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CF250T-5 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 our motorcycle Model: CF250T-5(V5).

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

Chapter 2：inspection and adjusting key points，service guide.

Chapter 3 and later：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 scooters.

INDEX

Conversion Table

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

Cautions for Operation

Safety Cautions

Warning: Hazardous components in exhaust。
Do not run the engine in a enclosed or poorly ventilated place for long time。

Caution: Battery liquid(dilute sulfuric acid) is highly caustic and may cause burns to skin and eyes. Flush with water if splashed to skin and get immediate medical attention. Flush with water if splashed to clothes to avoid burns.

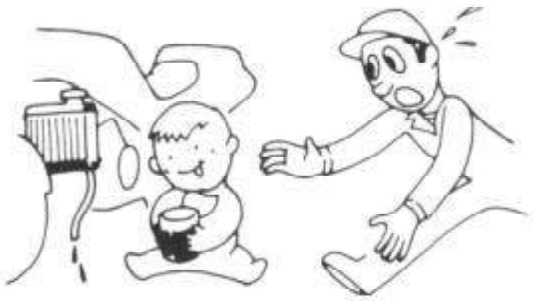
Keep battery and liquid away from reach of children

Caution: Wear proper work clothes,cap and boots. If necessary, were dust-glass,gloves and mask.

Warning: Do not touch the engineor muffler with bare hands when the engine has just stopped to avoid scalding. Wear long-sleeve work clothes and gloves for operation.

Warning: Coolant is poisonous. Do not drink or splash to skin, eyes or clothes.Flush with plenty of soap water if splashed to skin. Flush with water and consult the doctor If drinking the coolant, induce vomiting and consult doctor.

Keep coolant away from reach of children.



Warning: Gasoline is highly flammable. No smoking or fire. Also keep against sparks.Vaporized gasoline is also explosive. Operate in a well-ventilated place.

Caution: When charged, Battery may generate hydrogen which is explosive.Charge the battery in a well-ventilated place.

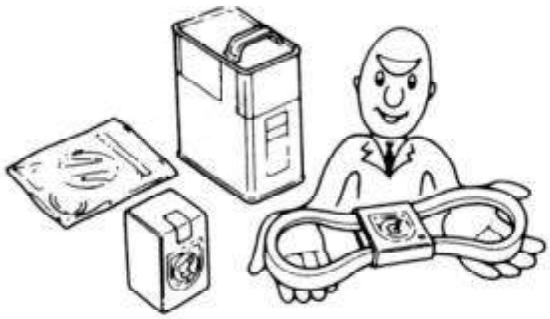
Warning:Be careful not to get clamped by the turning parts like wheels and clutch

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

Warning: When more than two people are operating, keep reminding each other for safety purpose.

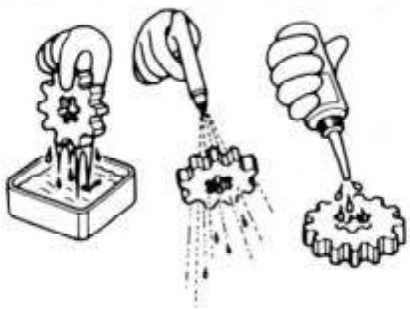
Cautions for Disassembling and Assembling

■ Use genuine CFMOTO parts, lubricants and grease

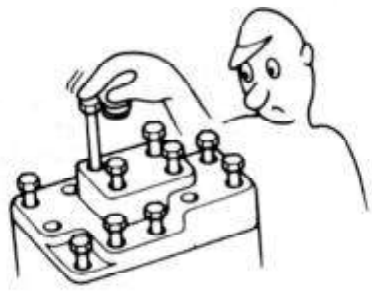


■ Place and store the disassembled parts separately in order for correct assemble.

■ Clean and blow off the detergent after disassembling the parts. Apply lubricants on the surface of moving parts.



■ If not knowing the length of screws,install the screws one by one and tighten with same torque.



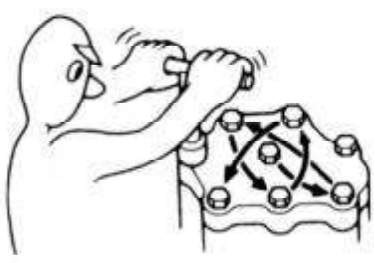
■ Clean the mud, dust before overhauling。

■ Replace the disassembled washers, o-rings,piston pin circlip, cotter pin with new ones.

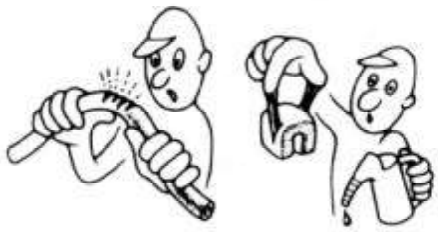
■ Elastic circlips might get distorted after disassembled. Do not use the loosed circlips.

■ Measure the data during disassembly for correct assembling.

■ Pre-tighten the bolts, nuts and screws, then tighten according to the specified torque,from big to small and from inner side to outer side.



■ Check if the disassembled rubber parts are aged and replace if necessary. Keep the rubber parts away from grease.



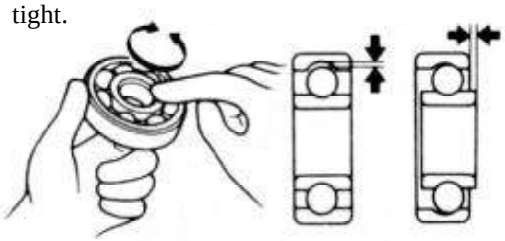
■ Use special tools wherever necessary

■ Turn the ball bearing with hands to make sure the bearing will turn smoothly.

•Replace if the axial or radial play is too big.

• If the surface is uneven, clean with oil and replace if the cleaning does not help.

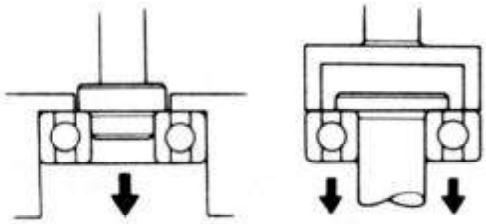
• When pressing the bearing into the machine or to the shaft, replace the bearing if it could not be pressed tight.



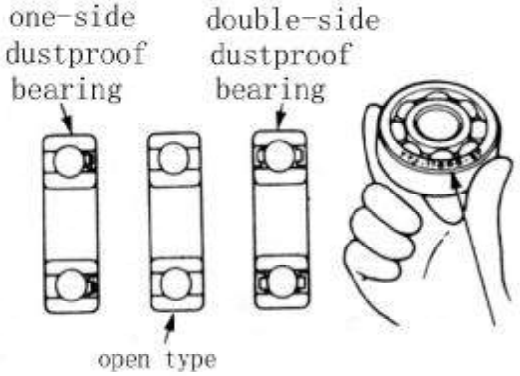
■ Keep the bearing block still when blowing dry the bearing after washing clean. Apply oil or lubricant before assembling.

■ Apply or inject recommended lubricant to the specified parts.

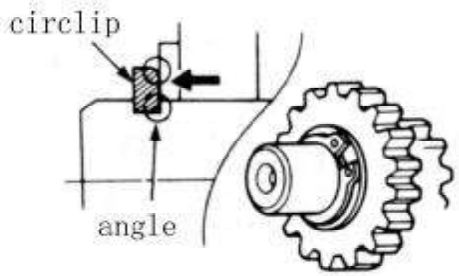
■ If the disassembling of pressed ball bearing is done by pressing the balls, the disassembled bearing should not be used again.



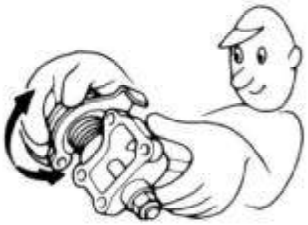
■ Install the one-side dust-proof bearing in the right direction. When assembling the open type or double-side dustproof bearing,install with manufacturer's mark outward.



■ Install the elastic circlip properly.Turn the circlip after assembling to make sure it has been installed into the slot.

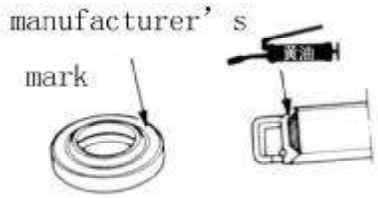


■ After assembling, check if all the tightened parts are properly tightened and can move smoothly.

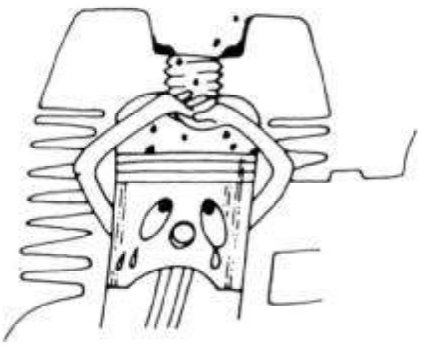


■ Install oil seal with the side of manufacturer's mark outward.

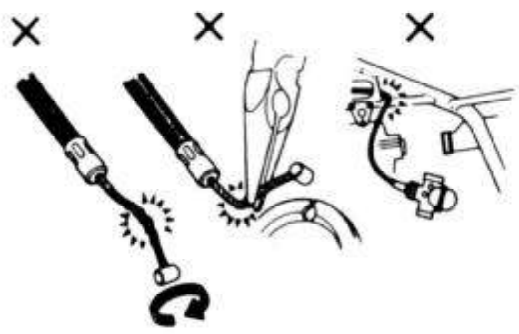
- do not fold or scratch the oil seal lip
- apply grease to the oil seal lip before assembling



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

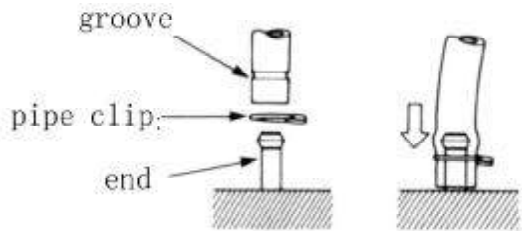


■ Do not twist or bend the cables too much.Distorted or damaged cables may cause poor operation.

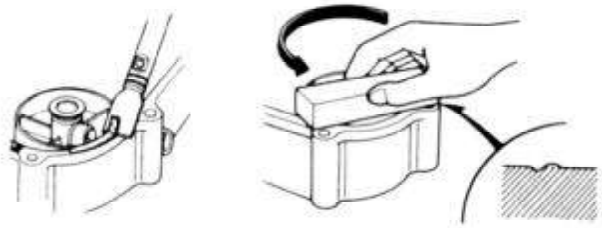


■ Brake fluid and coolant may damage coating, plastic and rubber parts. Flush these parts with water if splashed.

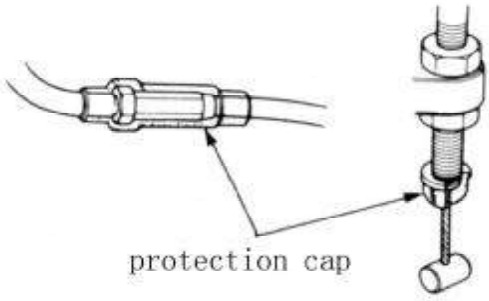
■ When installing pipes, insert the pipe till the end. Fit the pipe clip, if any, into the groove. Replace the pipes or hoses that cannot be tightened.



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



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



Number Engrave Place

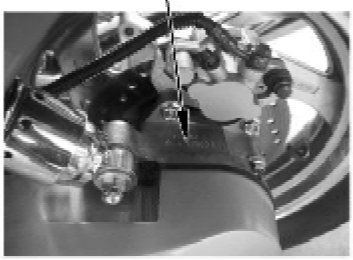
CF250T-5

Frame Number：LCETDJPK～

Engine Number：172MM-A ～

Frame Number
Engrave Place

Engine Number Engrave Place



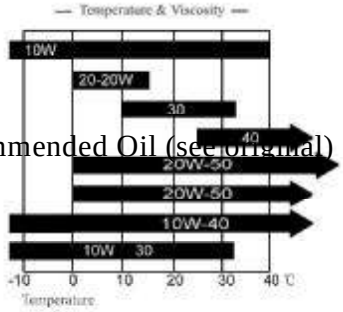
Major Specifications

Item				Parameter
Model				V5 CF250T-5
Length				2225mm
Width				875mm
Height				1110mm
Wheel base				1490mm
Engine type				172MM-A
Displacement				244.3ml
Fuel type				Unleaded gasoline 90 Octane or above
Dry weight				166kg
Number of Passengers				2(including driver)
Max. Load				150kg
Tire		Front		100/90－18
		Rear		150/80－15
Ground Clearance				150mm
Min. turning radius				5m
Engine	Starting			Electrical starting
	Engine type			4-stroke, gasoline engine
	Arrangement and No. of cylinder			Single, horizontal
	Combustion chamber type			Hemispherical
	Valve Driving type			OHC chain driving
	Bore x stroke			72mm×60mm
	Compression Ratio			10:1
	Max. power			11kw/7000r/min
	Max. torque			17.6N • m/5500r/min
	Cam valve	Valve intake	On	0° (1mm) BTDC
			Off	30° (1mm) ABDC
		Valve exhaust	On	35° (1mm) BBDC
			Off	5° (1mm) ATDC
	Lubrication type			Pressure & Splash
	Oil pump type			Rotor
	Oil filter type			Full flow filter screen
	Cooling type			Forced water cooling

Item			Parameter
Fuel device	Air Filter type		Urethane foam filter
	Carburetor	Type	Vacuum Diaphragm type
		Diameter of mixing valve	26mm
Gearing	Clutch	Type	Dry, auto-centrifugal
		Operation mode	Automatic
	Initial Transmission	Gear type	Bevel gear
		Reduction ratio	2.938
	Secondary transmission	Gear type	Bevel Gear
		Reduction ratio	2.938
	Gearbox	Type	CVT
		Function	Auto-centrifugal
		Transmission ratio	2.2~0.9
Steering device	Steering angle	Right	35°
		Left	35°
Brake type		Front	Hydraulic Disc
		Rear	Hydraulic Disc
Buffer Device	Suspension	Front wheel	Telescopic
		Rear wheel	Swing arm
Frame type			Welded steel tube and plate

Overhaul Datasheet

Lubricating device

Item		Standard	Service limit
Engine Oil Capacity	Volume when replacing	0.8L	—
	Full capacity	1.0L	—
Recommended Oil (see original) 		• Special for 4-stroke motorcycle SAE-10W-40、20W-50 Substitutes must be used in the following range. • API type: SE or SF grade • SAE type: Choose from the left chart according to the environmental temperature	
Oil pump Rotor	Gap between inner and outer rotors	0.07～0.15mm	0.20mm
	Gap between outer rotor and body	0.07～0.17mm	0.25mm
	End face gap	0.05～0.10mm	0.12mm

Fuel Device

Item		Standard
Fuel Tank Capacity	Full capacity	17.0L
Carburetor	Designated marks	VE14C
	Main jet	
	Low-speed jet	
	Drop turn median value	
	Fuel level of float chamber	18.5±0.5mm
	Idle speed	1500±150r/min

Cooling Device

Item		Standard
Coolant capacity	Full Capacity	1100ml
	Reservoir tank capacity	340ml
	Standard density	50%
Opening pressure of radiator cap		108kpa(1.1kgf/cm^2)
Thermostat	Temperature / valve open	72±2℃
	Temperature/valve full open	88℃
	Overall lift	3.5～4.5mm

Cylinder head、valve

Item			Standard	Service limit
Compression pressure of cylinder			15.0kgf/cm² -600rpm	
Valve clearance		IN	0.10mm	
		EX	0.10mm	
Planeness				0.05mm
Camshaft	Cam Height	IN	31.60-31.72mm	31.52mm
		EX	31.60-31.72mm	31.52mm
Rocker arm	Inner diameter of rocker	IN/EX	12.000-12.018mm	12.10mm
	Outer diameter of rocker	IN/EX	11.973-11.984mm	11.91mm
Valve Valve guide bushing	Outer diameter of valve stem	IN	4.975-4.990mm	4.90mm
		EX	4.955-4.970mm	4.90mm
	Inner diameter of valve guide	IN	5.000-5.012mm	5.03mm
		EX	5.000-5.012mm	5.03mm
	Clearance between valve stem and guide	IN	0.010-0.037mm	0.08mm
		EX	0.030-0.057mm	0.10mm
	Thrown height of valve guide	IN/EX	12/12mm	
	Contact width of valve seat	IN/EX	1.2mm	1.8mm
Valve spring	Free length (outer/inner)	IN/EX	40.0/30.5mm	36.1/27.6mm

Auto CVT

Item		Standard	Service limit
Transmission Primary Sheave	Primary Sliding Sheave	27.000-27.033mm	27.06mm
	Outer diameter of bushing, Primary Sheave	26.959-26.980mm	26.94mm
	Outer diameter of weight roller	22.94-23mm	22.4mm
Belt width		27.2mm	25.5mm
Secondary Sheave	Clutch facing thickness		1.5mm
	Inner diameter of clutch housing	153-153.15mm	153.8mm
	Free length of clutch spring	135.0mm	127.0mm
	Outer diameter of secondary fixed sheave	39.95-39.975mm	39.94mm
	Inner diameter of secondary sliding sheave	40.0-40.025	40.06mm

Gearbox

Item		Standard
Gear oil	For replacing	0.2 L
	For disassembling	0.25 L
Recommended gearbox oil		SAE15W-40/SF

Starting motor

Item		Standard	Service Limit
Starting motor	Brush length	12.0-12.5mm	11.0

Crankshaft 、Piston、Cylinder

Item			Standard （mm）	Limit （mm）
Crankshaft	Big end, connecting rod	Axial clearance	0.10-0.35	0.5mm
		Radial clearance	0.013-0.025mm	0.05mm
	Crankshaft play		0.02mm	0.10mm
Piston	Piston installing direction		“IN” towards valve intake	
	Outer diameter of Piston		71.96-71.98mm	71.9mm
	Piston pin hole inner diameter		17.002-17.008mm	17.04mm
	Piston pin outer diameter		16.994-17mm	16.96mm
	Connection rod small end inner diameter		17.006-17.024mm	17.06mm
	Clearance between cylinder& piston		0.02-0.059mm	0.10mm
	Clearance between piston & pin		0.002-0.014mm	0.02mm
	Clearance between pin & connection rod		0.006-0.030mm	0.02mm
	Clearance between Piston ring & groove	Top ring （1）	0.015-0.05mm	0.09mm
		2nd Ring（2）	0.015-0.05mm	0.09mm
	Piston ring end gap	Top ring （1）	0.15-0.30mm	0.05mm
		2nd Ring（2）	0.10-0.25mm	0.05mm
		Oil ring	0.4-0.5mm	
	Installing direction， piston ring		Mark Upward	
Cylin-der	Inner diameter		72-72.019mm	72.1mm
	Upper distortion		---	0.05mm
	Roundness		0.002mm	0.05mm
	Cylindericity		0.005mm	0.05mm

Front wheel

Item			Standard	Service Limit
Front wheel	Bending, front wheel axle		—	0.2mm
	Play of wheel rim	Vertical	0.8mm	2.0mm
		Horizontal	0.8mm	2.0mm
	Tire	Groove	—	1.6mm
		Pressure	250kPa（2.5kgf / 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
		Pressure	280kpa(2.8kgf/cm^3)	--

Brake system

Item		Standard	Service Limit
Front brake	Brake lever play	10-20mm	--
	Brake disc thickness	4mm	3mm
Rear brake	Brake lever play	10-20mm	--
	Brake disc thickness	4mm	3mm

Battery、Charging system

Item			Standard
AC magneto Motor	Model		Permanent magnet AC type
	Output		3- phase AC
	Charging coil Resistance (20℃)		0.2-0.3Ω
Rectifier			Three-phase annular rectification Silicon controlled parallel-connected regulated voltage
Battery	Capacity		12V 10Ah
	Terminal point voltage	Fully charged	12.8V
		Insufficient charge	<11.8V
	Charging current/time	Standard	0.9A / 5～10H
		Quick	4A / 1H

Ignition system

Item		Standard
Ignition		CDI ignition
Sparking-plug	Type	Electricity negative type spark plug
	Standard	DPR7EA-9(NGK)
	Optional	DR8EA 、D7RTC
	Spark plug gap	0.8-0.9mm
Ignition timing	Max. advanced angle	28° CA
Peak voltage	Ignition coil	
	Pulse generator	

Light、Instrument、Switch、Pickup coil

Item		Standard
Fuse	Main	20A
	Auxiliary	5A×2 10A×2
Light， Bulb	Head light （Hi/Lo）	12V—35W/35W
	Brake light/tail light	12V—5W/21W
	Turning light	12V—10W×4
	Odometer indicator light	12V—3.4W
	Odometer light	12V—1.7W
	Turning Indictor	12V—3.4W
	High Beam Indicator	12V—3.4W

Tightening torque

Item	Torque N·m(kgf·m)	Item	Torque N·m(kgf·m)
Bolt, nut 5mm	5（0.5）	Screw 5mm	4（0.4）
Bolt, nut 6mm	10（1.0）	Screw 6mm	9（0.9）
Bolt, nut 8mm	22（2.2）	Bolt with flange, 6mmSH	10（1.0）
Bolt, nut 10mm	34（3.5）	Bolt with flange, nut6mm	12（1.2）
Bolt, nut 12mm	54（5.5）	Bolt with flange, nut8mm	26（2.7）
		Bolt with flange, nut10mm	39（4.0）

For others not listed in the chart, refer to the standard tightening torque。

Notes: 1.Apply some engine oil on the part of screw thread and contact surface.
2.Locknut must be replaced with a new one after removed.

Type	No. of Bolt & Nut	Thread diameter	Torque N·m(kgf·m)	Remarks
Checking、adjusting				
Check Gearbox oil /drain Bolt	2	M10×1.25		
Engine oil filter cover	1	M39×1.5	18~22	
Drain bolt	1	M12×1.5	20~25	
Spark plug	1	M12×1.25	15~20	
Lubricating system				
Oil plump and mounting bolt	2	M6×12	10	
Screw, oil pump plate	1	M3×12	2	
Cooling system				
Coolant drain bolt	1	6	8（0.8）	
Coolant temperature Alarm	1	R1/8	10（1.0）	
Impeller, water pump	1	7	10（1.0）	
Cylinder head/head cover				
Cylinder head cover bolt	2	6	10（1.0）	
Cylinder Stud	short 3	8	30（3.0）	
	long 1	8	30（3.0）	
Timing sprocket bolt	2	5	9（0.9）	
Tensioner spring seat bolt	1	8	10（1.0）	
Tensioner thread pin bolt	1	8	13（1.3）	
Belt, CVT system				
Left side cover bolt	5	6	10（1.0）	
Gearbox nut	1	14	78（8.0）	
Clutch special nut	1	28	69（7.0）	
Clutch nut	1	12	49（5.0）	
AC Magneto motor				
AC Magneto motor nut	1	14	103（10.5）	
Flange bolt for casing	8	6	12（1.2）	
Overriding clutch inner hex bolt	3	6	12（1.2）	

Frame

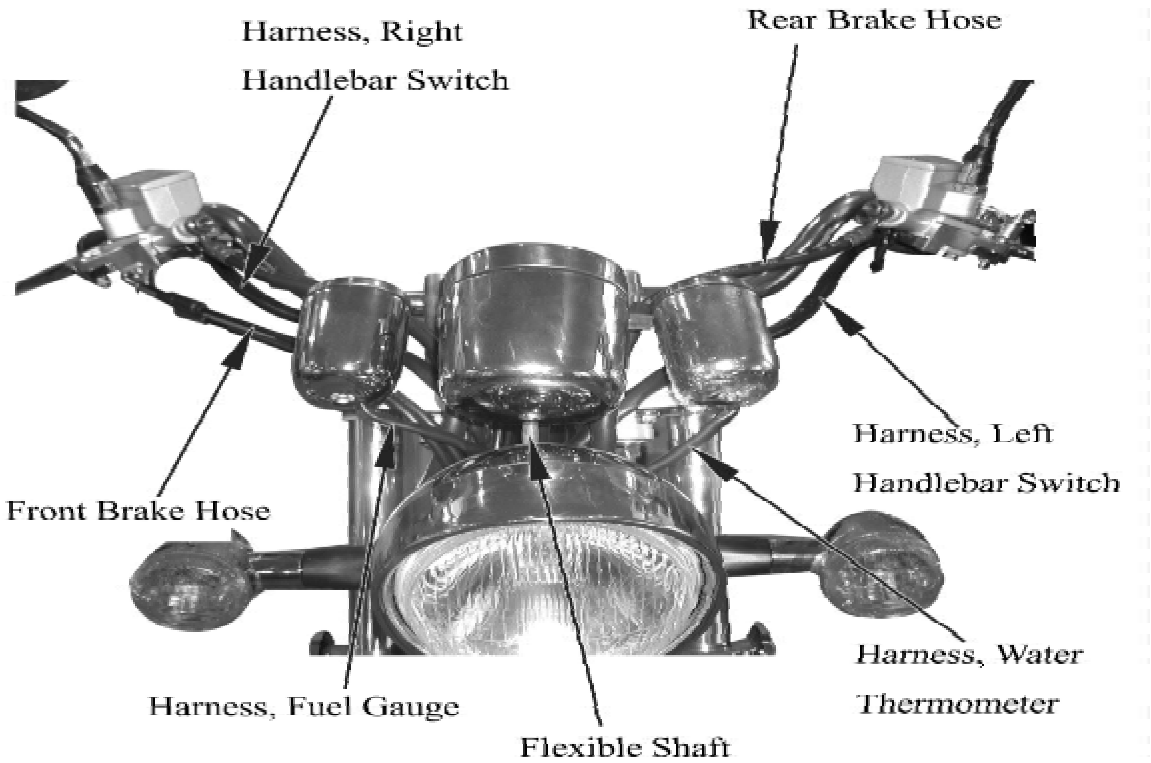
Type	No. of Bolt & Nut	Diameter (mm)	Tighteningtorque N·m(kgf·m)	Remarks
Engine disassembly				
Engine suspension mounting bolt	2	10	55（5.6）	
Engine suspension shaft nut	1	12	80（8.1）	
Front wheel, Front suspension, Steering				
Handlebar locknut	1	25	68（7.0）	
Handlebar mounting nut	1	10	55（5.6）	
Front wheel axle nut	1	14	100（10.1）	
Upper mounting bolt, absorber	4	8	40（4.1）	
Rear wheel ,Rear suspension				
Rear wheel axle nut	1	16	140（14.3）	
Upper mounting bolt, absorber	2	10	55（5.6）	
Lower mounting bolt, absorber	2	10	50（5.6）	
Rear fork mounting bolt	2	8	30（3.1）	
Brake system				
Front brake disc mounting bolt	6	8	12（1.2）	
Rear brake disc mounting screw	4	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）	

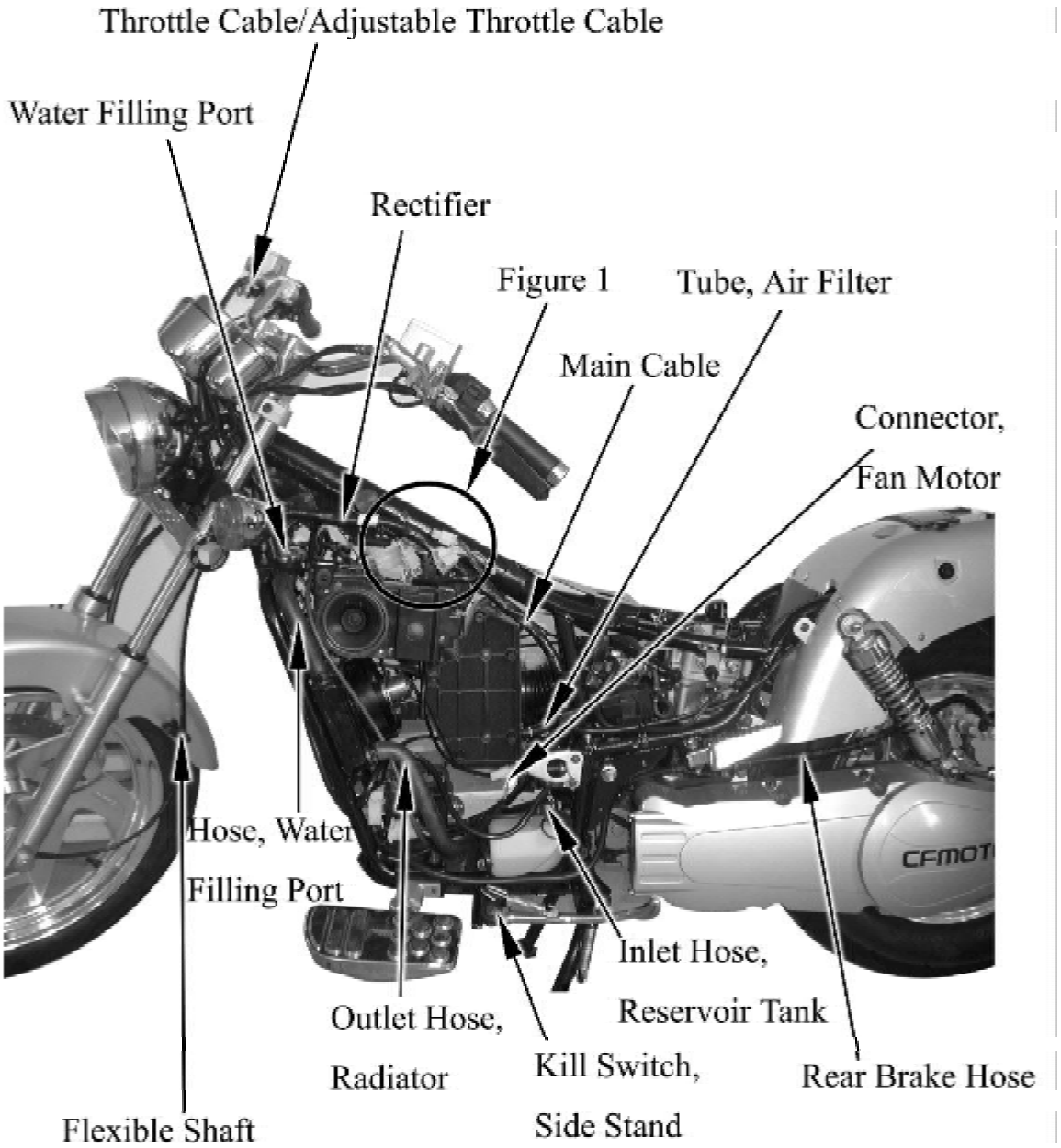
Lubricant, Sealant

Application Areas	Notes	Grease type
Inner surface, cylinder sleeve Conical surface, AC magneto rotor Bearing/flank, connecting rod big end Inner side, connecting rod small end Crankshaft main bearing surface Tooth flank, crankshaft timing sprocket Drive gear tooth flank, oil pump Piston pin outer surface Piston ring groove Piston ring Camshaft bearing rotating surface Timing sprocket tooth flank Rock arm shaft surface Sprocket tooth flank, oil pump Oil pump comp. Thread/joint face, drive wheel nut Outer surface, oil seal lips Tooth flank & bearing, reduction gear Cam surface Inner surface, rocker arm Valve stem (guide side)		Special SAE standard for 4 stroke motorcycle engine. 15w-40 API category: SE or SF engine oil
Water temperature alarm Screw thread part, timing sprocket mounting nut		Tightening sealant
Ball bearing, clutch Needle bearing, clutch Secondary sliding sheave, clutch	5.0-5.5g(do not apply on clutch surface)	Exxonmobile grease XHP222 (deep blue)
Sealing surface, all o-rings Tightening bolt, cylinder body	Do not apply on the sharp point	Sealant

Application areas	Notes	Types
Bearing race, head pipe Lip ,front wheel dust-proof seal Joint, meter flexible shaftJoint, throttle cable Throttle grip part Pivot, rear pedal(L) Pivot, rear pedal(R) Pivot, side stand Oil seal lip, rear fork Tooth flank, counter gear/small gear Axle part, main stand		Multi-purpose lubrication oil
Rear wheel axle nut		Engine oil
Dust-proof seal lip, lower part of front shock-absorber		Absorber oil # 5
Inner surface, handle bar		Engine oil

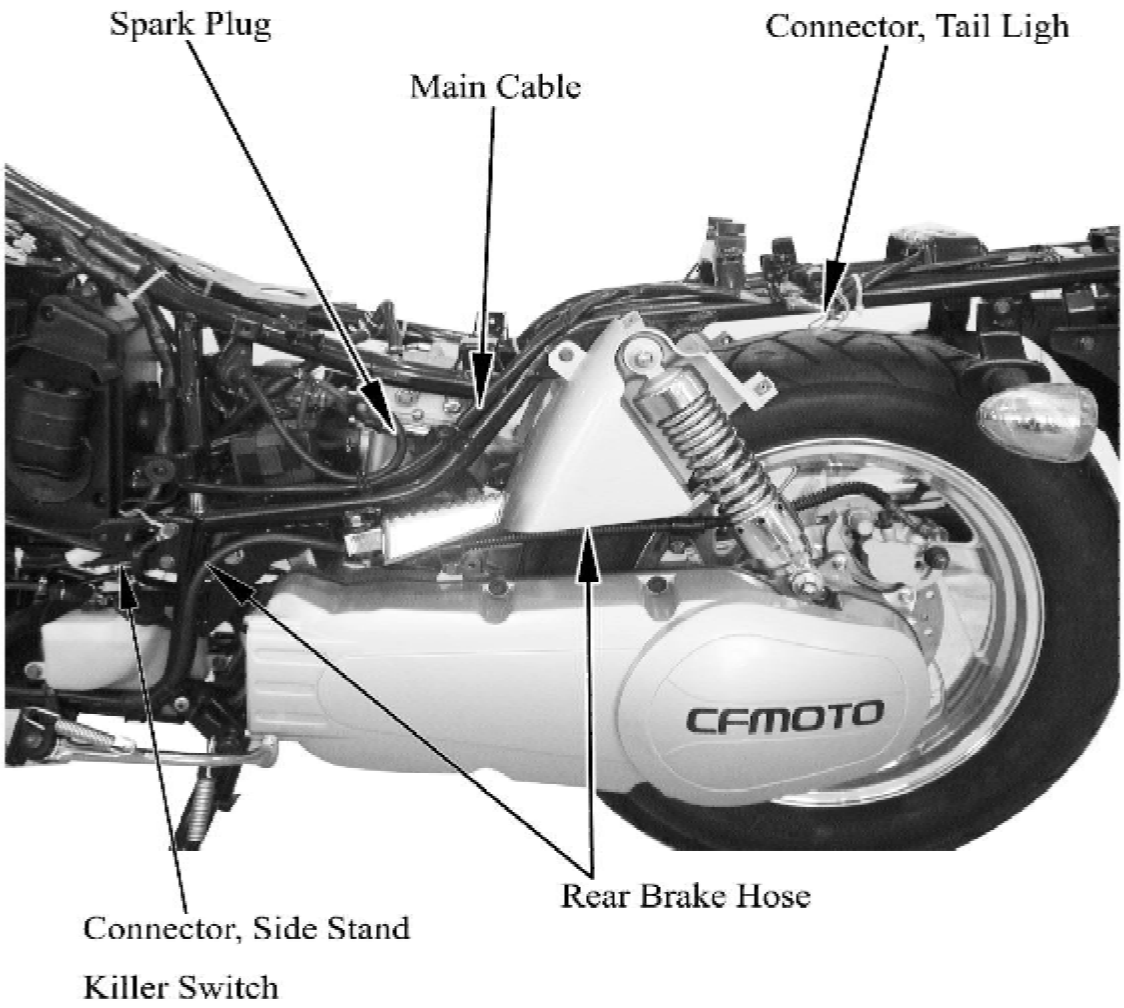
Wiring, Piping and Cable Routing

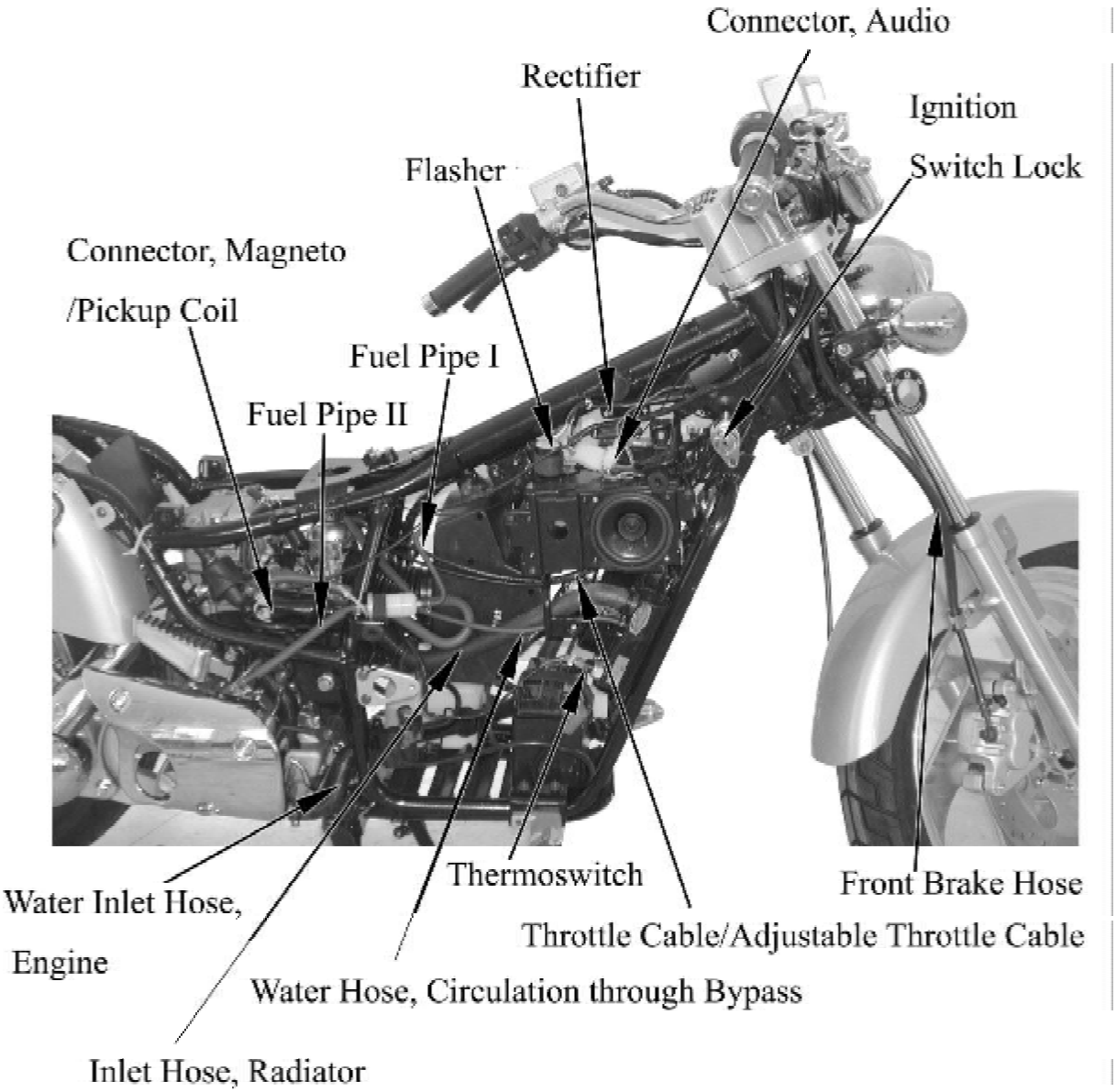


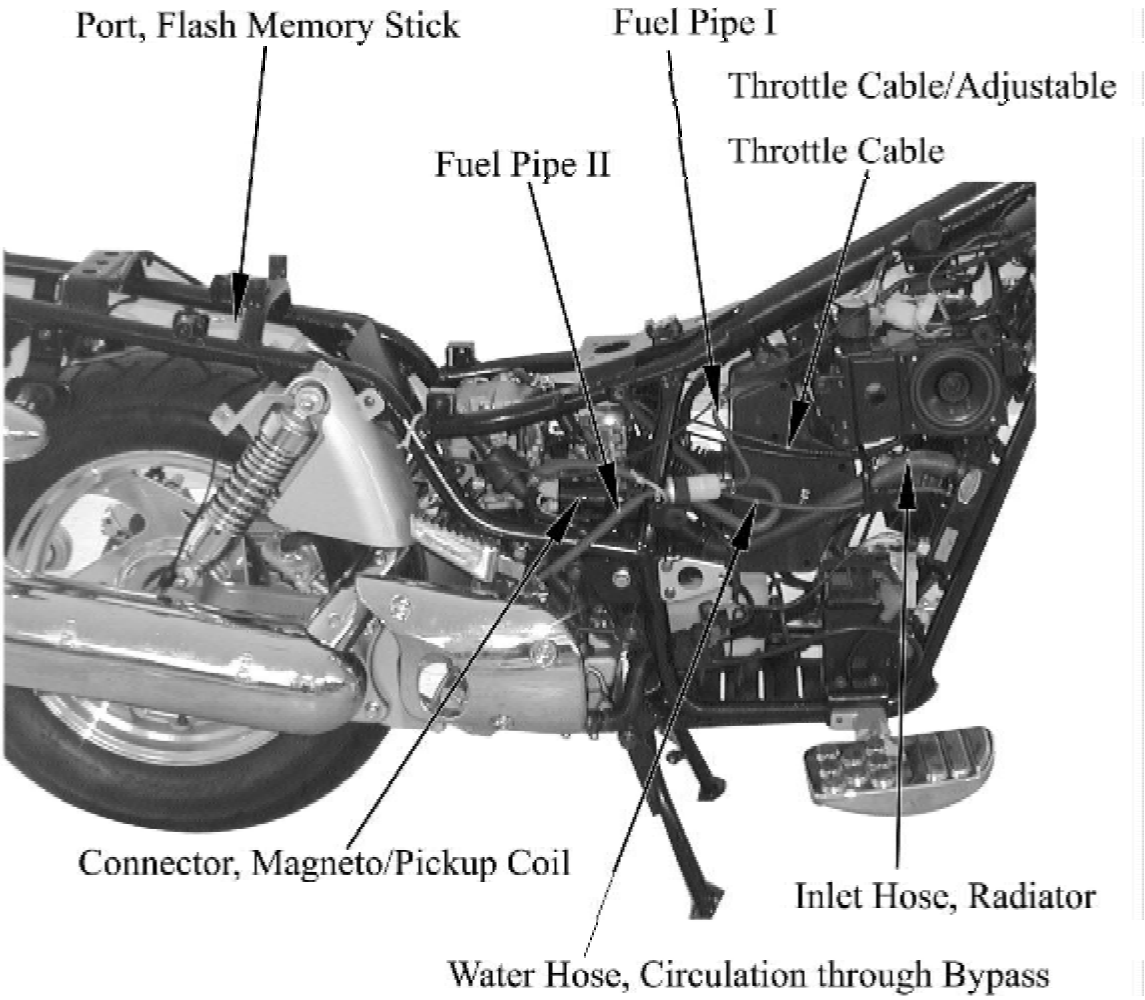

Throttle Cable/Adjustable Throttle Cable
Water Filling Port
Rectifier
Figure 1
Tube, Air Filter
Main Cable
Connector,
Fan Motor
Hose, Water
Filling Port
Inlet Hose,
Reservoir Tank
Outlet Hose,
Radiator
Kill Switch,
Side Stand
Rear Brake Hose
Flexible Shaft


3P Connector, Flasher
2P Connector, Fuel Sensor
9P Connector, Handle-bar Switch (L&R)
3P/4P Connector, Rectifier

Figure 1


Spark Plug
Main Cable
Connector, Tail Ligh
CFMOTO
Rear Brake Hose
Connector, Side Stand
Killer Switch


Connector, Audio
Rectifier
Ignition
Switch Lock
Flasher
Connector, Magneto
/Pickup Coil
Fuel Pipe I
Fuel Pipe II
Thermoswitch
Front Brake Hose
Water Inlet Hose,
Engine
Throttle Cable/Adjustable Throttle Cable
Water Hose, Circulation through Bypass
Inlet Hose, Radiator


Port, Flash Memory Stick
Fuel Pipe I
Throttle Cable/Adjustable
Throttle Cable
Fuel Pipe II
Connector, Magneto/Pickup Coil
Inlet Hose, Radiator
Water Hose, Circulation through Bypass

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.

Removal and Installation of muffler should be done after it is fully cooled.

- This chapter is on the disassembly and installation of outer parts˘˘exhaust pipe, muffler and fuel tank.
- Hoses, cables and wiring should be routed properly .
- Replace the gasket with a new one after muffler is removed.
- After muffler is installed, check if there is any exhaust leakage.

Tightening torque

Screw, Taillight/Brake Light 1.8N.m(0.18kgf.m)
Screw, Rear turning Light Housing 1.8N.m(0.18kgf.m)
Screw, Taillight Housing 1.8N.m(0.18kgf.m)

Trouble shooting

Loud exhaust noise

- Broken muffler
- Exhaust leakage

Insufficient power

- Distorted muffler
- Exhaust leakage
- Muffler clogged

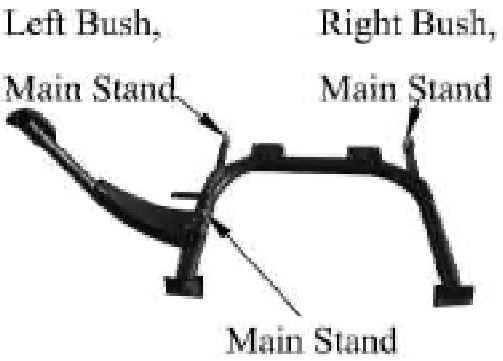
Main Stand

Caution

Make sure there is no deviation of the seat by shaking it up and down, back and forth after installation.

Installation

Install the left and right bush to the main stand.

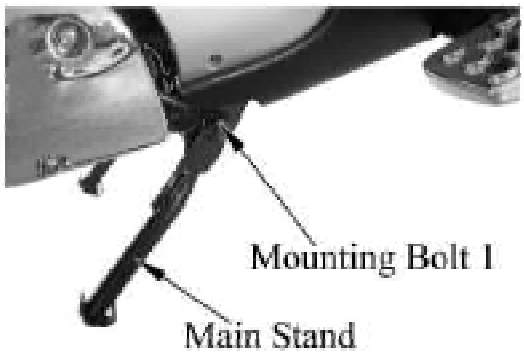


Note:

Apply grease to the outer surface of bush.

Install main stand to the vehicle with mounting bolt.

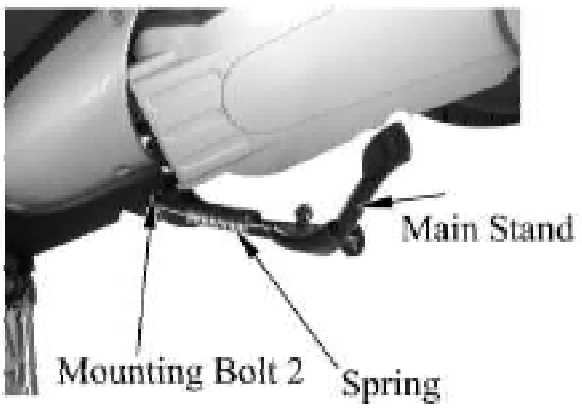
Tightening Torque: 26N.m(2.7kgf.m)



Install spring to main stand as illustrated.

Disassembly

Reverse the installation procedure for disassembly.



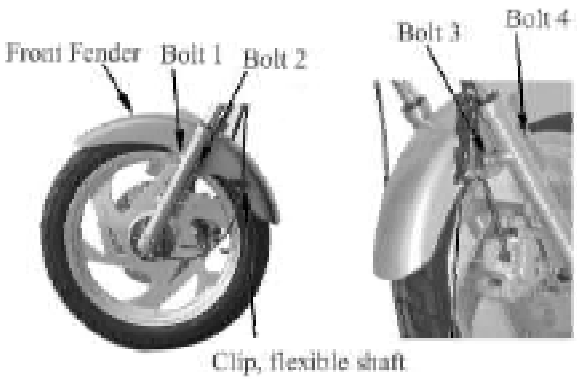
Front Fender

Removal

—Clip, flexible shaft

—Screw 1, Screw 2, Screw 3, Screw 4

—Front fender



Installation

Reverse the removal procedure for installation.

Seat

Removal

Unlock the passenger seat with ignition

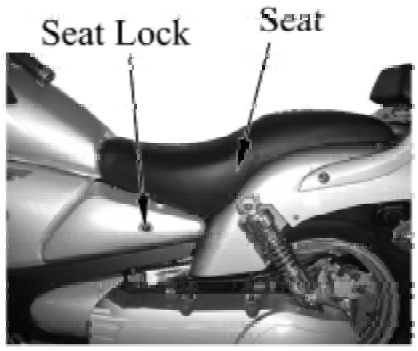
Push backward and lift passenger seat.

Installation

Reverse the removal procedure for installation.

Note:

Make sure that the seats are firmly installed.



Backrest

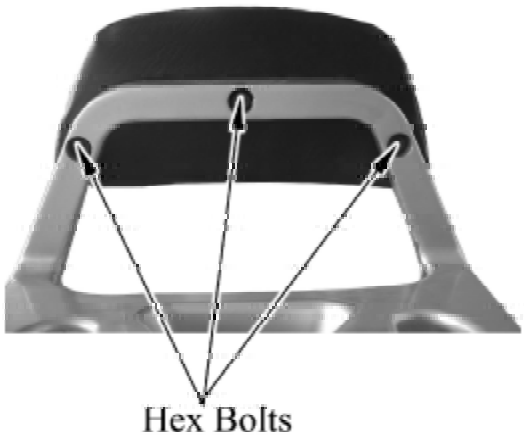
Removal:

—Three hex bolts

—Backrest

Installation

Reverse the removal procedure for installation.



Rear Left Panel

Removal:

—Seat

—Bolt

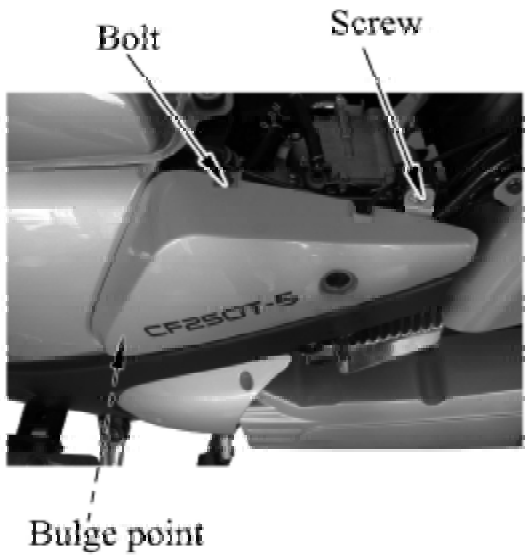
—Screw

Separate Rear Left Panel from frame.

Remove rear left panel

Installation

Reverse the removal procedure for installation.



Rear Right Panel

Removal:

—Seat

—Bolt

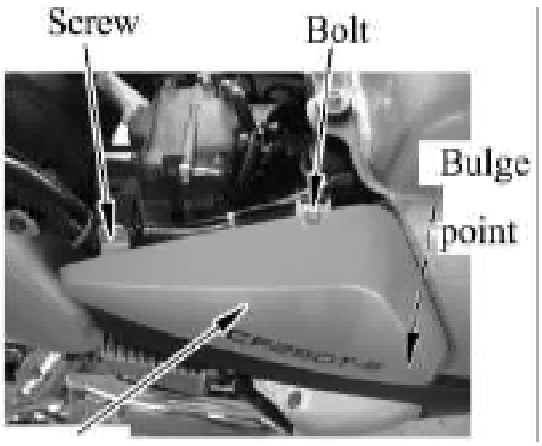
—Screw

Separate Rear Left Panel from frame.

Remove rear left panel

Installation

Reverse the removal procedure for installation.



Rear Right Panel

Front Vent Panel

Removal

—Six Tapping Screws

—Front Vent Panel

Installation

Reverse the removal procedure for installation.

Tapping Screw

Left Black Panel, Left Ornament Panel

Remove

—Front Vent Panel

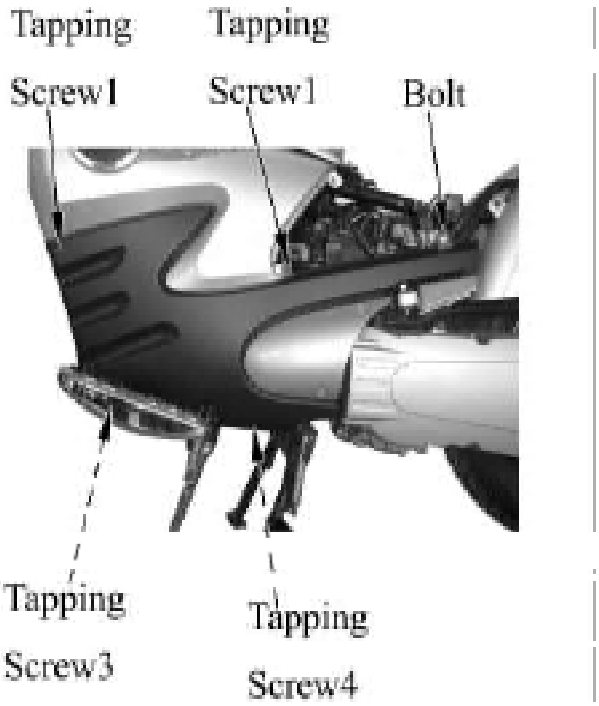
—Rear Left Panel

—Bolt 1, Tapping Screw 1, 2, 3, 4

Remove left black panel with ornament panel.

Installation

Reverse the removal procedure for installation.



Left Ornament Panel

Removal

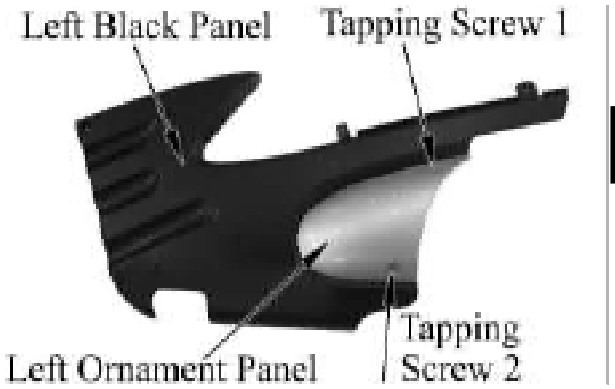
—Tapping Screw 1

—Tapping Screw 2

—Left Ornament Panel

Installation

Reverse the removal procedure for installation.



Right Black Panel, Right Ornament Panel

Removal

—Front Vent Panel

—Rear Right Panel

—Bolt, Tapping Screw 1, 2, 3, 4,

Remove right black panel with right ornament panel.

Installation

Reverse the removal procedure for installation.

Right Ornament Panel

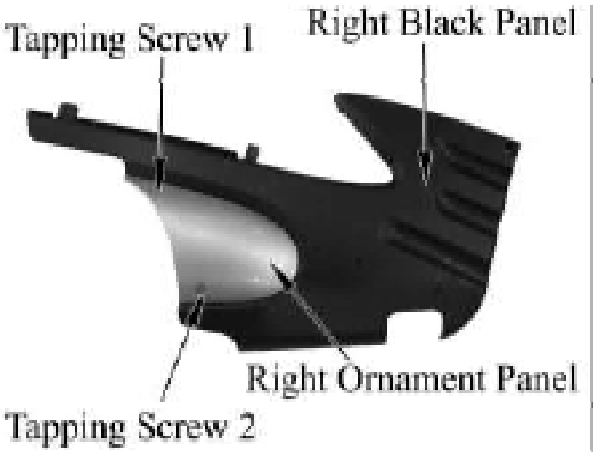
Removal

— Tapping Screw 1, Tapping Screw 2

—Right ornament panel

Installation

Reverse the removal procedure for installation.



Front Left Panel

Removal

—Front vent panel

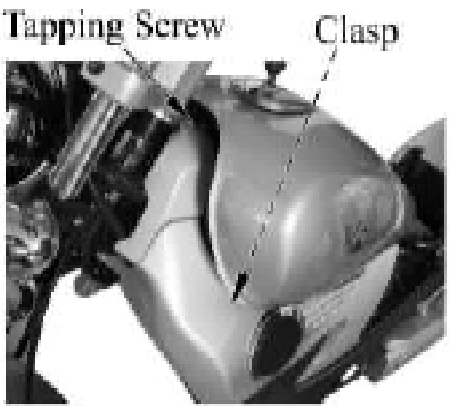
—Tapping screw

—Separate front left and right panels by acting on the front of front left panel.

—Separate front left panel from front left upper panel and remove front left panel.

Installation

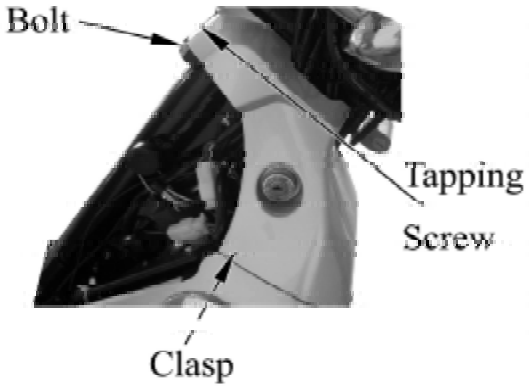
Reverse the removal procedure for installation.



Right Panel

Removal

—Ignition key
—Seat
—Fuel tank
—Front vent panel
—Bolt, Tapping Screw
—Separate front right and left panels by acting on the front of front right panel.
—Separate front left panel from front left upper panel and remove front right panel.



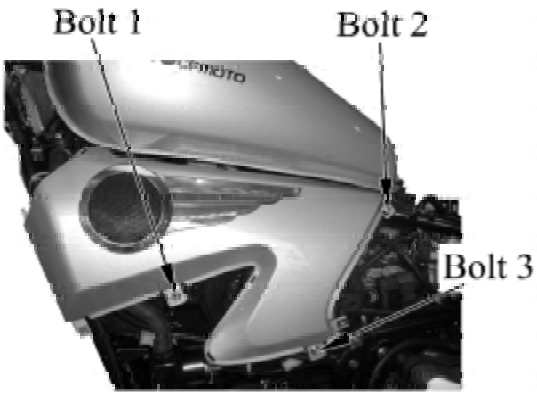
Installation

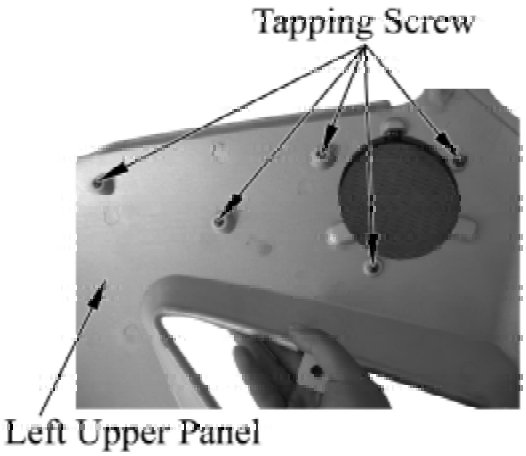
Reverse the removal procedure for installation.

Left Upper Panel, Left Speaker Cover and Grille

Removal

—Seat
—Front vent panel
—Rear panel (L&R)
—Black panel (L&R)
—Front left panel
—Bolt 1, Bolt 2, Bolt 3
—Left upper panel





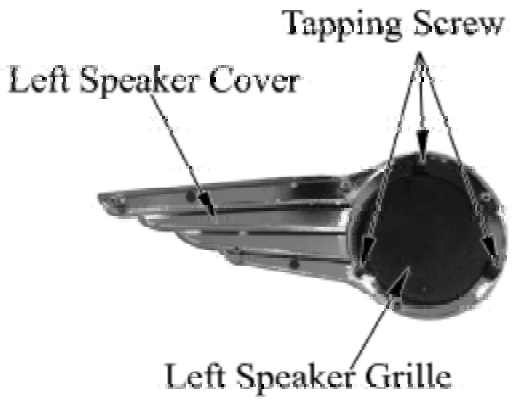
Installation

Reverse the removal procedure for installation.

Left Speaker Cover and Grille

Removal

—5 tapping screws;
—Speaker cover and grille
—3 tapping screws from left speaker cover;
—Speaker grille



Installation

Reverse the removal procedure for installation.

Front Right Panel, Right Speaker Cover & Grille

Removal

—Seat

—Fuel Tank

—Front vent panel

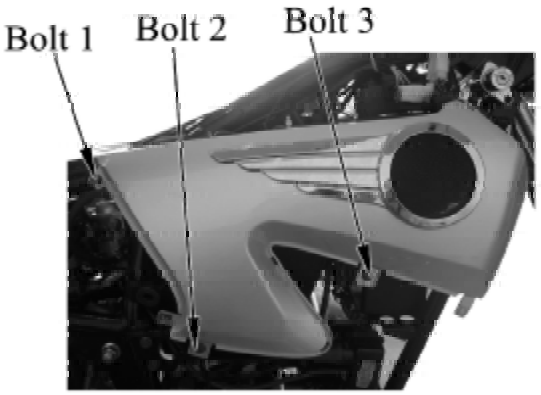
—Rear panel (L&R)

—Black panel (L&R)

—Protection panel (L&R)

—Bolt 1, Bolt 2, Bolt 3

—Front panel (R)



Installation

Reverse the removal procedure for installation.

Right Speaker Cover & Grille

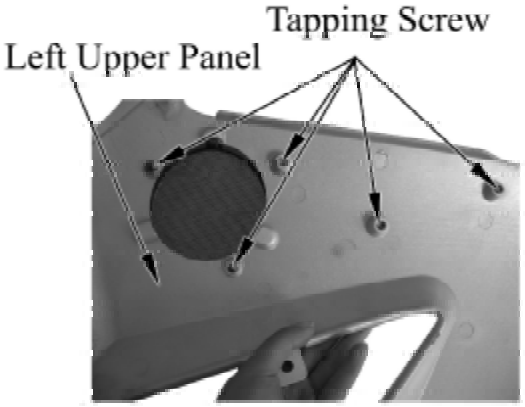
Removal

—5 tapping screws;

—Right speaker cover and grille

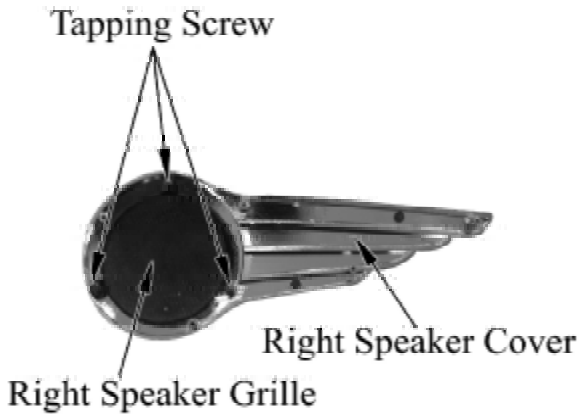
—3 tapping screws from right speaker cover;

—Speaker grille



Installation

Reversethe removal procedure for installation.



Seat Lock

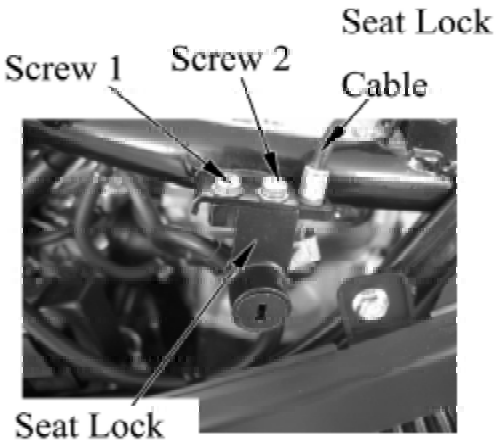
Remove:

— Driver seat

—Rear left panel

—Screw 1, Screw 2

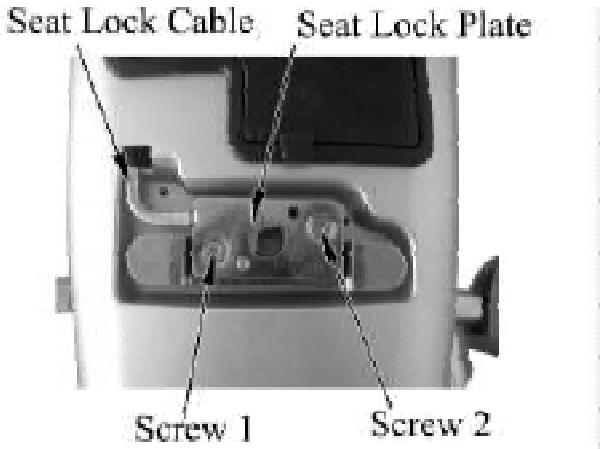
—Seat Lock



—Screw 3, Screw 4

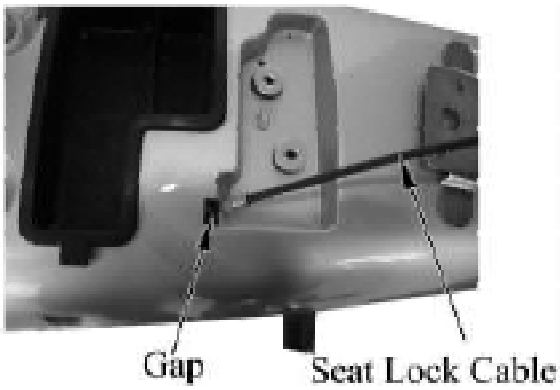
—Seat Lock Plate

Remove Seat lock cable from seat lock



Remove seat lock cable from gap and remove seat lock,

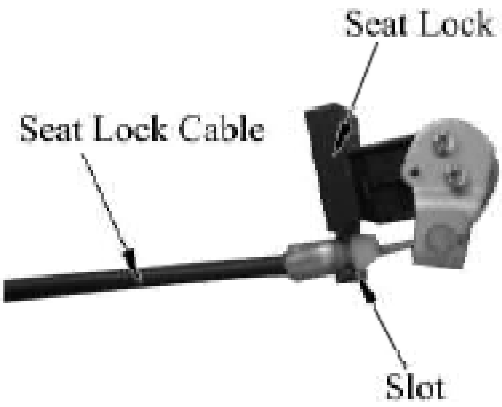
Separate seat lock plate and seat lock from the vehicle



Installation

Allow seat lock cable through rear fender from gap, install seat lock cable on seat lock as illustrated.

Reverse the removal procedure for installing seat lock and seat lock plate

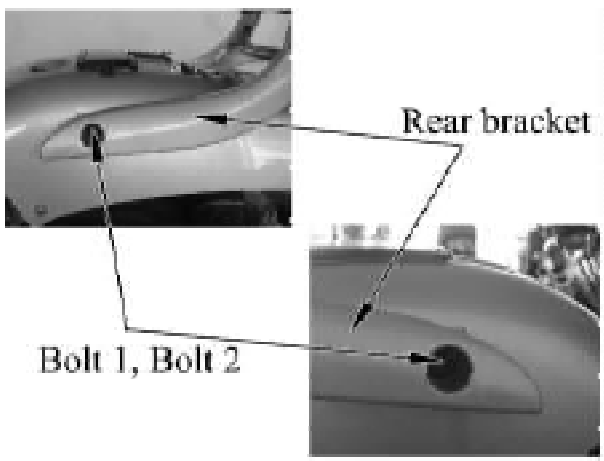


Rear Bracket

Removal

—Seat

—Bolt 1, Bolt 2

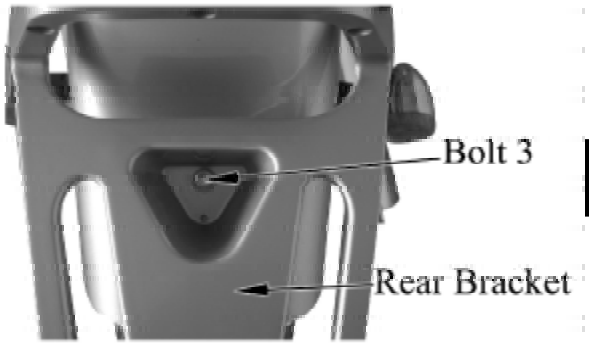


—Bolt 3

—Rear bracket

Installation

Reverse the removal procedure for installation



Rear Part of Rear Fender, Tool Box

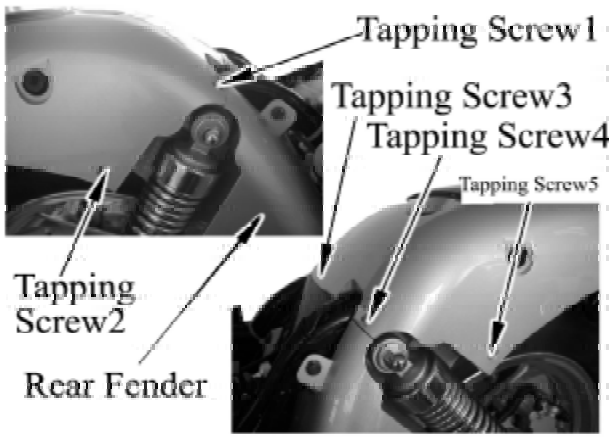
Removal

—Remove driver seat

—Seat lock plate

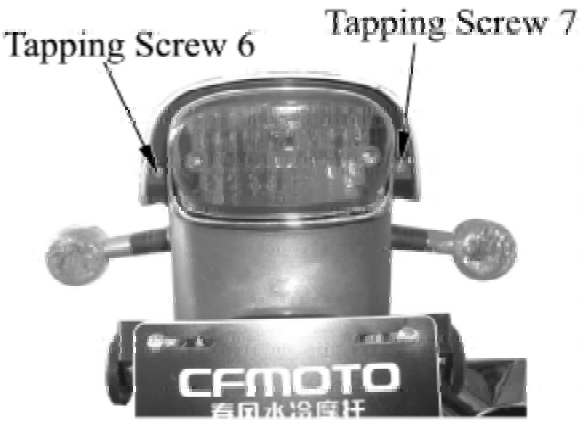
—Tapping screw1, 2,3,4,5

—Tapping screw 6 and tapping screw 7



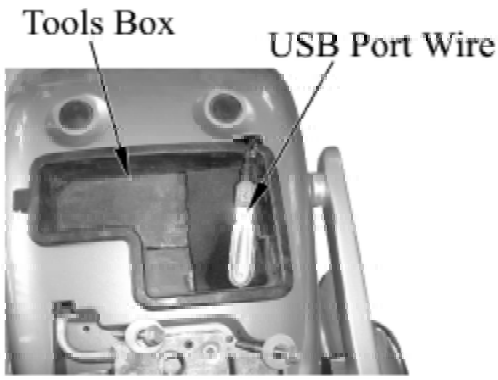
—Open the tool box cover, and remove the memory sticker from USB port, pull out the USB port wire.

—Rear part, rear fender



Installation

Reverse the removal procedure for installation



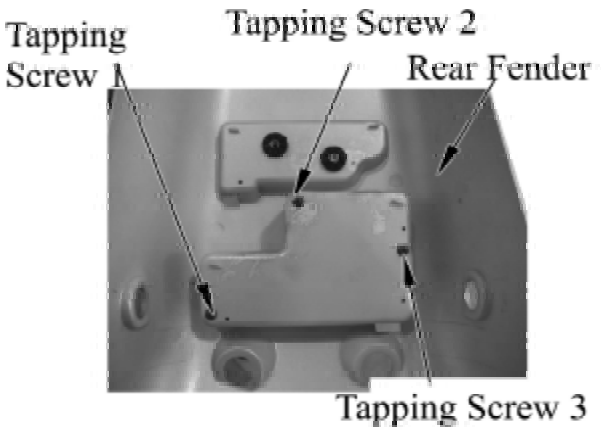
Tool box

Removal

—Turn over rear fender, remove tapping screw 1, tapping screw 2, tapping screw 3,remove tool box

Installation

Reverse the removal procedure for installation



Rear License Plate

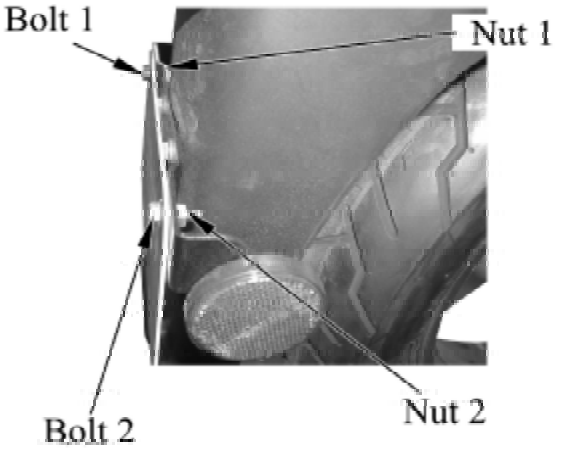
Removal

— Bolt 1, Bolt 2, Nut 1, Nut 2,

—License plate from rear fender.

Installation

Reverse the removal procedure for installation



Rear License Plate Bracket

Removal

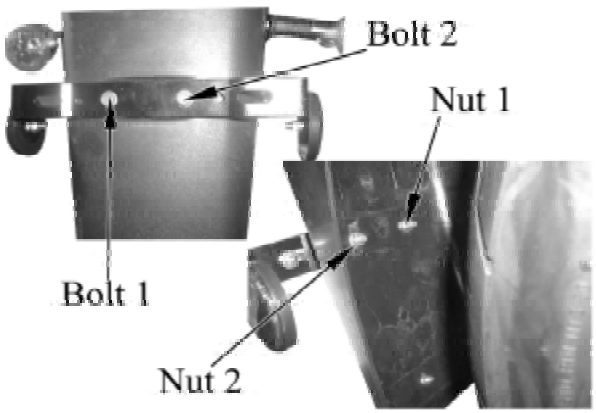
—Rear license plate

— Bolt 1, Bolt 2, Nut 1, Nut 2,

—Rear license plate bracket

Installation

Reverse the removal procedure for installation



Reflector

Removal:

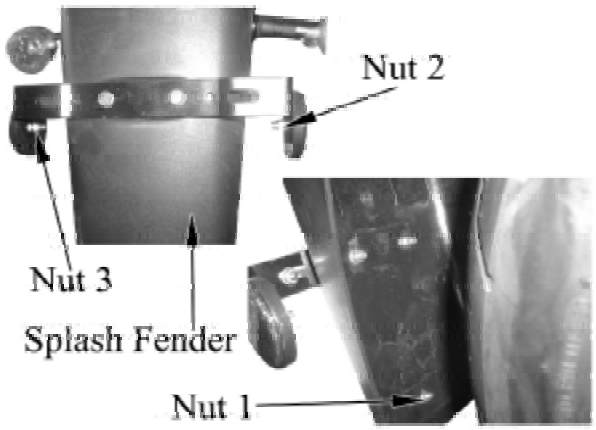
— Nut 1 and rear reflector

— Nut 2 and rear left reflector

— Nut 3 and rear right reflector

Installation

Reverse the removal procedure for installation



Fender

Removal

—Seat

—Seat lock plate

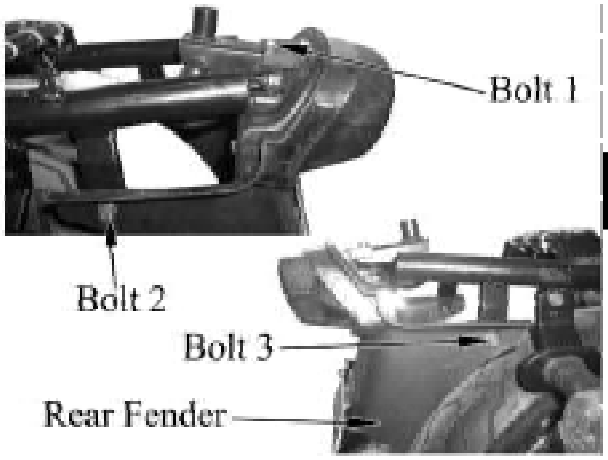
—Rear fender

—Bolt 1, Bolt 2, Bolt 3

—Splash fender comp.

Installation

Reverse the removal procedure for installation



Rear Fender (Center)

Removal

—Seat

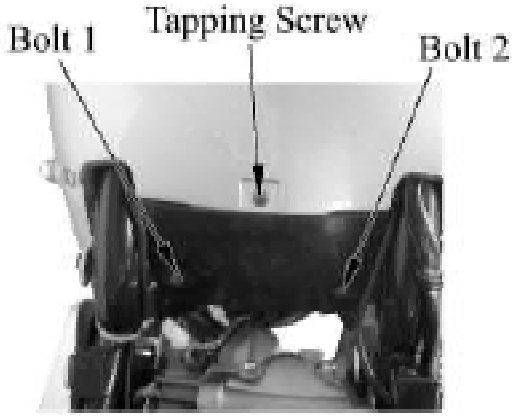
—Rear part, rear fender

—Bolt 1, Bolt 2

—Rear fender (Center)

Installation

Reverse the removal procedure for installation



Rear fender (Left Side)

Removal

—Seat

—Rear part, rear fender

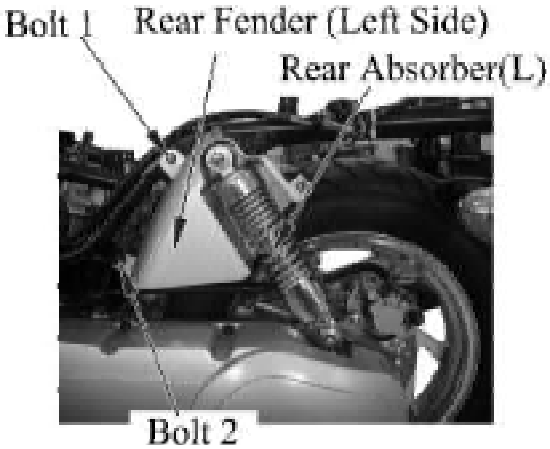
—Rear absorber (L)

—Bolt 1, Bolt 2

— Rear fender (Left side)

Installation

Reverse the removal procedure for installation



Rear fender (Right Side)

Removal

—Seat

—Rear part, rear fender

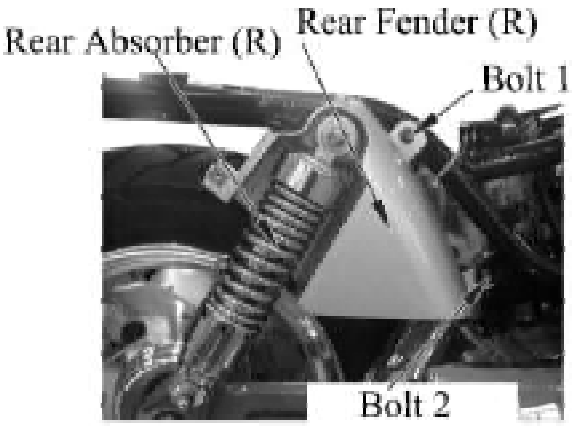
—Rear absorber (R)

—Bolt 1, Bolt 2

— Rear fender (Right side)

Installation

Reverse the removal procedure for installation



Right Cover

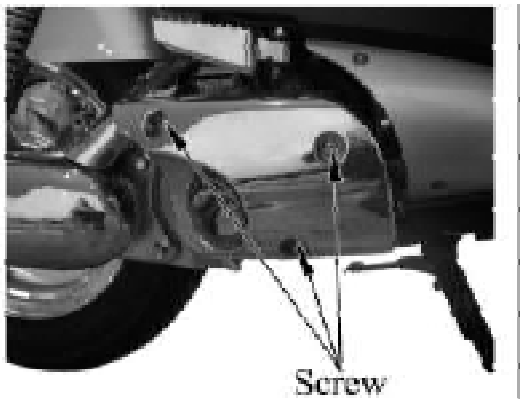
Removal

—3 Screws

—Right side cover

Installation

Reverse the removal procedure for installation

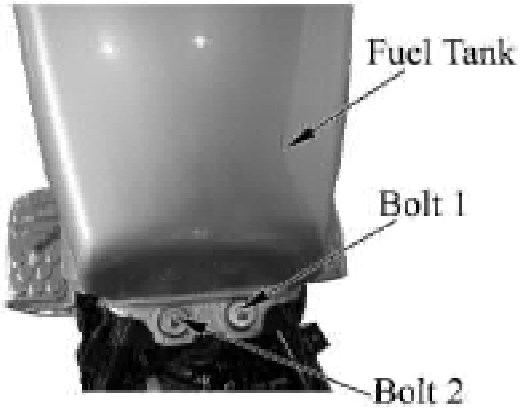


Fuel Tank

Disassembly

Warning

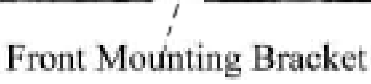
Gasoline is highly flammable, therefore smoke and fire are strictly forbidden in the work place. Special attention should also be paid to sparks. Gasoline may also be explosive when it is vaporized, so operation should be done in a well-ventilated place.



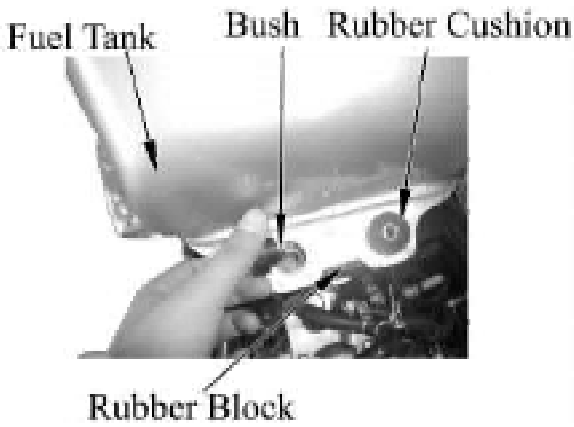
Remove seat

Remove Bolt 1, Bolt 2

Remove rubber cushion, bush and rubber block

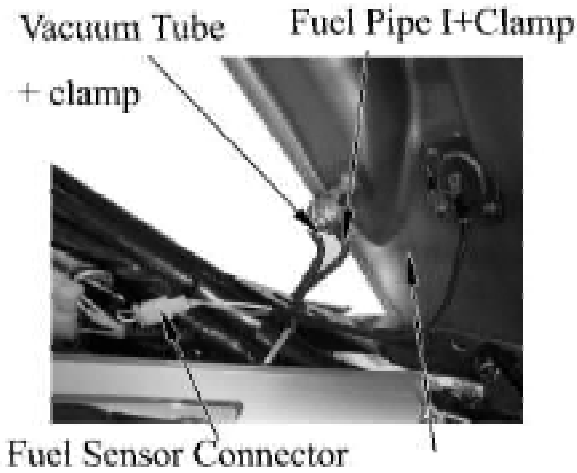


Remove the fuel tank in the backward direction, separate front mounting bracket front rubber cushion.



Disconnect 2P connector of fuel sensor.
Remove fuel pipe I and clamp
Remove vacuum tube and clamp
Remove fuel tank
Installation

Reverse the removal procedure for installation



Note:

Be careful not to damage main cable, pipes and hoses. Main cable, cables, pipes and hoses should be routed properly according to the routing drawing.
Take precaution against fuel leakage when removing fuel pipe I

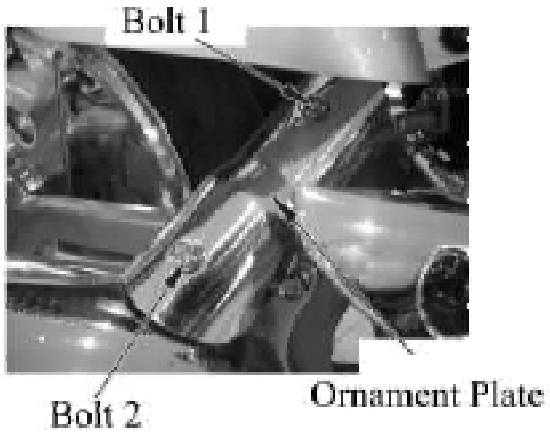
Muffler

Caution: Perform disassembly only after the muffler is cooleddown.

Remove:

—Seat

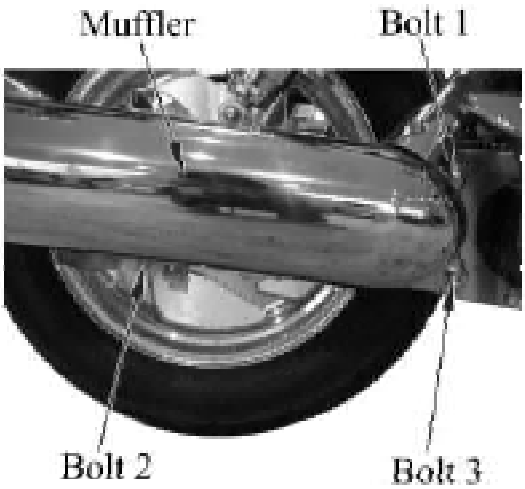
—Bolt 1, Bolt 2, ornament Plate



—Muffler elbow joint nut

Remove Bolt 1,2,3

Remove muffler.



Installation

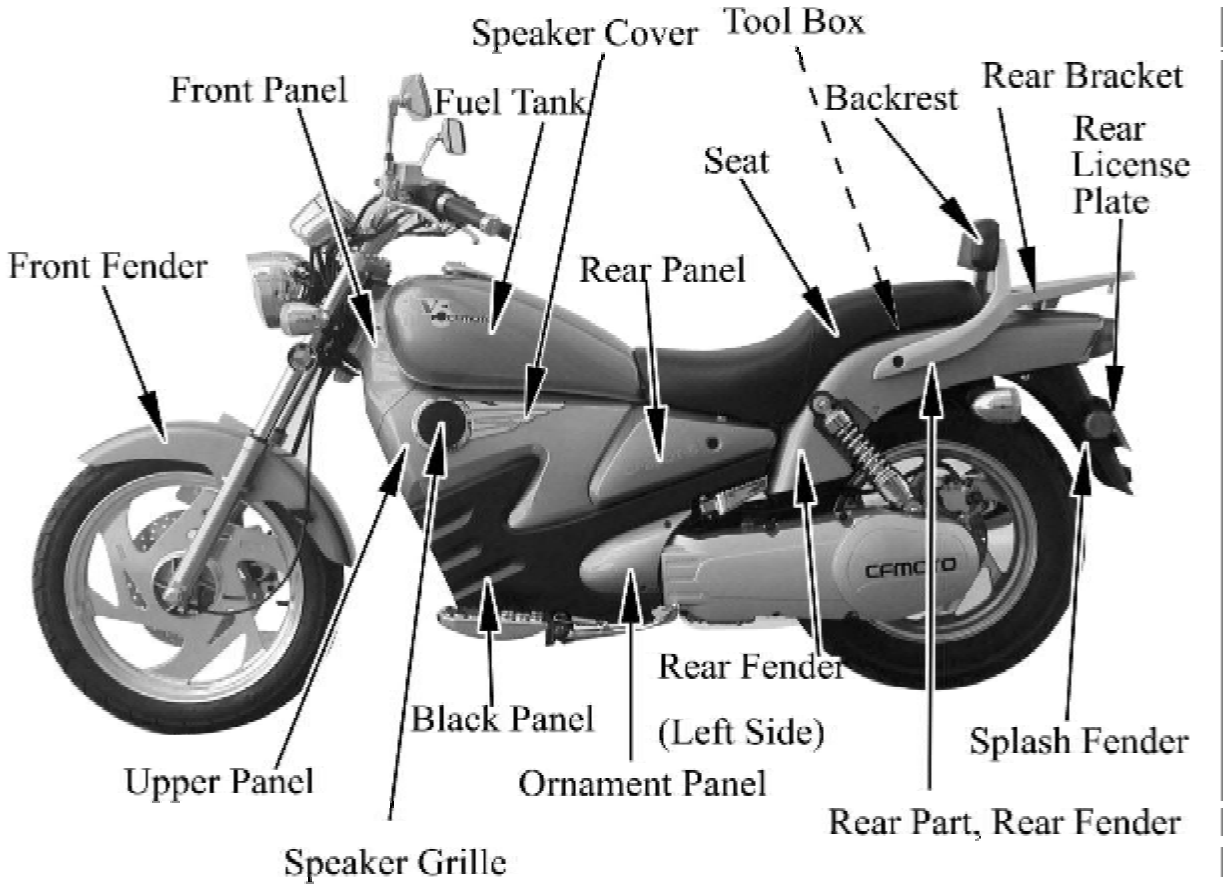
Reverse the removal procedure for installation

Install muffler ornament Plate

Note:

Replace sealing gasket when installing the muffler.

Description of Visible Parts



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 caught 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 brack

Periodical Replacement of Parts

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

Item	Interval	Remark
Air filter element	Clean or replace every 2000-3000km	
Engine oil	First month or 1000km Replace every 6000km	
Coolant	Replace every year	
Gearbox oil	Replace every year	

Check & Maintenance

○： Interval

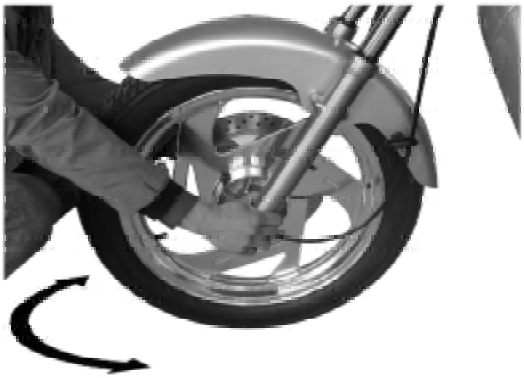
Check & maintenance item			Intervals			Standard
Part		Item	daily	Halfayear	Every year	
Steering device	Handlebar	Operation agility			○	
	Front fork	Damage			○	
		Steering column			○	
		Bearing, Steering Column			○	
Brake device	Brake lever	Play	○	○	○	Front wheel: lever end 10-30mm Rear wheel: lever end 10-30mm
		Brake efficiency	○	○	○	
	Connecting rod, oil pipe & Hose	Looseness and damage			○	
	Hydraulic brake and brake disc	Front and rear brake fluid level	○	○	○	Brake fluid above “LOWER” limit
		Brake disc Damage and wear			○	Replace when the thickness of front or rear brake disc is less than 3mm.。
Driving device	Wheel & Tire	Tire pressure	○	○	○	Front tire: 250kPa(2.50kgf/㎝ ^{2}) Rear tire :300kPa(3.00kgf/㎝ ^{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)
		Looseness of wheel Nut and axle		○	○	
		Front wheel bearing			○	
		Rear wheel bearing			○	
Damping Device	Suspension arm	Sway of Joint parts and rocker arm damage			○	
	Shock absorber	Oil leakage and damage			○	
		oil level			○	
Transmi-ssion system	Gearbox	Oil leakage and oil level				Remove filling bolt, add oil till oil level reaches edge of filling hole.

Check & Maintenance item			Intervals			Standard
Part		Item	daily	Half a year	Every year	
Transmis-sion device	Final Shaft	Looseness of joint parts		○	○	
		Sway of spline			○	
Electrical device	Ignition	Status of spark plug		○	○	Spark plug gap:0.8-0.9mm
		Ignition timing		○	○	
	Battery	Terminal joint			○	
	Electrical wiring	Looseness and damage connecting parts			○	
Engine	Body	Starting, abnormal noise	○		○	
		Timing chain ad-justment		○	○	
		Low-speed & accel-erating	○		○	
		Idle speed		○	○	1500±150r/min
		Exhaust		○	○	
		Filter element		○	○	
	Lubrica-tion device	Oil leakage		○	○	
		Stained oil and oil level	○	○	○	Diprod type: oil level should be between the upper and lower limits.
	Fuel de-vice	Fuel leakage		○	○	
		Joint condition of carburetor			○	
		Throttle			○	Throttle grip clear-ance 2-6mm. (Flange part).
	Cooling device	Water level	○	○	○	
		Water leakage			○	
Anti-diffusi on device for black, foul smoke And other harmful gas	Exhaust reduction device	Damage of pipe			○	
		Cleaning of air breather		○	○	
	Anti-diffu sion de-vice for CO, etc	Function of secon-dary air supply			○	
		Damage or fixing of Pipes			○	

Check & maintenance item		Intervals			Standard
Part	Item	daily	Half a year	Every year	
Lighting and turning indictors	Function	○	○	○	
Alarm and lock	Function			○	
Instruments	Function			○	
Exhaust pipe and muffler	Looseness or damage caused by installation			○	
	Function of muffler			○	
Frame	Looseness and/or damage			○	
Others	Lubrication & grease of frame parts			○	
Abnormal parts which can be determined during driving	Make sure if there is any abnormal 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.



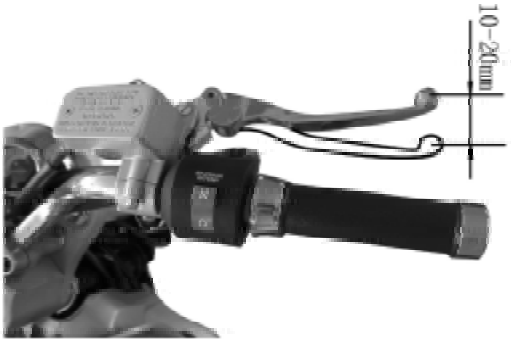
In case of any sway, check if it is the problem of the steering column or other parts and then do the maintenance accordingly.

In case of sway of the steering column, tighten the locknut or remove 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 bearing race of steering column is damaged.

Brake system

Brake lever play



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

Check play of lever ends.

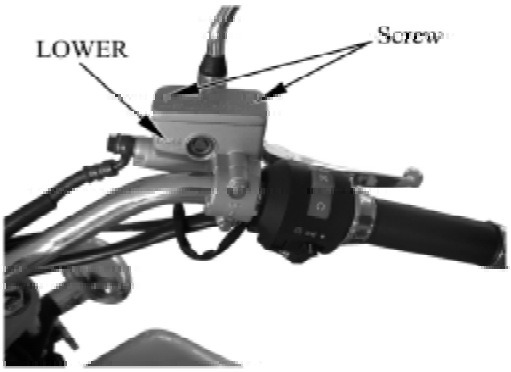
Play: 10-20mm

Master Cylinder

<Fluid level>

Check the brake fluid level

When the brake fluid level is near to the lower limit, check master Cylinder, brake hoses and joints for oil leakage. Remove the two mounting screws on oil cup cap, remove cap, add DOT3 or DOT4 brake fluid till the upper limit.

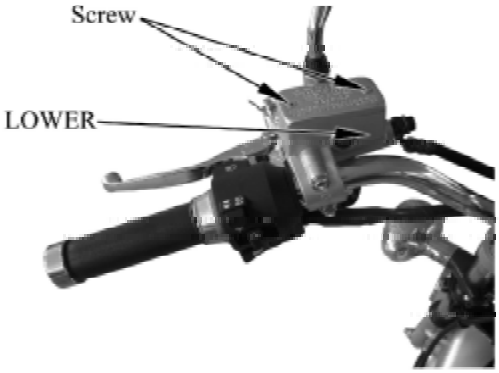


•Do not mix with dust or water when adding brake fluid.

• Use only the recommended brake fluid to avoid chemical reaction.

• Brake fluid may cause damages to the plastic and rubber parts. Keep the fluid away from these parts.

• Slightly turn the handlebar left and right till the master cylinder is in the horizontal status, then remove the oil cup cap.

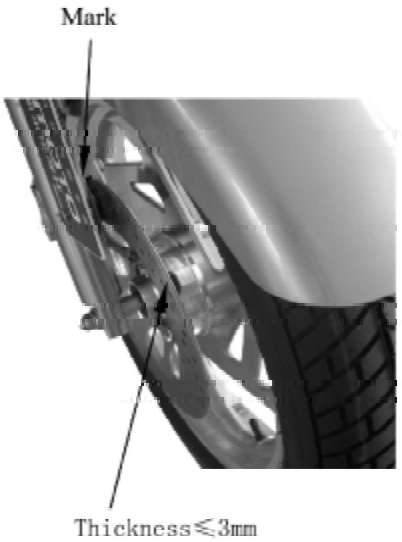


Brake disc, Brake Pad

< 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 disc.

Check if there is any wear or damage on the disc, when the brake disk thickness is ≤3 mm, replace the brake disc.

Min. limited thickness of the brake disc: 3mm

Replacement of Brake Fluid

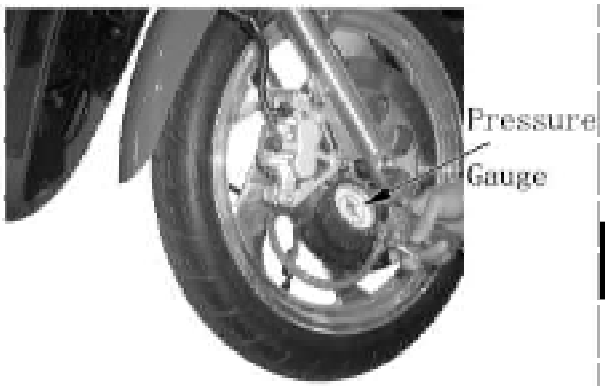
< Replacing brake liquid>

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.

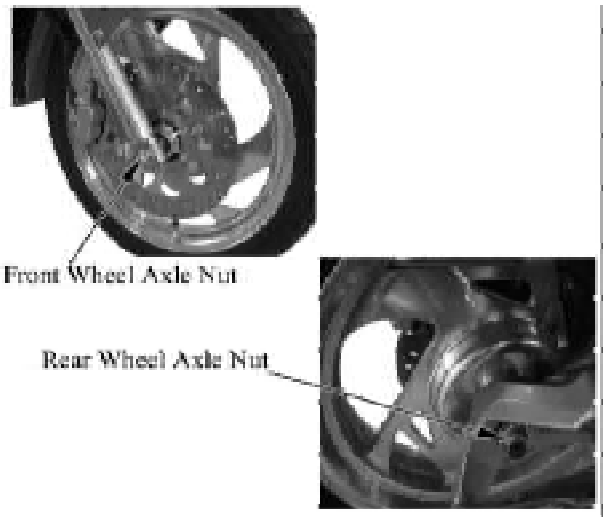
Tire pressure parameter:

Specified pressure/tire

	Front	Rear
Pressure	250kPa(2.50kgf/cm^2)	250kPa(2.50kgf/cm^2)
Tire specification	100/90-18	150/80-15

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:

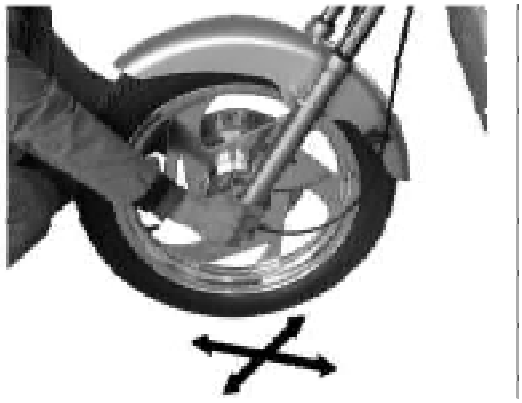
Front wheel axle nut: 80N·m(8.2kgf·m)

Rear wheel axle nut: 140N·m(14.3kgf·m)

Sway of wheel bearing

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

Turn handlebar 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 absorbers and the steering column.

Check front shock absorbers 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 absorbers and the hanging pivot part.

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

Rocking of the Joints

Park the scooter with main stand and rock engine left and right to check if there is damage or rocking with the cushion collar of rear suspension.

Replace the cushion collar in case of any rocking.

Ignition Device

Spark plug

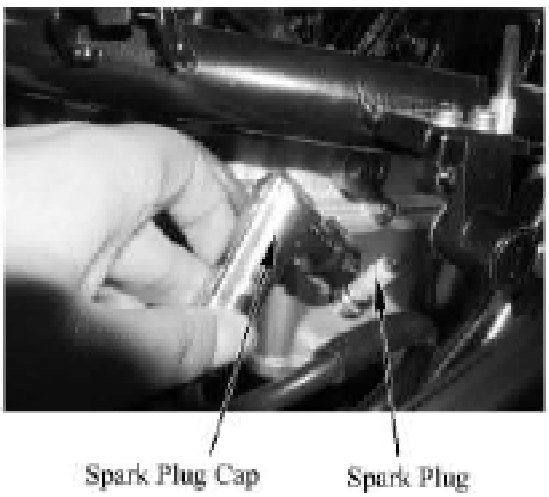
Remove:

—seat

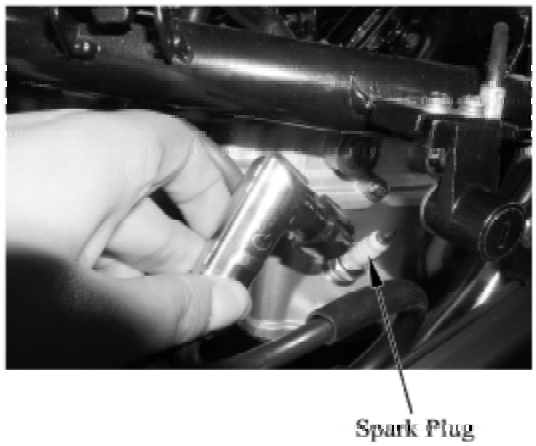
—Rear left panel

—Spark plug cap

—Clean the joint face of spark plug with compressed air when removing.

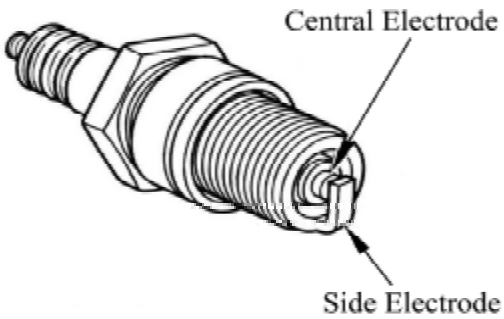


Remove the spark plug



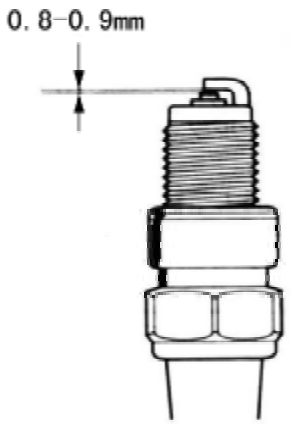
Check the central and side electrodes of the spark plug for any erosion, burning or damage of the insulate electromagnet.

Burning → Replace



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, screw in with hand and then tighten it with a spanner.

If the spark plug is a new one, screw in 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: 15-20N·m(1.5-2.0kgf·m)

Install the spark plug cap.

Install:

—Spark plug cap

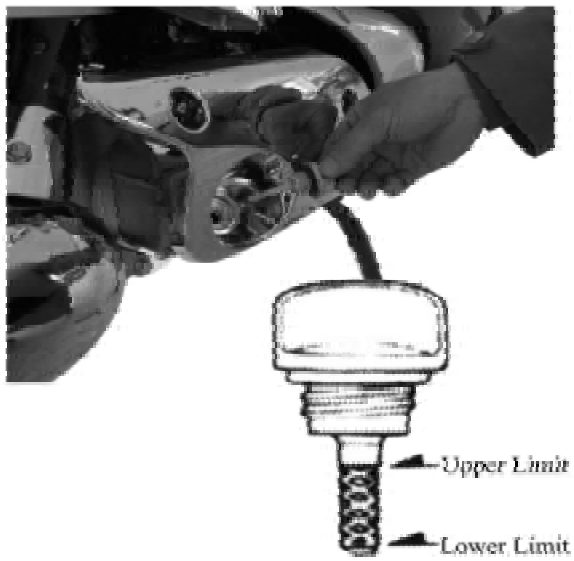
—Left and right ornament panels

—Seat

Lubrication

Inspection of engine oil

Warm up the engine.
Stop the engine and remove the oil dip rod and clean it.
Park the scooter on level ground.Insert the oil dip rod (DO NOT screw in) and check engine oil level 2~3 minutes after the engine stopped.
If oil level is between the upper and lower limit, oil is sufficient.
If oil level is near the lower limit, add oil till the upper limit.

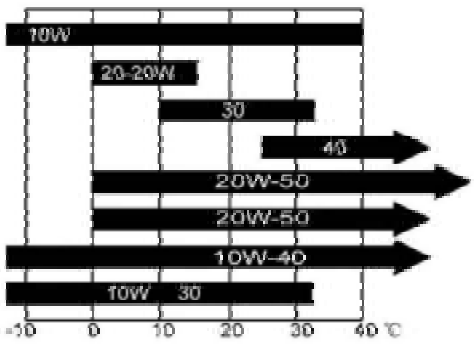


Recommended engine oil:

Special engine oil for 4-stroke motorcycle: SAE10W-40, 20 W - 50,For substitutes, select from following ranges:
API classification: SE or SF type engine oil.

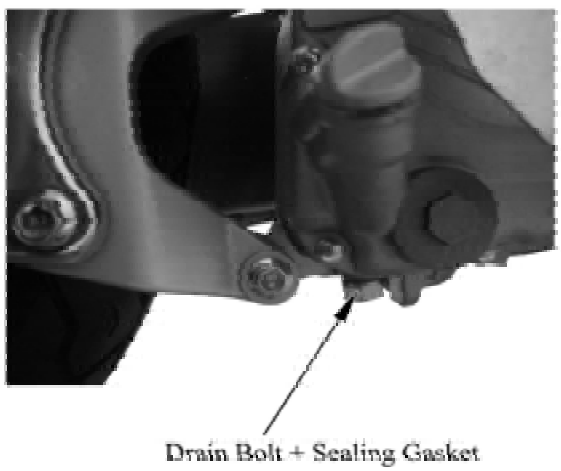
Note

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 engine, Remove oil dip rod,
Remove:
—Right cover
—Oil drain bolt
—Sealing gasket
Drain the oil.
Keep the scooter inclined right side and press the start button 2~3 times

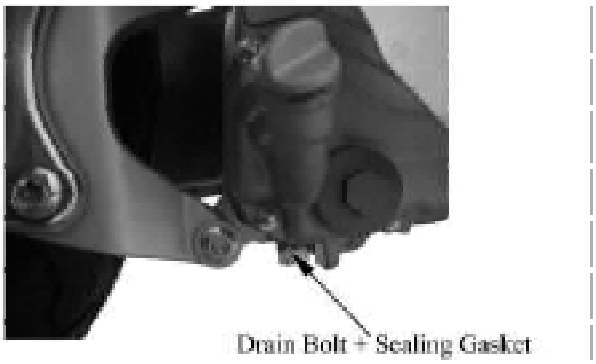


Install the cleaned drain bolt and new sealing gasket, and tighten it according to the specified torque.

Torque: 25N·m(2.5kgf·m)

Add the recommended engine oil.

Engine oil capacity: 0.8L(for replacing)
1.0L(for disassembling)

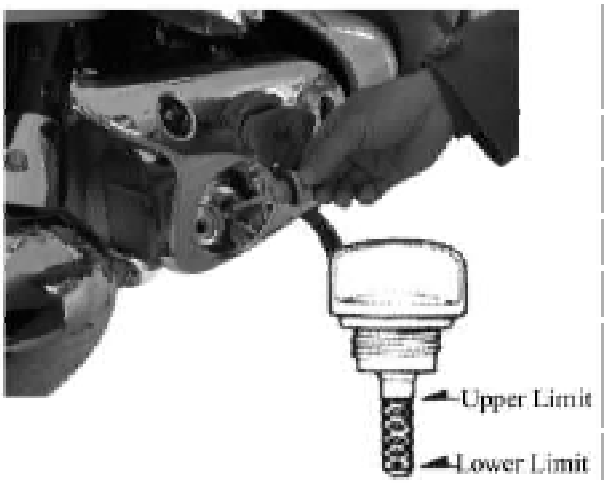


Check the oil level with the dip rod while adding till the oil level reaches upper limit.

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

Stop the engine, and check oil level again.

Install right cover



Cleaning the Oil Filter Screen

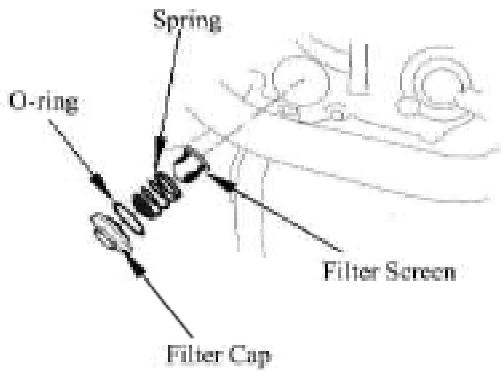
Drain engine oil.

Remove engine oil filter screen cover.

Remove 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 specified torque.

Torque: 20N·m(2.0kgf·m)



Fuel

Condition of the fuel system

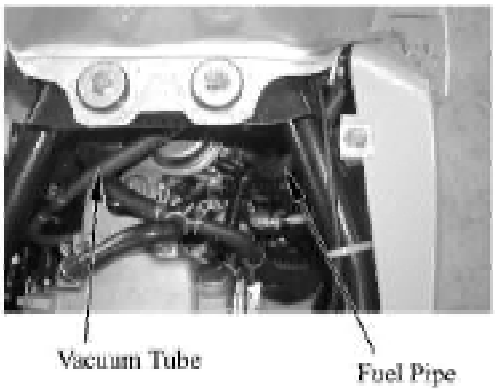
Remove seat

Check the fuel pipes for any aging or damage.

Aging, damage → Replace

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

Cracks, bending → Replace.



Replacing Air Filter Element

Remove:

—Seat

—Rear left panel

—Left black Panel

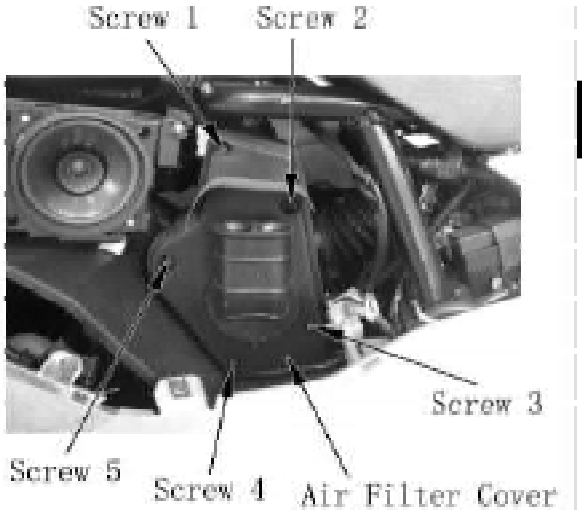
—Left Panel

—Front left Panel

—Screw 1,2,3,4,5and Air filter cover

Remove filter element and replace it.

Reverse the removal order for installation.



Idle Speed

Note

Check and adjust the following items before

inspection:

1.Status of the air filter and secondary air filter

2. Status of spark plug

Use an engine tachometer with reading error of 50r/min, and install properly according to operation manual.

Any incline of the vehicle body will cause change of the idle speed, so the vehicle should be parked with the main stand on the level ground and kept vertical.

Remove:

— seat

—Rear right ornament panels

Start the engine and keep it running unloaded at 6000rpm for about 5~6 minutes to warm up. (Outdoor temperature: 25℃)

Check idle speed and adjust with a flat screw to the required idle speed.

Idle speed: 1500 ± 150rpm

Reverse the removal procedure for installation of the disassembled parts after adjusting the idle speed.

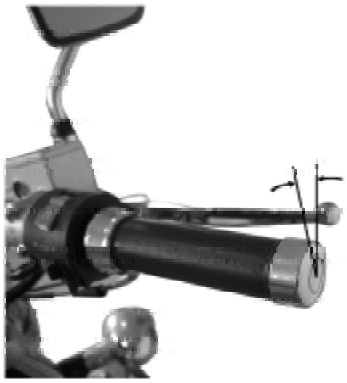
Throttle Grip

Check agility of throttle grip

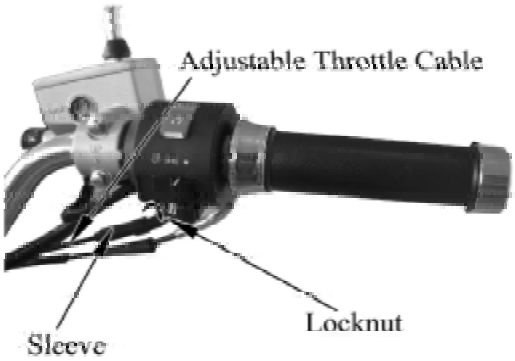
In case of any stiffness, check the throttle cable for damage or rust.

Check free play of throttle grip.

Free play: 2-6mm



Out of above range → Adjust



Remove adjustable throttle cable sleeve

Remove locknut, turn adjuster and adjust free play.

After adjusting, tighten locknut, install cable sleeve.

In case the adjusting failed to get the required free play, replace throttle cabel.

Cooling

Caution

Check of coolant level should be done on the reservoir tank instead of the radiator. If the radiator cap is opened while the engine is hot (over 100℃), the pressure of the cooling system will drop down and the coolant will get boiled rapidly. DO NOT open the radiator cap 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 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 reduce due to natural evaporation, check the coolant level regularly.

Caution

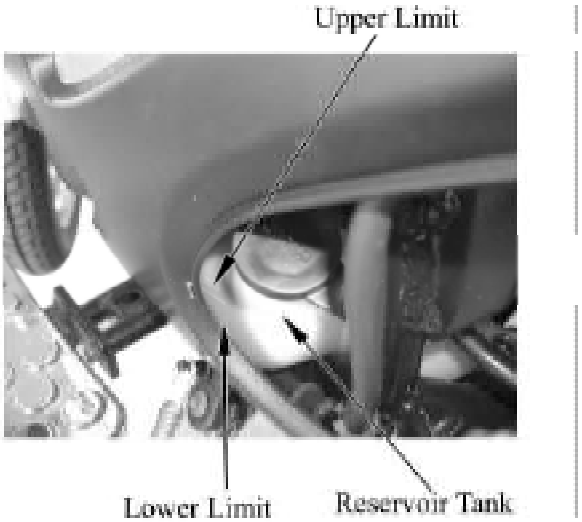
Coolant can prevent rust and resist freeze.

Ordinary water may cause engine rust or cracks in winter due to freezing.

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.

Remove left ornament panel

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

When the coolant level is below the lower limit, remove reservoir tank cap and fill coolant till upper limit.

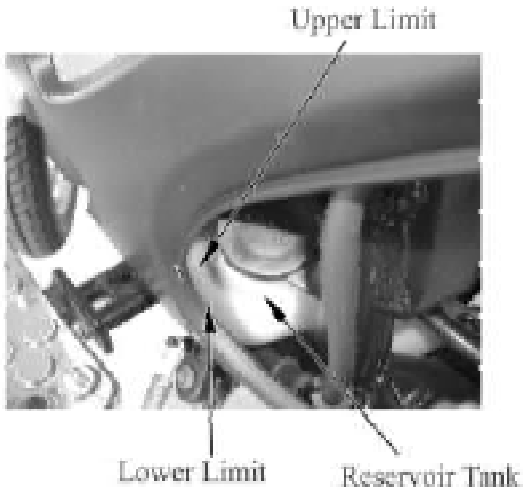
(coolant or diluted original liquid).

Recommended coolant: CFMOTO coolant

Standard density: 30%(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 reservoir tank and the air should be discharged before filling coolant.



Coolant Leakage

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

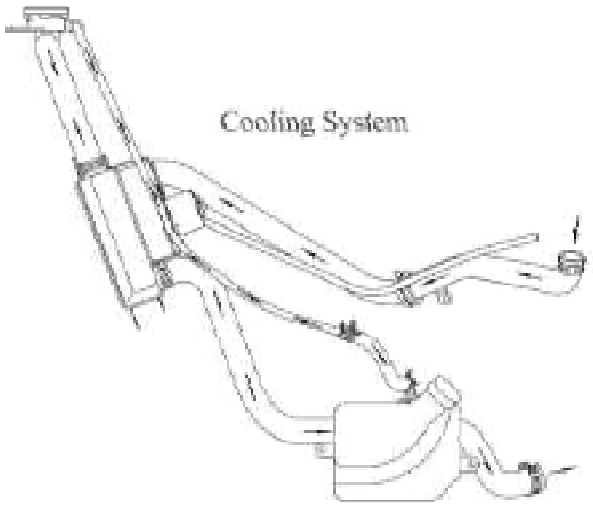
In case of any leakage, disassemble and do further check. (Refer to Chapter 6)

Check the radiator hose for aging, damages or cracks;

Aging, damage, cracks → Replace

Check the clamps of the coolant pipes. Tighten properly in case of any looseness.

Refer to (→6-8) for disassembly of radiator,.



Check radiator fins for mud and dust clog or damage. Correct the bent fins; clean the mud with water and compressed air.

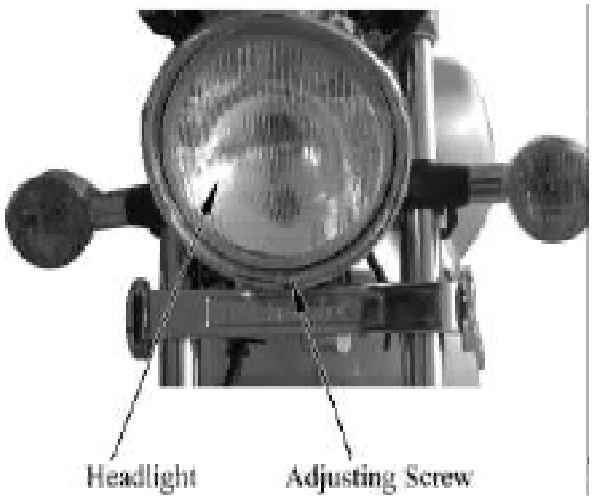
When the damaged area of the radiator fin is over 20%, replace with a new radiator. (→6-8)

Refer to P. 6-4 for replacing the coolant.

Lighting

Adjusting headlight beam

Turn screw with a cross driver to adjust the headlight beam.



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 leakage after installing the oil pump.

Standard

Item		Standard	Service limit
Oil pump rotor	Clearance between inner and outer rotors	0.07－0.15mm	0.20mm
	Body clearance	0.07－0.17mm	0.25mm
	End face clearance	0.05－0.10mm	0.12mm

Tightening torque

Bolt, oil pump body	10N・m(1.0kgf・m)
Screw, oil pump cover plate	2N・m(0.2kgf・m)
Partition Plate B	10N・m(1.0kgf・m)
Partition 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 or piston ring

Smudged Oil

.Oil is not replaced in time

. Wearing of piston ring

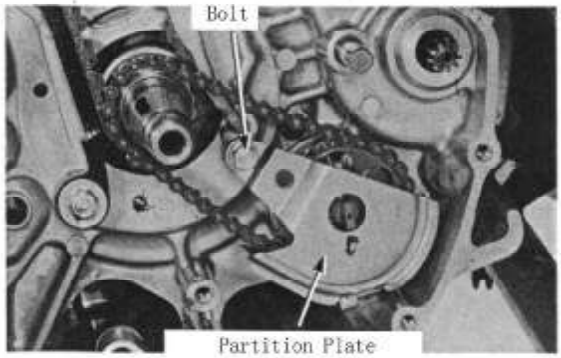
.Mixture of oil with coolant

. Poor sealing of water seal comp.

.Poor sealing of cylinder gasket

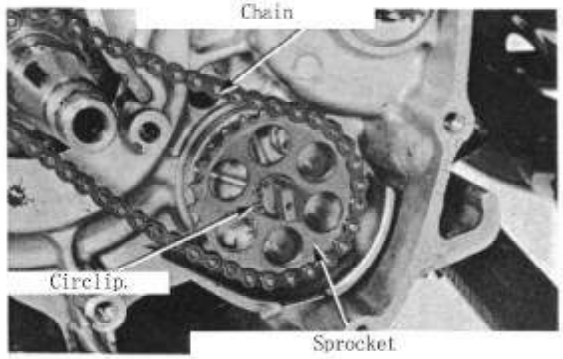
Oil pump

Remove bolt and partition plate

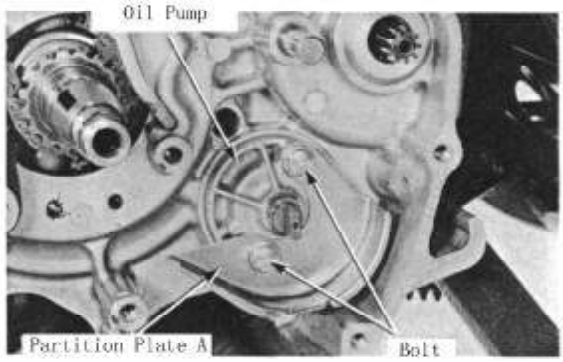


Remove retaining ring .

Remove sprocket and chain.

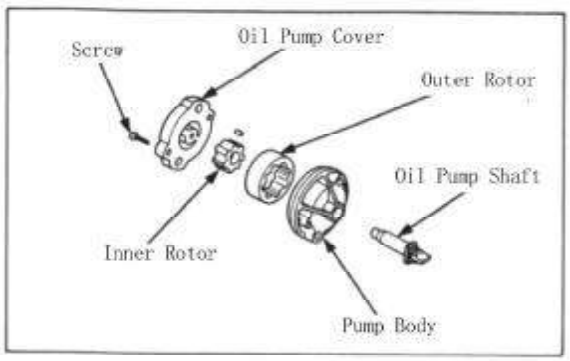


Remove 2 bolts, partition plate A, oil pump



Disassembly

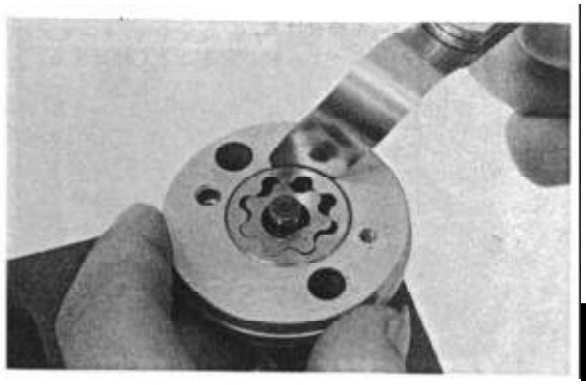
Remove screw and disassembly oil pump.



Inspection

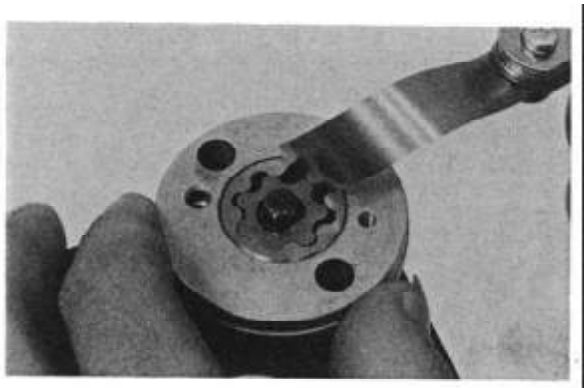
Check clearance between pump body and outer rotor.

Service Limit: 0.25mm→ Replace



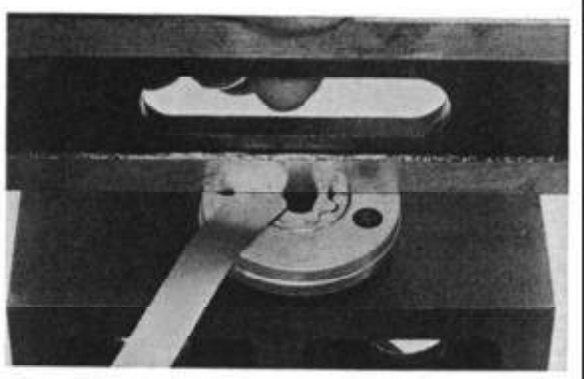
Check clearance between teeth top of inner rotor and teeth end of outer rotor.

Service Limit: 0.20mm→ Replace



Check clearance between pump body and end face of inner and outer rotors.

Service Limit: 0.12mm→ Replace



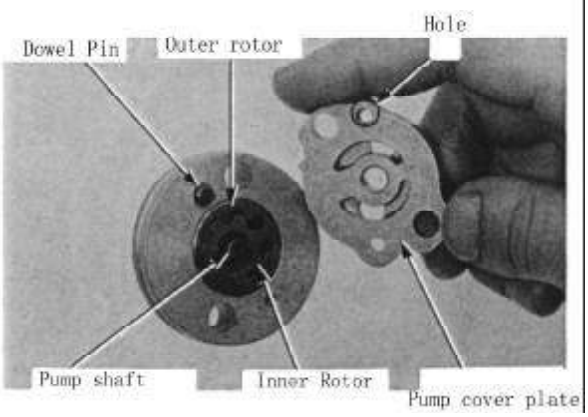
Assembly:

Assemble inner rotor, outer rotor and shaft to pump body.

Polymerize shaft notch with inner rotor.

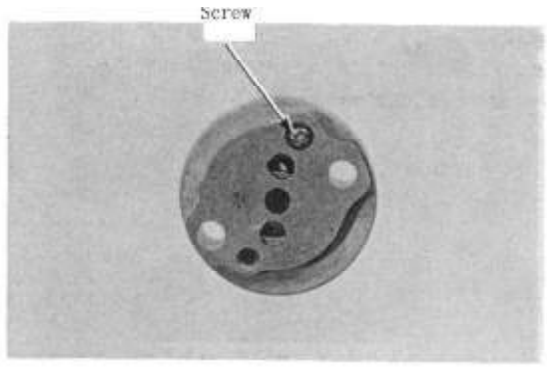
Install dowel pin.

Align hole of cover plate with dowel pin and install cover plate.



Tighten shaft with screw

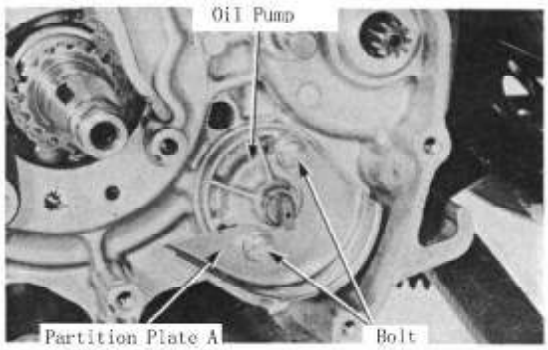
Make sure shaft can rotate freely.



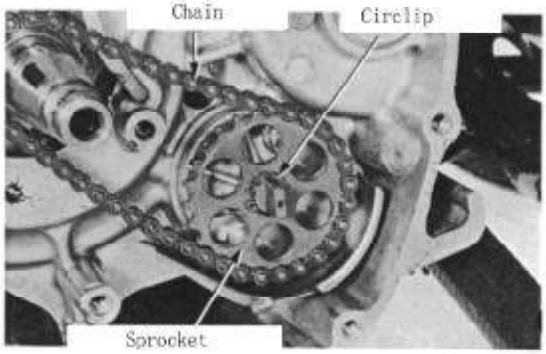
Installation

Install oil pump and Partition Plate A to right crankcase. Tighten with 2 bolts.

Make sure shaft can rotate freely.

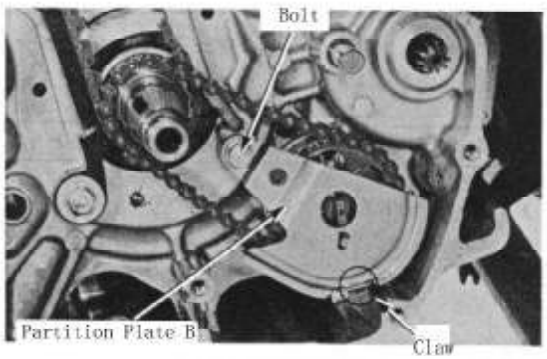


Install chain, driven sprocket and fix with retaining ring.



Polymerize hole of partition plate B with claw of partition plate A.

Install partition plate B, tighten bolt.



Install flywheel (→11-8)

Install stator, pick up coil, right side cover. (→11-9)

Chapter 5 Carburetor、Air Filter

Overhaul info

Caution:

Keep caution against fire when using gasoline.

●Check the installation position of o-rings, replace if necessary for installation.

●Remove the drainage screw of the float chamber before disassembly and discharge the gasoline from the carburetor.

●Do not remove enriching device.

●For early functioning of enriching device after the engine is warm up, there is a heater on the carburetor body to heat up the enriching device by coolant.

Maintenance Norm

Diameter of Carburetor Joint	Equivalent to 27mm
Type	VE14C
Std. Back cycle of adjusting screw	$1\ ^{3}/_{4}$ cycles
Idle speed	1500 ± 150rpm

Tools:

General-purpose tools:

Float meter

Troubleshooting

Starting Failure

- No fuel in fuel tank;
- Fuel supply failure
- Too much fuel in cylinder
- Clogged air filter
- Dirty fuel
- Faulty fuel pump

Engine Stop when Throttle is full open

- ◆ Damaged diaphragm
- ◆ Clogged vacuum tube
- ◆ Faulty fuel pump

Unsteady Engine Idle Speed

- Improper adjustment of idle speed;
- Over concentrated mixture
- Thinner mixture
- Clogged air filter
- Leakage at carburetor joint
- Dirty Fuel
- Improper function of chock valve
- Damaged vacuum tube joint
- Damaged carburetor heat insulator

Thinner Gas Mixture

- ◆Clogged fuel jet
- ◆ Clogged fuel tank cap hole
- ◆ Clogged fuel filter
- ◆ Broken, damaged or clogged fuel pipe
- ◆ Improper function of float valve
- ◆ Lower fuel level

Over concentrated gas mixture

- Enriching device always open
- Improper function of float valve
- High fuel level
- Clogged air nozzle
- Improper position of enriching device adjusting plate

Carburetor Removal

Remove seat, rear left and right panels(→2-3→2-4,)

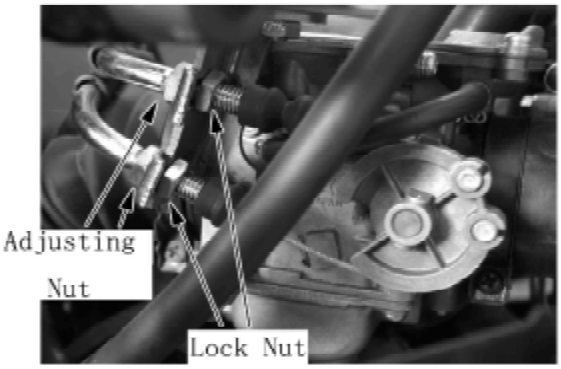
Release clamp for carburetor and air filter.

Release screw and remove carburetor joint.

Note:

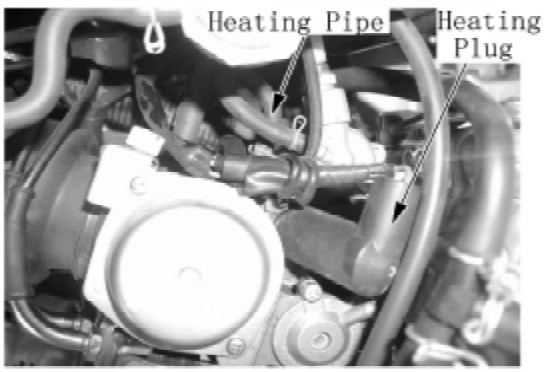
Do not drop the screw.

Loosen throttle cable adjusting nut and lock nut, remove throttle cable from carburetor.

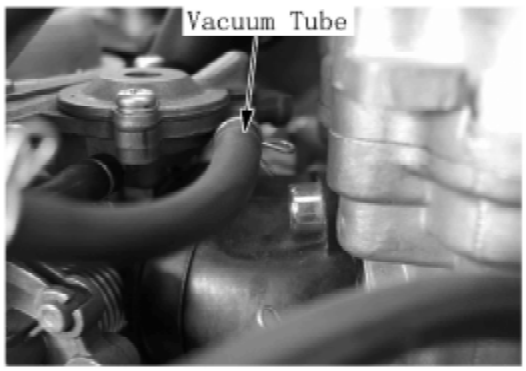


Disconnect heating pipe from carburetor heating device.

Remove heating pipe.



Disconnect vacuum tube from choke valve. Release carburetor clamp and remove carburetor from carburetor joint.

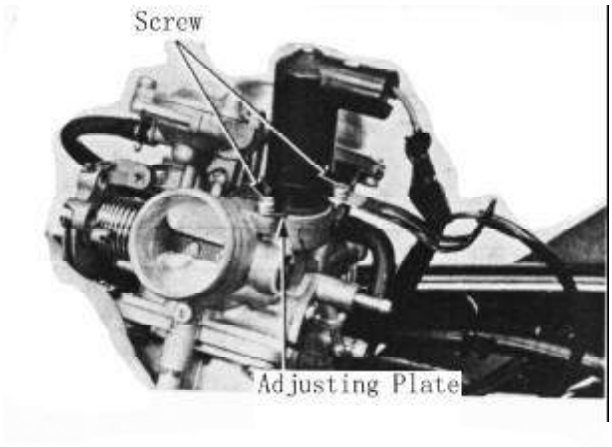


Note:

Cover the inlet hole with clean cotton yarn after carburetor is removed to avoid entrance of impurities.

Remove 2 screws from enriching device adjusting plate.

Remove enriching device.



Note:

Disconnect top box cover after removing rear right panel.

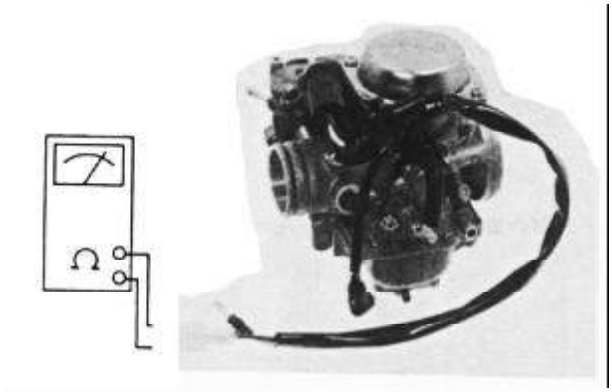
Be careful not to damage the valve after removing enriching device.

Inspection of enriching device

Check the conduction of wires of enriching device.

Resistance: <10Ω (After engine stopped over 10 minutes)

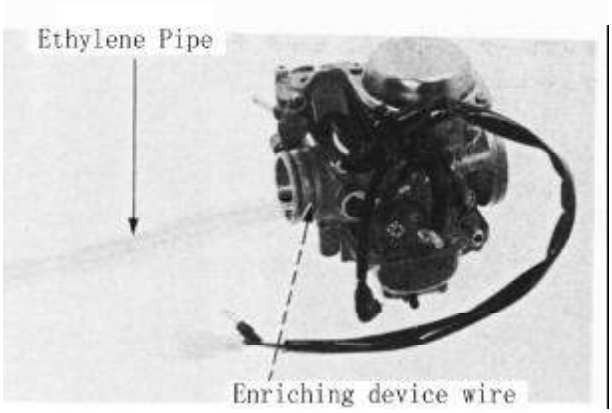
Replace enriching device if the wires are not conducted.



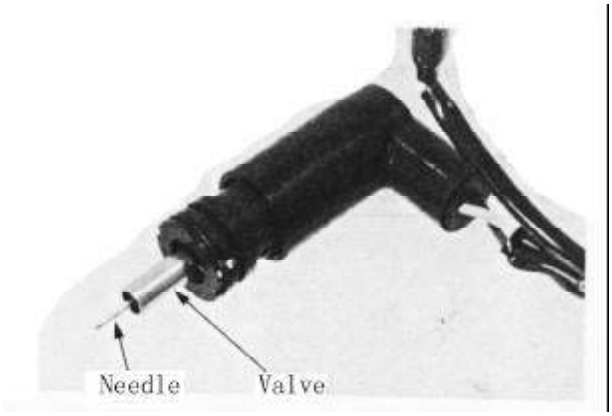
Connect the Ethylene pipe to the enriching device hole.

Connect enriching device yellow wire to Terminal + and green wire to Terminal - of battery for 5 minutes. Blow the pipe with mouth. If the pipe cannot be blown through, the enriching device is OK.

Disconnect wires from battery and wait 30 minutes. Blow pipe again. If the pipe can be blown through, it is OK.



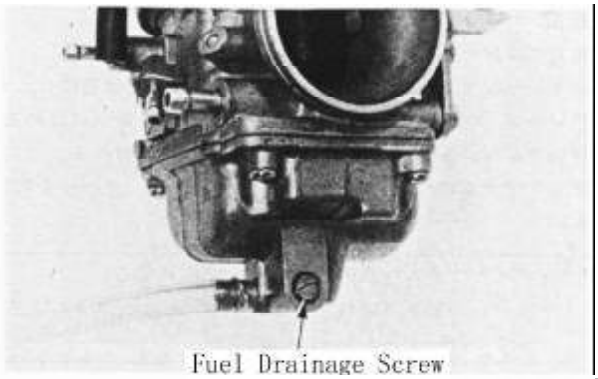
Damage, wearing, fault with valve and/or needle of enriching device → Replace.



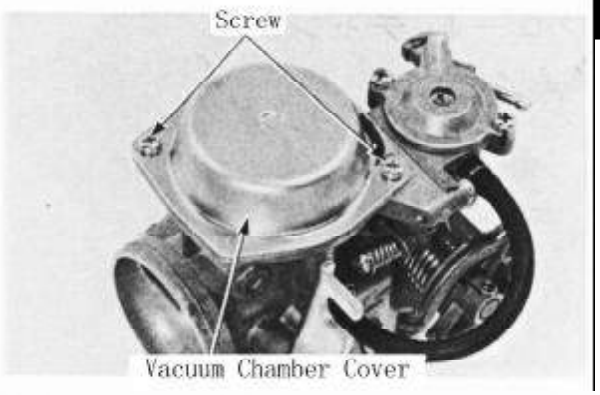
Vacuum Chamber

Disassembly

Remove fuel drainage screw and discharge fuel from float chamber.



Remove the two screws and open vacuum chamber cover.



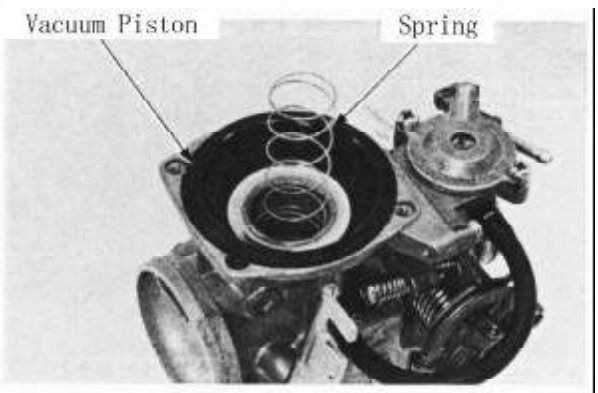
Remove spring and vacuum piston.

Remove:

—Fixing plug for needle valve of float level

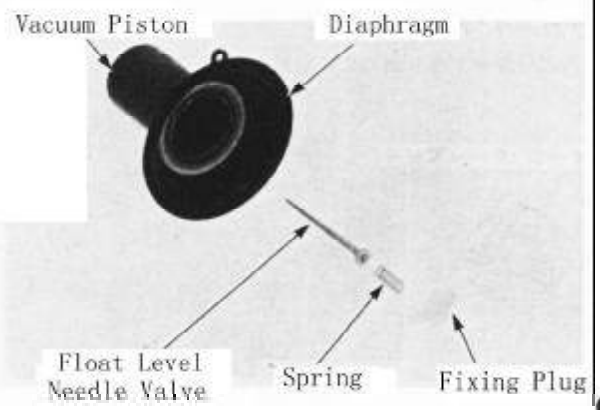
—Spring

—Needle valve



Caution:

Be careful not to damage diaphragm of vacuum piston.



Inspection of vacuum piston

Check needle valve for wearing or damage;

Check diaphragm for damage, aging or crack.

Assembly

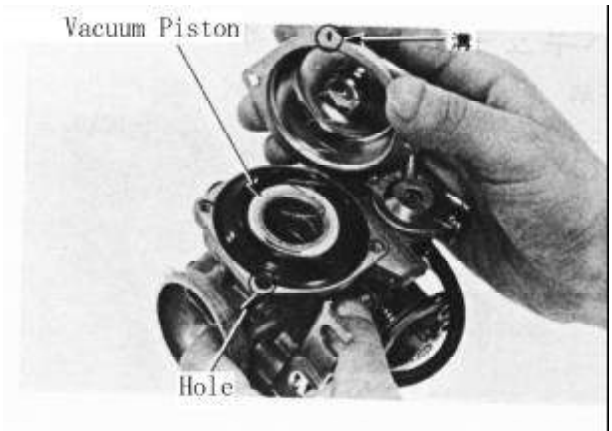
Reverse the disassembly order for assembly.

Hold bottom of vacuum piston, keep vacuum piston full open, make sure the diaphragm flange is embedded into the groove of carburetor body. Set the spring as illustrated. Overlap diaphragm hole with groove of cover, install vacuum chamber cover.

Note:

—Do not damage diaphragm

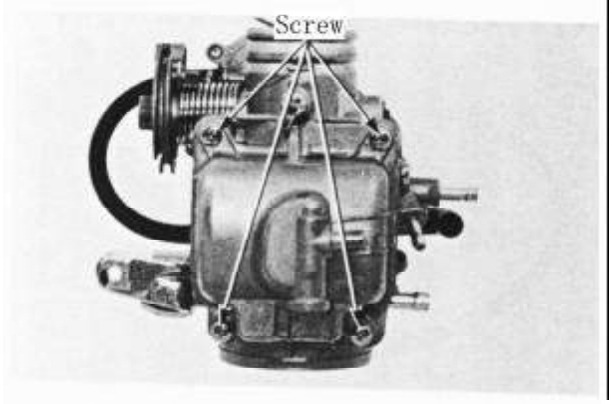
—Always hold the vacuum piston before tightening the small screws.

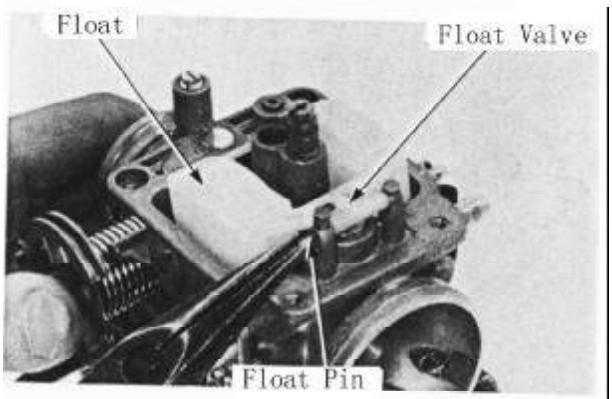


Float Chamber

Remove 4 screws and take out float chamber.

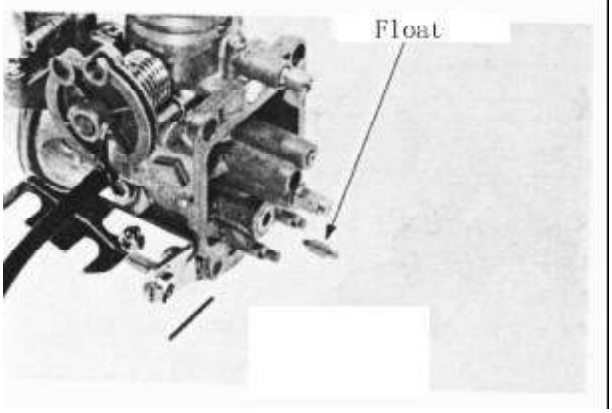
Remove float pin, float and float valve.



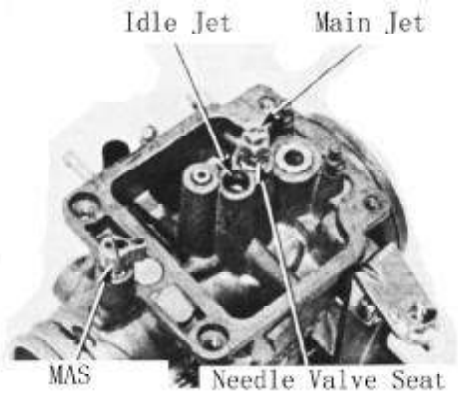


Inspection of Float Valve

Check wearing of valve seat contact surface.



Remove main jet, needle valve seat & adjusting nozzle,idle jet and MAS (mixture adjust screw).



Note:

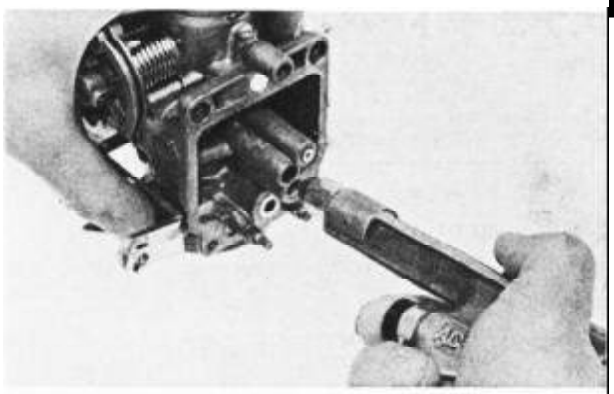
—Do not damage nozzle & screw;

—Before removing MAS, note down the tightening position. Over-tightening may cause damage to seat surface.

Clean nozzle with gasoline

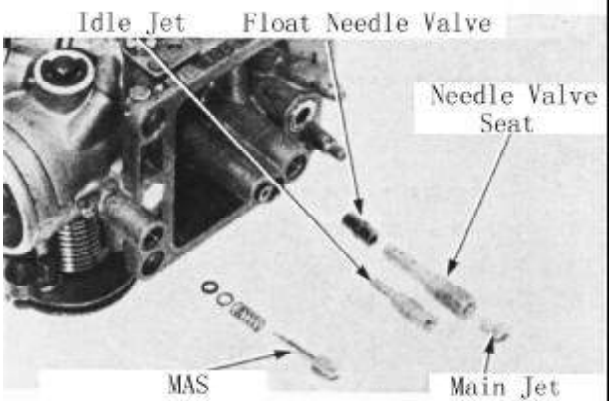
Use clean gasoline

Clean all the channels of carburetor body with compressed air after disassembly of float chamber.

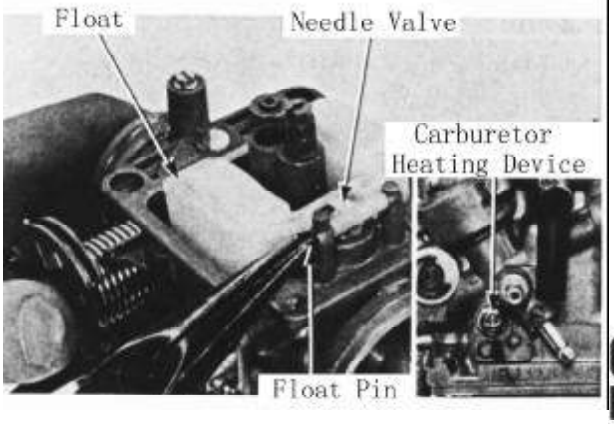


Assembly

Install adjust nozzle, nozzle seat, main jet, slow speed jet, MAS.



Install needle valve, float, float pin, carburetor heating device and screws.

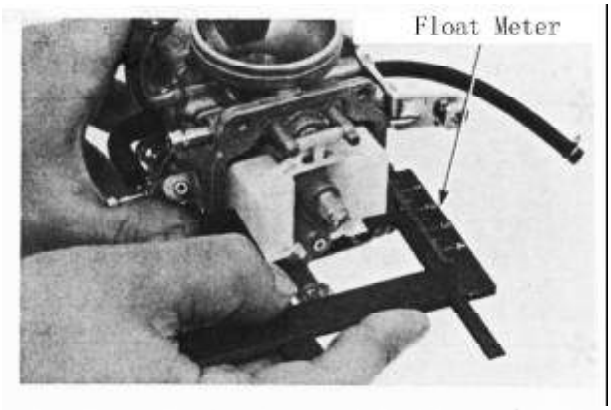


Inspection of float level

Check float level at main jet.

Float level: 18.5±0.5mm

General Purpose Tool: Float Meter

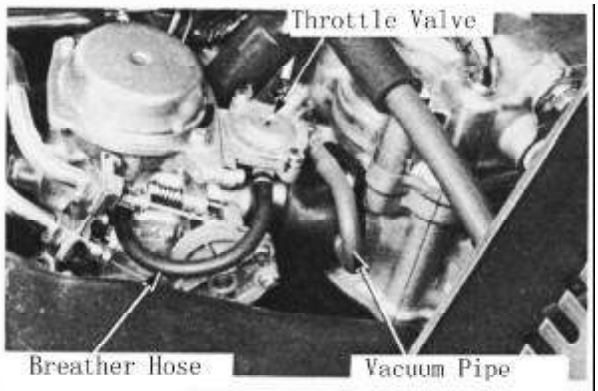


Check function of float and install float chamber. If float level is beyond the specified value, replace float with a new one.

Throttle Valve Inspection

Note:

Throttle valve inspection can be done on the vehicle.



Disconnect vacuum pipe and breather hose from throttle valve.

Connect vacuum pump to the vacuum pipe connector.

Connect pressure pump to the breather hose connector.

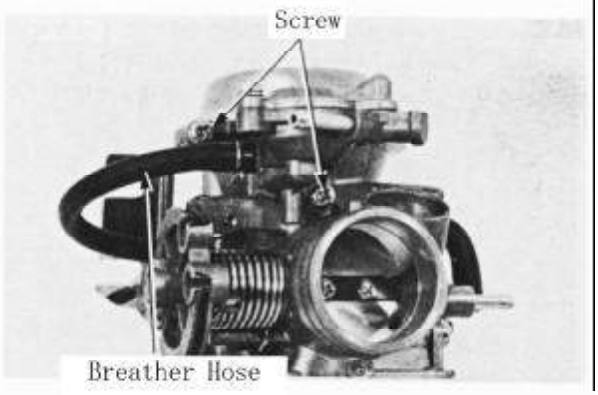
Operate vacuum pump to add vacuum pressure on the valve.

Vacuum pressure: 380mmHg

Throttle valve is normal when:

—No air flow in the breather hose, with vacuum pressure.

—Air flows in the breather hose, without vacuum pressure.



Replacement

Remove

—carburetor. (→5-3)

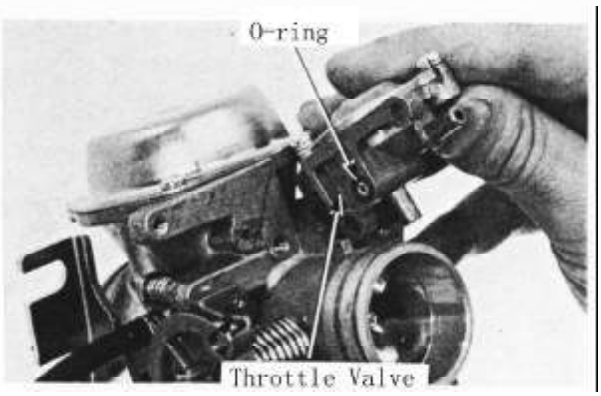
—Breather hose from throttle valve

—2 screws and throttle valve

—O-ring from valve.

Install a new O-ring to the valve as illustrated.

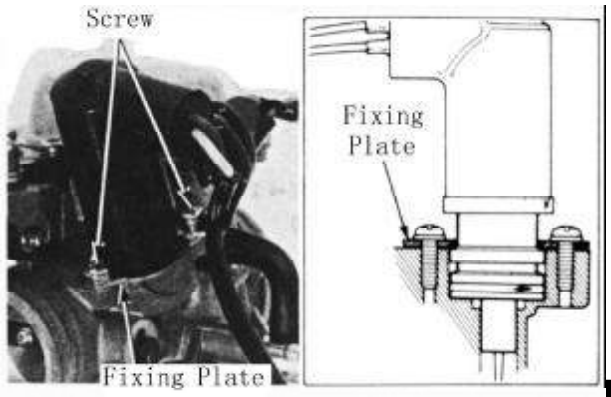
Install valve to the carburetor and tighten small screws.



Installation of Carburetor

Install enriching device to the carburetor

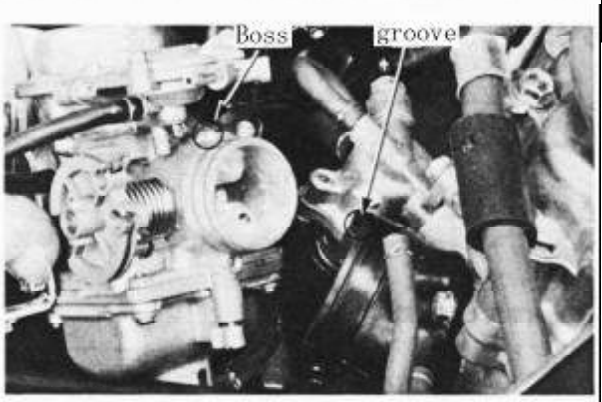
Install fixing plate as illustrated and make sure to tighten the small screws.



Note:

—Press enriching device to the bottom and fix outer groove with fixing plate.

—Keep the edge side with fillet of fixing plate downward.



Tighten fuel drainage screw of carburetor.

Overlap groove of carburetor heat insulator with flange.

Install carburetor.

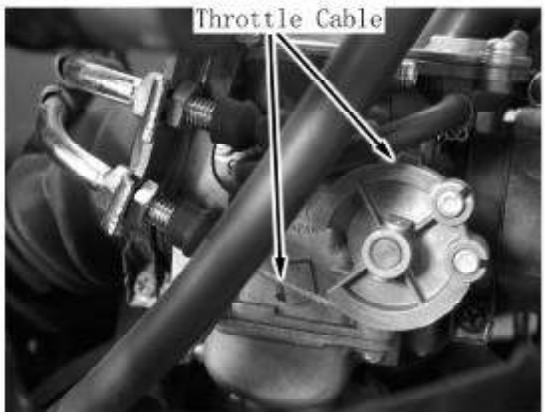
Install carburetor clamp.

Connect vacuum pipe with throttle valve.

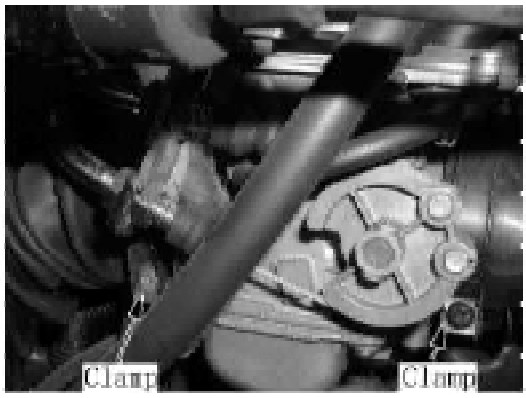
Connect water heating pipe.

Connect fuel pipe and make sure it is securely clamped.

Connect throttle cable to carburetor.



Fasten clamp for carburetor joint and air filter.



Adjust the following items:
—throttle cable (→3-14)
—idle speed (→3-13)

Adjust MAS

Adjustment should be done after the engine is warmed up.
Remove seat and left speaker cover (→2-3, 2-9)
Install tachometer.
Turn MAS according to standard return cycle.

STD. Return Cycle: 1-3/4 cycle
Start the engine.
Turn the throttle fixing screw and adjust the specified idle speed.

Idle Speed: 1500±150rpm

Slightly increase throttle from idle speed and check if engine speed varies steadily. Also check if engine speed drops steadily after releasing throttle.

In case of further adjustment, follow the steps below:

1. slowly turn MAS and find the max. idle speed from the standard return cycle range;
2. turn throttle fixing screw to adjust idle speed;
3. repeat above two steps;
4. slightly increase throttle and check the engine speed variation and idle speed fluctuation. Repeat above 4 steps in case of any fluctuation.

Air Filter

Disassembly

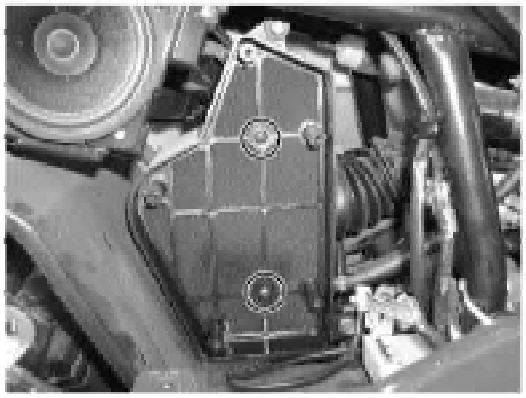
Remove:

— seat, front left panel, upper left panel, left black panel, rear left panel, left ornament panel(→chapter 2)

—5 fixing screws

—air filter cover

Remove 2 fixing screws, remove filter element press grid, filter element and anti-backfire grid.

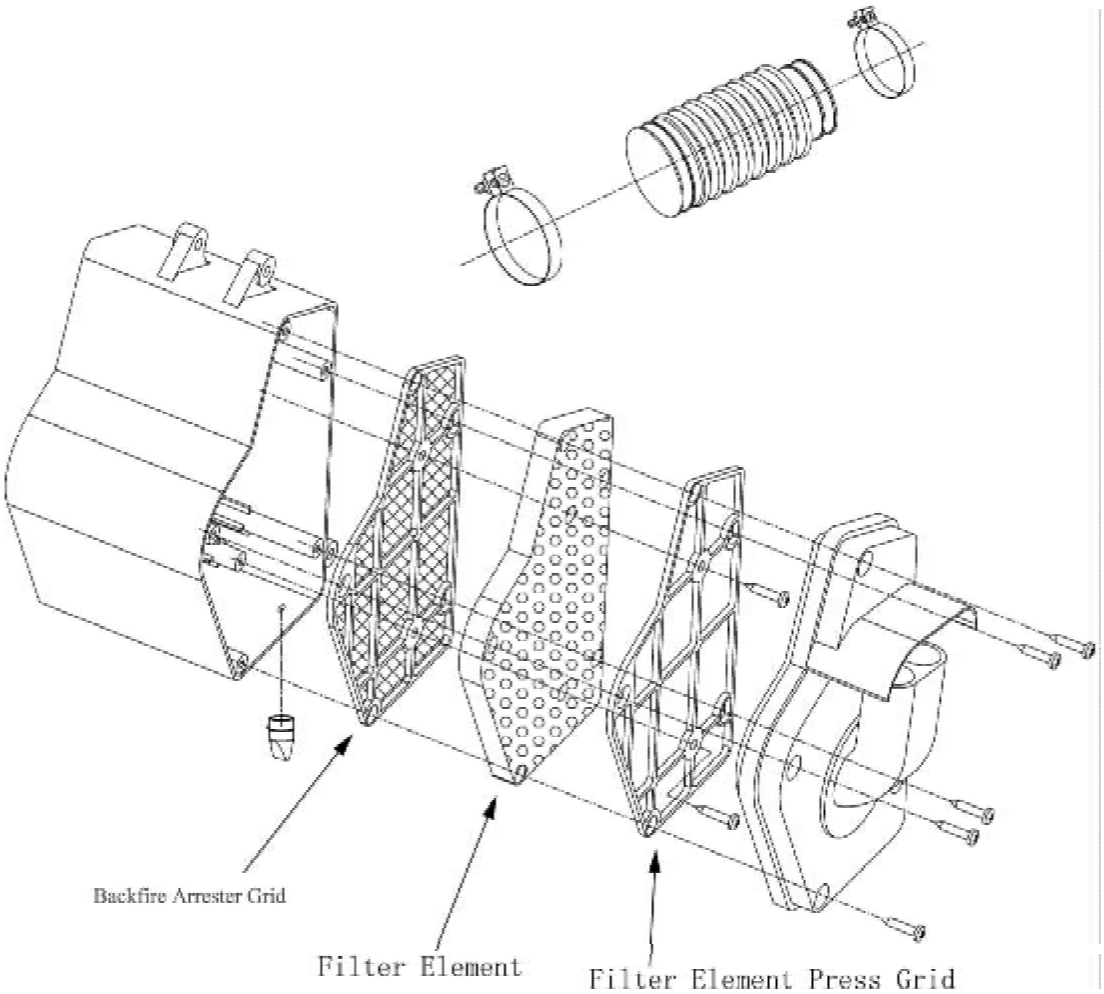


Check filter element for damage or stain. Replace or clean if necessary.

Installation:

Reverse the removal procedure for installation.

Air Filter


Backfire Arrester Grid
Filter Element
Filter Element Press Grid

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 slowly.

. 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, induce vomit immediately and see a physician.

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

. Check radiator fins for mud block and/or damage. Correct the bent fins. Clean off the mud with water and compressed air. Replace with a new one if the damaged fin area reached 20%.

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

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

. Don not stain the plastic 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).

. Refer to Chapter 18 for overhauling of temperature transducer.

Inspection standard

Item		Standard
Coolant capacity	Full capacity	1100ml
	Reservoir tank capacity	340ml
	Standard density	30%
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	8N·m(0.8kgf·m)
Thermoswitch	10N·m(1.0kgf·m)
Water pump impeller	10-14N·m(1.0kgf·m) left thread

Troubleshooting

Sharp rise of water temperature

- Faulty radiator cap
- Air in cooling system pipe
- Faulty water pump
- Faulty thermostat (thermostat is not open)
- Clogged radiator pipe or cooling pipes
- Coolant is not enough

No rise or slow rise of water temperature

- Faulty thermostat (thermostat is not closed)

Coolant leakage

- Faulty water pump 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

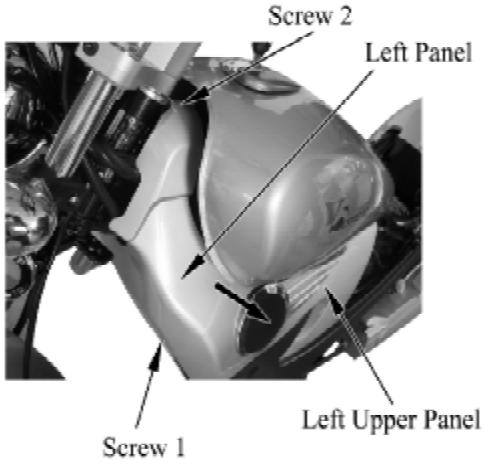
Note:

Open the radiator cap after coolant is fully cooled.

Remove:

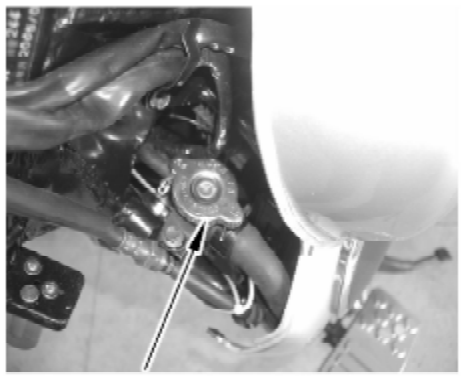
—Left panel

—Radiator cap(counter clockwise)



Check with a densimeter if the coolant density fits the local temperature.

Check coolant for stains



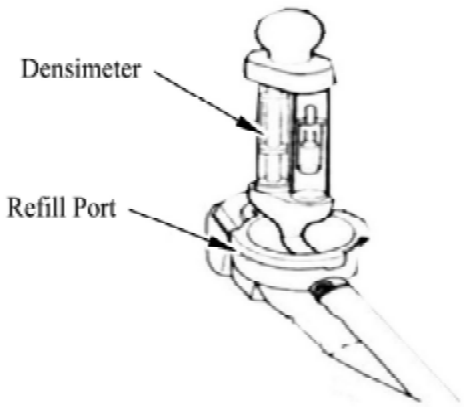
Inspection of radiator cap

Caution:

Open the radiator cap after the coolant is fully cooled.

Remove left panel

Remove radiator cap.

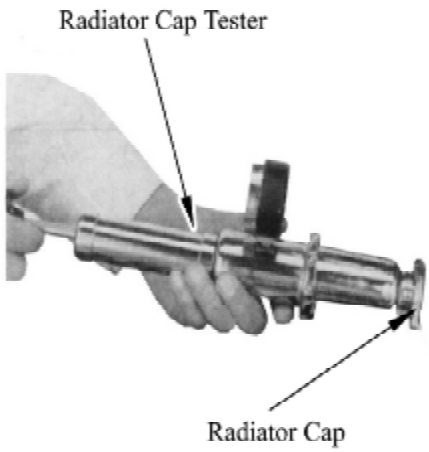


Caution:

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

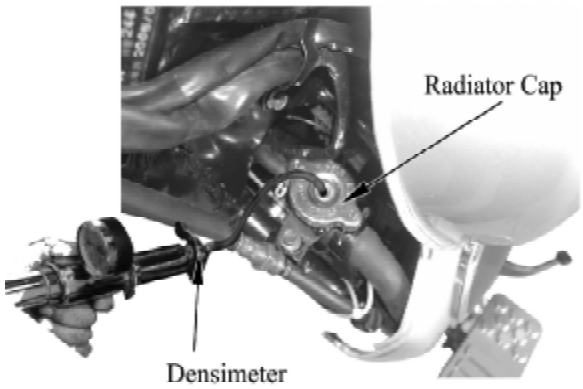
Apply the specified pressure for 6 seconds and make sure there is no pressure drop.

Opening pressure of radiator cap: 108kpa(1.1kgf/cm^2)



Pressure testing of cooling system

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



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

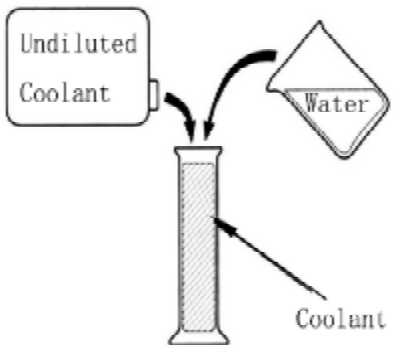
The coolant is poisonous, DO NOT drink or splash it to skin, eyes, and clothes.

-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, induce 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℃ lower than the actual lowest local temperature.

Coolant should be made from undiluted coolant with soft water.

Standard density of coolant: 30%

Recommended coolant: CFMOTO coolant

(Direct application without having to be diluted)

Drainage of coolant

Remove radiator cap cover

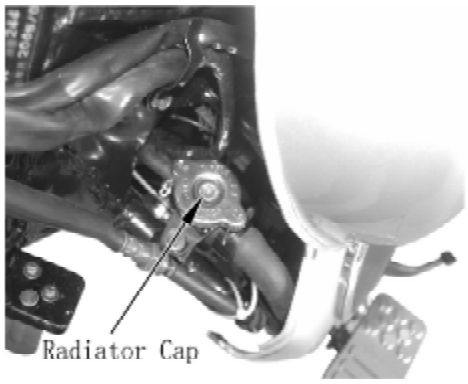
Caution:

Open the radiator cap after the coolant is fully cooled.

Remove

—left panel

—Radiator cap.(clockwise)

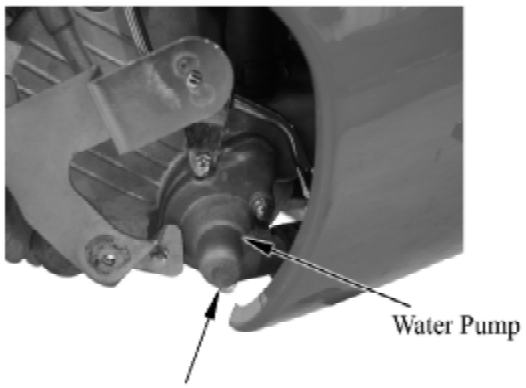


Remove drain bolt

Remove right side cover.(→1.1-2)

Remove drain bolt, seal gasket from water pump, drain coolant.

After drainage, assemble new seal gasket, drain bolt and tighten.



Reservoir Tank

Remove:

—Right speaker cover(→2-7)

—Bolt 1 & 2

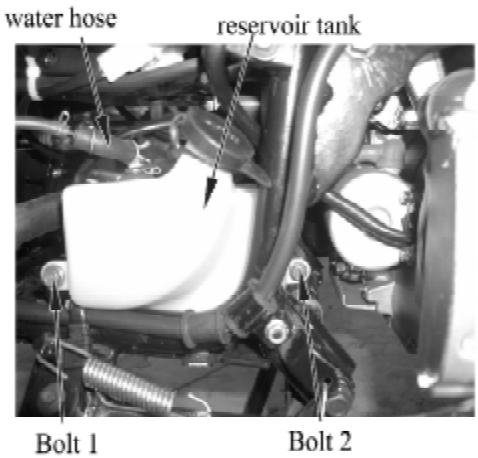
—Reservoir tank water hose

Remove reservoir tank; discharge coolant.

Flush reservoir tank.

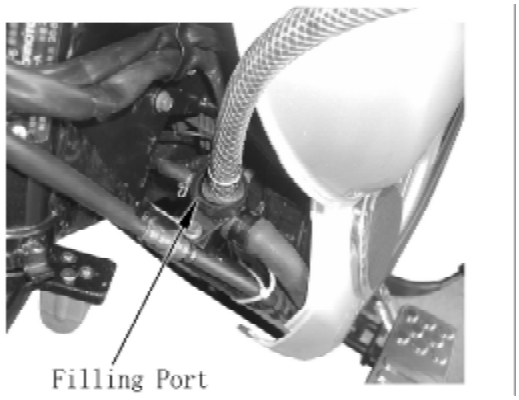
Install reservoir tank.

Install water hose.



Refilling Coolant

Open radiator cap and refill coolant from filling port.

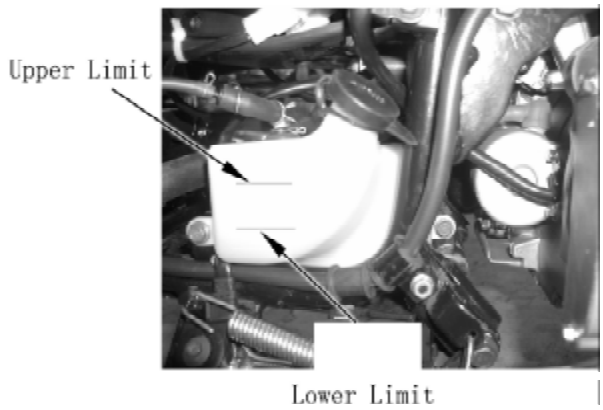


Start the engine and discharge air from cooling system. Check from filling port that air is fully discharged from cooling system and install the radiator cap.

Open reservoir tank cap and refill coolant till the upper limit.

Note:

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



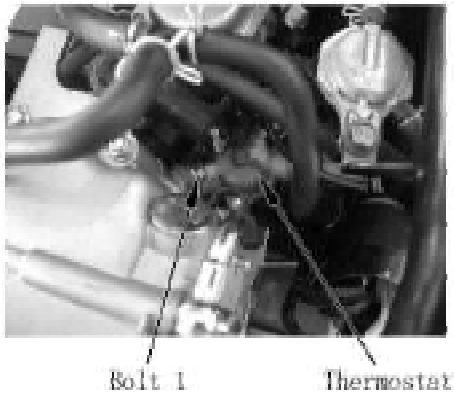
Air Discharge

Discharge the air from cooling 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;
4. Check coolant level in reservoir tank and refill till upper limit. Install reservoir tank cap.

Thermostat

Disassembly and Installation



Caution:

Remove the thermostat after coolant is fully cooled.

Remove

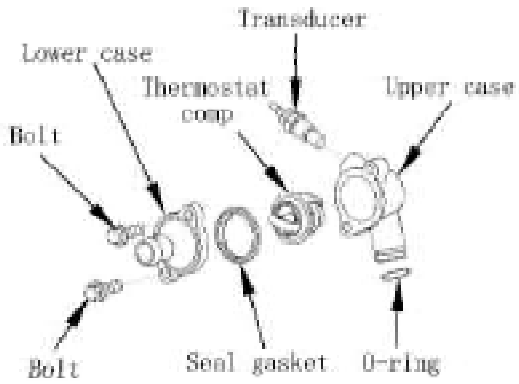
— seat (6-4)

—Bolt 1 and thermostat(5-3)

Remove bolt, upper and lower cases of thermostat.Take out thermostat.

Reverse the removal procedure for installation.

Fill coolant, and discharge air. (→6-4)



Overhaul

Note:

1 The thermostat must be replaced even if it is a bit open at normal temperature.

2 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.

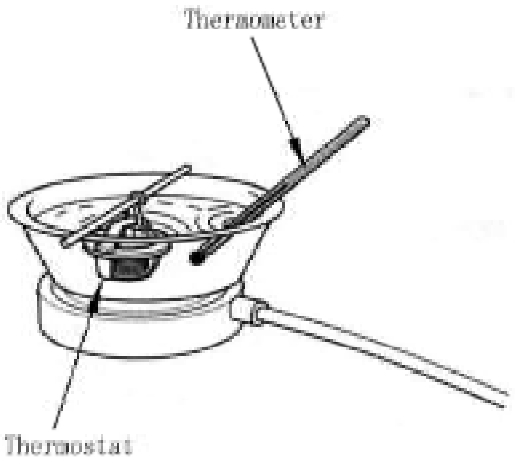
3 Keep the thermostat and thermometer from contacting the bottom of the vessel

Put thermostat into water, keep water temperature rising slowly, and check the opening temperature of thermostat valve.

Opening temperature of thermostatic valve: 72±2℃

Thermometer full open /lift Temperature: 3.5-4.5mm/88℃

Install thermostat.



Radiator

Caution:

Do not damage the Radiator fins.

Remove:

—Front Vent panel

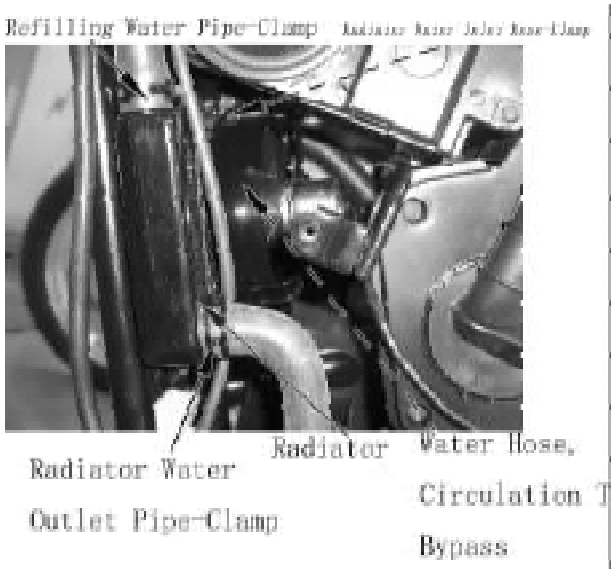
—Rear Left & right panel

—Left & right black panel

—left & right panel

—left & right upper panel

—Bolt 1



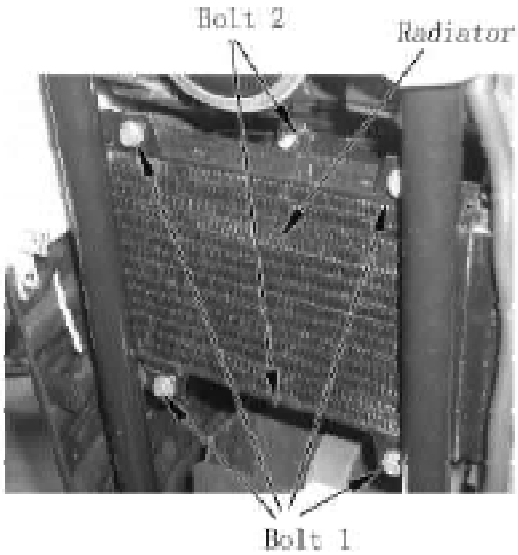
Release clamp, remove water inlet hose of filling port;

Release clamp, remove water outlet hose of radiator.

Release clamp, remove water inlet hose of radiator, water hose for circulation through bypass.

Disconnect thermoswitch;

Remove radiator and fan motor from front



Remove Bolt 2, and separate fan motor and radiator.

Installation

Reverse the removal procedure for installation.

Refill coolant and discharge air. (→6-4)

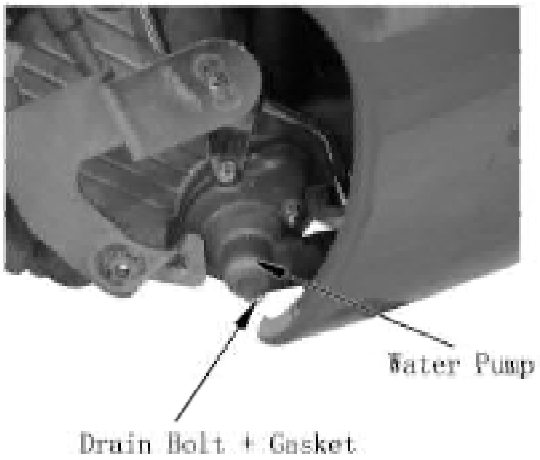
Note:

Check radiator fins for mud block and/or damage. Correct the bent fins. Clean off the mud with water and compressed air. Replace with a new one if the damaged fin area reached 20%.

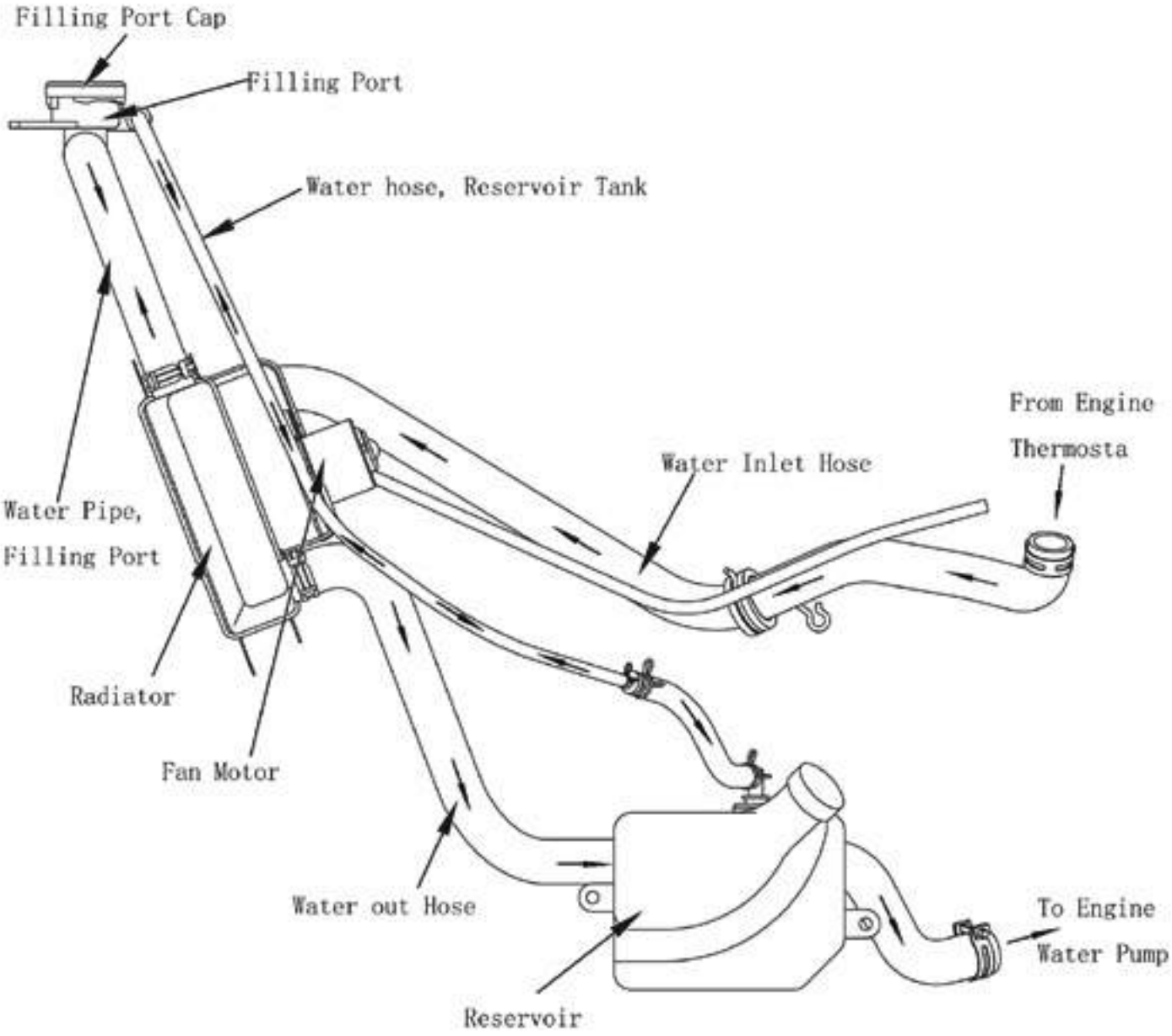
Water Pump(→ 11-4)

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 .



Cooling System Illustration



Chapter 7 Engine Removal and Installation

Overhaul info

Operation cautions:

Securely support the scooter with jack when installing or removing engine.

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

Wrap the frame to avoid any possible damage when installing or removing the engine.

Following operation doesn't require removal of engine from the vehicle.

—oil pump(→Chapter 4)

—carburetor, air filter (→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)

Engine Removal

Remove:

—Seat (→2-3)

—Rear panels (L&H)(→2-3)

—Rear bracket (→2-8)

—Rear part, rear fender (→2-9)

—Rear fender (center) (→2-11)

—Splash fender (→2-5)

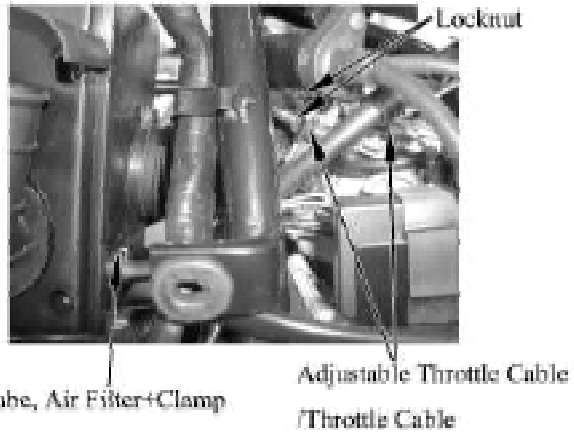
—Muffler (→2-20)

—Rear wheel (→Chapter 14)

Drain coolant(→6-4)

Release locknut, remove adjustable throttle cable/throttle cable from carburetor.

Release clamp and remove tube from air filter.



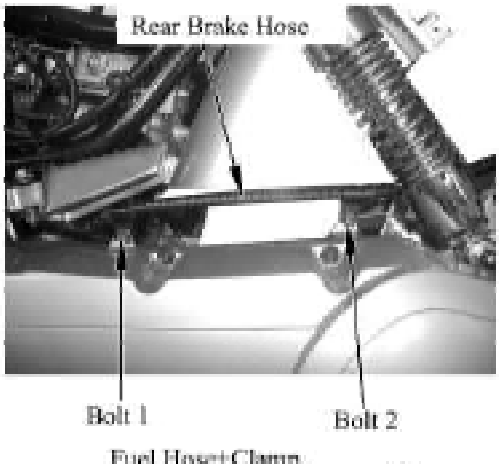
Remove spark plug cap from cylinder.

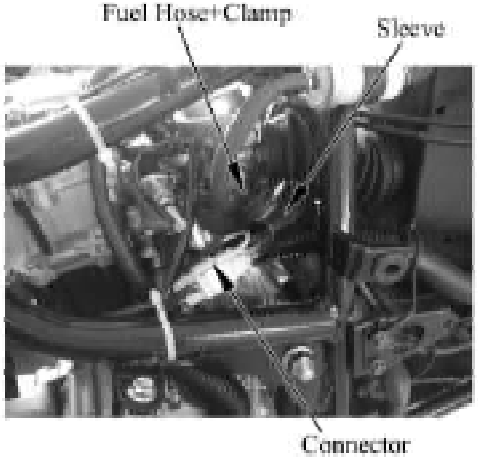
Remove spark plug cap.

Remove Bolt 1 & 2.

Release clamp, and remove fuel hose.

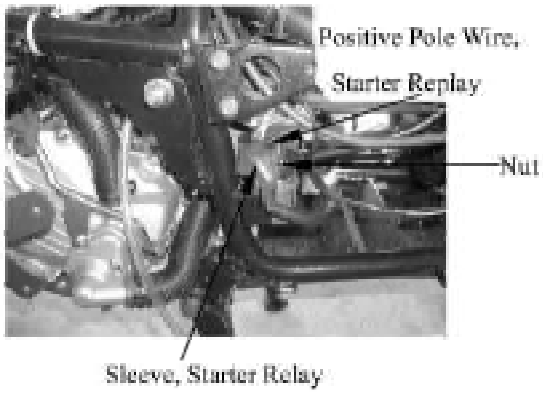
Remove sleeve, 3P connector of magneto, enriching device lead, 2P connector of pickup, water temperature transducer connector.



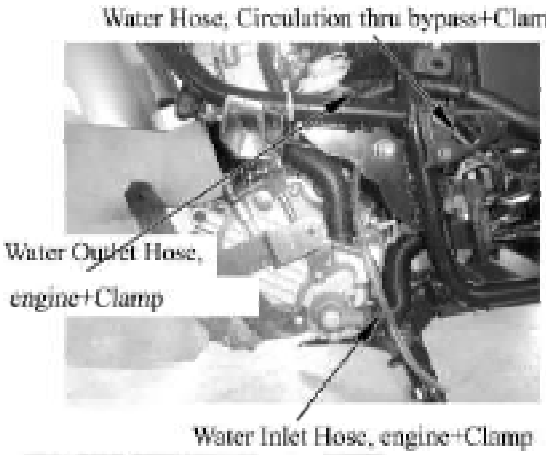


Remove nut and disconnect negative pole wire of starter relay

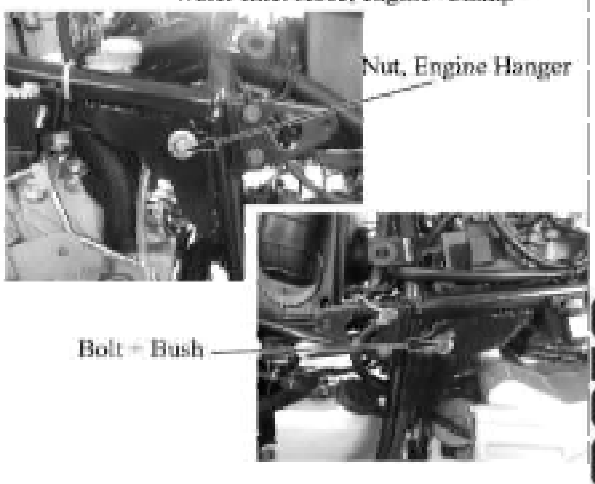
Remove protection sleeve of starter relay.
Remove Nut.
Disconnect positive pole wire of starter relay.



Release clamp, remove water outlet hose (engine)
Release clamp, remove water inlet hose (engine)
Release clamp, remove water hose (Circulation thru bypass)



Remove engine hanger nut, bolt & bush



Remove:

—nut for rear left absorber;
— rear left absorber from frame;
—engine, engine hanger and rear left absorber.
— lower nut of rear absorber;
— rear absorber from engine.

Note:

Removal of rear left absorber is the final step of engine removal.
Make sure engine is properly supported.

Engine Installation

Note:

Cables, pipes and electrical harness should be properly routed according to the routing diagram. (→1-20)

Install engine to frame in the following order:

1. Install rear absorber to engine according to specified torque;
2. Install suspension to engine and put on nut;
3. Install suspension bolt & bush, put engine onto frame;
4. Install rear absorber;
5. Tighten according to the following specified torque:

Hanger bolt:

55N·m(5.6kgf·m)

Rear shock absorber bolt(upper):

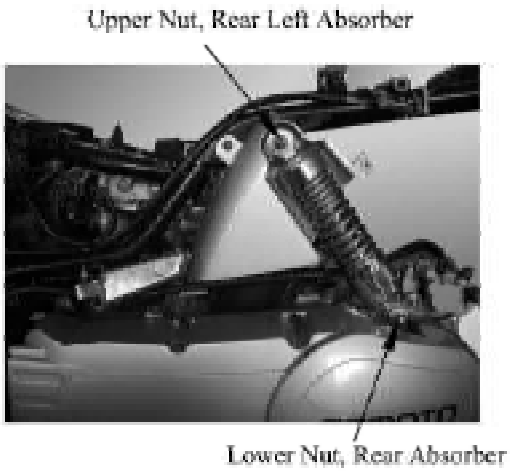
55N·m(5.6kgf·m)

Rear shock absorber (Lower):

30N·m(3.1kgf·m)

Hanger shaft nut:

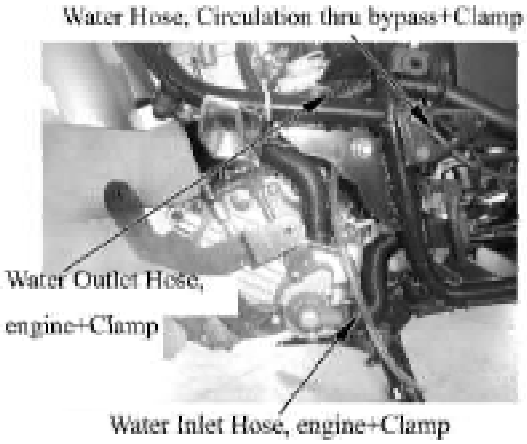
55N·m(5.6kgf·m)



Install water outlet and inlet hoses for engine and water hose (engine warm-up) with proper clamps.

Note:

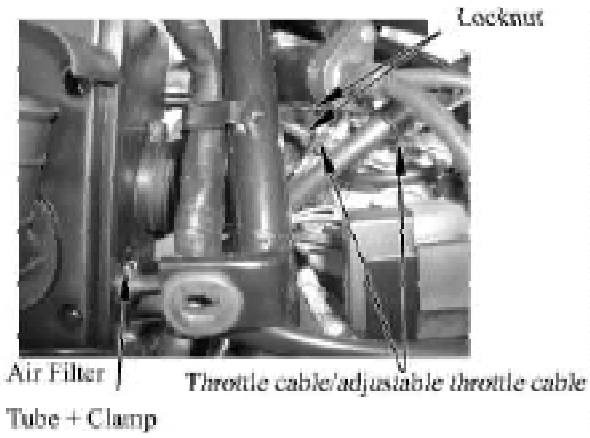
Hoses with crack or damages → Replace;
Water hoses should be installed properly without any leakage at joints.



Install air filter tube with clamp.

Connect throttle cable, adjustable throttle cable, adjust free play of throttle grip.(→3-15)

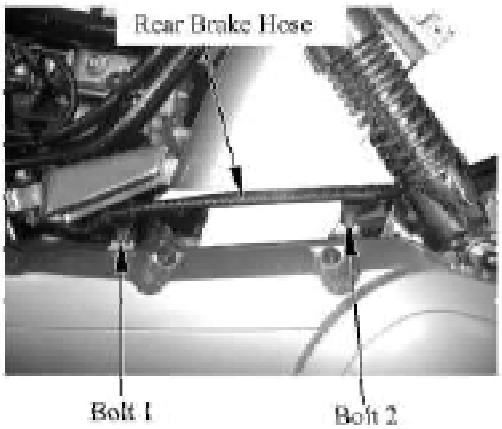
Tighten lock nut after adjustment.



Install Rear brake hose.

Note:

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

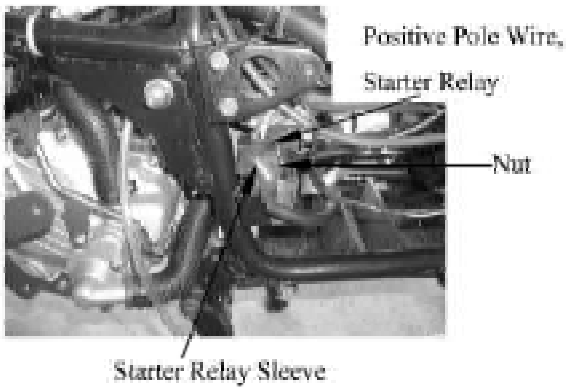


Install vacuum tube with relevant clamp.

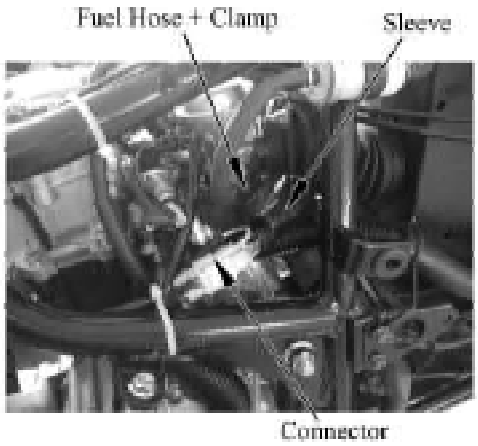
Install spark plug cap

Install negative pole wire of starter relay.

Lift starter relay sleeve, install positive pole wire with bolt.



Connect connector, put connector into sleeve and fix with tie band.



Install:

—Rear wheel (→Chapter 13)
—Muffler (→2-20)
—Rear left and right panel (→2-4)
—Rear Bracket (→2-5)
—Rear part of rear fender (→2-7)
—Rear fender (center) (→2-11)
—Fill coolant and discharge air.
—Seat (→2-3)

Chapter 8 Cylinder Cover, Cylinder Head, Cylinder Body, Valve Train

Overhaul info

Operating cautions

- Use a new gasket when installing cylinder head and check correct installation of dowel pin.
- Use a new gasket when installing cylinder and check correct installation of dowel pin.

Item			Standard	Service limit
Cylinder Compression Pressure			15.0kgf/cm^2-600rpm	—
Valve Clearance	IN		0.10mm	—
	EX		0.10mm	—
Cylinder head planeness			—	0.05mm
Camshaft	Cam top height	IN	31.60-31.72mm	31.52mm
		EX	31.60-31.72mm	31.52mm
Valve rocker arm	Inner diameter of rocker arm	IN/EX	12.000-10.018mm	12.1mm
	Outer diameter of rocker arm shaft	IN/EX	11.973-11.984mm	11.91mm
Valve guide	Outer diameter of Valve stem	IN	4.975-4.990mm	4.90mm
		EX	4.955-4.970mm	4.90mm
	Inner diameter of Valve guide	IN	5.000-5.012mm	5.03mm
		EX	5.000-5.012mm	5.03mm
	Clearance between valve stem and guide	IN	0.010-0.037mm	0.08mm
		EX	0.030-0.057mm	0.10mm
	Driving height of valve guide	IN/EX	12/12mm	—
	Contact width of valve-seat	IN/EX	1.2mm	1.8mm
Valve spring	Free length (External spring /internal spring)	IN/EX	40.0/30.5mm	36.1/27.6mm

Tightening torque

Refer to (→8-17)

Tools:

Special tool:

Valve guide reamer

Valve guide driver (5.0mm)

General Purpose Tools

Valve Spring Compressor

Valve Guide Driver

Valve Seat Cutterhead

Cutterhead holder (5mm)

Valve seat cutterhead (29.00mm) 45° EX

Valve seat Cutterhead (33.0mm) 45° IN

Plane Cutterhead (30.0mm) 32° EX

Plane Cutterhead (33.0mm) 32° IN

Inner Cutterhead (30.0mm) 60° IN, EX

Troubleshooting

Lower compression pressure

- Valve
  - Improper adjustment of valve clearance
  - Valve sinter or bent
  - Damaged valve spring
  - Improper valve timing
  - Poor sealing of valve seat
- Cylinder head
  - Poor seal of cylinder head gasket
  - Distorted or cracked cylinder head
- Wearing of cylinder, piston or piston ring.

Over-high compression pressure

Carbon deposit on piston or in combustion chamber

Noise

- Improper adjustment of valve clearance
- Valve sinter, damaged valve spring or weak spring
- Damaged or worn rocker arm and rocker arm shaft

Knocking or abnormal noise

- Wearing or damage with piston and cylinder
- Carbon deposit
- Wearing or damage with piston, piston pin and small end of connection rod
- Wearing or damage with piston or piston ring

Blue smoke from muffler

- Wearing or damage with cylinder, piston
- Improper installation of piston, piston ring
- Score with piston or cylinder

Removal of Cylinder Head Cover

Remove:

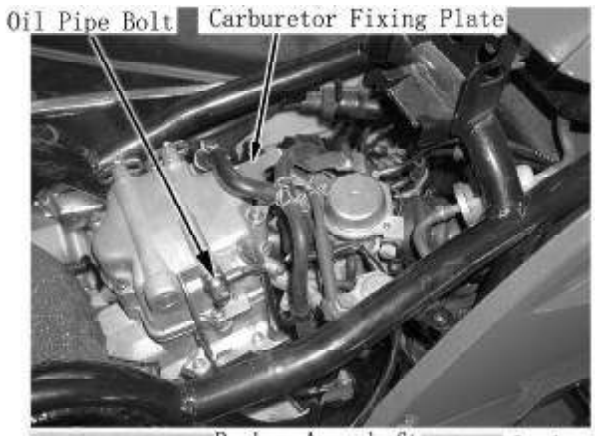
—seat (→2-3)

—Oil pipe bolt and copper washer.

—5 bolts for cylinder head cover

—Carburetor fixing plate and cylinder head cover

—Dowel pin from cylinder head cover

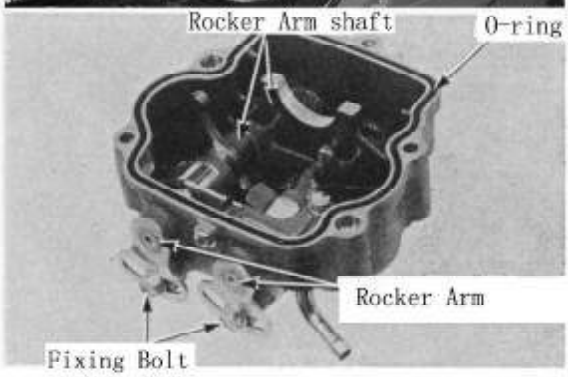


Disassembly of Cylinder Head Cover

Remove O-ring from cylinder head cover;

Remove fixing bolt of stem;

Remove rocker arm shaft and disassemble rocker arm.



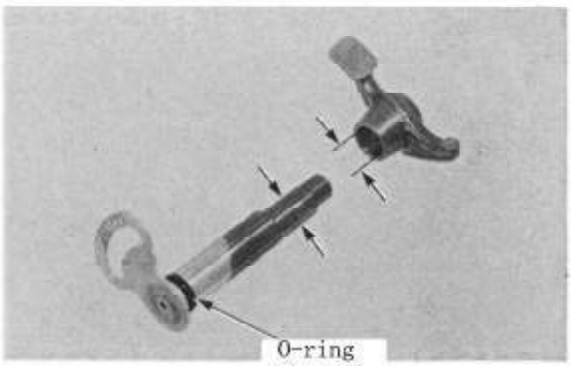
Inspection:

Rocker Arm → damage or wearing

Inner diameter → Replace when more than service limit of 12.10mm

Note:

In case there is any damage or wearing with rocker arm, check cam surface for damage or wearing.



Rocker arm shaft → damage or wearing

Outer diameter → Replace when less than service limit of 11.91mm

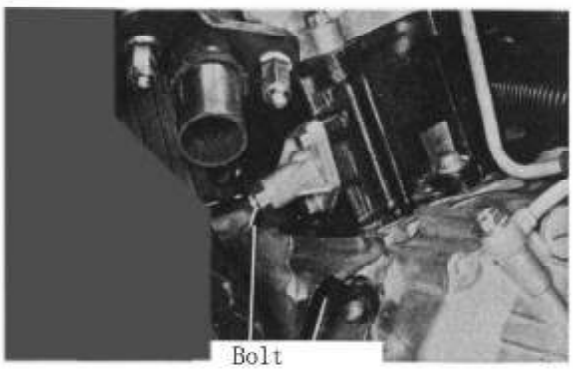
O-ring → Replace with a new one if necessary

Removal of Camshaft

Remove:

—Exhaust pipe, muffler (→2-20)

—Tensioning device



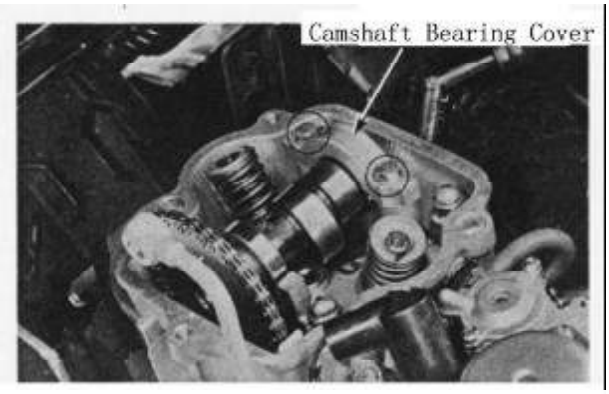
Remove:

—2 bolts

—Camshaft bearing cover;

—Chain from sprocket;

—Camshaft



Note:

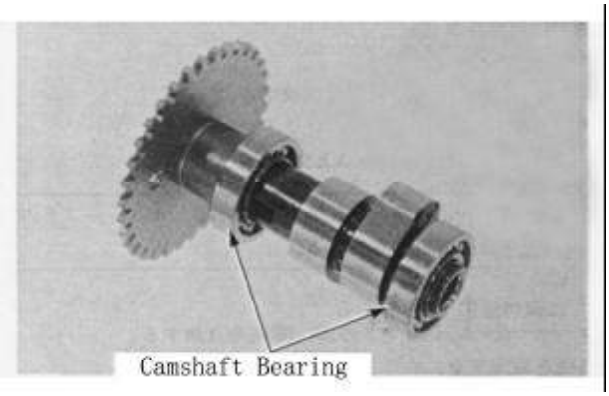
To prevent the timing chain from dropping into cylinder, hook the chain with a wire.

Inspection of Camshaft

Check cam surface for damage and height to cam.

Replace when less than service limit of 31.52mm

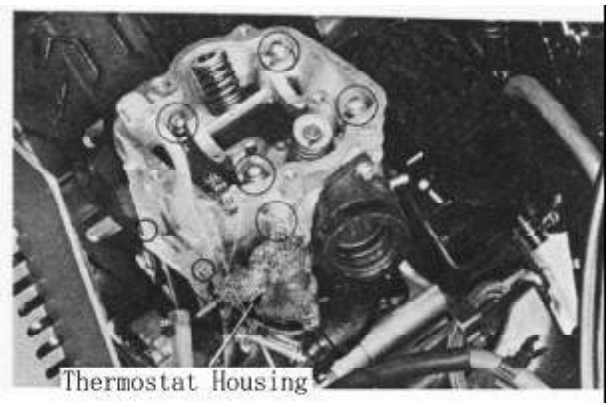
Check camshaft bearing for looseness or damage. Replace, if any.



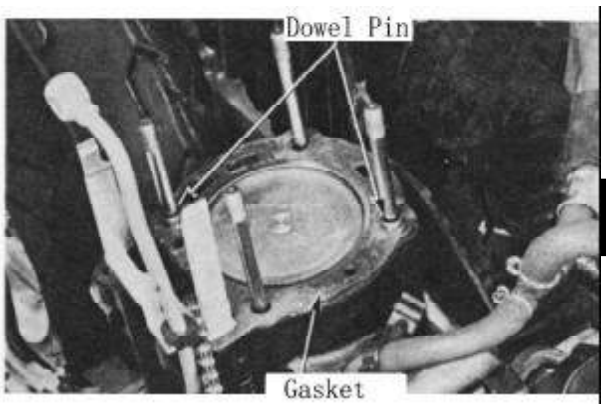
Removal of Cylinder Head

Remove air filter, carburetor (→Chapter 5)

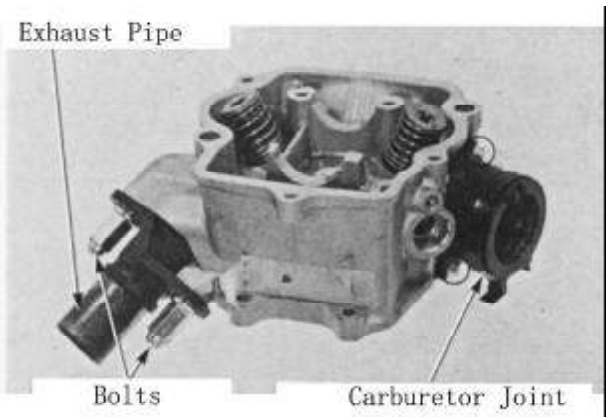
—Drain coolant;
—Remove bolt for thermostat housing;
—Remove thermostat housing from cylinder head
—Remove bolts for oil pipe support and cylinder base.
—Remove 4 nuts and 4 copper washers



Remove gasket, dowel pin.



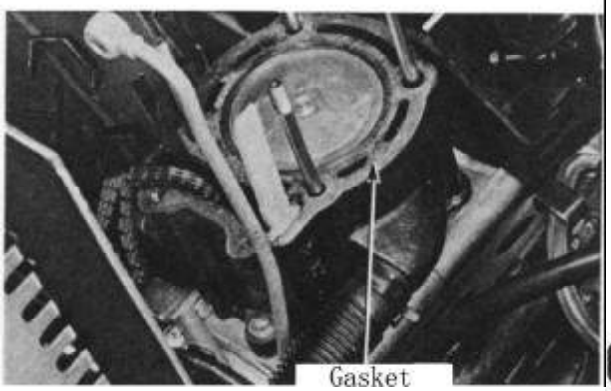
Remove 2 bolts for exhaust pipe;
Remove exhaust pipe
Remove carburetor joint.



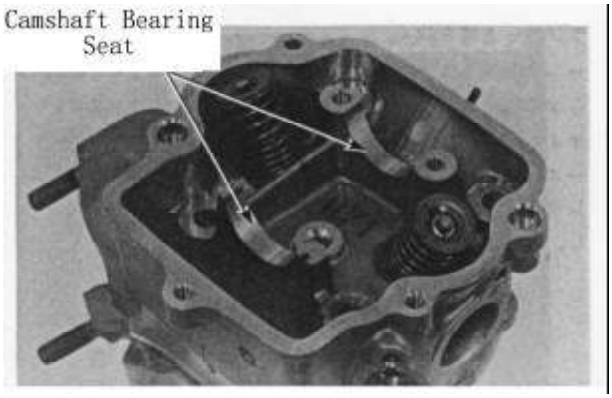
Remove cylinder gasket.

Note:

—Do not damage gasket surface;
—Do not drop gasket materials into engine or water jacket.



Check camshaft bearing seat for wearing or damage.



Disassembly of Cylinder Head

Remove with a valve spring compressor:

—Valve spring retainer lock;
—Valve spring retainer
—Valve spring
—Valve stem seal
—Valve

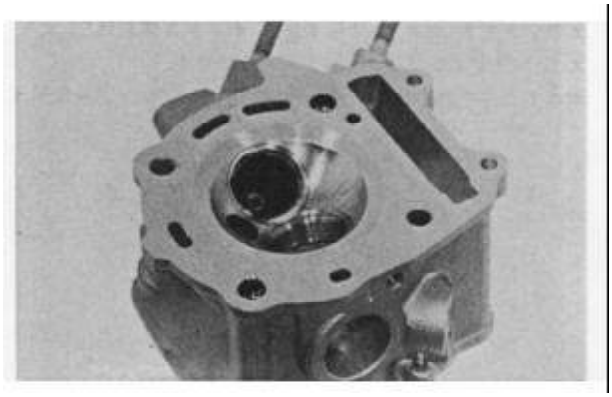
Note:

—Do not over tighten compressor;
—After disassembly, keep the parts with IN & EX separately.
Special tool: Valve spring compressor

Remove carbon deposit from combustion chamber;Clean off gasket materials from cylinder head.

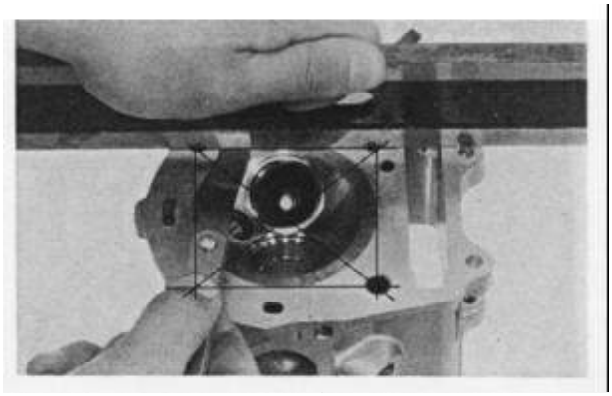
Note:

—Take care not to damage the surface of cylinder;
—Carbon deposit can be easily removed if dipped in gasoline.



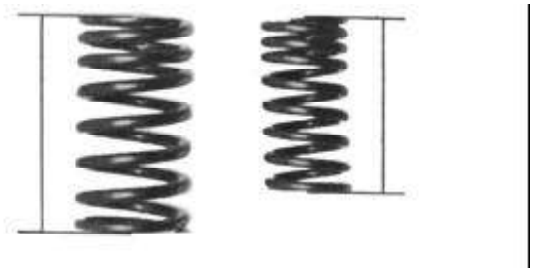
Inspection

Cylinder Head
Check spark plug hole and valve port for any cracks.
Check distortion of cylinder head with a square and a plug gauge.
Correct or replace cylinder head if it's more than service limit of 0.5mm.



Valve Spring

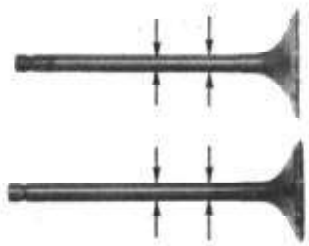
Check free length of valve inner and outer springs.
Replace when free length less than the following service limit:
Service limit: Inner Spring 27.6mm
Outer Spring 36.1mm



Valve, Valve Guide

Check intake and exhaust valves for bending, burning, scratch and eccentric wearing of valve stem end.
Put valve into valve guide and check for smooth function.
Measure outer diameter of valve stem;

Service limit: 4.90mm → Replace



Before measuring valve guide, remove carbon deposit with a reamer.
Special tool: Valve guide reamer

Note:

Always turn the reamer right. Do not insert or pull out the reamer while it is not turning.

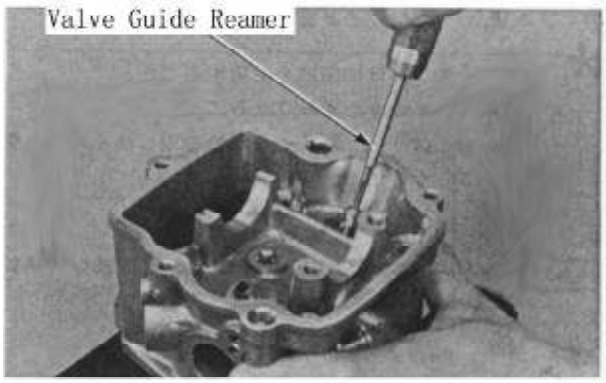
Measure inner diameter of valve guide.

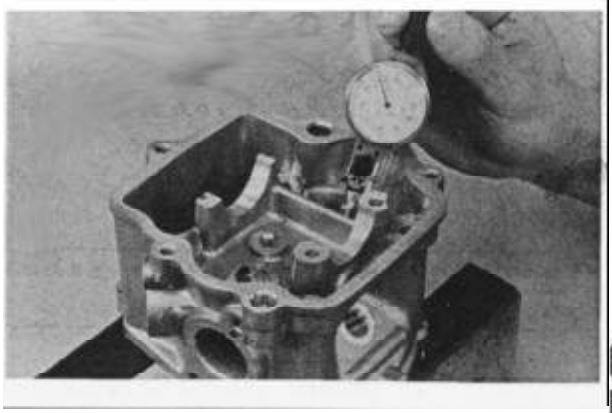
Out of Service limit: 5.03mm → Replace

Calculate the gap between valve stem and guide.The difference between inner diameter of valve guide and outer diameter of valve stem is the gap.

Out of Service limit: IN. 0.08mm → Replace
EX. 0.10mm → Replace

If the gap is out of service limit and valve guide is replaced with a new one, then calculate the again if the gap is within the service limit. If the valve guide is replaced, correct the valve seat if necessary. (→8-8)



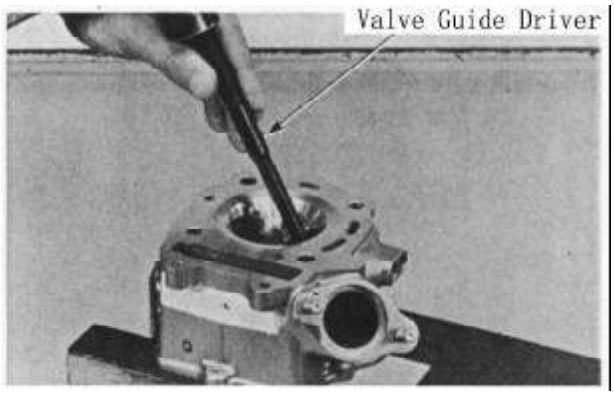


Replacement of Valve Guide

Drive out valve guide.

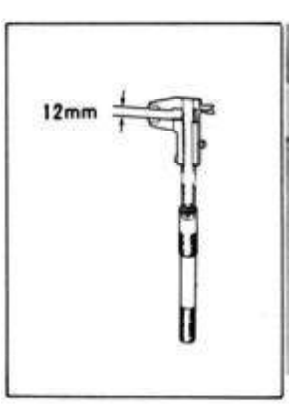
Note:

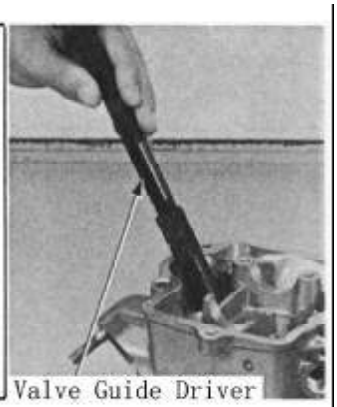
Take care not to damage cylinder head.
Special tool: Valve Guide Driver (5.00MM)
Adjust valve guide driver and keep the driving height at 12mm.
Drive in the valve guide.



Note:

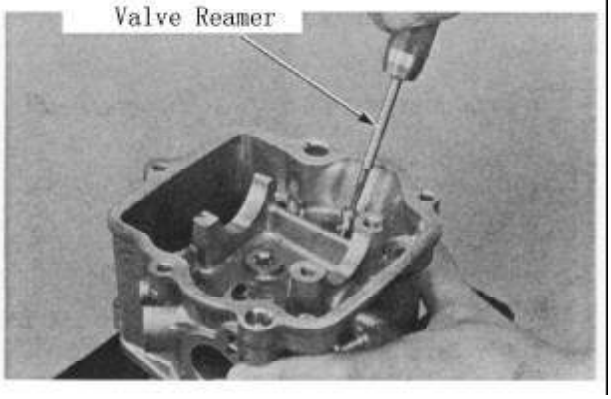
—After driving in the valve guide, make sure there is no damage with drive guide.
—When driving in the valve guide, make sure not to damage cylinder head surface.
General purpose tool: Valve Guide Driver
Correct valve guide with a reamer.





Note:

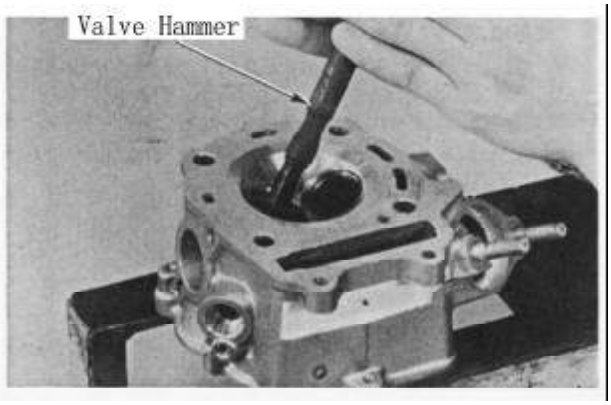
—When reaming valve guide, use cutting oil.
—Only turn the reamer right.
—Do not insert or pull out reamer while it is not turning.
Wash clean cylinder head and clean off scraps.
Special tool: Valve Guide Reamer



Inspection, Correction of Valve Seat

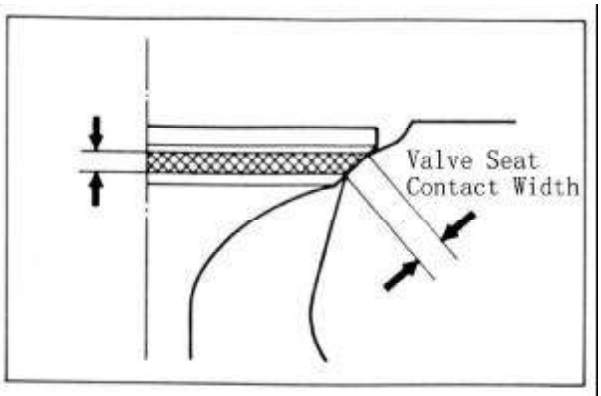
Inspection

Clean off carbon deposit at combustion chamber and valves.
Apply some red lead on valve face.
Make valve slide with valve hammer.
Remove valve and check valve face.
Replace the valve in case there is eccentric wearing or rough face.



Check valve seat contact width
Above service limit: 1.88mm → Correct

If contact width is not even, over wide or over narrow, correct with valve seat cutterhead.

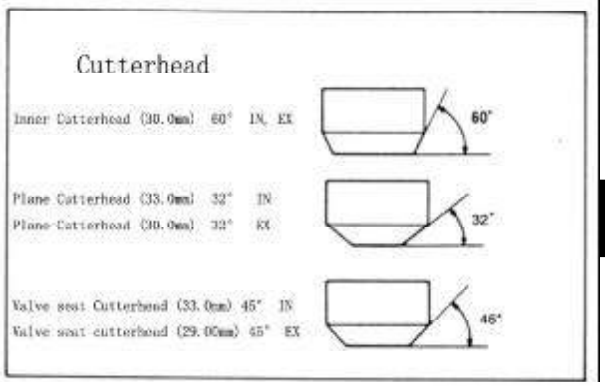


Valve seat cutterhead

Refer to owner's manual for correct operation.
Press cutterhead with a force of 4~5Kg.
Turn cutterhead and cut.

Note:

Apply engine oil to cutterhead to keep scraps off while cutting.



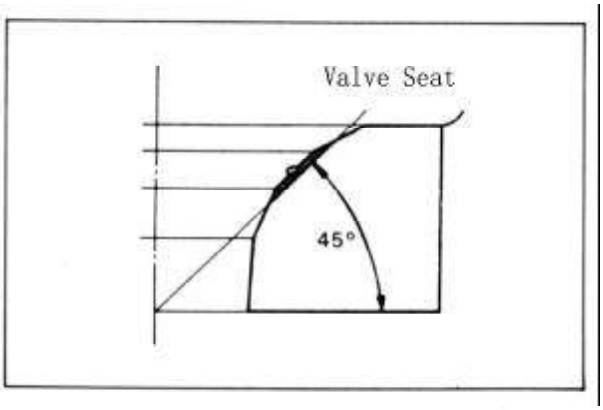
Correction of Valve Seat

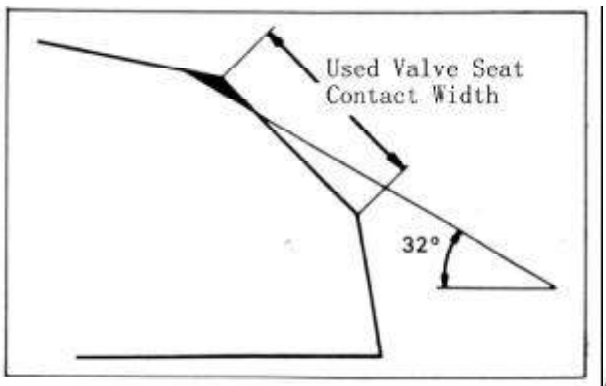
Cut valve seat with a 45° cutterhead till the rough surface and pinholes are abraded.

Note:

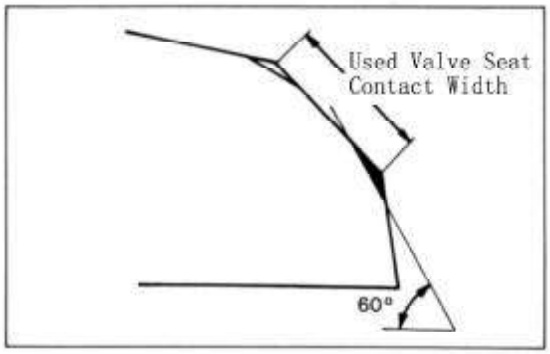
Do not over cut.

Use a 32° cutterhead for plane cutting.



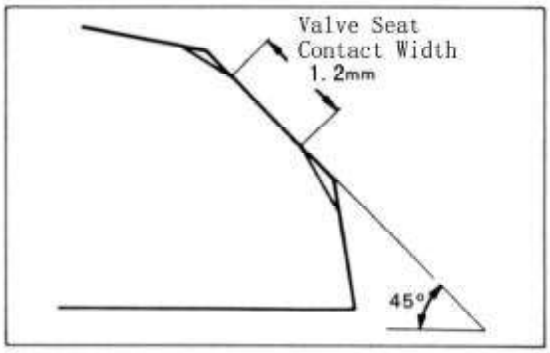


Use a 60° cutterhead for surface cutting.



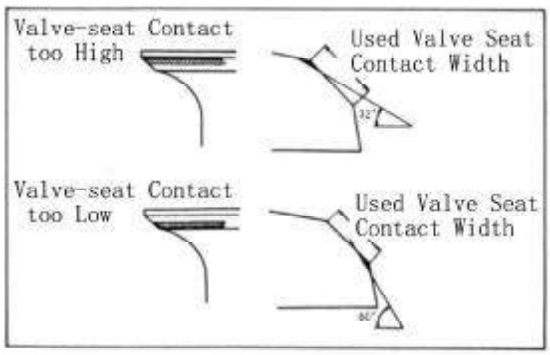
Use a 45° cutterhead for valve face cutting.Till the standard contact width value

Contact Width: 1.2mm



If valve-seat contact is too high, Use a 32° cutterhead for plane cutting.
If valve-seat contact is too low, Use a 60° cutterhead for surface cutting.

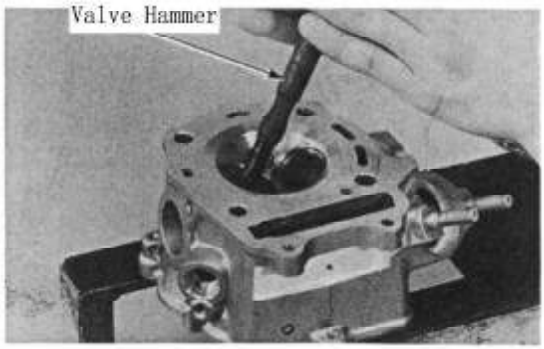
Use 45° **cutterhead,adjust to standard contact width.**



Apply polishing cream to valve face and adjust valve seating with valve hammer or valve seating tool.
After valve seating, wash clean cylinder head and valve.

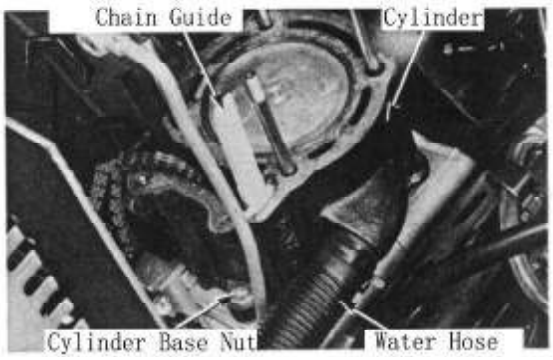
Note:

—Do not press valve seat too hard while grinding to avoid possible damage.
—Take care not to drop polishing cream between valve stem and guide while grinding



After all the correction, make sure with read lead the 45° valve-seat face is evenly on contact with center of valve-seat contact.

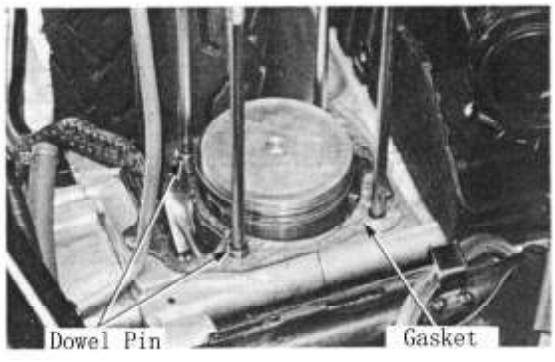
Cylinder Removal



Remove:

—Cylinder head (→8-4)
—Water hose connection from cylinder
—Chain guide
—Cylinder base nut and cylinder

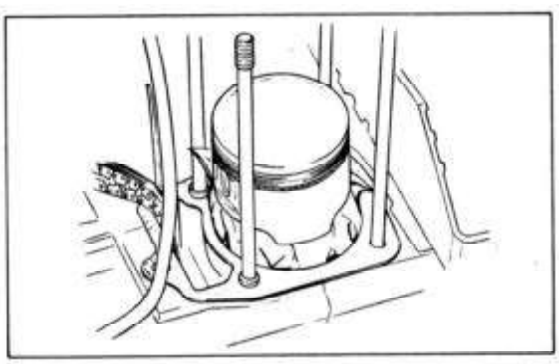
Remove cylinder gasket and dowel pin.



Clean off gasket materials on crankcase.

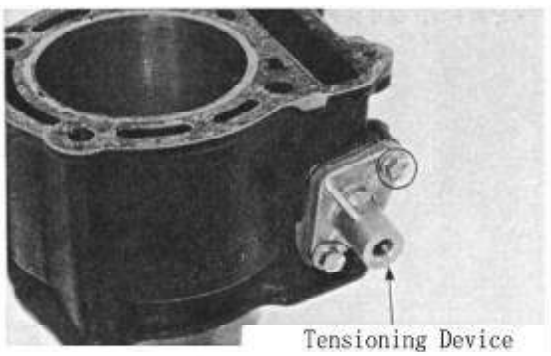
Note:

Do not drop any foreign materials into crankcase.



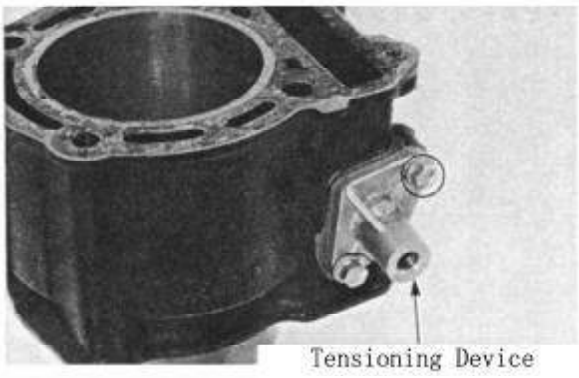
Remove tensioning device and gasket from cylinder.

Clean off gasket materials from cylinder.



Cylinder Installation

Install tensioning device to cylinder, with a new gasket.



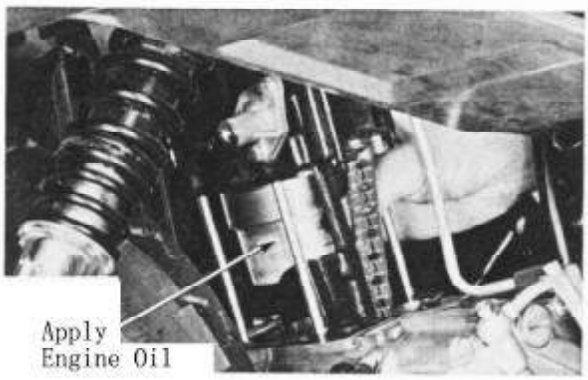
Install dowel pin and new cylinder gasket.

Apply clean engine oil to inner cylinder, piston and piston rings.
Install piston into cylinder while compressing piston rings.
Install cylinder onto crankcase.

Note:

—Take care not to damage piston or piston rings;
—The piston-ring openings should not be in the direction of piston pin and should be arranged in the equal angle of 120°.

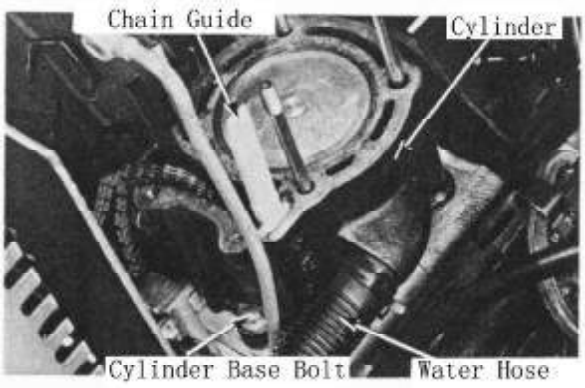
Temporarily install cylinder base bolt and gasket.
Install water hose to cylinder.
Install timing chain guide.



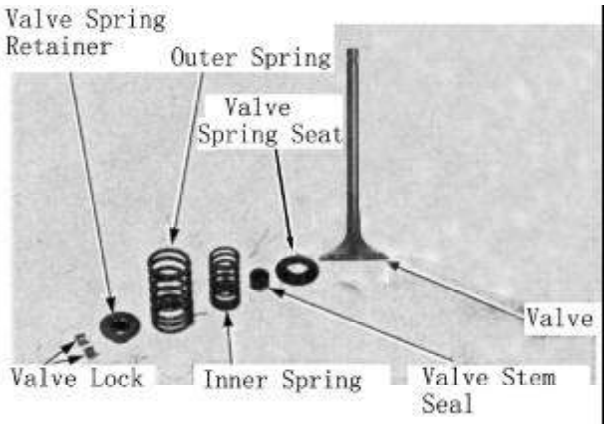
Note:

Make sure the lower end of chain guide is inserted into the groove of right crankcase.

Install cylinder head. (→8-14)
Tighten cylinder base bolt.



Cylinder Head Assembly



Install valve spring retainer, valve stem seal.

Note:

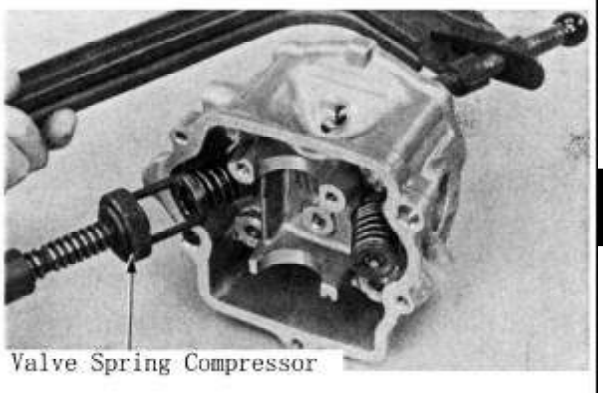
Replace with a new stem seal.

Apply some engine oil to valve stem, insert stem into valve guide.

Install valve lock with valve spring compressor.

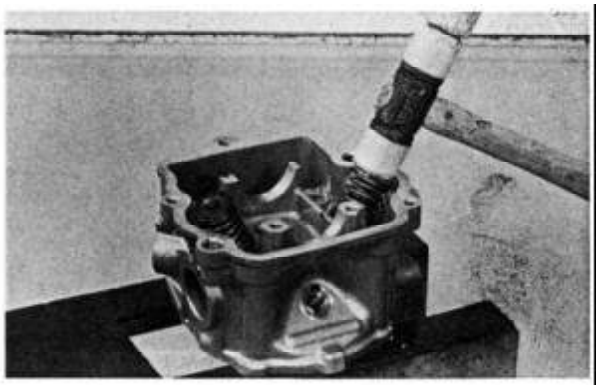
Note:

—Do not over tighten valve spring compressor;
—Install valve spring with the side of smaller pitch of screw in line with cylinder head side.
Special tool: Valve Spring Compressor

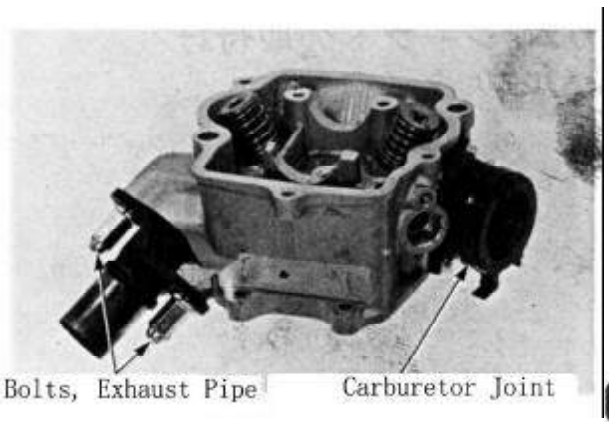


Strike slightly valve stem end 2~3 times with a rubber hammer to make valve and valve lock match well.
Take care not to damage valve.

Install exhaust pipe to cylinder head and tighten nuts.



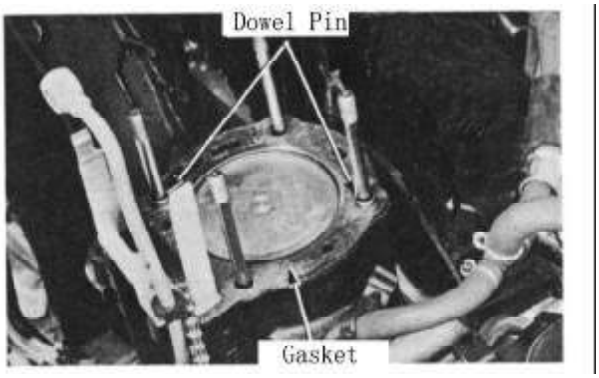
Install carburetor joint to cylinder head with 2 bolts.
Installation of Camshaft/Valve Timing.



Remove timing plug from right side cover
Remove CVT cover (→9-3)
Turn pulley counter clockwise, overlap T mark on Fly wheel with mark on right side cover.

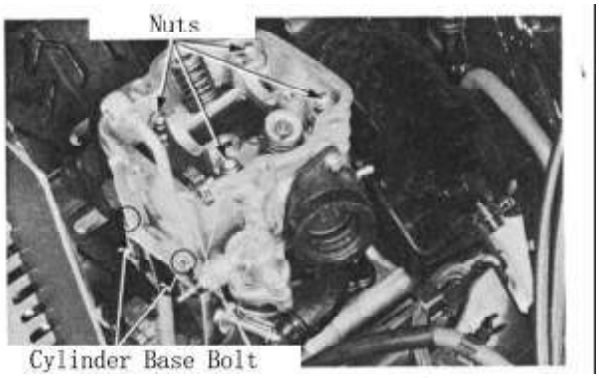
Install camshaft to cylinder head with IN,

Install dowel pin and new gasket to cylinder head.
Install cylinder head.



Install and tighten the 4 copper washers and 4 nuts.

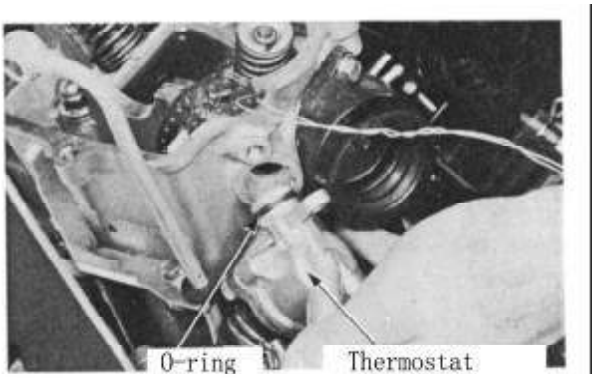
Tightening torque: 2.2-2.6kgf-m



Note:

Tighten nuts in crisscross direction in 2~3 progressive steps.

Install cylinder base bolts, fuel pipe fixing bolts.

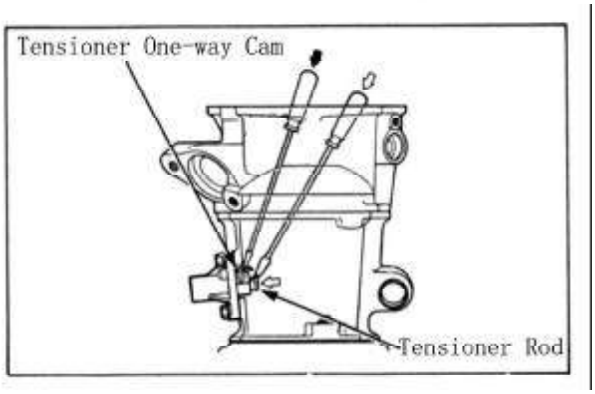


Install new O-ring to thermostat housing.
Install thermostat housing to cylinder head and tighten bolts.

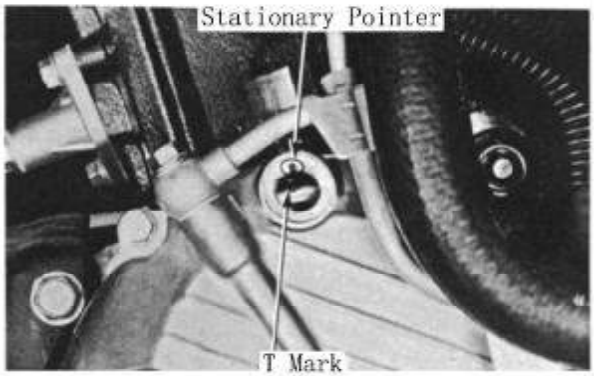
Install carburetor. (→5-9)

Chain Tensioner Installation/Valve Timing

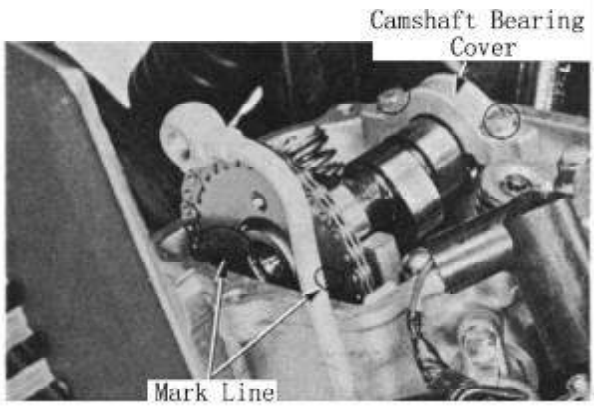
Lift the tensioner one-way cam, push the tensinoner rod all the way in.
Install tensioner to the cylinder.



Remove cover of timing inspection hole.
Remove CVT cover (→9-3)
Turn the primary sheave counterclockwise and align the flywheel T mark with stationary pointer of right side cover.

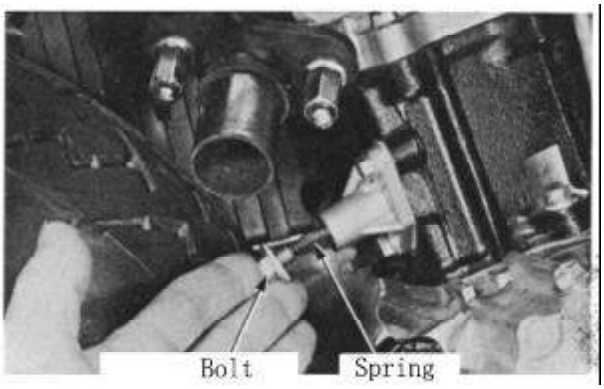


Install camshaft to cylinder head with IN, EX downwards.
Check if the mark line on cam sprocket is aligned with cylinder head terminal face.
Install chain to sprocket.
Install camshaft bearing cover and tighten the bolts.
Tightening Torque: 0.8-1.2kgf · m



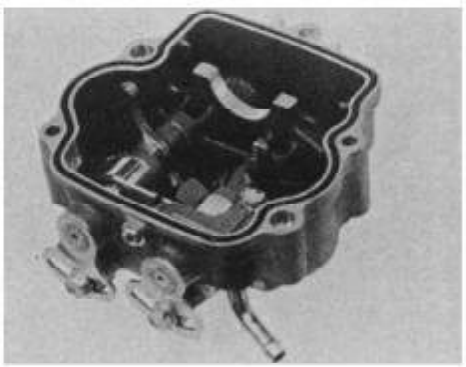
Install

—Gasket, tensioner and tighten bolts.
Tightening Torque: 0.8-1.2kgf · m
—CVT cover and timing inspection hole cover.
—Muffler (→2-20)



Cylinder Cover Assembly

Install new O-ring to the rocker axle.
Apply engine oil to rocker arm and axle and install to cylinder cover.
Install fixing bolt for valve timing adjuster.



Cylinder Cover Installation

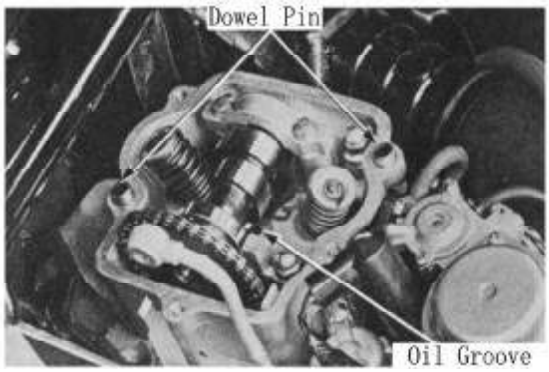
Fill the cylinder head oil groove with engine oil.

Install 2 dowel pins to cylinder head.

Install gasket to the cylinder head slot and install cylinder cover.

Tighten 5 bolts.

Tightening Torque: 0.8-1.2kgf · m



Note:

—Fix the carburetor fixing plate to the cylinder cover with bolts.

—Tighten bolts on the cross in 2 progressive steps.

Install oil pipe to cylinder cover with oil pipe bolt and copper washer.

Tightening Torque: 0.8-1.2kgf · m

Valve Adjustment

Valve adjustment should be done when the engine is cooled. (under 35℃)

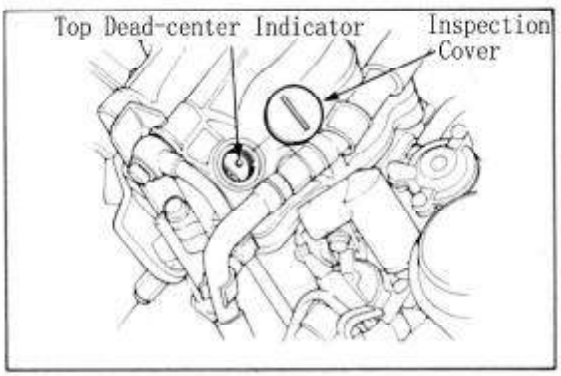
Remove:

—Seat (→2-3)

—CVT cover(→9-3)

—Inspection cover from cylinder cover.

Turn primary sheave counterclockwise slowly, align top dead-center indicator of camshaft with the mark on cylinder cover. Maintain piston at the upper dead-center position.



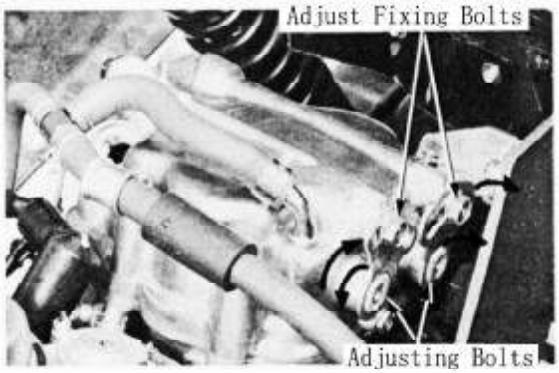
Release fixing bolts of valve adjuster.

Open IN, EX adjustors fully outwards, then return by one mark.

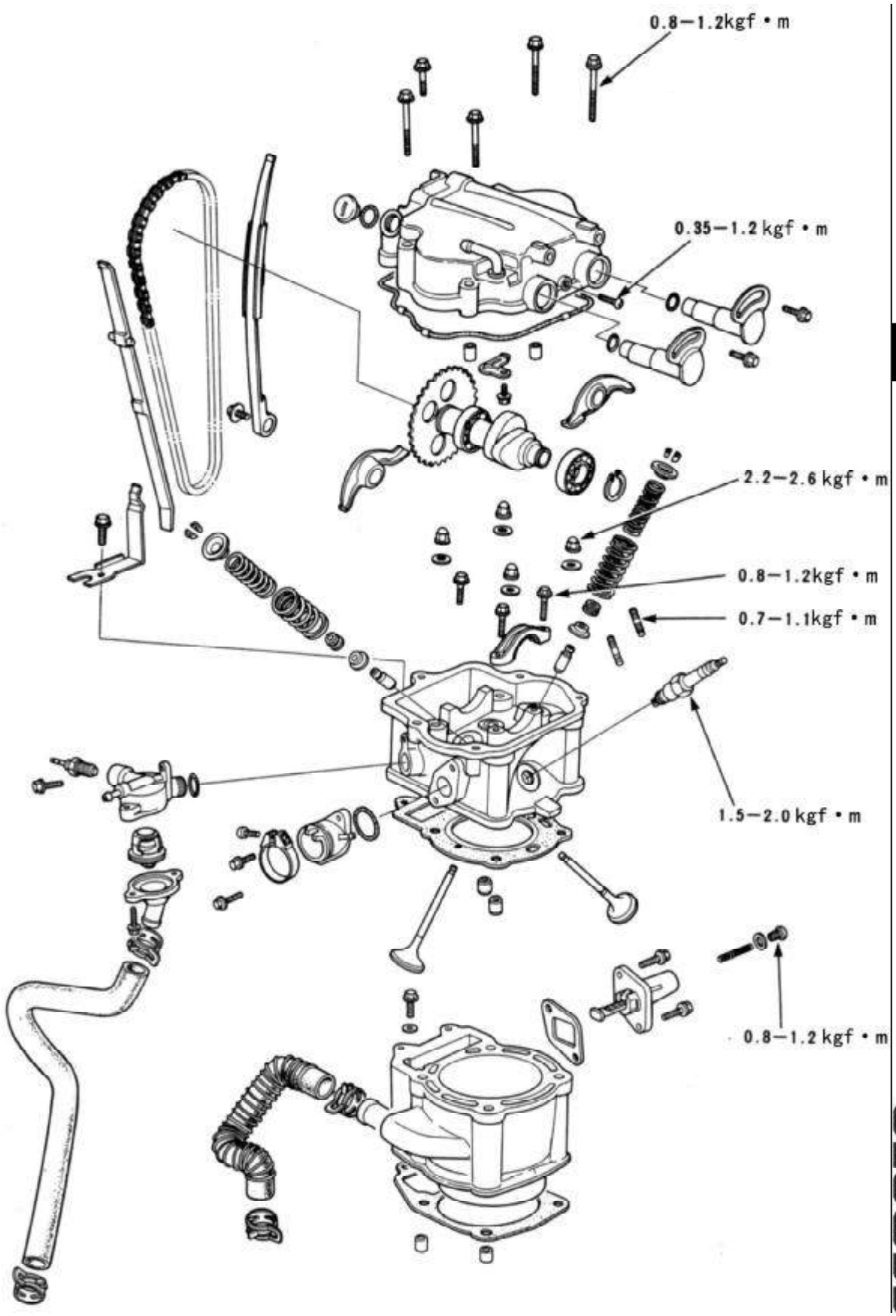
Tighten fixing bolts.

Install the removed parts.

Install Seat. (→2-3)



Cylinder Cover, Cylinder Head, Cylinder Body, Valve Train



Chapter 9 Primary Sheave, Clutch, Secondary Sheave

Overhaul Information

Note:

—Maintenance of CVT cover, belt, primary and secondary fixed sheave and clutch could be done without removing engine from vehicle;

—Do not apply greasy material to belt, primary and secondary fixed sheave;

Maintenance Standard:

Item	Standard (mm)	Service Limit (mm)
Inner diameter of collar, primary sliding sheave	27.000~27.033	27.06
Outer diameter of collar, primary fixed sheave	26.959~26.980	26.94
Belt width	24.2	22.5
Thickness, clutch shoe	----------	1.5
Inner diameter, clutch housing	153~153.15	153.8
Free length, clutch spring	135.0	127.0
Outer diameter, secondary fixed sheave	39.95~39.975	39.94
Inner diameter, secondary sliding sheave	40.000~40.025	40.06
Outer diameter, weights	22.94~23	22.4
Wearing of secondary fixed sheave/ secondary sliding sheave	----------	0.4

Tightening torque:

Refer to (→ 9-17)

Special Tool:

Nut spanner 39x41mm
Rotor Holder
Clutch Spring Compressor
Driving Tool Handle

General Purpose Tool

Removing Device Handle A
Removing Controller 15mm
Removing Controller 22mm
Bearing Remover 24 x 26mm
Bearing Remover 32 x 35mm
Press Handle

Troubleshooting

When engine is running, scooter does not run

—Worn/damaged Belt

—Damaged ramp plate

—Worn/damaged clutch shoe

Poor Speed Performance

—Worn/damaged belt

—Worn weights

—Faulty secondary sheave

Engine stops or suddenly accelerate when scooter starts to run:

—Broken clutch return spring

CVT Cover

Disassembly

Remove:

—Left ornament panel (→2-5)

—5 bolts of CVT cover, remove the other bolt from side with an open spanner.

—Dowel pin

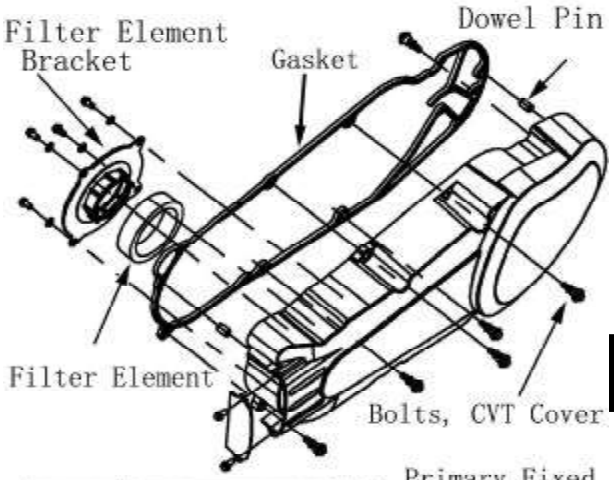
Bolts

Remove gasket from CVT cover.

Damaged, aged →Replace

Remove filter element and bracket from CVT cover;

Dust deposit or damaged filter element →Clean or Replace;



Installation

Reverse the removal procedure for installation.

Tightening torque: 0.8~1.2kgf・m

Belt

Disassembly

Remove CVT cover;

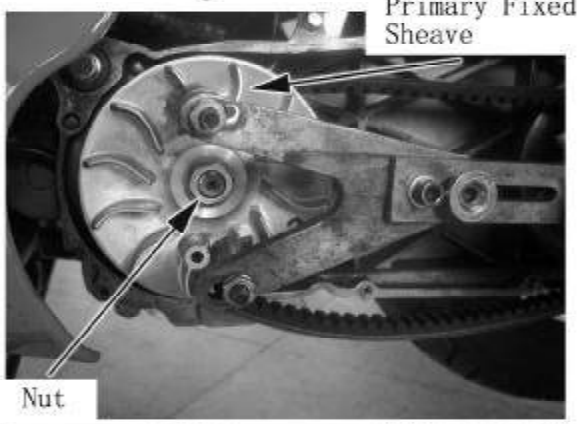
Hold primary fixed sheave with belt holder,

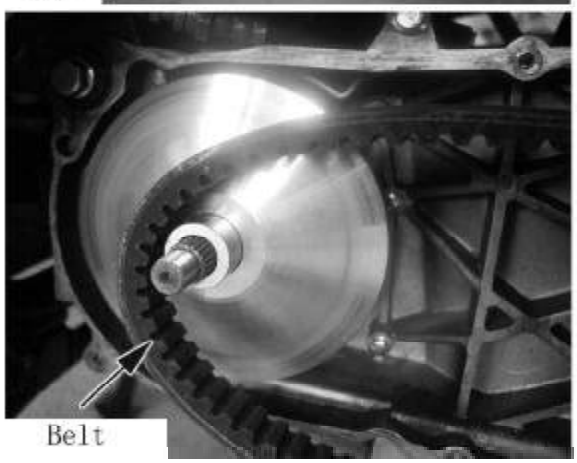
Release Nut;

Special Tool: Belt Holder

Remove washer, primary fixed sheave;

Remove belt;





Inspection

Check belt for cracks, teeth drop and abnormal wearing;
Measure the belt width;
Service Limit: 22.5mm

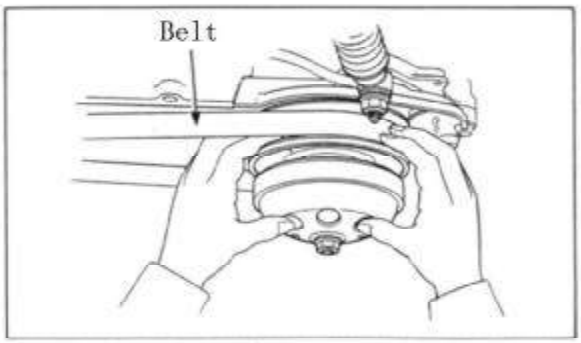
Note:

Replace with genuine parts.

Installation

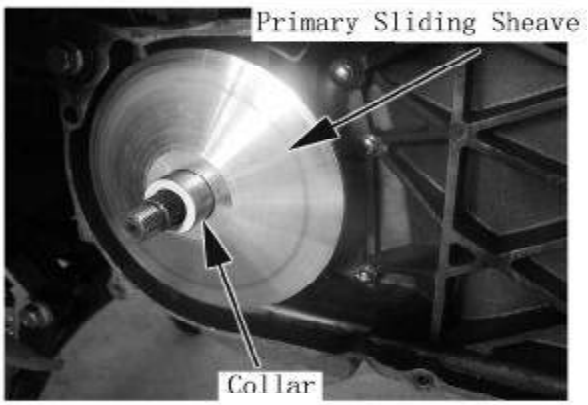
Turn the secondary sliding sheave clockwise while compress it.
Put belt on the secondary sheave.
Put belt on the collar of primary sheave and install primary sheave.
Install washer, nut and tighten.

Tightening torque: 8.0~10.0kgf • m



Note:

—The belt should not be seized;
—The direction mark on the belt should be same as its moving direction.
Install CVT cover.



Primary Sheave

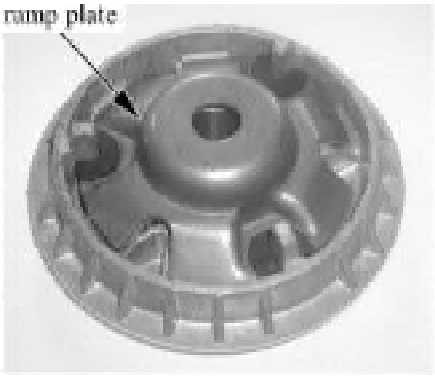
Remove:

—CVT cover and belt (→9-3)
—Primary sliding sheave

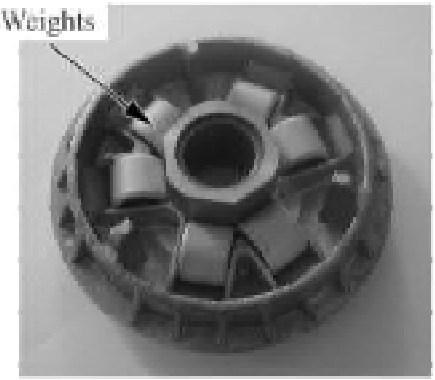
Disassembly

Remove collar

Remove ramp plate

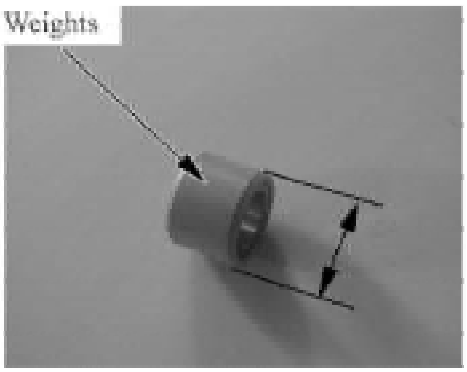


Remove weights.



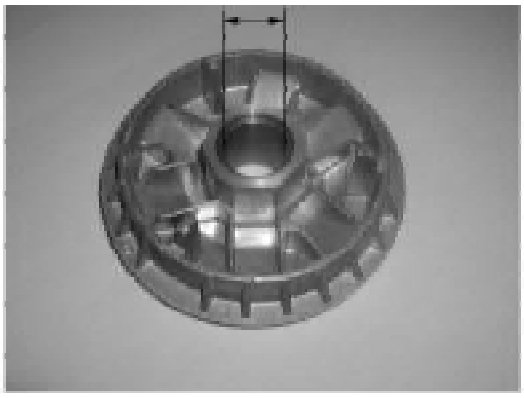
Check weights for wearing or damage.

Measure the outer diameter of weights.

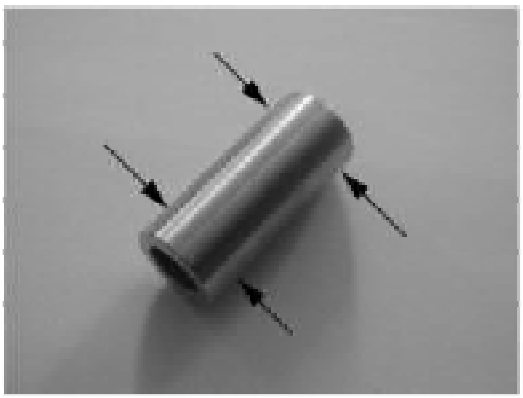


Service limit: <22.4mm → Replace

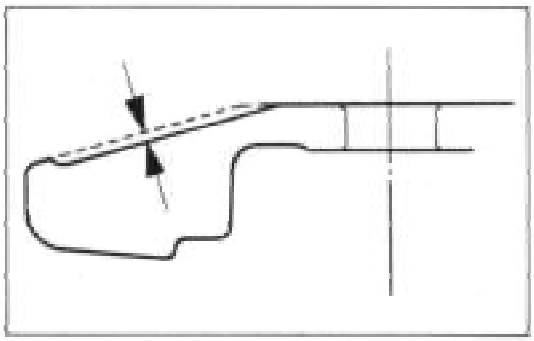
Measure the inner diameter of primary sliding sheave collar.
Service limit: >27.06mm →Replace



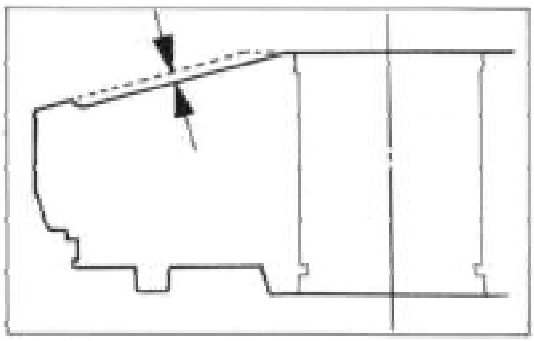
Check primary fixed sheave collar for wearing or damage.
Measure outer diameter of primary fixed sheave collar.
Service limit: <26.94mm →Replace



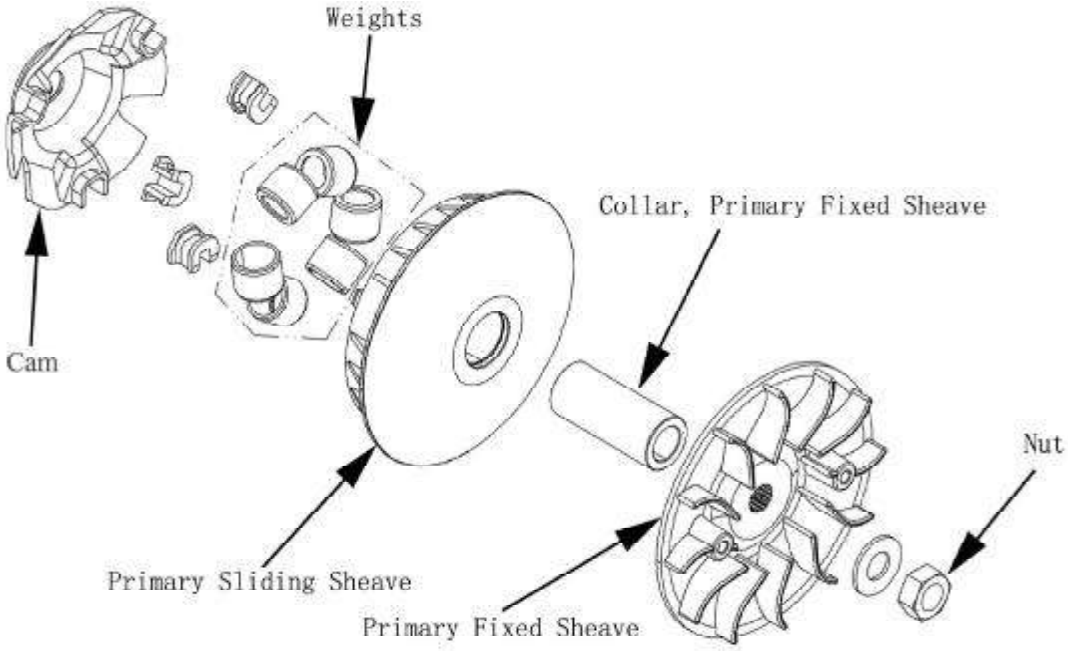
Check primary fixed sheave for wearing or damage.
Measure wearing depth of primary fixed sheave.
Service limit: > 0.4mm→Replace



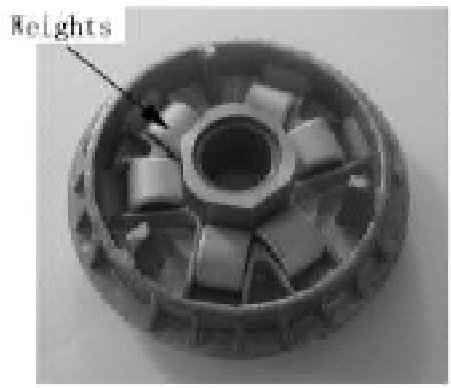
Check primary sliding sheave for wearing or damage.
Measure wearing depth of primary sliding sheave.
Service limit: > 0.4mm→ Replace



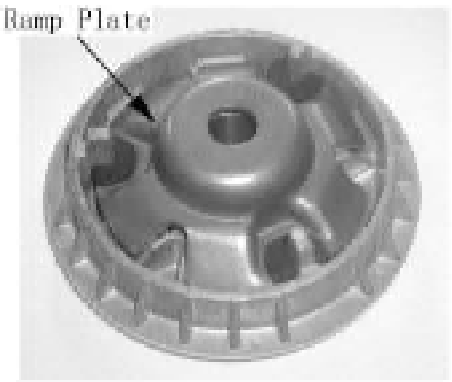
Assembly



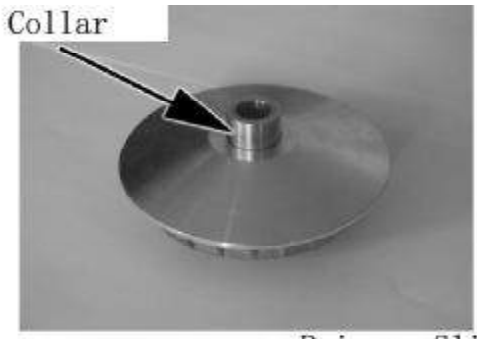
Install weights into primary sliding sheave.



Install ramp plate.

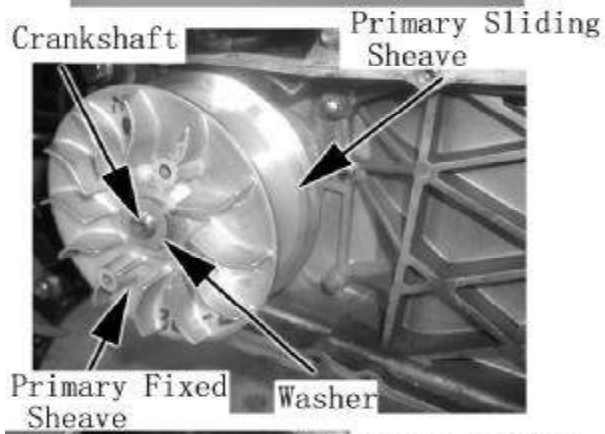


Install collar to primary sliding sheave.



Installation

Install primary sliding sheave to crankshaft.
Install belt. (9-4).
Install primary fixed sheave to crankshaft.
Install washer.
Hold primary fixed sheave and tighten nut.
Tightening Torque: 8.0~10.0kgf · m
Special Tool: Rotor Holder



Note:

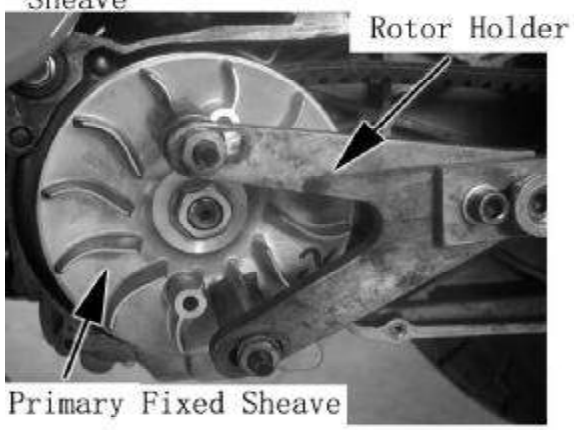
Do not stain greasy material such as engine oil to belt or sheave.
Make sure the belt is not seized.

Secondary Sheave, Clutch

Disassembly

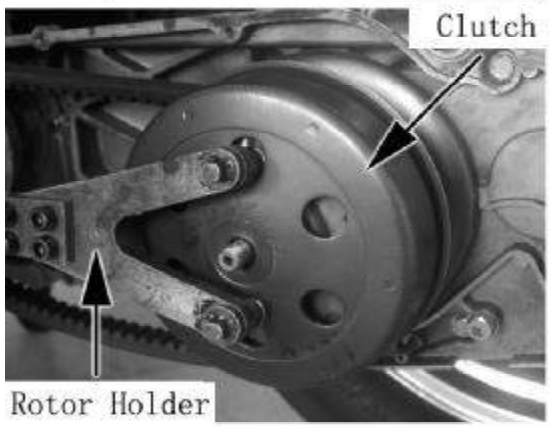
Remove:

—CVT Cover (→9-3)
—Primary fixed sheave & belt (→9-3)
—Nut (clutch carrier) while holding clutching housing.

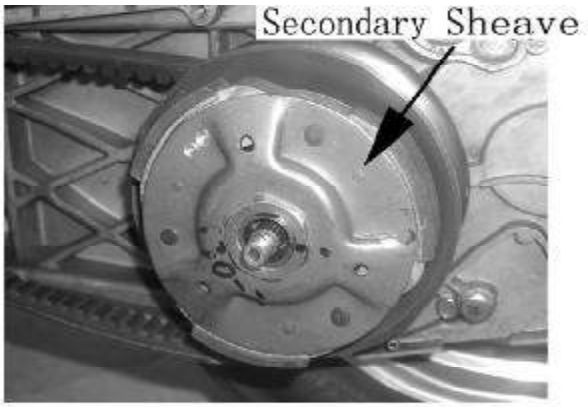


Special Tool: Rotor Holder.

Remove Clutch housing.



Remove secondary sheave

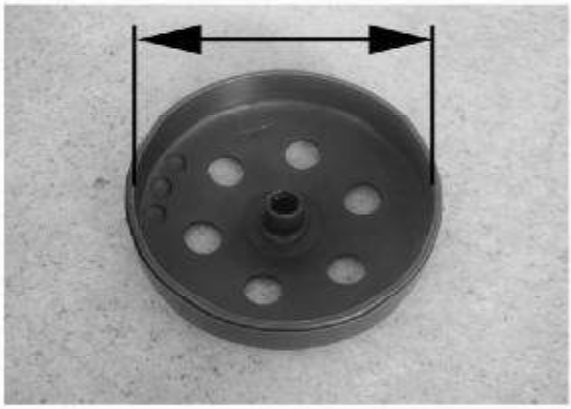


Inspection:

Check clutch housing for wearing or damage.

Measure inner diameter of clutch housing.

Service limit: > 153.8mm → Replace



Check clutch carrier for wearing or damage.

Measure thickness of clutch shoe.

Service limit: <1.5mm → Replace

Disassembly

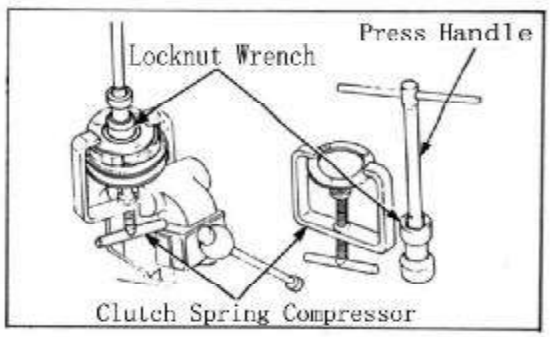
Attach clutch spring compressor to secondary sheave/ clutch.

Compress clutch spring.

Note:

Do not over compress clutch spring to avoid damage of secondary sheave.

Special Tool: Clutch Spring Compressor



Hold the compressor steady with a bench vice, remove nut.

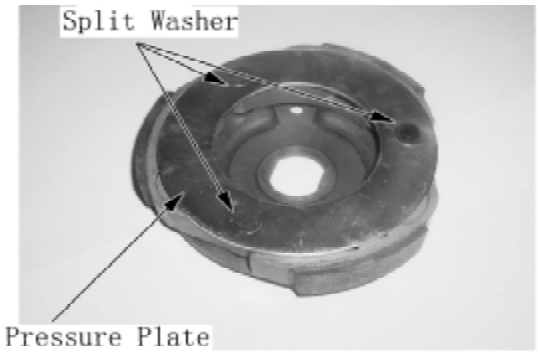
Special tool: Locknut Wrench 39 × 41mm

General purpose tool: Press handle

Loosen compressor, disassemble secondary sheave/ clutch.

Remove split washers, pressure plate,

disassemble clutch.

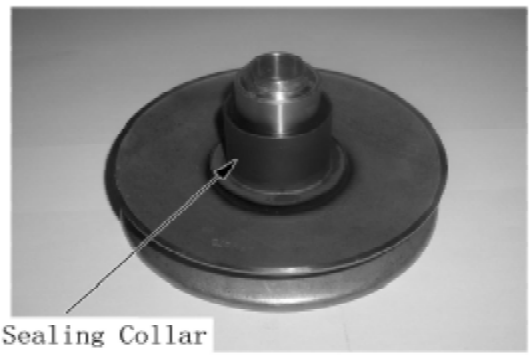


Note:

Do not stain clutch shoe with grease.

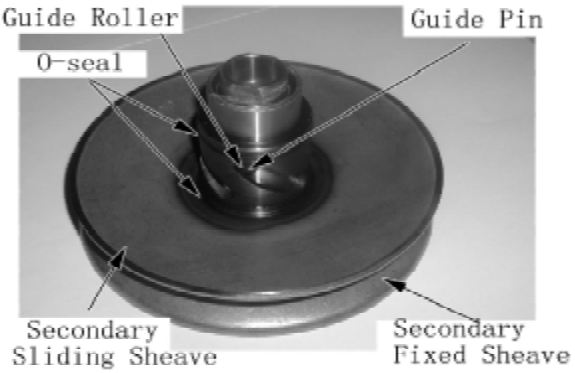
Disassembly of secondary sheave

Remove sealing collar.

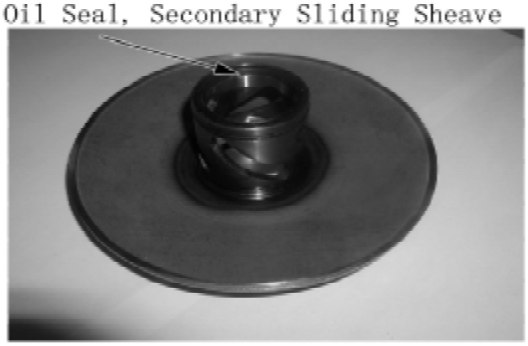


Take out guide pin, remove guide roller,remove secondary sliding sheave.

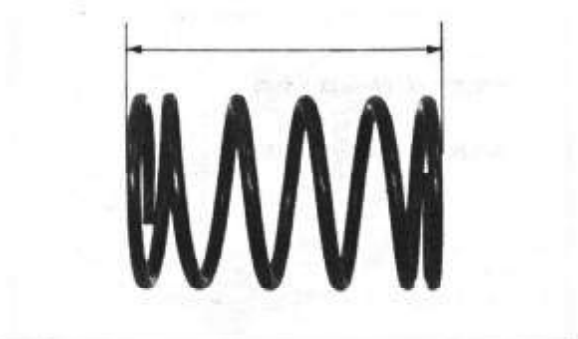
Remove O-seal from secondary sliding sheave.



Remove oil seal from secondary sliding sheave.



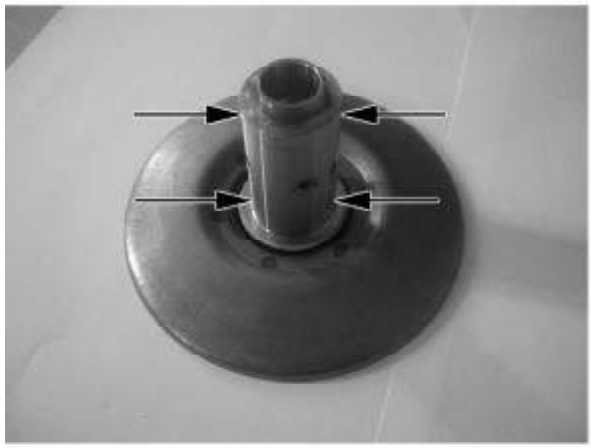
Inspection



Measure the free length of clutch spring.

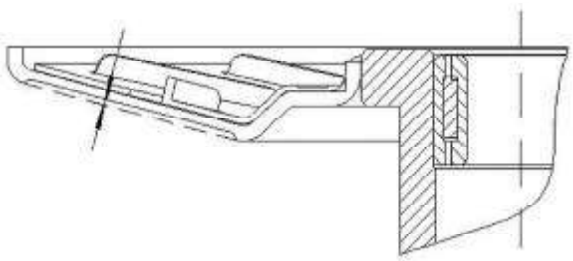
Service Limit: <127.0mm → Replace

Check spring for weakness or damage.
Replace if necessary.
Check Secondary sheave for wearing or damage.
Measure outer diameter of secondary fixed sheave.
Service Limit: <39.94mm → Replace

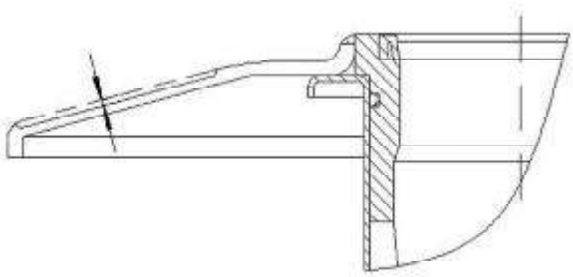


Check bearing of secondary fixed sheave for looseness.
In case of any looseness or noise, replace with a new one.
(→9-12)

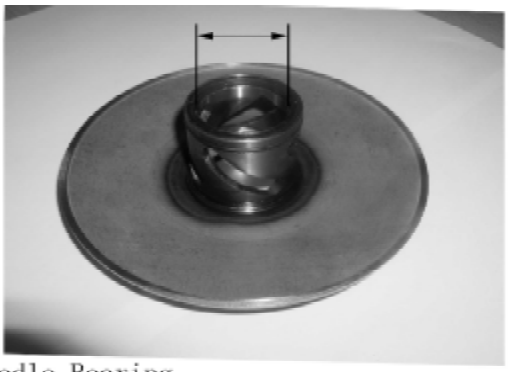
Measure wearing depth of secondary fixed sheave.
Service Limit: > 0.4mm → Replace



Measure wearing depth of secondary sliding sheave.
Service Limit: > 0.4mm → Replace

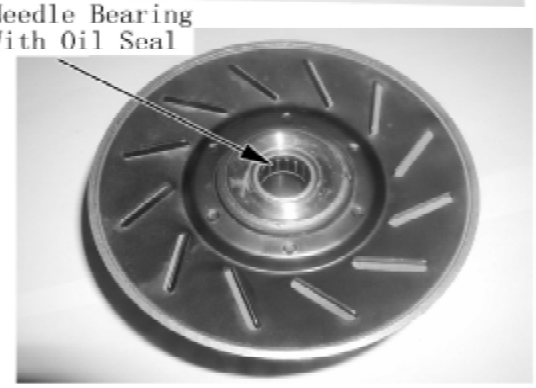


Check secondary sliding sheave for wearing or damage.
Measure inner diameter.
Service Limit: > 40.06mm → Replace
Check if there is any stepped wearing in the guide groove.

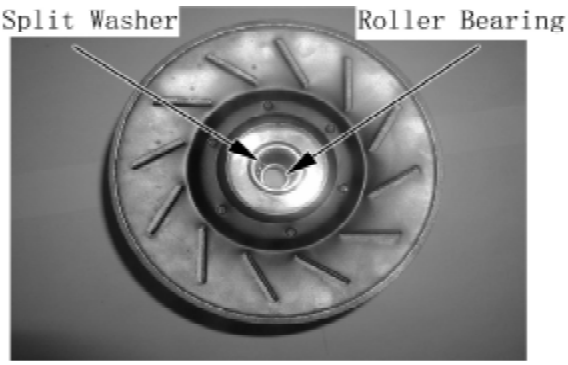


Replace the bearing on the secondary sheave.

Drive out the needle bearing with oil seal.
The needle bearing must be replaced with a new one.

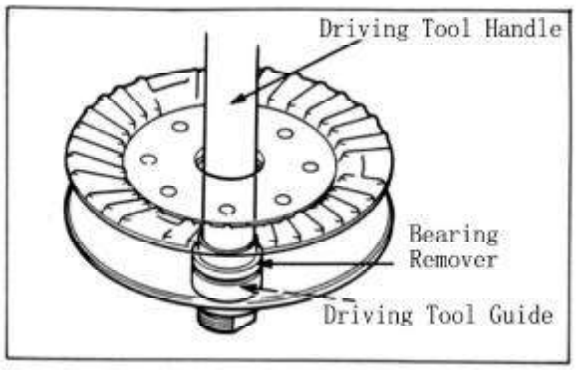


Remove split washer. Drive out the roller bearing from the driven face.
Replace roller bearing with a new one.



Apply lube to roller bearing.
Special Tool: Driving tool handle

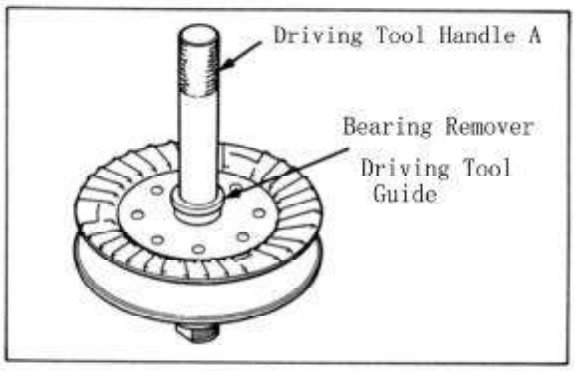
General purpose tool:
Bearing Remover 32 × 35mm
Driving Tool Guide 22mm



Install split washer.
Apply lube from the inner side of driven face.

Note:

Apply evenly 11~13g of lube.
Recommended Lube: XOM XHP222

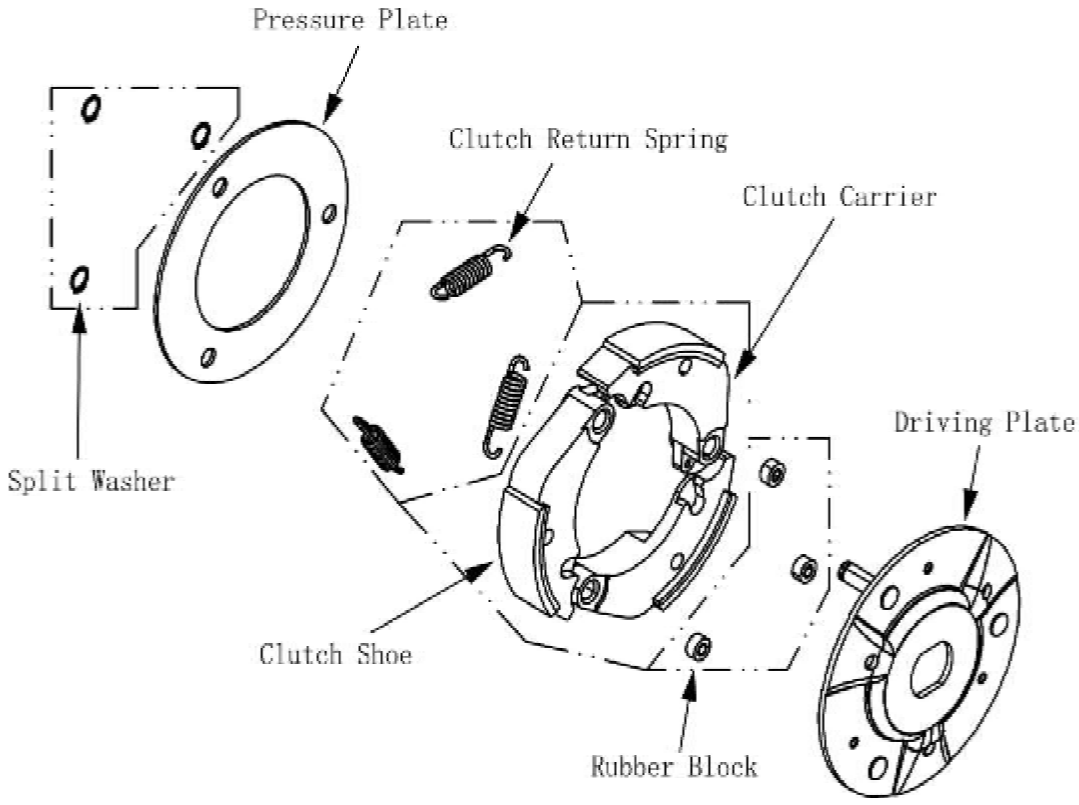


Press in the needle bearing.

General purpose tool:
Driving tool handle A
Bearing Remover 32 × 35mm
Driving Tool Guide 22mm

Apply lube to the groove part of secondary sheave oil seal. Install it on the needle bearing.

Assembly of Clutch

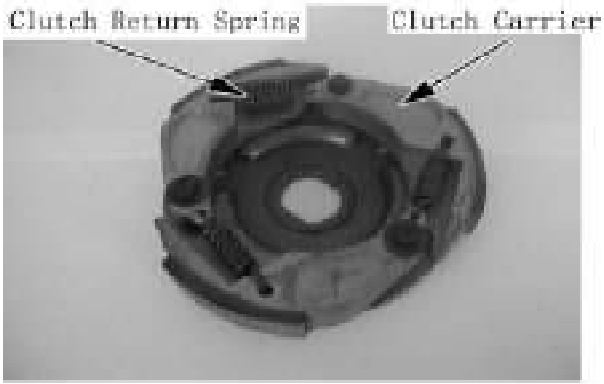


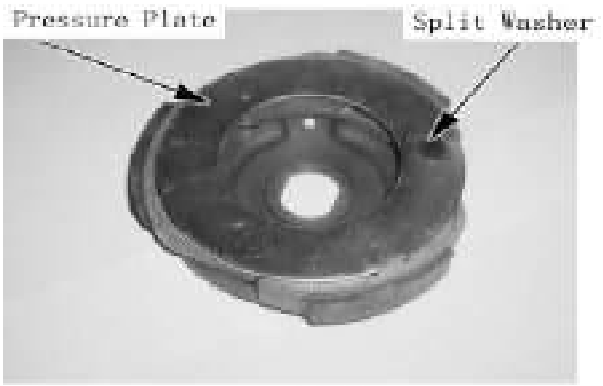
Install rubber blocks onto driving plate wrists.

Install clutch carrier to driving plate and clutch return spring onto clutch carrier.

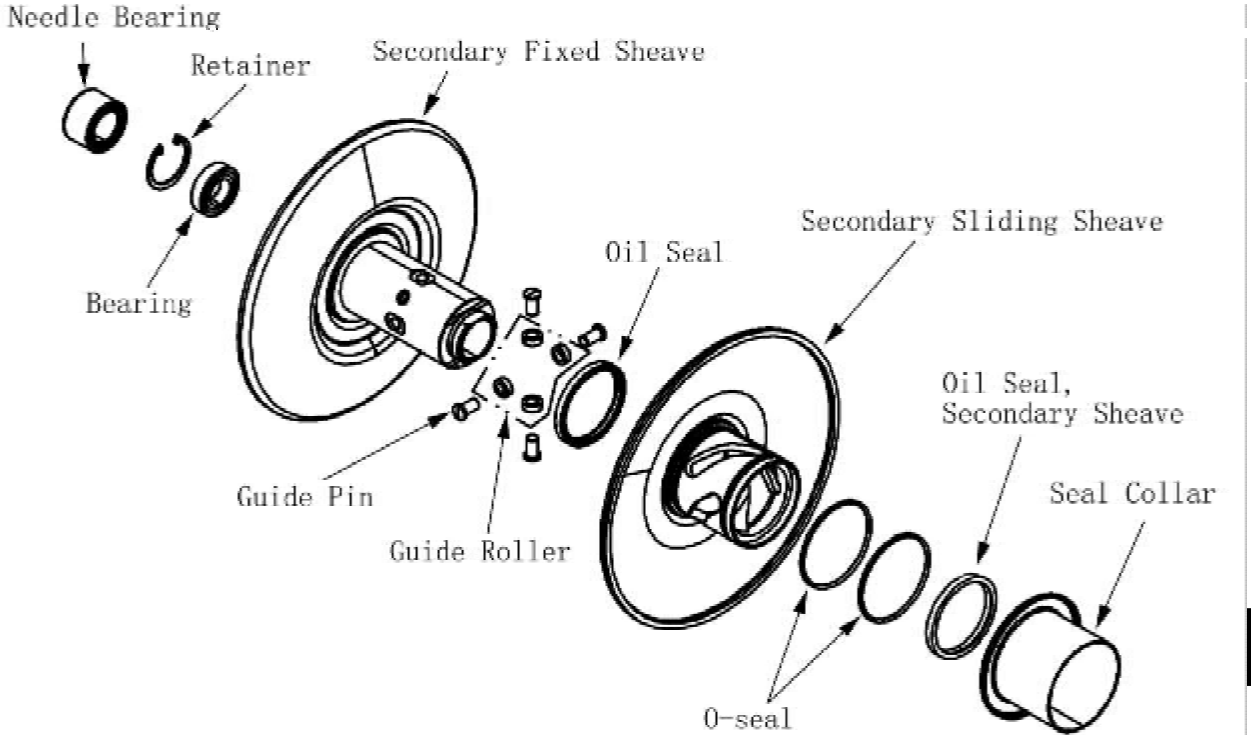
Install pressure plate and fix with split washer.

Keep the opening of split washer inward.





Secondary Sheave Assembly

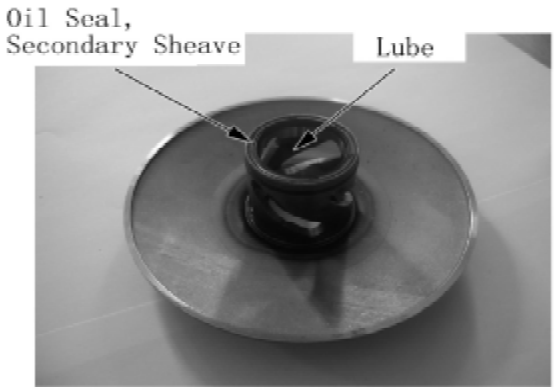


Clean sheave face

Install oil seal to secondary sliding sheave.

Apply lube to O seal and install it to secondary sliding sheave.

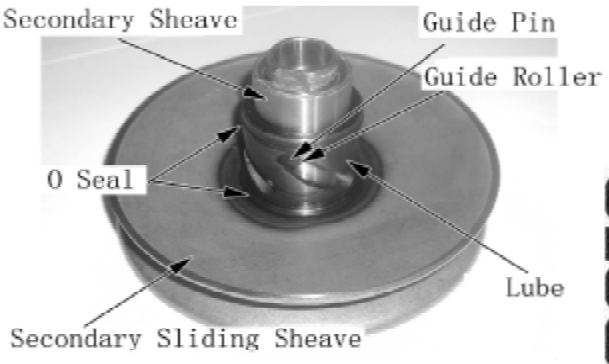
Apply lube to inner side of secondary sheave and guide pin.



Note:

Apply evenly 4~g of lube. Recommended Lube: XOM XHP222

Install secondary sliding sheave to secondary sheave assy. Apply lube to guide roller, guide pin and install into hole of secondary sheave.

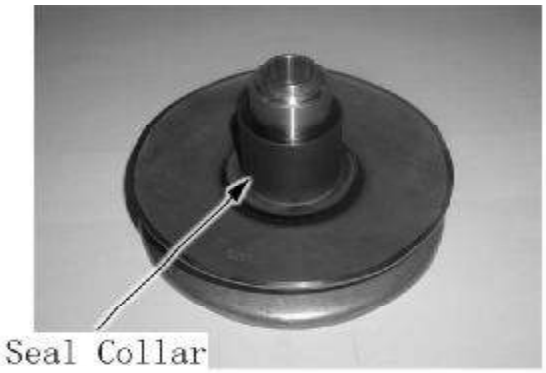


Install seal collar

Clean the overflow lube.

Note:

In case there is any lube or grease on the secondary sheave. Make sure to clean it.



Install clutch spring and clutch to secondary sheave and adjust with clutch spring compressor.

Compress clutch spring with clutch spring compressor.

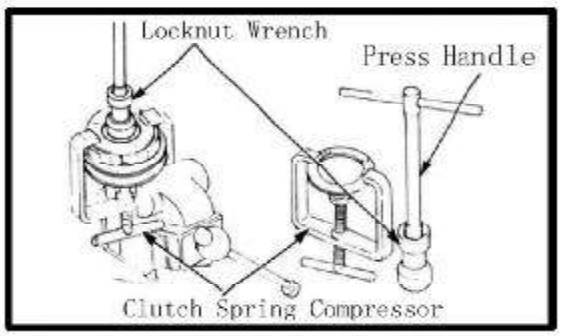
Install nut.

Hold compressor steady with a bench vice and tighten nut.

Tightening Torque: 7.0~9.0kgf · m

Special Tool: Clutch Spring Compressor Locknut Wrench

General Purpose Tool: Press Handle



Installation:

Install clutch and secondary sheave to driving shaft.

Note:

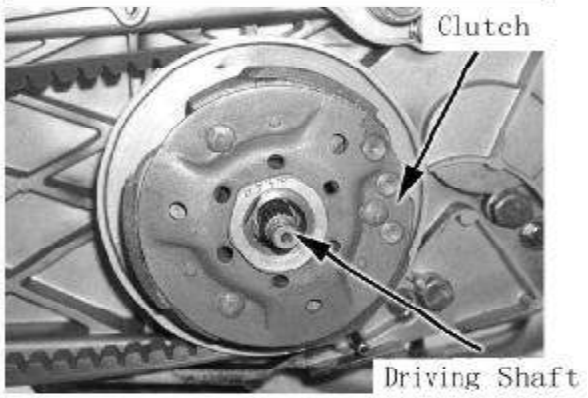
Clean the grease from driving shaft, if any.

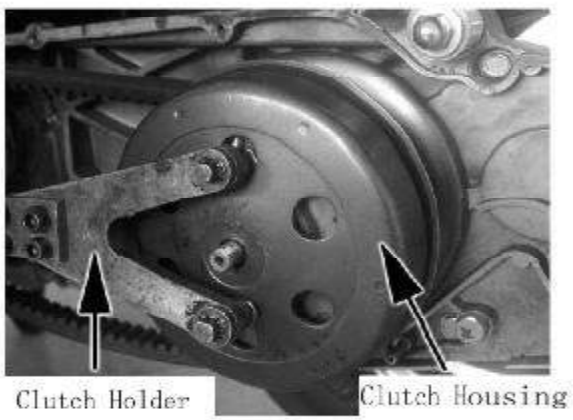
Install clutch housing.

Hold clutch housing with clutch holder and tighten nut.

Tightening torque: 5.0~6.0kgf · m

Special Tool: Clutch Holder





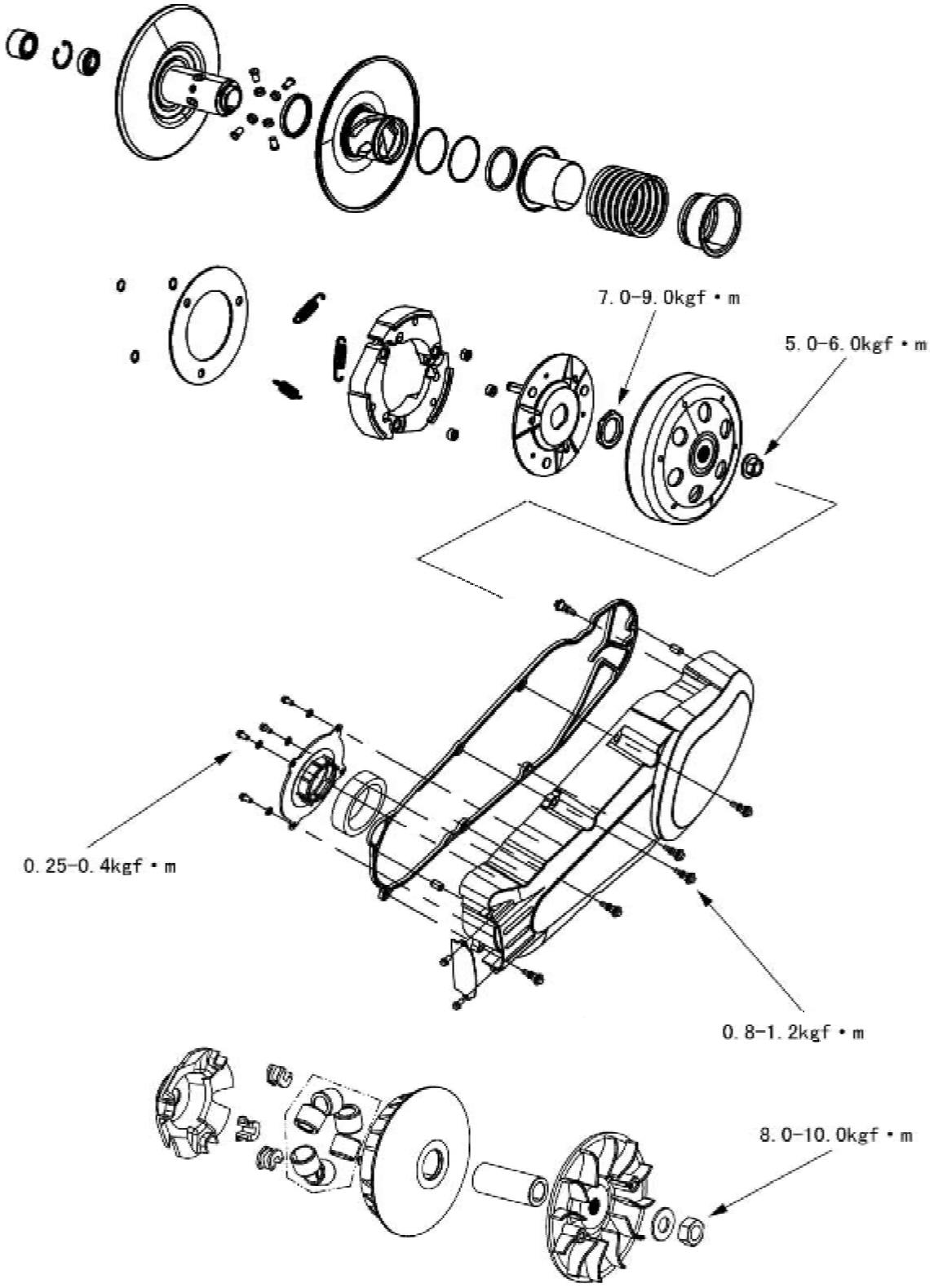
Install:

—Belt(→9-4)

—CVT cover (→9-3)

—Left speaker cover (→2-9)

Primary Sheave, Clutch, Secondary Sheave



Chapter 10 Gearbox

Overhaul Information

Overhaul Standard

Recommended Oil: SAE15W-40 or SAE20W-50 for 4-stroke motorcycle.
SE or SF engine oil as per API category (refer to table 3-11, Oil viscosity should adapt to the outdoor temperature of the area where the motorcycle is operated.)

Oil Capacity: 0.25L (when disassembling)
0.20L (when replacing)

Tightening Torque

Gearbox Bolt	6mm	0.8~1.2kgf·m
	8mm	2.0~2.4kgf·m
	10mm	1.0~1.4kgf·m

Tools

Special Tools

Bearing Remover Set 12mm
-Bearing remover 12mm
-Remover weight
Bearing Remover Set 20mm
-Bearing remover 20mm
-Bearing remover handle
-Remover weight
Drive Shaft Installation Tool
Drive Shaft Installer Tool Sleeve (2 pcs)

General Purpose Tools

Bearing puller 37×40mm
Bearing puller 52×55mm
Driving tool guide 12mm

Troubleshooting

When engine is running, scooter does not run.

• Gearbox damaged
• Gearbox ablated

Abnormal noise during running

• Worn, ablated gear or damaged gear surface
• Worn or loosen bearing

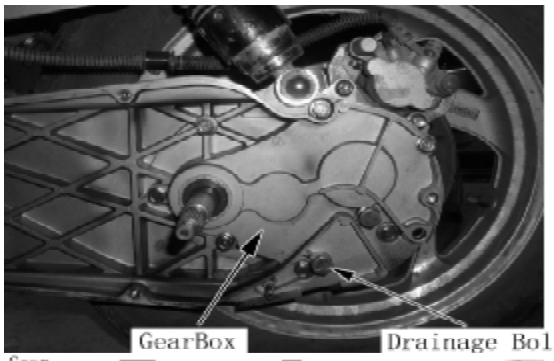
Oil leakage

• Excessive oil
• Worn or damaged oil seal

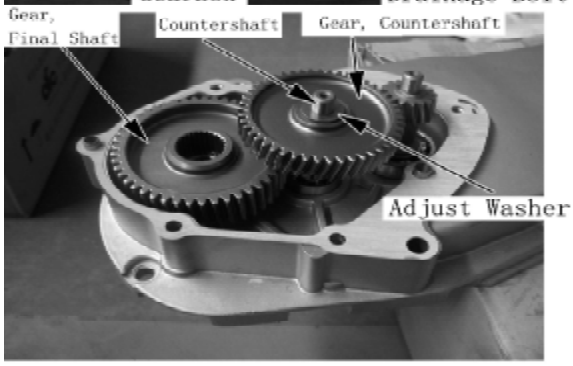
Disassembly

Remove:

—CVT cover (→9-3)
—Primary sheave, clutch, secondary sheave (→9-1,9-8)
—Oil drainage bolt and drain gearbox oil
—Rear wheel (→14-2)
—Bolt and gearbox
—Gearbox washer, dowel pin

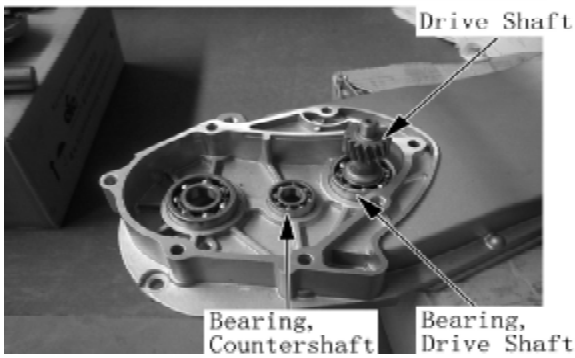


Remove adjust washer.
Remove countershaft gear, countershaft.
Remove final shaft gear, final shaft.



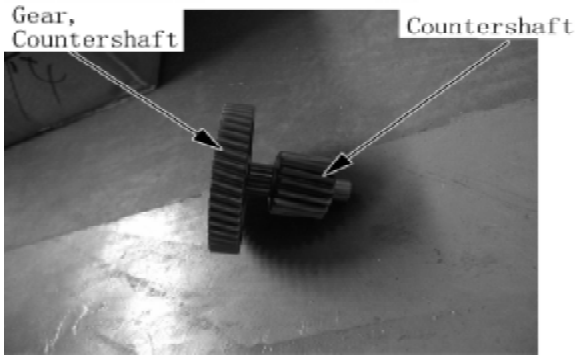
Inspection:

Check drive shaft, gear, bearing for damage or wearing.
In case of replacement of drive gear or bearing, strike out drive shaft together with gear.
Use bearing remover and shaft protection device (available from market) to remove gear from shaft.
Remove drive shaft oil seal from left crankcase.



Note:

After removal of drive shaft bearing from left crankcase, replace with a new one.
Check countershaft and gear for wearing or damage.

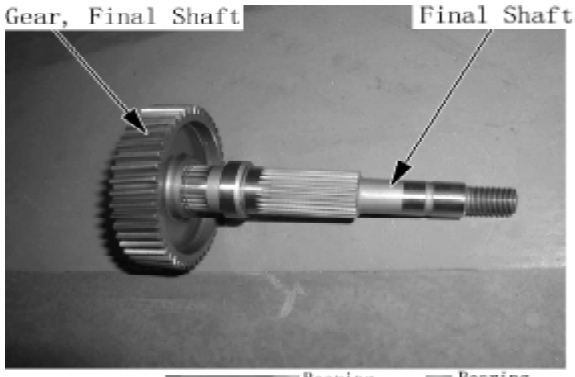


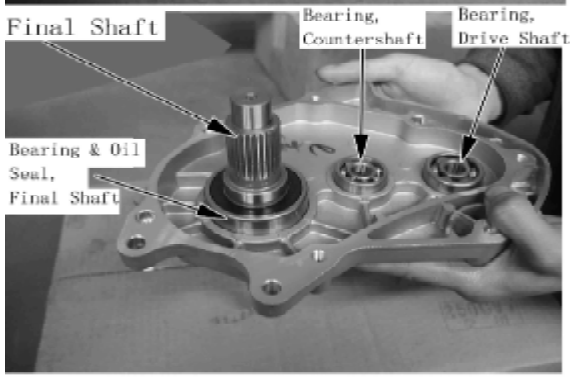
Check final shaft gear and final shaft for ablation, wearing or damage.

Check gearbox bearing and oil seal for wearing or damage. Use bearing remover for replacement of gearbox countershaft bearing and drive shaft bearing.

Special Tool:

Bearing Remover Set 12mm
-Bearing remover 12mm
-Bearing remover handle
-Remover weight





Check left crankcase bearing, oil seal for wearing or damage.

Use bearing remover for replacement of countershaft gear.

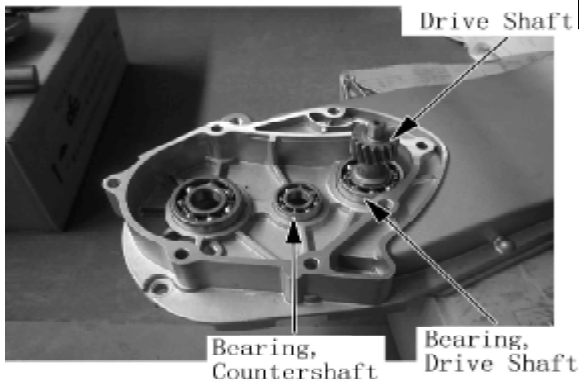
Special Tool:

Bearing Remover Set 15mm
-Bearing remover 15mm
-Remover weight

Use bearing remover for replacement of final shaft gear.

Special Tool:

Bearing Remover Set 20mm
-Bearing remover 20mm
-Remover weight



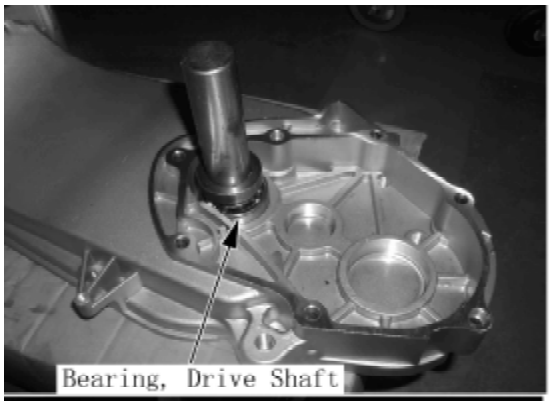
Assembly

Drive the new drive shaft bearing into left crankcase.

General Purpose Tool:

Driving Tool Guide 22mm

Driving Tool Handle A



Drive the new final shaft bearing into left crankcase.

General Purpose Tool:

Driving Tool Guide 20mm

Driving Tool Handle A

Drive the new countershaft bearing into left crankcase.

General Purpose Tool:

Driving Tool Handle A

Install final shaft oil seal.

Drive the new drive shaft bearing into gearbox.

General Purpose Tool:

Driving Tool Handle A

Install final shaft oil seal.

Drive the new drive shaft bearing into gearbox.

General Purpose Tool:

Driving Tool Guide 12mm

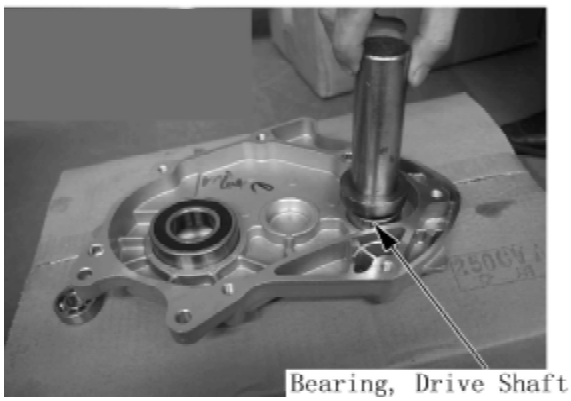
Driving Tool Handle A

Drive the new countershaft bearing into gearbox.

General Purpose Tool:

Driving Tool Guide 12mm

Driving Tool Handle A



Insert drive shaft into gearbox drive shaft bearing.

Special Tool:

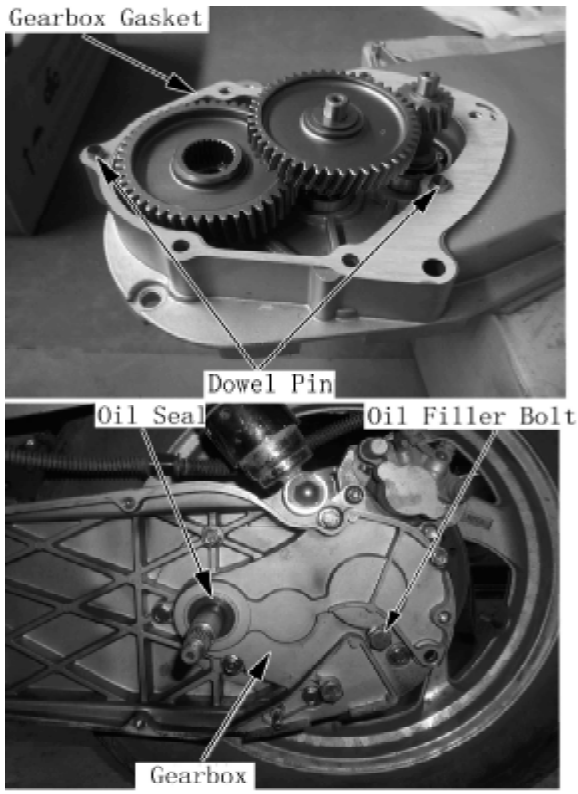
Drive Shaft Installation Tool
Drive Shaft Installation Tool Sleeve (2 pcs)

Install countershaft, countershaft gear, final shaft, final shaft gear,
final shaft oil seal and thrust washer.
Install dowel pin and new gearbox washer.

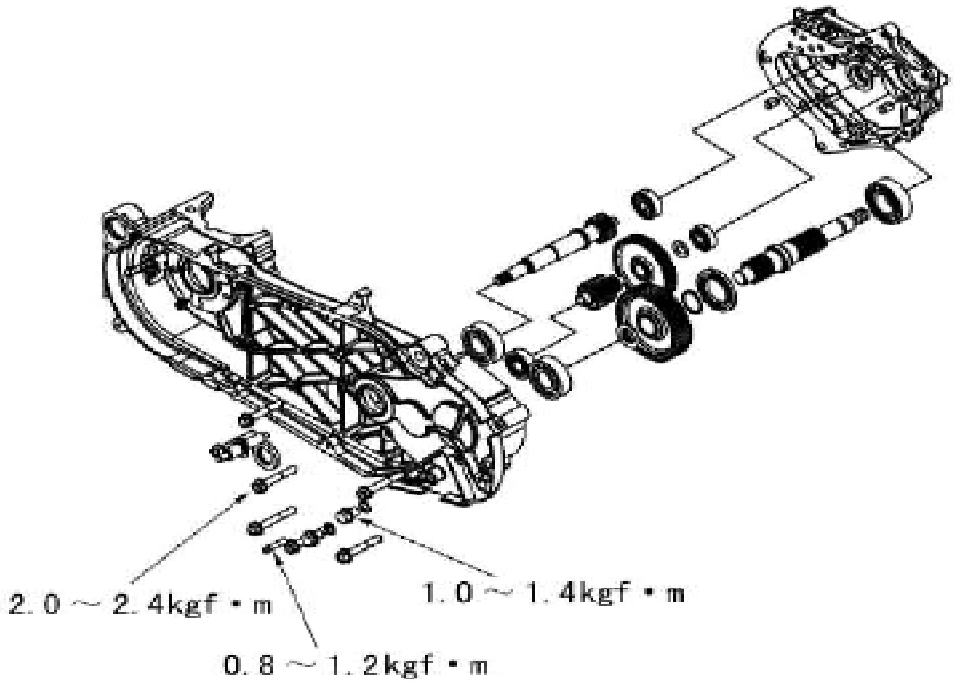
Install drive shaft oil seal.
Install gearbox.
Torque: 6mm: 0.8-1.2kgf.m
8mm: 2.0-2.4kgf.m
10mm: 1.0-1.4kgf.m

Install secondary sheave/clutch. (→9-15)
Install primary sheave, V belt and CVT cover.
(→9-8,→9-4 →9-3)
Install rear wheel (→14-3)

Remove oil filler bolt, fill with 200ml of gearbox oil.
Tighten oil filler bolt.



Gearbox



Chapter 11 Right Side Cover,Magneto, Water Pump

Overhaul Information

Caution:

Removal of right side cover, stator and flywheel should be done when the engine is cold.

Inspection of right side cover and magneto can be done without removing engine from vehicle.
Refer to Chapter 15 for inspection of magneto.

Tightening Torque

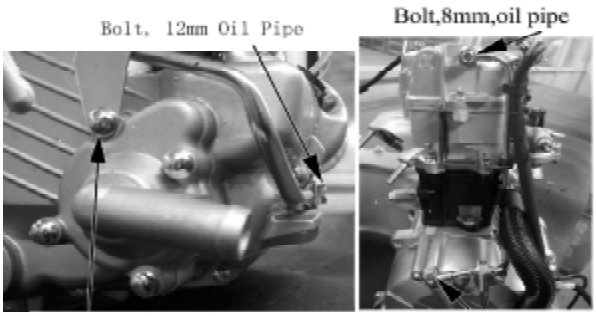
Refer to (→11-12, →11-13)

Trouble Shooting

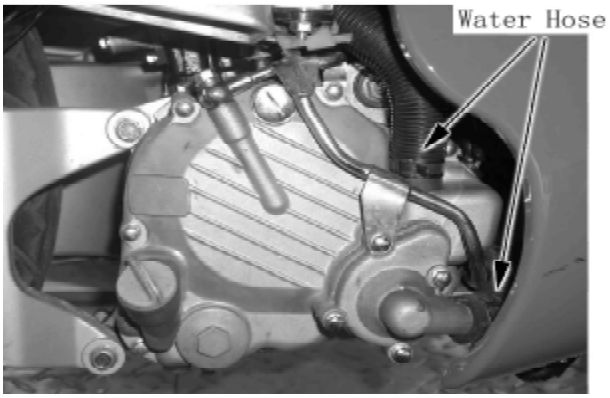
Trouble shooting of magneto. (→Chapter 15)

Right Side Cover Removal

Remove right side cover (→2-3)
Drain coolant (→6-4)
Drain engine oil (→3-11)
Remove 2 oil pipe tightening bolts, 2 pieces of 8mm oil pipe bolt,1 piece of 12mm oil pipe bolt.
Remove oil pipe.

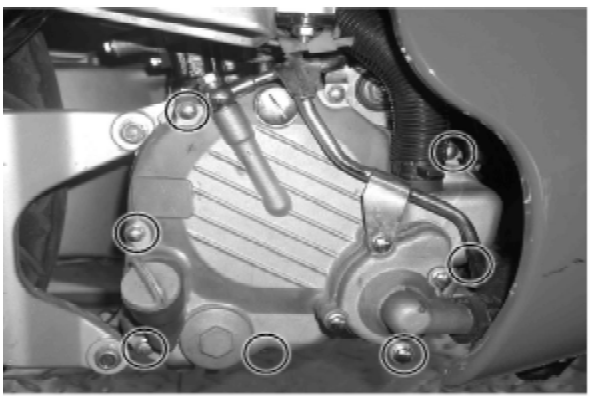


Remove water hose from water pump and right side cover.



Disconnect pickup coil with magneto and socket.

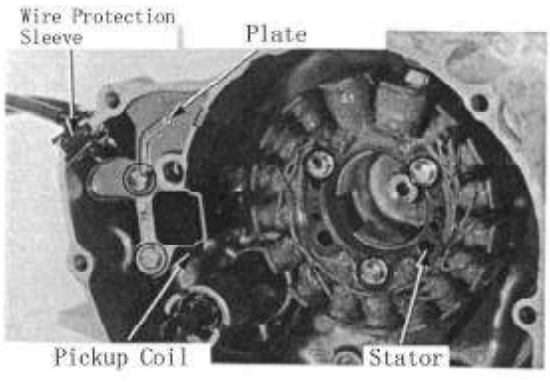
Remove crankcase breather hose from right side cover.
Remove 7 bolts for right side cover.
Remove right side cover.
Remove sealing gasket and dowel pin for right side cover.



Stator, Pickup Coil Removal

Remove:

—2 bolts;
—Crankcase breather hose;
—Pickup coil;
—3 fixing bolts for stator;
—Stator from right side cover;
—Wire protection sleeve from right side cover



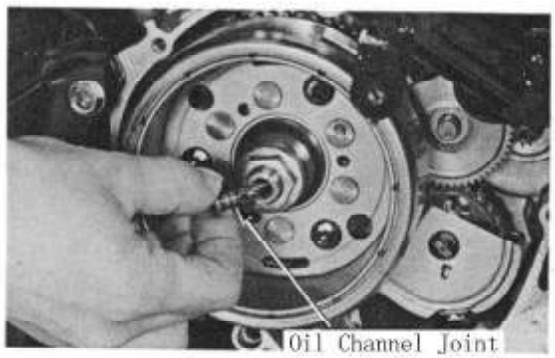
Flywheel Removal

Remove oil channel joint from crankshaft.
Hold flywheel with flywheel holder,
Remove flywheel nut and washer.

Remove straight pin for oil channel joint from crankshaft.

Note:

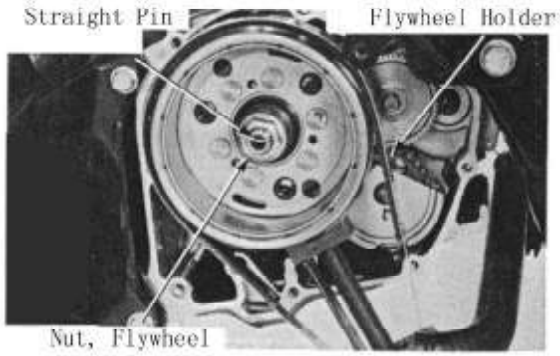
Keep caution not to drop straight pin into crankcase.
General Purpose Tool: Flywheel Holder

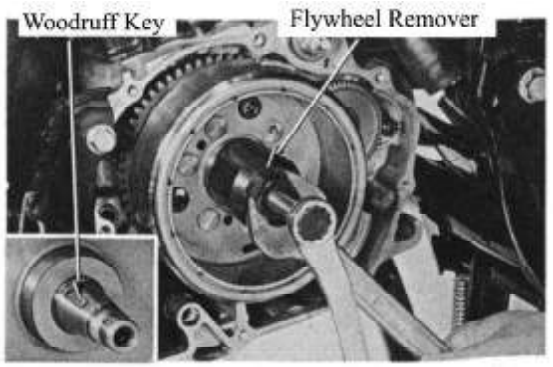


Remove flywheel with flywheel remover.

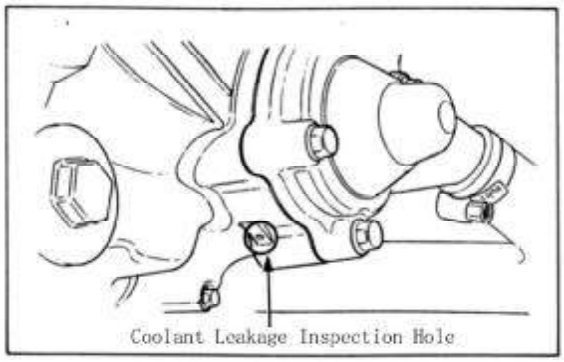
Remove woodruff key from crankshaft.

Special Tool: Flywheel Remover





Water Pump



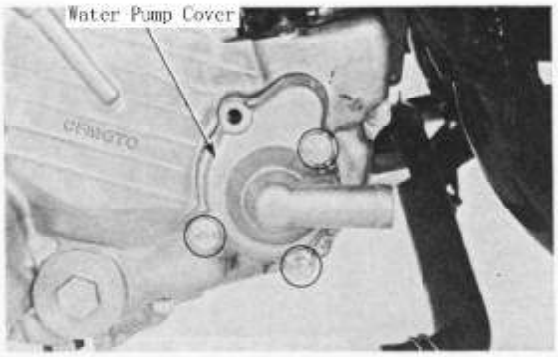
Inspection of Water Seal

When there is coolant leakage from inspection hole of lower part of right side cover, replace water seal by removing right side cover.

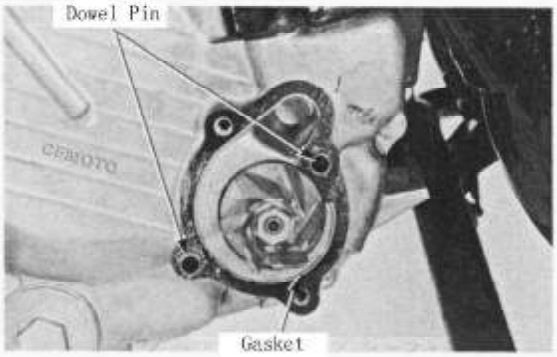
Removal of Water Pump Impeller
Drain coolant (→6-4)
Drain engine oil (→3-11)

Remove:

—Oil pipe (→11-2)
—Water hose from water pump
—3 bolts
—Water pump cover
Remove water pump gasket and 2 dowel pins.

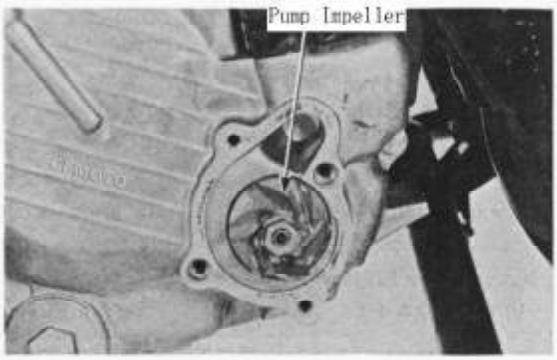


Remove water pump impeller.

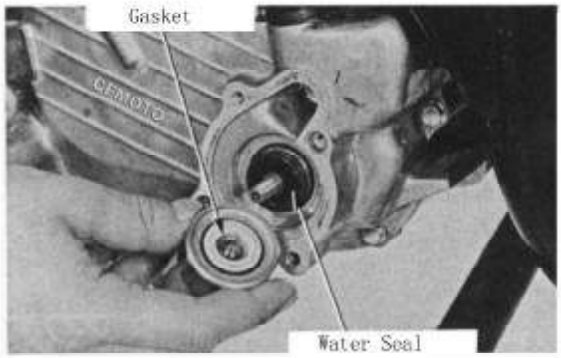


Note:

Impeller rotates in the left direction.



Check water seal and gasket for any damage or wearing.



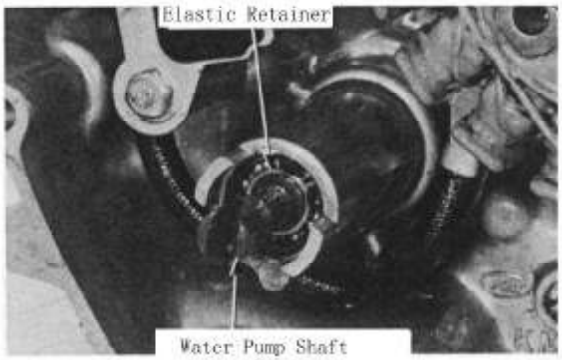
Note:

Water seal and gasket should be replaced by set.

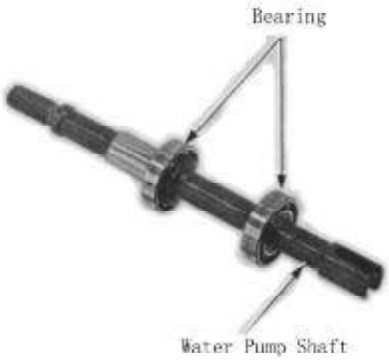
Removal of Water Pump Shaft

Remove:

—Right side cover (→11-2)
—Elastic retainer from right side cover
—Water pump shaft



Check bearing of water pump shaft. Replace in case of wearing or damage.



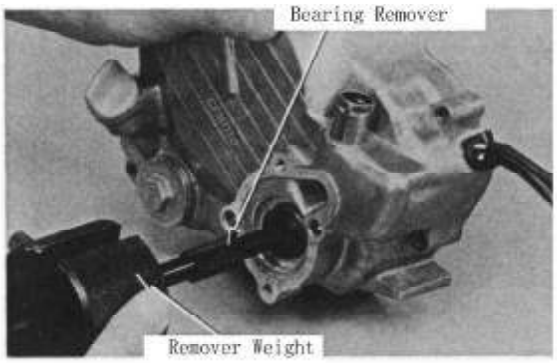
Replacing Water Seal

Remove water seal from right side cover with bearing remover.

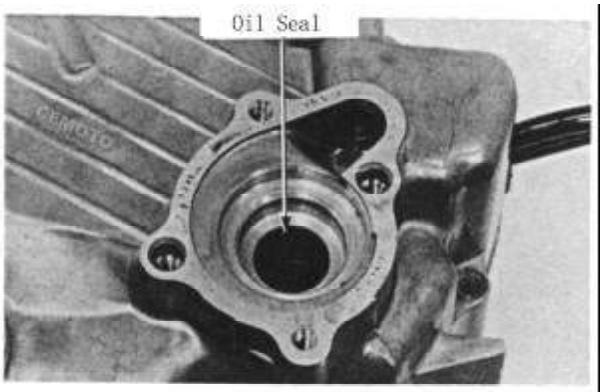
Remove oil seal.

Special Tool

Bearing remover set 15mm
-Bearing remover 15mm
-Remover shaft 15mm
-Remover head 15mm
-Remover weight



Drive the new oil seal into right side cover with its mark outward.

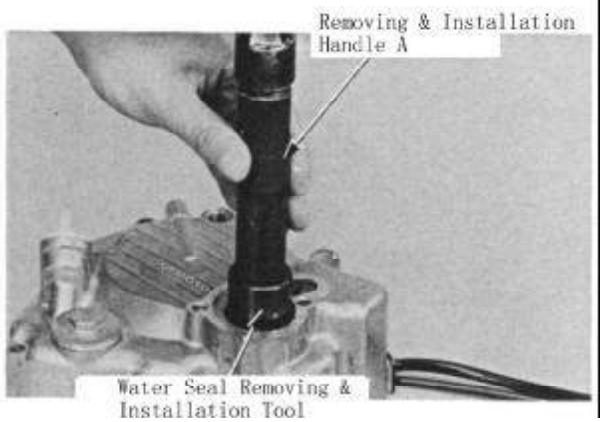


Special Tool: Bearing Puller 28×30mm
General Purpose Tool: Removing &Installation Handle A

Drive the new water seal into right side cover.

Note:

Apply sealant to the contact part of water seal and right side cover before driving in the water seal.

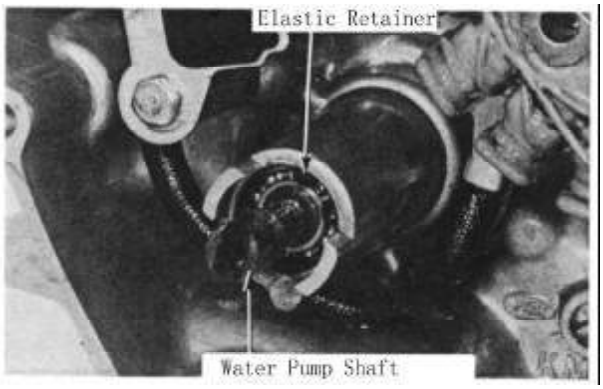


Special tool: Water Seal Removing & Installation Tool

General Purpose tool: Removing & Installation Handle A

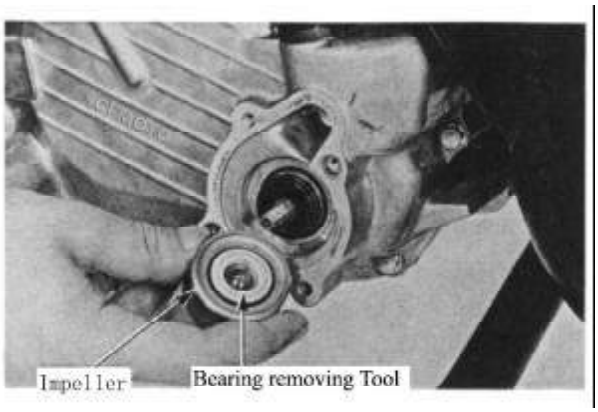
Installation of Water Pump Shaft

Install bearing to right side cover.
Install elastic retainer.
Install right side cover. (→11-9)



Installation of Water Pump Impeller

When replacing water seal, install a new gasket to the water pump shaft.

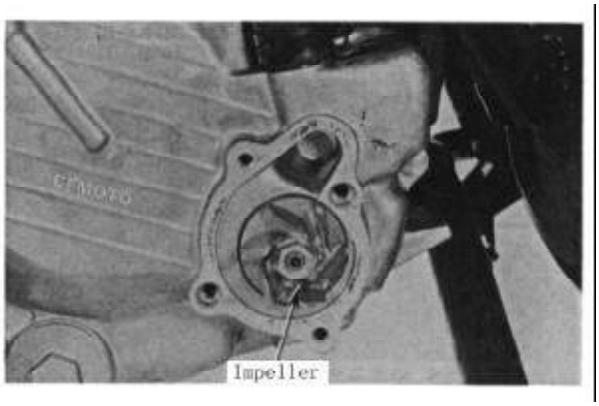


Fix impeller to the water pump shaft.

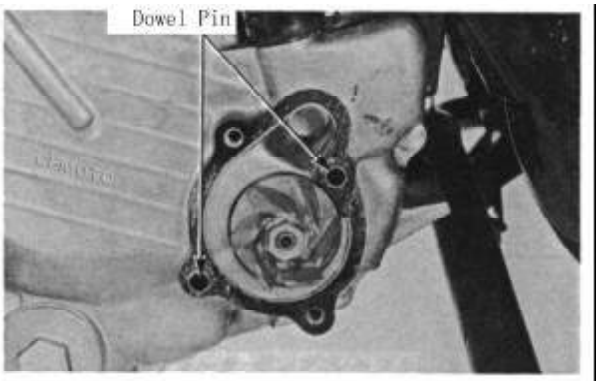
Tightening Torque: 1.0~1.4kgf · m

Note:

Water seal and gasket should be replaced by set.



Install dowel pins and water pump cover gasket.



Install water pump cover with 3 bolts.

Connect oil pipe. (→11-11)

Connect water hose.

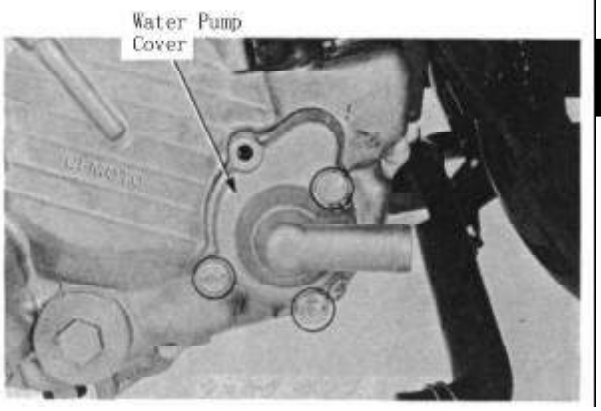
Fill engine oil. (→3-11)

Fill coolant. (→6-6)

Tightening Torque:

Oil pipe bolt 8mm 0.8~1.2kgf·m

12mm 1.8~2.2kgf·m



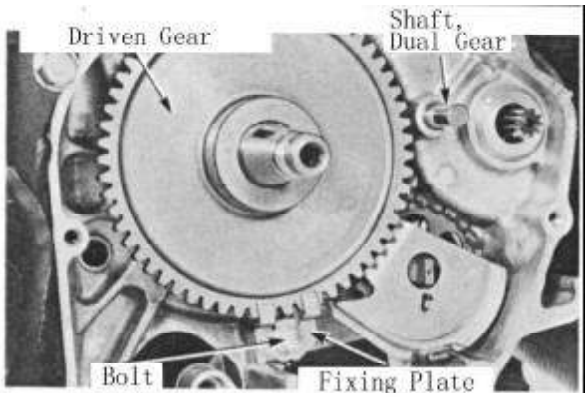
Flywheel Installation

Install driven gear to crankshaft.

Install fixing plate and tighten bolt.

Note:

Make sure driven gear can turn smoothly.

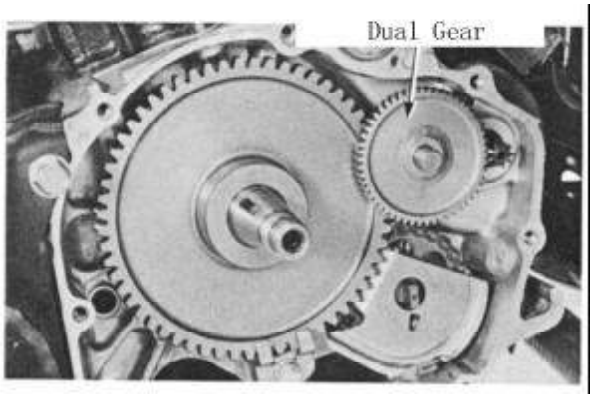


Install dual gear to the shaft.

Make sure there is no dust on the conical part of crankshaft.

Note:

Make sure there is no oil stain on the conical part of crankshaft.

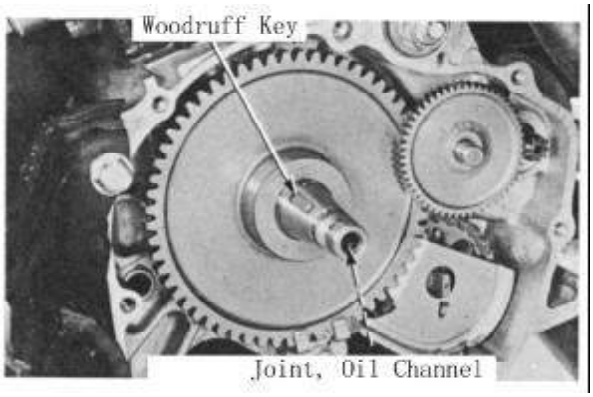


Install woodruff key.

Install flywheel to crankshaft.

Note:

Make sure there are no impurities in the flywheel taper hole before installation.

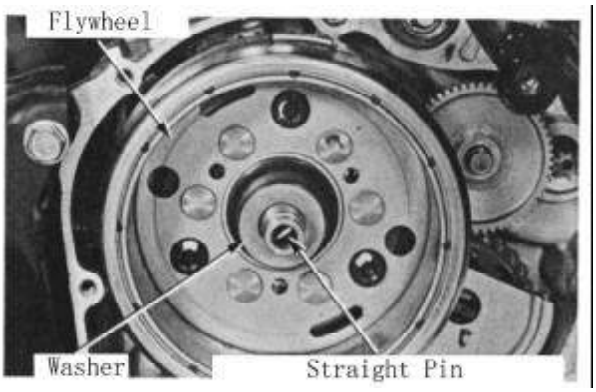


Apply oil to washer and install washer to crankshaft.

Install straight pin into crankshaft hole.

Note:

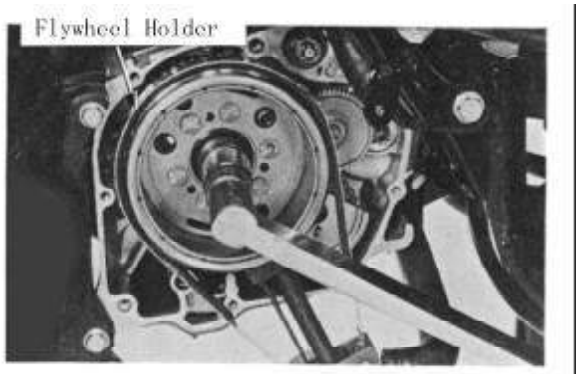
Take caution not to drop straight pin into crankcase.



Apply moly grease to flywheel nut and screw part of crankshaft.
Install flywheel nut to crankshaft.

Hold flywheel with flywheel holder and tighten nut.

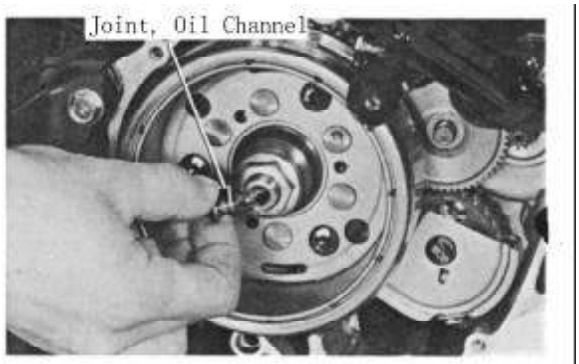
Tightening Torque: 10.5~11.5kgf · m
General Purpose Tool: Flywheel Holder



Install oil channel joint and spring to crankshaft.

Note:

Keep the groove of joint in line with straight pin.



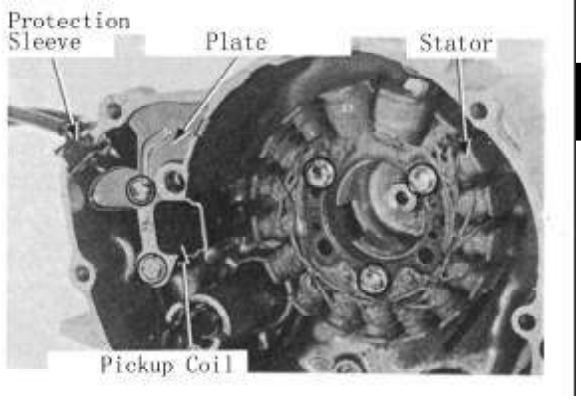
Stator, Pickup Coil Installation

Install stator to the right side cover and tighten 3 bolts.
Fix pickup coil and plate with 2 bolts.
Install wire protection sleeve into groove of right side cover.

Note:

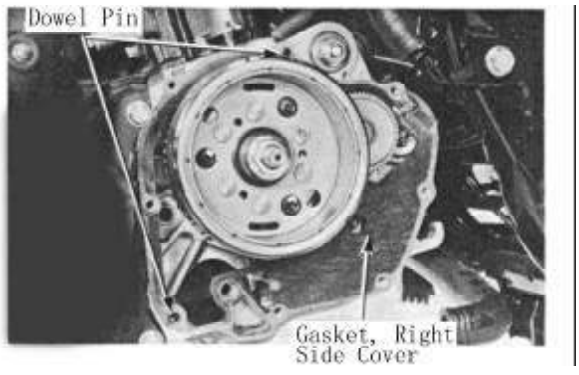
-Stator lead should go through the underside of pickup coil lead.

-Make sure the plate is firmly fixed on the right side cover.



Right Side Cover Installation

Install dowel pin and a new gasket to the right crankcase.



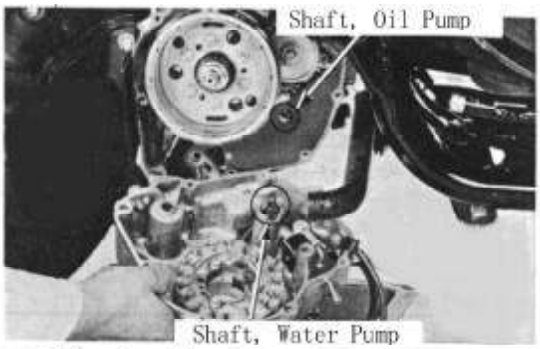
Keep water pump shaft groove in line with oil pump shaft.

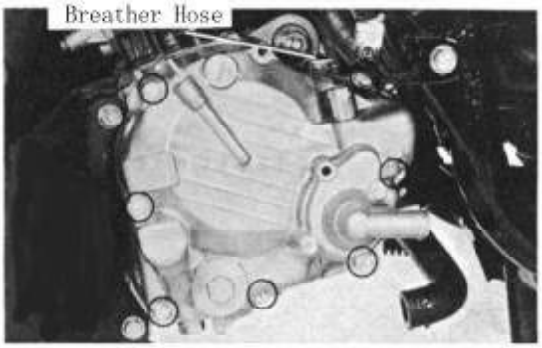
Install right side cover.

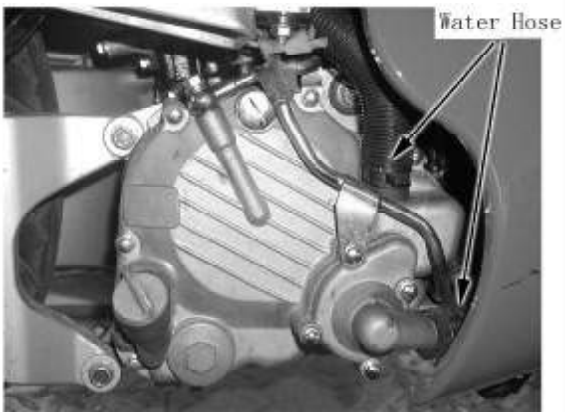
Install and tighten right side cover bolts.
Connect crankcase breather hose to right side cover.

Connect pickup coil and stator wire with couplers.

Connect water hose with water pump and right side cover.







Make sure there is no impurity in the oil pipe.

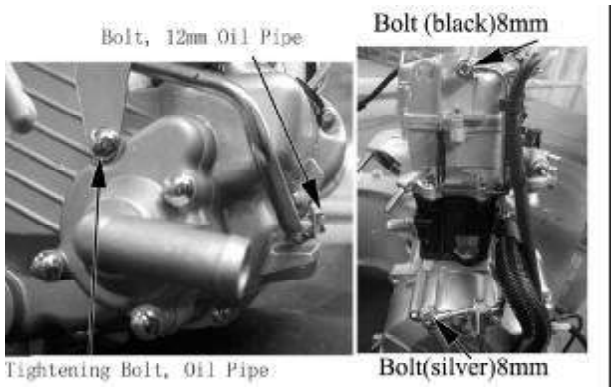
Install oil pipe with 2 pcs of 8mm bolts, 1 pcs of 12mm bolt and 2 pcs of copper washers.

Note:

-Use black bolt on the cylinder head cover side.

Use silver bolt on the right side cover.

Install oil pipe tightening bolts on the right side cover and water pump.



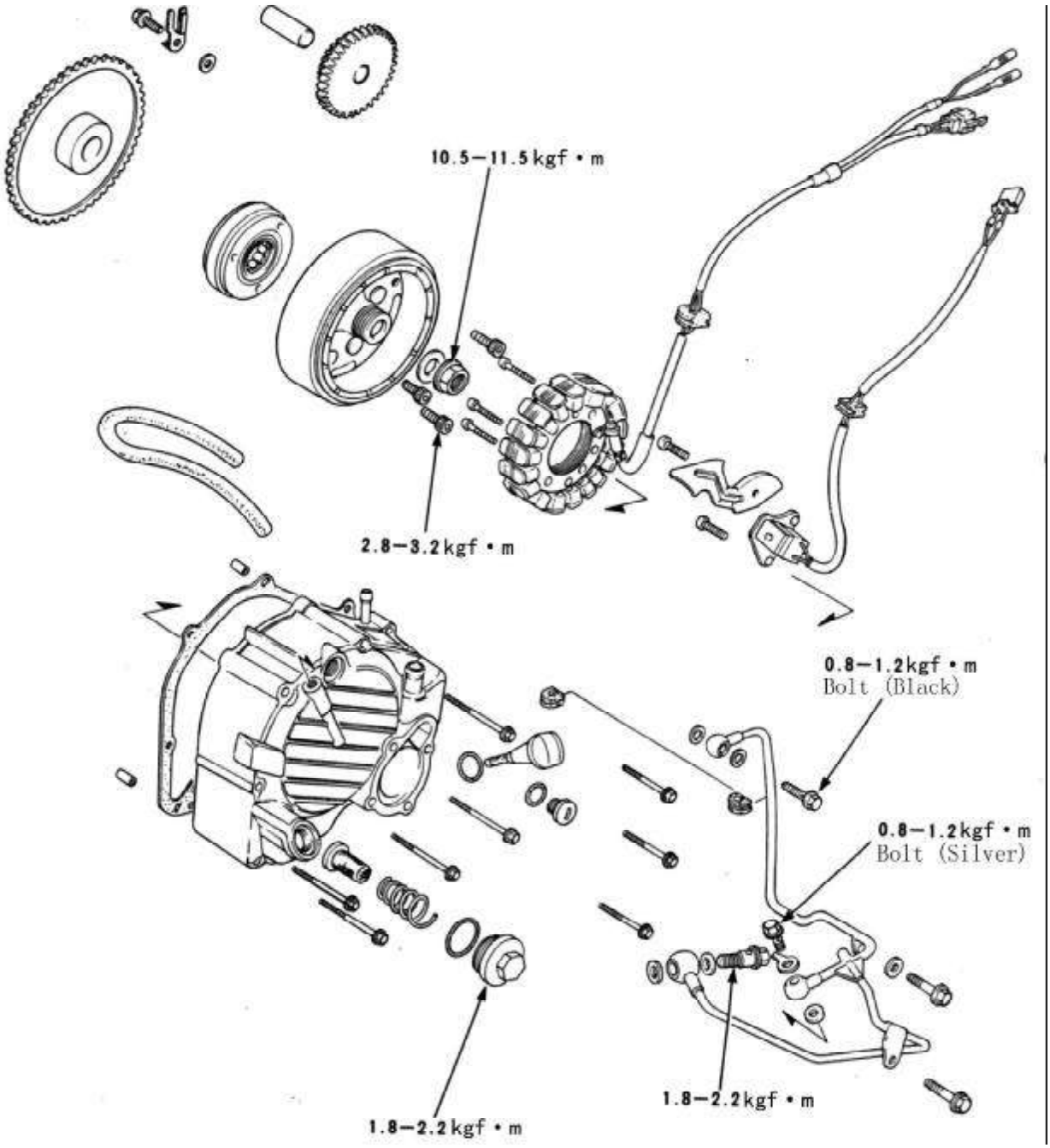
Tightening Torque:

Oil Pipe Bolt 8mm 0.8~1.2kgf • m

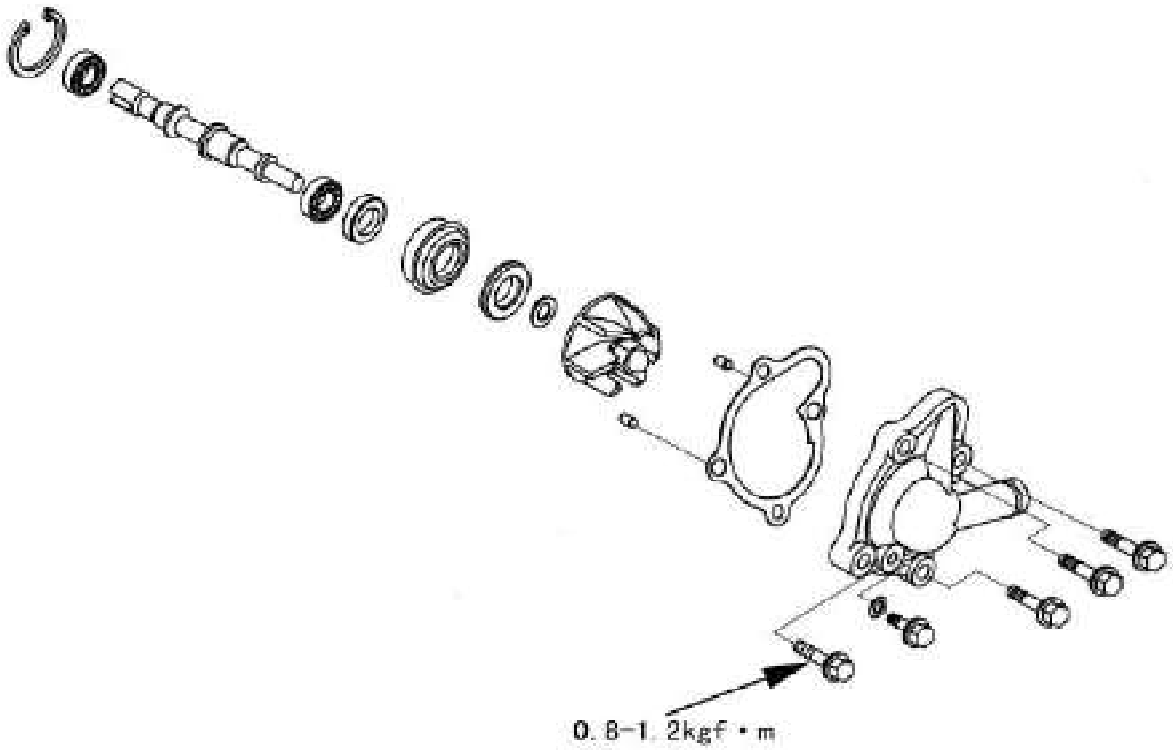
12mm 1.8~2.2kgf • m

Tighten the bolts for the two oil pipes.

Right Side Cover, Magneto



Water Pump



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 vehicle.(→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 (→Chapter 8)

—CVT cover、CVT system(→Chapter 9)

—Right side cover(→Chapter 11)

—Electric starting system(→Chapter 17)

—Lubricating system(→Chapter 4)

• For inspection of piston and piston ring, just remove cylinder cover、cylinder head and cylinder (→Chapter 8)

•Do not damage the crankcase joint face during inspection.

•Do not damage the inner surface of cylinder, piston excircle.

Overhaul standard

Item			Standard	Service limit
Piston	Installation direction		"IN" mark towards intake valve	—
	Outer diameter of piston		71.96-71.98mm	71.9mm
	Inner diameter of piston pin-bore		17.002-17.008mm	17.04mm
	Outer diameter of piston pin		16.99-17mm	16.96mm
	Inner diameter of connecting rod small end hole		17.006-17.024mm	17.06mm
	Clearance between cylinder and piston		0.02-0.059mm	0.10mm
	Clearance between piston and piston pin		0.002-0.014mm	0.02mm
	Clearance between piston pin and connecting rod.		0.006-0.030mm	0.02mm
	Clearance between piston ring and piston groove	Piston ring (1)	0.015-0.05mm	0.09mm
		Piston ring (2)	0.15-0.30mm	0.50mm
	Piston ring gap	Piston ring (1)	0.15-0.30mm	0.50mm
		Piston ring (2)	0.10-0.25mm	0.50mm
		Oil ring	0.40-0.50mm	
	Installation direction of piston ring		Mark upside	—
Cylinder	Cylinder bore		72-72.019mm	72.1mm
	Upper distortion			0.05mm
	Roundness		0.002mm	0.05mm
	Cylindricity		0.005mm	0.05mm
Crankshaft	Axial gap, connecting rod big end		0.10-0.35mm	0.5mm
	Radial gap, connecting rod big end		0.013-0.025mm	0.05mm
	Vibration		0.02mm	0.10mm

Tightening torque

Crankcase bolt	0.8-1.2kgf·m
Cylinder Stud	0.7-1.1kgf·m

Troubleshooting

Compression pressure is too low

- Worn or damaged piston ring
- Worn cylinder or piston
- Poor sealing of cylinder cover and valve. (→Chapter 8)
- Burnt, broken or jamed piston ring.

Compression pressure is too high

- Carbon deposit at piston top or in combustion chamber

Blue smoke from exhaust muffler

- Worn small end of connecting rod;
- Worn cylinder, piston ring or piston

Knocking

- Worn cylinder or piston
- Improper assembly of piston ring
- Damages to outside of piston or inner surface of cylinder
- Worn or damaged crankshaft bearing

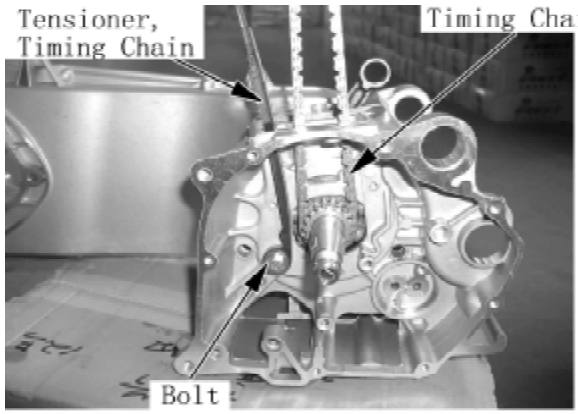
Disassembly of Crankcase

Remove:

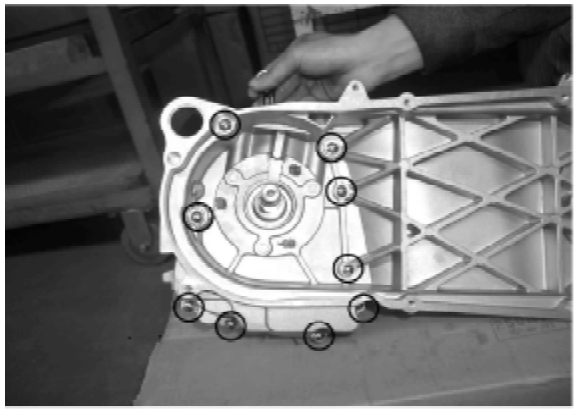
—Bolt

—Tenioner, timing chain

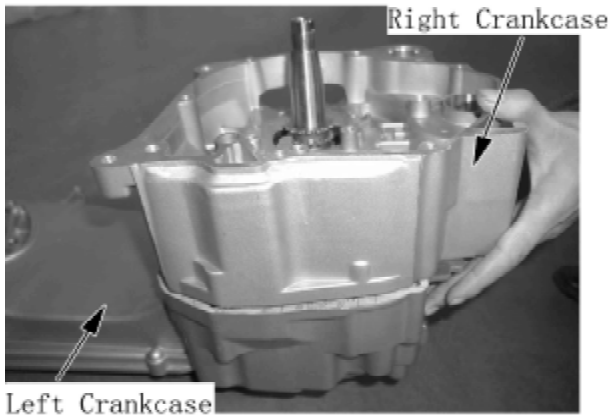
—Timing Chain



Remove crankcase bolts (9pcs)



Put left crankcase downward and remove right crankcase.

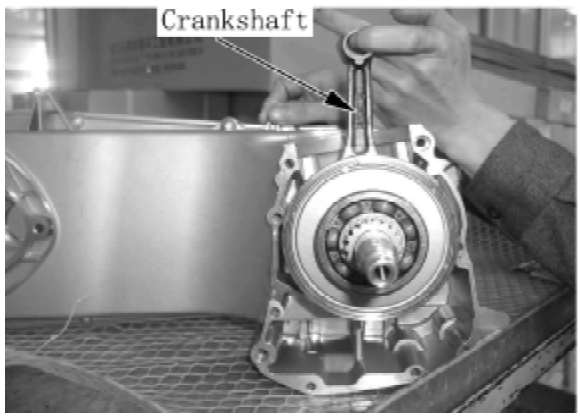


Note:

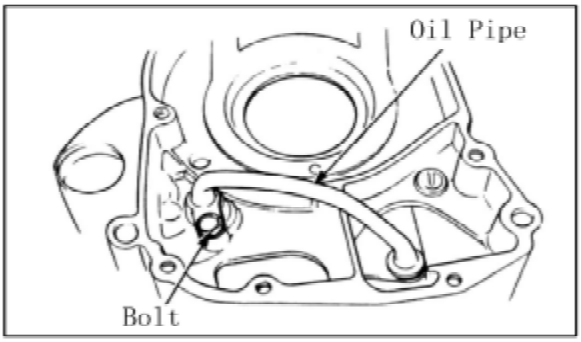
Do not pry surface of crankcase gasket.

Remove crankcase gasket and dowel pin.

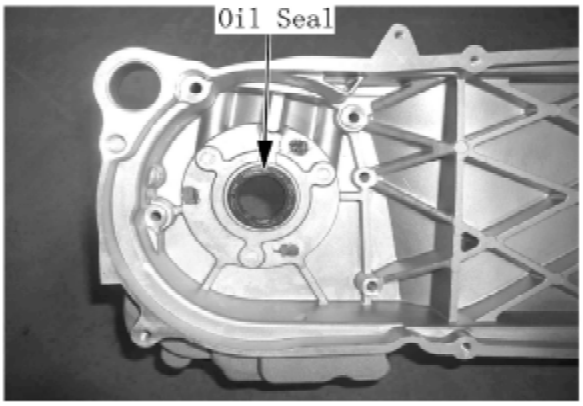
Remove crankshaft from left crankcase.



Remove bolt and remove oil pipe from right crankcase.

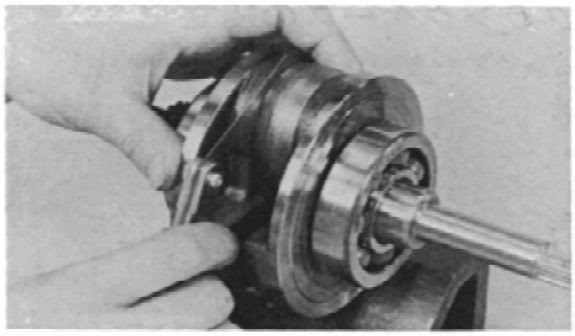


Remove oil seal from left crankcase.
The removed oil seal should be replaced with a new one when assembling.

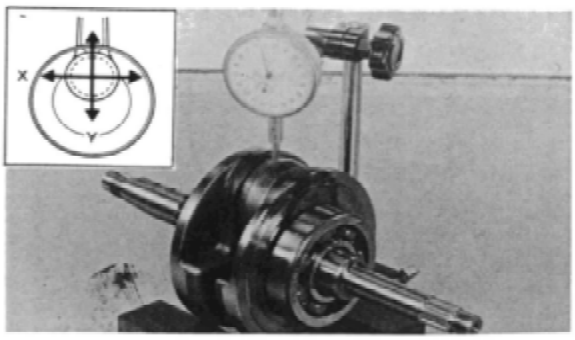


Crankshaft

Measure axial gap of connecting rod big end.
Service limit: > 0.5mm → Replace

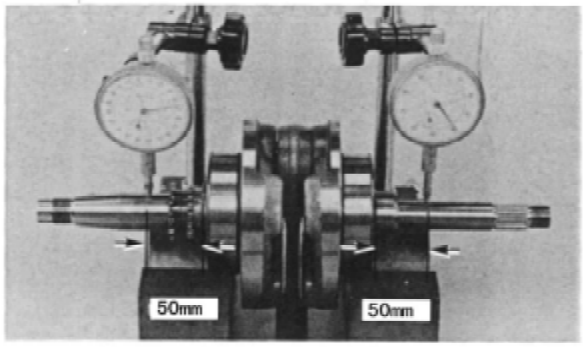


Measure the gap in the X, Y directions at the end face of connecting rod big end.
Service limit: > 0.05mm → Replace



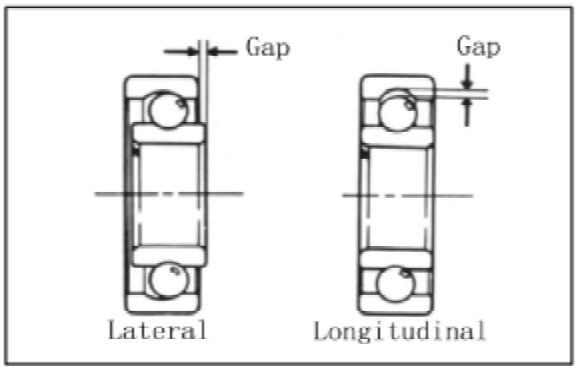
Measure the vibration of crankshaft

Service limit: > 0.10mm → Replace



Turn crankshaft and check for abnormal noise and gap.

In case of abnormal noise, replace crankshaft in a whole set.



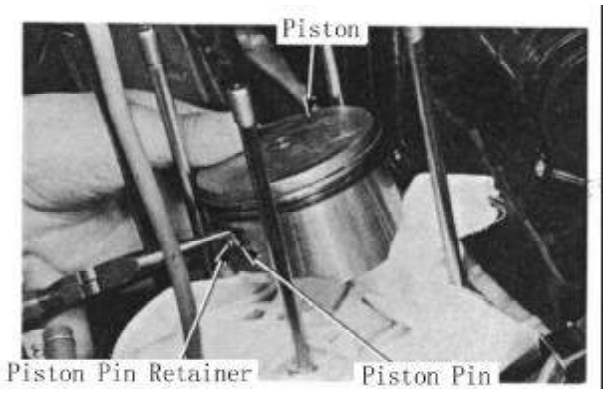
Disassembly of Piston

Remove piston pin retainer.

Note:

Take care not to drop piston pin retainer into crankcase.

Take out piston pin and remove piston.



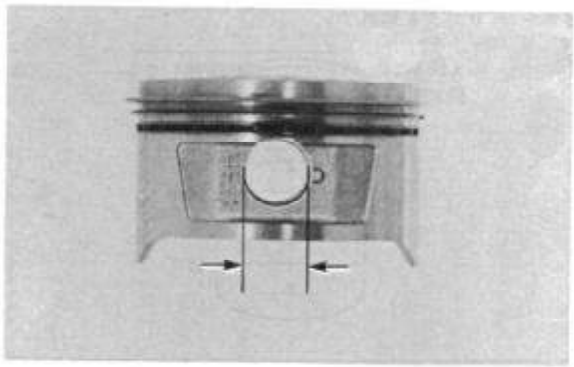
Inspection of piston, piston pin and piston ring

Measure inner diameter of piston-pin- bore

Service Limit: > 17.04mm → Replace

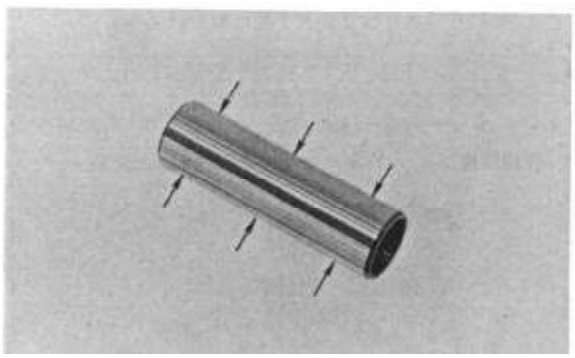
Measure outer diameter of piston pin

Service Limit: < 16.96mm → Replace



Measure gap between piston and piston pin

Service Limit: > 0.02mm →Replace

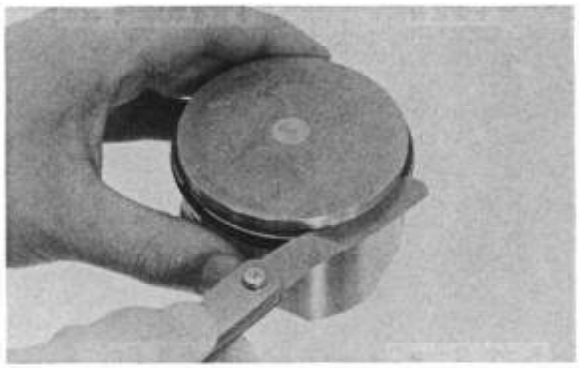


Check clearance between piston ring and piston-ring-groove.

Service Limit:

Top Ring > 0.09mm →Replace

2nd Ring > 0.09mm → Replace



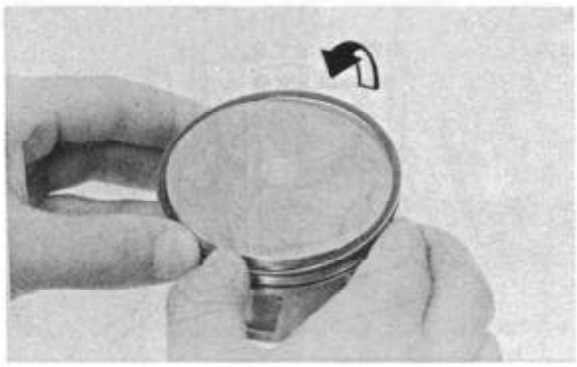
Check piston for scraps, wearing of groove and side cracks.

Measure inner diameter of connecting rod small end.

Service Limit: > 17.06mm→ Replace

Remove piston ring.

Take care not scrap or damage the piston.



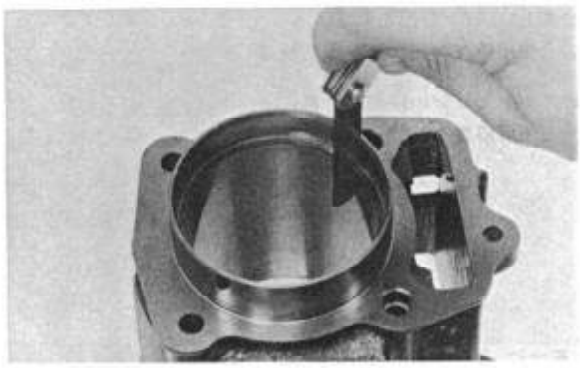
Install each piston ring separately to the cylinder bottom.

Press piston ring into cylinder from piston top.

Measure the working clearance of piston ring.

Service Limit:

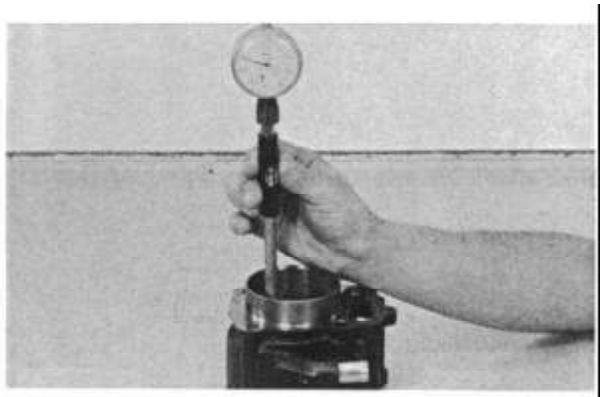
Top Ring, 2nd Ring: > 0.50mm →Replace



Measure piston outer diameter, at 14mm from piston skirt, in the direction 90° opposite to the piston pin.
Service Limit: <71.90mm → Replace

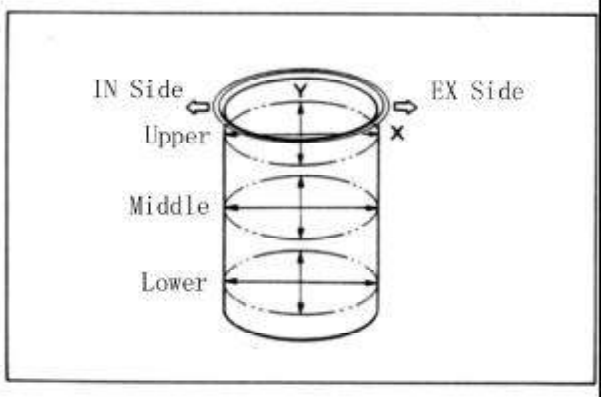
Inspection of Cylinder

Check cylinder inner side for wearing or scraps.
Measure Cylinder bore from 3 points of upper, middle and lower,in the right angle direction of piston pin (X-Y direction).
Take the maximum value as the cylinder bore.
Service Limit: Above 72.10mm → Rebore or Replace



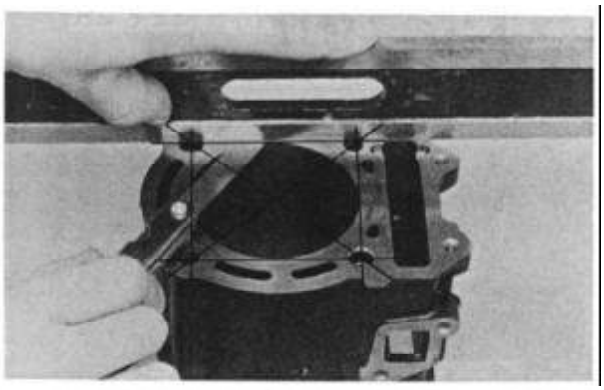
Calculate the clearance between cylinder and piston.
Take the maximum as the clearance value.
Service Limit: >0.10 → Rebore or Replace

Calculate the roundness from the measured values (difference between X direction and Y direction), cylindricity (bore difference among upper, middle and lower in X or Y direction)



Service Limit:
Roundness: > 0.05mm → Rebore or Replace
Cylindricity:> 0.05mm→ Rebore or Replace

In case of reboring, measure the maximum value of the piston outer diameter first to ensure that the clearance between cylinder and piston meets the standard value.
Max. values of outer diameter:
0.25, 0.50, 0.75mm
Standard Clearance: 0.010-0.040mm



Cylinder Warpage
Service Limit:>0.05mm→Rebore or Replace

Installation of Piston Ring

Install piston rings to the piston.

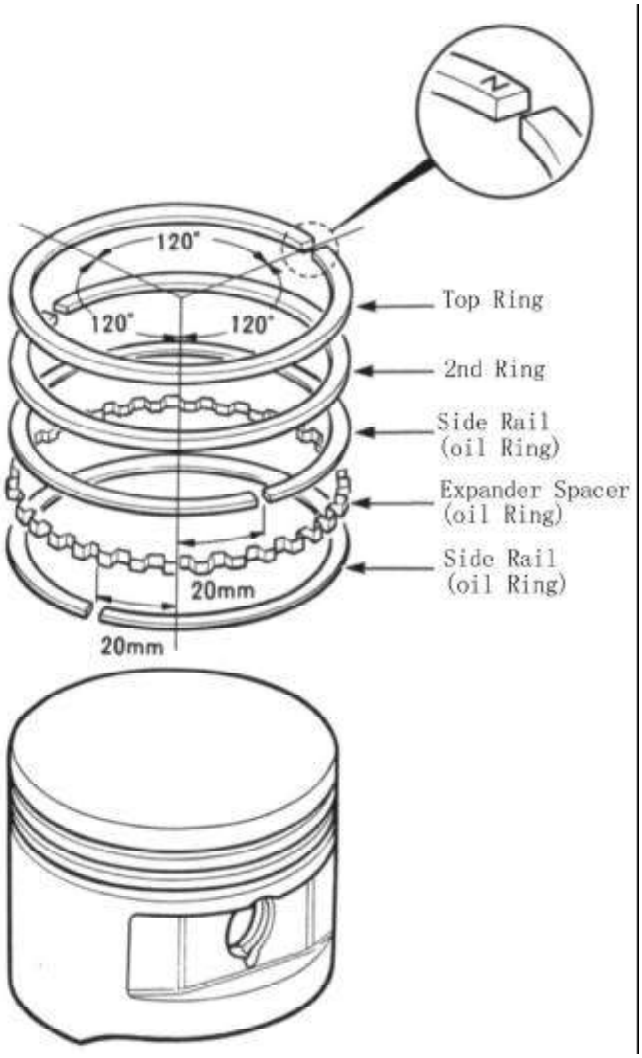
Apply oil to each ring.

Note:

Take care not to scrap piston or damage piston rings.

Keep the manufacturer's marks or numbers on the upper side of the rings.

Make sure piston rings can turn freely.



Installation of Piston

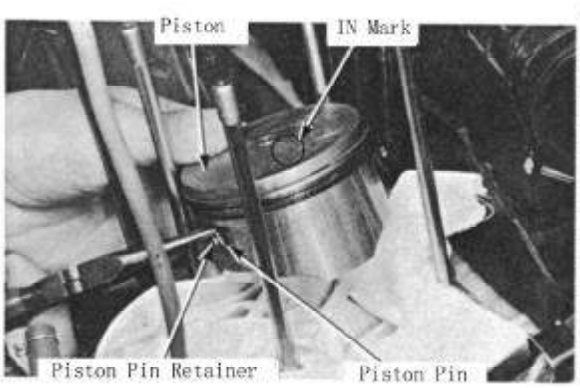
Installation of piston should be done after crankcase is completed.

Install piston, piston pin and piston pin retainer.

Note:

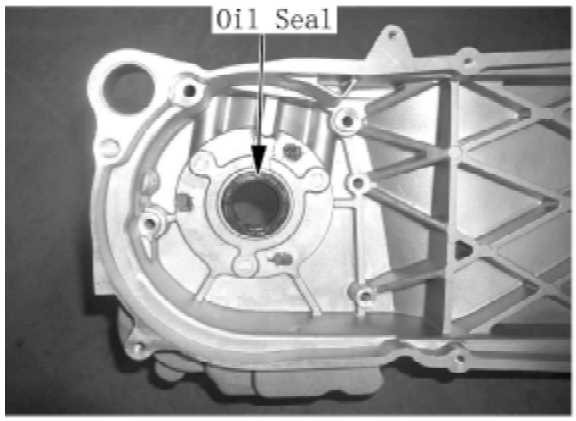
-The IN mark on the piston must face the intake valve

-Cover the crankcase opening with a clean rag to prevent piston pin or piston pin retainer from falling into crankcase.

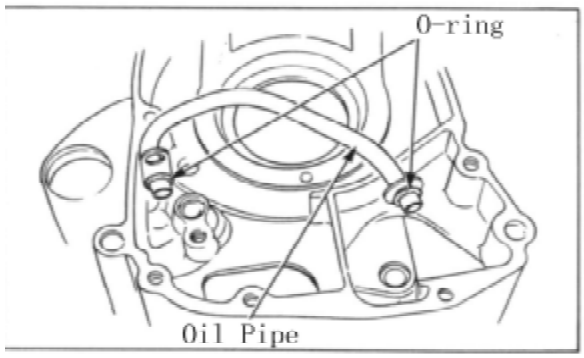


Assembly of Crankcase

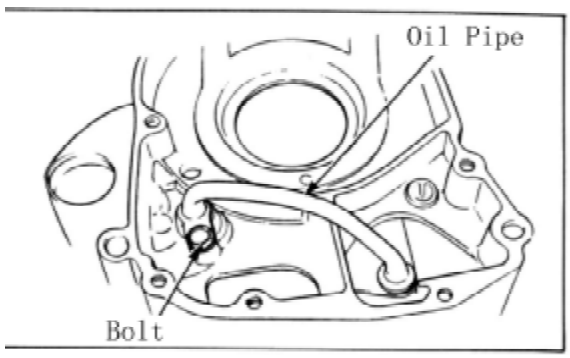
Clean the joint face of crankcase.
Take care not to damage crankcase joint face.
Install new oil seal on left crankcase.
Wash clean oil pipe and install new O-rings on the two ends.



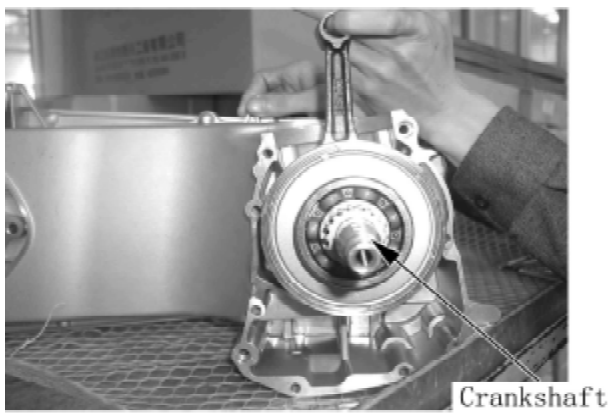
Install oil pipe to right crankcase and tighten with bolt.



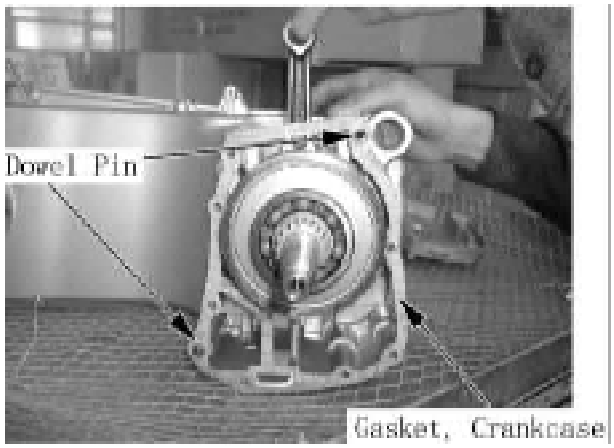
Install crankshaft to left crankcase.



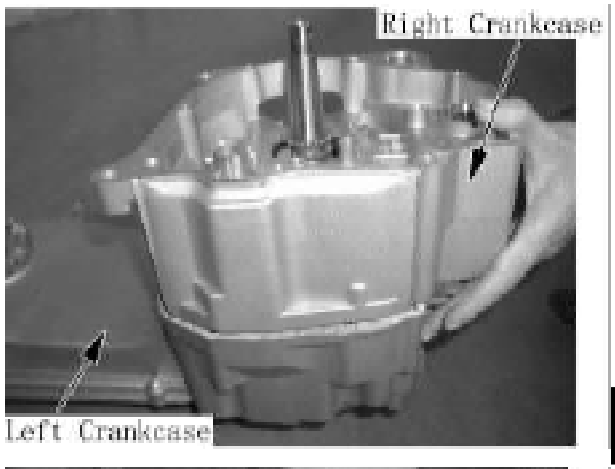
Note:
Take care not to damage oil seal.



Install new dowel pin and gasket to left crankcase.



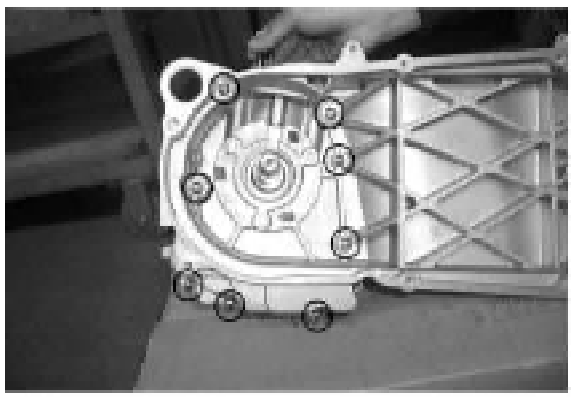
Put left crankcase downwards and install right crankcase.



Assemble crankcase.

Tighten crankcase with 9 bolts.

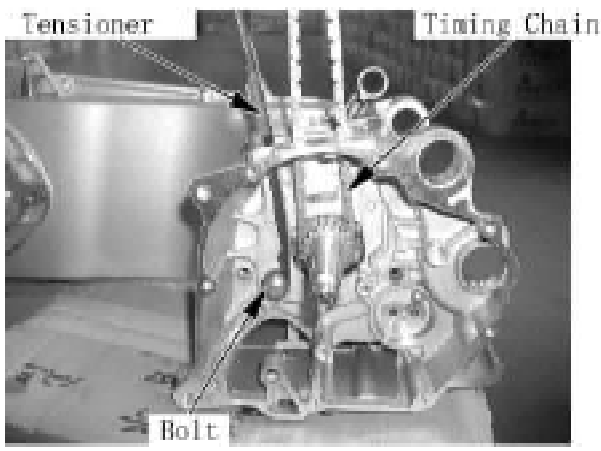
Tightening Torque: 0.8~1.2kgf · m



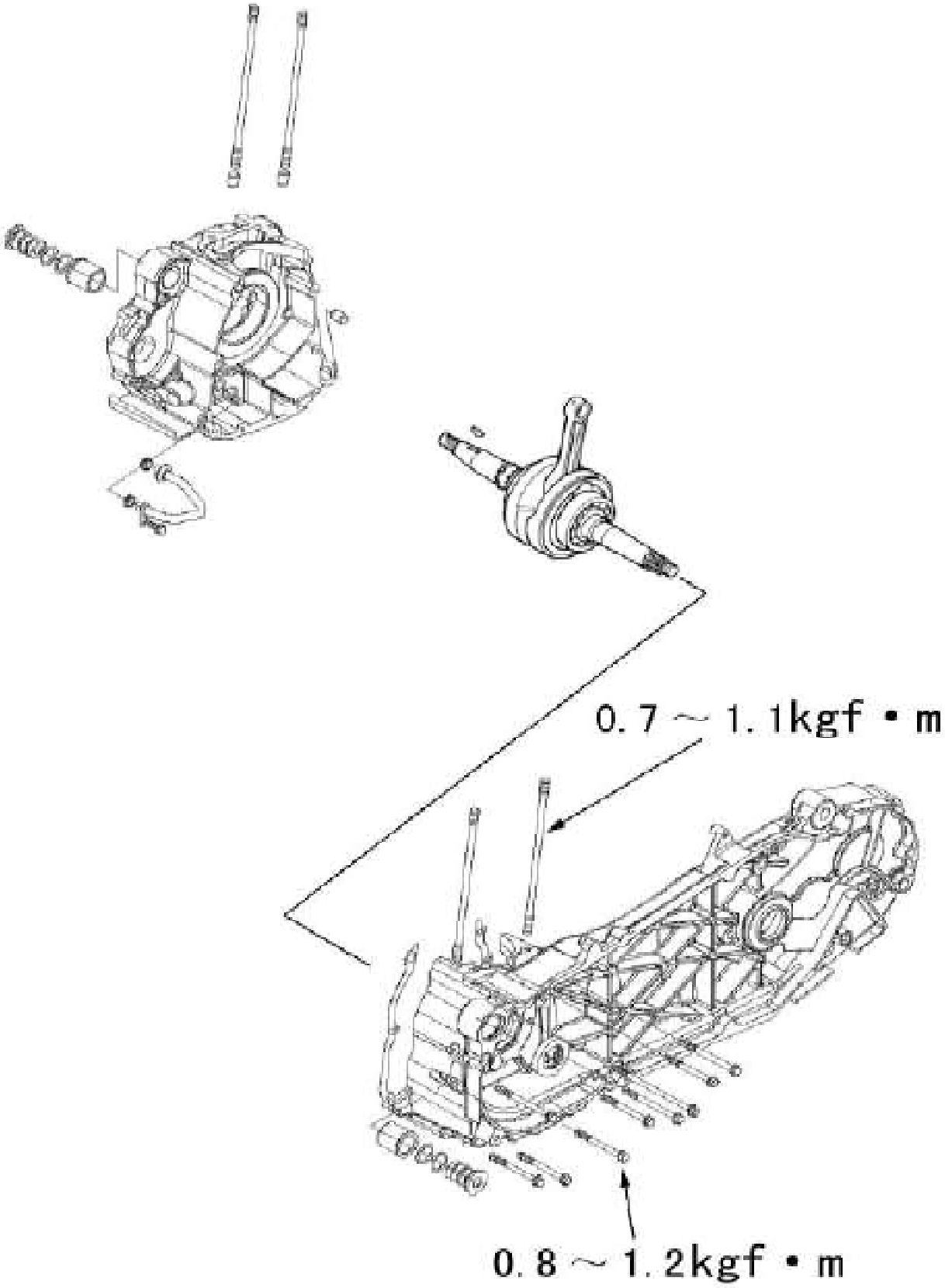
Install timing chain.

Install timing chain tensioner with bolt.

Tightening Torque: 0.8~1.2kgf · m



Crankcase, Crankshaft



13 Front Wheel,Front Brake,Suspension,Steering System

Overhaul information

Operating cautions

Notes

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

Overhaul standard

Item			Standard	Service Limit
Front wheel	Front wheel axle bend		—	0.2mm
	Rim Vibration	Longitudinal	0.8mm	2.0mm
		Lateral	0.8mm	2.0mm
	Tire	Remained tire thread	—	1.6mm
		Tire Pressure	250kPa（2.5kgf/cm^2）	—
Front brake	Free play (brake lever)		10－20mm	—

Tightening torque

Mounting nut, Handlebar	**55 N·m（5.6kgf·m）**
Nut, front wheel axle	**80 N·m（8.1kgf·m）**
Fixing bolt/nut, Front shock absorber	**40 N·m（4.1kgf·m）**

Special tools

Rod, bearing remover
Head 10mm, bearing remover,
Handle A , Driving Tool
Sleeve, Driving Tool 28×30
Guide tool 10mm
Locknut spanner
Bearing adjusting spanner, steering column
Bearing remover set,
Rotor puller
Remover shaft
Remover hammer
Bearing race mounting tool A 27×47mm, steering column
Bearing race mounting tool B 30×47mm, steering column
Assembling tool shaft

Troubleshooting

Heavy steering

·Upper thread is over tightened.
·Steering bearing is damaged or worn.
·Inner & outer bearing races are damaged,worn 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 warpage
·Worn tire
·Rocking of wheel bearing
·Engine fixing part is rocking. (Refer to Chapter 7)

Front wheel Vibrates

·Warped rim
·Faulty wheel bearing
·Faulty tire
·Improper balance of wheel
·Improper tightening of wheel axle

Wheel cannot turn freely

·Faulty.wheel bearing
·Front wheel axle is bended
·Brake drag

Front Suspension is too soft

·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

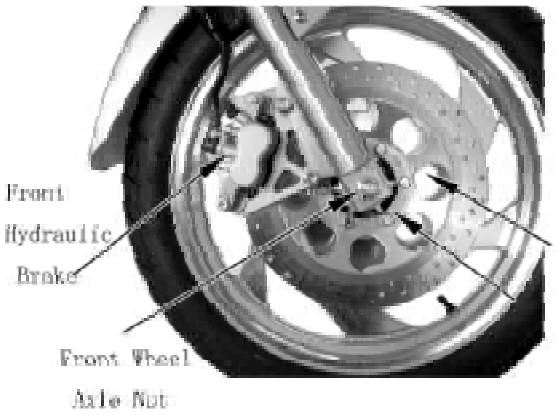
Poor brake

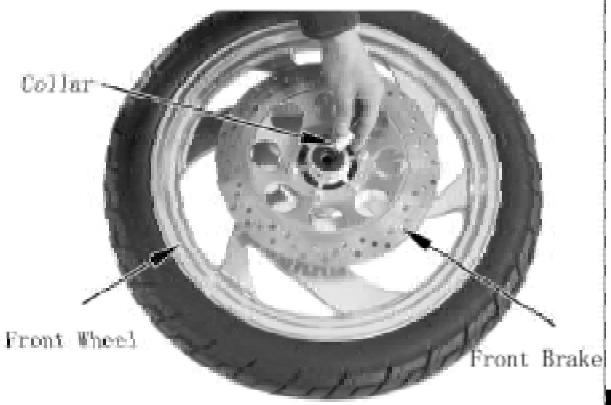
·Improper brake adjustment
·Stained or damaged brake disc.
·Worn brake shoe.

Front wheel

Removal

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



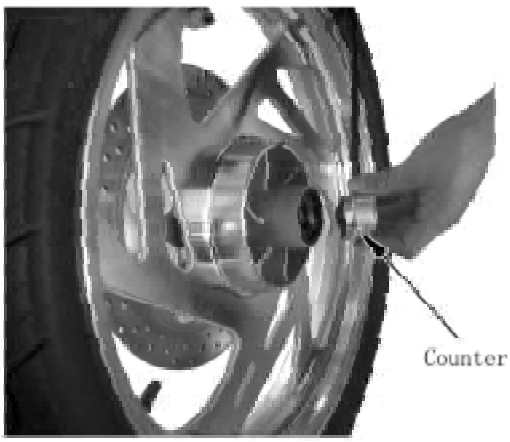


Remove:

—Front wheel axle

—Brake disk from brake calipers

—Front wheel.



Remove counter.

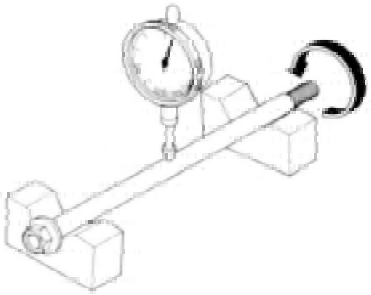
Remove collar from front wheel left side

Inspection

Wheel axle

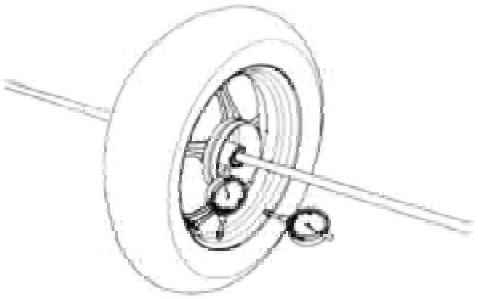
Set axle on a V block, measure axle vibration with centesimal gauge.

Service Limit: 0.2mm



Rim

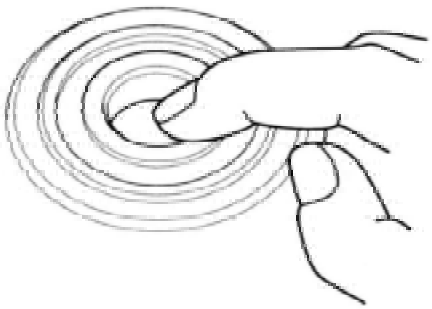
Check the rim for damage, warpage or scrapes.
Replace with a new one, if any.
Slowly turn the wheel, measure the rim vibration with a centesimal meter.



Service limit: Axial: 2.0mm
Radial: 2.0mm

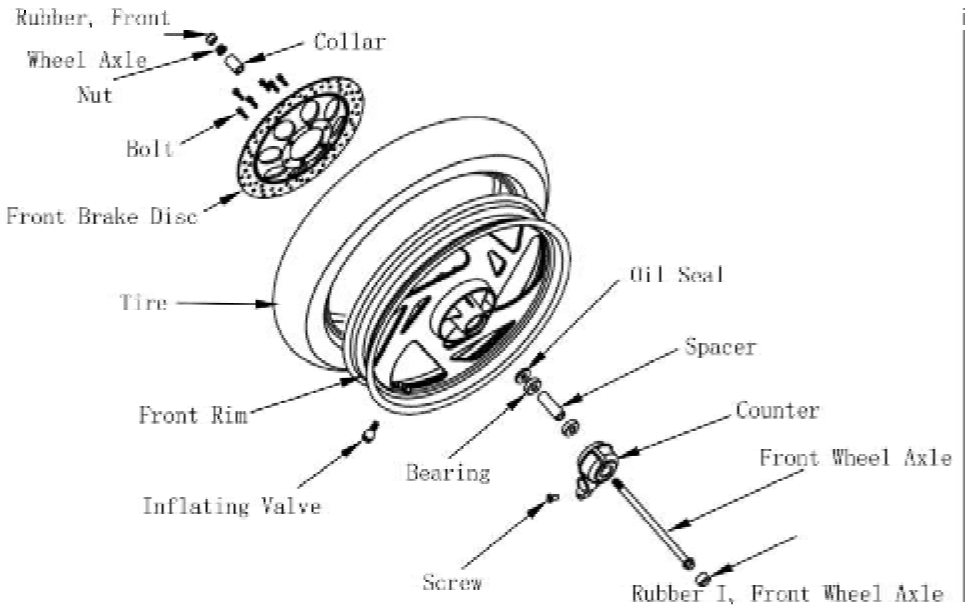
Wheel bearing

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 as a set (L&R).



Diassembly

Remove oil seal.

Install remover head on the rim

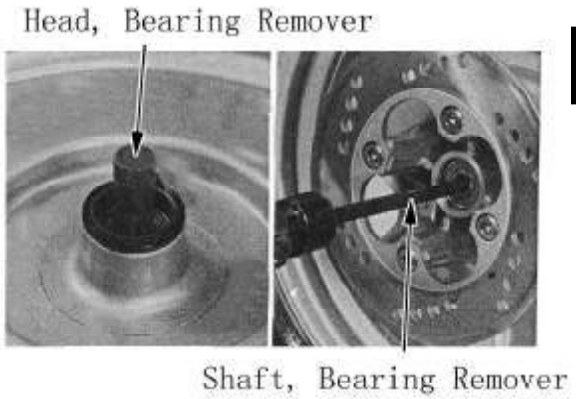
Install the bearing remover shaft on the remover head from the reserve side, strike in and remove the bearing

Remove spacer.

Special tool:

Shaft, Bearing remover

Head, Bearing remover 12mm



Note:

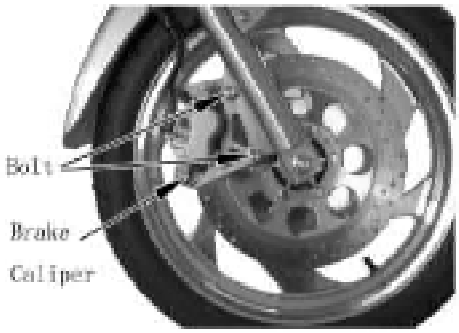
Replace the bearings in a set. Do not use the disassembled bearings.

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

Inspection

Brake disc thickness:<3mm → Replace

Remove bolt and brake calipers.



Inspection

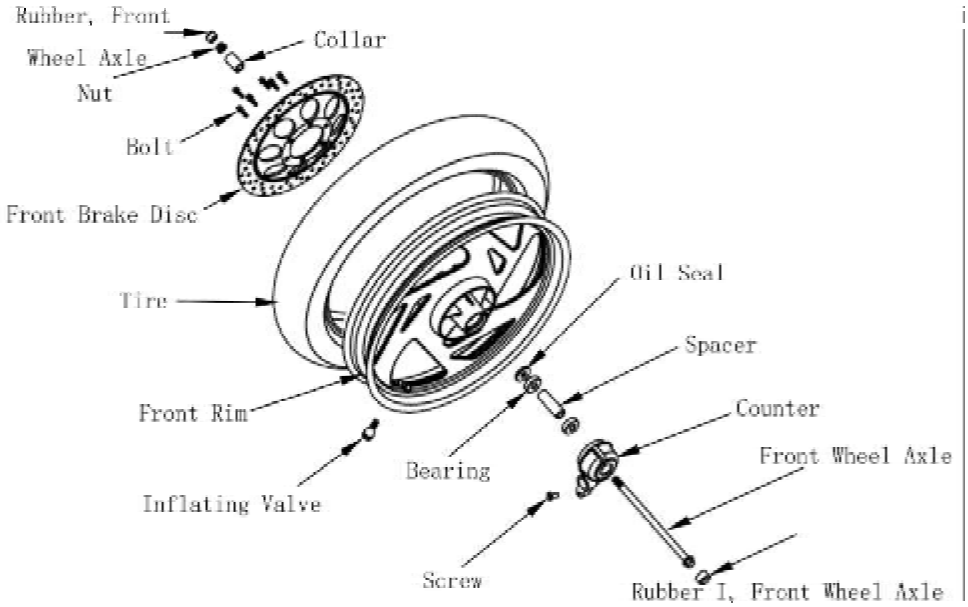
Brake clipper.

Check brake calipers for cracks.

Check oil leakage from the tightening parts.

Replace, if any.

Assembly



Assemble spacer

Apply lubrication grease to the running part of new bearing, Strike in the left side bearing first.
Install spacer.
Strike in right side bearing

Special tools:

Handle A , press tool A
Driving tool outer sleeve 28x30
Guide tool 12mm

Note:

Strike in the bearings in parallel.

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 between brake calipers.

Note

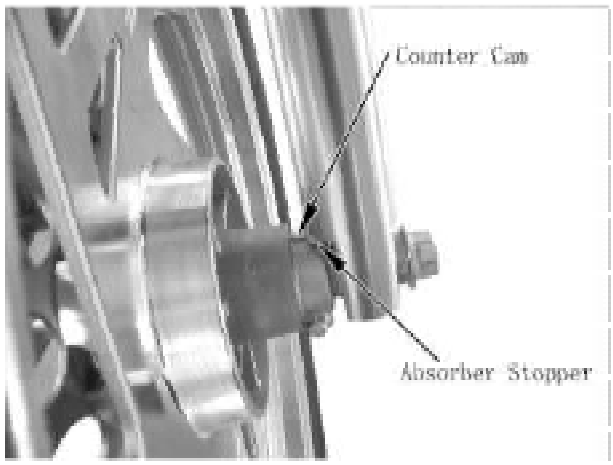
Make sure counter cam is in line with front absorber stopper.

Install front wheel axle and tighten nut.

Tightening Torque: 50-60N·m (5.0-6.0kgf·m)

Install speedometer cable to the counter and tighten the small screw.

Tightening Torque: 3.0-5.0N·m (0.35-0.5kgf·m)

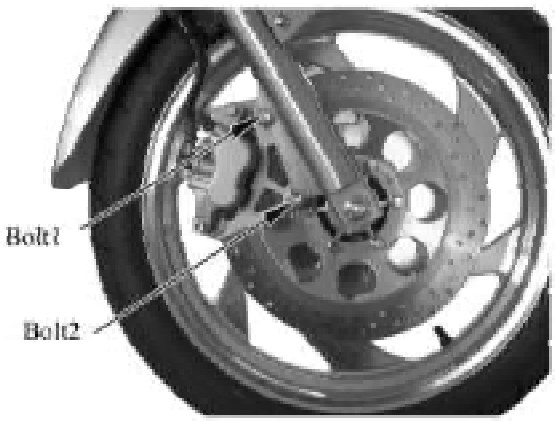


Front Shock Absorbers

Disassembly

Remove:

—Front vent panel(→2-4)
—Front left and right panel) (→2-7)
—Black panels (L&R) (→2-8)
—Left and right panels (→2-5)
—Front fender (→2-2)
—Front wheel (→13-3)
—Bolt 1 & Bolt 2



Loosen the bolts of front turning indicators.

Remove 4 fixing bolts of joint plate (2 for each of L&R), sealing cover and seal ring

Remove 4 fixing bolts of joint plate (2 for each of L&R), sealing cover and seal ring.

Note

There should be no damage with the seal ring.

Remove shock absorbers

Note:

Do not put the shock absorber upside down to prevent oil leakage from inner tube.

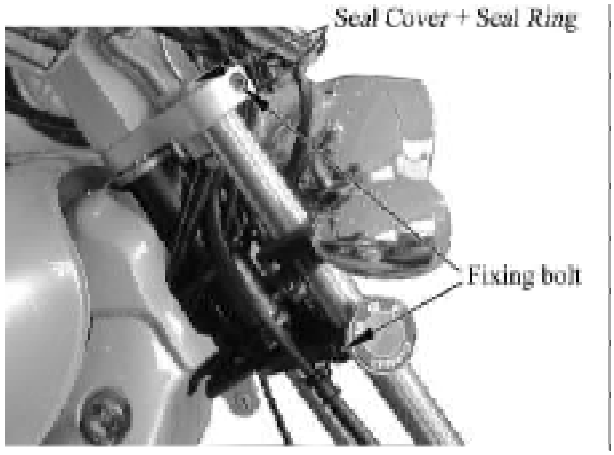
Inspection:

Oil leakage, aged or damaged oil seal →Replace

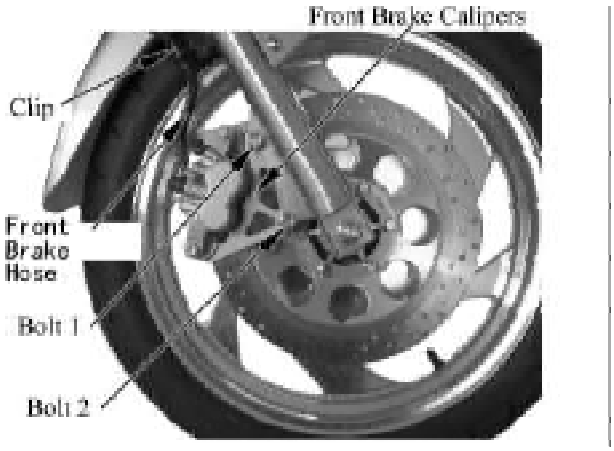
Installation

Installation of shock absorbers

Install the seal cover and seal ring of shock absorbers.
Tighten according to the specified torque
Tightening Torque: 50N•m (5.1kgf•m)



Install the 4 fixing bolts of absorbers, and tighten according specified torque.
Tightening Torque: 40N•m (4.1kgf•m)

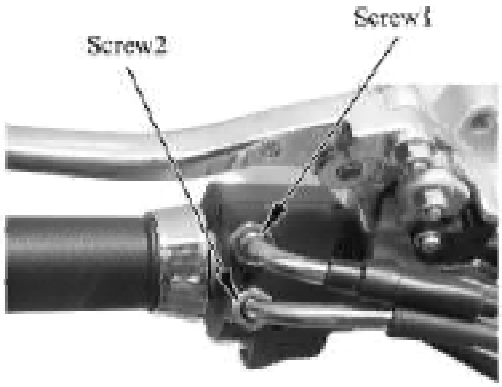


Install front wheel. (→13-3)

Set brake hose into clip.
Install brake calipers.
Set brake disc between calipers. Tighten bolt 1 & Bolt 2.

Tightening Torque: 30N•m (3.1kgf•m)

Install front fender (→2-2)

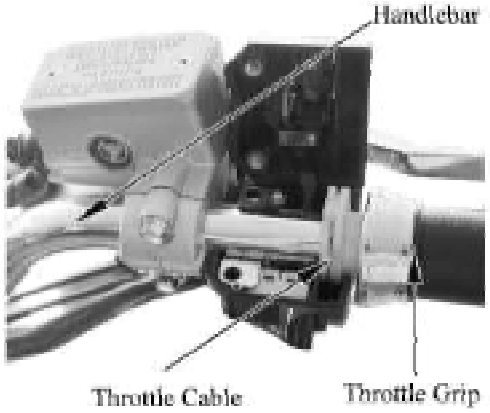


Right Handlebar Switch

Remove tapping screw 1 and 2.

Loosen right handlebar switch.

Remove throttle cable from throttle grip



Disconnect switch from connection box.

Remove right handlebar switch

Installation

Install right handlebar switch (→13-14)

Left Handlebar Switch

Disassembly

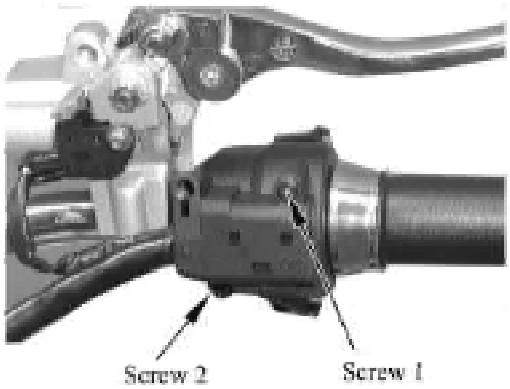
Remove screw 1 and screw 2

Disconnect switch from connection box.

Remove left handlebar switch

Installation

Install left handlebar switch (→13-14)

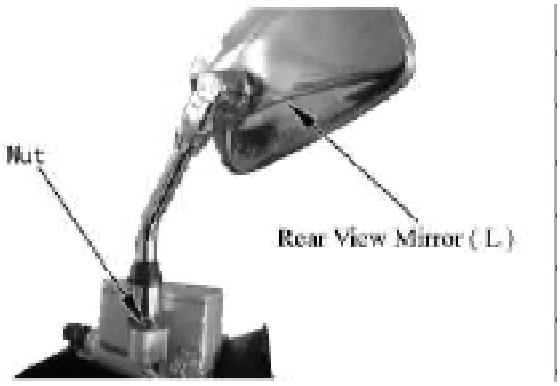


Rear View Mirrors

Disassembly

Loosen nut counter clock-wise,

remove left rear view mirror by turning it counter clockwise.



Loosen nut clock-wise,

remove right rear view mirror by turning it clockwise.

Installation:

Reverse the removal procedure for installation.

Master Cylinders

Removal:

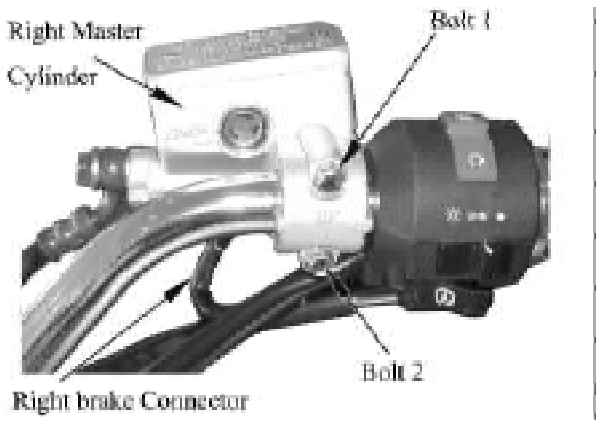
—Rear View Mirror (L&R)

—Bolt 1 & Bolt 2

Remove left master cylinder from handlebar.

Do not remove master cylinder from vehicle if it's not being replaced.

Refer to above for removal of right master cylinder.



Note:

1.Do not hang the master cylinders with brake hoses.

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.

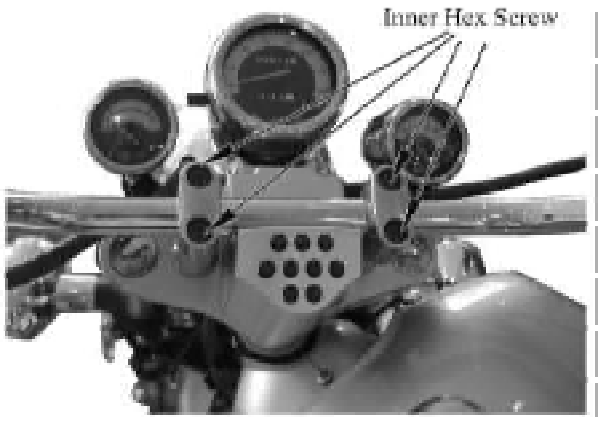
Handlebar Tube, Handlebar Lower Cover

Remove:

—handlebar Switch (L&R)(→ 13-10)

Separate left & right master cylinders from handlebar tube.

— 4 inner hex screws.



Installation of Handlebar

Installation of handlebar tube

Install 4 inner hex screws. Adjust the height of the handlebar properly to best fit your driving habit.

Tightening Torque: 50-60N.m (5.0-6.0kgf.m)

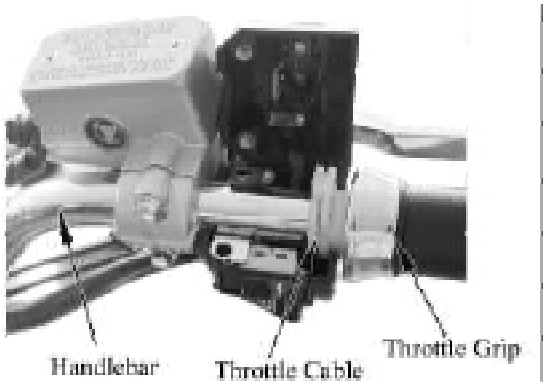
Note:

Main cable, throttle cable, brake hose, etc should be routed properly;

Installation of Throttle Grip, Throttle Cable

Apply lubrication grease to inner side of throttle grip and contact part with handlebar.

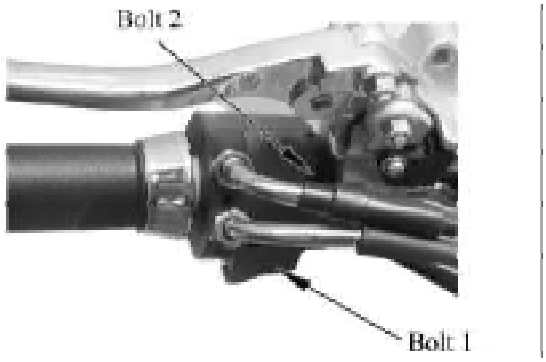
Install throttle grip to handlebar.



Install throttle cable to the front of right handlebar switch.

Apply lubrication grease to installation part and end of cable.

Install throttle cable to throttle grip.

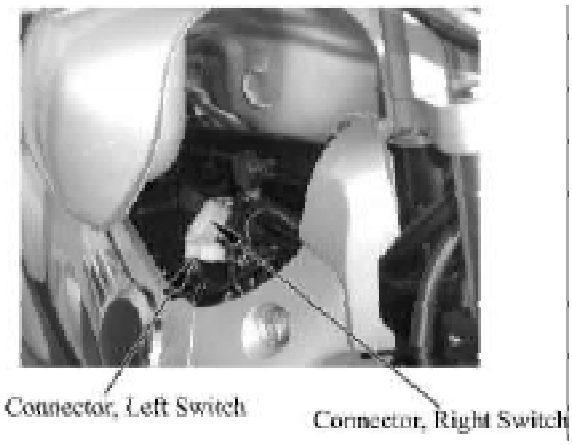


Installation of Right Handlebar Switch

Install right switch to handlebar with its limiter in line with location hole of handlebar.

Tighten with screw 1 & screw 2 from underneath.

Connect switch with connection box.

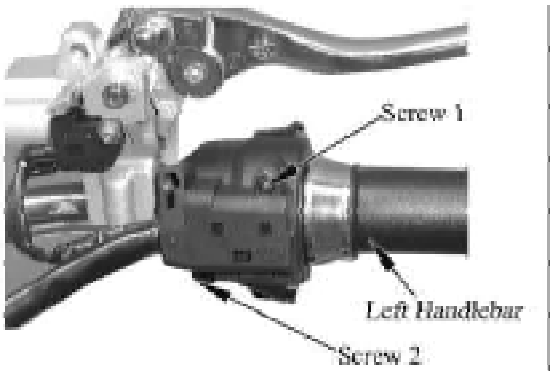


Installation of Left Handlebar Switch

Install left switch to handlebar with its limiter in line with location hole of handlebar.

Tighten with screw 1 & screw 2 from front.

Connect left handle switch with connection box.



Installation of Left Grip

Clean off the stains and grease from inner side of left grip and handlebar contact part.

Apply cementing agent to handlebar contact part and install left grip.

Note:

Leave the left grip several hours for drying of cementing agent after installation.

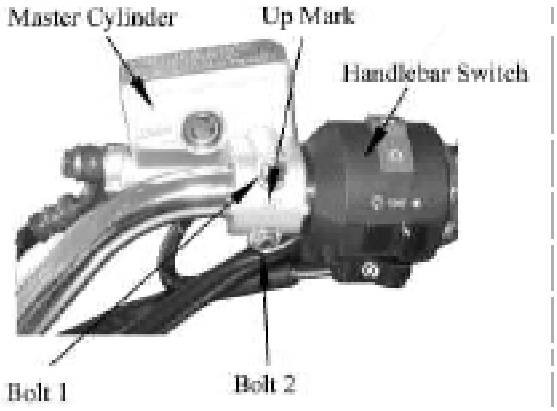
Installation of Mater Cylinders (L&R)

Install the masters with UP mark upward.

Measure the distance of master cylinder and left & right handlebar switch as well as lower cover of handlebar

Note:

Main cable, throttle cable, brake hose, etc should be routed properly;

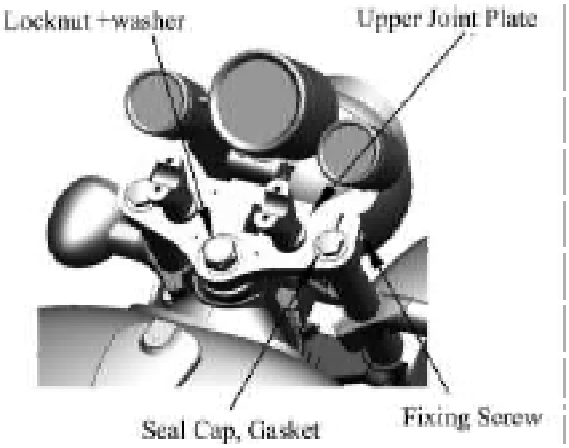


Install rear view mirrors （→ **13-12**）

Front Fork

Remove:

—Front wheel （→ **13-3**）
—Handlebar（→ **13-10**）
—Front fender（→ **2-2**）
—Locknut and washer, upper joint plate
—Seal cap and gasket, front shock absorber
—fixing screws, upper joint plate
—Upper joint plate

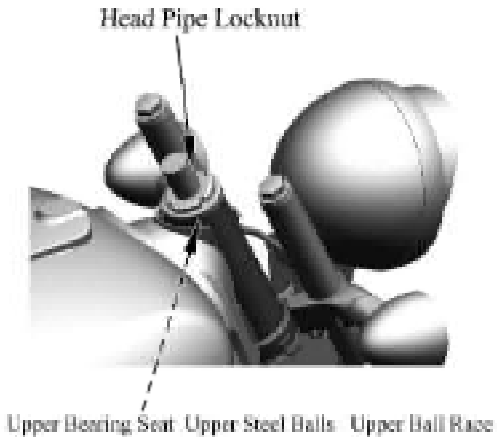


Remove head pipe locknut with special tool

Special Tool

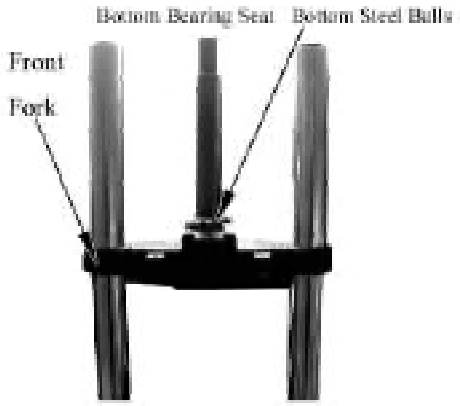
Head pipe locknut remover

Remove upper bearing seat, upper steel balls.



Remove bottom steel balls.

Remove front fork



Set special tool on head pipe and remove bottom ball race.

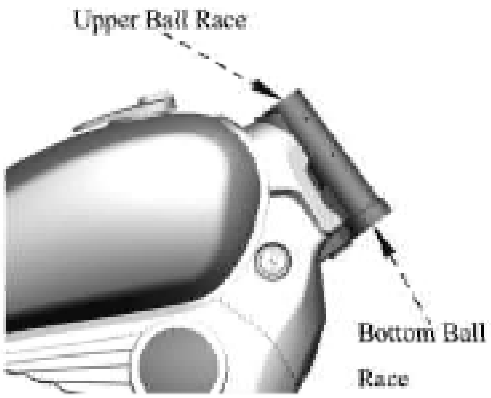
Special Tool:

Bearing remover set

Rotor puller

Rod, remover

Hammer remover



Set special tool on head pipe and remove upper ball race.

Special Tool:

Bearing remover set

Rotor puller

Rod, remover

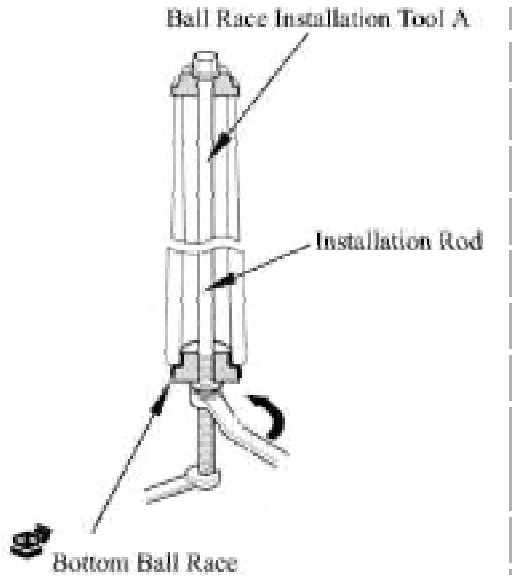
Hammer remover

Installation

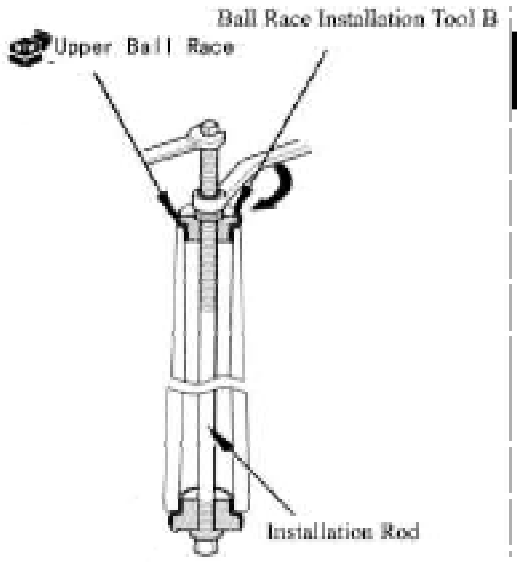
Install new bottom ball race with following special tools to steering stem

Special tools:

Ball race installation tool A
Installation Rod
Ball race installation tool B
Installation Rod



Hold installation rod, tighten locknut while press bottom ball race into head pipe.



Install new upper ball race with following special tools to steering stem.

Special Tools:

Ball race installation tool A
Installation Rod
Ball race installation tool B
Installation Rod

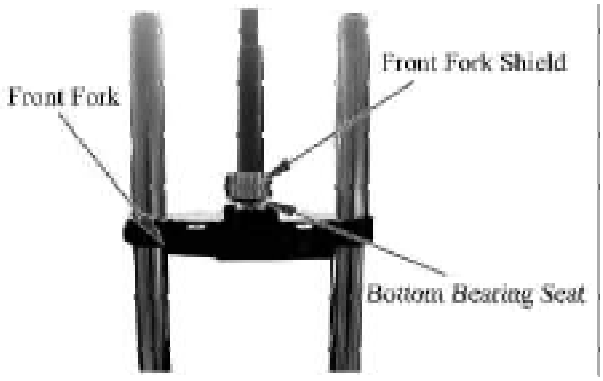
Hold installation rod, tighten locknut while press bottom ball race into head pipe.

Replacing Bottom Bearing Seat

Remove bearing retainer, press the new bearing retainer onto front fork with special tools and hydraulic press.

Special Tool:

Front Fork Shield

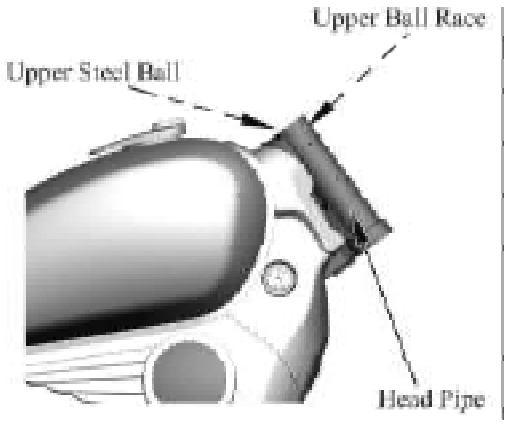


Installation

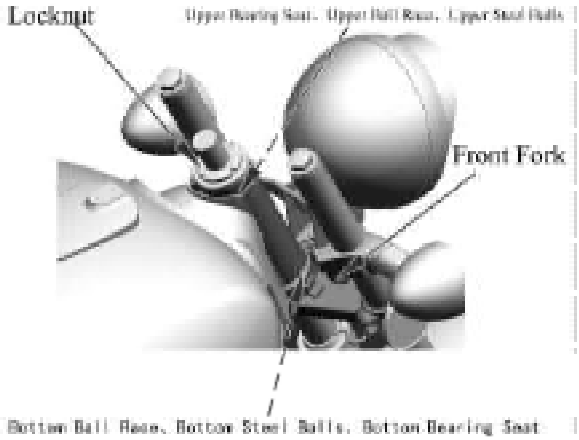
Apply lubrication grease to new upper steel balls and install to head pipe.

Install bottom bearing seat to front fork.

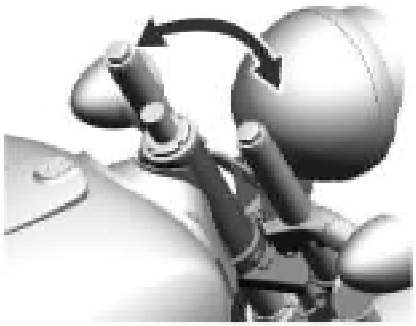
Apply lubrication grease to new bottom steel balls and install to front fork.



Insert front fork installed with bottom bearing seat,bottom steel balls into the head pipe installed withupper and bottom ball races, upper steel balls and upper bearing seat.
Tighten head pipe locknut.



Turn front fork left and right to the stoppers several times to ensure full grinding-in of bearing seat and ball race.

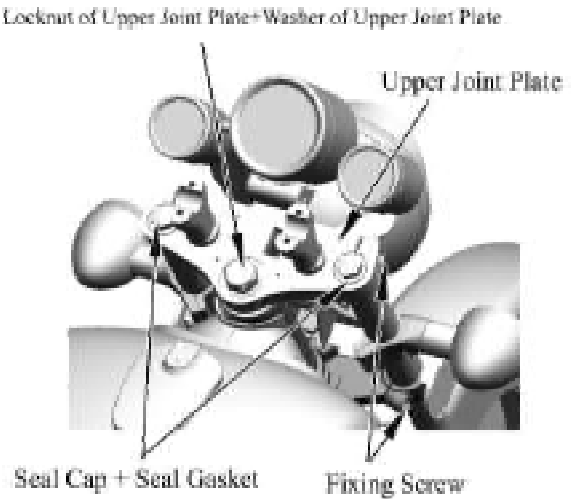


Install upper joint plate
Install and tighten washer and locknut of upper joint plate.
Tightening torque: 68N·M (7kgf·m)

Install seal cap and gasket of shock absorbers.
Tightening torque: 50N·M (5.1kgf·m)

Fix upper joint plate to frame with fixing screw.
Tightening torque: 40N·M (4.1kgf·m)

Turn front fork left and right to the stoppers several times and make sure it can turn freely without vertical swinging.



Install following parts:
—Front wheel
—Plastic parts
—Handlebar
—Front fender

Overhaul information

Operating notes

Notes

•Securely support the vehicle 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 wheel.
•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	Longitudal	—	2.0mm
		Horizontal	—	2.0mm
	Tire	Remained tire thread	—	1.6mm
		Tire Pressure	280kPa（3.0kgf / cm^2）	—
Rear Brake	Free play (brake lever)		10－20mm	—

14

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	55N•m (5.6kgf•m)
Rear fork mounting bolt	55N•m (5.6kgf•m)

Troubleshooting

Rear Wheel wobbles

•rim warpage.
•faulty tire.
• tire pressure too low
•improper wheel balance
•improper tightening of wheel axle nut.

Rear shock absorber is too soft

•weak spring.
•oil leakage from rear shock absorber

Rear shock absorber is too hard.

•bent rear shock absorber
•tire pressure too high

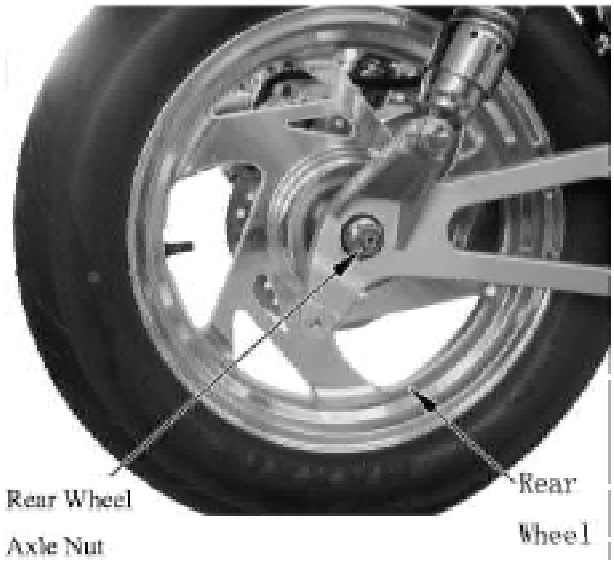
Poor brake effect

•improper brake adjustment
•stained brake shoe or brake disk
•worn or damaged brake shoes.

Rear Wheel

Removal:

Securely support the scooter with main stand.



Remove

—Muffler（→2-16）
—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, warpage or scrapes.
Refer to page 13－4，turn rim slowly and measure the rim vibration with centesimal meter。

Replace rim in case of any damage, warpage or scrapes.

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 axle nut.
Tighten according to specified torque.

Tightening Torque: 140N•m (14.3kgf•m)

Rear Fork

Securely support the scooter with main stand.

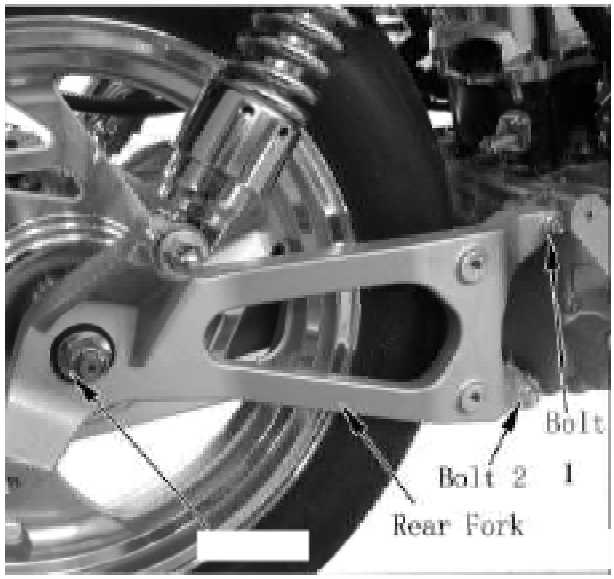
Remove:

—Muffler (→2-16)

—Bolt 1, Bolt 2 and rear wheel axle nut

—Rear right shock absorber（→**14-5**）

—Rear fork



Disassembly of Rear Fork

Remove front and oil seals.

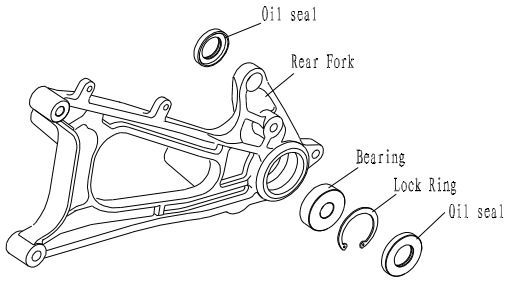
Remove lock ring.

Remove bearing with special tool.

Inspection:

Check bearing for smooth turning and balls for damage.

Replace with a new one if any.



Installation:

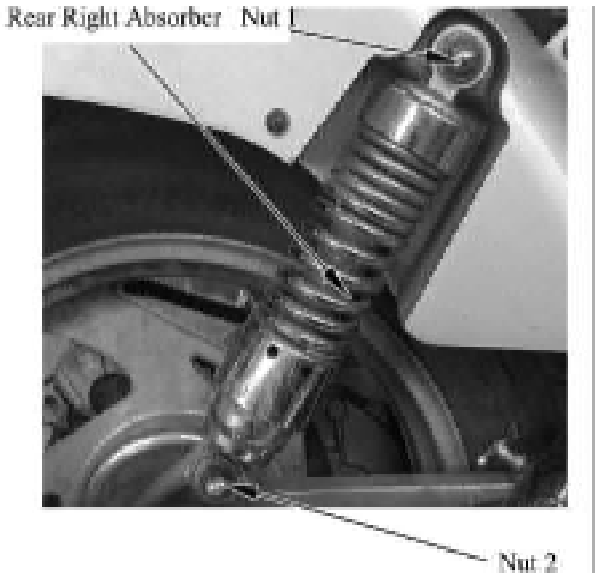
Press in the bearing with special tool;

Install lock ring, Oil seal.

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.

Remove:

—Passenger seat（→**2-3**）

—Rear Bracket（→**2-4**）

—Rear handrail （→**2-5**）

—Rear ornament panels (L&R)（→**2-3**）

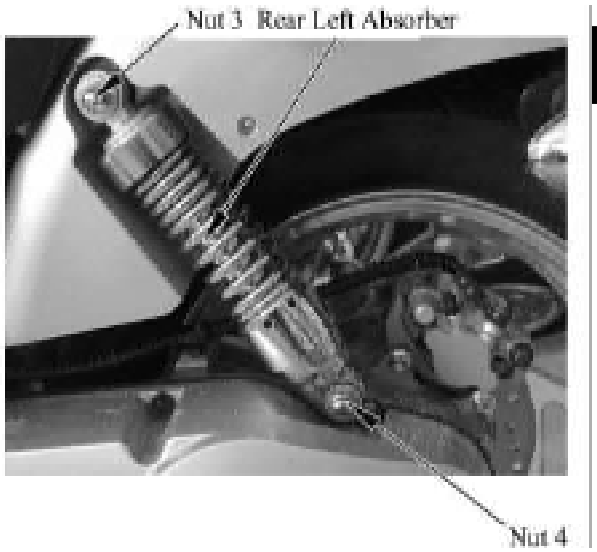
—Rear fender（→**2-7**）

—Nut 1 for rear left absorber

—Nut 2 for rear left absorber

Remove rear left absorber.

Rear Right Absorber



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.

Installation

Reverse the removal procedure for installation.

Tighten the nuts according to the specified torque.

Torque: 55N•m (5.6kgf•m)

Rear Brake

Rear brake caliper

Removal:

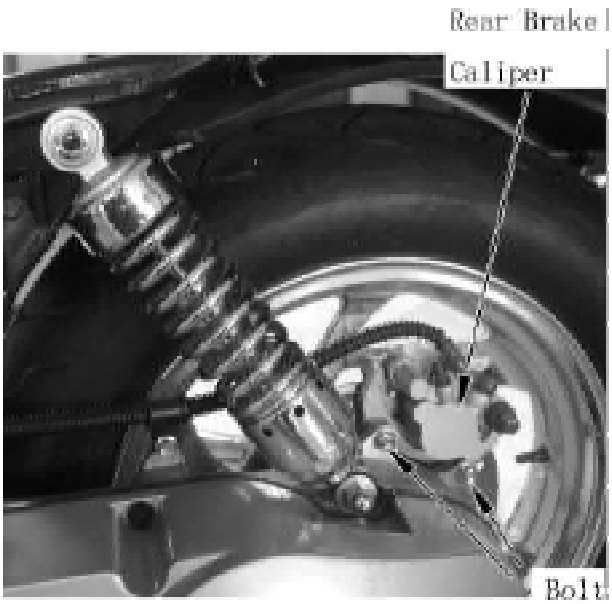
Remove:

—Bolt1

—Bolt2

—Nut

—Rear brake caliper



Inspection

Check rear brake caliper for cracks, oil leakage at 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 not more than 3mm.

Replacement

Remove:

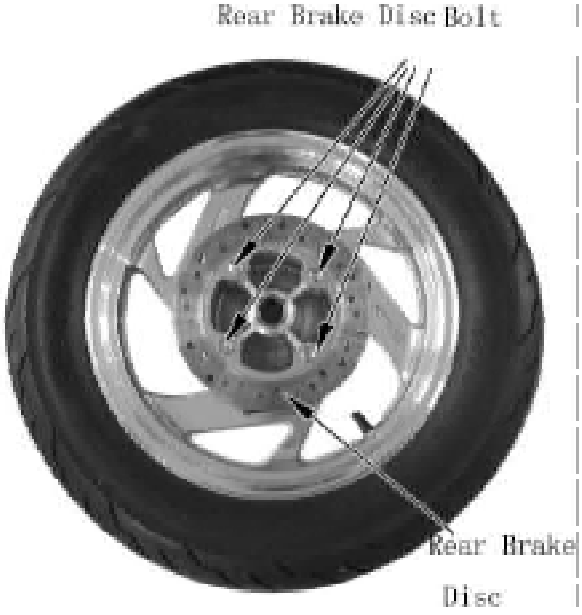
—Muffler (→2-15)

—Rear Right Absorber (→14-5)

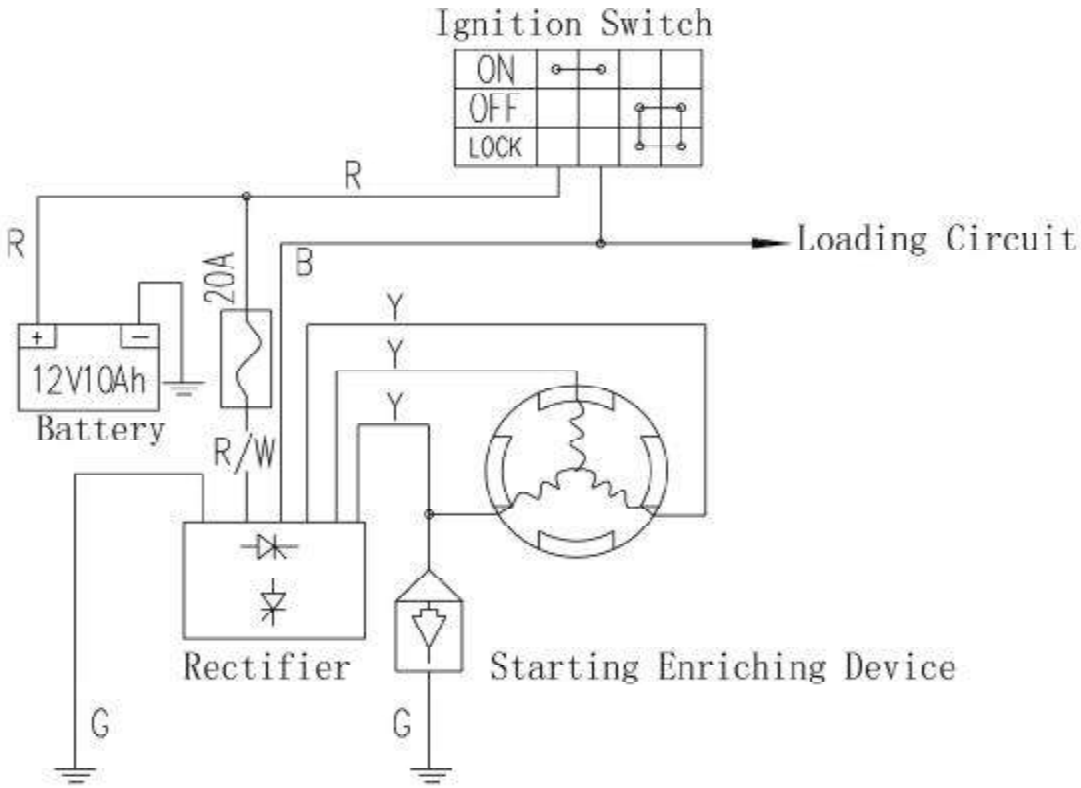
—Rear Fork (→14-4)

Remove fixing screws of rear brake disc. Remove rear brake disc.

Install the new rear brake disc.



Charging system diagram:



Overhaul information

Operation notes

Warning

•Usually no hydrogen will be generated during charging except when overcharged. Do not smoke when charging.

•Electrolyte is highly corrosive, splash to clothes, skin or eyes will cause burn or loss of sight. Wash with plenty of water if splashed. In case of splash into eyes, wash with plenty of water and consult the doctor.

Warning

•Spark arc may be generated when removing or joining the electrical parts with switch on and will damage the rectifier. Operation should be done with ignition switch OFF.

•Remove battery from vehicle for charging and do not open the electrolyte cover.

Warning

Replace if the battery service life expired.

•Keep the ignition switch OFF when disassembling electrical parts.

•Disconnect negative connection of battery when battery is stored on the vehicle.

•Fast charging is not recommended as it may reduce the life of battery.

•If battery is repeatedly charged and discharged deeply (fully-charge and fully-discharge), it may cause damage to the battery or shorten the service life or lower the capacity of battery. In addition, the capacity of battery will also lower in 2~3 years even under normal use. So the battery should also be replaced.

•If the terminal voltage is less than 12.4V, charge the battery normally.

•The inspection of charging system should be done in the procedure of troubleshooting table. (→ 15-3)

•Refer to illustration on page 15-9 for arrangement of charging system parts.

•Refer to chapter 11 for disassembly of AC magneto.

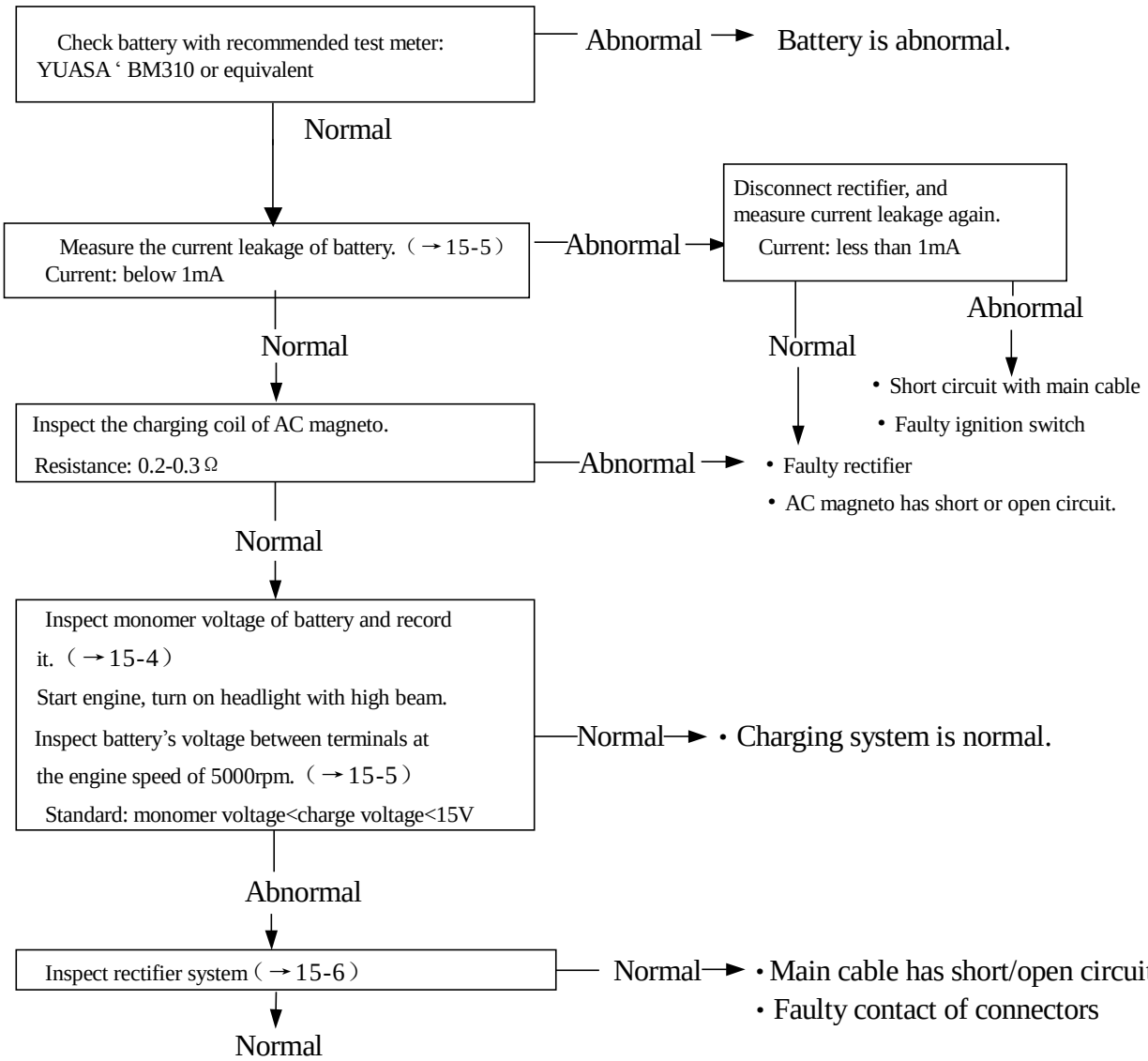
•The inspection of battery should be done following the owner's manual.

Overhaul standard

Item			Standard
AC magneto	Model		Permanent magnet alternator
	Output		3-phase AC
	Resistance of charging coil (20℃)		0.2-0.3Ω
Rectifier			3-phase loop rectification, controllable parallel connection, regulated voltage
Battery	Capacity		12V10Ah
	Current Leakage		Less than1mA
	Voltage between terminals	Fully-charged	12.8V
		Insufficient charge	Less than 11.8V
	Charging current/time	Standard	0.9A/5-10hours
		Fast charge	4A/60minutes

Troubleshooting

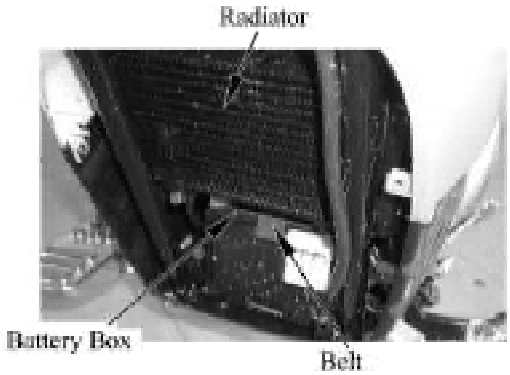
Battery overflow



Disassembly Battery

Caution:

Turn the ignition switch to OFF before operation.
Remove Vent Panel (→2-4)
Loosen belt, put battery on the ground.
Loosen negative terminal bolt and disconnect negative connection.
Remove positive terminal cap, loosen positive terminal bolt.
Disconnect positive terminal connection.



Installation:

Reverse the removal procedure for installation.

Notes

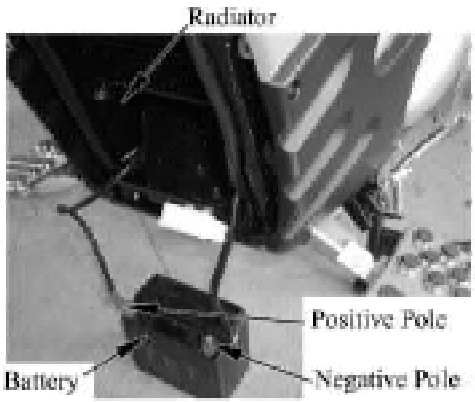
• Apply clean lubricant grease on the terminal post after installation.
•Install cover firmly on the positive terminal post after installation.

Inspection

Measure voltage between battery terminals, and check test status.

Complete test: 12.8V
Insufficient test: less than 11.8V

Recharge when charge is not sufficient.



Note

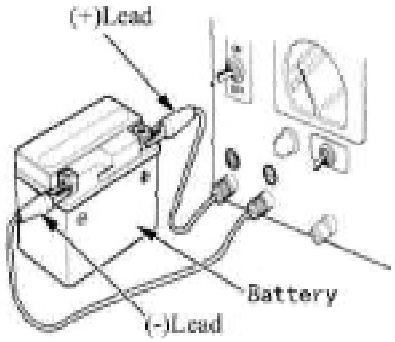
When recharging after charge, measure the voltage between terminals after 30 minutes. Measuring imme diately after charging will not gain the correct test due to the sharp voltage changes between the terminals.

Battery

Note

Usually no hydrogen will be generated during charging.
But overcharging may generate hydrogen.
No smoking during charging.
Charge according to the current and time specified on the label of battery.
Remove battery from vehicle. (Refer to above content)

Connect charger's positive wire to battery's positive terminal post.
Connect charger's negative wire to battery's negative terminal post.
Charging current/time: Standard: 0.9A/5-10hours
Fast charge: 4.0A/60mins



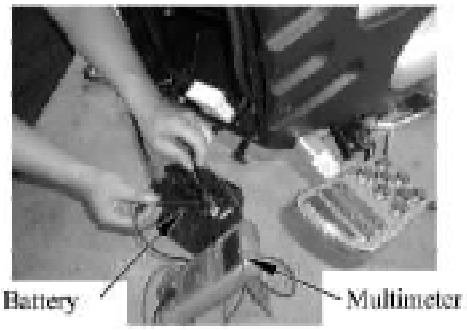
Notes

•Keep the battery's liquid temperature under 45℃. Reduce current to adjust the temperature if it is too high.
• Fast charge will reduce battery's life or cause damage to battery. Do not use fast charge unless in emergency case.

Inspection of charging system

Inspect charging status

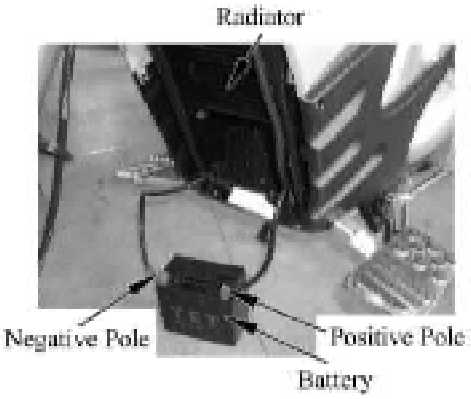
Remove battery (→15-4) and install a fully charged battery.
Keep ignition switch at the "OFF" position.
Connect voltmeter between battery's terminals after engine is started and warmed up.



Notes

•Avoid short circuit when measuring.
•Keep ignition switch at the "OFF" position.
•Use a fully charged battery for inspection.

Start engine and turn on high beam.
Increase engine speed slowly. Check voltage of battery's terminals which is usually between 13.5-15V, when the engine speed reaches specified speed (5000r/min).



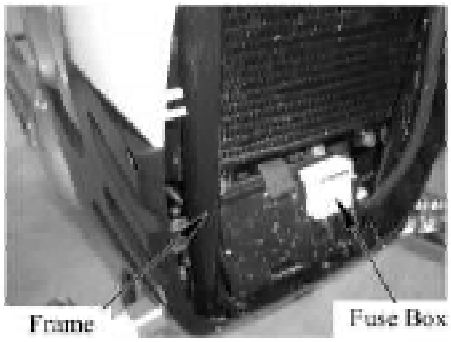
Standard:

Battery's monomer voltage<charging voltage<15V (5000rpm)

Electric leakage test

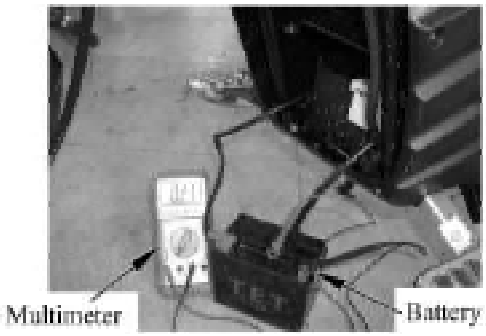
Remove vent panel(→ 2-4)
If disassembly or assembly of battery teminal are performed when current connected ,over voltage will be generated, which will cause damage to multimeter and elecrtical parts.
Keep ignition switch at the "OFF" position, and remove negative wire from battery.

Remove fuse box.



Connect AMP meter between negative terminal and negative wire.

Measure current leakage with ignition switch at the "OFF" position.



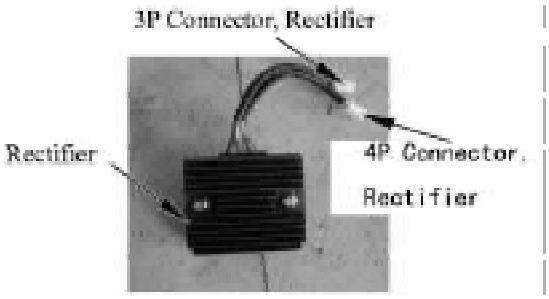
Notes

•If the measured current is higher than the limit, the multimeter will be burnt. Therefore, measure the current by shifting from the big to the small range.

•Do not turn on the ignition switch when measuring the current.

Current Leakage: less than 3mA

When leakage current is higher than specified limit, there is fault with the return circuit.
Measure current, at the same time disconnect terminals and connectors to check out the faults.



Rectifier

System inspection

Notes

Inspection can be done without removing the AC magneto from engine.

Remove:

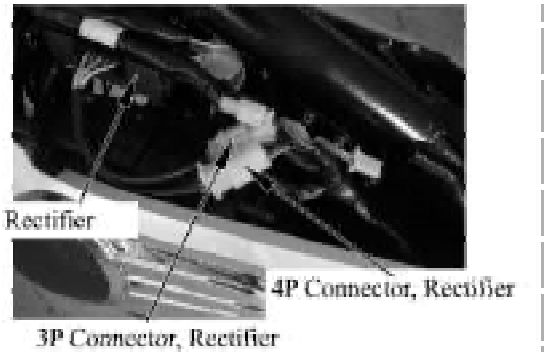
—Seat(→2-3)

—Fuel Tank (→2-13)

Disconnect rectifier with 2 connectors.

Check the connection terminals for loosening, bending, rust or come-off.
Check the following items of the main cable terminals of the two rectifier connectors:

Item	Result
Battery wire (red)	There should be voltage between red terminal(+) and frame body earthing wire
Earthing wire (green)	Green terminal must be connected with frame body earthing wire
Charging coil (yellow, yellow, yellow)	Resistance between yellow terminals is: 0.2-0.3Ω (at 20℃)
Ignition switch lead wire (black)	Black lead wire must be connected with black terminal.

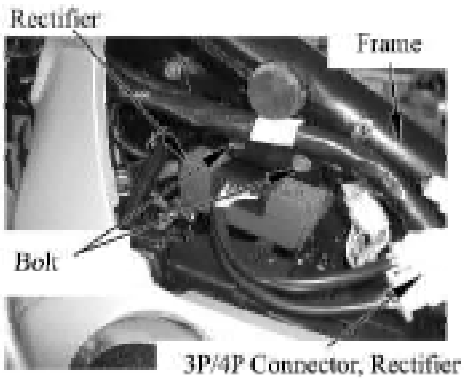


Disconnect starting enriching device when carrying out above inspection.

Disassembly

Remove:

—Seat(→2-3)
—Fuel Tank (→2-13)
—Bolt 1 and Bolt 2



Disconnect the two rectifier connectors.
Remove rectifier.

Reverse the removal procedure for installation.

Note:

Wires, hoses and cables should be routed properly.
(→ 1-20)

Inspection of AC magneto

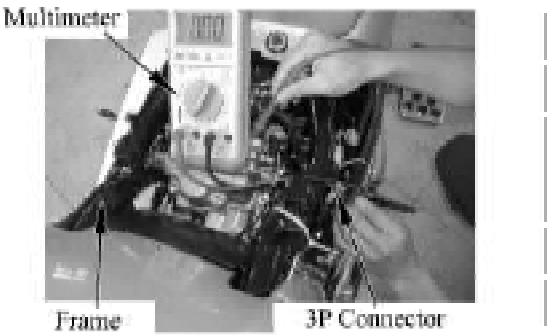
Remove rear right ornament panel （→ 2-5）

Disconnect connectors of AC magneto (yellow, yellow, yellow), and pickup coil (black/white,green).

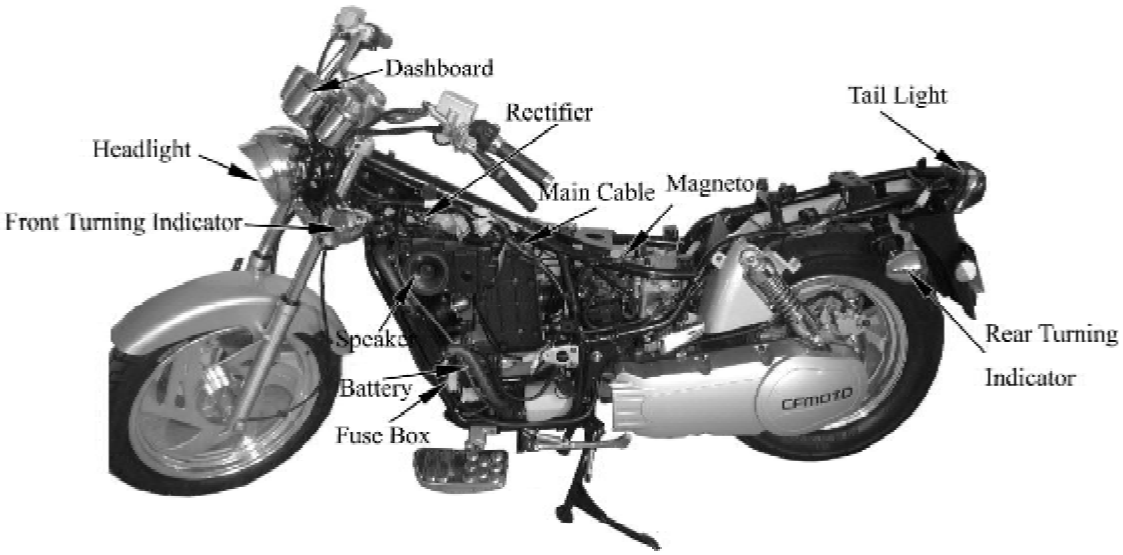
Measure the resistance between the yellow terminals of the AC magneto 3P connector.

Resistance: 0.2-0.3 Ω (at 20℃)

Make sure the yellow terminal of AC magneto 3P connector is not connected with frame body earth wire.



Replace with a new AC magneto in case of any faults found in above check.（→ 11-3）


Dashboard
Rectifier
Tail Light
Headlight
Main Cable
Magneto
Front Turning Indicator
Speaker
Rear Turning
Indicator
Battery
Fuse Box
CFMOTO

Overhaul information

Warning

Exhaust gas contains toxicant, DO NOT keep the engine run for a long time in a closed or poorly ventilated place.

•Inspect ignition system in the order of the content in troubleshooting table.
•Refer to (16-7) for arrangement of ignition system parts.
•Ignition advancer is integrated in the CDI, so the ignition system will automatically adjust ignition time.
•Be careful with CDI overhaul. Dropping or strong impact may cause damage to CDI. Always shut the ignition switch when overhauling.
•Most of the failures of ignition system are caused by faulty contacts between connectors or terminals. Check all the connections for any faults before overhauling.
•Select spark plug of proper heat value. Improper spark plug may cause malfunction or damage of engine.
•Refer to chapter 18 for inspection of switches.

Overhaul standard

Item		Standard
Ignition		CDI battery DC digital ignition
Spark plug		NGK
	Standard	DPR7EA-9
	Optional	DR8EA、D7RTC
	Spark plug gap	0.8－0.9mm
Ignition timing	Maximum advance angle	28° CA
Peak voltage	Ignition coil	≥150V
	Impulse generator	≥0.8V

Special tool

Peak voltage oscillograph 07HGJ-0020100

(Use together with digital muitimeter available in the market with input resistance over 10MΩ/DCV)

Troubleshooting

•Engine cannot be started.

Check fuel and air channels for any faults; If the fuel and air channels are normal, check the ignition system.

•Inspect ignition system for the following items:

1. Spark inspection:

Check in the following steps:

Remove spark plug

Remove spark plug cap

Set high tension flexible cable end to earthing

Check spark arc

It is normal if spark arc is more than 8mm while it is weak if it is less than 5 mm.

If the spark is normal, check the spark plug.

A faulty spark plug may be caused by the following reasons:

(1) Spark plug is too wet and drowned. This is because the gas mixture is too thick. Cut the fuel and start the engine several times..

(2) Carbon deposit on spark plug—Mixture too thick or oil combustion in the combustion chamber. Clean and burnish the spark plug.

(3) Cracks with spark plug insulator.

(4) Spark plug electrodes have short circuit or it is obstructed between negative pole and thread or positive pole and input end.

2. Faulty spark includes: no spark and weak spark.

Inspect the following aspects if there is no spark.

(1). Inspect ignition coil with multimeter or measurement in the following steps.

1) Measure primary bobbin resistance, usually it is about 1Ω.

2) Measure secondary bobbin resistance, usually it is about 4.2K.

3) Measure damp resistance, usually it is about 5K.

(2). Check CDI if it is out of service.

(3). Check ignition circuit. Usually the voltage between blue/black wire and earthing wire (green) should be 12V. If there is no voltage, check from the battery positive terminal to the end of blue/black wire.

(4). Check the cable: check if there are any faults from the input of trigger signal (output of magneto trigger) to output (CDI terminal) and ignition output wire (black/yellow).

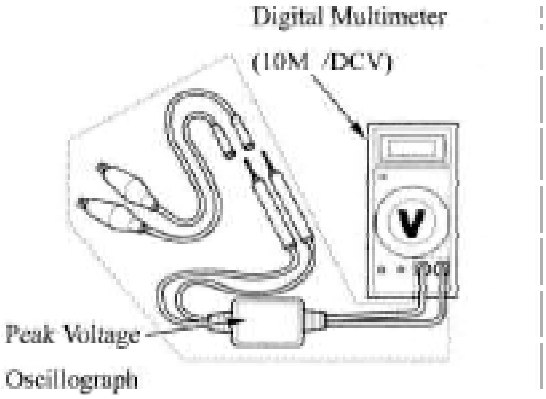
(5). Check stop switch. When switch is at the ignition position, black/white wire should be cut with green wire.

In case of weak spark, check the following:

(1). Check CDI .

(2). Check ignition coil and secondary coil whether there is short circuit, or fault with the damp resistance.

Inspection of ignition system



Note

•If the spark plug generates no spark, check first.
If there is come-off, loosening or poor contact with the wiring, then measure the peak voltage.
•Different multimeter has different input resistance and shows different readings. Thus it is impossible to obtain the correct reading. Measure with digital multimeter with input impedance over10MΩ/DCV).
Connect peak voltage oscillograph with digital universal meter.

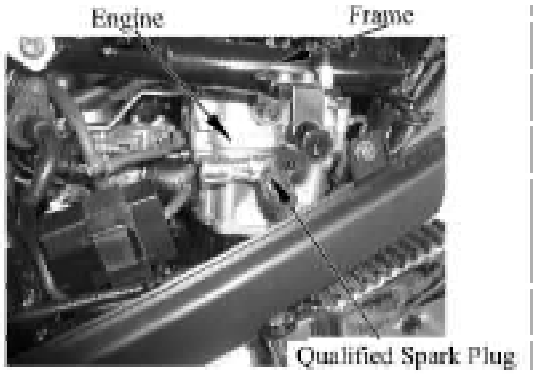
Special tools

Peak voltage oscillograph 519-922-150000
(Use together with digital multimeter available from the market with input impedance over 10MΩ/DCV)

Ignition coil primary voltage

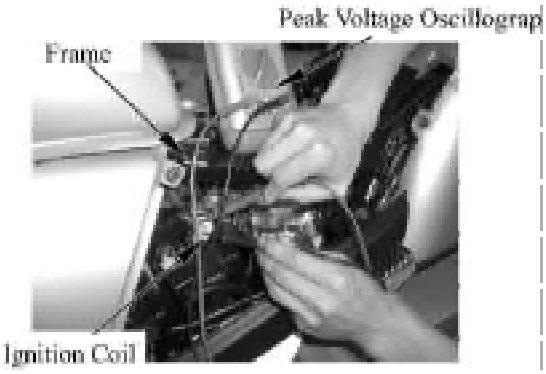
Notes

•Measurement should be done after all the wires are correctly connected.
•Inspection should be done when the spark plug and spark plug cap are properly installed. If the spark plug is removed, the peak voltage will rise.
Remove left ornament panel.(→ 2-4)
Keep 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 peak voltage oscillograph between primary wire terminal and frame body earthing wire.



Special tool

Peak voltage oscillograph
(Use together with digital multimeter available from the market with input impedance over 10MΩ/DCV) Connecting terminals: black/yellow (+) –frame earth wire (-)



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

Peak voltage: above 150V

Warning

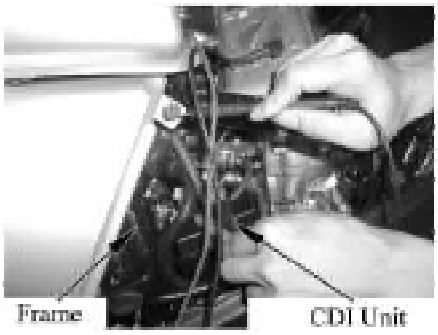
When measuring the voltage, do not touch the terminal with finger to avoid electric shock.

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

Pickup coil

Notes

• Measurement should be done after all the wires are correctly connected.
• Inspect with compression pressure in the cylinder, spark plug and spark plug cap are properly installed. If the spark plug is removed and then do the measurement, the peak voltage will rise.



Remove right ornament panel (→2-5)

Disconnect CDI unit connector.
Connect peak voltage oscillograph terminal with the following terminal of main cable.

Special tools

Peak voltage oscillograph 07HGJ-0020100
(Use together with digital multimeter available from the market with input impedance over 10MΩ/DCV)
Connecting terminal: blue/yellow (+) –green (-)

Keep ignition switch in the ON position, and start engine.

Peak voltage: over 0.8V

Warning

When measuring the voltage, do not touch the terminal with finger to avoid electric shock.
If peak voltage obtained from CDI unit connector is improper, measure again the peak voltage on the AC magneto 2P connector.

Pickup

Disassembly

Remove:

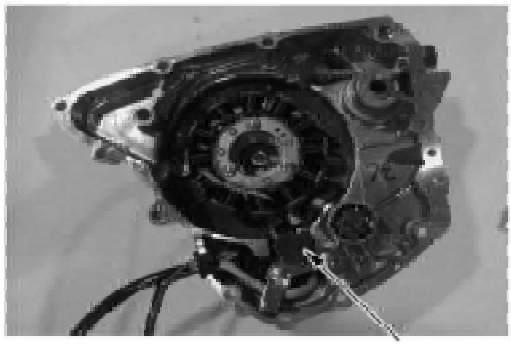
— AC magneto connector

—Water pump inlet hose and outlet hose, and drain coolant. (→ Chapter 6)

—Crankcase breather hose. (→ Chapter 11)

—Muffler. (→ Chapter 2)

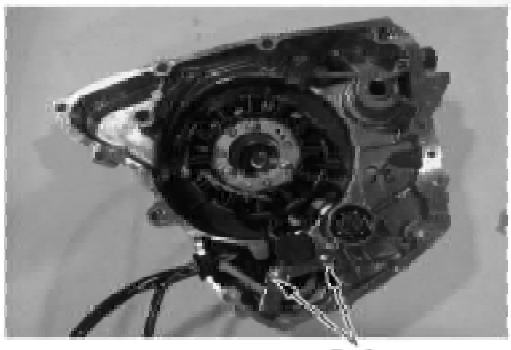
— Right side cover. (→ Chapter 11)



Warning

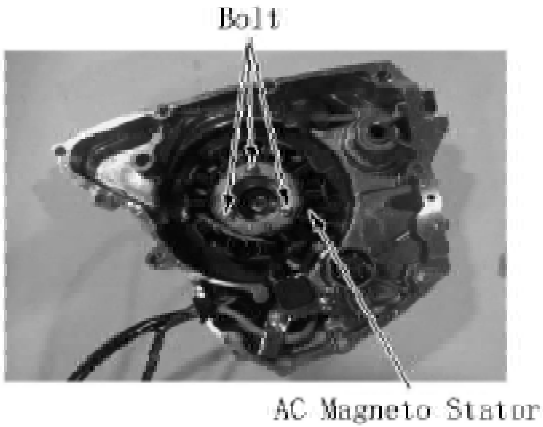
Stator is installed on the right side cover and is attached by the magnet of rotor. Be careful not to hurt the fingers when removing.

Loosen bolt, remove AC magneto stator and pickup.



Installation

Reverse the removal procedure for installation.



Ignition coil

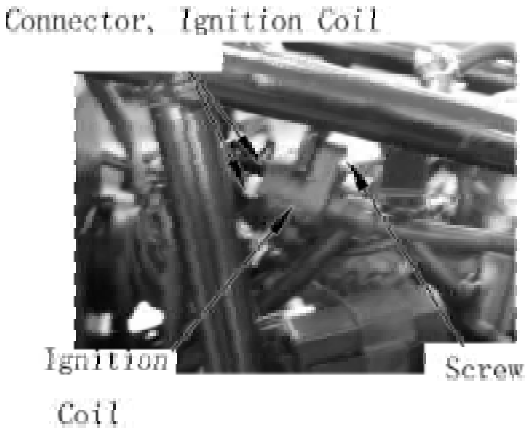
Disassembly

Remove left ornament panel (→2-5)

Remove spark plug cap

Disconnect primary terminal of ignition coil.

Loosen bolt, and remove ignition coil.



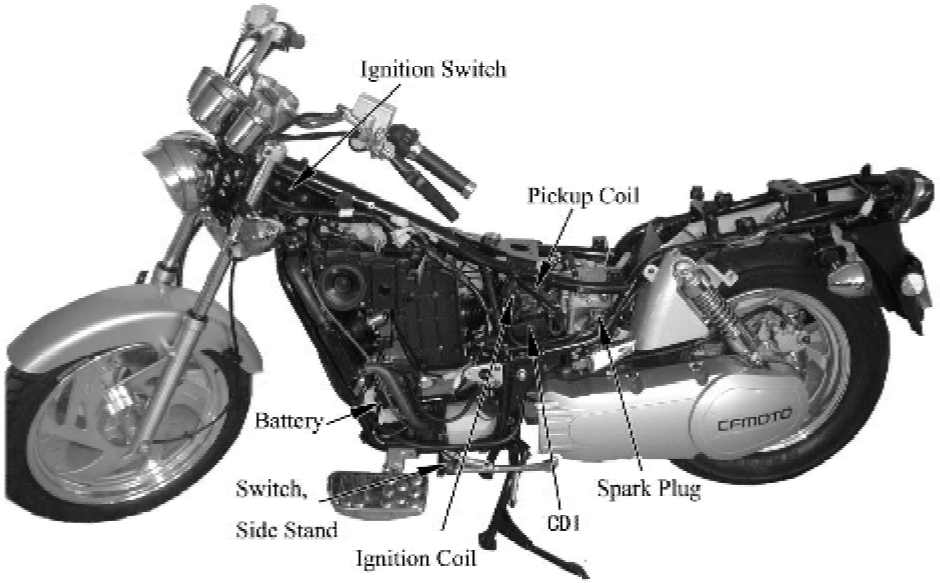
Installation

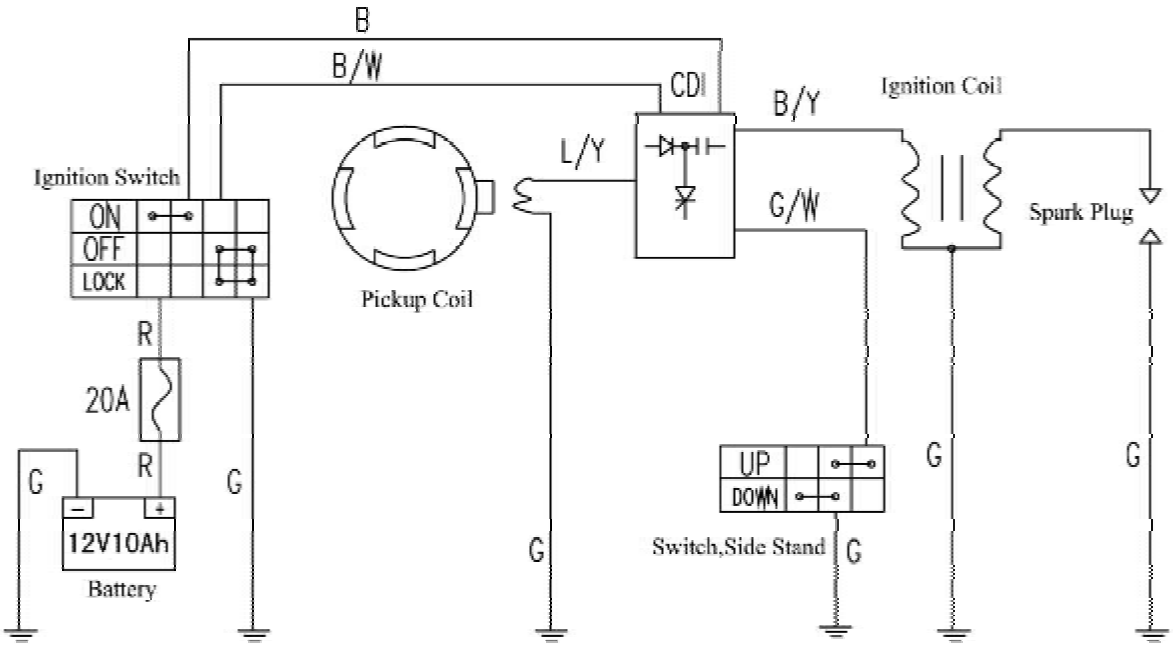
Reverse the removal procedure for installation.

Notes

Routing of wires, pipes and cables should pass properly (→Chapter 1-20).

Ignition System Diagram





Chapter17 Electrical Start System, Overriding Clutch

Overhaul information

Note:

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

Overhaul Standard

Item		Standard	Service Limit
Brush length		12.0-12.5mm	11.0mm
Brush Spring Force		680-920g	670g
Driven Gear, Starting motor	Inner Diameter	22.026-22.045 mm	22.10 mm
	Outer Diameter	42.175-42.2 mm	42.15 mm
Inner diameter of separating device, overriding clutch		58.899-58.925 mm	58.96 mm

Troubleshooting

Starting motor does not run

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

Starting motor is too weak.

• Insufficient Battery.
• Faulty contact of wire harness, couplers and terminal posts;
•Foreign matters in the motor or starting gear.

Starting motor runs but engine does not run

•Faulty overriding clutch
• Faulty dual gear of starter motor
•Improper installation of flywheel

Starter relay

Remove right speaker cover. (→2-9)
Hold brake lever and turn main switch to ON.
Press start button.
If the clatter sound can be heard, starter relay coil is normal.

Disconnect "+" wire with battery.
Disconnect "+" wire from starter relay with battery.
Disconnect starter relay connector and remove starter relay.
Connect "+"pole of a 12V battery with the Yellow/Red Terminator of starter relay.
Connect "-"pole of battery with green terminator of starter relay.

Note:

Avoid short circuit.

Check if the terminators of starter relay are conducted when connected with battery.
In case the terminators are always conducted or if they are not conducted, replace with a new one.

Electric Starting Motor

Removal

Remove engine (→Chapter 7)
Remove 2 fixing bolts and remove starting motor.

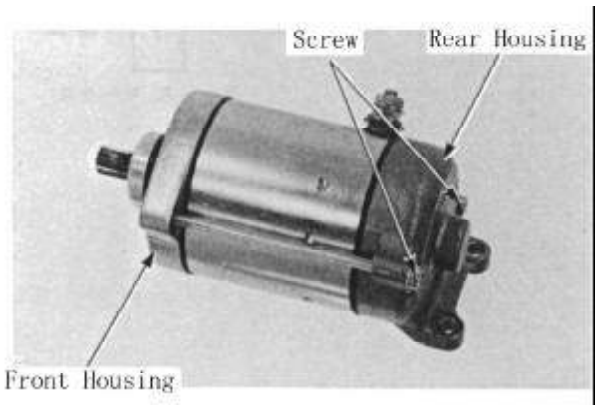
Disassembly

Remove 2 screws.
Remove front and rear cover.
Remove thrust washer and spacer.

Note:

Check position and numbers of thrust washer.

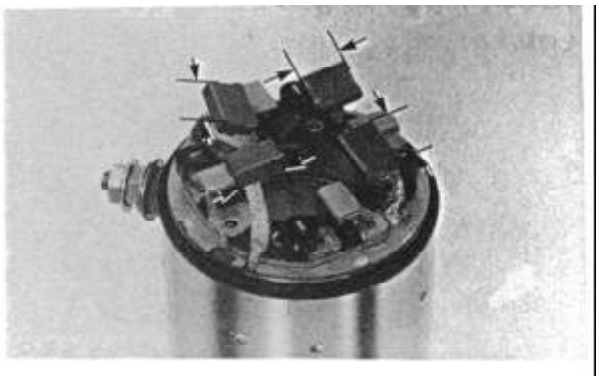
Remove armature and brush holder.



Inspection

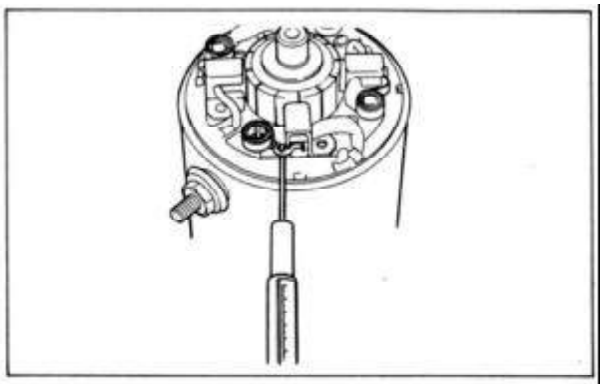
Measure brush length

Service Limit: < 11.0mm → Replace



Measure brush spring force:

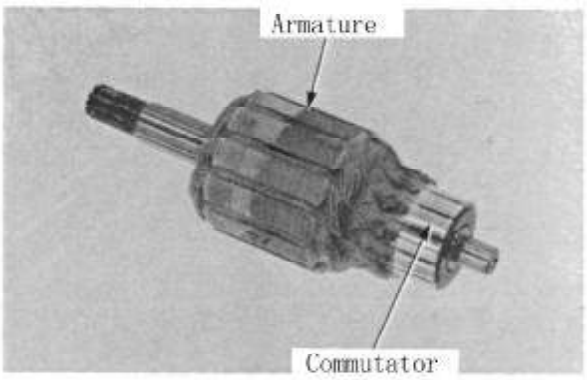
Service Limit: < 670g → Replace



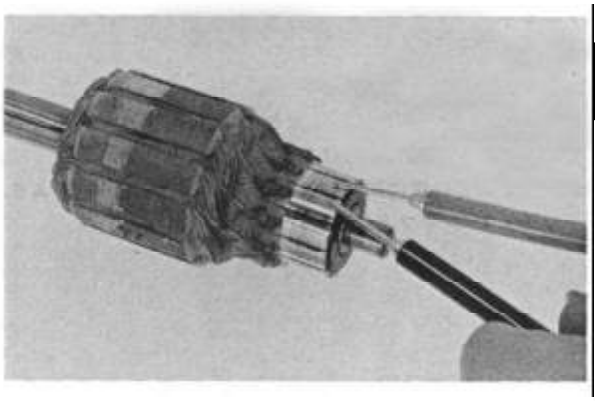
Check commutator color.

If color changes with more than two commutators,short circuit will be caused.

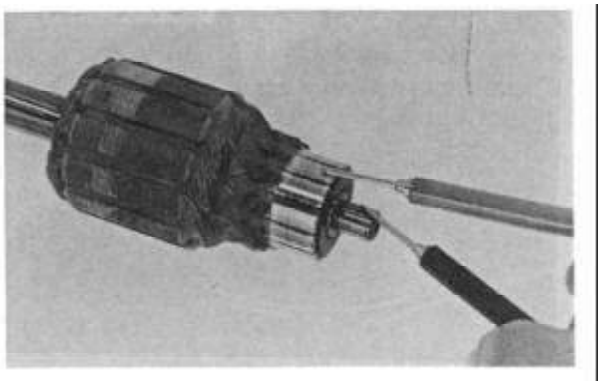
Replace the armature.



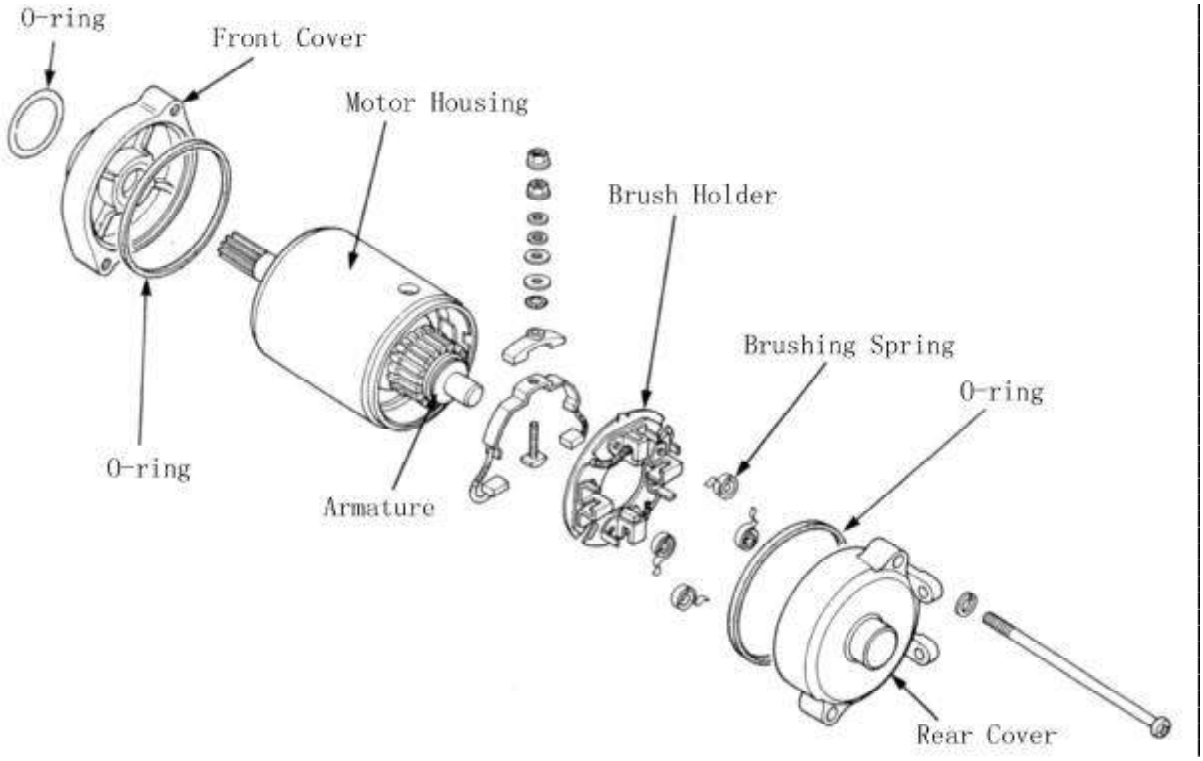
Make sure commutators are well connected.



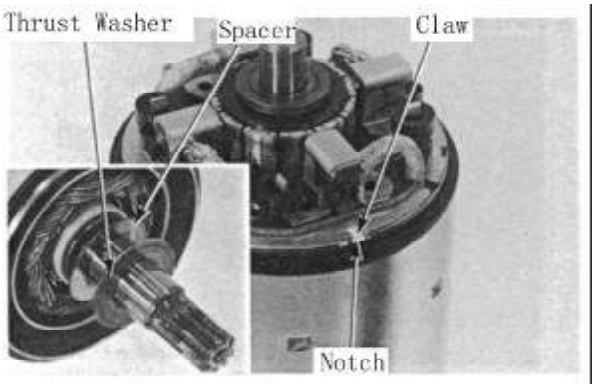
Make sure armature shaft is not conducted with commutators.



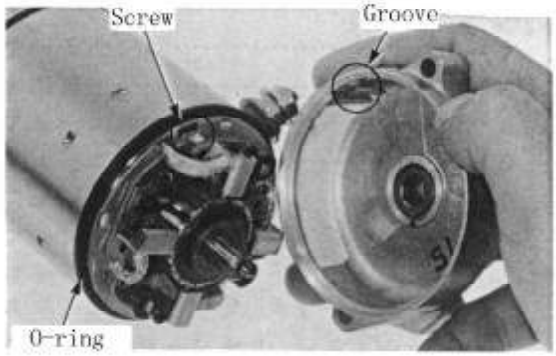
Installation



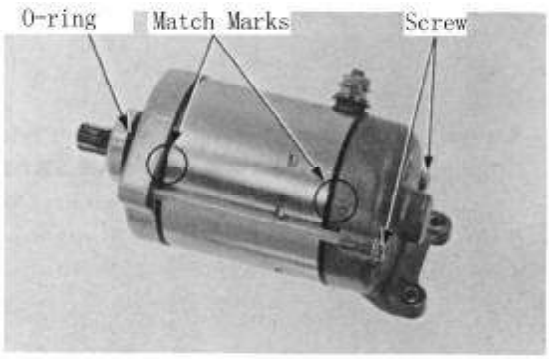
Install armature to motor housing.
Press brush into the brush holder, while install brush holder on the commutator.
Align notch of motor housing to the claw of brush holder.
Install brush holder to motor housing.
Install the same number of thrust washer, spacer to armature shaft in the same position as when disassembly.



Install O-ring to motor housing.
Apply a bit of grease to O-ring.
Align the groove of rear cover with brush holder pin and assemble.



Align the match marks of front and rear covers.
Tighten screw.
Install O-ring to front cover



Installation

Notes:

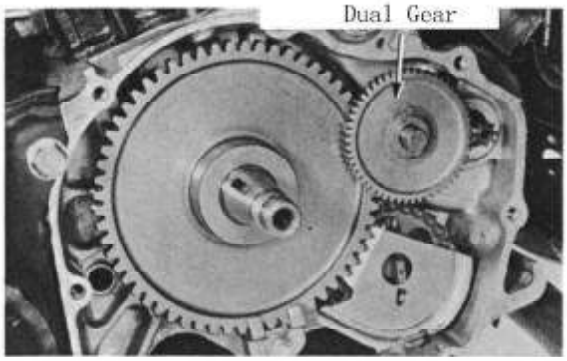
Connect the wire and confirm the rotating.direction before installing the starter motor on the engine.

Reverse the removal procedure for installation.

Overriding clutch

Disassembly

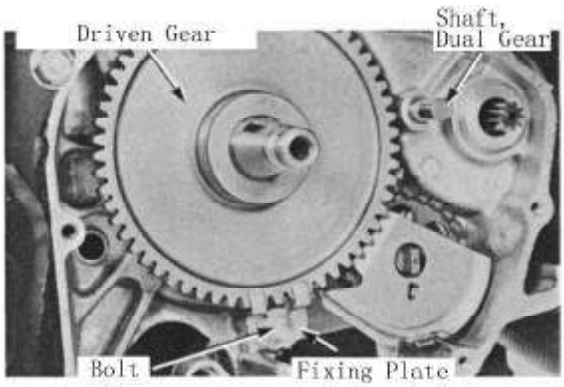
Remove dual gear



Remove dual gear shaft.

Remove bolt and fixing plate.

Remove driven gear.



Inspection

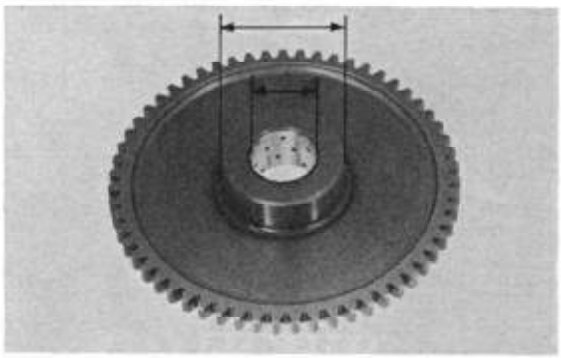
Check driven gear for wearing or damage.

Measure inner and outer diameters of driven gear.

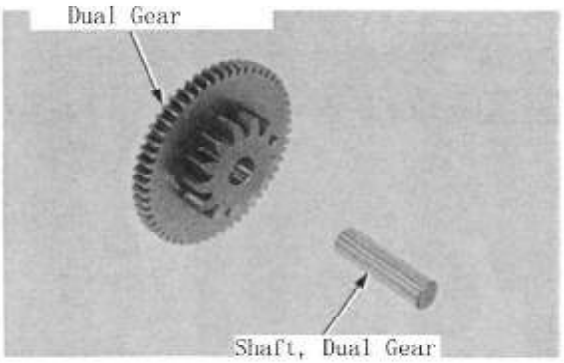
Service Limit:

Inner diameter: > 22.10mm →Replace

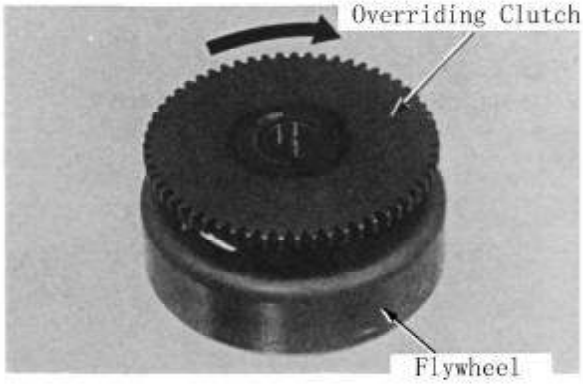
Outer Diameter:< 42.15mm →Replace



Check dual gear, dual gear shaft for wearing or damage.

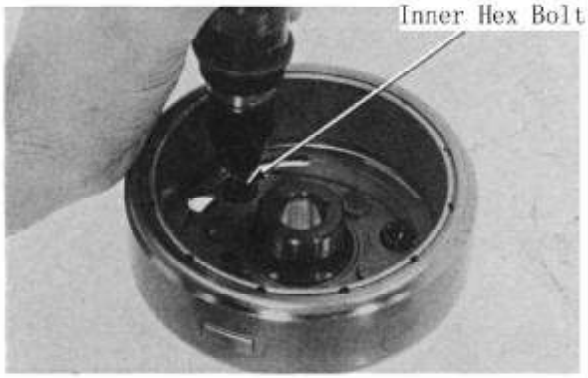


Install driven gear onto overriding clutch.
Check performance of overriding clutch.
Hold flywheel and make sure driven gear can only turn clockwise.



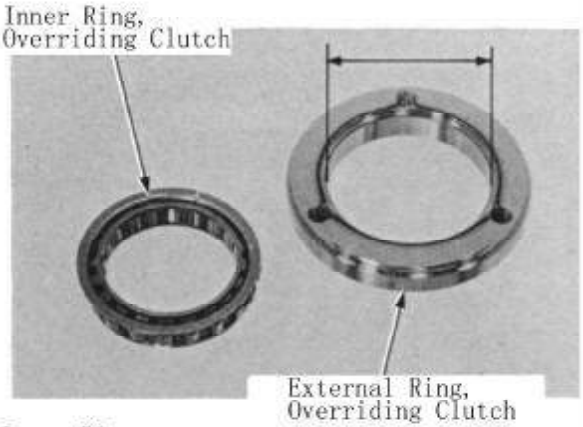
Disassembly

Remove three inner hex bolts.
Remove overriding clutch and separator.



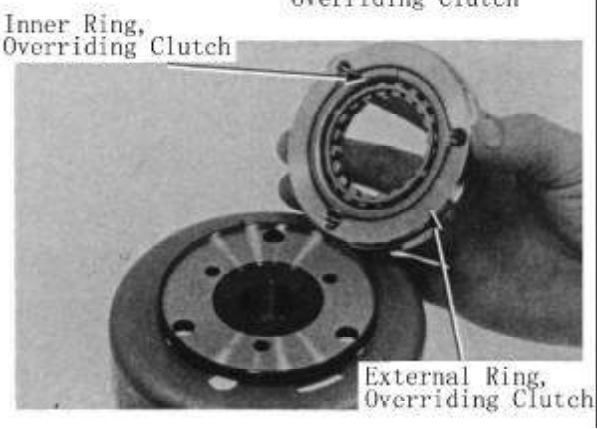
Check overriding clutch and separator for wearing or damage.

Measure separator inner diameter.
Service Limit: > 58.96mm → Replace



Install overriding clutch to separator.
Install overriding clutch unit to flywheel and tighten inner hex bolts.
Tightening Torque: 2.8~3.2kgf · m

Apply glue to screw part of bolts.



Overhaul information

Operation Instruction

Warning

•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 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 hot spot 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 OFF position, and replace after the bulb is cooled down.

—Replace the bulb with hands in clean gloves to avoid oil stains on the glass surface.

—Clean the glass with a piece of clean cloth dipped in alcohol or isoamyl acetate 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. Refer to 1-20.

•For removal and installation of taillight and rear turning lights, refer to chapter 2.

Overhaul standard

Item		Standard
Fuse	Main	20A
	Sub-fuse	5A×2 10A×2
Light, bulb	Headlight (Hi/Lo)	12V-35/35W
	Taillight/brake light	12V-5/21W
	Turning light	12V-10W×4
	Dashboard indicator	12V-1.7W
	Indicators	12V-3.4W

Troubleshooting

Head light cannot turn on

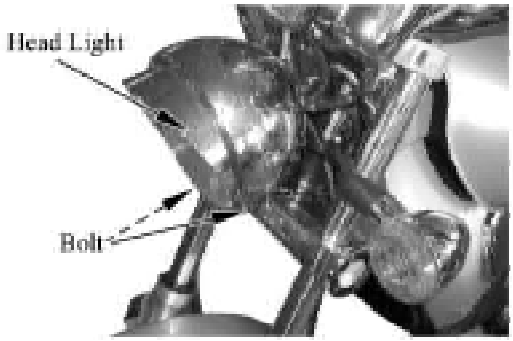
•Fuse break

•Open circuit with main cable

•Bulb burnt

•Night switch is damaged

Replacing bulb

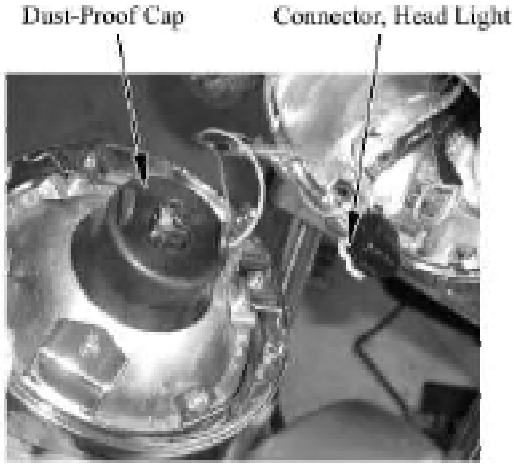


Head light bulb

Warning

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 headligh.(→ 18-5）

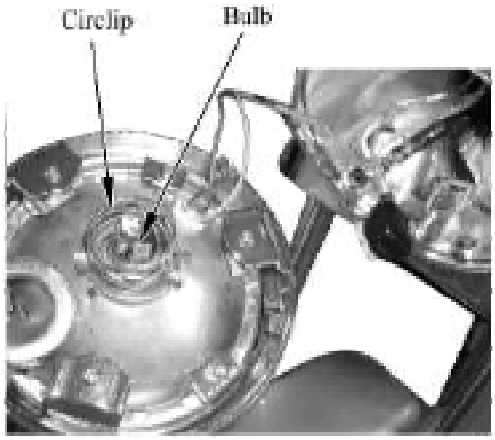


Disconnect headlight

Remove dust-proof cap, head light clamp,
pull out socket and replace with a new bulb.

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.（→ 3-17）

Inspection of headlight

Turn the ignition switch to ON position, turn light switch to the illuminating position and check if the headlight is on.

ON: Normal

Off: Breaking or short circuit of main cable.

Brake light/Tail light bulb

Remove 2 tapping screws, tail light cover.

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

Replace light/tail light bulb

Bulb Specification:12V-21/5W

Reverse the removal procedure for installation.

Turning Light Bulbs

Remove screw

Remove Rear turning light cover

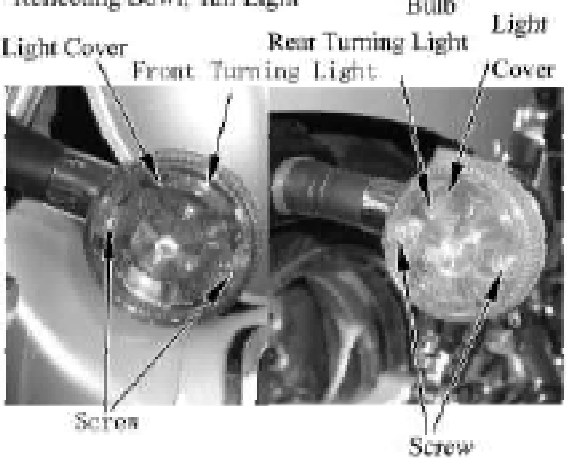
Replace turning light bulbs.

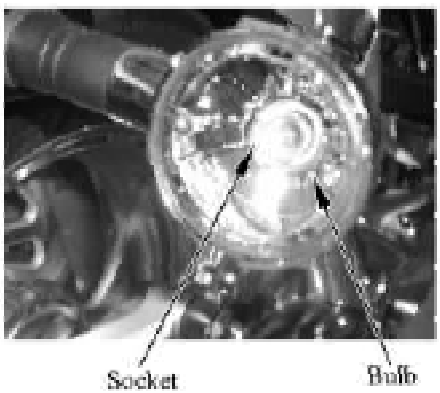
Bulb Specification:12V-10W

Repeat above steps for replacing front turning light bulbs.

Bulb Specification:12V-10W

Reverse the removal procedure for installation.



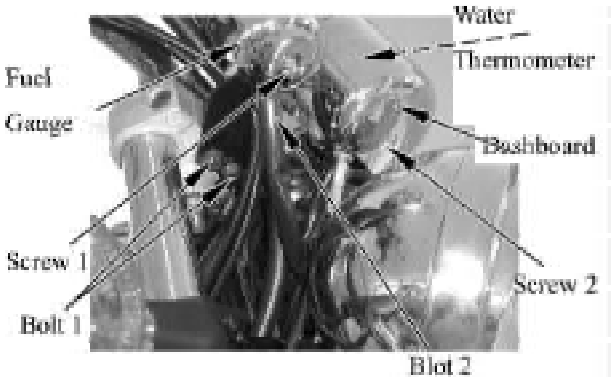


Dashboard, Fuel Gauge , Water Thermometer Illuminating Bulb

Remove fixing bolt 1, fuel gauge and fixing screw 1, fuel gauge fairing

Remove fixing bolt 2, dashboard and fixing screw 2, dashboard fairing

Repeat above steps of fuel gauge for replacing water thermometer Illuminating bulbs.



Remove bulb socket and replace with new bulbs.

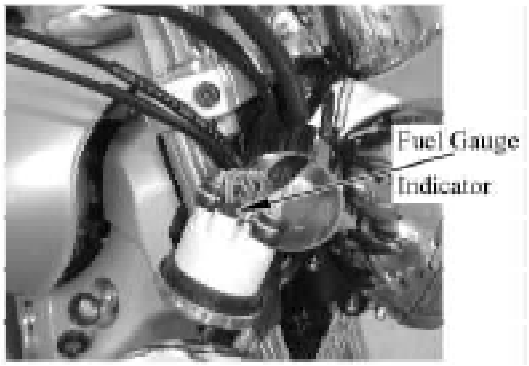
Bulb specification:12V-1.7W

Note:

Main cable and wires should be routed properly

（→ 1 - 2 0 ）

Reverse the removal procedure for installation.



Dashboard Indicating Bulb

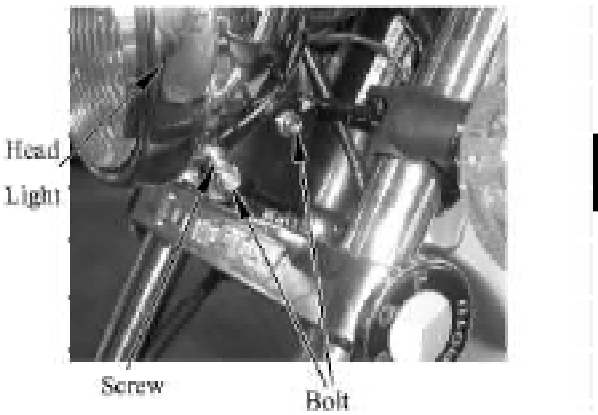
Repeat steps of dashboard Illuminating bulb for replacing dashboard bulb

Remove dashboard indicator socket.

Remove indicating light bulb and replace with new one.

Bulb specification: 12V-3.4W

Reverse the removal procedure for installation.

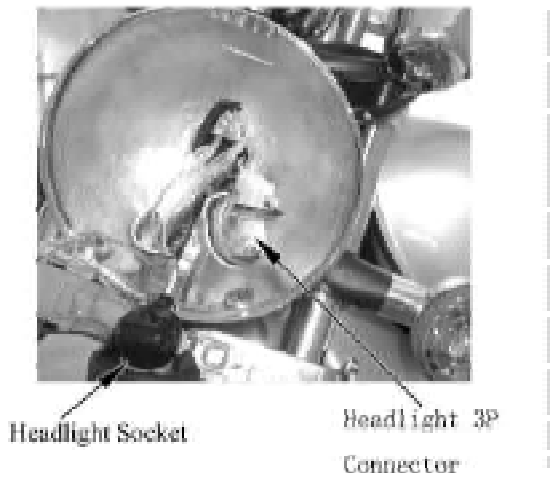


Headlight

Remove fixing bolts, head light front fairing

Disconnect headlight connector with front indicator light connector.

Reverse the removal procedure for installation.



Note

Be careful not to damage main cable when assembling.

After replacing, adjust the headlight beam.（→ **3-17**）。

Note

main cables and wires should be routed properly（→ **1-20**）

Ignition Switch Lock

Inspection

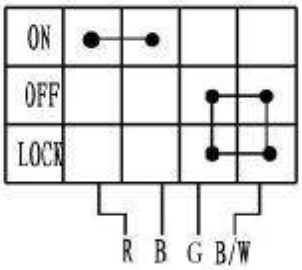
Remove:

—Fuel Tank（→ **2-13**）

Disconnect 4P connector of ignition switch lock

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

● - ● means proper connection

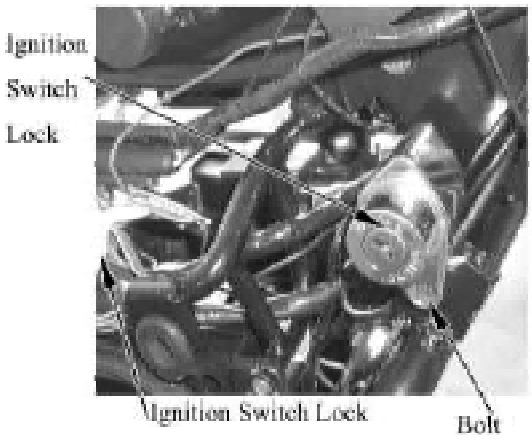


Disassembly

Remove fuel tank（→**2-13**）

Remove protection panel (RH) (→2-5)

Disconnect ignition switch lock 4P connector.



Remove bolt and ignition switch lock.

Reverse the removal procedure for installation.

Handlebar Switch

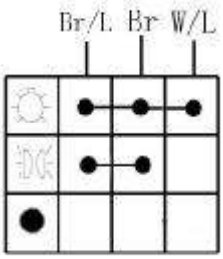
Remove fuel tank (→2-13)

Disconnect left and right handlebar switches.

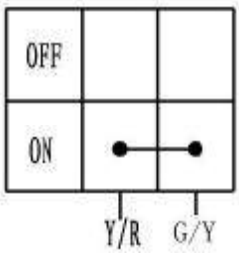
Check according to the following table if the coupler terminals are connected.

¡ ñ —● means proper connection

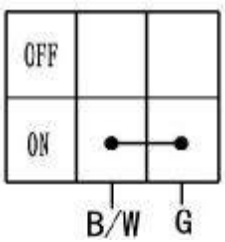
Illuminating Switch



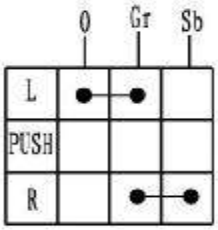
Starter Switch

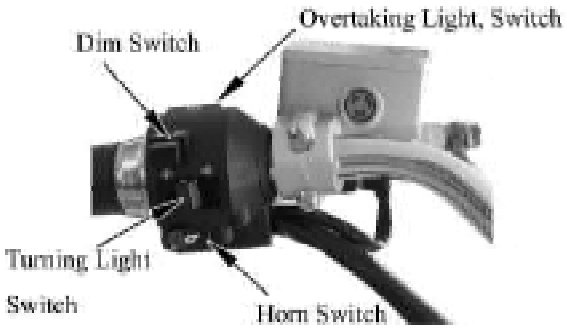


Kill Switch

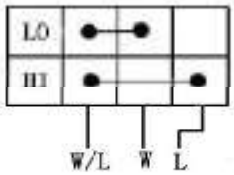


Turning Light Switch

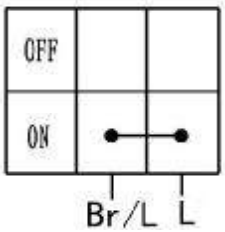




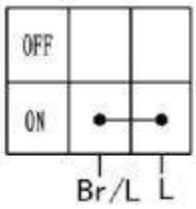
Dim Switch



Horn Switch



Overtaking Light Switch



In case of any abnormal found in above check, replace handlebar switch（→ 13-14）

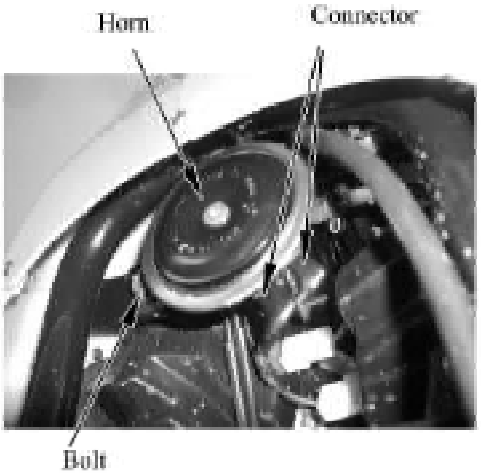
Brake Light Switch

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

Hold the brake lever——Connected.

Release the brake lever—Disconnected.

In case of any abnormal found in above check, replace brake light switch.



Horn

Inspection

Remove vent panel (→2-4)

Disconnect horn.

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

In case no hooter, replace with a new horn.

Removal and Installation

Remove vent panel（→2-4）
Disconnect horn.
Remove fixing bolt and horn.

Reverse the removal procedure for installation.

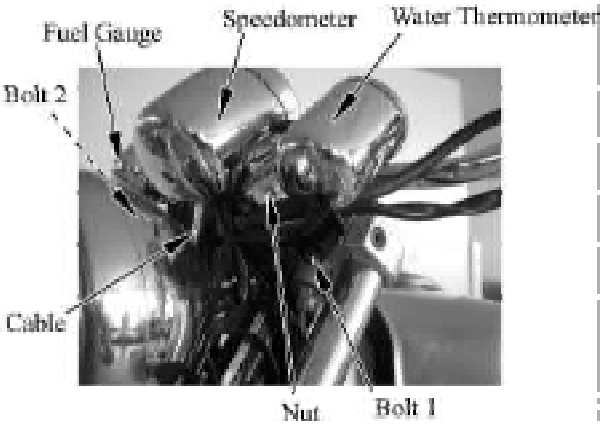
Dashboard

Note

Before inspection, make sure if the speedometer cable comes off or breaks.

Securely support front wheel with a jack.

Turn the front wheel fast and check if the speedometer pointer turns.
In case of any abormal found in above check, replace speedometer.



Removal and Installation

Remove dashboard fixing bolt.
Remove headlight fairing (→18-5)
Disconnect dashboard wire connector and remove cable.
Remove dashboard

Reverse the removal procedure for installation.

Caution:

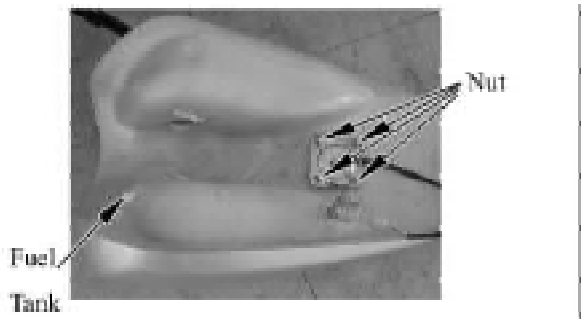
Main cables and wires should be routed properly.

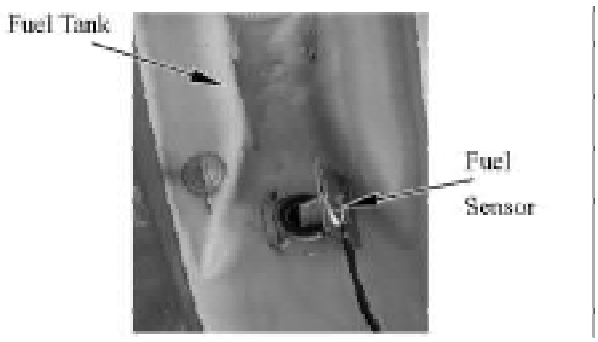
Fuel Sensor

Remove:

—Fuel tank (→2-13)

—4 fixing nuts and sensor from fuel tank





Inspection

Remove fuel sensor (refer to above steps)

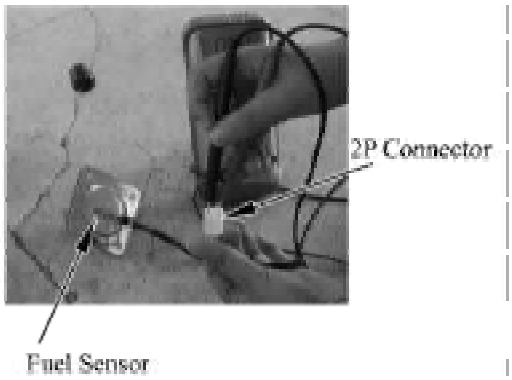
Connect 2P connector

Turn ignition switch to ON

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

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

Remove fuel sensor 2P connector



Connect multimeter between 2P connector terminals.
Shake float with hand and measure the resistance of float at different positions.

Connection terminal:

Float position:

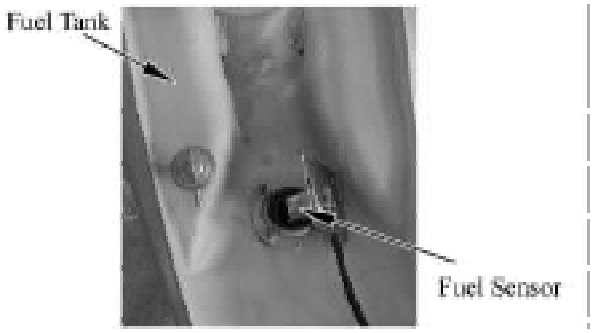
Upper:

Yellow/White-Green: 10±2Ω(20℃)

Lower:

Yellow/White-Green: 100±4Ω(20℃)

Replace the fuel sensor in case of any problems found.



Installation

Put fuel sensor into installation hole of fuel tank.
Fuel sensor should be fitted properly. No fuel leakage is allowed.

Connect with fuel sensor 2P connector.

Inspection of Fuel Level Gauge

Switch on power supply and check if fuel level gauge functions normally.
If fuel level gauge works normally, reverse the removal procedure for installation of plastic parts and seat.

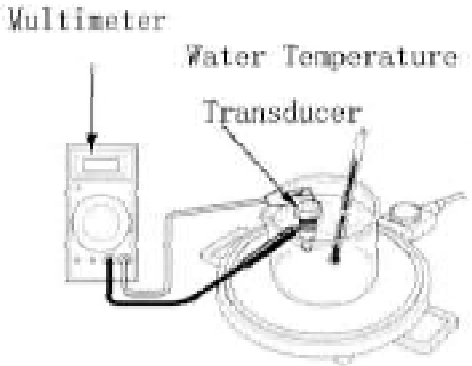
Water Temperature Transducer

Warning

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

Warning

·Coolant must reach the switch thread, and the depth from vessel bottom to sensor top should be over 40 mm.
·Keep liquid temperature for three minutes before measuring, and do not raise temperature sharply.
The thermometer should not contact the vessel bottom.



Disassembly

Remove rear right ornament panel（→ 2-5）
Disconnect from connector and remove transducer.
Put the transducer into a vessel with coolant, slowly heat up the liquid and measure the transducer resistance.

Temperature	Resistance
50℃	154 ± 16 Ω
88℃	52 ± 4 Ω
100℃	27 ± 4 Ω
120℃	162 ± 4 Ω

Replace the transducer if the measured readings exceed the above datas

Install transducer.
Connect with water temperature transducer connector.

Fill coolant and discharge air.
Reverse the removal procedure for installation of plastic parts and seat.

Starting Enriching Device System

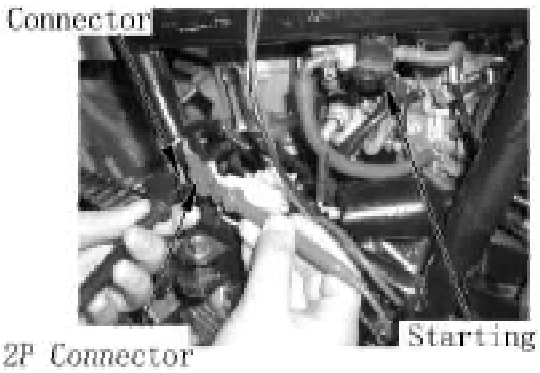
inspection

Warning

Exhaust gas contains toxic contents. Do not run the engine for a long time in a closed or poorly ventilated place.

Note

Inspection should be done after the engine is cooled down.



Unit inspection

Inspection of Resistance

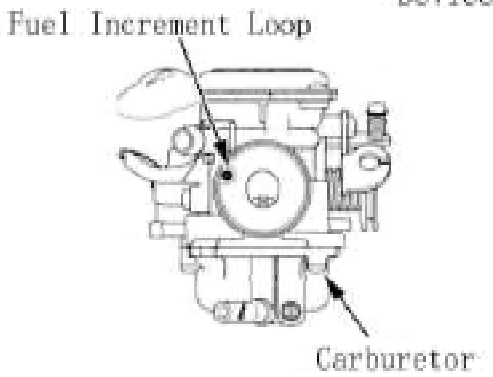
Note

The inspection of resistance can be done without removing the carburetor.

Disconnect 2 connector of starting enriching device.

Measure resistance between connector terminals

Standard value: 19.5 — 21.5 Ω（20℃）



Inspection

Remove carburetor（→ 5-3）

Connect ethylene pipe to fuel increment loop

Check that when the carburetor is cold, there is air current in the carburetor when blowing.

The fuel increment loop is fully open.

Connect the fully charged battery between connector terminals for 5 minutes.

There isn't air current in the carburetor when blowing

The fuel increment loop is fully closed.

If any fault found in the above inspection, replace the starting enriching device or check the carburetor for clog.（→ 5 - 4 ）

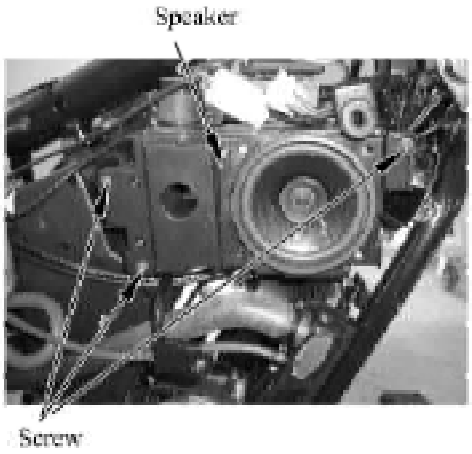
Audio System

Disassembly

Note

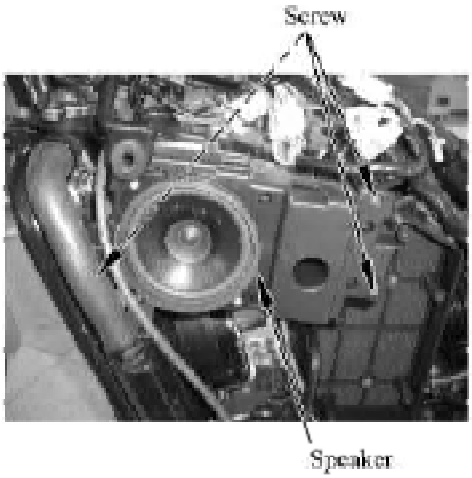
Main cable, wiring should be routed properly.

Remove right speaker cover (→2-6)



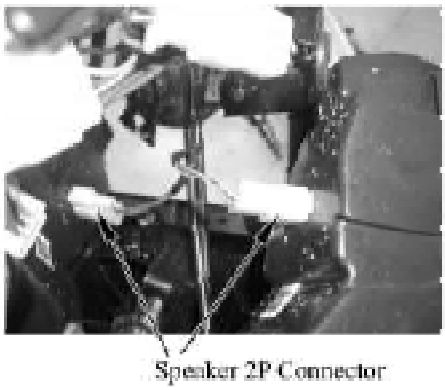
Remove 3 fixing screws.Remove right speaker.

Disconnect 2P connector.



Repeat above procedure for removal of left speaker.

Reverse the removal procedure for installation.



Disassembly of MP3 Player

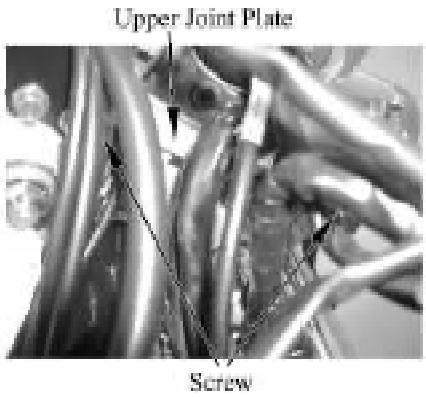
Note

Main cable, wiring should be routed properly.

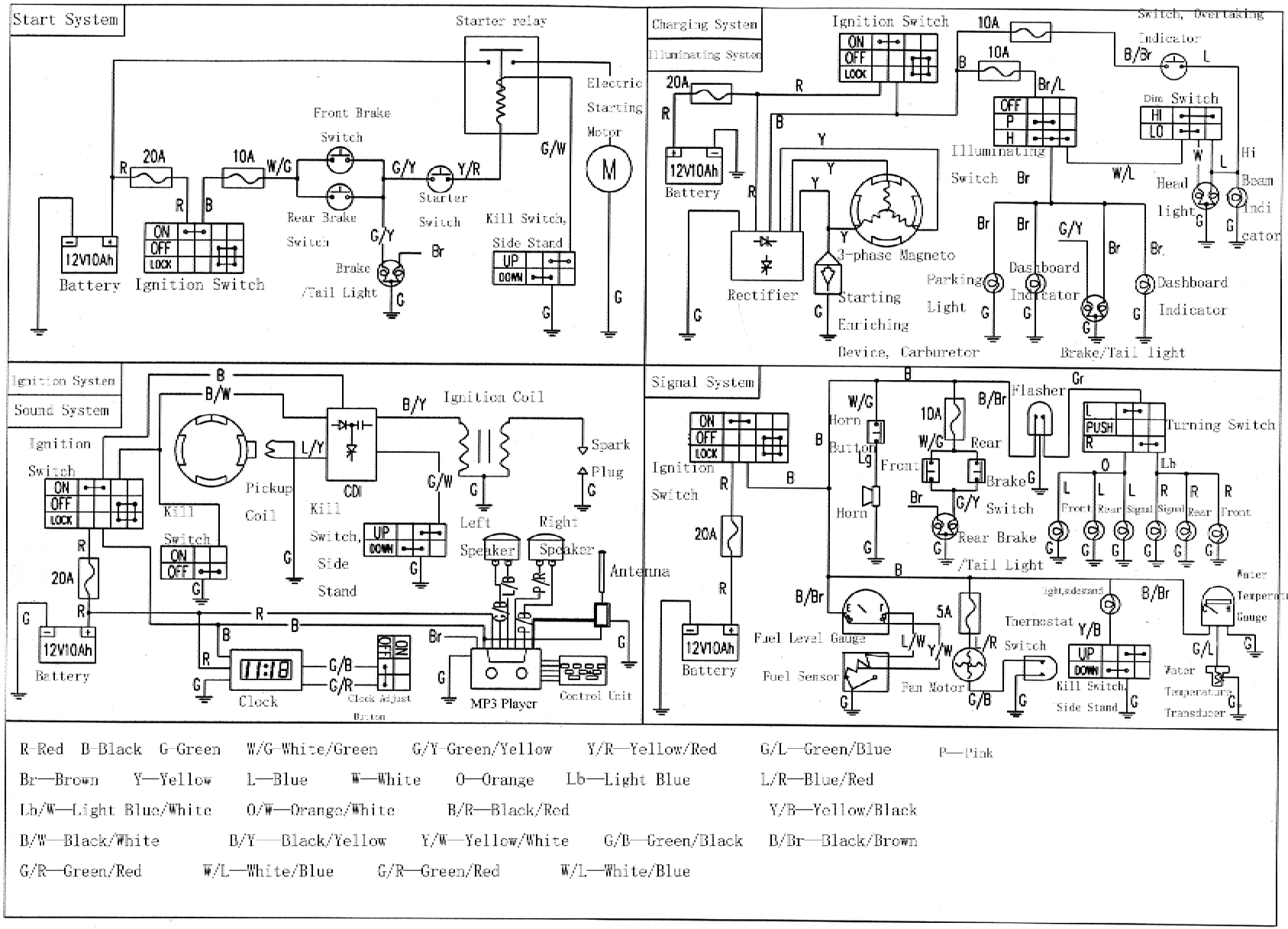
Remove 4 fixing screws and handlebar

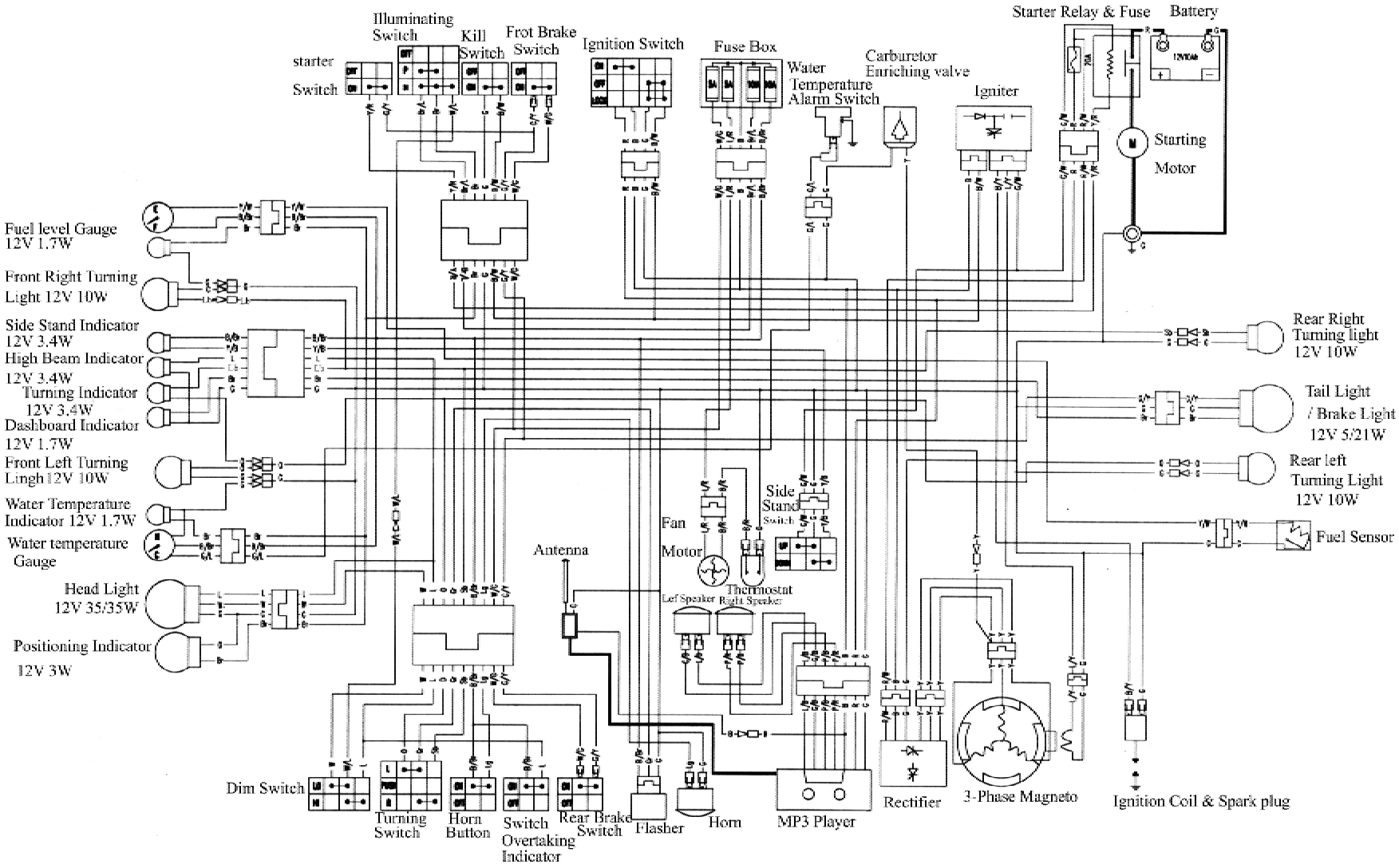
Remove 2 mp3 fixing screw and slip mp3 player from upper joint plate basipetally.

Disconnect mp3 player harness connector and antenna connector.



Reverse the removal procedure for installation.


Start System
Starter relay
Electric Starting Motor
Front Brake Switch
Rear Brake Switch
Starter Switch
Kill Switch, Side Stand
Brake /Tail Light
Battery
Ignition Switch
Charging System
Illuminating System
Ignition Switch
Switch, Overtaking Indicator
Dim Switch
Illuminating Switch
Head light
Hi Beam Indicator
Battery
3-phase Magneto
Rectifier
Starting Enriching Device, Carburetor
Parking Light
Dashboard Indicator
Brake/Tail light
Ignition System
Sound System
Ignition Switch
Ignition Coil
Pickup Coil
CDI
Kill Switch
Kill Switch, Side Stand
Spark Plug
Left Speaker
Right Speaker
Antenna
Clock
Clock Adjust Button
MP3 Player
Control Unit
Signal System
Horn Button
Horn
Flasher
Turning Switch
Front
Rear
Brake Switch
Rear Brake /Tail Light
Fuel Level Gauge
Fuel Sensor
Fan Motor
Thermostat Switch
Kill Switch, Side Stand
Water Temperature Gauge
Water Temperature Transducer
R—Red B—Black G—Green W/G—White/Green G/Y—Green/Yellow Y/R—Yellow/Red G/L—Green/Blue P—Pink
Br—Brown Y—Yellow L—Blue W—White O—Orange Lb—Light Blue L/R—Blue/Red
Lb/W—Light Blue/White O/W—Orange/White B/R—Black/Red Y/B—Yellow/Black
B/W—Black/White B/Y—Black/Yellow Y/W—Yellow/White G/B—Green/Black B/Br—Black/Brown
G/R—Green/Red W/L—White/Blue G/R—Green/Red W/L—White/Blue



R=Red B=Black G=Green W/G=White/Green G/Y=Green/Yellow Y/R=Yellow/Red G/R=Green/Red W/L=White/Blue L/R=Blue/Red Y/B=Yellow/Black B/Br=Black/Brown

Br=Brown Y=Yellow L=Blue W=White O=Orange Lb=Light Blue Y/W=Yellow/White G/B=Green/Black G/R=Green/Red W/L=White/Blue G/L=Green/Blue

Lb/W=Light Blue/White O/W=Orange/White B/R=Black/Red B/W=Black/White B/Y=Black/Yellow Y/W=Yellow/White G/B=Green/Black G/R=Green/Red W/L=White/Blue

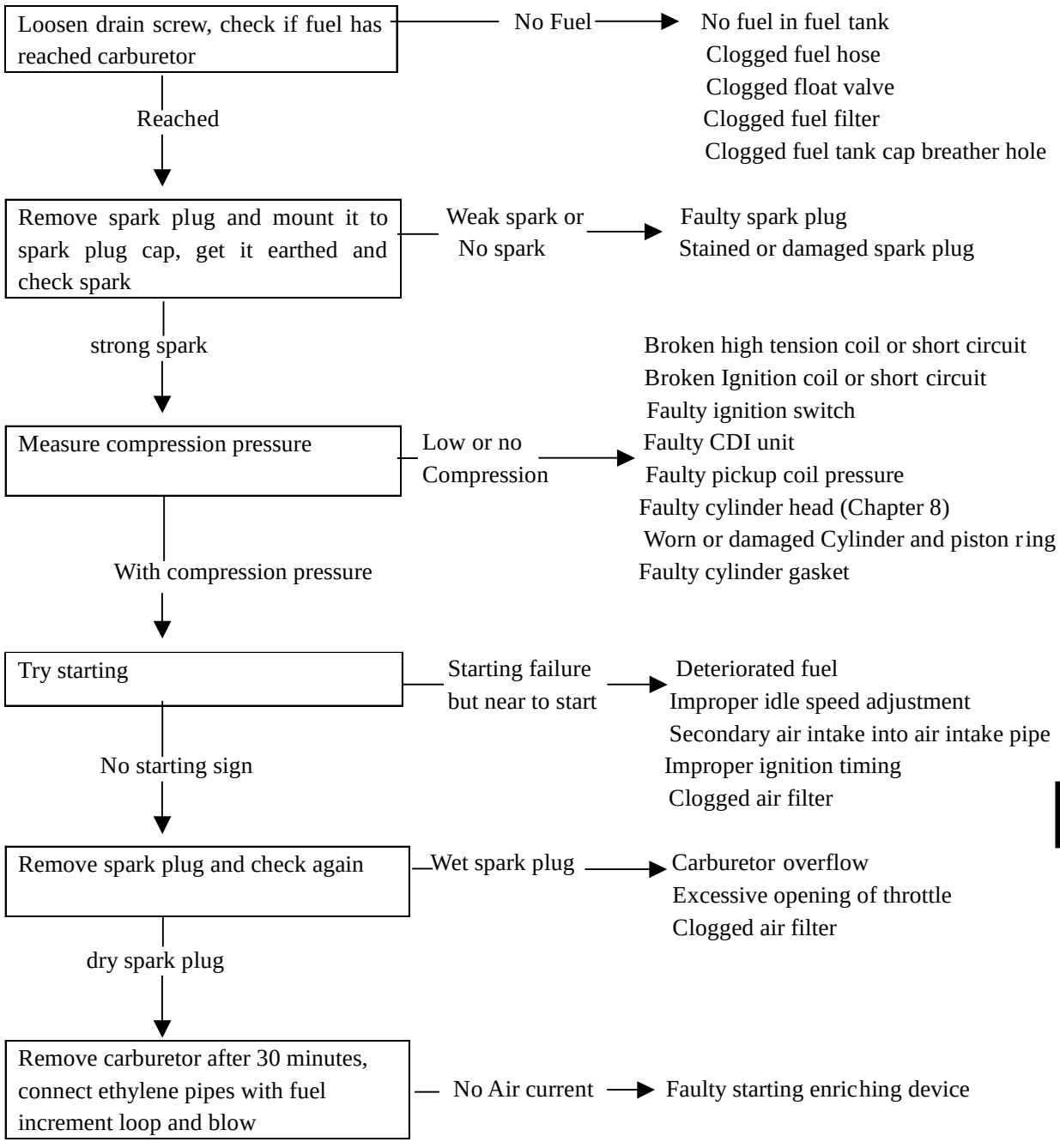
Chapter 20 Troubleshooting

Operating notice

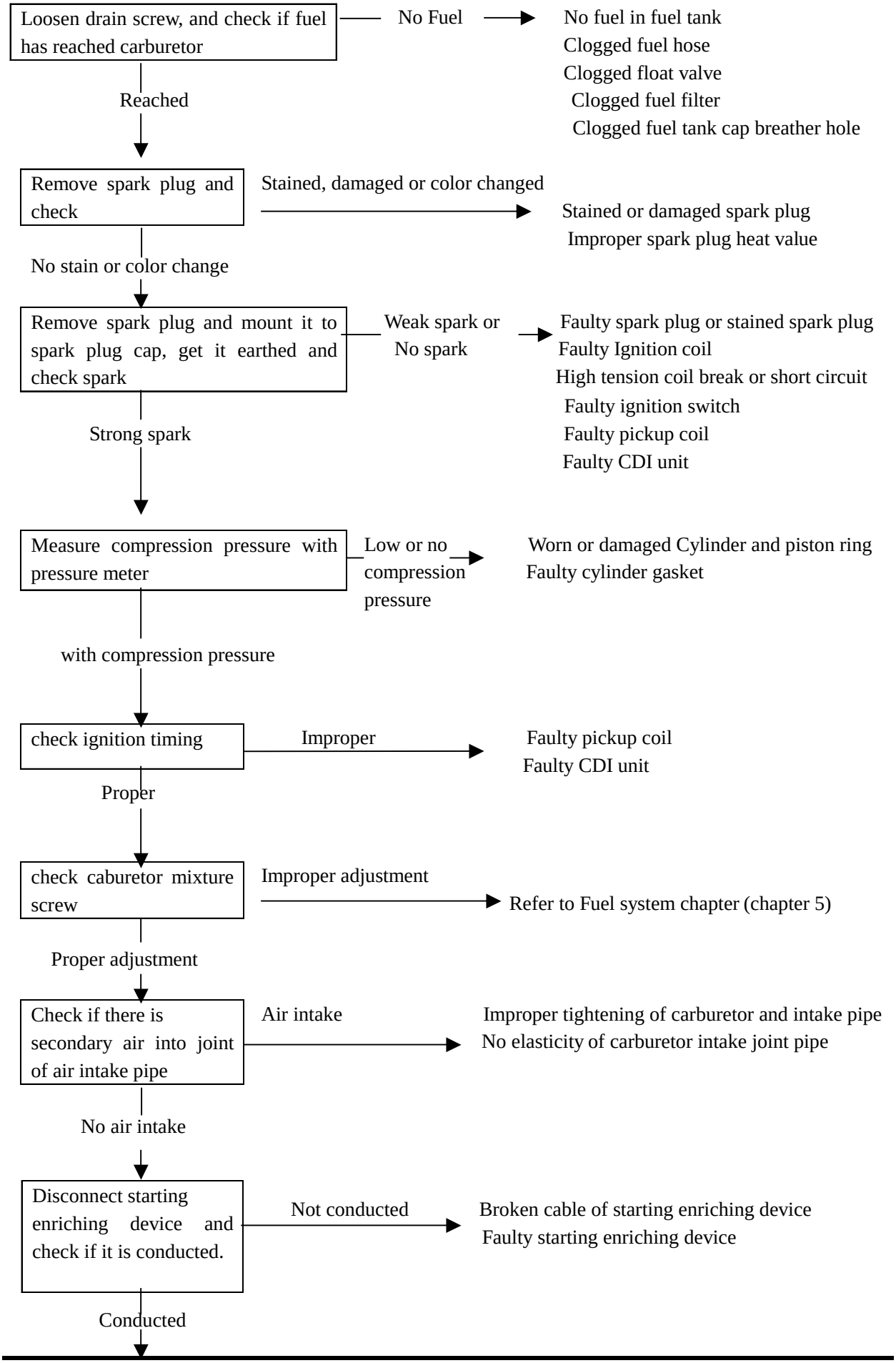
This chapter is a general explanation of major troubleshooting of the whole engine.
Refer to the relevant chapters for troubleshoo ting not listed in this chapter.

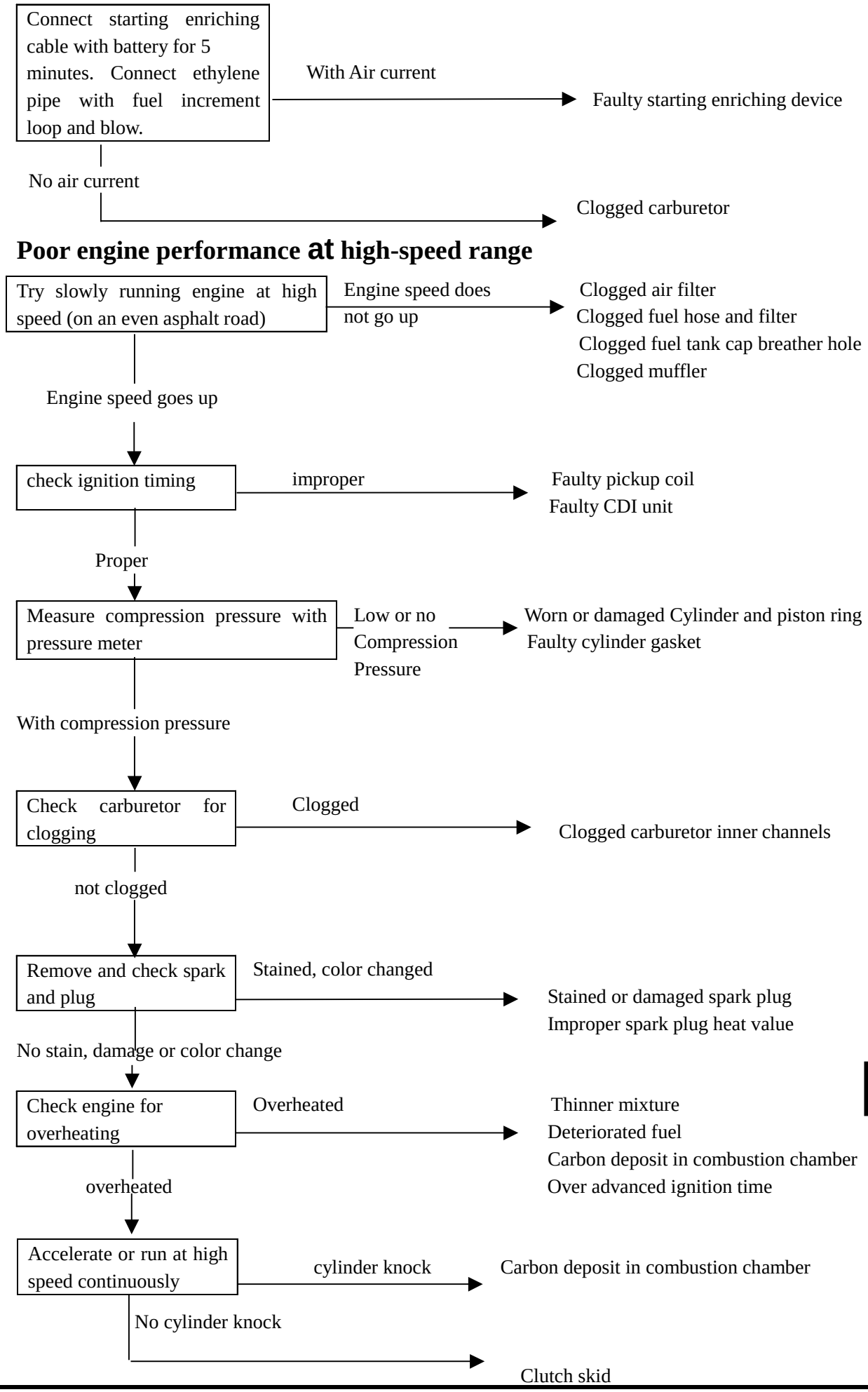
Starting failure/hard starting

In case of starting failure or hard starting, refer to chapter 17 and check the starting system.

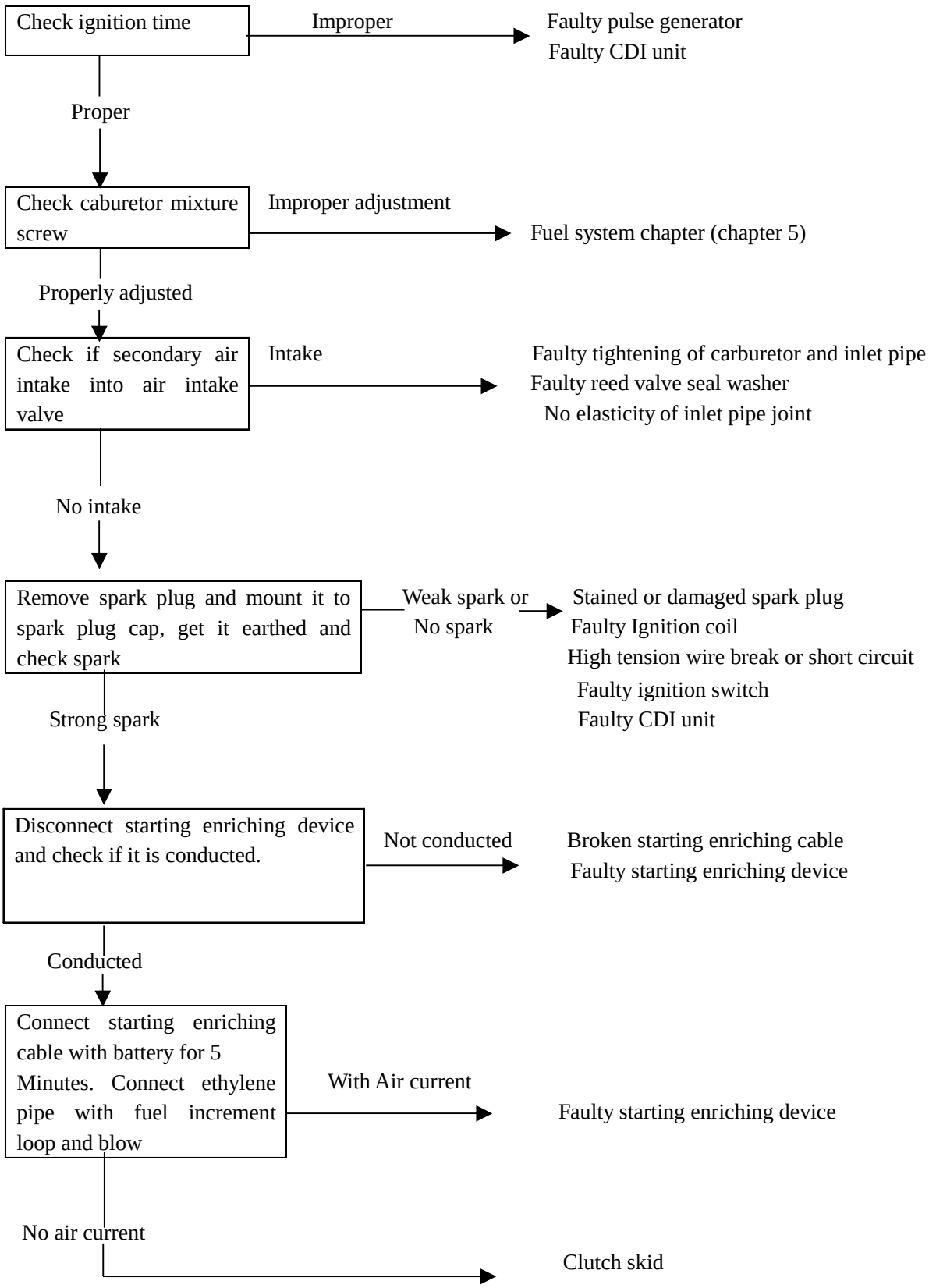


Unstable engine running or engine stops




Connect starting enriching cable with battery for 5 minutes. Connect ethylene pipe with fuel increment loop and blow.
With Air current
Faulty starting enriching device
No air current
Clogged carburetor
Poor engine performance at high-speed range
Try slowly running engine at high speed (on an even asphalt road)
Engine speed does not go up
Clogged air filter
Clogged fuel hose and filter
Clogged fuel tank cap breather hole
Clogged muffler
Engine speed goes up
check ignition timing
improper
Faulty pickup coil
Faulty CDI unit
Proper
Measure compression pressure with pressure meter
Low or no Compression Pressure
Worn or damaged Cylinder and piston ring
Faulty cylinder gasket
With compression pressure
Check carburetor for clogging
Clogged
Clogged carburetor inner channels
not clogged
Remove and check spark and plug
Stained, color changed
Stained or damaged spark plug
Improper spark plug heat value
No stain, damage or color change
Check engine for overheating
Overheated
Thinner mixture
Deteriorated fuel
Carbon deposit in combustion chamber
Over advanced ignition time
overheated
Accelerate or run at high speed continuously
cylinder knock
Carbon deposit in combustion chamber
No cylinder knock
Clutch skid

Unstable idle speed performance



Poor engine performance at middle or high speed