

FOREWORD

This service manual has been specially prepared to provide all the necessary information for the proper maintenance and repair of the DLX/FX/GX.

The DLX/FX/GX fits the needs of a wide variety of kart users above 16 years old. Those who will be servicing this kart should carefully review this manual before performing any repair or services.

All information, illustrations photographs and specifications contained in this manual are based on the latest product information available at the time of publication. Due to improvements or other changes, there may be some discrepancies in this manual. Therefore, if newest information is requested in the future, please contact the local distributor.

Distributor reserves the right to make production changes at any time, without notice and without incurring any obligation to make same or similar changes to vehicles previously built or sold.

SPECIFICATIONS

DIMENSIONS

Overall length-----	2075mm (87.7 inch)
Overall width-----	1235mm (48.6inch)
Overall height-----	1400mm (55.1inch)
Wheelbase-----	1450mm (57inch)
Front Track-----	1060mm (47.1inch)
Rear Track-----	1000mm (39.4inch)
Ground Clearance-----	130mm (5.1inch)

ENGINE

Type -----	Forced air – cooled 4 strokes
Engine capacity-----	150cc
Bore x stroke-----	57.4 x 57.8
Corrected Compression Ration-----	9.2: 1
Carburetor -----	PD25J
Output Power -----	9HP/7500rpm
Maximum Torque [N.m(r/min)-1]-----	8.0/4000-4500
Starting-----	Electric
Ignition -----	CDI
Lubrication -----	Force & Splash
Transmission -----	Automatic CVT

CAPACITIES

Load-----	1 rider or 90kg/198Ibs
Fuel tank -----	7L/1.54Gal
Starting-----	5s
Climbing-----	20-25°

CHASSIS

Front Brake -----Hydraulic disc/left foot control
Rear Brake ----- Hydraulic disc/left foot control
Front Tire-----19 x 7.0-8
Rear Tire-----18×9.5-8 or 22×10-10
Suspension-Front-----Dual A-arm with 1.8” (45mm) of travel
Suspension-Rear----- Spring over shock with 2.4”(60mm) of travel
Brake Track-----7m@20miles/h
Top Speed -----30miles/h(or limited as customers require)

WEIGHT

Dry Weight -----155kg/341lbs

TIRE PRESSURE

Front-----2.9Psi (20kPa/cm², 0.2kgf/cm²)

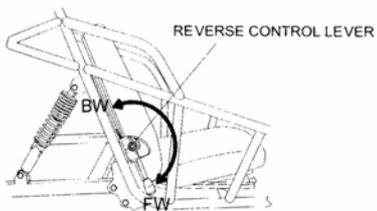
Rear-----2.2Psi (15kPa/cm²,0.15kgf/cm²)

WARRANTY

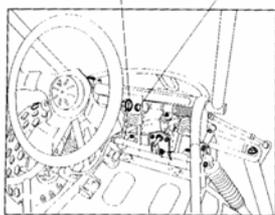
Parts & Workmanship-----6 months

* The specifications are subject to change without notice.

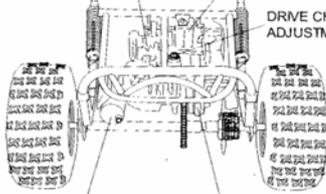
LOCATION OF PARTS:



ENGINE START SWITCH ENGINE STOP BUTTON

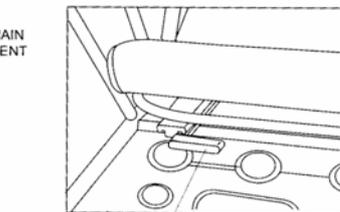


ENGINE AIR CLEANER



MUFFLER

REVERSE ASSY.



DRIVER SEAT LOCK SWITCH

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GENERAL INFORMATION

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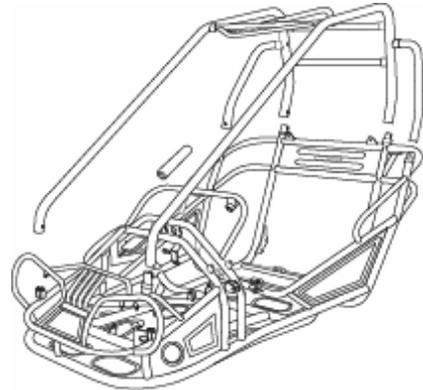
MODEL IDENTIFICATION

FRAME NUMBER

The frame number or VIN is stamped under the seat on the frame cross member and stickered behind the seat.

ENGINE NUMBER

The engine number is located on the lower front left side of the engine cases.

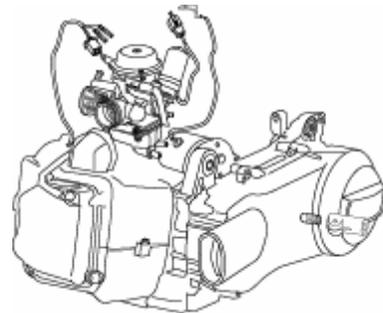


FUEL AND OIL RECOMMENDATIONS

Be sure to use the specified fuel and oil.

FUEL

Gasoline should be 85 to 95 octane or higher.
Unleaded gasoline is recommended.



ENGINE OIL

A high-grade 10W-40 motor oil should be used.

BREAK-IN PROCEDURE

For the first 2 hours of riding, do not exceed $\frac{2}{3}$ throttle.
Vary engine speed for the first 5 hours.
Never hold engine at full throttle for long periods of time.

PERIODIC MAINTENANCE AND TUNE-UP PROCEDURES

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PERIODICAL CHECK AND SERVICES

The maintenance intervals in the following table are based upon average riding conditions. Riding in unusually dusty areas require more frequent servicing.

Time of service Items	Initial service (first week)	Monthly	Quarterly	Yearly
Tire pressure/wear	I	I		
Brake performance	I	I		
Tightness of screws	I	I		
Air cleaner		C	C	I
Carburetor	I	A		C
Spark plug			C, A	
Drive chain	I	I	C, A, L	
Brake fluid			I	
Replace gearbox oil		I	R	
Chassis		C, L	L	
Fuel switch/fuel tank				C
Battery	I		I	
Engine oil		R		
Valve clearance of engine			A	

A: adjust C: clean I: inspect, clean or replace if necessary.
replace

L: lubricate R:

MAINTENANCE AND TUNE-UP PROCEDURE

This section describes the servicing procedures for each item in the Periodic Maintenance requirements.

SPARK PLUG

Clean up the carbon around the spark plug to prevent it from dripping into the cylinder when removing the spark plug.

Remove the spark plug

In general, it should be carried on after the engine is cold.
If the spark plug is too tight to remove, spray rust inhibitor on the spark plug washer and the thread part, rotate the spark plug after soaking.

Clean up the filth and carbon accumulation on the spark plug with a steel brush or a blade. Inspect the spark plug gap, in general it should be about 0.6 ~ 0.7mm.

When the carbon accumulation and wear of the spark plug are too serious, replace the spark plug. Replace with the spark plug of the same specification.

TIRE PRESSURE/WEAR

Check the tire pressure every time the kart is ridden. The tire pressure is very important for the stability of the ride.

Tire pressure			
Front	2.9Psi	20kPa/cm ²	0.20kgf/cm ²
Rear	2.2Psi	15kPa/cm ²	0.15kgf/cm ²

BRAKE PREFORMANCE

Always check that there is plenty of brake fluid in the brake fluid reservoir.



Check that the rear brake pads are in good condition.

Check the brake rotor for abnormal wear.

AIR CLEANER

Clean quarterly or more if in dust conditions.

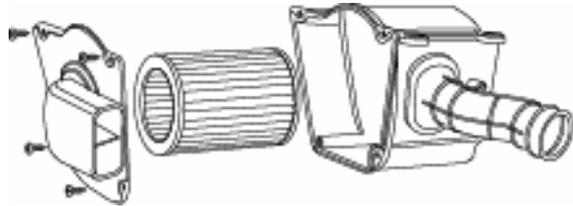
If the air cleaner is clogged with dust, performance will be severely decreased and if left unserviced, even engine damage can occur. Check and clean in the following manner.

Paper filter maintenance

Remove the air cleaner from its housing.

Tap filter on an object knocking dust from filter.

Replace the element if it is wrinkled torn.



FOAM FILTER MAINTENANCE

Remove foam filter from steel cage

Wash in non-flammable cleaning solvent

Submerge in oil and squeeze to remove excess oil

Install the element back into the air box.

CAUTION!

Before and during cleaning, inspect the element for tears. A torn element must be replaced.

Make sure the element is seated properly and no foreign material can pass by it.

CHASSIS NUTS AND BOLTS

Inspect first week and every month thereafter

Always pay attention to the karts nuts and bolts. Some loosening after use is a normal situation and should not be left unchecked regularly

TIGHTENING TORQUE CHART

Bolt Diameter	Conventional marked bolt			8.8 marked bolt		
	N.m	Kg.m	Ib-ft	N.m	Kg.m	Ib-ft
4	1 ~2	0.1 ~0.2	0.7 ~1.5	1.5 ~3	0.15 ~0.3	1.0 ~2.0
5	1 ~4	0.2 ~0.4	1.5 ~3.0	3 ~6	0.3 ~0.6	2.0 ~4.5
6	4 ~7	0.4 ~0.7	3.0 ~5.0	8 ~12	0.8~1.2	6.0 ~8.5
8	10 ~16	1.0 ~1.6	7.0 ~11.5	18 ~28	1.8 ~2.8	13.0 ~20.0
10	22 ~35	2.2 ~3.5	16.0~25.5	40 ~60	4.0 ~6.0	29.0 ~43.5
12	35 ~50	3.5 ~5.5	25.5 ~40	70 ~100	7.0 ~10.0	50.5 ~72.5
14	50 ~80	5.0 ~8.0	36.5 ~58	110 ~160	11.0 ~16.0	79.5 ~115.5
16	80 ~130	8.0 ~13.0	58 ~94	170 ~250	17.0 ~25.	123.0 ~181.0
18	130 ~190	13.0~19.0	94 ~137.5	200 ~280	20 ~28.0	144.5 ~202.5

FUEL SWITCH (PETCOCK)

Periodically clean the petcock externally with grease remover and water.

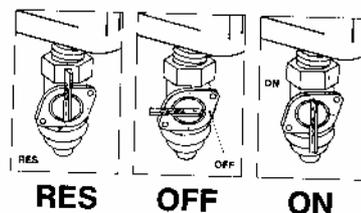
Check for any leaks or seeping fuel.

Replace the petcock if there are any leaks found.

This vehicle has a manually operated fuel valve. There are three positions.

“RES” “OFF” “ON”

“ON” position



The normal operating position for the fuel valve lever is the “ON” position. In

the position, fuel will flow to the carburetor.

“RES” position

If the fuel level in the fuel tank becomes too low for the engine to operate with the fuel valve lever in the “ON” position, turn the lever to the “RES” position to use the reserve fuel supply, and refuel as soon as possible.

“OFF” position

The closing position for the fuel valve is the “OFF” position.

When the vehicle is not in use, always make sure the petcock is in the “OFF” position.

FINAL GEAR OIL

Inspect monthly and change quarterly.

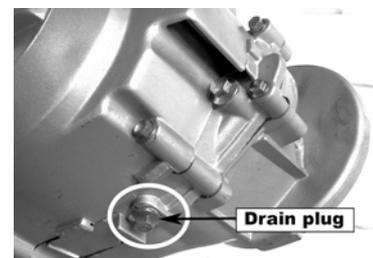
To check level, remove level screw on the left rear engine Case.



To drain oil, remove the drain plug at the rear bottom of the engine case. It is recommended to warm the engine for 10 minutes or more draining final drive oil.

NOTE:

80/90 wt. Gear oil is recommended in the final drive case. However, in extreme cold weather conditions, you may experience the kart to be hard to push. It is then advised to use lighter viscosity oil, such as 75 wt., or equivalent motorcycle transmission fluid.

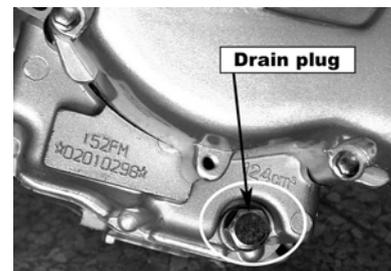


Final drive capacity	80ml 80/90wt
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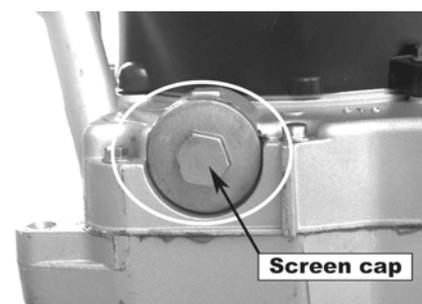
ENGINE OIL

Inspect every time before riding. Replace monthly.

Remove the drain plug from the left side bottom of the engine. Drain into oil pan for disposal.

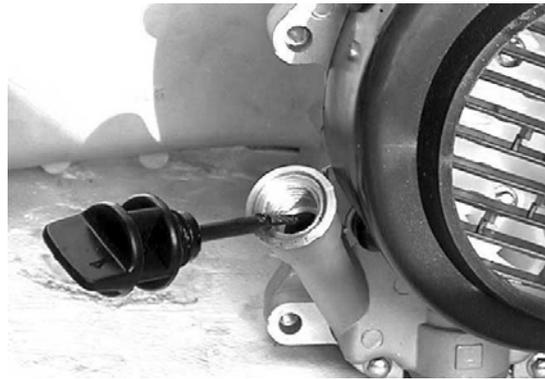


Remove the large cap on the right bottom of the engine and remove the screen.



Wash the screen with cleaning solvent and refit,

making sure the O-ring is still in good condition.
Refill the engine with 10W-40 engine oil and run for 5minutes.
Check oil level on the filler cap stick to assure proper level.
The cap need to be screwed in to check.



CHASSIS

Grease chassis bushings and bearings with grease quarterly to assure smooth operation and extended life of the bushings and the components.
If used in extreme wet and muddy conditions or dusty conditions, it is recommended more often.

CARBURETOR

Refer to Carburetor section.

VALVE CLEARANCE

Refer to Engine section.

ENGINE

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ENGINE COMPONENTS INSPECTION AND SERVICING

ENGINE COMPONENTS AND CRANK CONNECTING ROD

MECHANISM INSPECTION AND SERVICING

ENGINE COMPONENTS

CYLINDER

CYLINDER REMOVAL

The removal can be done on the vehicle body.

Remove cylinder head.

Remove cylinder.

Remove cylinder gasket, bolts

Erase cylinder gasket.

CAUTION!

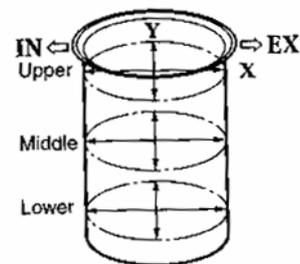
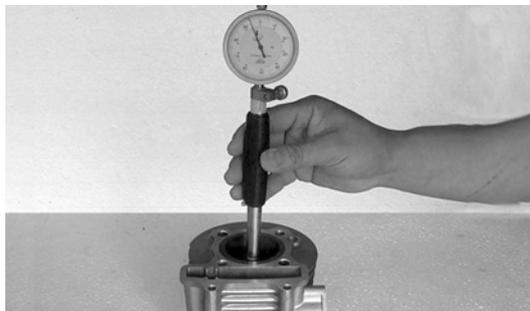
Do not damage the area of the cylinder.
Do not drop sundries, such as cylinder gasket material into the crankcase.

CYLINDER INNER WAL WEAR INSPECTION

Use a bore diameter dial gauge to measure the degree of wear.

The measure point is divided into three sectional planes in the axial direction: upper, middle, lower; measure every plane each time on the mutually perpendicular directions (X, Y), the

measured least dimension is the cylinder bore; at the most upper position measured is the largest diameter, and at the most lower position measured is the smallest diameter, their difference is the cylindricity of the cylinder. At the same cross section, measured the difference of diameter between two points mutually perpendicular; witch is the circularity of the cylinder.



In order to make the measuring point perpendicular with the bore axis of the cylinder, and to ensure the precision of the measurement, the bar of the gauge can be slightly swung in the direction of the gauge bar, and take the smallest reading number as the result.

In the situation without a dial gauge, a feeler gauge can be used to make relativity measurement, that is to put a new piston into the cylinder, and use the feeler gauge to measure the gap between the piston skirt and the cylinder wall, then figure out the abrasion loss of the cylinder. If the circularity of the cylinder exceeds the limit, then a cylinder reboring machine should be used to rebore the cylinder, and enlarge its diameter by 0.5mm or 1.00mm, then fit the piston and piston ring which size are also enlarged. If the wear is too severe and cannot be reworked, then a new cylinder should be installed.

Cylinder bore	57.4mm
Cylindircity	0.05mm
Circularity	0.05mm

CRANK CONNECTING ROD MECHANISM

PISTON SET

PISTON PIN INSPECTION AND SERVIVING

Insert the piston pin horizontally into the piston pin hole, and inspect the clearance between piston and piston pin.

Service limit	0.02mm
---------------	--------

If the free play is too much, the worn condition of piston pin and piston pin hole must be inspected respective.

Measuring the external diameter of piston pin.

Service limit	14.98mm
---------------	---------

If the result is less than Service limit, it should be replaced.

After replacement, the clearance between piston pin and piston pin hole must be assured to comply with the requirement.

Measuring the inner diameter of piston pin.

Service limit	15.02mm
---------------	---------

If the result is more than Service limits, it should be replaced.

After replacement, the clearance between the holes of piston pin must be assured to comply with the requirement.

PISTON RINGS INSPECTION AND SERVICING

Inspect if there is a flaw, serious wear, or serious conglutination and etc. on the piston ring.

If there is, it should be replaced.

The piston ring's lateral clearance and notch clearance are too large or too small with both cause malfunctions, so it must be measured.

Measure the clearance of piston ring in the piston ring groove. This clearance is the piston ring's lateral clearance.

First ring	0.09mm
Second ring	0.09mm

CONNECTING ROD END INSPECTION

Put the piston pin and bearing into the connecting rod end; inspect the degree of tightness of the piston pin in connecting rod end.

Measure the inner diameter of the connecting rod end.

Service limit	15.06mm
---------------	---------

When the abrasion of the bore exceeds the limitation, it should be replaced.

PISTON RINGS SET UP

Before setting up first apply oil on every piston ring, then enlarge piston rings, at the same time cover them on the piston and move downwards gradually, until piston rings fall into the ring groove.

PISTON SET INSTALLATION

Remove the gasket attached to the crankcase.

Mount piston onto the small end of the connecting rod.

The top of the piston with "IN" mark should be mounted towards the direction of the inlet port (if the mark is "EX", then it should be mounted towards the direction of the exhaust port).

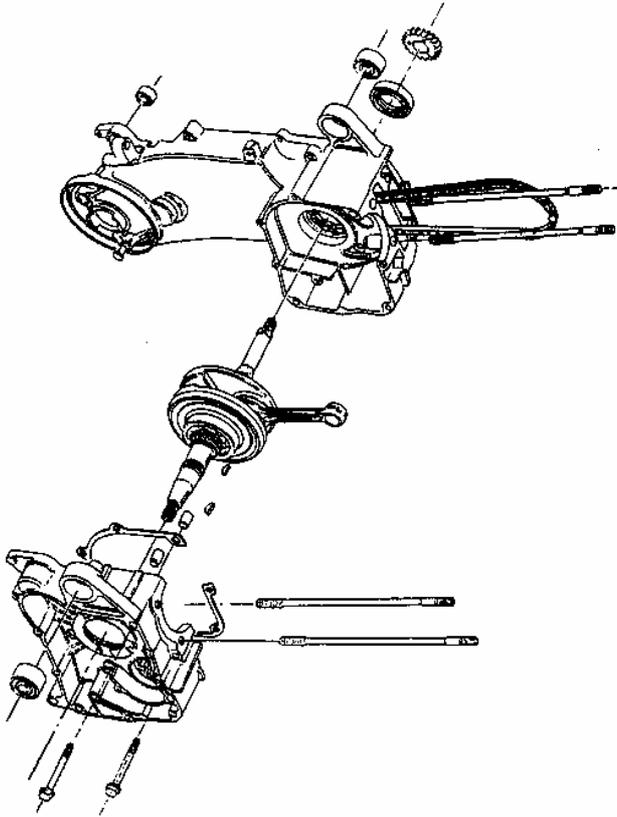
Mounting piston pin and piston pin clip

Apply oil on the piston pin to lubricate it.
Cover a piece of cloth on the crankcase port to avoid the piston pin clip from dropping into the crankcase.

CRANK CONNECTING ROD SET

The connecting rod is the component that link piston and crank.

The picture shows the structure and assembling relations of the crank connecting rod component.



CRANKCASE AND CRANKSHAFT REMOVAL

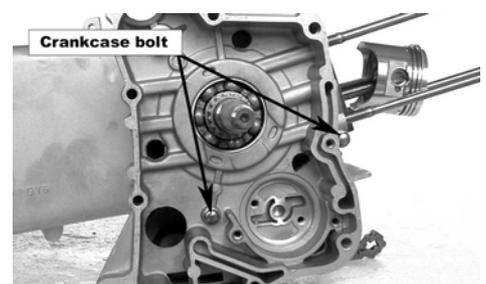
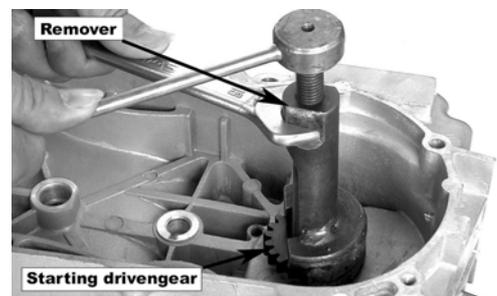
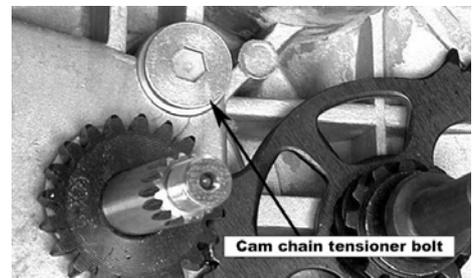
Before remove the crankcase and crankshaft, take the following procedures first:

- Remove the engine.
- Remove the cylinder cover.
- Remove the cylinder.
- Remove the piston.

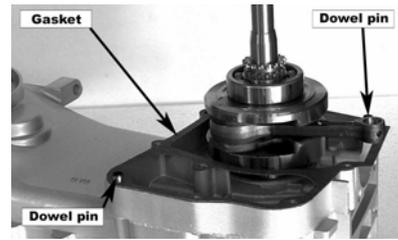
- Remove the drive plate and the driven plate.
- Remove the AC generator.
- Remove the starting motor.
- Remove the oil pump.
- Then remove the cam chain tensioner bolt. Remove the cam chain tensioner.
- Use special tools to remove the starting driven gear.

- Remove the crankcase positioning bolts.
- Separate the right crankcase and the left crankcase.

The joint face cannot be damaged.



Remove the gasket and the dowel pins.



Remove the crankshaft from the crankcase.
Take out the cam chain.

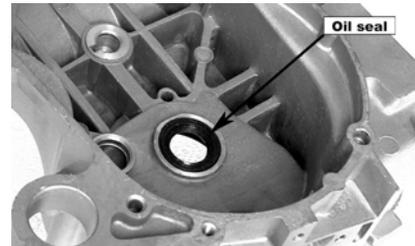


Remove the gasket on the crankcase joint face, pay attention not to damage the joint face.

Remove the oil seal from the left crankcase.

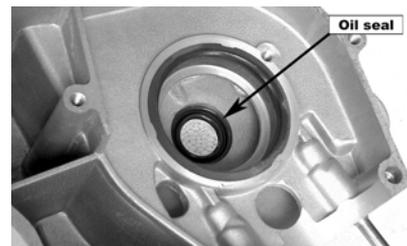


Remove the oil seal from the right crankcase.



CRANKSHAFT AND CRANKCASE INSPECTION

Replace the whole set of the crankshaft if serious wear is found while inspecting. Measuring the axial trend clearance of the big end of the connecting rod
When measuring make one side of the connecting rod big end close to the crank, and insert the feeler gauge between the other side and the crank, for the correct end play.



Service limit	0.55mm
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Measuring the radial trend (X,Y) clearance of the big end of the conrod.

Service limit	0.05mm
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Measuring the main shaft journal jump of the crankshaft.
If the crank journal jump is too much it will cause the engine to shake abnormally, and

shorten the lift of the engine, so it must be examined carefully when inspecting.

Service limit	0.10mm(A=90)
	0.10mm(B=105)

Examine if there is any loose, or unusual sound when the crank journal bearing turns, if there is, the whole set should be changed.

After cleaning the crankcase, inspect if there is any damage.

Inspect if the joint face of the crankcase is smooth and clean, and notice if it will affect the sealing performance between the left and right crankcase while reassembling.

After the above inspection, use oilstone to finish the crankcase if it has some surface damage, replace cover if damage is too severe.

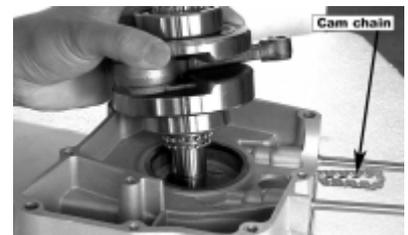
Because the right and left crankcase axle hole must be concentric, so generally they must be replaced at the same time.

CRANKSHAFT AND CRANKCASE INSTALLATION

Mount the crankcase oil seal.

Put the cam chain into the left crankcase..

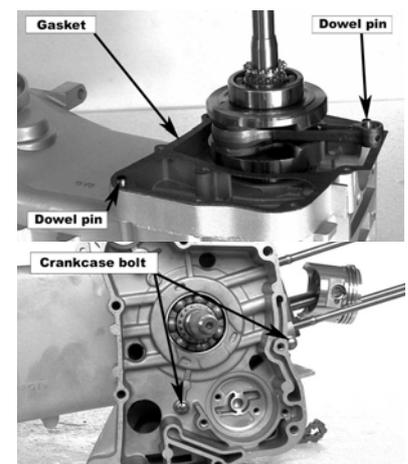
Put the crankshaft into the left crankcase.



Pay attention to avoid the cam chain damaging the oil seal.

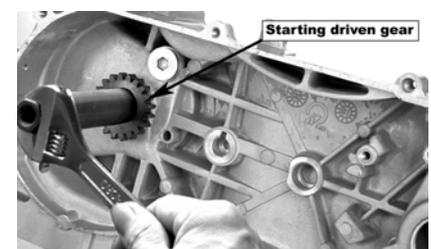
Mount the new dowel pins and gasket on the left crankcase. Joining the right crankcase and left crankcase together.

Tighten the crankcase positioning bolts.



Tightening torque	1.98 lbs.m
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Mount the starting driven gear.



Mount the cam chain tensioner

Mount the new O-ring on the cam chain tensioner bolt.

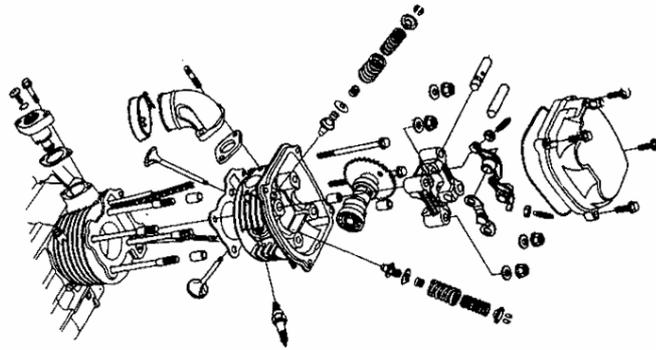
Apply some oil on the O-ring.

Tighten the cam chain tensioner bolt.

The O-ring must be mounted in the groove.

VALVE MECHANISM INSPECTION AND SERVICING

The picture shows the common valve train of a four-stroke engine. This is a kind of overhead valve train, its intake port, exhaust port, cam shaft are all located in the cylinder head, the valves bottom up over the combustion chamber.



GENERAL INTRODUCTION

The four-stroke engine completes its four stroke with one piston stroke.

Intake stroke

Compression stroke

Expansion stroke

Exhaust stroke

VALVE CLEARANCE ADJUSTMENT

Valve clearance is an important technical parameter in the valve train.

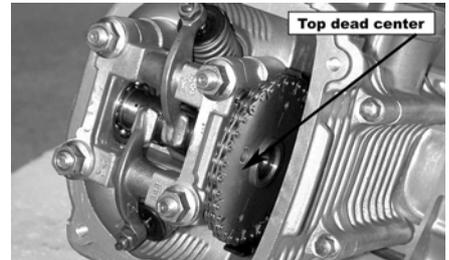
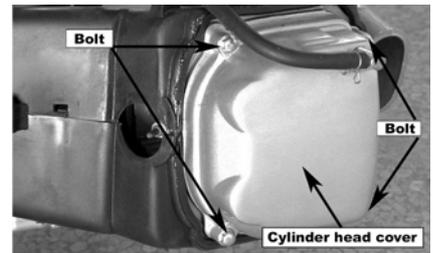
In order to make sure that during any conditions, especially when the engine is overheated, the valve can also close tightly, when the valve is in the cold condition, there must be certain clearance kept, this clearance is called valve clearance. When the engine is running, the valve clearance is demanded neither too big, nor too small. So, valve clearance adjustment is an important procedure in the valve train maintenance.

Remove the cylinder head cover.

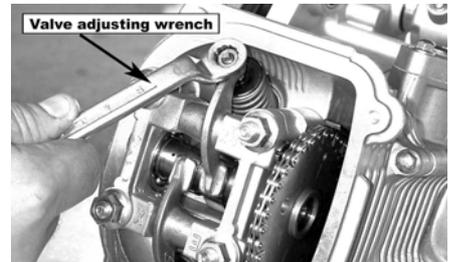
Inspection and adjustment must be done in cold condition (below 35°C).

Turn the cooling fan clockwise until the mark of the timing drive sprocket on the camshaft is in top dead center, and the “T” symbol (or other mark) of the magneto flywheel aligns to the crankcase mark.

The crankshaft should rotate, or the exhaust port may not be adjusted.



When adjusting, loosen the lock nuts, adjust the bolts with a valve adjusting wrench, turn clockwise, the valve clearance decreases, and turn counterclockwise, the valve clearance increases. Then, put a feeler gauge with specific size between valve and rocker to check for correct clearance.



Take out the feeler gauge, tighten the lock nuts, and then inspect the valve clearance again.

Sometimes when tightening the lock nuts, it will change the clearance so it must be rechecked for the proper clearance.

Valve clearance	0.08 ~ 0.12mm
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CAMSHAFT

The camshaft is a main driving unit of the valve train. There are the air inlet cam, the exhaust cam, and the cam journal on the shaft. It controls the intake and exhaust valve to open and close at the correct time. The camshaft wear will affect engine performance and cause excessive noise.

CAMSHAFT REMOVAL

Loosen valve cover bolts and remove cover.

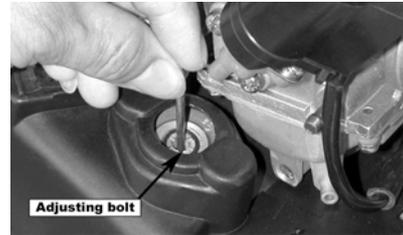
Remove the cam chain tensional bolt cap, and remove the



O-ring.

Tighten the cam chain tensioner adjusting bolt clockwise.

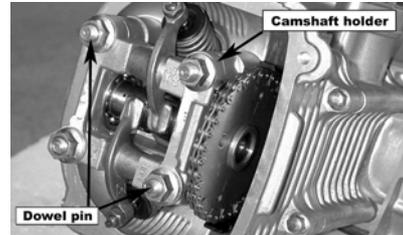
Turn the flywheel counterclockwise to make the “T” mark on the flywheel align with the mark on the crankcase. When the hole on the cam chain (timing drive chain wheel) is up, it is the top dead center position.



Remove the cylinder head positioning bolt.

Remove the camshaft holder bolt cap, washer.

Remove the camshaft holder and dowel pin.



Remove the cam chain wheel from the cam chain, and remove the camshaft.

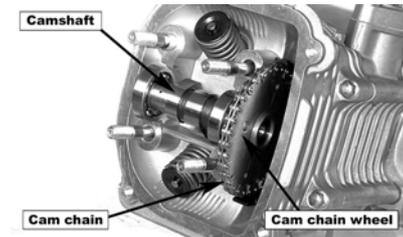
CAMSHAFT INSPECTION

Inspect if the camshaft bearings for play, if they are, then replace the whole set.

Inspect cam surface for damage.

Measure the height of the cam.

Inlet cam	25.96mm
Exhaust cam	25.815mm



CAMSHAFT INSTALLATION

Rotate the flywheel to align the “T” mark on the flywheel with the camshaft mark, and that the round hole on the cam chain wheel is up, and the left and right sits parallel with the cylinder head (the lobes of the camshaft are down), then install the camshaft on the cylinder head.

Mount the cam chain on the chain wheel.

Install the dowel pins.

Mount the camshaft holder, washer, bolt cap on the cylinder head.

Tighten the cylinder head bolt and nut.

While installing, first apply some oil on the thread part of the camshaft holder bolt.

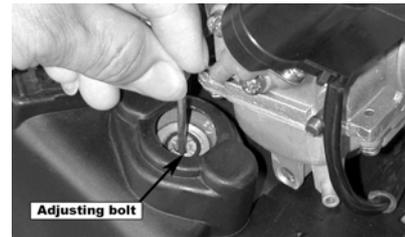
The camshaft nuts should be tightened diagonally in a 3 step process.

After installing, adjust the valve clearance.

Turn the cam chain tensioner adjusting bolt counter-clockwise, and release the lock.

Apply oil on the new O-ring.

Mount and tighten the cam chain tensioner cover bolt.



The O-ring must be mounted proper in the groove.

Replace the valve cover gasket, and mount the cover.

The valve cover gasket must be mounted properly in the groove.

Tighten the valve cover positioning bolt.

ROCKER ARM AND ROCKSHAFT

ROCKER ARM AND ROCKSHAFT REMOVAL

Remove the camshaft holder.

Take out the rockshaft by removing the bolt.

Remove the rocker arm.

ROCKER ARM AND ROCKSHAFT INSPECTION

Inspect if there is any abrasion or damage on the rocker arm and rockshaft or if the oil hole is clogged.

If there is abrasion on the surface of the rocker arm, the camshaft should also be inspected.

Measuring the inner diameter of the rocker arm.

Service limit	10.04mm
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Measuring the outer diameter of the rockshaft.

Service limit	9.96mm
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ROCKER ARM AND ROCKSHAFT INSTALLATION

Read the “EX” mark on the camshaft holder, then mount the exhaust port rocker arm and the rockshaft.

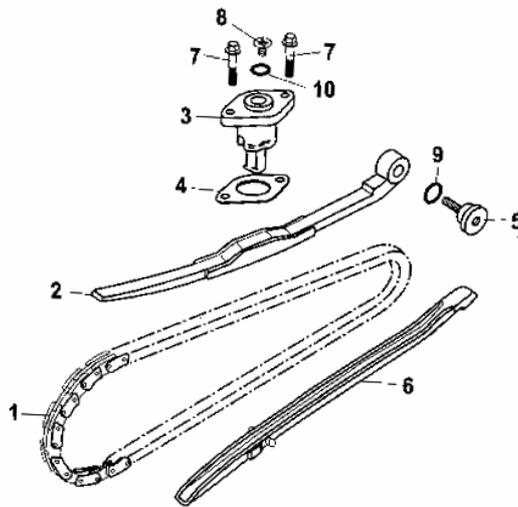
After that, mount the inlet port rocker arm and rockshaft.

Apply some oil on the rockshaft before mounting it on.

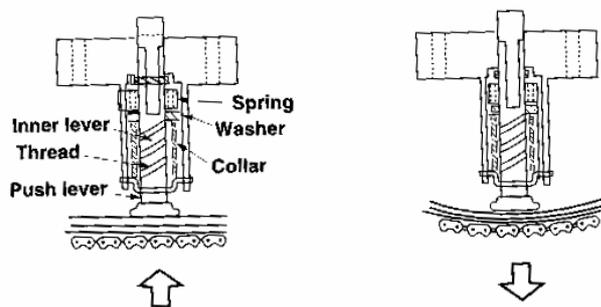
CAM CHAIN TENSIONER

The chain tensioner must be in good working order for proper chain tension.

1. Cam chain
2. Cam chain tensioner
3. Cam chain tensioner lifter.
4. Gasket
5. Cam chain tensioner pivot
6. Cam chain guide
7. Bolt
8. Nut
9. O-ring
10. O-ring



The operational principle of the tensioner is as shown in the picture.

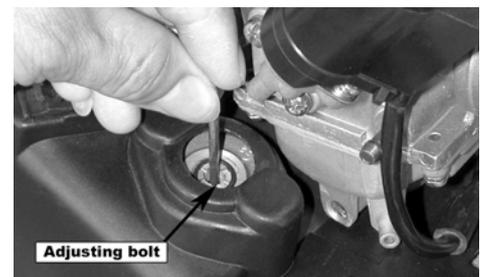


As for the adjustment of the cam chain tensioner, clockwise is tightening, and counterclockwise is loosening.

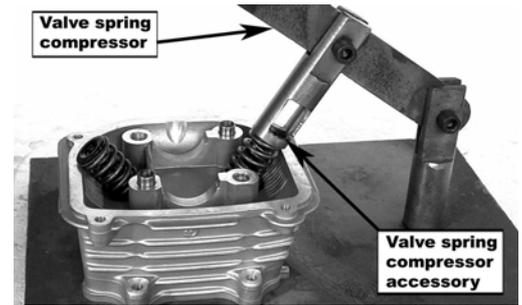
VALVE AND VALVE SPRING

VALVE AND VALVE SPRING REMOVAL.

Remove the cylinder head.



First remove the valve cotter with the valve compressor, then remove the upper spring race, valve spring, lower spring race, valve stem oil seal etc in turn. Remove the valve from the other side.



The removed parts should be placed properly in order. It's better to place the intake valve parts and exhaust valve parts separately.

VALVE AND VALVE SPRING INSPECTION

Inspect to see if the valve is bent or burned.

Inspect if the action is smooth between the valve and the valve guide.

Measure the outer diameter of the valve stem.



Service limit	4.94mm
---------------	--------

Measure the free length of the inner and outer valve spring.

Valve	Inlet valve	Exhaust valve
Inner spring	31.2mm	31.2mm
Outer spring	34.1mm	34.1mm



Valve and valve spring installation.

Mount the spring retainer, valve guide oil seal.

It's recommended to replace the valve guide oil seal with a new one.

After applying oil on the valve stem mount it into the valve guide.

Mount the inner and outer valve springs.

Mount the valve locker with a spring compressor.

When mounting, the twisting direction of the inner and outer springs must be opposite, and cannot be the same.

Tap at the valve gently two or three times with a rubber hammer to make the valve and the valve lock match well.

Do not damage the valve.

VALVE GUIDE

Carbon accumulation of the valve guide will make the valve move rough causing the valve to not open or close properly.

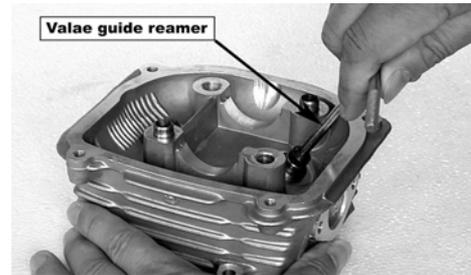
Valve guide abrasion is one of the reasons that cause the exhaust pipe fuming white smoke.

TO CLEAN CARBON ACCUMULATION OF THE VALVE GUIDIE

Remove the valve and springs etc.

Clean the carbon accumulation with a valve guide reamer.

Generally only turn right when using the reamer, and do not push in or out directly with the reamer.

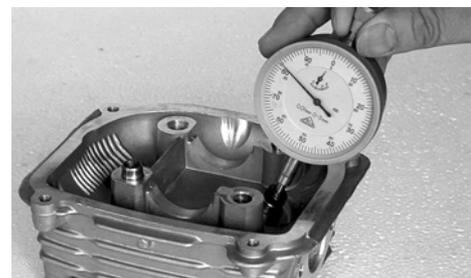


VALVE GUIDE INNER DIAMETER MEASUREMENT

Service limit	5.03mm
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Calculate the clearance between the valves stem and the valve guide.

(The inner diameter of the guide subtracts the outer diameter of the valve stem).



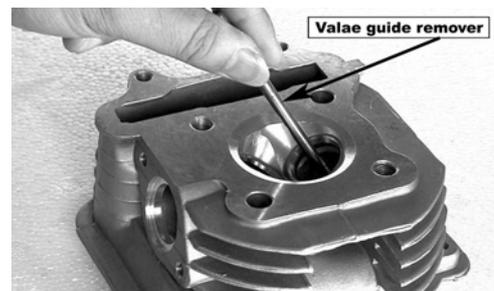
Valve	Inlet valve	Exhaust valve
Service limit	0.08mm	0.10mm

When the abrasion of the valve guide exceeds the use limit, it should be replaced; after replacing a new valve guide, the valve retainer must be adjusted.

VALVE GUIDE REPLACEMENT

Heat the cylinder head to 100 ~ 150□

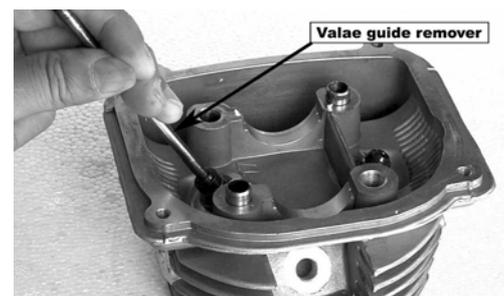
The cylinder head must be wholly and quickly heated to the specific degree, and cannot be heated partly, or it'll cause the cylinder head to distort. The temperature is very high, so two tecnitions are recommended.



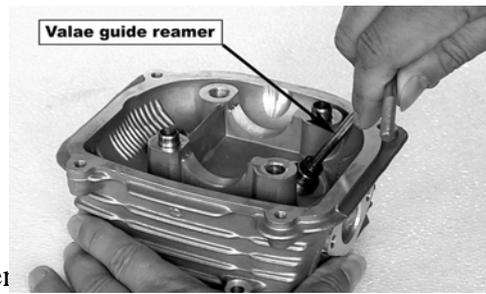
Tap the valve guide out with a valve guide remover or similar tool.

Do not damage the cylinder joint face.

After tapping the valve guide, you need to trim it with a reamer.



When using the reamer, cutting oil must be used. The reamer can only be turned right, do not push in or out directly.



Clean the cylinder head, and eliminate the scraps generated.

VALVE SEAT

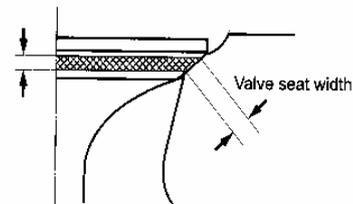
The relative position between the valve seat and the working surface of the valve is very important for the valve to seal properly.

VALVE SEAT WIDTH MEASUREMENT

Clean the carbon accumulation in the combustion chamber.

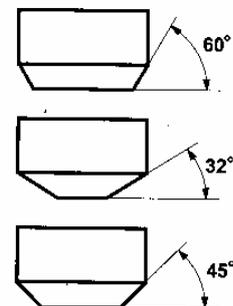
Measure the width of the valve seat with a vernier caliper.

Standard	0.6 – 1.2mm
Service limit	1.8mm



When abrasion causes the valve seat width uneven, too wide or too narrow, it will result in bad contact between the valve and the valve seat, and not seal tight, at this time it must be reamed with a customized valve seat milling cutter.

The valve seat milling cutter is the customized trimming tool for the valve seat, and it has three cutting angles, 32°, 45°, and 60°.



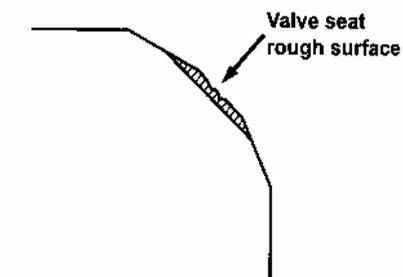
While trimming, press the valve seat milling cutter to make rotary motion with 40 ~ 50 N force.

Some oil must be applied on the valve seat milling cutter, to eliminate scrapping when trimming.

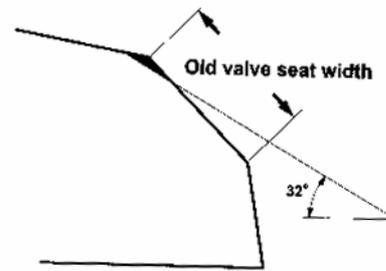
VALVE SEAT FINISHING

Ream out the defects on the working surface with a 45° coarse tooth milling cutter.

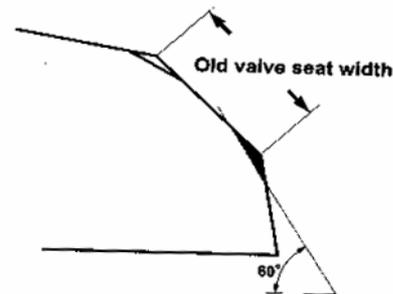
Do not ream too much.



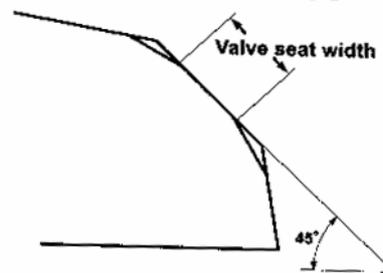
Ream the upper angles of the valve seat working surface with a 30°milling cutter.



Ream the lower angles of the valve seat working surface with a 60°milling cutter.



Finally, ream the valve seat to the specific seat width with a 45°milling cutter.

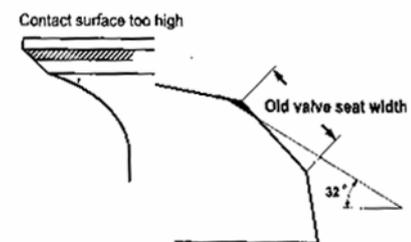


VALVE SEAT TOUCHING POSITION INSPECTION

Apply a thin layer of fluid on the valve seat, and put the valve on the seat rotate jointly, then

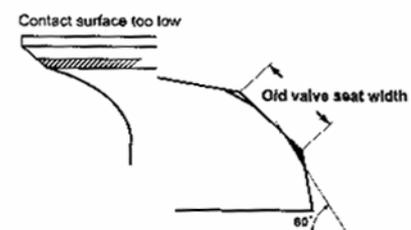
take out the valve and observe the contact surface on the valve face. If the contact position is too high, then cut out some of the upper part of the valve seat with a 32°milling cutter to reduce the working face of the valve seat.

If the contact position is too low, then cut out some of the lower part of the valve seat with a 60°milling cutter to raise the working face of the valve seat.



Finally , mill the working face of the valve seat to the specific width with a 45°milling cutter.

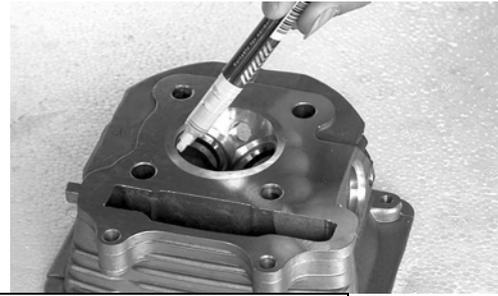
If the valve seat still cannot contact evenly with the valve after trimming, the valve should be revised or replaced.



VALVE AND VALVE SEAT LAPPING

After finishing, the valve and seat should be lapped in order to make them seal properly.

Spread a thin layer of silicon carbide on the working bevel of the valve, and use a valve suction cup tool. Then repeatedly rotate the valve suction cup to lap the valve and valve seat evenly, until they match tightly.



Before lapping, clean the valve, valve seat and valve guide.
When lapping do not use too much force.
During lapping, do not drop any silicon carbide into the place between the valve lever and the valve guide.

VALVE AND VALVE SEAT AIR IMPERMEABILITY INSPECTION

After lapping the valve and valve seat, the air impermeability of the joint surface should be inspected.

Method one: same as the method of “valve seat contact position inspection”.

Method two: evenly draw several lines on the working surface of the valve with a pencil. Put the valve into the valve seat, if the lines are all broken after turning $1/8 \sim 1/4$ ring, then it shows the air impermeability is good.

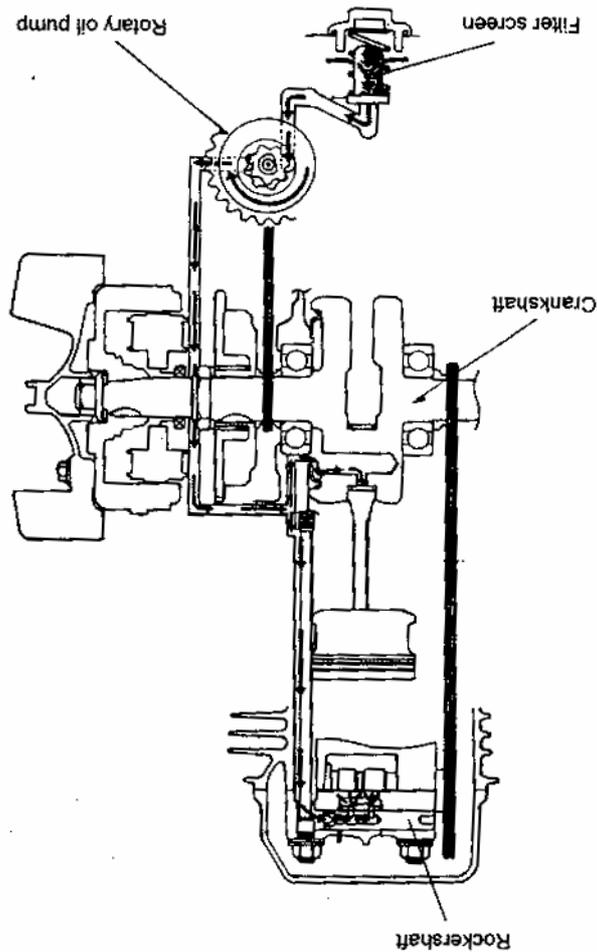
Method three: mount the valve on the cylinder head, and fill the inlet and exhaust vent with non flammable solvent, and preserve for 5 minutes, if there is no leaking, the valve is seated correctly.



Lubrication system inspection and servicing

GENERAL INTRODUCTION

The picture shows the functional diagram of the lubrication system. After the lubrication oil crosses the filter screen, it is pumped by the rotator oil pump, some of it goes into the big end of the connecting rod, and splashes on the cylinder wall and the small end of the connecting rod; the other goes through some oil passages, such as the shaft neck of the camshaft, and splashes on the cam rockshaft and cam chain. The lubrication oil that falls back into the oil groove can be recirculated.



OIL SYSTEM INSPECTION AND REPLACEMENT

OIL REPLACEMENT

Tighten the dipstick

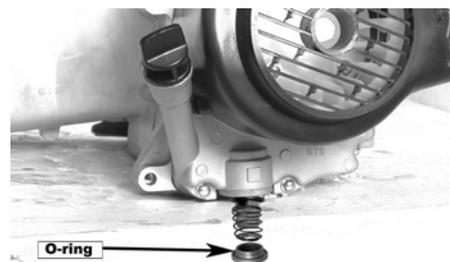
Remove the oil filter screen cap and the screen to let the oil flow out.



Inspect if there is any damage of the screen and O-ring, if so, it should be replaced.

Mount the oil filter screen and the screen covers and tighten them. Supply the application-specific oil to the specific level.

Oil level	Disassembling	Replacing
	0.90I	0.75I



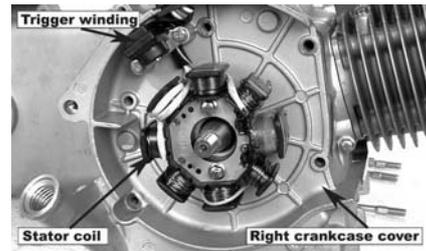
Start the engine and runs several minutes in the idle position to make sure there is no oil leaking. Stop the engine and inspect if the oil level is proper.

ROTARY OIL PUMP

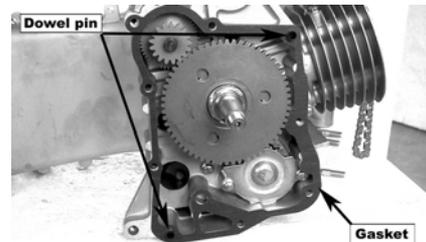
The oil pump is the critical component of the lubrication system, so it should be inspected, maintained periodically, and should be replaced as a unit when damaged seriously.

OIL PUMP REMOVAL

Remove the fly wheel of the magneto.
Remove the stator coil, trigger winding.

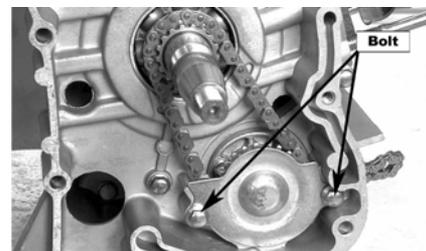


Remove the right crankcase cover bolts and remove the right crankcase cover.
Remove the gasket, dowel pins.

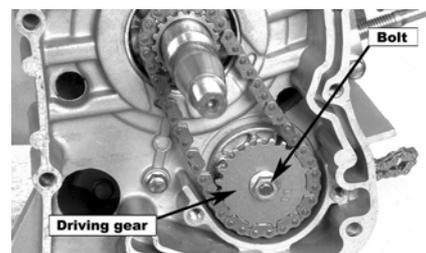


Remove the starting reduction gear, starting clutch.

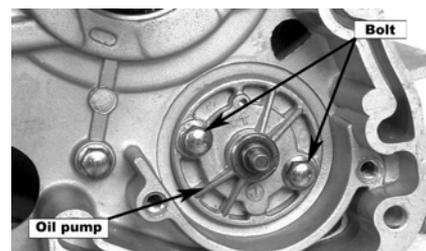
Remove the oil pump partition plate positioning bolts, and remove the oil pump partition plate.



Remove the oil pump driving gear nuts, and remove the driving gear, chain.



Remove the oil pump positioning bolts, and remove the oil pump assembly.

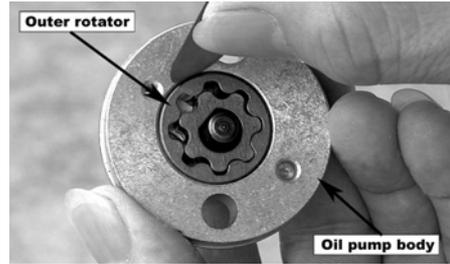


Remove the screws, and disassemble the oil pump.

OIL PUMP INSPECTION

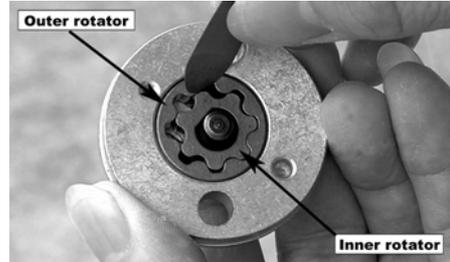
Inspect the clearance between the oil pump body and the outer rotator.

Service limit	0.12mm
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Inspect the clearance between the inner rotator and the outer rotator.

Service limit	0.12mm
---------------	--------



Inspect the clearance between the rotator plane and the oil pump.

Service limit	0.20mm
---------------	--------

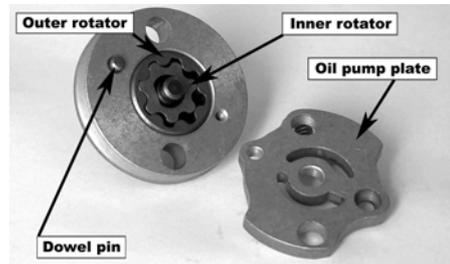


If the inspection result exceeds the above stated service limit, the whole set should be replaced.

OIL PUMP ASSEMBLING

Assemble the inner and outer rotators of the pump, and mount the oil pump shaft.

When assembling, align the unfilled corner of the oil pump shaft with the corner of the inner rotator, and then mount.

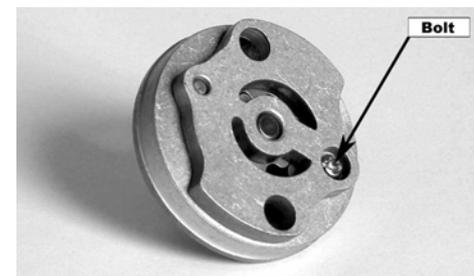


Mount the dowel pin.

After aligning the oil pump plate with the dowel pin, then you can install it.

Tighten the oil pump plate bolts.

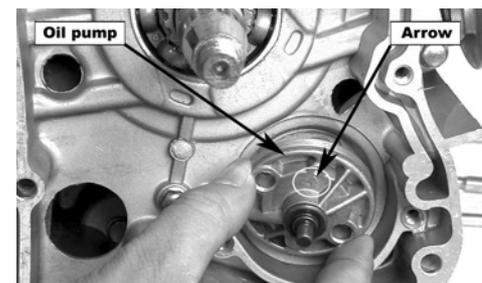
After assembling, gently turn the oil pump shaft, and make sure the oil pump can turn smoothly.



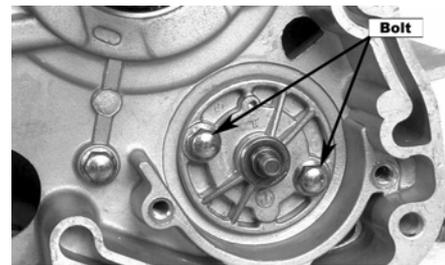
OIL PUMP INSTALLATION

Install the oil pump on the crankcase.

Before installing, fill the oil pump with oil. When installing, the arrow of the oil pump body must be upwards.



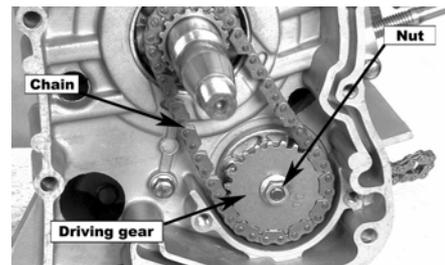
Tighten the oil pump positioning bolts.



Align the oil pump driving gear with the oil pump shaft unfilled corner, then mount the driving gear, chain.

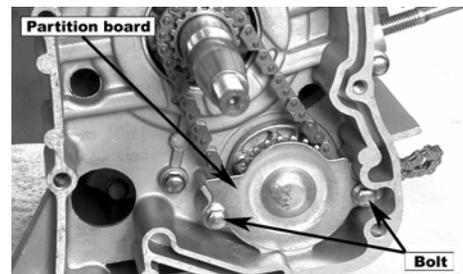
Mount the driving gear positioning nut and tighten it.

Install the partition board and tighten bolts.



Install the starting reduction gear, starting clutch.

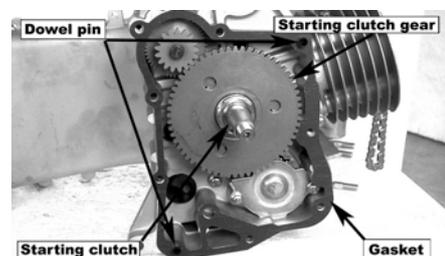
Mount the gasket, dowel pins.



Mount the right crankcase cover positioning bolt.

Mount the trigger winding and the stator coil.

Tighten the right crankcase cover positioning bolt.



The bolt should be gradually diagonally tightened in two to three steps.
After finishing the installation, inspect for any oil leaks.

FUEL SUPPLY SYSTEM INSPECTION AND SERVICING

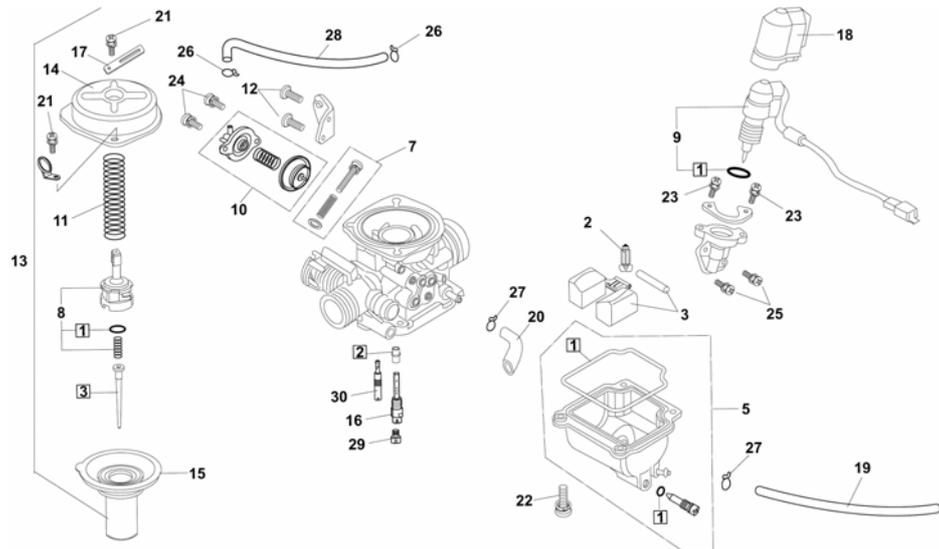
CV CARBURETOR

The CV carburetor is a constant vacuum carburetor.

The picture shows the structure of the CV carburetor.

1. Gasket set
2. Float valve set
3. Needle jet set
4. Float set
5. Float chamber set
6. Screw set A
7. Screw set B
8. Valve plate set

- 9. Starter valve set
- 10. Air cut valve set
- 11. Compression coil spring
- 12. Screw
- 13. Carburetor assy.
- 14. Top comp.
- 15. Vacuum piston comp.
- 16. Needle jet holder
- 17. Plate clip
- 18. Holder cap
- 19. Tube A
- 20. Tube B
- 21. Screw
- 22. Screw
- 23. Washer screw
- 24. Washer screw
- 25. Washer screw
- 26. Clip
- 27. Clip
- 28. Tube
- 29. Main jet
- 30. Slow jet



CARBURETOR IDLING ADJUSTMENT

AIR ADJUSTING SCREW ADJUSTMENT

Step one: turn on the air adjusting screw in the turn out by the prescribed number of turns.

Turn out number of turns	2 3/4 – 2 1/4
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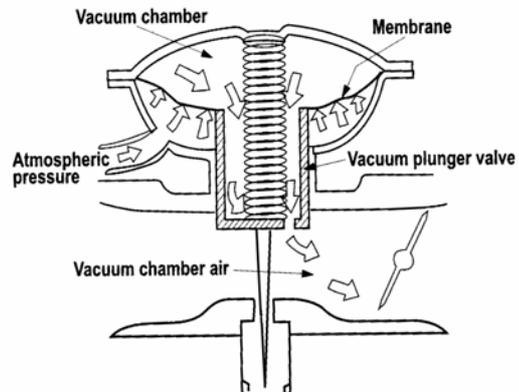
Step two: adjust the throttle adjusting screw to then prescribed idle rpm.

Step three: left and right adjust the air adjusting screw slightly to find the highest position of the rpm.

Add throttle quickly and gently (the rpm is from low to high), and return throttle immediately, then observe 10 to 15 minutes, if the idle remains the same.

VACUUM CHAMBER

The picture shows the structure of the vacuum chamber of the CV carburetor.



VACUUM CHAMBER REMOVAL

Remove the body cover. Remove the automatic choke lead wire.

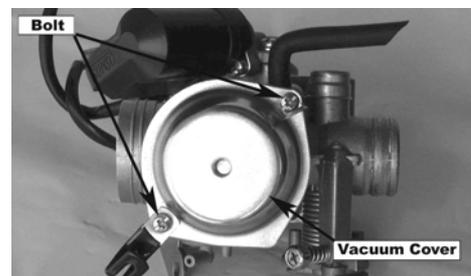
Loosen the fuel drain bolt, and drain the fuel in the float chamber. Remove the fuel line, and the vacuum pipe.

Loosen the throttle cable adjusting nut and positioning nut; remove the throttle cable.

Loosen the carburetor air inlet vent clip and the inlet manifold clip; remove the carburetor.

Remove the vacuum cover bolt, and remove the vacuum cover.

Notice: move slowly to prevent the spring from ejecting.



Take out the spring, the vacuum membrane and the plunger.



Press down the holding clamp of the needle valve top, and turn left to take out the clamp.

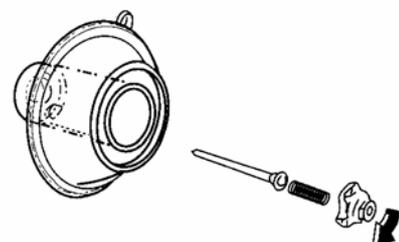
Take out the spring, needle valve.

Do not damage the vacuum membrane.

Inspect if the needle valve is worn or not.

Inspect if there is damage on the vacuum membrane.

Inspect if the plunger is damage.



VACUUM CHAMBER INSTALLATION

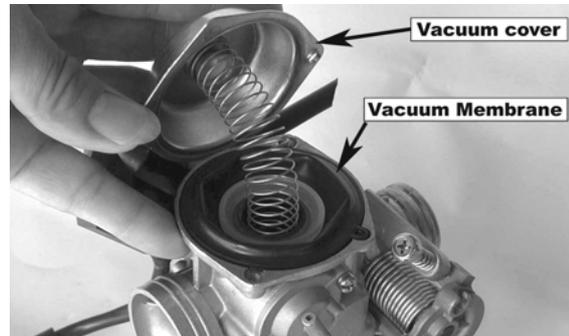
Mount the plunger, vacuum membrane into the carburetor body.

Push the plunger upwards in the direction of the vacuum chamber cover to make the carburetor jet tube in the condition of totally open.

Put the spring in.

Align the bulge part of the vacuum membrane with the fillister of the carburetor body, and then mount the vacuum chamber cover.

Tighten the bolt.



AUTOMATIC SIDE STARTER (CHOKE)

AUTOMATIC SIDE STARTER INSPECTION

Remove the fuel hose from the carburetor.

Turn out the carburetor float chamber drain screw, and drain the fuel in the carburetor.

Remove the automatic side starter lead wire, and remove the wire clip.

Remove the carburetor clamp, and remove the carburetor.

Check the connecting condition between the two lead wires.

The choke value should be below 10V. If it exceeds the specific valve, it should be replaced.

When the engine is cold, link a hose on the reserve supply fuel line and blow very gently.

To see if it is obstructed, the auto side starter is not good, and it should be replaced.

Remove the auto side starter cover.

Remove its positioning bolts and pieces.

Remove the auto side starter.

Inspect the auto side starting valve and fuel injection needle for wear.

Inspect the O-ring wear.

FLOAT CHAMBER

FLOAT CHAMBER REMOVAL

Remove the carburetor.

Remove the clamp, and remove the float chamber.

Remove the O-ring, and turn out the float chamber screw, remove the float pin, and remove the float and float valve.

Remove the choke adjusting screw and air adjusting screw.

Before removing, first tighten the two screws, gently counting the number of turns, then remove screws.

Do not use too much force, or it will damage the air adjusting screw head surface.

Remove the main fuel injection nozzle and fuel injection needle seat.

FLOAT CHAMBER INSPECTION

Inspect the float for any damage and for no fuel in the float. Inspect the float valve and float valve seat for wear. If there is wear, it should be replaced.

Clear every fuel line and air line on the carburetor body with compressed air.

FLOAT CHAMBER INSTALLATION

Install the main fuel injection nozzle and fuel injection needle seat.

Install the air adjusting screw and choke adjusting screw, and turn them into the proper position according to the noted number of turns while removing.

Mount the float valve, the float, and the float pin.

Tighten the float pin positioning screw.

FULE LEVEL INSPECTION

Measure the fuel level height.

Fuel level height	18.5mm
-------------------	--------

Inspect the float for any damage and inspect the float valve for excess wear.

Confirm the up and down movement of the float is normal.

CARBURETOR INSTALLATION

Inspect the float for any damage and inspect the float valve for excess wear.

Confirm the up and down movement of the float is normal.

CARBURETOR INSTALLATION

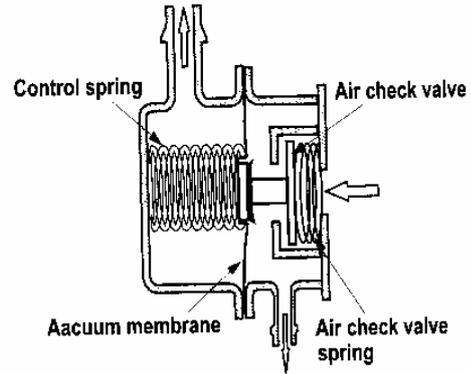
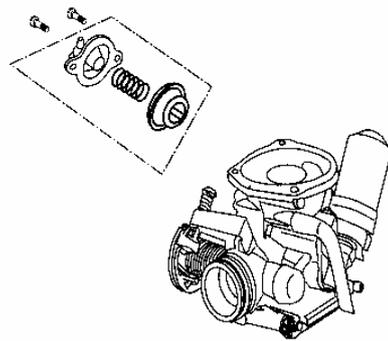
Reverse the removal procedure for installation.

After installing, make sure all carburetor linkage and cables are in correct position, make sure carburetor is in idle position,

AIR CUT VALVE (ACV)

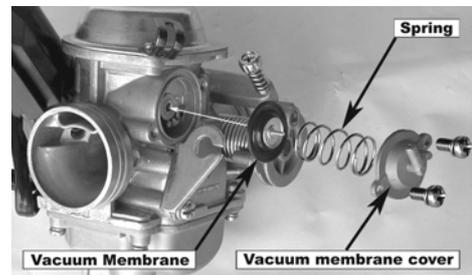
The air cut valve can avoid some abnormality when the throttle closes too quickly, such as that the mixed gases are too thin.

The structure of the air cut valve is shown in the picture.



AIR CUT VALVE REMOVAL

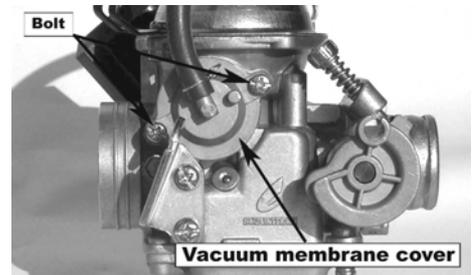
Remove the air inlet manifold of the cut valve.
 Remove the bolt, and remove the vacuum membrane cover, the spring, and the vacuum membrane.



AIR CUT VALVE INSTALLATION

Mount the vacuum membrane on the carburetor.
 Mount the spring, the vacuum membrane cover, and the lock bolt.

The bottom side of the vacuum membrane should be aligned with the carburetor, and the top side should be aligned with vacuum membrane.



AIR CHECK VALVE

The air check valve starts working under 50 km/h, and impel the second air inlet to burn, and reduce CO displacement.

AIR CHECK VALVE INSTALLATION

Reverse the procedure for removal

When installing, make sure every connecting pipes are connected properly, and they cannot be squeezed, bent, or clogged up.

TRANSMISSION COMPONENTS INSPECTION AND SERVICING

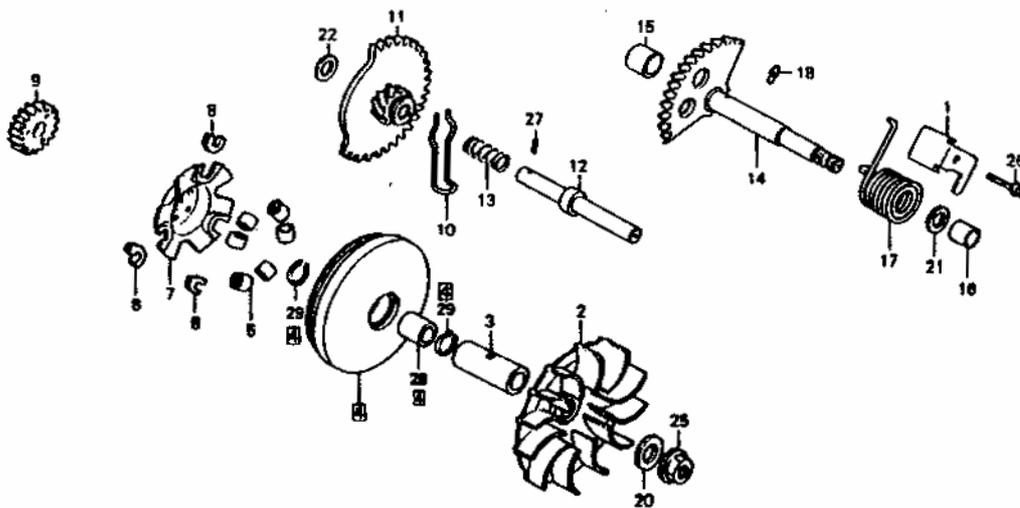
STARTING MECHANISM INSPECTION AND SERVICING

The starting mechanism can be divided into two types: kick starting and electric starting.

KICK RETURN STARTING MECHANISM

SPIRAL SPLINE TRANSFERRING STYLE STARTING MECHANISM

The picture shows the structure of the spiral spline transferring style starting mechanism.



- | | |
|---------------------------------------|-------------------------|
| 1. Kick starter spring stopping plate | |
| 2. Drive face | 15. Bush |
| 3. Drive face boss | 16. Spindle bush |
| 4. Movable drive face comp. | 17. Kick starter spring |
| 5. Weight roller set | 18. Special pin |
| 7. Ramp plate | 20. Washer |
| 8. Slide piece | 21. Washer |
| 9. Starting driven pulley | 22. Washer |
| 10. Starter gear friction spring | 25. Nut |
| 11. Starter idle gear comp. | 26. Bolt |
| 12. Starter idle shaft | 27. Roller |
| 13. Starter idle spring | 28. Face drive collar |
| 14. Kick starter spindle comp. | 29. Clip |

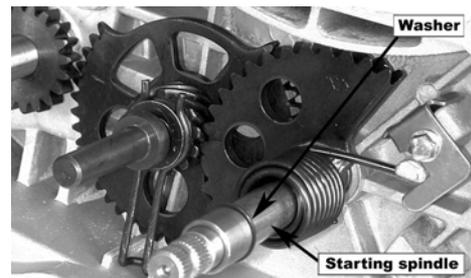
SPIRAL SPINE TRANSFERRING STYLE STARTING MECHANISM REMOVAL

Remove the left crankcase cover.

Remove the crankcase gasket, dowel pins.

Remove the movable driving plate (the whole set).

Remove the starting spindle washer.



Remove the return spring stopping plate, and remove the return spring.

Remove the whole set of starting lever.



Remove the starting idle shaft.

Disassemble the starting spindle.



Disassemble the starting idle shaft.



SPIRAL SPLINE TRANSFERRING STYLE STARTING

MECHANISM INSPECTION

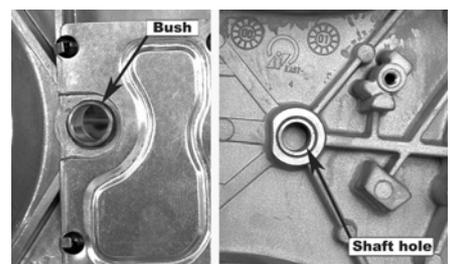
Inspect if there is any abrasion or damage of the starting spindle.

Inspect if there is any abrasion or damage of the starting idle shaft.

Inspect if there is any abrasion or damage of the starting spindle bushing and starting idle shaft hole.

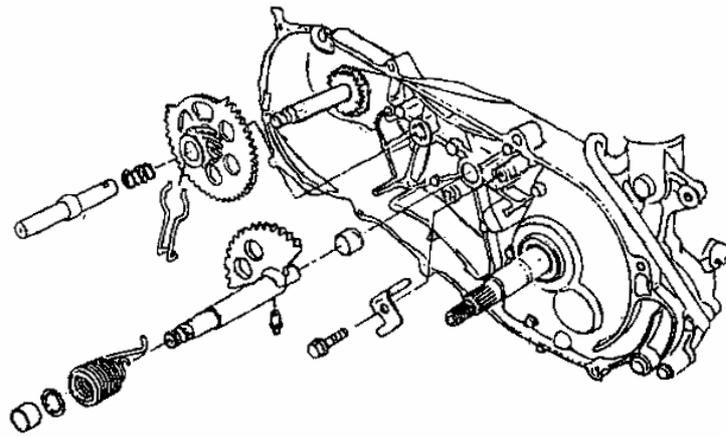


Inspect if there is any abrasion or damage of the starting spindle bushing and starting idle shaft hole.



SPIRAL SPLNE TRANSFERRING STYLE STARTING MECHANISM INSTALLATION

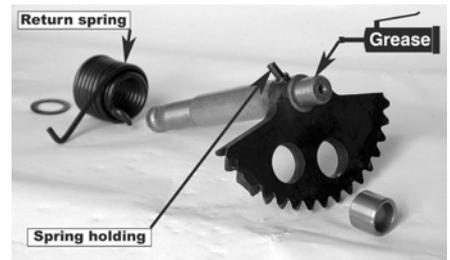
Install according to the picture.



Assemble the starting idle shaft set. Before assembling, apply a little grease on the bore of the idle shaft.

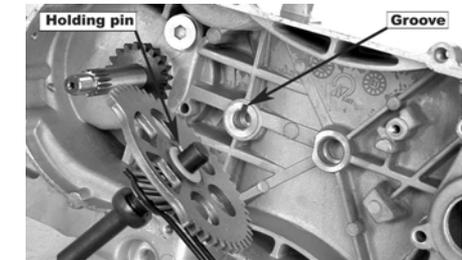


Assemble the starting spindle, the return spring, the spring holding pin. A little grease should be applied on the part under stress of the starting spindle.

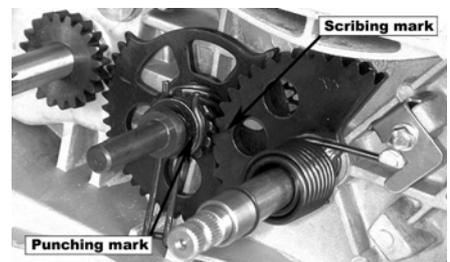


Align the idle shaft holding pin with the groove of the crankcase, then put into.

Before installing, apply a little grease on the groove of the rotary retaining spring on the idle shaft.
The rotary retaining spring should be aligned with the specific groove of the crankcase to install.

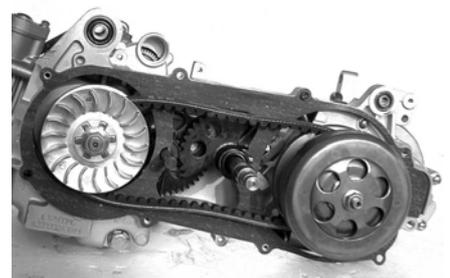


Align the scribing mark of the starting spindle with the punching mark of the idle shaft, and then mount the starting spindle.



Hook on the two ends of the return spring.
Install the return spring stopping plate.

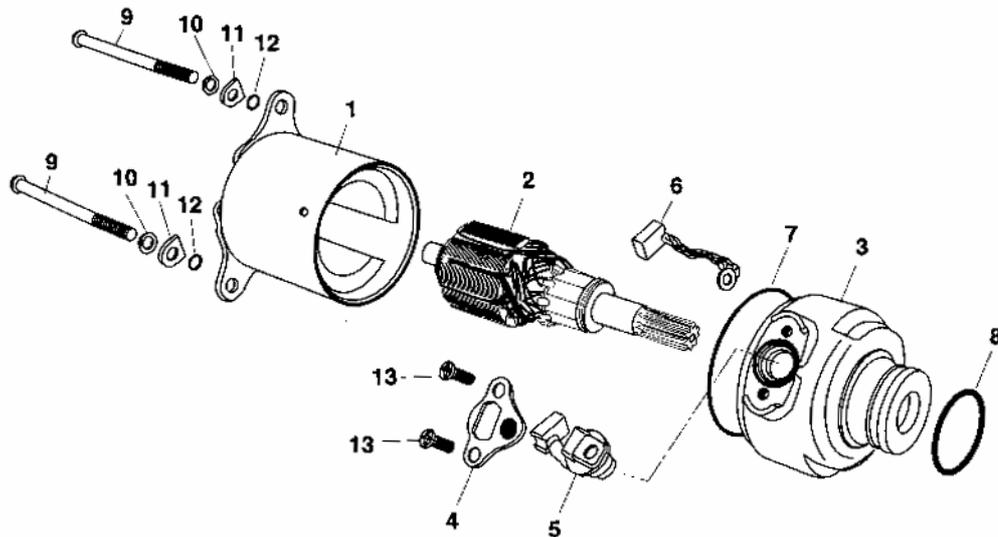
Install the crankcase dowel pin, gasket.
Install the driven belt, the driving plate.
Install the left crankcase cover and lock tightly.
Install the starting pedal.



ELECTRICAL STARTING MECHANISM

STARTER MOTOR

The starter motor is actually a direct current (DC) motor, and its structure is shown in the picture.

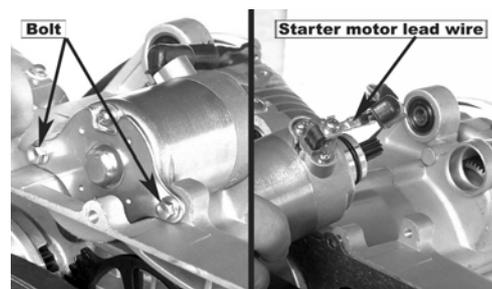


- | | |
|-------------------------------------|-------------------|
| 1. Outer Cover, Motor | 7. O-ring |
| 2. Rotor, Motor | 8. O-ring |
| 3. Base, Carbon Brush | 9. Bolt |
| 4. Plate, Positive Electrode | 10. Spring Washer |
| 5. Carbon Brush, Positive Electrode | 11. Washer |
| 6. Carbon Brush, Negative Electrode | 12. O-ring |

STRATER MOTOR REMOVAL

Before removal, first shut off the main switch, and disconnect the battery connecting wire. Then press the starting button, at this time the starter motor should not run. This must be done for insuring safety.

Remove the starter motor lead wire clamp.
Remove the starter motor holding bolt, and remove the starter motor.



Roll up the rubber water- resistance cover, and remove the starter motor joint.

Remove the motor case bolt, the carbon brush seat, and the motor case etc.

ARMATURE INSPECTION

Inspect the armature surface for uneven wear or damage or burn (changing color).

When there are metal fines attached to the gap of the armature surface, use a cleaning cloth to remove them.

Please do not use sandpaper to grind, and also do not wash it in any solvent which can dissolve or damage its insulation.

Measure the conducting condition of the armature coil according to the picture. It should be conductive.

Measure the conducting condition between the armature coil and the armature according to the right picture. It should be non-conductive. If not, it should be replaced.

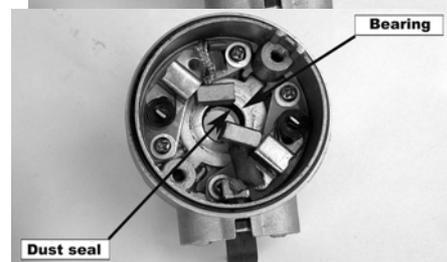
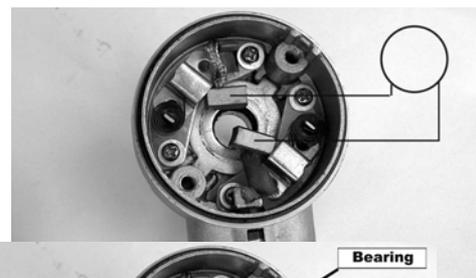
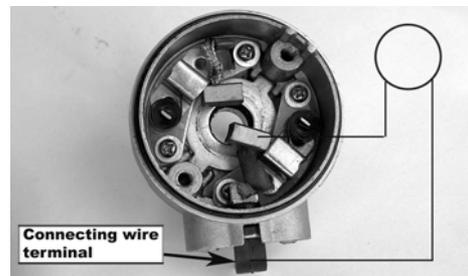
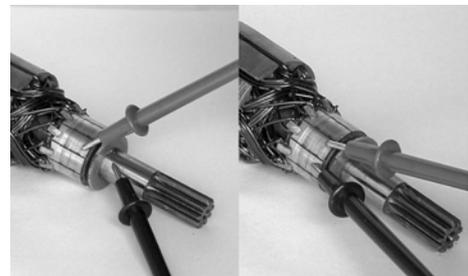
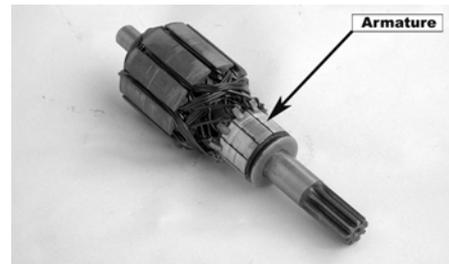
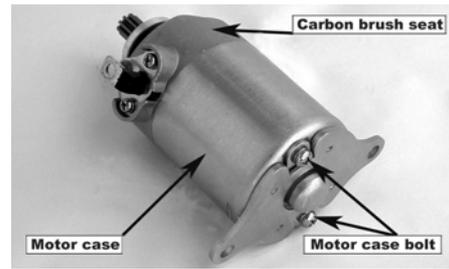
CARBON BRUSH INSPECTION

Inspect the insulating condition between the connecting wire terminal and the starter motor case, and it should be nonconductive.

Inspect the conducting condition between the connecting wire terminal and the carbon brush, and it should be conductive. Measure the length of the carbon brush. Replace it if it exceeds service limit.

Measure the insulating condition of the carbon brush bracket, and it should be non-conductive, if not, it should be replaced.

Inspect the needle bearing in the carbon brush base, it should be able to move smoothly with no play.

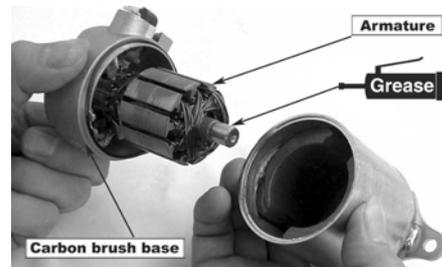


Inspect the dust seal for wear or damage.
If so, it should be replaced.

STARTER MOTOR INSTALLATION

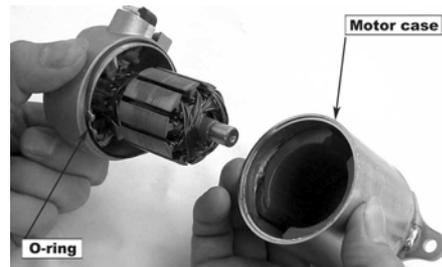
Apply some oil on the dust seal.
Install the carbon brush on the carbon brush base.
Apply a little oil on the moving part of the armature ends.
Put the carbon brush into the bracket, and then install the carbon brush base.

Do not damage the contact area of the carbon brush and the armature.
While installing, do not damage the lip of the dust seal.



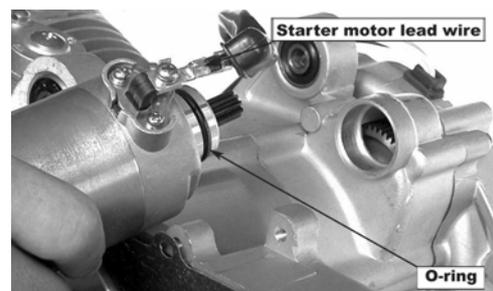
Mount the new O-ring on the carbon brush base.
Install armature into starter motor case, making sure not to damage the carbon brushes.
Tighten motor case bolts.

Make sure the starter motor case is free of metal particles, because it is magnetic.



Before installing the starter motor on the vehicle after assembling it, first connect the lead wires and inspect if the motor runs normally.

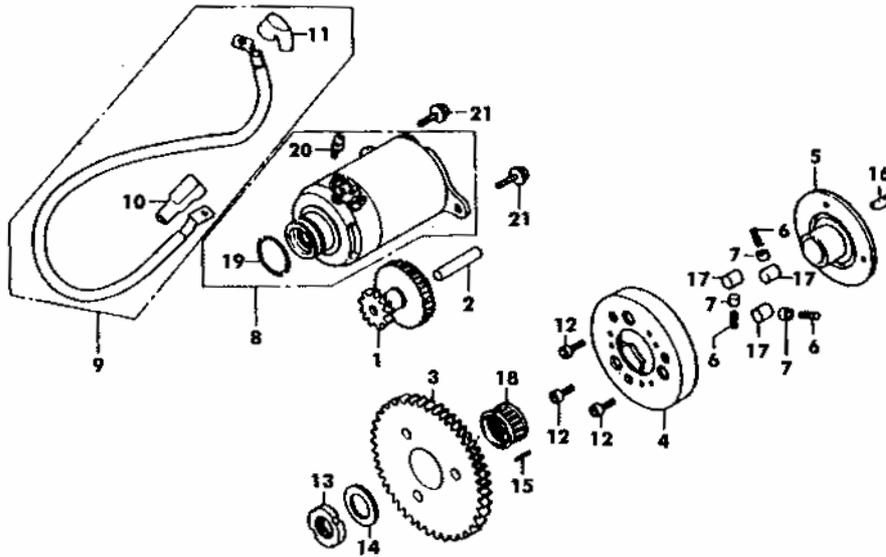
Apply oil on the O-ring, and install the starter motor.
Tighten holding bolts.



REDUCTION MECHANISM

The picture shows the structure of the reduction mechanism.

1. Starter reduction gear
2. Starter reduction gear shaft
3. Starting clutch gear comp
4. Starting clutch outer comp.
5. Flange starting clutch
6. Starting clutch roller spring
7. Spring holder
8. Starter motor



- | | |
|----------------------------|--------------------|
| 9. Starter motor lead wire | 16. Key woodruff |
| 10. Clamp | 17. Roller |
| 11. Clamp | 18. Needle bearing |
| 12. Bolt | 19. O-ring |
| 13. Nut | 20. Screw |
| 15. Dowel pin | 21. Bolt |

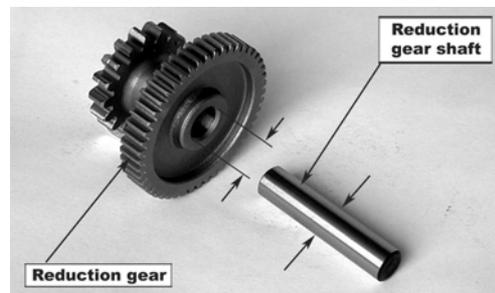
REDUCTION GEAR INSPECTION

Remove the starting clutch.

Remove the reduction gear to inspect its wearing degree.

Measure the inner diameter of the reduction gear shaft. It should be replaced when the diameter is more than 10.05mm.

Measure the outer diameter of the reduction gear shaft. It should be replaced when the diameter is less than 9.94mm.



ENGAGING MECHANISM

STARTING CLUTCH REMOVAL

Remove the right crankcase cover.

Remove the left crankcase cover.

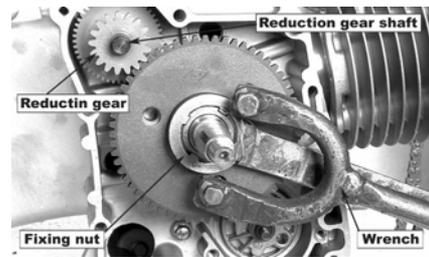
Hold the drive face with the universal set wrench.



Remove the starting clutch fixing nut.

Notice that the thread of the fixing nut should be left-handed rotation.

Remove the starting clutch (the whole set).



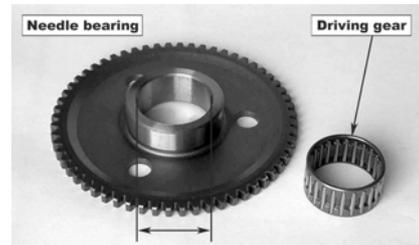
STARTING CLUTCH INSPECTION

Inspect if the movement between the clutch and the driving gear is normal. The driving gear should smoothly turn clockwise, and should not move counterclockwise.



Inspect if there is any abrasion or damage on the contact surface between the driving gear and the needle bearing. It should be replaced if the surface is damaged.

Measure the inner diameter of the driving gear. It should be replaced when the diameter is more than 32.06mm.



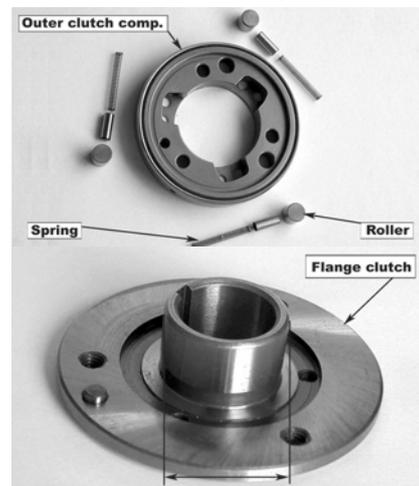
Inspect the condition of the needle bearing. It should be replaced if there is any damage.

Inspect if there is any abrasion or damage on the contact surface between the outer clutch component and the roller.

Inspect if there is any injury on the roller.

Inspect if there is any distortion of the spring.

If the damage is serious, it should be replaced.



Measure the inner diameter of the flange clutch. It should be replaced when the diameter is more than 27.94mm.

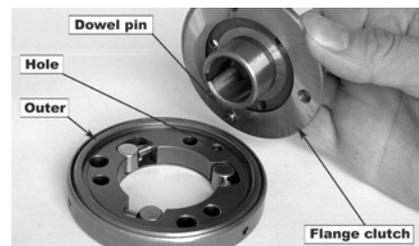
STARTING CLUTCH INSTALLATION.

Install the spring, the roller and the top pin on the body of the clutch.

Align the dowel pin on the flange clutch with the hole on the clutch body, then install.

Apply some thread lock on the outer clutch component bolt and tighten.

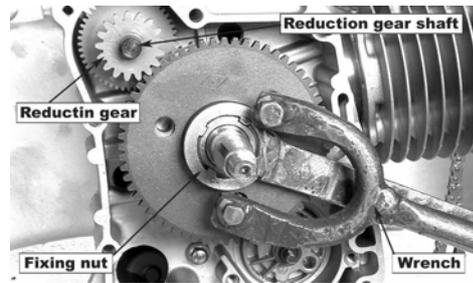
Apply some oil on the needle bearing and the driving gear, and then put the outer clutch component on.



Align the groove of the woodruff key on the crank, and install the starting clutch.

Apply some oil on the reduction gear and the reduction gear shaft, then install.

Hold the drive face with the universal wrench, at the same time fastens the clutch nut.



Notice that the thread of the nut should be left-handed rotation.

Install the right crankcase cover.

Install the left crankcase cover.

Take the reduction mechanism and the engaging mechanism as a whole unit, then this unit is called the starter.

CONTROLLING MECHANISM

STARTER REPLAY INSPECTION

Turn the main switch to the “ON” position, and press down the starting motor button, and listen if there is a “click” sound. If there is, it is normal; if there isn't, follow the below procedures to inspect.

Inspect to see if the brake switch is conductive. At this time, turn the main switch on and hold the brake lever.

The battery voltage should be at 12 volts.

Measure the voltage between the inlet line (the green/yellow line) starting relay and the ground wire of the body. The voltmeter reading should be close to the magnitude of voltage between the two ends of the battery. If not, then the brake switch, its wire or the wire connector is not good.

Inspect if the start button is conductive. At this time, remove the starting relay inlet line (the green/yellow line).

Connect the yellow/red line with the ground wire, and press the start button. It should be conductive between the yellow/red line and the ground wire, or the start button, its wire, or the wire connector is not good.

Inspect if the working condition of the starting relay. At this time, remove the starting relay.

Connect the C end the D end of the starting relay with the battery, and the A and B end with the multimeter.

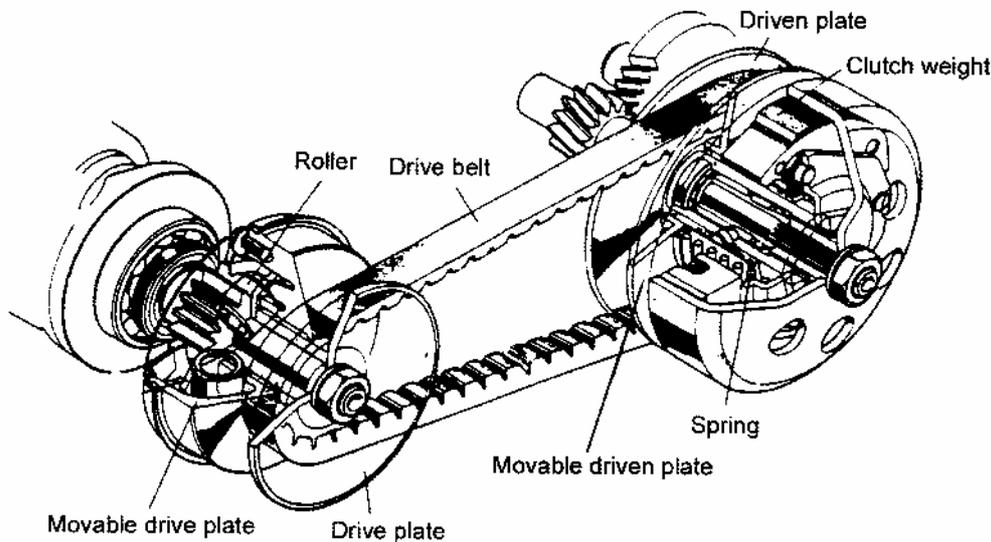
The battery voltage should at 12n volts.

At this time the multimeter should indicate conductive condition, or the starting relay is not good.

BELT DRIVEN CVT MECHANISM INSPECTION AND SERVICING

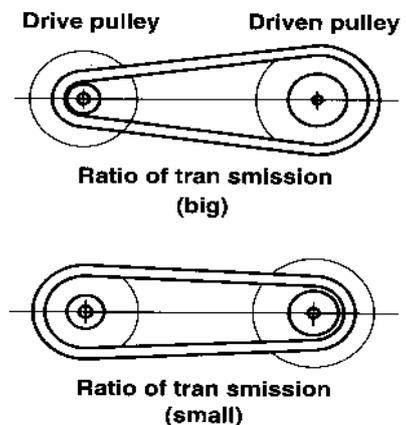
GENERAL INTRODUCTION

The belt driven CVT mechanism is made up of two belt pulleys (the drive belt pulley and the driven belt pulley) whose diameter can be changed, and a notched driven belt. The driving belt pulley is mounted on the engine crankshaft, and the driven belt pulley connects with the rear driven mechanism.

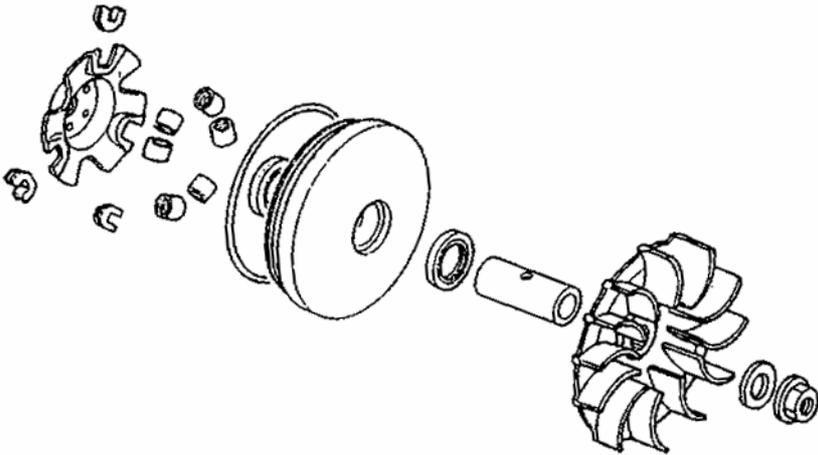


Its basic operational principle is to realize automatic CVT by the diameter changes (the transmission ratio changes) of the driving and driven belt pulley.

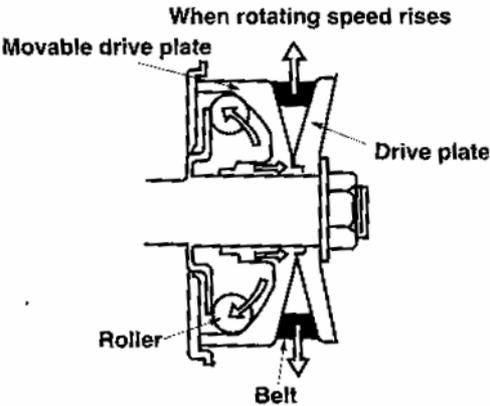
When the diameter of the driving belt pulley changes from small to big, proportionally the diameter of the driven belt pulley changes from big to small (because the perimeter of the driven belt is constant), at this time the speed increases. On the contrary, the speed decreases.



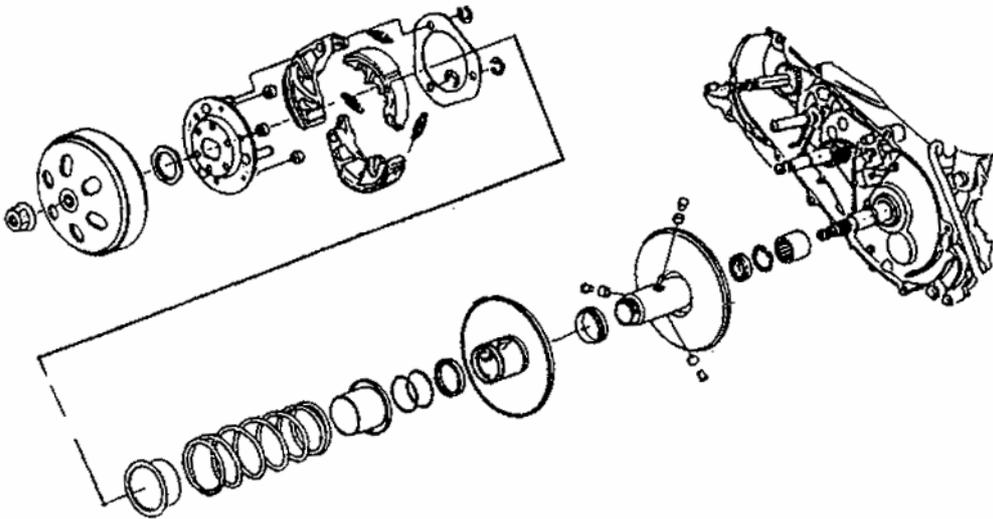
The structure of the driving belt pulley is shown in the picture.



The picture shows the working theory of the driving belt pulley.



The picture shows the structure of the driven belt pulley. The clutch showed in this picture is the automatic dry centrifugal weight clutch.



DRIVE BELT PULLEY

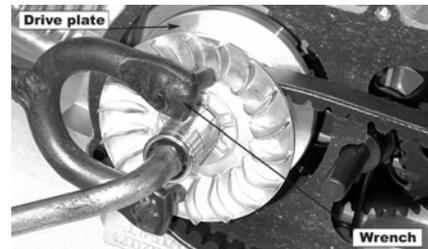
DRIVE BELT PULLEY REMOVAL

Remove the left crankcase air pipe lock bolt.

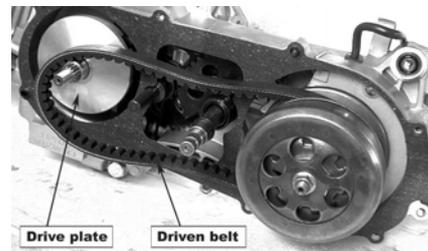
Remove the kick starter, and remove the left crankcase fixing bolt. Remove the left crankcase cover. Remove the gasket and the dowel pin.

Hold the drive plate with a universal wrench, and then remove the nuts and gasket on the drive plate shaft.

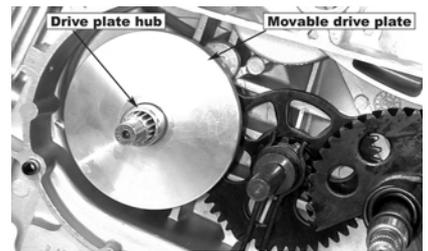
Remove the drive plate.



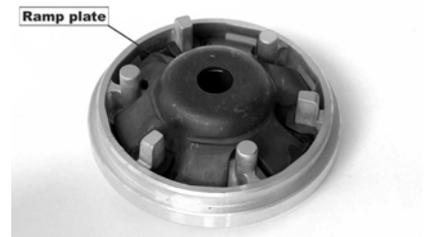
Remove the driven belt from the drive plate.



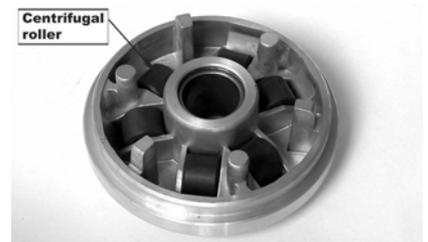
Remove the movable drive plate (the whole set).



Remove the ramp plate.



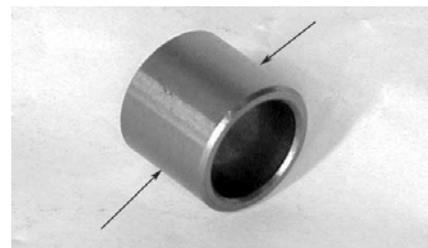
Remove the centrifugal rollers.



DRIVE BELT PULLEY INSPECTION

Inspect if there is any abrasion or damage of the centrifugal roller.

Measure the outer diameter of the centrifugal roller.



Service limit	17.0mm
---------------	--------

Measure the inner diameter of the movable drive plate.

Service limit	24.06mm
---------------	---------

Inspect if there is any abrasion or damage of the drive plate hub.

Measure the outer diameter of the drive plate hubs movable surface.

Service limit	23.94mm
---------------	---------

DRIVE BELT PULLEY INSTALLATION

Apply some grease evenly in the movable drive plate.

Put the centrifugal rollers into the movable drive plate

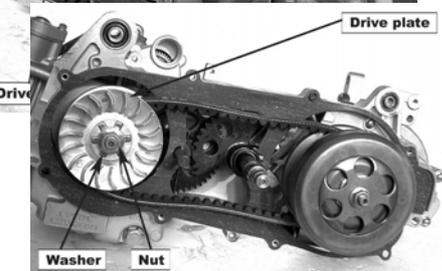
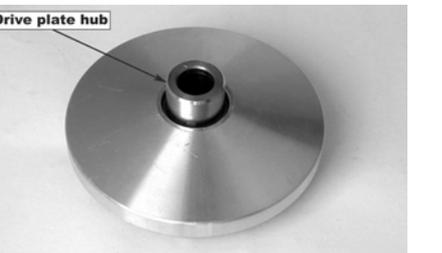
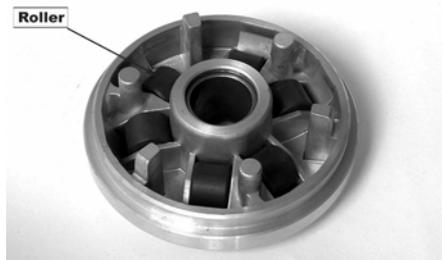
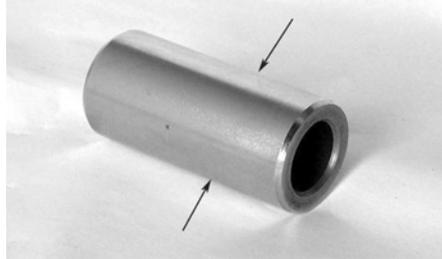
Install the ramp plate.

Put the drive plate hub into the drive plate.

Install the movable drive plate on the crankshaft.

Enlarge the driven plate belt groove, and mount on the driven belt. Mount the other end of the driven belt on the drive plate hub.

Mount the drive plate, the drive plate washer, and



nut.

Hold the drive plate with a multiuse holder to make it unmovable.

At the same time fasten the nut on the shaft.

Do not allow any grease or oil on the surface of the movable drive plate and the driven belt.

Clutch

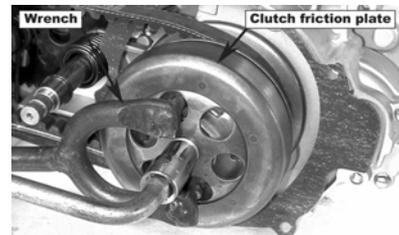
CLUTCH REMOVAL

Remove the left crankcase cover.

Remove the drive plate and the driven belt.

Hold the clutch friction plate with a multiuse holder, and remove the nut.

Remove the clutch friction plate.



CLUTCH INSPECTION

Inspect if there is any abrasion or damage on the clutch friction plate.

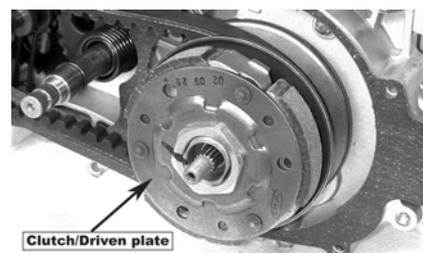
Measure the inner diameter of the clutch friction plate.



Service limit	125.5mm
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Inspect if there is any abrasion or damage of the clutch centrifugal weigh friction piece.

Measure the thickness of the clutch centrifugal weight friction piece.

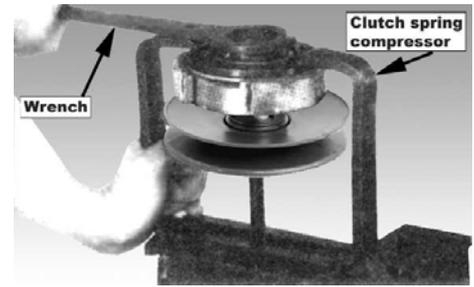


Service limit	1.5mm
---------------	-------

CLUTCH DISASSEMBLING

If it is needed to replace the centrifugal weight set, then you must disassemble clutch.

When the friction piece is worn, it should be replaced with the centrifugal weight set.



Remove the clutch friction plate.

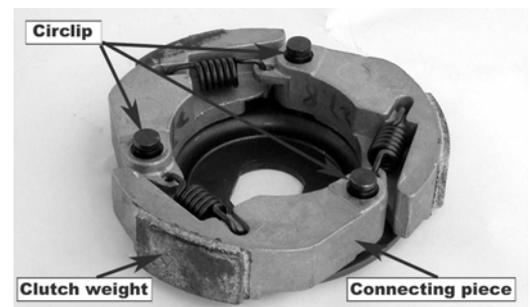
Remove the whole set of clutch/driven plate.

Compress the driven pulley spring with the clutch spring compressor, and at the same time remove the nut on the shaft.

Disassemble the clutch with the driven pulley.

Remove the circlip, and remove the connecting piece.

Remove the clutch centrifugal weight set and the spring.



CLUTCH INSTALLATION

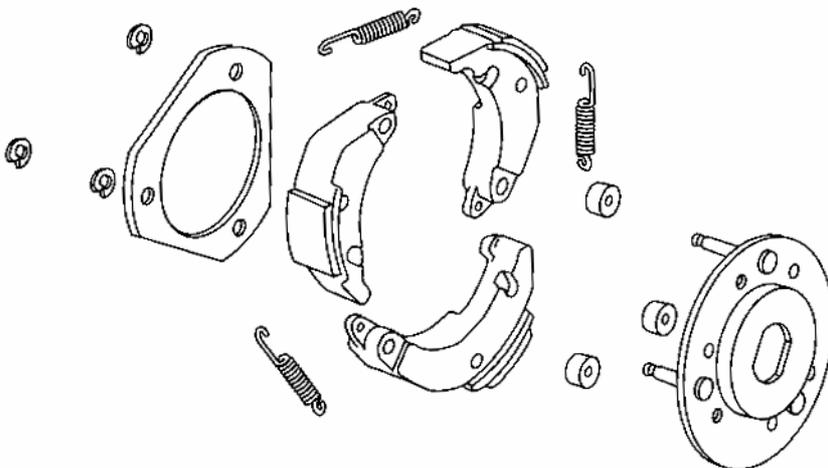
Mount the clutch damper rubber on the drive plate pin.

Mount the new clutch weight set and spring on the drive plate.

Install the connecting piece, the circlip, and the bottom plate.

Finally reverse the removal procedure for installation.

When assembling the clutch and the driven plate, you must use a clutch spring compressor, or it will damage the spring.
No grease on the driven pulley.

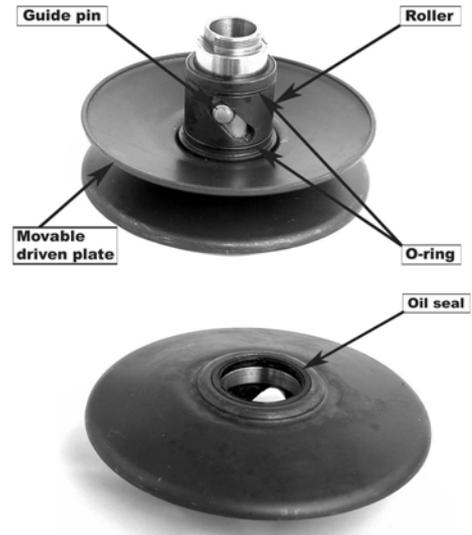


DRIVEN BELT PULLEY

DRIVEN BELT PULLEY REMOVAL

After removing the clutch friction plate, remove the guide pin, the roller and the movable driven plate.

Remove the oil seal on the movable driven plate.



DRIVEN BELT PULLEY INSPECTION

Measure the free length of the driven belt pulley spring.

Service limit	163.7mm
---------------	---------

Inspect if there is any abrasion or damage on the driven plate. Measure the outer diameter of the driven plate pulley hub.

Service limit	33.94mm
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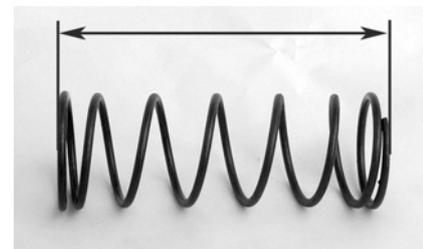
Inspect if there is any abrasion or damage of the movable drive plate.

Service limit	34.06mm
---------------	---------

Inspect if the groove of the guide pin is worn.

DRIVEN PLATE BEARING REPLACEMENT

If the driven plate needle bearing and the ball bearing are loose, damaged, or have some unusual sound, they should be replaced.
--



Remove the needle bearing from the driven plate.

The removed bearing cannot be reused.

Remove the circlip from the driven plate.
Drive the ball bearing out.

The removed bearing cannot be reused.

Apply some grease on the new ball bearing.
Drive the ball bearing into the driven plate with its front face upwards.
Mount the circlip.
Apply grease evenly on the inner wall of the driven plate.

Use the prescribed grease.

Drive in the new needle bearing with its mark upwards.

Use the specific tool.

Apply grease around the bearing.

DRIVEN BELT PULLEY INSTALLATION

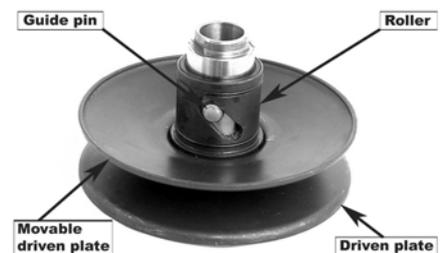
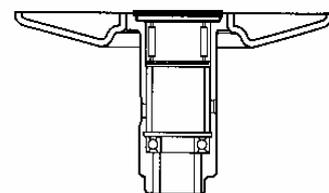
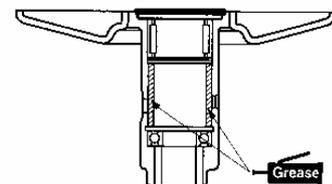
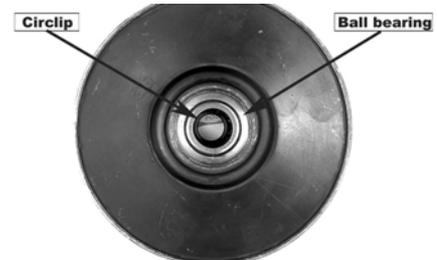
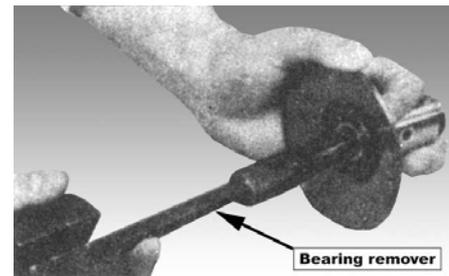
Remove the grease on the driven plate.
Mount the oil seal.
Apply a little grease on the O-ring.

Mount the movable driven plate into the driven plate.
After applying some grease on the roller, the guide pin, mount hole.

Install the oil seal collar.
Remove the excessive grease.

No grease on the movable faces of the driven plate.

Assemble with the clutch and install on the left crankcase.



TRANSMISSION BELT

TRANSMISSION BELT INSPECTION

Remove the left crankcase cover.

Inspect if the transmission belt is chapped or worn.

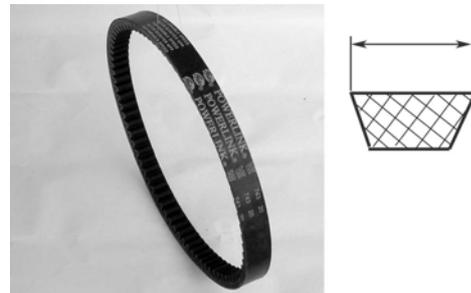
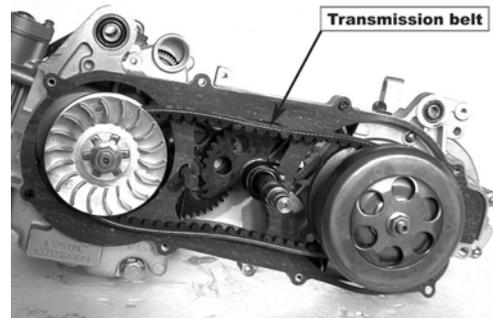
Measure the width of the belt.

Service limit	19.0mm
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Replace the belt if its width is less than the above limitation.

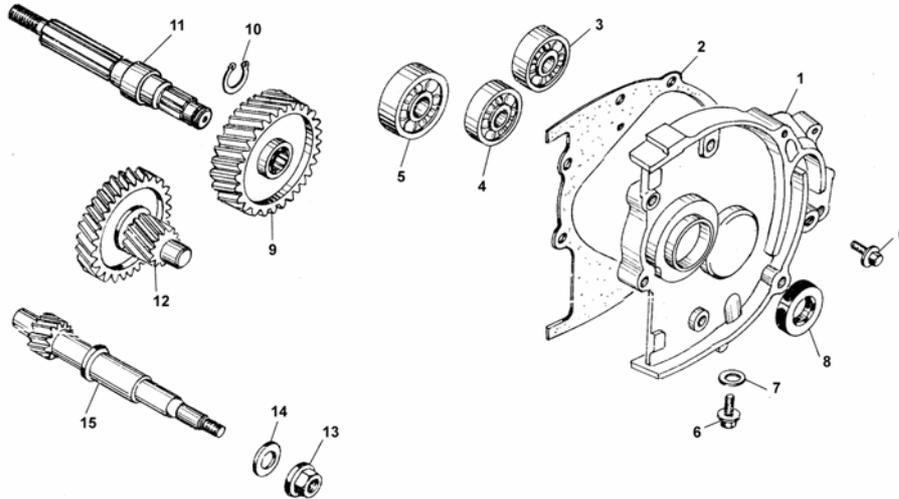
When replacing, you must use the OEM part for correct fit.
--

See the drive pulley removal and installation procedure for the replacement.



REAR TRANSMISSION MECHANISM INSPECTION AND SERVICING.

The structure of the rear transmission mechanism is shown in the following picture.



- | | |
|------------------------------|-------------------------|
| 1. COVER TRANSMISSION | 5. BEARING RADIAL BALL |
| 2. GASLET TRANSMISSION COVER | 6. BOLT SPECIAL |
| 3. BEARING RADIAL BALL | 7. WASHER |
| 4. BEARING RADIAL BALL | 8. OIL SEAL |
| | 9. GEAR FINAL |
| | 10. CIRCLIP EXTERNAL |
| | 11. SHAFT FINAL |
| | 12. SHAFT COMP. COUNTER |
| | 13. NUT |
| | 14. WASHES |
| | 15. SHAFT DRIVE. |

TRANSMISSION CASE OIL REPLACEMENT

TRANSMISSION CASE OIL INSPECTION

When inspecting the oil level the transmission case, use flat ground and keep the body level.

Inspect if there is oil leaking around the transmission case.

After the engine stops, remove the transmission case oil level bolt.

Observe the oil level, it is correct when the oil level is parallel with the observing hole.

When the oil level is too low, add until the oil flows from the level screw.

Supply the same kind of oil according to the prescribed brand and specification.

Mount the transmission case oil level bolt and the washer.

Inspect if the bolt oil seal is damaged.

TRANSMISSION CASE OIL REPLACEMENT

Remove the transmission case oil level bolt.

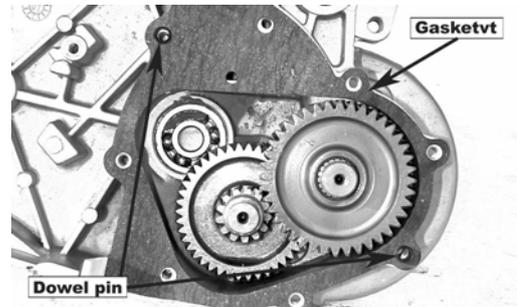
Remove the oil drain bolt to drain the oil.

Mount the drain bolt and its oil seal and fasten.

Supply the oil with the prescribed specification and oil level.

Mount the level bolt.

After replacing the oil, inspect for any oil leaks.



TRANSMISSION CASE

TRANSMISSION CASE REMOVAL

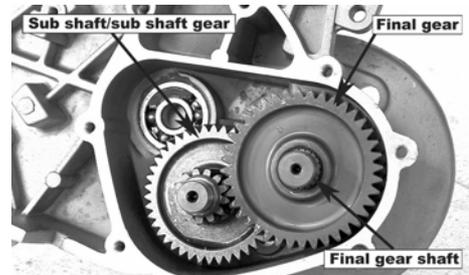
Remove the driven belt pulley.

Drain out the oil in the transmission case.

Remove the drive sprocket.

Remove the bolt, and remove the transmission case cover.

Remove the gasket and the dowel pin.



Remove the final gear, the final gear shaft, and remove the sub shaft/sub shaft gear.

TRANSMISSION CASE GEAR INSPECTION

Inspect if the sub shaft/sub shaft gear is damage or worm.



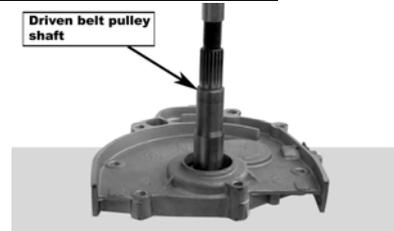
Inspect if the final gear, the final gear shaft is damage or worm.



BEARING ON THE TRANSMISSION CASE COVER REPLACEMENT

When removing or installing the bearing on the transmission case cover, you must use the specific tool shown in the picture.

Press the driven belt pulley shaft out of the transmission cover.



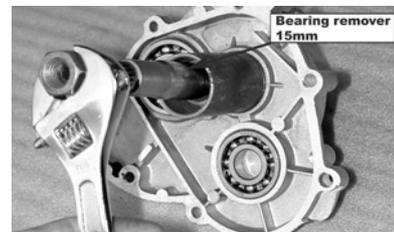
Remove the oil seal and drive out the bearing.



Remove the final gear shaft bearing.

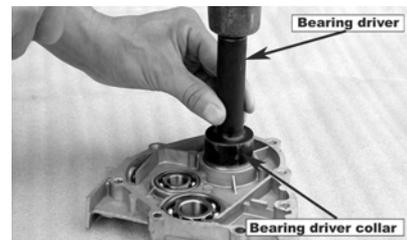


Remove the sub shaft bearing.

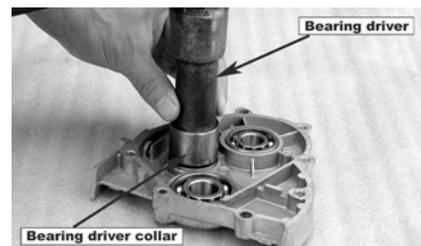


Drive in the new final gear shaft and bearing.

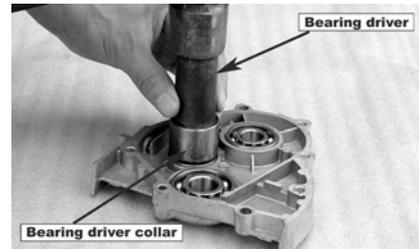
When driving in the final gear shaft bearing, keep the bearing parallel. The same is required when installing the sub shaft bearing and the driven pulley shaft bearing.



Drive in the new sub shaft bearing.



Drive in the driven pulley shaft bearing.



BEARING ON THE LEFT CRANKCASE BODY REPLACEMENT

When removing or installing the bearing on the left crankcase body, you must use the specific tool.

Inspect if the bearing and oil seal on the left crankcase for wear or damage. If it is damaged, then it must be replaced.

Remove the oil seal.

Drive out the final gear shaft bearing.

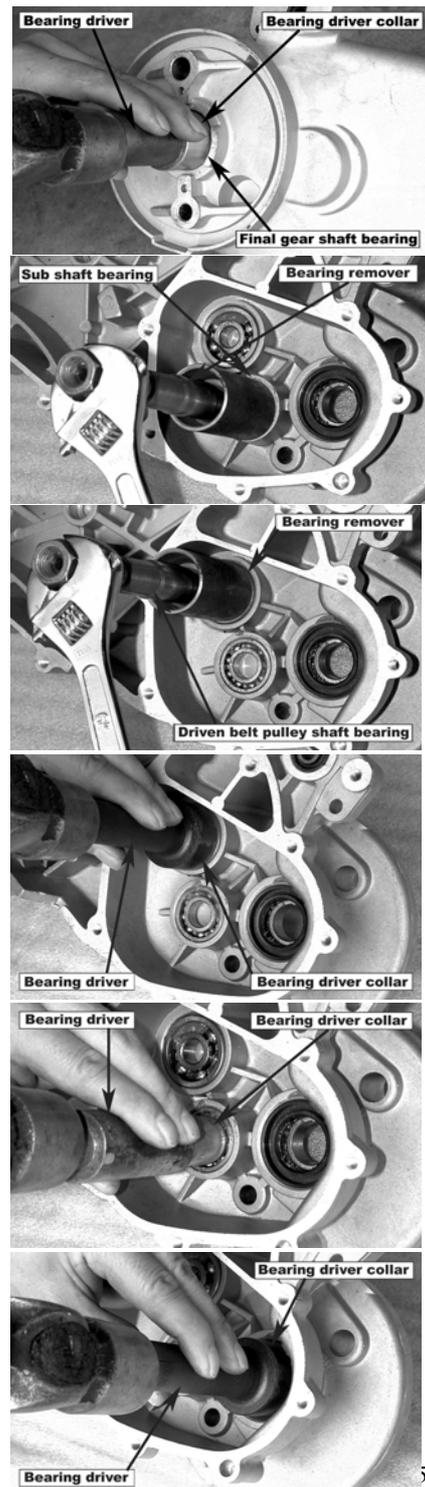
Remove the sub shaft bearing.

Remove the driven belt pulley shaft bearing.

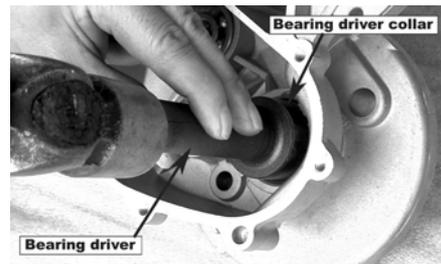
Drive in the new driven belt pulley shaft bearing.

Drive in the new sub shaft bearing.

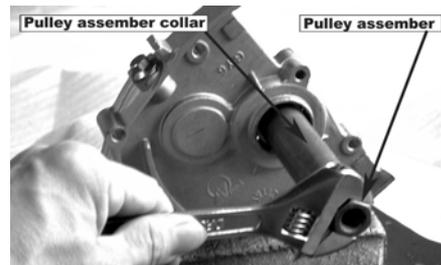
Drive in the new final gear shaft bearing.



Install the driven belt pulley shaft on the transmission case cover.



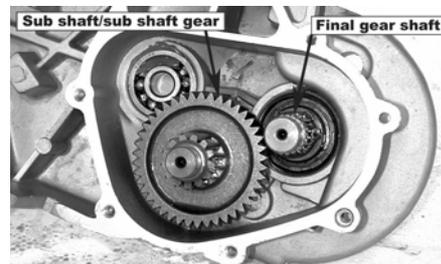
Drive in the transmission case cover oil seal.



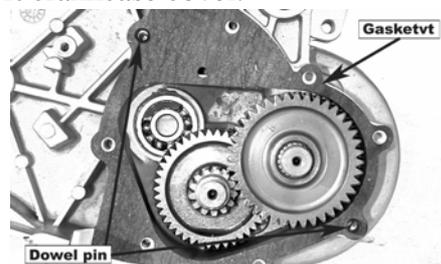
Mount the sub shaft/sub shaft gear and the final gear shaft into the left crankcase.



Mount the final gear on the final gear shaft.



Install the new dowel pin and gasket.

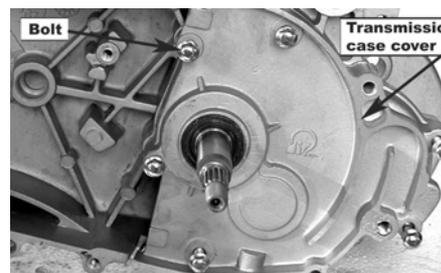


Install the transmission case cover and bolt.

Mount the driven pulley/the clutch set.

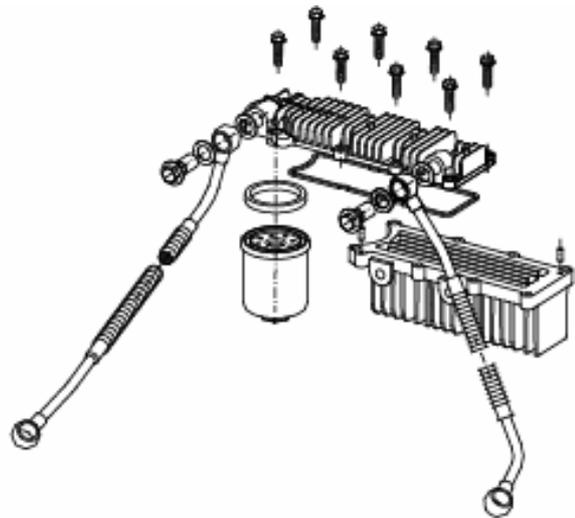
Mount the drive pulley, the transmission belt, and the left crankcase cover.

Fill the transmission case with oil.



OIL SYSTEM INSPECTION AND SERVICEING

1. Check all lines for leaks and cracks.
2. To replace a oil line first make sure the engine is cool and that the oil in side is not hot, loosen the bolt on both ends of the hose. Then take the hose out and replace with new one retighten bolts.
3. Oil filter, replacement, and changing of the oil.
 - a. On the bottom of the engine block case there is a 1/2 bolt head turn this counter clock wise to loose and drain oil. After the oil is drained replace and retighten clock wise.
 - b. The oil filter is removed by turning clock wise by using a coil filter wrench, when remove fill the new one with oil 2 mm from the top and replace back on the oil cooler turning counterclockwise. Engine MFG suggest that you change your oil and filter after you 40hr of running.



ELECTRIC SYSTEM

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IGNITION COIL-----	4-10
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CHARGING SYSTEM INSPECTION AND SERVICING

CHARGING SYSTEM INSPECTION

ELECTRIC LEAKAGE TESTING

Turn the main switch on the “OFF” position.

Disconnect the negative ground wire from the battery.

Connect the positive end of the ammeter with the negative end of the battery.

Connect the negative end of the ammeter with the ground wire.

Test the electric leakage. In general, it demands the number should be less than 1 mA; if it is unusual, inspect if there is short circuit of the main switch and the main wiring.

CHARGING STATUS INSPECTION

Install the fully charged battery.

Connect the voltmeter between the binding posts of the battery.

Remove the fuse, and connect the ammeter with two ends of the fuse.

Connect the tachometer with the engine (it's not needed when there is rpm indicator on the vehicle).

Start the engine, and accelerate slowly, measure the charging voltage and current.

Charging voltage (V)	13.5 ~ 15.5
Charging current (A)	0.5

*Measuring condition: 5000 r/min

If the voltage is not in the range of the above specified value, please inspect the voltage regulator.

BATTERY

The battery is an important component of the electric system. This battery used on the vehicle is a maintenance-free battery. For long period of storage, the battery will discharge by itself, so it should be charged every 3 month. After 2 ~3 years of regular usage, the capacity of the battery will descend, so it will need charging. Replace the same type of battery when replacing.

BATTERY REMOVAL

Shut down the main switch to make sure no electric current goes through the vehicle.
--

Disconnect the negative battery lead wire first.

Disconnect the positive battery second.

The disconnecting order cannot be reversed.
When disconnecting the positive cable, do not touch the body of the vehicle with the removal tool, or short circuit will occur and ignite gas to damage the battery.

BATTERY INSTALLATION

Connect the positive cable first, then connect the negative cable.

BATTERY OPEN-CIRCUIT VOLTAGE INSPECTION

Disconnect the cable on the battery terminals.

Disconnect the negative pole first, then the positive pole.

Measure the voltage between the two poles of the battery.

Full charging	13.1V
Under charging	12.3V

BATTERY CHARGING

Lift the battery out of the vehicle.

Connect the positive pole of the charger with the positive pole of the battery.

Connect the negative pole of the charger with the negative pole of the battery.

Charge the battery for the charging time marked on the battery.

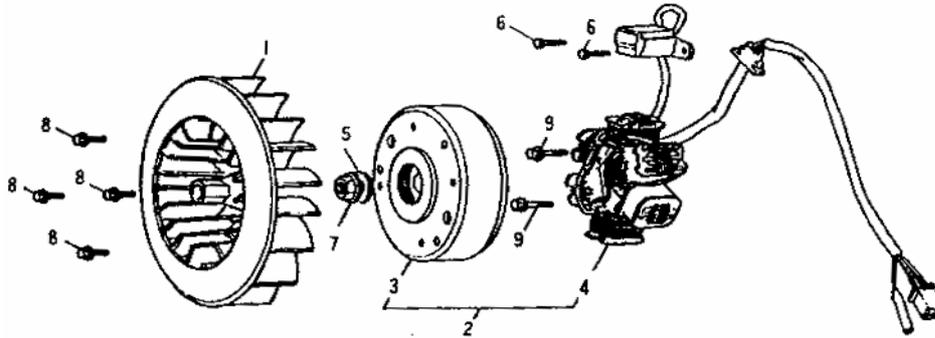
Unless it is emergent, do not use fast charging.
No smoking or open fire near the battery when charging.
At the beginning or the end of charging, turn off the charger first, in order to avoid the connecting part arcing.

Measure the voltage 30 minutes after charging is finished, and it should reach the specified value, or it's needed to recharge.

Charging current	Normal	0.7 A
	Fast	3.0 A
Charging time	Normal	5 ~ 10 hours
	Fast	30 minutes
Charging result		Open – circuit voltage \geq 12.8V

PRIMARY COIL

The picture shows structure of a common generator.



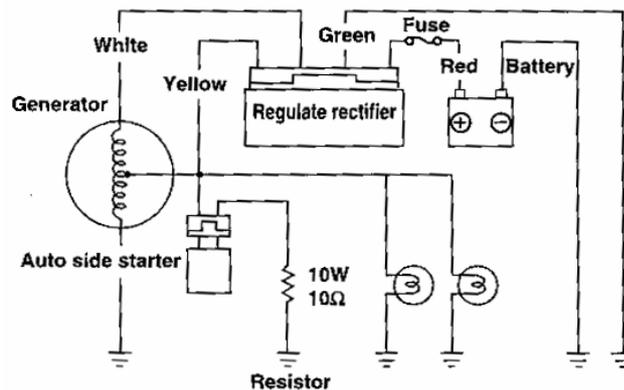
- | | |
|-----------------------|---------|
| 1. Cooling | |
| 2. Generator assembly | 6. Bolt |
| 3. Flywheel comp. | 7. Nut |
| 4. Stator comp. | 8. Bolt |
| 5. Washer | 9. Bolt |

Primary coil inspection

The inspection work can be done on the engine, and there is no need to remove the generator.

Remove the 4- core connector of the generator.

Measure the resistance value between the white wires of the generator and connecting wire of the vehicle body.



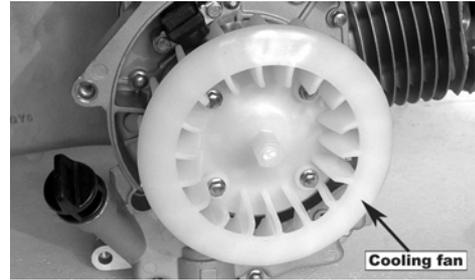
Standard value	$0.2 \sim 0.4 \Omega \square 20 \square \square$
----------------	--

When the actual value is more than the standard value, the coil should be replaced.

GENERATOR REMOVAL AND INSPECTION

GENERATOR REMOVAL

Remove the cooling fan cover bolt and screw.
Remove the cooling fan cover.
Remove the cooling fan bolt, and remove the cooling fan.



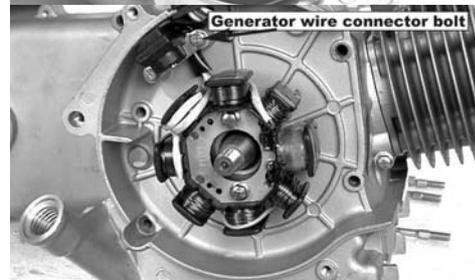
Hold the flywheel with a universal holding wrench, at the same time remove the flywheel nut.



Remove the flywheel with a flywheel puller, and remove the solid key.



Remove the generator wire connector.



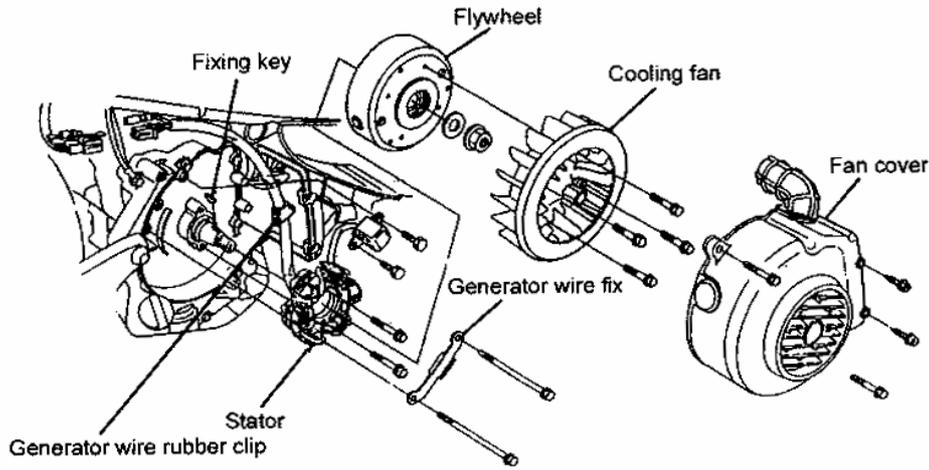
Remove the generator wire holder.
Remove the generator coil bolt.
Remove the generator wire rubber bushing from the right crankcase.
Remove the coil set.

Do not damage the coil when removing.

GENERATOR INSTALLATION

Reverse the removal procedure for installation.

When installing the flywheel, make sure there are no metal pieces, such as bolts or nuts, attaching to the inner wall of the flywheel.
After the installation is finished, start the engine to inspect and adjust the ignition timing.



REGULATE RECTIFIER

MAIN WIRING – SUB ELECTRIC CIRCUIT CONDITION INSPECTION

Take the voltage regulate rectifier inspection procedure by two step:
 First inspect the main wiring – sub electric condition, and then inspect the voltage regulator.
 Inspect only when engine is cold.

Remove the 4-core connector of the regulate rectifier.

Measure the conducting status between the main wiring terminals according to the previous wiring diagram.

Connecting type	Normal condition
Battery (the red wire) – Vehicle body	Battery voltage value
Connecting wire (the green wire) – Vehicle body	Conductive
Lighting wire (the yellow wire) – Vehicle body (remove the resistor, side auto starter plug, and turn the lighting switch to OFF)	Generally is 0.1 ~0.8 Ω
Charging wire (the white wire)- Vehicle body	Generally is 0.2 ~ 2.0Ω

	W (White)	Y (Yellow)	R (Red)	G (Green)
W (White)		∞	3 ~ 100KΩ	∞
Y (Yellow)	∞		∞	5 ~ 100KΩ
R (Red)	∞	∞		∞
G (Green)	∞	5 ~ 100KΩ	∞	

REGULATE RECTIFIER INSPECTION

When the main wiring – sub electric circuit condition is normal, inspect the regulate rectifier.

Inspect if the regulate rectifier plug contacts well.

Measure the resistance value between every regulate rectifier terminal.

If the resistance value between the terminals is unusual, replace the regulate rectifier.

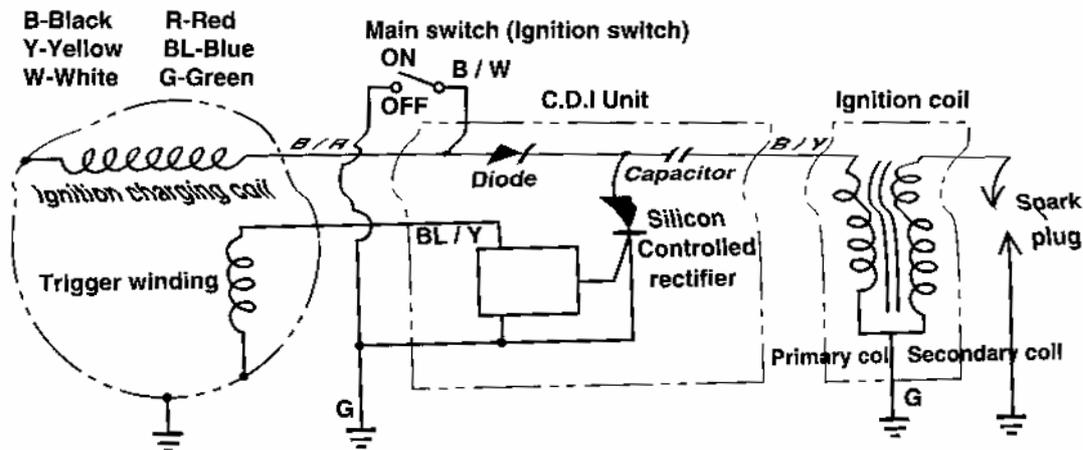
RESISTOR

RESISTOR RESISTANCE VALUE MEASUREMENT

Measure the resistance value between the resistor wire and the vehicle body. If it is normal when the actual value is in the range of $\pm 1\Omega$ value marked on the diagram or the resistor, if not, it should be replaced.

IGNITION SYSTEM INSPECTION AND SERVICING

The circuit working principle is shown in the picture.



IGNITION TIME INSPECTION

The CDI ignition system has already been adjusted in the factory, so there is no need to readjust it. If inspecting ignition function is necessary, take followed steps to inspect ignition timing.

Remove the ignition timing hole cover (or remove the fan cover).

Rotate the generator rotor, and align the "F" mark on the rotor with the crankcase timing ignition mark.

Clip the ignition timing indicator light wire clip on the high- voltage end of the ignition coil.

Start the engine and let it run at idle. At this time, observe if the mark on the crankcase aligns with the “F” mark on the rotor. If there difference is between $\pm 3^\circ$ it indicates correct ignition timing; on the contrary, if it is off $\pm 3^\circ$, it should be adjusted.

Slowly increase the engine rpm (when the 150 model increases to 5000 r/min), at this time, if the mark on the crankcase aligns with the rotor ignition advance angle mark, the advance angle device is good; if not, it should be adjusted or replaced.

When adjusting, the trigger winding can be loosened to adjust the angle between it and the ignition charging coil to adjust the ignition time.

IGNITION SYSTEM INSPECTION

When the spark plug does not spark, first inspect the wires, and if the connecting part is loose, or contacts bad etc; you can follow the electric circuit and take the method of measuring the voltage of every point to find out the trouble. Please refer to the previous picture for the following inspection.

Remove the old spark plug, and install a new one, if plug is bad.

It is important that every electric circuit wire connects correctly.
It is important that the cylinder compression pressure is normal.

Connect the negative end of the multimeter with the positive connecting iron of the primary ignition coil (black / yellow wire).

Press the starting button or use the kickstarter, and read the voltage value on the multimeter, the biggest voltage value should be above 112V.

When measuring the voltage, do not touch the metal part of the multimeter with finger, or an electric shock can happen.

Remove the 4-core and 2-core connector of the CDI component.

Connect the positive end of the multimeter with the ignition charging coil (black/red wire end) of the 2-core connector, and the negative end with the ground wire end (green end) of the 4-core connector.

Press the starting button, or use the kickstarter, and measure the highest voltage of the ignition charging coil, it should be more than 122V.

When the measured highest voltage of the ignition charging coil is not normal, then disconnect the generator connector to make further measurement.

If it is measured that the CDI component end is abnormal, however, the terminal voltage of the generator is normal, then there is a bad wire or bad connection.

When both are not normal, then it is a bad ignition charging coil.

Remove the 4-core and 2-core of the CDI component.

Connect the positive end of the multimeter with the trigger winding (green/red wire terminal) on the 4-core connector, and the negative end with the green wire terminal on the 4-core connector.

Press the starting button, or kickstarter, and measure the highest voltage of the trigger winding, which should be more than 2.1V.

When the measured highest voltage of the trigger winding is not normal, then remove the generator connector, and make further measurement.

If the measured terminal voltage of the CDI component is not normal, the generator terminal voltage is normal, then there is a bad wire or bad connection.

If both are not normal, then it is a bad trigger winding.

IGNITION CHARGING COIL

Remove the connector of the ignition charging coil wire.

Measure the resistance value between the ignition charging coil (black/red wire) and the body ground wire.

Standard value	300 ~1000 Ω (20 \square)
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When the actual value is more than the standard value, it should be replaced.

TRIGGER WINDING

Remove the connector of the trigger winding wire.

Measure the resistance value between the trigger winding (green/red wire) and the body ground wire.

When the actual value is more than the standard value, it should be replaced.

Standard value	40 ~ 300 Ω (20 \square)
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CDI COMPONENT

It is similar with the regular inspection, the CDI component inspection is also divided into two steps:
 First inspect every wiring, winding or coil connected with CDI;
 Then inspect the CDI component.

Remove the CDI component.

Inspect if the connector is loose or eroded.

Inspect the conduction and the resistance value of the main switch, the ignition charging coil, the trigger winding, and the ignition coil. When the main switch is in "OFF" position, it should be conducted, and the resistance value of every coil should be the standard value.

Inspect the resistance value between every CDI component terminal. If the actual value is not in the range of the value in the chart, then the CDI component is faulty.

CDI Component

	SW (B/W)	EXT (B/R)	PC (G/R)	E (G or G/W)	IGN (B/Y)
SW (B/W)		100 ~ ∞	50 ~ ∞	100 ~ ∞	∞
EXT (B/R)	0.5 ~ 50		100 ~ ∞	∞	∞
PC (G/R)	10 ~ 1000	10 ~ 1000		1 ~ 100	∞
E (G or G/W)	0.5 ~ 50	0.5 ~ 50	1 ~ 10		∞
IGN (B/Y)	∞	∞	∞	∞	

B- Black
 G-Green

W- White
 Y- Yellow

R-Red

The CDI component can also be inspected and measured with the CDI testing instrument.

Please carefully read the instrument specification so as to operate properly.

Connect CDI component with the special wire of the testing instrument.
 Observe the spark condition on the instrument when the switch is turned on different positions
 (OFF, P, EXT, ON1, ON2)

IGNITION COIL

IGNITION COIL REMOVAL

Remove the spark plug cap.

Remove the primary ignition coil wire.

Remove the ignition coil positioning bolt, and remove the ignition coil.

IGNITION COIL INSTALLATION

Reverse the removal procedure for installation.

When installing, connect the black/yellow wire of the primary ignition coil with the black/yellow connector of CDI, and the green wire the green connector of the CDI.
--

PRIMARY IGNITION COIL INSPECTION

Standard value	0.1 ~ 1.0K Ω (20 \square)
----------------	-------------------------------------

If the resistance value is ∞ , it indicates the coil is bad and should be replaced.

SECONDARY IGNITION COIL INSPECTION

Install the spark plug cap, and measure the resistance value of the secondary ignition coil.

Standard value	7 ~ 9K Ω (20 \square)
----------------	---------------------------------

The resistance value is in the standard range indicates it is good; however, ∞ indicates the coil is bad.

Remove the spark plug cap, and measure the resistance value of the secondary ignition coil .

Standard value	2 ~ 4K Ω (20 \square)
----------------	---------------------------------

The resistance value is in the standard range indicates it is good; however, ∞ indicates the coil is bad.

The ignition coil also can be inspected and measured with the ignition testing instrument.

Please operate properly according to the instruction.

Set the measuring switch of the ignition coil on the 1.2V position, and connect the ignition coil.

Turn the switch of the testing instrument to ON position, observe the spark over window and inspect the spark over situation of the ignition coil. If it is a normal consistent spark, it is good; if the spark does not flash consistently, it is not good.

SPARK PLUG

Clean the carbon around the spark plug to prevent it from dropping into the cylinder
Remove the spark plug.

When installing, connect the black/yellow wire of the primary ignition coil with the black/yellow connector of CDI, and the green wire with the green connector of CDI..

Clean the fifth and carbon accumulation on the spark plug with a steel brush or a blade.
Inspect the spark plug gap, in general it should be about 0.6 ~ 0.7mm.
When the carbon accumulation and wear of the spark plug are too much, replace the spark plug. Replace with the spark plug of the same specification.

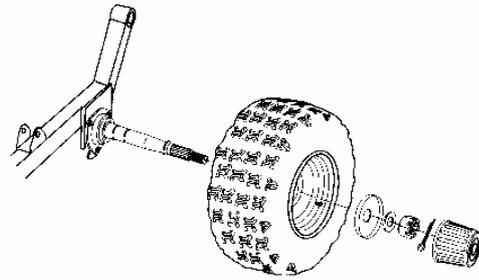
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REAR AXLE REMOVAL

Disassemble RR. Wheel

Remove the Cotter Pins on Axle Nut, RR.
Wheel



Remove the Axle Nut, RR. Wheel

Block up rear end of the machine

Remove rear wheel and hub assembly by sliding off splines fo axle

Remove the chain

Loosen nuts on bearing carrier and remove bolts

Remove axle and bearing carriers as a unit

REAR.SWINGARM

Note:

Swingarm, axle and motor can be removed as a unit if needed.

Remove Rear. Shock

Remove rear brake caliper and set aside.

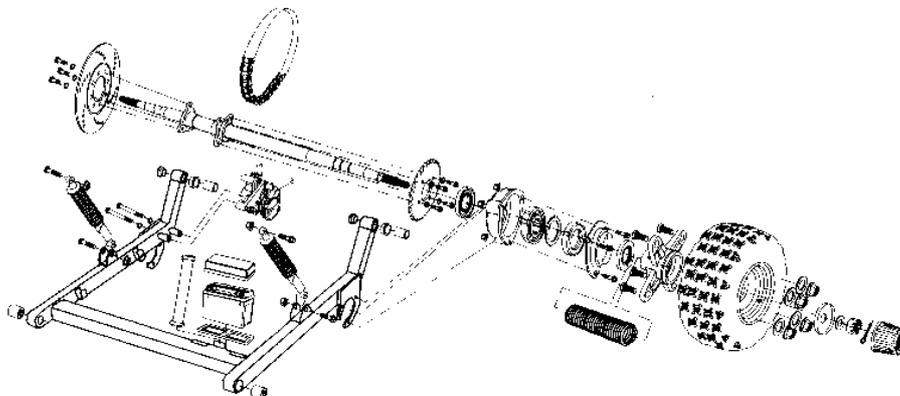
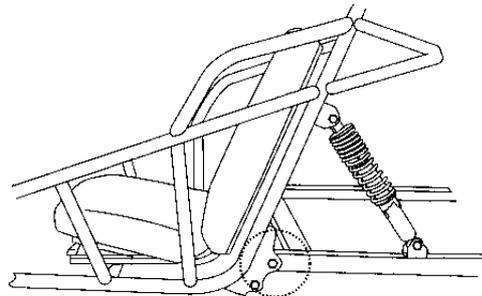
Do not remove brake hose!

Unplug brake light wiring from the electrical box

Remove throttle cable

Remove bolts from swingarm pivot

Check Buffer Rubber Bushing for wear. If wear is present on bushing, it should be replaced.



FRONT & REAR SHOCKS

The Front and Rear Shocks are oil dampened units.

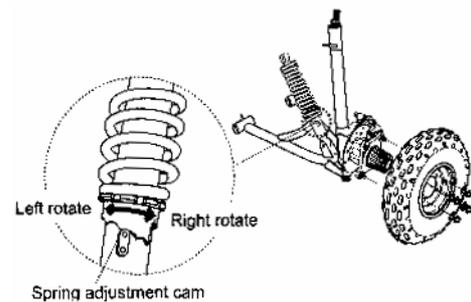
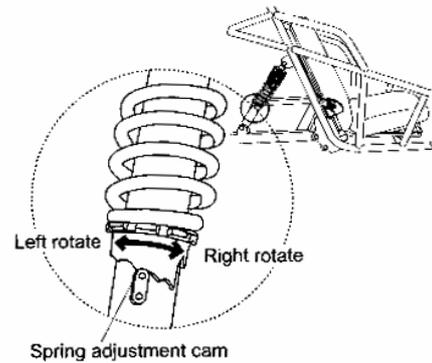
They are non rebuildable.

If any oil seepage is noticed the shock should be replaced.

ADJUSTMENT OF FRONT & REAR SHOCK

There are 5 positions for you to choose on each shock, the default position would be set by the manufacture in the middle (the third position).

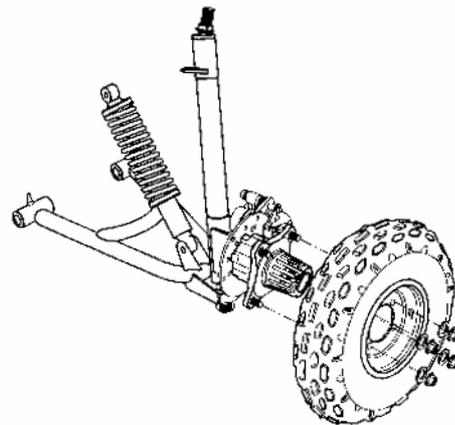
Please use round nut wrench as you adjust the position, the tension of shock spring would increase as you left screw and decrease as you right screw.



FRONT WHEEL REPLACEMENT

Do not disassemble the castle nuts when you replace the front wheels.

It is only necessary to tighten the nuts so that the wheel turns freely on the axle with minimum end play. Please tighten the nuts after replacing the wheels.



FRONT HUBS

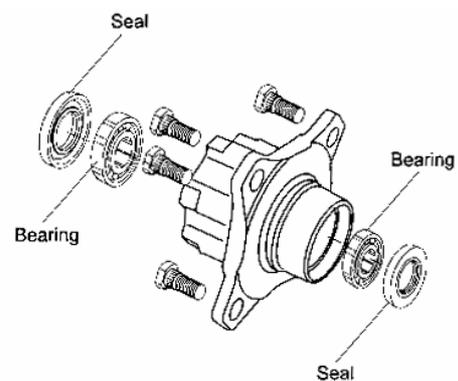
Check seals for rips or tears and replace if any exist.

Remove bearings with a punch from the opposite side.

Inspect bearings for ease of movement. If dirt or mud has gotten to them, wash them in cleaning solvent and spin with your finger. Never spin them with compressed air.

Apply an ample amount of grease to the bearing and reinstall with a bearing tool, making sure they go in straight. If the bearing is not straight, damage to the hub can occur.

Install seals into hub. It is recommended to apply a small amount of grease to the lip of the seal. If the retention spring is in bad shape, replace the seal with

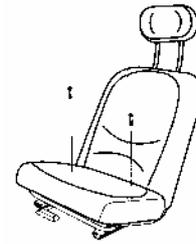


a new one.

SEAT

Remove all the Nuts and Bolts underneath the seat rail

Remove Seat

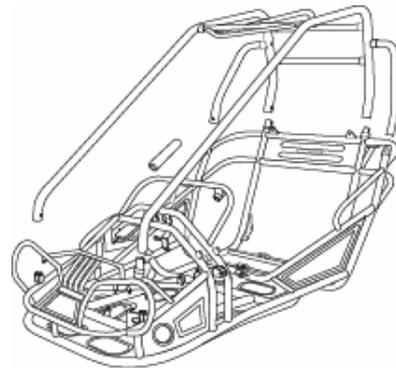


STEERING SHAFT

Remove Nuts, Steering Block and grease inside of Steering Block periodically.

Loosen Steering Shaft and Clamp Nut, Steering Gear box

Remove Steering Shaft



STEERING GEAR BOX AND BALL

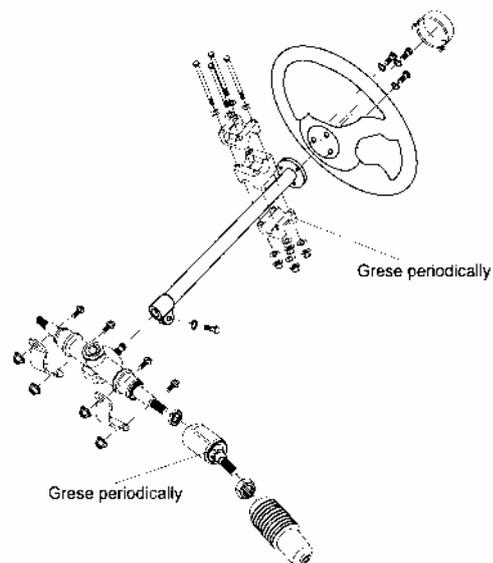
HEAD, STEERING GEAR BOX

Remove four bolts on LH & RH Clamp NUT, Steering Gear Box

Remove and check Ball Head Dust Cover, Steering Gear Box for wear.

Check Steering Cover on sides of Steering Gear Box and Grease the Ball Head.

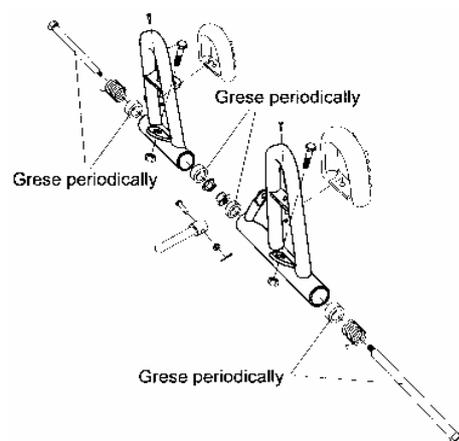
Steering Gear Box, fill with Grease after cleaning the dust. It is recommended to replace the Ball Joint if loose or not smooth



THROTTLE & BRAKE PEDAL

Remove Throttle, Throttle Pedal and Axle Nut, check

for signs of wear, replace if wear is present. Fill with grease in order to make the Throttle & Brake



Pedal swing more flexible before installation.

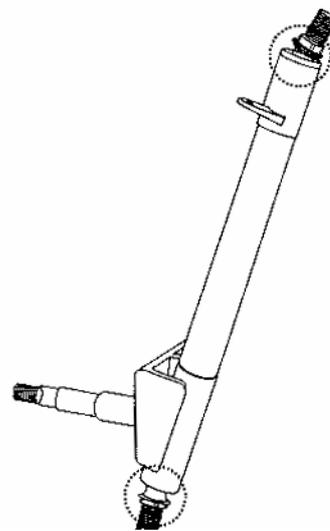
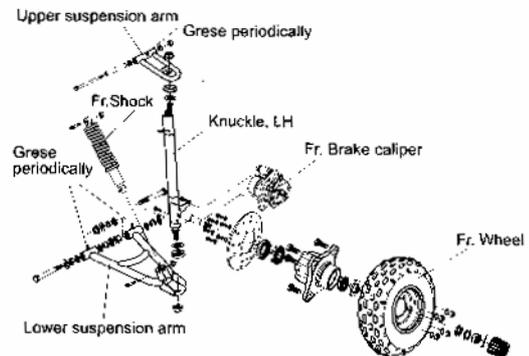
A-ARMS

Grease the nipples of Upper & Lower A-Arm, FR.

Wheel periodically

Removal Bolt of Upper & Lower A-Arm, FR. Wheel

Check the Nylon Bushing of Upper & Lower A-Arm, FR Wheel for wear, replace them immediately if wear is present.



STEERING KNUCKLE SUPPORT

Remove Rubber Dust Cover of the knuckle Support
Check the grease of Ball Joint clean it if dirty and fill with grease

Replace the Steering Knuckle support if the Ball Joint is loose or steering isn't flexible

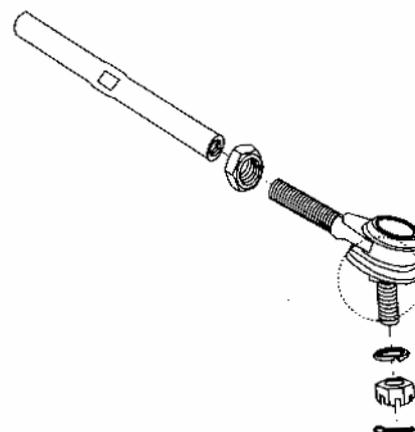
TIE ROD

Tie rods should be checked for ease of movement in their full rotation

Remove protective boot and apply grease

Check tie rod ends periodically for tightness at their adjusting nuts

Always use a new cotter pin after removal



REVERSE ADJUSTMENT

1. Press down the reverse lever to the “FW” position so that the units can move forward, pull back the level to “BW” so that the units can move backward.
2. Adjusting Nut #1 on the top of the reverse gear box, in the forward position there should be about 1/4 inch play in the cable for the correct adjustment.

SERVICE AIR CLEANER

Service pre-cleaner every 100 hours

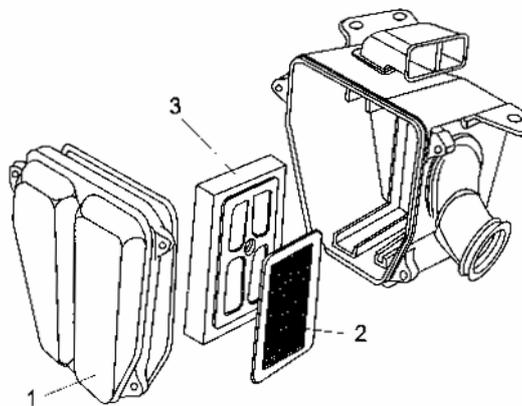
NOTE: service more often under dusty conditions.

1. Remove cleaner cover.
2. Remove air cleaner

Element 2, 3.

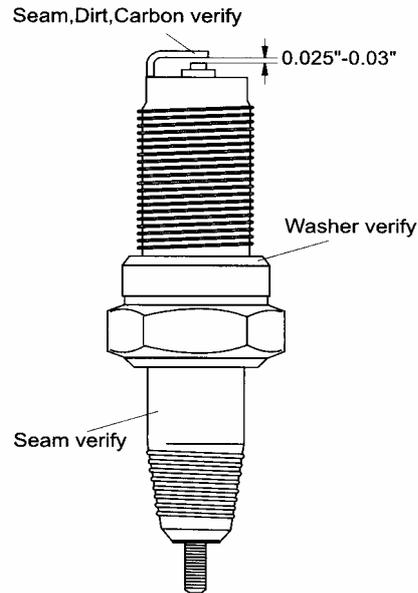
TO SERVICE-PRE-CLEANER

1. Clean foam filter with no-flammable cleaner.
If filter is paper tap filter on an object knocking dust from filter or replace with new filter.
2. Dry filter after cleaning, then dip it into engine oil specified by the manufacture, and ring excess oil out of filter.



SPARK PLUG

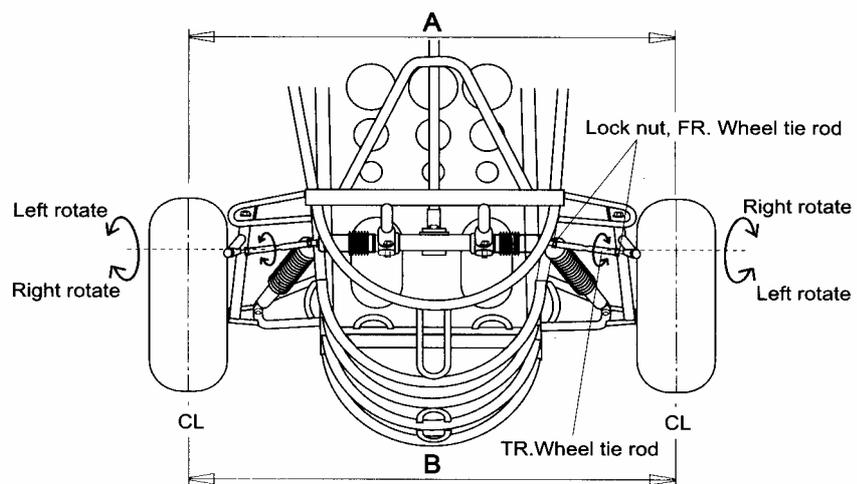
- Remove the spark plug and inspect it each time you change the oil. (Use a spark plugwrench). The electrodes should be kept clean and free of carbon. The presence of carbon or excess oil will greatly deter proper engine performance. If possible, check the spark plug gap (area between electrodes) using a wire feeler gauge. This specification is 0.025" ~ 0.030".
- Before installing spark plug coat threads lightly with graphite grease if possible, to ensure easy removal next time the spark plug needs inspection.
- It is advisable to replace the spark plug at least once a year to insure easy starting and good engine performance.



FRONT WHEEL ALIGNMENT

- The front wheel should be "toed-in" FROM 1/8" to 1/4". To check alignment measure distance from A to B to the centerline (CL) of the tires with the wheels point straight ahead. For the proper toe-in dimension A should be 1/8" ~ 1/4" greater than dimension B.

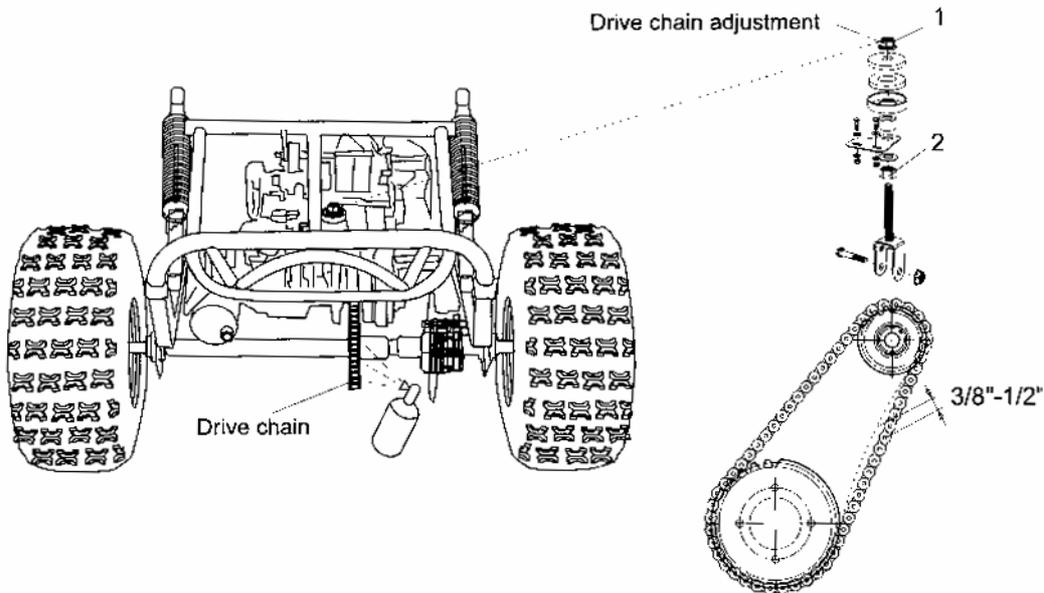
2. Loosen the lock nuts on both sides of Front Tie Rods. To Make Dimension B smaller, screw the rod left. If B needs to be longer screw the rod right. Tighten the jam nut tightly against the rod end. Recheck the distance and repeat the above steps until the Dimensions are per paragraph 1 above.



CHAIN ADJUSTMENT

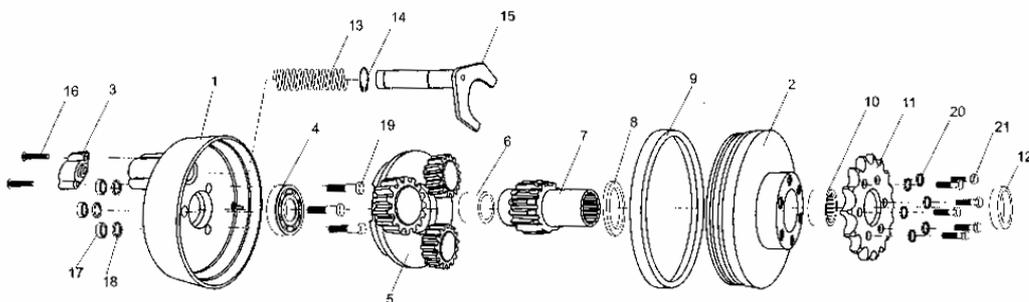
After the first two hours of operation, check the chain adjustment, and readjust if it has more than 1/2" flex.

1. Loosen Nut 1
2. Adjust Nut 2 (Turn nut clockwise in 1/2 turn increments, then turn nut #1 clockwise until nut is tight. Follow this procedure until chain is at proper tension.)



REVERSE COMP.

Check internal parts of Reverse Comp. periodically for parts wear, replace them if wear is present. Clean if dirty and re-grease using a liberal amount.



WIRING DIAGRAM

