoid damage of ECU. Do not insert and pull out ECU rashly.
9. It may cause the failure of engine starting when altering TPS (Throttle Position Sensor) randomly.
10. Avoid counter electrode when dismounting battery.
11. When the motorcycle rolls over for 7 seconds, the engine flameouts automatically if the roll over sensor is connected. Start the motorcycle again when reconnecting the roll over sensor.
12. Maintenance attention: Go to maintenance stations for maintenance when the error light flashes continuously for 15 times after 30hrs, 150hrs, 270hrs, 390hrs ect. of running of ECU.

III. Troubleshooting

1. The error relating to ECU system comes more from connection error rather than components error. Therefore affirm the followings when checking the abnormality of system:

- a. power supply
 - battery voltage
 - fuse integrity
 - starting relay coil
 - connection
- b. frame earth
- c. fuel supply
 - fuel pump
 - fuel filter screen
- d. ignition system
 - spark plug
 - ignition coil
 - screen shielding cap
- e. air inlet passage
 - air filter
 - idle speed valve
- f. others
 - ignition angle
 - idle speed atomization
 - TPS reset

2. Common Errors

a. Engine starting failure

Abnormal	Affirmation
Abnormal diagnosis analyzer	Fuel pump Ignition coil Injector
Fuel supply	Oil capacity in oil tank Starting of fuel pump Fuel pressure Fuel flow
Ignition	Spark plug Ignition coil Screen shielding cap
Data reliability	Coolant temperature Ignition angle Injection phase Air inlet temperature

b. Engine hard starting

Abnormal	Affirmation
Abnormal diagnosis analyzer	Fuel pump relay Ignition coil Injector Trigger signal Air temperature Coolant temperature Atmosphere pressure
Fuel supply	Oil capacity in oil tank Starting of fuel pump Fuel pressure Fuel flow
Priming speed	Starting motor Starting relay Battery Earth wire
Ignition	Sparking plug Ignition coil Screen shielding cap Trigger signal Ignition advance angle
Data reliability	Coolant temperature Air inlet temperature TPS position Idle speed valve Air filter

c. Engine idle speed flameout/unstable/too low

Abnormal	Affirmation
Abnormal diagnosis analyzer	Fuel pump relay Ignition coil Injector Trigger signal Air temperature Coolant temperature Atmosphere pressure
Fuel supply (low fuel pressure)	Pressure regulator valve Fuel pump Fuel filter screen Fuel flow
Cleaning of air inlet system	Air filter Idle speed valve
Air tightness of air inlet system	Air tightness between air inlet pipe and cylinder head Air tightness between air inlet pipe and throttle valve body Air inlet tube Air filter
Ignition	Spark plug Ignition advance angle
Data reliability	Coolant temperature sensor Air inlet temperature sensor TPS position Idle speed valve

d. Engine cannot return to idle speed/idle speed too high

Abnormal	Affirmation
Abnormal diagnosis analyzer	Fuel pump relay Ignition coil Injector Trigger signal Air temperature Coolant temperature Atmosphere pressure
Fuel supply (low fuel pressure)	Pressure regulator valve Fuel pump Fuel filter screen Fuel flow
Data reliability	Coolant temperature sensor Air inlet temperature sensor TPS position Idle speed valve
Air tightness of air inlet system	Air tightness between air inlet pipe and cylinder head Air tightness between air inlet pipe and throttle valve body Air inlet tube Air filter
Ignition	Ignition advance angle

e. Puffing sound when slowing down the engine

Abnormal	Affirmation
Abnormal diagnosis analyzer	Fuel pump relay Ignition coil Injector Trigger signal Air temperature Coolant temperature Atmosphere pressure
Fuel supply (low fuel pressure)	Pressure regulator valve Fuel pump Fuel filter screen Fuel flow
Data reliability	Coolant temperature sensor Air inlet sensor TPS position Idle speed valve
Air tightness of air inlet system	Air tightness between air inlet pipe and cylinder head Air tightness between air inlet pipe and throttle valve body Air inlet tube Air filter
Air tightness of exhaust system	Air tightness between exhaust pipe and cylinder head Air tightness between exhaust pipe and muffler Welding of muffler Other plugs of exhaust pipe

f. Engine works irregularly when throttle valve is open slightly

Abnormal	Affirmation
Abnormal diagnosis analyzer	Fuel pump relay Ignition coil Injector Trigger signal Air temperature Coolant temperature Atmosphere pressure
Cleaning of air inlet system	Air filter element Throttle valve body Idle speed valve
Data reliability	Coolant temperature signal Air inlet temperature signal TPS position Ignition advance angle
Air tightness of air inlet system	Air inlet tube Air filter
Ignition	Spark plug worn out

- g. Engine power descends when in maximum speed/Engine works irregularly when in acceleration

Abnormal	Affirmation
Abnormal diagnosis analyzer	Fuel pump relay Ignition coil Injector Trigger signal Air temperature Coolant temperature Atmosphere pressure
Fuel supply	Fuel lever Fuel pressure Fuel filter screen Injection capacity
Data reliability	Coolant temperature signal Air inlet temperature signal TPS position Ignition advance angle
Air tightness of air inlet system	Air inlet tube (sealed) Air filter (sealed) Air filter element
Ignition system	Spark plug Screen shielding cap High-pressure wiring Ignition coil

h. Detonation

Abnormal	Affirmation
Abnormal diagnosis analyzer	Fuel pump relay Ignition coil Injector Trigger signal Air temperature Coolant temperature Atmosphere pressure
Fuel supply	Fuel pressure Fuel filter screen Injection capacity Fuel quality
Data reliability	Coolant temperature signal Air inlet temperature signal TPS position signal Ignition advance angle
Air tightness of air inlet system	Air inlet tube Air filter
Ignition	Spark plug
TPS reset	
Thickness choice of cylinder gaskets	

Usage of Diagnosis Analyzer

Functions of Diagnosis Analyzer Buttons (FIG 1)

Selection bar: Highlighting of selection bar.

Button1 Downwards

Selection bar moves downwards

Button2 Upwards

Selection bar moves upwards

Button3 Rightwards

-Review the parameters corresponding to the selected functions.

-Activate LCD background light. (When "Background Light" is selected.)

Button4 OK

Selection of acknowledgement

Button5 Exit

- Cancel the executed selection
- Return to upper-level menu
- Return to main menu

Main Menu (FIG 1)

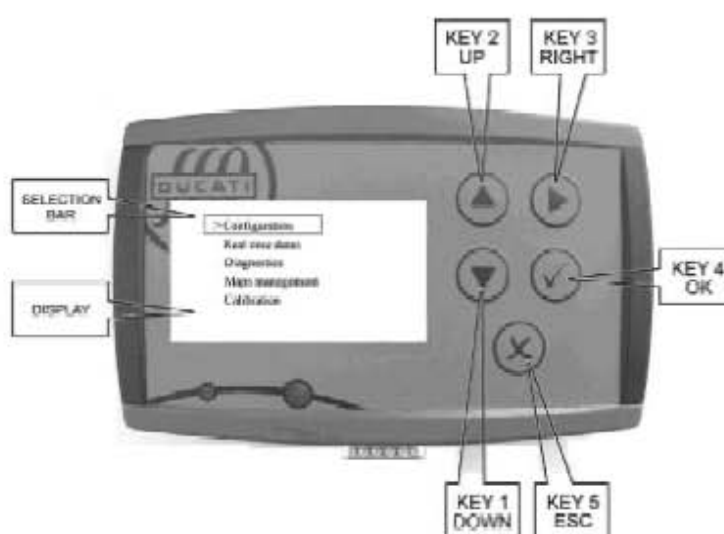


FIG 1

Connecting Diagnosis Analyzer

Note! Check for the correct battery voltage, wirings and fuses before connecting diagnosis analyzer.

Diagnosis wiring 2P plug locates beneath water-proof cover.

Switch on seat lock

Remove water-proof cover

Connect diagnosis analyzer as per the picture below.



Diagnosis Analyzer 3P Connector, Diagnosis Analyzer 3P Connector, Diagnosis Wiring

Note!!

Rotate power key to ON when screen indicates "Check Connection" after connecting diagnosis analyzer plug.

Main menu will be displayed after 5 seconds when the diagnosis analyzer indicates connected.

Calibration of TPS

Note! Check for the correct throttle cable and ECU etc. when in TPS calibration procedure.
-Set selection bar (using upwards or downwards button) at calibration. (FIG5);

Press OK button for acknowledgement

Options will be shown at the bottom of calibration menu. (FIG6)

-Zeroing of LAMBDA pulse spectrum

-TPS calibration

-Set selection bar (using upwards or downwards button) at TPS calibration (FIG6)

Press OK button for acknowledgement (FIG6)

-Screen prompts

-Press OK button for acknowledgement or ESC button for exit (FIG7)

- Press OK button to start calibration procedure.

-Rotate throttle to maximum and then fully return (FIG8)

-Press OK button for acknowledgement

-Screen indicates acknowledgement information, calibration is over. (FIG9)

-Press ESC button to return to main menu

-Rotate power key to OFF and remove diagnosis analyzer.



FIG 5



FIG 6



FIG 7



FIG 8



FIG 9

Configuration of Diagnosis Analyzer

Connect diagnosis analyzer and rotate power key to **ON**;
Diagnosis analyzer indicates "Connected"
and after 5 seconds shows the main menu (FIG10).

Move selection bar (using upwards or downwards button) to **configuration** (FIG10)

Press OK button for acknowledgement

Diagnosis analyzer screen will show the options (FIG11)

-**Background Light**

-**Language**

-**LCD Contrast**

Move selection bar to (using upwards or downwards button) **background light**.

Press **OK** button for acknowledgement (FIG11)

Background Light menu will show the options (FIG12)

-**Constant light on**

-**Economical**

Move selection bar (using upwards or downwards button) to **"Constant Light ON"**, press **OK**.

Set the screen background brightness at Constant Light On. (FIG12)

Move selection bar (using upwards or downwards button) to **"Economical"**, press **OK**.

The default of screen background brightness is "Constant Light On".

Press **ESC** to return to **configuration**.

Move selection bar (upwards or downwards button) to **"Language"**, press **OK**.

Language menu will show the options (FIG13)

- **English**
- **Italian**
- **French**



FIG 10



FIG 11



FIG 12



FIG 13

- **German**
- **Spanish**

Move selection bar (using upwards or downwards button) to **desired language** and press **OK**.

Press **ESC** to return to **configuration**.

Move selection bar (using upwards or downwards button) to **LCD contrast** and press **OK**.

Use upwards or downwards button to adjust **proper LCD contrast**.

Press **OK** button for acknowledgement or **ESC** button for exit. (FIG14).



FIG 14

Real-time Data

Main menu, move selection bar (using upwards or downwards button) to **Real-time Data**, press **OK** button for acknowledgement.

Show the **list of real-time data** (FIG 15, FIG 16, FIG 17)

1- inject. time Map

Injection time

2- inject. time out

Injection correction

3- injection. phase

Injection initial-phase angle

4- ignition. advance

Ignition advance angle

5- RPM

Engine rev

6- TPS

Throttle percentage

-TPS = 0%

Full-closed throttle

-TPS = 100%

Full-open throttle



FIG 15

7- Air. temperature

Air inlet temperature

8- Air. temp. cor

Air inlet temperature injection correction

9- Engine. Temp

Coolant temperature

10- Eng. Temp.cor

Coolant temperature injection correction

11- Air. pressure

Atmosphere pressure

12- Air. pres. cor.

Atmosphere pressure injection correction

13- Battery. voltage

Battery voltage

14- Battery. inj. off

Battery voltage injection correction

15- Lambda. offset

lambda value

16-Lambda. cor.

lambda injection correction

17-Crank. cor.

Crank correction

18-General. cor.

General correction of pulse spectrum

19-Idel. phase

Idle speed valve opening phase

20-Idel. duty

Idle speed valve duty ratio

21-ECU. Temperature

ECU temperature

22-Error code

Error code

23-Life. time

ECU life time



FIG 15



FIG 16



FIG 17

Diagnosis

Main menu, move selection bar (using upwards or downwards button) to diagnosis, press OK for acknowledgement (F1G18)

Diagnosis menu will show options (FIG19)



FIG 18

Error Check

Diagnosis activation

Engine working hours

Move selection bar (using upwards or downwards button) to **Error Check** (FIG19) and press **OK** for acknowledgement.

Error Check menu will show options (FIG20).



FIG 19

a) [[- 'φ c [l' l

Previous Error

Delete Previous Error

Move selection bar to **Current Error** and press **OK** for acknowledgement.

Screen shows current error code and related information.

Press **ESC** button for exit and return to **Error Check** (FIG20)

Move selection bar (using upwards or downwards button) to **Previous Error** and press **OK** button for acknowledgement.

Screen shows previous error code and related information.

Press **ESC** button for exit and return to **Error Check**.

Move to selection bar (using upwards or downwards button) to **Delete Previous Error** and press **OK** button for acknowledgement.

Screen shows the indication if delete previous errors is applied.

Press **OK** button to delete previous errors
from memory.

Press **ESC** button for exit and return to diagnosis.



FIG 20

Diagnosis Activation

Main menu, move selection bar (using upwards or downwards button) to **Diagnosis Activation**, press **OK** button for acknowledgement. (FIG21); Menu shows options (FIG22)

- **fuel pump relay test**
- **Fan relay test**
- **Idle speed valve test**
- **igniton coil check**
- **inspector check**

Move selection bar (using upwards or downwards button) to **fuel pump relay test**, press **OK** button for acknowledgement.

Press **OK** button again to implement test of target sample, or press **ESC** button to cancel test.

Screen shows the definite results and information confirmation after activating.

Move selection bar (using upwards or downwards button) to

fan relay test, press **OK** button for acknowledgement.

Press **OK** button again to implement test of target sample, or press **ESC** button to cancel test.

Screen shows the definite results and information confirmation after activating.

Move selection bar (using upwards or downwards button) to **idle speed valve test**, press **OK** button for acknowledgement.

Press **OK** button again to implement test of target sample, or press **ESC** button to cancel test.

Screen shows the definite results and information confirmation after activating.

Move selection bar (using upwards or downwards button) to **ignition coil check**, press **OK** button for acknowledgement.

Press **OK** button again to implement test of target sample, or press **ESC** button to cancel test.

Screen shows the definite results and information confirmation after activating.

Move selection bar (using upwards or downwards button) to **injector check**, press **OK** button for acknowledgement.

Press **OK** button again to implement test of target sample, or press **ESC** button to cancel test.

Screen shows the definite results and information confirmation after activating.

Press **ESC** button for exit and return to **diagnosis**.

Move selection bar (using upwards or downwards button) to **engine working hours**, press **OK** button for acknowledgement, press **OK** button again, screen shows the total working hours of ECU and the last maintenance time.

Press **ESC** button for exit and return to **diagnosis**.

Press **ESC** button for exit and return to main menu.



FIG 21



FIG 22

ECU Errors Coding Table

Short Flashing [S.F.] =Units of Error Code

Long Flashing [L.F.] = Tens of Error Code

S.C. = Short Circuit

O.C. = Open Circuit

Error Type	Error Code	Flashing Frequency	Diagnosis
ERROR_TPS_LOW	1	1 (S.F.)	- TPS is not connected - TPS is incorrect connected
ERROR_TPS_HIGH	2	2 (S.F.)	- Wiring faulty [Wiring connecting PIN20 ECU and PIN2 TPS is at the voltage $\geq +5V$] - TPS Faulty
ERROR_TEMP-H ₂ O_LOW	3	3 (S.F.)	- Wiring faulty[Short circuit between the two wirings of water temperature sensor: Wiring1 connects PIN19 ECU and PIN1 water temperature sensor; Wiring2 connects PIN17 ECU and PIN2 water temperature sensor] - Water temperature sensor faulty
ERROR_TEMP-H ₂ O_HIGH	4	4 (S.F.)	- Water temperature sensor is not connected → [Solve the problem o water temperature sensor before testing fan using diagnosis.(Error Code 4)] - Wiring faulty[Wiring connecting PIN19 ECU and PIN1 water temperature sensor is at voltage +5V] - Water temperature sensor faulty
ERROR_TEMP-AIR_LOW	5	5 (S.F.)	- Wiring faulty[Short circuit between the two wirings of air temperature sensor; Wiring1 connects PIN18 ECU and PIN1 air temperature sensor; Wiring2 connects PIN17 ECU and PIN2 air temperature sensor] - Air temperature sensor faulty
ERROR_TEMP-AIR_HIGH	6	6 (S.F.)	- Air temperature sensor is not connected - Wiring faulty[Wiring connecting PIN18 ECU and PIN1 air temperature sensor is at the voltage $\geq +5V$] - Air temperature sensor faulty
ERROR_PRES-AIR_LOW	7	7 (S.F.)	ECU faulty, air pressure matters
ERROR_PRES-AIR_HIGH	8	8 (S.F.)	
ERROR_VB_LOW	9	9 (S.F.)	Wiring faulty
ERROR_VB_HIGH	10	1 (L.F.)	Regulator faulty

ERROR_INJECTOR_S.C.	11	1 (L.F.) + 1(S.F.)	- Wiring faulty[Short circuit between the two wirings of injector: Wiring1 connects PIN7 ECU and PIN2 injector; Wiring2 connects PIN87 main relay and PIN1 injector] - Injector faulty
ERROR_INJECTOR_O.C.	12	1(L.F.) + 2(S.F.)	- Injector is not connected - Wiring faulty[Short circuit between wiring connecting PIN7 ECU and PIN2 injector and earth wire] → [Only when the engine is running at (RPM > 0)] - Injector faulty
ERROR_IDLE- VALVE_S.C.	13	1(L.F.) + 3(S.F.)	- Wiring faulty[Short circuit between the two wirings of idle speed valve: Wiring1 connects PIN8 ECU and PIN2 idle speed valve; Wiring2 connects PIN87 main relay and PIN1 idle speed valve] - Idle speed valve faulty
ERROR_IDLE- VALVE_O.C.	14	1(L.F.) + 4(S.F.)	- Idle speed valve is not connected - Wiring faulty[Short circuit between wiring connecting PIN8 ECU and PIN2 idle speed valve and earth wire] - Idle speed valve faulty
ERROR_FAN- RELAY_S.C.	15	1(L.F.) + 5(S.F.)	- Wiring faulty[Short circuit between wiring connecting PIN4 ECU and PIN85 fan relay and +battery] - Fan relay faulty - Only use diagnosis analyzer to test fan when there is no problem with water temperature sensor.
ERROR_FAN- RELAY_O.C.	16	1(L.F.) + 6 (S.F.)	- Fan relay is not connected - Wiring faulty[Short circuit between wiring connecting PIN4 ECU and PIN85 fan relay and earth wire]. → [fan is running constantly] - Fan relay faulty
ERROR_MAIN- RELAY_S.C.	17	1 (L.F.) + 7(S.F.)	- Wiring faulty[Short circuit between wiring connecting PIN3 ECU and PIN85 main relay and +battery] → [Error17 causes Error32 only when the engine is running] - Main relay faulty
ERROR_MAIN- RELAY_O.C.	18	1(L.F.) + 8(S.F.)	- Main relay is not connected → [Error18 causes Error12 and Error14] - Wiring faulty[Short circuit between wiring connecting PIN3 ECU and PIN85 main relay and earth wire] - Main relay faulty
ERROR_ENABLE- START_S.C.	19	1(L.F.) + 9 (S.F.)	- Wiring faulty[Short circuit between wiring connecting PIN10 ECU and PIN85 starter relay and +battery] - Starter relay faulty
	21、 22		Not Defined

ERROR_LAMBDA	23	2 (L.F.) + 3 (S.F.)	- Oxygen sensor is not connected - Wiring faulty [Short circuit between the two wirings of oxygen sensor: Wiring1 connects PIN12 ECU and PIN1 oxygen sensor; Wiring2 connects PIN11 ECU and PIN2 oxygen sensor] - Oxygen sensor faulty - Diagnose the oxygen sensor only when the engine is running at (RPM > 0). - Oxygen sensor starts to work when the motorcycle is at idle speed and water temperature TH₂O is > 35° C. - Error23 will be detected from ECU after about 3 minutes.
ERROR_SAFETY-SWITCH_0	24	2 (L.F.) + 4 (S.F.)	- Roll over sensor is not connected - Wiring faulty [Wiring connecting PIN13 ECU and PIN1 roll over sensor is at the voltage ≥ +5V] - Roll over sensor faulty
ERROR_SAFETY-SWITCH_1	25	2 (L.F.) + 5 (S.F.)	- Roll over sensor's working condition [Error25 causes Error32 only when the engine is running]. - Wiring faulty [Short circuit between wiring connecting PIN13 ECU and PIN1 roll over sensor and earth wire] - Roll over sensor faulty
	26		Not Defined
	27		
ERROR_TEMP-ECU_HIGH ECU	28	2 (L.F.) + 8 (S.F.)	ECU faulty, temperature problem
ERROR_TEMP-ECU_LOW ECU	29	2 (L.F.) + 9 (S.F.)	
ERROR_PICK-UP_O.C.	30	3 (L.F.)	- Trigger is not connected - Wiring faulty [Short circuit between wiring connecting PIN15 ECU and PIN1 trigger and +battery] - Trigger faulty Diagnosis is applied only when the engine is running at (RPM > 0). When in starting phase, ECU will not indicate the Error30, instead it indicates the rev of 0. [Diagnosis Analyzer → Main Menu → Status Surveillance → Real-time value → (5) RPM → RPM=0]
ERROR_PICK-UP	31	3 (L.F.) + 1 (S.F.)	Trigger faulty
ERROR_IGNITION_CURRENT	32	3 (L.F.) + 2 (S.F.)	- Ignition coil is not connected - Wiring faulty [Short circuit between wiring connecting PIN3 ECU and PIN85 main relay and +battery] [Only when the engine is running at (RPM > 0)] - Ignition coil faulty

Diagnosis light:

1) Engine is not working when power lock is on → No error code is detected:

- Diagnosis light is on for 5 seconds and then turns off permanently.

2) Engine is not working when power lock is on → Only one error code is detected:

- Diagnosis light turns off after being on for 10 seconds, and then flashes according to error code (Refer to Errors Coding Table).

- Followed by flashing according to error code, diagnosis light turns off after being on for 10 seconds, and then flashes again according to error code.

- Such loop continues until engine starts to work (if possible) or power lock is off.

3) Engine is not working when power lock is on → More error codes are detected:

- Diagnosis light turns off after being on for 10 seconds, and then flashes according to error code (Refer to Errors Coding Table)

Flash the 1st error code, diagnosis light turns off after being on for 10 seconds,

Flash the 2nd error code, diagnosis light turns off after being on for 10 seconds... It continues until flashing the last error code, diagnosis light turns off after being on for 10 seconds. Then it loops to flash the 1st error code...

- Such loop continues until engine starts to work (if possible) or power lock is off.

4) Engine is not working when power lock is on → Maintenance time is expired and no error code is detected:

- Diagnosis light turns off after being on for 5 seconds, and then starts to flash for 15 times to indicate that maintenance should be applied. After that, it turns off permanently;

- Such flashing signal appears every time when the power turns on after turning off until the following procedures are applied:

- Throttle valve keeps full-open, and then turns on the power;

- (Throttle valve keeps full-open) diagnosis light turns off;

- (Throttle valve keeps full-open) after 10 seconds, diagnosis light is on for 5 seconds, close throttle valve during these 5 seconds, and then turn off the power.

Above all is the procedures of resetting maintenance when maintenance time is expired.

Repeat the above procedures when overtime maintenance occurs again.

Maintenance time is a parameter of ECU MAP.

5) Engine is not working when power lock is on → Maintenance time is expired and one or more error codes are detected:

- Diagnosis light turns off after being on for 10 seconds, and then flashes according to error code (Refer to Errors Coding Table).

Flash the 1st error code, diagnosis light turns off after being on for 10 seconds,

Flash the 2nd error code, diagnosis light turns off after being on for 10 seconds... It continues until flashing the last error code, diagnosis light turns off after being on for 10 seconds. Then it loops to flash the 1st error code...

- Such loop continues until engine starts to work (if possible) or power lock is off.

- Maintain overtime errors until no other error is detected, and only after that it indicates.

- Engine is not working when injection system is resumed and power lock is open, the above 4) occurs again. (Maintenance time is expired and no error code is detected.)