

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 BD700-2,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

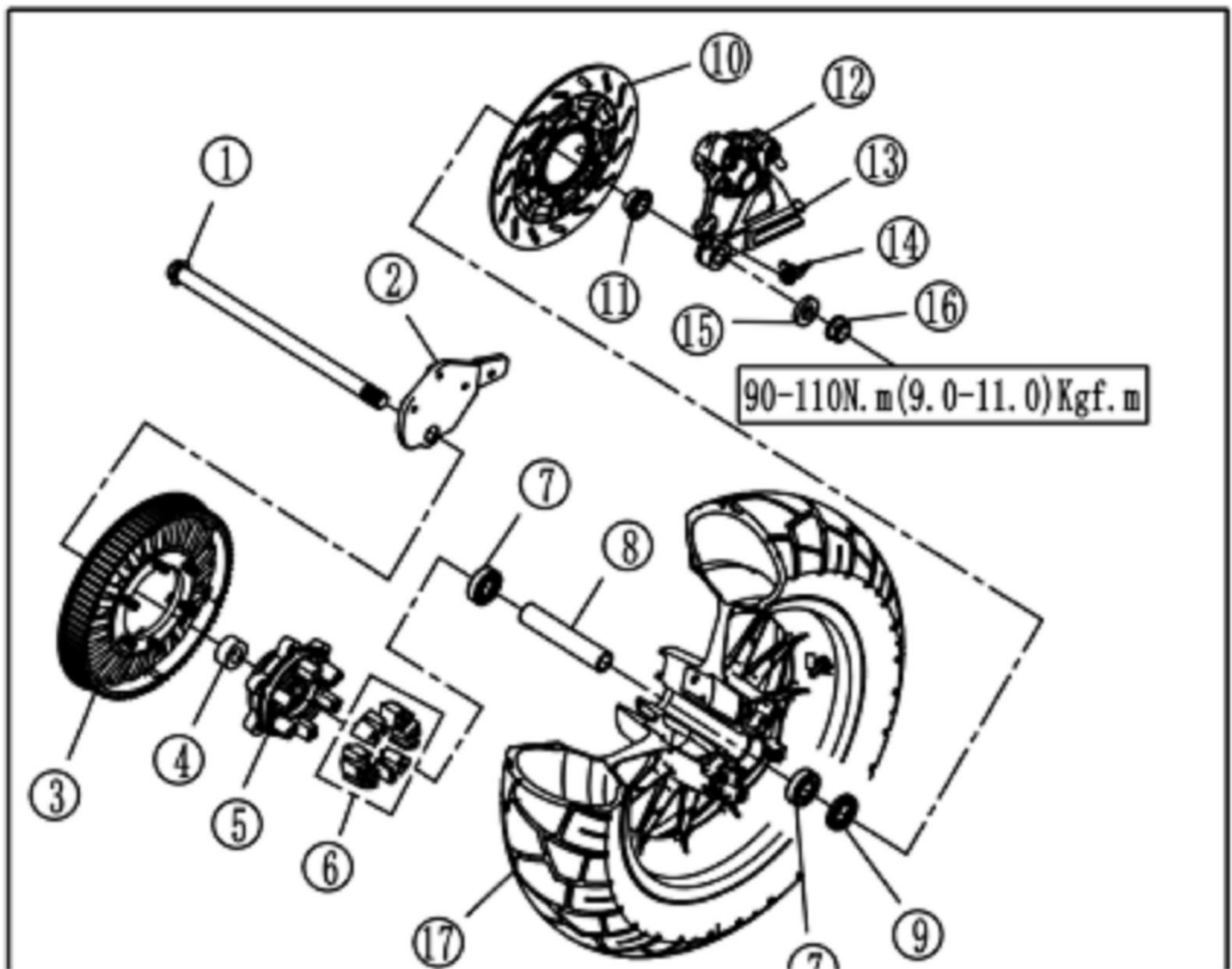
To know about the sequence of parts and disassembly steps,at the beginning of each decomposed chapter, there is an expansion diagram for reference.

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

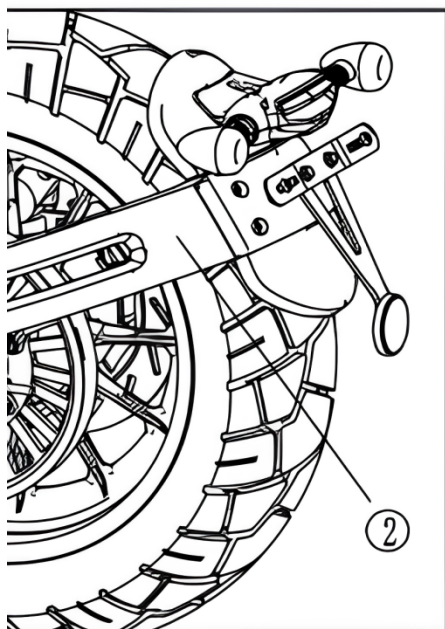
2.Some information related to the work,excepting the expansion diagram,there are detailed instructions in the work step format ⑤.

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



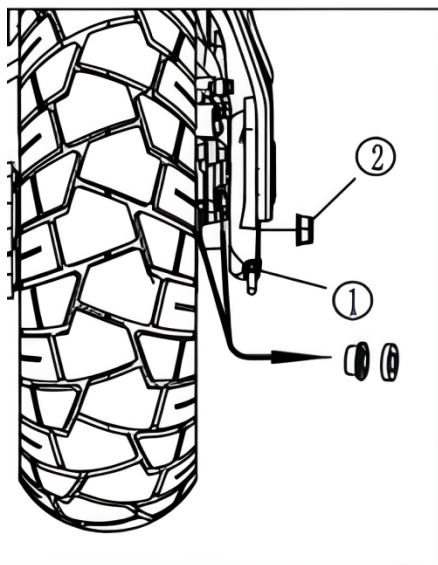
warning
Firmly support the motorcycle to prevent it from overturning

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.

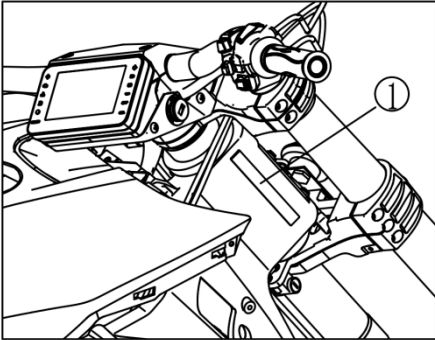


Please read the book before maintaining the vehicle

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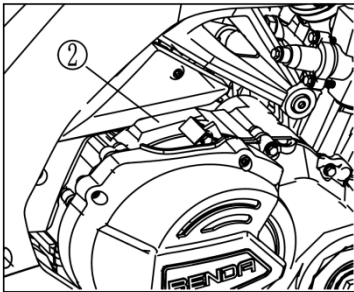
The first Chapter. Overview

1.1 Motorcycle identification



VIN

VIN ① Engraved on the right side of the frame faucet tube, turn the steering knob to the left to the bottom, and see the vehicle identification code ①



Engine serial number

Engine serial number ② Engraved 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.

Pay attention to safe operation

6.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 the disassembled parts

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.

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

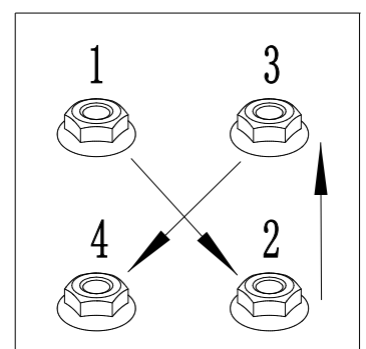
(apply lubricating grease to the oil seal and O-ring).

Follow the specified tightening torque.

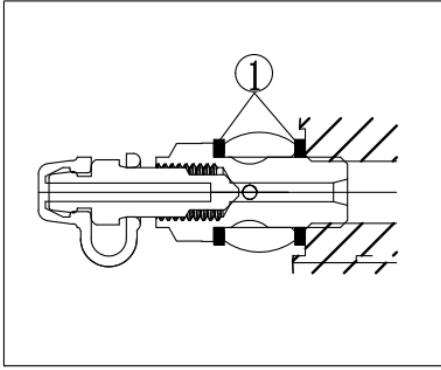
- When two people work together, they should closely cooperate.

9.Essential maintenance manual and parts catalog around you

- To ensure efficient, reliable, and safe operation.

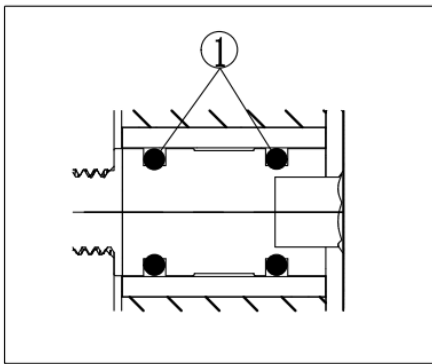


Gaskets, oil seals, and O-ring seals



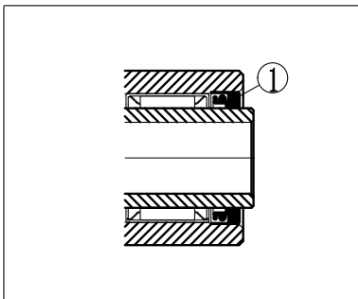
1. During the vehicle overhaul process, all sealing gaskets, oil seals, and O-ring seals must be replaced. The surface must be cleaned and lubricated in advance.

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.



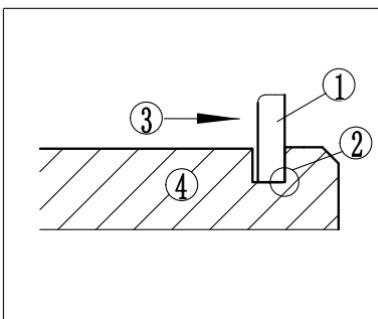
Locking washer and cotter pin

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

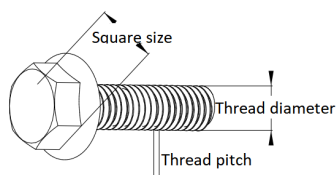
2.1 Tightening torque

NO	Locking components	Name	Size	Qty	Locking torque	
					Kgf.m	N.m
1	Hexagonal cylindrical head bolts for instrument bracket and handle seat	Hexagonal cylindrical head bolts for instrument bracket and handle seat	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	Hexagon flange bolts for upper connecting plate and handle seat	Hexagon flange bolts for upper connecting plate and handle seat	M12×1.25	2	4.5-7.2	45-72
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 front suspension bracket and frame inner hexagonal cylindrical head combination bolt	Engine front suspension bracket and frame inner hexagonal cylindrical head combination bolt	M12×1.25	2	4.5-7.2	45-72
7	Engine suspension bracket and frame nut	Engine suspension bracket and frame nut	M10×1.25	2	4.9-6.0	49-60
8	Engine suspension bracket and frame inner hexagonal cylindrical head bolt	Engine suspension bracket and frame inner hexagonal cylindrical head bolt	M10×1.25	2	3.5-4.0	35-40
9	Rear shock absorber and frame inner hexagonal cylindrical head bolt	Rear shock absorber and frame inner hexagonal cylindrical head bolt	M12×1.25	1	4.5-7.2	45-72
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	M12×1.25	1	4.5-7.2	45-72

11	Rear flat fork shaft and nut nut	Rear flat fork shaft and nut nut	M20×1.5	1	9.0-11.0	90-110
12	Hexagonal large flat head bolts inside the fuel tank and fuel pump	Hexagonal large flat head bolts inside the fuel tank and fuel pump	M5×0.8	5	0.5-1.0	5-10
13	Hexagon large flat head bolts for fuel tank and oil level sensor	Hexagon large flat head bolts for fuel tank and oil level sensor	M5×0.8	4	0.15-0.2	1.5-2
14	Hexagonal cylindrical head bolts inside the fuel tank and frame	Hexagonal cylindrical head bolts inside the fuel tank and frame	M8×1.25	4	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	M18×1.5	1	5.0-7.0	50-70
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 hexagonal flange nut	Headlamp and bracket hexagonal flange nut	M6×1	1	0.8-1.2	8-12
21	Hexagon flange bolts for large pulley and pulley seat	Hexagon flange bolts for large pulley and pulley seat	M10×1.25	6	4.5-5.5	45-55

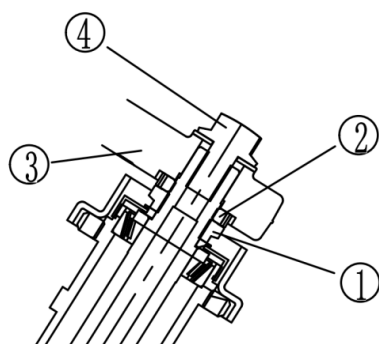
In addition to the specified locking torque, the general locking torque can be determined based on the screw diameter (opposite side width) when tightening screws and nuts (as shown in the table on the right).

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.

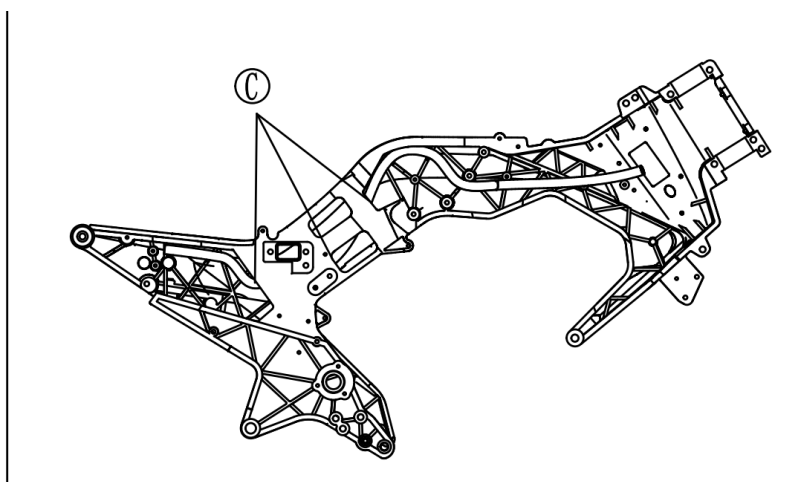
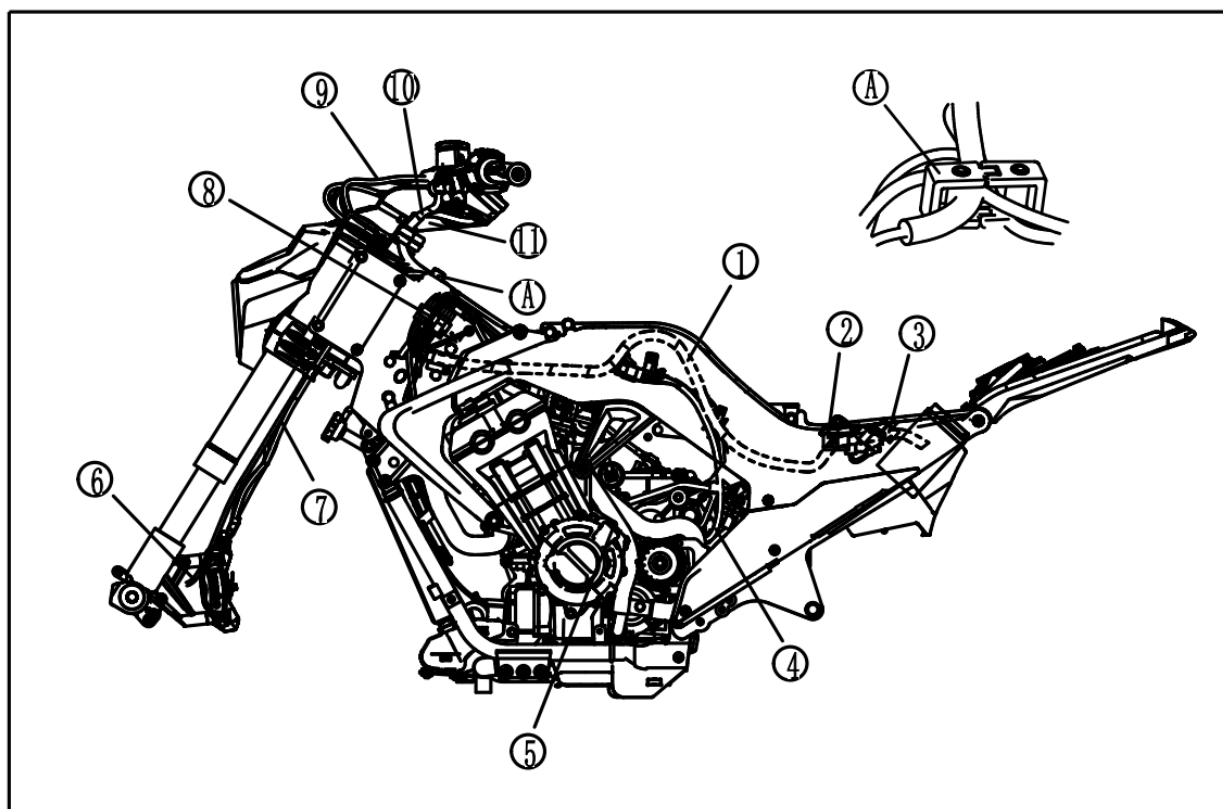


2.2 Cable wiring diagram

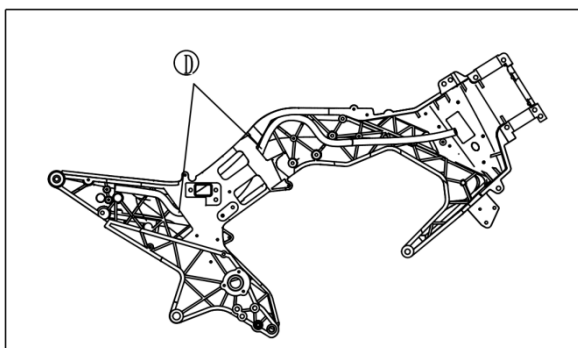
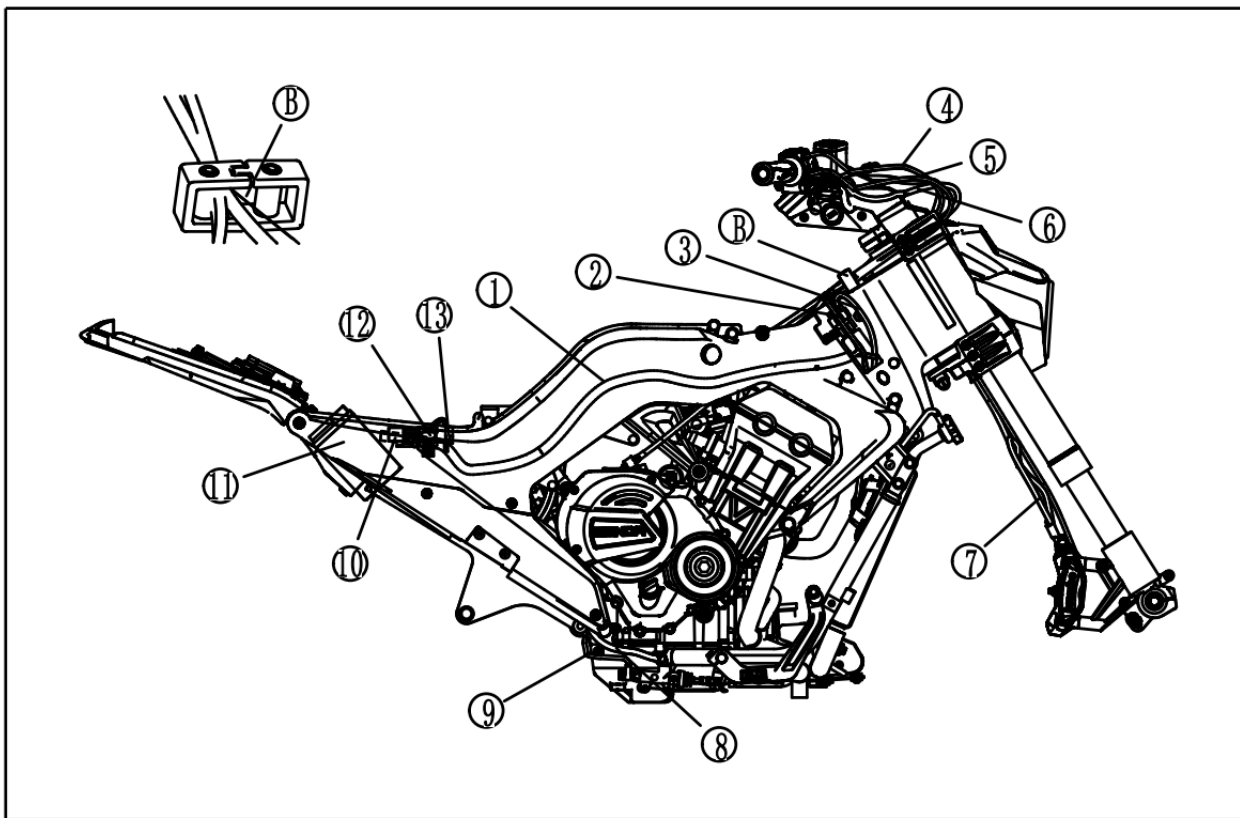
- | | | |
|-----------------------|---|---------------------------|
| 1 Main wiring harness | 5 Crankshaft phase cable | 9 Clutch cable |
| 2 Fuse box | 6 Front wheel speed sensor cable | 10 Instrument cable |
| 3 Start relay | 7 Front brake lower pump oil pipe | 11 Instrument lower cover |
| 4 Gear display cable | 8 Headlights, handle switch, front left turn, instrument panel insert | |

A Threading rack (clutch cable, instrument cable, handle switch cable, front wheel speed sensor cable passing through the rack)

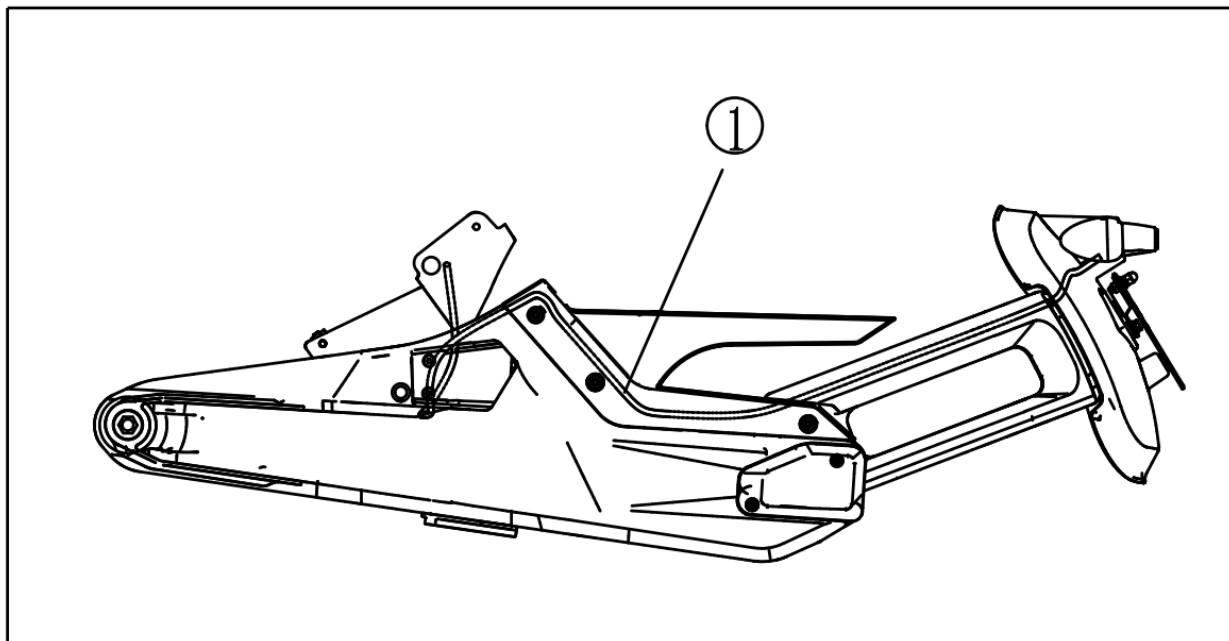
C The left branch of the main cable passes through the interior of the left frame



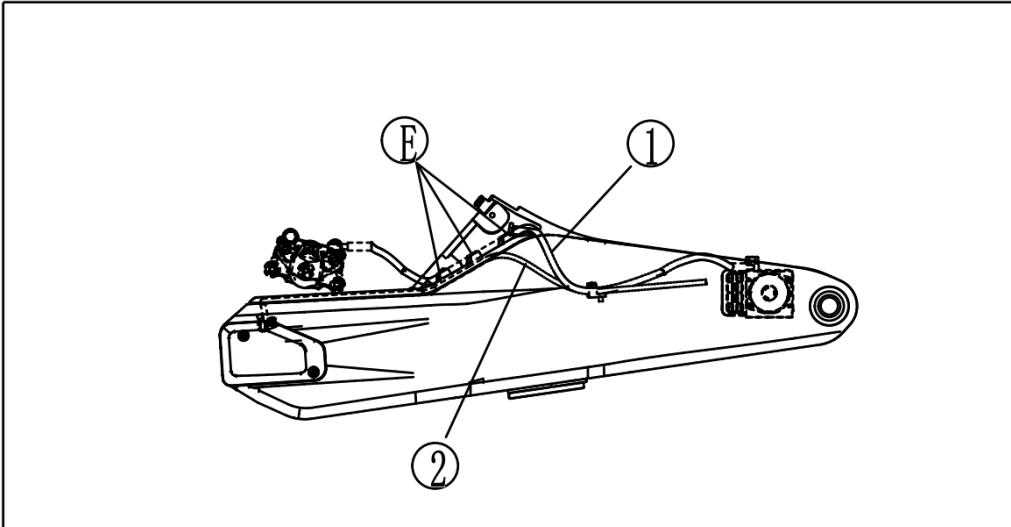
- | | | |
|---|-------------------------------------|----------------|
| 1 Main wiring harness | 6 Accelerator cable (return) | 11 Battery |
| 2 Oxygen sensor plug-in (four in one adapter) | 7 Front disc brake lower pump | |
| | left and right connecting oil pipes | 12 flasher |
| 3 Fan plug-in | 8 Rear brake oil cup oil pipe | 13 Dump switch |
| 4 Front brake handle oil pipe | 9 Rear brake pedal oil pipe | |
| 5 Accelerator cable (pulled) | 10 Auxiliary relay | |
- A Threading rack (throttle cable, front brake handle oil pipe passing through the rack)
- D The right branch of the main cable passes through the inside of the right frame



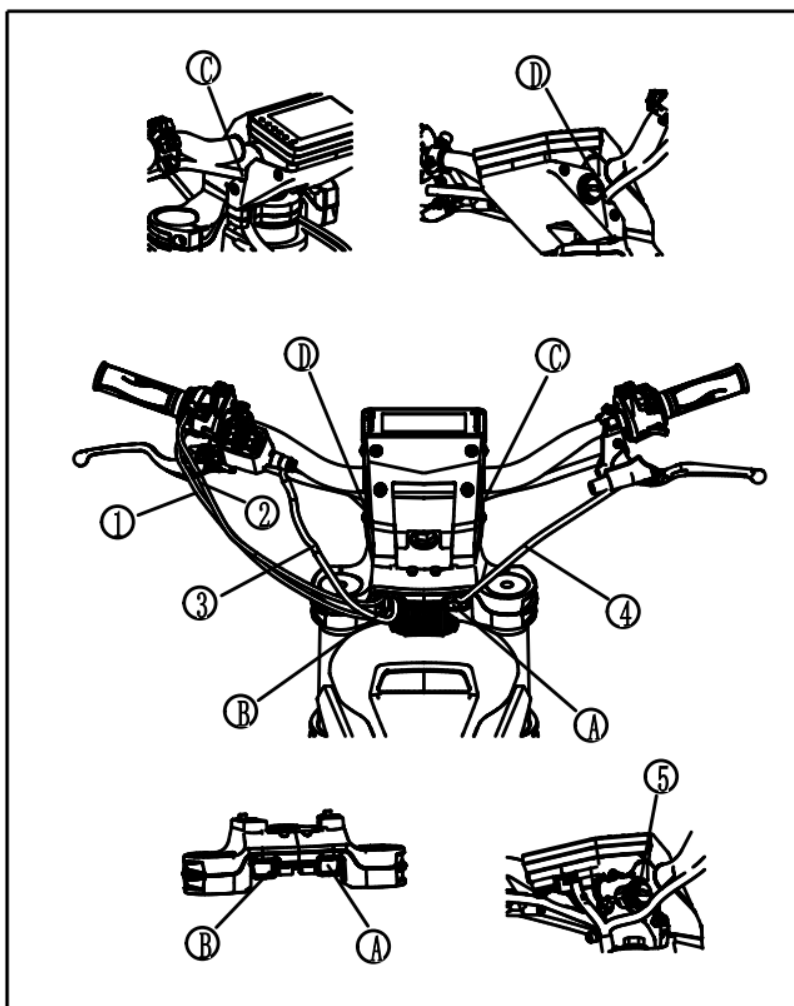
1 Tail light transition line (passing through the inner side of the rear fender bracket and the inner side of the chain guard)



- 1 Rear brake caliper oil pipe
- 2 Rear wheel speed sensor cable
- E The rear wheel speed sensor cable and the rear brake caliper oil pipe must pass through the right line clamp of the rear fork.



- | | |
|---|--|
| 1 Accelerator cable (pull) | A The clutch cable passes through the left wire frame |
| 2 Accelerator cable (return) | B The throttle cable and front brake handle oil pipe pass through the right wire frame |
| 3 Front brake upper pump oil pipe instrument lower shield | C Left hand handle switch passes through the left wire hole of the |
| 4 Clutch cable | D Right hand handle switch passes through the right wire hole of the |
| 5 USB interface | |



The Third Chapter. Check and adjust

3.1 Check and adjust

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
Content	Content	○	○	○
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	Clean or replace the engine oil filter element		○	○

engine oil filter element				
Check the operation of the front brake * and adjust or replace it if necessary	Check the operation of the front 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	Check the operation status/oil leakage of the front shock absorber, and repair it if necessary		○	○

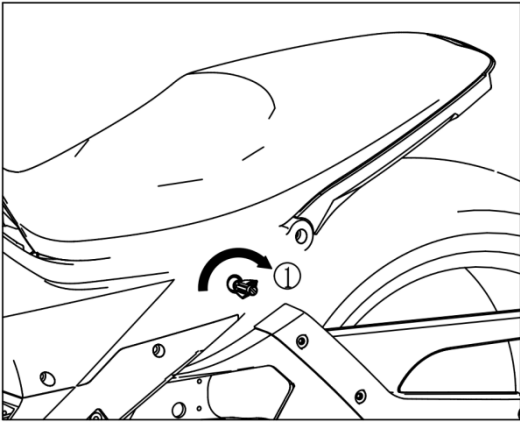
absorber, and repair it if necessary				
Check the operation status/oil leakage of the rear shock absorber, and repair it if necessary	Check the operation status/oil leakage of the rear shock absorber, and repair it if necessary	Check before driving		
Check the tension of the transmission chain and adjust it if necessary	Check the tension of the transmission chain and adjust it if necessary	○	○	○
Accessories/fastening parts * Check all accessories and fastening parts and make necessary corrections	Accessories/fastening parts * Check all accessories and fastening parts and make necessary corrections	○	○	○

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

Tips:

Brake fluid replacement

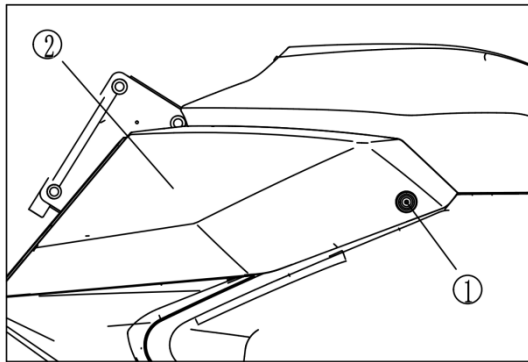
- 1.If the master cylinder or caliper needs to be disassembled, the brake fluid needs to be replaced. Check the brake fluid level under normal conditions and replenish the brake fluid if necessary.
- 2.The oil seal should be replaced every two years inside the master cylinder and caliper cylinder.
- 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

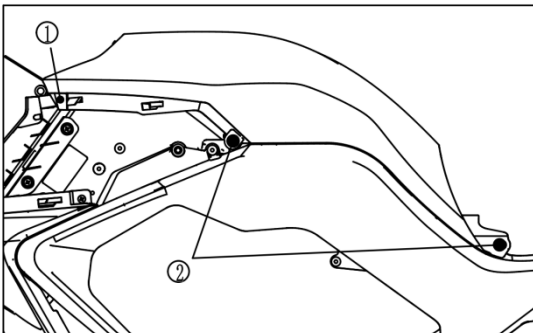
1.Cushion

Rotate the key in direction ① while removing the seat cushion towards the top and back.



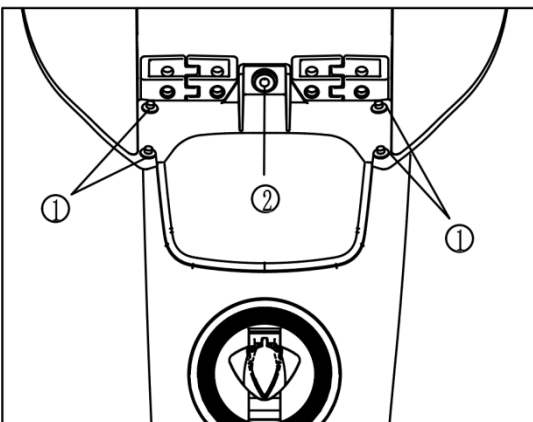
2.Fuel tank left and right decorative covers

Use a 5 # Allen wrench to remove bolt ①, remove the fuel tank decorative cover ②, and unplug the front turn signal connector.

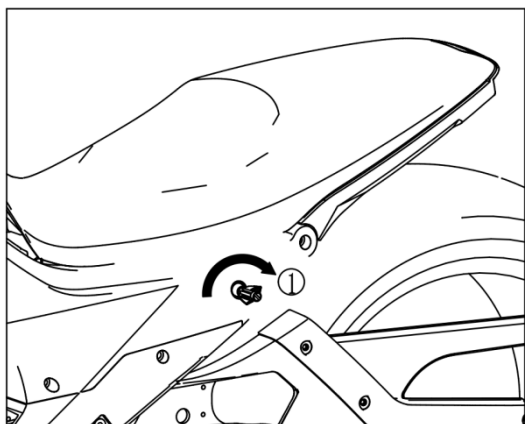


3.Fuel tank cover

Use a Phillips screwdriver to remove bolt ① and a 5 # Allen wrench to remove bolt ②.



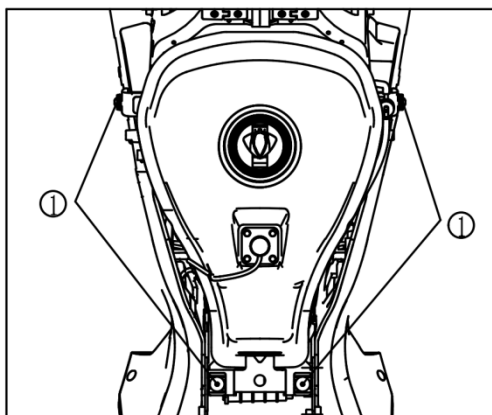
Use a screwdriver or other tool to remove the expansion screw ① and a 5 # Allen wrench to remove the front fixing bolt ②.



4. Fuel tank

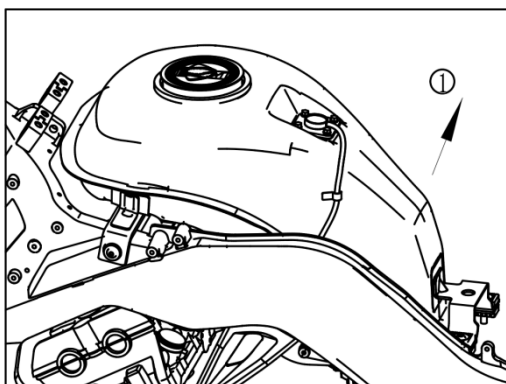
Use 6# Allen wrench to remove the left and right bolts

①



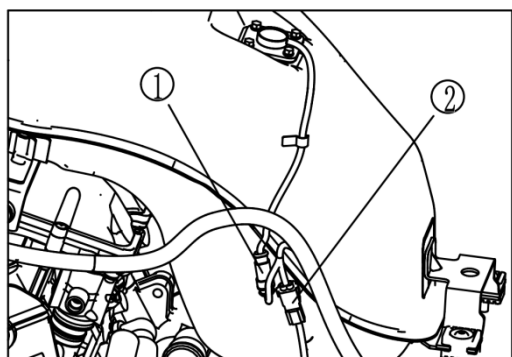
5. Lift the fuel tank

Lift the fuel tank towards the ① direction for a certain distance to facilitate plug-in removal.



6. Unplugging plugins

After lifting the fuel tank, remove the fuel level sensor plug ① and fuel pump plug ②.

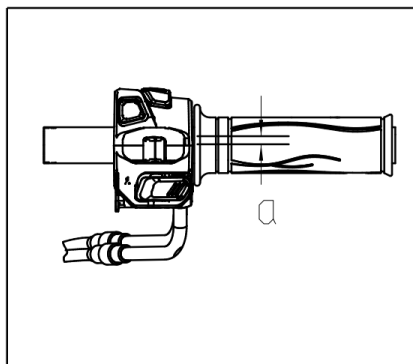


Installment

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

1. Fuel tank Torque: 20N. m (2Kgf. m)

3.2 Adjust the throttle cable



Check/adjust the free clearance of the throttle cable

1. Conduct an inspection

The free clearance of the peripheral part of the throttle handle α

The amount of free clearance on the periphery of the throttle handle:

3-7mm

Beyond the specified value → Adjust

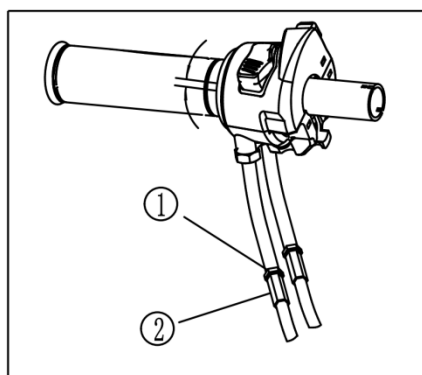
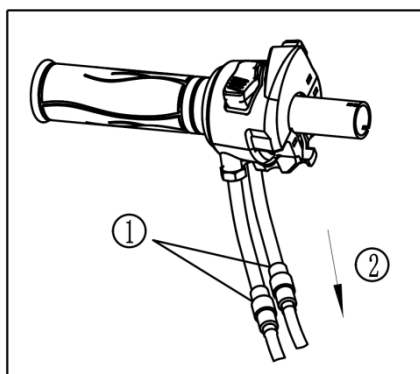
1. Adjust followings

- The amount of free clearance on the periphery of the throttle handle

Adjust order

First step (Accelerator handle cable)

Pull the adjusting bolt sheath ① down in the direction of the arrow ②



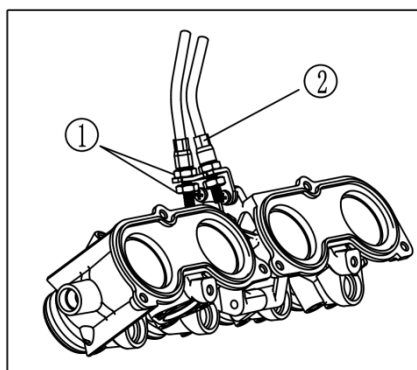
- Loosen the locking nut ①, Adjusting the regulator ② Adjust.

Spin in → increase gap

Swivel out → reduce gap

Tips:

When the throttle handle cable cannot be used for adjustment, adjust it at the throttle valve body.



The Second step (throttle valve)

- Tighten the locking nut ② Relax.

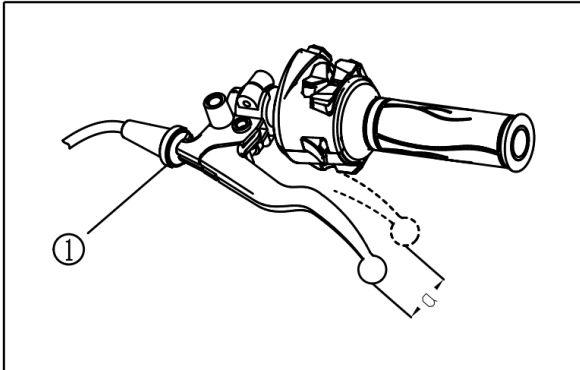
- Adjust the adjusting screw ① up and down

Spin in → increase gap

Swivel out → reduce

- Tighten the lock nut ②

3.3 Clutch adjustment

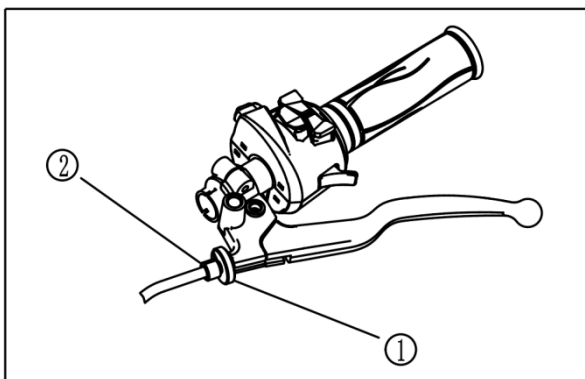


Clutch adjustment

1. Inspection:

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

Free travel:
10-15mm
Measure at the clutch handle



2. Adjust:

- Free stroke of clutch cable

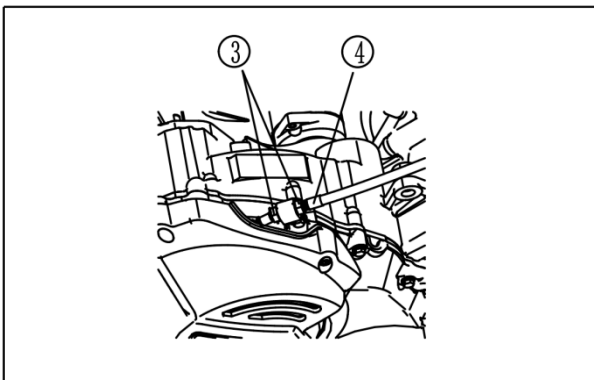
Adjust Step

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.

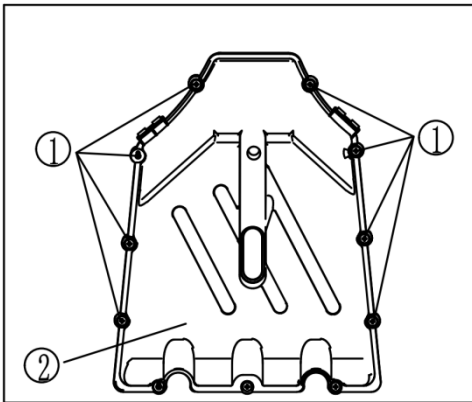
Screw in → increase in free stroke
Twist out → decrease in free stroke

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).

Forward → reduced free travel
Backward → increased free travel



3.4 Air filter cleaning

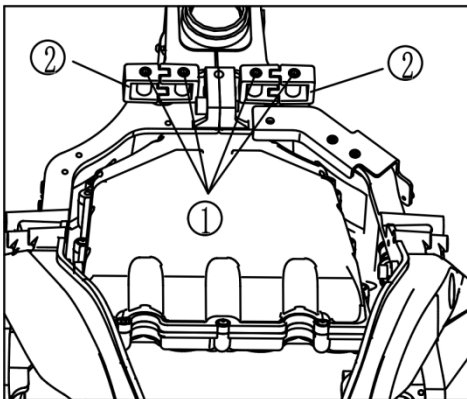


1. Remove the fuel tank

2. Remove the thread buckle

Use a 4 # Allen wrench to remove bolt ① and remove threading buckle ②;

After removing the threading buckle, the air filter can be removed through the reserved holes on the frame.



3. Remove the air filter cover • Remove the fixing bolts

① on the upper cover of the air filter, and remove the upper cover of the air filter.

Tips:

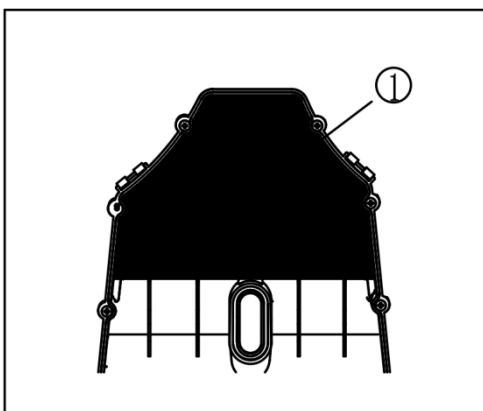
It is strictly prohibited to start the engine with the air filter removed. Otherwise, unfiltered air will enter the engine, causing rapid wear of its components and potentially damaging the engine.

•Dismantle air filter element①。

4.Check:

Damaged → Replace with dust → Use compressed air to blow off the dust on the sponge.

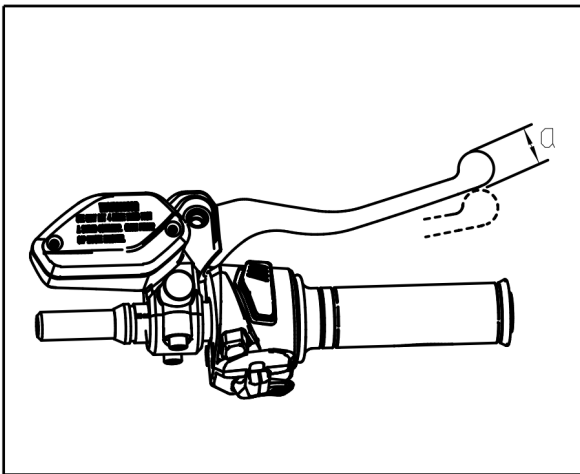
•If the filter element contains too much dirt, it can be cleaned with a neutral solution and must be blown dry after cleaning



3.5 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 fluid, check the oil



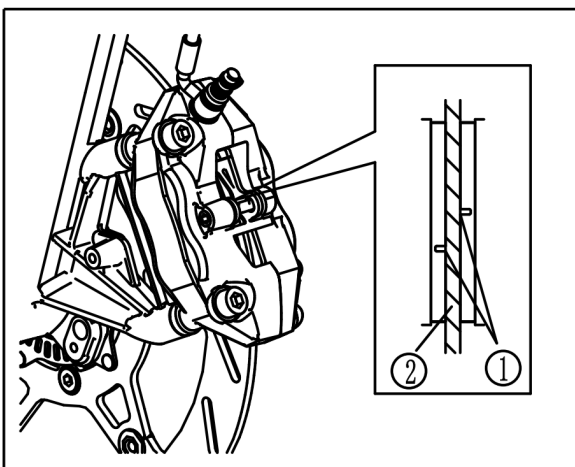
1. Conduct the following inspections: ● When turning left or right or driving, check if the brake hose has touched any other parts that are worn or may be worn. If touched → corrected
2. Check the free clearance at the front end of the brake handle.

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

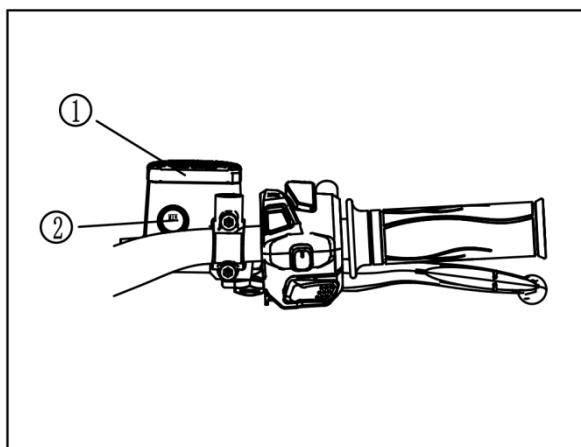
When the wear indicator ① is almost close to the brake disc ② → Replace the entire set

Brake pads.

● Wear of brake discs

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

3.6 Check brake fluid volume/exhaust air



Check brake fluid volume

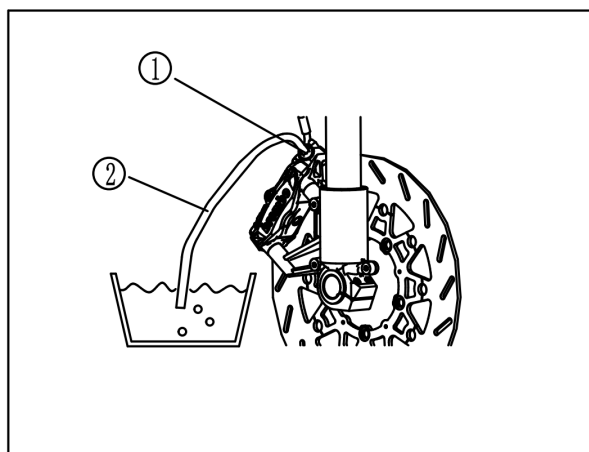
1. Check followings

- 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 fluid DOT4

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.



Discharge air

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

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.

Tips:

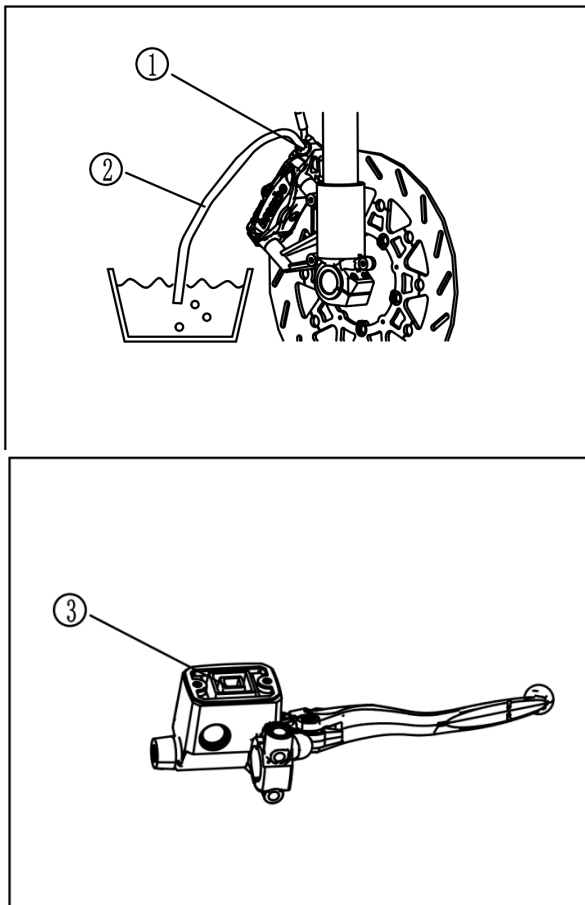
Do not loosen the brake handle before retightening the oil drain screw

5.Repeat the above actions, Until the oil drain screw completely discharges the air bubbles.

Tips:

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

3.7 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.

6. Install the brake fluid cylinder diaphragm back.

7. Replace the brake cylinder cover.

Replace brake fluid

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.

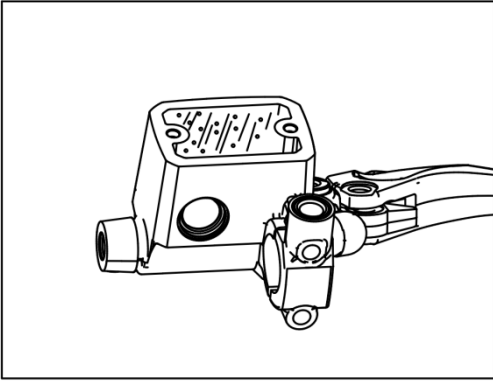
3. Lock the oil drain screw

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

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.



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.

3.8 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 checked, or air should be removed.

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

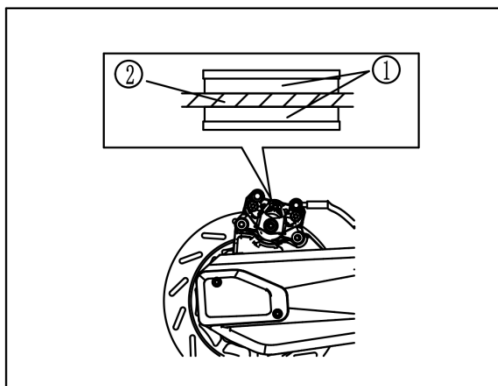
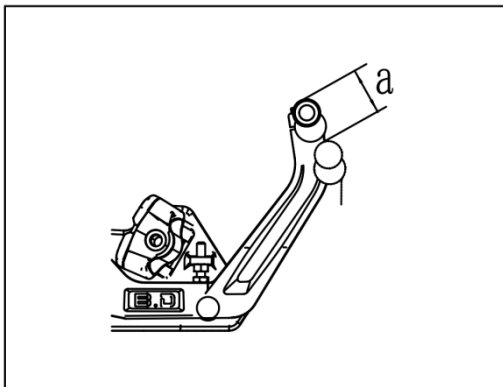
Check brake pads

1. Perform the following checks

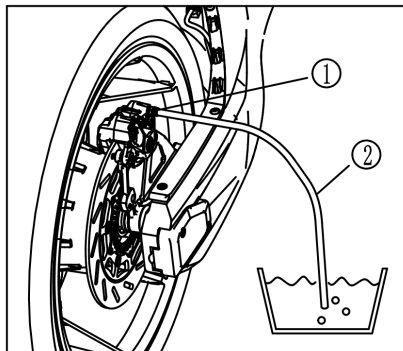
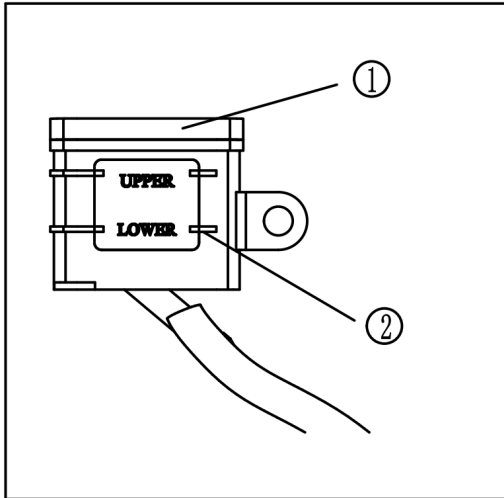
- Wear amount of brake pads

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.



3.9 Check brake fluid volume/exhaust 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 fluid DOT4

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.

Exhaust air



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

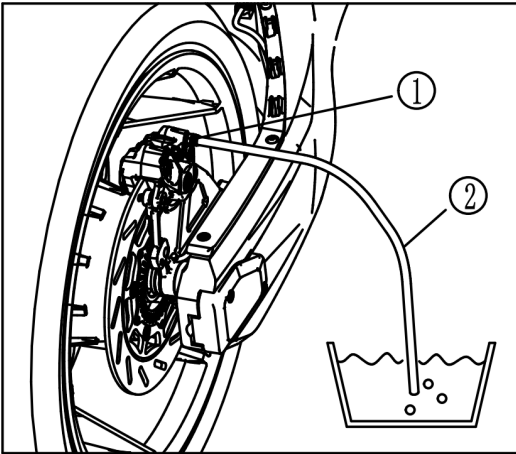
Tips:

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

5.Repeat the above action until the oil drain screw completely discharges the air bubbles.

Tips:

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



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.

6. Install the brake fluid cylinder diaphragm back.
7. Replace the brake cylinder cover.

3.10 Bleeding air/changing brake fluid

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

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

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

Designated brake fluid: pure DOT4

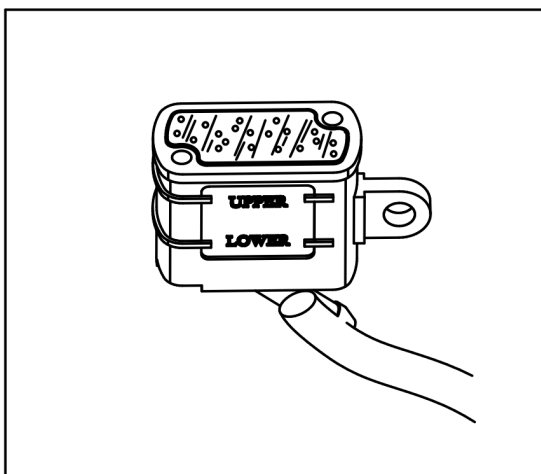
Tips:

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

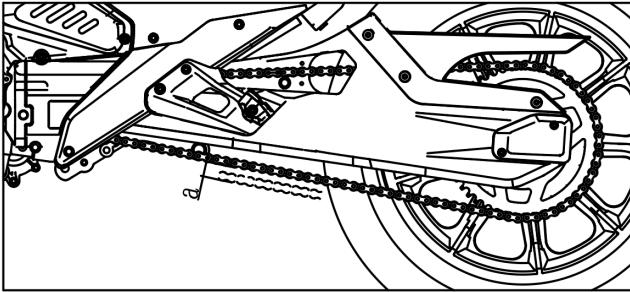
Tips:

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



7. Slowly move the brake pedal until no more bubbles appear at the small hole in the brake cylinder, and feel the brake pedal strong.
8. Release air。
9. After adjustment, install in the reverse order of disassembly

3.11 Check and adjust the drive chain/front fork adjustment

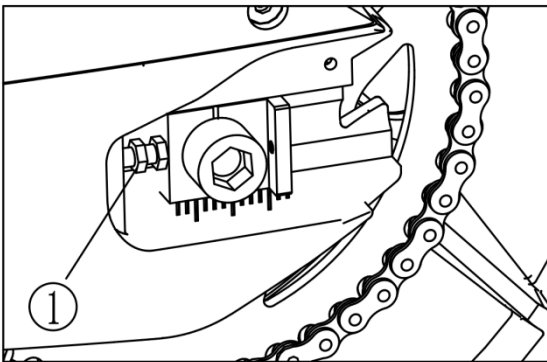


- Swing the chain up and down, check the swing amplitude a

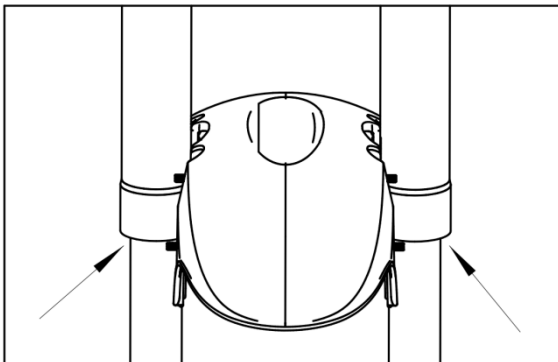
Normal swing range:
20-25mm

Tips:

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

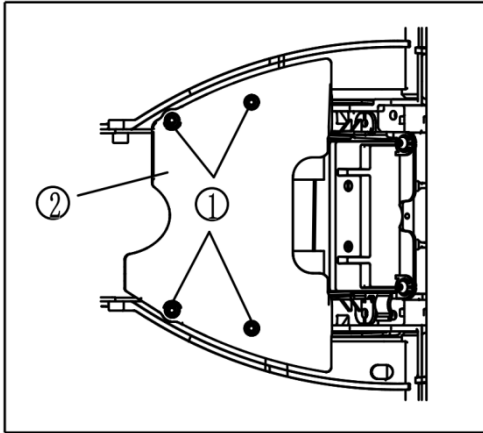


Warning: For your safety, it is recommended to go to a BENDA dealer or designated repair location for inspection and repair.



Front fork inspection

1. Park the motorcycle on a flat surface.
2. Check
 - Content
There are scars or damage → replace.
 - Oil seal
Serious oil leakage → Replace



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 times.

Interference in action → Repair

3.12 Front fork inspection/rear shock absorption adjustment

Rear absorption adjustment

 Warning:

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

1. Remove the seat cushion.

2. Use a 5 # Allen wrench to unscrew bolt ① and remove battery box ②.

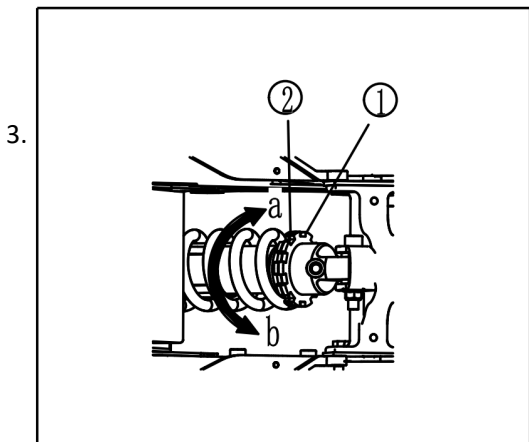
- Spring preload, loosen the locking nut ①, turn the adjustment device ② to the a or b direction.

Twist towards a → Spring preload value increases

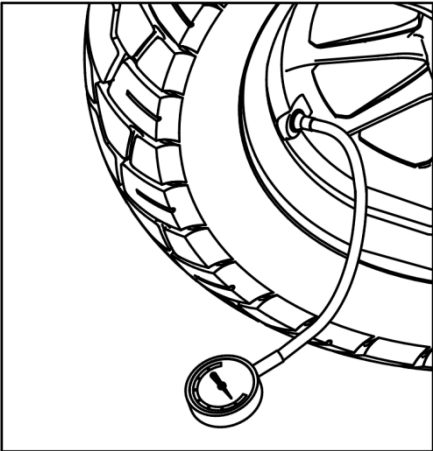
Twist towards b → decrease in spring preload value

Tips:

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



3.13 Tire Inspection



1.Gauge

- Tire pressure
- Exceeding the specification value range → Adjust

Cold tire pressure	Front tire	Rear tire
Load below 0-90kg	240 (2.4kgf/cm ²)	290(2.9kg f/cm ²)
Front 345kg/Rear462kg Maximum load	280kpa (3.0kgf/cm ²)	300kpa (3.0kgf/cm ²)

Load refers to the total weight of goods, cyclists, and accessories

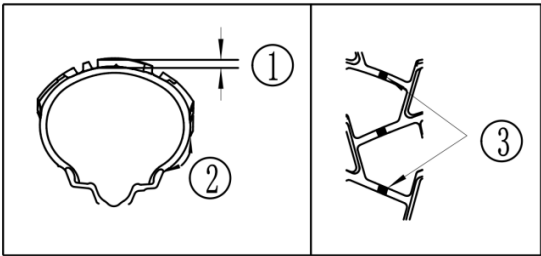
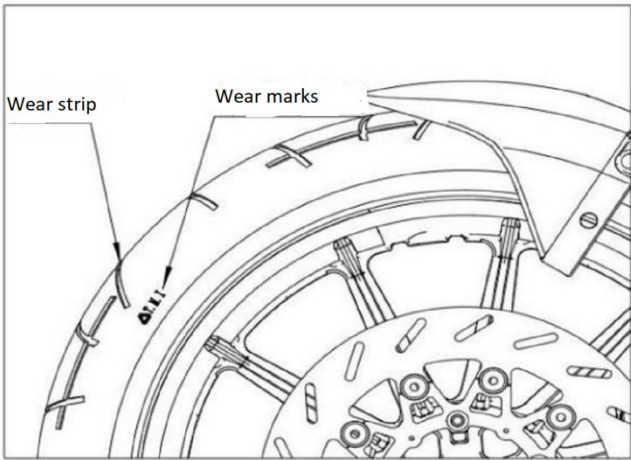
Front tire	130/70-19
Rear tire	310/35-18

2.Inspection

- Surface of tire
- Wear/damage→Replace

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

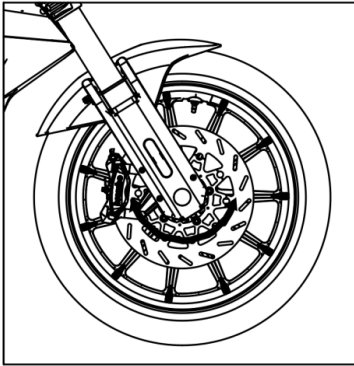
- ① Pattern depth
- ② Sidewall
- ③ Wear indicator layer



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 immediately.

3.14 Check the steering device

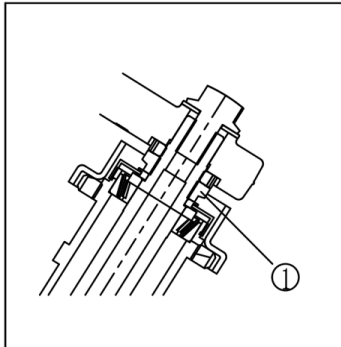


Check the steering device

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



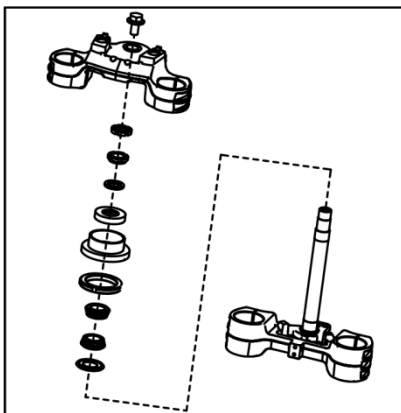
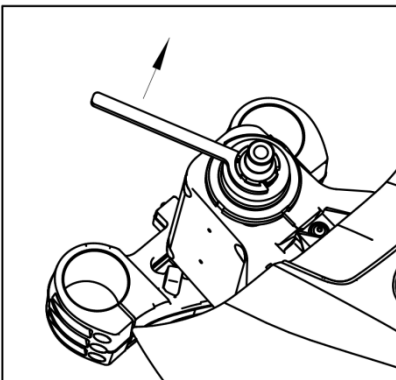
●Steering nut

Adjust the order:

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

●Lock the nut with a steering nut wrench

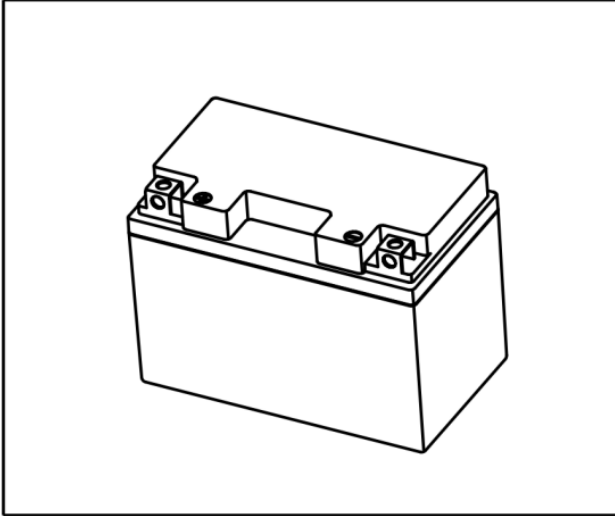
(Please refer to page "54" for the locking sequence and method)



● Install the steering seat

● Install the steering handle

3.15 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 ± 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) 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 ($24 \pm 5^{\circ}\text{C}$) 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 ≥ 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.

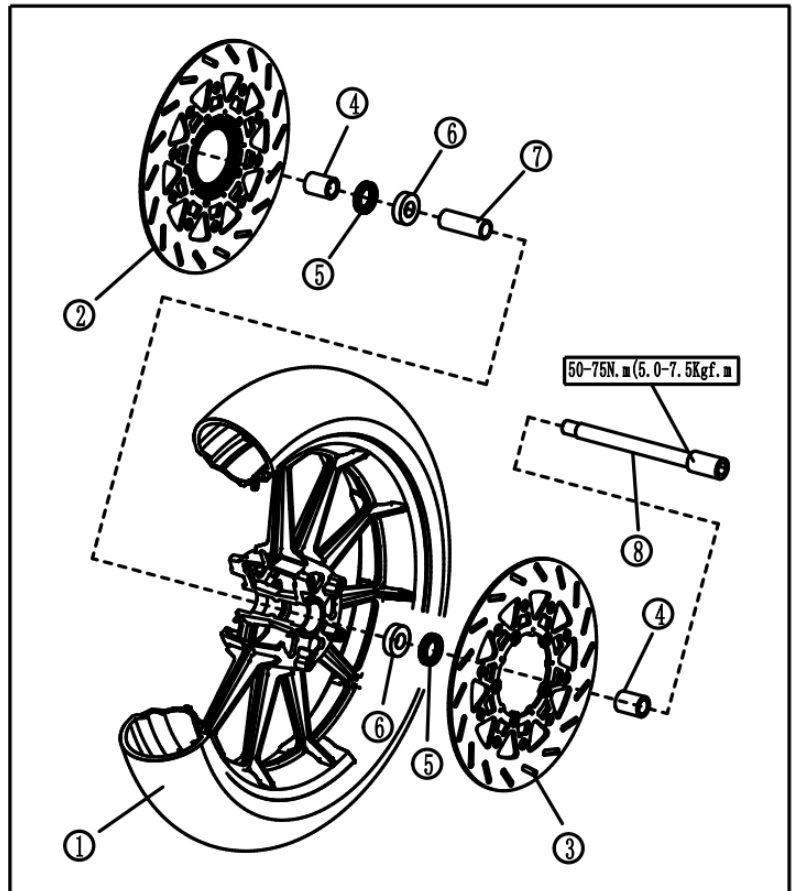
- Ensure that all electrical systems on the vehicle are turned off during breaks, lunches, shifts, and at the end

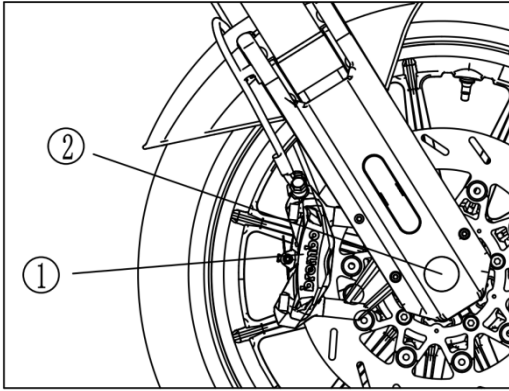
of work

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



Warning

1. Park the motorcycle on a flat surface.
2. Place the motorcycle on its central support.
3. Place appropriate items under the frame or engine and lift the front wheels

1.Dismantle

●Front Brake (1)

Use an 8 # Allen wrench to remove the bolts.

Front wheel axle cover (2)

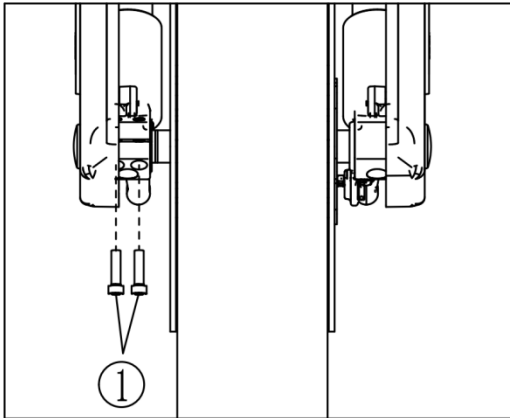
Remove using a plastic pry

Remove using a plastic pry

2. Disassembly

Front shock absorber locking screw (1)

Use a 6 # Allen wrench

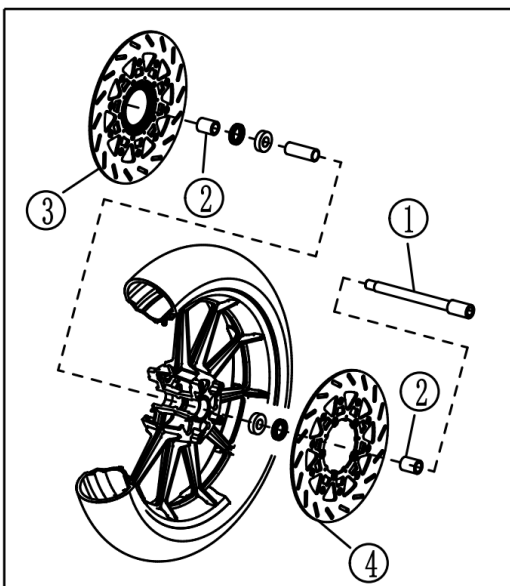


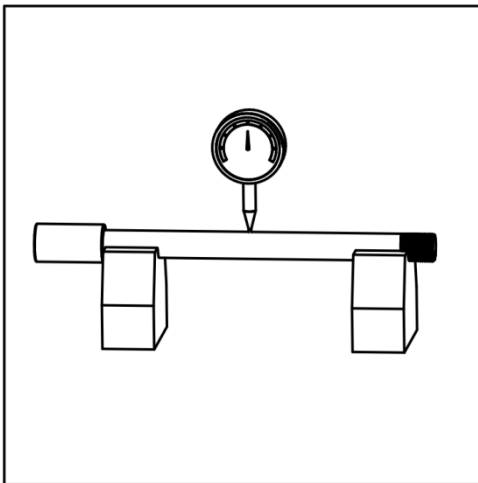
3. Disassembly

●Front wheel axle (1)

●Front wheel liner (2)

● Front brake discs (3) and (4)





Check Front tire

1.Check

Check the front wheel axle with a dial gauge:

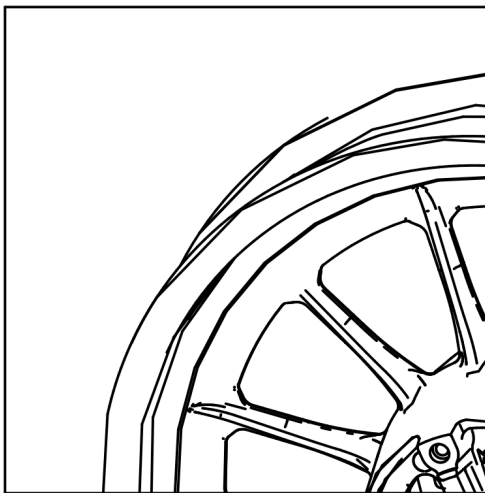
Bend → Replace



warning

Do not attempt to straighten the bent front axle

Twist degree of front wheel axle: 0.25mm



2.Inspection

●wheel

Deformation, damage or bending → Replace



warning

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

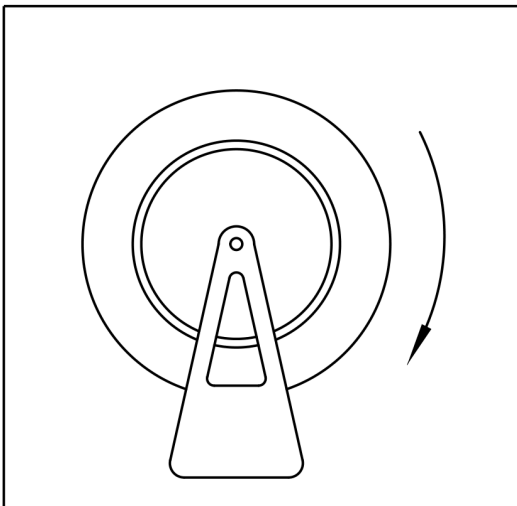
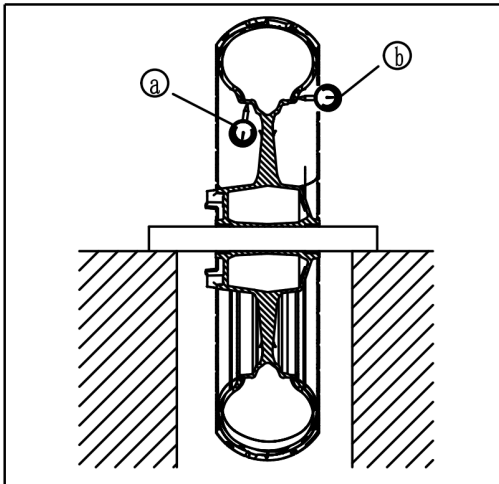
3. Inspection

- Slowly rotate the wheel rim to check for radial and axial runout
- Exceeding the limit → Replace

Rim runout limit

Radial: 1mm

Axial direction: 0.5mm



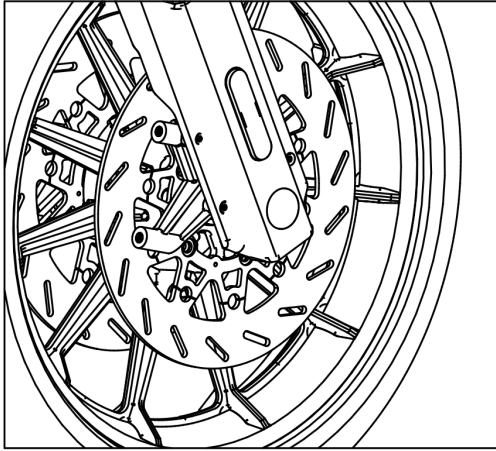
4. Inspection

- 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.

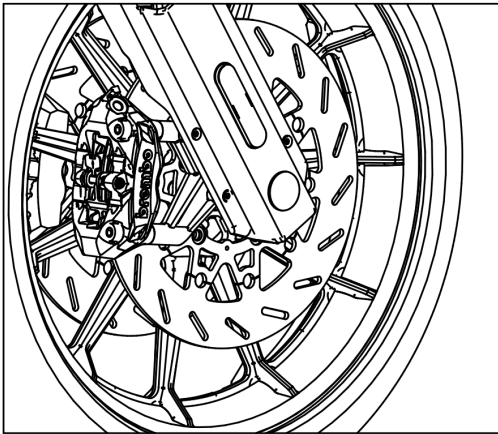


Install the front wheel

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)

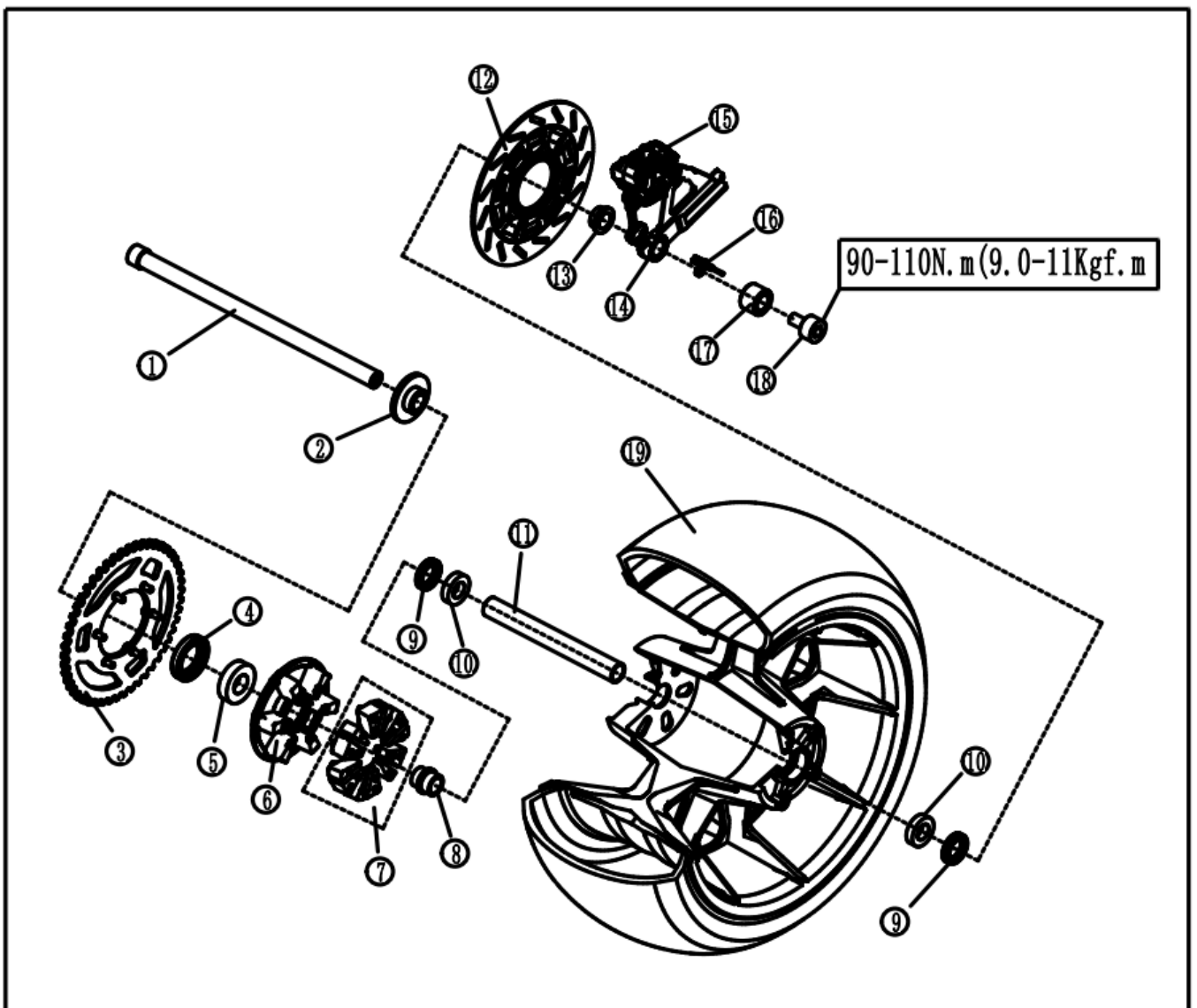


2.Install

- Front Wheel
- Front Brake Caliper

Rear Wheel

- | | | |
|---|--|--------------------------|
| (1) Rear Wheel Shaft | (9) Oil Seal (Hub Assembly) | (17) Rear Wheel Right |
| Bushing | | |
| (2) Rear wheel left bushing | (10) Rolling bearing (hub assembly) | (18) Rear wheel axle nut |
| (3) Spacer sleeve (hub assembly) in large sprocket | (11) Intermediate spacer sleeve (hub assembly) | (19) Rear wheel |
| (4) Oil seal (sprocket seat assembly) | (12) Rear brake disc | |
| (5) Sprocket rolling bearing (sprocket seat assembly) | (13) Aluminum bracket positioning sleeve | |
| (6) Sprocket Seat (Sprocket Seat Assembly) | (14) Caliper Installation Plate | |
| (7) Cushion rubber | (15) rear brake caliper | |
| (8) Sprocket Seat Bushing (Sprocket Seat Assembly) | (16) Rear Wheel Speed Sensor | |

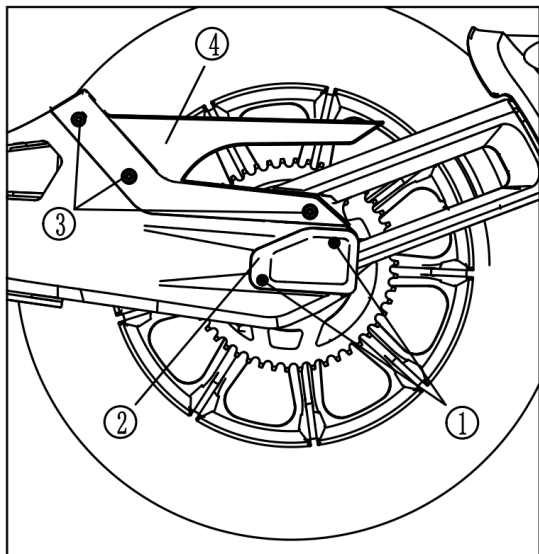


Rear tire



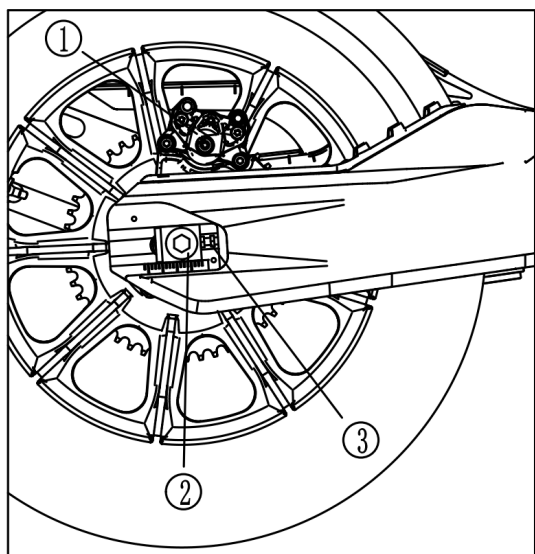
Warning

Firmly support the motorcycle to prevent it from overturning.



1.Dismantle

- Left and Right Decorative Cover(2)
- Chain Cover(4)

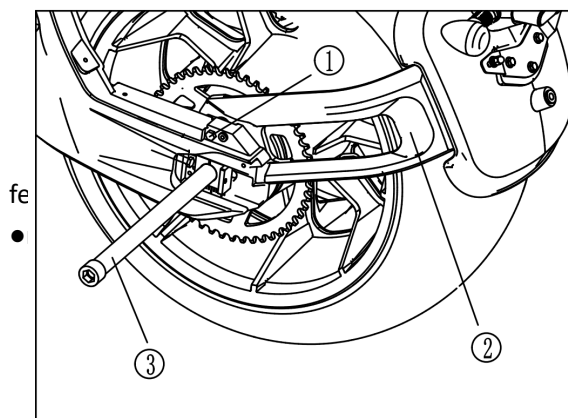


2.Dismantle

- Rear Brake Caliper(1)
- Rear wheel locking nut(2)
- Chain adjuster bolt(3)

Tips:

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

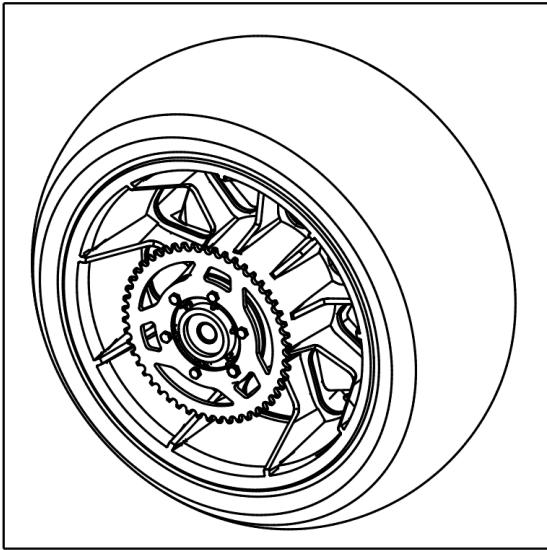


3.Dismantle

- Rear mud plate bracket limit bolt(1)
- After removing bolt (1), it is necessary to hold the rear axle.

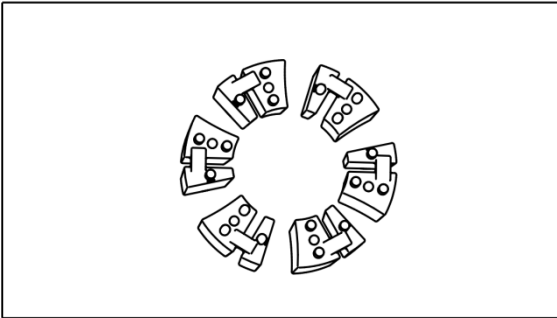
Tips:

When disassembling the rear axle, the rear brake caliper will fall off, be careful of safety.



4.Dismantle

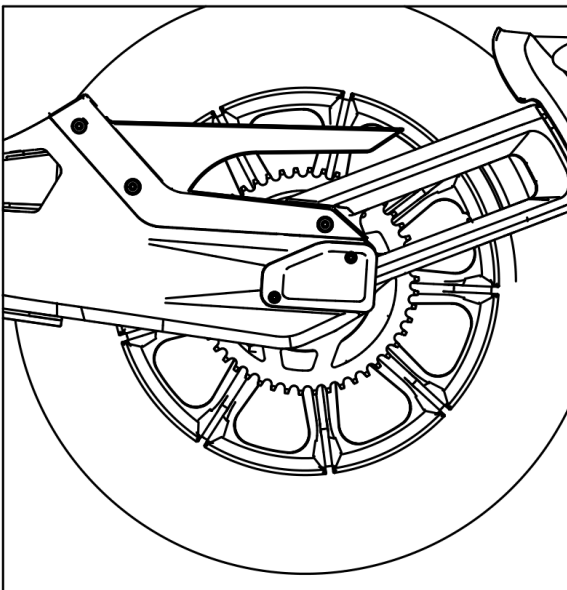
- Rear Wheel



5.Dismantle

- Buffer

Damaged or deformed → Replace



6.Install

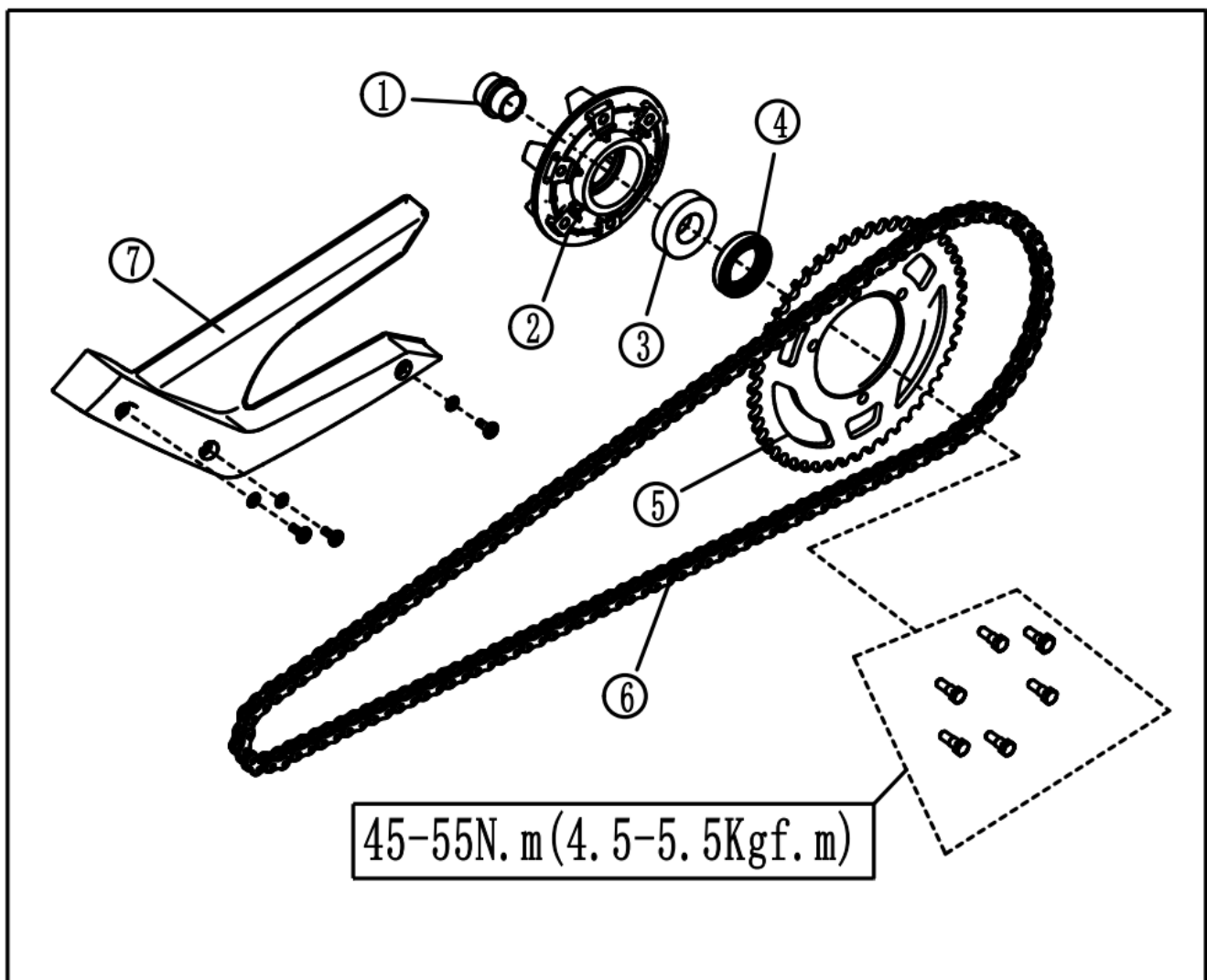
- Rear Wheel
- Disc brake bracket
- Rear fender bracket
- Rear wheel bushing
- Rear wheel axle
- Left and right decorative cover
- chain cover

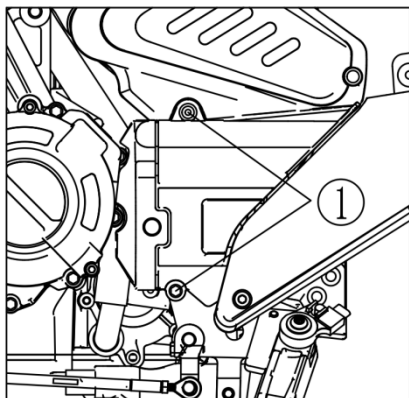
Rear wheel axle tightening torque:
90-110N.m(9.0-11.0Kgf.m)

4.2 Drive chain and sprocket

Drive chain

- (1) Sprocket seat bushing
- (2) Sprocket seat
- (3) Sprocket rolling bearing
- (4) Oil seal
- (5) Large sprocket
- (6) Drive chain
- (7) Chain cover





warning

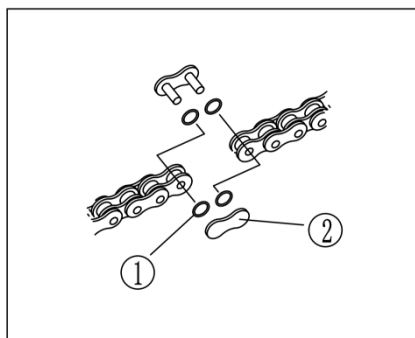
1. Park the motorcycle on a flat surface.
2. Place the motorcycle on its central bracket.

1.Dismantle

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

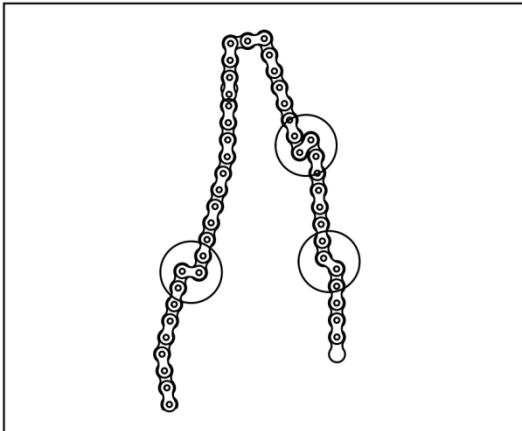
2.Dismantle

- Small pulley cover bolt ①
- Small pulley cover



3.Dismantle

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

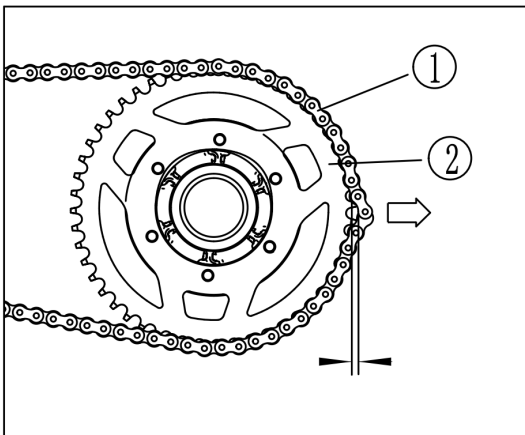


Drive chain inspection

1. Inspection

- Drive chain stuck

Stuck → lubricate or replace after cleaning.



2. Inspection

- Drive chain ①
- Driven sprocket ②

As shown in the figure, the gap after squeezing and pulling to the right should not exceed $\frac{1}{3}$ of the teeth

Exceeding → Replace

3. Inspection

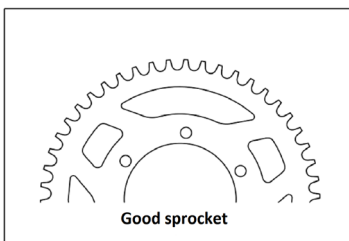
- Drive chain

Place the chain on a flat surface and measure its maximum when pressing it tightly (pushing it together)

Short length. Stretch outward as much as possible, if the

elongation exceeds $\frac{1}{4}$ in/ft,

It should be replaced.



4. Inspection

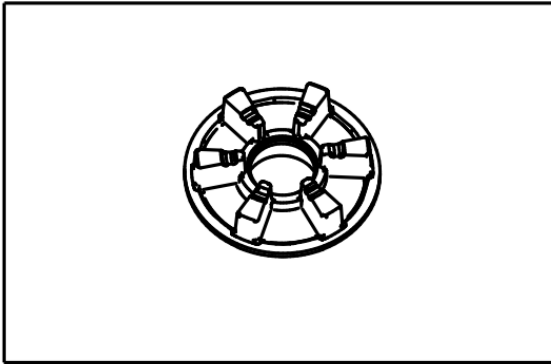
- Driven gear

The sprocket of the chain final drive device is a flat metal plate, located in its circle

Toothed on the outer edge of the circle. Install the chain around the sprocket, and install the sprocket teeth into the chain

The gap between the rollers.

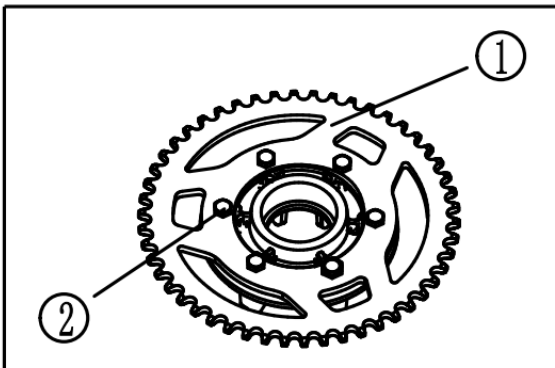
Worn sprockets can damage the chain. The wear of the sprocket can be seen, and the condition can be determined by comparing it with a new sprocket.



5. Inspection

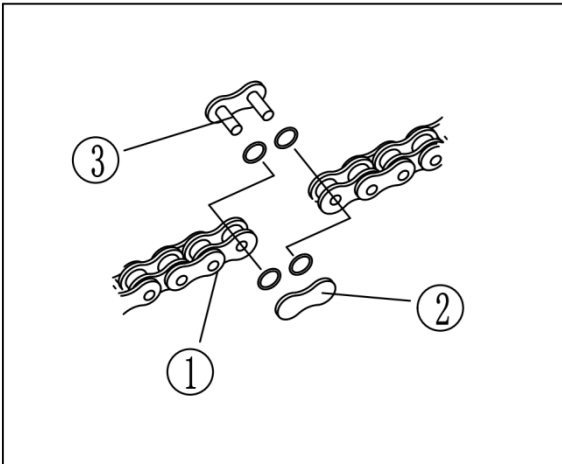
- Sprocket seat

Wear, damage, cracking → replace



Install

- Sprocket ①
- Sprocket fixed bolt ②



Install chain

- Chain ①
- Chain pressure plate ②
- Chain tensioner ③

Adjust

- Chain slack
- See page "29".

Chain Fault Repair Guide

Case 1 Damage to chain plates, pins, sleeves, and rollers

Reasons:

1. The chain and sprocket are not standard
2. Improper lubrication
3. Foreign object bite
4. Sprocket center offset

Ways:

1. Please choose standard sized sprockets and chains.
2. Please use cleaning agents and lubricating oil for maintenance every 500km.
3. Quickly remove foreign objects and confirm the condition of the chain and sprocket. If there is any damage, please replace them.
4. Adjust the position of the sprocket.

Tips:

Every 500km of driving distance, cover the chain with lubricating oil and use a cloth to prevent lubricating oil from spraying onto other parts.

Case 2 Vibration of the chain

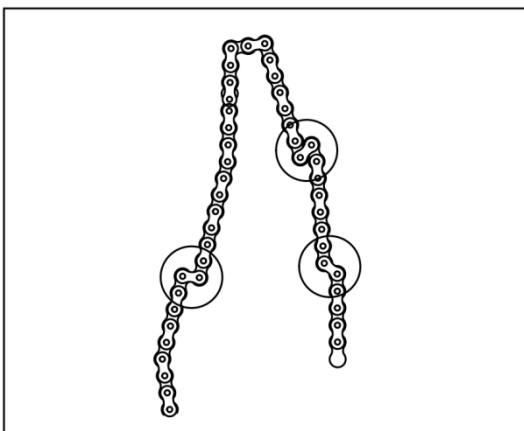
Reasons:

1. Excessive chain slack

2. The chain becomes stiff
3. Poor flatness of the sprocket

Ways:

1. Adjust the reasonable amount of relaxation
2. Stiffness of the chain not only causes chain vibration, but also causes abnormal engagement with the sprocket, resulting in sprocket damage
3. Please adjust the sprocket and flatness



Fatigue wear of the pin shaft

Fatigue wear



Insufficient lubrication



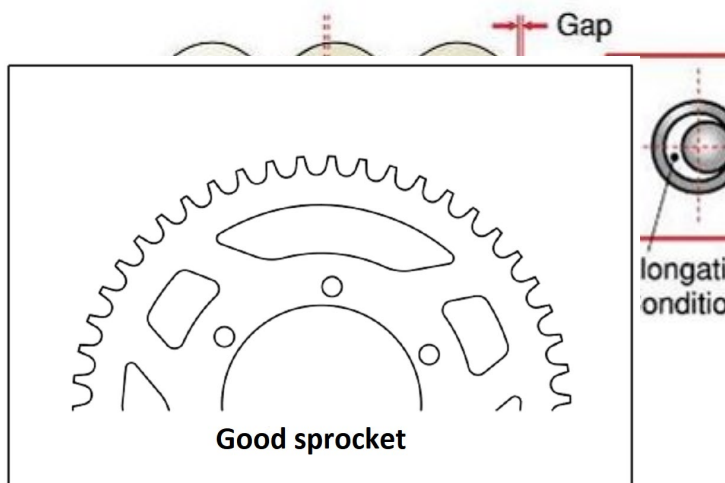
ONE clearance

Case 3 Interference between chain and sprocket

Reasons:

- 1.Excessive wear and stretching of the chain
- 2.Sprocket wear
- 3.Sprocket center skew
- 4.Excessive slack chain
- 5.foreign body

Wear causing voids

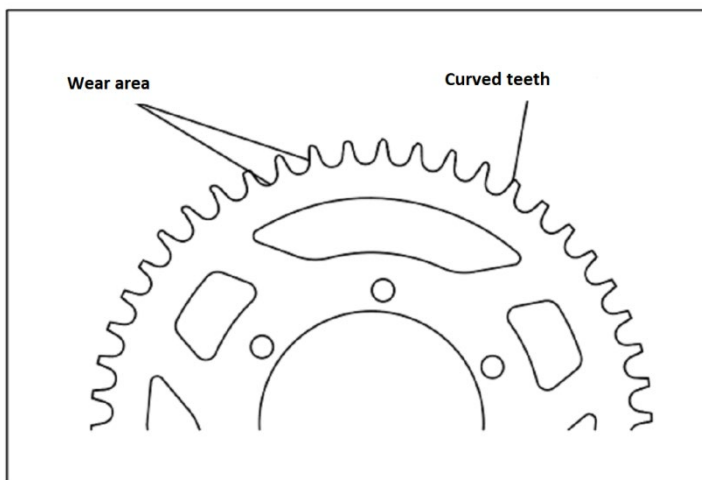


Attention:

Even if there is only a 0.1mm gap between each chain link, 100 chain links have a 10mm=1cm chain stretch. Stretching the chain can lead to sprocket tooth jumping, chain detachment, fracture, etc., and the stretched chain can reduce the operability of the motorcycle and also increase fuel consumption.

Ways:

- 1.Quickly replace the chain that has worn out beyond the specified adjustment range with a new one。
- 2.When confirming the status of the chain, also confirm if it matches the sprocket matching. If there are any scars, please replace them.
- 3.Make corrections on the premise of confirming whether the center of the front and rear sprockets are offset
- 4.Adjust the appropriate amount slack for the chain。
- 5.Remove the foreign objects and confirm the condition of chain and sprocket,If there are any scars,please replace them



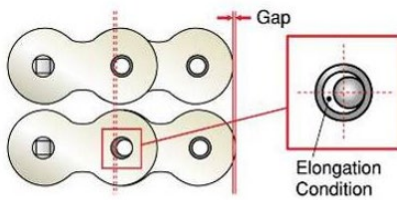
Normal swing range of chain :
20-25mm

One clearance

Case 4 High noise

Reasons:

1. The tension of the chain is too large and too loose
2. Poor flatness of the sprocket
3. Chain wear and stretching, or sprocket wear and tear
4. Contact with chain sleeve box and swing arm
5. Insufficient lubrication
6. Size of mismatched chains or sprockets



Due to this gap

Chain becomes

Ways:

1. Adjust the amount of slack according to the motorcycle guide through the tensioning device. When the standard amount of slack is 20-25mm above and below the chain, for motorcycles with a large stroke of the shock absorption system, the amount of slack should also increase accordingly.

2. Adjust the chain
3. Check the tension of the chain and the wear of the sprocket, and replace them at the same time.
4. Contact with the surrounding parts of the chain can cause damage to the chain. It needs to be repaired immediately.
5. Proper lubrication can prevent chain stretching and also effectively prevent rust. Moreover, when engaged with the sprocket, it can play a buffering role and also have an effect on noise. It is recommended to use cleaning agents and lubricating oil for maintenance every 500km.
6. Sprockets and chains should be paired with standard ones.



Wear caused by insufficient lubrication



Case 5 Pin rotation

Reasons:

1. When the chain runs onto the sprocket and excessive external force acts on it
2. Insufficient lubrication causes sticking of the pin and roller

Ways:

1. Regularly confirm the amount of slack. If oil slack is found, adjust the tensioning device to the appropriate amount of slack.
2. Use cleaning agents and lubricating oil for maintenance and upkeep every 500km.

Case 6 Chain stiffness

Reasons:

1. Poor flatness of the sprocket
2. Chain rusts and lacks lubrication
3. Biting in foreign objects
4. The chain is too tight
5. The detachment and displacement of the sealing chain link
6. Poor installation of chain links

Ways:

1. Adjust the sprocket for poor alignment. Poor flatness is caused by cracking of the chain link due to contact with the side of the sprocket, resulting in stiffness of the chain.
 2. Use cleaning agents every 500km. Maintain with lubricating oil. If oil is not injected for a long time, rust will occur and stiffness will occur due to corrosion in coastal and other corrosive environments without maintenance. The chain that has become stiff needs to be replaced with a new chain.
 3. Quickly remove foreign objects. Confirm the condition of the chain and sprocket, and replace them if there are any scars. If foreign objects such as small stones are bitten between the chain and sprocket, it can cause the chain link to crack and cause the chain to stiffen.
 4. Adjust the tensioning device to the appropriate amount of slack.
- If the sealing chain link falls off or shifts, please replace the chain.
6. Unriveted joints must not be used and new joints must be installed.

Chain maintenance

●The importance of maintenance

DID chain cleaning agent and lubricating oil not only have a lubricating effect, but also contain components to protect the sealing ring. Therefore, regular maintenance can prevent the sealing ring from aging.

A maintained chain can reduce friction, so it can also reduce fuel consumption.

●Maintenance precautions

When maintaining the chain, pay attention to three points:

① Between the inner and outer chain plates

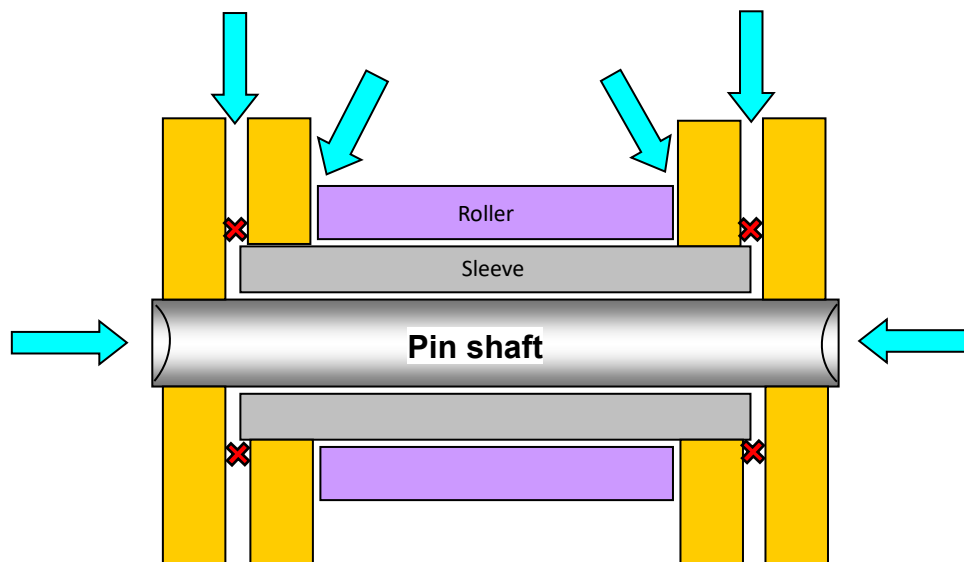
The surface of the sealed chain link is coated with lubricating grease, and the sealed chain link is covered with chain lubricating oil, which can reduce the impact of ultraviolet radiation and dust.

② Between the inner chain plate and the roller

Apply lubricating grease between the roller and sleeve. It can alleviate the impact caused by the engagement of rollers and sprockets, and prevent the fracture and abnormal wear of the pin shaft and sleeve.

③ Outer chain plate surface

Prevent rust on the surface of the chain plate.



Maintenance and upkeep time

- Every 500km to 1000km or after driving on rainy days.

When driving on rainy days, the lubricating oil in the chain runs back, so it is necessary to replenish the lubricating oil.

After driving, the temperature of the chain increases. If maintenance is carried out at this time, the lubricating oil is more easily soaked and easier to maintain.

- Due to the enhanced permeability of DID chain lubricating oil, its viscosity becomes very low in the early stages of spraying and splashes during driving.

As the lubricating oil dries after soaking, its viscosity increases, and its lubricity becomes stronger, making it less prone to splashing. Therefore, maintenance after driving, or not driving for about an hour after maintenance, can minimize the scattering of lubricating oil from the wheels and vehicle body.

4.3 Front fork

Remove the front fork



warning

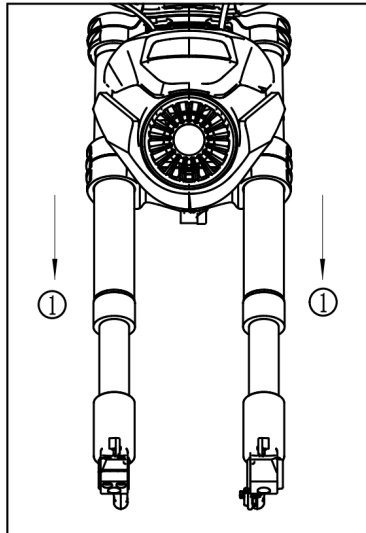
The motorcycle should be firmly supported to prevent

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 mudguard

4. Dismantle

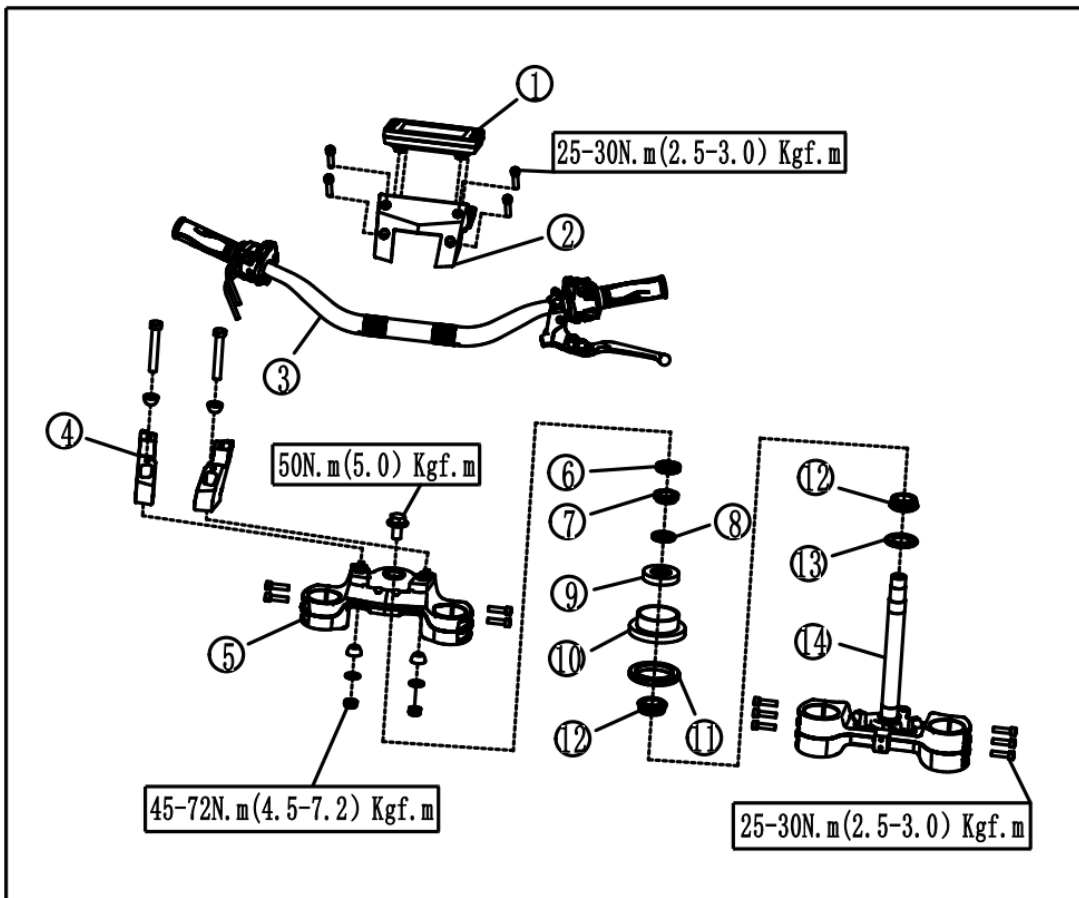
- Use a 6 # Allen wrench to remove the upper and lower connecting plate locking screws, along the direction ①

Remove the front shock absorber.

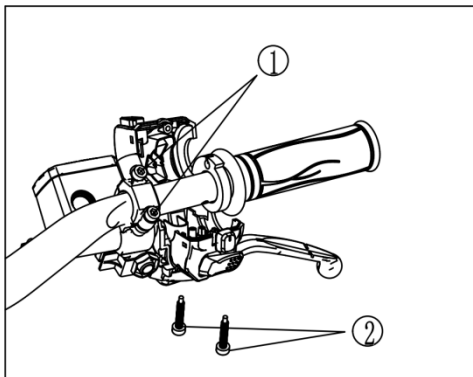


4.4 Steering shaft and handle

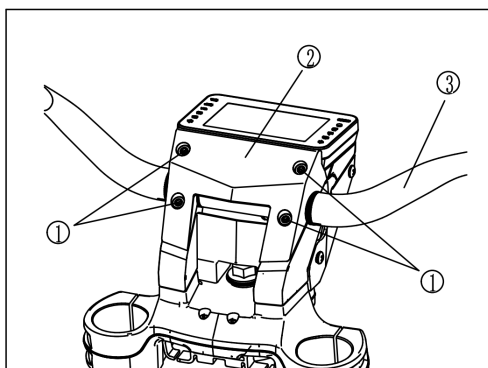
- | | |
|---------------------------------|------------------------------------|
| (1) Dust cover for instrument | (8) Dust cover |
| (2) Instrument bracket | (9) Dust cover bracket |
| (3) Steering handle | (10) front pipe cover |
| (4) Steering handle fixing seat | (11), front pipe compression nut |
| (5) Upper connecting plate | (12) tapered needle roller bearing |
| (6) Lock nut | (13) dust ring |
| (7) Lock nut | (14) steering shaft |



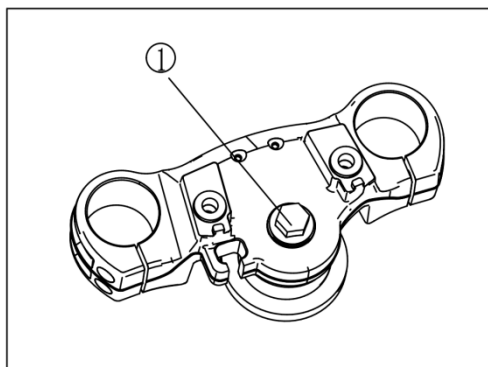
1.

**Handle**

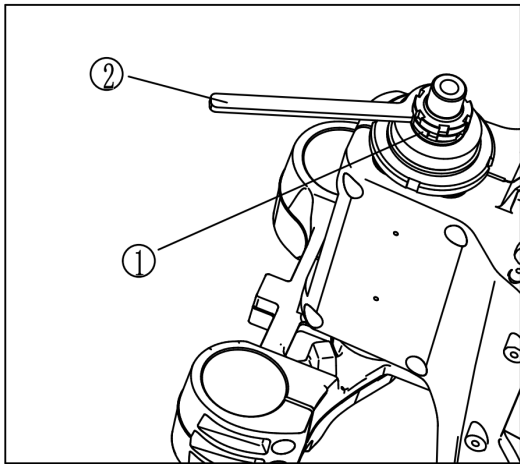
- Left and right handle switches
- Clutch and brake handle

**2.Dismantle**

- Instrument bracket fixing bolt ①
- Direction handle ③
- Front wheel
- Front fork

**3.Dismantle**

- Upper link plate compression bolt



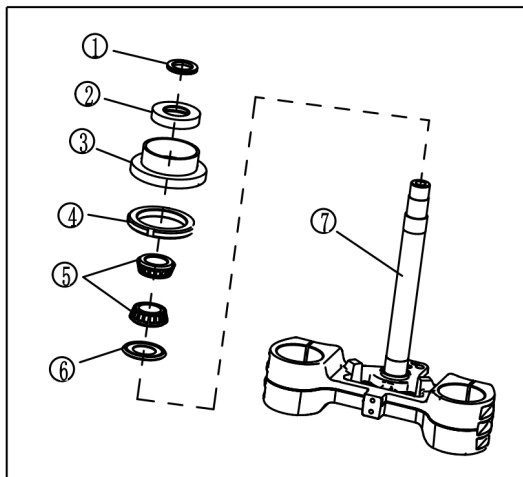
4. Dismantle

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



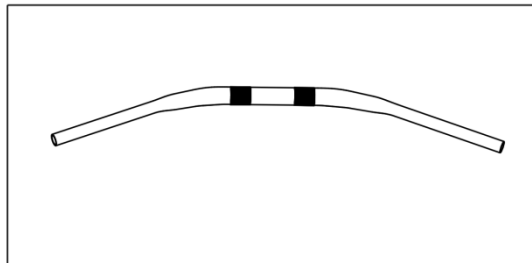
warning

Except for using a special wrench, no tools other than a wrench can be used for disassembly



5. Disassembly

- Dust ring (1)
- Dust ring bracket (2)
- Head pipe cover (3)
- Hold down nut (4)
- Tapered needle roller bearing (5)
- Dust ring (6)

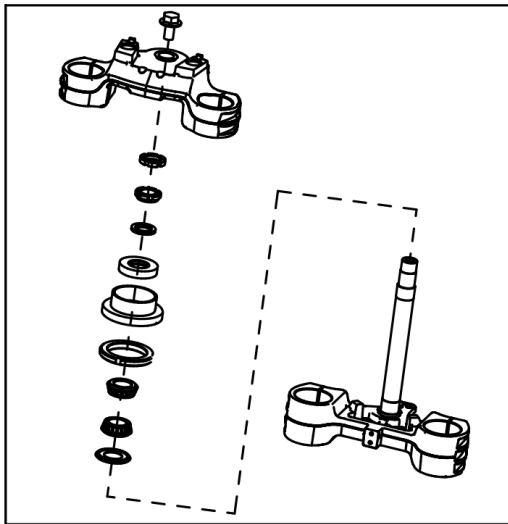
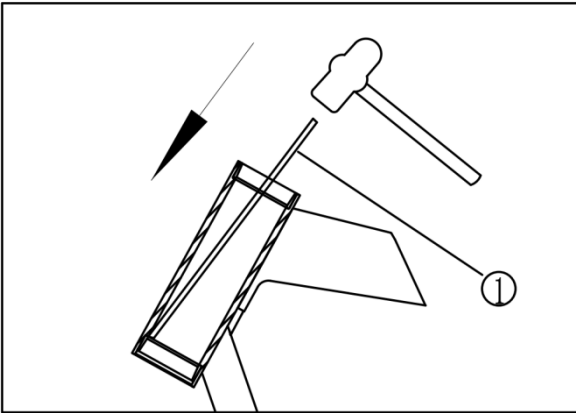


Bending, cracks, damage → Replace



warning

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



Steering shaft and handle

1. Clean the needle bearing and bearing ring seat thoroughly

- Needle roller bearings
- Bearing race

Wear and damage → replace

* * * * *

●As shown in the figure, use a long rod ① and a hammer to remove the bearing race and remove it from 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.

1. Apply butter

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

2. Installation

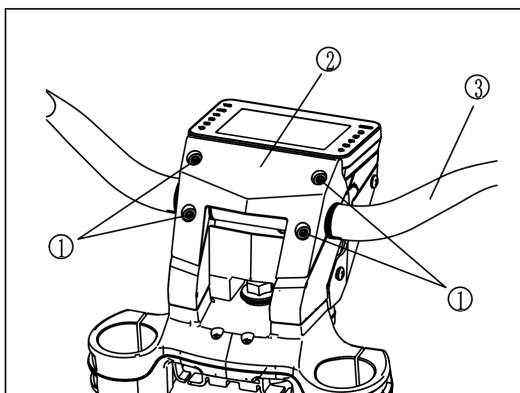
Install the steering shaft

Install in the reverse order of "disassembly".

Apply lithium based grease

- Dust ring bracket
- Dust ring
- Ring nut

After installation, make adjustments as described in Chapter 3.



Installation handle

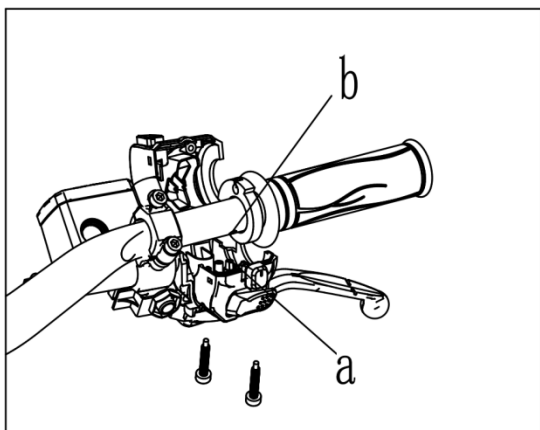
- Handle ③

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.



3. Installation

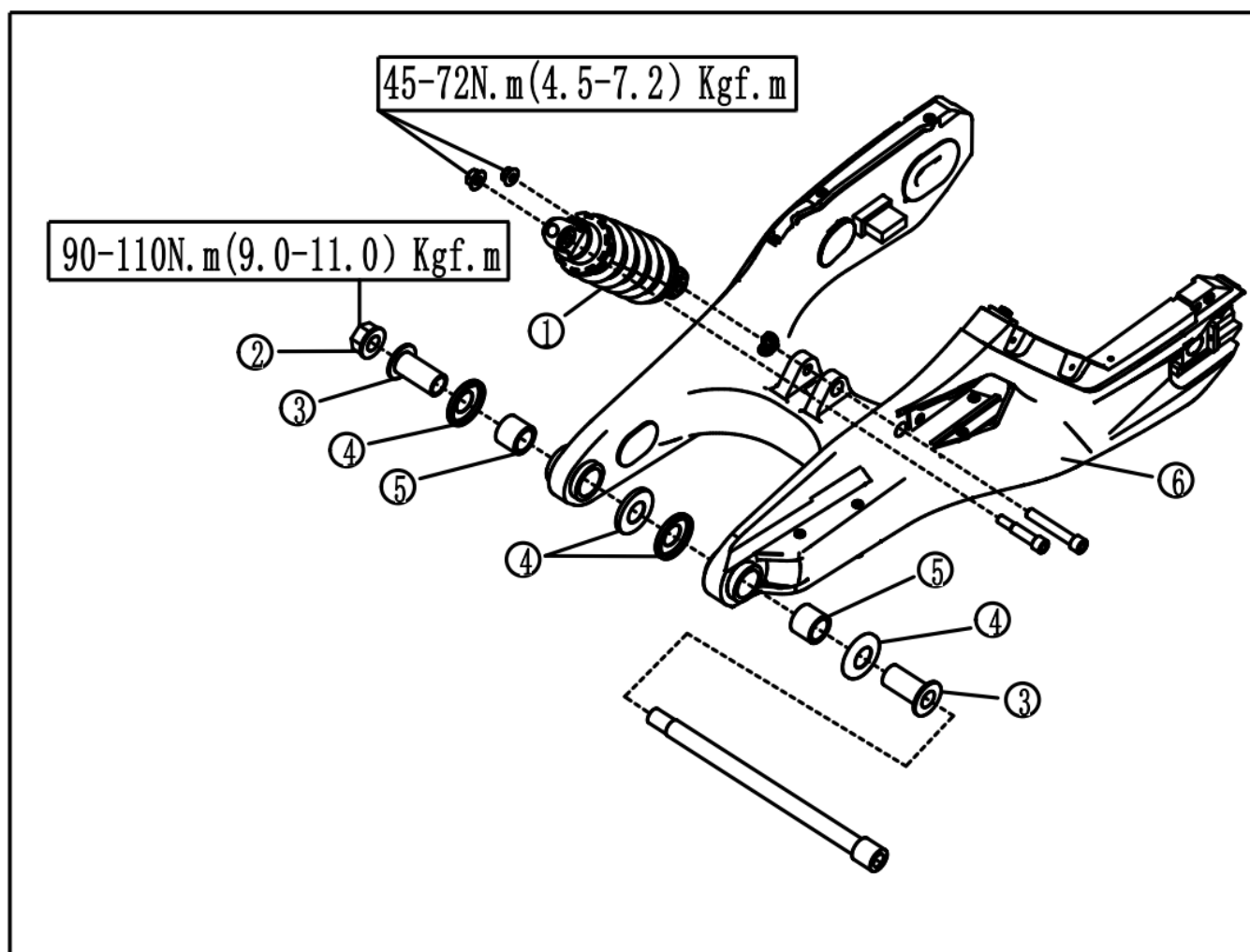
- Front brake handle
- Clutch handle

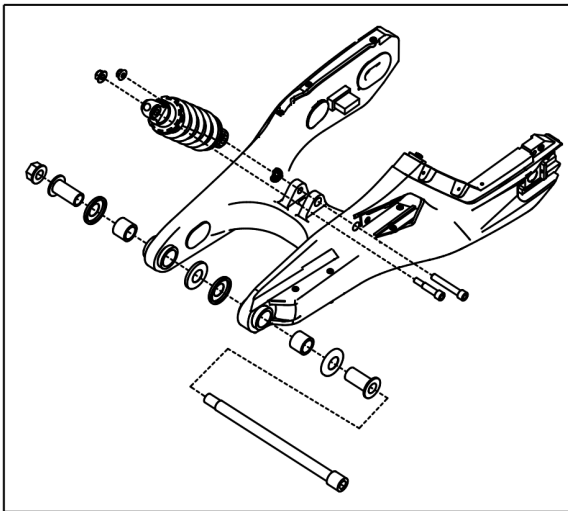
- Handle switch

During installation, insert the handle switch positioning pin a into the handle positioning hole b.

4.5 Rear shock absorber and Rear fork

- | | |
|---------------------------------|---------------------------|
| (1) Rear shock absorber | (4) oil seal |
| (2) Nut | (5) needle roller bearing |
| (3) Rear flat fork shaft sleeve | (6) Rear flat fork |





Dismantle

1. Rear shock absorber



warning

The motorcycle should be firmly supported to avoid overturning.

2. Dismantle

- Rear wheel

3. Dismantle

- Chain

4. Dismantle

- Nut
- Rear fork

Check

1. Inspection

- Rear flat fork tightness

If loose, tighten the shaft nut or exchange the bushing.

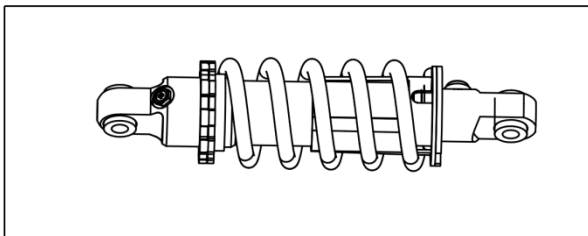
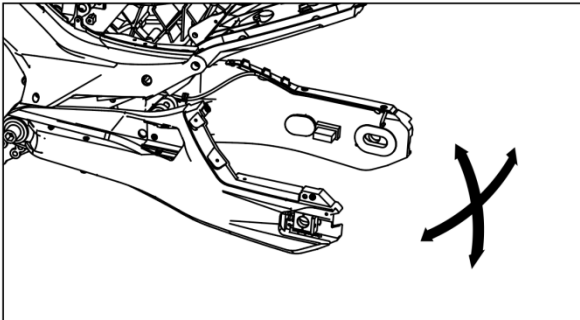
- Movement of the rear fork up and down

If the movement is not smooth, bent, or has rough areas → Replace the bushing

2. Check

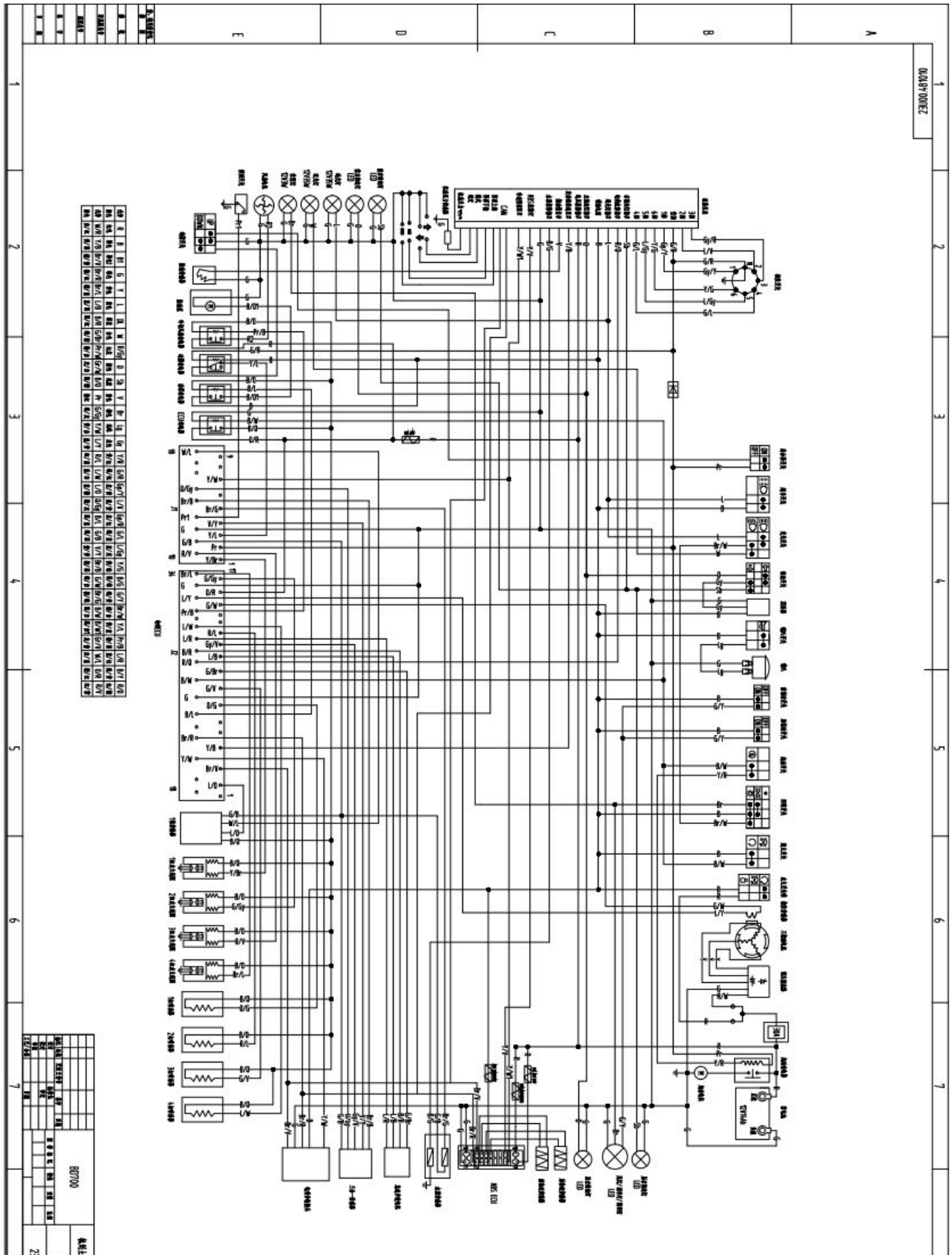
- Rear shock absorber

Oil leakage, deformation → Replace

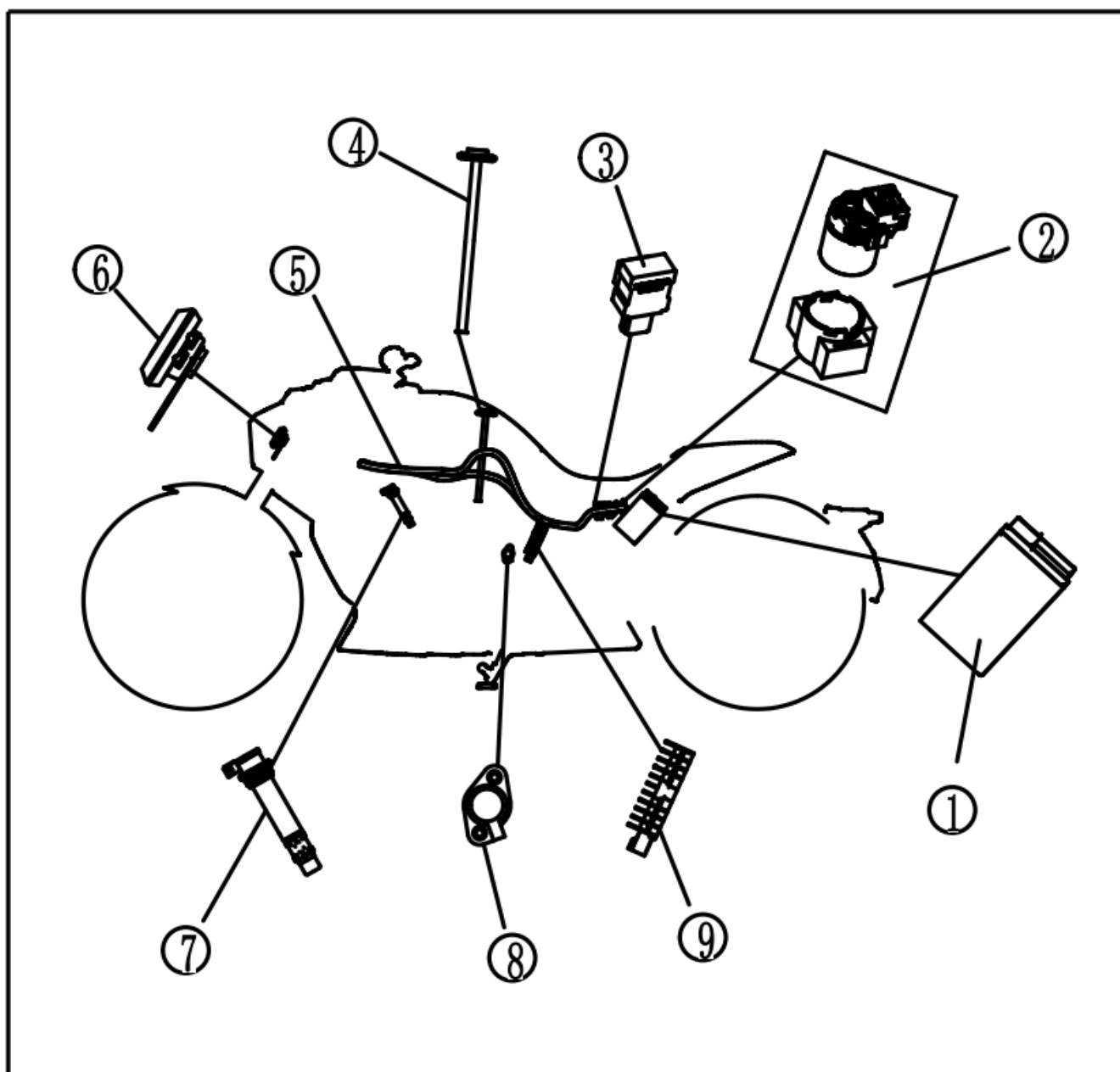


The Fifth Chapter. Electrical Equipment

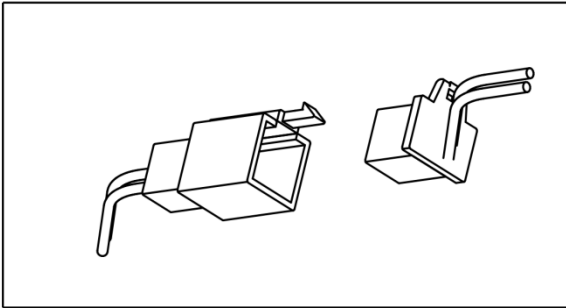
5.1 Circuit diagram



- | | |
|-----------------|----------------------------------|
| (1) Battery | (6) Horn |
| (2) Start relay | (7) spark plug cap |
| (3) Flasher | (8) gear display |
| (4) Fuel sensor | (9) voltage regulating rectifier |
| (5) Main cable | |



5.2 Connector inspection

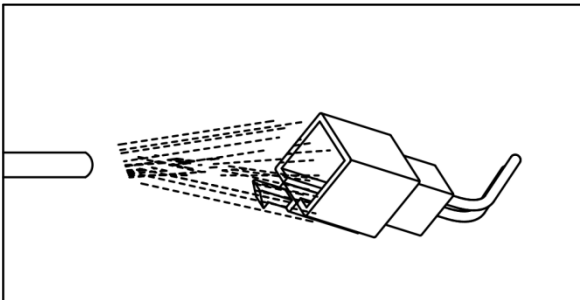


Dirt, rust, moisture, etc. on the connector should be removed.

1. Detachment

- Connector

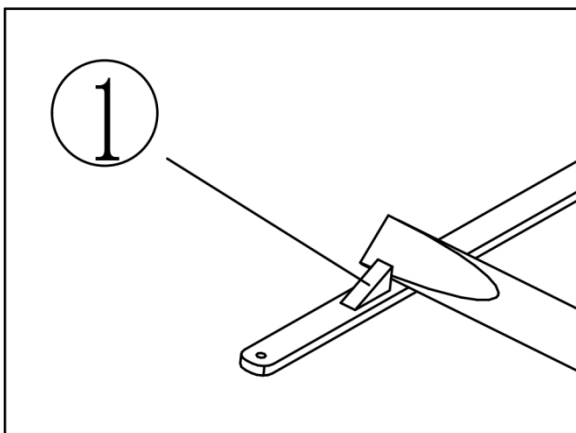
2. Blow dry each terminal with air.



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, the pin ① should be bent and the terminal should be reinstalled Insert the connector.



6. Connect

- Connector assembly

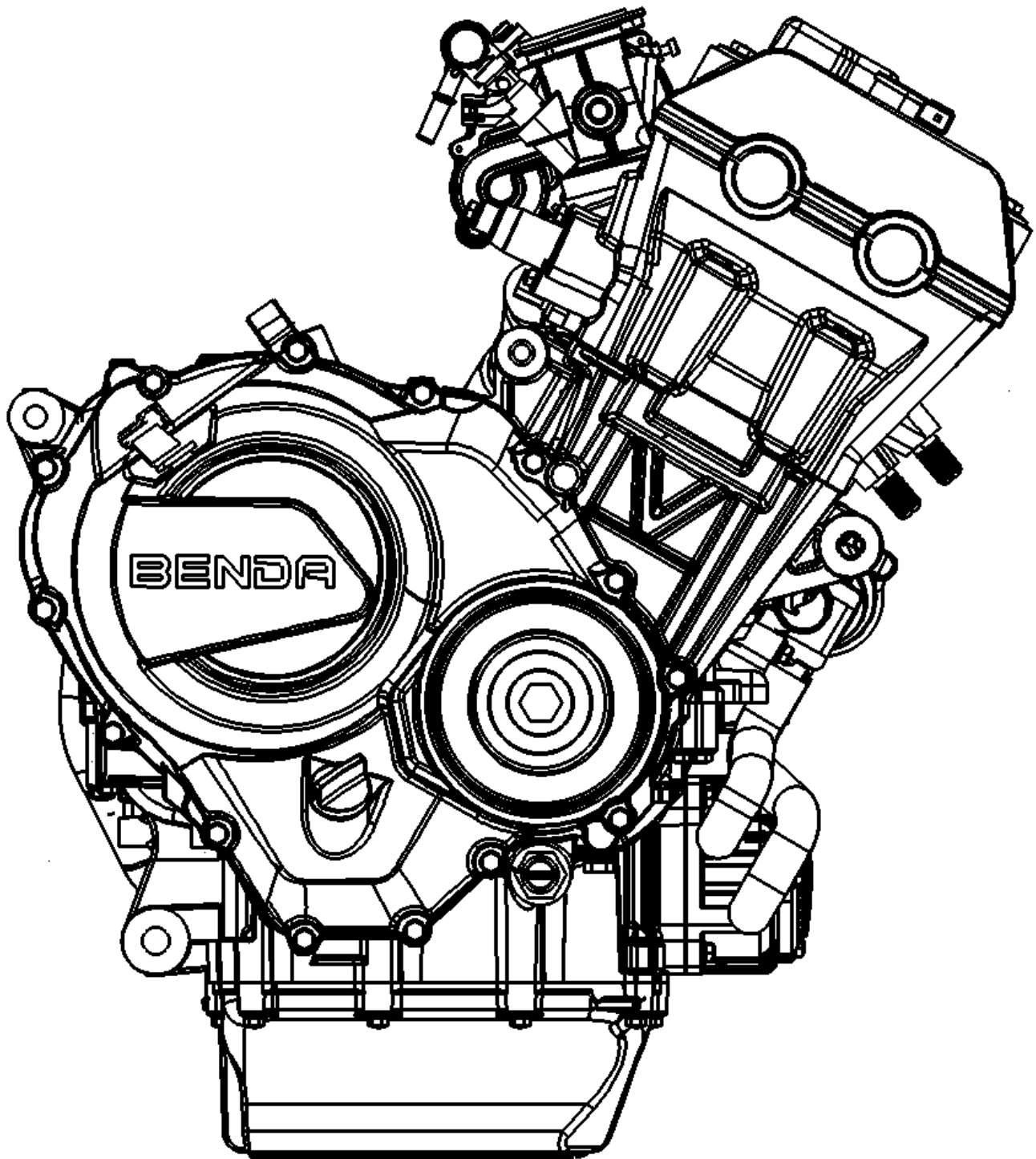
7. Use a multimeter to check for continuity.

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

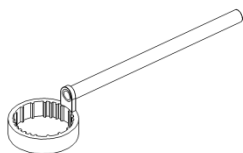
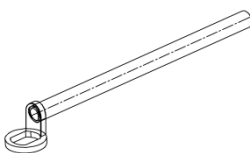
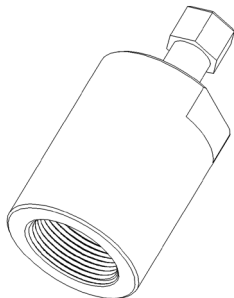
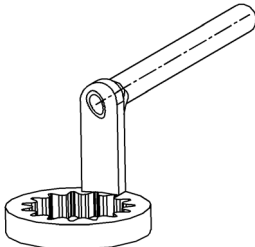


The correct maintenance process is crucial for the safety of maintenance personnel and the reliability and safety of the engine.

- 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 using toxic or flammable materials at work, 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 without authorization.

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 their codes	Disassembly and assembly of related components and descriptions	Special tools and their codes	Disassembly and assembly of related components and descriptions
467-001 	467-Sliding clutch tooling	467-002 	467-Magneto tooling
272V0.GZ1014 	Dismantling fixture for magneto rotor	467-002 	467-Output sprocket tooling

Engine torque table		
Program	Torque(N.m)	Note
Oil pressure sensor seat	25	
oil pressure sensor	15	
Screw plug M16X1.5	25	sealant
Screw plug Rc 1/4	15	sealant
Shift spring return pin	20~23	Tightening adhesive
Connecting rod bolts	15→30→58	
M6X14 bolt at the variable speed drum	8~12	Tightening adhesive
Box bolt M8X95	15→30	
Box bolt M8X45	22~24	
Box bolt M10X75	38→40	
Box bolt M6	8~12	
Tightening plate screws	8~10	
Five star wheel cylindrical head bolt M8X20	20~25	
Positioning wheel bolt M6	8~12	Tightening adhesive
Gear sensor cylindrical head bolt M5X20	5.5~7.5	
Oil pump driven sprocket bolt M6X14	8~12	Tightening adhesive
Tightening plate bolt	8~12	
Clutch nut M22X1	125~128	
Clutch combination bolt	8~12	
Overdrive clutch bolt M10X1.25X25	80-83	Tightening adhesive
Trigger cylindrical head bolt M5X12	5~8	Tightening adhesive
Crimping plate cylindrical head bolt M5X12	5~8	
Magneto rotor bolt M12X1.25X30	110~113	Tightening adhesive
Magneto stator cylindrical head bolt M6X35	10~12	Tightening adhesive
Wire pressing plate cylindrical head bolt	5~8	
Water temperature sensor	23~25	Sealant
Cylinder bolt M10X90	15→30→50	
Timing sprocket bolt M6X12	17~20	Tightening adhesive

Center cover	18~20	
spark plug	12~16	
Support seat bolts (three specifications)	23~25	
Cross groove countersunk head screw for water pipe baffle	8~12	
Output sprocket bolt M10X1.25X28	52~54	Tightening adhesive
Oil drain bolt	22~25	
Other unspecified M5	6	
Other unspecified M6	10	
Other unspecified M8	25	
Other unspecified M10	40	

Engine Technical Parameters Table(First)				
Program			Specification	
			BD467MU	
type			Inline, four cylinder, four stroke, water-cooled, overhead camshaft	
Bore X stroke			67mm x 48mm	
Total displacement			676mL	
Compression ratio			11.5:1	
Minimum no-load stable speed (idle)			1500r/min±150r/min	
Starting method			Electronic start	
Power			69KW/11000rpm	
Electrical system	Ignition method		ECU Ignition	
	Spark plug model		CR8E(NGK)	
	Electrode gap		0.8~0.9 mm	
	Magnetic motor form		Permanent magnet three-phase AC engine rotor flywheel type	
Combustion system	Combustion chamber type		Triangular combustion chamber	
	Air filter		Sponge filter cartridge filtration type	
	gasoline		95 # or above unleaded gasoline	
Air distribution system	Gas distribution method		DOHC/Chain drive	
Lubricating system	Lubrication method		Pressure splash lubrication	
	Oil pump type		Rotor type	
	Filter type		Full flow filtration paper filter cartridge	
	Oil grade		SAE15W/50	
	Oil filling amount		3.5L	
Cooling system	Cooling method		Closed coolant circulation cooling	
	Type of coolant		-35 ° C rust proof and antifreeze solution	
Drive system	Clutch type		Wet multi plate sliding clutch	
	Variable speed mode		Six speed constant mesh continuously variable transmission	
	Decelerator gear position		6th gear	
	Shift mode/sequence		Mechanical reciprocating /1-N-2-3-4-5-6-5-4-3-2-N-1	
	Transmission transmission ratio	Primary transmission ratio		1.69
		Secondary transmission ratio	First gear	3.071
			Second gear	2.235
			Third gear	1.777
			Fourth	1.52

			gear	
			Fifth gear	1.333
			Sixth gear	1.214
External dimensions				
Net mass	61.5KG			
External dimensions	Length X Width X Height: 476mmX480mmX535mm			
output mode	Sprocket output			
Engine output rotation direction	Looking counterclockwise from the left end of the engine when moving forward			

Engine technical parameter(Second)		
Inlet valve clearance		0.16±0.02mm
Exhaust valve clearance		0.25±0.02mm
Number of valves		Entering 8 rows and 8 rows
Working voltage (V)		12
piston diameter	Size A	66.965-66.970
	Size B	66.960-66.965
	Size C	66.955-66.960
Cylinder diameter	Size A	67.000-67.005
	Size B	66.995-67.000
	Size C	66.990-66.995
Installation clearance of piston cylinder	New conditions	0.05-0.085mm
	Wear limit	0.1mm
Installation clearance of piston rings		0.03-0.05mm
Jumping at the crankshaft bearing shell		Less than 0.03mm
Gap between connecting rod big end and crankshaft crank		0.05-0.2mm
Camshaft runout		Less than 0.04mm

10.1 Waterway inspection and maintenance

10.1.1 Notice:

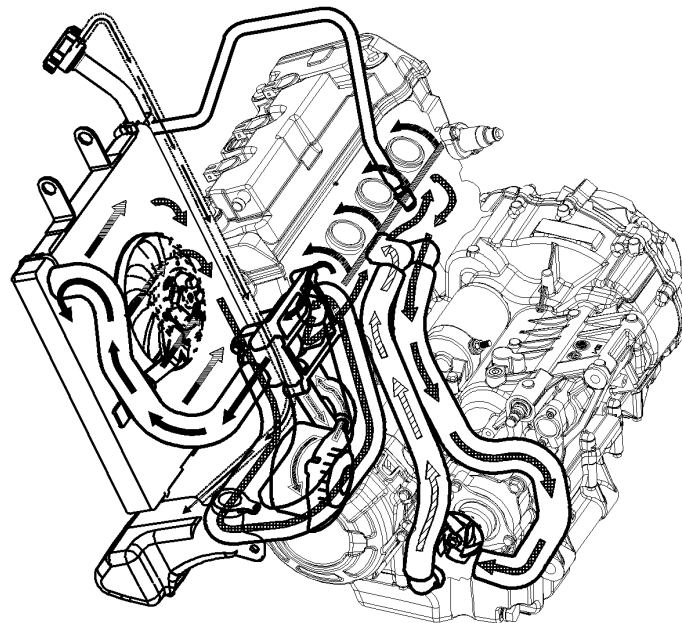
- When the engine is very hot, removing the radiator cap may cause coolant to spray out and cause serious burns to people. Dismantling and scattering
- Before covering the heat exchanger, make sure to let the engine and radiator cool down.
- The use of coolants containing silicate corrosion inhibitors 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.

10.1.2 Troubleshooting of abnormal water temperature

1 High engine temperature

- High temperature coolant temperature indicator or water temperature sensor malfunction
- Thermostat stuck or closed
- Radiator cover malfunction
- Insufficient coolant
- Blocked channels in radiators, hoses, or water jackets
- Air intake system
- Cooling fan motor malfunction
- Fan control relay malfunction
- Water pump malfunction

Waterway schematic diagram (detailed drawing on the next page)



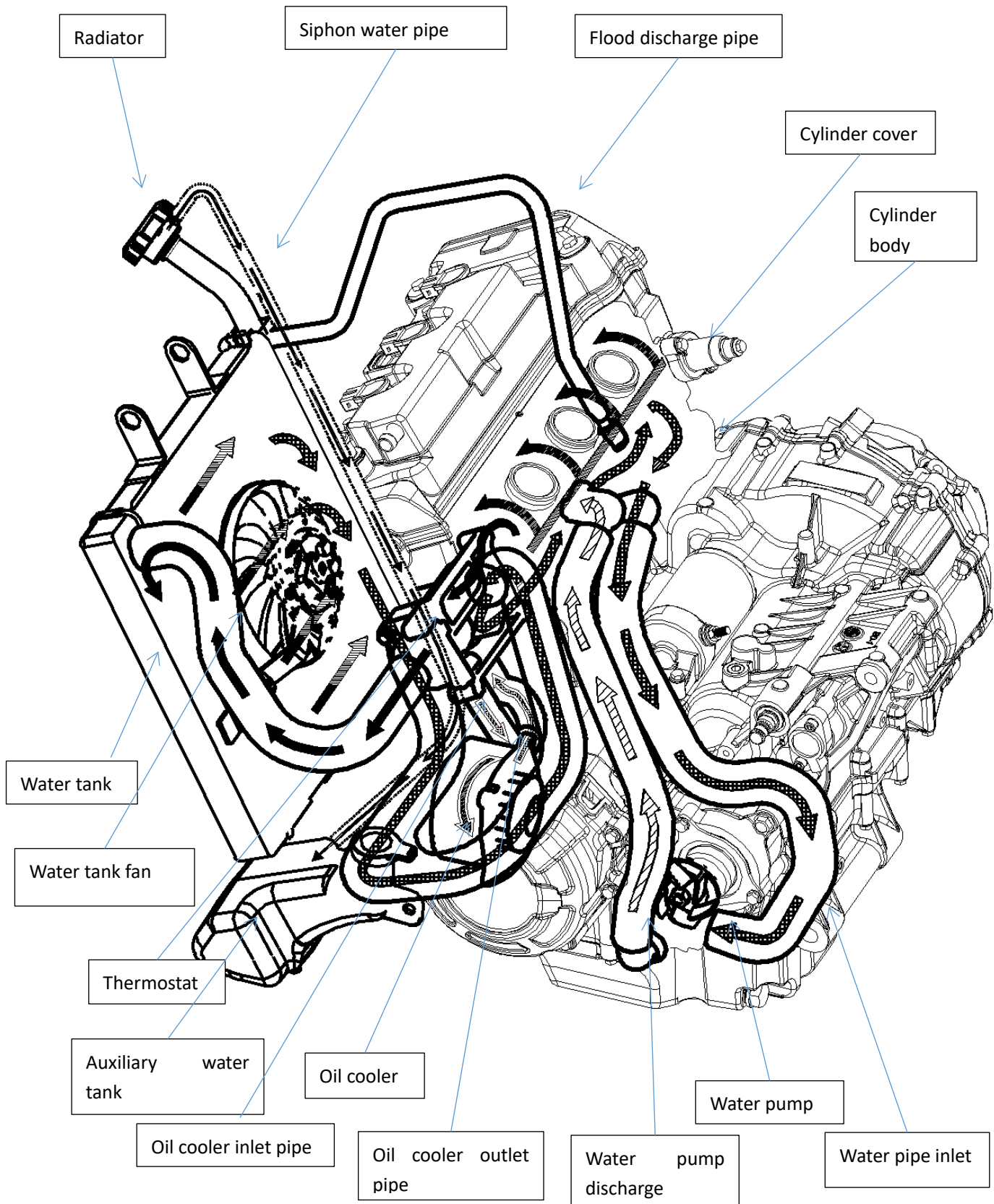
2 Low engine temperature

- 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

Waterway schematic diagram



10.2 Oil circuit inspection and maintenance

10.2.1 Notice:

The engine can be repaired with the oil pump on 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.

10.2.2 Abnormal oil pressure troubleshooting

1 Oil level too low

- Oil consumption
- External oil leakage
- Piston ring wear
- Improper installation of piston rings

- Cylinder wear
- Valve oil seal wear
- Valve oil seal wear

2 Low oil pressure

- Low oil
- Oil filter blockage
- Internal oil leakage
- Using incorrect engine 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

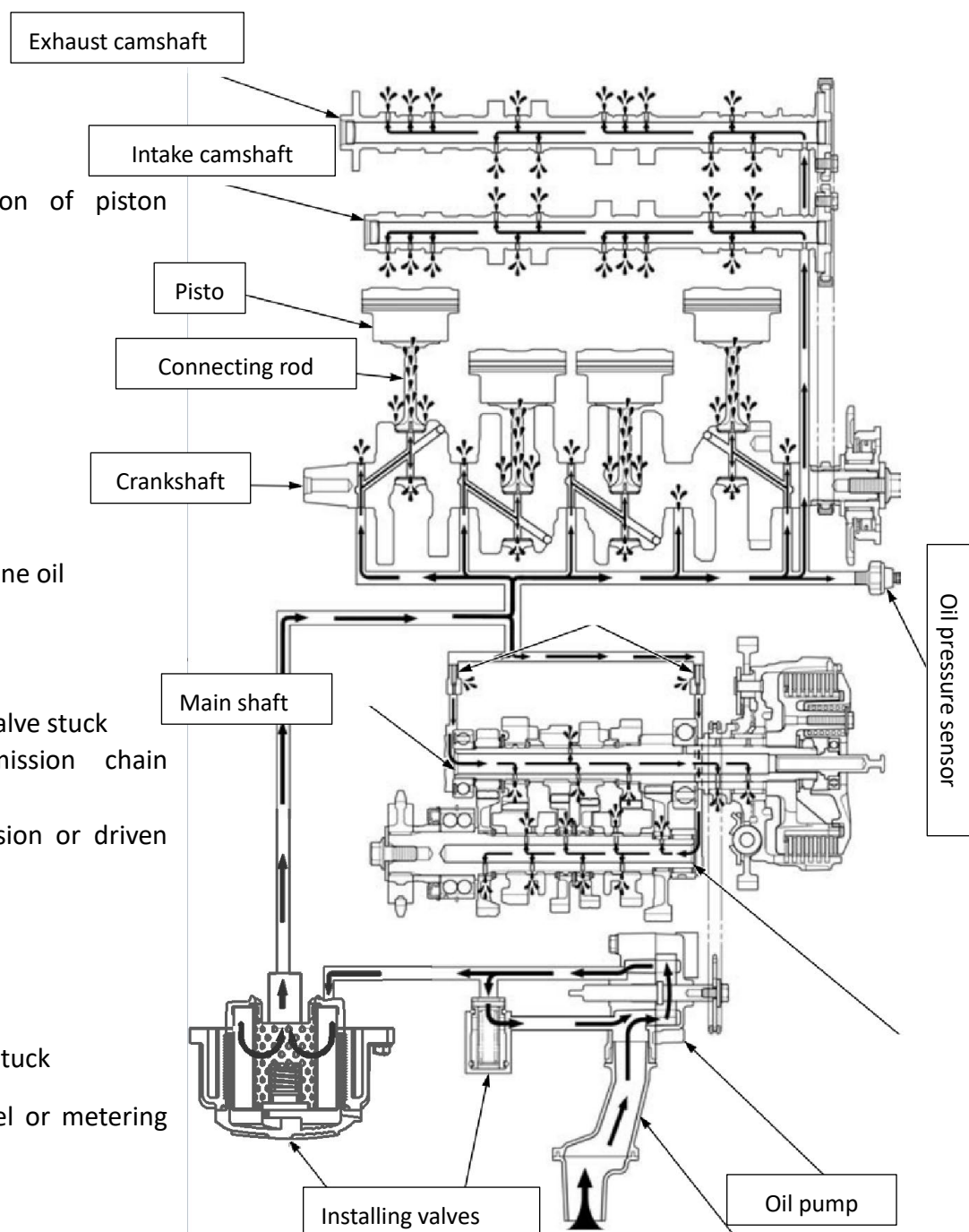
4 High oil pressure

- Oil pressure relief valve stuck
- Blocked oil filter channel or metering hole

Using incorrect engine oil

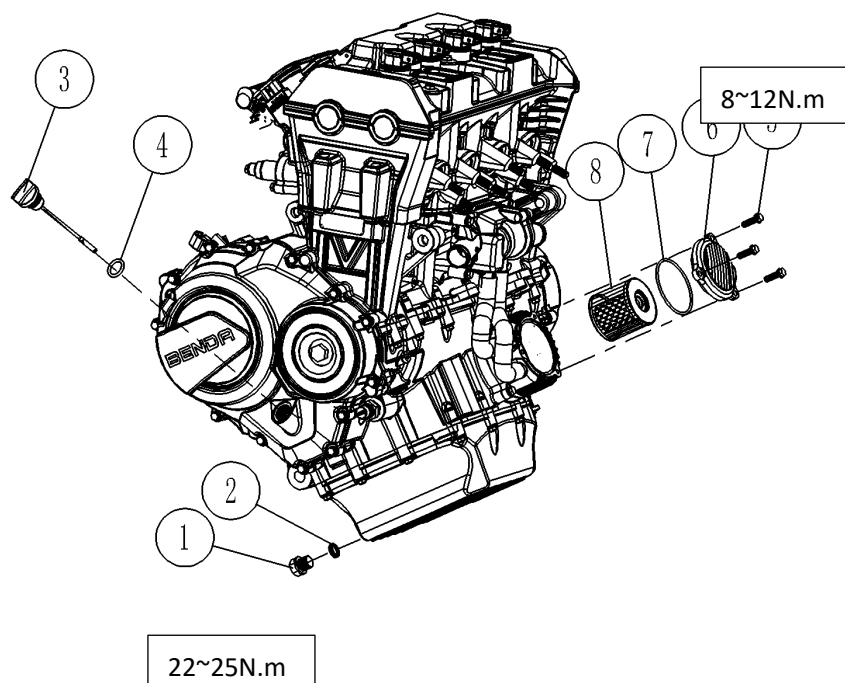
5 Oil emulsification

- Damaged cylinder head gasket
- The coolant leaks into the oil passage
- Water ingress



10.2.3 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 bolts 5
- Remove the oil filter cover 6
- Remove O-ring 7
- Remove filter element 8
- Replace the oil filter element8
- Assemble o-ring 7
- Assembling oil filter cover 6
- Tightening bolt 5
- Assemble gasket 2 and tighten the oil drain bolt 1
- Inject oil into the oil dipstick hole 2.9L
- Tighten the oil dipstick combination 3 and tighten it by hand

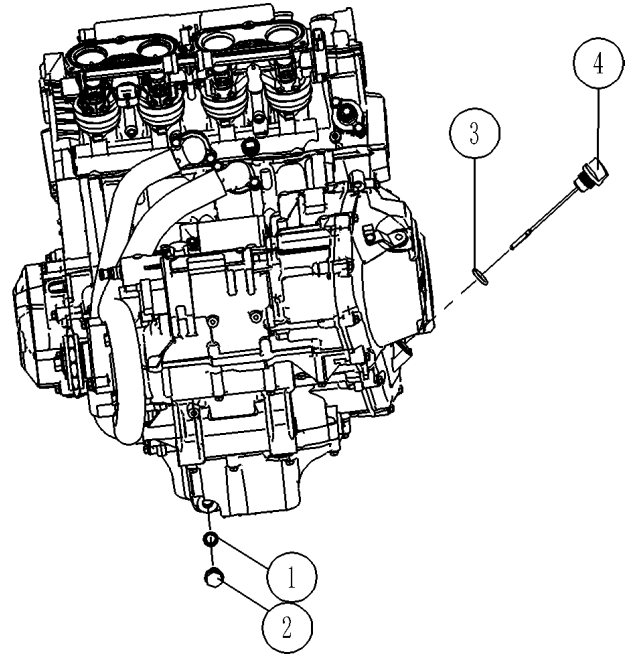


Attention

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

11.1 Drain the engine oil

- Remove the combination of oil dipstick 4 and O-ring 3
- Remove oil drain bolt 1 (M14X12)
- Remove the metal gasket 2 from the oil drain bolt

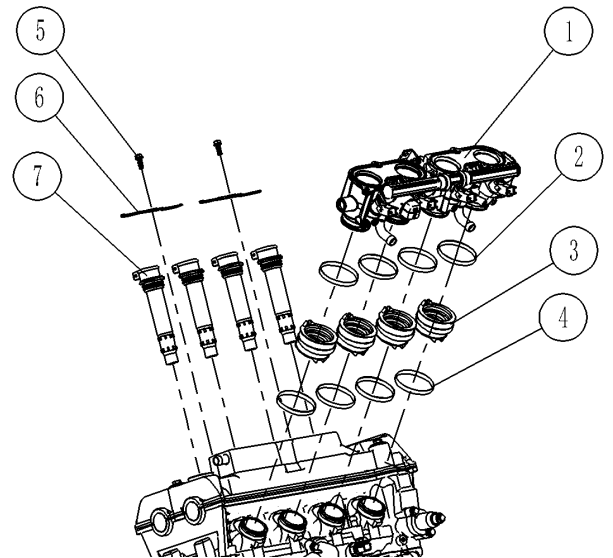


Attention

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

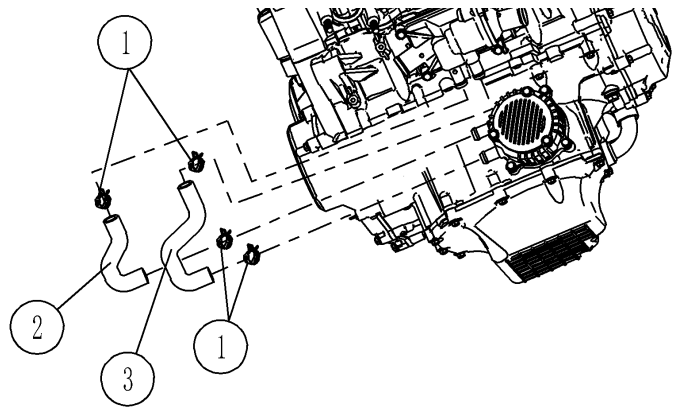
11.2 Throttle body

- Remove the limit clamp 2($\phi 48$)
- Remove throttle valve body 1
- Remove limit clamp 4($\phi 51$)
- Remove intake Inlet valve connecting pipe 3
- Remove bolts 5 (M6X12)
- Remove ignition coil baffle 6
- Remove ignition coil 7



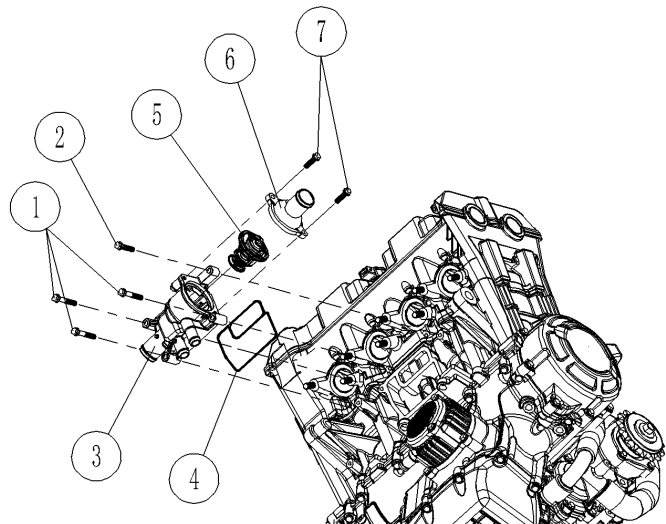
11.3 Inlet pipe and outlet pipe

- Remove wide clamp 1
- Remove cooler water inlet pipe 2
- Remove cooler water outlet pipe 3

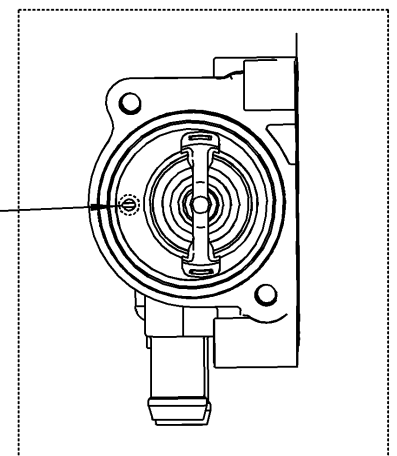


11.4 Thermostat

- Remove bolt 7(M6X35)
- Remove thermostat cover 6
- Remove thermostat assembly 5
- Remove bolt 1(M6X20)
- Remove bolt 2(M6X25)
- Remove thermostat mount 3
- Remove thermostat gasket 4

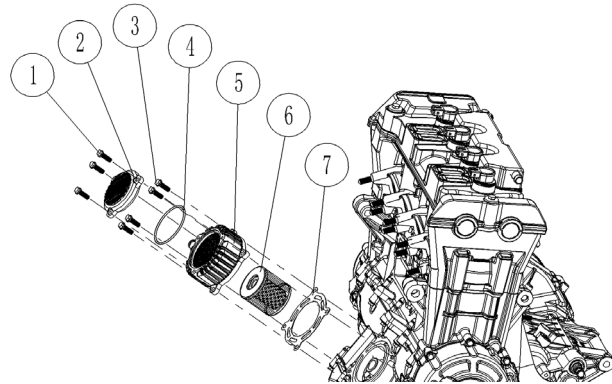


The thermostat assembly is located in the thermostat mounting seat. The orientation of the points on the thermostat assembly is shown in the figure



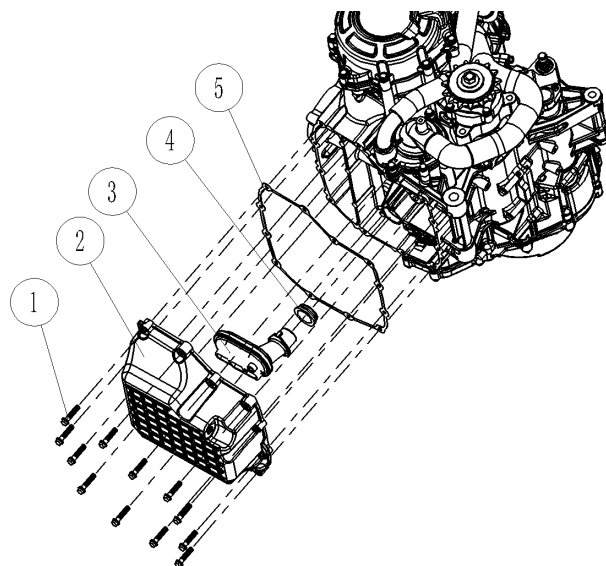
11.5 Cooler

- Remove bolt 1(M6X25)
- Remove oil filter cover 2
- Remove o-ring 4(63X2.5)
- Remove bolt 3(M6X20)
- Remove cooler housing 5
- Remove oil element 6
- Remove cooler paper pad 7



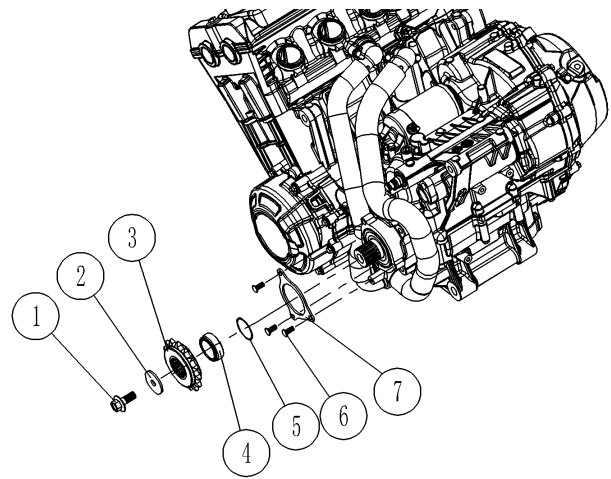
11.6 Oil pan

- Remove Bolt 1(M6X30)
- Remove Oil pan 2
- Oil suction tray 3
- Remove Oil pan sealing ring 4
- Remove oil pan paper pad 5



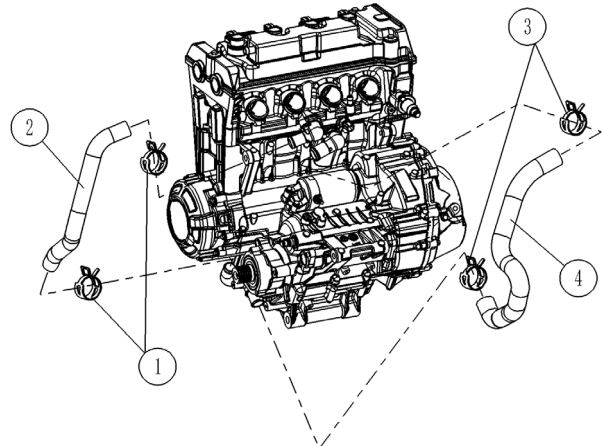
11.7 Output sprocket

- Remove bolt 1(M10X40X16.5)
- Remove Washer 2(10.2X37X2.5)
- Remove Output sprocket 3
- Remove bushing 4(30X40X16.5)
- Remove O-ring inside the liner 5(30X2)
- Remove cross recessed countersunk head screw 6
- Remove water pipe baffle 7



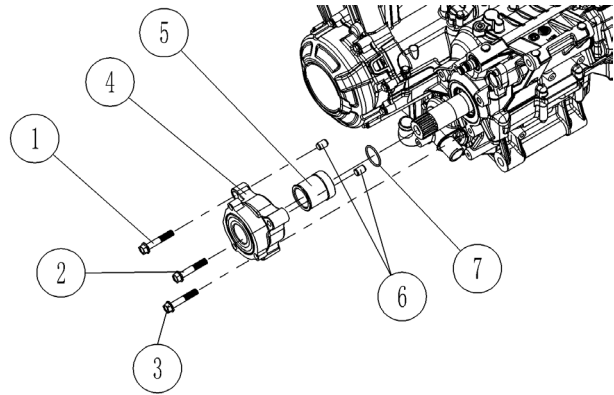
11.8 Water pump inlet and outlet pipes

- Remove wide clamp 1($\phi 29$)
- Remove water inlet pipe 2
- Remove wide clamp 3($\phi 31$)
- Remove water outlet pipe 4



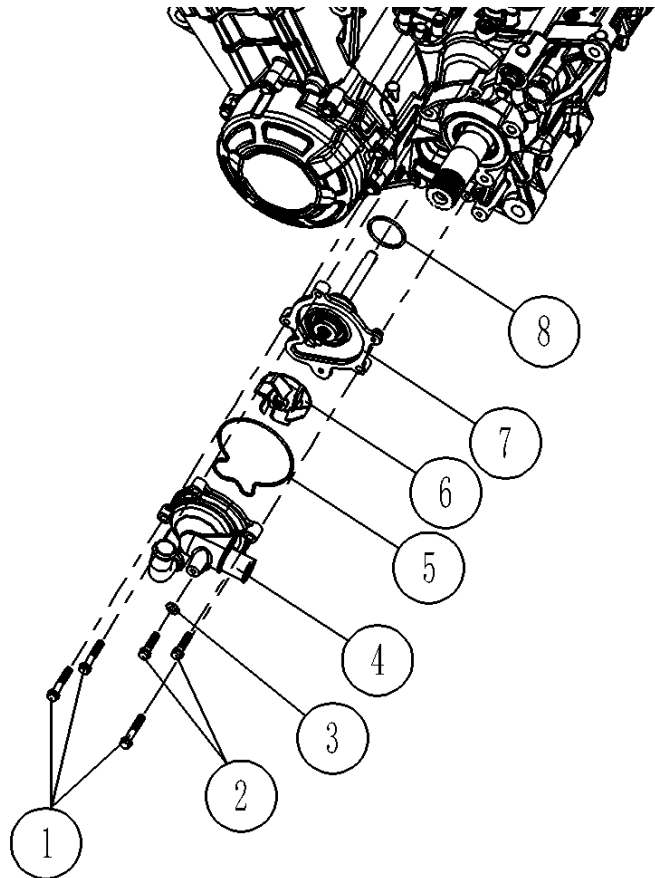
11.9 Support base

- Remove Hexagon socket bolt 1(M8X35)
- Remove bolt 2(M8X50)
- Remove bolt 3(M8X45)
- Remove support base 4
- Remove bushing 5(30X40X44.2)
- Remove locate pin 6(10X14)
- Remove o-ring 7(30X2)



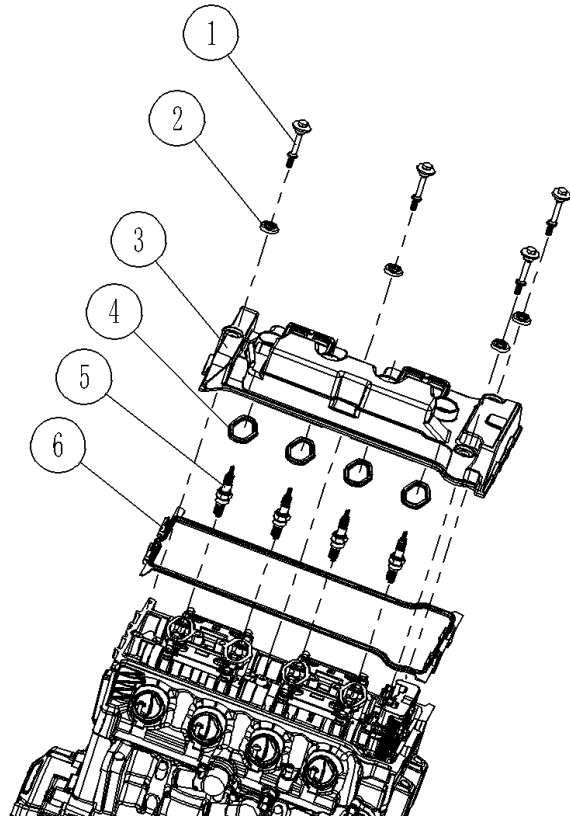
11.10 Water pump

- Remove bolt 1(M6X35)
- Remove bolt 2(M6X25)
- Remove washer 3(6X12X1.5)
- Remove water pump cover 4
- Remove water pump gasket 5
- Remove water pump impeller 6
- Remove Pump shaft press assembly 7
- Remove r-ring 8(33X2.5)



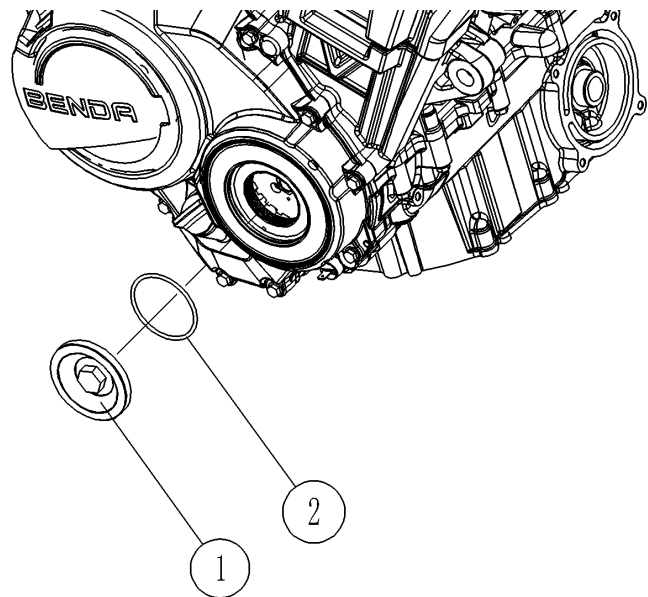
11.11 Cylinder head cover

- Remove step bolt 1
- Remove rubber gasket assembly 2
- Remove cylinder head cover 3
- Remove rectangular gasket 4
- Remove spark plug 5
- Remove cylinder head cover gasket 6



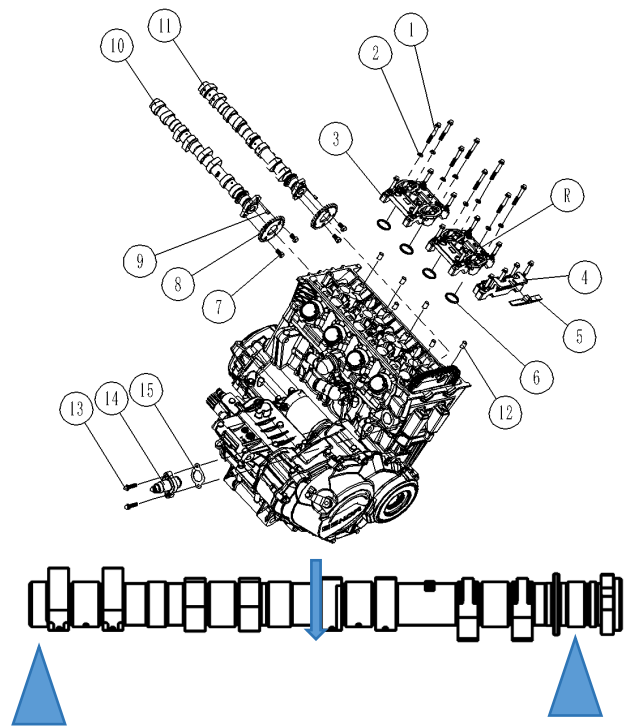
11.12 Center cover

- Remove center cover 1
- Remove o-ring(48*2.5)



11.13 Camshaft

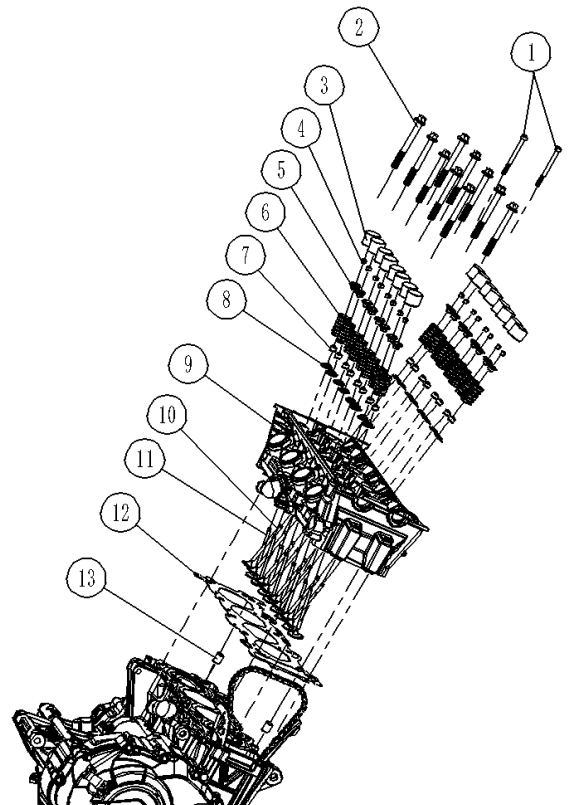
- Remove bolt 1(M6X45)
- Remove aluminium washer 2(6X12X1.5)
- Remove camshaft mount 3(L)
- Remove camshaft limit seat R
- Remove camshaft limit seat 4
- Remove chain guide plate 5
- Remove o-ring 6
- Remove locate pin 12(8X14)
- Remove exhaust camshaft assembly 11
- Remove exhaust camshaft assembly 10
- Remove hexagon head bolt 7(M6X12)
- Remove timing driven sprocket 8
- Remove roller pin 9(4X8)
- Remove bolt 13(M6X25)
- Remove tensioner 14
- Remove tensioner paper pad 15



✕Inspection: As shown in the upper right figure, support both sides of the camshaft (at the shaft diameter) with V-shaped blocks and check the camshaft runout with a dial gauge. If it exceeds 0.04, it needs to be replaced

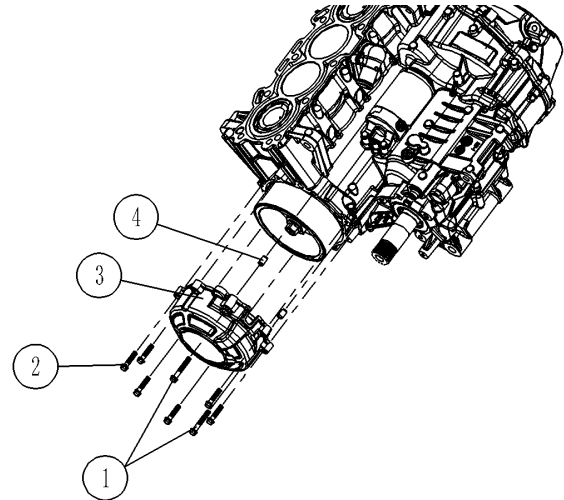
11.14 Cylinder head cover

- Remove cylindrical bolt 1(M6X70)
- Remove cylinder bolt 2(M10X90)
- Remove valve tappet 3
- Remove valve locking clip 4
- Remove valve spring upper seat 5
- Remove valve spring 6
- Remove valve spring lower seat 7
- Remove Oil seal 8
- Remove cylinder cover 9
- Remove intake and exhaust valve 10 11
- Remove cylinder cover gasket 12
- Remove locate pin 13(12X16)



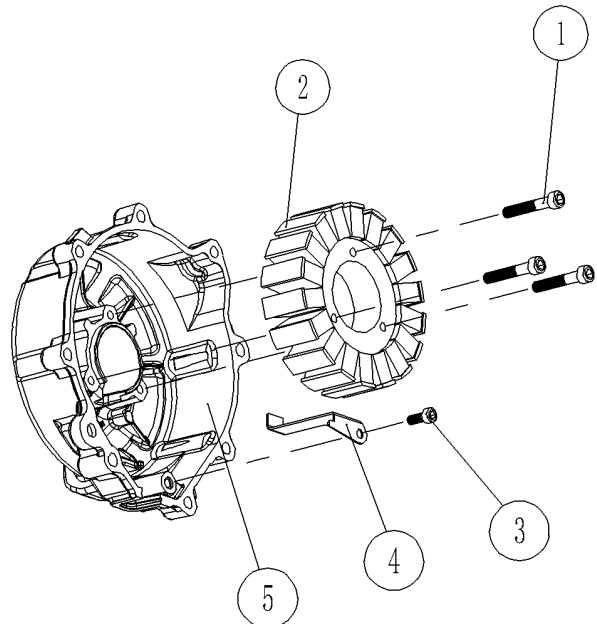
11.15 Left side cover

- Remove bolt 1(M6X40)
- Remove bolt 2(M6X28)
- Remove left side cover 2
- Remove locate pin 4



11.16 Left side cover assembly

- Remove cylindrical bolt 1(M6X35)
- Remove cylindrical bolt 3(M5X12)
- Remove wire pressure plate 4
- Remove magneto stator2

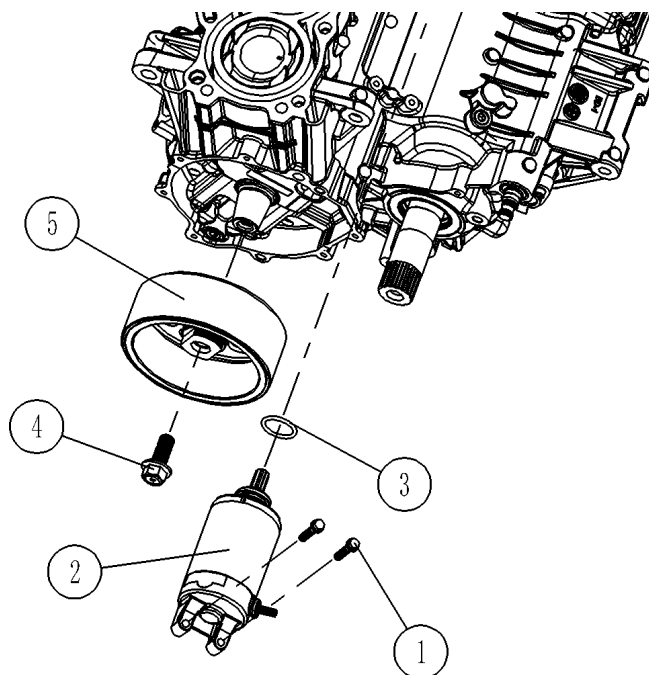


11.17 Magneto rotor,start motor

- Remove bolt 1(M6X30)
- Remove start motor 2
- Remove o-ring
- Remove bolt 4(M12X1.25X30)
- Remove magneto rotor 5

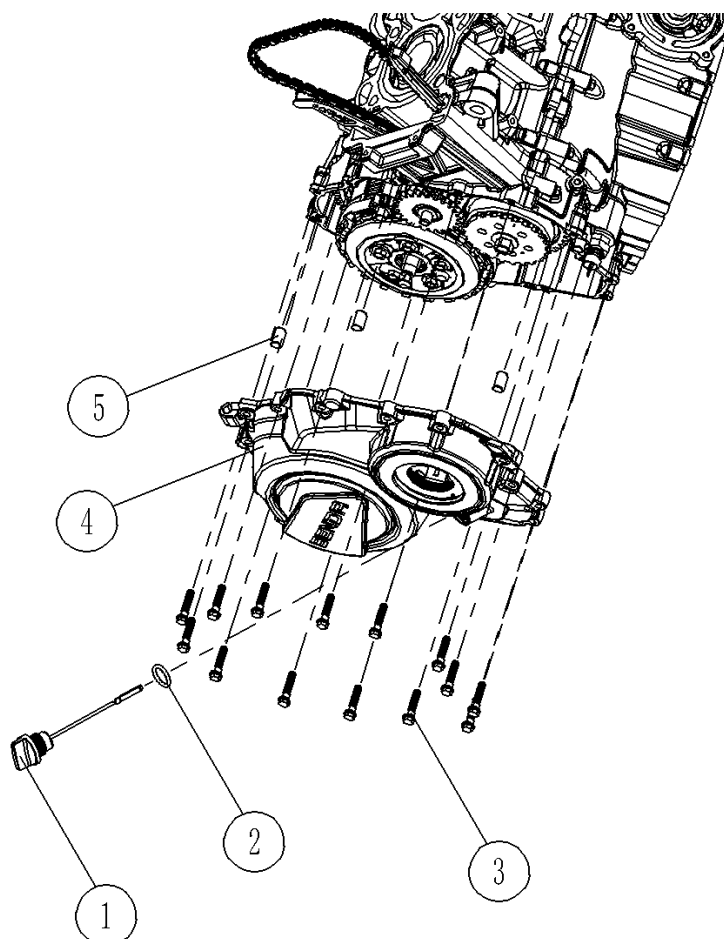
Attention

Remove the magnetic motor rotor 5 using a special tool



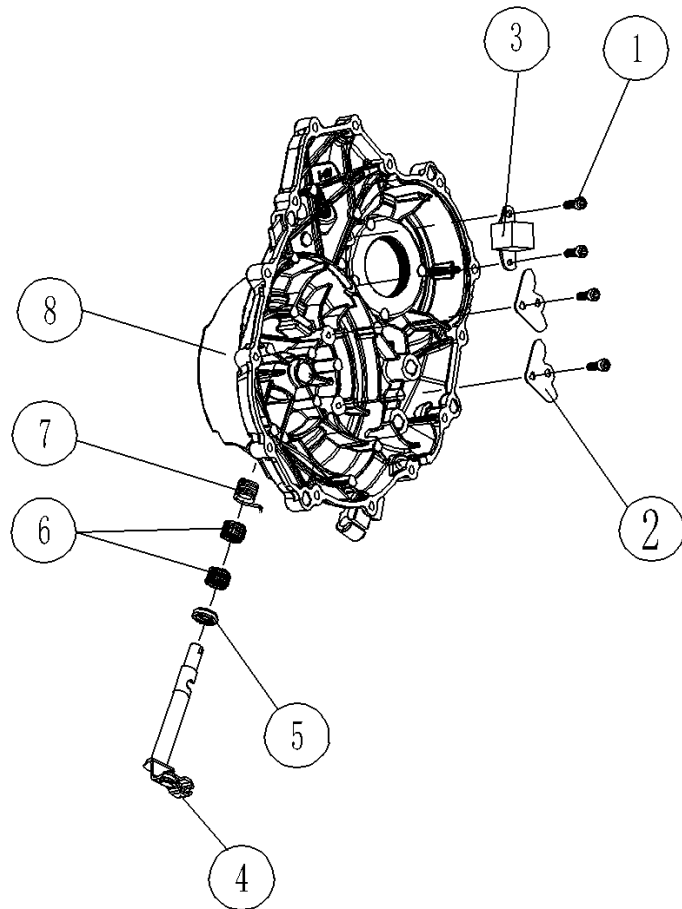
11.18 Right side cover

- Remove oil dipstick 1
- Remove o-ring 2
- Remove bolt 3
- Remove right side cover 4
- Remove located pin 5



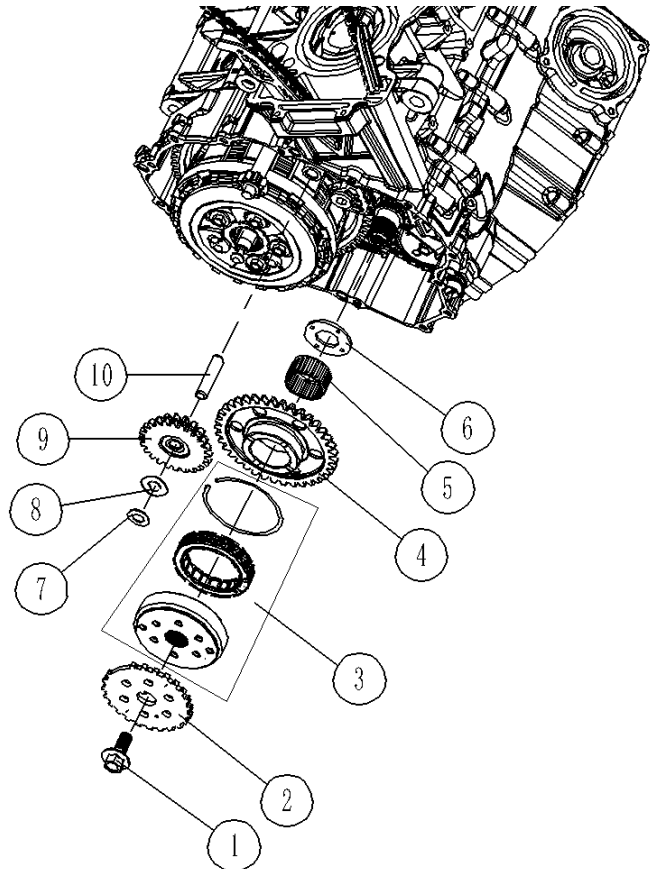
11.19 Right side cover disassembly

- Remove bolt 1
- Remove pressing line plate 2
- Remove trigger coil 3
- Remove clutch operate lever 4
- Remove oil seal 5(12X18X5)
- Remove roller pin bearing 6
- Remove clutch operate lever torsional spring 7



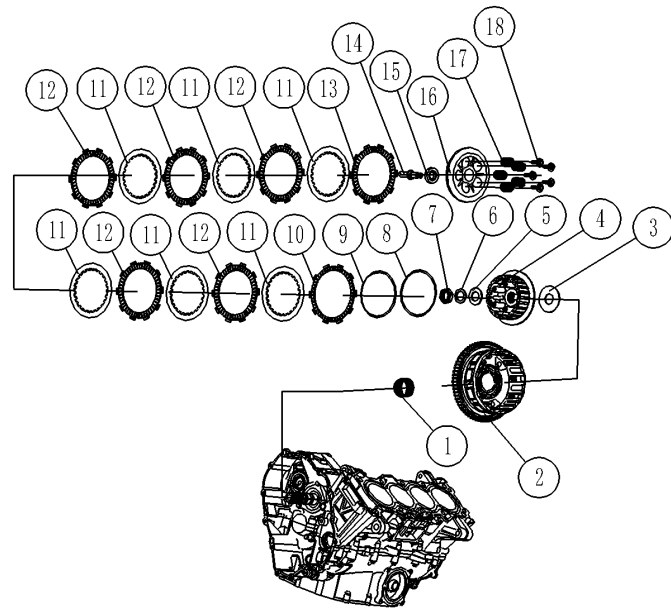
11.20 Overtaking clutch and dual gear

- Remove bolt 1(M10X1.25X25)
- Remove trigger disc 2
- Remove overtaking clutch combination 3
- Remove start driven gear 4
- Remove roller pin bearing 5
- Remove washer 6(21.2X42X2.5)
- Remove washer 7(10X20X1)
- Remove wave washer 8
- Remove dual gear 9
- Remove double gear shift 10



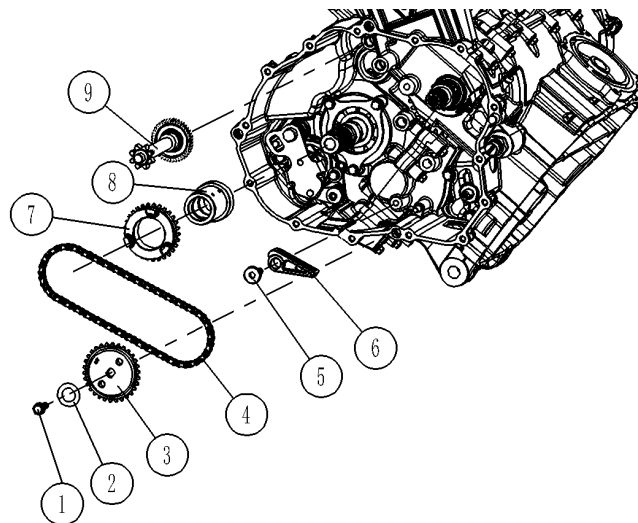
11.21 Clutch

- Remove combined bolt 18
- Remove pressure plate spring 17
- Remove clutch pressure plate 16
- Remove bearing 15
- Remove clutch detached top rod 14
- Remove friction pad 13(C)
- Remove clutch driven plate 11
- Remove friction pad 12(B)
- Remove clutch driven pad 11
- Remove friction pad 12(B)
- Remove clutch driven pad 11
- Remove friction pad 12(B)
- Remove clutch driven pad 11
- Remove friction pad 12(B)
- Remove clutch driven pad 11
- Remove friction pad 12(B)
- Remove clutch driven pad 11
- Remove friction pad 10(A)
- Remove disc washer 9
- Remove washer 8
- Remove clutch nut 7(M22X1)
- Remove wave washer 6
- Remove 5(22X39X2)
- Remove clutch driven disc 4
- Remove washer 3(25X60X2)
- Remove clutch drive wheel assembly 2
- Remove roller pin bearing 1(35X41X24)



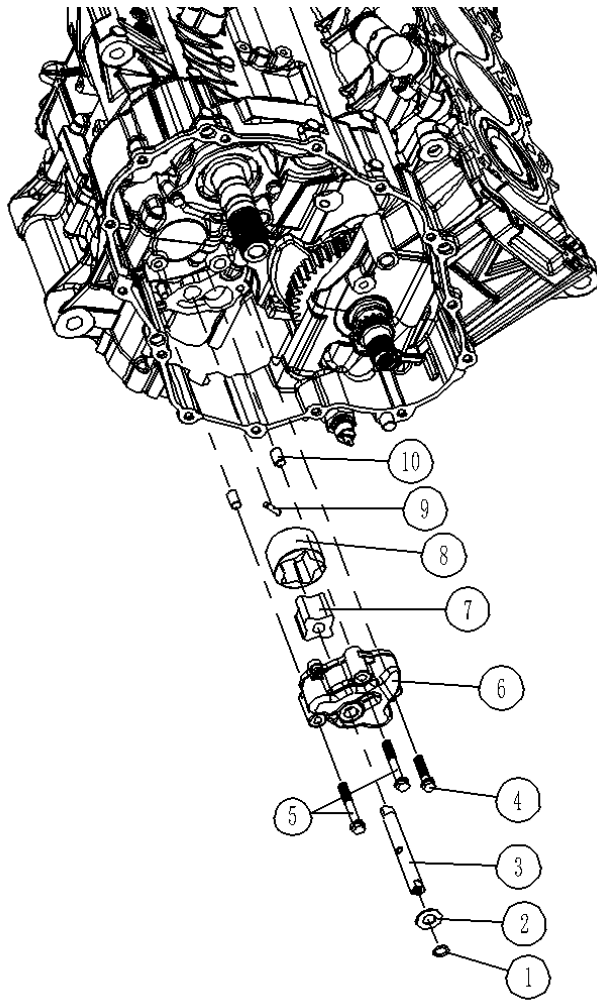
11.22 Main oil pump,driven gear

- Remove bolt 1(M6X14)
- Remove washer 2(M6X15X1)
- Remove oil pump driven gear 3
- Remove oil pump chain 4
- Remove tension plate bolt 5
- Remove oil pump chain guide plate 6
- Remove oil pump drive gear 7
- Remove clutch spacer sleeve 8
- Remove Starting primary gear 9



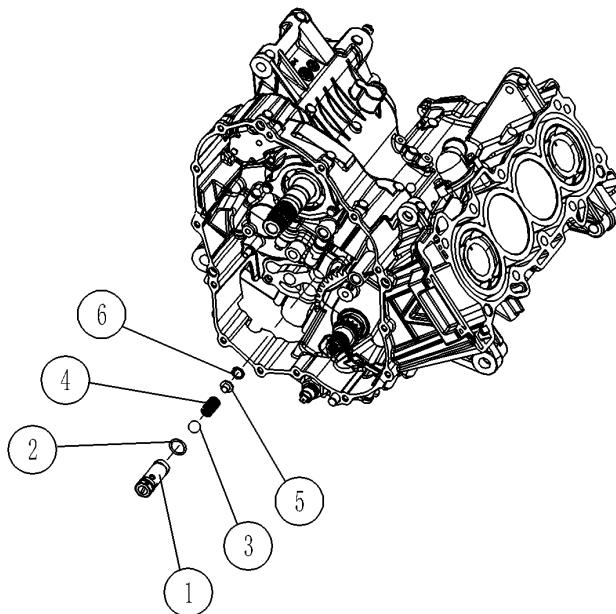
11.23 Oil pump group

- Remove shaft ring 1(Specification 10)
- Remove washer 2(10X20X1)
- Remove bolt 4(M6X30)
- Remove bolt 5(M6X45)
- Remove oil pump housing 6
- Remove locate pin 10
- Remove roller pin 9(4X15.8)
- Remove oil pump rotor 8
- Remove oil pump inside rotor7



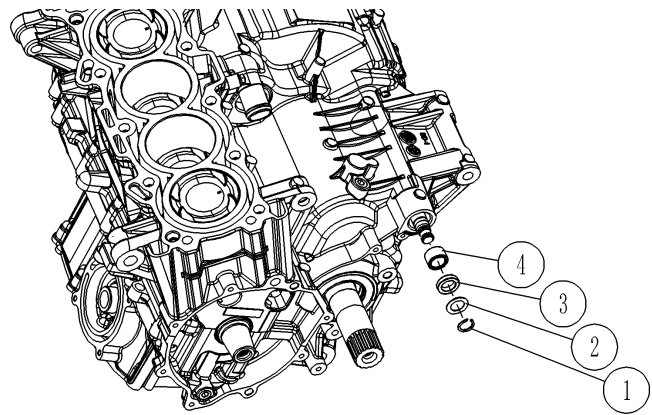
11.24 Pressure relief valve

- Remove pressure valve body 1
- Remove hole retaining ring 6
- Remove pressure valve spring 5
- Remove pressure relief valve spring 4
- Remove steel ball 2($\phi 13.5$)
- Remove o-ring 2(15X1.8)

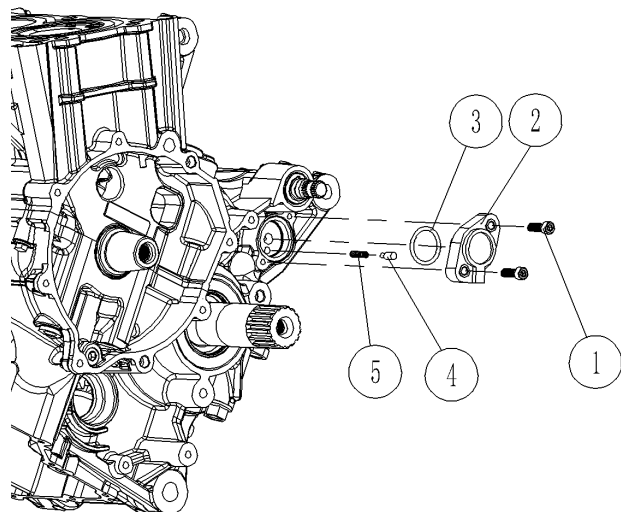


11.25 Shift oil seal,pin bearing

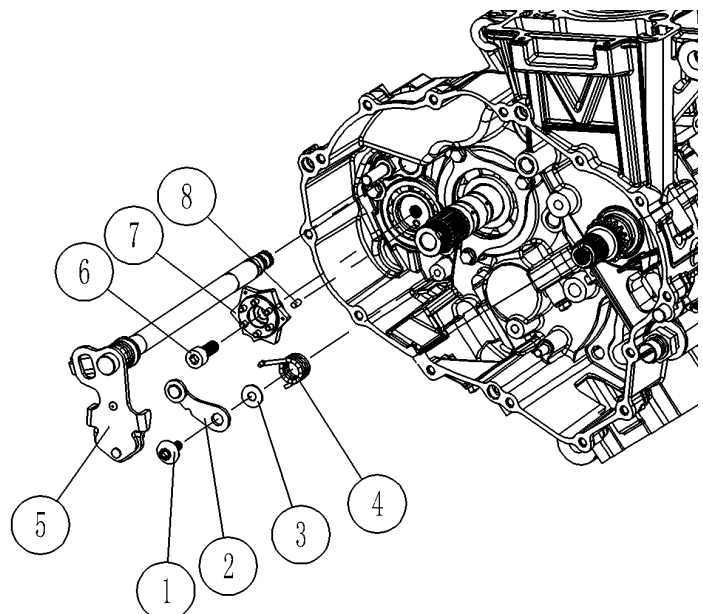
- Remove shaft bearing 1
- Remove washer 2(14X29X0.8)
- Remove oil seal 3(14X22X5)
- Remove pin bearing 4(14X20X12)

**11.26 Shift switch**

- Remove cylindrical head bolt 1(M5X20)
- Remove shift sensor 2
- Remove o-ring 3(25X2.5)
- Remove gear display contact 4
- Remove gear display contact spring 5

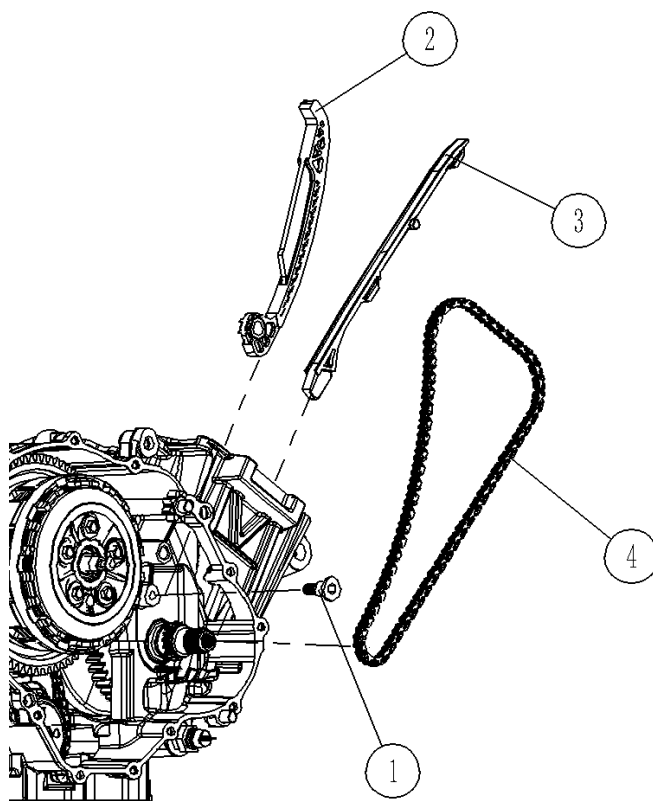
**11.27 Shift gear,Gear shifting mechanism**

- Remove positioning wheel bolt1
- Remove positioning wheel assembly2
- Remove washer 3(6X12X1)
- Remove positioning wheel torsional spring 4
- Remove shift lever assembly 5
- Remove cylindrical head bolt 6(M8X20)
- Remove five star wheel assembly7
- Remove roller pin 8



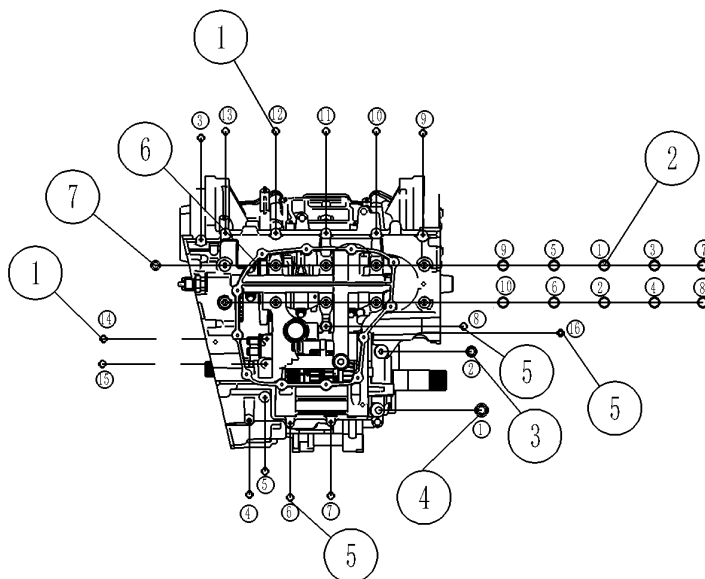
11.28 Chain,guide plate A,tension plate

- Remove tension plate bolt 1
- Remove tension plate 2
- Remove guide chain plate 3
- Remove chain 4



11.29Unpacking

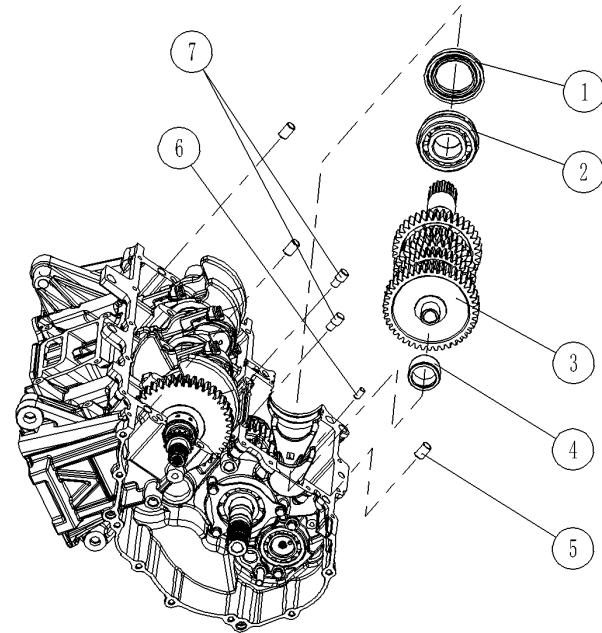
- Remove bolt 5(M6X50)
- Remove bolt 4(M10X75)
- Remove bolt 3(M8X45)
- Remove bolt 1(M6X35)
- Remove bolt 2(M8X95)



※Inspection: Gear wear,damage,replacement that affects usage

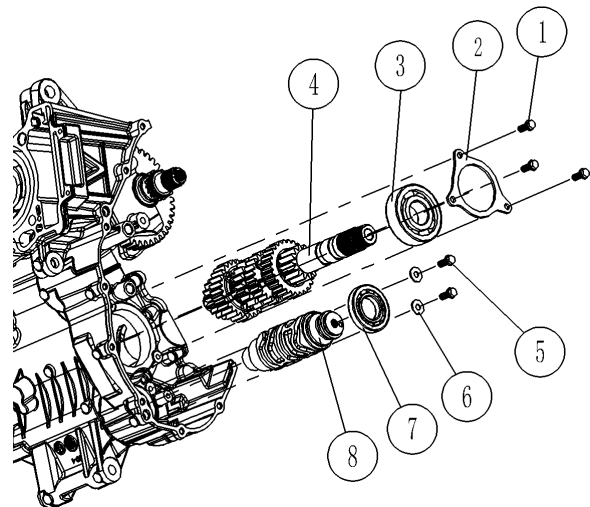
11.30 Secondary shaft

- Remove secondary axis combination 3
- Remove oil seal 1
- Remove bearing 2(30X62X23.8)
- Remove roller pin bearing 4
- Remove solid pin 5
- Remove roller pin 6(6X11.8)
- Remove fuel spray nozzle 7



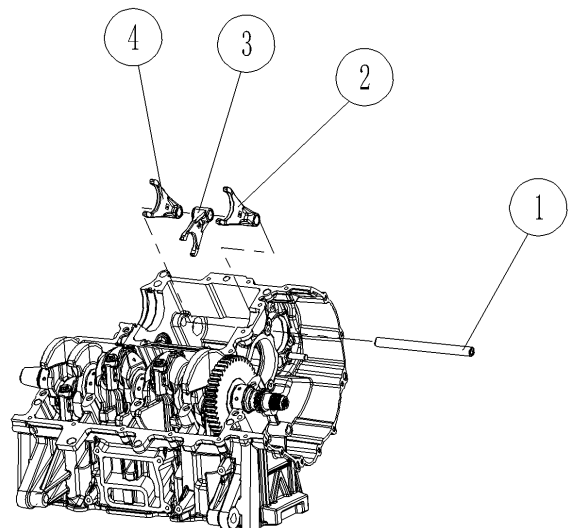
11.31 Main shaft,Variable speed drum

- Remove bolt 1(M6X14)
- Remove bearing baffle 2
- Remove bearing 3(25X62X17)
- Remove main shaft combination 4
- Remove bolt 5(M6X14)
- Remove washer 6
- Remove bearing 7(25X50x8)
- Remove variable speed drum 8



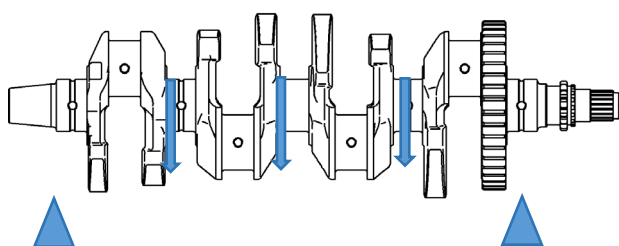
11.32 Fork shift

- Remove the shift fork shaft 1
- Remove fork 4 (L), middle fork 3 (C), and fork 2 (R) in sequence



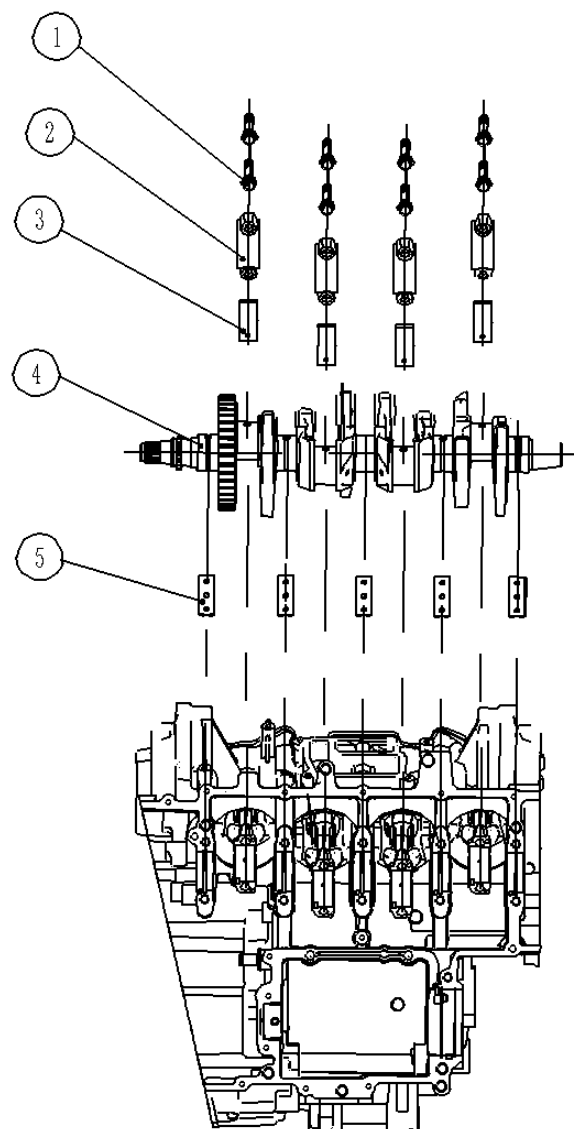
11.33 Crankshaft,Con-rod

※Inspection: The crankshaft has a runout, supported by an equal height V-shaped iron. The arrow in the figure indicates a runout with a limit value of 0.03mm. If it exceeds this limit, it is recommended to replace it.



※Inspection: ① Check if the bearing shells are damaged and replace them if necessary.
② The bearing should rotate flexibly without any jamming, and if necessary, it should be replaced.

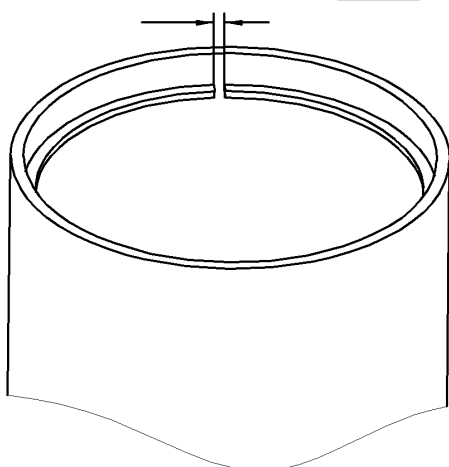
- Remove con-rod bolt 1
- Remove con-rod cap 2
- Remove piston con-rod
- Remove con-rod bearing shell 3
- Remove crankshaft 4
- Remove main bearing shell 5



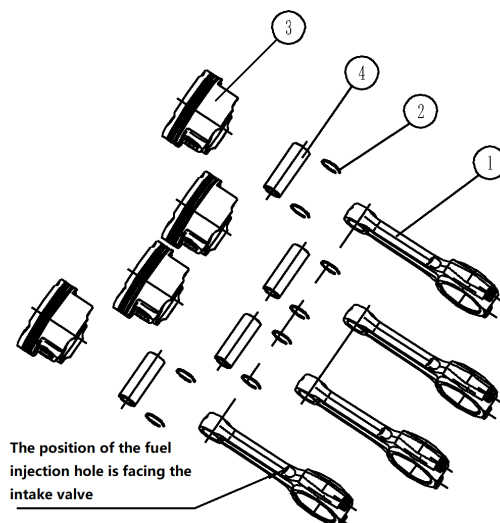
11.34 Piston con-rod

※ Inspection:Piston ring, use old cylinder block, as shown in the diagram below. If the measured value exceeds 0.4,

0.4

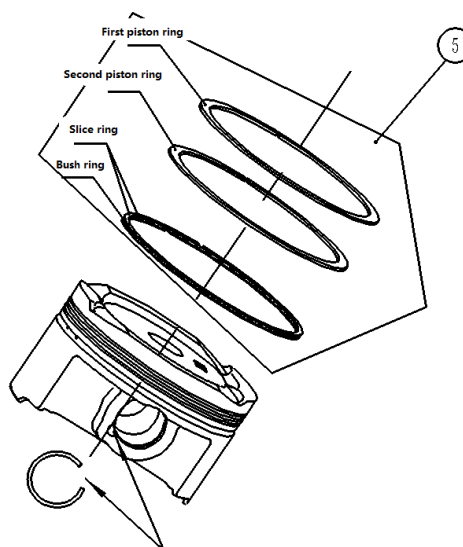


- Remove piston pin retainer 2
- Remove piston pin 4
- Remove piston 3



11.35 Piston ring

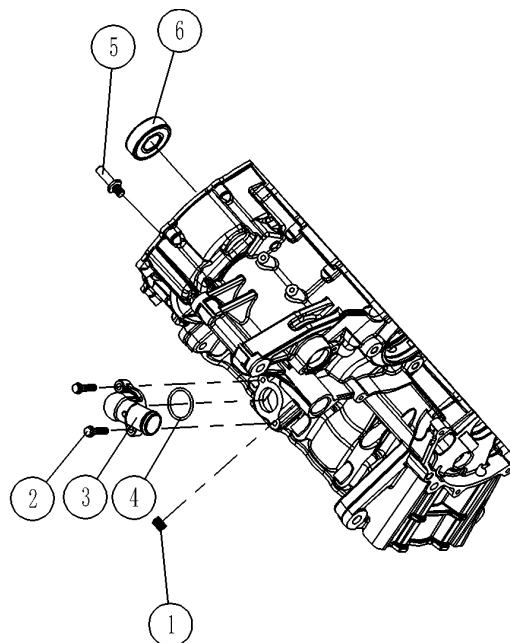
- Remove first piston ring
- Remove second piston ring
- Remove slice ring
- Remove bush ring
- Remove slice ring



The opening directions are staggered from each other

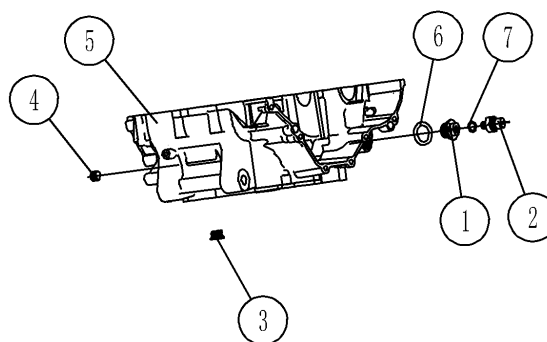
11.36 Upper box body

- Remove bolt plug 1
- Remove bolt2
- Remove outlet pipe joint 3
- Remove o-ring 4
- Remove shift spring return pin 5
- Remove bearing 6(20X47X14)



11.37 Lower box body

- Remove oil pressure sensor 2
- Remove aluminium washer 7
- Remove oil pressure sensor 1
- Remove o-ring 6
- Remove screw plug 3(M16X1.5)
- Remove screw plug 4

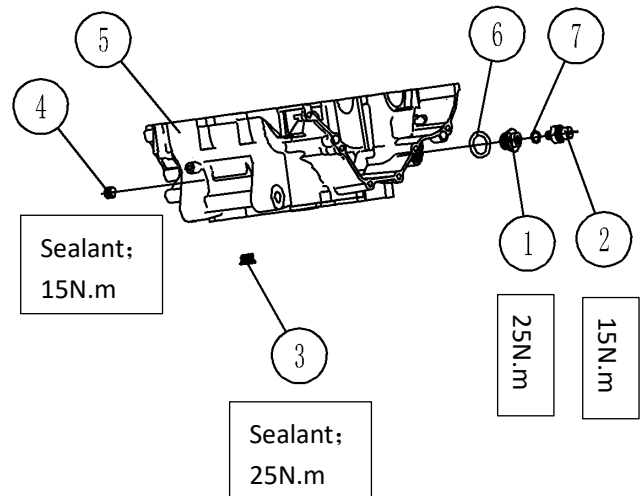


※Clean inspection: Clean the components with cleaning agents, check for any defects that may affect their use, and replace them if necessary

12.1 Lower box body

※Inspection: Whether each oil passage is cleaned thoroughly, whether there is any damage to the joint surface, and whether there are any defects in the appearance. If there are any, they need to be treated and replaced

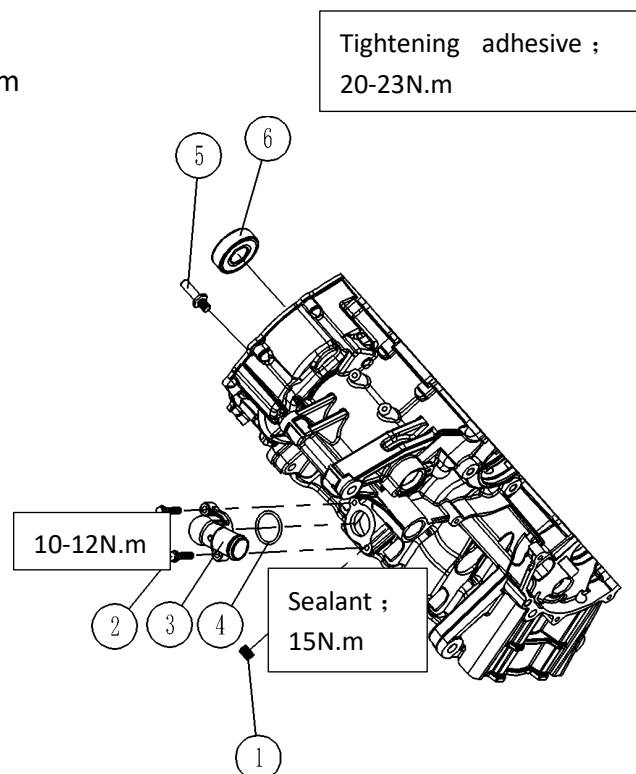
- Assemble screw plug 4(Rc1/4)
- Assemble screw plug 3(M16X1.5)
- Assemble o-ring 6(18.2X2.4)
- Assemble oil pressure sensor seat 1
- Assemble copper washers7(10X15)
- Assemble oil pressure sensor 2



12.2 Upper box body

※Inspection: Whether the oil passage is cleaned thoroughly, whether there is any damage to the joint surface, and whether there are any defects in the appearance. If there are any, they need to be treated and replaced

- Assemble bearing 6(20X47X14)Press to the bottom
- Assemble shift spring return pin 5
- Assemble o-ring 4(28X2.5)
- Assemble outlet pipe joint 3
- Assemble bolt 2
- Assemble screw plug1

**Attention**

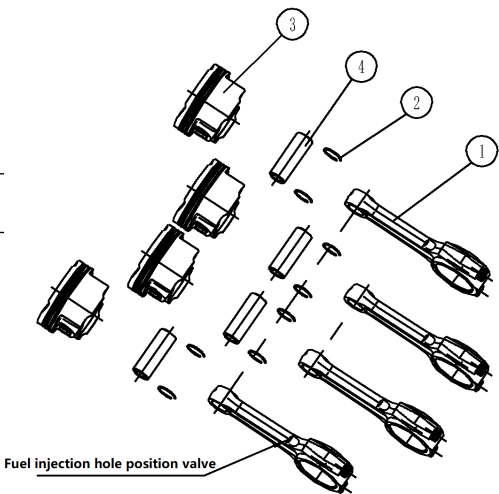
The bearing is installed with an oil seal facing inside the box.

12.3 Piston con-rod

Piston diameter	Group size	Mark
$\phi 67_{-0.045}^{-0.030}$	$\phi 67_{-0.035}^{-0.030}$	A
	$\phi 67_{-0.040}^{-0.0351}$	B
	$\phi 67_{-0.045}^{-0.0401}$	C

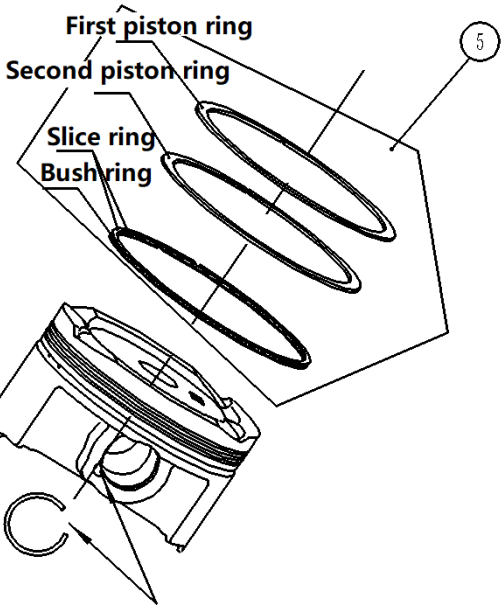
- Loosen the connecting rod bolts
- Assemble piston pin retaining ring 2 to piston 3, with the opening direction misaligned with the disassembly groove
- Assemble piston pins4
- Assemble piston pin retaining ring 2

Apply engine oil



Attention

The position of the connecting rod fuel injection hole is assembled on the same side as the marked point on the piston intake valve end

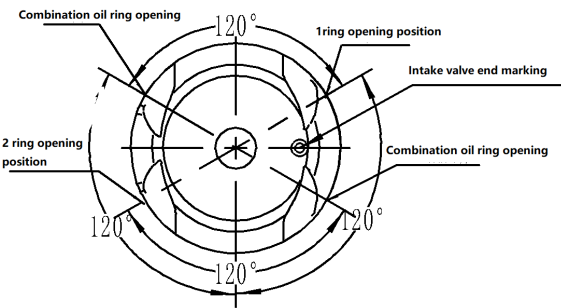


- Assemble Slice ring
- Assemble Bush ring
- Assemble Bush ring
- Assemble second piston ring
- Assemble first piston ring

The opening directions are staggered from each other

Attention

The piston ring opening is assembled according to the position shown in the diagram. The piston ring is marked with one side facing the top of the piston, the first ring marked as 1TOP, and the second ring marked as 2TOP.

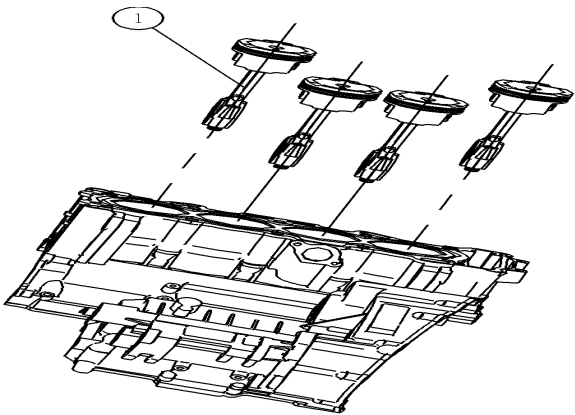


12.5 Assembly of crankshaft and connecting rod

Piston diameter	A	B	C
Cylinder diameter	A	B	C

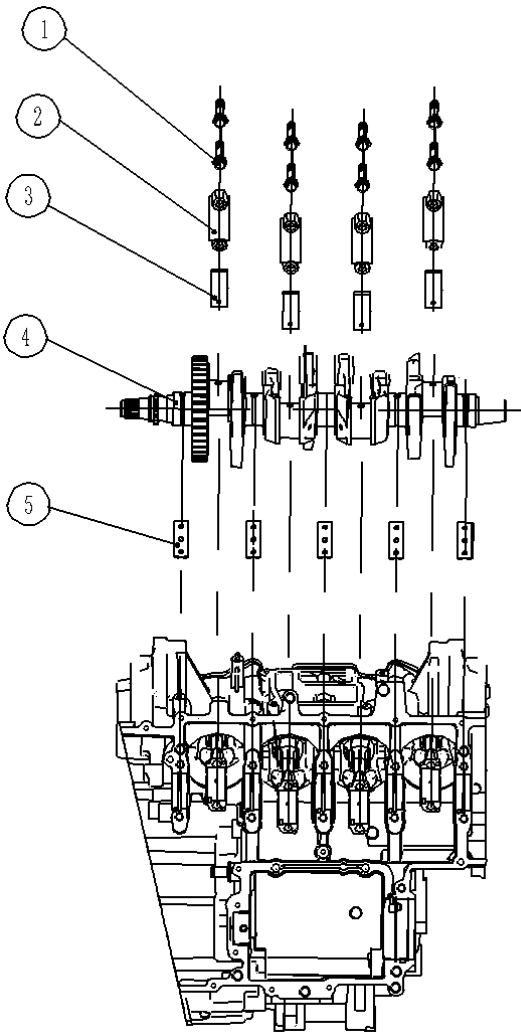
- Pistons and cylinder blocks should be paired according to the above table for use
- Apply oil evenly on the inner wall of the cylinder, and apply engine oil to the piston skirt before installing it
- Remove connecting rod bolts 1 and connecting rod cap 2 in sequence, place them in their respective positions, and do not misplace them

Connecting rod bearing selection table Note: The colors in parentheses are optional			Connecting rod aperture	
			1	2
			39.000--39.006	39.006--39.012
Co- rod journal diameter	A	35.985--35.990	Green(Brown)	Brown(Black)
	B	35.990--35.995	Yellow(Green)	Green(Brown)
	C	35.995--36.000	Yellow	Yellow(Green)



- Select the connecting rod bearing according to the table above3
- Clean the connecting rod and connecting rod cap with a metal cleaner
- Install the con-rod bearing3,Flush with the cross-section of con-rod , apply molybdenum oil

Main bearing selection table Tips :The colors inside the parentheses are optional			Box aperture	
			A	B
			37.000--37.008	37.008--37.016
Main shaft diameter of crankshaft	A	33.990--33.995	Green(Yellow)	Brown(Green)
	B	33.995--34.000	Yellow(Pink)	Green(Yellow)
	C	33.985--33.990	Brown(Green)	Black(Brown)



- Select the main bearing 5 according to the above table
- Clean the position of the box assembly tile 5 with a metal cleaning agent,
- Install the main bearing 5 and apply molybdenum oil on the surface of the bearing
- Apply molybdenum oil to the diameter area of crankshaft 4 and assemble crankshaft 4
- After finding the corresponding number of connecting rod cap 2, assemble it onto the crankshaft
- Assembly of connecting rod bolts 1

Sealant
8-12N.m

Attention

Piston identification point INToward to inlet end

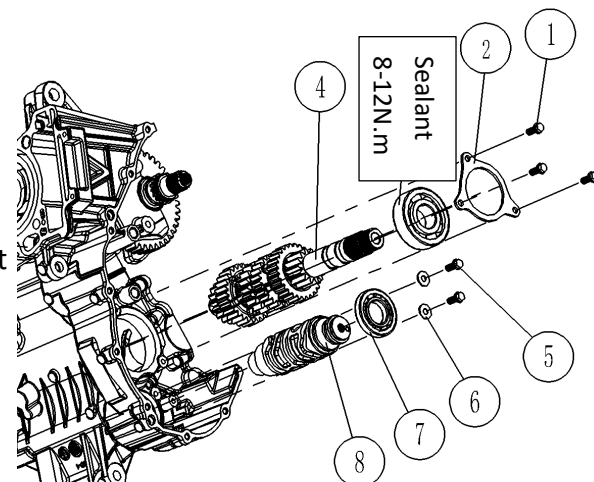
Apply engine oil to the threads and flange surfaces of the connecting rod bolts; Tighten in three stages, with the first tightening lasting 15N M Second time30N.m,third time58N.m

Spindle and variable speed drum; Shift fork; Secondary axis

Engine disassembly

12.6 Main shaft,variable speed drum

- Assemble variable speed drum8
- Assemble bearing 7(25X50x8)Apply engine oil for easy installation
- Assemble washer 6(6X18X2)
- Assemble bolt 5(M6X14)
- Assemble main shaft combination 4
- Assemble bearing3(25X62X17),apply engine oil for easy installment
- Assemble bearing baffle2
- Assemble bolt 1(M6X14)

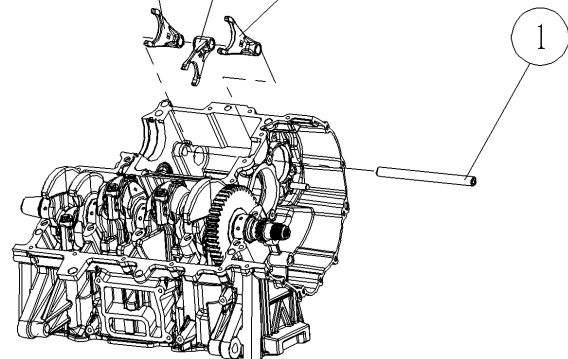


Attention

Install the bearing baffle with the rounded corner facing the direction of bearing 3

12.7 Shift fork

- Install the shift fork 4 (L), middle shift fork 3 (C), and shift fork 2 (R) in sequence, and install them into the designated position of the variable speed drum 8
- Assemble fork shaft 1 and apply engine oil before assembly

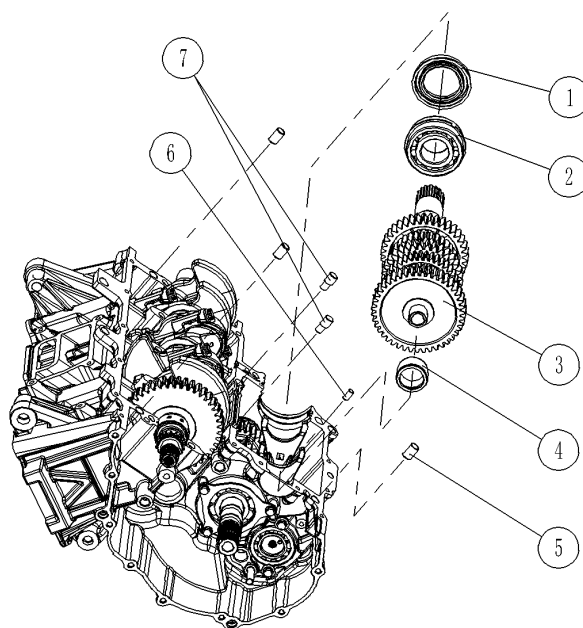


12.8 Counter shaft

- Assemble roller pin6(6X11.8)
- Assemble roller pin bearing 4,apply engine oil before installation
- Assemble bearing 2(30X62X23.8)
- Assemble secondary shaft combination 3, with the shift fork stuck in the corresponding position
- Assemble fuel spray nozzle 7
- Assemble solid pin5
- Assemble oil seal1,apply tighten adhesive before assembling

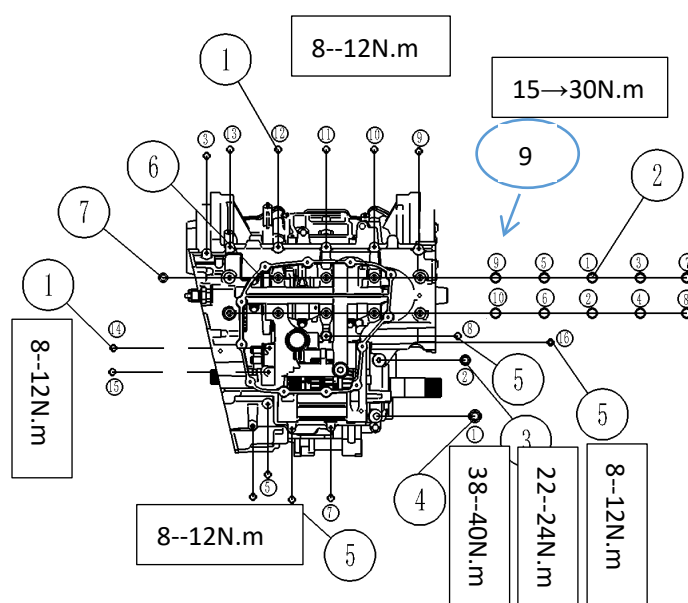
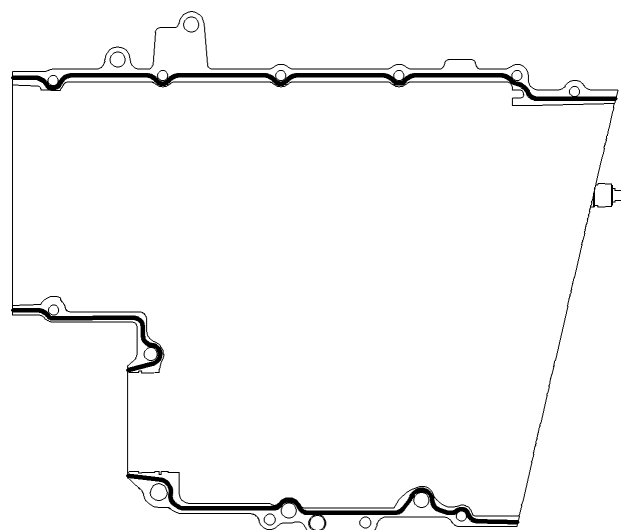
Attention

Align the pin hole of needle roller bearing 4 with needle roller bearing 6, and ensure that the oil hole of fuel nozzle 7 is exposed in the direction of the main shaft



12.9 Mould assembling

- After cleaning the adhesive in the right figure with metal cleaning agent, apply sealant evenly according to the thick line diagram
- Assemble bolt2(M8X95),No.9(Number inside the ellipse) Insert the aluminum washer 7 into the bolt and tighten it in the order indicated in the diagram. The first time is 15N. m, and the second time is 30N M
- Assemble bolt1(M6X35)
- Assemble bolt3(M8X45)
- Assemble bolt4(M10X75)
- Assemble bolt5(M6X50)

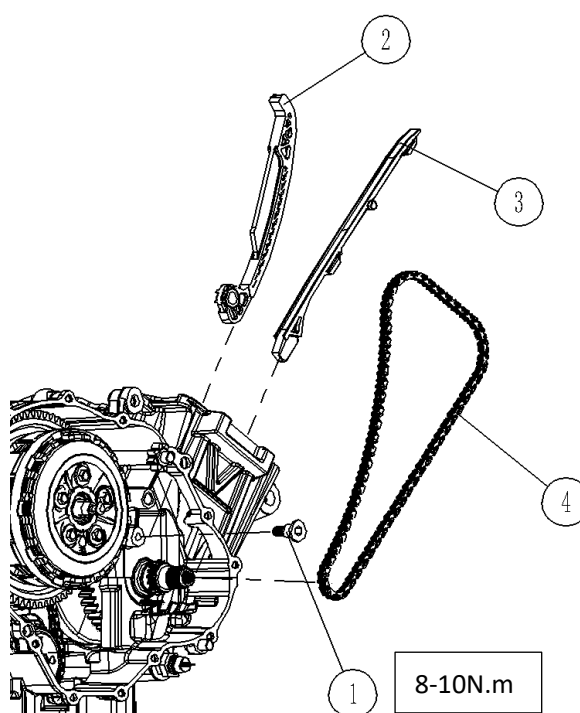


Attention

Bolt 16 is on the upper box

12.10 Chain,guide chain plate A,tension plate

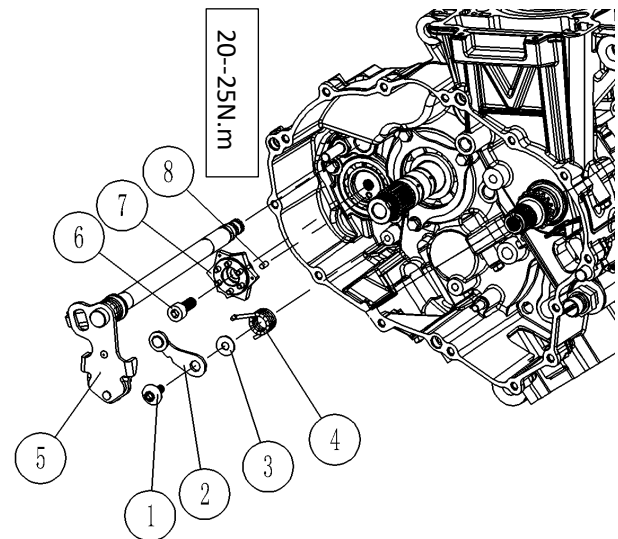
- Assemble chain 4
- Assemble guide chain plate 3
- Assemble tension plate 2
- Assemble tension plate bolt1



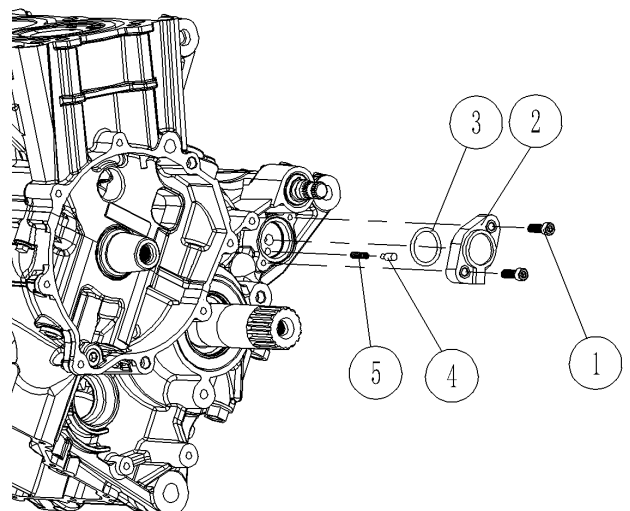
bearing

12.11 Shift lever,shift gear shifting mechanism

- Assemble needle roller 8 into the pin hole of the variable speed drum
- Assemble the five star wheel assembly 7 onto the mounting hole of the needle roller 8
- Assembling cylindrical head bolts 6(M8X20)
- Assemble gear lever assembly 5, with the gap in the middle of the spring clamped into the limit bolt
- Assembly of positioning wheel torsion spring4
- Assemble washer 3(6X12X1)
- Assembly of positioning wheel components 2
- Assemble locating wheel bolt 1



Thread adhesive8--12N.m



Attention

1Positioning wheel assembly 2 should be installed on the step of positioning wheel bolt 1

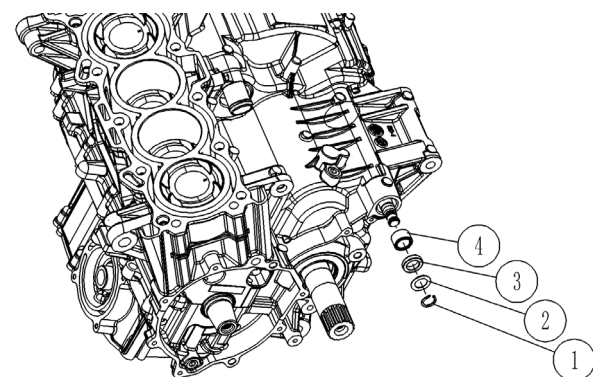
2Is the assembly direction of the positioning wheel torsion spring 4 correct

12.12 Gear switch

- Assemble gear display contact spring 5
- Assemble gear display contact 4
- Assemble O-ring 3 (25X2.5)
- Assemble gear sensor 2
- Assemble cylindrical head bolts 1(M5X20)

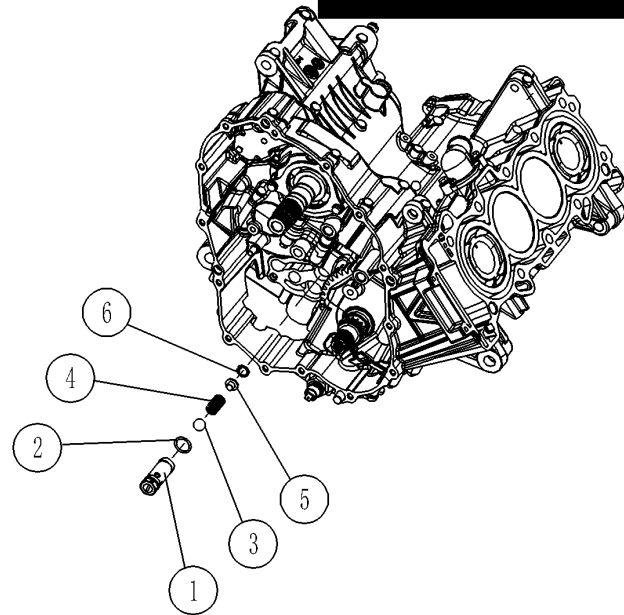
12.13 Shift lever oil seal,roller pin

- Assemble needle roller bearing 4 (14X20X12), apply engine oil before assembly for easy assembly
- Assemble oil seal3(14X22X5),apply tightening adhesive
- Assemble washer 2(14X29X0.8)
- Assemble shaft ring1



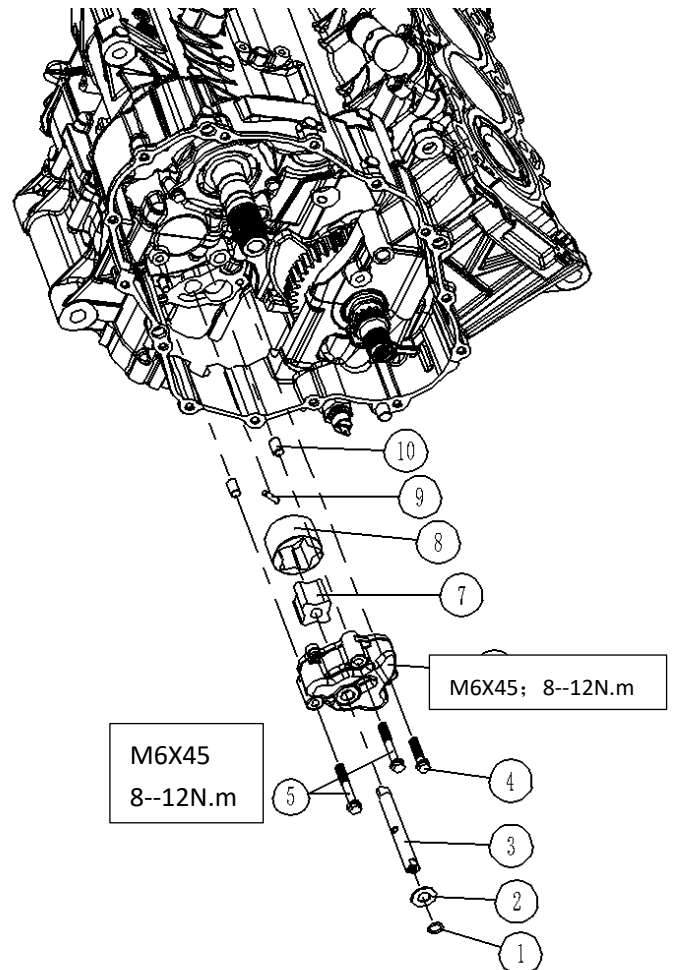
12.14 Pressure relief valve

- Assemble steel ball 2($\phi 13.5$)
- Assemble pressure relief spring 4
- Assemble pressure relief valve plug 5
- Assemble hole retaining ring 6 To the inner wall groove of pressure relief valve 1
- Assemble o-ring 2(15X1.8) to the groove of pressure relief valve body 1
- Assemble pressure relief valve body 1 assembly



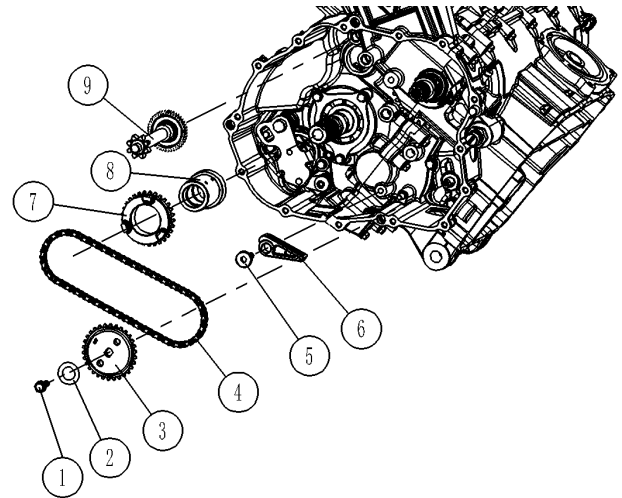
12.15 Oil pump assembly

- Assemble the outer rotor 8 of the oil pump, with the dot facing the oil pump housing, and apply engine oil on the surface
- Assemble the inner rotor 7 of the oil pump, with the groove facing towards the oil pump housing, and apply engine oil on the surface
- Assemble oil pump shaft 3
- Assemble roller pin 9(4X15.8)
- Assemble washer 2(10X20X1)
- Assemble the retaining ring 1 (size 10) for the shaft into the groove of the oil pump shaft 2
- Assemble locating pin 10 onto the box body
- Assemble oil pump housing 6
- Assemble bolt 5(M6X45)
- Assemble bolt 4(M6X30)



12.16 Main oil pump,driven gear

- Assemble the start primary gear 9
- Assemble clutch spacer sleeve 8
- Assemble oil pump drive gear 7
- Assemble oil pump chain 4
- Assemble oil pump chain guide plate 6
- Assemble tension plate bolt 5
- Assemble oil pump driven gear 3,Insert into the corresponding hole position
- Assemble washer 2(M6X15X1)
- Assemble bolt 1(M6X14)

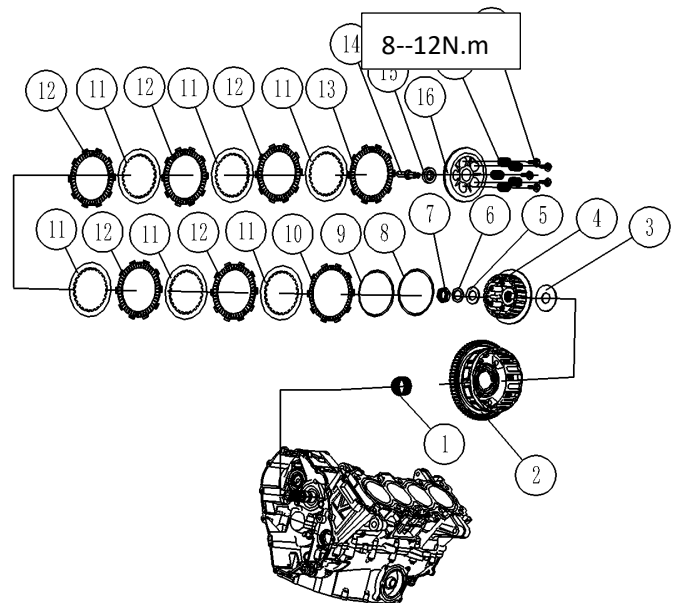


Attention

Apply oil to the bottom of clutch spacer 8

12.17 Clutch

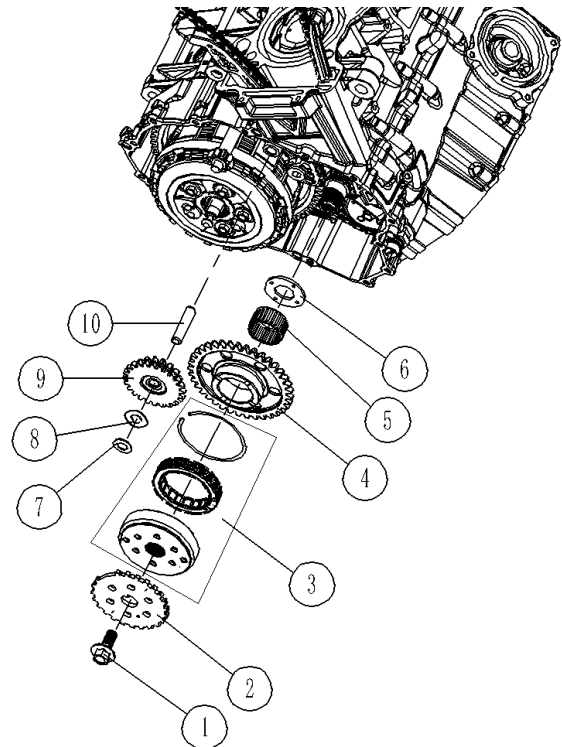
- Assemble roller pin 1(35X41X24)
- Assemble the clutch drive wheel assembly 2, Align the pin hole with the pin of the oil pump drive gear
- Assemble washer 3(25X60X2)
- Assemble clutch driven disc 4
- Assemble washer 5(22X39X2)
- Assemble wave washer 6,Horn facing downwards
- Assemble clutch nut7(M22X1), Torque 125-128N.m
- Shift inspection: Smooth gear shifting without Jamming
- Assemble washer 8
- Assemble disc washer 9,Horn facing downwards
- Assemble friction plate 10(A)
- Assemble clutch driven plate 11
- Assemble friction plate12(B)
- Assemble clutch driven plate 11
- Assemble friction plate12(B)
- Assemble clutch driven plate 11
- Assemble clutch detached top rod 14
- Assemble friction plate12(B)
- Assemble bearing15
- Assemble clutch driven plate 11
- Assemble clutch pressure disc16
- Assemble friction plate12(B)



- Assemble clutch pressure disc spring 17
- Assemble clutch driven plate 11
- Assemble combined bolt 18
- Assemble friction plate12(B)
- Assemble clutch driven plate 11
- Assemble friction plate13(C)

12.18 Overtaking clutch and dual gear

- Assemble dual gear shaft10
- Assemble dual gear9
- Assemble wave washer 8
- Assemble washer7(10X20X1)
- Assemble washer6(21.2X42X2.5)
- Assemble roller pin bearing 5
- Assemble the driven gear 4 and apply engine oil to the small end
- Assemble overtaking clutch combination 3
- Assemble trigger disc 2
 - Assemblebolt1(M10X1.25X25),After confirming that the trigger disk through-hole can be connected, tighten it



Attention

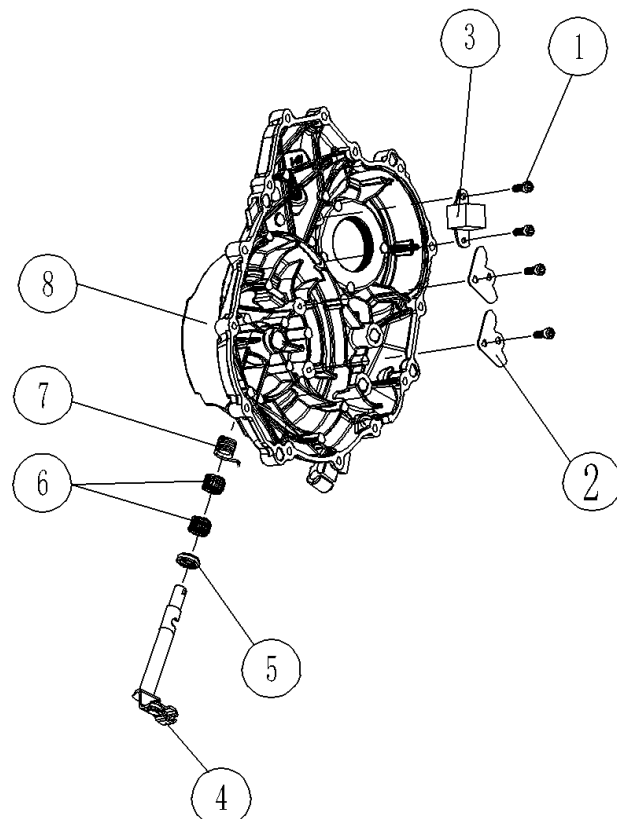
1. Check the direction of rotation of the overrunning clutch combination, it can only be rotated counterclockwise
2. Trigger disk 2's engraved line is flush with the box surface

Tighten adhesive80--83N.m

Tighten adhesive
5-8N.m

12.19 Assemble the right side cover

- Assemble roller pin bearing 6,Apply cylindrical retaining adhesive before assembly and tap into the right cover 8
- Assemble oil seal 5(12X18X5),Apply fastening adhesive to the outer circle and install it into the right cover 8
- Assemble The torsion spring 7 of the clutch operating rod is first installed on the clutch operating rod 4. After adjusting the position,the rotation angle is tightened. The gap position of the clutch operating rod is basically concentric with the center hole of the right cover, and most of the gap position of the clutch operating rod is facing the clutch
- Assemble trigger coil 3,Install the wire into the groove
- Assemble tension disc 2
- Assemble cylindrical bolt 1(M5X12)

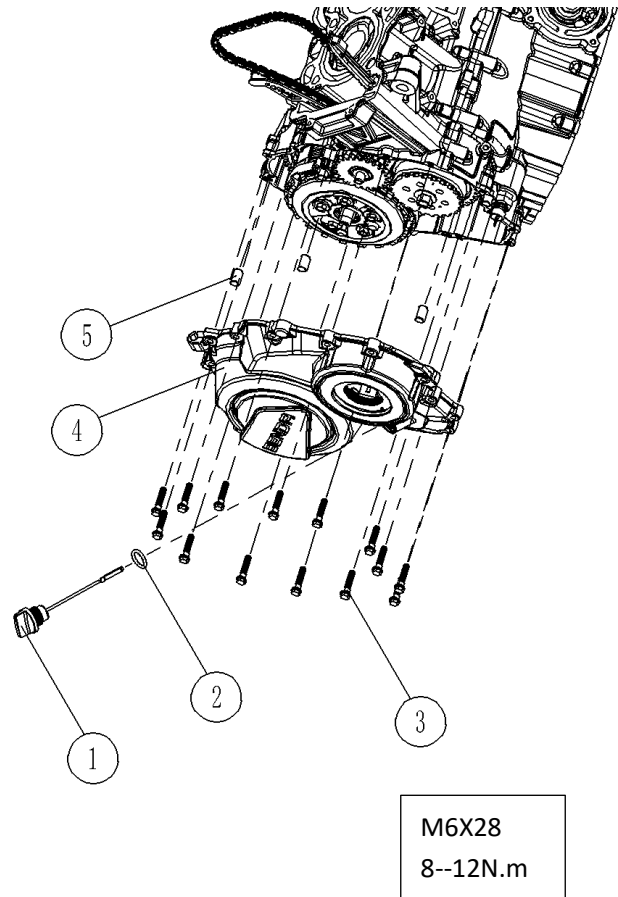


Attention

When assembling,do not press to the wire.

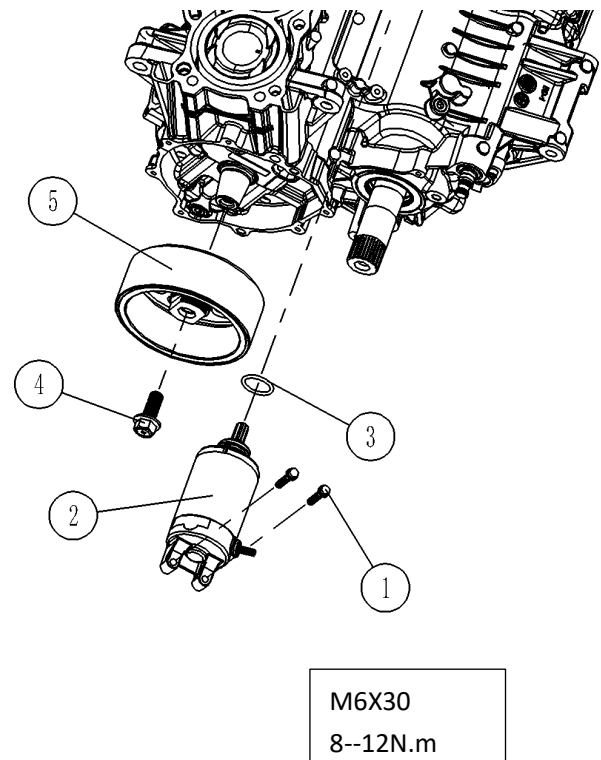
12.20 Right side cover

- Assemble locating pin 5
- Apply sealant evenly to the joint surface of the right cover 4
- Assemble right side cover
- Assemble bolt3
- Assemble o-ring 2
- Assemble oil dipstick 1



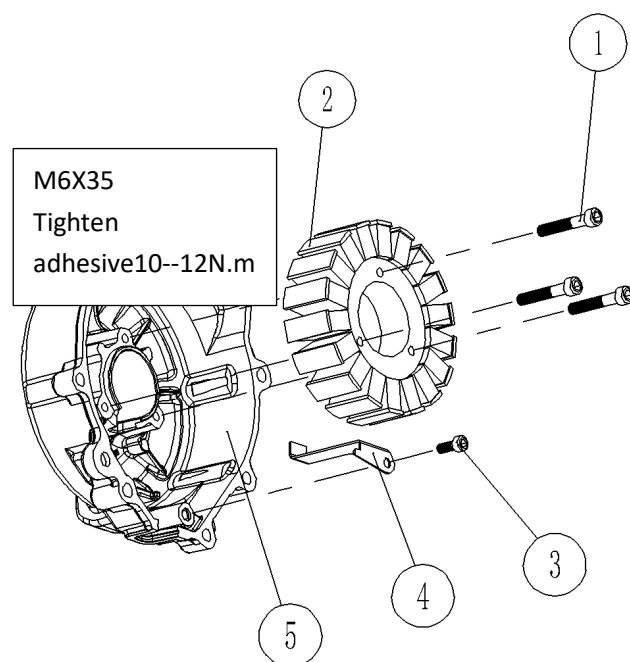
12.21 Magneto rotor, start motor

- Assemble Magneto rotor 5
- Assemble bolt4(M12X1.25X30),Use fixtures to fix the rotor of the magneto and tighten bolt
- Assemble o-ring
- Assemble start motor 2,Apply butter to the joint end of the box body
- Assemble bolt1(M6X30)



12.22 Left side cover assembly

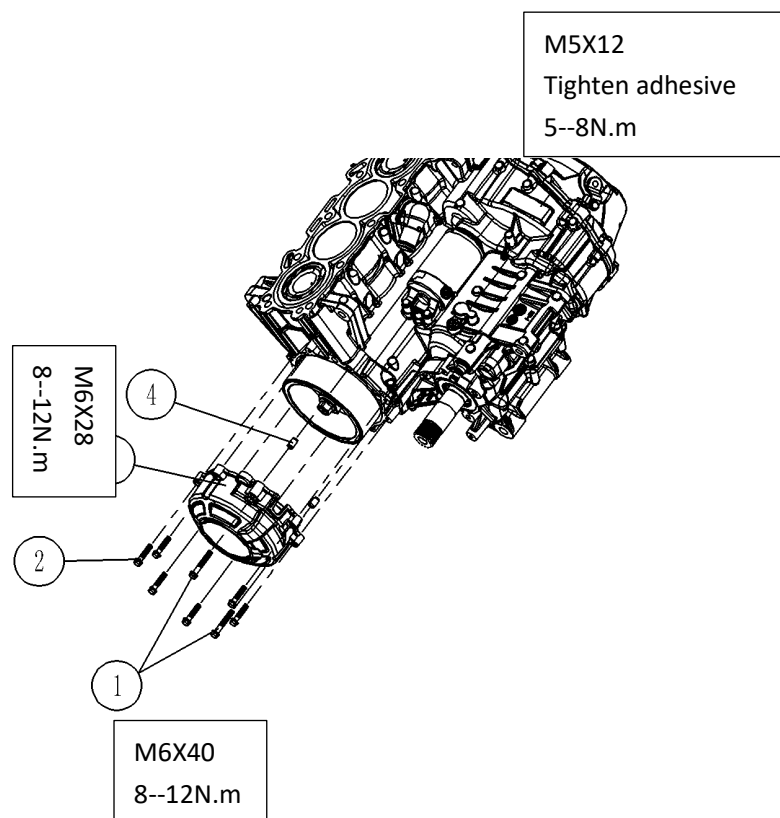
- Assemble magneto stator 2,align bolt holes
- Assemble Cylindrical head bolt1(M6X35)
- Assemble wire pressure plate 4
- Assemble cylindrical head bolt 3(M5X12)

**Attention**

The assembly angle of wire clamp 4 shall be installed in the harness slot. It is forbidden to press the harness. The harness rubber block of magneto stator 2 shall be applied with sealant and clipped into the left cover slot

12.23 Left side cover

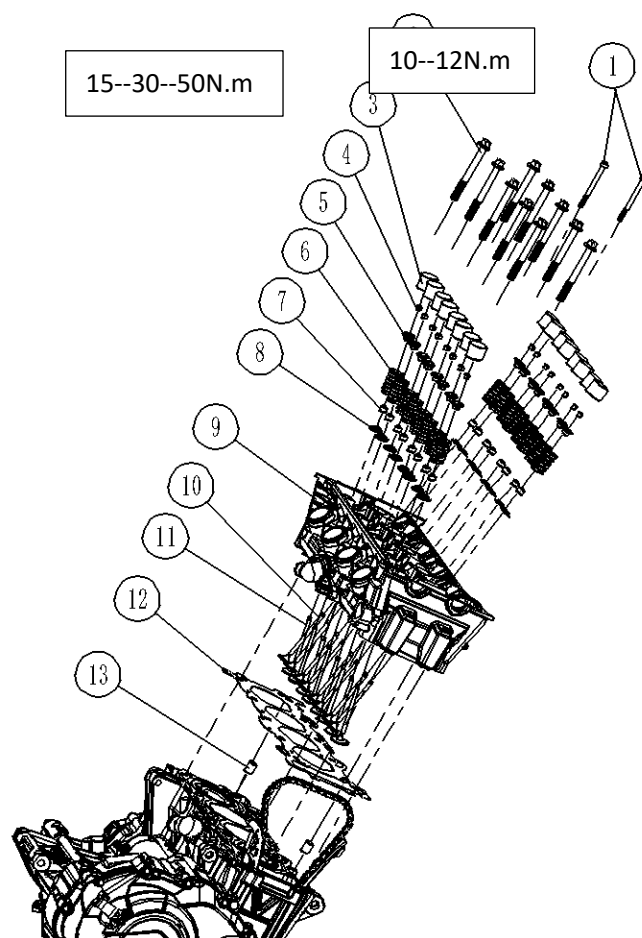
- Assemble locating pin 4
- Assemble Apply sealant evenly to the joint surface between the left cover 2 and the box body
- Assemble bolt2(M6X28)
- Assemble bolt1(M6X40)

**Attention**

When assembling,do not extrude wire

12.24 Cylinder cover

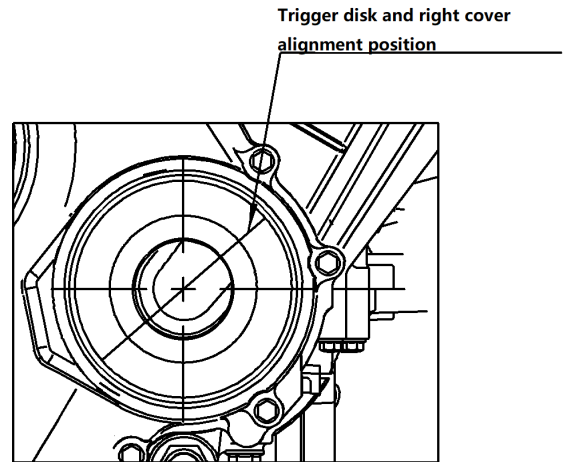
- Assemble locating pin13(12X16)
- Assemble the cylinder head gasket 12 has a positional relationship,Reverse installation is strictly prohibited
- Assemble valve oil seal 8, apply oil and install it. Do not tilt it. If the spring falls out, replace it in a timely manner
- Assemble intake,exhaust valve 10、 11, Apply molybdenum oil before assembly
- Assemble Valve spring lower seat 7, with the large opening facing downwards
- Assemble Valve spring 6, colored surface facing upwards
- Assemble Valve spring upper seat 5, with the large opening facing upwards
- Assemble Valve lock clip 4, gently tap with a nylon hammer to confirm that it does not come off
- Assemble Cylinder cover 9
- Assemble cylinder bolt2(M10X90)
- Assemble cylindrical headbolt 1(M6X70)
- Assemble valve tappet 3

**Attention**

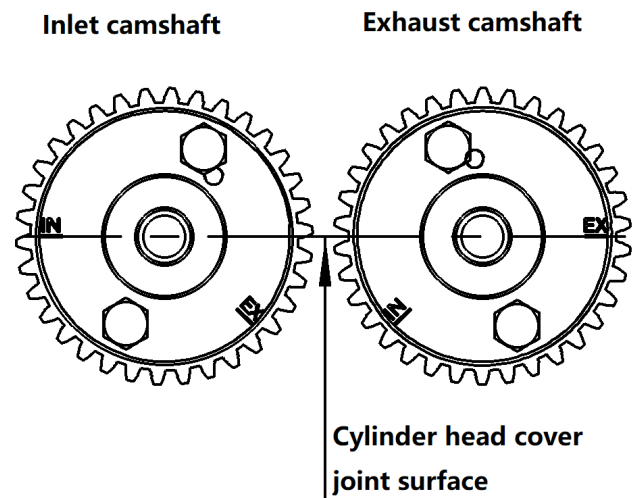
Cylinder bolt2 thread apply the engine oil

12.25 Camshaft

- Align the identification of the crankshaft trigger plate with the identification of the right cover, as shown in the diagram on the right
- Assemble roller pin9(4X8)
- Assemble timing driven chain wheel 8
- Assemble hexagon head bolt 7(M6X12)
- Assemble Inlet camshaft assembly 10, timing driven sprocket IN identification facing backwards, marking flush with cylinder head
- Assemble Exhaust camshaft assembly 11, timing driven sprocket EX identification facing forward, marking flush with cylinder head, as shown in the right figure
- Assemble locating pin 12(8X14)

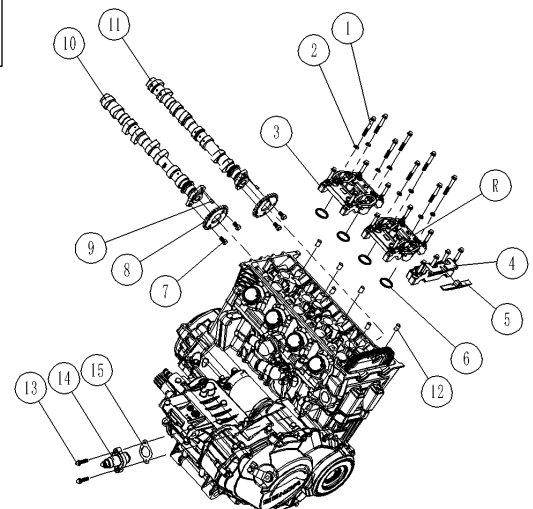


- Assemble o-ring 6
- Assemble chain guide plate 5
- Assemble Camshaft limit seat4
- Assemble camshaft limit seat R
- Assemble Camshaft mount seat 3(L)
- Assemble aluminum washer 2(6X12X1.5)
- Assemble bolt1(M6X45)
- Assemble tension paper pad 15, Assemble tension14
- Assemble bolt 13(M6X25)



M6X25
8--12N.m

Tighten
adhesive
17--20N.m



Attention

1. The bolt tightening sequence follows the identification sequence of camshaft mounting seat 3 (L) and camshaft limit seat R
2. Apply engine oil to the rotating friction area

12.26 Adjust timing

·Align the trigger plate markings on the crankshaft with the markings on the right cover

·Rotate the crankshaft in order to align with the top dead center of the cylinder1-2-4-3

·Measure the valve clearance of cylinder 1 with a feeler gauge, select the valve lifter, and place it on the cylinder

·Align the crankshaft rotation 180 ° trigger plate marking with the right cover marking

·Measure the valve clearance of cylinder 2 with a feeler gauge, select the valve lifter, and place it on the cylinder

·Align the crankshaft rotation 180 ° trigger plate marking with the right cover marking

·Use feeler gauge the fourth cylinder clearance,and select valve tappet,cylinder alignment

·Align the crankshaft rotation 180 ° trigger plate marking with the right cover marking

·Use feeler gauge the third cylinder clearance and select valve tappet,cylinder alignment

·Remove intake and exhaust cam,Intake and exhaust cam sprocket,Contraction adjustment device

·Selected valve lifters for cylinder assembly

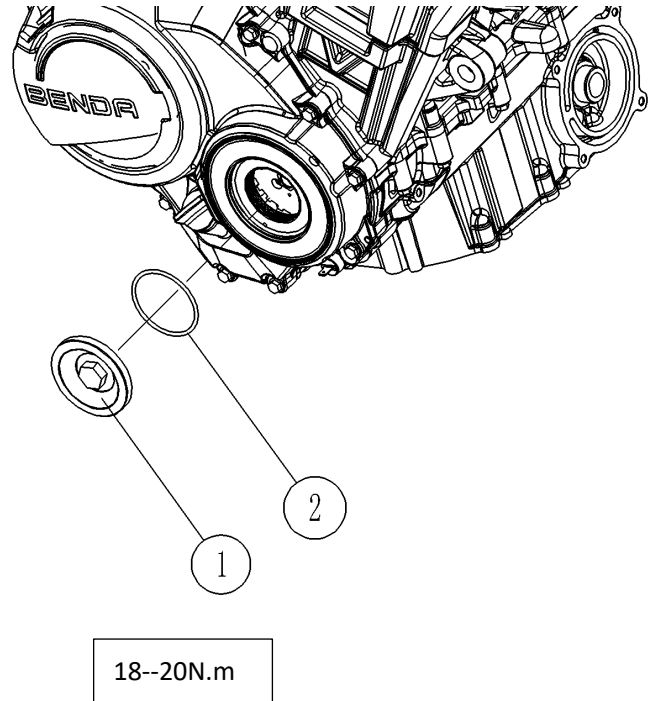
·Assemble the intake and exhaust sprockets according to the previous process, and loosen the adjustment device

12.27 Center cover

·Take o-ring 2(48X2.5)install on the center cover 1

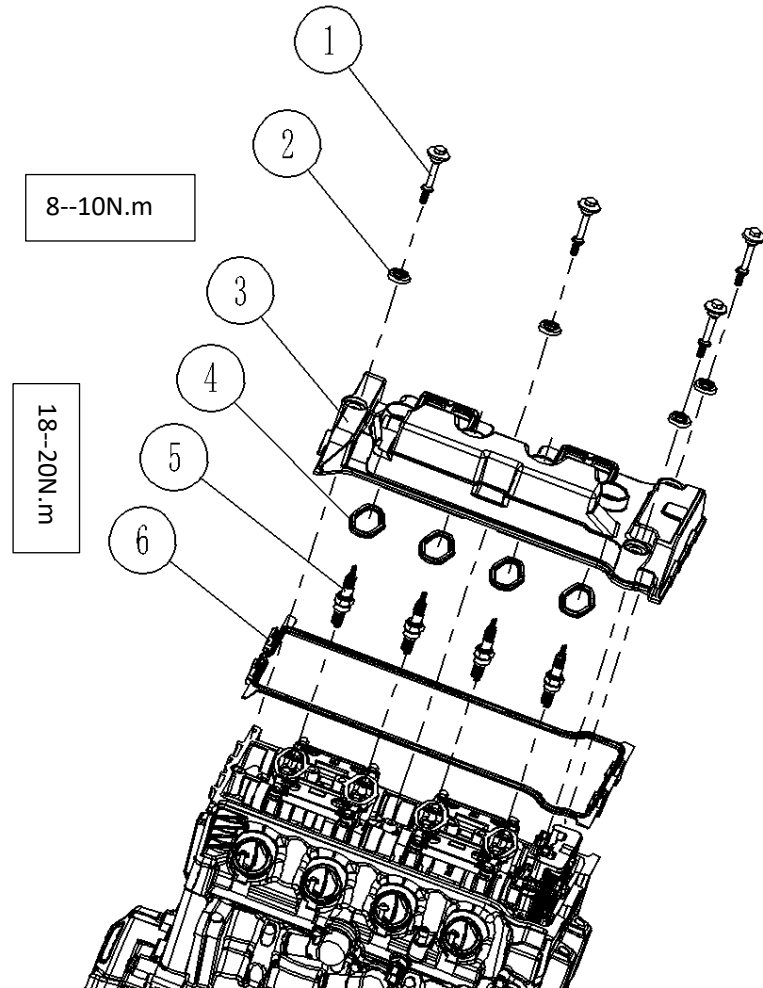
·Tighten the center cover 1

Inlet valve clearance	Exhaust valve clearance
0.16 ± 0.02	0.25 ± 0.02



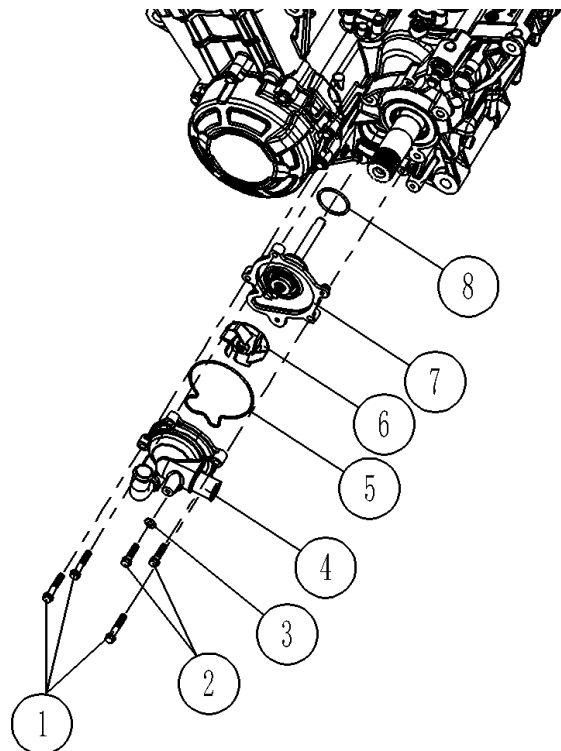
12.28 Cylinder head cover

- Assemble Cylinder head cover gasket 6 to cylinder head 3 groove
- Assemble Rectangular sealing ring 4 to cylinder head 3 groove
- Assemble spark plug 5
- Assemble cylinder head cover 3
- Assemble Rubber gasket assembly 2
- Assemble step bolt 1



12.29 Water pump

- Assemble o-ring 8(33X2.5)
- Assemble water pump impeller 6
- Assemble Water pump cover gasket 5
- Assemble water pump cover 4
- Assemble washer 3(6X12X1.5)
- Assemble bolt 2(M6X25)
- Assemble bolt 1(M6X35)



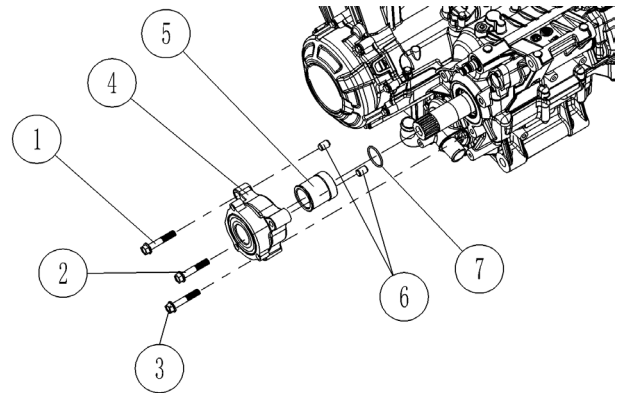
12.30 Support base

- Assemble o-ring 7(30X2)to liner 5
- Assemble liner 5(30X40X44.2)
- Assemble locating pin 6(10X14)
- Assemble support base 4
- Assemble bolt 3(M8X45)
- Assemble bolt 2(M8X50)
- Assemble Hexagon bolt 1(M8X35)

M8X50
23--25N.m

Hexagon
bolt
23--25N.
m

M8X45
23--25N.m

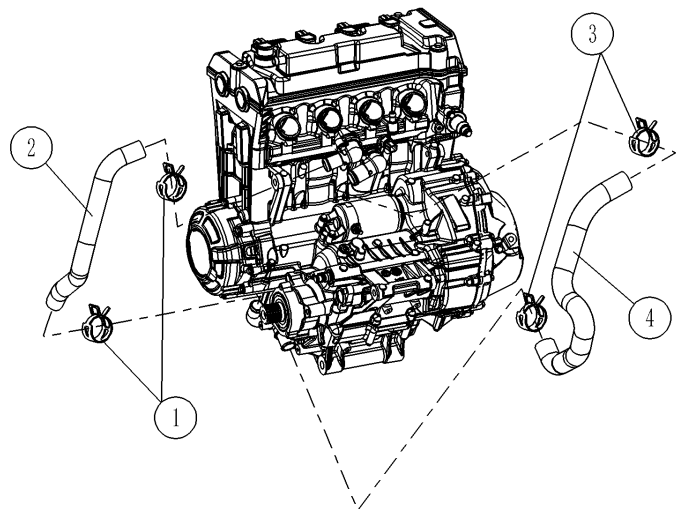


12.31 Water pump inlet and outlet pipes

- Assemble outlet pipe 4, Clamp the water pipe with a wide edge clamp 3 (31)
- Assemble inlet pipe 2, Assemble wide clamp 1($\phi 29$) clamp the pipe

Attention

The inlet pipe 2 is pressed between the box and the support seat

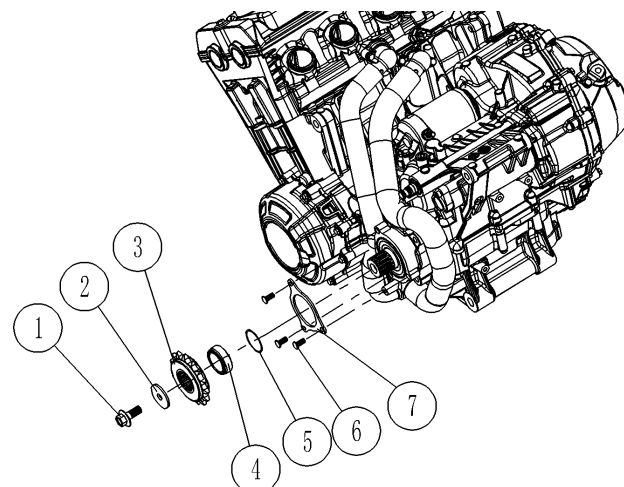


12.32 Output sprocket

- Assemble water pipe baffle 7
- Assemble cross-shaped groove countersunk screw 6
- Assemble o-ring inside the liner 5(30X2)
- Assemble liner 4(30X40X16.5)
- Assemble output sprocket 3
- Assemble washer 2(10.2X37X2.5)
- Assemble bolt 1(M10X40X16.5)

Attention

Bushing 4, washer 2 with chamfered surface, and sprocket with logo facing outward installation



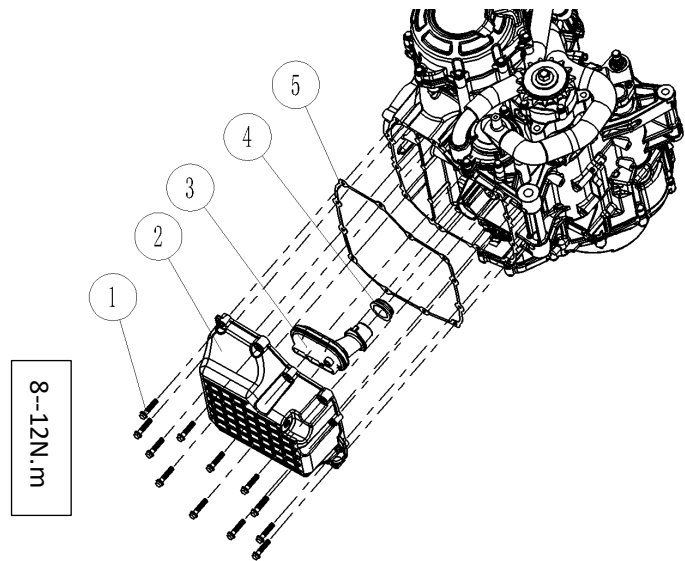
M6X35
8--12N.m

M6X2
8--12N Thread adhesive
52--54N.m

8--12N.m

12.33 Oil pan

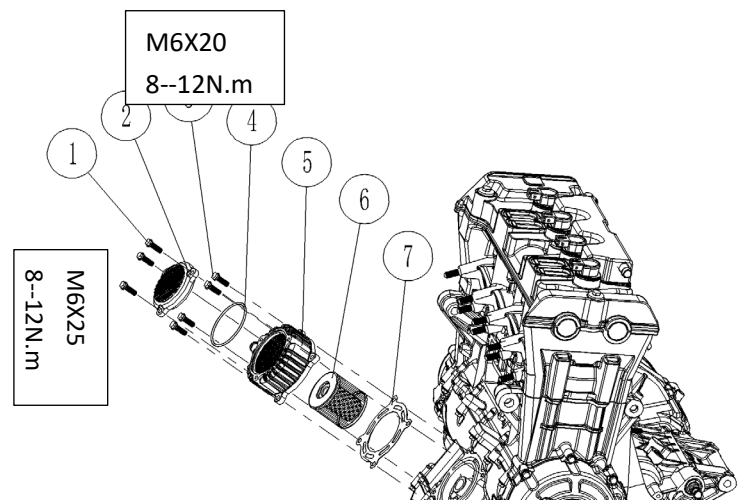
- Assemble oil pan paper pad 5
- Assemble Oil suction cup sealing ring 4
- Assemble oil suction tray 3
- Assemble Oil pan 2
- Assemble bolt1(M6X30)

**Attention**

Uniform tightening of bolts using diagonal method

12.34 Cooler

- Assemble cooler paper pad 7
- Assemble oil element 6
- Assemble cooler housing 5
- Assemble bolt 3(M6X20)
- Assemble o-ring 4(63X2.5)
- Assemble oil filter cover 2
- Assemble bolt 1(M6X25)

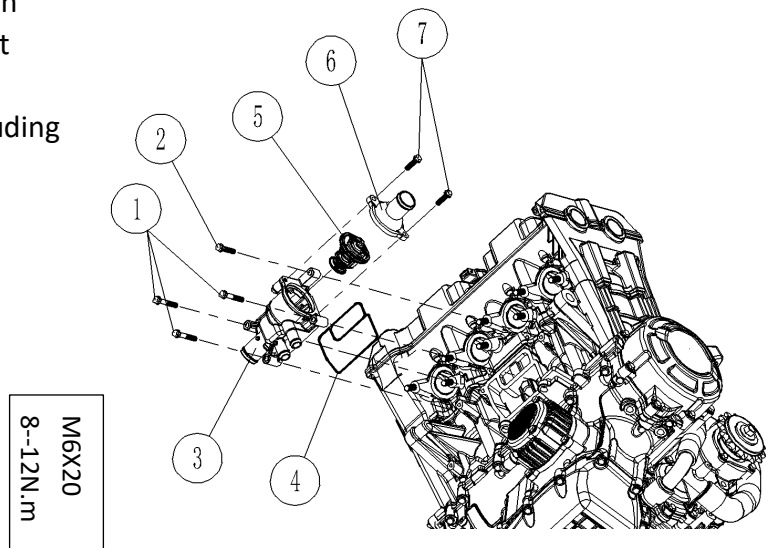
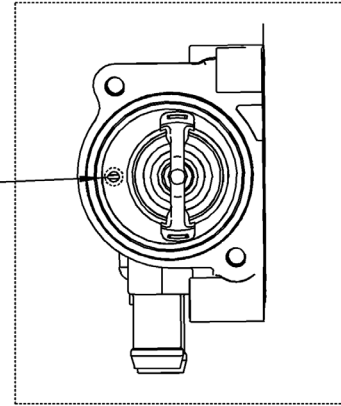
**Attention**

The cooler paper pad 7 has an installation direction and needs to be aligned

12.35 Thermostat

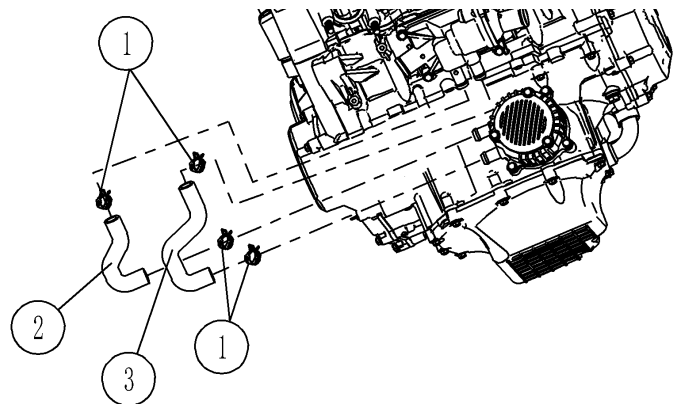
- Assemble thermostat gasket 4
- Assemble thermostat mount seat 3
- Assemble bolt 2(M6X25)
- Assemble bolt 1(M6X20)
- Assemble thermostat components,Installation direction as shown in the diagram on the right
- Assemble thermostat cover 6 with the protruding end of the round root facing upwards
- Assemble bolt 7(M6X35)

The thermostat assembly is located in the thermostat mounting seat, and the point on the thermostat assembly is facing towards the diagram as shown



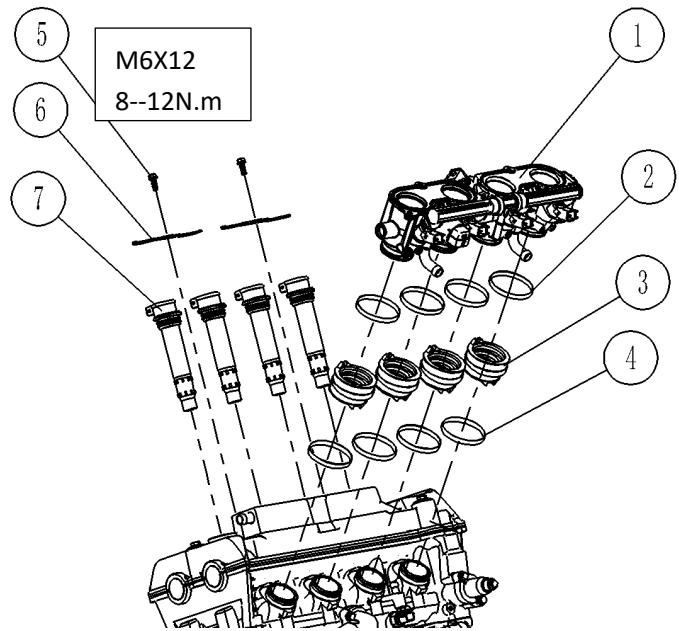
12.36 Inlet,outlet pipes

- Assemble the cooler outlet pipe 3 and install it in place with a wide edge clamp 1
- Assemble the inlet pipe 2 of the cooler and install it in place with a wide edge clamp 1



12.37 Throttle valve body

- Assemble ignition coil 7, Facing towards the exhaust pipe side
- Assemble ignition coil baffle 6
- Assemble bolt 5 (M6X12)
- Assemble the intake valve connecting pipe 3 and use the limit clamp (φ51) clamp
- Assemble throttle valve body 1 and use limit clamp 2 (φ 48) Clamp



12.38 Adding engine oil

- Install the oil drain bolt metal gasket 1
- Assemble oil drain plug 2 (M14X12)
- Remove oil dipstick 4, add 3.5L of oil, and after filling, tighten the oil dipstick

