KAYO MOTO

TT140/TT125

Service Manual

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Zhejiang Kayo Motor Co., Ltd.
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If the content involved in this manual is changed due to vehicle improvement and other reasons, no prior notice will be given. Performing maintenance should be based on the actual condition of the vehicle.

Zhejiang Kayo Motor Co., Ltd.
Research and development department of the vehicle
November 2023

Preparation instructions

This service manual provides a detailed introduction to the maintenance and adjustment procedures, disassembly and assembly essentials, inspection and maintenance points, troubleshooting methods, and maintenance technical data of the TT140 and TT125 two wheeled motorcycle. It also includes detailed graphical materials to guide the operation.

Please read this manual carefully and carry out maintenance according to standard operating procedures, which can effectively extend the service life of various components, improve engine performance, and enhance the reliability of the entire vehicle.

The first chapter mainly introduces general work items, tools used, basic techniques, and maintenance parameters.

The second chapter introduces the assembly and disassembly techniques of the vehicle cover panel

The third chapter introduces the regular inspection and adjustment of the entire vehicle

The fourth chapter introduces the disassembly of the assembly components of the power supply and exhaust system

The fifth chapter introduces the methods and precautions for disassembling, inspecting, repairing, and assembling various parts of the engine

The sixth chapter introduces relevant information about the surrounding area of the vehicle

Appendix: Electrical schematic diagram

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The unit conversion table in this book

Item	Unit conversion
Pressure	1kgf/cm^2=98.0665kPa；1kPa=1000Pa
	1mmHg=133.322Pa=0.133322kPa
Torque	1kgf·m=9.80665N·m
Volume	1mL=1cm^3=1cc
	1L=1000cm^3
Force	1kgf=9.80665N
Length	1in=25.4mm

Danger/Warning/Attention

Please carefully read the following explanation, which emphasizes the specific meanings of the words "Danger", "Warning", and "Attention". When repairing the engine, special attention should be paid to their prominent meanings.

Danger: means to be vigilant to high danger
Warning: means to be vigilant to moderate danger
Attention: means to pay attention to minor danger

However, Attention please the "Danger" and "Warning" contained in this service manual cannot cover all potential dangers during engine use and maintenance. Therefore, in addition to the relevant provisions of "Danger" and "Warning", maintenance personnel must also have basic knowledge of mechanical safety. If you are not sure about completing the entire maintenance operation process, please consult a more experienced senior technician.

1 Maintenance information

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1.1 Precautions for operation

Safety precautions

1.Work clothes (one-piece work clothes, etc.), hats, safety boots suitable for the operation must be worn, and if necessary, dust-proof glasses, dust-proof mask, gloves and other safety protection articles should be worn to protect your body.

2.Due to the harmful components contained in exhaust gas, which can cause cancer, birth defects, or other reproductive hazards, it is prohibited to operate the engine for a long time in enclosed areas and poorly ventilated areas.

3.When the engine is just stopped, the temperature of the engine and muffler is still very high. Do not touch them before cooling to avoid burns.

4.Battery solution (dilute sulfuric acid) is a strong corrosive agent that poses a risk of burns and blindness when it comes into contact with the skin and eyes. If clothes or skin accidentally come into contact with battery solution, please immediately rinse with plenty of water and seek treatment at the hospital. Batteries and battery solutions should be strictly stored and must be kept in a safe place out of reach of children. When charging a battery, flammable and explosive hydrogen gas is generated, and there is a risk of explosion once there is an ignition source or electric spark approaching. Therefore, please charge in a well ventilated area.

5.Due to the fact that gasoline is a flammable substance, fireworks are strictly prohibited in the workplace. Pay attention not only to open flames, but also to electric sparks. In addition, the evaporated gasoline poses a risk of explosion. Please choose a well ventilated area for operation.

6.During maintenance, be careful not to let rotating and movable parts such as the rear wheel and clutch grip hands and clothes.

7.When two or more people are working, they must constantly greet each other to confirm safety.

Precautions for disassembly and assembly

1.Parts, lubricating oil and grease must use products recommended by Kayo brand.

2.The parts of each system should be sorted and kept separately, so that each part can be reinstalled in their original position.
3.Please clean the soil and dust on the vehicle before maintenance.
4.Gaskets, O-rings, piston pin retaining rings, cotter pins, etc. must be replaced with new ones after disassembly.
5.If the opening of the elastic retaining ring is too large during disassembly, it will be deformed, and it will easily fall off after reassembly. Please do not use the elastic retaining ring that has loosened its strength and lost its elasticity.
6.After the parts are disassembled and inspected, they should be cleaned before measurement and the cleaning agent should be blown off with compressed air. Lubricating oil should be applied to the moving surface before assembly.
7.When disassembling, necessary places should be inspected and relevant data should be measured so that it can be restored to the state before disassembly during assembly.
8.Fasteners such as bolts, nuts, and screws should be pre-tightened first, and then tightened according to the specified tightening torque on the diagonal according to the principle of from large to small, from inside to outside.
9.When the rubber parts are disassembled, check whether they are aging, and replace them in advance if necessary. In addition, as rubber parts are not resistant to corrosion from gasoline, kerosene, etc., try not to let volatile oils and greases attach to them.
10.According to the requirements of the Service manual, apply or inject the recommended grease on the designated parts.
11.Correct special tools should be used for disassembly and assembly operations.
12.Ball bearings can be rotated with fingers to confirm whether the rotation is flexible and smooth. If force is applied to the ball during disassembly, the disassembled bearing should not be used again:

- If the axial and radial gap of the bearing is too large, replace it.
- Bearings that feel stuck when rotating should be cleaned, and those that still feel stuck after cleaning should be replaced, and those that cannot be cleaned should be replaced directly.
- It was originally a tight fit with the body or the shaft diameter, but if the fit is not tight after disassembly, the bearing should be replaced.

13.Bearings should be coated with engine oil or grease before assembly. Pay attention to the installation direction when assembling single-sided dust-proof bearings. When assembling open-type or double-sided dust-proof bearings, install the side engraved with the manufacturer's logo and size facing outward during assembly.
14.When installing the rectangular retaining ring, the chamfered side should face the direction of the force. Do not use the retaining ring that has been loosened and lost its elasticity. After assembly, turn the rectangular retaining ring to confirm that it has been firmly installed in the groove.
15.After assembly, it is necessary to check whether all fastening parts are tightened and whether the work is normal.
16.Brake fluid and coolant can damage the coating surface, plastic parts, rubber parts, etc. Do not let

them adhere to these parts. In box of adhesion, rinse them with water immediately.

17.The oil seal should be installed with the side marked by the manufacturer facing outward (in the direction without oil)：

- When assembling, pay attention not to curl the lip of the oil seal or scratch the lip of the oil seal with burrs.
- Apply lubricating grease to the oil seal lip before assembly.

18.When installing rubber hose parts, insert the rubber hose to the root of the joint. If there is a pipe clip, install the pipe clip in the dent of the pipe. Replace the rubber hose that is not tight during installation.

19.Do not get dust, mud, etc. into the interior of the engine or the hydraulic system of the brake.

20.The gasket materials attached to the joint surfaces of each engine box must be cleaned before assembly. The collision marks on the contact surface must be evenly polished and removed with an oilstone.

21.Do not twist or bend the cables excessively. A deformed or damaged cable may cause poor movement or damage.

22.When assembling protective cap parts, if there is a groove, the protective cap must be inserted into the groove.

Running-in of the engine

An engine has many components that engage in relative motion, such as pistons, piston rings, cylinder blocks, and transmission gears that mesh with each other. Therefore, in the early stages of its use, standardized running in is necessary. Running in can make the moving parts adapt to each other, correct working gaps, and form a smooth friction surface that can withstand large loads. Only a standardized running in engine can have excellent performance and reliability.

The comparison table for the maximum throttle opening during the new vehicle's running-in period is as follows:

Within the first 0-5 working hours	Maximum throttle opening<70%
Within the first 5-10 working hours	Maximum throttle opening<100%

Attention：

- Avoid fully opening the throttle during the running-in period;
- During the running-in period, please pay attention to the coordination between engine accessories and do not overload them;
- During the running-in period, maintenance should be carried out according to daily maintenance regulations, and any faults found should be promptly eliminated;

- Do not let the engine run for a long time in low speed gear;
- After the running-in is completed, the entire machine should undergo maintenance after the running-in period before entering the normal driving phase.

1.2 Vehicle identification number

① Frame number
② Vehicle nameplate
③ Engine number

Vehicle model	TT125	TT140
Frame number	L6JYGJLC~	L6JYGKLC~
Engine number	1P54FMI-2~	1P56FMJ-2~

1.3 Main parameter table

Items		Parameters
Vehicle model		TT140
Length (mm)		1780
Width (mm)		750
Height (mm)		1120
Wheelbase (mm)		1220
Displacement（ml）		140.4
Fuel type		≥RQ93
Vehicle curb weight (kg)		82
Maximum loaded mass (kg)		65
Tire specifications	Front wheel	Front 70/100-17
	Rear wheel	Rear 90/100-14
Minimum ground gap（mm）		290
Engine	Starting method	Electric start/foot start
	Engine type	Single cylinder, four stroke, oil cooled, manual clutch
	Gas distribution method	Chain drive
	Cylinder diameter × stroke (mm)	56×57mm
	Maximum power (kw/r/min)	6.8 kW（7500±500 r/min）
	Maximum torque (N.m/r/min)	9.7 N.m（5500±500r/min）
	Compression ratio	8.8: 1
	Lubrication method	Pressure+splash
	Oil pump type	Rotor type
	Lubricating oil filter type	Filter type
	Oil grade	15W/40-SF

Items		Parameters	
Air filter type		Sponge filter cartridge filtration type	
Fuel tank capacity		5.8L	
Drive system	Clutch type	Manual wet multi plate	
	Variable speed mode	Constant mesh four speed transmission	
	Gearshift	Four gears	
	Transmission mode/sequence	Pedal/N-1-2-3-4	
	Output mode	Chain wheel drive #428H；15T/41T	
	Engine output rotation direction	When in forward gear, it is clockwise when viewed from the rear of the vehicle	
Steering device	Steering angle	Left	45°
		Right	45°
Brake device type		Front	Hydraulic disc brake
		Rear	Hydraulic disc brake
Front shock absorption		Inverted reduction not adjustable，L=735mm	
Rear shock absorption		Non adjustable　L=360mm	
Rear flat fork		Steel flat fork	
Directional handle		Steel directional handle	
Frame type		High strength steel pipe frame	
Front and rear wheel rims		Front 1.6×17steel ring；Rear1.85×14steel ring	

Items		Parameters
Vehicle model		TT125
Length (mm)		1780
Width (mm)		750
Height (mm)		1120
Wheelbase (mm)		1220
Displacement（ml）		123.7
Fuel type		≥RQ93
Vehicle curb weight (kg)		81
Maximum loaded mass (kg)		65
Tire specifications	Front wheel	70/100-17
	Rear wheel	90/100-14
Minimum ground gap（mm）		290
Engine	Starting method	Electric start/foot start
	Engine type	Single cylinder, four stroke, air-cooled, manual clutch
	Gas distribution method	Chain drive
	Cylinder diameter × stroke (mm)	54×54
	Maximum power (kw/r/min)	6.8 kw /7000±375r/min
	Maximum torque (N.m/r/min)	9.75N·m /6000±250 r/min
	Compression ratio	9.0：1
	Lubrication method	Pressure+splash
	Oil pump type	Rotor type
	Lubricating oil filter type	Filter type
	Oil grade	10W/40-SN

Items		Parameters	
Air filter type		Sponge filter cartridge filtration type	
Fuel tank capacity		5.8L	
Drive system	Clutch type	Manual wet multi plate	
	Variable speed mode	Constant mesh four speed transmission	
	Gearshift	Four gears	
	Transmission mode/sequence	Pedal/N-1-2-3-4	
	Output mode	Chain wheel drive #428H；15T/41T	
	Engine output rotation direction	When in forward gear, it is clockwise when viewed from the rear of the vehicle	
Steering device	Steering angle	Left	45°
		Right	45°
Steering device		Front	Hydraulic disc brake
		Rear	Hydraulic disc brake
Brake device type		Inverted reduction not adjustable，L=735mm	
Front shock absorption		Non adjustable L=360mm	
Rear shock absorption		Steel flat fork	
Rear flat fork		Steel directional handle	
Directional handle		High strength steel pipe frame	
Frame type		Front 1.6×17 steel ring；Rear 1.85×14 steel ring	

1.4 Maintenance parameter table

Lubrication device

Items		Standards	Usage limit
Engine oil capacity		TT125:850ml/TT140:950ml	—
Recommended engine oil		Only use TT125:10W/40-SN TT140:15W/40-SF engine oil. Do not replace or mix different grades of engine oil as this can cause engine damage and accidents	
Oil pump rotor	Radial gap between outer and	0.06-0.15	—
	End face gap between rotor	0.04-0.1	—

Air intake system (see 05 Engine section for details)

Wheels (same front and rear wheels)

Items		Standards	Usage limit
Rim runout	Longitudinal	0.8mm	2.0mm
	Transverse	0.8mm	2.0mm
Tire	Residual groove	—	3mm
	Front wheel air pressure	200kPa（29PSI）	—
	Rear wheel air pressure	250kPa（36PSI）	—

Brake system

Items		Standards	Usage limit
Front brake	Brake disc thickness	3.5mm	3mm
Rear brake	Brake handle stroke	2 ~ 6mm	—
	Brake disc thickness	3.5mm	3mm

Battery/charging device

Items			Standards
Rectifier type			Full wave rectification
Battery	Capacity		12V 4Ah
	Voltage between terminals	Fully charged	14.4V
		Insufficient charging	Less than 9.6V

Ignition device

Items		Standards
Ignition method		CDI contactless ignition
Spark plug	Type	Resistor spark plug
	Standard	A7RTC
	Spark plug gap	0.6~0.7mm
	Spark characteristics	Blue and white light

Valve train+cylinder cover (see 05 Engine section for details)

Cylinder+piston+piston ring+crank connecting rod (see 05 Engine section for details)

Clutch+transmission mechanism (see 05 Engine section for details

1.5 Tightening torque of fasteners

Attention：

Before installing the thread, apply anti-rust grease on the threaded part and joint surface

Tightening torques at designated parts - whole vehicle parts

No.	Items	Fastener code	Quantity	Tightening torque (N · m)
1	Carburetor mounting bolts	Blue white zinc M6*16	2	10-12
2	Lower pressure block fixing bolt	Blue white zinc M10*30*1.5	2	25-30
3	Front and rear disc brake disc mounting bolts	M8*16	4	25-30
4	Engine mounting bolts	Blue white zinc M8*25	2	25-30
5	Single support mounting bolt	Blue white zinc M10*35*1.5	1	49-59
6	Flat fork mounting nut	Blue white zinc M12*1.25	1	80-90
7	Oil cooler mounting bolts	Blue white zinc M6	4	10-12
8	Big cover nut	Chromium plated grade 6	1	35-40
9	Brake pedal mounting bolts	Blue white zinc M8*16	1	25-30
10	High pressure package mounting bolts	Blue white zinc M6*20	1	10-12
11	Rear wheel axle mounting nut	Blue white zinc M14*1.5	1	80-90
12	Silencer tube mounting bolts	Blue white zinc M8*35 half thread	1	25-30
13	Fixed silencer pipe nut	Blue white zinc M6	2	10-12
14	Front wheel axle mounting nut	Blue white zinc M14*1.5	1	80-90

Tightening torque for specified parts - Engine section (see 05 Engine section for details)

Tightening torque of fasteners in unspecified positions

Category	Torque N·m	Category	Torque N·m
5mm bolts and nuts	4.5~6	5mm screws	3.5~5
6mm bolts and nuts	8~12	6mm screws	7~11
8mm bolts and nuts	18~25	6mm raised bolts	10~14
10mm bolts and nuts	30~40	8mm raised bolts and nuts	20~30
12mm bolts and nuts	35~50	10mm raised bolts and nuts	30~40

Engine maintenance tools (see 05 - Engine section for details)

Special tools for engines (see 05 - Engine section for details)

1.6 Lubricating grease, sealant, thread locking adhesive

Coating site	Points for attention	Oils and fats
Connection part between frame	A small amount of sealing gasket on the silencing pipe is sufficient	Lightweight lithium soap based lubricating grease
Front and rear axle parts		
Silencer pipe sealing gasket		

Lubrication of control cables, bearings, and rotating parts

Parts	Content	Oils
At the throttle knob	lubrication	Mobil XHP222 grease
At the flat fork bearing		
At the steel bending of the frame		
Single support installation within the opening range		
Brake pedal installation shaft		

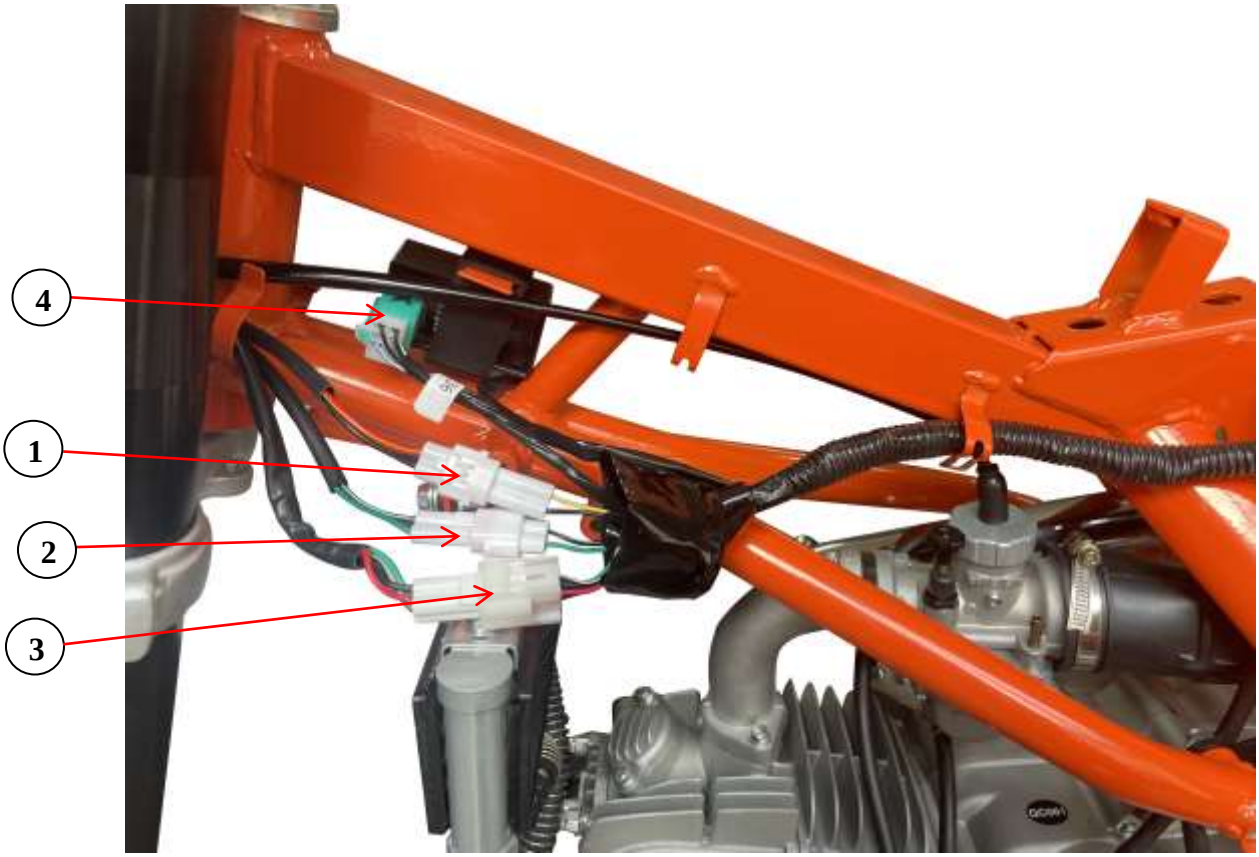
Installation accessories for each fastener part

Parts	Content	Installation accessories
Guide sprocket mounting bolts	Tightening	Red thread locking adhesive (Xindeli 2271)
Rear sprocket mounting screws		
Engine fixing bolts		
Front disc brake disc mounting bolts		Blue bolt locking adhesive (Xindeli 2242)
Rear disc brake disc mounting bolts		

Engine operating materials and installation accessories (see 05 Engine section for details)

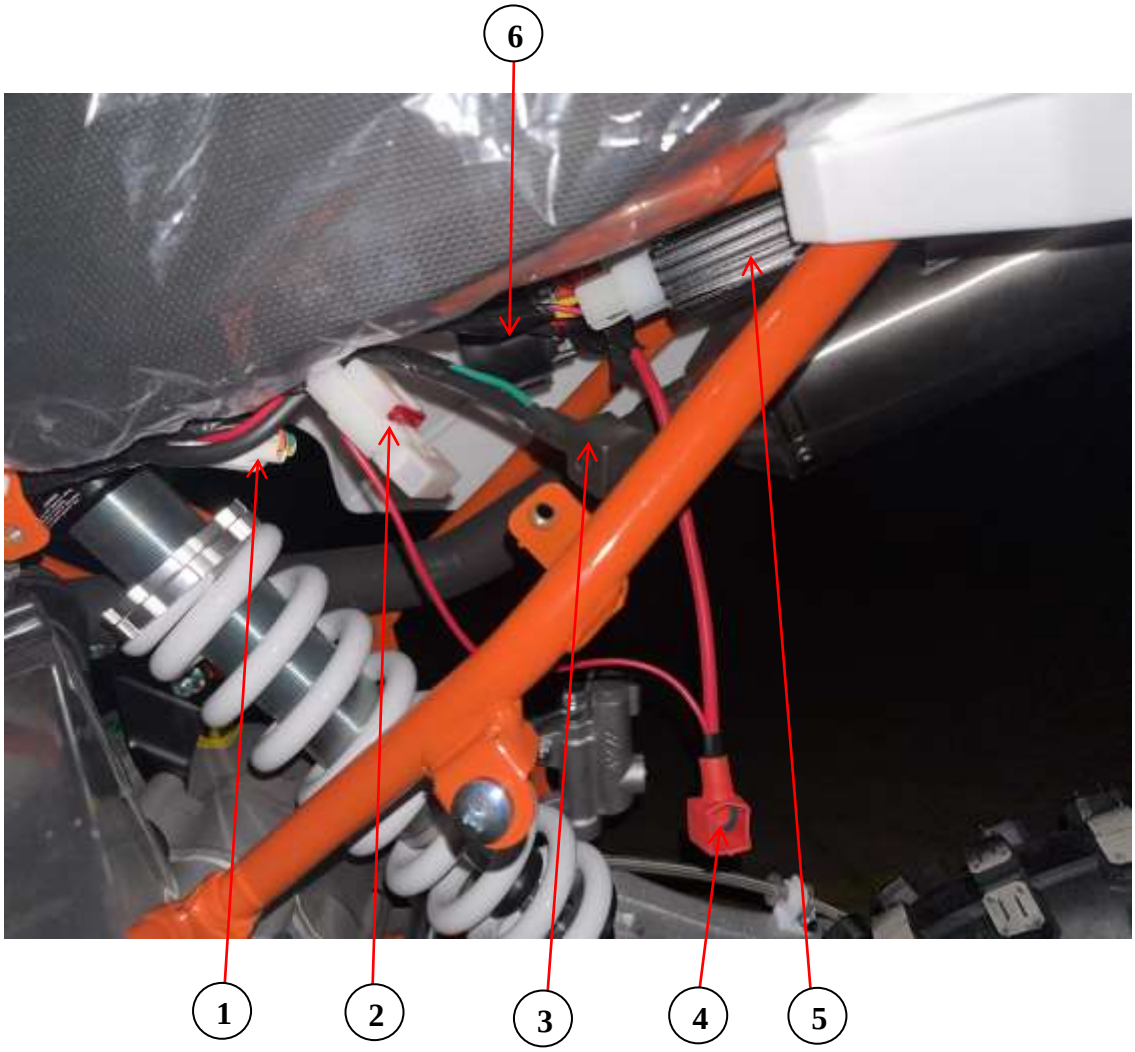
Engine operating materials include lubricating oil (engine oil), lubricating grease (butter), etc; Installation accessories include flat sealant, thread locking adhesive, etc

1.7 Wiring diagram for cables, hoses, and cables

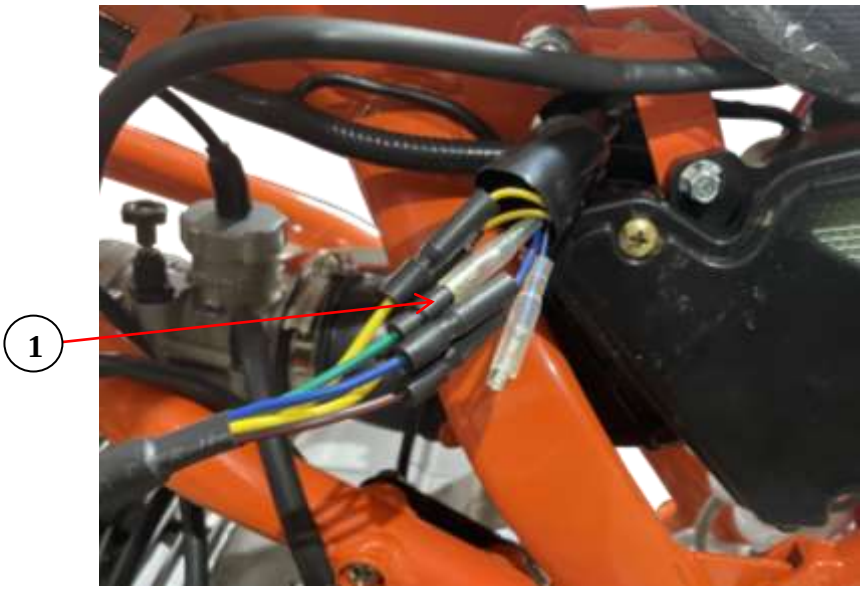


1.Electric start switch plug-in 2.Emergency shutdown switch plug-in 3.Electric door lock plug-in 4.Igniter plug-in

Attention: Before inspecting and repairing the above components, the cover must be removed. For specific disassembly, refer to the second Chapter - Covering parts of the vehicle

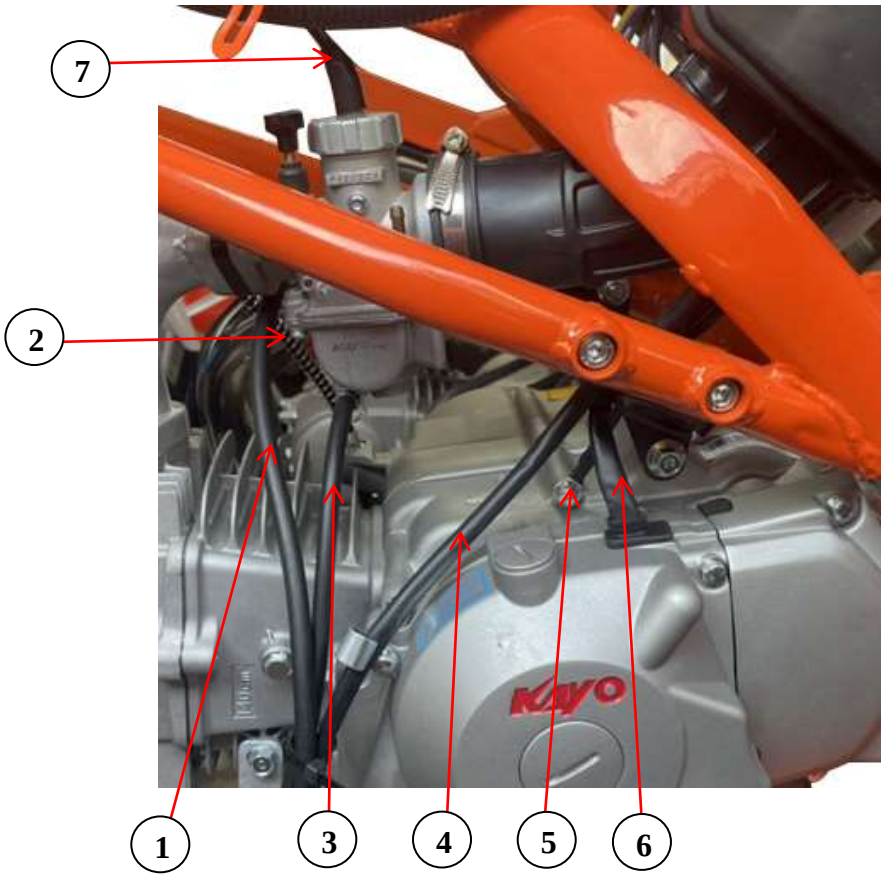


1.Relay plug-in 2.Fuse 3.Power negative wire 4.Power positive wire 5.Voltage regulator 6.Relay

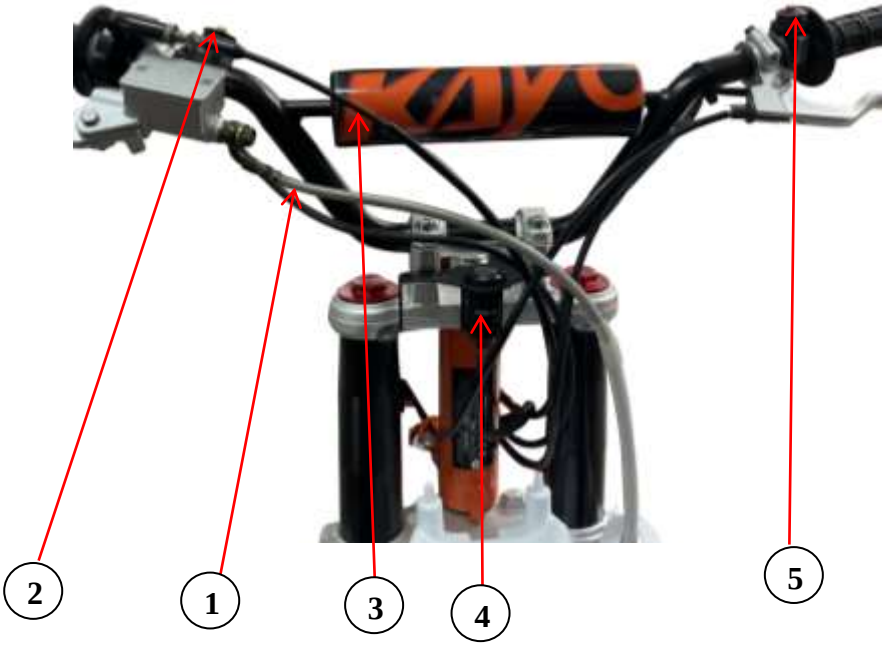


1. Magneto plug-in

Attention: Before inspecting and repairing the above components, the cover must be removed. For specific disassembly, refer to the second Chapter - Covering parts of the vehicle



1.Balance oil pipe 2.Clutch line 3.Oil discharge hose 4.Starting motor line 5.Engine grounding wire 6.Magneto line 7.Throttle line



1.Front brake oil pipe 2.Start switch 3.Throttle wire 4.Electric lock 5.Flameout switch

2 Covering parts of the vehicle

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2.1 Maintenance information

Precautions for operation

When replacing the covering parts with regulatory warning labels affixed or riveted on the vehicle, the corresponding labels must be correctly and completely supplemented as they are.

This chapter describes the disassembly and assembly sequence of vehicle body covers. When repairing internal components of the vehicle that require disassembly of relevant covers, it can be referred to in this chapter.

This chapter describes the disassembly and assembly operations of shelves, seat cushions and exterior parts.

Please pass the pipes and cables through the correct position according to the wiring diagram of cables, pipes and cables.

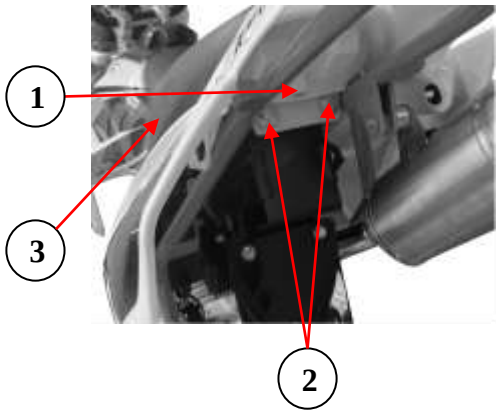
2.2 Installation torque

M8 bolts	21（2.1）	Torque N·m(kgf·m)
M6 bolts	10（1.0）	Torque N·m(kgf·m)
M5 bolts	5（0.5）	Torque N·m(kgf·m)
Self-tapping screw	4（0.4）	Torque N·m(kgf·m)

2.3 Disassembly and assembly of the seat cushion

Disassembly

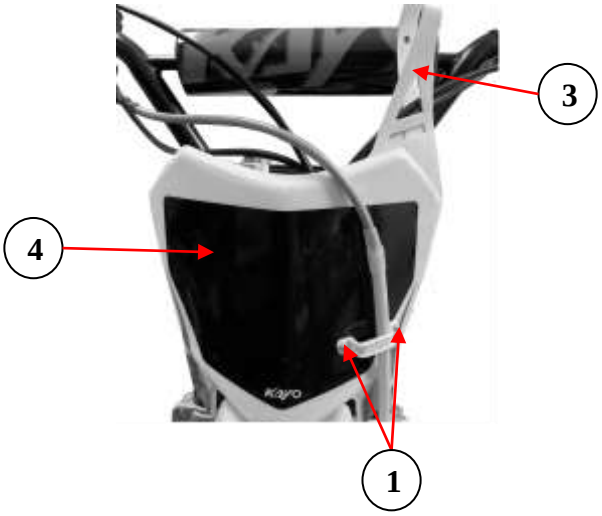
Remove the fixed self tapping screw 1
Remove the bolt 2 fixed to the vehicle body
Remove the seat cushion 3



Installation

Follow the reverse order and direction of disassembly
After installation, check whether the seat cushion is installed in place, secure, etc

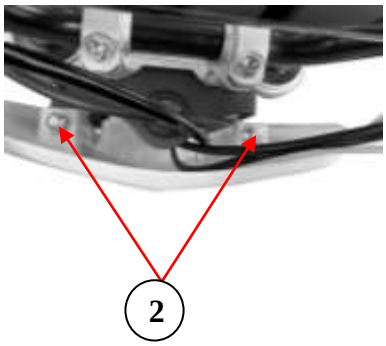
2.4 Disassembly and assembly of the front panel



Disassembly

Remove the wire card fixing screw 1
Remove the panel fixing bolt 2

Pull the strap out from bottom to top 3
Remove the front panel 4



Installation

Install in the reverse order of disassembly

2.5 Disassembly and assembly of the front left and right guard plates

Front right guard plate

Disassembly

Remove the seat cushion (→ 2.3)

Remove the front right fender mounting bolt 1

Remove the front right fender mounting bolt 2

Remove the front right fender 3

Attention

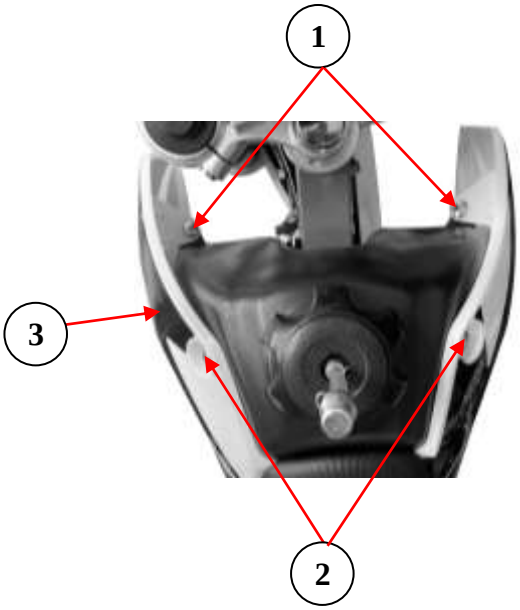
The disassembly and assembly method of the front left guard is the same as that of the right guard

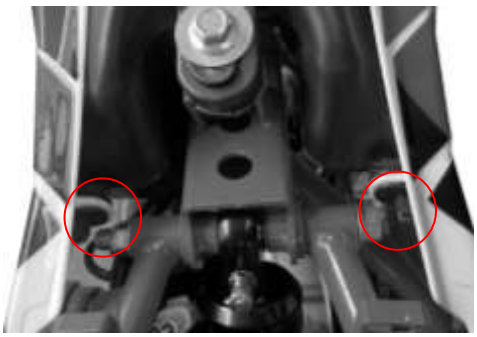
Installation

Install in the reverse order of disassembly

Attention

There are two fixing points between the left and right front guard plates and the fuel tank. When removing, pull out the guard plate from the rear, do not forcefully remove damaged plastic parts.





2.6 Disassembly and assembly of the rear left and right guard plates

Rear right guard plate

Disassembly

Remove the seat cushion (→ 2.3)

Remove the rear right fender mounting bolt 1

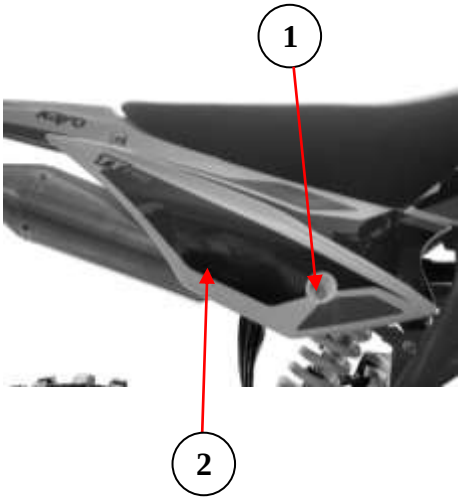
Remove the rear right guard board 2

Attention

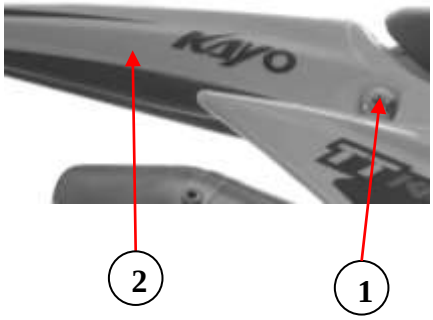
The disassembly and assembly method of the rear left fender is the same as that of the rear right fender

Installation

Follow the reverse order and direction of disassembly

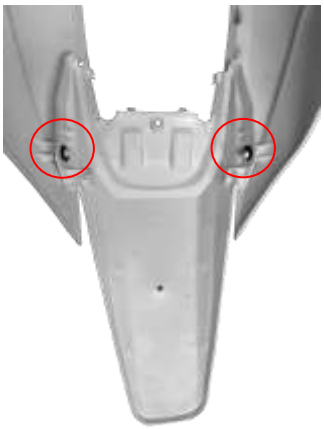


2.7 Disassembly and assembly of the rear center guard board



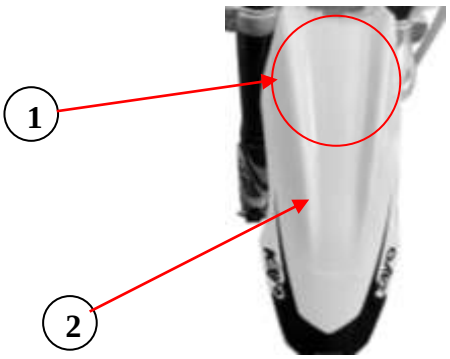
Disassembly
Remove the seat cushion (→ 2.3)
Screw out 2 bolts 1 (one on the left and one on the right)
Remove the rear center guard 2

Installation
Follow the reverse order and direction of disassembly

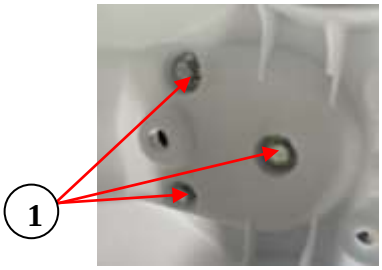


Attention
There are two fixing points between the rear center guard and the rear guard. When removing, pull out the rear guard from both sides and do not forcefully remove the damaged plastic parts

2.8 Disassembly and assembly of the front fender



Disassembly
Remove the nut 1 that fixes the front fender
(Located at the tail of the front fender)
Remove the front fender 2

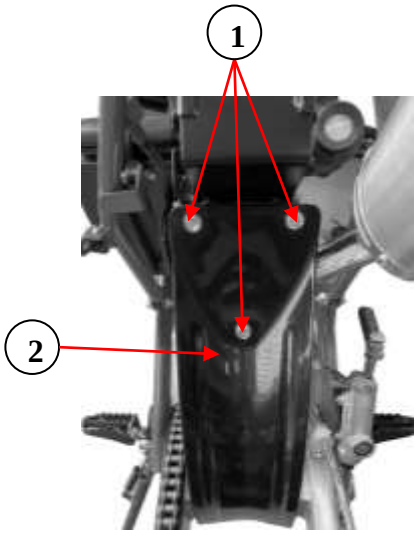


Installation
Install in reverse order of disassembly

2.9 Disassembly and assembly of the small fender

Disassembly

Remove bolt 1
Remove the rear small fender 2



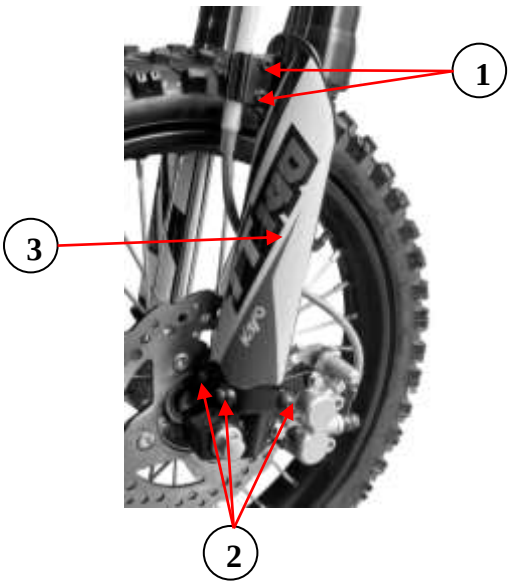
Installation

Proceed in the reverse order of disassembly

2.10 Front shock absorber guard

Disassembly

Remove the bolt 1 fixed to the pipe clamp
Remove the bolt 2 fixed to the front shock absorber
Remove the front shock absorber guard plate 3



Installation

Proceed in the reverse order of disassembly

Attention

The right front shock absorber guard and the left front shock absorber guard are the same except for step 1.

3 Regular inspection and adjustment

Driver safety……3-1

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3.2 Inspection and maintenance methods……..3-5

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3.6 Shift mechanism and fuel device……3-16

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3.8 Inspection of the brake mechanism……....3-17

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3.10 Inspection of the high voltage package and spark plug……3-18

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3.12 Start lever…….....3-19

3.13 Oil cooler…….……..3-20

3.14 Oil gas seperator…….……...3-20

Driver safety

Fire warning

The fuel used in vehicles, gasoline, is an extremely flammable and highly explosive toxic liquid, and the vapor generated by gasoline also has the same properties. Fuel vapor may diffuse and be ignited by sparks or flames far from the vehicle. During operation and for a period of time after operation, the muffler will generate high temperatures that can ignite flammable materials. At this time, the muffler may come into contact with flammable materials and may cause a fire. For example, driving through areas with a large amount of hay; Park in fuel storage areas, etc.

To reduce the risk of explosion or combustion, please follow the following instructions:

- Use an approved gasoline tank to store fuel.
- Do not refuel gasoline tanks in the vehicle's cargo tank or on board, as electronic electrostatic discharge may ignite fuel.

● Strictly follow the correct refueling procedures.

● Do not start or operate the engine without properly tightening the fuel tank cap, as gasoline is toxic and can cause injury or death.

● Do not use your mouth to siphon gasoline.

● If you accidentally swallow gasoline or gasoline enters your eyes or inhales gasoline vapor, seek medical attention immediately.

● If gasoline splashes on you, please wash with soap and water and immediately change your clothes.

Warning

Gasoline is highly flammable and explosive under certain circumstances. Before refueling the fuel tank, please allow the engine and exhaust system to cool down. When handling gasoline, always be vigilant. When refueling, be outdoors or in a ventilated area and turn off the engine. Do not leave plastic fuel tanks filled with gasoline in the cargo area while driving. The static electricity generated between the cargo box and the plastic fuel tank may cause sparks. Do not smoke during refueling operations, and do not allow open flames or sparks to approach refueling or gasoline storage areas.

Do not overfill the fuel tank and do not fill it to the neck of the fuel tank.

If gasoline splashes onto the skin or clothes, immediately rinse with soap and water and change clothes. Do not start and run the engine in a closed area. Engine exhaust is toxic and can cause loss of consciousness or death in a short period of time. The chemical substances contained in the engine exhaust of this product are known to cause cancer, birth defects, or other reproductive defects or other reproductive hazards. Only operate this vehicle outdoors or in well ventilated areas.

Maintenance information

Operation precautions

Attention

- Due to the presence of toxic components such as carbon monoxide (CO) in the exhaust gas, please do not operate the engine for a long time in closed or poorly ventilated areas.
- When the engine first stops, the temperature of the muffler and engine is still very high. If it comes into contact with the skin, it can cause burns. If maintenance must be carried out immediately after the engine has stopped, long sleeved work clothes and gloves must be worn for operation.

- Gasoline is very easy to catch fire, and smoking and fire are strictly prohibited in the workplace. Not only should we pay attention to open flames, but we should also pay special attention to electrical sparks. In addition, due to the risk of explosion from evaporated gasoline, operations should be carried out in a well ventilated area.

Attention

Do not let rotating components such as the drive system catch hands and clothes.

Attention

The vehicle must be placed on a flat and stable surface.

3.1 Determination of the maintenance cycle

The maintenance of the engine is a regular and periodic task, and it is very important to maintain the engine at a certain time interval. Standardized maintenance and upkeep can ensure excellent engine performance, reliable operation, and economic durability. The following is the maintenance and upkeep cycle table for the engine:

Attention: The following table is designed according to normal usage conditions. Under harsh conditions, the maintenance cycle of the engine should be correspondingly short.

Maintenance items \ Maintenance period		Mileage/Time（Whichever Comes First）					
		Unit	Initial maintenance	Regular maintenance intervals			
		mile	100	600	1200	1800	2400
		km	150	1000	2000	3000	4000
		Month	1	6	12	18	24
*	Fuel pipe				I		I
**	Fuel filter			R:Every1800 mile (3000 km)			
*	Throttle control				I		I
	Air filter			C	C	C	C
	Spark plug			I	I	I	I
*	Valve gap		I	I	I	I	I
	Engine oil		R	R	R	R	R
**	Oil filter screen				C		C
	Clutch		I	I	I	I	I
	Chain		I、L	I、L:Every 300 mile (500 km)or three months			
	Chain guide system inspection			I	I	I	I
	Brake caliper brake pad			I	I	I	I
	Brake system		I	I	I	I	I
	Single support				I		I
*	Suspension system				I		I
*	Spark eliminator			C:Every 1000 mile (1600 km) or every 100 working hours			
*	Nuts, bolts, fasteners		I		I		I
**	Wheel hub/tire		I	I	I	I	I
**	Steering head bearing		I		I		I
	Oil gas separator oil storage cup			I:Every 124 mile (200km）			
**	Valve reset			I:Every 1800 mile (3000 km)			

*	Cylinder head bolts			I:Every 1800 mile (3000 km)
*	Spoke tension		I	I:Every 300 mile (500 km)

The meaning of capital letters in the table:
I: inspect and clean, adjust, lubricate, and replace if necessary.
C: Cleaning L: Lubrication A: Adjustment R: Replacement

3.2 Inspection and maintenance methods

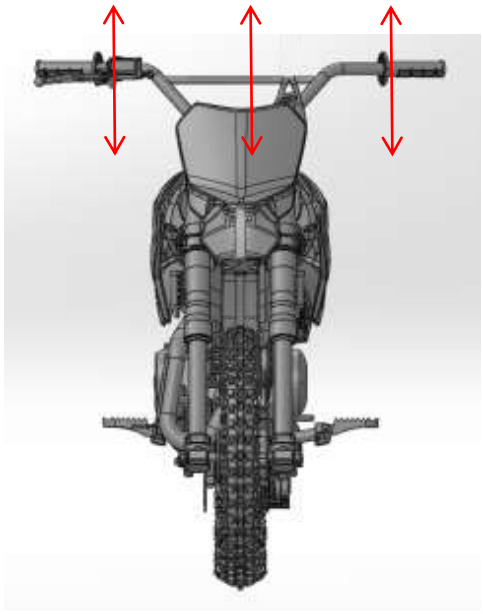
Inspection and maintenance items			Maintenance period			Judgment criteria
Inspection parts		Inspection items	Daily inspection	Semi-annual inspection	Annual inspection	
Steering device	Steering handle	Operational flexibility	○			
	Steering system	Damage	○			
		Installation status of the steering system	○			
		The shaking of the bearings	○			
Braking device	Brake pedal	Pedal stroke	○	○		
		Braking effect	○	○		
	Connecting rods and oil pipes	Relaxation, looseness, and damage	○		○	
	Hydraulic braking and brake discs	Front and rear brake fluid volume	○	○		The brake fluid should be above the LOWER limit
		Wear and damage of brake discs	○	○		When the front disc thickness of the current brake disc is less than 3mm, and the working disc thickness of the rear brake disc is less than 3mm, it should be replaced in time.
	Brake pads	Wear and damage of brake discs	○	○		Minimum brake pad (friction pad) thickness ≥ 1mm; Please replace it when it is less than 1mm
Running device	Wheel	Tire pressure	○	○		Front wheel：200kPa（29PSI） Rear wheel：250kPa（36PSI）
		Tire cracking and damage	○		○	

		Tire groove depth and abnormal wear	○		○	If there is no wear indication on the tire surface, the residual groove depth size should not be less than 3mm
		Loosening of wheel nuts and wheel axles	○	○		
		Shake of front wheel bearings	○		○	
		Shake of rear wheel bearings	○		○	
Buffer device	Rear flat fork	Shake of the connecting part	○		○	
		Bearing inspection	○		○	
	Shock absorber	Oil leakage and damage	○		○	
		Effect			○	
Transmission device	Front shock absorber	Transmission and lubrication	○		○	
	Rear shock absorber	Transmission and lubrication	○		○	
	Gearbox	Oil leakage and oil quantity	○		○	Loosen the refueling bolt port, and the amount of oil should reach the port of the hole

Inspection and maintenance items			Maintenance period			Judgment criteria
Inspection parts		Inspection items	Daily inspection	Semi-annual inspection	Annual inspection	
Transmission device	Chain sprocket drive	Looseness of the connection part	○	○		
		Shaking at the chain	○	○		Chain swings up and down 20-30 millimeters
Electrical device	Ignition device	Status of spark plugs		○		Spark plug gap: 0.6mm~0.7mm
		Ignition period		○		
	Battery	Terminal connection status			○	
	Electrical wiring	Looseness and damage of the connection part			○	
Fuel device		Fuel leakage		○		
		The status of the throttle			○	Gap of throttle knob: 2-6mm
Exhaust pipe and muffler		Check for looseness and damage during installation			○	
		The function of a muffler			○	
Frame		Looseness and damage			○	
Other		Lubricating grease status of various parts of the frame			○	
Parts that can confirm anomalies during operation		Confirm if there are any abnormalities in the relevant parts	○			

3.3 Steering column and braking system

Place the vehicle in a horizontal position, grip the steering handle tightly, and apply force in the direction shown in the diagram to check for any shaking.



If shaking is felt, it should be confirmed whether it is the steering column shaking or the connecting plate shaking, and corresponding maintenance should be carried out.

If the steering column or upper and lower connecting plates shake, increase the locking force of the steering column locking nut or disassemble the steering column for maintenance

Place the vehicle in a horizontal position and slowly turn the steering wheel to the left and right to confirm if it can rotate smoothly and flexibly, and whether the left and right limits are the same. If there is obstruction in some areas, check the main cable assembly and cables for any interference, confirm if there is any interference, and whether the steering bearing is damaged.

Attention: It is necessary to confirm that the steering is flexible, otherwise the control handle will be unable to control the direction and accidents will occur

Front brake handle gap:

Operate the front brake handle, check the braking effect and the action of the handle.

Check the gap at the front brake handle

Gap: 2-6mm

Front brake pump combination

〈 Liquid volume 〉

Check the amount of brake fluid

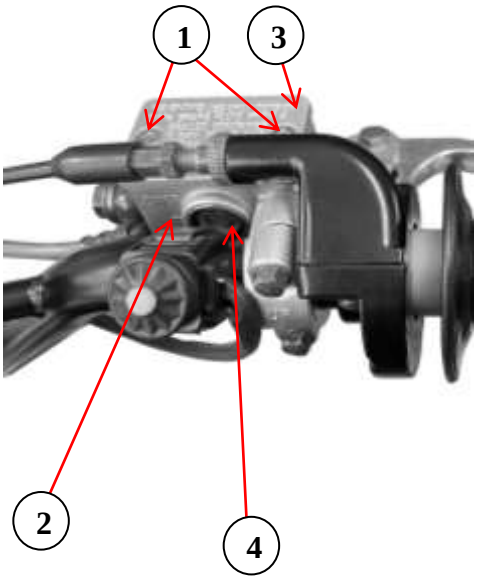
Check the brake fluid volume through observation hole 4. When the brake fluid volume decreases to near the lower limit line 2 (LOWER), the vehicle will no longer be able to use. It is necessary to check the leakage of the brake pump, brake pipe, and various connections. If the inspection is normal, it is necessary to check the wear of the brake disc and brake pad. If there is damage or wear below the limit of use, please replace it.

It is also necessary to inspect these items before each use of the vehicle

Remove the two exhaust screws 1

Remove the oil cup cover 3

Replenish the brake fluid recommended by Kayo until it reaches the upper limit line



Attention

- When replenishing brake fluid, dust and water should not be mixed in
- To prevent chemical changes, please use the specified brand of brake fluid
- Because brake fluid can damage the plastic and rubber surfaces, please do not splash it onto these components

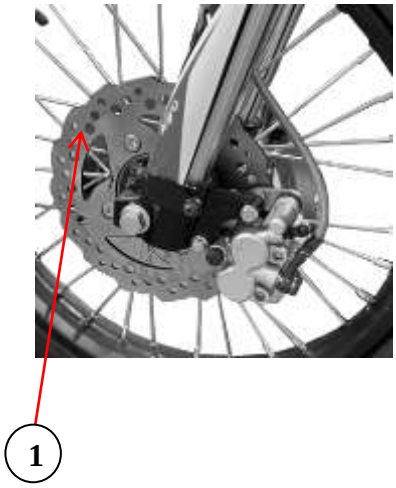
Turn the steering lever slightly to the left and right, and remove the oil cup cover after the brake pump assembly is in a horizontal state

1.Exhaust screw
2.Lower limit line
3.Oil cup cover
4.Observation hole

Front brake disc, brake pad〈Wear of the brake pads〉

Check the wear of the brake pads

If the wear has reached the wear limit, replace the brake pads



Attention

The brake pads need to be replaced as a complete set

Inspection and replacement of the brake discs

Check the sliding surface of brake disc 1 for wear or damage. If the current brake disc thickness is ≤ 3mm, replace the brake disc

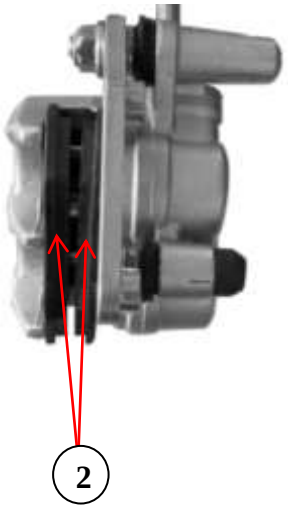
Front brake disc service limit thickness: 3mm

Check the minimum thickness of brake friction plate 2

Minimum friction plate thickness ≥ 1 mm

If it is less than the minimum friction plate thickness, please replace it with a new brake friction plate

Check if there is any damage or crack on the brake friction plate. If there is any damage or crack, please replace it with a new brake friction plate



Attention： Please regularly check the brake fluid level to keep it in a safe position. Check the oil circuit and connection points for damage. If there are any, please replace them in a timely manner. Check the main pump/caliper for damage. If there are any, please replace them in time

Attention：Do not open the brake fluid cup for a long time

Oil change (Brake fluid replacement)

Replace the brake fluid once a year

Rear brake pump combination〈Fluid volume〉

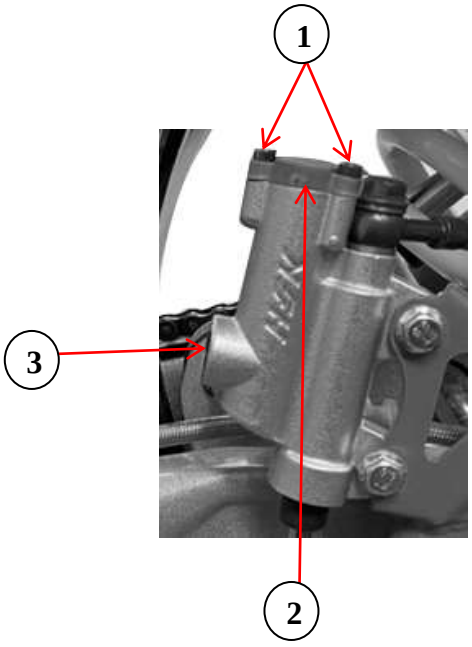
Check the amount of the brake fluid

Check the brake fluid level through observation hole 3. When the brake fluid level is less than 50%, the vehicle will no longer be able to use. It is necessary to check the leakage of the brake pump, brake pipe, and various connections. If the inspection is normal, it is necessary to check the wear of the brake disc and brake pad. If there is damage or wear below the limit of use, please replace it. It is also necessary to inspect these items before each use of the vehicle

Remove the two exhaust screws 1 from the oil cup cover

Remove the oil cup cover 2

Replenish the brake fluid recommended by Kayo until it reaches the upper limit line



- When replenishing brake fluid, dust and water should not be mixed in.
- To prevent chemical changes, please use the specified brand of brake fluid
- Because brake fluid can damage the plastic and rubber surfaces, please do not splash it onto these components

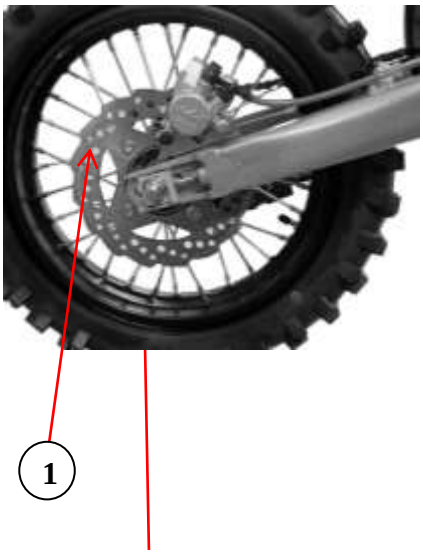
Attention： Please regularly check the brake fluid level to keep it in a safe position. Check the oil circuit and connection points for damage. If there are any, please replace them in time. Check the main pump/caliper for damage. If there are any, please replace them in time

Attention：Do not open the brake fluid cup for a long time

Rear brake disc, brake pad〈Wear of the brake pads〉

Check the wear of the brake pads

If the wear has reached the wear limit, replace the brake pads



Attention

The brake pads need to be replaced as a complete set

Inspection and replacement of the brake discs

Check the sliding surface of brake disc 1 for wear or damage. If the current brake disc thickness is ⩽ 3mm, replace the brake disc

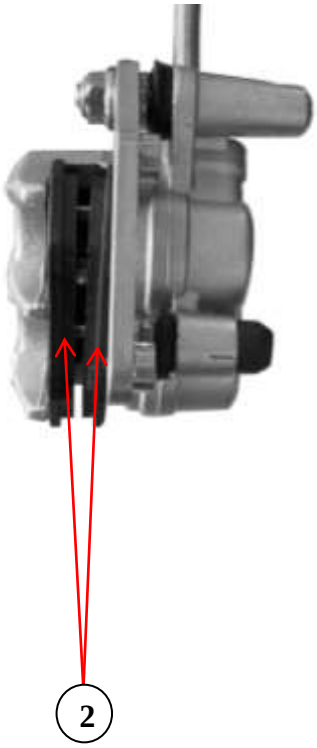
Rear brake disc service limit thickness: 3mm

Check the minimum thickness of brake friction plate 2

Minimum friction plate thickness ⩾ 1 mm

If it is less than the minimum friction plate thickness, please replace it with a new brake friction plate

Check if there is any damage or crack on the brake friction plate. If there is any damage or crack, please replace it with a new brake friction plate



Oil change (Brake fluid replacement)

Replace the brake fluid once a year

3.4 Wheels

Jack up the front wheels in a horizontal position with a tool to ensure that there is no force on the vehicle body. Shake the front wheels left and right to check if they are securely connected and if there is any shaking

If there is shaking, check and tighten the axle, rim bolts, and nuts.

If there is still shaking, check and replace: bearings and other related tire accessories.

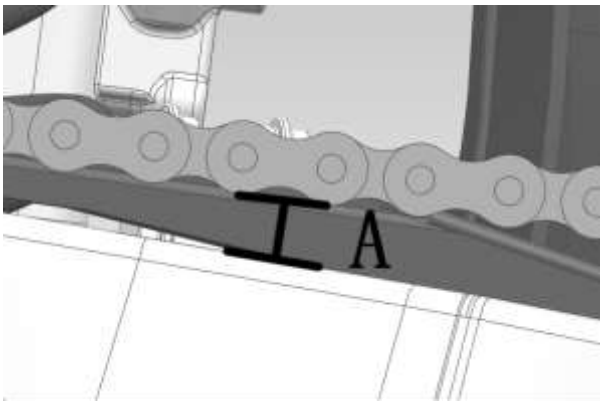
Chain inspection

The chain transmits the power output from the engine to the wheels, enabling the motorcycle to move normally and is an important component of the motorcycle. Therefore, the chain needs to be regularly inspected and maintained to protect its normal use.

The chain tension can be adjusted according to demand, and the steps are as follows:

◆ Fix the motorcycle so that the rear wheels are completely suspended

◆ Measure the distance between the rear of the flat fork and the chain, and the normal distance A should be within 20-30 millimeters



◆ Loosen the rear axle nut

◆Find the position with the biggest tension on the chain

◆Adjust the front and rear positions of the tensioner to align the two ends of the flat fork

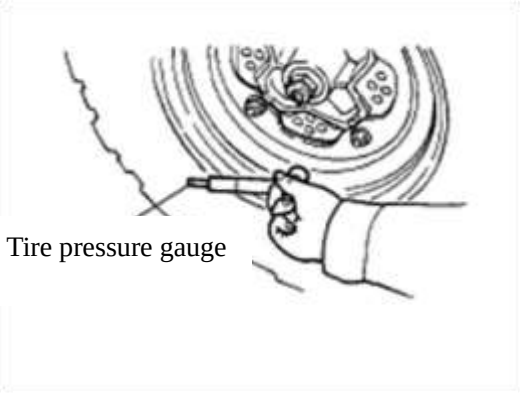
◆ Tighten the tensioner nut

◆ Tighten the rear axle nut

◆ Check the maximum tension point and readjust the tension if necessary

Tire pressure

Use a pressure gauge to check the tire pressure



Tire pressure gauge

Attention

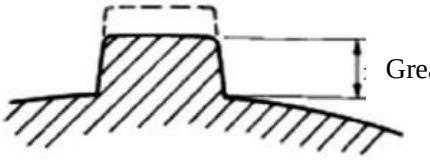
The inspection of the tire pressure should be carried out while the tire is cool. If used in a state where the tire pressure is not appropriate, it will lead to poor operation and riding comfort, and cause adverse effects such as tire bias wear.

Designated air pressure/tire

	Front wheel	Rear wheel
Air pressure	200kPa（29PSI）	250kPa（36PSI）
Tire size	See the first chapter	See the first chapter

Tire pattern

Check the tire pattern, and once the height of the pattern is less than 3mm, replace it with a new tire

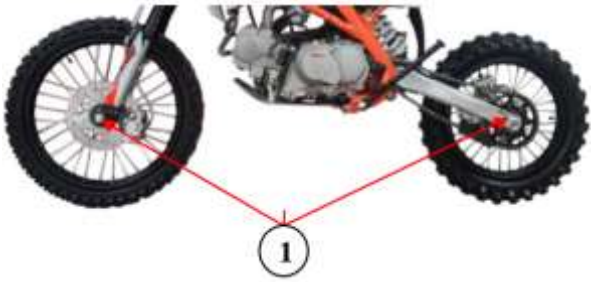


Greater than 3mm

Attention

When the tire pattern is less than 3mm, it must be replaced immediately

Wheel nuts and wheel axles
Check if the front wheel axle and rear wheel axle nut 1 are loose
Tighten according to the specified torque when there is looseness
Torque:
Front wheel axle nut: 80N·mm～90N·mm
（8kgf·mm ～ 9kgf·mm）
Rear wheel axle nut: 80N·mm～90N·mm
（8kgf·mm ～ 9kgf·mm）

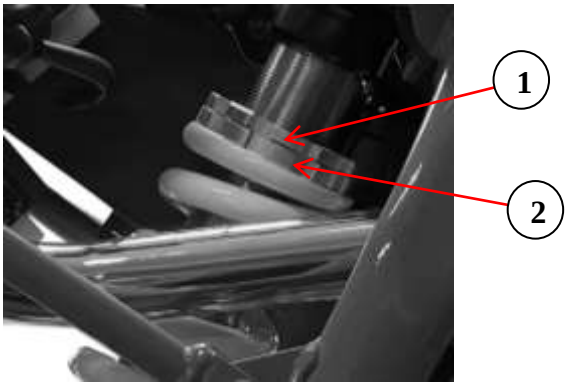


Use a tool to lift the front wheels, and when there is no force on the front wheels, shake the wheels laterally to check for any shaking, proper limit, or conflicts with the cable cables.

3.5 Suspension system

Place the vehicle body in a horizontal position and compress it up and down several times according to the position shown in the diagram. If there is shaking or abnormal noise, check whether the rebound of the shock absorber is appropriate, whether there is oil leakage, and whether each fastening part is damaged or loose.

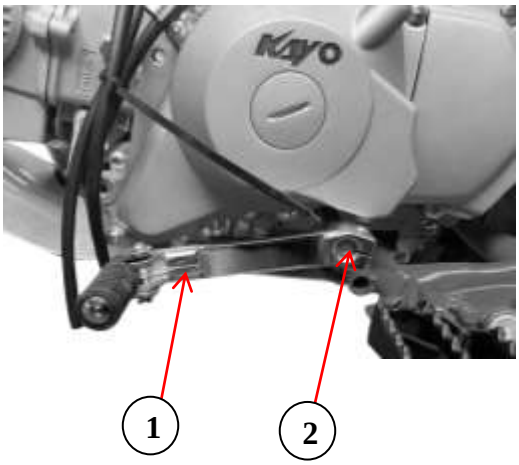
Adjustment of the shock absorbers



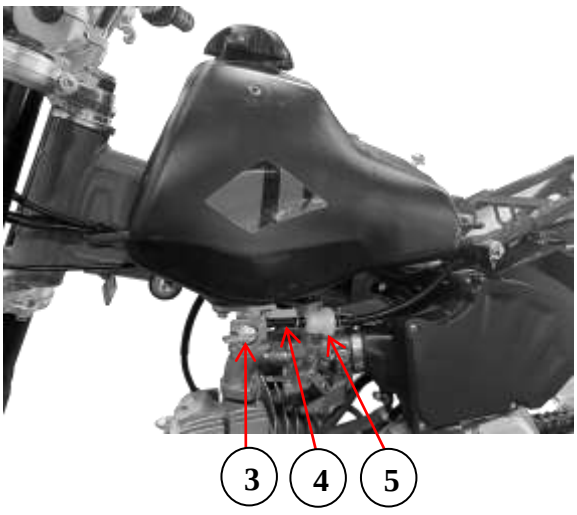
Use a special tool to adjust the adjustment turntable 1 and 2 of the shock absorber according to the load
Rotate the rotary table 1 counterclockwise (to achieve the loosening effect), and then adjust the rotary table 2 according to the appropriate hardness of the shock absorber. Clockwise rotation adjusts from low to high, and counterclockwise rotation adjusts from high to low.

3.6 Shift mechanism and fuel device

Gear shifting mechanism
Replace the gear and check if the shift lever 1 is flexible and if the gear is shifting in. If the gear is not flexible or there is abnormal movement, tighten the fixed nut 2 of the shift lever
(Installation angle is parallel to the ground and deviates by 10°)

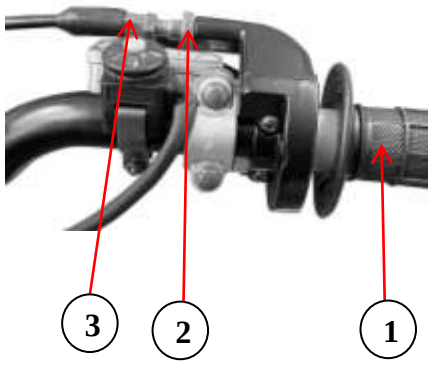


Fuel installation
The status of the fuel system
Check if oil pipe 4 is aged or damaged.
When the oil pipe is aged or damaged, replace it with a new one.
Check if there is any accumulation or damage of impurities in gasoline filter 5, and replace it with a new one in time.
Check if throttle switch 3 is normal.
Check if the fuel tank vent pipe or the adsorption pipe of the fuel evaporation system is cracked or bent. If there is any damage, replace it with a new one



3.7 Inspection of the throttle

Check the free travel of the throttle grip 1
If the travel is not comfortable, first loosen the fastening nut 2 on the grip, and then adjust the throttle wire 3 according to the tightness of the travel.
(Gap of throttle knob: 2-6mm)



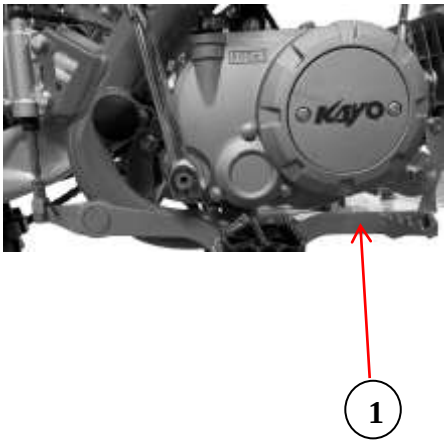
3.8 Inspection of the brake mechanism

Brake handlebar

Check if the oil pipe of the disc brake is aged or damaged.
When the oil pipe of the disc brake is aged or damaged, replace it with a new one.
Before starting the vehicle, check the brake handle to see if the braking effect and stroke of the handle are appropriate.

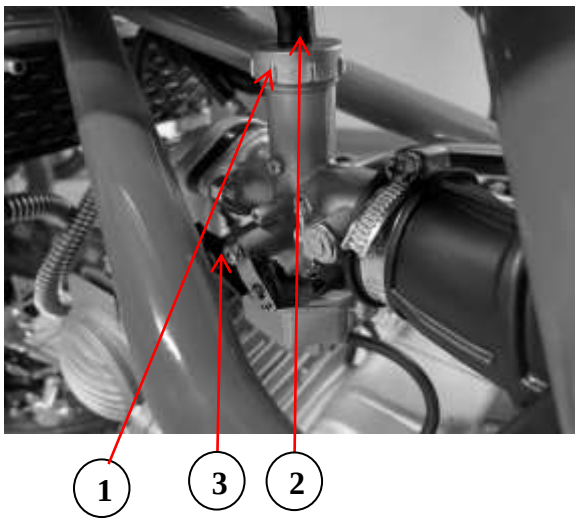
Brake pedal

Before starting the vehicle, check the brake pedal 1 to see if the braking effect and pedal travel are appropriate. Check if the torsion spring and other fasteners are installed in place and if the rebound is normal.
(Installation angle is parallel to the foot pedal and deviates by 10°)



3.9 Inspection of the carburetor

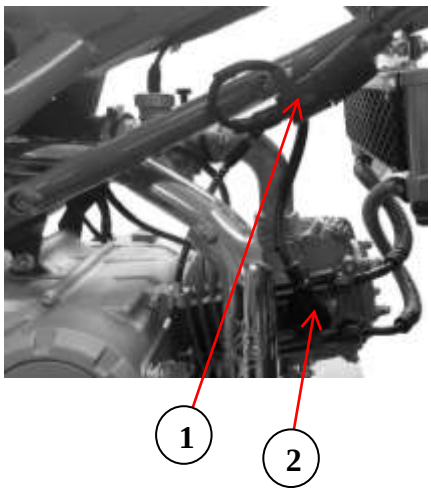
Check if the end cover 1 on the top of the carburetor is tightened, and check if the throttle wire 2 on the end cover is tightened.



If the vehicle cannot start normally due to other reasons, the damper 3 can be pulled to start. After starting, the damper must be reset to its initial position.

Attention
After adjusting all other items of the engine to the specified range, check the idle speed of the carburetor again.
The engine should be in a hot state for operation
(This model is in EPA status and has been adjusted to the specified range before leaving the factory. Adjusting the idle speed is prohibited)

3.10 Inspection of the high voltage package and spark plug



High voltage package

Before starting the vehicle, check whether the two ends of high-pressure package 1 are tightened and whether the connection is normal.
If it cannot start normally, check if the circuit diagram is correct
(→ 1.7 Wiring diagram of cables, hoses, and cables)

Spark plug

Remove the high-pressure package cover cap 2

Remove spark plug 3 using a spark plug socket wrench

Check the spark plug and replace it if the electrode is damaged or the insulation is broken. The gap of the spark plug must be appropriate and free of carbon deposits in order to achieve its excellent performance. When cleaning carbon deposits, first use a towel to wipe off dust and oil stains around the spark plug, then clean the spark plug with gasoline, and then use a brush to clean the spark plug.

Carefully screw on the spark plug by hand to avoid damaging the threads of the cylinder head. After the spark plug is seated, use a spark plug socket wrench to tighten and compress the washer.

Attention

Failure to tighten the spark plug can cause the engine to overheat or even damage the engine. Tightening too tightly can damage the spark plug hole threads in the cylinder head.

3.11 Air filter

Before starting the vehicle, check if the fasteners on the air filter are loose, otherwise it may cause a decrease in speed or even flameout.

After the air filter element becomes dirty, it will affect the intake and engine power reduction. If there is a lot of dust in the operating area, maintenance should be carried out more frequently than the maintenance schedule.

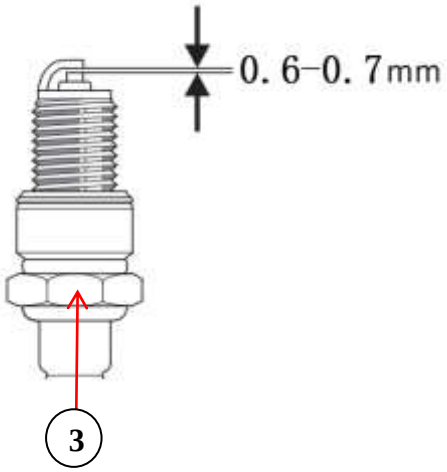
Remove bolt 1 to replace the inner filter element and filter screen.

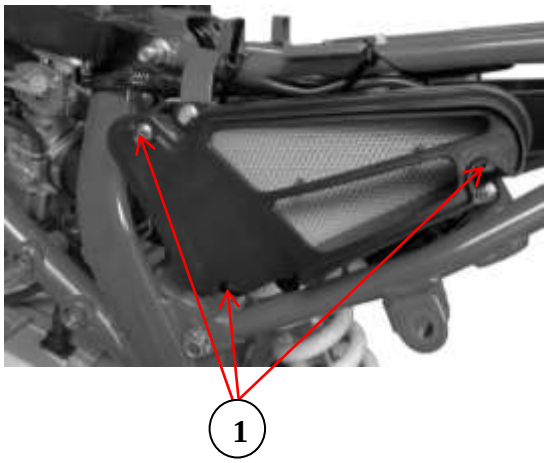
3.12 Start lever

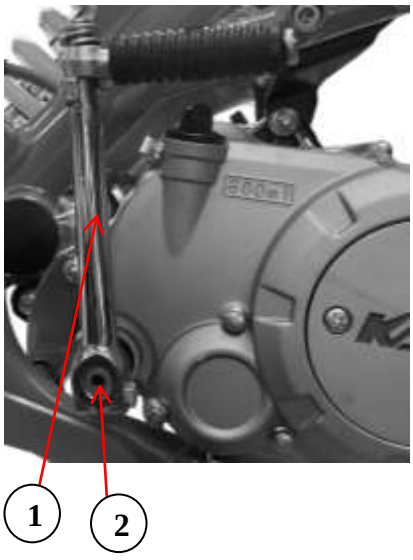
When the start switch fails, the vehicle can be started using the start lever. The steps for starting the entire vehicle are as follows:

1.Turn the fuel tank switch to the "ON" position;

2.Squeeze the clutch handle with your left hand;







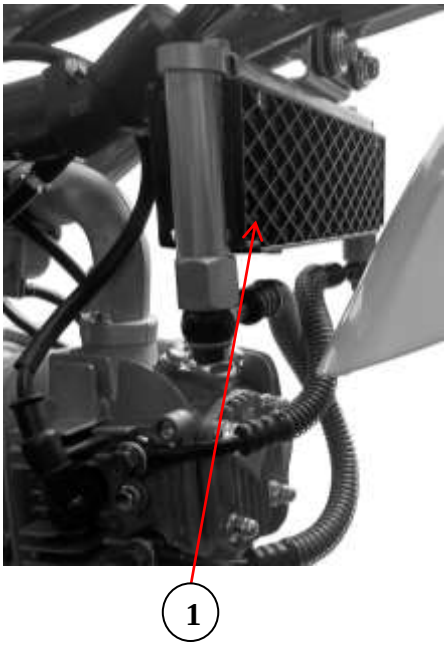
3.Squeeze the brake lever tightly with your right hand;
4.Press the right foot vigorously on the foot activation lever;
5.The engine starts working and the start lever is moved back to its original position, ending the entire vehicle's start.

Attention

Simply lubricate the joint part 2 with grease, as excessive lubrication may cause shoes to slip on the pedal and affect riding.

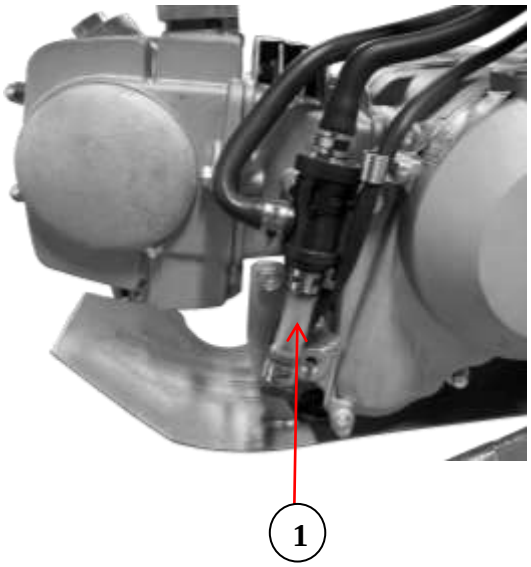
3.13 Oil cooler (only TT140 model)

Check if there is any oil leakage in the oil cooler, if the heat sink area is intact, and if there are any damages or blockages that affect the oil cooling effect.
If replacement is required, please go to an authorized Kayo distributor to replace the same specification of Kayo genuine products



3.14 Oil gas seperator

Check if the oil in the oil storage cup 1 at the bottom of the oil gas separator is almost full. Please empty it before filling it up.
(Please perform this operation after the engine is turned off and cooled for a period of time)



4 Around the engine

Maintenance information……4-1
4.1 Fuel system……...4-2
4.2 Air intake system……..4-2
4.3 Exhaust system…….....4-3
4.4 Disassembly and installation of the oil cooler……..4-5
4.5 Disassembly and installation of the engine …….4-5
4.6 Battery……..4-8

Maintenance information

Operation precautions

- During operation and maintenance, please ensure that the vehicle is stationary for no less than 1 hour with the engine turned off. Confirm that the heating components have cooled before proceeding with maintenance to avoid injury to maintenance personnel
- Be careful not to damage the frame, engine body, bolts, and cables during operation
- When disassembling the engine, in order to protect the frame, the frame should be wrapped and protected
- When the engine is removed, corresponding containers should be prepared to collect engine oil and fuel to protect the environment. During installation, the engine oil should be replenished as required
- During vehicle operation and for a period of time after operation, some components of the vehicle may experience high temperatures. Touching high-temperature components at this time can cause burns, such as mufflers, engines, etc. Please make contact after the vehicle has completely cooled down

4.1 Fuel system

Disassembly

Remove the seat cushion and front left and right guard plates

(→ The second chapter-Covering parts of the vehicle)

Remove the mounting bolt 1

(One on the left and one on the right at the front of the fuel tank)

Turn the oil switch to OFF 2

Remove the oil delivery pipe 3 (at the connection to the carburetor)

Remove the fuel tank 4

Attention

There is a gasoline filter 5 in the middle of fuel pipe 3. If there are too many impurities or damage, pull the buckles on both sides of the oil pipe outward to replace it

Gasoline is very easy to catch fire, so smoking and fire are strictly prohibited in the workplace, not only open flames, but also high attention should be paid to electric sparks

In addition, due to the risk of explosion after gasoline evaporation (vaporization), operations should be carried out in a well ventilated area. There is a one-way ventilation valve 5 on the top of the fuel tank cap, which can intercept some gasoline volatilization and other issues. Be careful not to lose it while driving.

Installation

Install in the reverse order of disassembly

Check the integrity of each oil pipe during installation

4.2 Air intake system

Carburetor

Disassembly

Fuel tank, front left guard board

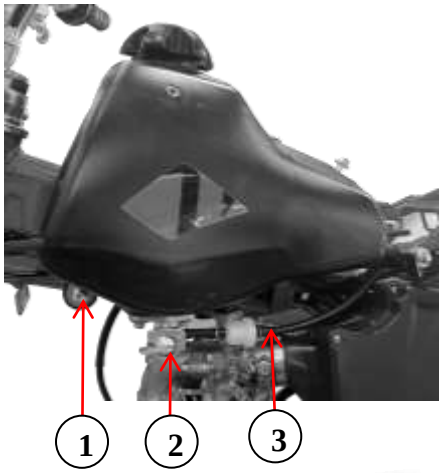
(→The second chapter-Covering parts of the vehicle)

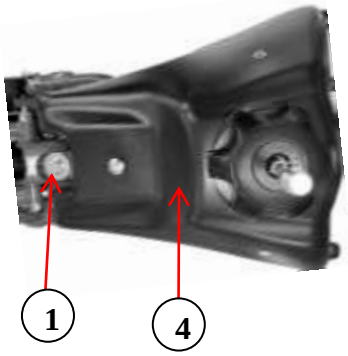
Remove the mounting bolt 1

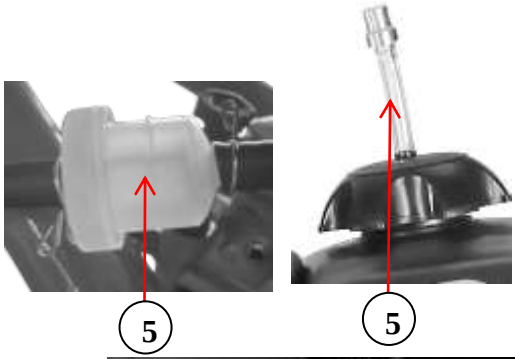
Loosen the clamp 2

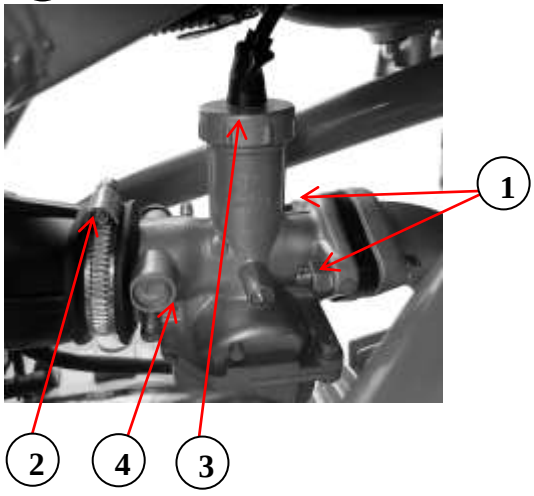
Remove the throttle cable 3

Remove the carburetor 4









disassembly

Installation

Install in the reverse order of disassembly

Air filter

Disassembly

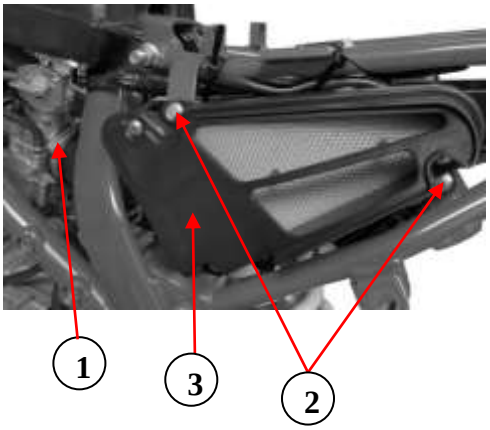
Remove the seat cushion, fuel tank, front left guard, and rear left guard

(→The second chapter-Covering parts of the vehicle)

Loosen the clamp 1

Remove the 2 mounting bolts 2

Remove the air filter 3



Installation

Install in the reverse order of disassembly

4.3 Exhaust system

Exhaust pipe

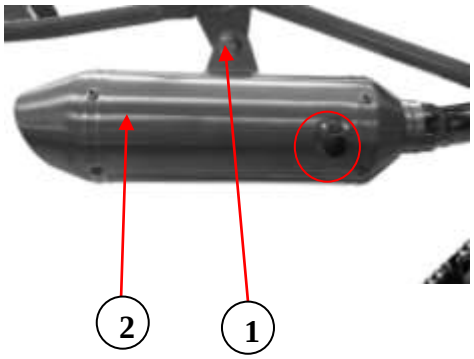
Disassembly

Right rear guard plate

(→The second chapter-Covering parts of the vehicle)

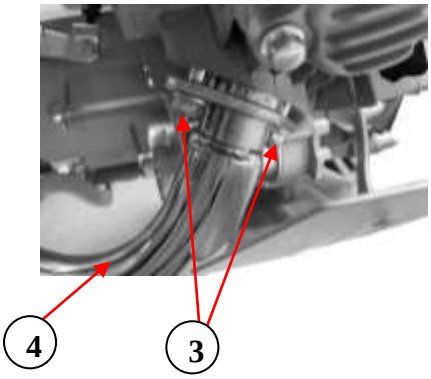
Remove the fixing bolt 1 of the muffler tube

Remove the muffler 2



Remove the fixed muffler pipe mounting bolt 3

Remove the muffler pipe 4



Attention

There is also an installed insulation column 5 in the red circle. Check if the insulation column is damaged. If the insulation column melts or is damaged, it may cause damage to the rear assembly board. There is a sealing gasket 6 at the interface of the silencing pipe, do not lose it.

Installation

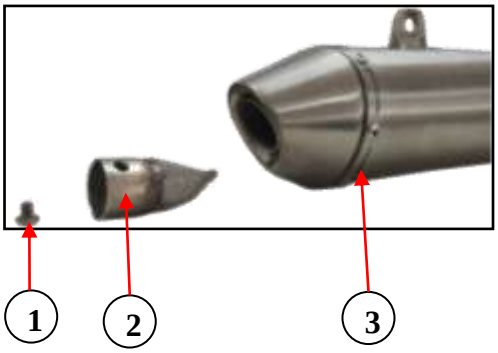
Install in the reverse order of

Spark eliminator

Please perform the following operations while the silencer is cooling to prevent burns!

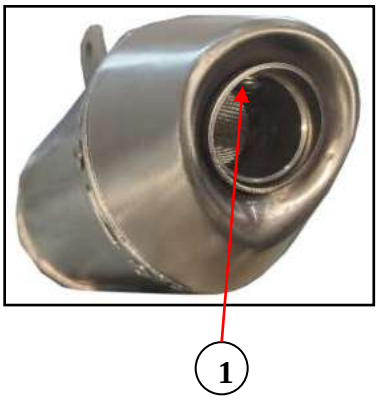
Disassembly

Remove the fixing bolt 1 of the spark arrester using an allen wrench
Remove spark eliminator 2 from muffler 3
When installing the spark arrester, proceed in the reverse order of disassembly.

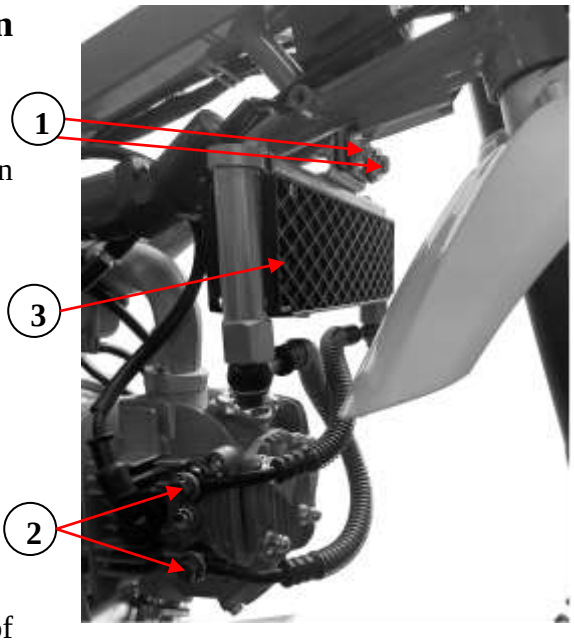


Cleaning of the spark arresters:

After removing the spark eliminator from the silencer, use a brush to remove any carbon deposits or other debris attached to the wire mesh of the spark eliminator, without damaging the wire mesh. Spark eliminators must be kept intact without any openings, holes, or other damage. If any damage is found, it must be replaced in time



4.4 Disassembly and installation of the oil cooler



(Only for TT140 models, this step can be ignored for TT125 models)

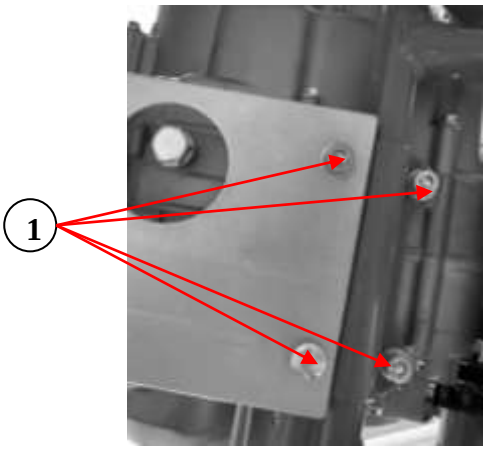
Disassembly

Remove the bolt 1 fixed to the frame
Remove the bolt 2 fixed to the engine
Remove the oil cooler 3

Installation
Install in the reverse order of disassembly

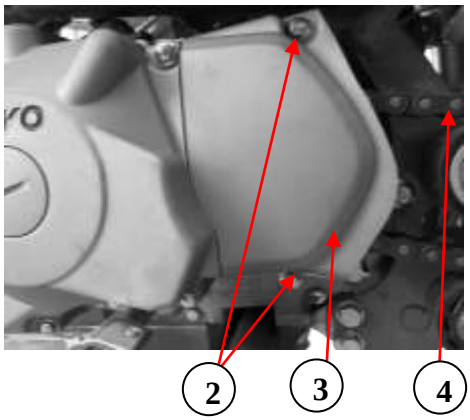
4.5 Disassembly and installation of the engine

Disassembly
Remove the seat cushion and body cover (→ The second chapter-Covering parts of the vehicle)
Remove the grounding wire, motor wire, etc. from the engine
(→ 1.7 Cable Wiring Diagram)
Remove the fuel tank
(→ 4.1 Fuel system)
Remove the air filter, carburetor, and throttle cable
(→ 4.2 Air intake system)
Remove the exhaust pipe assembly
(→ 4.3 Exhaust system)



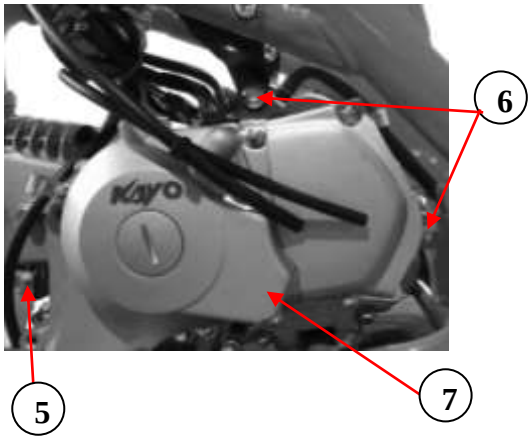
Remove the bolt 1 that secures the foot rest connection seat

Remove the fixing bolt 2
Remove the engine rear cover 3
Remove the chain 4



Remove the bolts 5 that secure the tray
Remove the bolts 6 that secure the engine (two on the left and two on the right)
Remove the engine 7

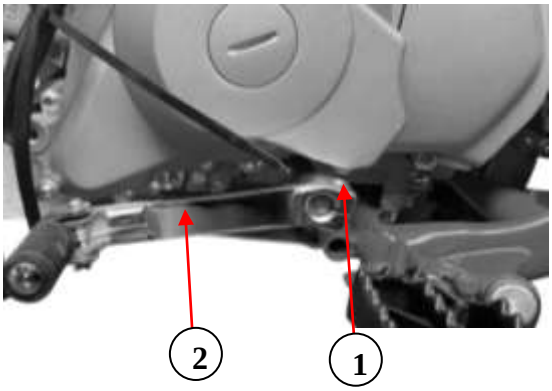
Installation
Install in the reverse order of disassembly



Engine shift lever

Disassembly

Remove the fixing bolt 1
Remove the shift lever 2

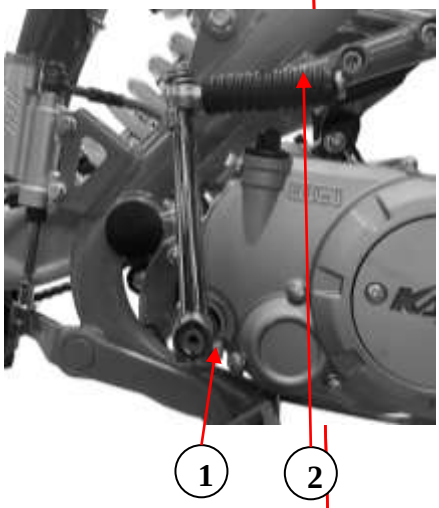


Installation
Install in the reverse order of disassembly

Engine foot start lever

Disassembly

Remove the fixing bolt 1
Remove the foot start lever 2

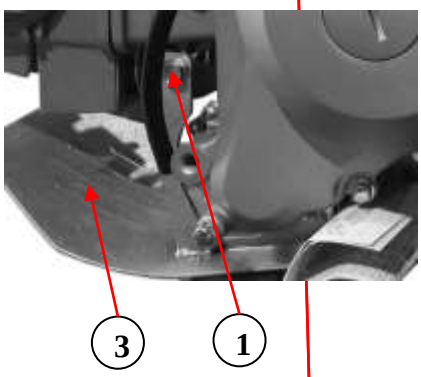


Installation
Install in the reverse order of disassembly

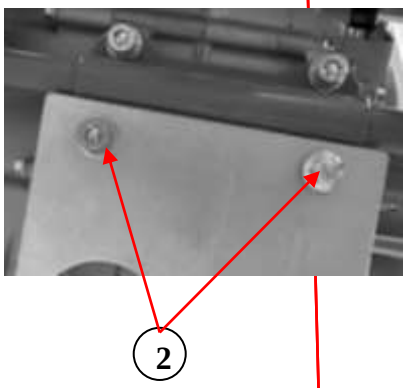
Engine tray

Disassembly

Remove the fixing bolt 1 (one on the left and one on the right)
Remove the fixing bolt 2 (located at the end of the tray)
Remove the engine tray 3



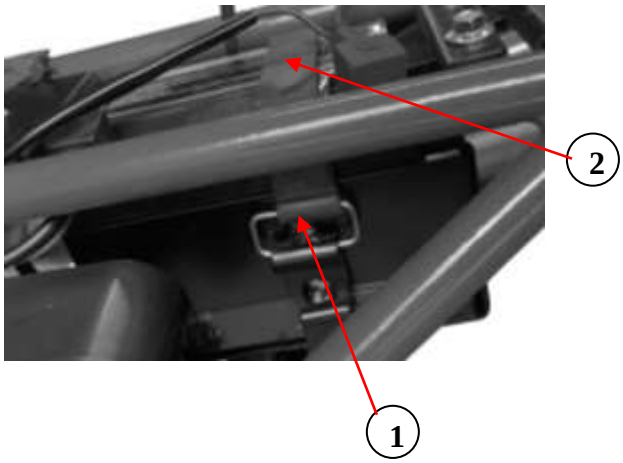
Installation
Install in the reverse order of disassembly



4.6 Battery

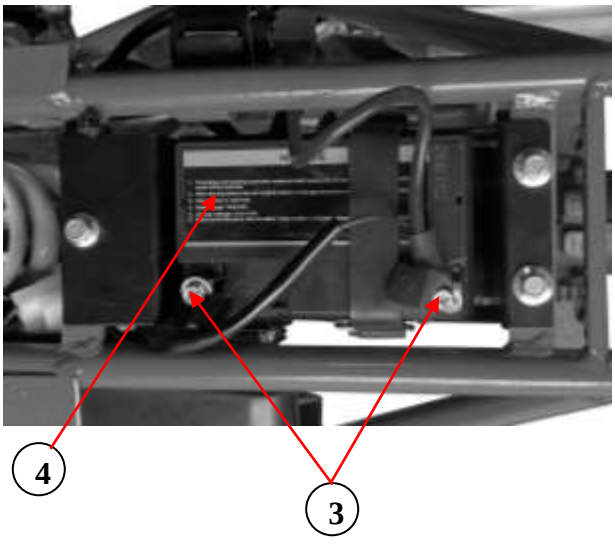
Attention

Before disassembling the battery, wear protective equipment such as gloves and goggles to avoid damage to the skin and eyes caused by other harmful substances. When disassembling the battery, the engine and power supply must be turned off first. During the disassembly process, the disassembly tool should not directly touch the positive and negative poles at the same time, causing a battery short circuit.
When disassembling, first remove the negative terminal connecting cable, and then remove the positive pole. When installing, first install the positive pole, and then the negative pole.



Disassembly

Remove the seat cushion (→ 2.3)
Remove the belt buckle 1 from the fixed battery box
Remove the belt 2 on the battery box
Pull apart the black and red square sheaths
Remove the bolt 3 fixed to the battery
Remove the battery 4



Installation

Install in the reverse order of disassembly

Attention

There are no torque requirements for bolts in this section, just tighten them

5 Engine (TT125)

Main performance technical parameters……5-2
5.1 Cylinder head and valve……...5-3
5.2 Cylinder block and piston……5-15
5.3 Clutch, driving gear, oil pump……5-21
5.4 Left crankcase cover, magneto, starter motor…….....5-29
5.5 Crankcase, crankshaft, transmission gear…….....5-35

Main performance technical parameters

Items			Specifications
Engine	Model		1P54FMI-2
	Type and number of cylinders		Single cylinder, air-cooled, four stroke, horizontal
	Cylinder diameter × stroke		Φ54×54mm
	Cylinder working volume		123.7ml
	Compression ratio		9.0：1
	Carburetor form		PZ26
	Lubrication method		Pressure+splash
	Starting method		Electric start+foot start
	Maximum power/corresponding speed		6.8KW/7000rpm
	Maximum torque/corresponding speed		9.75N.m/6000rpm
	Idling		1650±150 r /min
Drive system	Clutch		Manual wet multi plate
	Transmission		Four speed constant mesh type
	Variable speed mode		Left foot operated reciprocating
	Primary reduction ratio		3.722
	Gear ratio	1st gear	3.273
		2nd gear	1.938
		3rd gear	1.352
		4th gear	1.05
		5th gear	
		6th gear	
Ignition system	Ignition method		C.D.I Contactless ignition
	Spark plug		A7RTC
	Spark plug gap		0.6mm-0.7mm
Oils	Fuel grade		≥RQ93
	Engine oil	Specifications	10W/40-SN
		Capacity	0.85L

Cylinder head and valve

Maintenance instructions
Troubleshooting
Disassembly of the cylinder head valve cover and left cylinder head cover
Disassembly of the cylinder head cover
Disassembly of the cylinder head
Disassembly of the cylinder head
Inspection of the valves and valve springs
Inspection of the valve rocker arm and rocker arm shaft
Inspection of the camshaft components
Inspection of the spark plugs
Inspection of the cylinder head
Inspection and grinding of the valve seats
Inspection of the valve guide
Replacement of the valve guide
Measure the width of the valve seat contact surface
Assembly of the cylinder head
Installation of the cylinder head
Installation of the cylinder head cover
Installation of the cylinder head driven sprocket
Installation of the cylinder head valves

Maintenance instructions

Precautions:

- The lubrication of the camshaft and rocker arm is carried out by the oil passage on the cylinder head entering the camshaft through the oil hole on the right cover. Foreign objects must not enter the oil passage on the cylinder head, right cover, and camshaft, and it should be kept unobstructed.
- Before installing the cylinder head, the cylinder head positioning pin must be assembled properly.
- The camshaft should not have scratches, and oil should be applied first during assembly.

Technical specifications

Items	Standard value mm	Maintenance limit value mm
Axial gap between rocker arm and cylinder head rocker arm opening gear	0.1～0.35	0.5
Radial gap between rocker arm and rocker arm shaft	0.005～0.028	0.05
Free length of the valve spring	Valve outer spring 35.55	34.55
	Valve inner spring 32.78	31.78
Valve gap	0.01～0.03	------
Cam shaft base circle runout	0.02	0.04

Items			Standard value mm	Maintenance limit value mm
Valve	Valve stem outer diameter	Intake	φ4.970～φ4.985	φ4.955
		Exhaust	φ4.955～φ4.970	φ4.940
	Inner diameter of valve guide	Intake	φ5～φ5.012	φ5.035
		Exhaust	φ5～φ5.012	φ5.035
	Gap between valve stem and guide tube	Intake	0.015～0.042	0.075
		Exhaust	0.03～0.057	0.085
	Valve sealing strip width		1.5	----
Cylinder head	Flatness		0.05	0.07
	Valve seat sealing surface width		0.8	----

Troubleshooting

Low cylinder air pressure:

1.Valve

--Incorrect valve gap adjustment

--Valve sealing is not tight

--Incorrect valve timing

--Broken valve spring

2.Cylinder head

--Spark plug not tightly connected to cylinder head

--Damaged cylinder head gasket

--Cracks or sand holes in the cylinder head

3.Cylinder body, piston, piston ring

--Excessive or broken piston ring gap

--The piston has cracks or excessive wear

--Excessive diameter or sand holes in the cylinder body

Blue smoke in the exhaust

1.Worn valve guide

2.Leakage or damage of the oil shield

3.Leakage of the cylinder head sealing gasket

4.Excessive piston ring gap

5.Excessive mesh wear on the inner diameter of the cylinder body

Excessive noise or abnormal noise

1.Incorrect valve adjustment

2.Valve stuck or valve spring broken

3.Excessive wear of the rocker arm

4.Incorrect valve timing

5.Worn camshaft

Disassembly of the cylinder head valve cover

1. Use a 17 ring wrench to remove the valve covers for the intake and exhaust of the cylinder head;

2. Remove the O-ring of the valve cover for the intake and exhaust of the cylinder head.

Disassembly of the left cylinder head cover

1. Remove the bolt M6 fastening the left cover of the cylinder head × 110. Aluminum pad;

2.Remove the left cover of the cylinder head and the sealing of the left cover of the cylinder head.

Disassembly of the cylinder head cover

1.Remove the four cap nuts, iron washers, and copper washers that fasten the top cover of the cylinder head

(Pay attention to the assembly position of the copper pad);

2.Remove the cylinder head cover Remove the sealing gasket of the cylinder head cover.

Disassembly of the cylinder head

1.Remove the timing bolt that fastens the timing driven sprocket and remove the timing driven sprocket installed on the camshaft;

2.Remove the connecting bolts between the cylinder head and cylinder block;

3.Remove the cylinder head assembly and place it on the maintenance bench;

3. Remove the disc bolts that fasten the right cover of the cylinder head, and then remove the right cover and sealing gasket;

4. Remove the intake and exhaust rocker shafts, and then remove the intake and exhaust rocker arms and limit plate components;

6.Remove the camshaft assembly;

7.Remove the spark plug using a spark plug socket.。

Disassembly of the cylinder head

1.Use a valve remover to press down the valve spring, remove the valve lock clamp, and then loosen the valve remover to remove the valve spring seat, valve outer spring, inner spring, and outer spring seat ring;

2.Remove the intake and exhaust valves.

Attention：

1.In order to prevent permanent deformation of the valve spring, it is not necessary to compress the valve spring too much, just remove the valve lock clamp;

2.All removed parts should be marked to ensure that they reach their original assembly position during assembly.

Inspection of the valves and valve springs

Check if the valve is bent, burned or has abnormal wear on the valve stem, and measure the outer diameter of the valve stem. Maintenance limit value:

Intake: φ 4.955mm

Exhaust: φ 4.940mm

Maintenance limit value of the valve sealing strip width: 2.0mm

Attention：

If the valve sealing strip is rough, unevenly worn, or has abnormal contact with the valve seat, which cannot guarantee sealing performance, the valve should be replaced.

Measure the free length of the valve spring:

Outer spring 35.55mm, maintenance limit value: 34.55mm;

Inner spring 32.78mm, maintenance limit value: 31.78mm;

Inspection of the valve rocker arm and rocker arm shaft

1. Check if there is abnormal wear or damage to the valve rocker arm. If there is abnormal wear or severe damage to the R circular surface, a new valve rocker arm needs to be replaced.

2. Check if there is abnormal wear on the outer circle of the rocker arm shaft. If the wear is severe, it is necessary to replace the rocker arm shaft with a new one.

Inspection of the camshaft components

1.Check whether the convex surface of the camshaft is worn or damaged, and whether the bearings at both ends of the camshaft rotate flexibly. If the wear is severe or the bearings rotate with jamming, replace the camshaft components with new ones;

Inspection of the spark plugs

1.The gap between the side electrode and the center electrode is 0.6-0.7mm. Insert a 0.6-0.7mm thickness gauge between two electrodes. If the gap is too large, gently tap the side electrode to press the thickness gauge. On the contrary, the side electrode should be adjusted so that it can be inserted.

Inspection of the cylinder head

1.Check if the sealing of the cylinder head is good. If the sealing of the cylinder head is poor, it should be replaced with a new cylinder head or intake and exhaust valve;

2.Check for cracks in the spark plug hole and valve seat;

3.Check whether the cylinder head is deformed, and use a knife edge ruler and a feeler gauge to check the flatness of the cylinder head (limit size 0.07mm).

Inspection and grinding of the valve seats

Completely remove the carbon deposits in the combustion chamber, apply a thin layer of red ink evenly on the valve seat, place the valve on the valve seat, gently tap the valve not to rotate, and then extract the valve. If there are intermittent contact marks on the valve working surface, the valve seat should be ground and repaired.

Firstly, remove the carbon deposits on the intake and exhaust valve seats, then apply abrasive to the valve seats, and then use a rubber tipped grinding tool to suck on the valve and grind the valve seats.

Inspection of the valve guide

Measure the inner diameter of each valve guide with a dial gauge and make a record.

Maintenance limit value:

Inner diameter of intake duct: φ 5.035 mm

Inner diameter of exhaust duct: φ 5.035 mm

Attention：

Before measuring the inner diameter of the valve guide, the carbon deposits inside the guide should be completely removed.

If the valve guide needs to be replaced, the valve seat should undergo a new sealing surface grinding treatment, and each valve should be inserted into the guide, observing its movement, and finally calculating the gap between the valve stem and the valve guide.

Maintenance limit gap: intake: 0.075 mm

Exhaust: 0.085mm

Valve guide replacement

After heating the cylinder head in a constant temperature oven to 100-150 degrees Celsius, remove and support the cylinder head (be careful not to burn), and use a valve disassembly tool to drive the valve guide towards the rocker arm chamber side.

Attention：When removing the valve guide, do not damage the cylinder head

Press the new valve guide in place and expand the hole of the newly installed valve guide after the cylinder head cools down.

Attention：

When expanding holes, cutting oil must be applied to the reamer, and rotation should be carried out when installing or removing the reamer.

Finally, clean the cylinder head with a cleaning agent and use compressed air to remove any metal chips that have accumulated on the cylinder head.

Measure the width of the valve seat sealing surface

Maintenance limit value: 1.5 mm

If the sealing surface of the valve seat is too wide, too narrow, or has dents, the valve seat should be ground to achieve the correct sealing width.

When grinding the valve, use an electric gun to cover the rubber tube (using a tight fit), and then place the valve stem on the rubber tube. Apply a small amount of graphite paste used for grinding to the valve sealing strip, and then fit it onto the valve seat sealing line. Start the electric gun, rotate the valve, and grind the valve and seat ring together.

After grinding, check whether the sealing line between the valve and seat ring has been ground, otherwise it should be re ground. If the grinding is not in place, the valve or cylinder head should be replaced.

Assembly of the cylinder head

1.Seal the valve outer spring seat and valve oil onto the valve guide;

2.After applying lubricating oil to the stems of the intake and exhaust valves, install them into the valve guide, install the valve inner and outer springs, and valve spring seats;

3.Use a valve remover to press down the valve spring, and then install the valve lock clip into the valve spring seat;

Attention：

1.The spiral density of the inner and outer springs of the valve is relatively sparse, with one end facing outward in the direction of the color code;

2.To prevent permanent deformation of the valve spring, the spring should not be excessively compressed to fit into the valve lock clamp.

4.Check if the valve lock clamp is properly assembled;

5.Conduct air tightness testing on the assembled cylinder head assembly. If there is no leakage in the cylinder head assembly, proceed to the next step of operation;

6.Install the camshaft assembly into the cylinder head hole.

7.Place the valve rocker arm and limit plate assembly into the cylinder head groove, and then assemble the rocker arm shaft into place through the cylinder head and valve rocker arm holes;

8.Install the sealing gasket on the right cover of the cylinder head and the right cover of the cylinder head, install the bolts into the corresponding holes on the cylinder head, and tighten them.

Attention：

1.After the cylinder head is installed, rotate the rocker arm. The rocker arm should rotate flexibly without any jamming,

2.Tightening torque of the right cover fixing bolt: 8-12N·m.

Installation of the cylinder head

1.Remove the old cylinder head gasket, install the new cylinder head gasket, and then install the positioning pin;

2.Tighten the chain and install the timing driven sprocket into the timing chain assembly. At this time, the O-ring mark, connecting screw hole, and key groove of the crank connecting rod component of the timing driven sprocket should be in a straight line;

3.Install a flanged bushing and a small rectangular sealing ring at the oil hole position of the double head bolt B, and install a large rectangular sealing ring and a return channel rectangular ring bushing at the corresponding positions;

4.Pass the combination of the timing driven sprocket and timing chain through the chain cavity of the cylinder head component, assemble the cylinder head component on the cylinder block, use the connecting bolt of the left cover of the cylinder head to cover the aluminum washer, and insert it into the timing driven sprocket hole through the center hole of the right cover of the cylinder head through the camshaft combination hole.

Installation of the cylinder head cover

1.Install the sealing gasket on the cylinder head cover, paying attention to the direction of the hole position and not installing it incorrectly;

2.Align the arrow direction of the cylinder head cover with the direction of the cylinder head exhaust port and install it on the cylinder head part;

3.Install copper washers on the oil passage holes of the double head bolts B on the cylinder head cover, and iron washers on other positions. Then, install cap nuts separately and screw them in more than three threads by hand. Use a gun to pre tighten the copper washers using the diagonal cross over method, and then tighten them using a torque wrench cross over method.

Attention：

1.Do not allow dust and foreign objects to enter the cylinder;

2.Tightening torque of bolts A and B: 13-16N·m;

3.The copper washer is assembled on the B bolt at the oil passage.

Installation of the cylinder head timing driven sprocket

1.Connect the cylinder head components and cylinder block with bolts, pre tighten with a plum blossom gun head, torque: 8-12N·m.

2.Rotate the crank connecting rod components to align the center of the keyway with the top connecting hole of the cylinder block;

3.Hang the timing driven sprocket on the camshaft assembly, aligning the center of the half circle key of the crank connecting rod component, the O-ring mark of the timing driven sprocket, and the notch of the cylinder head timing mark on the same straight line;

4.Move the camshaft assembly to align the threaded hole of the camshaft assembly flange with the timing driven sprocket hole, then tighten it with the timing sprocket bolt with a tightening torque of 7-11N·m, and then tighten the spark plug with a torque wrench with a torque of 11N·m

5.Check if the engine is in the timing position. If it is not, readjust the timing position of the engine.

Method of timing adjustment:

(1) Remove the large and small view hole covers of the left front cover and the left cover of the cylinder head;

(2) Rotate the locking nut of the magneto with a special tool, and observe whether the timing line "|" on the magneto rotor is aligned with the timing mark on the small viewing hole "|" on the left front cover through the timing mark on the left front cover;

(3) After aligning the above timing marks, pay attention to observing whether the timing mark "o" on the timing driven sprocket is in line with the notch of the cylinder head timing mark; Only when both (2) and (3) are met can the engine be in the correct timing position.

After adjusting the timing position, assemble the large and small sight glass covers onto the left front cover and then install the left cover of the cylinder head.

Installation of the cylinder head valve cover

1.Install the sealing gasket on the left cover of the cylinder head;

2.Clip the convex part of the cylinder head into the slot of the inner hole of the left cylinder head cover, and then tighten the connecting bolt of the left cylinder head cover with a torque of 8-12 N;

3.Place the intake and exhaust valves in a closed state, adjust the valve adjustment screws to ensure that the gap between the screws and the valve is between 0.01 to 0.03mm for intake and 0.01 to 0.03mm for exhaust. Tighten the valve adjustment nut with a torque of 9-11N·m;

4.Install the valve cover with an O-ring and tighten it onto the screw hole of the intake and exhaust valve chamber, with a torque of 12-16N·m.

Cylinder body and piston

Maintenance instructions **Inspection of the pistons, piston rings, and piston pins**
Troubleshooting **Installation of the piston rings**
Dismantling of the cylinder body **Installation of the piston**
Inspection of the cylinder body **Installation of the cylinder block**
Disassembly of the piston

Maintenance instructions

Precautions：

- The lubricating oil at the cylinder head is transmitted to the cylinder head through the small oil hole next to the B bolt in the right crankcase of the engine. Before installing the cylinder, ensure that the small oil hole next to the B bolt in the right crankcase is unobstructed.
- Do not allow dust or dust to seep into the crankcase.

Technical specifications

Items			Standard value mm	Maintenance limit value mm
Cylinder body	Inner diameter of cylinder body		φ54.00～φ54.01	φ52.42
	Out of roundness		0.007	0.012
	Flatness of cylinder surface		0.05	0.07
Pistons, piston rings, piston pins	Outer diameter of piston		φ53.975～φ53.985	φ53.945
	Inner diameter of piston pin hole		φ14.002～φ14.008	φ14.018
	Gap between piston pin and piston pin hole		0.002～0.014	0.028
	Piston ring closing gap	Top ring/second ring	0.1～0.3	0.5
		Oil ring	0.2～0.7	1.4
	Gap between piston ring and piston ring groove	Top ring	0.02～0.06	0.08
		Second ring	0.02～0.06	0.08
	Gap between cylinder bodyand piston		0.02～0.035	0.075
	Outer diameter of the piston pin		φ13.994～φ14.000	φ13.990
Connecting rod small end	Internal diameter		φ14.016～φ14.028	φ14.04
	Gap between connecting rod small end and piston pin		0.016～0.034	0.05

Troubleshooting

Low or unstable compression force

The cylinder bodyor piston ring is worn

Discharge excessive black smoke

1.Worn cylinder body, piston or piston ring
2.Incorrect installation of piston rings
3.Scratches or scratches on the piston or cylinder bodywall

Overheating

Excessive carbon accumulation on the piston

Knock or abnormal noise

1.Worn piston or cylinder
2.Excessive carbon accumulation on the piston

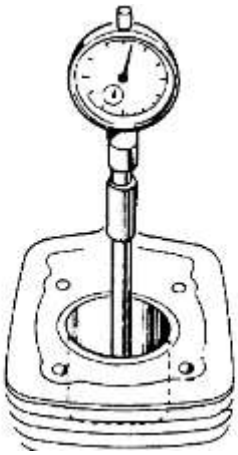
Disassembly of the cylinder block

1.Remove the timing driven sprocket, remove the chain guide wheel bolts and aluminum washers, remove the chain guide wheel, remove the cylinder block connecting bolts, and remove the cylinder block.

Scrape the remaining gasket on the surface of the cylinder block clean with a scraper.

Attention：

If the gasket is immersed in gasoline, it is easy to disassemble. When performing this operation, avoid damaging the contact surface of the cylinder block.



Inspection of the cylinder block

Check the cylinder block for wear or damage.

To measure the inner diameter of the cylinder block, three positions should be taken, namely the top, middle, and bottom of the piston stroke. Measurements should be made in two directions that are at right angles to each other.

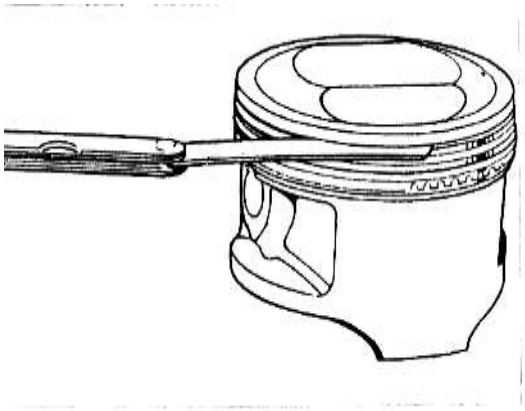
Maintenance limit value: φ 54.02mm

Disassembly of the piston

Use pointed nose pliers to remove the piston pin retaining ring and remove the piston pin and piston.

Attention：

Do not drop the piston pin retainer ring into the crankcase when removing it



Inspection of the pistons and piston rings

Remove the piston ring;

Attention：Do not damage the piston ring during disassembly.

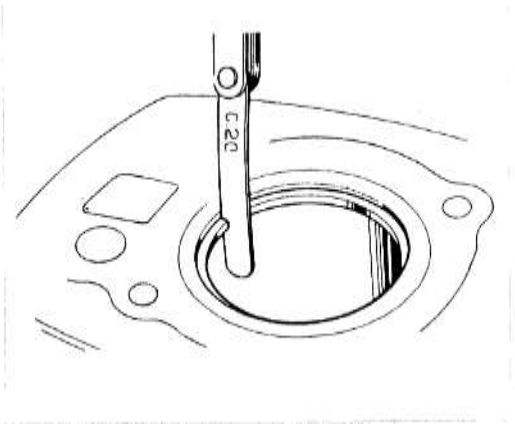
Measure the gap between the piston ring and the piston ring groove, maintenance limit value:

The first ring: 0.08mm

The second ring: 0.08 mm

Oil ring: 0.15 mm

Check whether the piston is worn or cracked, and whether the piston ring groove is worn.



Insert the piston ring into the cylinder and measure the closing gap of the piston ring.

Maintenance limit value:

The first ring: 0.5mm

The second ring: 0.5mm

Oil ring: 1.4 mm

Measure the inner diameter of the piston pin hole:

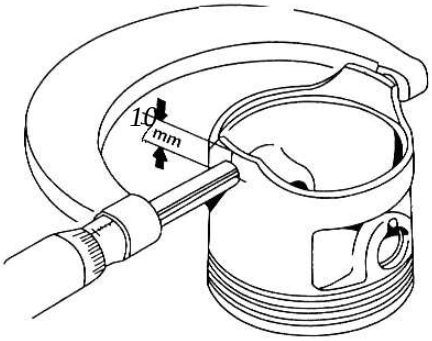
Maintenance limit value:φ14.018mm

Measure the outer diameter at a height of 7 mm from the piston skirt

Maintenance limit value: ϕ 53.945mm

Calculate the gap between the cylinder and piston.

Maintenance limit value: 0.085mm



Measure the outer diameter of the piston pin

Maintenance limit value: 13.99 mm

Calculate the gap between the piston and piston pin

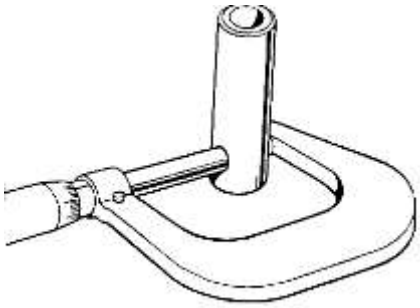
Maintenance limit value: 0.028mm

Installation of the piston rings

1.Thoroughly clean the piston ring groove;

2.Install the oil ring assembly, piston ring (second ring), and piston ring (first ring) in sequence;

3.Install the piston pin retaining ring at the unmarked end of the piston pin hole, with the opening and notch staggered by 120 degrees.



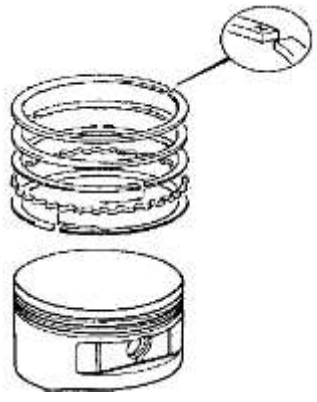
Attention：

1.During installation, the piston and piston ring should be prevented from being damaged;

2.When installing the piston ring, the first and second rings should not be installed incorrectly, and the marked side of the first and second rings should face the top of the piston;

3.After installation, the piston ring should rotate flexibly.

3.The gap between each ring in the oil ring should match the gap of the lining ring before it can be used; When installing the oil ring, the lining ring should be installed first, and then the scraper ring should be installed.



Installation of the piston

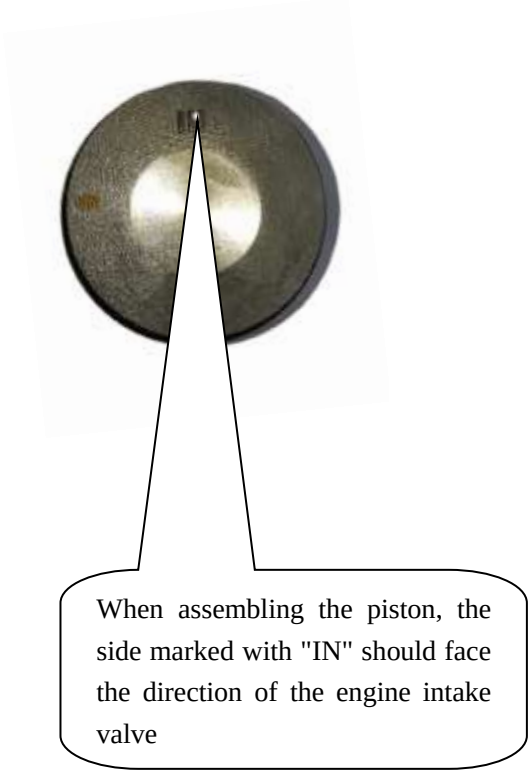
Install the piston components and piston pins on the small end of the connecting rod, with IN facing the inlet valve direction. Install the piston pin retainer ring at the left end of the piston pin hole, and manually stagger the opening of the piston ring 1, 2, and oil ring assembly by 120°. Install the piston, piston pin, and piston pin retainer ring.

Attention：

1.When installing the piston, the side marked with "IN" should face the direction of the engine's intake valve;

2.If the piston pin retaining ring is severely deformed, it must be replaced with a new one;

3.Do not let the piston pin retainer fall into the crankcase.



Installation of the cylinder block

1.Insert two positioning pins into the double head bolt A and install them into the pin hole of the left crankcase component, and replace with a new cylinder block sealing gasket;

2.Install a middle rectangular sealing ring into the oil return passage of the left crankcase component;

3.Apply a layer of engine oil evenly on the surface of the cylinder block, piston, and piston ring;

4.First, stagger the openings between the piston rings by 120°, and then gently assemble the cylinder body in place;

5.Pass the timing chain assembly through the chain cavity end of the cylinder block and suspend it outside the cylinder body;

6.Install the chain guide wheel into the chain cavity of the cylinder block, install the chain guide wheel bolts and aluminum pads, and tighten them with a torque of 10-14N·m. Install the cylinder block connecting bolts and tighten them.

Attention：When installing the cylinder block, avoid damaging the piston rings.

Clutch, driving gear, oil pump

Maintenance instructions
Troubleshooting
Removal of the right crankcase cover
Disassembly of the clutch
Disassembly of the driving and driven gears
Removal of the oil pump
Inspection of the right crankcase cover
Inspection of the clutch cover
Inspection of the clutch friction plate
Inspection of the driven gear, driving gear, and driving gear shaft sleeve
Inspection of the oil pump
Inspection of the oil filter screen
Assembly of the oil filter screen and oil pump
Assembly of the driven gears, driving gears, and driving gear bushings
Assembly of the clutch
Installation of the clutch
Assembly of the right crankcase cover
Installation of the right crankcase cover

Maintenance instructions

Explanation：

After removing the right crankcase cover, the disassembly, installation, and maintenance work related to the clutch and oil pump can be carried out without removing the engine.

Technical specifications

Items		Standard value mm	Maintenance limit value mm
Clutch	Free length of the spring	20.1～20.9	19.5
	Free thickness of the friction active plate	2.80～3.00	2.70
	Flatness of the clutch driven plate	0.1	0.14
	Gap between clutch gear sleeve and friction driving plate	0.03～0.10	0.20
Oil pump	Radial gap between outer and inner rotors	0.06～0.15	----
	End face gap between rotor assembly and cover plate	0.04～0.1	----

Troubleshooting

Clutch

If there is a malfunction in the operation of the clutch, it can usually be corrected by adjusting the free stroke of the clutch handle.

Clutch slipping during acceleration

1.Insufficient free travel
2.The outer cover is worn
3.Clutch plate bending

After releasing the clutch, the vehicle will slowly move

1.Excessive free travel
2.The clutch plate is bent

Excessive handle pressure

1.Clutch cable sticking, damaged or unclean
2.The clutch release mechanism is damaged

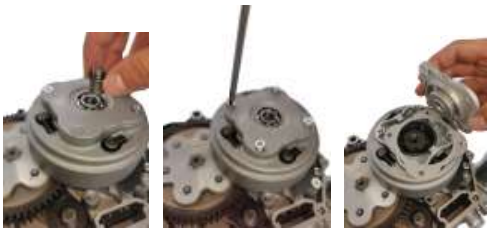
Oil pressure too low

1.Oil pump malfunction
2.Oil pump drive gear broken
3.The oil passage is blocked

Disassembly of the right crankcase cover

1.Firstly, drain the oil (remove the oil drain bolt and gasket below the right box, and wait for the oil in the box to flow out);

2.Remove the fastening bolts of the right cover, remove the right crankcase cover and the sealing gasket of the right crankcase cover.



Disassembly of the clutch

1.Remove the clutch oil pipe, oil pipe, and spring;

2.Remove the clutch end cover bolts, and then remove the end cover and sealing gasket;

3.Remove the clutch lock nut and retaining washer;

4.Remove the clutch assembly (remove the large clutch retainer ring, take out the clutch friction plate, driven plate, gear sleeve, driving plate, main spring, and release spring. Attention: Do not disassemble the clutch assembly unless necessary.)

Disassembly of the driving and driven gears

1.Remove the driving gear and driving gear shaft sleeve;

2.Remove the driven gear retainer ring and the driven gear.

Disassembly of the oil pump

1.Remove the fastening bolts of the oil pump;

2.Remove the oil pump components and oil pump sealing gasket;

Inspection of the right crankcase cover

1.Check if the O-ring of the oil dipstick on the right crankcase cover is damaged. If the O-ring is found to be broken, replace it with a new one;

2.Check if the crankshaft oil seal of the right crankcase cover is damaged. If the oil seal is found to be broken, replace it with a new one;

3.Check if the starting shaft oil seal and clutch push rod oil seal are damaged. If any oil seal cracks are found, a new oil seal needs to be replaced.

Inspection of the clutch spring

Measure the free length of the clutch spring

Maintenance limit value: 19.5mm

Inspection of the clutch friction plate

If there are scratches or discoloration marks on the clutch friction plate, it should be replaced. Measure the thickness of each clutch friction plate.

Maintenance limit value: 2.7mm

Check whether the surface of the clutch driven plate is twisted, and use a feeler gauge during the inspection.

Maintenance limit value: 0.14 mm

Check the gap between the clutch gear sleeve and the friction plate.

Maintenance limit value: 0.2 mm

Inspection of the clutch cover

Check if the grooves on the drum shape of the outer cover are nicked or scratched due to clutch disc friction. If severe, replace the outer cover.

Inspection of the driven gear, driving gear, and driving gear shaft sleeve

1.Check the driven gears for wear and damage. If the wear and damage are severe, replace the driven gears with new ones.

2.Check the driving gear and shaft sleeve for wear and damage. If the wear and damage are severe, replace them with new ones.

Attention：The oil hole of the driving gear shaft sleeve must not be blocked.

Inspection of the oil pump

1.Check if there is any wear or damage to the inner and outer rotors of the oil pump. If the wear and damage are severe, replace the oil pump rotor component with a new one;

Radial gap between outer rotor and inner rotor: 0.06-0.15

2.Check if the oil pump cover plate is worn or damaged, and if so, replace it with a new right oil pump cover plate;

End face gap between rotor assembly and cover plate: 0.04-0.1

3.Check the oil pump gear for wear

and damage, and if so, replace it with a new one.

Inspection of the oil filter screen

1.Check if the engine oil filter screen is blocked or damaged. If it is blocked, clean and remove the blockage on the filter screen. If the filter screen is damaged, replace it with a new engine oil filter screen.

Assembly of the oil filter screen and oil pump

1.Install the engine oil filter screen assembly 1 (in the thin direction);

2.Install the oil pump positioning pin, oil pump sealing gasket, and oil pump assembly, and tighten them with bolts;

3.Apply an appropriate amount of sealant to the outer circle of the oil drain bolt thread, install the oil drain bolt and gasket, and tighten them (if the gasket is deformed, replace it with a new one). Tightening torque: 20-25N. m.

Assembly of the driven gear, driving gear, and driving gear shaft sleeve

1.Install the clutch shaft sleeve, apply an appropriate amount of engine oil to the outer circle of the clutch shaft sleeve, and then install the driving gear and rotate flexibly;

2.Install the driven gear combination and clip the driven gear retainer ring into the groove of the spindle component.

Attention：

1.After tightening the bolts, check whether the oil pump gear rotates flexibly and without jamming;

2.Check if the oil passage at the combination of the cylinder surface oil passage and oil filter screen of the right crankcase component

body is unobstructed.

3.The driving gear has a stepped end facing outward.

Assembly of the clutch

1.Install the clutch spring, driving plate, and gear sleeve;

2.Install the friction plate onto the outer gears of the gear sleeve, and then install the driven plate into the groove of the outer cover;

3.Install the friction plate and driven plate components again, and then repeat the installation of one friction plate and one driven plate;

4.Press down the gear sleeve and driving plate, install the large retaining ring into the groove of the outer cover, and then release it. Press down again and check that the driving disc is flexible and free from jamming;

5.Install 4 shock absorption springs on the concave holes of the driving disc and the protruding points of the outer cover.

Installation of the clutch

1.Install the clutch body and check if the gear sleeve is properly inserted into the driving gear step;

2.Install the thrust washer component, clip it into the spline groove of the crank connecting rod component, and then install the butterfly washer component and round nut component in sequence (the round nut should be screwed in three or more threads before tightening);

Attention：

1. Tightening torque of locking nut: 40-50N • m

2. Torque wrench torque setting value: 50N • m;;

3.Install the end cover sealing gasket and clutch end cover (note that the end cover bearing must not fall off);

4.Install 4 screws and tighten, with a torque value of 4-7N • m;

5.Install the oil duct, oil duct spring, and oil duct.

Assembly of the right crankcase cover

1.Install the O-ring of the oil dipstick into the root of the dipstick, then screw it into the oil dipstick hole of the right crankcase cover and tighten it;

2.Slide the clutch push rod into the corresponding hole of the right box cover, then insert the oil seal label facing upwards into the push rod, and gently tap it into place with the oil seal tool;

3.After screwing the clutch adjusting nut into the adjusting bolt by more than 3 threads, place the adjusting bolt in a straight groove upwards, install it into the corresponding threaded hole of the cam shift plate, and pre tighten it. Then clip the cam dial plate into the corresponding position of the right crankcase cover;

4.Align the limit plate with the threaded hole on the right cover, install the cross countersunk head screw into the limit plate screw hole and tighten it in place.

5.Combine the clutch control lever with the return spring, evenly apply an appropriate amount of butter on the adhesive area of the clutch control lever with a brush, and then pass through the installation hole of the right box cover. The flat surface of the semicircular rod should fit with the cam shift plate. Install the end of the return spring into the positioning hole of the right crankcase cover, and then hook the return spring hook completely onto the control arm with a screwdriver without falling off;

6.Insert the positioning pin through the pin hole of the right box cover into the groove of the control lever, and apply

an appropriate amount of Sanhe sealant at the positioning pin to prevent the pin from falling;

7.Rotate the clutch control lever in the correct direction and confirm that the clutch control lever resets flexibly.

Installation of the right crankcase cover

1.Replace the old sealing gasket of the right crankcase and install a new sealing gasket;

2.Install a positioning pin on the box, assemble the right crankcase cover in place and tighten it, with a **tightening torque of 8-12N • m**

3.Install the starting shaft oil seal, and the oil seal should sink 0.5mm from the end face. Check that the oil seal is flat and there should be no deviation or deformation. Be careful not to damage the sealing surface of the oil seal lip.

4.Adjust the adjustment bolt and check the free rotation stroke of the small end of the control arm for 5-8mm, and tighten the nut.

Left crankcase cover, magneto, starter motor

Maintenance instructions
Disassembly of the left crankcase cover
Disassembly of the stator and rotor of a magneto
Disassembly of the starting motor
Disassembly of the starting sprocket and chain
Disassembly of the transition plate, tensioning plate, and guide plate
Disassembly of the timing chain and chain tensioner
Inspection of the left crankcase cover
Inspection of the magneto stator and rotor
Inspection of the starting motor
Inspection of the starting sprocket and chain
Inspection of the transition plate, chain tensioning plate, and guide plate
Inspection of the timing chain and chain tensioning wheel
Assembly of the timing chain and chain tensioner
Assembly of the transition plate, chain tensioning plate, and guide plate
Assembly of the starting sprocket and chain
Assembly of the starting motor
Installation of the magneto rotor and stator
Assembly of the left crankcase cover
Installation of the left crankcase cover

Maintenance instructions

The disassembly and installation of the magneto and starter motor described in this section can be completed by removing the left crankcase cover without removing the engine.

Disassembly of the left crankcase cover

Remove the fastening bolts of the left front cover, remove the left crankcase cover, positioning pin, and sealing gasket;

Disassembly of the stator and rotor of a magneto

1.Remove the mounting bolts of the magneto stator trigger, then remove the screws of the small pressure wire plate, and remove the small pressure wire plate;

2.Remove the disc bolts of the stator coil, then remove the fastening bolts of the wire harness pressing plate, and then remove the magneto stator component and wire harness pressing plate from the left crankcase cover.

3.Remove the locking nut of the magneto rotor and use a special tool to remove the magneto rotor.

Attention:

1.When disassembling the magneto rotor, only special tools can be used for disassembly, and knocking on the magneto rotor is not allowed;

2.If the magneto rotor is accidentally impacted during disassembly and assembly,

such as falling to the ground or being struck by foreign objects, it should be replaced with a new magneto rotor.

Disassembly of the starting motor

Remove the fastening bolts of the motor with the disc, and then remove the starting motor from the transition plate.

Disassembly of the starting sprocket and chain

Remove the fastening bolts of the starting sprocket pressure plate, and remove the sprocket pressure plate and sprocket.

Disassembly of the transition plate, tensioning plate, and guide plate

1.Remove the chain tensioning plate and guide plate;

2.Remove the fastening bolts of the transition plate;

3.Remove the transition plate from the left crankcase body.

Disassembly of the timing chain and chain tensioner

Remove the chain tensioner from the chain tensioner arm and then remove the timing chain from the crankshaft.

Inspection of the left crankcase cover

Check if there is any damage to the left crankcase cover, and replace it if necessary.

Inspection of the magneto stator and rotor

1.Check if the contacts and coils of the magneto stator are burned or damaged, and if so, replace them with a new magneto stator.

2.Check if the magneto rotor and overrunning clutch are worn or damaged, and if so, replace them with new ones.

Inspection of the starting motor

Check if there is any damage to the gears of the starting motor,

Check the motor gears for signs of wear and damage.

Inspection of the starting sprocket and chain

1.Check if the starting sprocket is worn or damaged. If it is, replace it with a new one. Check if the sprocket oil seal is damaged. If the oil seal is found to be broken, replace it with a new one.

2.Check the chain for wear and damage, and if so, replace it with a new one;

Inspection of the transition plates, chain tensioning plates, and guide plates

1.Check if the sealing oil pan is worn or damaged;

2.Check if the transition plate oil seal and O-ring are damaged. If any oil seal or O-ring is found to be broken, replace it with a new one.

3.Check the chain tension plate and guide plate for abnormal wear and damage, and replace them with new ones if any.

Inspection of the timing chain and chain tensioner

1.Check the timing chain for wear and damage, and if so, replace it with a new sprocket;

2.Check the chain tensioner for wear and damage, and if so, replace it with a new tensioner.

Assembly of the timing chain and chain tensioner

1.Pass the timing chain through the chain cavity of the cylinder block and cover it on the timing drive sprocket of the crank connecting rod component, with the other end suspended outside the cylinder body;

2.Install the chain tensioning roller onto the box chain tensioning arm.

Assembly of transition plate, chain tensioning plate, and guide plate

1.Apply an appropriate amount of engine oil to the O-ring and install it into the sealing groove of the transition plate;

2.Use the oil seal special tool to install the oil seal into the corresponding hole of the transition plate (Attention: **the oil seal should be installed flat and not cut**), 0.5mm lower than the end face;

3.Install the transition plate into the left crankcase component Φ 115 holes, and tighten with bolts, with a torque of 8-12N.m;

4.Install the chain guide plate and chain tension plate into the corresponding positions of the transition plate.

Assembly of the starting sprocket and chain

1.Install the starting chain (64 sections) onto the starting sprocket assembly, and then assemble the large starting sprocket assembly into the oil seal hole of the transition plate through the left crank;

2.Tighten the sprocket pressure plate with bolts at the corresponding position of the transition plate;

3.Use the oil seal special tool to install the sprocket oil seal.

Attention:

1.Inject an appropriate amount of engine oil into the internal control of the

starting sprocket before installing the oil seal.

2.The oil seal should be installed flat and without cutting edges.

Assembly of the starting motor

Install the starting motor into the transition plate hole, and install the starting chain on the driving sprocket of the starting motor assembly. Tighten the starting motor with a bolt with a disc, with a torque of 8-12N • m.

Installation of the magneto rotor and stator

Install the magneto rotor onto the crankshaft connecting rod component (**Attention: check that the magneto rotor uni-directional roller must not fall off, and the keyway should be aligned with the crankshaft half circle key to assemble in place**), screw the nut M10 into the crankshaft connecting rod component thread for more than three threads, and then tighten it with a gun;

Attention：

Magneto rotor locking nut tightening torque: 40-50N·m, torque wrench torque setting value: 50N·m

Assembly of the left crankcase cover

1.Insert the small viewing hole O-ring into the slot of the small viewing hole cover, and then install it in the corresponding hole of the left crankcase front cover;

2.Insert the O-ring of the large viewing hole into the groove of the large viewing hole cover, and then install it in the corresponding hole of the left crankcase front cover;

3.Install the stator of the magneto into the corresponding position on the front cover of the left crankcase, and tighten the stator of the magneto with 2 bolts with a torque of 8-12N·m; The trigger is assembled and tightened with

hexagonal bolts, with a torque of 4-7N·m; Install and tighten the small crimping plate

4.Clip the stator wire harness of the magneto into the slot of the front cover, press the cable with a wire harness clamp, and tighten it with a disc bolt with a torque of 8-12N·m.

Attention：

1.Apply an appropriate amount of thread tightening agent to the first three threads of the stator installation bolts before assembly;

2.The trigger gap is approximately 0.6-0.85mm.

Installation of the left crankcase cover

1.Install the positioning pin, replace the old left crankcase sealing gasket, and install a new sealing gasket;

2.Assemble the left crankcase cover in place and tighten it.

Tightening torque: 8-12N • m;

Crankcase, crankshaft, transmission gear

Maintenance instructions
Troubleshooting
Dismantling of the gear change mechanism
Disassembly of the return spring of the starting shaft
Disassembly of the crankcase
Disassembly of the crankshaft and main and auxiliary shafts
Disassembly of the left box body
Disassembly of the left box bearing
Inspection of the gear change mechanism
Inspection of the starting shaft and components
Inspection of the crankshaft
Inspection of the crankshaft bearings
Inspection of the main and auxiliary shaft components
Inspection of the variable speed drum
Inspection of the left and right boxes
Inspection of the left and right box bearings
Assembly of the left crankcase body
Assembly of the right crankcase body
Assembly of the main and auxiliary shafts/crankshaft/variable speed drum/starting shaft
Assembly of the box
Assembly of the gear change mechanism
Assembly of the return spring of the starting shaft

Maintenance instructions

This section introduces the installation and inspection of the transmission and crankshaft. When performing the above work, the crankcase should be separated first, and the disassembly of other components of the engine should be carried out before the crankcase is separated.

Work before crankcase separation

Disassembly of the cylinder head
Disassembly of the cylinder/piston
Disassembly of the clutch, master slave gear, and oil pump
Disassembly of the magneto

Technical specifications

Items			Standard value mm	Maintenance limit value mm
Variable speed drum fork	Inner diameter of shift fork		Φ25～φ25.039	Φ25.065
	Claw thickness		4.85～4.95	4.75
Shift arm	Shaft outer diameter		φ11.55～φ11.584	φ11.50
	Shaft runout		0.05	0.10
Start axis	Shaft outer diameter		φ13.75～φ13.784	φ13.70
	Shaft runout		0.05	0.10
Crankshaft	Inner diameter of connecting rod small end		φ14.016～φ14.028	φ14.04
	Connecting rod big end side gap	Axial	0.10～0.30	0.5
		Radial	0.008～0.016	0.02

Troubleshooting

Difficulty shifting gears

1.Shift fork bent

2.Shift fork shaft bent

Transmission Jump

1.Worn shift gear pawl

2.Bent or worn shift forks

3.Shift fork shaft bent

There is noise in the crankshaft

1.The bearing at the large end of the connecting rod is worn

2.Connecting rod bending

3.Wear on crankshaft bearings

There is noise in the shift gears

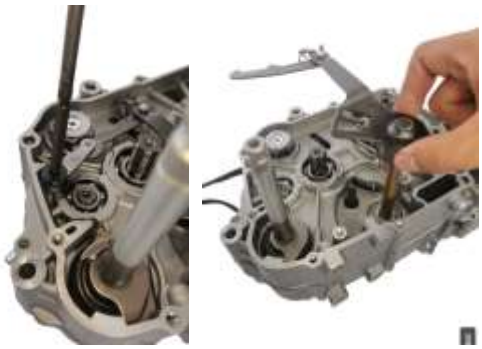
1.Worn shift gears

2.Worn spline shaft

Disassembly of the gear change mechanism

1.Remove the variable speed drum positioning plate and remove the variable speed drum positioning plate;

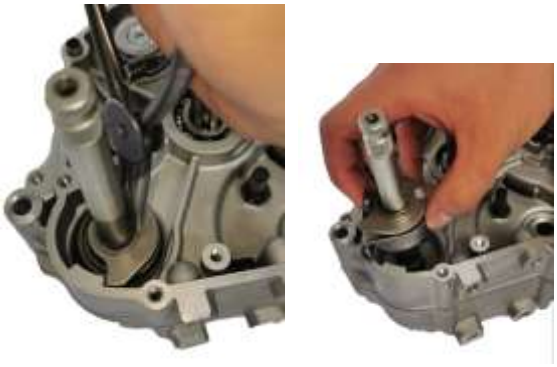
2.Remove the shift arm components.



Disassembly of the return spring of the starting shaft

1.Remove the spring seat circlip of the starting shaft;

2.Remove the starting shaft spring seat and return spring.



Disassembly of the crankcase

1.Place the left crankcase of the engine facing upwards;

2.Remove the bolts of the gear display pressing plate, and remove the gear display pressing plate and gear display cable assembly;

3.Remove the fastening bolts of the gear display and remove the gear display;

4.Remove the fastening bolts of the box, separate the left and right crankcase, and remove two positioning pins and sealing paper pads.

Disassembly of the crankshaft and main and auxiliary shafts

Remove the crankshaft components, main and auxiliary shaft components, variable speed drum components, and starting shaft components from the box.

Attention:

1.Take the crankshaft to avoid knocking and damaging the threads;

2.When removing the main and auxiliary shaft components, ensure that no parts are left behind.

Disassembly of the left box body

1.Remove the tension roller spindle and take out the tension roller II.

2.Remove the tension arm spindle of the left box body and then remove the tension arm.

3.Remove the upper sealing screw plug of the left box body, remove the washer, tension rod spring, and tension rod.

4.Use special tools for bearings to remove bearings 6001 and 6203 from the left box body.

5.Remove the secondary shaft oil seal and shift arm oil seal.

Disassembly of the right box bearing

1.Remove the oil drain plug from the right box and then remove the gasket;

2.Remove the shift positioning bolt;

3.Use special tools for bearings to remove bearings 6201 and 6203 from the left box body.

Inspection of the gear change mechanism

1.Check if the positioning plate roller is worn and if the shift arm spring is broken.

2.Check the outer diameter of the shift arm shaft for abnormal wear and bending.

Maintenance limit value: Φ 11.50mm

Inspection of the starting shaft and components

1.Check if the reset spring of the starting shaft is worn or broken; Check if the gears are damaged;

2.Check the outer diameter of the starting shaft for abnormal wear and bending.

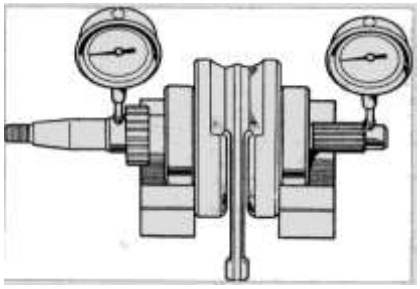
Maintenance limit value: Φ 13.70mm

Attention: If the engine only starts electrically, this step is not required.

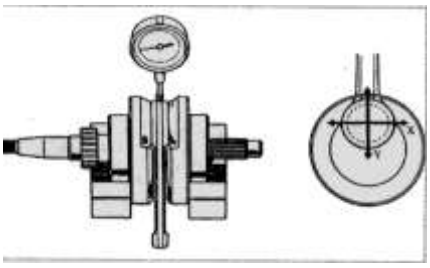
Inspection of the crankshaft

Place the crankshaft on a V-shaped iron.

Use a dial gauge to measure the radial runout of the shaft diameters at both ends of the crankshaft.

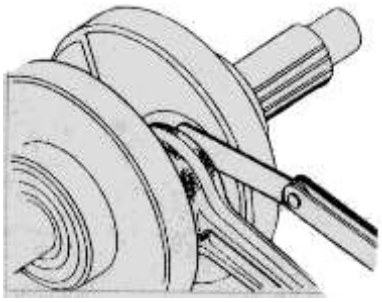


Maintenance limit value: 0.1 mm



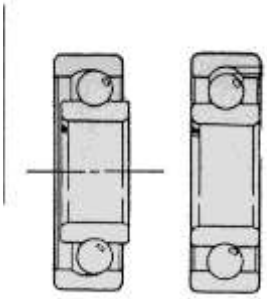
Measure the radial gap at two points in the X and Y directions of the connecting rod big end.

Maintenance limit value: 0.02 mm



Measure the side gap of the connecting rod big end with a thickness gauge.

Maintenance limit value: 0.5 mm



Inspection of the crankshaft bearings

Check whether the left and right bearings of the crankshaft rotate flexibly. If the rotation is not flexible or there is jamming, replace the bearings of the same model;

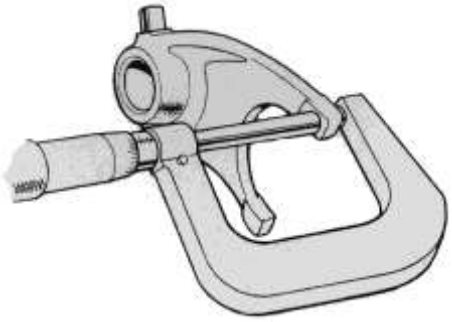
Inspection of the main and auxiliary shaft components

Check if there is excessive or abnormal wear on the gears of the main and auxiliary shaft components, and check if each snap ring is deformed or detached.

Inspection of the variable speed drum

Check if there is abnormal wear on the inner diameter of the shift fork of the variable speed drum.

Maintenance limit value: Φ 25.065mm



Check if there is abnormal wear on the thickness of the shifting fork claw of the variable speed drum.

Maintenance limit value: 4.75mm

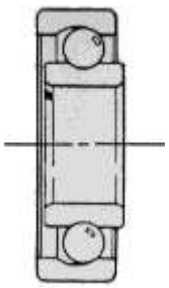
Inspection of the left and right boxes

1.Check if there is any damage to the left and right crankshaft bodies, and replace them if necessary.

Inspection of the left and right box bearings

1.Check whether all bearings of the left and right boxes rotate flexibly; If the rotation is not flexible or there is jamming, the bearing of the same model should be replaced;

2.Remove the crankshaft bearings from the left and right boxes and inspect their radial and end jumps. If any noise or large radial and end jumps are found, replace them with new bearings.



Assembly of the left crankcase body

1.Preinstall the chain tension arm assembly and chain tension arm core shaft into the M8 screw hole of the left crankcase assembly by hand, and use a pneumatic gun to install the chain tension arm core shaft into the M8 screw hole of the left crankcase assembly and tighten it with a torque of 18-20N.m;

2.Press bearing 6001 and bearing 6203 into the corresponding hole of the left crankcase assembly using bearing press equipment and install them in place;

3.Install the chain tension rod assembly into the tension rod hole (note that the rubber head of the tension rod should not fall off), and then install the chain tension rod spring, gasket, and sealing screw plug in sequence and tighten them with a torque of 20-25N.m;

4.Align the tensioning roller II with the corresponding threaded hole in the left crankcase, and screw the tensioning roller core into the threaded hole and tighten it in place.

Assembly the right crankcase body

1.Insert the oil drain plug gasket onto the oil drain plug, then install it into the corresponding screw hole of the right crankcase assembly and tighten it with a torque of 20-25N.m;

2.Install the shift positioning bolt into the M8 screw hole of the right crankcase assembly and

tighten it to a torque of 18~20N.m;

3.Press bearing 6201 and bearing 6203 into the right crankcase assembly using bearing press equipment ϕ 32 and ϕ 40 holes and press into place.

Assembly of the main and auxiliary shafts/crankshaft/variable speed drum/starting shaft

1.Install the keyway end of the crank connecting rod component into the left crankcase component φ 52 within holes;

2.Install the main and auxiliary shaft components, as well as the variable speed drum components, into the corresponding holes of the left crankcase components;

3.Install the starting shaft into the corresponding hole of the left crankcase component.

Assembly of the box

1.Confirm that the positioning pin and sealing gasket of the box are assembled in place;

2.The components on the right and left boxes correspond one by one to keep the parts stable and allow the right box to combine with the parts. When assembly is difficult, a rubber hammer can be used to evenly strike them in place;

3.Install the pipe clamps (vent pipe clamp and overflow pipe clamp) and the box closing bolts into the corresponding holes of the left crankcase components;

4.Use the cross over method to pre tighten the bolts from the lower locating pins of the left and right crankcase components; Tightening torque 8-12N.m;

5.Install the gear display and tighten the hexagonal bolts into the corresponding holes of the left crankcase components and tighten them;

6.Install the gear display cable, gear display pressure plate, and fastening bolts into the corresponding holes of the left crankcase components and tighten them;

7.Install the secondary shaft oil seal and shift arm

oil seal into the corresponding holes of the left crankcase components and tighten them.

Attention：

1.After the box is closed, the main and secondary shaft components should rotate flexibly, with an axial gap of 0.1-0.4;

2.The crankshaft and connecting rod components should rotate flexibly, without any abnormal noise or jamming;

3.The oil seal lip must not be damaged.

Assembly of the gear change mechanism

1.Install the shift arm into the corresponding hole of the left crankcase component;

2.Install the positioning plate of the variable speed drum into the corresponding hole of the left crankcase component and tighten it;

Assembly of the return spring of the starting shaft

1.Rotate the spindle clockwise until it cannot rotate, and install the reset spring and spring seat onto the starting shaft.

2.Align the marking point on the starting shaft return spring seat with the marking point on the starting shaft, use a screwdriver to start the shaft return spring, install the spring into the slot on the right crankcase, and install the starting shaft clamp ring in place;

5 Engine (TT140)

Main performance technical parameters……5-44
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5.2 Cylinder block and piston……5-55
5.3 Clutch, driving gear, oil pump……5-60
5.4 Left crankcase cover, magneto, starter motor…….....5-66
5.5 Crankcase, crankshaft, transmission gear…….....5-71

Main performance technical parameters

Items			Specifications
Engine	Model		1P56FMJ-2
	Type and number of cylinders		Single cylinder, air/oil cooled, four stroke, horizontal
	Cylinder diameter × stroke		Φ56×57mm
	Cylinder working volume		140.4ml
	Compression ratio		8.8：1
	Carburetor form		PZ27
	Lubrication method		Pressure+splash
	Starting method		Electric start+foot start
	Maximum power/corresponding speed		6.8KW/7500rpm
	Maximum torque/corresponding speed		9.7N.m/5500rpm
	Idling		1650±150 r/min
Drive system	Clutch		Manual wet multi plate
	Transmission		Constant mesh two-stage transmission and four-speed transmission
	Variable speed mode		Left foot operated reciprocating
	Primary reduction ratio		3.722
	Gear ratio	1st gear	3.273
		2nd gear	1.938
		3rd gear	1.353
		4th gear	1.05
		5th gear	
		6th gear	
Ignition system	Ignition method		C.D.I Contactless ignition
	Spark plug		A7RTC
	Spark plug gap		0.6mm-0.7mm
Oils	Fuel grade		≥RQ93
	Engine oil	Specifications	15W/40-SF
		Capacity	0.95L

Cylinder head and valve

Maintenance instructions
Troubleshooting
Disassembly of the cylinder head valve cover and left cylinder head cover
Disassembly of the cylinder head cover
Disassembly of the cylinder head
Disassembly of the cylinder head
Inspection of the valves and valve springs
Inspection of the valve rocker arm and rocker arm shaft
Inspection of the camshaft components
Inspection of the spark plugs
Inspection of the cylinder head
Inspection and grinding of the valve seats
Inspection of the valve guide
Replacement of the valve guide
Measure the width of the valve seat contact surface
Assembly of the cylinder head
Installation of the cylinder head
Installation of the cylinder head cover
Installation of the cylinder head driven sprocket
Installation of the cylinder head valves

Maintenance instructions

Precautions:

- The lubrication of the camshaft and rocker arm is carried out by the oil passage on the cylinder head entering the camshaft through the oil hole on the right cover. Foreign objects must not enter the oil passage on the cylinder head, right cover, and camshaft, and it should be kept unobstructed.
- Before installing the cylinder head, the cylinder head positioning pin must be assembled properly.
- The camshaft should not have scratches, and oil should be applied first during assembly.

Technical specifications

Items	Standard value mm	Maintenance limit value mm
Axial gap between rocker arm and cylinder head rocker arm opening gear	0.1～0.35	0.5
Radial gap between rocker arm and rocker arm shaft	0.005～0.028	0.05
Free length of the valve spring	Valve outer spring30.5	29.5
	Valve inner spring 29	28
Valve gap	0.01～0.04	------
Cam shaft base circle runout	0.02	0.04

Items			Standard value mm	Maintenance limit value mm
Valve	Valve stem outer diameter	Intake	φ 4.970~φ 4.985	φ 4.955
		Exhaust	φ 4.955~φ 4.970	φ 4.940
	Inner diameter of valve guide	Intake	φ 5~φ 5.012	φ 5.035
		Exhaust	φ 5~φ 5.012	φ 5.035
	Gap between valve stem and guide tube	Intake	0.015～0.042	0.075
		Exhaust	0.03～0.057	0.085
	Valve sealing strip width		1.5	----
Cylinder head	Flatness		0.05	0.07
	Valve seat sealing surface width		0.8	----

Troubleshooting

Low cylinder air pressure:
1.Valve
--Incorrect valve gap adjustment
--Valve sealing is not tight
--Incorrect valve timing
--Broken valve spring
2.Cylinder head
--Spark plug not tightly connected to cylinder head
--Damaged cylinder head gasket
--Cracks or sand holes in the cylinder head
3.Cylinder body, piston, piston ring
--Excessive or broken piston ring gap
--The piston has cracks or excessive wear
--Excessive diameter or sand holes in the cylinder body

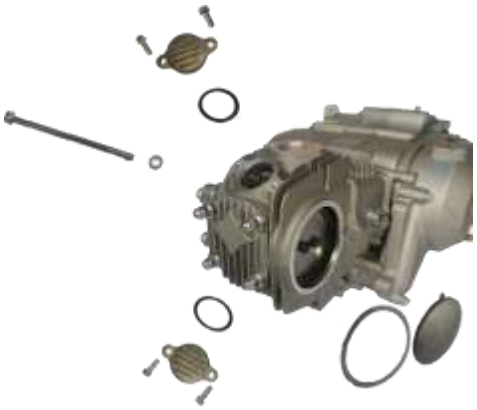
Blue smoke in the exhaust
1.Worn valve guide
2.Leakage or damage of the oil shield
3.Leakage of the cylinder head sealing gasket
4.Excessive piston ring gap
5.Excessive mesh wear on the inner diameter of the cylinder body

Excessive noise or abnormal noise
1.Incorrect valve adjustment
2.Valve stuck or valve spring broken
3.Excessive wear of the rocker arm
4.Incorrect valve timing
5.Worn camshaft

Disassembly of the cylinder head valve cover

1.Use an 8-10 ring wrench to remove the valve cover bolts for the intake and exhaust of the cylinder head:

2.Remove the O-ring of the valve cover for the intake and exhaust of the cylinder head.



Disassembly of the left cylinder head cover

1.Remove the M6³110 bolts and aluminum pads that fasten the left cover of the cylinder head;

2.Remove the left cover of the cylinder head and the sealing gasket of the left cover of the cylinder head.

Disassembly of the cylinder head cover

1.Remove the four cap nuts, iron pads, and copper pads that fasten the top cover of the cylinder head (pay attention to the assembly position of the copper pads);

2.Remove the cylinder head cover and the sealing gasket of the cylinder head cover.

Disassembly of the cylinder head

1.Remove the timing bolt that fastens the timing driven sprocket, remove the timing driven sprocket installed on the camshaft, and remove the positioning pin installed on the camshaft;

2.Remove the connecting bolts between the cylinder head and cylinder block;

3.Remove the cylinder head assembly and place it on the maintenance bench;

4.Remove the inner hexagonal bolts that fasten the right cover of the cylinder head, remove the oil cooling pipe bolts, oil cooling pipes, and aluminum washers installed on the right cover of the cylinder head, and then remove the right cover and sealing gasket;

5. Remove the intake and exhaust rocker shafts, and then remove the intake and exhaust rocker arms and limit plate components;

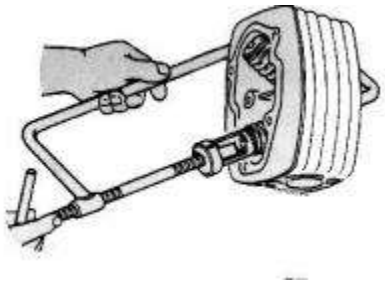
6.Remove the camshaft assembly;

7.Remove the spark plug using a spark plug socket.

Disassembly of the cylinder head

1.Use a valve remover to press down the valve spring, remove the valve lock clamp, and then loosen the valve remover to remove the valve spring seat, valve outer spring, inner spring, and outer spring seat ring;

2.Remove the intake and exhaust valves.



Attention：
1.In order to prevent permanent deformation of the valve spring, it is not necessary to compress the valve spring too much, just remove the valve lock clamp;
2.All removed parts should be marked to ensure that they reach their original assembly position during assembly.

Inspection of the valves and valve springs

Check if the valve is bent, burned or has abnormal wear on the valve stem, and measure the outer diameter of the valve stem.

Maintenance limit value:

Intake: φ 4.955mm

Exhaust: φ 4.940mm

Maintenance limit value of the valve sealing strip width: 2.0mm

Attention：

If the valve sealing strip is rough, unevenly worn, or has abnormal contact with the valve seat, which cannot guarantee sealing performance, the valve should be replaced.

Measure the free length of the valve spring:

Outer spring 30.5mm, maintenance limit value: 29.5mm;

Inner spring 29mm, maintenance limit value: 28mm;

Inspection of the valve rocker arm and rocker arm shaft

1. Check if there is abnormal wear or damage to the valve rocker arm. If there is abnormal wear or severe damage to the R circular surface, a new valve rocker arm needs to be replaced.

2. Check if there is abnormal wear on the outer circle of the rocker arm shaft. If the wear is severe, it is necessary to replace the rocker arm shaft with a new one.

Inspection of the camshaft components

1. Check whether the convex surface of the camshaft is worn or damaged, and whether the bearings at both ends of the camshaft rotate flexibly. If the wear is severe or the bearings rotate with jamming, replace the camshaft components with new ones;

Inspection of the spark plugs

1.The gap between the side electrode and the center electrode is 0.6-0.7mm. Insert a 0.6-0.7mm thickness gauge between two electrodes. If the gap is too large, gently tap the side electrode to press the thickness gauge. On the contrary, the side electrode should be adjusted so that it can be inserted.

Inspection of the cylinder head

1.Check if the sealing of the cylinder head is good. If the sealing of the cylinder head is poor, it should be replaced with a new cylinder head or intake and exhaust valve;

2.Check for cracks in the spark plug hole and valve seat;

3.Check whether the cylinder head is deformed, and use a knife edge ruler and a feeler gauge to check the flatness of the cylinder head (limit size 0.07mm).

Inspection and grinding of the valve seats

Completely remove the carbon deposits in the combustion chamber, apply a thin layer of red ink evenly on the valve seat, place the valve on the valve seat, gently tap the valve not to rotate, and then extract the valve. If there are intermittent contact marks on the valve working surface, the valve seat should be ground and repaired.

Firstly, remove the carbon deposits on the intake and exhaust valve seats, then apply abrasive to the valve seats, and then use a rubber tipped grinding tool to suck on the valve and grind the valve seats.

Inspection of the valve guide

Measure the inner diameter of each valve guide with a dial gauge and make a record. Maintenance limit value:

Inner diameter of intake duct: φ 5.035 mm

Inner diameter of exhaust duct: φ 5.035 mm

Attention：

Before measuring the inner diameter of the valve guide, the carbon deposits inside the guide should be completely removed.

If the valve guide needs to be replaced, the valve seat should undergo a new sealing surface grinding treatment, and each valve should be inserted into the guide, observing its movement, and finally calculating the gap between the valve stem and the valve guide.

Maintenance limit gap: intake: 0.075 mm

Exhaust: 0.085mm

Valve guide replacement

After heating the cylinder head in a constant temperature oven to 100-150 degrees Celsius, remove and support the cylinder head (be careful not to burn), and use a valve disassembly tool to drive the valve guide towards the rocker arm chamber side.

Attention: When removing the valve guide, do not damage the cylinder head.

Press the new valve guide in place and expand the hole of the newly installed valve guide after the cylinder head cools down.

Attention:
When expanding holes, cutting oil must be applied to the reamer, and rotation should be carried out when installing or removing the reamer.

Finally, clean the cylinder head with a cleaning agent and use compressed air to remove any metal chips that have accumulated on the cylinder head.

Measure the width of the valve seat sealing surface

Maintenance limit value: 1.5 mm

If the sealing surface of the valve seat is too wide, too narrow, or has dents, the valve seat should be ground to achieve the correct sealing width.

When grinding the valve, use an electric gun to cover the rubber tube (using a tight fit), and then place the valve stem on the rubber tube. Apply a small amount of graphite paste used for grinding to the valve sealing strip, and then fit it onto the valve seat sealing line. Start the electric gun, rotate the valve, and grind the valve and seat ring together.

After grinding, check whether the sealing line between the valve and seat ring has been ground, otherwise it should be re ground. If the grinding is not in place, the valve or cylinder head should be replaced.

Assembly of the cylinder head

1.Install the valve outer spring seat ring and oil guard onto the valve guide;

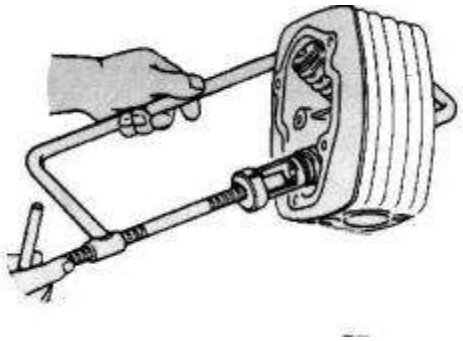
2.After applying lubricating oil to the stems of the intake and exhaust valves, install them into the valve guide, install the valve inner and outer springs, and valve spring seats;

3.Use a valve remover to press down the valve spring, and then install the valve lock clip into the valve spring seat;

Attention：

1.The spiral density of the inner and outer springs of the valve is relatively sparse, with one end facing outward in the direction of the color code;

2.To prevent permanent deformation of the valve spring, the spring should not be excessively compressed to fit into the valve lock clamp.



4.Check if the valve lock clamp is properly assembled;

5.Conduct air tightness testing on the assembled cylinder head assembly. If there is no leakage in the cylinder head assembly, proceed to the next step of operation;

6.Install the camshaft assembly into the cylinder head hole.

7.Place the valve rocker arm and limit plate assembly into the cylinder head groove, and then assemble the rocker arm shaft in place through the cylinder head and valve rocker arm holes;

8.Install the sealing gasket on the right cover of the cylinder head and the right cover of the cylinder head, install the bolts into the corresponding holes on the cylinder head, and tighten them. Install the oil cooling pipe, oil cooling pipe bolts, and aluminum washers again:

Attention：

1.After the cylinder head is installed, rotate the rocker arm. The rocker arm should rotate flexibly without any jamming,

2.Tightening torque of the right cover fixing bolt: 8-12N.m.

Installation of the cylinder head

1.Remove the old cylinder head gasket, install the new cylinder head gasket, and then install the positioning pin;

2.Tighten the chain and install the timing driven sprocket into the timing chain assembly. At this time, the O-ring mark, connecting screw hole, and key groove of the crank connecting rod component of the timing driven sprocket should be in a straight line;

3.Install the flanged bushing and small rectangular sealing ring at the oil hole position of the double head bolt B;

4.Pass the combination of the timing driven sprocket and timing chain through the chain cavity of the cylinder head component, assemble the cylinder head component on the cylinder block, and install a locating pin on the camshaft flange. Then, use the aluminum washer on the connecting bolt of the left cylinder head cover to insert it into the timing driven sprocket hole through the center hole of the right cylinder head cover through the camshaft assembly hole.

Installation of the cylinder head cover

1.Install the sealing gasket on the cylinder head cover, paying attention to the direction of the hole position and not installing it incorrectly;

2.Align the arrow direction of the cylinder head cover with the direction of the cylinder head exhaust port and install it on the cylinder head part;

3.Install copper washers on the oil passage holes of the double head bolts B on the cylinder head cover, and iron washers on other positions. Then, install cap nuts separately and screw them in more than three threads by hand. Use a gun to pre tighten the copper washers using the diagonal cross over method, and then tighten them using a torque wrench cross over method.

Attention：

1.Do not allow dust and foreign objects to enter the cylinder;

2.Tightening torque of bolts A and B: 13-16N.m;

3.The copper washer is assembled on the B bolt at the oil passage.

Installation of the cylinder head timing driven sprocket

1.Connect the cylinder head components and cylinder block with bolts, pre tighten with a plum blossom gun head, torque: 8-12N.m.

2.Rotate the crank connecting rod components to align the center of the keyway with the top connecting hole of the cylinder block;

3.Hang the timing driven sprocket on the camshaft assembly, aligning the center of the half circle key of the crank connecting rod component, the O-ring mark of the timing driven sprocket, and the notch of the cylinder head timing mark on the same straight line;

4.Move the camshaft assembly to align the threaded hole of the camshaft assembly flange with the timing driven sprocket hole, then tighten it with the timing sprocket bolt with a tightening torque of 7-11N.m, and then tighten the spark plug with a torque wrench with a torque of 11N.m

5.Check if the engine is in the timing position. If it is not, readjust the timing position of the engine.

Method of the timing adjustment:

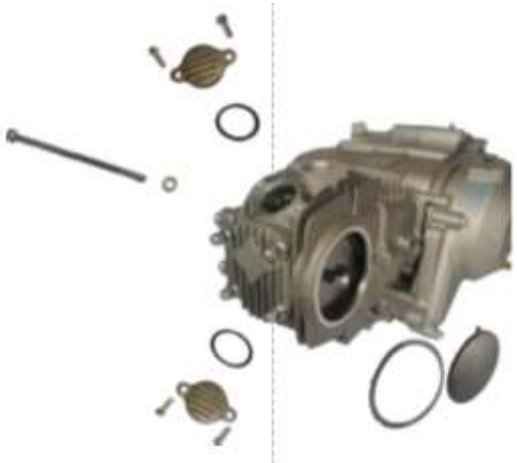
(1)Remove the large and small view hole covers of the left front cover and the left cover of the cylinder head;

(2)Rotate the locking nut of the magneto with a special tool, and observe whether the timing line "one" on the magneto rotor is aligned with the timing mark on the small viewing hole "one" on the left front cover through the timing mark on the left front cover;

(3)After aligning the above timing marks, pay attention to observing whether the timing mark "o" on the timing driven sprocket is in line with the notch of the cylinder head timing mark;

Only when both (2) and (3) are met can the engine be in the correct timing position.

After adjusting the timing position, assemble the large and small sight glass covers onto the left front cover and then install the left cover of the cylinder head.



Installation of the cylinder head valve cover

1.Install the sealing gasket on the left cover of the cylinder head;

2.Clip the convex part of the cylinder head into the slot of the inner hole of the left cylinder head cover, and then tighten the connecting bolt of the left cylinder head cover with a torque of 8-12N;

3.Place the intake and exhaust valves in a closed state, adjust the valve adjustment screws to ensure that the gap between the screws and the valve is between 0.01-0.03mm for intake and 0.01-0.03mm for exhaust. Tighten the valve adjustment nut with a torque of 9-11N.m; 4. Install the valve cover with an O-ring and fasten it to the screw hole of the intake and exhaust valve chamber with a disc bolt, with a torque of 8-10N.m.

Cylinder body and piston

Maintenance instructions
Troubleshooting
Dismantling of the cylinder body
Inspection of the cylinder body
Disassembly of the piston
Inspection of the pistons, piston rings, and piston pins
Installation of the piston rings
Installation of the piston
Installation of the cylinder block

Maintenance instructions

Precautions：

- The lubricating oil at the cylinder head is transmitted to the cylinder head through the small oil hole next to the B bolt in the right crankcase of the engine. Before installing the cylinder, ensure that the small oil hole next to the B bolt in the right crankcase is unobstructed.
- Do not allow dust or dust to seep into the crankcase.

Technical specifications

Items			Standard value mm	Maintenance limit value mm
Cylinder body	Inner diameter of cylinder body		φ 56~φ 56.01	φ 56.02
	Out of roundness		0.007	0.012
	Flatness of cylinder surface		0.05	0.07
Pistons, piston rings, piston pins	Outer diameter of piston		φ 55.98~φ 55.99	φ 55.945
	Inner diameter of piston pin hole		φ 13.002~φ 13.008	φ 13.018
	Gap between piston pin and piston pin hole		0.002～0.014	0.028
	Piston ring closing gap	Top ring/second ring	0.1～0.3	0.5
		Oil ring	0.2～0.7	1.4
	Gap between piston ring and piston ring groove	Top ring	0.02～0.06	0.08
		Second ring	0.02～0.06	0.08
	Gap between cylinder bodyand piston		0.02～0.035	0.075
	Outer diameter of the piston pin		φ 12.994~φ 13.000	φ 12.990
Connecting rod small end	Internal diameter		φ 13.016~φ 13.028	φ 13.04
	Gap between connecting rod small end and piston pin		0.016～0.034	0.05

Troubleshooting

Low or unstable compression force
The cylinder bodyor piston ring is worn
Discharge excessive black smoke
1.Worn cylinder body, piston or piston ring
2.Incorrect installation of piston rings
3.Scratches or scratches on the piston or cylinder bodywall

Overheating
Excessive carbon accumulation on the piston
Knock or abnormal noise
1.Worn piston or cylinder
2.Excessive carbon accumulation on the piston

Disassembly of the cylinder block

1.Remove the timing driven sprocket, remove the chain guide wheel bolts and aluminum washers, remove the chain guide wheel, remove the cylinder block connecting bolts, and remove the cylinder block.

Scrape the remaining gasket on the surface of the cylinder block clean with a scraper.

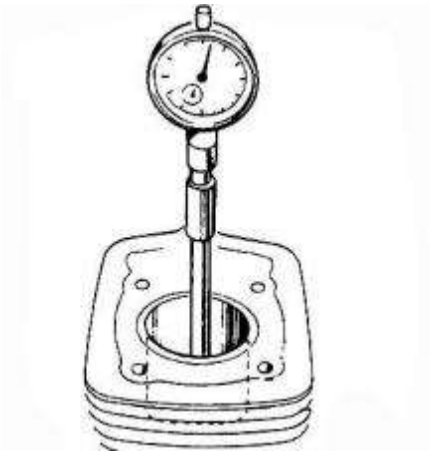
Attention：
If the gasket is immersed in gasoline, it is easy to disassemble. When performing this operation, avoid damaging the contact surface of the cylinder block.

Inspection of the cylinder block

Check the cylinder block for wear or damage.

To measure the inner diameter of the cylinder block, three positions should be taken, namely the top, middle, and bottom of the piston stroke. Measurements should be made in two directions that are at right angles to each other.

Maintenance limit value: φ 56.02mm

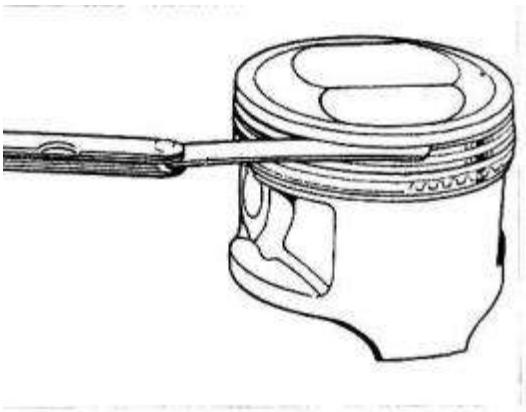


Disassembly of the piston

Use pointed nose pliers to remove the piston pin retaining ring and remove the piston pin and piston.

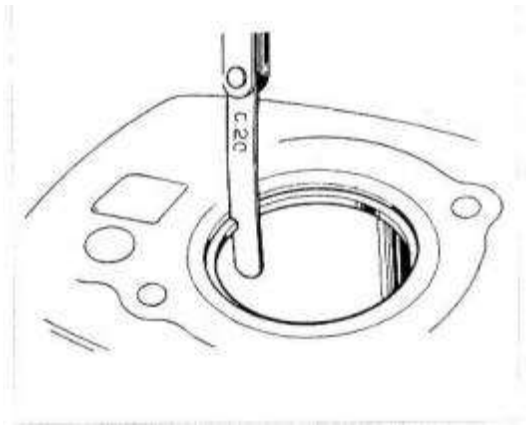
Attention：
Do not drop the piston pin retainer ring into the crankcase when removing it

Inspection of the pistons and piston rings
Remove the piston ring;



Attention：Do not damage the piston ring during disassembly.

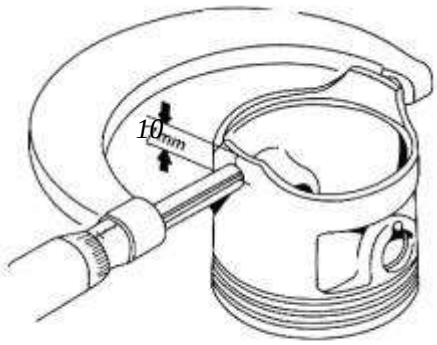
Measure the gap between the piston ring and the piston ring groove, maintenance limit value:
The first ring: 0.08mm
The second ring: 0.08 mm
Oil ring: 0.15 mm
Check whether the piston is worn or cracked, and whether the piston ring groove is worn.



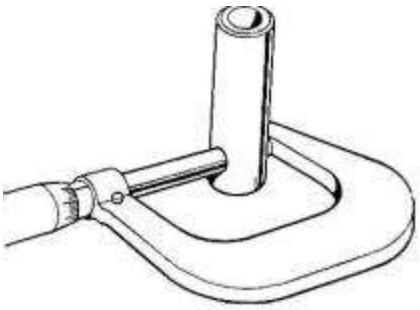
Insert the piston ring into the cylinder and measure the closing gap of the piston ring.
Maintenance limit value:
The first ring: 0.5mm
The second ring: 0.5mm
Oil ring: 1.4 mm

Measure the inner diameter of the piston pin hole:
Maintenance limit value:φ13.018mm

Measure the outer diameter at a height of 7 mm from the piston skirt
Maintenance limit value: φ 55.945mm
Calculate the gap between the cylinder and piston.
Maintenance limit value: 0.075mm



Measure the outer diameter of the piston pin
Maintenance limit value: 12.99 mm
Calculate the gap between the piston and piston pin
Maintenance limit value: 0.028mm



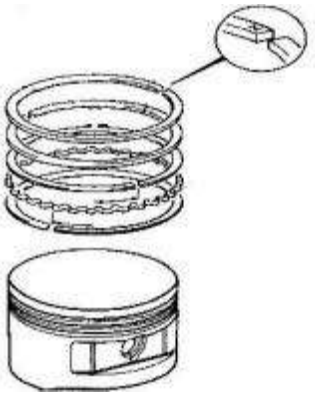
Installation of the piston rings

1.Thoroughly clean the piston ring groove;
2.Install the oil ring assembly, piston ring (second ring), and piston ring (first ring) in sequence;
3.Install the piston pin retaining ring at the unmarked end of the piston pin hole, with the opening and notch staggered by 120 degrees.

Attention：

1.During installation, the piston and piston ring should be prevented from being damaged;
2.When installing the piston ring, the first and second rings should not be installed incorrectly, and the marked side of the first and second rings should face the top of the piston;
3.After installation, the piston ring should rotate flexibly.

3.The gap between each ring in the oil ring should match the gap of the lining ring before it can be used;
When installing the oil ring, the lining ring should be installed first, and then the scraper ring should be installed.



Installation of the piston

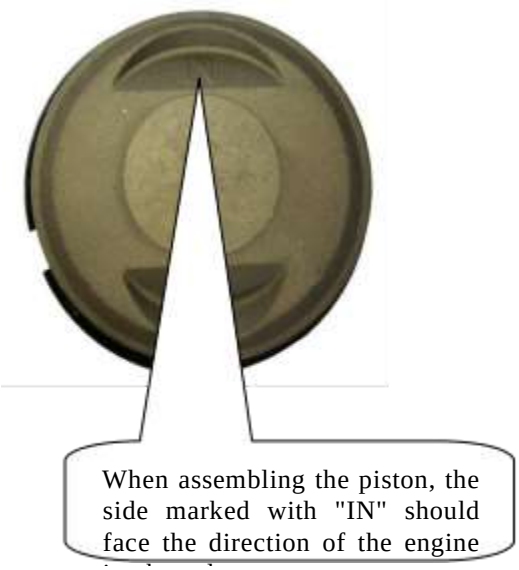
Install the piston components and piston pins on the small end of the connecting rod, with IN facing the inlet valve direction. Install the piston pin retainer ring at the left end of the piston pin hole, and manually stagger the opening of the piston ring 1, 2, and oil ring assembly by 120°. Install the piston, piston pin, and piston pin retainer ring.

Attention：

1.When installing the piston, the side marked with "IN" should face the direction of the engine's intake valve;

2.If the piston pin retaining ring is severely deformed, it must be replaced with a new one;

3.Do not let the piston pin retainer fall into the crankcase.



Installation of the cylinder block

1.Insert two positioning pins into the double head bolt A and install them into the pin hole of the left crankcase component, and replace with a new cylinder block sealing gasket;

2.Install a middle rectangular sealing ring into the oil return passage of the left crankcase component;

3.Apply a layer of engine oil evenly on the surface of the cylinder block, piston, and piston ring;

4.First, stagger the openings between the piston rings by 120°, and then gently assemble the cylinder body in place;

5.Pass the timing chain assembly through the chain cavity end of the cylinder block and suspend it outside the cylinder body;

6.Install the chain guide wheel into the chain cavity of the cylinder block, install the chain guide wheel bolts and aluminum pads, and tighten them with a torque of 10-14N.m. Install the cylinder block connecting bolts and tighten them.

Attention：When installing the cylinder block, avoid damaging the piston rings.

Clutch, driving gear, oil pump

Maintenance instructions
Troubleshooting
Removal of the right crankcase cover
Disassembly of the clutch
Disassembly of the driving and driven gears
Removal of the oil pump
Inspection of the right crankcase cover
Inspection of the clutch cover
Inspection of the clutch friction plate
Inspection of the driven gear, driving gear, and driving gear shaft sleeve
Inspection of the oil pump
Inspection of the oil filter screen
Assembly of the oil filter screen and oil pump
Assembly of the driven gears, driving gears, and driving gear bushings
Assembly of the clutch
Installation of the clutch
Assembly of the right crankcase cover
Installation of the right crankcase cover

Maintenance instructions

Explanation:

After removing the right crankcase cover, the disassembly, installation, and maintenance work related to the clutch and oil pump can be carried out without removing the engine.

Technical specifications

Items		Standard value mm	Maintenance limit value mm
Clutch	Free length of the spring	20.1～20.9	19.5
	Free thickness of the friction active plate	2.80～3.00	2.70
	Flatness of the clutch driven plate	0.1	0.14
	Gap between clutch gear sleeve and friction driving plate	0.03～0.10	0.20
Oil pump	Radial gap between outer and inner rotors	0.06～0.15	----
	End face gap between rotor assembly and cover plate	0.04～0.1	----

Troubleshooting

Clutch

If there is a malfunction in the operation of the clutch, it can usually be corrected by adjusting the free stroke of the clutch handle.

Clutch slipping during acceleration
1.Insufficient free travel
2.The outer cover is worn
3.Clutch plate bending

Excessive handle pressure
1.Clutch cable sticking, damaged or unclean
2.The clutch release mechanism is damaged

After releasing the clutch, the vehicle will slowly move
1.Excessive free travel
2.The clutch plate is bent

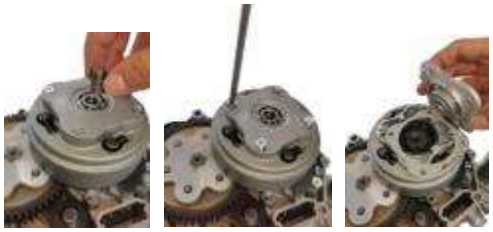
Oil pressure too low
1.Oil pump malfunction
2.Oil pump drive gear broken
3.The oil passage is blocked

Disassembly of the right crankcase cover

1.Firstly, drain the oil (remove the oil drain bolt and gasket below the right box, and wait for the oil in the box to flow out);
2.Remove the fastening bolts of the right cover, remove the right crankcase cover and the sealing gasket of the right crankcase cover.

Disassembly of the clutch

1.Remove the clutch oil pipe, oil pipe, and spring;
2.Remove the clutch end cover bolts, and then remove the end cover and sealing gasket;
3.Remove the clutch lock nut and retaining washer;
4.Remove the clutch component, remove the clutch large retaining ring, take out the clutch friction plate, driven plate, gear sleeve, driving plate, main spring, and release spring.



Disassembly of the driving and driven gears

1.Remove the driving gear and driving gear shaft sleeve;
2.Remove the driven gear retainer ring and the driven gear.

Disassembly of the oil pump

1.Remove the fastening bolts of the oil pump;
2.Remove the oil pump components and oil pump sealing gasket;

Inspection of the right crankcase cover

1.Check if the O-ring of the oil dipstick on the right crankcase cover is damaged. If the O-ring is found to be broken, replace it with a new one;

2.Check if the crankshaft oil seal of the right crankcase cover is damaged. If the oil seal is found to be broken, replace it with a new one;

3.Check if the starting shaft oil seal and clutch push rod oil seal are damaged. If any oil seal cracks are found, a new oil seal needs to be replaced.

Inspection of the clutch spring

Measure the free length of the clutch spring
Maintenance limit value: 19.5mm

Inspection of the clutch friction plate

If there are scratches or discoloration marks on the clutch friction plate, it should be replaced. Measure the thickness of each clutch friction plate.
Maintenance limit value: 2.7mm

Check whether the surface of the clutch driven plate is twisted, and use a feeler gauge during the inspection.
Maintenance limit value: 0.14 mm

Check the gap between the clutch gear sleeve and the friction plate.
Maintenance limit value: 0.2 mm

Inspection of the clutch cover

Check if the grooves on the drum shape of the outer cover are nicked or scratched due to clutch disc friction. If severe, replace the outer cover.

Inspection of driven gear, driving gear, and driving gear shaft sleeve

1.Check the driven gears for wear and damage. If the wear and damage are severe, replace the driven gears with new ones.

2.Check the driving gear and shaft sleeve for wear and damage. If the wear and damage are severe, replace them with new ones.

Attention：The oil hole of the driving gear shaft sleeve must not be blocked.

Inspection of the oil pump

1.Check if there is any wear or damage to the inner and outer rotors of the oil pump. If the wear and damage are severe, replace the oil pump rotor component with a new one;

Radial gap between outer rotor and inner rotor: 0.06~0.15

2.Check if the oil pump cover plate is worn or damaged, and if so, replace it with a new right oil pump cover plate;

End face gap between rotor assembly and cover plate: 0.04~0.1

3.Check the oil pump gear for wear and damage, and if so, replace it with a new one.

Inspection of the oil filter screen

1.Check if the engine oil filter screen is blocked or damaged. If it is blocked, clean and remove the blockage on the filter screen. If the filter screen is damaged, replace it with a new engine oil filter screen.

Assembly of the oil filter screen and oil pump

1.Install the engine oil filter screen assembly 1 (in the thin direction);

2.Install the oil pump positioning pin, oil pump sealing gasket, and oil pump assembly, and tighten them with bolts;

3.Apply an appropriate amount of sealant to the outer circle of the oil drain bolt thread, install the oil drain bolt and gasket, and tighten them (if the gasket is deformed, replace it with a new one). The tightening torque is 30-40N.m.

Assembly of the driven gear, driving gear, and driving gear shaft sleeve

1.Install the clutch shaft sleeve, apply an appropriate amount of engine oil to the outer circle of the clutch shaft sleeve, and then install the driving gear and rotate flexibly;

2.Install the driven gear combination and clip the driven gear retainer ring into the groove of the spindle component.

Attention：

1.After tightening the bolts, check whether the oil pump gear rotates flexibly and without jamming;

2.Check if the oil passage at the combination of the cylinder surface oil passage and oil filter screen of the right crankcase component body is unobstructed.

3.The driving gear has a stepped end facing outward.

Assembly of the clutch

1.Install the clutch spring, driving plate, and gear sleeve;

2.Install the friction plate onto the outer gears of the gear sleeve, and then install the driven plate into the groove of the outer cover;

3.Install the friction plate and driven plate components again, and then repeat the installation of one friction plate and one driven plate;

4.Press down the gear sleeve and driving plate, install the large retaining ring into the groove of the outer cover, and then release it. Press down again and check that the driving disc is flexible and free from jamming;

5.Install 4 shock absorption springs on the concave holes of the driving disc and the protruding points of the outer cover.

Installation of the clutch

1.Install the clutch body and check if the gear sleeve is properly inserted into the driving gear step;

2.Install the thrust washer component, clip it into the spline groove of the crank connecting rod component, and then install the butterfly washer component and round nut component in sequence (the round nut should be screwed in three or more threads before tightening);

Attention：

1.Tightening torque of locking nut: 40-50N² Torque setting value of m-force wrench: 50N ² M;

3.Install the end cover sealing gasket and clutch end cover (note that the end cover bearing must not fall off);

4.Install 4 screws and tighten with a torque value of 4-7N ² M;

5.Install the oil duct, oil duct spring, and oil duct.

Assembly of the right crankcase cover

1.Install the O-ring of the oil dipstick into the root of the dipstick, then screw it into the oil dipstick hole of the right crankcase cover and tighten it;

2.Slide the clutch push rod into the corresponding hole of the right box cover, then insert the oil seal label facing upwards into the push rod, and gently tap it into place with the oil seal tool;

3.After screwing the clutch adjusting nut into the adjusting bolt by more than 3 threads, place the adjusting bolt in a straight groove upwards, install it into the corresponding threaded hole of the cam shift plate, and pre tighten it. Then clip the cam dial plate into the corresponding position of the right crankcase cover;

4.Align the limit plate with the threaded hole on the right cover, install the cross countersunk head screw into the limit plate screw hole and tighten it in place.

5.Combine the clutch control lever with the return spring, evenly apply an appropriate amount of butter on the adhesive area of the clutch control lever with a brush, and then pass through the installation hole of the right box cover. The flat surface of the semicircular rod should fit with the cam shift plate. Install the end of the return spring into the positioning hole of the right crankcase cover, and then hook the return spring hook completely onto the control arm with a screwdriver without falling off;

6.Insert the positioning pin through the pin hole of the right box cover into the groove of the control lever, and apply an appropriate amount of Sanhe sealant at the positioning pin to prevent the pin from falling;

7.Rotate the clutch control lever in the correct direction and confirm that the clutch control lever resets flexibly.

Installation of the right crankcase cover

1.Replace the old sealing gasket of the right crankcase and install a new sealing gasket;

2.Install a positioning pin on the box, assemble the right crankcase cover in place and tighten it,

Tightening torque: 8-12N ² M

3.Install the starting shaft oil seal, and the oil seal should sink 0.5mm from the end face. Check that the oil seal is flat and there should be no deviation or deformation. Be careful not to damage the sealing surface of the oil seal lip.

4.Adjust the adjustment bolt and check the free rotation stroke of the small end of the control arm for 5-8mm, and tighten the nut.

Left crankcase cover, magneto, starter motor

Maintenance instructions
Disassembly of the left crankcase cover
Disassembly of the stator and rotor of a magneto
Disassembly of the starting motor
Disassembly of the starting sprocket and chain
Disassembly of the transition plate, tensioning plate, and guide plate
Disassembly of the timing chain and chain tensioner
Inspection of the left crankcase cover
Inspection of the magneto stator and rotor
Inspection of the starting motor
Inspection of the starting sprocket and chain
Inspection of the transition plate, chain tensioning plate, and guide plate
Inspection of the timing chain and chain tensioning wheel
Assembly of the timing chain and chain tensioner
Assembly of the transition plate, chain tensioning plate, and guide plate
Assembly of the starting sprocket and chain
Assembly of the starting motor
Installation of the magneto rotor and stator
Assembly of the left crankcase cover
Installation of the left crankcase cover

Maintenance instructions

The disassembly and installation of the magneto and starter motor described in this section can be completed by removing the left crankcase cover without removing the engine.

Disassembly of the left crankcase cover

Remove the fastening bolts of the left front cover, remove the left crankcase cover, positioning pin, and sealing gasket;

Disassembly of the stator and rotor of a magneto

1.Remove the mounting bolts of the magneto stator trigger, then remove the screws of the small pressure wire plate, and remove the small pressure wire plate;

2.Remove the disc bolts of the stator coil, then remove the fastening bolts of the wire harness pressing plate, and then remove the magneto stator component and wire harness pressing plate from the left crankcase cover.

3.Remove the locking nut of the magneto rotor and use a special tool to remove the magneto rotor.

Attention：

1.When disassembling the magneto rotor, only special tools can be used for disassembly, and knocking on the magneto rotor is not allowed;

2.If the magneto rotor is accidentally impacted during disassembly and assembly, such as falling to the ground or being struck by foreign objects, it should be replaced with a new magneto rotor.

Disassembly of the starting motor

Remove the fastening bolts of the motor with the disc, and then remove the starting motor from the transition plate.

Disassembly of the starting sprocket and chain

Remove the fastening bolts of the starting sprocket pressure plate, and remove the sprocket pressure plate and sprocket.

Disassembly of the transition plate, tensioning plate, and guide plate

1.Remove the chain tensioning plate and guide plate;

2.Remove the fastening bolts of the transition plate;

3.Remove the transition plate from the left crankcase body.

Disassembly of the timing chain and chain tensioner

Remove the chain tensioner from the chain tensioner arm and then remove the timing chain from the crankshaft.

Inspection of the left crankcase cover

Check if there is any damage to the left crankcase cover, and replace it if necessary.

Inspection of the magneto stator and rotor

1.Check if the contacts and coils of the magneto stator are burned or damaged, and if so, replace them with a new magneto stator.

2.Check if the magneto rotor and overrunning clutch are worn or damaged, and if so, replace them with new ones.

Inspection of the starting motor

Check if the gears of the starting motor are damaged, and check if the motor gears are worn or damaged.

Inspection of the starting sprocket and chain

1.Check if the starting sprocket is worn or damaged. If it is, replace it with a new one. Check if the sprocket oil seal is damaged. If the oil seal is found to be broken, replace it with a new one.

2.Check the chain for wear and damage, and if so, replace it with a new one;

Inspection of the transition plates, chain tensioning plates, and guide plates

1.Check if the sealing oil pan is worn or damaged;

2.Check if the transition plate oil seal and O-ring are damaged. If any oil seal or O-ring is found to be broken, replace it with a new one.

3.Check the chain tension plate and guide plate for abnormal wear and damage, and replace them with new ones if any.

Inspection of the timing chain and chain tensioner

1.Check the timing chain for wear and damage, and if so, replace it with a new sprocket;

2.Check the chain tensioner for wear and damage, and if so, replace it with a new tensioner.

Assembly of the timing chain and chain tensioner

1.Pass the timing chain through the chain cavity of the cylinder block and cover it on the timing drive sprocket of the crank connecting rod component, with the other end suspended outside the cylinder body;

2.Install the chain tensioning roller onto the box chain tensioning arm.

Assembly of transition plate, chain tensioning plate, and guide plate

1.Apply an appropriate amount of engine oil to the O-ring and install it into the sealing groove of the transition plate;

2.Use the oil seal special tool to install the oil seal into the corresponding hole of the transition plate (Attention: the oil seal should be installed flat and not cut), 0.5mm lower than the end face;

3.Install the transition plate into the left crankcase component φ 115 holes, and tighten with bolts, with a torque of 8-12N. m;

4.Install the chain guide plate and chain tension plate into the corresponding positions of the transition plate.

Assembly of the starting sprocket and chain

1.Install the starting chain (64 sections) onto the starting sprocket assembly, and then assemble the large starting sprocket assembly into the oil seal hole of the transition plate through the left crank;

2.Tighten the sprocket pressure plate with bolts at the corresponding position of the transition plate;

3.Use the oil seal special tool to install the sprocket oil seal.

Attention：

1.Inject an appropriate amount of engine oil into the internal control of the starting sprocket before installing the oil seal.

2.The oil seal should be installed flat and without cutting edges.

Assembly of the starting motor

Install the starting motor into the transition plate hole, and install the starting chain on the driving sprocket of the starting motor assembly. Tighten the starting motor with a bolt with a torque of 8-12N.m.

Installation of the magneto rotor and stator

Install the magneto rotor onto the crankshaft connecting rod component (Attention: check that the magneto rotor uni-directional roller must not fall off, and the key slot should be aligned with the crankshaft half circle key for assembly), screw the nut M10 into the crankshaft connecting rod component thread for more than three threads, and then tighten it with a gun;

Attention：

Tightening torque of the locking nut of the magneto rotor:

40-50N ² m. Torque wrench torque setting value: 50N ² M

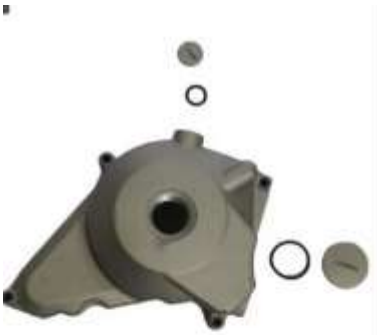
Assembly of the left crankcase cover

1.Insert the small viewing hole O-ring into the slot of the small viewing hole cover, and then install it in the corresponding hole of the left crankcase front cover;

2.Insert the O-ring of the large viewing hole into the groove of the large viewing hole cover, and then install it in the corresponding hole of the left crankcase front cover;

3.Install the stator of the magneto into the corresponding position on the front cover of the left crankcase, and tighten the stator of the magneto with 2 bolts with a torque of 8-12N.m; The trigger is assembled and tightened with hexagonal bolts, with a torque of 4-7N.m; Install and tighten the small crimping plate

4.Clip the stator wire harness of the magneto into the slot of the front cover, press the cable with a wire harness clamp, and tighten it with a disc bolt with a torque of 8-12N.m.



Attention：

1.Apply an appropriate amount of thread tightening agent to the first three threads of the stator installation bolts before assembly;

2.The trigger gap is approximately 0.6-0.85mm.

Installation of the left crankcase cover

1.Install the positioning pin, replace the old left crankcase sealing gasket, and install a new sealing gasket;

2.Assemble the left crankcase cover in place and tighten it.

Tightening torque: 8-12N²M;

Crankcase, crankshaft, transmission gear

Maintenance instructions
Troubleshooting
Dismantling of the gear change mechanism
Disassembly of the return spring of the starting shaft
Disassembly of the crankcase
Disassembly of the crankshaft and main and auxiliary shafts
Disassembly of the left box body
Disassembly of the left box bearing
Inspection of the gear change mechanism
Inspection of the starting shaft and components
Inspection of the crankshaft
Inspection of the crankshaft bearings
Inspection of the main and auxiliary shaft components
Inspection of the variable speed drum
Inspection of the left and right boxes
Inspection of the left and right box bearings
Assembly of the left crankcase body
Assembly of the right crankcase body
Assembly of the main and auxiliary shafts/crankshaft/variable speed drum/starting shaft
Assembly of the box
Assembly of the gear change mechanism
Assembly of the return spring of the starting shaft

Maintenance instructions

This section introduces the installation and inspection of the transmission and crankshaft. When performing the above work, the crankcase should be separated first, and the disassembly of other components of the engine should be carried out before the crankcase is separated.

Work before crankcase separation

Disassembly of the cylinder head
Disassembly of the cylinder/piston
Disassembly of the clutch, master slave gear, and oil pump
Disassembly of the magneto

Technical specifications

Items			Standard value mm	Maintenance limit value mm
Variable speed drum fork	Inner diameter of shift fork		φ 34~φ 34.039	φ 34.065
	Claw thickness		4.85～4.95	4.75
Shift arm	Shaft outer diameter		φ 11.55~φ 11.584	φ 11.50
	Shaft runout		0.05	0.10
Start axis	Shaft outer diameter		φ 13.75~φ 13.784	φ 13.70
	Shaft runout		0.05	0.10
Crankshaft	Inner diameter of connecting rod small end		φ 13.016~φ 13.028	φ 13.04
	Connecting rod big end side gap	Axial	0.10～0.30	0.5
		Radial	0.008～0.016	0.02

Troubleshooting

Difficulty shifting gears

1.Shift fork bent

2.Shift fork shaft bent

Transmission Jump

1.Worn shift gear pawl

2.Bent or worn shift forks

3.Shift fork shaft bent

There is noise in the crankshaft

1.The bearing at the large end of the connecting rod is worn

2.Connecting rod bending

3.Wear on crankshaft bearings

There is noise in the shift gears

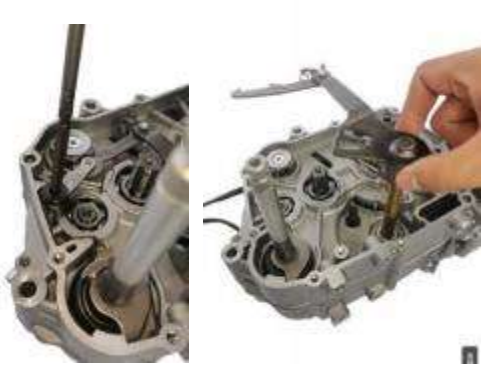
1.Worn shift gears

2.Worn spline shaft

Disassembly of the gear change mechanism

1.Remove the variable speed drum positioning plate and remove the variable speed drum positioning plate;

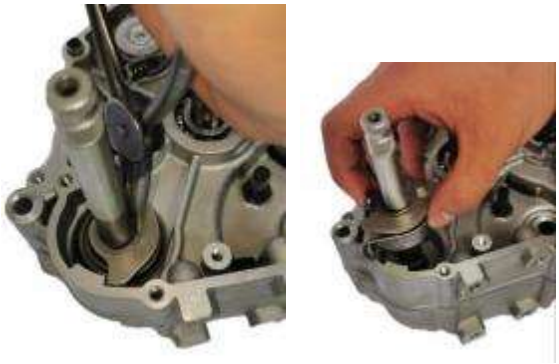
2.Remove the shift arm components.



Disassembly of the return spring of the starting shaft

1.Remove the spring seat circlip of the starting shaft;

2.Remove the starting shaft spring seat and return spring.



Disassembly of the crankcase

1.Place the left crankcase of the engine facing upwards;

2.Remove the bolts of the gear display pressing plate, and remove the gear display pressing plate and gear display cable assembly;

3.Remove the fastening bolts of the gear display and remove the gear display;

4.Remove the fastening bolts of the box, separate the left and right crankcase, and remove two positioning pins and sealing paper pads.

Disassembly of the crankshaft and main and auxiliary shafts

Remove the crankshaft components, main and auxiliary shaft components, variable speed drum components, and starting shaft components from the box.

Attention：

1.Take the crankshaft to avoid knocking and damaging the threads;

2.When removing the main and auxiliary shaft components, ensure that no parts are left behind.

Disassembly of the left box body

1.Remove the tension roller spindle and take out the tension roller II.

2.Remove the tension arm spindle of the left box body and then remove the tension arm.

3.Remove the upper sealing screw plug of the left box body, remove the washer, tension rod spring, and tension rod.

4.Use special tools for bearings to remove bearings 6001 and 6203 from the left box body.

5.Remove the secondary shaft oil seal and shift arm oil seal.

Disassembly of the right box bearing

1.Remove the oil drain plug from the right box and then remove the gasket;

2. Remove the shift positioning bolt;

3.Use special tools for bearings to remove bearings 6201 and 6203 from the left box body.

Inspection of the gear change mechanism

1.Check if the positioning plate roller is worn and if the shift arm spring is broken.

2.Check the outer diameter of the shift arm shaft for abnormal wear and bending.

Maintenance limit value: φ 11.50mm

Inspection of the starting shaft and components

1.Check if the reset spring of the starting shaft is worn or broken; Check if the gears are damaged;

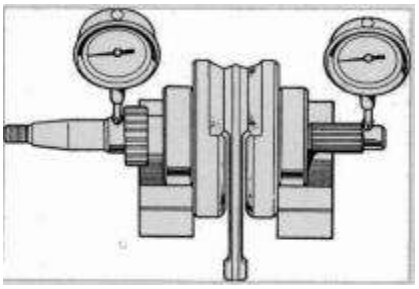
2.Check the outer diameter of the starting shaft for abnormal wear and bending. Maintenance limit value: φ 13.70mm

Note: If the engine only starts electrically, this step is not required.

Inspection of the crankshaft

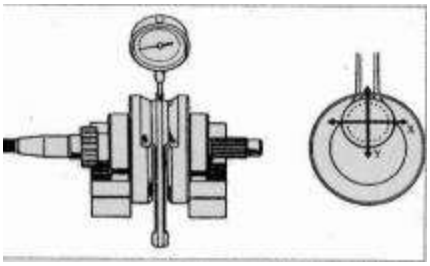
Place the crankshaft on a V-shaped iron.

Use a dial gauge to measure the radial runout of the shaft diameters at both ends of the crankshaft. Maintenance limit value: 0.1 mm



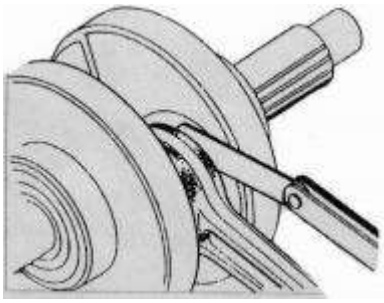
Measure the radial gap at two points in the X and Y directions of the connecting rod big end.

Maintenance limit value: 0.02 mm



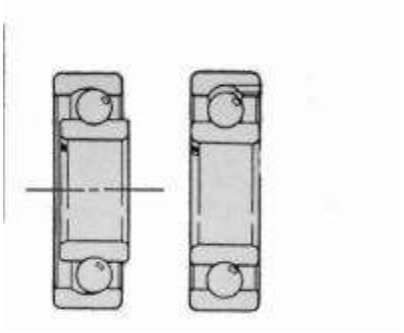
Measure the side gap of the connecting rod big end with a thickness gauge.

Maintenance limit value: 0.5 mm



Inspection of the crankshaft bearings

Check whether the left and right bearings of the crankshaft rotate flexibly. If the rotation is not flexible or there is jamming, replace the bearings of the same model;



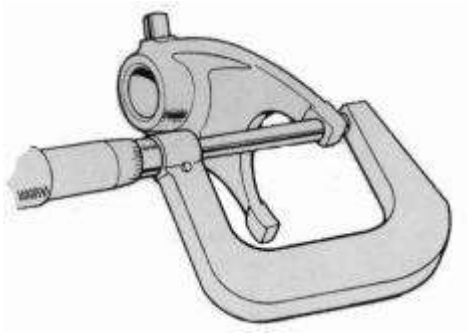
Inspection of the main and auxiliary shaft components

Check if there is excessive or abnormal wear on the gears of the main and auxiliary shaft components, and check if each snap ring is deformed or detached.

Inspection of the variable speed drum

Check if there is abnormal wear on the inner diameter of the shift fork of the variable speed drum. Maintenance limit value: φ 34.065mm

Check if there is abnormal wear on the thickness of the shifting fork claw of the variable speed drum. Maintenance limit value: 4.75mm



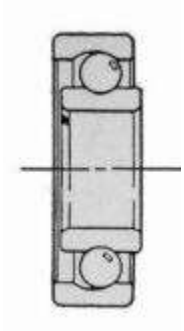
Inspection of the left and right boxes

1.Check if there is any damage to the left and right crankshaft bodies, and replace them if necessary.

Inspection of the left and right box bearings

2.Check whether all bearings of the left and right boxes rotate flexibly; If the rotation is not flexible or there is jamming, the bearing of the same model should be replaced;

2.Remove the crankshaft bearings from the left and right boxes and inspect their radial and end jumps. If any noise or large radial and end jumps are found, replace them with new bearings.



Assembly of the left crankcase body

1.Preinstall the chain tension arm assembly and chain tension arm core shaft into the M8 screw hole of the left crankcase assembly by hand, and use a pneumatic gun to install the chain tension arm core shaft into the M8 screw hole of the left crankcase assembly and tighten it with a torque of 18-20N.m;

2.Press bearing 6001 and bearing 6203 into the corresponding hole of the left crankcase assembly using bearing press equipment and install them in place;

3.Install the chain tension rod assembly into the tension rod hole (note that the rubber head of the tension rod should not fall off), and then install the chain tension rod spring, gasket, and sealing screw plug in sequence and tighten them with a torque of 30-35N.m;

4.Align the tensioning roller II with the corresponding threaded hole in the left crankcase, and screw the tensioning roller core into the threaded hole and tighten it in place.

Assembly of the right crankcase body

1.Insert the oil drain plug gasket onto the oil drain plug, then install it into the corresponding screw hole of the right crankcase assembly and tighten it with a torque of 30-35N.m;

2.Install the shift positioning bolt into the M8 screw hole of the right crankcase assembly and tighten it to a torque of 18~20N.m;

3.Press bearing 6201 and bearing 6203 into the right crankcase assembly using bearing press equipment φ 32 and φ 40 holes and press into place.

Assembly of the main and auxiliary shafts/crankshaft/variable speed drum/starting shaft

1.Install the keyway end of the crank connecting rod component into the left crankcase component φ Within 52 holes;

2.Install the main and auxiliary shaft components, as well as the variable speed drum components, into the corresponding holes of the left crankcase components;

3.Install the starting shaft into the corresponding hole of the left crankcase component.

Assembly of the box

1.Confirm that the positioning pin and sealing gasket of the box are assembled in place;

2.The components on the right and left boxes correspond one by one to keep the parts stable and allow the right box to combine with the parts. When assembly is difficult, a rubber hammer can be used to evenly strike them in place;

3.Install the pipe clamps (vent pipe clamp and overflow pipe clamp) and the box closing bolts into the corresponding holes of the left crankcase components;

4.Pre tighten the bolts from the lower locating pins of the left and right crankcase components using the cross over method; Tightening torque 8-12N.m;

5.Install the gear display and tighten the hexagonal bolts into the corresponding holes of the left crankcase components and tighten them;

6.Install the gear display cable, gear display pressure plate, and fastening bolts into the corresponding holes of the left crankcase components and tighten them;

7.Install the secondary shaft oil seal and shift arm oil seal into the corresponding holes of the left crankcase components and tighten them.

Attention：

1.After the box is closed, the main and secondary shaft components should rotate flexibly, with an axial gap of 0.1-0.4;

2.The crankshaft and connecting rod components should rotate flexibly, without any abnormal noise or jamming;

3.The oil seal lip must not be damaged.

Assembly of the gear change mechanism

1.Install the shift arm into the corresponding hole of the left crankcase component;

2.Install the positioning plate of the variable speed drum into the corresponding hole of the left crankcase component and tighten it;

Assembly of the return spring of the starting shaft

1.Rotate the spindle clockwise until it cannot rotate, and install the reset spring and spring seat onto the starting shaft.

2.Align the identification point on the return spring seat of the starting shaft with the identification point on the starting shaft, use a screwdriver to start the return spring of the shaft, install the spring into the slot on the right crankcase body, and install the starting shaft circlip in place;

6 Vehicle chassis

Maintenance information…… 6-2

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6.5 Steering system……..6-10

6.6 Rear suspension system…….6-11

Maintenance information

Attention

•When conducting maintenance work on the front wheel and suspension system, the frame must be firmly supported before operation

•The maintenance and inspection of lighting, instruments, and switches should be carried out according to the corresponding chapters

•Do not exert excessive force on the wheels. Be careful not to damage the wheels

•When disassembling tires from the wheel rims, it is necessary to use specialized tires and wheel rim protectors to avoid damaging the wheels

Maintenance benchmark

Items		Standards	Usage limit
Wheel rim	Axial runout	0.8mm	2.0mm
	Radial runout	0.8mm	2.0mm
Tires	Residual groove	—	3mm
	Front wheel air pressure	200kPa	—
	Rear wheel air pressure	250kPa	—
Front brake	Brake handle gap	2-6mm	—

Tightening torque

Name	Specifications	Torque
Chain wheel mounting bolts	GB5783 M8*30	25~30N·m
Front brake disc bolts	M8*16	25~30N·m
Front brake caliper body bolts	GB5789 M6*32	10~12N·m
Rear disc brake bolt	Blue white zinc M6*20 full thread	10～12N·m
Big cover nut	Chromium plated grade 6	35～40N·m
Front shock absorber bolt	Blue white zinc M8*25	17-22N·m
Rear flat fork bolt	Blue white zinc Φ12*205*M12*1.25mm	80-90N·m

Tools

Inner hexagonal m6	Torque wrench
Open end ratchet wrench s8	Pneumatic wrench s12
Open end wrench s10-s12	Pneumatic wrench s14
Open end ratchet wrench s14	Socket wrench m12
Cross screwdriver	Socket wrench m14
Flat screwdriver	Pointed nose pliers
Hammer	External circlip pliers
Wooden hammer	Iron hammer

6.1 Troubleshooting

1.Steering weight
1)Damage and wear of steering bearings
2)Damaged and worn inner and outer races of bearings
3)Direction column deformation
4)Low tire pressure
5)Tire wear
2.Shake the steering handle
1)Damaged and poorly tightened steering bearings
2)Left and right shock absorbers do not match
3)Tire skewness
4)Frame deformation
5)Tire wear and eccentric wear
6)Wheel bearing shaking
3.Front wheel runout
1)Wheel rim deformation
2)Poor wheel bearings
3)Poor tires
4)Improper wheel balance
5)Poor fastening around the wheel axle
4.Wheel rotation is not flexible
1)Poor wheel bearings
2)Improper installation of front wheels
3)Brake oil pipe and cable are stuck
5.Front suspension too soft
1)Reduced elasticity of the front shock absorber
2)Low tire pressure
6.Front suspension too hard
1)Damaged front shock absorber
2)Excessive tire pressure
7.Abnormal noise from the front shock absorber
1)Poor front shock absorber
2)Loose fastening parts of the shock absorber
8.Poor braking effect
1)Poor brake adjustment
2)The surface of the brake disc is dirty
3)Brake pad wear

6.2 Front wheels

Disassembly

Use tools to lift the entire vehicle and ensure that there is no force acting on the front wheels
Remove the front wheel axle 1
Remove the front wheel assembly 2

Disassembly of rear wheels
Use tools to lift the entire vehicle and ensure that there is no force acting on the rear wheels

Remove the chain 1
Remove the rear axle 2
Remove the rear wheel assembly 3

Disassembly of the disc brake disc

Remove the fixed bolt 1
Remove the disc brake disc 2
Remove the front wheel 3

Installation

Install in the reverse order of disassembly
Wheel axle mounting nut torque:
80N•m~90N•m
Brake disc mounting bolt torque:
25•m~30N•m
(Apply thread fixing agent)

Inspection

Brake disc thickness: If it is less than 3mm, replace it with a new brake disc

Disassembly of the chain wheel disc

Remove the two sprocket locking plates 1
Remove the fixing bolt 2
Remove the sprocket 3

Attention

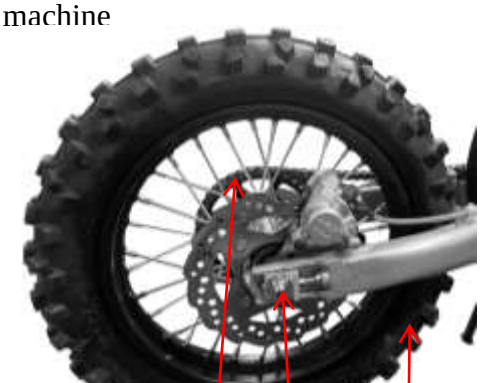
To remove the sprocket lock, you need to flatten the protrusions at both ends, loosen the bolts, and take out the sprocket lock.
The installation bolts of the disc brake disc and chain wheel disc are both equipped with thread tightening agent and are not easy to remove. You can use a hair dryer to heat the bolts before removing them

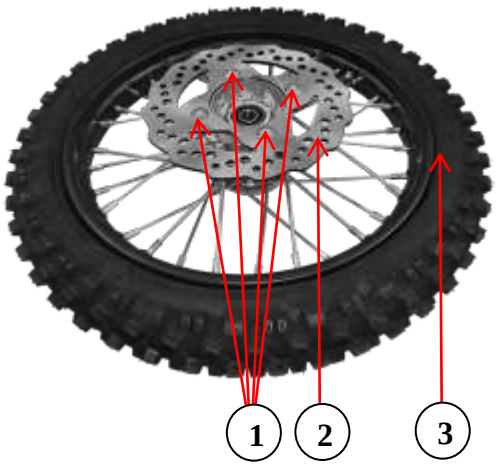
Inspection of the wheel rims

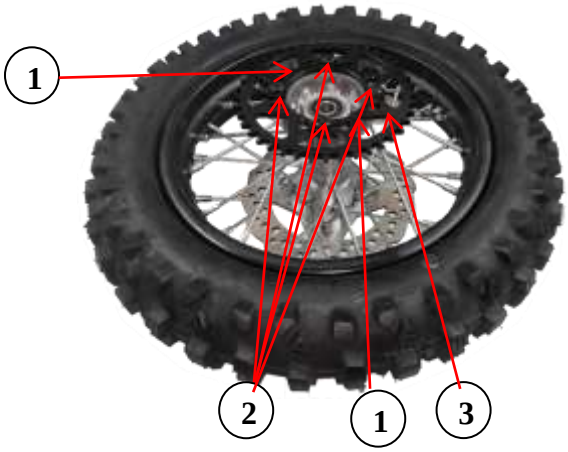
Check for damage, deformation, or scratches on rim 1, and replace it if there are any abnormalities. Slowly rotate the wheel and measure the runout of rim 1 using a dial gauge
Usage limit: Axial: 2.0mm
Radial: 2.0mm

Installation of the wheel rims

Press rim 2 into the tire on a dedicated machine





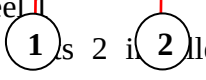


6.3 Braking sy

assembly of the ke caliper

nove front wheel 1

Remove the two s 2 i lled on the front shock absorber



Remove the brake caliper 3

Inspection

Observe if there are cracks in the brake caliper and if there is oil leakage at each fastening point, replace it if there is any

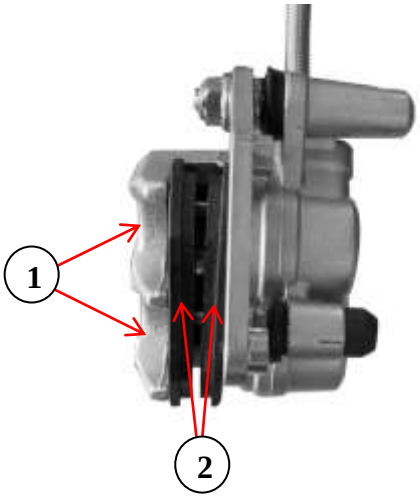
Installation

Brake caliper fixing bolt 2 torque: 10N•m~12N•m (coated with thread fixing agent)

Replacement of the shoe blocks

Loosen the fastening bolt 1

Remove the shoe block 2



Inspection

Measure the thickness of the front shoe friction layer 2. When the thickness of the shoe friction layer 2 is less than or equal to 1 mm, replace both brake pads with new ones at the same time.

Installation

Install in the reverse order of disassembly

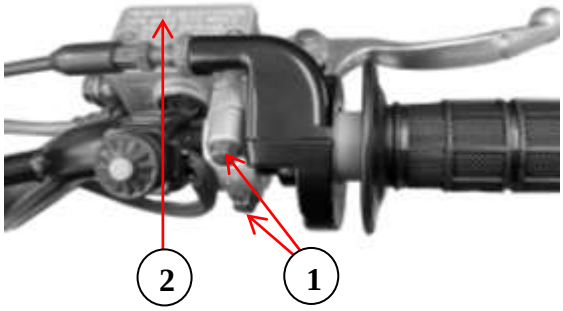
Disassembly of the front brake pump

Remove the bolt 1

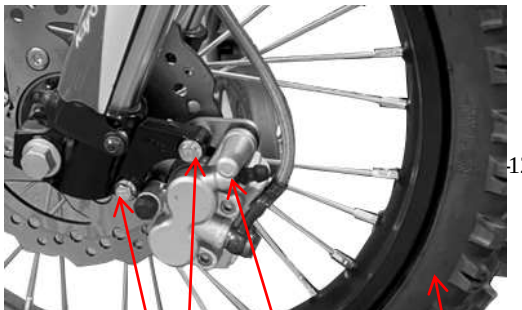
Separate the front brake handbrake pump 2 from the steering lever, and there is no need to remove the front brake handbrake pump from the vehicle body without replacing the brake pump assembly

Installation

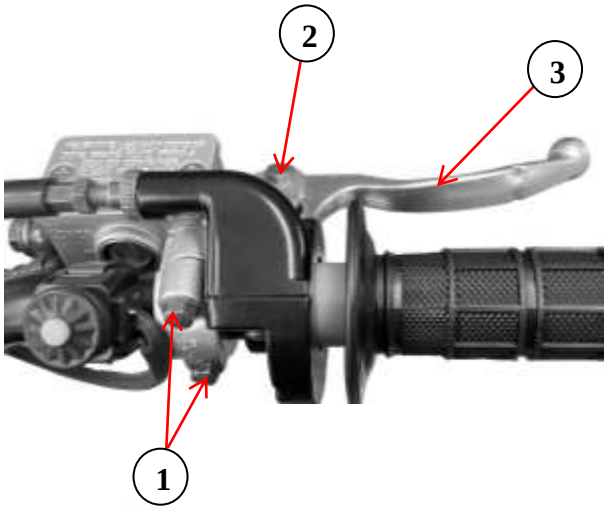
Install in the reverse order of disassembly



ention: Do not use the brake oil pipe to pend the brake pump, due to concerns that the front brake handbrake pump may tip over and cause air to enter the hydraulic



system, it is necessary to maintain the installation position while fixing it on the steering handle.
The direction of the oil pipe on the vehicle body must be arranged according to the cables and wires in first Chapter, and the smooth flow of the brake oil circuit must be ensured
When the brake system assembly is installed, the braking force must be checked.



Disassembly of the brake handle

Disassembly

Remove the two fixed bolts 1
Remove the brake handle bolt 2
Insert the brake handle 3

Installation
Install in the reverse order of disassembly

Disassembly of the throttle handle

Disassembly

Remove the two bolts 1 that secure the throttle seat
Take out a section of the throttle cable from the plastic clip 2
Pull out the throttle lever 3 in the direction of the arrow

Installation
Install in the reverse order of disassembly

Rear brake foot brake pump
Disassembly

- move the rear wheel
- move the bolt 1

Remove the bolt 2 connecting the brake pedal

Remove the rear brake foot brake pump 3

Installation

Install in the reverse order of disassembly

Attention： When installing the oil pipe, it is necessary to ensure that the brake oil circuit is unobstructed. When the brake system assembly is installed, the brake force must be checked. If the front and rear cannot be linked to control the brake system, check whether the connector is connected. Check whether the brake fluid volume in the brake oil cup is between the upper and lower limit graduation lines. If necessary, add the recommended brake fluid by Kayo to the upper and lower limit graduation lines. Check whether the brake switch and its operation are normal.

Bolt 1 torque requirement: 10-12N·m

Disassembly of the brake pedal

Disassembly

Remove the mounting bolts 1

Remove the rear brake torsion spring 2

(Pry both ends apart)

Remove the bolt 3

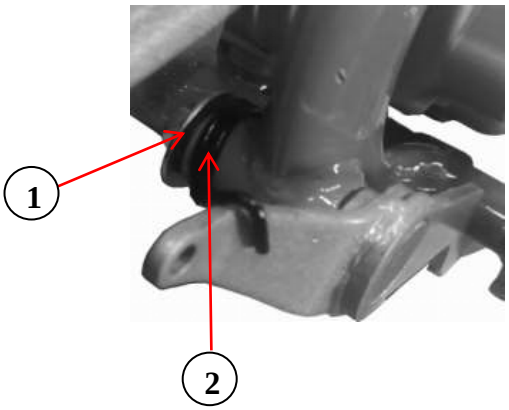
Remove the brake pedal 4

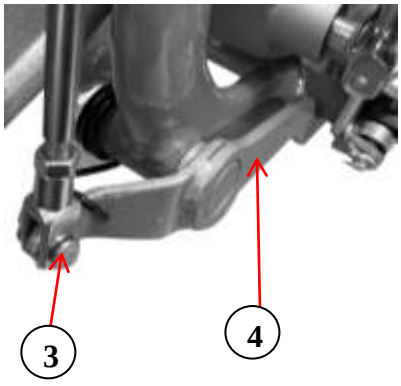
Attention

The bending angle of the split pin is greater than 180°

Add a small amount of grease to the rear brake torsion spring

(Mobil XHP222 grease)





Installation

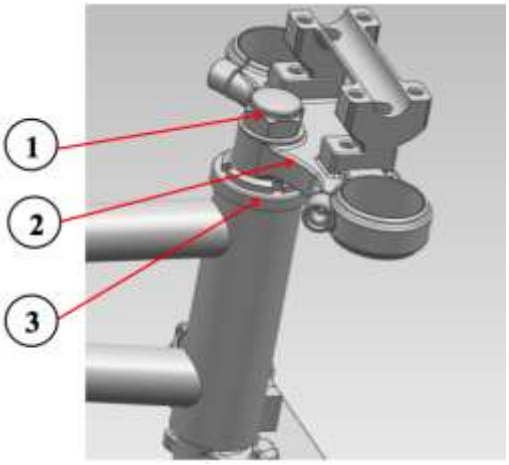
Install in the reverse order of disassembly

6.4 Front suspension system

Disassembly of the front suspension

assembly

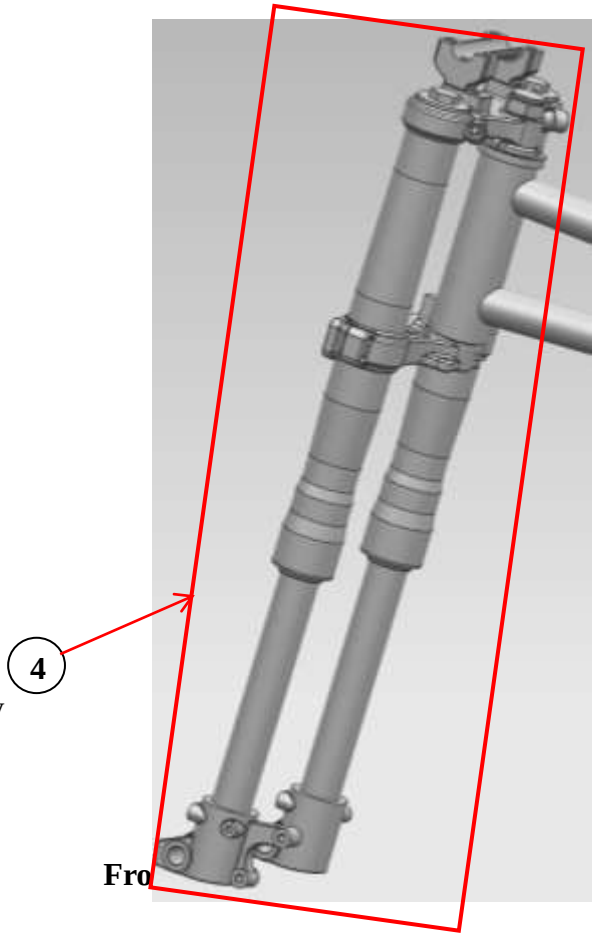
Attention： When repairing the suspension system, first raise the front wheels of the entire vehicle overhead.



Disassembly

Remove the front panel (→ 2.4)
Remove the front fender (→ 2.8)
Remove the steering handle assembly (→ 6.5)
Remove the front panel upper bracket
Remove the front wheel (→ 6.2)
Remove the front brake caliper

Remove the large cover nut 1
Remove the upper connecting plate 2
Remove the dust cover 3



Remove the front suspension assembly 4

Installation

Install in the reverse order of disassembly

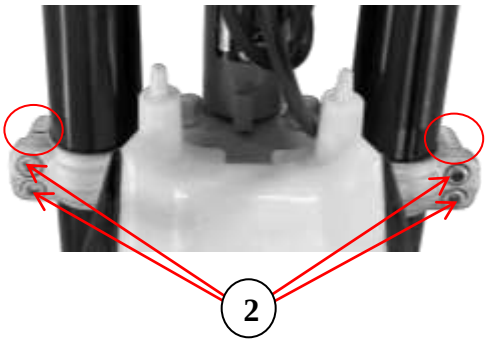
Fro

isassembly

Remove the bolt 1 fixed to the upper

connecting plate
Remove the bolt 2 fixed to the lower connecting plate

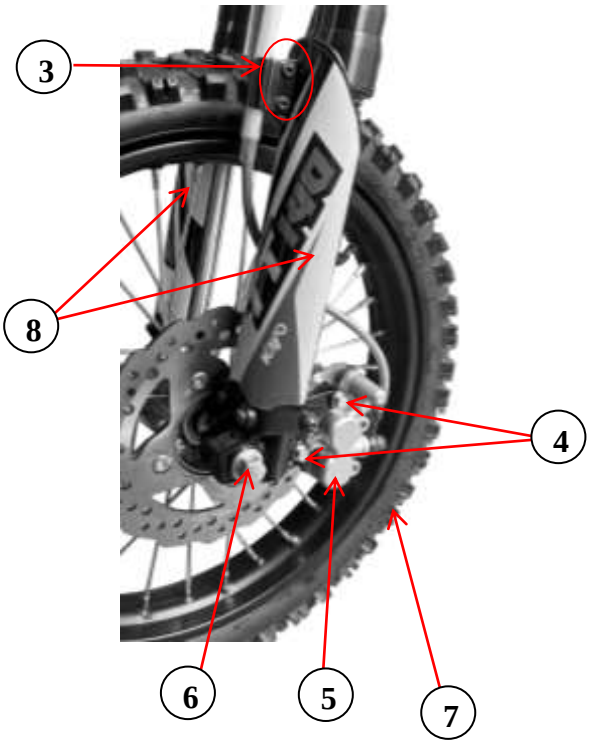
Attention
The gaps at the four red circles should be sealed with wooden strips before removing the shock absorber, otherwise it will be difficult to open them when installing the shock absorber.
The bottom of the shock absorbing red cover is flush with the plane of the upper connecting plate
Bolt torque requirement: 17-22 N.m



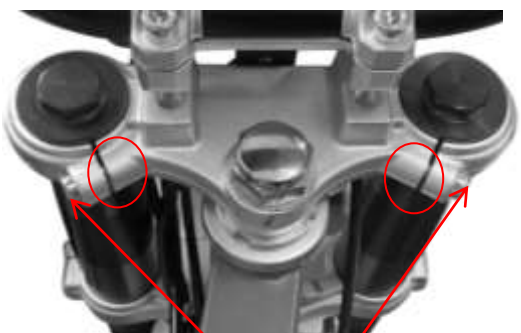
Take out the front brake oil pipe 3 from the gap
Remove the bolt 4 that secures the front brake lower pump
Remove the front brake lower pump 5
Remove the front wheel axle 6
Remove the front wheel 7
Remove the front shock absorber 8

Installation
Install in the reverse order of disassembly

Attention
The difference between the left and right front shock absorbers is only at the pipe clamp and disc brake
If you need to remove the front shock absorber guard, please refer to (→ 2.10)



5 Steering system



Disassembly of the steering handle

Remove the front panel 1 (→ 2.4)

Installation

Install in the reverse order of disassembly

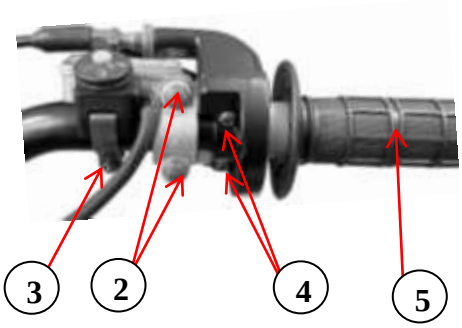
Disassembly of the right-hand handle assembly

Remove the bolt 2 that secures the front disc brake pump

Remove the bolt 3 that secures the start switch

Remove the bolt 4 that secures the throttle seat

Remove the right handle sleeve 5



Disassembly of the left hand handle assembly

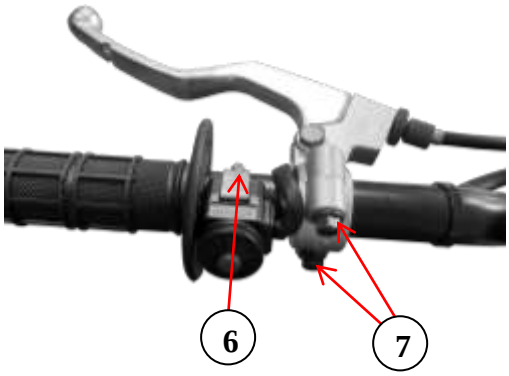
Remove the bolt 6 that secures the flameout switch

Remove the bolt 7 that secures the clutch lever

Remove the four bolts 8 that secure the upper pressure block

Remove the upper pressure block 9

Remove the steering handle 10



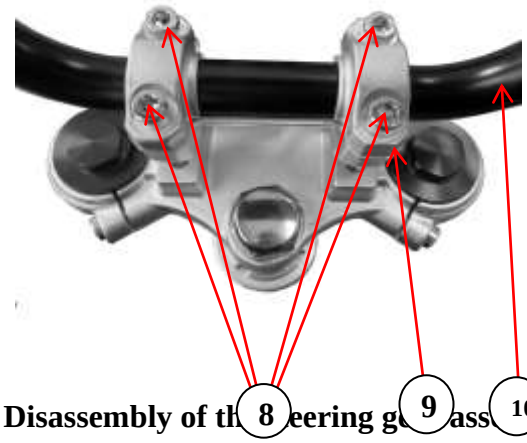
Attention： The main cable assembly, throttle cable, brake oil pipe, and cable attachment should be arranged correctly according to the diagram (→ 1.7)

Installation

Follow the reverse order of disassembly for the steering handle assembly

After installation of the directional handle, tilt the vertical ground back 3-5°

The flameout switch is horizontally facing back 45°



Disassembly of th eering g ass bly

nove the bolt 1 that secures the panel bracket

Remove the panel bracket 2
Remove the bolt 3 that secures the lower pressure block
Remove the lower pressure block 4
Remove the large cover nut 5
Remove the upper connecting plate 6
Remove the dust cover 7
Remove the lower connecting plate assembly 8

Installation

Install in the reverse order of disassembly

Attention

Do not lose gaskets and dust covers and other accessories during disassembly
Torque of the large cover nut: 35-40N·m
The steering column and bearings on the lower connecting plate are installed using a hydraulic press, and do not need to be disassembled unless they are damaged

6.6 Rear suspension system

Disassembly

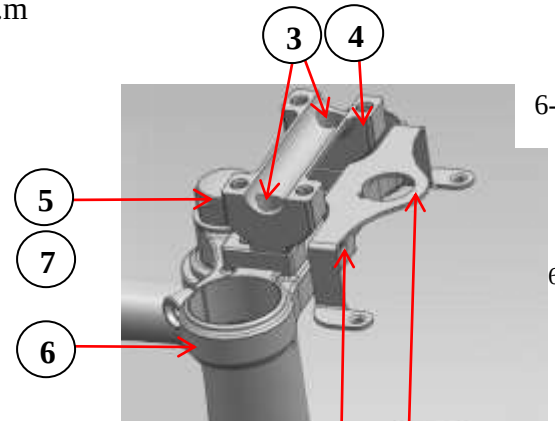
Remove the seat cushion, rear center guard, rear left guard, and rear mudguard assembly (→ 2.0 body cover)
Remove the chain 1
Remove the fixed rear shock absorber flange shaft 2
Remove the flat fork shaft 3 (remove the black cover)
Remove the rear suspension assembly 4

Installation

Install in the reverse order of disassembly

Attention

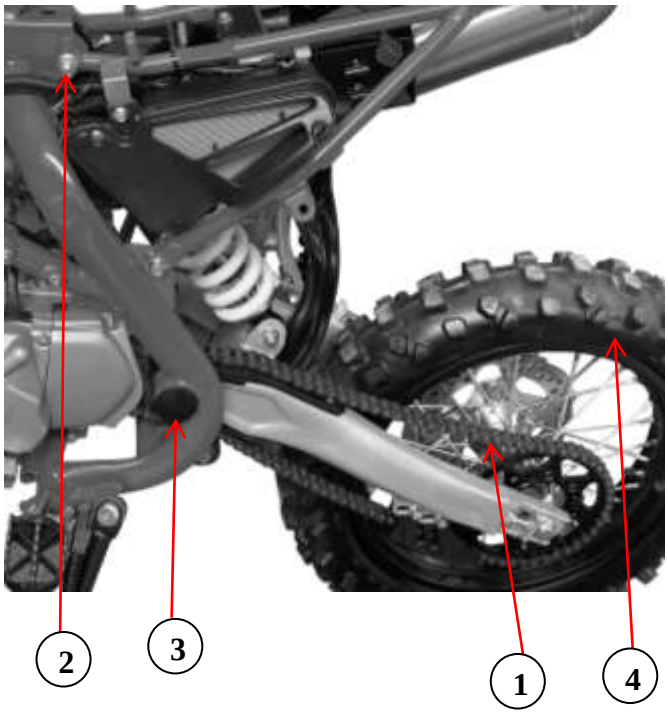
The flange shaft runs from right to left
Rear shock absorption torque requirement: 25-30N.m
Rear flat fork torque requirement: 80-90 N.m



6-11

6-12

（Lower link board) (Upper link board）



assembly of the rear shock absorber

ıen repairing the suspension system, the vehicle body should be suspended first and

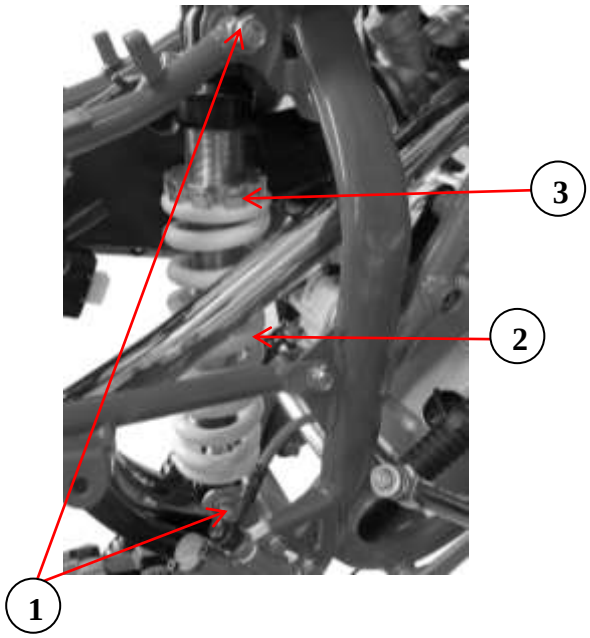
the suspension system should be removed, otherwise the vehicle body will fall down due to lack of support

Park the vehicle on a level surface and use a jack to firmly support the rear of the vehicle

Remove the seat cushion and rear left guard panel

Remove the bolt 1 that installs the rear shock absorber on the vehicle body and the rear fork assembly

Remove the rear shock absorber 2



Inspection

Check the removed shock absorber and adjust the adjustment turntable 3 to the appropriate position

Installation

Install in the reverse order of disassembly

Disassembly of the rear flat fork

When repairing the rear fork, the vehicle body should be suspended first. When disassembling the rear fork, otherwise the vehicle body will fall down due to lack of support

Park the vehicle on a level surface and use a jack to firmly support the rear of the vehicle

Remove the flange shaft 1 connecting the tire and rear fork

Remove the chain 2

Remove the rear disc brake 3

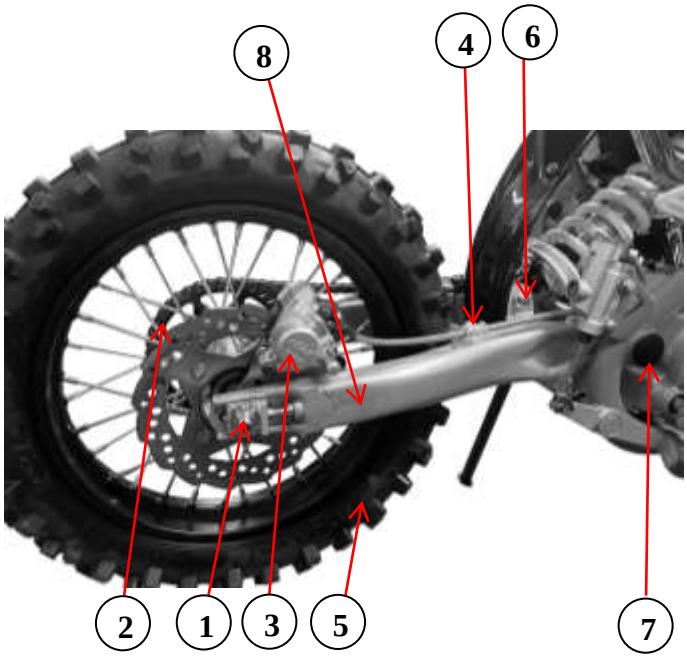
Remove the rear disc brake oil pipe 4 from the oil pipe clamp

Remove the rear wheel 5

Remove the bolt 6 fixed to the rear shock absorber

Remove the flat fork shaft 7

Remove the rear flat fork assembly 8



Installation

Install in the reverse order of disassembly

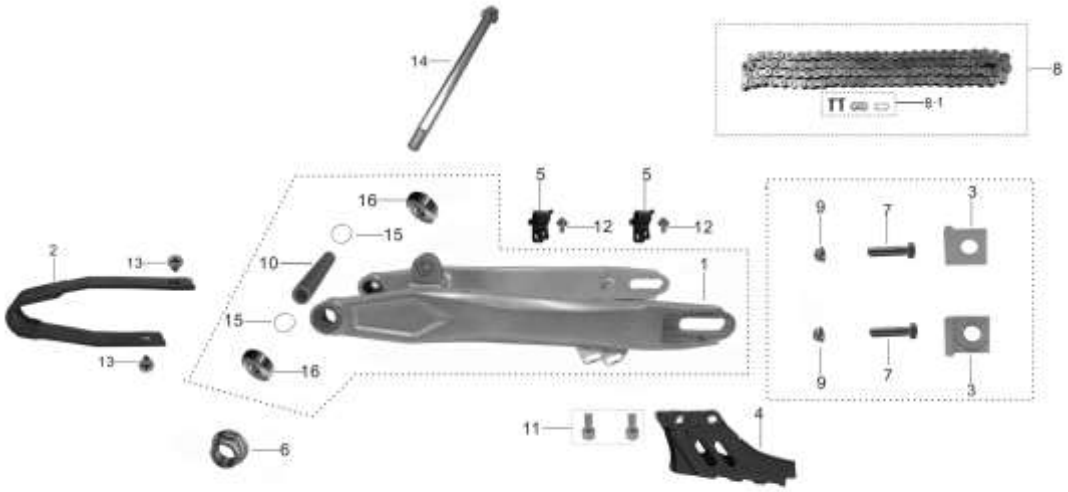
Attention

The flange shaft runs from right to left

Torque requirement 80-90N·m

Inspection

The diagram of the total composition of the rear fork of the vehicle is as follows



Flat fork assembly

No.	Name	Quantity	No.	Name	Quantity
1	Steel flat fork	1	9	Hexagonal nut GB6170-86	2
2	Guide chain sleeve	1	10	Flat fork bushing	1
3	Aluminum chain adjustment block	2	11	Hexagon socket cylindrical head combination screw GB9074	2
4	Chain stopper	1	12	Outer hexagonal large head flange bolt GB5789	2
5	Rear disc brake oil pipe clamp	2	13	Cross countersunk head machine screw GB819	2
6	Hexagon flange self-locking nut GB6187-86	1	14	Flange shaft	2
7	Outer hexagonal opposite side bolt GB5783	2	15	Rubber O-ring	1
8	Chain	1	16	Bearing	2
8-1	Chain joint	1			

Inspection after disassembling the rear fork

- Check the chain to see if it is damaged. If it is, replace it with a new one
- Check if the rear flange shaft is bent or damaged, and if so, replace it with a new flange shaft
- Check the steel flat fork, and if there is any damage, replace it with a new one
- Check the flat fork bearing to see if there is any damage. If there is any damage, replace the flat fork bearing
- Check the guide chain sleeve. If the guide chain sleeve is damaged, replace it with a new one
- Check if the other parts are damaged, and if there is any damage, replace them with new ones

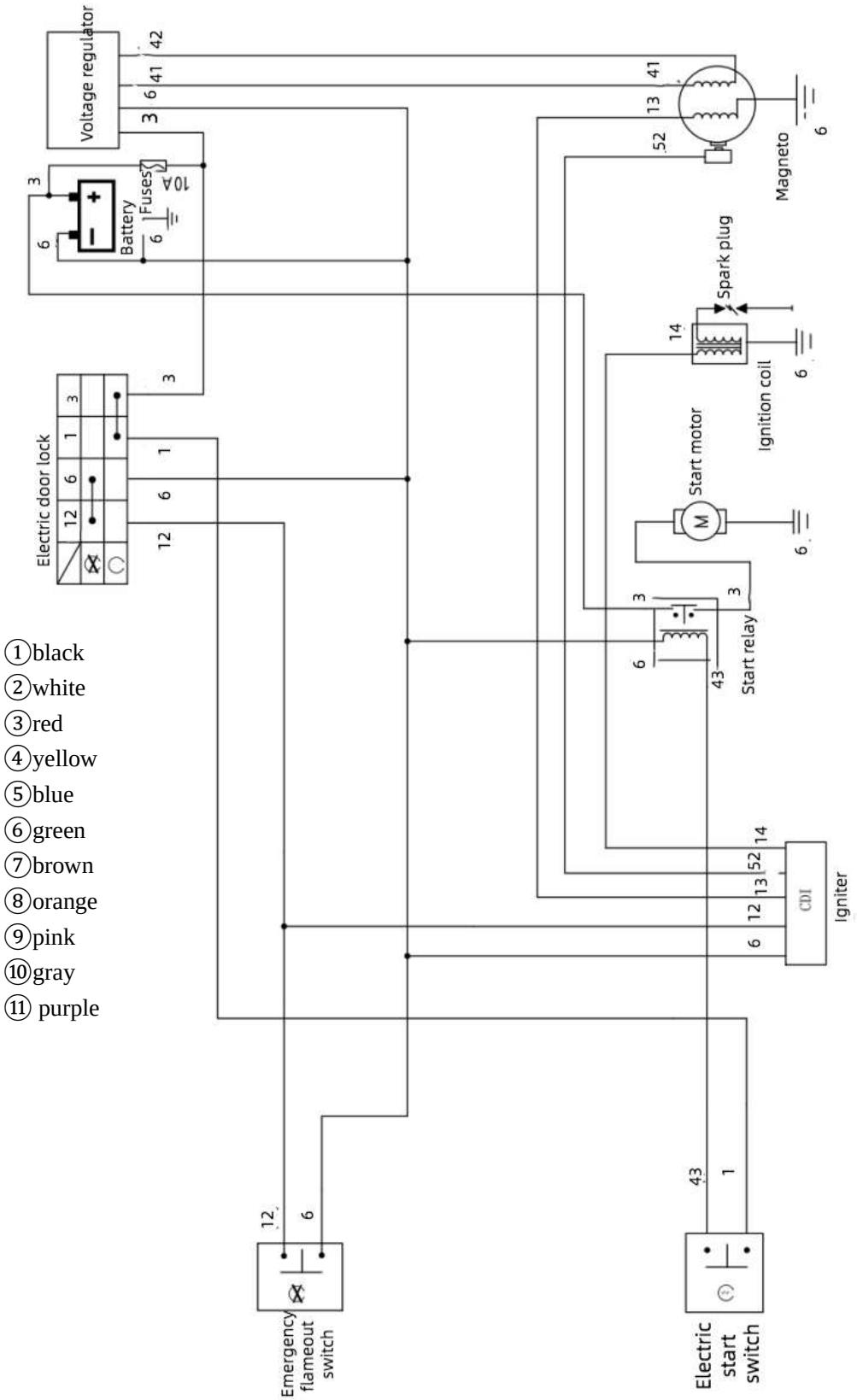
Installation

Perform in the reverse order when decomposing by a rear flat fork

Attention： When installing the bushing, apply Mobil XHP222 lubrication to both ends of the flat fork shaft

6-13

Appendix


Voltage regulator
42
41
6
3
Battery
Fuses
10A
Magneto
Spark plug
Ignition coil
Start motor
Start relay
Electric door lock
CDI
Igniter
Emergency flameout switch
Electric start switch
①black
②white
③red
④yellow
⑤blue
⑥green
⑦brown
⑧orange
⑨pink
⑩gray
⑪ purple