

## Forward

1. Welcome to read this motorcycle maintenance manual. This manual aims to provide you with basic knowledge and skills related to motorcycle repair and maintenance. Before carrying out any repair or maintenance work, please ensure that you have read and understood all the information in this manual.


2. Safety Tips : Please ensure you have taken appropriate safety actions before performing any maintenance work.

3. The book is only the reference for maintaining BD500-2(DARK FLAG), Please refer to the actual product and the relevant content in the user manual when repairing.

4. BENDA MOTO will continue to work hard to improve and manufacture various models and models. If any modifications or significant changes to product specifications. We will inform distributor in advance and incorporate the content into the reprinted maintenance manual.

### Important Information

**The following text and symbols often appear in this manual, and are explained as follows :**

 Warning sign indicate attention ! Warning ! Self safety and vulnerability.  
Tips: This means that certain procedures must be followed to avoid damaging the locomotive

## How to use this manual

### The structure

The manual is made up of various categories.(Refer to the symbol description part on the next page)

The First Title① : In the upper right part of each page,there are representative texts and symbols on this page

The second Title② : In the upper left corner of every chapter,both have this title.

The Third Title③ : The title is sub-title,and it is used in a step-by-step manner in conjunction with the wireframe.

### stretch-out view

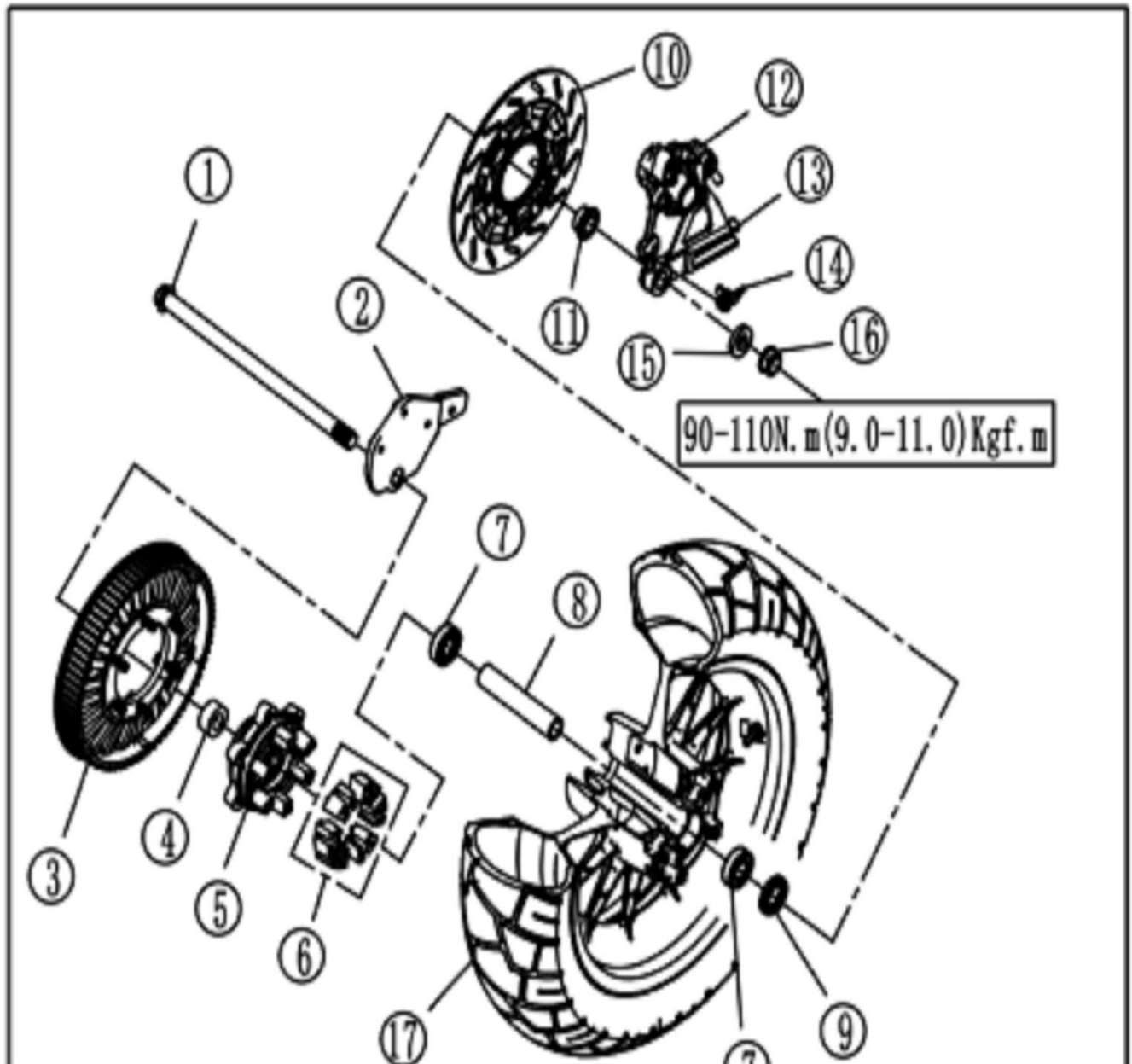
To know about the sequence of parts and disassembly steps,at the beginning of each decomposed chapter, there is an expansion diagram for reference.

1.For decomposition and combination work, there is an unfolding diagram ④ for reference purposes.

2.Some information related to the work,excepting the expansion diagram,there are detailed instructions in the work step format ⑤.

### Rear wheel

- |                                  |                                  |
|----------------------------------|----------------------------------|
| (1) rear axle                    | (9) Oil seal (hub assembly)      |
| (2) Rear fender bracket          | (10) Rear brake disc             |
| (3) Large pulley                 | (11) Rear wheel liner            |
| (4) Left rear wheel liner        | (12) Rear brake lower pump       |
| (5) Wheel seat assembly          | (13) Rear carbon brake bracket   |
| (6) Bumper                       | (14) Rear wheel speed sensor     |
| (7) Bearing (hub assembly)       | (15) Rear wheel right liner      |
| (8) Bushing (wheel hub assembly) | (16) Rear wheel axle locking nut |

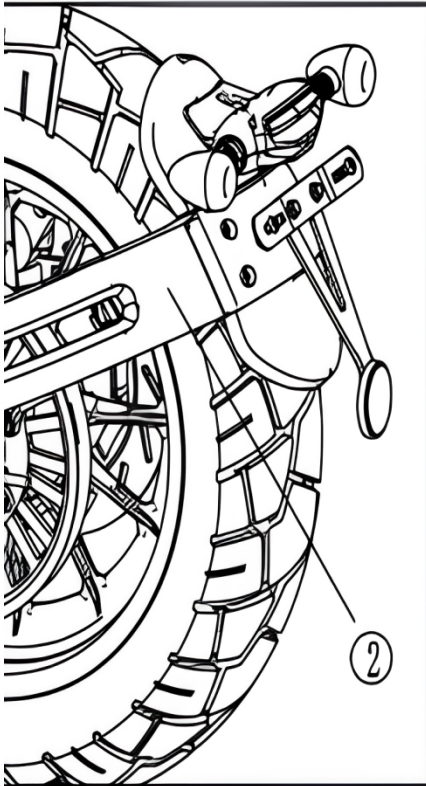


## Rear wheel



### Warning

Firmly support the motorcycle to prevent it from overturning

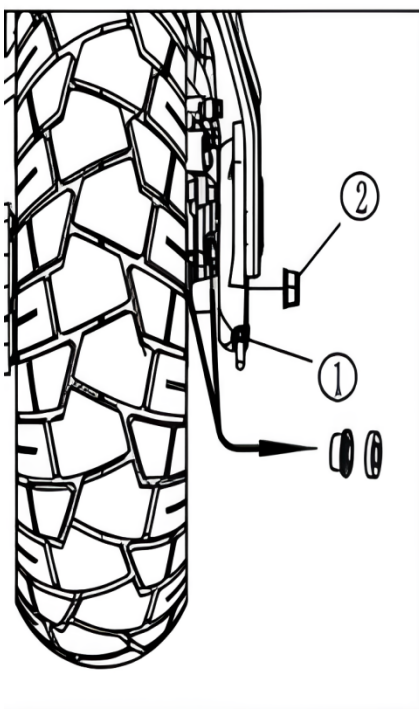


### 1 Dismantle

- "Rear mudguard 2" fixing bolt ①
- "Rear mudguard bracket 2 and rear mudguard 2" ②
- Adjusting bolts for the rear fender mounting bracket ③

### 2 Dismantle

- Belt adjustment nut ①
- Rear wheel locking nut ②
- Rear axle ③
- Rear wheel liner



### Tips:

When disassembling the rear axle, the bushing will fall off, be careful not to lose it.





Warning: operating, repairing and maintaining a vehicle can expose you to chemicals, including Engine exhaust, carbon monoxide, phthalates, and Lead, which can cause cancer, congenital defects, Or other injuries. In order to to maximize reduce the Exposure, avoid inhaling exhaust, unless necessary, Otherwise, do not idle the engine, maintain the vehicle in a well ventilated area, wear gloves or wash hands frequently when maintaining the vehicle

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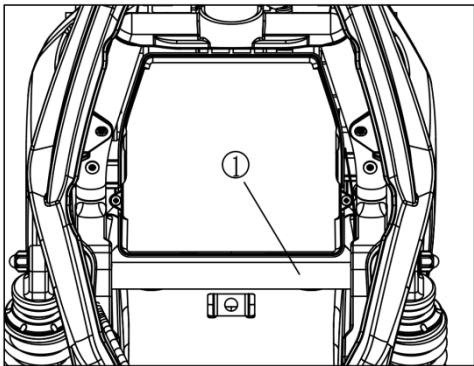
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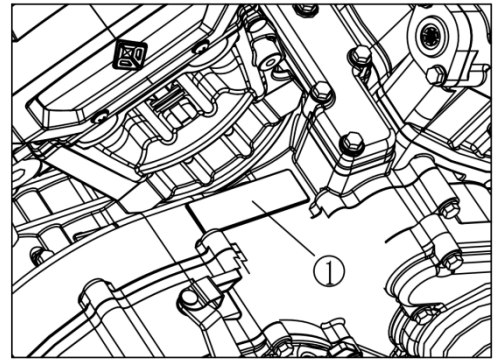
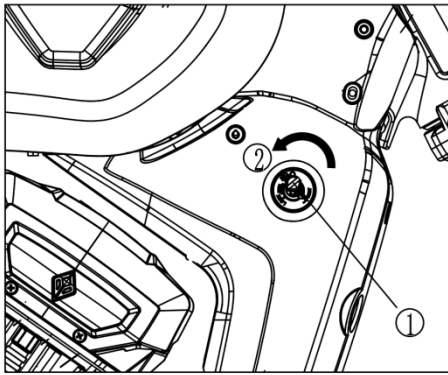
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# The first Chapter. Overview

## 1.1 Motorcycle identification



VIN  
VIN②①Engraved on the right side of the frame faucet tube, turn the steering knob to the left to the bottom, and see the vehicle identification code①  
Engine serial number  
Engine serial number②Engraved on the right side of the engine box.



## 1.2 Maintenance precautions

### 1. Car wash

- Clean the dirt and dust on the vehicle body and engine very well.

To prevent entry into the machine during operation.

### 2. No smoke and fire

- Do not allow fireworks to approach the repair site.

### 3. Using correct tool

- Always use special tools for areas where special tools are used. Ensure that the parts are not damaged.

- Reliance on appropriate tools and measuring instruments for correct maintenance operations.

### 4. Using authentic components

- The components and oils used must be genuine products and recommended varieties from "BENDA", and do not use components from other brands.

### 5. Vulnerable parts must be replaced with new ones

- The sealing gasket (gasket), O-ring, cotter pin, spring ring, and lock washer must be replaced with new ones.

## 6. Pay attention to safe operation

- During maintenance, great attention should be paid to operational safety to avoid work-related accidents and avoid burns from engines, exhaust pipes, mufflers, etc.

- Always consider the correct tools, correct handling, correct fixing position, and convenient force during homework to ensure a stable operating position for the body.

## 7. Follow the correct sequence and promptly organize disassemble parts

The sequence of loosening threads is:

- The sequence of loosening threads is:

Twist it from the outside to the inside, and loosen it in 2-3 diagonal steps.

When disassembling, important components should be inspected and measured during disassembly, and their records should be retained for reference during assembly.

Arrange the removed components in order according to their respective parts to prevent mixing and loss.

## Maintenance precautions

Overview

8. When doing disassembly operations, we should follow the correct sequence and promptly organize the disassembled parts

- The sequence of tightening the threads is :

Tighten in 2-3 diagonal steps from the inside to the outside

- During assembly, confirm the correction results of each component and the data before disassembly, and proceed with the operation.

- Do not allow dust and foreign objects to adhere to various parts during assembly.

- Assemble each part while confirming its action.

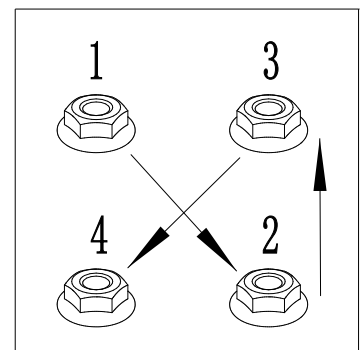
Apply engine oil to the rotating and sliding parts  
(apply lubricating grease to the oil seal and O-ring).

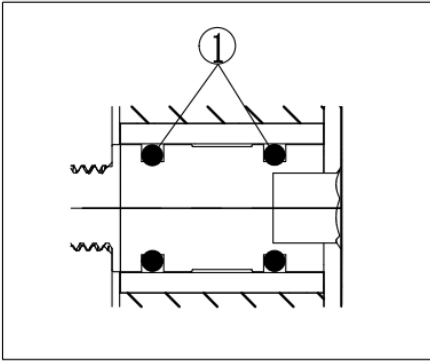
Follow the specified tightening torque.

- When two people work together, they should closely cooperate.

## 9. Essential maintenance manual and parts catalog around you

- To ensure efficient, reliable, and safe operation.

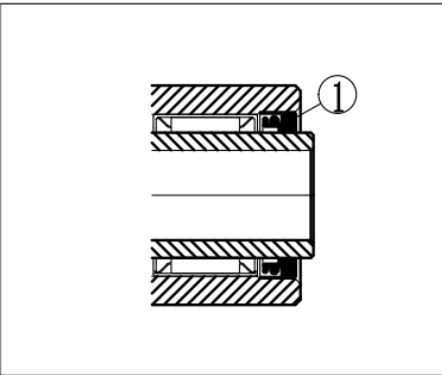




### Gaskets, oil seals, and O-ring seals

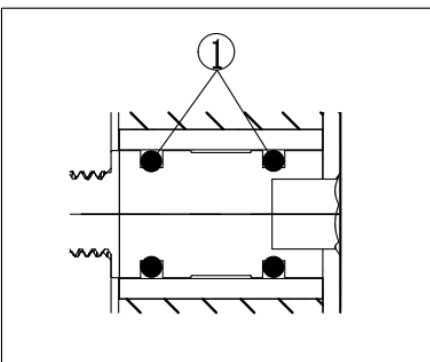
1. During the vehicle overhaul process, all sealing gaskets, oil seals, and O-ring seals must be replaced. The surface must be cleaned and lubricated in advance.

2. During the reassembly process, all matching parts and bearings should be properly coated with lubricating oil, and the lip of the oil seal should be coated with lubricating oil.



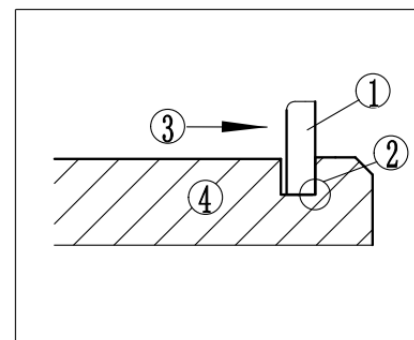
### Locking washer and cotter pin

1. After dismantling all lock washers, lock washers, and split pins, they all need to be replaced.



### Bearings and oil seals

When installing bearings and oil seals, grease should be applied to their sealing lips, and sufficient lubricating oil should be added when installing bearings.



### Circlip

Before reassembling, all elastic retaining rings should be carefully inspected. All deformed circlips need to be replaced. When installing the elastic retaining ring, make sure that its sharp angle part (2) is located on the opposite side of the retaining ring that bears thrust (3), and (4) is the shaft.



## The Second Chapter. Specification

### 2.1 Tightening torque

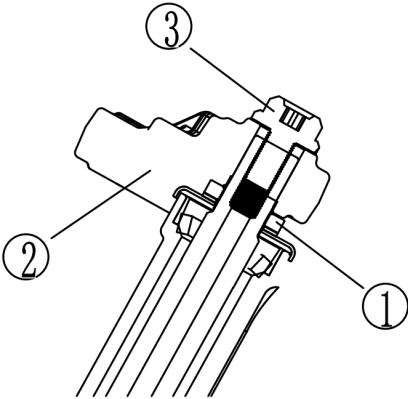
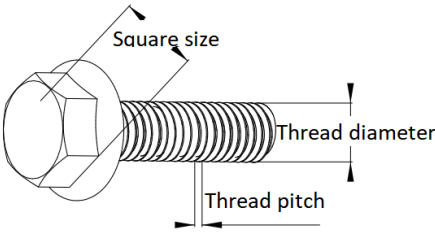
No	Locking components	Name	Size	Qty	Locking torque	
					Kgf.m	N.m
1	Pressing block and steering handle hexagonal cylindrical head bolt	Pressing block and steering handle hexagonal cylindrical head bolt	M8× 1.25	4	1.8-2.8	18-28
2	Handle switch and steering handle hexagonal cylindrical head bolt	Handle switch and steering handle hexagonal cylindrical head bolt	M6 × 1.0	4	0.3-0.5	3-5
3	Upper connecting plate and handle fixing seat nut	Upper connecting plate and handle fixing seat nut	M10×1.25	2	3.5-4.5	35-45
4	Steering shaft and ring nut nut	Steering shaft and ring nut nut	M25 × 1.0	1	2.0-2.4	20-24
5	Caliper and front fork hexagonal cylindrical head bolt	Caliper and front fork hexagonal cylindrical head bolt	M10×1.25	2	2.3-2.7	23-27
6	Engine hanger front mounting plate and frame inner hexagonal cylindrical head combination bolt	Engine hanger front mounting plate and frame inner hexagonal cylindrical head combination bolt	M8 × 1.25	2	2.5-3.0	25-30
7	Engine suspension bracket and frame nut	Engine suspension bracket and frame nut	M10×1.25	3	4.9-6.0	49-60
8	Engine hanger rear mounting plate and frame hexagonal flange bolts	Engine hanger rear mounting plate and frame hexagonal flange bolts	M10×1.25	2	3.5-4.0	35-40
9	Rear shock absorber	Rear shock	M10×1.25	1	2.5-3.5	25-35

	and frame nut	absorber and frame nut				
10	Rear shock absorber and rear flat fork inner hexagonal cylindrical head bolt	Rear shock absorber and rear flat fork inner hexagonal cylindrical head bolt	M10×1.25	1	2.5-3.5	25-35
11	Rear flat fork shaft and nut nut	Rear flat fork shaft and nut nut	M16 × 1.5	1	7.1-11.2	71-112
12	Hexagonal large pan head bolts inside the fuel tank and fuel pump	Hexagonal large pan head bolts inside the fuel tank and fuel pump	M5 × 0.8	6	0.5-1.0	5-10
13	Hexagonal large pan head bolts for fuel tank and oil level sensor	Hexagonal large pan head bolts for fuel tank and oil level sensor	M5 × 0.8	4	0.15-0.2	1.5-2
14	Hexagonal flange bolts for fuel tank and frame	Hexagonal flange bolts for fuel tank and frame	M8 × 1.25	2	1.8-2.8	18-28
15	Front wheel axle and front fork inner hexagonal wheel axle	Front wheel axle and front fork inner hexagonal wheel axle	M20 × 1.5	1	5.0-7.0	50-75
16	Rear wheel axle and nut nut	Rear wheel axle and nut nut	M20 × 1.5	1	9.0-11.0	90-110
17	Hexagon disc head step bolt between brake disc and wheel hub	Hexagon disc head step bolt between brake disc and wheel hub	M8 × 1.25	10	1.8-2.8	18-28
18	Hexagon flange bolts for brake pump and brake oil pipe	Hexagon flange bolts for brake pump and brake oil pipe	M10×1.25	3	2.5-3.5	25-35
19	ABS control unit and brake oil pipe hexagonal flange bolts	ABS control unit and brake oil pipe hexagonal flange bolts	M10 × 1.0	3	2.5-3.5	25-35
20	Headlamp and bracket inner hexagonal cylindrical head bolt	Headlamp and bracket inner hexagonal cylindrical head bolt	M8 × 1.25	1	1.8-2.8	18-28
21	Hexagon flange bolts for large pulley and pulley seat	Hexagon flange bolts for large pulley and pulley	M10×1.25	6	4.5-5.5	45-55

In addition to the specified locking torque, the general locking torque can be determined based on the screw diameter (opposite side width) when tightening screws and nuts (as shown in the table on the right).

Tightening torque

Screw diameter (across edge width) × pitch	Locking
M5 (8mm) ×0.8	3-4Nm (0.3-0.4kg.m)
M6 (10mm) ×1.0	5-8Nm (0.5-0.8kg.m)
M8 (12mm) ×1.25	12-19Nm (1.2-1.9kg.m)
M10 (14mm) ×1.25	24-39Nm (2.4-3.9kg.m)
M12 (19mm) ×1.25	45-72Nm (4.5-7.2kg.m)

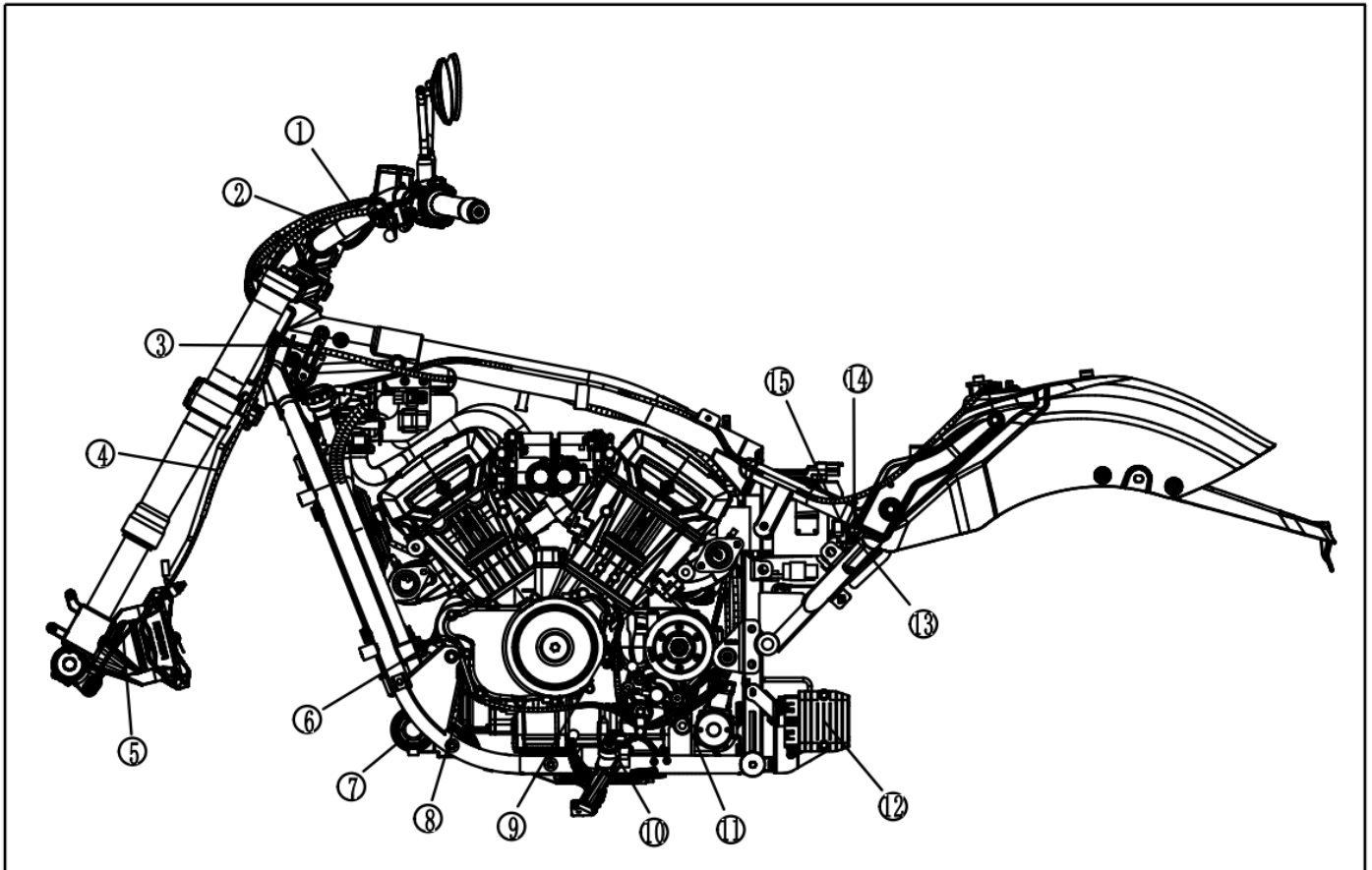


Tightening sequence for steering system

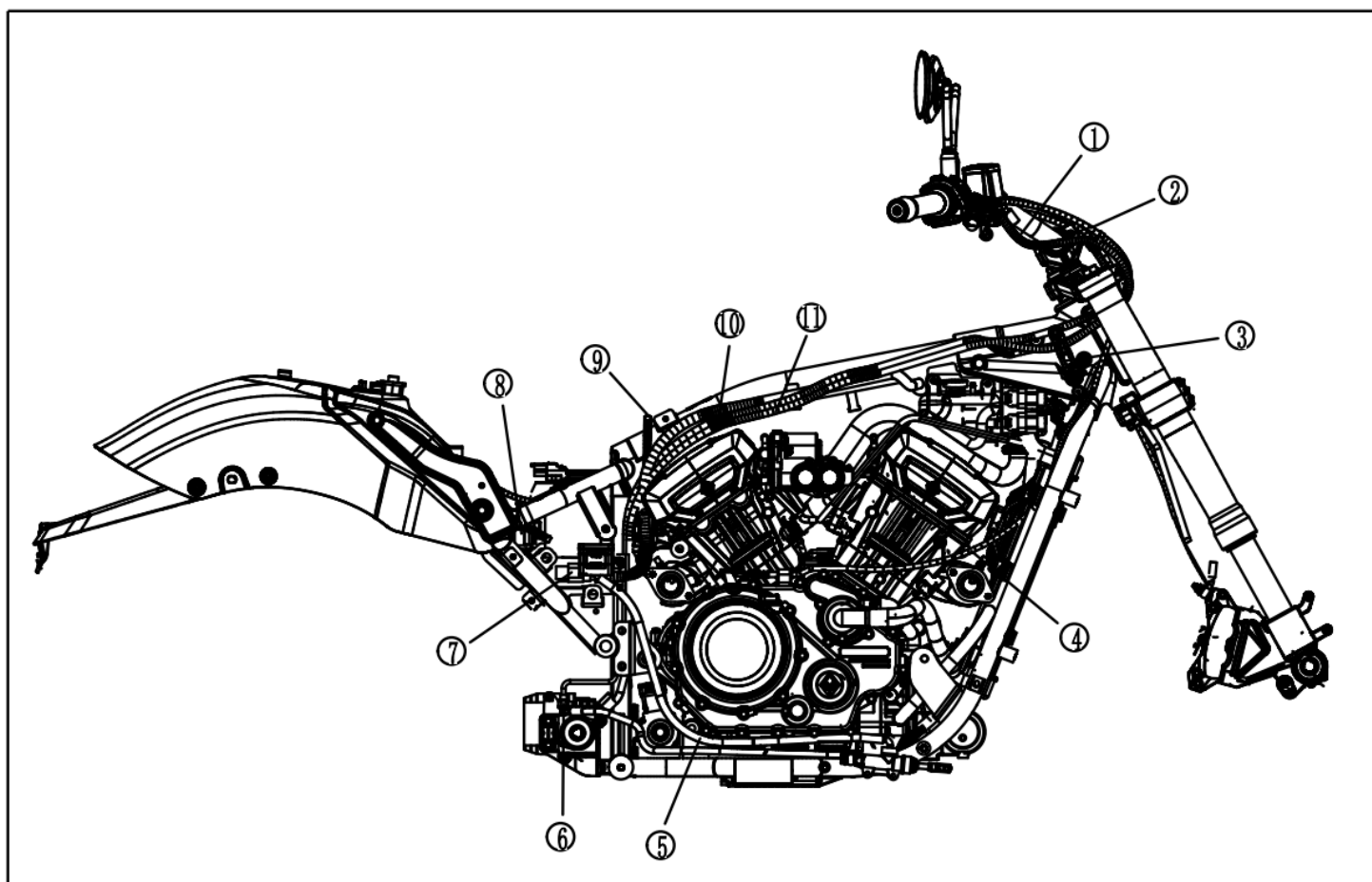
1. First, tighten the nut ① to 30-35N. m.
2. Rotate the steering handle 2-3 times to the left and right again, and ensure that it does not get stuck and the bearings do not become loose during rotation.
3. Loosen the nut ① by 1/4 turn before tightening, with a tightening torque of 20N. m
4. Screw the nut ② onto the nut ① and tighten it tightly.
5. Then assemble the upper connecting plate of serial number ③ and the bolt of serial number ④, with a tightening torque of 25-35N. m.

## 2.2 Cable wiring diagram

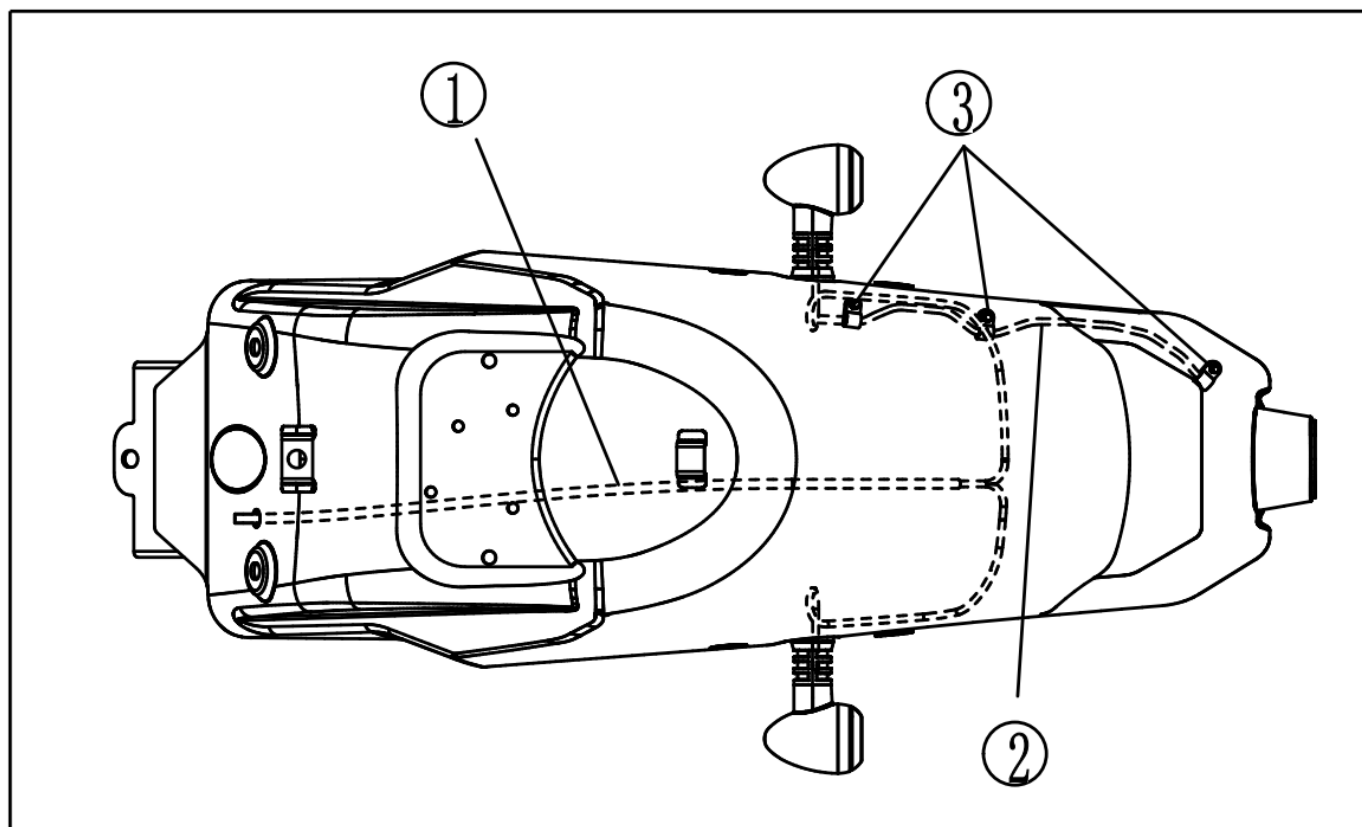
- |  |                                 |
|--|---------------------------------|
| 1 clutch cable   | 9 crankshaft phase cable        |
| 2 Left Hand Handle Switch Cable  | 10 Single strut flameout cable  |
| 3 Left cable rack  | 11 gear display cable           |
| 4 front brake caliper oil pipe   | 12 Voltage Regulating Rectifier |
| 5 Front wheel speed sensor cable<br>(cable must pass through the cable rack) | 13 Fuse box                     |
| 6 starting motor positive cable  | 14 Dump switch                  |
| 7 Carbon Canister  | 15 Flasher                      |
| 8 Oil pressure sensor cable  |                                 |



- |   |                                  |
|---|----------------------------------|
| 1 Right hand handle switch cable                        | 7 Auxiliary relay                |
| 2 Front brake handle oil pipe)                          | 8 Start relay                    |
| 3 right cable rack (cables must pass through cable rack | 9 main harness                   |
| 4 clutch cable  | 10 electronic injection harness  |
| 5 Rear brake oil cup oil pipe                           | 11 Airbag shock absorber harness |
| 6 Rear brake switch                                     |                                  |



- 1 Rear turn signal transition line
- 2 License plate light line
- 3 License plate lamp line constraint clamp



## The Third Chapter. Check and adjust

### 3.1 Regular inspection and adjustment

#### Brief Introduction

This chapter includes project information that should be regularly checked and adjusted. Strictly implementing these preventive maintenance measures can ensure more reliable operation and longer service life of vehicles. The information in this chapter applies to both vehicles that have started regular maintenance and vehicles that are ready for sale. All maintenance personnel should be familiar with the content of this chapter.

#### Content

Project	Project	Break-In Period- One Thousand Or 1 Month	Initial Three Thousand Or 3 Months	Every Other Three Thousand Or 3 Months
Check the valve clearance and adjust it if necessary	Check the valve clearance and adjust it if necessary	○	○	○
Check the condition of the spark plug and replace or clean it if necessary	Check the condition of the spark plug and replace or clean it if necessary	○	○	○
Clean the air filter and replace it if necessary	Clean the air filter and replace it if necessary	○	○	○
Check the fuel pipeline for cracks or damage, and replace it if necessary	Check the fuel pipeline for cracks or damage, and replace it if necessary		○	○
Engine oil change (preheating the engine before draining)	Engine oil change (preheating the engine before draining)	○	○	○
Clean or replace the engine oil filter element	Clean or replace the engine oil filter element	○	○	○
Check the operation of the front brake * and	Check the operation of the front brake * and adjust or replace it		○	○



adjust or replace it if necessary	if necessary			
Check the operation of the rear brake and adjust or replace it if necessary	Check the operation of the rear brake and adjust or replace it if necessary		○	○
Check the operation of the clutch * and adjust or replace it if necessary	Check the operation of the clutch * and adjust or replace it if necessary		○	○
Suspension system * Check if the rocker arm system is loose and tighten if necessary.	Suspension system * Check if the rocker arm system is loose and tighten if necessary.	○	○	○
Properly lubricate and maintain.	Properly lubricate and maintain.		○	○
Check for loose bearings on the wheels and make necessary corrections. Conduct appropriate disassembly and maintenance every 12000 (8000) or 12 months.	Check for loose bearings on the wheels and make necessary corrections. Conduct appropriate disassembly and maintenance every 12000 (8000) or 12 months.		○	○
Check if the wheel bearings are loose/damaged, and replace them if damaged	Check if the wheel bearings are loose/damaged, and replace them if damaged	○	○	○
Check the balance status/damage of the steering bearing * and repair it if necessary	Check the balance status/damage of the steering bearing * and repair it if necessary		○	○
Check the operation status/oil leakage of the front shock absorber, and repair it if necessary	Check the operation status/oil leakage of the front shock absorber, and repair it if necessary		○	○
Drive belt*	Check the belt tension and adjust it if necessary	<b>Check before driving</b>		
Accessories/fastening parts * Check all accessories and	Accessories/fastening parts * Check all accessories and fastening parts and make	○	○	○

fastening parts and make necessary corrections	necessary corrections			
Check whether the voltage and ventilation of the battery are normal, whether the cables are worn, and make necessary corrections	Check whether the voltage and ventilation of the battery are normal, whether the cables are worn, and make necessary corrections	○	○	○

**It is recommended that these items be repaired by a BENDA dealer.**

Notes :

**Change brake fluid**

1.If the master cylinder or caliper needs to be disassembled, the brake fluid needs to be replaced. Check the brake fluid level under normal conditions and replenish the brake fluid if necessary.

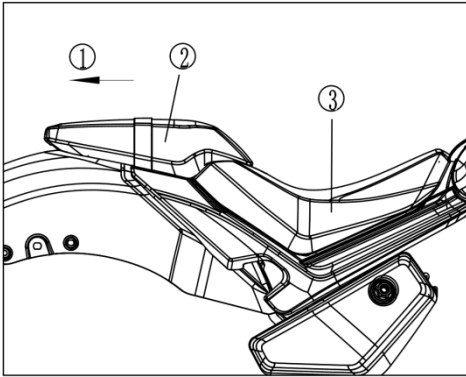
2. Replace the oil seal inside the master cylinder and caliper cylinder every two years.

3. Replace the brake hose every 4 years. Alternatively, when cracks or damage are found, they should be replaced promptly.

## Removal and installation of seat cushion, protective plate, and fuel tank

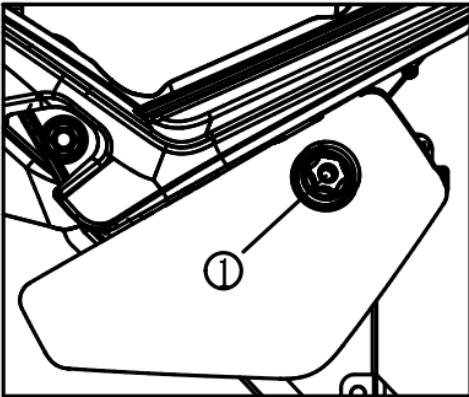
### 1.Cushion

Rotate the key counterclockwise, and after the rear seat cushion pops up, remove the rear seat cushion ② in the direction of ①, and remove the tail light plug; Remove the large seat cushion ③ directly.



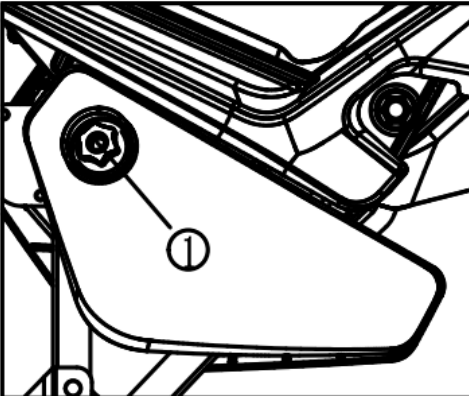
### 2.Left guard board

Use a 10 # Allen wrench to remove bolt ① and then pull out the protective plate outwards



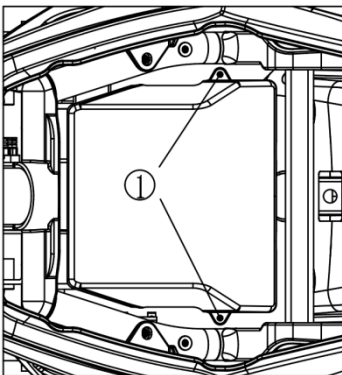
### 3.Right guard board

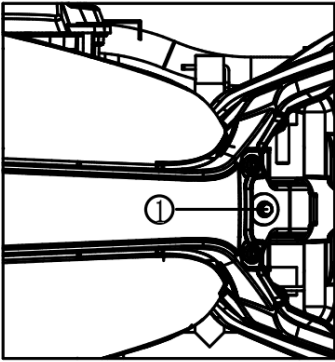
Use a 10 # Allen wrench to remove bolt ① and then pull out the protective plate outwards



### 4.Battery box cover

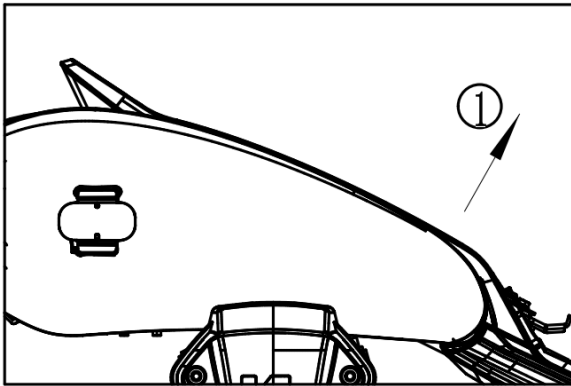
Use cross screwdriver wrench the bolt



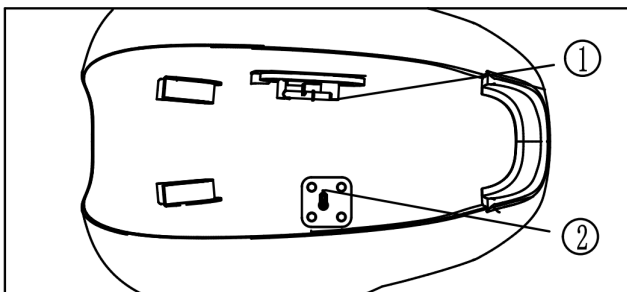


### 5. Fuel tank

Remove the bolt ① with a 10 # socket



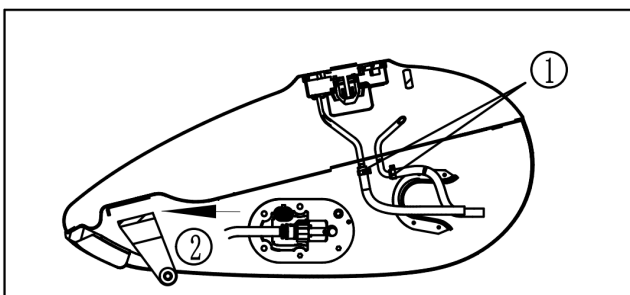
6. Lift the fuel tank in the direction of ①



7. Remove the plugs of the fuel pump

① and fuel level sensor ② from the fuel pump and fuel position sensor.

8. Use circlip pliers to loosen the clamps on the fuel pipe, adsorption hose, and overflow pipe



① Remove the two rubber hoses. Then follow the arrow

② Unplug the high-pressure oil pipe. Remove the fuel tank.

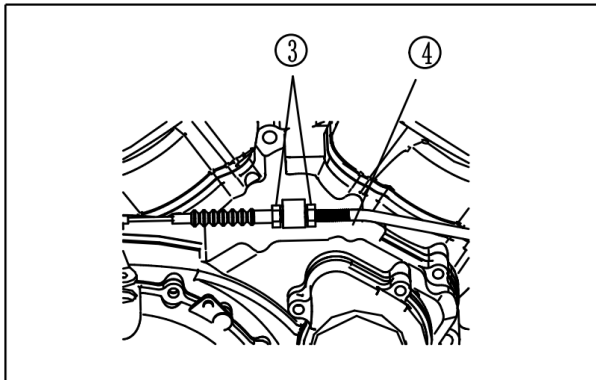
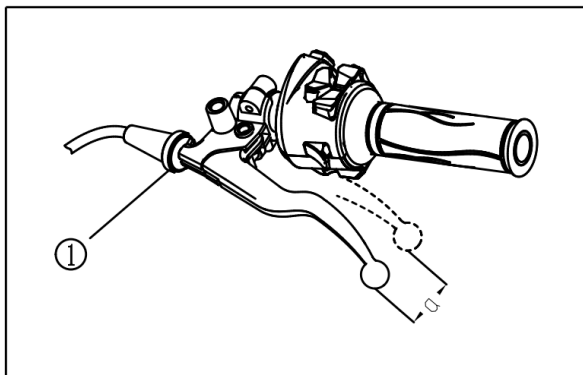
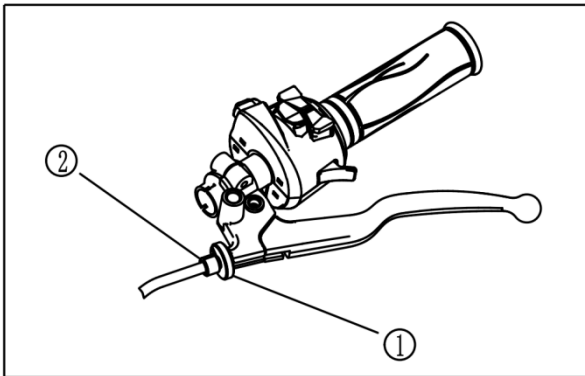
### Install

Contrary to the disassembly steps, pay attention to the following points

1. Fuel tank

2. Seat cushion Torque: 20N. m (2.5Kgf. m)

## 3.2 Clutch adjustment



Forward → reduced  
free travel

### Clutch adjustment

#### 1. Inspection :

- The free stroke of the clutch cable exceeds the specification range → Adjust

Free travel:

10-15mm

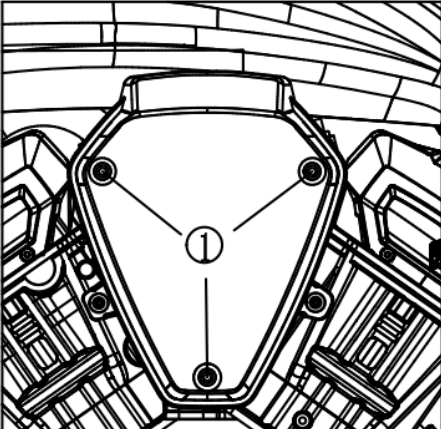
Measure at the clutch handle

1. Confirm that the adjustment device (2) and locking nut (1) have been fully tightened.
2. Loosen the locking nut (1).
3. Screw in or back the adjusting nut (2) until the specified free stroke is reached.

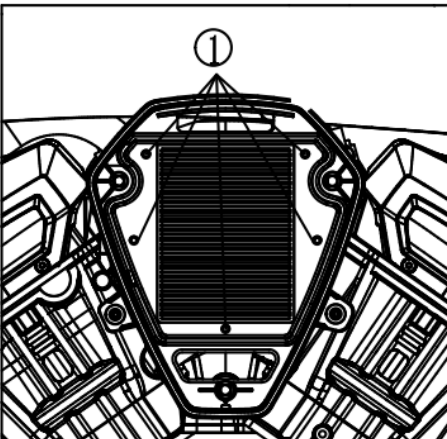
Screw in → increase in  
free stroke

4. Tighten the loosening nut (1).
5. Loosen the locking nut (3).
6. Adjust the screw (4) in the front and rear (with the front direction of the vehicle) until the correct free travel is reached.
7. Tighten the locking nut (3).

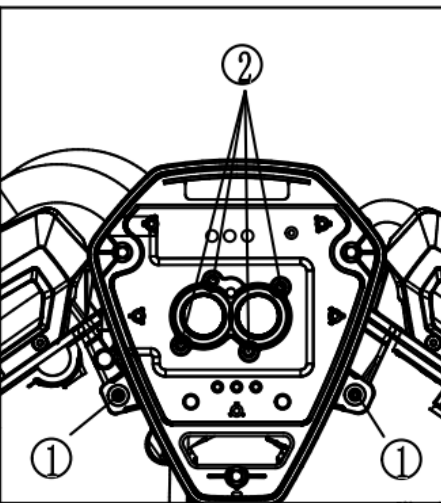
### 3.3 Air filter cleaning



1. Disassembly of left and right air filters  
Use a 5 # Allen wrench to remove bolt ① and remove the air filter cover.

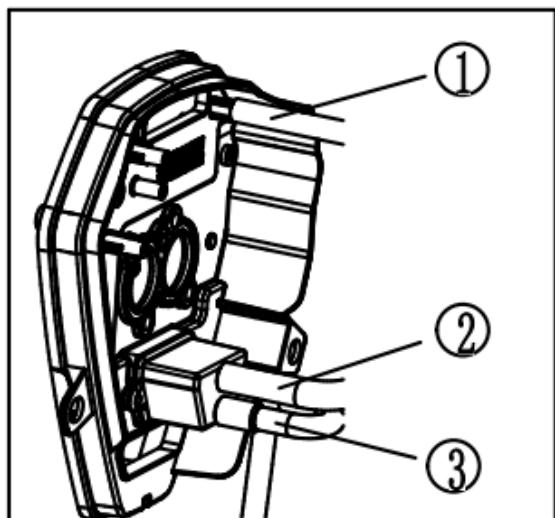


After removing the air filter cover, use a Phillips screwdriver to remove the bolt ①.  
Remove.  
Filter element.

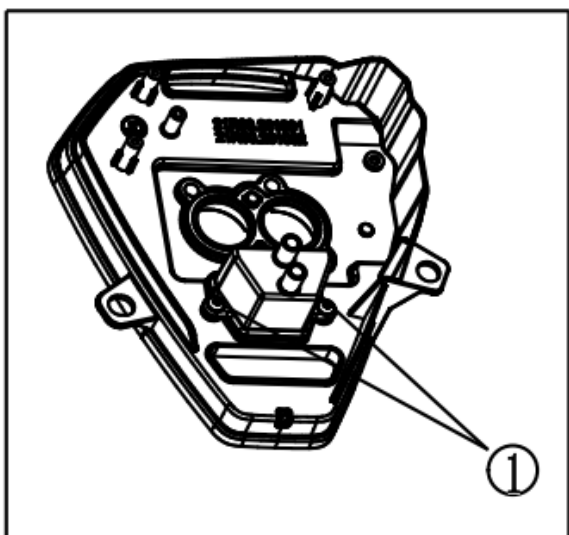


Use a 5 # Allen wrench to remove the bottom shell fixing bolts ① and ②.

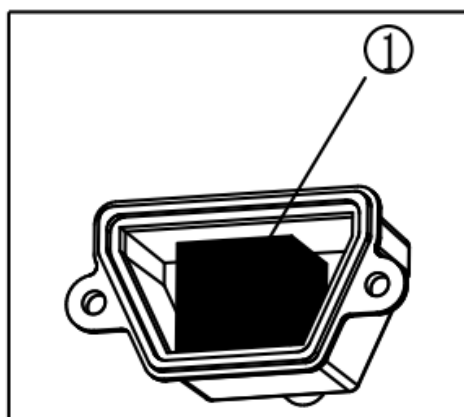




Remove the ordinary air pipe ①.  
Remove the exhaust pipe ②.  
Remove the drip pipe ③.



Use a cross screwdriver to remove the fixing bolt ① of the exhaust gas collection box



Take out the filter sponge ①.

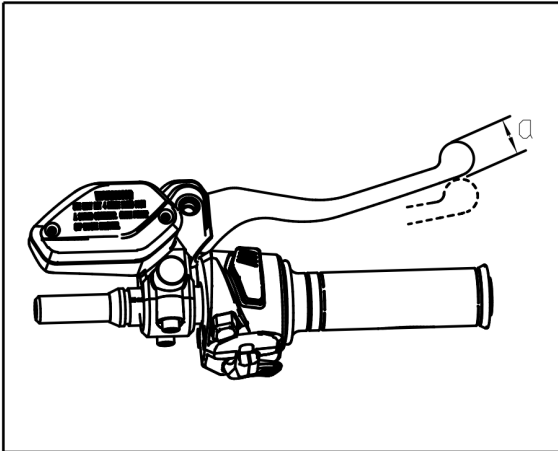
2. Inspection:

Damaged → Replace

Dust → Use compressed air to blow off the dust on the sponge and filter element.

If the filter element contains too much dirt, it can be cleaned with a neutral solution and must be blown dry after cleaning.

### 3.4 Front brake inspection



**Warning :** When the brake feels soft, it may be due to oil leakage or air mixing that the braking effect is not good. It is necessary to check the amount of brake

1. Conduct the following inspections: ● When turning left or right or driving, check if the brake hose has touched any other parts that are worn or may be worn. If touched → corrected
2. Check the free clearance at the front end of the brake handle.

Free clearance at the front end of the brake handle:  
a: 5.5-10.5mm

**Tips :**

The clearance is guaranteed by manufacturing and does not require adjustment.

Check the brake pedal

1. Perform the following checks

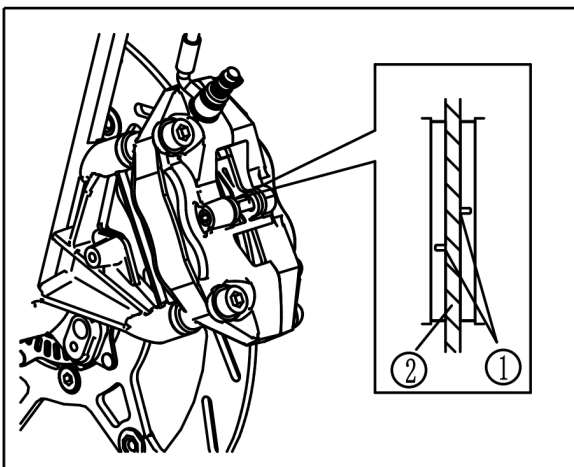
● Wear amount of brake pads

When the wear indicator ① is almost close to the brake disc ② → Replace the entire set

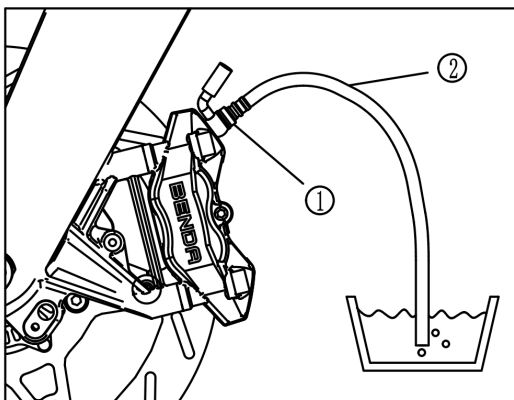
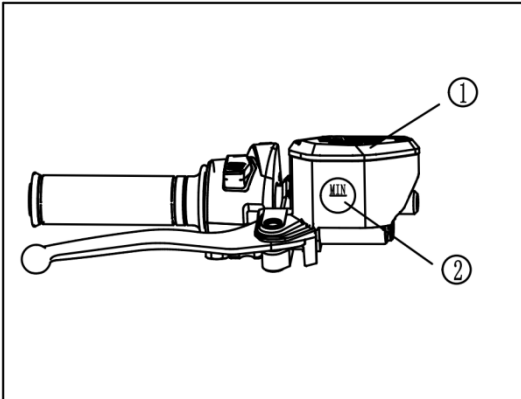
Brake pads.

● Wear of brake discs

If the thickness of brake disc ② is not greater than 4mm, replace it.



### 3.5 Check brake fluid volume



**Tips :**

Do not loosen the brake handle before retightening the oil drain screw.

**1. Check followings**

- Brake fluid volume
- When the brake fluid cover surface ① is in a horizontal state, check the fluid level, which should be above the level shown in the figure ②.
- Fill the brake fluid below the lower limit position to above the lower limit position.

Designated brake fluid: pure brake

**Tips :**

Do not mix different brands of brake fluid. If DOT4 oil is not available, DOT3 oil can also be used. Brake fluid can corrode painted surfaces and rubber parts. If splashing occurs, please wipe it clean

**Tips :**

Simultaneously replenish the brake fluid, do not lower it below the lower limit.

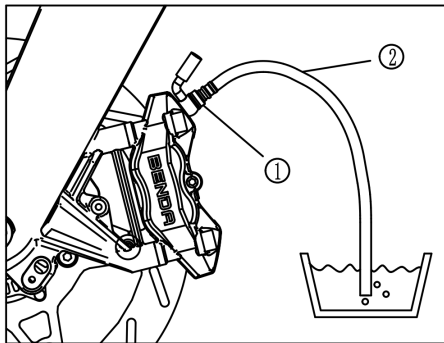
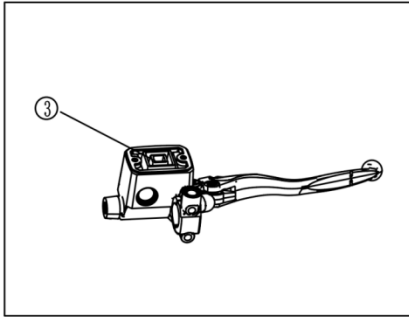


**Warning :** When disassembling brake fluid related parts, it is necessary to confirm whether other parts are locked and sealed

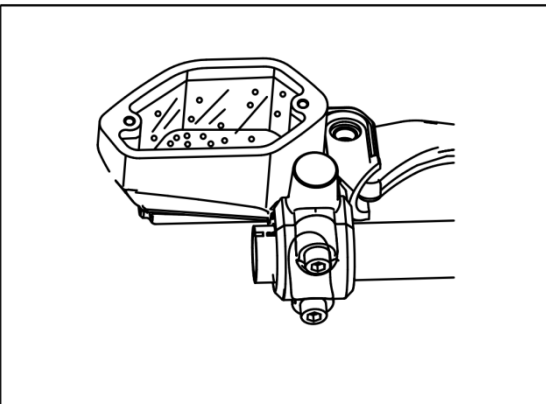
**Sequence of release the air :**

1. Remove the brake fluid cylinder head.
2. Remove the brake fluid cylinder Diaphragm.
3. Install a plastic tube ② at the front end of the oil drain screw ①, and prepare an oil container at the front end of the plastic tube.
4. After applying the brakes several times, grip the brake handle tightly and loosen the oil drain screw by about 1/2 turn, then quickly tighten it again.
5. Repeat the above actions , Until the oil drain screw completely discharges the air bubbles.
6. Install the brake fluid cylinder diaphragm back.
7. Replace the brake cylinder cover.

### 3.6 Replacing brake fluid



Oil drain screw :  
6Nm (0.6kg.m)



1. Place the main cylinder in a horizontal position and remove the brake fluid cylinder head.

2. Install a plastic tube ② at the front end of the oil drain screw ①, and prepare an oil pan at the front end of the plastic tube. Loosen the oil drain screw and repeat several times until the oil drain screw no longer discharges brake fluid.

**Warning:** Wipe off the brake fluid sprayed on the brake discs, tires, and wheels.

3. Lock the oil drain screw

4. Remove the brake fluid cylinder diaphragm ③.

5. Inject brake fluid above the lower limit.

6. Pull the brake handle to fill the brake fluid pipe with brake fluid.

**Tips :**

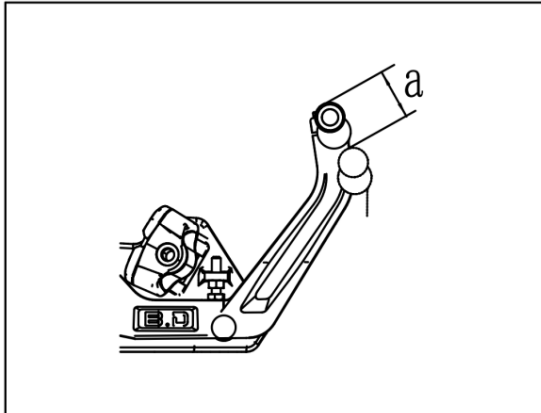
At the same time, replenish the brake fluid and do not lower it below the lower limit.

7. Slowly move the brake handle until no more bubbles appear at the small hole in the brake cylinder, and feel the brake handle strong.

8. Release air.

After adjustment, install in the reverse order of disassembly.

### 3.7 Check and adjust the rear brake/rear brake pad inspection



#### Rear brake inspection

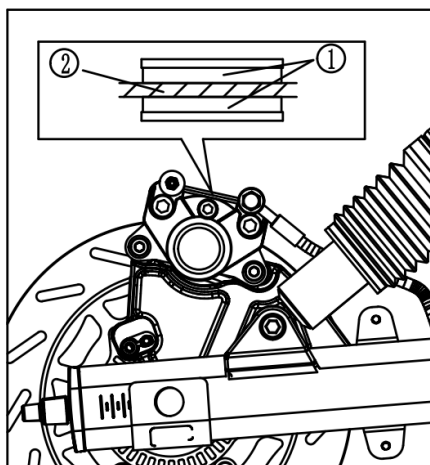
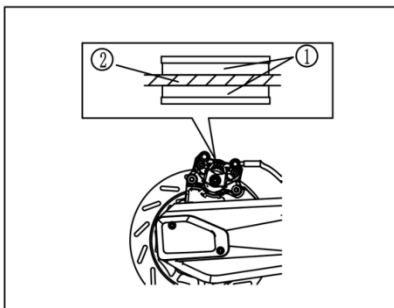
**Warning :** When the brake feels soft, it may be due to oil leakage or air mixing that the braking effect is not good. The brake fluid level should be checked, the oil bolts should be

#### 1. Perform the following checks

- When turning left or right or driving, check whether the brake hose has touched other parts, which are worn or may be worn. If touched → corrected

#### 2. Check the free clearance at the front end of the brake pedal.

Free clearance of the front end of the brake handle : a : 20–30mm



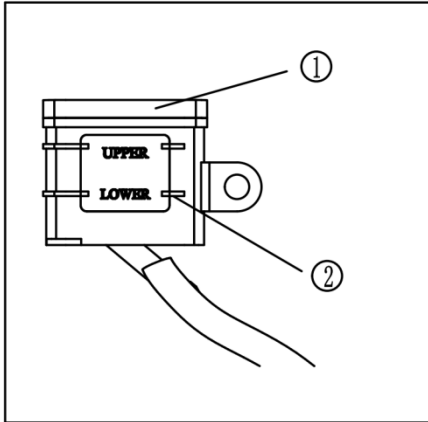
#### Check brake pads

#### 1. Perform the following checks

- Wear amount of brake pads  
If the thickness of brake pad ① is worn to only 2-3mm, replace the entire set of brake pads.
- When the wear of the brake disc reaches a thickness of no more than 4mm, replace it.

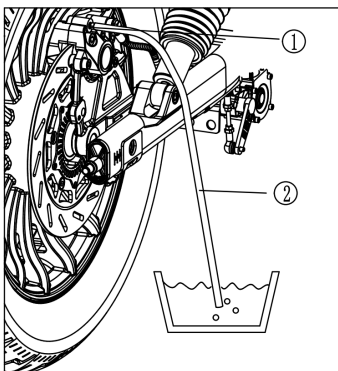
### 3.8 Check brake fluid volume/exhaust air

**Warning :** Hold the brake handle and check for any brake fluid leaks. Wipe off the brake fluid sprayed on the brake discs, tires, and wheels.



**Tips :**  
Do not loosen the brake pedal before tightening the drain screw again.

**Tips :**  
Do not mix different brands of brake fluid. If DOT4 oil is not available, DOT3 oil can also be used. Brake fluid can corrode painted surfaces and rubber parts. If splashing occurs, please wipe it clean immediately.



**Tips :**  
Simultaneously replenish the brake fluid, do not lower it below the lower limit.

**Warning :** When disassembling brake fluid related parts, it is necessary to confirm whether other parts are locked and sealed before releasing air.

Check brake fluid volume

1. Perform the following checks ●  
Brake fluid level

● When the brake fluid cover surface ① is in a horizontal state, check the fluid level, which should be above the level shown in the figure ②.

● Fill the brake fluid below the lower limit position to above the lower limit position.

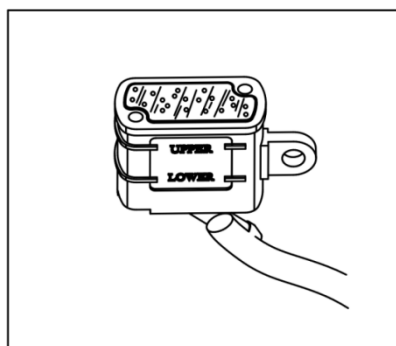
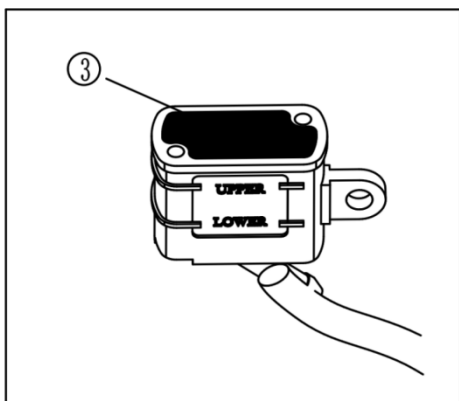
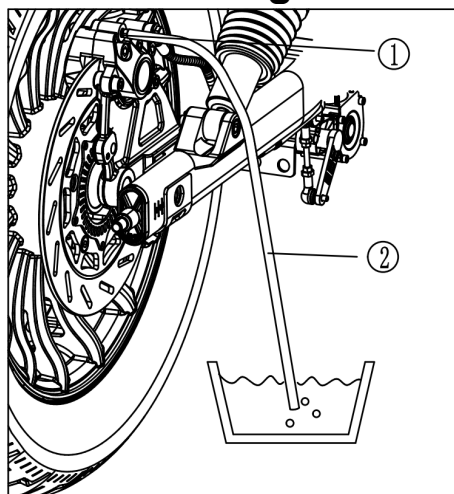
Designated brake fluid: pure brake

#### Discharge air

Sequence of releasing air:

1. Remove the brake fluid cylinder head.
2. Remove the brake fluid cylinder diaphragm
3. Install a plastic tube ② at the front end of the oil drain screw ①, and prepare an oil container at the front end of the plastic tube.
4. After applying the brakes several times, press and hold the brake pedal, loosen the oil drain screw by about 1/2 turn, and quickly tighten it again.
5. Repeat the above action until the oil drain screw completely discharges the air bubbles.
6. Install the brake fluid cylinder diaphragm back.
7. Replace the brake cylinder cover.

### 3.9 Bleeding air/changing brake fluid



Oil drain screw :  
6Nm (0.6kg.m)

**Tips :**  
At the same time, replenish the brake fluid and do not lower it below the

#### Check brake fluid volume

1. Place the main cylinder in a horizontal position and remove the brake fluid cylinder head.
2. Install a plastic tube (2) at the front end of the oil drain screw (1), and prepare an oil pan at the front end of the plastic tube. Loosen the oil drain screw and repeat several times until the oil drain screw no longer discharges brake fluid.

**Warning:** Wipe off the brake fluid sprayed on the brake discs, tires, and wheels.

3. Tighten the oil drain screw.
4. Remove the brake fluid cylinder diaphragm (3).
5. Inject brake fluid above the lower limit.

Designated brake fluid: pure

#### Tips :

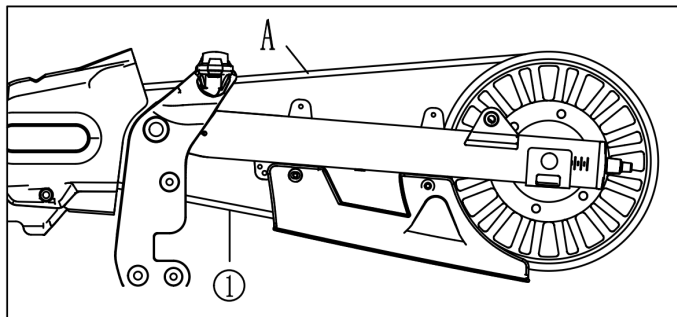
Do not mix different brands of brake fluid. If DOT4 oil is not available, DOT3 oil can also be used.

6. Pull the brake pedal to fill the brake fluid pipe with brake fluid.
7. Slowly move the brake pedal until the small hole in the brake cylinder is no longer present. Bubbles emerge until the brake pedal is felt to be strong.
8. Release air. After adjustment, install in the reverse order of disassembly.

### 3.10 Check and adjust the drive chain/front fork adjustment

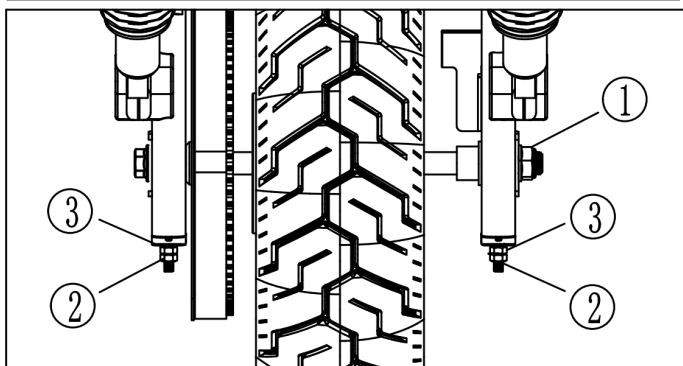
#### Check and adjust the drive belt

- Use a tool (wrench, T-shaped socket, etc.) with one hand to strike the middle A position of the



upper end of the belt ① with appropriate force, and use the red dot of the belt tension gauge with the other hand to align with the striking area and read.

Belt tension:  
65–70HZ



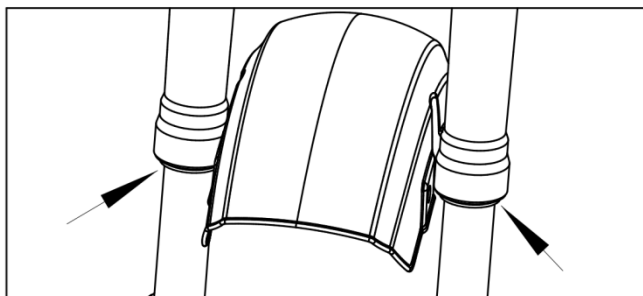
#### Tips :

There are scale marks on the belt adjuster, and during adjustment, it should be ensured that the number of marks on both sides of the rear fork adjuster is consistent. After passing the left and right adjustment, tighten the adjuster lock nut ② and the axle lock nut ①.



**Warning:** For your safety, it is recommended to go to a BENDA dealer or designated repair location for inspection and

#### Front fork inspection



1. Park the motorcycle on a flat surface.

2. Inspection

● Content

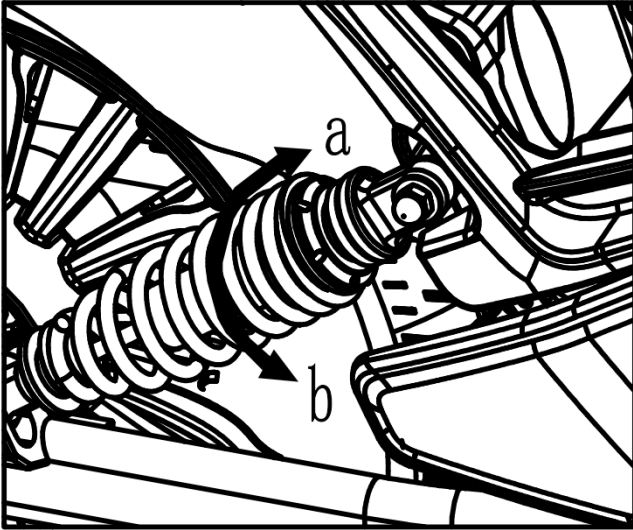
There are scars or damage → replace.

Oil seal

Serious oil leakage → replace.



## 3.11 Front fork inspection/rear shock absorption adjustment



3. Maintain the motorcycle in a vertical parking position and brake the front brake.

4. Inspection:

● Action status

Slide the front fork up and down several

Interference in action → Repair

 Warning:

●The motorcycle should be firmly supported to eliminate the risk of overturning.

●Spring preload

Loosen the locking nut ① and turn the adjustment device ② to the a or b direction.

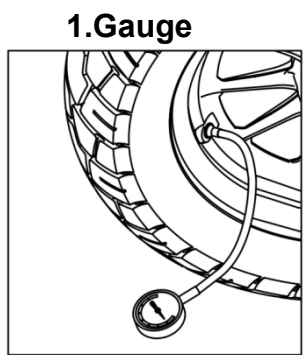
Twist towards a → Spring preload value increases

Twist towards b → decrease in spring preload value

Tips :

Do not turn the adjustment device beyond the maximum or minimum position.

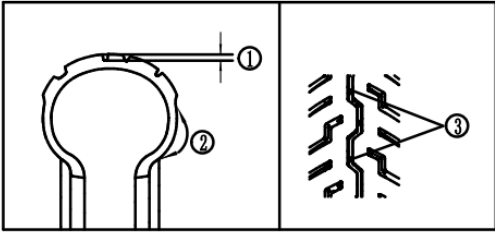
3.12 Tire Inspection



2.Inspection

- Surface of tire

Wear/damage → Replace



Minimum pattern depth  
(front and rear wheels):  
Almost close to the wear indicator strip

- Tyre pressure
- Exceeding the specification value range → Adjust
- \* **Load** refers to the total weight of goods, cyclists, and accessories

Cold tire pressure	Front tire	Rear tire
Load below 0-90kg	240 (2.4kgf/cm <sup>2</sup> )	290 (2.9kgf/cm <sup>2</sup> )
Front 345kg/Rear462kg Maximum load	280kpa (3.0kgf/cm <sup>2</sup> )	300kpa (3.0kgf/cm <sup>2</sup> )
Front tire	150/80-16 (4PR)	
Rear tire	180/65-16 (6PR)	

- ②Sidewall
- ③Wear indicator layer

Warning:

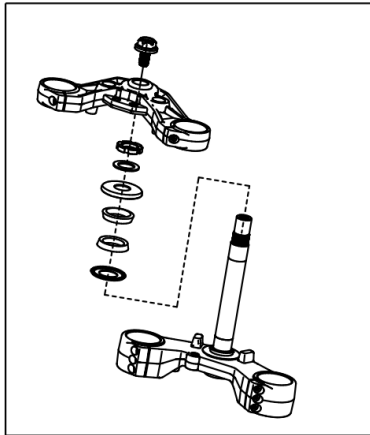
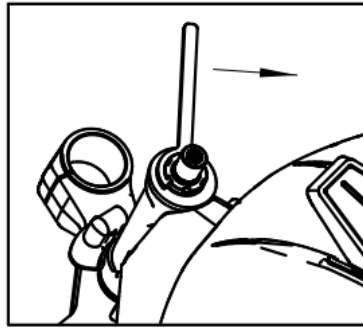
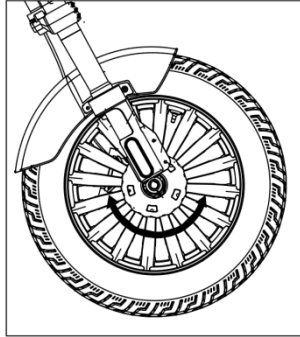
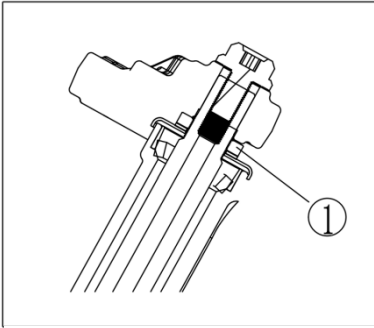
- It is dangerous to use worn tires and motorcycles in a timely manner. If the tire pattern is about to be worn out, the tire should be replaced

### 3.13 Check the steering device

#### Check the steering device

##### 1. Perform following checks

With the front wheels supported, shake the lower part of the front fork by hand to check if the steering shaft is loose. Check if the steering handle can rotate smoothly left and right.



##### 2. Perform following checks

- Steering nut

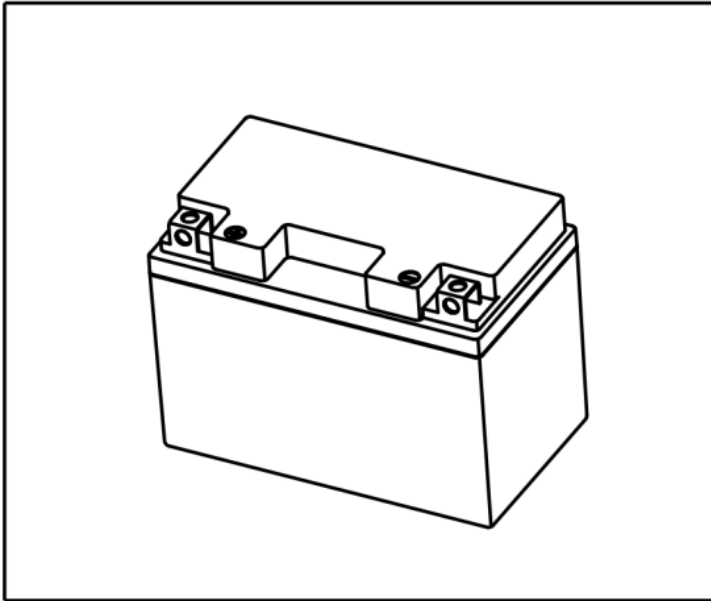
Adjust the order:

Remove the steering handle (refer to page "53")

- Lock the nut with a steering nut wrench  
(Please refer to page "54" for the locking sequence and method)

- Install the steering seat
- Install the steering handle

### 3.14 Battery Check



#### Check Battery

##### 1.Dismantle :

- Battery Box cover
- Refer to the section on "Removing the Battery Box Cover"

#### 2.Battery maintenance requirements for inventory vehicles

- If the vehicle has been parked for more than 15 days, the negative terminal connection of the battery should be disconnected and the battery terminal voltage checked once a month. If the terminal voltage of the battery is lower than 12.6V, charging should be carried out.
- For batteries on vehicles parked for more than a year, if they are not recharged according to the above requirements, they must be replaced and disposed of as scrap.
- Before using the vehicle, the battery terminal voltage should reach 12.6V, otherwise charging should be carried out.

#### 3.Appearance inspection of the battery before charging

- Appearance inspection of the battery before charging  
If the battery casing is broken or acid leakage occurs, the battery cannot be charged. After identifying the cause, replace the battery.
- The battery with a broken end post cannot be charged. After identifying the cause, replace the battery.  
A battery with bloating caused by excessive discharge or overcharging cannot be charged and should be replaced.
- Before charging, clean the end post and remove the oxide skin on the surface.  
Apply butter on the pole during charging

to prevent electrical corrosion.

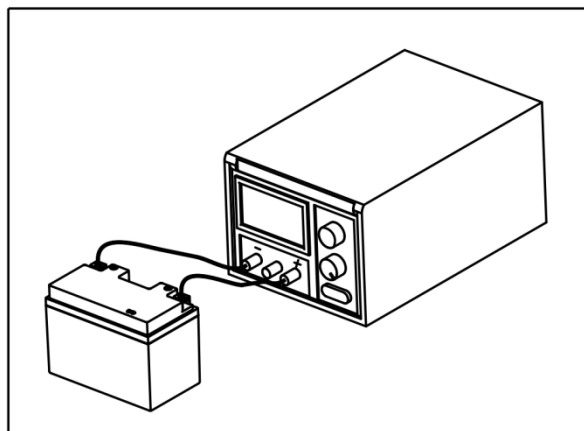
#### **4.Precautions during charging**

- Maintain ventilation during charging and charge at room temperature.
- Smoking is strictly prohibited during charging and the Introduction of sparks should be avoided.
- When wiring after charging, connect the positive wire first: When disassembling the wire before charging, disconnect the negative wire first.

#### **5.Battery Charging**

- Connect the positive pole of the charger to the positive pole of the battery, and connect the negative pole of the charger to the negative pole of the battery.
- Confirm that the battery terminal is clean and the charging circuit is connected properly.
- It is recommended to use a constant voltage of 14.7 volts (maximum cannot exceed  $14.7 \pm 0.1$  volts, charging current should not exceed 0.3 times the battery capacity, i.e. 0.3C) until the charging current is within 0.3A, indicating that the battery is fully charged.
- There is no condition for constant voltage charging, and constant current charging can be carried out according to the following specifications:
  - (a) Charge at a current of 1/10 capacity value.
  - (b)(b) Correspondence between charging time and battery voltage (reference)

Battery Voltage V	12.85~ 12.75	12.75~ 12.65	12.65~ 12.55	12.55~ 12.45	12.45~ 12.35	12.35~ 12.20	12.20~ 12.05	12.05~ 11.95
Charge time h	2.5	3.5	5	6.5	8	9	10	11



(c) For batteries with an open circuit voltage below 12.6 volts, there may be a phenomenon of the battery not charging in the early stages of charging. Due to severe battery depletion, the proportion of lead acid inside the battery is close to pure water, and the internal resistance of the battery is high. As the battery charges, the proportion of lead acid inside the battery increases, and the charging current of the battery can gradually return to normal.

- During the charging process, if there is acid spraying from the battery exhaust hole, the charging should be stopped immediately.
- During the charging process, when the battery temperature exceeds 45 degrees, stop charging until the battery temperature drops to room temperature, reduce the charging current by half, and continue charging.
- When the battery is repeatedly fed seriously (when the battery terminal voltage repeatedly drops below 12V), it will greatly shorten the battery life.
- For a low battery, if it cannot maintain a rear end voltage of more than 12V after being charged and left at room temperature ( $24 \pm 5$  °C) for 24 hours, it is considered to meet the scrapping conditions and is not allowed to be loaded for use.

#### 6.Requirement for Install

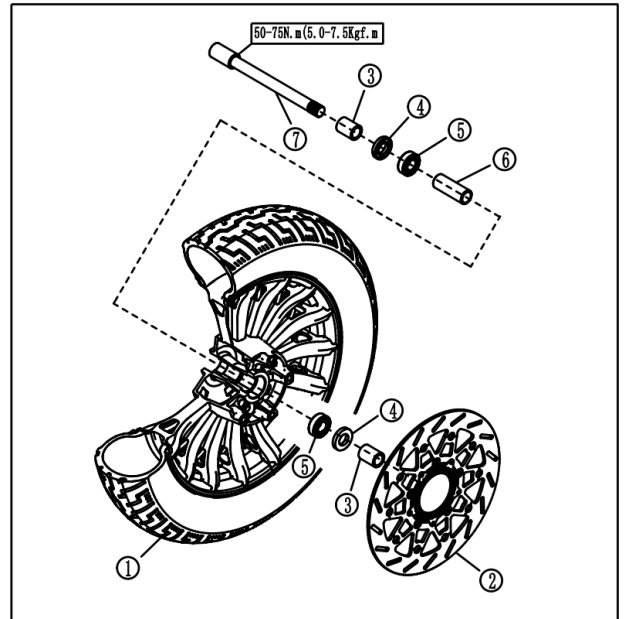
- The voltage of the battery should be  $\geq 12.6$  before assembly, otherwise it should be charged
- The sequence of connecting the battery wires: first connect the positive battery wire and then connect the negative battery wire.

- Sequence of disconnecting battery connections: Disconnect the negative terminal of the battery first, and then the positive terminal of the battery.
- When assembling the battery, ensure that all electrical accessories are in the "off" position.
- Ensure that all electrical systems on the vehicle are turned off during breaks, lunches, shifts, and at the end of work.

## The Fourth Chapter. Car body

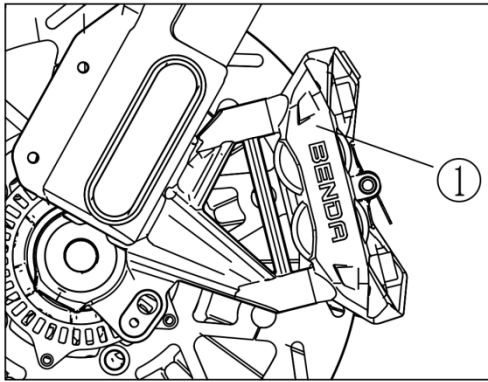
### 4.1 Front and Rear Tire Inspection

- ① Front Tire
- ② Front left brake disc
- ③ Front Right brake disc
- ④ Front tire bushing
- ⑤ Oil seal (hub assembly)
- ⑥ Rolling bearing (hub assembly)
- ⑦ Intermediate spacer sleeve (hub assembly)
- ⑧ front axle





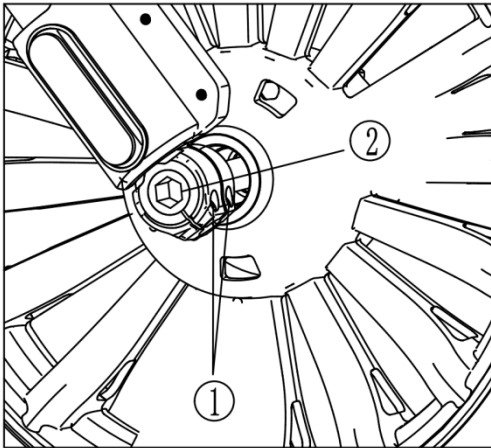
### Dismantle



#### 1.Dismantle

##### ●Front Brake①

Use an 8 # Allen wrench to remove the bolts.



##### Front wheel axle cover ②

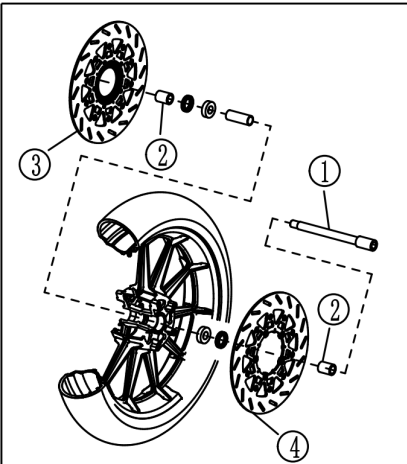
Remove using a plastic pry

Remove using a plastic pry

#### 2. Disassembly

##### Front shock absorber locking screw ①

Use a 6 # Allen wrench

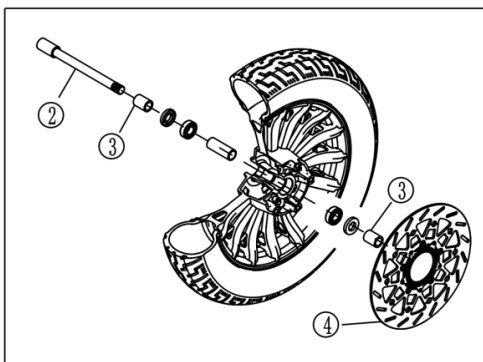


#### 3. Disassembly

##### ●Front wheel axle①

##### ●Front wheel liner②

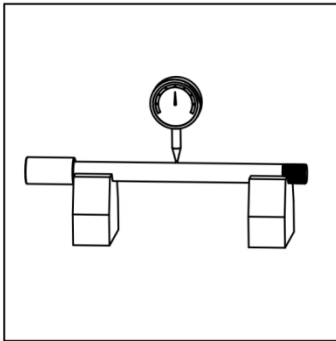
##### ●Front brake discs③and④



Check Front tire

## 1.Check


Check the front wheel axle with a dial gauge: Bend → Replace



 warning

Do not attempt to straighten the bent front

Twist degree of front wheel  
axle : 0.25mm

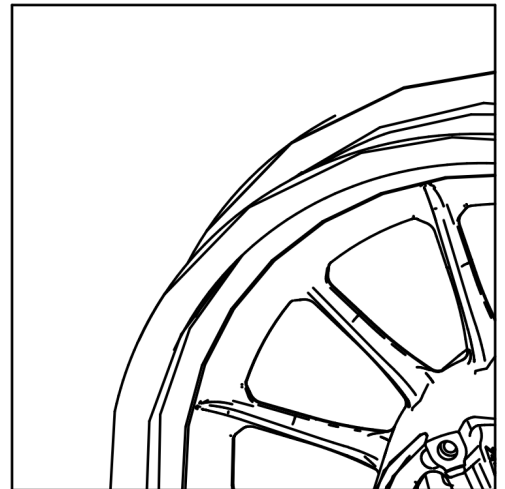
 warning

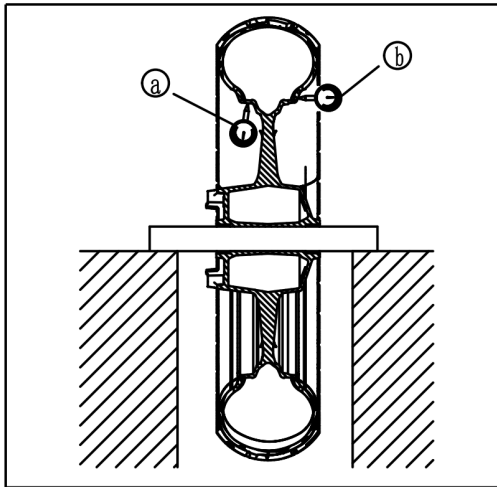
Even for minor repairs, do not attempt to  
repair the wheels yourself

## 2.Inspection

●wheel

Deformation, damage or bending → Replace



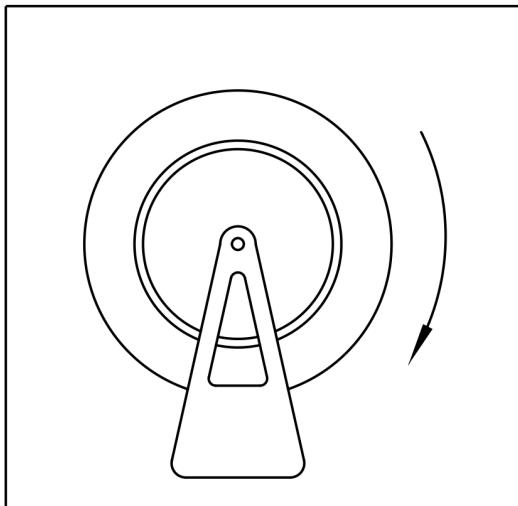


### 3. Inspection

● Slowly rotate the wheel rim to check for radial and axial runout

Exceeding the limit → Replace

Rim runout limit  
Radial: 1mm  
Axial direction:



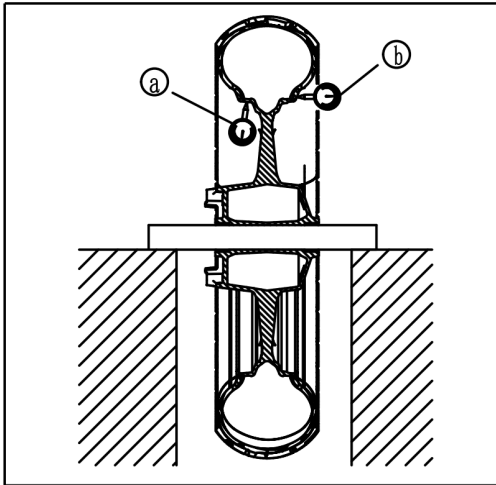
### 4. Inspection

● Wheel bearings

There is clearance or uneven rotation, looseness, or abnormal noise in the bearing inside the wheel hub → Replace.

● Oil seal

Worn or damaged → Replace.



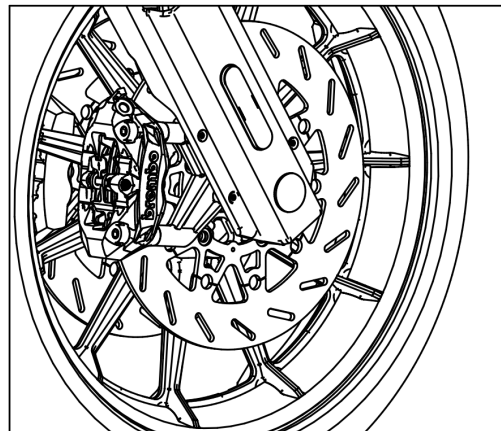
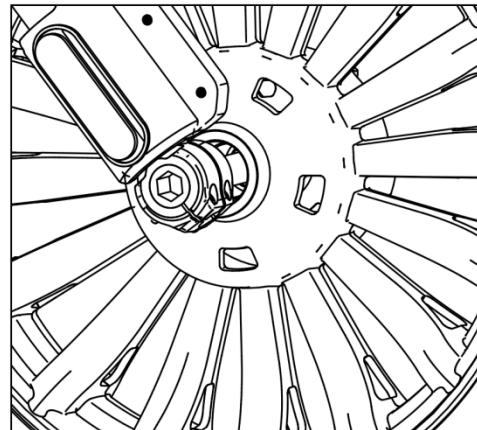
### 1. Installation

- Front wheel liner
- Front wheel axle
- Front wheel axle plug cover

Front wheel axle tightening torque : 50-75N.m (5.0-7.5Kgf.m)

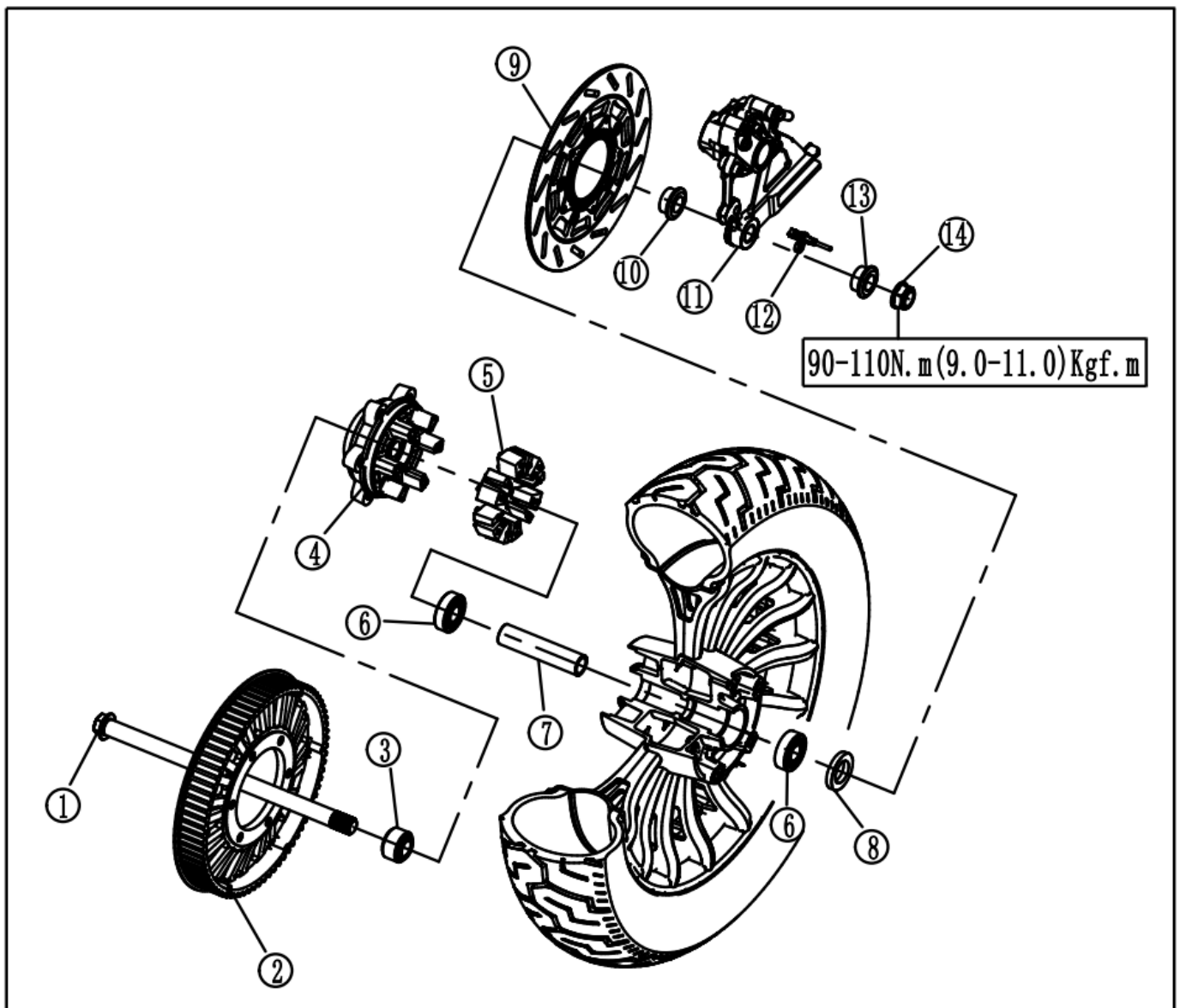
### 2.Install

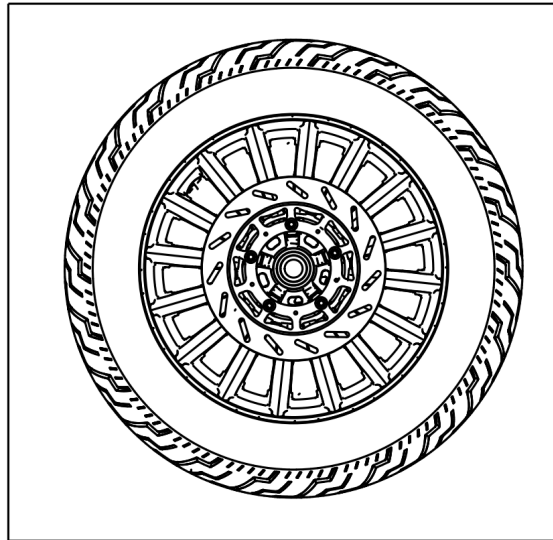
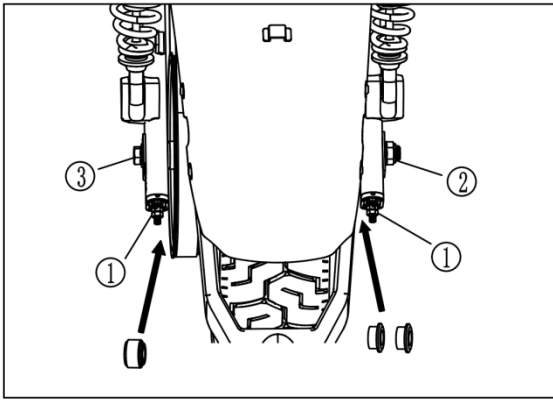
- Front Wheel
- Front Brake Caliper



### Rear wheel

- |  |                               |
|--|-------------------------------|
| (1) Rear axle  | (9) Rear brake disc           |
| (2) Large pulley                                     | (10) Rear wheel liner         |
| (3) Rear left liner                                  | (11) Rear disc brake bracket  |
| (4) Rear wheel speed sensor with wheel seat assembly | (12) Rear wheel speed sensor  |
| (5) Buffer block                                     | (13) Rear wheel right bushing |
| (6) Bearing (Hub Assembly)                           | (14) Rear Wheel Axle Lock Nut |
| (7) Bushing (Hub Assembly)                           |                               |
| (8) Oil seal (Hub assembly)                          |                               |





## Rear wheel

### Warning

Firmly support the motorcycle to prevent it from overturning.

#### Tips :

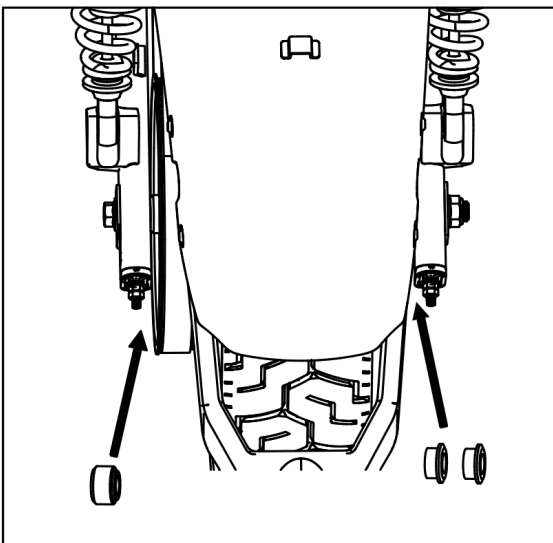
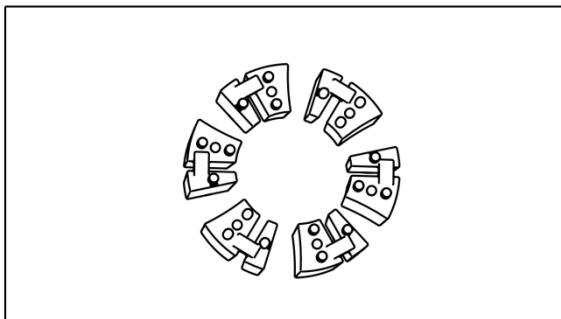
When disassembling the rear axle, the bushing will fall off, be careful not to lose it

### 1. Disassembly

- Belt adjustment nut ①
- Rear wheel locking nut ②
- Rear wheel axle ③
- Rear wheel liner

#### Tips :

When disassembling the rear axle, the bushing will fall off, be careful not to lose it.



### 3. Disassembly

- Buffer block

Damaged or deformed → Replace

### 4. Installation

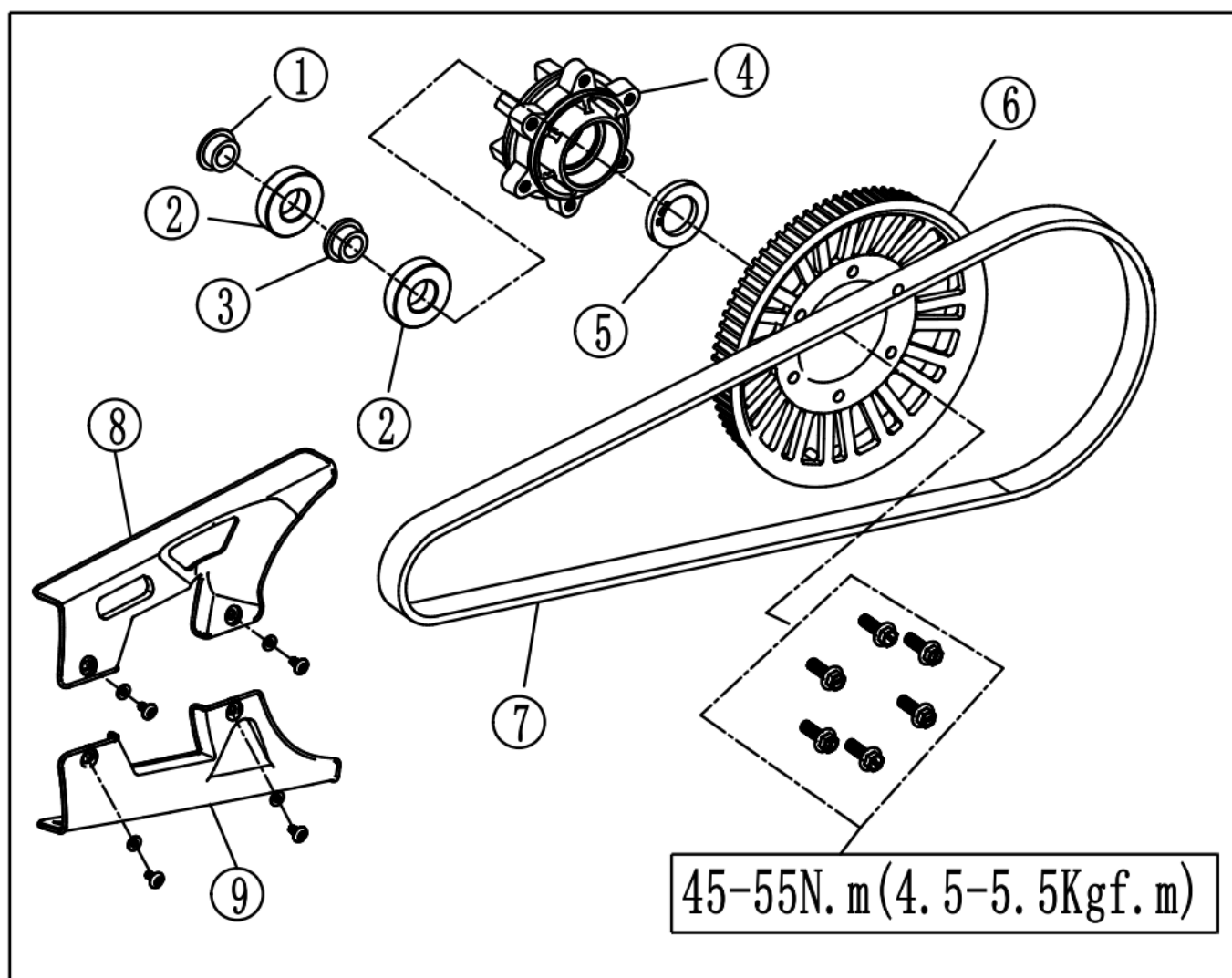
- Rear wheel
- Disc brake bracket
- Rear fender bracket
- Rear wheel liner
- Rear wheel axle

Rear wheel axle tightening torque :  
90-110N.m (9.0-11.0Kgf.m)

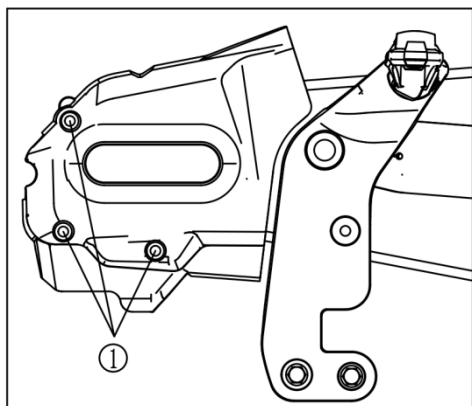
## 4.2 Drive belt

### Drive belt

- (1) Spacer 2
- (2) Deep groove ball bearing
- (3) Belt cover on spacer1
- (4) Belt cover under pulley seat
- (5) Oil seal
- (6) large pulley
- (7) drive belt
- (8) Upper belt cover
- (9) Lower belt cover





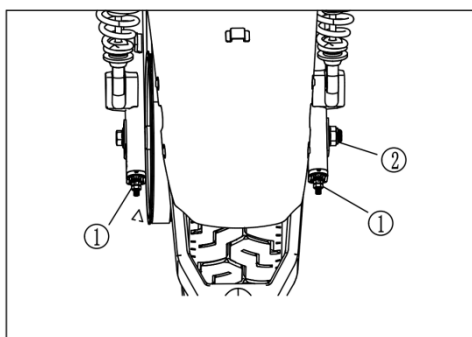


**Warning**

- 1 Park the motorcycle on a flat surface.
- 2 Place the motorcycle on its central bracket.

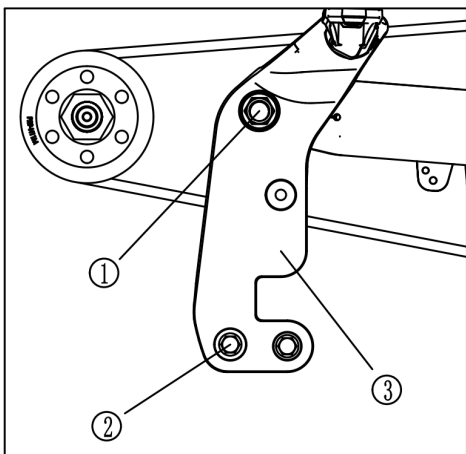
**1.Dismantle**

- Loosen the belt adjust nut
- Loosen the rear axle nut



**2.Dismantle**

- Small pulley cover bolt (1)
- Small pulley cover



**3.Dismantle**

- O-ring (1)
- Chain pressure plate (2)
- Chain
- Driven gear

## Drive belt inspection

### 1. Safety Use Warning

Check whether the belt transmission system is working properly every time you ride. If you notice any abnormalities or damage on the right side, you need to carefully inspect and repair it. If it is necessary to replace transmission system components, it is necessary to consult a qualified retailer and provide corresponding technical and after-sales services.

Please carefully read the precautions in the user manual to avoid damaging the belt drive system. In order to safely use the belt drive system, please rule out the following forms of improper use:

- Damage to the belt caused by human factors
- Use in competitions, stunts, or techniques
- Drive belt failure caused by wheel lockup
- Improper repair or maintenance
- Structural changes under external interference or vehicle conditions

Any incorrect operation or other improper use can lead to early belt failure and termination of warranty

### 2. Precautions for belt installation and use

The belt needs to be installed to the recommended tension value (65-70Hz)

The transmission belt should be placed on or removed from the gear train in its natural state. It is prohibited to use any tools to pry the belt or use large external forces to forcibly install it, otherwise it will damage the strength of the belt and cause early failure of the belt.

Parallelism is particularly important for the installation of synchronous belts.

It is necessary to ensure that the maximum parallelism of the belt installation does not exceed  $0.25^\circ$ .

The installation of intermediate synchronous belts is also very important.

It is necessary to ensure that the maximum does not exceed 0.5% of the center distance of the wheel train

It is strictly prohibited to have the tooth surface curved

Do not bend your back

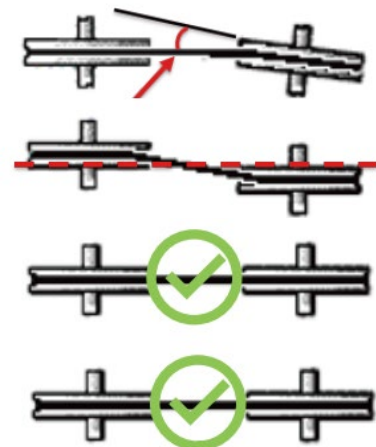
Twisting and flipping are strictly prohibited

It is strictly prohibited to tie the belt

It is strictly prohibited to apply lubricating oil to the tooth surface

It is strictly prohibited to use belts to remove pulleys

It is strictly prohibited to pry the belt



### 3. Precautions for belt maintenance and upkeep

Check the belt tension within a fixed mileage.






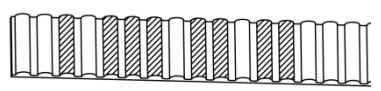
If it is below the lower limit value, the belt needs to be retensioned and the tensioning screws checked for abnormalities.




If the belt experiences deviation, edge grinding, etc., it is necessary to check the parallelism of the shaft for abnormalities and readjust the belt alignment.

After driving in a harsh environment, it is necessary to check the transmission system. If there is sediment accumulation in the system, it is necessary to rinse it with clean water before cycling.

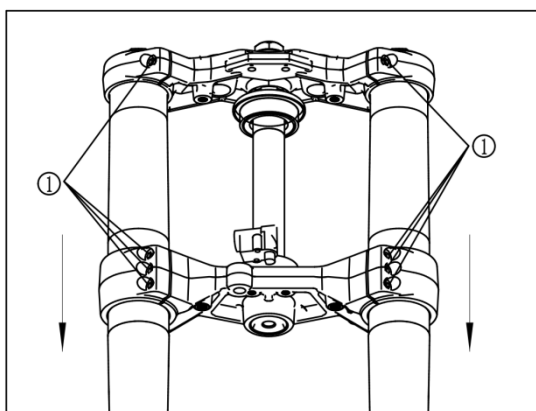
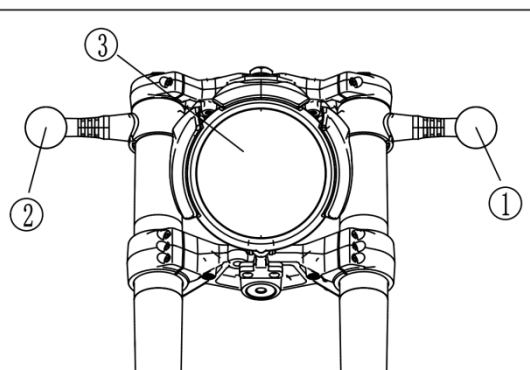
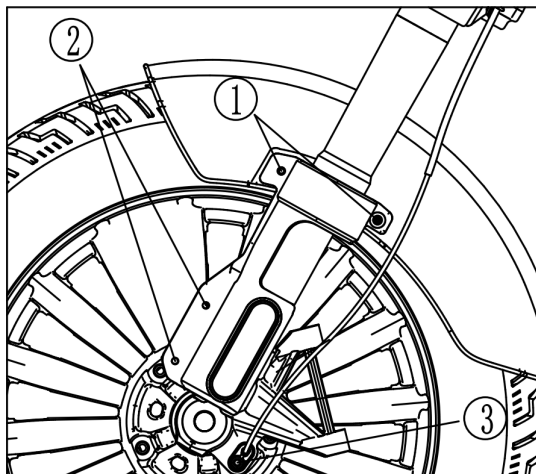
If foreign objects enter the gear train and cause abnormal damage to the belt, it is necessary to replace the belt in a timely manner and check the damage of the pulley. If the pulley is damaged, it should be replaced in a timely manner.

### 4.Common problems and solutions for daily use of belts

Frequently Asked Questions	Pictures	Reasons	Solutions
Tooth shear		1.Improper operation 2.Exceeding the lifespan of the belt design	1.Replace with a new belt and use it correctly 2.Replace with a new belt
Belt neat and broken		1.Excessive bending of the belt before or during installation 2.Foreign objects entering the drive system 3.The diameter of the pulley is too small 4. The installation tension is too low	1.Replace with a new belt and install it correctly 2.Remove foreign objects and replace with a new belt 3.Choose a suitable pulley and replace it with a new belt 4.Replace the belt with a new one and set the correct tension
Irregular belt breakage		1.Excessive system impact load 2.Design service life of the overrunning rope	1.Check the transmission system and replace it with a wider or stronger belt 2.Replace with a new belt
Shearing on the toothed side		1.Abnormal alignment of the transmission system	1.Check the alignment of the transmission system and replace it with a new belt
Scratches on the belt tooth surface		1.There are foreign objects in the transmission system 2.Abnormal surface of the pulley	1.Remove foreign objects and replace with a new belt 2.Check the surface condition of the pulley and replace it with a new one
Belt and canvas wear		1.There are foreign objects in the transmission system 2. The installation tension	1.Remove foreign objects and replace with a new belt 2. Replace the belt with a new one and set the correct

		<p>is too high</p> <p>3. Abnormal surface of the pulley</p> <p>4. Belt and pulley mismatch</p>	<p>tension</p> <p>3. Check the surface condition of the pulley and replace it with a new one</p> <p>4. Replace with a toothed matching pulley and belt</p>
Partial damage to the belt		1. Foreign objects entering the transmission system	1. Remove foreign objects and replace with a new belt
Belt side wear		<p>1. Abnormal alignment of the transmission system</p> <p>2. Defects in the edge of the pulley block</p>	<p>1. Check the alignment of the transmission system and replace it with a new belt</p> <p>2. Replace with a new pulley and belt</p>
Belt back cracking		<p>1. The ambient temperature is too high or too low</p> <p>2. Belt aging</p>	<p>1. Check the working environment and replace it with a new belt</p> <p>2. Replace with a new belt</p>

## 4.3 Front fork



Warning: The motorcycle should be firmly supported to prevent overturning.

### Remove Front fork

1. Park the motorcycle on a flat surface.
2. Place suitable brackets under the frame and engine to support the front wheels.
3. Disassembly

#### ● Front wheel

Front fender bolt ① (5 # Allen wrench)

Mudboard bracket bolt ② (5 # Allen wrench)

Front wheel speed sensor ③ (10 # sleeve)

- Headlamp ③ - Use a 6 # Allen wrench and a 13 # open-ended wrench to loosen the headlight Fixed point.

Front left and right turn signals ① and ② - Use a 5 # Allen wrench.

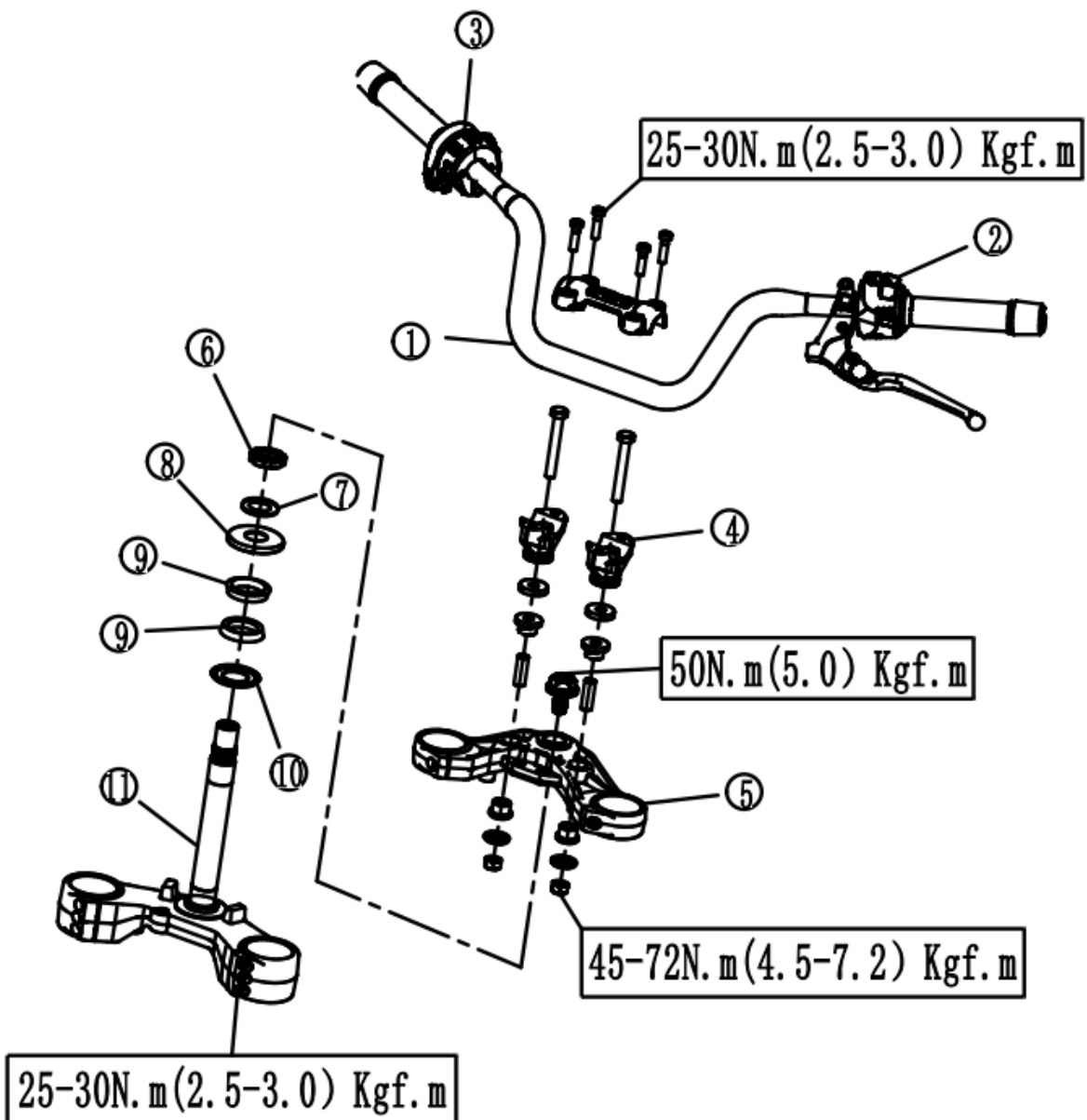
#### 5. Disassembly

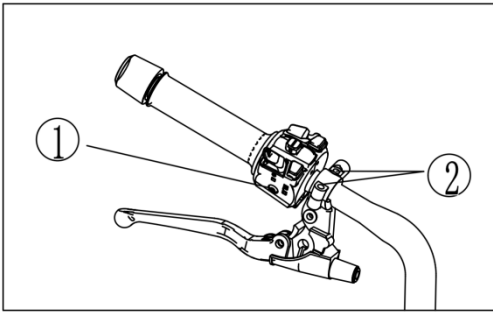
Upper and lower connecting plate locking bolts ① 6 # Allen wrench.

Remove the front shock absorber in the direction of the arrow.

## 4.4 Steering shaft and handle

- |   |                                   |
|---|-----------------------------------|
| (1) Steering handle                                       | (8) dust cover                    |
| (2) Left switch   | (9) tapered needle roller bearing |
| (3) Right switch  | (10) dust ring                    |
| (4) Lower connecting plate of steering handle fixing seat | (11) Lower connecting plate       |
| (5) Upper connecting plate                                |                                   |
| (6) Ring nut  |                                   |
| (7) Flat cushion  |                                   |

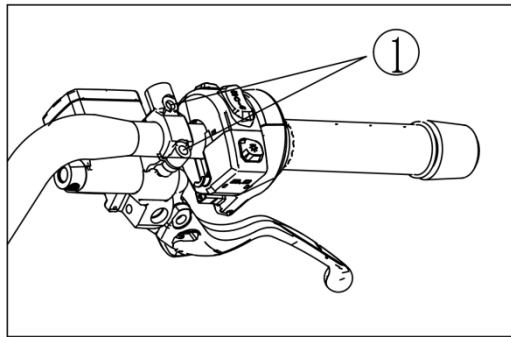




### Handle

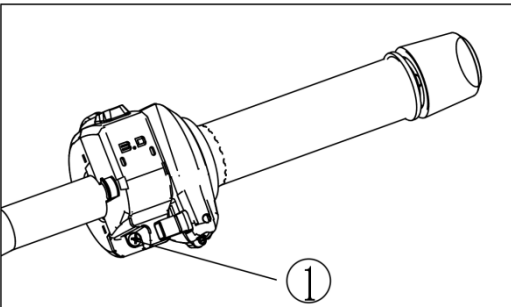
#### 1. Disassembly

- Left and right handle switches
- Clutch and brake handle



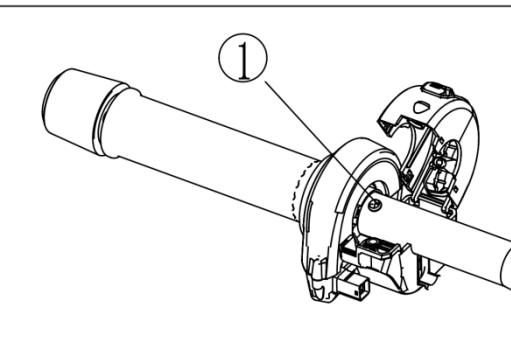
#### 2. Dismantle

- Brake handle bolt ①



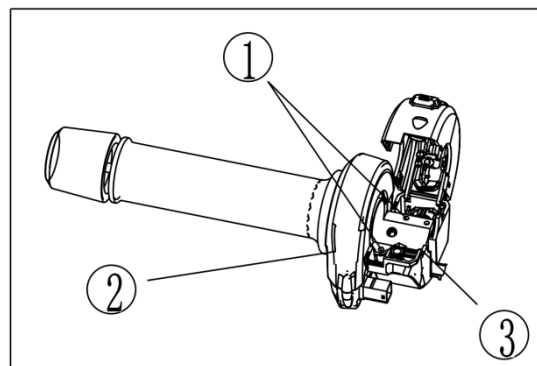
#### 3. Dismantle

- Right switch upper and lower housing fastening bolts



#### 4. Dismantle

- Right switch with the direction to put the fixing bolt

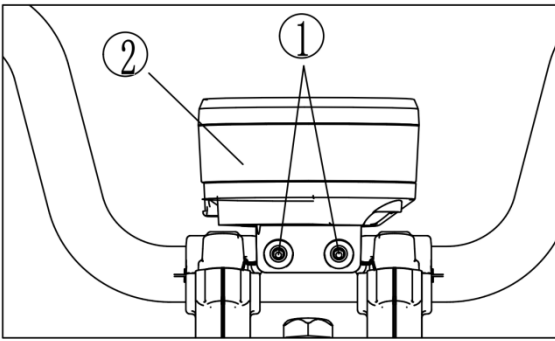


#### 4. Dismantle

- Ring nut ①
- Use a steering nut wrench ② Disassemble

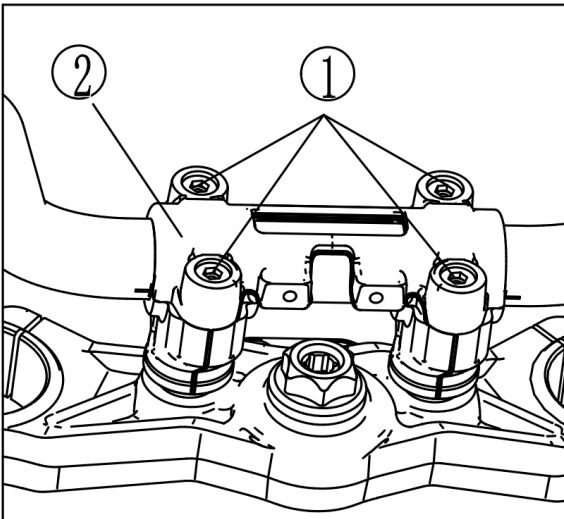
#### 5. Disassembly

- Connecting bolt ① between the right switch and the electronic throttle handle
- Separate the handle ② from the right switch ③



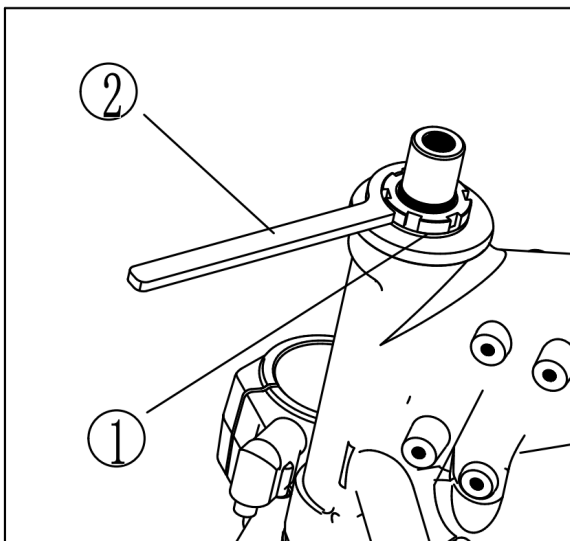
#### 6. Disassembly

- Instrument plug-in, instrument fixing bolt ①
- Remove the instrument ②



#### 7. Disassembly

- Pressing plate fixing bolt ①
- Remove the pressure plate ②



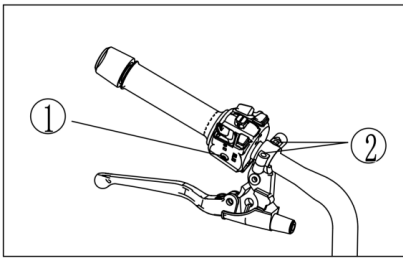
#### 8. Disassembly

- Use a steering wrench ② to remove the ring nut ①

#### ⚠ Warning

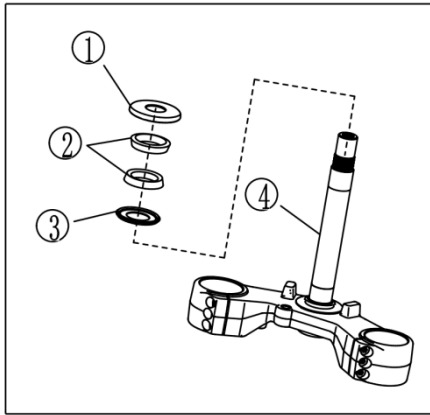
Do not attempt to straighten the bending direction of the handle, as this may weaken the handling of the handle and cause danger.





## 9. Disassembly

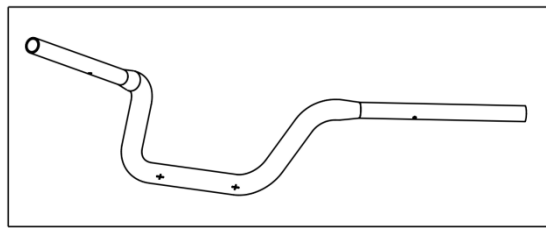
- Dust cover ①
- Needle roller bearing ②
- Dust ring ③
- Steering shaft ④



## Check the direction handle

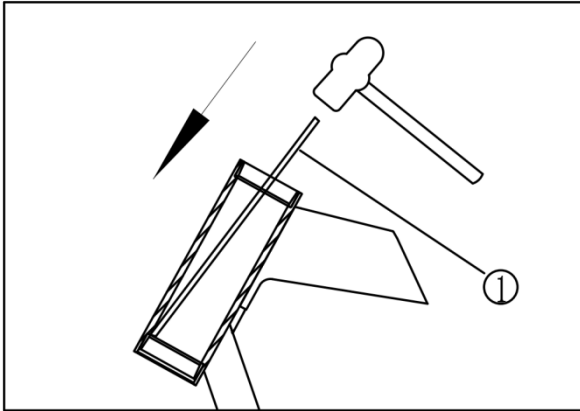
### 1. Inspection

- Left and right directional handlebars
- Bending, cracks, damage → Replace



## ⚠ warning

Do not attempt to straighten the bending direction of the handle, as this may weaken the handling of the handle and cause danger.



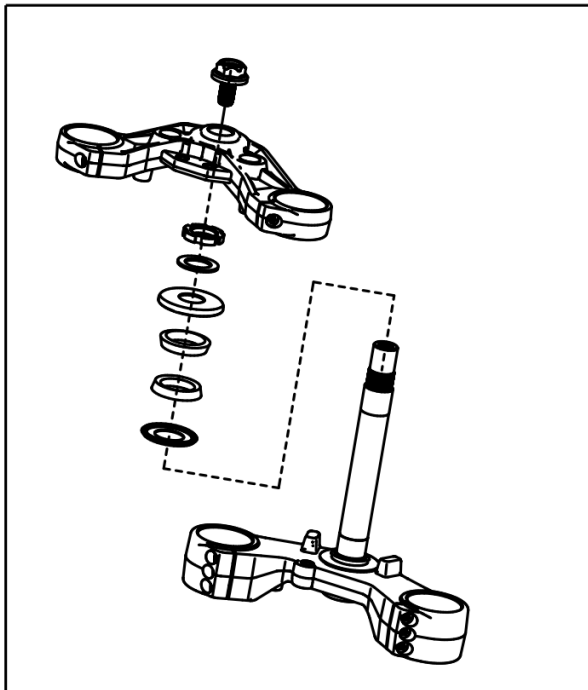
### Check front steering shaft

1. Clean the needle bearing and bearing ring seat thoroughly

2. Inspection

- Needle roller bearings
- Bearing race

Wear and damage → replace



\*\*\*\*\*  
\*

### Step :

- As shown in the figure, use a long rod (1) and a hammer to remove the bearing race
- It is taken out of the groove of the steering pipe. Install new dust seals, needle bearings, and bearing races.

\*\*\*\*\*  
\*

### Tips :

- The bearing races, needle bearings, and dust seals are always replaced as a complete set.
  - Obliquely installed bearing races can cause damage to the frame, so it is important to carefully install them in a horizontal state.
- Do not strike the needle roller and rod surface.

Install the steering shaft

### Install in the reverse order of "disassembly".

1. Apply butter

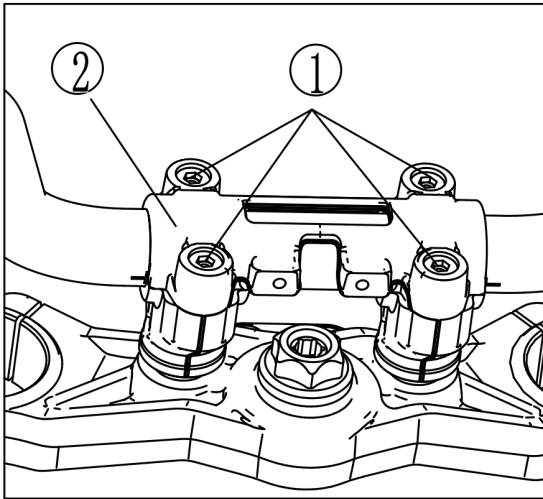
- Needle roller bearings (upper and lower)
- Bearing race (upper and lower)

Apply lithium based grease

2. Installation

- Dust ring bracket
- Dust ring
- Ring nut

After installation, make adjustments as described in Chapter 3.



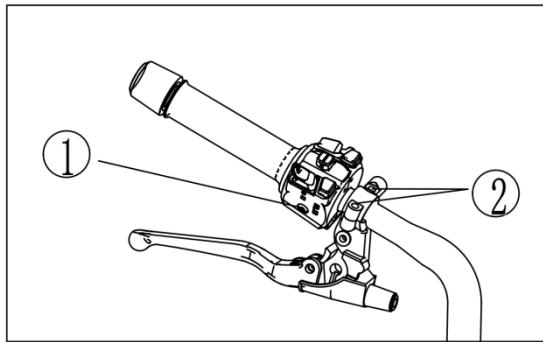
## Install handle

Pressing plate bolt ①

Tightening torque  
25-30N. m (2.5-3.0Kgf. m)

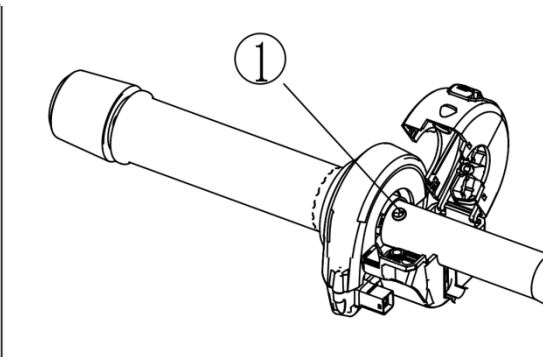
Tips :

- The middle position of the handle tube is marked and aligned with the scale line during installation.



### 2.Installation

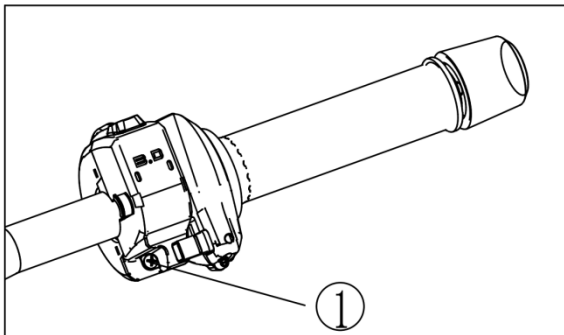
- Left switch ①
- Clutch handle ②



### 3.Installation

- Right handle switch

When installing, first connect the right switch to the handle, and then install the bolt①  
Secure the switch with the handle tube.

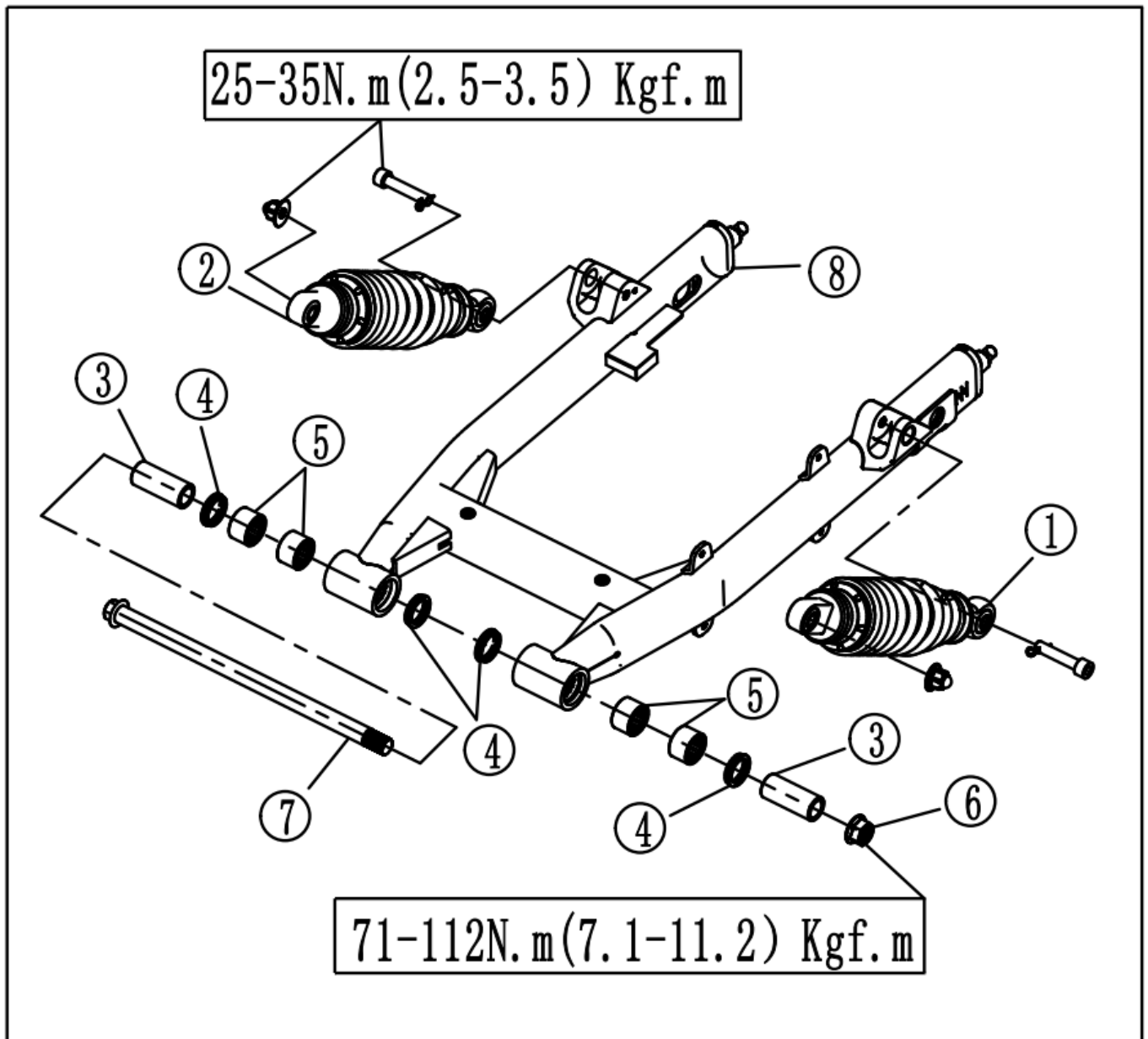


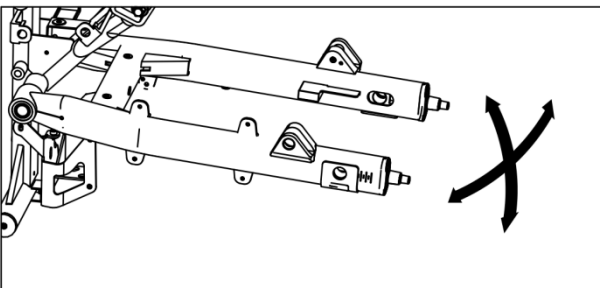
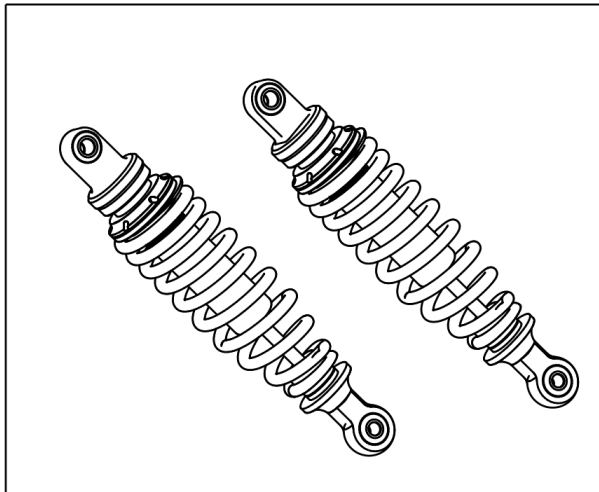
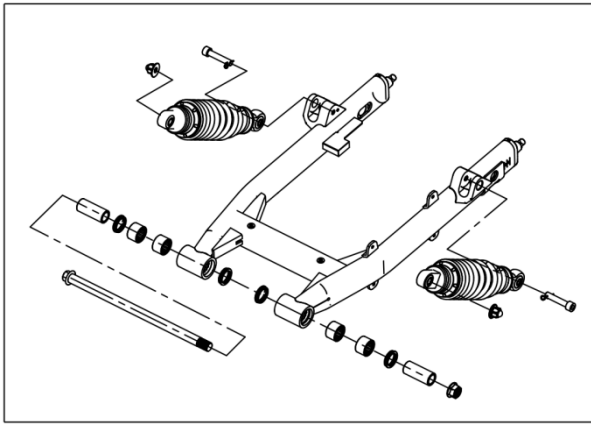
### 4.Installation

- Connecting bolts①of the upper and lower housing of the right switch
- Brake handle

## 4.5 Rear shock absorber and Rear fork

- (1) Left spring rear shock absorber
- (2) Right spring rear shock absorber
- (3) Bushing
- (4) Oil seal
- (5) needle bearing
- (6) Nut
- (7) Rear fork shaft





## Dismantle

### 1.Rear shock absorber



Warning

The motorcycle should be firmly supported to avoid overturning.

## 2.Dismantle

### ●Rear wheel

## 3.Dismantle

### ●Belt

## 4.Dismantle

### ●Screw

### ●Rear fork

#### 1.Check

If the tightness of the rear flat fork is loose, tighten the shaft nut or exchange the bushing.

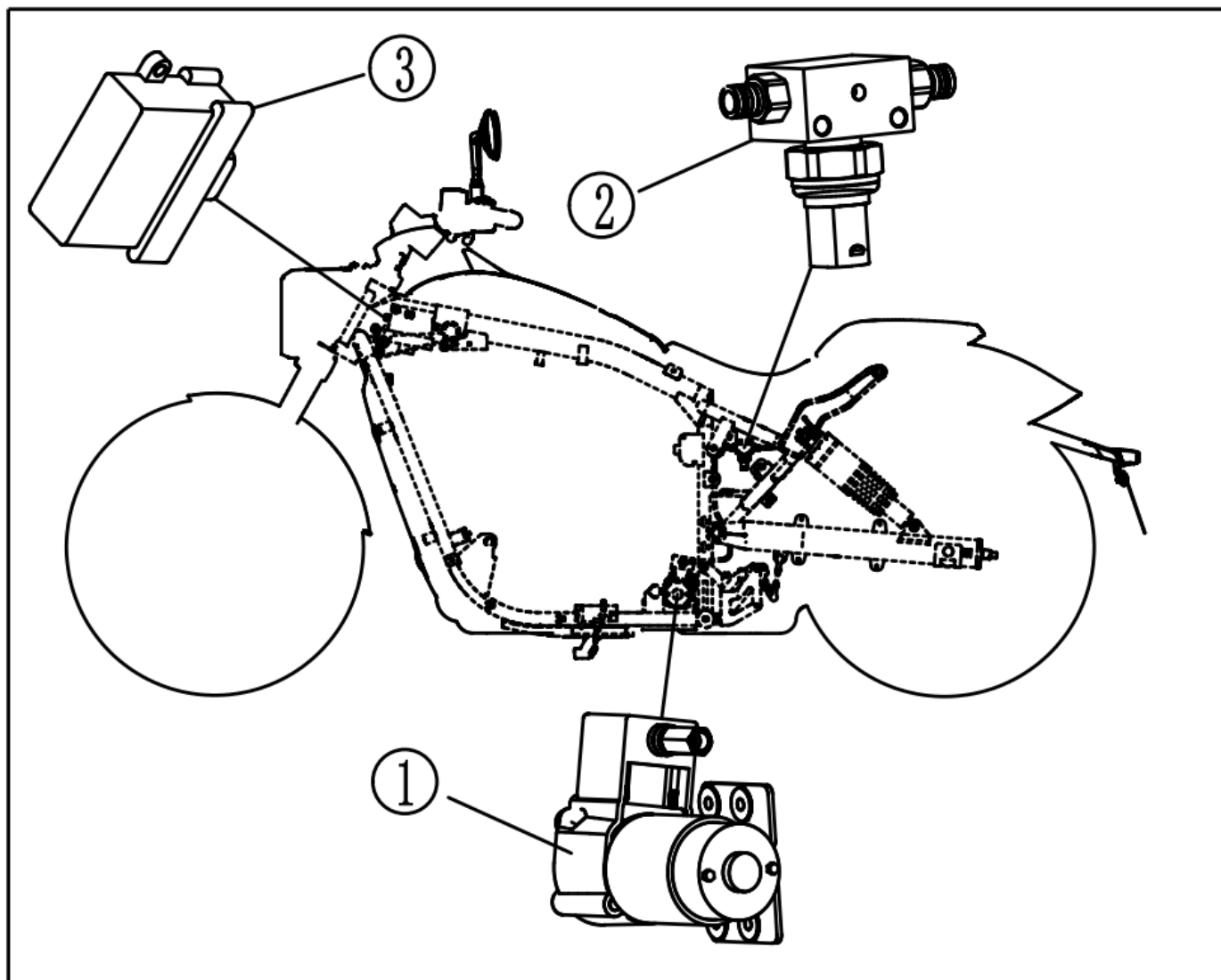
If the movement of the rear flat fork is not smooth, bent, or has rough parts, replace the bushing

#### 2. Inspection

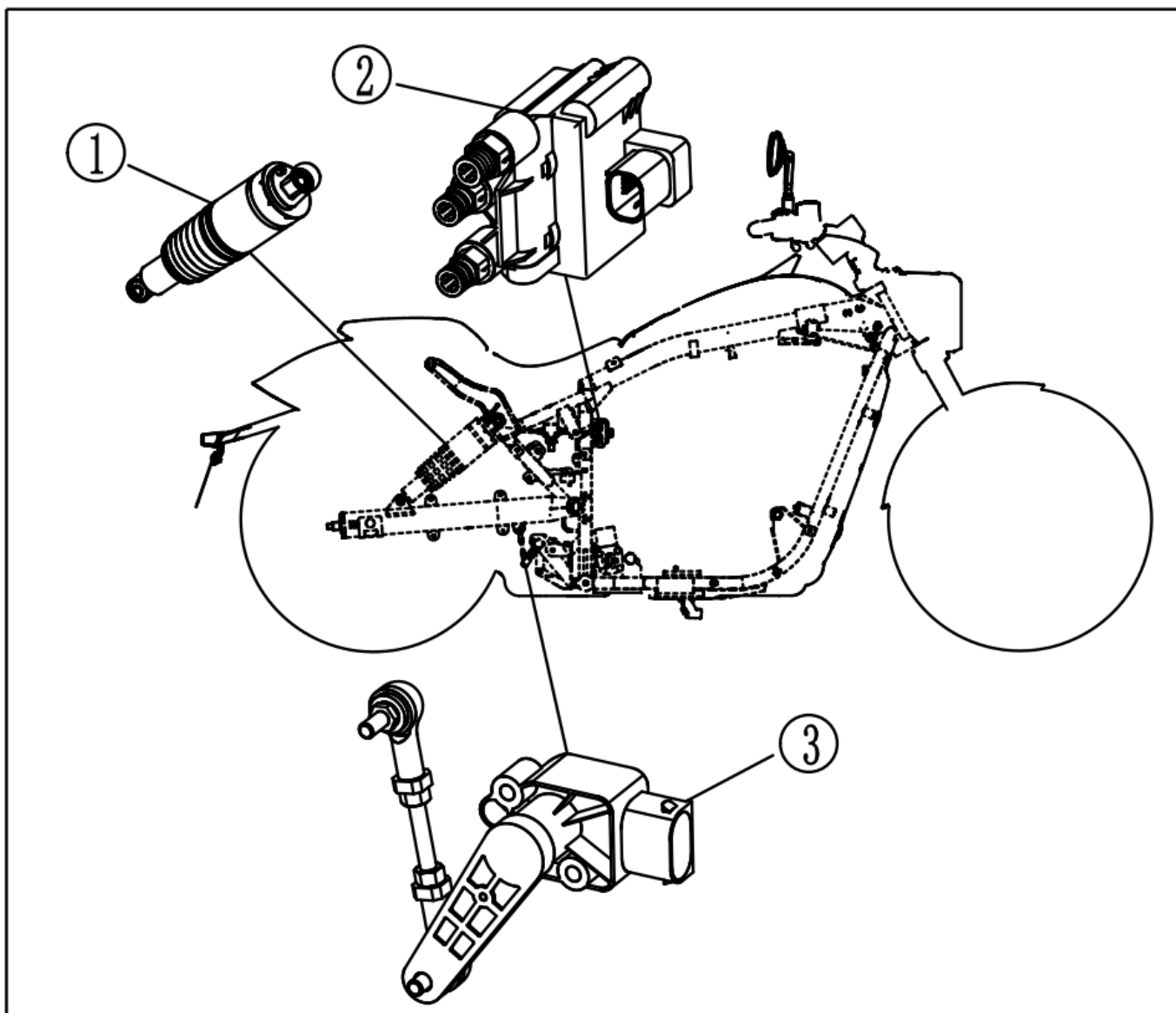
Oil leakage and deformation of the rear shock absorber → Replace

## 4.6 Airbag shock absorption vehicle model

- (1) Air pump - installed on the lower side of the frame
- (2) Pressure sensor - installed on the left rear side of the frame
- (3) Airbag shock absorber ECU - installed at the head of the frame



- (1) Airbag rear shock absorber
- (2) Distribution valve - installed in the middle square tube of the frame
- (3) Height sensor installed on the right side of the ABS control unit mounting bracket and rear fork

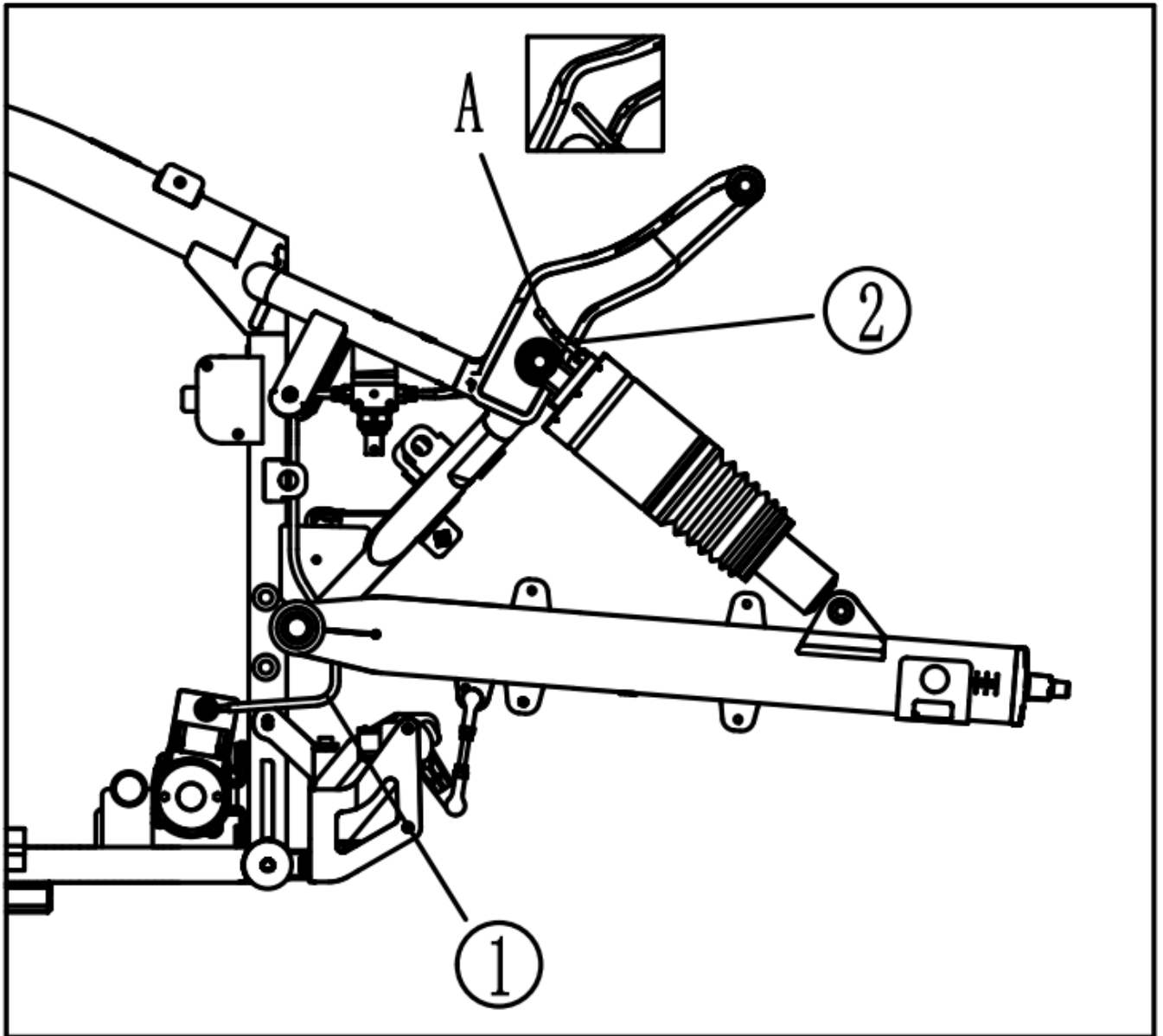


## 4.7 Air duct distribution of airbag rear suspension system

(1) Formed gas pipe - air pump connection distribution valve

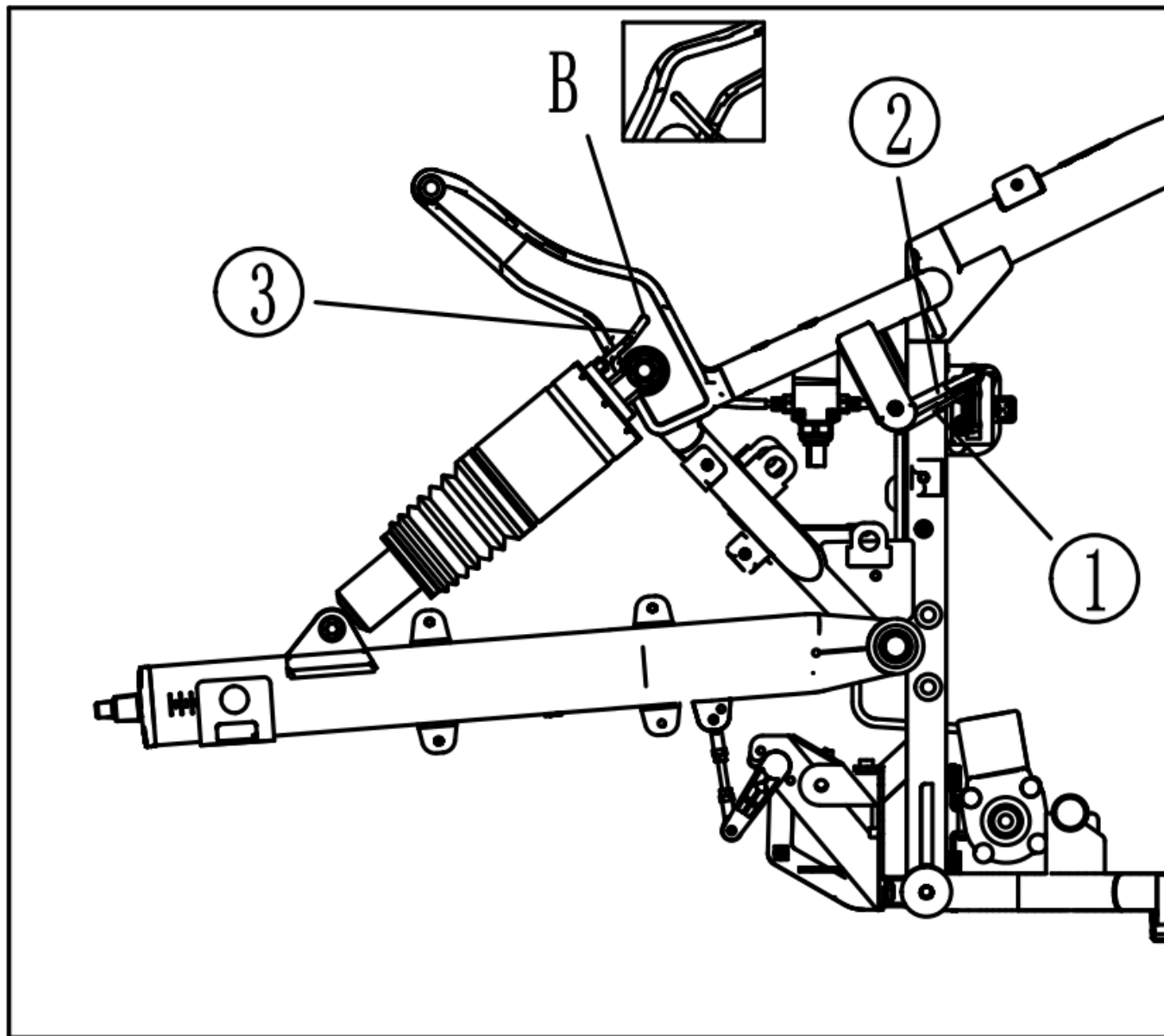
(2) Formed air pipe - pressure sensor connected to left airbag rear shock absorber

A The air pipe passes through the small hole at the rear of the frame

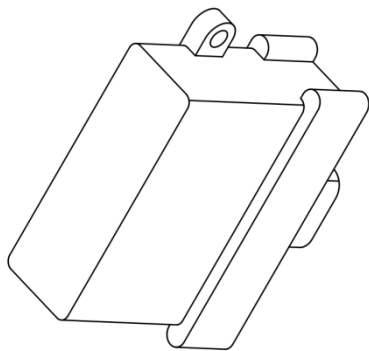




- (1) Formed gas pipe - air pump connection distribution valve
  - (2) Formed gas pipe - distribution valve connection pressure sensor
  - (3) Formed air pipe - pressure sensor connected to right airbag rear shock absorber
- B Air pipe passes through the small hole at the rear of the frame

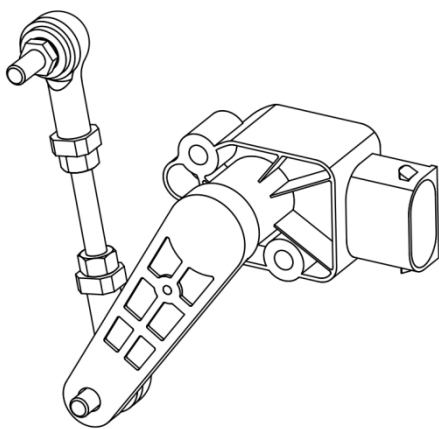


## 4.8 Maintenance precautions for airbag rear suspension system



### • ECU controller

It is strictly prohibited to directly touch the controller pin to prevent static electricity from damaging the internal components of the controller; If there is a replacement controller, it is necessary to insert the connector in place to ensure normal communication and good sealing; Unauthorized disassembly of the controller is strictly prohibited. Any problems caused by unauthorized disassembly shall be the responsibility of the disassembler. When washing the car, it is strictly prohibited to spray high-pressure water guns directly around the parts (especially at the connectors) to prevent water from rushing into the interior.



- **Piping** The inlet and outlet of the shock absorber must not be stepped on or pressed to avoid abnormal phenomena such as bending or flattening of the air duct. During vehicle maintenance, regularly check for any bent or cracked air ducts. If there are any abnormalities such as bent or cracked air ducts, please go to the nearest 4S store to replace the air ducts to avoid affecting the air ducts and causing abnormal body lifting.

During maintenance, check for any air leaks in the pipelines and ensure that the vehicle can be lifted and lowered normally.

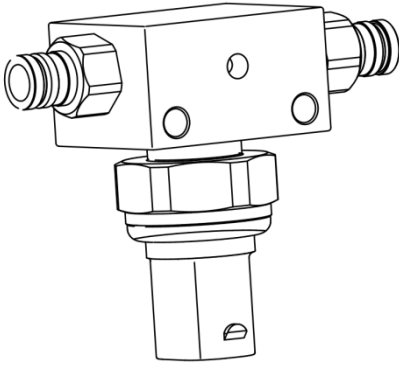
### • Harness

Regularly check the connectors for looseness, detachment, damage, etc. Regularly check the relays and fuses for any abnormalities, and if there are any abnormalities, replace the corresponding components in a timely manner. When washing the car, it is strictly

prohibited to spray high-pressure water guns directly around the parts (especially at the connectors) to prevent water from rushing into the interior.

- **Height sensor**

Regularly check if the relevant bolts of the height sensor assembly are loose, tighten them regularly, and tighten them to a torque of 5-7 n-m; If the vehicle disassembles components such as height sensors and pull rod assemblies, it is necessary to recalibrate the vehicle height (refer to the automatic calibration function). When washing the car, it is strictly prohibited to spray high-pressure water guns directly around the parts (especially at the connectors) to prevent water from rushing into the interior.



- **Regularly check the install bolts of the pressure sensor** for looseness and tighten them regularly.

When washing the car, it is strictly prohibited to spray high-pressure water guns directly around the parts (especially at the connectors) to prevent water from rushing into the interior.

- **Air pump**

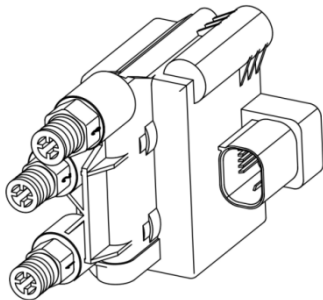
Regularly check the installation bolts, bracket tightening bolts, pipelines, and connectors for looseness, and tighten them regularly.

Vehicles are strictly prohibited from wading in water to avoid water flooding the air pump and causing damage to the air pump.

When washing the car, it is strictly prohibited to use a high-pressure water gun to directly spray around the air pump (especially at the pump body and connectors) to prevent water from rushing into the interior.

- **Inspection of vulnerable parts of air pump**

The air pump is a vulnerable component and needs to be regularly checked for normal air supply. When not overweight, the sport mode and cruise mode can be switched normally, and the vehicle height can be raised and lowered normally. If the cumulative working time of the air pump reaches 200h, it is necessary to replace the air pump or related components.

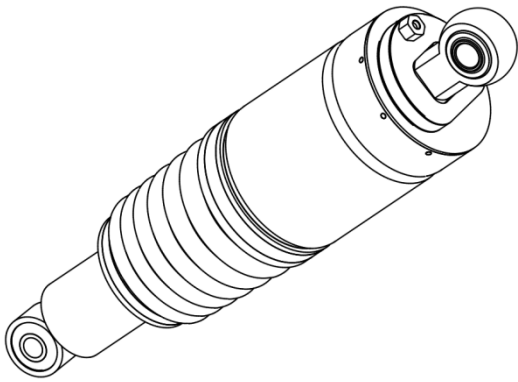


- **Distribution valve**

Regularly inspect the installation bolts, pipelines, and connectors for looseness.

When washing the car, it is strictly prohibited to spray high-pressure water guns directly around the parts (especially at the connectors) to prevent water from rushing into the interior.

- **Air spring shock absorber**



Squeezing or stepping on the air intake of the air spring shock absorber is strictly prohibited to prevent any abnormal phenomena such as bending or flattening of the pipeline, which may affect the normal lifting and lowering of the vehicle body. Regularly check whether the air spring shock absorber can lift and lower normally, and whether there are any abnormalities such as cracks in the airbag.

- **Requirements for replacing vulnerable parts of air spring shock absorbers**

A. Air spring assembly, dust cover, shock absorber, dust cover, buffer block:

- √ Use for 2 years or 30000 kilometers (whichever comes first), replacement is recommended;

- √ After 3 years of use or 50000 kilometers (whichever comes first), mandatory replacement is required.

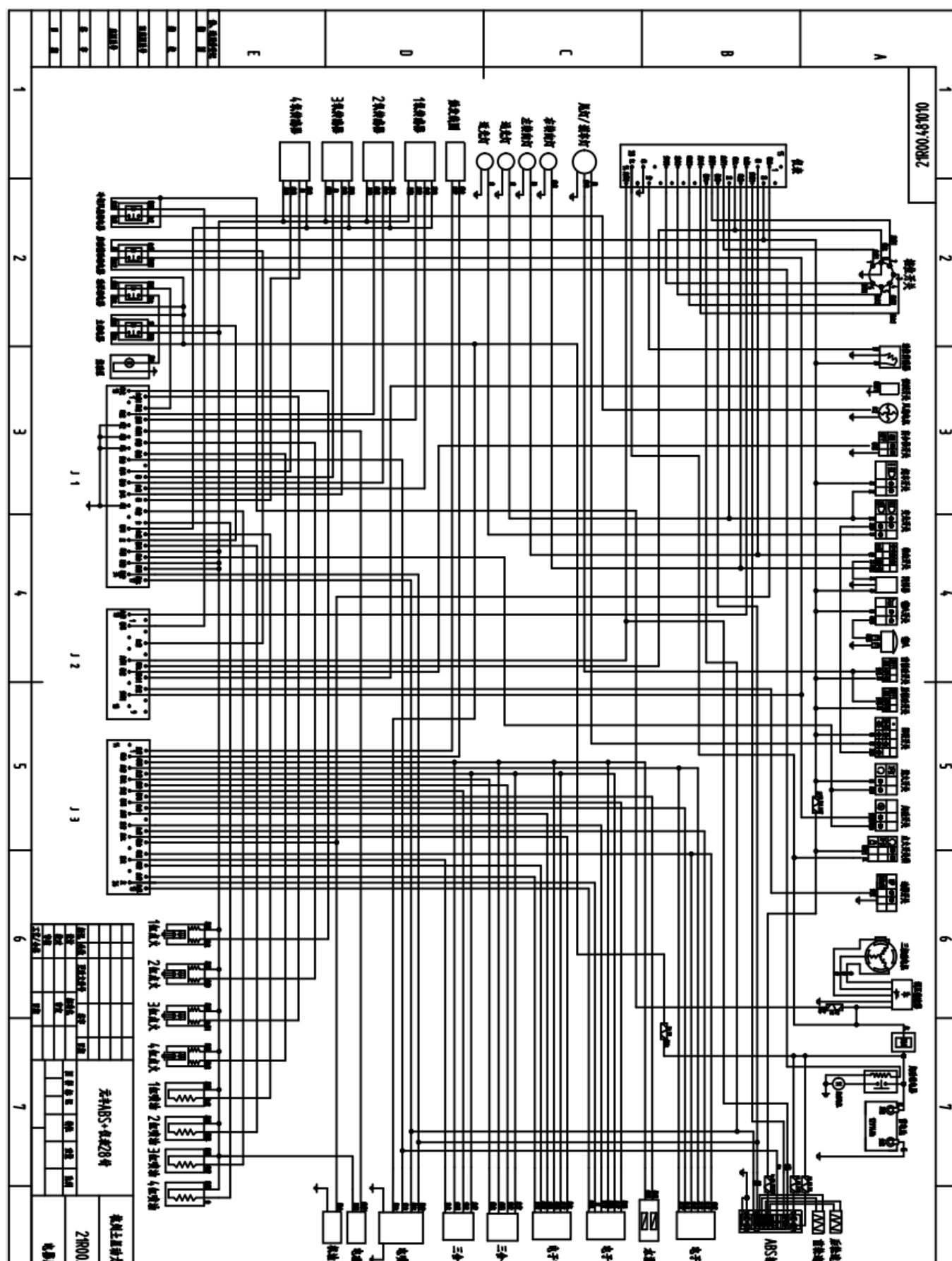
- √ If a component is damaged within 2-3 years or 30000 to 50000 kilometers, the damaged component can be replaced separately.

B. O-ring and rubber sleeve:

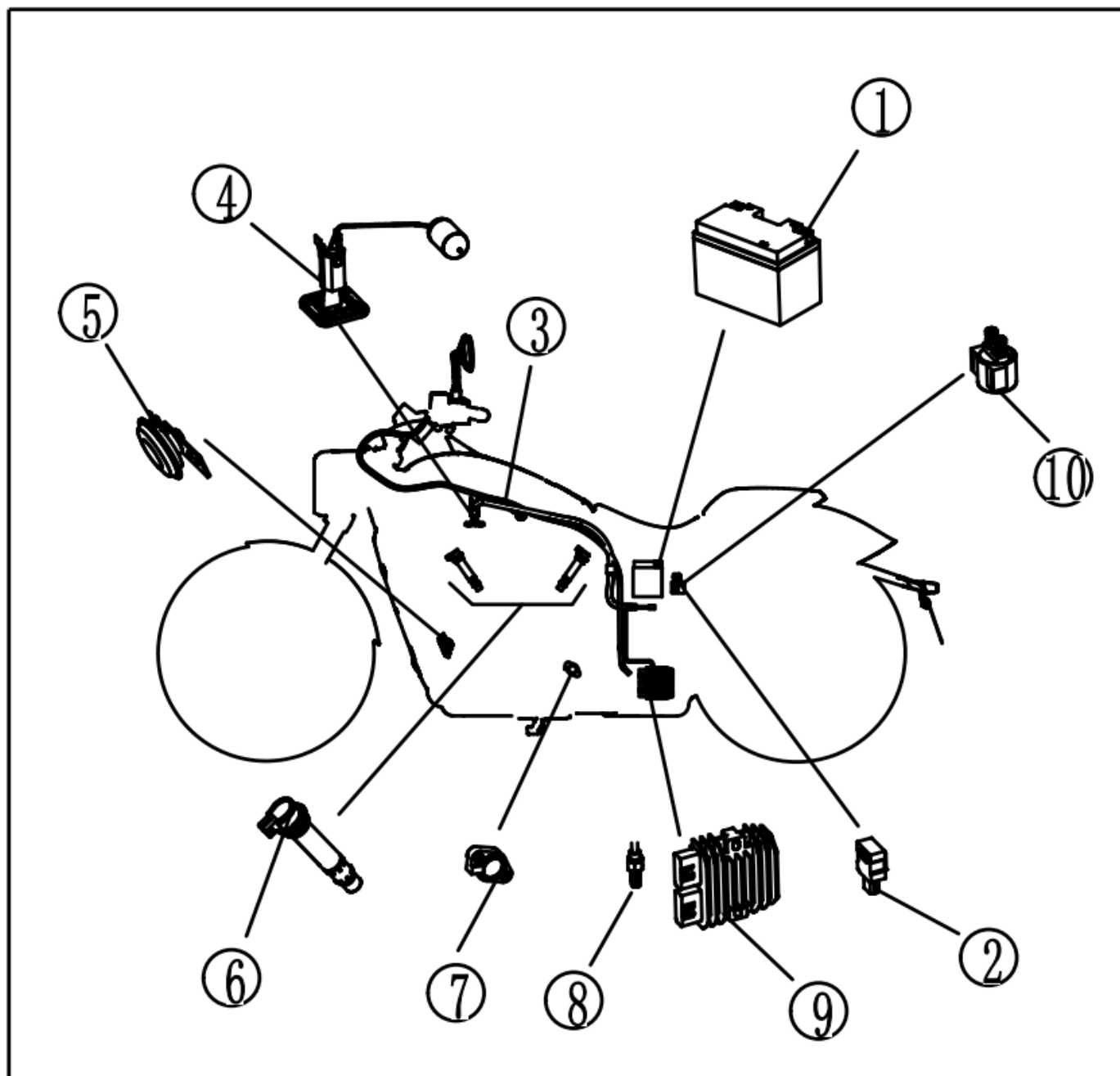
2 years or 20000 kilometers (whichever comes first), mandatory replacement.

## The Fifth Chapter. Electrical

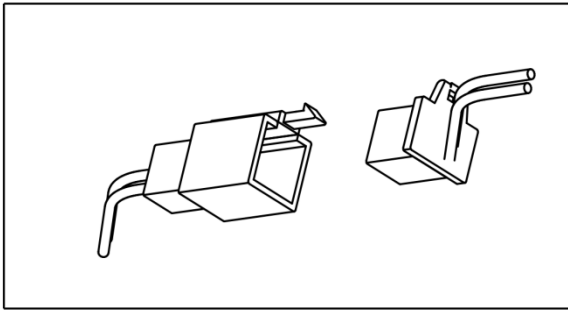
## 5.1 Circuit diagram



- |                 |                                  |
|-----------------|----------------------------------|
| (1) Battery     | (6) Spark plug cap               |
| (2) Flasher     | (7) gear display                 |
| (3) Main cable  | (8) rear brake switch            |
| (4) Fuel sensor | (9) voltage regulating rectifier |
| (5) Horn        | (10) activation relay            |



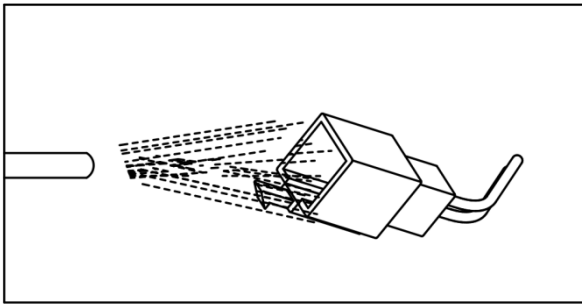
## 5.2 Connector inspection



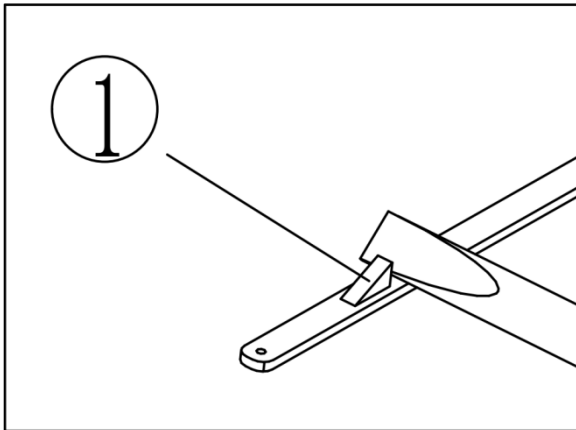
Dirt, rust, moisture, etc. on the connector should be removed.

1. Detachment

● Connector



2. Blow dry each terminal with air



3. Each connector should be connected and disconnected 2-3 times.

4. Check the wire by pulling it by hand to ensure that it does not come out.

5. If the terminal is pulled out by hand, bend the pin ① and reinsert the terminal into the connector.

6. Connection

● Connector

7. Use a multimeter to check for continuity.

Tips :

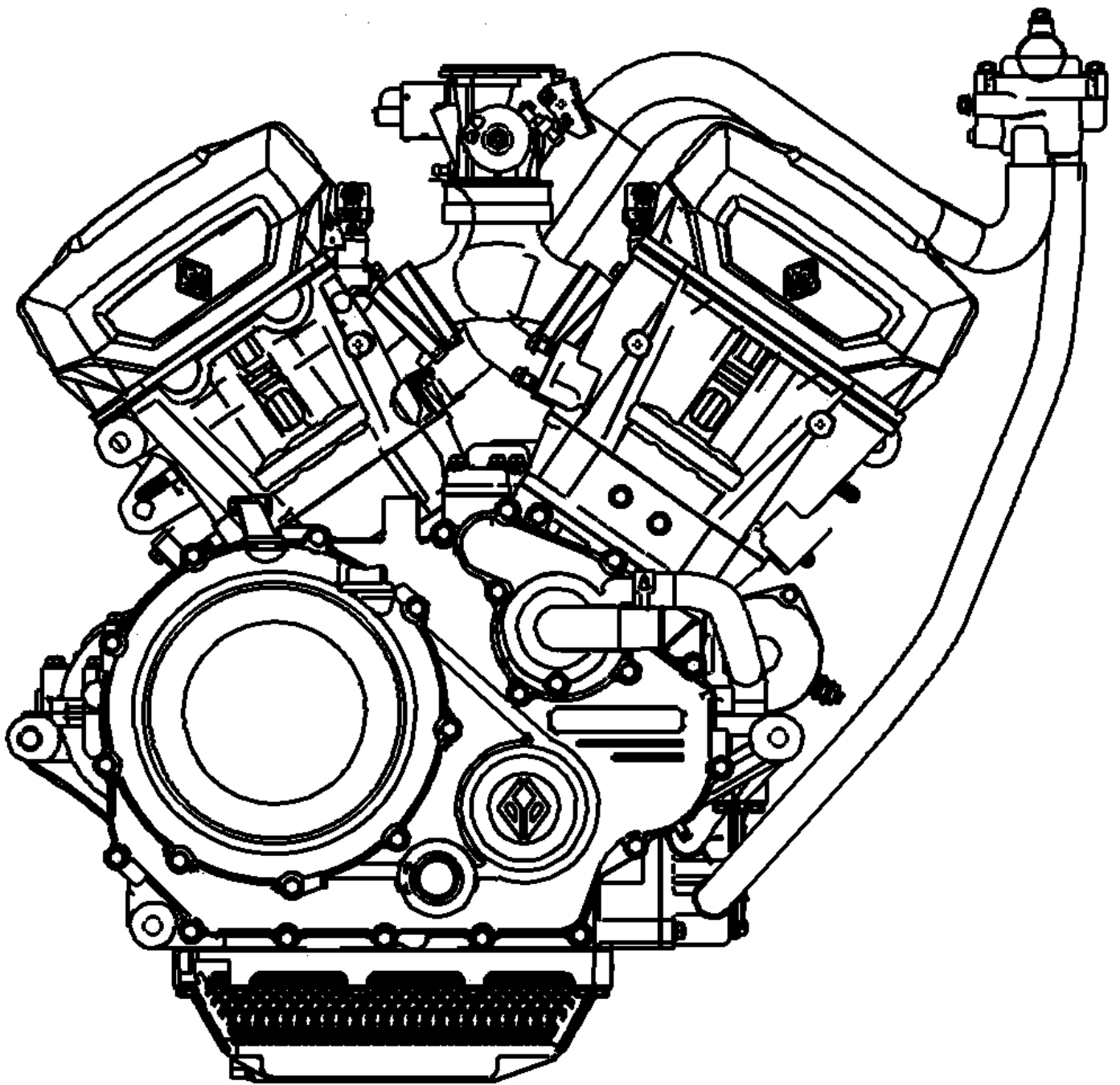
If it is found that the circuit is not conducting, clean all wiring terminals.

Whenever checking the wiring harness, be sure to follow steps 1-7 for inspection.

Connect the multimeter to the connector for inspection, as shown in the figure.





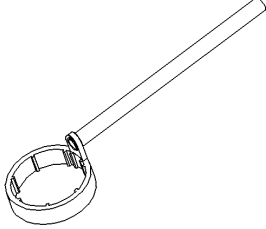
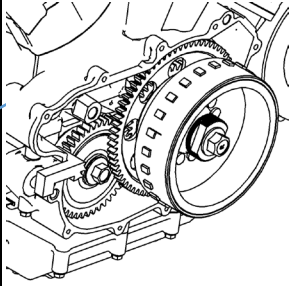
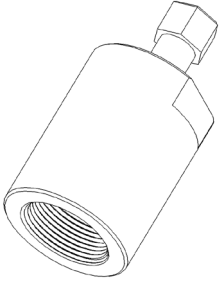
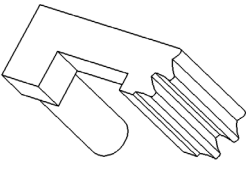
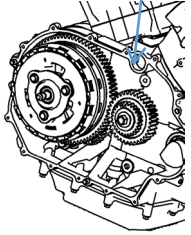


The correct maintenance process is crucial for the safety of maintenance personnel and the reliability and safety of the engine.

- When two or more people work together, they should pay attention to safety.
- When starting the engine indoors, it is necessary to ensure that the exhaust gas is discharged outdoors.
- When working, When using toxic or flammable materials, it is necessary to strictly follow the manufacturer's instructions and ensure smooth ventilation in the workplace.
- It is strictly prohibited to use gasoline as cleaning fluid.
- To avoid burns, do not touch uncooled engine, oil, and exhaust system components.
- If the fuel, lubrication, and exhaust systems have been repaired, their markings and leaks must be checked.
- To protect the natural environment, do not dispose of engine oil and unused parts at will.

**Warning:**

- When repairing and maintaining, if it is necessary to replace parts, genuine components from Hangzhou Saturn Power Technology Co., Ltd. or recommended products must be used.
- Disassembled components that need to be reused should be arranged in order to avoid confusion during assembly.
- Ensure the use of specialized tools in accordance with the requirements specified in the maintenance manual.
- Ensure that the components used for assembly are clean and that the areas that require lubrication must be lubricated.
- Use specialized lubricants, adhesives, and sealants.
- When tightening bolts, screws, and nuts, first tighten the ones with larger specifications and tighten them from the inside out according to the specified torque.
- Use a torque wrench to tighten bolts with torque requirements. If grease and oil are stuck on the threads, they must be wiped off.
- After disassembling the components, they should be inspected and cleaned before measurement.
- After assembly, inspect the fastening and operation of the components.
- Do not use disassembled oil seals, gaskets, self-locking nuts, locking washers, cotter pins, elastic retaining rings, and other components during assembly. New parts should be replaced.

Special tools and codes	Disassembly and assembly of related components and descriptions	Special tools and codes	Disassembly and assembly of related components and description
GZ453-10013	Clutch stop tool 	GZ453-10012	Disassembly and assembly of magnetic motor rotor bolts Disassembly and assembly of balance shaft bolts 
272V0.GZ1014	Dismantling fixture for magneto rotor 		Disassembly and assembly of clutch drive gear bolts 

453 Engine torque table		
Program	Torque (N.m)	Note
Countersunk screw M6X8	6	Tightening adhesive
Oil pressure sensor	15	Tightening adhesive
Screw plug Rc1/8	15-18	Tightening adhesive
Screw plug ( M16X1.5 )	23-25	Tightening adhesive
Shift lever spring return pin	20 ~ 23	Tightening adhesive
Variable speed drum cylindrical head bolt M8X20	20-25	
Gear display cylindrical head bolt M5X20	5-7	
Positioning wheel bolt M6	10-12	
Con-rod bolt	15 →30→50	
Box bolt M8X95	15 → 30	
Box bolt M6X40 Gray	13-14	
Box boltM8X45	15 →25	
Box boltM8X70	15 →25	
Box bolt M6X65 Gray	13-14	
Balance shaft driven wheel bolt M10X1.25LHX12	52-54	Tightening adhesive
Rotor bolt M12X1.25X30	118-120	Tightening adhesive
Cylinder cover screw plug	23-27	Sealant
Water temperature sensor	24	Sealant
Cylinder cover screw plug	15 →30→50	
Tension plate bolt	10-12	
Timing sprocket bolt M6X12	17-20	Tightening adhesive
Water pump drive gear bolt M10X1.25LHX25	80-83	Tightening adhesive
Clutch combined bolt	12-15	
Clutch bolt M22X1	125-128	Tightening adhesive
Spark plug	12-16	
TriggerM5X12	6-8	
Top dead center screw plug	22-25	
Turning crankshaft hole	22-25	
Oil drain plug M14X12	22-25	
Oil pressure relief valve	25-30	Tightening

		adhesive
TMAP Sensor cross slot screwM4X20	6	
Other unspecified M5	6	
Other unspecified M6	10	
Other unspecified M8	25	
Other unspecified M10	40	

453 Engine technical Parameters(First)				
Program		Specification		
		BD453V0MR		
Type		V- type, four cylinder,four stroke,water cooling,overhead camshaft		
Bore×stroke		53.5mm×55.2mm		
Total displacement		496mL		
Compression ratio		11.5:1		
Minimum no-load		1400r/min±100r/min		
Starting method		Electronic start		
Power		40kw/10000rpm		
Electrical system	Ignition method		ECU ignition	
	Spark plug		CR 8 E ( NGK )	
	Electrode gap		0.8~0.9 mm	
	Magneto form		Permanent magnet three-phase AC engine rotor flywheel type	
Combustion system	Combustion chamber type		Triangular combustion chamber	
	Air filter		Dry paper element	
	Gasoline		92# or above unleaded gasoline	
Air distribution system	Gas distribution method		DOHC/Chain drive	
Lubricating system	Lubrication method		Pressure lubrication	
	Oil pump type		Rotor type	
	Filter type		Full flow filtration paper filter cartridge	
	Oil grade		SAE15W/50	
	Oil amount		3.8	
Cooling system	Cooling method		Closed coolant circulation cooling	
	Type of coolant		-35° C Rust proof antifreeze solution	
Drive system	Clutch type		Wet multi plate sliding clutch	
	Transmission method		Six speed constant mesh continuously variable transmission	
	Decelerator gear		6 gear	
	Shift mode/sequence		Mechanical reciprocating/1- N -2-3-4-5-6-5-4-3-2- N -1	
	Transmission ratio	Primary transmission ratio	2.17	
		First gear	3.071	

			Second gear	2.235
			Third gear	1.777
			Fourth gear	1.52
			Fifth gear	1.333
			Sixth gear	1.214
External size	550mm × 475mm × 540mm			
Net mass	71KG			
Output mode	Pulley output			
Engine output rotation direction	Looking counterclockwise from the left end of the engine when moving forward			



Engine technical parameter(Second)		
Inlet valve clearance		0.10±0.02
Outlet valve clearance		0.20±0.02
Number of valves		Exhaust 8 Enter8
Work voltage ( V )		12V
Piston diameter	Size A	53.465-53.47
	Size B	53.46-53.465
	Size C	53.455-53.46
Cylinder diameter	Size A	53.5-53.505
	Size B	53.495-53.5
	Size C	53.49-53.495
Installation clearance of piston cylinder	New conditions	0.03mm-0.04mm
	Wear limit	0.08mm
End clearance of piston ring		0.03-0.05mm
Jumping at the crankshaft bearing shell		Less than 0.03mm
Gap between con-rod big end and crankshaft crank		0.1mm-0.3mm
Camshaft runout		Less than 0.012mm

# The sixth Chapter Engine

## 6.1 Waterway inspection and maintenance

### 6.1.1 Notice :

• When the engine is very hot, removing the radiator cap may cause coolant to spray out and cause serious burns to people. Dismantling and scattering.

Before covering the heat exchanger, make sure to let the engine and radiator cool down.

The use of coolants containing silicate corrosion inhibitors may cause water pump seal wear or radiator blockage. Using tap water may cause engine damage.

The coolant should be inspected and replaced according to the maintenance plan.

When adding or replacing coolant, do not use non ethylene glycol coolant, tap water, or mineral water.

Improper use of coolant may cause damage, such as engine corrosion, blocked cooling channels, or radiator and water pump seal is worn out prematurely.

After repairing the system, use a coolant detector to detect leaks.

### 6.1.2 Troubleshooting of abnormal water temperature

Waterway diagram(See detailed drawing on the next page)

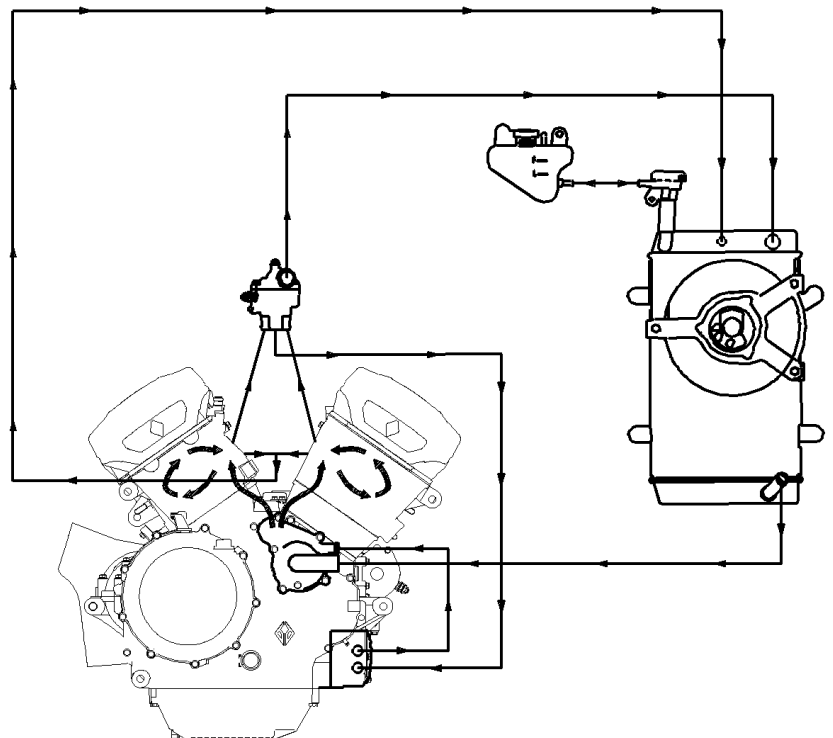
#### 1 High engine temperature

High temperature coolant temperature indicator or water temperature sensor malfunction

- Thermostat stuck or closed
- Radiator cover malfunction
- Insufficient coolant
- Radiator, Blocked channels with hoses or water jackets
- Inlet system
- Cooling fan motor malfunction
- Fan controller relay malfunction
- Water pump malfunction

#### 2 Low Engine temperature

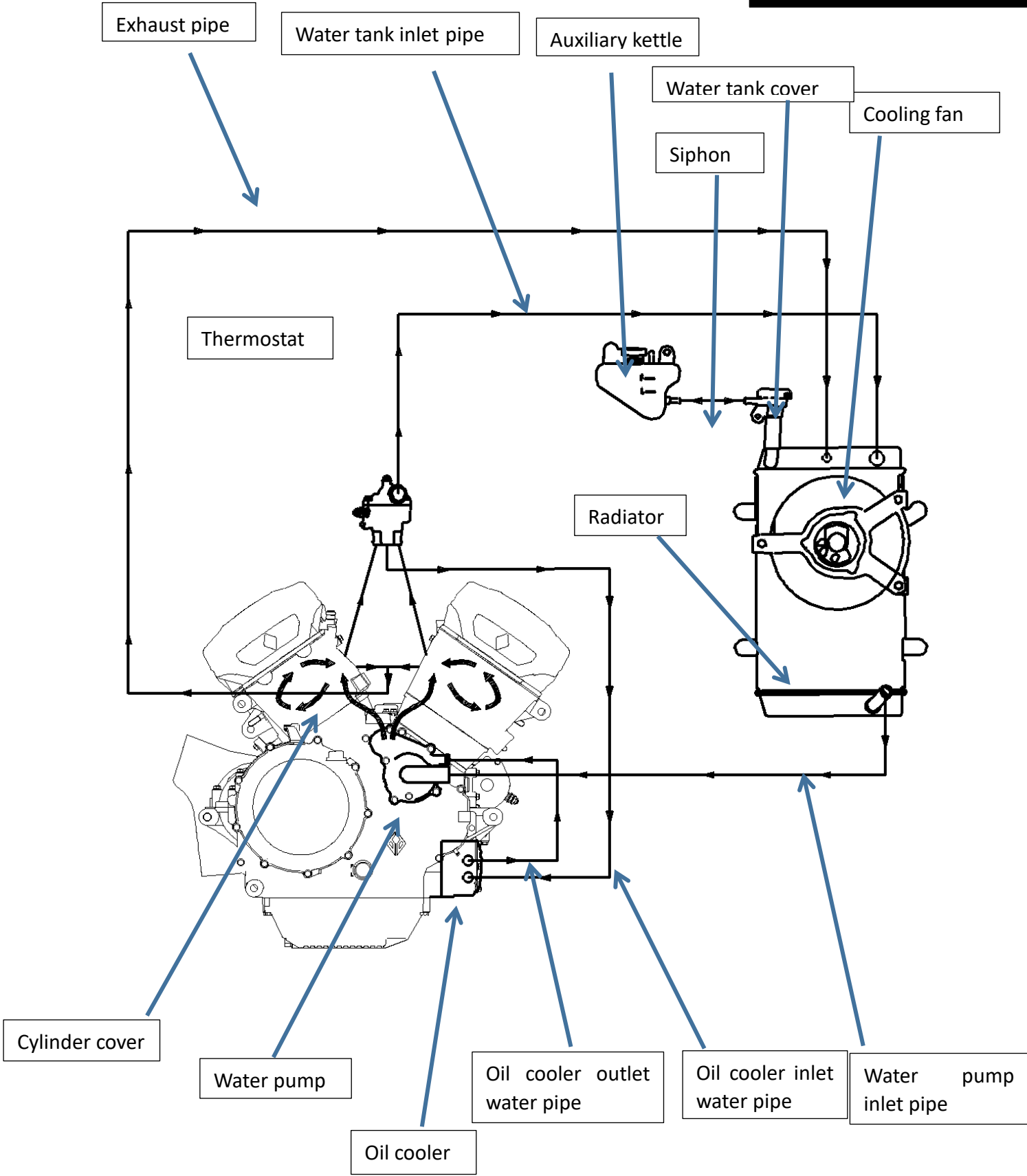
- High temperature coolant temperature indicator or water temperature sensor malfunction
- Thermostat stuck



- Fan control relay malfunction

### 3 Coolant leakage

- Mechanical seal failure of water pump
- O-ring deterioration
- Radiator cover malfunction
- Damaged or deteriorated cylinder head gasket
- Loose hose connections or clamps
- Damaged or deteriorated hoses
- Damaged radiator



## 6.2 Oil circulation inspection and maintenance

### 6.2.1 Notice:

The engine can be repaired with oil pump of the frame, The disassembly and installation of the oil pump maintenance procedure must be carried out with the oil drained. When using it, attention should be paid not to let dust or dirt enter the engine. After installing the oil pump, check if the engine oil pressure is normal. If any part of the oil pump is damaged beyond the specified usage limit, the oil pump assembly should be replaced.

### 6.2.2 Abnormal oil pressure troubleshooting

#### 1 Oil level too low

- Oil consumption Oil circulation diagram (PICS as follows)
- External oil leakage
- Piston ring wear
- Improper installation of piston ring
- Cylinder wear
- Valve oil wear
- Valve conduit wear

#### 2 Low oil pressure

- Low oil level
- Oil filter clog
- Internal oil leakage
- Use the incorrect oil

#### 3 No oil pressure

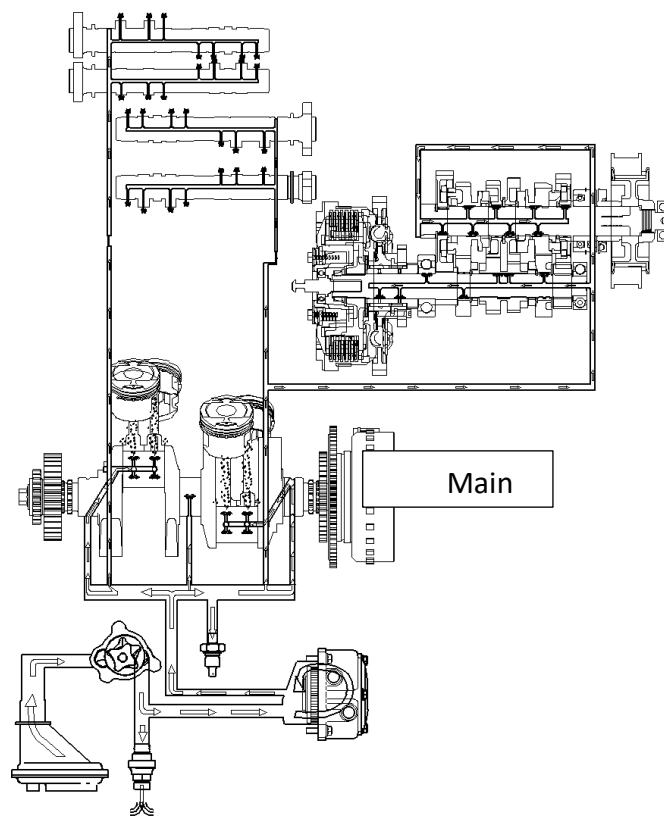
- Oil level too low
- Oil pressure relief valve stuck
- Oil pump transmission chain broken
- Oil pump transmission or driven sprocket broken
- Oil pump damaged
- Internal oil leakage

#### 4 High oil pressure

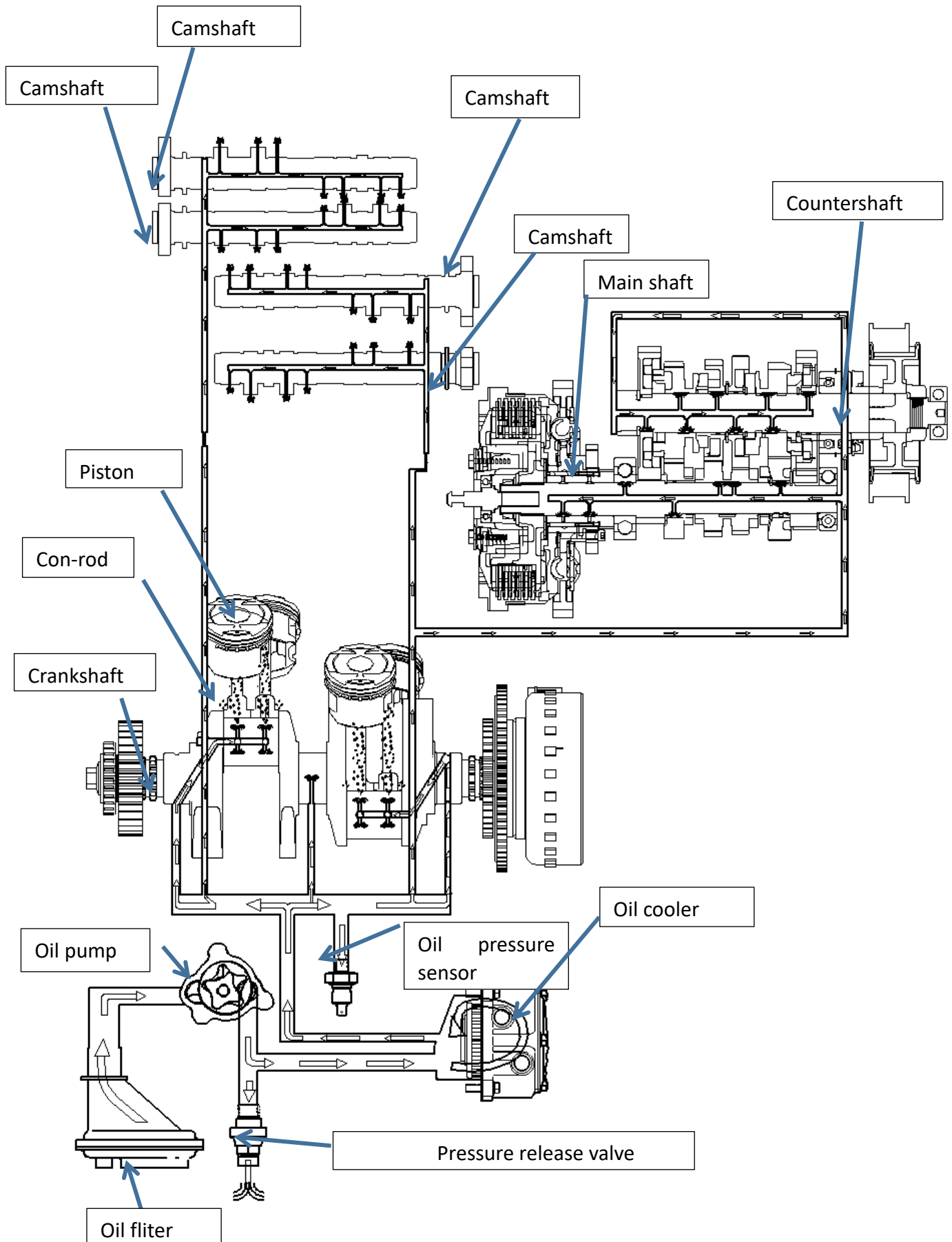
- Oil pressure relief valve stuck or closed
- Blocked oil filter channel or metering hole
- Using incorrect engine oil

#### 5 Oil emulsification

- Cylinder head gasket damage
- The coolant leaks into the oil passage
- Water ingress

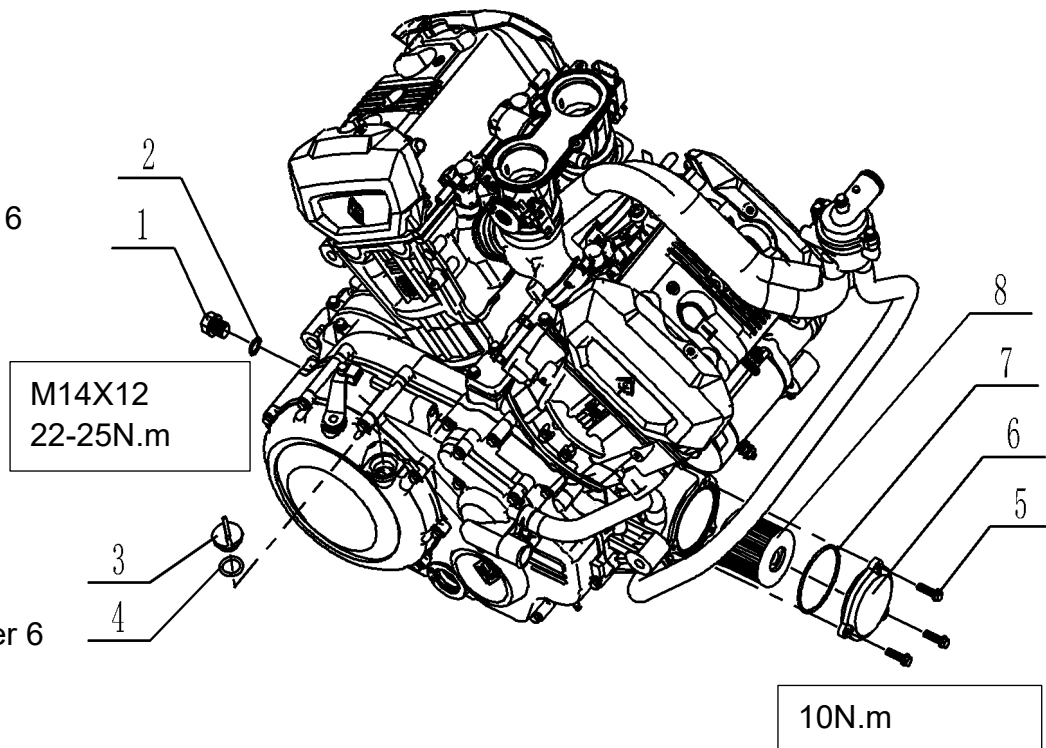


Oil circulation diagram



### 6.2.3 Change engine oil and oil filter element

- Remove the combination of oil dipstick 3 and o-ring 4
- Remove the oil drain bolt 1 and gasket 2
- Drain the engine oil
- Remove bolt 5
- Remove oil filter cover 6
- Remove the o-ring 7
- Remove element 8
- Replace oil element 8
- Assemble o-ring 7
- Assemble oil filter cover 6
- Tightening bolt 5
- Assemble gasket 2 and tighten the oil drain bolt A1
- Inject oil into the oil dipstick hole 3.8L
- Tighten the oil dipstick combination 3 and tighten it by hand



#### Attention

Be careful of burns when draining oil from the hot engine.

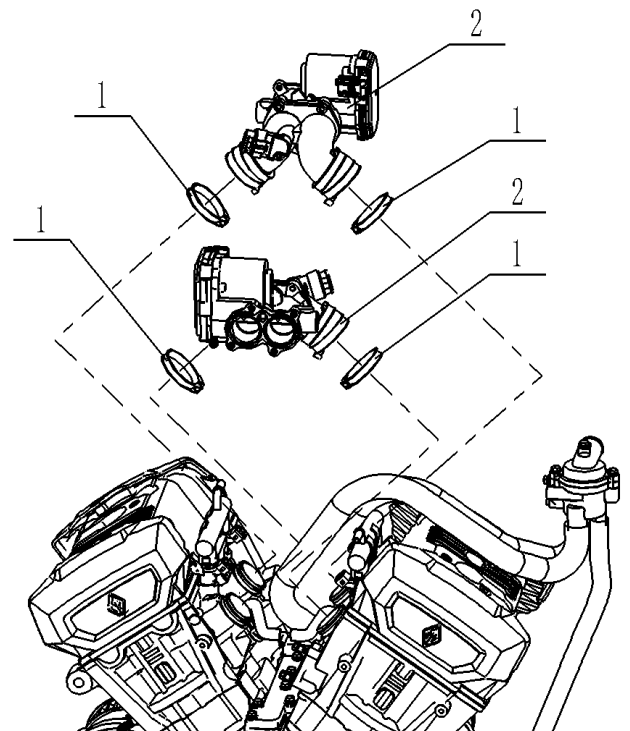
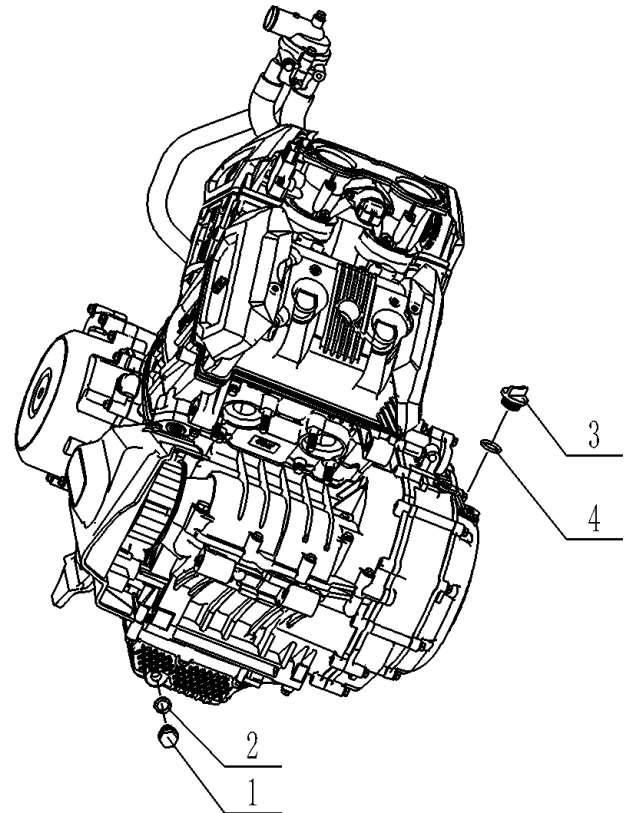
## The Seventh Chapter Engine

### 7.1 Drain the engine oil

- Remove the oil dipstick 3
- Remove O-ring 4
- Remove drain oil bolt 1
- Remove metal seal ring 2

#### Attention

Be careful of burns when draining oil from the hot engine.



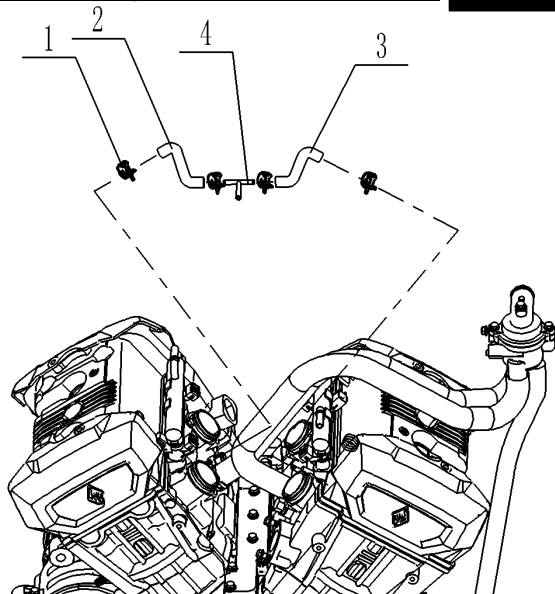
### 7.2 Throttle valve

- Remove hose clamp 1
- Remove throttle valve body combination 2



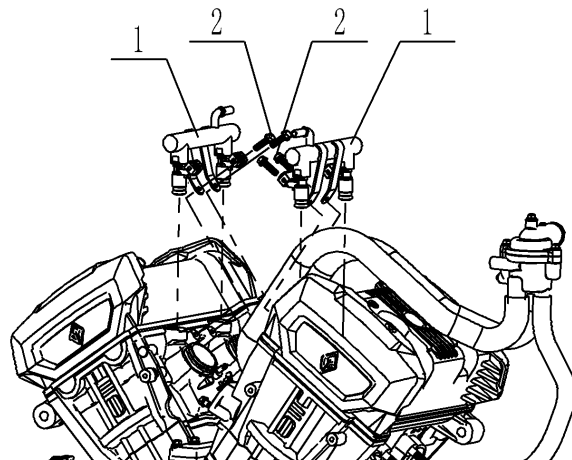
## 7.3 Exhaust pipe

- Remove Clamp 1
- Remove the emptying airway 23
- Remove the exhaust tee pipe 4



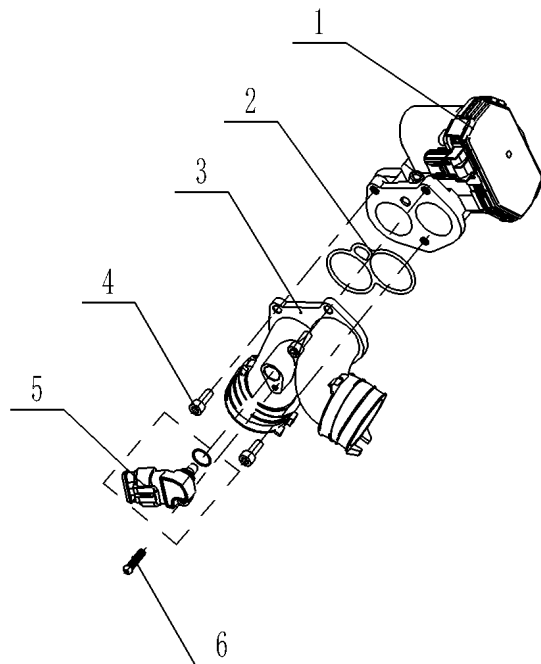
## 7.4 Oil rail

- Remove bolt 2
- Remove stainless steel oil rail 1



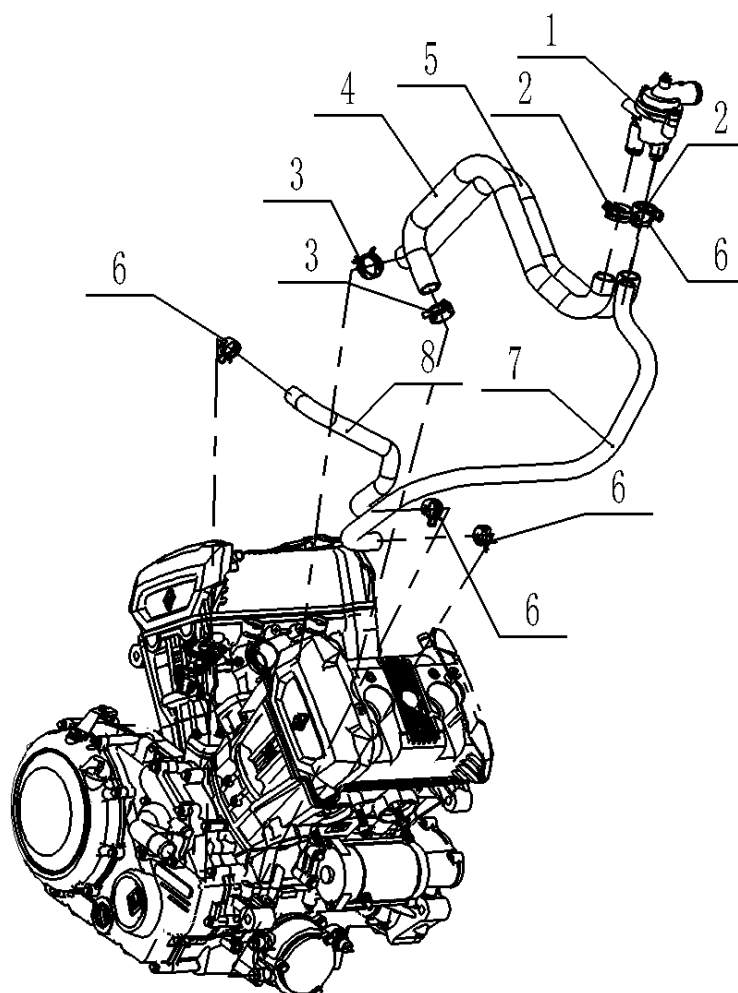
## 7.5 Disassembly of throttle valve

- Remove the bolt 6
- Remove TMAP sensor combination 5
- Remove the bolt 4
- Remove the three-way intake pipe 3
- Remove the three-way intake pipe seal ring 2



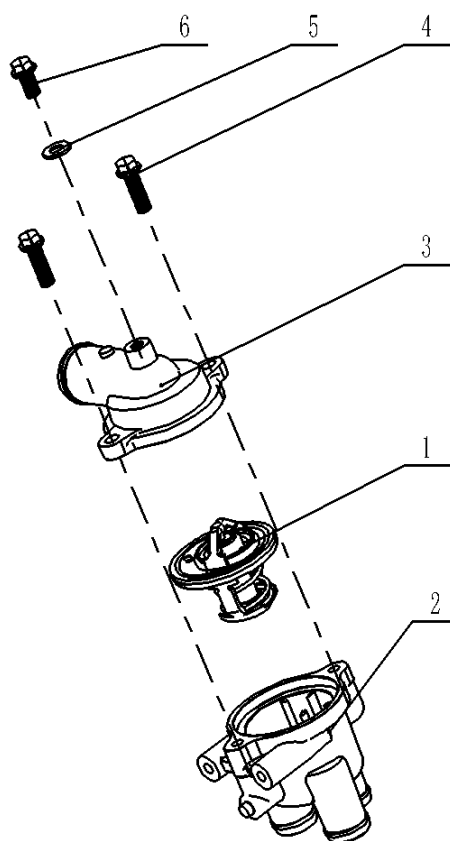
## 7.6 Cooler water pipe

- Remove the clamp 6
- Remove the cooler outlet water pipe 8
- Remove the hose clamp 2
- Remove the clamp 3
- Remove the front cylinder outlet pipe of the water pipe 4
- Remove the clamp 6
- Remove cooler inlet water pipe 7
- Remove the clamp 2
- Remove the clamp 3
- Remove the rear cylinder outlet pipe 5



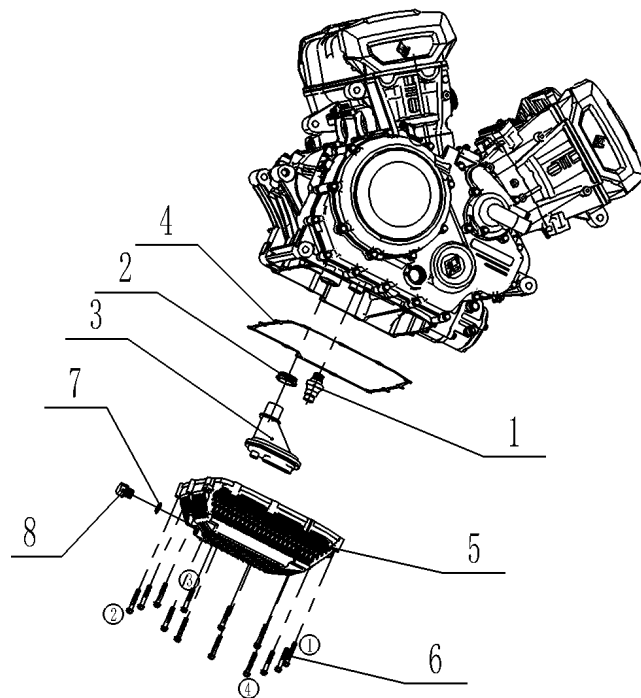
## 7.7 Thermostat

- Remove the bolt 6
- Remove copper washer 5
- Remove the bolt 4
- Remove thermostat cover 3
- Remove thermostat 1



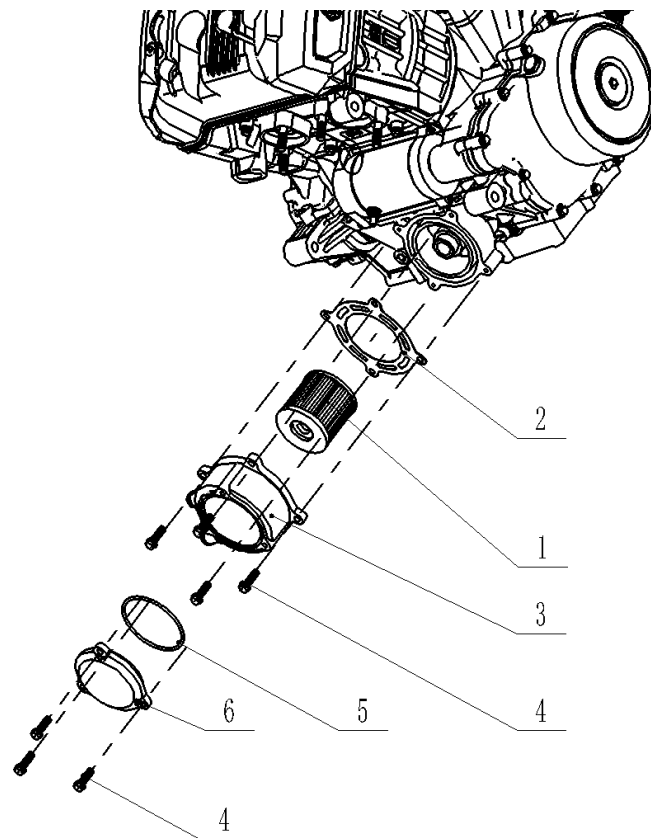
## 7.8 Oil pan

- Remove drain oil bolt 8
- Remove metal seal ring 7
- Remove the bolt 6
- Remove oil suction cup assembly 3
- Remove oil suction tray seal ring 2
- Remove oil pressure relief valve 1
- Remove oil pan gasket 4



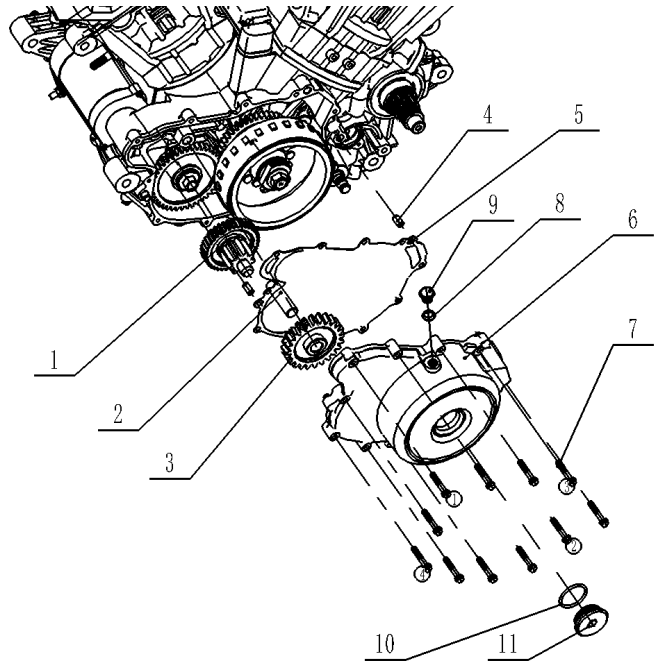
## 7.9 Cooler

- Remove the bolt 4
- Remove oil filter cover 6
- Remove o-ring 5
- Remove the bolt 4
- Remove cooler case 3
- Remove engine oil filter element 1
- Remove cooler copper washer 2



## 7.10 Left side cover

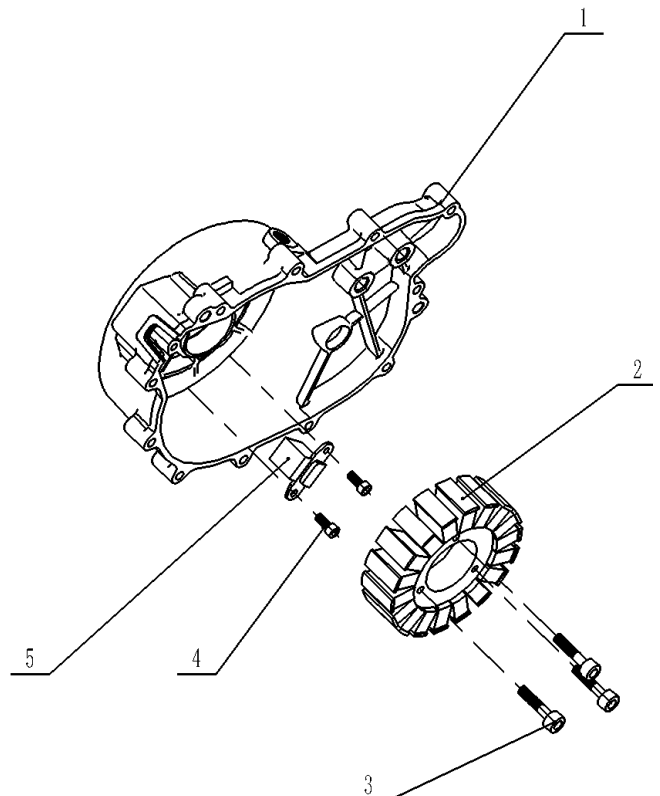
- Remove plug screw 9
- Remove TDC plug screw seal ring 8
- Remove rotary crankshaft hole plug 11
- Remove o-ring 10
- Remove the bolt 7
- Remove left side cover assembly 6
- Remove left side cover paper pad 5
- Remove locating pin 4
- Remove start idler gear 3
- Remove start idler gear shaft 2
- Remove start dual gear 1



0

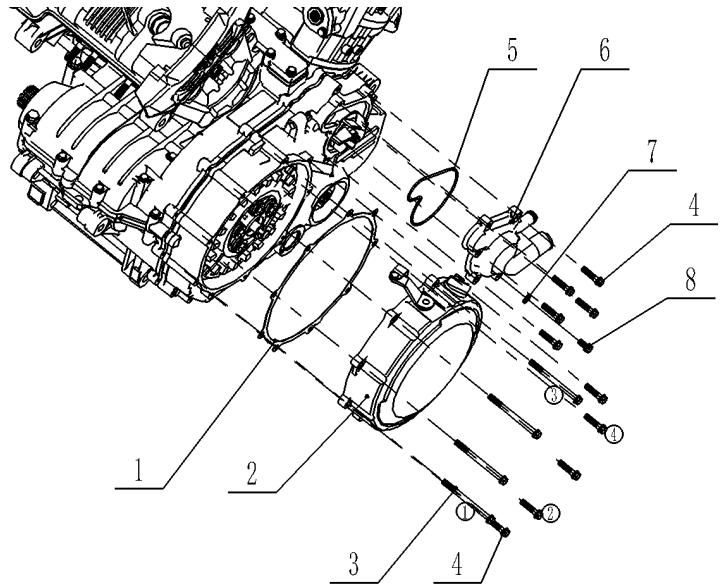
## 7.11 Disassembly of left side cover

- Remove the bolt 4
- Remove trigger 5
- Remove the bolt 3
- Remove magneto stator 2

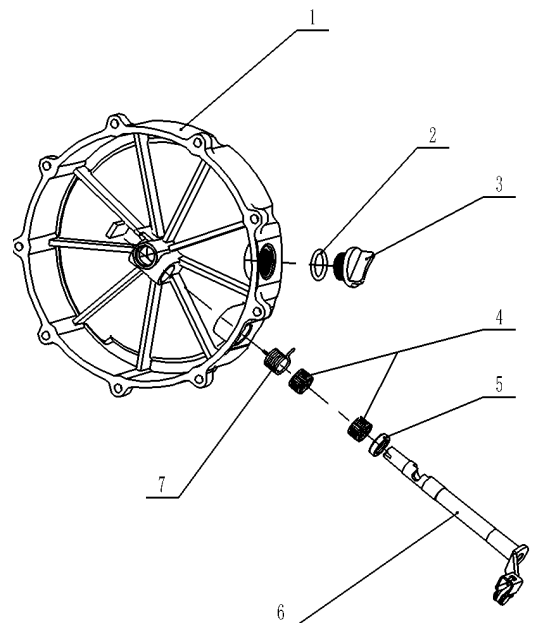


**Right side cover****7.12 Clutch cover and water pu**

- Remove the bolt 4
- Remove the bolt 3
- Remove clutch cover 2
- Remove clutch cover paper pad 1
- Remove the bolt 8
- Remove copper washer 7
- Remove the bolt 4
- Remove water pump cover 6
- Remove water pump seal ring 5

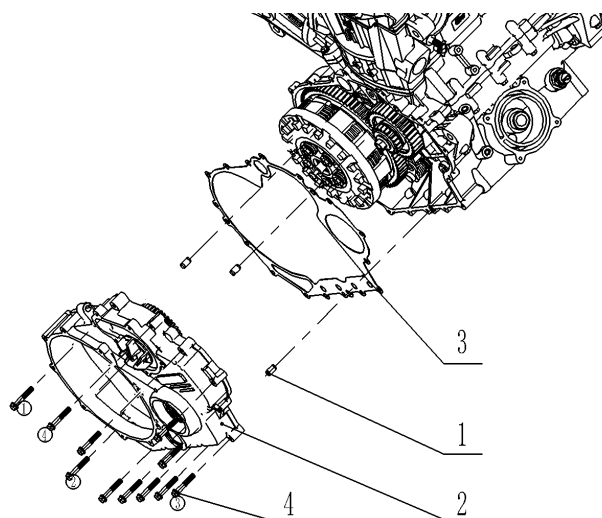
**7.13 Clutch cover disassembly**

- Remove clutch lever 6
- Remove oil ring 5
- Remove clutch operate lever torsion spring 7
- Remove needle roller bearing 4
- Remove oil hole plug 3
- Remove o-ring 2



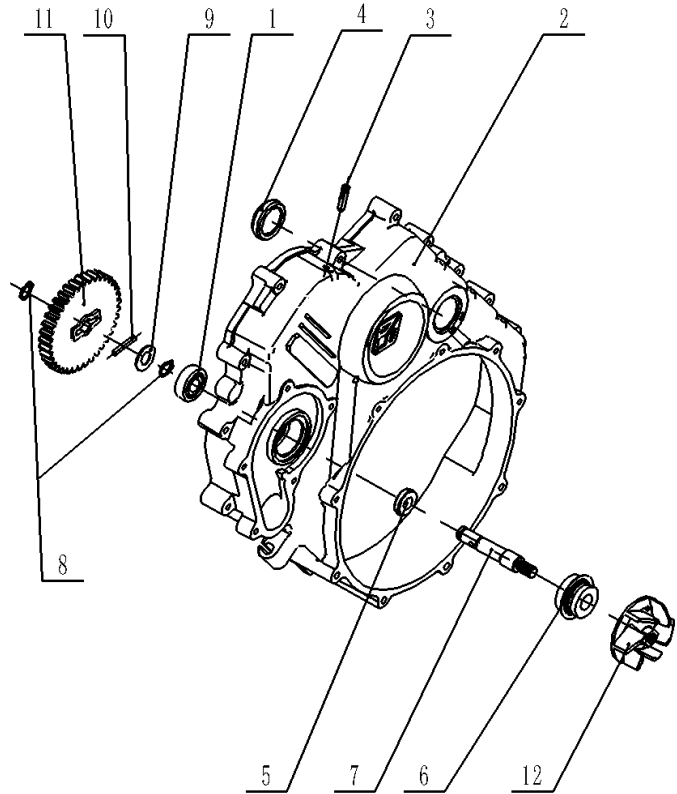
## 7.14 Right side cover

- Remove the bolt 4
- Remove right side cover combination 2
- Remove pin 1
- Remove right side cover paper pad 3



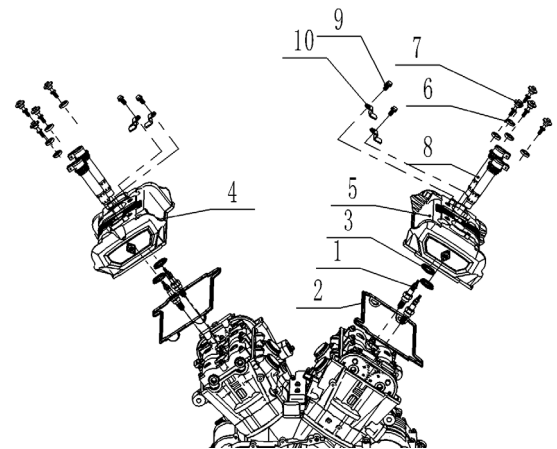
## 7.15 Disassembly of right side cover

- Remove water pump impeller 12
- Remove the shaft retaining ring 8
- Remove water pump driven wheel 11
- Remove needle roller 10
- Remove washer 9
- Remove shaft retaining ring 8
- Remove water pump shaft 7
- Remove oil seal 5
- Remove bearing 1
- Remove the oil level viewer 4



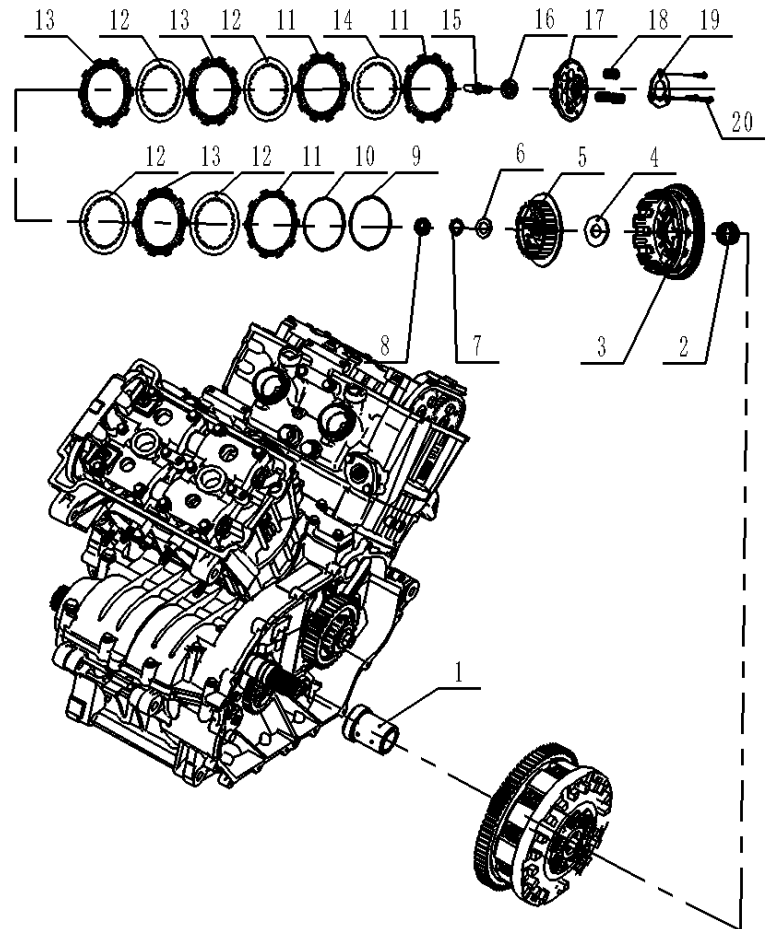
## 7.16 Cylinder head cover

- Remove the bolt 9
- Remove ignition coil platen 10
- Remove high voltage ignition coil 8
- Remove cylinder head cover step bolts 7
- Remove rubber gasket assembly 6
- Remove rear cylinder head cover 5 and front cylinder head cover 4
- Remove spark plug 1
- Remove spark plug seal 3
- Remove cylinder head cover seal ring 2



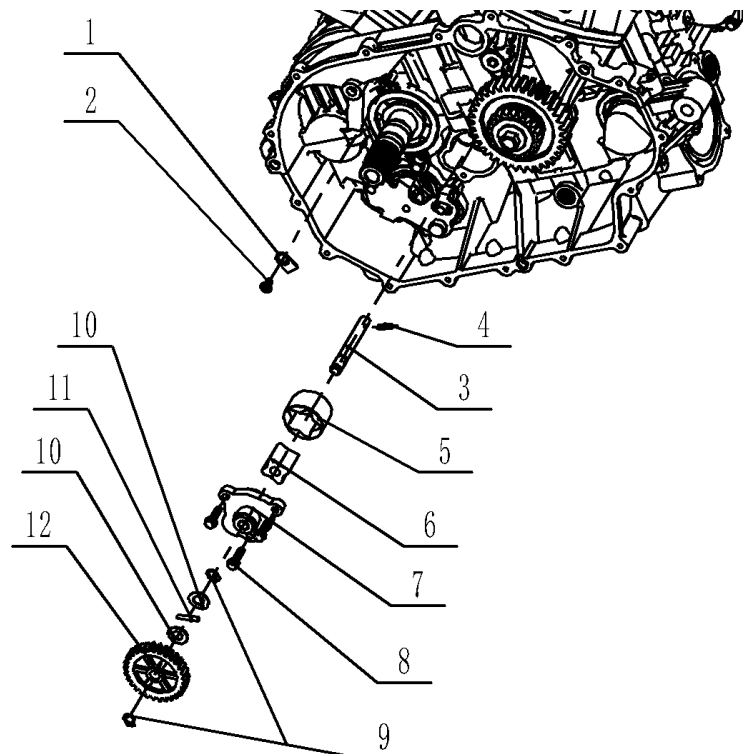
## 7.17 Clutch

- Remove bolt assembly 20
- Remove platen 19
- Remove clutch pressure disc spring 18
- Remove clutch pressure disc 17
- Remove bearing 16
- Remove clutch release ejector lever 15
- Remove friction plate I 11
- Remove sheet II 14
- Remove friction plate I 11
- Remove steel sheet I 12
- Remove friction plate II 13
- Remove steel sheet I 12
- Remove friction plate II 13
- Remove steel sheet I 12
- Remove friction plate I 11
- Remove dished gasket 10
- Remove gasket 9
- Remove clutch nut 8
- Remove wave washer 7
- Remove gasket 6
- Remove clutch driven disc 5
- Remove the gasket 4
- Remove clutch drive gear 3
- Remove needle roller bearing 2



## 7.18 Oil pump

- Stop ring for removing shaft 9
- Remove oil pump driven gear 12
- Remove gasket 10
- Remove needle roller 11
- Remove gasket 10
- Stop ring for removing shaft 9
- Remove the bolt 8
- Remove the rotor 6 inside the oil pump
- Remove the outer rotor of the oil pump 5
- Remove oil pump shaft 3

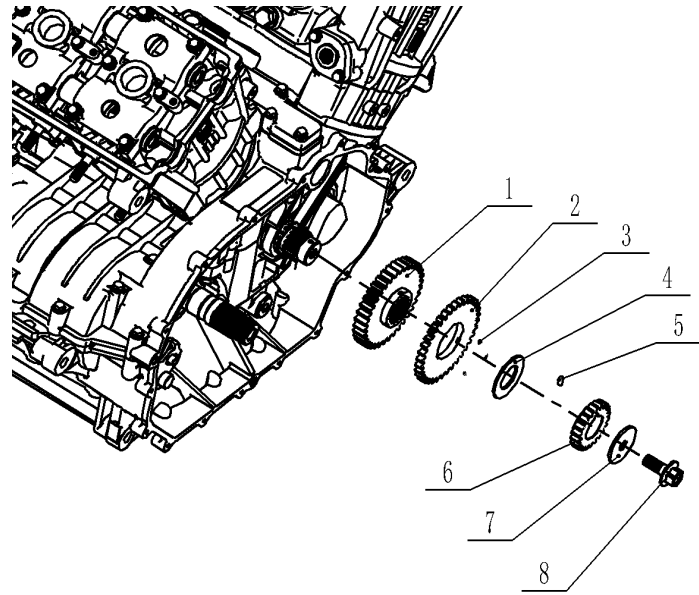




- Remove needle roller 4
- Remove countersunk screw 2
- Remove bearing baffle 1

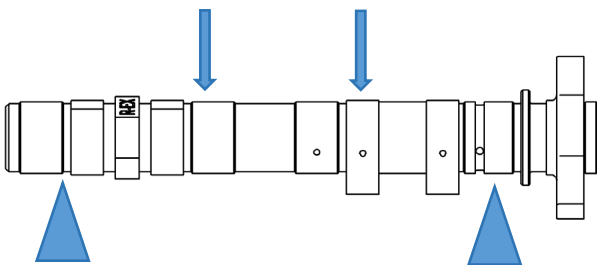
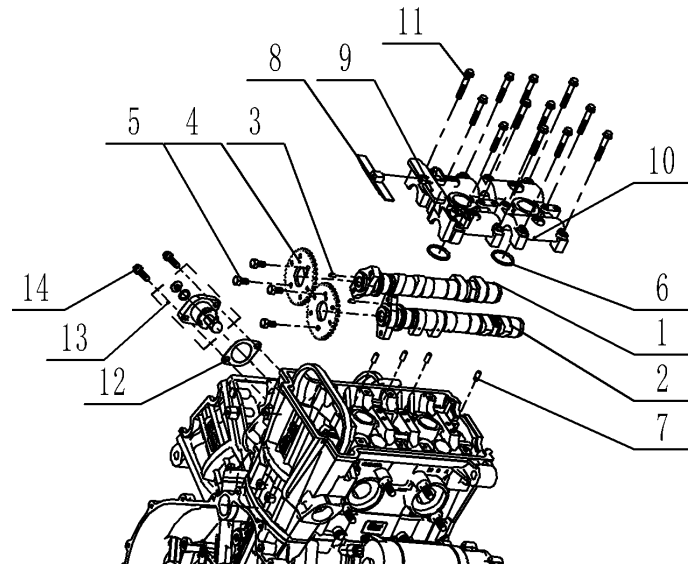
## 7.19 Clutch driving wheel

- Remove the bolt 8
- Remove the gasket 7
- Remove pump driving gear 6
- Remove needle roller 5
- Remove spacer 4
- Remove anti-backlash gear 2
- Remove spring 3
- Remove clutch drive gear 1



## 7.20 Front cylinder camshaft

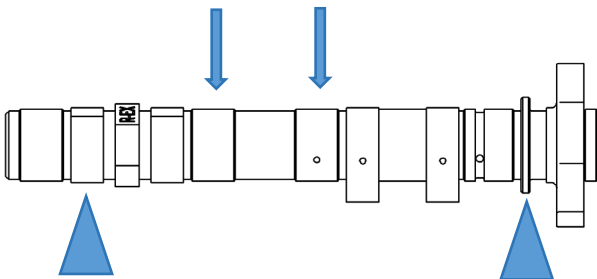
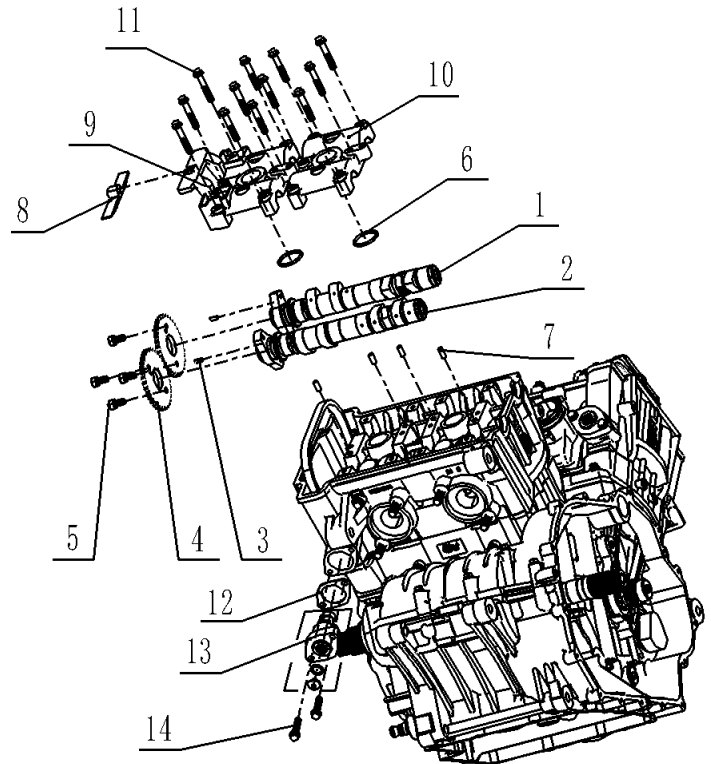
- Remove the bolt 11
- Remove camshaft limit seat 9 (R)
- Remove camshaft limit seat 10 (L)
- Remove guide plate 8 (B)
- Remove o-ring
- Remove front cylinder intake camshaft 1
- Remove front cylinder exhaust camshaft 2
- Remove cylindrical pin 7
- Remove the bolt 5
- Remove timing driven sprocket 4
- Remove needle roller 3
- Remove the bolt 14
- Remove tensioner 13
- Remove tensioner pad 12



※ Inspection: As shown above, use V-shaped blocks to support both camshafts  
 Side (shaft diameter), and check the bulge with a dial indicator  
 When the axle runout, more than 0.012 need to be replaced

## 7.21 Rear cylinder camshaft

- Remove the bolt11
- Remove camshaft limit seat 9 (R)
- Remove camshaft limit seat 10 (L)
- Remove guide plate 8 (B)
- Remove o-ring
- Remove front cylinder intake camshaft 1
- Remove front cylinder exhaust camshaft 2
- Remove cylindrical pin 7
- Remove the bolt5
- Remove timing driven sprocket 4
- Remove needle roller 3
- Remove the bolt14
- Remove tensioner 13
- Remove tensioner pad 12

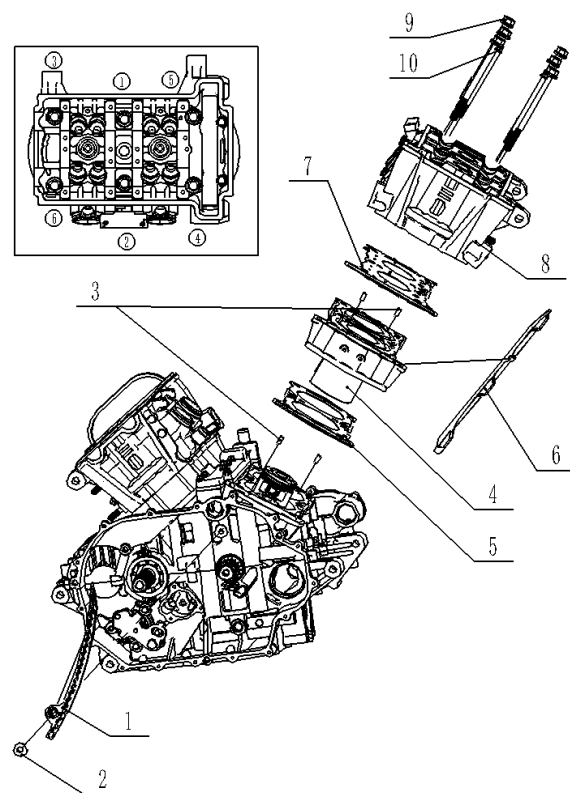


※ Inspection: As shown above, use V-shaped blocks to support both camshafts  
 Side (shaft diameter), and check the bulge with a dial indicator  
 When the axle runout, more than 0.012 need to be replaced

### head

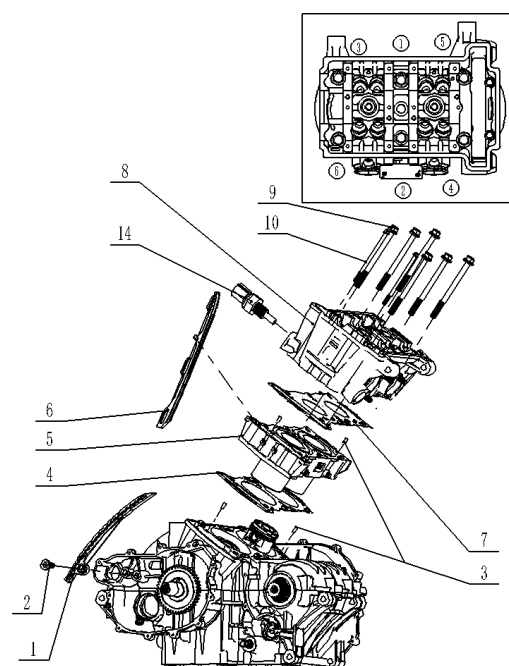
## 7.22 Front cylinder head of cylinder body

- Remove the bolt10 ( M6X110 )
- Remove cylinder head bolts 9
- Removed cylinder head assembly 8
- Remove cylinder head gasket 7
- Remove guide plate 6 (A)
- Remove cylindrical pin 3
- Remove cylinder block assembly 4
- Remove cylinder block paper gasket 5
- Remove cylindrical pin 3
- Remove the tightening plate screws 2
- Remove tightening plate 1



## 7.23 Cylinder body

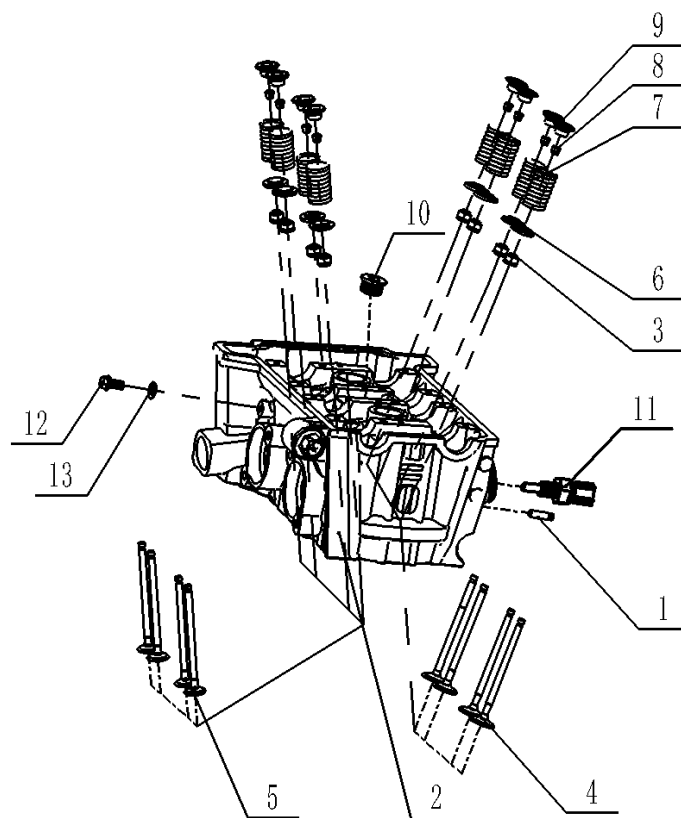
- Remove the bolt10 ( M6X110 )
- Remove cylinder head bolts 9
- Removed cylinder head assembly 8
- Remove cylinder head gasket 7
- Remove guide plate 6 (A)
- Remove cylindrical pin 3



- Remove cylinder block assembly
- Remove cylinder block assembly
- Remove cylindrical pin 3
- Remove the tightening plate screws 2
- Remove tightening plate 1

## 7.24 Front cylinder head split

- Remove valve spring upper seat 9
- Remove valve card lock 8
- Remove valve spring 7
- Remove valve spring lower seat 6
- Remove valve oil seal 3
- Remove intake valve 4 exhaust valve 5
- Remove the bolt 11
- Remove copper gasket 12
- Remove plug 10

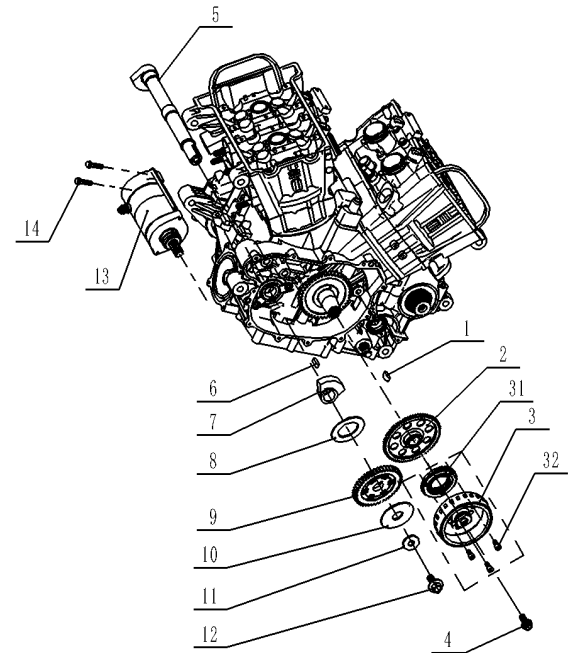


## 7.25 Rear cylinder head disassembly

- Remove valve spring upper seat 9
- Remove valve card lock 8
- Remove valve spring 7
- Remove valve spring lower seat 6
- Remove valve oil seal 3
- Remove intake valve 4 exhaust valve 5
- Remove the bolt 12
- Remove copper gasket 13
- Remove plug 10
- Remove overflow pipe 1
- Remove the water temperature sensor 11

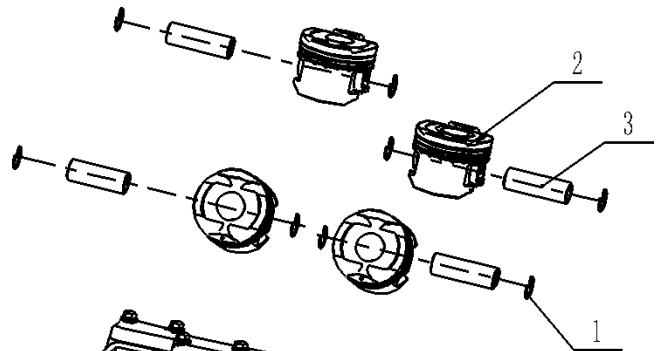
## 7.26 Magnetorotor and balance shaft

- Remove the bolt 4
- Remove the rotor clutch assembly 3
- Remove the starting driven gear 2
- Remove Semicircle key 1
- Remove the bolt 12
- Remove washer 11
- Remove washer 10
- Remove the balance shaft driven gear assembly 9
- Remove washer 8
- Remove balance block 7
- Remove flat key 6
- Remove balance shaft 5
- Remove the bolt 14
- Remove start motor 13



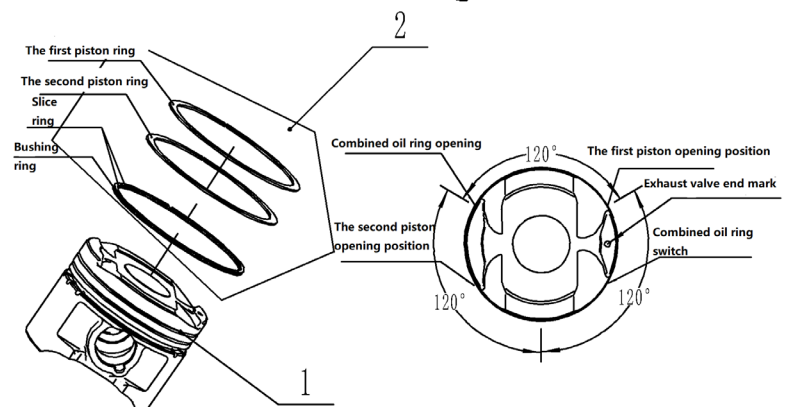
### Attention

Remove the bolt 4 with special tools  
Remove magnetorotor 3 with special tools  
Remove the bolt 12 with special tools

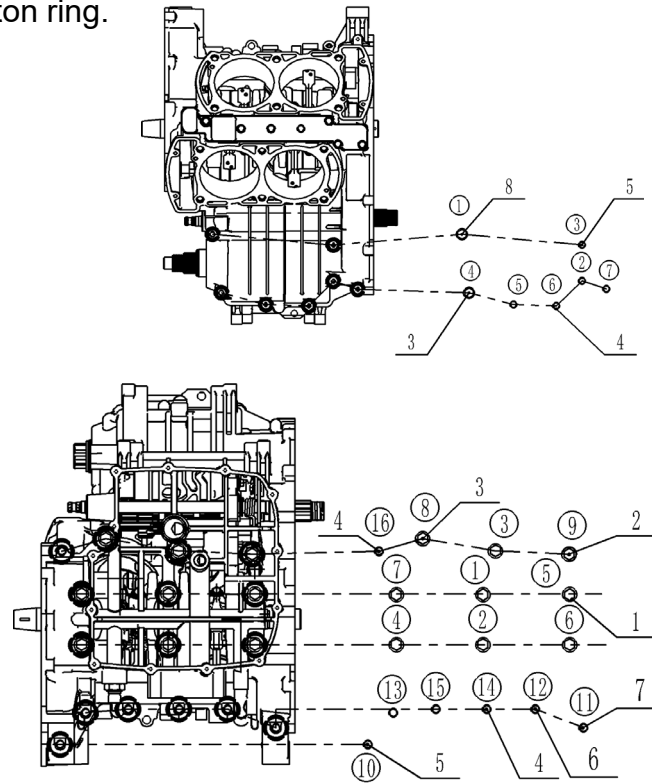
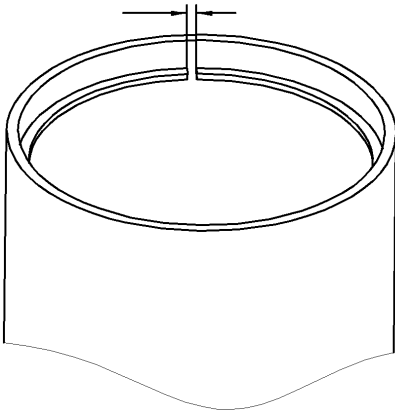


## 7.27 Piston

- Remove piston pin retainer 1
- Remove piston pin 3
- Remove piston assembly 2
- Remove the first piston ring
- Remove the second piston ring
- Remove the ring
- Remove the bushing ring
- Remove the ring



※ Inspection: Piston ring, using the old cylinder block, as shown below  
If the value exceeds 0.4, replace the piston ring.

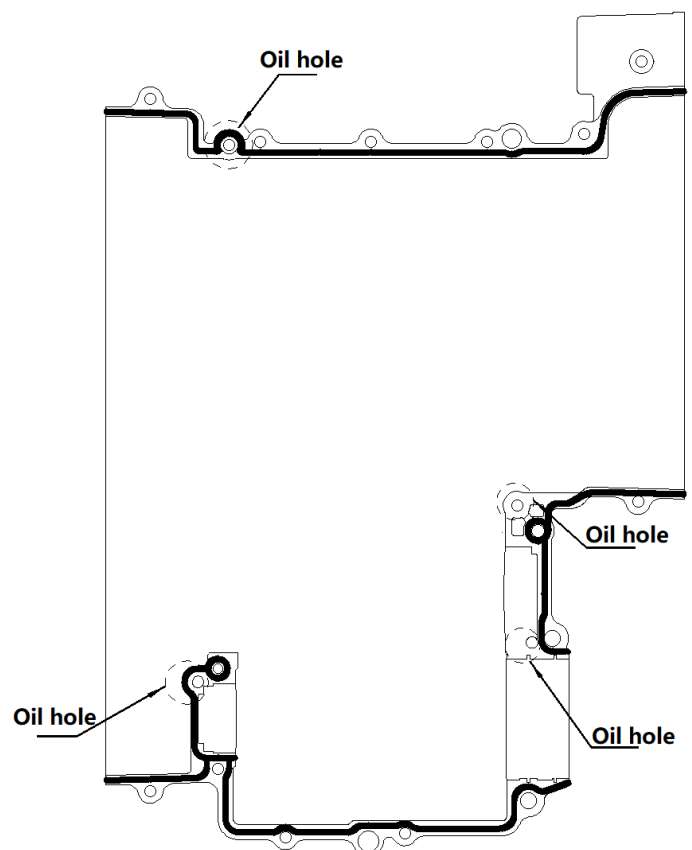


## 7.28 Unpacking

- Remove the bolt 5
- Remove the bolt 4
- Remove the bolt 3
- Remove the bolt 8
- Remove the bolt 7
- Remove the bolt 6
- Remove the bolt 5
- Remove the bolt 4
- Remove the bolt 1

## 7.29 Clean up the sealant

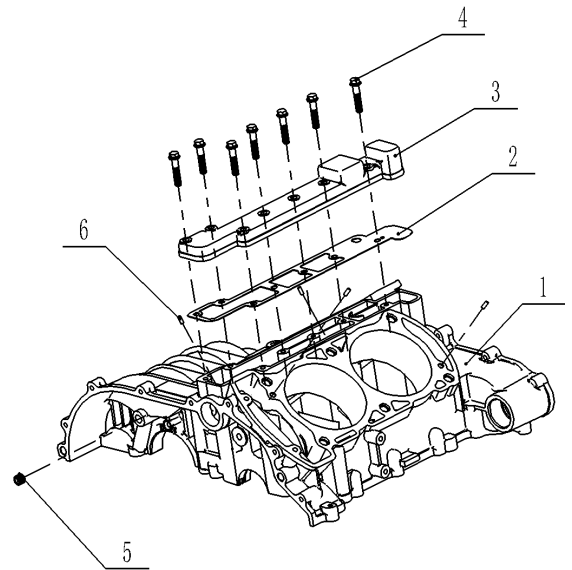
- Clean up sealant with cleaning agent





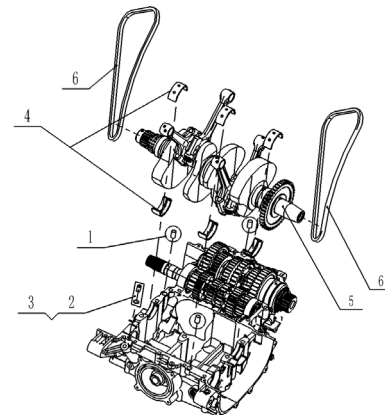
## 7.30 Upper box

- Remove the bolt 4
- Remove water pump cover 3
- Remove the water channel cover paper pad 2
- Remove screw plug 5
- Remove circular pin 6



## 7.31Crankshaft

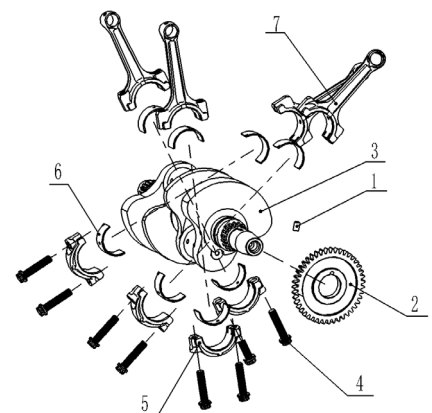
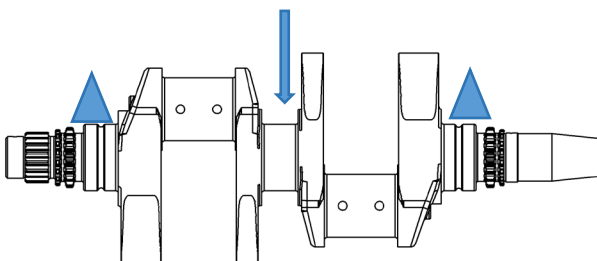
- Remove crankshaft assembly 5
- Remove timing chain 6
- Remove the main bearing 4
- Remove cylindrical pin 1
- Remove O-ring 3 locating pin 2



## 11.32 Disassembly of crankshaft

- Remove the balance shaft drive wheel 2
- Remove needle roller 1
- Remove the connecting rod bolt 4
- Remove con-rod assembly 7
- Remove con-rod bearing 6
- Remove con-rod cap 5

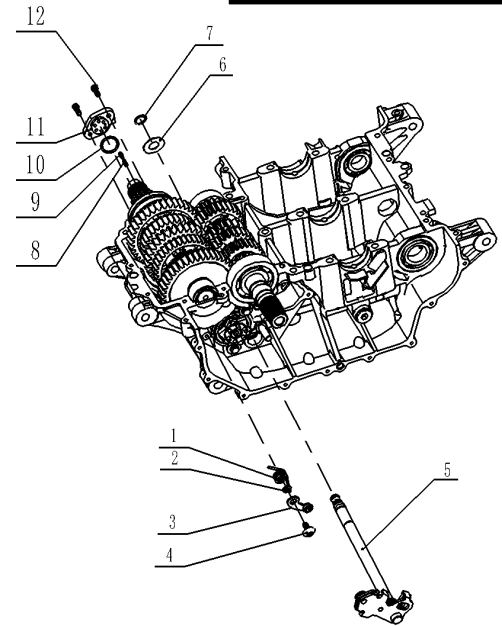
※ Inspection: Crankshaft runout, supported by an equal height V-shaped iron,  
The arrow below indicates a jump, limit value  
0.03mm. If the value exceeds 0.03mm, replace it.



※ Inspection: ① There is no damage to the bearing, if there is replacement.  
Bearing rotation is flexible, there is no stuck, if any

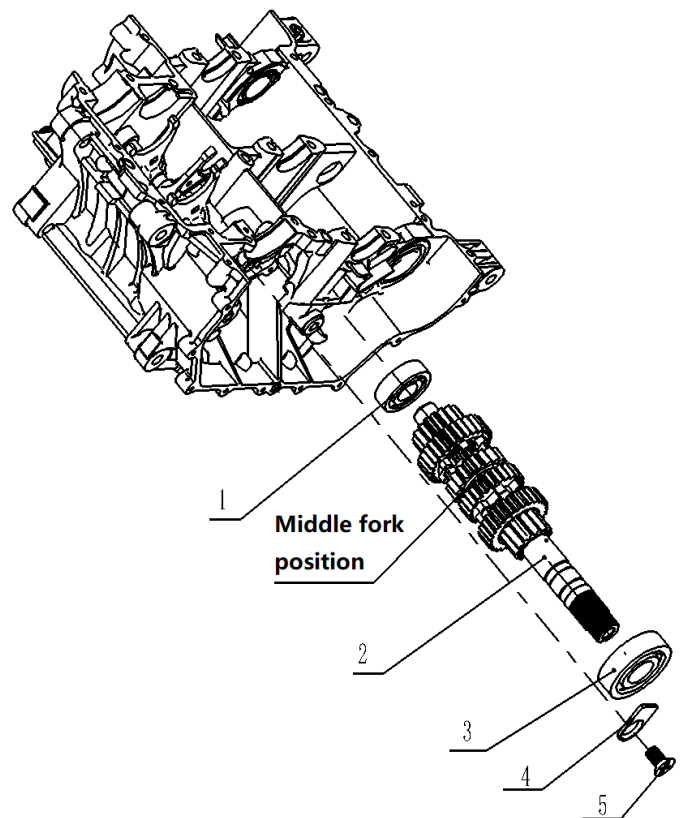
## 11.33 Shift lever assembly

- Remove the bolt 12
- Remove gear display 11
- Remove O-ring 10
- Remove gear display contact 9
- Remove the gear display spring 8
- Remove the locating wheel bolt 4
- Remove the variable speed drum positioning wheel 3
- Remove washer 2
- Remove the variable speed drum positioning wheel spring 1
- Remove gear lever 5



## 11.34 Main Axis

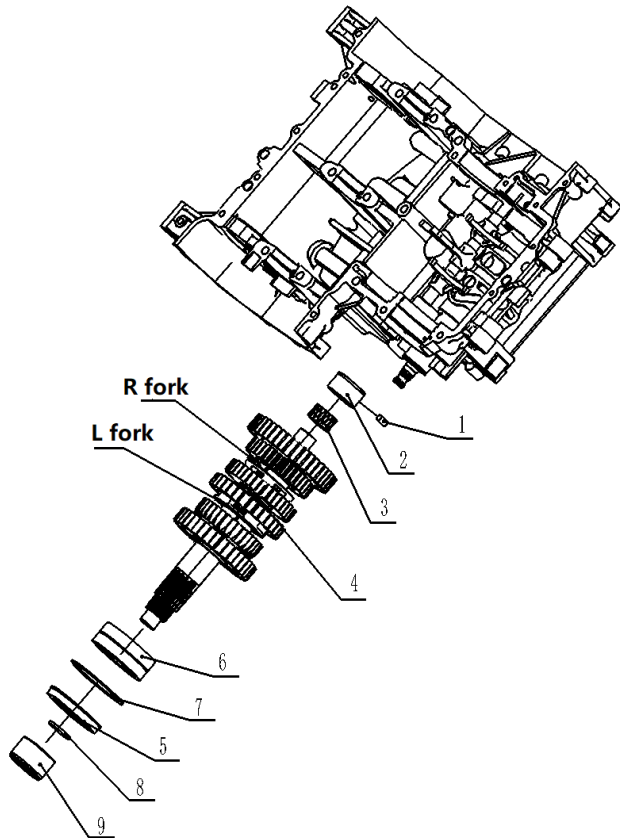
- Remove countersunk screws 5
- Remove bearing baffle 4
- Remove bearing 3
- Remove spindle assembly 2
- Remove bearing 1



※ Inspection: Gear wear, damage, affect the use of replacement

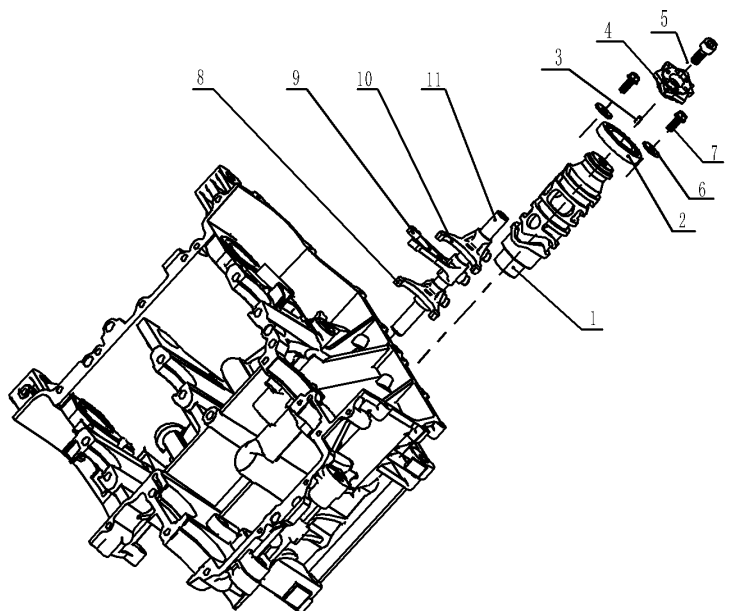
## 11.35 Counteraxis

- Remove countershaft assembly 4
- Remove bushing 9
- Remove O-ring 8
- Remove oil seal 5
- Remove bearing retainer 7
- Remove bearing 6
- Remove needle roller 1
- Remove bearing outer ring 2
- Remove needle roller bearing 3



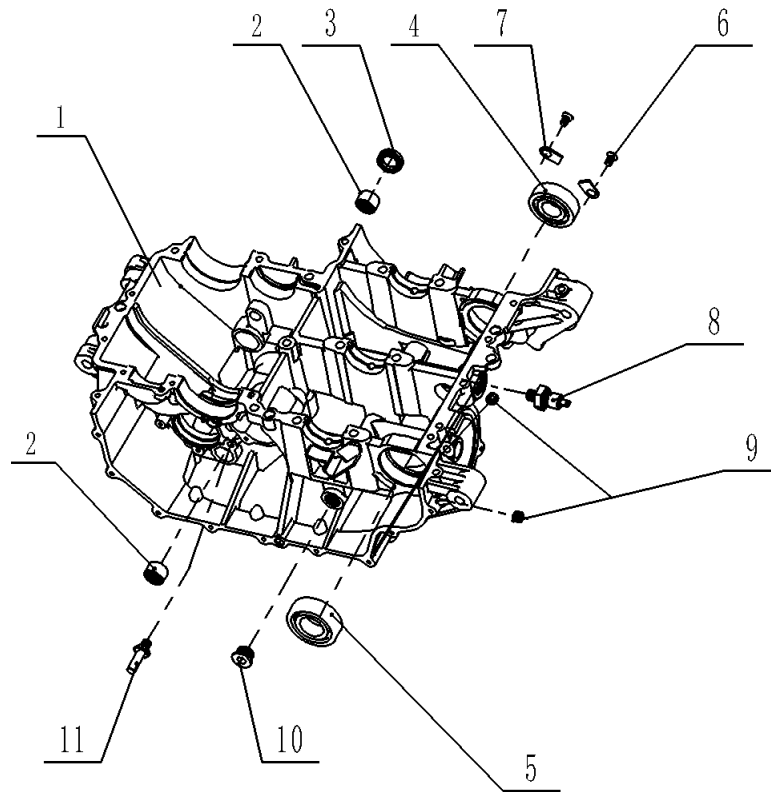
## 11.36 Variable speed drum

- Remove the fork shaft 11
- Remove R fork 10
- Remove the middle fork 9
- Remove L fork 8
- Remove the bolt 5
- Remove 5 Star Round 4
- Remove the bolt 7
- Remove gasket 6
- Remove variable drum 1



## 11.37 Disassembly of lower box

- Remove screws 6
- Remove bearing baffle 7
- Remove bearing 4
- Remove bearing 5
- Remove oil seal 3
- Remove needle roller bearing 2
- Remove shift lever spring return pin 11
- Remove oil pressure sensor 8
- Remove plug 9
- Remove plug 10



※ **Cleaning inspection:** Cleaning parts with detergent,  
Check for defects affecting use, if replaced

## The eighth Chapter Engine

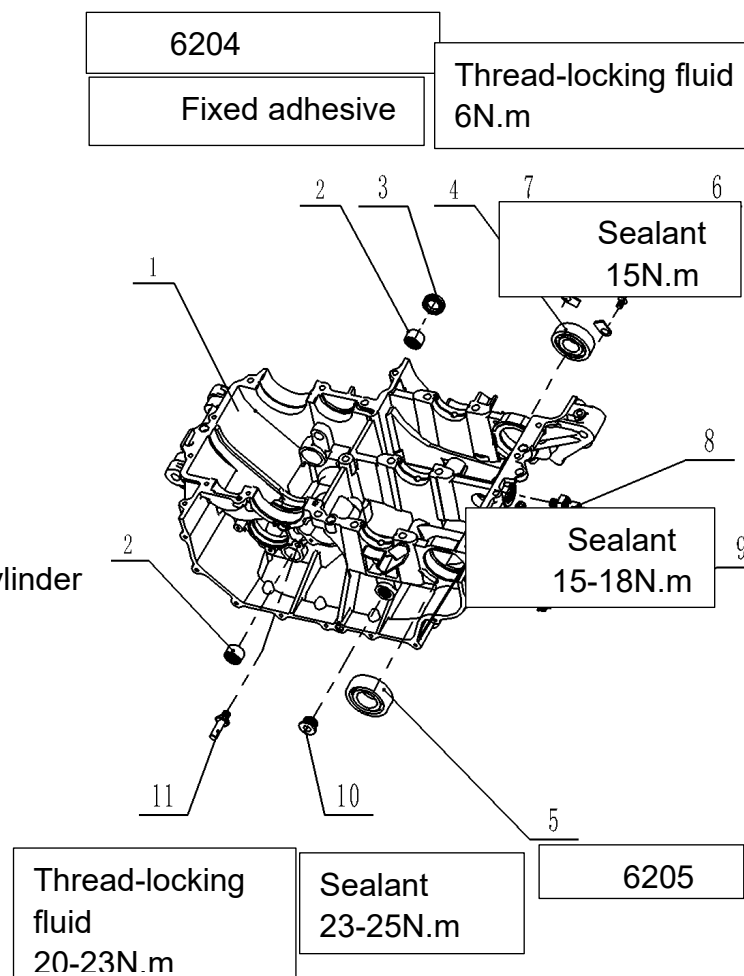
### 8.1 Assembling the lower box

※ Inspection: 1 Check whether the oil passage of the container is smooth

2 The joint surface of the box appearance has no damage and

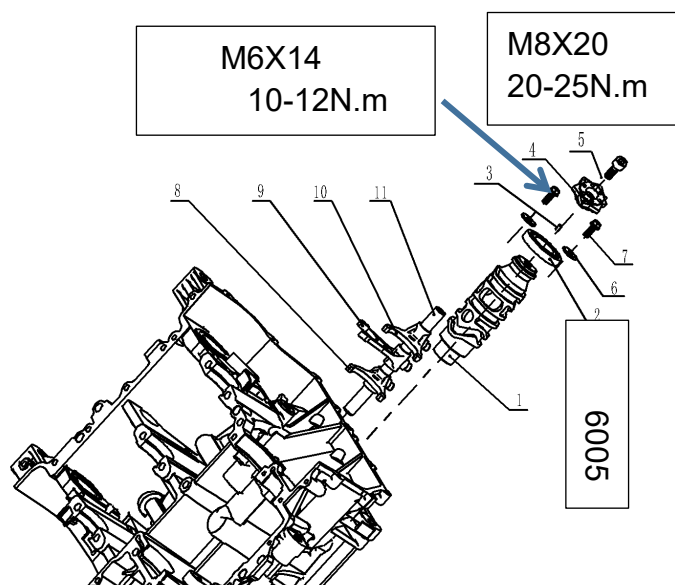
Defects affecting the use, if any, of replacement

- Assemble needle roller bearing 2
- Assemble oil seal 3. Apply adhesive to outer cylinder before assembly
- Assemble bearing 5 and press to the end
- Assemble bearing 4 and press to the end
- Assembly of bearing baffle 7
- Assemble screws 6
- Assemble oil pressure sensor 8
- Assemble plug 9 (Rc1/8)
- Assemble plug 10 (M16X1.5)
- Assemble shift lever spring return pin 11



### 8.2 Variable Drum

- Assemble variable speed drum 1
- Assemble bearing 2
- Assemble needle roller 3
- Assemble five star wheel 4
- Assemble cylindrical head bolts 5
- Assemble L fork 8
- Assemble the middle fork 9
- Assemble R fork 10



- Assemble the fork shaft 11
- Assemble washer 6
- Assemble bolt 7

<b>Attention</b>
<b>The direction of the fork letters is on the right of the figure.</b>

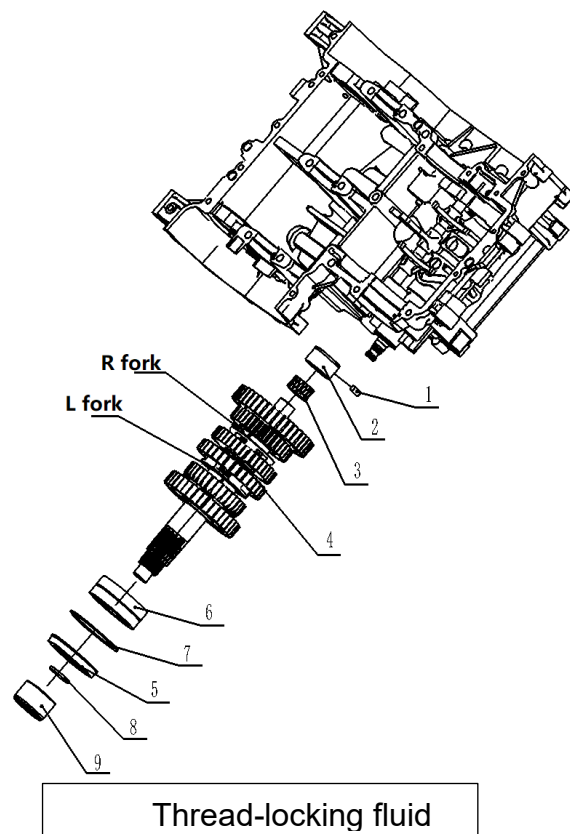
### 8.3 Auxiliary axis

Assemble needle roller 1

- Assemble needle roller bearing 3
- Assemble bearing outer ring 2
- Assemble bearing 6
- Assemble bearing retainer 7
- Assemble oil sealing 5. Apply tightening glue in a circular circle before assembly
- Assemble O-ring 8
- Assemble bushing 9
- Assemble countershaft assembly 4

#### Attention

1 As shown in the picture on the right, insert the fork into the slot 4 of the countershaft assembly.  
2 The bearing pin is stuck into the box groove

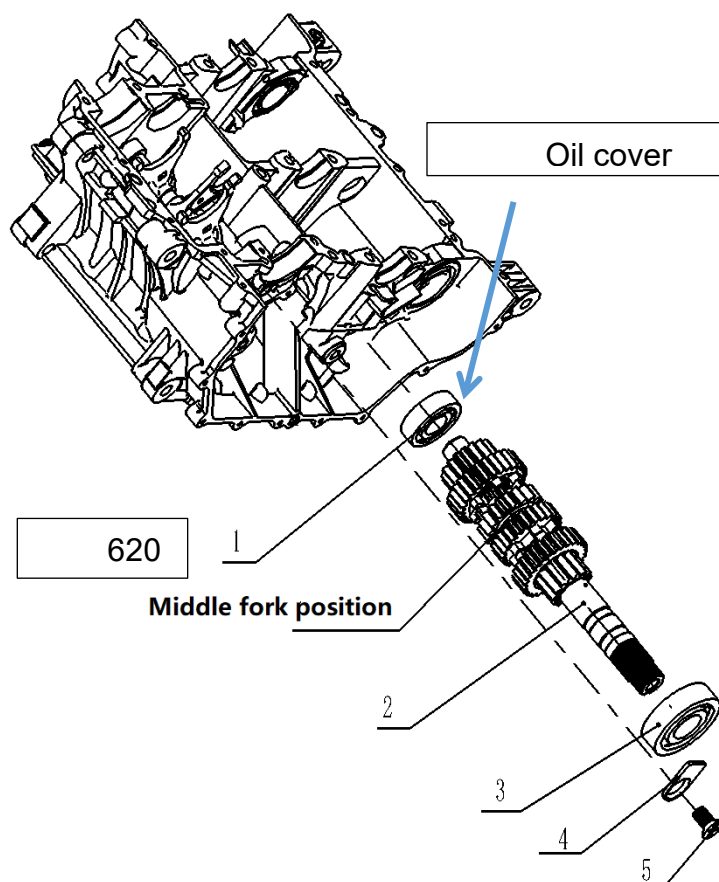


### 8.4 Main Axis

- Assembly bearing 1
- Assemble spindle assembly 2
- Assemble bearing 3
- Assembly of bearing baffle 4
- Mounting countersunk screws 5

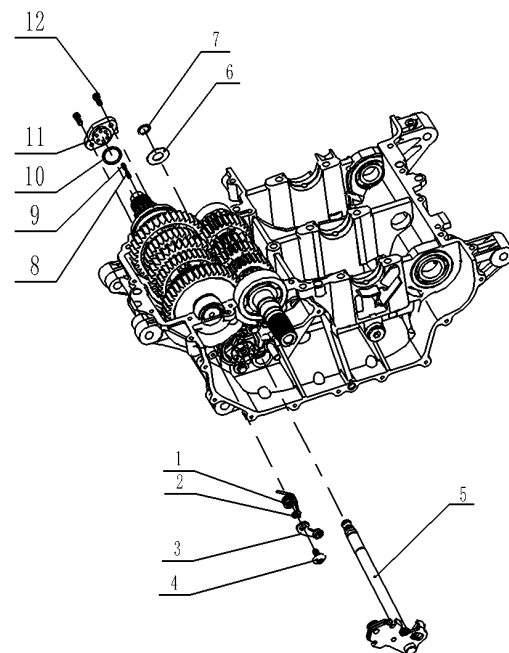
#### Attention

1 Bearing 1 oil cover (marked) towards the housing  
2 Bearings should be assembled in place, and confirm that the pressure plate compacts the bearing  
3 Insert the fork into the slot shown in the figure



## 8.5 Shift lever assembly

- Assemble variable speed drum positioning wheel spring 1
- Assemble gasket 2
- Assemble variable speed drum positioning wheel 3
- Assemble positioning wheel bolts 4
- Assemble shift lever 5
- Assemble washer 6
- Assemble shaft ring 7
- Assemble the variable gear indicator spring 8
- Assemble variable gear indicator contactor 9
- Assemble o-ring
- Assemble variable gear indicator 11
- Assemble cylindrical head bolts 12



Attention

Shift check, clear gear

Connecting rod tile selection table			Con-rod aperture	
Colors in brackets are optional			1	2
			39.000--39.006	39.006--39.012
Con-rod shaft diameter	A	35.995--36.000	BR/GN	BK/BR
	B	36.000--36.005	GN/YE	BR/GN
	C	36.005--36.010	YE	GN/YE

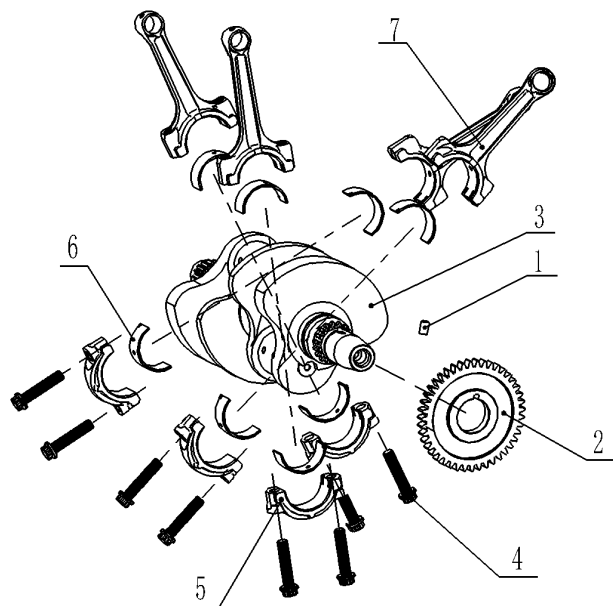
## 8.6 Crankshaft disassembly

※ Choose the connecting rod tile according to the matching table on the right.

- Remove con-rod bolts 4
- Remove con-rod cover 5
- Assemble con-rod bearing shell 6
- Assemble con-rod assembly 7
- Assemble con-rod cover 5
- Assemble con-rod bolts
- Assemble needle roller 1
- Assemble balancing shaft driving wheel 2

Attention

Apply oil to the Inner surface of bearing bush  
Disassembly of Con-rod cover and connecting rod pair





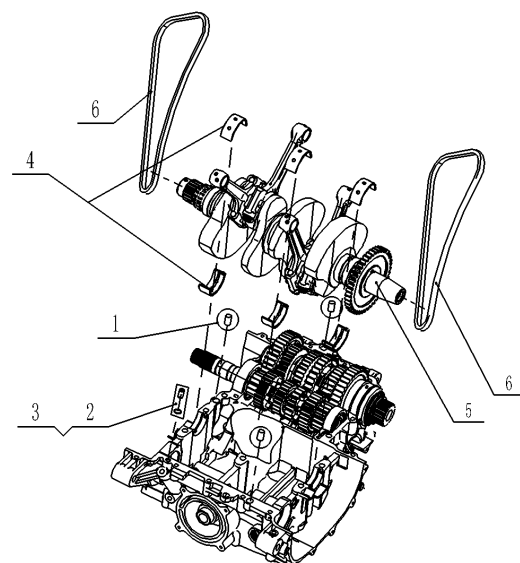
## 8.7 Crankshaft

Spindle tile selection table Note:The color in bracket are optional			Crankcase bore	
			A	B
			42.000--42.008	42.008--42.016
Crankshaft main shaft diameter	A	37.985--37.990	BK/BR	BU/BK
	B	37.990-37.995	BR/GN	BK/BR
	C	37.995--38.000	GN/YE	BR/BK

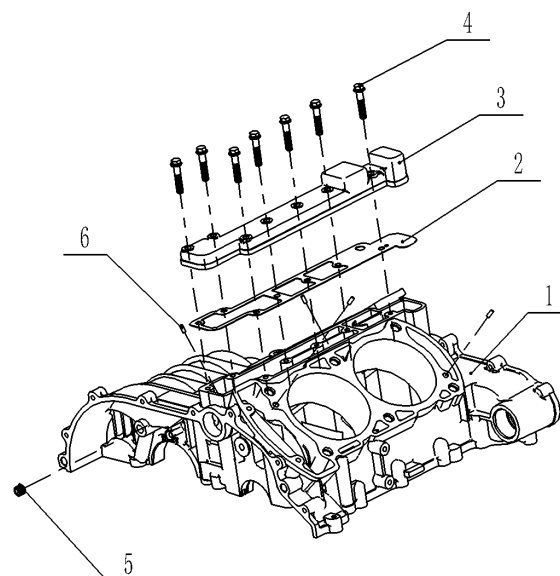
※ Select the spindle tile according to the matching table above

- Assemble cylindrical pin 1
- Assemble O-ring 3 positioning pin 2
- Assemble main shaft shell 4
- Assemble timing chain 6
- Assemble crankshaft assembly 5

Attention
Apply oil to the Inner surface of bearing bush.



M6X30  
10-12N.m



Rc1/8  
15-18N.m

## 8.8 Upper box

※ Inspection:1 Check whether the oil passage of the container is smooth

2 Whether the joint surface of the box is damaged or Defects affecting the use, if any, of replacement

- Assemble round pin 6
- Assemble plug 5 (Rc1/8)
- Assemble the water channel cover paper pad 2

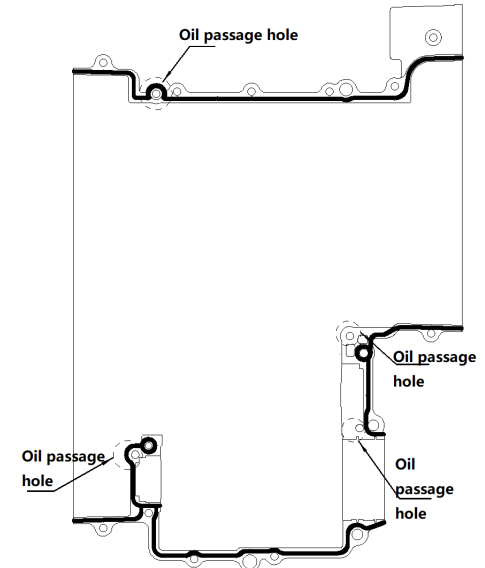
- Assemble water pump cover 3
- Assemble bolts 4

## 8.9 Assemble mould and apply the glue

- Use Metal cleaning agent cleans the sealant on the closing surface
- Apply sealant evenly according to the black line as shown

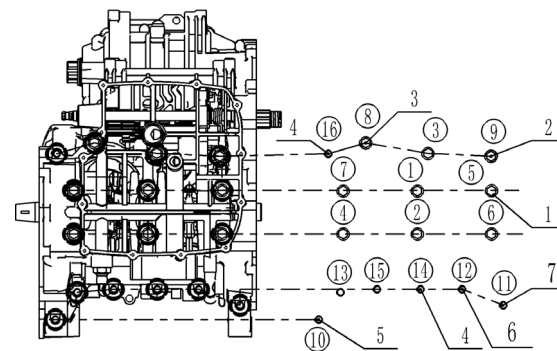
### Attention

- 1 Ensure that the sealing surface around the oil passage hole has sealant
- 2 No sealant is allowed in the oil passage holes



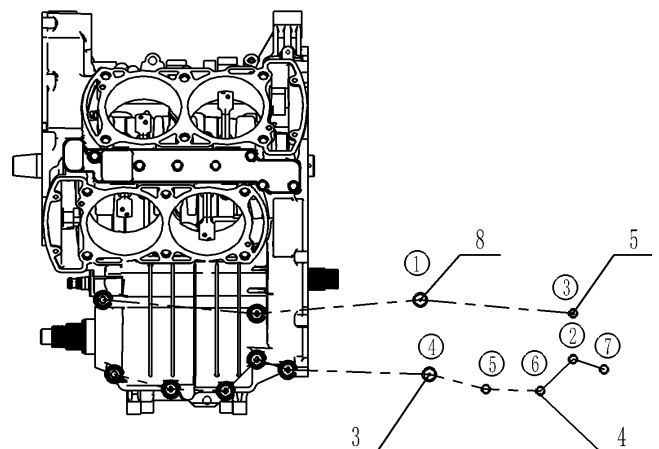
## 8.10 Assemble mould

- Assemble bolt 1(M8X95), tightening torque 15→30N.m
- Assemble bolt 4(M6X40), tightening torque 10-12N.m
- Assemble bolt 5(M6X65), tightening torque 10-12N.m
- Assemble bolt 6(M6X40 gray), tightening torque 13-14N.m
- Assemble bolt 7(M6X65 gray), tightening torque 13-14N.m
- Assemble bolt 3(M8X45), tightening torque 15→25N.m
- Assemble bolt 4(M6X40), tightening torque 10-12N.m
- Assemble bolt 5 (M6X50), tightening torque 10-12N.m
- Assemble bolt 8(M8X70), tightening torque 10-12N.m  
15 →25N.m



### Attention

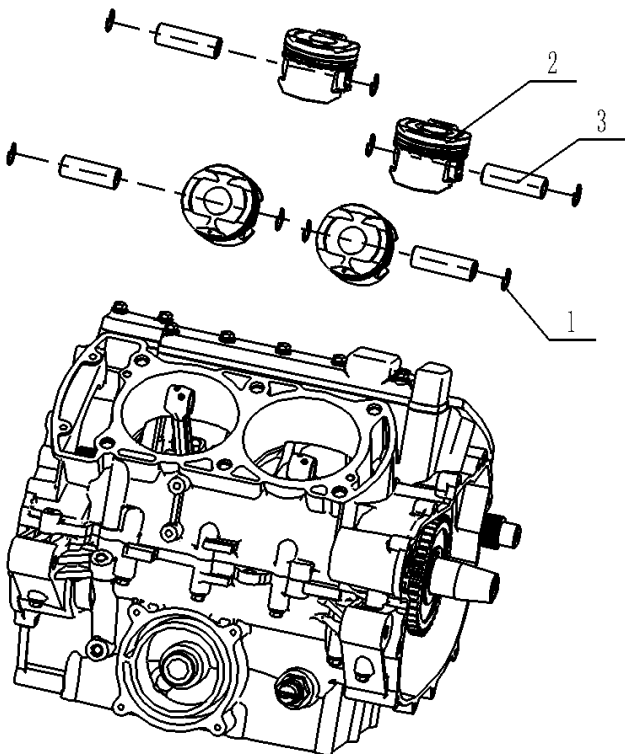
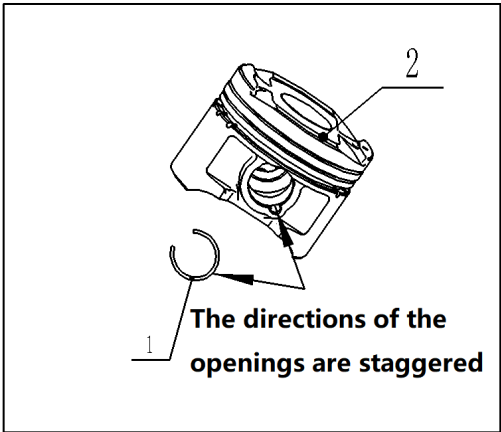
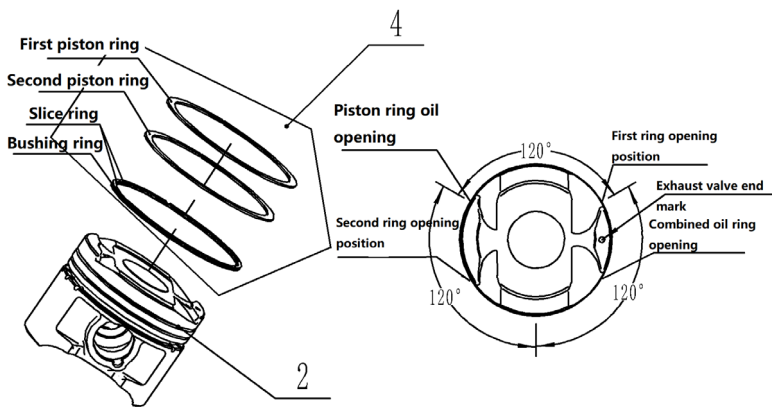
- 1 Crankshaft axial clearance detection, clearance range 0.12-0.16
- 2 Turn the crankshaft and the test torque is 0-1N.m



## 8.11 Piston

- Assemble slice ring 4
- Assemble bushing ring 4
- Assemble slice ring 4
- Assemble the second piston ring 4
- Assemble the first piston ring 4
- Assemble piston assembly 2
- Assemble piston pin 3
- Assemble piston pin retainer 1

Piston diameter	Group size	Mark
$\varnothing 53.5_{-0.045}^{-0.030}$	$\varnothing 53.5_{-0.035}^{-0.030}$	A
	$\varnothing 53.5_{-0.040}^{-0.035}$	B
	$\varnothing 53.5_{-0.045}^{-0.040}$	C



Attention

1 Each ring has a specific mounting ring slot, be careful not to miss the wrong installation

2 The opening direction between each ring groove should be kept at different angles, adjust to ensure that the opening position of the piston ring is as shown in the figure, the piston ring has a marked side towards the top of the piston, the first ring is marked with 1JLR, the second ring is marked with 2JLR

3 The top surface of the piston faces the exhaust side with points, marked in the circle as shown in the figure

4 The retainer of the piston pin cannot face the gap of the piston

## 8.12 Magneto rotor and balance shaft

- Assemble semicircular key 1
- Assemble starting driven gear 2
- Assemble the rotor clutch assembly 3
- Assemble bolts 4
- Assemble balance shaft 5
- Assemble flat key 6
- Assemble balance block 7
- Assemble gasket 8
- Assemble balance shaft driven gear assembly 9
- Assemble gasket 10
- Assemble gasket 11
- Assemble bolts 12
- Assemble starting motor 13
- Assemble bolts 14

Thread lock sealer

20.2X62X2

M10X1.25LHX  
12  
Thread-locking  
fluid

M12X1.25X30  
Thread-locking fluid  
118-120N.m

### Attention

Install the Balance shaft driven gear assembly 9 according to the corresponding positive point  
Tighten the bolts. 12 to secure the bolts using the stop tool

## 8.13 Disassembly of The rear cylinder head

- Assemble the overflow pipe 1
- Assemble valve oil seal 3
- Assemble intake valve 4 exhaust valve 5
- Assemble valve spring lower seat 6
- Assemble valve spring 7
- Assemble valve spring upper seat 9
- Assemble valve card lock 8
- Assemble plug 10
- Equipped with water temperature sensor 11
- Assemble copper washers 13

Sealant  
10-12N.m

Sealant  
23-27N.

Sealant  
10-12N.m

Thread-locking fluid

M6 X 110  
10-12N.m

### Attention

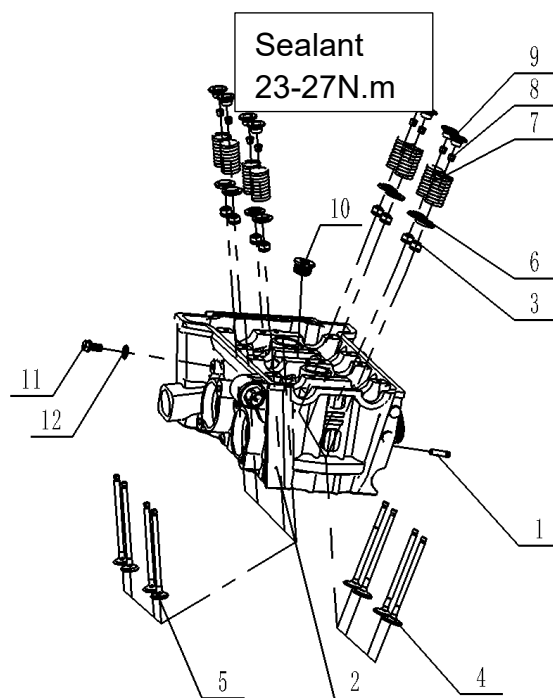
- 1** Valve oil seal 3 can not tilt after loading, oil seal spring can not fall out
- 2** Valve spring lower seat 6 big mouth down, valve spring 7 colored surface (dense end) down, valve spring upper seat big mouth up
- 3** Tap with a nylon hammer to make sure the valve card lock 8 does not fall off

- Assemble bolts 12

## 8.14 Disassembly of front cylinder head

- Assemble the overflow pipe 1
- Assemble valve oil seal 3
- Assemble intake valve 4 exhaust valve 5
- Assemble valve spring lower seat 6
- Assemble valve spring 7
- Assemble valve spring upper seat 9
- Assemble valve card lock 8
- Assemble plug 10
- Assemble copper gasket 12
- Assemble bolts 11

Sealant  
10-12N.m



Sealant  
24N.m

### Attention

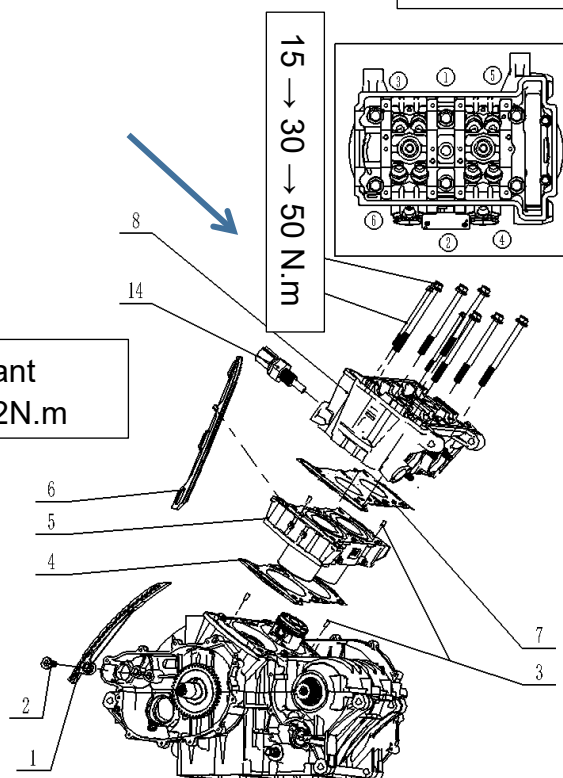
4 Valve oil seal 3 can not tilt after loading, oil seal spring can not fall out  
5 Valve spring lower seat 6 big mouth down, valve spring 7 colored surface (dense end) down, valve spring upper seat big mouth up  
6 Tap with a nylon hammer to make sure the valve card lock 8 does not fall off

M6 X 110  
10-12N.m

## 8.15 Cylinder block rear cylinder head

- Assemble tightening plate 1
- Assemble tightening plate screws 2
- Assemble cylindrical pin 3
- Assemble cylinder block paper gasket
- Assemble cylinder block assembly
- Assemble guide plate 6 (A)
- Assemble cylindrical pin 3
- Assemble cylinder head gasket 7
- Assemble rear cylinder head assembly 8
- Assemble cylinder head bolts 9
- Assemble bolt 10 (M6X110)
- Assemble water temperature sensor 14

Sealant  
10-12N.m



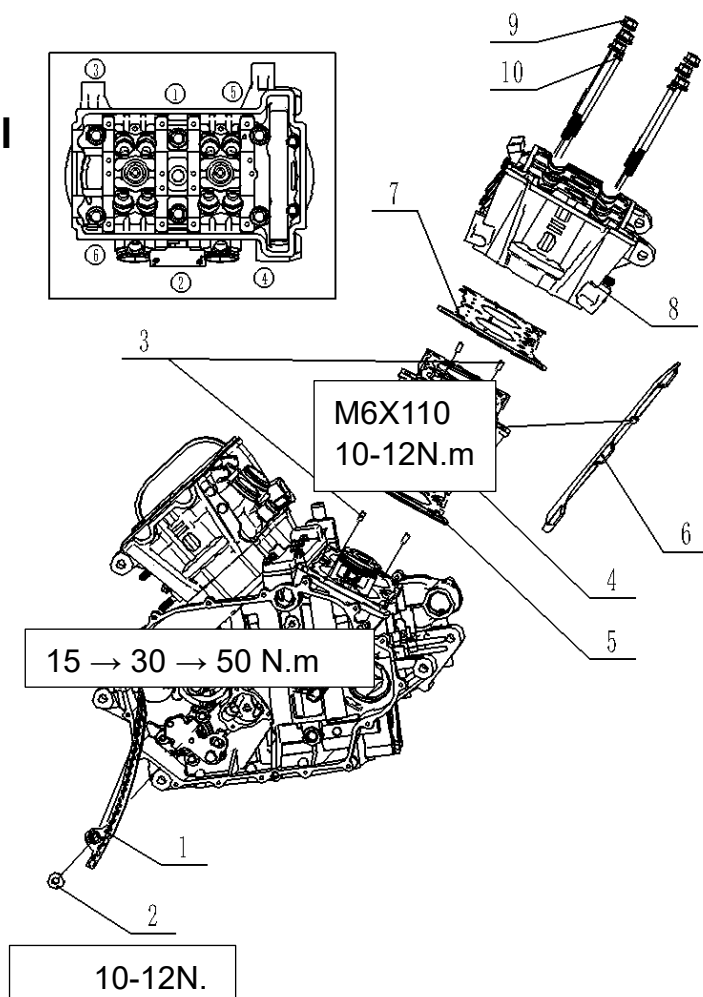
### Attention

- 1 Cylinder block assembly
- 2 Apply oil to inner wall before assembly
- 3 Apply oil to piston skirt
- 4 Apply oil to piston rings
- 5 Apply oil to cylinder head



## 8.16 Front cylinder head of cylinder bl

- Assemble tightening plate 1
- Assemble tightening plate screws 2
- Assemble cylindrical pin 3
- Assemble cylinder block paper gasket 5
- Assemble cylinder assembly 4
- Assemble guide plate 6 (A)
- Assemble cylindrical pin 3
- Assemble cylinder head gasket 7
- Assemble rear cylinder head assembly 8
- Assemble cylinder head bolts 9
- Assemble bolt 10 (M6X110)



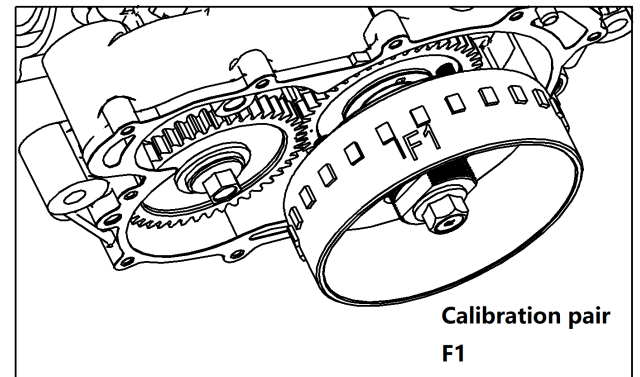
### Attention

- 1 Cylinder block assembly 4 Apply oil to inner wall before assembly
- 2 Apply oil to piston skirt

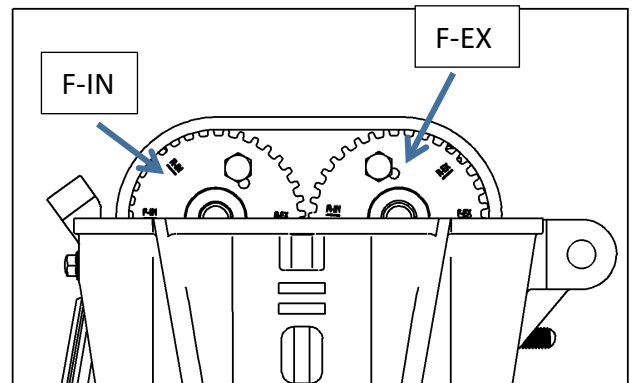
10-12N.m

## 8.17 Front cylinder camshaft

- Assemble needle roller 3
- Assemble Timing driven sprocket 4
- Assemble bolts 5
- Turn the crankshaft to the right time point as shown in Figure 1



- Assemble front cylinder intake camshaft 1
- Assemble front cylinder exhaust camshaft 2
- Timing driven sprocket adjustment as shown in figure 2 on the right, F-IN and F-EX line is flush with cylinder head



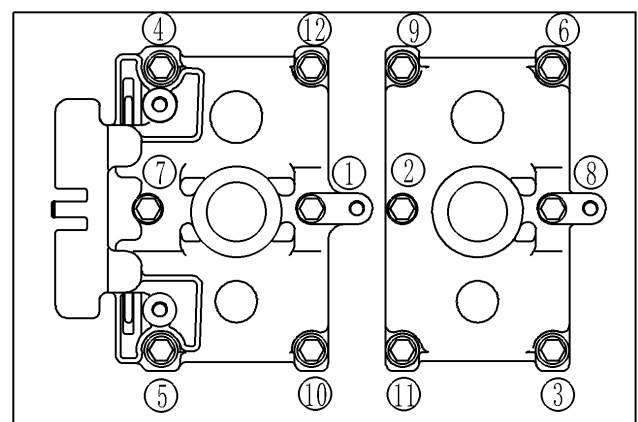
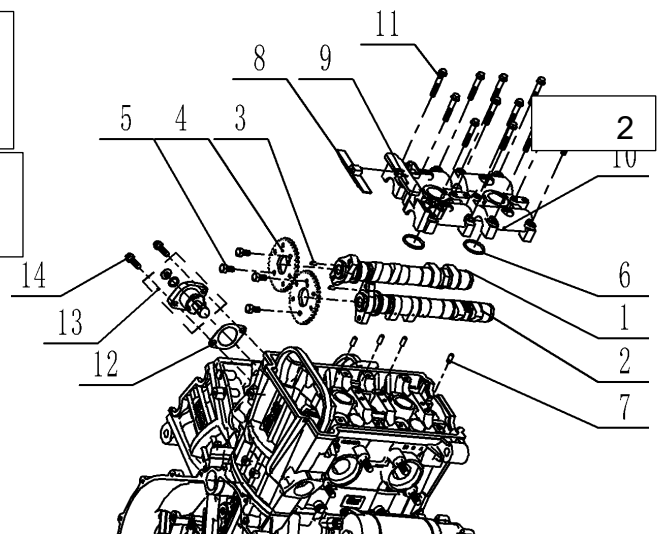
- Assemble O-ring 6
- Assemble guide plate 8 (B)
- Assemble cylindrical pin 7
- Assemble camshaft limit seat 9 (R)
- Assemble Camshaft limit seat 10 (L)

M6X35  
10-12N.m

M6X12  
Thread-locking  
fluid

M6X25  
10-12N.m

- Assemble bolts 11
- Assemble tensioner pad 12
- Assemble tensioner 13
- Assemble bolts 14



## Attention

Pretighten bolt 11 in two times, the first time screw in half of the length of the bolt, the second time gradually make the piece 9 piece 10 fit with the cylinder head, and then tighten in sequence according to the third figure on the right.

## Rear cylinder camshaft

### 8.18 Rear cylinder camshaft

- Assemble needle roller 3
- Assemble Timing driven sprocket 4
- Assemble bolts 5
- The crankshaft rotates 270° counterclockwise (according to the rotor arrow)  
To the correct time point shown in Figure 1 on the right

- Assemble front cylinder intake camshaft 1
- Assemble front cylinder exhaust camshaft 2

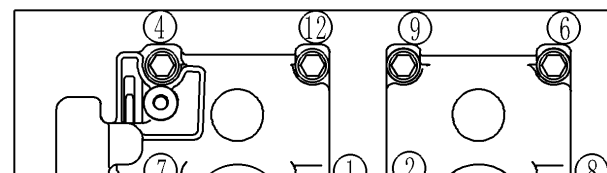
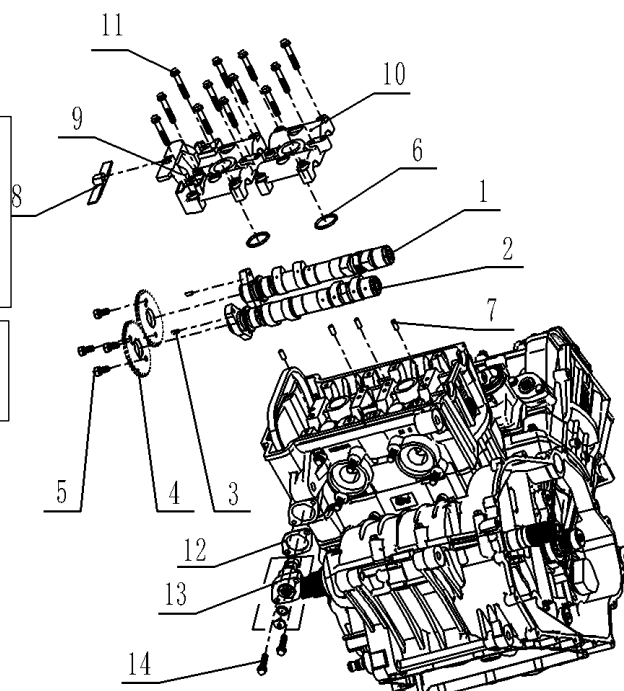
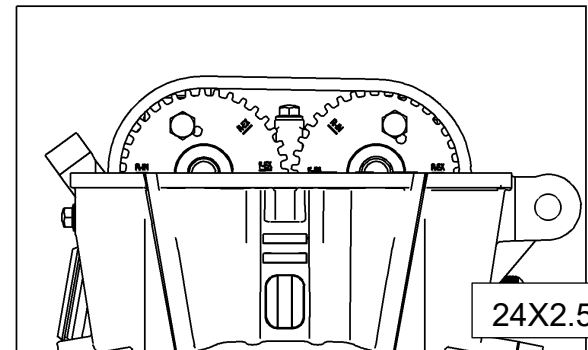
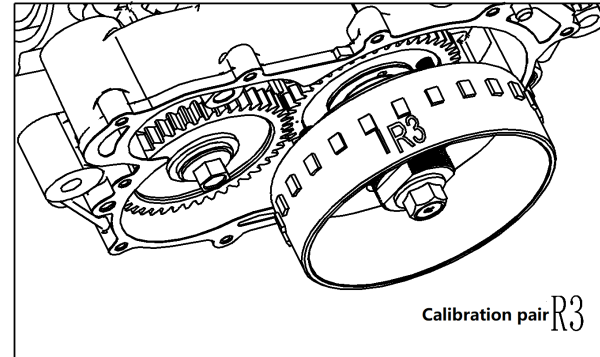
M6X35  
10-12N.m

- Timing driven sprocket adjustment as shown in Figure 2 on the right, R-IN  
Flush with R-EX line and cylinder head

- Assemble O-ring 6
- Assemble guide plate 8 (B)
- Assemble cylindrical pin 7
- Assemble camshaft limit seat 9 (R)
- Assemble Camshaft limit seat 10 (L)
- Assemble bolts 11
- Assemble tensioner pad 12
- Assemble tensioner 13

M6X12  
Thread-locking fluid  
17-20N.m

M6X25  
10-12N.m



- Mounting bolts 14

### Attention

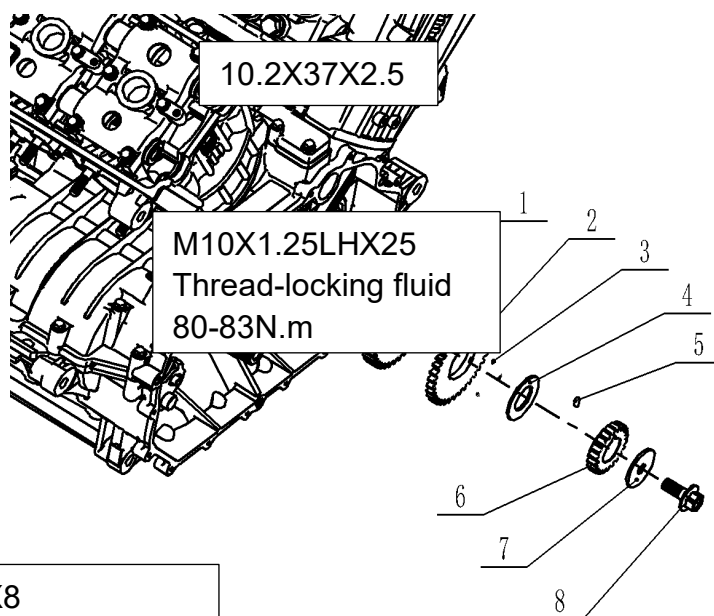
Pretighten bolt 11 in two times, the first time screw in half of the length of the bolt, the second time gradually make the piece 9 piece 10 fit with the cylinder head, and then tighten in sequence according to the third figure on the right

## Clutch

### driving wheel; Oil pump

## 8.19 Clutch driving wheel

- Assemble clutch driving gear 1
- Assemble anti-backlash gear 2
- Assemble spring 3
- Assemble gasket 4(Specification)
- Assemble needle roller 5
- Assemble water pump driving gear 6
- Assemble gasket 7
- Assemble bolts 8

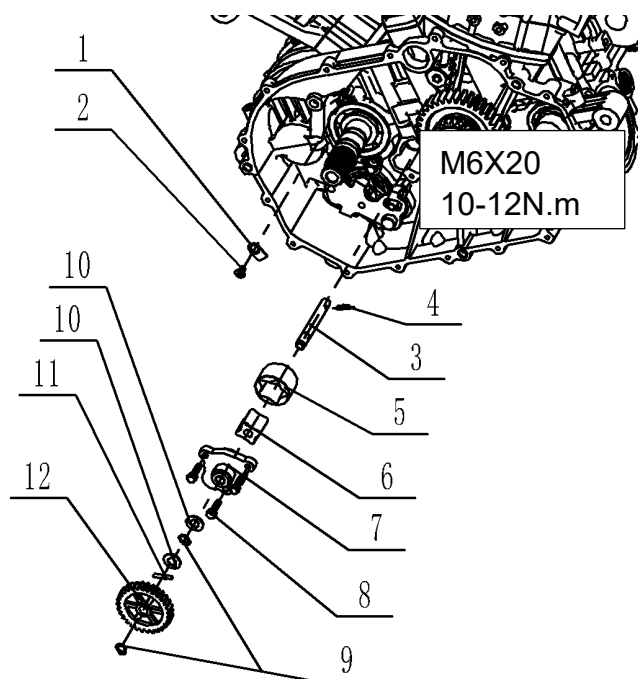


### Attention

When tightening bolt 8, use special stop gear to stop the rotation

## 8.20 Oil pump

- Assemble bearing baffle 1
- Assemble countersunk screw 2
- Assemble needle roller 4
- Assemble oil pump shaft 3
- Assemble the inner rotor of the oil pump 6
- Assemble oil pump outer rotor 5
- Assemble oil pump cover 7
- Assemble bolts 8



- Assemble gasket 10
- Assemble shaft ring
- Assemble gasket 10
- Assemble needle rolling 11
- Assemble oil pump driven gear 12
- Assemble shaft ring

### Attention

- 1 Oil pump inner and outer rotors before assembly
- 2 Apply oil at one end of the oil pump shaft into the housing
- The 3 axis is assembled with the side of the retaining ring pressing the collapsing edge inward

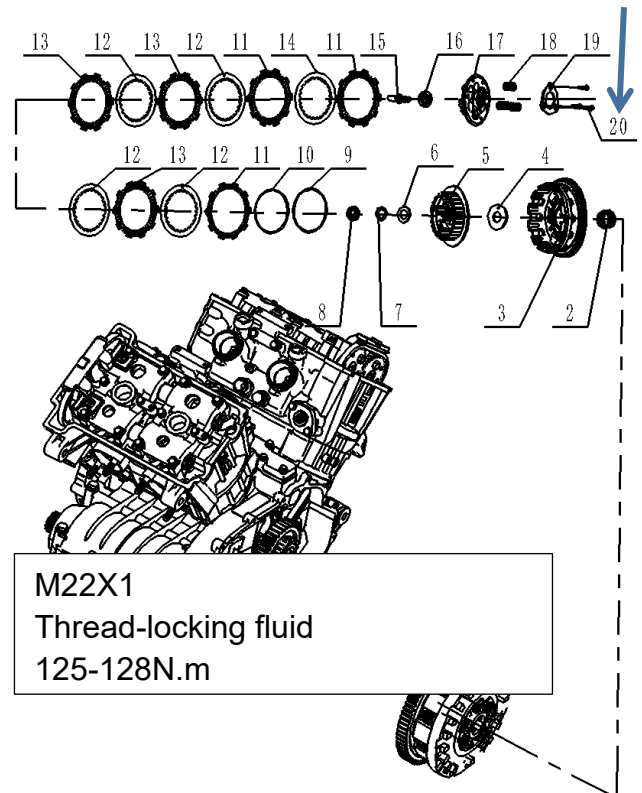
6003

12-15N .m

**Clutch Engine disassembly**

## 8.21 Clutch

- Assemble clutch spacer 1
- Assemble needle roller bearing 2
- Assemble clutch driving gear 3
- Assemble washer 4 (size 25X60X2)
- Assemble clutch driven disc 5
- Assemble washer 6 (specification 22X39X2)
- Assemble waveform washers 7
- Assemble the clutch nut 8
- Assemble gasket 9
- Assemble dish washers 10
- Assemble friction plate I 11
- Assemble steel sheet I 12
- Assemble friction plate II 13
- Assemble steel sheet I 12
- Assemble friction plate II 13
- Assemble steel sheet I 12
- Assemble friction plate II 13
- Assemble steel sheet I 12
- Assembling friction plate I 11
- Assembly of steel sheet II 14
- Assembling friction plate I 11
- Assemble clutch release ejector lever 15
- Assemble bearing 16
- Assemble clutch pressure plate 17



- Assemble the clutch pressure disc spring 18
- Assemble plates 19
- Assemble bolt assembly 20

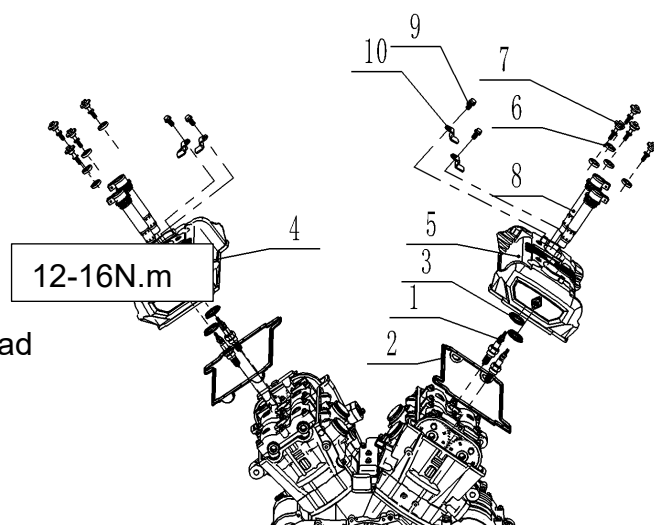
Attention
1 Wave washer 7 flared big mouth facing down
2 Steel plate I 12 Steel plate II 14 punch collapse side down assembly
3 Dish gasket 10 flared big mouth facing up.

M6X12  
8-10N.m

## Cylinder head cover; Right cover assembly; Right cover Engine disassembly

### 8.22 Cylinder head cover

- Assemble spark plug 1
- Assemble cylinder head cover seal ring 2
- Assemble spark plug seal ring 3
- Assemble cylinder head cover 5 and front cylinder head cover 4
- Assemble rubber gasket assembly 6
- Assemble cylinder head cover step bolts 7
- Assemble high voltage ignition coil 8
- Assemble ignition coil platen 10
- Assemble bolts 9

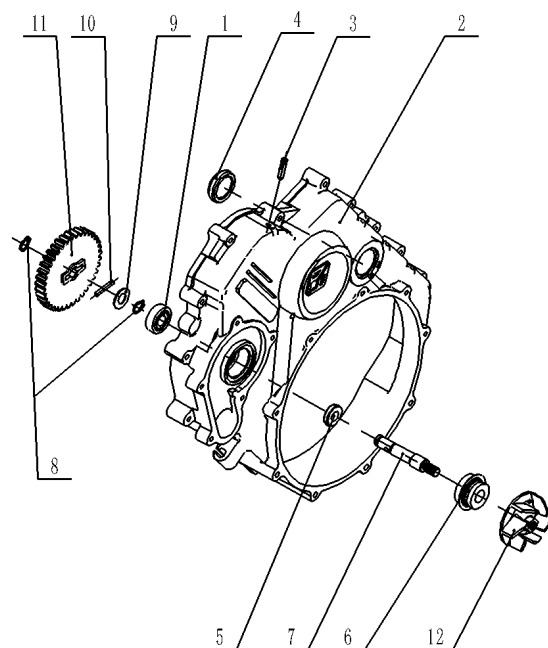


### 8.23 Assemble the right cover

- Assemble the oil level viewer 4, and apply it in an outer circle before assembly

#### **Thread-locking fluid**

- Assemble bearing 1
- Assemble oil sealing 5. Apply adhesive in a circle before assembly
- Assemble pump shaft 7
- Assemble shaft ring 8
- Assemble gasket 9
- Assemble needle rolling 10
- Assemble water pump driven wheel 11
- Assemble shaft ring 8
- Assemble the pump impeller 12 and tighten it by hand

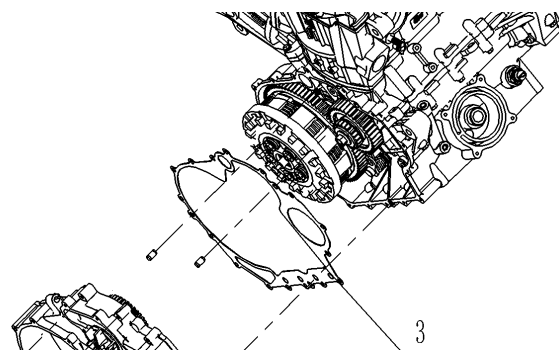


#### **Attention**

The shaft is assembled with the side of the retaining ring pressed inward

M6X35  
10-12N.m

### 8.24 Right cover



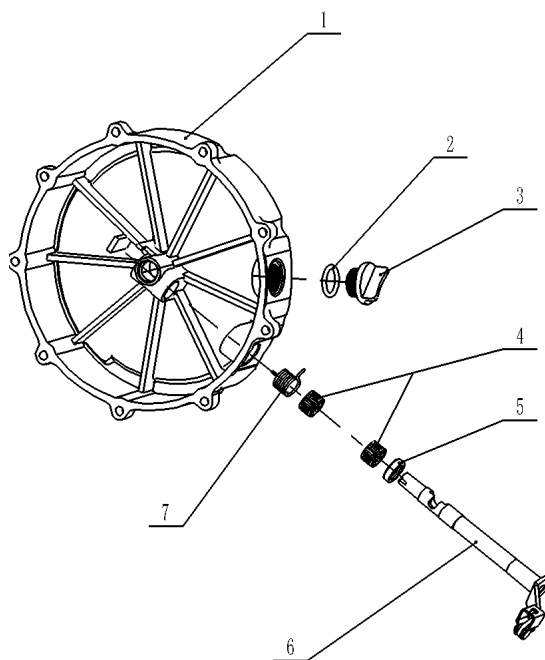
- Assemble the right cover paper pad 3
- Assemble pin 1
- Assemble right cover combination 2
- Assemble bolts 4

Attention
Bolt 4 Tightening sequence, approximately diagonal fastening



## 8.25 Clutch cover assembly

- Assemble o-ring 2
  - Assemble fuel hole plug 3
  - Assemble needle roller bearing 4
  - Assemble oil seal 5, and apply tightening glue to the outer circle
  - Assemble the clutch operating lever 6
  - Assemble torsion spring 7
- After the clutch operating lever passes through the clutch cover 1 insert the clutch operating torsion spring 7 under the clutch operating lever.



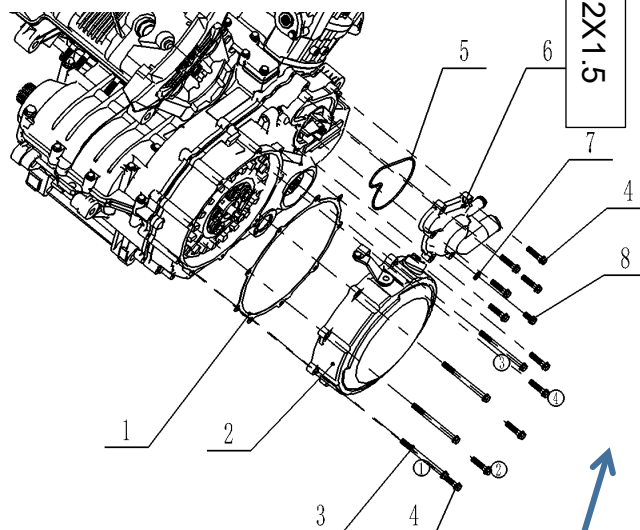
### Attention

The torque spring 7 of the clutch operating rod is first set on the clutch operating rod 6, and the rotation Angle is locked after adjusting the position. The gap position of the clutch 1 is basically concentric with the center hole of the right cover 1, and most of the gap of the clutch operating rod 6 is towards the clutch.

M6X25  
10-12N.m

## 8.26 Clutch Cover Water pump co

- Assemble water pump seal ring 5
- Assemble the water pump cover 6
- Assemble bolts 4
- Assemble copper gasket 7
- Assemble bolts 8
- Assemble clutch cover paper pad 1
- Assemble clutch cover 2
- Assemble bolts 3



### Attention

M6X75  
10-12N.m

M6X30  
10-12N.m

M5X12  
6-8N.m

- 1 Bolt 3 and bolt 4 are tightened in approximately diagonal order
- 2 Check that the water pump sealing ring is properly assembled.

- Assemble bolts 4

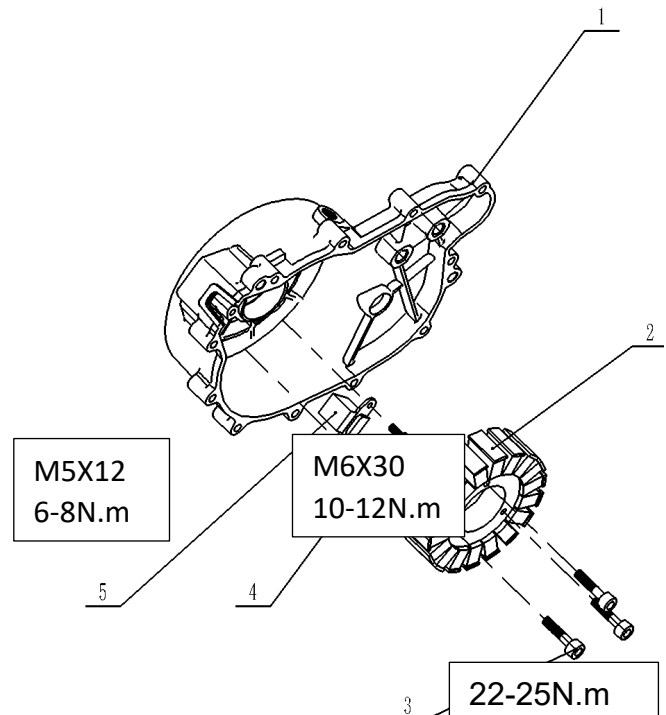
## Left cover subassembly; Left cover Engine disassembly

### 12.27 Assemble the left cover

- Assemble magneto stator 2
- Assemble bolts 3
- Assemble trigger 5
- Assemble bolts 4

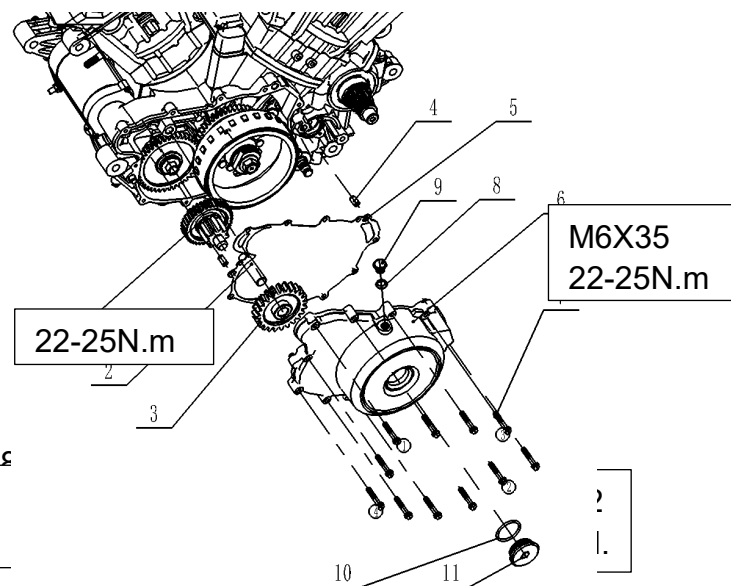
#### Attention

- 1 Trigger assembly Angle, wire installed in the harness slot, do not press the harness
- 2 Magneto stator wire harness rubber block stuck in the left cover 1 card slot



### 12.28 Left side cover

- Assemble starting dual gear 1
- Assemble starting idle gear shaft 2
- Assemble starting idle gear 3
- Assemble locating pin 4
- Assemble the left cover paper pad 5
- Assemble left cover assembly 6
- Assemble bolt 7
- Assemble top dead center plug sealing ring 8
- Assemble plug 9
- Assemble o-ring
- Assemble turning shaft hole plug 11



#### Attention

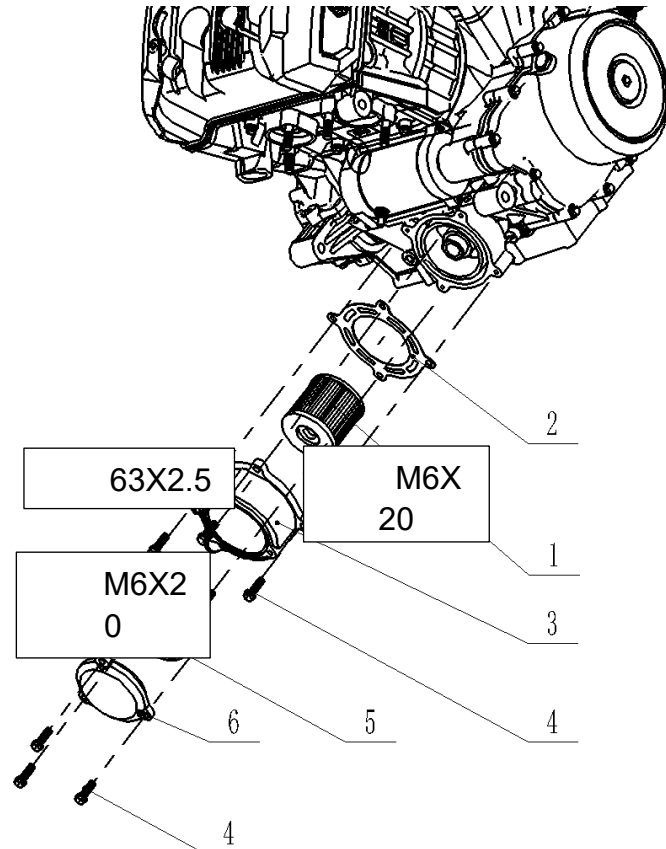
Bolt 7 Fasteners Tighten approximately diagonally

Apply sealant to the grooves of the sealant block in the middle part of the left cover

## Cooler; Oil pan Engine disassembly

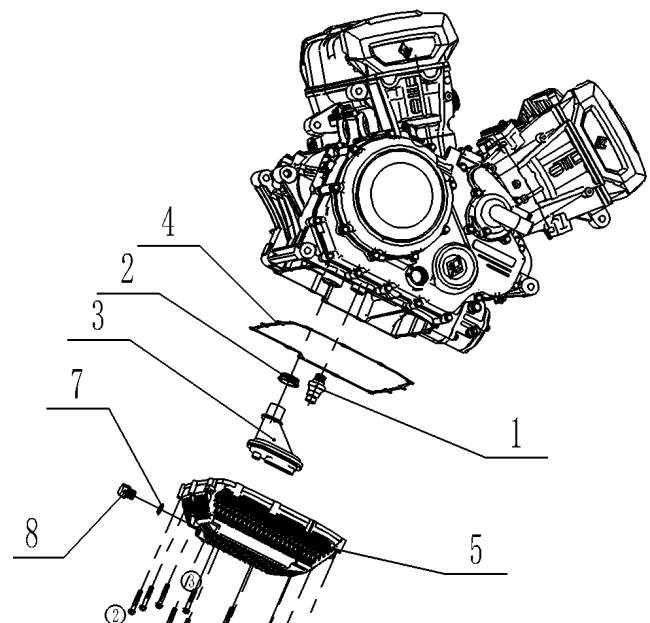
### 12.29 Cooler

- Assemble cooler copper gasket 2
- Assemble the cooler housing 3
- Assemble bolts 4
- Assemble oil filter 1
- Assemble O-ring 5
- Assemble oil filter cap 6
- Assemble bolts 4



### 8.30 Oil pan

- Assemble oil relief valve 1
- Assemble oil suction pan seal ring 2
- Assemble oil pan assembly 3
- Assemble oil pan gasket 4
- Assemble oil sump 5
- Assemble bolts 6



- Assemble metal sealing ring 7
- Assemble oil drain bolt 8

#### Attention

Wipe the bonding surface with a dust-free cloth before loading the oil pan  
Bolts 6 Tighten in an approximate diagonal sequence.

M6X12  
10-12N.m

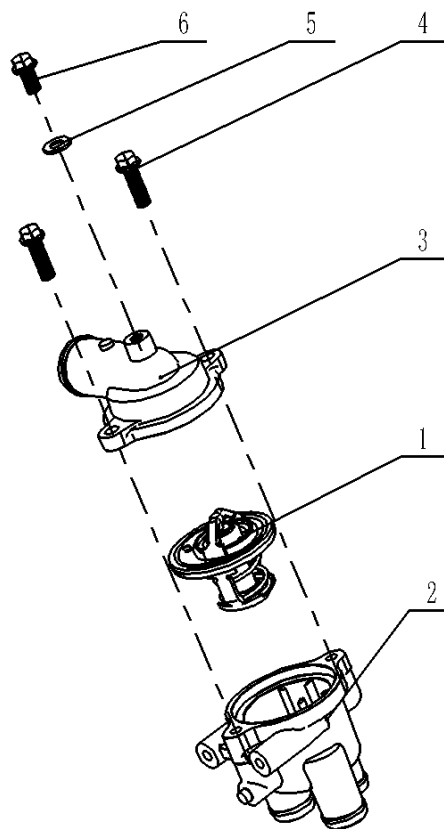
M6X20  
10-12N.m

## Thermostat; Cooler water pipe

Engine disassembly

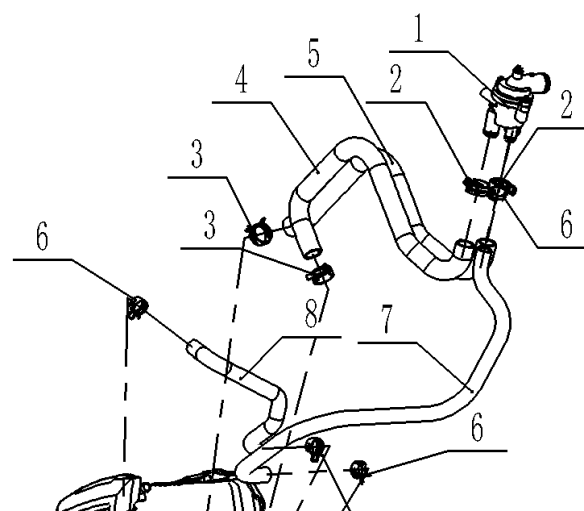
### 8.31 Thermostat

- Assemble thermostat 1
- Assemble thermostat cover 3
- Assemble bolts 4
- Assemble copper gasket 5
- Assemble bolts 6



### 8.32 Cooler Water pipe

- Assemble rear cylinder outlet pipe 5
- Assemble clamps 3
- Assemble clamps 2



- Assemble cooler inlet pipe 7
- Assemble clamp 6
- Before assembling the water pipe, the cylinder outlet pipe 4
- Assemble clamps 3
- Assemble throat band 2
- Assemble cooler outlet pipe 8
- Assemble clamp 6

M6X16  
10-12N.m

M4X20  
6N.m

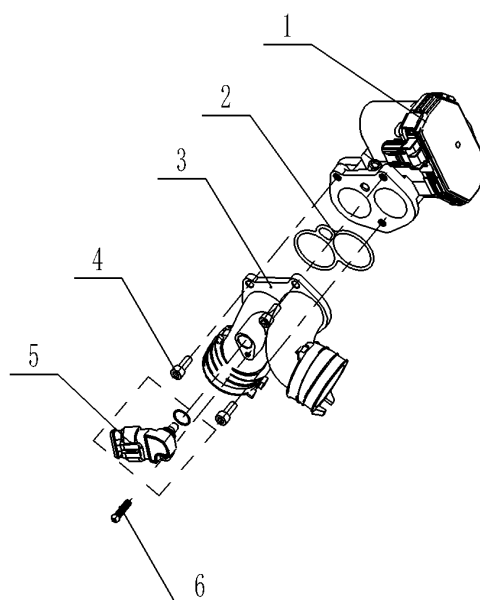
M6X12  
8-10N.m

## Valve assembly; Oil rail; Emptying pipe

Engine disassembly

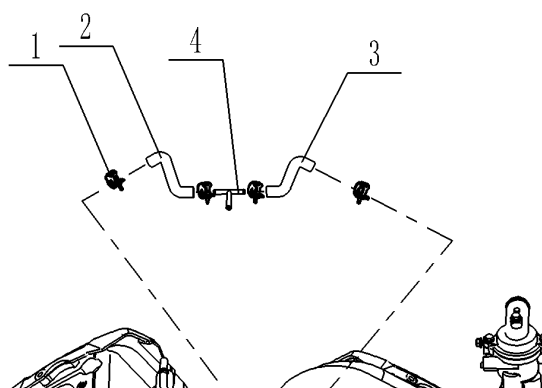
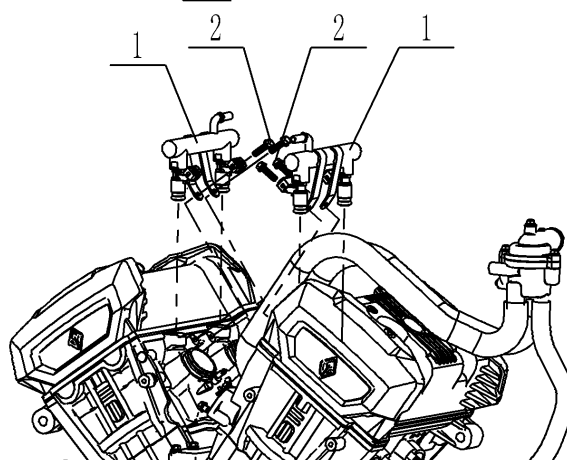
### 8.33 Valve assembly

- Assemble three-way inlet pipe seal ring 2
- Assemble three-way intake pipe 3
- Assemble bolts 4
- Assemble TMAP sensor Assembly 5
- Assemble the cross slot screws 6



### 8.34 Oil rail

- Assemble stainless steel oil rail 1
- Assemble bolt 2



## 8.35 Exhaust pipe

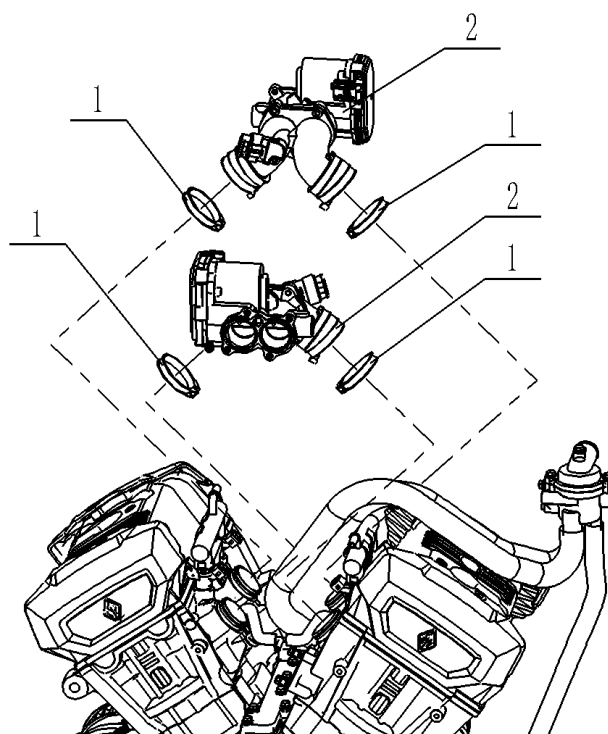
- Assemble exhaust tee 4
- Assemble exhaust pipe 23
- Assemble clamps 1

**Throttle valve; Add the oil**

**Engine disassembly**

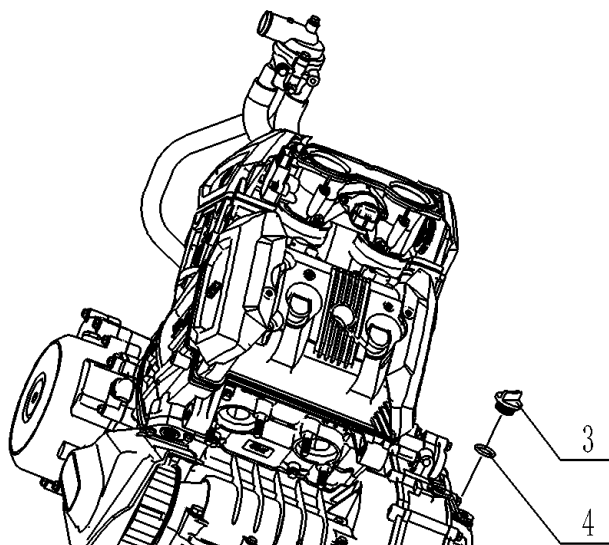
## 8.36 Throttle valve

- Assemble throttle valve body assembly 2
- Remove throat band 1



## 12.37 Add oil

- Assemble metal sealing ring 2
- Assemble oil drain bolt 1



- Add 10W-40 Shell oil 4L
- Assemble o-ring 4
- Assemble oil scale 3 and tighten by hand

M14X12 22-25N.m
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