CSC
MOTORCYCLES

RX6

SERVICE MANUAL

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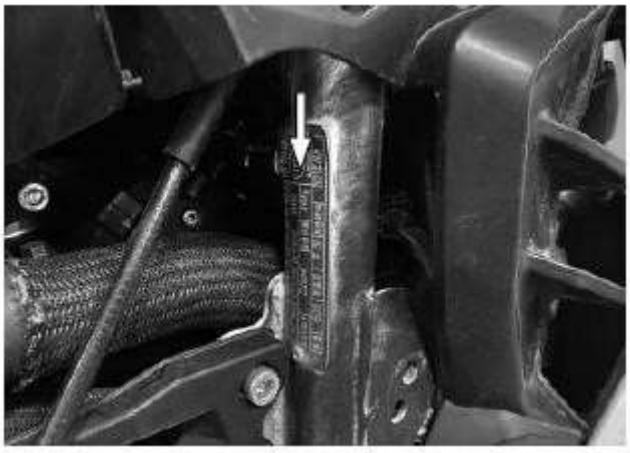
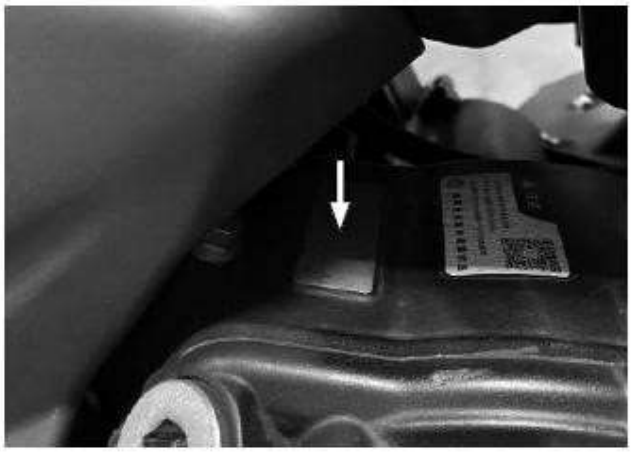
Chapter 1 Overview

Printing position of VIN number	Maintenance interval table
Maintenance precautions	Wiring diagram
Main performance technical data	Symbol description
Standard torque value	

Printing position of machine number

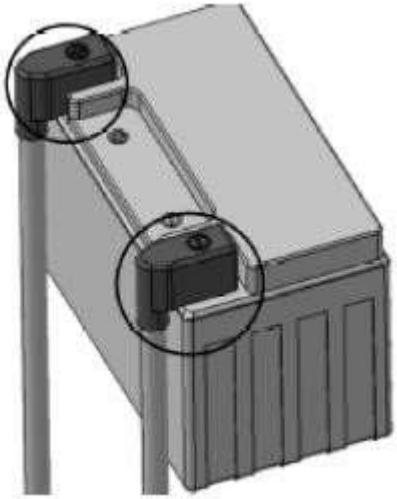
Vehicle picture:

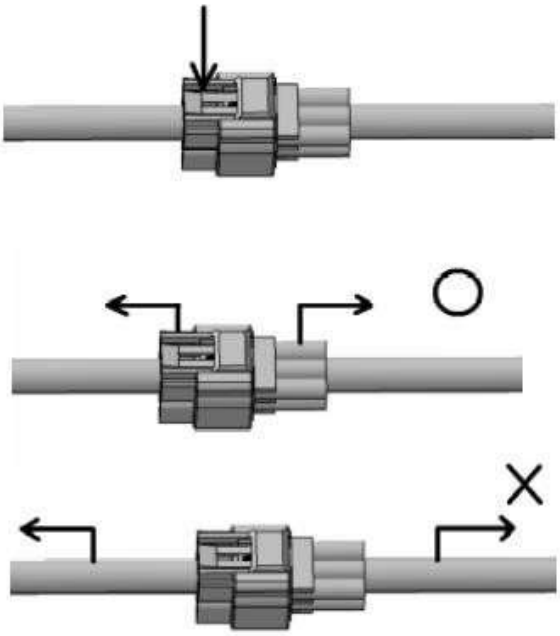
Printing position of frame number:  The frame number is engraved on the right side of the frame riser	Location of nameplate:  The frame nameplate is riveted on the right side of the frame at the front suspension of the engine.

Printing position of engine number:  The engine number is engraved above the right crankcase body	

Maintenance precautions

1. Parts, accessories, lubricating oil and other auxiliary materials produced by the company or approved and recommended by the company shall be used. If the used parts do not meet the specifications or requirements, the motorcycle may be damaged. 2. When reassembling after disassembly, new washers, seal components and cotter pins shall be replaced.	
3. Please tighten the bolts or nuts in diagonal cross sequence, and gradually tighten them in 2-3 times to reach the specified torque.	
4. After the parts are disassembled, clean them before inspection and measurement. When cleaning parts, non-combustible or high ignition point cleaning fluid shall be used. Before assembly, the sliding surface of parts shall be applied with the specified lubricating oil.	

After assembly, check whether all parts are installed correctly. Rotation, movement, and operation check are required.	
5. Special and general tools must be used in assembling and disassembling motorcycles. 6. The specified or equivalent grease (oil) must be applied or injected at the specified place. 7. When more than two people operate, pay attention to each other's safety, and work together. 8. Before operation, the negative terminal (-) of the battery must be removed, and the spanner should not touch the frame. After the operation, the connection, fixation and connection of each part shall be confirmed again. If the battery has been removed, the positive terminal (+) should be connected first.	
9. When the fuse is blown, check the cause and replace the corresponding fuse according to the specified capacity after repair.	
10. The covers shall cover the terminal after the operation.	

11. When disassembling the connector with lock, the lock must be released before operation. When disassembling the connector, hold the connector body and do not pull the wire harness. Before connecting the connector, the terminal shall not be broken or bent. Confirm that the terminal is not too long or falling off, and the connector should be fully inserted.	
12. The harness fixing belt shall be tightly fastened to the specified position of the frame. The clip shall clamp the wire harness correctly. The wire harness shall be clamped at the place that is not in contact with the part with high temperature. The wire harness shall be clamped at the place not in contact with the edge and acute corner of the vehicle body. And the wire harness shall not pass through the place where it contacts with the head and front part of bolts and screws. The wire harness should not be loosened or pulled by force. If the wire harness needs to contact with the edge and acute corner in any case, it should be protected with hose or tape at the contact part. Do not break the covering of the wire harness. If the wire harness is damaged, it should be repaired by winding with plastic tape. Do not press on the wire harness when installing parts. Do not twist the wiring harness.	13. When wiring, it should be noted that when the handle is turned left and right to the limit position. The wire bundle shall not be too tight and too loose, and it should be confirmed that there is no prominent bending, pressed phenomenon, edge interference and other phenomena. 14. When using the test table, please follow the maintenance manual after understanding the instructions in the operation manual. 15. Do not drop or throw any parts. 16. If the terminal is rusted, it shall be treated with sandpaper before connecting. 17. Cables should not be twisted or bent by force. The deformed or damaged cable is the cause of poor operation and damage.

Main performance technical data

	Items	Data
Dimensions and weight	Length × Width × Height	7.2 ft × 2.7 ft × 4.6 ft
	Wheelbase	4.75 ft
	Minimum ground clearance	6 inches
	Vehicle quality	Curb weight: 540lbs, full load: 870 lbs
Vehicle body	Frame form	Steel tube type
	Front suspension	Hydraulic spring composite shock absorber
	Rear suspension	Hydraulic spring composite center shock absorber
	Front tire size	120/70-17 M/C； 120/70-ZR17 M/C(58W)
	Rear tire size	160/60-17 M/C； 160/60-ZR17 M/C(69W)
	Front wheel pressure	Single: 36 psi, double: 36 psi
	Rear wheel pressure	Single: 36 psi, double: 36 psi
	Brake, front	Hand brake, double disc, diameter: Φ 299mm
	Rear brake	Foot brake, disc, diameter: Φ 240mm
	Fuel tank capacity	5.5 Gallons
	Fuel grade	95#
Engine	type	Double cylinder, four stroke, water cooled
	Cylinder diameter × piston stroke	82mm × 61.5mm
	Cylinder displacement	650cc
	Compression ratio	11.5:1
	Maximum net power/corresponding rotation speed	52.0KW/8500rpm
	Maximum torque/corresponding speed	62N.m/7000rpm
	Valve clearance (cold state)	IN：0.10～0.15mm，EX：0.15～0.20mm
	Valve drive mechanism	Chain drive
	Air filter element	Paper filter type
	Lubricating system	Splash lubrication plus pressure lubrication
	Type of oil pump	Rotor type
	Engine oil grade	SN-5W/40 or equivalent
	Filling quantity of oil	If replace the filter and fill oil, 2.8L; if not replace the filter and fill oil, 2.7L
	Oil filter element	Filter, replaceable
	Starting mode	Electric starting
	Idle speed	1500±150r/min
	Clutch	Manual wet multi-chip
	Clutch operating system	Manual mechanical type
	Gearshift	Constant meshing two-pole drive and six-gear speed transmission
	Primary reduction ratio	1.659
Transmission system	Gear ratio	Ⅰ 3.214
		Ⅱ 2.222
		Ⅲ 1.75
		Ⅳ 1.476
		Ⅴ 1.295
		Ⅵ 1.143
	Final reduction ratio	3.063
	Gear shift	Left foot operated shuttle

		Sequence Ⅰ－N－Ⅱ－Ⅲ－Ⅳ－Ⅴ－Ⅵ
Electric and EFI	Generator	413W / 5000r / min, 12V15 pole_ Three-phase full-wave DC
	Battery capacity	12V12Ah
	Power supply system	DC power supply
	Fuse	30A*1、25A*3、15A*3、5A*2
	Spark plug model	NGK LMAR9D-J
	Spark plug gap	0.6～0.7mm
	Anti-theft device type	Type 2 locking steering mechanism and engine (electronic direction lock)
	Fuel supply mode	EFI
	Ignition mode	Inductive discharge ignition
	Headlamp	LED 12V 35W/35W
	Steering lamp	Front: 12V1.3W rear: 12V1.3W
	Brake lamp/rear position lamp	12V0.8W/0.54W

Torque value of main standard parts

Vehicle body

Items	Quantity	Thread diameter (mm)	Torque value (N.m)
Assembly of engine front suspension	4	8	28～35
Assembly of engine rear suspension	2	10	55～65
Assembly of front shock absorber	2	8	28～32
Cap nut of connecting plate on steering column	1	24	60～70
Steering column and front shock absorber	2	10	45～55
Handlebar and clip	4	8	21～25
Front axle	1	14	75～85
Flat fork shaft	1	14	75～85
Rear axle	1	14	75～85
Cradle rear component and rear stabilizer connecting shaft	1	10	45～55
Cradle rear component and cradle front component shaft	1	12	60～70
Cradle rear component and flat fork connecting shaft	1	12	60～70
Cradle front component and frame connecting shaft	1	12	60～70
Frame and rear flat fork connection	1	14	75～85
Brake disc and hub connection	9	8	28～32
Front brake calipers and front shock absorber connection	2	10	55～65
Brake oil pipe connection	8	10	24～28

Except for the torque values of important parts listed in the above table, the torque ranges of other standard fasteners are shown in the table below

Items	Torque value (N.m)
5mm bolts and nuts	4~6
6mm bolts and nuts	8~12
8mm bolts and nuts	28~32
10mm bolts and nuts	35～45
5mm screw	4~6
6mm screw	7～11

Regular maintenance table

Inspection Cycle / Inspection Items	Mileage / Time	Initial 500 Miles / First 3 Months	Every 2,500 miles / Every 15 Months	Every 5,000 miles / Every 30 Months
Air Filter (Filter Cartridge)		–	Clean / Inspection	Replace
*Bolts and nuts of muffler		Fastening	–	Fastening
* Valve clearance (Cold-state check) In 0.1mm/ out 0.15mm		No inspection without fault		
Spark Plug		No inspection without fault		
Engine Oil		Replace	Replace	Replace
Oil Filter Element		Replace	–	Replace
Clutch Cable Adjustment		Inspection / Adjustment	Inspection / Adjustment	Inspection / Adjustment
*Throttle Body		Check	–	Check
Throttle Cable		Check	Check	Inspection / Lubrication
Idle Speed		Check	Check	Check
Fuel Evaporative Pollutant Control System		–	–	Check
* Coolant		Replace every 8,000 km or every 24 months		

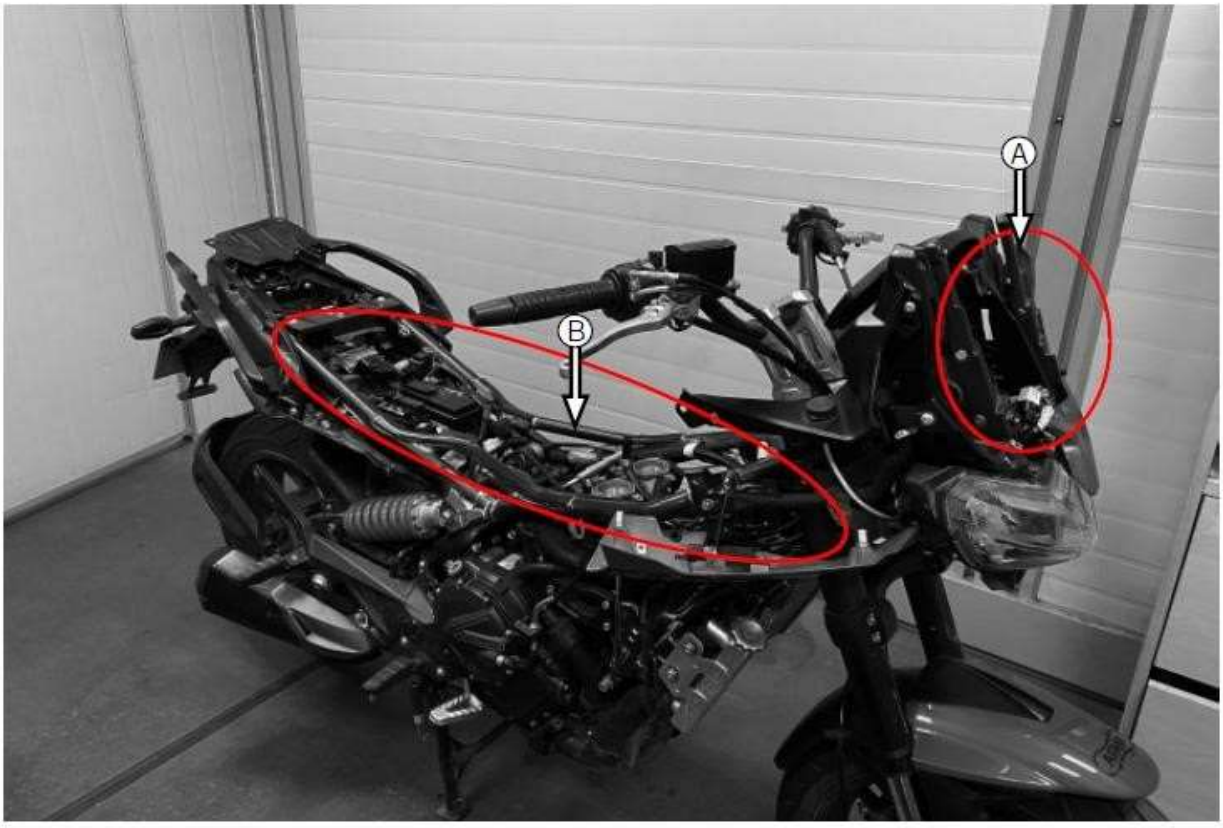
Radiator hose	–	Check	Check for replacement
Fuel pipe	–	Check	Check
Drive chain	Check	Check	Check
	Check, clean and lubricate every 1,000 km		
* Brake	Check	Check	Check
* Brake fluid hose	–	Check	Check
	Replace every 4 years		
Brake fluid	–	Check	Check
	Replace every 2 years		
Tire	–	Check	Check
* Steering mechanism	Check	–	Inspection/lubrication
* Front fork	–	–	Check
*Rear shock absorber	–	–	Check
* Bolts and nuts mounted on the vehicle body and engine	Fastening	Fastening	Fastening

Note: When checking according to the items in the table, further cleaning, lubrication, adjustment or replacement shall be carried out if necessary.

Note: When driving for a long time under bad road conditions and high-power conditions, the inspection frequency shall be increased.

Note: The items marked with "*" in the table should be handled by the qualified franchise Repair Shop.

Wiring diagram



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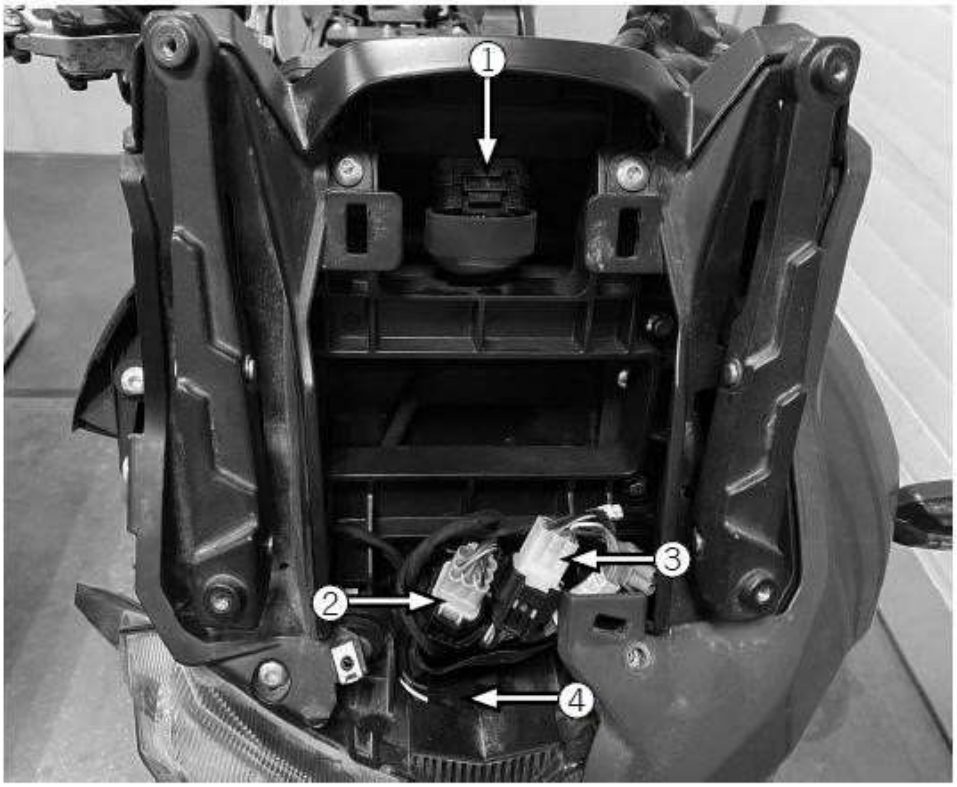
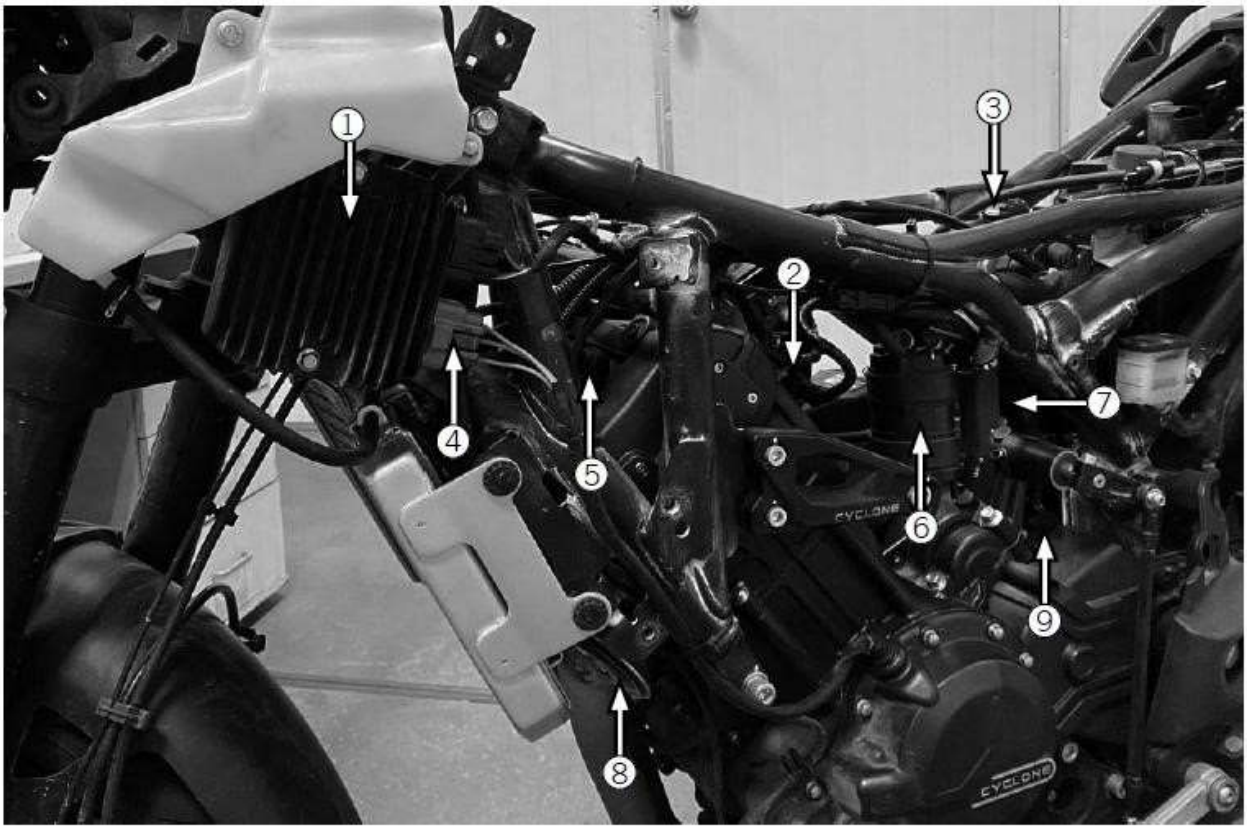
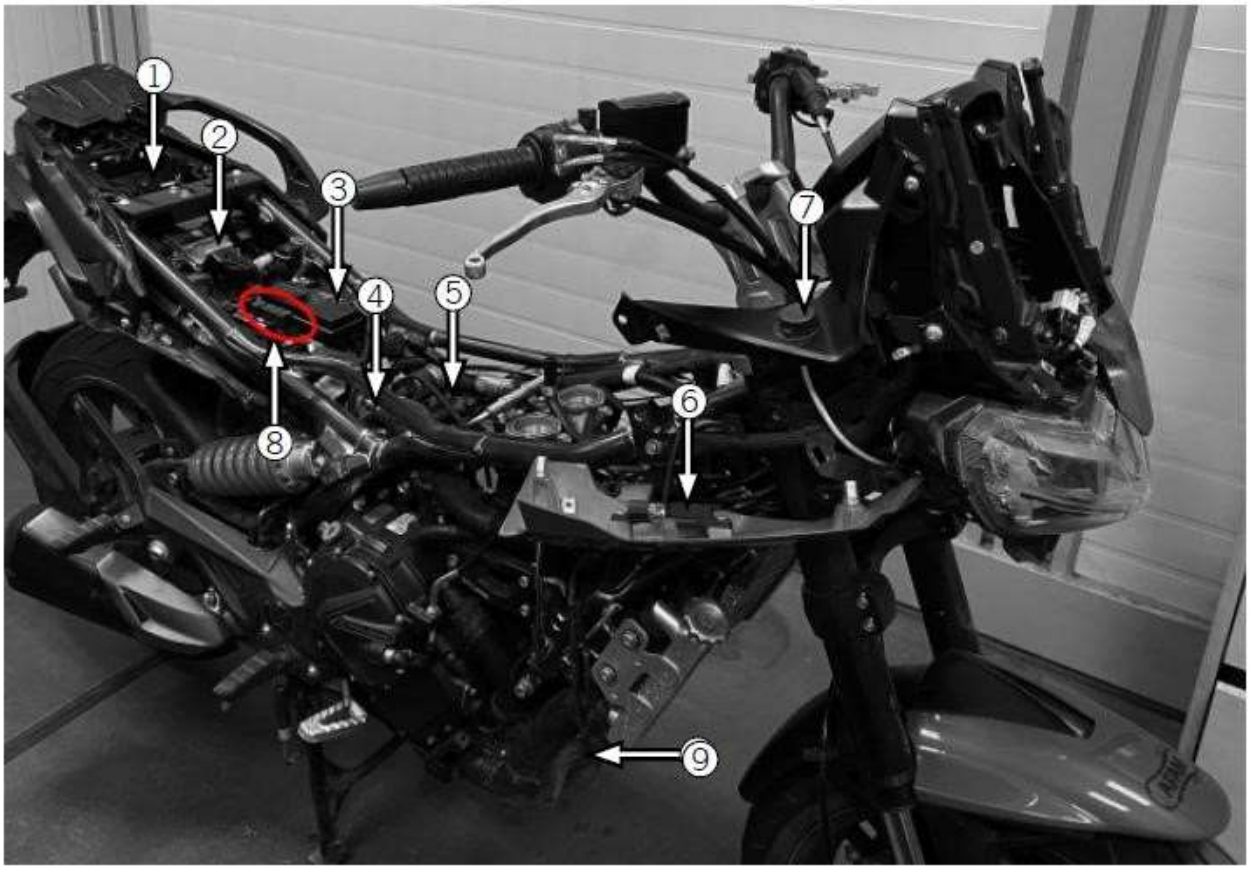


1 Instrument wiring, 2 Headlamp wiring, 3 Wheel Speed sensor wiring, 4 Front lamp wiring

Ⓑ-left



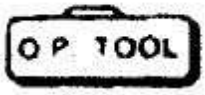
1 Voltage regulating rectifier, 2 Storage battery, 3 One button start wiring, 4 Magneto wiring, 5 Left ignition coil, 6 Carbon canister, 7 Start relay, 8 Horn, 9 Gear switch



1 Body controller, 2 ECU, 3 Battery, 4 ABS, 5 Fuel pump wiring,
6 Remote control signal receiver, 7 USB interface, 8 Relay fuse box, 9 Oxygen sensor

Symbol description

Meaning of symbols in this manual:

Graphic symbols	The meaning of graphic symbols	Graphic symbols	The meaning of graphic symbols
	Measures to be prompted during operation, inspection and maintenance.		Use general tools.
	Special instructions or disposal measures proposed to prevent certain damage to vehicles.		Specification of tightening torque: 50 N.m.
	Special instructions or measures proposed to avoid a great injury or personal injury.		Use the recommended oil.
	When reassembling after disassembly, new parts must be replaced.		Use thread locking agent.
	Use special tools.		Use lithium grease.

Chapter 2 Lubrication system

Maintenance instructions	Inspection of engine oil
Troubleshooting	Replacement of engine oil
Lubrication position of the whole vehicle	Cleaning of oil coarse filter
Lubrication of each operating line	Cleaning and replacement of oil filter
Engine lubrication system diagram	Oil pump

Maintenance instructions

This section introduces the checking and replacement methods of engine oil, as well as the cleaning methods of oil coarse filter and oil filter. Besides, it also introduces the parts of the motorcycle.

Engine oil is an important factor affecting engine performance and service life. It must be used according to regulations. It is not allowed to use common engine oil, gear oil, vegetable oil, etc.

The engine is filled with SN-5W/40 grade oil when it is sold out of the factory. When changing the engine oil, please drain the original engine oil in the crankcase, wash it with washing kerosene, and then fill it with new engine oil as required.

When checking or cleaning the machine system, the engine may not be removed, but the oil in the engine shall be drained before checking or cleaning.

Technical specifications: oil filling capacity: if replace the filter, 2.8L; if not replace the filter, 2.7L; if open the middle tank, 3.0L.

Oil pump flow: 12L / min (when engine speed is 6000 rpm).

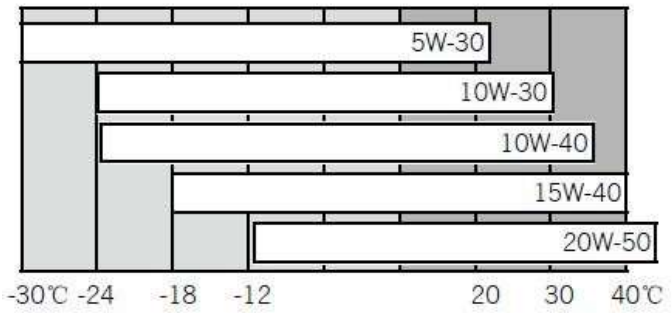
Tightening torque of oil drain screw plug: 25 ~ 30 N.m.

Warning:

If repeatedly exposed to engine oil for a long time, it may cause skin cancer. While this is unlikely unless you handle used oil every day, it is still important to be careful to wash your hands thoroughly with soap and water immediately after handling used oil. Keep children away.

Choose the viscosity according to the temperature

Low temperature performance	Fuel economy	High temperature performance	Lubricity performance at high temperature
	Low temperature start-up		Noise reduction performance at high temperature



Troubleshooting

Oil contamination 1. Failure to change the oil according to the maintenance interval table; 2. Damage to the threads of the oil injection port, poor sealing; 3. The piston ring is worn. Low oil pressure 1. The oil level is too low; 2. The oil passage, orifice or oil filter net are blocked; 3. Oil pump failure.	Excessive oil consumption 1. The engine is leaking oil; 2. The piston ring is worn; 3. The guide rods of intake and exhaust valves are worn; 4. The oil shield is worn or damaged.

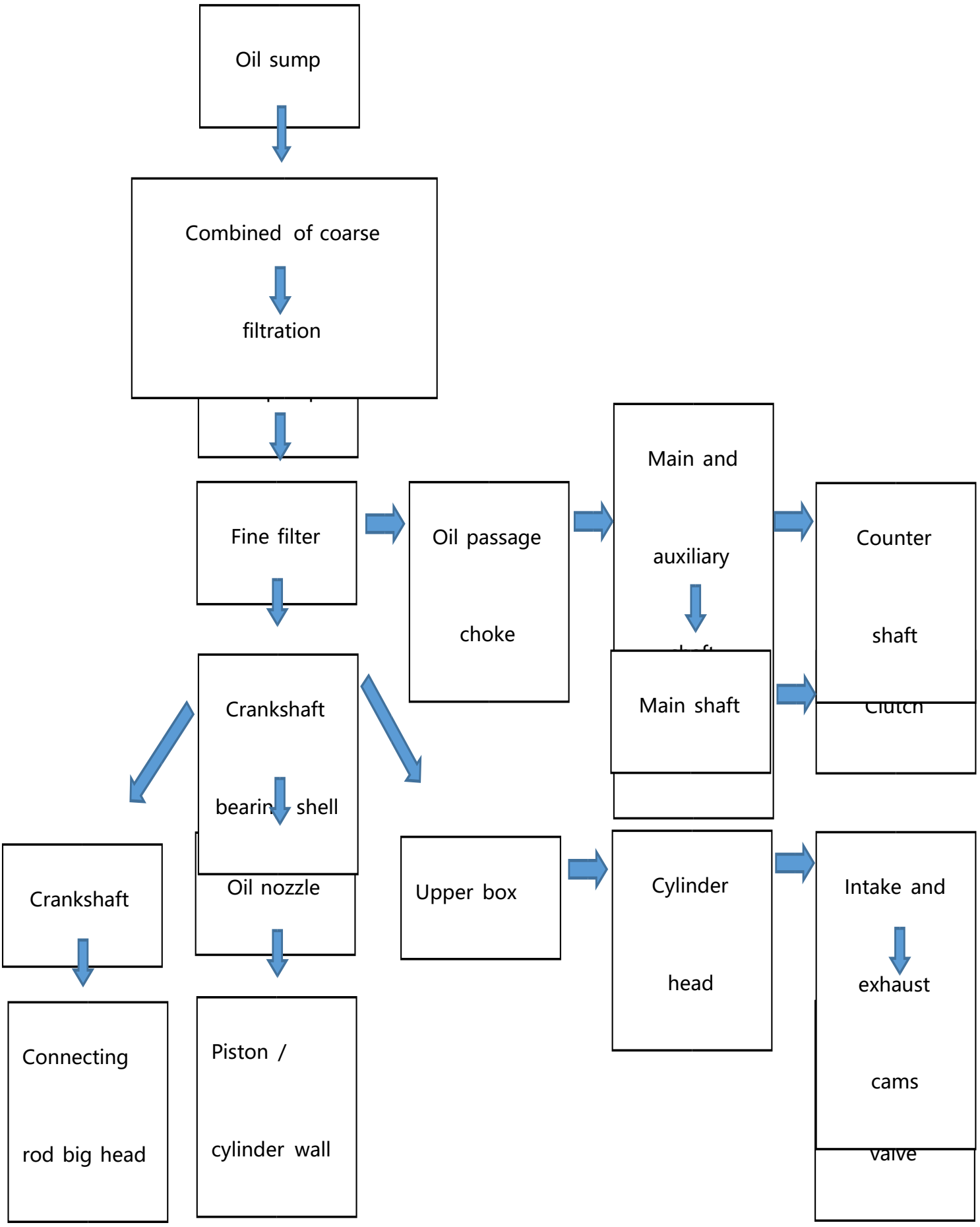
Lubrication position of the whole vehicle

Except for the positions shown in the figure above, except that the special engine oil for the chain is used for the drive chain, lithium base grease is used for other positions.
All oils not specified in this manual shall adopts common oils.
All sliding surfaces and cables not shown in this figure shall be coated with oil or grease.

Lubrication of each operating line

The clutch control line and throttle control line shall be regularly checked. The method is to remove the upper end connection of each operating line, and fully maintain the wire rope and each fulcrum with lithium base grease.

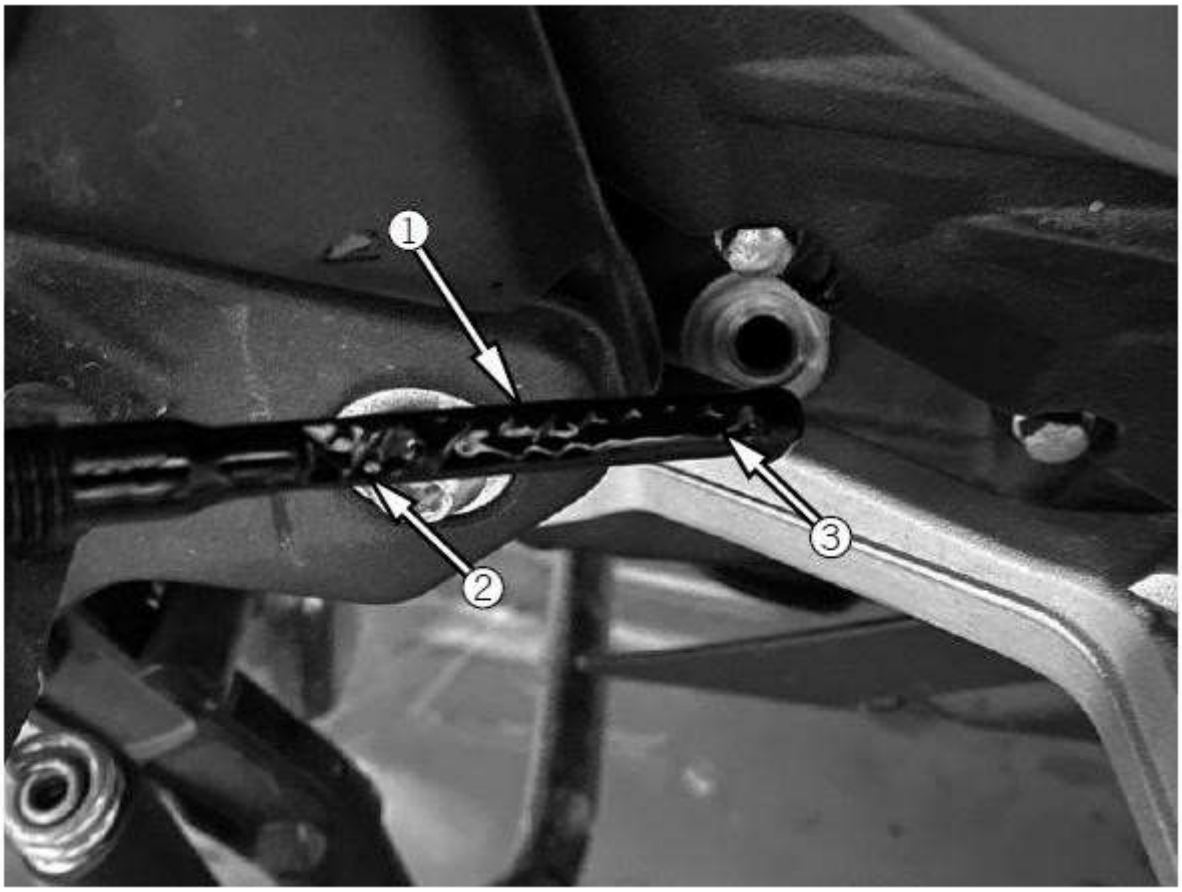
Engine lubrication system diagram



Inspection of engine oil

Support the motorcycle on a flat surface, remove the oil ruler plug, check the lower end of the ruler. If the oil level is below the lower engraved line, the recommended oil should be replenished until it is filled to the upper limit of the middle deviation.

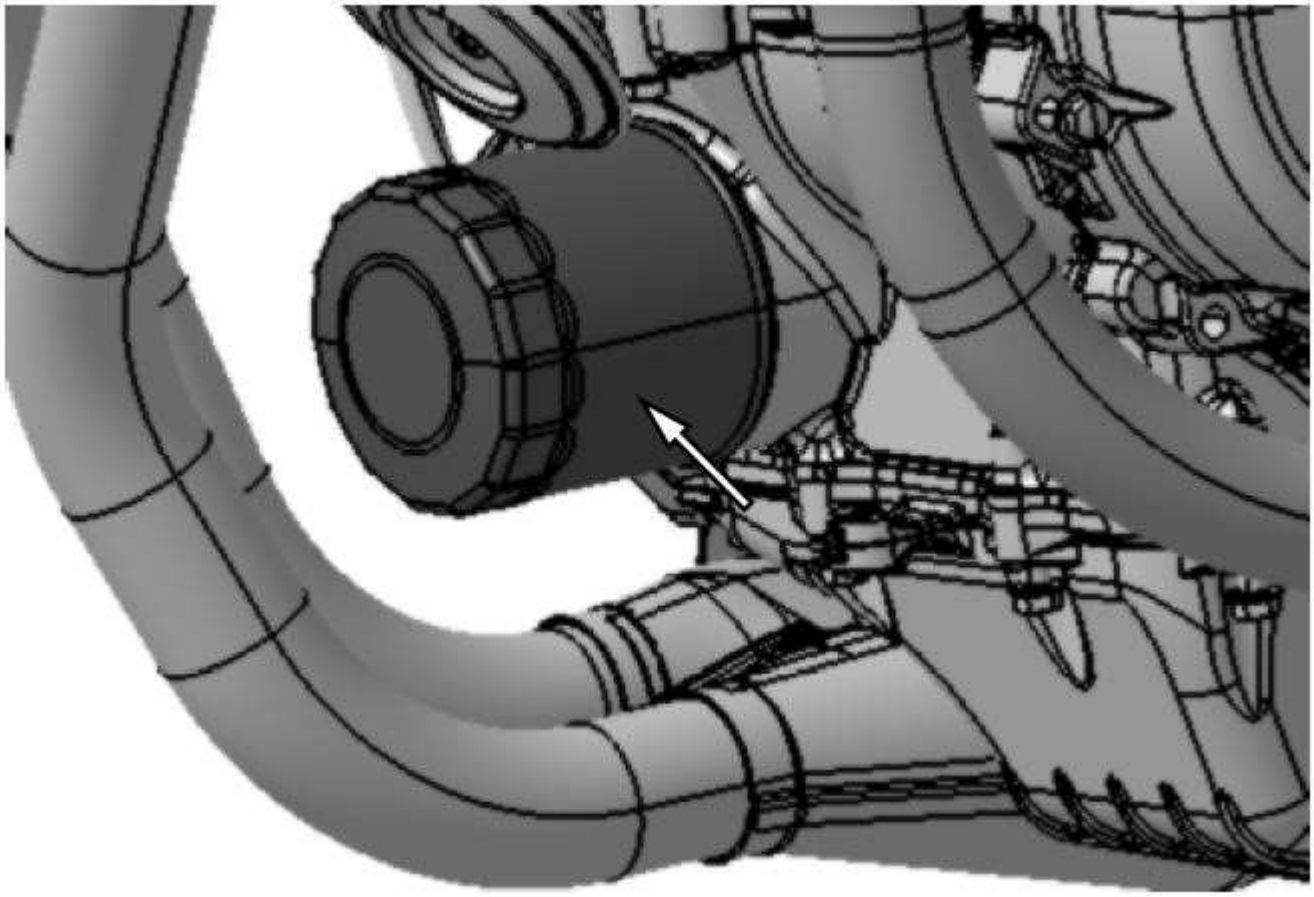
Method: remove the oil filler plug, slowly inject the oil with a funnel, and check the oil capacity in the engine with the oil dipstick until the oil level reaches the middle and upper limit of oil level gauge. Then install the oil level gauge and tighten it.



1 Oil level gauge, 2 Upper limit line of oil level gauge, 3 Lower limit line of oil level gauge

Replacement of oil filter

Remove the oil filter with a tool and replace it with a new one

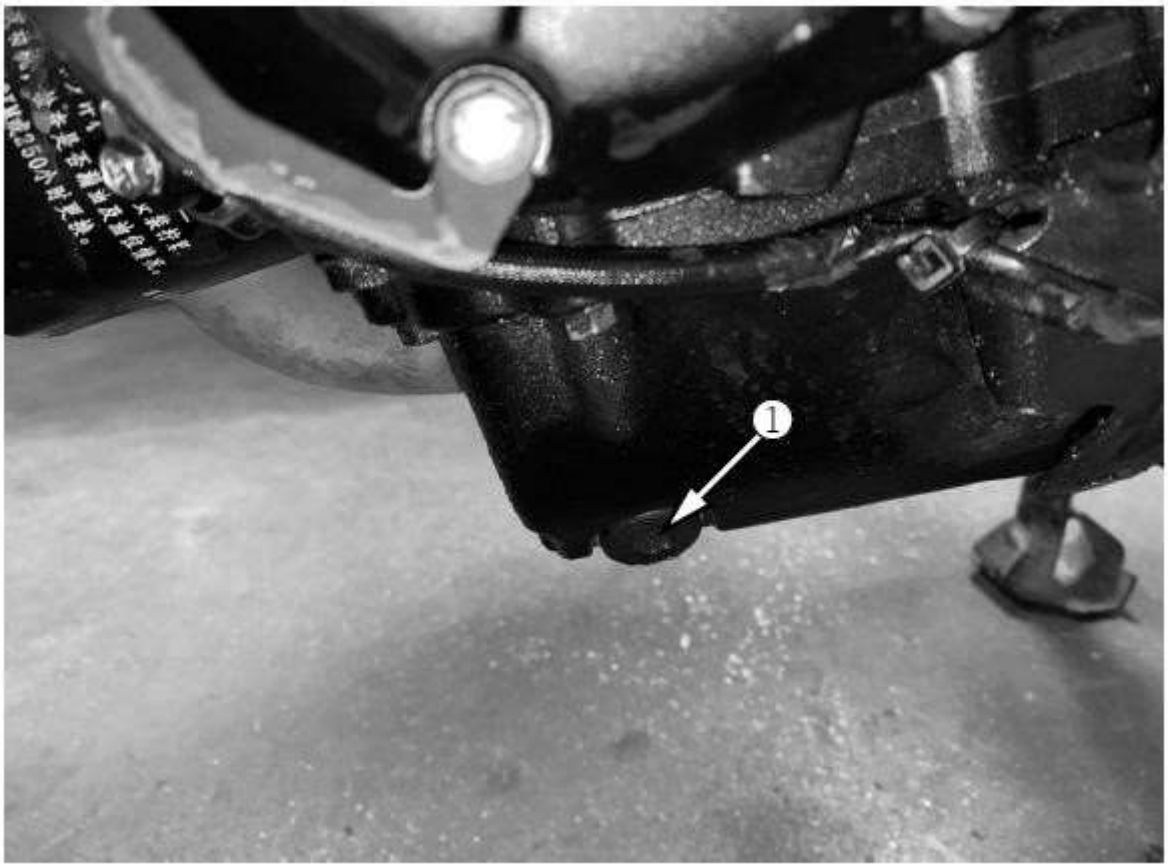


Oil filter cover

Replacement of engine oil

Oil changes should be done before the engine has cooled down. Only in this way can the oil in the crankcase be removed quickly and completely.

During replacement, open oil bolt, drain waste oil, clean oil drain bolt, replace new gasket, and then install oil drain bolt. Loosen the oil filling plug, slowly fill the new code-designated engine oil into the crankcase with funnel, and then install the oil filling plug.



1 Loosen the oil drain bolt, 2 Fill the oil

Chapter 3 Inspection and adjustment

Maintenance instructions	Idle speed
Spark plug	Braking system
Timing phase	Running system
Lubricating oil	Clutch operating line
Coolant	Drive chain
Cylinder pressure	Battery
Timing chain tension	Headlight dimming
Valve clearance	Riser steering bearing
Air filter and oil collector	Suspension system
Throttle control	Bolts, nuts and fasteners

Maintenance instructions

This section introduces the checking and adjustment of various parts of SR650 two wheeled motorcycle. The technical requirements for checking and adjustment are also introduced.

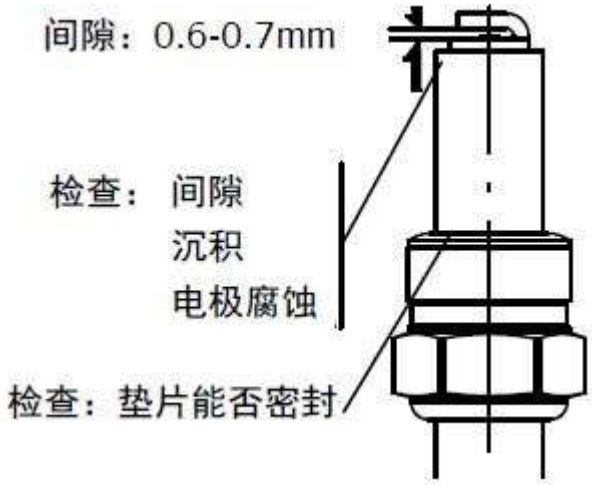

Notes:

Unless otherwise specified or indicated in the maintenance interval table, inspect and adjust all parts of the SR650 two-wheeled motorcycle in accordance with this section before you use the motorcycle.

Technical specifications	Vehicle Body
Engine Spark plug NGK LMAR9D-J The spark plug gap is 0.6～0.7mm Valve clearance (cold state) IN: 0.1 ～ 0.15, EX：0.15～0.20 Idle speed 1500r/ min ± 150r/ min Cylinder pressure ≥0.6MPa/300rpm	The free stroke of throttle handle is 2-6 mm The free stroke of clutch handle is 10-20 mm The free stroke of front brake handle is 5-10 mm The free stroke of the rear brake pedal is 10 ~ 15mm The tension of drive chain is 15-25 mm Tire pressure front wheel Single: 36 psi, double: 36 psi Rear wheel Single: 36 psi, double: 36 psi Tire size Front wheel 120 / 70-17 M / C; 120/70-ZR17 M/C(58W) Rear wheel 160 / 60-17 M / C; 160/60-ZR17 M/C(69W)

Spark plug

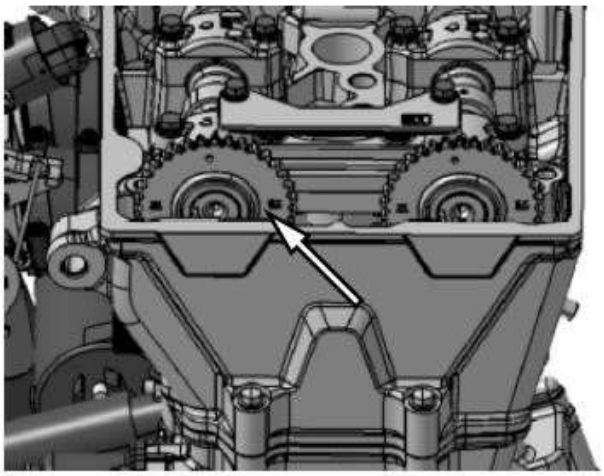
Remove spark plug cap Remove the spark plug with socket wrench. Check whether the spark plug insulator is damaged and whether the electrode is ablated. If it is damaged, replace it.
Check the electrode clearance with a feeler gauge. The electrode clearance of spark plug is 0.7 ~ 0.8 mm. Adjust the clearance carefully. Then use spark plug cleaner or steel wire to remove carbon and dirt. Check whether the spark plug gasket is in good condition.
To install the spark plug, first screw the spark plug in and tighten it by hand, and then tighten it by socket wrench. Put on the spark plug cap.



Clearance: 0.6～0.7mm
Inspection: clearance
Deposition
Electrode corrosion
Check whether the gasket is sealed

Timing phase

It is carried out in a new car or when the timing phase is suspected.
Remove the left front cover, rotate the rotor fastening bolt clockwise to make the "I" mark on the rotor align with the closing box when it is on the right side, and remove the cylinder head cover to see if it is in the timing position (as shown in the figure).



Coolant

Support the motorcycle on the flat ground with a special fixture, loosen the bolts on the lower side of the water pump to see if there is coolant overflow. Tighten the bolts after inspection.

Lubricating oil Support the motorcycle on the flat ground so that the engine is in a horizontal position without tilting left and right. Take out the oil dipstick plug and check whether the oil level at the lower end of the oil dipstick is between the upper and lower score lines. When the engine oil is too little, it shall be replenished in time.	Check whether the coolant in the accumulator is between the upper and lower marking lines. If it is too little, replenish it in time.

Replenish method: pull off the filler cap of the accumulator, and use the funnel to guide the coolant slowly until the coolant level is at the upper limit of the middle part. Then cover the water filler cap.

1 Accumulator, 2 Radiator water inlet

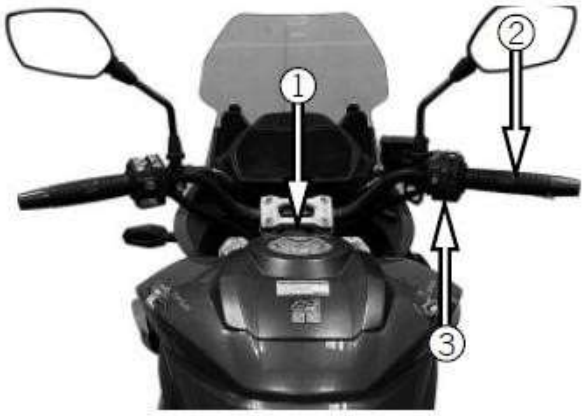
Cylinder pressure

When the engine can't be started or it is difficult to start, other faults have been eliminated. When it is suspected that the cylinder pressure is abnormal, check the cylinder pressure.

Cylinder pressure: ≥ 0.6 mpa/ 300 rpm.

During the test, remove the spark plug, install the pressure gauge at the installation place of the spark plug, fully open the throttle handle, start the engine by electricity, and check whether there is air leakage at each connection part of the pressure gauge. Set the pressure gauge to zero and start the engine again until the pressure gauge stops rising. The maximum indication of the pressure gauge is usually reached after 1-2 starts. The maximum indication is the cylinder pressure.

Install the spark plug back to its original position after the test.

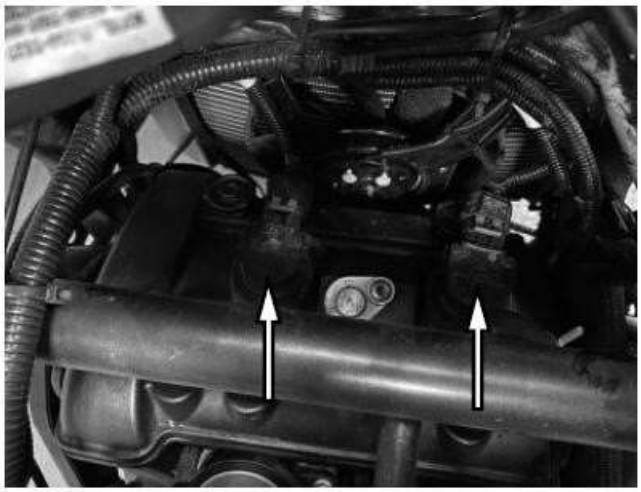


1 Turn the key clockwise, 2 Fully open the throttle handle, 3 Press the electric start button

In the added coolant, the proportion of antifreeze and pure water should always be kept at half. Do not only add antifreeze or pure water.

A funnel should be used when refilling to prevent the coolant from flowing out. Also check the water pipe of the accumulator for leakage or damage, if it is leaking or damaged, replace it.

If the accumulator is empty, check the coolant level of the radiator. Turn the radiator cap counterclockwise to see if the coolant level reaches the bottom of the neck of the radiator injection port. If not, add coolant.

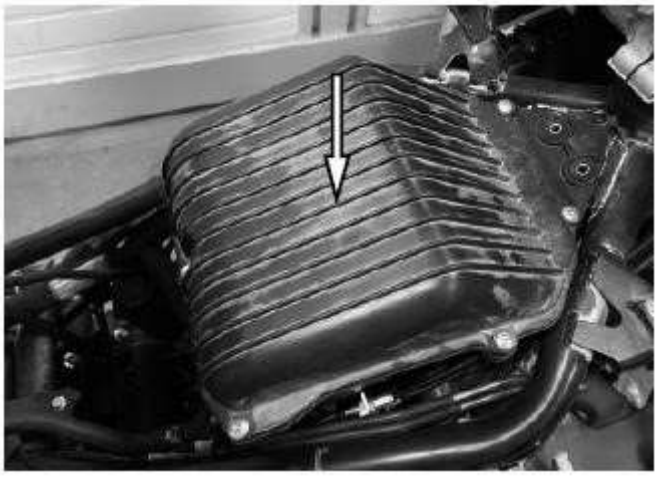


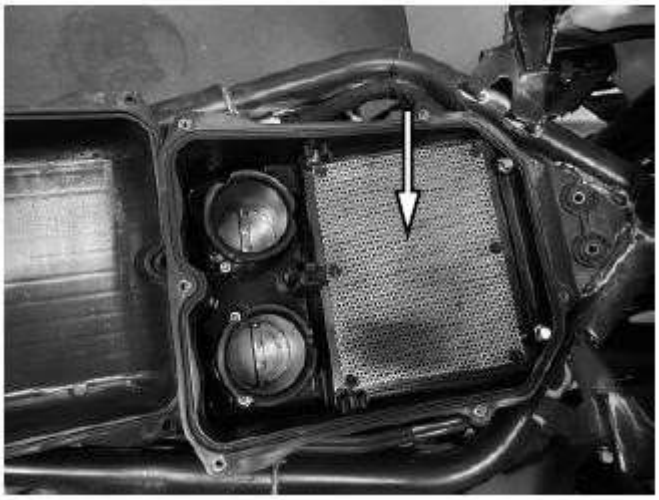
Remove the spark plug and test the cylinder pressure

Warning: Before opening the radiator cap, make sure that the engine and radiator are completely cooled, otherwise it may cause the coolant to spray out and cause serious scald.	The main reasons for low cylinder pressure are as follows: Incorrect valve clearance adjustment Valve leakage Cylinder head seal washer ablation The piston ring or cylinder is worn The piston is worn The main reasons for high compression force are as follows: There is carbon deposit on the top of combustor or piston

Air filter element

Cleaning and replacement of air filter element

1. Open and remove the seat cushion with the key and remove the fuel tank. 2. Loosen the fastening screws of the air filter housing.  Loosen air cleaner cover	
3. Remove the air filter cover and air filter element	



Notes:

1. Remove the filter element and check whether the filter element is normal. The filter element is a paper filter element, and the dirt on the surface can be cleaned by compressed air; If the filter element is too dirty, broken or damaged, it shall be replaced;

2. When driving in dusty areas, the cycle of cleaning and replacing the air filter element shall be shortened;

3. Keeping the air filter clean can improve the working efficiency of the engine and prolong the service life of the engine.

After cleaning or replacing the filter element, assemble the whole vehicle in reverse order.

Throttle control

First, check whether the throttle operating line is deformed, kinked or damaged.
Then measure the free stroke of the throttle handle. Turn the handle to one side of the free stroke, draw a straight line between the handle and the counterweight with a marker pen, then turn the handle to the other side of the free stroke, and measure the distance of the straight-line staggering, which is the free stroke of the throttle handle.
The free stroke is 2-6 mm.

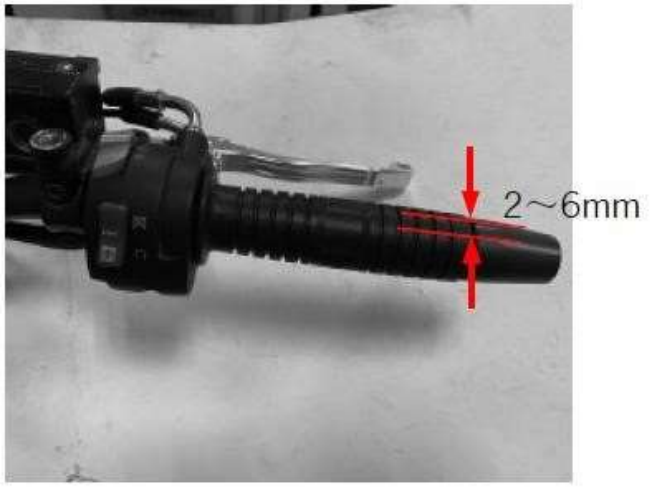
Idle speed

Note:

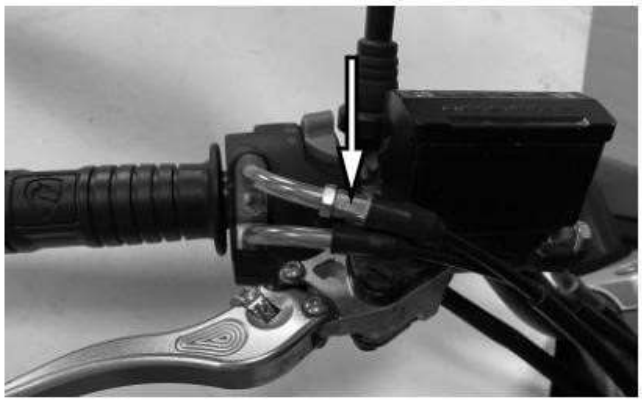
After other items of the engine have been adjusted to the specified range, check and adjust the idle speed.

The idle speed of the car is controlled by ECU. The idle air flow of throttle body has been adjusted at the factory. Therefore, do not adjust the idle speed adjusting screw. When the idle speed is unstable, there is no idle speed or the idle speed is too high, please find out the cause of the fault according to the

	troubleshooting method of EMS system and remove the fault.

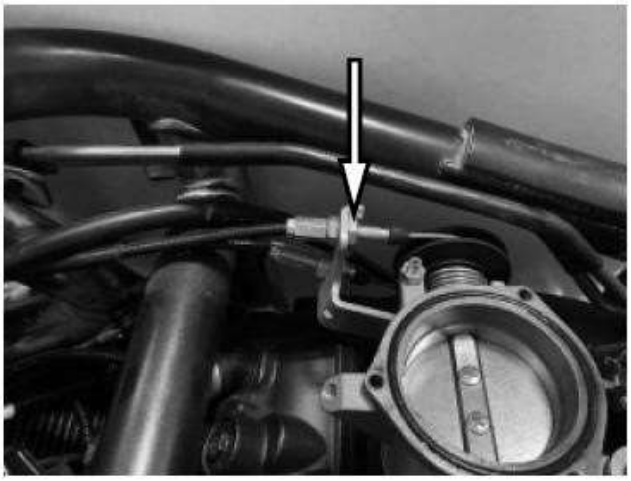
	**Idle speed 1500r/ min ± 150r/ min**。

If the free stroke is not enough or too large, it shall be adjusted. Adjustment method:
Fine adjustment: Pull to open the protective rubber sleeve, loosen the lock nut A, and turn the adjusting screw to adjust to a suitable free stroke. Then tighten the lock nut A and install the protective rubber sleeve.



Lock nut A

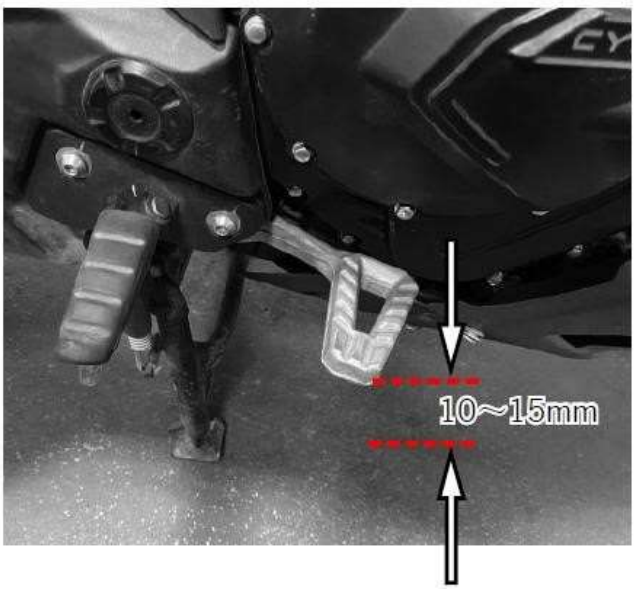
Rough adjustment: If the fine adjustment cannot be in place, separate the throttle control line from the throttle body, loosen the lock nut B, and adjust the larger stroke range. After adjustment, tighten the lock nut B.
Check whether the throttle can rotate smoothly from full open to full close in any position. If there is hysteresis, adjust or replace it.



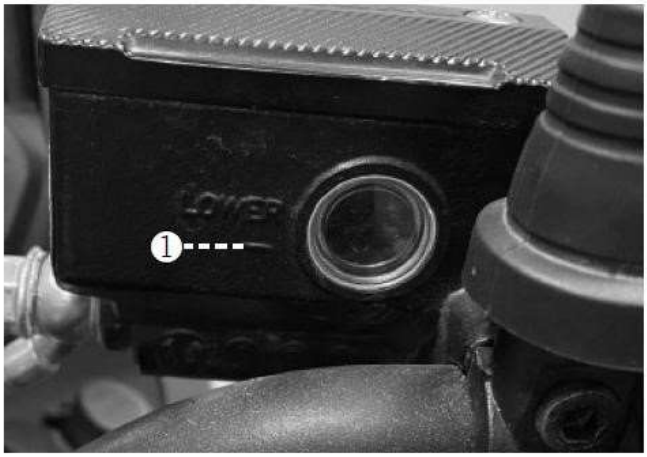
Lock nut B

Check the free stroke of the front brake handle.
The free stroke of the brake handle is 5-10 mm.

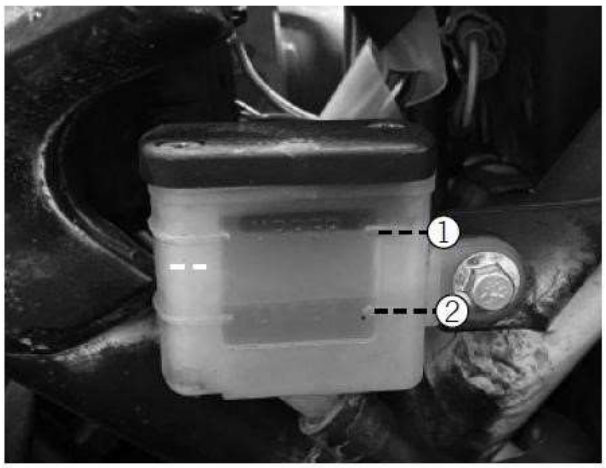
Check the free stroke of the rear brake pedal.
The free stroke of the rear brake pedal is 10-15 mm.
If adjustment is needed, turn the adjusting nut to reach the specified free stroke position.



Inspection of brake fluid level:
Check the brake fluid level in the front brake cylinder. If the level is too low but not completely empty, replenish the brake fluid directly. The specification of replenishing brake fluid is DOT 4.



1 Lower engraved line



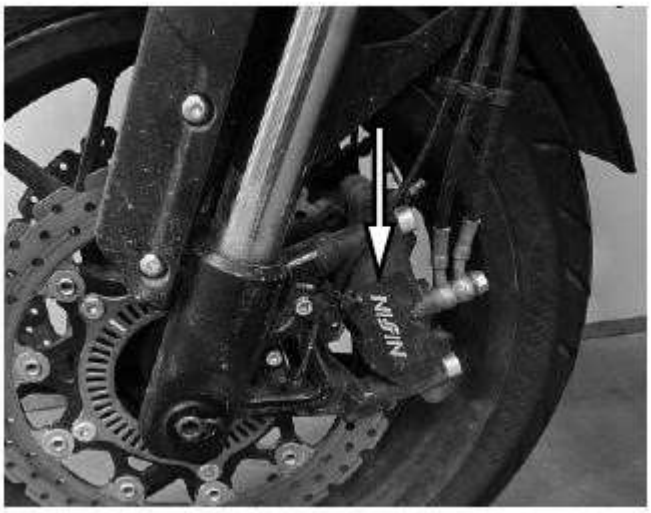
1 Lower limit line, 2 Lower limit line

If it is found that the brake fluid in the cylinder is turbid, with impurities or peculiar smell, the brake fluid should be drained and refilled. Refer to the vacuum filling method of brake fluid in the next section.
If the brake fluid in the front and rear brake cylinders is exhausted, use a vacuum pump to pump air at the brake caliper body bleeder nozzle, and then fill the cylinder.
Refer to the vacuum filling method of brake fluid in the next section.

Vacuum filling method of brake fluid:

This method is applicable to the filling of brake fluid in a new car or when the brake fluid in the brake cylinder is exhausted.

1、 Use a vacuum pump to pump air at the brake caliper body bleeder nozzle.



Front brake caliper body

3. Operate the brake handle or pedal to remove the residual air of the brake caliper.

4. When the vacuum pump has completely eliminated the air in the brake caliper and the brake fluid, squeeze the handle or step on the pedal tightly, and quickly tighten the vent nozzle bolt. The tightening torque range is between 7 ~ 9 N.m. 5. Install the brake cylinder cover. The gasket should be flat during installation. If necessary, replace it with a new one.

6. After filling, check the oil cup, hydraulic brake hose and all connecting parts for oil leakage.

Note:

1. The brand of brake fluid is DOT4 non petroleum base brake fluid.

2. The brake fluid shall not be mixed with other impurities, otherwise chemical changes will occur and the braking performance will be reduced.

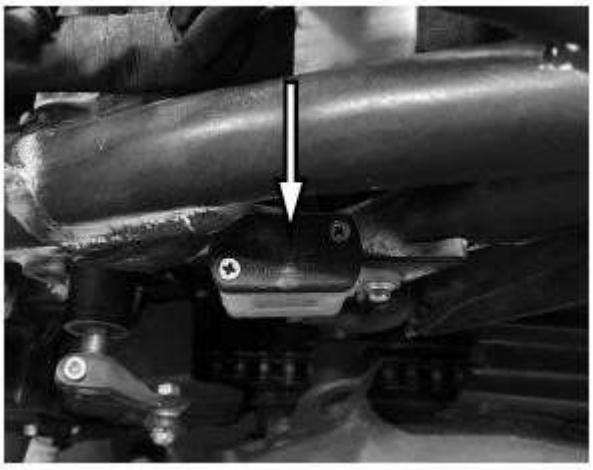
Rear brake caliper body

Warning:

The brake fluid is highly corrosive and shall not be splashed on the surface of painting parts or plastic parts; In case of contact with eyes or skin, rinse immediately with plenty of water and consult a doctor

2、 Open the brake cylinder cover and fill brake fluid.

Front brake cylinder cover



Rear brake cylinder cover

Size and pressure of tire	Clutch operating line
Check the tire pressure with a tire pressure gauge	Check the free stroke of the clutch handle.

to see if it meets the recommended tire pressure requirements.

Note:

Check the tire pressure when the tire is at the normal temperature.

Tire size and recommended tire pressure

Tire size	Front tire		Rear tire	
	120/70-17		160/60-17	
Cold tire pressure	Single		Double	
	Front tire	Rear tire	Front tire	Rear tire
	36 psi	36 psi	36 psi	36 psi

If the tire pressure does not meet the specified requirements, check the tire for cuts, embedded nails or other sharp objects.

Free stroke of clutch control handle: 10-20 mm.

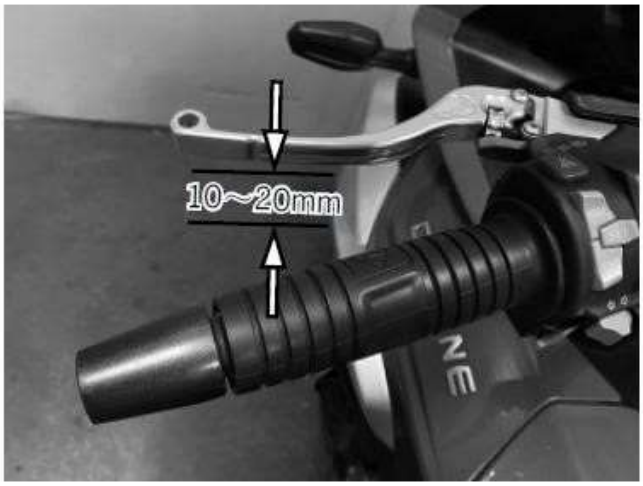
Adjustment method:
Fine adjustment: Pull to open the protective rubber sleeve, loosen the lock nut, and turn the adjusting screw to adjust to a suitable free stroke. Then tighten the lock nut and install the protective rubber sleeve.

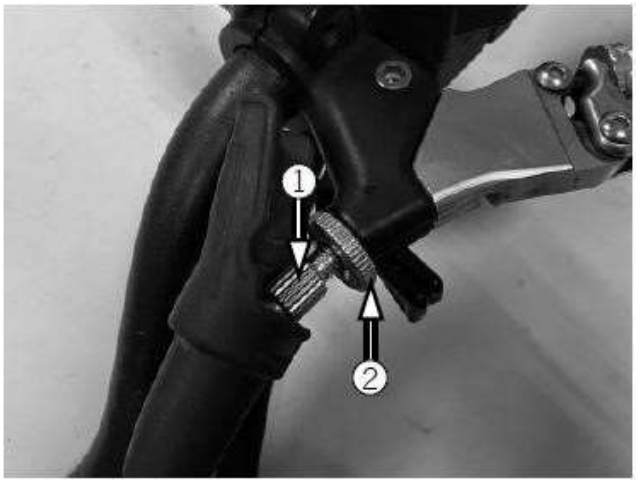
If the fine adjustment can not achieve suitable free stroke, the clutch operating line at the handle end must be removed to adjust the engine end.

Rough adjustment: First remove the clutch operation line at the handle end, then remove the clutch control arm at the engine end, rotate the clutch control arm to a suitable angle, then install it, install the clutch operation line, and finally adjust it to a suitable free stroke according to the fine adjustment method.

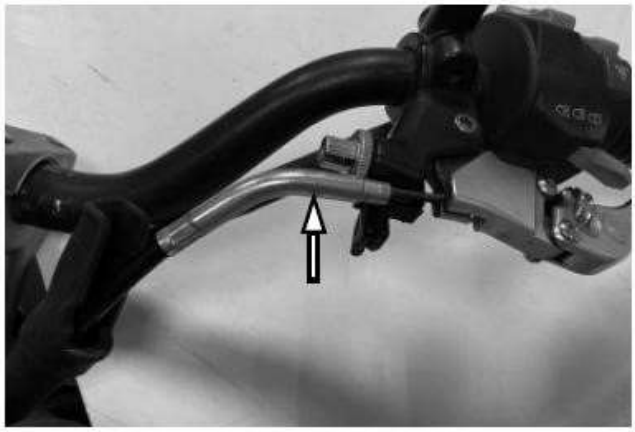
Note:

It is necessary to ensure that the clutch handle has suitable free stroke! If it is too loose, it may cause the clutch not to be disengaged; If it is too tight, it may cause poor engagement of clutch and damage clutch easily.



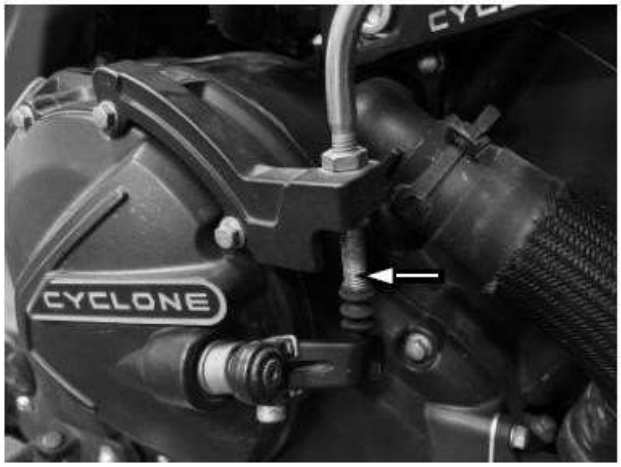


1 Adjusting coil, 2 Lock nut



Remove the clutch operating line

Chain adjuster adjusting bolt



Adjust clutch operating line

Note:

The marking on the chain adjusters on both sides must be consistent.

Warning:

The rear axle nut must be tightened with a tightening torque of 75~85 N.m.

Drive chain

Inspection of drive chain tension

Support the motorcycle on the flat ground with the side bracket and set the transmission in the neutral position. Check the tension of the drive chain. The method is to press the chain up and down with your fingers to check the up and down movement of the chain below.

Sag of transmission chain: 15 ~ 25 mm.

If the chain is too loose or too tight, it needs to be adjusted.

Adjustment method:

Loosen the rear shaft nut, turn the adjusting nut on the chain adjuster, tighten the rear shaft nut after reaching the specified chain tension, and check the free rotation flexibility of the rear wheel and the consistency of the front and rear wheels.

Rear axle nut

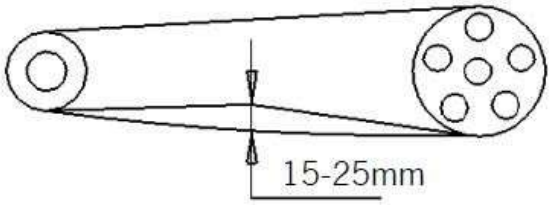
Cleaning and inspection of chain

Clean the drive chain with cleaning fluid to remove dust and soil, and then air dry to check whether the chain is worn or broken. If it is damaged, replace the chain. Then install the chain and apply the special lubricant for the chain;

Check the worn condition of large and small chain wheels. If the gears are seriously worn, missing or broken, they should be replaced

Note:

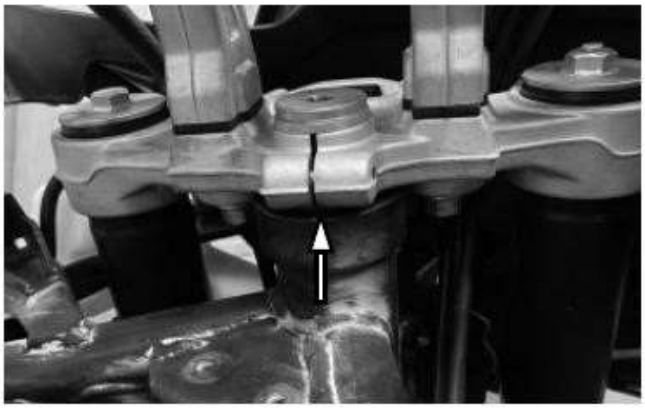
Apply proper amount of chain special lubricating oil on the connecting shaft of lock plate.

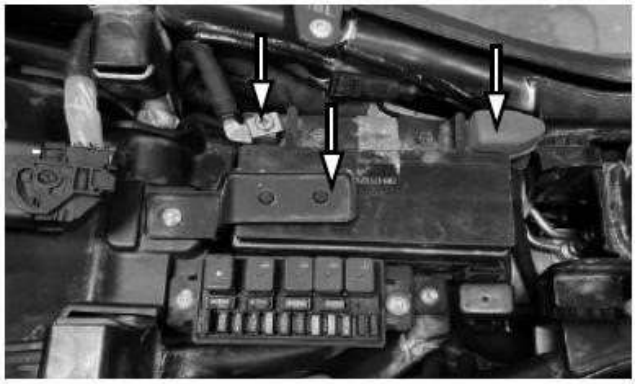


Sagging degree

Battery

Disassembly of battery First remove the seat cushion, remove the left cover, remove the negative pole of the battery first, then the positive pole, and remove the battery	**Riser steering bearing** Support the motorcycle with a jack or other bracket to make the front wheel off the ground, and check whether the steering handle can rotate freely.

strap, then you can take out the battery. Clean the positive and negative pole of the battery and the external surface of the battery. **Installation of battery** Install in reverse order. When connecting the electrode wire, the positive pole must be connected first. **Note:** **The starting and EMS system of the car completely rely on the battery power supply, so it is very important to keep the battery fully charged, otherwise it cannot be started.**	If the steering handle cannot rotate freely, and there is axial movement or stagnation, adjust the adjusting nut of the front fork riser.  Support the front wheel
 Remove the seat cushion	 Front fork riser adjusting nut



Remove the electrode wire and binder plate

Suspension system

Front suspension

Put the front brake in the braking state and press the front fork several times to check whether the front suspension works normally.

In case of abnormal noise or "click" sound, all fasteners shall be checked and tightened according to the specified torque value.

Rear suspension

Press the rear of the seat cushion firmly to check whether the rear fork sleeve is worn or damaged. If it is damaged, replace it. Check whether the whole suspension assembly is firmly installed and whether it is damaged or deformed.

Bolts, nuts and fasteners

All bolts, nuts and fasteners should be tightened according to the interval table. Check all split pins, safety clamps and locks.

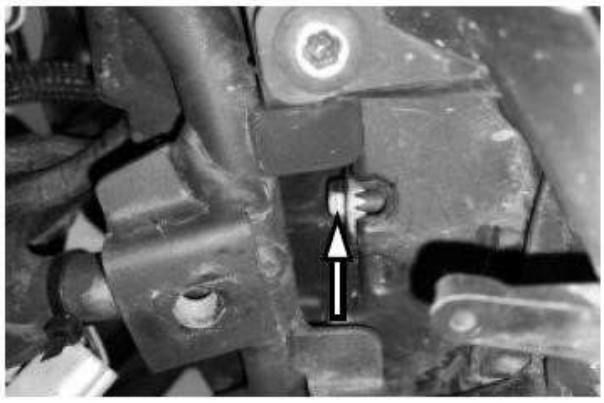
Headlight dimming

Check the direction of headlight before driving.

The headlamp can be adjusted vertically.

Adjustment method:

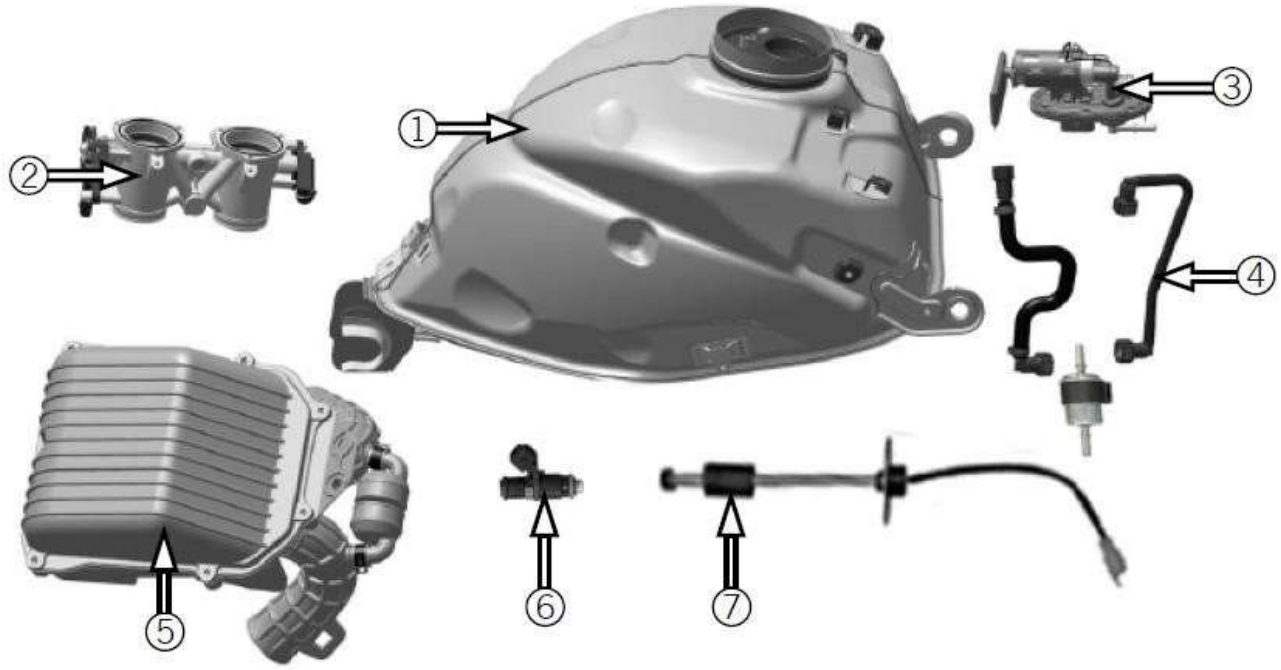
Use a cross screwdriver to rotate clockwise to adjust the light height upward, otherwise, adjust the light height downward to a height you want.



Headlamp height adjustment bolt

Fuel system

This section describes the knowledge of the fuel system.



1 Fuel tank, 2 Throttle body, 3 Fuel pump, 4 High pressure oil pipe, 5 Air filter, 6 Fuel injector, 7 Fuel sensor

Maintenance instructions	Replacement of fuel filter
Troubleshooting	Disassembly and installation of air filter
Disassembly and installation of fuel tank	Removal and installation of throttle body
Disassembly and assembly of fuel tank	

Warning:

Pay great attention to fire prevention when handling gasoline!

When disassembling the components of the fuel system, pay attention to the installation position of the seal Components. When reassembling, be sure to use a new seal Components. Do not disassemble the throttle body (the fuel injector can be removed).

Technical specifications

Throat diameter is equal to Φ31mm.

Idle speed 1500r/min±150 r/min

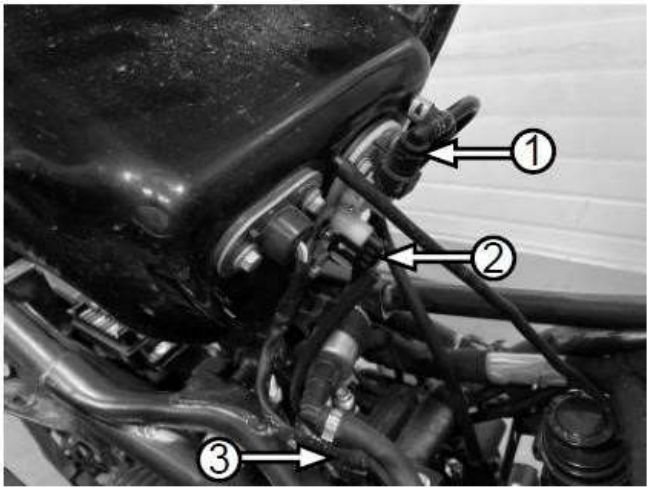
The free stroke of throttle handle is 2 ～ 6mm

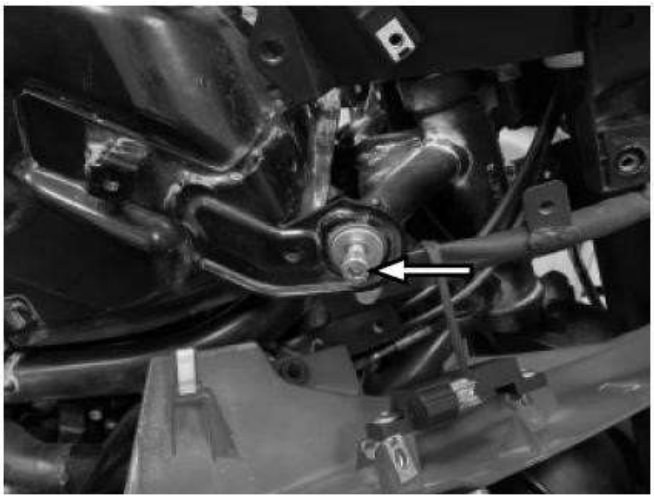
Troubleshooting

The engine can be ignited but cannot be started 1. There is no fuel in the fuel tank or there is too little fuel in the fuel tank; 2. Too much fuel entering the cylinder; 3. The air filter is blocked; 4. The spark plug is off; 5. The flow of fuel pipe is not smooth;	6. Fuel quality (containing moisture); 7. The fuel oil is stored too long; 8. Fuel switch failure; 9. Fuel filter failure (blockage).

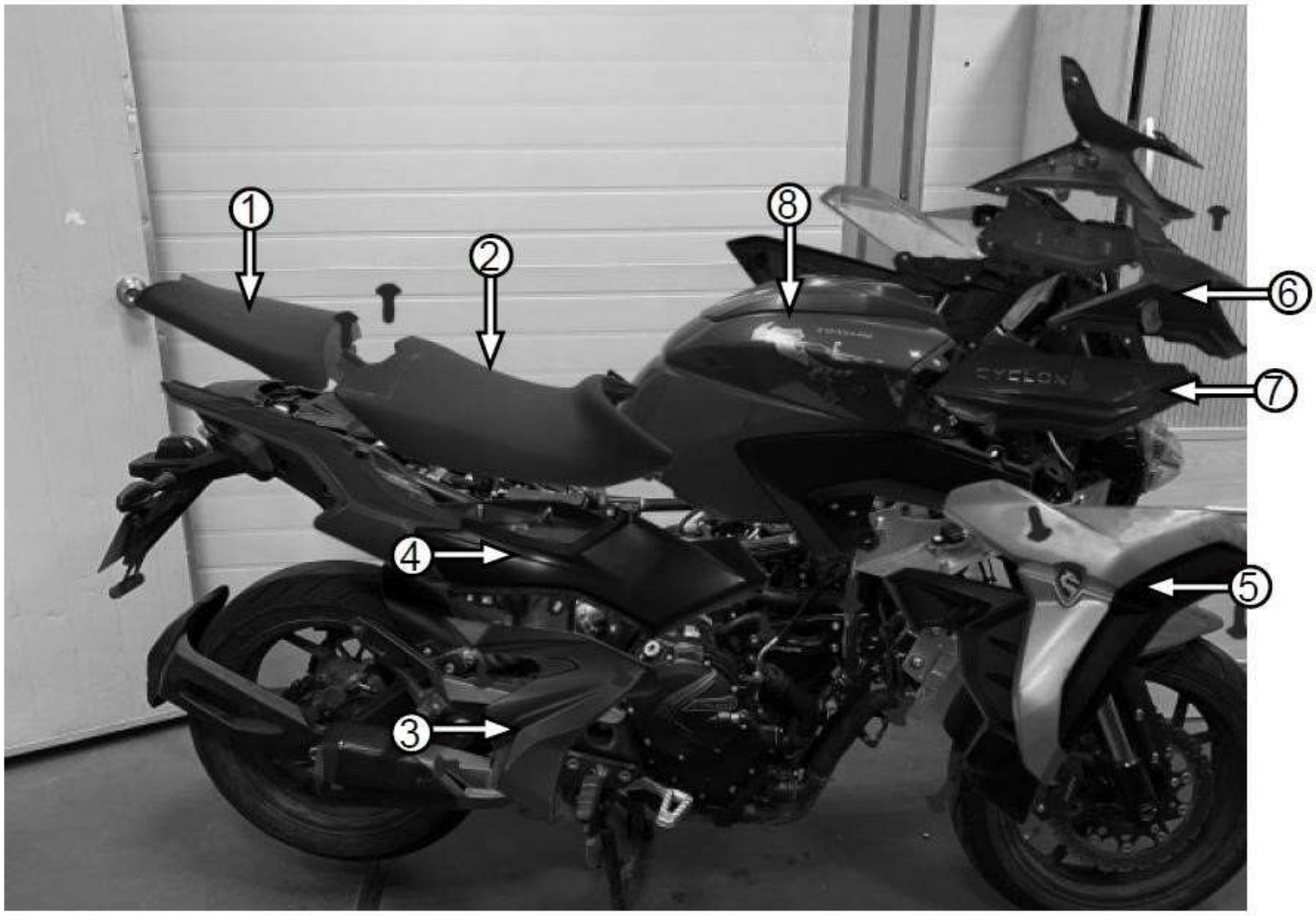
Disassembly and installation of fuel tank

Disassembly steps:

1、 Remove the seat cushion (open the rear seat cushion with the key, remove the seat cushion, and remove the two fixing bolts M6 of the front seat cushion × 20. Take out the front seat cushion).  	4. Remove the fuel pipe ①. ② Remove the fuel pump connector. Remove the connector of the fuel sensor③. 

2、 Remove 4 M6 × 12 bolts from the side cover and fuel tank trim cover assembly, 8 M6 × 16 connecting bolts, 12 M5 × 12 connecting bolts. 	5、 Remove the fuel tank  Remove the fuel tank
3、 Remove 1 M8×25 fixing bolt from the left and right of the oil tank assembly.	In order to avoid the contamination of the fuel delivery pipeline, the joint shall be sealed with adhesive tape after the fuel pipe is pulled out. When disassembling the fuel tank, the fuel tank is not stable. It is recommended that two people help to disassemble the fuel tank.
	**Installation procedures:** The installation procedures of the fuel tank is reverse to the disassembly procedures. During installation, pay attention to the routing of fuel pipe control line, and strictly follow the wiring diagram. Pay attention to avoid fuel pipeline pollution.

Disassembly / installation of fuel tank



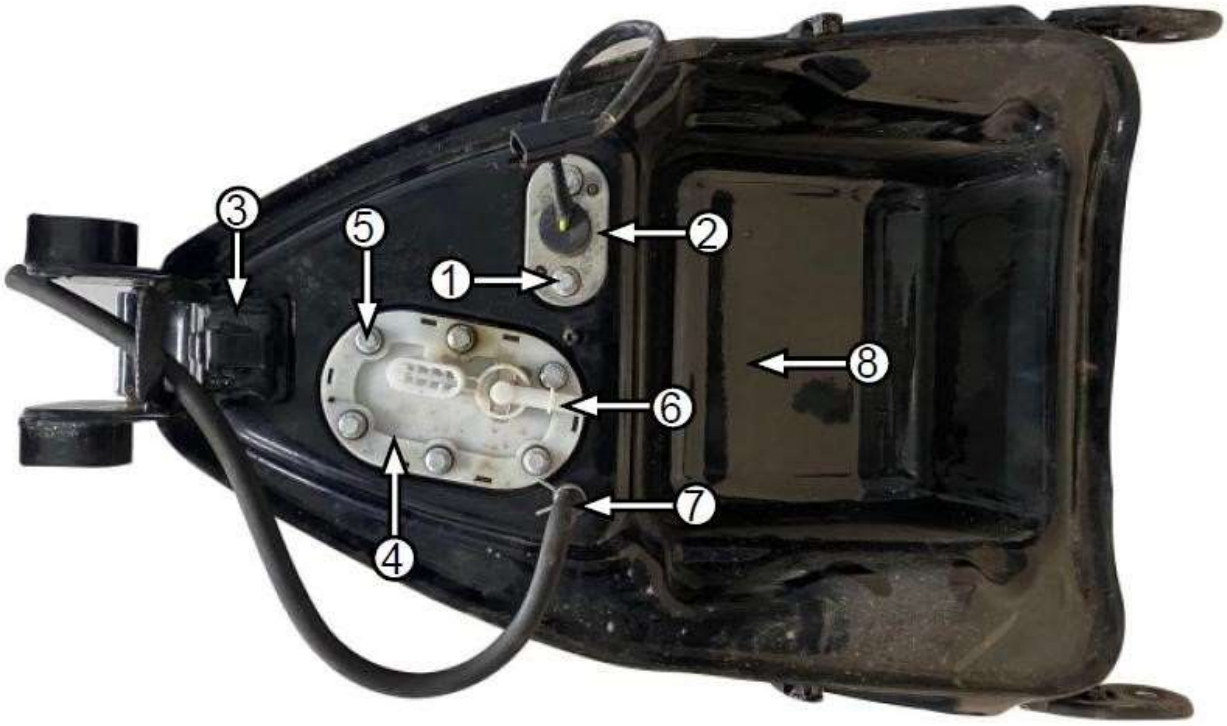
order	Procedure	Quantity	Remark
	Disassembly sequence		The installation sequence is reverse to the disassembly sequence
1	Rear seat cushion	2	
2	Front seat cushion	1	
3	Left and right side covers of frame	2	
4	Left and right middle side covers of frame	2	
5	Left and right front side plate assembly of frame	2	
6	Left and right front flow guide cover assembly	2	
7	Rear section of left and right rear deflectors	2	
8	Fuel tank trim cover assembly	1	

Disassembly and assembly of fuel tank

Refer to the figure below for the disassembly and assembly of the fuel tank.

The assembly procedures are in reverse order to the disassembly procedures.

Pay attention to the oil outlet of the oil pump towards the front of the fuel tank during assembly.



order	Procedure	Quantity	Remark
	Disassembly sequence		The installation sequence is reverse to the disassembly sequence
1	Bolt M6X20	2	
2	Fuel sensor	1	
3	Fuel filter	1	
4	Fuel pipe	1	
5	Bolt M5×20	6	
6	Fuel pump assembly	1	
7	Fuel evaporation pipe	1	
8	Fuel tank	1	

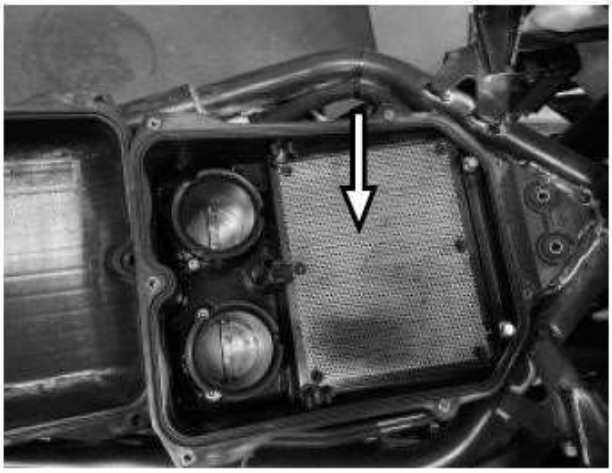
Replacement of fuel filter

Replacement cycle: the whole vehicle runs for 9,000 miles.
Tools: slotted screwdriver.

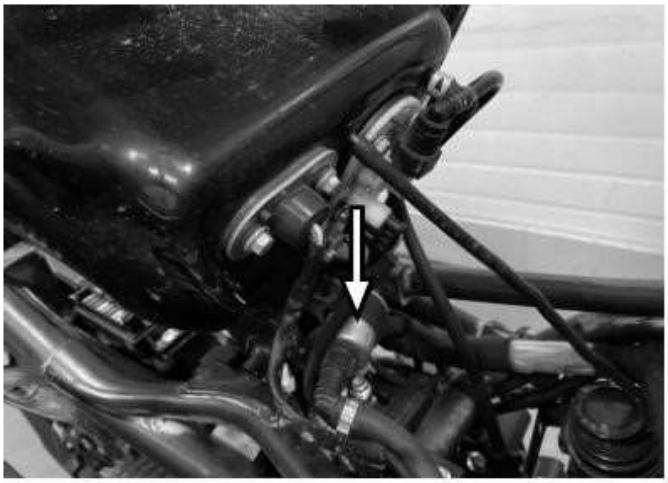
Note:

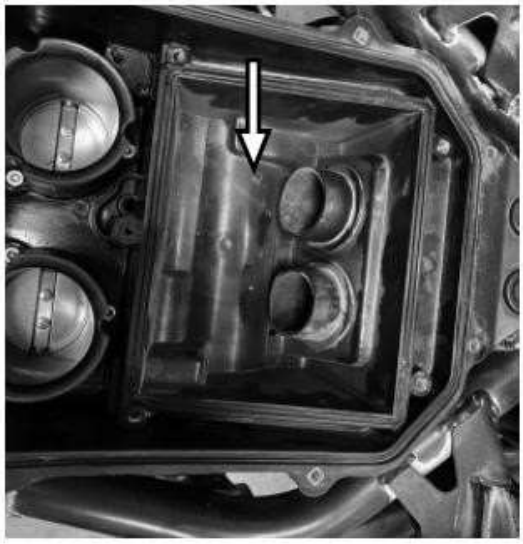
Do not pull the liquid level sensor and float rod assembly hard during installation and disassembly.

Disassembly procedures of filter:
Press the inverted buckle of the filter and pull out the filter.



Take out the filter element

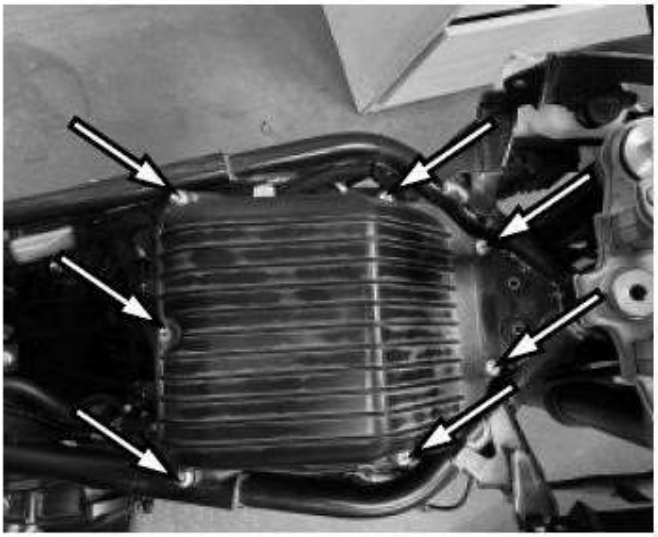




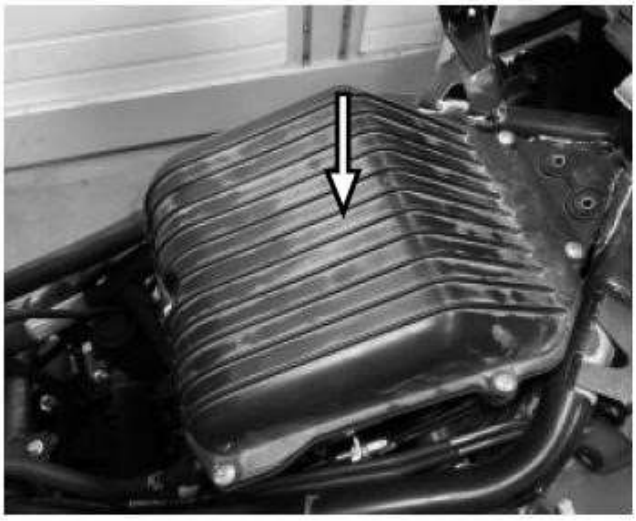
Filter cavity

Cleaning and replacement of air filter element

Open the cushion, loosen the upper body screw of the air filter, remove the upper body, take out the filter element, and clean or replace the filter element. Clean the sand and dust in the filter cavity with a clean cotton cloth.

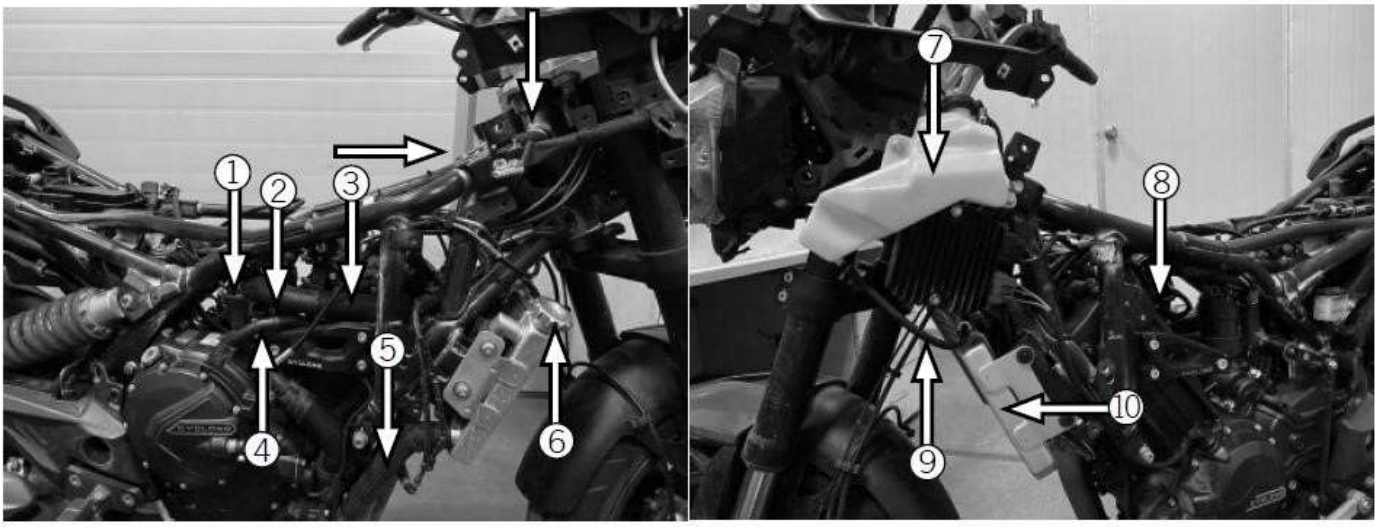


Fixing screw

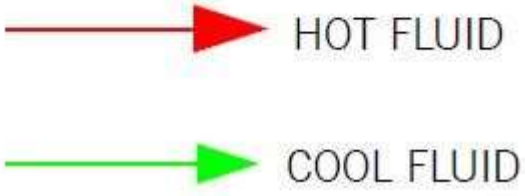


Take out the air filter cover

Cooling system



1 Thermostat, 2 Cylinder head outlet pipe, 3 Water cooler inlet pipe, 4 Water cooler small circulation inlet pipe, 5 Water cooler outlet pipe,
6 Radiator water tank cover, 7 Auxiliary water tank, 8 Temperature sensor, 9 Auxiliary water tank connecting hose, 10 Radiator



Maintenance instructions	Water pump
Troubleshooting	Thermostat
Inspection of performance	Cooling electrical system
Radiator	

Maintenance instructions

The maintenance of this part must be carried out under coolant cooling or low temperature.

The maintenance of this part can be carried out on the vehicle.
The replenishment of coolant is carried out by the hydraulic accumulator. The radiator cap shall not be removed except for the re replenishment of coolant after the disassembly of the cooling system or the extraction of the radiator.
After the inspection and maintenance, the radiator detector is used to check whether there is water leakage in each connecting part and sealing part.

Warning: **If the radiator cap is opened when the coolant temperature is above 100 ℃, there is a risk of severe boiling due to the pressure drop. Therefore, never open the cap at this time**.	**Note:** **When the coolant adheres to the painting surface, sometimes it will damage the painting surface. Therefore, in case of adhesion, it should be washed with water quickly**.

Maintenance benchmark

Item		Standard value	Use limit
Radiator cap relieving pressure		12.8 psi	10 psi～15psi
Opening temperature of thermostat valve	Boiling point	71℃	/
	Fully boiling	88℃	/
	Full boiling (88 ℃)	3.5mm	/
Coolant boiling temperature (50% mixture ratio)	Atmospheric pressure	107.7℃	/
	12.8 psi pressure	125.6℃	/
Coolant capacity		860ml	/

Coolant mixture ratio table

The lowest temperature in the use area	Mixture ratio	Antifreeze (ml)	Pure water (ml)
-9℃	20%	240	960
-16℃	30%	360	840
-25℃	40%	480	720
-37℃	50%	600	600
-44.5℃	55%	660	540

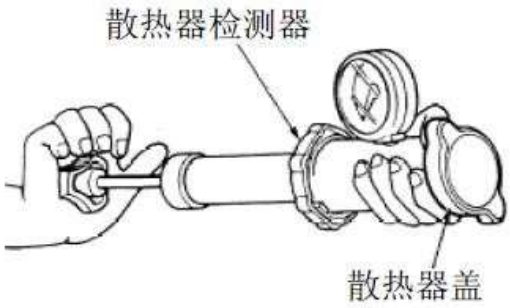
Bold type refers to the mixture ratio of coolant filling when the vehicle leaves the factory.
Use the specified coolant to replenish.
Avoid mixing with other brands of coolant.
This coolant is toxic and must not be drunk.
For the lowest temperature in the use area, the mixture ratio with about - 5 ℃ shall be selected.

Troubleshooting

Water temperature rise too high 1. Poor fan switch; 2. Poor radiator cap; 3. Poor thermostat; 4. Too little coolant; 5. The water pipe or water pipe sleeve is blocked; 6. The radiator blade is blocked; 7. The radiator is blocked; 8. The water pump is abnormal; 9. The cable is short circuited.	The water temperature does not rise or does not rise well 1. Poor fan switch; 2. Poor thermostat; 3. The cable is short circuited. Water leakage 1. Poor mechanical seal; 2. Deterioration and poor adhesion of O-rings; 3. Damage and deterioration of water pipe.

Inspection of performance

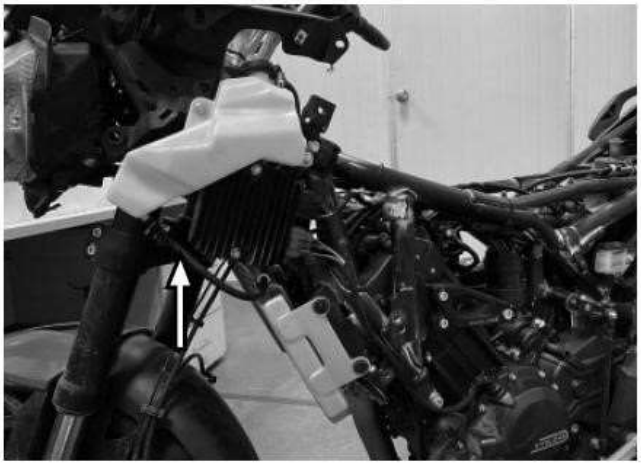
Inspection of radiator cap

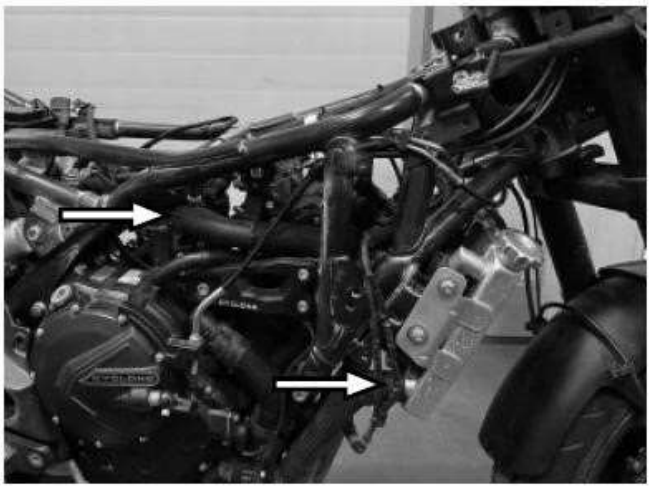
Warning: **Make sure the coolant is completely cool before opening the cover.** Install the radiator cap on the radiator detector to increase the pressure of the pump. If it can be maintained within the specified pressure range for 6 seconds, it can be used	 Radiator detector Radiator cap
Note: **When installing the cap on the detector, first coat the sealing surface with water.** Valve opening pressure of radiator cap: 11 ～ 15 psi	**Inspection of radiator pressurization** Install the radiator detector on the radiator, increase the pressure of the pump, and confirm whether it can be maintained within the specified pressure range for 6 seconds. Specified pressure: 11 - 15 psi. Confirm whether the pipe and the connecting parts are leaking. Do not increase the pressure above the specified pressure, which may cause damage to the radiator and other connecting parts

Radiator

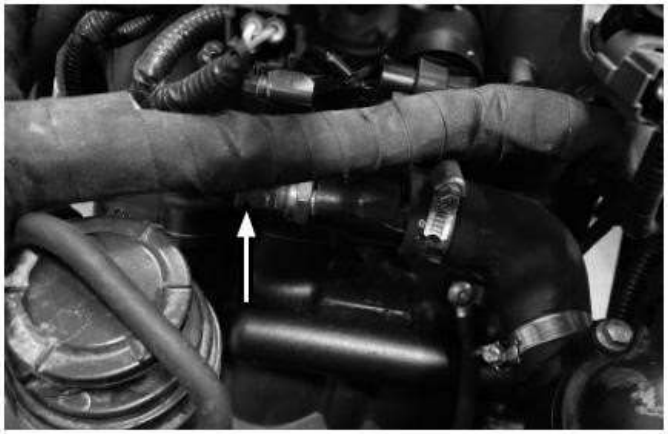
Disassembly of radiator

1、 Park the motorcycle on the ground, remove the cover and fuel tank, loosen the hoop, pull out the water pipe and drain the coolant.

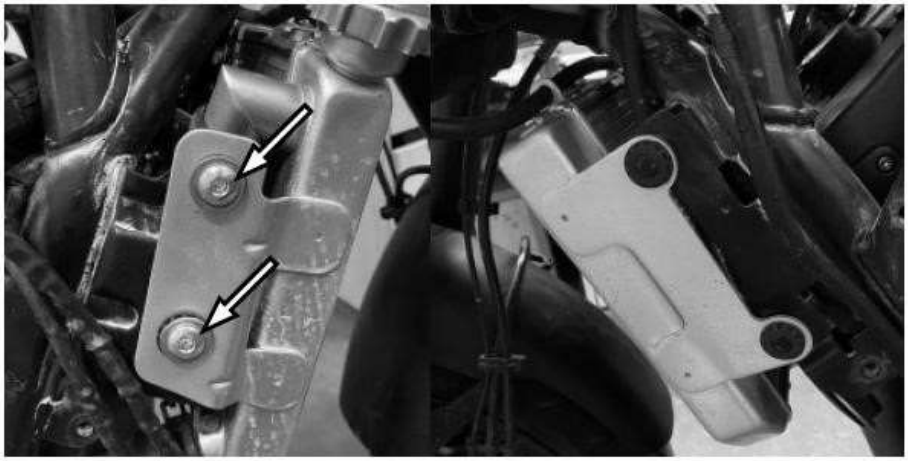




2、 Unplug the temperature control switch connector and fan power cord.

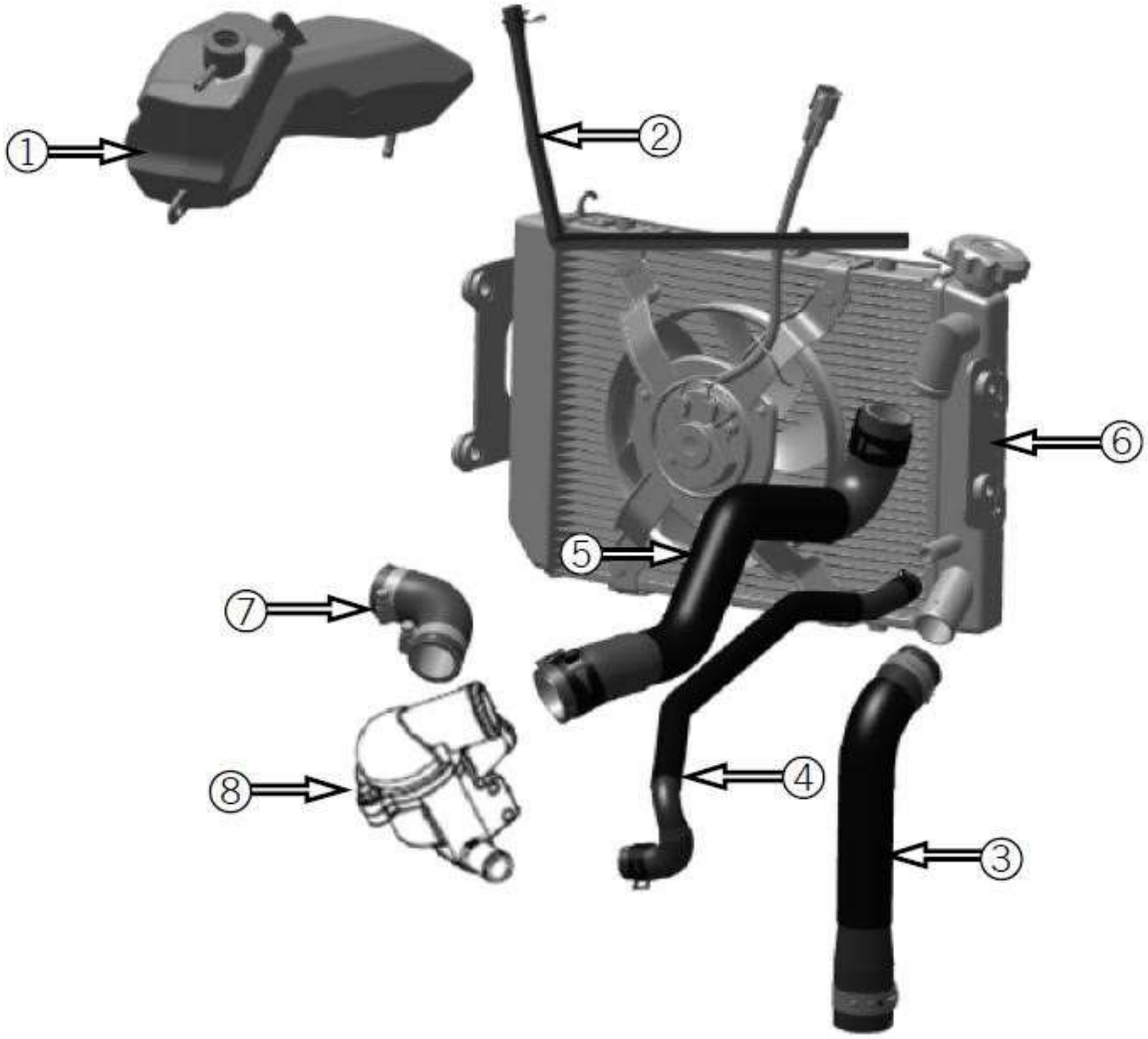


3、 Remove the fixing bolts of the radiator and remove the radiator.



Installation of radiator Reverse the order of disassembly. Avoid damaging the radiator during disassembly. After installation, don't forget to fill in the coolant and check whether the connection parts are leaking.	

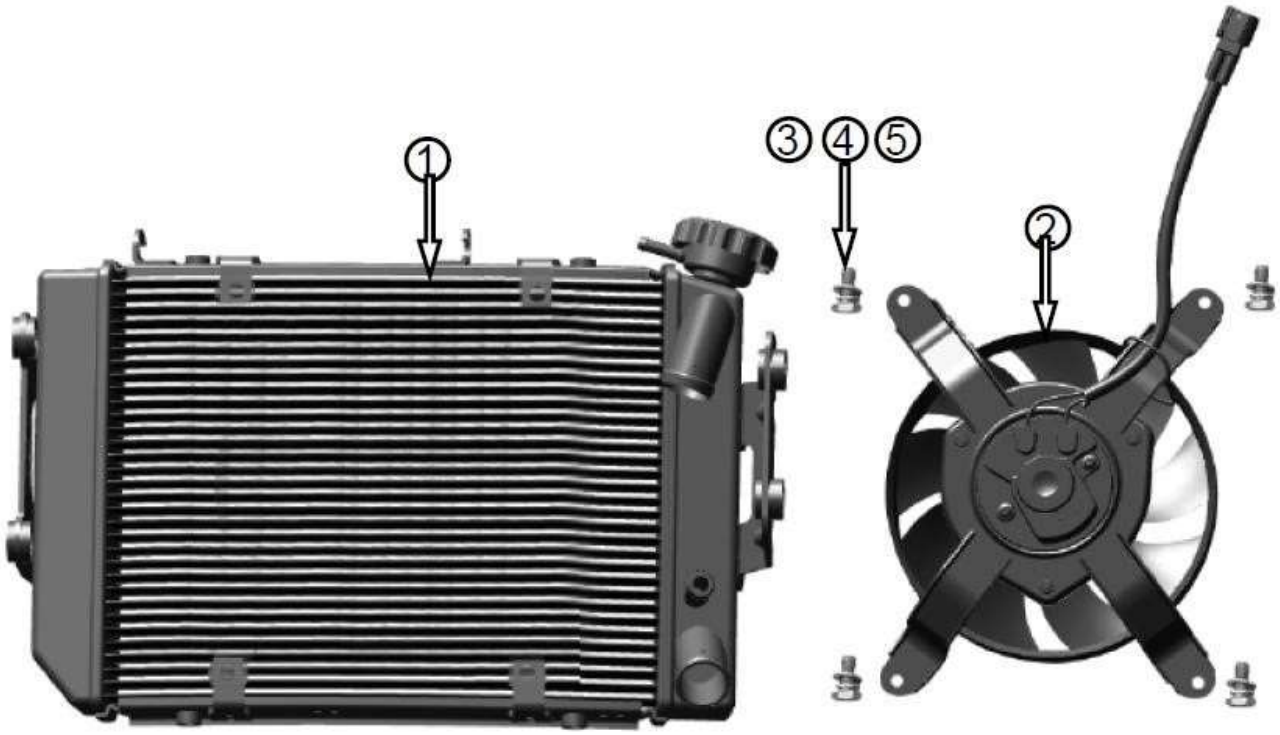
Disassembly / installation of radiator



order	Procedure	Quantity	Remark
	Disassembly sequence		The installation sequence is reverse to the disassembly sequence
1	Attached water tank	1	
2	With hose connecting hose	1	
3	Water pump inlet pipe	1	
4	Small circulating water inlet pipe of water cooler	1	
5	Water inlet pipe of water cooler	1	
6	Water cooler	1	
7	Cylinder head outlet pipe	1	
8	Thermostat	1	

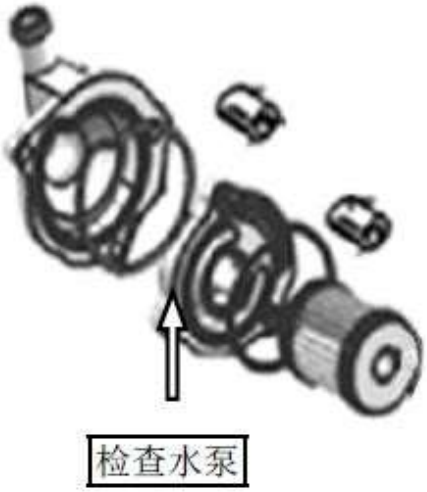
Disassembly/ assembly of radiator

Refer to the figure below for disassembly/ assembly of radiator.
Be careful not to damage the heat sink.



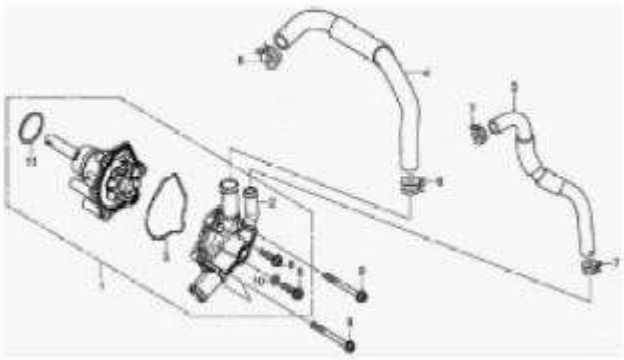
order	Procedure	Quantity	Remark
	Disassembly sequence		The assembly sequence is reverse to the disassembly sequence
1	Water cooler	1	
2	Fan components	1	
3	Adjusting bolt M6 × 16	2	
4	Spring washer ф6	2	
5	Washer φ6	2	

Water pump

<table>
<tr>
<td>Disassembly and assembly of water pump
Be sure to drain the coolant before disassembling the water pump.
Loosen the small circulating water pipe clamp and the water pump inlet and outlet pipe clamp.
Remove 3 connecting bolts.
 
Take out the water pump.</td>
<td>Inspection of water pump
Remove the connecting bolts, open the water pump, and check whether the seal washer and the water pump turbine are damaged.
 

Inspection of water pump</td>
</tr>
<tr>
<td>Install the water pump in reverse order. The O-shaped seal washer shall be replaced during installation, and the oil shall be smeared on the water pump mounting hole to facilitate assembly.
Replace the seal washer (6) at the drain hole during installation.</td>
<td>If the turbine of the water pump is damaged, or the water pump leaks beyond repair, please replace it with a new one.</td>
</tr>
</table>

Disassembly/ installation of water pump



order	Procedure	Quantity	Remark
	Disassembly sequence		The installation sequence is reverse to the disassembly sequence
1	Pump assembly	1	
2	Water pump	1	
3	Special shaped seal washer	1	
4	Connecting water pipe	1	
5	Small circulating water pipe	1	
6	Clamp 27	2	
7	Clamp 22	2	
8	Bolt 6 x 20	2	
9	Bolt M6 × 60	1	
10	Seal washer	1	
11	O-shaped seal washer	1	

Thermostat

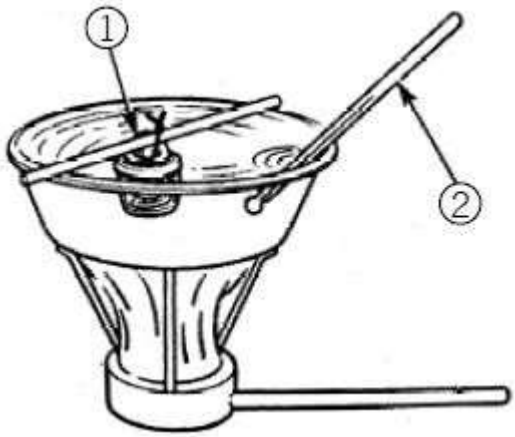
Disassembly and assembly of thermostat

Loosen the connecting bolt with T-shaped sleeve and pull out the thermostat.

Thermostat

Inspection of thermostat

Put the thermostat into the detection container, then gradually increase the water temperature and detect the valve opening temperature.



1 Thermostat, 2 Water temperature gauge

Boiling point	160 F
Full boiling temperature	190 F

Degree of full boiling	3.5mm

Note:

Do not let the thermostat touch the container.
If the thermostat has a little valve open at room temperature, it should be replaced.

The valve opening should be Maintained at 88 for about 5 minutes before measurement.

Cooling electrical system

Overview

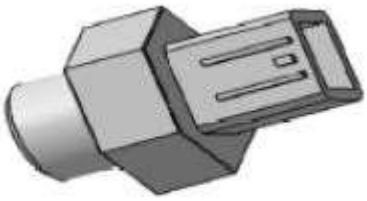
When the working temperature of the engine reaches a limit, the cooling water will circulate through the radiator, and the temperature will continue to rise. Turn on the fan switch on the radiator, turn on the power supply of the fan, and the fan will rotate to take away the engine heat of the cooling water circulation, and the water temperature will drop until the fan switch is turned off and the fan stops running. The system consists of the following components:
Fan switch
Fan

Circuit diagram

White
Fan assembly
Black / white
Fan switch
Green

Introduction of main components
Fan switch (temperature control switch)
1. Working principle
The fan switch is actually a kind of heat sensitive switch. When the temperature rises, the paraffin expands and pushes the moving contact to move. The paraffin expansion coefficient is proportional to the temperature. When the temperature reaches a certain value, the moving contact will be connected with the static contact; When the temperature drops, the moving contact is disconnected from the static contact under the action of spring force. The fan switch on and off controls the operation of the fan.

2. Basic parameters
Operating temperature of switch: opening temperature 88 ℃ ± 3 ℃, close 80 ℃ ± 3℃
Rated working current: DC 12V 5A.



3. Failure mode
The switch is normally on;
The switch cannot be connected;
The temperature deviation of the switch operation is too large;
The insert is rusted and has poor contact.

Fan assembly

1. Working principle

The fan assembly is composed of fan motor, fan leaf and bracket. The cooling fan of radiator is generally axial-flow fan, the air inlet is fan leaf end, the air outlet is motor end, and the wind direction of inlet and outlet is in the same direction. The motor uses a 12V DC motor, which drives the fan leaf to rotate to form the flow of wind and take away the heat from the radiator.

2. Basic parameters

Fan output air volume ≥ 400m3 / h;

Motor speed (4500 ± 400）r/min；

Rated working current ≤ 4A;

Fan rotation direction: clockwise when viewed from the motor output shaft.

3. Failure mode

Fan motor open circuit failure;

Fan motor short circuit failure;

The fan leaf interferes with the support, and the fan is noisy during operation;

The joint between fan leaf and motor shaft slips; The bracket is broken.

Failure phenomenon	Possible causes	Solution
The water temperature has given an alarm, but the fan still doesn't work	Line break;	Connection repair;
	Open circuit failure of fan switch;	Replace the fan switch;
	Fan motor failure;	Replace the fan motor;
	The fan page is stuck or slipping.	Inspection and maintenance.
The fan keeps working	Line short circuit;	Maintenance exclusion;
	Open circuit failure of fan switch	Replace the fan switch
Excessive fan noise	The fan leaf interferes with the bracket;	Inspection and maintenance;
	The fan leaf is loose or broken;	Fastening or replacement;
	The bracket is broken.	Replace the bracket.

Disassembly and installation of engine

1 Throttle valve body, 2 Air filter, 3 Engine, 4 Frame, 5 Muffler, 6 Transmission pedal

Disassembly and installation of engine

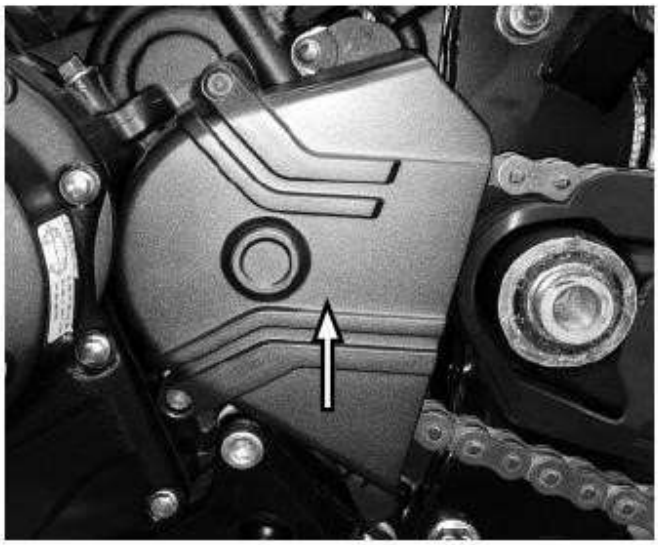
Maintenance instructions	Installation of engine
Disassembly of engine	

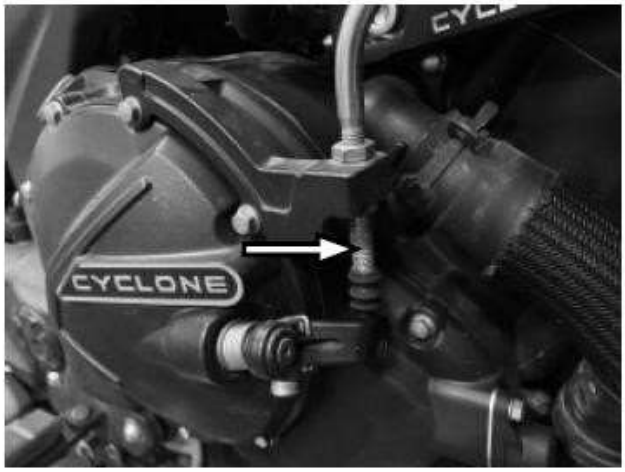
Maintenance instructions

Only when the crankshaft, balance shaft and transmission part of the engine are maintained (sectioned), it is necessary to disassembly the engine from the frame. When maintaining other parts of the engine, it is not necessary to disassembly the engine from the frame. Before removing the engine, the motorcycle shall	Specifications Engine net weight 77 lbs Engine oil quantity: if replace the filter, 2.8L; if not replace the filter, 2.7L; if open the middle box, 3.0L. Cooling water capacity 1900ml

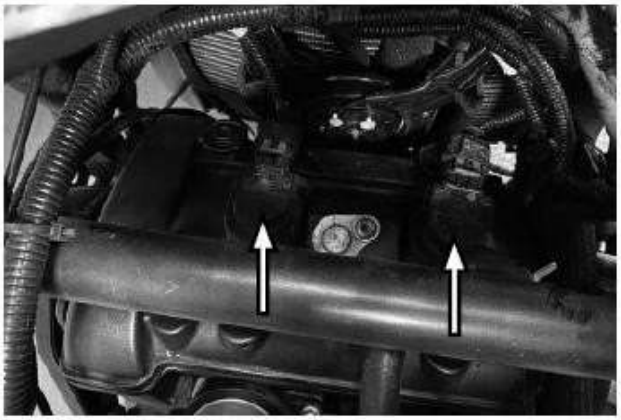
be supported on the flat ground with side bracket, and the cooling water and engine lubricating oil shall be drained. In order to maintain the cylinder head, cylinder block, piston and other heat engine parts, it is necessary to remove the cover, oil tank, radiator, throttle body, air filter assembly, etc. If you need to remove the left front cover of the engine for maintenance, you need to remove the transmission pedal and left rear cover, etc. The installation sequence is reverse to the disassembly sequence. When resuming installation, all wiring pipes shall be arranged according to the wiring diagram, and the removed hoops shall be replaced with new ones.	Important torque value Engine suspension bolt M10: 55 ～ 65 N.m

Disassembly of engine

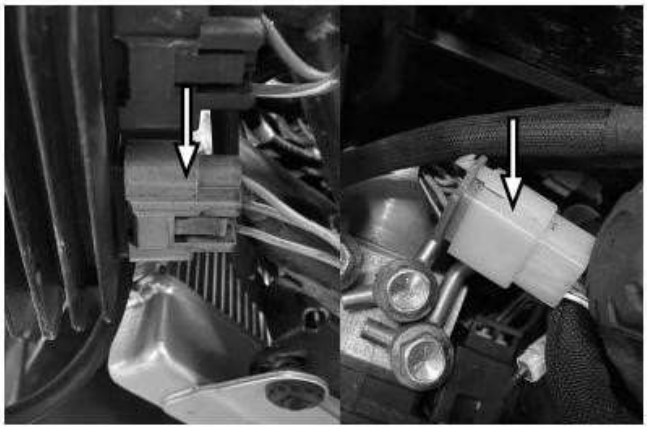
Park the motorcycle on the flat ground and drain the cooling water and engine lubricating oil. Remove the cover, oil tank, muffler and radiator (refer to relevant chapters). 	Disassembly of left rear cover  Disassembly of left rear cover
Disassembly of clutch cable.	Remove the drive chain Remove the starting motor wire and engine grounding wire



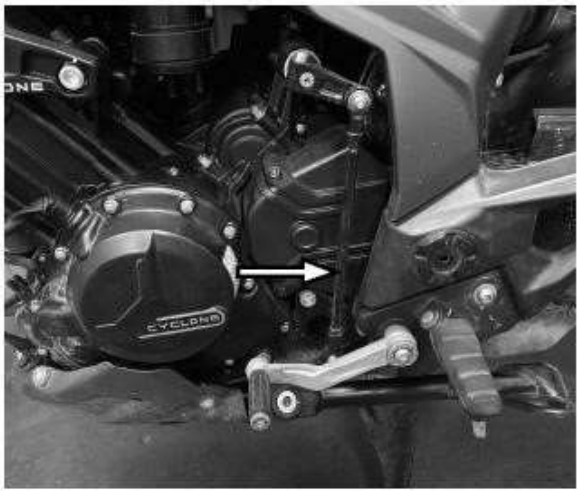
Remove ignition coil.



Remove the output line, gear display line and switch line of the magneto.



Disassembly of transmission control sub-assembly

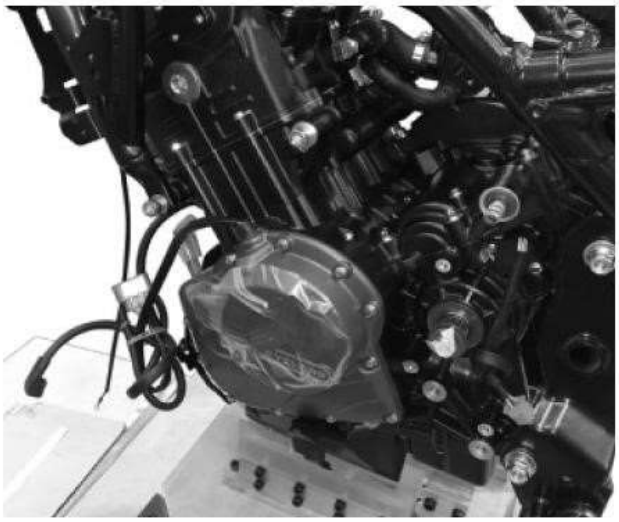


Remove four M10×1.25×35 hexagon socket head mounting screws from the front suspension of the engine.

Disassembly of engine rear suspension mounting bolts

order	Procedure	Quantity	Remark
	Disassembly sequence		The installation sequence is reverse to the disassembly sequence

Disassembly the engine



1	Cover, oil tank, radiator, muffler, air filter, etc.		Refer to relevant chapters
2	Variable speed control components	1	
3	Left rear cover	1	
4	Bolt M10×1.25×35	2	
5	Suspension shaft M12×1.25×207-25	1	
6	Suspension shaft M12×1.25×244-25	1	
7	Nut M12	2	

Installation of engine

The engine is installed in the reverse order of disassembly.
During installation, pay attention to the cables during installation, and the wiring shall be arranged according to the wiring diagram.

Frame, exhaust system

1 Tail light component, 2 Rear fender, 3 Closure panel, 4 Frame, 5 Muffler

Maintenance instructions	Disassembly / installation of rear fender
Troubleshooting	Disassembly/ installation of exhaust muffler
Closure panel, headlamp and instrument	Rear position lamp combination

Maintenance instructions

During the maintenance of this part, special attention shall be paid to the covers, instruments and lamps not to be scratched or damaged.

Disassembling or maintaining parts before the exhaust system cools may cause severe burns.

This part mainly includes the disassembly and installation of cover, rear fender, exhaust muffler, radiator and lamp.

Important torque value	Armrest fastening screw	28～32 N.m

Troubleshooting

Excessive emission noise 1. The emission system is damaged; 2. Exhaust leakage;	Work abnormalities 1. The exhaust system is deformed; 2. Exhaust leakage; 3. The muffler is blocked.

Closure panel, headlamp and instrument

Disassembly procedures of closure panel, headlamp and instrument

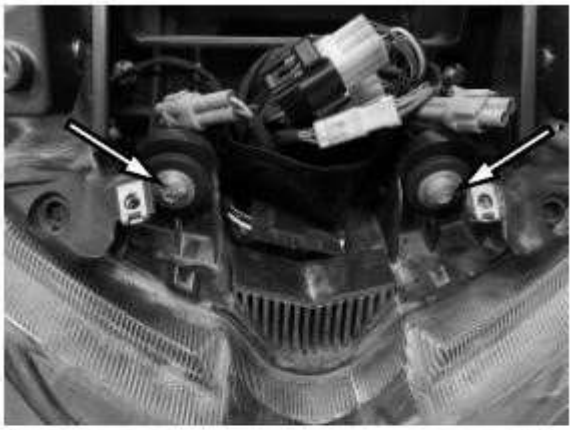
1、Support the motorcycle with side bracket on the flat ground and remove the cushion.

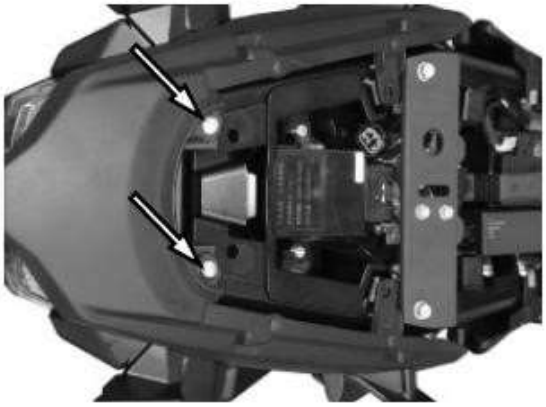
2、Remove the cover mounting bolts. Remove the cover. Pay attention to handle with care, do not scratch the decorative surface.

3、Remove the headlamp fixing screws and two hexagon socket screws M6 × 30, 2 hexagon socket screws M6 × 20 remove the headlamp assembly.

Disassembly / installation of rear tail lamp

1. Unscrew 2 M6 × 20 inner hexagon socket step screws from the fixing screws of the cover plate. Remove the cover plate.





2. Remove 2 rear tail lamp fixing nuts and M6 nuts.

5、 Remove 6 instrument panel assembly mounting screws and 4 hexagon socket screws M6 × 16, 2 hexagon socket screws M5 × 12. Unplug the connecting plug of the instrument, remove the instrument cluster, remove 3 M6 × 12 mounting nuts of the instrument, and take out the instrument.

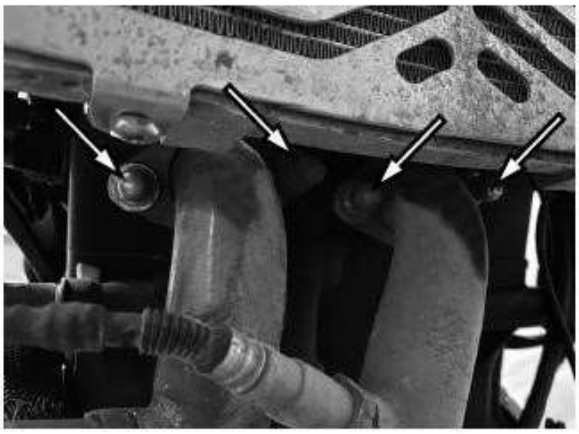
1. Unscrew 2 M6 × 20 inner hexagon socket step screws from the fixing screws of the cover plate. Remove the cover plate.

4、 Remove 2 rear tail lamp fixing nuts, M6 nut.

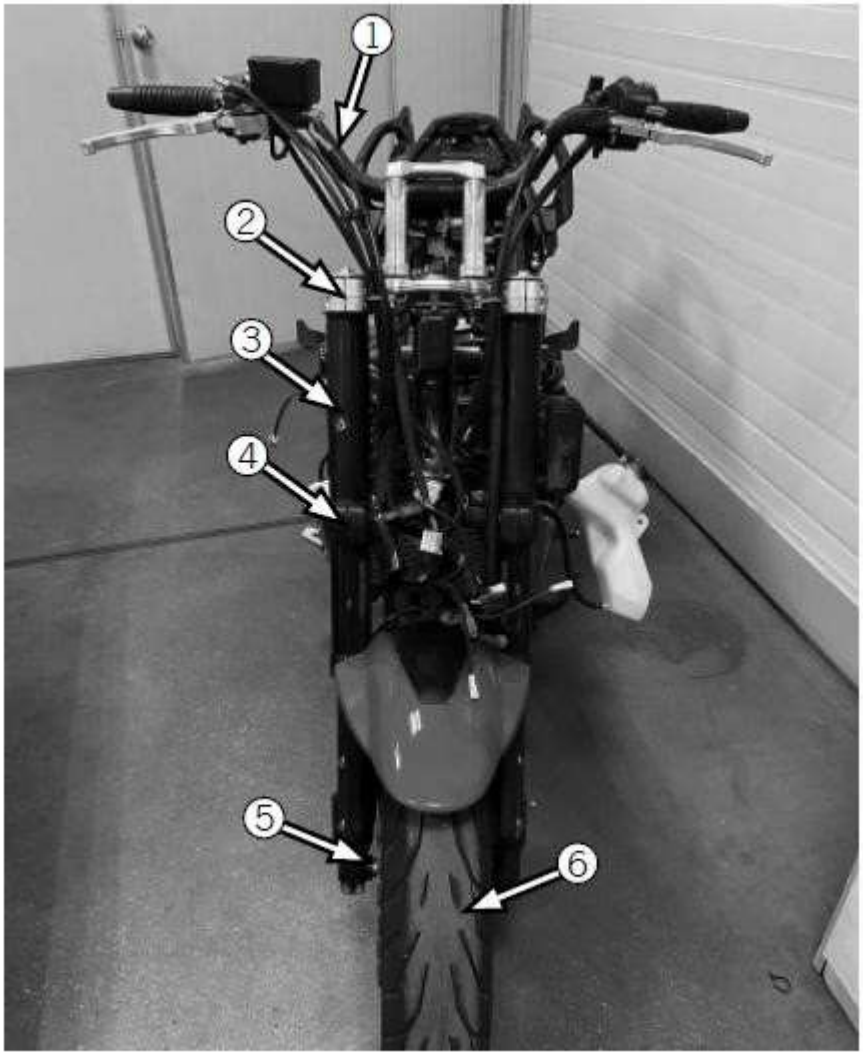
Installation procedures of closure panel, headlamp and instrument: The installation steps of the cover, headlamp and instrument are in the reverse order of the disassembly. Pay attention not to scratch the cover and damage the bulb during installation. **Note:** **In the process of disassembly, do not scratch the appearance surface of the cover and do not break the tenon.**	

Disassembly/ installation of exhaust muffler

Disassembly procedures of exhaust muffler 1. Support the motorcycle on the ground with the main bracket, and pull out the oxygen sensor plug. 	 **Installation procedure of exhaust muffler**
2. Remove 6 hexagon socket step screws M6 × 20 from the fixing screws of the lower shroud assembly.	Proceed in the reverse order of disassembly. The muffler seal washer at the engine exhaust port should be replaced with a new one.
	During installation, apply sealant to the joint of exhaust pipe and muffler, and then tighten the bolts of exhaust port and muffler support after the hoop bolts of joint are tightened, otherwise air leakage will be caused. **Note:**

3. Remove the 4 long nuts M8 × 19 connecting the muffler and the engine exhaust port, 4 hexagon socket screws M8 × 30. Remove one M10×1.25×164-23 connecting bolt between the rear muffler and the frame, and remove the silencer.  	**Make sure the muffler is completely cooled before operation, otherwise it will cause scald.**

Front wheel, front suspension, steering column, front brake



1 Control sub-assembly, 2 Upper connecting plate, 3 Lower connecting plate and riser assembly, 4 Front shock absorber, 5 Front axle, 6 Front wheel components

Maintenance instructions	Front wheel
Important torque value	Front suspension
Troubleshooting	Direction column
Control sub-assembly	Brake, front

Maintenance instructions

When maintaining the front wheel, the motorcycle should be reliably supported by a jack or other bracket under the engine to keep the front wheel off the ground.
Only tires marked "TUBELESS" should be used.
Inhalation of friction plate dust will cause respiratory discomfort. Do not use air duct or dry brush to clean the brake components. Please go to the professional repair network for repair and maintenance.

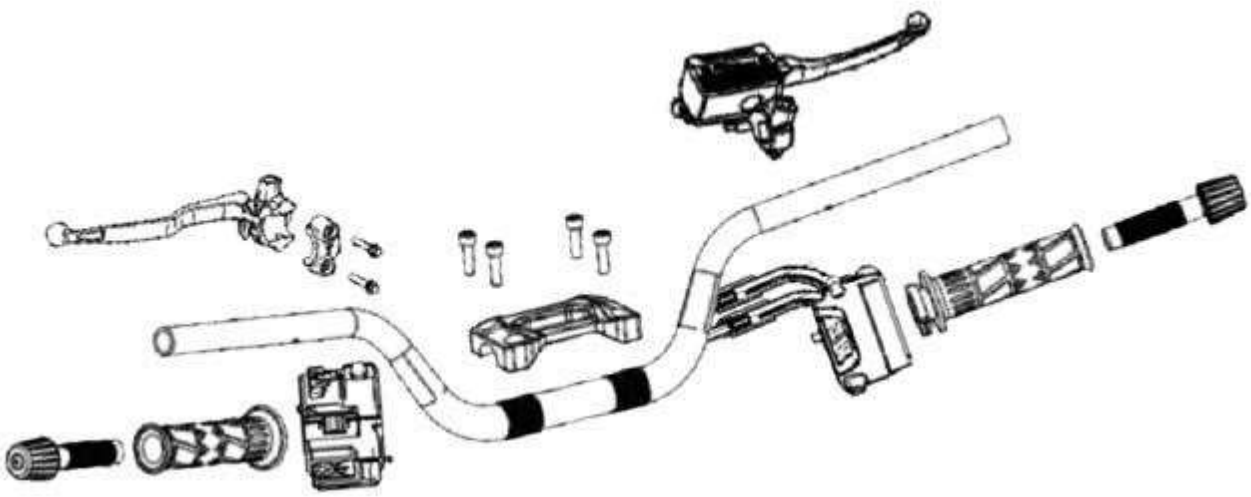
Important torque value

Front axle Handlebar fixing bolt Fixing bolts of upper and lower connecting plates	75 ~ 85 N.m 21 ~ 25 N.m	Fastening bolts of front shock absorber plate Front fork riser nut Fastening screw of	20 ~ 25 N.m 60 ~ 70 N.m
	28 ~ 32 N.m	brake disc	28 ~ 32 N.m

Troubleshooting

Unstable direction 1. The bearing of riser is damaged; 2. Insufficient tire pressure; 3. Tire is damaged; 4. The wheel bearing is damaged. 5. The adjusting nut of riser is too tight.	**Difficulty in turning the wheel.** 1. The wheel bearing and axle sleeve are damaged 2. The tire pressure is not enough. 3. The brake disc does not reset.
Steer to one side or not in a straight line 1. The adjustment of left and right shock absorbers is uneven; 2. The front fork is bent; 3. The front axle is bent and the wheel is not installed correctly; 4. The wheel bearing is damaged;	**Suspension is too soft** 1. The elasticity of the front fork spring is not enough; 2. The hydraulic oil level is too low or the fluid type is wrong.
Front wheel runout 1. Deformation of wheel rim 2. Wear of wheel bearing 3. Deformation or looseness of wheel spokes 4. Front axle is loose 5. Tire is damaged	**The suspension device is too hard** 1. The hydraulic oil level is too high or the fluid type is wrong. 2. Bending of front shock absorber fork tube 3. The front shock absorber is blocked. **Poor brake performance** 1. There is air in the brake pipe; 2. The brake shoe is worn; 3. There is water or oil on the brake shoes.

Disassembly / **assembly of control sub-assembly**



Caution

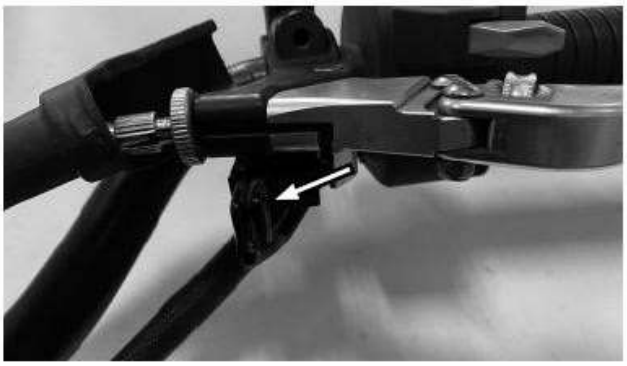
The front brake master cylinder shall be hoisted with steel wire rope, and its height shall be at least the same as that of the original installation position, so as to prevent air from invading the master cylinder and affecting the braking performance. It is forbidden to twist the brake hose.

When assembling clutch handle and front brake cylinder block, the opening shall be aligned with the marking point of handlebar.

The opening at the back end of the clip is aligned with the marking point of the handlebar. First tighten the front bolt of the clip, and then the back bolt.

After installation, adjust the throttle control line.

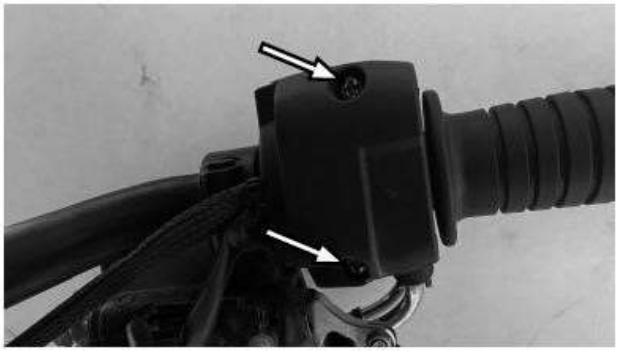
The cable and wiring are consistent with the wiring diagram.

1、Pull out the brake switch plug. 	5. Pull out the clutch switch plug. 

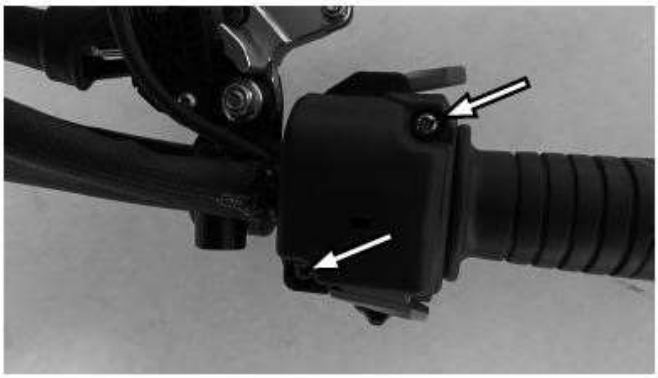
2、Remove the front brake master cylinder clip bolt.

6. Remove the clutch handle bolt.

3、Remove the right combination switch screw.



7. Remove the left combination switch screw.



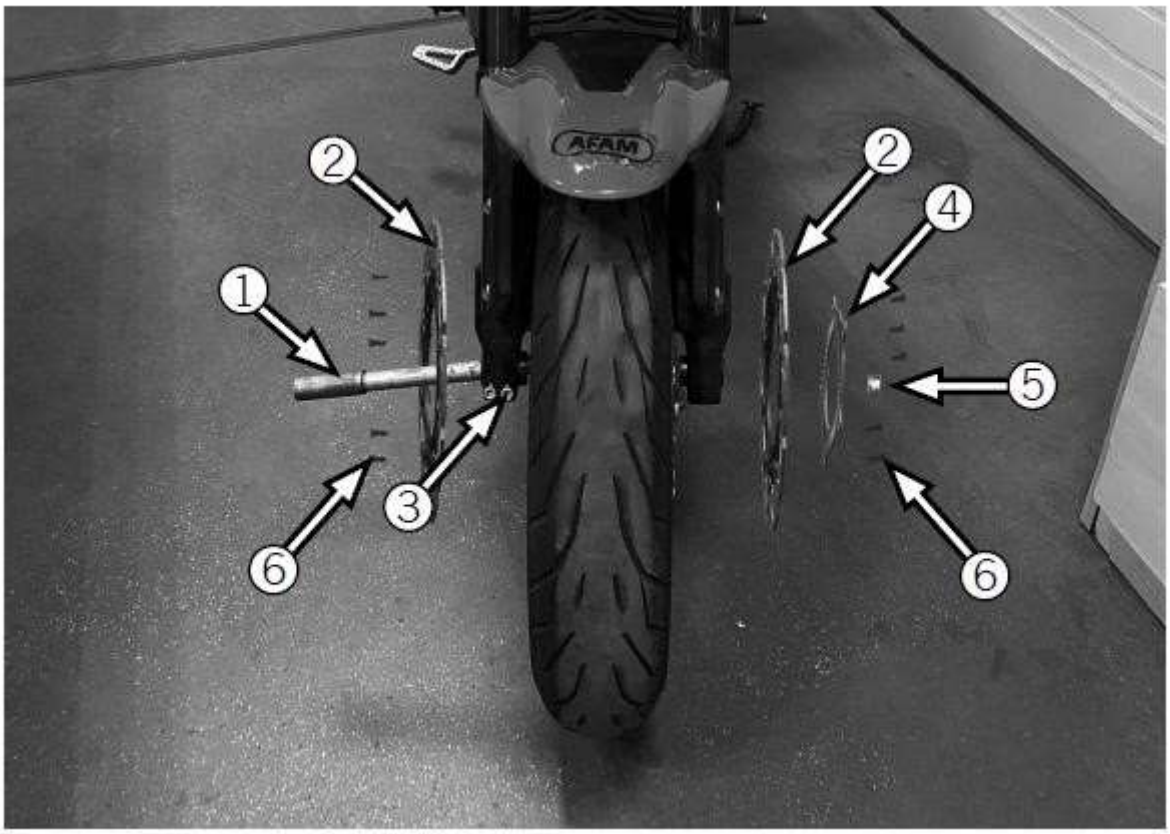
4、Remove fixing screws of accelerator cable seat.

8. Remove the handlebar clip fixing bolt.

Maintenance requirements

order	Procedure	Quantity	Remark
Disassembly sequence		The installation sequence is reverse to the disassembly sequence	
1	Brake switch plug	2	
2	Clamp bolt of front brake master cylinder	2	Note: Tighten the upper bolt first, then the lower bolt
3	Front brake cylinder block components	1	
4	Clutch switch plug	2	
5	Clutch line	1	
6	Counterweight bolt	2	
7	Counterweight	2	
8	Left handlebar	1	Align the clutch handle to the direction and fasten the positioning point of the handle tube (the joint between the handle and the clip is flush with the positioning point of the handle tube)
9	Clutch handle bolt	1	Note: Tighten the upper bolt first, then the lower bolt
10	Clutch handle	1	
11	Left combination switch screw	2	The locating pin of the left switch assembly is clamped into the limit hole of the steering handle tube; The screws shall be fastened in place without looseness. There shall be no gap after the upper and lower covers are fastened
12	Left combination switch	1	
13	Throttle cable	2	Note: do not bend or twist the throttle cable
14	Fuel feeder	1	
15	Right combination switch screw	2	The locating pin of the right switch assembly is clamped into the limit hole of the steering handle tube; The screws shall be fastened in place without looseness. There shall be no gap after the upper and lower covers are fastened
16	Right combination switch	1	
17	Clip bolt M8 × 30	4	Note: Tighten the front bolts first, and then the rear bolts
18	Clip	1	
19	Handlebar	2	Pay attention to the position of marks during installation

Front wheel disassembly / assembly



1 Front wheel axle, 2 Front wheel axle fastening bolts, 3 Front brake disc, 4 Front gear ring, 5 Front wheel left bushing, 6 Front brake disc bolts

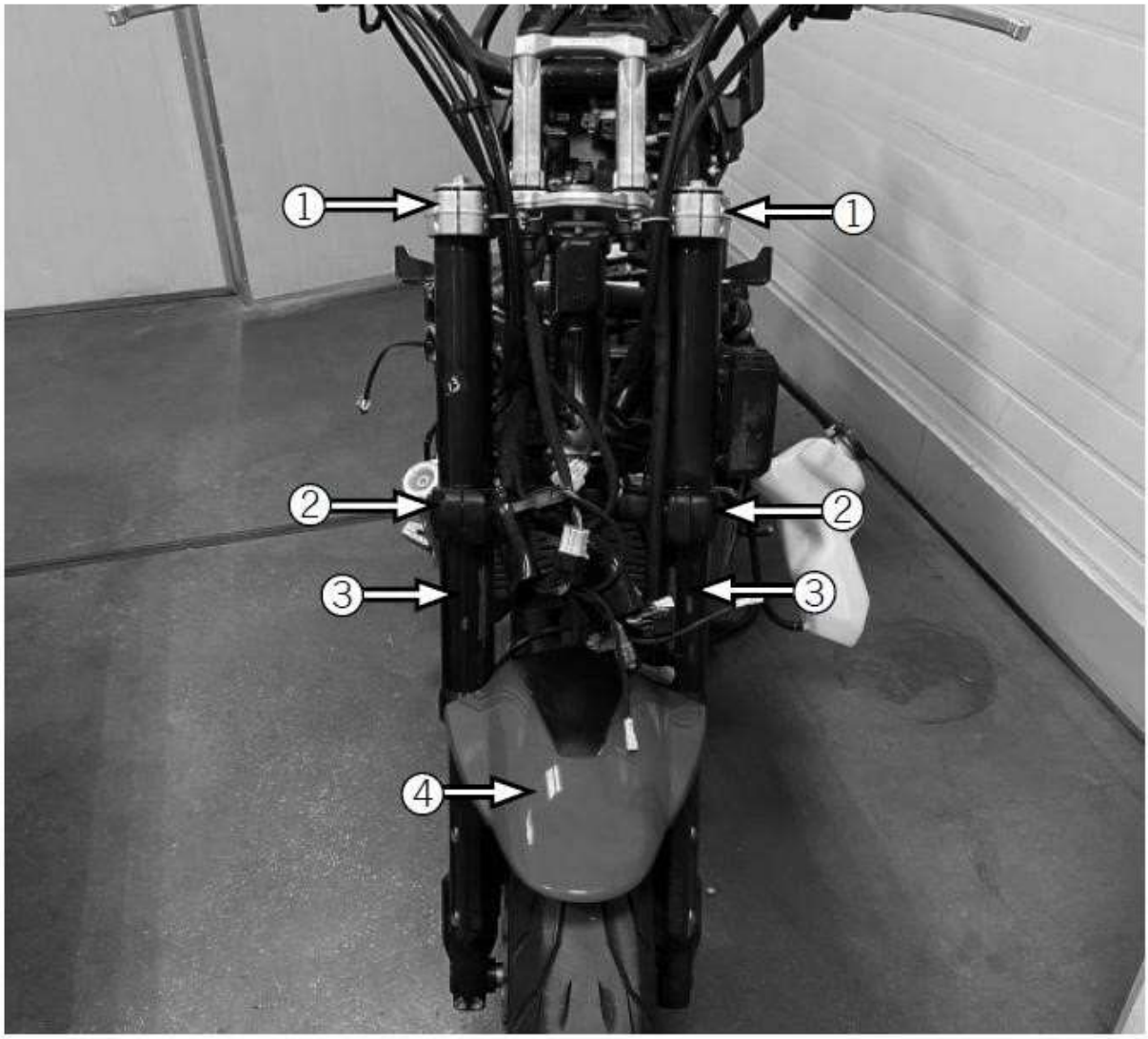
Caution

Soiled brake discs and friction discs may reduce braking performance. Please pay attention to replacing friction discs and cleaning soiled brake discs.
When the brake caliper is removed, do not pull the brake handle to avoid difficulties when assembling the front wheel.
The vehicle bearing shall be replaced in a complete set.

Maintenance requirements

order	Procedure	Quantity	Remark
Disassembly sequence		The installation sequence is reverse to the disassembly sequence	
1	Bolt	2	Tightening torque: 55-65 N.m
2	Front axle	1	Tightening torque: 75-85 N.m. Apply lithium grease
3	Front wheel left bushing	1	Apply lithium grease during assembly
4	Front wheel right bushing	1	Apply lithium grease during assembly
5	Front brake disc bolts	6	Tightening torque: 28-32 Nm
6	Front brake disc assembly	1	
7	Front speed instrument	1	

Front suspension disassembly / assembly



1 Upper shock absorber bolt, 2 Lower shock absorber bolt, 3 Front shock absorber, 4 Front fender

Caution

Lift the front brake master cylinder with steel wire rope, and the height shall be at least the same as that of the original installation position. It is forbidden to twist the brake hose.

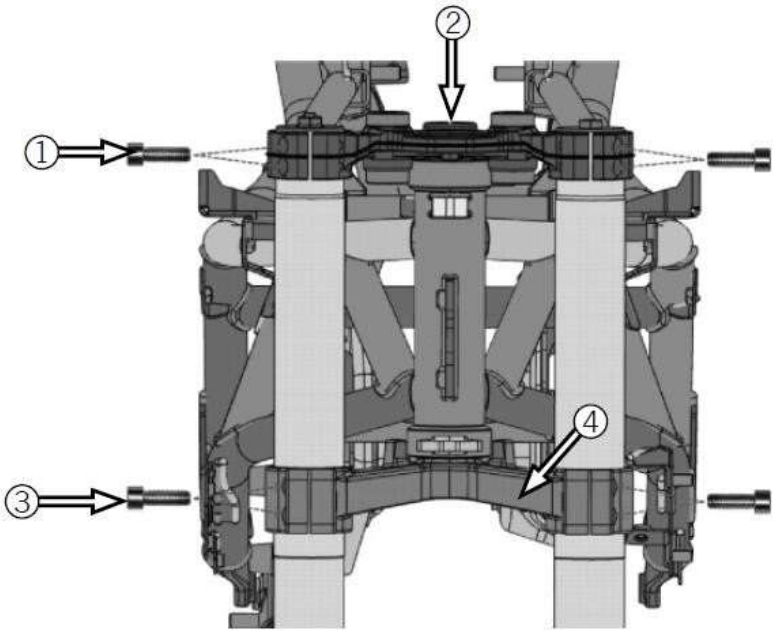
When the brake caliper is removed, do not pull the brake handle to avoid difficulties when assembling the front wheel.

Before removing the shock absorber, loosen the lock nut of the steering column, but do not remove it.

Maintenance requirements

order	Procedure	Quantity	Remark
Disassembly sequence		The installation sequence is reverse to the disassembly sequence	
1	Brake caliper bolt	2	Tightening torque: 45-50 N.m
2	Front brake oil pipe fixing clip nut	1	
3	Front brake caliper components	1	Note: Lift the front brake main cylinder with steel wire rope, and do not twist the brake hose Flex brake hose
4	Front fender bolts	4	Hexagon socket boss bolt M6x16
5	Front fender	1	
6	Lower connecting plate mounting bolt	4	Hexagon socket bolt M8x35, just loosen it
7	Mounting bolt of upper connecting plate	2	Hexagon socket bolt M8x30, just loosen it. Don't drop it.
8	Front shock absorber	2	

Disassembly / assembly of steering column



1 Upper damping bolt, 2 Steering column locking bolt, 3 Lower damping bolt, 4 Steering column combination

Caution

Soiled brake discs and friction discs may reduce braking performance. Please pay attention to replacing friction discs and cleaning soiled brake discs.

When the brake caliper is removed, do not pull the brake handle to avoid difficulties when assembling the front wheel.

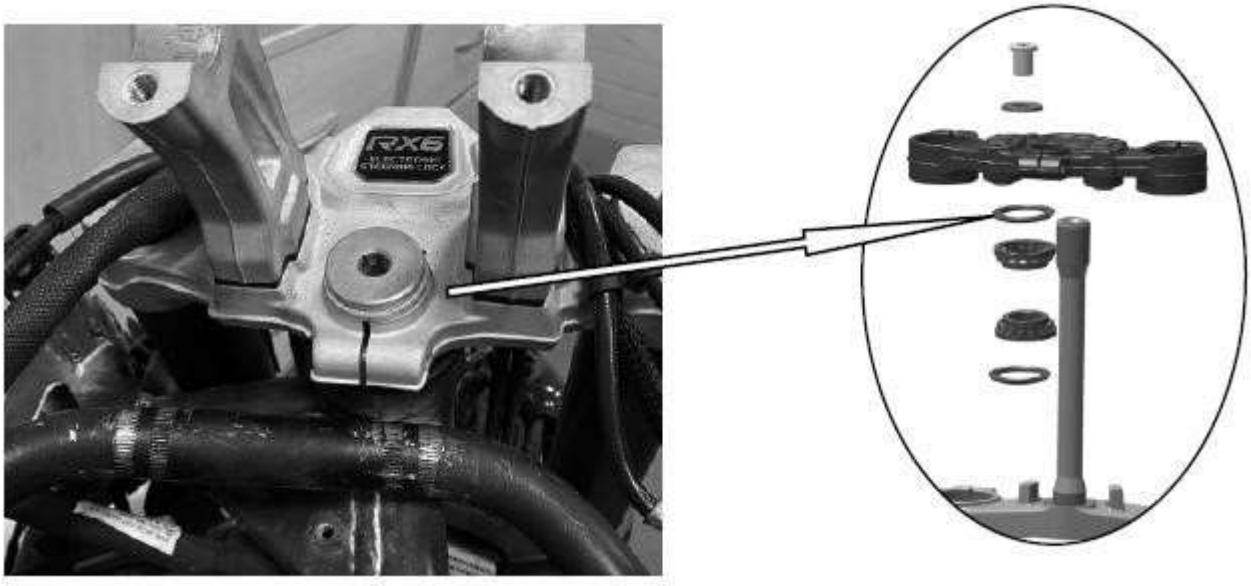
The vehicle bearing shall be replaced in a complete set.

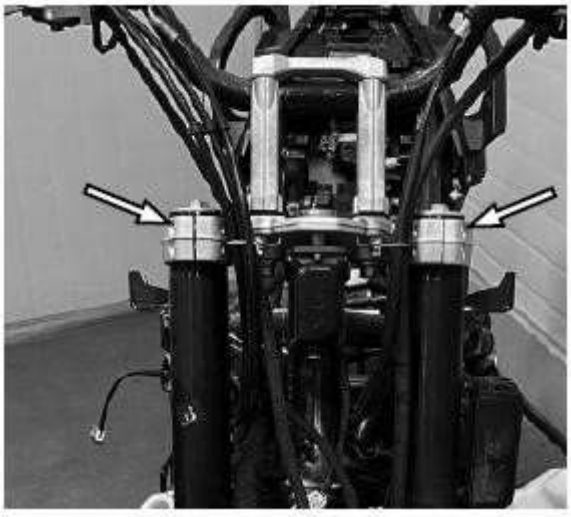
Maintenance requirements

order	Procedure	Quantity	Remark
Disassembly sequence		The installation sequence is reverse to the disassembly sequence	
1	Steering column lock bolt	1	Assembly torque: 60-90 N.m
2	Steering column gasket	1	
3	Upper connecting plate damping bolt M8 × 25	2	
4	Upper connecting plate	1	
5	Ignition switch lock screw	2	Hexagon socket screw M6 X 20
6	Combined ignition switch components	1	
7	Shock absorber bolt of lower connecting plate M10 × 40	2	Torsion force of left and right front shock absorber: 45～55 N.m;
8	Adjusting nut	1	The assembly torque is 10 ~ 12 N.m, and the steering column is rotated repeatedly during assembly
9	Tapered roller bearing	2	
10	Steering column assembly	1	Turn the steering column repeatedly during assembly
11	Direction column bearing washer	1	

Assembly of directional column

Apply enough lithium grease on the surface of bearing roller.
Place the steering column into the frame riser.
Place the bearing and steering column dust ring, upper connecting plate assembly, flat washer and steering column bolt in turn. While tightening the steering column bolt, rotate the steering column repeatedly to make the bearing roller fit with the seat ring. Tighten the steering column adjusting bolt to 35 N.m → rotate it three times in the left and right direction → adjust the bolt back 60 ° → finally tighten it to 30 N.m, adjust the height of the front shock absorber again, and the end cover of the front shock absorber shall be exposed to the horizontal surface of the upper connecting plate, and the left and right shall be consistent; Then tighten the hoop screws of the direction column of the upper connecting plate to 25 ~ 30 N.m. the direction column can rotate flexibly without clamping and interference within the maximum angle range.





Brake, front

Maintenance instructions

Soiled brake discs and friction discs may reduce braking performance. Please pay attention to replacing friction discs and cleaning soiled brake discs.

Do not clean the brake components with air duct or dry brush in case of inhaling friction plate dust and causing respiratory discomfort. For repair and maintenance, please go to specialized maintenance centers.

The spilled brake fluid will seriously damage the surface of instrument glass and oil and gas components, and it is also harmful to some rubber. Be careful when disassembling the master cylinder

First, confirm that the master cylinder is horizontal.

Do not allow contaminants (dirt, water, etc.) to enter the master cylinder.

Once the hydraulic system is opened or the brake is loose, the air in the brake system must be drained.

When the system maintenance, DOT4 brake fluid must be used, and do not mix with different types of brake fluid.

Before driving a motorcycle, the running state of the brake must be checked.

Troubleshooting

1. There is air in the pipeline; 2. Pipeline leakage; 3. The brake fluid level is low. 4. The brake friction plate is dirty; 5. The piston seal of brake auxiliary cylinder is worn and aged. 6. The piston seal of brake master cylinder is worn and aged. 7. The piston of brake auxiliary cylinder is stuck and worn. 8. The piston of brake master cylinder is stuck and worn. 9. The brake shoes are worn. 10. Poor sliding of brake shoe. 11. The pipeline is blocked.	The brake handle is not flexible 1. The brake system is blocked 2. The piston of brake caliper is stuck and worn. 3. Poor sliding of brake shoe. 4. The pipeline is blocked. 5. The piston of main brake pump is stuck and worn. 6. The brake handle is bent. The brake deviates to one side 1. Dirty brake discs / friction plates. 2. The wheels are not calibrated. 3. The brake disc is warped and deformed. 4. Poor sliding of brake shoe.
12. The brake disc is warped and deformed. 13. Pipeline is polluted.	

Front brake caliper components removal/ assembly

1 Front brake disc, 2 Brake caliper bolts, 3 Front brake caliper

Caution

Soiled brake discs and friction discs may reduce braking performance. Please pay attention to replacing friction discs and cleaning soiled brake discs.

Lift the front brake master cylinder with steel wire rope, and the height shall be at least the same as that of the original installation position. It is forbidden to twist the brake hose.

When the brake caliper is removed, do not pull the brake handle to avoid difficulties when assembling the front wheel.

Do not clean the brake components with air duct or dry brush in case of inhaling friction plate dust and causing respiratory discomfort. For repair and maintenance, please go to specialized maintenance centers.

After replacing the friction plate, operate the brake handle repeatedly to make the caliper cylinder piston close to the friction plate and reset.

Maintenance requirements

order	Procedure	Quantity	Remark
Disassembly sequence		The installation sequence is reverse to the disassembly sequence	
1	Brake caliper bolt M10×40	2	Tightening torque: 55-65 N.m
2	Front brake caliper components	1	Lift the front brake main cylinder with steel wire rope, and do not twist the brake hose.
3	Spring clip	1	
4	Friction plate locating pin	1	
5	Friction plate	2	

Rear wheel, rear brake, rear suspension devices

1. Rear brake disc 2 Rear brake caliper body 3 Rear fork assembly 4 Rear shock absorber 5 Rear wheel combination 6 Sprocket 7 Rear axle 8 Chain guard

Maintenance instructions	Rear fork assembly
Troubleshooting	Rear shock absorber
Rear wheel	Rear fork rocker arm assembly

Maintenance instructions

This section describes the removal, installation and maintenance of the rear wheel, rear brake, rear fork, rear shock absorber and rocker arm connecting rod. When performing repair and maintenance for the rear wheel, rear shock absorber and rocker arm connecting rod, the motorcycle should be reliably supported by an air jack or other bracket under the engine.

Important torque value

Fastening nut on rear axle shaft: 75 ～ 85N.m

Nut on rear fork shaft: 75 ～ 85N.m

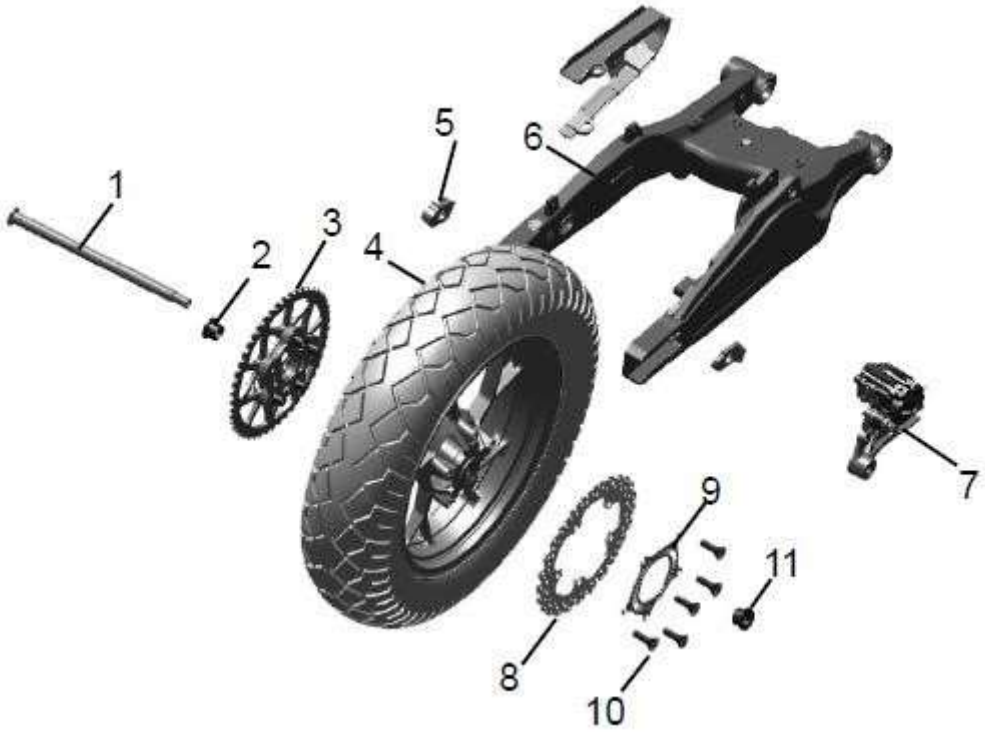
Damping rocker arm M10 bolt and nut 45 ~ 55N.m. Damping rocker arm M 12 bolt and nuts 60 ~ 70N.m

Fastening screw on brake disc: 28 ~ 32N.m

Troubleshooting

Swings of the rear wheel 1. Deformation of wheel rim; 2. The rear wheel bearing is worn; 3. Low tire pressure; 4. Inconsistency in the left and right of the	Difficulty in turning the wheel. 1. Wheel bearings and shaft sleeves are damaged; 2. Incorrect wheel installation; 3. Bent rear axle
regulator; 5. Damaged wheel sleeve. Noise Loose fasteners.	3. Rear brake friction plate cannot reset Abnormal suspension 1. The shock absorber spring is too hard or too soft; 2. Damaged rear fork bearing; 3. Bent shock absorber.

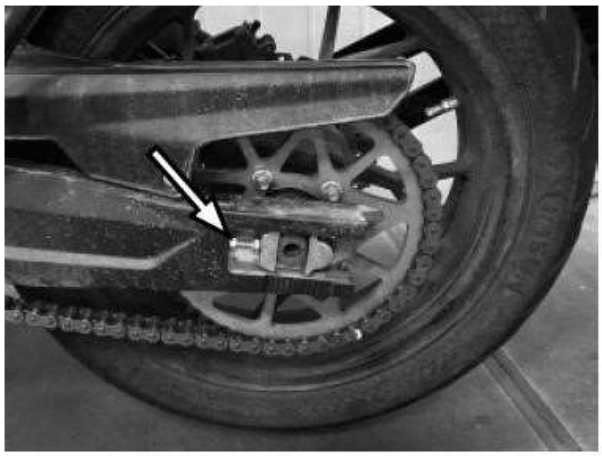
Rear wheel

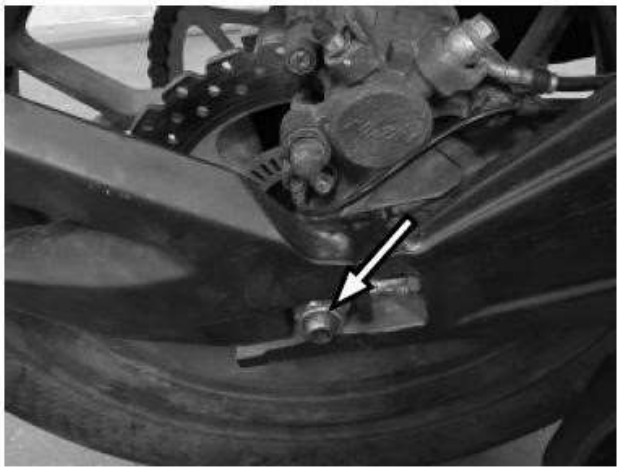
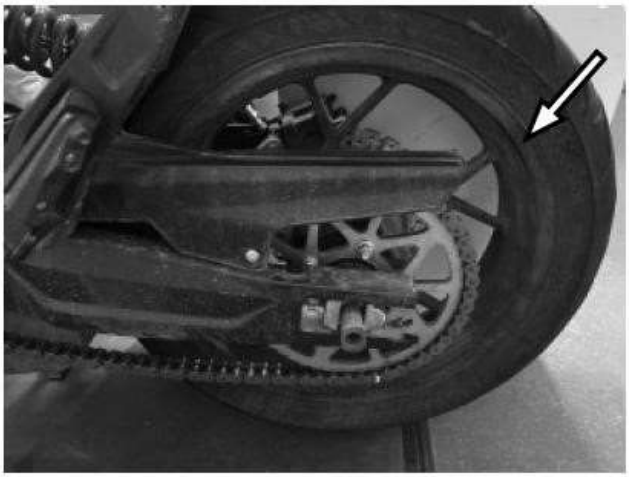
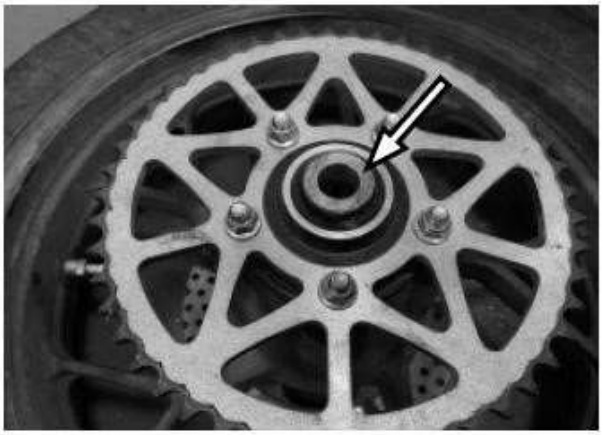


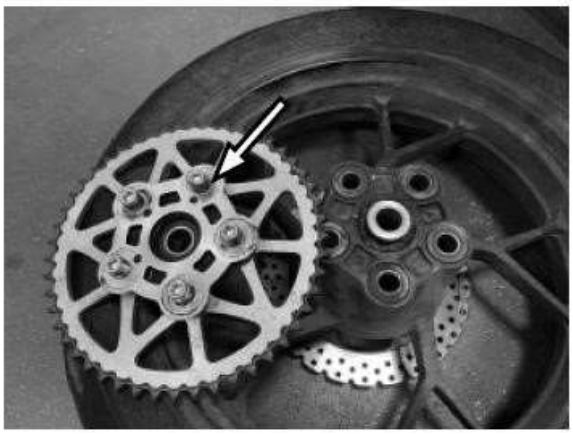
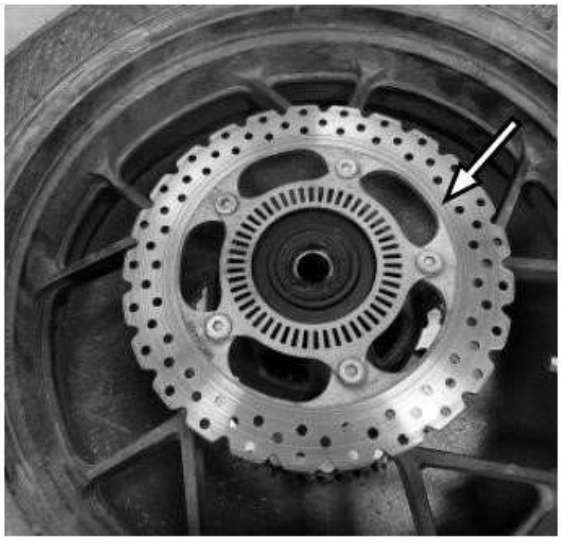
1. Rear axle 2. Rear wheel left bushing 3. Sprocket 4. Chain adjuster and nut 5. Rear wheel assembly 6. Flat fork combination
7. Rear brake caliper body 8 Rear brake disc 9 Rear speed signal panel 10 Right rear wheel bushing 11 Rear brake disc fastening screws

Disassembly steps of rear wheel

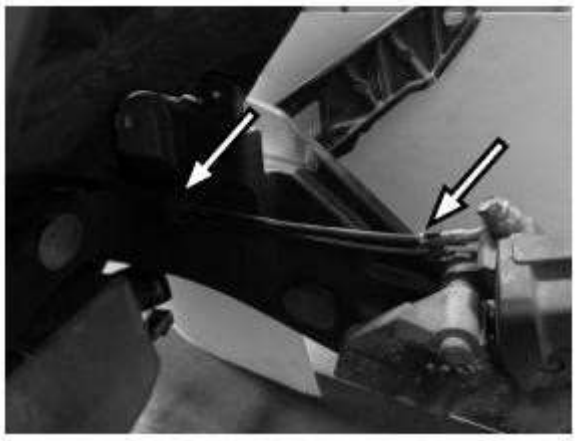
1. Loosen the chain adjusting bolt and lock nut to get them separated from the positioning baffle.	3. Take out the rear axle.

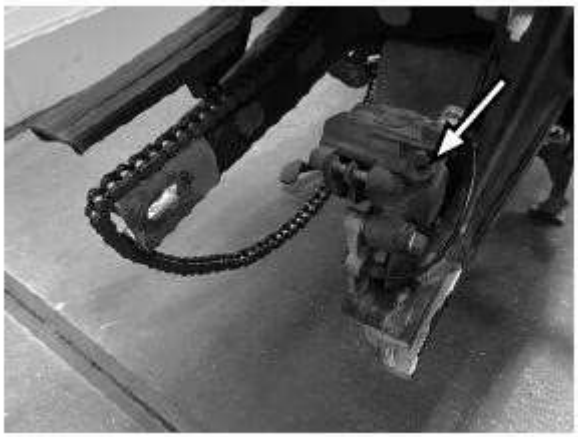
2. Screw out rear axle fastening nut M14×1.5. 	4. Take out the rear wheel assembly. 
5. Take out the right rear wheel bushing. 	
6. Take out the left rear wheel bushing.	
	

7. Take out the sprocket to get the rear wheel. 	
8. Take out the disc of rear disc brake. 	

Rear flat fork

Disassembly steps of rear fork: 1. Remove the rear wheel assembly first (refer to disassembly steps of rear wheel). 2. Remove the brake oil pipe clamp.	**Note:** When removing the brake caliper body, make sure that the rear brake caliper body is lower
	than the rear brake cylinder body to prevent air from entering the cylinder body reducing the braking performance. And after removing the rear brake caliper body, if it does not need to be replaced, do not step on the rear brake pedal.

3. Pull the rear brake caliper body backward out of the suspension position.

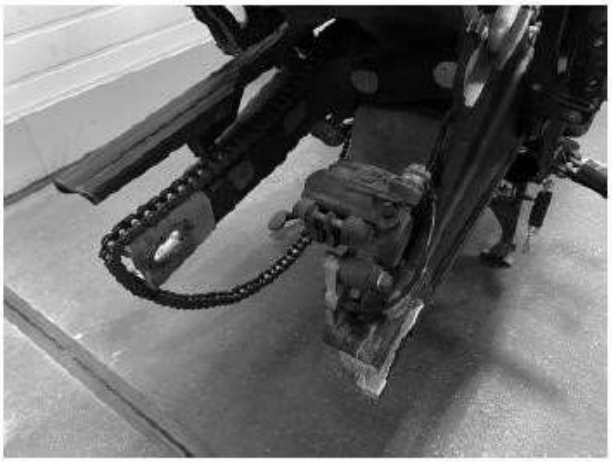


4. Remove the connecting bolt M12×1.75×5 of between rear damper and flat fork

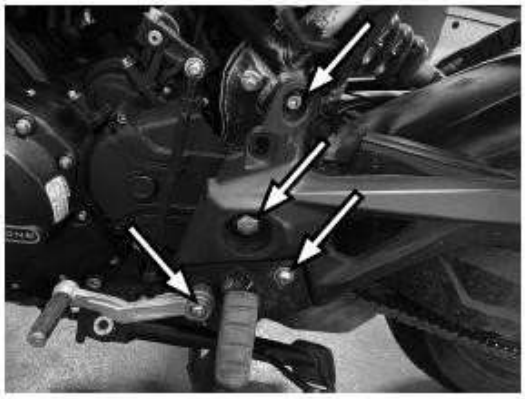
Warning:

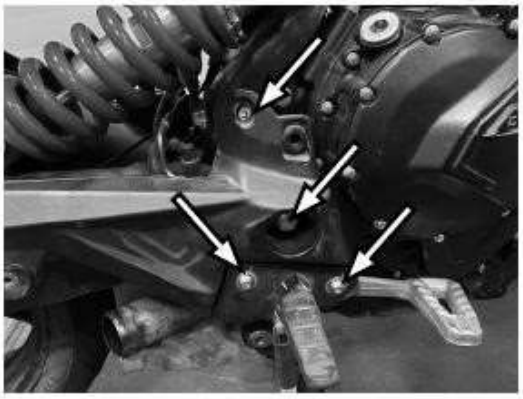
Tighten the flat fork shaft fastening nut to the specified torque of 75 ~ 85N.m.

Removal/installation of flat fork

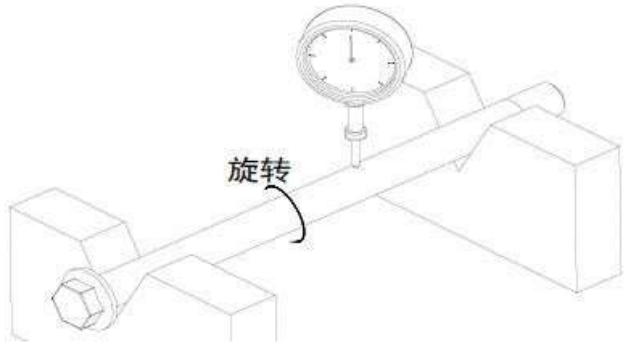


5. Loosen the 2 M16×1.5×30 bolts from left and right flat fork shafts, 2 M8 × 40 bolts, remove the left and right pedals, then pull out the flat fork shaft from the right side, and pull out the flat fork backward.

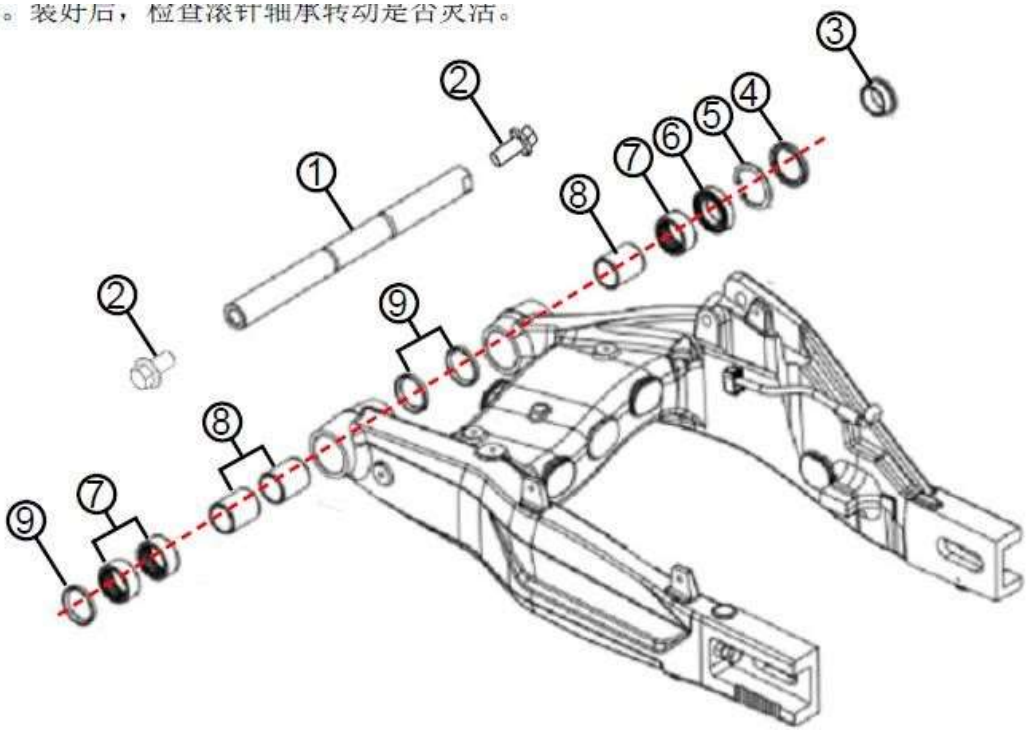




Inspection of flat fork shaft

Place the flat fork shaft on the V-shaped seat, and test the deflection of the flat fork shaft with a dial indicator. If the figure goes beyond or equal to 0.2 mm, replace the flat fork shaft with a new one.  Rotate	
Disassembly/assembly steps of rear fork Refer to the figure below for the disassembly/assembly of the rear fork. The sealing ring and needle roller bearing should be replaced after removal. After the needle bearing is installed, make sure that it is 3 mm away from the end, and the needle shall be coated with lithium grease. After installation, check whether the needle roller bearing rotates flexibly.	

1。装好后，检查滚针轴承转动是否灵活。



order	Procedure	Quantity	Remark
	Disassembly sequence		The assembly sequence is reverse to the disassembly sequence
1	Flat fork shaft	1	
2	Hexagon flange bolt M16×1.5×30	2	
3	Side bushing of flat fork shaft	1	
4	Framework oil seal 42×30×6	1	
5	Retaining ring for hole	1	
6	Deep groove ball bearing	1	When assembling, make sure that the shaft sleeve rotates flexibly
7	Roller bearing	3	When assembling, make sure that the shaft sleeve rotates flexibly
8	Flat fork inner bushing	3	
9	Frame oil seal 37×30×5	3	

Chapter 4 General introduction of electrical system

Precautions for Circuit Inspection	System principle and structure

Precautions for Circuit Inspection

1. When disconnecting and connecting the connector, turn the ignition switch to the OFF position to avoid damage to the electrical components.
2. When checking the circuit, please adopt the probe that can be inserted from the front and back of the connector and reliably contacted with the terminal.
3. The power supply and relevant electrical components shall be disconnected during the inspection of the circuit.
4. When using voltage check, check the battery voltage first.
5. When there is a fault in the electrical system, it is generally diagnosed according to the following steps:
   A. Observe the fault performance to locate the faulty subsystem;
   B. Using the elimination method and the circuit diagram to minimize the fault range; C. Check the circuits of subsystems for open circuit, short circuit or wrong connection;
   D. Check the relevant components for failure or damage.
6. When investigating the circuit fault, check the place that is easy to dismantle first. Parameter detection method and part replacement method can be adopted, but when using part replacement method, make sure that there is no overload in the circuit to avoid damaging new parts.
7. Please prepare multimeter and clamp meter for circuit inspection.
8. Most of the instantaneous electrical failure is caused by the wire connector or wire failure.

System principle and structure

The electrical system is an essential guarantee that the motorcycle can operate normally, safely, reliably and efficiently. It covers a wide range of subjects, including motor, electrical, electronic technology, computer, electrochemistry, acoustics, optical materials, etc. And with the development of electronic technology in particular, the motorcycle electrical system will undergo significant changes. The electrical system is more advanced than traditional motorcycles in that it applies more advanced automotive electronics and is much more complex. It consists of the following subsystems.

Power supply system
Starting system
Engine management system
Cooling system (electrical part)
Lighting signal system
Information display system

In the following chapters, we will describe them separately. Among them, the cooling system has been described in Chapter 5 and will not be described again.

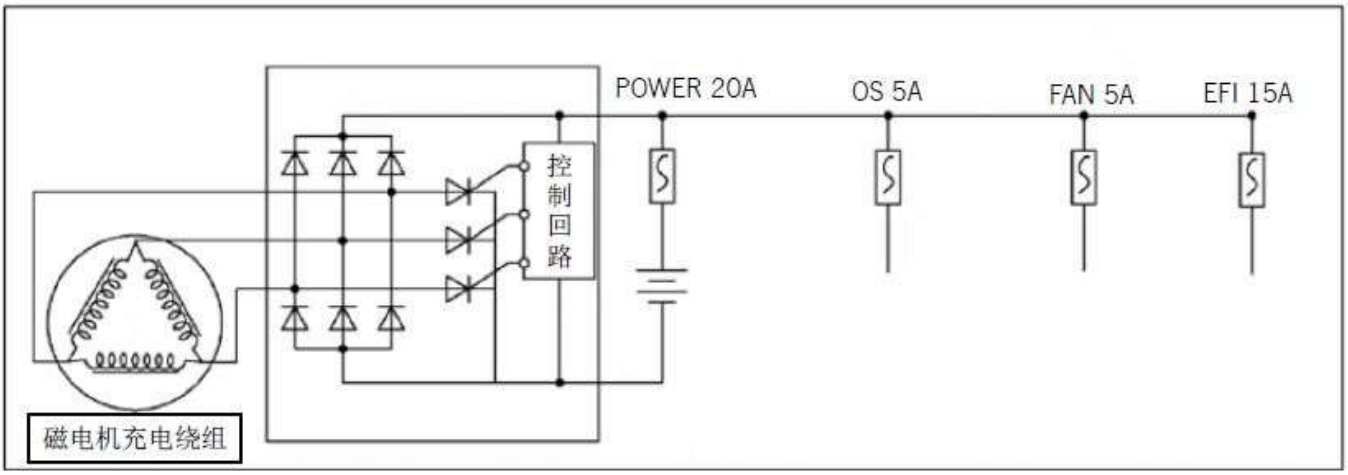
Battery and power supply system

Overview	Introduction of main components
Circuit diagram	Main fault diagnosis
Parts layout	

Power supply system is the premise of vehicle electrical system, which can provide sufficient power for other electrical subsystems. The functions include: charging, storing and discharging. Power supply system is characterized by large power supply capacity, up to 168W. It consists of the following parts:

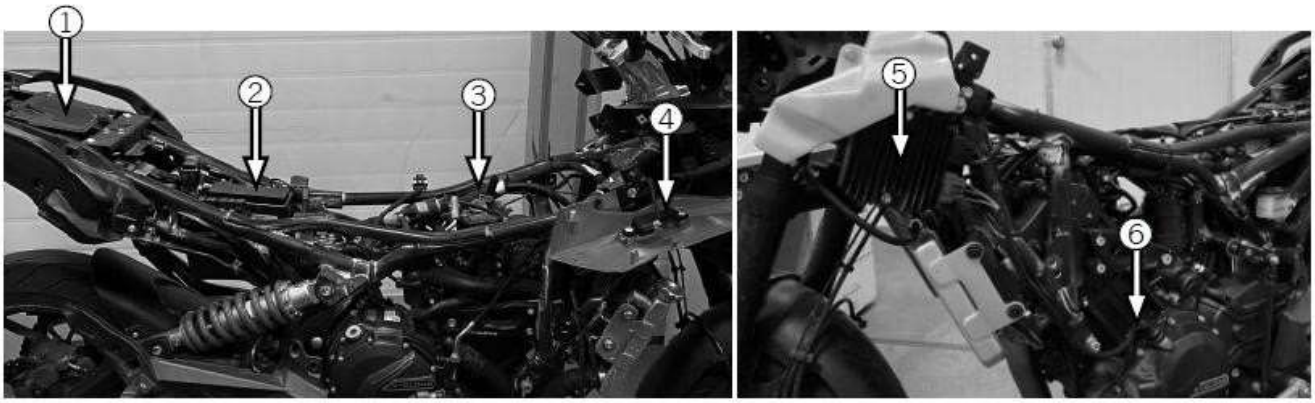
Magneto
Voltage regulating rectifier
Battery
Combination ignition switch
Fuses

Circuit diagram



Control circuit
Charging winding of magneto

Parts layout



1 Body controller, 2 Battery, 3 Main electric harness, 4 Remote control signal receiver, 5 Voltage regulating rectifier, 6 Magneto

Magneto

1. Outline drawing

2. Working principle

The crankshaft drives the rotor to rotate, and the stator winding coil cuts the magnetic line of force to generate the induced electromotive force to output alternating current, E=Blv. Motorcycle magneto is a permanent magnet alternator. The permanent magnet steel is the rotor and the coil winding is the stator. Magneto is the main power supply of electrical system.

3. Basic parameters

The rotor consists of six magnets with 12 poles;

The stator winding has 18 poles in total, connected by three-phase △, and the winding resistance of each phase is 0.3-0.5 Ω;

Calibration power: 168W / 5000r / min (cold engine state) (maximum attenuation of hot engine is 8%).

4. Failure mode

Broken magnetic steel;

Faded magnetic properties of the magnetic steel;

Short circuited stator winding to the ground;

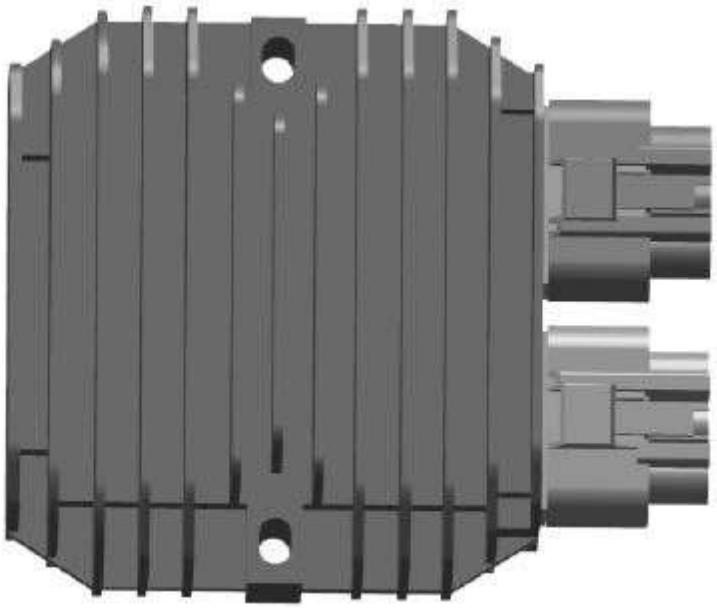
Short circuit of stator winding inter turn;

Fall off and open circuit of welding points of stator winding;

Friction damage between rotor and stator (foreign matter entering).

Voltage regulating rectifier

1. Outline drawing



2. Working principle

The three-phase sinusoidal alternating current which fluctuates with the speed of the magneto is converted into a stable direct current through a full wave rectification and controllable voltage stabilizing charging circuit. The voltage regulating rectifier provides power to the load and charge the battery.

3. Basic parameters

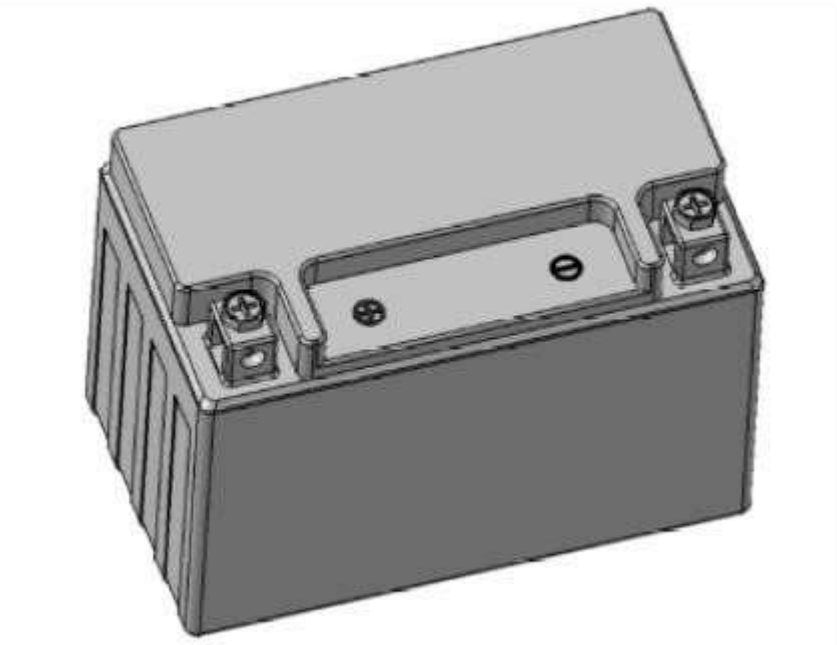
Structure type: three phase full wave rectifier, short circuit type; Regulating voltage: 14.5V ± 0.5V； Working current: 15A.

4. Failure mode

Out-of-control voltage regulator circuit, causing overcharge to the battery;
Open circuit or short circuit of the rectifier circuit, failing to charge the battery or causing insufficient charging;
Short circuit or open circuit of outgoing line.

Battery

1. Outline drawing



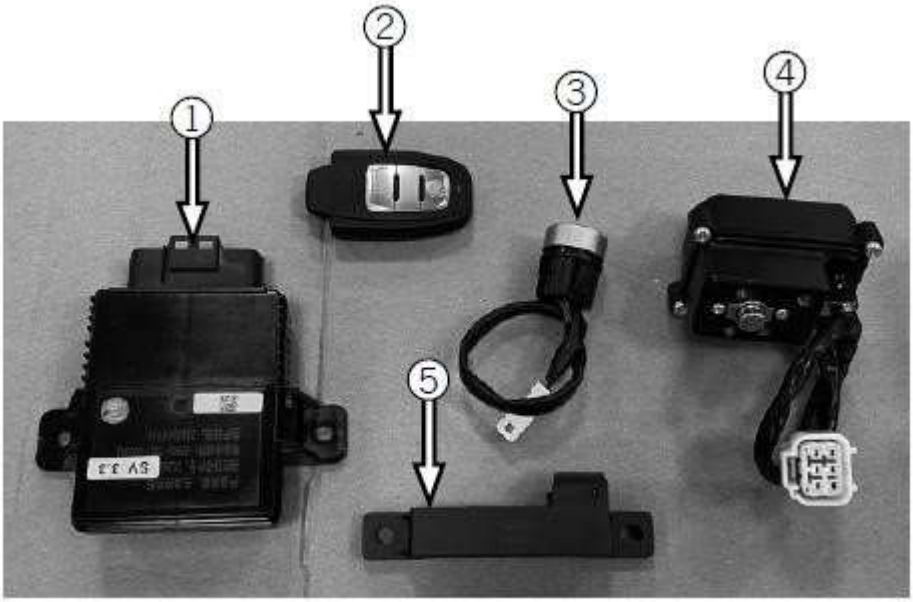
2. Working principle
Immersed in electrolyte, the two kinds of lead (negative electrode) and lead dioxide (positive electrode) can produce 2V voltage. There are six cells connected in series, and the voltage can reach 12 ~ 13V. It is the auxiliary power supply of the electrical system and can absorb the overvoltage in the circuit.

3. Basic parameters
Battery type: valve regulated wet load maintenance free lead-acid battery, model: 12V/9A·h;
10HR rated capacity: 9A·h (25 ℃ ± 2℃);
High-rate discharge performance () 90A: duration more than 90s; voltage greater than 8.5V after 5s.

4. Failure mode
Polarized plates leading to reduced capacity, failure to provide the energy required for starting and reduced charging performance;
Leakage, causing corrosion electrode;
Too much internal resistance, serious self-discharge phenomenon, voltage below 5V.

Body controller

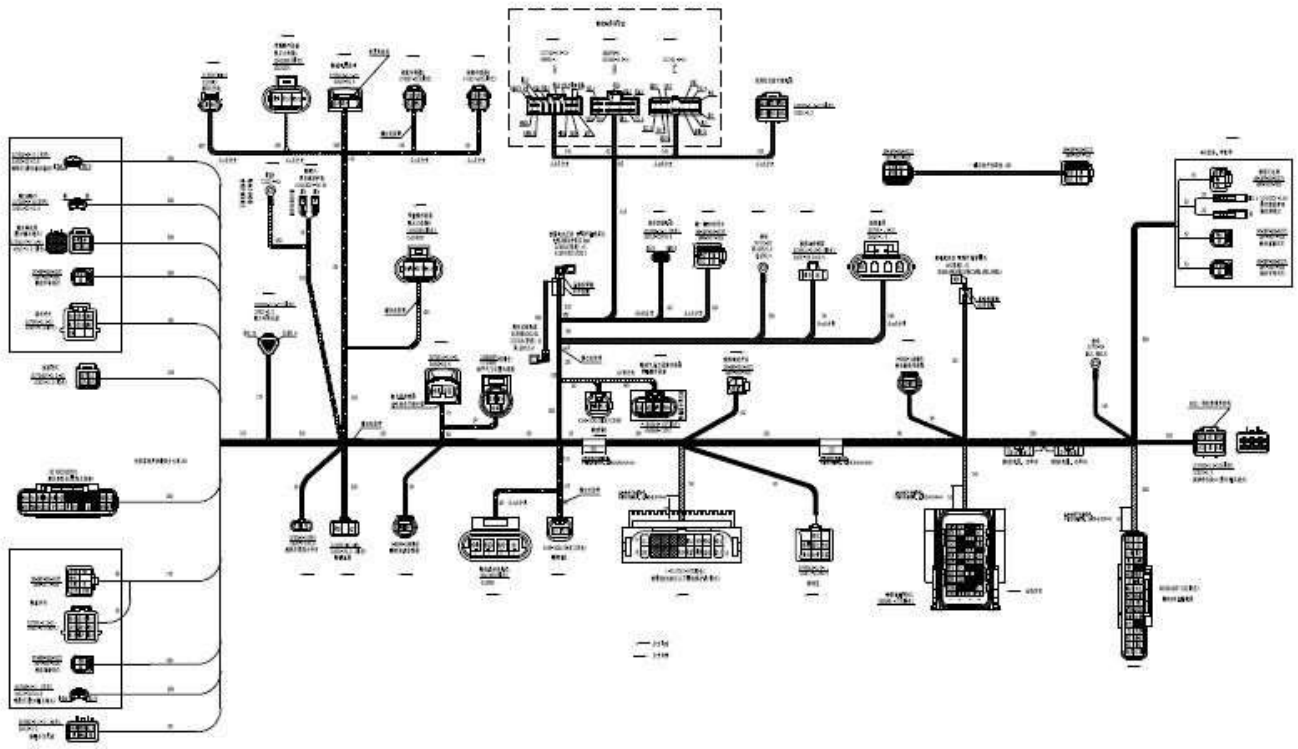
1. Outline drawing



1 Body controller body, 2 Remote controller, 3 One key start switch, 4 Electronic direction lock, 5 Remote control signal receiver

Wire harness

1. Outline drawing



2. Working principle

The wire bundle consists of wires of various specifications, connector sheaths, terminals, conduit pipes, tapes, fuse and other parts of various specifications through bifurcation, riveting, wrapping and assembly. Through the connection of wire harness, the electrical and electronic equipment of the whole vehicle can work normally.

3. Basic parameters

The on-off status of all colored wires shall conform to the electrical wiring diagram;
Riveting of each branch and terminal shall be firm and connected well;
The conduit pipes and the tape should be tightly wrapped without looseness;
All connectors and corresponding electrical and electronic equipment shall be reliably connected.

4. Failure mode

Terminal and connector are not assembled in place and loose;
Short circuit to ground or adjacent wires caused by damaged wire sheath;
Corrosion at the fork, causing unreliable connection or open circuit;
Instantaneous failure and poor contact of wire head or wire (most instantaneous electrical failures are caused by this);
Poor contact or burnt out of the fuse;
Unstable installation of wire harnesses on the body of the car to tie the turn, causing the wire vibration wear loss or poor contact.

Main fault diagnosis

Failure phenomenon	Possible causes	Solution
No electricity in the whole vehicle: when the key is turned on, there is no display on the instrument, and other electrical functions cannot be performed.	Burnt out main fuse;	Replace the main fuse
	Poor contact of main fuse circuit;	Plug in again
	Poor contact of the positive and negative lines of the battery;	Reconnect
	No electricity in the battery;	Charge or replace it
	Ignition switch failure;	Repair or replace
	Poor connection between ignition switch outgoing line and main cable;	Plug in again
	Open circuit or short circuit of main cable.	Repair or replace
Low battery voltage	The whole vehicle is stored too long	Charge with DC stabilized voltage charger
	Vehicle charging circuit fault or too large vehicle quiescent current	Check the charging circuit and quiescent current of the whole vehicle
	Decaying battery capacity, battery does not store power, battery self-discharge	Replace battery
The battery is not fully charged	Poor connection between outgoing line of voltage regulating rectifier and main cable or magneto	Plug in again
	Open circuit or short circuit of main cable	Repair or replace
	Magneto failure	Replace the magneto
	Failed voltage regulating rectifier	Replace the voltage regulating rectifier
	Batteries failing to store power	Replace battery
Battery overcharge: The battery shows a large volume of gas or deformation	Failed voltage regulating rectifier	Replace

Starting system

Overview	Introduction of main components
Circuit diagram	Main fault diagnosis
Parts layout	

1. Overview

When the engine starts to work, it needs the help of external force to make it work first, then it can perform the ignition and fuel supply program, and the internal-combustion engine can cycle combustion and work stably. The motorcycle is only equipped with electric starting. Firstly, remove the gear switch, side bracket switch, clutch switch protection, and then press the start button, turn on the starter relay, so the starting motor begin to rotate, driving the intermediate gear and isolator, so that the engine can enter the working cycle, and the engine can be ignited, injected and burned normally. The system consists of the following components:

Starting motor;

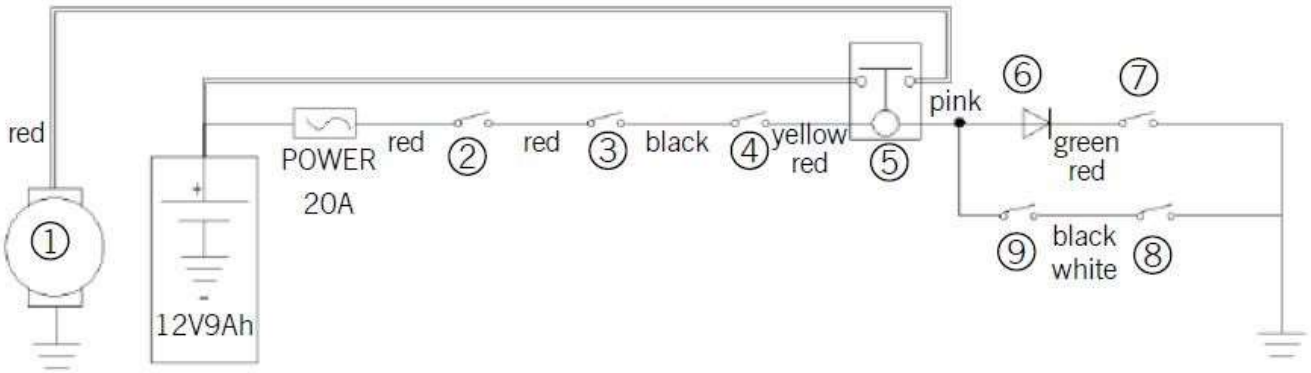
Starter relay

Battery

Start switch and flameout switch;

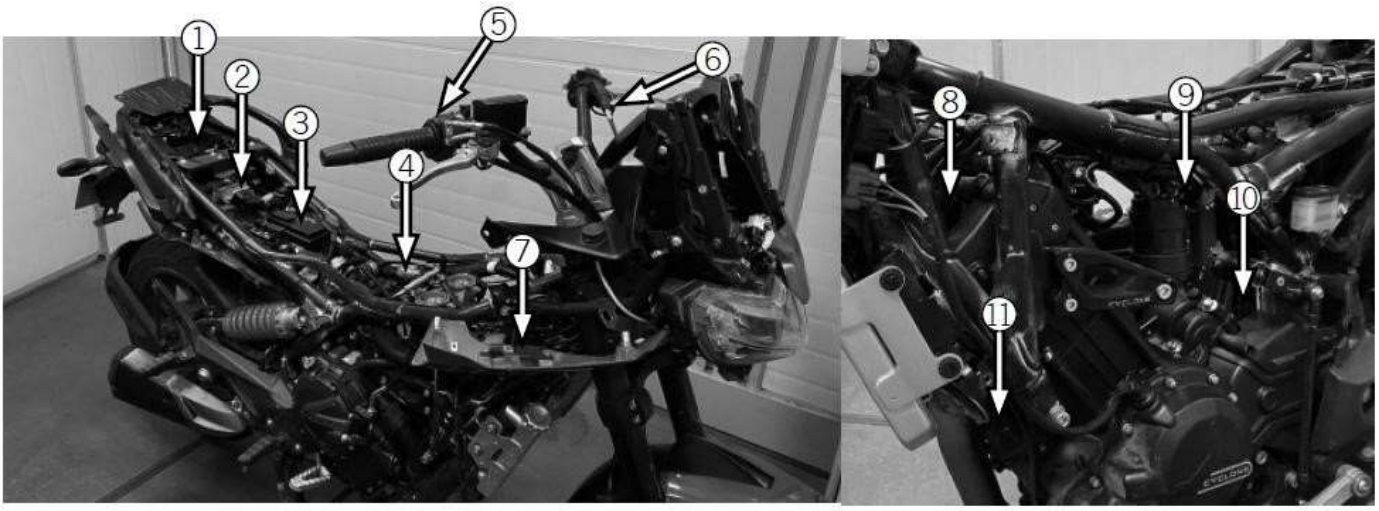
Neutral switch, side bracket switch and clutch switch.

Circuit diagram



1 Starting motor, 2 Ignition switch, 3 Flameout switch, 4 Electric starting switch, 5 Starting relay, 6 Isolation diode, 7 Neutral switch, 8 Side bracket switch, 9 Clutch switch

Parts layout

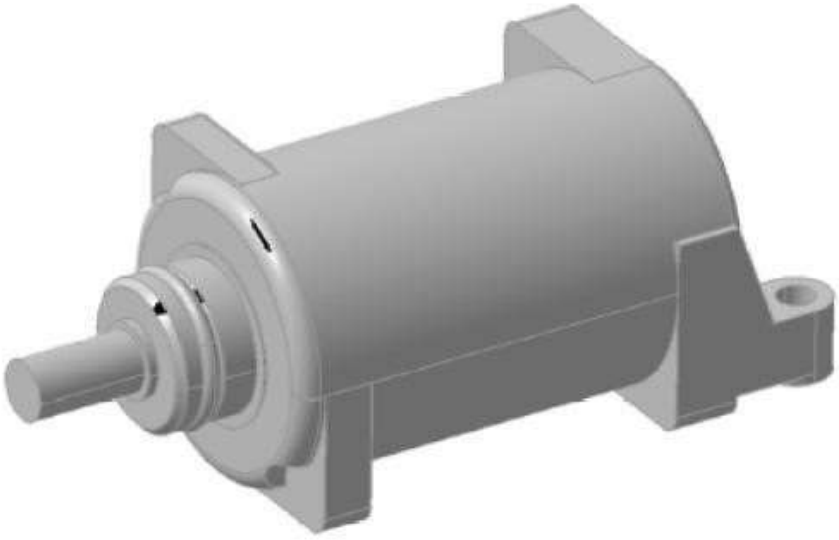


1 Body controller body, 2 ECU, 3 Battery, 4 Cable harness, 5 Clutch switch,
6 Start the flameout switch, 7 Remote control signal receiver, 8 Ignition coil, 9 Start relay, 10 Gear switch, 11 Start motor

Introduction of main components

Starting motor

1. Outline drawing



2. Working principle

The current carrying conductor is subject to electromagnetic force in magnetic field, F=Bli. Apply power to the positive and negative terminals of the starter motor (negative override), and the motor shaft starts to rotate, thus driving the initial engine operation through the reduction gear, the isolator, and the crank

3. Basic parameters

The stator has four magnets, four poles and four carbon brushes;

Specification: 12V650W;

Rotation direction of output shaft: viewed from the tooth end, clockwise; Output characteristics

Motor characteristics	Condition	Voltage (V)	Current (A)	Speed r/min	Torque N.m
	No load	11.5	≤30	≥10000	/
	Load	9.5	≤120	≥6000	1.0
	Brake	6	≤300	/	≥2.5

4. Failure mode

Motor open circuit failure;

Excessive wear of carbon brush;

Broken stator magnetic steel;

Faded magnetic properties of the magnetic steel;

Friction short circuit between rotor winding enameled wire and stator;

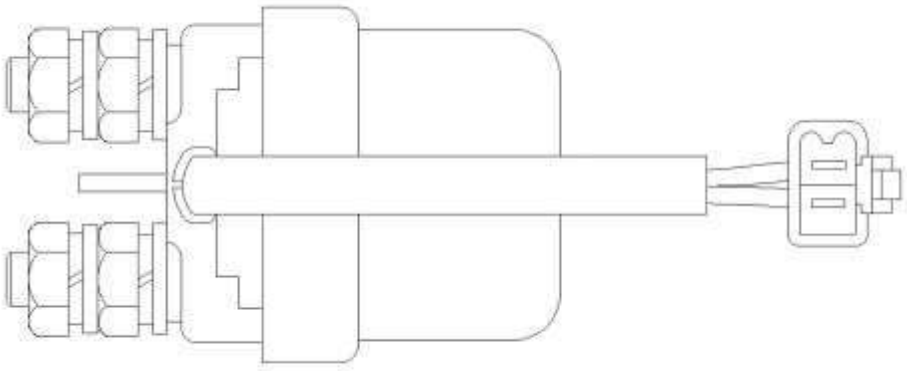
Bearing failure, causing abnormal noise of motor operation;

Poor oil seal causing short circuit failure due to oil in motor;

Poor waterproof causing decreased performance of the motor due to water in the motor.

Start relay

1. Outline drawing



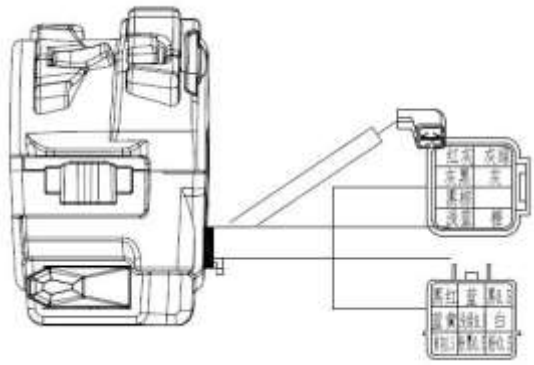
2. Working principle
Turn on the voltage at both ends of the relay coil so that it can generate electromagnetic force and pull on the movable contact and the fixed contact. The small current through the operating switch and relay coil can control the large current through the starting motor and relay contact. The starter relay also contains the power circuit (power pole B, coil terminal).

3. Basic parameters
Nominal voltage: 12V;
Rated current: DC150A;
Closing voltage: ≥ DC7V;
Released voltage: ≤ DC4.5V;
Contact voltage drop: below 0.2V (at 150A);
Coil current: below 3.5A.

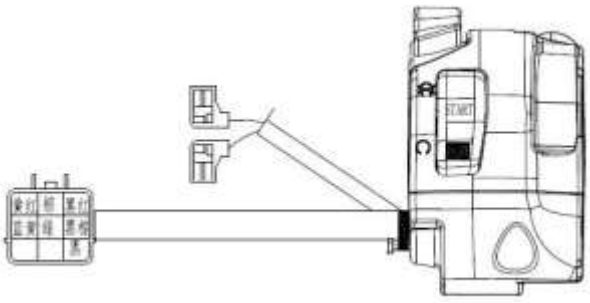
4. Failure mode
Open circuit of the coil or lug causing failure in the contact point pulling in;
Short circuit of the coil, causing failure in the contact point pulling in;
Corroded or ablated contact point, causing failure in connection even if it is closed;
Contacts that cannot be disconnected caused by excessive current;
Open circuit of power circuit (power pole B, coil terminal) , causing the whole vehicle unable to start.

Control switch (left and right combination switch, gear switch)

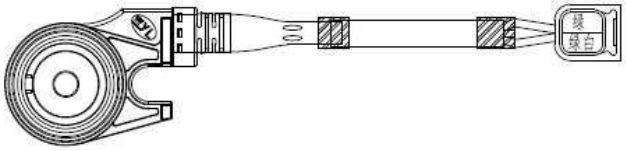
1. Outline drawing



Left combination switch



Right combination switch



Side bracket switch

Gear switch

2. Switch function

Left combination switch functions

							Orange	Green	Light blue					
					△	Emergency lamp	○—○—○							
		White	Blue and yellow	Blue	⇦	Left turn	○—○					Light green	Black	Blue

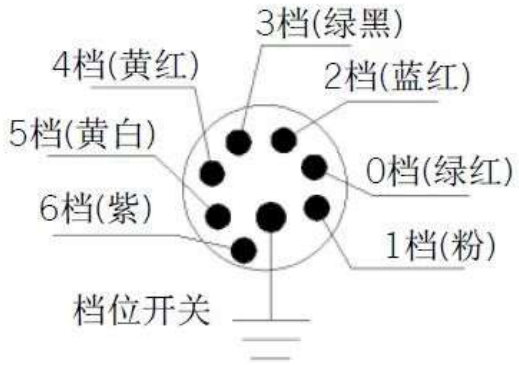
	Low beam										Trumpet		
	High beam					Right turn					Overtaking light		

Right combination switch functions

		Red and black	Black and white				
	Flameout					Black and white	Yellow and red
	Work				Start		

Pack up			The engine can work
Lay down			Engine cannot be started or turned offt.

Side bracket switch functions



4th gear (yellow and red)
3rd gear (green and black)
2nd gear (blue and red)
5th gear (yellow and white)
6th gear (purple)
Neutral gear (green and red)
1st gear (pink)
Gear switch
Gear switch functions

3. Failure mode
Broken positioning pin of the switch, rotating on the handle tube when in use;
The switch has no or weak sense of being in place;
The button cannot be reset;

Switch failure and lead wire breakage make the switch unable to be connected;
Lead wire breakage, switch dysfunction;
Loose side bracket switch and poor contact;
Abrasion, open circuit or open circuit of side bracket switch lead-out wire;
Switch worn, vibrated, and corroded by water.

Main fault diagnosis

Failure phenomenon	Possible causes	Solution
Start relay does not close: press the start button, and the sound of relay closing is not heard, and the starting motor does not rotate.	The battery voltage is too low;	Charge the battery;
	The corresponding fuse is not connected or burnt out:	Connect the fuse or replace it;
	Open circuit of neutral line of gear switch:	Connect or replace the gear switch;
	Side bracket switch open circuit failure;	Connect or replace the side bracket switch；
	Clutch switch open circuit failure;	Connect or replace the clutch switch;
	Open circuit failure of start button;	Connect the circuit or replace the left switch;
	Open circuit failure of flameout switch;	Connect the circuit or replace the left switch;
	Starter relay failure;	Replace the starter relay；
	The relevant lines of the main cable are open circuit.	Repair or replace the main cable.
Starting motor does not run: there is a sound of relay closing, but the motor does not run.	The battery voltage is too low;	Charge the battery;
	Loose thick wire connector;	Fasten the connector;
	Motor open circuit failure;	Replace the motor;
	Open circuit between pole contacts of starter relay;	Replace the starter relay；
	Motor short circuit failure;	Replace the motor;
	Engine stuck and motor locked.	Check the engine.
Motor speed is too low	The battery voltage or capacity is too low;	Charge or replace the battery;
	Poor contact of connector head;	Fasten the connector;
	The output torque of starting motor is not enough;	Replace the motor;
	Excessive engine resistance.	Check the engine.

Lighting signal system

Overview	Introduction of main components
Circuit diagram	Main fault diagnosis
Parts layout	

1. **Overview**

Lighting signal system is an important guarantee for the safe driving of vehicles, which includes the headlamp lighting system, signal lamp control system, and horn system.

Headlamp lighting system:

When the vehicle is driving at night, it needs the headlamp to illuminate the road and remind the surrounding vehicles and people of the existence of the vehicle. When driving at medium and high speed, it uses the high beam lamp, and when meeting, it uses the low beam lamp. The low beam lamp is required to be anti-glare. In addition, for the dual lamp lighting system, when one high beam fails, the other high beam is not allowed to light up, which needs to be controlled by the headlamp controller.

Signal lamp control system:

When the vehicle is turning, it is necessary to prompt the surrounding vehicles and people to avoid reasonably by flashing the turn signal; When driving at night, the tail light is needed to indicate the existence of the vehicle and illuminate the license plate number; When braking, you need to light up the brake light to indicate that the vehicle behind is braking and decelerating. The flashing of turning signal lamp is controlled by switch and flasher, and the other lamps are only controlled by switch.

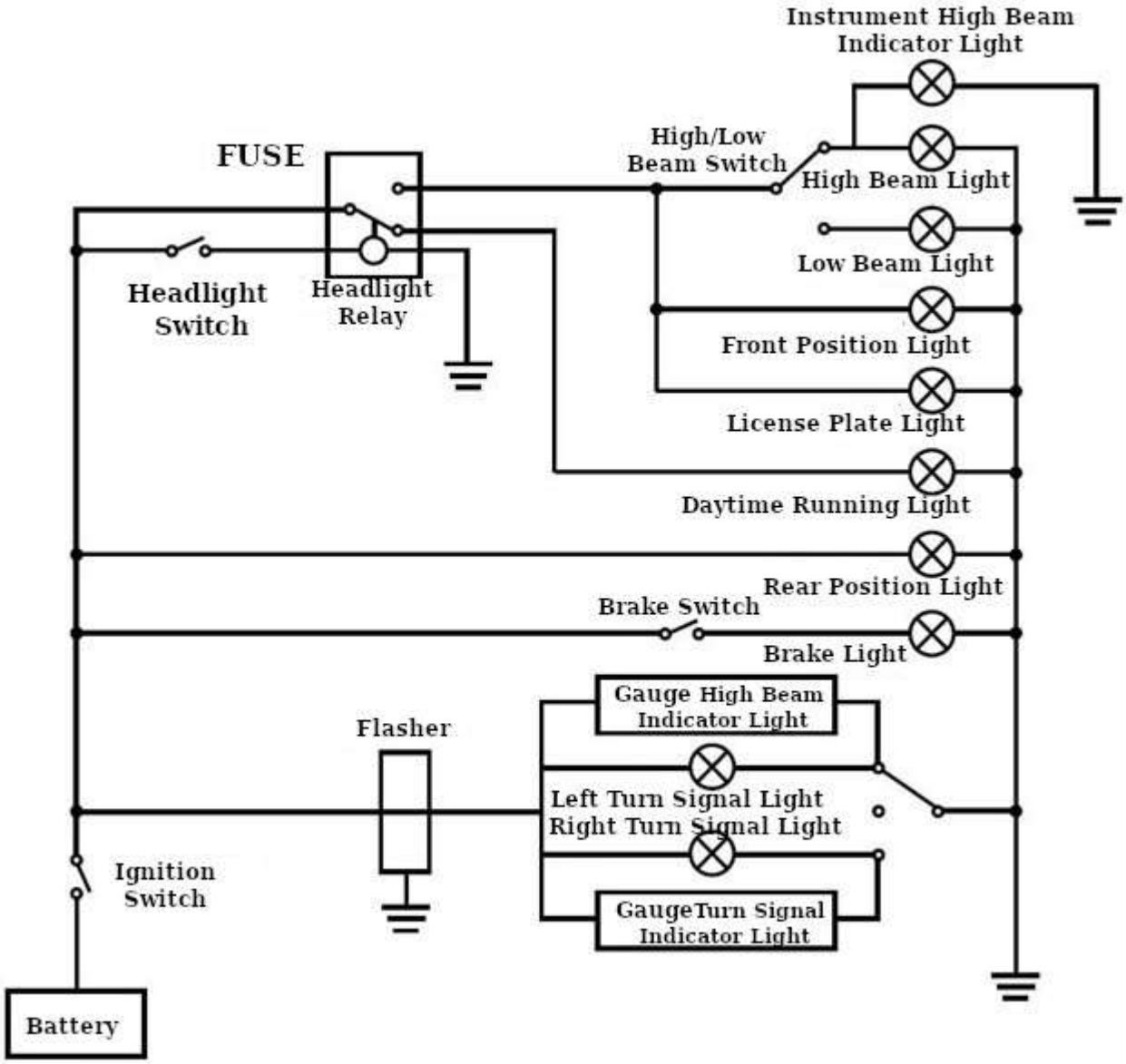
Horn system:

If other vehicles or pedestrians are obstructing or may hinder the driving of the vehicle, the horn can be used to prompt to ensure driving safety. The operation of the horn is controlled by the horn button.

Component parts:

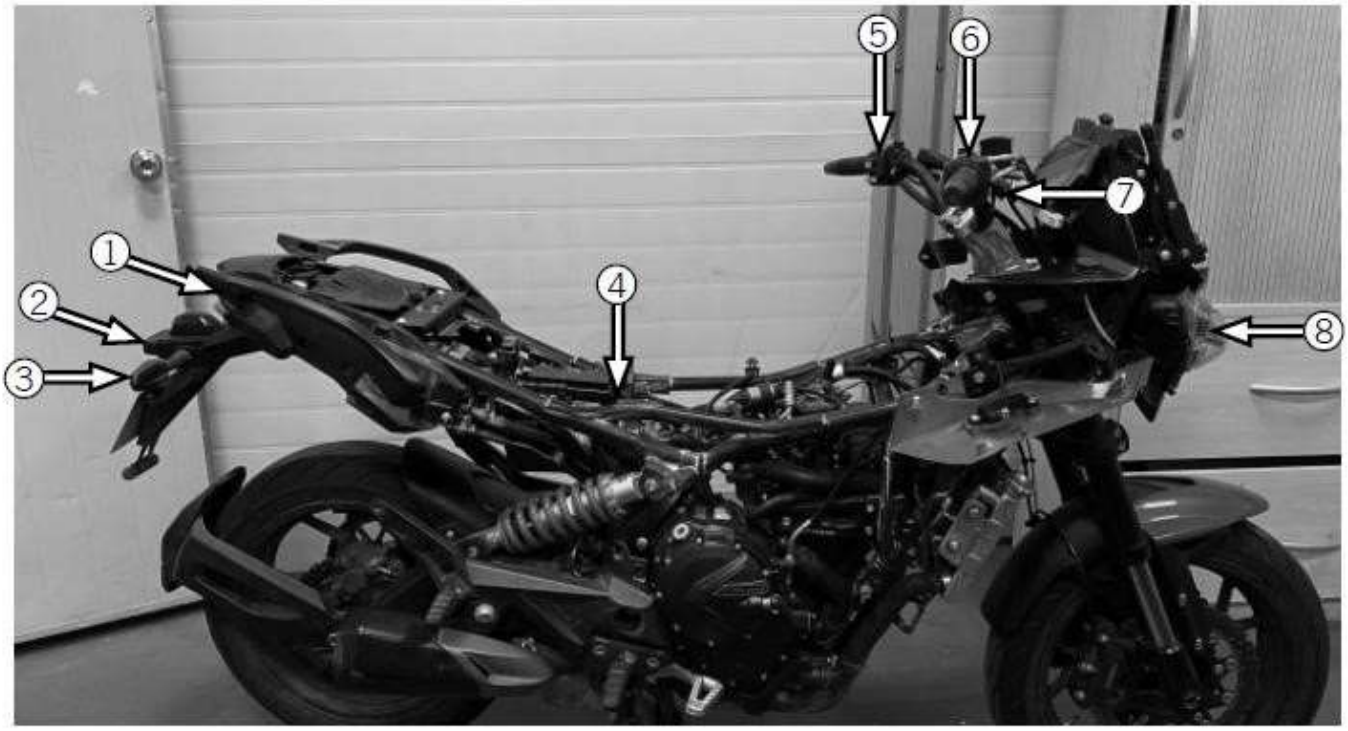
- Headlamp (including daytime running lamp)
- Combined rear position lamp
- Turn signal lamp
- Horn
- Headlamp relay
- Flasher
- Front brake lamp switch
- Rear brake lamp switch
- Left and right combination switch

Circuit diagram



Fuse | Headlight switch | Headlamp relay
High and low beam switch | Instrument high beam indicator | High beam lamp
Low beam lamp | Front position lamp | License plate lamp
Daytime running lamps (DRLs) | Rear position lamp | Brake switch
Brake lamp | Instrument steering indicator lamp | Flasher
Left turn signal | Right turn signal | Instrument steering indicator lamp
Ignition switch | Battery

Parts layout



1 Combined tail lamp, 2 License plate lamp, 3 Rear right turn signal lamp, 4 Flasher,
5 Left combination switch, 6 Right combination switch, 7 Front brake switch, 8 Headlamp

Introduction of main components

Headlamp

1. Outline drawing

2. Working principle

Headlamp beads generally have high beam filament and low beam filament. The high beam filament is located at the focus of the parabolic surface of the headlamp reflector. The light is reflected by the reflector and becomes a parallel beam, which is then scattered through the lamp glass, and can evenly illuminate the road within 100m in front; The low beam filament is located above the front of the focus, and the light can illuminate the road within 30m in front after reflection. Because the shading plate is equipped under the lamp bead, the light cannot be dazzling.

3. Basic parameters

Headlamp bulb specification: 55 / 60W;
Position lamp specification: LED 1.4W.

4. Failure mode

Lamp bead failure;
Water or dust in the lamp;
Loose welding of circuit board;
The lamp shell glass is scratched；
Lamp line open circuit or short circuit;
The mirror deformed at high temperature; Broken or loose baffle;
Slanting light.

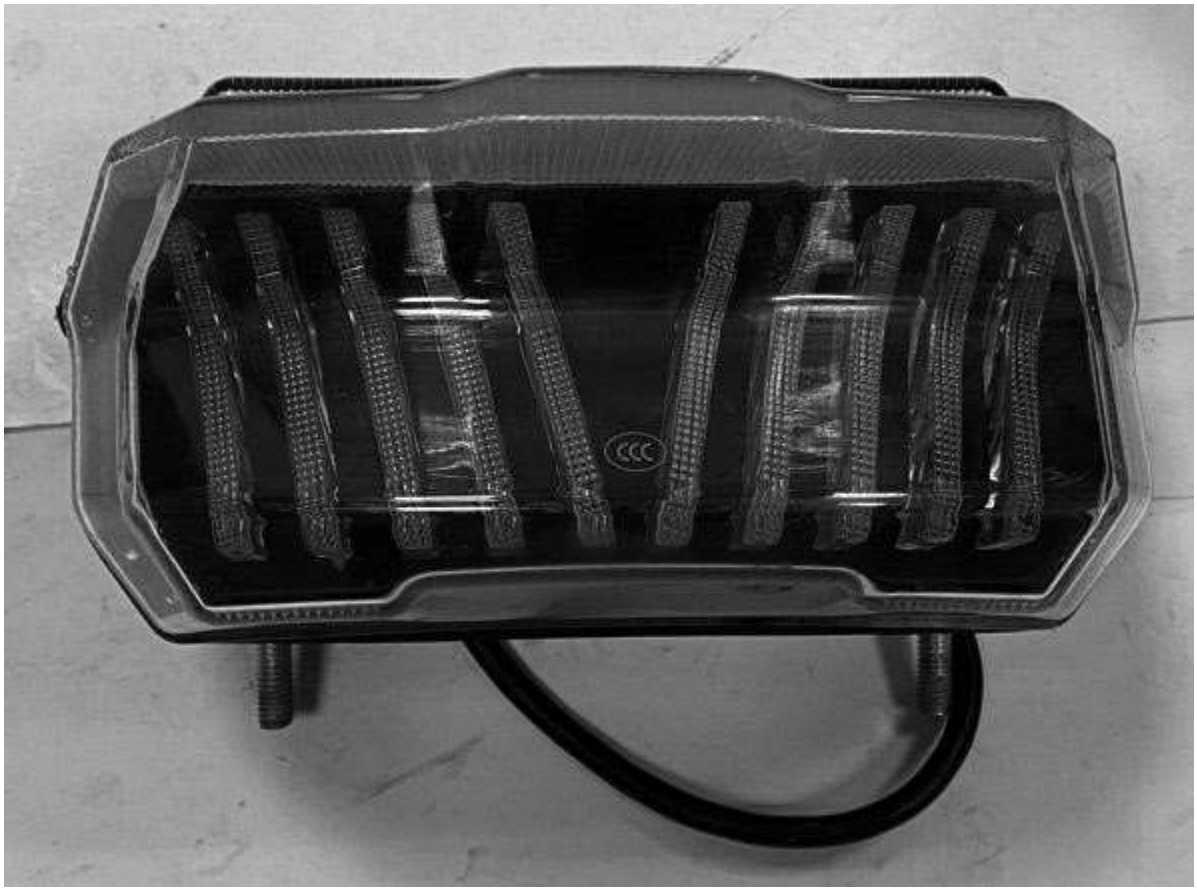
5. Lighting adjustment

Up and down adjustment: adjust the adjusting screw at the back of the headlamp. Turn the adjusting screw clockwise to adjust the light to move down, and vice versa.

Left and right adjustment: the left and right of the vehicle is not available.

Combined rear position lamp

1. Outline drawing



2. Working principle

The combined rear position lamp integrates the functions of tail lamp and brake lamp. The light of the tail lamp and brake lamp is red, the tail lamp/brake lamp bead is a double filament bead, the low power bead is used for the tail lamp, and the high-power bead is used for the brake lamp.

3. Basic parameters
Rear position lamp bead specification: LED 2.7W;
Brake light bead specification: LED 3.1W.
4. Failure mode
Lamp bead failure;
The lamp holder is loose;
Lamp line open circuit or short circuit;
Water or dust in the lamp;
The lamp glass is scratched or damaged;
The reflection block falls off.

License plate signal lamp

1. Outline drawing

2. Working principle

The light of the license plate lamp is white, and the light of the license plate lamp is formed by the reflection of the reflecting block through the transparent plexiglass below.

3. Basic parameters

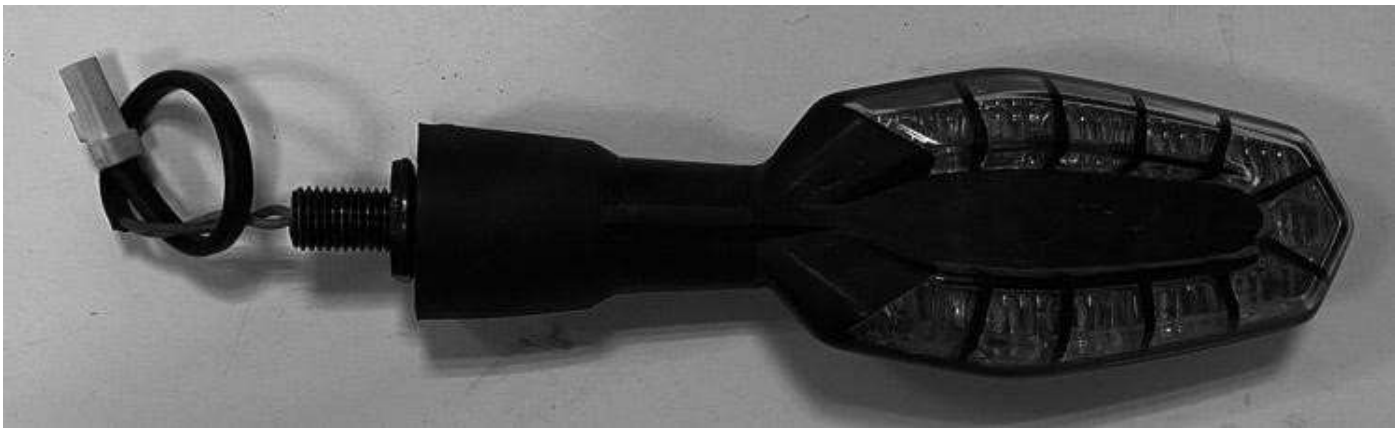
Specification of license lamp bead: 5W;

4. Failure mode

Lamp bead failure;
Loose circuit board;
Lamp line open circuit or short circuit;
Water or dust in the lamp;
The lamp glass is scratched or damaged;
The reflection block falls off.

Front turn signal lamp

1. Outline drawing



2. Working principle

The front turn signal lamp is composed of lamp glass, lamp shell, reflector, lamp holder, handle and lamp bead. The light emitted by the lamp beads is reflected into concentrated light by the reflector, and then scattered into uniform and soft orange light by the lamp glass.

3. Basic parameters

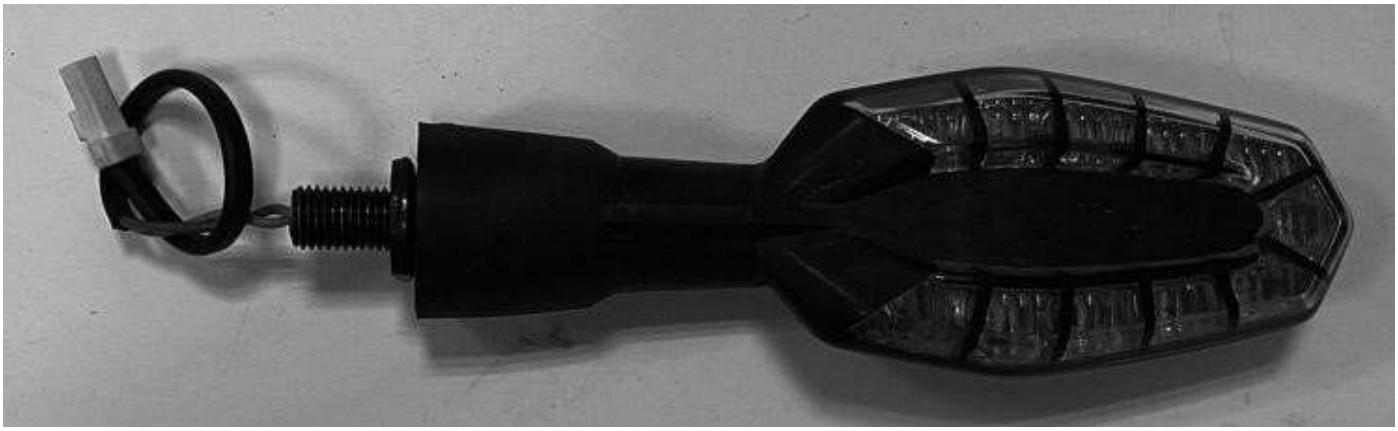
Specification of front turn signal lamp bead: LED 2.3W.

4. Failure mode

Lamp bead failure;
The lamp holder is loose;
Lamp line open circuit or short circuit;
Water or dust in the lamp;
The lamp glass is scratched or damaged;
Loose or broken handle.

Rear turn signal lamp

1. Outline drawing



2. Working principle

The rear turn signal lamp is composed of lamp glass, lamp shell, reflector, lamp holder, handle and lamp bead. The light emitted by the lamp beads is reflected into concentrated light by the reflector, and then scattered into uniform and soft orange light by the lamp glass.

3. Basic parameters
Specification of front turn signal lamp bead: LED 2.3W.

4. Failure mode

Lamp bead failure;
The lamp holder is loose;
Lamp line open circuit or short circuit;
Water or dust in the lamp;
The lamp glass is scratched or damaged;
Loose or broken handle.

Front brake lamp switch

1. Outline drawing

2. Working principle

When braking, hold the brake handle tightly, and the contact contacts with the conductive elastic sheet under the action of spring force, so as to connect the circuit, and the brake light is on. Release the brake handle, press the brake handle against the switch guide rod to compress the spring, so that the contact leaves the conductive spring, the circuit is disconnected, and the brake light is off.

3. Basic parameters

The opening stroke of the switch is 2mm and the full stroke is 4mm.

4. Failure mode
The contact and shrapnel are rusted and the contact is
poor; The switch is stuck and the guide rod cannot work;
The leading out insert is broken or rusted.

Rear brake lamp switch

1. Outline drawing

2. Working principle

The pull rod of the rear brake light switch is connected with the brake pedal through a spring. When the brake pedal is pressed, the brake pull rod moves downward, and the contact moves down with it. It contacts the two-contact shrapnel at the same time, connects the circuit, and the brake light is on; When the brake pedal is released, the brake pull rod moves upward under the elastic force of the return spring, so that the contact leaves the two-contact shrapnel, the circuit is disconnected, and the brake lamp is off.

3. Basic parameters

The connection stroke of the switch is 2.5mm and the full stroke is 6mm.

4. Failure mode

The contact and shrapnel are rusted and the contact is poor; The switch is stuck, and the pull rod cannot work; Open circuit or short circuit of outgoing line.

Horn

1. Outline drawing

2. Working principle

Working current circuit of horn: positive lug → horn coil → contact → negative lug. After the current passes through the horn coil, the magnetic field generates suction on the armature, which makes the bass diaphragm and the treble diaphragm move at the same time. When the contact is opened, the current is interrupted, and the electromagnetic force disappears. The diaphragm returns by its own elastic force, the contact is closed again, and the circuit is connected again. So repeatedly, the diaphragm vibrates continuously and sends out sound. The contact clearance can be adjusted by screw to change the vibration frequency of diaphragm, so as to change the sound level.

3. Basic parameters

Voltage: DC12V, Current: 1.5A; Sound pressure level: 105dB

4. Failure mode

Contact ablation;
The contact clearance is too large or too small (can be adjusted and repaired);
Coil short circuit or short circuit;
The leading out insert is broken or rusted

5. Horn adjustment

After the horn works for a long time, the contact arm may deform, causing the contact gap to be too large or too small, making the volume of the horn too small or unable to make sound. At this time, it can be repaired by adjusting the screw. Now loosen the lock nut, turn the screw clockwise or anticlockwise, turn on the power supply of the horn at the same time, adjust until the sound is loudest, and finally lock the nut.

Main fault diagnosis

Failure phenomenon	Possible causes	Solution
Headlamp does not light up: The high beam lamp cannot be turned on; The low beam lamp cannot be turned on; None of them can work.	The engine does not start;	Start the engine;
	The corresponding fuse is not connected or burnt out:	Connect the fuse or replace it;
	The corresponding switch fails;	Repair or replace the switch;
	Headlamp relay failure;	Replace the headlamp relay;
	Lamp bead failure;	Replace lamp beads;
	Poor connection on the line;	Re plug;
	The relevant lines of the main cable are open circuit.	Repair or replace the main cable.
The headlamp cannot be reliably lit	Poor contact of fuse, lamp bead or circuit;	Re connect the poor contact area;
	Headlamp relay failure.	Replace the headlamp relay.
Position light does not work: The front position light does not work; The tail light doesn't work; None of them can work.	The corresponding fuse is not connected or burnt out:	Connect the fuse or replace it;
	Lamp bead failure;	Replace lamp beads;
	Poor connection on the line;	Re plug;
	The relevant lines of the main cable are open circuit.	Repair or replace the main cable.
Turn signal lamp does not work: The front turn signal lamp cannot be turned on; The rear turn signal lamp cannot be turned on; None of them can work.	The battery voltage is too low;	Charge the battery;
	The corresponding fuse is not connected or burnt out:	Connect the fuse or replace it;
	Failure of left turn signal switch;	Repair or replace the left switch;
	Failure of right turn signal switch;	Repair or replace the right switch;
	Flasher failure;	Replace flasher;
	Lamp bead failure;	Replace lamp beads;
	Poor connection on the line;	Re plug;
	The relevant lines of the main cable are open circuit.	Repair or replace the main cable.
Brake light cannot be turned on	The corresponding fuse is not connected or burnt out:	Connect the fuse or replace it;
	Failure of front brake light switch;	Replace the front brake light switch;
	Failure of rear brake light switch;	Adjust and replace the rear brake light switch;
	Lamp bead failure;	Replace lamp beads;
	Line fault.	Inspection and maintenance.
The horn does not sound	The corresponding fuse is not connected or burnt out:	Connect the fuse or replace it;
	Failure of horn button;	Repair or replace the left switch;
	Horn failure;	Adjust or replace the horn;
	Poor connection on the line;	Re plug;
	The relevant lines of the main cable are open circuit.	Repair or replace the main cable.

Information display system

Overview	Introduction of main components
Circuit diagram	Main fault diagnosis
Parts layout	

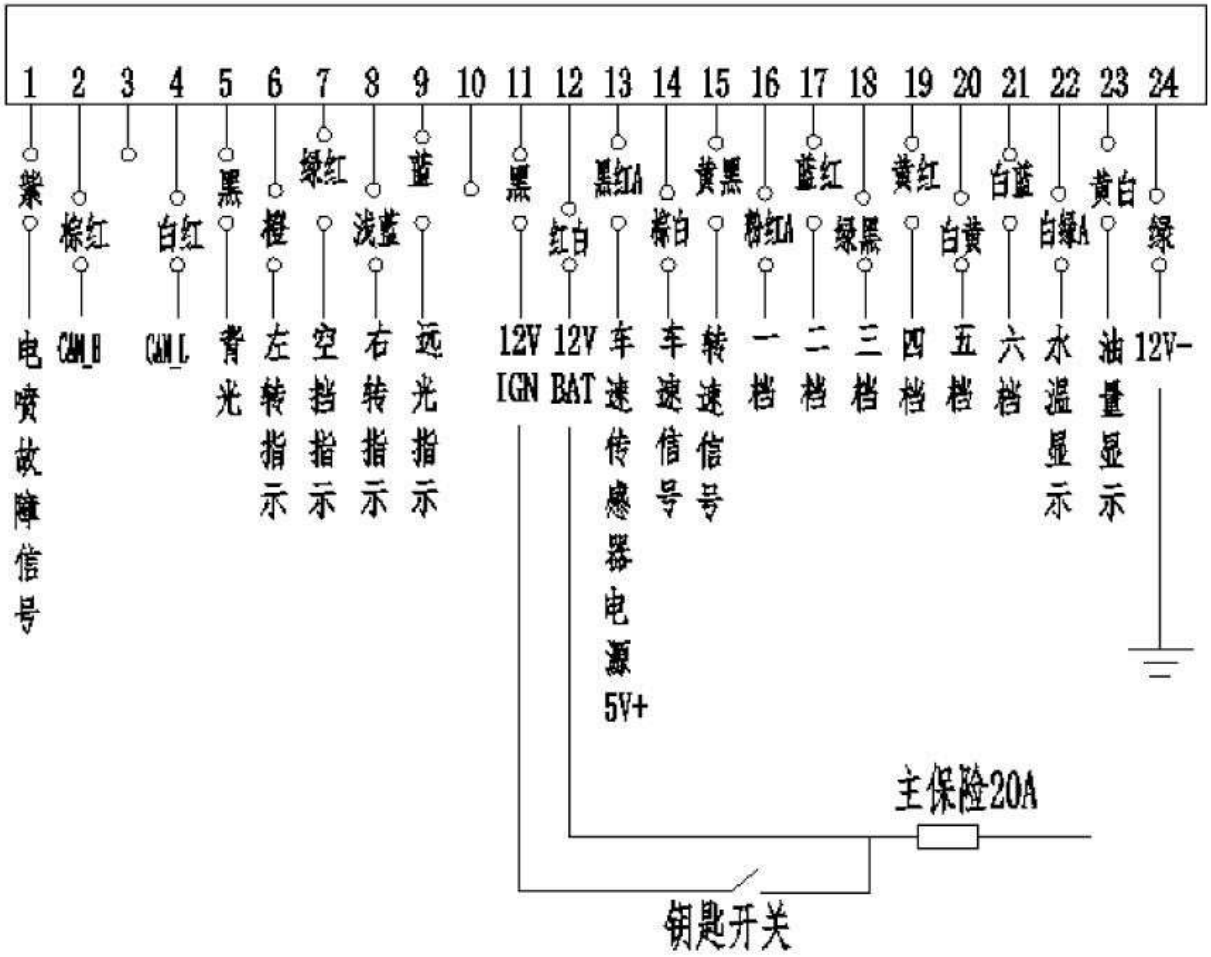
Overview

The information display system displays the static and dynamic information of the whole vehicle through the instrument panel, and provides it to the driver to guide the driver to operate safely. The displayed vehicle information includes the following contents: vehicle speed, engine speed, oil level, gear, voltage alarm, water temperature alarm, steering indication, high beam indication, accumulated/subtotal mileage/time, clock, EMS fault code.

The signal transmission of the display system is all electronic signal, and the instrument is also all electronic instrument. The components of the system include:

- Instrument assembly
- Speed sensor
- Oil level sensor
- Gear switch
- Signal switch
- ECU

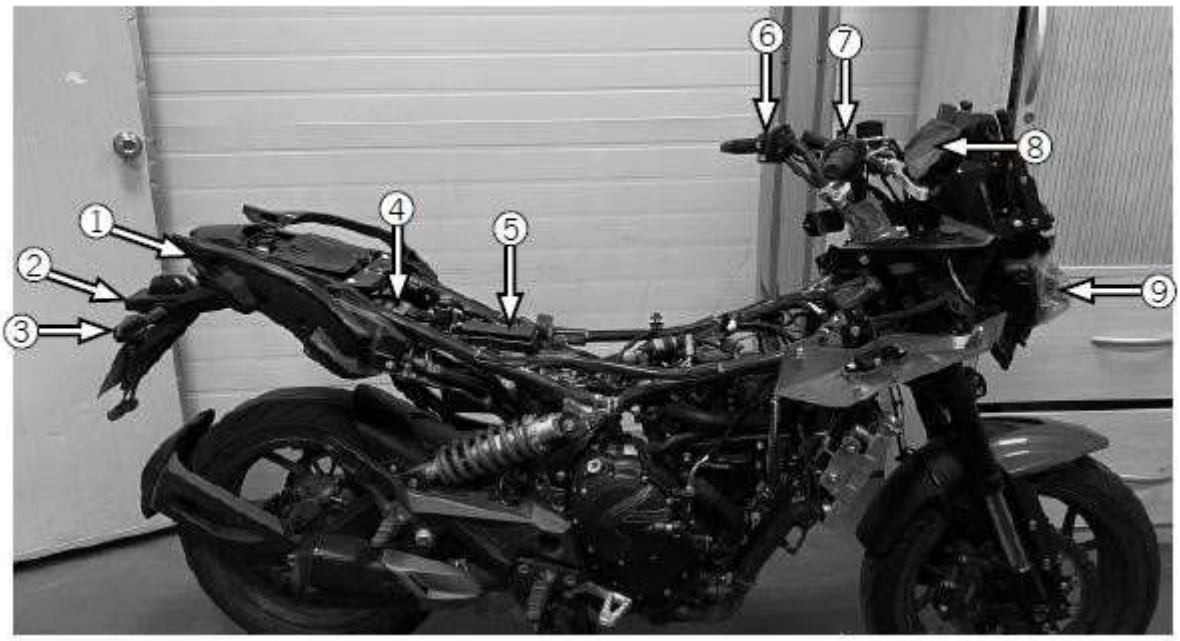
System schematic diagram



Purple
EFI fault signal
Brown and red
White and red
Black
Backlight
Orange
Left steering indicator
Green and red
Neutral gear indicator
Light blue
Right steering indicator
Blue
High beam indicator
Black
Black and red A
Speed sensor power 5V+
Brown and white
Vehicle speed signal
Yellow and black
Speed signal

Pink A
First gear
Black and red
Second gear
Green and black
Third gear
Yellow and red
Fourth gear
White and yellow
Fifth gear
White and blue
Sixth gear
White and green A
Water temperature display
Yellow and white
Volume readout
Green
Main fuse 20A
Key switch

Parts layout



1 Combination tail lamp, 2 Rear registration plate lamp, 3 Rear right steering pilot lamp, 4 ECU 5. Battery, 6 Left combination switch, 7 Right combination switch, 8 Front brake switch, 9 Headlamp

Introduction of main components

Instrument assembly

1. Outline drawing

2. Working principle

All electronic instruments (also known as digital instruments), the first input is all electronic signals (including digital signals and analog signals), through circuit processing, all converted into digital signals, through the CPU control output, drive stepper motor pointer, LCD and LED, display the information.

3. Pin menu

Pin number	Function	Pin number	Function
1	EFI fault signal	13	Speed sensor power 5V+
2	CAN_H(reserved)	14	Speed (vehicle speed signal)
3	ABS (suspended light)	15	Tacho (speed signal)
4	CAN_L(reserved)	16	First gear (-)
5	ILL(backlight)	17	Second gear (-)
6	L-TURN	18	Third gear (-)
7	N<->(neutral)	19	Fourth gear (-)
8	R-TURN	20	Fifth gear (-)
9	YG+(high beam)	21	Sixth gear (-)
10		22	Engine coolant temperature (resistance value)
11	IGN<+>(positive pole of power supply)	23	FUEL(Fuel signal)
12	BATT<+>(battery positive)	24	GND(ground)

4. Basic functions

The instrument display contents include: vehicle speed, engine speed, steering indication, high beam indication, neutral indication, oil level alarm indication, engine temperature alarm indication, gear display, clock display, oil level display, accumulated mileage display, subtotal mileage display,

accumulated driving time display, subtotal driving time display, EMS fault code display, green backlight.

5. Possible failures

Some functions cannot be displayed correctly;
The operation button can't adjust the clock and switch the mode;
Water inflow to the instrument.
Mechanical vibration fracture of shell;
The surface is discolored or scratched.

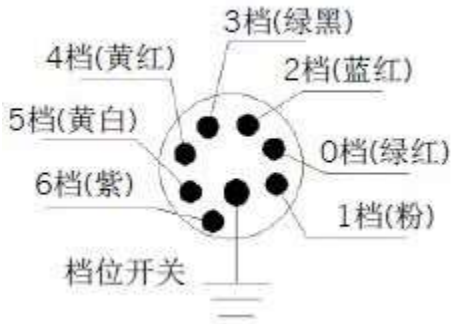
Gear switch

1. Outline drawing

2. Working principle

The rotation of the speed change drum drives the moving contact to rotate, and the moving contact is pressed and contacted with the end contact of the gear switch under the action of the spring force. There are 7 contacts on the end face of the gear switch corresponding to the gears of the shift drum: 1st - Neutral - 2nd - 3rd - 4th - 5th - 6th, leading to 7 color wires. When the speed change drum rotates, the corresponding color line is grounded.

3. Position map of gear color line

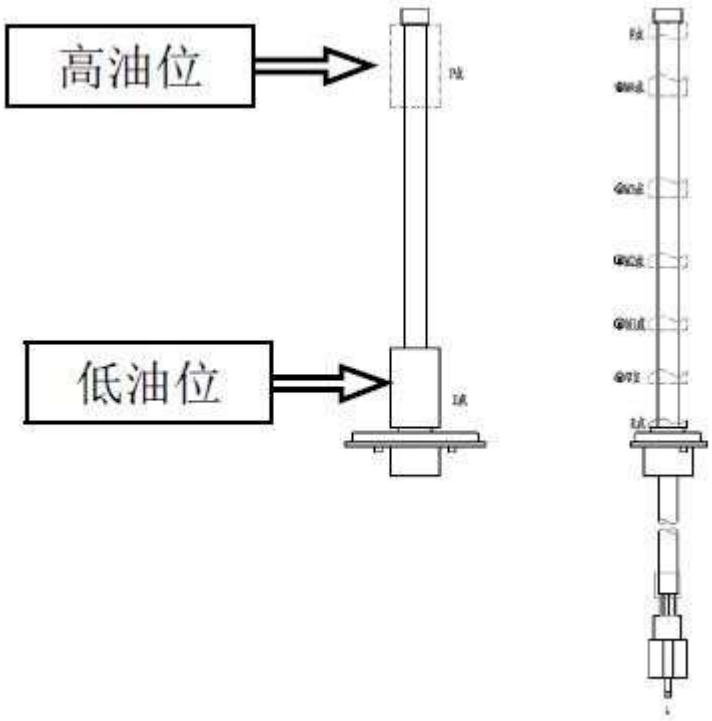


4th gear (yellow and red)
3rd gear (green and black)
2nd gear (blue and red)
5th gear (yellow and white)
6th gear (purple)
Neutral gear (green and red)
1st gear (pink)
Gear switch

4. Failure mode	Contact wear to poor contact; The gear switch vibrates or the press fit is broken; The gear switch is loose; Poor contact of connector; Open circuit or short circuit of outgoing line.

Oil level sensor

1. Outline drawing



High oil level
Low oil level

2. Working principle

The oil level sensor consists of float, floating rod, magnetic core, lead wire, etc. The float, floating rod and magnetic core form a variable resistor. The height of oil level changes, which drives the float up and down. The position of variable resistor changes, and the corresponding resistance value is output.

3. Corresponding relationship between instrument display scale and oil level sensor resistance

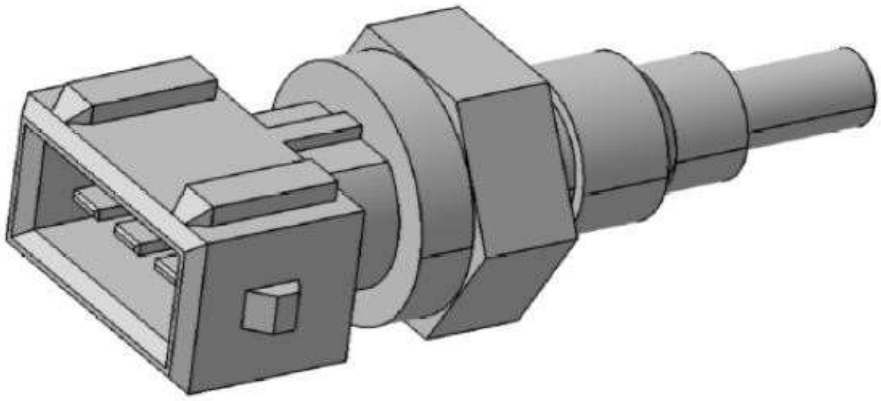
Check point	LCD segment code	Input cathode)	Error value
E	1 flicker	R≥95	
	1 grid	85≤R < 95	
	2 grids	70≤R < 85	
	3 grids	36≤R < 70	
	4 grids	24≤R < 36	
F	5 grids	R < 24	± 2
Note: when one grid is displayed, one grid flashes; when the resistance value is more than 95 Ω ,the 6 cells and the icon will flash together.			

4. Failure mode

Float falling off;
Poor contact between contact piece and thick film circuit board;
The stent was broken; The
circuit board is damaged;
The outgoing line falls off.

Water temperature sensor

1. Outline drawing



2. Working principle

Water temperature sensor: after the engine starts, the temperature in the water tank rises, and the resistance value of the water temperature sensor reaches the set value. At this time, LCE receives the signal, processes it and sends it to the instrument, which displays the water temperature scale to remind the driver.

3. Corresponding relationship between instrument display scale and resistance value of water temperature sensor

Temperature (℃)	Standard resistance（ Ω）
45	265.0~323.0
50	216.0~264.0
54	185.0~229.0
60	148.5~180.5
80*	74.6~90.6
90	53.5~66.5
100	40.6~48.6
108	34.0~38.0
110	32.0~36.0
113	30.0~34.0
115*	25.7~31.7
120	23.0~27.0
125	2.05~24.5

Main fault diagnosis

Failure phenomenon	Possible causes	Solution
Speed indication fault: The speed number is not displayed; Large deviation of indicated speed.	The distance between speed sensor and signal panel is too large;	Reduce the distance to 2mm;
	Vehicle speed sensor failure;	Replace the speed sensor;
	Signal panel failure;	Replace the signal panel;
	Instrument failure;	Replace the instrument;
	Poor wiring, open circuit or short circuit.	Replug or repair.
With speed and without mileage increase indication	Instrument failure.	Replace the instrument.
Engine speed indication fault	Poor wiring or open circuit;	Re-plug or repair;
	Instrument failure;	Replace the instrument;
	ECU failure.	Replace ECU.
Oil level indication fault: There is oil, but no indication; There is no oil, but indication.	Fuel sensor failure or float stuck;	Replace the fuel sensor;
	Instrument failure;	Replace the instrument;
	Poor wiring, open circuit or short circuit.	Replug or repair.
Failure phenomenon	Possible causes	Solution
Gear indication fault: no gear indication; gear indication error.	The moving contact spring fails;	Replace the spring;
	The moving contact or gear switch contact is worn;	Change the moving contact or gear switch;
	Gear switch failure;	Change the gear switch;
	Instrument failure;	Replace the instrument;
	Poor wiring, open circuit or short circuit.	Replug or repair.
The water temperature alarm light is always on	Poor wiring or open circuit;	Re-plug or repair;
	Instrument failure;	Replace the instrument;
	ECU failure.	Replace ECU.
The voltage alarm lamp gives false alarm, and the voltage alarm lamp cannot give alarm	Poor wiring or open circuit;	Re-plug or repair;
	Instrument failure.	Instrument failure.
Instrument backlight does not light up	Poor wiring or open circuit;	Re-plug or repair;
	Instrument failure;	Replace the instrument;
The instrument cannot display the	Poor wiring or open circuit;	Re-plug or repair;
information that ECU should display		
	Instrument failure;	Replace the instrument;
	ECU failure.	Replace ECU.
The direction indicator cannot be turned on and the high beam indicator cannot be turned on	Poor wiring or open circuit;	Re-plug or repair;
	Instrument failure.	Replace the instrument.
Clock display fault: No display, no adjustment or large error.	Instrument failure.	Replace the instrument.
LCD cannot switch mode	Instrument failure.	Replace the instrument.
The function of the instrument cannot be adjusted	Instrument failure.	Replace the instrument.

Engine management system

1. Overview

The engine management system adopts the closed-loop EFI system. By controlling the injection quantity, it can effectively control the air-fuel ratio of the mixture, and make the air-fuel ratio of the engine reach the optimal value under various working conditions, so as to improve the power, reduce the fuel consumption, reduce the exhaust pollution, improve the driving performance, low temperature starting performance and idle performance.
The control of closed-loop EFI system includes: fuel quantitative control, ignition timing control, ignition closing angle control, etc. Fuel quantity control is the most important function of the system, which includes λ Closed loop control, start control, post start control, warm-up control, idle speed control, part load control, full load control, acceleration and deceleration control, overspeed oil cut-off control and deceleration oil cut-off control.

The basic components of the system are as follows
1. Sensor:
Three in one sensor (air density information, load information, load range information, acceleration and deceleration information)
Engine temperature sensor (engine temperature information)
Muffler oxygen sensor (information of excess air coefficient greater than 1 or less than 1)
Engine speed sensor (speed information, crankshaft position)

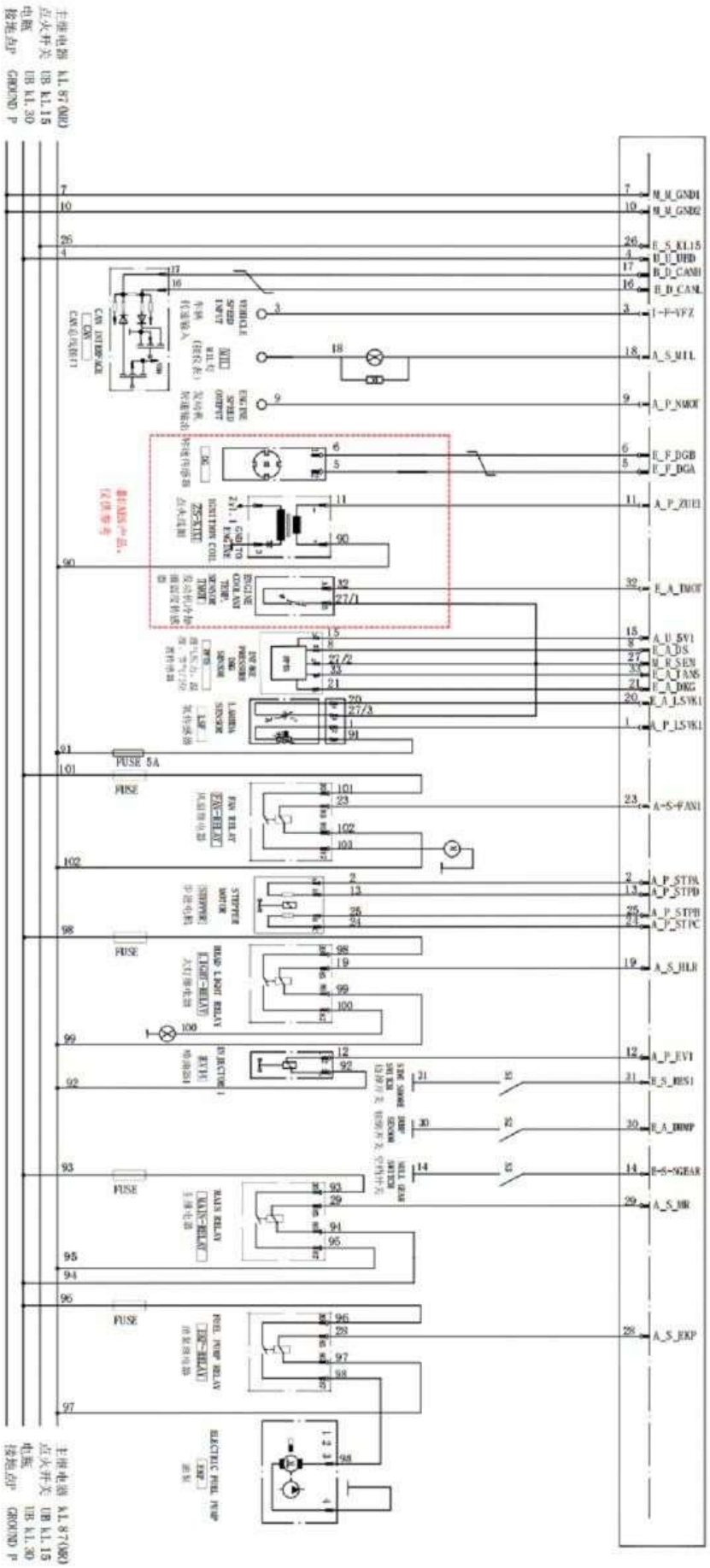
2. Actuator:
Fuel pump
Fuel injector (fuel supply)
Ignition coil
High voltage connecting line
Spark plug (ignition)
Throttle, idle stepper motor (intake)

3. Electronic control unit:
ECU

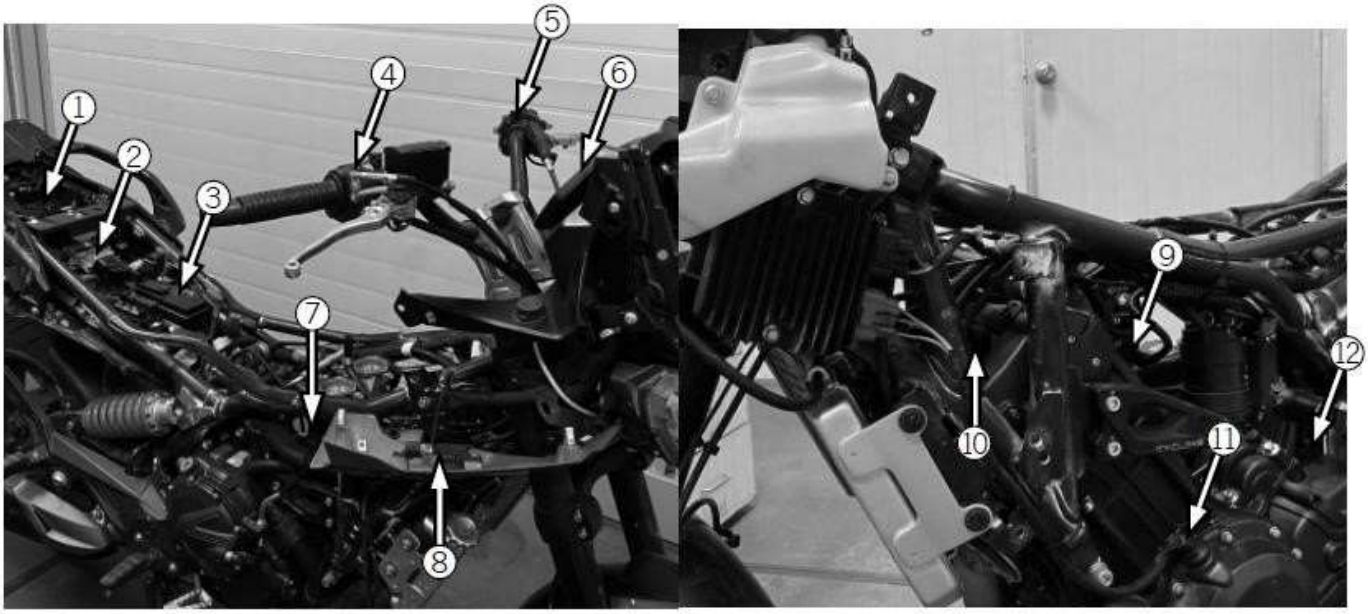
Maintenance precautions

1. The EFI system fault diagnosis can be carried out through the fault indicator light on the vehicle instrument, and the special diagnostic instrument can also be used to communicate with the vehicle ECU to carry out EFI system fault diagnosis and read the fault code.
2. Turn on the key switch for fault diagnosis.
3. If the throttle position is adjusted, it is necessary to turn off the key switch and restart the engine for idle position self-learning.
4. In case of sensor failure, ECU will limp and continue to drive by default, and the user is requested to drive the vehicle to the special repair shop in time for maintenance; If the actuator fails, the ECU will not be able to control the vehicle normally. Please contact the special repair shop immediately for maintenance.

System schematic diagram



Parts layout

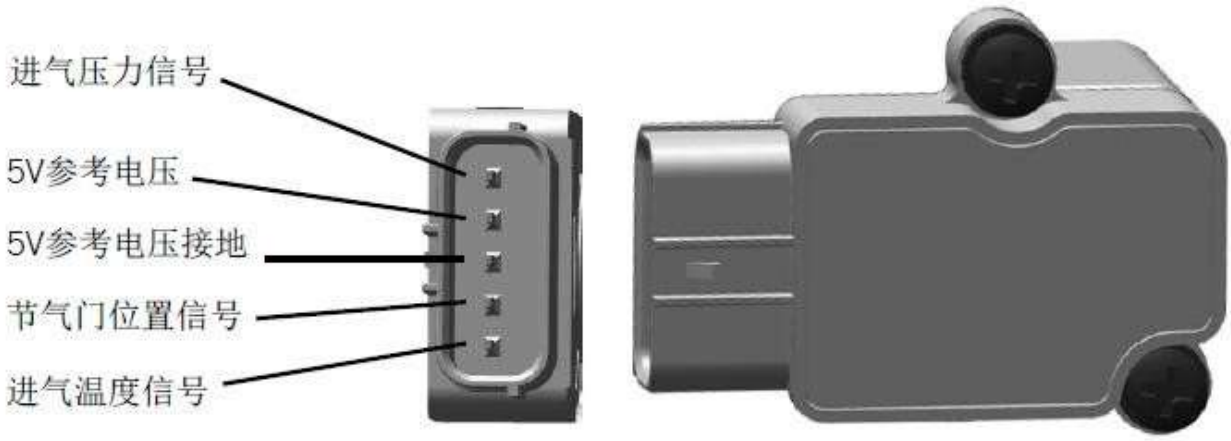


1 Body controller body, 2 ECU, 3 Battery, 4 Rear license plate lamp, 5 Right combination switch, 6 Left combination switch,
7 Three in one sensor, 8 Remote control signal receiver, 9 Water temperature sensor, 10 Ignition coil, 11 Magneto, 12 Gear switch

Introduction of main components

Three in one sensor

1. Outline drawing



Intake pressure signal
5V reference voltage
5V reference voltage grounding
Throttle position signal
Intake air temperature signal

2. Working principle

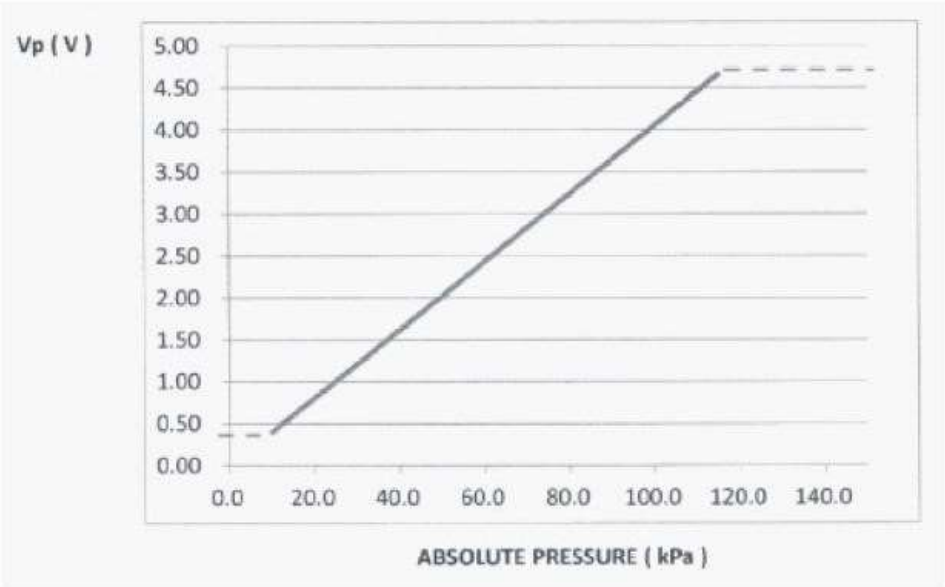
The three in one sensor is the function of the intake manifold absolute pressure sensor, the function of the intake manifold absolute temperature sensor and the throttle opening function are integrated into one whole.
The absolute pressure sensor of intake manifold is composed of pressure conversion element (elastic diaphragm + strain resistance) and signal conditioning circuit which amplifies the output signal of conversion element. One side of the pressure conversion element is the vacuum chamber, and the other side leads in the intake manifold pressure, so the higher the absolute pressure in the intake manifold, the greater the deformation of the diaphragm, and the deformation is proportional to the pressure. The resistance of the strain resistor attached to the elastic diaphragm changes in direct proportion to its deformation. Using this principle, the pressure change in the intake manifold can be converted into an electrical signal.
The core temperature sensor of engine intake air temperature sensor is composed of semiconductor thermistor with negative temperature coefficient characteristic (NTC). The temperature sensor usually needs a special measuring circuit to test its resistance characteristics. The output characteristic of the semiconductor thermistor with negative temperature coefficient is that the resistance of the thermistor is inversely proportional to the temperature, that is, when the temperature increases, the output resistance of the thermistor decreases; When the temperature decreases, the output resistance of the thermistor increases.
The throttle sensor is an angle sensor with linear output. Its essence is an angular displacement sliding rheostat, which is composed of two arc-shaped sliding contact resistors and two sliding contact arms. The rotating shaft of the sliding arm is connected with the throttle shaft on the same axis. Add 5V supply voltage US to both ends of sliding contact resistance. When the throttle valve

rotates, the sliding arm rotates with it and moves on the sliding resistance at the same time, and the potential UP of the contact is led out as the output voltage, so that the opening angle signal of the throttle valve can be converted into the voltage signal.

3. Basic parameters

Pressure test range: 10 ~ 115kPa;
Ultimate pressure: 655kpa (exceeding this pressure will cause permanent damage)
Working temperature range: - 40 ℃ ~ 125 ℃
Storage temperature range: - 40 ℃ ~ 150 ℃
Working voltage: 5V ± 0.25VDC；
Maximum working current: < 10mA DC

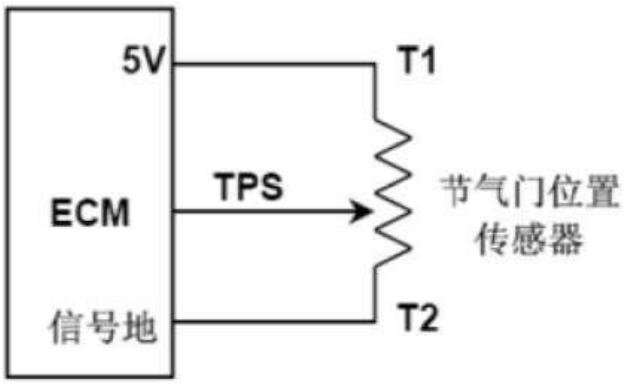
Relationship between intake pressure and output voltage:

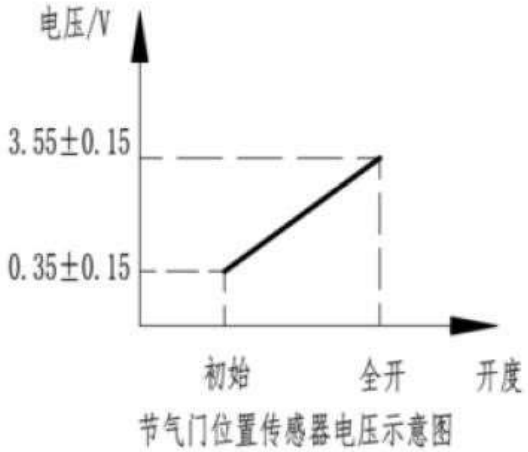


The characteristic parameters of thermistor when the intake air temperature sensor is unloaded are shown in the table below:

Temp.(℃)	Resistance(Ω)			Temp. Coef.(%/℃)	Temp. Tolerance(℃)		Audit tolerance @T± 1K Resistance(Ω)	
	MIN.	CENTER	MAX.		MIN.	MAX.	MIN.	MAX.
-40	37610	41690	45770	-5.61	-1.74	1.74	34220	46540
-35	28730	31620	34500	-5.45	-1.67	1.67	26160	34900
-30	22120	24170	26220	-5.30	-1.61	1.61	20240	26440
-25	17150	18620	20090	-5.14	-1.54	1.54	15800	20280
-20	13390	14450	15510	-5.00	-1.47	1.47	12380	15620
-15	10530	11300	12060	-4.85	-1.40	1.40	9760	12120
-10	8341	8896	9451	-4.71	-1.32	1.32	7832	9552
-5	6649	7053	7456	-4.58	-1.25	1.25	6298	7562
0	5335	5629	5923	-4.44	-1.18	1.18	5090	6026
5	4307	4522	4736	-4.32	-1.10	1.10	4124	4802
10	3498	3655	3812	-4.19	-1.02	1.02	3356	3864
15	2858	2972	3087	-4.08	-0.94	0.94	2766	3134
20	2348	2431	2514	-3.96	-0.86	0.86	2286	2558
25	1940	2000	2060	-3.85	-0.78	0.78	1900	2100
30	1598	1654	1711	-3.74	-0.91	0.91	1566	1752
35	1323	1375	1428	-3.64	-1.05	1.05	1296	1456
40	1100	1149	1198	-3.55	-1.19	1.19	1070	1226
45	920	965	1009	-3.45	-1.34	1.34	889	1028
50	773	813	854	-3.36	-1.49	1.49	742	867
55	652	689	726	-3.28	-1.64	1.64	621	735
60	552	586	620	-3.19	-1.79	1.79	527	631
65	470	500	531	-3.11	-1.95	1.95	451	543
70	401	429	457	-3.04	-2.12	2.12	386	470
75	344	369	394	-2.96	-2.28	2.28	329	404
80	297	319	342	-2.89	-2.45	2.45	283	350
85	257	277	297	-2.82	-2.62	2.62	245	303
90	222	241	259	-2.75	-2.80	2.80	212	267
95	193	210	227	-2.68	-2.98	2.98	187	237
100	169	184	199	-2.62	-3.17	3.17	166	210

Throttle position opening
Measurement range: 7% ～ 93% (from idle to full open)
Throttle position sensor reference voltage: 5V ± 0.1V
When the throttle is fully closed, the normal output of the reference voltage is 12% ± 5%
When the throttle is fully open, the normal output of the reference voltage is between 83% and 93% The working characteristic curve of throttle position sensor is as follows:





节气门位置传感器电压示意图

Signal ground
Throttle position sensor

Voltage (V)
Initial
Fully boiling
Opening degree
Schematic of the Throttle Position Sensor Voltage

3. Corresponding relationship between instrument display scale and oil level sensor resistance

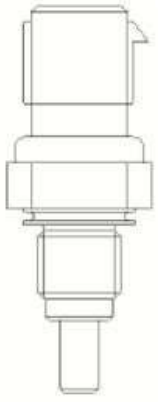
The warning light flashes	≥97 Ω
Display 1 grid	82Ω ~ 97Ω
2	67 Ω ~ 82 Ω
3	
	52 Ω ~ 67 Ω
4	37 Ω ~ 52 Ω
5	22 Ω ~ 37 Ω
Display 6 grids	7Ω ~ 22 Ω
Note: when one grid is displayed, one grid flashes; When the resistance value ≥ 97 Ω. The 6 grids and the icon flash together.	

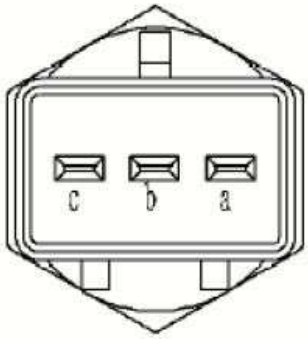
4. Failure mode

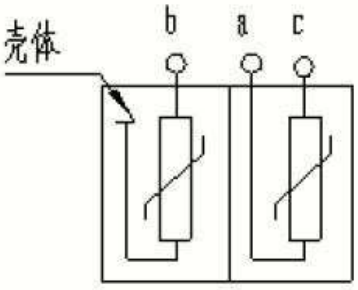
The sensor probe is blocked by foreign matters;
Air leakage failure of sensor connection;
Sensor short circuit or open circuit failure;
The sensor fails to feed water;
Mechanical failure of sensor.

Engine temperature sensor

1. Outline drawing







2. Working principle

The engine temperature sensor is a negative temperature coefficient (NTC) thermistor. By using the temperature sensitive characteristics of the thermistor, the change of the ambient temperature is converted into the change of the resistance value of the thermistor, which is then converted into a voltage signal through a voltage divider circuit and output to the ECU. The thermistor value decreases with the increase of coolant temperature, but it is not linear.

3. Basic parameters

The temperature curve R-T table of engine temperature sensor is as follows:

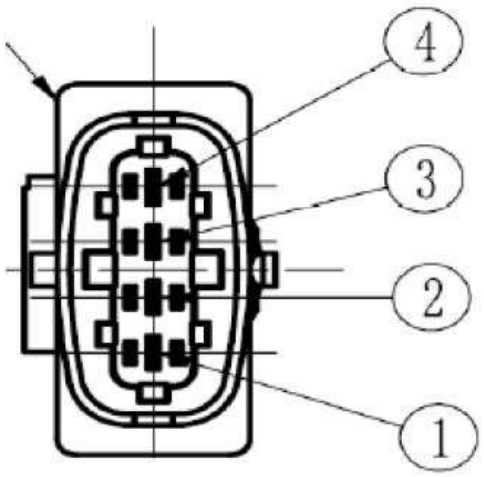
4. Failure mode

The resistance is not accurate;
Sensor open circuit or short circuit.
Engine temperature sensor temperature curve R-T table

ECU passageway resistance				Instrument passageway resistance (b`housing)	
Temperature (℃)	Standard resistance (Ω)	Resistance precision (±%)	Temperature precision (±?)	Temperature (℃)	Standard resistance (Ω)
-40	100, 865	4.87	0.7	45	265.0-323.0
-35	72, 437	4.64	0.7	50	216.0-264.0
-30	52, 594	4.43	0.7	54	185.0-226.0
-25	38, 583	4.21	0.7	60	148.5-180.5
-20	28,582	4.00	0.7	80 (•)	74.6-90.6
-15	21,371	3.8	0.7	90	53.5-66.5
-10	16,120	3.60	0.6	100	40.6-48.6
-5	12,261	3.40	0.6	108	34.0-38.0
0	9,399	3.21	0.6	110	32.0-36.0
5	7,263	3.06	0.6	113	30.0-34.0
10	5,658	2.92	0.6	115(•)	25.7-31.7
15	4,441	2.78	0.6	120	23.0-27.0
20	3,511	2.64	0.6	125	20.5-24.5
25(•)	2,795	2.50	0.6		
30	2,240	2.45	0.6		
35	1,806	2.40	0.6		
40	1,465	2.36	0.6		
45	1,195	2.31	0.6		
50	980	2.27	0.6		
55	809	2.23	0.6		
60	671	2.19	0.6		
65	559	2.15	0.6		
70	469	2.11	0.6		
75	395	2.07	0.6		
80	334	2.04	0.6		
85 (•)	283	2.00	0.6		
90	241.8	2.10	0.7		
95	207.1	2.21	0.7		
100	178.0	2.31	0.8		
105	153.6	2.42	0.8		
110	133.1	2.52	0.9		
115	115.7	2.61	0.9		
120	100.9	2.68	1.0		
125	88.3	2.75	1.1		
130	77.5	2.80	1.1		
135	68.3	2.84	1.2		
140	60.3	2.87	1.2		
145	53.4	2.89	1.2		
150	47.5	2.90	1.2		

Oxygen Sensor

1. Outline drawing and pin definition



Oxygen sensor pin definition

No.	Corresponding cable color	Usage
1	Red	Heating positive
2	White	Heating negative
3	Gray	Signal ground
4	Black	Oxygen sensor signal

2. Working principle

OSMa oxygen sensor is based on multilayer ceramic elements with flat plate structure, in which zirconia layer is the core element. The working principle of zirconia element is equivalent to a simple solid primary cell. According to the electrochemical principle, there will be potential difference between the two electrodes due to the difference of oxygen ion concentration. When the air-fuel ratio of the engine is lean, the oxygen ion concentration in the exhaust gas is relatively high, the oxygen ion concentration difference between the inner and outer electrodes is small, that is, the potential difference is small, and the output voltage signal of the oxygen sensor is close to 0V; On the contrary, when the air-fuel ratio is rich, the oxygen ion concentration in the exhaust gas is relatively low, the oxygen ion concentration difference between the inner and outer electrodes is large, that is, the potential difference is large, and the output voltage of the sensor is close to 1V.

3. Basic parameters

Exhaust temperature 450 ℃, characteristic parameters of oxygen sensor:
Concentrated gas mixture（ λ＜ 1). The output voltage of the oxygen sensor is greater than or equal to 750mV when the temperature is high;
When lean mixture（ λ＞ 1), the output voltage of the oxygen sensor is less than or equal to 120mV;
The concentration and dilution response time is less than 80 mS;

The response time of dilute concentration is less than 65mS.
13.5V, heater power at 450 ℃ exhaust: 7.0
13.5 V, 450 ℃ exhaust heater current: 0.52A±0.10A
Nominal voltage of oxygen sensor: 13.5V
Maximum operating voltage of oxygen sensor: 18V
Minimum operating voltage of oxygen sensor: 10V
Limit voltage of oxygen sensor (at 21 ℃, ＜60s): 21V

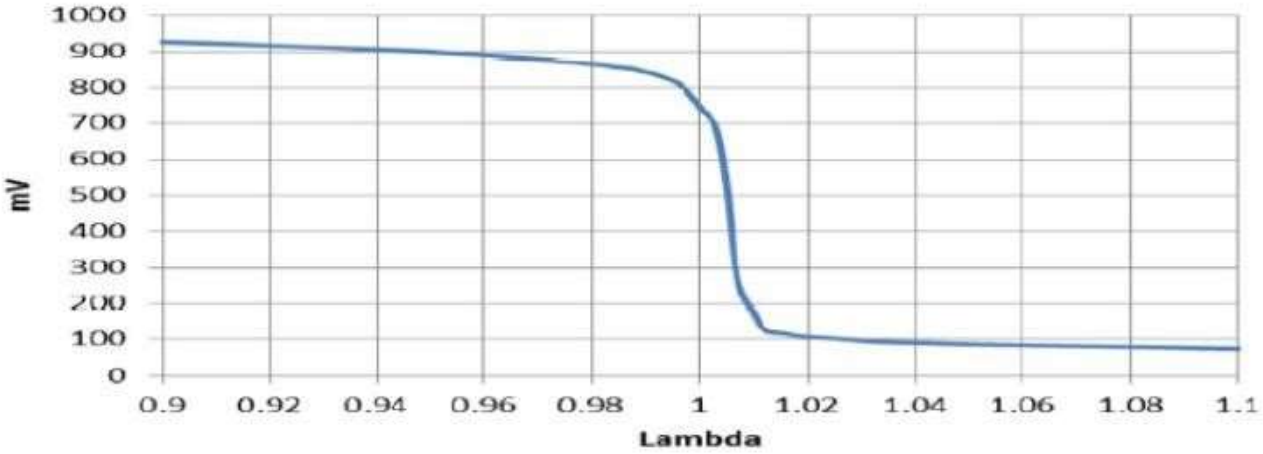
4. Failure mode

Heating element failure;
Sensor element failure;
The ceramic tube was broken;
Heating circuit short circuit or open circuit;
Sensor circuit short circuit or open circuit.

Exhaust temperature 850 ℃, characteristic parameters of oxygen sensor:

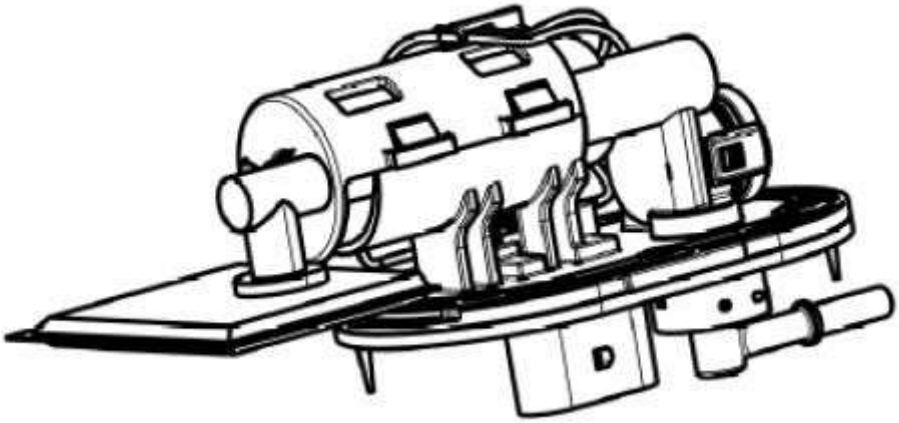
		250 hours of durability	650 hours of durability
Exhaust temperature	850℃	850℃	850℃
Sensing element voltage (mV) when λ=0.97 (CO=1%)	≥720	≥700	≥700
Sensing element voltage (mV) when λ=1.1	≤90	≤100	≤100
Response time (ms) (600mV to 300mV)	≤200	≤250	≤250
Response time (ms) (300mV to 600mV)	≤60	≤60	≤60

When the exhaust temperature is 450 ℃, the conversion characteristics of the oxygen sensor are as follows:



Fuel pump

1. Outline drawing



2. Working principle

The fuel pump is integrated with fuel pump core, fuel pump bracket, filter, oil pressure regulator, etc., which is installed in the fuel tank; The fuel pump core works, and the fuel is filtered through the pump core to the filter, and then adjusted to a certain pressure by the oil pressure regulator and output to the external oil pipe, and finally to the injector; The constant fuel pressure is set to 350 kPa.

3. Basic parameters

Storage temperature: - 40 ° C～80 ° C；
Operating temperature: - 40 ° C～70 ° C；
Fuel temperature: -30°C～70°C；
The insulation resistance of conductive part and insulating part is above 500 MΩ;

4. Failure mode

The oil pump cannot rotate;
Failure of oil pressure regulator;
Support vibration failure;
Fuel pump short circuit or open circuit;
Poor sealing of sealing ring.

Fuel injector

1. Outline drawing and pin definition

Power supply + main relay
Injector signal

2. Working principle

The fuel injector is actually an electromagnetic switch control element device. Its fuel supply mode adopts top fuel supply structure.
The inner part of the injector is designed with an electromagnetic coil around the iron core. The two electrodes from the electromagnetic coil are the input control interface of the injector. The fuel injector is directly connected with the control circuit of the engine electronic control module (ECM) and the system power supply through the engine harness.
The solenoid coil of the fuel injector directly receives the output control voltage signal of the engine electronic control module (ECM), that is, it is electronically controlled by the engine
The control module (ECM) directly drives the solenoid to control the opening and closing timing of the ball valve at the lower end of the injector.
When the electromagnetic coil is energized, the electromagnetic force is generated to overcome the spring force and fuel pressure of the ball valve, so that the ball valve rises. The high-pressure fuel (250 ~ 400kPa) in the fuel line can pass through the valve seat hole of the fuel injector through the orifice plate and form a conical spray to spray into the valve body of the intake valve. When the power of the injector is cut off, the magnetic force of the solenoid coil disappears automatically, and the ball valve of the injector closes automatically under the action of the return spring, which stops the injection action of the injector.
The orifice plate of the fuel injector is a thin plate at the head of the fuel injector, which is used to accurately control the fuel injection quantity and evenly atomize.

3. Basic parameters

Working temperature range: - 40 ℃ ~ 130 ℃
System fuel pressure: 350kPa
Static coil resistance: 12.5 Ω±0.8 Ω
Normal working voltage: 9 ~ 15V

Storage temperature: - 40 ~ 70℃

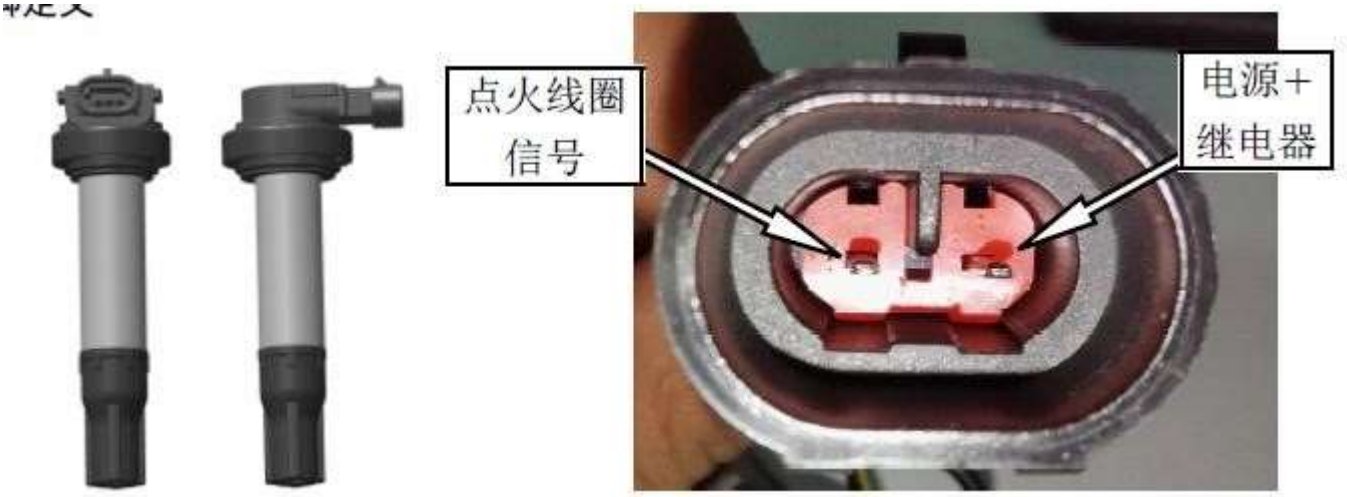
The temperature at which the deviation of fuel quantity from	-40		+45	℃
20 ℃ is not more than 5%				
O-ring leakage permit in the range of -35 — -40℃	The fuel in the O-ring area is allowed to be wet, but no dripping is allowed			
Allowable vibration acceleration			400	m/s^2
Supply voltage Insulation resistance	6 1	16		V M Ω
Permissible leakage current			0.75	mA
Tolerable internal fuel pressure			1100	kPa
Tolerable torque			6	Nm
Tensile force that can be withstood			600	N

4. Failure mode

The fuel injector is blocked;
Open circuit or short circuit of electromagnetic coil; Fuel injector vibration failure; Poor sealing of sealing ring.

Ignition coil

1. Outline drawing and pin definition



Ignition coil signal
Power supply + relay

2. Working principle

The ignition coil consists of primary winding, secondary winding, iron core and shell. When the battery voltage is applied to the primary winding, the primary winding charges. Once the ECU cuts off the primary winding circuit, the charging will be stopped. At the same time, high voltage electricity will be induced in the secondary winding, and the spark will be generated through the high voltage connecting line and spark plug discharge, which will ignite the fuel air mixture in the cylinder.

3. Basic parameters

Working voltage: 6 ~ 16V;
Primary coil resistance: 0.53Ω±0.08Ω；
Secondary coil resistance: 8kΩ±1.2kΩ；
Primary coil inductance: 1mH±0.2mH；
Secondary coil inductance: 9.5H±1.9H；
Insulation resistance: under normal temperature, the insulation resistance between ignition coil shell and spark plug cap copper sleeve is greater than 1000MΩ；

4. Failure mode

Open circuit of primary winding;
Breakdown and short circuit of secondary winding;
Surface discharge;
Loose connection between ignition coil and spark plug cap;
The insulation rubber sleeve of spark plug cap and ignition coil joint cap is aging and leakage;
The clip spring of spark plug cap and ignition coil connector cap is invalid and the contact is poor.

Spark plug

1. Outline drawing

2. Working principle

The function of the spark plug is to introduce the high pressure produced by the ignition coil into the combustion chamber and ignite the mixture by spark between its two electrodes. The spark plug is mainly composed of center electrode, side electrode, connecting screw, insulator, sealing washer and shell. In order to better restrain the interference of ignition to the outside world, damping resistance powder is added between the connecting screw and the center electrode. According to the length of the insulator skirt, the spark plug can be divided into different thermal mass. The longer the insulator skirt is, the lower the heat dissipation degree and the lower the calorific value, otherwise, the higher the calorific value.

3. Basic parameters

Spark plug model: CR9E(NGK);
There is a resistance of 3-6kΩ inside the spark plug

4. Failure mode

Serious carbon deposition on spark plug;
The spark plug electrode is ablated;
The spark plug insulator is broken;
The spark plug is overheated;
The spark plug leaks

Idle stepper motor

1. Outline drawing and pin definition

B high
A high
A low
B low

2. Working principle

The basic working principle of idle bypass air volume control valve comes from the principle of stepping motor. It is composed of rotor made of two special-shaped permanent magnet modules, stator component composed of two groups of two-phase electromagnetic coils, screw rotor transmission mechanism which converts rotary motion into straight line, conical regulating control valve, input circuit signal connector, spring, metal forming assembly fixed shell, rubber sealing ring and other main components. When a specific electric pulse input signal acts on the two groups of electromagnetic coils respectively, the polarity of the electromagnetic field formed by the two groups of coils will be changed in a certain order. According to the principle that the same magnetic field attracts and the different magnetic field repels each other, the rotor mechanism will be driven to rotate in a certain direction. Therefore, the stepper motor can transform the electric pulse input signal into discontinuous mechanical rotary motion, and then transform the rotary motion of the rotor into the forward and backward linear motion of the adjusting head through the screw rotor transmission mechanism.

3. Basic parameters

Rated total operating voltage: 12V;
Allowable working voltage: 7.5V ~ 14.2V;
Allowable working temperature: -40℃ ~ 150℃;
DC resistance specification of each coil: 53±5.3Ω（ test at 27 ℃);
Inductance characteristics of each coil: 33±5mh (test at 25 ℃ with 1000Hz sine wave input signal);

4. Failure mode

Pipeline blockage or air leakage;
Idle speed actuator blocked;

Open circuit or short circuit of electromagnetic coil;
Idle actuator vibration failure.

ECU

1. Outline drawing

2. Working principle

ECU obtains various information about the actual working state of the engine or the whole vehicle through several sensors configured by the engine management system. ECU drives the actuator configured by the system to perform the optimization and control of engine operating conditions according to the data calibrated and stored in advance by the system.
The main input signal sensors of EFI system include: engine intake pressure sensor (MAP), engine intake temperature sensor (MAT), cylinder head temperature / coolant temperature sensor (CLT), oxygen sensor (O2) and crankshaft position sensor (CPS). ECU controls the engine through the actuator equipped with the system. The actuators of the system mainly include fuel injector (INJ), ignition coil (IGN), electric fuel pump and idle air control valve (IACV).

3. Basic parameters

Normal working voltage range: 9V~16V;
ECU system includes short time anti 26V voltage protection and short time anti 13V reverse polarity voltage protection. If the ECU is subjected to overvoltage or reverse polarity voltage for a long time, the ECU hardware will be permanently damaged.
the ECU hardware will be permanently damaged.
Storage temperature: -40℃~105℃
Working temperature: -20℃～85℃

4. Failure mode

Connector failure;
Component damage;

Water inlet short circuit;
The components are loose and fail after vibration.

EMS fault diagnosis process

1. Analyze the situation reflected by users
Make detailed records of problems (faults, other situations reflected by the user) and the occurrence process stated by the user.
2. Check, record and sort out diagnostic trouble code
It can read out the fault content through the instrument fault indicator and fault diagnosis instrument, and look up the fault code table
Diagnostic trouble code confirmation procedure:
Turn on the power supply, connect the fault diagnosis instrument, read and clear the historical fault, turn off the power supply, start the engine, run at idle speed for 2min (if it cannot be started, press the start button for 5s) and perform 2-3 times of acceleration and deceleration operation. The fault diagnosis instrument reads the current fault.
3. Appearance inspection
Check whether the wire connector, fuse, high voltage connecting wire, throttle and its parts are abnormal.
4. Basic function check
   - Check battery
   - Check whether the engine can start, idle and accelerate
   - Check the fuel pump for operation
   - Check the ignition spark and spark plug
   - Check the engine speed sensor for iron filings
   - Check whether the pressure sensor hose is damaged
   - Check whether the fuel injector is blocked
   - Other examinations.
5. According to the confirmed fault code, appearance inspection and basic function inspection results, carry out fault treatment.
6. Use the fault diagnosis instrument to check whether the idle speed data of the hot engine in the system is within the specified range.
7. The method in the fault diagnosis table is used for fault analysis and treatment.
8. Clear the fault record.

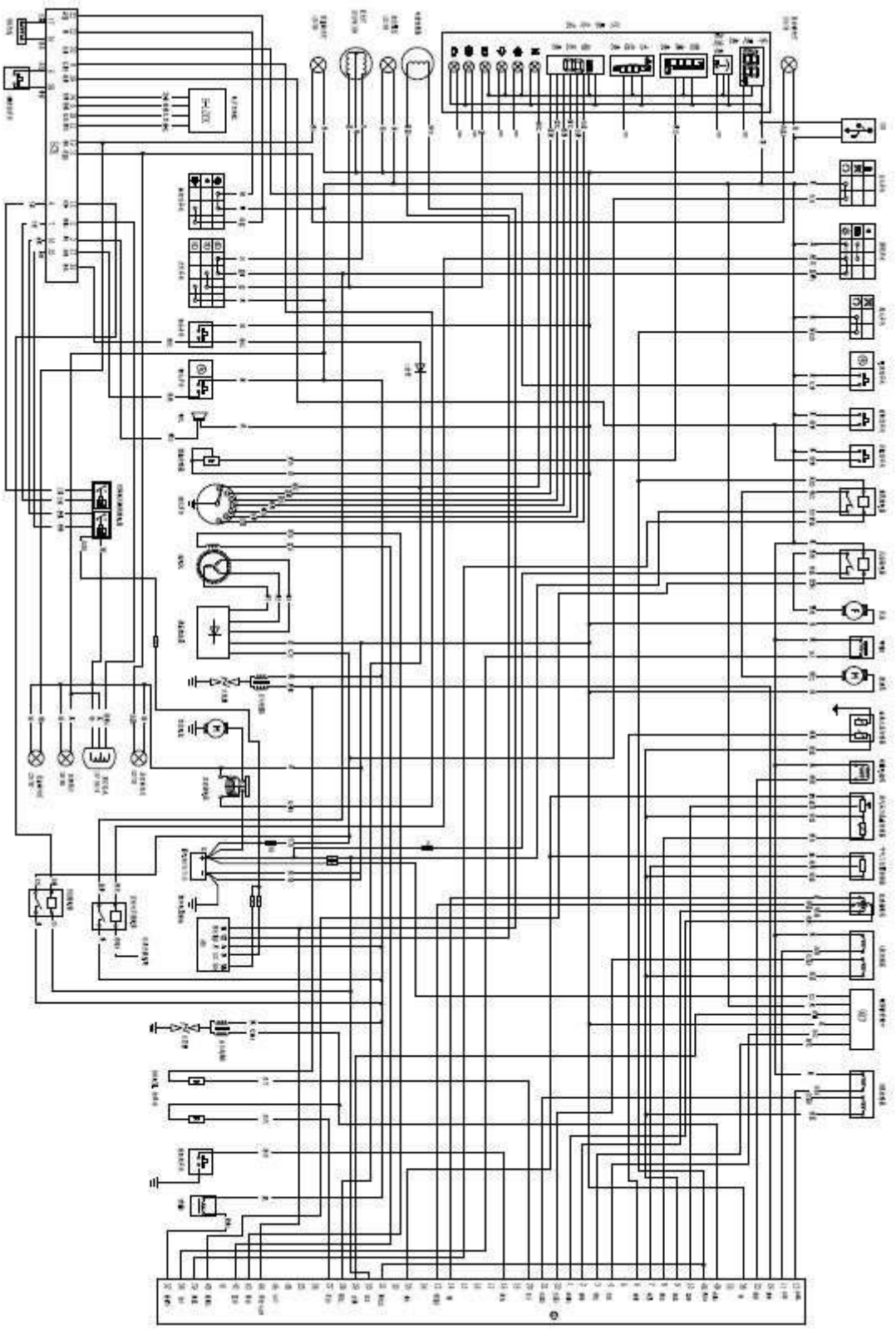
EMS fault diagnosis table

Failure phenomenon	Possible causes	Solution
Difficult to start	Starting system fault;	Maintain the starting system as described in the previous chapter;
	Excessive engine starting resistance or insufficient cylinder pressure;	Check the mechanical part of the engine:
	Blockage of air filter or air leakage of throttle body and intake pipe:	Repair air filter, throttle body or intake pipe:
	No spark or abnormal spark:	
	The fuse is blown;	Replace fuse:
	The starting speed is lower than 300r / min	Check the starting system;
	Poor contact of high voltage connecting wire;	Reconnect
	Aging of spark plug cap and poor water insulation;	Replace the spark plug cap;
	Main cable line fault or poor grounding:	Line maintenance;
	Spark plug failure;	Remove carbon deposit or replace spark plug;
	Ignition coil fault	Replace the ignition coil;
	Emergency stop switch failure	Replace the emergency stop switch
	ECU failure.	Re plug or replace ECU;
	The engine speed sensor or signal wheel is faulty.	Remove scrap iron and adjust clearance;
	No fuel pressure or insufficient fuel pressure:	
	Oil pump relay failure;	Reconnect or replace the oil pump relay;
	The fine filter is blocked or the oil pump fails;	Replacement of fine filter or oil pump:
	The fuel pipe is blocked or leaking;	Replace the oil pipe;
	Injector failure.	Replace the fuel injector.
	Intake pressure sensor failure or hose rupture:	Replace the intake pressure sensor or connecting pipe;
	Incorrect ignition timing:	Adjust the ignition timing again;
	The fuel is deteriorated or contains water.	Replace the qualified fuel.
The engine idles unsteadily or does not idle, the return oil stalls	The engine cylinder pressure is insufficient;	Check the mechanical part of the engine:
	Blockage of air filter or air leakage of throttle body and intake pipe:	Repair air filter, throttle body or intake pipe:
	The exhaust system is blocked;	Replacement or cleaning:
	Ignition system check:	
	Poor contact of high voltage connecting wire;	Reconnect
	Aging of spark plug cap and poor water insulation;	Replace the spark plug cap;
	Carbon deposition or failure of spark plug;	Remove carbon deposit or replace spark plug;
	The engine speed sensor or signal wheel is faulty;	Remove scrap iron and adjust clearance;
	Incorrect ignition timing:	Adjust the ignition timing again;

	Oil supply system inspection:	
	Fine filter blocked or oil pump failure:	Replacement of fine filter or oil pump:
	The fuel pipe is blocked;	Oil pipe replacement:
	Injector failure;	Replace the fuel injector;
	Idle speed control system check:	
	The idle screw is loose;	Adjust the idle screw and tighten it;
	Throttle position sensor fault	Replacing throttle position sensor
Unstable engine speed or no idle speed, fuel return and flameout	Intake pressure sensor and hose failure;	Replace the intake pressure sensor or connecting pipe;
	Water temperature sensor failure;	Replace the water temperature sensor;
	Idle stepper motor fault;	Replace the idle stepper motor and its pipeline;

	Poor line connection or poor grounding;	Check and connect the circuit;
	ECU failure.	Re plug or replace ECU.
	Incorrect fuel grade, deterioration or water content.	Replace the qualified fuel.
Engine idling is too high	The throttle line does not reset;	Adjust the throttle line and idle screw;
	Oil pump pressure regulator failure;	Replace the pressure regulator;
	Intake air temperature sensor failure;	Replace the intake air temperature sensor;
	Idle stepper motor and connecting pipe fault.	Replace the idle stepper motor.
Insufficient engine power: the speed does not go up when accelerating or the reaction is slow when the engine is stalled; Poor and weak performance during acceleration; Engine spitting and unstable speed	Engine mechanical failure;	Maintain the mechanical part of engine;
	Blockage of air filter or air leakage of throttle body and intake pipe:	Repair air filter, throttle body or intake pipe:
	The exhaust system and three-way catalyst are blocked;	Replacement or cleaning:
	Ignition coil, high-voltage wire or spark plug fault	Maintenance or replacement;
	Oil pump or oil supply pipeline fault:	Maintenance or replacement;
	Fuel injector blockage or failure;	Clean or replace;
	The signal of each sensor is abnormal;	Replace the failed sensor;
	Poor line connection or poor grounding;	Check and connect the circuit;
	ECU failure.	Re plug or replace ECU.
Excessive fuel consumption	The engine cylinder pressure is insufficient;	Maintain the mechanical part of engine;
	Ignition coil, high-voltage wire or spark plug fault;	Maintenance or replacement;
	Phase sensor and circuit fault	Maintenance or replacement;
	Oil pump or oil supply pipeline fault:	Maintenance or replacement;
	Fuel injector blockage or failure;	Clean or replace;
	ECU failure.	Re plug or replace ECU.
When using other electrical loads, the idle speed is poor or the engine stalls	Other electrical load is too large or intermittent short circuit makes the battery voltage unstable;	Replace other electrical loads;
	The short circuit between the system line and other load lines makes the system signal voltage unstable.	Check and re connect the wiring.

Electrical schematic diagram



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