KAYO MOTO

A180

SERVICE MANUAL

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Preparation Instructions

This SERVICE MANUAL introduces detailed information for A180 four-wheeled vehicle (ATV),including the maintenance and adjustment procedures, disassembly and assembly instructions, inspection and maintenance points, troubleshooting methods and maintenance technical data and detailed graphical data to guide the operation .

Please read this manual carefully and follow it strictly during inspection and repair, this can effectively prolong the service life of various parts, improve the

The first chapter mainly introduces general operation items, tools used, basic technologies and maintenance parameters.

The second chapter introduces the assembly and disassembly operation of the whole vehicle cover.

The third chapter introduces the regular inspection and adjustment of the whole vehicle.

The fourth chapter introduces the disassembly of engine peripheral assembly parts.

The fifth chapter introduces the methods and precautions of disassembly, inspection, maintenance and assembly of various parts of the engine.

The sixth chapter introduces the information about vehicle chassis.

The seventh chapter introduces the inspection and

Catalogue

The contents in this manual are subject to change due to vehicle improvements and other reasons without further notice.The actual state of the vehicle shall prevail during maintenance.

ZHEJIANG KAYO MOTOR CO., LTD.

R & D department

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Unit conversion table in this book

Item	Unit conversion
Pressure	1kgf/cm^2=98.0665kPa；1kPa=1000Pa
	1psi=6.8948kPa
Torque	1kgf·m=9.80665N·m
Volume	1mL=1cm^3=1cc
	1L=1000cm^3
Moment of force	1kgf=9.80665N
Length	1in=25.4mm

Danger/Warning/Caution

Please read the following explanation carefully,which emphasize the special meanings of the words "danger", "warning" and "caution", and pay special attention to the prominent meanings when repairing the engine.

Danger: Be alert to high danger

Warning: Be alert for moderate danger

Caution: Pay attention to minor hazards

However, please note that the “danger” and “warning” contained in this SERVICE MANUAL cannot cover all potential risks during the use and maintenance of the engine. Therefore, in addition to the “danger” and “warning” regulations, maintenance personnel must also have basic mechanical safety knowledge. If you are not sure to complete the entire maintenance operation process, please consult a more experienced senior technician.

1 Maintenance information

1.1 Operation note

Safety Precautions

1、Work clothes (coveralls), hats and safety boots suitable for the operation must be worn, and if necessary, safety protection such as dust-proof glasses, dust masks and gloves should be worn to protect themselves from injury.

2、Because the exhaust gas contains harmful components, it is forbidden to run the engine for a long time in closed places or places with poor ventilation.

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

4、The battery solution (dilute sulfuric acid) is a strong corrosive agent, which may cause burns and blindness when it touches the skin and eyes. If your clothes or skin are accidentally stained with battery solution, please rinse them with plenty of water and go to the hospital for treatment in time. The battery and battery solution should be kept strictly and must be kept in a safe place out of the reach of children. When the battery is charged, it will produce flammable and explosive hydrogen. Once a fire source or electric spark approaches, there is a danger of explosion. So please charge in a well-ventilated place.

5、As gasoline is flammable, fireworks are strictly prohibited at the work site. Pay attention not only to open flames, but also to electric sparks. In addition, the vaporized gasoline is at risk of explosion,

please choose a well-ventilated place for operation.

6. Be careful not to let the rear wheel, clutch and other rotating parts and movable parts pinch hands and clothes during maintenance.

7. When two or more people perform operations, they must constantly greet each other to confirm

safety.

Precautions for disassembly and assembly

1、Parts, Parts, lubricants and greases must use KAYO designated recommended products.

2、The parts of each system should be sorted and kept separately to ensure that the parts can be installed back to their original positions.

3、Please clean the dirt and dust on the ATV before maintenance.

4、Gaskets, O-rings, piston pin retaining rings, split pins, etc. must be replaced with new ones after disassembly.

5、The elastic collar will be deformed if the opening is too large during disassembly, and it will easily fall off after reassembly. Please do not use elastic collar that have become loose or have lost their elasticity.

6、After the parts are disassembled and inspected, they should be cleaned and the cleaning agent should be blown off with compressed air before the measurement.Apply lubricating oil on the moving

7、surface before assembling.

8、When disassembling, check the necessary places and measure relevant data so that it can be restored to the state before disassembly.

9、 Fasteners such as bolts, nuts and screws should be pre-tightened first and then tightened on the diagonal with the specified tightening torque according to the principle of from large to small and from inside to outside.

10、During disassembly, rubber parts should be checked for aging during disassembly and replaced in advance if necessary. In addition, since rubber parts are not resistant to gasoline, kerosene, etc., please try not to let volatile oils and greases adhere to them.

11、Smear or inject the recommended grease in the specific places according to the requirements of the SERVICE MANUAL.

12、The correct special tools should be used for disassembly and assembly operations.

13、The inner ring or outer ring of the ball bearing can be rotated by fingers to confirm whether the rotation is flexible and smooth. If the disassembly method of applying force on the ball is adopted during disassembly, the dismantled bearing should not be used again:

□● If the bearing axial or radial clearance is too large, replace it.

□● The bearings that feel stuck in rotation should be cleaned, and those that still feel stuck after cleaning should be replaced, and those that cannot be cleaned should be replaced directly.

□● If the bearing is originally compaction fit with vehicle or axle diameter, but it gets unsuitable after disassembly, replace it.

14、The bearings should be coated with oil or grease before assembly.Pay attention to the installation direction when assembling single-sided dust-proof bearings.Open type or double-sided dust-proof bearings should be installed with the manufacturer's logo and size outward when assembling.

15、When installing the rectangular retaining ring, the chamfered side should face the direction of force. Do not use the retaining ring that has been slackened and lost its elasticity. After assembling, turn the rectangular retaining ring to confirm that it is firmly installed in the groove.

16、After assembly, it is necessary to check whether each fastening part is tightened and whether it is working properly.

17、Brake fluid and coolant will damage the painted surface, plastic parts, rubber parts, etc., do not allow them to adhere to such parts, in case of adhesion, immediately rinse with water.

18、The oil seal should be installed with the side marked by the manufacturer facing outward (the direction without oil):

□● When assembling, be careful not to curl the oil seal lip and prevent burrs from scratching the oil seal lip.

□● Apply grease to the oil seal lip before assembling.

19、When installing hose parts, insert the hose into the root of the joint. If there is a pipe clamp, install the pipe clamp in the dent of the pipe. Replace the hoses that are not tight during installation.

20、Do not get dust, dirt, etc. into the engine and brake hydraulic system.

21、The gasket material attached to the joint surface of each engine box must be cleaned up before assembly. Touch marks on the contact surface must be grind evenly with oilstone to remove them.

22、Do not twist or bend the cable excessively. Deformed and damaged cables will cause malfunction or breakage.

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

Engine running-in

The engine has many parts for relative movement, such as pistons, piston rings, cylinder blocks, intermeshing transmission gears. Therefore, in the initial stage of using,it is necessary to perform standardized running-in, which can make the moving parts adapt to each other,correct the working clearance, and form a good smooth friction surface that can withstand heavy loads. Only the engine that has been run-in standardized can have excellent performance and reliability.

The recommended running-in time is 10 hours, and the specifications are as follows:

0～10 hours: Avoid continuous operation at a throttle greater than 1/2. , while changing vehicle speed. It is not recommended to run for a long time at a fixed throttle position.After every 1 hour of work, stop and turn off the engine to cool down for 5-10 minutes to avoid sudden acceleration.Throttle change should be slow, not sudden big sudden small,do not drag goods during running-in.

Note ：

- During the running-in period, carry out daily maintenance according to the specification, and promptly remove any fault；
- After the running-in is over, the whole machine can be maintained before entering the normal driving stage.

1.2 Vehicle identification number

①VIN number

②Vehicle nameplate

③Engine number

Model	A180
VIN number	
Engine number	

1

2

3

1.3 Main parameter list

Item		Parameter
Model		A180
Length（mm）		1560
Width（mm）		1020
Height（mm		1000
Wheelbase（mm）		1085
Engine mode		1P63QML
Displacement（ml）		177
Fuel type		No. 92 gasoline and above
Dry Weight(kg)		155
Number of passengers		1 person（only rider）
Max. Loading weight		1 person ＋ 80kg = 140kg
Tire size	Front	AT23×7-10
	Rear	AT22×10-10
Ground Clearance		160mm
Turning radius (minimum turning radius of the closest point)		2400mm
Engine	Starting method	Electric start、Hand pull start
	Engine type	Single cylinder, four-stroke, air-cooled
	Air distribution	CHOHO/Chain drive
	Cylinder diameter x stroke（mm）	62.5×57.8
	Compression ratio	10.0:1
	Lubrication method	Pressure + splash lubrication
	Oil pump type	Rotor type
	Lubricating oil filter type	Full flow filter rotary
	Engine oil grade	SF MA 15W-40
	Cooling type	Air Cooling

Item		Parameter	
Air filter type		Sponge filter element filtering type	
Throttle body	\	\	
	\	\	
Fuel capacity		5.6L	
Transmission system	Clutch type	Automatic clutch	
	Variable speed method	CVT	
	Shift gear	F-N-R	
	Shift mode/sequence	Manual/F-N-R	
	Output type	Rear axle output	
	Rotation direction of engine output	In the forward gear, viewed from the rear of the vehicle, the front is clockwise.	
Steering device	Maximum steering	45°±1°	
Braking device type		front	Hydraulic disc
		rear	Hydraulic disc
Buffer mode	Suspension method	Front wheel double rocker independent suspension, rear wheel non-independent suspension	
Frame type		Steel pipe and steel plate welded type	

1.4 Maintenance parameter list

Lubricating device

Item		Standard	Limitation
Engine oil capacity	Change oil	800ml(No oil filter replaced）	—
	Change oil	850ml（Replace the oil filter）	
	Full capacity	900ml	—
Recommended engine oil		Only use SF MA 15W-40 or equivalent engine oil, do not substitute or mix different brands of engine oil, which will cause engine damage and cause accidents.	
Oil pump rotor	Radial clearance of inner and outer rotor	—	0.12mm
	Radial clearance between outer rotor and pump body	—	0.12mm
	Axial clearance between rotor surface and pump	0.05~0.1	0.2mm

Intake system（ For details, please see 05-Engine section)

Wheels (front and rear wheels are the same)

Item		Standard	Limitation
Rim jump	Vertical	0.8mm	2.0mm
	Horizontal	0.8mm	2.0mm
Tyre	Residual groove	—	3mm
	Air pressure	35kPa（0.35kgf/cm2）	—

Brake system

Item		Standard	Limitation
Front brake	Brake disc thickness	3.5mm	3.0mm
Rear brake	Brake handle stroke	10~20mm	—
	Brake disc thickness	4.0mm	3.5mm

Battery / charging device / trigger coil

Item				Standard
Magneto	Type			Permanent magnet alternator
	Output			Three-phase full wave
	Magneto trigger coil resistance			150
	Magneto no-load voltage (engine in cold state)			No
	Maximum output power of magneto			180w
	Regulated voltage			14.5 ± 0.5V
	Trigger coil peak voltage			≥1V，200r/min；≥8.5V，2000r/min
Rectifier type				Full wave rectification
Battery	Capacitance			12V 7Ah
	Voltage between terminals	Fully charged		14.4V
		Insufficient charging		Less than11.8V

Ignition device

Item		Standard
Ignition method		CDI electronic ignition
Spark plug	Type	Resistance spark plug
	Standard	A7RTC
	Spark plug gap	0.6~0.7mm
	Spark characteristics	Blue and white light
	primary	0.3 Ω
	Secondary	3.8 kΩ
Peak voltage	Ignition coil primary	300~450V
	Pulse generator	20kV~30kV
Coil resistance of starting relay		3.5 Ω

Lighting / Meter / Switch

Item		Standard
Fuse		10A
Light, bulb	Headlamp	12V—35W
	Tail light/brake light	12V—2.8W

Valve train + cylinder head (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

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

Tightening torque of the designated part-Whole vehicle

No.	Item	Fastener code	Quantity	Tightening torque（N·m）
1	Suspension lower rocker bolt	GB5789 M10×1.25×70	4	45~59
2	Front shock-absorbing bolt	GB5787 M10×1.25×40	4	45~59
3	Rear shock bolt	GB5787 M10×1.25×50	1	45~59
4	Rear shock bolt	GB5787 M10×1.25×45	1	45~59
5	Slotted nut for front wheel hub installation	GB9457 M14×1.5×H18	2	126~218
6	Steering rod ball pin slot nuts	GB9457 M10×1.25	4	33~45
7	Direction handlebar gland screw	GB70-85 M8×30	4	22~30
8	Front brake caliper bolt	GB5789 M8×25	4	22~30
9	Front brake disc bolt	M8×1.25×20	8	22~30
10	Rear brake caliper body bolt	GB5789 M8×25	2	22-30
11	Rear brake disc mounting screw	GB70-85 M8×16	4	22~30
12	Mounting bolt of direction handlebar pressure block	GB5783 M10×1.5×30	2	45~59
13	Oil cooler mounting bolt	GB5789 M6×25	4	9~12
14	Trailer ball fixing plate mounting screw	GB70-85 M10×1.5×30	4	45~59
15	Slotted nut for rear wheel hub installation	GB9457 M16×1.5	2	199~311
16	Slotted nut for steering column installation	GB9457 M10×1.25	1	110~130
17	Steering column clamp mounting bolt	GB5787 M8×60	2	22~30
18	Mounting bolts in front of fuel tank	GB5789 M6×25	2	9~12
19	Mounting bolts behind the fuel tank	GB5789 M6×30	2	9~12
20	Horn mounting bolt	GB5787 M6×16	1	9~12
21	Negative pressure switch bolt	GB5787 M6×16	1	9~12
22	Engine mounting bolt	GB5787 M10×1.25×160	1	45~59
23	Sprocket base mounting screws	GB70-85 M8×20	4	38~51
24	Plastic bottom bracket mounting screws	GB70-85 M6×45	4	13~16
25	Cross pan head tapping screw	GB845-85 ST4.2	—	—
26	Cross pan head machine screw	GB828-88 M5×16	2	—
27	Cross large flat head machine screw	TM6	—	—
28	Rim mounting nut	GB6187-86 M10×1.25	16	45~59

Tightening torque of the specified part - engine part (see 05-engine part for details)

Tightening torque of fasteners at unspecified positions

Type	Torque（N·m）	Type	Torque（N·m）
5mm bolt and nut	4.5~6	5mm screw	3.5~5
6mm bolt and nut	8~12	6mm screw	7~11
8mm bolt and nut	18~25	6mm convex bolt	10~14
10mm bolt and nut	30~40	8mm convex bolt and nut	20~30
12mm bolt and nut	35~50	10mm convex bolt and nut	30~40

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

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

1.6 Lubricants and sealants

Coating place	Note	Grease
Steering bearing		Lightweight lithium soap grease
Throttle cable connection		
Active part of the rocker arm		
Inner peripheral surface of steering column		
Cushion lock movable part		
Active part of shift mechanism		

Lubrication of operating cables, bearings and rotating parts

Position	Content	Grease
Spherical shaft sleeve of steering shaft		General Lithium Grease for Automobile
Rear axle support		
Front and rear shock absorber joints		
Throttle handle shaft and cable connector		
Left and right brake lever shaft		

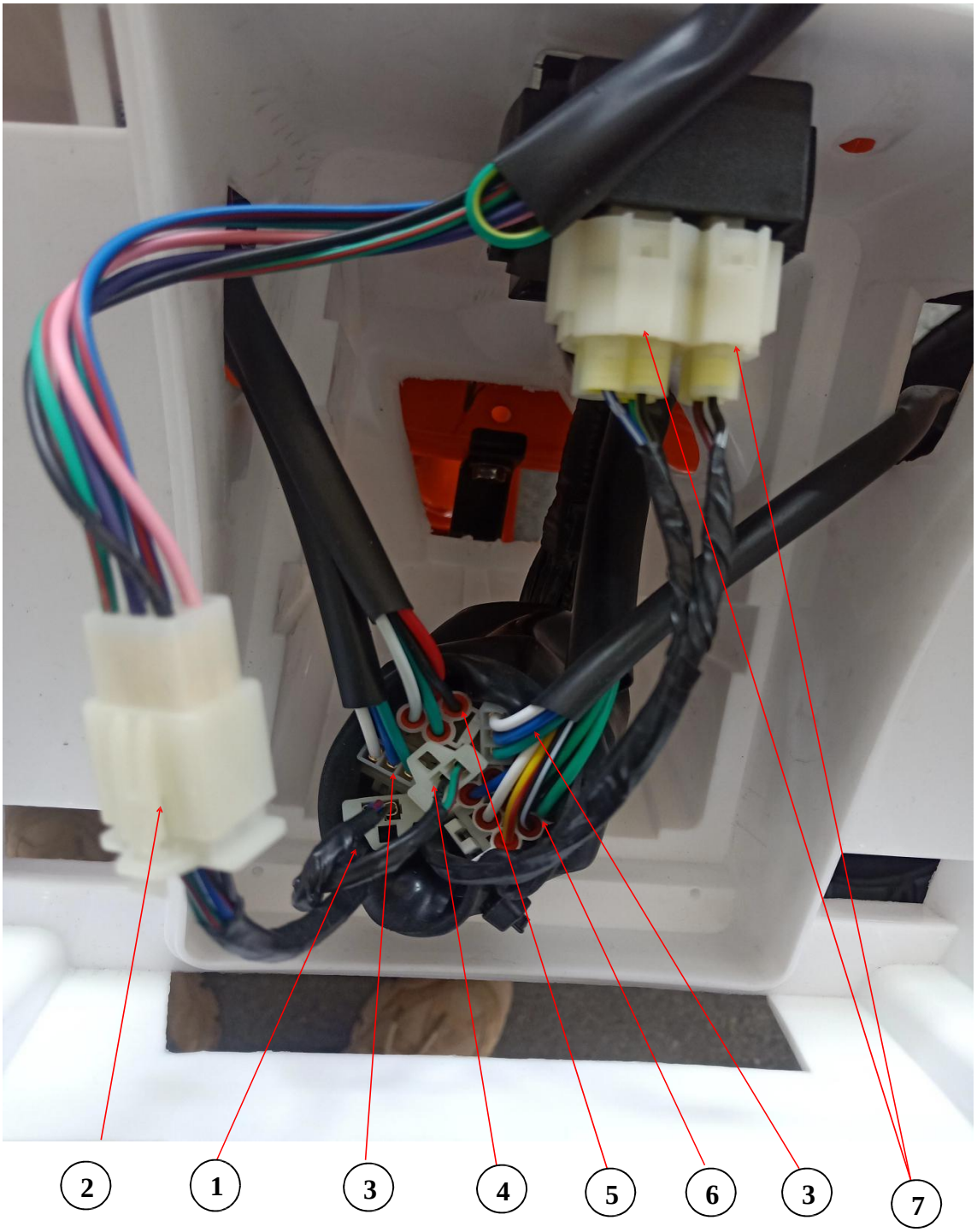
Parking cable connection		GB/T5671

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

Engine operating materials include lubricating oil (oil), grease (butter) and coolant, etc.

Installation accessories include plane sealant, thread locking glue, etc.

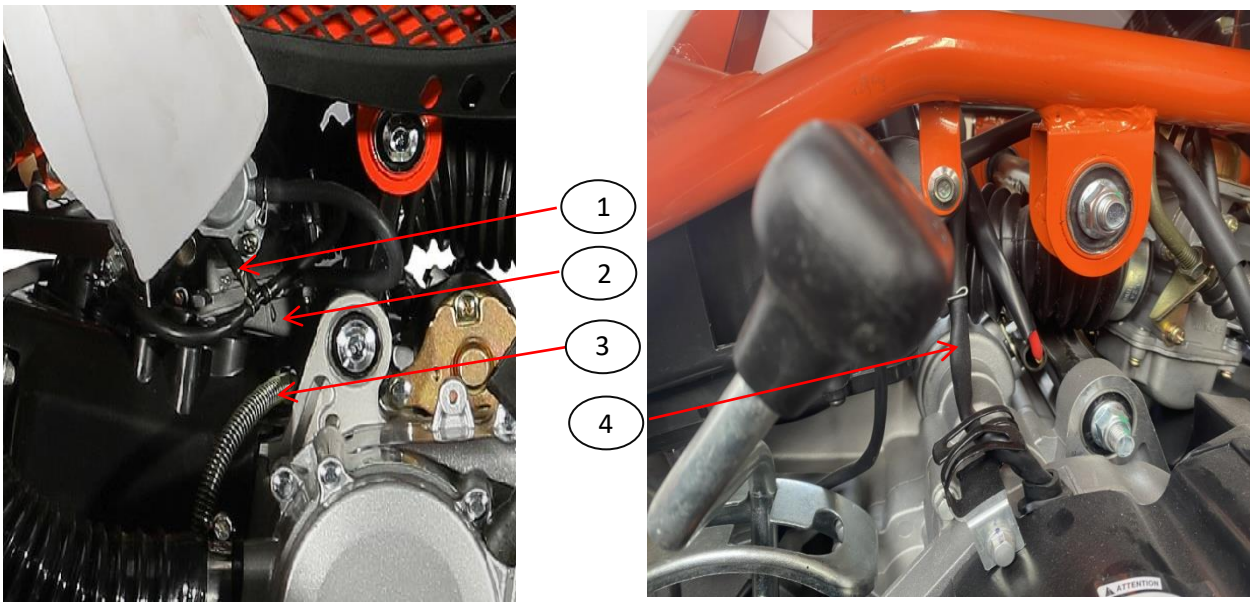
1.7 Cable, hose and cable wiring diagram

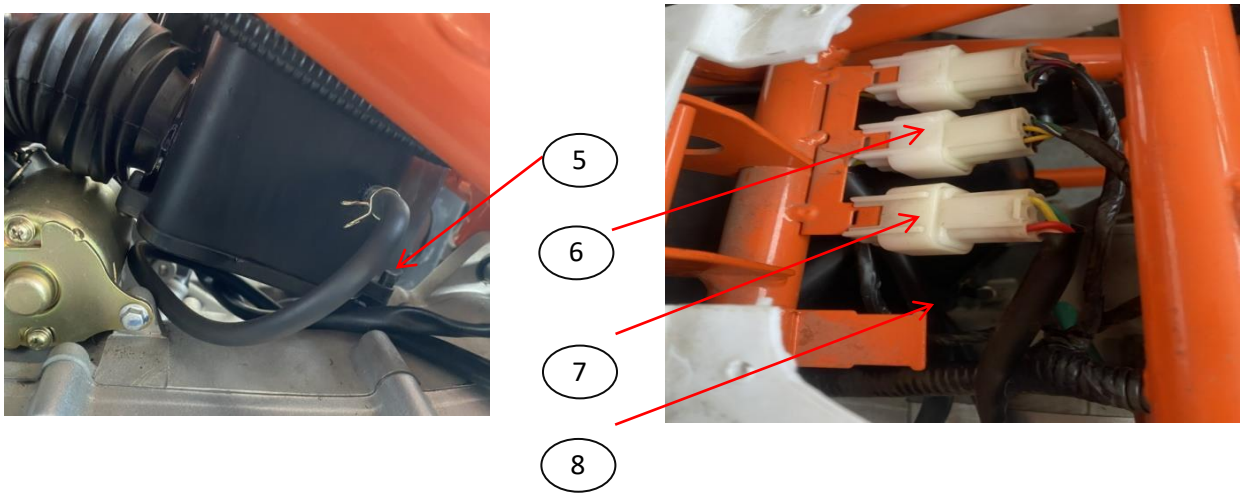


1. Gear display connector 2. Gear indication connector 3. Headlamp connector 4. Spare neutral display connector 5. Electric door lock switch connector 6. Left handle multi-function switch connector 7. Igniter connector

Note: The front panel must be removed before inspecting and repairing the above components. For detailed disassembly, please refer to Chapter 2 Body Covering Parts

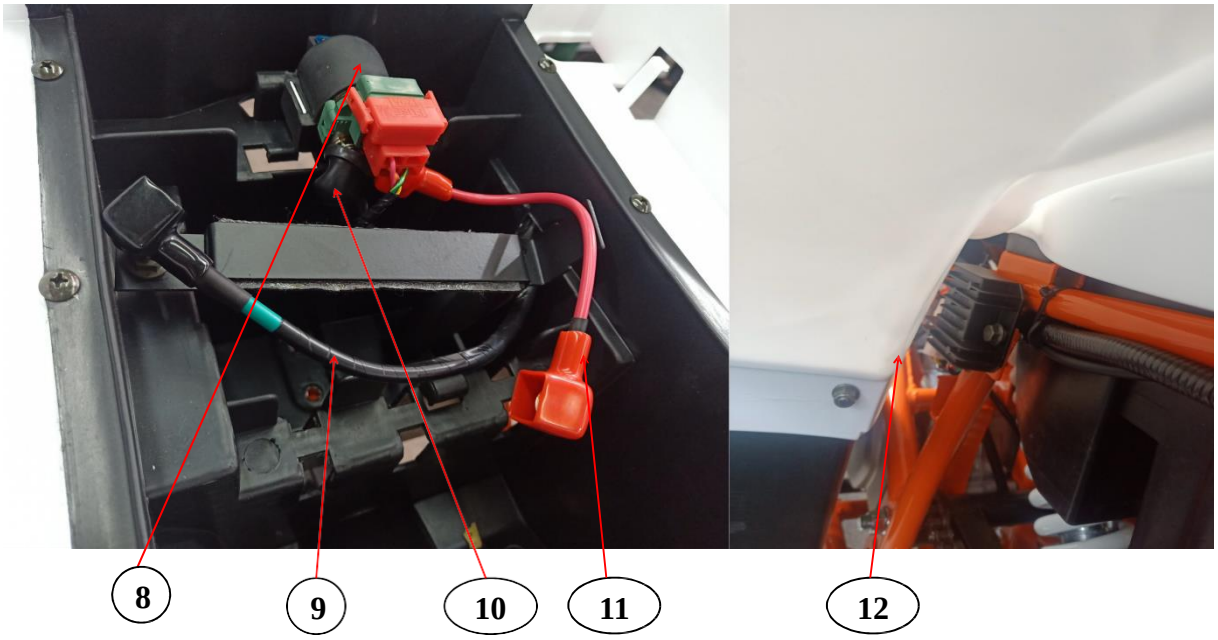
8. Brake sensor (one for left and right) 9. Throttle cable 10. Brake oil pipe



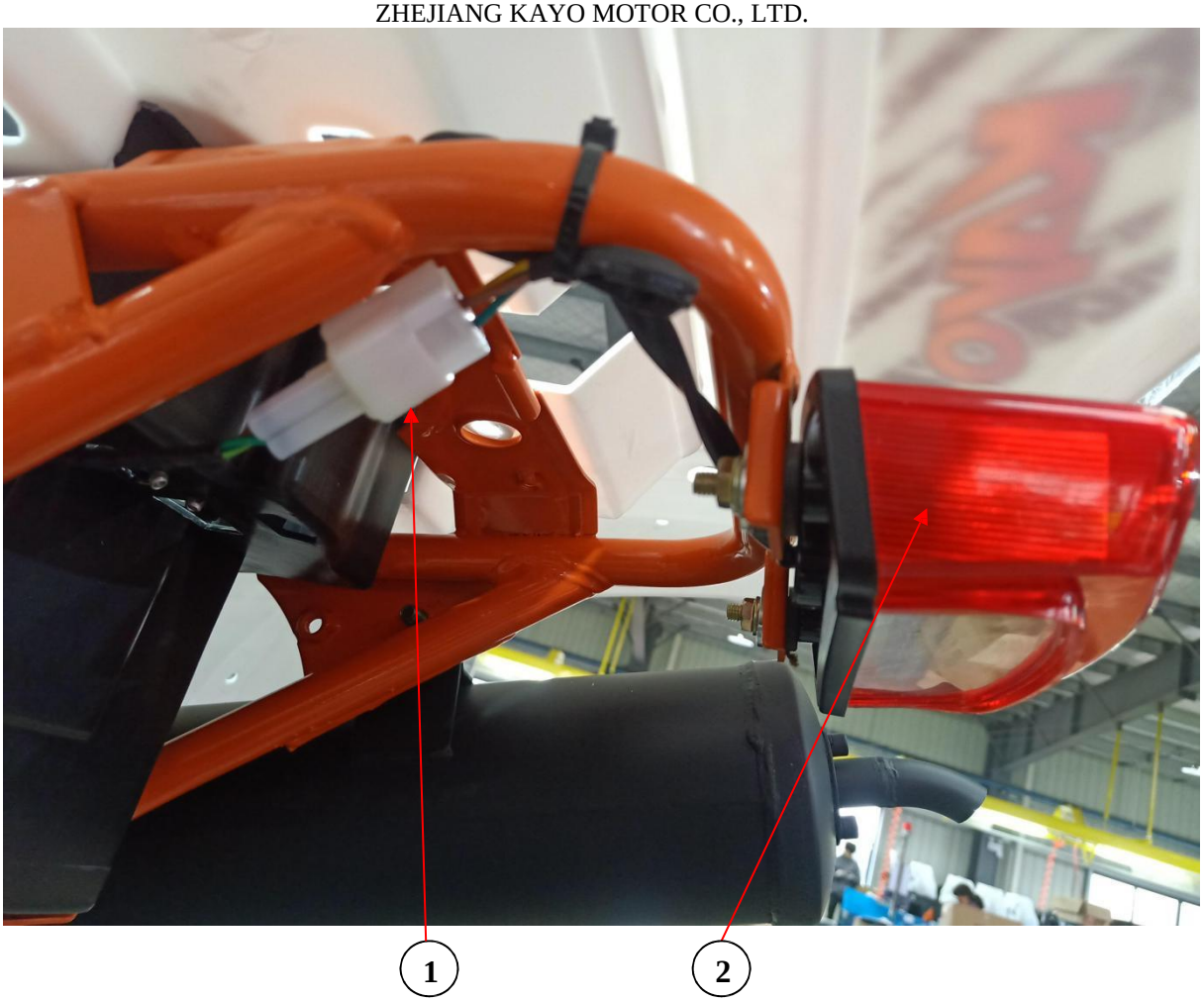


1. Carburetor negative pressure pipe 2. Carburetor 3. Carburetor drain pipe 4. Starter motor line 5. Engine exhaust pipe 6. gear display connector 7. Magneto trigger connector 8.Stabilized rectifier connector

Note: The front and rear jerseys must be removed before checking and repairing the above parts. For specific disassembly, see Chapter 2 Body Covering Parts



8. Relay 9. Battery negative wire 10. Starting motor wire 11. Battery positive wire 12. Voltage stabilizer rectifier



1. Taillight connection cord 2. Taillight

2 Vehicle cover

2.1 Overhaul information

Operation notes

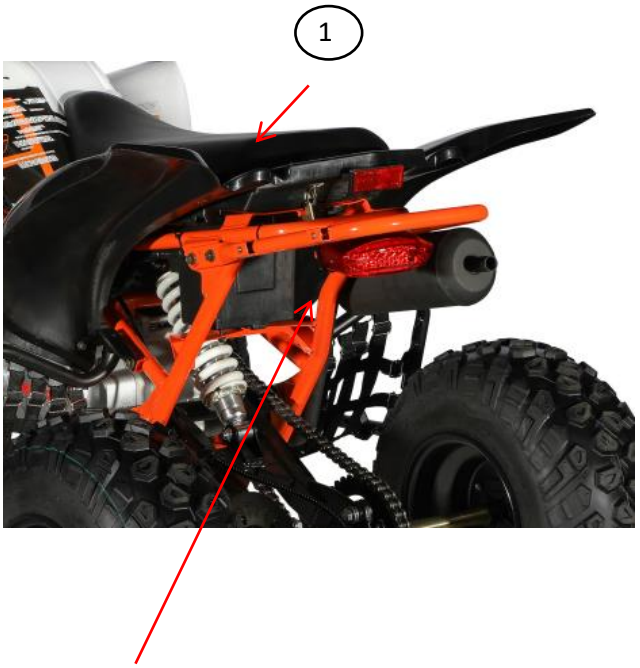
When replacing the covering parts affixed and riveted with the warning signs of laws and regulations on vehicles, the corresponding signs shall be filled correctly and completely as they are.

This chapter describes the disassembly and assembly sequence of the body cover. When the relevant covers need to be disassembled for the maintenance of the internal parts of the finished vehicle, refer to this chapter.This chapter describes the disassembly and assembly operations of shelves, seat cushions, and exterior parts. Please pass the pipes and cables from the correct position according to the wiring diagram of cables, pipes and cables.

2.2 Installation torque

M8 bolt	21（2.1）	Torque N·m(kgf·m)
M6 bolt	10（1.0）	Torque N·m(kgf·m)
M5 bolt	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

Pull up the seat cushion hook 2

Lift the back of the seat cushion and pull the seat cushion backward 1

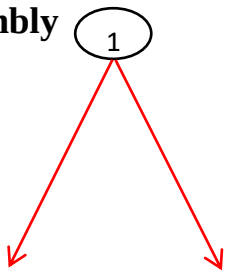
Remove the seat cushion

Assembly

Follow the reverse order and direction of disassembly

After installation, check whether the seat cushion is in place and firm, etc.

2.4 Assembly and disassembly of front cover of the hood, gear display meter, gear display, and shift lever assembly



2.4.1 Front cover of the hood

Disassembly

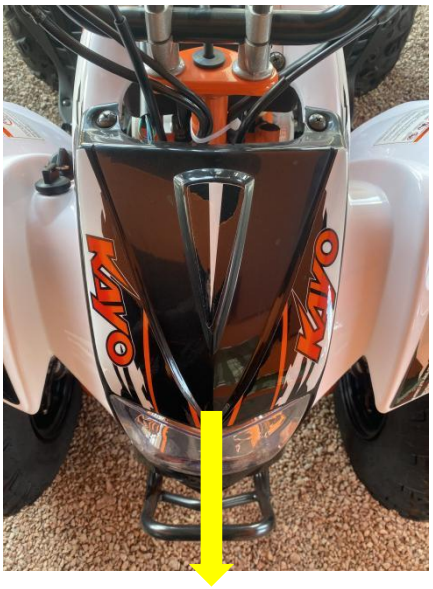
Remove the front panel fixing bolt 1,

and remove the head cover in the direction

of the arrow

(Note: the buckle on the head cover is easy to break,

and proceed with caution)

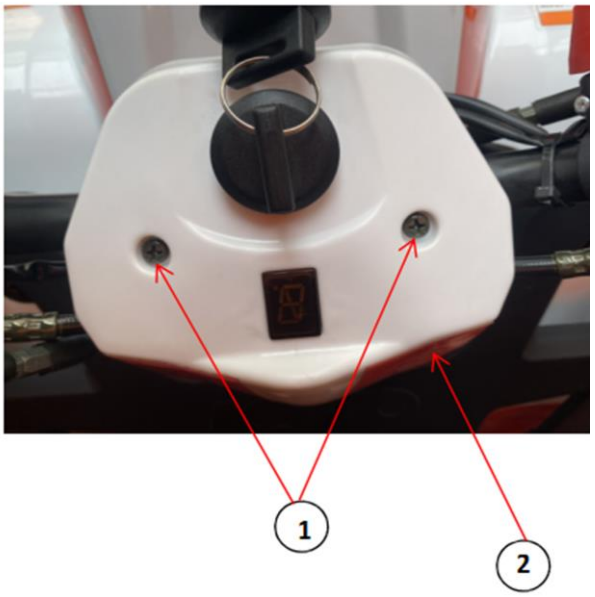


Assembly

Follow the reverse order and direction of

disassembly

2.4.2 Front gear display lampshade



Disassembly

1. Remove the fixing bolt 1 of the front lampshade

Remove the instrument front cover 2

(Note: before removing the front lampshade, remove the head cover and pull out the main lock insert)

Assembly

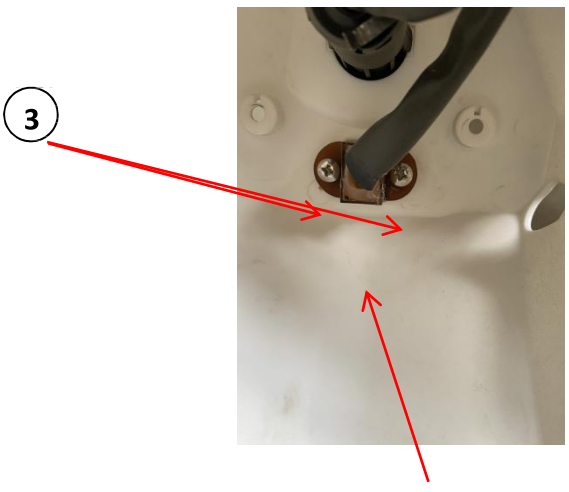
Follow the reverse order and direction of disassembly.

2.4.3 Gear display meter

Disassembly

Remove the gear display nut 3

Remove the gear display table 4 (Note: it need to be removed before disassembly)

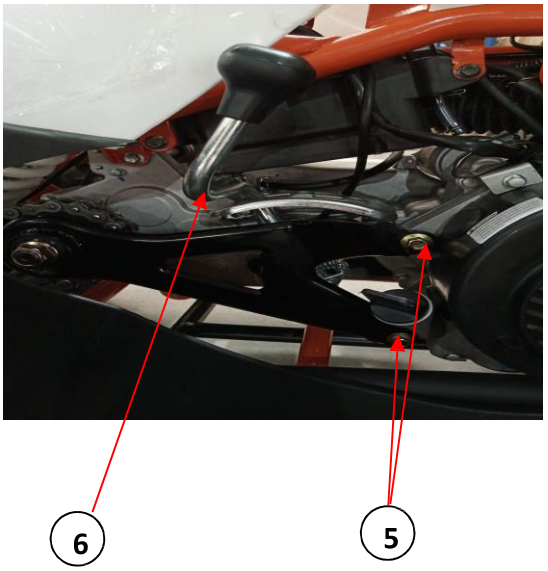


Assembly

Follow the reverse order and direction of disassembly

4

2.4.4 Shift lever assembly



Disassembly

Remove the foot stop lever mounting bolt 6

Remove the foot stop lever 5

Assembly

Follow the reverse order and direction of disassembly.

2.5.1 Left and right pedal tubes

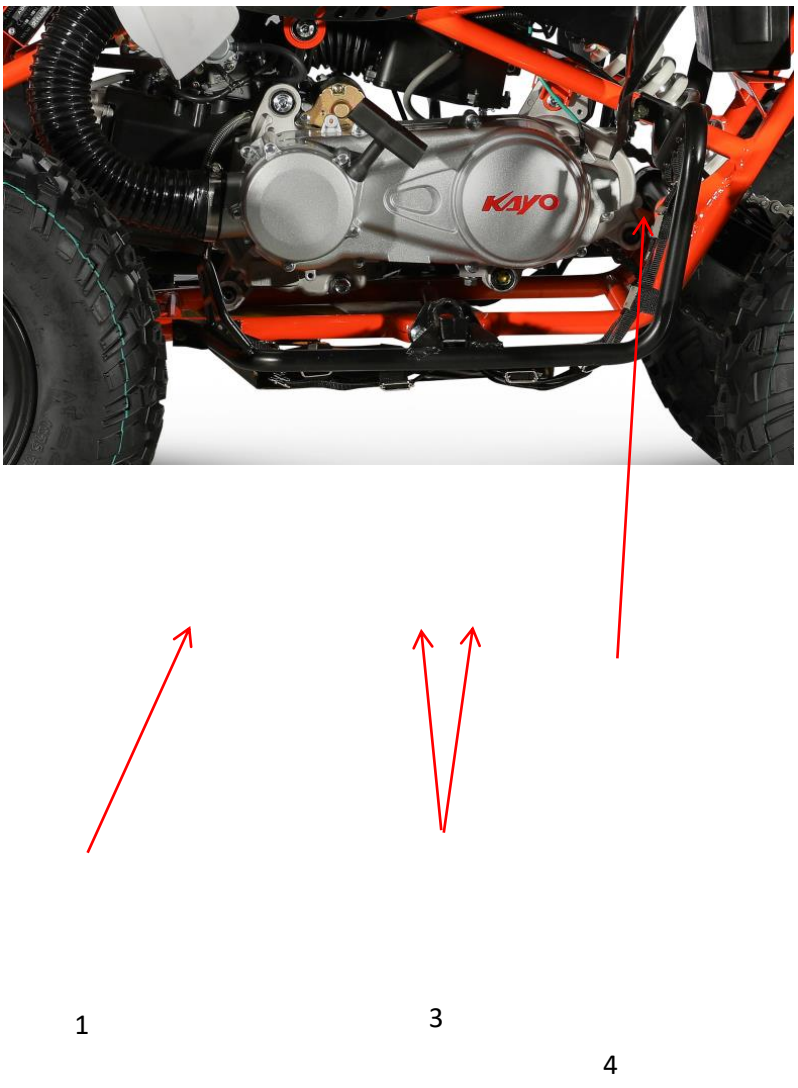
Remove the left foot pedal tube

Remove fastening screws 1/2, 3, 4/5 (Note: 2 and 4 are on the corresponding right side)

Remove the left foot pedal tube

Remove the left foot tube

The removal method of the right pedal tube is the same as that of the left pedal tube



Assembly

Follow the reverse order and direction of disassembly

2.5.2 Left and right iron pedals

Remove the left iron pedal

Remove the pedal fixing bolt 1 and the iron pedal 2

Disassembly method of right iron pedal and left iron pedal

1

2

2.6 Middle guard plate, front vehicle cover and rear vehicle cover

2.6.1 Middle guard plate

Disassembly

Remove the fixing bolt 1 of the middle guard plate, and remove the middle guard plate in the direction of the arrow

(Note: The buckle on the hood is easy to break, and operate with caution)

Assembly

Follow the reverse order and direction of

disassembly

2.6.2 Front vehicle cover

Disassembly

Remove the fixing bolts 1, 2, 3/4

and 5 of the front vehicle cover, and take off the front vehicle cover (Note: 4 is on the corresponding side)

(Remove the middle guard before removing the front vehicle cover)

Assembly

Follow the reverse order and direction of disassembly

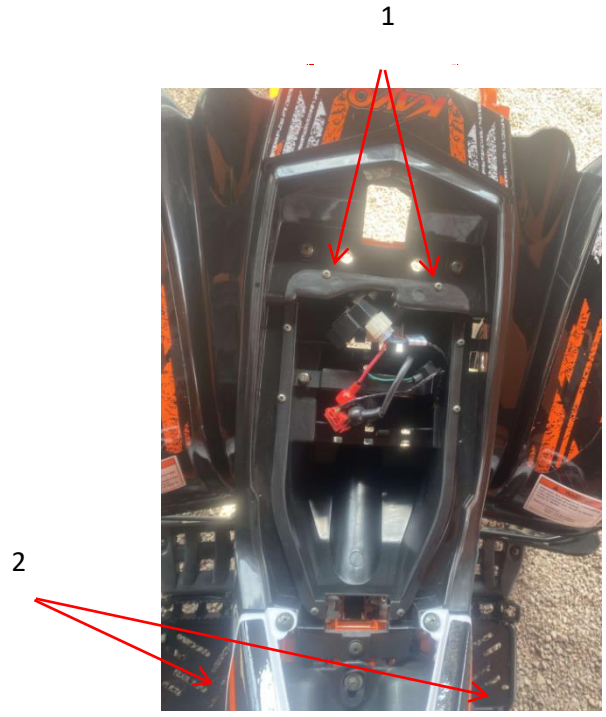
Note

Before disassembly, remove the cables on the front assembly board, and check the cables and connectors after installation to prevent wrong connection

2.6.3 Rear vehicle cover

Disassembly

Remove the fixing bolts 1, 2, 3, and take off the rear vehicle cover



Assembly

Follow the reverse order and direction of

disassembly

Note

3

Before disassembling, disconnect the cables of the tail lamp and rear turn signal lamp, and when disassembling the battery, turn off the ignition switch, disassemble the positive pole of the battery first, and install the negative pole of the battery.

Check the disassembled electrical appliances, cables, etc. after installation.

3 Regular inspection and adjustment

Maintenance Information

Operation notes

Note

- Since the exhaust gas contains toxic components such as carbon monoxide (CO), please do not run the engine for a long time in a closed place or a poorly ventilated place.
- When the engine just stopped, the temperature of muffler and engine was still very high, and if it came into contact with skin, it would cause burns. If the engine must be overhauled when it has just stopped, it is necessary to wear long-sleeved overalls and gloves for operation.
- Gasoline is very easy to catch fire, so fireworks are strictly prohibited in the workplace. Pay attention not only to open flames, but also to electrical sparks. In addition, because the evaporated gasoline is in danger of explosion, the operation should be carried out in a well-ventilated place.

Note

Don't let the rotating parts such as the drive system catch your hands and clothes

Note

The vehicle must be placed on a flat and stable ground

3.1 Determination of maintenance cycle

Engine maintenance is a regular periodic work. It is very important to maintain the engine at a certain time interval. Standardized maintenance can ensure excellent engine performance, reliable operation, economy and durability. The following is the maintenance cycle schedule of LT180 engine：

Note: The following table is designed according to normal use conditions. Under severe conditions, the maintenance period of the engine should be shortened accordingly.

Maintenance item	Item	Odometer km				
	cycle	1000km	4000km	8000km	12000km	Remark
Fuel system access			I	I	I	
Fuel filter		C	C	C	C	
Carburetor choke						
Air filter element	Note ①					
Spark plug		I	I	I	I	
Valve clearance		I	I	I	I	
Engine lubricating oil	Per year	R	R	R	R	
Lubricating oil filter screen	Per year R			C		
Clutch		I	I	I	I	
Carburetor idle speed		I	I	I	I	

The vehicle should be repaired according to the specified maintenance time. The meanings of various codes in the table are as follows：

C: Clean

R: Replace

A: Adjust

L: Lubricate

3 Regular inspection and adjustment

I: Inspect

Note ①: When driving in a dusty place, it should be cleaned frequently

3.2 Inspection and maintenance method

Inspection and maintenance items			Maintenance period			Judgment criteria
Inspect parts		Inspection item	Daily	Half a year	One year	
Steering gear	Steering wheel	Flexibility of operation	○			
	steering system	Damage	○			
		Installation status of the steering system	○			
		Sway of the ball pin	○			
Braking device	Brake pedal	Pedal stroke	○	○		
		Braking effect	○	○		
	Connecting rods and oil pipes	Relaxation, looseness and damage	○		○	
	Hydraulic brake and brake disc	Front and rear brake fluid volume	○	○		Brake fluid should be above the LOWER limit
		Wear and damage of brake disc	○	○		If the working disc thickness of the front 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 pad	Wear and damage of brake pads	○	○		The minimum brake pad (friction pad) thickness ≥1mm; please replace if it is less than 1mm
Walking device	wheel	Tire pressure	○	○		Front:35kPa (0.35kgf/ cm2)(5PSI) Rear:35kPa (0.35kgf/ cm2) (5PSI)
		Tire cracks and damage	○		○	
		Tire groove depth and abnormal wear	○		○	If there is no wear indication on the tire surface, the depth dimension of the remaining groove should not be less than 3mm
		Loose wheel nuts and wheel axles	○	○		
		Shake of the front wheel bearing	○		○	
		Shake of the rear wheel bearing	○		○	
Buffer device	Rocker arm	Shaking of the connecting part and damage to the rocker arm	○		○	
	Shock absorber	Oil spill and damage	○		○	
		Function			○	
Transmissi	Front axle	Transmission, lubrication	○		○	
	Rear axle	Transmission, lubrication	○		○	

on	Gearbox	Oil spill and oil volume	○		○	Loosen the oil filler bolt, and the oil quantity should reach the orifice.

Inspection and maintenance items			Maintenance period			
Check parts		Inspection item	Daily	Half a year	One year	Judgment criteria
Transmission	Output shaft (transmission	Looseness of connecting part	○	○		
		Shake of the spline			○	
Electrical installation	Ignition device	The state of the spark plug		○		Spark plug clearance：0.6~0.7mm
		Ignition period		○		
	Accumulator	Terminal connection status			○	
	Electric circuit	Looseness and damage of the connection			○	
Fuel device		Fuel leak		○		
		Throttle status			○	Throttle lever clearance：2 ~ 6mm
Lighting device and turn		Function	○	○		
Alarm and locking device		Function			○	
Meter		Function			○	
Exhaust pipe and muffler		Whether the installation is loose or damaged			○	
		Function of muffler			○	
Frame		Looseness and damage			○	
Other		Grease status of each part of the			○	
The abnormal part can be confirmed during operation		Confirm whether there is any abnormality in relevant parts	○			

3.3 Steering column, brake system

Place the ATV on a level place, hold the direction handle firmly in the direction shown in the figure, and check if there is any shaking.

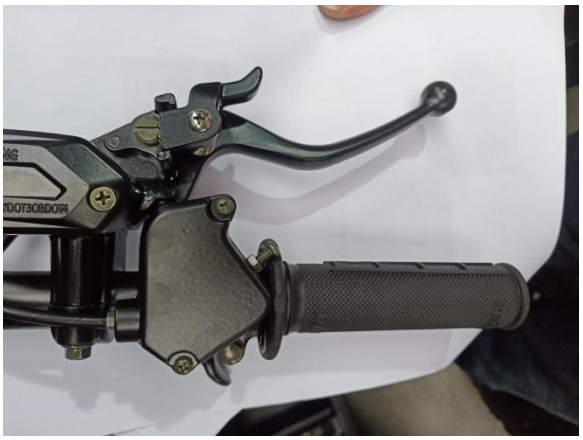
If shaking is felt, it should be confirmed whether the steering column is shaking or other shaking, and corresponding maintenance should be carried out.

If the steering column shakes, increase the locking force of the steering column locking nut or disassemble the steering column for maintenance.

Place the car in a horizontal position and slowly turn the direction handle to the left and right to confirm whether it can turn smoothly and flexibly.If there is obstruction in some places, check whether the main cable assembly and cables interfere. If the end Position of the steering pull rod is not observed, confirm whether there is interference and whether the steering bearing is damaged.

Note: It must be confirmed that the steering is flexible, otherwise an accident will occur due

to the inability to control the direction of the handle



Clearance of the front brake handle:

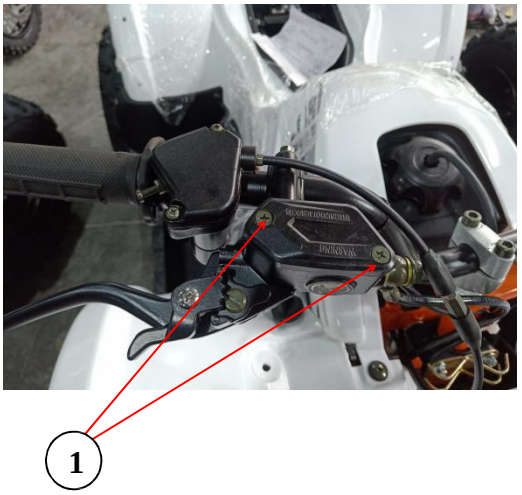
Operate the front brake handle to check the braking effect and the movement of the handle.

Check the play at the front brake lever

Front brake pump combination

<Fluid volume> Check the brake fluid volume

Check the brake fluid quantity through the observation hole 3. When the brake fluid quantity decreases to near the lower limit of hole 3, the vehicle will not be used continuously at this time, so 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 it is damaged or worn below the service limit, replace it.

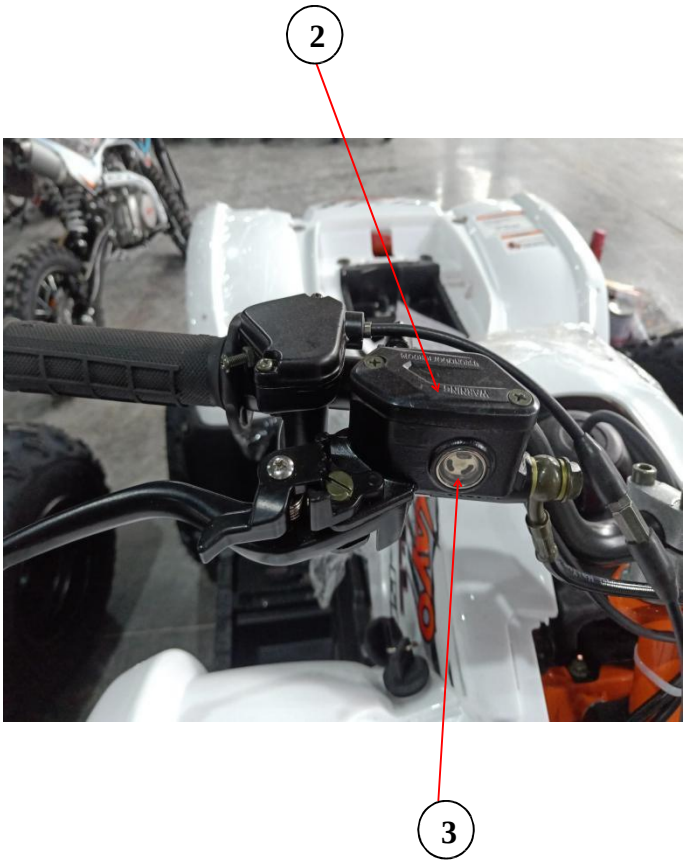


It is also necessary to check these items before using the vehicle every time.

Remove two exhaust screws 1

Remove the oil cup cover 2

Replenish the brake fluid recommended by Kayo until the upper limit.



Note

- Do not mix dust and water when replenishing brake fluid.
- To prevent chemical changes, please use the designated brand of brake fluid.
- Because the brake fluid will damage the plastic surface and rubber surface, please do not splash it on these parts.

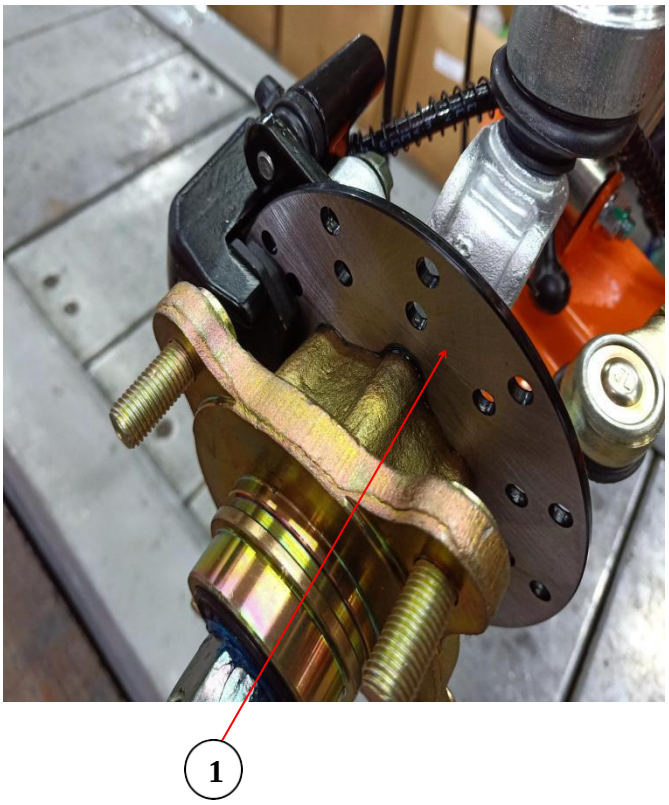
Turn the steering handle slightly to the left

and right, and then 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 <brake pad wear>

Check the wear of the brake pads, if the wear has reached the wear limit, replace the brake pads.



Note: Brake pads need to be replaced as a whole

Inspection and replacement of brake discs

Check whether the sliding surface of brake disc

1is worn or damaged. If the current brake disc

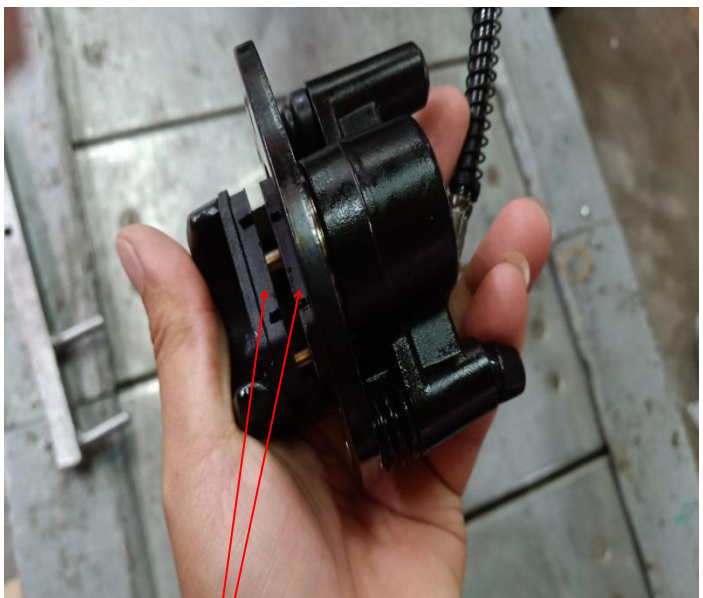
thickness ≤3.0mm, replace the brake disc.

Use limit thickness of front brake disc: 3.0mm

Check the mini. thickness of brake lining 2.

The minimum lining thickness ≥1 mm.If it is less than the minimum friction lining thickness, please replace with a new brake friction lining.

Check whether the brake friction lining is damaged or cracked. If it is damaged or cracked, please replace it with a new one.



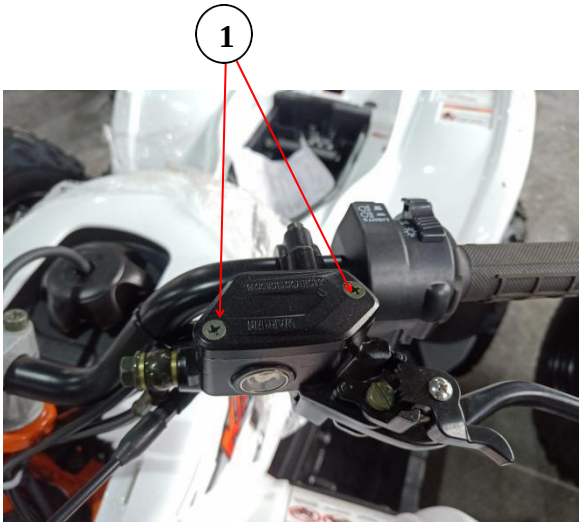
Note: Please check the position of the brake fluid level frequently to keep the fluid level at a safe position; check the oil circuit and connection points for damage, if any, please replace it in time; check the main pump/caliper for damage, if any, please replace it in time .

Note: Do not open the brake fluid oil cup for a long time.

Oil change <brake fluid replacement>

Change the brake fluid once a year

Rear brake pump combination < liquid quantity >



Check the brake fluid quantity

Check the brake fluid quantity through the observation hole 3. When the brake fluid quantity is reduced to the vicinity of the lower limit of the hole 3, the vehicle can no longer be used. It is necessary to check the leakage of the brake pump, brake pipe and various joints. If the inspection is normal, it is necessary to check the wear of the brake disc and brake pad. If it is damaged or worn below the service limit, replace it.

It is also necessary to check these items before using the vehicle every time

Remove the two exhaust screws 1 of the oil cup cover

Remove the oil cup cover 2

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

- Do not mix dust and water when replenishing brake fluid.
- To prevent chemical change,please use brake fluid of specified brand.
- Because brake fluid will damage plastic surface and rubber surface, please do not splash it on these parts.

Note: Please check the position of the brake fluid level frequently to keep the fluid level in a

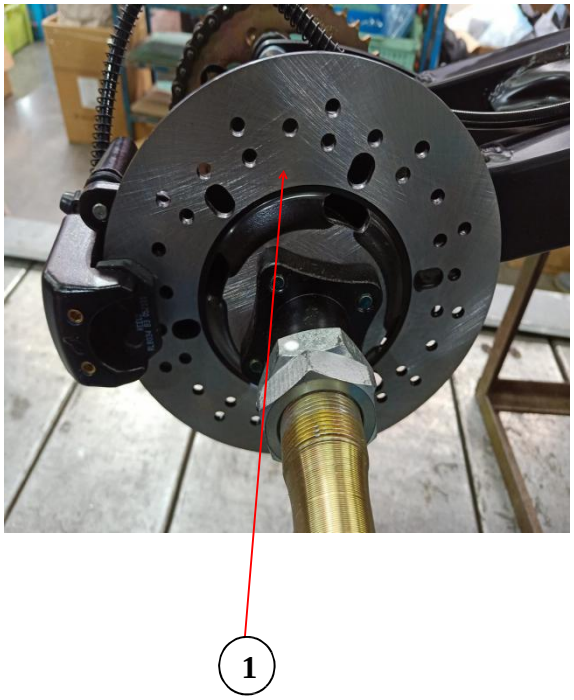
safe position; check whether the oil circuit and connection points are damaged, and if there is any damage, please replace it in time; check whether the main pump/caliper is damaged, and if there is any damage, please replace it in time .

Note: Do not open the brake fluid oil cup for a long time.

Rear brake disc, brake pad <brake pad wear>

Check the wear of the brake pads If the wear

has reached the wear limit, replace the brake pads.



Note: The brake pads should be replaced as a complete set

Inspection and replacement of brake discs

Check whether the sliding surface of brake disc 1 is worn or damaged. If the current brake disc thickness ≤3.0mm, replace the brake disc

Use limit thickness of rear brake disc: 3.0mm

Check the minimum thickness of the brake friction lining 2. The minimum friction lining thickness ≥ 1 mm. If it is less than the minimum friction lining thickness, please replace with a new brake friction lining; check whether the brake friction lining is damaged or cracked. If there is damage or cracks, please Replace with new brake pads.

Oil change <brake fluid replacement>

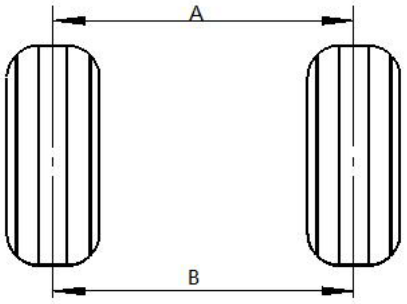
Brake fluid is replaced once a year

3.4 Wheel

Lift the front wheel with tools in a horizontal position, make sure that the body has no acting force on the wheels, shake the front wheel left and right, check whether the connection of the front wheel is firm, check whether there is shaking, and check and tighten the rocker arm, axle, rim bolts and nuts. If there is still shaking, check and replace: bearing, rocker arm buffer sleeve and ball pin.

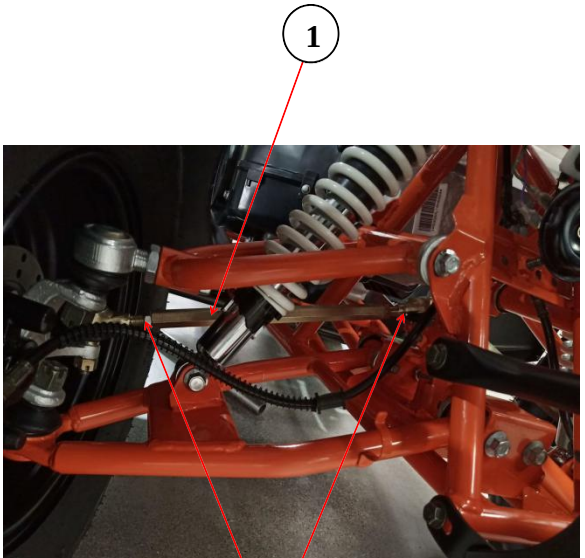
Front wheel size

Place the body in a horizontal position and measure the toe-in size of the wheel;The front face of the front wheel relative to the forward driving direction of the vehicle is: A, and the back face of the wheel is: B



Toe size: A-B=1.5 ~ 2.5mm

F is the forward direction



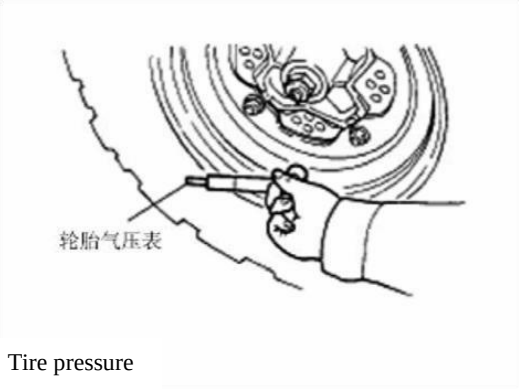
If it is not in this range, adjust the lock nut 2 of

the steering rod 1

Note: After adjusting the toe size, drive the vehicle slowly and make sure that the handlebars can correctly restrict the

direction of the vehicle body

Tire pressure Check the tire air pressure with tyre gauge



Tire pressure

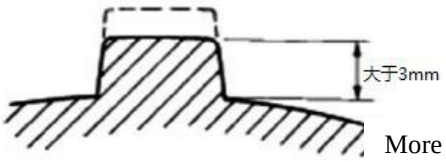
Note: Check the tire pressure when the tire is cold. If the tire is used under an improper tire pressure, it will worsen the operation and riding comfort, and cause adverse effects such as tire eccentric wear.

Designated air pressure / tire

	Front	Rear
Air pressure	35kPa（0 .35kgf/cm²）	35kPa（0.35kgf/cm²）
Tire size	See chapter one	See chapter one

Tire pattern

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



More than 3cmm

Note

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

Wheel nut and wheel axle

Remove the front and rear hub caps 1.

Check the front axle, rear axle nuts and bolts for looseness. If there is looseness, tighten it to the specified torque.

Torque: Front axle nut: 126N·mm～218N·mm (12.6kgf·mm ～ 22kgf·mm)

Rear axle nut: 199N·mm～311N·mm （20kgf·mm ～ 31kgf·mm）

Shaking of the wheel hub

Raise the front wheel with a tool. When the body does not exert any force on the front wheel, shake the wheel axially to check whether there is shaking.

Remove the front wheel when there is shaking, and check the wheel hub

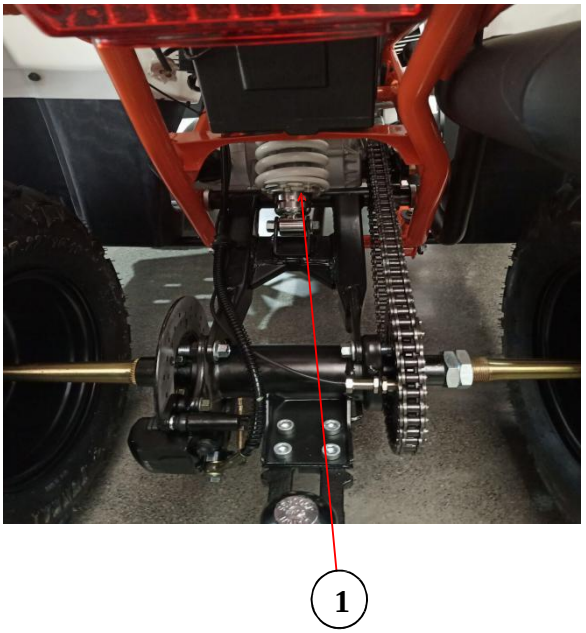
3.5 Suspension system

Place the car body in a horizontal position and compress the car body up and down several times according to the position shown in the figure. If there is shaking or abnormal noise, check the shock absorber for oil leakage, and whether the fastening parts are damaged or loose, etc.

Adjustment of shock absorber

Use the special tool to adjust the adjusting cam 1 of the shock absorber according to the load.

Clockwise rotation is from high to low, and counterclockwise rotation is from low to high.Two-way adjustable

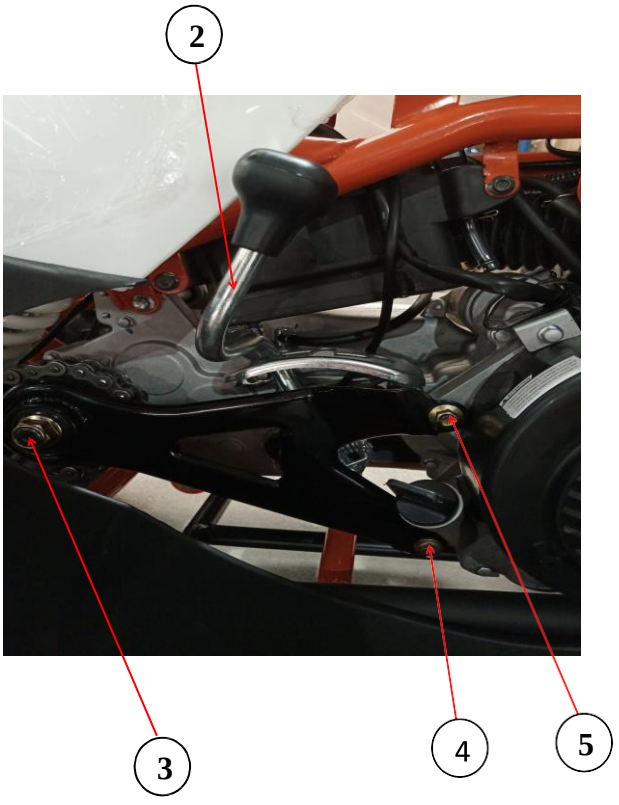


3.6 Gear shifting mechanism and fuel device

Shift mechanism

Change gears, check whether gear shifting mechanism 2 is flexible and whether the gears are in gear. If gear shifting is not flexible, adjust the angle of gear shifting mechanism lever 2;

Loosen the lock nuts 3, 4, 5, remove the foot lever to adjust the angle of the lever of the shift mechanism



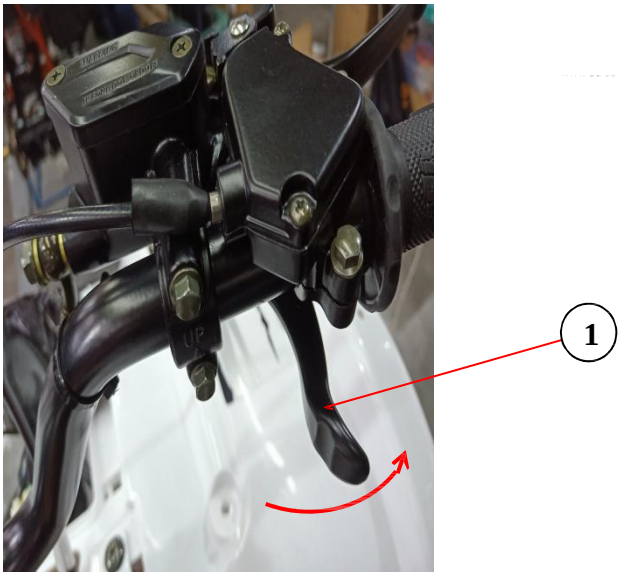
Fuel device

Status of fuel system

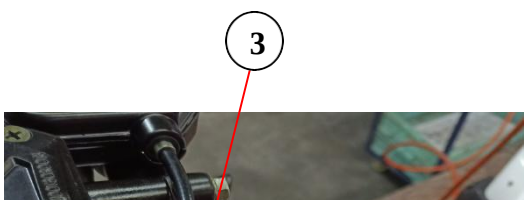
Remove the seat cushion (→ 2.3.1) and check whether the fuel pipe is aged or damaged. Replace the fuel pipe with a new one when it is aged or damaged. Check whether the vent pipe of fuel tank or adsorption pipe of fuel evaporation system is cracked or bent, and replace it with a new one if it is damaged.

In general, this length is only adjusted to 3 mm ~ 5 mm.

3.7 Throttle check



Check the free stroke of throttle button 1
Clearance: 2 ~ 6 mm



When the clearance is not within the specified range, adjust the clearance.

Remove the sheath 3, loosen the throttle cable lock nut 2, and turn the regulator to adjust the free stroke of the throttle button; After adjustment, tighten the lock nut 2 and install the throttle cable sheath 3; If the adjuster still cannot reach the specified clearance or the action is still inflexible, replace the accelerator cable with a new one.

Adjustment of speed limiting device

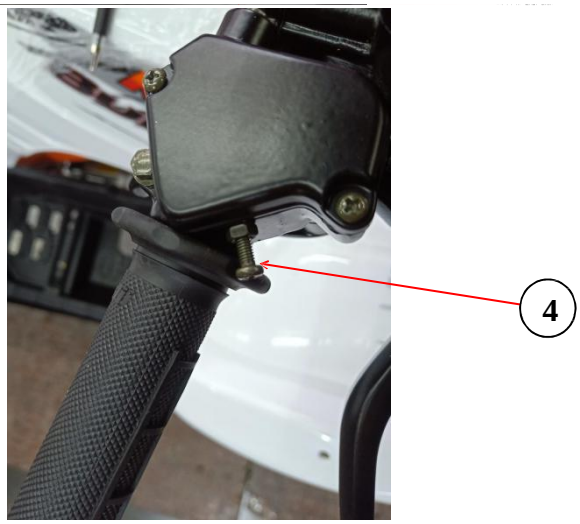
The speed limiter is used to limit the opening of the throttle valve.

Check the thread limit length of speed-limiting screw 4, which is a=12mm

Adjustment method

Loosen the lock nut and adjust with a Phillips screwdriver **Note: For beginners, the speed-limiting device should be tightened, and the speed-limiting device can only be used to change the size of the throttle after the technology reaches a certain level.**

In addition, 12mm is the limit length of the thread of the speed limiter.



Pinch the brake lever with your hand and observe the tail light. If the tail light does not light up, please check whether the line connector is loose or fall off. If the wiring is normal, replace the tail light in time.

Horn inspection

Press and hold the horn switch 2 and observe the horn. If the horn does not sound or the sound is too soft, please check whether the wiring is loose or fall off. If the wiring is normal, replace the horn in time.

3.8 Gear display meter

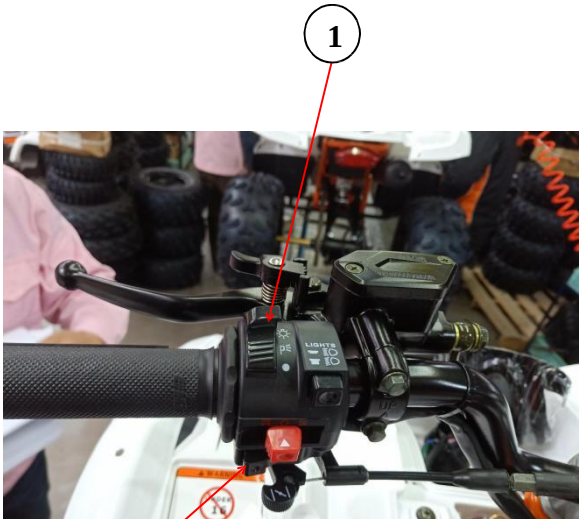
Check the display meter

When the vehicle system is powered on for the first time (or after changing the gear display meter for the first time), turn on the power and start the engine. When each gear is engaged during driving, pay attention to whether the gears shown on the display meter are correct, if not, it should be repaired in time.

3.9 Lighting device

Note: Before checking the lighting device, the whole vehicle system must be powered on.

Headlamp inspection



Turn the headlight switch 1 forward to the first gear, and observe whether the front fog lamp is on. If it does not, please check whether the line connector is loose or falling off. If the wiring is normal, replace the anti-fog lamp in time; In the second gear, observe whether the front headlights are on. If not, please check whether the line connectors are loose or fall off. If the wiring is normal, please replace the headlights in time.

4 Engine surroundings

Maintenance Information

Operation notes

Note:

- During operation and maintenance, please ensure that the vehicle is turned off and stand still for no less than 1 hour. Confirm that the heating components are cooled before performing maintenance to avoid injury to maintenance personnel.
- Be careful not to damage the frame, engine body, bolts, cables, etc. during operation.
- When disassembling and assembling the engine, in order to protect the frame, the frame should be wrapped and protected.
- When the engine is removed, in order to protect the environment, prepare corresponding containers to hold the coolant, oil, and fuel, and add coolant and oil as required during installation.

Tightening torque

Engine bracket mounting bolt	GB5787	M10×1.25×160	45~59N·m

4.1 Fuel System

Disassemble

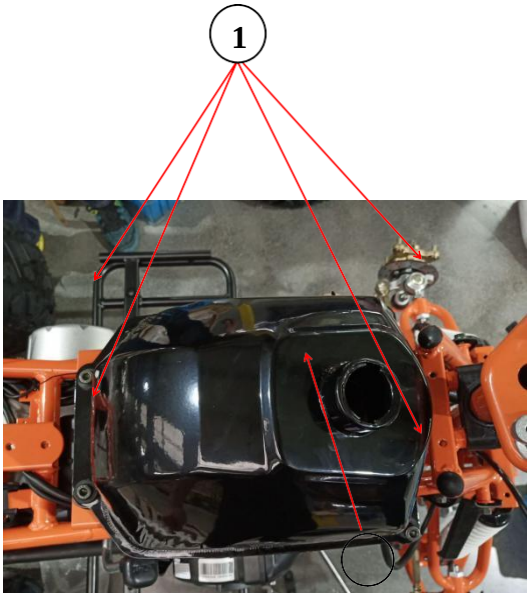
Remove the foot gear, remove the seat cushion, the front cover of the gear indicator, and the front assembly board (→Chapter 2 Body Cover)

Remove the mounting bolt 1

Remove screw 3

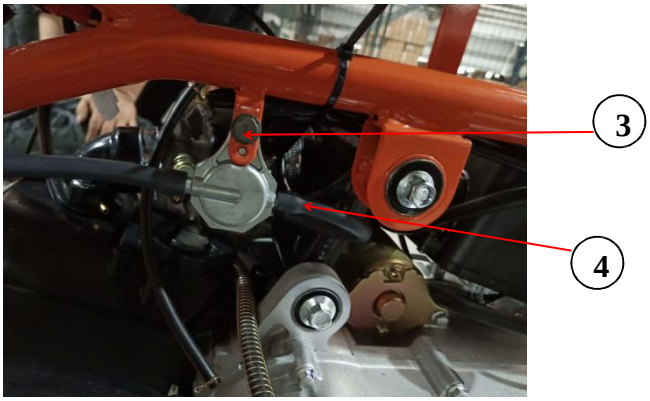
Remove the oil pipe 4 (connecting to the carburetor)

Remove the mo



2

Note:Gasoline is very easy to catch fire, so fireworks, not only open flames, but also electric sparks are strictly prohibited in workplaces. In addition, because gasoline is in danger of explosion after evaporation (vaporization), it should be operated in a well-ventilated place. When disassembling the fuel tank, if there is still fuel in the fuel tank, the oil pipe should be blocked to prevent fuel leakage, and then the fuel tank should be disassembled.



Assembly

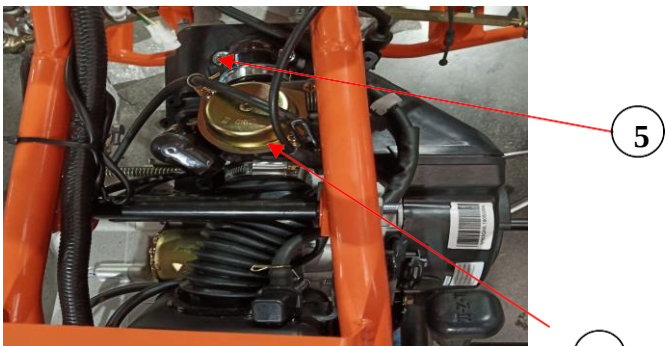
Installation shall be carried out in the reverse order of disassembly.

The connector is required to be plugged in place, and there is an obvious "click" sound Check the

4.2 Intake system

Disassembly

2



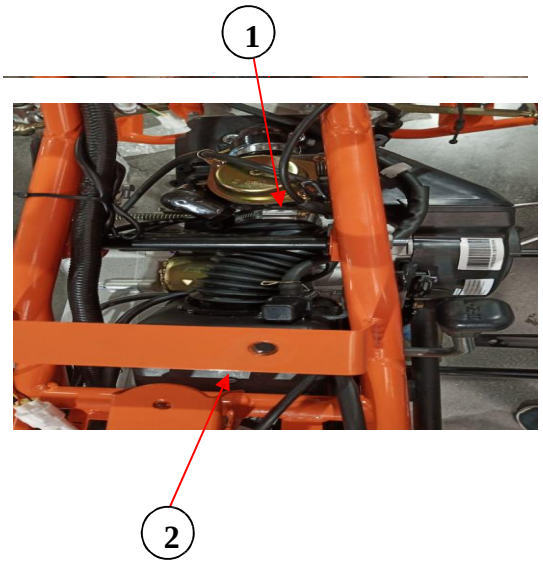
Remove the seat cushion and rear assembly board (→Chapter 2 Body Cover)

Remove the mounting bolts 5 (1 each on the left and right) Remove the carburetor 6

Remove the fuel tank (→4.1 Removal and installation of the fuel tank)

Loosen the clamp 1

Remove the air filter 2



Assembly

Installation shall be carried out in the reverse order of disassembly

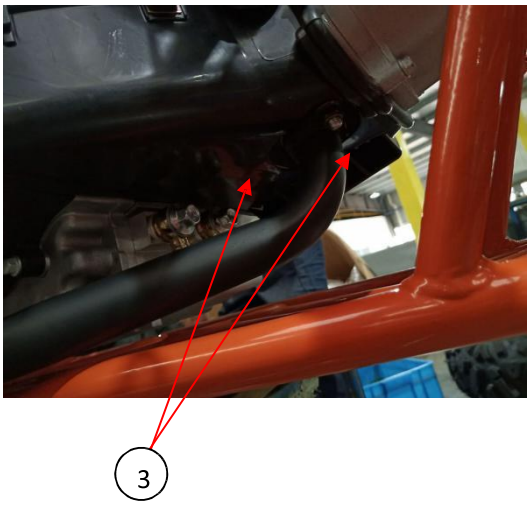
4.3 Exhaust system

Disassemble

Remove the seat cushion, front cover of gear indicator, front assembly plate and rear assembly plate (→ Chapter 2 Body Covers)

Remove two screws 3

Remove muffler fixing bolt 3



Assembly

Installation shall be carried out in the reverse order of disassembly

Disassemble

Remove the muffler mounting screw 1

Remove the muffler mounting screw 2

Remove the silencer 3

4.4 Disassembly and installation of engine

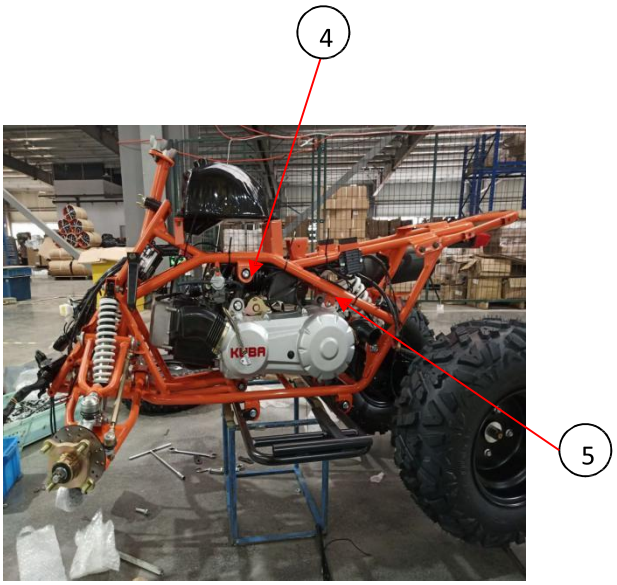
Disassemble

Remove the seat cushion, the front cover of the gear display meter, the left foot pedal, the right foot pedal, and the rear body assembly (→Chapter 2 Body Covers)

Remove the fuel tank (→ 4.1 Fuel system)

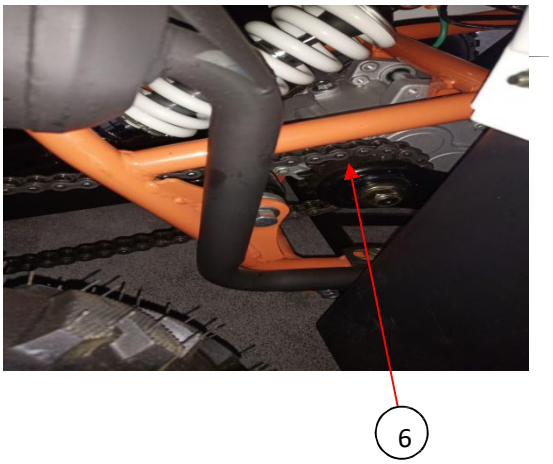
Remove the air filter and carburetor (→ 4.2 Intake system)

Remove the exhaust pipe assembly (→ 4.3 Exhaust system)



Remove bolt 4

Remove bolt 5



Remove the chain 6

Assembly

Installation shall be carried out
in reverse order of disassembly

5. Engine information

Catalogue

8-1 ~ 8-9	Generator/starting clutch	**8**
9-1 ~ 9-5	Crankshaft, axle box	**9**

Symbol sign

These symbols are used in this manual to indicate special maintenance procedures. If supplementary information about these symbols is needed, special annotations will be made in this article instead of using symbols.

Caution	It means that if the instructions are not followed,equipment damage or personal injury is very likely.
Engine oil	Limited use of SF MA 15W-40 or equivalent engine oil; otherwise, we will not be responsible for the warranty liability for damage caused thereby.
Butter	KING MATE G-3.
Gear Oil	85W/90 GL-5.
Lock	Apply a fixative and use a medium-strength fixative, unless otherwise specified.
Seal	Apply liquid oil sealant.
Update	New products must be replaced before assembly.
Special tools	Use special tools
Correct	Correct assembly method.

1. Preparation of information, fault diagnosis

Wrong	Wrong assembly
Instruction	Instructions for machine parts
Direction	Indicates the direction of action position and the direction of action.
	Position and orientation of the matching parts folded with each other.
	Bolt, assembly direction position--means wear

General safety matters

carbon monoxide

If it is necessary to run the engine in some operation matters, please work in a well-ventilated place, and do

NOTE

Exhaust gas contains toxic carbon monoxide, which can make people lose their intuition and cause shock and death

Battery

NOTE

- Battery will produce flammable hydrogen, so do not let sparks near the battery, especially when charging.
- Battery liquid contains sulfuric acid, please pay attention not to touch eyes, skin and clothes. If you accidentally touch it, please wash it with whom. If you touch your eyes, you must seek medical attention immediately.
- If you don't swallow battery liquid, please use plenty

Gasoline

Gasoline has low ignition point and explosiveness. Please work in a well-ventilated place. Fireworks are strictly prohibited in workplaces or places where

NOTE

Gasoline is extremely flammable, and may explode under certain conditions. so don't let children touch it.

Brake pad

Do not use highpressure air or dry brush to clean brake components, but use vacuum aspirator or a lternative methods to reduce asbestos fabric spre ading into the air

Oil

NOTE

Using engine oil or transmission oil, although it is not confirmed that skin contact for a long time may cause skin cancer, it is recommended to wash hands with soapy water immediately after contact with engine oil, and keep children away from it.

High temperature object

NOTE

Engine and exhaust system parts will generate high temperature after the engine runs, which will last for a long time. When handling these parts, wear insulating gloves or wait for them to cool before handling.

NOTE

Inhalation of asbestos fibers can cause respiratory

Brake fluid

NOTE

Brake oil will damage the surface of painted parts. In addition, it will damage the structure of plastic or

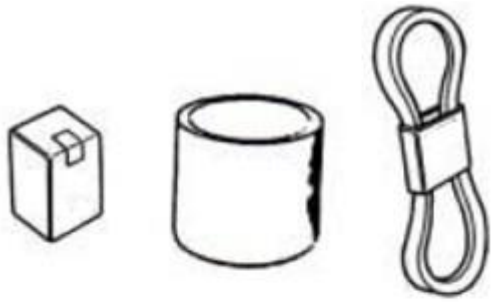
rubber parts. Please put a clean cotton cloth on these parts during maintenance. Do not let children touch

1.Preparation of information, fault diagnosis

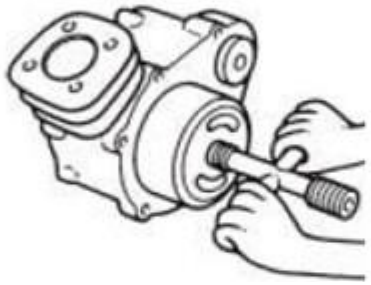
1. Preparation of information, fault diagnosis

Operation rules

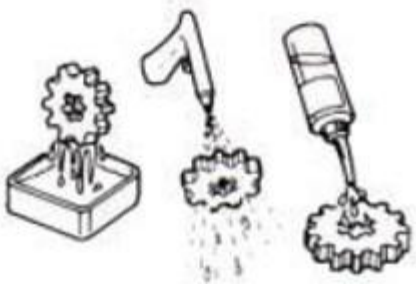
- Please use the factory parts and recommended oil, the use of nondesign specification parts will



- Please use special tools for designated parts. Special tools are used to remove or replace special parts or components without causing them to be damaged.

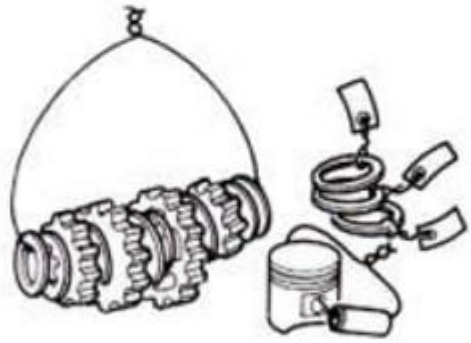


- Please use metric tools to repair this locomotive. Metric bolts, nuts and screws cannot be replaced by imperial bolts. Disassembly and assembly using incorrect tools will damage the locomotive.
- Before removing or opening the cover plate on the scooter for maintenance work, the exterior of the parts or components must be cleaned. Because the dirt Accumulated outside may fall into the engine or the brake system, causing damage.
- Before disassembling the measuring parts, clean the parts in a solvent with high ignition point (such as



- The wire head must not be bent or twisted, otherwise

- Rubber parts will deteriorate due to aging and are easily damaged by solvents and oils. These parts should be checked before reassembly and replaced if necessary.
- To loosen the parts with multiple joints, they should cross each other, loosen from the outside to the inside, and loosen the small joints first. If the larger one is loosened first, it will increase the strength of the smaller joint.



- Before disassembling important parts, pay special attention to their separation positions, so that they can be correctly installed during reassembly.
- Non-reusable parts should be replaced with new ones during disassembly, including gaskets, metal sealing washers, O-rings, oil seals, buckles and split pins, etc.

Torque value(Engine part）

Item	Quantity	Thread size (mm）	Torque value （kgf-m）	备注
Cylinder head cover bolt	4	6	1.0-1.4	
Cylinder head nut	4	8	1.8-2.2	Threaded part coated with engine oil
Cylinder/cylinder head stud	4	8	0.7-1.0	Torque on the side of the crankcase
Left side bolt of cylinder head	4	6	1.0-1.4	
Valve adjusting fixing nut	4	5	0.7-1.1	Thread parts coated with oil
Spark plug	1	10	1.0-1.4	
Carburetor heat insulator joint nut	2	6	0.7-1.1	
Engine drain bolt	1	12	3.5-4.5	
Engine drain bolt	1	30	1.3-1.7	
Crank oil drain bolt	1	8	0.8-1.2	
Crank oil filler bolt	1	10	1.0-1.4	
Oil pump screw	3	3	0.1-0.3	
Engine left side cover bolt	7	6	1.0-1.5	With rubber ring pad
Cam chain tensioner bolt	1	6	0.8-1.2	Hexagon socket bolt
Cam chain adjuster bolt	2	6	1.0-1.4	
Clutch drive plate nut	1	28	5.0-6.0	
Clutch cover fixing nut	1	12	5.0-6.0	
Drive disk nut	1	12	5.0-6.0	
Flywheel nut	1	12	5.0-6.0	
One-way clutch locking bolt	3	6	1.0-1.4	Apply fixative
One-way clutch nut	1	22	9.0-10.0	Threaded part coated with engine oil
Crankcase bolt	7	8	1.5-2.0	
Gear box cover bolt	7	8	2.0-2.4	
Exhaust pipe fixing bolt	2	8	3.0-3.6	
Chlorine drain pipe joint nut	2	6	1.0-1.4	

The torque value of the above-mentioned important locking parts. Please refer to the standard reference value for the parts not listed.

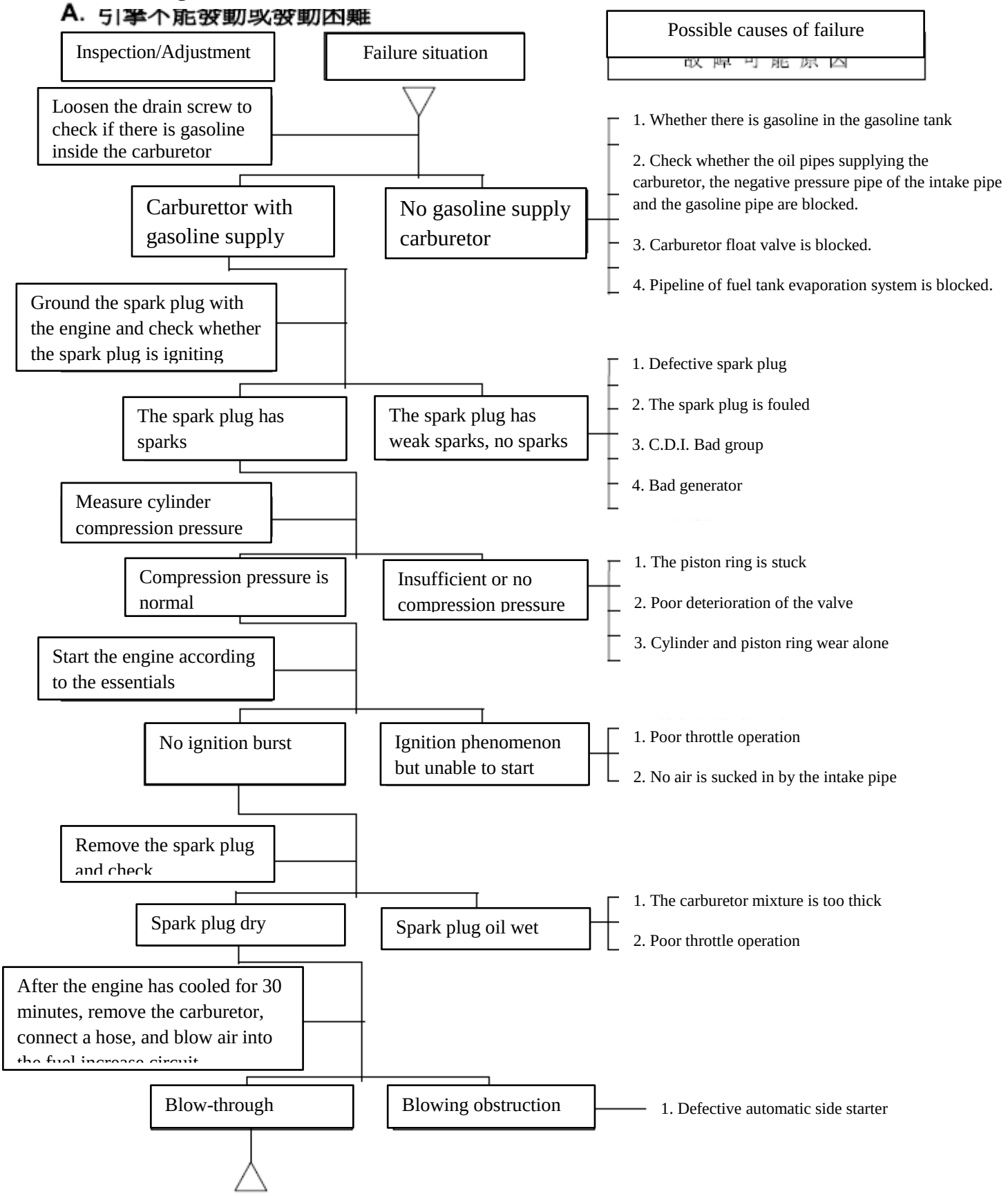
Torque standard reference value

Type	Tightening torque	Type	Tightening torque
5mm bolt and nut	0.45-0.60 kgf-m	3mm screw	0.05-0.08 kgf-m
6mm bolt and nut	0.8-1.20 kgf-m	4mm screw	0.10-0.15 kgf-m
8mm bolt and nut	1.80-2.50 kgf-m	5mm screw	0.35-0.50 kgf-m
10mm bolt and nut	3.00-4.00 kgf-m	6mm screw, SH nut	0.70-1.10 kgf-m
12mm bolt and nut	5.00-6.00 kgf-m	6mm round bolt and nut	1.00-1.40 kgf-m
		8mm round bolt and nut	2.40-3.00 kgf-m
		10mm round bolt and nut	3.50-4.50 kgf-m

Fault diagnosis

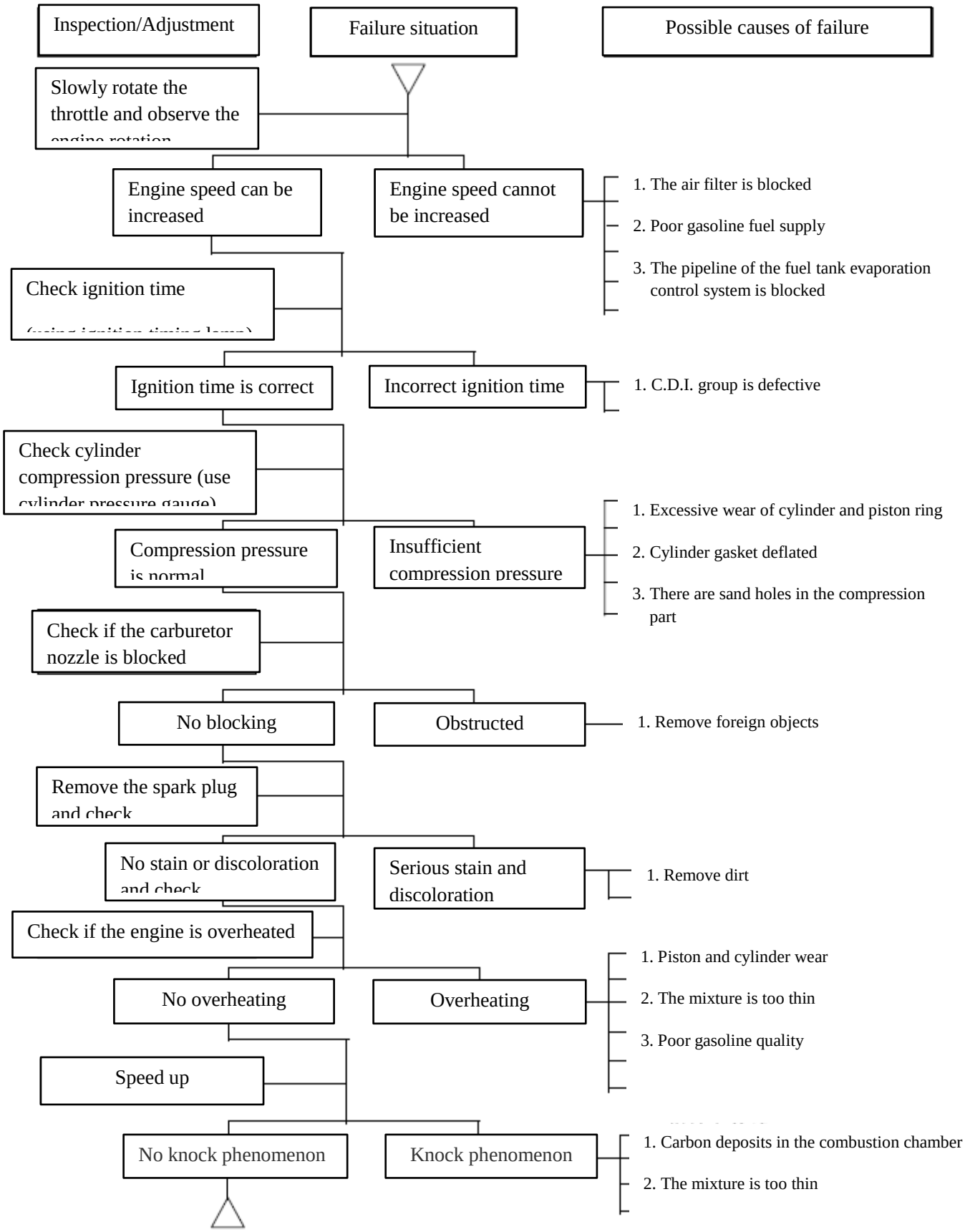
故障 **The engine cannot be started or is difficult to start**

A. 引擎不能發動或發動困難



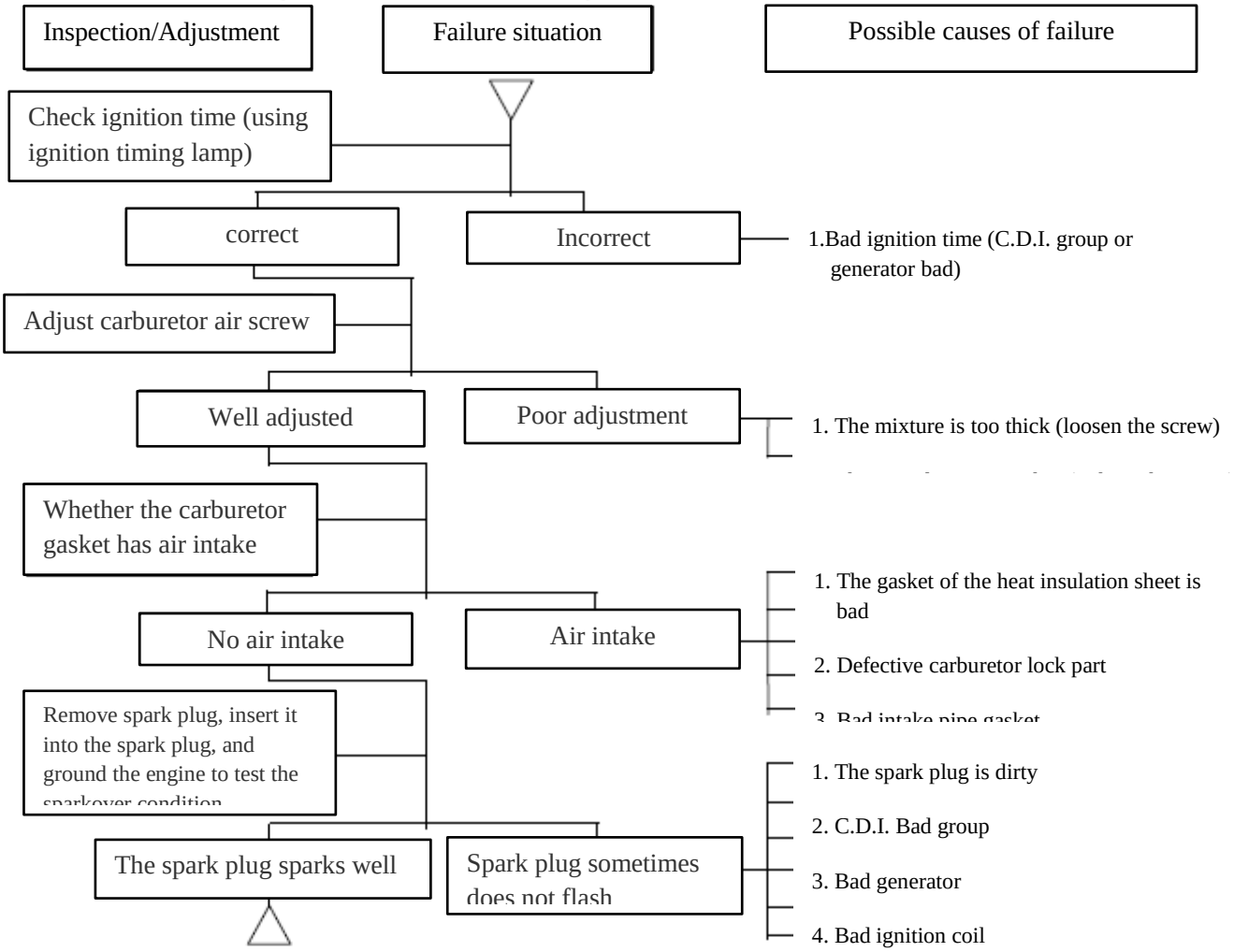
Unable to speed up, weak

B.

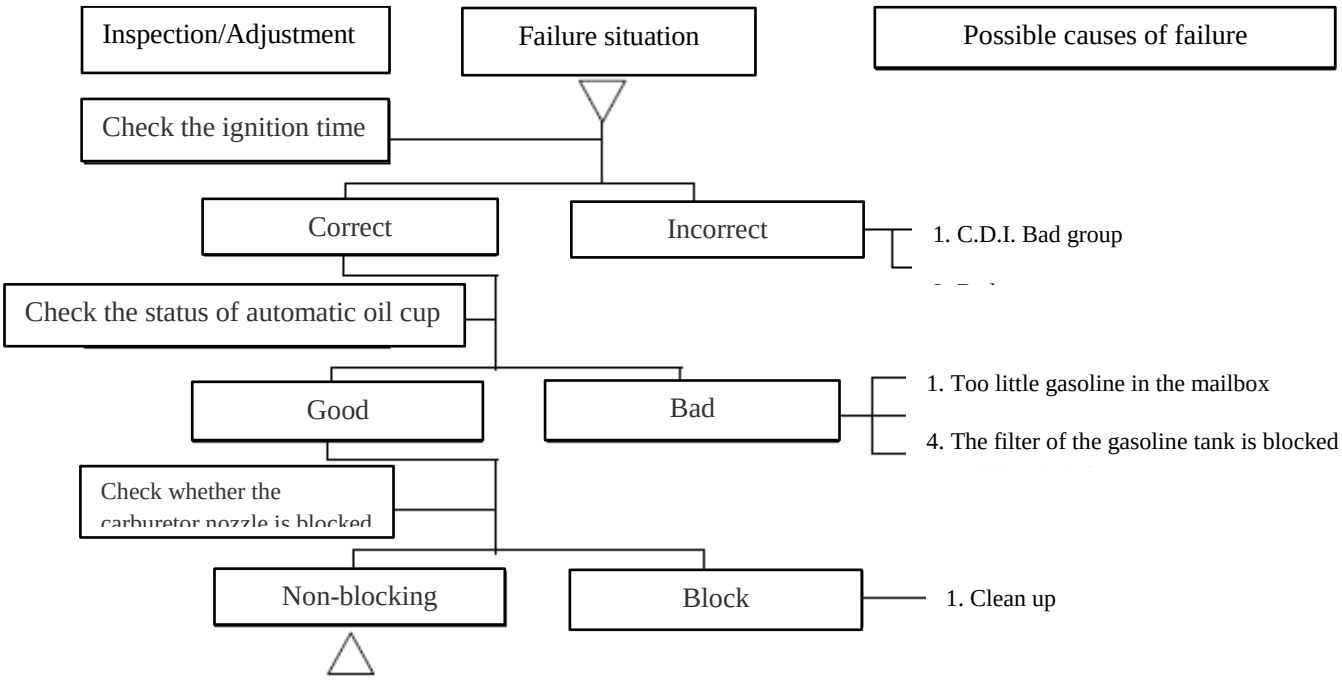


C. Engine running poorly (especially at low speed and idling speed)

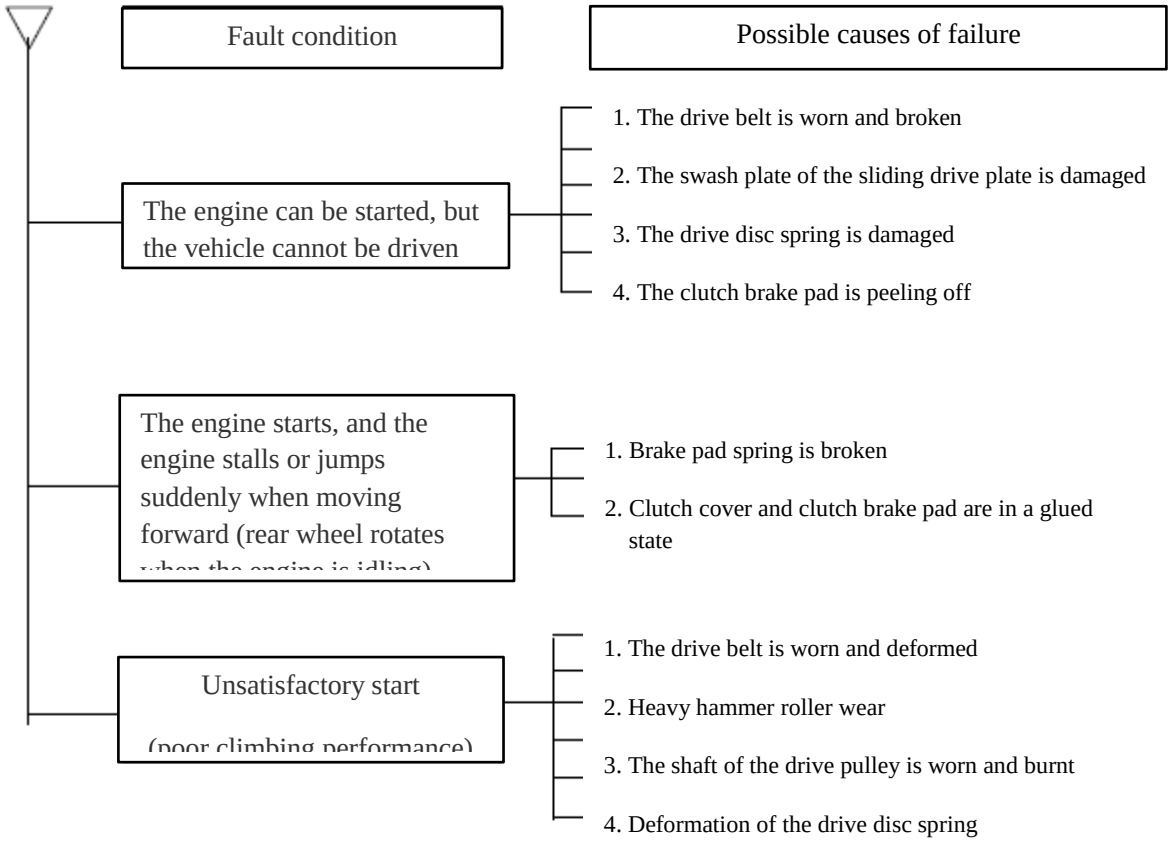
C. 引擎運轉不良(特別是低速及怠速時)



D. Engine running poorly (poor high speed)



E. Clutch, driving/driven



2. **Maintenance information**

1.Preparation of information, fault diagnosis

Operation precautions

specification

Engine oil	Capacity	900 c.c.
	Replacement quantity	850 c.c.
Transmission gear oil	Capacity	400 c.c.
	Replacement quantity	350 c.c.
Spark plug	TORCH A7TC gap：0.6 ~ 0.7mm	
Mark "F" of idle ignition angle	Before top dead center 13°/1700 rpm	
Full ignition angle	Before top dead center28°/5000 rpm	
Idle speed	1700±100 rpm	
Cylinder compression pressure	10±1 kg/cm2	
Valve clearance: inlet/exhaust	0.03~0.05mm	

2.Maintenance information

Check the dispaly regularly

NO	Item	first time 300KM	a month every 6000KM	three months every	three months every	a year every 12000KM
1	☆Air filter	I		C	C	R
2	☆Secondary air filter	I		C	C	R
3	☆Gasoline filter	I			I	R
4	☆Oil filter	C			C	c
5	Engine oil change	R	Change every 1000 kilometers			
6	Bolt locking inspection of each part	I	I			
7	Check the gearbox for oil leakage	I	I			
8	☆Spark plug inspection or replacement	I	I			
9	☆Gear oil replacement	I	Change every 1000 kilometers			
10	☆Ignition timing	I	I			
11	☆Carburetor throttle actuation	I		I		
12	☆Engine screw torque	I		I		
13	☆CVT transmission (belt)				I	R
14	☆CVT transmission (roller)				C	
15	Gasoline pipeline	I		I		
16	Cam chain	I		I		
17	☆Valve clearance	I		A		
18	☆Crankcase oil and gas recovery system	I		C		
19	☆Crankcase blow-by oil spill pipe	I	Drain oil every 2,000 kilometers			

Note：I-Inspection A-Adjustment R-Replace C-Clean

The above is only based on driving 1,000 kilometers per month, whichever comes first.

Note:

1. ☆ **For items related to exhaust gas emissions, in accordance with the regulations of the**

Environmental Protection Agency, normal maintenance must be carried out in accordance with the provisions of the instruction manual.

2.When driving on gravel roads or under severe environmental pollution, you should increase the frequency of cleaning the air filter to extend the service life of the engine.

3.Frequent high-speed driving and more mileage, the maintenance frequency must be increased.

4.Expected maintenance:

a.Ignition system-there are obvious continuous ignition failures, engine stalls, afterburning, overheating and other phenomena for maintenance inspection.

b.Carbon deposit removal-when there is significant horsepower underground, the carbon deposits in the cylinder head, piston head and exhaust system are removed.

c. Replace the piston and cylinder with new ones if they are excessively worn or jammed.

Lubrication system

Engine oil quantity

NOTE

●ATV must be placed on a flat ground when checking the oil level.

●After the engine runs continuously for 3-5 minutes, turn off the engine for 3-5 minutes, and

Change the engine oil

Turn off the engine and remove the oil dipstick.

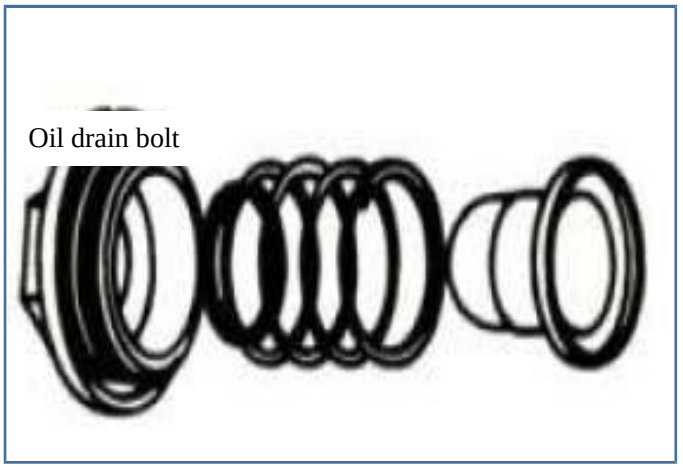
Remove the oil leakage bolt at the bottom left side of the crankcase to drain the oil.

After the oil leaks completely, the bolts and washers can be cleaned to install the bolts. If the washers are damaged, they need to be replaced.

Torque: **3.5~4.5 kgf-m**

NOTE

After the engine is warmed up, change the oil to make the oil flow out more easily.



Replenish engine oil to the specified capacity.

The oil viscosity is SF MA 15W-40 or an oil of

equivalent quality.

Engine oil volume: Decomposition: 900 c.c.

Replacement: 850 c.c.

Start the engine at idle for a few minutes, and check for oil leaks.

Then remove the oil dipstick to check the oil level.

Oil filter cover

Clean the oil filter

To leak the oil from the engine, remove the oil filter cover, spring and filter from the lower right side of the engine.

If the filter is attached, you can clean the filter with a solvent (high-pressure air jet is recommended to remove foreign objects).

Check whether the O-ring is damaged, and replace it if necessary.

Reinstall the filter, spring and filter cover.

Torque: **1.3~1.7 kgf-m**

Transmission gear oil

Check

Check the gearbox for oil leakage.

Erect the locomotive with the main parking frame on the flat ground.

Turn off the engine and remove the gear oil filler bolt.

Place a measuring cup under the drain hole.

Remove the bolt of oil leakage hole and drain the gear oil into the measuring cup.

Check whether there is enough oil.

Grease bolt

Replace

Remove the oil injection bolt first, and then remove the oil drain bolt to drain the oil.

After the gear oil is drained, install the oil drain bolt.

Torque: **0.8~1.2 kgf-m**

NOTE

Check whether the sealing gasket is in good condition. If it is deformed or damaged, replace it with a new one.

Add a certain amount of gear oil from the oil injection hole.

Install the oil filler bolt.

Torque: **1.0~1.4 kgf-m**

2.Maintenance information

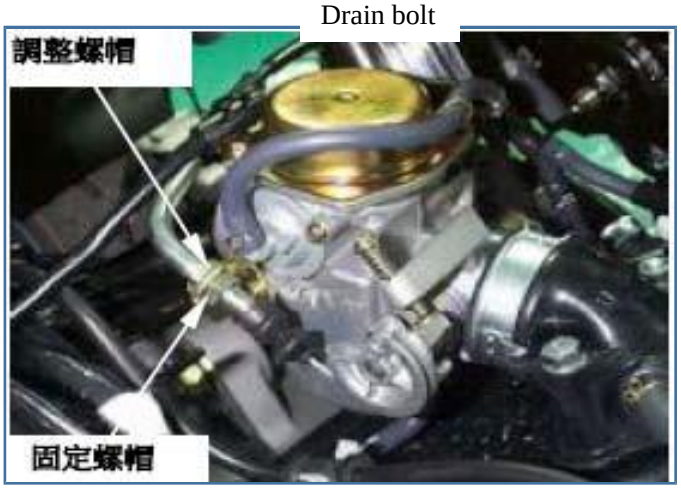
Gear oil viscosity 85W/90 GL-5

Gearbox oil quantity:

When decomposed: 400 c.c.

When replacing: 350 c.c.

Drain bolt



Please make the main adjustment from the lower end of the wire.

Loosen the fixing nut and turn the adjusting nut to adjust.

Tighten the fixing nut and check the operation of the throttle.

Adjusting nut

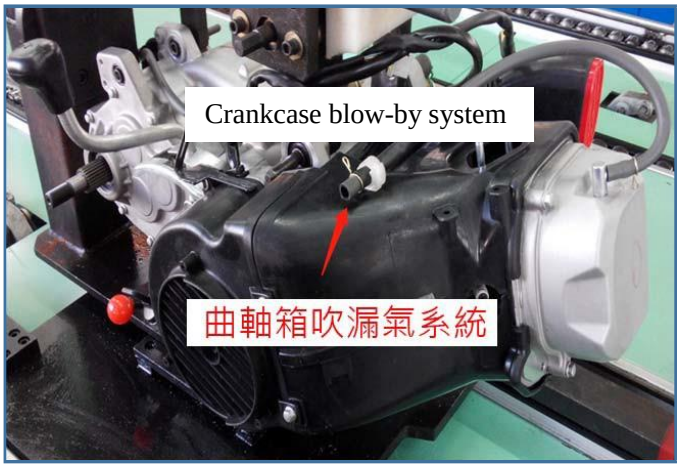
Fixed nut

Crankcase blow-by system

Pull out the plug from the lower end of the drain pipe to drain the internal deposits.

NOTE

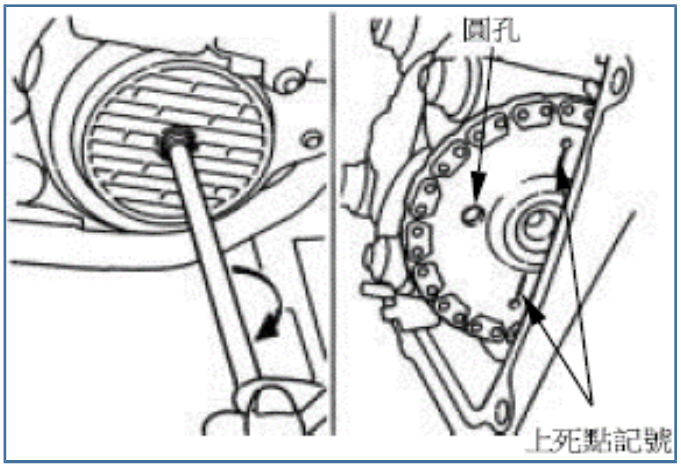
Riding in rainy conditions or at full throttle, the maintenance schedule needs to be shortened, and any deposits can be seen on the transparent section of the drain pipe.



Valve clearance adjustment

NOTE

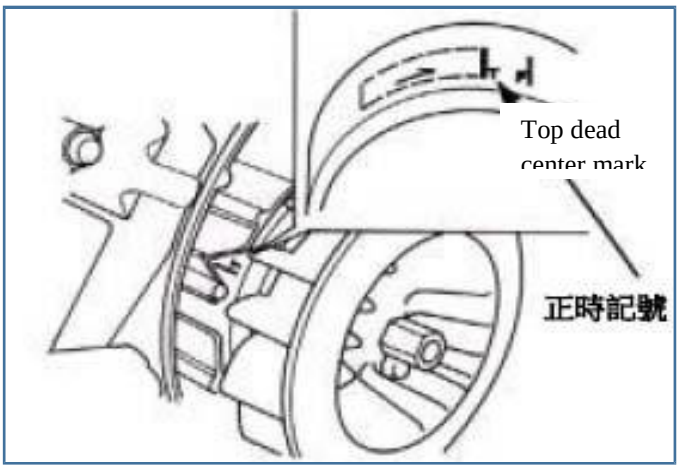
When the engine cools down (below 35℃), check and adjust the valve clearance.



Remove the cylinder head cover

Remove the timing inspection hole cover on the cooling fan cover.

Turn the crankshaft clockwise with a T-shaped wrench to align the "T" mark on the generator flywheel with the mark on the crankcase, and the top dead center mark on the cam sprocket, and also level the top of the cylinder head. The other half of the cam sprocket is a single circle. The hole faces upwards (the piston is at the top dead center of the compression stroke).



NOTE

The machine with the starting embryo reducing valve mechanism should not move in the reverse direction of the time slot to prevent the pressure reducing valve from operating and the valve clearance can

Timing mark

Valve clearance adjustment

Note

Note

Valve clearance inspection and adjustment

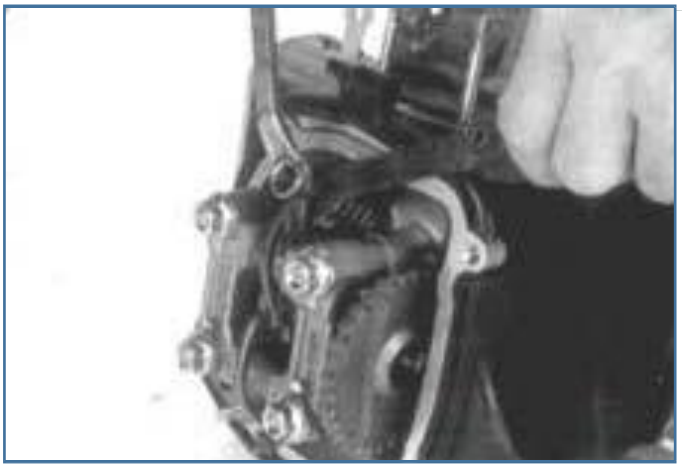
Check and adjust the valve clearance with a thickness gauge.

Valve clearance (inlet /exhaust): 0.03~0.05mm.

When adjusting, the fixed nut is sent, and the adjusting bolt is rotated to adjust.

NOTE

When adjusting the valve rocker arm gap, it is necessary to confirm whether all adjustments are made to the reference value, and after the fixed nut is tightened, the valve gap should be checked again.



High voltage coil wire

Carburetor idle speed adjustment

NOTE

●The idle speed can be checked and adjusted only after all other parts of the engine that need to be adjusted have been adjusted.

●To check and adjust the idle speed correctly, the engine must be warmed up to working

Set up the main stand of the locomotive and start the engine warming.

Connect the tachometer (tachometer wire clamp, clamped on the high-voltage coil wire).

Lift the carburetor cover from the luggage compartment.

Turn the throttle and throttle positioning bolt to adjust the specified idle speed.

Specified idle speed: 1700±100 rpm

Idling pollution emission adjustment

Adjust the engine after warming up for ten minutes.

1. Install the engine speed needle.
2. Adjust the idle speed screw, the engine speed is 1700±100rpm.
3. The sampling pipe of the exhaust gas instrument is connected to the test hole at the front end of the exhaust pipe, and the air volume adjustment screw is adjusted to make the idle pollution emission value within the reference.
4. Immediately release the micro throttle and repeat 2-3 times.
5. After the vehicle speed is stable, read the engine tachometer and exhaust gas analyzer, and repeat the NO.2-NO.4 actions until the test value is within the standard.

Pollution emission standard: CO: below 4.5%

HC:below 9000 P.P.M.

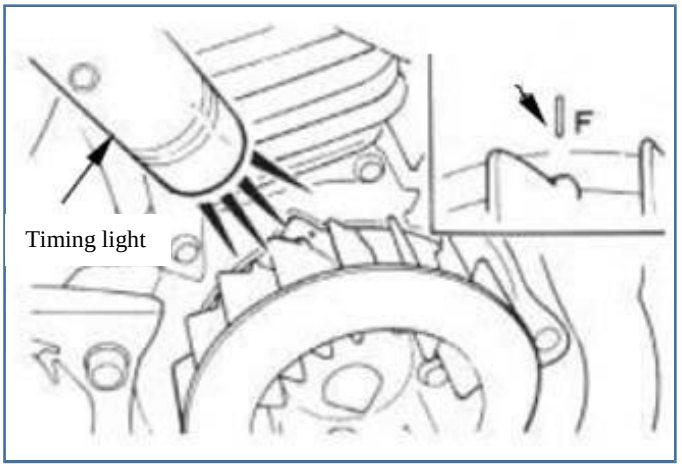
Throttle throttle set screw

Ignition system

NOTE

The C.D.I. ignition system is set at the factory, so it cannot be adjusted.

Ignition timing inspection program: to confirm

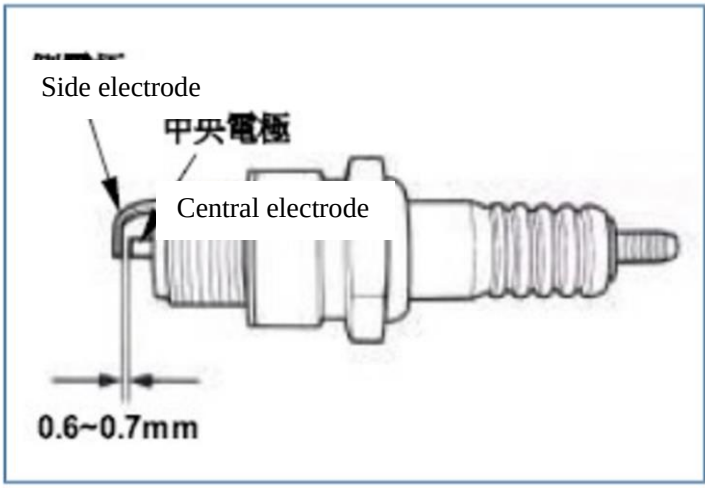


Remove the right side cover of the body.

Remove the timing inspection hole cover on the cooling fan cover, or remove the cooling fan cover.

Check ignition timing with timing lamp.

Start the engine and adjust the engine speed to 1700rpm. If the mark is aligned with the "F" point, the ignition timing is correct. Raise the engine speed to 5000 rpm to check the timing of the entry angle. If the score is between the entry angle marks "II", it means correct. If the ignition timing is incorrect, check the C.D.I group, pulse flywheel and pulse



Spark plug

Specified spark plug (A7TC, A7RTC)

Remove the spark plug cover.

Clean the dirt around the spark plug hole.

Remove the spark plug.

Measure the electrode gap of the spark plug. Spark plug electrode gap: 0.6~0.7 mm

Adjust the side electrode carefully to change the gap.

First screw the spark plug into the spark plug hole by

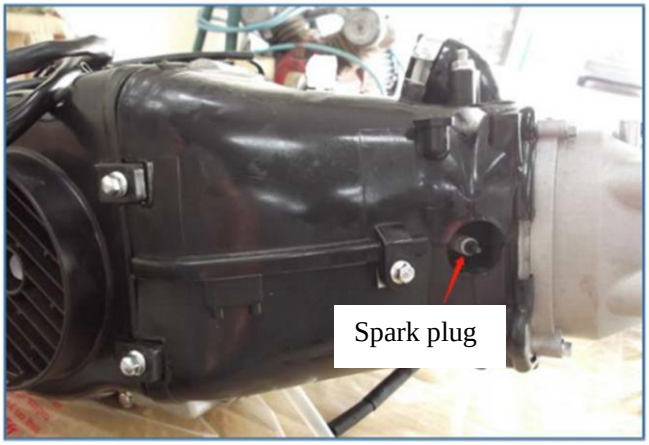
Cylinder compression pressure

Turn off the engine after warming up the engine.

Remove the spark plug.

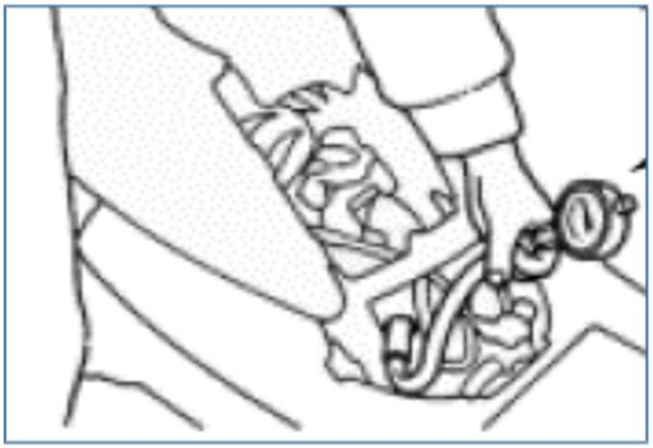
Put the cylinder pressure gauge into the spark plug hole.

The electric starter motor will be turned on to turn the engine.



NOTE

Turn the engine until the pressure gauge no longer rises.The highest pressure is usually reached within 4-7 seconds.

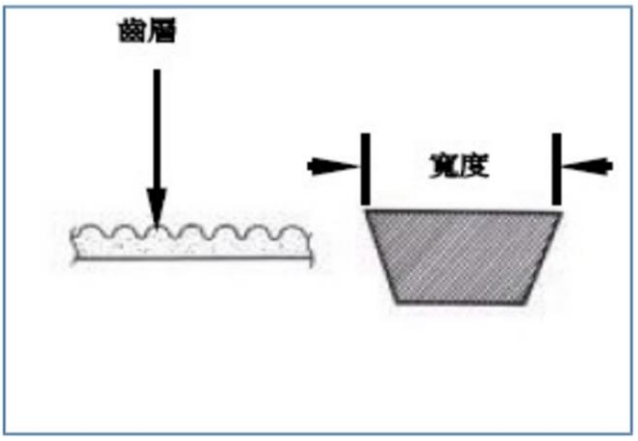


Compression pressure: 10+1kg/cm^2

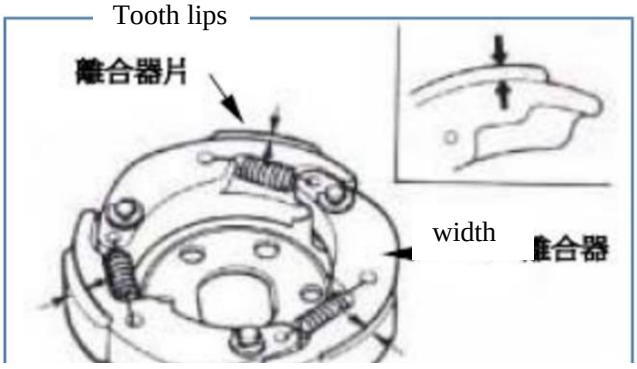
If the compression pressure is too low, check the following items:

- The valve clearance is incorrect.
- The valve is leaking.
- Cylinder head leaks, pistons, piston rings, and cylinders are worn out.

If the compression pressure is too high, it means too much carbon deposits in the combustion chamber or the top of the piston.



Tooth lips



Drive System

Drive belt

Remove the 9 bolts of the left side cover of the engine

and the cover.

Check the belt for cracks, eccentric wear or excessive wear.

If necessary or according to the regular checklist maintenance and replacement period, replace with new products.

Width limit: 20.8mm or more

Clutch plate

Clutch plate

clutch

Start the vehicle and gradually increase the throttle opening to check the movement of the clutch.

If the car jitters forward, check the wear of the clutch plate and replace it if necessary.

Catalog of Specialized Tools

					
name	Crankcase bushing drawing press-in device	name	Crankcase bushing drawing press-in device	name	Valve spring remover/installer
					
name	Valve spring removal/installation	name	Valve clearance adjustment wrench	name	Valve lash adjuster
					
name	Oil seal knock-in fixture	name	Oil seal knock-in fixture	name	Oil seal knock-in fixture
					
name	Bearing knock-in fixture	name	Bearing knock-in fixture	name	Bearing knock-in fixture ψ17mm
					

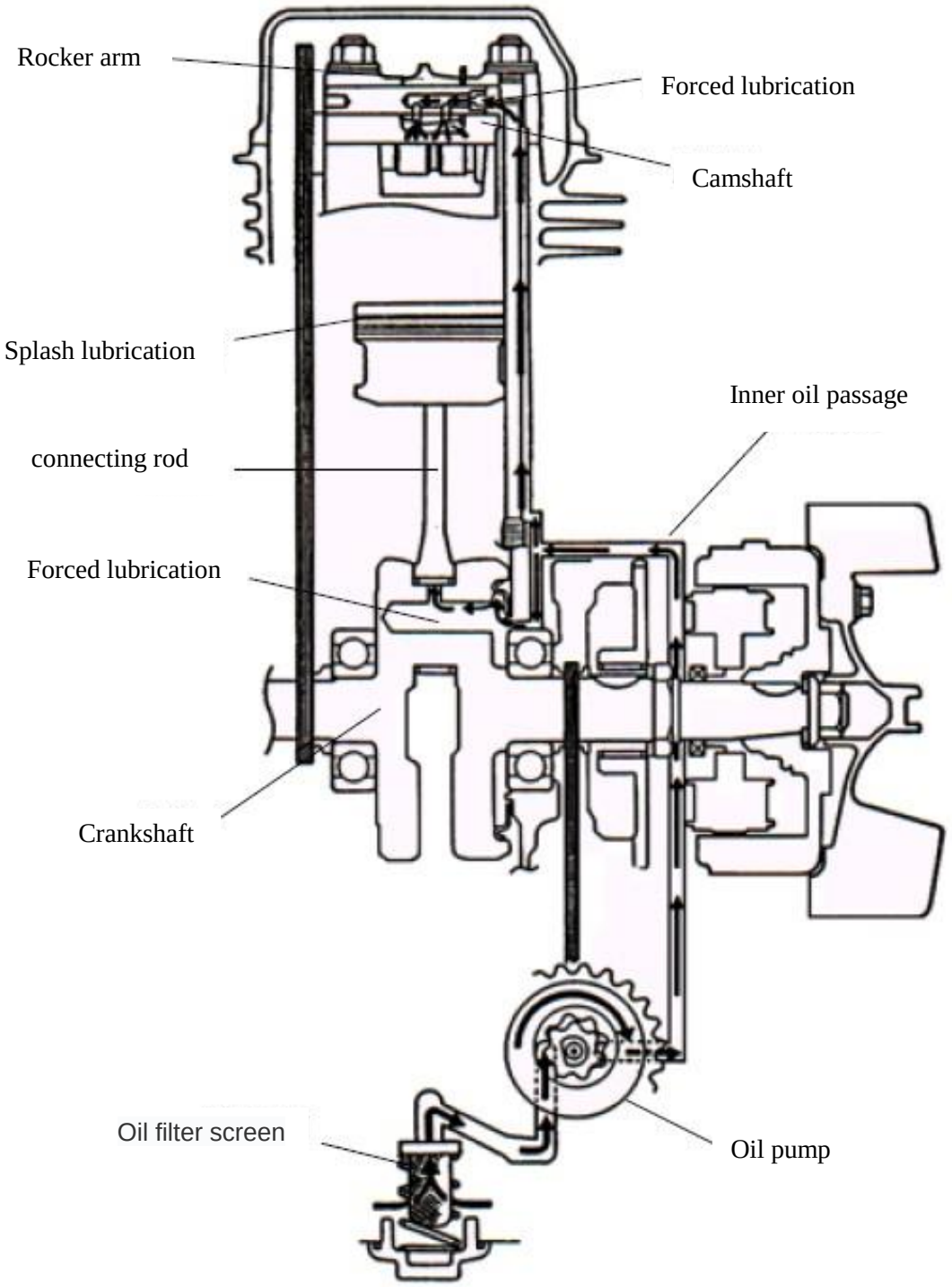
3.Lubrication system

name	Internally drawn bearing extractor	name	Out-drawing bearing extractor	name	Clutch spring compressor

Catalog of Specialized Tools

					
name	Clutch fixed nut wrench	name	Universal fixator	name	Alternator flywheel remover

3.Lubrication system



3.Lubrication system

Operational notes:

- This section covers the maintenance work of the oil pump, engine oil and gear oil.

Specification

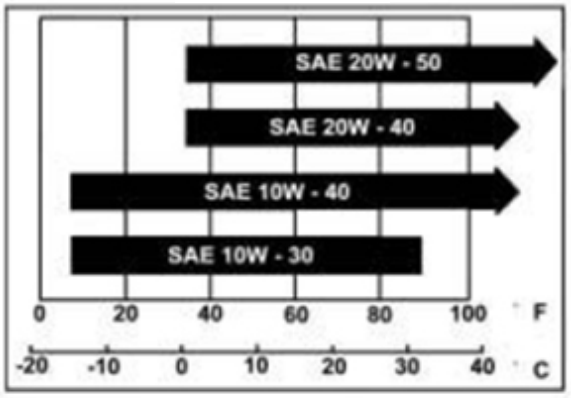
Engine oil capacity:

Decompose 900c.c.

Replace 850c.c.

Use oil viscosity SF MA 15W-40 or equivalent

Oil viscosity



Unit:mm

Item		Standard value	Available limit
Oil pump	Inner and outer rotor clearance	-	0.12
	Outer rotor body clearance	-	0.12
	Clearance between rotor end face and body	0.05~0.10	0.20

Torque value

Oil drain bolt	3.5-4.5 kgf-m
Oil filter cover	1.3-1.7 kgf-m
Gear oil drain bolt	0.8-1.2 kgf-m

Troubleshooting

Oil level is too low

Engine oil is leaking.

Worn valve casing or oil seal

Insufficient oil pressure

Oil level is too low

Blockage of oil filter, oil line and oil pipe

Oil pollution

Oil was not changed on time

Damaged cylinder head gasket

3.Lubrication system

Engine oil

Turn off the engine, erect the locomotive vertically on a flat ground, and check the oil level with a dipstick after 3-5 minutes.

Do not screw in the dipstick when checking.

If the oil level is close to the lower limit, replenish it to the upper limit with recommended engine oil.

Engine oil change

Note

Please drain the oil when the engine is warm to ensure smooth and complete oil leakage.

Dipstick

Place an oil pan under the engine and remove the oil leakage bolt to drain the oil.

Confirm that the aluminum washer of the drain bolt should be replaced with a new one if it is damaged.

Lock the drain bolt.

Torque value: 3.5-4.5 kgf-m

Oil drain bolt

Oil filter cleaning

Remove the oil filter cover.

Remove the oil filter and spring.

Clean the oil filter (recommended to use high-pressure

air jet to remove debris)

Check the O-ring of the oil filter cover and the condition of the filter. If it is damaged, replace it.

Reinstall the oil filter and spring.

Lock back the filter cover.

Torque value: 1.3-1.7 kgf-m

Pour engine oil (oil viscosity SF MA 15W-40) into the engine oil hole.

Install the oil dipstick and start the engine to idle for a few minutes.

Turn off the engine and wait for 3-5 minutes to check the oil level again to see if it meets the reference value.

Check the appearance of the engine for oil leakage.

Oil filter cover

If the oil quantity is too low, replenish the engine oil.

(standard oil quantity: 900 c.c. / general replacement: 850 c.c).

Oil pump disassembly

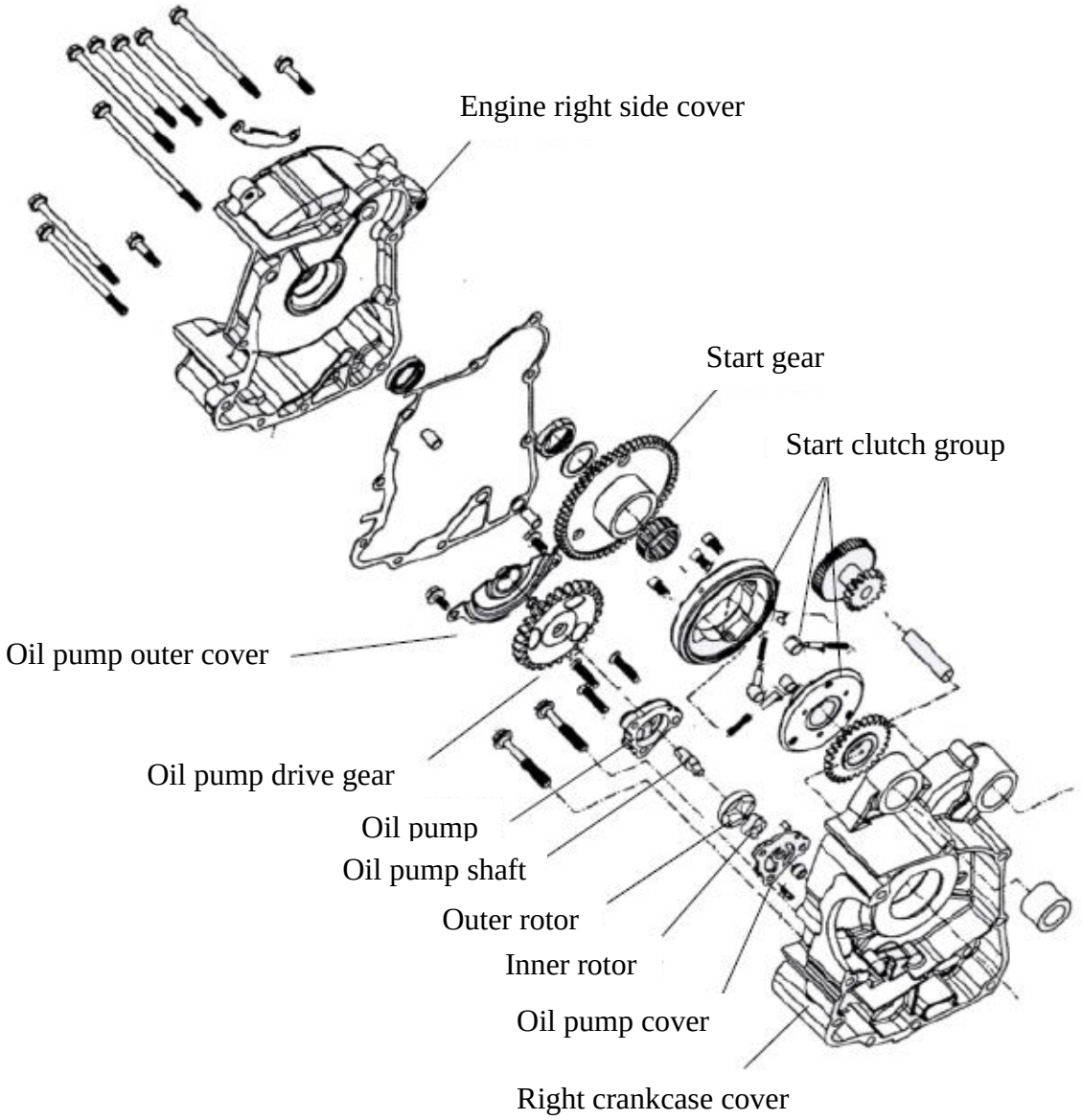
Remove the generator (refer to Chapter 8)

Remove the one-way clutch and start gear (fixed nut X1).

Confirm that the pump shaft can rotate freely.

Remove the oil pump cover (bolt x2), and then remove the oil pump drive gear fixing clip and gear.

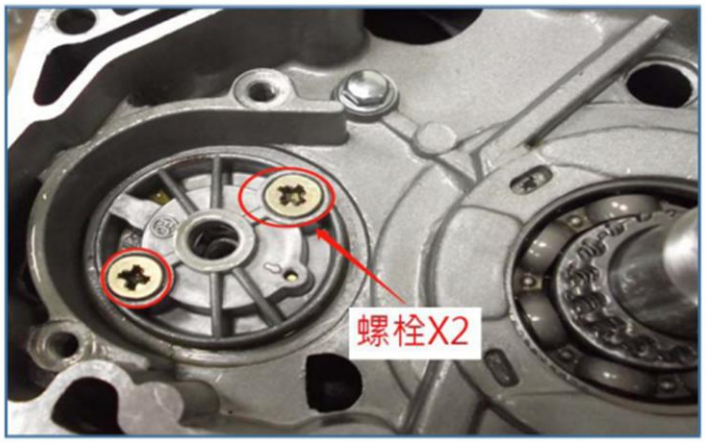
Remove the fixing screw (screw x2) of the oil


Engine right side cover
Start gear
Start clutch group
Oil pump outer cover
Oil pump drive gear
Oil pump
Oil pump shaft
Outer rotor
Inner rotor
Oil pump cover
Right crankcase cover

Install the drive gear and fixing clip.

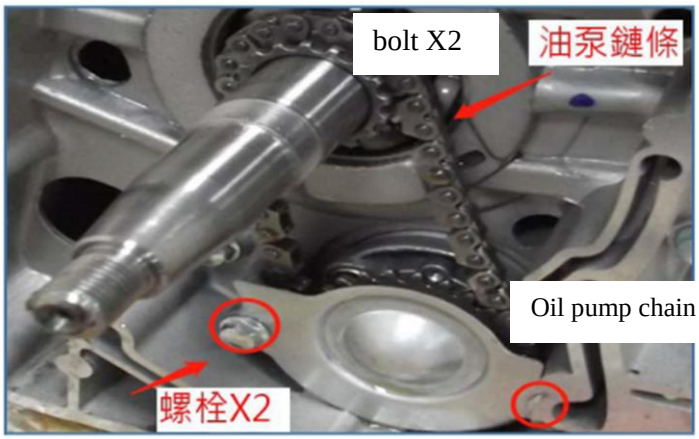
Note

Check whether the oil pump can rotate smoothlv.



Oil pump installation

Install the oil pump (bolt X2)



Install the oil pump chain and lock the oil pump cover (bolt X2)

bolt X2

Install the starting gear and alternator set.

(See Chapter 8)

Gear oil inspection

Turn off the engine and remove the oil filler bolt

and drain bolt

Remove the gear oil injection port bolt, place a measuring cup under the drain bolt, remove the gear oil drain bolt, introduce the gear oil into the measuring cup, and check whether the gear box oil meets the standard value. If the amount of oil is too low, add gear oil.

Gear oil viscosity

(standard oil volume: 400 c.c./general replacement: 350 c.c.).

Drain bolt

Gear oil replacement

Remove the gear oil injection hole bolt and the gear oil drain bolt, and drain the oil.

Install and tighten the gear oil drain bolt (confirm the sealing gasket of the bolt, replace it if it is damaged)

Torque value: 0.8-1.2 kgf-m

Pour new gear oil (350cc.) from the gear oil injection hole, replenish it, install the gear oil injection hole bolts and tighten.

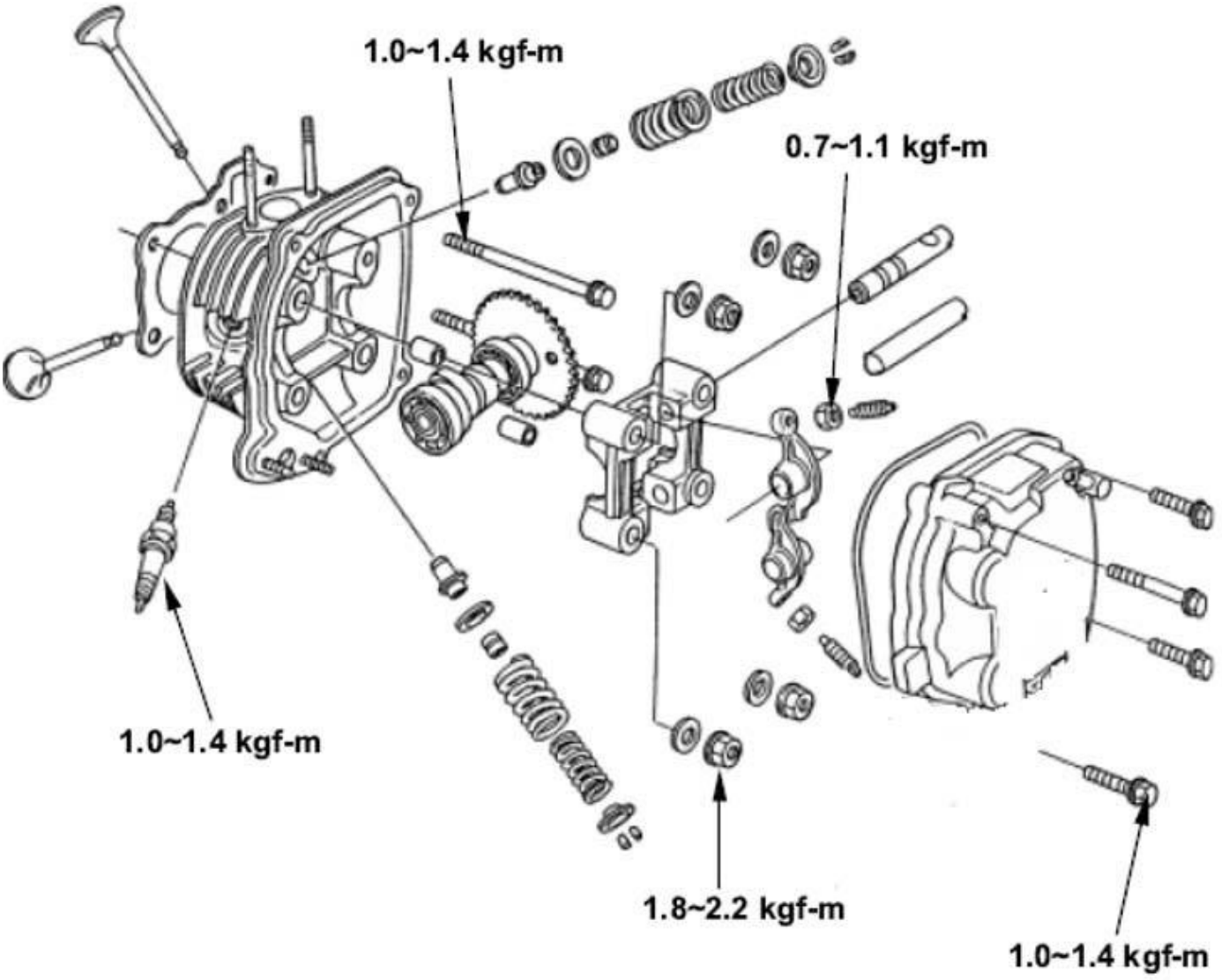
Torque value: 1.0-1.4 kgf-m

※After changing the gear oil

Start the engine for a test ride for 2 to 3 minutes.

Turn off the engine and check for oil leakage.

4.Cylinder head/valve



Precautions for operation

General matters

- This section covers the maintenance of cylinder heads, valve valves, camshafts and rocker arms.
- The maintenance of the cylinder head cannot be done while the engine is still installed on the frame.

Specification

unit：mm

Item			Standard	Available limit
Compression pressure			$10 \pm 1\ kg/cm^2$	-
Camshaft	Cam height	Intake	29.810	29.440
		Exhaust	29.530	29.160
Rocker	Inner diameter of rocker arm		10.000 ~ 10.015	10.100
	Outer diameter of rocker shaft		9.966 ~ 9.984	9.910
Valve	Outer diameter of steam valve stem	Intake	4.975 ~ 4.990	4.900
		Exhaust	4.950 ~ 4.975	4.900
	Guide bush		5.000 ~ 5.012	5.030
	Clearance between valve stem and guide sleeve	Intake	0.010 ~ 0.037	0.080
		Exhaust	0.025 ~ 0.062	0.100
	Valve spring free length (outer large spring)		37.000	33.500
	Valve spring free length (inside small spring)		35.000	31.500
Flatness of cylinder head joint surface			-	0.050

Torque value

Cylinder head cover bolt	1.0-1.4 kgf-m
Left side bolt of cylinder head	1.0-1.4 kgf-m
Cylinder head nut	1.8-2.2 kgf-m (Threaded part and seat surface coated with engine oil)
Timing chain automatic tensioner sealing bolt	0.8-1.2 kgf-m
Timing chain automatic tensioner bolt	1.0-1.4 kgf-m

Valve adjusting fixing nut	0.7-1.1 kgf-m (Threaded part and seat surface coated with engine oil)
Spark plug	1.0-1.4 kgf-m

Tool

Special tools

Valve wire reamer 5.0mm

Valve guide driver 5.0mm

Valve spring compressor

4.Cylinder head/valve

Fault diagnosis

The problems at the upper end of the engine usually affect the engine performance. These problems can be judged by measuring the compression pressure or tracking the source of abnormal sound.

Idle speed is not smooth

The compression pressure is too low.

Compression pressure is too low

1. Valve

- ●Poorly adjusted valve clearance
- ●Burned or bent valve
- ●Inaccurate valve timing
- ●Valve spring damage
- ●Valve carbon deposit
- ●Poor air tightness of the valve seat
- ●Poor spark plug installation

2. Cylinder head

- ●Cylinder head gasket is deflated or damaged
- ●The cylinder surface is skewed or cracked

3. Piston

- ●Piston ring wear

Compression pressure is too high

- ●Excessive carbon deposits in the combustion chamber or the top of the piston.

Different sound

- ●Poorly adjusted valve clearance

4.Cylinder head/valve

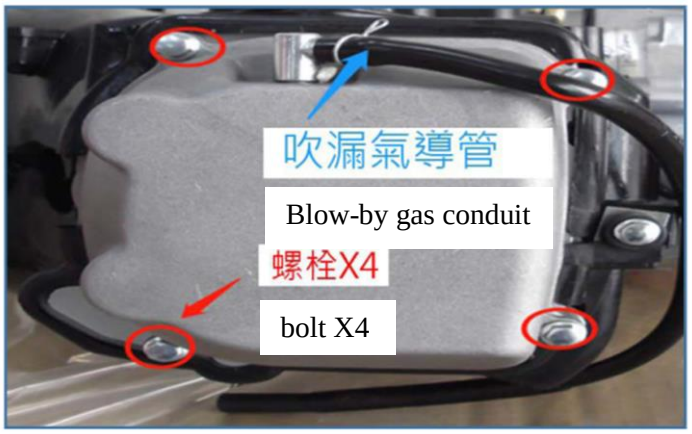
- Burned valve or damaged valve spring
- Camshaft wear or damage
- The cam chain is worn or loose
- The cam chain tensioner is worn or damaged
- Camshaft chain gear wear
- Wear of rocker arm or rocker shaft

The exhaust pipe emits white smoke

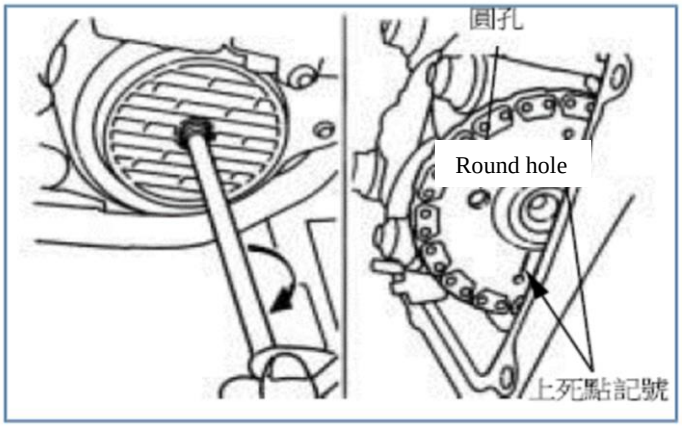
- Worn valve guide or valve guide
- Worn valve guide oil seal

Camshaft disassembly

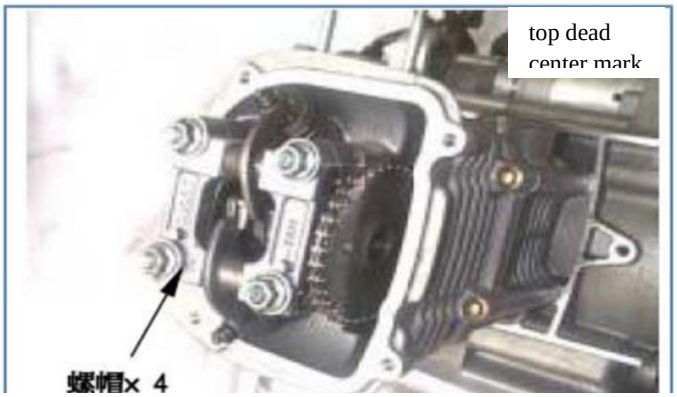
Remove the engine body fan cover, cover A component, and cover B component, and remove the crankcase blow-by air duct from the cylinder head. Remove the cylinder head cover bolts and remove the cylinder head cover (bolt X4)



Remove the screw cover of the cam bar adjuster and remove the O-ring. Use a flat screwdriver to rotate in a clockwise direction, tighten the screws in the cam bar adjuster, and loosen the adjuster



Rotate the flywheel clockwise with a T-shaped wrench to align the "T" mark on the flywheel with the crankcase mark. The upward position of the round hole on the cam gear is the top dead center of compression.



Remove the nut and washer of the camshaft fixing seat.

The corners are sealed 2-3 times to loosen the nut.

nut X4

Remove the camshaft fixing seat and rocker arm group.

Remove the cam chain from the cam gear.

Remove camshaft

Check camshaft

Check whether the cam height is damaged.

Available limit:

IN: Exchange under 29.440 mm

EX: Replace under 29.160 mm.

Check whether the camshaft bearings are loose or worn.

If so, replace the entire set of camshafts.

Camshaft holder decomposition

Use 5mm bolts to screw in the cam rocker arm shaft and pull out the cam rocker arm shaft.

Remove the cam rocker arm.

Check the camshaft holder

Check whether the camshaft fixing seat, valve rocker arm, and rocker arm shaft are worn or damaged.

⚠ Note

- When the sliding surface of the valve rocker arm is worn, it must be checked.
- Whether the fixed surface of the camshaft

4.Cylinder head/valve

Measure the inner diameter of the valve rocker shaft hole of the camshaft fixing seat.

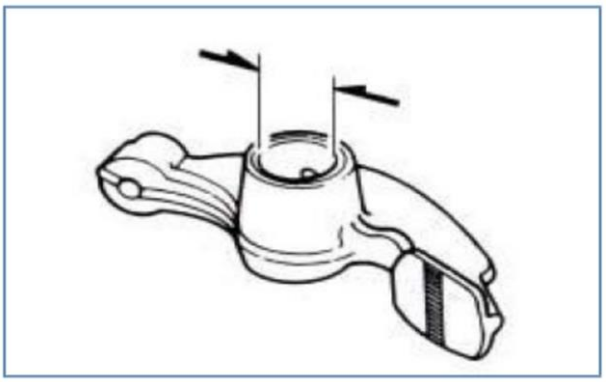
Available limit: 10.1mm above exchange.

Determination of the inner diameter of the valve rocker arm.

Available limit: 10.1mm above exchange.

Measurement of the inner diameter of the valve rocker arm.

Available limit: exchange above 10.1mm

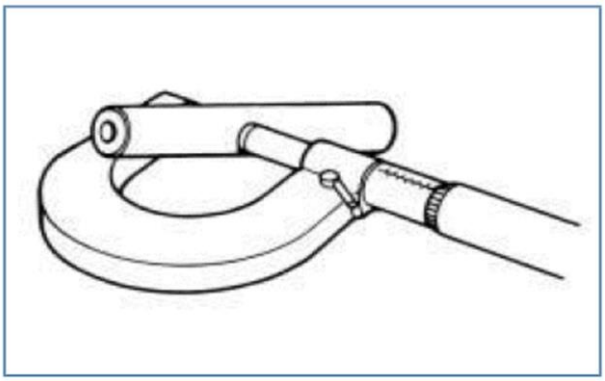


Measure the outer diameter of the valve rocker arm shaft and the movable part of the valve rocker arm.

Available limit:exchange above 9.910.

Calculate the clearance between the valve rocker arm shaft and the valve rocker arm.

Available limit: exchanges above 0.10.



4.Cylinder head/valve

Cylinder head removal

Remove the fan cover.

Remove the engine cooling cover (bolt x4)

Remove the camshaft

Blow-by gas conduit

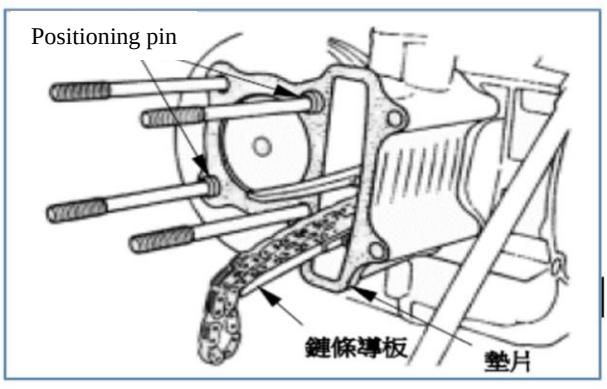
Bolt X 4

Remove the 2 bolts on the left side of the cylinder head.

Remove the cylinder head gasket and 2 positioning pins.

Remove the chain guide.

Remove all the debris from the gasket on the joint surface of the cylinder and the cylinder head.



4.Cylinder head/valve

⚠ Note

- Do not damage the cylinder and the cylinder joint surface.
- When scraping out the debris, avoid debris or foreign matter from entering the crankcase

Chain guide

Gasket

Cylinder head decomposition

Use a valve spring compressor to press down the valve spring.

After removing the valve plug, loosen the compressor and remove the spring stopper, spring and valve.

Valve bolt

⚠ Note

In order to prevent the spring from losing its elasticity, do not over-compress the spring, and use the most suitable length to remove the valve plug

Special tool: valve spring compressor

Remove the valve guide oil seal.

Remove the carbon deposits in the combustion chamber.

Remove the debris and foreign matter from the gasket surface of the cylinder head

⚠ Note

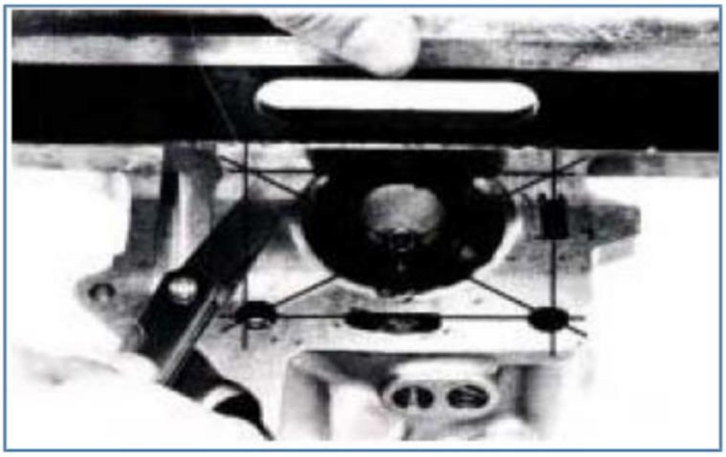
Do not damage the joint surface of the cylinder head.

Inspection

Cylinder head

Check the spark plug hole and valve hole for cracks.

Measure the flatness of the cylinder head with a

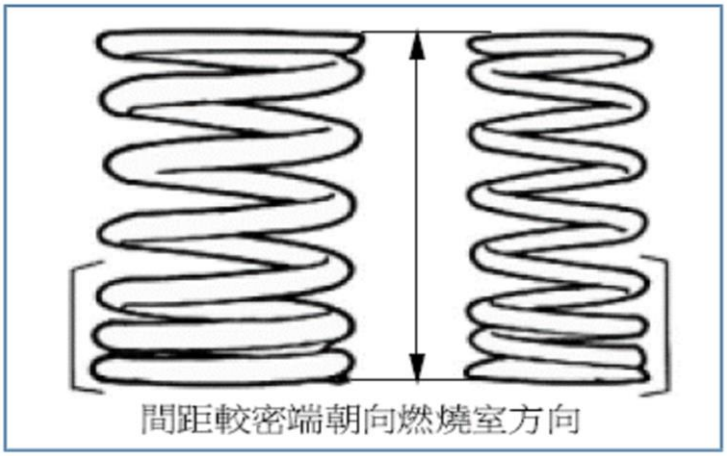


Free length of valve spring

Measure the free length of the inlet and exhaust valve springs.

Available limit: Large spring 33.5mm

Small spring 31.5mm



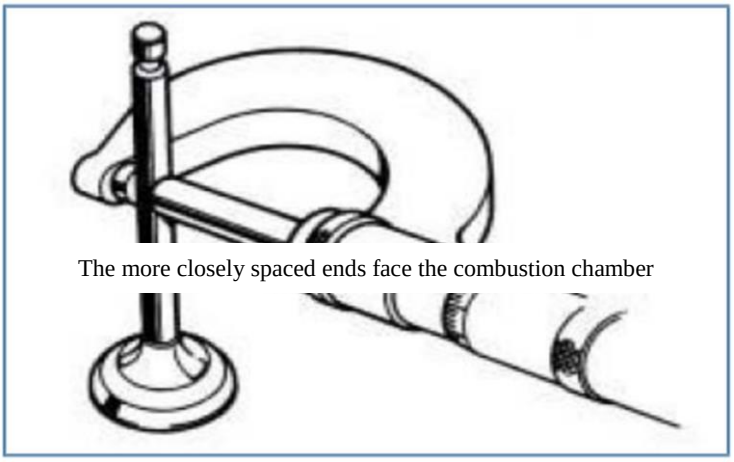
Valve lever

Check each valve lever for bending, burnt damage or abnormal wear.

Check the movement of each valve stem in the pipe, measure and record the outer diameter of the valve stem.

Available limit: Air intake 4.90mm

Exhaust 4.90mm



Valve Executive

Note

Before measuring the catheter, remove the carbon deposits with a reamer.

Special tool: valve guide reamer 5.0mm

Measure and record the inner diameter of each catheter with a plug gauge.

Available limit: 5.03mm

Valve guide reamer 5.0mm

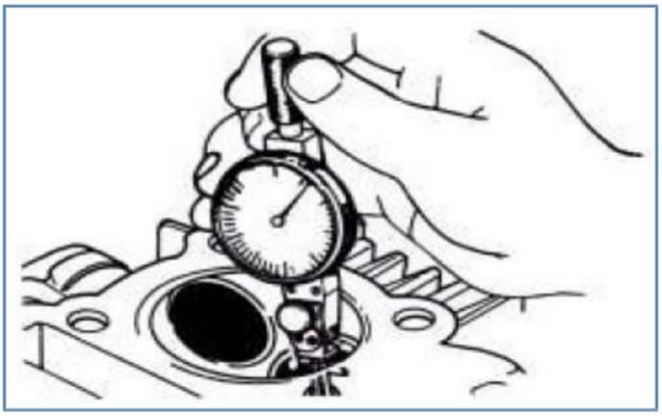
Subtract the outer diameter of the matched valve stem from the inner diameter of each catheter to obtain the clearance value between the valve stem and the catheter.

Available limit: Intake →0.08mm

Exhaust→0.10mm

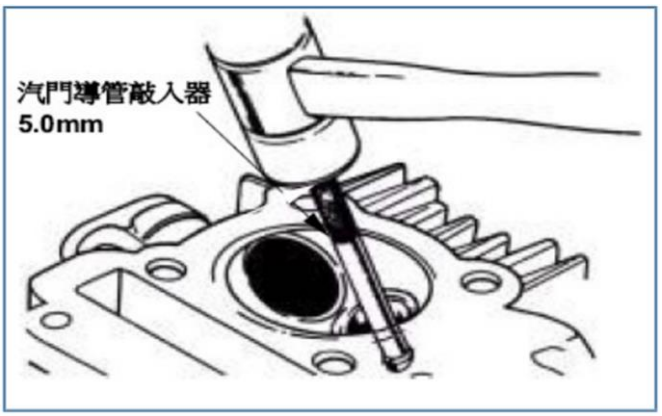
NOTE

If the gap between the valve and the catheter exceeds the usable limit, first calculate whether the gap can meet the standard after only replacing the new catheter;if so, only replace the catheter.



After replacement, use a reamer to trim the fit.

If the fitting clearance is still exceeded after replacing the new pipe, the valve must be replaced.



NOTE

When replacing the catheter, the valve seat must be trimmed at the same time.

Valve guide replacement

Heat the cylinder head to 100-150°C with heating plate or oven.

NOTE

- Do not use flames to directly heat the cylinder head during heating, otherwise the cylinder head may be deformed.
- Wear insulated gloves to avoid burns during

Valve guide knocker 5mm

Fix the cylinder head and push out the old pipe from the side of the combustion chamber.

Tool: Valve guide knocker 5mm

Valve guide knocker 5mm

NOTE

- After the catheter is pressed in, check for damage.
- When pressing in the new pipe, cylinder head

Adjust the valve guide knocker so that the height of the guide tube is 13mm.

When pressing in the catheter, it must be pressed in from the rocker side.

Tool: Valve guide reamer 5 mm

After the cylinder head has cooled to room temperature, ream the new duct with a reamer.

Valve guide reamer 5.0mm

NOTE

- Cutting oil is required when trimming with a reamer.
- When inserting or moving the reamer,

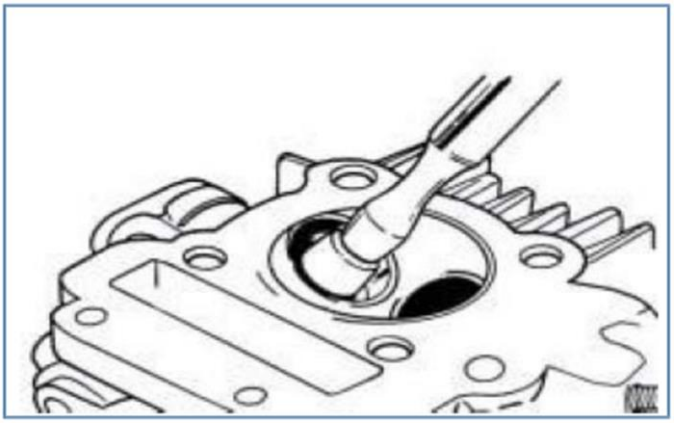
Trim the valve seat and clean the cylinder head to remove any metal debris.

Special tool: valve guide reamer 5mm

Valve seat inspection and repair

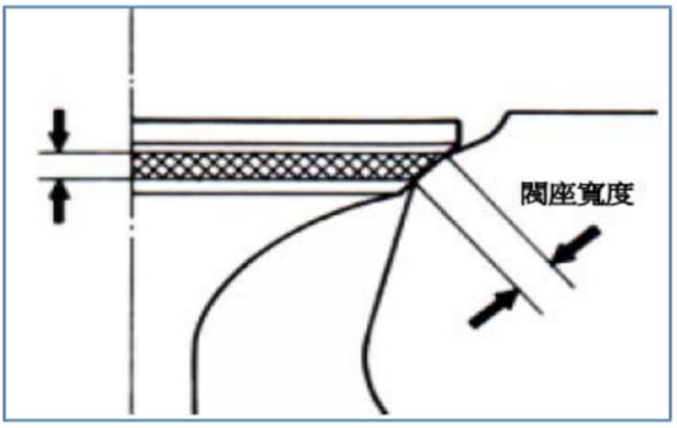
Remove all carbon deposits on the intake and exhaust valve parts.

Apply a thin layer of emery to the contact surface of the valve valve and the valve seat, and use a special grinding tool to drive the valve valve to grind each other.



NOTE

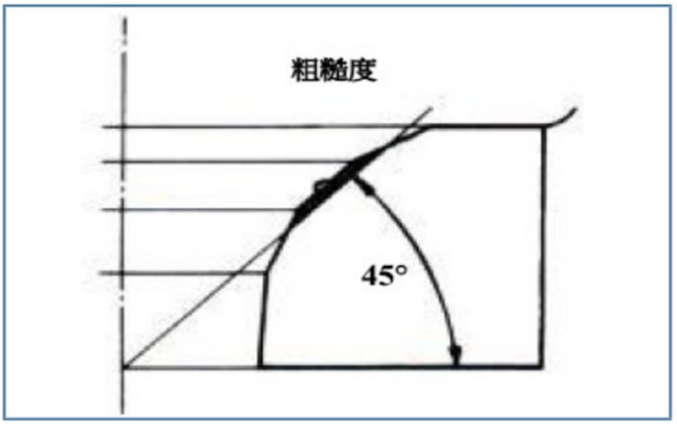
- Do not allow emery to enter the valve stem and conduit.
- After running-in, wash away the emery, and apply a layer of red lead on the contact



Remove the valve and check whether the valve contact surface is tight.

Valve seat width

NOTE



The valve can not be repaired and reused. If the valve surface is rough, worn or incomplete contact with the valve seat, it must be replaced. After the contact surface of the valve and the valve seat is ground, it should be replaced if it cannot be tightly sealed

Roughness

Check the valve seat

If the valve seat is too wide, too narrow or has dents, the valve seat must be ground and trimmed.

Valve seat width

Available limit: 1.6mm

Check the contact surface of the valve seat.

Grinding valve seat

The worn seat surface must be trimmed with a special valve seat surface dresser.

Use a 45° seat surface dresser to grind any rough or irregular surfaces of the seat.

Width of old valve seat

NOTE

r valve guide is replaced, the seat
t be corrected with a 45° dresser.

Use a 32° cutter to remove 1/4 of the upper seat surface.

Use a 60° cutter to remove 1/4 of the lower seat surface.

Remove the cutter and check the new seat surface.

Use a 45° cutter to grind the seat surface to the specified width.

NOTE

Confirm that all rough potholes and irregular surfaces have been completely removed.

Trim again if necessary.

Apply a thin layer of Prussian blue or red lead on the valve seat surface.

Install the valve through the guide tube until it is in contact with the valve surface, lightly press the valve, but do not rotate, so that a clear mark is produced on the valve surface (the entire circumference must be evenly contacted).

NOTE

The position of the contact surface between the valve seat and the valve is very important for the tightness of the valve

If the contact surface on the valve valve is too high, grind the valve seat with a 32° cutter.

Grind the seat surface with a 45° cutter to the specified width.

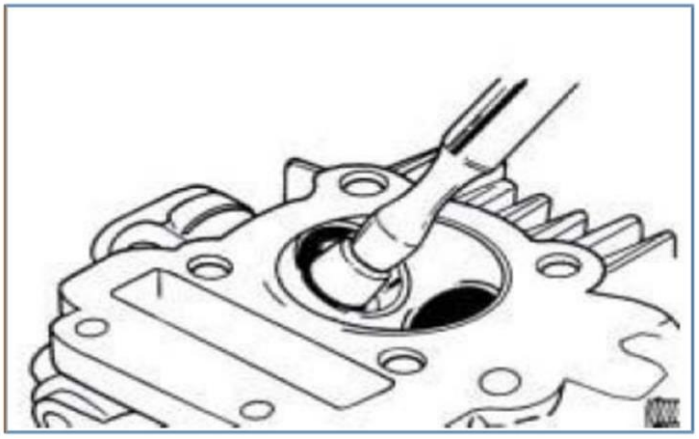
If the contact surface on the valve valve is too low, grind the inner valve seat with a 60° cutter.
Grind the seat surface with a 45° cutter to the specified width.

The contact surface is too low

Width of old valve seat

After the valve seat is trimmed, apply a thin layer of emery on the contact surface between the valve and the valve seat, and the valve is driven by a special grinding tool to grind each other.

After grinding, clean all the emery coated on the cylinder head and cylinder valve.

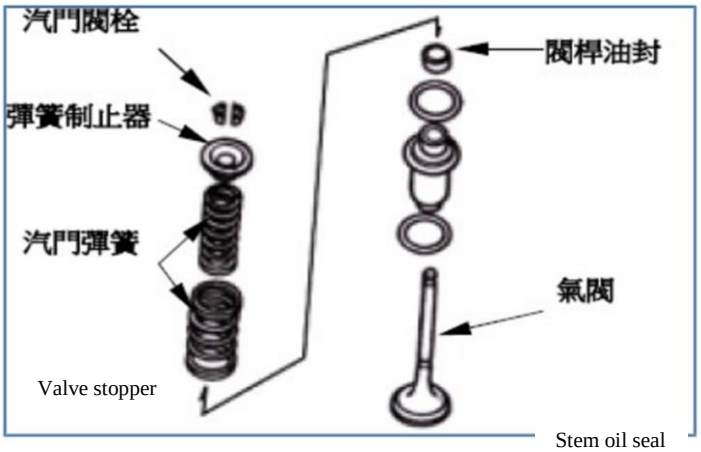


Cylinder head combination

Lubricate the valve stem with engine oil, and then insert the valve into the catheter.

Install a new valve stem oil seal.

Install the valve spring and spring stopper.



NOTE

The end with the denser spring turns must face the direction of the combustion chamber.

Use a valve compressor to depress the valve spring.

After installing the valve plug, loosen the compressor.

NOTE

In order to prevent the spring from losing its elasticity, do not over-compress the spring, and use the most suitable length to install the safety valve.

Special tool: valve spring compressor

Tap the valve stem with a rubber hammer to make the valve plug and the valve stem fit well.

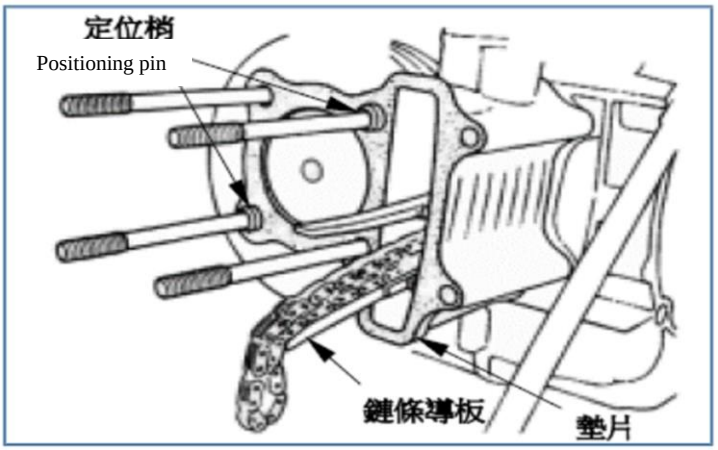
NOTE

Support the cylinder head on the workbench to avoid damaging the valve.

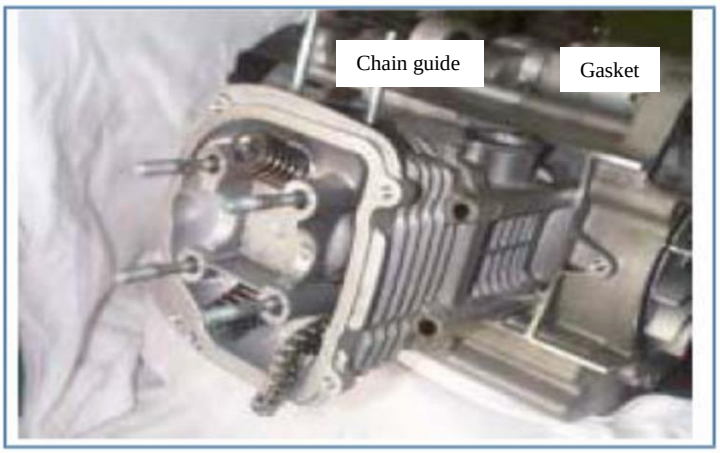
Cylinder head installation

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

Install the cam chain guide.



Install the cylinder head



Camshaft installation

Combined camshaft fixing seat.

Assemble the exhaust valve rocker arm on the side marked "EX" on the camshaft mount.

Install the intake valve rocker arm and rocker arm shaft.

NOTE

The chamfer at the tip of the rocker arm shaft of the intake side valve must be sealed with the bolt hole of the camshaft fixing seat.

First align the mark "T" on the magneto flywheel with the mark convex line on the right cover of the crankcase, and then install the chain on the cam chain, ensuring that the line of the two small holes on the sprocket is parallel to

Turn the side with the "EX" mark of the cam holder assembly toward the exhaust

Turn the crankshaft clockwise with a T-shaped wrench, so that the mark "T" on the generator flywheel is aligned with the mark on the crankcase (the piston is at the dead center of the compression stroke)

Install fixed pin

Install the camshaft fixing seat, gasket and nut on the cylinder head.

Tighten the cylinder head nut (nut x4).

Tighten the 4 nuts above the cylinder head first, and then tighten the 2 cylinder head fixing bolts on the left side of the cylinder head.

Torque value: 1.8-2.2 kgf-m

Lock the spark plug.

Torque value: 1.0-1.2 kgf-m

NOTE

- Apply engine oil to the threads of the cylinder head bolts and tighten them 2-3 times diagonally.
- The torque of the lock should not exceed the standard value to avoid causing the cylinder to deform and skew, produce abnormal noise or

Valve clearance adjustment

Loosen the gap adjustment nuts and bolts on the valve rocker arm.Measure with thickness gauge and adjust the gap of each valve.After adjusting to the standard value, fix the adjusting bolt and tighten the adjusting nut.

Standard value: 0.03-0.05 mm

Turn the cam chain tensioner counterclockwise with a thin flat-blade screwdriver to make it pop out and tighten the chain guide plate, install new O-ring coated oil into the tensioner adjustment hole, and lock the tensioner adjustment hole bolt cover.

NOTE

The O-ring must be installed in the groove.

Blow-by gas conduit

Replace the O-ring of the cylinder head cover and install the cylinder head cover.

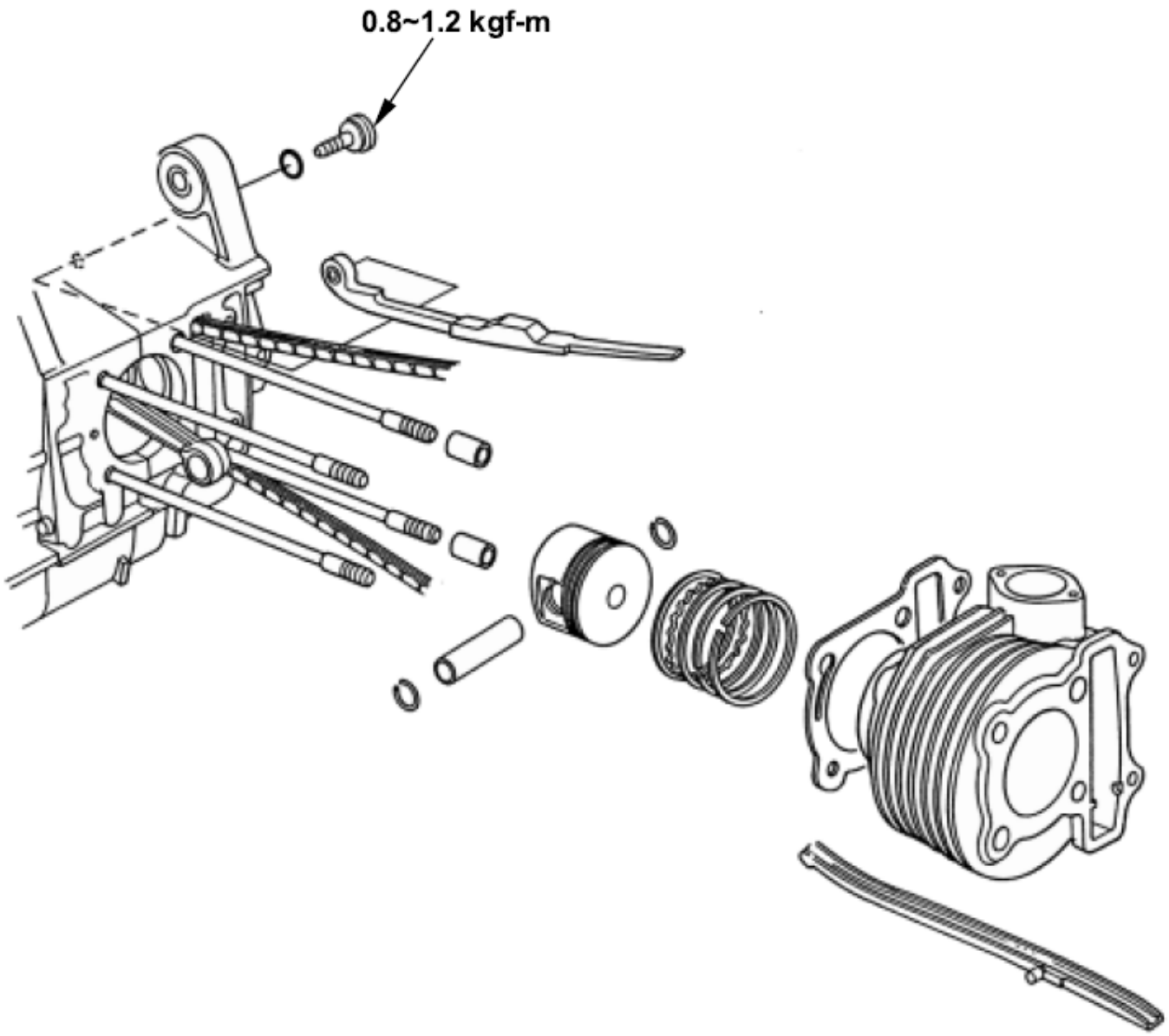
Bolt X 4

NOTE

The O-ring must be installed in the groove.

Tighten the cylinder head cover fixing bolts.

Link the blow-by air duct to the cylinder head cover.



Precautions in operation

General matters

- Cylinders and pistons cannot be repaired while the engine is installed on the vehicle.

Specification

unit：mm

Item			Standard value	Available limit
cylinder	Inner diameter		62.450~62.550	62.650
	Top surface parallelism		-	0.050
	Cylindricity		-	0.050
	Roundness		-	0.050
Pistons and piston rings	Clearance between piston ring and ring groove	Top ring ring	0.025~0.060	0.090
		Second ring	0.015~0.050	0.090
	Piston ring joint clearance	Top ring	0.100~0.250	0.500
		Second ring	0.250~0.400	0.650
		Oil scraper ring	0.200~0.800	-
	Piston outer diameter		62.450~62.500	62.410
	Piston outer diameter measurement position		Approximately 9mm at the bottom of the skirt	-
	Piston and cylinder clearance		0.050~0.100	0.200
	Piston tip bore inner diameter		15.002~15.008	15.040
Piston tip outer diameter			14.994~15.000	14.960
Piston and piston tip clearance			0.002~0.014	0.020
Inner diameter of small end of connecting rod			15.016~15.034	15.060

Fault diagnosis

Compression pressure is too low or unstable

Worn cylinder or piston ring.

Compression pressure is too high

Carbon deposits in pistons and combustion chambers.

Smoke from exhaust pipe

Cylinder piston or piston ring is worn.

Poor installation of piston ring.

Damage to the cylinder or piston.

Engine overheated

Excessive carbon deposits on the top of the

Knocking or abnormal sound

Cylinder and piston wear.

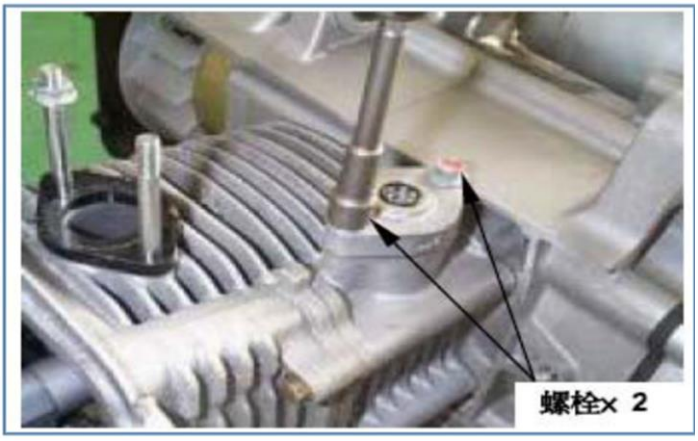
Too much carbon deposits on the piston head.

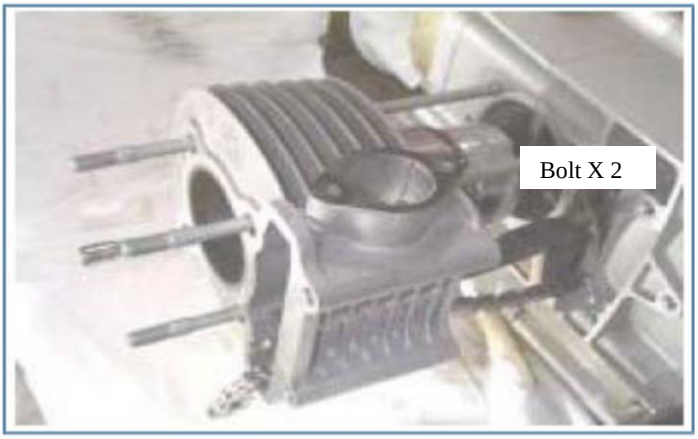
Piston tip hole and piston tip wear.

Cylinder disassembly

Remove the cylinder head (refer to Chapter 6).

Remove 2 bolts and take out the cam chain automatic adjuster.





Take out the cam chain guide.

Remove the cylinder.

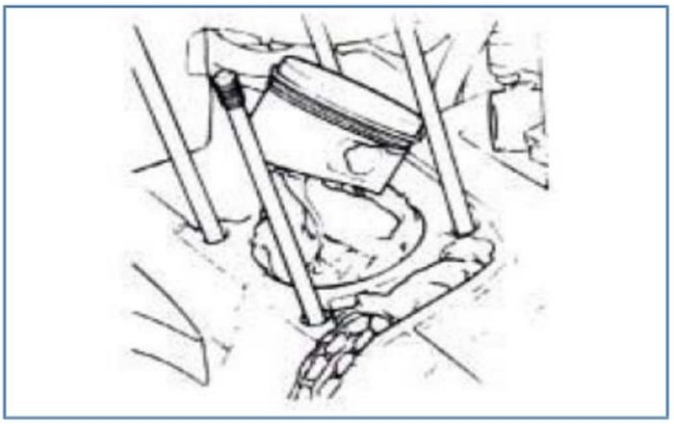
5.Cylinder/piston

Remove the cylinder gasket and fixed pin.

The residue of the gasket attached to the joint surface of the cylinder head and the crankcase is scraped out clean.

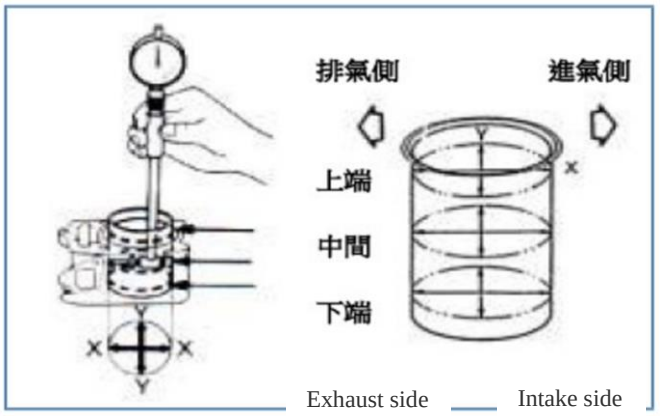
Plug the crankcase hole and cam chain hole with a cleaning cloth.

Remove all gasket debris and foreign matter on the joint surface of the cylinder and the crankcase.



NOTE

The gasket debris can be soaked with the solution, which is easier to remove.

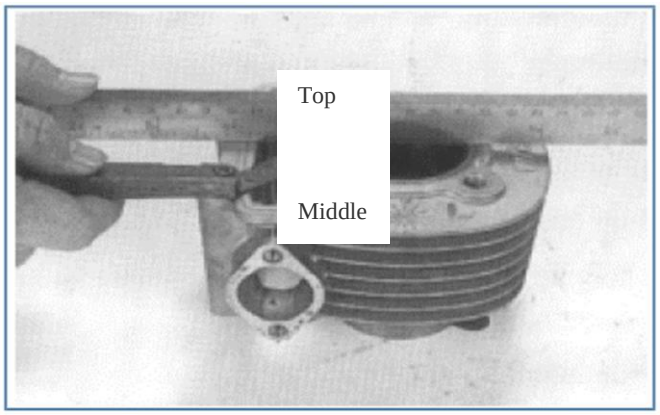


Inspection

Check whether the inner diameter of the cylinder is worn or damaged.

Divide the upper, middle and lower positions in the cylinder, and measure and record the value of the cylinder inner diameter in the X and Y axis directions respectively.

Usable limit: 62.650mm



Calculate the roundness (the difference between the X direction and the Y direction) and the cylindricality (the difference between the inner diameters of the upper, middle, and lower positions in the X or Y direction), and the maximum value shall prevail.

Usable limit:

Roundness:
correction or replacement above 0.05 mm
Cylindricity:

correction or replacement above 0.05 mm

Check the flatness of the cylinder.

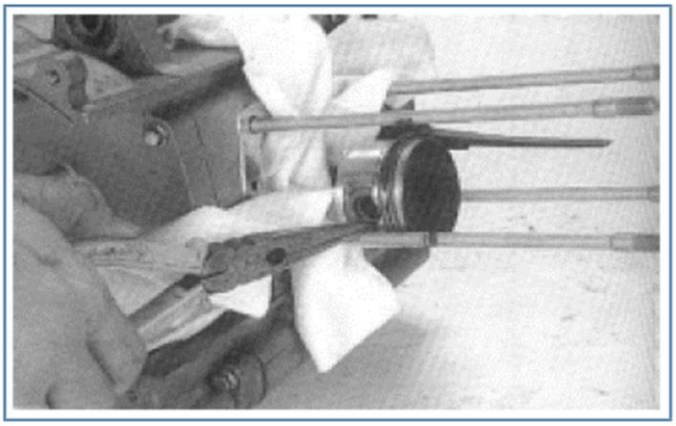
Usable limit:

correction or replacement above 0.05mm

Piston disassembly

Use a clean cloth to plug the crankcase opening and cam chain hole to prevent the piston pin buckle and other parts from falling into the crankcase during disassembly.

Use needle-nose pliers to clamp out the retaining ring on the side of the piston tip.



Push out the piston tip from the end of the buckle.

Remove the piston ring.

The piston ring is easy to break, please be careful when removing it.

NOTE

The piston ring is easy to break, please be careful when removing it.

Remove the piston ring.

Check whether the piston ring is damaged and whether the ring groove is worn.

Remove the carbon deposits attached to the piston ring groove.

Install the piston ring and measure the gap of the piston ring groove.

Usable limit: Top ring: replace above 0.09mm

Second ring: replace above 0.09mm

Remove the piston ring, install each piston ring on the bottom of the cylinder, and then push the piston ring 20mm away from the top surface of the cylinder

NOTE

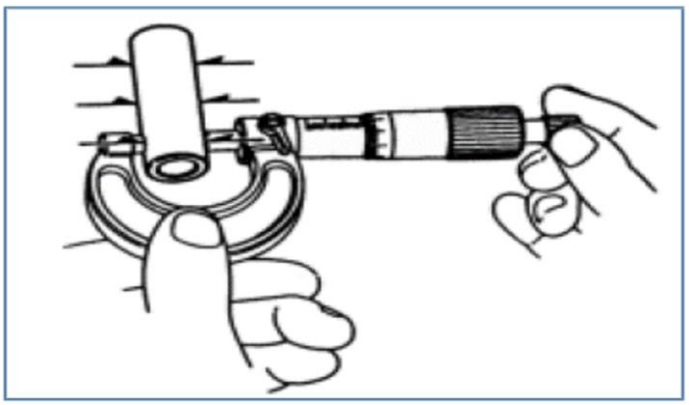
Use the top of the piston to push the piston ring parallel into the cylinder.

Usable limit:

Top ring: replace above 0.05mm

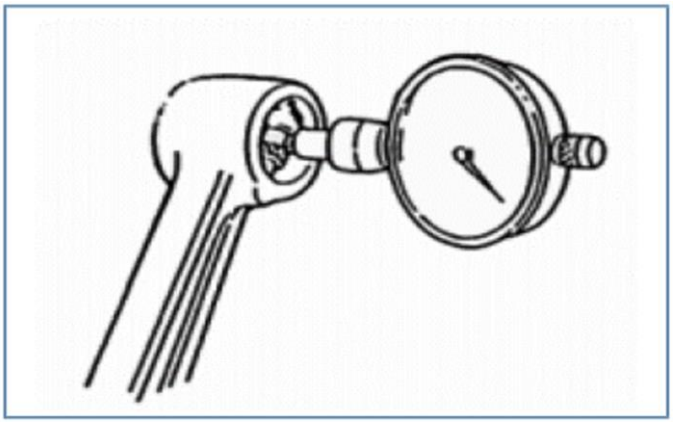
Measure the outer diameter of the piston tip.

Usable limit: 14.96 mm



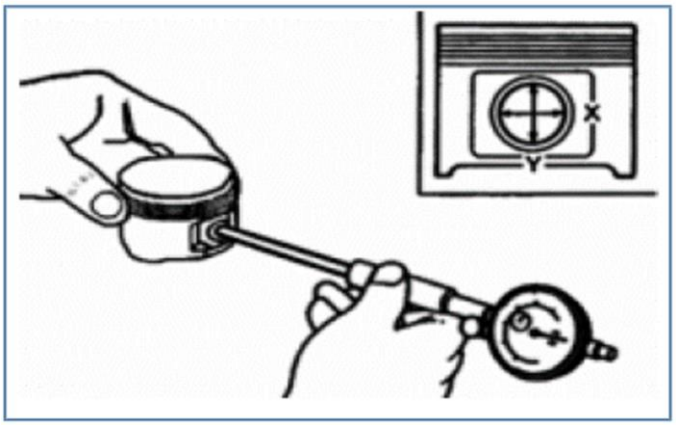
Measure the inner diameter of the small end of the connecting rod.

Usable limit: 15.06 mm



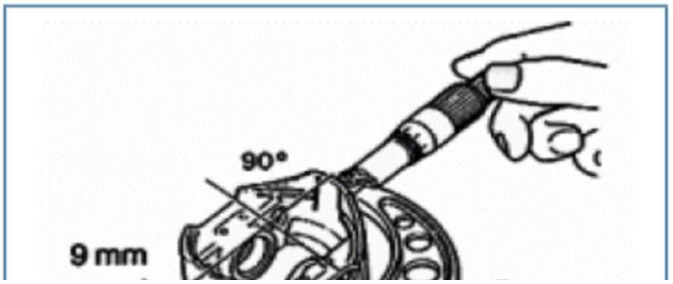
Measure the inner diameter of the piston pin hole.

Usable limit: 15.04 mm



Calculate the clearance between the piston tip and the piston tip hole.

Usable limit: 0.02 mm



Measure the outer diameter of the piston.

NOTE

The measurement position is 9mm from the bottom of the piston and 90° from the tip hole of the piston.

Usable limit: 62.410mm

Compare this measurement with the usable limit,

and calculate the piston and cylinder clearance.

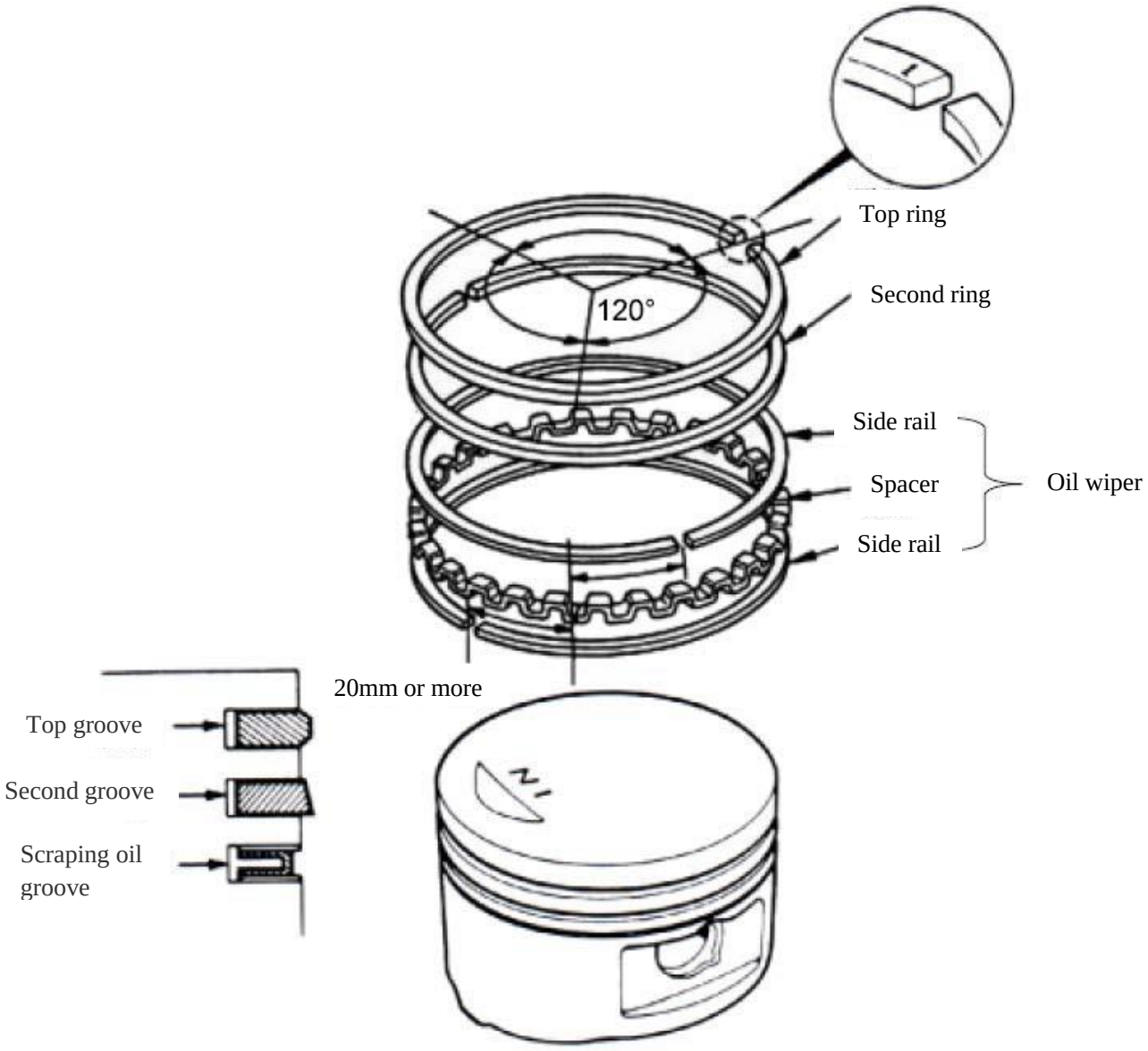
Piston ring installation

Clean the piston head, ring groove and piston skirt.

Carefully spread the piston ring into the piston

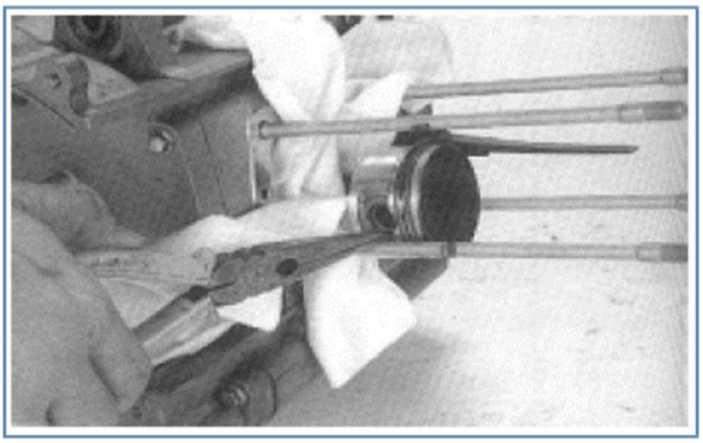
NOTE

- Do not damage the piston and piston ring during installation.
- All the marks on the piston ring must be upward when installed.
- After the installation is complete, it must be confirmed that all piston rings can rotate freely, and there


Top ring
Second ring
120°
Side rail
Spacer
Side rail
Oil wiper
20mm or more
Top groove
Second groove
Scraping oil groove

Piston installation

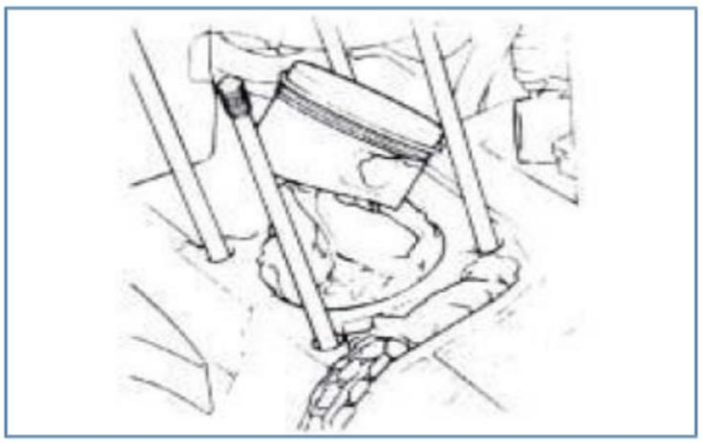
Install the piston and piston tip, and place the mark IN on the top surface of the piston on the side of the intake valve.



Install the new piston pin buckle.

NOTE

- Do not make the buckle ring gap on the piston tip, and align the gap for assembling the buckle ring on the piston.
- During operation, a piece of cloth must be placed on the piston skirt and crankcase to prevent



Cylinder installation

Remove all shim debris and foreign objects on the crankcase joint surface, and be careful not to let the debris or foreign objects fall into the crankcase.

NOTE

The gasket debris can be wetted with the solution, which can be easier to remove.

Install 2 positioning pins and new gaskets.

Coat the inside of the cylinder, piston and piston ring with new engine oil.

Carefully insert the cylinder into the piston.

When inserting, insert one ring at a time in accordance with the piston ring.

NOTE

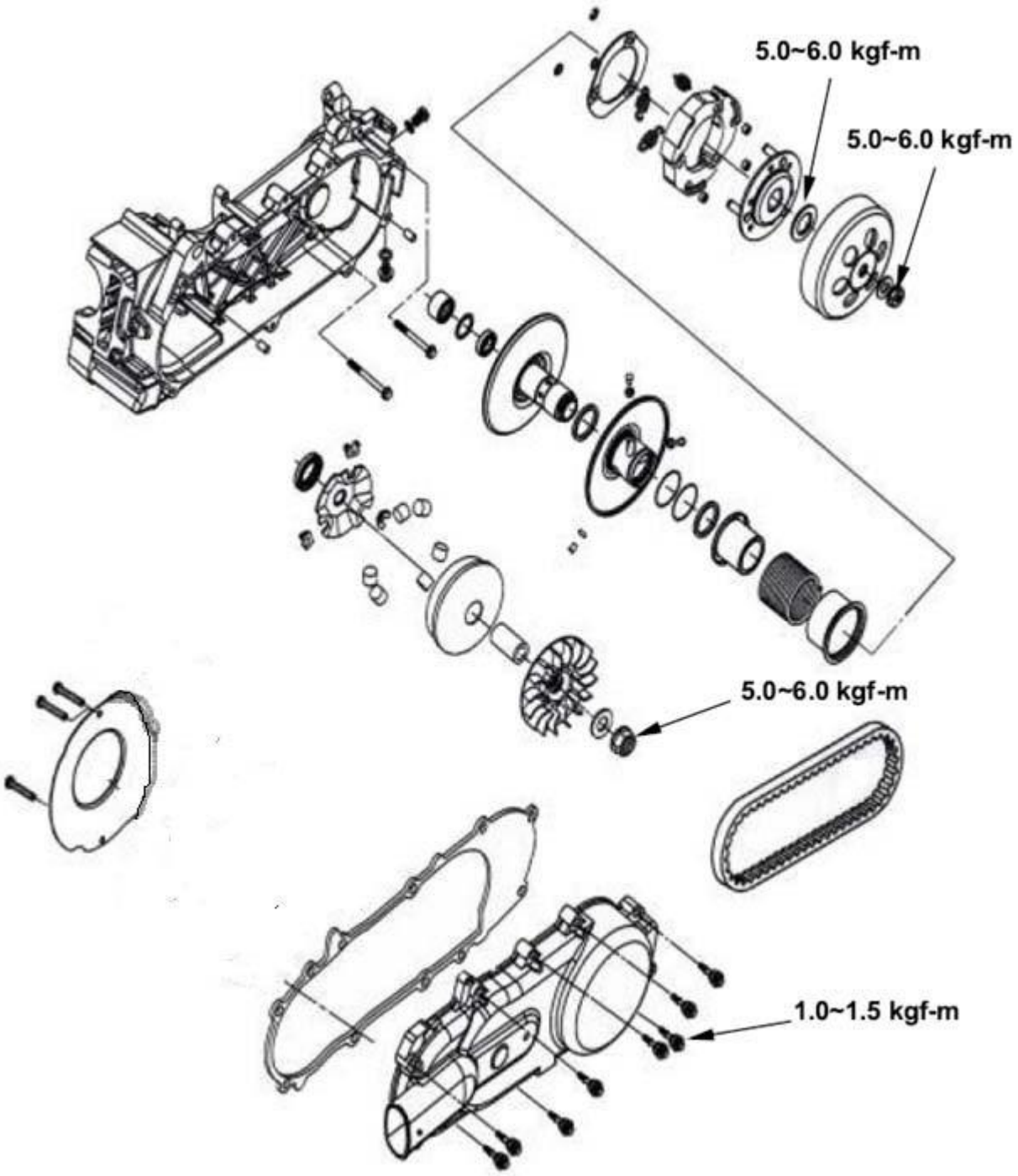
Do not use force to sleeve the cylinder into the piston, as it is easy to damage the piston and piston ring.

Install the cam chain guide, cylinder head gasket and positioning pin.

Install the cylinder head (refer to Chapter 4)

Install the cam chain automatic adjuster (bolt x2)

bolt x2



6.V-belt drive system

Maintenance instruction

Matters needing attention in operation

General matters

- The driving disc, clutch and transmission disc can be repaired on the vehicle.
- There shall be no grease on the surface of drive belt and drive plate.

Specification

unit:mm

Item	Standard value	Available limit
Drive belt width	22.30	20.8
Inner diameter of sliding drive pulley	23.989~24.052	24.060
Outer diameter of sliding drive pulley hub	23.960~23.974	23.940
Outer diameter of heavy hammer roller	19.950~20.050	19.450
Inner diameter of clutch overcoat	134.90~135.10	135.40
Thickness of clutch pad	2.500	1.500
Length of drive pulley spring	130.00	125.00
Outer diameter of drive pulley set	33.965~33.985	33.940
Inner diameter of sliding drive pulley	34.000~34.025	34.060

Torque value

Sliding drive belt pulley nut: 5.0-6.0 kgf-m

Clutch overcoat nut: 5.0-6.0 kgf-m

Drive belt pulley nut: 5.0-6.0 kgf-m

Tool

Clutch spring compressor

Internally drawn bearing extractor

Clutch fixing nut wrench

Universal fixing clip

Fault diagnosis

The engine starts but the wheels don’t turn

1. Drive belt is broken.
2. Inclined plate is worn.
3. Clutch comes to damage and wear the disc.

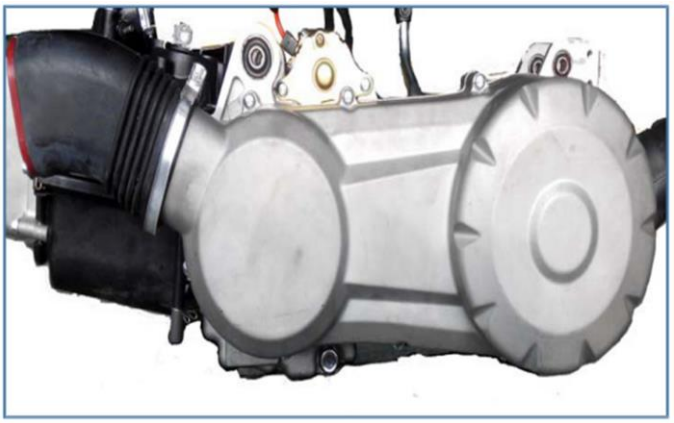
Poor high-speed performance or insufficient horsepower

1. Drive belt is worn out.
2. Power of the drive disc spring is insufficient.

Left crankcase cover

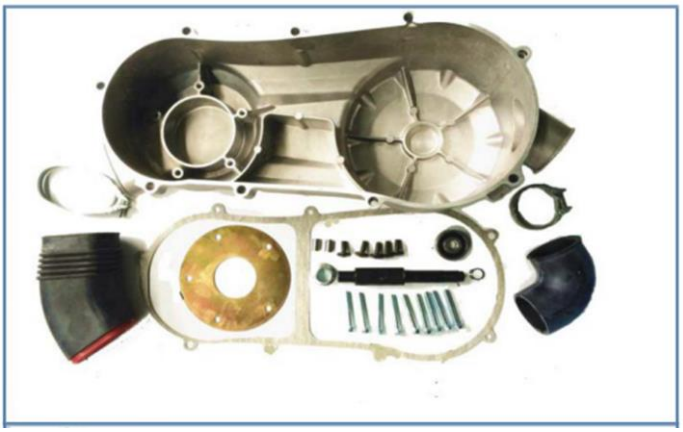
Disassembly of box cover

Remove the left engine cover (bolt x9)



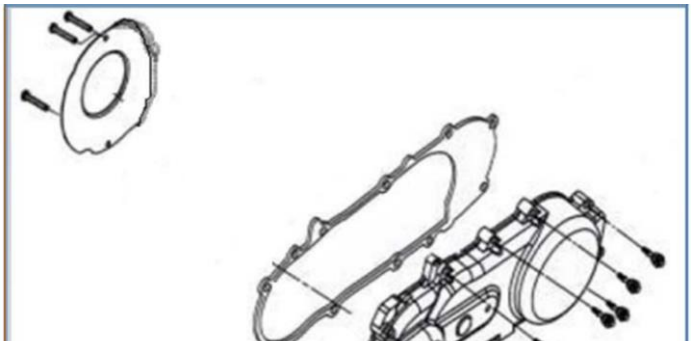
Inspection

The inside of the left side cover is dirty and blown out with an air gun. Whether the left side cover and bearing hole are worn or damaged, replace them with new ones if they are defective.



Assembly

Install in reverse order of disassembly



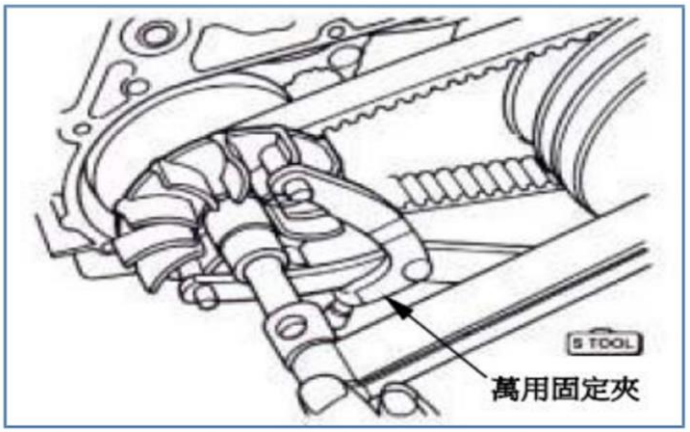
6.V-belt drive system

Drive belt

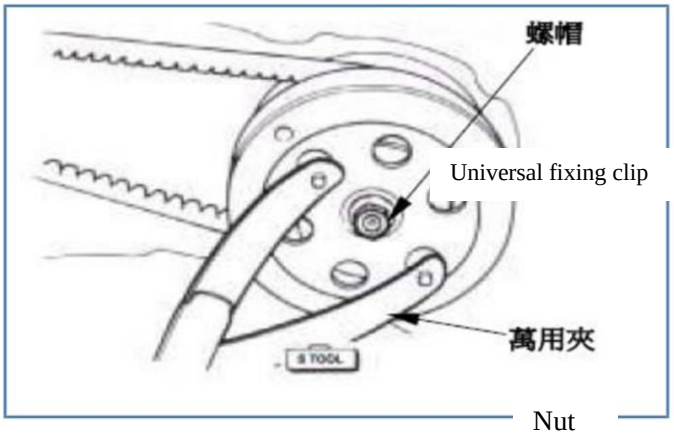
Disassemble

Remove the left crankcase cover.

Use the universal fixing clip to fix the drive plate, and remove the nut and drive plate.



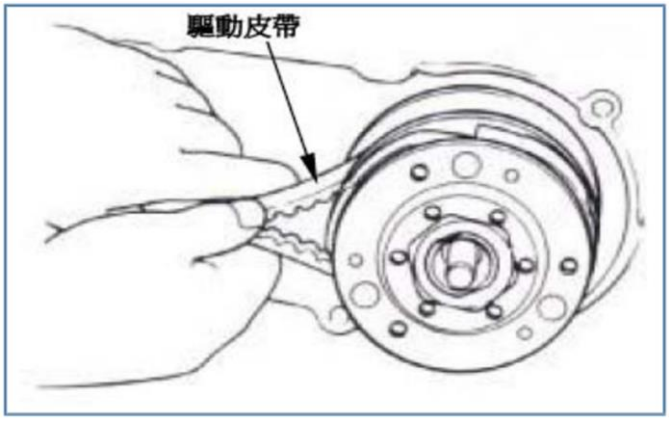
Use the universal fixing clip to fix the clutch cover, and remove the nut and clutch cover.



Nut

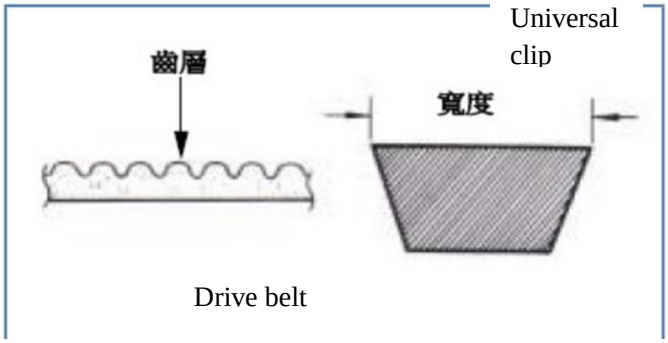
NOTE

Use special tools to loosen the lock nut. If only the rear wheel or the rear brake is fixed, the reduction gear system will be damaged.



Universal clip

Squeeze the drive belt into the groove of the drive pulley as shown in the figure to loosen it, and then take out the belt and clutch at the same time. Remove



Drive belt

the drive belt from the groove of the clutch drive pulley.

Inspection

Check the drive belt for cracks and wear, and replace it if necessary.

Measure the width of the drive belt as shown in the figure.

If it exceeds the maintenance limit, replace the drive belt.

Tooth layer

width

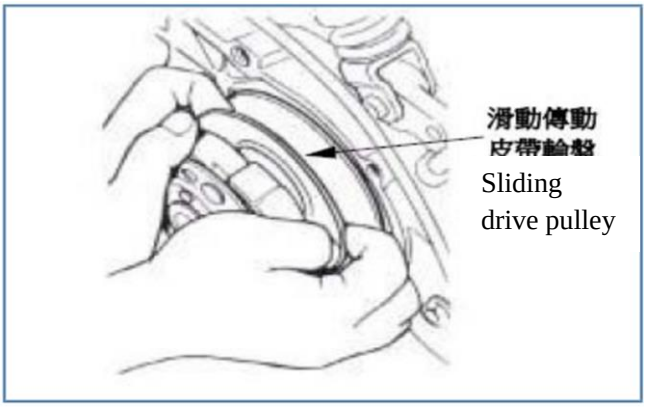
Usable limit: 20.8 mm

NOTE

- Please use original parts for replacement.
- There must be no grease on the surface of the drive belt or pulley.

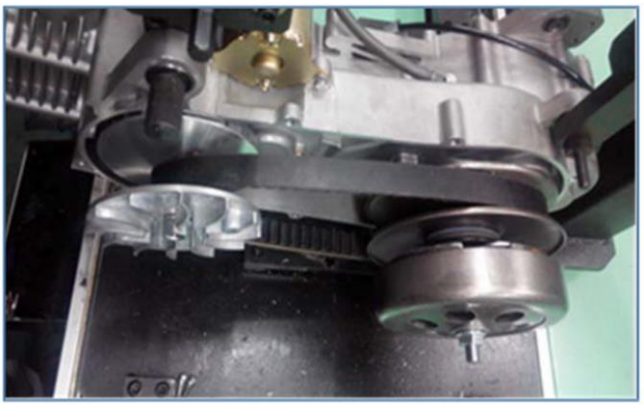
Installation

First pull the drive pulley disk apart, and then insert the drive belt into the drive pulley disk.



NOTE

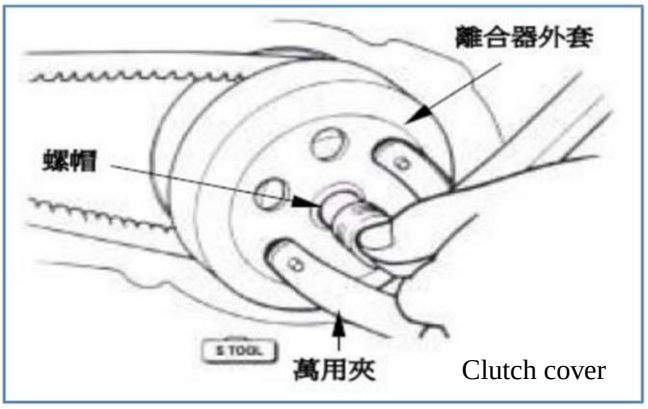
After the drive belt pulley is pulled apart and positioned, the drive belt is then inserted into the drive pulley plate, so that the belt can be easily assembled on the sliding belt pulley.



Assemble the clutch that has been installed in the drive belt on the drive axle.

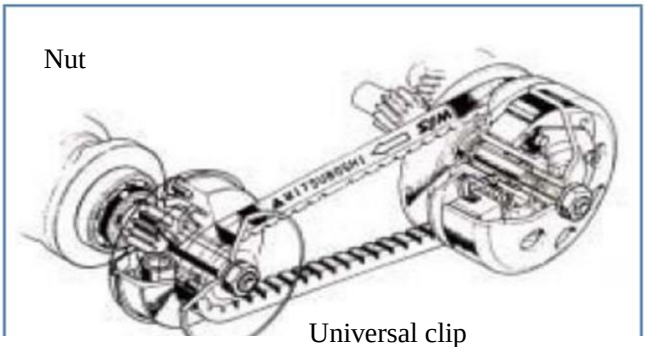
Put a sliding belt pulley on the other end of the belt.

Install the clutch cover.



Fix the clutch jacket with a universal fixing clip and tighten the nut to the specified torque value.

Torque value: 5.0-6.0 kgf-m.



NOTE

When assembling the drive belt, if there is an

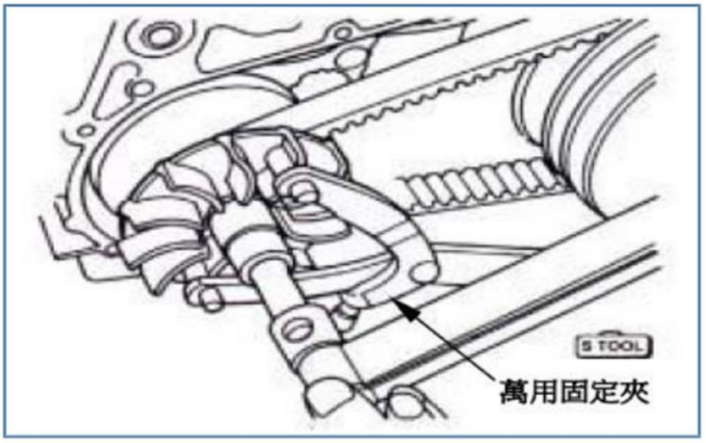
Sliding drive plate

Disassemble

Remove the left crankcase cover.

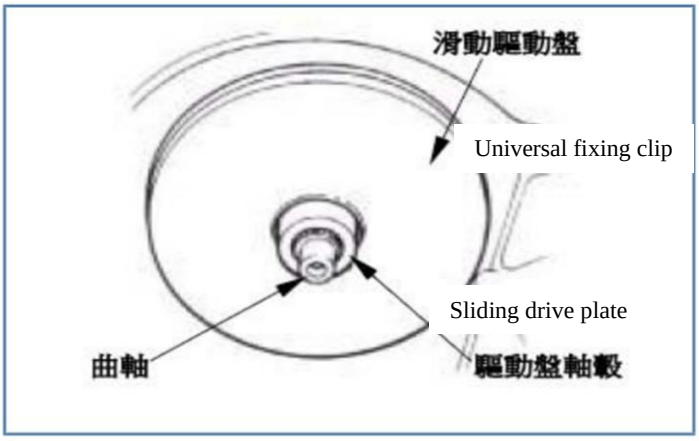
Fix the drive plate with a universal clamp, and remove the fixing nut of the drive plate.

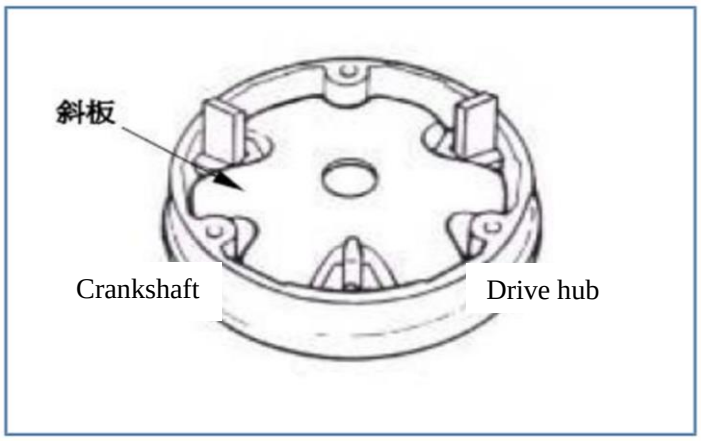
Remove the drive disk.



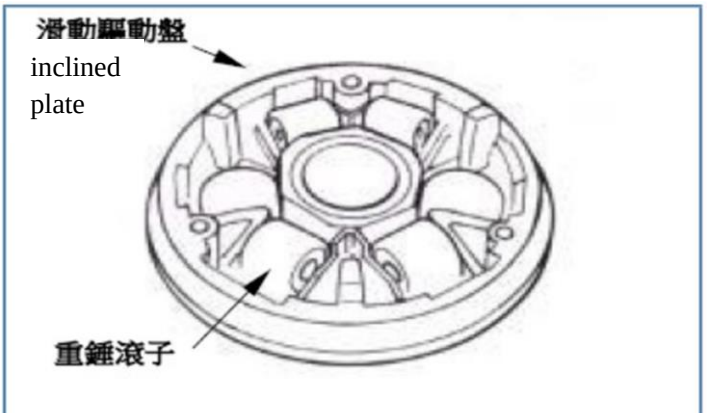
Remove the drive belt from the belt pulley.

Remove the sliding drive plate assembly and drive plate hub from the crankshaft.





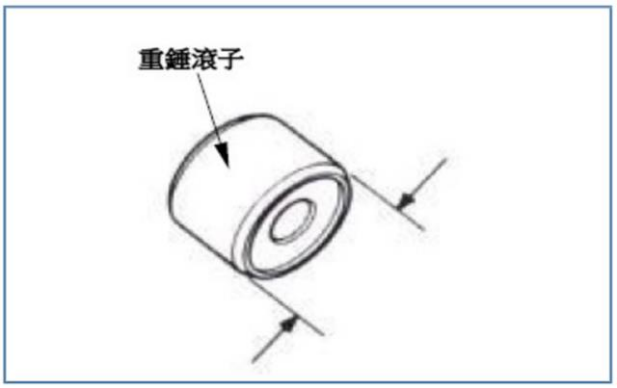
Remove the inclined plate.



Remove the hammer roller from the sliding drive plate.

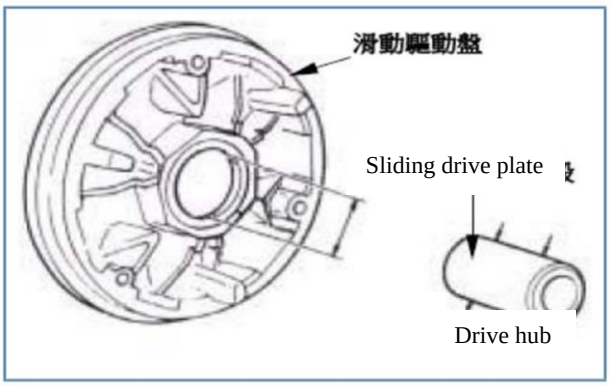
Inspection

The function of the sliding drive disc is to use the centrifugal force of the heavy hammer roller to roll according to the angle of the swash plate and push the sliding drive disc to achieve the function of speed change; therefore, if the heavy hammer roller is worn or damaged, the centrifugal force will be affected .



Check the rollers for wear or damage, and replace them if necessary.Measure the outer diameter of each roller and replace it with a new one if it exceeds the specified limit of use.

Usable limit: 19.45 mm



Check whether the drive shaft hub is worn or damaged,

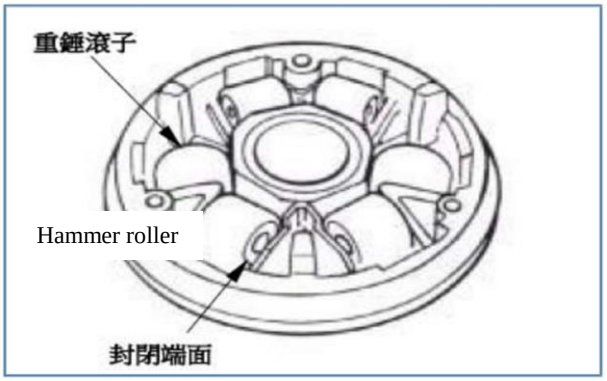
and replace it if necessary.

Measure the outer diameter of the drive shaft hub, it should be replaced if it exceeds the specified limit of use.

Usable limit: 23.94 mm.

Measure the inner diameter of the sliding drive plate, and replace it if it exceeds the specified limit of use.

Usable limit: 24.06 mm.

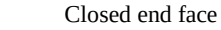


Combination/installation

Install the heavy hammer roller.

NOTE

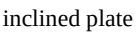
●The two end faces of the heavy hammer roller are different. In order to prolong the life of the roller and prevent abnormal wear, please assemble the closed end face on the sliding drive plate in a counterclockwise direction.



Install the inclined plate guide rubber sleeves (3 pieces)

on the inclined plate.

Install the inclined plate.

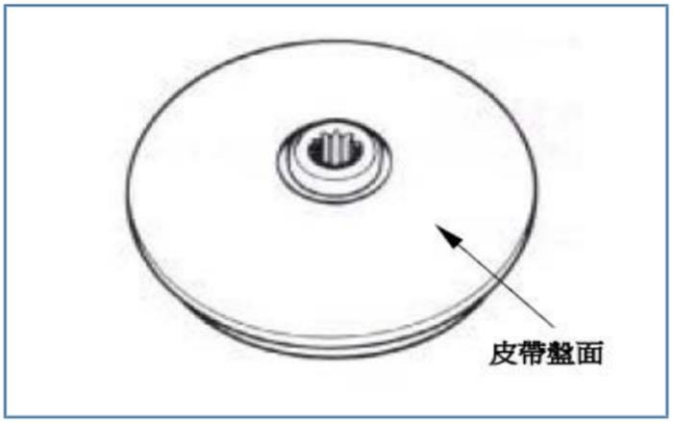


Use 4-5 kg of butter to coat the inside of the drive shaft hole.

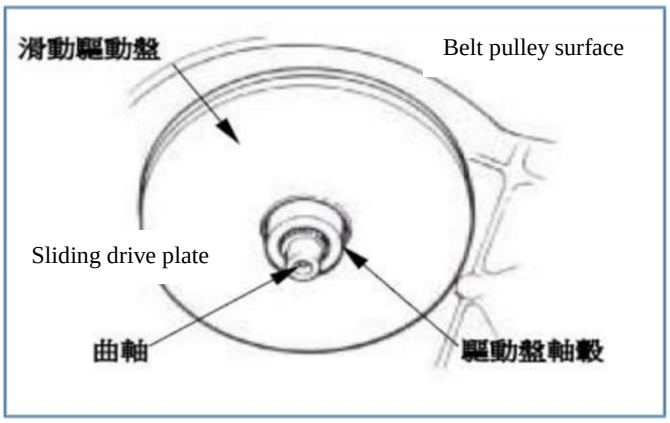
Install the drive shaft hub.

NOTE

There should be no grease on the belt surface, remove unnecessary grease with oil removing agent.



Install the sliding drive plate assembly on the crankshaft.

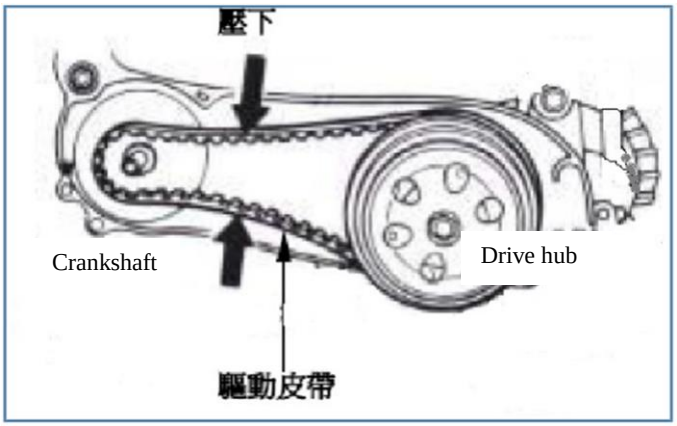


Installation of drive plate

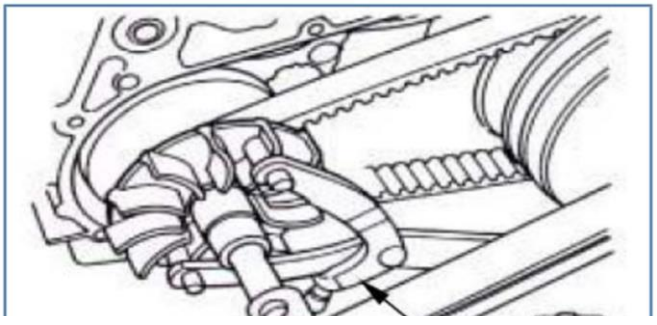
Put the drive belt on the sliding drive plate, and press down the upper and lower ends of the drive belt to separate the belt from the drive plate hub.

NOTE

Pressing down the upper and lower ends of the driving belt can prevent the belt from being damaged and ensure that the driving plate can be locked.



Depress



Drive belt

Install the drive plate, washer and nut.

NOTE

Make sure that there is no grease on both sides of the belt pulley, and remove unnecessary grease with oil removing agent.

Fix the drive disk with a universal clamp.

Tighten the nut to the specified torque.

Universal fixing clip

Torque value: 5.0-6.0 kgf-m

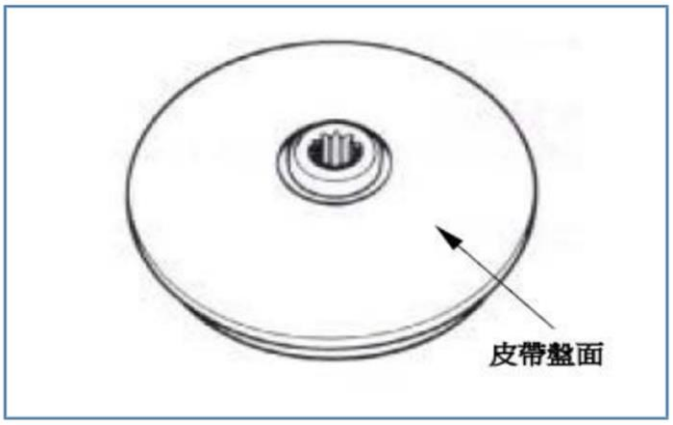
Install the left crankcase cover.

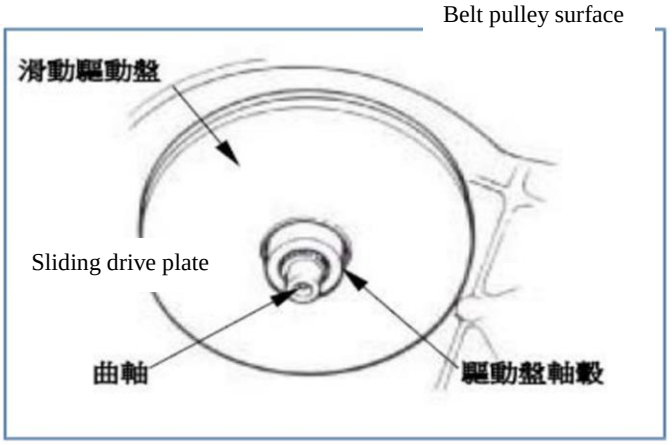
Use 4-5 kg of butter to coat the inside of the drive shaft hole.

Install the drive shaft hub.

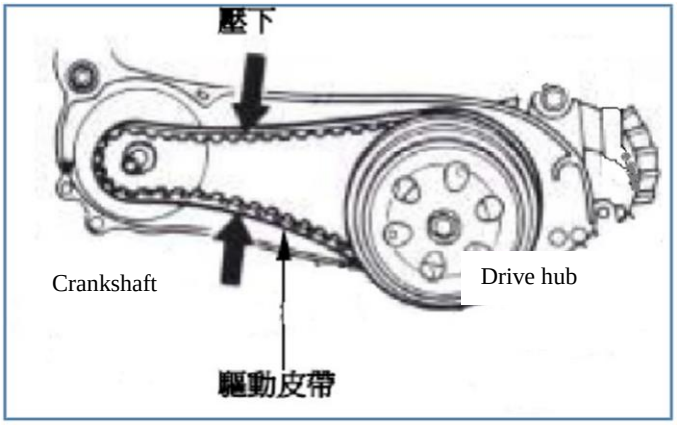
NOTE

There should be no grease on the belt surface, and remove unnecessary grease with oil removing agent.



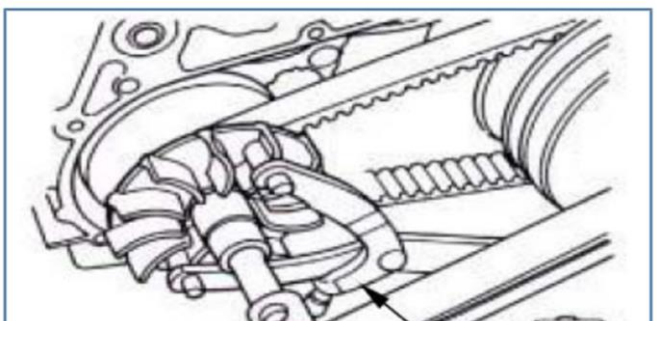


Install the sliding drive plate assembly on the crankshaft.



Driver installation

Put the drive belt on the sliding drive plate, and press down the upper and lower ends of the drive belt, so



that the belt is separated from the drive plate shaft hub.

NOTE

Pressing down the upper and lower ends of the drive belt can prevent the belt from being damaged and ensure that the drive plate can be locked.

Drive belt

Install the drive plate, washer and nut.

NOTE

Make sure that there is no grease on both sides of the belt pulley, and remove unnecessary grease with oil removing agent.

Fix the drive disk with a universal clamp.

Tighten the nut to the specified torque.

Universal fixing clip

Torque value: 5.0-6.0 kgf-m

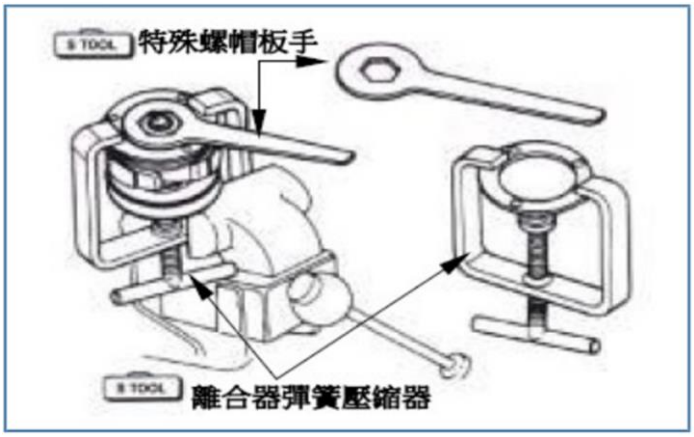
Install the left crankcase cover.

Clutch/drive belt pulley

Decomposition

Remove the drive plate and clutch/drive belt pulley.

Compress the clutch spring and install it on the clutch assembly, and tighten the spring compressor to make the nut easy to fit.

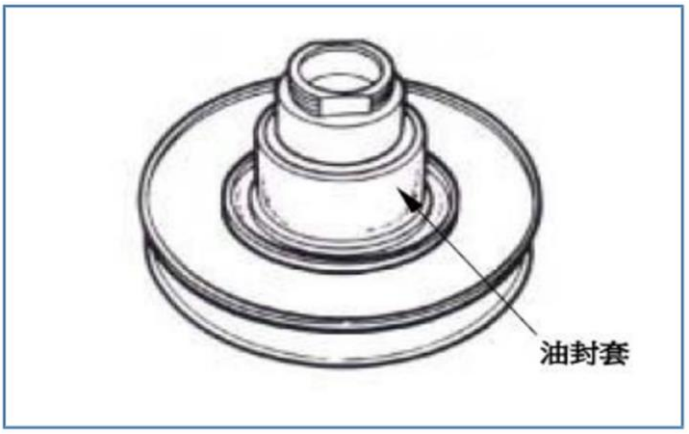


NOTE

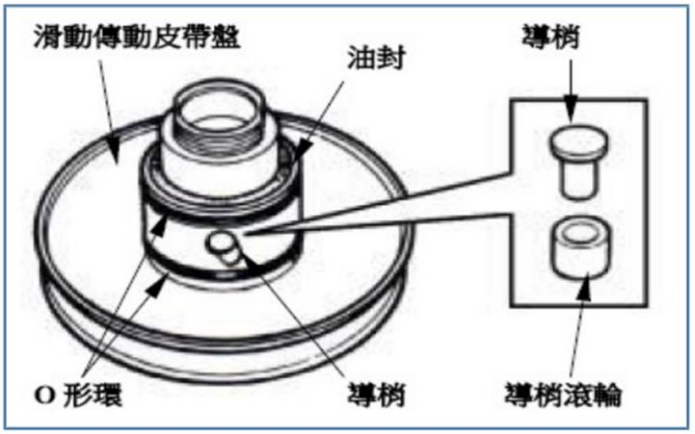
Do not over-tighten the spring compressor.

Clamp the clutch spring compressor on the vise as shown in the figure, and use a special nut wrench to remove the fixing nut.

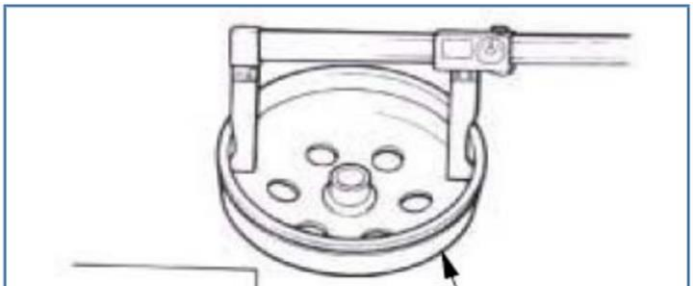
Loosen the clutch spring compressor, and remove the clutch and spring from the drive belt pulley.



Remove the oil seal sleeve from the drive belt drum.



Remove the guide pin, the guide pin roller and the sliding drive belt pulley, and remove the O-ring and the oil seal gasket from the sliding plate.

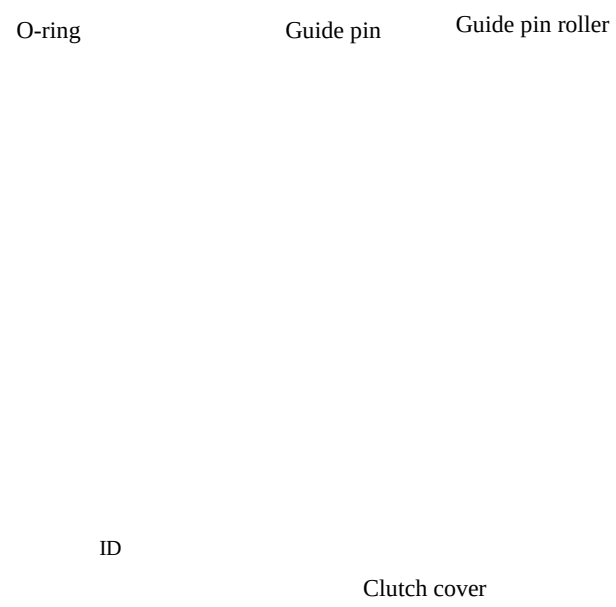


Inspection

Clutch cover

Measure the inner diameter of the friction surface of the clutch jacket. If the maintenance limit is exceeded, replace the clutch jacket.

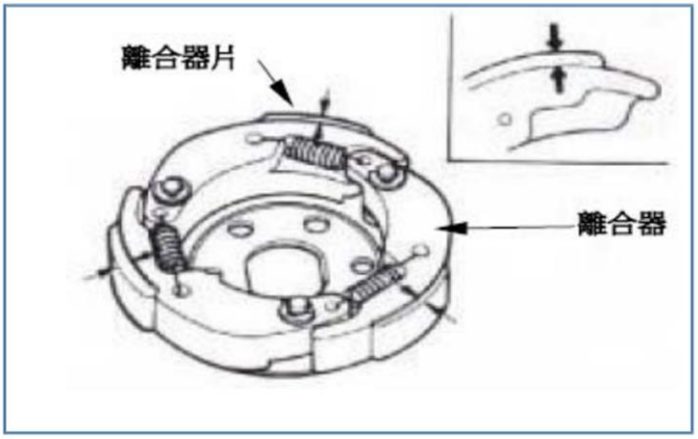
Available limit: 135.40 mm.



Clutch plate

Measure the thickness of each piece and replace it if it exceeds the maintenance limit.

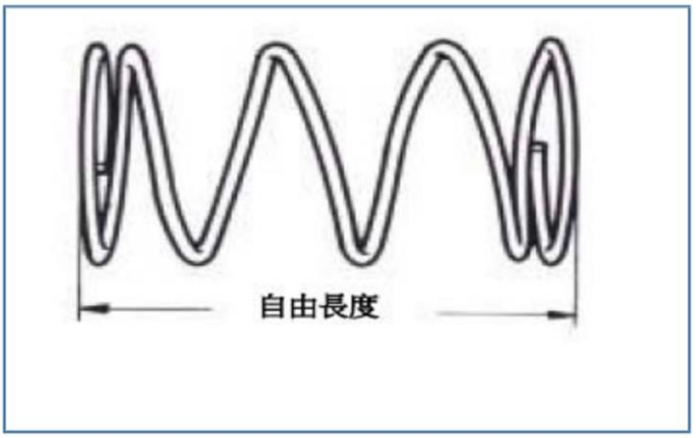
Usable limit: 1.5mm



Drive pulley spring

Measure the length of the drive belt pulley spring and replace it if it exceeds the maintenance limit.

Usable limit: 125 mm.



Drive belt pulley

Check the following:

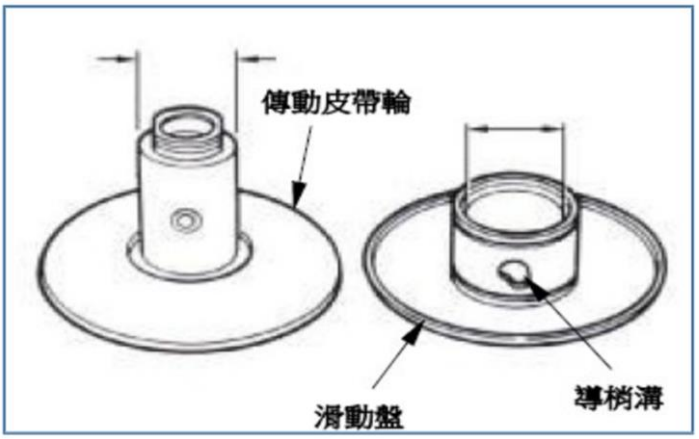
- Whether the two disk surfaces are damaged or excessively worn.
- Whether the guide pin groove is damaged or deformed.

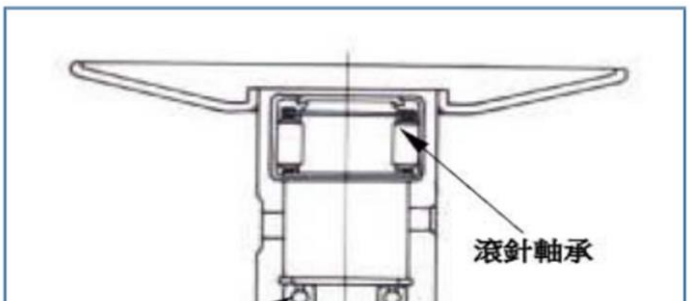
Replace damaged or excessively worn parts.

Measure the outer diameter of the drive disc shaft and the inner diameter of the sliding drive disc shaft hole. If it exceeds the maintenance limit, replace it.

Usable limit: Outer diameter 33.94 mm

Inner diameter 34.06mm



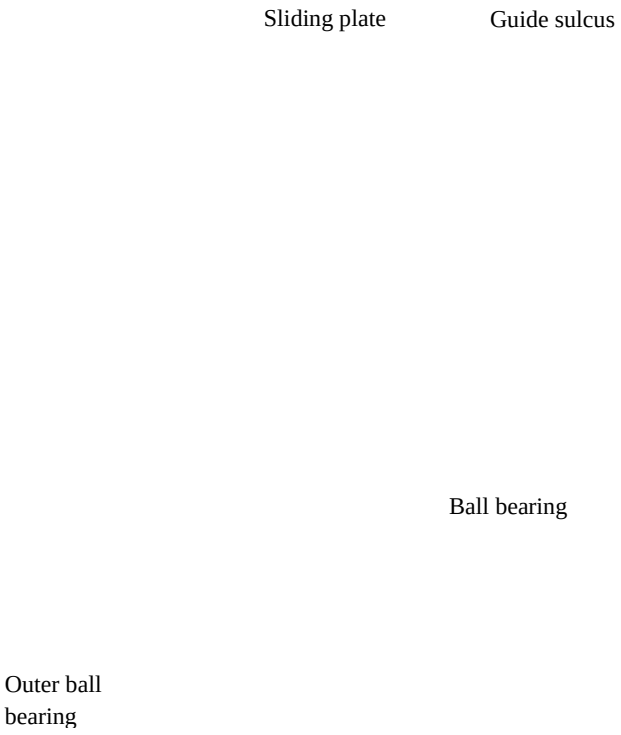


Inspection of the transmission belt pulley bearing

Check whether the inner bearing oil seal is damaged.Replace if necessary.

Check the needle bearing for damage or excessive clearance, and replace it if necessary.

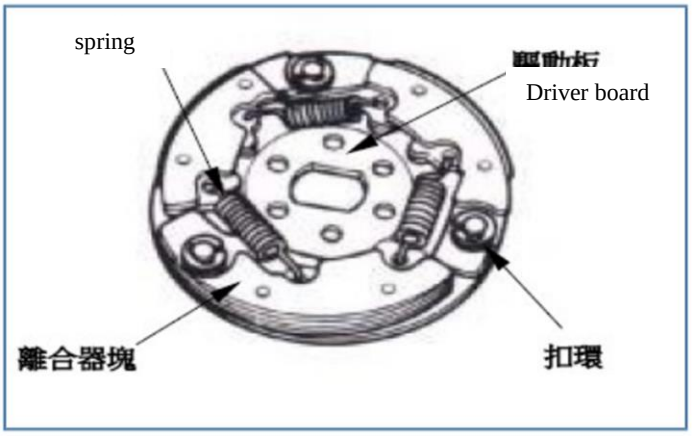
Rotate the inner side of the outer bearing with your fingers to check whether the bearing can rotate smoothly and silently, whether the outer side of the bearing is consistent and fixed, and replace the bearing if necessary.



Replacement of clutch block

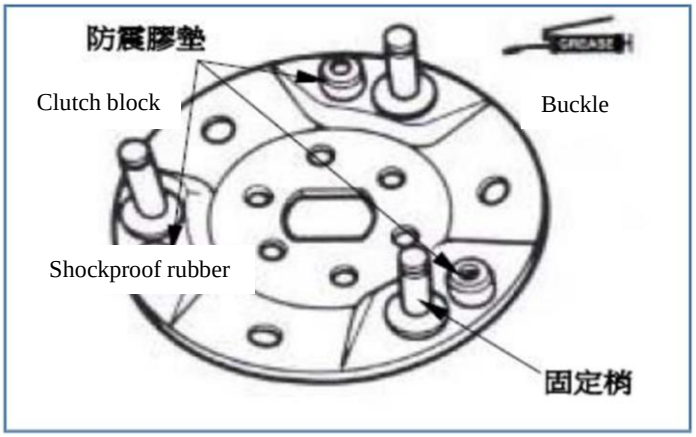
Remove the retaining ring and washer, and then remove the clutch block and spring from the drive plate.

Check the spring for damage or insufficient tension.



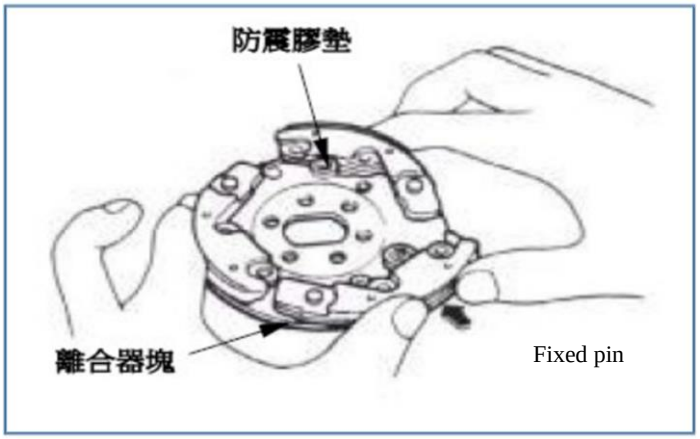
Check whether the shockproof rubber is damaged or deformed. If necessary, replace it.

Spread a little butter on the fixed tip.



Spread a little butter on the fixed pin, but there should be no butter on the clutch block. If there is butter on the clutch block, replace it.

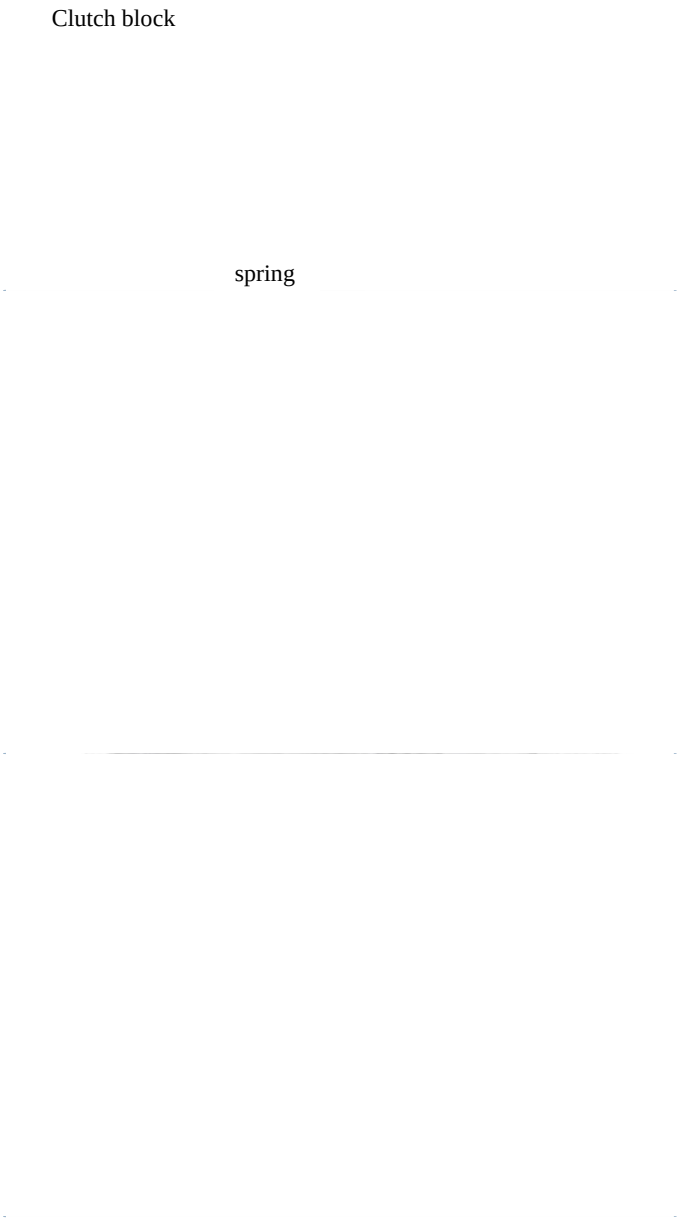
Install the new clutch block on the fixed pin and push it to position.



NOTE

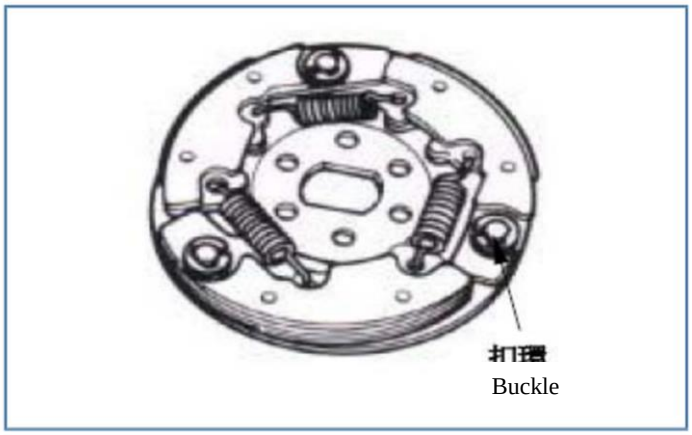
●Butter or lubricating oil will damage the friction plate on the clutch block and make it lose its binding force.

Shockproof rubber



Use pliers to snap the spring into the groove.

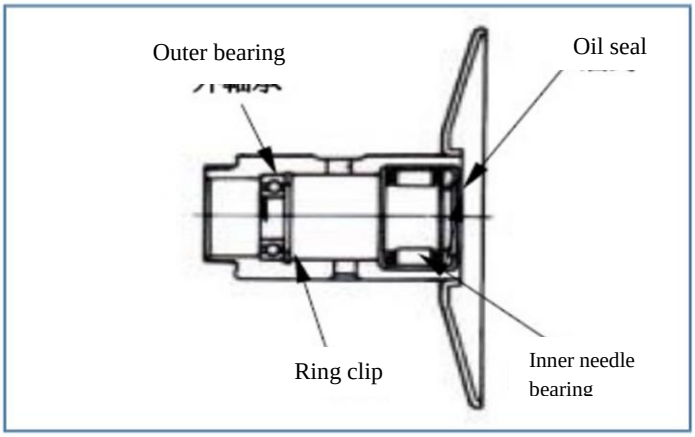
Install the buckle and the bearing plate on the fixed pin.



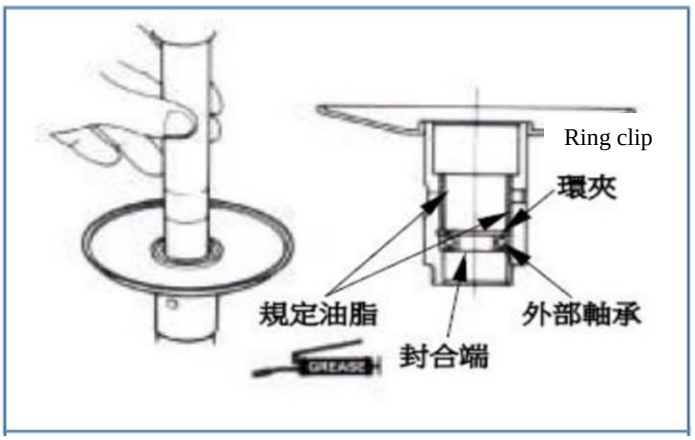
Replacement of drive belt pulley bearing

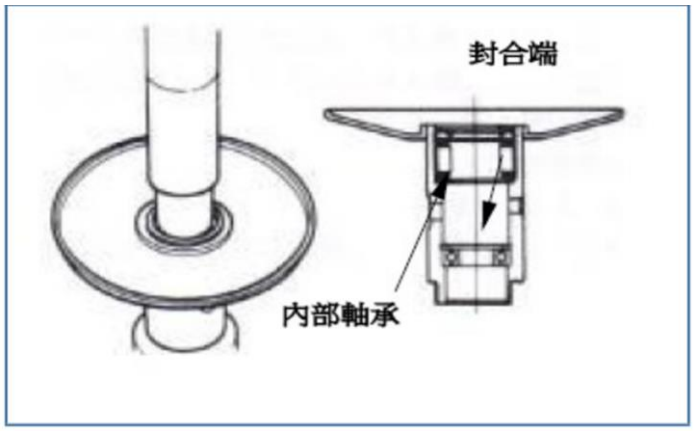
Remove the inner bearing.

NOTE



- The drive pulley is equipped with an oil seal on one side of the internal bearing. The oil seal should be removed first.
- For internal ball bearings, the ring clamp must be removed first, and then the bearing





Remove the retaining ring of the outer bearing, and then push the bearing out towards the inner bearing. Push the new bearing into position, and its sealed end should face outward. Apply the specified grease, and install the G-3 grease on the ring clamp to fix the bearing.

Specified grease

Outer bearing

Sealed end

Sealed end

Install the new inner bearing.

NOTE

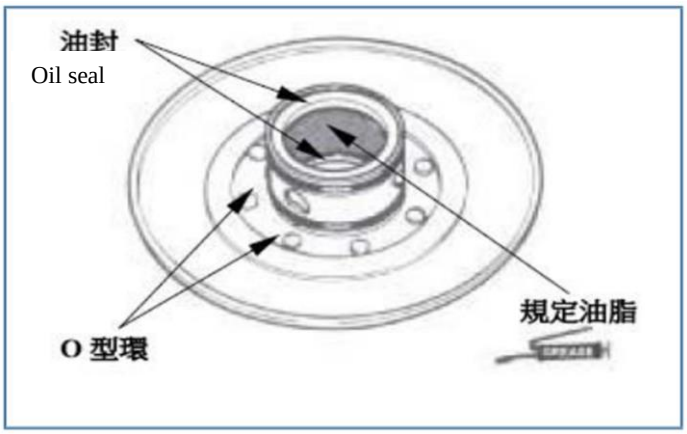
- When installing the bearing, pay attention that the sealed end should face outward.
- Use the hydraulic press to install needle bearings, and use the hydraulic press or drive

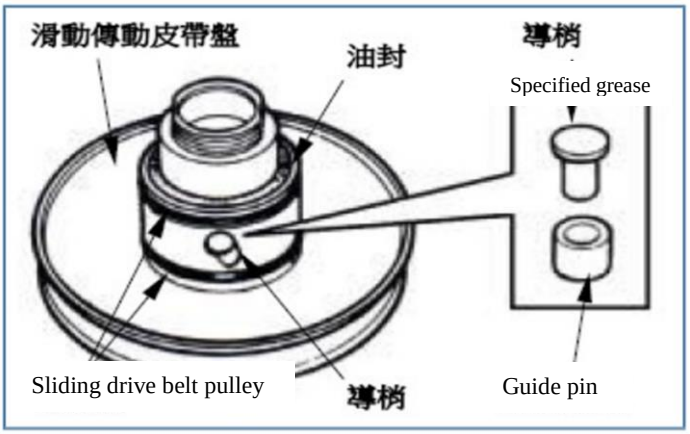
Inter bearing

Align the oil seal lip with the bearing and install a new oil seal (if necessary).

Installation of clutch/drive pulley assembly

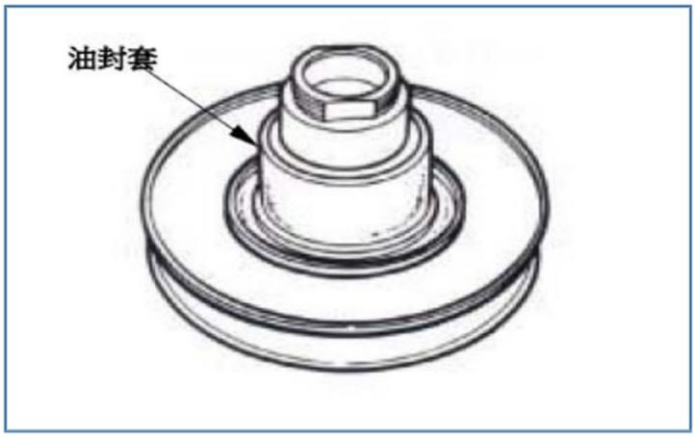
Install a new oil seal and O-ring on the sliding drive wheel. Use the specified grease to lubricate the inside of the sliding plate.



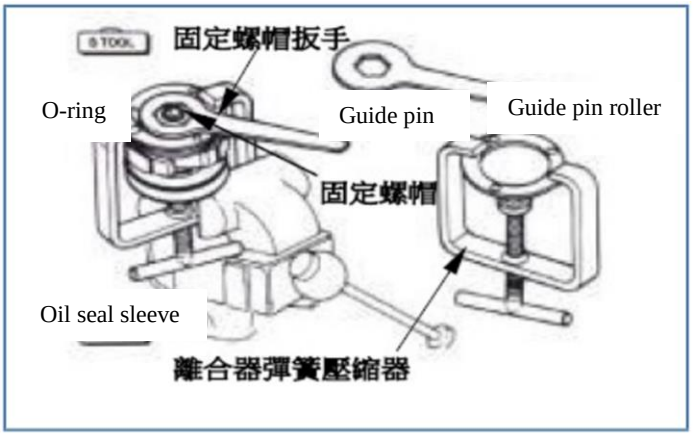


Install the sliding drive plate on the drive belt plate.

Install the guide pin and the guide pin roller.



Install the oil seal sleeve.



Install the drive belt disc, spring and clutch into the clutch spring compressor, and turn the compressor handle to press down the assembly until the fixed nut can be installed.

Clamp the clutch spring compressor on the vice, and screw the nut to the specified torque with a special nut wrench.

Remove the spring compressor.

Torque value: 5.0-6.0 kgf-m.

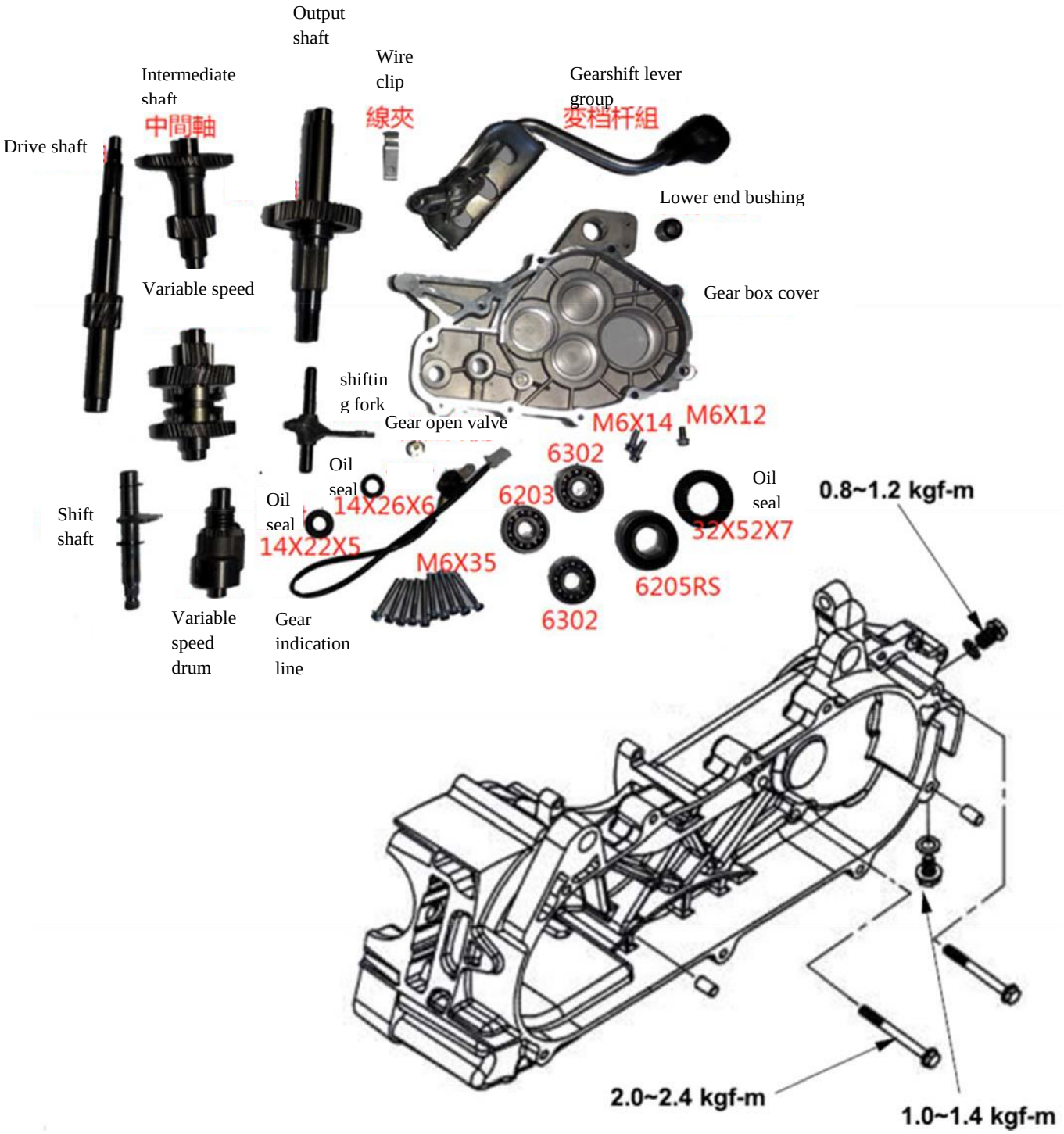
Install the clutch/drive belt disc and the drive belt on the drive shaft.

Fixed nut wrench

Fixed nut

Clutch spring compressor

7.Final reduction mechanism/reverse gear mechanism



七、Final reduction mechanism/reverse gear mechanism

Precautions in operation

Specification

Use gear oil: four-stroke lubricating oil.

Gear oil volume: 400 c.c. (350 c.c. when replacing).

Torque value

Gear box cover	**2.0-2.4 kgf-m**
Gearbox drain bolt	**1.0-1.4 kgf-m**

Tool

Special tools

Internally drawn bearing extractor

Out-drawing bearing extractor

Fault diagnosis

l reduction mechanism/reverse gear mechanism

ATV can't move after the engine starts

- Damaged transmission gear set
- Transmission gear set burned out
- Broken drive belt

Gear oil leaking

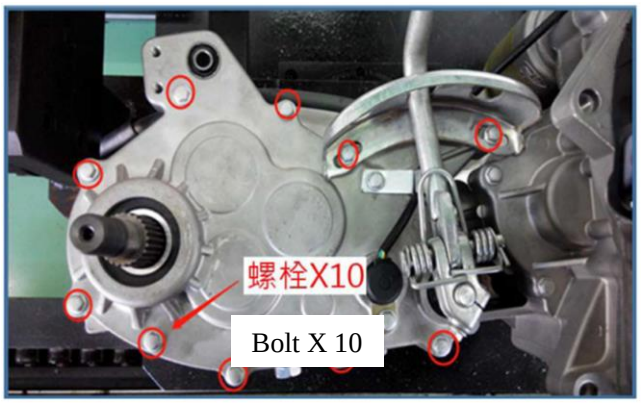
- Oil level is too high
- Worn or damaged oil seal

Final deceleration mechanism/reverse gear mechanism decomposition

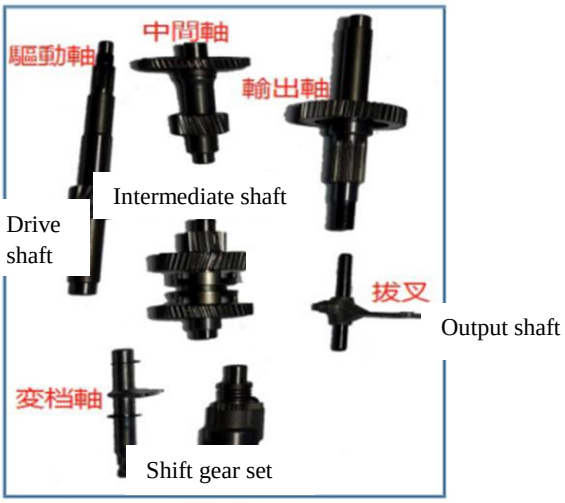
Drain the gear oil and remove the clutch

Remove the gear box cover bolts (M6X35) X10, and remove the gear box cover and final drive shaft.

Remove the gasket and positioning pin.

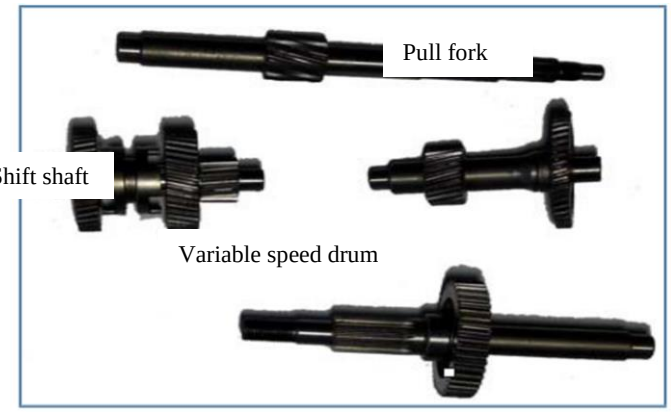


Remove the drive shaft, intermediate shaft, output shaft, shift gear set, shift shaft, shift drum and fork



Final reduction mechanism/reverse gear mechanism inspection

Check the disassembled gears and shift shaft sets for wear or damage.

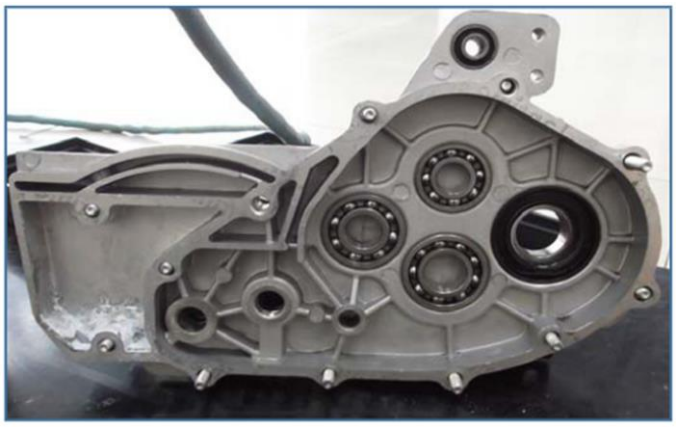


Gear shaft group inspection

Check the removed gears for wear or damage.

Reverse gear inspection

Whether it is worn or damaged.



Check the bearings on the gearbox and the cover.
Turn the inner ring of each bearing with your fingers.
The bearing needs to rotate smoothly and quietly,
and check whether the outer ring of the bearing is
tightly combined with the gear box and the cover.
If the bearing rotates unevenly, has abnormal noise,
or is loose in combination with the gear box or the cover
, it should be removed and replaced with a new one.
Check whether the oil seal is worn or damaged, and
replace it if necessary.

NOTE

- Do not remove the drive shaft from the gear box unless necessary.
- If the drive shaft is removed from the gearbox, its

Check whether the drive shaft and gears are worn or damaged.

Bearing replacement

NOTE

Never assemble used bearings. Once the bearings are removed, they must be replaced.

When pulling out the gearbox bearings or the bearings on the cover, the following special tools are required:

Internally drawn bearing extractor

Install the new bearing into the gearbox or cover.

Special tools:

Press into the bearing with a C-shaped press or bearing knock-in jig.

Press the drive shaft out of the gear box.

Remove the oil seal from the gear box.

Use the inner pull-out bearing extractor to remove the drive shaft bearing from the cover.

NOTE

Press the drive shaft out of the gear box, and use a shaft guard during operation.

Special tools:

Internal pull-out bearing extractor.

If the bearing of the drive shaft is still connected to the shaft when the drive shaft is pressed out, the bearing needs to be pulled out with an externally drawn bearing extractor and shaft protector.

Special tools:

Universal bearing extractor or externally drawn bearing extractor.

Shaft guard.

Install a new drive shaft bearing on the gear box.

Then install the drive shaft.

Install the new final shaft bearing on the gear box cover.

Special tools:

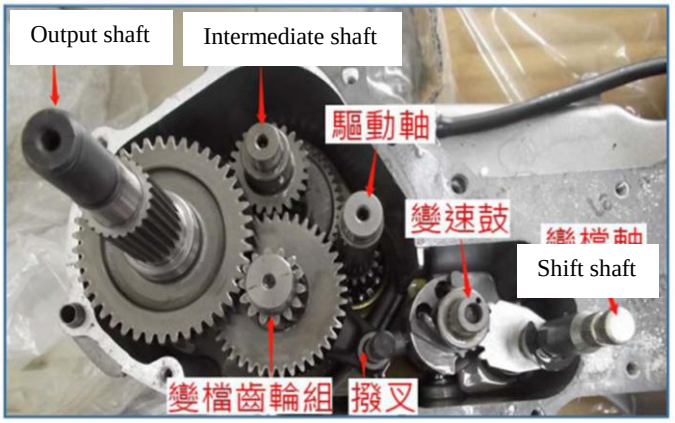
Press into the bearing with a C-shaped press or bearing knock-in jig.

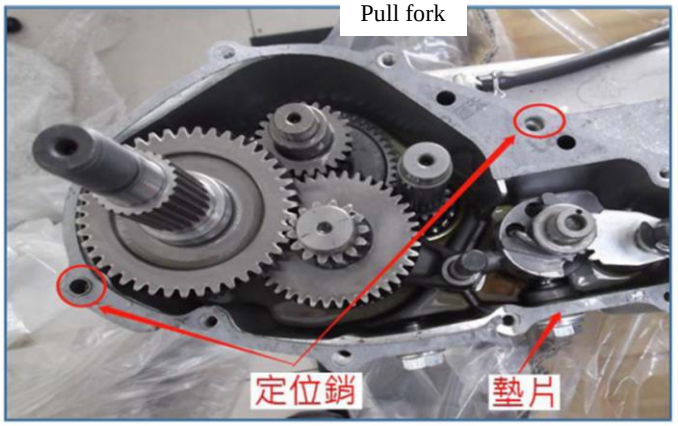
Grease the lips of the new final shaft oil seal and install it.

Final reduction mechanism/reverse gear combination

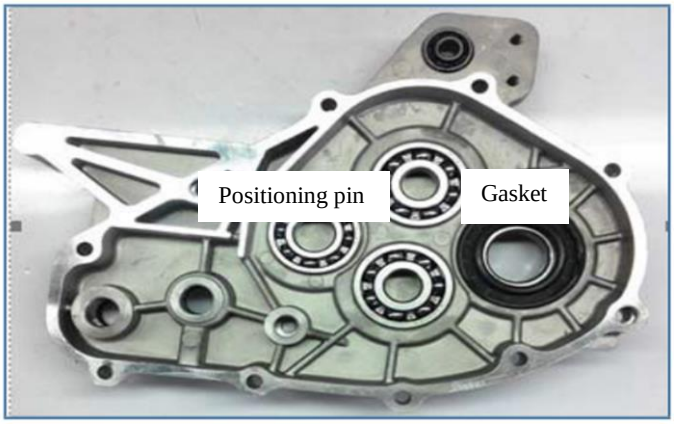
Install the drive shaft, intermediate shaft, output shaft, shift gear set, shift shaft, shift drum and fork.

gear box cover and bolts (10 pieces) and



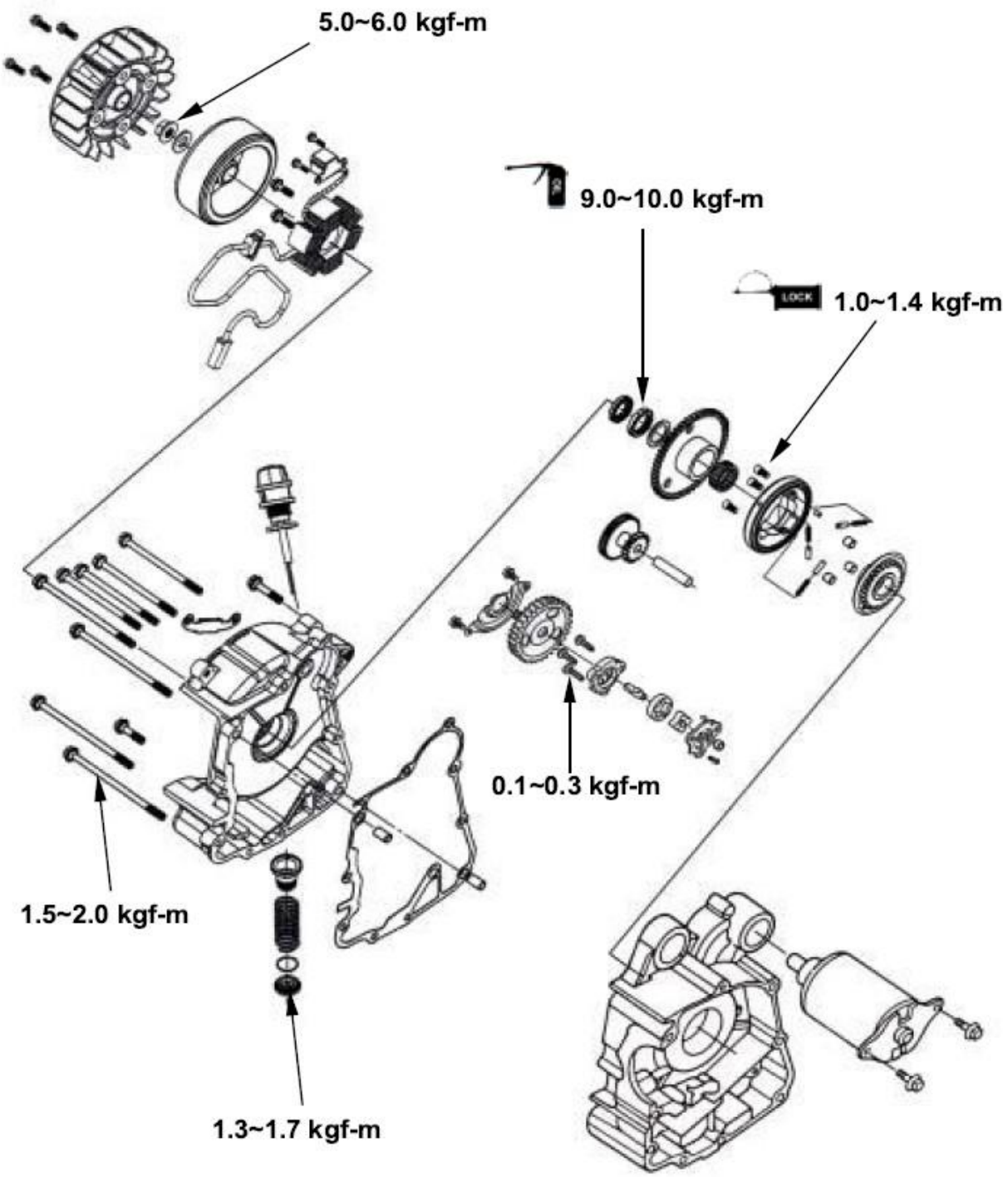


Install positioning pins (2) and new gaskets.



Coat the lip of oil seal of drive shaft, wheel output shaft and gear shaft with butter, install

8.Alternator/Starting clutch



8.Alternator/Starting clutch

Operation precautions

General matters

●Refer to Chapter 1 Engine Fault Diagnosis and Inspection.

Specification

unit:mm

Item	Available limit
Inner diameter of starting driven gear	22.1

Torque value

Flywheel nut	5.0-6.0 kgf-m
Bolt 8mm	1.5-2.0 kgf-m
Oil filter cover	1.3-1.7 kgf-m
Starting clutch fixing bolt	9.0-10.0 kgf-m Add oil to the thread
Starting clutch hexagon socket bolt	

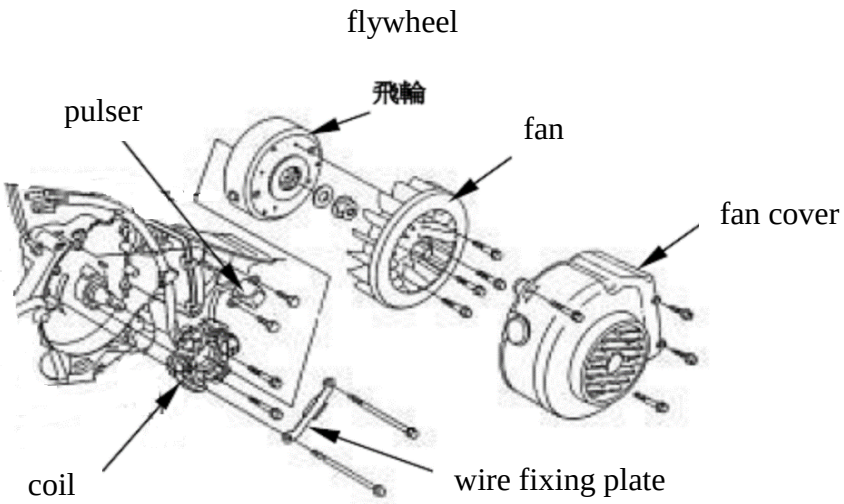
Special tools

Flywheel puller

Universal fixator

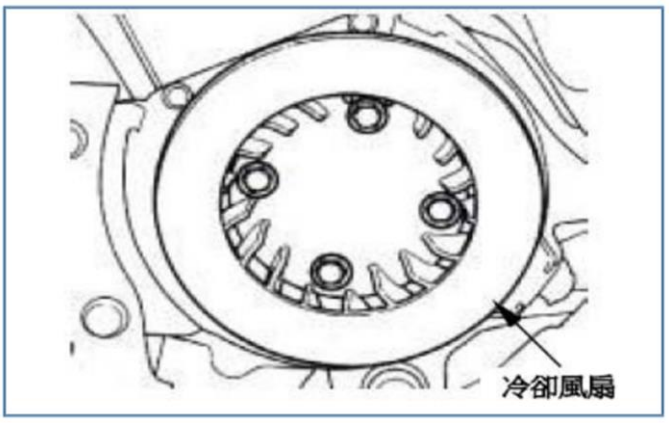
8.Alternator/Starting clutch

Alternator disassembly

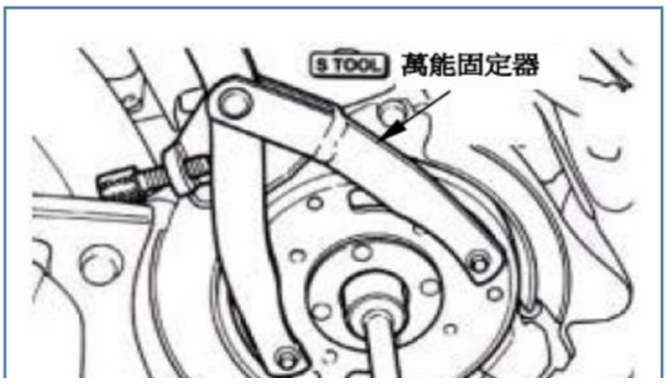


Flywheel removal

Drain the engine oil and remove the cooling fan cover (bolt X4)



Remove the cooling fan (bolt X4)



cooling fan

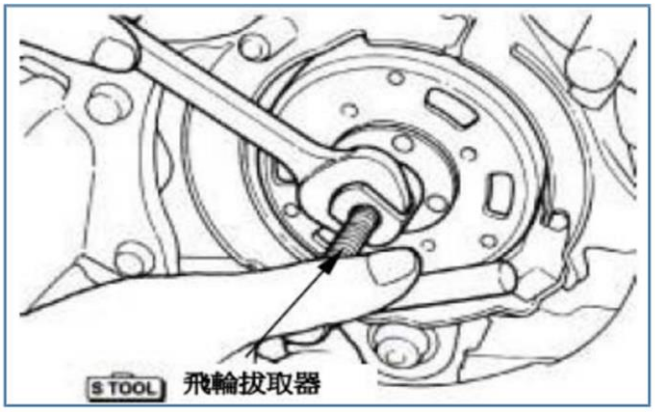
Universal fixing clip

Use the universal fixing clip to fix the flywheel.

Remove the 10 mm nut on the flywheel.

Special tools:Universal fixator

Use the flywheel extractor to remove the flywheel.



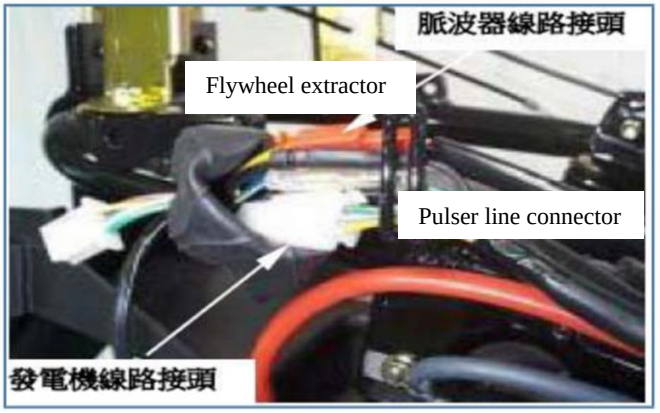
Special tools:

Flywheel extractor

Shaft guard

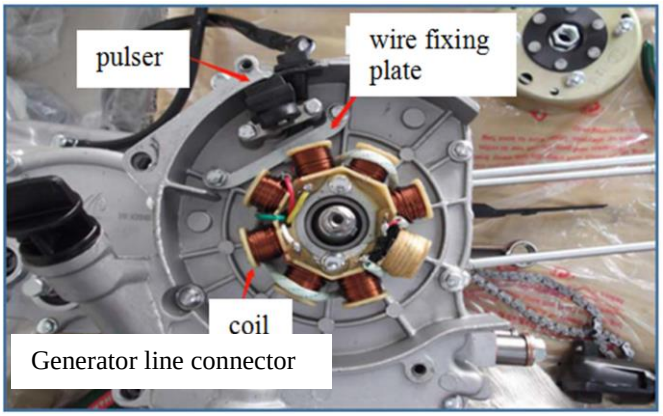
NOTE

Before installing the flywheel extractor, insert the shaft protector on the end of the right crankshaft to avoid damage to the crankshaft



Disassembly of generator coil set

Remove the alternator wire connector and pulse generator connector.



Remove the six bolts of the pulsator, generator coil and wire fixing piece, and take out the alternator coil assembly.

NOTE

Please avoid damaging the generator coil.

Right crankcase cover removal

Remove the right crankcase cover (bolt X9)

Remove the positioning pin and gasket.

Clean the gasket debris and foreign matter on the joint surface of the cover and the crankcase.

NOTE

The joint surface must not be damaged.

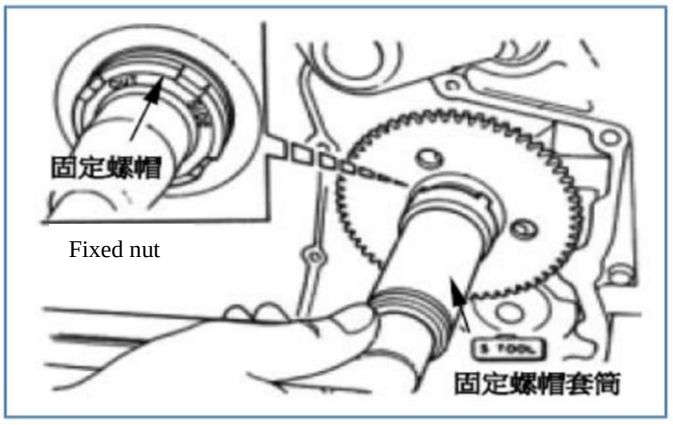
Bolt X 9

Starting clutch

Start clutch removal

Fix the starting driven gear with a universal fixer.

Remove the 22mm anti-falling fixing bolts and gaskets.



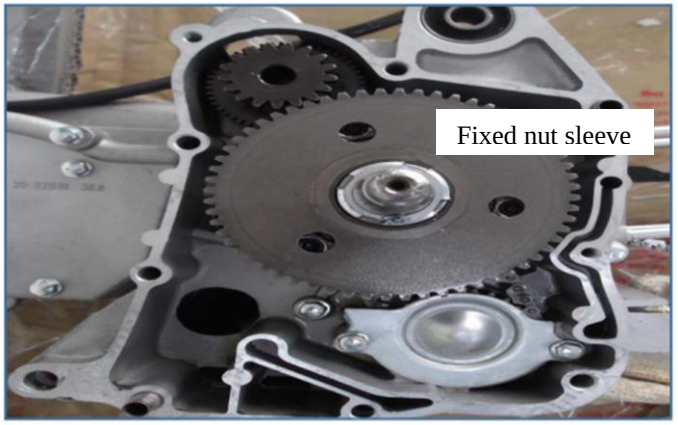
Special tools:

Anti-dropping fixed nut sleeve

Universal fixator

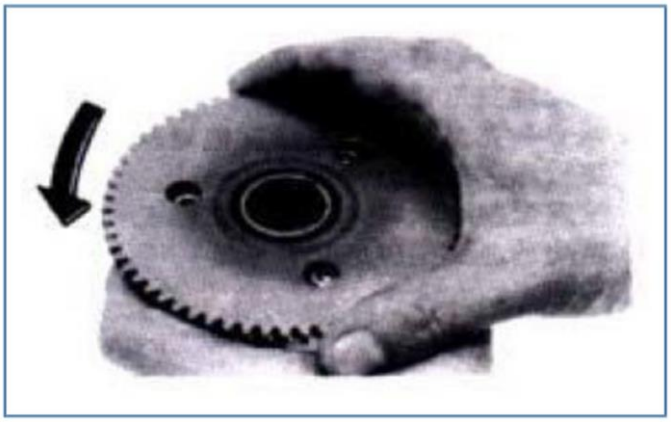
NOTE

The fixed nut is a left-handed thread.



Remove the starting driven gear.

Remove the starting clutch, starting idler and shaft.



Starting clutch inspection

Install the starting driven gear on the starting clutch.

Fix the starting clutch and rotate the starting driven gear.

Lifting driven gear must be rotatable clockwise, but not

counterclockwise.

8.Alternator/Starting clutch

Check whether the starting driven gear is worn or damaged.

Measure the inner diameter of the starting driven gear.

Usable limit:

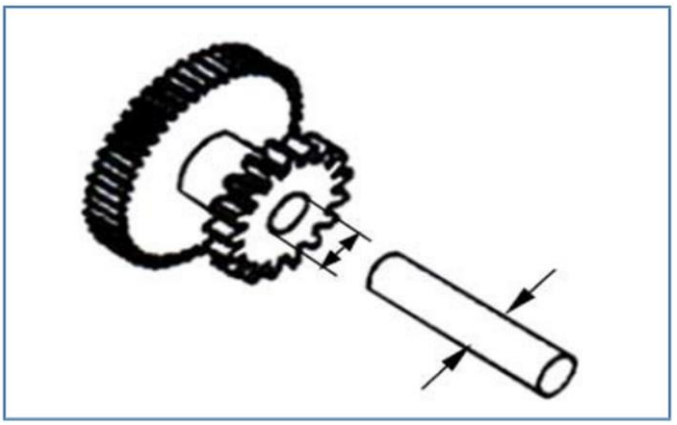
Inner diameter: below 22.1 mm

Check whether the starting idler gear and shaft are worn or damaged.

Measure the inner diameter of starting idler gear.

Usable limit:

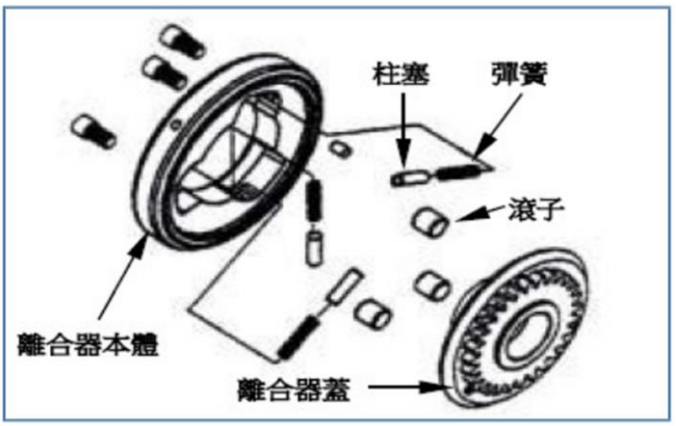
Inner diameter: below 10.05 mm



Measure the outer diameter of starting idler gear shaft.

Usable limit:

Inner diameter: above 9.94 mm



Plunger spring

Disassemble

Remove the hexagon socket bolt (bolt x3) of the starting

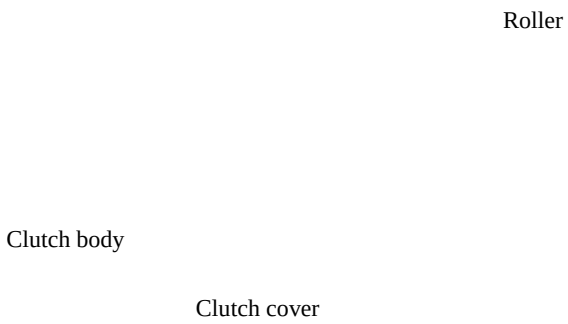
clutch.

Separate the clutch and clutch cover.

Remove the clutch roller, plunger and spring from the one-way clutch.

Check each roller and plunger for wear and damage.

Install the roller, plunger and spring.



8.Alternator/Starting clutch

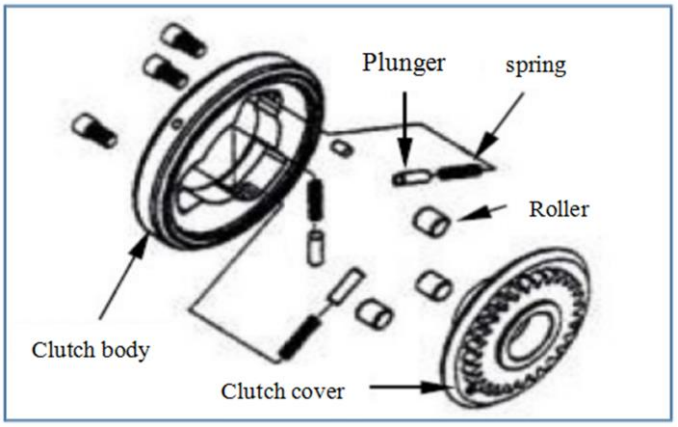
Installation

Assemble in the reverse order of disassembly.

NOTE

Apply adhesive to the threads of the hexagon socket bolts.

Torque value: 1.0-1.4 kgf-m



Starting clutch installation

Install the idler shaft and idler.

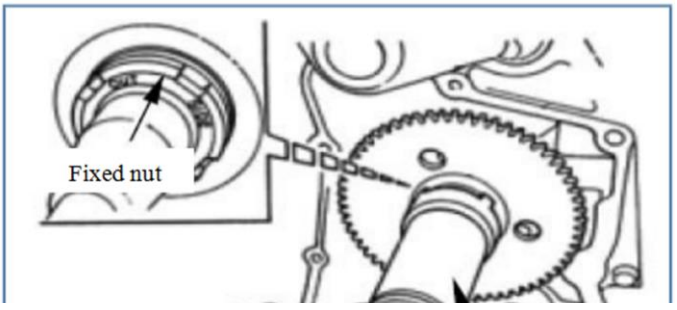
Install the starting clutch.

Install the starting driven gear on the starting clutch.

Use a universal holder to fix the starting driven gear.

Tighten the 22mm anti-dropping fixed nut and gasket.

NOTE



Apply engine oil to the threads of the fixed nut.

Special tools:

Anti-dropping fixed nut sleeve

Universal fixator

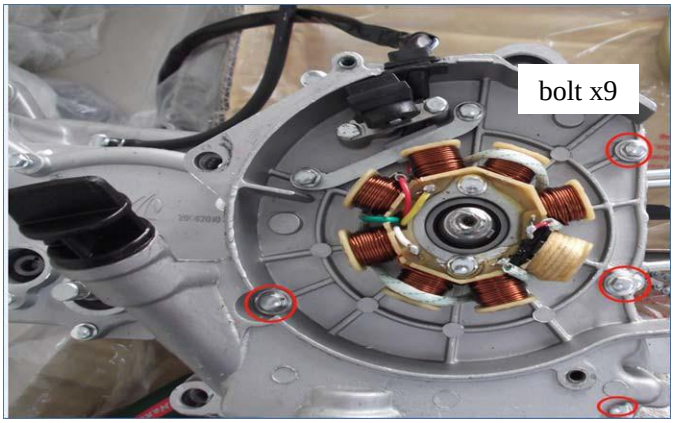
Torque value: 9.0-10.0 kgf-m

Right crankcase cover installation

Install positioning pins and new gaskets on the crankcase.

Replace the oil seal on the right side of the crankshaft on the crankcase cover and apply oil to the oil seal lip.

Install the right crankcase cover on the right



Generator coil set installation

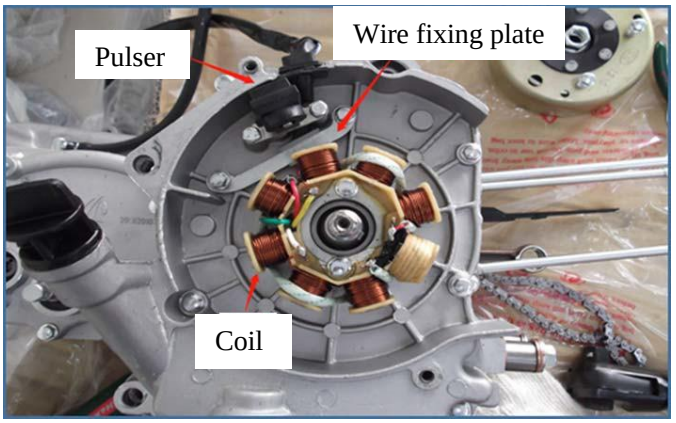
Lock the coil assembly on the right crankcase cover (screw x2).

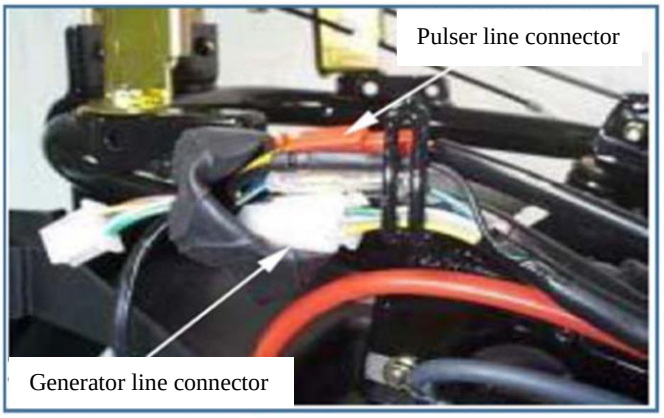
Lock the pulse generator (screw x2).

Lock the wire fixing piece (screw x2).

Torque value: 1.5-2.0 kgf-m

Put the harness rubber sleeve into the fixing notch on the crankcase cover.





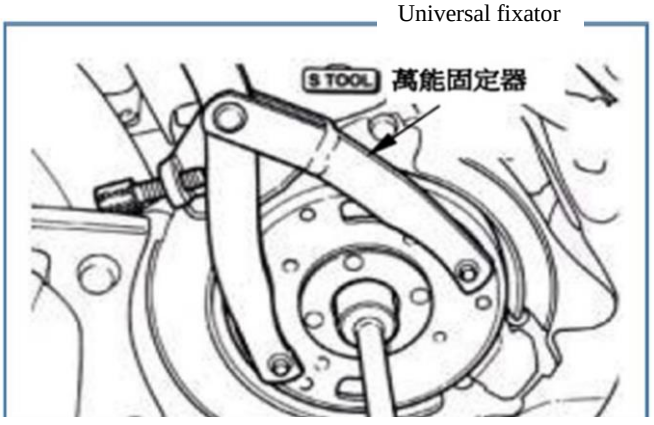
Flywheel installation

Confirm that there is no adsorbed iron filings in the flywheel, and remove it if there are any.

Align the key on the crankshaft with the key groove in the flywheel and install the flywheel.

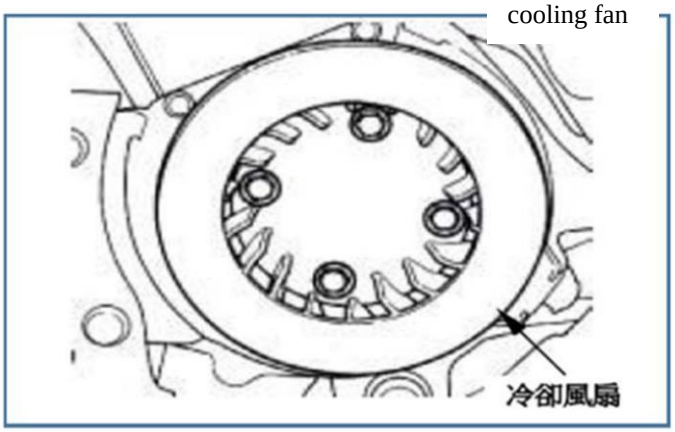
Fix the flywheel with the universal fixing clip to fix the crankshaft, and then tighten the nut.

Torque value: 5.0-6.0 kgf-m



Install the cooling fan (boltX4)

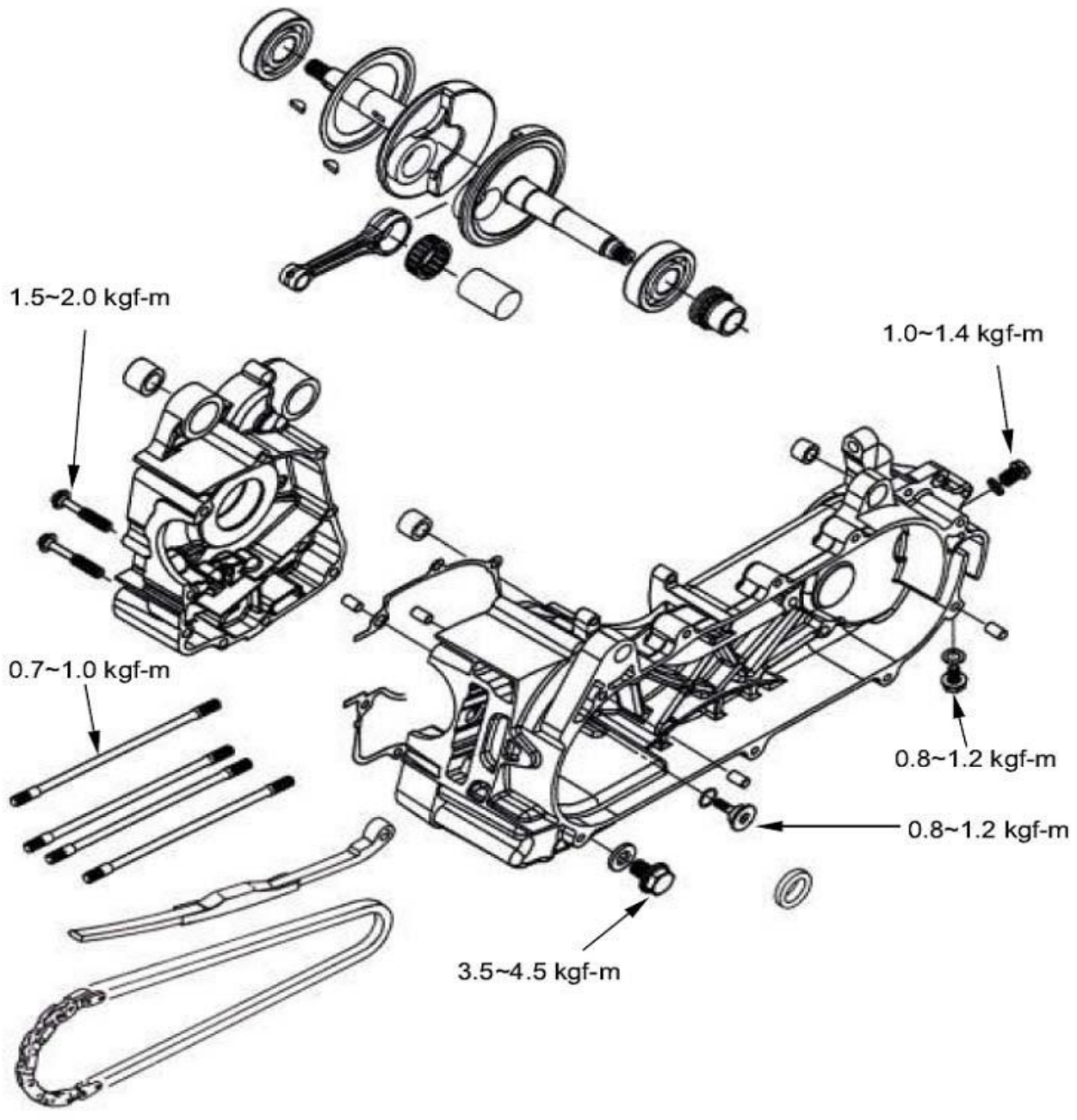
cooling fan



Remove the cooling fan cover (bolt X4)

Replenish engine oil according to the specified quantity.

9.Crankcase/Crankshaft/Balance Shaft



Precautions in operation

General matters

- In this section, the crankcase is separated to maintain the crankshaft and balance shaft set.

- Before separating the crankcase, remove the following parts:

  Cylinder Head Chapter 4

  Cylinder/Piston Chapter 5

  V-belt drive mechanism Chapter 6

  Generator/starting clutch chapter 8

- If crankshaft bearings or timing chains need to be replaced, the whole set of crankshafts needs to be replaced.

Specification

Unit：mm

Item	Standard value	Available limit
Large end clearance of connecting rod	0.100~0.350	0.550
Radial clearance of big end of connecting rod	0.006~0.016	0.050
Crankshaft shimmy	—	0.100

Torque value

Crankcase bolt	1.5~2.0 kgf-m
Cylinder/cylinder head stud bolt	0.7~1.0 kgf-m
Engine oil drain bolt	3.5~4.5 kgf-m
Cam chain tensioner bolt	0.8~1.2 kgf-m

Special tools

Internally drawn bearing extractor

Out-drawing bearing extractor

Bearing press-in fixture

Oil seal press-in fixture

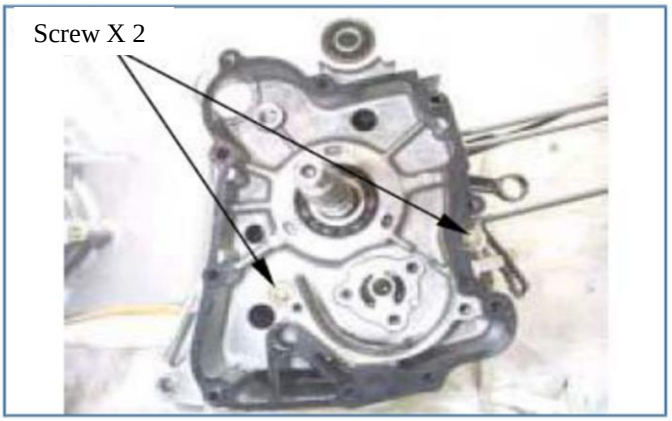
Fault diagnosis **Engine noise is too loud**

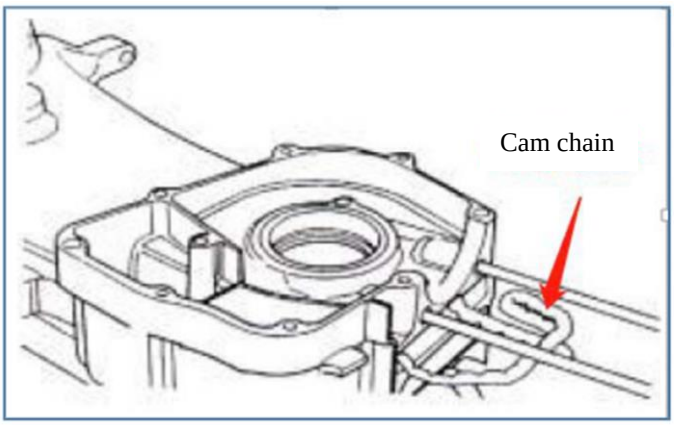
- The bearing clearance is too large
- Excessive clearance of crankshaft tip bearing
- Piston tip or piston tip hole wear
- Too large balance shaft clearance

9. **Crankcase/Crankshaft/Balance Shaft**

Crankcase separation

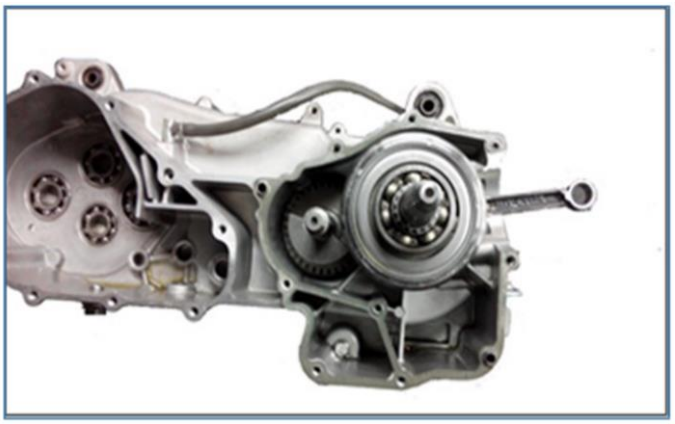
Remove the 2 connecting bolts of the right crankcase from the right side of the crankcase





Remove 5 balance shaft cover bolts from the left crankcase, and remove and pull

Force rod fixing bolts 3



Turn the left crankcase down and disassemble the right crankcase. Separate the left/right crankcase.

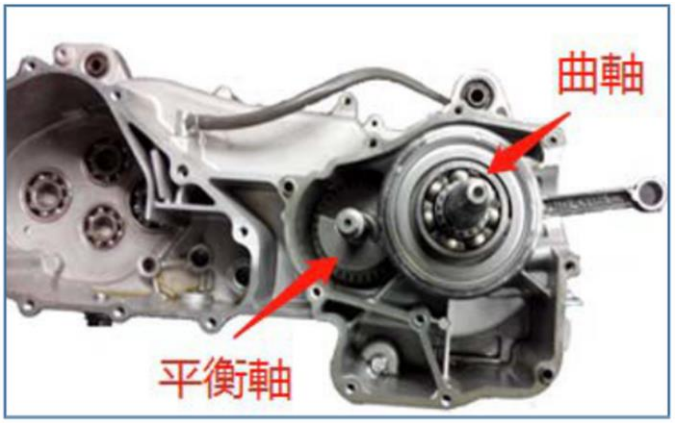
Remove the cam chain

NOTE

- Never pry the joint surface of the crankcase to separate it, otherwise it will damage the joint surface and cause oil leakage.
- Before pressing the left/right crankcase, the cam chain must be separated from the drive

9. **Crankcase/Crankshaft/Balance Shaft**

Remove the crankshaft and balance shaft from the left crankcase.



NOTE

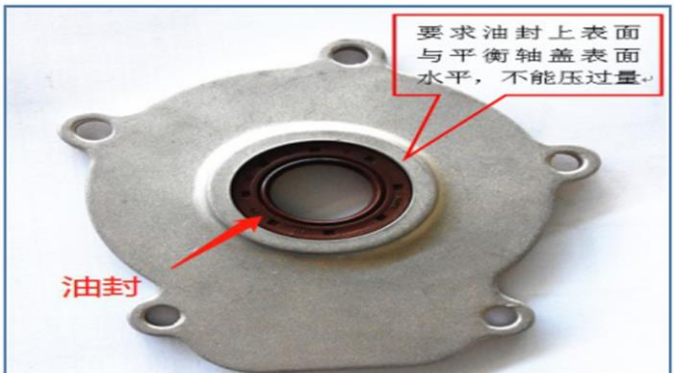
- The left/right side bearing of the crankshaft is press-fitted on the crankshaft.

Remove the gasket and fixed pin (2).

Remove the shim debris on the crankcase joint surface with the shim scraper.

NOTE

- Avoid damaging the joint surface of the crankcase.
- The gasket debris is easier to remove after



Remove the balance cover oil seal

9.Crankcase/Crankshaft/Balance Shaft

Balance Shaft

Scrape surface debris

The upper surface of the oil seal is required to be level with the surface of the balance shaft cover, and not excessive pressure

Oil seal

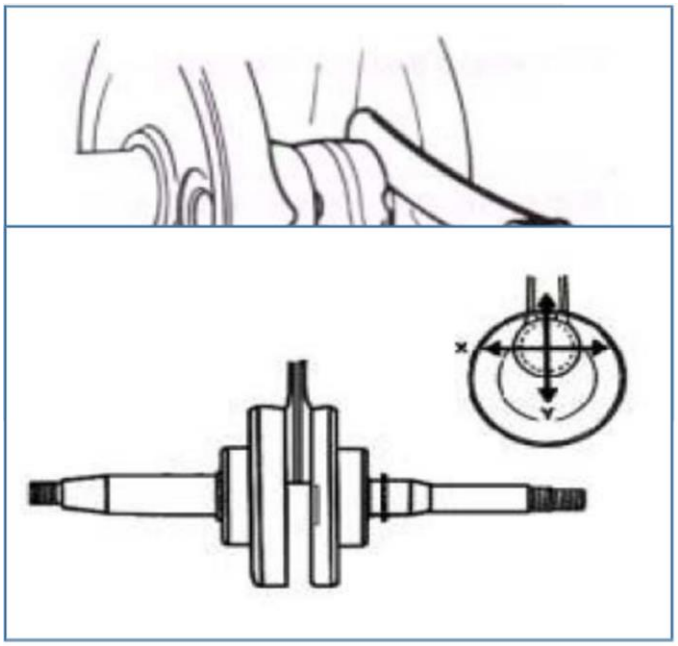
Tension rod fixing bolt X3

Crankshaft inspection

Measure the axial clearance of the big end of the connecting rod with a thickness gauge.

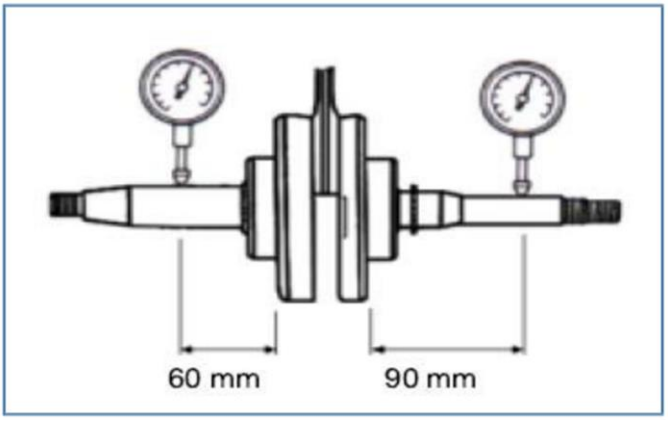
Usable limit:

replace new products above 0.55 mm



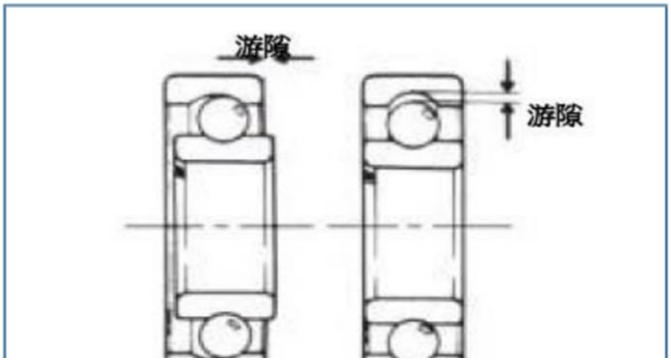
Measure the radial clearance of the big end of the connecting rod in the vertical direction of the crankshaft.

Usable limit: 0.05 mm



Place the crankshaft on the V-groove block, and measure the crankshaft yaw at the two points shown in the figure with a dial gauge.

Usable limit: 0.10 mm



Bearing inspection

Use your fingers to rotate the bearing. The bearing needs to rotate freely, smoothly and quietly.

And check whether the inner ring is firmly connected to the crankshaft.

If there is irregularity, abnormal sound or weak combination, replace the whole set of crankshafts.

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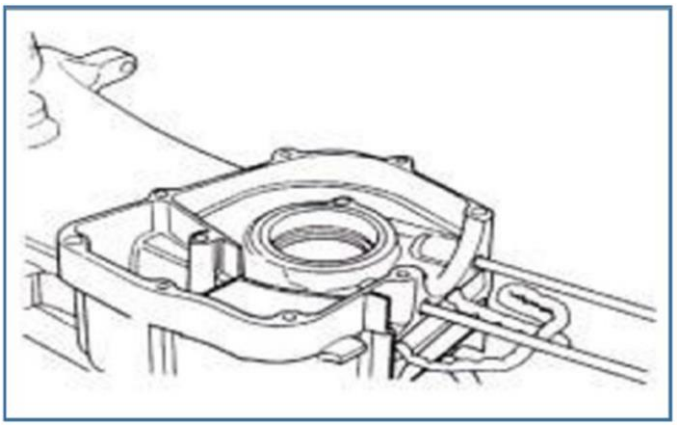
Crankcase combination

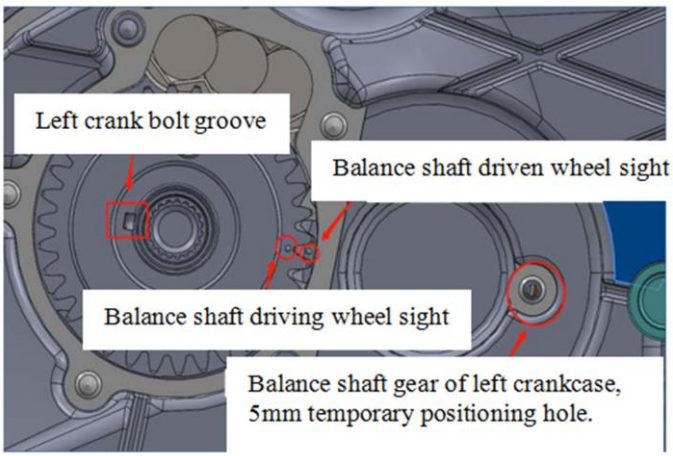
Install the cam bar into the right crankcase chain hole and spread the chain.

NOTE

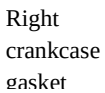
Do not damage the cam chain when installing the crankshaft.



When installing the balance shaft driving gear, ensure that the balance shaft driven gear is temporarily positioned,use the 5mm positioning pin to insert into the gear hole of the left crankcase balance shaft for temporary positioning.Using the front sight on the driven gear of the balance shaft as a reference,and install the star on the driving gear of the balance shaft and the bolt groove on

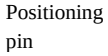


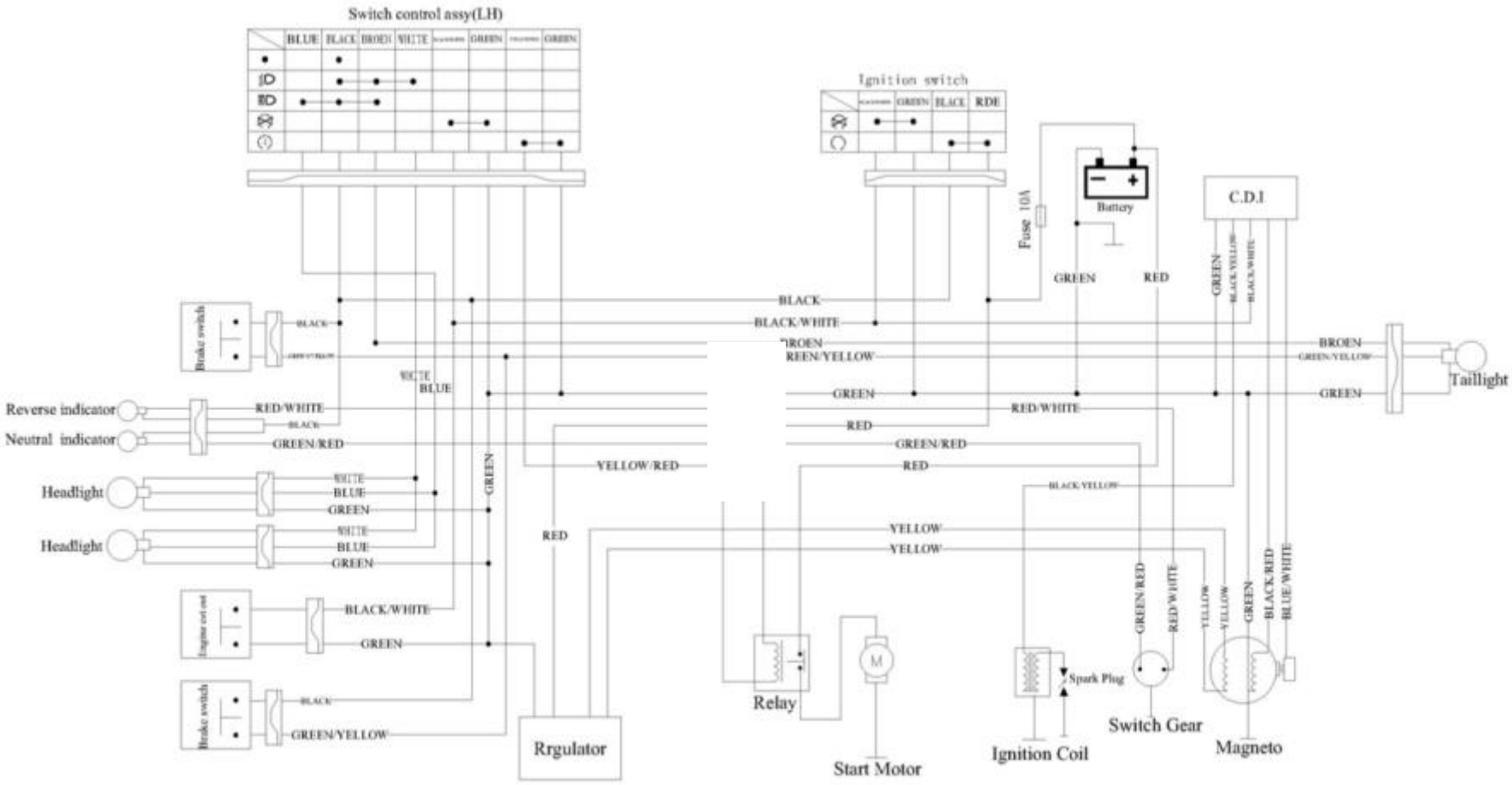
Install 2 locating pins and new right crankcase gasket.



Install the right crankcase and tighten the crankcase bolts (2 bolts).

Torque value: 1.5-2.0 kgf-m.





AU180 electrical circuit