

Maintenance Manual of Two- wheeled Motorcycle K-BLADE 125(QJ125T-13B)



Contents

INTRODUCTION.....	- 1 -
Preparatory information.....	- 2 -
General safety.....	- 2 -
Maintenance rules.....	- 3 -
Motorcycle identification.....	- 7 -
Key parts.....	- 8 -
Important notes.....	- 12 -
Special tool.....	- 12 -
Specification table (QJ125T-13B).....	- 19 -
Fault diagnosis.....	- 21 -
Inspection / adjustment.....	- 42 -
Inspection and Maintenance of Electrical System.....	- 69 -
I. Battery/Charging System.....	- 72 -
1.1 Preparatory Information.....	- 72 -
1.2 Fault Diagnosis.....	- 73 -
1.3 Battery.....	- 74 -
1.4 Charging System.....	- 76 -
1.5 Disassembly of Voltage and Current Regulator.....	- 77 -
1.6 Alternator Charging Coil.....	- 78 -
1.7 Disassembly of Alternator.....	- 79 -
II. Ignition System.....	- 83 -
2.1 Preparatory Information.....	- 83 -
2.2 Fault Diagnosis.....	- 85 -
2.3 Trigger.....	- 86 -
2.4 Spark Plug.....	- 86 -
2.5 Ignition Coil.....	- 87 -
2.6 ECU Unit.....	- 87 -
III. Starter System.....	- 89 -
3.1 Preparatory Information.....	- 89 -
3.2 Fault Diagnosis.....	- 89 -
3.3 Starter Motor.....	- 90 -
3.4 Starter Relay.....	- 91 -
IV. Bulbs /Switches/Instruments.....	- 95 -
4.1 Preparatory Information.....	- 95 -
4.2 Fault Diagnosis.....	- 95 -
4.3 Headlight.....	- 96 -
4.4 Front Turn Signal Light.....	- 97 -
4.5 Taillight.....	- 98 -
4.6 Rear Turn Signal Light.....	- 101 -
4.7 Instruments.....	- 105 -

4.8 Main Switch.....	- 107 -
4.9 Horn.....	- 111 -
4.10 Handlebar Switch.....	- 112 -
Inspection and Maintenance of Chassis.....	- 116 -
V. Brake.....	- 119 -
5.1 Preparatory Information.....	- 119 -
5.2 Fault Diagnosis.....	- 120 -
5.3 Front Brake Disc.....	- 120 -
5.4 Front Fluid Brake.....	- 122 -
5.5 Rear Drum Brake.....	- 129 -
VI. Body Cover.....	- 138 -
VII. Front Wheel/Front Suspension.....	- 142 -
7.1 Preparatory Information.....	- 142 -
7.2 Fault Diagnosis.....	- 143 -
7.3 Front Wheel.....	- 144 -
7.4 Handlebar.....	- 148 -
7.5 Front Fork.....	- 152 -
7.6 Front Shock Absorber.....	- 159 -
VIII. Rear Wheel/Rear Suspension.....	- 168 -
8.1 Preparation of Information.....	- 168 -
8.2 Fault Diagnosis.....	- 168 -
8.3 Rear Wheel.....	- 169 -
8.4 Rear Shock Absorber.....	- 171 -
8.5 Disassembly/Installation of Engine.....	- 174 -
IX. Fuel Tank/Seat/Rear Grab Rail.....	- 182 -
9.1 Preparatory Information.....	- 182 -
9.2 Fault Diagnosis.....	- 182 -
9.3 Seat.....	- 183 -
9.4 Rear Grab Rail.....	- 185 -
9.5 Fuel Tank.....	- 186 -
Inspection and maintenance of engine.....	- 191 -
X. Lubrication System.....	- 195 -
10.1 Preparatory Information.....	- 195 -
10.2 Fault Diagnosis.....	- 196 -
10.3 Fuel Pump.....	- 196 -
XI. Cylinder Head Cover.....	- 202 -
11.1 Preparatory Information.....	- 202 -
11.2 Cylinder Head Cover.....	- 203 -
XII. Cylinder Head / Valve.....	- 206 -
12.1 Preparatory Information.....	- 206 -
11.2 Fault Diagnosis.....	- 208 -
12.3 Cylinder Head.....	- 208 -
XIII. Cylinder Block and Piston.....	- 221 -
13.1 Preparatory Information.....	- 221 -

13.2 Fault Diagnosis.....	- 224 -
13.3 Cylinder Block.....	- 224 -
13.4 Piston.....	- 225 -
13.5 Installation of Cylinder Block.....	- 230 -
XIV. Left Cover/Drive Disc/Clutch/Driven Wheel/Kickstarter.....	- 236 -
14.1 Preparatory Information.....	- 236 -
14.2 Fault Diagnosis.....	- 237 -
14.3 Left Crankcase Cover.....	- 238 -
14.4 Drive Disc.....	- 239 -
14.5 Driven Pulley.....	- 242 -
14.6 Clutch.....	- 244 -
14.7 Installation.....	- 245 -
14.8 Kickstarter Mechanism.....	- 246 -
XV. Reduction Gear.....	- 255 -
15.1 Preparatory Information.....	- 255 -
15.2 Fault Diagnosis.....	- 256 -
15.3 Gearbox.....	- 256 -
XVI. Crankcase.....	- 263 -
16.1 Preparatory Information.....	- 263 -
16.2 Fault Diagnosis.....	- 265 -
16.3 Flywheel.....	- 266 -
16.4 Crankcase.....	- 267 -
XVII. Exhaust Emission Control System.....	- 276 -
17.1 Guarantee of Exhaust Emission Control System.....	- 276 -
17.2 Regular Maintenance Notice.....	- 277 -
17.3 Mechanical Function of Exhaust Control System.....	- 277 -
17.4 Catalyst Conversion System.....	- 279 -
XVIII. Electronic Injection System.....	- 282 -
18.1 Introduction of Electronic Injection System.....	- 282 -
18.2 EFI Parts.....	- 284 -
18.3 Fault Maintenance and Diagnosis Method.....	- 298 -
18.4 Common Troubleshooting Methods.....	- 300 -
Circuit Diagram.....	- 307 -

INTRODUCTION

This Maintenance Manual is the explanation for the maintenance essentials of motorcycle (QJ125T-13B).

Preparatory information includes all matters needing attention for operation in the Maintenance Manual. Please read this Manual carefully before operation.

Inspection and adjustment is the explanation for the essentials of inspection and adjustment, as well as the safety of motorcycles and performance maintenance methods of parts, which should be implemented from the time of regular inspection.

Chapter II and subsequent chapters are the explanations for the decomposition, combination and inspection of the others of electrical equipment, motorcycle and engine.

Exploded diagrams and system diagrams, maintenance fault diagnosis and instructions are provided above all chapters.

Note:

The style or structure of the motorcycle and the photographs, pictures or instructions on the Manual are subject to change without further notice.

Preparatory information

General safety

Carbon monoxide

If the engine must be started, ensure that the workplace is well-ventilated and do not operate the engine in a closed place.

Note

Exhaust gas contains carbon monoxide, a kind of toxic gas, which may cause people to lose consciousness and possibly lead to death.

It is necessary to operate the engine in an open place, and exhaust cleaning system should be used when the engine is operated in a closed place.

Gasoline

Workers should operate in a well-ventilated workplace. Smoke and fire are strictly prohibited in the workplace or the place where gasoline is stored.

Accumulator

Battery may emit explosive gas. Keep it away from spark, open flames and smoking area. Keep it well ventilated when it is being charged.

Battery contains sulfuric acid (electrolyte). Burns may be caused when it contacts with skin or eyes. Therefore, workers should wear protective clothing and mask.

-If electrolyte splashes on the skin, rinse it immediately with fresh water.

-If electrolyte splashes in the eyes, rinse them with fresh water immediately for more than 15 minutes and consult a doctor.

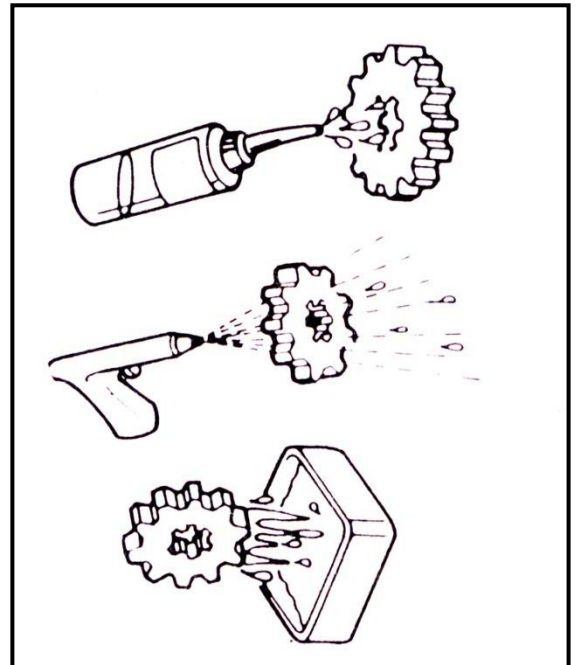
The electrolyte is toxic. If you accidentally drink electrolyte, you should immediately drink plenty of water, milk and magnesium oxide milk (a laxative antacid) or vegetable oil, and consult a doctor. Keep it out of the reach of children.

Maintenance rules

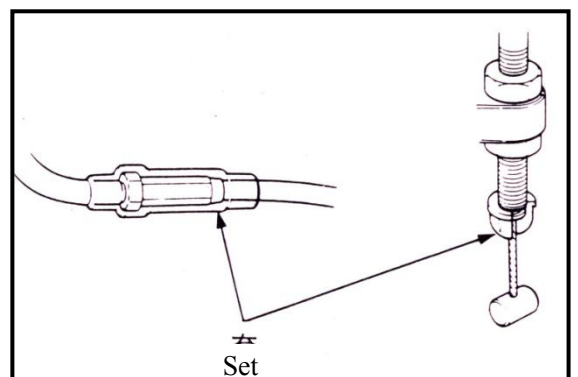
During the maintenance of the motorcycle, use metric tools as much as possible. The motorcycle may be damaged due to the use of incorrect tools.

Before removing or opening the fender for maintenance, clean the dirt from the outside of part or assembly, to prevent the dirt from falling into the engine, chassis or brake system.

After disassembling and before measuring the wear value, clean the parts and blow them with a compressed air machine.

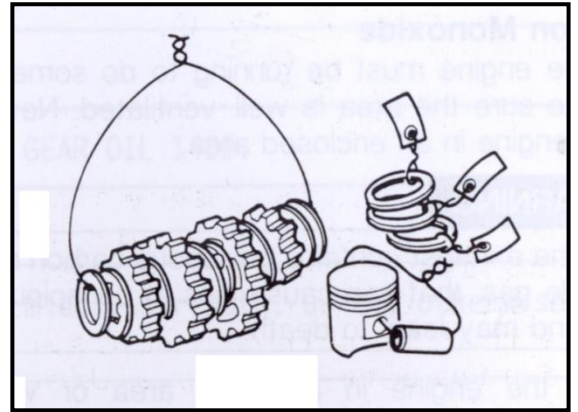


The rubber parts may deteriorate due to aging and are easily damaged by solvents or oils. They should be inspected before reassembly and replaced if necessary.

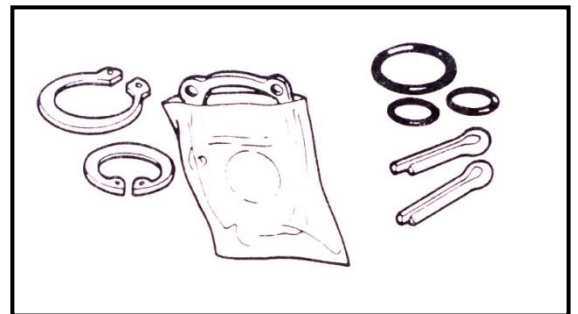


Loosen parts with multiple assemblies from outside to inside. First loosen small assemblies.

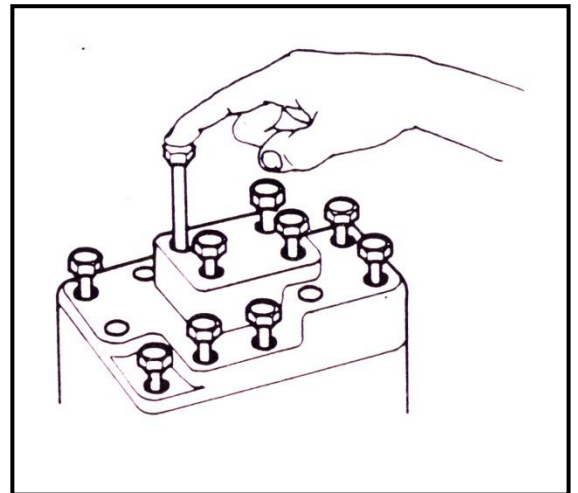
Complex assemblies such as gearboxes should be stored in the proper assembly order for future assembly.



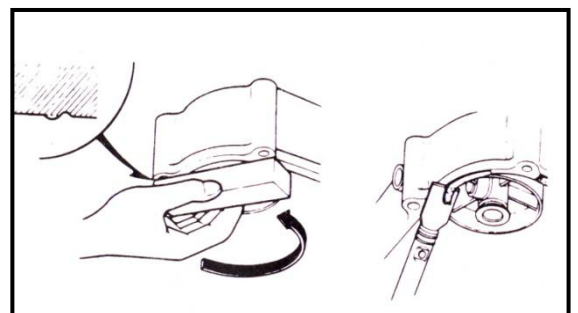
Complex assemblies such as gearboxes should be stored in the proper assembly order for future assembly. The parts that will no longer be used should be replaced promptly before dismantling.



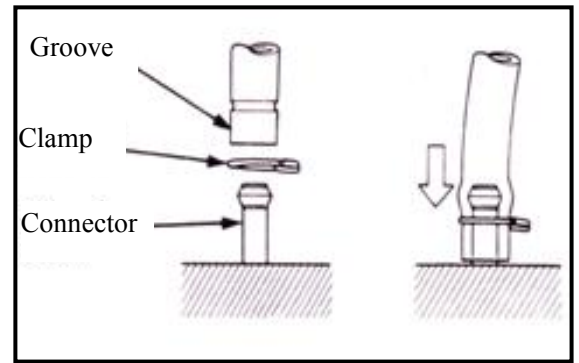
The lengths of bolts or screws are different for assembly and fender, and they must be installed in the proper positions. If they are mixed, put the bolt in the hole and check whether it is proper.



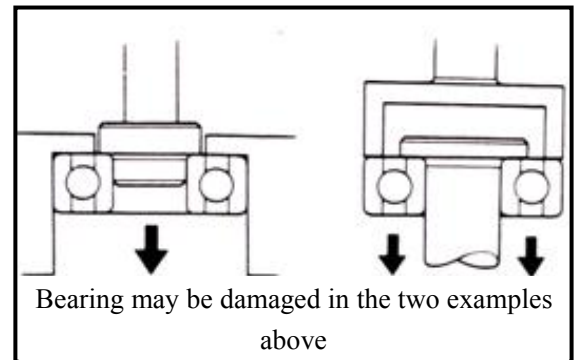
Installation of oil seal: the oil seal groove should be filled with lubricating grease, check whether the oil seal is smooth and may be damaged.



Installation of rubber hose (fuel, vacuum, or coolant): its end should be plugged into the bottom of connector, so that there is enough place at the hose to clamp the connector. Rubber or plastic dirt-proof boots should be fitted at the original design position.



Disassembly of ball bearing: use tools to support one or two (inner and outer) bearing rolling rings. If the force is applied to only one rolling ring (either inside or outside), the bearings may be damaged when being disassembled and they must be replaced.



Loose cable is a potential safety hazard of electrical safety. Check the next cable after clamping the cable, to ensure electrical safety;

Wire clamps are not allowed to bend in the direction of the solder joint;

Bundle the cable at the designated location;

Cables are not allowed to be placed at the end of frame or at the corners;

Cables are not allowed to be placed at the ends of bolts or screws;

Keep cables away from heat source or the position where the cable may be caught during movement;

Cables should not be kept too tight or loose when being placed along the faucet handle, and must not interfere with adjacent parts in any steering position;

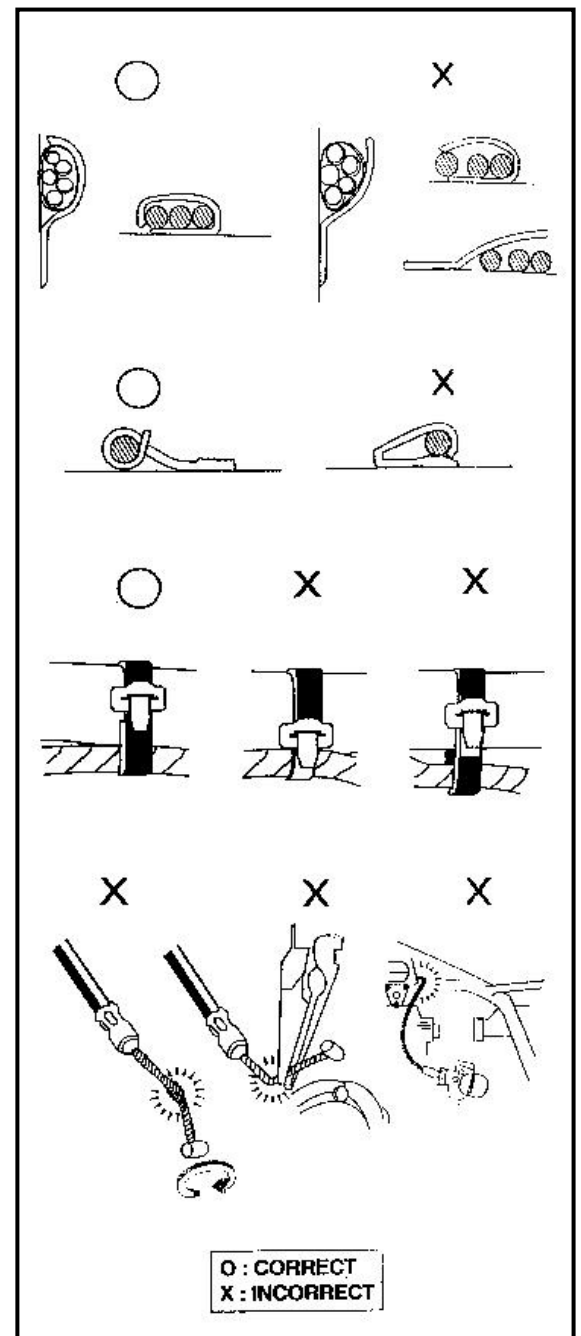
Cables should be smoothly placed and must not be twisted or knotted;

Before connectors are mated, check whether the connector sheath is damaged and the connector is opened excessively;

If the cable is at a sharp or corner, please protect it with tape or a hose;

After the cable is repaired, please bind it up reliably with tape;

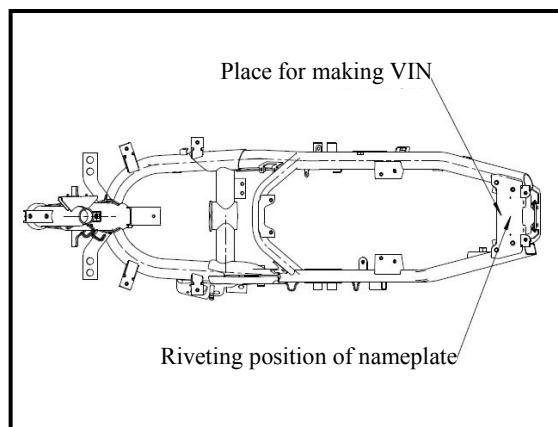
The control wire must not bend or twist. If the control line is damaged, inflexible operation may be caused;



Motorcycle identification

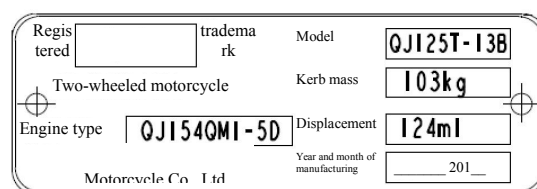
1. The frame serial number is:

☆LBBTEJDB????????☆, as shown in the figure.

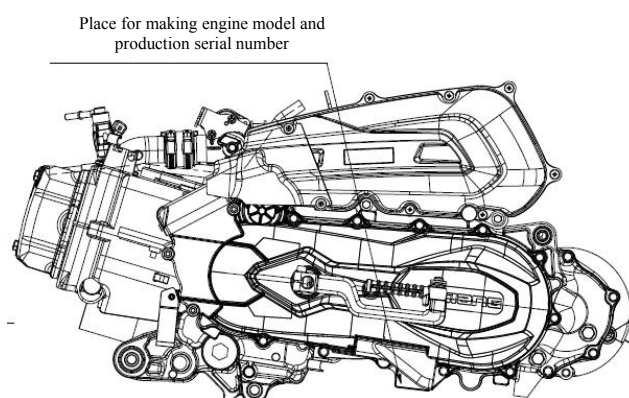


2. Frame nameplate rivet and frame is shown in the figure.

Frame nameplate contents are described in the figure.



2. Serial number of engine ① is marked at the housing of crankcase, and the printing method is: QJ154QMI-4D*□□□□□□*, as shown in the figure



Key parts

Positions of Key Parts

- (1) Left handlebar switch
- (2) Instrument assembly
- (3) Right handlebar switch
- (4) Throttle control grip
- (5) Front brake handle
- (6) Power lock
- (7) Front luggage trunk
- (8) Storage battery
- (9) Foot starting lever
- (10) Sidestand
- (11) Center stand
- (12) Storage compartment
- (13) Rear brake handle/rear brake pedal
- (14) Hooks for luggage
- (15) USB interface (inside the front luggage trunk)



Characteristics

Power lock

This power lock has electromagnetic anti-theft function.

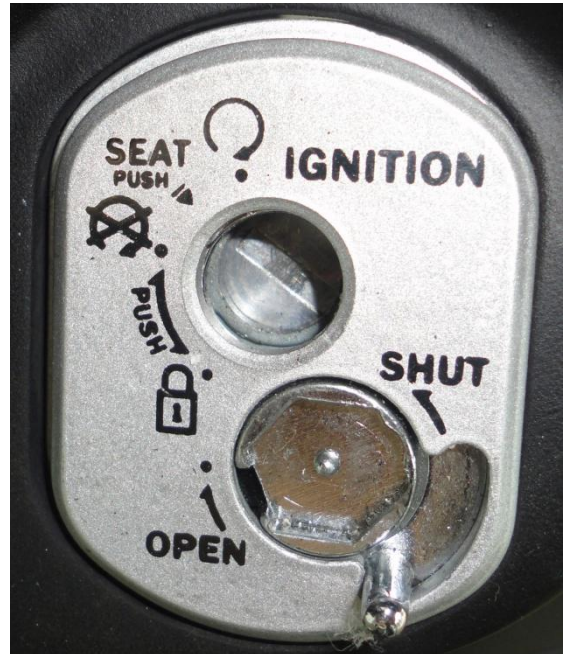
When the lower switch of power lock is moved to the "OPEN" position, the key can be inserted in the upper key hole for operation. When the lower switch is moved to the "SHUT" position, the upper key hole is closed, and the upper key hole is only opened when the "key handle switch" is reset to the "OPEN" position.

“○” mark.....rotate the key to the position of “○” mark, the engine can be started and the key cannot be removed;

"SEAT" mark... rotate the key to the position of "SEAT" mark, press the key down and the seat cushion will be opened;

“⊗” mark.....rotate the key to the position of “⊗” mark, cut off the power, the engine cannot be started and the key can be removed;

“⊞” mark.....rotate the handlebar to the left, press the key and rotate it to the position of “⊞” mark, the steering gear will be locked. To start it, insert the key and rotate to the position of “⊗” mark, the front steering lock is automatically released;

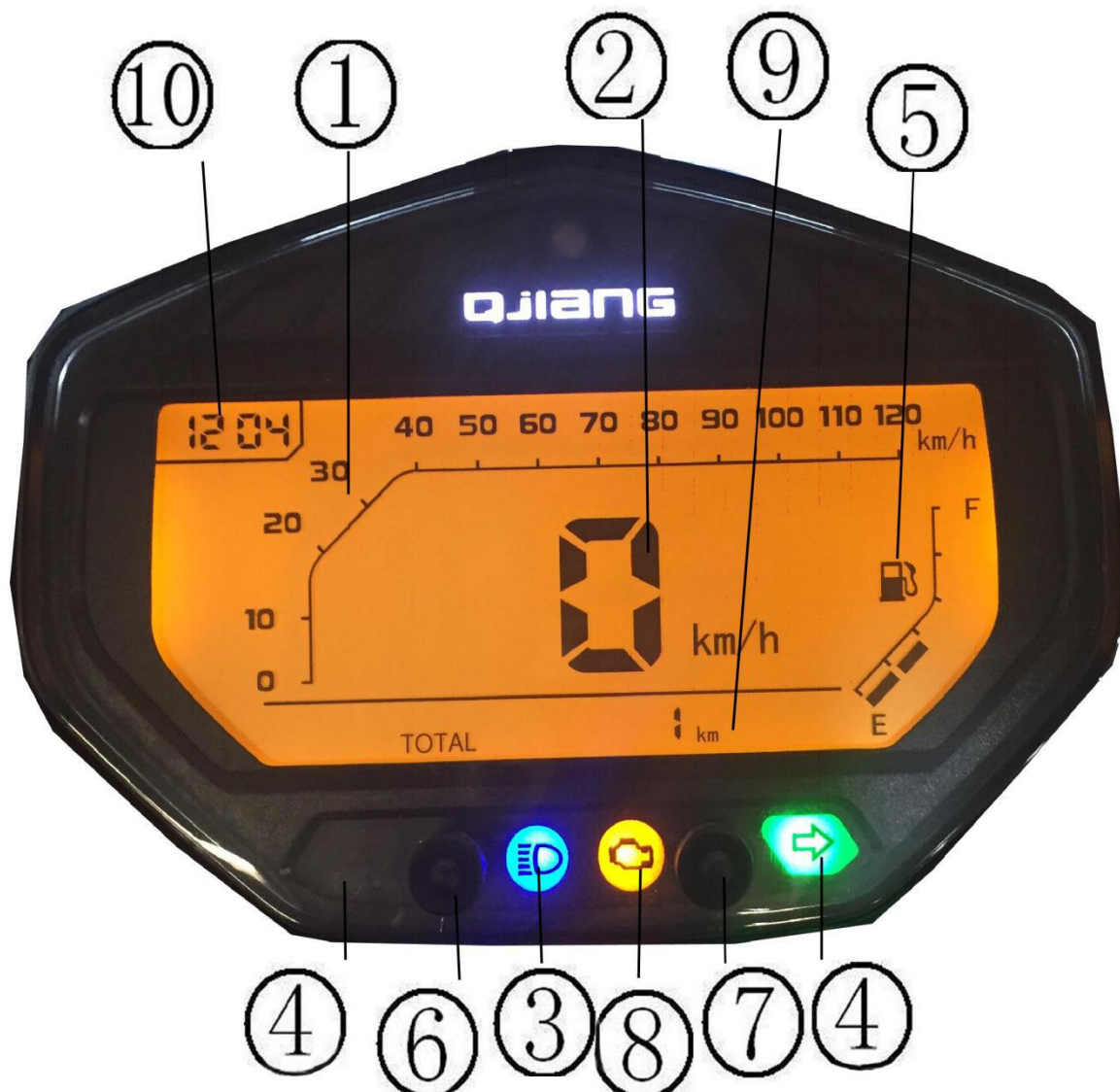


Key handle switch



Warning:
Do not rotate the key to the position of “⊞” position while driving, otherwise it will cause the direction to go out of control and thus result in an accident.

Gauge




(1) Speed indicator:

It indicates the driving speed range, and the unit is km/h (kilometres per hour).

(2) Speed display

It displays the specific driving speed. The speed unit can be selected as km/h (kilometres per hour) or mph (miles per hour) according to the instructions in (6) and (7).

(3) High beam light indicator:

When the headlight high beam is on, the blue high beam indicator will be on and the “ ” mark will be displayed.

(4) Turn signal light indicator:

When the turn signal light is rotated to the left or to the right, the green turn signal light indicator of panel will flash accordingly.

(5) Fuel gauge:

It indicates the amount of fuel in the fuel tank. When the pointer of fuel gauge is in the Zone E, and the oil level is at the first line or below, the fuel indication symbol will flash continuously, indicating that the fuel is

insufficient. Please replenish the fuel in time.

(6) Left function button A (left button), (7) right function button B (right button):

Function	Power supply	Show	A (left key)	B (right key)	result
Mileage function switching	ON	TOTAL	<3 seconds		TRIP A
		TRIP A	<3 seconds		TRIP B
		TRIP B	<3 seconds		TOTAL
		TRIP A or TRIP B	>3 seconds		TRIP A or TRIP B zero clearing
Clock setting		TOTAL	>3 seconds		The position of hour is flashing
		TOTAL		<3 seconds	The position of hour +1
		TOTAL	<3 seconds		Switch to the position of minute and it will flash
		TOTAL		<3 seconds	The position of minute +1
		TOTAL	<3 seconds		Exit the clock menu
Unit switching		/		>3 seconds	Switch the unit of speedometer and odometer between kilometre and mile

(8) Fault indicator of engine

When the key is rotated to "ON", the fault indicator light of engine will be on, the pump will run for 3 seconds, at which point the motorcycle is started. If the indicator light goes out after the motorcycle is started, the motorcycle is normal and there is no fault; if the indicator light is on, there is a fault. Similarly, if the indicator light is off during driving, the vehicle is running normally. If the indicator light is on, there is a fault and the vehicle needs to be stopped for inspection. Please contact the Motorcycle Dealer to check the motorcycle with the special fault diagnosis instrument.

(9) Odometer

According to your needs, you can select the "Trip" (TRIP A or TRIP B) or "Total" (TOTAL) function on the odometer.

Trip: A odometer that can be cleared to record the Interval mileage traveled during a certain period of time. In the "Trip" (TRIP A or TRIP B) state, it can be cleared according to the instructions in (6) and (7).

Total: Record the total mileage that has been traveled.

The speed unit can be selected as km/h or mph according to the instructions in (6) and (7).

(10) Clock display

The clock can be adjusted according to the instructions in (6) and (7).

Important notes

1. Please use the parts of dealers. Damage may be caused to the engine when the parts that do not meet the design specifications of Company are used.
2. Only metric tools can be used for maintenance work. Metric bolts, nuts and screws are not interchangeable with imperial fasteners.
3. During reassembly work, use new washers, O-rings, split pins and locking plates.
4. When tightening bolts or nuts, first tighten the bolts with large diameter or leaning to the inner side, and then gradually tighten them to the specified torque in the diagonal order, unless otherwise specified.
5. Wash the removed parts with a cleaning solution. Lubricate all sliding surfaces before assembly.
6. After assembly, check whether all parts have been correctly installed and operated.
7. Degrease and remove oil before measurement. Add recommended lubricant to the lubrication location during assembly.
8. When the engine and drive system need to be stored for a long time after being disassembled, please apply lubricant to the surface of the parts to prevent rust and dust.

Special tool

Special tool refers to a tool specially designed for assembling or disassembling some parts of motorcycle and using it on a specific location. Appropriate special tools are indispensable for complete and accurate adjustment and assembly operations. Parts should be disassembled and assembled safely, reliably and quickly using special tools, so as to improve work efficiency and save labor.

1. Tools for maintenance of engine

When disassembling the engine, certain parts can be smoothly assembled and disassembled only using specially designed tools.

The list and pictures of special tools for the disassembly and assembly of engine parts are shown in Tables 1-1 and 1-2.

Table 1-1

Name	Remarks
Special socket wrench	Used to remove the flywheel bolts, Fig. 1-3
Clutch holder	Fig. 1-4
Flywheel puller	Fig. 1-5
Feeler gauge	Fig. 1-6
Bearing removal tool	Fig. 1-7
Bearing installation tool	Fig. 1-8
Oil seal replacer	Fig. 1-9
Disassembly tool handle	Fig. 1-10
Piston pin pull-out device	Fig. 1-11
Piston ring opening clamp	Fig. 1-12
Spark plug socket wrench	Fig. 1-13
Measuring clutch thickness	Fig. 1-14

<p>Cylinder diameter tester</p> <p>Dial gauge</p>	<p>Fig. 1-15</p> <p>Measure the inner diameter of piston pin hole, as shown in Fig. 1-16</p>
---	--

Table 1-2

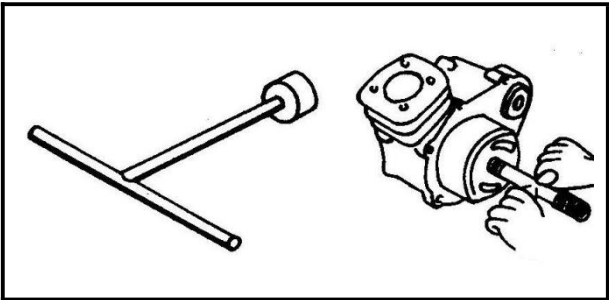


Fig. 1-3

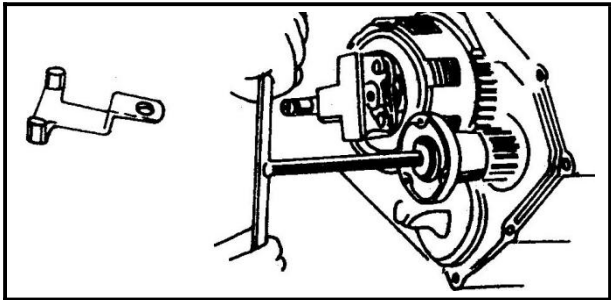


Fig. 1-4

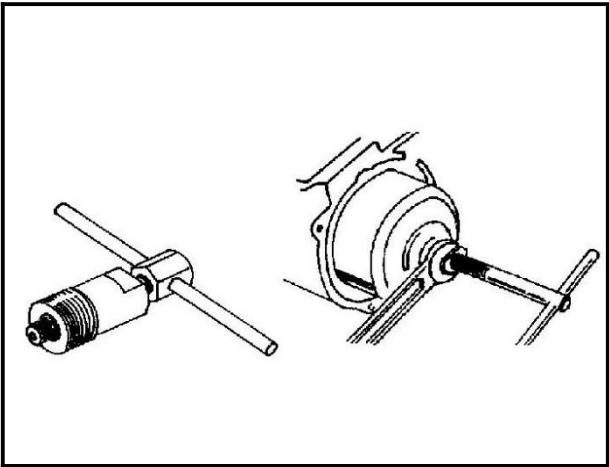
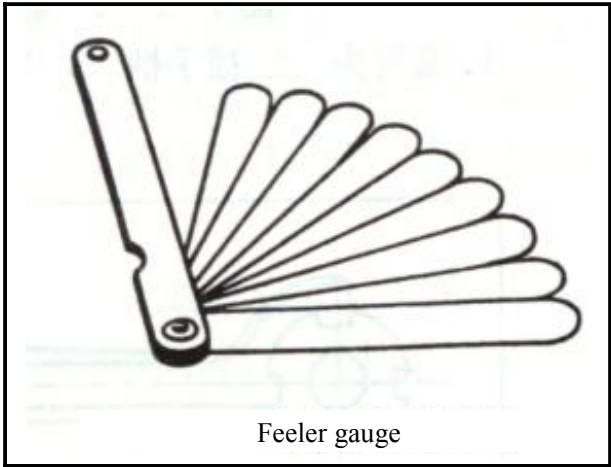


Fig. 1-5



Feeler gauge

Fig. 1-6

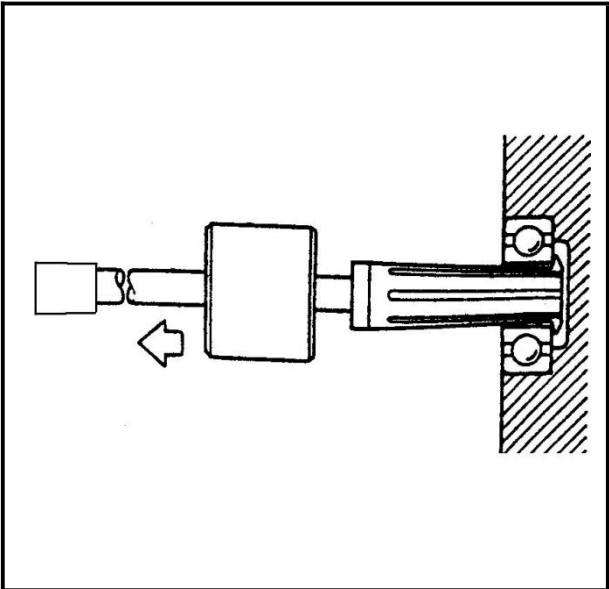


Fig. 1-7

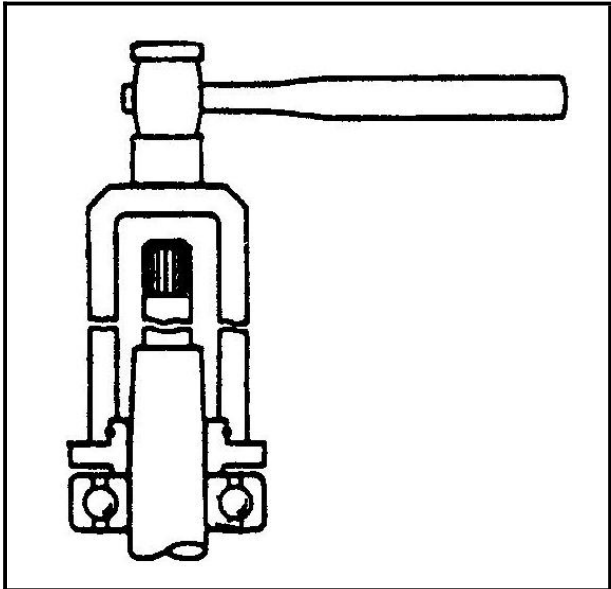


Fig. 1-8

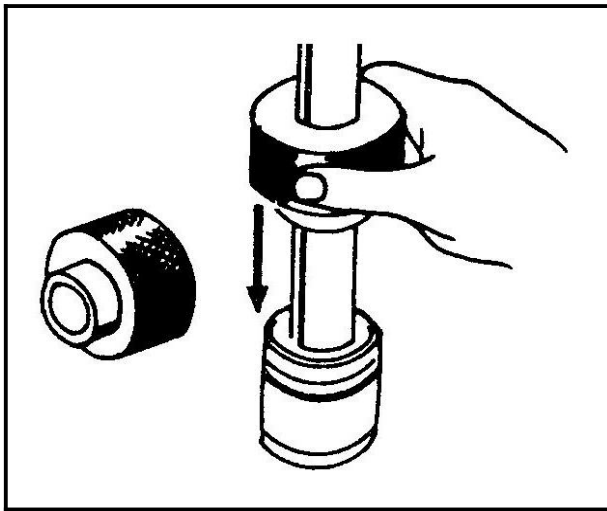


Fig. 1-9

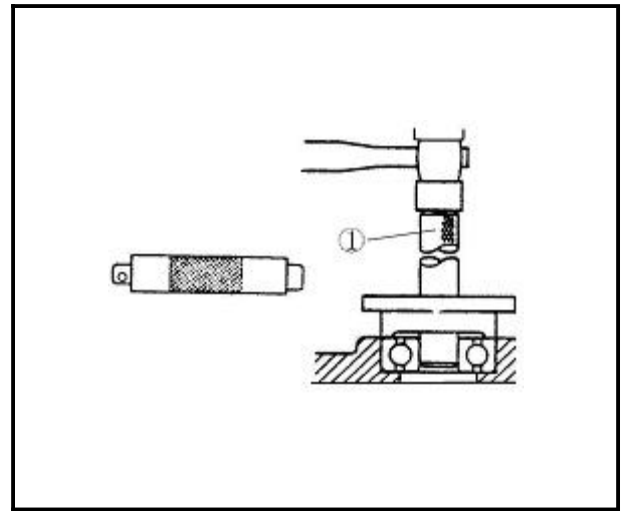


Fig. 1-10

①Handle

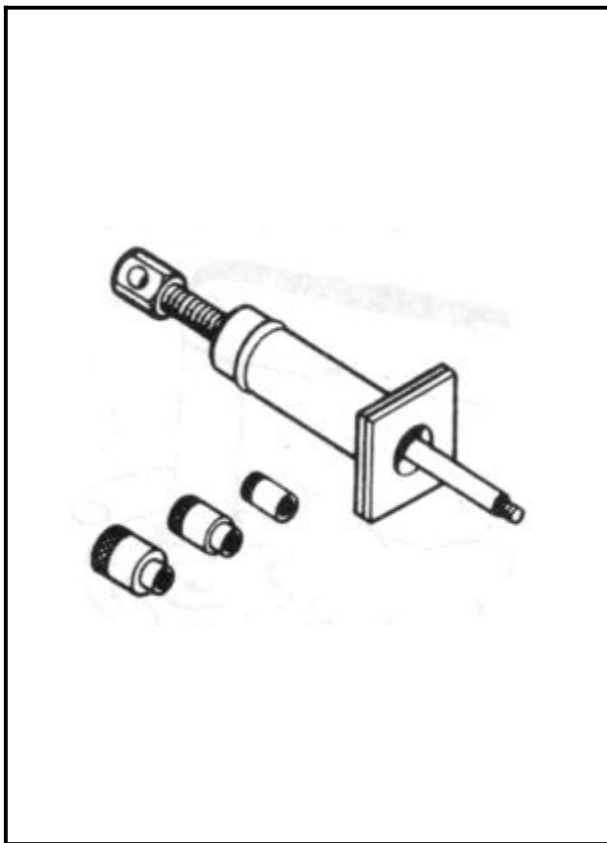


Fig. 1-11

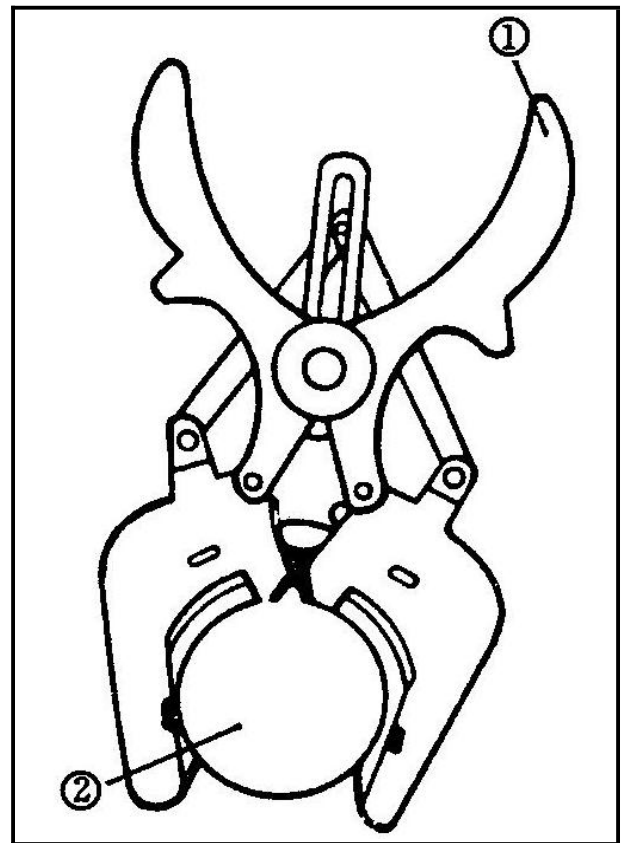


Fig. 1-12

①Opening clamp ②Piston

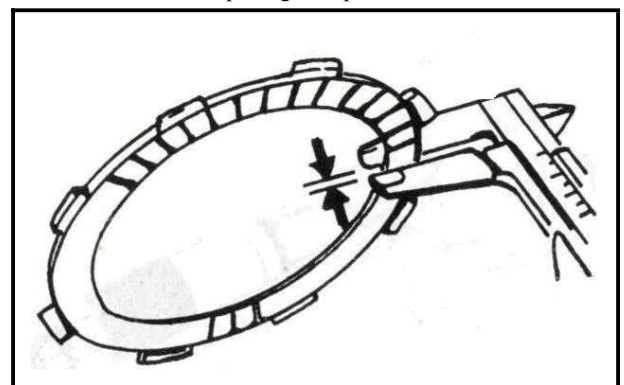
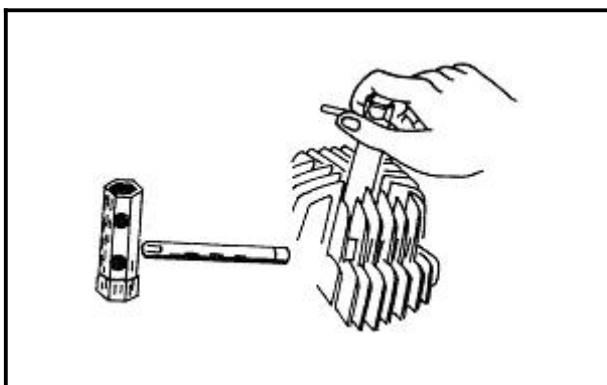


Fig. 1-13

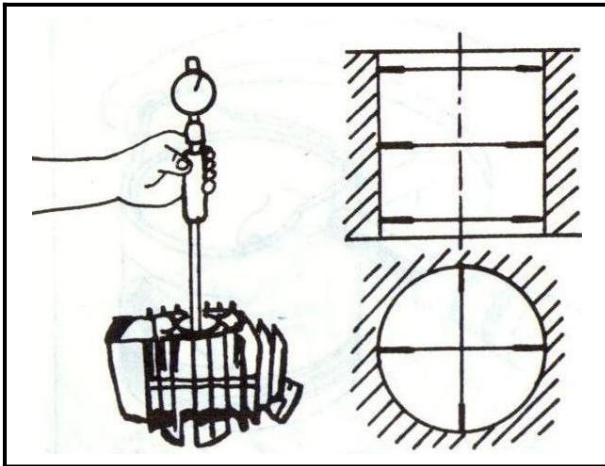


Fig. 1-15

Fig. 1-14

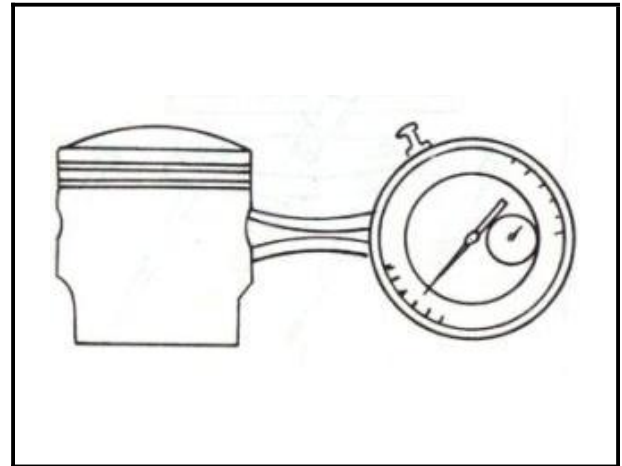


Fig. 1-16

2. Tools for chassis maintenance

The list and pictures of common and special tools for the disassembly and assembly of chassis parts are shown in Tables 1-17 and 1-18.

Table 1-17

Name	Remarks
Torque wrench	Fig. 1-19
Allen wrench	Fig. 1-20
Socket wrench	Fig. 1-21
Micrometer	Fig. 1-22
Magnetic frame, V-shaped block	Fig. 1-23
Dial gauge	Fig. 1-24
Vernier caliper	Fig. 1-25
Spring snap ring pliers	Fig. 1-26
Knock-on screwdriver	Fig. 1-27
Front fork oil seal installation tool	Fig. 1-28
Front fork seal driving tool	Fig. 1-29
Steering nut wrench	Fig. 1-30

(1) Common tools for chassis maintenance

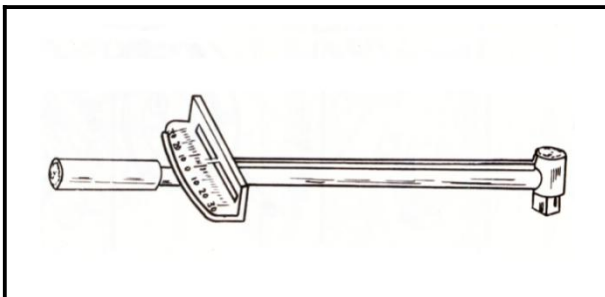
Table 1-18

Fig. 1-19

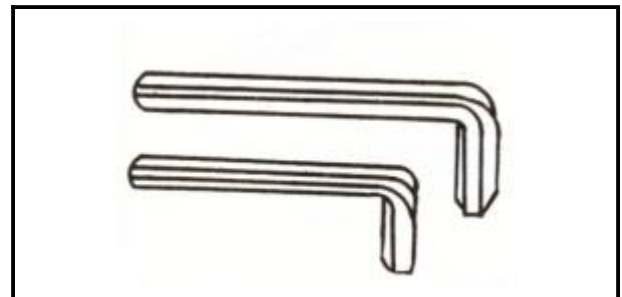


Fig. 1-20

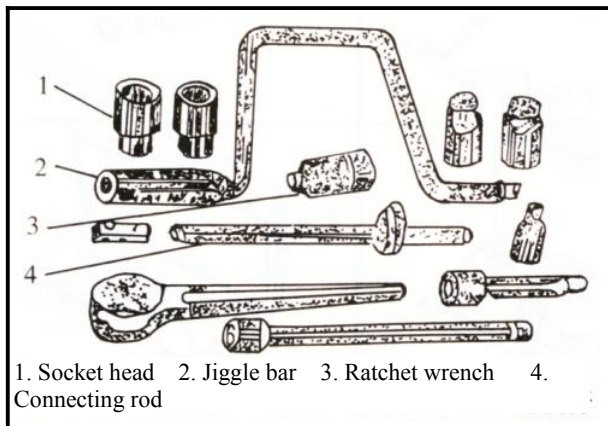


Fig. 1-21

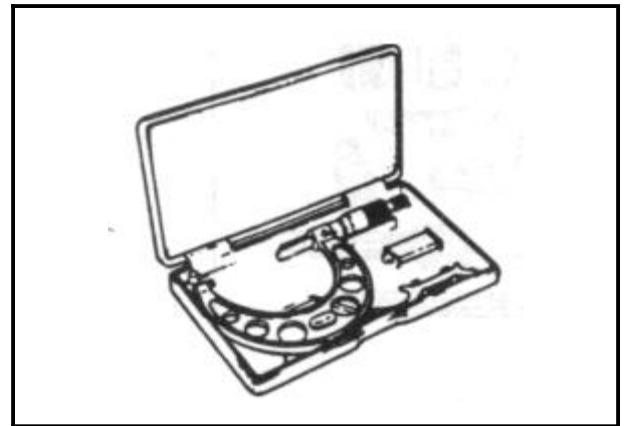


Fig. 1-22

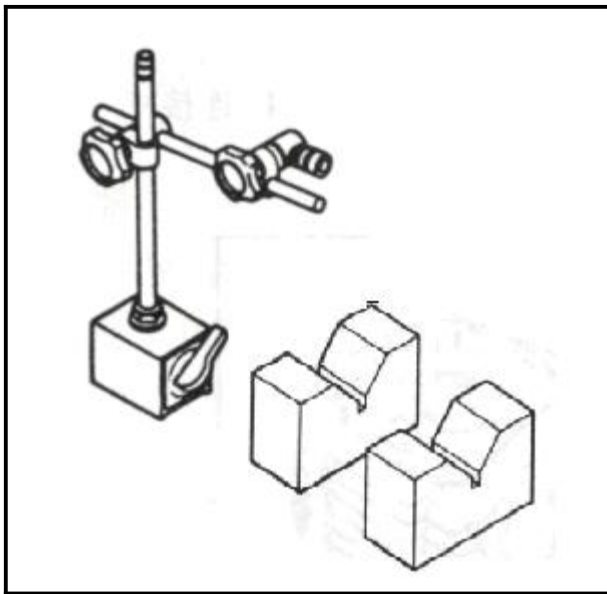


Fig. 1-23

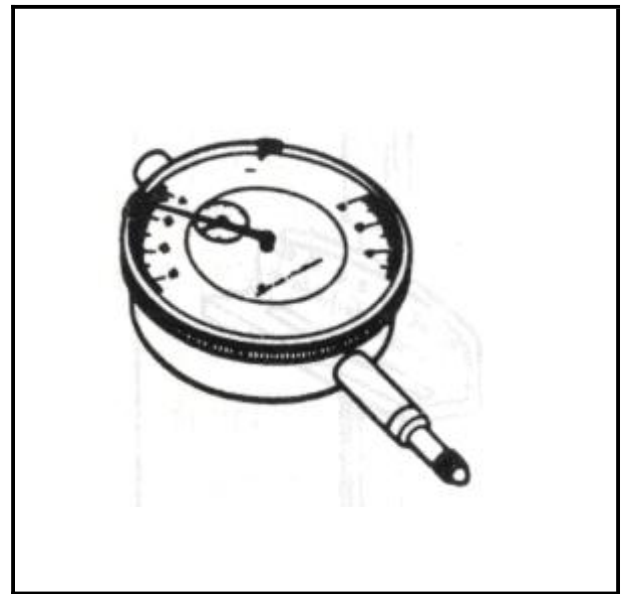


Fig. 1-24

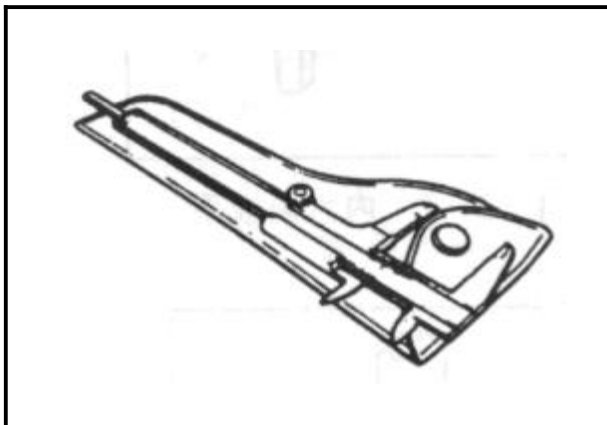


Fig. 1-25

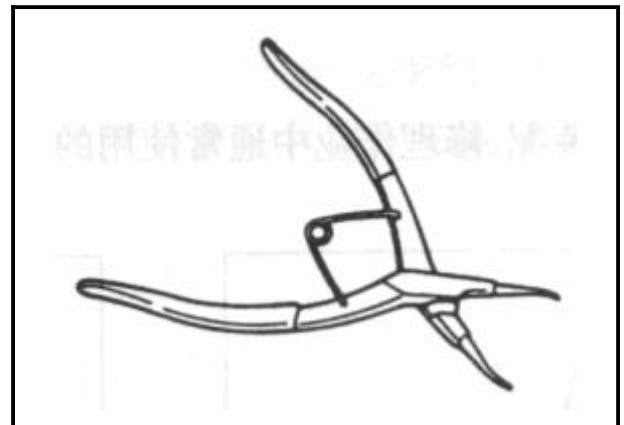


Fig. 1-26

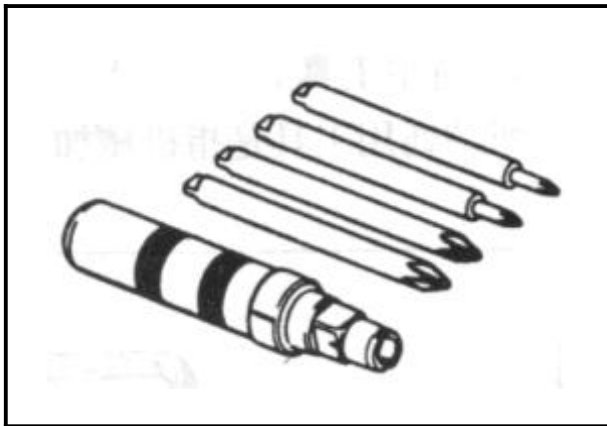


Fig. 1-27

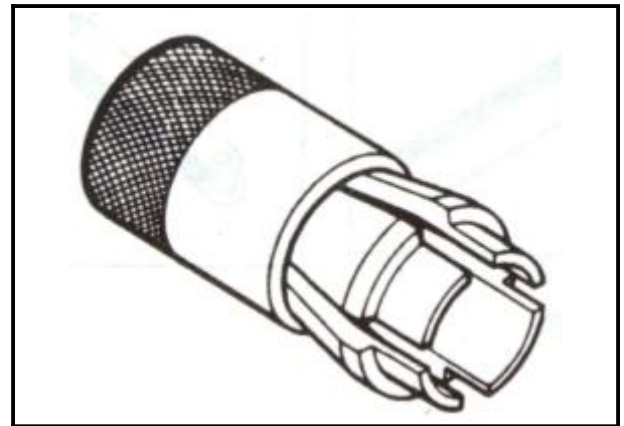


Fig. 1-28

(2) Special tools for maintenance of chassis: Front fork seal driving tool.

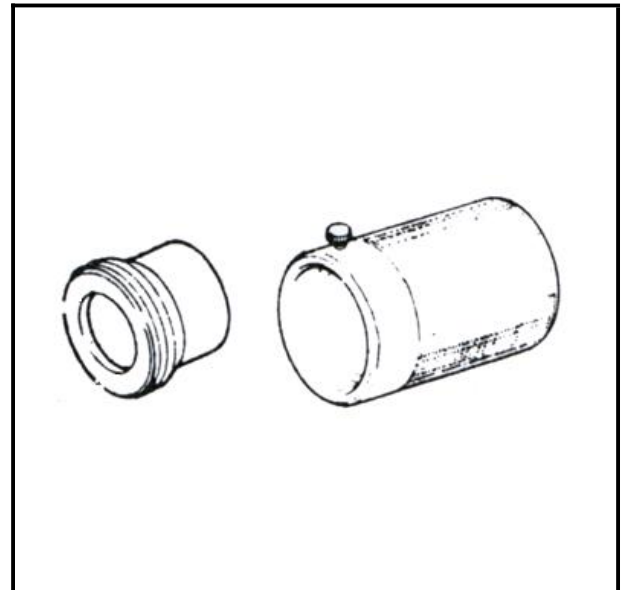
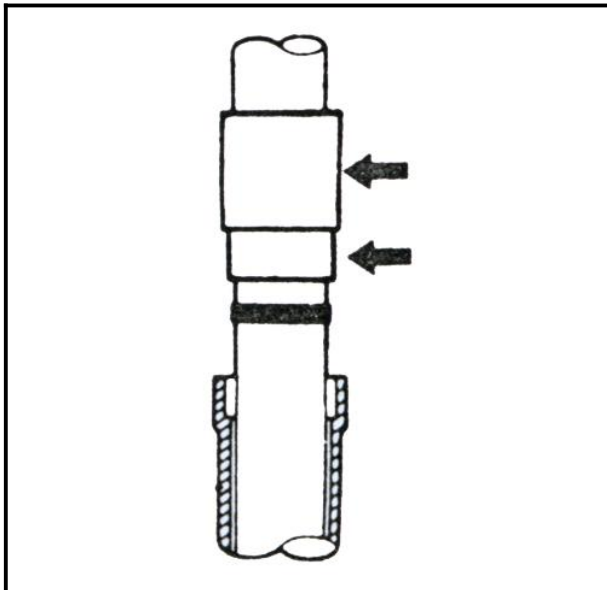


Fig. 1-29

(3) Steering nut wrench.

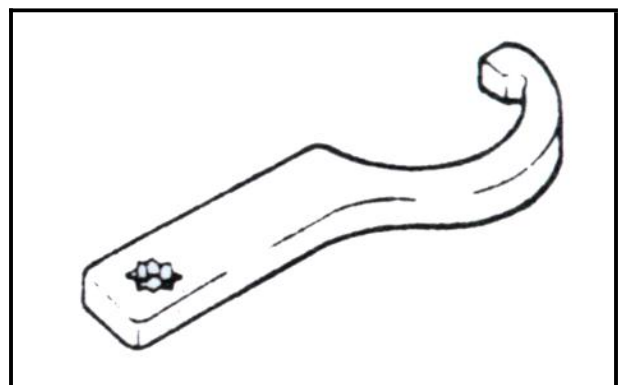
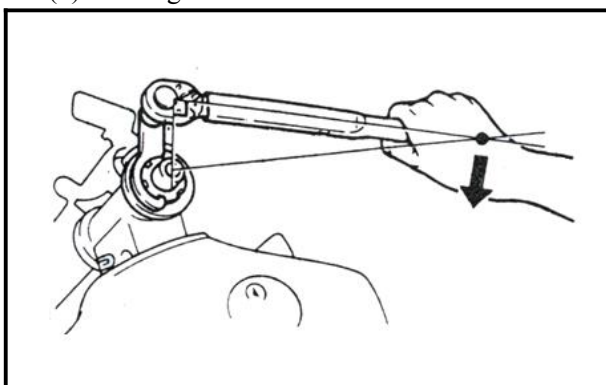


Fig. 1-30

3. Tools for electrical parts

The list and pictures of special tools for the testing of electrical parts are shown in Table 1-31 and 1-32.

Table 1-31

Name	Remarks
Multimeter	Fig. 1-33
Ignition tester	Fig. 1-34

Table 1-32

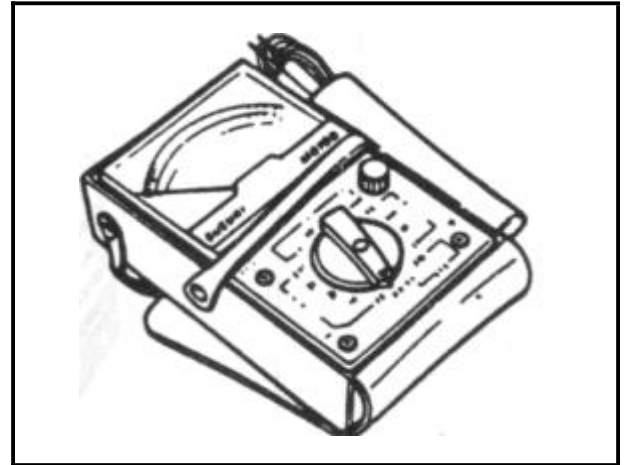
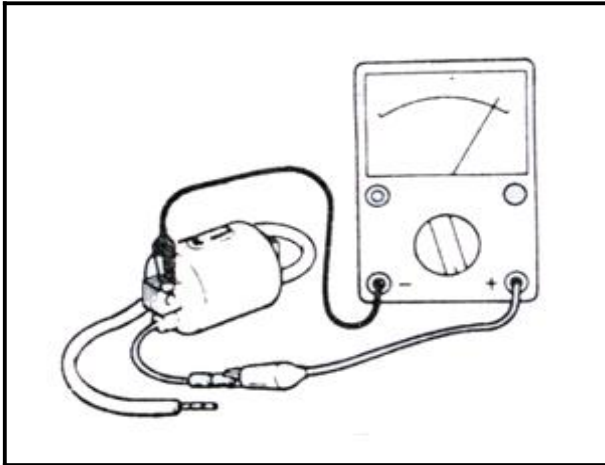


Fig. 1-33

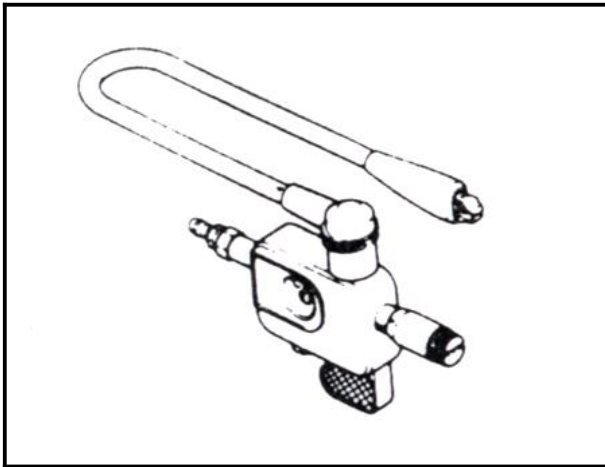
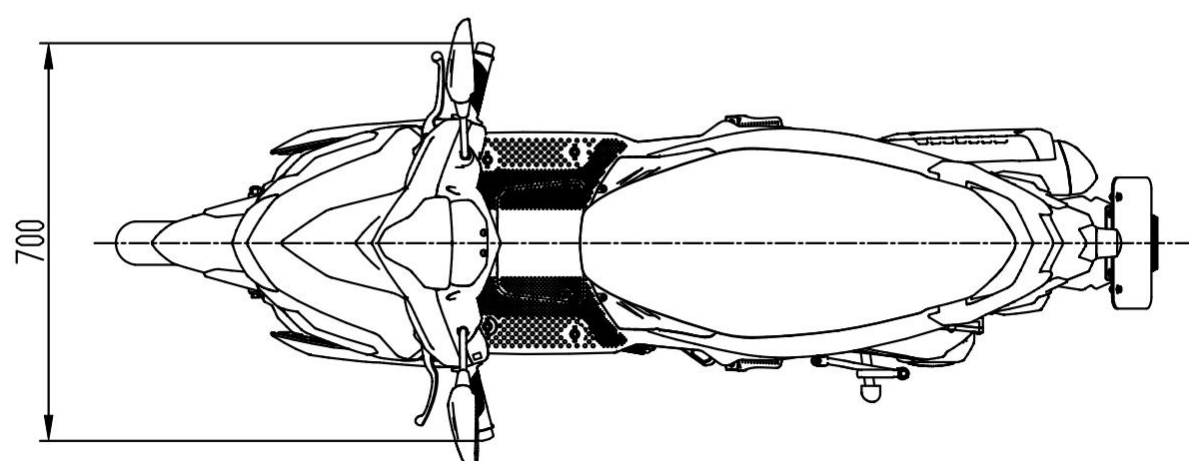
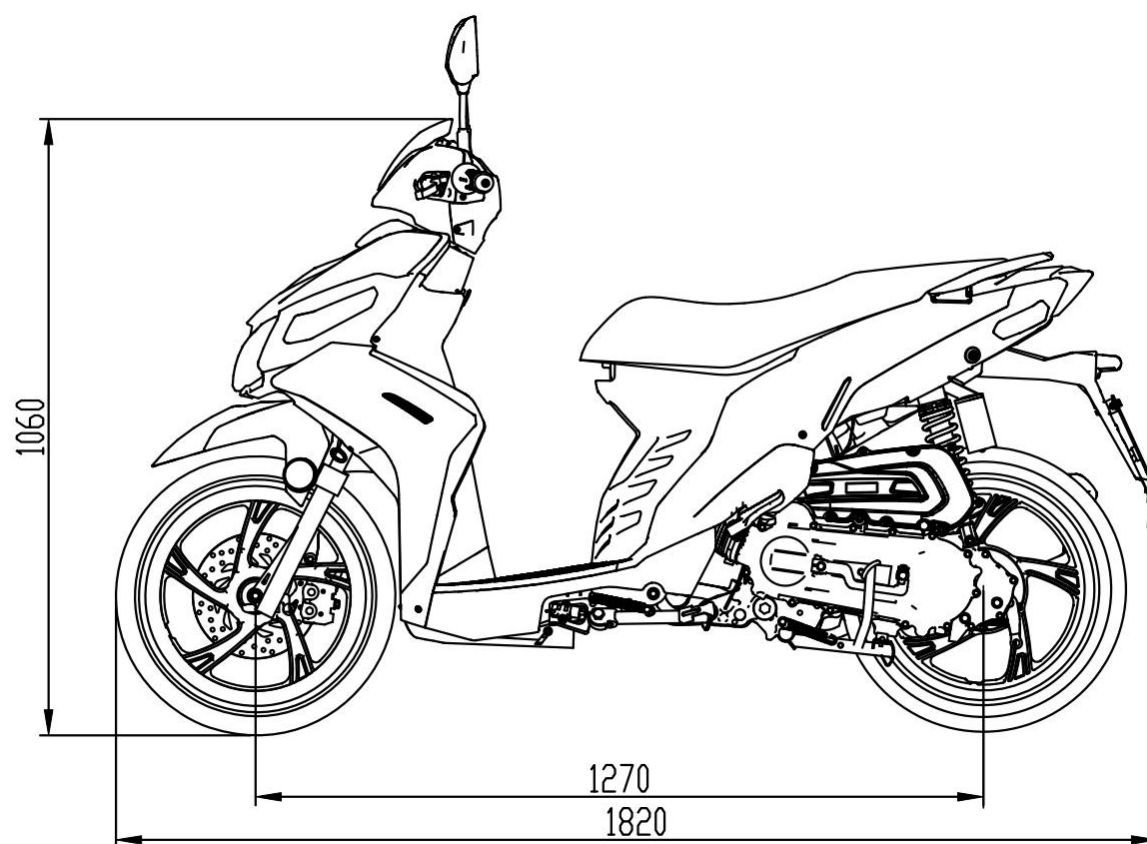


Fig. 1-34

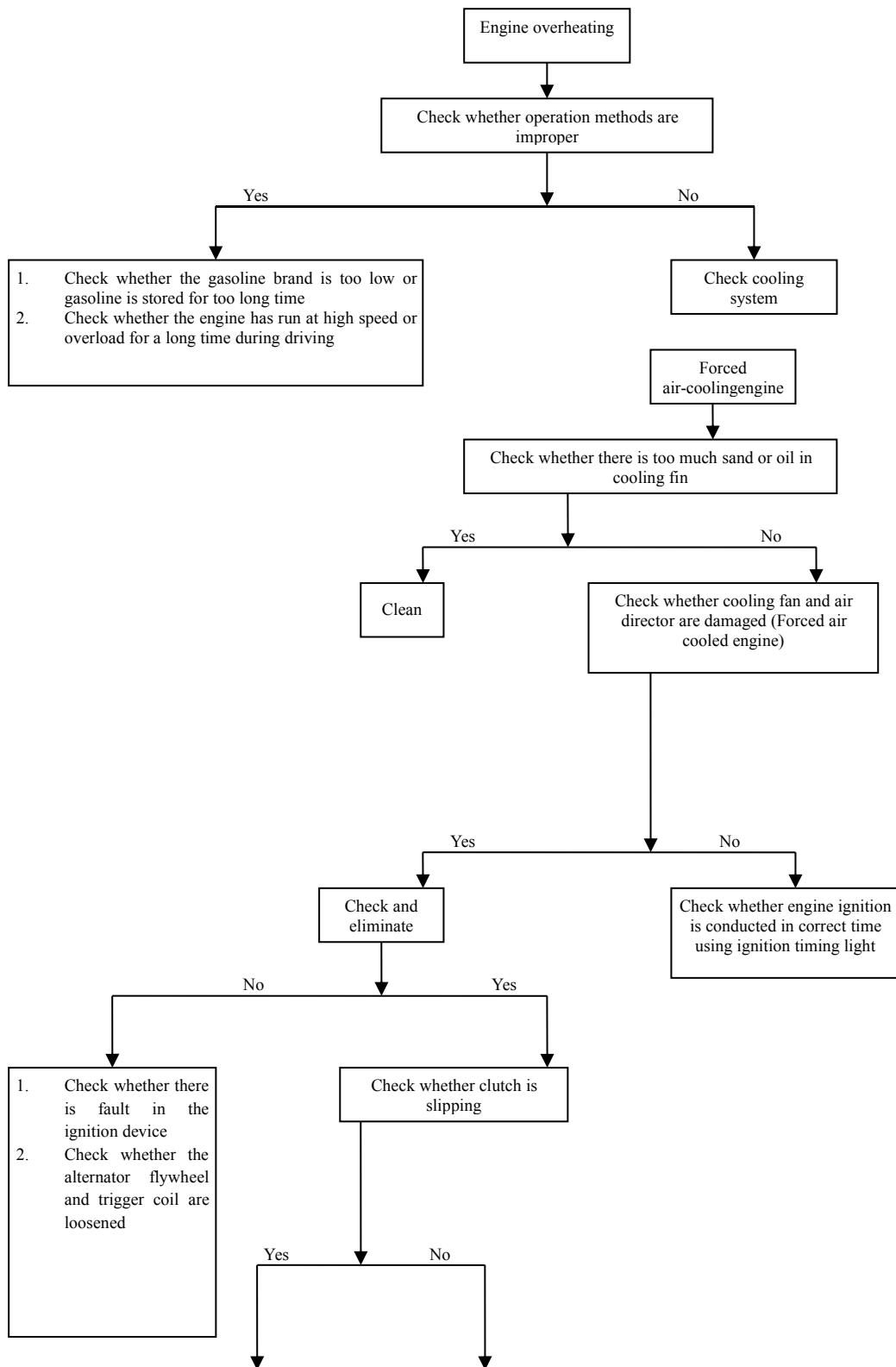
Specification table (QJ125T-13B)

Model		QJ125T-13B		Engine	Engine type	QJ154QMI-4D
L (mm)		1820			Fuel type	Lead-free gasoline (92/95)
W (mm)		700			Number of cylinders	1
H (mm)		1060			Cylinder diameter×strok	φ53.5×55.0
Wheelbase mm		1280			Total displacement	123.6ml
Weight (kg) (Curb weight)		Front axle	41		Starting mode	Pedal, electric
		Rear axle	62		Cooling mode	Forced air-cooling
		Total	103		Lubrication mode	Pressure splash
Tank capacity		4.9±0.5L			Fuel oil consumption	1.75L/100km
Transmission gear	Clutch type	Dry automatic centrifugal			Air Cleaner	Paper
	Transmissio n	Auto			Throttle Body	29B-02T
	Drive mode	Belt drive		Maximum speed	85km/h	
	Drive type	Mechanical		Climbing ability	≥20 degrees	
Electric equipment	Battery capacity/typ	YTX7A-BS		Idle speed-rpm	1500±100rpm/min	
	Engine type	120W		Maximum torque	9.0N·m/6000rpm	
	Spark plug	B7RTC		Maximum horsepower	6.3kW/7500rpm	
	Spark plug gap	0.6~0.7mm		Compression ratio	9.0:1	
	Ignition mode	ECU		Cylinder pressure	1.25MPa/1500rpm	
Type of front shock absorber		Hydraulic damping		Brake	Diameter of front fluid brake	Φ220mm
Type of rear shock absorber		Spring			Diameter of rear brake	Φ130mm

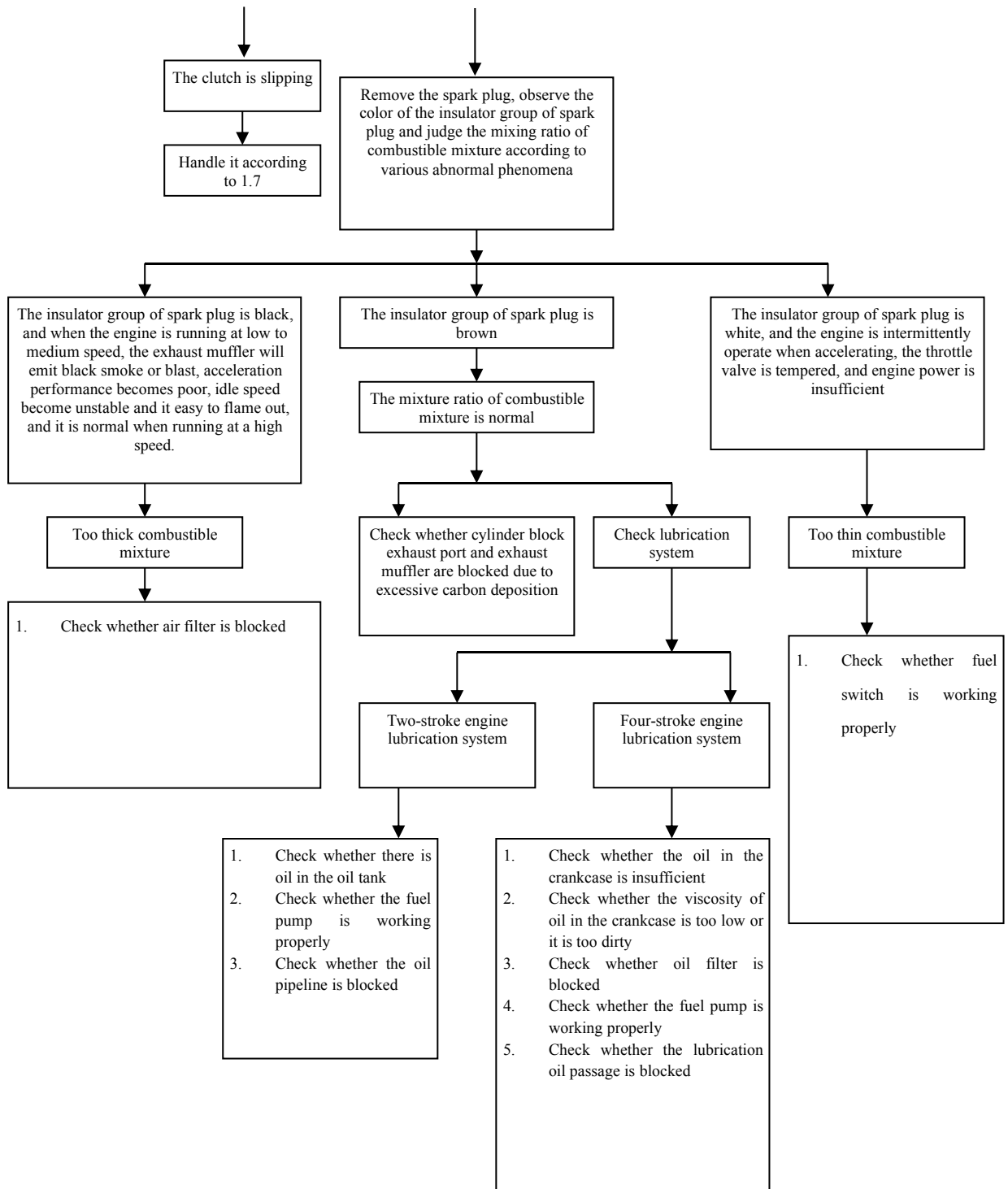
QJ125T-13B



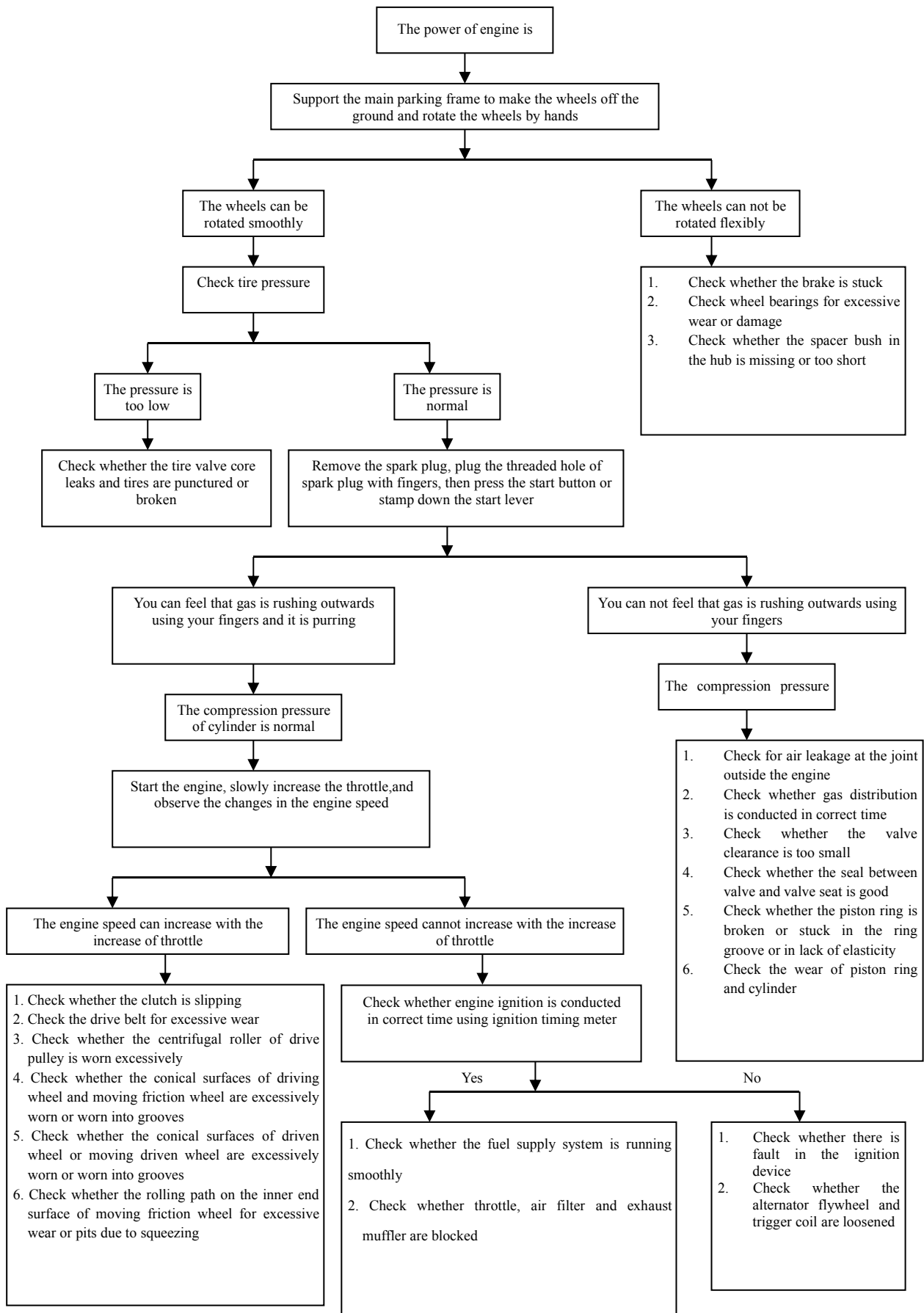
Fault diagnosis



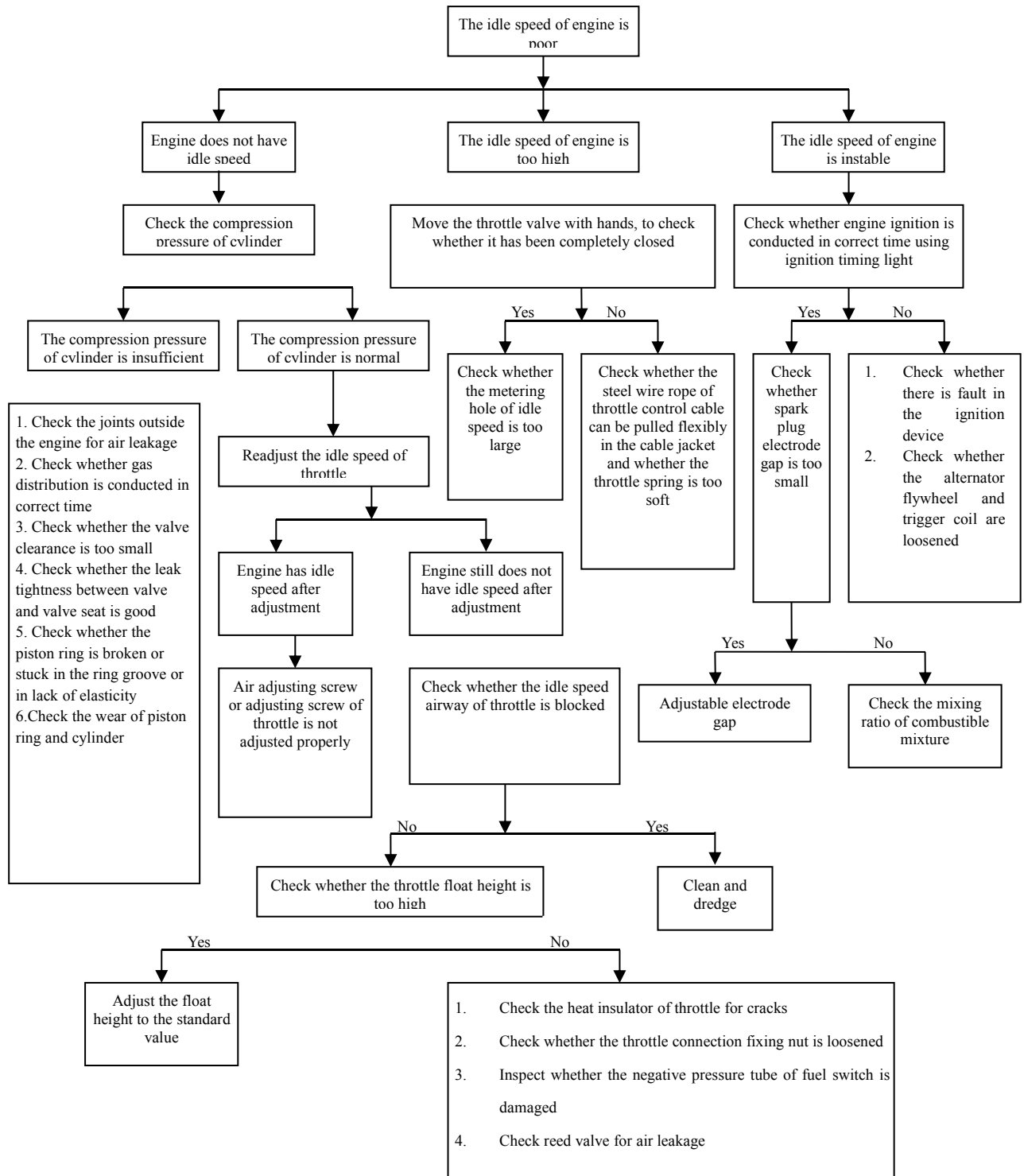
Engine overheating fault diagnosis procedure



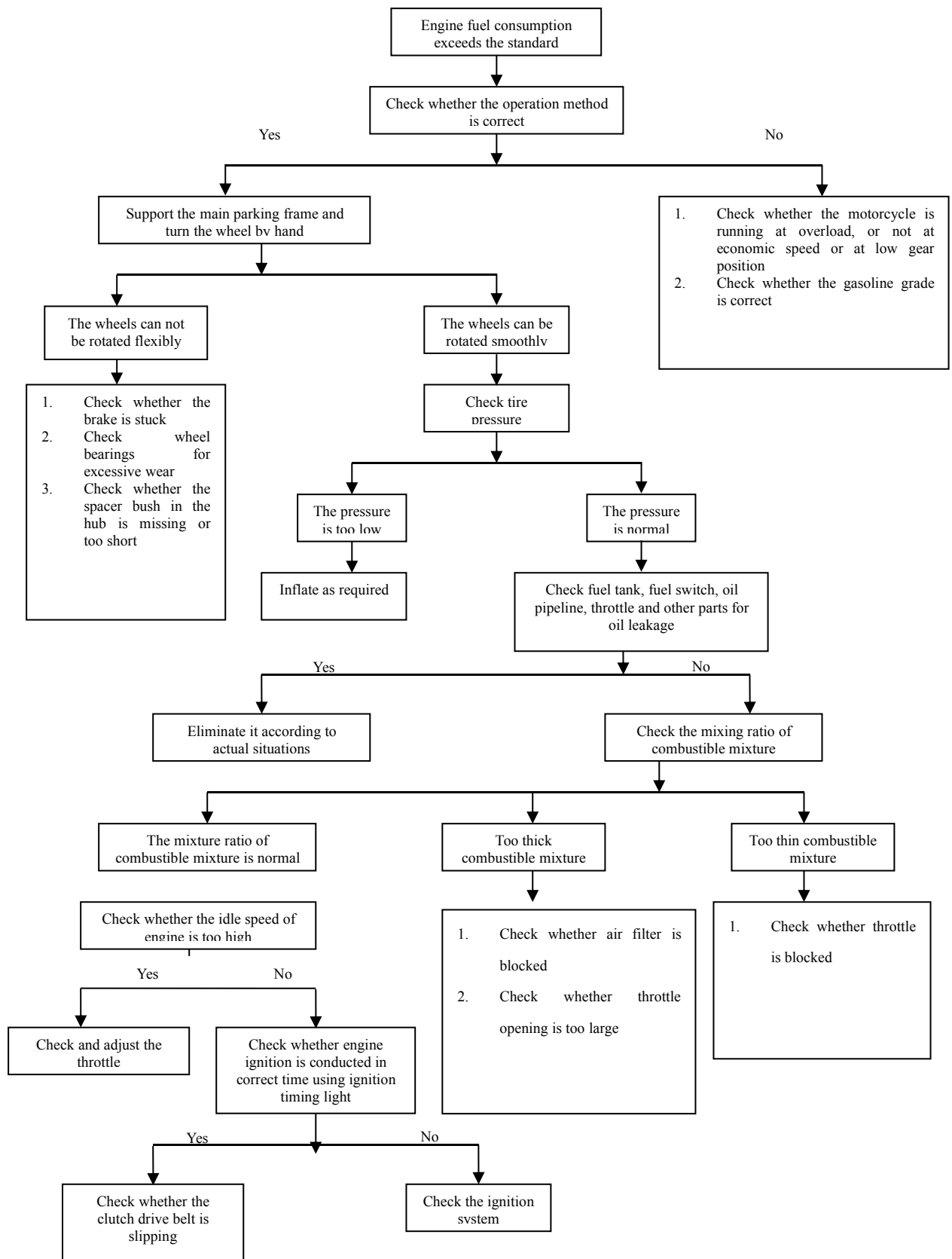
Fault diagnostic procedure for insufficient power of engine



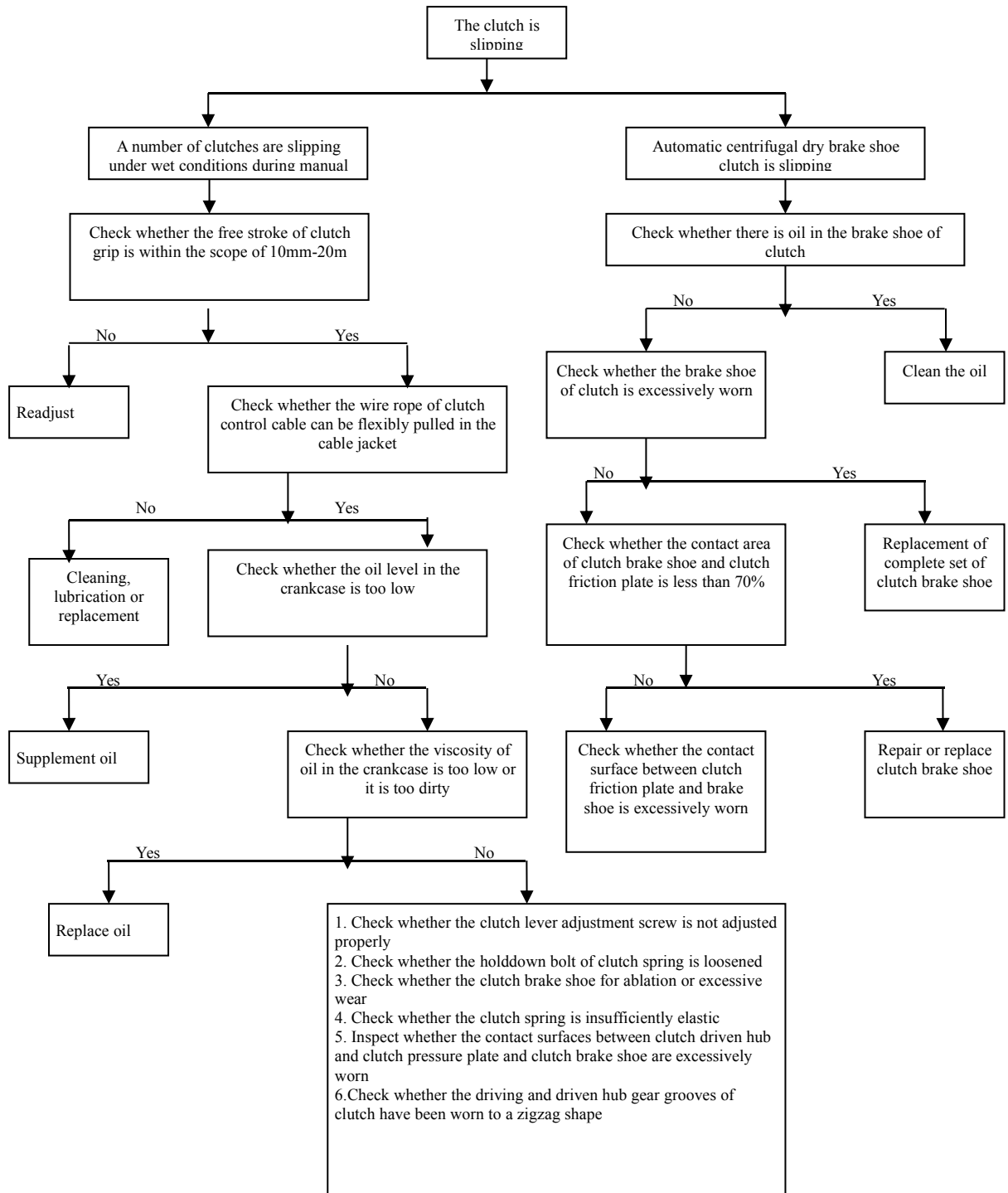
Fault diagnostic procedure for poor idle speed of engine



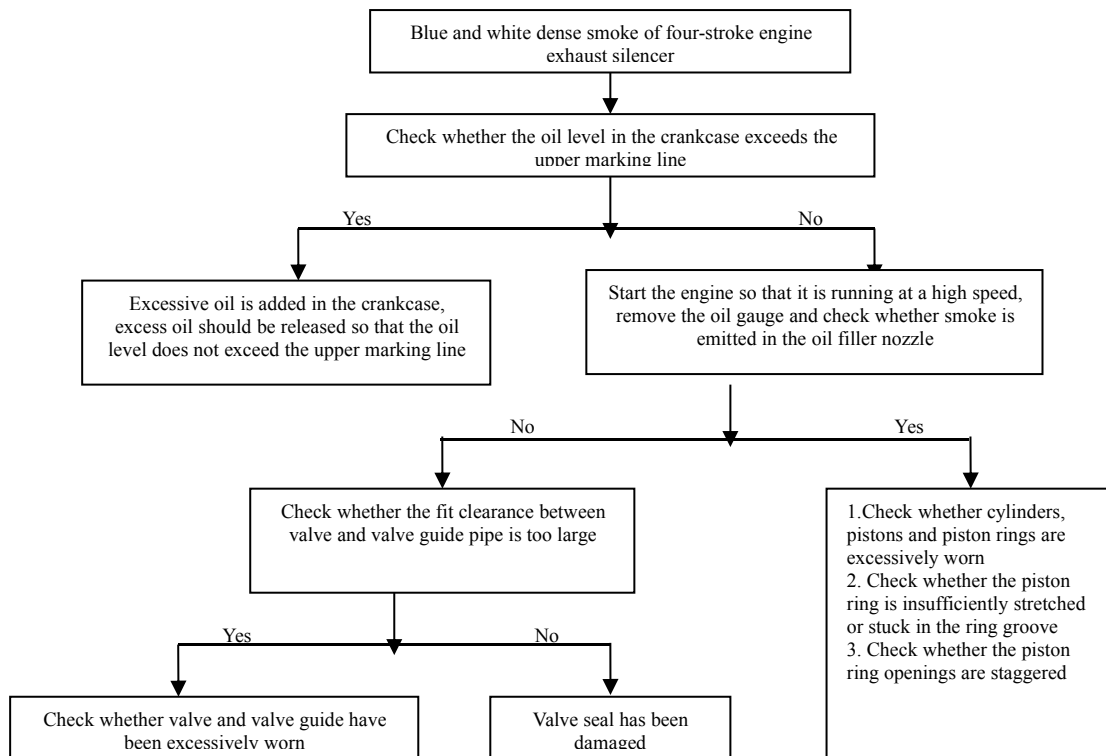
Fault diagnostic procedure for excessive oil consumption of engine



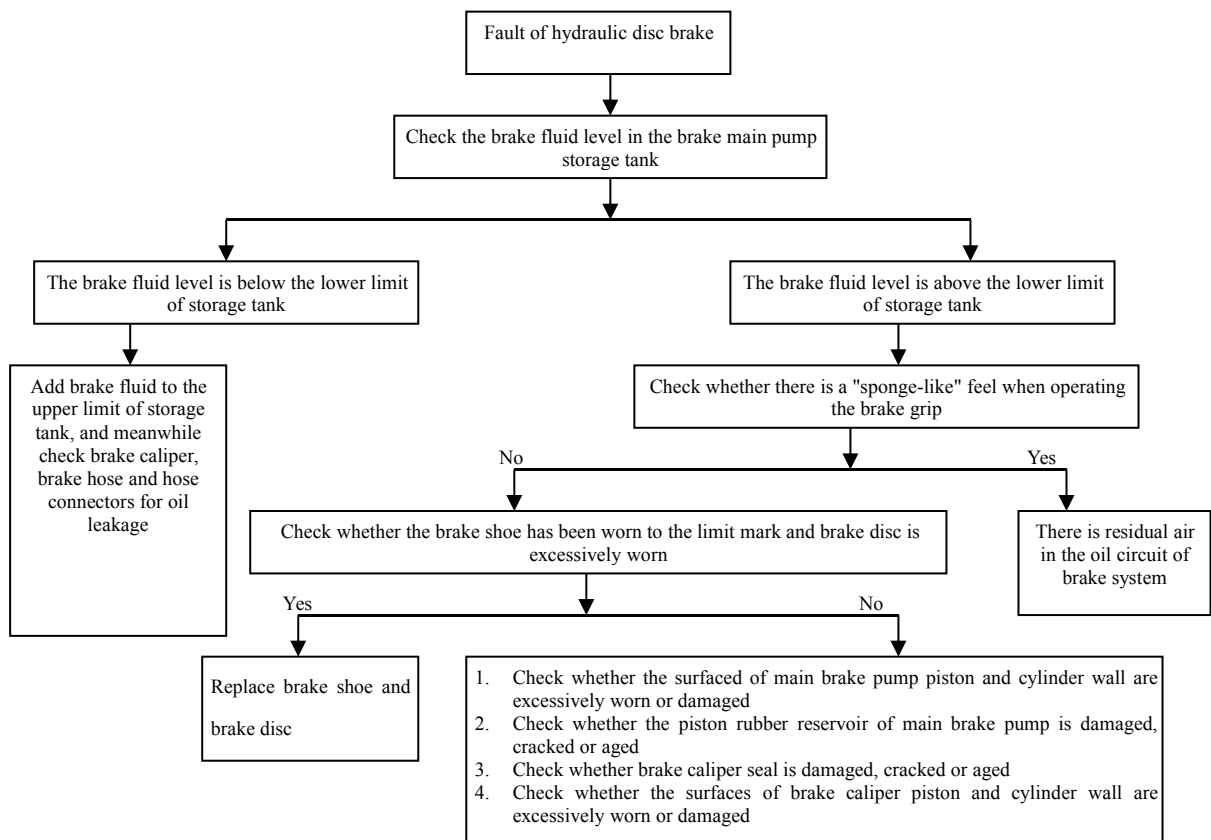
Fault diagnostic procedure for clutch slipping



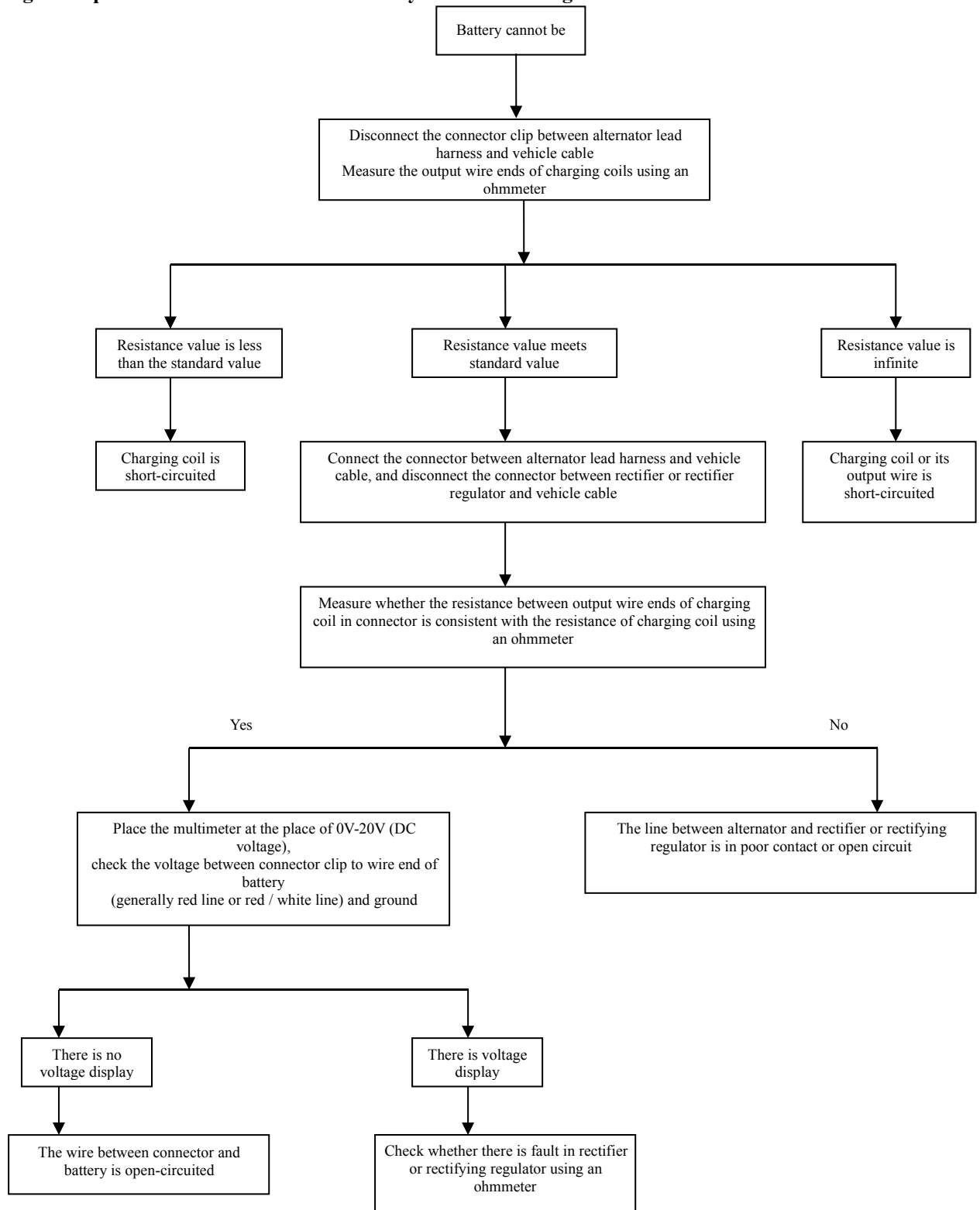
Fault diagnostic procedure for blue and white dense smoke of four-stroke engine exhaust silencer



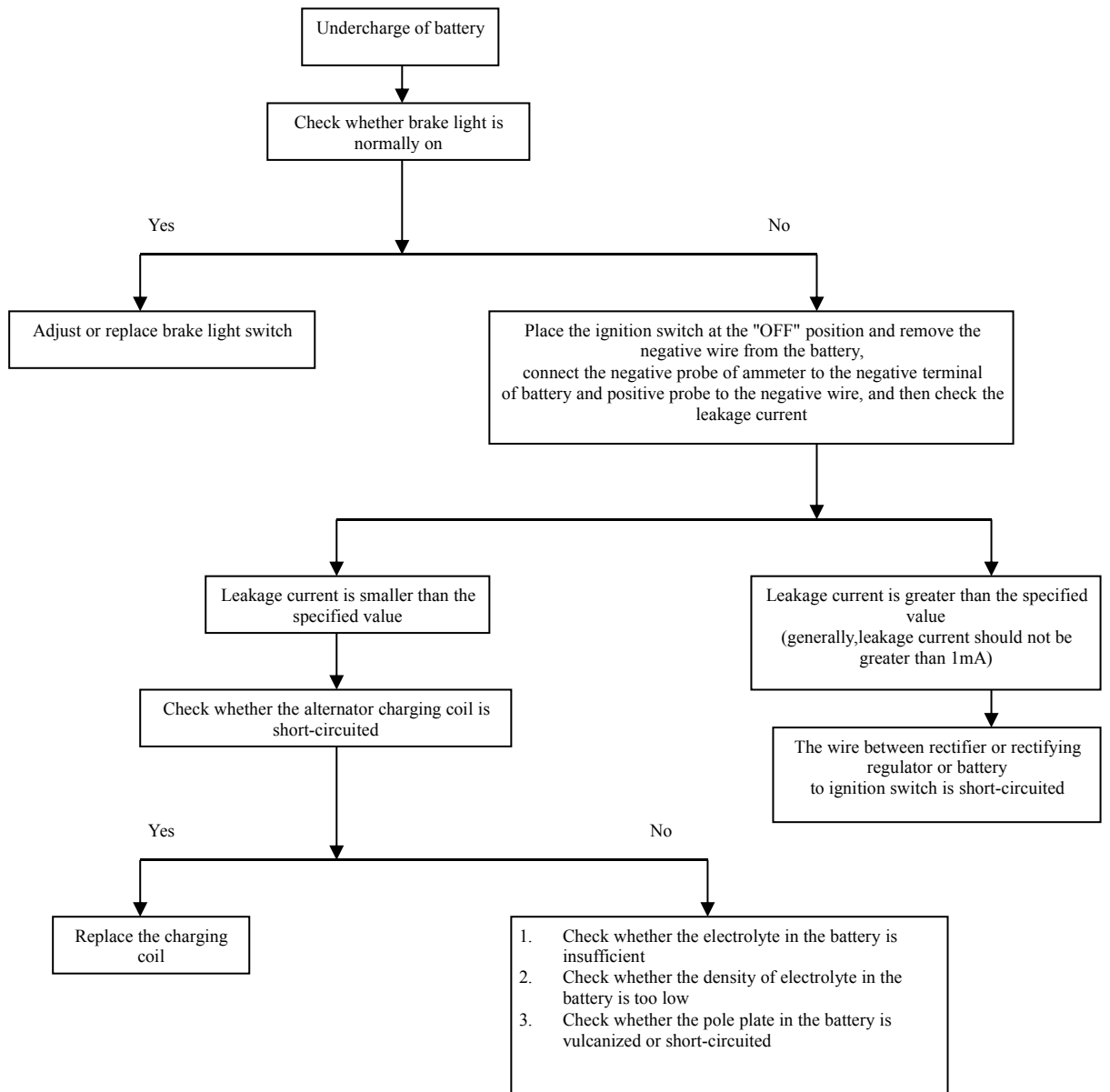
Diagnostic procedure for the fault that hydraulic disc brake does not work



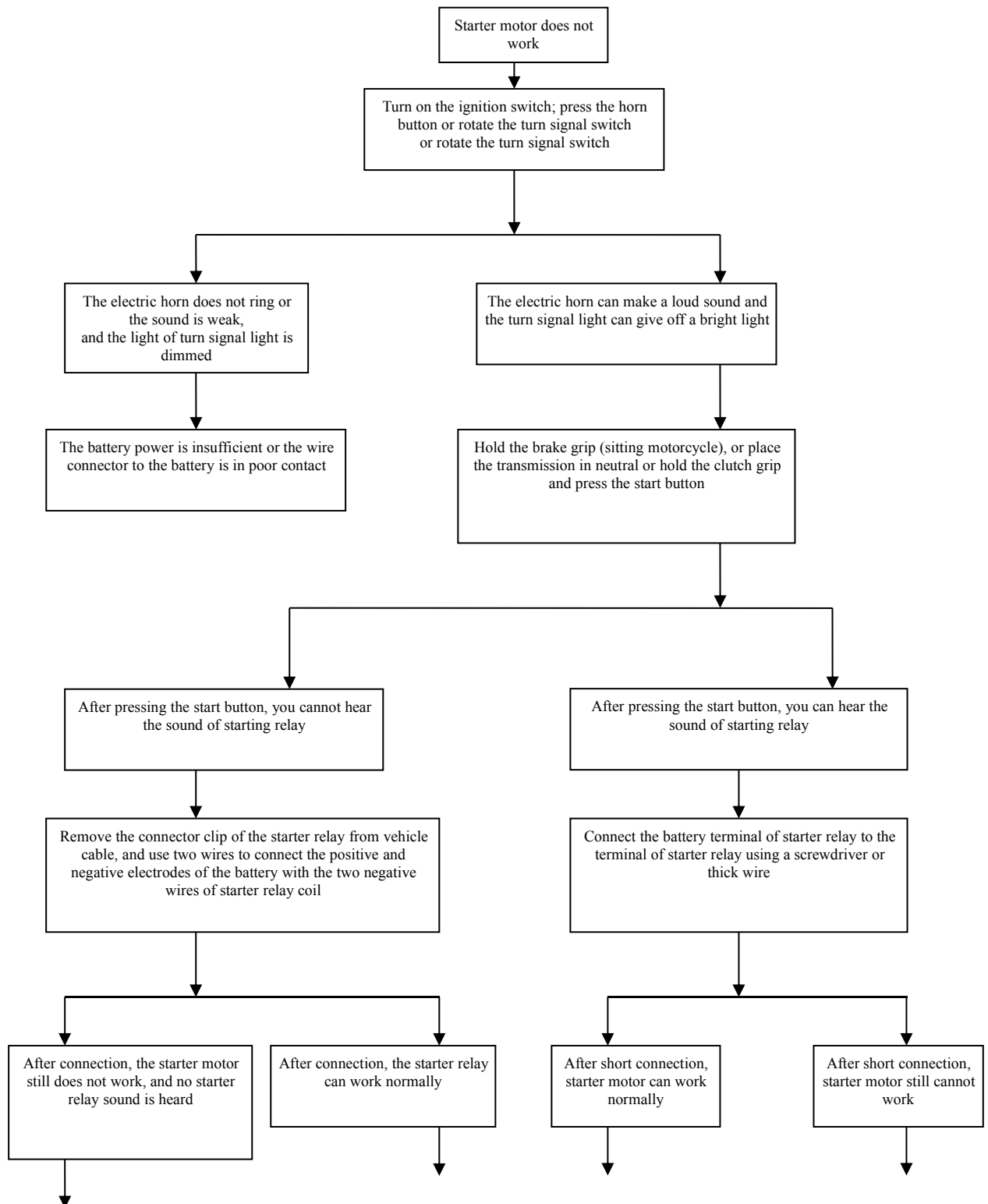
Diagnostic procedure for the fault that battery cannot be charged

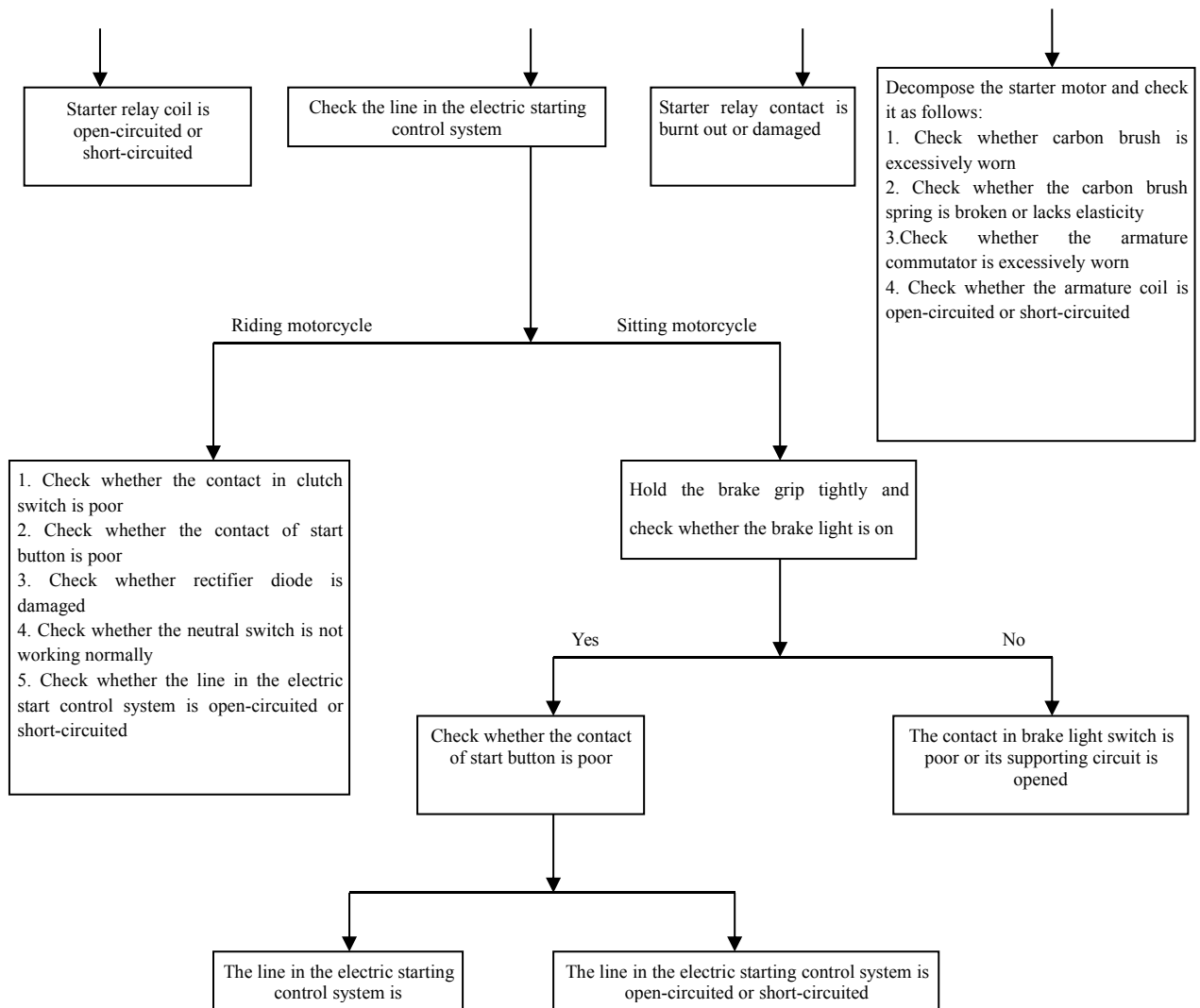


Diagnostic procedure for undercharge of battery

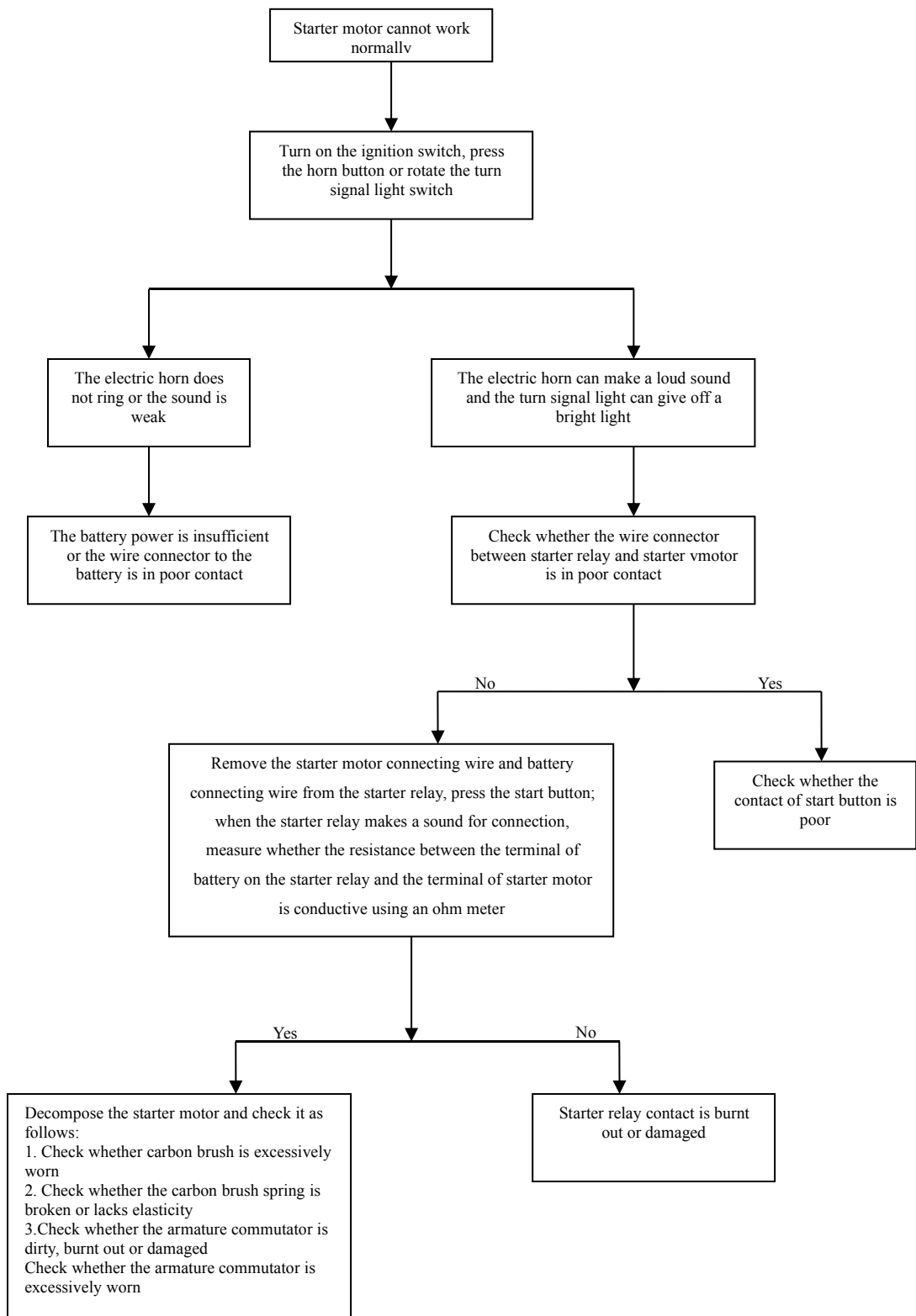


Diagnostic procedure for the fault that starter motor does not work

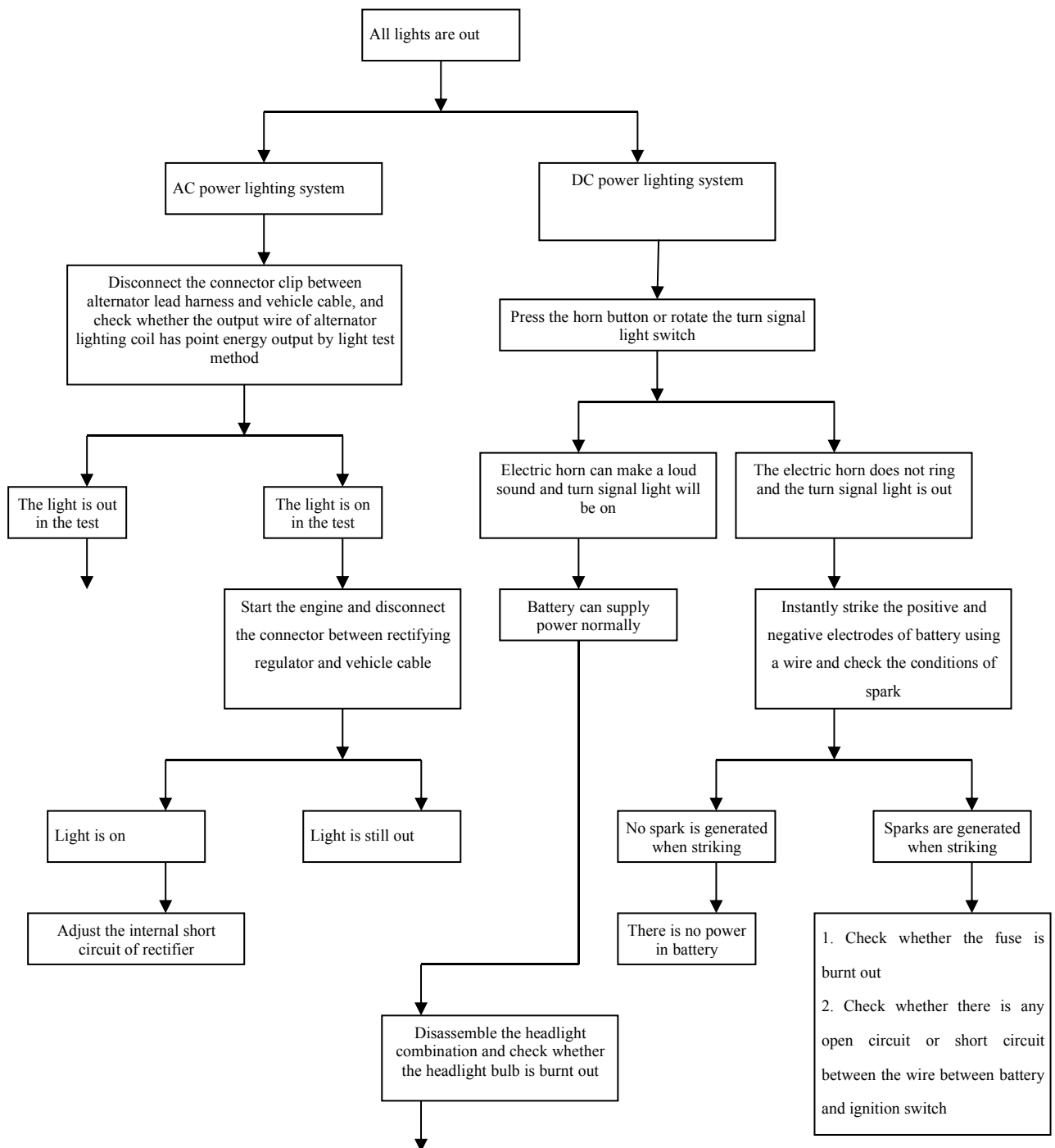


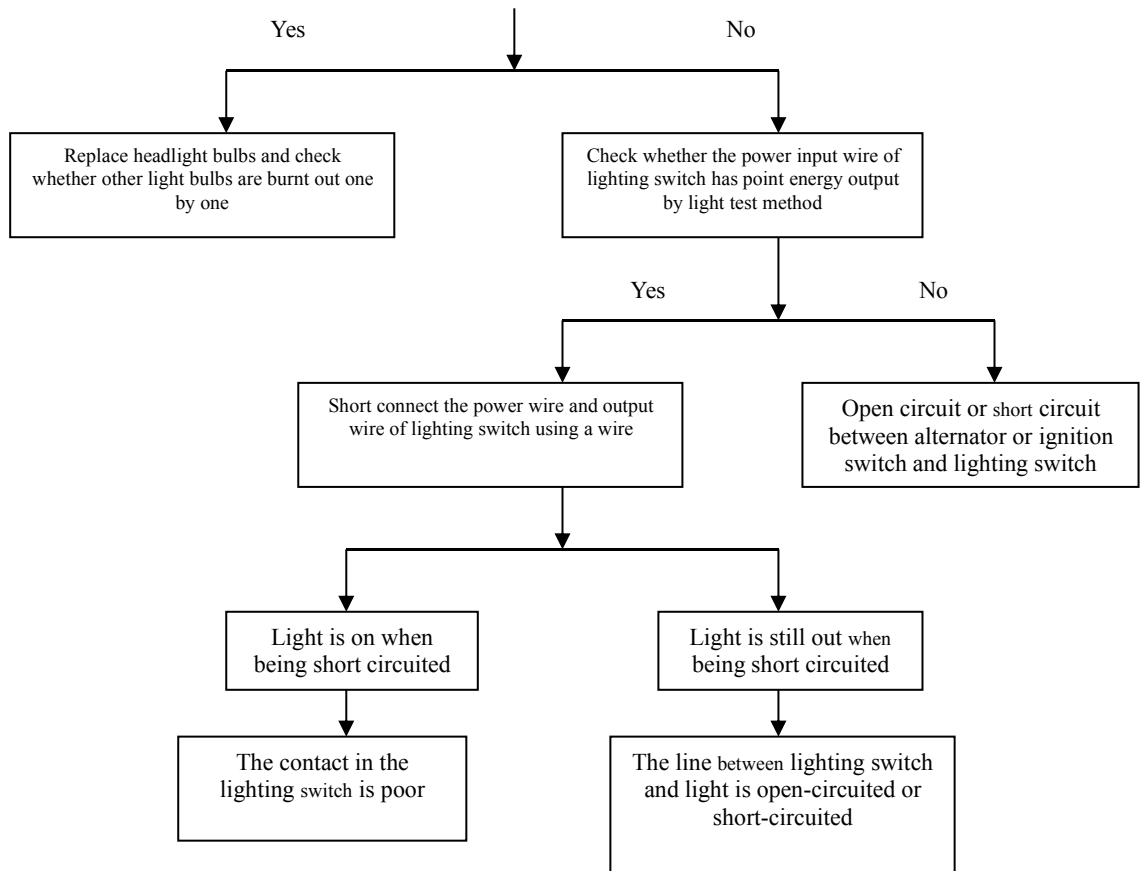


Diagnostic procedure for the fault that starter motor cannot work normally

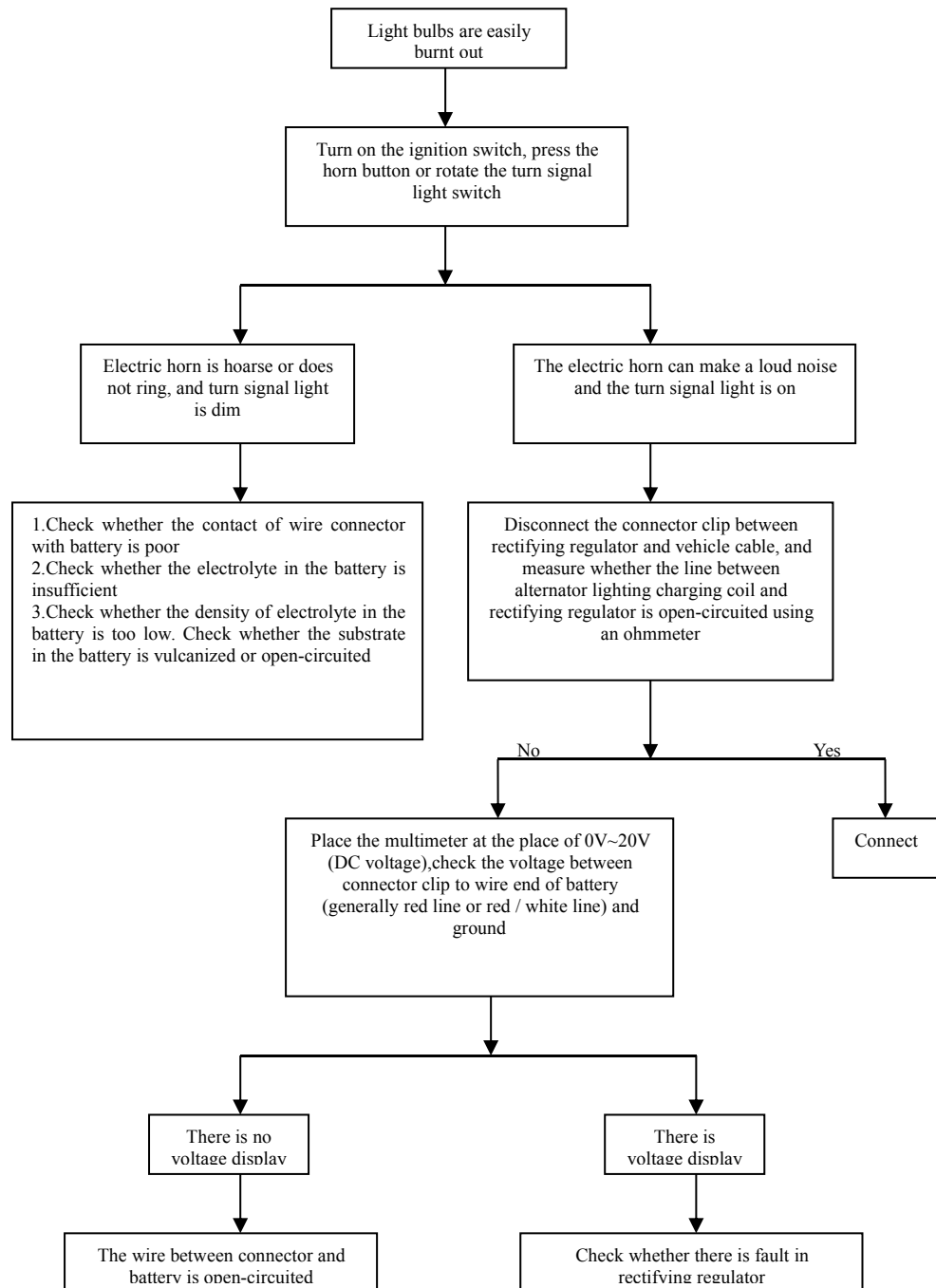


Diagnostic procedure for the fault that all lights are out

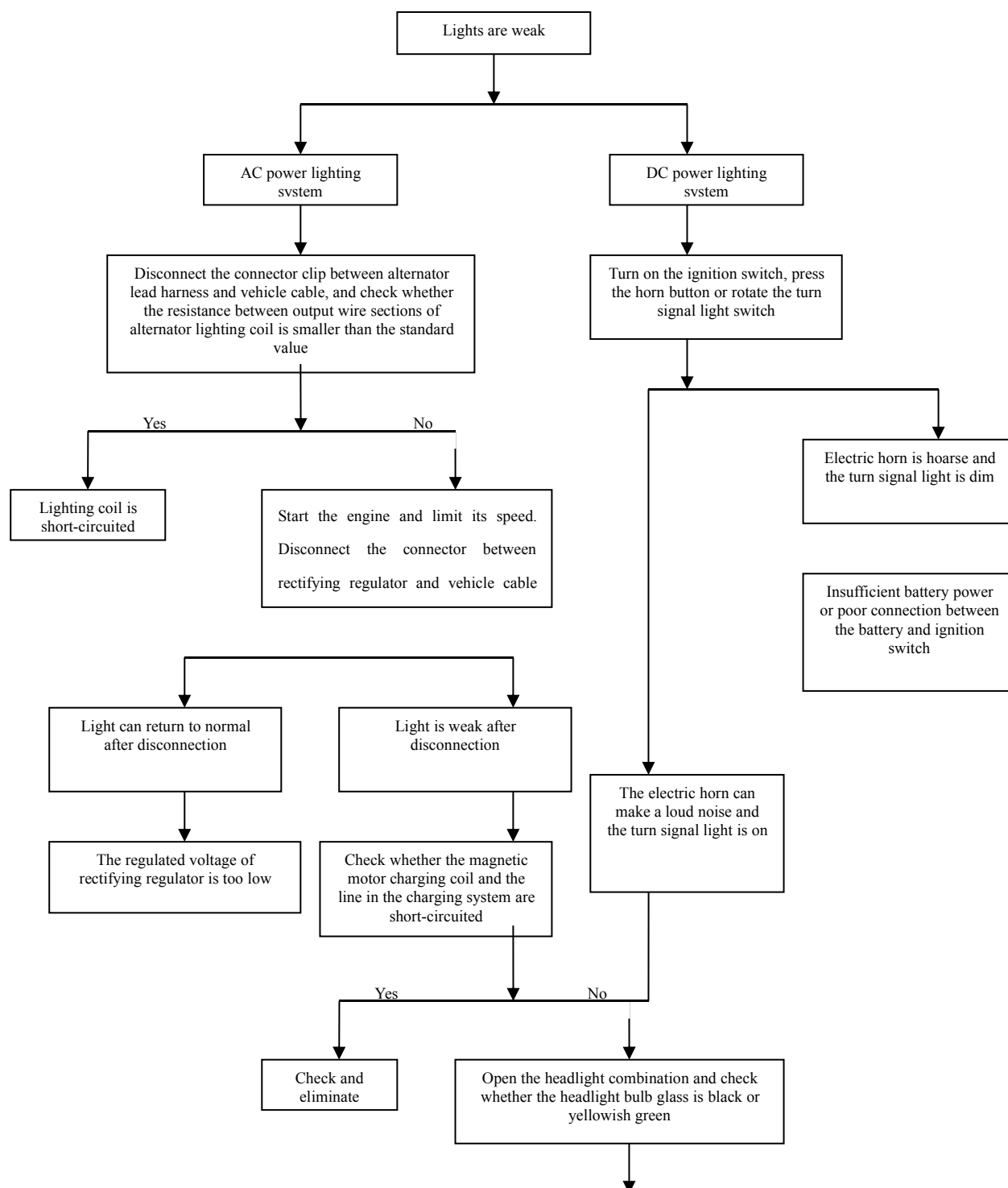


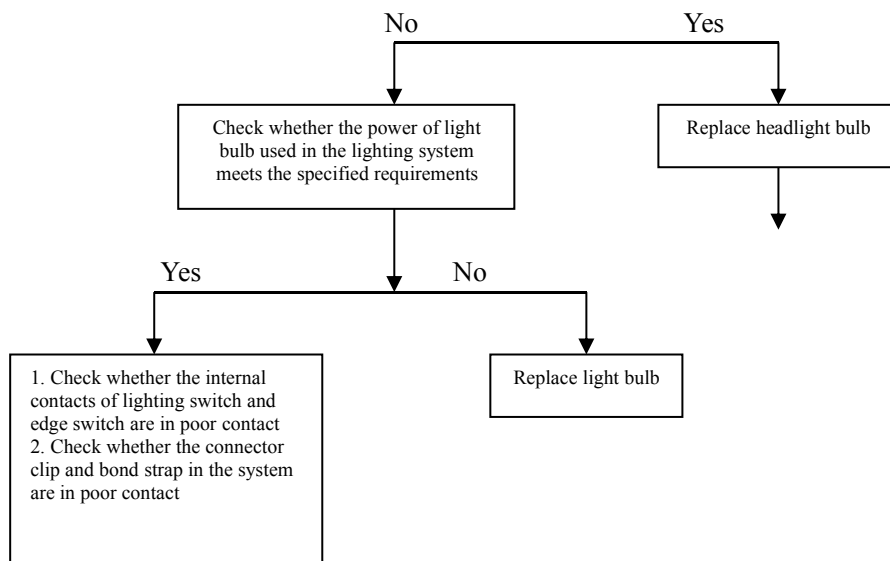


Diagnostic procedure for the fault that light bulbs are easily burnt out



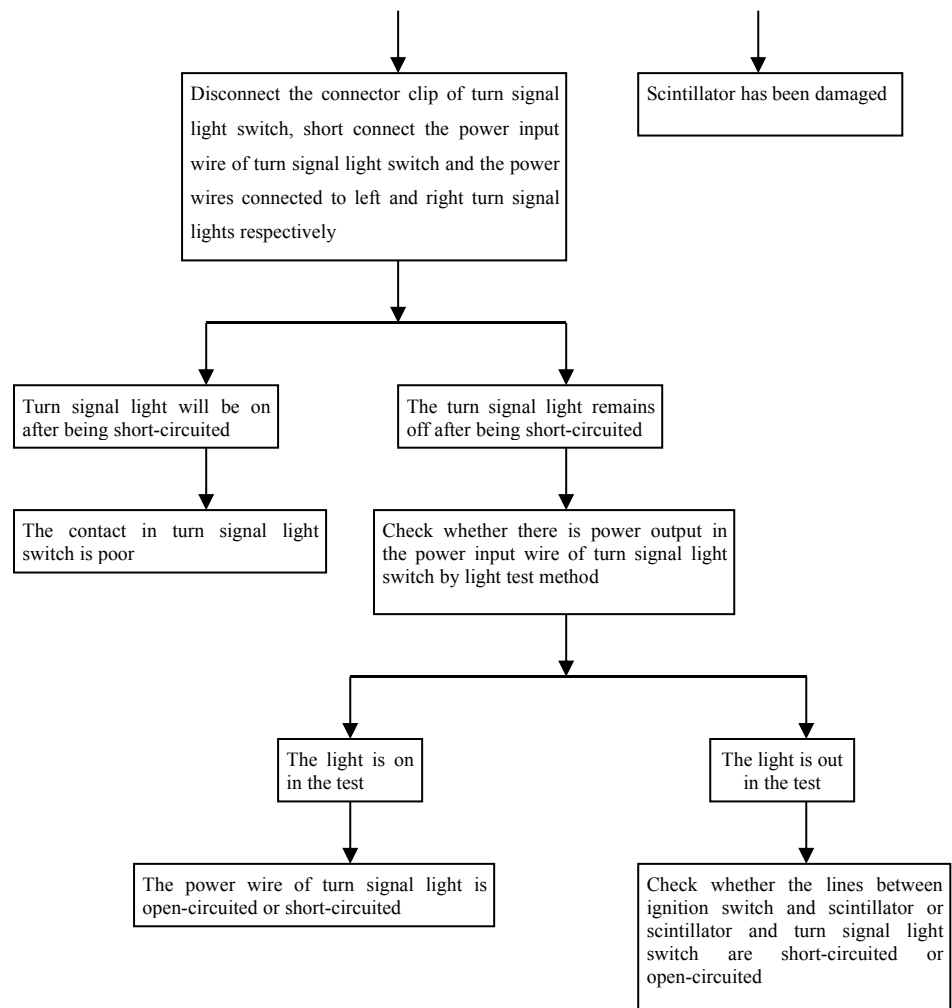
Diagnostic procedure for the fault that lights are weak



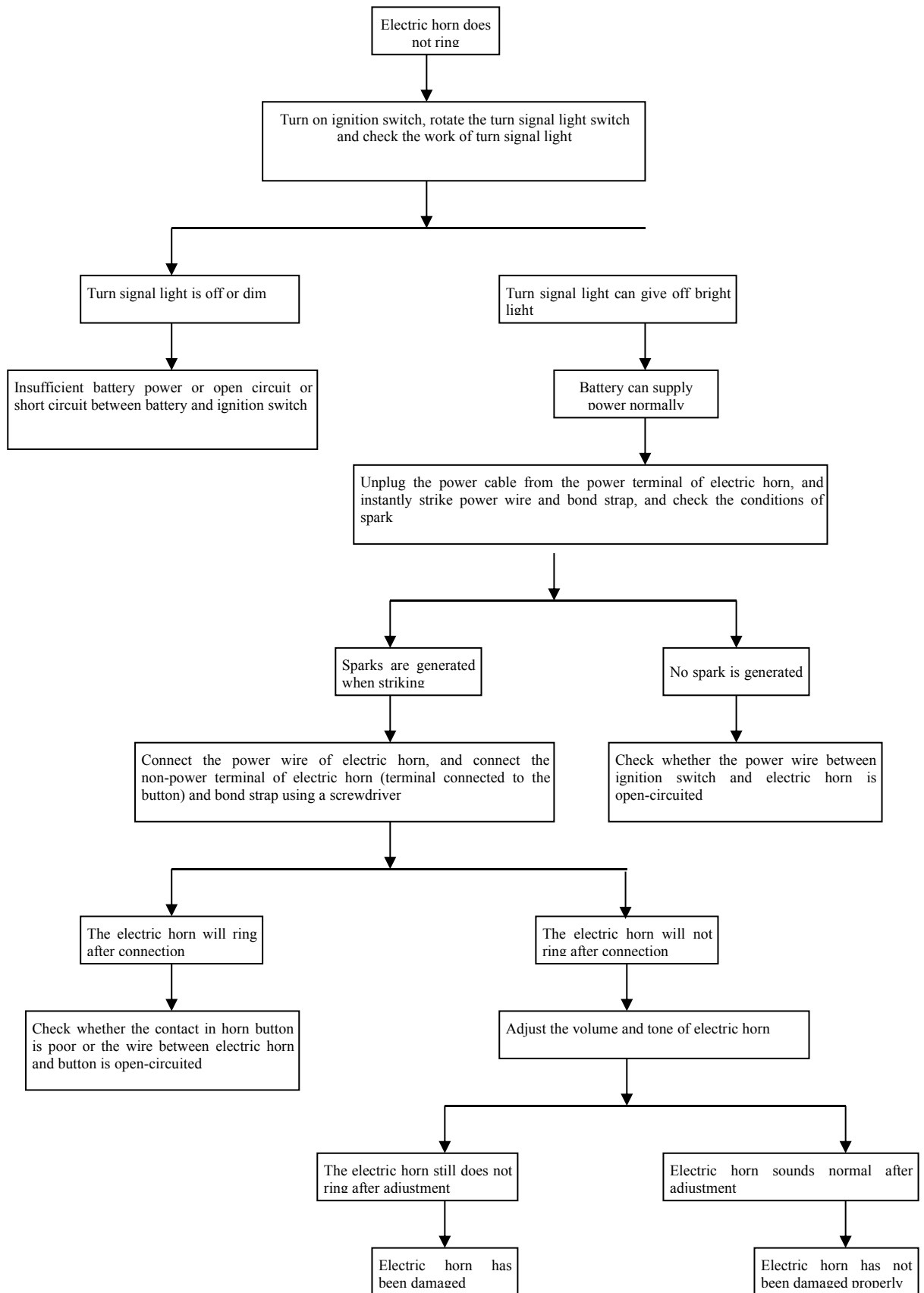


Diagnostic procedure for the fault that turn signal lights are out

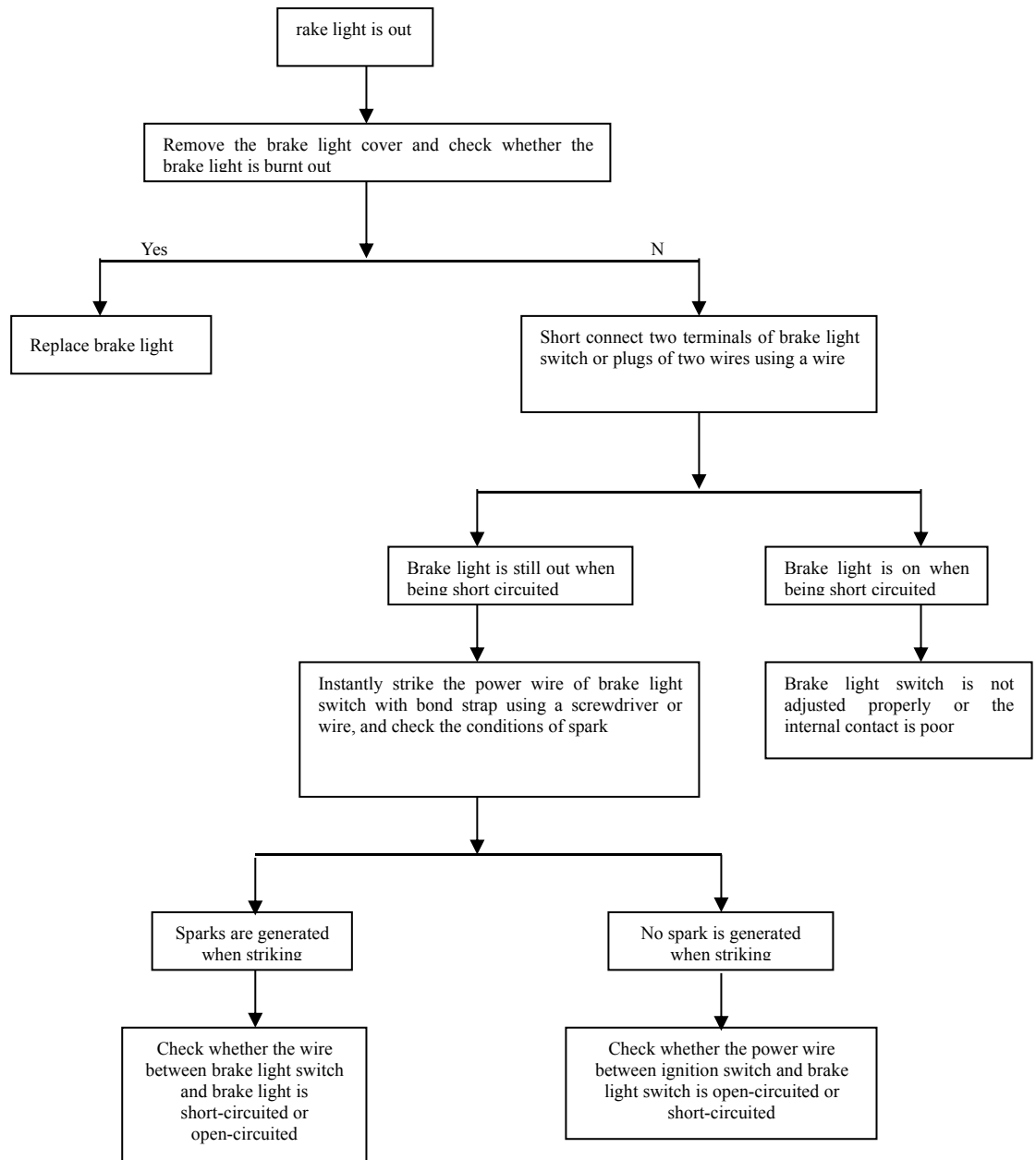




Diagnostic procedure for the fault that electric horn does not ring



Diagnostic procedure for the fault that brake light is out



Inspection / adjustment

Preparatory information	Inspection of brake fluid for leakage
Regular maintenance checklist	Inspection of brake
Engine Oil/Filter	Inspection of brake fluid level
Inspection/adjustment of throttle cable	Inspection of wear of brake pad
Air Cleaner	Inspection of brake light switch
Spark plug	Headlight
Accumulator	Clutch
Ignition timing	Front/rear suspension system
Cylinder pressure	Bolt/nut/fixture
Gear oil	Rim / tire
Driving belt	Steering Column Bearing and Handlebar Fixator
Free stroke of front/rear brake	

Preparation standard

Common

Warning!

- Before the engine is running, make sure that the surrounding air is well ventilated. Do not start the engine in a confined place, because exhaust gas contains carbon monoxide which may cause people to lose consciousness or die.
- Under certain conditions, gasoline is volatile and explosive. Workplaces must be ventilated and flame should be extinguished. Smoke and fire are strictly prohibited in the workplace or the place where gasoline is stored.

Specifications

Engine

Idle speed	1500±100rpm/min
Spark plug gap	0.6~0.7mm
Spark plug specifications	B7RTC
Compression pressure of cylinder	1.25Mpa/1400rpm
Ignition time	BTDC 12 degrees ±1 degree 1500±100rpm

Motorcycle body

Free stroke of front brake lever		10～20mm		
Free stroke of rear brake lever		10～20mm		
Tire pressure unit: Kpa		Specifications		Tire pressure
		Front wheel	80/80-14	190±10kpa
		Rear wheel	100/70-14	210±10kpa
Torque value	Front axle locknut	55～62 N·m		
	Rear wheel mounting nut	100～113 N·m		

Regular maintenance checklist

	Maintenance mileage and time		1000 KM	Every 3000 KM	Every 6000 KM	Every 12000 KM	Every 14500 KM	Tools
	Inspection items	New motor cycle	One month	Three months	Six months	Twelve months	Fifteen months	
*	Air Cleaner	I		C	C	R	C	General tools
*	Gasoline filter	I			I	R		General tools
*	Oil filter	C			C	C		General tools
	Replacement of engine oil level gauge	R	Replaced once every 3000KM					General tools
	Tire pressure	I	I	I	I	I	I	Tire pressure gauge, inflator
	Battery inspection	I	I	I	I	I	I	Hydrometer, multimeter
	Actuation clearance inspection	I	I	I	I	I	I	General tools
	Handlebar loosening inspection	I			I	I		General tools
	Shock absorber operation inspection	I			I	I		General tools
	Inspection of bolt loosening at all parts	I	I	I	I	I	I	Torque wrench
	Inspection of gearbox for oil leakage	I	I	I	I	I	I	General tools
*	Inspection or replacement of spark plug	I		I	R	R	I	General tools
*	Replacement of gearbox oil	I	Replaced once every 5000KM					General tools
	Lubrication of parts of body				L	L		Oil lubricator
	Muffler	I	I	I	I	I	I	General tools
*	Ignition timing	I	I	I	I	I	I	Timing light
*	Throttle	A	I	A	A	A	A	Tachometer CO HC analyzer
*	Idle exhaust gas inspection	A	I	A	A	A	A	
*	Throttle inspection	I		I	I	I	I	General tools
	Fuel pipeline inspection	I		I	I	I	I	General tools

	Electrical equipment of lighting instrument	I	I	I	I	I	I	Visual multimeter
	Side stand of main footpeg	I			I	I		General tools
	Dampers			I	I	I	I	General tools
*	Engine bolt torque	I		I	I	I	I	Torque wrench
	Front/rear brake			I	I	I	I	General tools
	Driving belt		Every 8000km: I every 24000km: R					General tools
	Clutch			I	I	I	I	General tools
*	Valve		I	I	I	I	I	Feeler gauge
*	Front brake hydraulic hose		I	I	I	I	I	General tools
			Replace it once every four years					
*	Front brake hydraulic oil		I	I	I	I	I	General tools
			Replace it once every two years					

Expected inspection

1	Ignition system – If there is obviously abnormal continuous ignition, engine misfire, post-ignition overheating or other phenomena, conduct maintenance inspections.
2	Carbon removal – If there is an obvious lack of horsepower, remove the carbon from cylinder head, piston head and exhaust system.
3	Piston, cylinder – If cylinder is excessively worn, please replace it with a new one.

Please go to dealers regularly for inspection and adjust it to ensure the best conditions. The table above is based on the monthly mileage of 1,000 kilometers.

I—Inspection A—Adjustment R—Replacement C—Cleaning L—Lubrication

Note: 1. “*” is the item in which exhaust emissions are involved. Normal maintenance must be conducted in accordance with the provisions of the State Environmental Protection Agency and the Company’s operating instructions, and it should not be adjusted and repaired without approval, otherwise, we will not assume any responsibility for it.

2. When riding on gravel roads or under severe environmental pollution conditions, add the number of cleaning air filter to extend the service life.

3. Maintenance frequency should be added to the motorcycles which often run at a high speed and have a large mileage.

Engine Oil/Filter

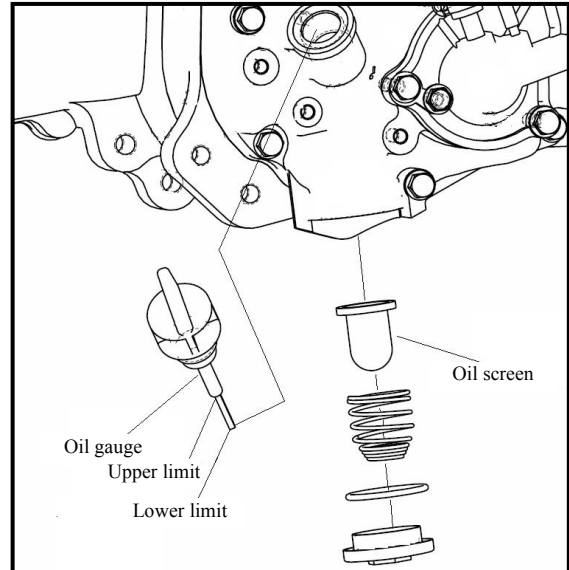
Oil level

*Note

- When checking the oil level, the motorcycle must be parked on a flat surface.
- Check the oil level after the engine has run for 2-3 minutes or been parked for about 2-3 minutes.

Check the oil level.

When the oil level is at the position below the lower limit, replenish the oil to the upper limit.



Oil replacement

*Note

When the engine is warmed up, the oil may flow out more easily.

Turn off the engine.

Remove the oil drain bolt from the bottom of crankcase and drain the oil.

After the oil completely leaks out, install the oil drain bolts and seal washer after cleaning.

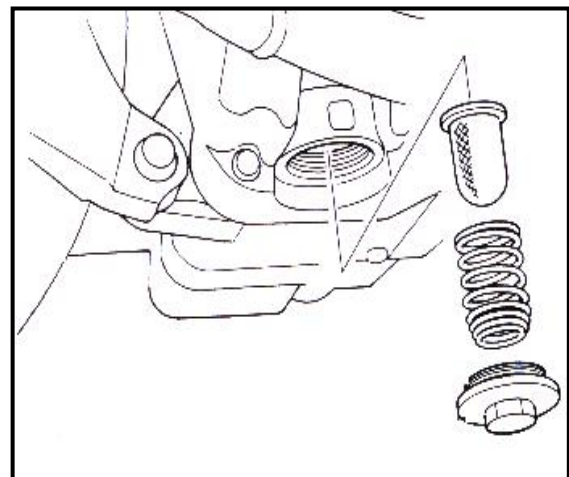
Supplement the oil to the specified capacity.

Add 700ML of oil to the crankcase for maintenance.

Oil trademark: SF, SAE 10W/40, SAE15W/40

Check for oil leaks, start the engine, and idle for several minutes.

Check the oil level.

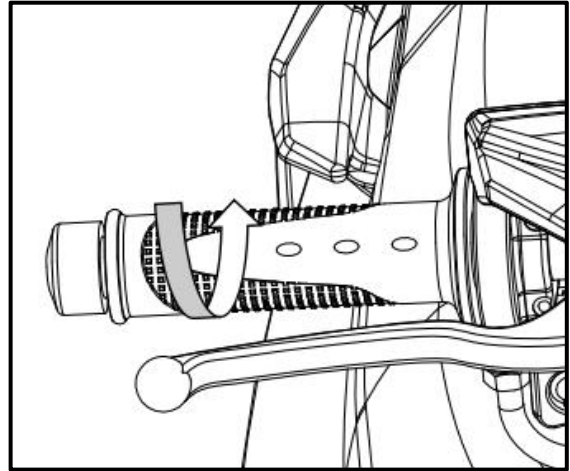


Inspection/adjustment of throttle cable

Check whether the throttle cable can be pulled smoothly.

Check the free stroke of throttle cable.

Free stroke: 5-10mm



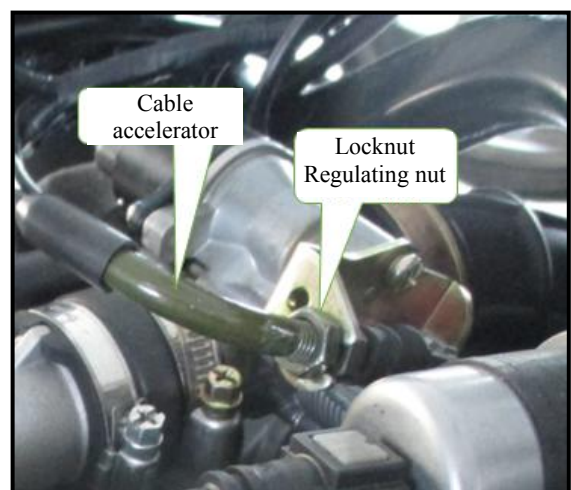
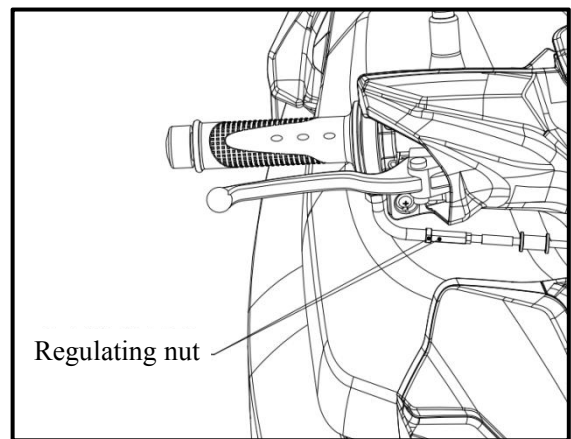
The main adjusted position is at the side of throttle valve.

Loosen the mounting nut, and then rotate the adjusting nut for adjustment.

★ If necessary, adjust the upper end of throttle cable as follows:

- (1) Remove the dust cover of throttle cable.
- (2) Loosen the locknut.
- (3) Rotate the adjusting nut until the free clearance of the throttle grip is 5 - 10 mm.
- (4) Tighten the locknut.
- (5) After adjusting the free stroke, rotate the lever to the left and right to confirm whether the idle speed of engine has changed.

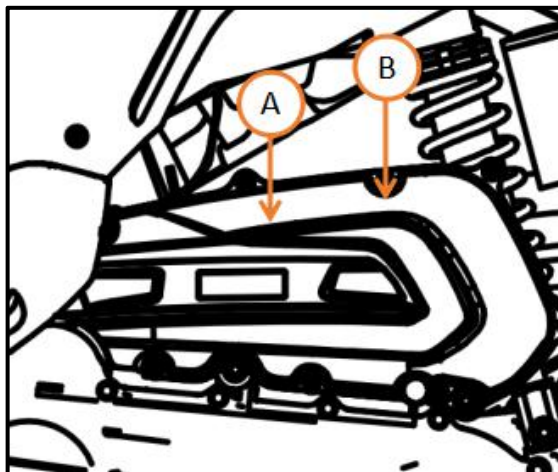
If the upper end of adjusting throttle cable cannot reach the specified free gap, adjust the lower end of throttle cable. The steps are the same as the procedures for adjusting the upper end of throttle cable.



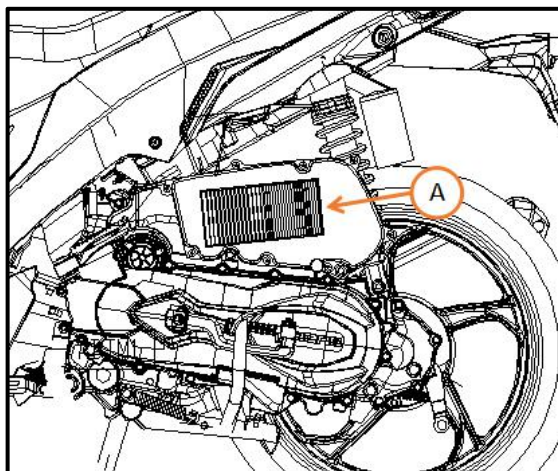
Air Cleaner

Filter element replacement

Remove the mounting screw at air filter cover [B].
Remove the upper cover of filter [A].

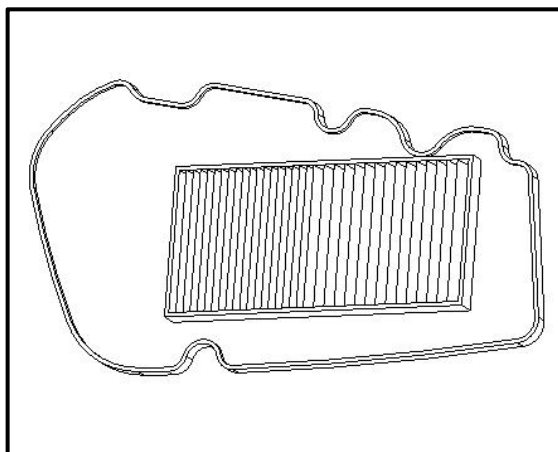


Remove the element [A] from the filter.



Check whether the filter element is contaminated or damaged.

If there is any contamination and damage, please replace it with a new one.



Installation

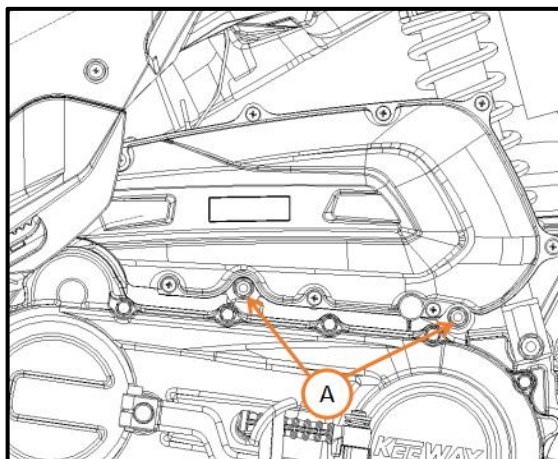
It should be conducted in the reverse order of disassembly

Time of filter element replacement

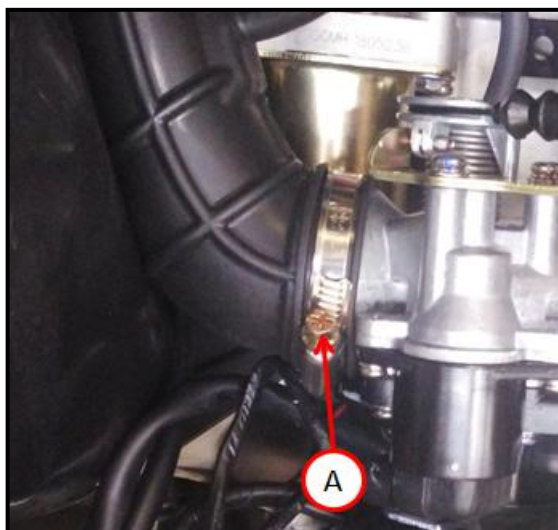
If motorcycle often runs on bad roads or in rainy days, it should be replaced ahead of time.

Remove air filter

Remove air filter mounting bolt [A]

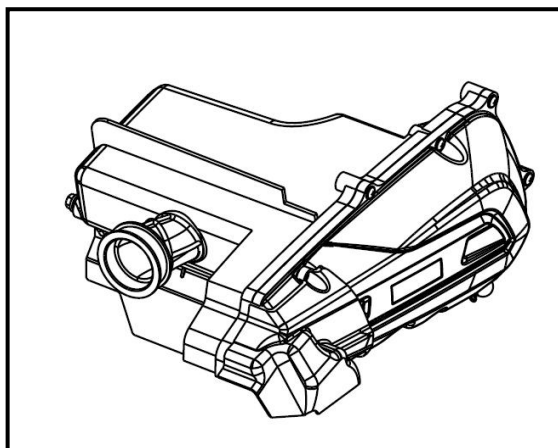


Remove the clamp assembly [A].



Remove the filter.

Check whether the filter is contaminated or damaged.
If there is any contamination and damage, please replace it with a new one.



Installation

It should be conducted in the reverse order of disassembly

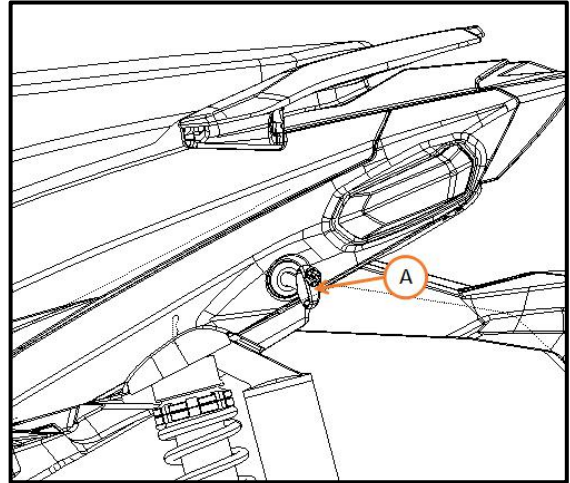
***Note**

•Make sure whether the air filter has been installed before installing air filter cover.

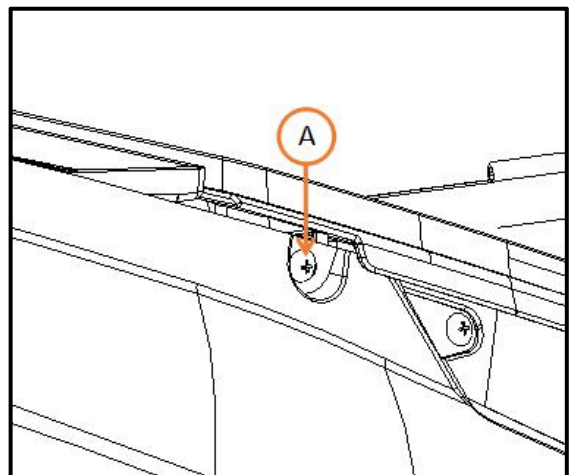
Spark plug

Disassembly

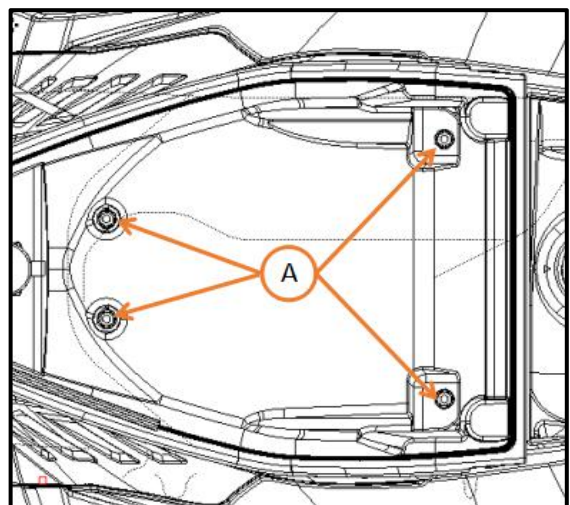
Open the seat cushion lock using the key [A] and turn up the seat cushion.



Remove the mounting screw [A] at the front bracket of left and right protectors.



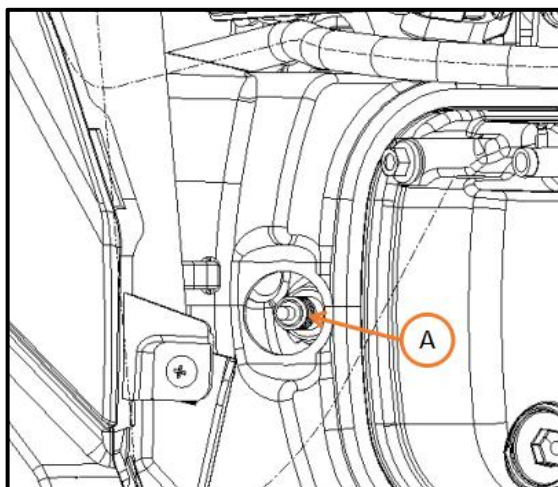
Remove the mounting bolt [A] on the helmet barrel and disconnect the USB cable plug when removing the helmet barrel.



Remove the spark plug cap [A].



Remove the spark plug [A].



Inspection

Check spark plug for burning, contamination and carbon deposition.

In the above cases, clean it a wire brush or spark plug cleaner.

*Note:

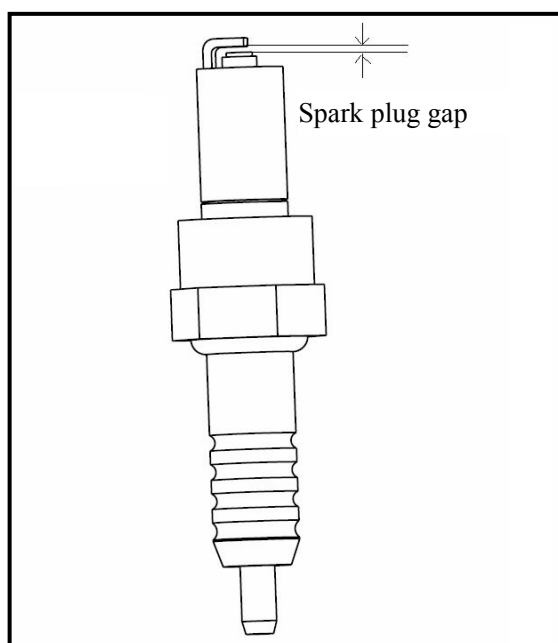
Clean the spark plug using the compressed air to ensure that no debris falls into the combustion chamber.

Remove spark plug using spark plug wrench or alternative tool.

(1) Check:

Conduct the following inspections and replace the parts when necessary

- Whether insulator is damaged
- Whether electrode is worn
- Burning conditions, color
 - If it is light gray, combustion conditions are good.



—If it is pale white, ignition system is out of order or the mixture is too thin.

—If it is damp or black with carbon deposit, the mixture is too thick.

Check the spark plug visually.

If there is crack or wear in the insulator, please replace it with a new one.

(2) Reuse of spark plug

Clean the electrode of spark plug with a wire brush or spark plug cleaner. Check the gap between the central electrode and the side electrode of spark plug with a steel feeler gauge.

If necessary, carefully bend the side electrode to adjust the gap.

Spark plug model: B7RTC

Gap: 0.6-0.7mm

Reinstall the spark plug on the cylinder head and tighten it according to the specified torque.

Caution: to prevent the cylinder cover from being damaged, first screw the spark plug with the heads and then tighten it with a wrench according to the specified torque.

Torque value:

Spark plug 10-15N·m

(3) Replace the spark plug

Adjust the spark plug clearance to the specified value with a steel feeler.

Be careful: Do not screw the spark plug too tightly.

Install and tighten the new spark plug manually.

Tighten it by 1/2 turn after sealing washer has touched spark plug hole.

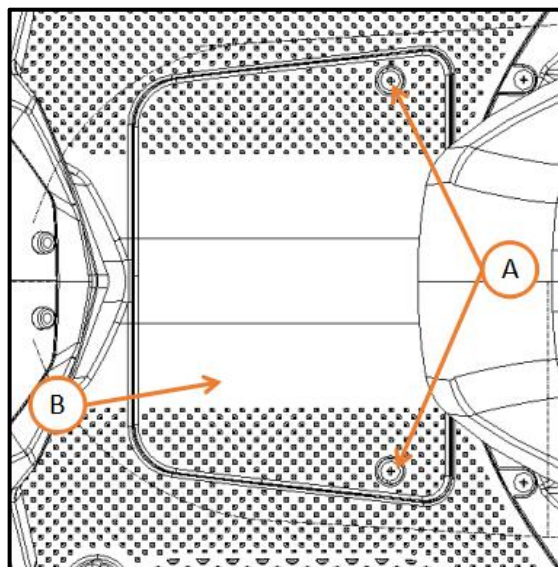
***Note**

Before installing spark plugs, clean the surfaces of spark plugs and seal washer.

Accumulator

Battery disassembly

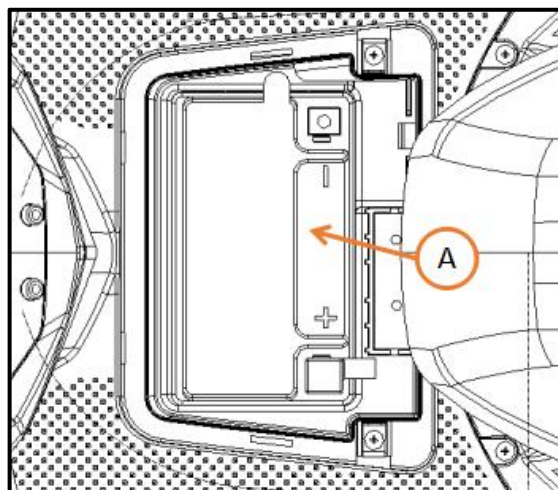
Remove the screw [A], and open the storage battery cover [B].



Remove the negative lead and then the positive lead.
Remove the battery [A].

Warning!

When disassembling the positive electrode, tools should not touch the frame, otherwise, short circuit and sparks may be caused and thus gasoline may ignite, and battery may be damaged, which are very dangerous.



Installation of Battery

It should be conducted in the reverse order of disassembly.

Warning!

To prevent short circuit, first connect the positive electrode and then the negative electrode.

Inspection of charging state (closed-circuit voltage)

Open the storage battery cover.
Remove battery retainer assembly.
Remove the negative lead and then the positive lead.
Take out the battery.

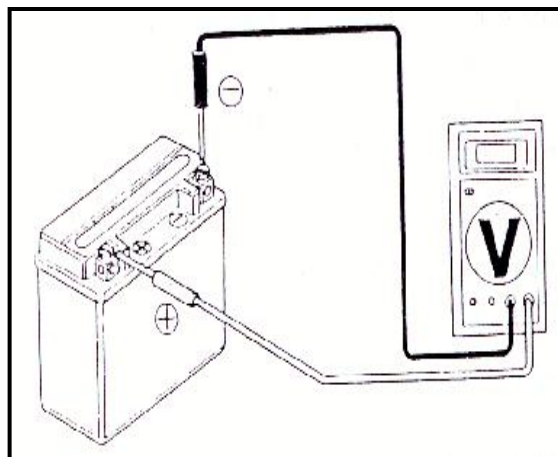
Measure the voltage between battery terminals.

Fully charged: 13.1V

Undercharge: 12.3V

***Note**

Inspection under the charged state must be conducted using a voltmeter.



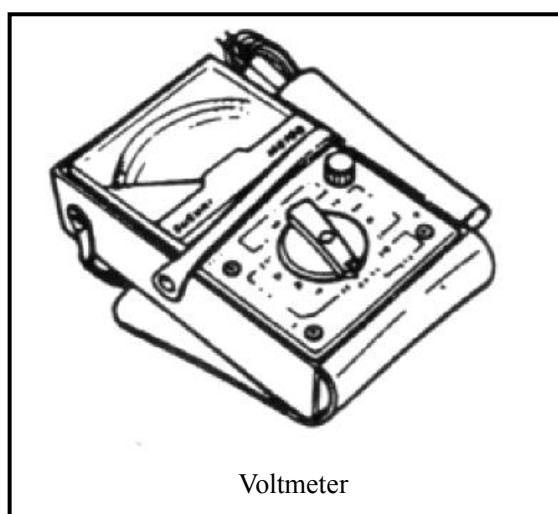
Charging

Connection method: The positive electrode of charger is connected to the positive electrode of battery.

The negative electrode of charger is connected to the negative electrode of battery.

Warning!

- Never use a source of ignition near batteries.
- First turn off the charger switch before starting charging or after completing charging. to prevent sparks at the connection position and avoid the danger of explosion.
- In the process of charging, conduct the standard operation according to the current time marked on the battery.



***Note**

- Battery cannot be used generally during the quick charging of battery, except in emergencies.
- Measure the voltage 30 minutes after charging.

Charging current: Standard: 0.6A

Quick: 6.0A

Charging time: Standard: 10-15 hours

Quick: 30 minutes

**Completion of charging: open circuit voltage:
12.8V or more**

Ignition timing

*Note

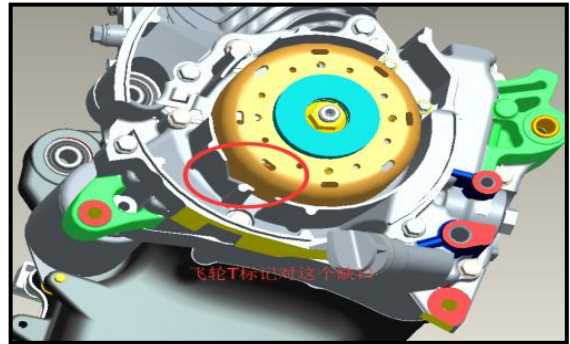
Check the ignition system when the ignition timing is incorrect.

Remove the mounting bolt.

Remove the end cover of alternator.

Check whether engine ignition is conducted in correct time using ignition timing light

- Check whether the "T" mark on the top dead center of flywheel is aligned at the mark on the top dead center of box. At the same time, the crankshaft is flexible and cannot be stuck by the chain. Adjust the timing chain, so that the timing driven sprocket on the camshaft is parallel to the upper plane of cylinder head.



Cylinder pressure

Implement it when warming up the engine.

Remove the seat and motorcycle protector.

Remove the spark plug.

Install the pressure gauge of upper cylinder.

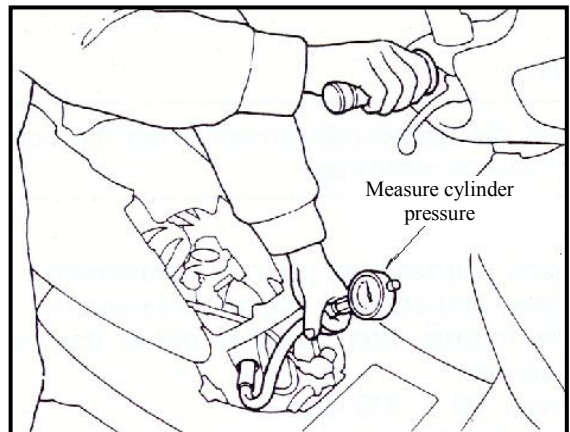
Rotate the throttle handle to the fully open position and run the starter motor to measure the cylinder pressure.

Compression pressure: 1.25Mpa/1400rpm

When the compression pressure is too low, inspect the following items:

- Washer of cylinder head for damage
- Piston ring for damage
- Piston ring for wear
- Piston, cylinder and valve for wear

Check whether there is excessive carbon deposit in combustion chamber and piston top when compression pressure is too high.



Gear oil

Inspection

***Note**

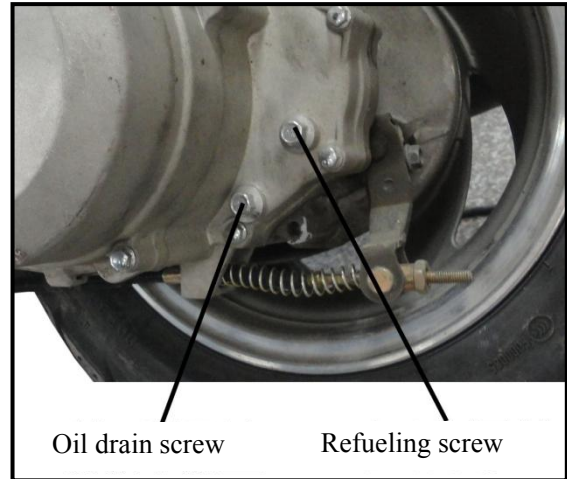
When checking the oil level, place the center stand at the flat floor and make the motorcycle body vertical.

Remove the gear oil inspection bolt after the engine stops.

The working conditions are normal when the oil level is below the lower limit of inspection bolt hole.

Please supplement gear oil when the oil amount is too small.

Install gear oil inspection bolt.



***Note**

Confirm the bolt airtightness and check whether there is slipping or damage.

Replace gear oil

Remove gear oil inspection bolt.

Remove the oil drain bolt to drain the gear oil.

Install the oil drain bolt.

***Note**

Confirm the bolt airtightness and check whether there is slipping or damage.

Open the refueling bolt

Supplement gear oil.

Check whether there is oil leakage at the positions after inspection.

Install gear oil inspection bolt.

Gear oil

Maintenance oil volume: 120mL.

Torque value:

Drain bolt 22~29 N·m

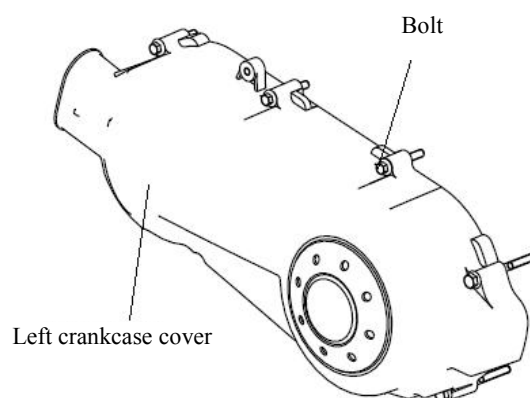
Driving belt

Remove the mounting bolt on the left crankcase cover.

Remove the left crankcase cover

Note:

Remove the mounting bolt in a staggered form.



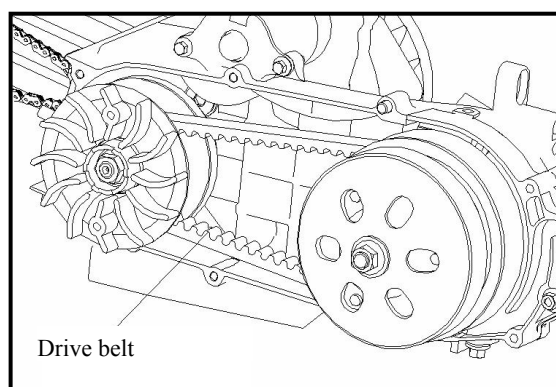
Check the drive belt for excessive wear

Replace it with a new one when necessary or regularly.

It should be conducted in the reverse order of disassembly.

Torque value:

Left crankcase cover mounting bolt 10~12N.m

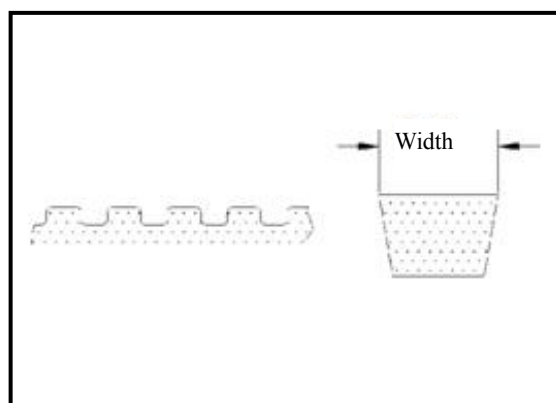


Measure the width of v-belt.

Allowable limit: 19 mm.

Note:

Please select the original parts when replacement.

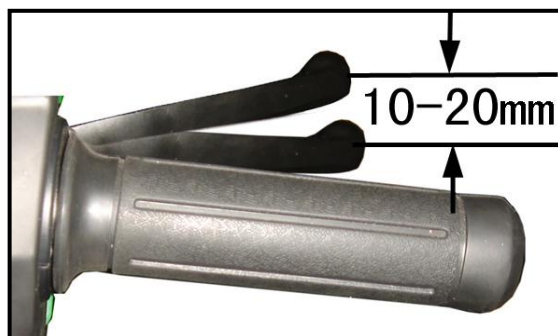


Free stroke of front/rear brake

Free stroke of front brake

Measure the free stroke of front brake lever at the tip of brake lever.

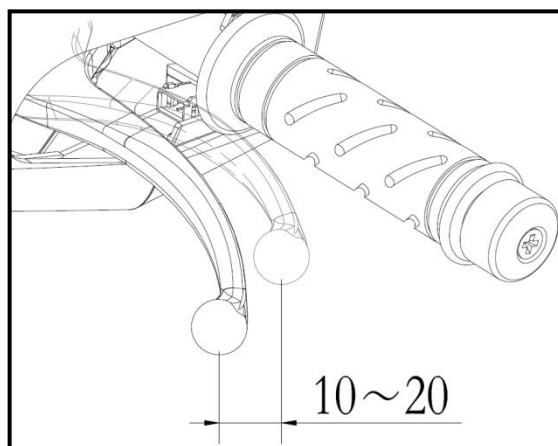
Free stroke: 10-20mm



Free stroke of rear brake

Measure the free stroke of front brake lever at the tip of brake lever.

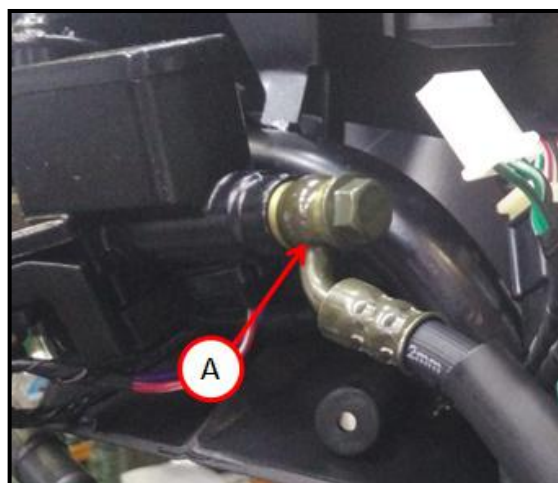
Free stroke: 10-20mm

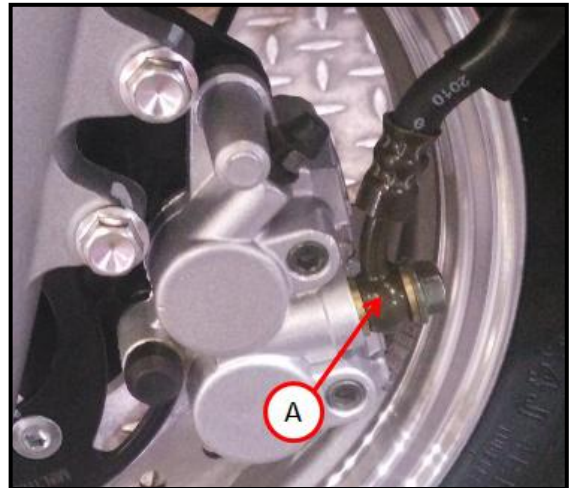


Inspection of brake fluid for leakage

●Rotate the brake lever to check whether brake fluid leaks from the brake hose [A].

★If brake fluid leaks from any position, check or replace the defective part.





Check brake hoses and brake lines for damage and ensure their installation status

- Remove: the headlight cover panel.
- Check brake hoses, brake lines and fittings for corrosion, cracks or leaks.
 - If the brake hoses and brake lines are not properly serviced, the high pressure inside the brake lines may cause brake fluid to leak [A] or the brake hoses and the brake forming tubes to burst. When checking rubber hoses, bend and twist them. When checking rubber hoses, bend and twist them.

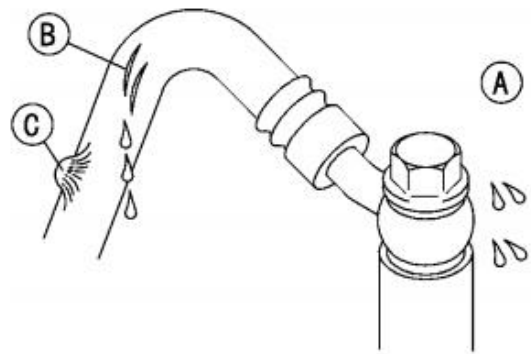
★ If any cracks [B], swelling [C] or leaks are found on the brake hose or brake forming tube, they must be replaced.

- Tighten all hollow bolts and nuts of brake hose.

Tightening torque for hollow bolt of brake hose:
30 N•m

- Check the winding method of brake hose.

★ If the brake hoses and brake lines are not wound correctly, please discharge brake hoses and brake lines by correct winding method.



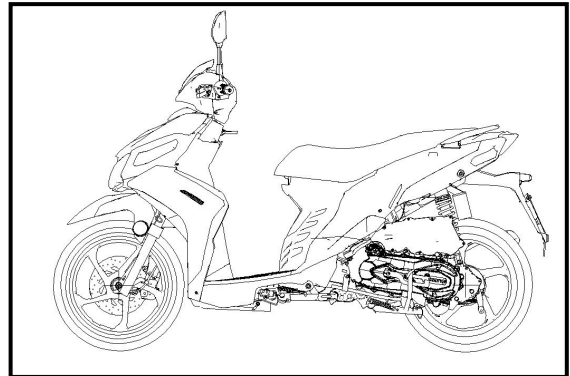
Inspection of brake

- Check whether front brake and rear brake are normal when riding a motorcycle on a dry road.

★ If the brake is abnormal, check the brake system.

Warning

If you need to test-ride a motorcycle during the inspection, make sure to do it at a place under safe traffic conditions.



Inspection of brake fluid level

- Check whether the level of brake fluid in the front brake fluid reservoir is higher than the lower limit [A].

Remarks

- When checking the brake fluid level, make the brake fluid reservoir level.

★ If the level is lower than the lower limit, add brake fluid to the reservoir until the liquid level reaches the high liquid level line.

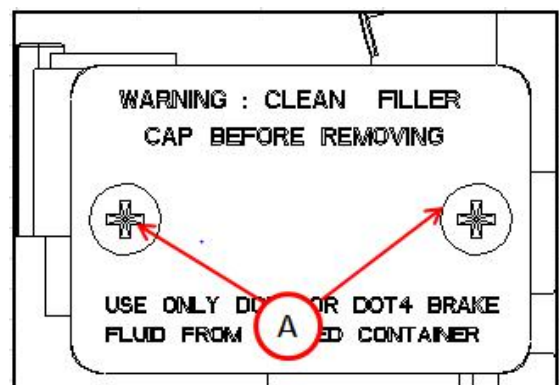


- After aligning the reservoir cover, tighten the two screws [A] of the reservoir cover with a screwdriver.

If you need to add brake fluid but are not sure about the type and brand of brake fluid in the brake fluid reservoir, you must replace the brake fluid in the brake fluid tube. After replacing brake fluid, use only brake fluid of the same type and brand.

Recommended disc brake fluid

Grade: DOT4



Inspection of wear of brake pad

Inspection of wear of brake pad

- Remove the brake pads (see “Disassemble front/rear brake pad” in chapter “Brake” for details).

- Check the thickness of friction plate of brake pad inside the caliper [A].

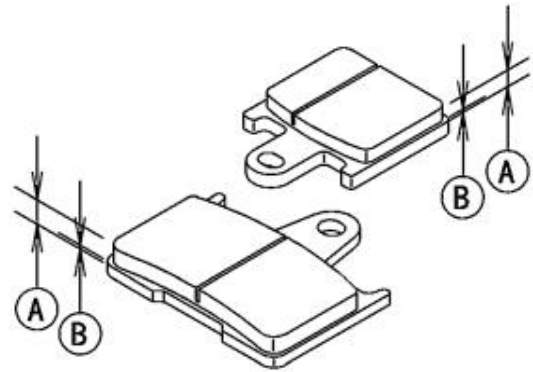
★ If the thickness of friction plate of any brake pad is lower than the operating limit [B], replace the two brake pads inside the caliper simultaneously.

Thickness of friction plate of brake pad

Standard:

Front wheel brake pad: 6.0 mm

Operating limit: 3 mm



Check the rear brake shoe for wear

Inspect the brake shoe assembly for wear and replace the brake shoe if necessary.

Measure the thickness of brake shoe and record the maximum value.

*Note

- Use a micrometer for measurement.

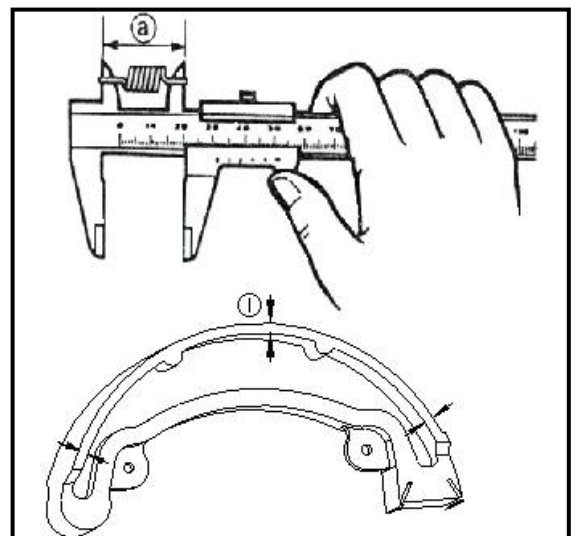
If the thickness of brake shoe is less than the maintenance value or contaminated by grease, it should be replaced.

Note:

Replace the brake shoes in pair.

Thickness of rear brake shoe 4.5mm

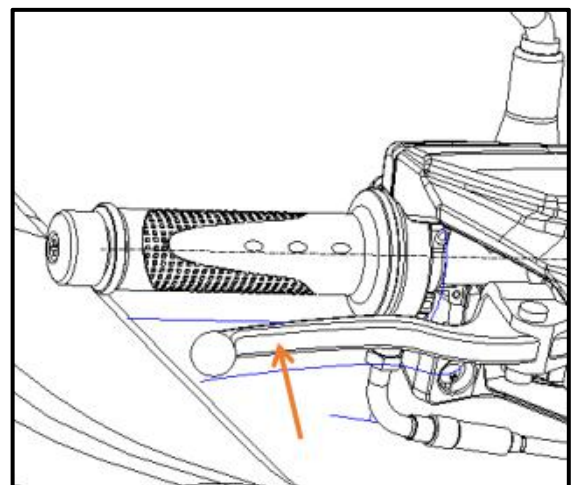
Allowable limit: brake shoe 3.0mm

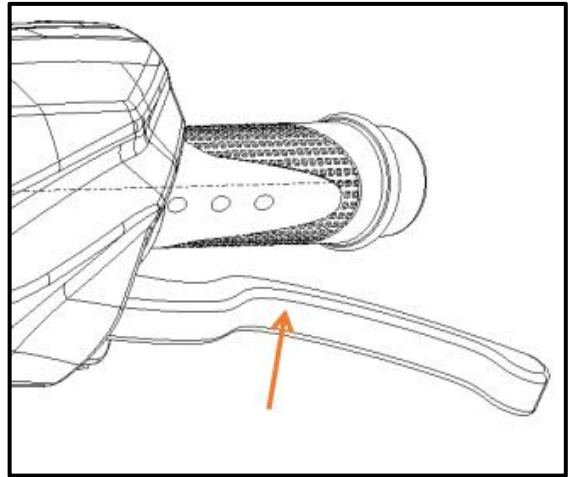


Inspection of brake light switch

- Open the electric door lock.

- When the brake lever is pulled by about 15 mm, the brake light is on.





★ If the brake light is off, check whether the brake light switch plug is inserted properly.

★ If the brake light is off, check or replace the following parts:

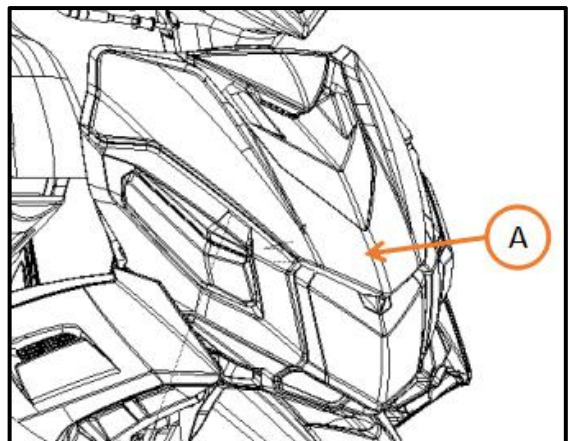
- Battery;
- Brake light;
- Fuse;
- Front brake light switch;
- Rear brake light switch;
- Cable harness.

Headlight

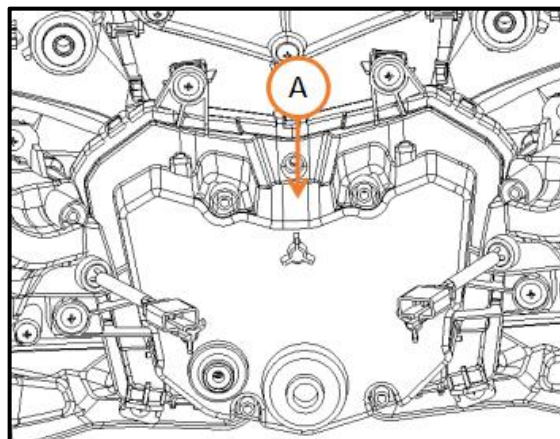
Disassembly

Remove the headlight cover panel [A].

Connect the headlight wire connector.



Remove the headlight [A].



Installation

It should be conducted in the reverse order of disassembly.

Clutch

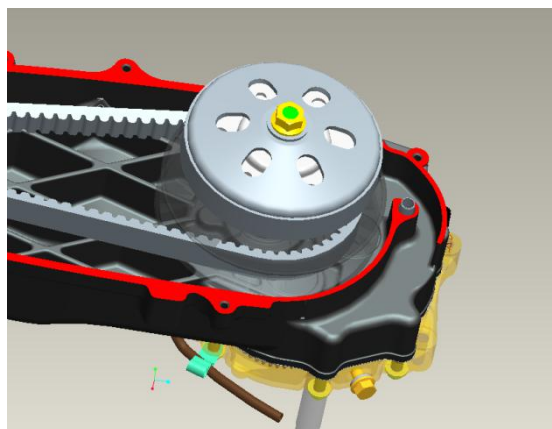
Start the engine and slowly increase the rotation speed to check the clutch operation, such as checking the clutch friction block when the motorcycle is not moving or the engine is out.

Please replace it with a new one.

Clutch clearance: 10 ~ 20mm

Steps for replacing rear clutch:

- 1. Remove the locknut of rear clutch;**
- 2. Disassemble the rear clutch;**
- 3. Replace it with a new rear clutch;**
- 4. Lock the rear clutch nut.**



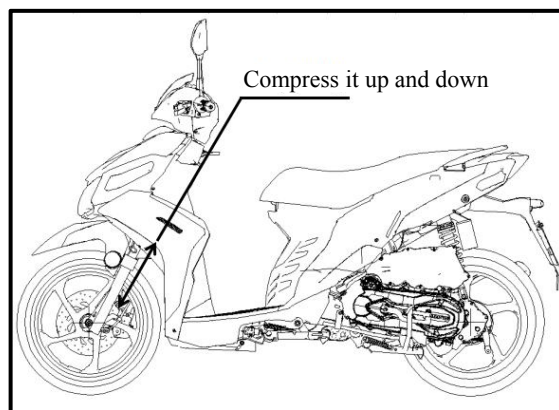
Torque value:

Clutch nut 50 ~ 60 N·m

Front/rear suspension system

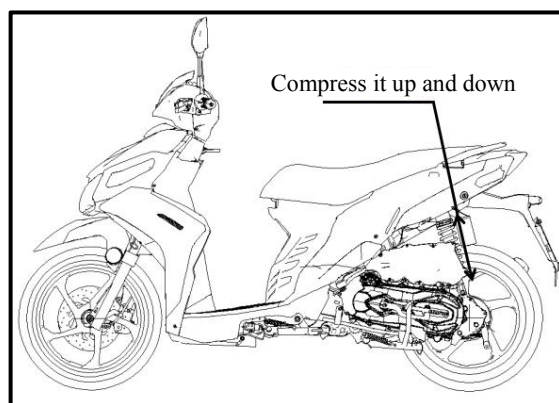
Front part

Tighten the front brake and compress the front shock absorber up and down to check the operation.
Check whether the front shock absorber leaks and its parts are damaged and loosened.



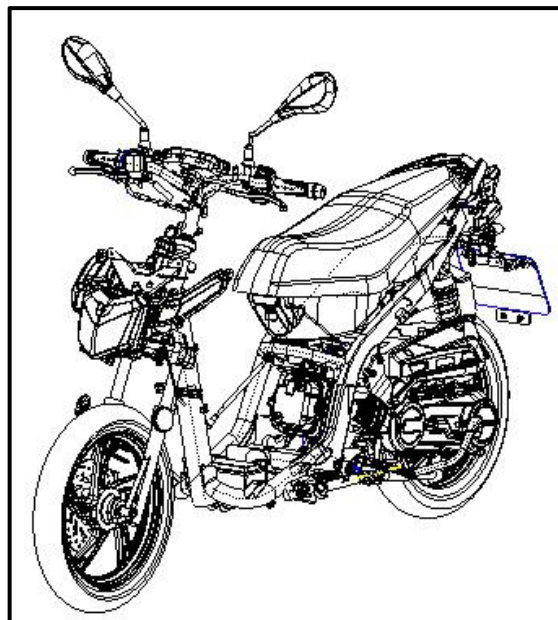
Rear part

Compress rear shock absorber up and down to check the operation.
Check whether the parts of rear shock absorber are damaged and loosened.
Suspend the rear wheel, and swing the rear wheel to check whether the engine suspension bushes are loosened.



Bolt/nut/fixture

Check whether the bolts, nuts and fixtures of various parts of motorcycle are loosened.
If they are loosened, tighten it to the specified torque value.



Front and rear wheel

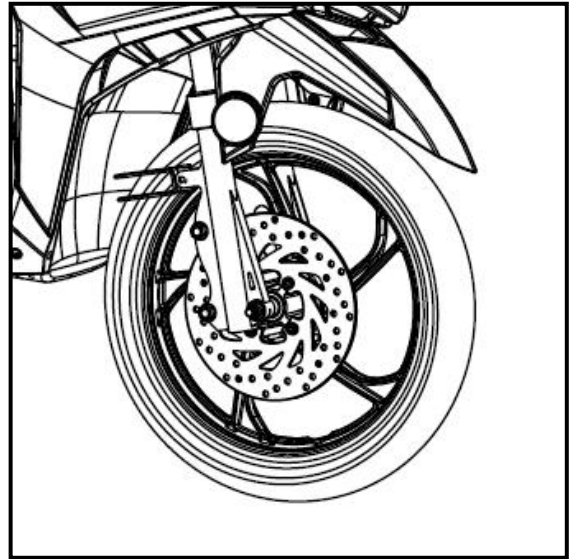
Check whether the front axle mounting nut is loose.
Check whether the rear axle mounting nut is loose.
If loose, tighten it to the specified torque value.

Torque value:

Front wheel axle locknut 55-62 N•m

Mounting nut of rear wheel 100-113 N•m

Name	Specifications
Front rim	MT1.6×14
Rear wheel rim	MT2.50×14



Front / rear tire

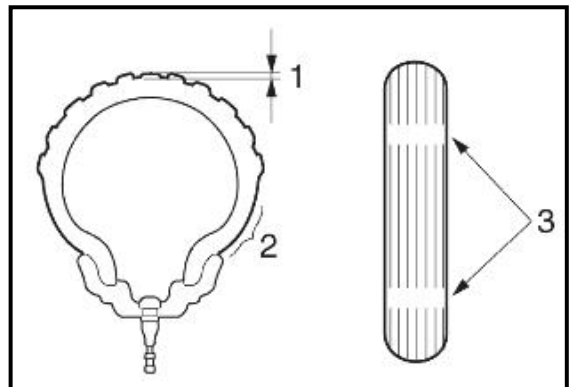
Check tires for cracks, iron nails or other damages.

Check tire surface

Wear → Replace

1. Tire tread depth
2. Side wall
3. Wear indication

Wear limit: 1mm



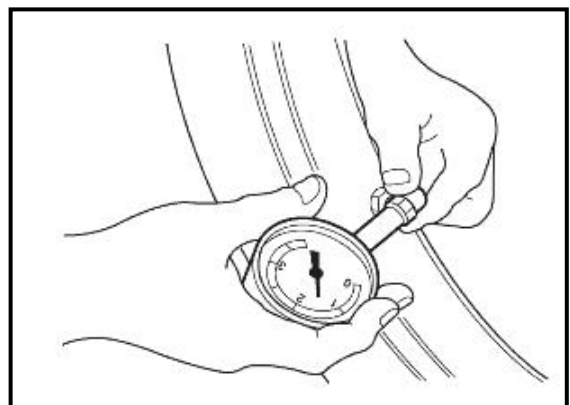
Check tire pressure.

*Note

Tire pressure measurement should be conducted at cold state.

Specified air pressure Unit: Kpa

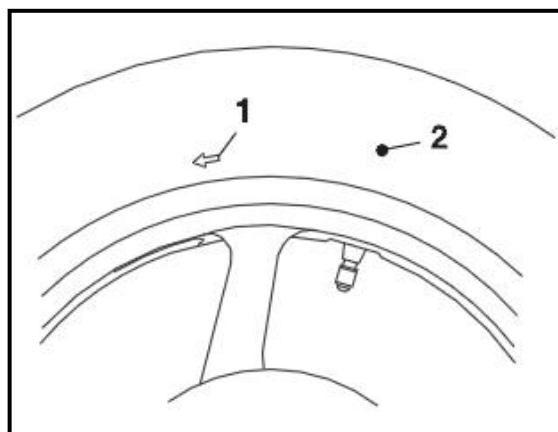
Gauge		Tire pressure
Front wheel	90/90 ~ 12	190±10
Rear wheel	3.50 ~ 10	210±10



Note

If there is a rotation direction at the tire, mark it with “1”

- Point the mark to the rotation direction when installing the tire.
- Align mark “2” to the installation position of rim valve

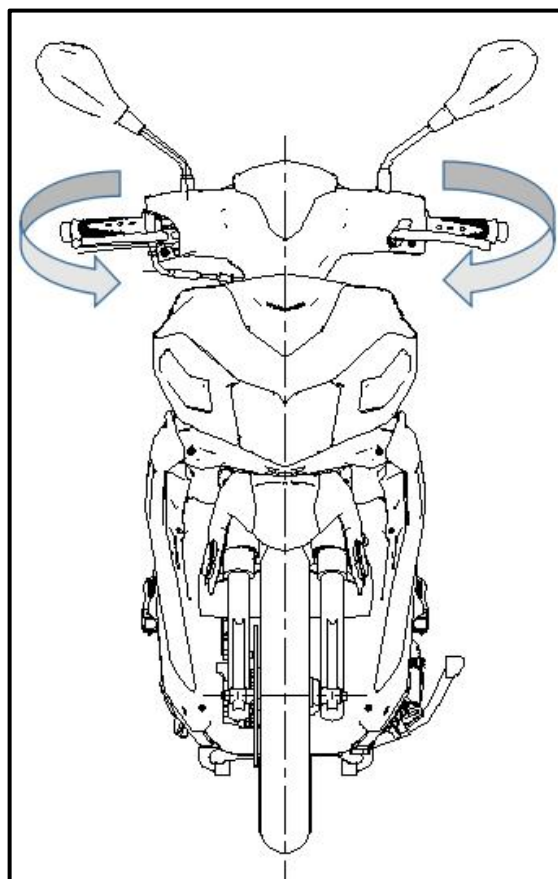


Steering Column Bearing and Handlebar Fixator

Swing the handlebar from side to side, and check whether wires are involved.

Rotate the front wheel, and freely swing the handlebar to confirm.

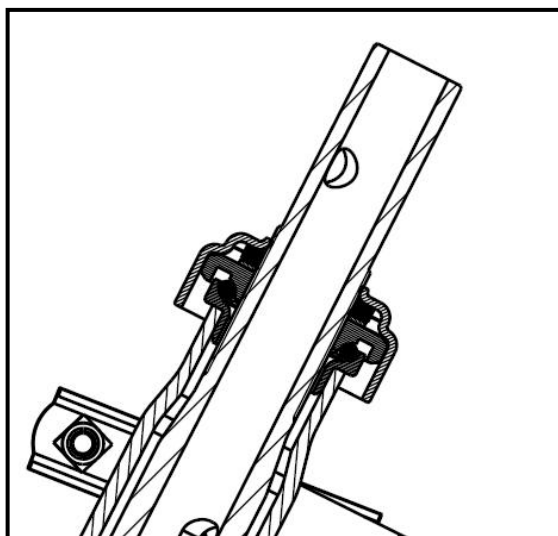
If the handlebar cannot be swung smoothly, check the steering column bearing when it is loosened.



Make the following adjustments

Steering nut [A]

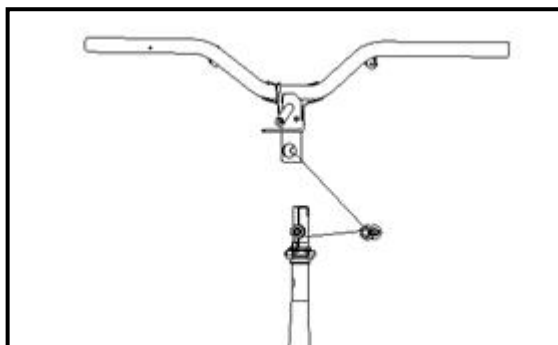
Disassemble handlebar (see “handlebar” in Chapter VII of this book for details)



Lock the steering nut using the steering nut wrench

Disassemble handlebar (see “front fork” in Chapter VII of this book for details)

Installation of handlebar

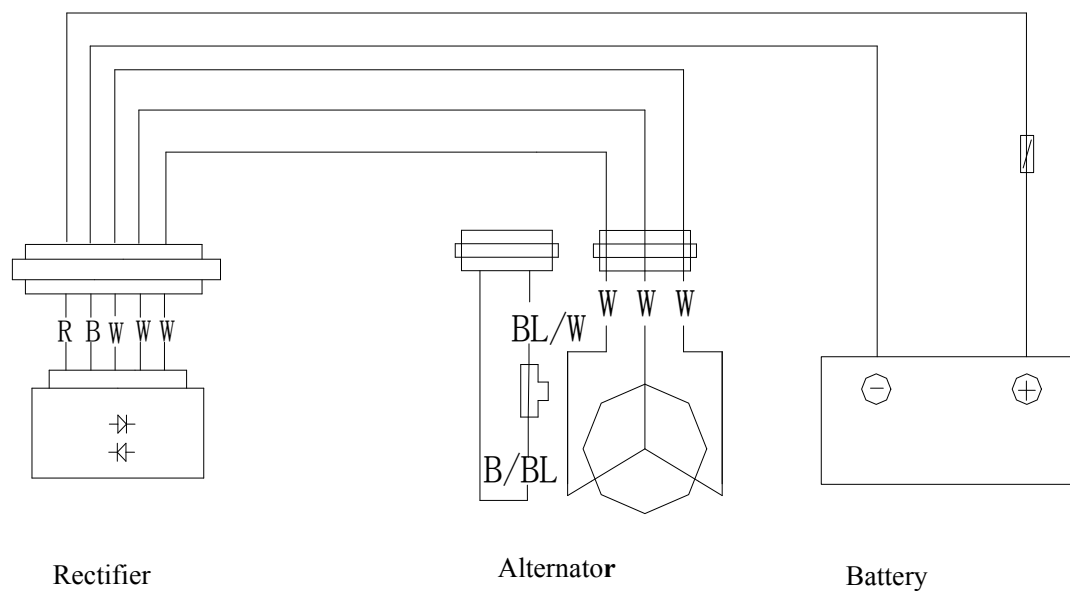
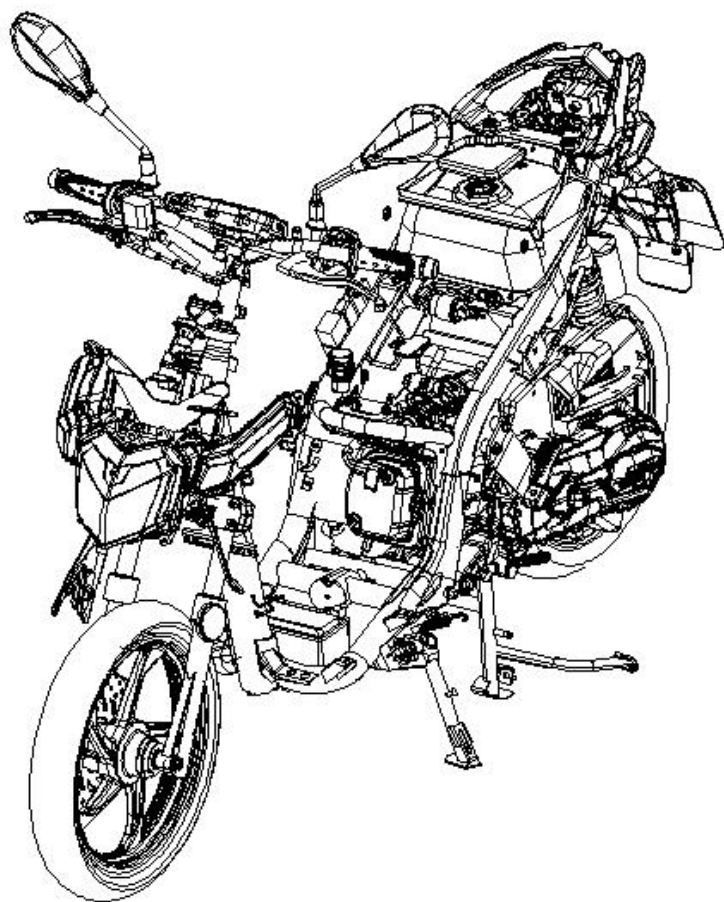


Inspection and Maintenance of Electrical System

Torque Table of Fastener of Electrical System

Fastening location and fastener name	Tightening torque (N·m)
Rectifier bolt	5~7 N·m
High-voltage coil mounting bolt	5~7 N·m
Flywheel mounting nut	50~60N·m
Lock torque of trigger	10~12 N·m
Torque of right cover mounting bolt	10~12N.m
Torque of stator mounting bolt	10~12N.m
Starter motor bolt	10~12 N·m
Starter motor nut	5~7N·m
Starter relay mounting bolt	10~12 N·m
Starter relay nut	5~7N·m
Main Switch Mounting bolt	10~12 N·m
Horn mounting bolt	10~12 N·m

Charging System



I. Battery/Charging System

Preparatory Information-----1.1

Fault Diagnosis-----1.2

Battery-----1.3

Charging System-----1.4

Voltage and Current Regulator-----1.5

Alternator Charging Coil-----1.6

Disassembly of alternator-----1.7

1.1 Preparatory Information

Notes for operation

*Note

1. The battery can be used repeatedly by charging and discharging. If the battery is placed after discharging, the service life will be shortened and the performance will be degraded. Generally, the performance of battery that has been used for about 2-3 years will be degraded. For the battery with degraded performance (reduced capacity), the voltage will recover but the voltage will drop rapidly when a load is applied.
2. Overcharging of battery: Generally, overcharging can be observed on the battery body. If the battery is short-circuited internally, no voltage is detected at the battery terminal or the voltage is low. Regulator fault: The battery voltage will be too high, and the battery life will be shortened.
3. If the battery is placed for a long time, the battery will discharge by itself, and the power capacity will be reduced, so battery must be charged once about every 3 months.
4. Charging system should be inspected in the order of fault diagnosis table.
5. If current flows through the electrical components, do not remove the connectors. Otherwise, the voltage may become too high and the electronic components in voltage regulator may be damaged. The main switch must be turned off before operation.
6. Maintenance-free (dry-charged) batteries do not need to be inspected, so electrolyte and distilled water are not required.
7. Check all electrical loads.
8. Emergency charging should not be used unless in an emergency.
9. When the battery is charged in an emergency, the battery must be removed from the motorcycle before charging.
10. Do not use liquid-filled batteries when the batteries are exchanged.
11. Use a voltmeter when checking the charging state of battery.

Technical parameters

Item			Specifications
Accumulator	Capacity/type		12V-6AH/dry-charged
	Voltage (20℃)	When fully charged	13.1V
		Must be charged	12.3V (Have not run for 1 hour)
	Charging current		Standard: 0.6A, quick: 6A
	Charging time		Standard: 10-15 hours, quick: 30 minutes
Alternator	Capacity		160W/5000rpm
	Coil impedance value (20℃)		0.8±0.3Ω between white and white
Voltage regulator	Type		Three-phase full-wave
	Battery charging voltage		14.5±0.5V/5000rpm

Lock torque value

Rectifier bolt	5~7 N·m
High-voltage coil mounting bolt	5~7 N·m
Flywheel mounting nut	50~60N·m
Lock torque of trigger	10~12 N·m
Torque of right cover mounting bolt	10~12N.m
Torque of stator mounting bolt	10~12N.m

Tools

Universal fixing wrench
Flywheel puller
Test instrument
 Multimeter

1.2 Fault Diagnosis

1.2.1 No power

Overdischarge of battery
 Battery wire is not connected
 The fuse is broken
 Defective power switch

1.2.2 Low voltage

Poor battery charging
 Poor contact
 Poor charging system
 Defective voltage and current regulator

1.2.3 Discontinuous current

Battery wire is not connected properly
 Discharging system contact is defective

Lighting system is in poor contact or short circuit

1.2.4 Poor charging system

Defective contact, short wire or short circuit of wire connector

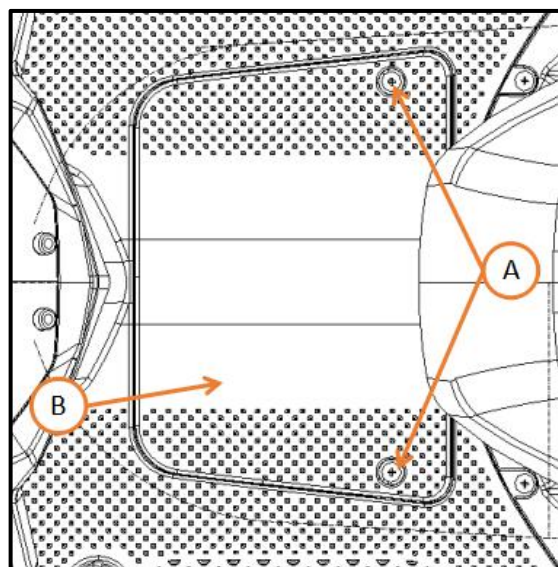
Defective voltage and current regulator

Alternator operation is poor

1.3 Battery

1.3.1 Battery Disassembly

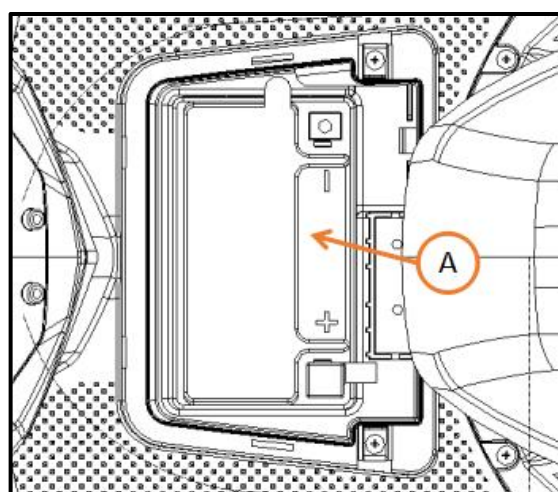
Remove the screw [A], and open the storage battery cover [B].



Remove the negative lead and then the positive lead.
Remove the battery [A].

Warning!

When disassembling the positive electrode, tools should not touch the frame, otherwise, short circuit and sparks may be caused and thus gasoline may ignite, and battery may be damaged, which are very dangerous.



1.3.2 Installation of Battery

It should be conducted in the reverse order of disassembly.

Warning!

To prevent short circuit, first connect the positive electrode and then the negative electrode.

1.3.3 Check the charging state (open-circuit voltage).

Open the battery cover and remove the battery pressing plate assembly.

Remove the battery connector wire.

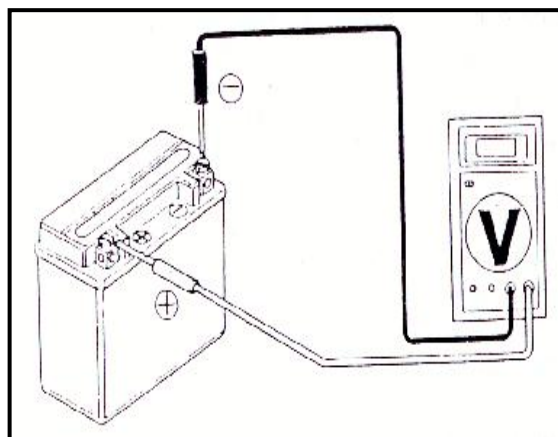
Measure the voltage between battery terminals.

Fully charged: 13.1V

Undercharge: 12.3V (the battery has not worked for 1 hour)

*Note

Inspection under the charged state must be conducted using a voltmeter.



1.3.4 Charging

Connection method: The positive electrode of charger is connected to the positive electrode of battery.

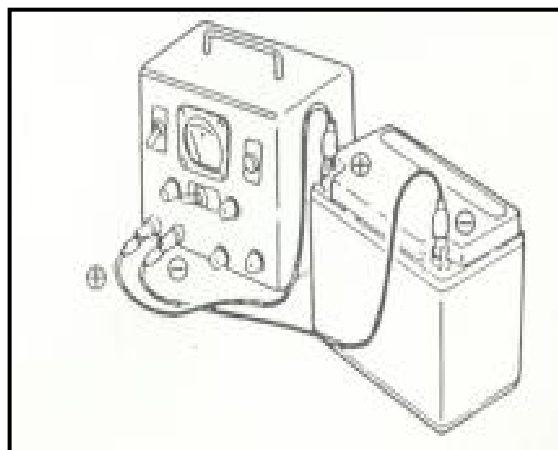
The negative electrode of charger is connected to the negative electrode of battery.

Warning!

- Batteries should be kept far away from the source of ignition.
- First turn off the charger switch before starting charging or after completing charging. To prevent sparks at the connection position and avoid the danger of explosion.
- In the process of charging, conduct the standard operation according to the current time marked on the battery.

*Note

- Battery cannot be used generally during the quick charging of battery, except in emergencies.
- Measure the voltage 30 minutes after charging.



Charging current: Standard: 0.6A

Quick: 6.0A

Charging time: Standard: 10-15 hours

Quick: 30 minutes

**Completion of charging: open circuit voltage:
12.8V or more**

1.4 Charging System

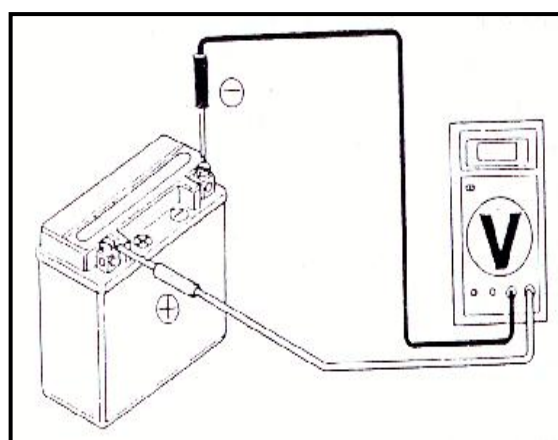
1.4.1 Short-circuit Testing

Remove the grounding wire from the battery and connect the voltmeter between the negative electrode of battery and grounding wire. Rotate the switch to the OFF position and check for a short circuit.

***Note**

Connect the positive electrode of multimeter to the negative electrode of battery.

If there is any abnormality, check whether the main switch and the main wiring are short-circuited.



1.4.2 Inspection of Charging State

Test the battery with a multimeter in a fully charged state.

After the engine is warmed up, install the fully charged batteries.

Connect a voltmeter between battery terminals.

Remove the main fuse, and connect an ammeter between two terminals.

Start the engine, slowly increase the speed and measure the limit voltage and current.

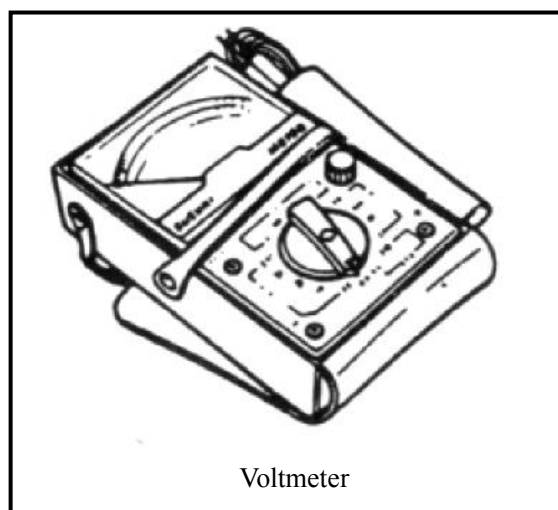
Limit voltage/speed: 14-15V (5000rpm)

When the limit voltage is not within the specified value range, check the voltage regulator.

Check the limit voltage of lighting system.

***Note**

Set the multimeter at the position of alternating voltage.



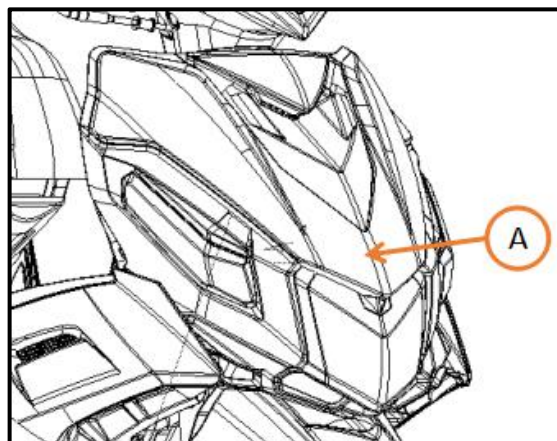
Limit voltage: $13.1 \pm 0.5V/5000rpm$

When the limit voltage is not within the specified value range, check the voltage and current regulator.

1.5 Disassembly of Voltage and Current Regulator

1.5.1 Disassembly of regulator

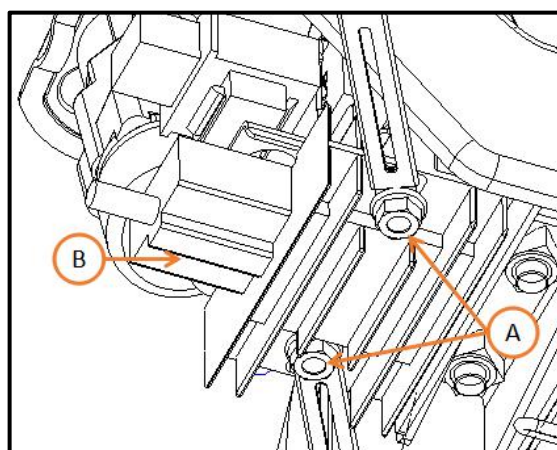
Remove the headlight cover panel [A]



Disassembly

Regulator mounting bolt [A]

Regulator [B]



1.5.2 Inspection of Circuit at Main Wiring End

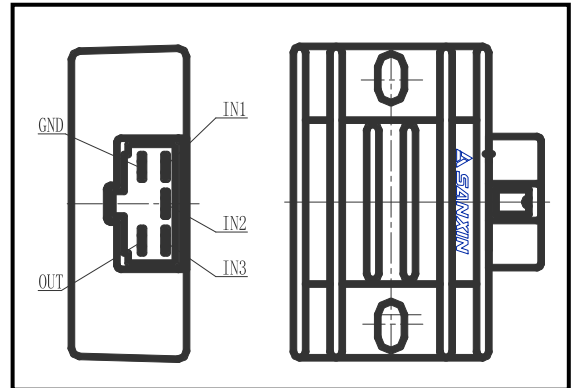
Remove the 4P plug of voltage and current regulator.

Check the continuity between main wiring terminals in the following way.

Item (wire color)	Judgment
Between battery (red) and bond strap of body	There is electric power storage Voltage
Between bond strap wire (black) and bond strap of body	There is wire
Between charging coil (white) and bond strap of body	There is resistance in alternator coil

1.5.3 Inspection of Voltage and Current Regulator

- 1、 Rotate the multimeter to the position of diode;
- 2、 Connect the black probe to the red terminal of regulator, and connect the red probe to the white terminals (white 1, white 2, white 3) of regulator respectively. The pointer gauge will display a certain value, otherwise, it indicates that regulator is damaged and needs to be replaced.
- 3、 Connect the red probe to the black terminal of regulator port, and connect the black probe to the white terminals (white 1, white 2, white 3) of regulator respectively. The pointer gauge will display a certain value, otherwise, it indicates that regulator is damaged and needs to be replaced.



*Note

- Do not touch the metal part of test rod of multimeter with fingers during inspection.
- Use a multimeter to check. The impedance values may be different when different multimeters are used, so the check may not be correct.

The voltage regulator should be replaced when the impedance between the terminals is abnormal.

1.5.4 Installation

It should be conducted in the reverse order of disassembly.

Torque value:

Rectifier bolt 5 - 7 N·m

1.6 Alternator Charging Coil

*Note

Check the alternator charging coil and operate at the engine.

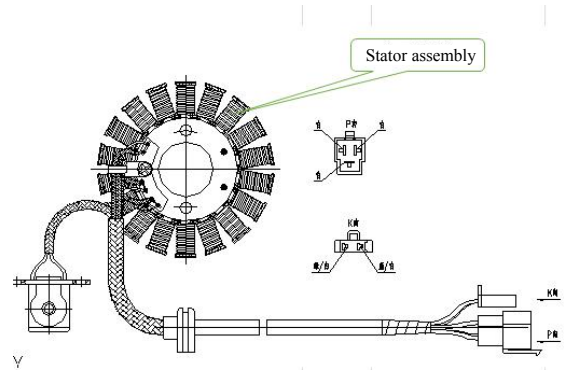
1.6.1 Inspection

Remove the alternator connector.

Use a multimeter to measure the impedance between the white coil of alternator and the motorcycle.

Standard value: $0.8 \pm 0.3 \Omega$ (20°C)

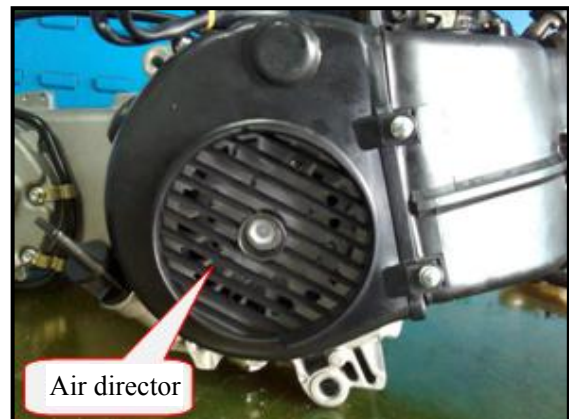
Replace the alternator coil when the measured value exceeds the standard value.



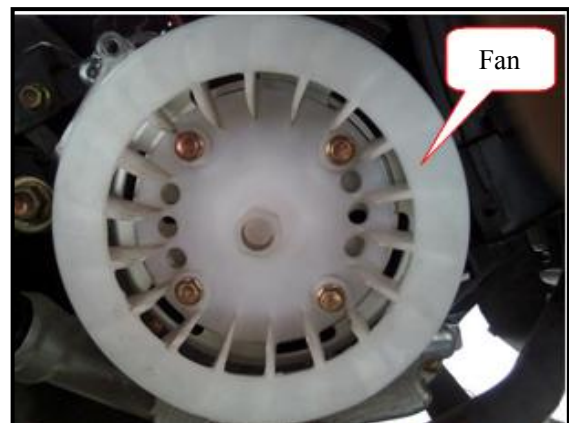
1.7 Disassembly of Alternator

1.7.1 Disassembly

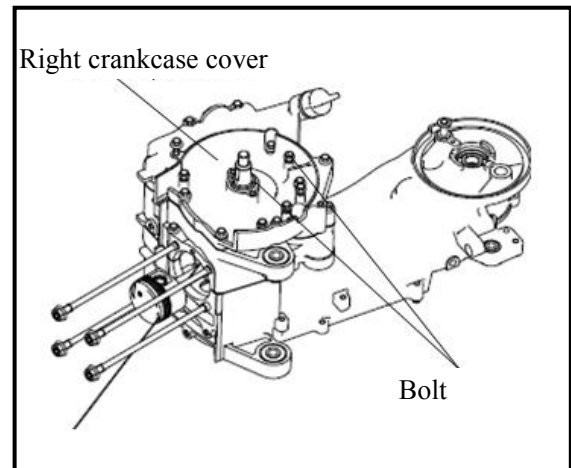
Remove the air director



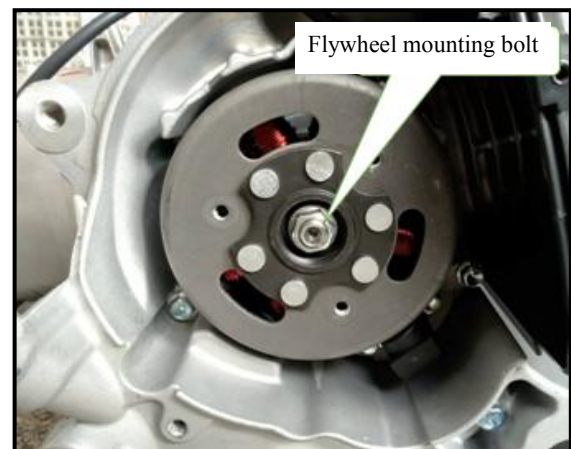
Remove the fan



Remove right cover mounting bolt



Use a universal mounting wrench to fix the flywheel.
Remove the flywheel mounting bolt.



Use universal mounting wrench



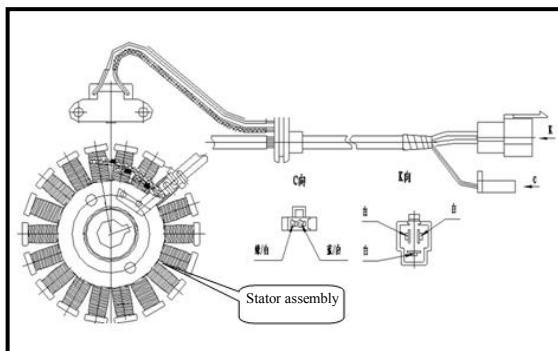
Use a flywheel puller to remove the flywheel.
Remove the mounting key.



Remove stator mounting bolt



Remove the alternator wire connector.
Remove the alternator stator.



1.7.2 Installation

The alternator should be installed in the reverse order of disassembly.

*Note

The inner surface of flywheel is magnetic, so bolt should not be installed on it.

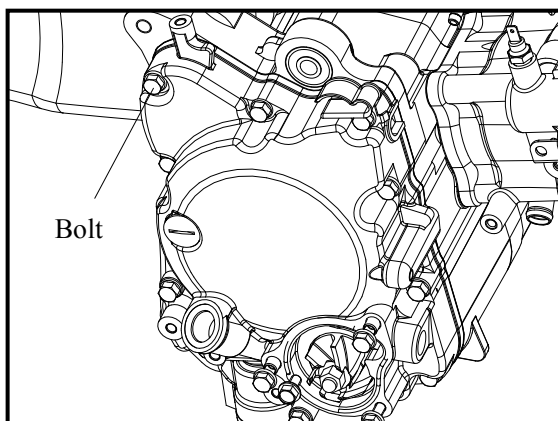
Torque value:

Flywheel mounting nut 50-60N·m

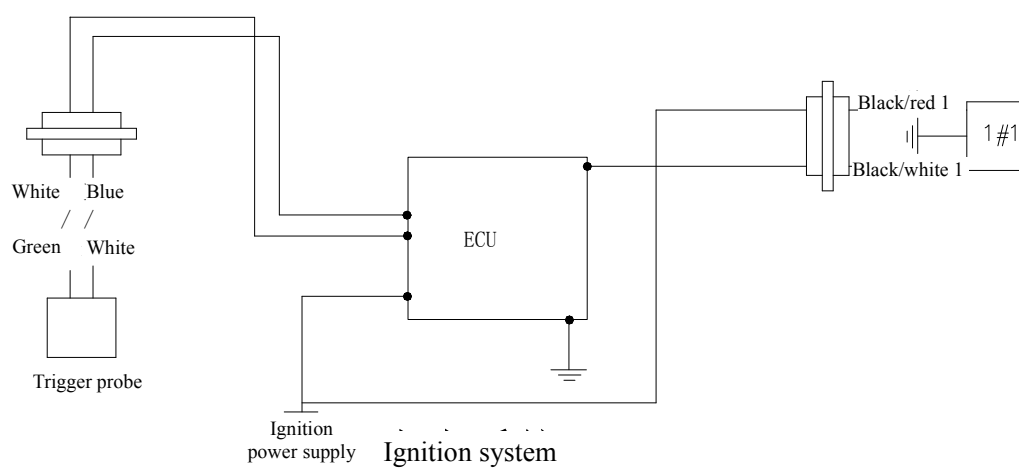
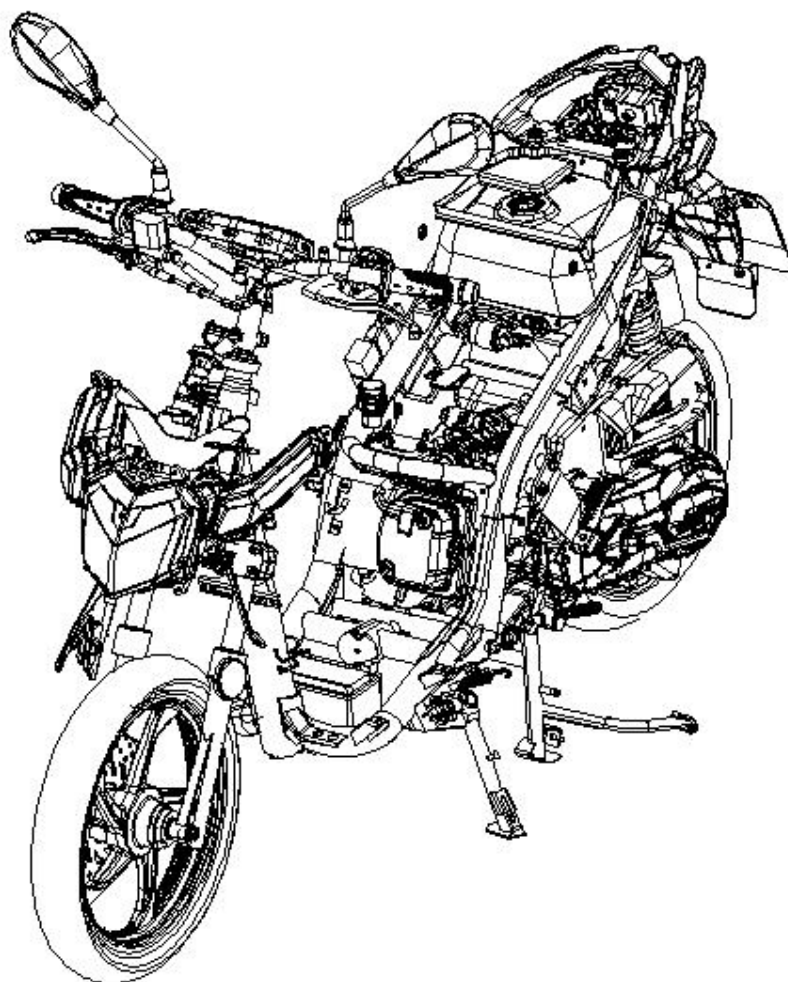
Torque of right cover mounting bolt 10-12 N·m

Torque of stator mounting bolt 10-12 N·m

Lock torque of trigger 7-9N·m



Ignition System



II. Ignition System

Preparatory Information-----	2.1
Fault Diagnosis -----	2.2
Inspection of Ignition System-----	2.3
ECU-----	2.4
Ignition Coil -----	2.5
Trigger -----	2.6

2.1 Preparatory Information

Precautions for operation

1. Ignition system should be inspected step by step in the order of fault diagnosis table.
2. The ignition system is in the ECU group, so the ignition time does not need to be adjusted.
3. Ignition system should be inspected in the order of fault diagnosis table.
4. The ignition system ECU should not fall off, droop or be hit by strong force (which is the main reason for the failure), and special attention should be paid when disassembling.
5. The main reason for ignition system fault is poor contact of connector, so first check whether the connectors are in poor contact.
6. Check whether the heat value of spark plug is appropriate, because improper spark plug may cause the engine to run unsmoothly or burn the spark plug.
7. The inspection in this chapter is mainly about the maximum voltage. The inspection of the impedance value of ignition coil should be based on the judgment.
8. Check the main switch according to the conduction table.
9. Alternator and stator should be removed according to the disassembly instructions.

Warning

Ignition system may generate an extremely high voltage. Do not touch the spark plug or coil while the engine is running; otherwise, you may be exposed to a serious electric shock.

*Note

Do not disconnect battery cable or any other electrical connections while the ignition is on or

the engine is running. This is to prevent damage to ECU. Do not reverse the electrodes of battery. The side of negative electrode should be grounded. This is to prevent damage to ECU.

Technical parameters

Item			Standard value
Spark plug is recommended			TORCH B7RTC
Spark plug gap			0.6~0.7mm
Impedance of trigger (20°C)	Primary coil		0.58Ω±15%
	Secondary coil	There is a spark plug cover	13KΩ±15%
		There is no spark plug cover	8KΩ±15%
Impedance of trigger (20°C)			150±15Ω
Maximum voltage in one measurement of ignition coil			15V
Trigger voltage			Above 1.7V

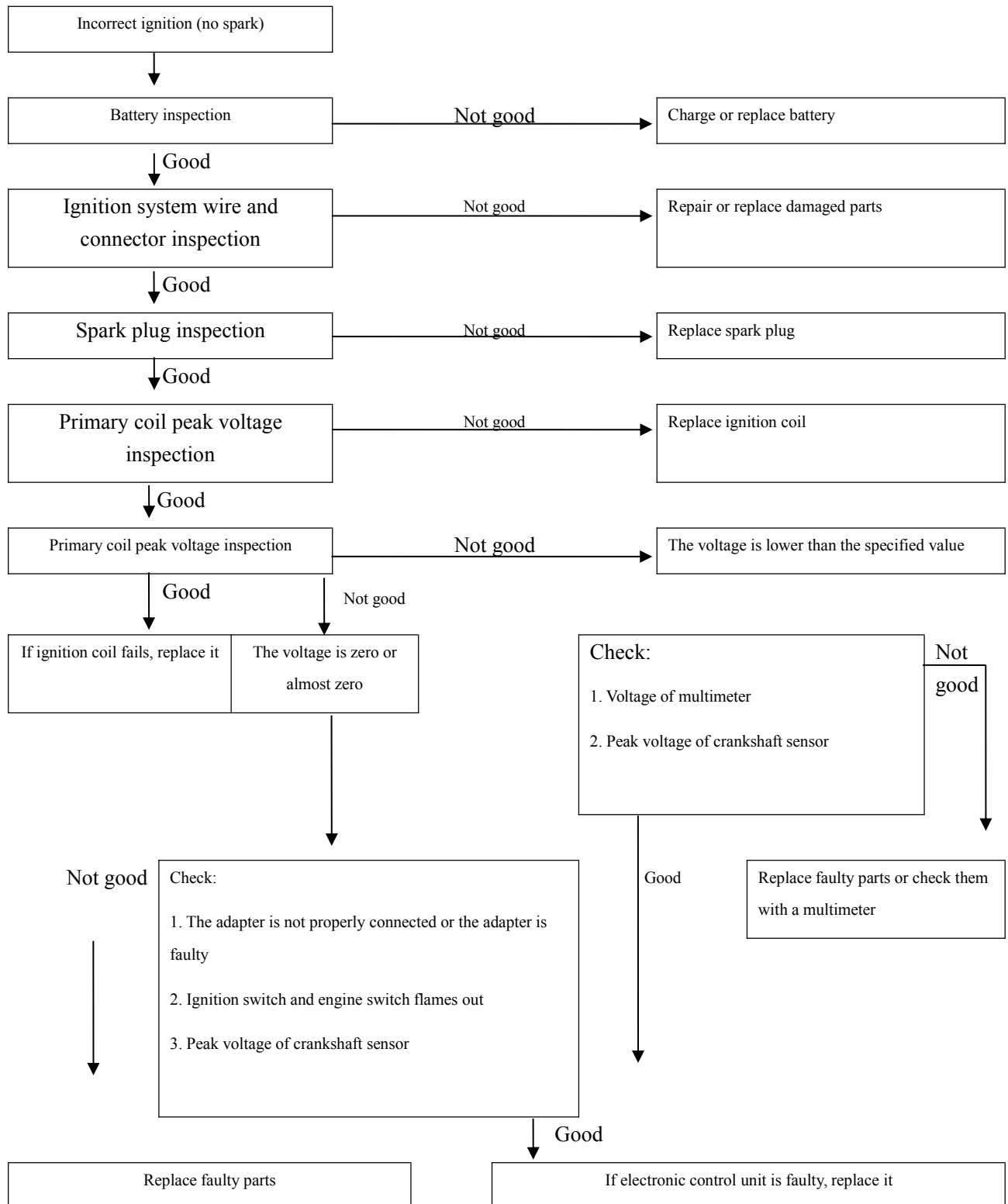
Lock torque value

Rectifier bolt 5~7 N·m
 High-voltage coil 5~7 N·m
 mounting bolt

Tools

Accessories of maximum voltmeter
 Multimeter

2.2 Fault Diagnosis



2.3 Trigger

2.3.1 Disassembly of trigger

- It cannot be separately removed and integrated with alternator

***Note**

The trigger can be checked on the engine.

2.3.2 Inspection

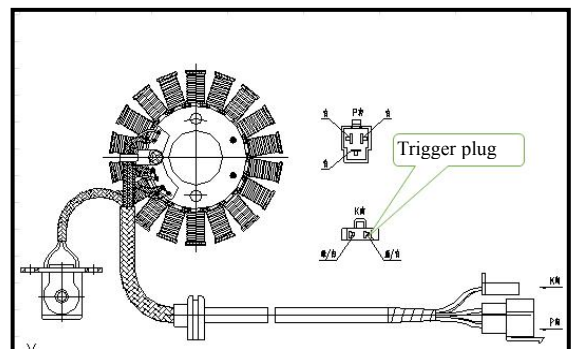
Remove the body protector.

Remove trigger wire connector.

- Measure the impedance value between blue / white terminal and green / white terminal at engine side and bond strap of motorcycle. .

Standard value: $150 \pm 15 \Omega$ (20°C)

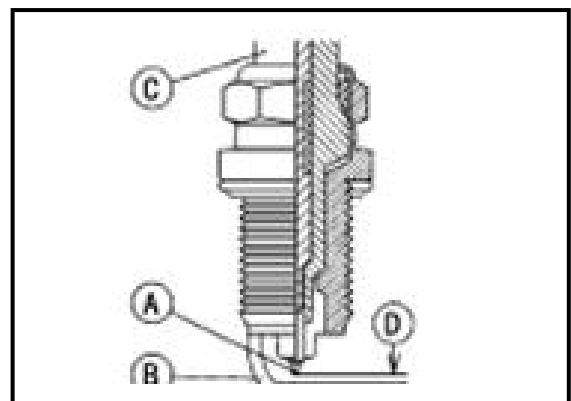
Replace the alternator when the measured value exceeds the standard value.



2.4 Spark Plug

2.4.1 Inspection of spark plug

- Disassemble spark plug (see section “disassembly of spark plug”)
 - Visually inspect the spark plug
 - If the center electrode of spark plug [A] and/or side electrode [A] is corroded or damaged, or insulated terminal [C] is broken, replace the spark plug
 - ★ If the spark plug is dirty or there is carbon deposit, replace the spark plug
 - Use a wire feeler to measure the gap [D]
 - If the gap is incorrect, replace the spark plug
- Spark plug gap: 0.6-0.7mm**
- Use standard spark plugs or their equivalents
- Spark plug: B7RTC(TORCH)



2.5 Ignition Coil

2.5.1 Disassembly

Remove the seat and helmet barrel.

Remove the spark plug cover.

Remove the primary wire of ignition coil.

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

Install it in the reverse order of disassembly.

***Note**

Primary coil is / white wire connector installation.

2.5.2 Check the primary coil

***Note**

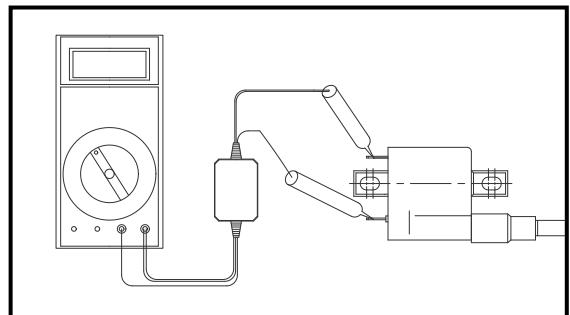
- When there is no spark in the spark plug, it is necessary to check whether the parts of wiring are loosened or in poor contact;
- There are many brands of multimeter, the internal impedances are different and the tested values are different.

- Check the primary coil
- Measure the impedance among the terminals of primary coil.

Standard value: $(0.58 \pm 15\%) \Omega$ (20°C)

★The impedance value is good in the standard value.

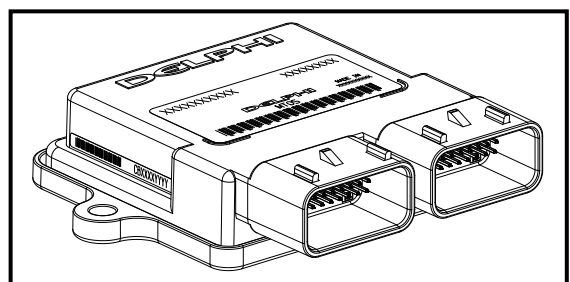
★If the impedance value is “ ∞ ”, it indicates that the wire in the coil is disconnected and the ignition coil needs to be replaced.



2.6 ECU Unit

- System inspection
- Remove ECU and check the parts at wiring terminal related to ignition system.

(See section “ECU” of electronic injection system for details)



Starter System

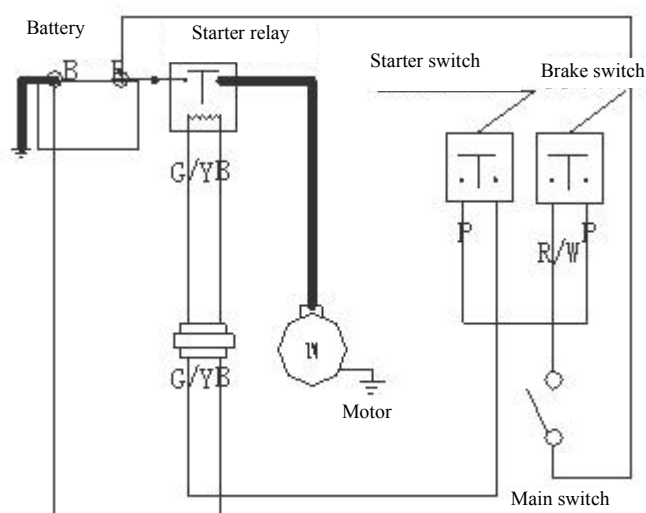
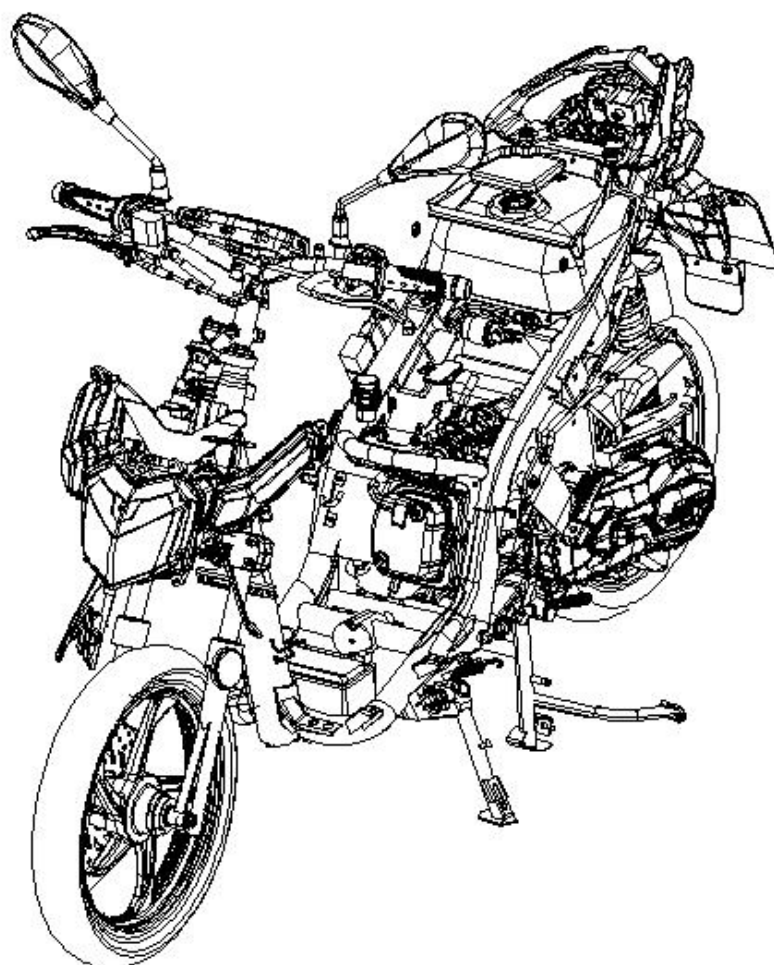


Diagram of starter

III. Starter System

Preparatory Information -----3.1

Fault Diagnosis-----3.2

Starter Motor -----3.3

Starter Relay-----3.4

3.1 Preparatory Information

Precautions for operation

Starter motor can be removed on the engine.

Starter clutch should be disassembled in accordance with the working procedures.

Technical parameters

Item	Standard value	Operating limit
Length of starter motor brush	12.5mm	8.5mm
Stator idle shaft bushing		8.3mm
Outer diameter of starter idle shaft		7.94mm

Lock torque value

Starter motor bolt	10~12 N·m
Starter motor nut	5~7N·m
Starter relay mounting bolt	10~12 N·m
Starter relay nut	5~7N·m

Tools

Mounting nut wrench
Multimeter

3.2 Fault Diagnosis

3.2.1 Start failure

- The fuse is broken
- Insufficient battery power
- Detective main switch
- Defective starter clutch
- Defective brake switch
- Defective starter relay

- Defective connecting wire
- Defective starter motor

3.2.2 Too weak rotation force of starter motor

- Insufficient battery power
- Defective connecting wire
- The gear of starter motor is struck by foreign body

3.2.3 Starter motor can rotate but rotation engine cannot work

- Defective starter clutch
- Reverse rotation of starter motor
- Insufficient battery power

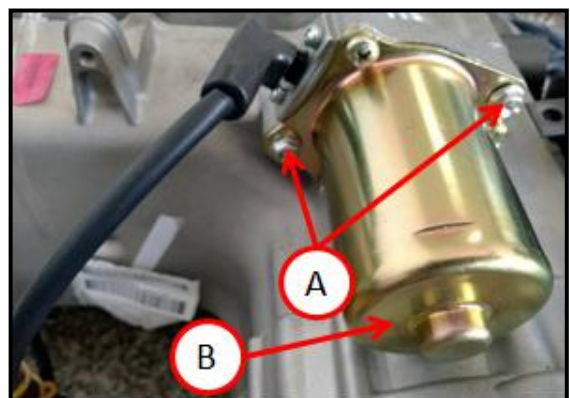
3.3 Starter Motor

3.3.1 Disassembly

*Note

Before disassembling starter motor, first turn off the main switch, remove the bond strap of battery, then turn on the power and check whether starter motor is running to confirm safety.

Remove the mounting bolt of starter motor, remove the starter motor and remove the starter motor wire connector.



3.3.2 Installation

Install starter motor wire and then install the dust cover.

And then install the starter motor.

Torque Value:

Starter motor bolt	10~12 N·m
Starter motor nut	5~7N·m

3.4 Starter Relay

3.4.1 Disassembly

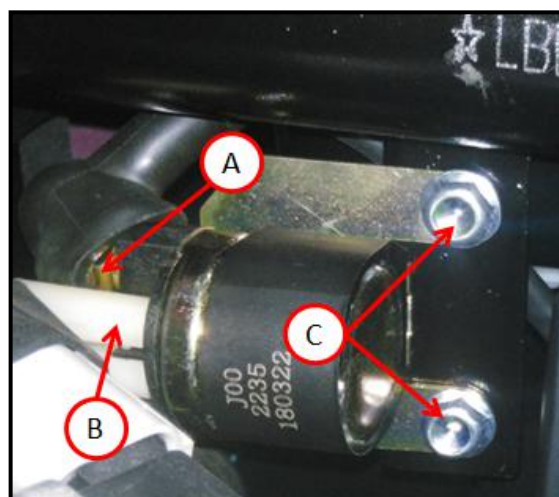
Remove the seat cushion and helmet barrel.

Disassembly

Starter relay nut [A]

Starter relay connector [B]

Starter relay mounting bolt [C]



3.4.2 Operation Inspection

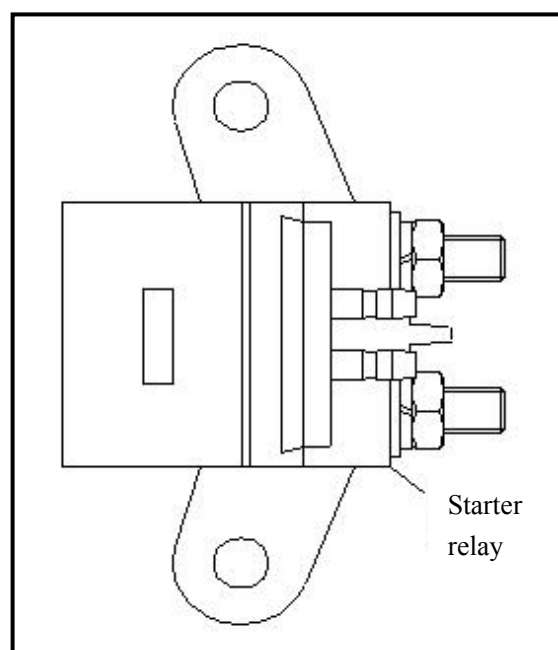
Remove the body protector.

When the main switch is related to “ON”, check whether a “click” sound is made after turning on starter motor.

It is normal when a sound is made.

When there is no sound:

- Check starter relay voltage.
- Check bond strap circuit of starter relay.
- Check the operation of starter relay.

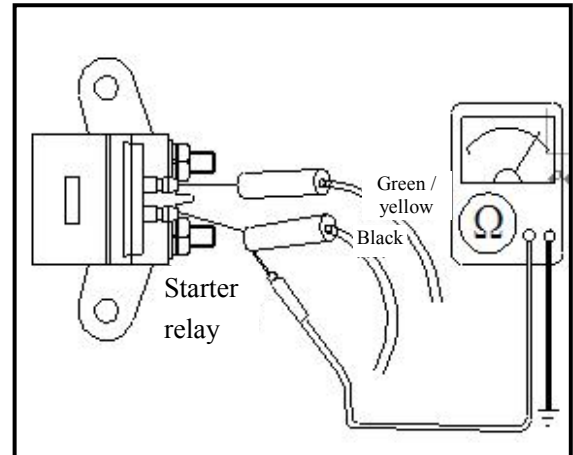


3.4.3 Inspection of Voltage of Starter Relay

Erect main foot, and measure the voltage between the negative electrode (green/yellow) of starter relay connector and bond strap of motorcycle body.

Place the main switch at the position of “ON”, pull the brake lever and ensure that the battery voltage meets the regulations.

When no voltage is applied to the starter relay wire, check the continuity and wire of brake switch.



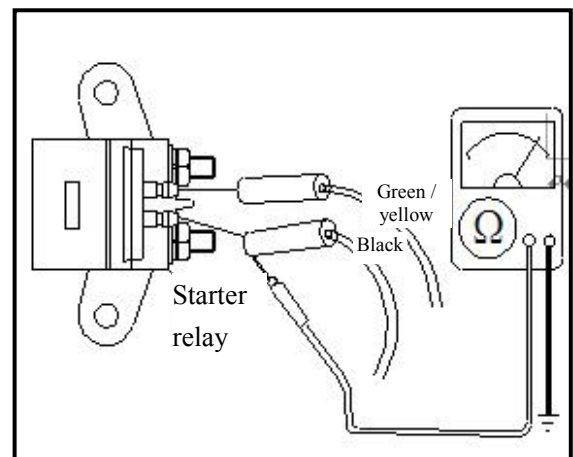
3.4.4 Inspection of Bond Strap Circuit of Starter Relay

Remove starter relay connector.

Check the continuity between black wire connector terminal and bond strap of body.

Ensure that the continuity between black wire connector terminal and bond strap of body is good after start button is pressed.

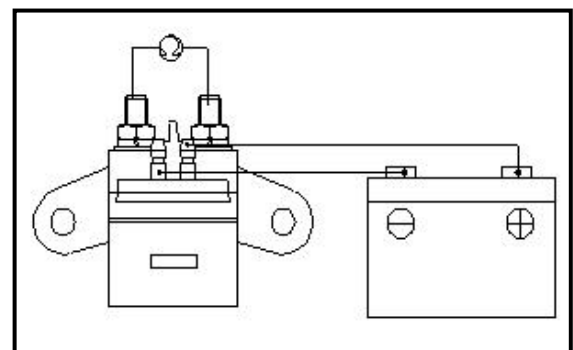
When it is nonconductive, check the continuity and wire of start button.



3.4.5 Operation Inspection

Connect the starter relay to the battery and connect the terminal of starter motor to multimeter.

Connect the fully charged battery between the black and green/yellow wires of the relay. At this point, “Da” sound is made in the relay and the resistance indication of multimeter is “zero”.



3.4.6 Installation

It should be conducted in the reverse order of

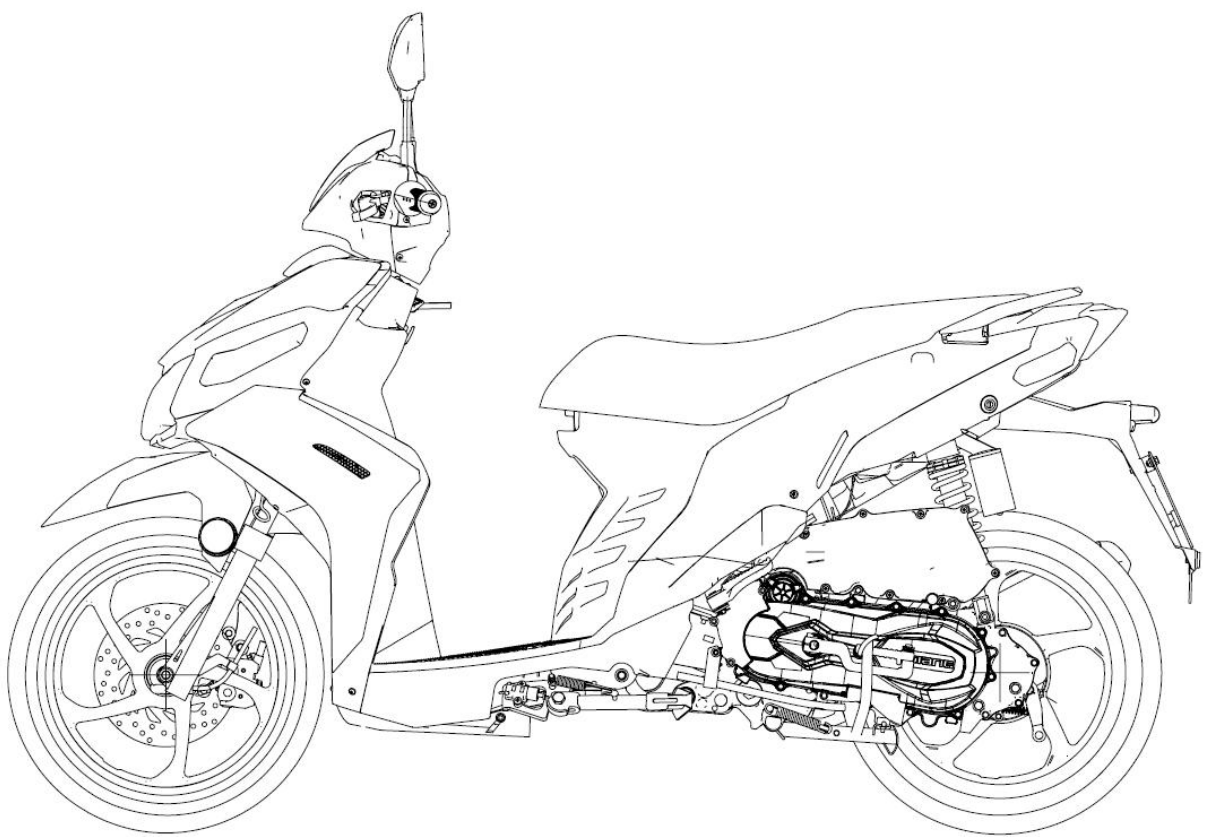
disassembly.

Torque value:

Starter relay mounting bolt 10-12 N·m

Start relay nut 5-7N•m

Bulbs/Switches/Instruments



IV. Bulbs /Switches/Instruments

Preparatory Information-----	4.1
Fault Diagnosis-----	4.2
Headlight -----	4.3
Front Turn Signal Light -----	4.4
Taillight -----	4.5
Rear Turn Signal Light-----	4.6
Instrument-----	4.7
Main Switch -----	4.8
Horn-----	4.9
Handlebar Switch-----	4.10

4.1 Preparatory Information

Precautions for operation

Switch can be removed from motorcycle for measuring the continuity of switch.

Lock torque value		Tools
Main Switch Mounting bolt	10~12 N·m	Multimeter
Horn mounting bolt	10~12 N·m	

4.2 Fault Diagnosis

4.2.1 The “ON” light of main switch is off.

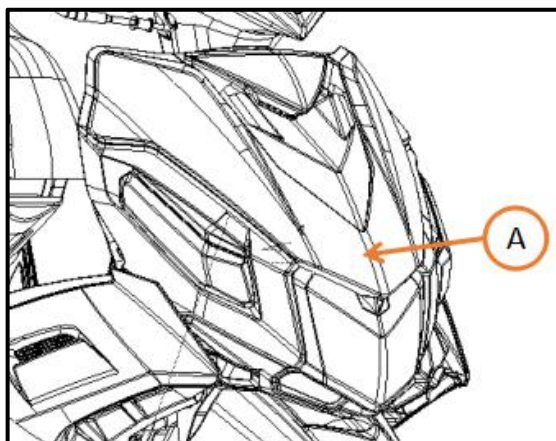
- Defective light bulb.

- Defective switch.
- The connector is in poor contact or disconnected.

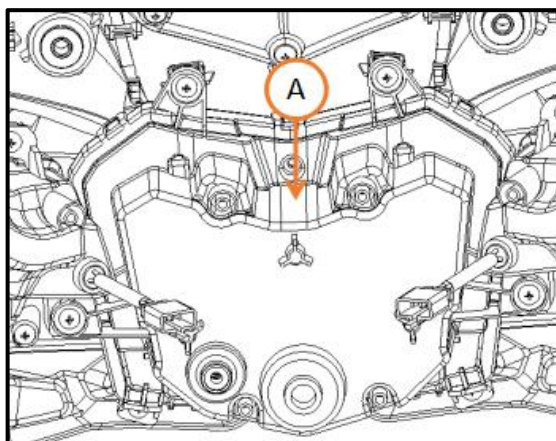
4.3 Headlight

4.3.1 Disassembly

Remove the headlight cover panel [A].

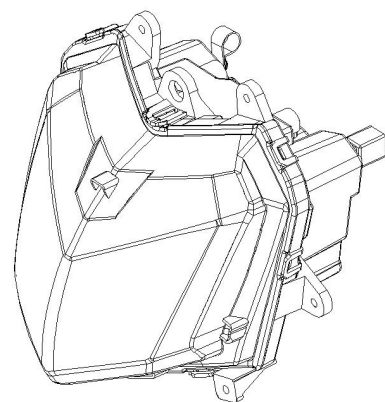


Remove the headlight [A].



Replace headlight.

The headlight is an LED light source and needs to be replaced as a whole.



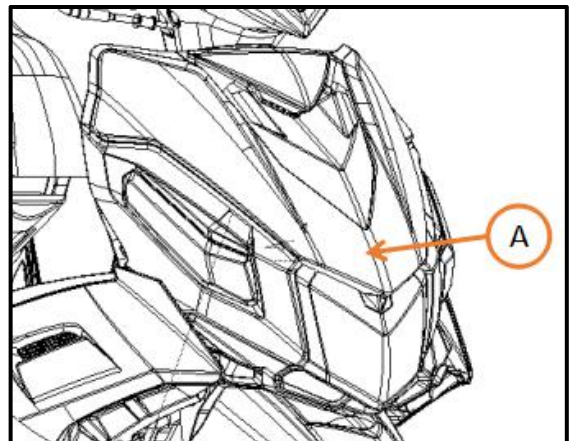
4.3.2 Installation

It should be conducted in the reverse order of disassembly.

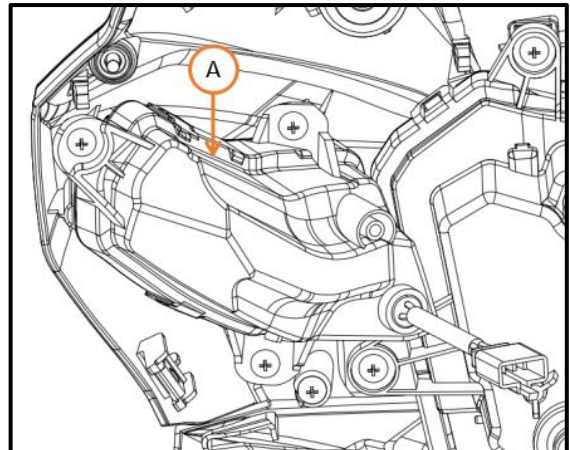
4.4 Front Turn Signal Light

4.4.1 Disassembly of front turn signal light

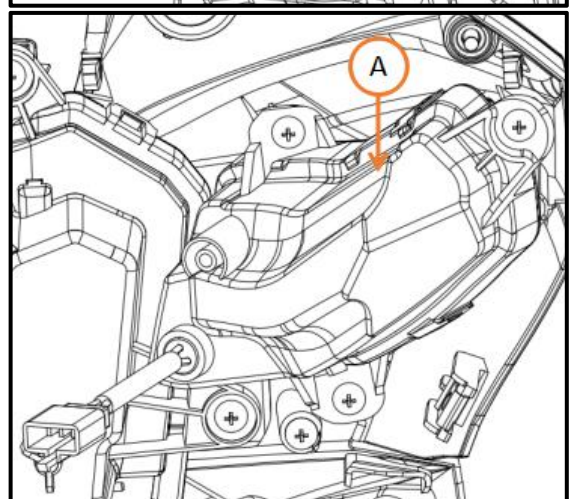
Remove the headlight cover panel [A].



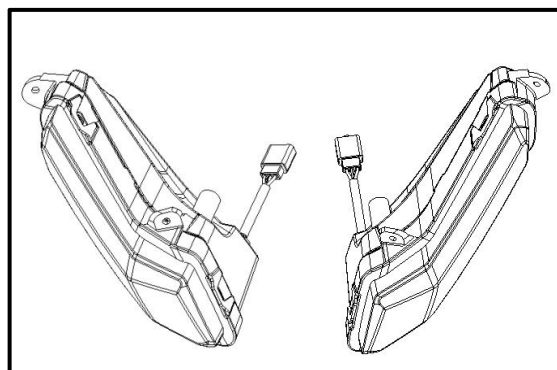
Remove front left turn signal light [A].



Remove front right turn signal light [A].



Replace the front left/right turn signal light.
The front left turn signal light is an LED light source and needs to be replaced as a whole.



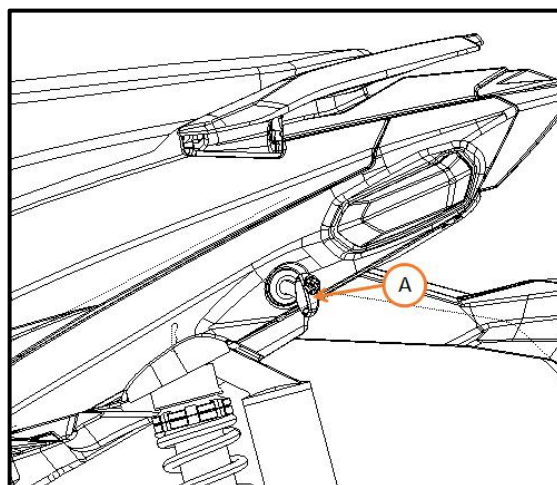
4.4.2 Installation

The turn signal light should be installed in the reverse order of disassembly.

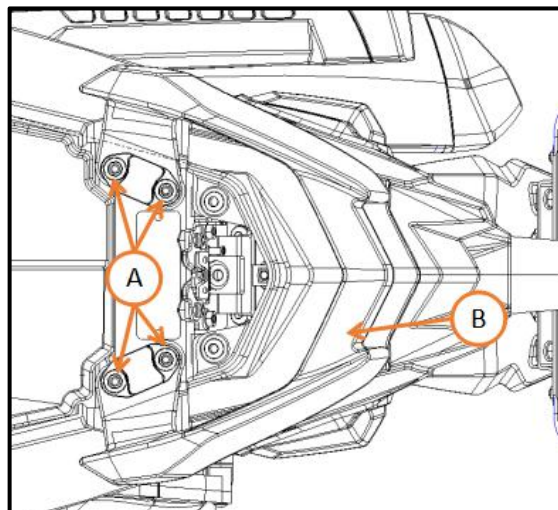
4.5 Taillight

4.5.1 Disassembly

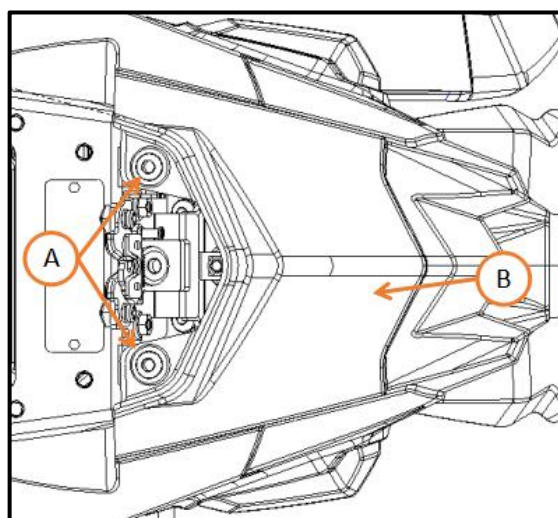
Open the seat cushion lock using the key [A] and turn up the seat cushion.



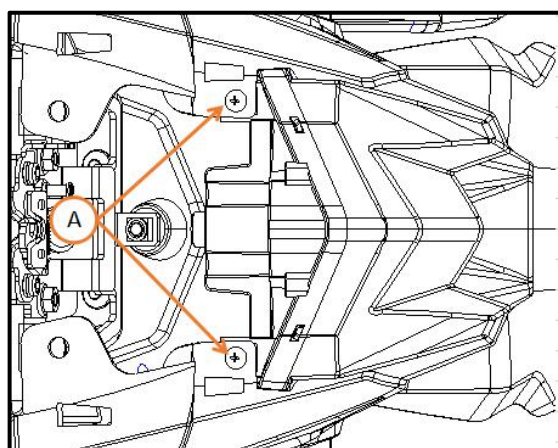
Remove the mounting screw of rear grab rail[A] and take down the rear armrest [B].



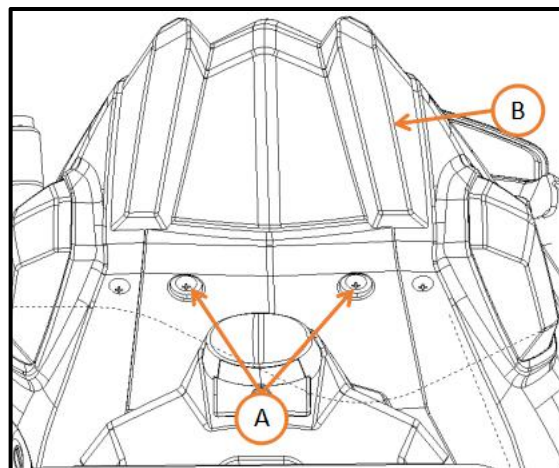
Remove the mounting bolt of rear bracket [A] and take down the rear bracket [B].



Remove the tapping screw [A] on the taillight.

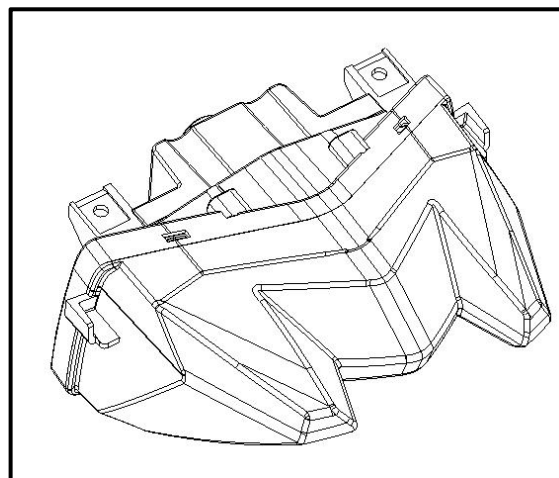


Remove the tapping screw [A] on the taillight, disconnect the taillight connector and remove and replace the taillight [B]



Replace the taillight.

The taillight is an LED light source and needs to be replaced as a whole.



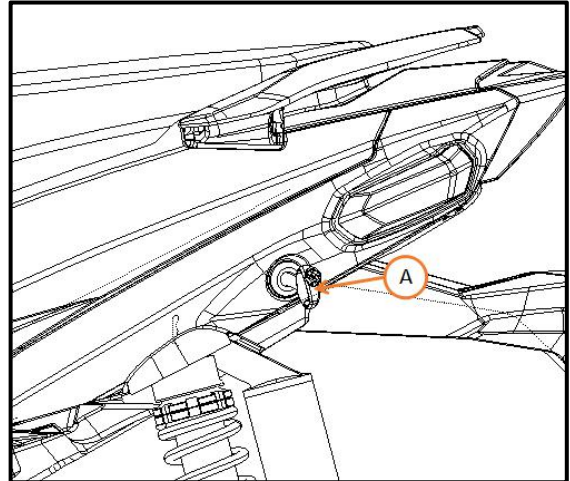
4.5.2 Installation

The taillight should be installed in the reverse order of disassembly.

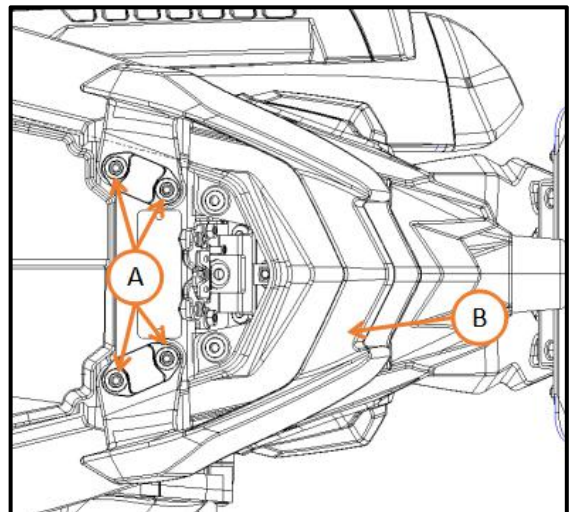
4.6 Rear Turn Signal Light

4.6.1 Disassembly

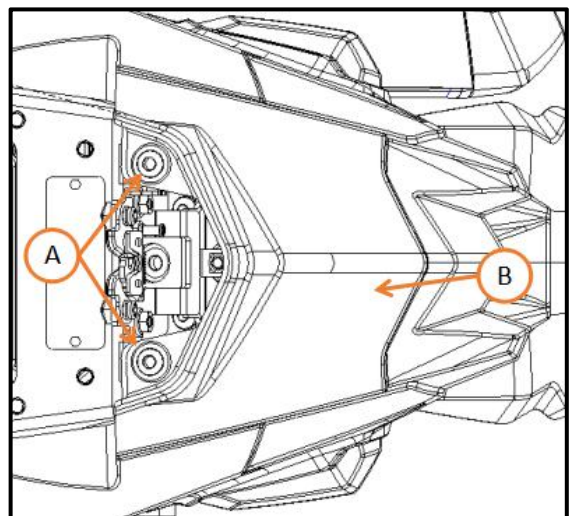
Open the seat cushion lock using the key [A] and turn up the seat cushion.



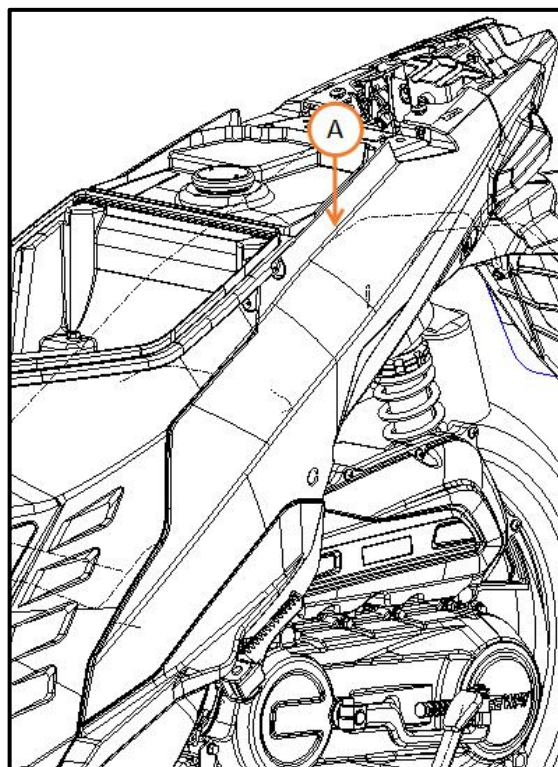
Remove the mounting screw of rear grab rail[A] and take down the rear armrest [B].



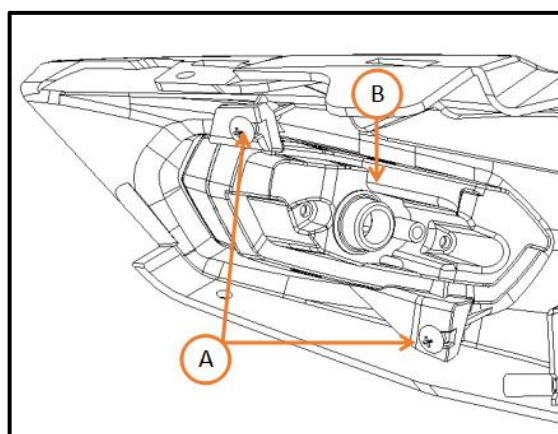
Remove the mounting bolt of rear bracket [A] and take down the rear bracket [B].



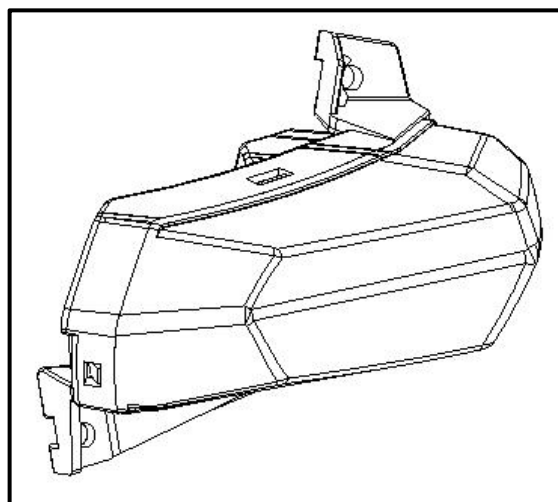
Remove left protector and left lower protector [A].
Disconnect rear left turn signal light connector.



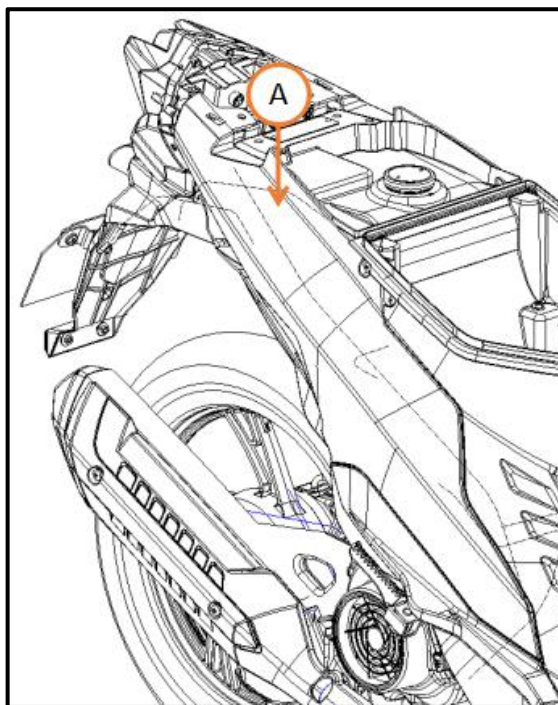
Disconnect rear left turn signal light mounting screw [A].
Remove rear left turn signal light [B].



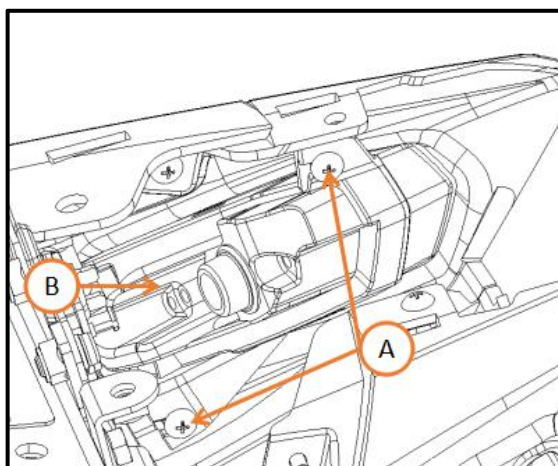
Remove rear left turn signal light.
The rear left turn signal light is an LED light source
and needs to be replaced as a whole.



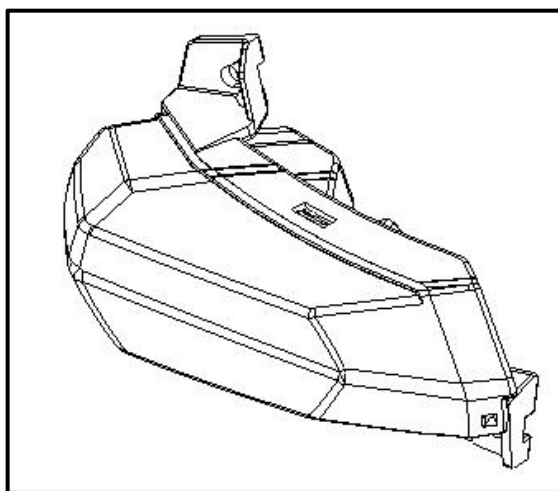
Remove left protector and left lower protector [A].
Disconnect rear left turn signal light connector.



Disconnect rear right turn signal light mounting screw [A].
Remove rear right turn signal light [B].



Remove rear right turn signal light.
The rear right turn signal light is an LED light source
and needs to be replaced as a whole.



4.6.2 Installation

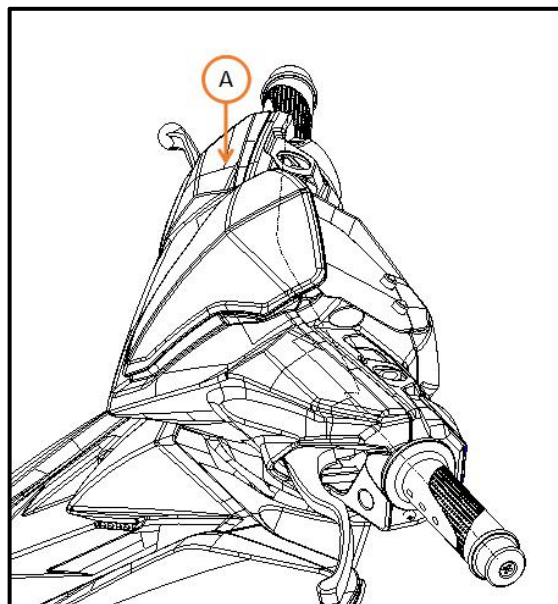
The turn signal light should be installed in the reverse

order of disassembly.

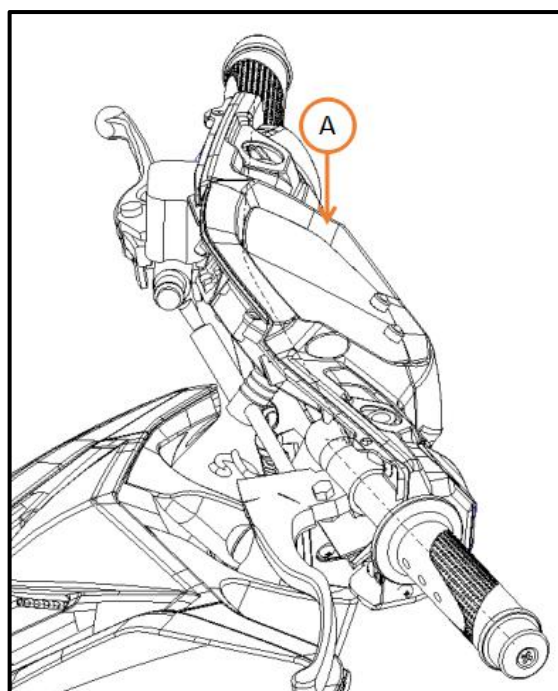
4.7 Instruments

4.7.1 Disassembly

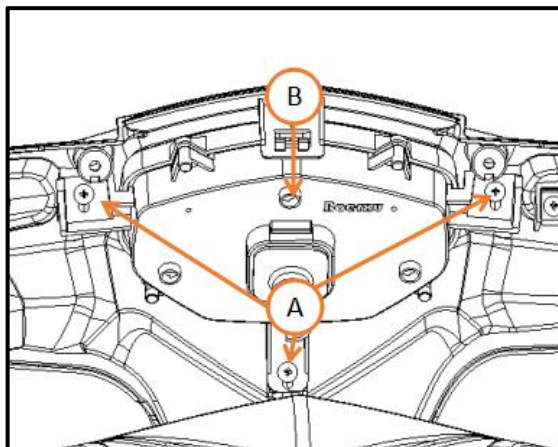
Remove the front protector of cock [A].



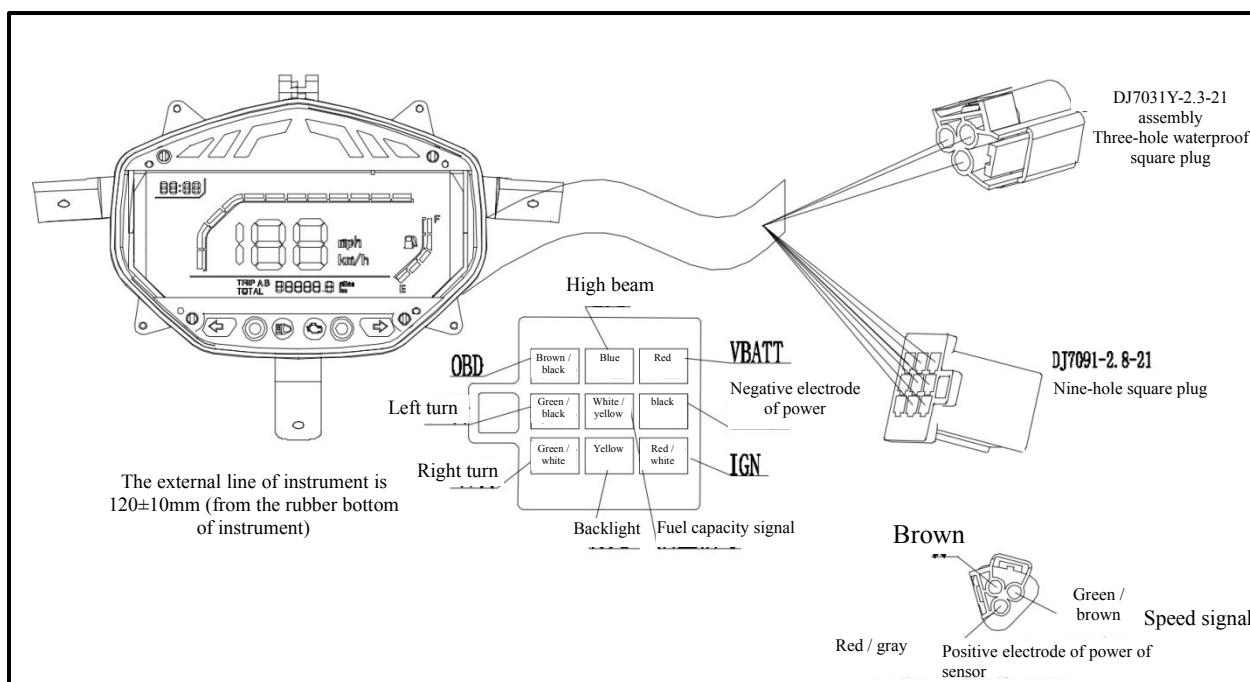
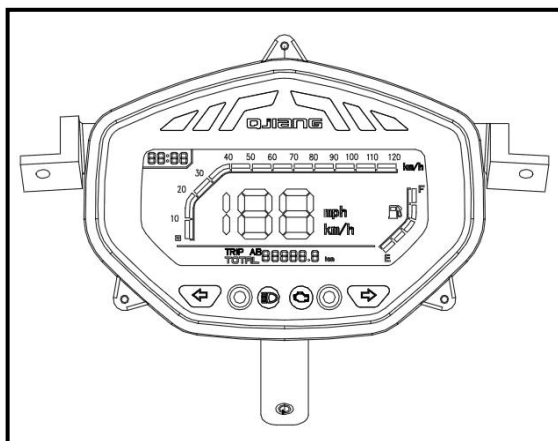
Remove the instrument wire cable connector and remove the rear protector of cock [A].



Remove the screw [A], and remove the instrument [B].



Gauge



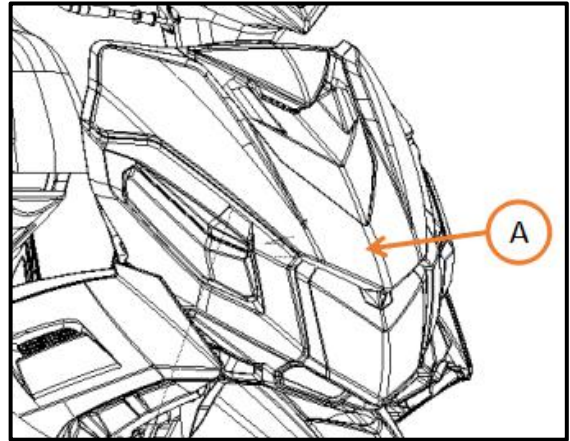
4.7.2 Installation

The instrument should be installed in the reverse order of disassembly.

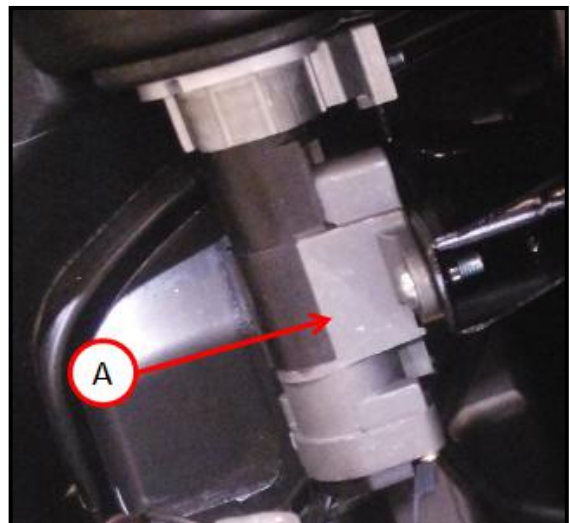
4.8 Main Switch

4.8.1 Disassembly

Remove the headlight cover panel [A].

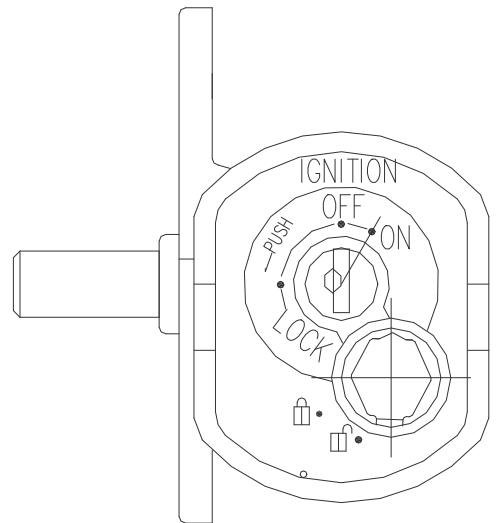


Remove the main switch [A] wire connector.





Check the conduction of connector terminal.



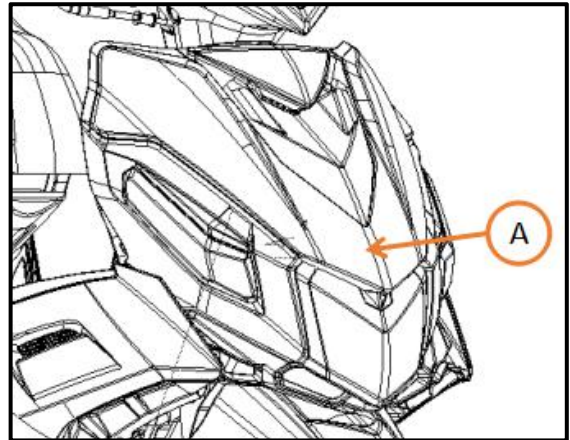


Schematic wiring diagram

Gear	Line color	Red	brown
	Line diameter	0.75	0.75
ON			
OFF			
LOCK			

4.8.2 Replacement of Main Switch

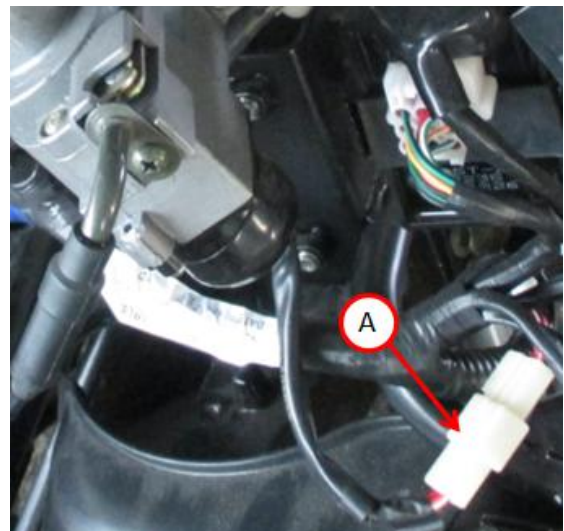
Remove the headlight cover panel [A].



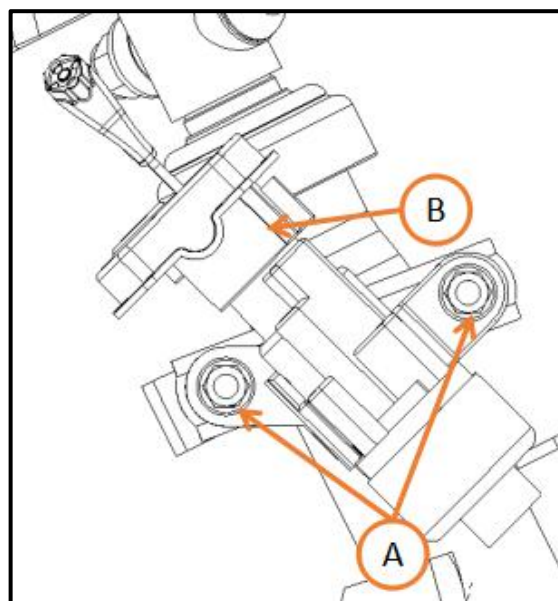
Remove foot protector [A].



Remove the main switch cable connector [A]



Remove the mounting screw [A] and remove the main switch [B].



4.8.2 Installation

The instrument should be installed in the reverse order of disassembly.

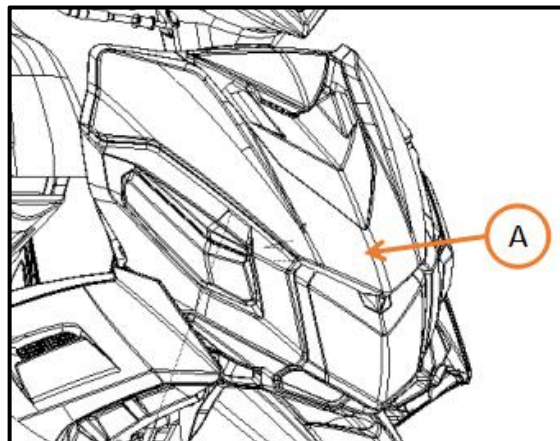
Torque:

Main switch mounting bolt 10-12N.m

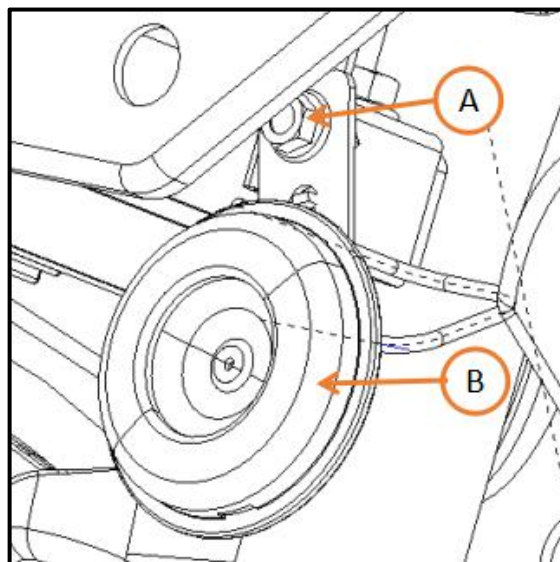
4.9 Horn

4.9.1 Disassembly

Remove the headlight cover panel [A].



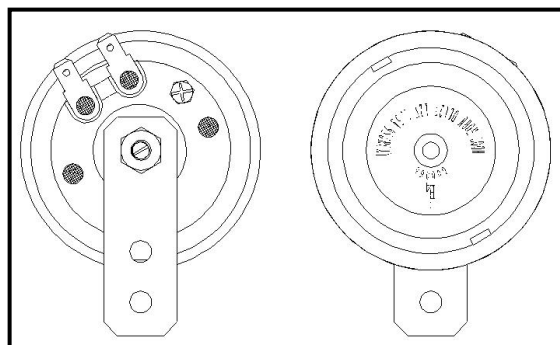
Remove the horn wire, remove the bolt [A], and take out the horn [B].



4.9.2 Inspection

Remove the horn wire.

If the horn sounds after being connected to the battery, it is in good conditions.



4.9.3 Installation

The horn should be installed in the reverse order of disassembly.

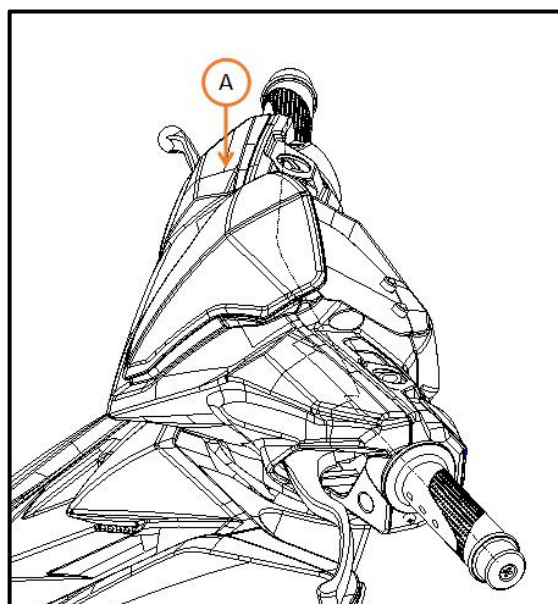
Torque:

Horn mounting bolt 10-12N.m

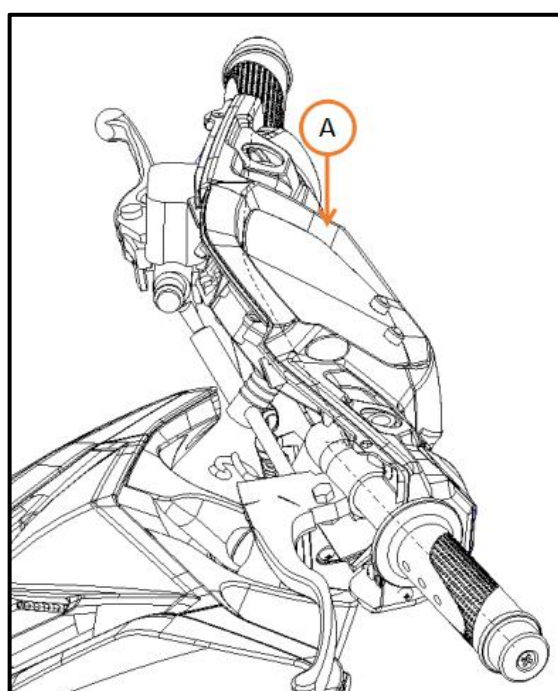
4.10 Handlebar Switch

4.10.1 Disassembly

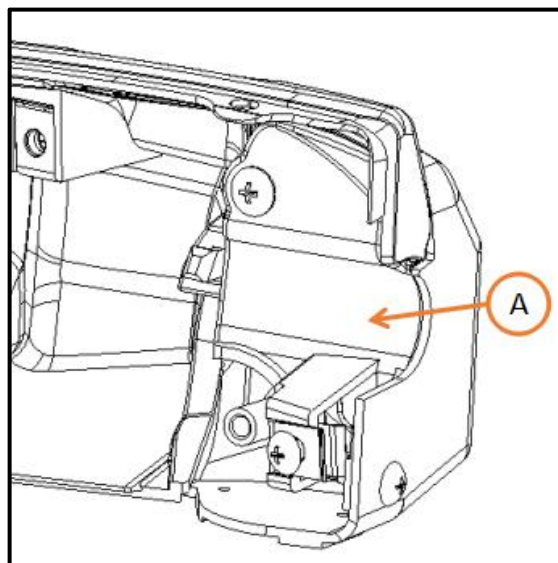
Remove the front protector of cock [A].



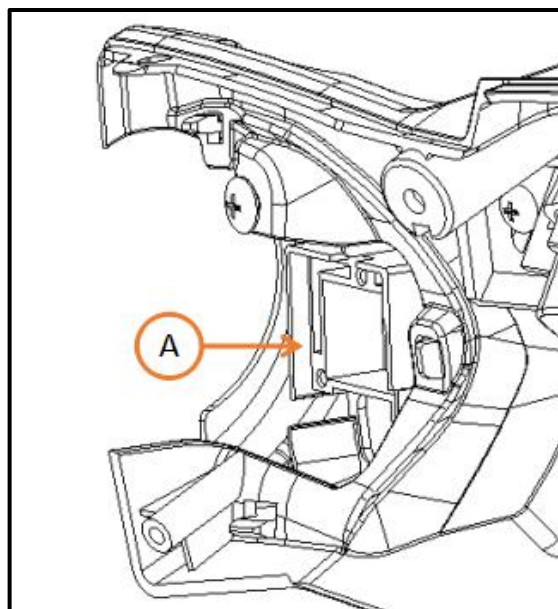
Unplug the handle switch connector, unplug the instrument cable connector, and remove the back cover of cock [A].



Remove left combination switch [A].

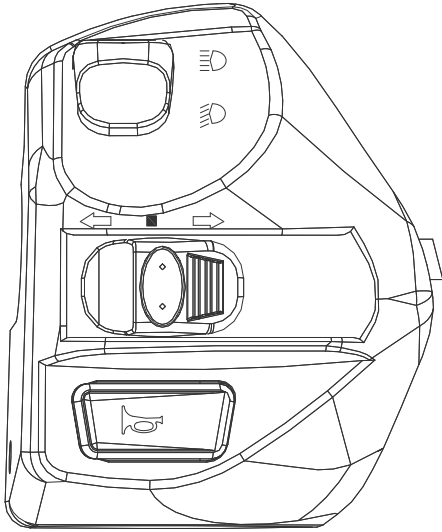


Remove right combination switch [A].



4.10.2 Inspection















Left Handlebar Switch



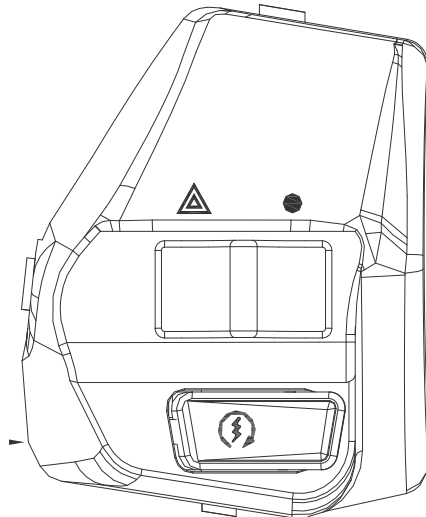
Horn





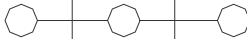
Dimmer

Turn signal

Function on Color	Green	Light green	Function on Color	Blue	Blue / white	white	Function on Color	Orange	Gray	Light blue
										
										

Right handlebar switch (The headlight is always on)



Function Color	Function	Gray	Light blue	Function Color	Green / yellow	Purple
						
						

4.10.3 Installation

The horn should be installed in the reverse order of disassembly.

Torque:

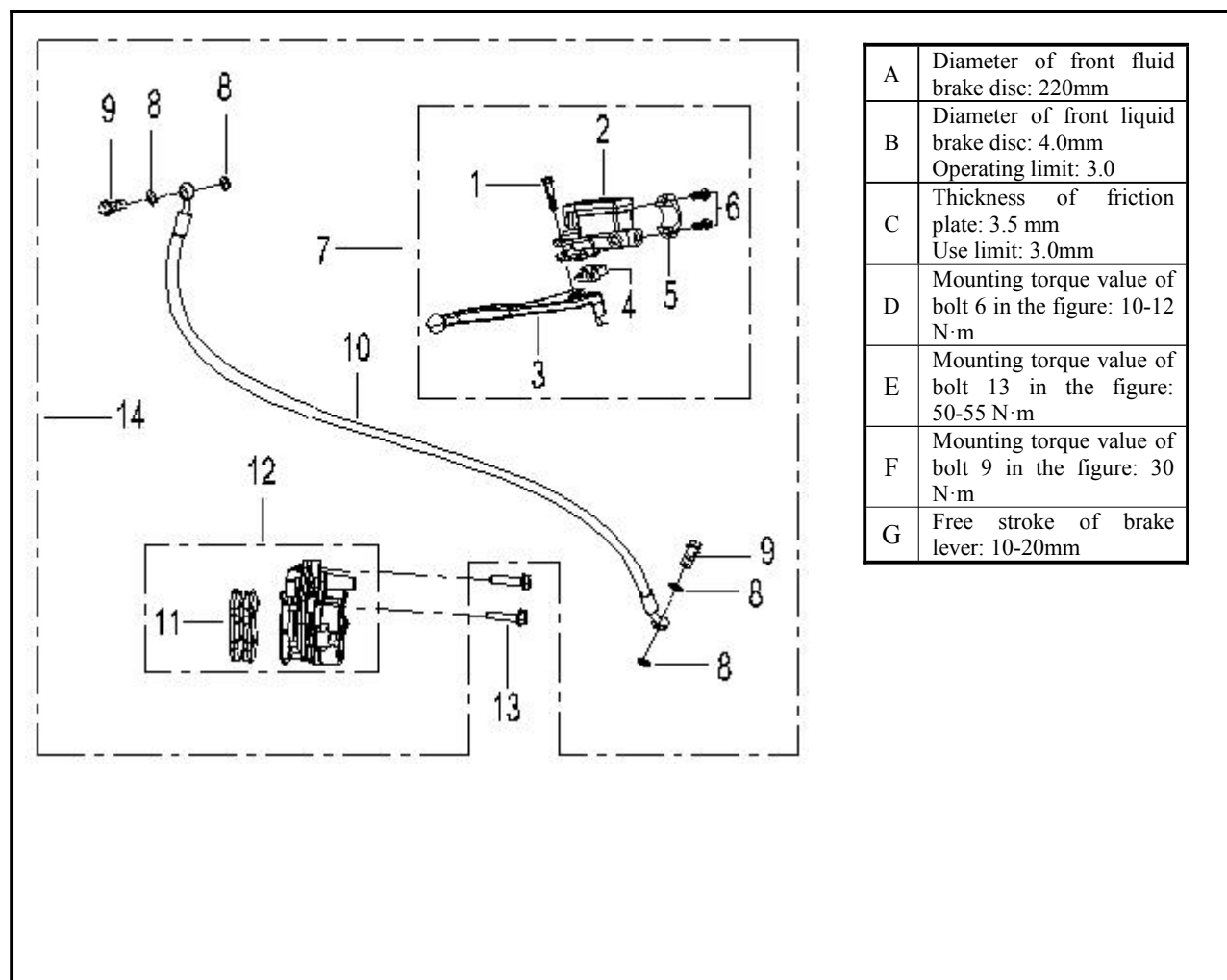
Horn mounting bolt 10-12N.m

Inspection and Maintenance of Chassis

Torque Value Table of Chassis Fastener

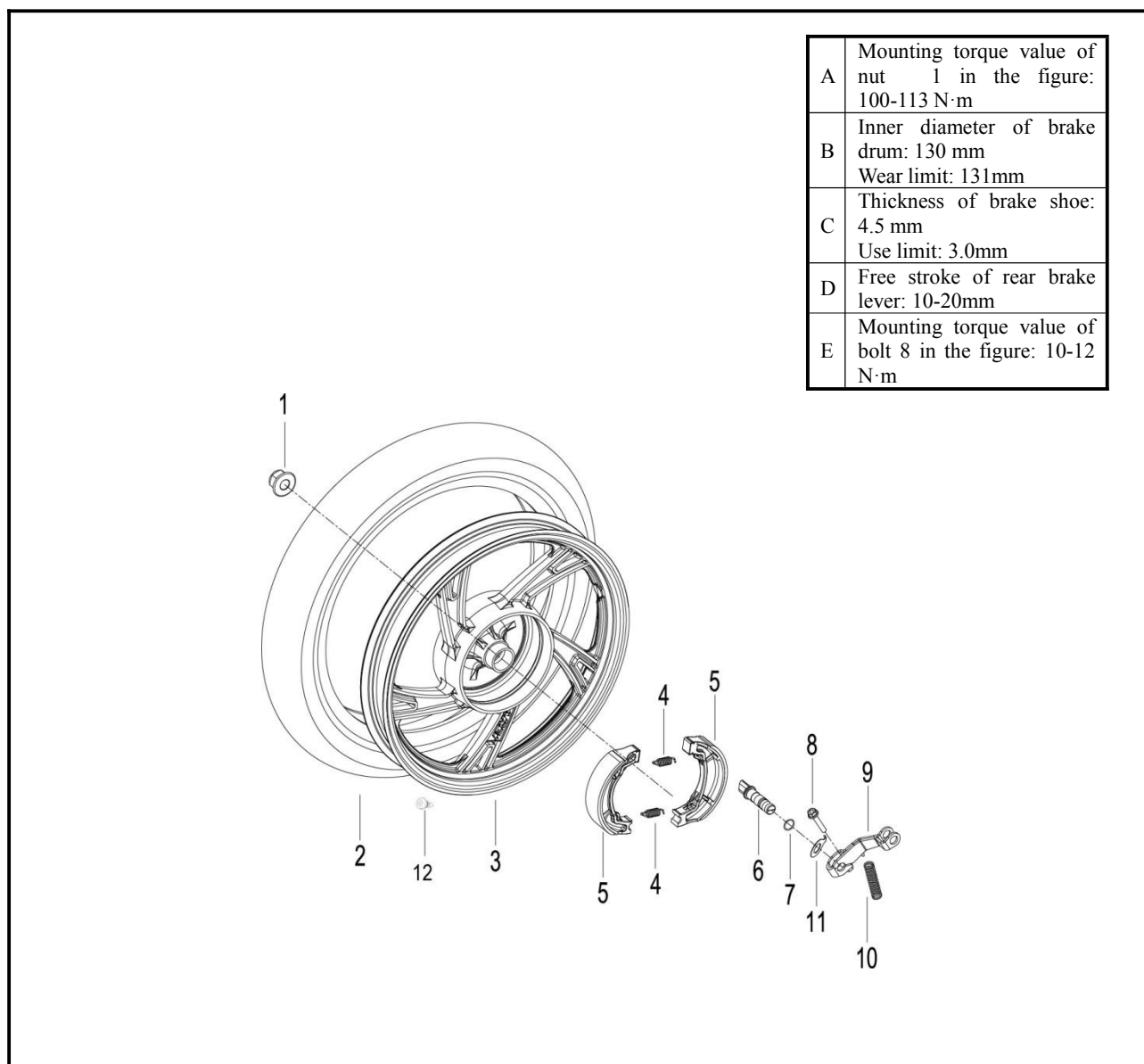
Fastening location and fastener name	Tightening torque (N·m)
Mounting screw of front brake disc	22 ~ 29 N·m
Mounting screw of rear brake disc	10 ~ 12 N·m
Mounting bolt of front brake cylinder assembly	22 ~ 29 N·m
Mounting bolt of rear brake cylinder assembly	22 ~ 29 N·m
Mounting screw of front fuel pump	10 ~ 12 N·m
Rear brake rocker arm assembly mounting bolt	10 ~ 12 N·m
Mounting screw of front brake hose	30 N·m
Handlebar mounting bolt	45 ~ 50 N·m
Front axle clamp nut	55 ~ 62 N·m
Clamp bolt of front shock absorber	37 ~ 44 N·m
Nut of steering axle	2.5 N·m
Locknut of steering axle	70 N·m
Mounting screw of front fuel pump	5 ~ 9 N·m
Mounting bolt of rear fuel pump	5 ~ 9 N·m
Mounting bolt of front brake cylinder assembly	22 ~ 29 N·m
Screw at the bottom of front shock absorber	22 N·m
Bolt at the cover of front shock absorber	22 N·m
Rear wheel mounting nut	100 ~ 113 N·m
Nut at the top of rear shock absorber	37 ~ 44 N·m
Bolt at the bottom of rear shock absorber	22 ~ 29 N·m
Mounting bolt of rear brake cylinder assembly	22 ~ 29 N·m
Mounting bolt for hanging plate of rear shock absorber	37 ~ 44 N·m
Nut at front end of muffler	10 ~ 12 N·m
Muffler cylinder mounting bolt	37 ~ 44 N·m
Power hanger mounting bolt	37 ~ 44 N·m
Power shaft mounting nut	45 ~ 52 N·m
Rear rack mounting bolt	22 ~ 29 N·m
Fuel tank mounting bolt	10 ~ 12 N·m
Helmet barrel mounting bolt	5 ~ 9 N·m
Fuel tank retainer mounting bolt	10 ~ 12 N·m
Fuel pump retainer mounting nut	3.5 ~ 5 N·m

Front fluid brake



No.	Name
1	Lever bolt
2	Fuel pump
3	Fluid brake lever
4	Front fluid brake switch
5	Mounting cover
6	Bolt M6×23
7	Fuel pump assembly
8	Gaskets
9	Hexagon flange screw
10	Brake hose assembly
11	Brake pad assembly
12	Brake cylinder assembly
13	Bolt M10×1.25×35
14	Front fluid brake assembly

Rear drum brake



No.	Name
1	Self-locknut M16×1.5
2	Outer tube 100/70-14
3	Rear wheel rim assembly
4	Spring of rear brake shoe
5	Brake shoe assembly
6	Rear brake camshaft
7	Seal
8	Hexagon bolt with flange M6×35
9	Rear brake rocker arm assembly
10	Rear brake return spring
11	Brake wear indicator
12	Air valve

V. Brake

Preparatory Information-----5.1

Fault Diagnosis-----5.2

Front Fluid brake Disc-----5.3

Front Fluid Brake -----5.3

Rear Drum Brake -----5.5

5.1 Preparatory Information

Operation Precautions

*Note

- Do not expose the brake assembly to oil when installing or removing.
- Use specified cleaning agent to avoid reducing brake performance.

* Check brake before riding

Technical parameters

Item	Standard value (mm)	Allowable limit (mm)
Diameter of front brake disc	φ220	/
Thickness of front brake disc	4.0	3.5
Thickness of front brake shoe	6.0	3.0
Inner diameter of rear brake drum	φ130	131
Thickness of rear brake shoe	4.5	3.0

Torque value

Mounting bolt of fuel pump assembly 10-12 N•m

Mounting bolt of front brake cylinder assembly 22-29 N•m

Front wheel axle 55-62 N•m

Mounting bolt of rear brake rocker arm 10-10 N•m

Mounting nut of rear wheel 100-113 N•m

5.2 Fault Diagnosis

5.2.1 Poor brake performance

1. Proper adjustment of brake
2. Wear of brake shoe
3. Improper installation of brake shoe
4. Pollution of brake shoe and fluid brake disc

5.2.2 Slow Reaction of Brake or Tight Lever

1. Proper adjustment of brake
2. Wear of brake shoe
3. Improper installation of brake shoe

5.2.3 Abnormal noise of brake

1. Wear of brake shoe
2. Pollution of brake shoe and fluid brake disc

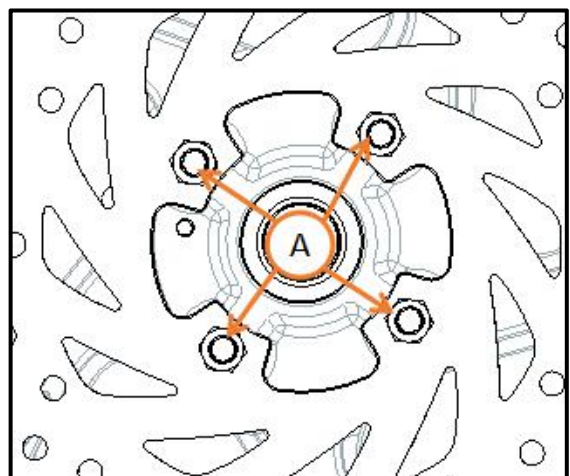
5.3 Front Brake Disc

5.3.1 Disassembly of front brake disc

Remove the front axle

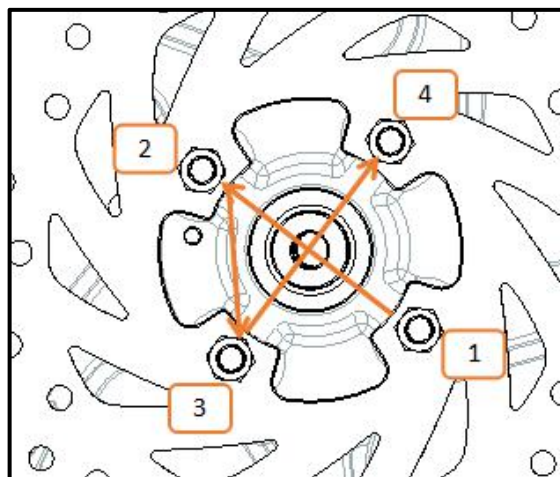
Remove the front wheel. (See 7.3.1 for details)

Remove the clamp screw [A] of front brake disc



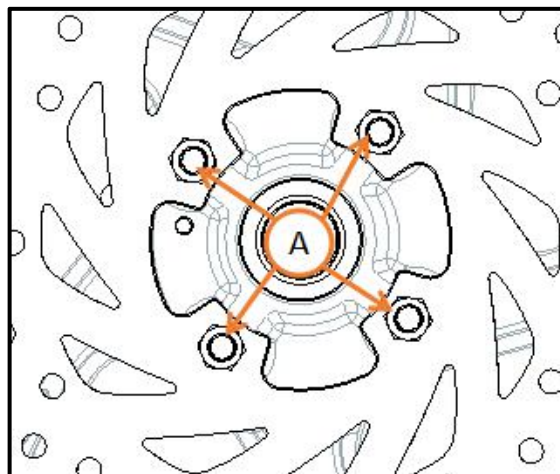
Note:

When disassembling the clamp screw of front brake disc, follow the instructions on the right figure



5.3.2 Installation of front brake disc

Insert the front brake disc into the edge of rim, and insert 4 clamp screws [A] after applying one drop of thread sealant at the end of thread



Tighten the bolt to the brake disc by means of tightening the fastening bolt alternately, and tighten 4 screws according to the following torque value:

Torque value:

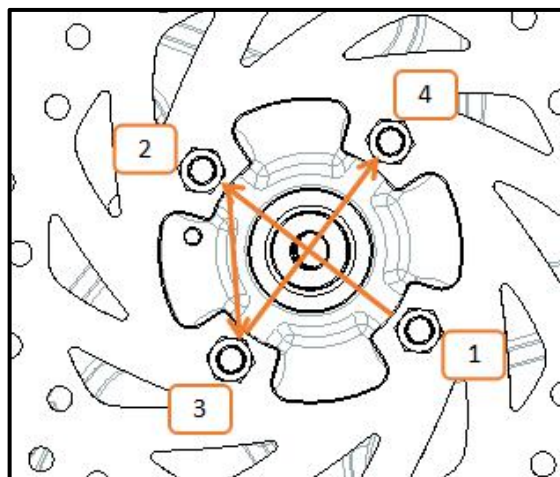
Clamp screw of brake disc 22-29N•m

***Note**

- Do not expose the brake assembly to oil when installing or removing.
- Use specified cleaning agent to avoid reducing brake performance.

***Note**

If there is grease on the brake shoe, braking performance will be reduced and the brake will fail.



5.3.3 Inspection of front brake disc

Check the brake disc for wear, and replace it if necessary.

Measure the brake disc and record the maximum value.

If the thickness of brake disc is smaller than the maintenance value, it should be replaced.

Specifications

Diameter of front fluid brake disc $\phi 220\text{mm}$

Thickness of front brake disc 4.0mm

Allowable limit:

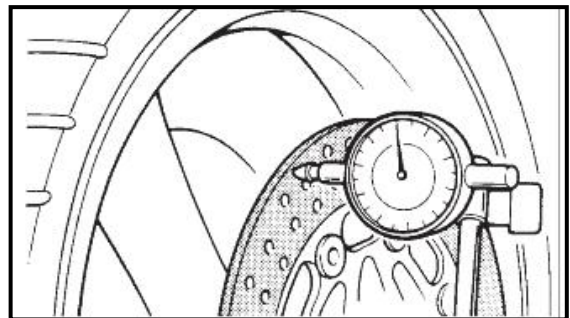
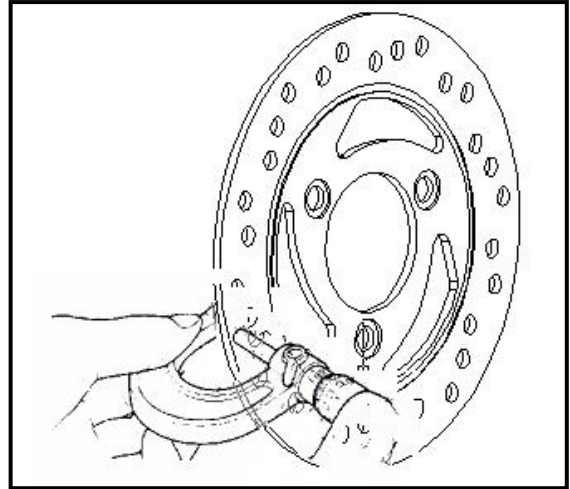
Brake disc 3mm

***Note**

- Use a micrometer for measurement.

Measure the jump value at the edge of front brake disc

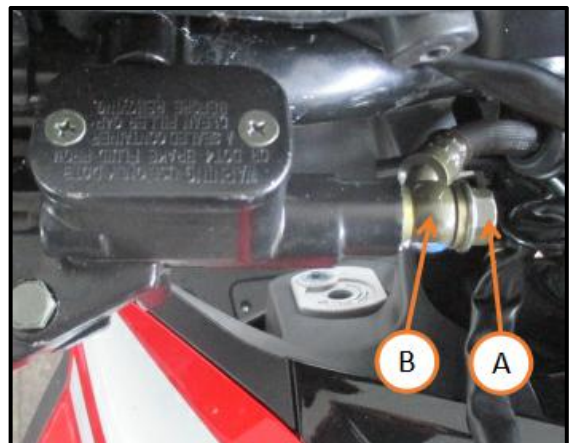
Available limit 0.15mm

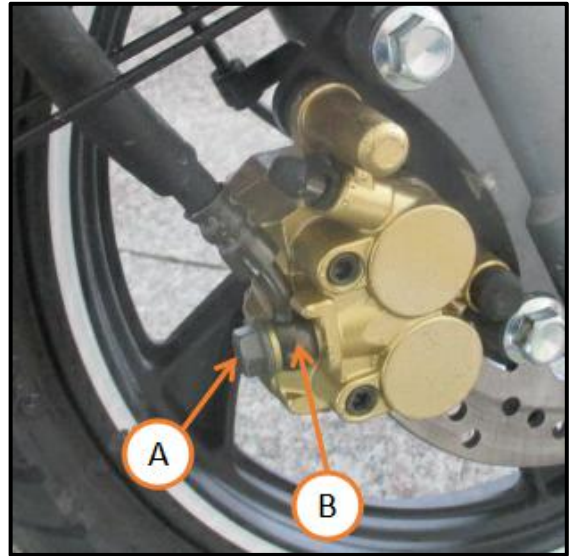


5.4 Front Fluid Brake

5.4.1 Replacement of brake hose

Note
Brake fluid may quickly corrode the surface of painted part, so if the brake fluid spills on any plastic part, it must be thoroughly rinsed immediately.
<ul style="list-style-type: none">• Remove the hollow bolt of brake hose [A].• When removing brake hose, be careful not to spill brake fluid on any painted part.• When removing brake hose [B], temporarily fix the end of brake hose in a high place to minimize the loss of brake fluid.• If brake fluid overflows, clean it immediately.





- All sides of brake line fittings are equipped with washers. They need to be replaced with new ones when installed.

- Tighten:

Lock torque of hollow bolt of brake hose: 30 N•m;

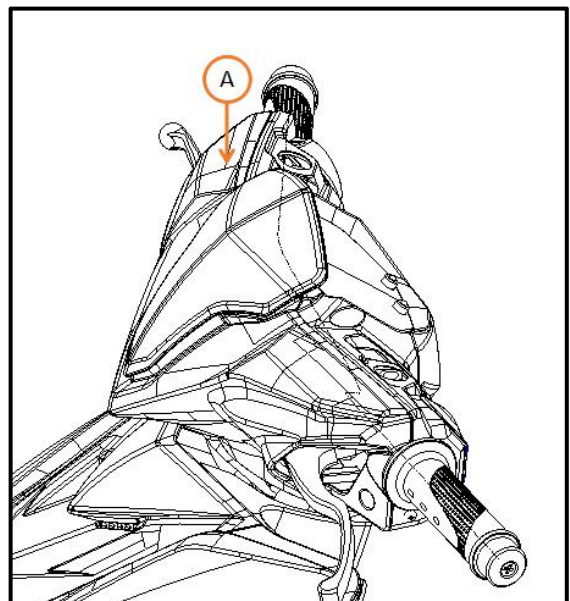
- Avoid sharply bending, kinking, squeezing or twisting in the process of installing the brake hose.

- Fill the brake line with brake fluid after installing brake hose. (See “replacement of brake fluid” for details).

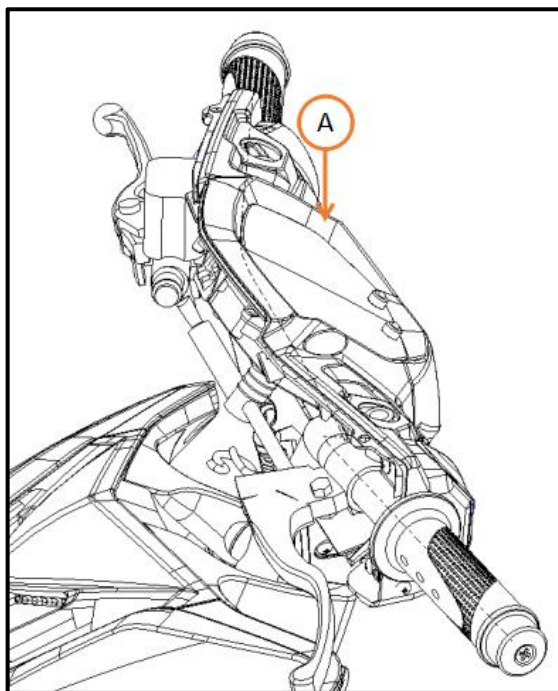
5.4.2 Front master cylinder

5.4.2.1 Disassembly of front master cylinder

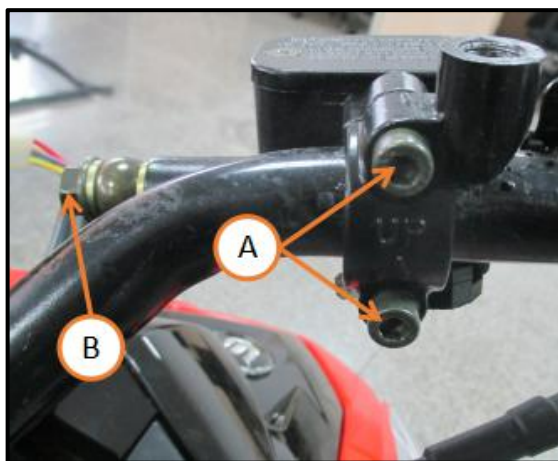
Remove the front protector of cock [A].



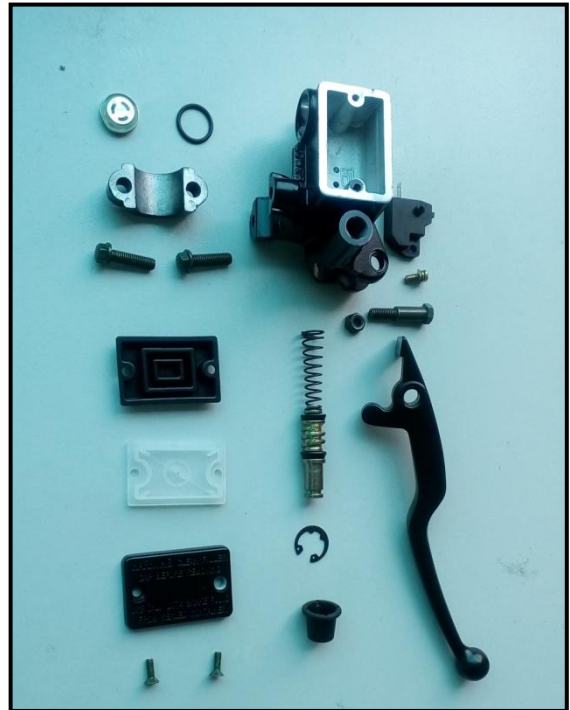
Remove the instrument wire cable connector and remove the rear protector of cock [A].



- Remove mounting bolt [A] of front master cylinder tube.
- Remove mounting bolt [B] at mounting cap of front master cylinder and remove master cylinder.



- Remove reservoir cap bolt, remove reservoir cap, reservoir washer and diaphragm, and pour the brake fluid into the container.
- Remove lever locknut and remove lever bolt.
- Remove plunger dust cap.
- Remove plunger spring with a special tool—inside circlip pliers, and remove plunger assembly.



5.4.2.2 Assembly of master cylinder

Before assembly, clean all parts with brake fluid or alcohol, including master cylinder.

Note
<p>Except brake pad and disc brake, other brake parts can only be cleaned with disc brake fluid, isopropyl alcohol or ethanol. Do not clean the above parts with other liquid. Gasoline, oil or other gasoline distillates may corrode rubber parts. If oil spills onto any part, it will be difficult to clean thoroughly and eventually corrode the rubber parts inside the disc brake.</p>

- Apply brake fluid to new parts and inner wall of brake cylinder.
 - Be careful not to scratch the piston or the inner wall of brake cylinder.
 - Install plunger assembly. If the front reservoir or rear reservoir on the plunger assembly is damaged, replace it with a new one.
- Incorrect use or reverse installation of front and rear reservoirs should be avoided.
- Press the plunger assembly down and install it into the plunger spring using a special tool—inside circlip pliers, and press it into the dust cap.
 - Apply silicon grease to the pivot bolt of brake lever.



- Install the lever, and tighten the lever bolt and locknut.

Lock torque of lever bolt: 1.0 N•m

Lock torque of locknut: 5.9 N•m

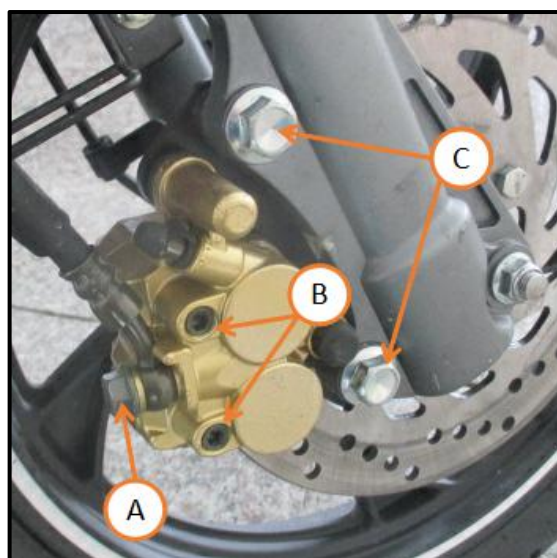
5.4.3 Front caliper

5.4.3.1 Disassembly of front caliper

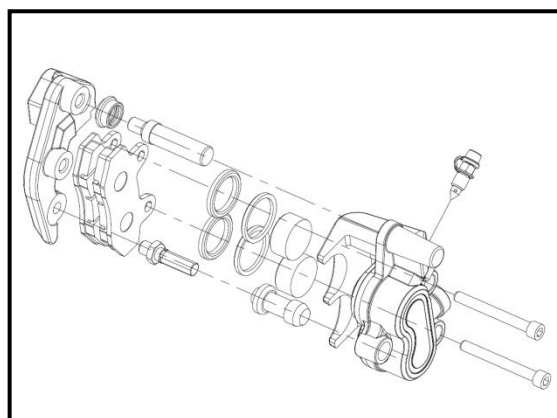
- Loosen front caliper brake pin [B] and hollow bolt [A], and then gently tighten them (Tighten them a little bit, and do not tighten too much).

Mounting bolt of front caliper [C]. Remove front caliper

- Remove hollow bolt [A]



- Remove brake pad pin
- Remove brake pad
- Remove spring
- Remove the front brake mounting bracket
- Remove the piston with compressed air. The method for removing piston is as follows:
 - Install a rubber washer and a board with a thickness of 10mm (0.4 in.) or more in the middle of the caliper
 - Inject the compressed air into oil port slowly, and pull the piston out when the piston touches the rubber washer.



Warning

To avoid serious injuries, do not put your fingers or palms in front of the piston!
Otherwise, the piston may crush your hands or your fingers when the compressed air is injected into the caliper.

- Take out the dust ring and seal.

Note

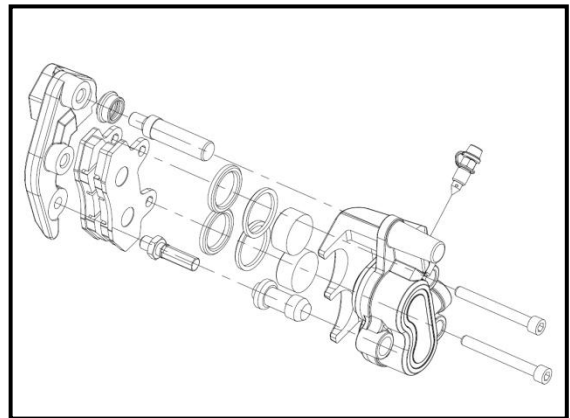
Except brake pad and disc brake, other brake parts can only be cleaned with disc brake fluid, isopropyl alcohol or ethanol. Do not clean the above parts with other liquid. Gasoline, oil or other gasoline distillates may corrode rubber parts. If oil spills onto any part, it will be difficult to clean thoroughly and eventually corrode the rubber parts inside the disc brake.

Remarks

- If compressed air is not available, remove the piston from both calipers as follows (connect brake hose to caliper).
- Prepare a container to hold the brake fluid.
- Press the brake lever until the piston is pushed out of the brake cylinder, and then remove the caliper.

5.4.3.2 Assembly of front caliper

- Insert the oil seal and dust ring. Note that the oil seal groove and the dust groove should be flat, if oil seal or dust ring is damaged, replace it with a new one.
- Install piston
- Install spring
- Install front brake mounting bracket
- Install brake pad
- Install brake pad pin

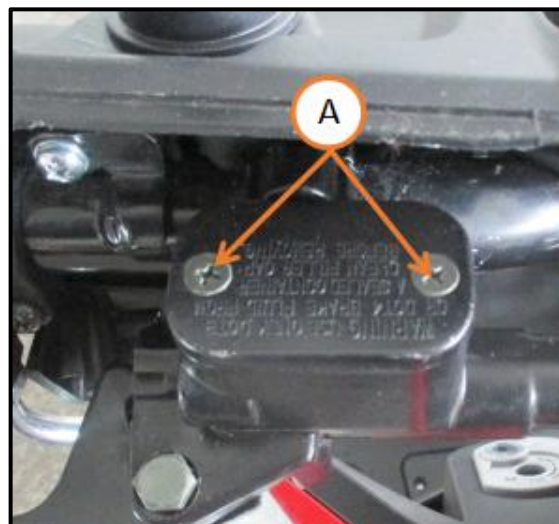


5.4.4 Replacement and filling of front brake fluid

Warning

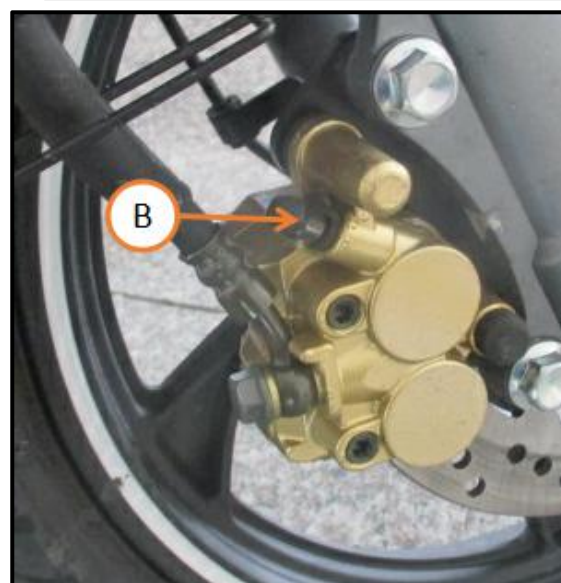
Use only the prescribed brake fluid. Other types of brake fluid may damage the rubber seal, thus causing leakage and degrading the braking performance. Use the same brand of brake fluid in the process of adding brake fluid. Brake fluid must not be the mixture of different brands, because it may cause dangerous chemical reactions and also degrade braking performance. When adding brake fluid, be careful not to allow any water to enter the container. Water will significantly reduce the boiling point of liquid, and it may cause the formation of vapor bubbles, king performance.

- Remove the master cylinder reservoir cap bolt [A], and remove reservoir cap and reservoir washer.



- Loosen the bleed screw of slave pump of front brake [B], and vacuumize from the bleed screw using a vacuum pump to pump the brake fluid completely.
- Add new brake fluid to master cylinder reservoir, keep the brake fluid in the reservoir not less than 1/3 of its volume, and pull the brake lever for several times quickly, and lock the bleed screw of slave cylinder [B].

○ Operate the brake lever and feel. If you feel that it is softer than before, please repeat the above actions to refill.



Warning

The precautions for handling disc brakes are as follows:

1. It is forbidden to reuse brake fluid!
2. If the container containing the brake fluid is not sealed or has been opened for a long time, the brake fluid inside the container must not be used!
3. Do not mix brake fluids of different types or brands. This will reduce the boiling point of the brake fluid, resulting in brake failure or corrosion of rubber brake parts.
4. Do not open the reservoir cap for a long time to prevent the brake fluid from getting wet.
5. Do not replace brake fluid in rain or strong winds!
6. In addition to brake pads and brake discs, only disc brake fluid, isopropyl alcohol or alcohol can

be used to clean the brake parts. Do not clean the above parts with any other liquid! Gasoline, oil or other gasoline distillates may corrode rubber parts. Gasoline, oil or other gasoline distillates may corrode rubber parts. If oil is splashed on any part, it will be difficult to completely clean and eventually corrode the rubber parts inside the disc brake.

7. When handling brake pads or brake discs, prevent any brake fluid or other oil from splashing on them. If you accidentally spill any brake fluid or other oil on the brake pads or discs, clean them using solvent with a high flash point! Do not use any solvents that may leave oily residues! If the brake fluid or oil cannot be completely removed from the brake pad, replace it with a new one!

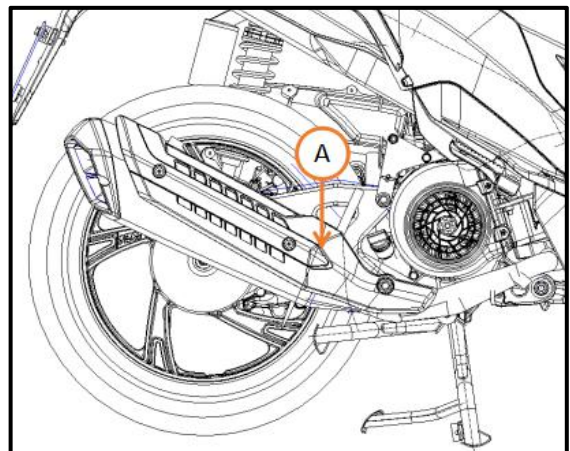
8. The brake fluid may quickly corrode the surface of painted part, so if any brake fluid spills, it must be wiped!

9. The air in the brake line must be drained whenever the brake line connector or exhaust valve is opened!

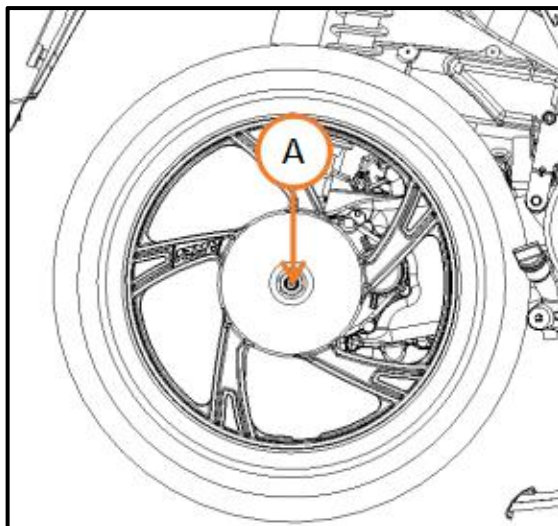
5.5 Rear Drum Brake

5.5.1 Disassembly

Remove the muffler [A]



Remove the rear wheel mounting nut [A]

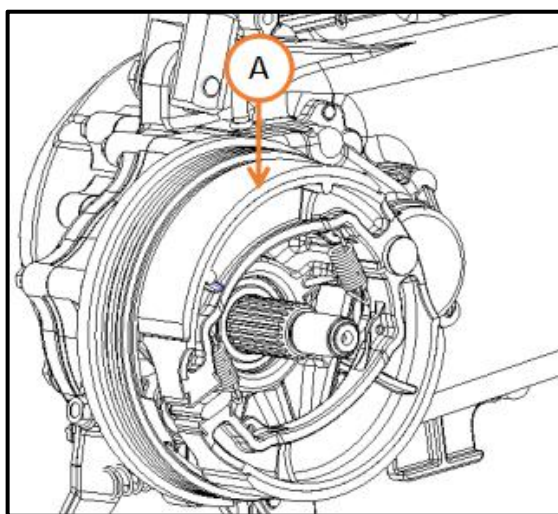


Remove rear wheel.

Remove brake shoe assembly

***Note**

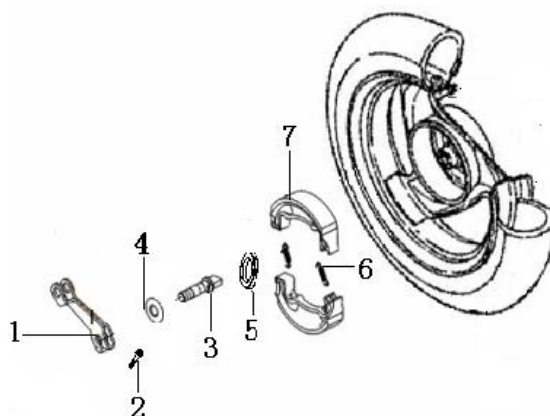
- Replace brake shoe.
- If brake shoe is used again, mark it on its side before disassembly so that it can be installed at the original location.



Remove the following assembly from the engine

Rear brake:

1. Rear brake rocker arm assembly
2. Bolt M6×30
3. Rear brake camshaft
4. Front brake wear indicator
5. Seal ring
6. Brake shoe tension spring
7. Brake shoe assembly



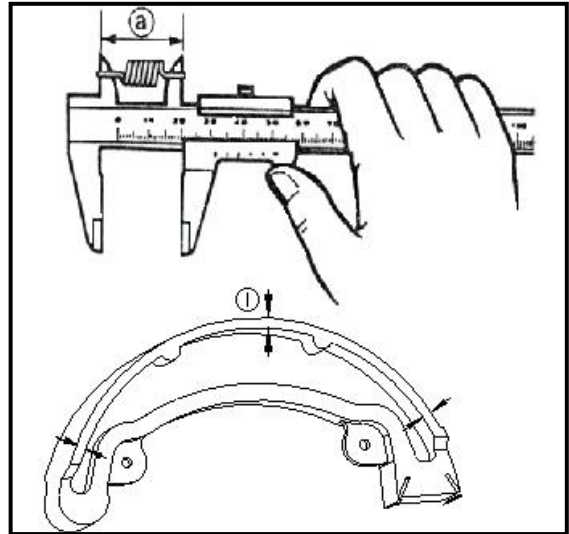
5.5.2 Inspection

Inspect the brake drum and brake shoe for wear and replace the brake shoe if necessary.

Measure the brake shoe and record the maximum value.

*Note

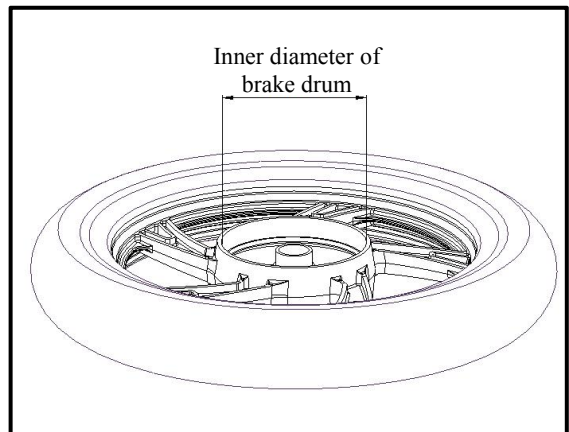
- Use a micrometer for measurement.



Measure the inner diameter of brake drum.

If the thickness of brake shoe is less than the maintenance value or contaminated by grease, it should be replaced.

Note: Replace the brake shoes in pair.



Specifications:

Inner diameter of rear brake drum $\phi 130\text{mm}$

Thickness of rear brake shoe 4.5mm

Allowable limit:

Inner diameter of brake drum $\phi 131\text{mm}$

Brake shoe 3mm

5.5.3 Installation

Install it in the reverse order of disassembly.

*Note

If there is grease on the brake shoe, braking performance will be reduced and the brake will fail.

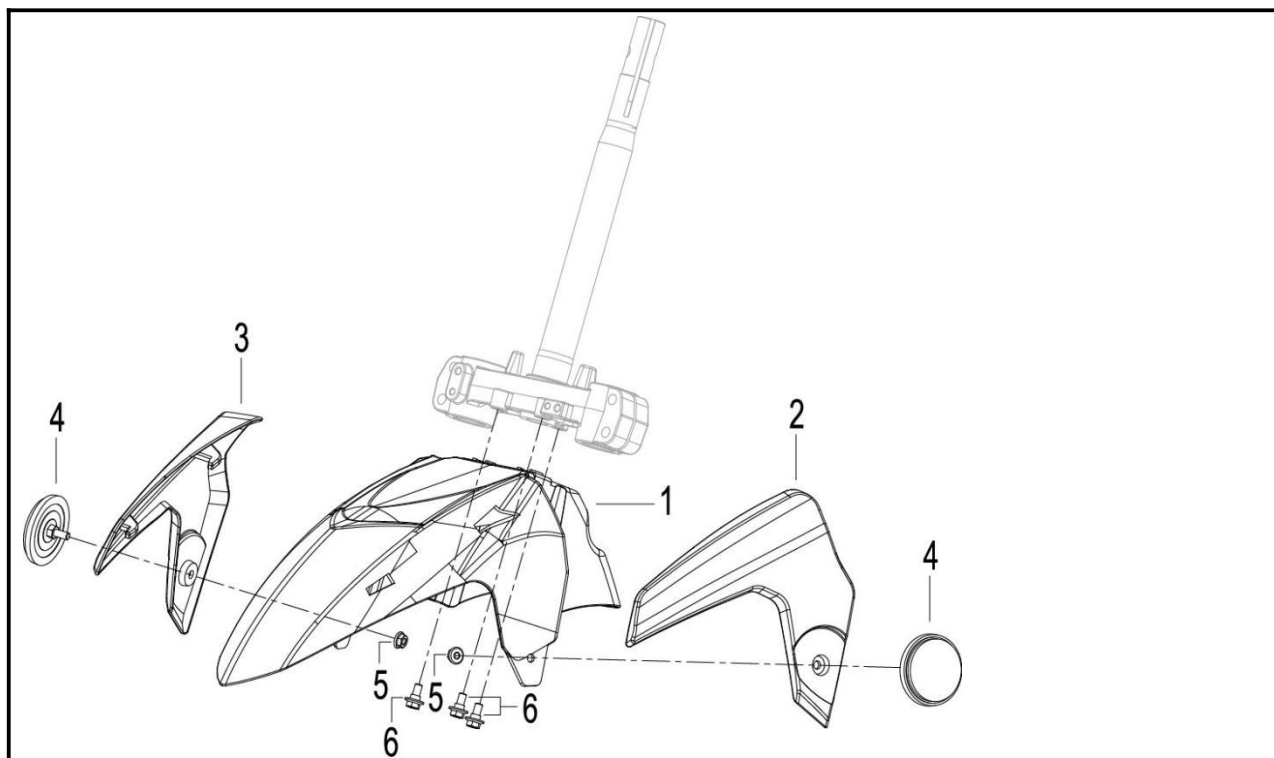
Lock the bolt and nut to the specified torque values.

Torque value:

Mounting nut of rear wheel 100-113 N·m

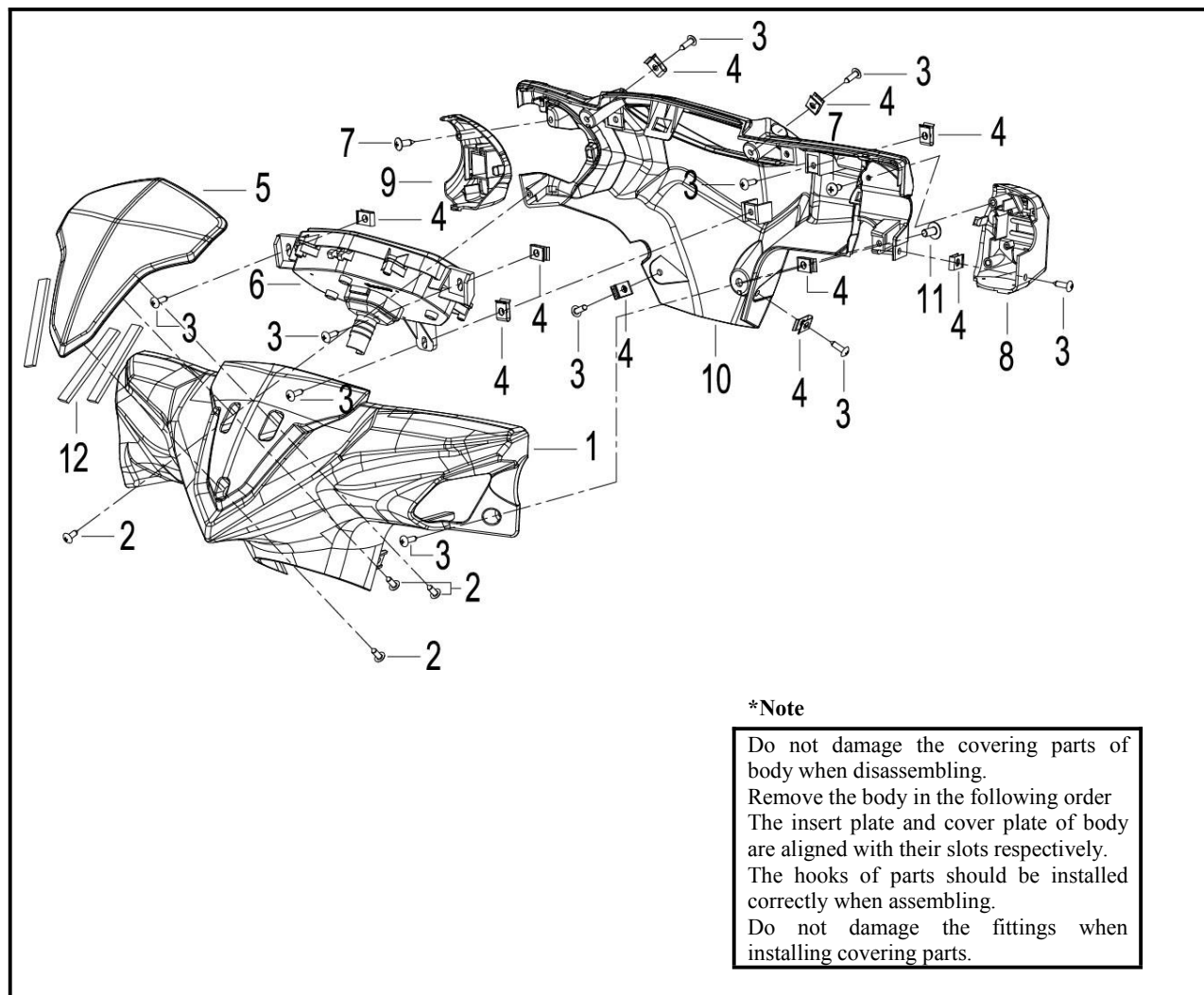
Mounting bolt of rear brake rocker arm: 10-12 N·m

Front fender



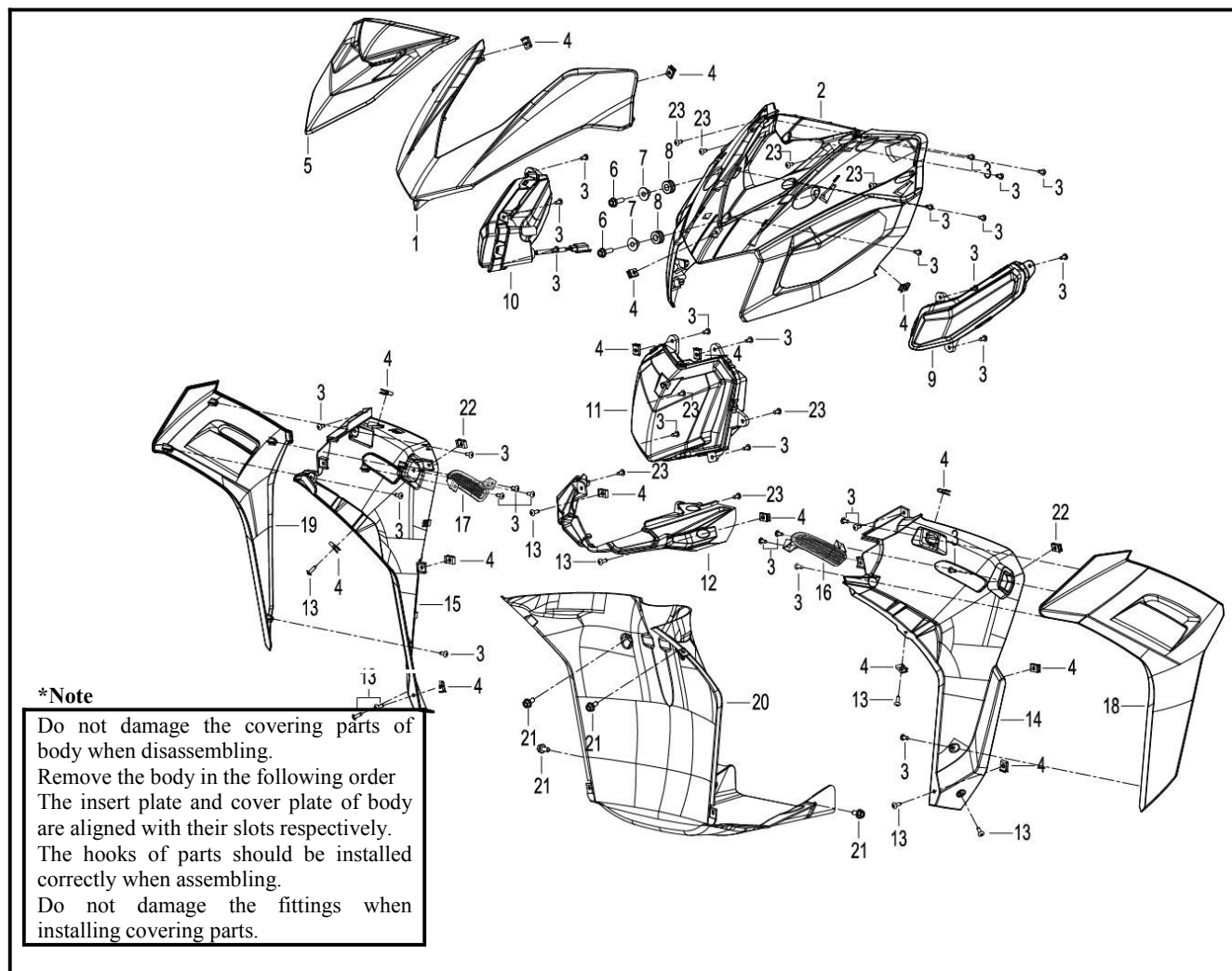
No.	Name
1	Front fender
2	Left cover of front fender
3	Right cover of front fender
4	Side reflector assembly
5	Self-locknut M6
6	Boss bolt M6×14

Cock cover



No.	Name
1	Front cock cover
2	Self-tapping screw ST4.2×13
3	Self-tapping screw ST4.2×16
4	Clamp ST4.2
5	Windshield
6	Instrument assembly
7	Self-tapping screw ST4.8×16
8	Left combination switch
9	Right combination switch
10	Rear upper cock cover
11	Screw M6×12
12	Spongy cushion of taillight

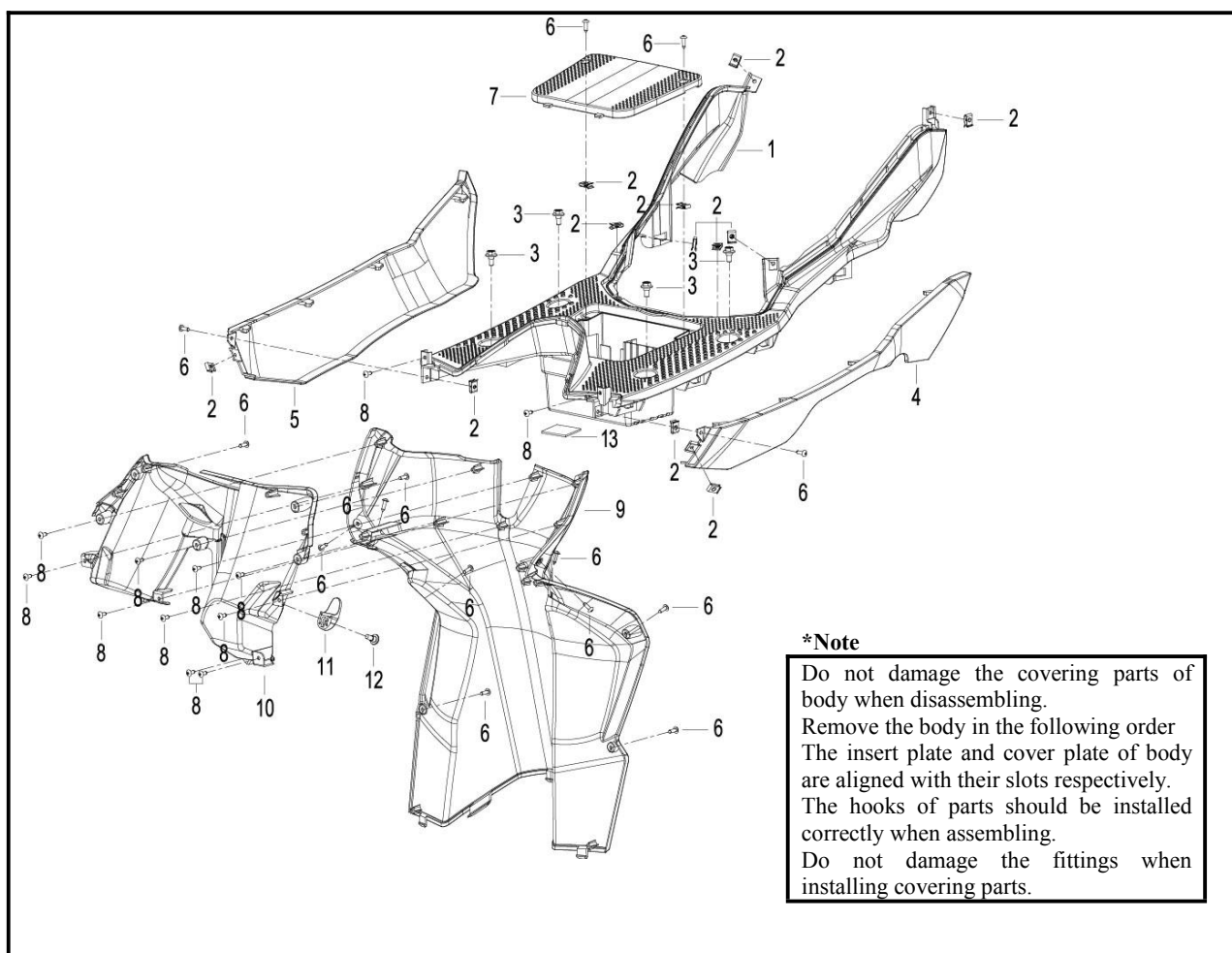
Cowling



No.	Name		
1	Front headlight panel (bright red 2#RB) with decals	13	Self-tapping screw ST4.2×16
2	Front headlight baseboard	14	Left bracket
3	Self-tapping screw ST4.2×13	15	Right bracket
4	Clamp ST4.2	16	Left grid
5	Upper cover plate of front headlight	17	Right grid
6	Hexagon bolt with flange M6×20	18	Left bracket
7	Headlight bushing	19	Right bracket
8	Rubber washer of cover	20	Inner protector of base plate
9	Front left turn signal light	21	Bolt M6×12
10	Front right turn signal light	22	Clamp ST4.2
11	Headlight	23	Self-tapping screw ST4.2×16

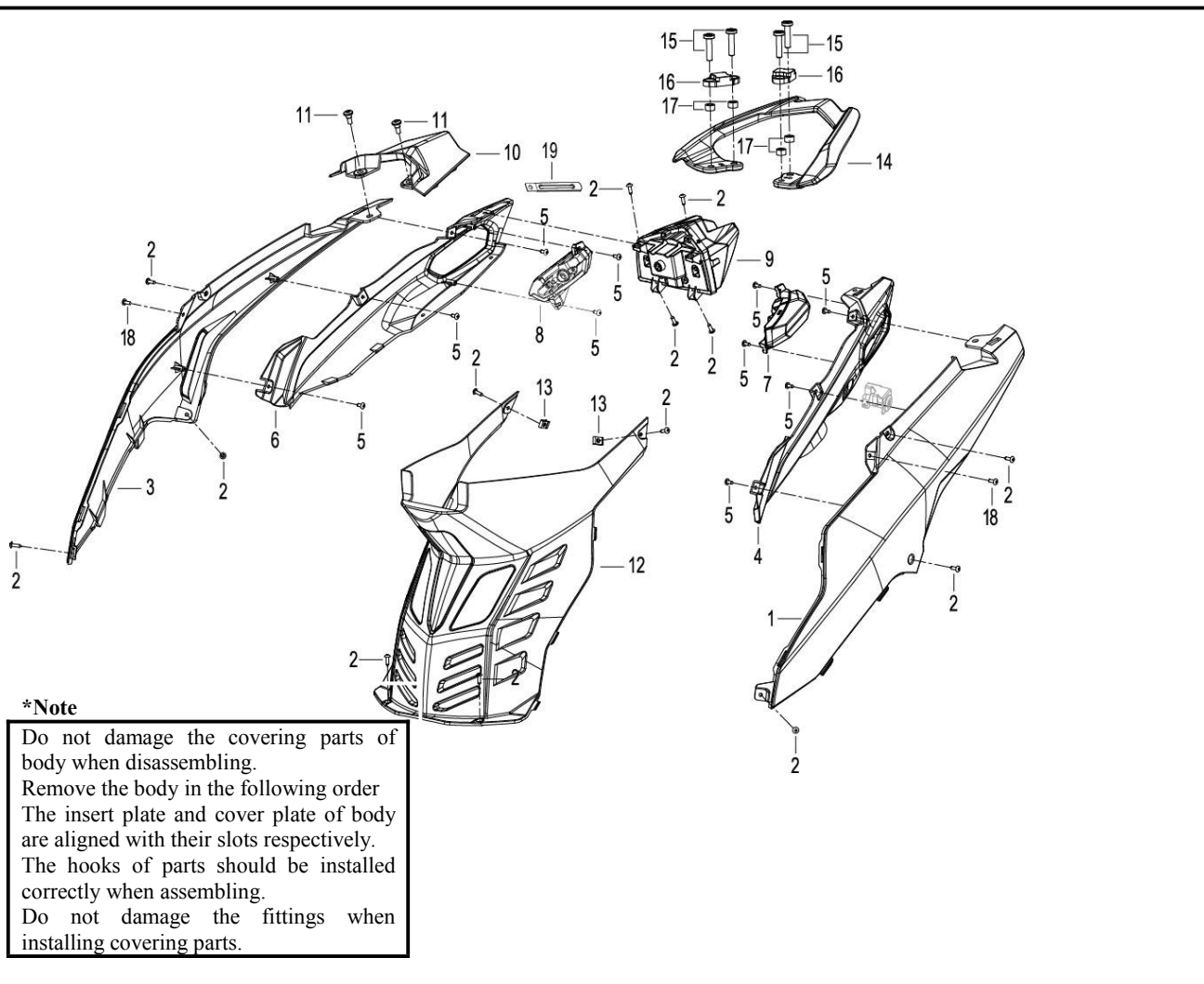
12	Lower cover of front headlight		
----	--------------------------------	--	--

Foot protector



No.	Name
1	Footrest
2	Clamp ST4.2
3	Boss bolt M6×14
4	Left bead (matt silver black BA)
5	Right bead (matt silver black BA)
6	Self-tapping screw ST4.2×16
7	Battery box cover
8	Self-tapping screw ST4.2×13
9	Foot protector
10	Back panel of front storage compartment
11	Mounting bucket of rear large cover
12	Pedal rubber mounting bolt
13	Spongy cushion I of foot protector

Cover

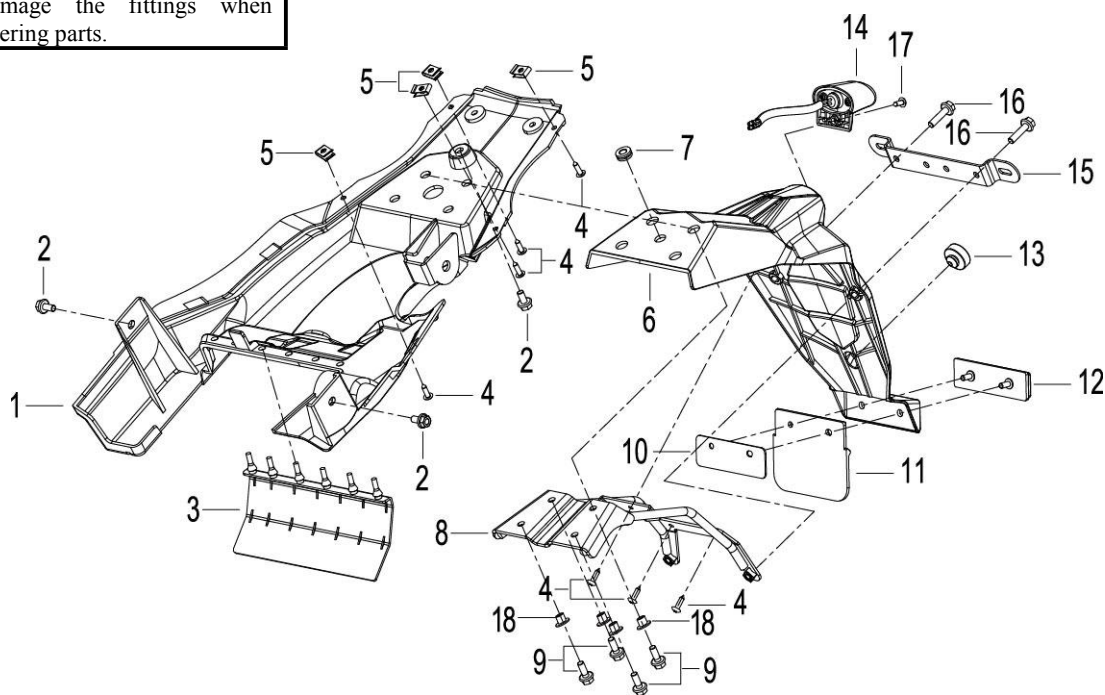


No.	Name	No.	Name
1	Left protector	11	Pedal rubber mounting bolt M6×16
2	Self-tapping screw ST4.2×16	12	Front bracket of left and right protector
3	Right protector	13	Clamp ST4.2
4	Left lower cover	14	Rear grab rail
5	Self-tapping screw ST4.2×13	15	Rear rack screw II M8×35
6	Right lower cover	16	Supporting pad of seat cushion
7	Rear left turn signal light	17	Mounting bushing of rear grab rail
8	Rear right turn signal light	18	Self-tapping screw ST4.2×13 F
9	Taillight	19	Clamp assembly 81mm
10	Rear cover plate of guard		

Rear fender

*Note

Do not damage the covering parts of body when disassembling.
Remove the body in the following order
The insert plate and cover plate of body are aligned with their slots respectively.
The hooks of parts should be installed correctly when assembling.
Do not damage the fittings when installing covering parts.



No.	Name	No.	Name
1	Front part of rear fender	10	Water retaining rubber pressing plate
2	Bolt M6×12	11	Retaining rubber of rear fender
3	Rear fender rubber	12	Rear reflector
4	Self-tapping screw ST4.2×16	13	Buffering rubber ring of seat cushion
5	Clamp ST4.2	14	Rear license plate light
6	Rear fender	15	Rear license mounting plate
7	Rubber washer of cover	16	Bolt M6×25
8	Rear fender holder assembly	17	Self-tapping screw ST4.2×13
9	Hexagon bolt with flange M6×20	18	Collar

VI. Body Cover

Remove the body in the following order

Front guard of handlebar→windshield→rear guard of handlebar→instrument→front large cover→front inner fender→foot guard→



Battery box cover→ right and left pedal cover plates → right and left pedal rubbers→left and right guards of pedal →rear storage rack→seat cushion→



Helmet barrel→ right and left rear guards→right and left front guards→rear fender
→rear inner fender→rear inner fender water rubber



→rear lower fender →pedal → front fender

***Note**

Do not damage the covering parts of body when disassembling.

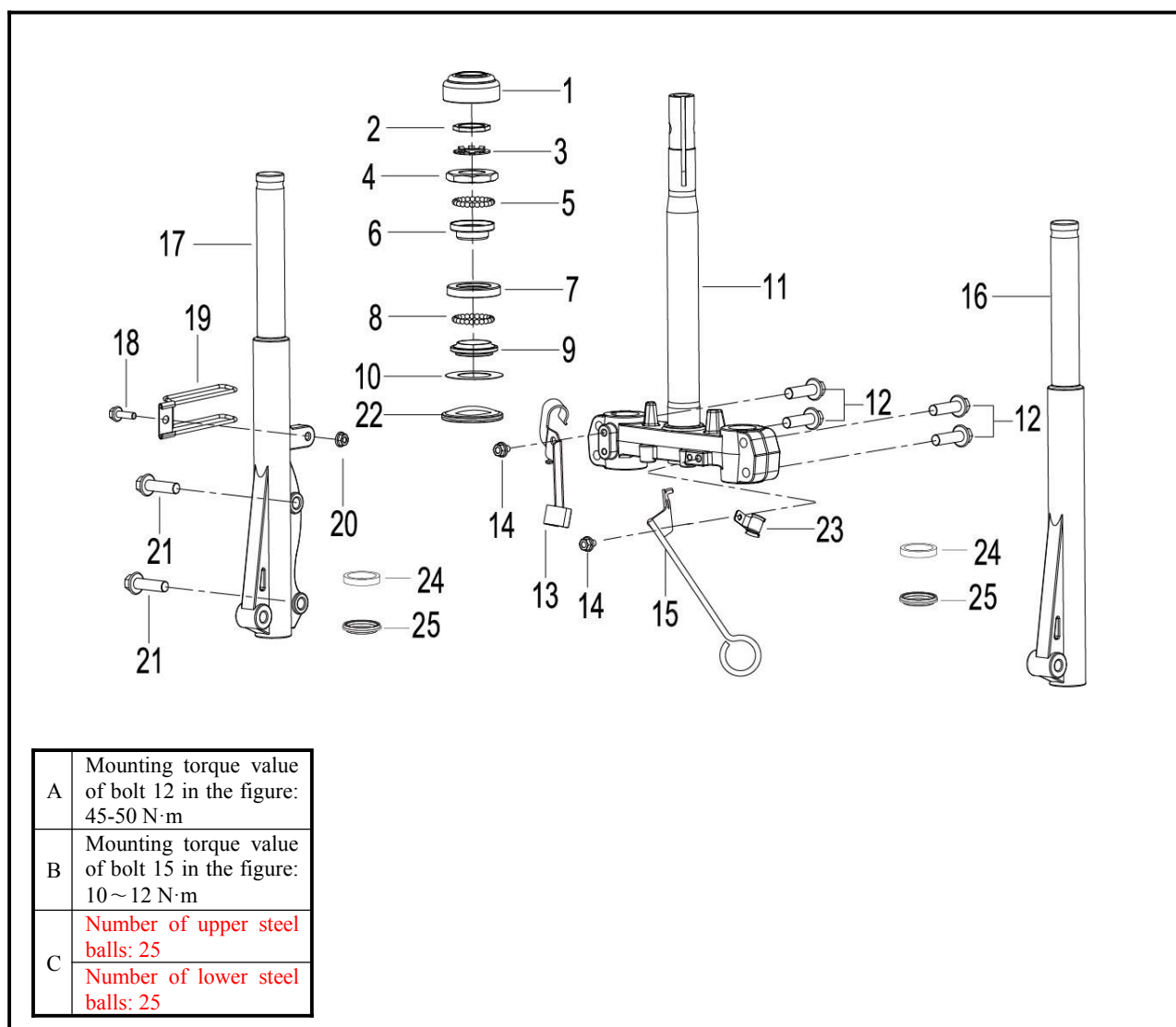
Remove the body in the following order

The insert plate and cover plate of body are aligned with their slots respectively.

The hooks of parts should be installed correctly when assembling.

Do not damage the fittings when installing covering parts.

Front Fork

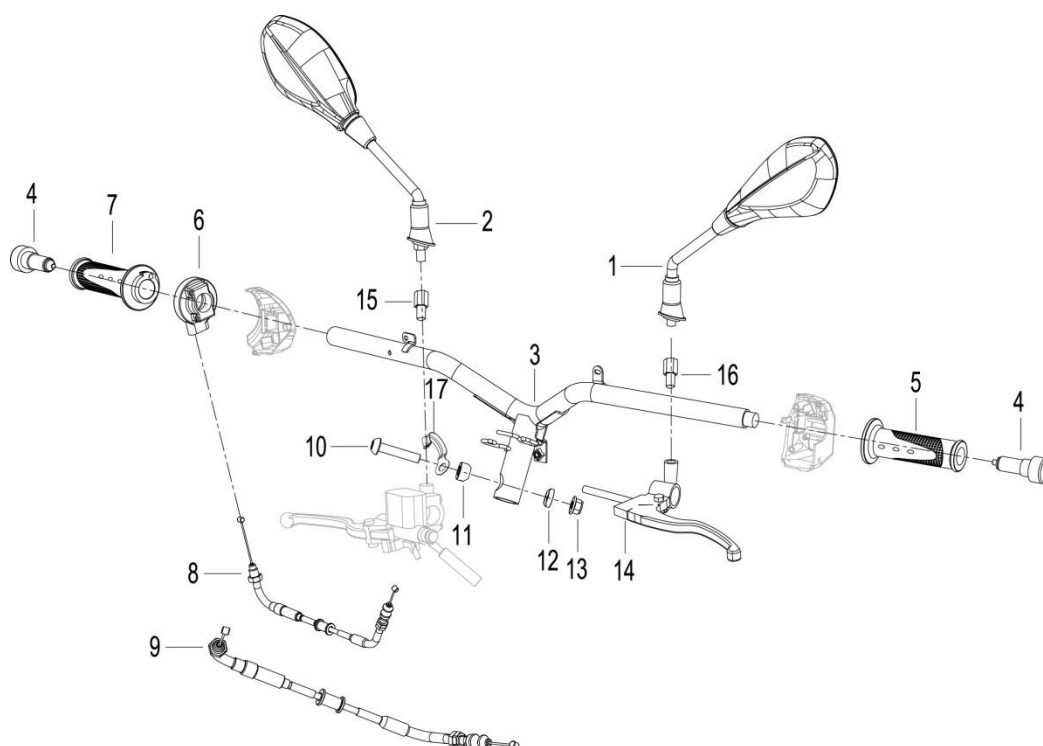


No.	Name	No.	Name
1	Dust cover	14	Bolt M6×12
2	Locknut	15	Gear housing clamp assembly
3	Lockplate	16	Front left shock absorber assembly
4	Upper steel bowl of upper bearing	17	Front right shock absorber assembly
5	Steel ball 5/32"	18	Hexagon bolt with flange M6×20
6	Upper steel bowl holder	19	Front fluid brake clamp assembly
7	Lower steel bowl holder	20	Hexagon flange nut M6
8	Steel ball 1/4 inch	21	Bolt M10×1.25×35
9	Lower steel bowl	22	Dust washer
10	Dust ring	23	Clutch clamp assembly
11	Lower bracket welding assembly	24	Oil seal assembly
12	Inner hexagon screw M10×1.25×40	25	Front shock absorber dust seal

13	Fluid brake hose clamp	26	Odometer clamp II
----	------------------------	----	-------------------

Handlebar

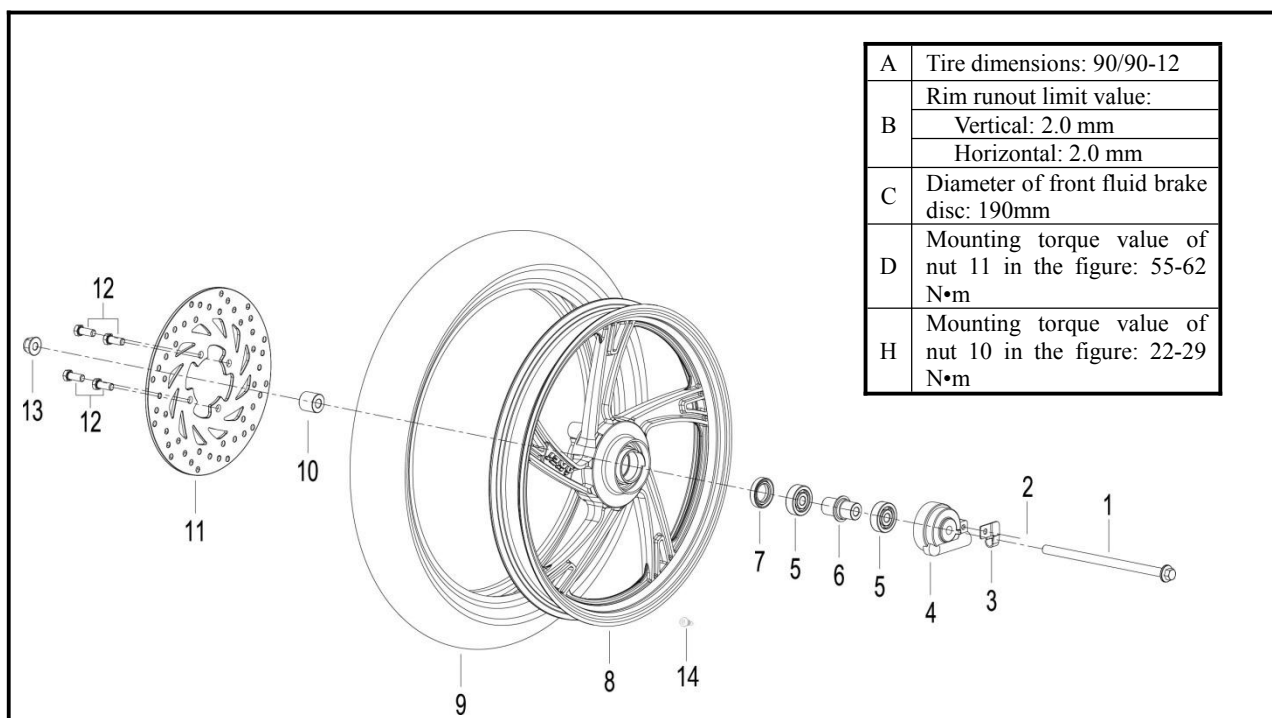
A	Mounting torque value of bolt 8 in the figure (handlebar mounting bolt): 45-50N·m
B	Free stroke of front brake lever: 10-20mm
C	Free stroke of rear brake lever: 10-20mm
D	Free stroke of throttle lever (Fig. 6): 5-10mm



No.	Name	No.	Name
1	Left rear view mirror assembly	10	Handlebar mounting bolt
2	Right rear view mirror assembly	11	Handlebar cap
3	Handlebar welding assembly	12	Handlebar mounting sleeve II
4	Grip end assembly	13	Self-locknut M10×1.25
5	Left handlebar jacket	14	Left lever assembly
6	Throttle cable Mounting seat	15	Lower mounting thread sleeve of rear view mirror M10×1.25 left rotation
7	Right grip assembly	16	Lower mounting thread sleeve of rear view mirror M10×1.25 right rotation

8	Throttle cable assembly	17	Main cable clamp
9	Rear brake wire assembly	18	

Front wheel



No.	Name
1	Pivot shaft
2	Screw M5×12
3	Speedometer cable holder
4	Gear housing assembly
5	Rolling bearing 6300-2RS
6	Front wheel middle shaft sleeve assembly
7	Front wheel oil seal assembly
8	Front rim (bright black + white trim)
9	Front rim (bright black + white trim)
10	Inner and outer tubes
11	Collar of front wheel
12	Front brake disc
13	Bolt M10×1.25×20
14	Self-locknut M10×1.25

VII. Front Wheel/Front Suspension

Preparatory Information-----7.1

Fault Diagnosis-----7.2

Front Wheel-----7.3

Handlebar -----7.4

Front Fork-----7.5

Front Shock Absorber-----7.6

7.1 Preparatory Information

Operation Precautions

Before the front wheel is disassembled, support the bottom of the motorcycle with jacks and do not reverse the front wheel when it floats above the ground.

There should be no grease attached to the brake shoe or brake disc during operation.

Technical parameters

Measuring position	Item		Standard value (mm)	Allowable limit (mm)
Front wheel axle	Bending degree			0.2
Front wheel	Rim shimmy	Vertical direction		2.0
		Horizontal direction	Within 1.0	2.0

Torque value

Handlebar mounting bolt 45~50 N·m

Front axle clamp nut 55~62 N·m

Nut of steering axle 2.5 N·m

Locknut of steering axle 70 N·m

Clamp bolt of front shock absorber 45~50 N·m

Tools

Bearing removal rod

Locknut wrench

**Mounting screw of 10~12 N·m
front fuel pump**

**Mounting bolt of front 22~29 N·m
brake cylinder assembly**

**Screw at the bottom of 22 N·m
front shock absorber**

**Bolt at the cover of 22 N·m
front shock absorber**

7.2 Fault Diagnosis

7.2.1 Turning Difficulty of Handlebar

The handlebar bearing fails.

The handlebar bearing fails.

The tire pressure is too low.

Tire leaks.

7.2.2 Instability of Direction

The handlebar bearing fails.

The tire pressure is not enough.

The front fork and front wheel axle are bent.

The front wheel tire is deformed and deviates.

7.2.3 Front Wheel Shimmy

The rim is deformed.

The front wheel axle bearing is loosened.

Defective tire.

7.2.4 Rotation Difficulty of Wheel

The wheel axle bearing fails or the gear seat fails.

7.2.5 Abnormal Sound of Front Shock Absorber

Friction sound of shock absorber guard.

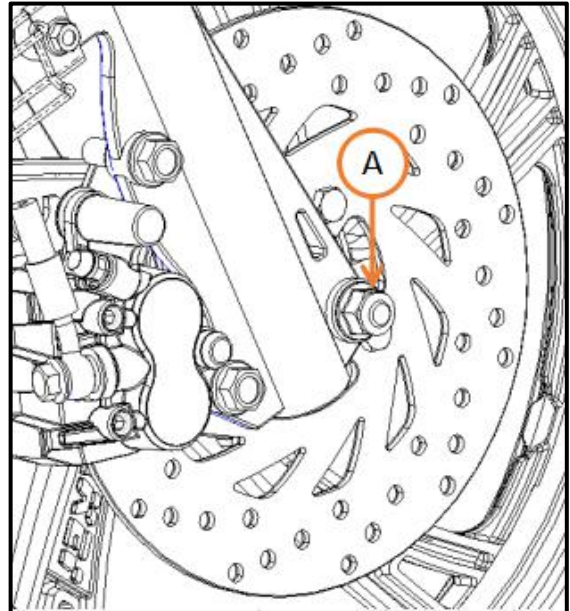
The bolts of all parts of shock absorber are loose.

7.3 Front Wheel

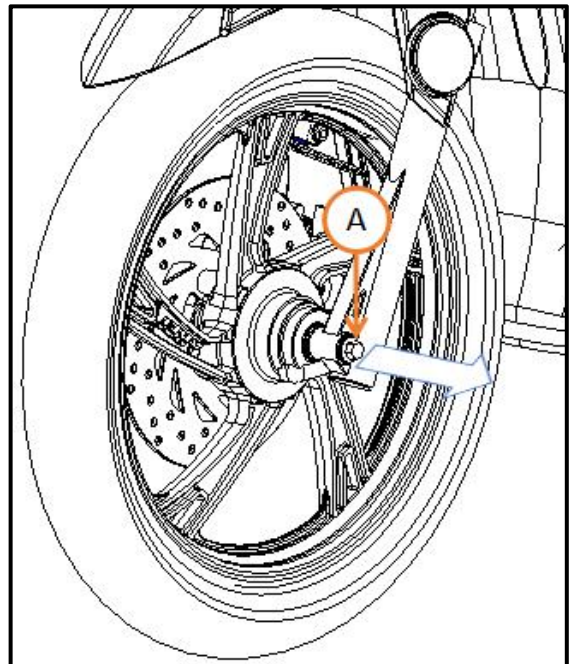
7.3.1 Disassembly

Support the bottom of motorcycle body to float the front wheel.

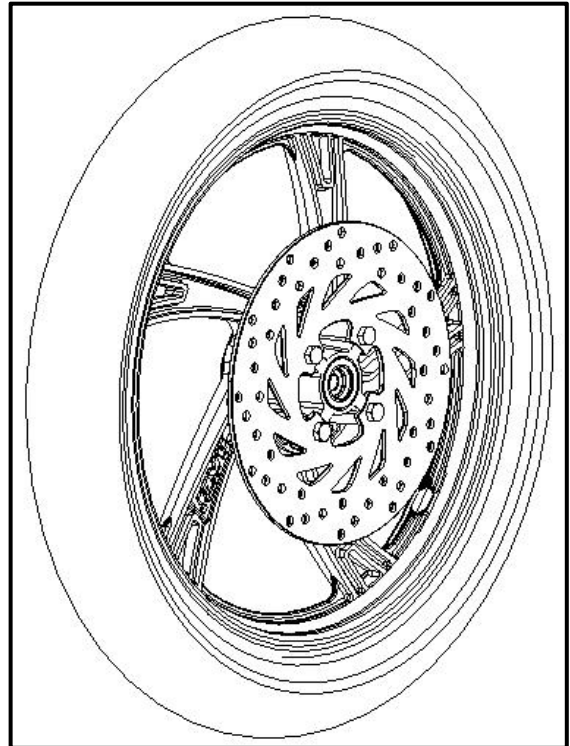
Remove the front wheel axle locknut [A].



Remove the front wheel axle [A].



Remove the front wheel

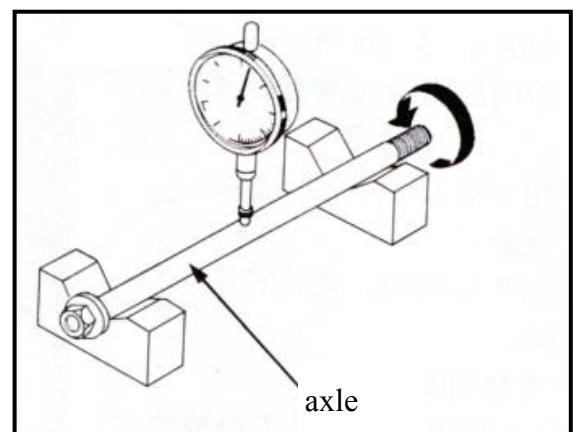


7.3.2 Inspection

7.3.2.1 Bending Inspection of Wheel Axle

Put the wheel axle on the V-shaped seat and measure the eccentricity with a dial gauge.

Available limit: Replace the wheel axle if the eccentricity is 0.2mm above



7.3.2.2 Rim Shimmy Inspection

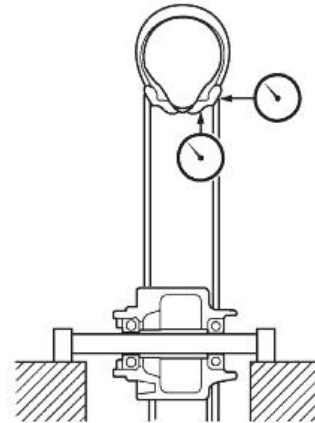
Put the rim on an accurate bracket and check the swinging amplitude of the rim.

Rotate the wheel with hands and read the swinging amplitude.

Available limit:

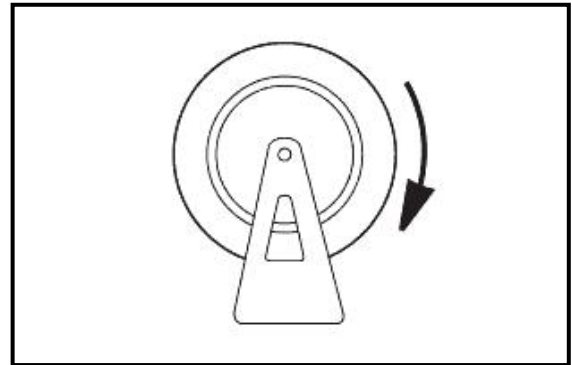
Vertical direction: Replace the rim if the swinging amplitude is 2.0mm or above.

Horizontal direction: Replace the rim if the swinging amplitude is 2.0mm or above.



7.3.2.3 Inspection of Front Wheel Bearing

- Bearing
The front wheel rotates unsmoothly or it is too loose → Replace the bearing
- Oil Seal
Damage/wear → Replacement



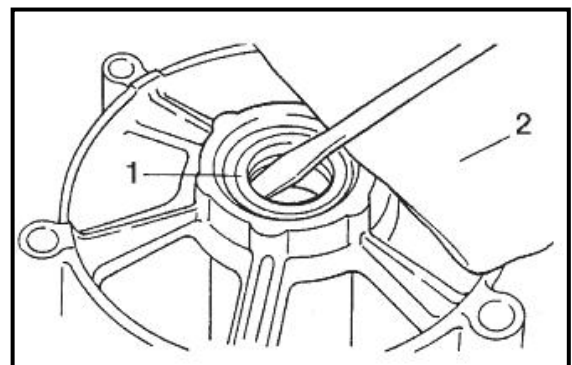
7.3.3 Replacement of Bearing

7.3.3.1 Disassembly of Bearing

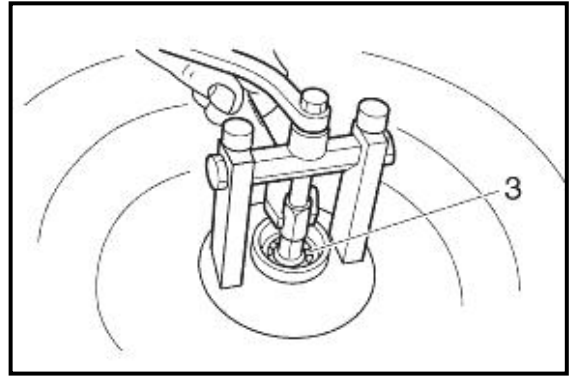
Remove the oil seal [1].

Note:

To avoid damaging the rim, please put a cloth [2] between the screwdriver and the surface of rim



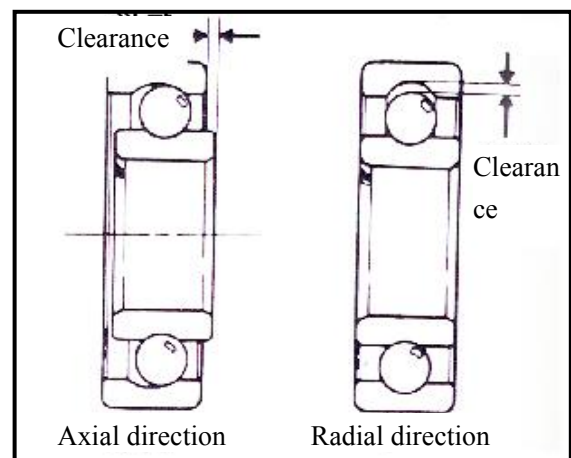
Remove the bearing [3] with a bearing puller.



7.3.3.2 Inspection of Bearing

Check the rolling conditions of bearing.

If the bearing does not roll, it may be worn or loose and thus it should be replaced with a new one.



7.3.3.3 Installation of Bearing

Note:

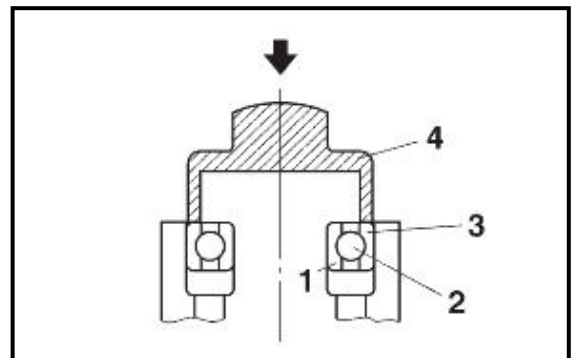
The bearing disassembled should be replaced with a new one.

Then push the bearing with bearing installation tools.

***Note**

Do not apply pressure on the inner race ring [1] or ball bearing [2] of wheel bearing and only apply pressure to the outer race ring [3] of bearing

Use the seat in line with the diameter of outer race ring [4] of bearing



7.3.4 Installation

Install it in the reverse order of disassembly.

Note

- The oil seal on the front wheel should be lubricated.

- The engagement part or mobile part of gear seat assembly should be lubricated.

Note

- When the odometer gear seat assembly fails to lock the front wheel axle, the odometer gear seat assembly will be deformed.
- After the wheel axle is installed, rotate the wheel to confirm whether the speedometer drive shaft rotates.

Torque value:

Front wheel axle locknut 55-62 N•m

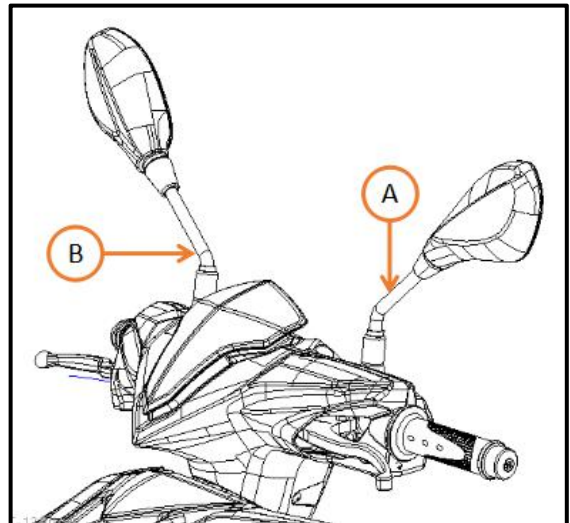
Front wheel axle head fastening bolt 10-12 N•m

7.4 Handlebar

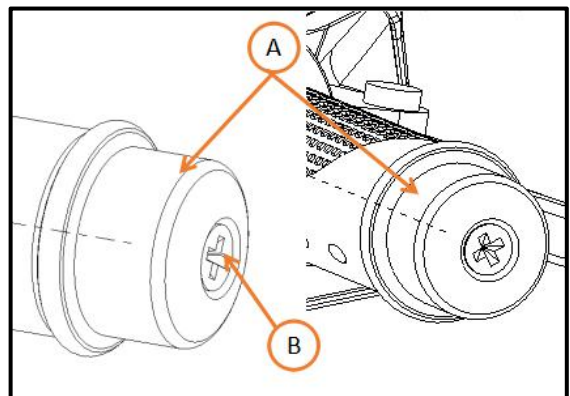
7.4.1 Disassembly

Remove the left rear view mirror assembly [A]

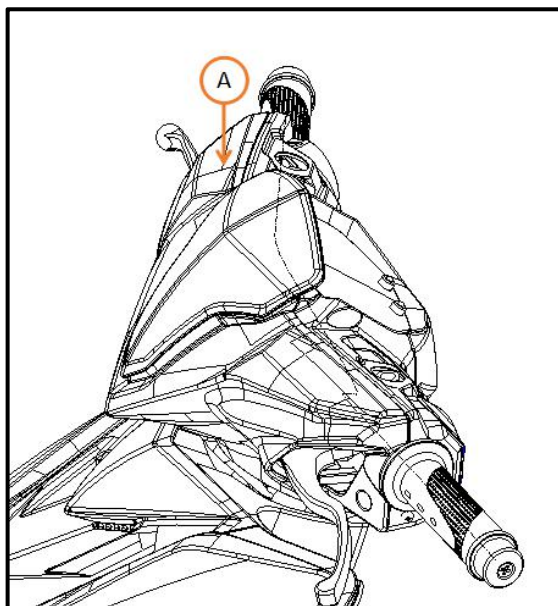
Remove the right rear view mirror assembly [A]



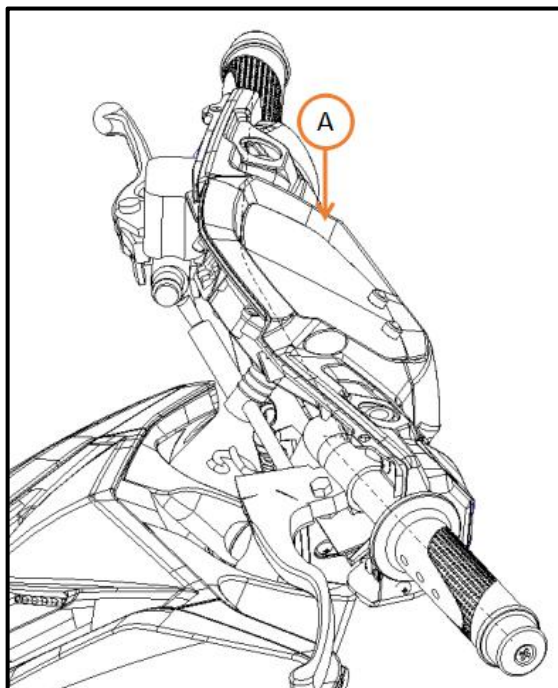
Remove screw [B], and take out the balance weight [A].



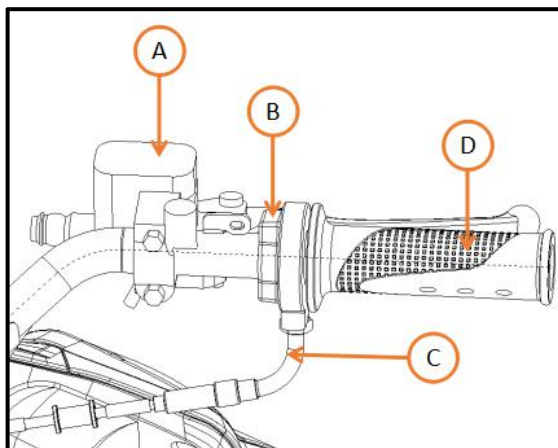
Remove the front protector of cock [A].



Remove the meter wire cable connector and remove the rear protector of cock [A].



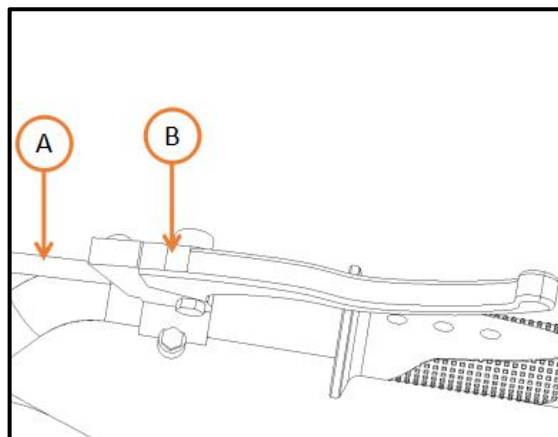
Remove
Master cylinder of fluid brake [A]
Throttle cable mounting seat [B]
Throttle cable assembly [C]
Right grip assembly [D]



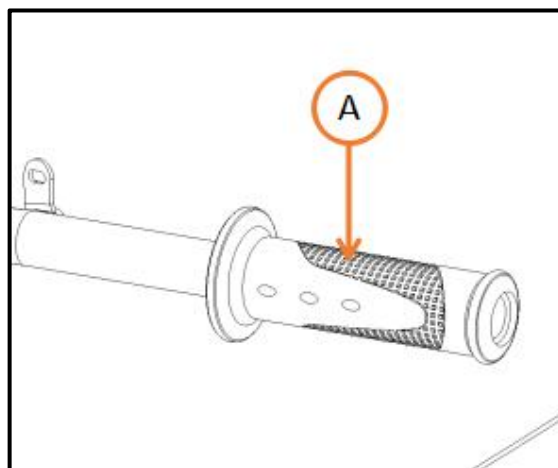
Remove

Rear brake line [A]

Left lever assembly [B]

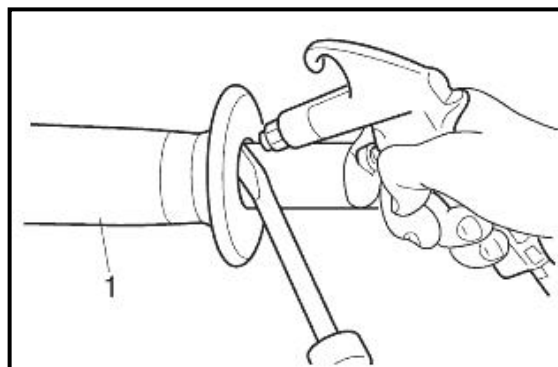


Remove the left handlebar grip [A].



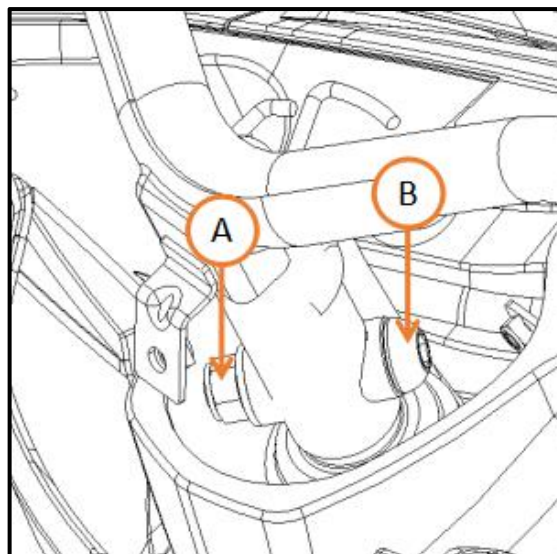
Note:

Compress the compressed air between the left handlebar and left handlebar grip [1] and slowly press the left handlebar grip.

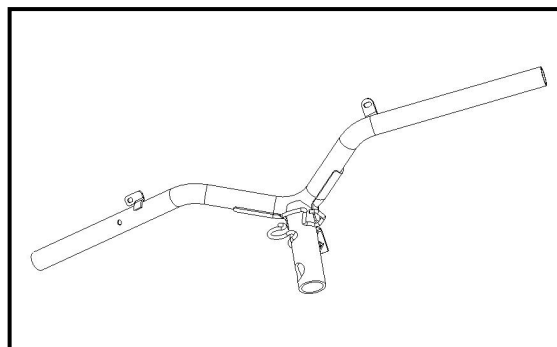


Remove the nut [A]

Remove the mounting bolt of handlebar [B].



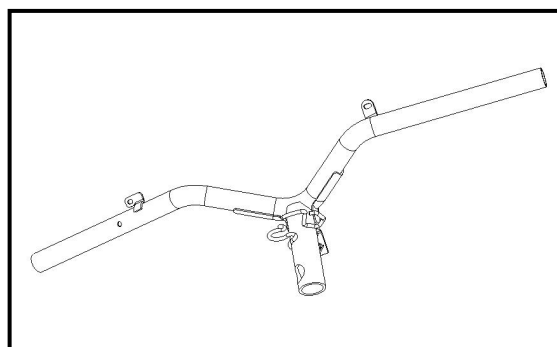
Remove the handlebar.



7.4.2 Inspection

Handlebar welding assembly

Deformation, cracking of welding seam
→replacement



7.4.3 Installation

Install it in the reverse order of disassembly.

Torque value:

Handlebar mounting bolt 45~50 N·m

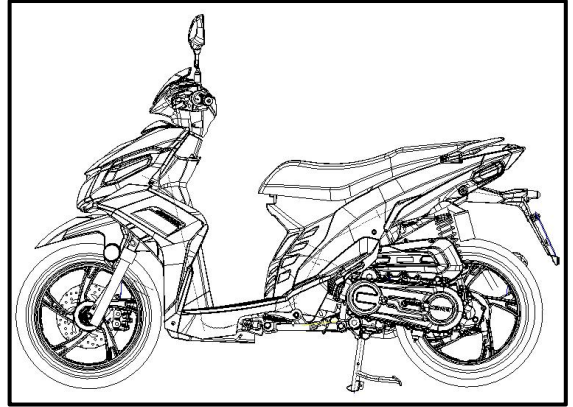
Mounting screw of front fuel pump 10~12 N·m

Left lever mounting bolt 10~12 N·m

7.5 Front Fork

7.5.1 Disassembly

Support the center stand and park the motorcycle stably.



Remove the front wheel. (See 7.3.1 for details)

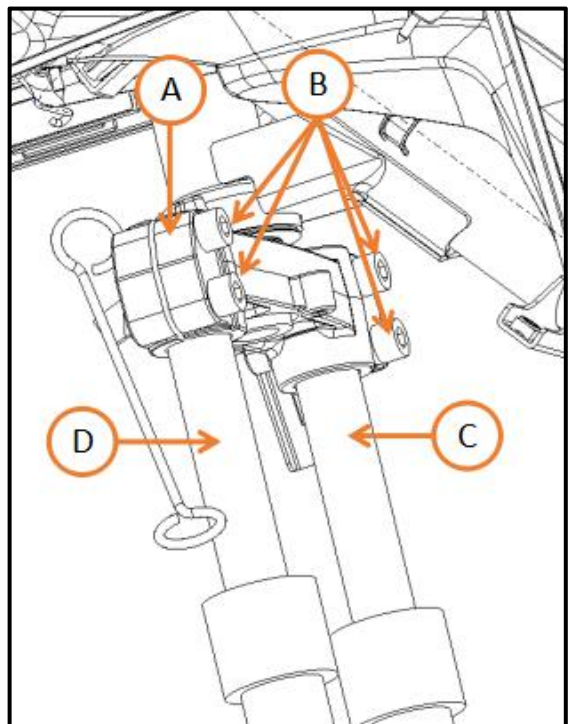
Remove the handlebar. (See 7.4.1 for details)

Remove the front headlight cover, front inner fender and front fender. (See Chapter VI for details)

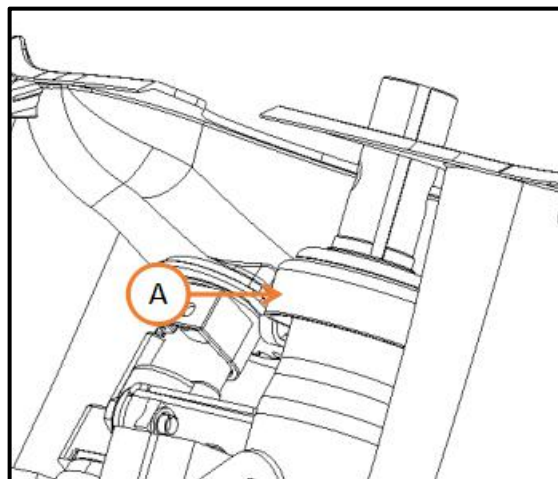
Remove the front brake cylinder assembly. (See 5.4.3 for details)

Remove the four front shock absorber clamp bolts [B] of lower bracket [A].

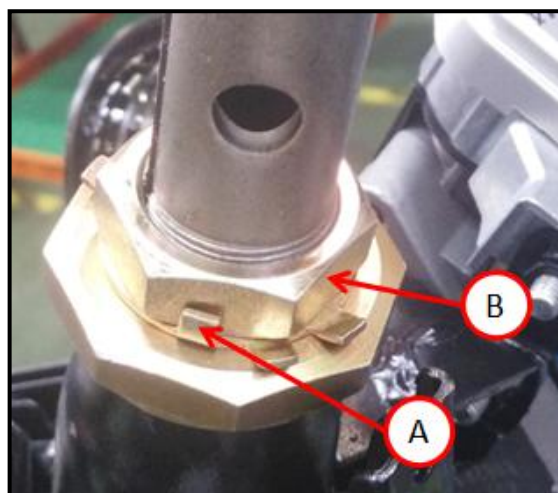
Remove the front right shock absorber [C] and front left right shock absorber [D].



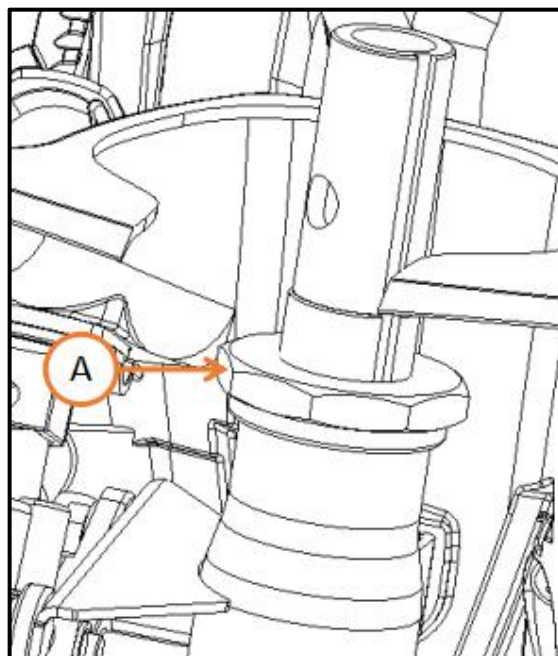
Remove the dust cover [A]



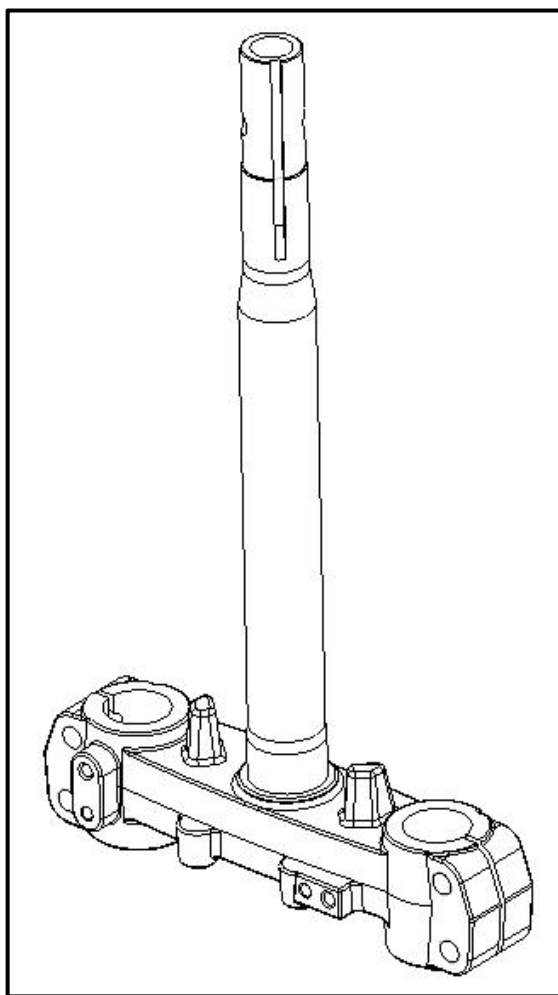
Pry up the raised edge of stop washer [A]
Remove gland nut [B]



Remove the locknut [A]



Remove the lower bracket assembly

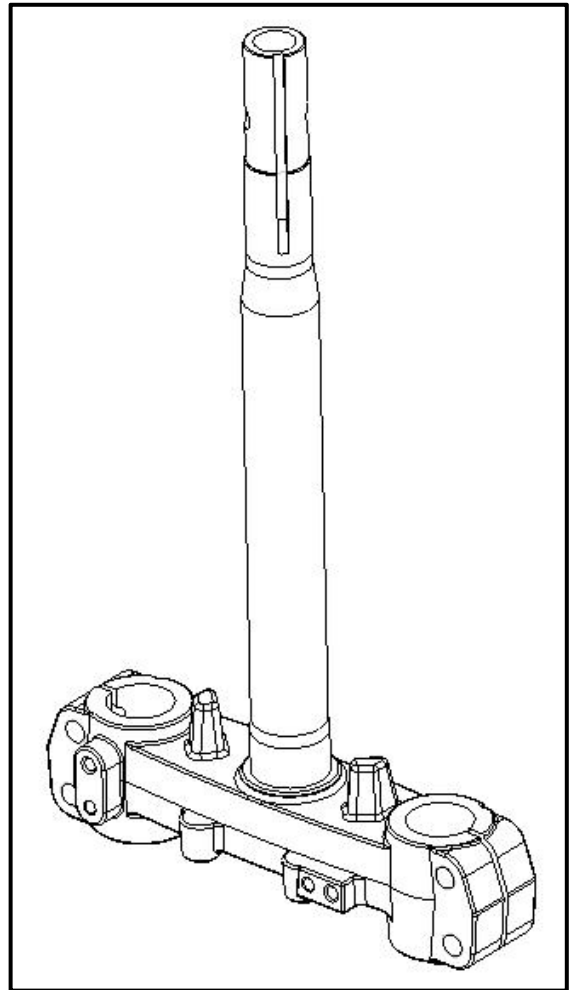


7.5.2 Inspection of Steering Column

Inspection

Steering column

Deformation / bending → replacement



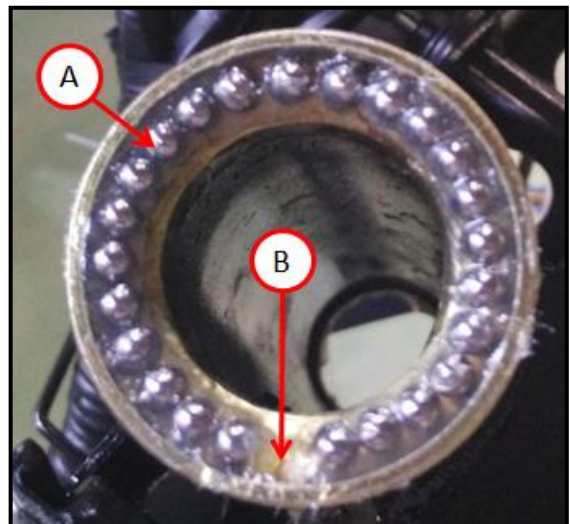
Clean the rolling ball and bearing race

Inspection

Ball [A]

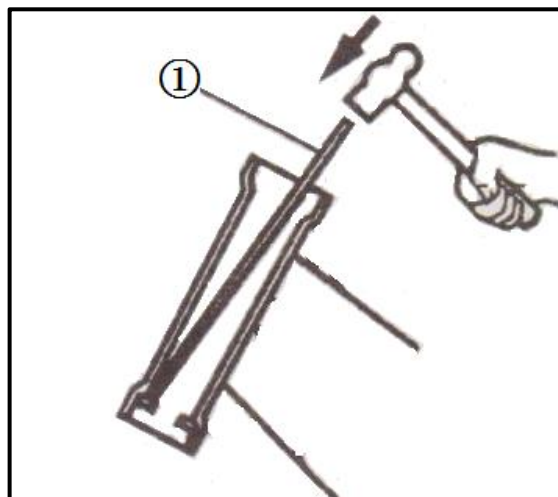
Bearing race [B]

Wear, operation → replacement.



Replacement step:

Disassemble the bearing race with a long rod ① and a hammer and remove it from the groove of head pipe, as shown in the figure



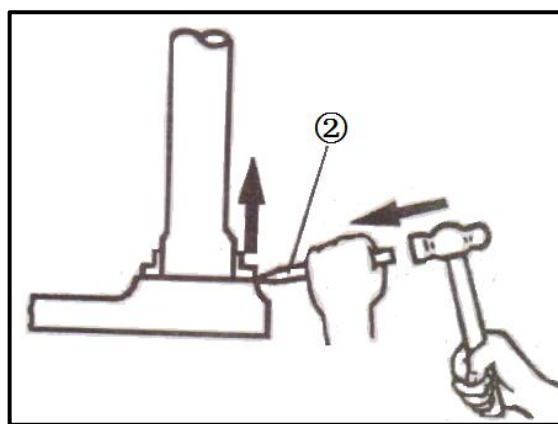
Disassemble the bearing race of steering lever with a flat chisel ② and a hammer, as shown in the figure

***Note:**

Balls, bearing races and dust seals are always replaced in sets.

The ball and bearing race mounted obliquely will cause the wear of rack, therefore, they shall be mounted horizontally carefully.

Do not strike the surfaces of ball and direction axle.



7.5.3 Installation

Install it in the reverse process of disassembly

Torque value:

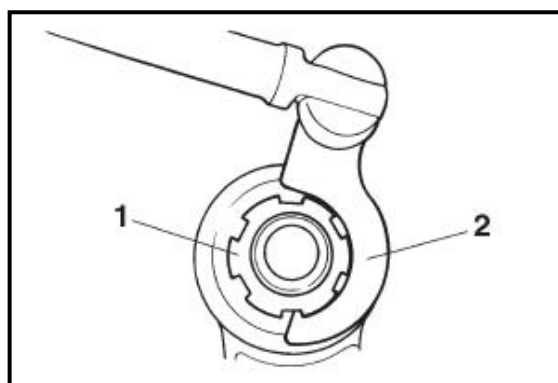
Nut of steering axle **2.5 N·m**

Locknut of steering axle **70 N·m**

Clamp bolt of front shock absorber **37~44 N·m**

Note:

Assemble or disassemble the steering axle nut [1] with a steering nut wrench [2].



Note:

- Make the torque wrench perpendicular to the steering nut wrench.
- Rotate the direction axle left and right several times to check whether it rotates smoothly.

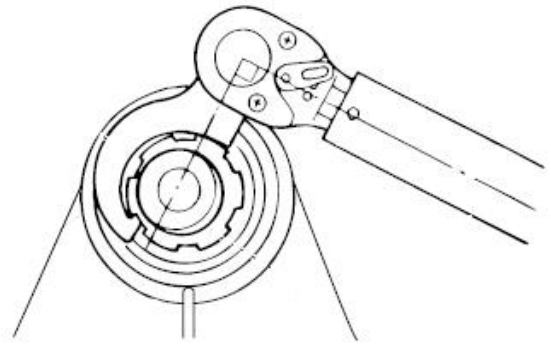
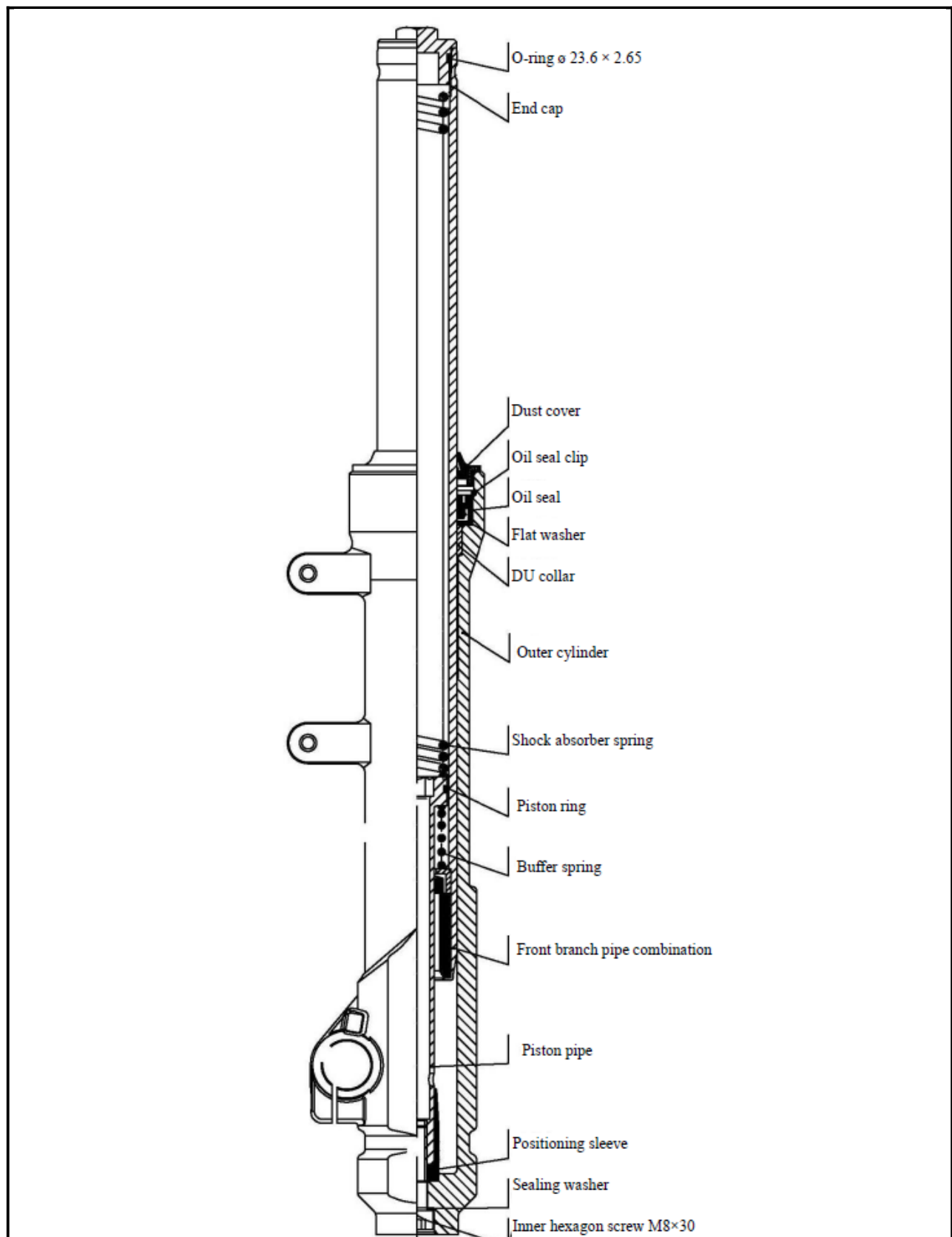


Diagram of front shock absorber



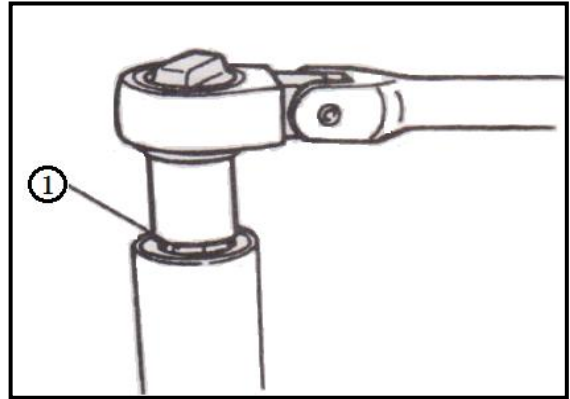
7.6 Front Shock Absorber

7.6.1 Disassembly

Disassembly

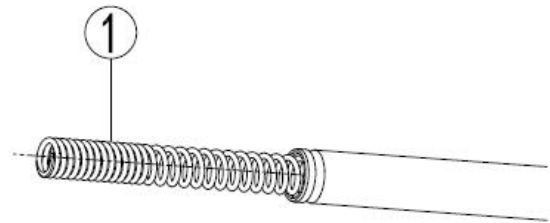
Cap bolt ① and O-ring seal

Oil drainage



Disassembly

Spring ①



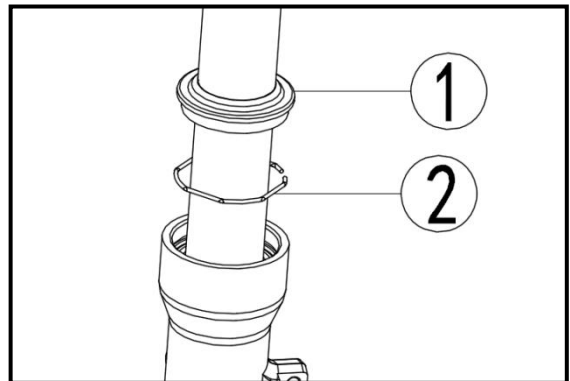
Disassembly

Dust ring ①

Wire clamp ②

Note:

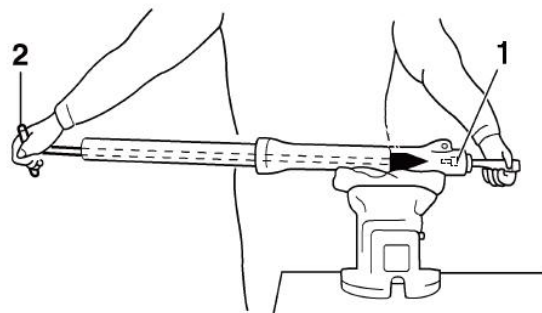
Do not damage the surface of inner tube



Disassembly

Bolt ①

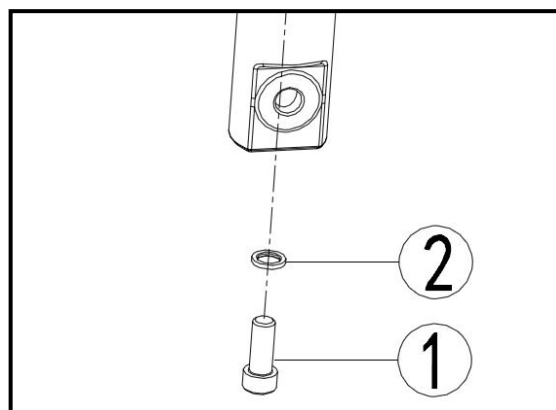
Hold the shock absorber lever and loosen the bolts with the T-shaped handle ② and the shock absorber clamp.



Disassembly

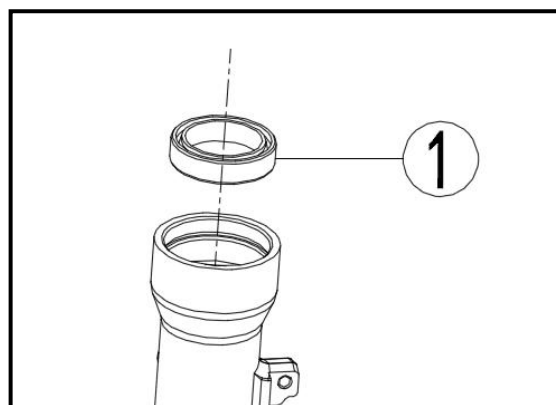
Bolt ①

Washer ②



Disassembly

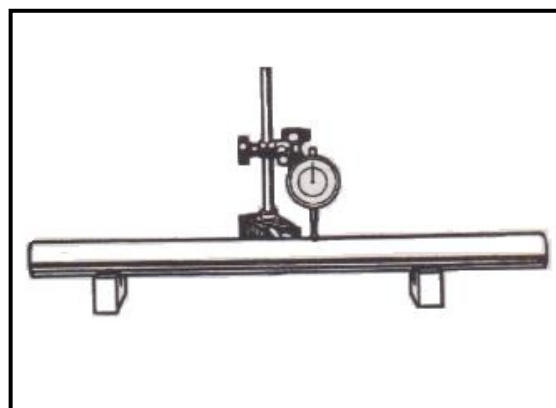
Oil seal ①



7.6.2 Inspection

Inspection

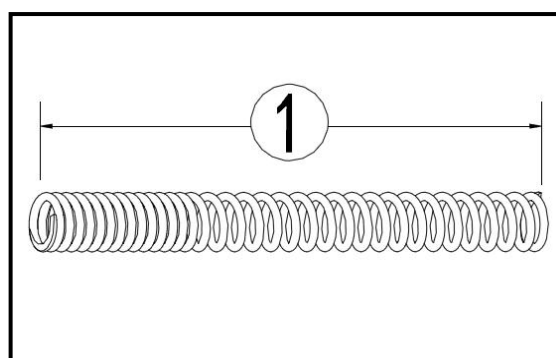
Bending degree of inner tube



Measurement

Free length of front shock absorber spring:
277.5mm

Minimum free length: 274.5mm



Inspection

Damper rod ①

Shock absorber piston ring ②

Scratch, damage, bending → Replacement

Spring ③

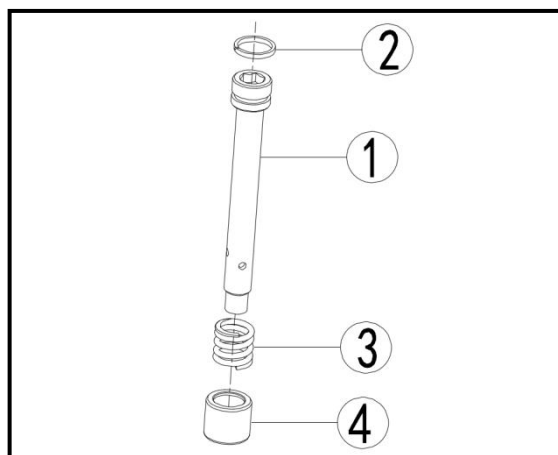
Oil plug rod ④

Wear, damage→Replacement

Waste→Clean all oil holes using the compressed air

Note:

Do not attempt to straighten the bent damper bar, otherwise, it may seriously damage the damper rod.



7.6.3 Installation

Install it in the reverse process of disassembly

Note

Be sure to use the following new parts when reassembling the shock absorber

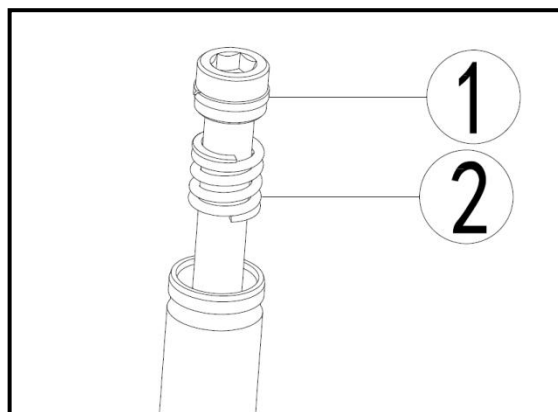
- Oil Seal
- Dust ring

Ensure that all parts are clean before re-installation

Installation

Shock absorber piston ring ①

Spring ②



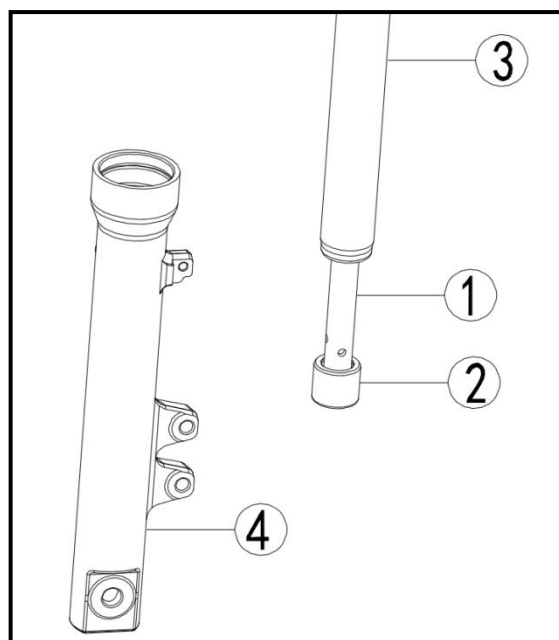
Installation

Damper rod ①

Oil plug rod ②

Inner tube ③

Outer tube ④

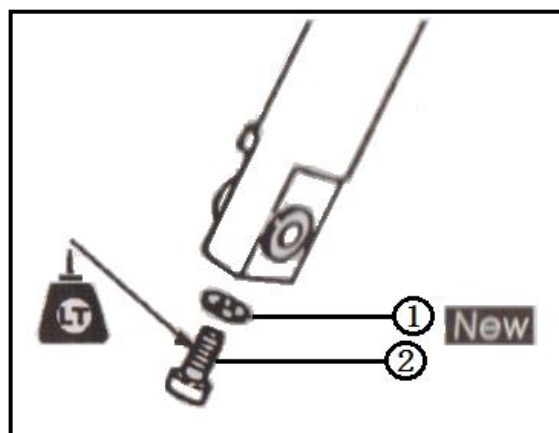


Installation

Washer ①

Bolt (damper rod) ②

Note: When assembling bolt ②, add thread-locking adhesive



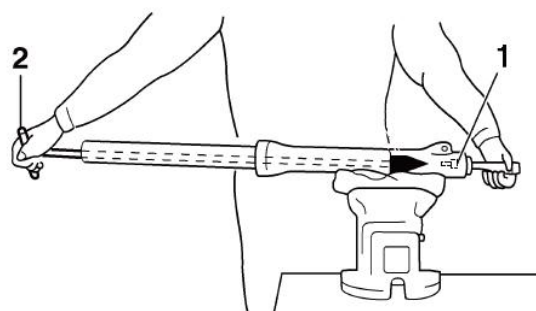
Tighten

Bolt (damper rod) ①

Torque value: 22 N•m

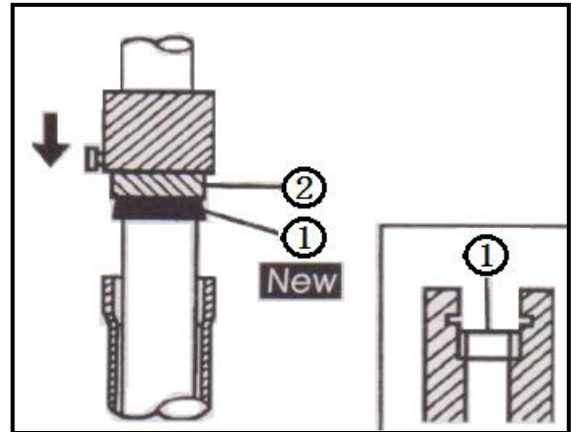
Note

Tighten the bolt ① of damper rod with the T-shaped handle ② and the shock absorber clamp.



Installation

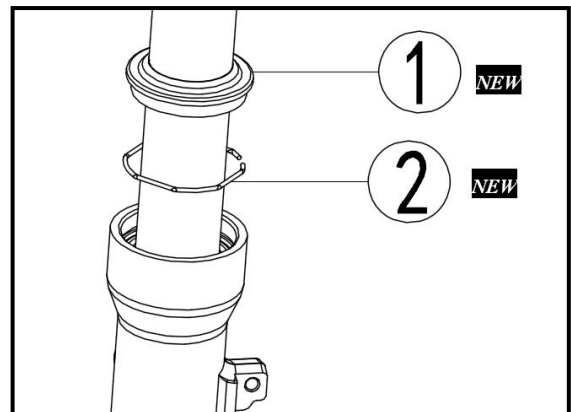
Oil seal ①



Installation

Dust ring ①

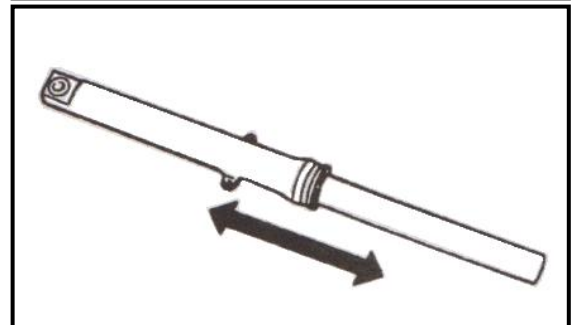
Wire clamp ②



Inspection

Extension of inner tube

Unable to extend smoothly - recheck after disassembly

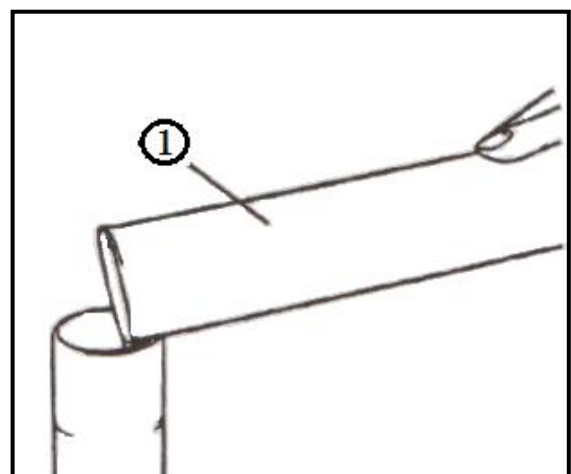


Refuel

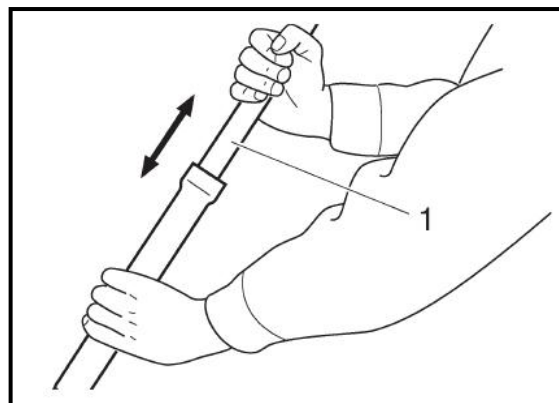
Measuring cup ①

Shock absorber oil: 32# shock absorber oil

Oil capacity: 130±2ml

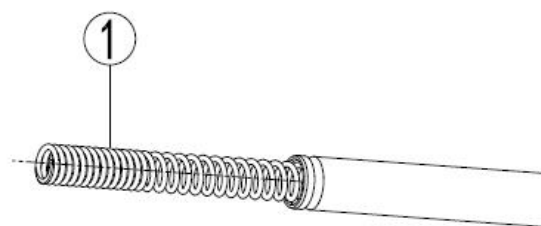


After refueling, slowly move the shock absorber [1] up and down, to fill the tube with oil



Installation

Spring ①



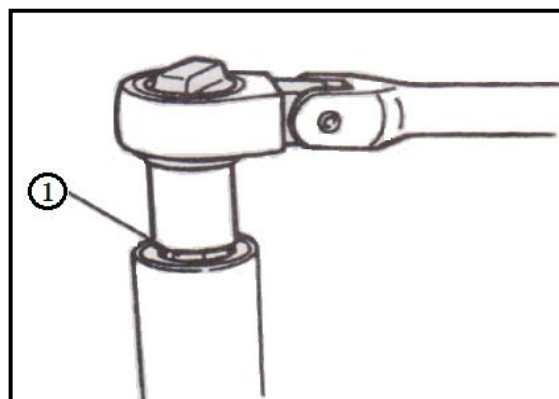
Installation

Cap bolt ① and O-ring seal

Note

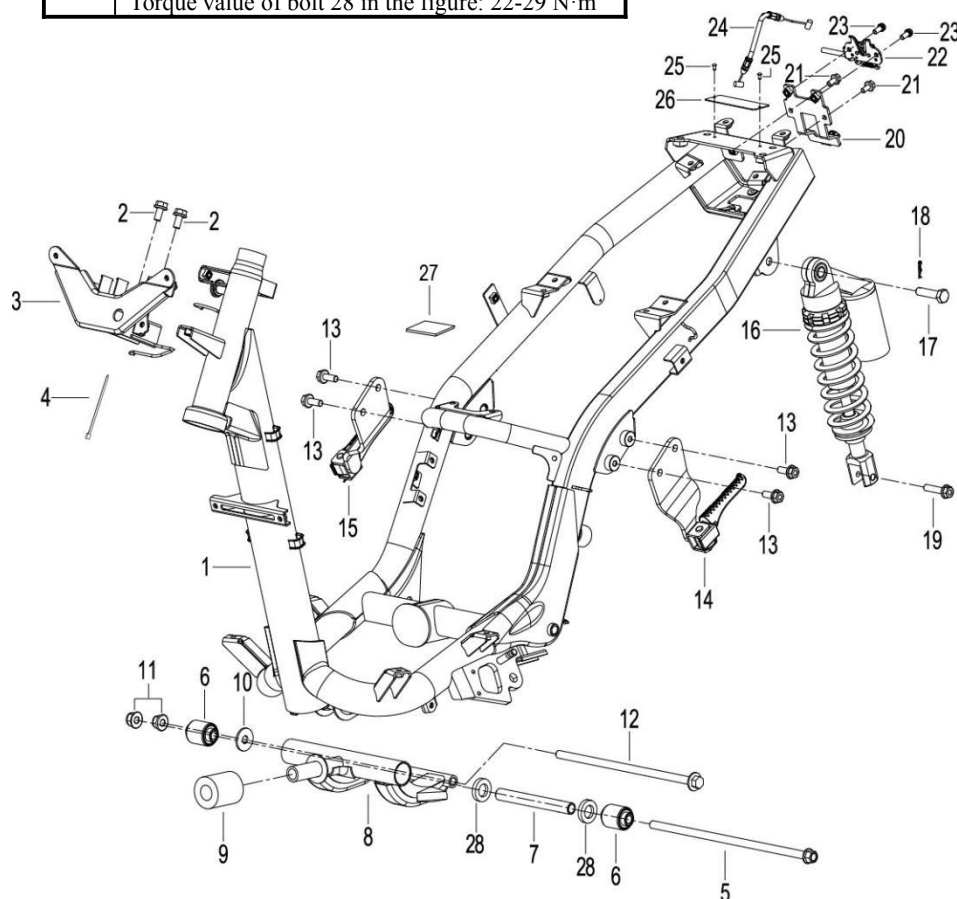
Do not damage the surface of inner tube

Torque value of cap bolt: 22 N·m



Frame

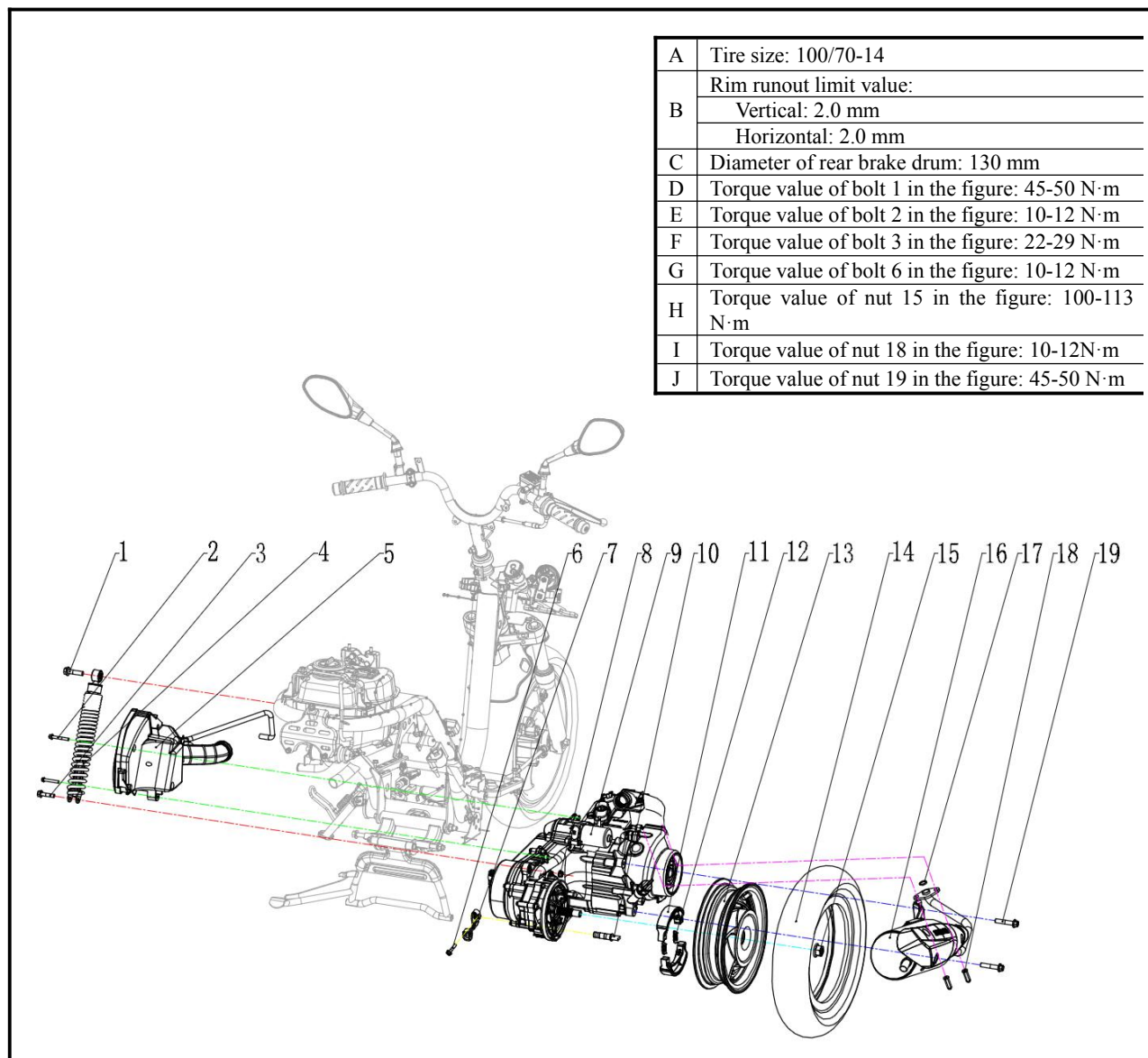
A	Torque value of nut 7 in the figure: 45-50 N·m
B	Torque value of nut 9 in the figure: 45-50 N·m
C	Torque value of bolt 14 in the figure: 10-12 N·m
D	Torque value of bolt 17 in the figure: 10-12 N·m
E	Torque value of bolt 22 in the figure: 10-12 N·m
F	Torque value of bolt 23 in the figure: 10-12 N·m
G	Torque value of bolt 25 in the figure: 10-12 N·m
	Torque value of bolt 28 in the figure: 22-29 N·m



No.	Name	No.	Name
1	Frame welding assembly	15	Right rear pedal assembly
2	Hexagon bolt with flange M8×16	16	Rear shock absorber assembly
3	Headlight cover bracket assembly	17	Hexagon bolts with split pin hole on shank M10×1.25×40
4	Lashing band 3×150	18	Split pin
5	Hanging bracket mounting shaft M10×1.25×276	19	Bolt M8×35
6	Power hanger buffer collar	20	Seat lock mounting holder
7	Middle collar of power hanger	21	Bolt M6×12
8	Power hanger welding assembly	22	Seat lock assembly
9	Power hanger buffer collar	23	Screw M6×12~8.8~ZG

10	Washer $\phi 10$	24	Seat cable assembly
11	Self-locknut M10 \times 1.25	25	Self-plugging rivet 3.2 \times 7
12	Middle stand shaft	26	Nameplate of frame
13	Bolt M8 \times 25	27	Spongy cushion I of foot protector
14	Left rear pedal assembly	28	Rubber ring

Rear wheel/rear suspension



No.	Name	No.	Name
1	Bolt M10×1.25×40	11	Brake shoe assembly
2	Bolt M6×30	12	Brake shoe tension spring
3	Bolt M8×35	13	Rear wheel rim assembly
4	Rear shock absorber assembly	14	Tubeless tire 100/70-14
5	Air filter assembly	15	Self-locknut M16×1.5
6	Bolt M6×35	16	Muffler
7	Rear brake rocker arm assembly	17	Exhaust pipe washer
8	Self-locknut M8	18	Nut M6
9	Engine	19	Bolt M10×1.25×50
10	Rear brake camshaft		

VIII. Rear Wheel/Rear Suspension

Preparatory Information-----8.1

Fault Diagnosis-----8.2

Rear Wheel-----8.3

Rear Shock Absorber-----8.4

Disassembly / Installation of Engine-----8.5

8.1 Preparation of Information

Notes for operation

There should be no oil stains attached on the surface of brake disc or brake shoe.

Technical parameters

Item		Standard value (mm)	Available limit (mm)
Swinging amplitude of rear wheel	Vertical direction		2.0
	Horizontal direction		2.0

Torque value

Rear wheel mounting nut	100 ~ 113 N·m
Bolt at the top of rear shock absorber	37 ~ 44 N·m
Bolt at the bottom of rear shock absorber	22 ~ 29 N·m
Nut at front end of muffler	10 ~ 12 N·m
Muffler cylinder mounting bolt	37 ~ 44 N·m
Power hanger mounting bolt	37 ~ 44 N·m
Power shaft mounting nut	45 ~ 52 N·m

Tools

Bearing removal rod
Torque wrench

8.2 Fault Diagnosis

8.2.1 Rear Wheel Shimmy

Deformation of rim

Tire fault

The rear tire is not fastened

The rear tire pressure is not enough.

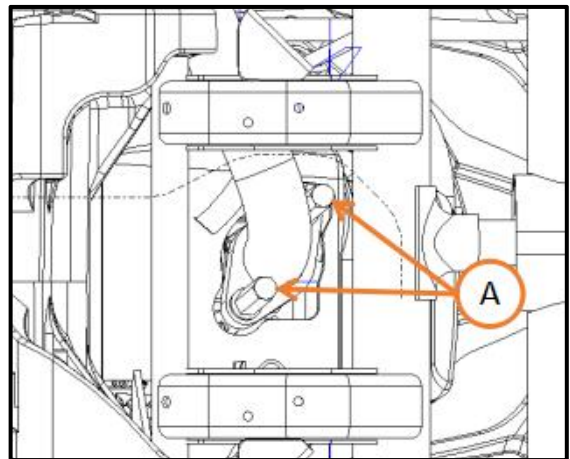
8.2.2 Too soft shock absorber

Weak spring elasticity

8.3 Rear Wheel

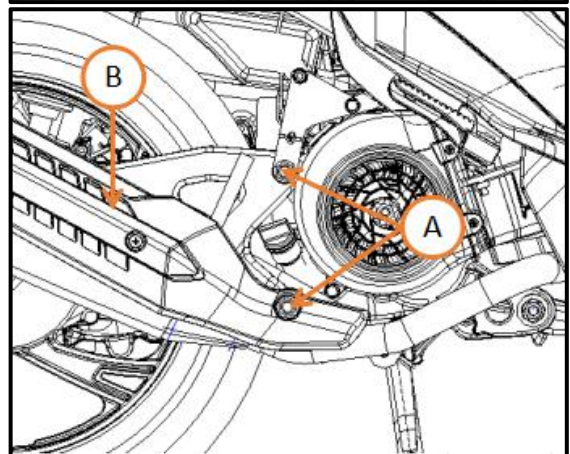
8.3.1 Disassembly

Remove the mounting nut at front end of muffler [A]

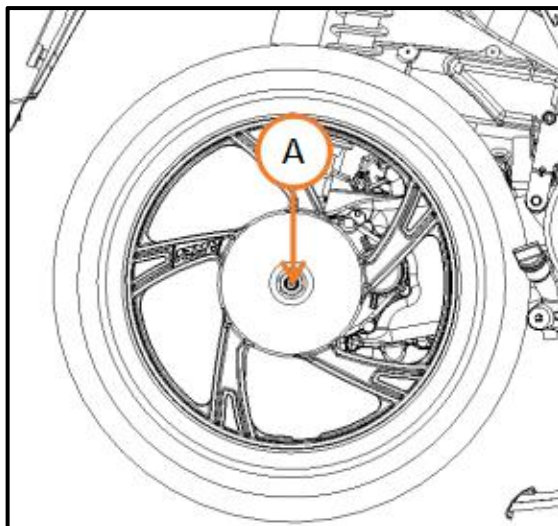


Remove the muffler cylinder mounting bolt [A], and disconnect the oxygen sensor cable connector.

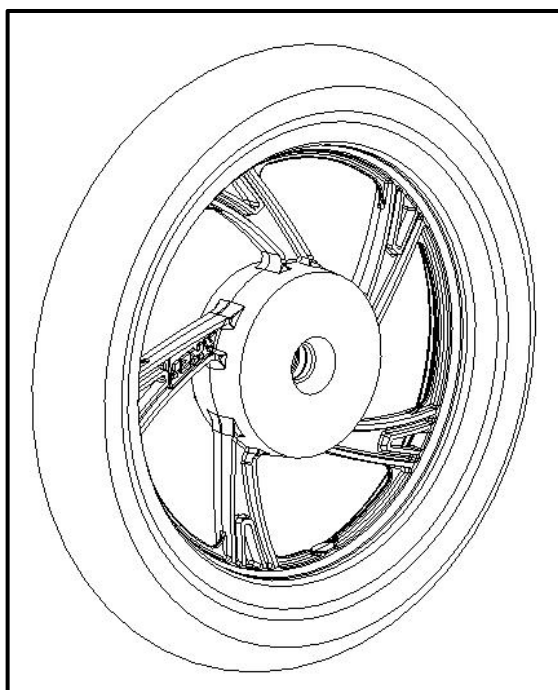
Remove the muffler [B]



Remove the rear wheel mounting nut [A]



Remove rear wheel



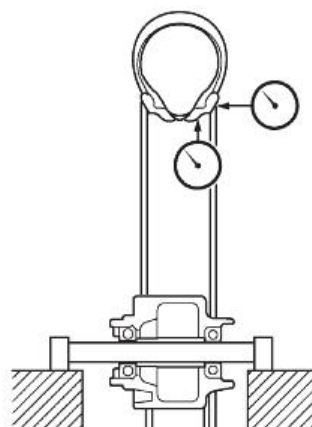
8.3.2 Inspection

Rotate the wheel with hands and measure the eccentricity ratio using a dial indicator.

Available limit:

Vertical direction: Replace the rim if the swinging amplitude is 2.0mm or above.

Horizontal direction: Replace the rim if the swinging amplitude is 2.0mm or above.



8.3.3 Installation

Install the rear wheel in the reverse order of disassembly, and lock the nut.

Torque value:

Rear wheel mounting nut **100 ~ 113 N·m**

Nut at front end of muffler **10 ~ 12 N·m**

Muffler cylinder mounting bolt **45 ~ 50 N·m**

8.4 Rear Shock Absorber

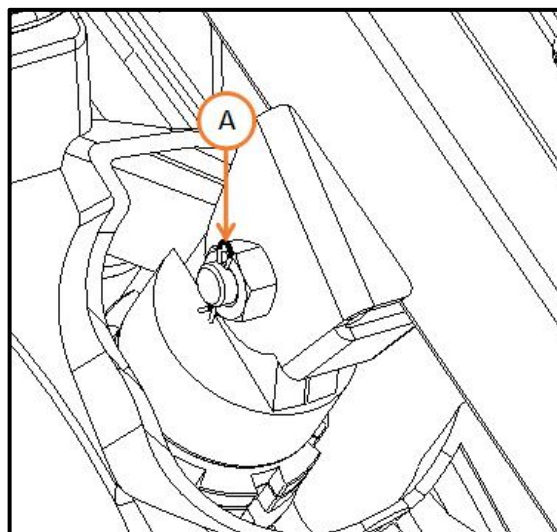
8.4.1 Disassembly

Disassemble seat cushion. (see 9.3.1)

Disassemble fuel tank. (See 9.5.1 for details)

Remove the right cover. (see Chapter VI for details)

Remove the split cotter at the upper mounting bolt of rear shock absorber [A].



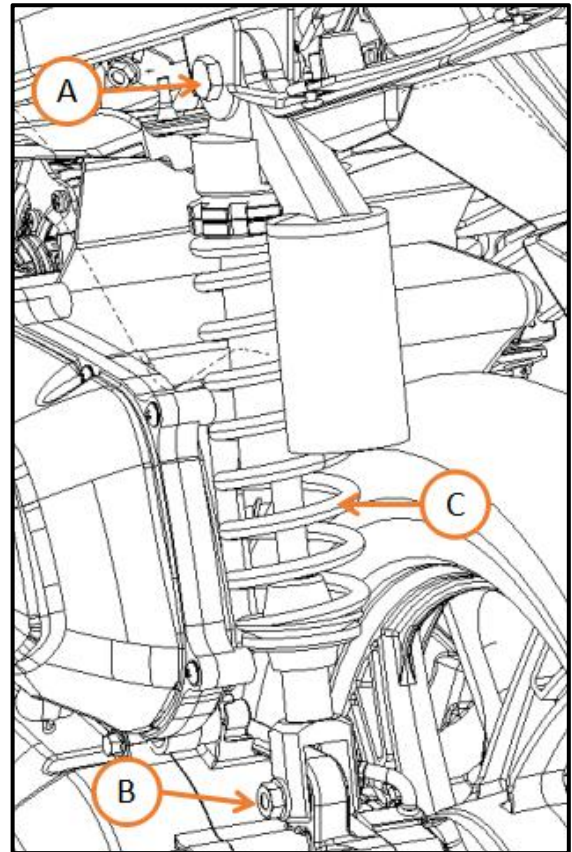
Remove upper mounting bolt of rear shock absorber

[A]

Remove lower mounting bolt of rear shock absorber

[B]

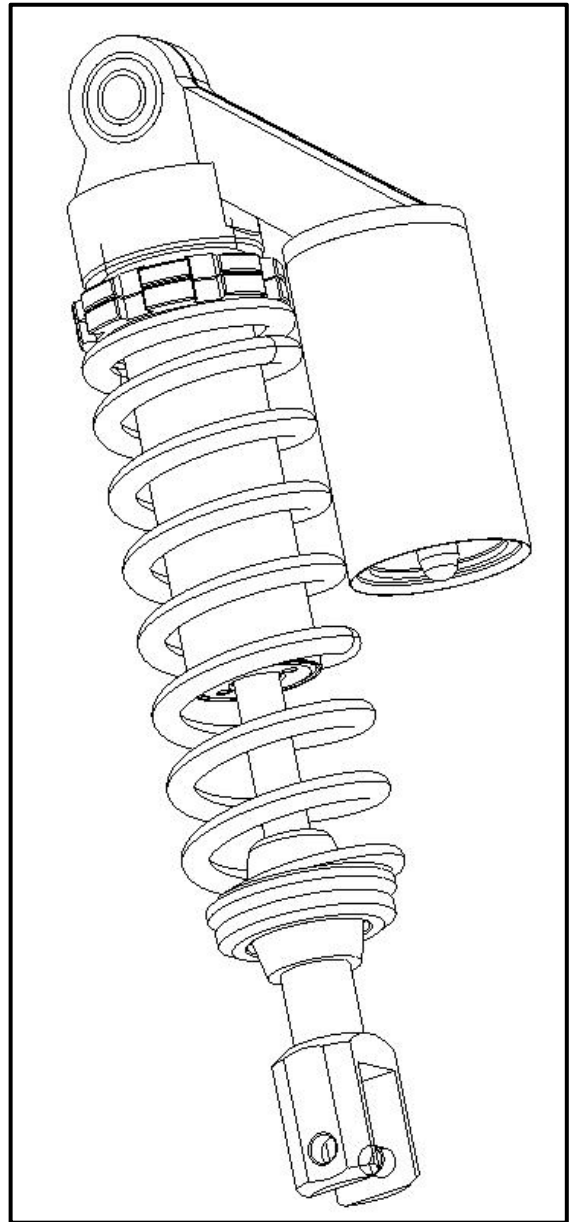
Remove the rear shock absorber [C]



8.4.2 Inspection

Rear shock absorber

Oil leakage, deformation → Replacement



8.4.3 Installation

Install the rear shock absorber in the reverse order of disassembly.

Torque value:

Upper mounting bolt: 45-50 N·m

Lower mounting bolt: 22-29 N·m

8.5 Disassembly/Installation of Engine

8.5.1 Preparatory Information

Precautions for operation

Keep the motorcycle at a neutral position when disassembling the engine.

Remove the engine when maintaining the crankshaft and final drive shaft.

The engine can be installed on the frame and may not be disassembled when maintaining the alternator, camshaft, carburetor, drive wheel/clutch/driven wheel and fuel pump.

Preparation standard

The engine is not only the power source of the motorcycle, but also the transmission part and the main rear suspension device of the motorcycle. On the one hand, the power of engine is realized by the rotation motion output by the crankshaft, and it will drive the rear wheel directly after being decelerated through the clutch and V-shaped belt stepless speed change device; on the other hand, the entire engine also works as the rocker arm of main girder.

Locking torque

Lower mounting bolt of rear shock absorber 22-29 N·m

Mounting bolt of engine suspension 45-50 N·m

Clamp nut of engine shaft 45-50 N·m

8.5.2 Fault Diagnosis

Engine shaking

The main beam rocker of the whole motorcycle is bent and shakes

The transmission device of engine is loose

The suspension bolt of engine is loose

8.5.3 Disassembly of Engine

- Support the rear part of motorcycle using a support.

- Disassemble:

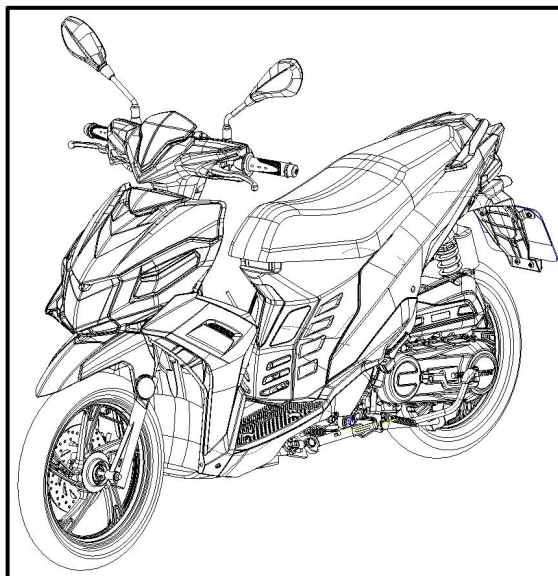
Rear rack (see Chapter IX for details)

Seat (see Chapter IX for details)

Left and right protector (see Chapter VI for details)

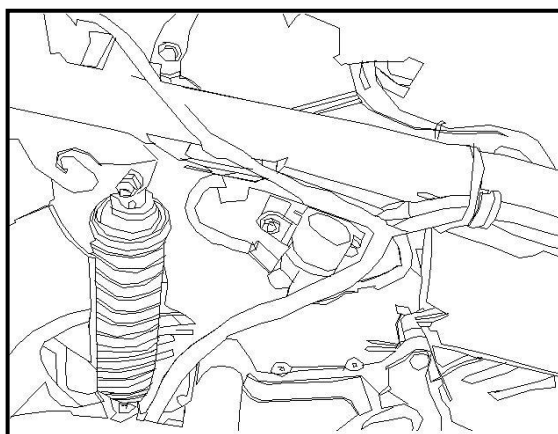
High-pressure fuel pipe

Muffler (see this chapter for details)

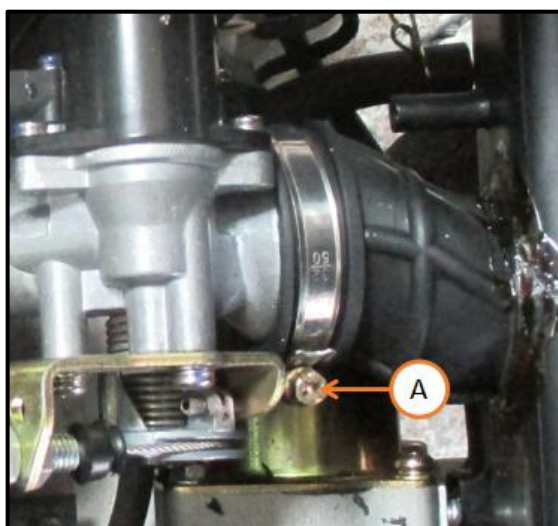


- Disconnect:

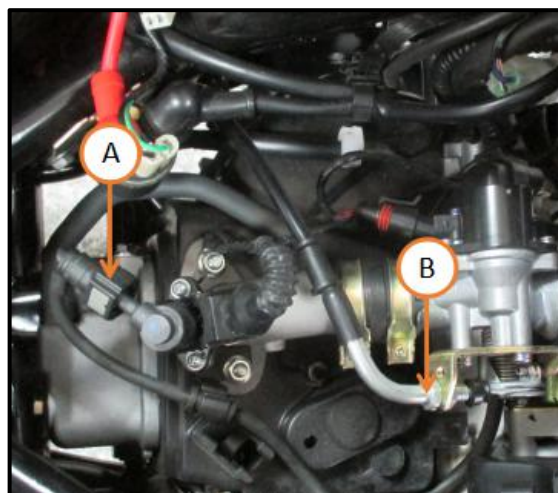
Joint used for connecting cable and electrical parts of engine



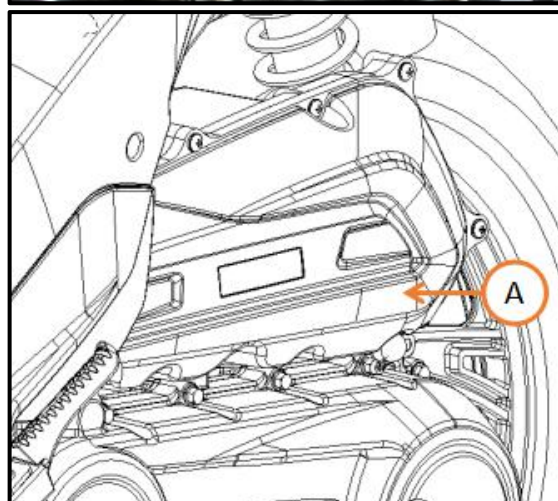
- Loosen the clamp between throttle valve and air filter [A]



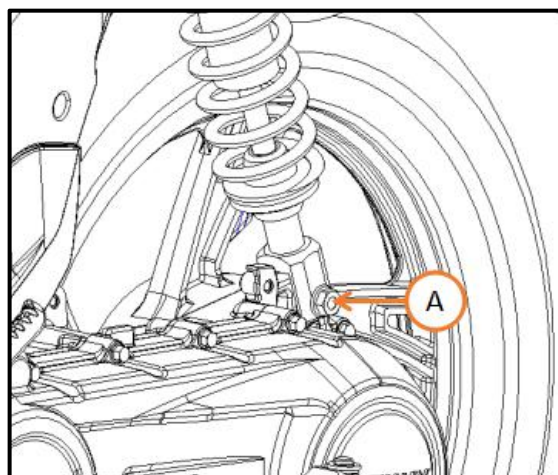
- Disconnect:
Throttle clutch [A]
Pipe connector [B]



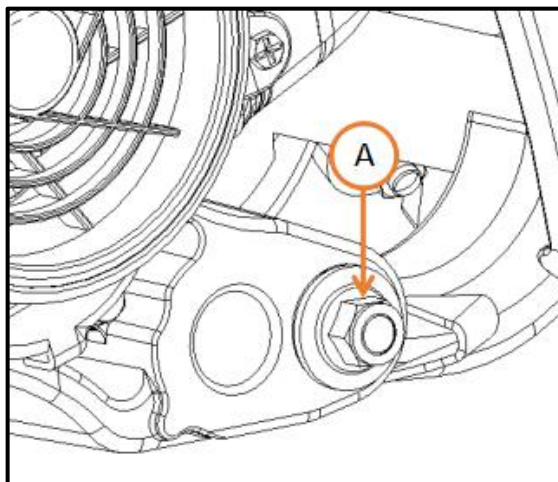
- Remove the air filter [A]



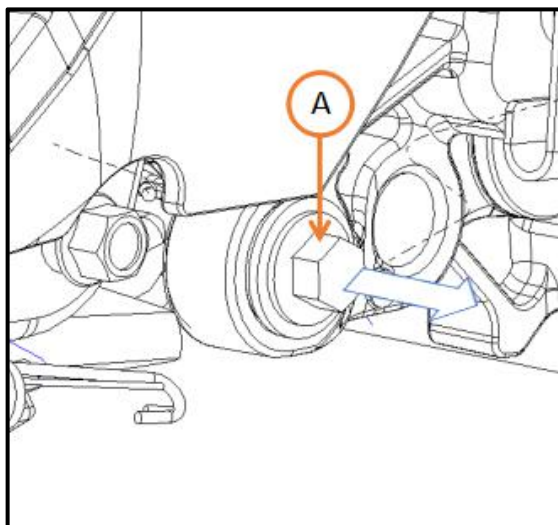
- Remove lower bolt of rear shock absorber [A]



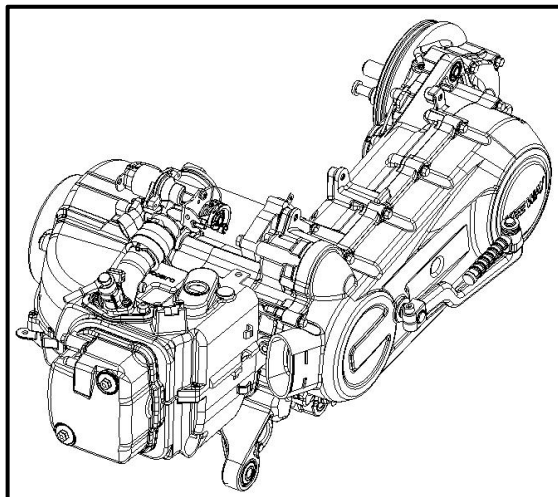
- Remove the engine shaft mounting nut [A] on the power hanger



- Remove the engine shaft [A] on the power hanger



Remove the engine from the frame.



8.5.4 Installation of Engine

- Install the engine in the reverse order of “disassembly”.

Installation torque value:

Mounting nut of rear wheel 100-113 N•m

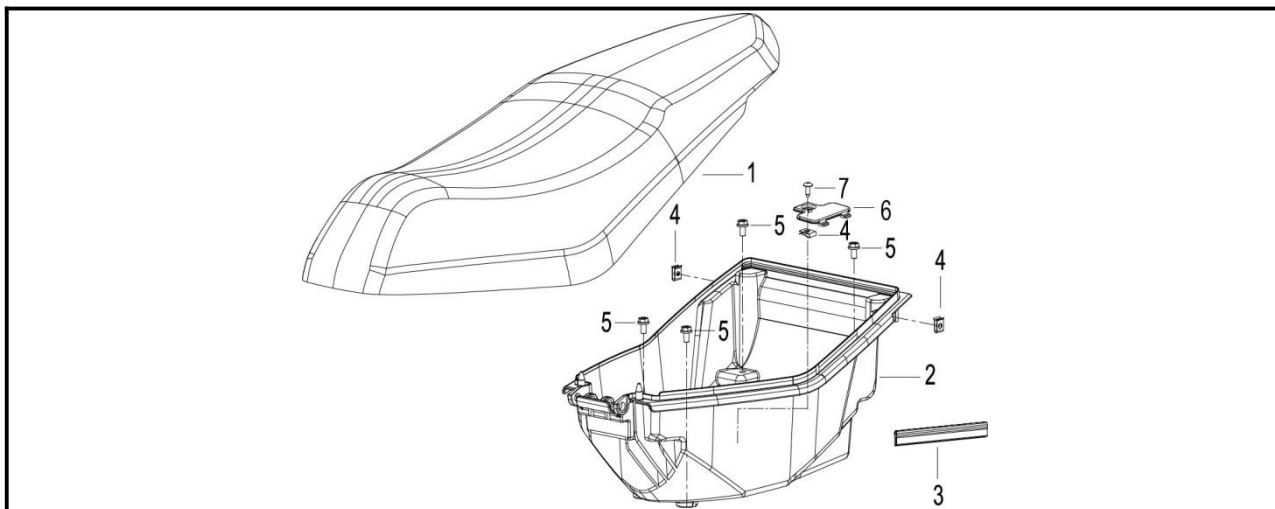
Bolt at the bottom of rear shock absorber 22-29

N·m

Mounting bolt of engine suspension 45-50 N·m

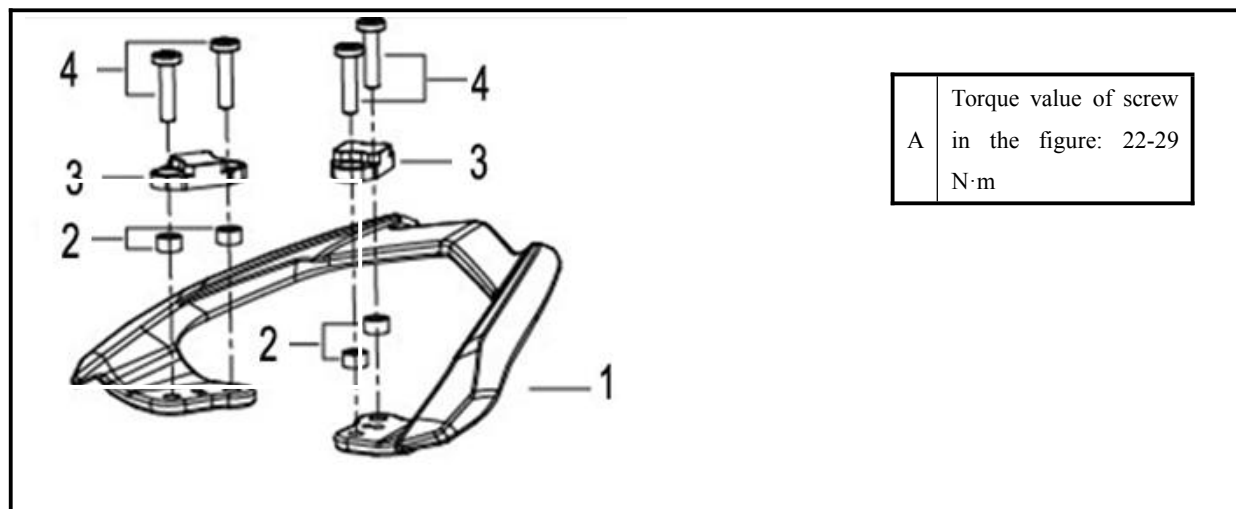
- Arrange wires, cables and hoses correctly.
- Install the parts disassembled previously (see the corresponding chapters).
- Adjustment:
Throttle cable (see “inspection/adjustment”
—“inspection / adjustment of throttle cable”)
- Fill up the engine with engine oil (see
“inspection/adjustment” —“engine oil/filter”).

Seat Cushion



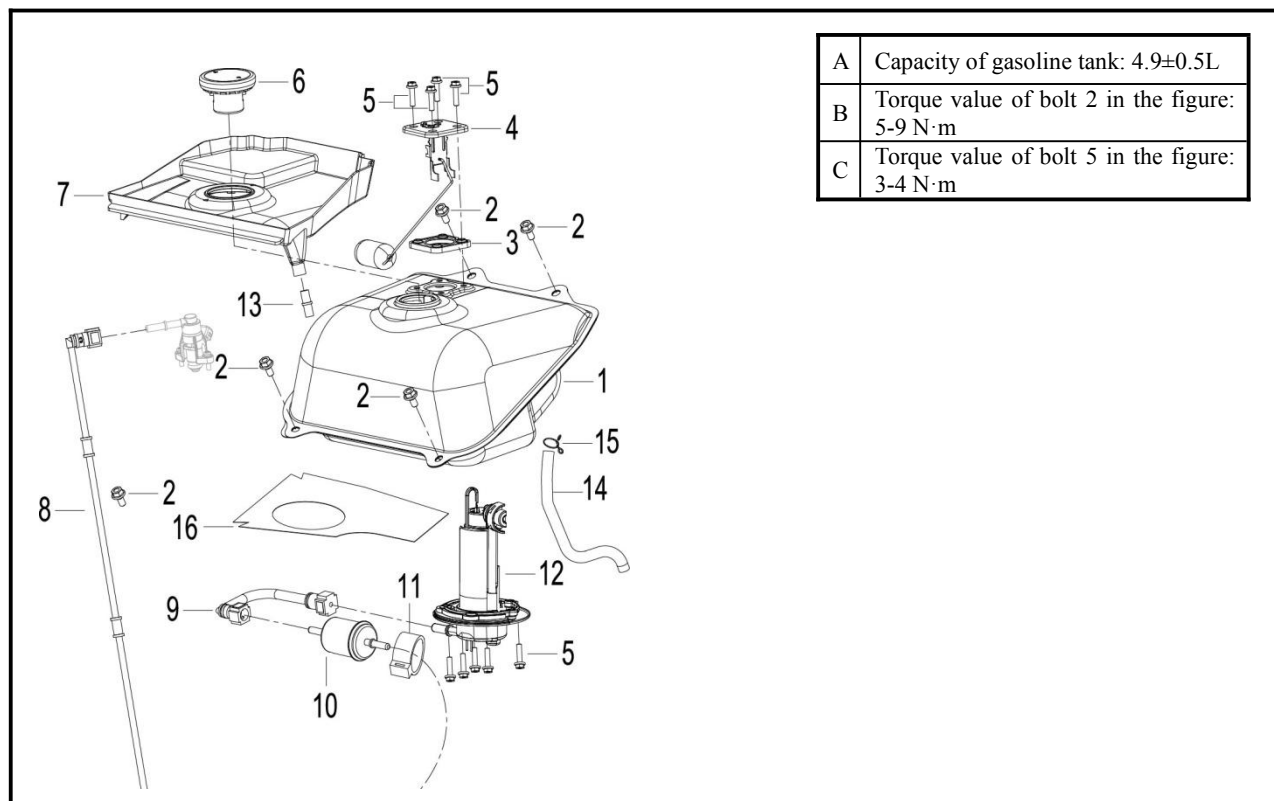
No.	Name
1	Seat cushion assembly (No. 39 leather/Benelli)
2	Helmet barrel
3	Helmet barrel sealing strip
4	Clamp ST4.2
5	Bolt M6×12
6	Helmet barrel bottom cap
7	Self-tapping screw ST4.2×10

Rear Rack



No.	Name
1	Rear grab rail
2	Collar
3	Supporting pad
4	Rear rack screw II M8×35

Fuel tank



No.	Name	No.	Name
1	Fuel tank assembly	11	Filter jacket
2	Bolt M6×12	12	Fuel pump assembly
3	Sensor rubber washer	13	Joint
4	Fuel sensor assembly	14	Fuel hose Φ7×Φ11×380
5	Bolt M5×20	15	Wire clamp Φ10.5
6	Fuel tank cover assembly	16	Insulated tin foil paper of fuel tank
7	Waterproof cushion		
8	High-pressure fuel hose assembly II		
9	High-pressure fuel hose assembly		
10	Filter assembly		

IX. Fuel Tank/Seat/Rear Grab Rail

Preparatory Information-----9.1

Fault Diagnosis-----9.2

Seat-----9.3

Rear Grab Rail-----9.4

Fuel Tank-----9.5

9.1 Preparatory Information

Precautions for operation

The disassembly site should be away from the fire source.

Tighten bolts and nuts to the specified torque values during assembly.

Check whether all the parts are installed or operated correctly after assembly.

Technical parameters

Item	Standard	Allowable limit
Tank capacity	4.9±0.5L	/

Locking torque

Rear rack mounting bolt **22～29 N·m**

Fuel tank mounting bolt **10～12N·m**

Helmet barrel mounting bolt **10～12 N·m**

Fuel tank retainer mounting bolt **10～12 N·m**

Fuel pump retainer mounting nut **3.5～5 N·m**

9.2 Fault Diagnosis

Reduction of gasoline quantity

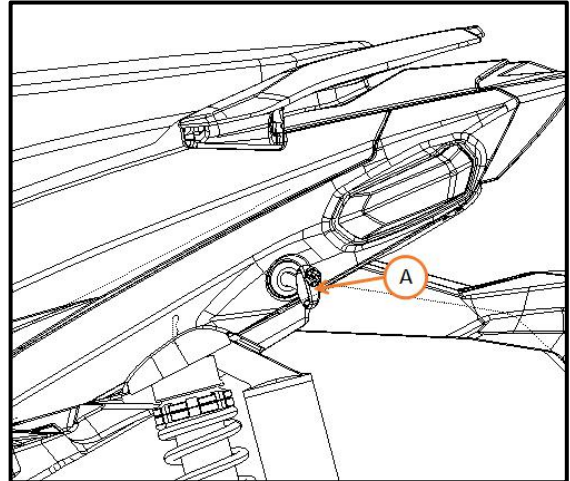
Natural consumption of gasoline

Gasoline leakage

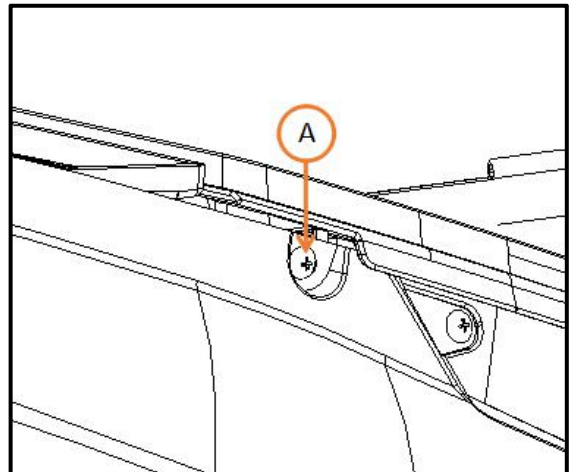
9.3 Seat

9.3.1 Disassembly

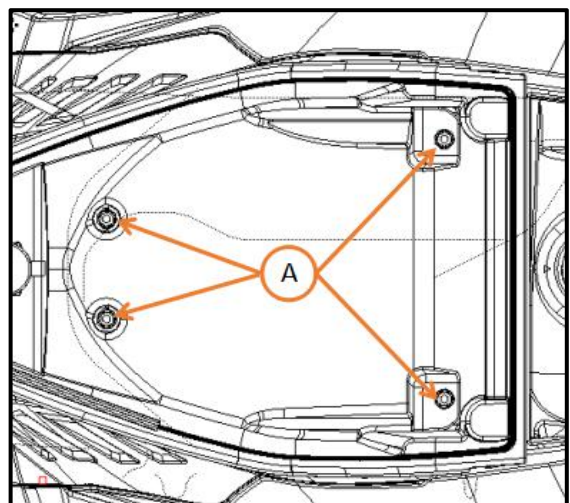
Open the seat cushion lock using the key [A] and turn up the seat cushion.



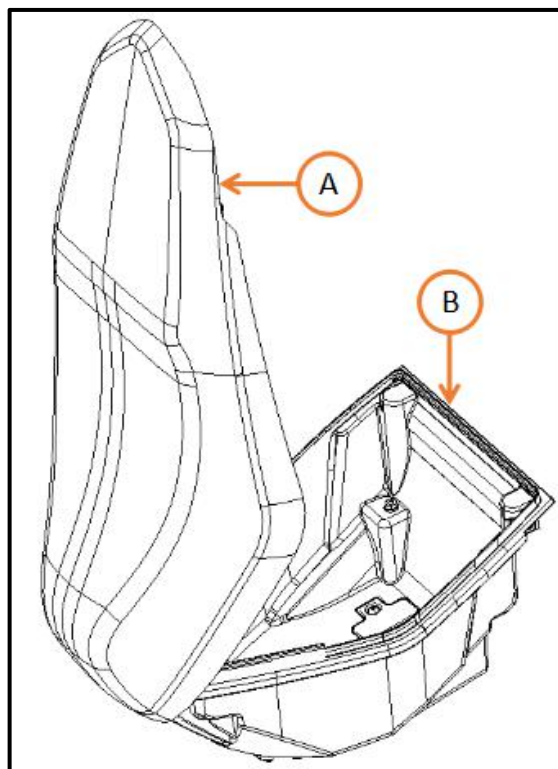
Remove the mounting screw [A] at the front bracket of left and right protectors.



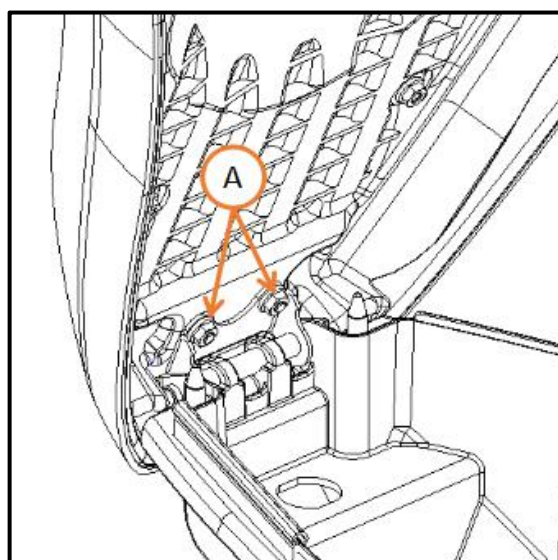
Remove the mounting bolt [A] on the helmet barrel and disconnect the USB cable plug when removing the helmet barrel.



Remove seat [A] and helmet barrel[B].



Remove seat cushion mounting nut [A]
Separate seat from helmet barrel



9.3.2 Installation

Install it in the reverse order of “disassembly”

Torque value:

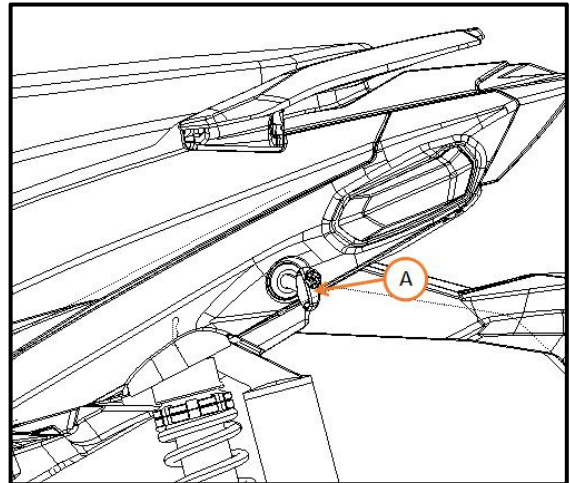
Helmet barrel mounting bolt 10-12 N·m

Seat mounting bolt 10-12 N·m

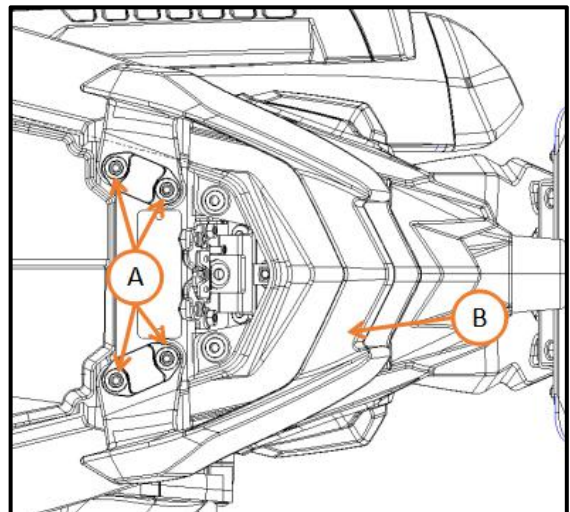
9.4 Rear Grab Rail

9.4.1 Disassembly

Open the seat cushion lock using the key [A] and turn up the seat cushion.



Remove the mounting screw of rear grab rail[A] and take down the rear armrest [B].



9.4.2 Installation

Install it in the reverse order of “disassembly”

Torque value:

Rear grab rail mounting bolt 22-29 N·m

9.5 Fuel Tank

9.5.1 Disassembly

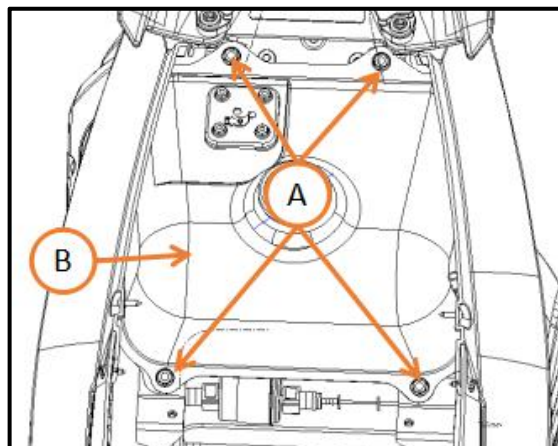
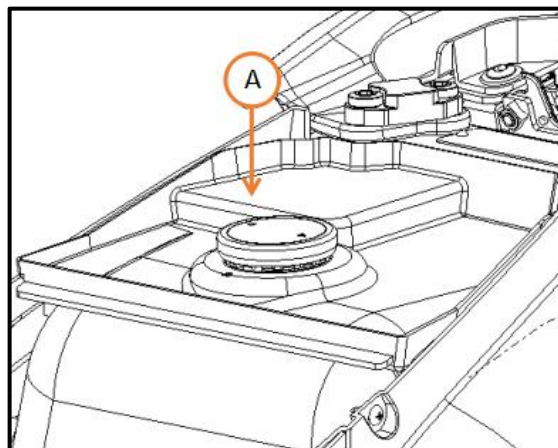
Warning

Gasoline is extremely flammable and may even cause explosion in some cases. Therefore, it must be ensured that the above operations are performed in a well-ventilated area, and any fire source or spark is strictly prohibited, including any devices with indicators. No smoking! Close the electric door lock! Disconnect the negative electrode (-) of battery

In order to minimize the amount of spilled fuel, the fuel in the fuel tank should be extracted when the engine is cool. If some fuel spills, it must be thoroughly cleaned.

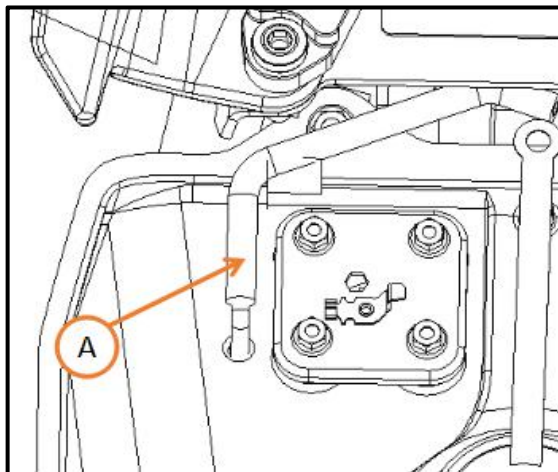
- Remove seat cushion and helmet barrel (see 9.3.1 for details)
- Remove waterproof gasket [A]

- Remove
Fuel tank mounting bolt [A]



●Disassemble

Connecting pipe of dump valve [A]



●Disassemble

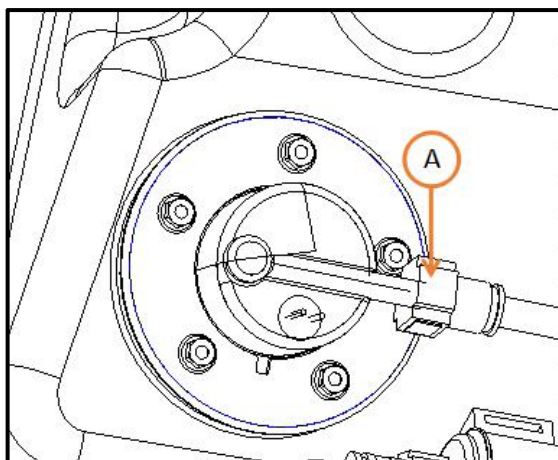
Fuel hose connector [A]

Warning

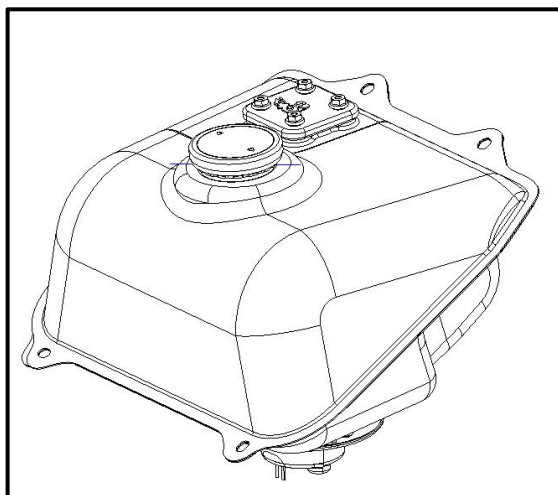
The fuel hose connector must be covered with a cloth when being removed. The residual pressure in the fuel pipeline when the hose is removed may cause the ejection of fuel.

Note:

- Remove the fuel hose with hands. Do not remove the hose with tools forcibly.
- Although the fuel in the fuel tank has been removed, there may still be fuel residuals, so be careful when disassembling the fuel hose.
- Do not remove the fuel hose from the fuel hose connector. Remove the connector from the fuel pump interface.

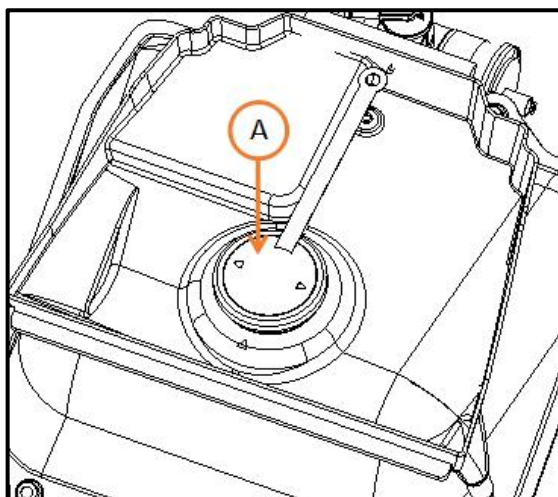


Remove the fuel tank from the frame



●Remove

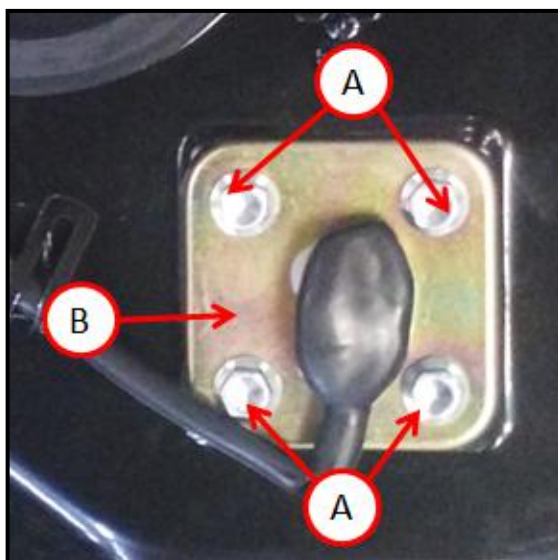
Fuel tank cover [A]



●Remove

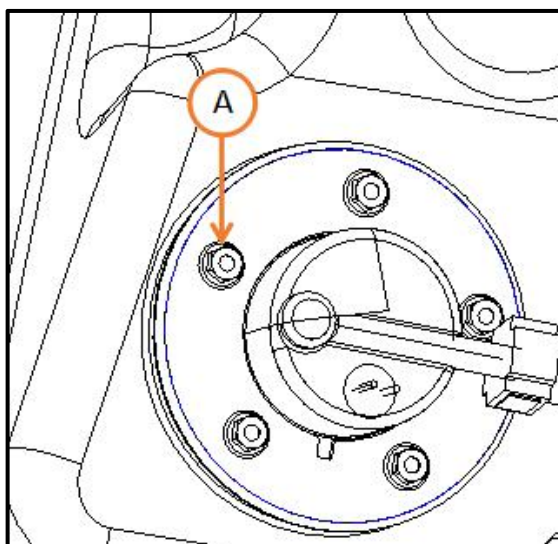
Bolt [A]

Fuel level sensor [A]



●Remove

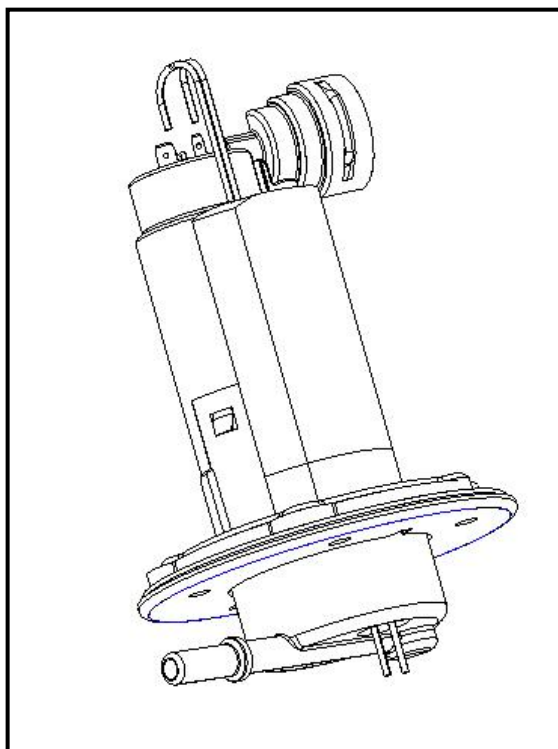
Fuel tank retainer mounting nut [A]



- Take out
fuel pump

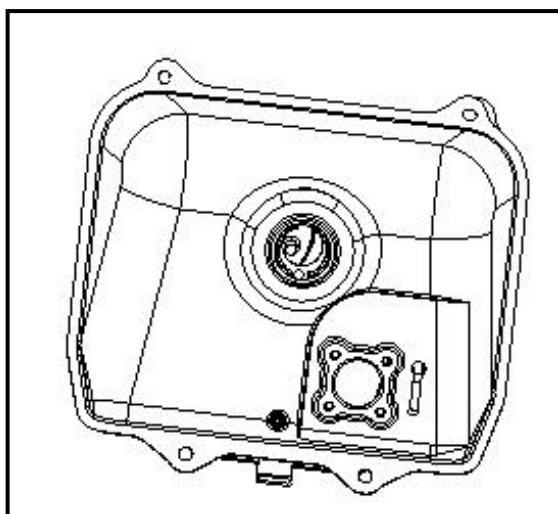
Note

Do not drop the fuel pump, especially avoid falling on hard surfaces, otherwise the fuel pump may be damaged.



9.4.2 Inspection

- Inspection
 - Fuel tank
 - Damage/rust→Replacement



- Inspection

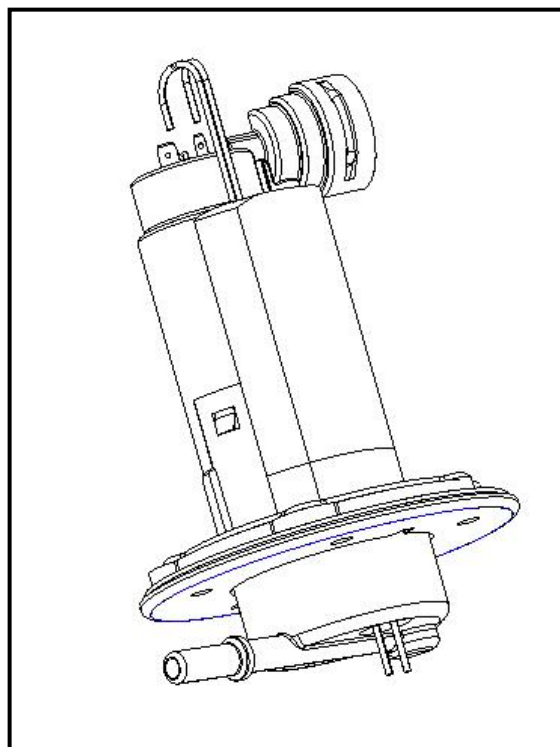
- Inspect fuel pump

- Fuel pump

- Block-clean it

- Crack/damage→Replace fuel pump assembly

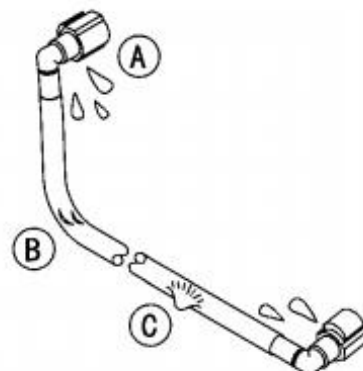
- Performance inspection of fuel pump (see Chapter XVII for details)



- Inspection

Fuel hose

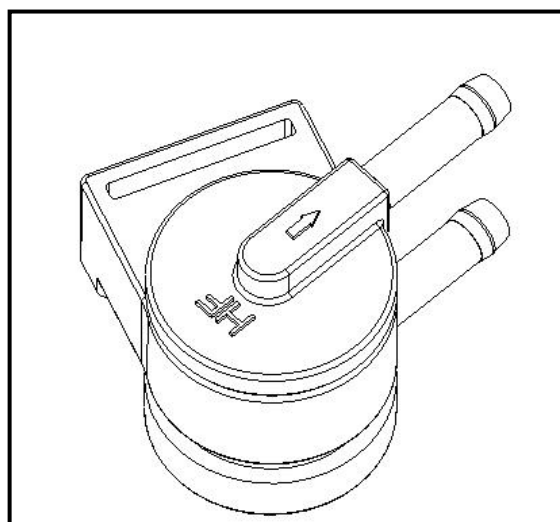
If any wear, crack [B] or expansion [C] is found → the fuel pipe must be replaced.



- Inspection

Dump valve

Damage/fault→Replacement



9.5.3 Installation

Install it in the reverse order of “disassembly”

Torque value:

Fuel tank mounting bolt 10-12 N·m

Fuel level sensor mounting bolt 5-9 N·m

Fuel pump retainer mounting nut 3.5-5 N·m

Note:

Do not damage the mounting surface of fuel tank
when installing the fuel pump
Use new fuel pump seal ring

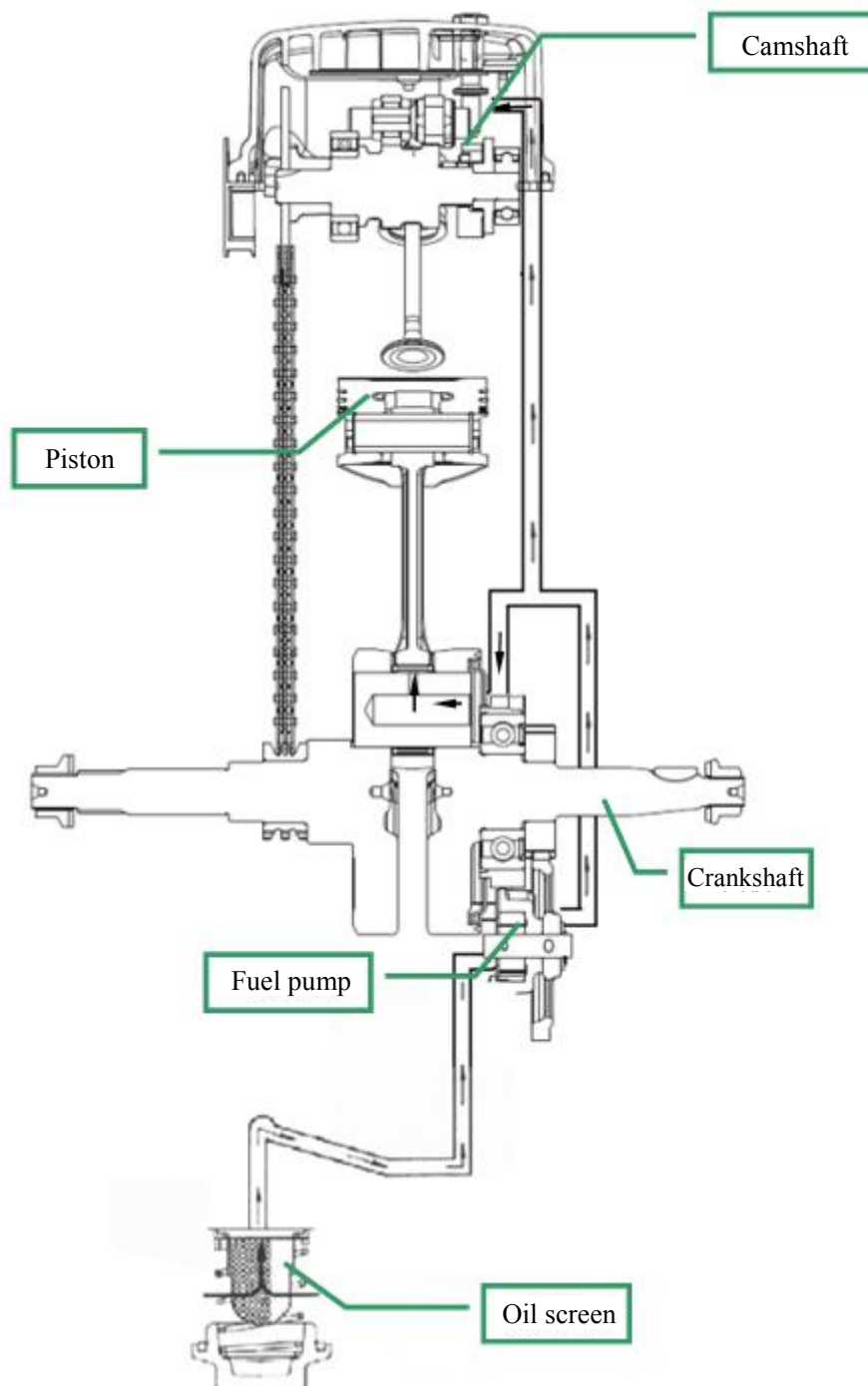
Inspection and maintenance of engine

Table of torque value of engine fastener

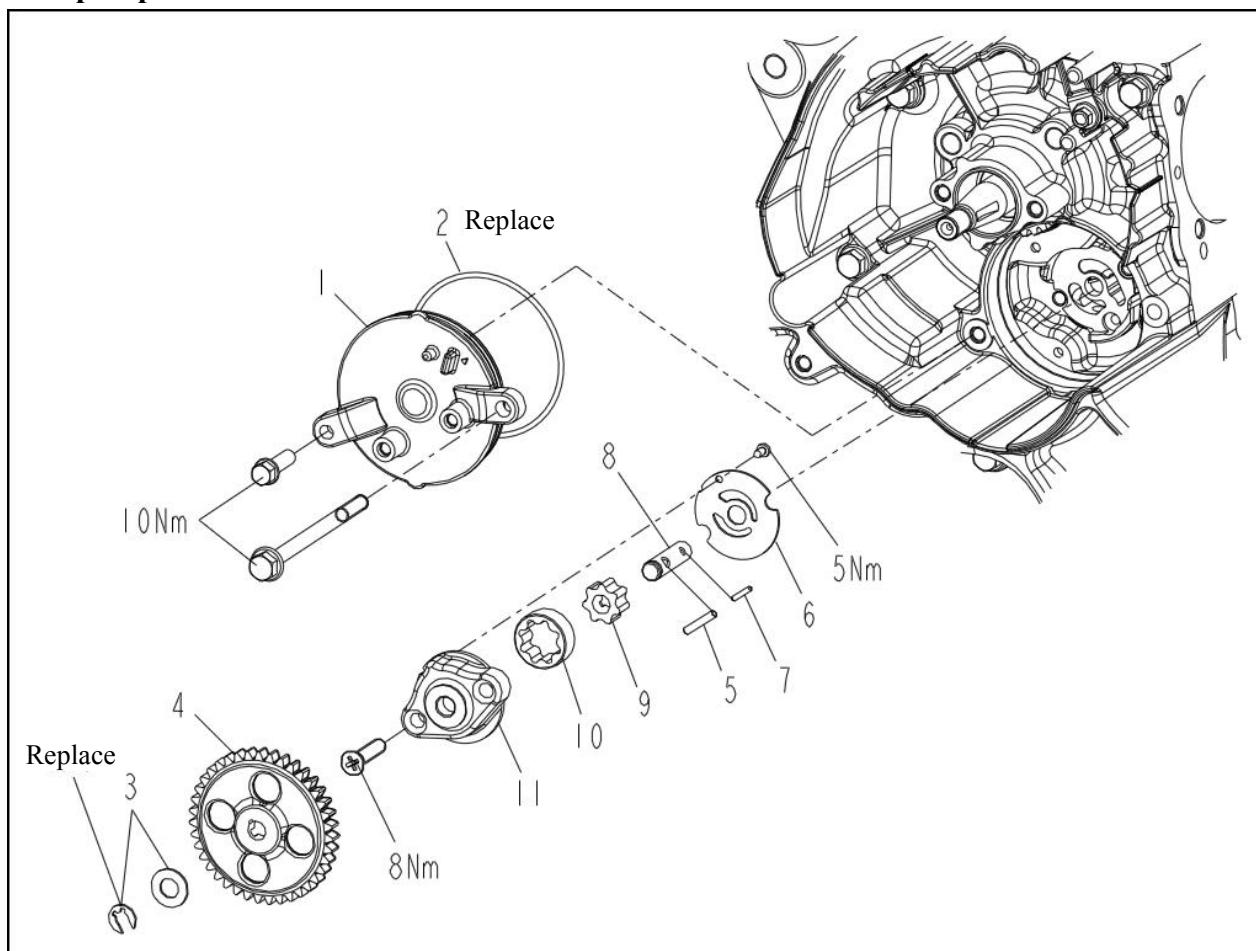
Fastening location and fastener name	Tightening torque (N·m)
Cylinder head nut	25~28
Oil drain bolt	22~35
Spark plug	10~15
Assembling bolt	10~12
Transmission chamber cover bolt	10~12
Motor mounting bolt	10~12
Fuel pump mounting bolt	10~12
Fuel pump sprocket mounting bolt	10~12
Flywheel locknut	50~60
Right cover stud	10~12
Impeller mounting screw	10~12
Double-end stud	18~22
Chain regulator mounting bolt	10~12

Main parameters of engine			
Engine type			Four stroke, single cylinder, four valves, single spark plugs
Cooling mode			Forced air-cooling
Cylinder diameter×stroke			53.5mm×55mm
Displacement			123.6ml
Compression ratio			9.0: 1
Maximum net power / corresponding speed			6.3Kw/7500r/min
Maximum torque/ corresponding rotating speed			9.0N.m/6000r/min
Injection type			Electronic fuel injection
Starting mode			Electric / foot-operated starter
Idle speed			1500±100r/min
Spark plug model			B7RTC
Maximum lift range of intake/exhaust valves, opening and closing angle with respect to the dead point, and valve clearance	Intake valve	Maximum lift range	6.5mm
		Opening angle	357°
		Closing angle	569°
	Exhaust valve	Maximum lift range	6.3mm
		Opening angle	156°
		Closing angle	360°
Lubrication mode			Splash lubrication, pressure lubrication
Amount of oil added			0.7L

Lubrication System



Fuel pump



No.	Working/parts	Qty	Remarks
	Disassemble fuel pump		Remove this part in sequence
	Alternator		Refer to the disassembly of alternator
1	Fuel pump cover	1	
2	O-Ring	1	
3	Retainer ring/washer	1/1	
4	Fuel pump gear	1	
5	Roller pin	1	
6	Base plate of fuel pump	1	
7	Pin	1	
8	Fuel pump shaft	1	
9	Inner rotor of fuel pump	1	
10	Outer rotor of fuel pump	1	
11	Fuel pump	1	
			Install it in the reverse order of decomposition and disassembly.

X. Lubrication System

Preparatory Information ~ ~ ~ ~ ~ 10.1

Fault Diagnosis ~ ~ ~ ~ ~ 10.2

Fuel Pump ~ ~ ~ ~ ~ 10.3

10.1 Preparatory Information

Action of Lubrication System:

The function of the lubricating system of engine is to provide lubricant to the friction surface of workpiece to make the dry surface friction become into the liquid friction between lubricant particles so as to reduce the wear of parts; cool the parts with high heat loads; absorb the impacts of bearing and other parts and reduce noise; increase the sealability between the piston ring and cylinder wall; clean and remove the impurities on the surfaces of parts.

Precautions for operation

After disassembling fuel pump, clean the parts carefully and blow the surfaces of parts using high-pressure gas.

During the disassembly of fuel pump, do not drop the foreign body into the crankcase.

Technical parameters

Item		Standard	Allowable limit
Oil capacity	When replacing the oil	0.6L	/
	When disassembling	0.7L	/
Rotor of fuel pump	Radial clearance between inner and outer rotors	0.035~0.155	0.20
	Clearance between outer rotor and pump	0.15~0.21	0.25
	Rotor end gap	0.05~0.10	0.15

Locking torque

Tightening torque of tapping screw at base plate of fuel pump: 5 N·m

Tightening torque of mounting screw of fuel pump: 8 N·m

Tightening torque of mounting screw at fuel pump cover: 10 N·m

10.2 Fault Diagnosis

10.2.1 Reduced oil level

Natural consumption of oil

Oil leaks

10.2.2 Burnout of engine

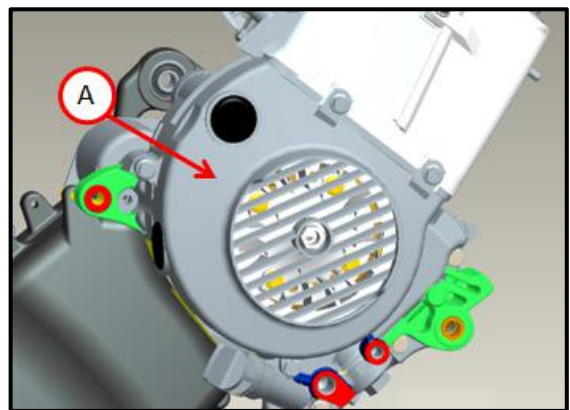
There is no oil or the oil level is too low

Oil path is blocked

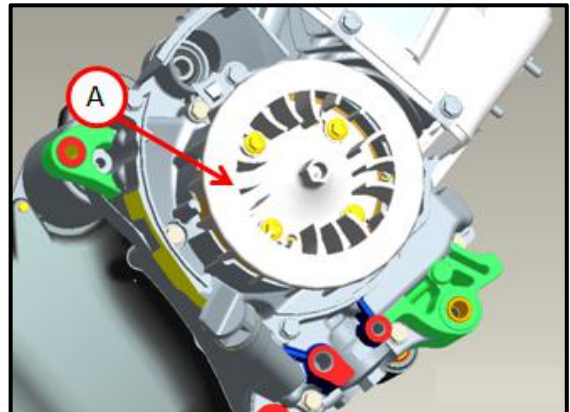
10.3 Fuel Pump

10.3.1 Disassembly

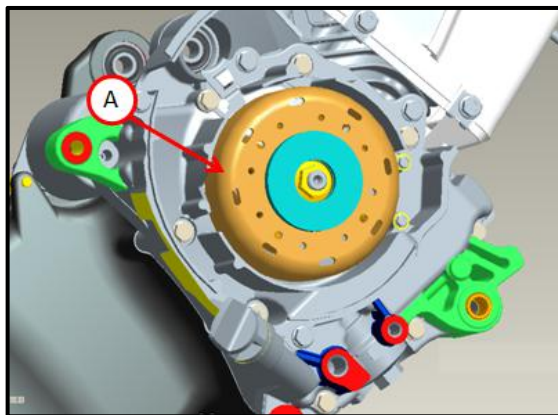
Disassemble the bolt and remove the volute [A].



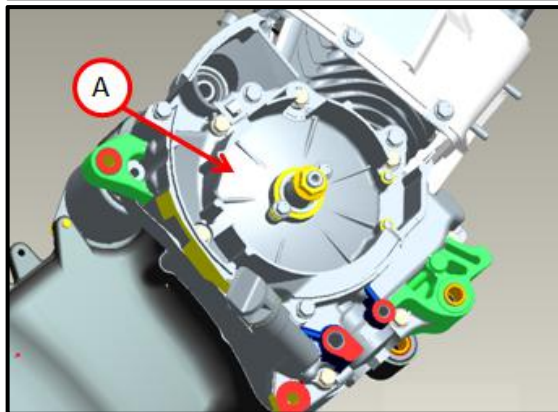
Disassemble bolt and remove fan [A].



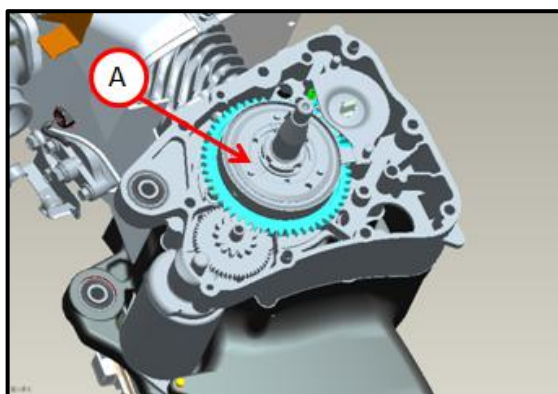
Disassemble the mounting nut and remove the alternator [A]



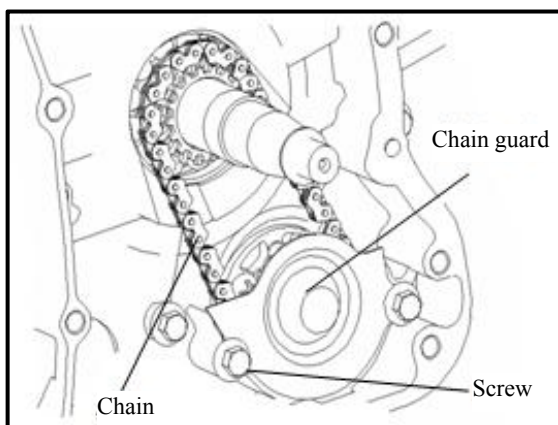
Disassemble bolt and remove right cover assembly [A]



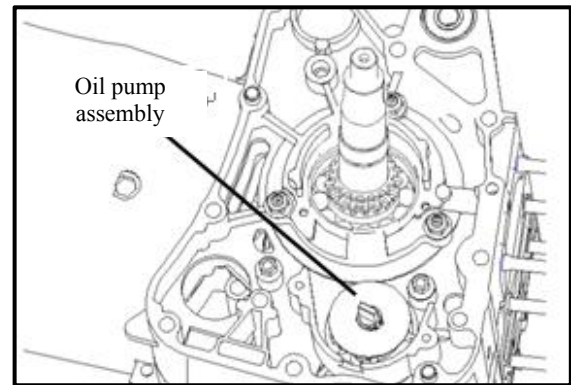
Disassemble overrunning clutch nut, and remove overrunning clutch assembly [A]



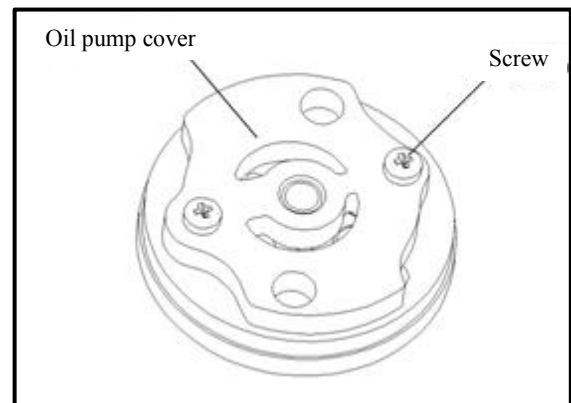
Loosen mounting screw at the chain guard of fuel pump, and remove chain guard.
Disassemble sprocket mounting nut.
Remove sprocket and chain.



Disassemble screw, and remove the fuel pump assembly.



Disassemble screw, and remove the fuel pump cover.

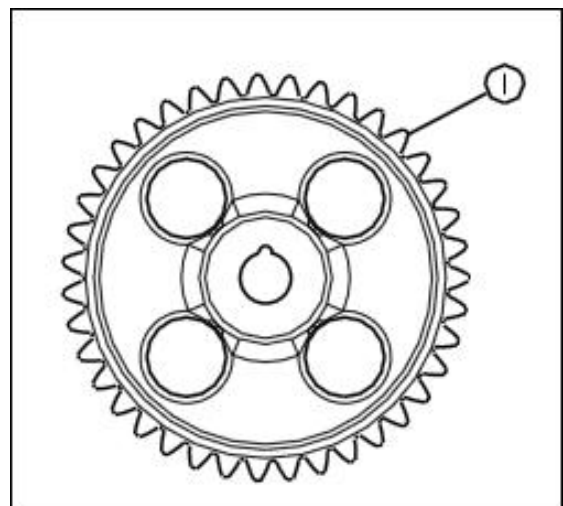


10.3.2 Inspection

1. Check:

- Fuel pump gear ①

Cracks / damage / wear → Replace defective gears.



2. Measure

- Gap between inner rotor and outer rotor ①
- Gap between outer rotor and fuel pump ②
- Gap between inner rotor and outer rotor and end face of fuel pump ③

Specifications do not meet the requirements → replace fuel pump.

① Inner rotor

② Outer rotor

③ Fuel pump

Gap between inner rotor and outer rotor:

0.035-0.155mm

<Limit>: 0.20 mm

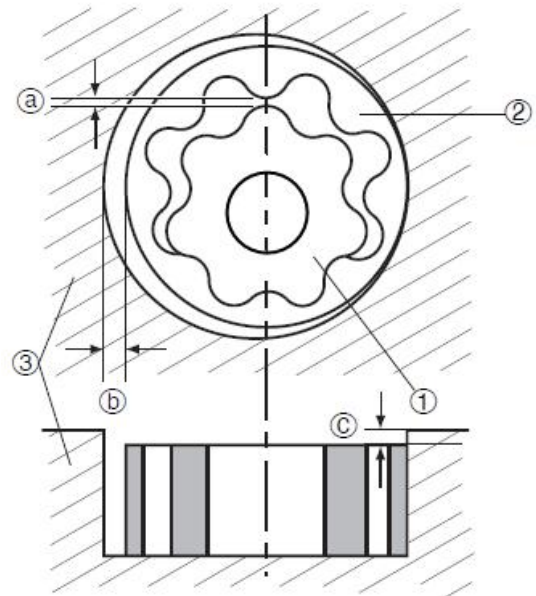
Gap between outer rotor and fuel pump:

0.15~0.21mm

<Limit>: 0.25 mm

Gap between inner rotor and outer rotor and end face of fuel pump: 0.05-0.10mm

<Limit>: 0.15 mm



3. Check

- Whether the fuel pump is running

Rough rotation → repeat steps (1) and (2) or replace defective parts.

10.3.3 Installation

Install it in the reverse order of disassembly.

Tightening torque of tapping screw at base plate of fuel pump: 5 N·m

Tightening torque of mounting screw of fuel pump: 8 N·m

Tightening torque of mounting screw at fuel pump cover: 10 N·m

Note:

After tightening the bolt, ensure the smooth rotation of fuel pump

Installation of fuel pump

1. Install:

Install it in the reverse order of disassembly.

Tightening torque of tapping screw at base plate of fuel pump: 5 N·m

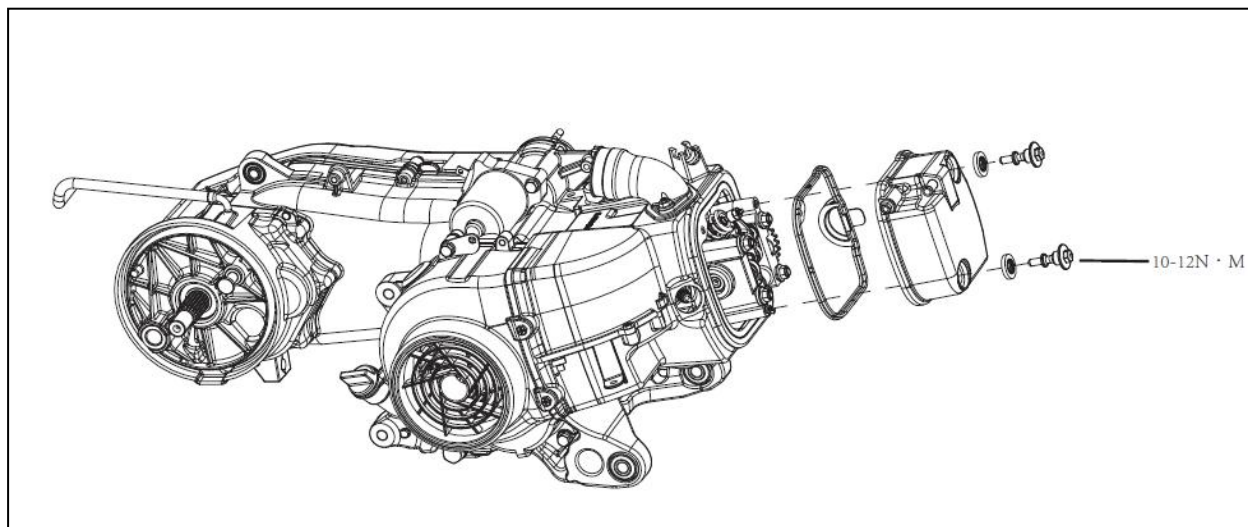
Tightening torque of mounting screw of fuel pump: 8 N·m

Tightening torque of mounting screw at fuel pump cover: 10 N·m

Note:

After tightening the bolt, ensure the smooth rotation of fuel pump.

Sub-assembly of Cylinder Head Cover



XI. Cylinder Head Cover

Preparatory information-----11.1

Cylinder Head Cover-----11.2

11.1 Preparatory Information

Precautions for operation

This section includes the services of cylinder head cover component, cylinder head cover gasket and bolts.

When removing and storing parts, mark them to make sure they are reinstalled in their original positions.

The disassembled parts need to be cleaned.

When removing the cylinder head cover, be careful not to damage the matching cylinder head joint surface.

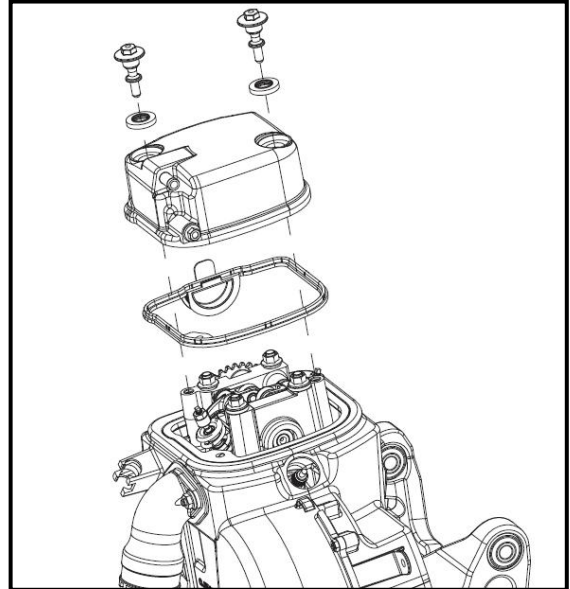
Locking torque

Mounting bolt of cylinder head cover 10-12 N·m

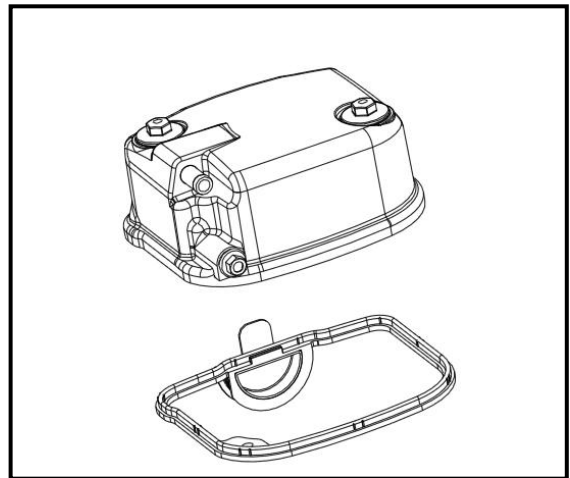
11.2 Cylinder Head Cover

11.2.1 Disassembly

Remove the bolts used for fixing cylinder head cover in turn, and remove the cylinder head cover from the engine.



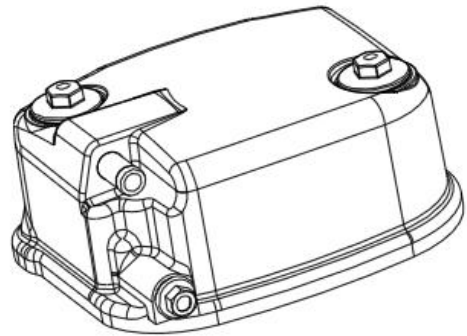
Remove the cylinder head cover sealing washer



11.2.2 Check

Cylinder Head Cover

Damage / wear → replacement



11.2.3 Installation

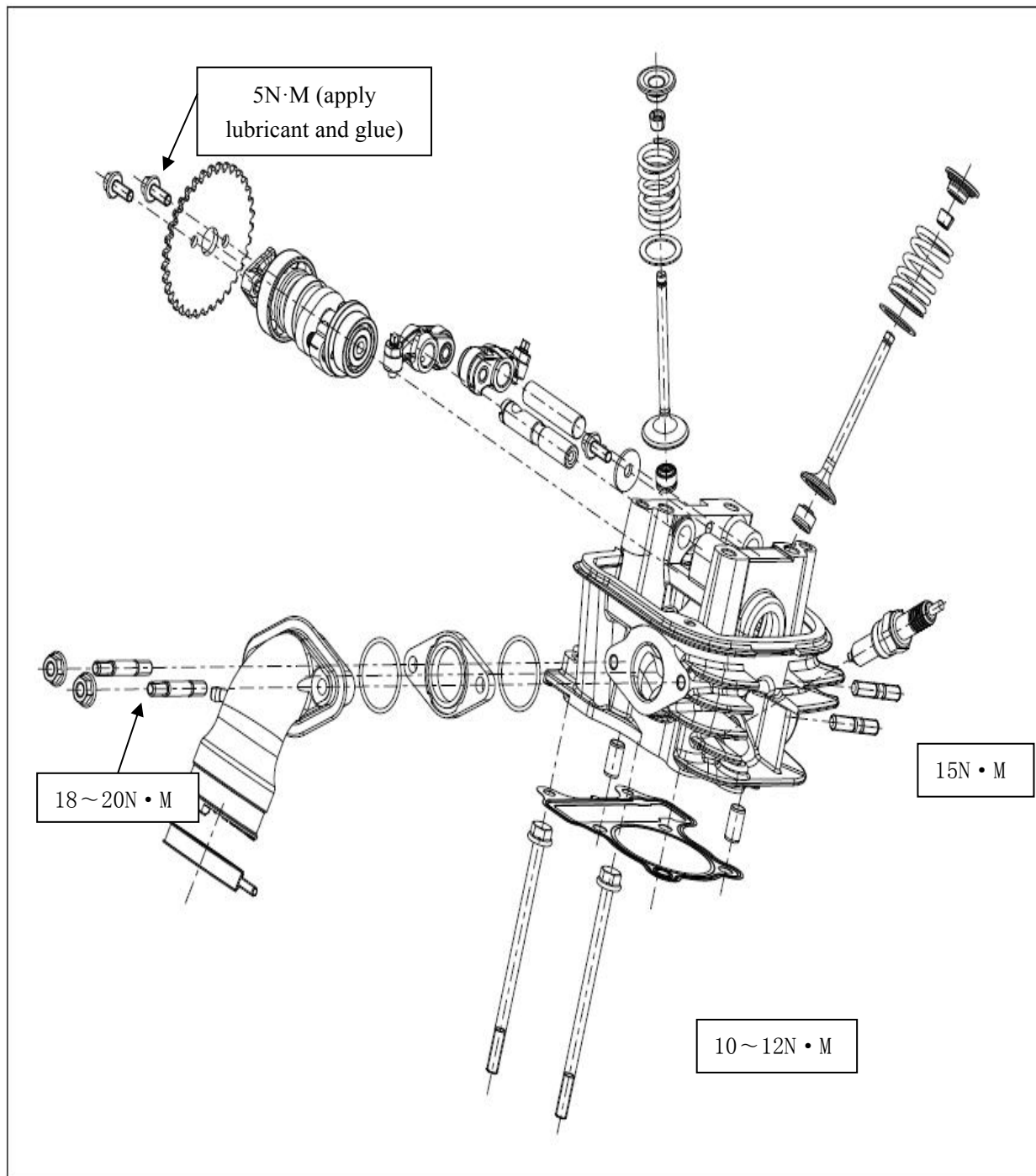
Install it in the reverse order of disassembly.

Note:
When cylinder head cover is removed and reinstalled every time, the gasket of cylinder head cover must be replaced with a new one. When installing, ensure that the seal is installed in the groove of cylinder head cover, and that the groove of cylinder head cover and the cylinder head mounting surface should be cleaned and free of debris.

Torque value:

Torque of cylinder head cover bolt: 10-12 N·m

Cylinder Head / Distribution



XII. Cylinder Head / Valve

Preparatory Information-----12.1

Fault Diagnosis-----12.2

Cylinder Head-----12.3

12.1 Preparatory Information

Function of Cylinder Head:

Cylinder head is used to seal the cylinder and it forms a combustion chamber with the piston to withstand the high temperature and high pressure gas. And it can also complete the intake and exhaust through the distribution mechanism.

Precautions for operation

In order to ensure the sealing of cylinder head and upper box, the cylinder head withstands great bolt pretightening force. Pretightening force value: 19-23 N·m.

Before the inspection and measurement, all parts shall be cleaned and blown with high-pressure air.

Technical parameters

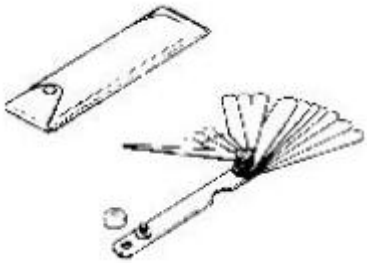
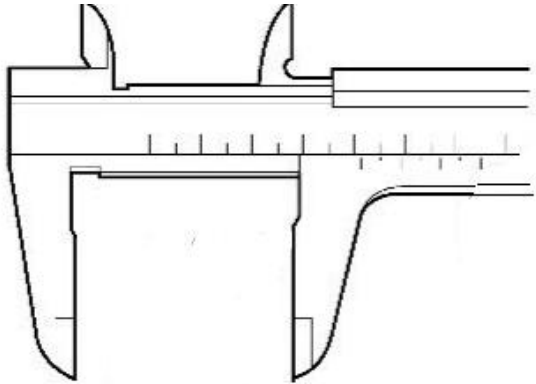
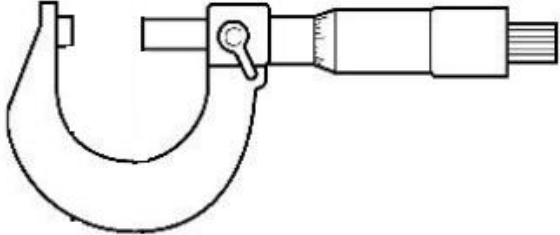
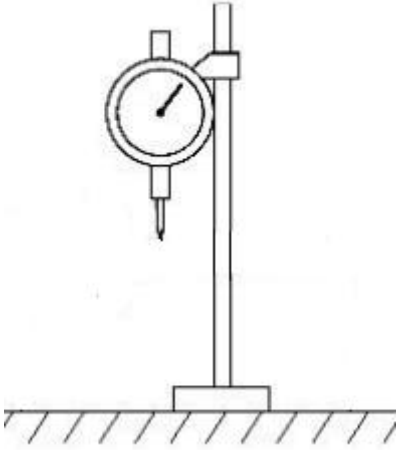
Item			Standard	Allowable limit
Cylinder pressure			1.2Mpa	—
Planeness of cylinder head			0.05	0.08
Valve Valve guide	Valve clearance	Inlet	0.03 ~ 0.05	—
		Exhaust	0.05 ~ 0.08	—
	Outer diameter of valve stem	Inlet	4.97 ~ 4.98	4.95
		Exhaust	4.95 ~ 4.96	4.94
	Inner diameter of valve guide:	Inlet	5.000 ~ 5.012	5.05
		Exhaust	5.000 ~ 5.012	5.05
	Clearance between valve seam and	Inlet	0.02 ~ 0.042	0.1
		Exhaust	0.04 ~ 0.062	0.1

	valve guide			
	Width of valve seat	Inlet	0.9 ~ 1.1	1.3
		Exhaust	1.1 ~ 1.3	1.5
Valve spring	Free length	Inlet	30.8	29.8
		Exhaust	30.8	29.8
Camshaft	Height of camshaft		32.28	31.7
	Height of exhaust camshaft		32.12	31.6

Locking torque

Cylinder head screw	25 ~ 28 N·m
Stud bolt of air inlet duct	18 ~ 20 N·m
Stud bolt at exhaust side	18 ~ 20 N·m
Bolt at sprocket cavity	10 ~ 12 N·m
Spark plug	15N·m
Sprocket bolt	5N.m (apply lubricant and glue)

Tools

	
Feeler gauge	Caliper
	
Micrometer	Runout gauge

11.2 Fault Diagnosis

12.2.1 Compression pressure is low

Valve clearance is not adjusted properly
Valve burns out or is bent
The airtightness of valve seat is not poor
The washer of cylinder head is leaking
The spark plug is not installed properly

11.2.2 Abnormal sound of cylinder head

Valve clearance is not adjusted properly
Valve spring is damaged
Camshaft is worn or damaged
Camshaft or valve rocker arm is worn

12.2.3 Compression pressure is too high

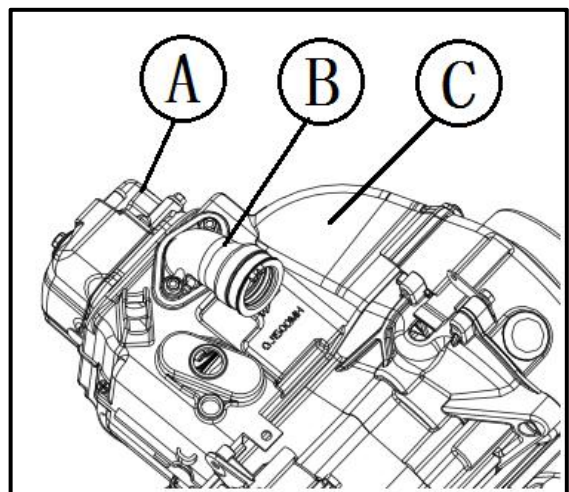
Excessive carbon deposition in the combustion chamber

12.3 Cylinder Head

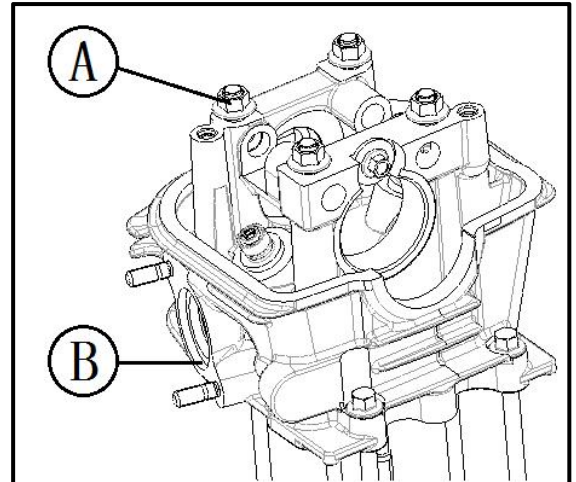
12.3.1 Disassembly

Disassembly

After removing the intake pipe [B], remove the air director [C] and remove the cylinder head [A].



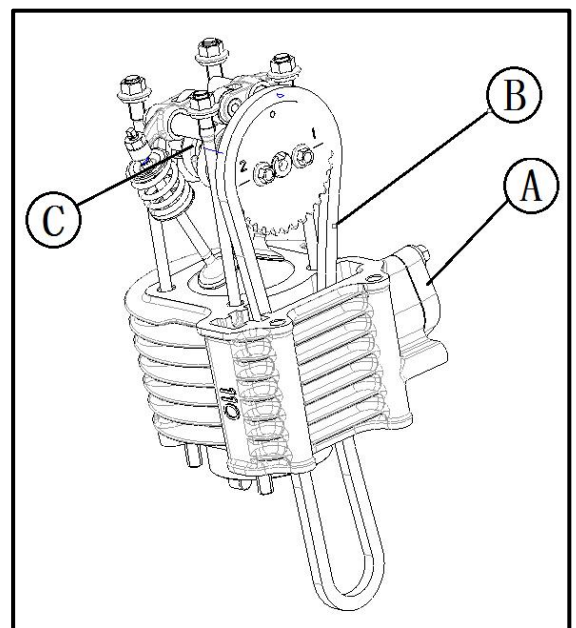
Loosen four flange nuts [A] and remove cylinder head [B].



Loosen the tensioner [A], loosen the chain [B], remove the cylinder head and remove the camshaft [C].

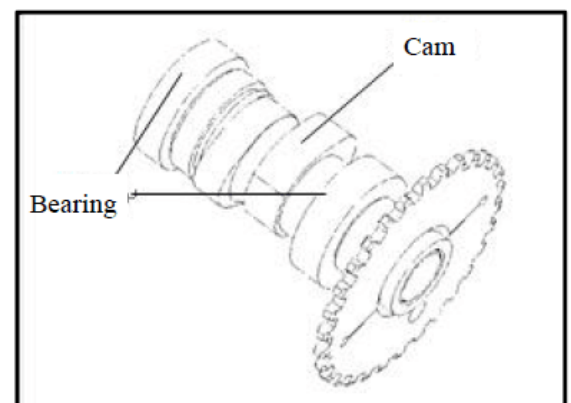
Note:

The chain should be suspended by a section of wire to prevent it from falling into the crankcase.



12.3.2 Inspection of Cylinder Head

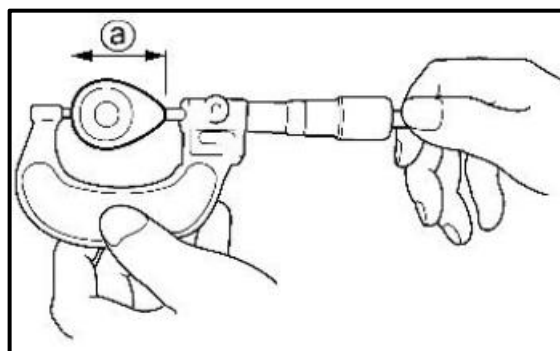
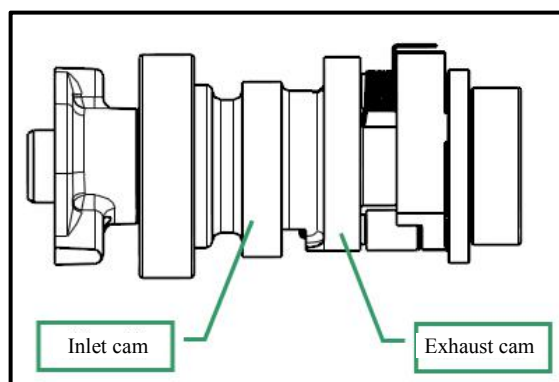
Check the outer ring of bearing, and replace the bearing if it cannot rotate smoothly and flexibly. Check the inner ring of bearing, and replace the bearing if it is not fixed firmly on the camshaft. Check the boss of camshaft, and replace it in case of any pitting-type corrosion, scratch or blueing. Measure the height of cam and meanwhile check whether it is worn or damaged. If it is inconsistent with the specified value, make replacement.



Measure the height of camshaft with a micrometer [a]

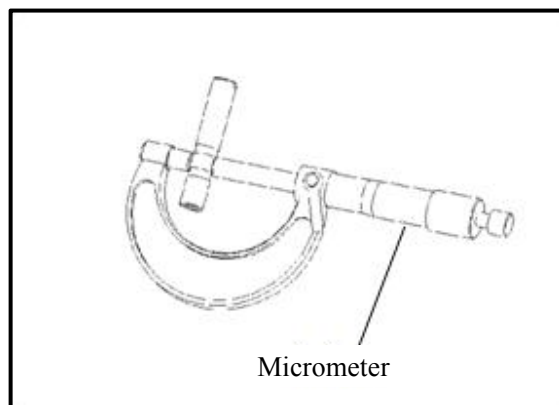
Allowable limit: intake: 31.7mm.

Exhaust: 31.6mm



Measure the external diameter of rocker arm.

Allowable limit: 9.95mm.

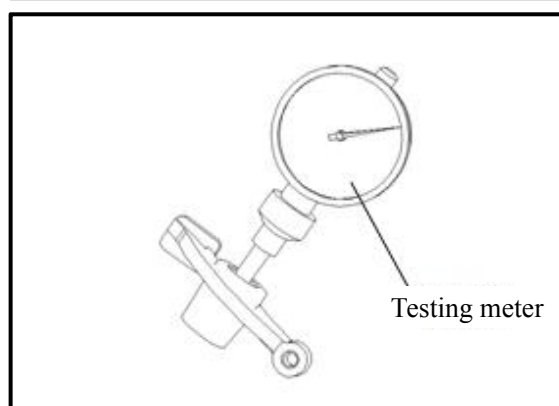


Measure the inner diameter of rocker arm hole.

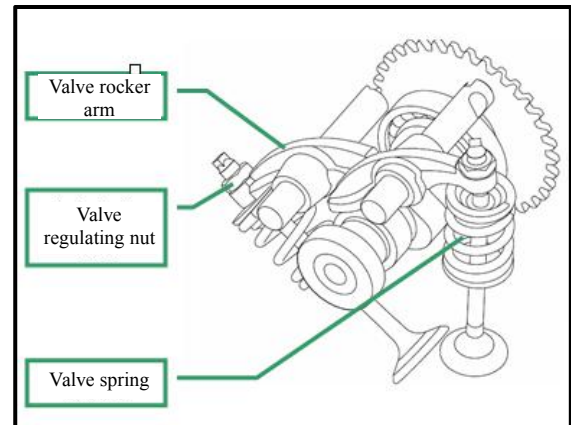
Allowable limit: 10.1mm.

Clearance between rocker arm hole and rocker arm shaft.

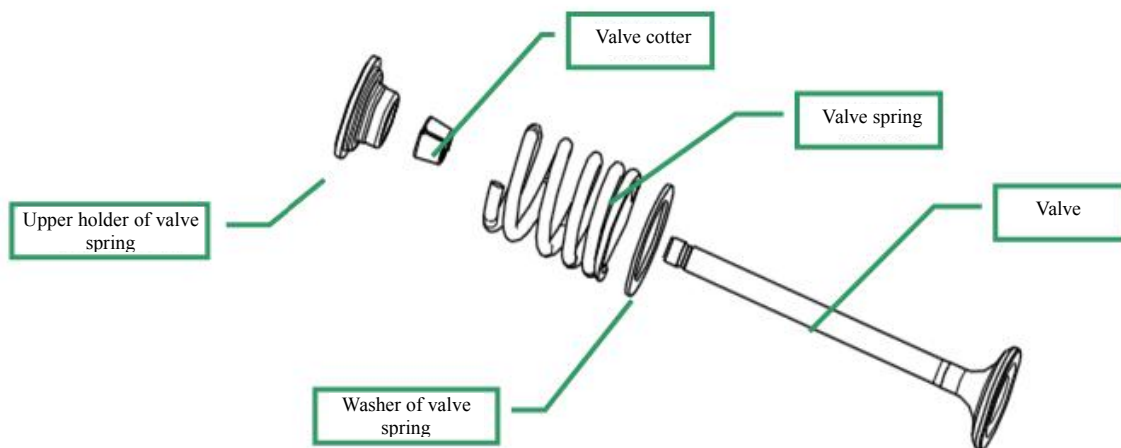
Allowable limit: 0.1mm.



Loosen valve adjusting nut, remove valve rocker arm, compress valve spring with valve spring compression tool, and remove valve cotter. Remove the upper holder of valve spring, valve spring, valve spring washer and valve successively.



12.3.3 Valve decomposition

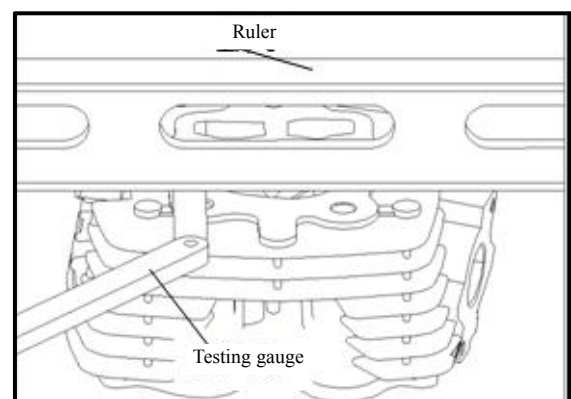


12.3.4 Valve inspection

Clear the carbon deposits on the cylinder head. Measure the flatness of the cylinder head joint surface.

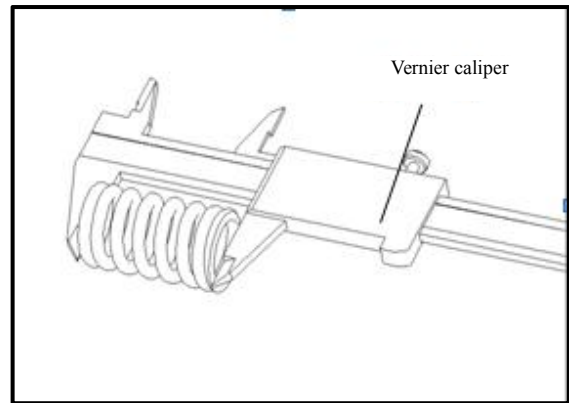
Allowable limit: 0.08 mm.

When the flatness of the cylinder head joint surface exceeds the use limit, place a fine sandpaper on the flat plate, make the cylinder head joint surface fit the sandpaper and sand the surface in 8 shape.



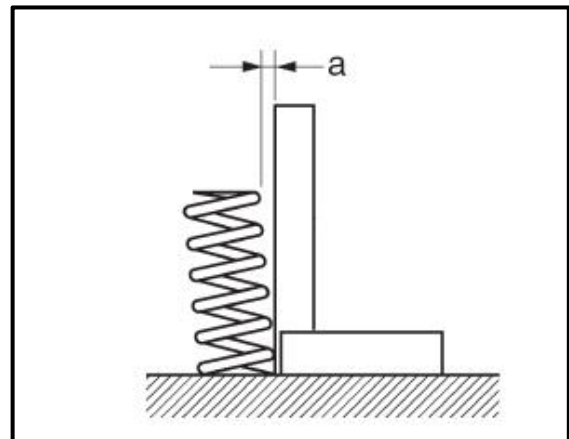
Measure the free length of valve spring.

Allowable limit: spring: 29.8 mm.



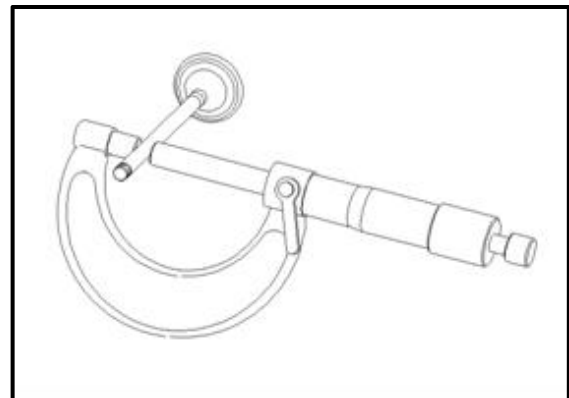
Measure the gradient of intake / exhaust spring of valve [a]

Allowable limit: 1.6mm



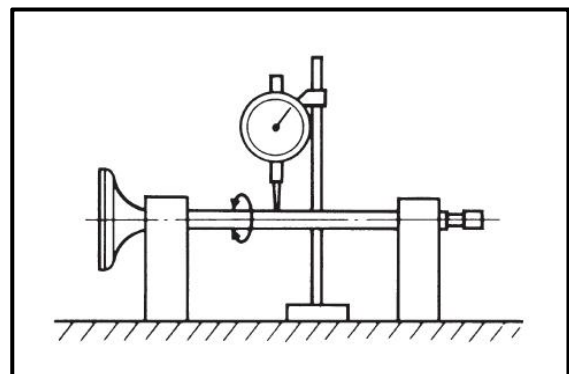
Measure the external diameter of valve stem.

Allowable limit: 4.95mm.



Measure the run-out of valve stem

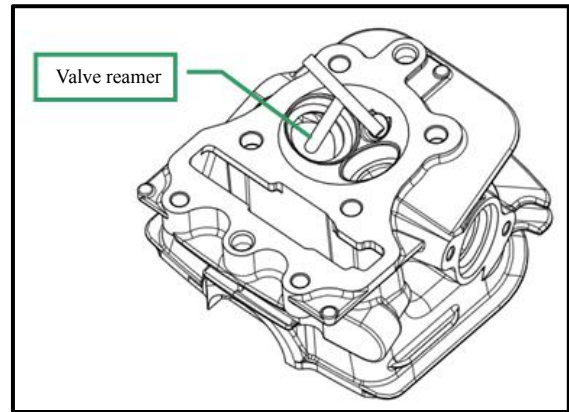
Allowable limit: 0.04 mm



Check the valve guide and remove the carbon deposits in the valve guide with a reamer before check.

Note:

Rotate the reamer clockwise and do not rotate the reamer counterclockwise.



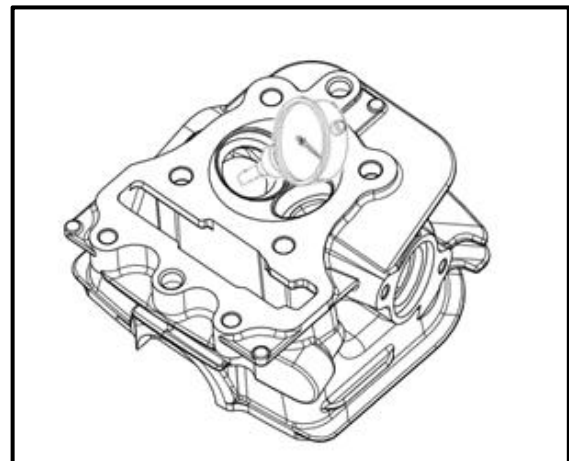
Measure the inner diameter of valve guide.

Allowable limit: intake /exhaust: 5.05mm.

Allowable limit of clearance between valve and valve guide:

Intake valve: 0.10mm.

Exhaust valve: 0.10mm.



12.3.5 Replacement of valve guide

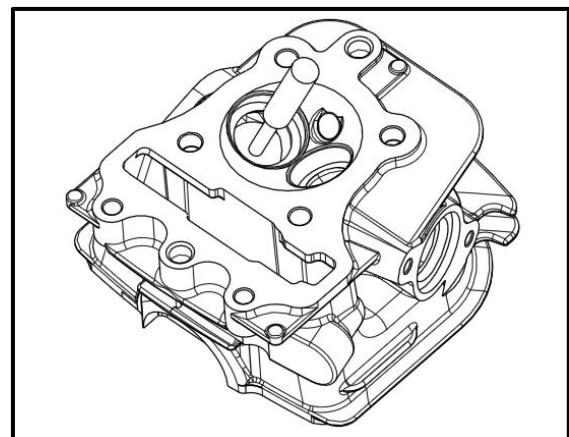
Note:

If the clearance between valve and valve guide exceeds the limit, replace the valve guide.
After the valve guide is replaced, the valve seat ring surface must be finished.

Put the valve guide in the freezing cavity of refrigerator to cool it for an hour.

Use the electric furnace or oven to heat the cylinder head to 100-150°C.

Fix the cylinder head and remove the valve guide from the upper side of cylinder head with the valve guide puller [1].

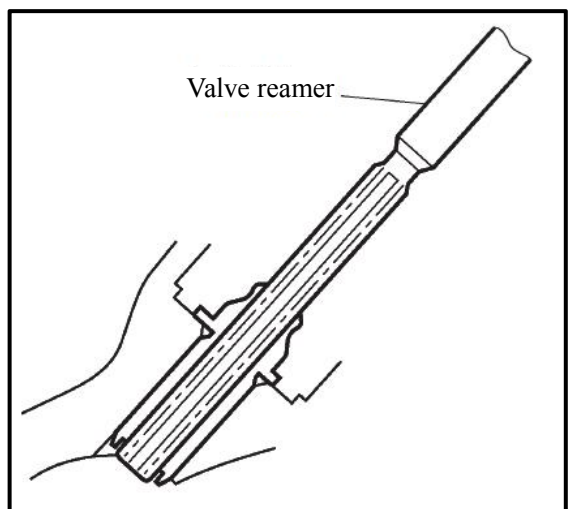
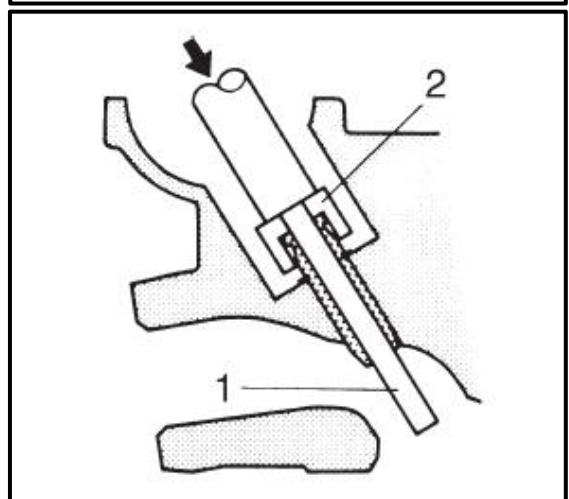
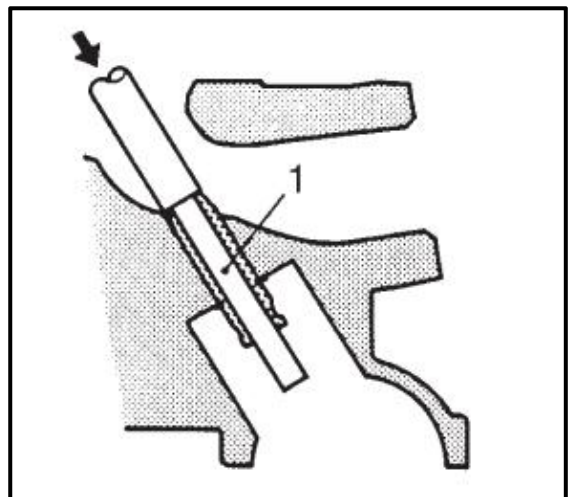


- Put a new O-ring on the new valve guide.
- Install the valve guide from the top of cylinder head.
- Install new valve guide using valve guide mounting tool [2] and guide using valve guide remover [1].

Note:
Do not damage the cylinder head when installing the valve guide.

After the valve guide is embedded, carry out the finishing by using the valve guide reamer.

Note:
Add an appropriate amount of cutting oil during cutting with a reamer. The reamer shall be rotated clockwise.

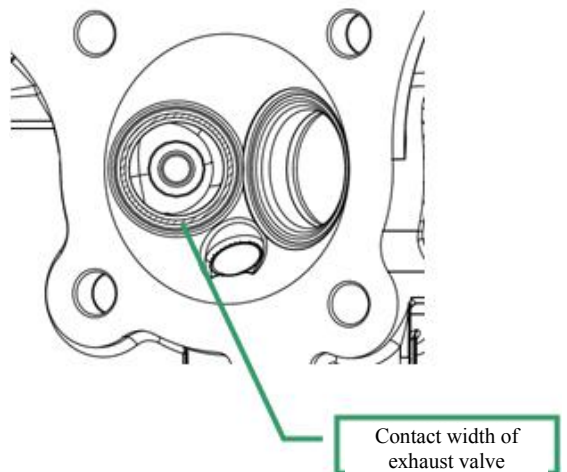
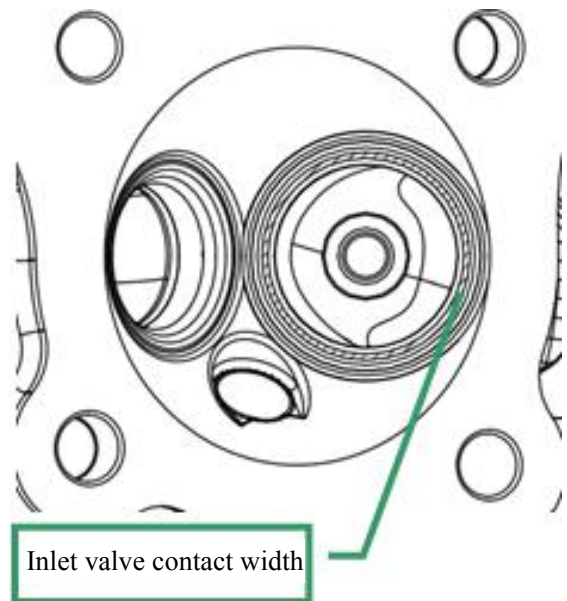


Clean the carbon deposits in the combustion chamber and valve, and thoroughly rinse the intake and exhaust valves.

Check the width of valve seat contact surface (width of valve seat ring).

Allowable limit: intake valve: 1.3 mm

Exhaust valve: 1.5 mm.

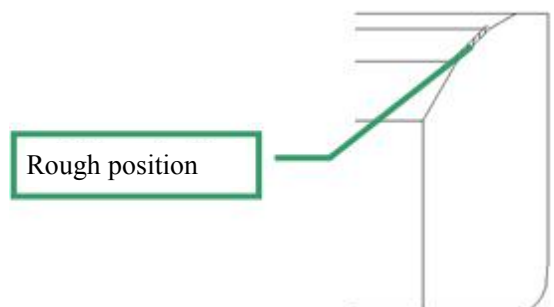


12.3.6 Finishing Valve Seat Ring

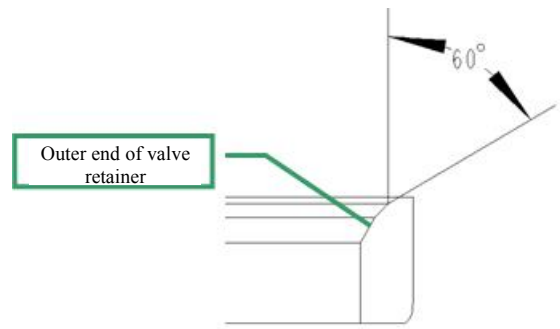
Use a 45°reamer to remove the rough or uneven parts on the surface of valve seat ring.

Note:

Apply a layer of transparent or Prussia blue coating to the valve seat ring, so that it can be seen more clearly.

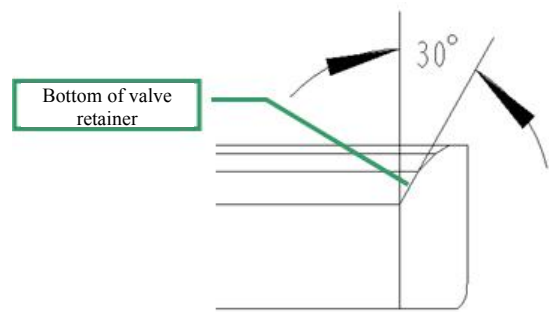


Remove the carbon deposit at outer end of valve seat ring with a 60° reamer.



Remove the carbon deposit at outer end of valve seat ring with a 30° reamer.

Remove the reamer, and check the places that have been handled.



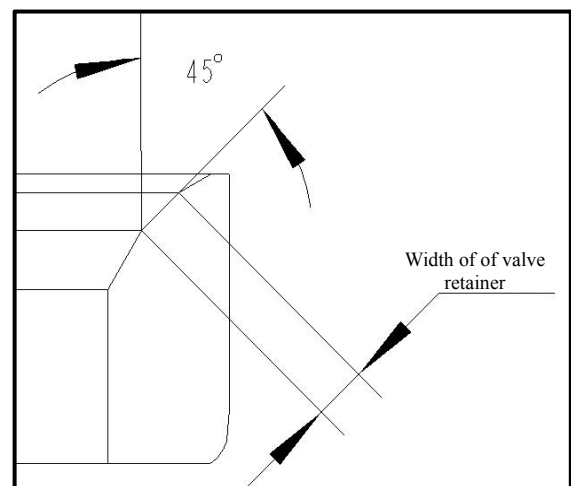
Grind the valve seat ring with a 45° finishing reamer to reach an appropriate width.

Make sure to remove all dents and uneven parts.

Standard valve seat ring width: intake valve:

1.0mm

Exhaust: 1.2mm

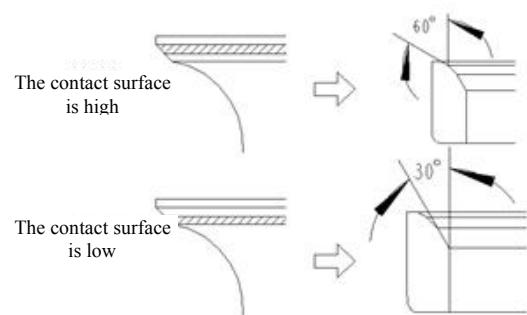


If the contacted position is in the too high part of valve, please lower the valve seat ring with a 20° flat reamer.

If the contacted position is in the too low part of valve, raise the valve seat ring with a 60° internal reamer.

Use the 45° finishing reamer to finish the valve seat ring again to make it meet the required specification.

After the valve seat ring is grinded, apply polish to the valve surface and gently polish the valve.



12.3.7 Installation of Cylinder Head

Installation shall be carried out in the order contrary

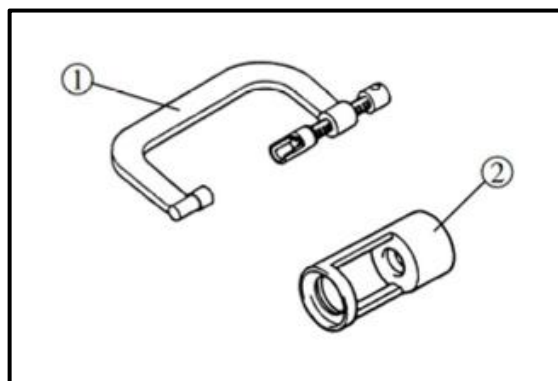
to the disassembly order.

Special tools:

QJ153-10-0104/G10 valve spring pressure gauge①

QJ153-10-0105/G10 connector②

The contact surface
is low



Precautions for Installation of Valve:

When the valve is installed, apply appropriate amount of engine oil to the surface of the valve stem and then install the valve stem into the valve guide.

Valve spring retainer①

Valve oil seal②

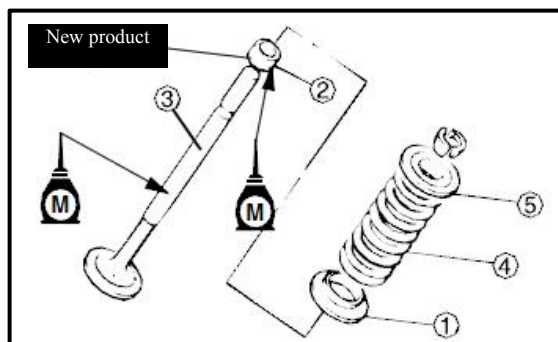
Valve③

Valve spring④

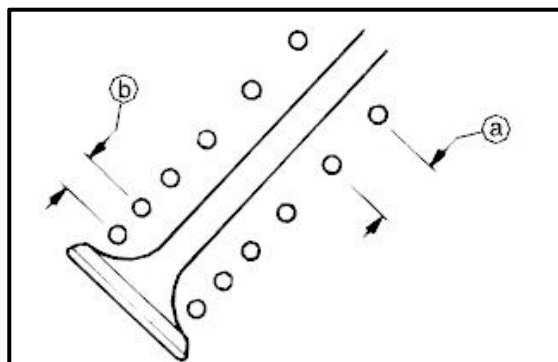
Spring plate⑤

Note:

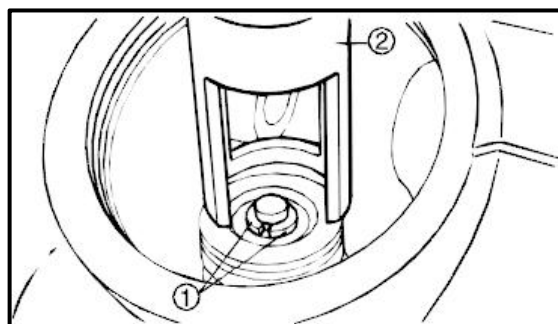
Before installation, check whether there are burrs at the end of the valve. If there are burrs at the end of the valve, polish the end of the valve stem with an oilstone.



When installing the valve spring, install the end of spring with smaller pitch toward the combustion chamber.



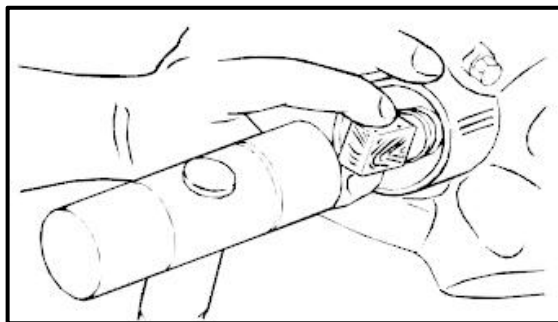
Use the valve spring compression tool ② when installing the valve cotter ①.



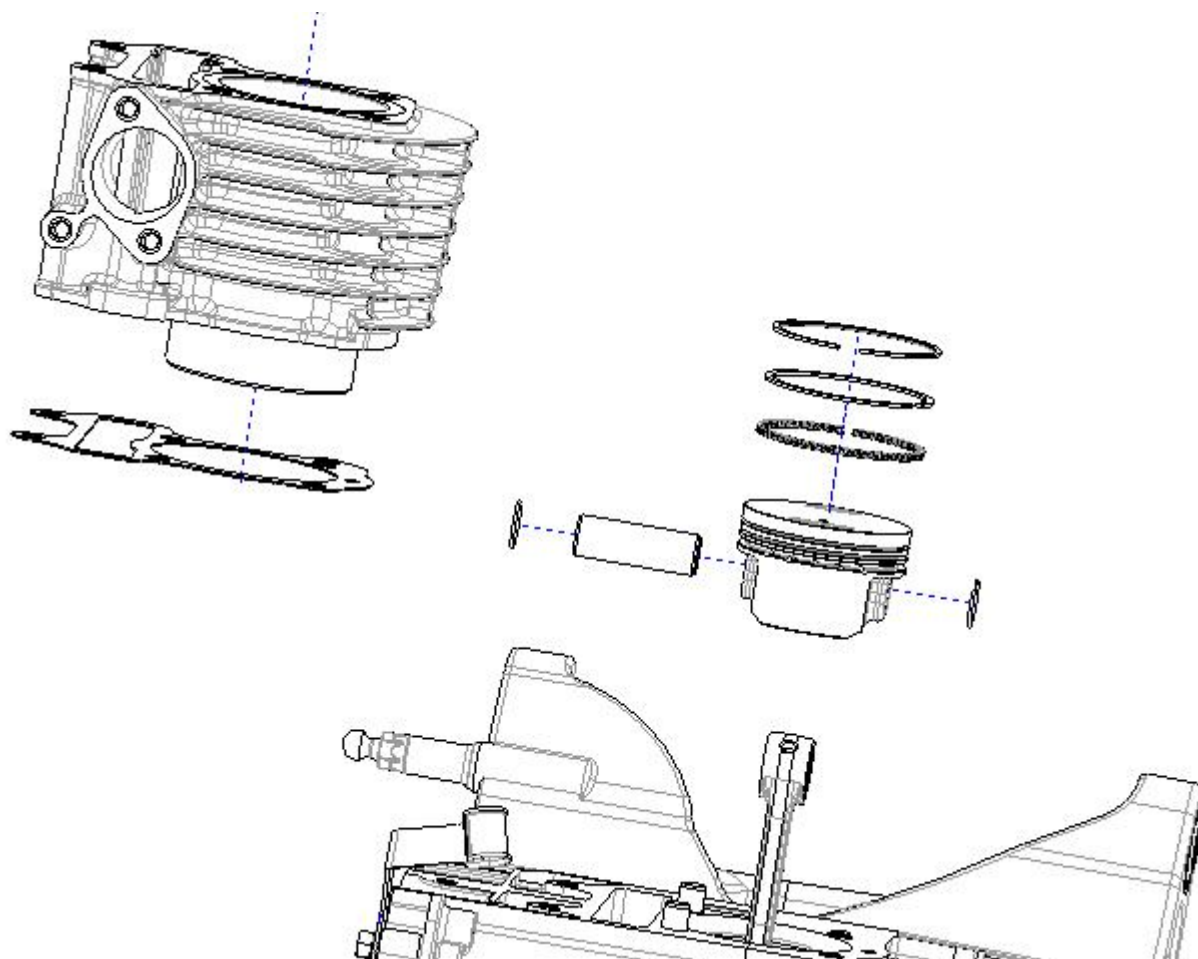
Knock the valve lock plate gently with a soft hammer to fix it on the valve stem.

Note:

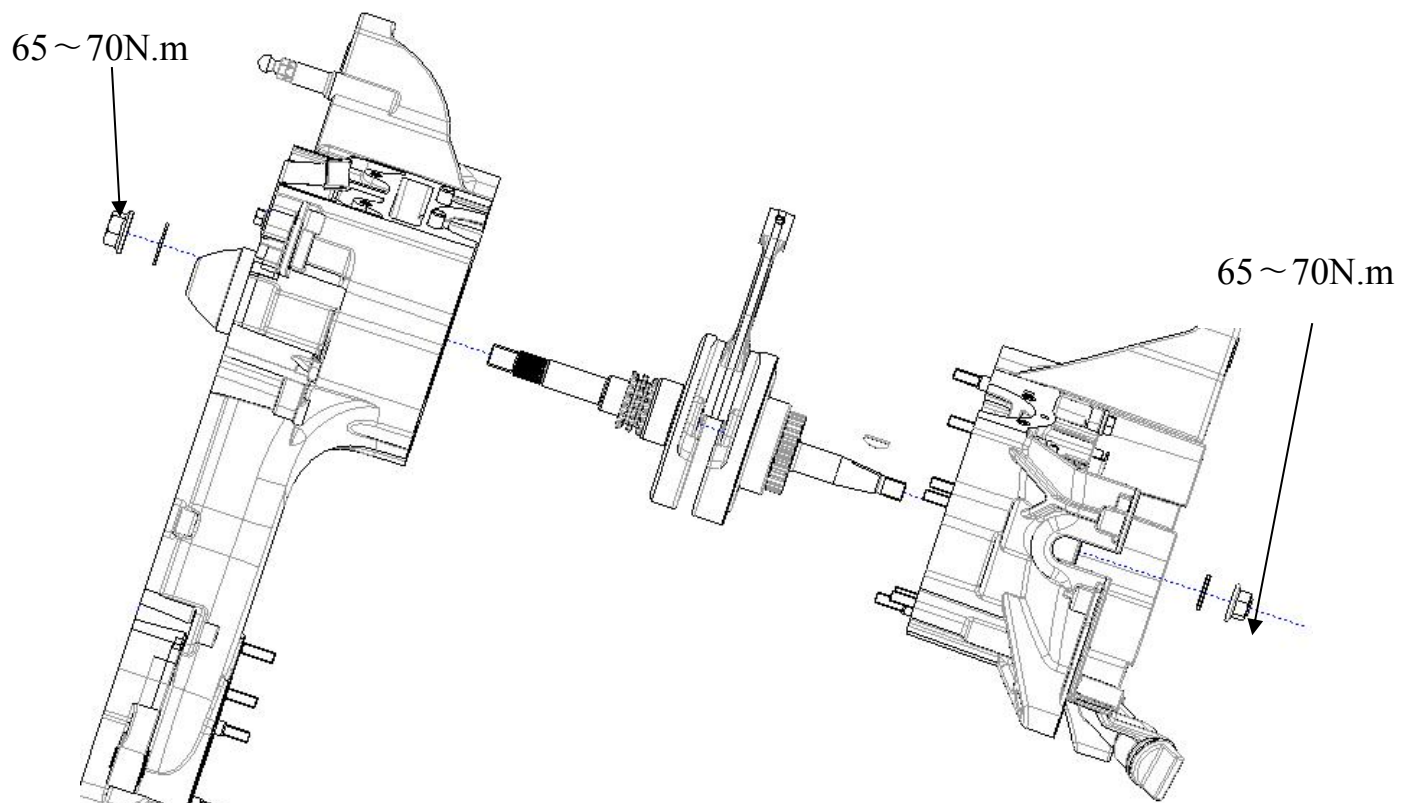
Do not knock the valve lock plate overly to avoid damaging the valve.



Cylinder Block, Piston



Crankshaft connecting rod



XIII. Cylinder Block and Piston

Preparatory Information-----	13.1
Fault Diagnosis-----	13.2
Cylinder Block-----	13.3
Piston-----	13.4
Installation of Cylinder Block-----	13.5

13.1 Preparatory Information

Function of cylinder block:

The cylinder block provides a space for gas compression, combustion and expansion and guides the movement of piston.

It can also transfer some heat in the cylinder to the surrounding cooling mediums.

Function of piston:

1. It can withstand the pressure generated by the combustion of combustible gas mixture in the cylinder and transmit the pressure to the connecting rod to drive the crankshaft to rotate.

2. Form a combustion chamber together with the cylinder head and other parts.

Precautions for operation

Before the inspection and measurement, all parts shall be cleaned and blown with high-pressure air.

Technical parameters

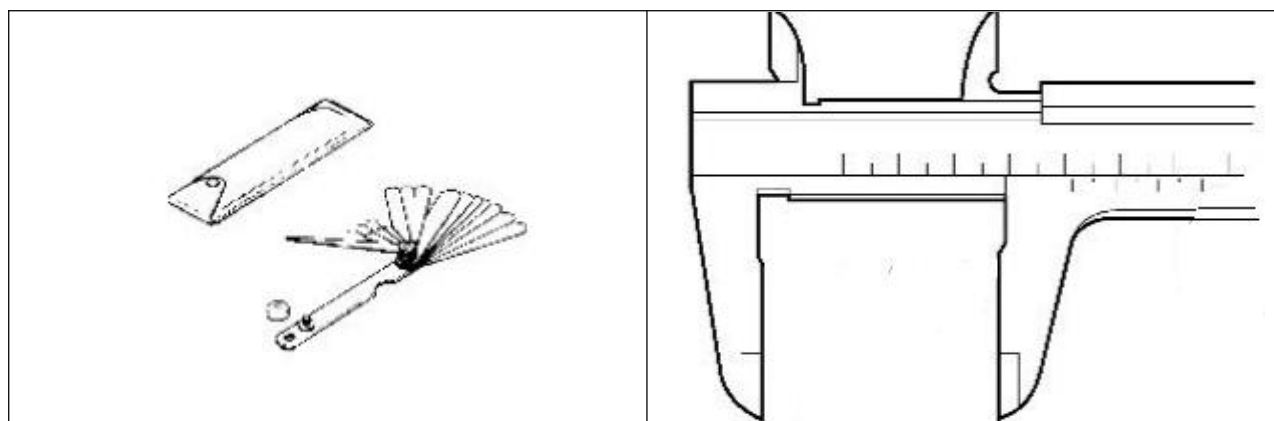
Item		Standard value	Allowable limit
Air cylinder	Inner diameter	53.5 ~ 53.51	53.61
	Cylindricity	0.005	0.05
	Roundness	0.004	0.05
	Planeness	0.02	0.05
Piston and piston ring	Outer diameter of piston (measurement point)	53.465 ~ 53.475 (7mm at the bottom of piston skirt)	53.4
	Inner diameter of piston pin hole	13.002 ~ 13.008	13.03
	Outer diameter of piston pin	13 ~ 12.994	12.96
	Clearance between piston and piston pin	0.002 ~ 0.014	0.07
	Clearance between piston ring and ring groove	First ring	0.02 ~ 0.06
		Second ring	0.02 ~ 0.06
	Piston ring joint clearance	First ring	0.10 ~ 0.25
		Second ring	0.3 ~ 0.5
		Oil ring	0.20 ~ 0.60
Connecting rod small end	Inner diameter of connecting rod small end	13.010 ~ 13.018	13.05
	Clearance between connecting rod and piston pin	0.010 ~ 0.024	0.10
Crankshaft components	Lateral clearance of big end of connecting rod	0.1 ~ 0.35	0.50
	Radial clearance of big end of connecting rod	0.008 ~ 0.018	0.05
	Run-out	0.03	0.1

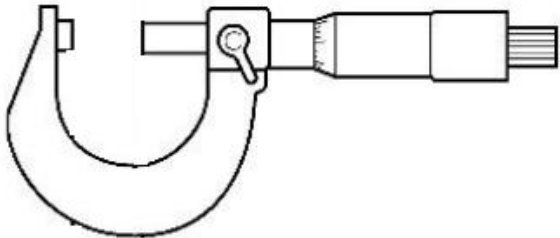
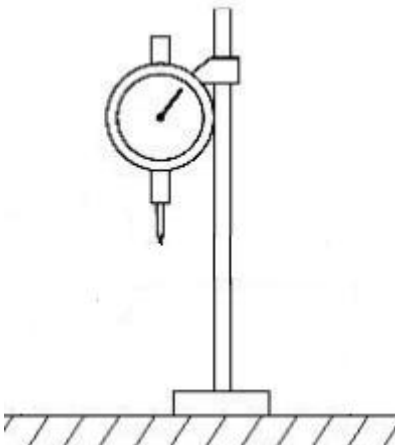
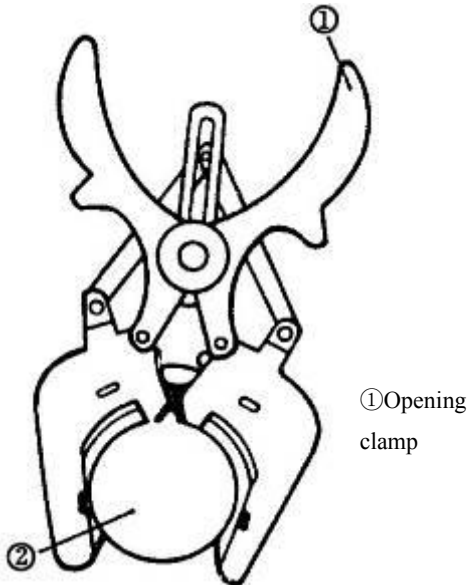
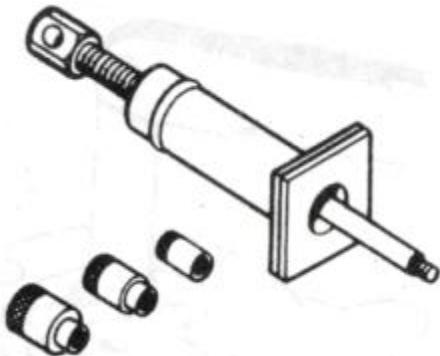
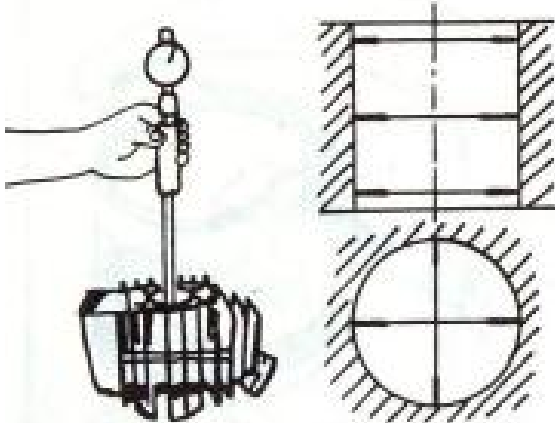
Locking torque

Nut at crankshaft clutch 65-70N.m

Flywheel nut 65-70N.m

Tools



Feeler gauge	Caliper
	
Micrometer	Runout gauge
 <p>①Opening clamp ②</p>	
Piston ring opening clamp	Piston pin pull-out device
	
Cylinder diameter tester	

13.2 Fault Diagnosis

13.2.1 Compression pressure is low

Wear, burning loss or damage of piston
Wear or damage of cylinder and piston
Damage of washer and leakage between crankcase and gas

13.2.2 Compression pressure is high

Excessive carbon deposition in the combustion chamber

13.2.3 Exhaust pipe is emitting white smoke

Wear and damage of piston ring
Wear or damage of piston and cylinder

13.2.4 The sound of piston is abnormal

Damage of cylinder, piston and piston ring
Wear of piston pin hole and piston pin

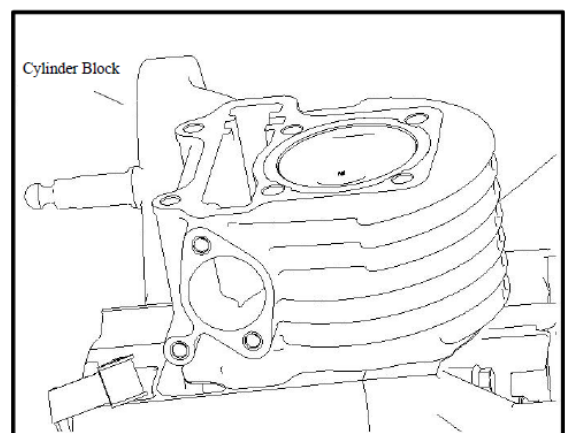
13.3 Cylinder Block

13.3.1 Disassembly of Cylinder Block

Remove cylinder head cover, see 11.2.1

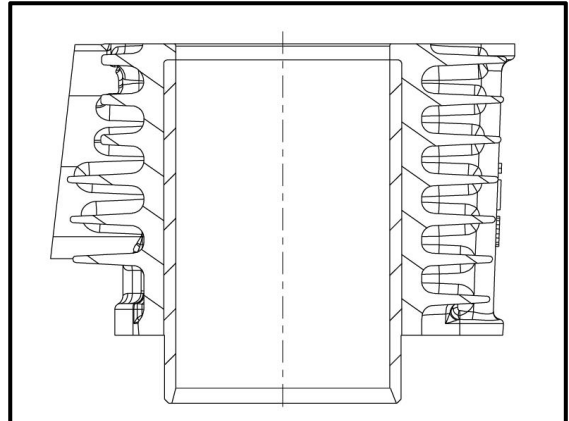
Remove cylinder head, see 12.3.1

Disassembly of Cylinder Block

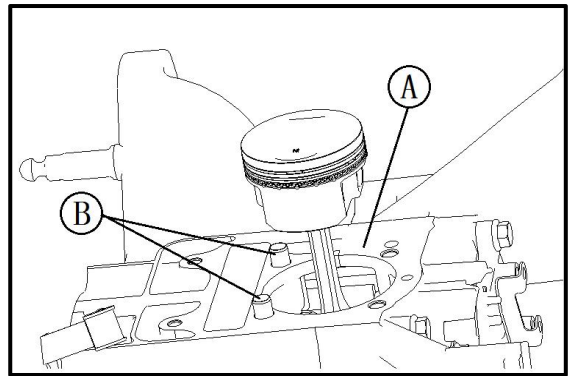


13.3.2 Inspection of Cylinder Block

Check the wear situation of inner wall of cylinder.
If the wear is serious, please replace it.



Remove the washer [A] and dowel pin [B].
Clean the washers attached to the cylinder.



13.4 Piston

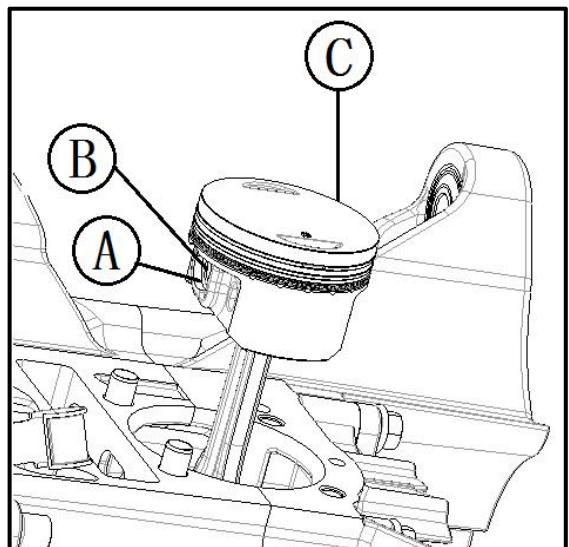
13.4.1 Disassembly

Remove the piston pin retainer [A].

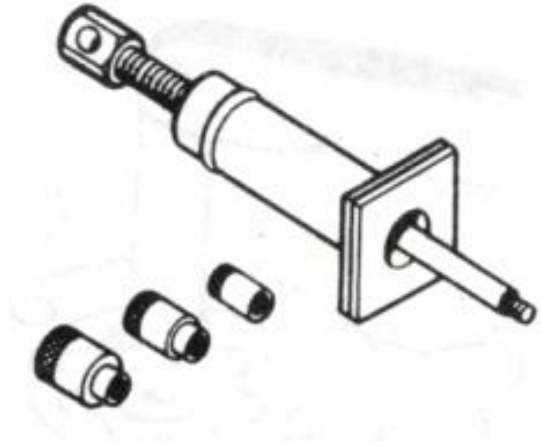
Note:

During disassembly, do not drop the retainer into the crankcase.

Take out the piston pin [B] and remove piston [C].



Piston pin pull-out device

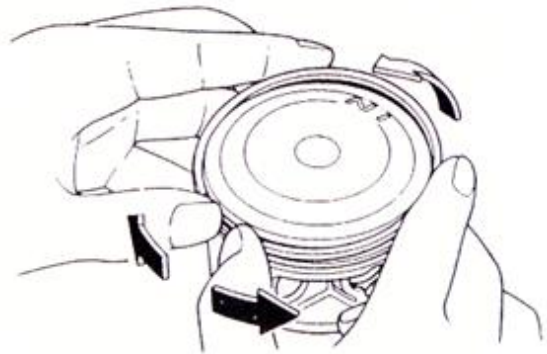


Remove the piston ring.

Note:

Do not break or damage the piston ring.

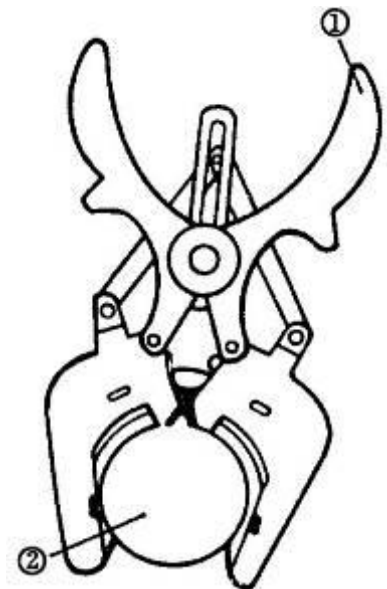
Clear the carbon deposits inside the piston ring groove.



Piston ring opening clamp

① Opening clamp

② Piston



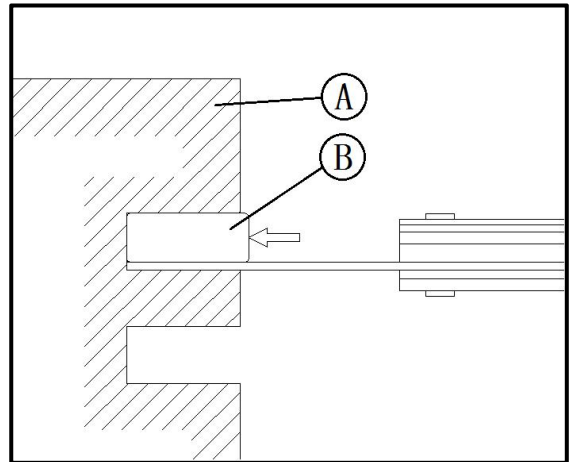
13.4.2 Inspection

Install the piston ring.

Measure the clearance between piston ring [B] and piston ring groove.

Allowable limit: top ring: 0.09mm.

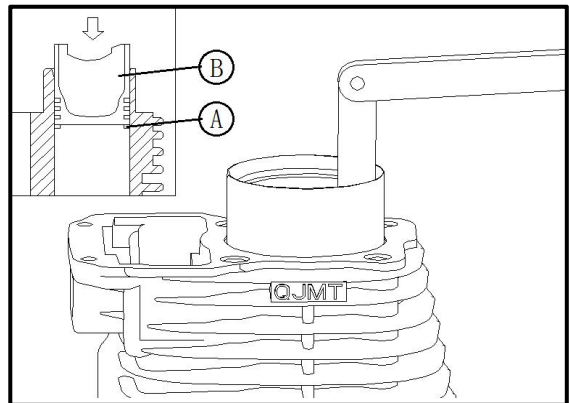
Second ring: 0.09mm.



Remove the piston ring and install the piston rings at the bottom of cylinder.

***Note:**

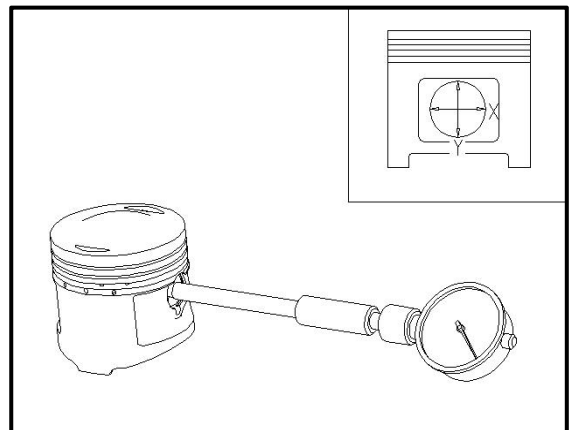
Note: Press the piston ring [A] in the cylinder by using the piston head [B].



Measure the piston ring joint clearance.

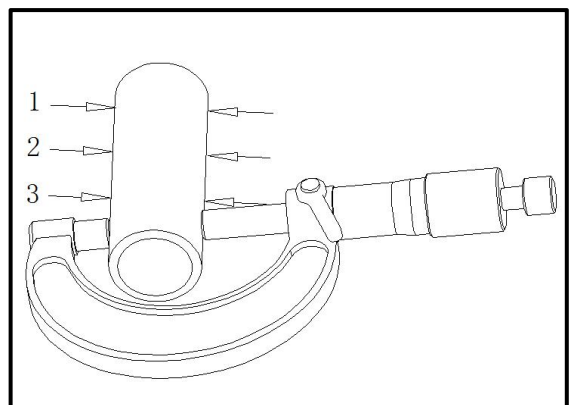
Allowable limit: First ring: 0.5mm

Second ring: 0.8mm



Measure the inner diameter of piston pin hole.

Allowable limit: 13.03mm.



Measure the outer diameter of piston pin.

Allowable limit: 12.96mm.

Clearance between piston pin hole and piston pin.

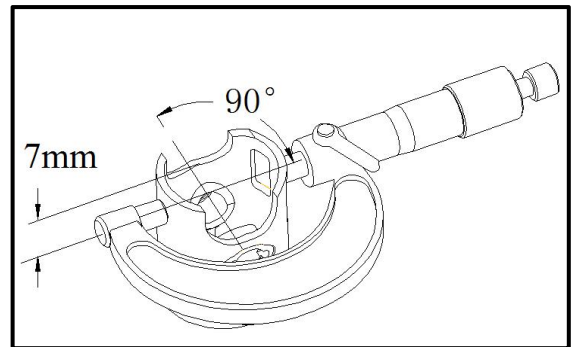
Allowable limit: 0.07mm.

Measure the outer diameter of piston.

***Note:**

The measurement position forms an angle of 90 degrees with the piston pin and it is 7mm below the piston skirt part.

Allowable limit: 53.4mm.



●Check the damage and wear on the inner wall of cylinder.

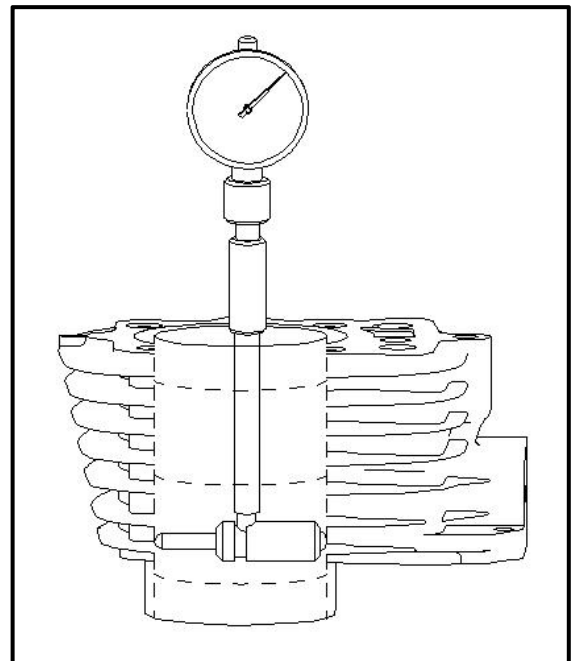
***Note:**

Measure the inner diameter of cylinder in the upper, middle and lower positions in the direction which forms a right angle (90 degrees) with the piston pin.

○Allowable limit: 53.61mm.

●Measure the clearance between cylinder and piston , whichever is the greater

○Allowable limit: 0.21mm.

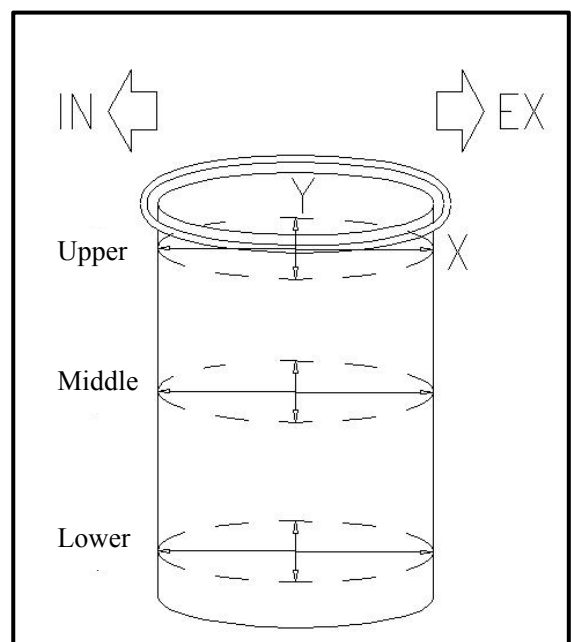


●Measure the roundness of inner wall of cylinder (inner diameter difference between X and Y directions).

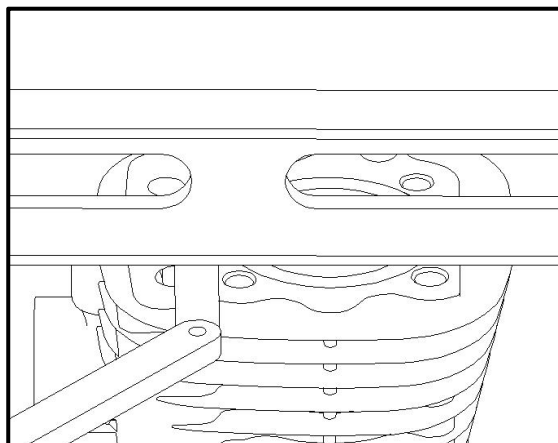
Allowable limit: 0.05mm

●Measure the cylindricity of inner wall of cylinder (inner diameter difference between X and Y directions in upper, middle and lower positions).

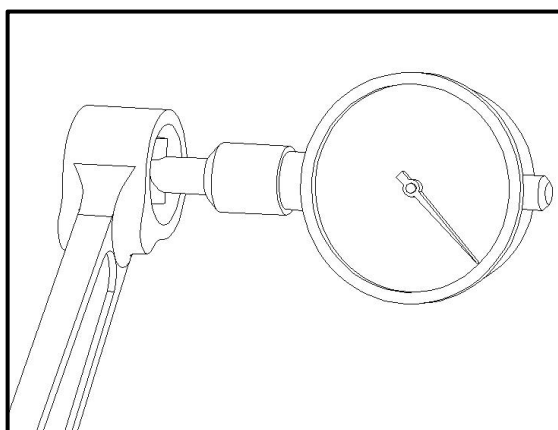
Allowable limit: 0.05mm



- Check the planeness of cylinder surface.
- Allowable limit: 0.05mm.



- Measure the inner diameter of small end of connecting rod.
- Allowable limit: 13.05mm.

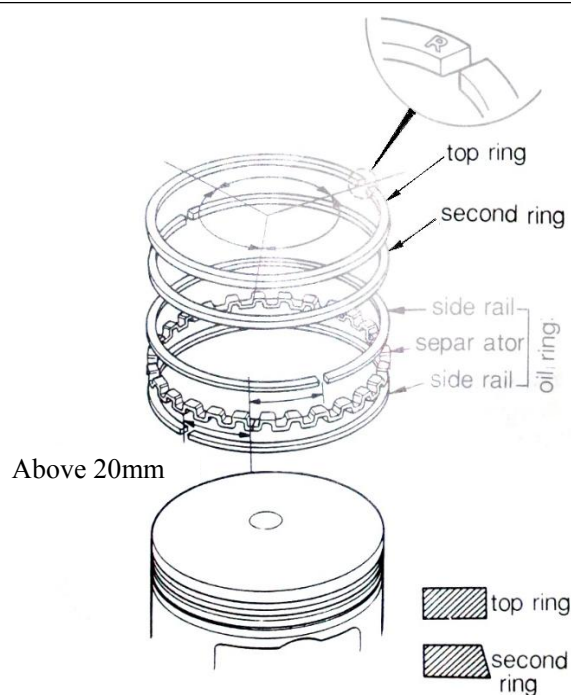


13.4.3 Installation of Piston

- Apply oil to the piston ring and piston evenly, make the piston ring mark side up and install it properly.

***Note:**

Do not scratch the piston and do not break the piston ring.
After the piston ring is installed, it can rotate freely in the piston ring groove.



Put the surface of piston with mark upwards.



Clean the washers attached to the crankcase.

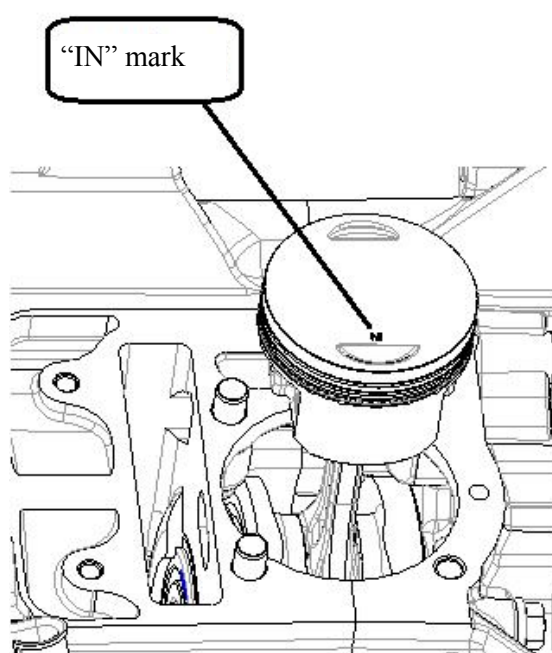
Note:

Foreign matters shall not fall into the crankcase.

Install the piston, piston pin and piston pin retainer.

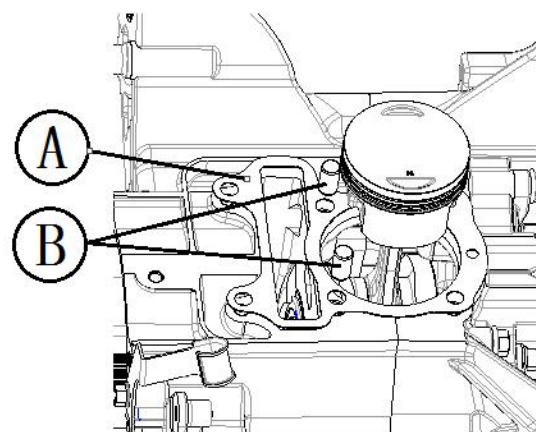
Note:

Install the piston into the intake valve according to the “IN” mark at the top.



13.5 Installation of Cylinder Block

Install the washer [A] and dowel pin [B] on the crankcase.

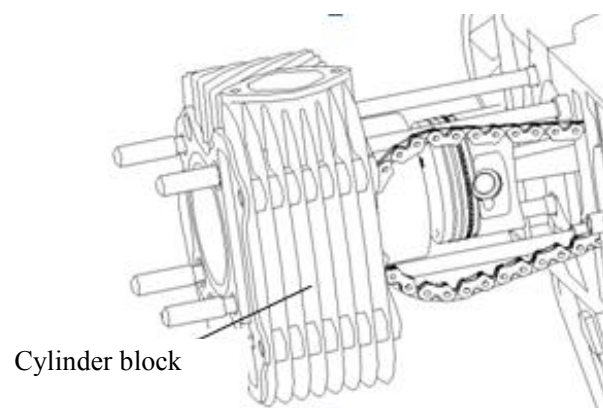


Apply oil to the inner wall of cylinder, piston and piston ring.

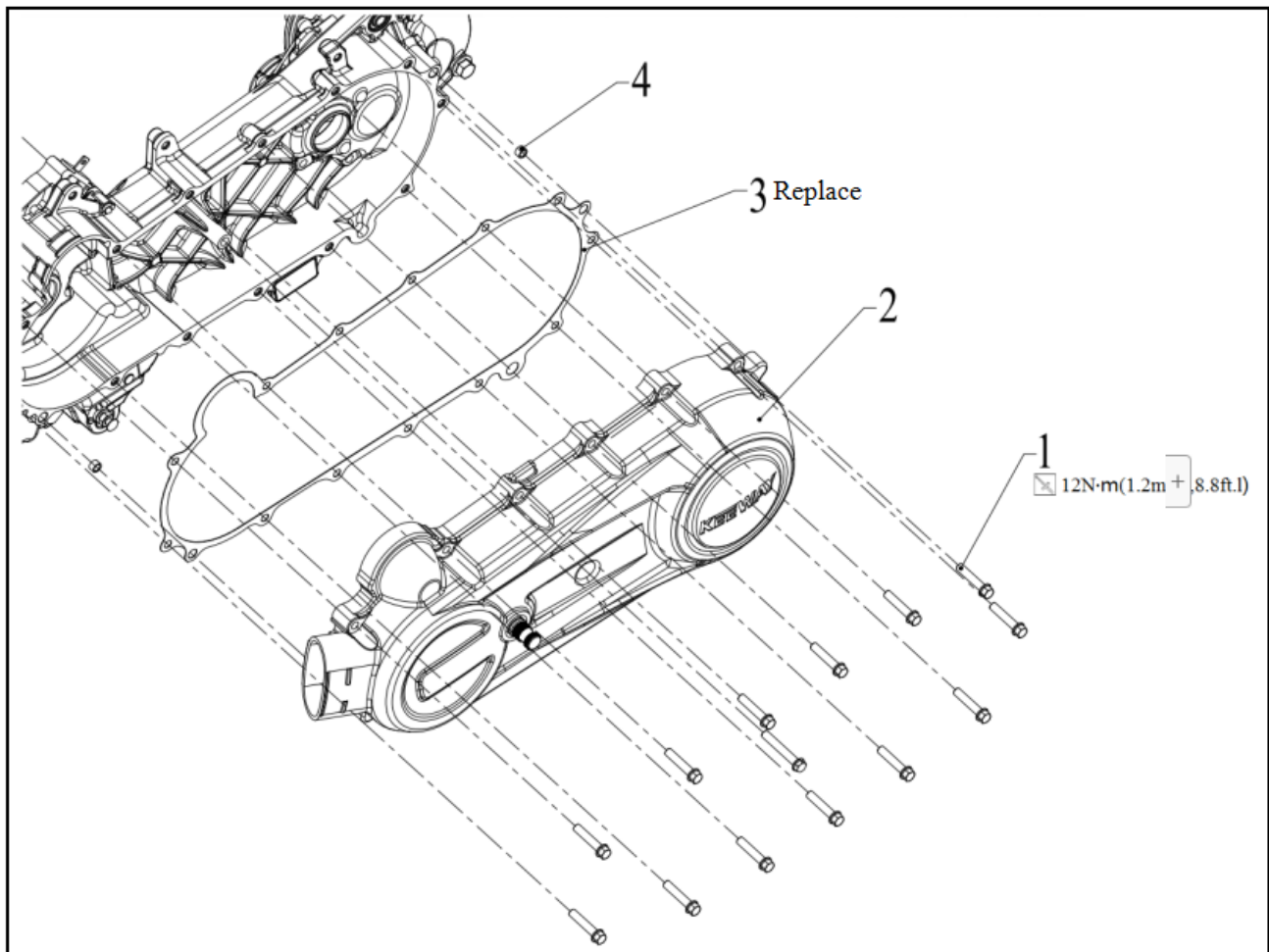
Install the piston ring into the cylinder carefully.

Note:

Do not damage the piston ring.

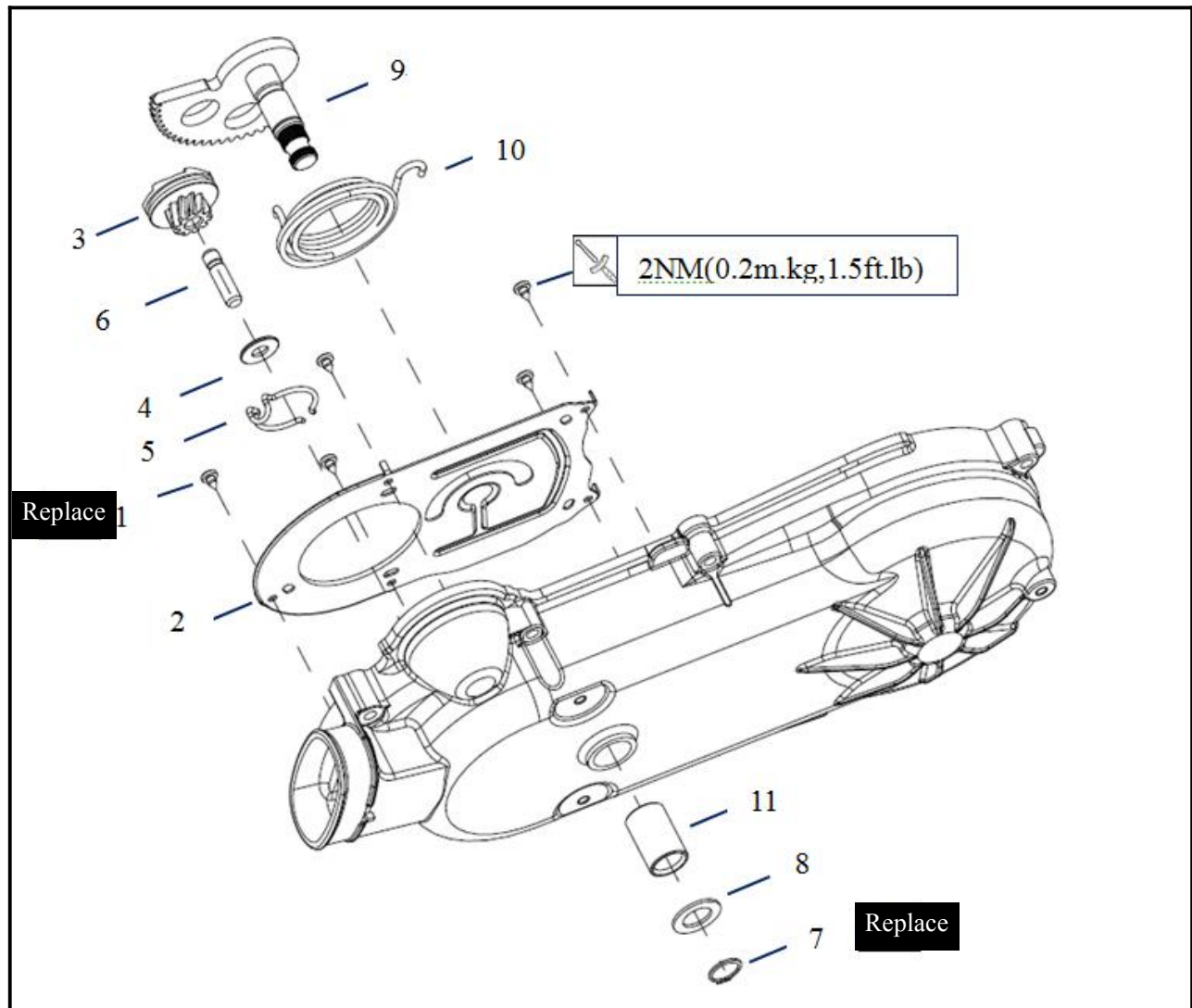


Left cover

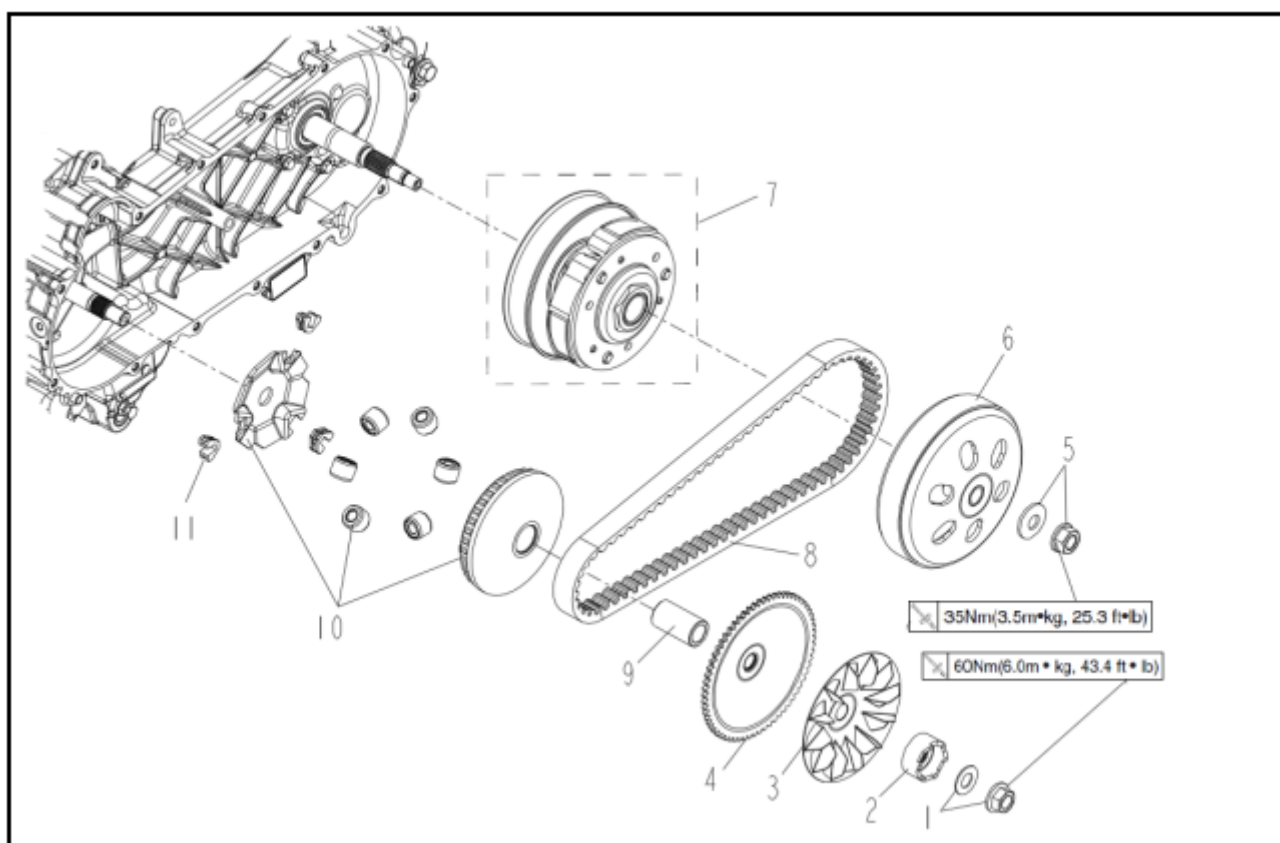


No.	Working/parts	Qty	Remarks
	Remove the left cover		
1	Bolt	13	
2	Left cover	1	
3	Washer on left cover	1	
4	Dowel pin	1	
			Install it in the reverse order of <u>disassembly</u>

Foot starter

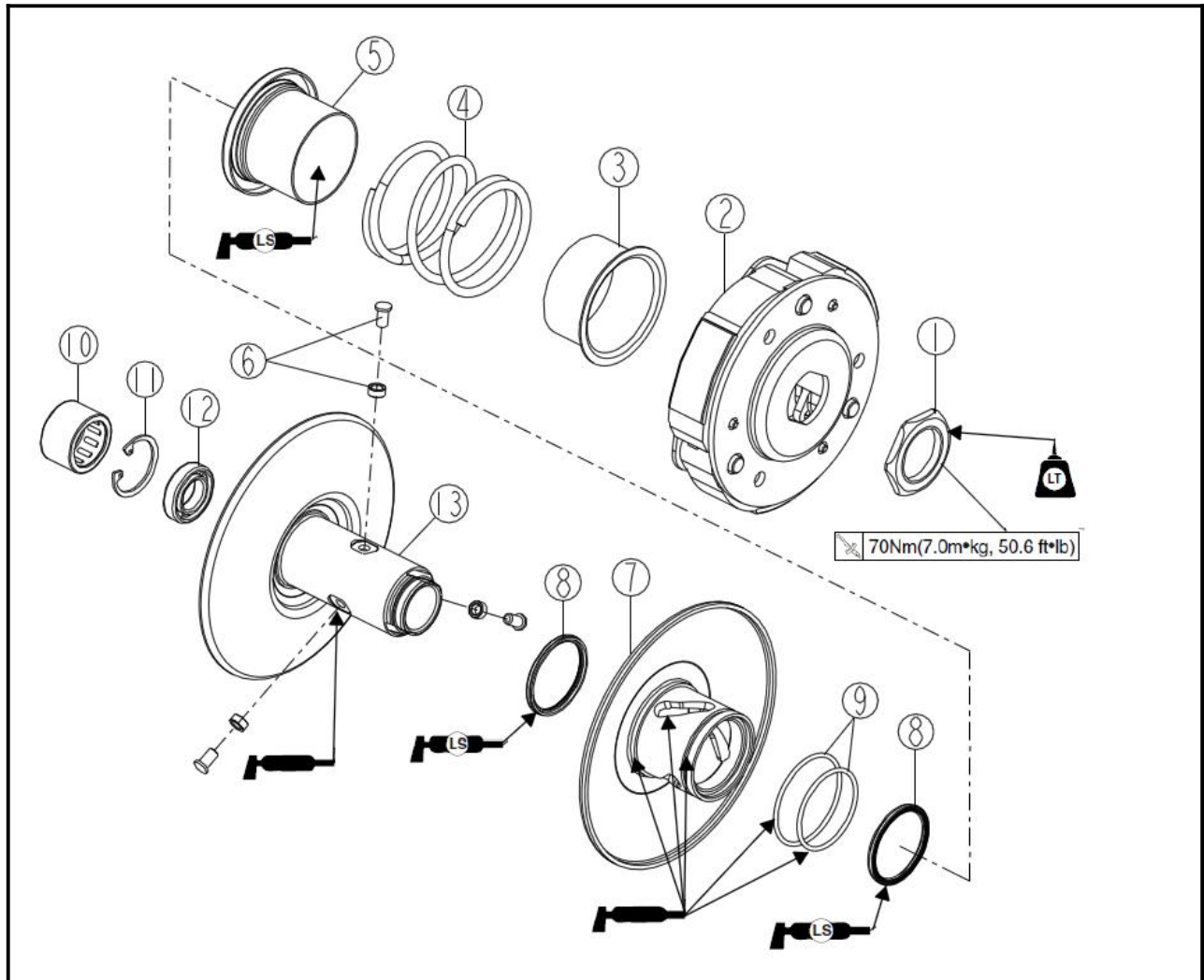


No.	Working/parts	Qty	Remarks
	Remove foot starter		
1	Tapping screw	5	
2	Partition	1	
3	Foot starter claw assembly	1	
4	Spacer	1	
5	Clamp	1	
6	Pin shaft	1	
7	Retainer	1	
8	Foot starter shaft washer	1	
9	Sector gear assembly	1	
10	Foot starter shaft spring	1	
11	Foot starter bearing	1	
			Install it in the reverse order of disassembly



No.	Working/parts	Qty	Remarks
	Remove V-belt, clutch, driving pulley and driven pulley		Remove this part in sequence
1	Hexagon flange nut of driving pulley / taper washer	1/1	
2	Starting claw	1	
3	Fan blade	1	
4	Left disc of front clutch	1	
5	Hexagon flange nut of driving pulley / taper washer	1/1	
6	Centrifugal disc assembly	1	
7	Rear clutch assembly	1	
8	V-belt	1	
9	Collar	1	
10	Active friction disc assembly/clutch roller/disengaging disc	1/6/1	
11	Damper	3	
			Install it in the reverse order of decomposition and <u>disassembly</u> .

Removing Rear Clutch Assembly



No.	Working/parts	Qty	Remarks
	Remove rear clutch assembly		Remove this part in sequence
1	Rear clutch assembly nut	1	
2	Driver board assembly	1	
3	Spring seat cover	1	
4	Filter spring	1	
5	Spring cover	1	
6	Mounting shaft/sliding bearing	3/3	
7	Passive stepless transmission	1	
8	Frame seal ring	2	
9	O-ring	2	
10	Needle bearing	1	
11	Retainer	1	
12	Rolling bearing	1	
13	Rear driving master disc	1	
			Install it in the reverse order of decomposition and disassembly.

XIV. Left Cover/Drive Disc/Clutch/Driven Wheel/Kickstarter

Preparatory Information-----	14.1
Fault Diagnosis-----	14.2
Left Crankcase Cover-----	14.3
Driving Disc-----	14.4
Driven Wheel-----	14.5
Clutch -----	14.6
Installation -----	14.7
Kickstarter Mechanism -----	14.4

14.1 Preparatory Information

Function:

Function: Drive disc/clutch/slave wheel together constitute the stepless transmission. The torque is transmitted between driving disc and driven wheel through the v-belt.

Precautions for operation

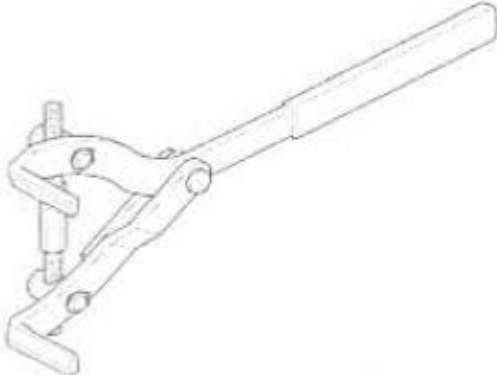
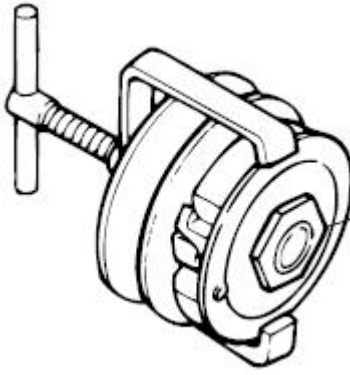
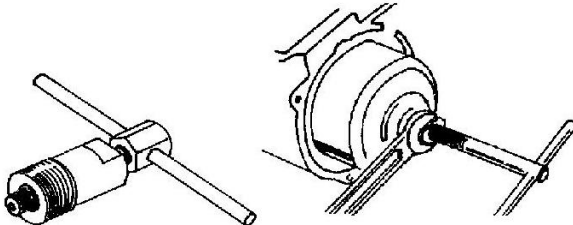
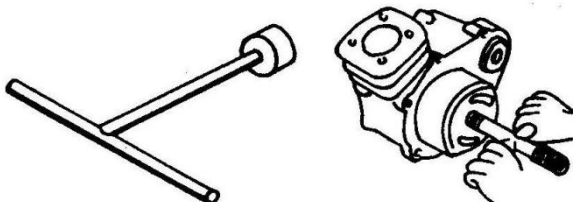
Note: during operation, the surface of the v-belt should not be attached with grease. In case of any grease, it must be removed, so as to minimize the slip between v-belt and belt pulley.

Locking torque

Clutch locknut	45-50 N·m
Clutch spring bolt	10 N·m
Right cover mounting bolt	12 N·m

Oil filter mounting nut	10 N·m	
Crankshaft retainer bolt	5 N·m	Apply locking agent to threads

Tools

	
Central pivot universal fixer of clutch	Clutch spring compressor
	
Flywheel puller	Socket wrench

14.2 Fault Diagnosis

14.2.1 Motorcycle cannot run after the engine is started

Worn v-belt
 Broken driven wheel
 Broken or damaged of clutch friction pad
 Broken clutch spring

14.2.2 Insufficient horsepower

Worn v-belt
 Deformed clutch spring
 Worn rolling ball
 Dirty surface of driving belt pulley

14.2.3 There is chattering phenomena during running

Broken spring of clutch friction pad

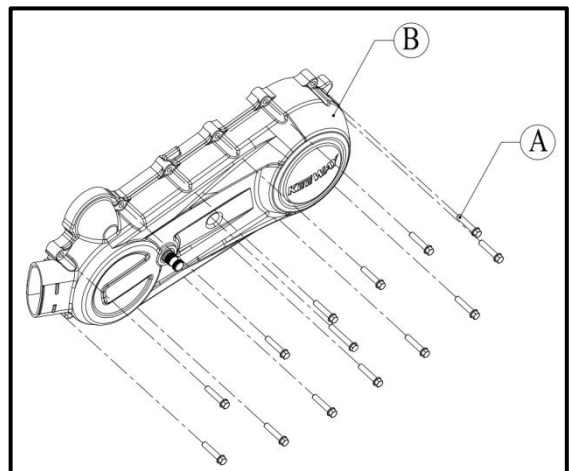
14.3 Left Crankcase Cover

14.3.1 Disassembly

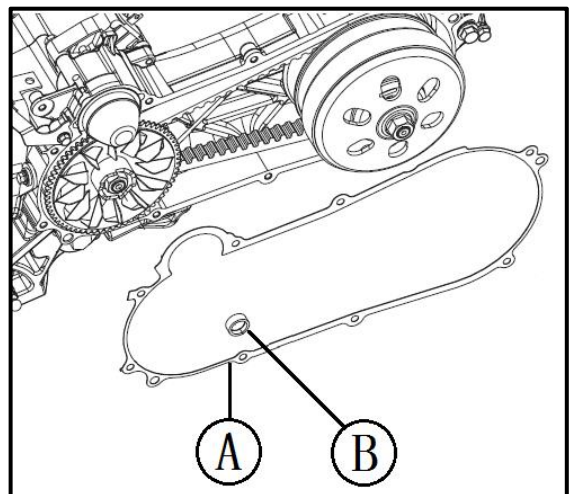
Remove the tank cover mounting bolt [A] and remove the left cove of crankcase [B].

Note:

Remove the mounting bolt in a staggered form.



Remove the washer [A] and dowel pin [B].



14.4 Drive Disc

14.4.1 Disassembly

Disassembly

- Remove the hexagon flange nut of driving pulley using a wrench ②

- Taper washer

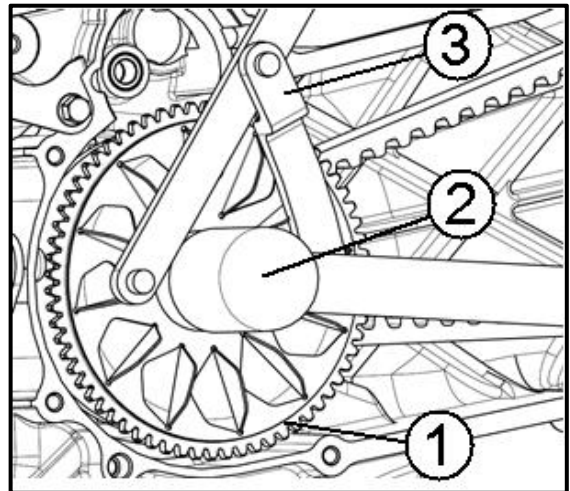
- Fan blade

Left disc of front clutch ①

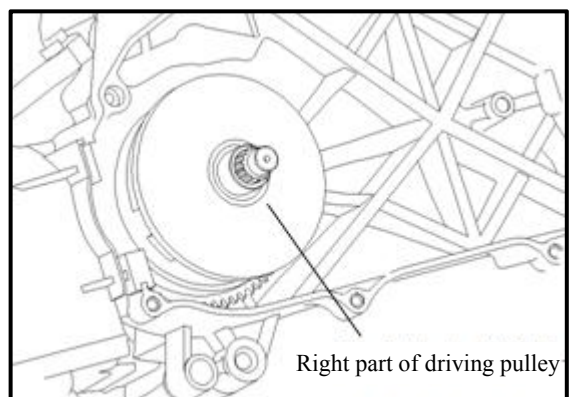
Remarks:

Fix the left disc of front clutch ① using a fixator ③, and then loose the hexagon flange nut of driving pulley using a wrench ②.

Rotate mounting tool: QJ153-10-0106/G20



Remove the right half assembly of driving wheel.

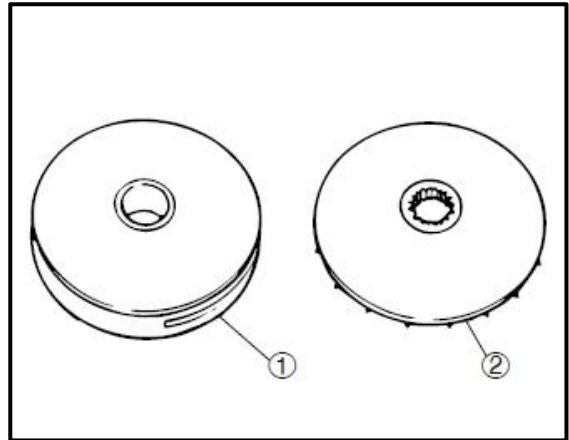


14.4.2 Inspection

Check:

- Active friction disc combination ①
- Left disc of front clutch ②

Cracks / damage / wear → Replace the defective part.

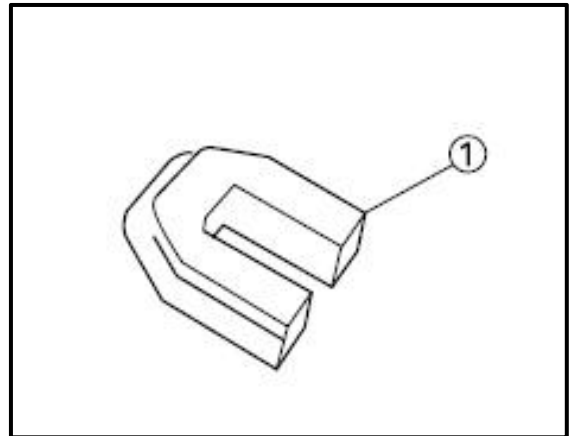


Check damper

1. Check:

- Damper ①

Damage / wear → replacement



Check the weight of clutch roller

Check the weight of all clutch rollers in the following sequences

1. Check:

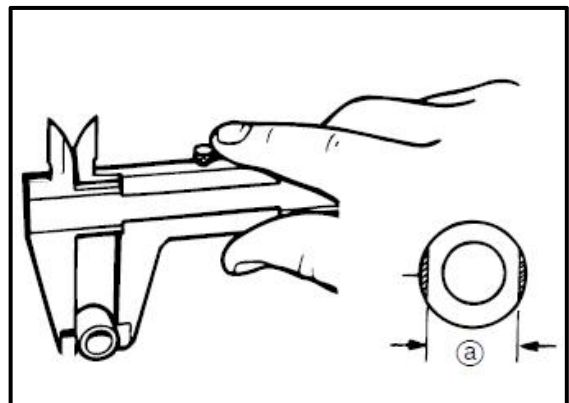
- Weight of clutch roller

Cracks / damage / wear → Replace the defective part.

2. Measure:

- Outer diameter of clutch roller ①

Specifications do not meet the requirements → replace it.



Outer diameter of clutch roller: 18.1 ± 0.05 mm
<Limit>: 17.3mm

14.4.3 Assembly

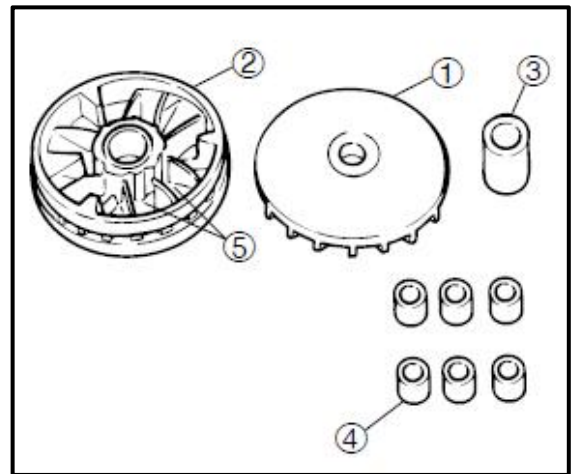
1. Clean:

Left disc of front clutch ①

- Active friction disc combination ②
- Axle sleeve ③
- Clutch roller ④

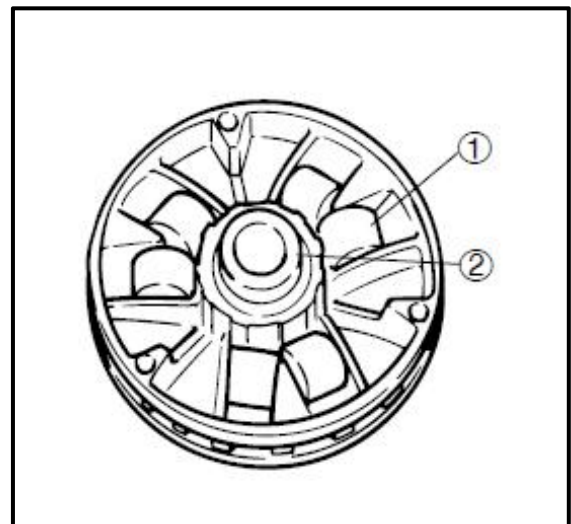
Remarks:

Clean the dirt and grease on V-shaped surface of driving pulley using diluent.



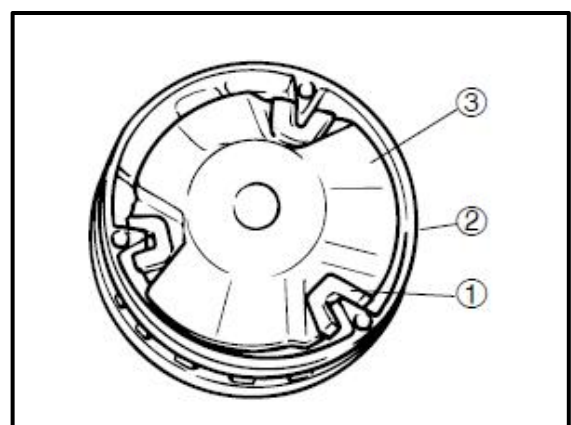
2. Assembly:

- Clutch roller ①
- Axle sleeve ②



3. Assembly:

- Damper ①
- Active friction disc combination ②
- Separating disc ③



14.5 Driven Pulley

14.5.1 Disassembly

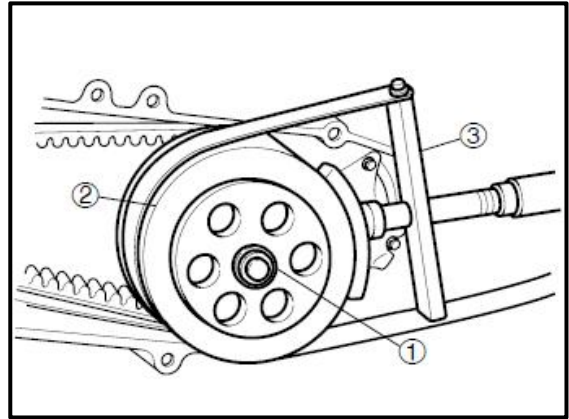
Disassembly

- Hexagon flange nut of driven pulley ①
- Taper washer
- Centrifugal disc assembly ②

Remarks:

Fix the centrifugal disc assembly ② using a bracket ③, and then loosen the hexagon flange nut of driven pulley.

Locking torque of mounting nut: 50-60N.m



Loosen

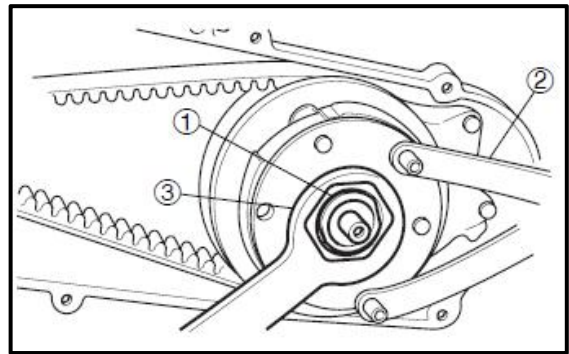
- Rear clutch assembly nut ①

Note:

Rear clutch assembly nut ① is not completely removed in this stage.

Remarks:

Fix the rear clutch assembly using a fixator ②, and then loosen the rear clutch assembly nut ① using a wrench ③.

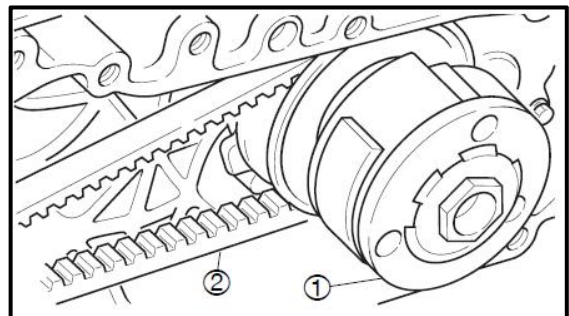


Disassemble:

- Rear clutch assembly ①
- V-belt ②

Remarks:

Remove V belt and rear clutch assembly from the side of driving pulley.



14.5.2 Check

Check the driven pulley

1. Check:

- Passive stepless transmission
- Rear driving master disc

Cracks / damage / wear → Replace the defective part.

2. Check:

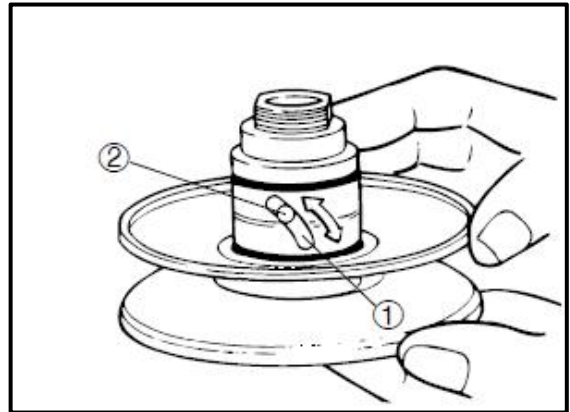
- The torque cam groove ① on the passive stepless transmission

Damage / wear → replacement

3. Check

Mounting shaft—sliding bearing②

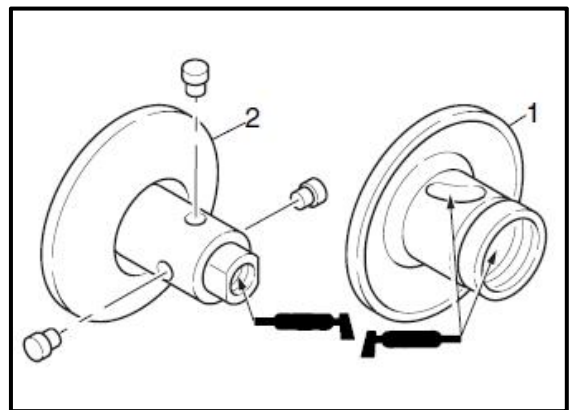
Damage / wear → replacement



14.5.3 Assembly

1. Lubrication:

- Passive stepless transmission ①
- Rear driving master disc ②
- The torque cam groove on the passive stepless transmission
- Frame seal ring
- Bearing

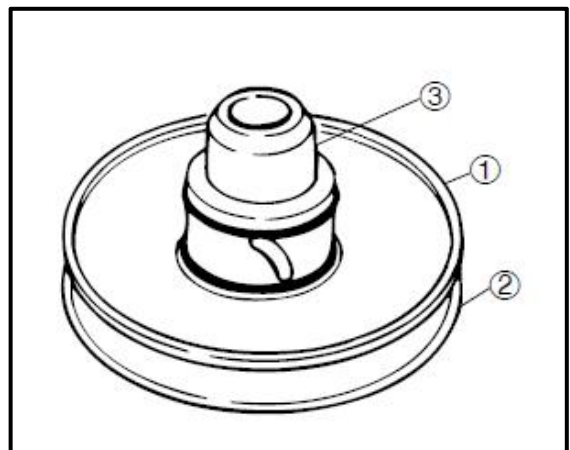


2. Assembly:

- Passive stepless transmission ①

Note:

After applying lubricating oil, install it on the guide rail ③ of rear driving master disc ②.

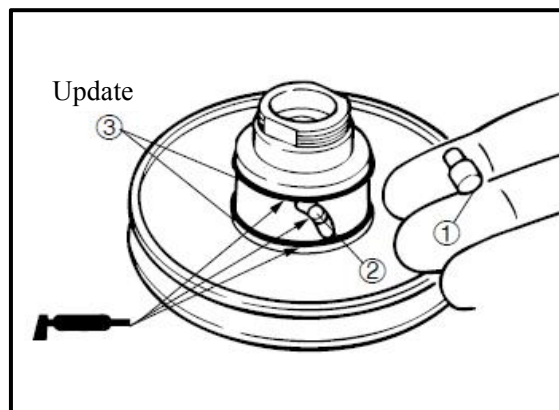


3. Assembly:

- Mounting shaft—sliding bearing ①

4. Lubrication:

- The torque cam groove on the passive stepless transmission ②
- O-ring updating ③



14.6 Clutch

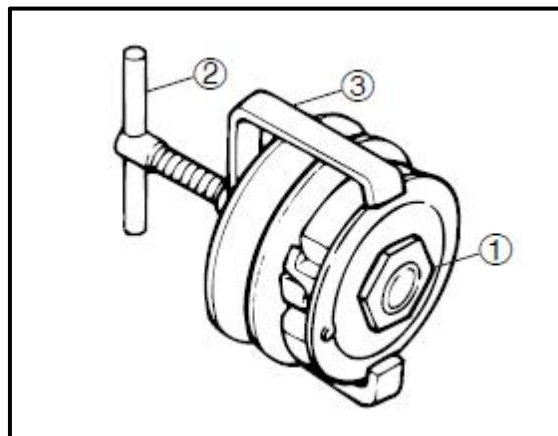
14.6.1 Disassembly

Disassemble:

- Rear clutch assembly nut ①

Remarks:

As shown in the figure, install the clutch spring seat ② and the clutch spring seat clamping arm ③, compress the clutch spring, and remove the rear clutch assembly nut.



14.6.2 Check

Check driver board assembly

1. Measure:

- Driver board assembly

Scratch → polish it with raw emery paper

Damage / wear → replacement

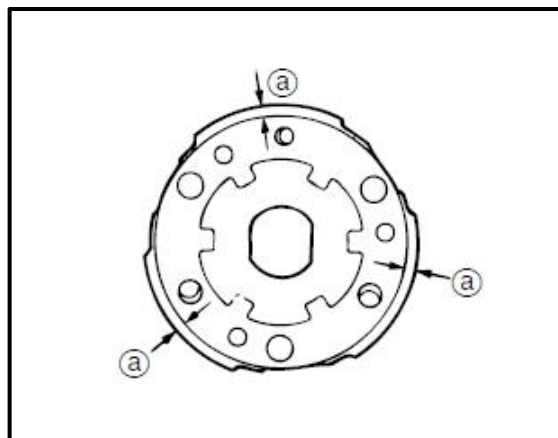
Thickness of friction plate of driver board assembly:

2.75 mm

<Limit>: 2.25 mm

Remarks:

- Check the thickness of friction plate of driver board assembly (a).
- Do not reuse the clutch spring after it is removed.
- Remove the entire driver board assembly.



Check V-belt

1. Check:

- V-belt ①

Cracks / damage / wear → Replace the defective part.

Grease/oil → clean the driving pulley and driven pulley

Remarks:

Remove V belt and rear clutch assembly from the side of driving pulley.

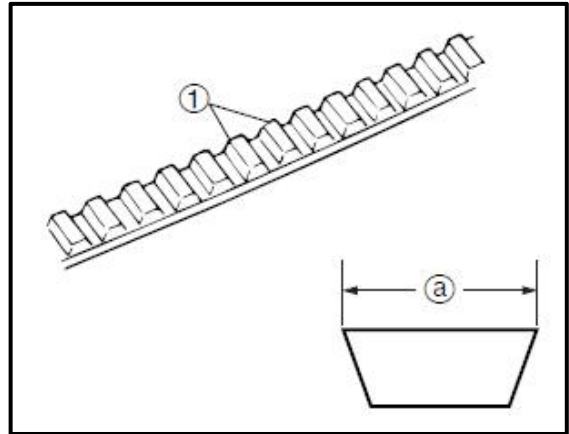
2. Measure:

- V-belt width ②

Specifications do not meet the requirements → replace it.

V-belt width: 20 ± 0.8 mm

<Limit>: 17.5 mm



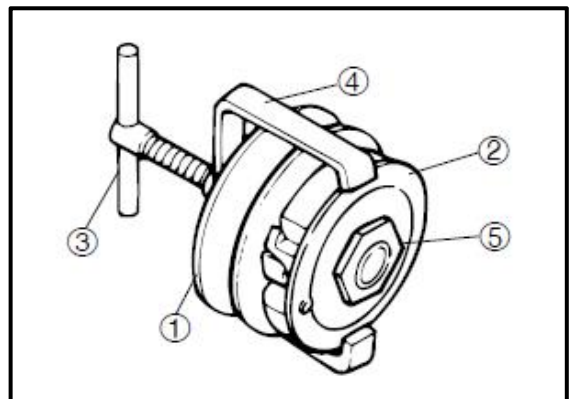
14.6.3 Assembly

2. Assembly:

- Rear driving master disc ①
- Clutch spring
- Driver board assembly ②

Remarks:

As shown in the figure, install the clutch spring seat ③ and the clutch spring seat clamping arm ④, compress the clutch spring, and tighten the rear clutch assembly nut ⑤.



14.7 Installation

1. Disassemble V-belt transmission:

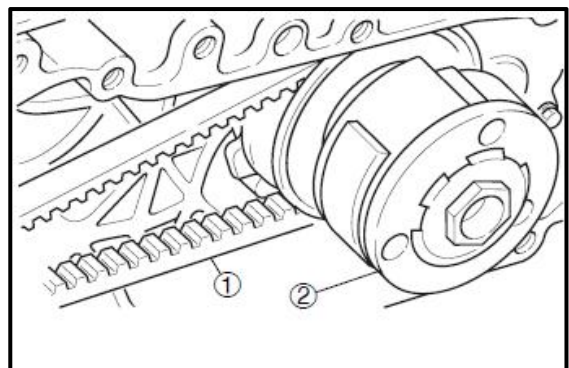
- V-belt ①
- Rear clutch assembly ②

Note:

There should be no grease on V-belt and rear clutch assembly.


Remarks:

Install V-belt at the side of driving pulley.



2. Assembly:

- Rear clutch assembly nut ①


 70Nm(7.0m • kg, 50.6 ft • lb)

Remarks:

Fix the rear clutch assembly using a fixator ②, and then loosen the rear clutch assembly nut ① using a wrench ③, and apply thread sealant.

3. Assembly:

- Centrifugal disc assembly ①
- Taper washer — hexagon flange nut of driving pulley ②

 35Nm(3.5m • kg, 25.3 ft • lb)

Remarks:

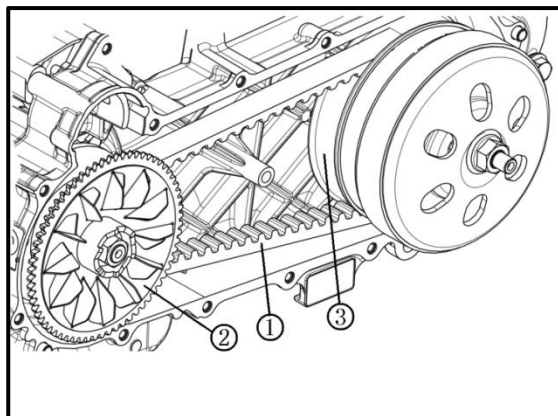
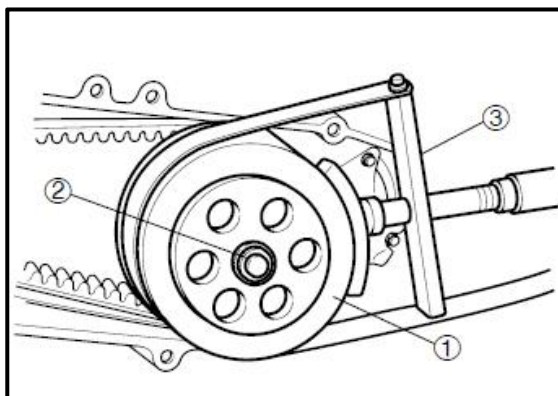
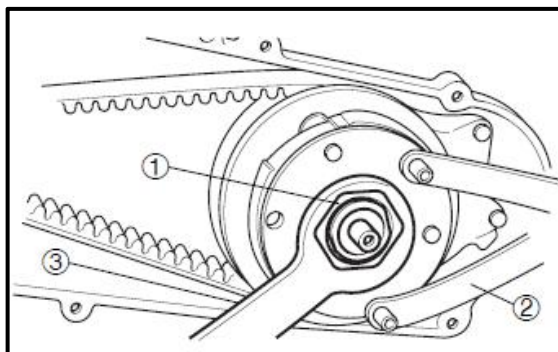
Fix the centrifugal disc assembly ① using a bracket ③, and then tighten the hexagon flange nut ② of driven pulley.

4. Position:

- V-belt ①

Remarks:

Put the V-belt ① in the middle between the driving pulley ② (widest position of belt pulley) and the driven pulley ③ (narrowest position of belt pulley), and tighten the nut, to ensure that V-belt has been applied with a certain pre-tightening force.

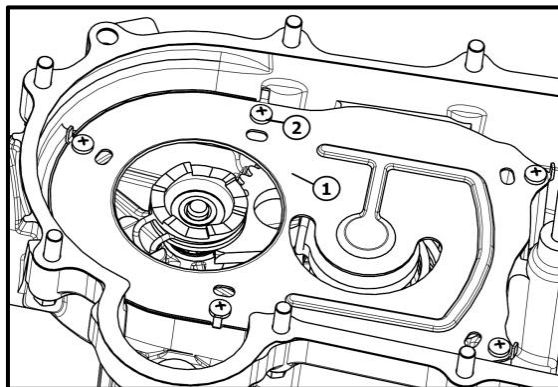


14.8 Kickstarter Mechanism

14.8.1 Disassembly

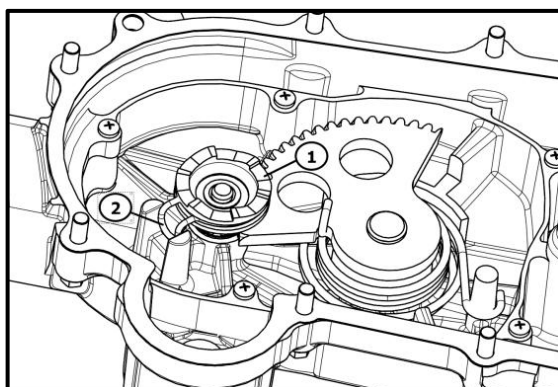
Remove the left crankcase cover.

Loosen screw ② and remove the damper ①.



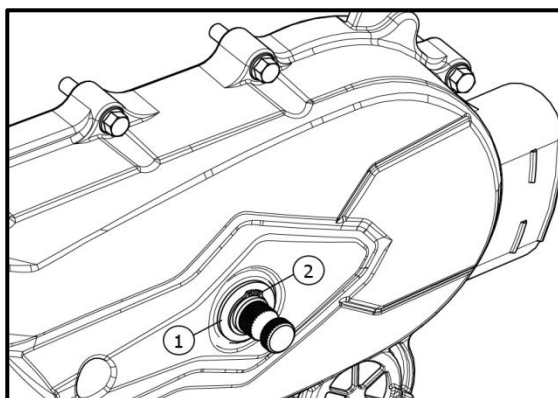
Remove:

- Kickstarter claw assembly ①
- Clamp ②



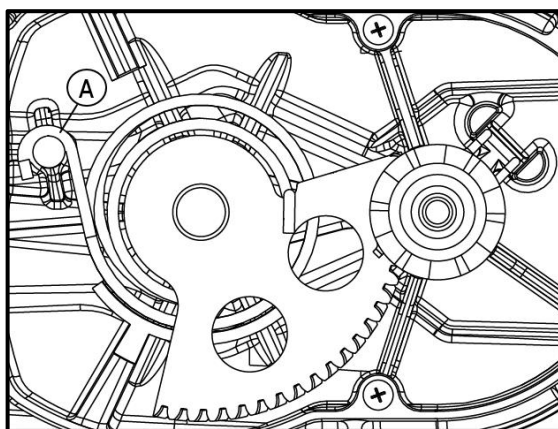
Remove:

- Kickstarter washer ①
- Retainer ②



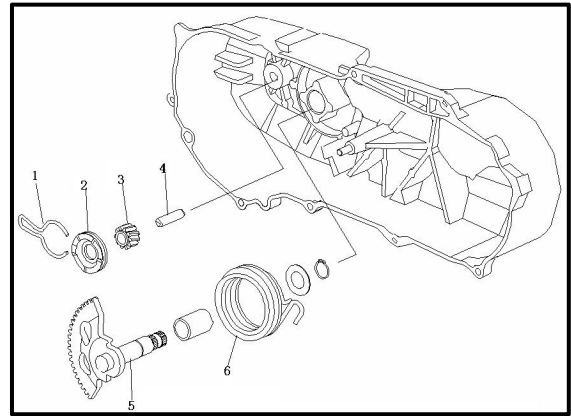
Remove:

Kickstarter spring [A]



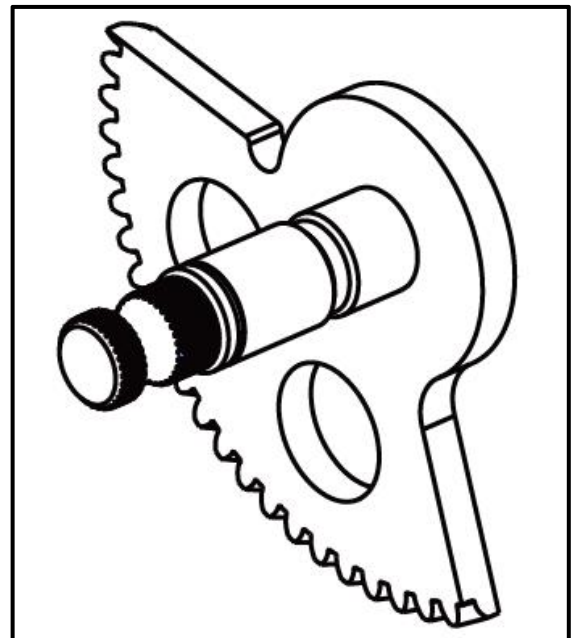
Remove:

- 1 Snap spring**
- 2 Starter claw**
- 3 Idle gear**
- 4 Idle gear shaft**
- 5 Starter shaft assembly**
- 6 Kickstarter shaft spring**

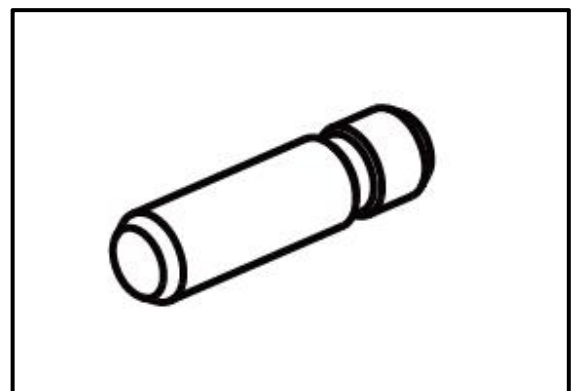


14.8.2 Check

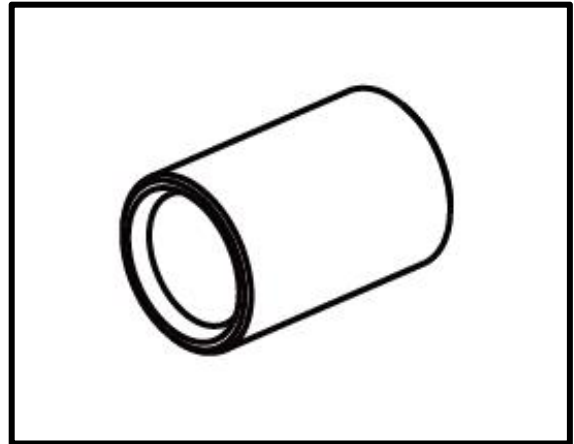
Check starter shaft for wear.



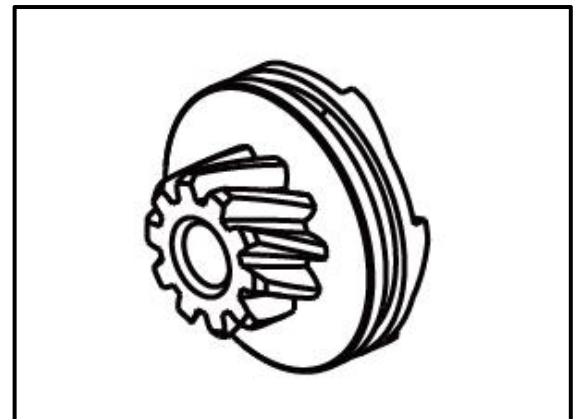
Check the force-bearing parts of idle gear shaft for wear.



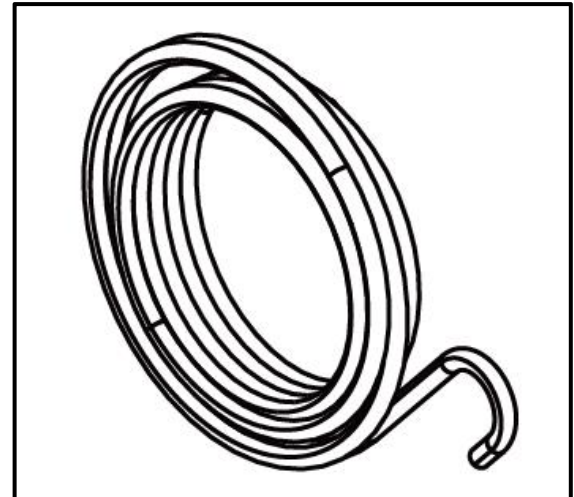
Check the force-bearing parts of starter shaft for wear.



Check idle gear for wear.



Measure the clamping force of spring.
Standard value: 8-12N.m.

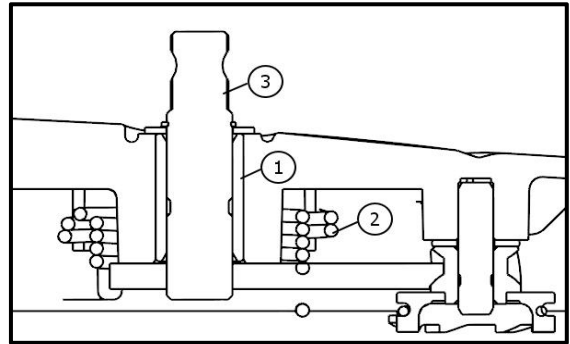


14.8.3 Installation

1. Install:

- Kickstarter bearing ①
- Kickstarter spring ②
- Sector gear assembly ③

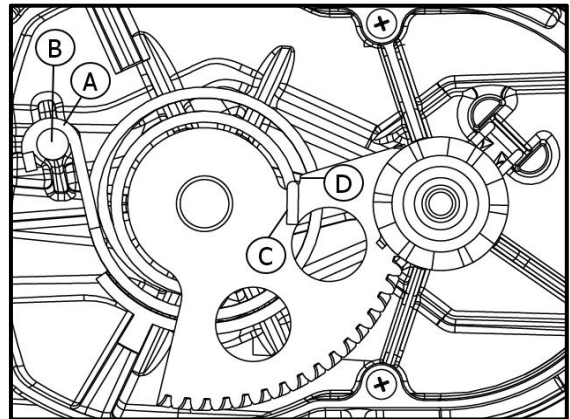
Note:
Apply grease when installing kickstarter bearing ①



2. Hook:

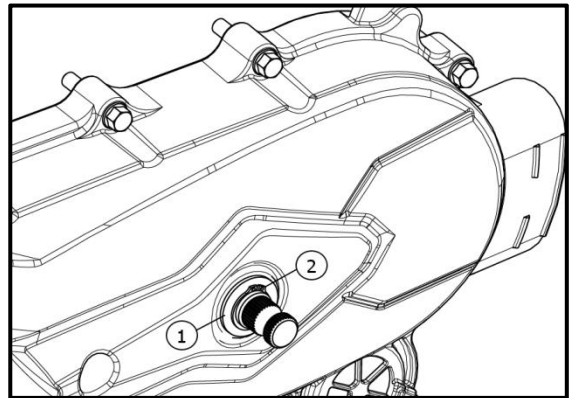
Kickstarter spring

Note:
Fix the kickstarter spring hook [A] at the side of left cover post [B], and fix the hook [C] at the end of sector gear [D]



3. Install:

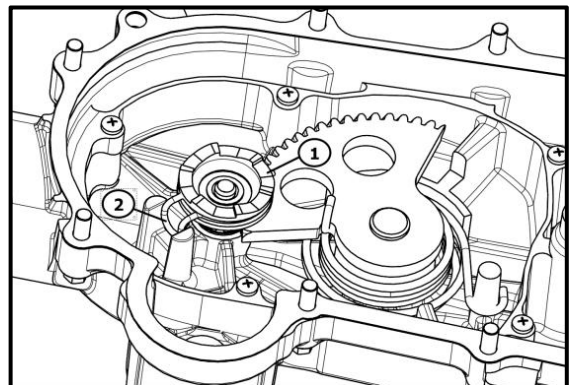
- Kickstarter washer ①
- Retainer ②



4. Install:

- Kickstarter claw assembly ①
- Clamp ②

Note:
The end of clamp shall be placed on the left cover, and apply grease to the kickstarter claw assembly and clamp between two cylinders

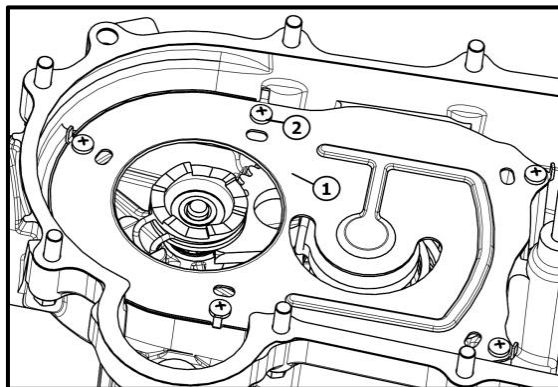


5 Install:

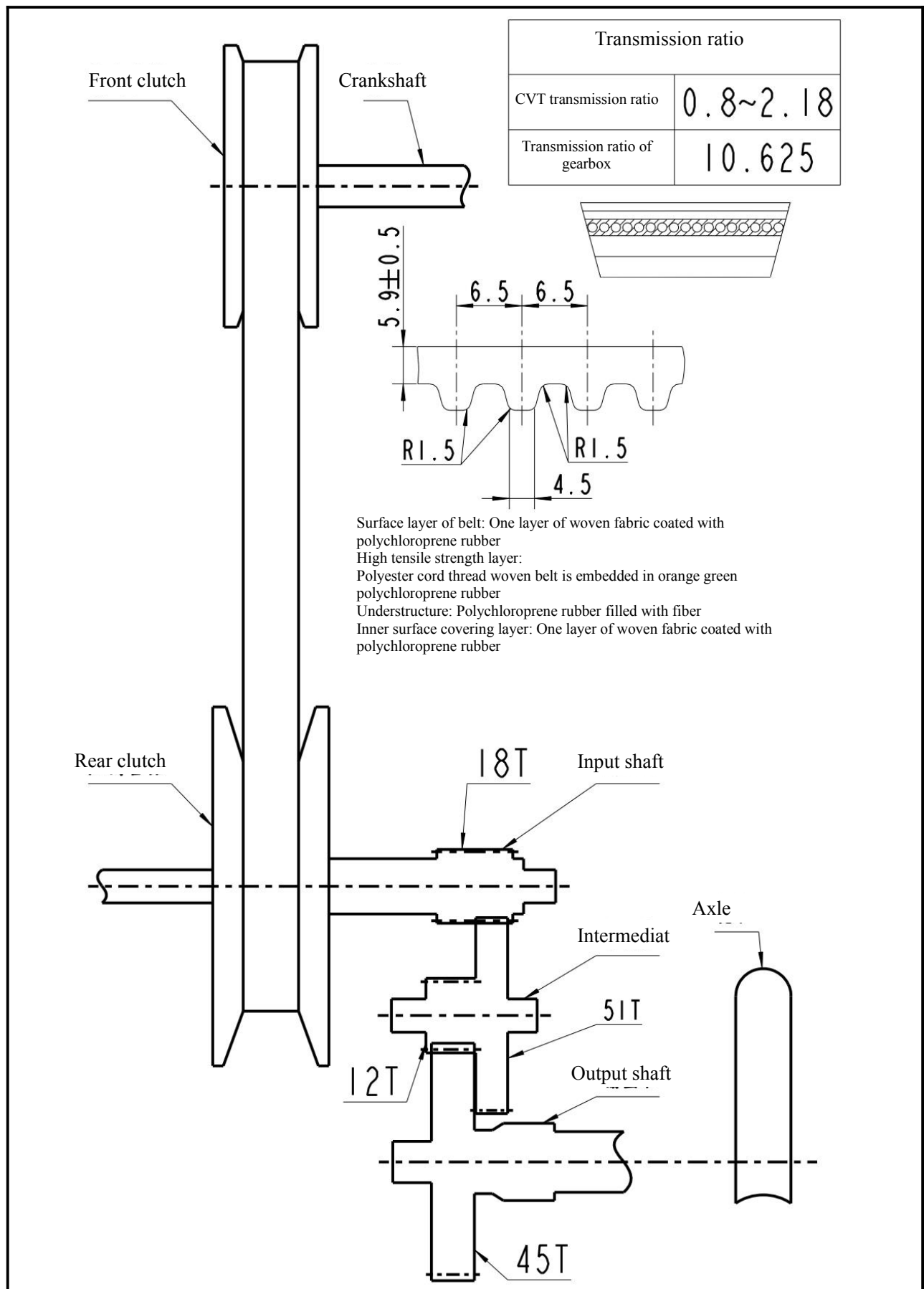
- Partition ①
- Tapping screw ②

Note:

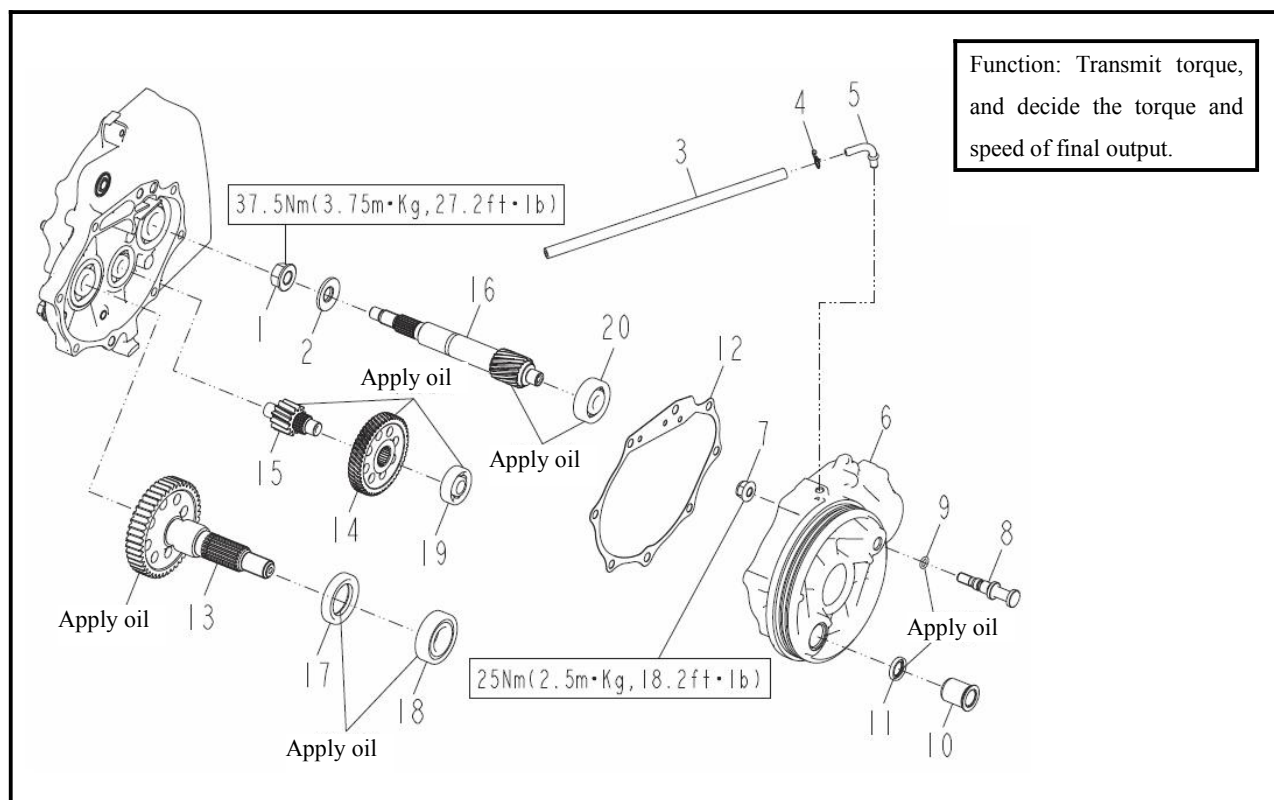
After the tapping screw is installed, press the head of screw using the anti-loosening strip on the partition firmly



Drive system



Drive system



Working/parts	Qty	Remarks
Hexagon flange nut	1	Remove this part in sequence
Taper washer	1	
Ventilation duct	1	
Wire clamp	1	
Blow-by duct of gearbox	1	
Gearbox cover	1	
Self-locknut	1	
Pin shaft	1	
O-Ring	1	
Collar	1	
Oil Seal	1	
Gearbox gasket	1	
Output shaft assembly of gearbox	1	
Intermediate gear	1	
intermediate gear shaft	1	
Input shaft of gearbox	1	
Oil Seal	1	
Deep groove ball bearing	1	
Deep groove ball bearing	1	
Deep groove ball bearing	1	
		Install it in the reverse order of decomposition and disassembly.

XV. Reduction Gear

Preparatory Information-----15.1

Fault Diagnosis-----15.2

Geabox-----15.3

15.1 Preparatory Information


Function of reduction gear:

Transmit torque, and decide the torque and speed of final output.

Locking torque

Torque value of cap bolt of gear chamber: 18-22 N·m

Tools

	
Bearing removal tool	

15.2 Fault Diagnosis

15.2.1 Motorcycle cannot run after the engine is started

Transmission gear is broken

Transmission gear burns out

15.2.2 Gear oil leaks

There is too much gear oil

Oil seal is damaged

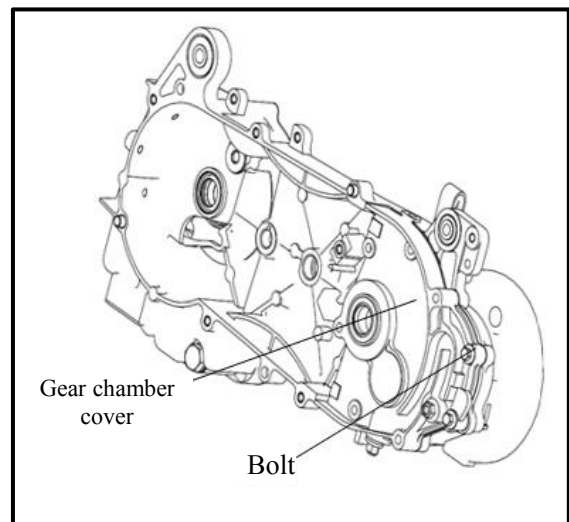
15.3 Gearbox

15.3.1 Disassembly

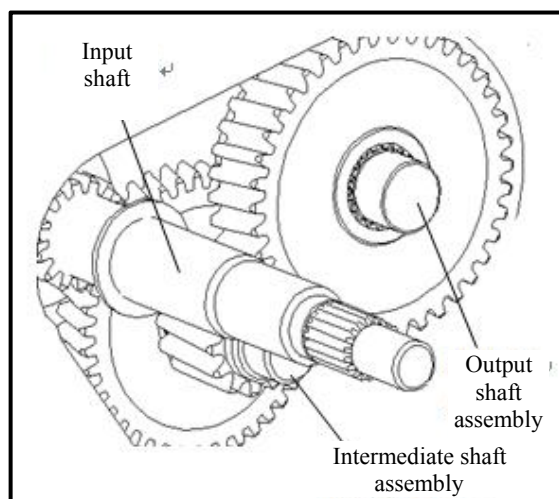
Remove the oil drain nut to drain the gear oil in the gearbox.

Loosen bolt and remove the gear chamber cover.

Remove washer and dowel pin.



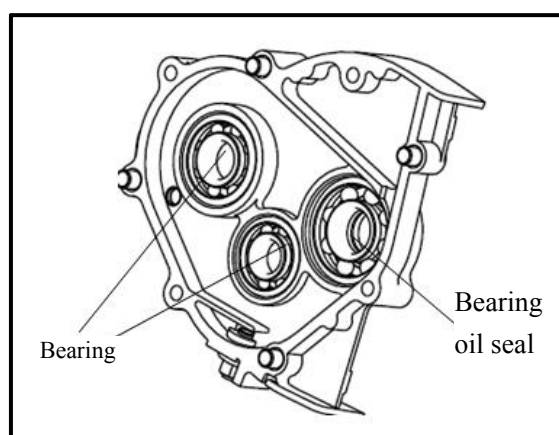
Remove output shaft assembly, intermediate shaft assembly, input shaft.



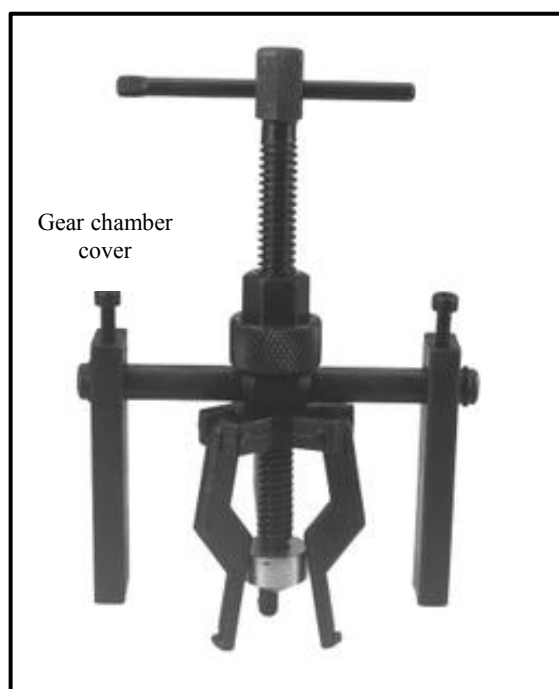
Remove the oil seal on the left crankcase and gear chamber cover, and knock out the bearing.

Note:

The bearing disassembled cannot be reused and should be replaced with a new one;
Bearings and oil seals should be disassembled by using special tools.



Bearing withdrawal tool: QJ153-7-0101/G15



15.3.2 Inspection

1. Measure:

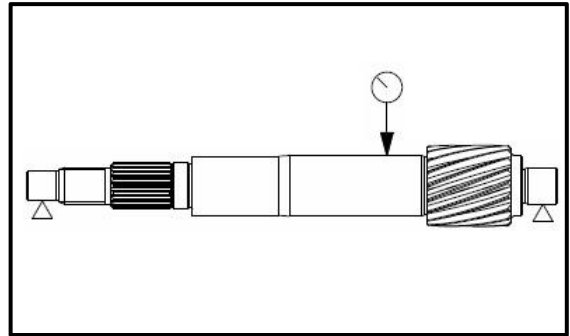
· Runout of input shaft

(centering device and dial indicator are used)

★ Exceed the limit size → replace the input shaft

Runout limit of input shaft

0.02mm(0.0008in)



2. Measure:

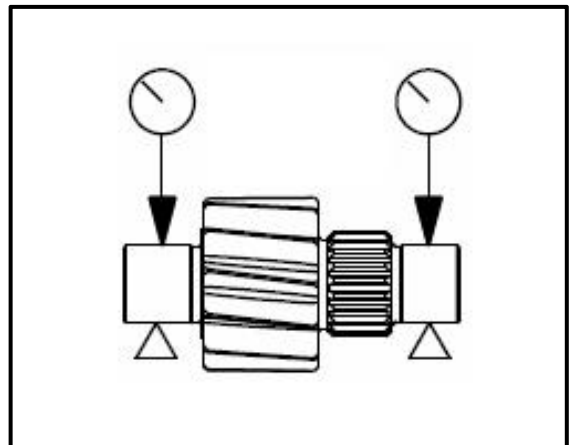
· Runout of intermediate gear shaft

(centering device and dial indicator are used)

★ Exceed the limit size → replace the intermediate gear shaft

Runout limit of intermediate gear shaft

0.02mm(0.0008in)



3. Measure:

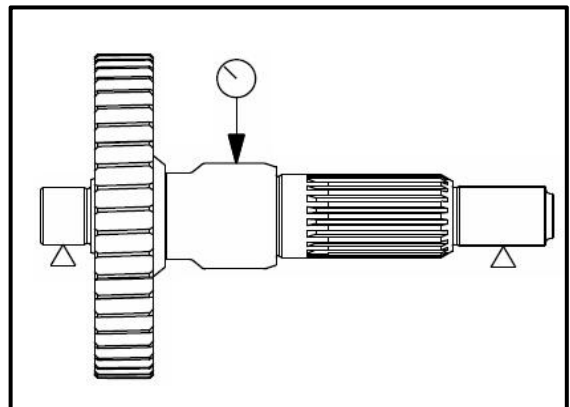
· Runout of output shaft

(centering device and dial indicator are used)

★ Exceed the limit size → replace the output shaft

Runout limit of output shaft

0.02mm(0.0008in)



4. Check

·Transmission gear

Blueing, pitting corrosion, wear → Replace defective gears

5. Check

·Gear engagement

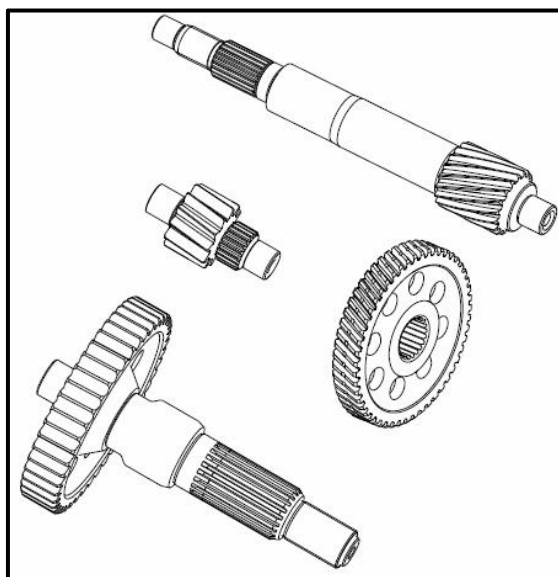
(each tooth meshes with the corresponding tooth of matching gear)

Improper engagement → replace the pair of gears

6. Check

·Whether the shaft drive system is rotating flexibly

Inflexible rotation → Replace defective parts



15.3.3 Installation

Install it in the reverse order of disassembly.

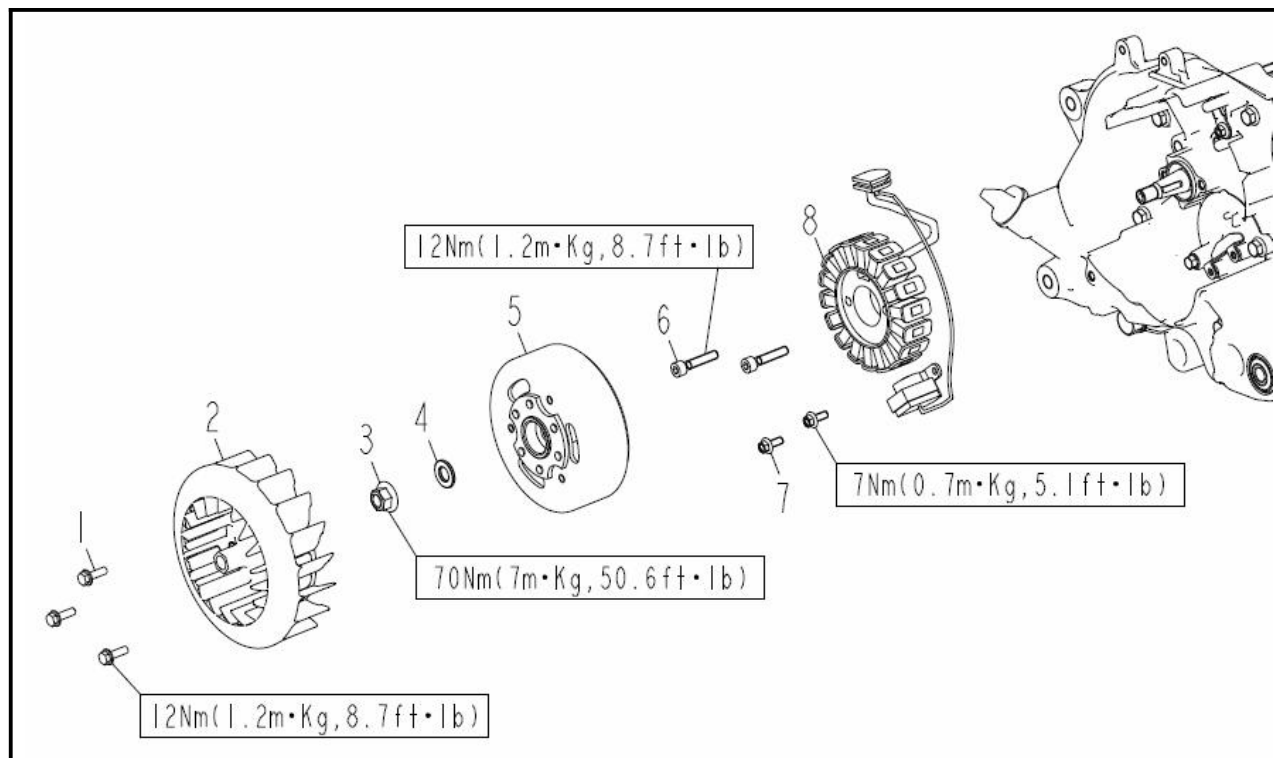
Note:

Bearings and oil seals should be installed by using special tools, to avoid damage.

Torque value of cap bolt of gear chamber: 18-22

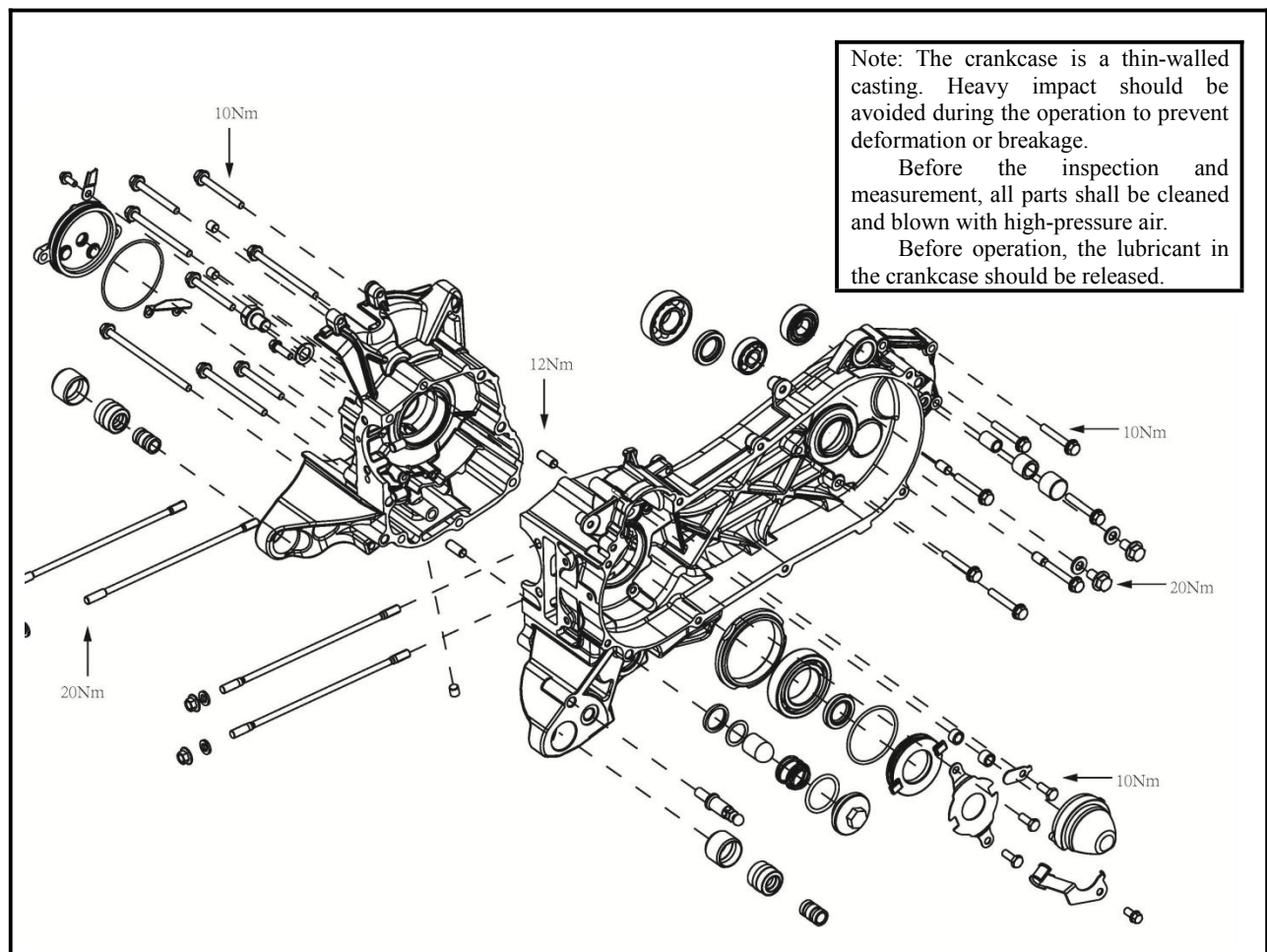
N·m

Alternator

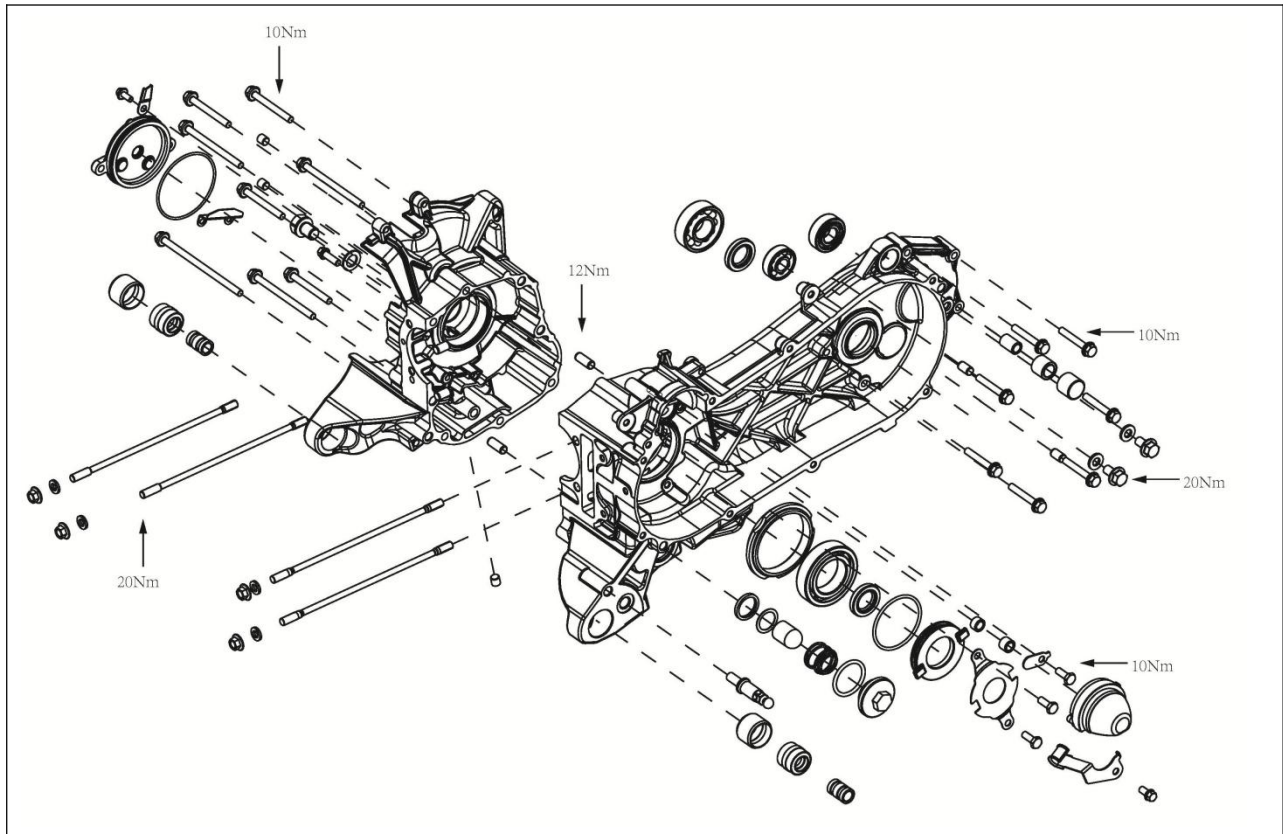


No.	Working/parts	Qty	Remarks
	Alternator		Disassemble according to part number
1	Bolt	3	
2	Fan assembly	1	
3	Nut	1	
4	Spacer	1	
5	Flywheel combination	1	
6	Inner hexagon screw	2	
7	Bolt	2	
8	Stator assembly	1	
			Install it in the reverse order of decomposition and disassembly.

Crankcase



Disassembly and Installation of Crankcase Bearing



Specifications:

1. Rolling bearing 6203	Apply oil
2. Rolling bearing 6202	Apply oil
3. Rolling bearing 6204	Apply oil
4. Rolling bearing 61905	Apply oil
5. Rolling bearing 6205	Apply oil
6. Rolling bearing 6204	Apply oil
7. Rolling bearing 6203	Apply oil
8. Rolling bearing 6002	Apply oil
9. Oil seal	Apply oil

Torque Value

Retainer screw	7Nm	Apply locking agent
----------------	-----	---------------------

Matters needing attention

1. The bearing disassembled cannot be reused and should be replaced with a new one;
2. Bearings and oil seals should be disassembled by using special tools, to prevent damaging the crankcase body;
3. When installing new bearing and oil seal, apply oil or lubricating grease with the specifications shown in the figure;

XVI. Crankcase

Preparatory Information-----16.1

Fault Diagnosis-----16.2

Flywheel-----16.3

Crankcase-----16.4

16.1 Preparatory Information

Function of crankcase:

The crankcase is the force-bearing part of engine. Its main function is to support the crankshaft, clutch, gearbox, cylinder block and cylinder head, withstand the combustion explosion impact and inertia force of movement of crankshaft connecting rod mechanism and form a part of closed (oil and air seal) space.

The crankcase is also equipped with suspension holes, and the engine is connected with the frame and other parts through the connection with the suspension holes on the motorcycle.

Precautions for operation

The crankcase is a thin-walled casting. Heavy impact should be avoided during the operation to prevent deformation or breakage.

Before the inspection and measurement, all parts shall be cleaned and blown with high-pressure air.

Before operation, the lubricant in the crankcase should be released.

Technical parameters

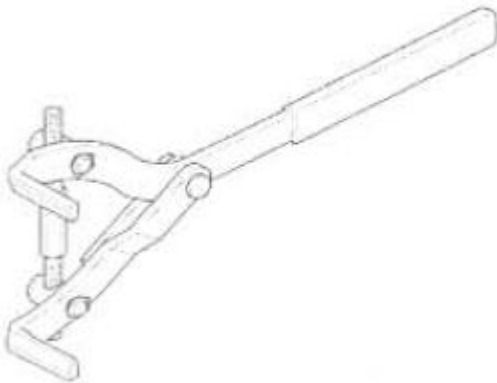
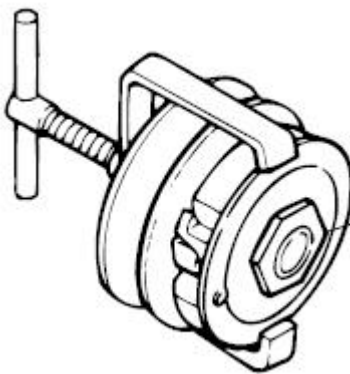
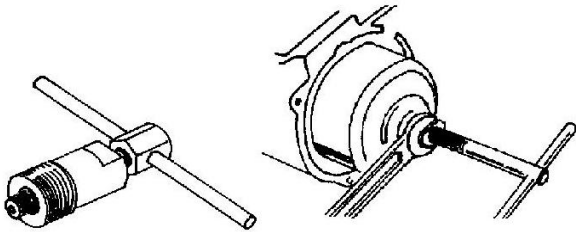
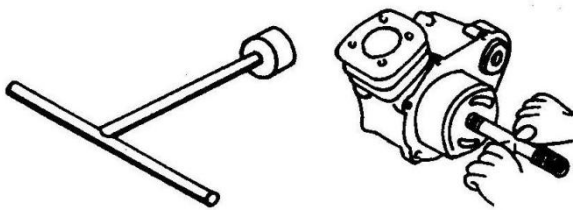
Item		Standard value	Allowable limit
Crankshaft	Lateral clearance of big end of connecting rod	0.1-0.35	0.55

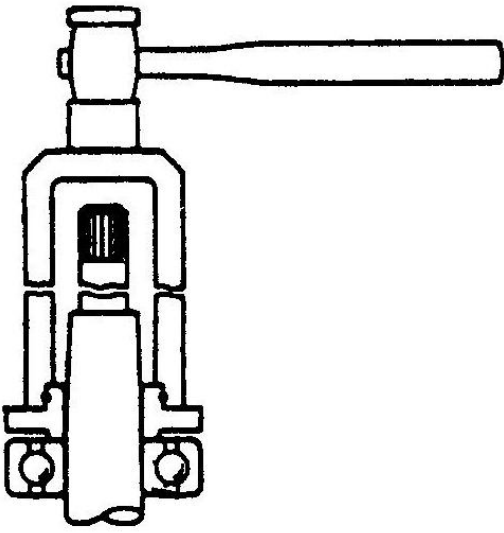

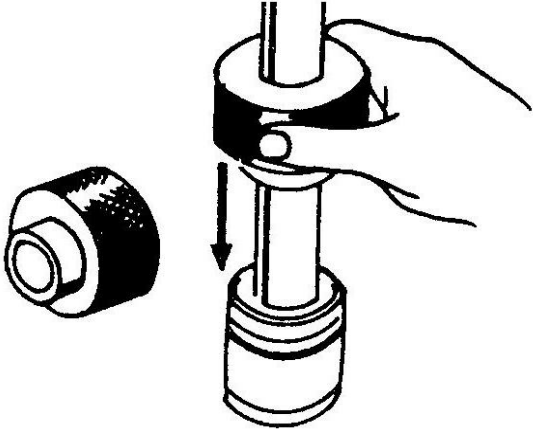
	Radial clearance of big end of connecting rod	0.008-0.016	0.05
	Shimmy	-	0.1

Locking torque

Assembling bolt	10 N·m	Apply oil
Main chain guide screw	10 N·m	Apply locking agent
Gear position sensor mounting screw	7 N·m	Apply oil
Oil drain plug screw	34 N·m	Apply oil
Oil seal cover bolt	28 N·m	Apply oil
Clutch line guide support bolt	10 N·m	Apply oil
Retainer screw	18 N·m	Apply locking agent

Tools

	
Central pivot universal fixer of clutch	Clutch spring compressor
	
Flywheel puller	Socket wrench

	
<p>Bearing installation tool</p>	<p>Bearing screwdriver</p>
	
<p>Oil seal replacer</p>	

16.2 Fault Diagnosis

16.2.1 Abnormal sound of crankcase

Scattered or broken parts in the crankcase

Loosened crankcase bearing

Loosened crank pin bearing

Stuck clutch

16.3 Flywheel

16.3.1 Disassembly

1. Disassemble:

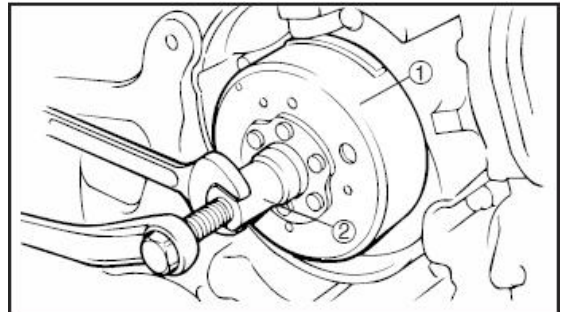
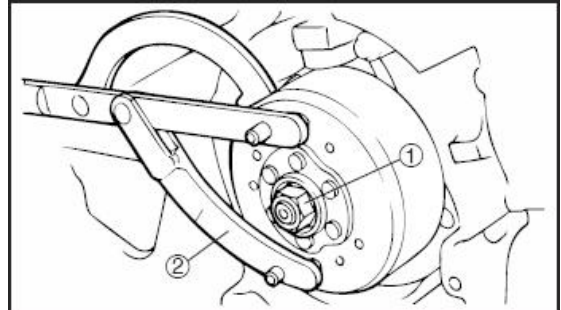
- Nut ①
- Washer

Note:

- Fix the flywheel and fixture ② before removing the nut and gasket
- Flywheel fixture is not allowed to collide with the boss on the flywheel

2. Disassemble:

- Flywheel ①
- (use the flywheel pulling tool ②)



16.3.2 Installation

1. Install:

- Flywheel ①

Note:

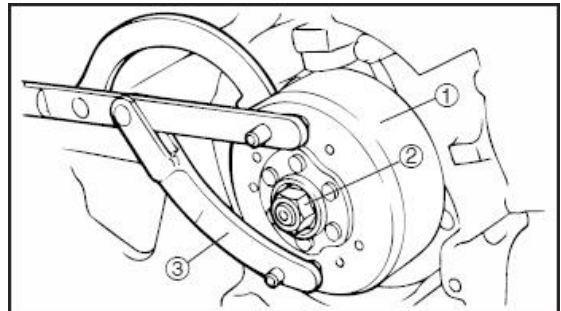
- Clean crankshaft cone and flywheel hub
- When installing the flywheel, ensure that the woodruff key on the crankshaft is properly fixed in the keyway

2. Tighten:

- Nut ② 70Nm (7m·Kg, 50.6ft·lb)

Note:

- Fix the flywheel using a fixture ③, and then tighten the flywheel nut ②
- Flywheel fixture is not allowed to collide with the boss on the flywheel



16.4 Crankcase

16.4.1 Disassembly

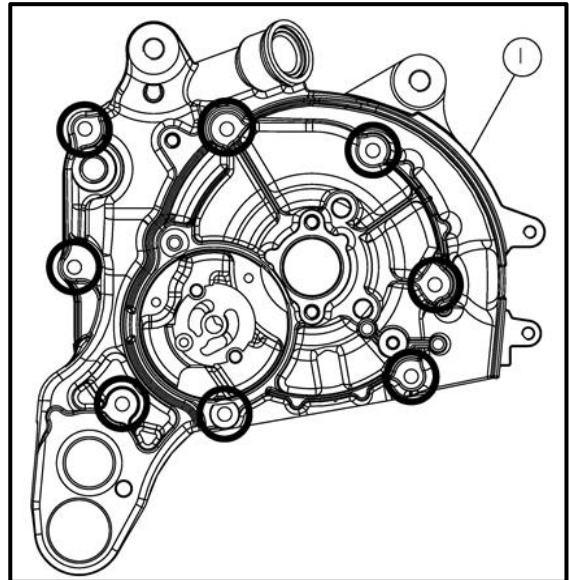
Steps for opening crankcase:

Components of left crankcase②

a. Remove assembling bolt of crankcase

Precautions:

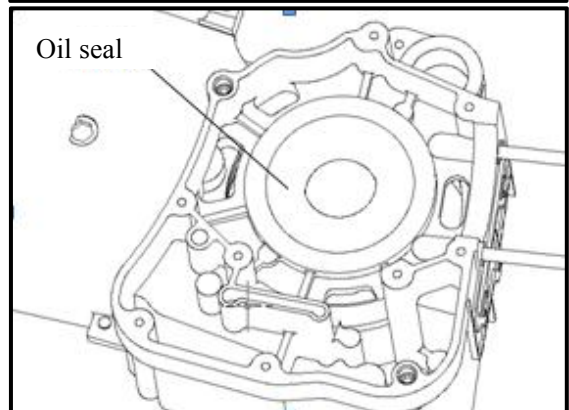
For the crankcase assembling bolt marked as shown in the figure, first loosen 1/4 of the engagement length and then completely loosen assembling bolt later in the staggered mode;



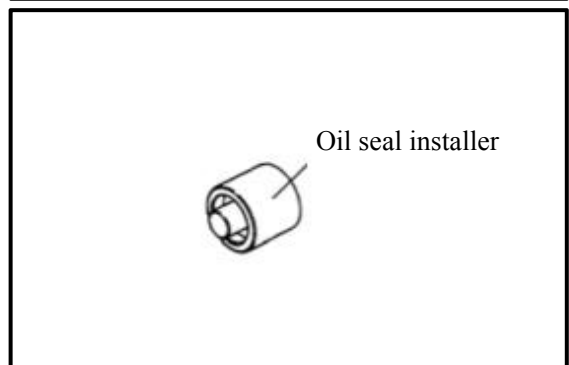
Remove the oil seal of left crankcase.

Note:

The removed oil seal cannot be used again.
Oil seal should be disassembled by using special tools.

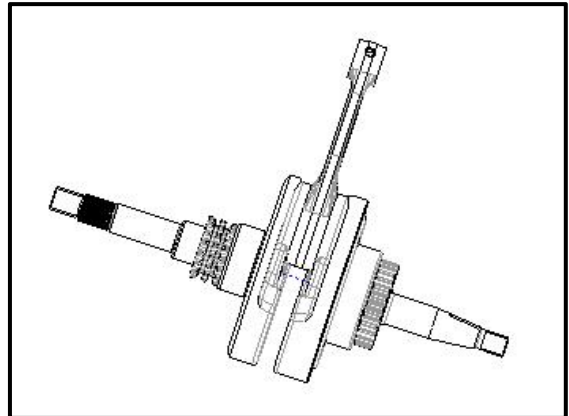


Oil seal installer **tool number**
QJ153-10-0107/G32

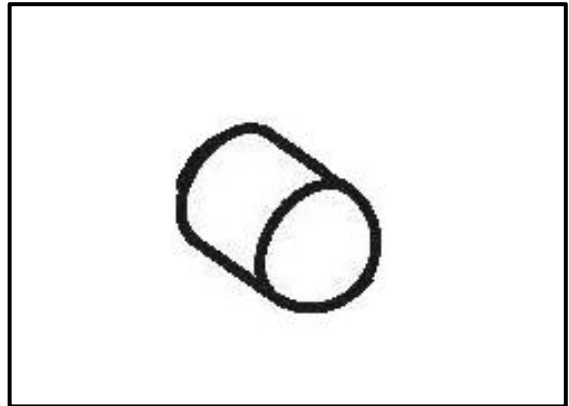


16.4.2 Inspection

Check the crankshaft for defects such as cracks; if there is any defect, replace crankshaft components;

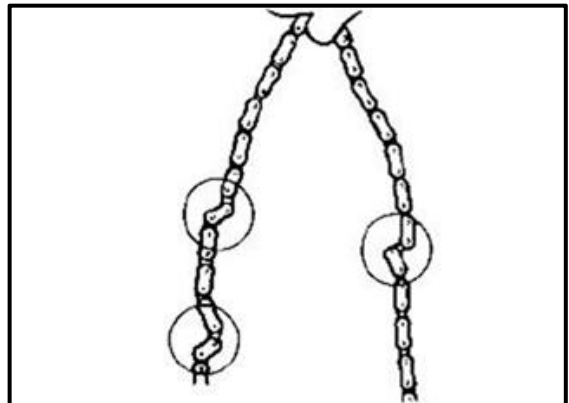


Check the oil filter for clogging and damage; if there is any defect, replace oil filter;



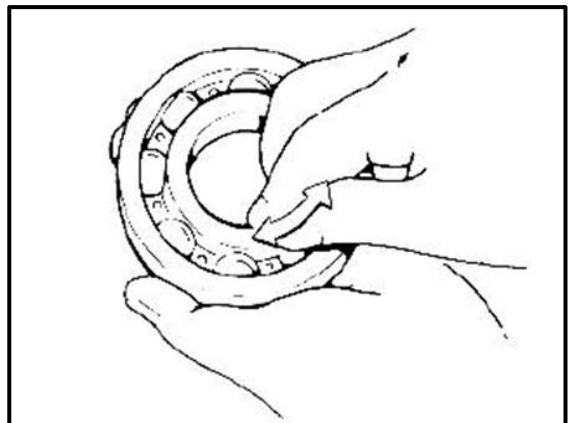
Check the timing chain

Visually inspect the chain for wear, and feel whether the chain cannot rotate flexibly with two hands; if there is any defect, replace the timing chain, and meanwhile readjust the initial position of tensioner of main chain guide;



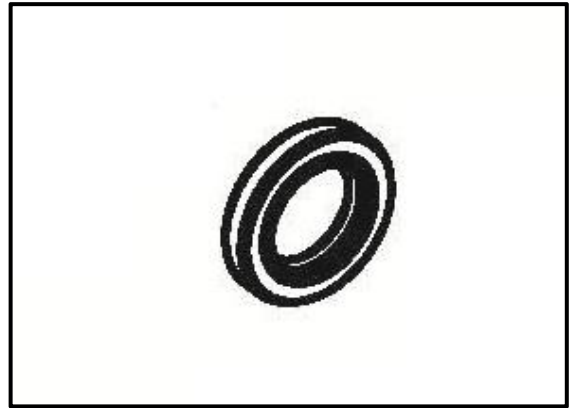
Check crankcase bearing

Rotate the inner ring of bearing with your fingers to check whether the bearing cannot rotate flexibly and is blocked; if necessary, replace the new bearing with special tools.



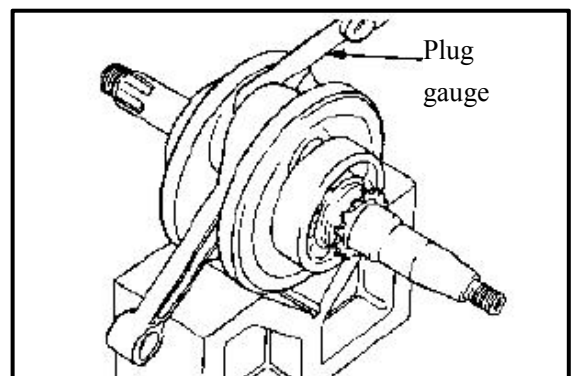
Check oil seal

Check the seal lip for damage or deformation, and whether there is any edge cut deformation in the outer ring; if necessary, replace the oil seal with special tools.



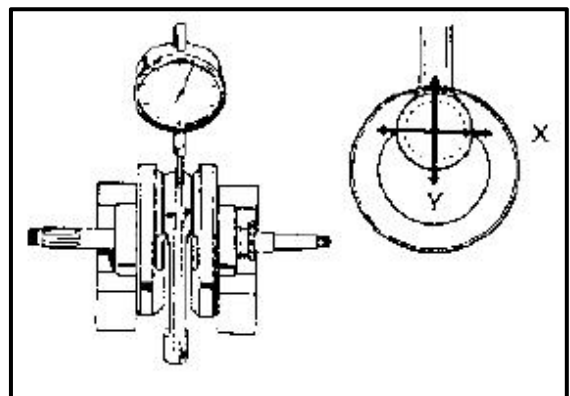
Measure the lateral clearance of big end of connecting rod.

Allowable limit: 0.55mm.



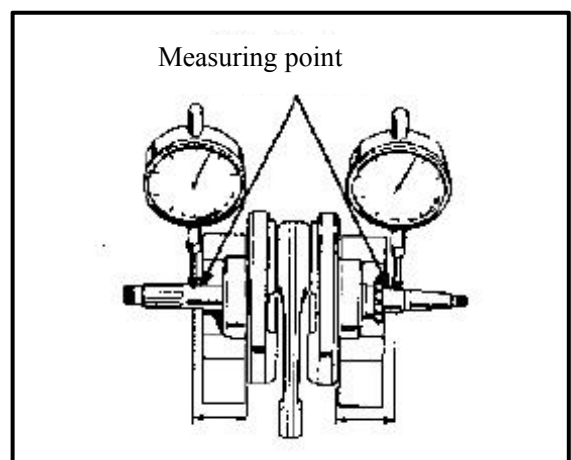
Measure the clearance of big end of connecting rod in X-Y direction.

Allowable limit: 0.05mm.



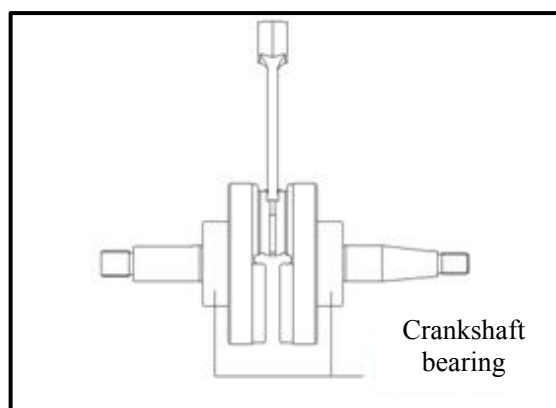
Measure the shimmy of crankshaft.

Allowable limit: 0.1mm.



Check whether the crankshaft bearing rotates with abnormal noise or whether it is loose.

If there is abnormal noise or it is loose, replace the crankshaft assembly.



16.4.3 Installation of crankcase

Assemble the crankcase in the reverse order of disassembly.

Do not apply glue, lay and keep the left case flat, and then use a paper pad of reevaluation box, and then align the right box with the positioning pin and gently buckle it, and finally knock it diagonally.

Note:

Oil seals should be installed by using special tools, to avoid damage.

Paper pads must not leak out and must not be folded.

Torque value of assembling bolt 10-12N·m

Matters needing attention

1. Clean the parts, apply oil or grease with the specified specifications evenly on the seal of bearing to be replaced for future use;

2. Bearing, bearing plate:

Note: The round edge side of retainer of bearing faces the pressing surface of bearing, and the tightening torque of retainer bolt should be ensured (7N·m);

3. Clean the assembling surface and other joint surfaces;

4. Apply sealant at the assembling surface:

Note: Apply sealant around the bolt hole evenly, and prevent sealant going into the lubricating oil passage of crankcase.

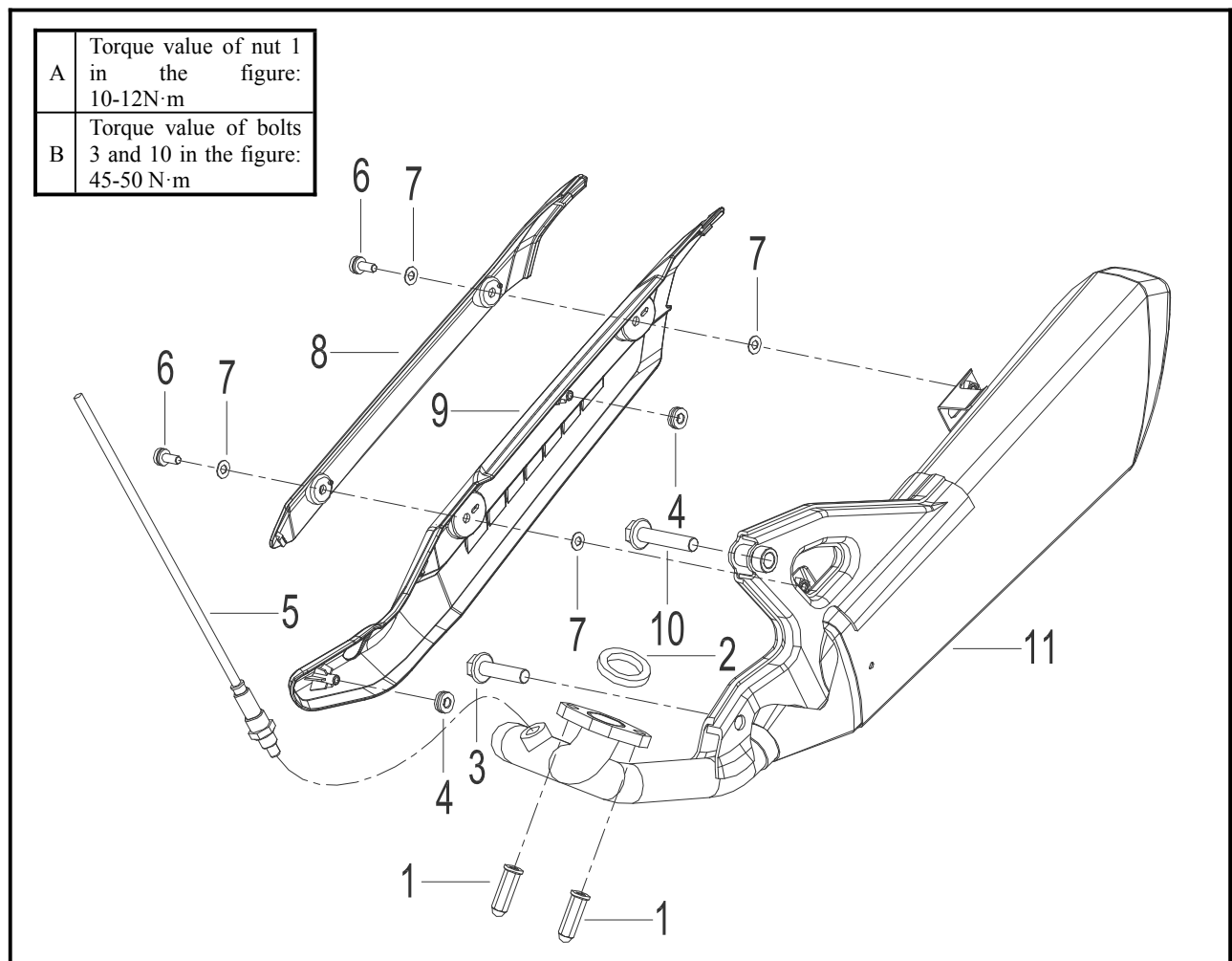
5. After the internal parts of left crankcase are assembled, assemble the right crankcase to left crankcase, and slightly knock the crankcase with a

soft hammer;

6. Bolts for assembling crankcase

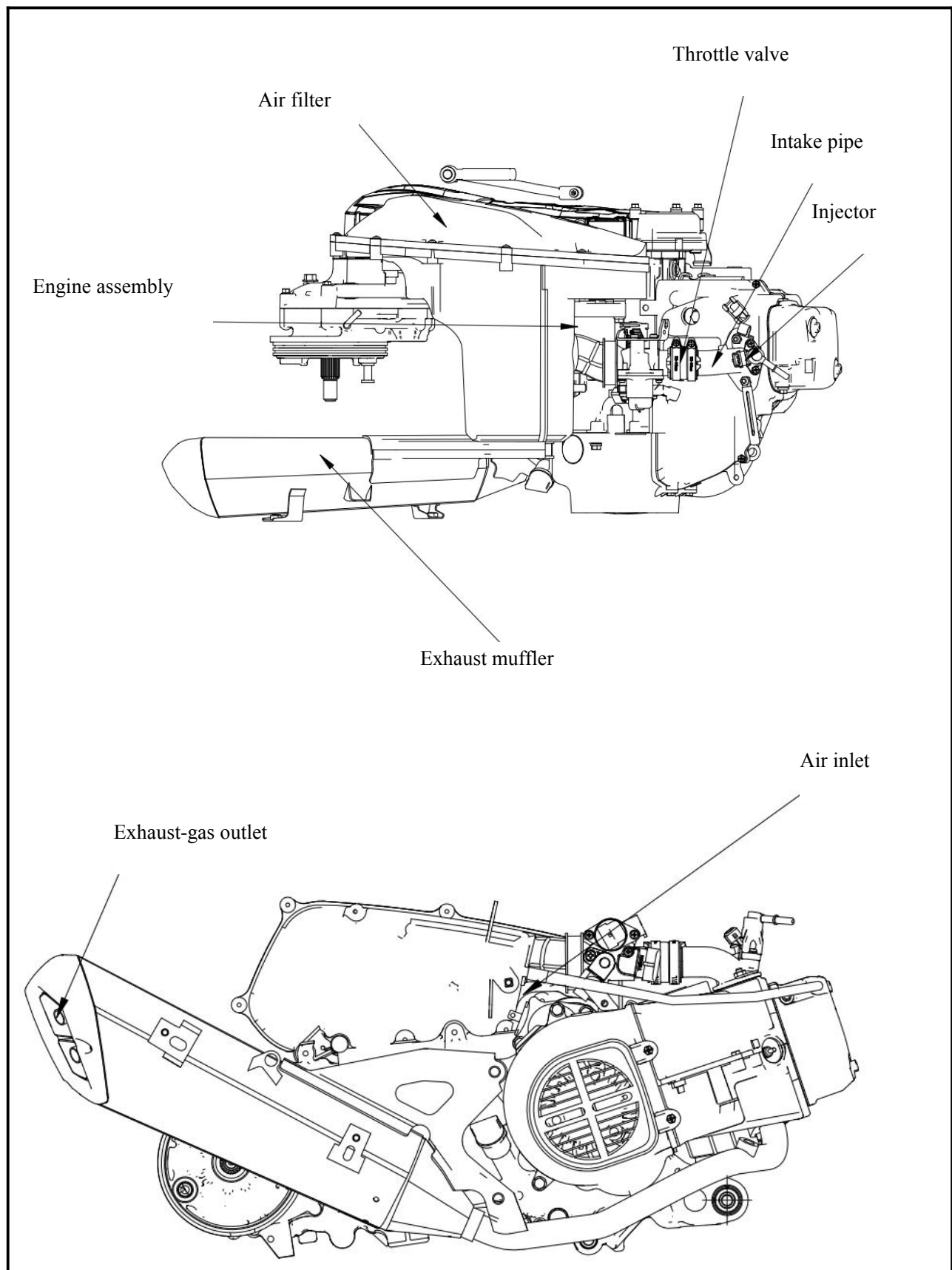
Note: Tighten the assembling bolt on the left crankcase, and its tightening torque should meet the requirements ($10\text{N}\cdot\text{m}$);

Muffler

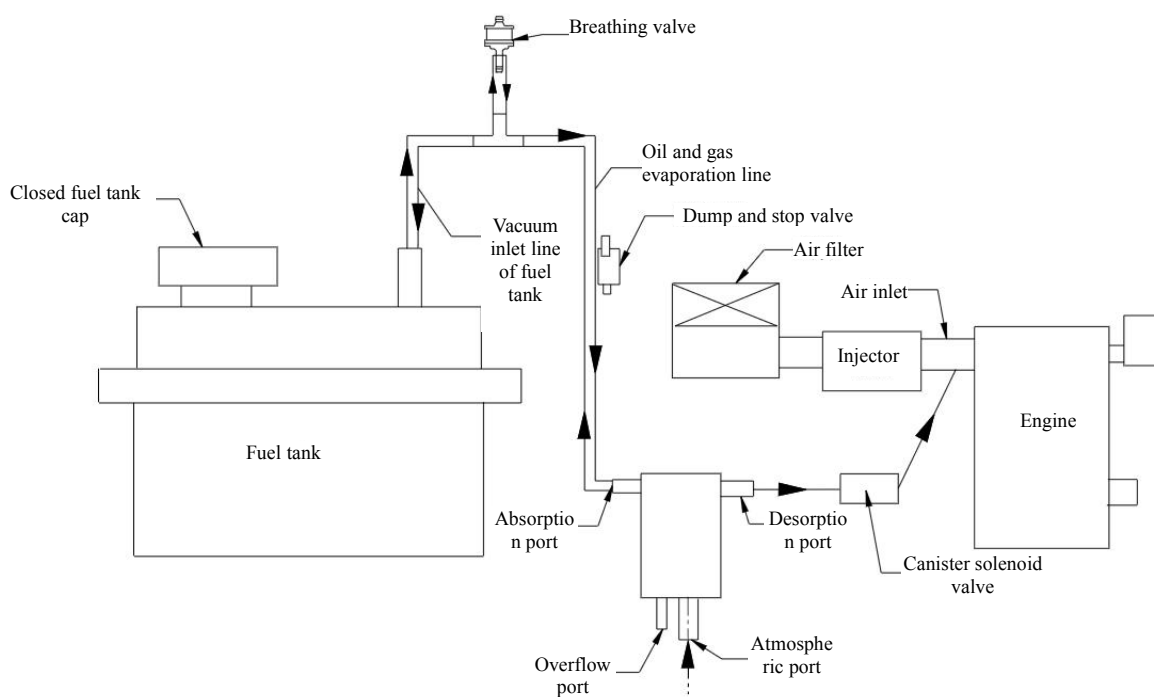
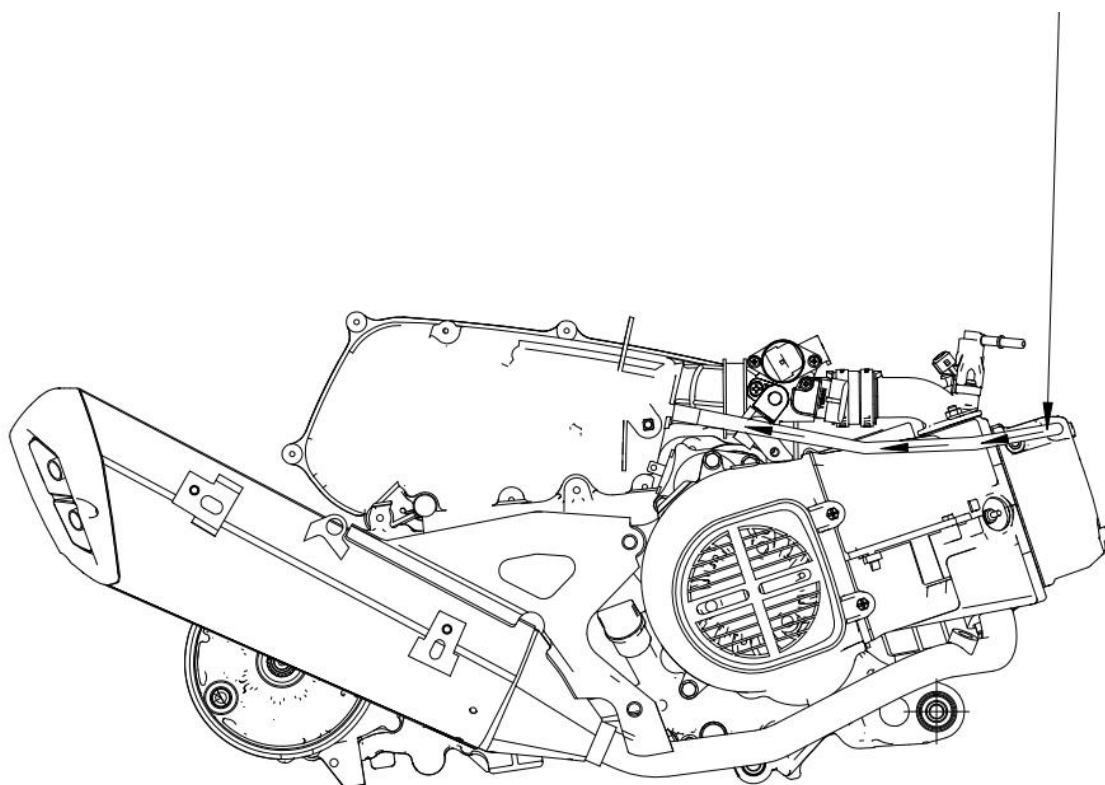


No.	Name
1	Nut M6
2	Exhaust pipe washer
3	Bolt M10×1.25×40
4	Rubber sleeve of muffler guard
5	Oxygen sensor
6	Combination screw M6×16
7	Insulation gasket
8	Muffler cover
9	Muffler cover
10	Bolt M10×1.25×55
11	Muffler welding assembly

Emission Control



Air outlet position of crankcase



Temporarily absorb the fuel vapor overflowed from fuel tank in the activated carbon canister using the absorption ability of activated carbon in the tank;

When negative pressure is generated in the fuel tank, air will enter the carbon canister through the atmosphere entry, enter the evaporating pipe from the absorption port of carbon canister and finally enter the fuel tank.

When engine is running under certain conditions, desorption is conducted through the control of carbon canister solenoid valve, fuel vapor is led into the engine to participate in the combustion, and the activated carbon in the tank will restore the absorption ability.

When the evaporation plant of carbon canister is blocked, the breathing valve will play a role in the following aspects:

1. When a positive pressure of 8-15kpa is generated in the fuel tank, the breathing valve will automatically exhaust

When a negative pressure of -1.0 - -1.5kpa is generated in the fuel tank, the breathing valve will automatically open, and air will enter the fuel tank through the breathing valve

XVII. Exhaust Emission Control System

Guarantee of Exhaust Emission Control System-----17.1

Regular Maintenance Notice/Guarantee Emission Standard-----17.2

Mechanical Function of Exhaust Control System-----17.3

Catalytic Conversion System-----17.4

17.1 Guarantee of Exhaust Emission Control System

1. The exhaust emission control system of the motorcycle complies with the provisions of GB14621. This Company will provide the guarantee in the case of completely normal use and maintenance as required within the effective service life of the exhaust emission control system.
2. Scope of guarantee
 - 1) Function guarantee of exhaust emission control system
It is guaranteed that the system meets the regular or irregular exhaust inspection performed by government agencies within the scope of use (15,000 km).
3. If the following situations exist, this guarantee clause will not be applicable, but the provincial or city dealers or service departments of this Company are still willing to serve customers at a reasonable price if there are maintenance needs.
 - 1) The regular maintenance is not performed according to the time or mileage specified by this Company.
 - 2) The regular inspection, adjustment or maintenance is not carried out at the dealers or service centers of this Company or the maintenance record certificates cannot be provided.
 - 3) Overload or improper use.
 - 4) The motorcycle is transformed, original parts are disassembled or other devices are installed at will.
 - 5) The motorcycle is used for races or frequently ridden on the roads which are applicable to non-motor vehicles.
 - 6) Damage is caused due to typhoon, flood and other weather disasters or damage and faults are caused due to negligence, accident or impact of foreign objects.
 - 7) The motorcycle is disused in a long term without regular maintenance.
 - 8) The odometer is damaged and not maintained immediately or it is transformed, disused or changed artificially.
 - 9) The motorcycle is sent to the inspection station for exhaust inspection every three months.

The new motorcycle manufactured by this Company has passed the GB 4569 and GB 16169 standard after noise test.

17.2 Regular Maintenance Notice

- In order to ensure that the degree of environmental pollution will not become increasingly serious, the state requires that all the motor vehicles produced by all manufacturers must meet the air pollution emission standards. The production of this Company meets the provisions of air pollution emission standards, meanwhile, the Company also strives to purify the air and take efforts to reduce air pollution.
- This motorcycle has passed rigorous inspection before leaving the factory and meets the provisions of air pollution emission standards. However, due to the different service conditions of this product, we have formulated the following regular checklist on exhaust emission. To ensure normal emission, the users should carry out inspection, adjustment or maintenance in accordance with the specified time.
- For other individual problems on use, please ask the dealers .
- The relevant emission provisions are shown below:

Emission regulation	CO	HC	NO _x
Emission standard	≤1.14g/km	≤0.38g/km	0.07g/km

※ If the emission standard changes, the newest national provision shall prevail.

- If the regular inspection is not carried out at the dealers or service centers of this Company, this Company will not be responsible for the prohibition. Please make necessary inspection at any time to maintain the best motorcycle conditions.

Note: ①The cleaning frequency of air filter should be increased if the motorcycle is ridden on sandy roads or in the seriously polluted environment to prolong the service life of engine.

②If the motorcycle is always ridden at a high speed or in a frequent manner with large mileage, the maintenance degree should be increased.

Precautions for guarantee of emission standards

- 1) The unleaded gasoline should be restricted.
- 2) The engine oil with the specification specified should be used.
- 3) Please carry out maintenance in accordance with the provisions of the regular maintenance table.
- 4) For the exhaust control system, arbitrary adjustment or replacement (including use of spark plug, idle adjustment and ignition timing) is strictly prohibited.
- 5) Precautions:
The catalyst device will be greatly affected due to the block of ignition system, charging system or fuel system; therefore, please go to the dealers or service centers specified by this Company for inspection, adjustment or maintenance if you feel that the engine is unsmooth.
- 6) The exhaust control system of the motorcycle complies with the national regulations. Therefore, if any parts of the system need to be replaced, make sure to use the original parts of this Company and carry out replacement by the specified dealer or service center

17.3 Mechanical Function of Exhaust Control System

Summary

The exhaust countermeasure is to use four-stroke single-cylinder engine and air induction device, maintain a good level of exhaust and adopt activated carbon canisters for exhaust from fuel evaporation.

※ Engine improvement

Strive to increase the combustion efficiency depending on improved spark plug, combustion chamber, compression ratio, ignition time, exhaust system and other engine elements and high intake and exhaust efficiency.

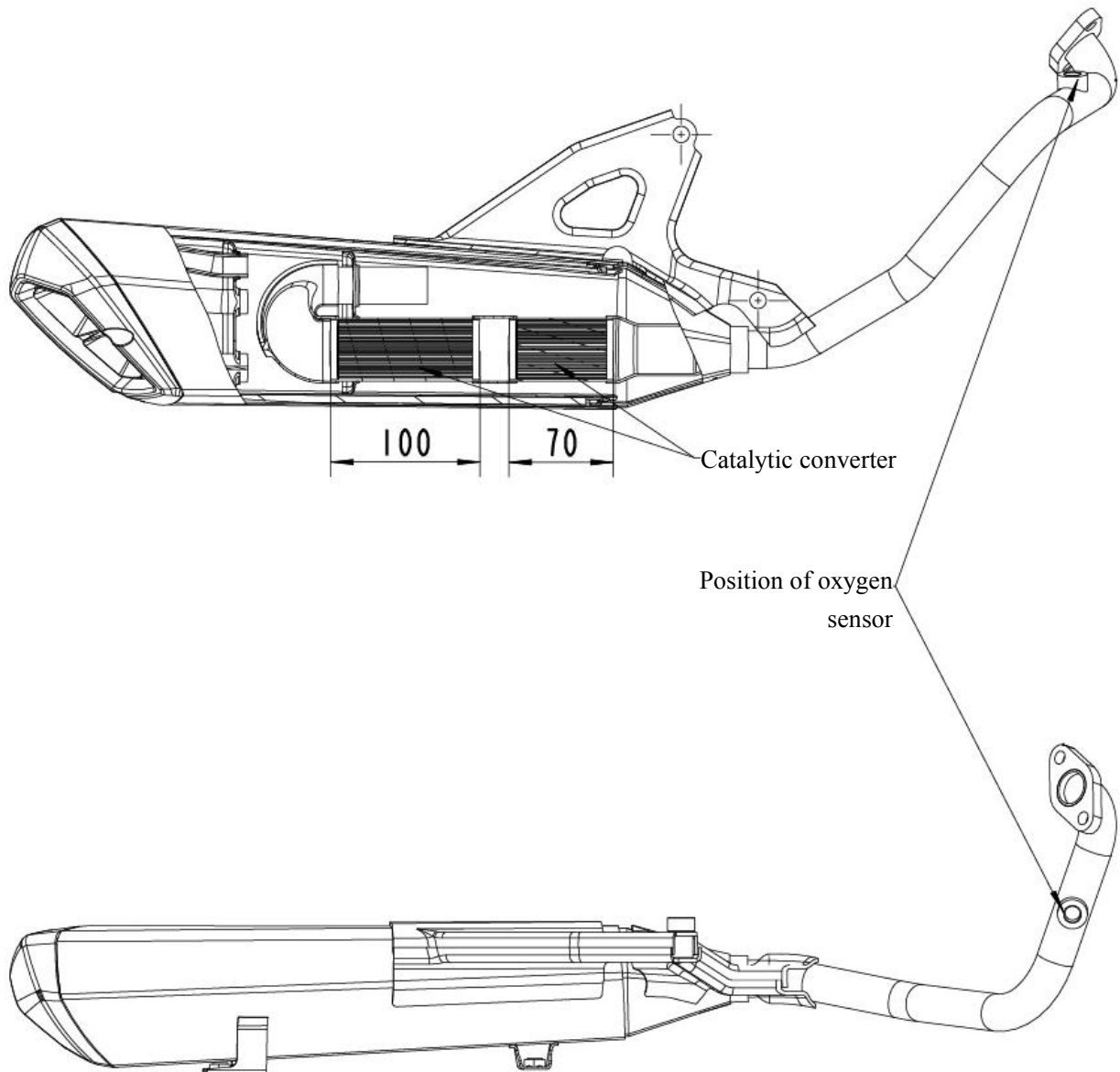
※ Air induction device

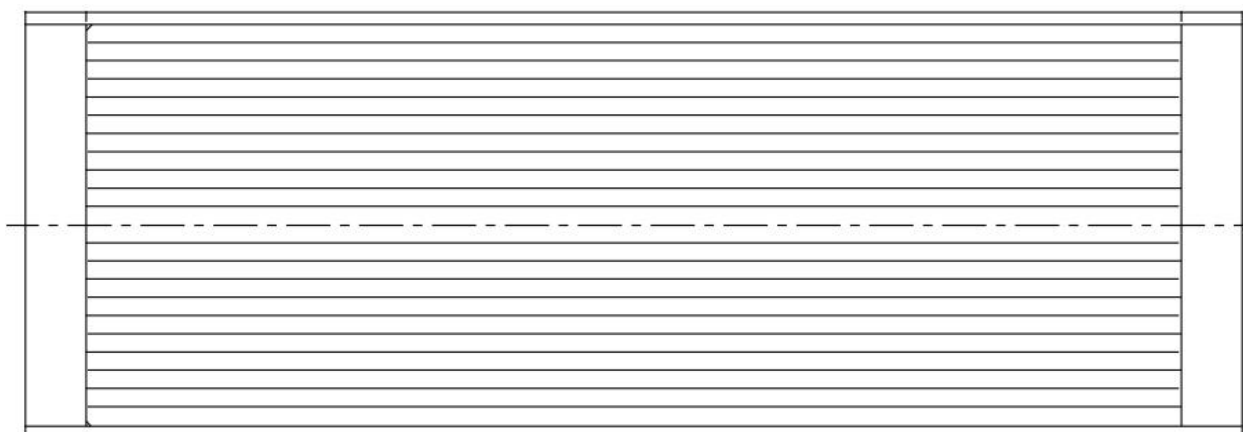
After air is induced into the exhaust pipe, the chemical reaction of incompletely burnt CO and HC will occur to generate harmless gases.

Distinction	device	Constituent part	Function
Exhaust system	Catalyst device	Catalyst converter	The canned oxydic catalyst installed in the middle of exhaust pipe will oxidize CO, HC and NOX.

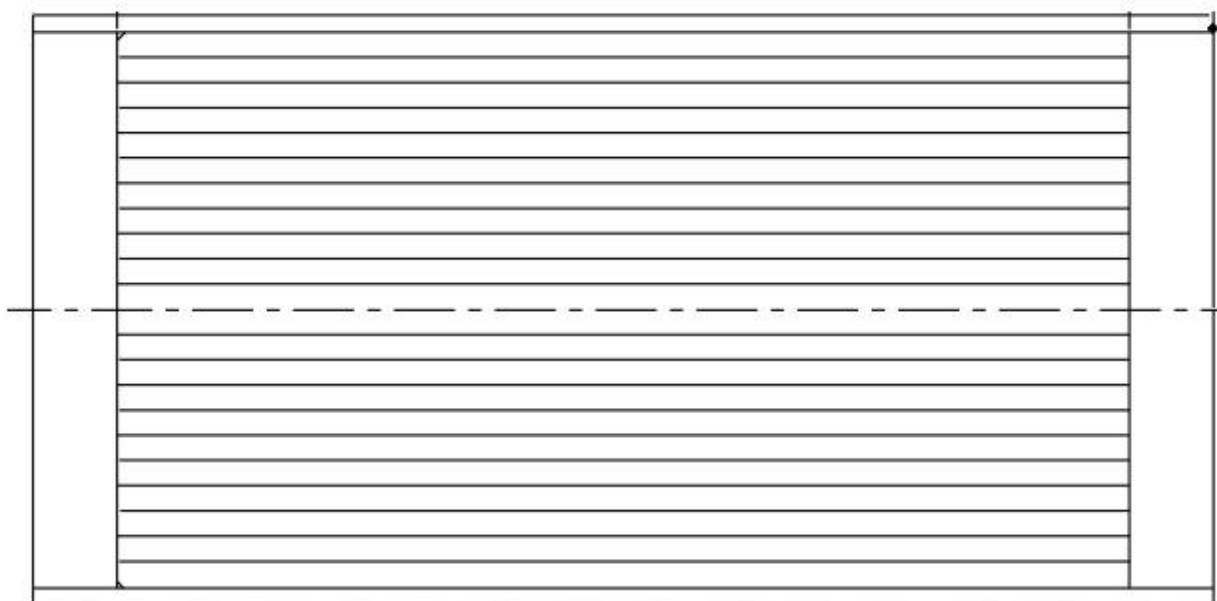
17.4 Catalyst Conversion System

17.4.1 Construction





Catalytic converter Hole density 200 c p s i
 Precious metal content 40g / f t³
 Volume 138.5cm³
 Effective volume 113.1cm³



Catalytic converter Hole density 200 c p s i
 Precious metal content 28g / f t³
 Volume 96.98cm³
 Effective volume 75.4cm³

17.4.2 Instructions

1. The function of catalyst conversion is to convert the completely burnt gases (including HC, CO and NOX) into H₂O, CO₂, N₂ and other harmless gases and then discharge them.
2. When the catalyst containing platinum, rhodium and other rare metals is converted, unleaded gasoline should be used.

※Leaded gasoline will lead to the failure of catalyst.

• **General precautions during maintenance of motorcycles (exhaust pipes) with catalytic converters:**

- 1) The motorcycle with a catalytic converter should not be touched after the engine is turned on or off, because the temperature is high in a short time.
- 2) The motorcycle with a catalytic converter should not be close to combustibles.
- 3) The carbon monoxide in the exhaust pipe is harmful to human body, so do not operate the engine in a closed space.
- 4) The motorcycle with a catalytic converter should not use leaded gasoline. (to prevent catalyst poisoning)
- 5) Do not start the engine by pushing the motorcycle. If necessary, start the engine by pushing the motorcycle after the temperature of the engine and catalytic converter is reduced.
- 6) Do not ride the motorcycle by putting into gear or turning off the motorcycle during downhill running.
- 7) Do not ride the motorcycle with poor ignition.
- 8) When maintaining the ignition system of engine, it is not allowed to start the engine to check whether the spark plug can generate sparks by removing the spark plug. If it is necessary, the time should not be too long.

XVIII. Electronic Injection System

Electronic Fuel Injection System ~ ~ ~ ~ ~ 18.1

Parts of Electronic Fuel Injection System ~ ~ ~ ~ ~ 18.2

Fault Diagnosis ~ ~ ~ ~ ~ 18.3

Common Troubleshooting Methods ~ ~ ~ ~ ~ 18.4

18.1 Introduction of Electronic Injection System

It adopts the small engine electronic injection system from Delphi Corporation. For this system, the closed-loop control is realized by an oxygen sensor. The oil injection and ignition are controlled by ECU. A three-way catalyst is used to carry out after treatment for the gas burnt by the engine to convert it into harmless gas and discharge it to the air. This system adopts the closed-loop control self-learning system which can effectively eliminate the manufacturing differences between the system and related mechanical parts, improve the overall consistency of the motorcycle and remove the errors caused due to wear and other factors after actual use.

- The on-board diagnostic system (referred to as OBD system) refers to a diagnostic system integrated in the engine control system that can monitor the faulty components that affect exhaust emissions and the main functional state of engine. It has the ability to identify, store and display fault information through a self-diagnostic fault indicator (MIL).
- When repairing the motorcycle with an OBD system, maintenance personnel can quickly and accurately locate the faulty components through the diagnostic apparatus, thus greatly improving the efficiency and quality of repair.
- OBD technology involves many new concepts. The following is a brief introduction to some basic knowledge about OBD technology in order to help readers better understand the subsequent contents.
- The electronic control unit constantly monitors sensors, actuators, associated circuits, fault indicators and battery voltages, and even the electronic control unit, and conducts reliability detection to the output signal of sensor, drive signal of actuator and internal signal (e.g., closed loop control, cooling liquid temperature, idle speed control, battery voltage control, etc.). Once a link is found to be faulty, or a signal value is not trusted, the electronic control unit should be used to immediately make fault information records in the fault memory of RAM. The fault information record is stored in the form of a fault code and displayed in the order in which the faults occur.

Faults can be divided into "steady-state faults" and "incidental faults" according to the frequency (including the faults caused due to a short wire harness open-circuit or poor connector contact)

- Motorcycle EFI systems, like other electronically controlled gasoline injection systems, can significantly reduce emissions on the one hand and cause difficulties in engine maintenance on the other. At present, it is in the market incubation period of motorcycle EFI system, and maintenance personnel can see and feel the throttle engine. However, some of the mechanical components of electronically controlled gasoline injection system that are previously familiar to people are eliminated and replaced with various electronic components. Originally, maintenance personnel and even drivers may adjust the throttle by themselves; however, the data is now stored in the computer chip and must be adjusted by electronic instruments, which is beyond the reach of general maintenance personnel. If the electronic components of the system fail, it may not be seen from the outside. It is often necessary to use various instruments for testing, so as to identify them. Therefore, maintenance personnel often feel unable to find the way to start working when repairing electronically controlled gasoline injection engines. Based on these actual situations, we have prepared this maintenance manual, and we hope to play its role in two aspects: on the one hand, help the engineers in engine plants or OEMs to understand the electronic control systems of engine more deeply; on the other hand, help the maintenance personnel in various areas repair electronically controlled gasoline injection engine. This manual first introduces the composition and working principles of electronically controlled gasoline injection system. Next, the structure and performance of various components of the system are described in detail.
- In general, fault diagnosis instrument is an essential tool in the maintenance of electronically controlled gasoline injection system. The fault diagnosis instrument can be used to call the fault information record stored in the ECU out. To help the reader understand the true meaning of each fault code, this manual lists the conditions under which the ECU sets various fault information records. However, many faults are not directly determined based on the fault information record, but a series of analyses are required to find the true fault. Therefore, this manual uses quite a bit of space to describe how to find the true fault based on the fault information record.

Due to the presence of electronic control components, new contents are given to the cause of engine failure. In other words, the same engine fault may be caused either by mechanical components or by electronic components. Moreover, the actual fault of engine can be diagnosed not just with the fault diagnosis instrument. Therefore, this manual also starts from the symptoms of the engine, and finds the fault in combination with electronic control system.

18.2 EFI Parts

18.2.1 Engine Controller (MT05.2 ECU)

The engine controller is used to detect the running state of engine in real time through various sensors, and ensure the original motorcycle emission and fuel economy while optimizing the driving performance of motorcycle under various working conditions through reasonable calculation and self-learning control output devices. The engine controller can also wake up the self-diagnosis when the system is faulty.

18.2.1.1 ECU Appearance



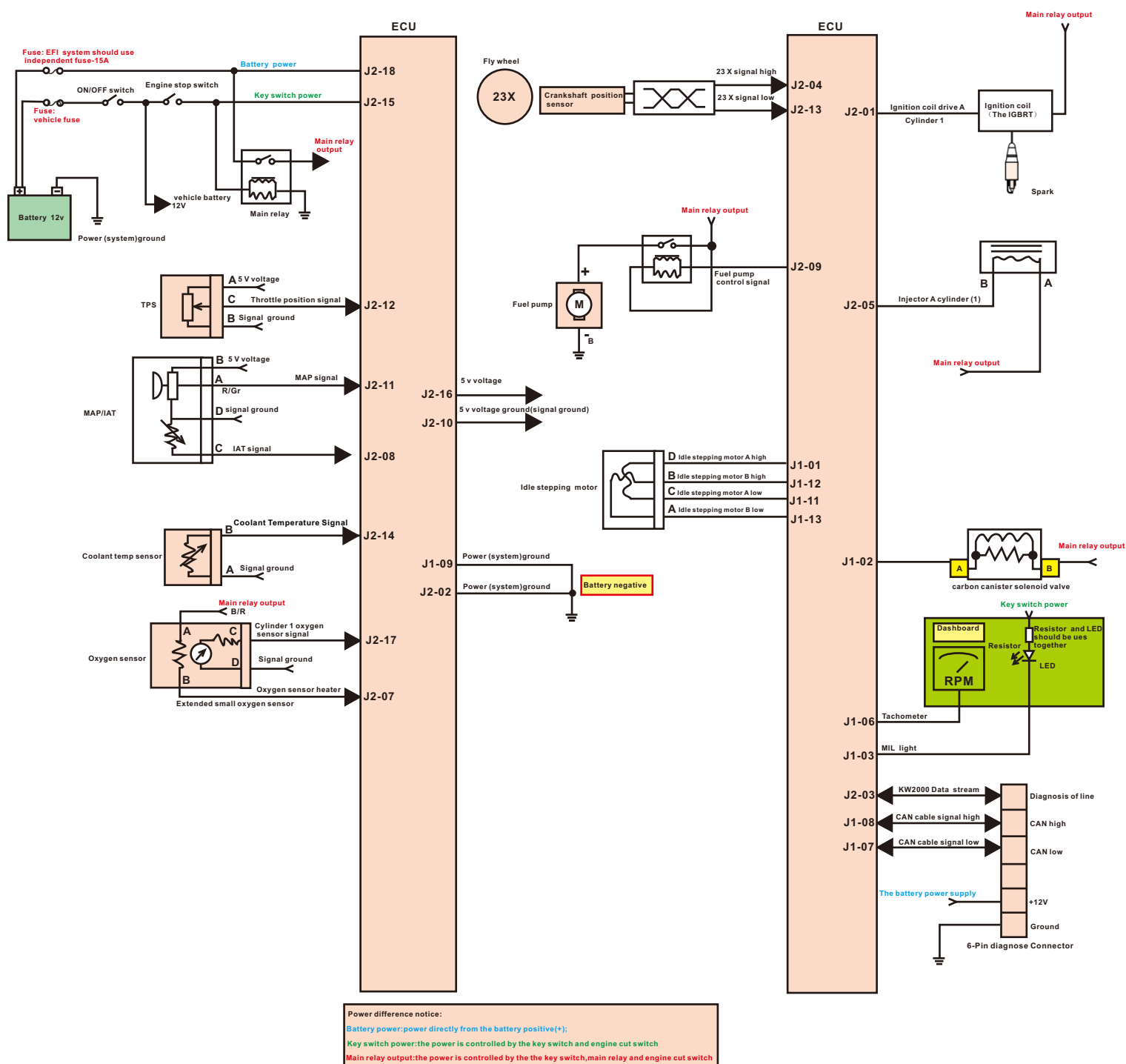
18.2.1.2 ECU Pin Definition

Connector	Function Description	J2-1	Ignition coil drive A (cylinder 1)
J1-1	Idle control valve A high	J2-2	The power supply (system) is grounded
J1-2	EVBP	J2-3	KW2000
J1-3	Fault light	J2-4	23X signal is low
		J2-5	Nozzle A
J1-6	Tachometer		
J1-7	CAN line signal is low	J2-7	Oxygen sensor of cylinder 1 is heated
J1-8	CAN line signal is high	J2-8	Intake temperature signal
J1-9	The power supply (system) is grounded	J2-9	Fuel pump control signal
J1-10	Ignition coil drive B (cylinder 2)	J2-10	5V reference voltage grounding (signal grounding)
J1-11	Idle stepper motor A low	J2-11	Intake pressure signal
J1-12	Idle stepper motor B high	J2-12	Throttle position signal

J1-13	Idle stepper motor B low	J2-13	23X signal is low
		J2-14	Cooling water temperature signal
		J2-15	Ignition power supply
		J2-16	5V reference voltage
		J2-17	Oxygen sensor signal of cylinder 1
		J2-18	Battery power supply

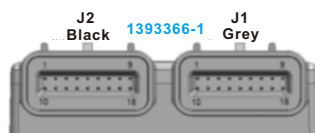
Remarks: The pin definition and the circuit diagram of EFI system are mainly based on the relevant sensors installed in the actual motorcycle and their functions. If the above parts are not installed on the whole motorcycle, please ignore it. Example: This model does not have a canister solenoid valve, please ignore it.

18.2.1.3 Circuit Diagram of Electronic Injection System



Connector	Functional description
J1-1	Idle stepping motor A high
J1-2	carbon canister solenoid valve
J1-3	MIL light
J1-6	Tachometer
J1-7	CAN cable signal low
J1-8	CAN cable signal high
J1-9	Power (system)ground
J1-11	Idle stepping motor A low
J1-12	Idle stepping motor B high
J1-13	Idle stepping motor B low
J2-1	Ignition coil drive A
J2-2	Power (system)ground
J2-3	KW2000 Data stream
J2-4	23 X signal high
J2-5	Injector A cylinder (1)
J2-7	Oxygen sensor heater
J2-8	IAT signal
J2-9	Fuel pump control signal
J2-10	5 v voltage ground(signal ground)
J2-11	MAP signal
J2-12	Throttle position signal
J2-13	23 X signal low
J2-14	Coolant Temperature Signal
J2-15	Key switch power
J2-16	5 V voltage
J2-17	Cylinder 1 oxygen sensor signal
J2-18	Battery power

Cable plug code (TYCO)	
J1(Grey)	J2(Black)
1488533-6	1488533-5



Precautions:

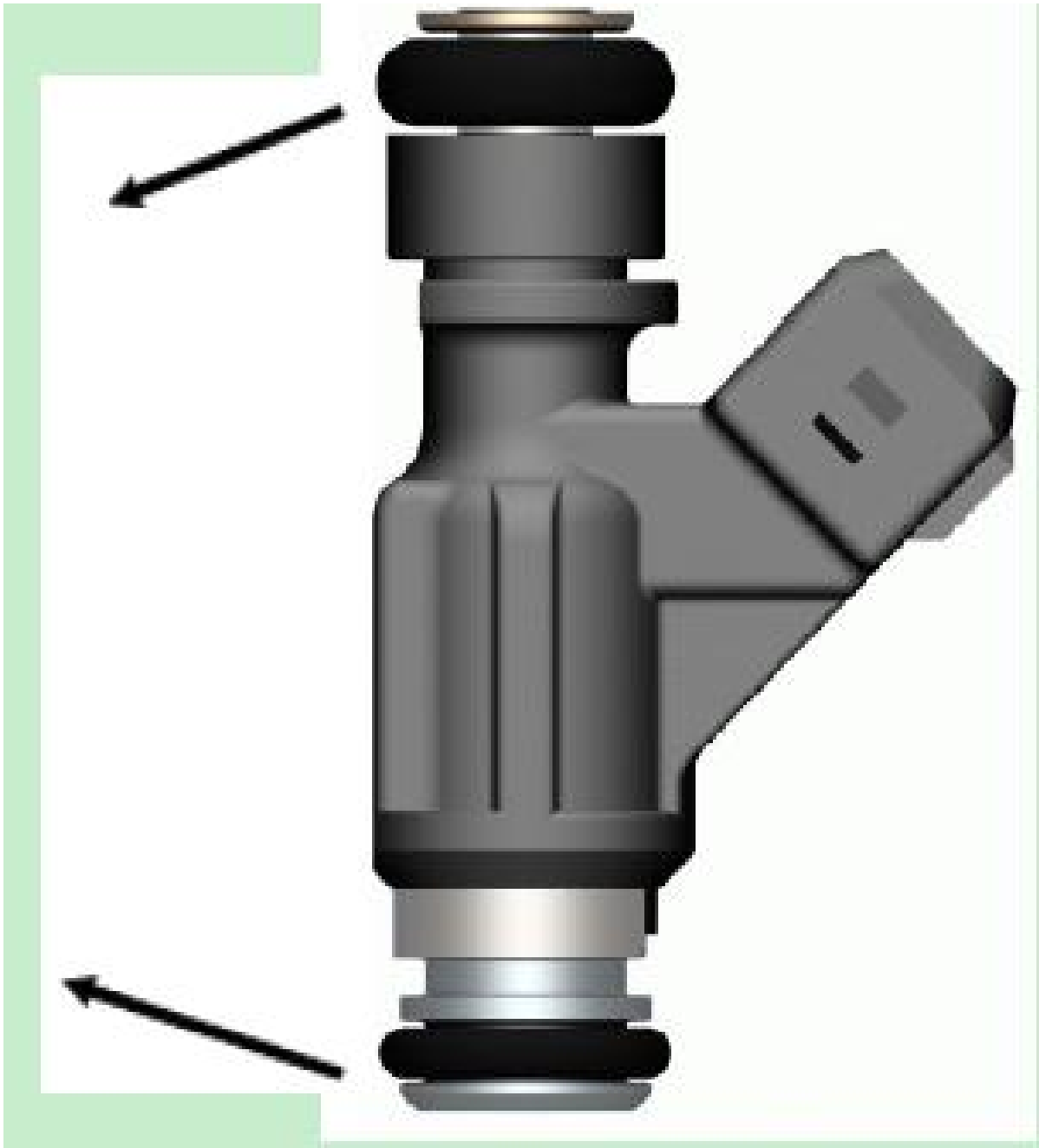
- a) Do not place the ECU at high-temperature parts, such as muffler or engine;
- a) Do not place the ECU near water drops, engine oil or any liquid;
- b) Do not allow mud or other pollutants to cover the ECU and thus affect the heat dissipation of the ECU;
- c) Connect it using M8 bolt and ensure that the tightening torque is about 3.9Nm, the mounting surface must be flat to prevent generating external force to ECU and thus making the circuit board bent.
- d) The normal working DC power supply voltage range of the ECU is 9 to 16V. Permanent damage will not be caused to the ECU both when it works for one minute under DC voltage of 26V or less and when it works for one minute or less under the DC voltage with the reverse voltage of 13V or less.

18.2.2 Fuel Injector

18.2.2.1 Working Principle of Fuel Injector:

An electromagnetic coil is designed around the iron core inside the fuel injector. The two electrodes led by the electromagnetic coil are the input control interfaces of fuel injector. When the electromagnetic coil is energized, the generated electromagnetic force overcomes the spring force of ball valve and fuel pressure to make the ball valve rise so that the high-pressure fuel (250Kpa) in the fuel pipe can flow through the nozzle plate through the valve seat hole of fuel injector and form taper vapor to spray to the intake valve. When the fuel injector is powered off, the electromagnetic force of electromagnetic coil will disappear and the ball valve of fuel injector will close automatically under the action of return spring, so that the fuel injection action of fuel injector stops.

18.2.2.2 Appearance of Fuel Injector:



Precautions:

- A filter is designed inside the fuel injector, but it is not a maintainable part, because its design function is to filter the accumulated impurities from the fuel filter in the oil line to the fuel injector

only. Impurities can cause the cohesion, flow deviation, leakage and other faults of fuel injector, so the fuel filter is very significant.

- The fuel injector should be replaced with that with the same part number only,

18.2.3 Throttle Body

18.2.3.1 Working Principle of Throttle Body:

Throttle body assembly mainly consists of the following components: main casting valve, return spring, throttle wire, throttle body position sensor and idle speed adjusting screw.

The throttle body position sensor provides the ECU with a throttle opening;

Note: The engine idle speed is automatically controlled by the EFI system within the normal range. Do not adjust the idle screw with a great force.

18.2.3.2 Appearance of Throttle Body:



18.2.3.3 Cleaning Method of Throttle

Clean the throttle body with a carburetor cleaner, spray cleaner at the inner wall of throttle body, and gently remove dust and carbon deposit and other items using a brush.

Precautions:

Be careful to prevent the bypass airway from being blocked by dirt.

18.2.4 Temperature Sensor of Engine Cylinder Head

18.2.4.1 Working Principle of Temperature Sensor of Engine Cylinder Head

The engine cylinder head temperature sensor is used in the air cooled engine to measure the temperature of engine cylinder head. Within the sensor temperature range, the resistance will change with the temperature of engine and the temperature characteristic is the negative temperature coefficient resistance characteristic. It is an irreparable part.

18.2.4.2 Appearance of Temperature Sensor of Engine Cylinder Head



18.2.5 Intake temperature sensor signal

18.2.5.1 Working Principle of Intake Temperature Sensor

It is used to measure the intake air temperature, its resistance will change with the intake air temperature and its characteristic is also the negative temperature coefficient resistance characteristic. It is also an irreparable part.

18.2.5.2 Appearance of Intake Temperature Sensor



Intake pressure sensor / intake temperature sensor (integrated)

18.2.6 Inlet Pressure Sensor

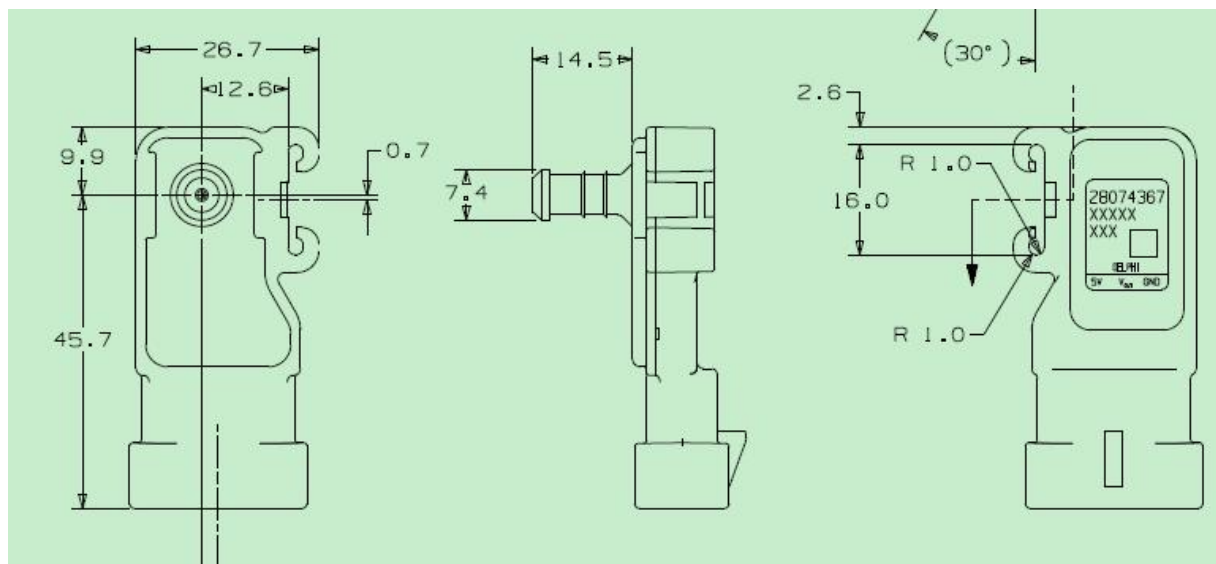
18.2.6.1 Working Principles of Inlet Pressure Sensor

This sensor is used to measure the absolute pressure of air intake elbow, reflect the size of intake pressure according to the difference of resistance, and then calculate the intake volume in engine combustion chamber through indirect conversion, and it is also a non-serviceable part.

18.2.6.1 Appearance of Inlet Pressure Sensor



Intake pressure sensor / intake temperature sensor (integrated)



18.2.7 Oxygen Sensor

18.2.7.1 Working Principle of Oxygen Sensor

Oxygen sensor can be used to detect the oxygen content in the waste gas of engine exhaust pipe for internal fuel closed loop control of ECU, thus maintaining engine combustion at the most reasonable state of air and fuel ratio (14.7).

18.2.7.2 Appearance of Oxygen Sensor



18.2.8 Ignition Coil

18.2.8.1 Working Principle of Ignition Coil

The ignition coil can provide energy to the spark plug and the ignition coil and spark plug are connected by a high-voltage cable.

18.2.9 Idle Speed Stepper Motor

18.2.9.1 Working Principle of Idle Speed Stepper Motor

The function of idle speed control valve is to control the flow area of bypass air passage of throttle body, so as to adjust the air volume of engine and control the idle speed of engine.

18.2.9.1 Appearance of idle speed stepper motor



18.2.10 Fuel pump assembly

18.2.10.1 Working Principle of Fuel Pump Assembly

The electric fuel pump and pressure regulator work together to provide 250Kpa gasoline pressure to the engine and the fuel pump is installed at the bottom of fuel tank.

18.2.10.2 Appearance of Fuel Pump Assembly



18.2.10.3 Fault Diagnosis of Fuel Pump Assembly

- a) After it is unlocked with a key, the fuel pump will run for about 3 seconds. If you can hear the rotation sound of fuel pump, perform the operations according to the requirements in Article d.
- b) Disconnect the fuel pump connector and check whether the fuel pump supply voltage is around 12V.
- c) If there is no problem in step 2, the external battery is connected to supply 12V DC power to the fuel pump to check whether the fuel pump is running.
- d) If the fuel pump is running normally, use a gasoline pressure gauge to check whether the fuel tube pressure at the front end of the injector is about 250Kpa when the engine is in idling state.
- e) If the pipeline pressure is lower than 220Kpa, check whether there is leakage in the oil line, whether the fuel pump is rotating in the reverse direction, and whether the filter is blocked.

18.2.10.4 Common Problems

- a) The fuel pump assembly plug-in is reversed, which enables the fuel pump to reverse and fail to provide the engine with sufficient fuel pressure, resulting in engine failure.
- b) The fuel pump is damaged and fails to rotate.

Precautions:

1. Because there is no gasoline in the fuel tank of new motorcycle at the beginning, a lot of air is generated at fuel pipe, so it needs to start it for several times to empty the air in the fuel line, and then the engine can work properly, which is normal. Motorcycle will be started easily in the future.
2. Because gasoline can cool fuel pump, do not let fuel pump work little oil or no gasoline, which may burn fuel pump.

18.3 Fault Maintenance and Diagnosis Method

The fault light is located on the instrument panel with a FI mark below. Under normal circumstances, after the key is turned, if the engine in the neutral position, and the fault light is on, it indicates that the electronic injection system is powered and it can work; if the fault light is off, it indicates that the electronic injection system circuit is disconnected, it will not work and the connection of positive and negative electrodes of fuse and battery should be checked. If the fault light is off after the engine is started, it indicates that there is no fault; on the contrary, if the fault light is still on after the engine is started, it indicates that the electronic injection system works abnormally and the fault should be removed if any.

Table of fault code

Manifold Absolute Pressure Sensor (MAP)	P0107	MAP Circuit Low Voltage or Open	KsDGDM_MAP_ShortLow
	P0108	MAP Circuit High Voltage	KsDGDM_MAP_ShortHigh
Intake Air Temperature Sensor (IAT)	P0112	IAT Circuit Low Voltage	KsDGDM_IAT_ShortLow
	P0113	IAT Circuit High Voltage or Open	KsDGDM_IAT_ShortHigh
Coolant/Oil Sensor	P0117	Coolant/Oil Temperature Sensor Circuit Low Voltage	KsDGDM_CoolantShortLow
	P0118	Coolant/Oil Temperature Sensor Circuit High Voltage or Open	KsDGDM_CoolantShortHigh
Throttle Position Sensor (TPS)	P0122	TPS Circuit Low Voltage or Open	KsDGDM_TPS_ShortLow
	P0123	TPS Circuit High Voltage	KsDGDM_TPS_ShortHigh
Oxygen Sensor	P0131	O2S 1 Circuit Low Voltage	KsDGDM_O2_1_ShortLow
	P0132	O2S 1 Circuit High Voltage	KsDGDM_O2_1_ShortHigh
Oxygen Sensor Heater	P0031	O2S Heater Circuit High Voltage	KsDGDM_O2_HeaterShortHigh
	P0032	O2S Heater Circuit Low Voltage	KsDGDM_O2_HeaterShortLow
Fuel Injector A	P0201	Injector A Fault	KsDGDM_INJ_CYL_A_FaultHigh
Fuel Injector B	P0202	Injector B Fault	KsDGDM_INJ_CYL_B_FaultHigh
Fuel Pump Relay (FPR)	P0230	FPR Coil Circuit Low Voltage or Open	KsDGDM_FPP_CircuitShortLow
	P0232	FPR Coil Circuit High Voltage	KsDGDM_FPP_CircuitShortHigh
Crankshaft Position Sensor (CKP)	P0336	CKP Sensor Noisy Signal	KsDGDM_CrankNoisySignal
	P0337	CKP Sensor No Signal	KsDGDM_CrankNoSignal
Ignition Coil A	P0351	Cylinder A Ignition Coil fault	KsDGDM_EST_A_Fault
Ignition Coil B	P0352	Cylinder B Ignition Coil fault	KsDGDM_EST_B_Fault

Ignition Coil B	P0352	Cylinder B Ignition Coil fault	KsDGDM_EST_B_Fault
Idle Control System	P0505	Idle Speed Control Error	KsDGDM_IdleControl
System Voltage	P0562	System Voltage Low	KsDGDM_SysVoltLow
	P0563	System Voltage High	KsDGDM_SysVoltHigh
MIL	P0650	MIL Circuit Malfunction	KsDGDM_MIL_Circuit
Tachometer	P1693	Tachometer Circuit Low Voltage	KsDGDM_TAC_Circuit_Low
	P1694	Tachometer Circuit High Voltage	KsDGDM_TAC_Circuit_High
Oxygen Sensor 2	P0137	O2S 2 Circuit Low Voltage	KsDGDM_O2_2_ShortLow
	P0138	O2S 2 Circuit High Voltage	KsDGDM_O2_2_ShortHigh
Oxygen Sensor Heater 2	P0038	O2S Heater 2 Circuit High Voltage	KsDGDM_O2_HeaterShortHigh
	P0037	O2S Heater 2 Circuit Low Voltage	KsDGDM_O2_HeaterShortLow
Vehicle Speed Sensor	P0500	VSS No Signal	KsDGDM_VSS_NoSignal
Park Neutral Switch Diag	P0850	Park Neutral Switch Error	KsDGDM_ParkNeutralSwitch
CCP	P0445	CCP short to high	KsDGDM_CCP_CircuitShortHigh
	P0444	CCP short to low/open	KsDGDM_CCP_CircuitShortLow
Rollover Sensor Diagnostic	P1500	Rollover Sensor malfunction/Triggered	KsDGDM_RolloverSensor
BLM_MaxAdapt	P0171	Several BLM value hit maximum	KsFDIAG_BLM_MaxAdapt
BLM_MinAdapt	P0172	Several BLM value hit minimum	KsFDIAG_BLM_MinAdapt
PESystLean	P0174	PE mode burned AFR keeps lean	KsFDIAG_PESystLean

Remarks: The table of fault code is mainly based on the relevant sensors installed in the actual motorcycle and their functions. If the parts in the above table are not installed on the whole motorcycle, please ignore it.

Example: This model does not have a canister solenoid valve, please ignore it.

18.3.1 Diagnosing Fault Using Diagnostic Apparatus



Operation method:

- a) Find the 16-hoe or 6-port diagnose interface at motorcycle; connect it using the adapter.
- b) Connect connecting wire and diagnostic apparatus interface;
- c) Open the key for diagnosis;

18.4 Common Troubleshooting Methods

18.4.1 Maintenance Tool

- a) Disassembly and assembly of electronic control system components - common automotive mechanical parts removal tool
- b) Electronic control system circuit and system electrical signal - digital multimeter (with buzzer)
- c) Electric control system fault diagnosis and engine working condition detection
 - Electronic control system fault diagnostic apparatus (recommended)
- d) Electronic control system fault code table (emergency use)
- e) Fuel pressure gauge, range: 0-300kPa





Tool name:
Cylinder pressure gauge
Function:
Check the cylinder pressure.



Tool name:
Fuel pressure gauge
Function:
Check the fuel system pressure, and judge the working conditions of fuel pump and fuel pressure regulator in the fuel system.

18.4.2 Engine Working Data Flow Displayed by Diagnostic Apparatus

Analyze and determine engine fault using the engine working data flow displayed by the diagnostic apparatus.

18.4.2.1 Step I

- a) Engine harness and the vacuum pipeline—may affect the system to control air flow and fuel supply
- b) Whether oxygen sensor is assembled in place—may affect the system to determine the air to fuel ratio
- c) Engine fault indicator—may affect the system to give an alarm for fault
- d) Storage battery voltage—determine whether the power of storage battery is sufficient
- e) Determine whether coolant temperature sensor, intake temperature sensor, intake manifold absolute pressure sensor and oxygen sensor display value are normal
- f) Working range of throttle position sensor—it cannot be fully opened or closed, which may affect engine power performance and some system functions

18.4.2.2 Step II

Check whether ECU power is turned off—the communications between diagnostic apparatus and system is interrupted after turning off key switch

18.4.2.3 Step III

- a) Coolant temperature and coolant temperature cycle—predicts whether the thermostat is working properly
- b) Storage battery voltage —Indicate whether the generator is working properly.
Too high: there may be fault in voltage regulator;
Too low: there may be improper connection of generator or generator fault
- c) Intake manifold pressure—it can predict whether there is leakage in intake and valve clearance problems.
Valve clearance is too small: this value is too high, so engine power performance may be affected; in addition, due to too early opening of exhaust valve and increase in exhaust temperature, oxygen sensor and three-way catalytic converter service life may be significantly shortened;
Valve clearance is too large: it may cause low intake manifold pressure, and thus affect the system to determine the working state of engine, thus resulting in abnormal idle speed during warm-up of motorcycle.
In addition, if the exhaust system is blocked, for example: a foreign body exists in the exhaust channel; the oil consumption is too high, thus blocking three-way catalytic converter; three-way catalytic converter is blocked due to internal damage, which will cause slightly high value.
- d) Number of cycles of oxygen sensor value—the number of cycles is too small, indicating fault of oxygen sensor

18.4.3 Simple Troubleshooting

Please follow the following steps to repair EFI system. To repair fault in one step, the subsequent steps may be stopped. And then use diagnostic apparatus to conduct inspection and acceptance and clear fault code according to Section 14.4.2 “Engine Working Data Flow Displayed by Diagnostic Apparatus”.

When using diagnostic apparatus, the voltage of storage battery should not be lower than 8.5 V.

18.4.3.1 Daily Use and Maintenance

- 92# or 95# gasoline should be high quality without lead.
- ECU has a moisture-proof function, but high-pressure water gun should not be used to rinse its shell.
- The petrol filter should be changed every 7000-10000 km.
- Under normal conditions of use, clean the throttle body every 10,000 km or 1 year.

18.4.3.2 Fault phenomenon-Start Fault

a) Rotate ignition switch to “On” position, and check whether engine fault lamp is on.

If it is off:	<ul style="list-style-type: none">◆ Check fuse and grounding wire◆ Check whether ECU plug is connected firmly◆ It is able to check whether this lamp and line is normal using the check function of diagnostic apparatus actuator◆ Check and repair bulb and its line◆ Judge using another ECU
It is be able to be on:	<ul style="list-style-type: none">◆ Connect diagnostic apparatus to system diagnosis interface

b) Check whether diagnostic apparatus can be connected to system for communications

If not:	<ul style="list-style-type: none">◆ Check fuse and grounding wire◆ Check whether ECU plug is connected firmly◆ Test whether diagnostic apparatus is working normally at another normal motorcycle◆ Judge using another ECU
If yes:	<ul style="list-style-type: none">◆ Remove the fault indicated by diagnostic apparatus

c) Check ignition system fault—whether normal ignition can be made for spark plug

If not:	<ul style="list-style-type: none">◆ Check whether high-voltage line and spark plug are plugged firmly or damaged◆ Use another ignition coil for assembly judgment◆ Judge using another ECU
If yes:	<ul style="list-style-type: none">◆ Check whether high-voltage line is connected to ignition coil and spark plug properly

d) Check oil supply system fault

Check whether fuel pump is working—it is able to hear the sound that the fuel pump is working near the fuel tank when starting engine

Not work:	<ul style="list-style-type: none"> ◆ Check whether fuel pump relay is working normally ◆ Check whether the connection and working of crankshaft position sensor is normal ◆ Judge using another ECU ◆ Check fuel pump line 	
Be able to work:	1) Check whether fuel supply pressure is greater than 220Kpa	
	2) Insufficient pressure:	<ul style="list-style-type: none"> ◆ Check whether there is sufficient fuel in the fuel tank ◆ Check whether fuel filter needs to be replaced (note: replace the fuel filter special for electronic injection should be replaced once every 7000-10000km) ◆ Check whether fuel supply pipe and fuel return pipe are damaged
	3) Normal pressure:	<ul style="list-style-type: none"> ◆ Check whether there is any abnormality in nozzle control line ◆ Check whether nozzle needs to be cleaned

e) Confirm whether cylinder is submerged

If yes:	<ul style="list-style-type: none"> ◆ After completely opening the throttle and turning on starting motor, there should be working sign in engine after several seconds
---------	---

f) Check whether crankshaft position sensor clearance is too large

18.4.3.3 Fault phenomenon—Start failure with tempering

- a) Check whether ignition coil is loosened;
- b) Check whether timing gear ring is loosened.

18.4.3.4 Fault phenomenon—Too high or too low idle speed (idle speed is obviously inconsistent with target idle speed)

Too high idle speed:	<ul style="list-style-type: none"> ◆ When the water temperature is lower than 68 degrees, the system will increase idle speed to accelerate warming-up process, which is normal phenomenon. Check the items according to the following items except that ◆ Check whether there is any leakage in the stepper motor and the 4 black hoses connected to the stepper motor ◆ Check whether there is any leakage the connection between the throttle body and the engine ◆ Check whether valve clearance, especially exhaust valve clearance is too large
Too low idle speed:	<ul style="list-style-type: none"> ◆ Check fuel quantity in fuel tank, fuel filter, fuel line pressure and nozzle ◆ Check whether the engine cylinder is able to work normally ◆ Checking valve clearance and confirm whether it is too small

18.4.3.6 Fault phenomenon—Instable idle speed with deceleration and flameout

- a) Checking valve clearance;
- b) Check whether idle speed bypass hole and throttle body are too dirt.

18.4.3.7 Fault phenomenon—Insufficient power of deceleration

- a) Check whether the parameters are normal at idle speed and high idle speed;
- b) Check fuel quantity in the fuel tank and fuel filter;
- c) Check whether exhaust system is blocked, for example: whether three-way catalytic converter is blocked by burning oil or damage;
- d) Check fuel line pressure and nozzle;
- e) Check whether fault lamp is on, and whether normal ignition can be conducted for only one cylinder.

18.4.3.8 Fault phenomenon—Slight burning phenomenon

Check whether the spark plug clearance meets specification of 0.6-0.7mm

18.4.3.9 Fault phenomenon—Fault lamp is on, but fault code is inconsistent with fault

It may be caused due to instable connection of system grounding wire, reconnect the grounding wire, disconnect the power cable of battery for 3 minutes and then start the engine.

18.4.3.10 Fault phenomenon—Extremely high fuel consumption

- a) Check whether the oxygen sensors of two cylinders are assembled in place; if it is in the loose state, the oxygen sensor may incorrectly judge that the combustion in the cylinder is thin, and then increase fuel, which may result in unusually high fuel consumption.
- b) After confirming that the engine mechanical parts and oxygen sensor are in normal conditions, run the engine to observe the oxygen sensor reading. If the reading is always greater than 500 mV at normal water temperature, check whether there is leakage in fuel injector.

Matters needing attention

- The vast majority of EFI parts cannot be repaired; after the confirmation of damaged parts, generally replacement is taken.
- When starting the engine, do not operate any mechanism (including the throttle, do not pull the throttle for start) on the engine.
- If engine fault lamp becomes on during the engine operation, cause must be checked and eliminated as soon as possible.
- Do not use leaded gasoline, because lead may damage the oxygen sensor and three-way catalytic converter.

- If oil consumption is abnormal, the problem should be resolved as soon as possible, because some of the substances in the oil may damage the oxygen sensor and three-way catalytic converter.
- Valve clearance should not be too small, if the exhaust valve is not shut off tightly, exhaust temperature may become too high and thus shorten the life of three-way catalytic converter.
- °At the temperature of below 10°C, if the vehicle and engine run at low speed for a long time, the exhaust pipe may have carbon deposition and become black, which is a normal phenomenon. It will be eliminated after a period of high-speed operation, or appropriate means should be taken to keep the engine coolant temperature within the specified temperature range.

Circuit Diagram

