172MM

ENGINE MANUAL

CFMOTO

Technical Specifications

Model			CF250T
Overall length			2265mm
Overall width			745mm
Overall height			1355mm
Wheel base			1625mm
Engine type			172MM
Displacement			244cm^3
Fuel			Gasoline
Dry mass			169kg
Riders			2
mass	Front wheel		106kg
	Rear wheel		172kg
Ground clearance			145mm
Capability	Brake distance		≤7m (30km/h)
	Minimum turning radius		2900mm
Engine	Starting mode		Electric
	Type of engine		Four stroke water cooled
	Cylinder configuration	and	Single, vertical
	Shape of combustion chamber		Semi- sphere
	Valve		OHC chain
	Bore x stroke		72mm x 60mm
	Compression pressure		15.0kg/cm^2-600rpm
	Maximum power		12.5kw/7500rpm
	Maximum torque		17.6N.m/5500rpm
	Valve: Intake valve	Open	BTDC 0^0 (at 1mm)
		Close	ABDC 30^0 (at 1 mm)
	Valve: Exhaust valve	Open	BBDC 35 1mm
		Close	BTDC 5^0 (at 1 mm)
	Clearance	Intake valve	0.1mm (cooled)
		Exhaust valve	0.1mm (cooled)
	Minimum idle speed		1500±150 rpm
	Lubricating system: Lubricating mode		Pressure spray
	Oil pump type		rotor
	Oil filter type		Whole flow filtering
	Oil capacity		1.0 L
Cooling mode			Electric, water cooled

Fuel system	Air filter		Paper element
	Fuel tank capacity		12.0 L
	Carbu: Model		VE14C
	Carbu: Valve diameter		30 mm
	Carbu: Throttle diameter		27 mm
Electrical system	Ignition mode		C.D.I
	Igniting timing		17° BTDC 1500 rpm
	Spark plug		DPR7EA-9 (NGK)
	Electrode gap		0.8-0.9 mm
	Battery capacity		12V/10Ah
Transmission system	Transmission mode from engine to shifter		Engine– Shifter–Clutch
	Reduction ratio from engine to shifter		1.00
	Clutch type		Dry, multi-plate, automatic, centrifugal
	Shifter type		Stepless shifting
	Shifter operating mode		Automatic, Centrifugal
	Shifting ratio (primary)		2.1 – 0.88
	Reductor	mode	Reducing by 2 stages
		1st	2.64
		2nd	2.85
Caster			28^0
Trail			90 mm
Air pressure		Front wheel	175kpa
		Rear wheel	225kpa
Steering angle			≤48^0
Braking mode			Front: Disc Rear: Drum
Suspension		Front wheel	Telescopic
		Rear wheel	Swinging
absorber		Front wheel	Reciprocating
		Rear wheel	Reciprocating

2 Inspection and adjustment

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Inspection and maintenance

Note:

1. The inspection items of operations include of that of high speed running items.
2. [⌘] indicates the specified obligatory checking time. [①] indicates the recommended checking time specified by other manufacturers.
3. [ ] indicates the periodic replacement of safe parts.
4. The words "high speed" in column Judgement Standard mean the running at over 80km/h.

Items of inspection and maintenance			Inspection and maintenance period				Standard	Remark
			Before running	1st month	Used by family: Each 6 month	Used by family: Each 12 month		
Control system	Handle	Clearance and loosing				●		
		Operation conditions				●		
	Wheel	Turning angles in left and right				●		
	Front fork	Damage			●	●		
		Installation conditions of front fork and main shaft			●	●		Steering column
		Loosing of front fork and main shaft bearing				●		Steering column
Brake device	Braking pedal	Clearance and tolerance between the pedal and ground			●	●	20-30mm for pedal mode. 10-20mm for lever mode.	
		Kicking amount and the sound heard	●					
		Braking sound heard		○	●	●		
	Rods and cables	Disconnection, loosing and damage		○		●		
	Hoses and pipes	Leakage, damage and condition		○	●	●		
		Braking hose replacement					☆Each 4 year	
	Reserve tank	Liquid amount	●		●	●	Liquid level height: Front wheel: Above the lower mark.	
	Master cylinder, wheel cylinder and disc caliper	Functions wears and damages				●		
		Replacement of cylinderheads, dust seals and rubber parts					☆Each 2 year	

Items of inspection and maintenance			Inspection and maintenance period				Standard	Remark
			Before running	1st month	Used by family			
					Each 6 month	Each 12 month		
Brake device	Braking drum and shoe	Clearance between the drum and friction disc				●		
		Wears of braking shoes and friction disc				●		Indicator mode
		Wear and damage of braking drum				●	Rear wheel: Dia.130mm. thickness limit:131mm	
	Braking disc and pad	Clearance between disc and pad			○	●		Indicator mode
		Wear of pad				●	Thickness for front wheel: 5mm, Using limit: 4mm	
		Wear and damage of disc				●		
	Braking liquid supply	Braking liquid replacement			●		Each year	
Running device	Wheel	Tire pressure	●		●	●	Unit: kg/cm² One rider normal: Front 1.75, Rear 2.00 One rider High speed: Front 1.75, Rear 2.00 Two riders normal: Front 1.75, Rear 2.25 Tire standard: Front 110/90-12, Rear 120/90-10	
		Cracks and damages of tire	●		●	●		
		Tire thread depth and wears	●		●	●	Remained depth: Front: 0.8mm Rear: 0.8mm	
		Foreign metal chips and other things on tires	●		●	●		
		Loosing of wheel nuts and bolts			●	●	Torque of front wheel: 5.0-7.0kg-m. Torque of rear wheel: 10.0-12.0kg-m.	Wheel axle nuts.
		Rims side ring and wheel disc		○		●	Front rim wobbling:: Transverse : 2.0mm. Longitudinal : 2.0mm. Rear rim wobbling: Transverse: 2.0mm. Longitudinal: 2.0mm.	
		Loosing of front wheel				●		
		Loosing of rear wheel				●		

2 Inspection and adjustment

Items of inspection and maintenance			Inspection and maintenance period				Standard	Remark
			Before running	1st month	Used by family			
					Each 6 month	Each 12 month		
Damping device	Chassis springs	Damages				●		Absorber springs
	Suspension arm	Loosing and damage of arms				●		
	Absorbers	Leakage and damage				●		
		Loosing of connections				●		
Transmission device	Clutch	Functions		○	●	●		
	Transmission	Leakage and oil amount			●	●	Oil amount: filling to the oil hole.	Rear wheel gear box.
	Oil supply	Oil replacement of rear wheel gear box					Each 3 year	
	Others	Clean of belt housing and air filter				○		
Electric device	Ignition device	Spark plug condition			●	●	Electrode gap: 0.8-0.9mm DPR7EA-9(NGK)	
	Battery	Terminal connection				●		
	Wiring conditions	Loosing and damage of connecting				●	☆Each 4 year	
Engine	Engine body	Matching and un-normal sounds			●	●		
		Low speed and accelerating conditions		○	●	●	Idle : 1500± 100rpm	
		Exhaust condition			●	●		
		Air filter element replacement					Each 20000km	
		Valve clearance		○		●	At cooling condi -tion: Breathing in: 0.08-0.12mm. Exhausting: 0.08-0.12mm	
	Lubrication	Oil cleanness and amount			●	●	The oil level should be located between the upper and lower marks	
		Leakage			●	●		
		Oil amount	●					
		Blocking of oil filter element				●		
		Replacement of engine oil					First time: 1000km, after then, once a time for each 3000km.	

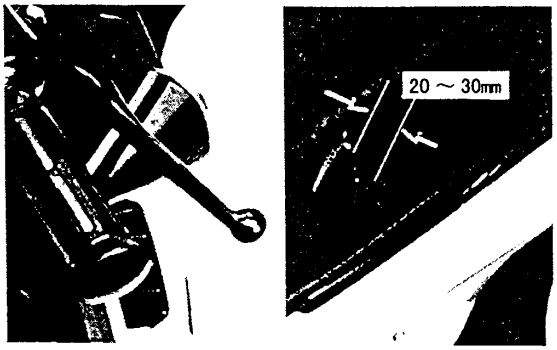
Items of inspection and maintenance			Inspection and maintenance period				Standard	Remark
			Before running	1st month	Used by family			
					Each 6 month	Each 12 month		
Engine	Fuel device	Fuel leakage			●	●		
		Carburetor connecting condition				●		
		Throttle				●		
		Fuel filter blocking				●		
		Fuel amount	●					
		Replacement of fuel hose					☆Each 4 year	
	Cooling device	Water amount	●		●	●	Auxiliary water tank: Water level is between the upper and lower limits.	
		Water leaking				●		
		Radiator cover function				●	Valve opening pressure:0.75-1.05kg/cm^2	
		Cooling water replacement						
Lights and indicators		Functions		○	●	●		
		Coming on, going out, dirt and damage	●					
Alarm and locking		Function				●		
Rear mirror and reflector		Mirroring condition	●					
Reflector and license plate		Contamination and damage	●					
Meters		Function				●		
Exhaust pipe and silencer		Installation loosing and damage				●		
		Silencer function						
Frame and body		Loosing and damage				●		
Un-normal position found by first running day		Confirm the un-normal condition		●				
Others		Oiling conditions of very position of motorcycle			●	●		

Braking device

Braking pedal (front braking lever)

<Clearance>

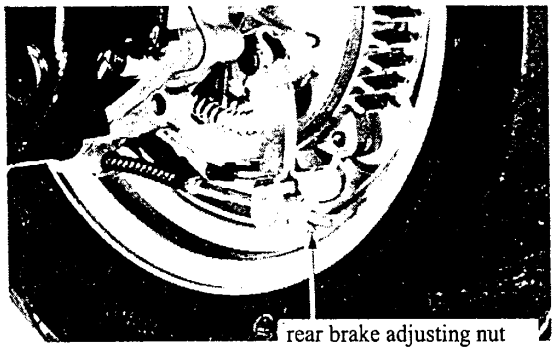
Before the operation, check the sound of brake and ake sure that there is no air entered into it.
If there is air inside, it should be exhausted.(← 16-3)
The clearance of braking pedal should be inspected.
Clearance: 20-30mm



The adjustment can be made by turning the rear braking adjusting nut.

Note

When the braking pedal is treaded down, the clearance between the upper face of braking pedal and ground should be 30-40mm.

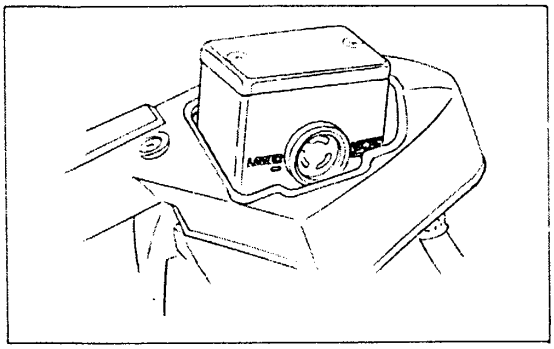


After the adjustment the operation of brake should be confirmed. If it is necessary readjustment should be carried out again.(← 14-6)

Braking liquid tank

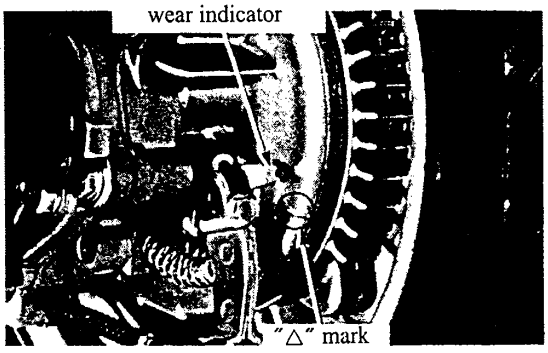
<Liquid amount>

Check the amount of liquid. When the liquid amount is reduced to the lower limit the leakage on various locations should be inspected.
Remove two (2) small screws and take out the liquid store tank.
Refill the braking liquid DOT 3 or DOT 4 up to the upper limit mark.



Caution

- Don't mix the dust and water into the liquid when refilling of braking liquid.
- Don't use the braking liquid that is not conformable to the brand required in order to prevent from the chemical change.
- Don't touch the plastic or rubber parts with the braking liquid to prevent from the corrosion.
- Turn the handle to left side and remove the tank only when it is at a level condition.



Braking drum and shoe

<Wears of braking drum and shoes>

When the braking pedal is treaded down and the brake indicator is aligned with the mark " △ ", the braking shoes should be replaced with new ones.(← 14-5)
Check the appearance of braking drum that is free of damages.
Check the inside of braking drum and make sure that there are un-normal wear and damage when the braking shoes reach at the using limit or sound noisily.(←14-5)

Braking disc and plate



<Wear of braking plate>

Check the wear of braking plate through the long hole marked with an arrow.

Replace the braking plate if it worn out into the limited. (← 16-4)

ⓘ Caution

The braking plates should replaced with whole set.

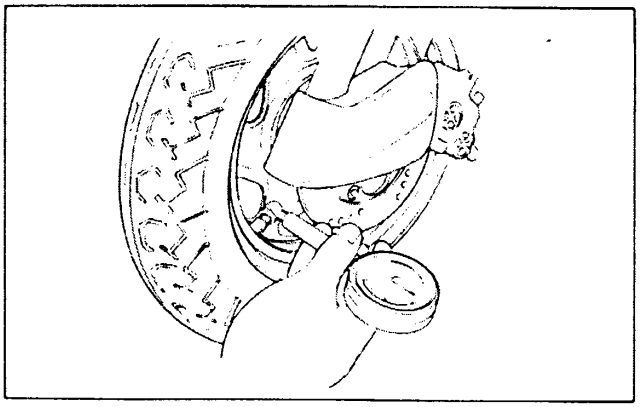
Check the sliding face of braking disc whether there is wear or damage. (← 16-6)

Braking liquid supply

<Replacement of braking liquid>

The braking liquid should be replaced for each year. (← 16-3)

Running device



Wheel

<Air pressure of tire>

Check the air pressure of tires.

ⓘ Caution

Check the tire when it is cooled.

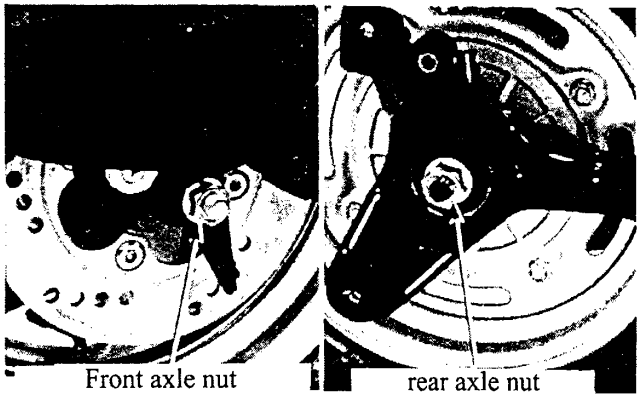
Appointed air pressure:

Unit: kg/cm²

	Front wheel	Rearwheel	
1 rider	General speed	1.75kg/cm²	2.00kg/cm²
	High speed	1.75kg/cm²	2.00kg/cm²
2 riders	General speed	1.75kg/cm²	2.25kg/cm²

Appointed tire:

	Tire specification
Front	110/90-12
Rear	120/90-10



<Loosening of wheel axle nut>

Check the loosing of front wheel nut.

Check the loosing of rear wheel nut.

Tighten the nut with the specified tightening torque for the loosing.

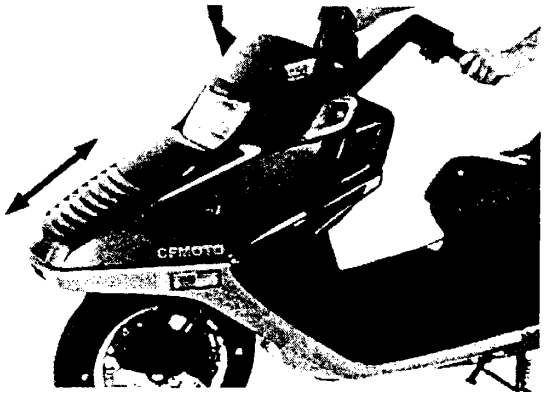
Torque:

Front wheel axle nut: 5.0-7.0kg-m

Rear wheel axle nut: 10.0-12.0kg-m

Damage of rim:

Check the corrosion, wobbling and deviation of front and rear rims.(← 13-6,14-2)



Damping device

Sock absorber

<Oil leakage and damage>

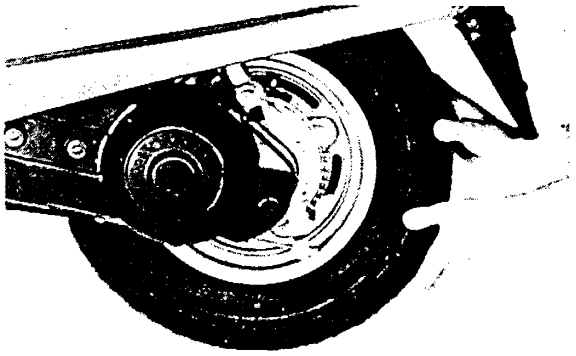
Brake the front wheel and press the front absorber down several times to check the operation.

Check the leakage of front absorber and damages or loosing of other locations.

Press down and release up the rear absorber several times to check the operation.

Check the oil leakage, damage and loosing of various locations of rear absorber.

Raise the rear wheel and check whether the bush of engine suspension is loosened by pushing the wheel left and right.



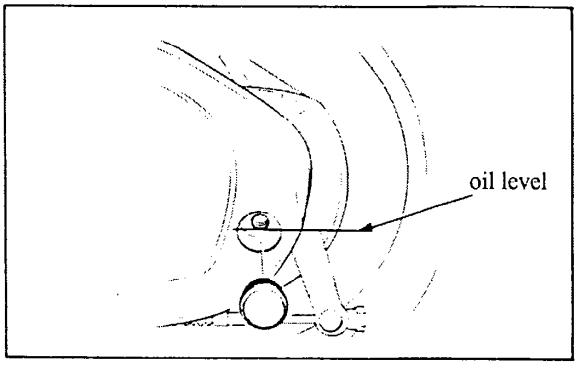
Power transmission device

Transmssion gear box

<Leakage and oil amount>

Note

Check the oil amount with the main stand sustained on plane floor.

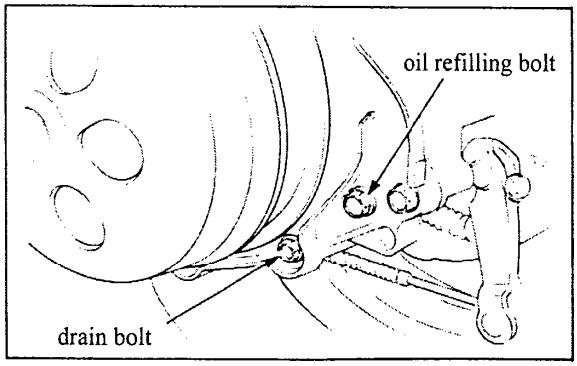


Stop the engine and remove the bolt of gear box. If the oil level can be seen from the bolt hole, it indicates that the oil is enough, otherwise please refill the recommended oil.

Recommended oil: Used for 4 stroke motorcycle, SAE10W or API Category SE grade engine oil.

The oil viscosity used should be conformable to the temperature of running region. (← 2-12)

Be sure that the sealing gasket is free from damage then put the oil bolt on its position.



Oil refilling

Replacement of oil of transmssion gear box:

Removal of left cover.(← 8-3)

Removal of refilling bolt.

Removal of drain bolt to drain the oil.

Make sure that the sealing gasket is free of damage and put the drain bolt on its position.

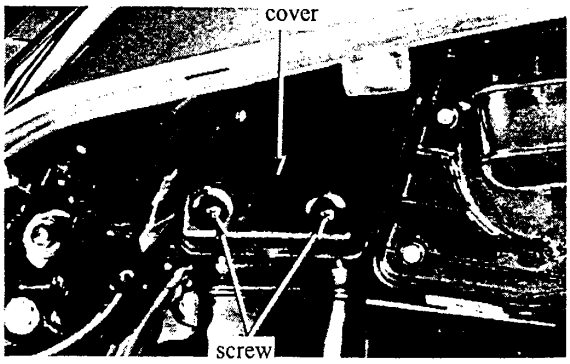
Refilling of recommended oil.

Oil capacity: 0.15L (replace)

Put the refilling bolt back to its position.

Start the engine and confirm whether there is leakage.

Confirm the oil amount.

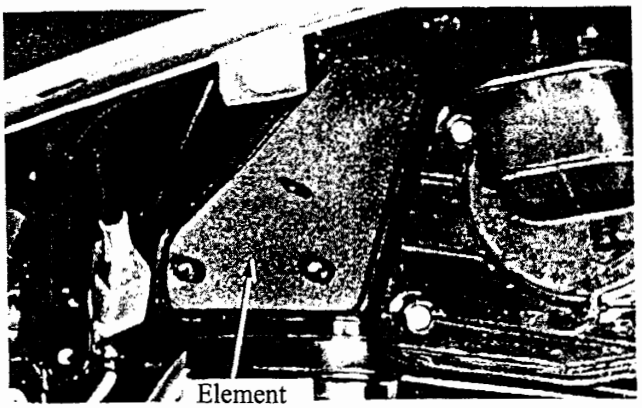


Cleaning of belt casing and air filter:

Removal of left rear cover.(← 12-2)

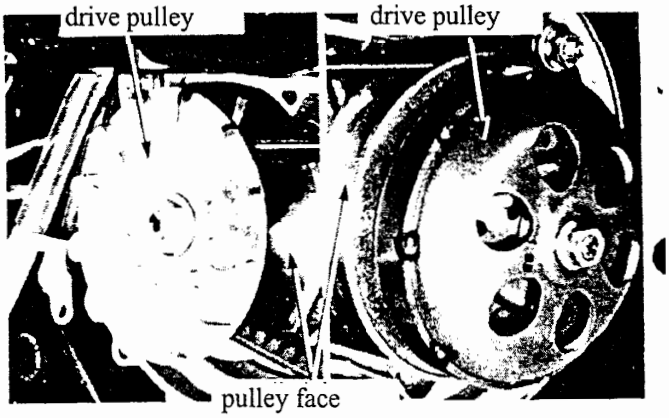
Removal of two small screws and claw located at the cover in order to take off the filtering element cap.

Removal of element from the cover.
Cleaning of filtering element and
mounting it after completely drying.
Don't immerse the filtering element in the oil.
Mounting of filtering cap.
Mounting of left rear cover.



<Drive and driven belt pulleys>

Removal of lower cover.(← 12-2)
Removal of left side cover.(← 8-3)
Check the wears on the surfaces of drive and driven pulleys. Measure the depth worn if there is any.(→8-6 8-11)



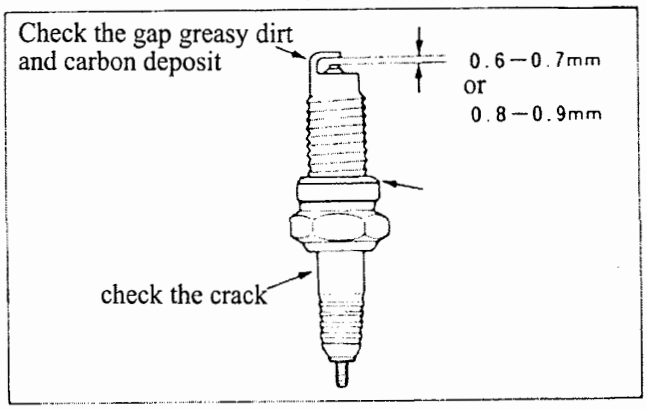
Electric device

Ignition device

<Condition of ignition spark plug>

Removal of spark plug.
Checking of damage, dirt and carbon deposit.
Cleaning off the dirt or carbon deposit with a brush or spark plug cleaning tool.
Adjusting of the clearance of spark plug.

Spark plug	Clearance (mm)
HGK DPR7EA-9	0.8-0.9



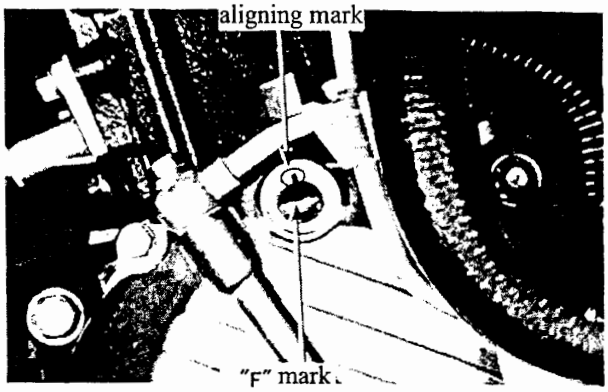
Turn the spark plug to the bottom with fingers and then tighten it with required torque.

Torque: 1.5-2.0kg-m

Ignition time:

Note

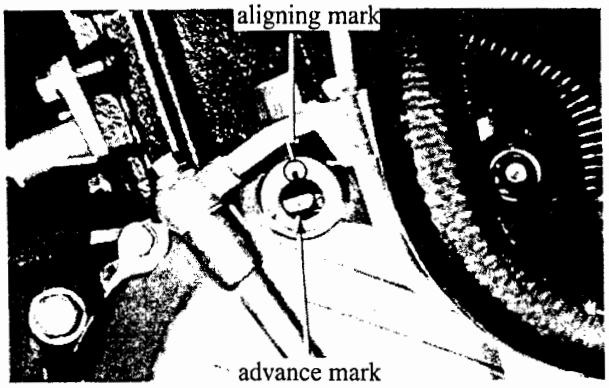
The ignition time is not required to be adjusted because of the use of CDI device.
If the ignition time is confused, check the ignition device. (→ 16)



Removal of seat.(→ 12-2)
Removal of ignition timing hole cap.
Confirming of ignition time with ignition timing light.
When the idle speed is 1500 ± 100 rpm and the mark "F" is aligned with the aligning mark, it indicates that the ignition time is correct.

<Function of ignition advanced angle device>

The ignition timing light should be connected as the same procedure as checking of ignition time. Increase the revolution of engine gradually, As soon as the speed reaches at 6500-6900rpm and the advance angle mark is aligned with the aligning mark, it indicates that thefunction of advanced angle is correct.

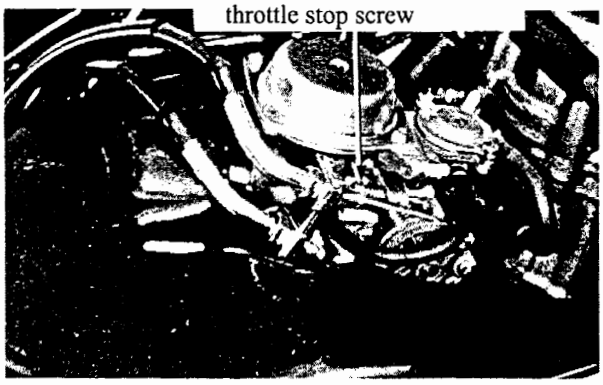


Engine

Engine body

Caution

- The idle speed should be adjusted under the condition of warm engine.
- The adjustment of carburetor after the overhaul should be performed only after the adjustment of air control screw.(→ 3-10)



Removal of the seat.(→ 12-2)
Warming of the engine.
Sustaining of the motorcycle with main stand and connecting of speedometer.

Turning of stopping screw of throttle valve and adjusting it to the specified idle speed.

Idle speed: 1500 ± 100rpm

Adjusting of air control screw for unstable idle operation and revolution.(→ 3-10)

<Replacement of air filter element>

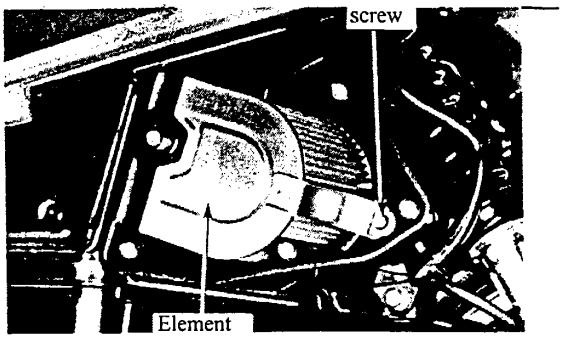
Removal of left rear cover.(→ 12-2)

Removal of five small screws and take off the air filter cover.

Removal of screws and take away the element.
Checking of dirt and damage of the element. Replacing of element if necessary.

Recommended period of replacement: Each 20000km.

The element should be replaced in advance if the running condition is very bad.



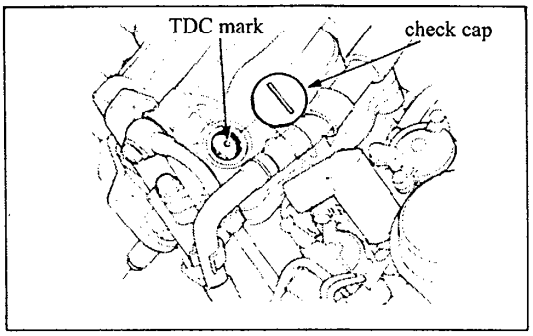
Caution

- The element is oiled it can not be cleaned by blowing.
- After assembly make sure that the air filter cover is floated.

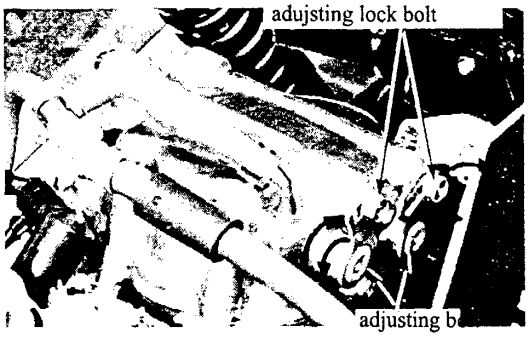
<Valve clearance>

Caution

The valve clearance should be adjusted under the condition of cold engine. (35°C)



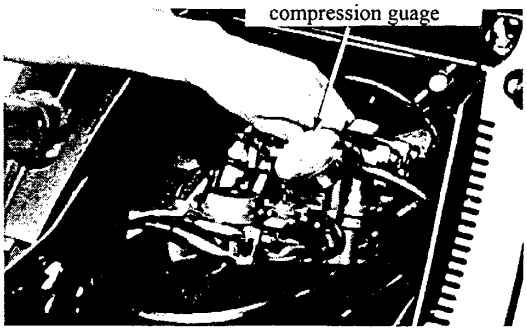
Removal of the seat.(→ 12-2)
Removal of the left side cover.(→ 8-3)
Removal of checking cap from cylinder cover.
Turn the drive pulley to left side slowly and align the upper dead point mark of cam shaft with the mark of cylinder cover to locate the piston at the upper dead point of compression.
Loosen the adjusting bolt of thrust rod.
Open the IN and EX adjusters towards the outside and return one graduation towards the inside.
Tightening of adjusting bolt.
Mounting of all parts disassembled.



<Cylinder compression pressure>

Removal of the seat.(12-2)
Removal of the cap of spark plug.
Removal of the spark plug.
Connecting of the compression pressure meter into the thread hole of spark plug.
Open the throttle completely.

Turn the starter to measure the compression pressure.



Caution

Don't turn the starter continuously for more than 5 seconds because the battery will be exhausted.

Compression pressure: 15.0kg/cm^2-600rpm.

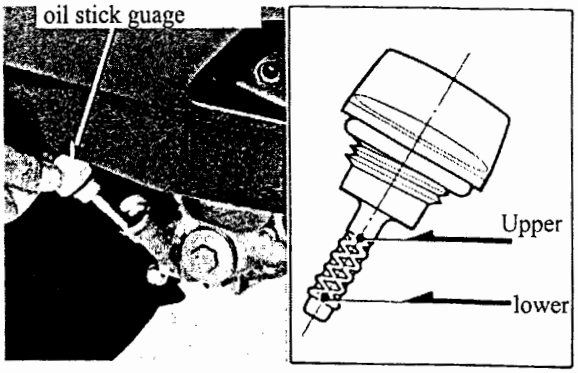
Special tool: Compression pressure meter 07305-0010000.

The following items should be inspected when the compression pressure is low:

⌘ Compression leakage of valve.(→ 6-8)
⌘ Failure of valve clearance.(→ 2-10)
⌘ Damage of cylinder gasket.(→ 6-5)
⌘ Wear of piston ring.(→ 7-4)
⌘ Wears of piston and cylinder.(→ 7-5)

The following items should be inspected when the compression pressure is high:

⌘ Carbon-deposit on the piston head and cylinderhead.



Lubrication device

<Dirt of lubricating oil and oil amount>

Note

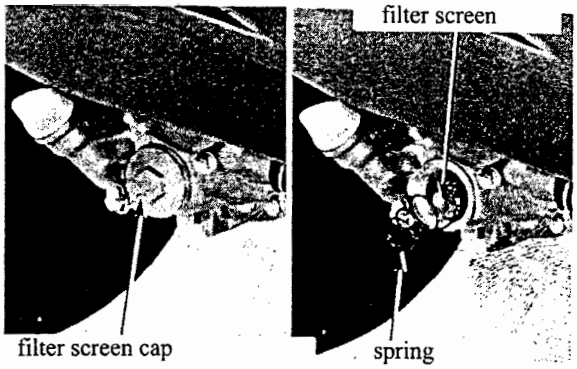
- When the oil amount is Checked, keep the motorcycle vertical.
- Warm the engine for 2-3 minutes. Stop the engine and check the oil amount after 2-3 minutes.

Don't insert the oil stick gauge when the oil amount is checked.

When the oil is below the lower limit, refill the recommended oil from the refilling hole.

Refill the oil up to the upper limit mark.

Replace the oil if the oil is obviously dirty.



<Blocking of oil filter>

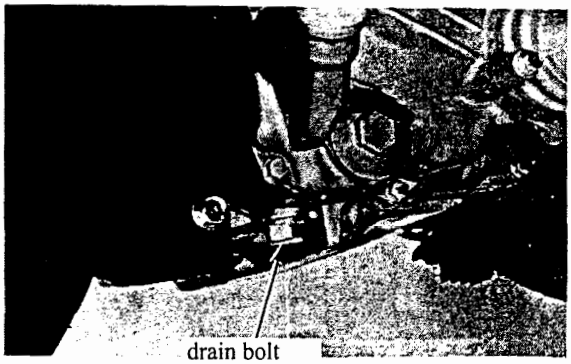
Drain the oil of engine.

Removal of the spring and filter screen.

Cleaning of filter screen.

Put the filter screen, spring and filter screen cap on and tighten them.

Torque: 1.8-2.2kg-m



Note

The opening of screen should face to the inside.

Refill the engine oil.

<Replacement of engine oil>

Note

Warm the engine first and then drain the oil off.
Take out the oil stick gauge.
Removal of the bolt of drain tube and drain away all of oil.
After cleaning of the bolt of lower drain tube put it back to its position.

Torque: 2.0-2.5kg-m

Caution

Replace the sealing gasket if it is damaged.

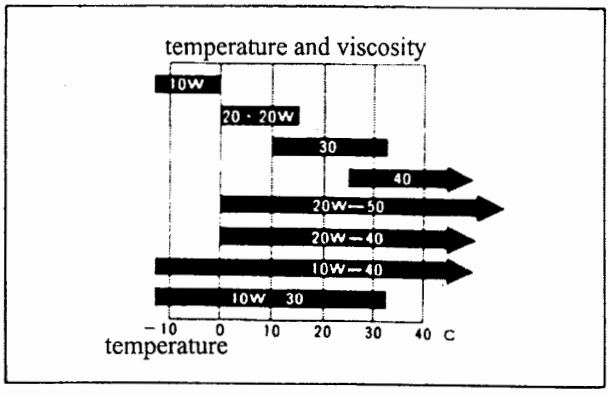
Refill the recommended engine oil from the refilling hole.

The capacity of engine oil : 0.8L

Recommended oil: SAE10W-30, SAE10W-40 or S-AE20W-50, API category SE grade or equivalent engine oil.

The engine oil that its viscosity is suitable to the temperature of running area should be chosen for use in accordance with the table listed at right side.

Confirm the oil amount after checking of the leakage .



Fuel device

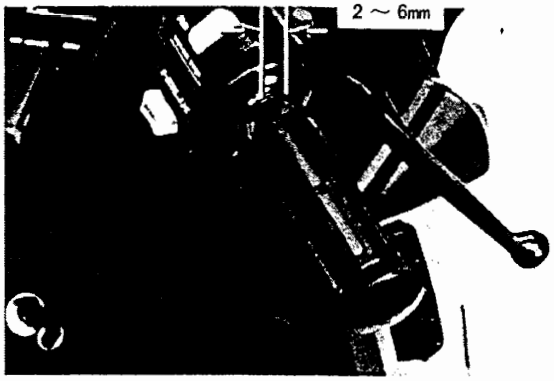
<Conditions of throttle and throttle valve>

Checking of the clearance at the flange position of throttle grip.

Clearance: 2-6mm

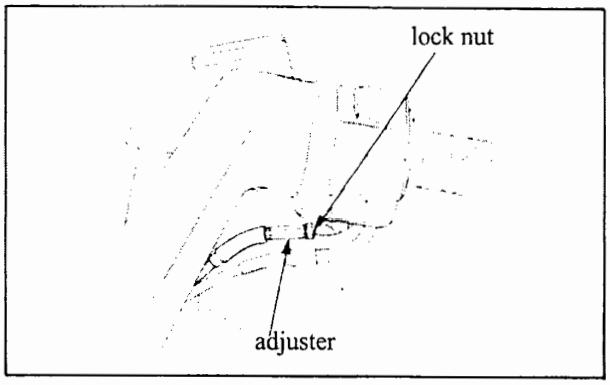
Checking of the aging, damaging and twisting of throttle cable.

Release the throttle grip completely and check whether the throttle grip operates smoothly.



Perform the fine adjustment on throttle grip.

Loosen the lock nut and turn the adjusting bolt to adjust the clearance.



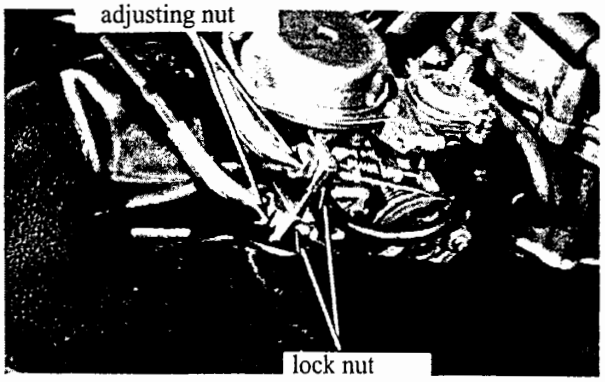
If the specified clearance can not be adjusted by the adjuster located at the throttle grip, the clearance can be adjusted through the adjusting nut located at the carburetor.

Removal of the seat.(→ 12-2)

Loosen the lock nut and turn the adjusting nut to adjust the clearance.

If the stable operation can not be achieved by adjustment of adjusting nut, replace the throttle cable.

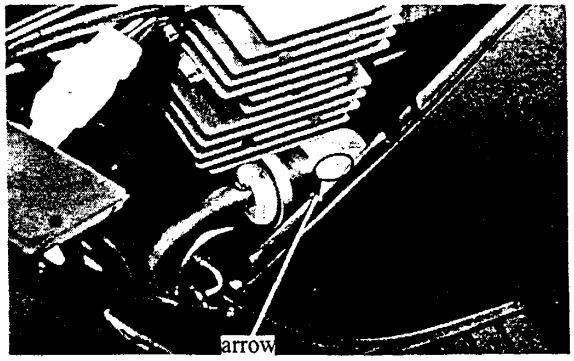
Install the parts dismounted.



CFMOTO

<Blocking of fuel filter>

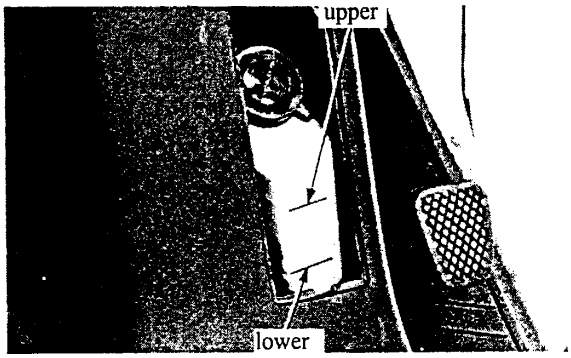
Removal of the seat and maintenance cover.(→ 12-5)
Checking of the blocking or dirt of fuel filter and change the fuel if necessary.



Cooling device

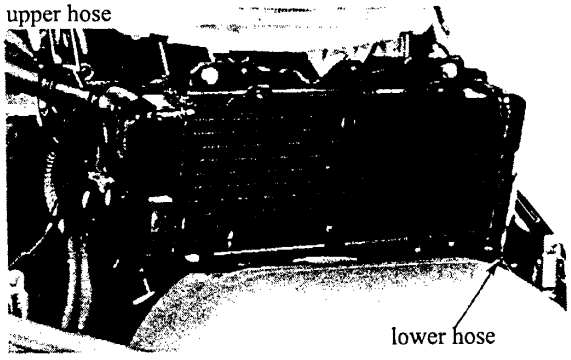
<Water amount>

Sustain the main stand.
Remove the cap of auxiliary water tank and the water level of auxiliary water tank should be between the upper limit and lower limit.
If the water is not sufficient, refill the cooling liquid up to the upper limit mark.
Recommended cooling liquid: 30% density



<Water leakage>

Removal of the covers of various parts and components to check the aging, damage and leakage of the cooling water hoses from the sides of engine and heat radiator.

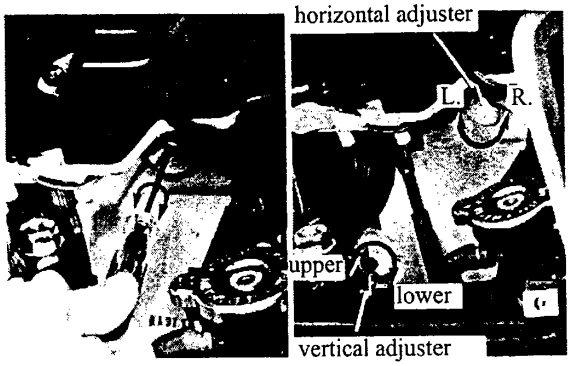


Others

Lights and indicators

<Head light>

Removal of maintenance cover.(→ 12-4)



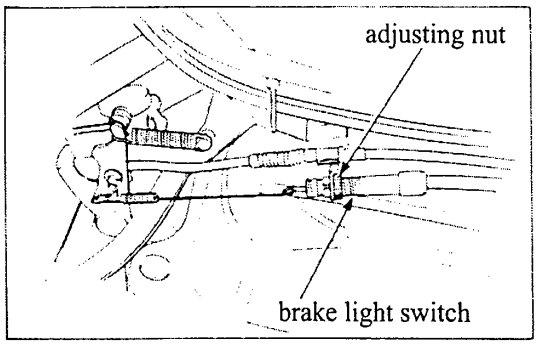
Adjust the vertical light beam by adjusting of vertical adjusting screw.
Insert the cross screw driver into the adjusting screw and turn it to right to make the light beam moving down.

Adjust the horizontal light beam by adjusting of horizontal adjusting screw.
Insert the cross screw driver into the adjusting screw and turn it to right to make the light beam moving left.

CFMOTO

<Braking light>

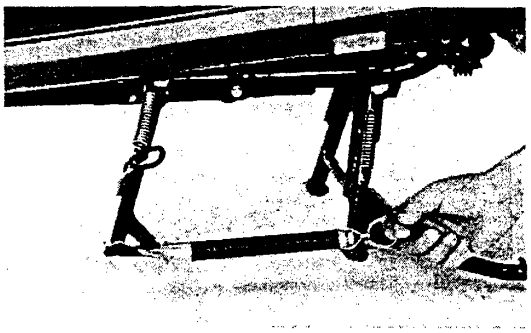
The braking light can be adjusted after the clearance adjustment of braking pedal.
Removal of bottom plate.(→ 12-8)
Tread the braking pedal down 43-48mm, then depress the starting button and simultaneously turn the adjusting nut to rotate the starting motor.
After adjustment, move the braking pedal, the braking light will comes on when the pedal is depressed 5-20mm. Depress the starting button with the brake locking condition ON to confirm the turning condition of starting motor.
The front braking light is not necessary to be adjusted.



<Side stand>

Sustain the side stand.

As shown in right figure, add a 2.0-3.0 kg of load to the top of side stand to confirm whether the side stand can be moved smoothly. If it is difficult to move down and up, apply some grease on the pivot.
Check the springness and transverse looseness of side stand.



3 Fuel system

Maintenance information 3-1
Troubleshooting 3-2
Disassembly of carburetor 3-3
Fuel thickening valve for starting 3-4
Installation of carburetor 3-9
Fuel tank 3-11

Points for attention

Warning

Fire and smoking are forbidden when using the gasoline.

- Make sure of the installation position of O-ring and replace it with new one when assembling.
- Before the removal of carburetor, the fuel leakage screw in the float chamber should be loosened and the gasoline in the carburetor should be drained out.
- Don't dismount the start thickening device.
- In order to make the start thickening valve closed earlier just as soon as the engine is warmed, the cooling liquid loaded in the body of carburetor will heat the heater that is used for heating of start thickening valve.

Specification

Diameter of throttle	About 27mm
Model	VE14C
Returned turns of air regulating screw	$1^{3}/_{4}$ turns
Idle speed	1500 ± 150rpm

Tool

General tool

gauge of float level 07401-0010000

CFMOTO

Troubleshooting

Failure of starting:

- No fuel in the fuel tank.
- The fuel can not pass through.
- Too much fuel inside the cylinder.
- Air cleaner is blocked.
- Fuel is dirty.
- Fuel pump is no good.

The idle speed of engine is unstable and the rotating is no good:

- Adjustment of idle speed is no good.
- Mixed gas is too thick.
- Mixed gas is too thin.
- Air cleaner is blocked.
- Air has been taken from the breathing system.
- fuel is dirty.
- Performance of air cut valve is no good.
- Damage on joint of vacuum tube.
- Damage on heat insulating body of carburetor.

There is no output and the engine stops when fuel throttle is opened completely:

- Damage on vacuum piston diaphragm.
- Negative pressure channel is blocked.
- Fuel pump is no good.

Mixed gas is thin:

- Fuel nozzles are blocked.
- Air hole of fuel cap is blocked.
- Fuel filter is blocked.
- Fracture, damage and blocking of fuel tubes.
- Performance of float valve is no good.
- Fuel level is too low.

Mixed gas is too thick:

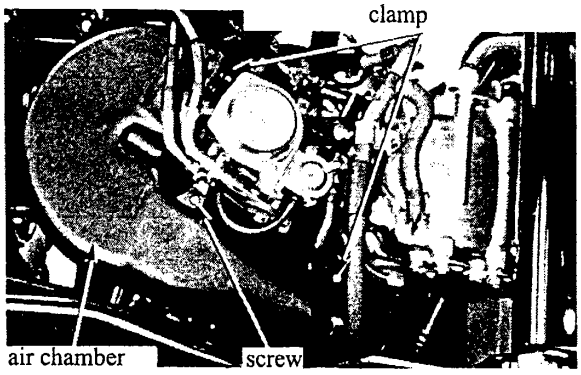
- The start thickening valve is always opening.
- Performance of float valve is no good.
- Fuel level is too high.
- Air nozzles are blocked.
- The groove position of adjustment plate of auto-start thickening valve is incorrect.

Removal of carburetor:

Removal of the seat.(→)

Loosening of clamps for fixing the air filter throttle tube and air filter.

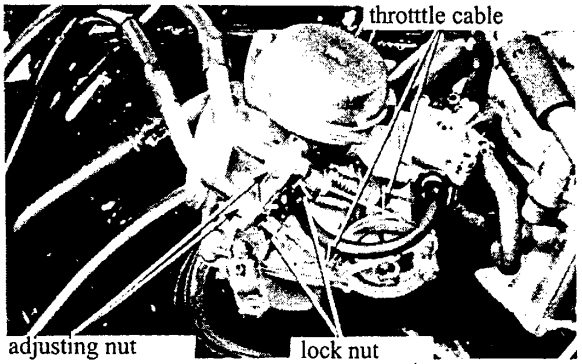
Loosening of the screw and take off the air filter throttle tube.



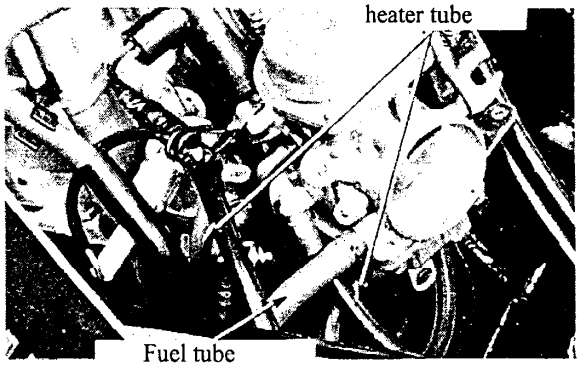
Note

Don't lose the screws.

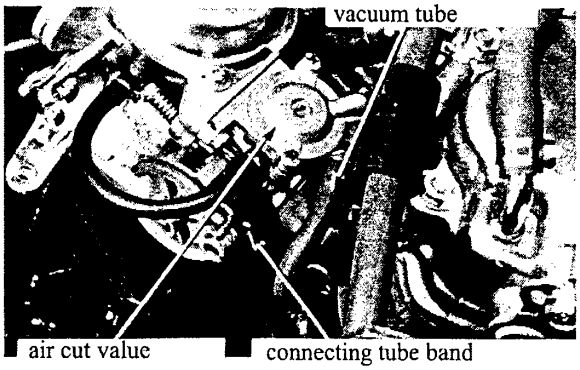
Loosing of the adjusting nut of throttle cable and fixing nut so as to take away the throttle cable from carburetor.



Dismount the connection of heating tube from carburetor heating device and take off the heating tube.



Dismount the connection of vacuum tube from choke valve and loosen the clamp of carburetor to dismount the carburetor from heat insulating body.



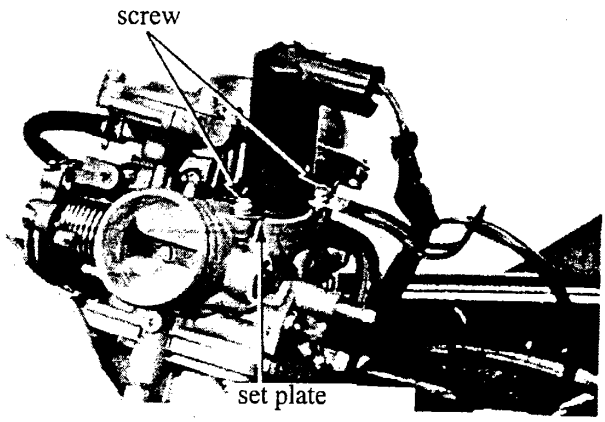
Note

Cover the opening of intake with clean cotton yarn to avoid foreign substance entering into the opening after the removal of carburetor.

Dismount the two small screws of start thickening device and remove the start thickening device from the carburetor.

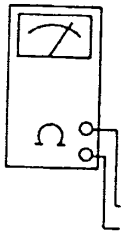
Note

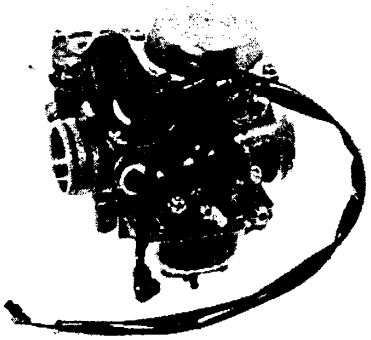
Dismount the start thickening device after removal of the cover of luggage case.
Don't damage the valve after removal of start thickening device.



Inspection of start thickening device

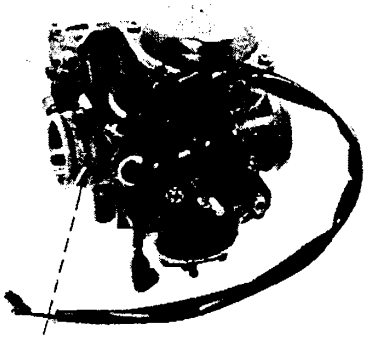
Inspect the conductance between the wires of start thickening device.
Electric resistance value: below (After more than 10 minute of engine stopping.)
If there is no electrical conduction, replace the start thickening device.



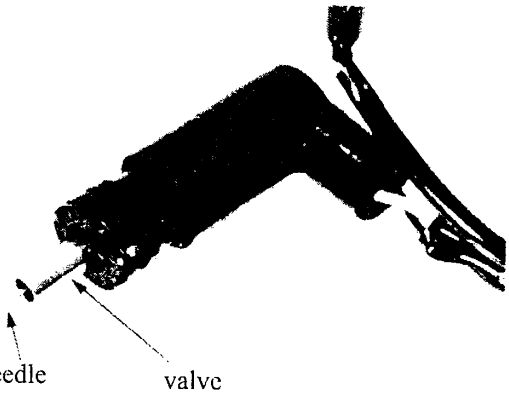


Connect the vinyl tube to start thickening loop of carburetor. Connect the yellow and green wires of start thickening device to the terminals of battery. Apply electrical voltage for 5 minutes. Blow the vinyl tube with mouth, if the tube can not be blown through it indicates that the function is perfect. Disconnect the wires of start thickening device from battery and laying up for 30 minutes. Blow the tube vinyl with mouth again, if the tube can be blown through it indicates that the function is perfect.

vingl tube



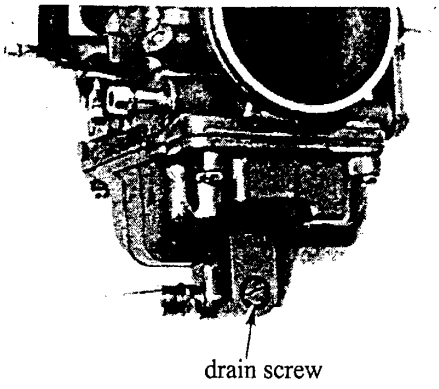
Check the valve and the needle of start thickening device free from scratch, wear and damage. Replace the start thickening device assembly if necessary.



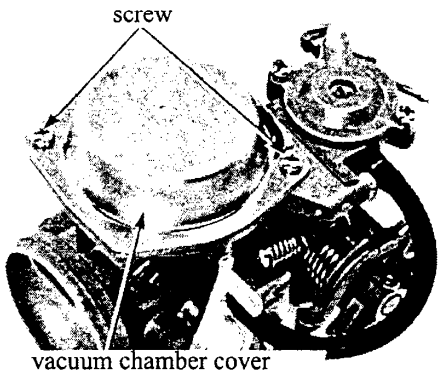
Vacuum chamber

Disassembly

Loosening of the drain screw and drain out the gasoline in float chamber.



Dismount the two small screws and open the cap of vacuum chamber.

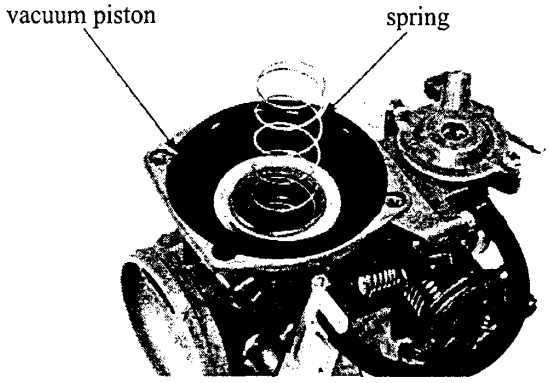


Removal of the spring and vacuum piston.

Removal of the set plug of jet needle and dismounting of spring and jet needle.

Caution

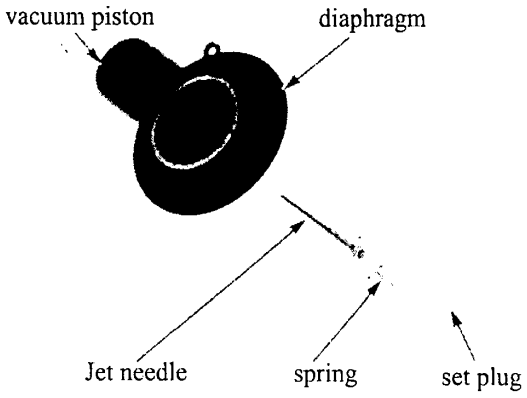
Don't damage the diaphragm of vacuum piston.



Inspection of vacuum piston:

Check the jet needle whether it is free of wear and damage.

Check the diaphragm whether it is free from damage, aging and crack.



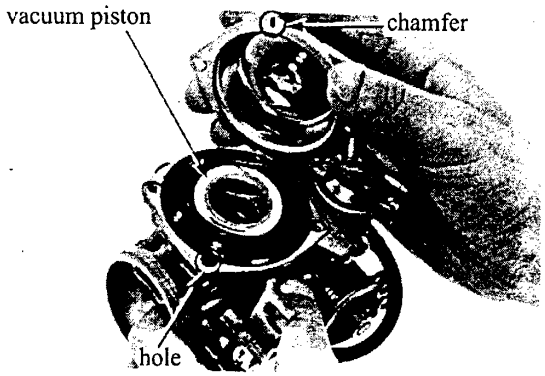
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Assembly

The assembly will be carried out in a contrary sequence of disassembly.

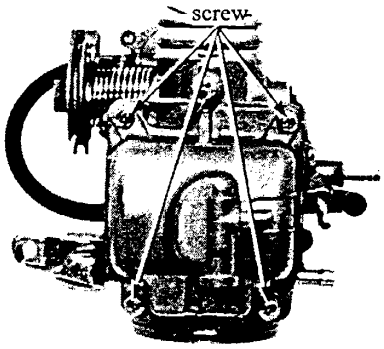
Support the bottom of vacuum piston with the fingers and make it open completely and make sure that the flange of diaphragm is positioned in the groove of carburetor body. The spring will be installed as shown in the figure.

Match the diaphragm hole with the cap groove and install the cap on position.



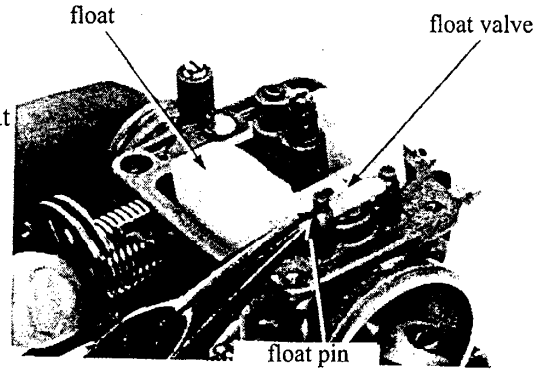
ⓘ Caution

Don't damage the diaphragm.
Always support the vacuum piston until tightening of small screws.

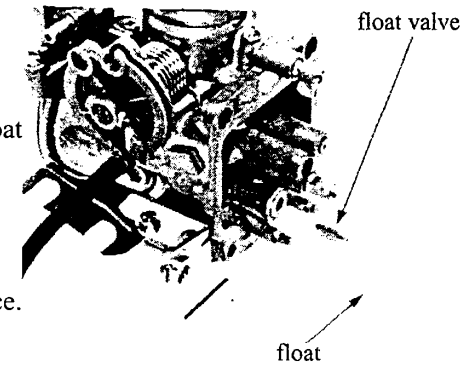


Float chamber:

Removal of the 4 small screws and take out the float chamber.



Take away the float pin and dismount the float and float valve.



Inspection of float valve:

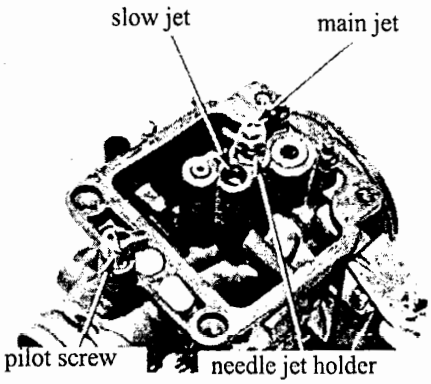
Check the worn condition on valveseat connecting face.

Removal of the main jet, float needle jet holder, needle adjusting jet, slow jet (slow jet) and pilot screw.

ⓘ Caution

Don't damage the jets and screws during the assembly.

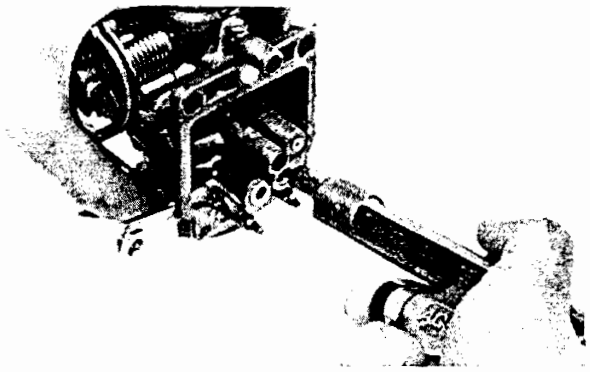
Before the removal of the pilot screw, record down the rotating speed up to the complete screwed position. If the pilot screw is screwed too tight the seat face will be damaged.



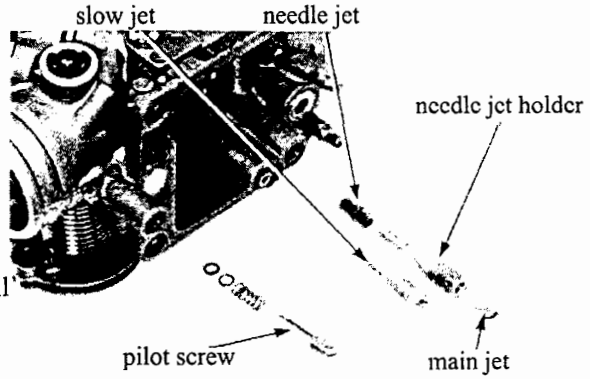
Clean the jets with new washing detergent.

Blow the channels of carburetor with compressed air to clean those channels.

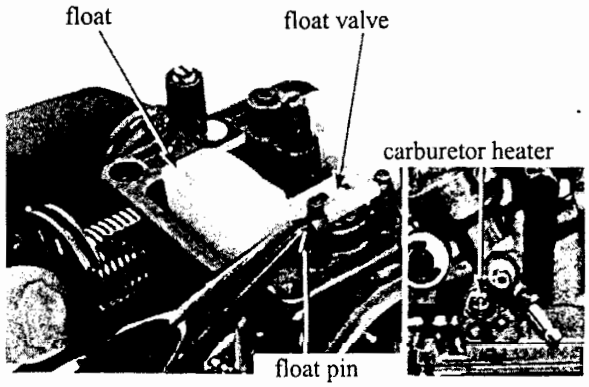
The cleaning should be performed after the disassembling of vacuum chamber.



Assembly of float chamber:
Install the needle adjusting jet, needle adjusting jet holder, main jet, slow jet and pilot screw.



Install the float needle valve, float and float pin. Install the heater of carburetor and small screws.



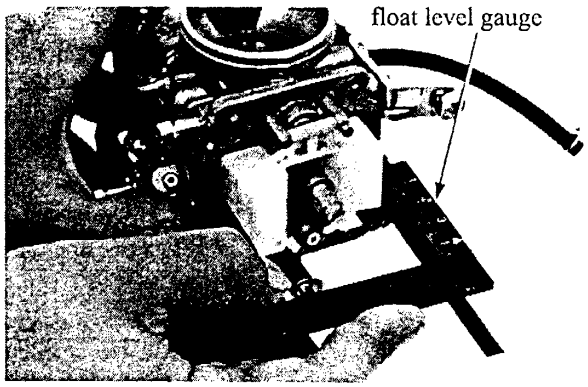
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Fuel level inspection:

Check the fuel level (float height) at the position of main jet.

Fuel level: 18.5 ± 1.0mm

General tool
Float level gauge 07401-0010000

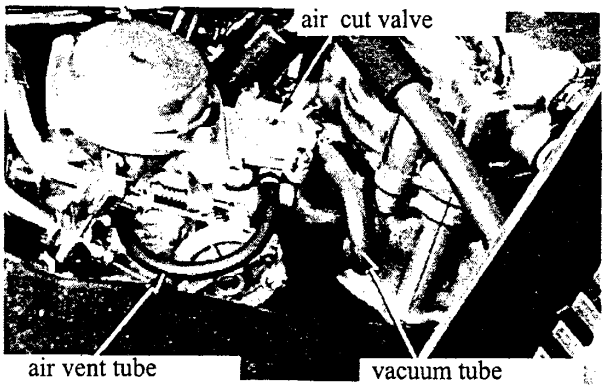


choke valve

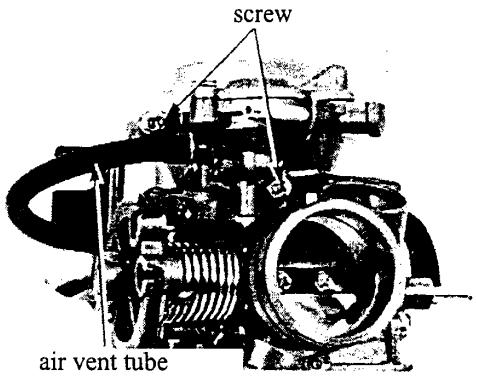
Inspection

Note

The choke valve can be checked at the motorcycle.

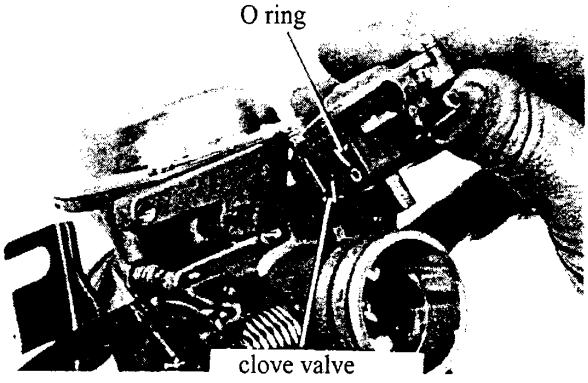


Dismount the connector of vacuum tube air vent pipe.
Connect the vacuum pump on the vacuum tube connector of valve.
Connect the pressure pump on the air vent pipe connector of valve.
Operate the vacuum pump to apply the negative voltage.



Negative voltage: 380mmHg

When the negative voltage is applied, if the air flows in the air vent pipe it indicates that the valve is normal, if the air in the air vent pipe does not flow it indicate that the valve has defects.



Replacement

Removal of carburetor.£¨ú3-3£©
Removal of air vent pipe from choke valve.
Removal of two small screws and take out the choke valve.
Removal of O-ring for sealing.

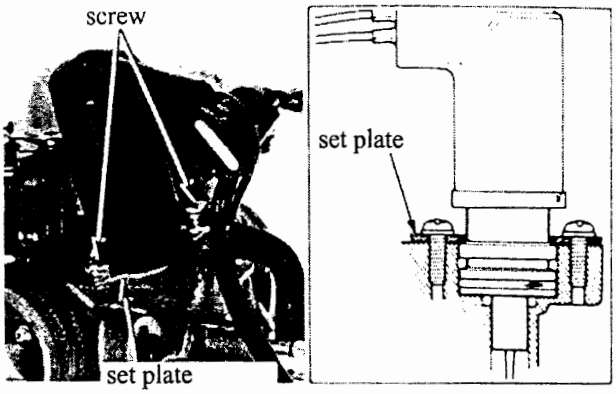
As shown in figure, install the new O-ring for sealing on the valve.
Install the valve on the carburetor and tighten the small screws.

Installation of carburetor:

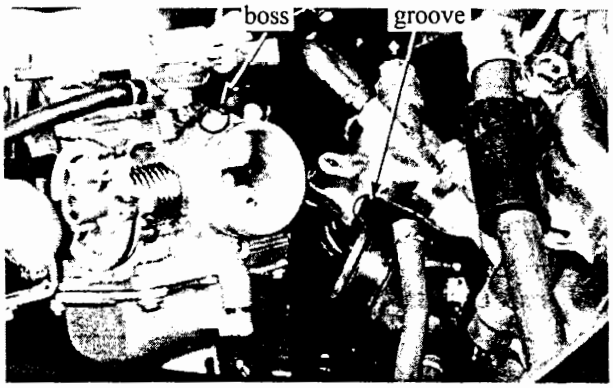
Install the start thickening device on the carburetor.
As shown in figure, install the set plate and tighten the small screws surely.

Note

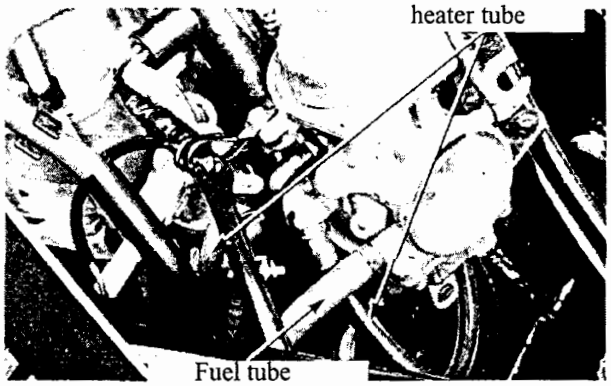
- Press the start thickening device down to the end and the groove should be pressed with set plate.
- The flange of set plate should face down.



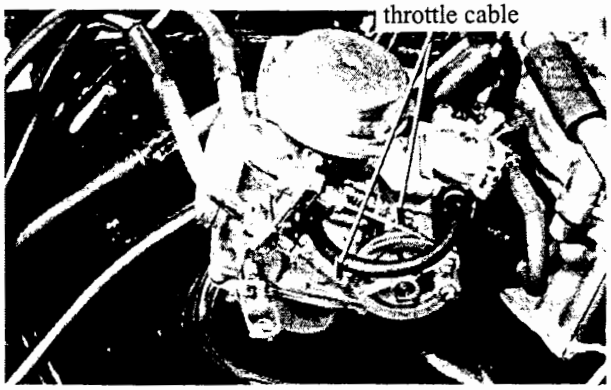
Tighten the drain screw of carburetor.
Align the groove of insulating body of carburetor with the boss of carburetor and install the carburetor.
Install the clamps of carburetor.
Connect the vacuum tube on the choke valve.



Connect the heating tube of carburetor.
Connect the fuel tube and clamp it tightly.

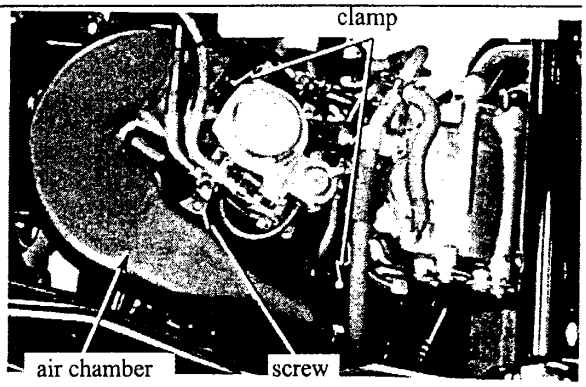


Connect the throttle cable to carburetor.



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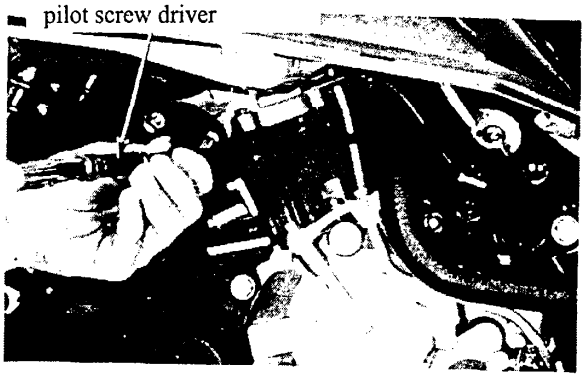
Install the air chamber on the air filter casing and carburetor and tighten the clamps for connecting of air chamber and air filter casing.
Tighten the small screws and air chamber.



The following adjustment should be performed:

- →
- →
-

Adjustment of pilot screw of idle speed:
The adjustment should be carried out after the engine is warmed.
Removal of the seat and right rear cover.(¡ 12-2)
Install the tachometer.
Counter-turn the standard returning turns from the position where the pilot screw is screwed at the end.



Standard returning turns: $2^1/_2$ turn

Start the engine.
Turn the fixing screw of throttle to adjust the specified idle speed.

Idle speed: 1500 ± 100rpm

Accelerate lightly from the idle speed and confirm whether the speed change is stable. In reverse, confirm whether the speed change is normal from acceleration to idle speed and whether the rotation is stabilized.

If it is necessary to make an adjustment it should be carried out as following sequence:
①

②

③ ① ②
④

① ④

Special tool
Screw control wrench 07908-4730000

Fuel tank

Disassembly:

→

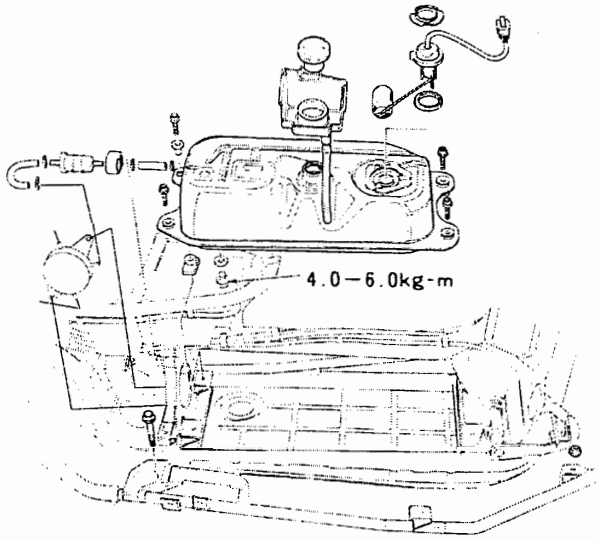
→

Loosen the bolts and nuts and dismount the right water pipe from chassis.

Removal of connector of fuel device.

Removal of fuel tube.

Loosen the four fixing bolts of fuel tank and take off the fuel tank.



Fuel cock

Disassembly:

→

→

Loosen the bolts and nuts and take away the fuel pump of negative pressure.

Loosen all of clamps on hoses of fuel pump of negative pressure.

Take out the fuel output tube, negative pressure tube and fuel inlet tube.

ⓘ Caution

Don't open the fuel cock.

Inspection:

Remove the fuel output tube of negative pressure fuel pump from the carburetor.

Tread on the brake pedal and depress the starting button to start the starting motor. The gasoline will spray from the fuel output tube of negative pressure fuel pump.

ⓘ Caution

A vessel should be prepared for containing of gasoline sprayed from the negative pressure fuel pump.

For a long time starting of start motor will exhaust the energy of battery so the starting time should not exceed 5 seconds.

If there is no fuel spraying from the fuel output tube of negative pressure fuel pump, replace the negative pressure fuel pump.

ⓘ Caution

After the replacement of new negative pressure fuel pump, it may be necessary to start the starting motor for many times for the spraying of fuel from the fuel output tube of negative pressure fuel pump.

Installation:

Perform the installation as the counter sequence as disassembly.

ⓘ Caution

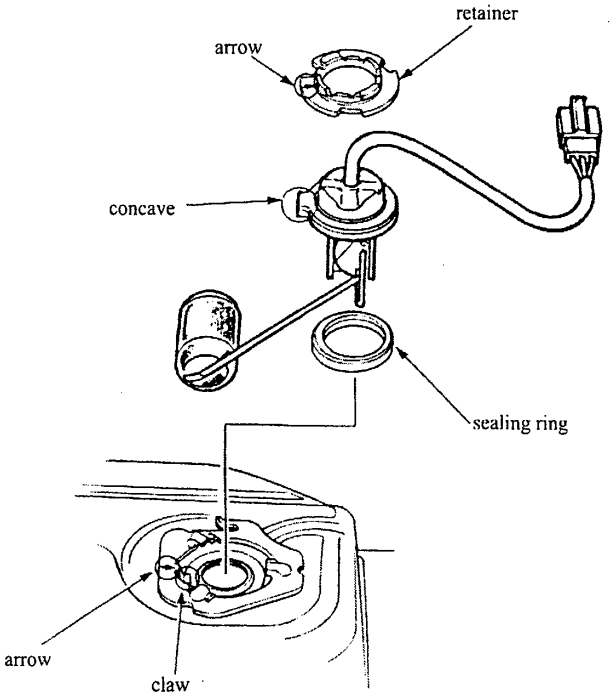
Pay attention to the arrow mark on negative pressure fuel pump when the connections of fuel output tube and fuel inlet tube are installed.

Fuel sender

Disassembly:

Removal of the fuel tank.(→ 3-11)

Turn the fuel sense retainer to left and take off the fuel sense device.



Don't bend the float arm of fuel device, otherwise, the fuel tank will send the wrong indications.

Assembly:

Make sure that there is no damage on sealing ring of fuel sense device.

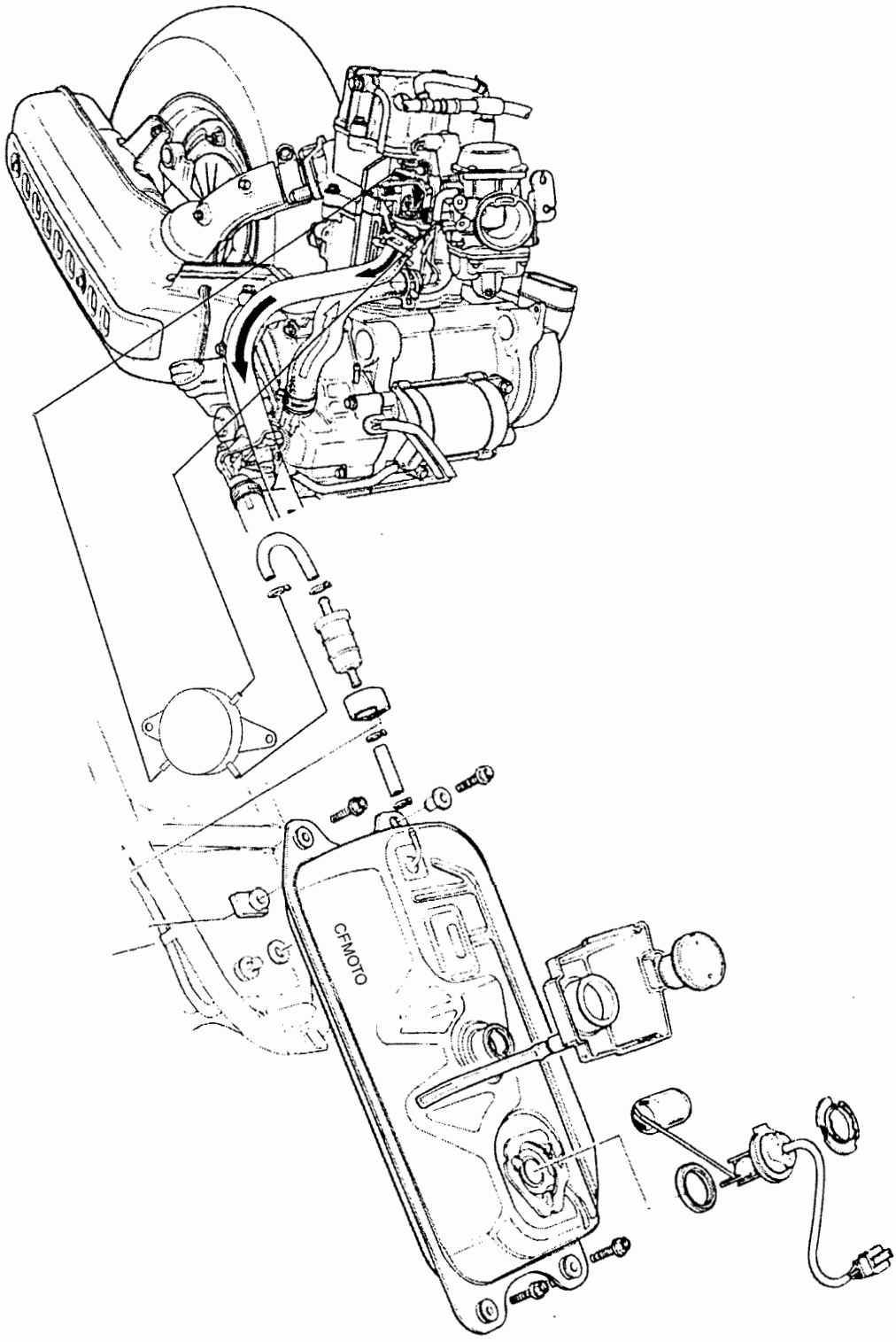
Align the concave of fuel sense device with the claw of fuel tank.

Install the retainer of fuel sender.

After the installation of retainer, make sure that the arrow mark of retainer is aligned with the arrow mark on fuel tank.

CFMOTO

Fuel system



4 COOLING SYSTEM

Maintenance information..... 4-1
Troubleshooting.....4-3
Replacement of cooling liquid 4-4
Inspection of performance.....4-4
Radiator.....4-5
Water pump.....4-7
Thermostat..... 4-10
Thermal sensor.....4-12

Maintenance and repair information

Precautions for operation

● Conduct operation under the cooling condition.
● Don' t open the cover of radiator because when the temperature of cooling liquid is over 100℃ , if you open the cover of radiator, the pressure of liquid will drop and the liquid will boil very quickly, this is very dangerous.

● The cooling liquid is supplemented in reserve water tank. Don't open the cover of radiator except that the cooling liquid is supplemented after disassembling of cooling device and discharging of cooling liquid.
● The cooling device can be repaired on the motorcycle.
● The cooling liquid should be cleaned down with water soon if it sticks on painted surface, otherwise the painted surface will be damaged.
● Check the connection parts and sealing parts for leakage using a tester for radiator cover after checking or repairing.
● See the chapter 20 for check of the fan motor, thermal switch and thermal sensor.

Reference standards for maintenance and repair

Item		Normal value	Limit for use
Safe pressure of radiator cover		0.9kg/cm^2	Over 0.75kg/cm^2 or 1.05kg/cm^2
Temp. for thermostat valve opening	Start open	71±1.5℃	
	Full open	80℃	
	Full open (95℃)	3.5-4.5 mm	
Boiling temp. for radiator liquid (mix. ratio 50%)	Atmosphere pressure	107.7℃	
	0.9kg/cm^2, pressure increases	125.6℃	

Item		Volume
Liquid volume of radiator	Radiator/engine	1.42 L
	Reservoir	0.40 L
	Full volume	1.82L

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Specific gravity of cooling liquid

Temp.of liquid ℃ / Liquid Density %	0	5	10	15	20	25	30	35	40	45	50
5	1.009	1.009	1.008	1.00	1.007	1.006	1.005	1.003	1.001	0.999	0.997
10	1.018	1.017	1.017	1.01	1.015	1.014	1.013	1.011	1.009	1.007	1.005
15	1.028	1.027	1.026	1.02	1.024	1.022	1.020	1.018	1.016	1.014	1.012
20	1.036	1.035	1.034	1.03	1.031	1.029	1.027	1.025	1.023	1.021	1.019
25	1.045	1.044	1.043	1.04	1.040	1.038	1.036	1.034	1.031	1.028	1.025
30	***1.053***	***1.051***	***1.051***	***1.04***	***1.047***	***1.045***	***1.043***	***1.041***	***1.038***	***1.036***	***1.032***
35	1.066	1.062	1.060	1.05	1.056	1.054	1.052	1.049	1.046	1.043	1.040
40	1.077	1.070	1.068	1.06	1.064	1.062	1.059	1.056	1.053	1.050	1.047
45	1.088	1.078	1.076	1.07	1.072	1.069	1.056	1.063	1.060	1.057	1.054
50	1.088	1.084	1.082	1.08	1.077	1.074	1.071	1.068	1.065	1.062	1.059
55	1.095	1.093	1.091	1.08	1.085	1.082	1.079	1.076	1.073	1.070	1.067
60	1.100	1.098	1.095	1.09	1.089	1.086	1.083	1.080	1.077	1.074	1.071

Mixing of cooling liquid (for rust-proof and freeze-proof)

Minimum temp. at place used	Mixture ratio	Cooling liquid	Pure water
-9℃	20%	364cc	1456cc
-16℃	30%	546cc	1274cc
-25℃	40%	728cc	1092cc
-37℃	50%	910cc	910cc
-44.5℃	55%	1001cc	819cc

The figures in italics mean the standard mixing ratio.

Recommended: Cooling liquid with -35 for high freeze-proof, corrosion-proof and boil-proof (It can be used directly, it is not necessary to prepare.)

Precautions for cooling liquid use

Warning

Please use the recommended cooling liquid when supplementing (If it is original liquid, it should be diluted for use.)

Don't mix the cooling liquid with other brand of cooling liquid for use.

The cooling liquid is poison, it can't be drunk.

A tolerance of -5¡æ will be needed for minimum temp. at the place used.

Torque for tightening

Water pump impeller	1.0-1.4 kg-m(left turning)
Oil pipe bolts	0.8-1.2 kg-m
Oil- controlling bolt	1.8-2.2 kg-m
Thermal sensor	0.8-1.2 kg-m

Tools

Special tools

Bearing remover assembly15 mm	07936-KC10000
Bearing remover 15 mm	07936-KC10500
(shaft for removing, 15 mm)	07936-KC10100
(remover head, 15 mm)	07936-KC10200
Balance block for removing	07741-0010201
Mechanical seal driver	07945-4150400
Bearing- removing tool	07946-1870100

General tool

Driver handle	07749-0010000

Troubleshooting

Water temperature increasing:

>lNot proper water thermometer or thermal sensor
>Not proper radiator cover
>Not proper thermostat
>Not enough cooling liquid
>Water hose or piping system blocked
>Radiator fan blocked
>Radiator blocked
>Not proper water pump
>Short circuit of wire harness

No increasing or un-proper increasing of water temperature:

>Not proper water thermometer or thermal sensor
>Not proper thermostat
>Wire harness broken

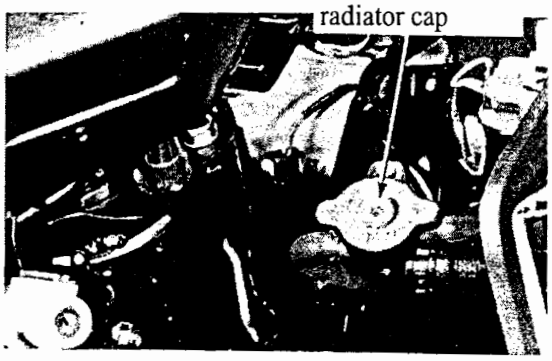
Water leakage:

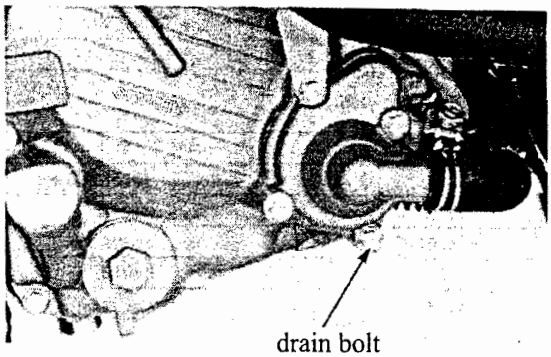
>Not proper mechanical sealing
>Not proper sealing due to aged o-ring
>Water hose damaging or aging

Replacement of cooling liquid

Remove the radiator cover after confirming that the cooling liquid has cooled thoroughly.

→





Caution

℃

→

Fill the cooling liquid in reservoir.
Volume of cooling liquid: about 1820cc
Radiator side: about 1420cc
Reserve side: about 400cc
Evacuate the air according to following points:
. Start the engine after lock the rear brake, conduct accelerating for several times.
. Confirm that no burble is found at the entrance of radiator cover and the level of liquid is stable.

liquid reaches the edge of entrance.
. Install the radiator cover.
. Confirm the liquid volume of reserve water tank.

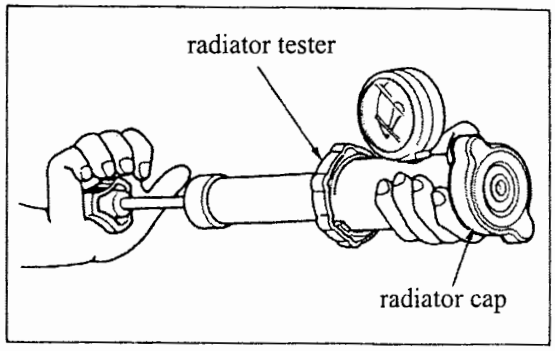
Performance inspection

Inspection of radiator cover

Warning

The radiator cover can be removed only after confirming that the radiator liquid has cooledthoroughly.

Install the radiator cover on the radiator tester.Increase the rotating speed of the pump. It is better to keep 6 seconds within the normal pressure.



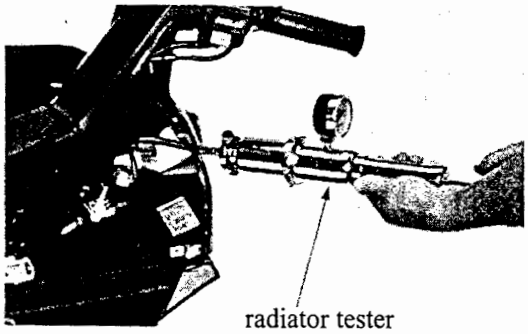
Note

The water should be applied on the sealingsurface firstly when install the radiator cover on radiator tester.

The valve pressure of radiator cover: 0.9±0.15 kg/cm^2

Pressure testing of radiator

Install the radiator tester on radiator, increase the rotating speed of the pump. Confirm if it keeps 6 seconds within fixed pressure.
Specified pressure: 0.9±0.15 kg/cm²
Confirm that no any leakage in hose and other connecting parts.

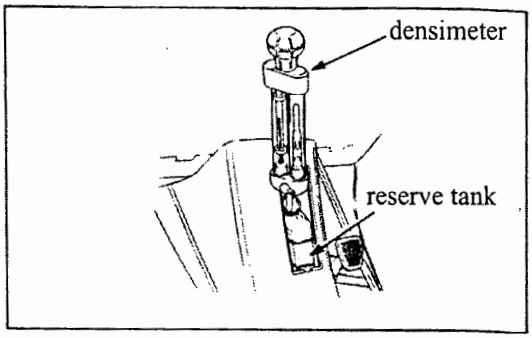


ⓘ Caution

Don't make the pressure exceed specified value.Too high pressure will damage the radiator and connecting parts.

Inspection of specific weight

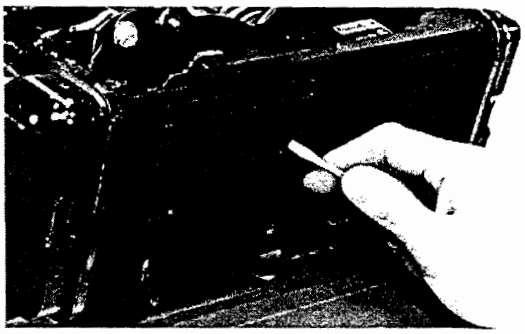
Remove the reserve tank cover.
Remove the reserve tank case.
Inspect the specific gravity of cooling liquid with a gravitometer.
Check if the cooling liquid is clean.



Radiator

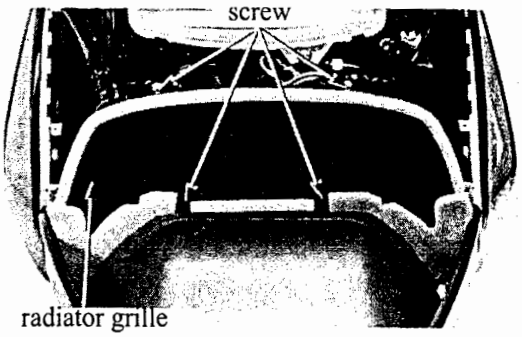
Checking

→

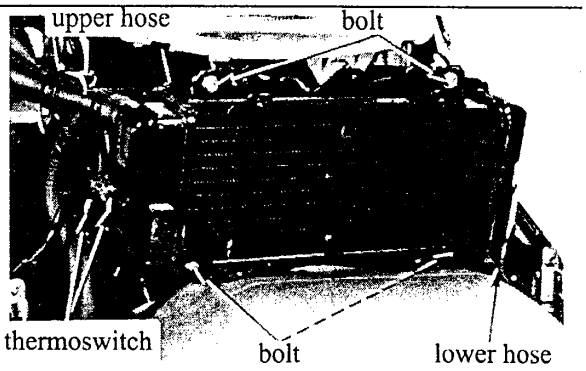


Removing

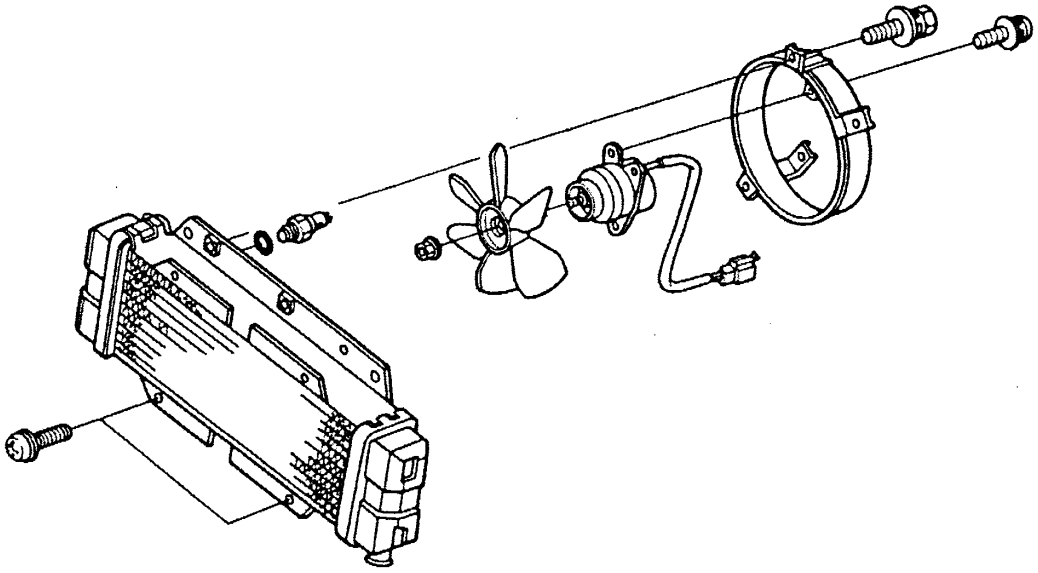
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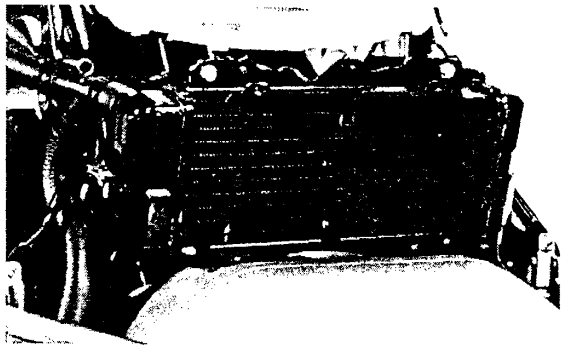


Remove the upper hose and lower hose from the radiator.
Disconnect the thermoswitch wire.
Loosen 4 bolts, remove radiator.



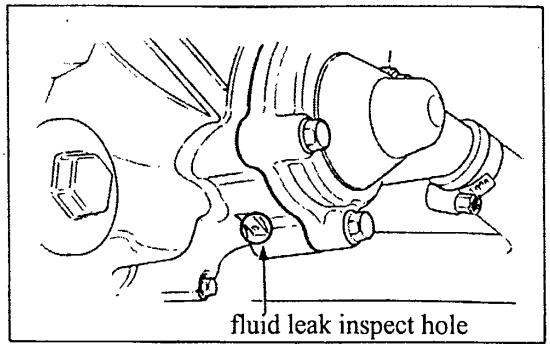
Disassembly
Loosen 3 bolts, remove the cover from radiator.
Loosen the nuts, remove the cooling fan from fan motor.
Loosen the screws, remove the fan motor from Cover.



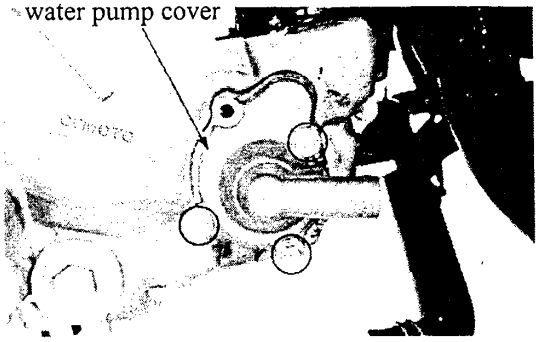


Water pump

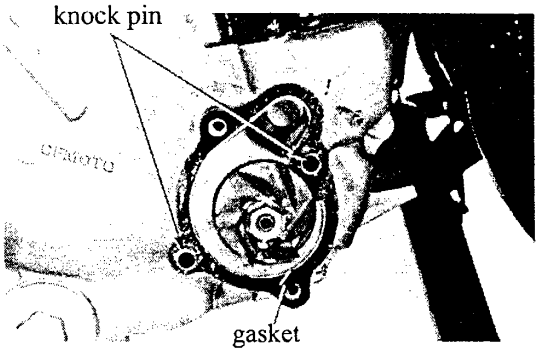
Check of mechanical sealing
If the cooling liquid leakage is found at the liquid leakage check hole of the lower part of right crank-case cover, that means , the mechanical sealing of the water pump is not good. Remove the right crank-case cover,replace the mechanical seal.



→
→
→



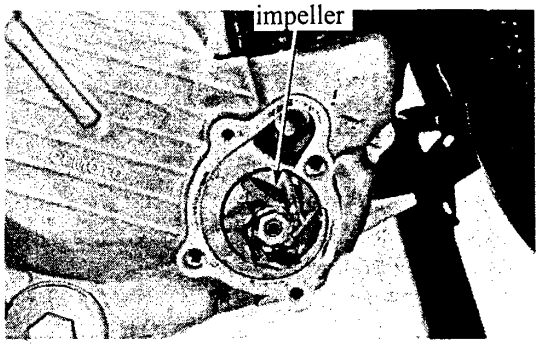
Remove the gasket and 2 knock pins.



Remove the water pump impeller.

ⓘ Caution

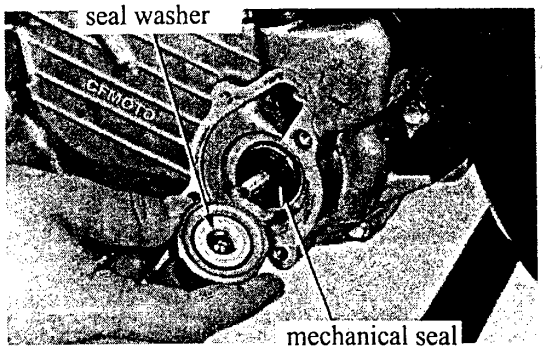
The impeller is left rotation.



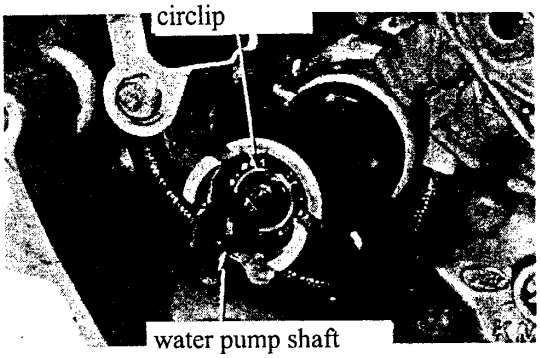
Check the mechanical seal and gasket for damage of wear.

Note

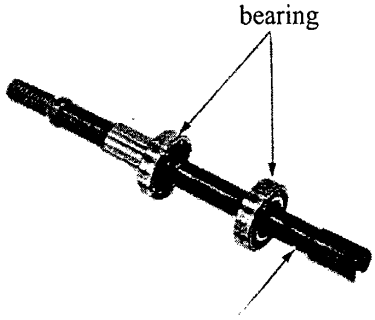
The mechanical seal and gasket should be replaced together.



Removal of water pump shaft
Remove the right crankcase cover. (→ 10-2)
Remove the circlip from right crankcase cover.
Remove the water pump shaft.



Check the bearing of water pump shaft, if there is wearing or damaging replace it.

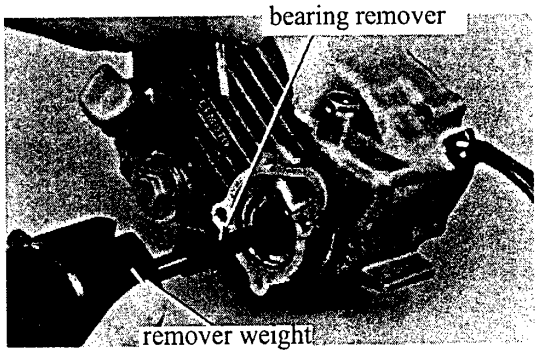


Replacement of mechanical seal

Remove the mechanical seal from right crankcase cover using the bearing remover.
Remove the oil seal.

Special tools

Bearing remover assembly	15 mm	07936-KC10000
Bearing remover	15 mm	07936-KC10500
(Shaft for removing	15 mm)	07936-KC10100
(Remover head	15 mm)	07936-KC10200
Balance block for removing		07741-0010201



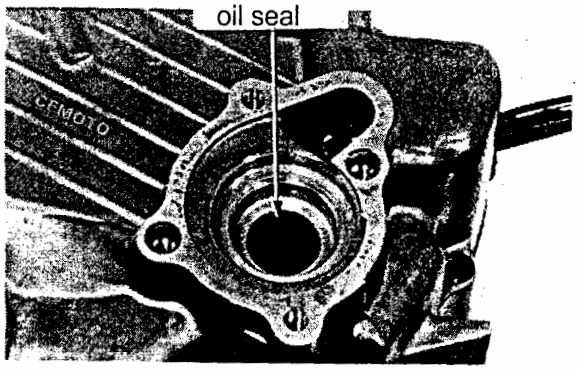
Make the new oil seal surface with mark towards outside, knock the new oil seal in right crankcase cover.

Special tool

Bearing remover 28 x 30 mm 07946-1870100

General tool

Driver handle A 07749-0010000



Knock the new mechanical seal in right crankcase cover.

ⓘ Caution

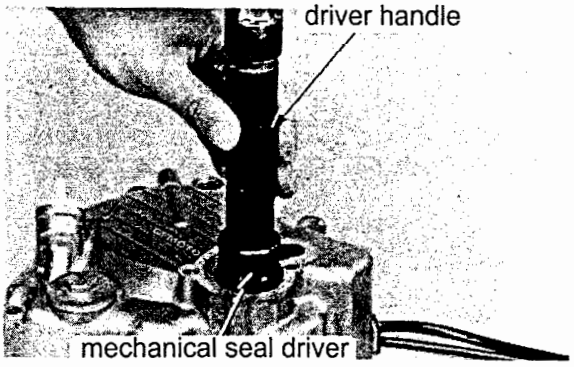
Apply the sealing compound on the joint part between the mechanical seal and right crankcase cover before knock the new mechanical seal in.

Special tool

Driver for mechanical seal 07945-4150400

General tool

Driver handle A 07749-0010000

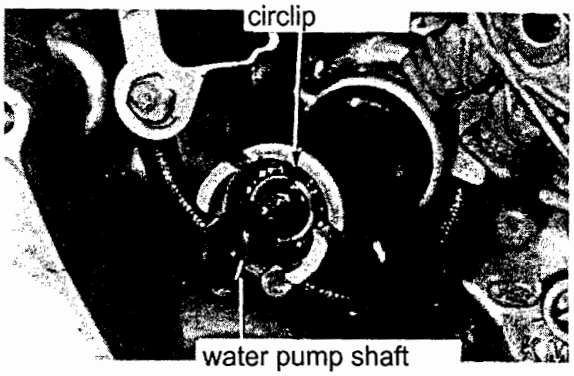


Installation of water pump shaft

Install the water pump shaft on right crankcase.

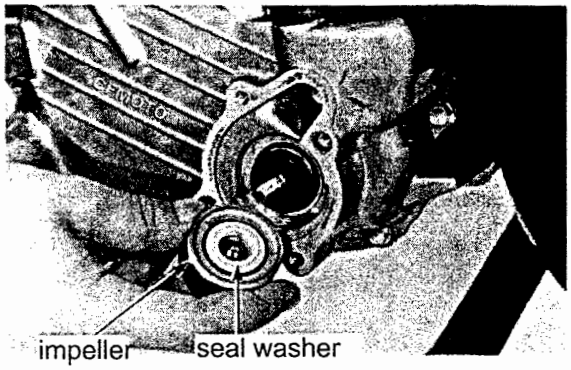
Install the circlip.

Install the right crankcase cover. (¡ú10-10)



Installation of water pump impeller

Install a new sealing washer on impeller when replace the mechanical seal.

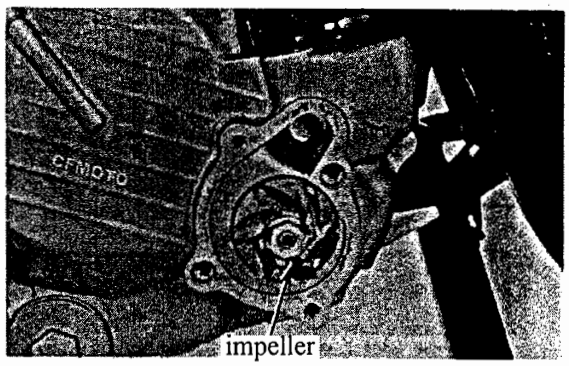


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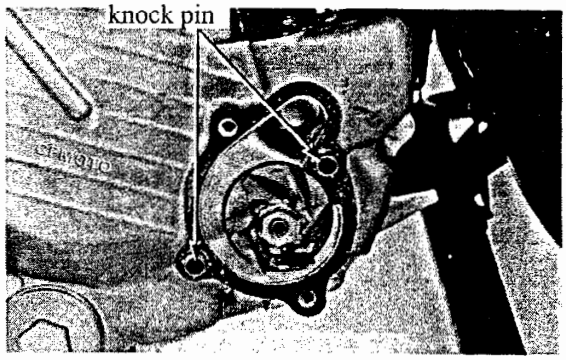
Fix the impeller on water pump shaft.
Torque:1.0-1.4 kg-m

ⓘ Caution

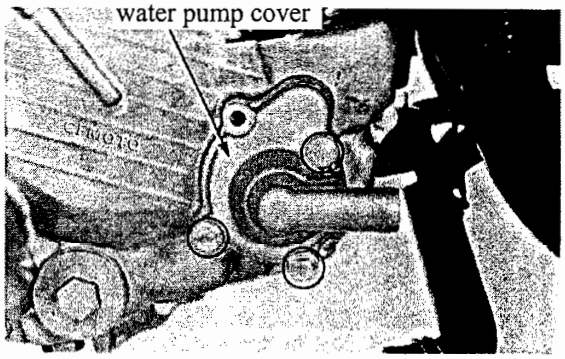
The water pump impeller is left rotation.



Install two knock pins and new washer.



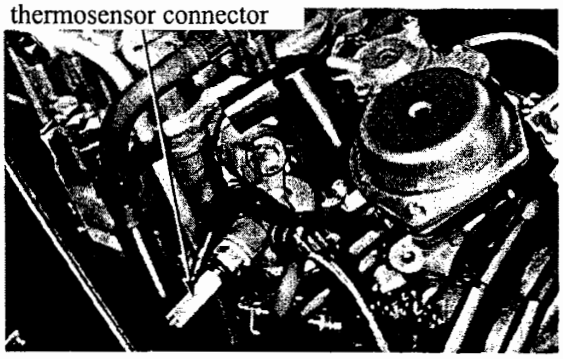
Install the water pump cover with 3 bolts.
Connect oil pipe. (¡ú10-12)
Connect water hose.
Fill in engine oil. (¡ú2-11)
Fill in radiator liquid. (¡ú4-4)
Torque:
Oil pipe bolts 8 mm 0.8-1.2 kg-m
12 mm 1.8-2.2 kg-m



Thermostat

Removal

Remove the seat. (¡ú12-2)
Remove the thermo-sensor connector.
Discharge the cooling liquid. (¡ú4-4)
Loosen the bolts, remove the thermostat casing from the cylinder cover.



Loosen two bolts, remove the casing cover of thermostat.
Remove the o-ring from the thermostat casing.



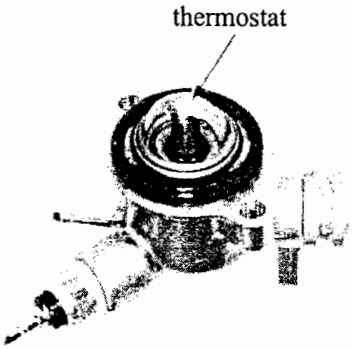
Remove the thermostat from the casing.

Inspection

Put the thermostat in testing container, increase the water temperature gradually, conduct the temperature test of valve open.

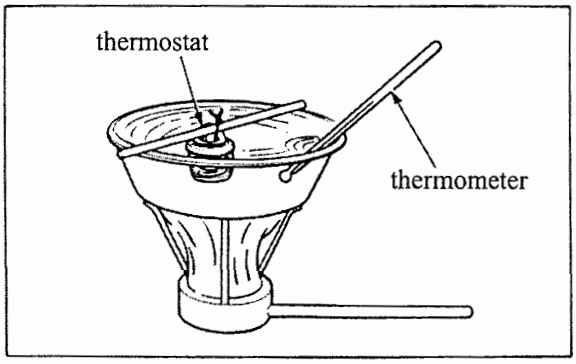
Specification of thermostat

Beginning temp. when valve is opened	71 1.5
Temp. when valve is fully opened	80
Increased level when valve is fully opened	3.4- 4.5 mm



Note

.Don't let thermostat contact with container directly.
.The thermostat should be replaced provided the valve opens a little at normal temperature.
.Test about 5 minutes at 80¡æ, then measure the increased level.

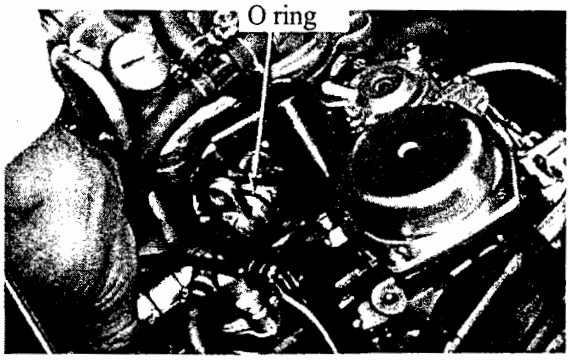


Installation

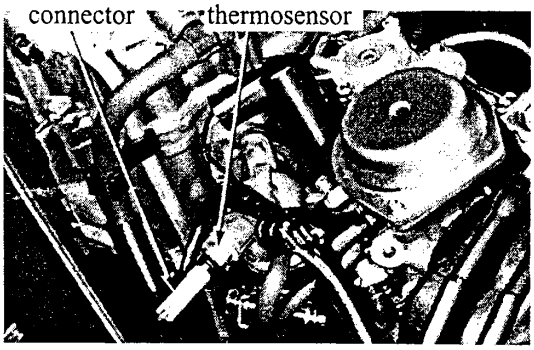
Install according to opposite order for removing.

Note

Replace the o-ring of thermostat casing with a new one, apply grease.
Fill in cooling liquid, evacuate air. (4-4)



Termosensor

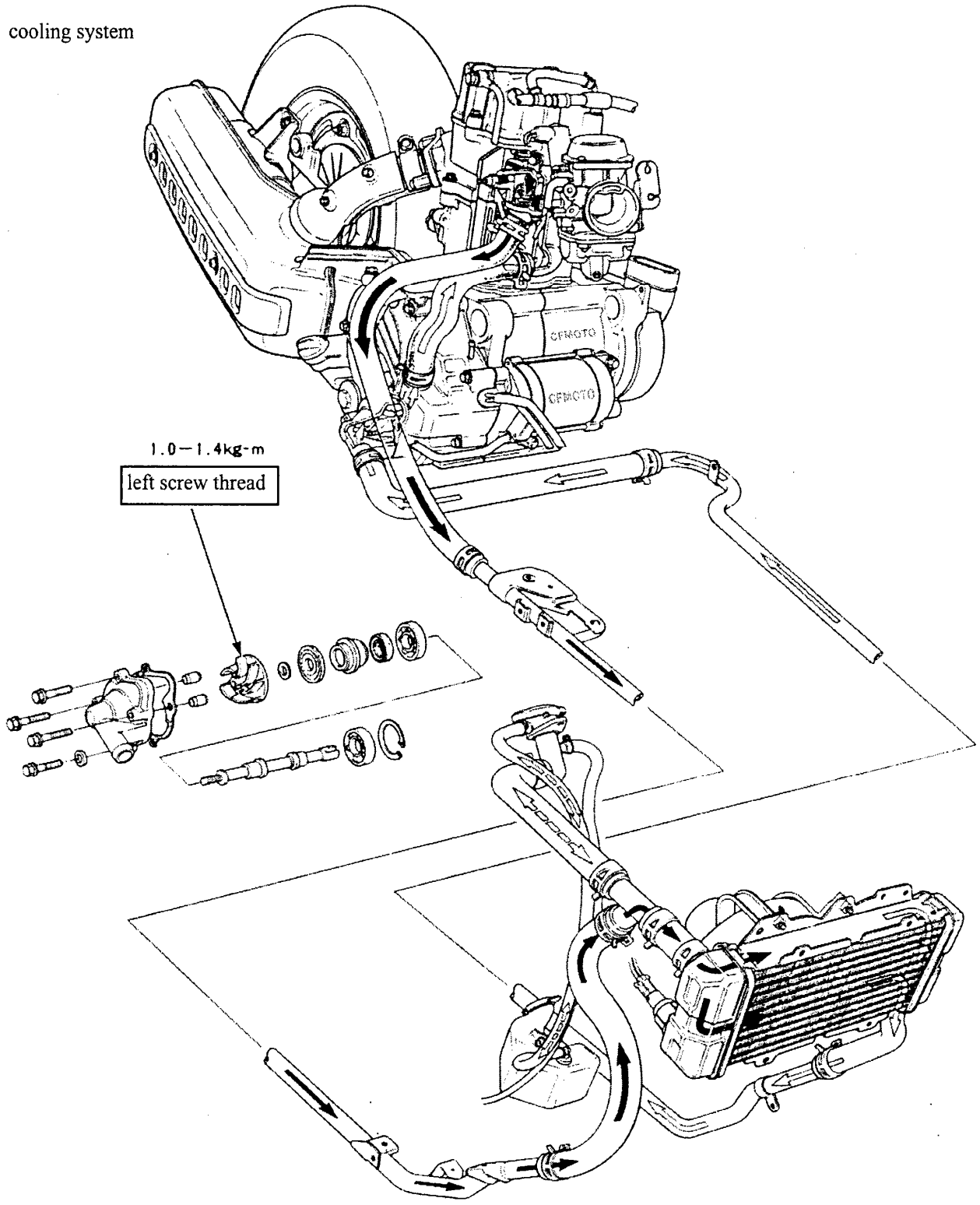


Removing
Remove the seat. (>12-2)
Discharge the cooling liquid. (>4-4)
Remove the thermosensor connector.
Remove the thermosensor.

Installing

Apply the thread fixed glue on thermosensor thread, then install the thermosensor on thermostat casing.
Torque:0.8-1.2 kg-m
Connect the thermosensor wire.
Fill in the cooling liquid.(>4-4)
Install the seat. (>12-2)

cooling system



CFMOTO

6 CYLINDER HEAD AND VALVE

Maintenance information..... 6-1
Trouble diagnosis.....6-2
Removal of cylinder head cover.....6-3
Disassembling of cylinder head cover.....6-3
Removal of cam shaft.....6-3
Removal of cylinder head.....6-4
Disassembling of cylinder head.....6-6
Replacing of valve guide.....6-8
Inspection and dressing of valve seat.....6-8
Assembling of cylinder head.....6-11
Installing of cylinder head.....6-12
Installing of cam shaft/timing of valve.....6-12
Assembling of cylinder head cover.....6-13
Installing of cylinder head cover.....6-14

Maintenance information

Precautions for operation

. A new cylinder gasket should be used when the cylinder head is installed. Confirm if the knock pin is installed properly.

Reference for maintenance

Item		Normal value	Limit for use
Deformation of cylinder head		——	0.05
Contact width of valve seat		1.1	1.8
Ext. dia. of valve stem	IN	4.975-4.990	4.90
	EX	4.955-4.970	4.90
Int. dia. of valve guide		5.000-5.012	5.03
Clearance between valve and valve guide	IN	0.010-0.037	0.08
	EX	0.030-0.057	0.10
Free length of valve spring	IN	30.7	27.6
	EX	40.1	36.1
Height of cam		31.570-31.690	31.52
Rocker arm int. dia.		12.000-12.018	12.10
Rocker arm shaft ext. dia.		11.966-11.984	11.91

Torque for tightening

Detail information (→ 6-15)

Tools

Special tools

Valve guide reamer	07984-MA60000
Valve guide driver (5.0 mm)	07942-MA60000

General tools

Valve spring compressor	07757-0010000
Valve guide driver	07743-0020000

Valve seat cutter

Cutter holder (5 mm)	07781-0010400
Seat cutter (29.0 mm) 45° EX	07780-0010300
Seat cutter (33.0 mm) 45° IN	07780-0010800
Flat cutter (30.0 mm) 32° EX	07780-0012200
Flat cutter (33.0 mm) 32° IN	07780-0012900
Inner cutter (30.0 mm) 60° IN, EX	07780-0014000

Trouble shooting

The cylinder head doesn't rotate well. The trouble can be found by means of measuring the compression pressure or sound from engine upper part.

low or unstable compression pressure

. Valve
- No proper adjustment of rocker arm shaft
- Sintering or bending of valve
- Damaging of valve spring
- No proper timing of valve
- No proper sealing of valve seat

. Valve clearance
- Leakage of cylinder gasket
- Deformation or crack of cylinder head

. No proper cylinder and piston
(→ chapter 7)

Too high compression pressure

. Carbon-deposit of piston combustion chamber

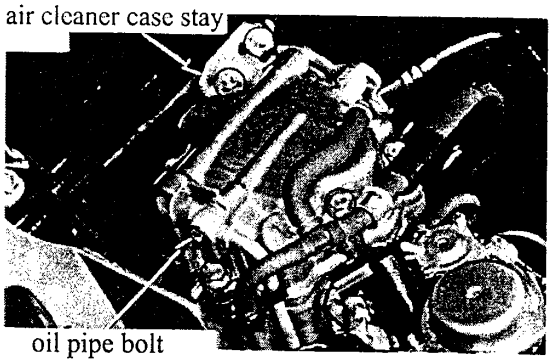
Noise

. No proper adjustment of rocker arm shaft
. Sintering of valve, or damaging of valve spring and low elasticity
. Damaging and wearing of rocker arm and rocker arm shaft

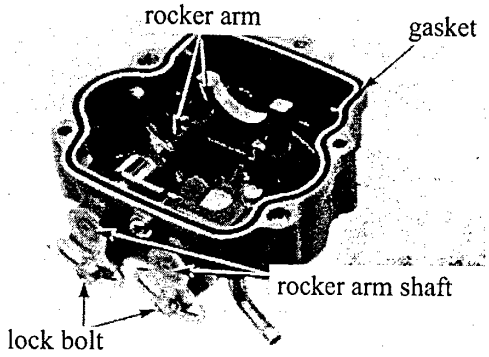
Removal of cylinder head cover

Remove the valve sear. (→ 12-2)
Remove the oil pipe bolt and copper gasket from cylinder head cover.

Remove the lock bolt from air cleanner case.
Remove 5 bolts of cylinder head cover, remove the air cleanner and cylinder head cover.
Remove the knock pin from the cylinder head.



Disassembling of cylinder head cover
Remove the o-ring from the cylinder head cover.
Loosen the retaining bolt for tappet adjuster, take out the rocker arm shaft, remove the rocker arm.



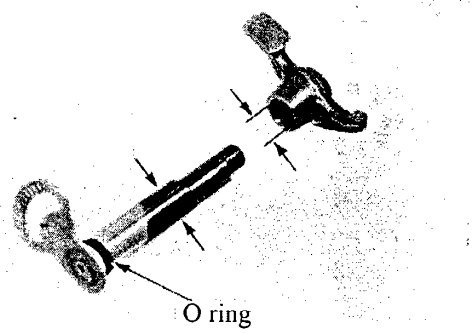
Inspection

Rocker arm
Check the rocker arm for damaging or wearing.
Measure the internal diameter.
Limit for use:
Replace it if it is over 12.10 mm.

ⓘ Caution

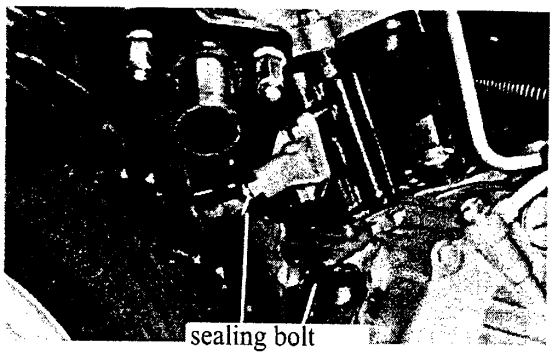
If the rocker arm is worn or damaged, the cam surface of camshaft should be checked for wearing or damaging.

Rocker arm shaft
Check the rocker arm shaft for wearing or damaging.
Measure the external diameter.
Limit for use:
Replace it if it is under 11.91 mm.
Check the o-ring. Replace it if it is damaged.



Removal of camshaft

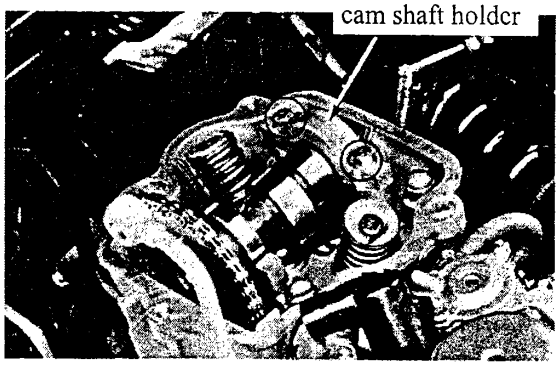
Remove the exhaust pipe and muffler. (>14-2)
Remove the sealing bolt for timing chain adjustment and spring.



Loosen 2 bolts, remove the spring seat of camshaft. Remove the chain from sprocket.Remove the camshaft.

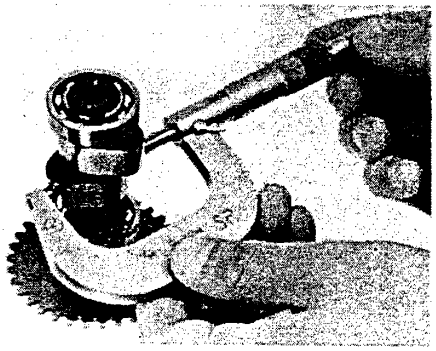
Note

In order to avoid the timing chain to fall into cylinder, it should be hanged with a steel wire.

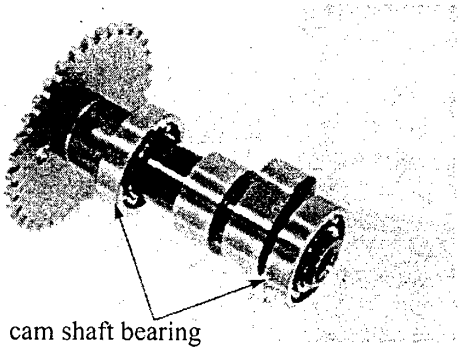


Inspection of camshaft

Check the scrape of cam surface and height of cam.
Limit for use:
Replace it if it is under 31.52 mm.

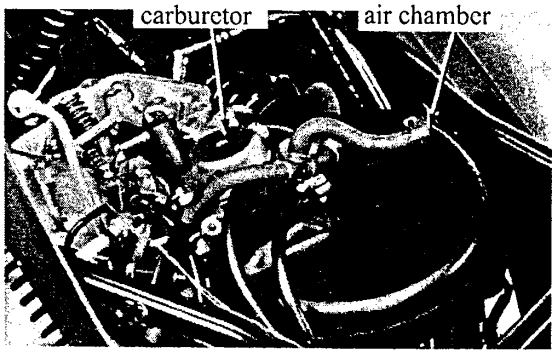


Check the camshaft bearing. If there is any loose or damage on it , replace the camshaft assembly.



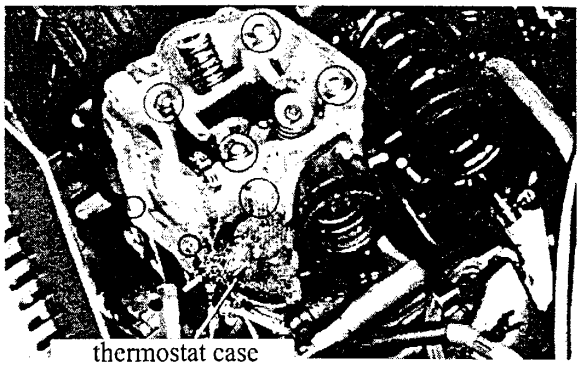
Removal of cylinder head

Remove the air chamber and carburetor.

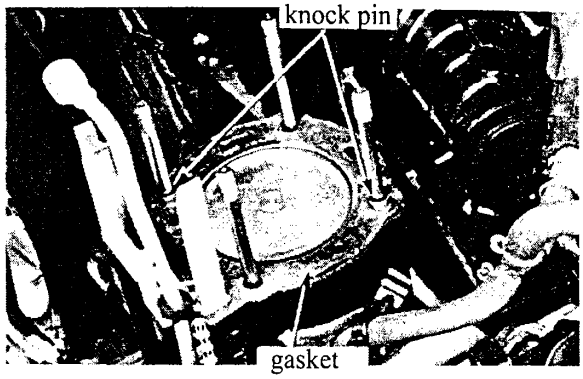


Draining of cooling liquid

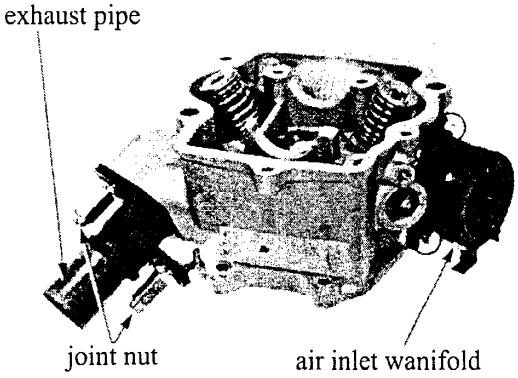
Remove the bolt of thermostat case, remove the thermostat case from the cylinder head.
Remove the retaining bolt for oil pipe support and the bolt on cylinder head base.
Remove 4 nuts of cylinder head cover and 4 copper gaskets.



Remove the cylinder head gasket and locating pins.



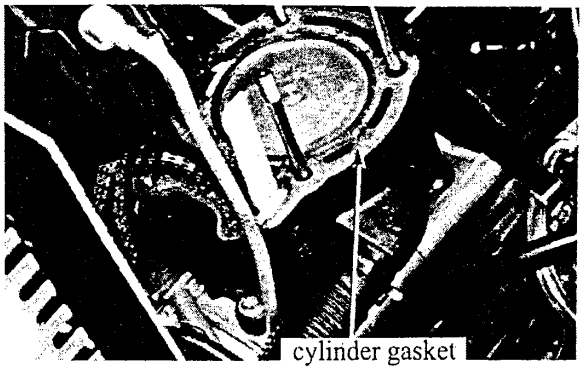
Remove 2 connection nuts for exhaust pipe,
Remove the exhaust pipe from cylinder head.
Loosen 2 bolts and remove the heat insulator of carburetor.



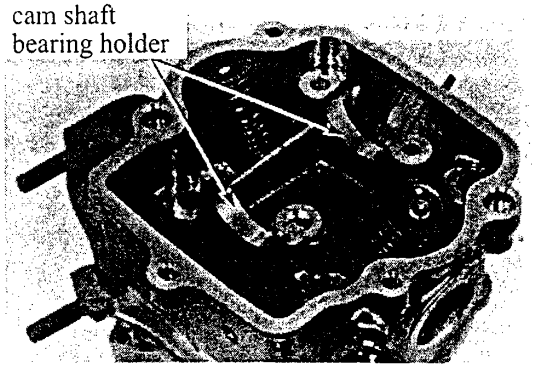
Take out the cylinder gasket material on cylinder.

ⓘ Caution

. Take care, don't damage the surface of cylinder gasket.
. The cylinder gasket material should not be fallen into engine and piping system.



Check the camshaft bearing seat for wearing or damaging.



Disassembling of cylinder head

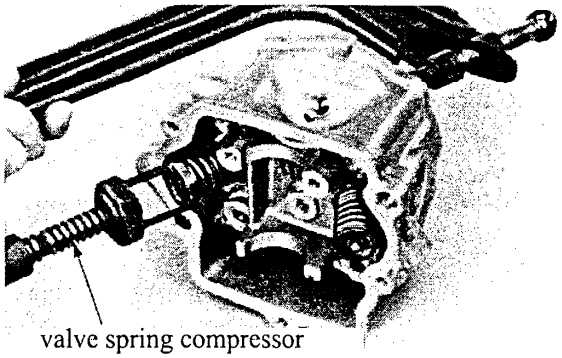
Remove the valve pin, protecting ring, valve spring, valve seat, valve stem seal and valve.

Note

. Don't tighten the compressor too tight.
. The parts of side IN and side EX should be separated after being disassembled.

Special tool

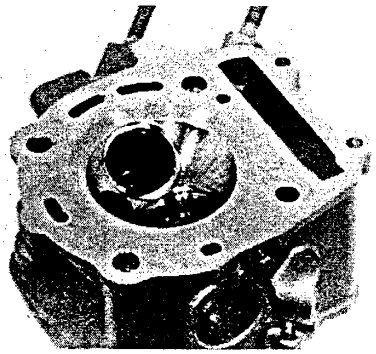
Valve spring compressor 07757-0010000

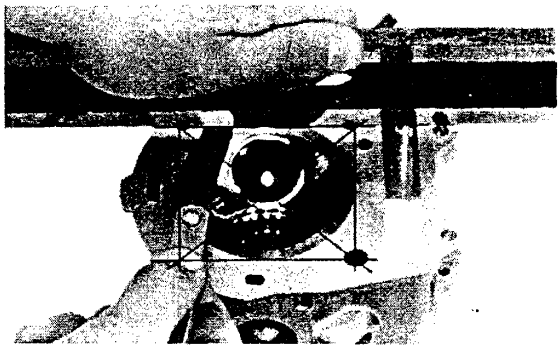


Remove the carbon-deposit from combustion chamber. Remove the gasket material stuck on surface of cylinder head cover.

Note

Take care, don't damage the surface of cylinder. It is easy to remove in gasoline.





Inspection

Cylinder head

Check the cracks round the spark plug hole and valve hole.

Check the deformation of cylinder head using a right-angle rule and a filler.

Limit for use:

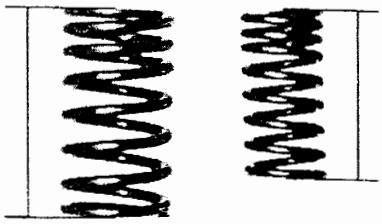
Replace or dress it if it is over 0.5 mm.

Valve spring

Measure the free lengths of internal and external springs.

Limit for use:

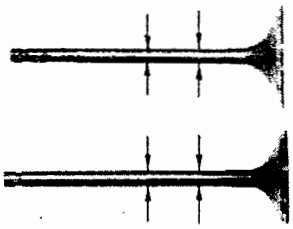
Replace the internal spring if it is under 27.6 mm.
Replace the external spring if it is under 36.1 mm.



Valve and valve guide

Check the bending, burning and scrape, as well as the wearing of valve stem end.
Put the valve into valve guide, check if it moves stably.
Measure the external diameter of valve stem.
Limit for use:

Replace it if it is under 4.90 mm.

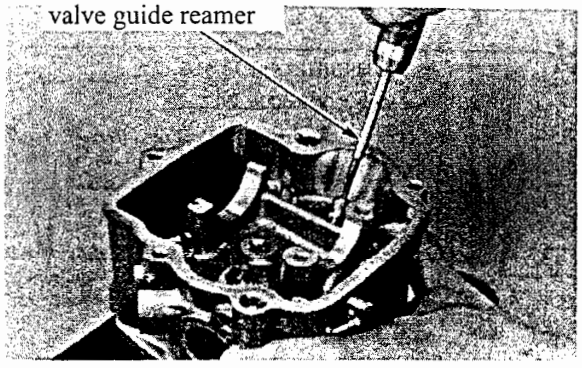


Use a reamer to pass through the valve guide to remove the carbon-deposit.
Special tool:
Valve guide reamer 07984-MA60000

ⓘ Caution

Make the reamer rotate always to right.Don't insert or draw the reamer when the reamer doesn't rotate.

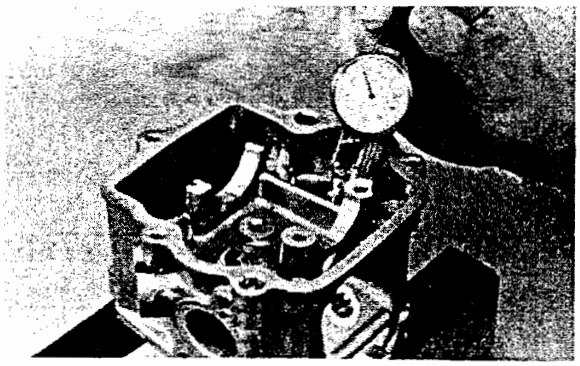
valve guide reamer



Measure the internal diameters of valve guide tubes.

Limit for use:

Replace it if it is over 5.03 mm.



Calculate the clearance between valve stem and valve guide.
The clearance between valve stem and valve guide is valve guide int. dia. minus valve stem ext. dia. value.
Limit for use:
For IN : Replace it if it is over 0.08 mm.
For EX: Replace it if it is over 0.10mm.
Replace the valve guide with a new one When the clearance exceeds the use limit.At this time ,the use limit should be calculated.If it is within the use limit, only replace the valve guide tube. The valve seat maybe needs to be dressed according to the condition of replaced valve guide. (>6-8)

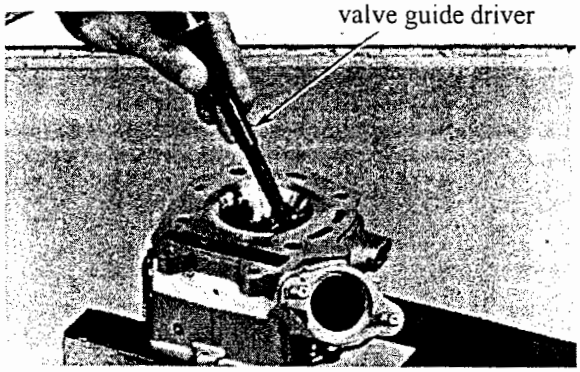
Replacement of valve guide

Knock out the valve guide.

Note

Take care, don't damage the cylinder head.

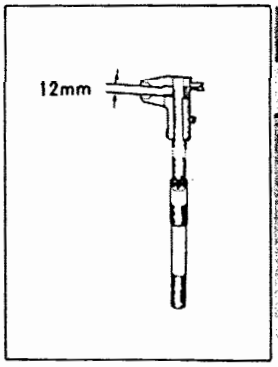
Special tool:Driver of valve guide (5.0 mm)
07942-MA60000



Adjust the driver for valve guide, make the driving height of valve guide reach 12 mm.
Knock the valve guide in.

Note

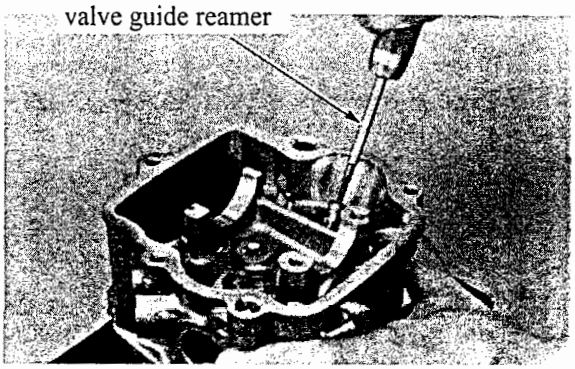
.Confirm that the valve guide is not damaged after it is knocked in.
.Take care, don't damage the surface of cylinder head when the valve guide is knocked in.





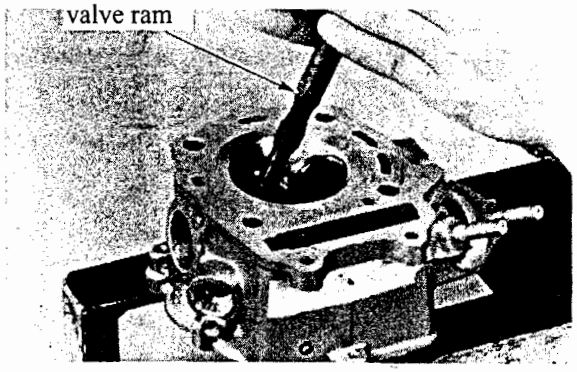
General tool:Valve guide driver 07743-0020000

Use a reamer to process the valve guide after it is knocked in.
Caution
. The cutting oil should be used when processing with reamer.
. Only let reamer rotate to right.
. Don't make the reamer insert in valve guide or draw out of it when the reamer doesn't rotate.



Clean the cylinder head and remove the cutting chips.

Special tool:
Reamer for valve guide 07984-MA60000



Inspection and dressing of valve seat

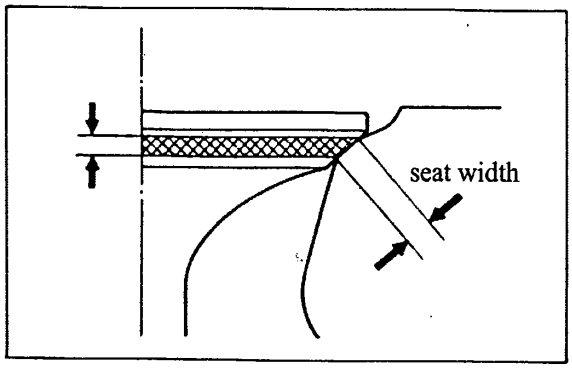
Inspection of valve seat

Remove the carbon-deposit of cylinder head combustion chamber and valve.
Apply a layer of thin mechanic's bluing dye on contact surface of valve uniformly.
Make the valve slide using a valve ram.
Remove the valve and check the contact surface of valve.
Replace the valve if the contact surface of valve become rough or has serious wearing.

Inspection of valve seat contact width

Limit for use: Dress it if it is over 1.8 mm.

A valve seat cutter should be used to dress if the contact width is not uniform,too wide or too narrow.



Valve seat cutter

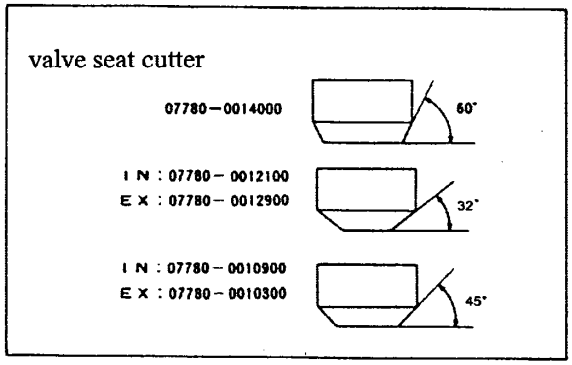
Please refer to the instruction of valve seat cutter for details.

4-5 kg of power should be used to press on valve seat cutter when dressing.

Rotate the cutter chuck while conduct grinding.

Note

Apply the engine oil on cutter chuck to make the chips fall down when grinding.

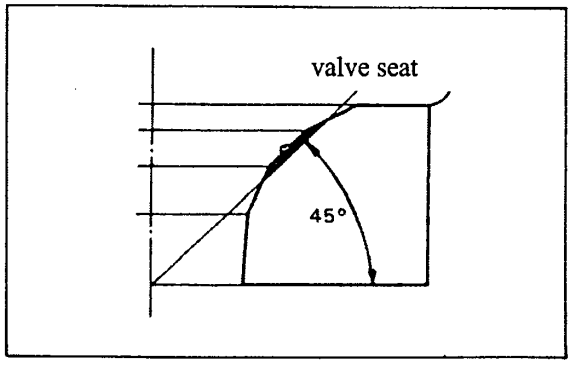


Dressing of valve seat

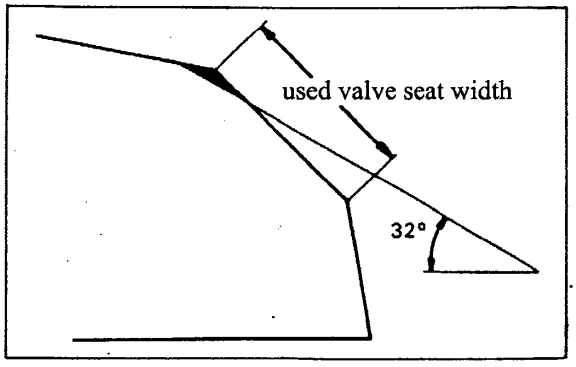
Use a valve seat face cutter chuck with 45° to conduct grinding, until the rough surface and needle hole are removed.

Note

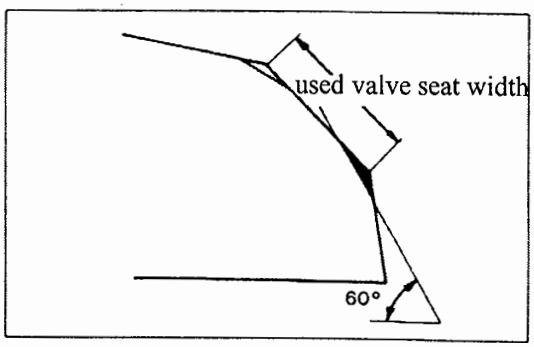
Take care, don't grind excessively.



Use the cutter chuck with 32° to perform plane grinding.



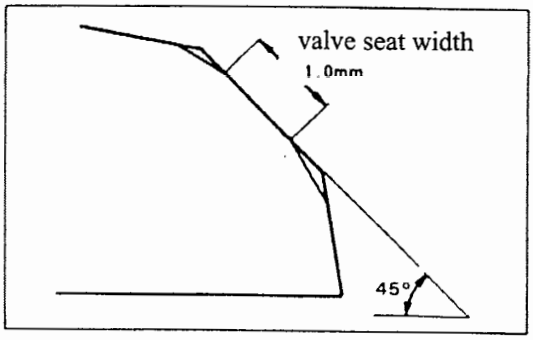
Use the cutter chuck with 60° to conduct surface grinding.



Use the cutter chuck with 45° to carry out the dressing of valve seat until the normal width of valve seat face is reached.

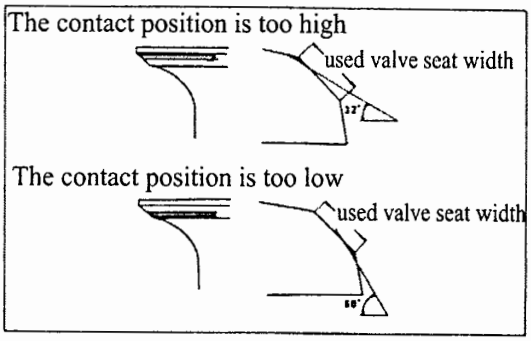
Contact width

Normal value: 1 mm

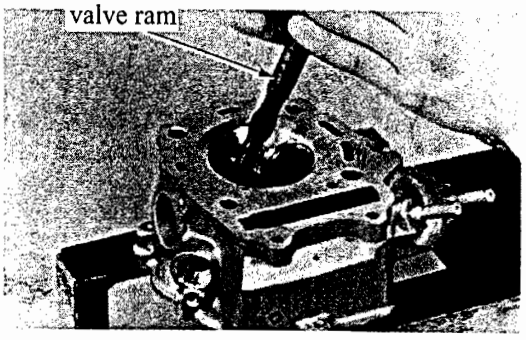


Use a cutter chuck with 32° to grind plane if the contact position is too high.
Use a cutter chuck with 60° to grind plane If the contact position is too low.

Use the cutter chuck with 45° and adjust to normal contact width.



Apply the polishing paste on contact surface uniformly after dressing.
Use a valve ram or coordinating device of valve to conduct coordinating and grinding.
Clean the cylinder and valve after grinding.



ⓘ Caution

- Pressing the valve on the valve seat powerfully to conduct rotating and grinding will cause the damage, so a light pressing will be needed.
- Take care, don't make the polishing paste fall in the gap between valve stem and valve guide tube.

Use the bluing dye to confirm that the valve seat surface contacts with the center of valve contact surface uniformly after dressing.

Assembling of cylinder head
Install the spring seat and valve stem seal.

Note

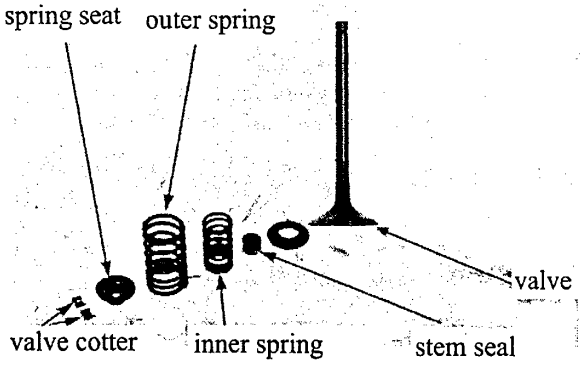
Replace with new one after remove the valve stem seal.

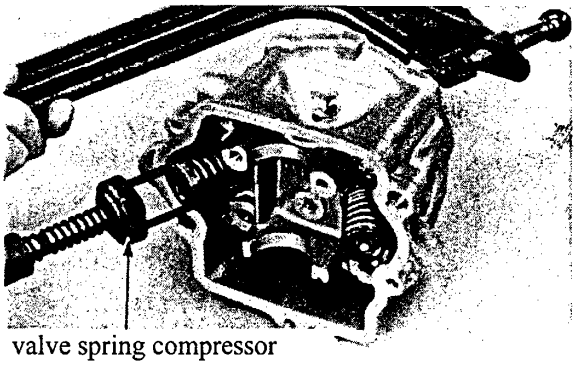
Apply a few of engine oil on valve stem, then insert in valve guide.
Install the valve pin using the valve spring compressor and accessory.

Caution

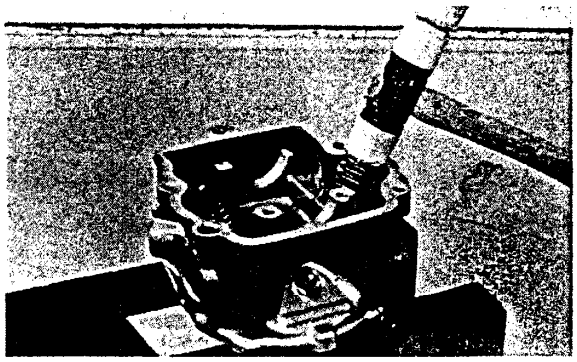
. The valve spring compressor should not be installed too tight.
. Make the small thread pitch surface of valve spring face to the side of cylinder head to install.

General tool:
Valve spring compressor 07757-0010000

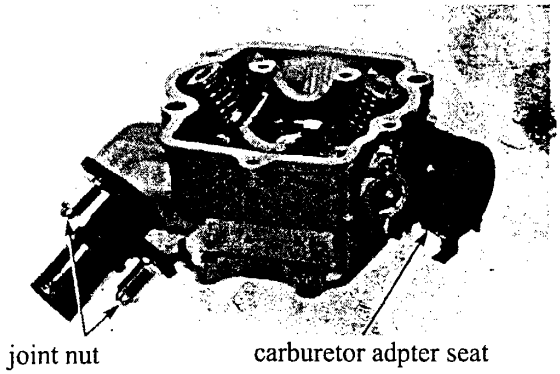




Use a rubber hammer to knock the top of valve stem 2-3 times slightly to make the valve and valve pin fit well.
Take care, don't damage the valve.

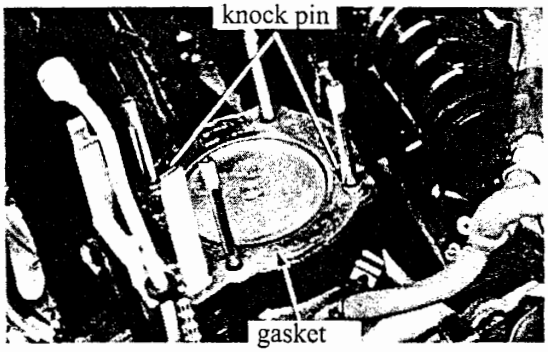


Install the exhaust pipe on cylinder head, tighten the joint nuts.
Install the carburetor adapter seat on cylinder head with 2 bolts.



Installing of cylinder head

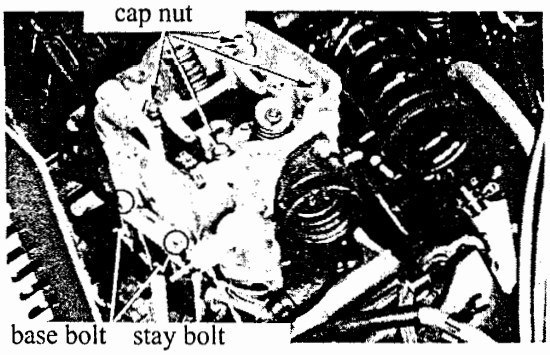
Install the knock pin and new cylinder gasket on cylinder head.



Installing of cylinder head
Install and tighten 4 copper gaskets and 4 cylinder caver nuts.
Torque: 2.2-2.6 kg-m

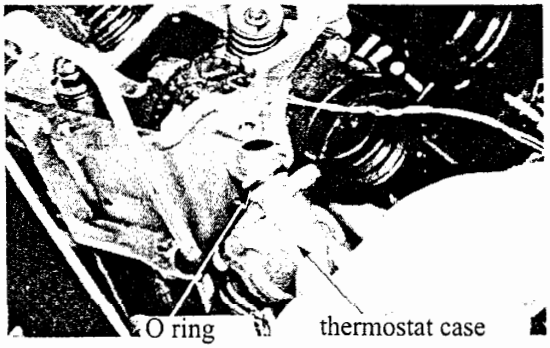
Note

Tighten the nuts of cylinder head cover in 2-3 times and in diagonal direction.



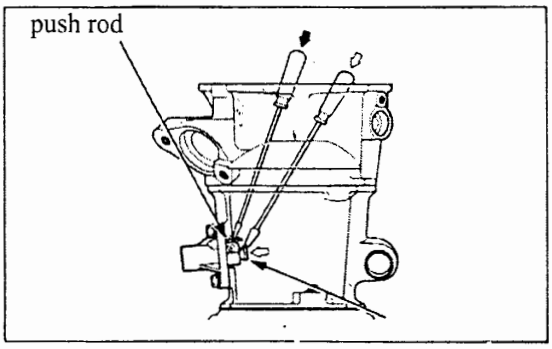
Install the bolts of cylinder head base, oil pipe stay and oil pipe stay bolt.

Install a new o-ring on thermostat case.
Install the thermostat case on cylinder head and tighten the bolts.
Install the carburetor. (→ 3-9)

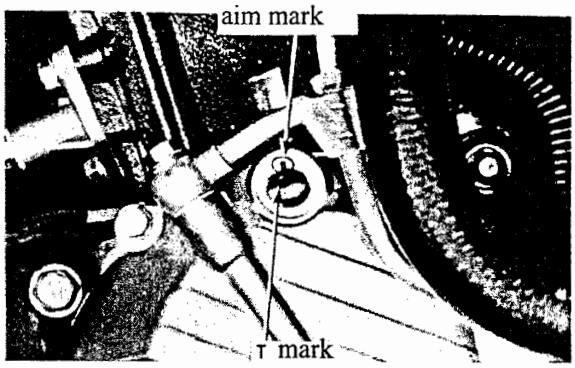


Installing of camshaft/valve timing

Push the jaw of cam chain adjuster, press the push rod to bottom.

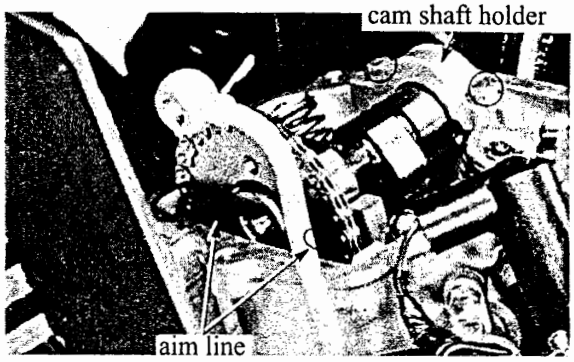


Remove the timing hole cover from right crankcase cover.
Remove the left crankcase cover(→ 8-3)
Rotate the drive belt wheel counter clockwise and make the "T" mark of the flying wheel coincide with the alignment mark of right crankcase cover.



Put the IN and EX cam of camshaft downwards, then install the camshaft onto cylinder head cover. Confirm if the aim line of cam sprocket aligns with the line on cylinder head cover. Install the cam chain on the cam sprocket.
Install the camshaft bearing seat,tighten bolts.

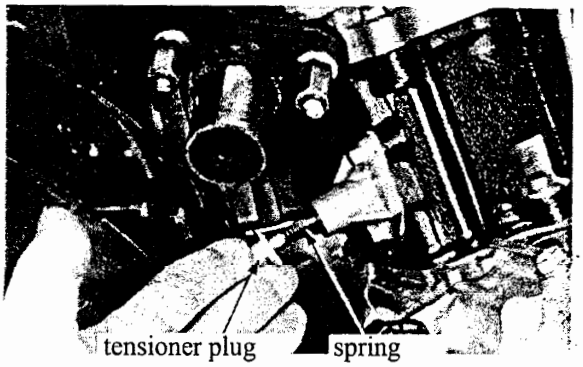
Torque: 0.8-1.2 kg-m



Install the spring and sealing washer of cam chain adjuster.Install the sealing parts.

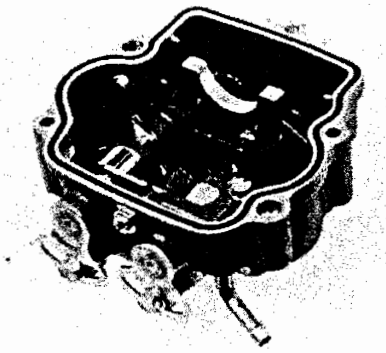
Torque: 0.8-1.2 kg-m

Install left crankcase cover and timing hole cover.
Install the exhaust mufflcr.(→ 14-2)



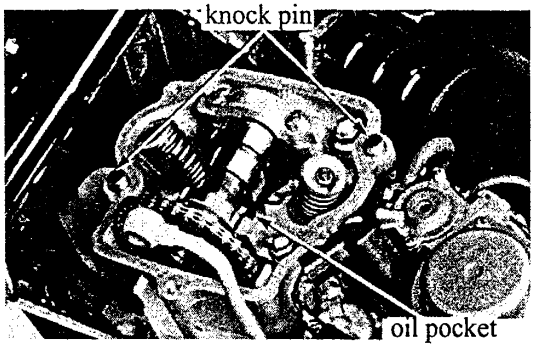
Assembling of cylinder head cover

Install the new o- ring on the rocker arm shaft.
Apply the engine oil on the rocker arm and shaft, then install them to cylinder cover.
Install the retaining bolt of the tappet adjuster temporarily.



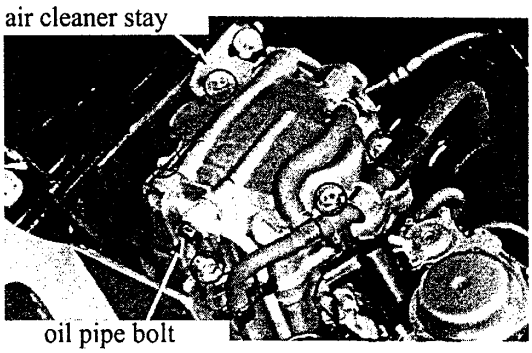
Installation of cylinder head cover

Fill the engine oil in full oil bag of the cylinder head cover.
Install two knock pins on cylinder cover.
Install rubber sealing washer in the slot of cylinder head cover, then install the cylinder head cover.



Tighten the air cleanner stay and five bolts of cylinder head cover.

Torque: 0.8-1.2 kg-m



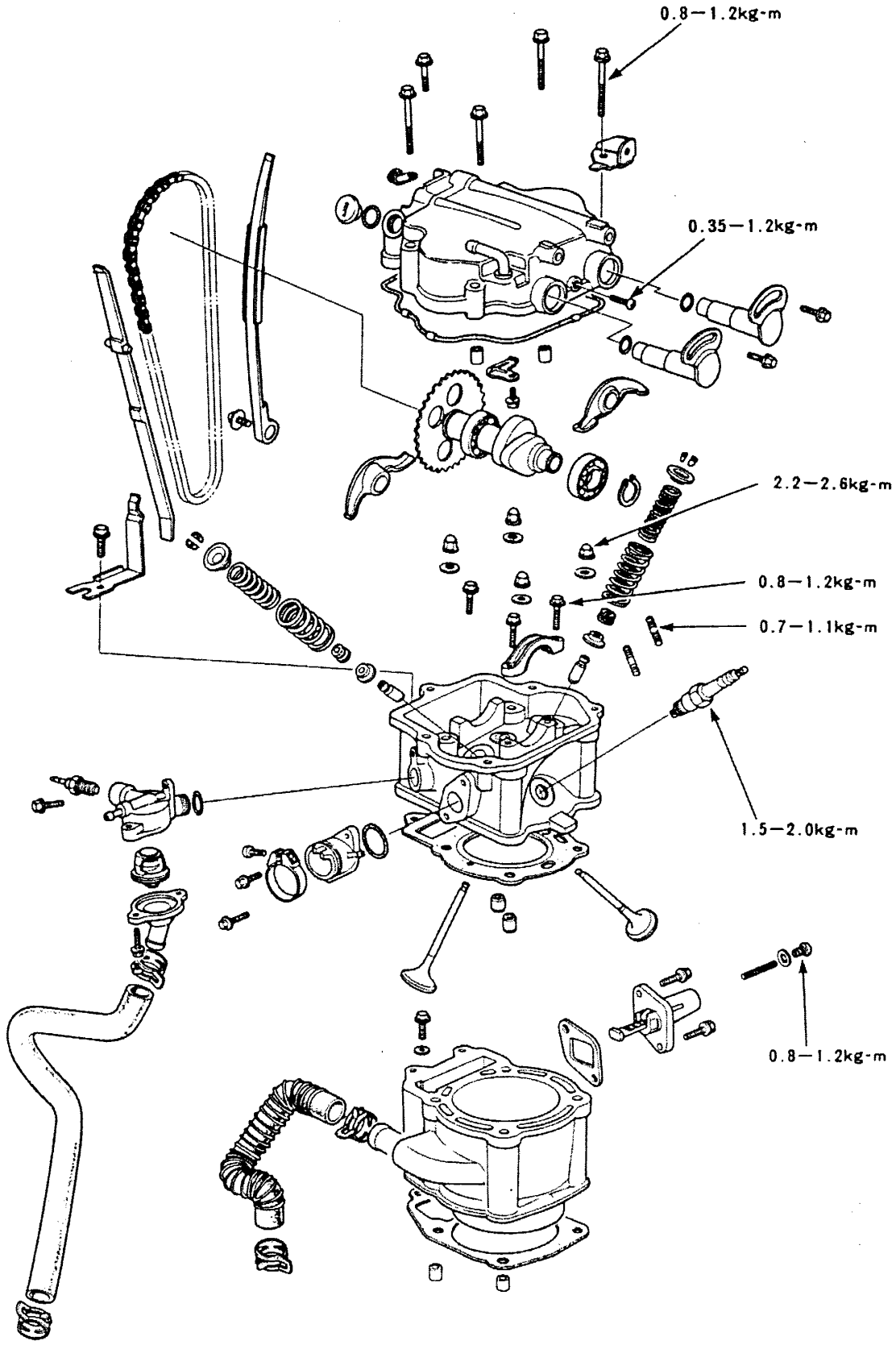
Note

.Tighten the air cleanner stay onto the cylinder head cover using the bolts on left-rear sides.
.Tighten bolts in diagonal direction with two or three times.

Tighten the air cleanner case onto the stay with bolts.
Install the oil pipe on the cylinder head cover using the oil pipe bolts and copper washer.

Torque: 0.8-1.2 kg-m

Adjustment of tappet (>2-10)
Adjustment of valve clearance (>2-12)
Installation of seals (>12-2)


0.8—1.2kg-m
0.35—1.2kg-m
2.2—2.6kg-m
0.8—1.2kg-m
0.7—1.1kg-m
1.5—2.0kg-m
0.8—1.2kg-m

7 CYLINDER AND PISTON

Maintenance information.....7-1
Trouble diagnosis.....7-1
Removal of cylinder.....7-2
Removal of piston.....7-3
Installation of piston.....7-6
Installation of cylinder.....7-7

Maintenance and repair information

Operation precautions:
.Use a new cylinder gasket and confirm if the knock pin is installed properly when install the cylinder.

Reference for maintenance

Item			Normal value	Limit for use
Cylinder	bore		72.000-72.010	72.10
	Upper deformation		----------	0.05
	circularity		----------	0.05
	Cylintricity		----------	0.05
Piston,Piston ring, piston pin	Ring slot and ring clearance	First ring/ second ring	0.015-0.050	0.09
	Piston ring close clearance	First ring/ Second ring	0.15-0.35	0.50
		Oil(side rack)	0.2-0.7	---------
	External dia. of piston		71.970-71.990	71.90
	Bore of piston pin hole		17.002-17.008	17.04
	Bore of connection rod small end		17.016-17.034	17.06
	External dia. of piston pin hole		16.994-17.000	16.96
	Clearance of cylinder and piston		0.010-0.040	0.10
	Clearance of piston and piston pin		0.002-0.014	0.02

Torque for tightening
Timing chain adjuster base bolt 0.8-1.2 kg-m

Trouble shooting

Low compression pressure
. Wear of cylinder , piston, and piston ring

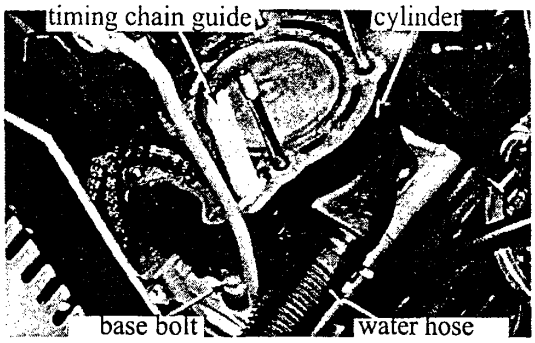
Smoking from muffler (ñaused by oil)
. Wear of cylinder and piston
. Not proper installation of piston and piston ring
. Damage of piston and cylinder

Overheat
. carbon-deposit of combustion chamber and piston ring

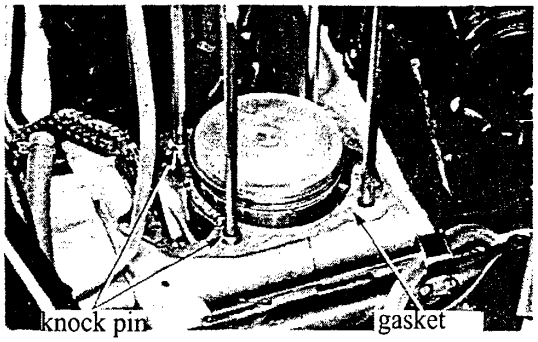
Detonation, abnormal sound
. wear of piston and cylinder
. carbon-deposit
.wear of piston, piston pin and connection rod small end.
. wear of piston and piston ring

Removal of cylinder

Remove the cylinder head. (>chapter 6)
Remove the water hose connector from the cylinder.
Remove the timing chain guide.
Loosen the bolts on cylinder base, remove the cylinder



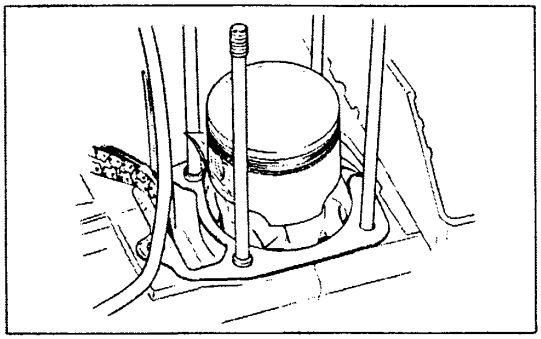
Remove the cylinder gasket and knock pins.



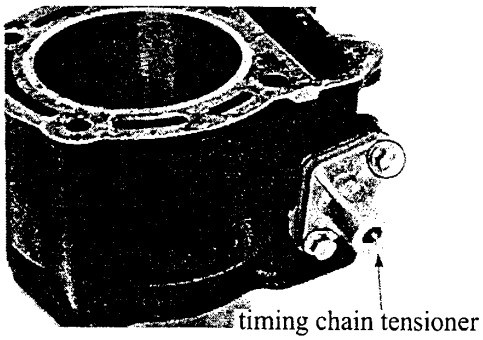
Remove the cylinder gasket material stuck on crankcase.

Caution

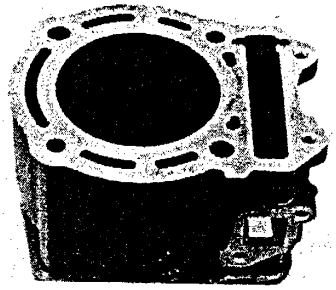
Take care don't let foreign matter enter crankcase.



Remove the timing chain adjuster base and cylinder gasket.



Remove the cylinder gasket material stuck on the cylinder.



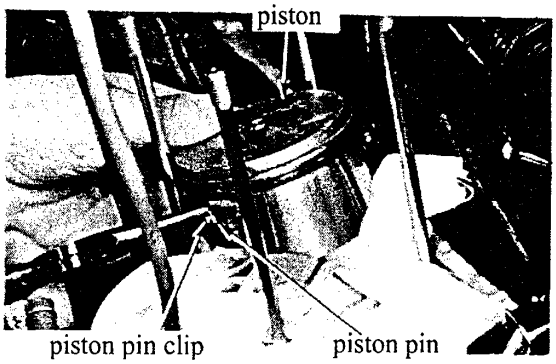
Removal of piston

Remove the piston pin circlip.

ⓘ Caution

Take care, don't make the circlip fall in case.

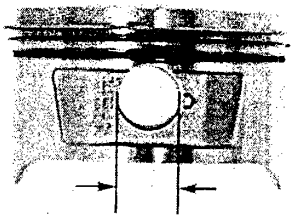
Draw the piston pin and remove the piston.



Inspection of piston, piston pin and piston ring

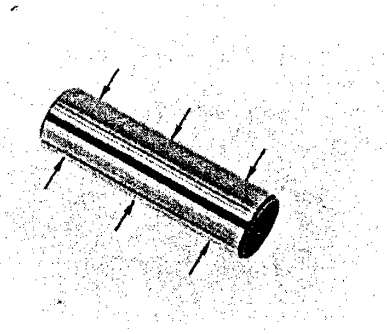
Measure the bore of the piston pin hole.

Limit for use: Replace if it is over 17.04 mm



Measure the external dia. of piston pin.

Limit for use: Replace if it is under 16.96 mm.

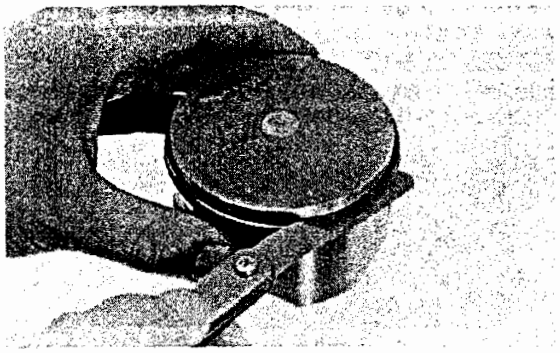


calculate the clearance between piston and piston pin.

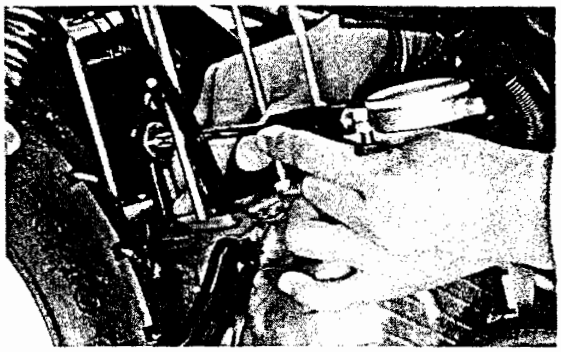
Limit for use: Replace if it is over 0.02 mm.

Check the clearance of piston ring and ring slot.

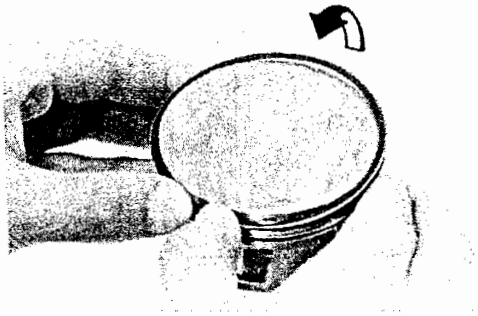
Limit for use:
First ring Replace if it is over 0.09 mm.
Second ring Replace if it is over 0.09 mm



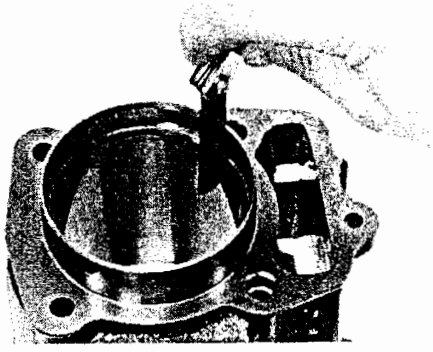
Check the damage of piston ,wear of ring slot and side crack.



Measure the bore of connection rod small end.
Limit for use: Replace if it is over 17.06 mm.



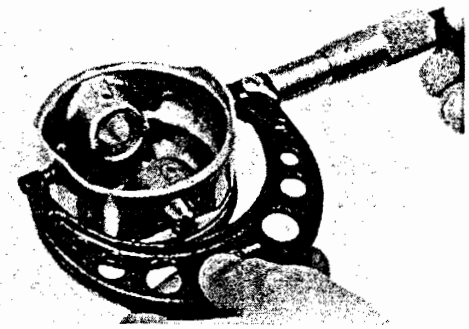
Remove the piston ring.
Take care, don't damage the piston and piston ring.



Install the piston rings on the low part of cylinder.
Press the piston rings into cylinder from piston head.
Measure the close clearance of piston ring.
Limit for use:
First and second rings: Replace if it is over 0.50 mm.

Measure the external dia. of piston at 14 mm calculated from the low end of piston skirt in a direction of 90 relative to piston pin.

Limit for use: Replace if it is under 71.900 mm.

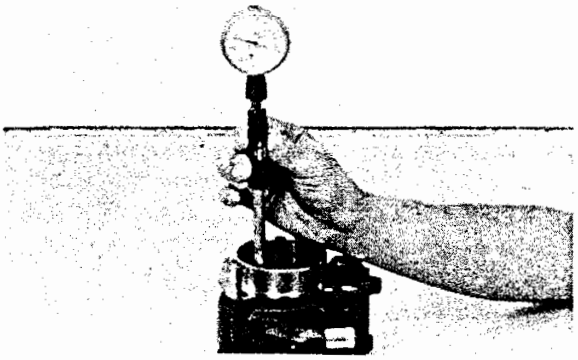


Inspection of cylinder

Inspect the wear and damage of internal surface of the cylinder.

Measure the bore values of cylinder at top, median and bottom in the direction of piston pin and its right angle(X-Y direction), and record them . Take the maximum as the bore value of the cylinder.

Limit for use: Correct or replace if it is over 72. 10 mm.



Calculate the clearance between cylinder and piston. Take maximum as clearance value.

Limit for use: Correct or replace if it is over 0.10 mm.

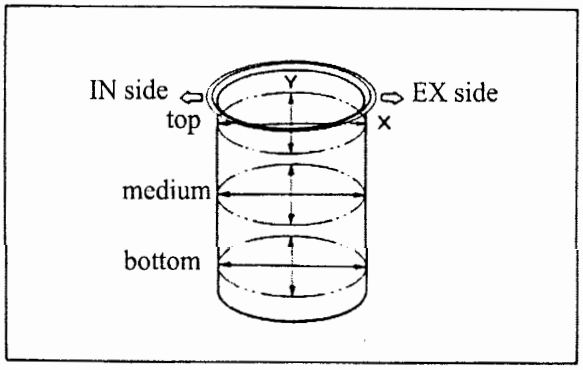
Calculate the circularity (difference between the X direction and Y direction) and cylintricity (difference of top, median and bottom bore values in X or Y direction).

Take the maximum as their value.

Limit for use:

Circularity: Correct or replace if it is over 0.05 mm.

Cylintricity: Correct or replace if it is over 0.05 mm.



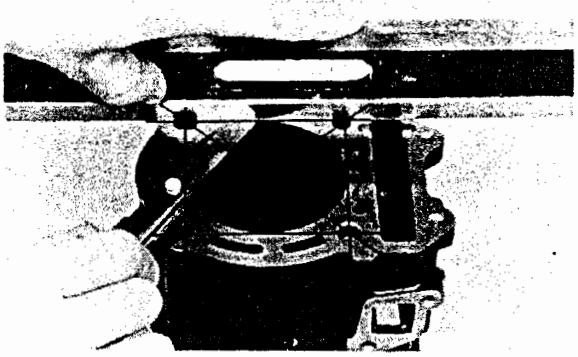
Measure the super maximum external diameter value part when make boring of cylinder so that the clearance between piston and cylinder reaches normal value.

Super maximum external dia. value:0.25, 0.50 and 0.75 mm

Normal clearance: 0.010-0.040 mm

Check the deformation of top surface of Cylinder.

Limit for use: Correct or replace if it is over 0.05 mm.

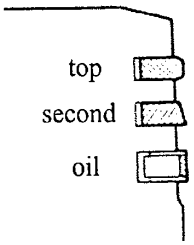


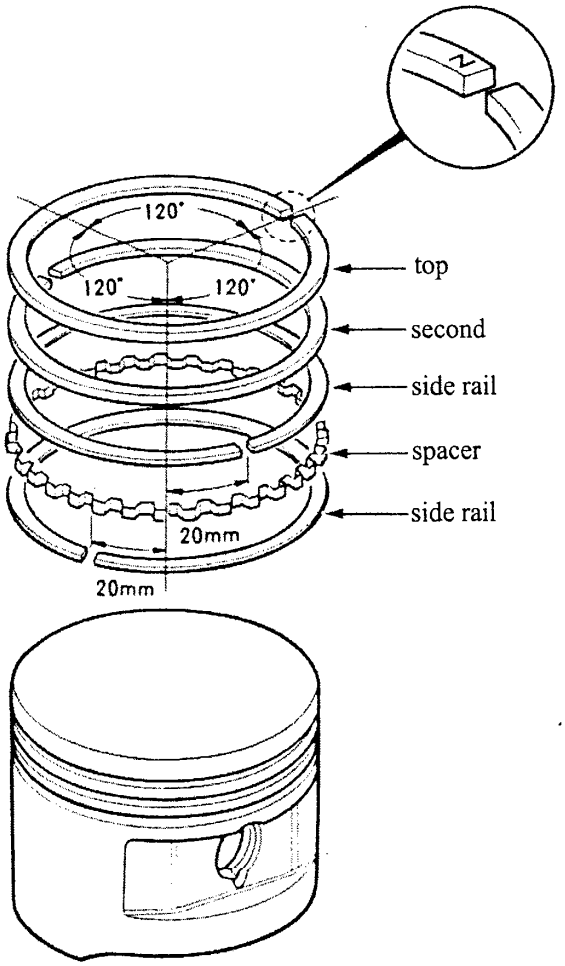
Installation of piston ring

Install the piston ring onto piston.
Apply the oil on piston rings.

Caution

. Take care, don't damage piston and piston ring.
. Put the piston ring surface with mark upwards.
. Confirm that the piston ring can rotate freely after installing.



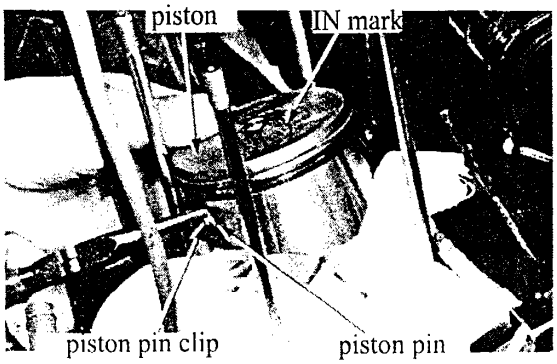


Installation of piston

Install the piston, piston pin and circlip.

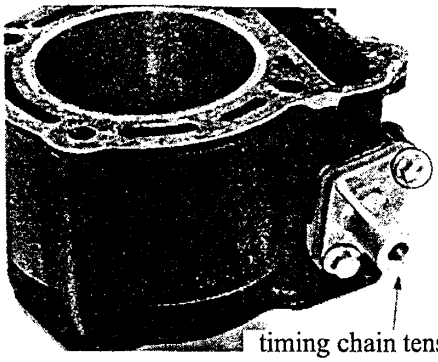
Note

. Make the mark "IN" be toward the entrance side.
. In order to prevent the piston pin , circlip, etc. falling in crankcase, please block with cotton.

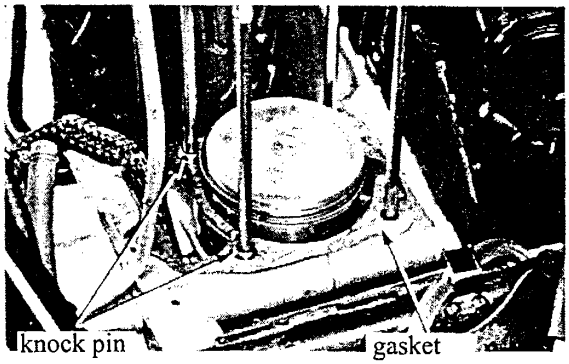


Installation of cylinder

Install the base of cam chain adjuster on cylinder using a new cylinder gasket.



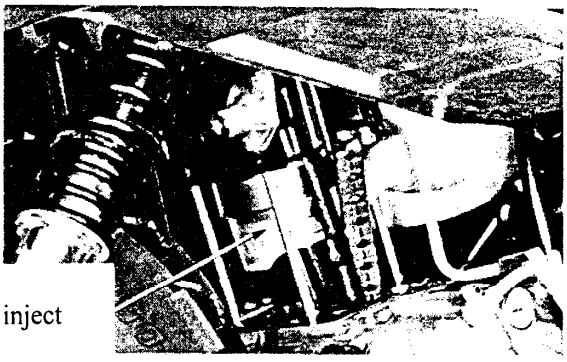
Install the knock pin and new cylinder gasket.



Apply clean engine oil on internal surface of cylinder, piston and piston ring.
Compress the piston ring while installing the cylinder onto piston, and install on crankcase.

Note

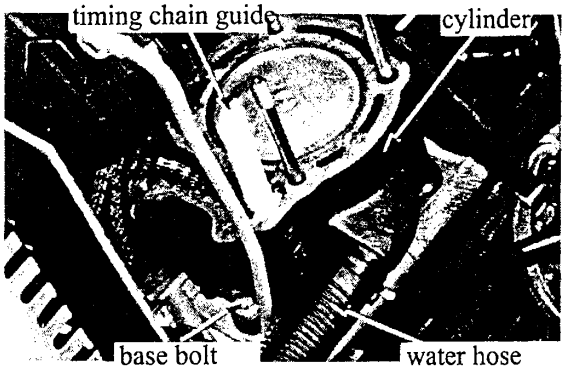
Take care, don't damage the piston and piston ring.
Take care to making the close position of piston ring keep clear of piston pin direction and other right angle direction, in three equal part position of 120°.



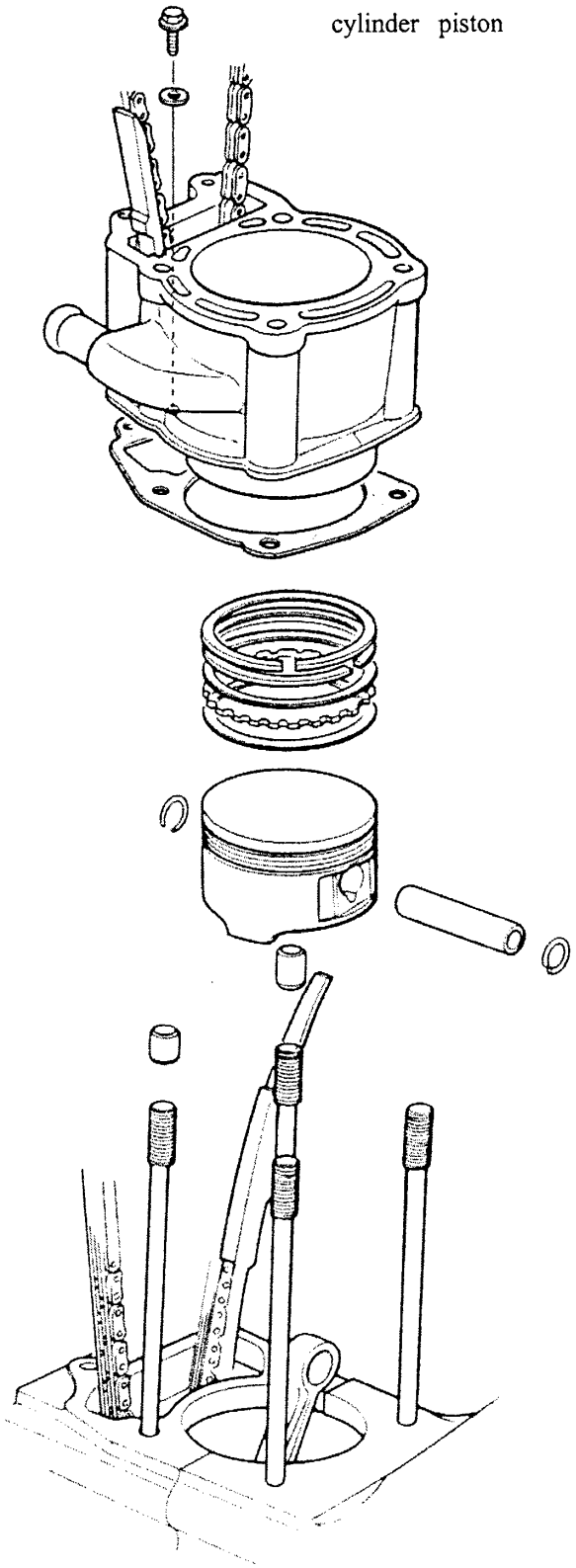
Install the cylinder base bolts and sealing gasket.
Fit the water hose to cylinder.
Install the cam chain guide.

Note

Confirm that the low end of cam chain guide inlays in slot of right crankcase.



Install the cylinder head. (>chapter 6)
Tighten the bolts of cylinder base.


cylinder
piston

8 DRIVE PULLEY CLUTCH AND DRIVEN PULLEY

Maintenance information..... 8-1
Trouble shooting 8-2
Left crankcase cover.....8-3
Drive belt.....8-3
Drive pulley 8-4
Clutch, driven pulley 8-8

Maintenance information

Precautions for operation

. The maintenance and repair of drive pulley , transmission , clutch and driven pulley can be done on motorcycle.

. Take care, don't let oil or grease stick on surfaces of drive belt, drive pulley and driven pulley.

Reference for maintenance

Item	Normal value (mm)	Limit for use (mm)
Movable drive pulley bush bore	27.000-27.021	27.06
Drive pulley thimble ext. dia.	26.970-26.990	26.94
Width of drive belt	22-23	21.0
Thickness of clutch friction plate	-------	1.5
Bore of clutch separating device	135.0-135.2	135.5
Free length of driven pulley spring	98.8	94.0
Ext. dia. 0f driven pulley assembly	39.965-39.985	39.94
Bore of movable drive pulley	40.000-40.025	40.06
Ext. dia. of weight roller	23.5	23.2
Drive pulley/driven pulley wear	--------	0.4

Torque for tightening

Detail information (>8-17)

Tools

Special tools

Wrench for lock nut 39 x 41 mm	07GMA-KS40100
Clutch spring compressor	07960-KM10000
Drive pulley holder	07923-KM10000
Driver handle	07947-3710001

general tools

Remover handle A	07749-0010000
Bearing remover 32 x 35 mm	07746-0010100
Removal controller 15 mm	07746-0040300
Removal controller 22 mm	07746-0041000
Extension device	07725-0020500
Bearing remover 24 x 26 mm	07746-0010700

Trouble shooting

The engine can be started but can't run.

. The belt is worn or damaged .
. The ramp plate is damaged.
. The friction plate of clutch is worn or damaged.

The engine shuts down or accelerates suddenly when starting and accelerating

. The spring of clutch centrifugal block breaks.

The max. speed can't be reached due to lack of output power

. The belt is worn.
. The driven pulley bearing is concave.
. The weight roller is worn.
. The driven pulley doesn't work well.

Left cover

Removal

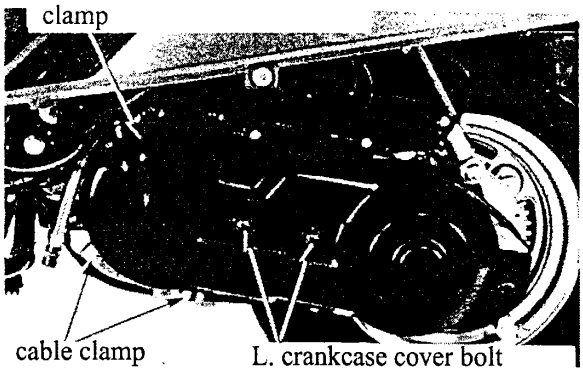
Remove the left-rear cover. (>12-2)

Loosen the bolt, then remove the clamp of brake cable from left cover.

Remove the air cleanner clip of drive belt.

Loosen two bolts of left cover and remove the left cover.

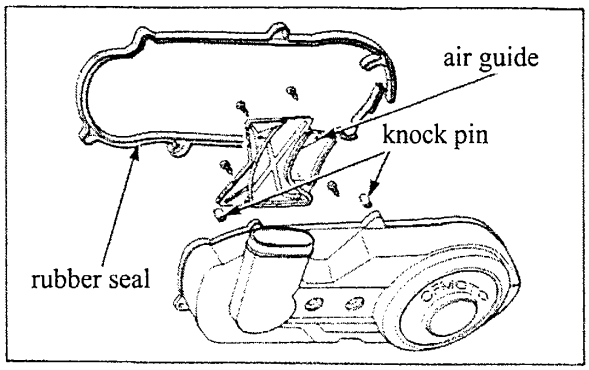
Take out the knock pin.



Remove the rubber seal from left cover.

Inspect the rubber seal for damage or aging,replace it with a new one if necessary.

Loosen the small screw, remove the air guide from the left cover.



Installation

Conduct installation according to opposite order of removal.

Torque: 0.8-1.2 kg-m

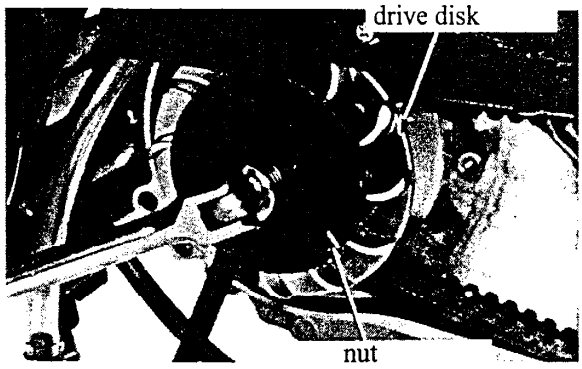
Drive belt

Removal

Remove left cover.

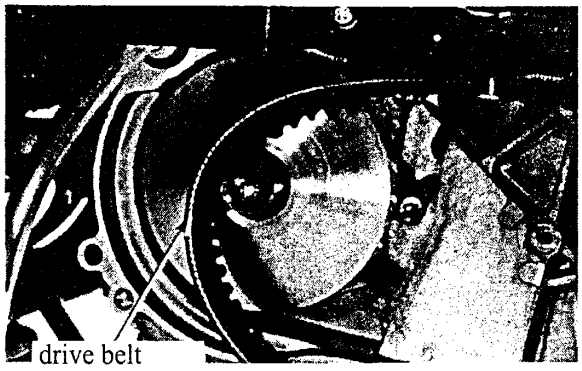
Hold the drive pulley using the drive pulley holder, loosen the nut of drive pulley.

Special tool:Drive pulley holder 07923-KM10000



Remove the washer and drive pulley.

Remove the drive belt.

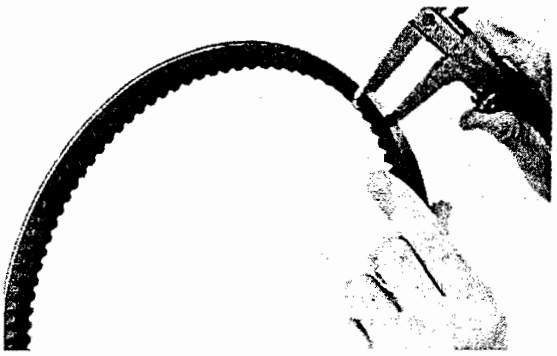


Inspection

Inspect the belt for crack, insert gear for falling off, cotton cloth for peeling off and abnormal wear.
Measure the width of drive belt.
Limit for use: Replace if it is under 21.0 mm.

Note

Use genuine parts when replacing.

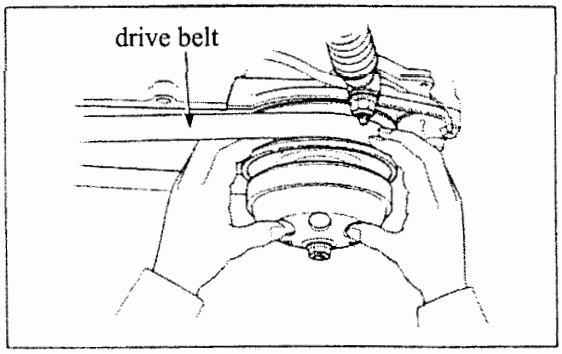


Installation

Rotate movable driven pulley on right while compress it, press the drive belt onto driven pulley.
Press the drive belt onto the dist thimble of movable drive pulley, install the drive pulley.
Install the washer, drive pulley nut.Use the disk seat to keep the condition while tighten the nut.
Torque: 0.8-1.2 kg-m

Note

Confirm that the drive belt is not inserted in.

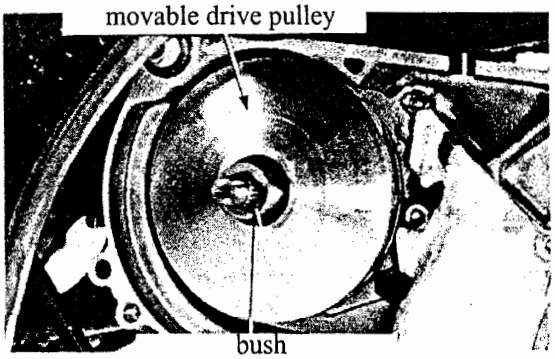


Install the left cover.

Drive pulley

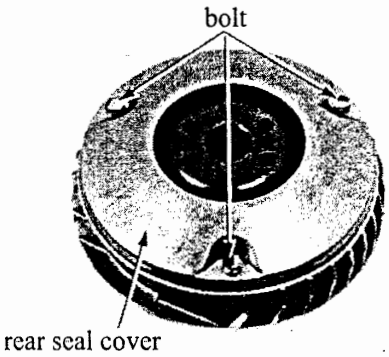
Removal

Remove left cover and drive belt(>8-3)
Remove the movable drive pulley.
A bearing remover sold in the market can be used when the spline is hard.

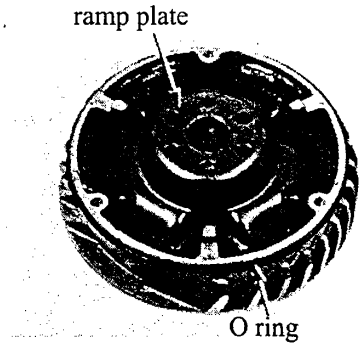


Disassembling

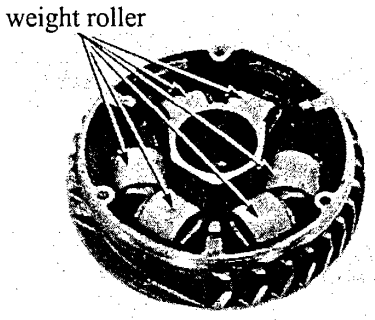
Remove the drive pulley thimble.
Loosen 3 bolts, then remove the sealing rear cover of movable drive pulley.



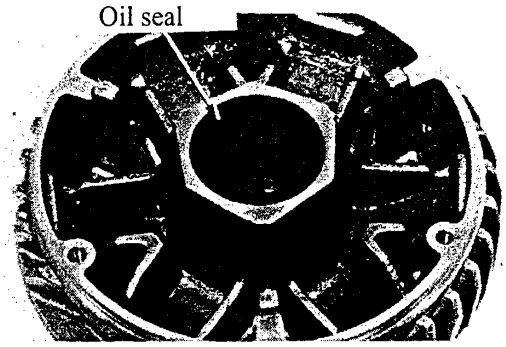
Remove the ramp plate and O-ring.



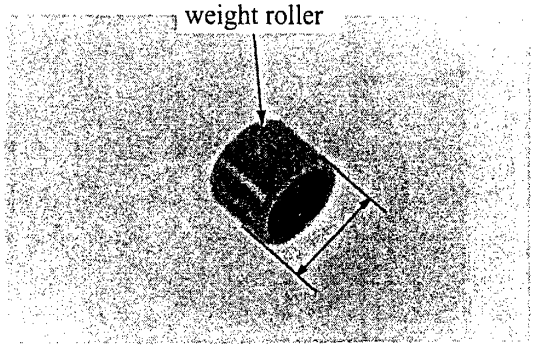
Remove the weight roller.



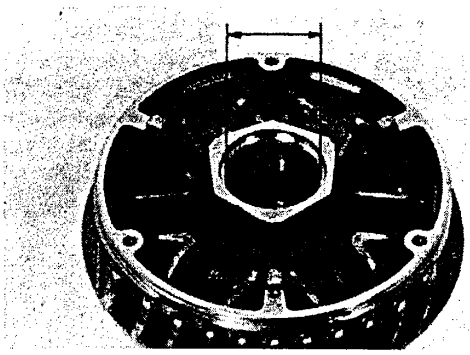
Inspection
Inspect the pulley sealing gasket for wear and damage, replace it with a new one if necessary.



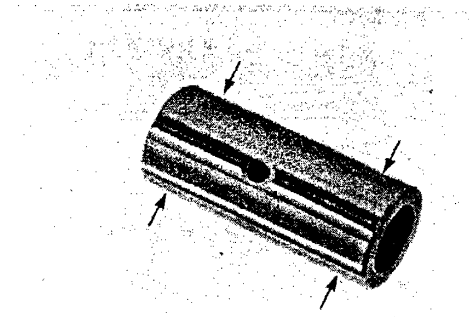
Inspect the weight roller for wear, scrape and damage.
Measure the external dia. of weight roller.
Limit for use: Replace if it is under 23.2 mm.



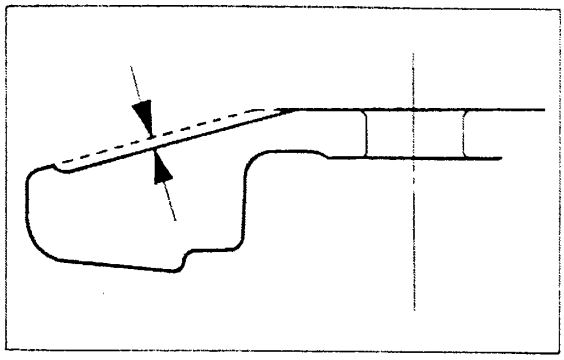
Measure the collar of movable drive pulley.
Limit for use: Replace if it is over 27.06 mm.



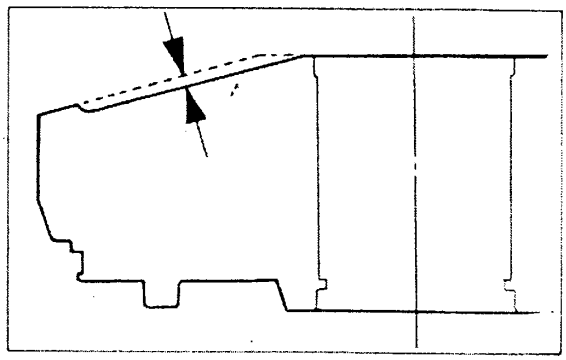
Inspect the drive pulley thimble for damage or wear.
Measure the external dia. of slide disk between thimble and drive pulley.
Limit for use:Replace if it is under 26.94 mm.



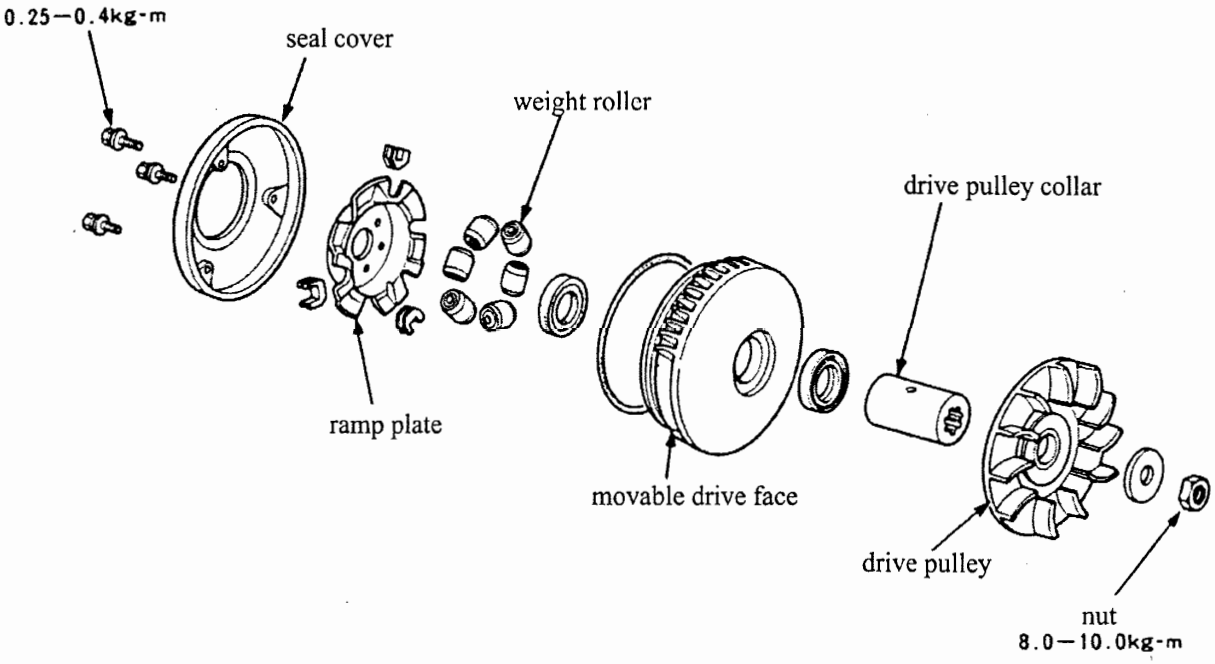
Inspect the drive pulley for wear or damage.
Measure drive pulley for wear depth.
Limit for use:Replace if it is over 0.04 mm.



Inspect the movable drive pulley for wear or damage.
Measure the wear depth of movable drive pulley.
Limit for use: Replace if it is over 0.04 mm.



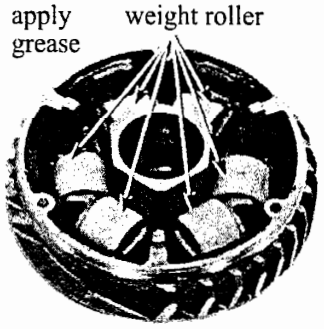
Assembling



Apply grease in movable drive pulley,insert the weight roller.
Apply 25-30g of grease on whole circle uniformly.

Note

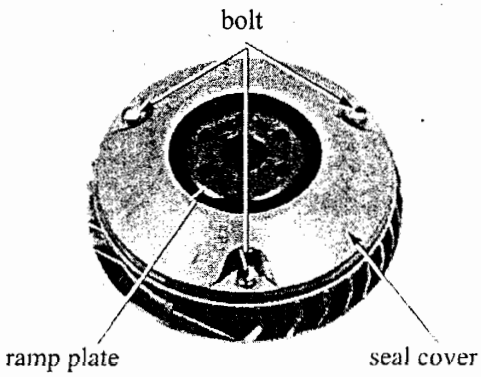
Specified grease:
No.3 MoŞlithium base grease



Install O-ring, apply grease.
Install the ramp plate and movable drive pulley sealing cover, then tighten the bolts.

Caution

Take care, do n't make the grease overflow from o-ring slot.



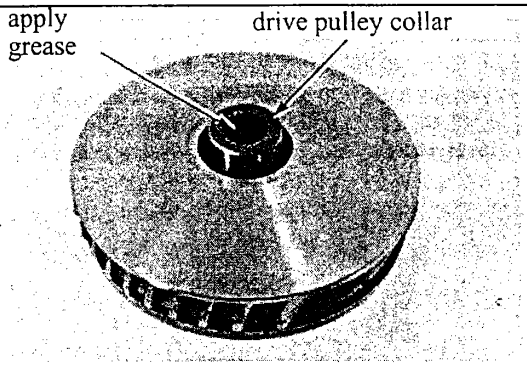
CFMOTO

Apply 4-5g of grease uniformly on drive pulley collar.

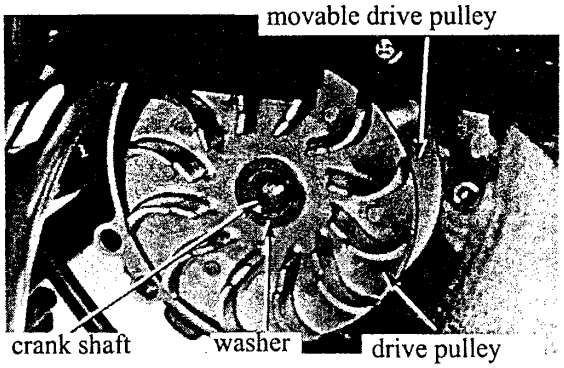
Note

Specified grease:
No.3 MoS lithium base grease

Make the side with spline on drive pulley collar to outside when installing.



Installing
Install movable drive pulley onto crankshaft .
Install the belt. (>8-3)
Install drive pulley onto crankcase, then install the washer.

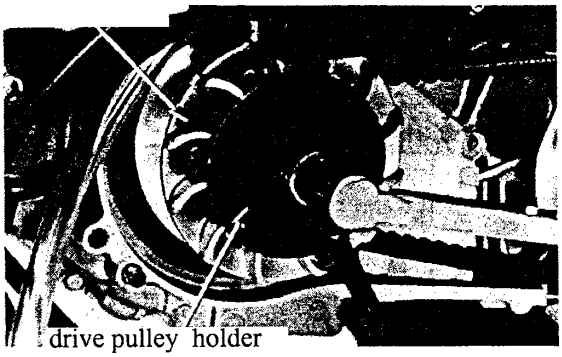


Press on the pulley and tighten the nuts.
Torque: 8.0-10.0 kg-m.
Special tool:
Drive pulley holder 07923-KM10000

Caution

Don't make the engine oil, grease, etc. stick on belt and pulley.

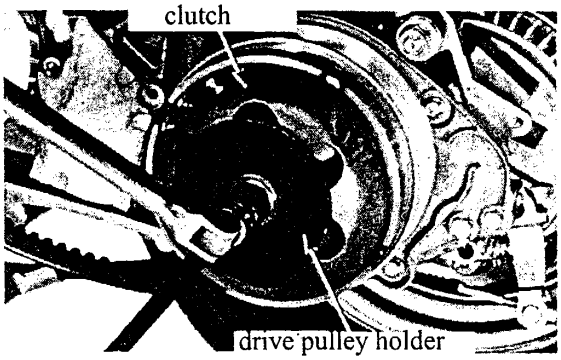
Confirm if the drive belt is not inserted in.



Clutch, driven pulley

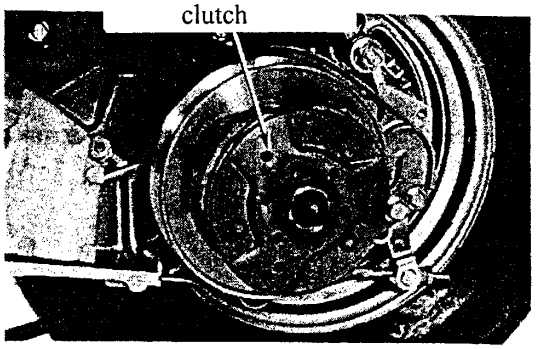
Removal
Remove the left cover. (>8-3)
Remove drive pulley and drive belt. (>8-3)
Press on the separating device of clutch to remove the nut of the separating device.

Special tool:
Drive pulley holder 07923-KM10000

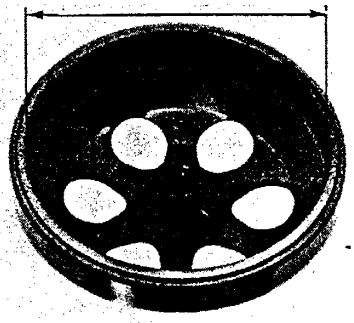


Removal the separating device of clutch.

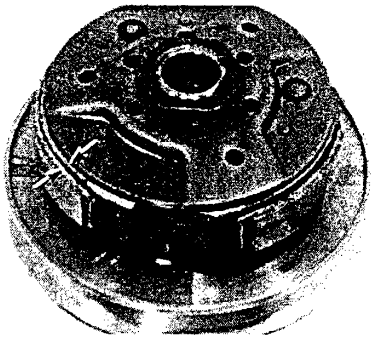
Remove the driven pulley of clutch.



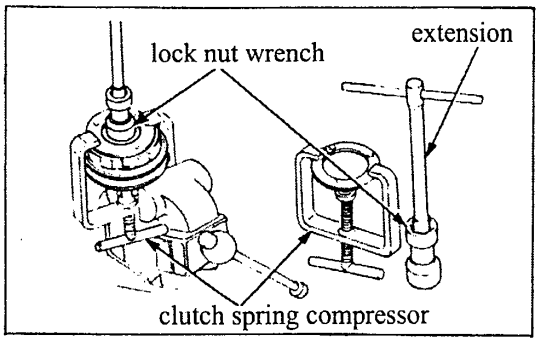
Inspection
Inspect the separating device of clutch for wear or damage.
Measure the bore of separating device.
Limit for use: Replace if it is over 135.5 mm.



Inspect the clutch brake shoes for wear or damage.
Measure the thickness of friction plate.
Limit for use:Replace if it is under 1.5 mm.



Disassembling
As shown on the figure, install the clutch/driven pulley on spring compressor of clutch, compress the driven pulley spring.



Caution

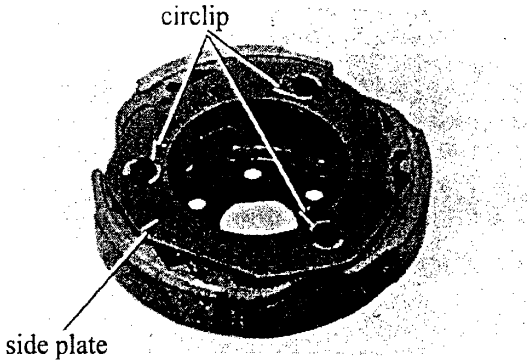
In order to avoid the damage of driven pulley,don't press the spring too tight.

Special tools:
Clutch spring compressor 07960-KM10000

Use a vice to hold the compressor,Remove the lockg nut.
Special tool:
Wrench for nut-lock 39 x 41 mm 07GMA-KS40100
General tool:Extension device 07716-0020500

Loose the compressor, disassemble the clutch and driven pulley.

Remove the circlip and side disk,disassemble the clutch.

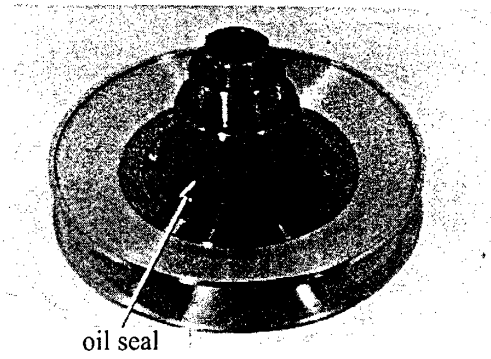


ⓘ Caution

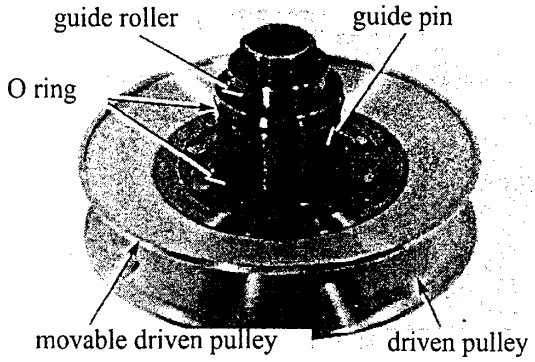
Take care , don't make the greases tick on friction plate of centrifugal shoe.

Disassembling of driven pulley

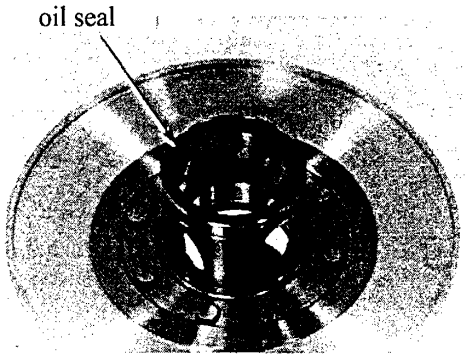
Remove the seal.



Draw the guide pin and remove the guide roller.
Remove the movable driven pulley from the driven pulley.
Remove the O-ring from movable driven pulley.

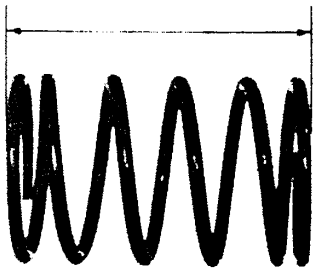


Remove the oil seal from the movable driven pulley.



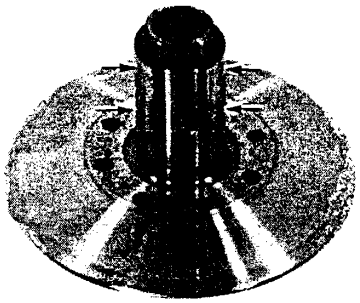
Inspection

Measure the free length of the driven pulley spring.
Limit for use:Replace if it is under 94.0 mm.

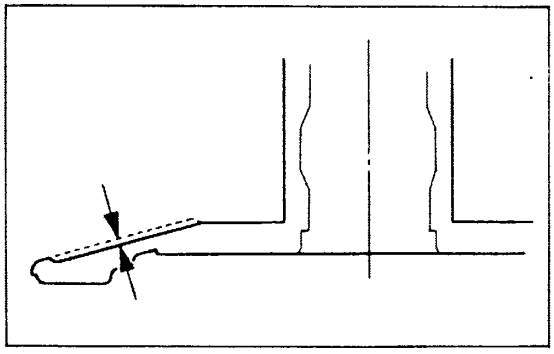


Inspect the driven pulley spring for damage or lack of elasticity. Replace the spring if necessary.

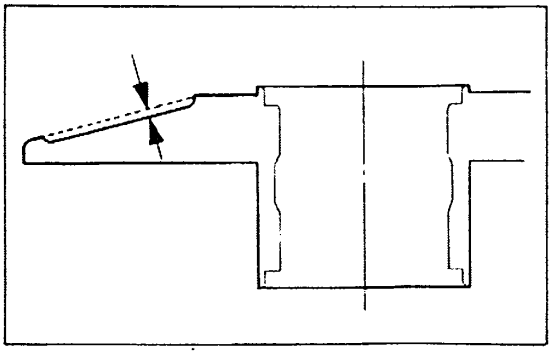
Inspect the driven pulley for damage or scrape.
Measure the external diameter of driven pulley.
Limit for use:Replace it if it is under 39.94 mm.
Inspect the bearing of driven pulley for loosing. Replace with a new one if there is abnormal sound or loosing condition on bearing. (>8-12)



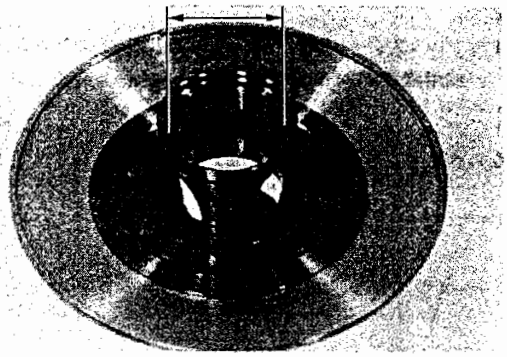
Measure the wear depth of driven pulley.
Limit for use:Replace if it is over 0.4 mm.



Measure the wear depth of movable driven pulley.
Limit for use: Replace if it is over 0.4 mm.

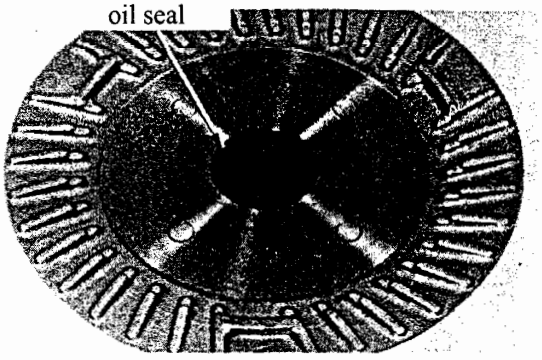


Inspect the movable driven pulley fro wearing and damage.
Measure the bore.
Limit for use:Replace if it is over 40.06 mm.

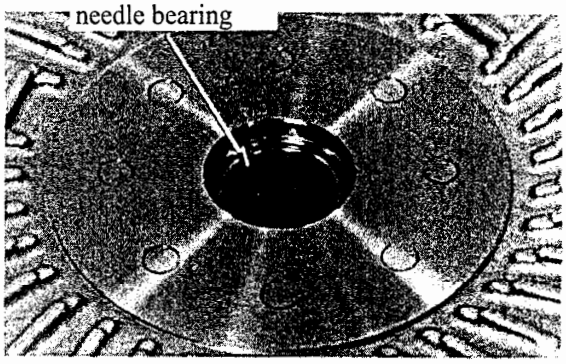


Inspect the guide slot for step wear.

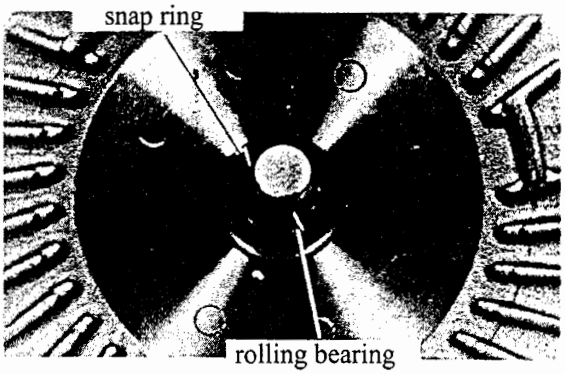
Replacement of driven pulley bearing
Remove the oil seal.



Knock the needle bearing out of the driven pulley.
Replace the removed bearing with a new one.



Remove the snap ring, knock the outside bearing out of the driven face.
Replace the removed bearing with a new one.

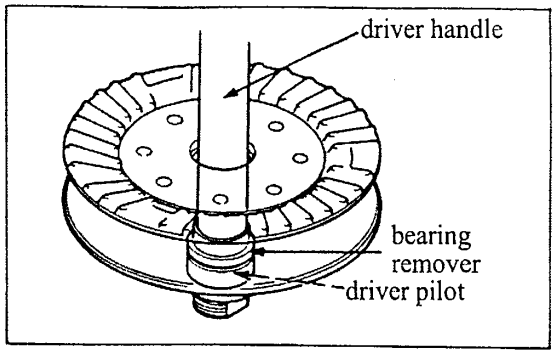


Apply the grease on outside bearing.

Special tool: Driver handle 07947-3710001

General tools:

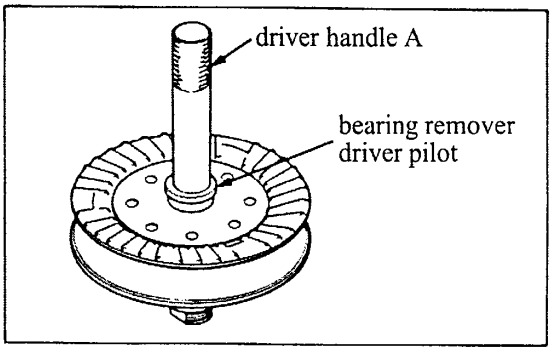
Bearing remover	32 x 35 mm	07746-0010100
Driver guide	22 mm	07746-0041000



Install the snap ring.
Apply the grease on the bore of driven surface.

Note

Apply 11-13g of grease on whole circle uniformly.
Specified grease:
No.3 MoS_2 lithium base grease



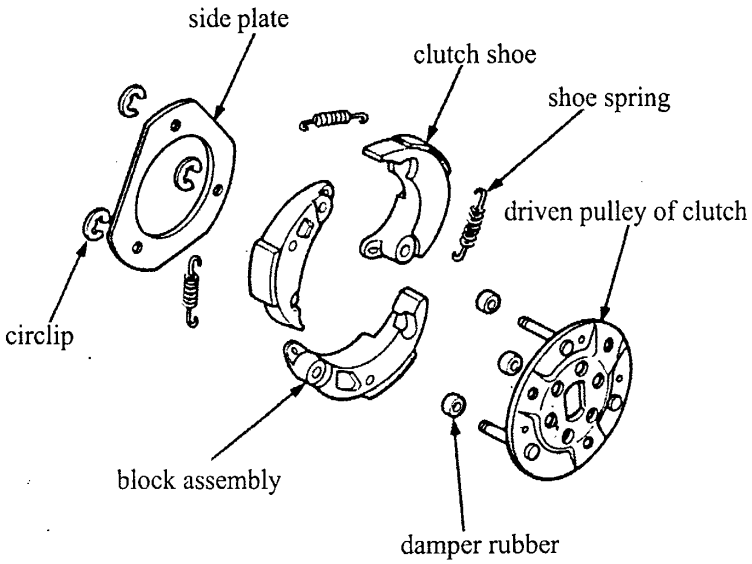
Press the needle bearing in its position with punching machine.

General tools:

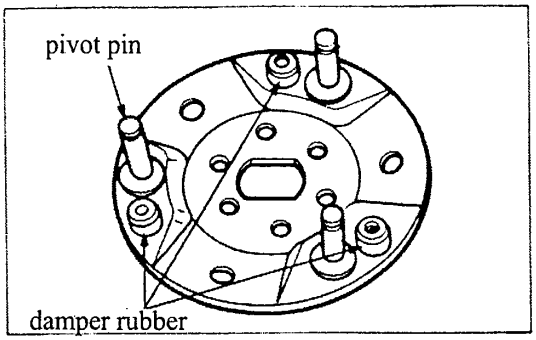
Driver handle A		07449-0010000
Bearing remover	32 x 35 mm	07746-0010100
Driver guide	22 mm	07746-0041000

Apply the grease on the slot of seal and install it on needle bearing.

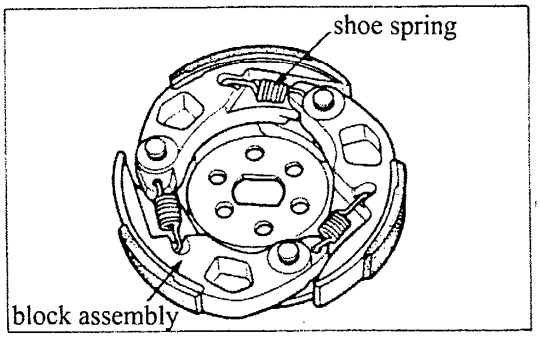
Assembling of clutch



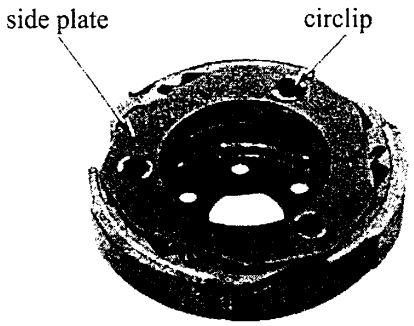
Install the damping rubber gasket onto drive shaft plate pivot.



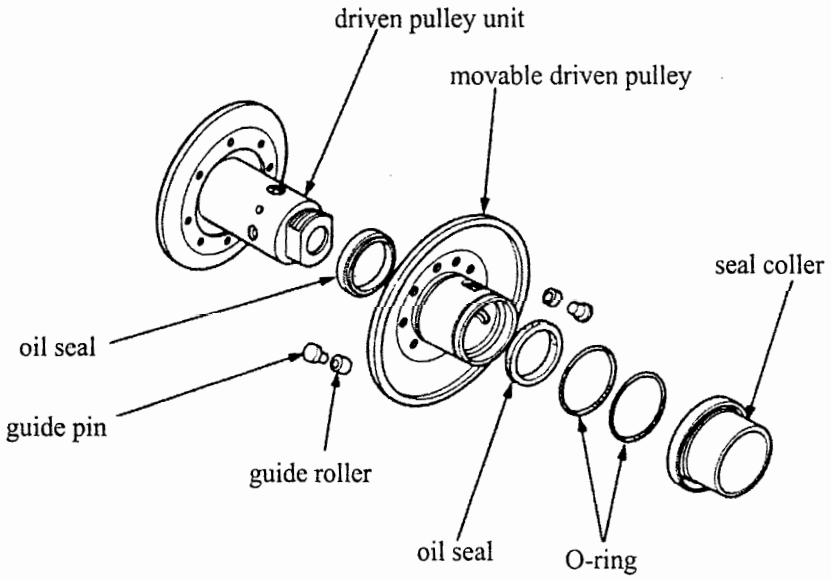
Install the centrifugal block on drive shaft plate, then install brake shoe spring on centrifugal block.



Install the side disk and fix it with circlip.



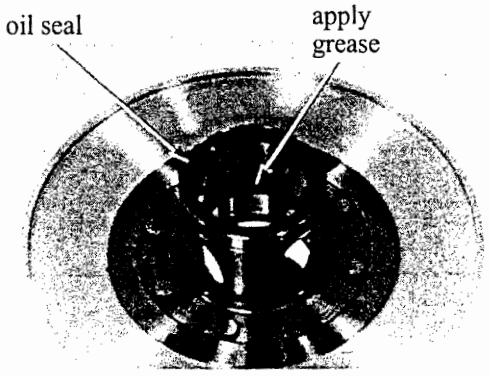
Assembling of driven pulley



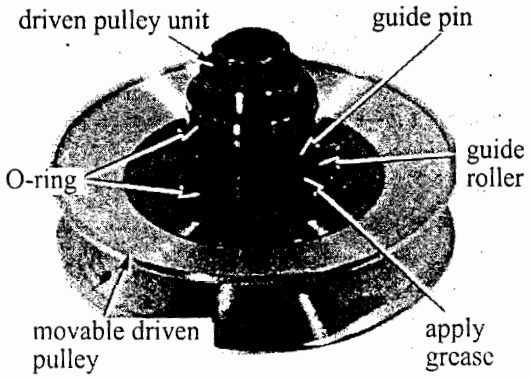
Clean the pulley surface.
Install the oil seal on movable driven pulley.
Apply a few grease on O-ring,install it on movable driven pulley.
Apply grease on the bore of movable driven pulley and guide roller.
Apply 4-5g of grease on whole circle uniformly.

Note

Specified grease:No. 3 MoS_2 lithium base grease



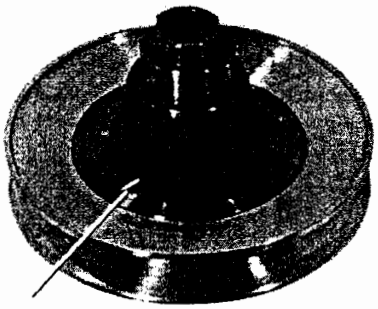
Install the movable driven face on driven pulley.
Apply grease on guide roller and guide pin and then install them in holes of driven pulley.



Install the sealing thimble.
Wipe the overflowed grease.

Note

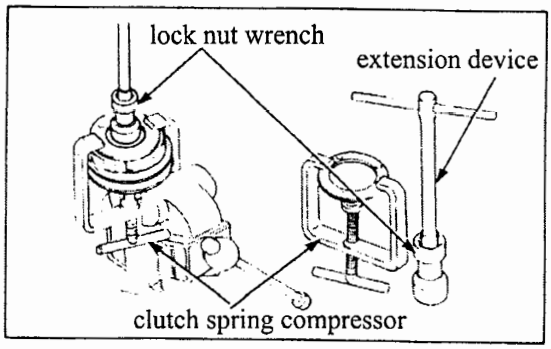
The grease stuck on driven pulley should be cleaned away.



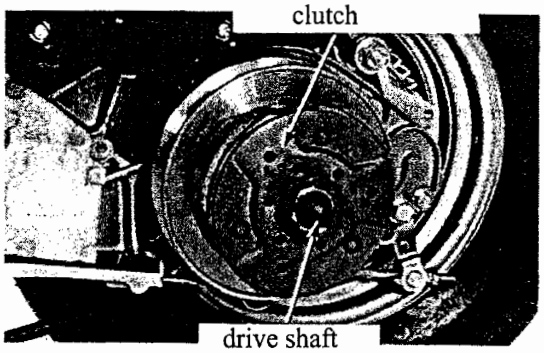
Install the driven pulley spring and clutch on driven pulley, then conduct adjustment using a clutch spring compressor.

Note

Make the n otch on driven pulley coin cid e with the notch on drive shaft plate.



Compress driven face spring using a compressor, install the retaining screw of clutch. As shown on the figure, fix the compressor with a vice, and tighten the nuts of clutch.
Torque: 7.0-9.0 kg-m.



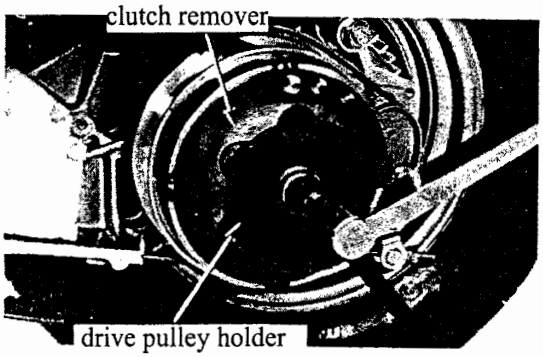
Special tools:
Spring compressor of clutch 07960-KM10000
Wrench 39 x 41 mm 07GMA-KS40100

General tool :
Extension device 07716-0020500

Installation
Install the clutch and driven pulley onto main shaft.

Note

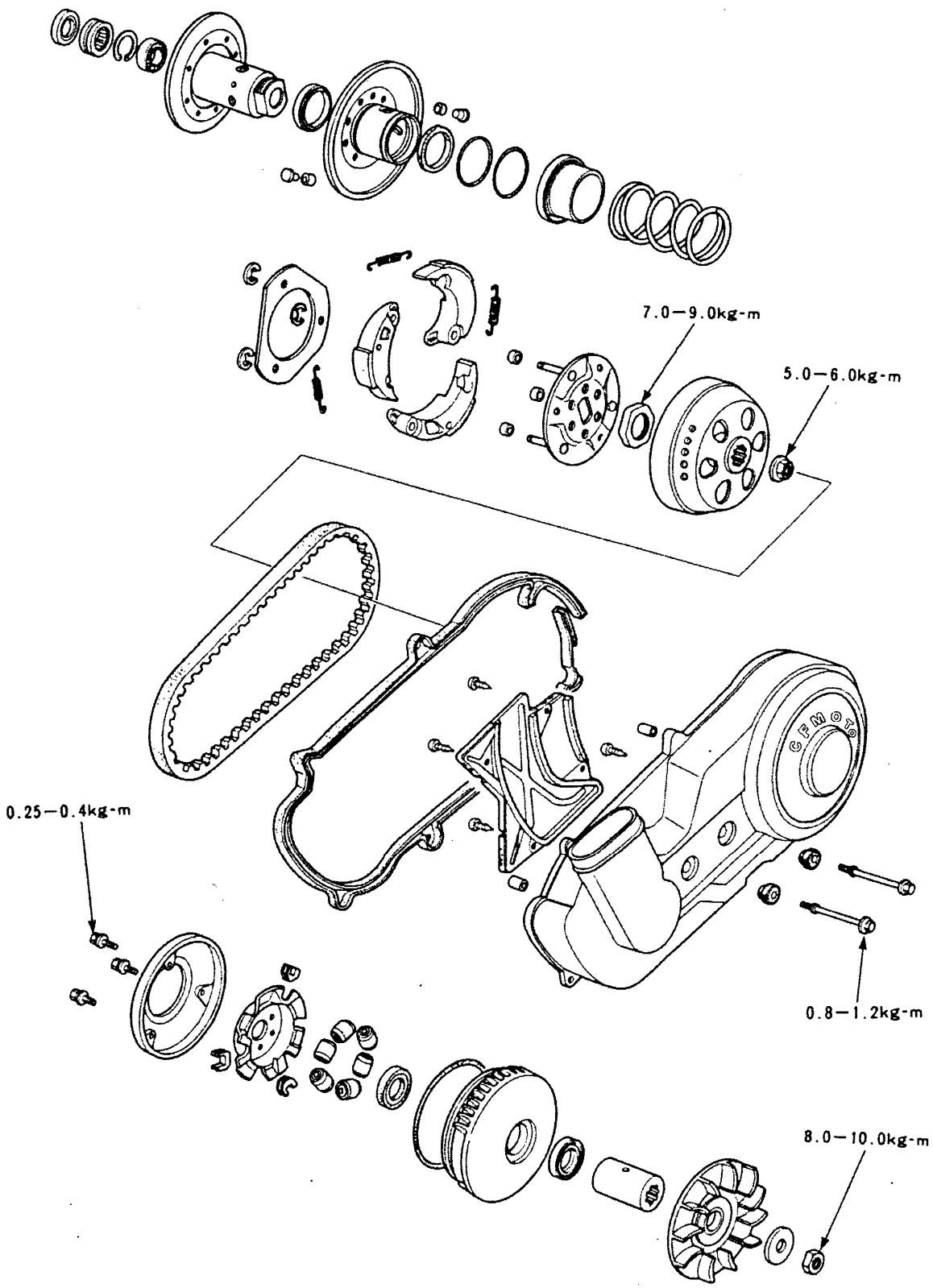
The g ease stuck on drive shaft should be cleaned away.



Install the separating device of clutch.
Make the separating device of clutch remain in its condition using a drive pulley holder, tighten the nuts of clutch separating device.
Torque: 5.0-6.0 kg-m.

Special tool: Drive pulley holder 07923-KM10000

Install the drive belt . (>8-4)
Install the left cover. (>8-3)
Install the left-rear cover. (>12-2)
Drive pulley, clutch and driven pulley


7.0—9.0kg-m
5.0—6.0kg-m
0.25—0.4kg-m
0.8—1.2kg-m
8.0—10.0kg-m

9 TRANSMISSION

Maintenance information.....9-1
Diagnosis of trouble.....9-1
Disassembling.....9-2
Inspection.....9-2
Assembling.....9-4

Maintenance information

Reference for maintenance

Recommended oil:
. SAE10W-30 or SAE20W-50 for 4-stroke motorcycle
. Class SE or SF engine oil (API category)
Engine oil volume: 0.22L (when disassembling)
0.15L (when replacing)

Torque for tightening

Bolts for transmission cover	6 mm	0.8-1.2 kg-m
	8 mm	2.0-2.4 kg-m
	10 mm	1.0-1.4 kg-m

Tools

Special tools:

Bearing remover assembly	12 mm	07936-1660001
-Bearing remover	12 mm	07936-1660100
-Balance block for remover		07741-0010201
Bearing remover assembly	20 mm	07936-3710001
-Bearing-remover	20 mm	07936-3710600
-Bearing remover handle		07936-3710100
-Balance block for remover		07741-0010201
Tool shaft for crankshaft –installing		07965-1660200
Tool thimble for crankshaft-installing (2 pieces)		07965-1660300

General tools:

Bearing driver	37 x 40 mm	07746-0010200
Bearing driver	52 x 55 mm	07746-0010400
Driver guide	12 mm	07746-0040200

Trouble shooting

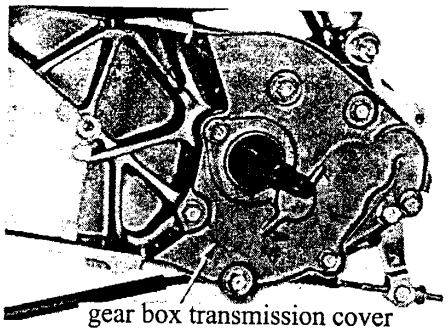
The engine can be started, but can't run.
. Transmission is damaged.
. Transmission is burnt.

Abnormal sound occurs when running.
. The gear is worn or burnt, the gear face is damaged.
. The bearing is worn or loose.

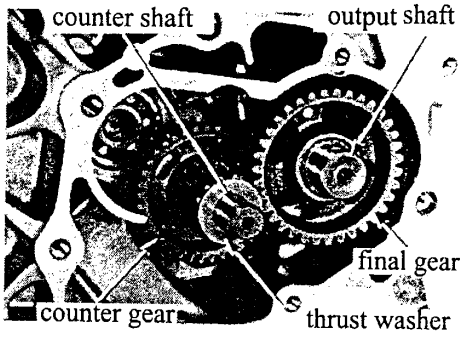
Leakage of engine oil
. Too much oil is filled.
. Oil seal is worn or damaged.

Disassembling

Remove the driven pulley assembly. (>8-8)
Discharge the transmission gear oil. (>2-7)
Remove the rear wheel. (>14-2)
Loosen the bolts, remove the transmission cover.
Remove the cylinder gasket and knock pin.

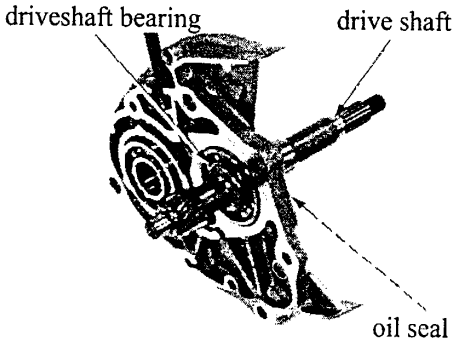


Remove the thrust washer.
Remove the output shaft gear and output shaft.
Remove the countershaft and its gear.



Inspection

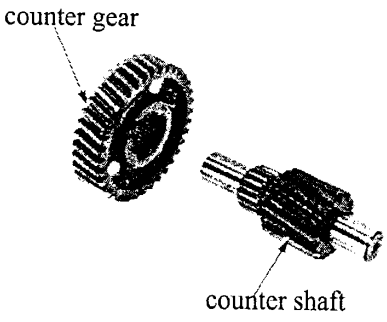
Inspect the drive shaft, gear and bearing for wear and damage.
Knock out the drive shaft and bearing together if it is necessary to replace the shaft or bearing.Remove the bearing from the shaft using a bearing remover and protecting device for shaft (07931-1870000) sold in market.
Remove the oil seal of drive shaft from transmission cover.



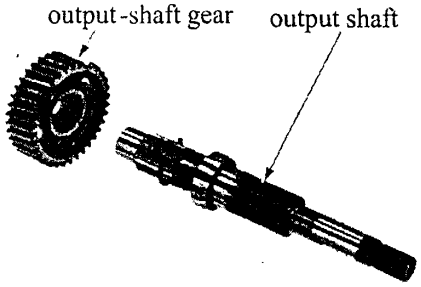
Note

The bearing should be replaced with a new one when the drive shaft bearing is removed from transmis - sion cover.

Inspect the countershaft and gear for wear and damage.



Inspect the output shaft gear and output shaft for burning, wearing or damaging.

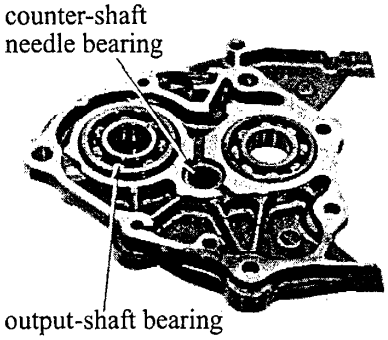


Inspect the transmission cover bearing for wearing or damaging.
A bearing remover should be used if it is necessary to replace the output shaft bearing.

Note

The countershaft needle shaft and transmission cover should be replaced together.

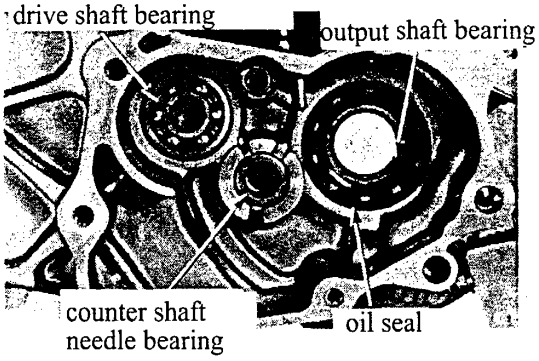
Special tools:
Bearing remover assembly 20 mm 07936-3710001
-Bearing remover 20 mm 07936-3710600
-Bearing remover handle 07936-3710100
-Remover balancing block 07741-0010201



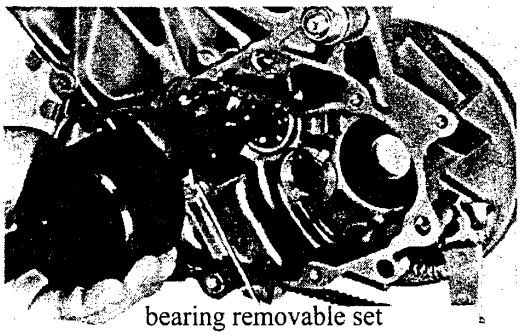
Inspect the bearing and oil seal of left crankcase for damaging or wearing.

Note

The needle bearing of countershaft and left crankcase should be replaced together.



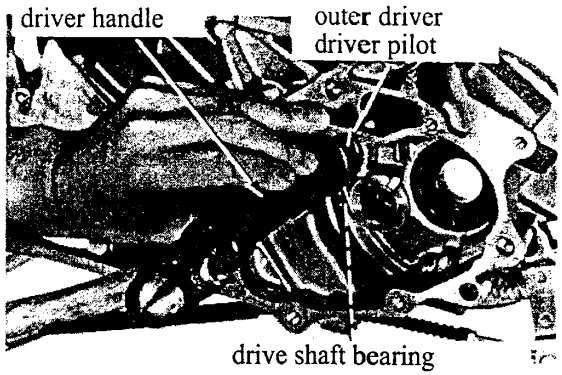
The bearing remover should be used if it is necessary to replace the drive shaft bearing.
Special tools:
Bearing remover assembly 12 mm 07936-1660010
-Bearing remover 12 mm 07936-1660100
-Remover balancing block 07741-0010201



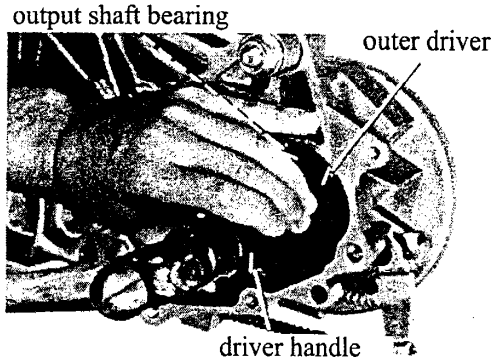
Assembling

Knock a new drive shaft bearing into left crankcase.

General tools:
Bearing remover 37 x 40 mm 07746-0010200
Bearing driver guide 12 mm 07746-0040200
Driver handle A 07949-0010000

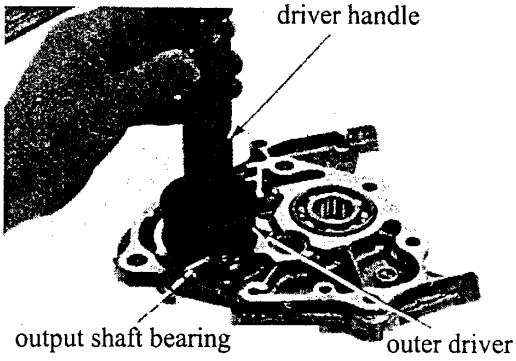


Knock a new output shaft bearing into left crankcase.
General tools:
Bearing remover 52 x 55 mm 07746-0010400
Bearing driver guide 22 mm 07746-0041000
Driver handle A 07949-0010000

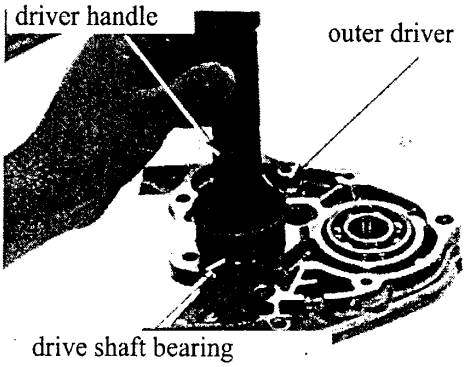


Install the output shaft oil seal.
Knock the new output shaft bearing into gear box cover.

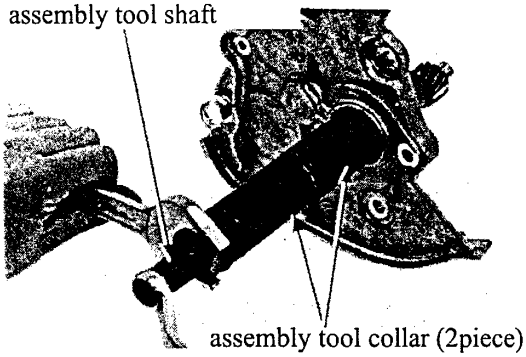
General tools:
Bearing remover 52 x 55 mm 07746-0010400
Driver handle A 07949-0010000



Knock a new drive shaft bearing into transmission cover.
General tools:
Bearing remover 52 x55 mm 07746-0010400
Driver handle A 07949-0010000
Bearing driver guide 22 mm 07746-0041000



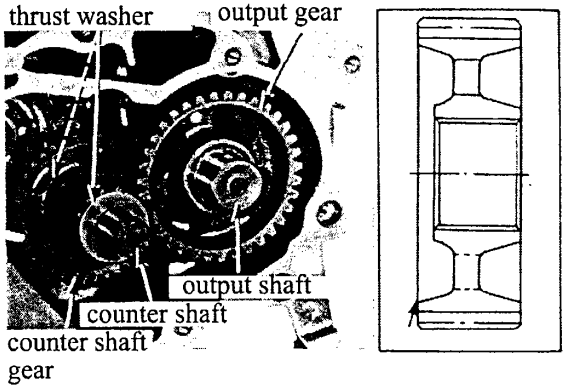
Insert the drive shaft into the bearing of transmission cover with special tools.
Special tools:
Tool shaft for crankshaft assembling 07965-1660200
Tool washer (2 pieces) for crankshaft assembling 07965-1660300
Install the drive shaft oil seal.



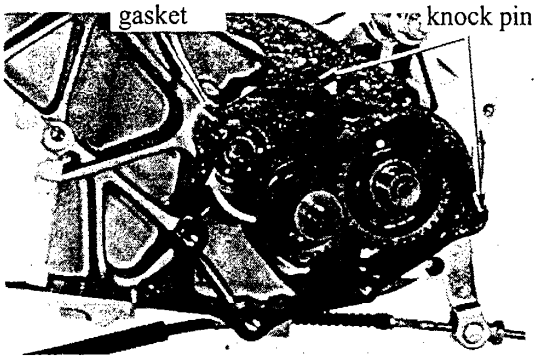
Install the countershaft, countershaft gear, output shaft, output shaft gear and thrust washer.

Note

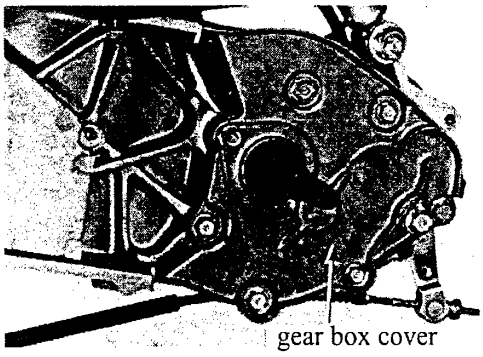
Pay attention to the installing direction of output gear.

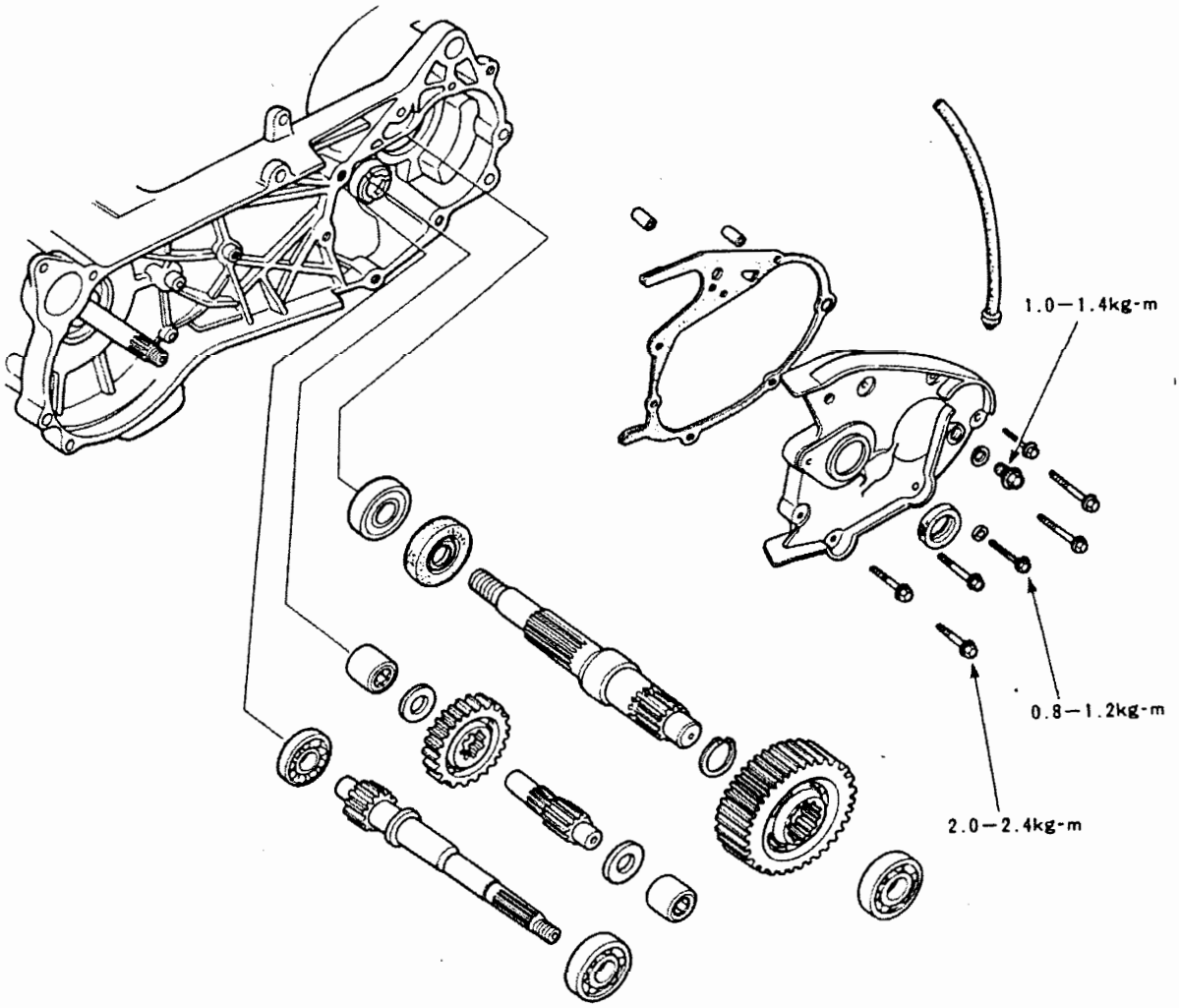


Installing of knock pin and new cylinder gasket.



Installing of transmission cover
Torque:6 mm 0.8-1.2 kg-m
8 mm 2.0-2.4 kg-m
10 mm 1.0-1.5 kg-m
Install the driven pulley/clutch. (>8-16)
Install the driven pulley, transmission belt and left crankcase cover. (>8-3,8-4,8-8)
Install the rear wheel.
Inject gear oil into the transmission box.




1.0—1.4kg-m
0.8—1.2kg-m
2.0—2.4kg-m

10 MAGNETO,START CLUTCH AND OIL PUMP

Maintenance information.....10-1
Trouble shooting..... 10-2
Removal of right crankcase cover 10-2
Removal of stator and pickup coil 10-3
Removal of flying wheel..... 10-3
Start clutch..... 10-4
Engine oil pump.....:.10-6
Installation of flying wheel..... 10-9
Installation of stator and pickup coil 10-10
Installation of right crankcase cover 10-10

Maintenance information

Precaution for operation

. The operation can be conducted on magneto, start clutch and engine oil pump under the condition of the engine with load.

. Please to see the chapter 17 for the inspecting of magneto.

. Take care, don't make the foreign matter fall into the inside of the engine when remove the right crankcase cover.

. The engine oil pump should be replaced with a new set when it reaches the life time.

Reference for maintenance and repair

Item		Normal value	Limit for use
Starting motor driven gear	int. dia.	22.026-22.045	22.10
	ext. dia.	42.175-42.2	42.15
Int. dia. of start clutch separator		58.897-58.927	58.96
Oil pump	Clearance of impeller tip	0.15	0.20
	Clearance between pump body and outer impeller	0.15-0.20	0.25
	Clearance between impeller and pump body	0.04-0.09	0.12

Torque for tightening

Flying wheel nuts	10.5-11.5 kg-m	(apply MoO_2 grease)
Oil pipe bolt	8 mm	0.8-1.2 kg-m
	12 mm	1.8-2.2 kg-m
Start clutch bolts	2.8-3.2 kg-m	(apply thread fixative)

Tools:

Special tool

Flying wheel remover	07933-KM10000

General tool

Flying wheel stay	07725-0050000

Trouble shooting

. Trouble shooting of magneto (>chapter 17)

. Trouble shooting of starter motor (>chapter 19)

Too low oil level

. Natural consumption of oil

. Oil leakage

. Piston ring worn

. Valve guide or valve seat worn

No proper lubricating of oil

. Too low oil level

. Oil filter, oil passage or oil pipe blocked

. Oil pump damaged

Oil polluted

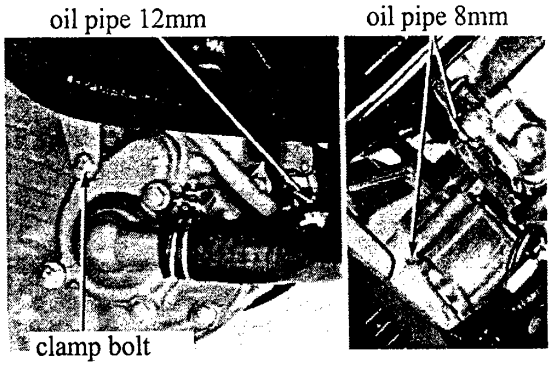
. Oil is not changed

. Cylinder gasket damaged

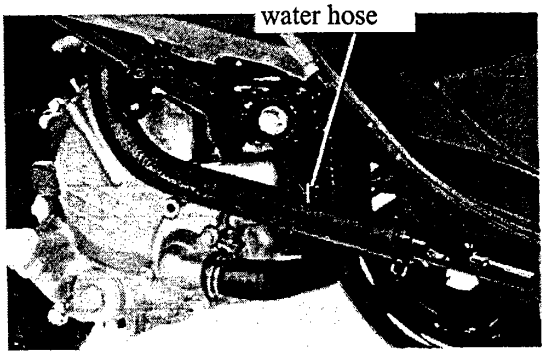
. Piston ring worn

Removal of right crankcase cover

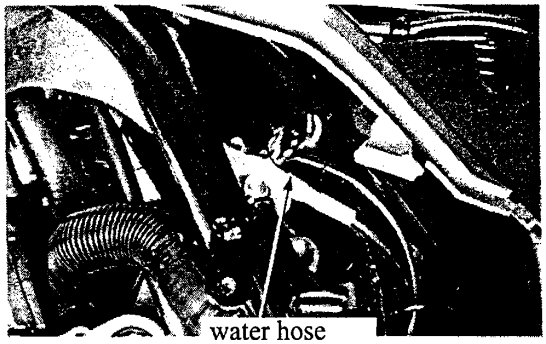
Remove the right-rear cover. (>12-2)
Drain the cooling liquid. (>4-4)
Drain the engine oil. (>4-4)
Loosen two bolts for retaining the pipe, two 8 mm oil pipe bolts, and one 12 mm oil pipe bolt, remove the oil pipe.



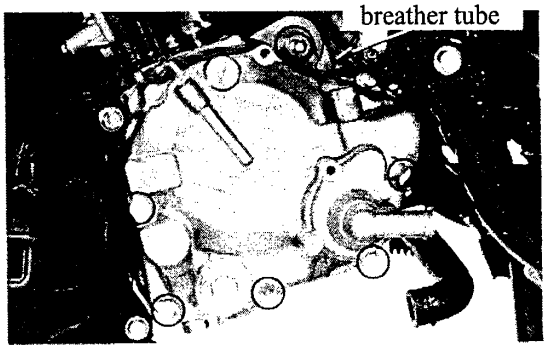
Remove the water hose from the water pump and right crankcase cover.



Cutoff the pickup coil, magneto connector and connection of socket.

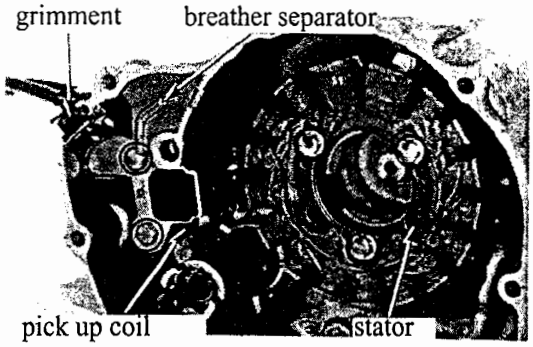


Remove the breather pipe of crankcase from right crankcase cover. Loosen 7 bolts of right crankcase cover, remove the right crankcase cover.
Remove the cylinder gasket and knock pin.

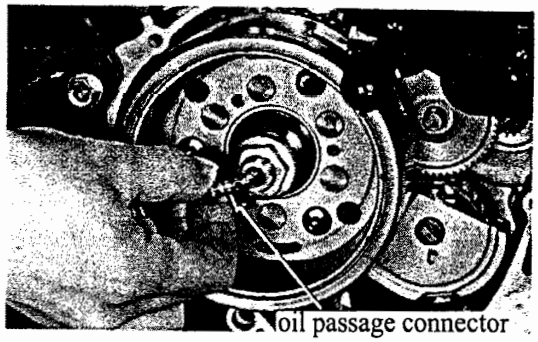


Removal of stator and pickup coil

Loosen two bolts, remove the crankcase breather separator and pickup coil.
Loosen 3 bolts for retaining stator, remove the stator from right crankcase cover.
Remove the wire- protecting ring from right crankcase cover.



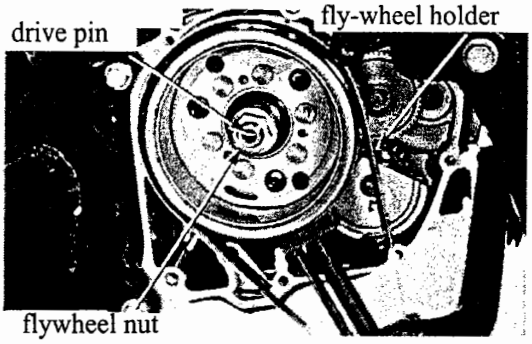
Removal of flying wheel
Remove the oil passage connector from crankshaft.



Hold the flying wheel with a flying wheel holder, remove the flying wheel nuts and washer.
Remove the cylindrical pin of oil passage connector from crankshaft.

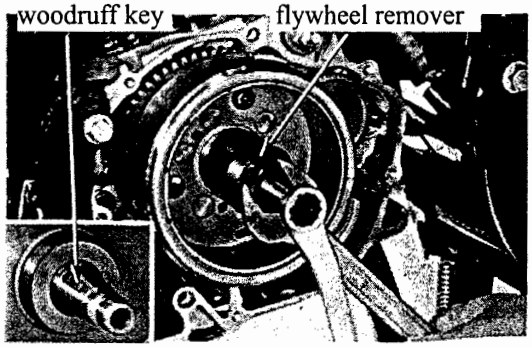
Note

Take care, don't make the pin fall into crankcase.



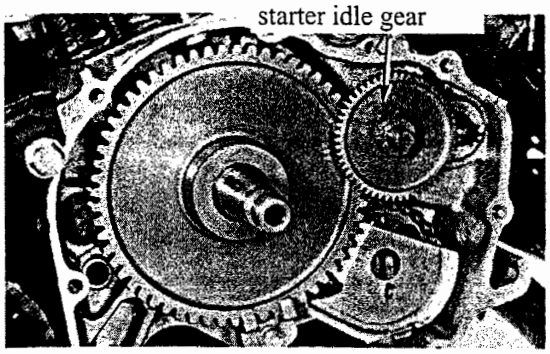
General tool:
Flying wheel holder 07725-0050000

Remove the flying wheel with a flying wheel remover.
Remove the woodruff key from the crankshaft.
Special tool:
Flying wheel remover 07933-KM10000

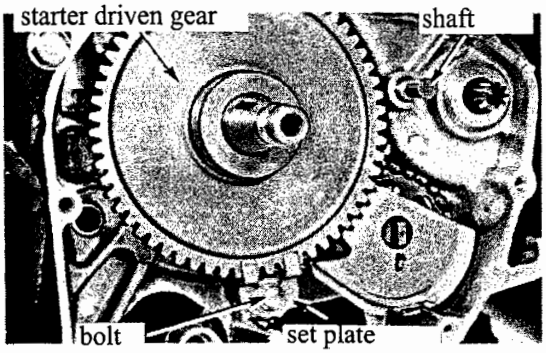


One way clutch

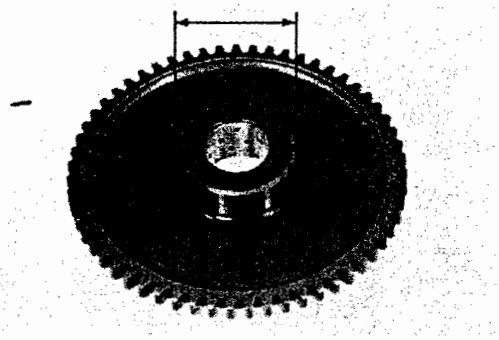
Removal
Remove the starter idle gear.

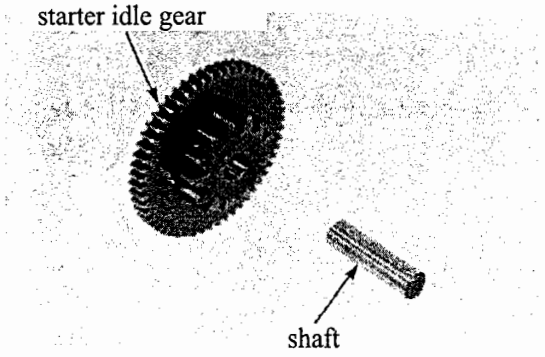


Remove the starter idle gear shaft.
Loosen the bolt, remove the set plate.
Remove the starter driven gear.



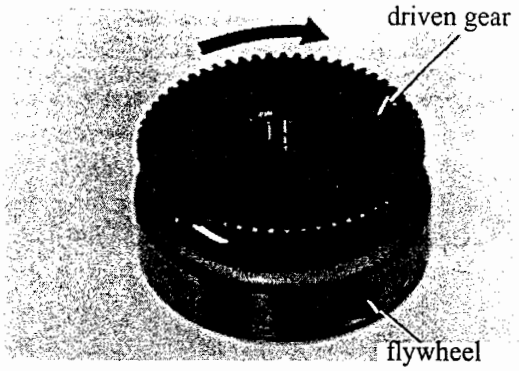
Inspect
Inspect the starter driven gear for wearing or damaging.
Measure the internal and external diameters of starter driven gear.
Limit for use:
Internal dia.: Replace it if it is over 22.10 mm.
External dia.: Replace it if it is under 42.15 mm.



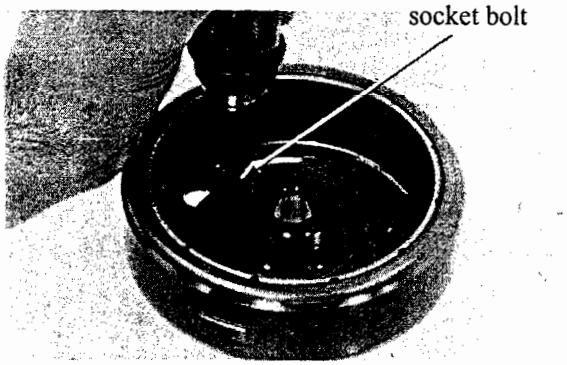


Inspect the starter idle gear and its shaft for wearing and damaging.

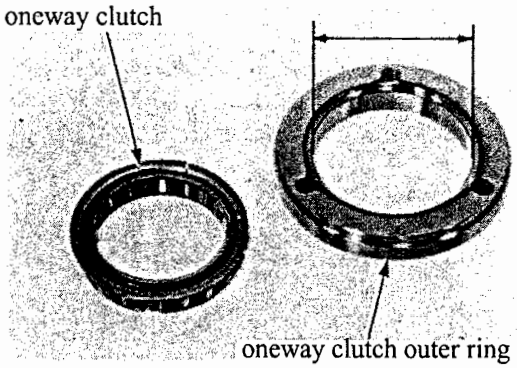
As shown on the figure, install the driven gear of starter on one- way clutch, inspect the operation of start clutch.
Press on the flying wheel, if the driven gear of the starter only rotates in clockwise direction,It is good.



Disassembling
Loosen three 6 mm concave head bolts, remove the start clutch and its separating device.

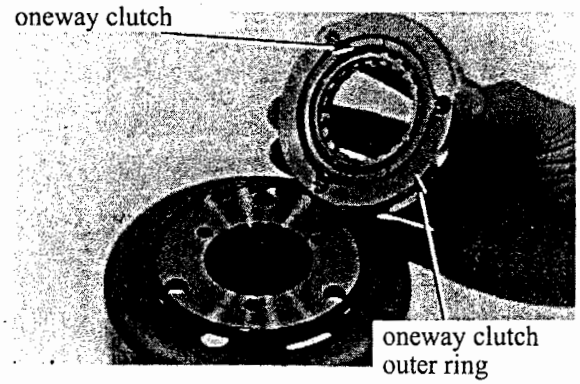


Inspect the start clutch and its separating device for wearing and damaging.
Measure the internal diameter of start clutch separating device.
Limit for use:Replace it if it is over 58.89 mm.



Install the start clutch on start clutch separating device.
Install the start clutch unit on flying wheel,tighten 6 mm concave head bolt.
Torque: 2.8-3.2 kg-m

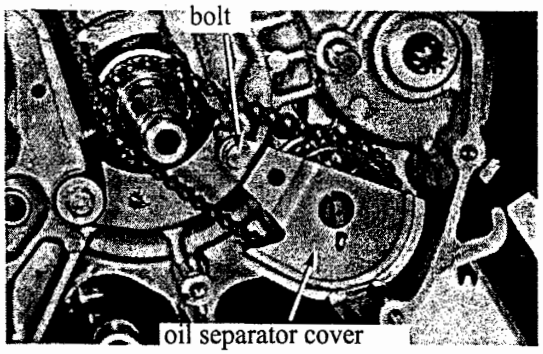
Apply the lockbond on thread of concave head bolt.



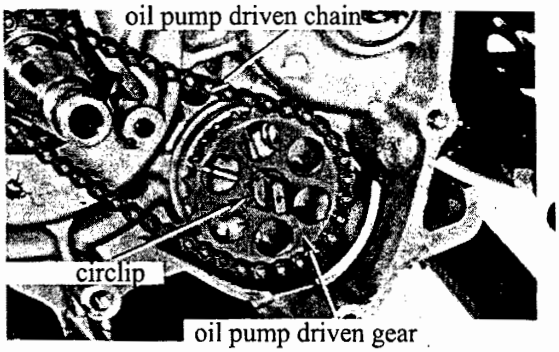
Oil pump

Removing

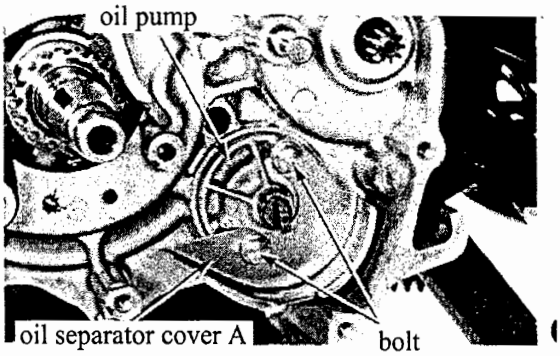
Loosen the bolts, remove the oil separator cover.



Take out the circlip for shaft, remove the driven gear of oil pump and chain.

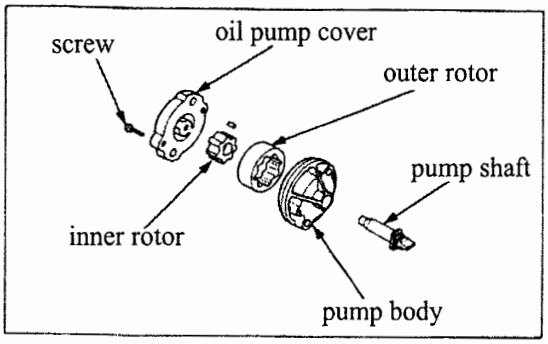


Loosen 2 bolts, remove the oil pump separator cover A and oil pump.



Disassembling

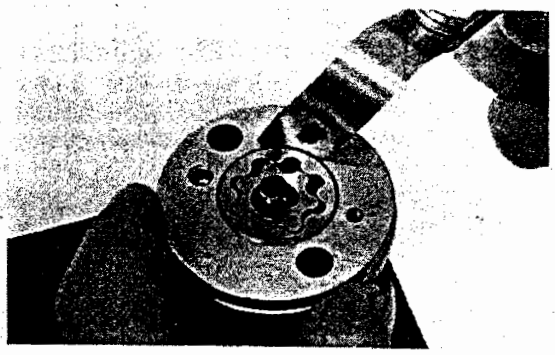
Loosen the small screws, disassemble the oil pump.



Inspection

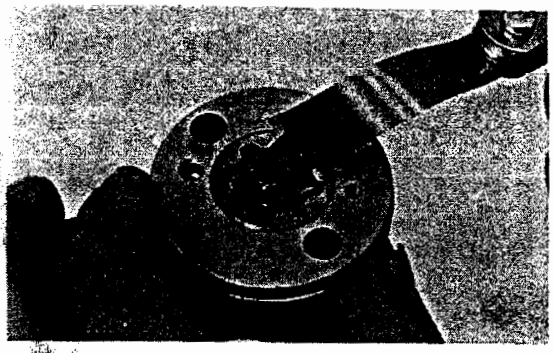
Inspect the clearance between oil pump body and external rotor.

Limit for use:Replace it if it is over 0.25 mm.



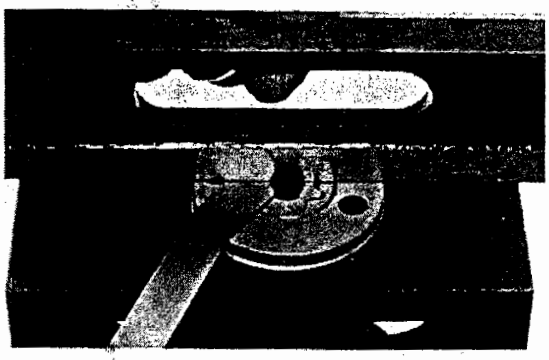
Inspect the clearance between the addendum of internal rotor and tooth root of external rotor.

Limit for use:Replace it if it is over 0.20 mm.



Inspect the clearance between oil pump body and end faces of external rotor and internal rotor.

Limit for use: Replace it if it is over 0.12 mm.



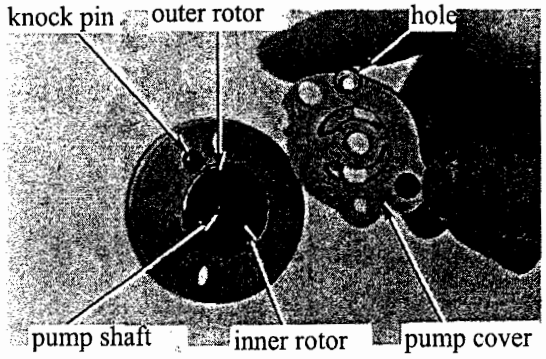
Assembling

Install the ext. and int. rotors, and oil pump shaft on pump body.

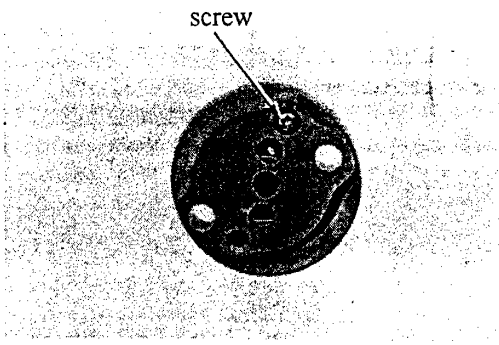
Make the notch of oil pump shaft coincide with internal rotor.

Install the knock pin.

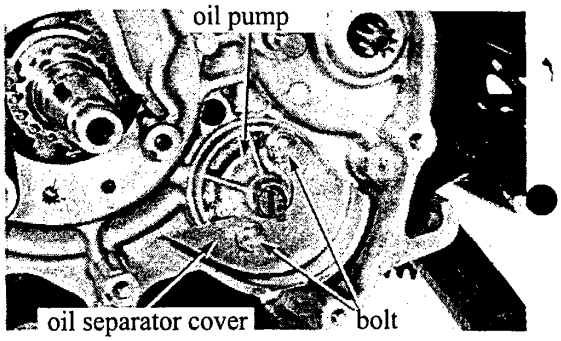
Make the hole of oil pump cover align with knock pin, install the cover.



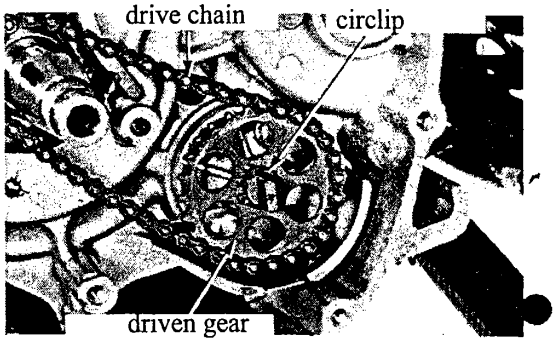
Tighten the oil pump shaft with small screw.
Confirm that the oil pump shaft can rotate freely after tightening.



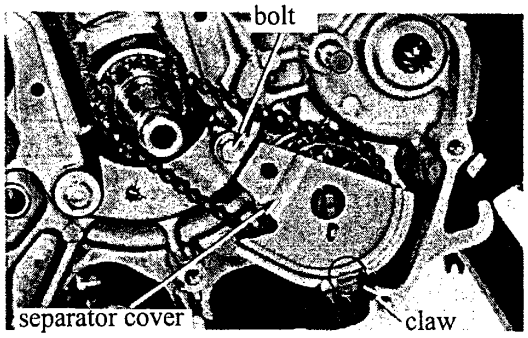
Installing
Install the oil pump and oil separator cover on right crankcase, tighten with two bolts.
Confirm that the oil pump shaft can rotate freely.



Install the oil pump chain and driven gear,fix the sprocket with circlip.



Make the hole of oil separator cover coincide with the claw of oil separator cover A. Install the oil separator cover and tighten the bolts.



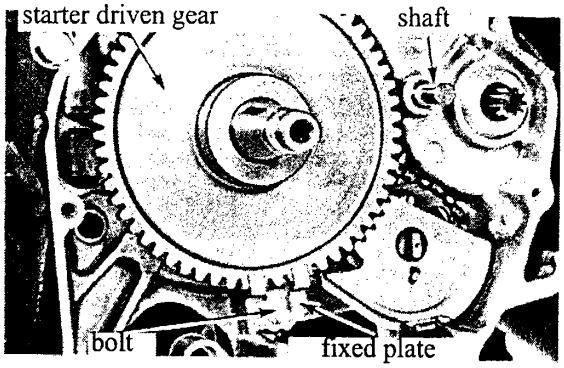
Installation of flying wheel

Install the driven gear of starter motor on crankshaft. Install the fixed plate and tighten the bolts.

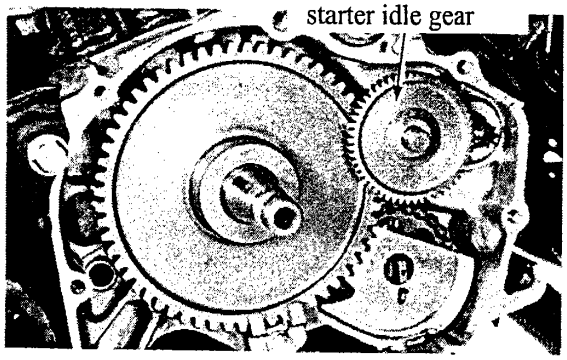
Note

Confirm that the driven gear of starter motor can rotates freely.

Install the starter idle gear shaft.



Install the starter idle gear on the idle gear shaft.

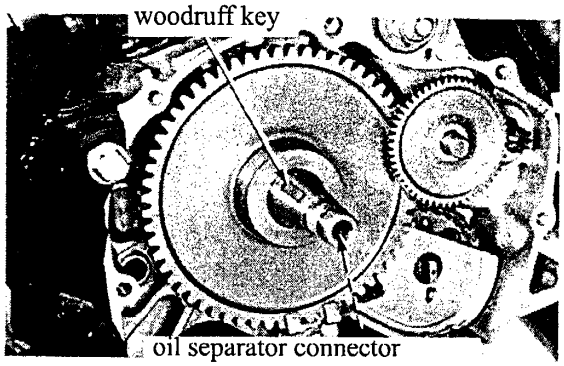


Confirm that the cone part of crankshaft doesn't stick dust etc..

Note

Confirm that the cone part of crankshaft doesn't stick oil and etc.. If there is any oil on it , remove them.

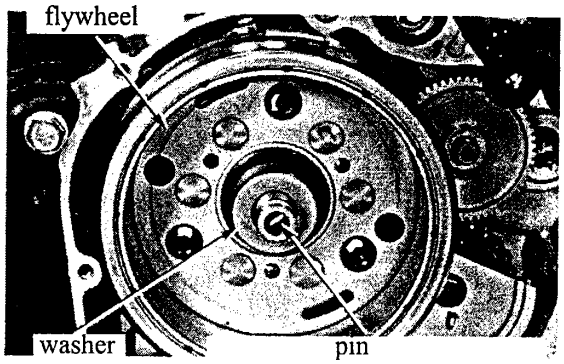
Install the woodruff key in the slot of crankshaft.



Make the woodruff key of crankshaft coincide with the keyway of flying wheel, install the flying wheel on crankshaft.

Caution

Confirm that there is not any foreign matter stuck on inside of flying wheel before installing.



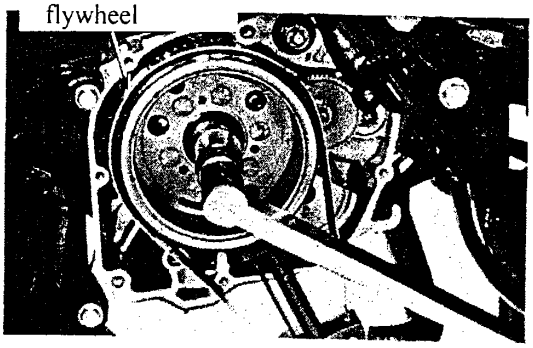
Apply oil on washer, install the washer on crankshaft. Install the pin of oil passage connector in the hole of crankshaft.

Note

Take care, don't make the pin fall in the crankcase.

Apply the MoS_2 grease on the flying wheel nuts and crankshaft thread, install the flying wheel nuts on crankshaft.
Retain the flying wheel with a flying wheel holder, tighten the flying wheel nuts.
Torque: 10.5-11.5 kg-m

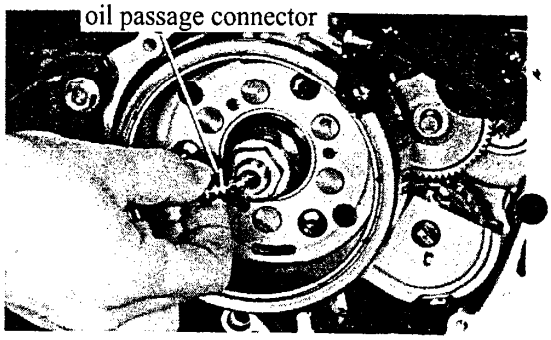
General tool:
Flying wheel holder 07725-0050000



Install the oil passage connector and spring on crankshaft.

Note

Make the slot of oil passage connector coincide with pin.

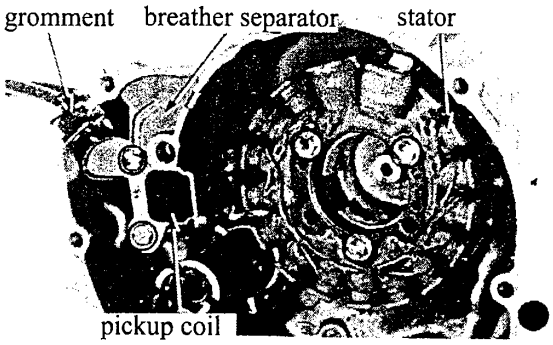


Installing of stator and pickup coil

Install the stator on right crankcase cover,tighten 3 bolts.
Install the pickup coil and separator with 2 bolts.
Install the wire- protecting ring in the slot of right crankcase cover.

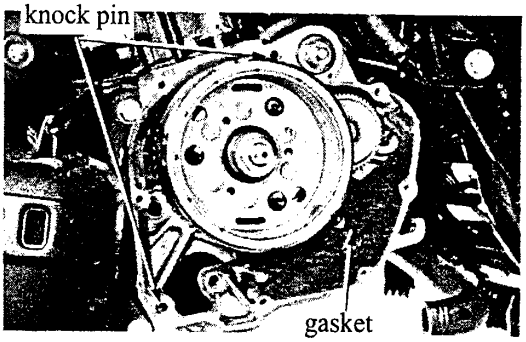
Note

The stator wire should pass the low side of pickup coil lead. As shown on the figure, these parator should be installed on right crankcase cover.

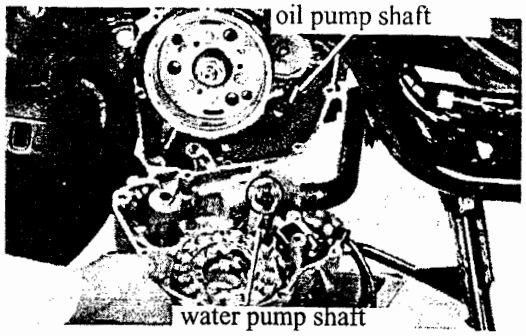


Installing of right crankcase cover

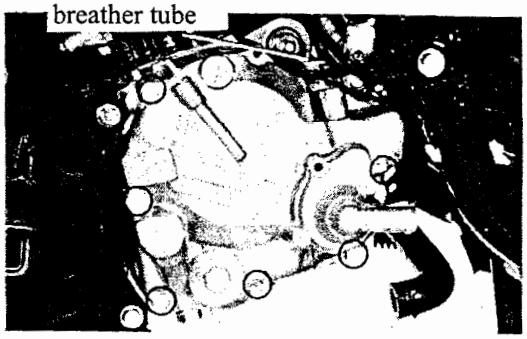
Install the knock pin and new cylinder gasket on right crankcase.



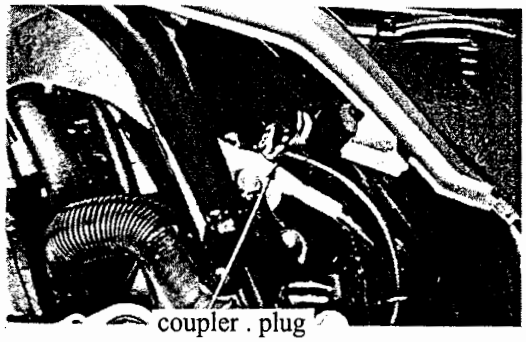
Make the slot of water pump shaft coincide with oil pump shaft, install the right crankcase cover.



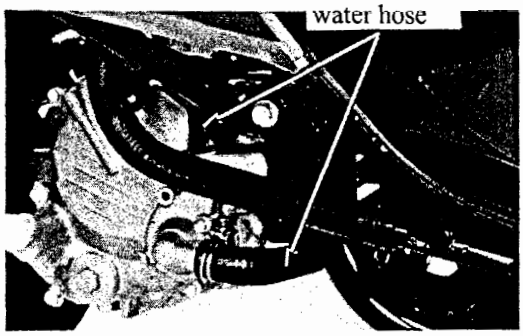
Install and tighten the bolts of right crankcase cover. Connect the breather tube of crankcase to right crankcase cover.



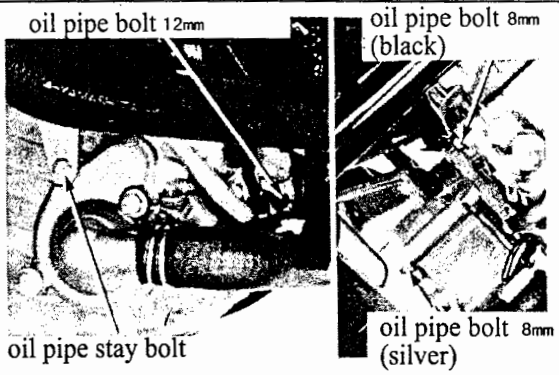
Connect the pickup coil, stator wire coupler and plug.



Connect the water pump hose to water pump and right crankcase cover.



Confirm that the oil pipe is not blocked.
Install the oil pipe with two 8 mm bolts,two 12 mm bolts and two copper gasket.

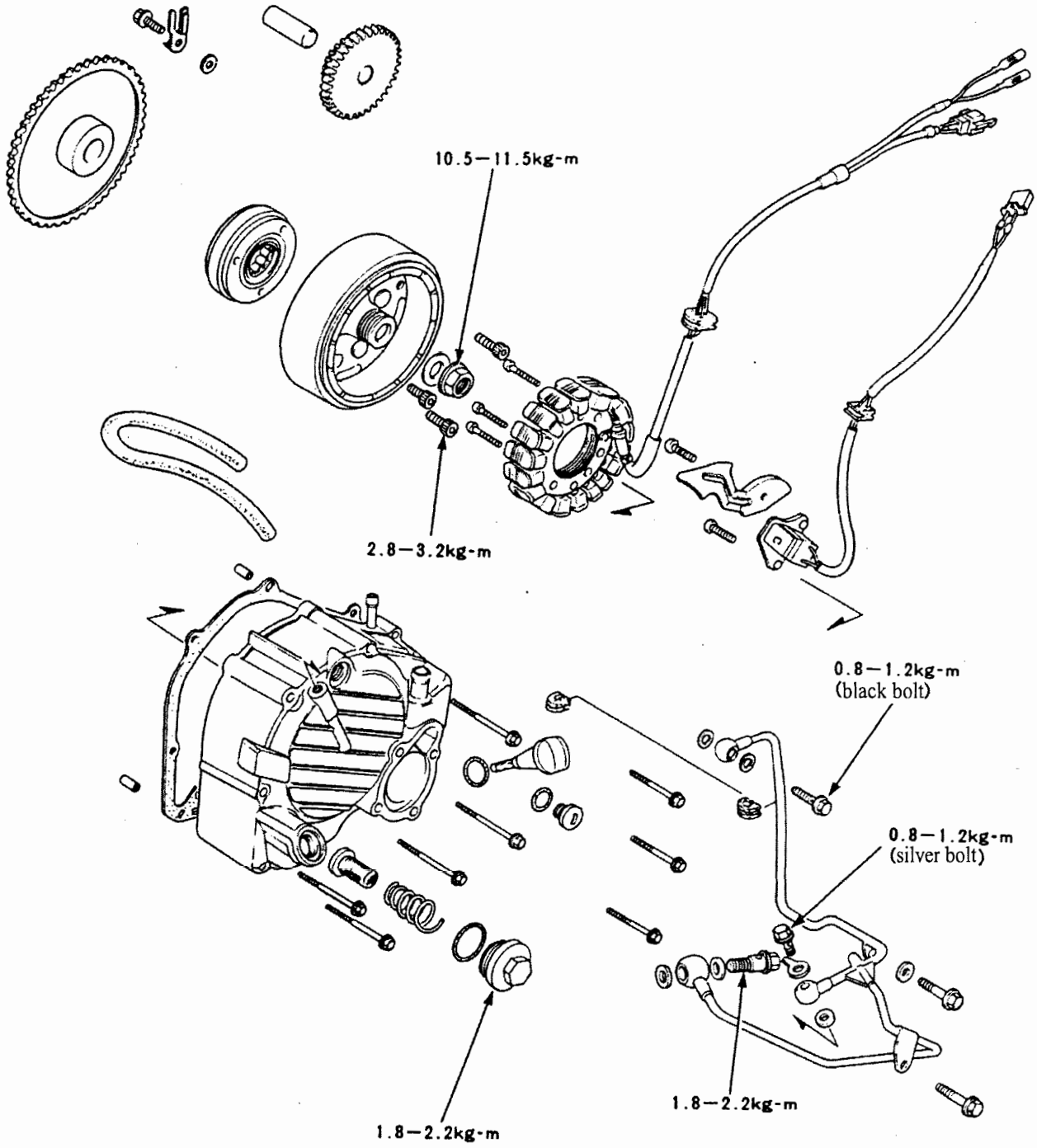


Warning

. The black oil pipe bolts should be used on the side of cylinder cover, the silver oil pipe bolts should be used on the side of right crankcase cover. The bolts with different colors shouldn't be installed incorrectly otherwise the burning maybe occur because the oil passages are different.
. Make the copper gasket claw of right crankcase coincide with the convex part of right crankcase.

Install the oil pipe stay bolts on right crankcase cover and water pump.
Tighten the oil pipe bolts.
Torque:
Oil pipe bolt: 8 mm 0.8-1.2 kg-m
12 mm 1.8-2.2 kg-m

Tighten 2 oil pipe stay bolts.


10.5—11.5kg-m
2.8—3.2kg-m
0.8—1.2kg-m
(black bolt)
0.8—1.2kg-m
(silver bolt)
1.8—2.2kg-m
1.8—2.2kg-m

11 CRANKCASE

Maintenance information.....11-1
Trouble diagnosis.....11-1
Disassembling of crankcase.....11-2
Crankshaft 11-3
Assembling of crankcase 11-4

Maintenance information

Precautions for operation

. This chapter is used to describe the disassembling of crankcase and operations relative to crankshaft. Conduct these operations after removing the engine from the frame.

. Remove the following parts before disassembling the crankcase.

Cylinder head (>chapter 6)
Cylinder, piston (>chapter 7)
Drive pulley assembly, driven pulley assembly (>chapter 8)
Magneto, starter motor driven gear (>chapter 10)
Carburetor, air cleanner case (>chapter 13)
Rear wheel, hanger (>chapter 14)
Starter motor (>chapter 20)

Reference for maintenance

Item		Normal value	Limit for use
Crankshaft	Side clearance of connection rod big end	0.05-0.04	0.6
	Axial clearance of Connection rod big end	0-0.008	0.05
	Swing	——	0.10

Torque for tightening

Crankcase bolts 0.8-1.2 kg-m
Cylinder stud bolts 0.7-1.1 kg-m

Trouble shooting

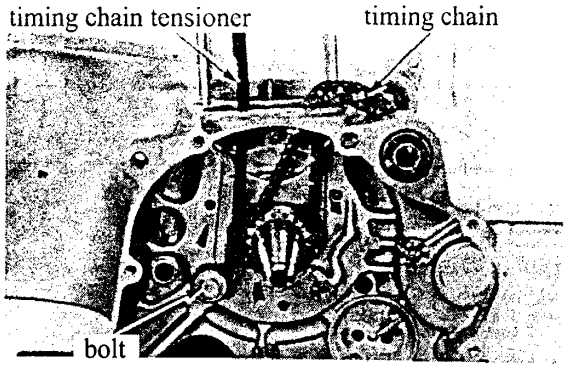
Engine noise

. Bearing loose
. Connection rod journal bush loose
. Piston pin and piston pin hole loose

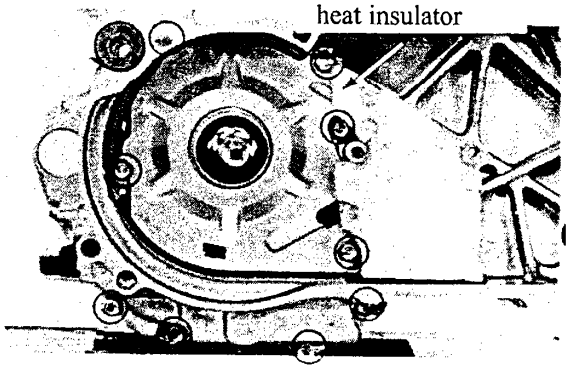
Disassembling of crankcase

Loosen the bolts, remove the timing chain tensioner.

Remove the timing chain.



Remove 9 bolts of crankcase and heat-insulating material.

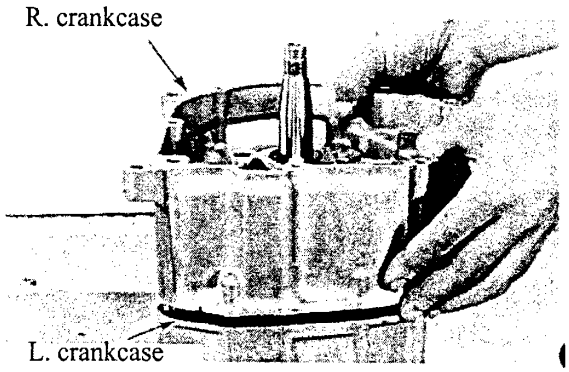


Put the left crankcase downwards, remove the right crankcase.

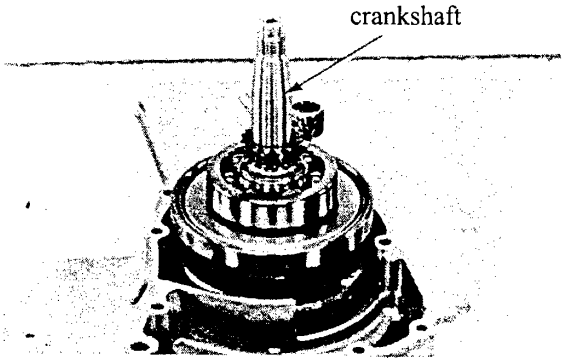
ⓘ Caution

Don't prize the surface of cylinder gasket.

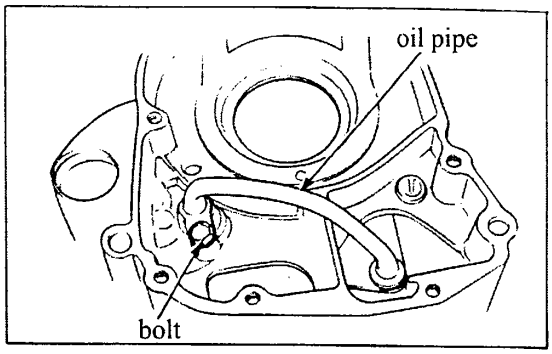
Remove the cylinder gasket and knock pin.



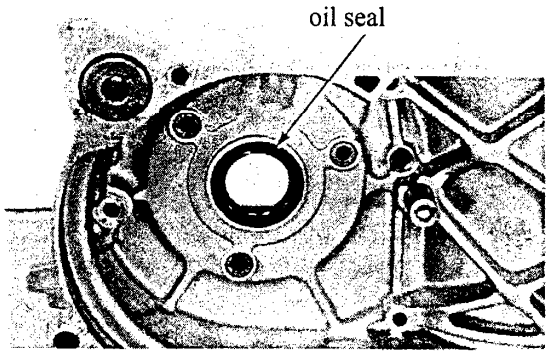
Remove the crankshaft from left crankcase.



Loosen the bolts, remove the oil pipe from the right crankcase.

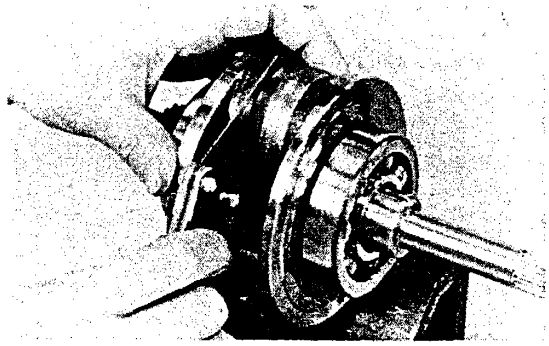


Remove the oil seal from the left crankcase.

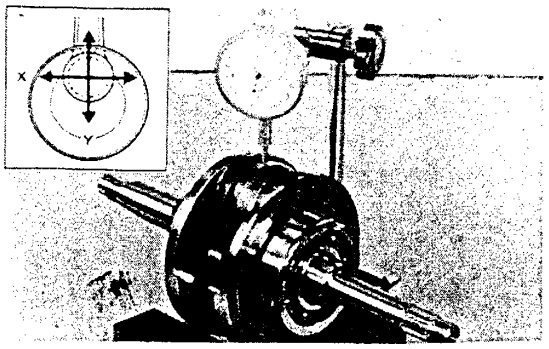


Crankshaft

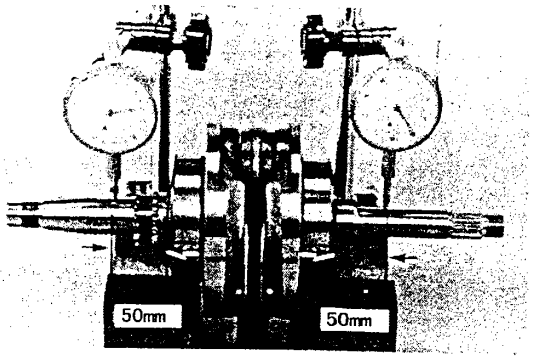
Measure the side clearance of connection rod big end.
Limit for use: Replace it if it is over 0.6 mm.



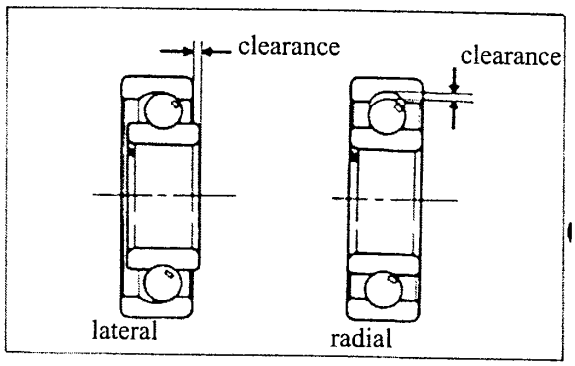
Measure the clearances in X and Y directions on the shaft end faces of connection rod big end.
Limit for use: Replace it if it is over 0.05 mm.



Measure the vibration and swing of crankshaft.
Limit for use Replace it if it is over 0.10 mm.



Rotate the journal bush of crankcase drive shaft , check if there is abnormal sound or clearance. Replace the crankcase assembly if the abnormal sound or clearance is found.



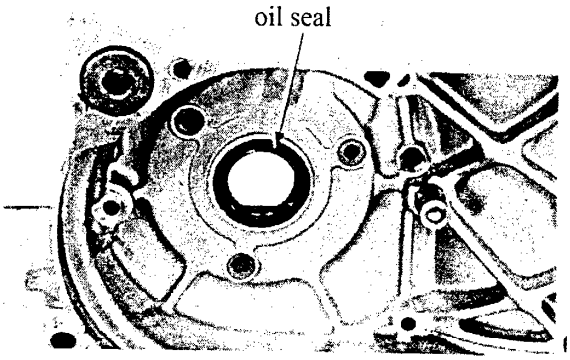
Assembling of crankcase

Clean the joint face of crankcase.

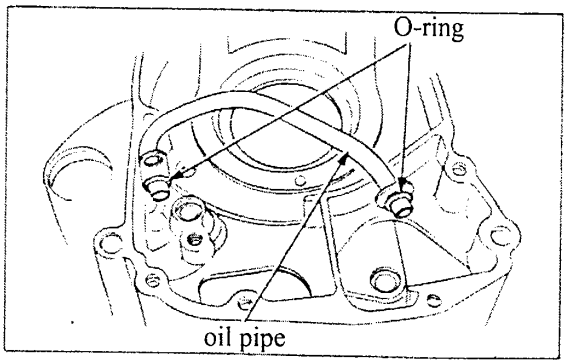
ⓘ Caution

Take care, don't damage the joint face of crankcase

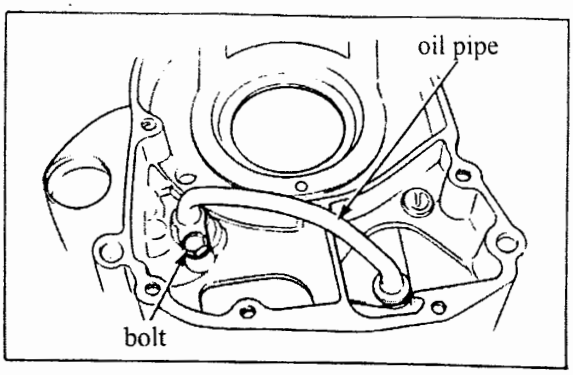
Install a new o-ring on left crankcase.



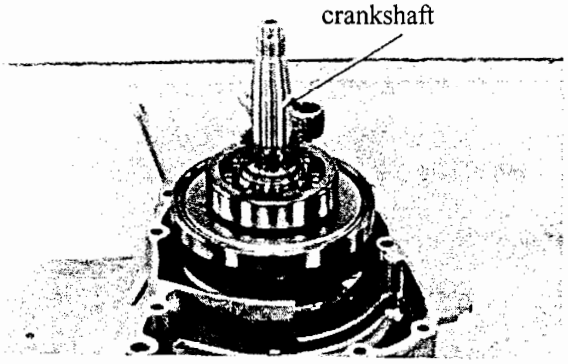
Clean the oil pipe, install new o-rings on two ends.



Install oil pipe on right crankcase and tighten it with bolt.



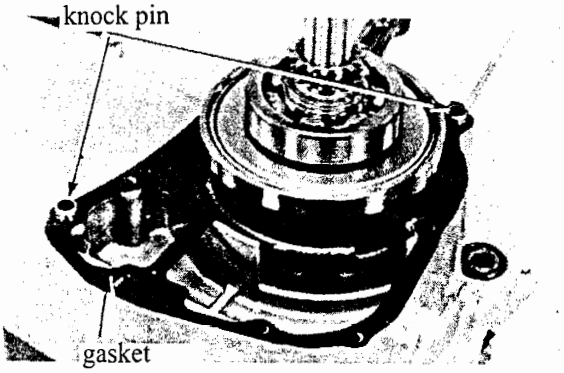
Install the crankshaft on left crankcase.



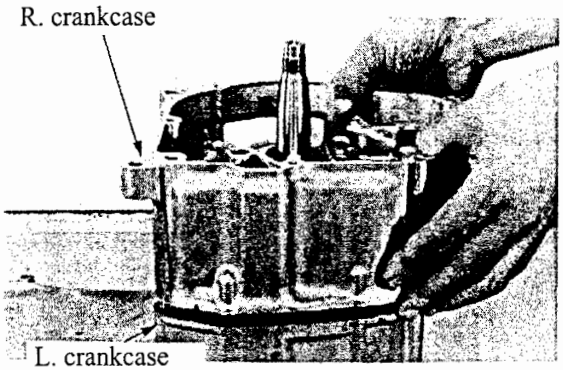
Caution

Take care, don't damage the oil seal.

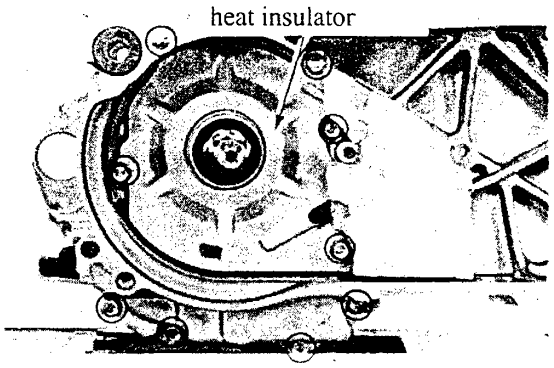
Install the knock pin and new cylinder gasket on left crankcase.



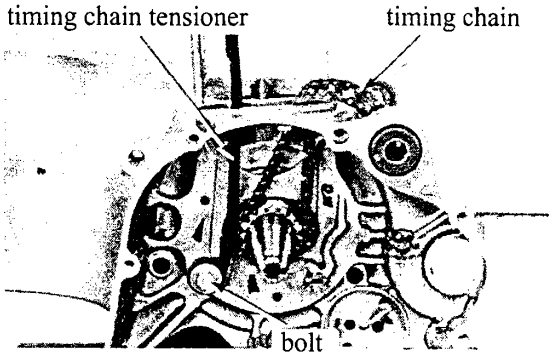
Put the left crankcase downwards, assembly the right crankcase.

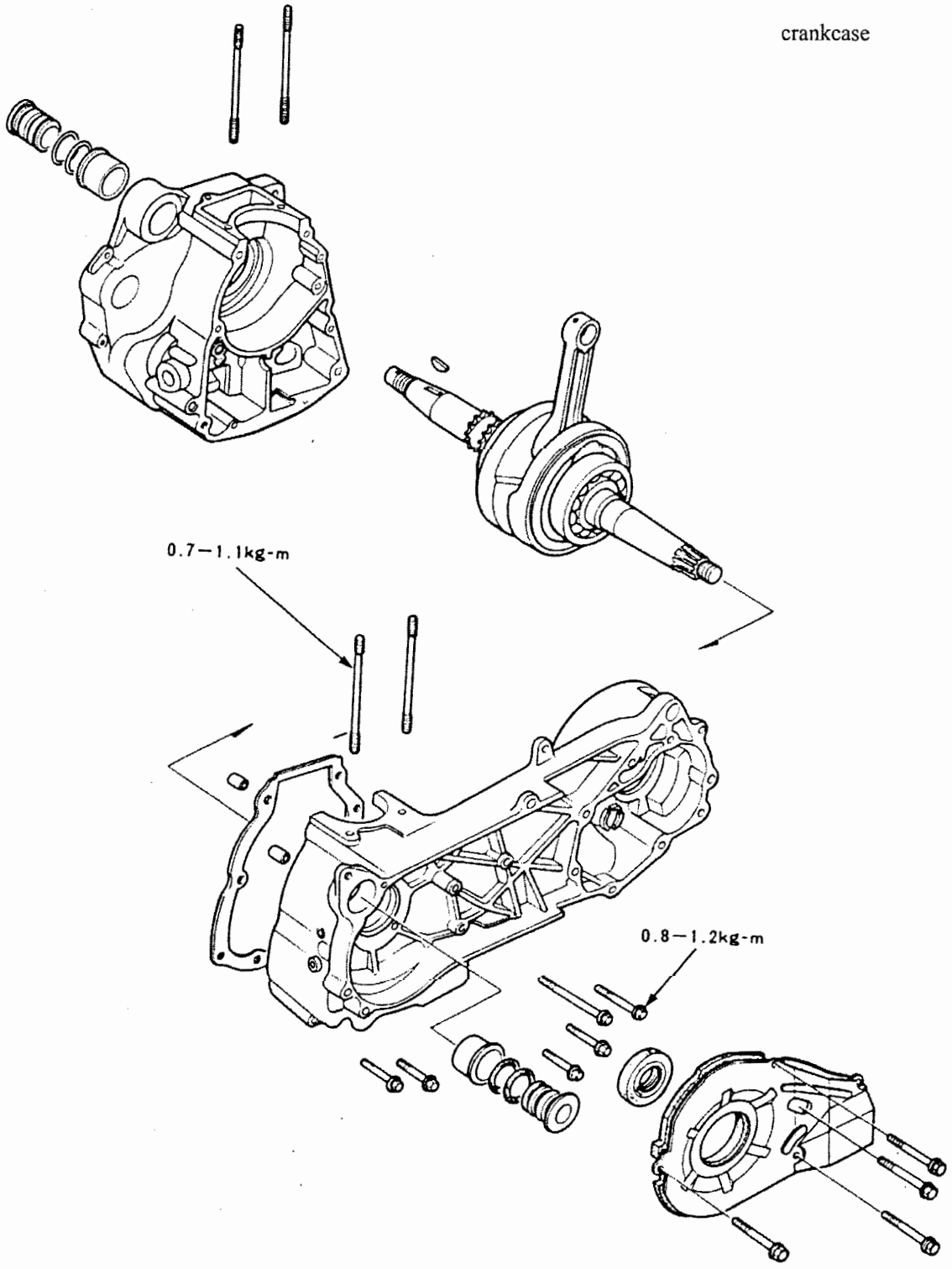


Install the heat -insulating material.
Tighten the crankcase with 9 bolts.
Torque:0.8-1.2 kg-m



Install the timing chain.
Install the timing chain tensioner with bolts.
Torque: 0.8-1.2 kg-m




crankcase
0.7—1.1kg-m
0.8—1.2kg-m