Malaguti

English

SERVICE MANUAL

XSM | XTM 125

Preface

Due to the increasing variety of motorcycles, new structures and new technologies have been adopted. In order to make users and maintenance personnel better master the maintenance, adjustment and maintenance technology of XSM_XTM two wheeled motorcycle, we have compiled this maintenance manual. We hope this manual can help the users and maintenance personnel and give guidance on maintenance technology.

This manual takes XSM_XTM two wheeled motorcycle as the main line. The contents of Chapter 1 to Chapter 2 are applicable to the adjustment of various parts of the motorcycle. In Chapter 3, we narrate separately according to each component of motorcycle. In Chapter 4, we list the electrical system maintenance precautions and schematic diagram.

Relevant standard maintenance procedures, maintenance precautions and general repair knowledge are not included in this manual. If users or maintenance personnel need to consult the above content, please refer to other relevant materials.

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Thank you for choosing XSM_XTM two wheeled motorcycle! We wish you enjoy the comfort and pleasure it will bring you on your future trip!

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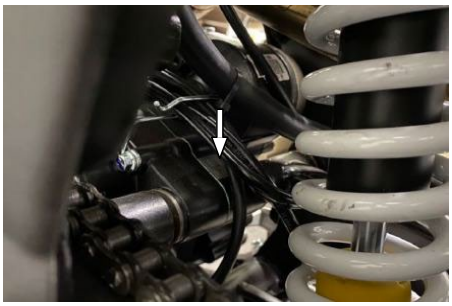
Chapter 1 Overview

Printing Position of Machine Number	Maintenance Interval Table
Maintenance Precautions	Wiring Diagram
Main Performance Technical Data	Symbol Description
Standard Torque Value	

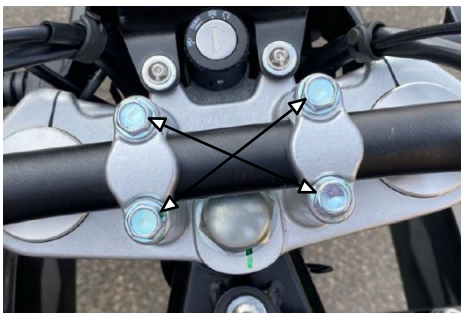
Printing Position of Machine Number

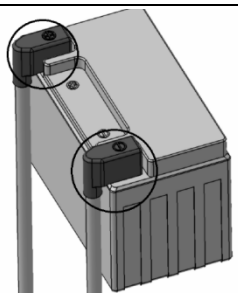
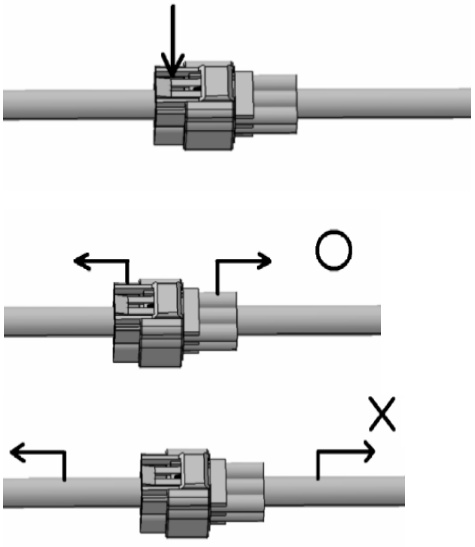
Vehicle picture:

Printing position of frame number:	Printing position of engine number:

	
The frame number is engraved on the right side of the frame riser	The engine number is printed on the right side of the crankcase, near the rear shock absorber. The engine number can be seen from the rear right side of the vehicle.

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, the cotter pins of new washers and seal components shall be replaced.	
3. When fastening bolts or nuts, they shall be carried out in diagonal cross sequence and tightened step by step in 2-3 times to reach the specified standard torque value.	
4. After the parts are disassembled, they shall be cleaned 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 there are more than two people operate the motorcycle, they should care 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, the reason shall be checked and the corresponding fuse must be replaced 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	13. When wiring, pay attention to turning

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.	the handle 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	2080mm×820mm×1180mm, 2140mm×825mm×1220mm
	Wheelbase	1425mm
	Minimum ground clearance	140mm
	Vehicle quality	Curb weight: 124 kg, full load: 290 kg
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	100/80-17 52H(XSM)/90/90-21 54M(XTM)
	Rear tire size	130/70-17 62H(XSM)/120/80-18 64M(XTM)
	Front wheel pressure	1.9 bar (190 kPa) (27.56 PSI)
	Rear wheel pressure	2.1 bar (210 kPa) (30.46 PSI)
	Front brake	Hand brake, disc, diameter Φ 300mm(XSM)/ Φ 260mm(XTM)
	Rear brake	Foot brake, disc, diameter: Φ218mm
	Fuel tank capacity	7.2L ± 3%
	Fuel grade	95# / E5
Engine	Type	Single cylinder, four strokes, water cooled
	Cylinder diameter piston stroke	58mm×47mm
	Cylinder displacement	124cc
	Compression ratio	12.0±0.5 ：1
	Maximum net power/corresponding rotation speed	10.7kW/9750rpm
	Maximum torque/corresponding speed	10.9N.m/8000rpm
	Valve clearance (cold state)	IN：0.1~0.15mm；EX：0.2~0.25mm
	Valve drive mechanism	Chain and sprocket transmission

	Air filter	Paper filter type
	Lubricating system	Splash lubrication plus pressure lubrication
	Type of oil pump	Rotor type
	Engine oil grade	SJ-10W/40 or equivalent
	Filling quantity of oil	Daily maintenance 1L, if open the middle tank 1.15L
	Oil filter	Filter, replaceable
	Starting mode	Electric starting
	Idle speed	1700±100r/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	2.379
Transmission system	Gear ratio	I 3.000
		II 2.000
		III 1.500
		IV 1.200
		V 1.080
		VI 0.956
	Final reduction ratio	4.769(XSM) / 5.308(XTM)
	Gear shift	Left foot operated shuttle
		Sequence Ⅰ－N－Ⅱ－Ⅲ－Ⅳ－Ⅴ－Ⅵ
Electric and EFI	Generator	200W/5000r/min 12V 12 pole_ Three-phase full-wave DC

	Battery capacity	12V7Ah
	Power supply system	DC power supply
	Fuse	30A,15A, 7.5A, 2A
	Spark plug model	NGK CR9EB
	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 36W
	Turn signals	LED
	Brake lamp/rear taillight	LED

Torque Value of Main Standard Parts

Vehicle body

Items	Quantity	Thread diameter (mm)	Torque value (N.m)
Assembly of engine front suspension	4	10	37~45
Assembly of engine rear suspension	2	10	37~45
Assembly of front shock absorber	2	8	20~24
Cap nut of connecting plate on steering column	1	24	45~55
Steering column and front shock absorber	4	8	20~24
Handlebar and clip	4	8	20~24
Front axle	1	14	70~80
Flat fork shaft	1	12	70~80
Rear axle	1	14	70~80
Cradle rear component and rear stabilizer connecting shaft	1	12	70~80
Cradle rear component and cradle front component shaft	1	12	70~80
Cradle rear component and flat fork connecting shaft	1	12	70~80
Cradle front component and frame connecting shaft	1	12	70~80
Frame and rear flat fork connection	1	12	70~80
Front brake disc and hub connection	6	6	10~12
Front brake calipers and front shock absorber connections	2	8	22~24
Brake oil pipe connection	8	10	25~30

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	8~10
8mm bolts and nuts	17~19
10mm bolts and nuts	35~40
3.9mm self tapping screw	1~3
4.2mm self tapping screw	2~4

Regular maintenance table

Inspection items \ Inspection cycle	Mileage	Initial 1000km	Every 5000km	Every 10000km
	Time	First 3 months	Every 15 months	Every 30 months
Air filter (filter cartridge)			Cleaning / inspection	Replacing
*Bolts and nuts of muffler		Fastening		Fastening
* Valve clearance (Cold-state check) 0.1/0.15 In 0.1mm/ out 0.15mm		No inspection without fault		
Spark plug		No inspection without fault		
Engine oil		Replace	Replace	Replace
Oil filter		Replace		Replace
Free stroke of clutch handle		Inspection / adjustment	Inspection / adjustment	Inspection / adjustment
*Throttle body		Check		Check
Throttle cable clearance		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 and replace
Fuel pipe			Check	Check
Transmission 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:

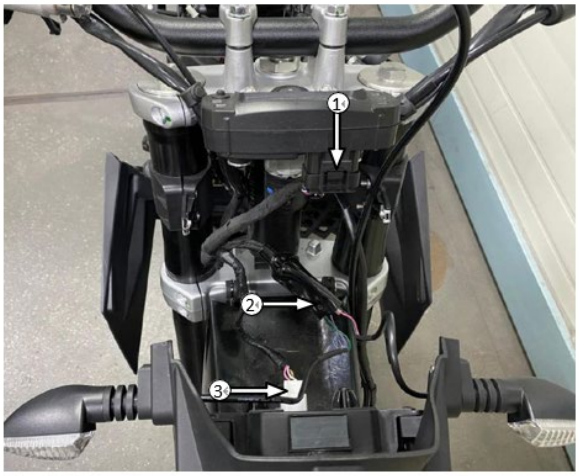
When driving for a long time under bad road conditions and high power conditions, the inspection frequency shall be increased.

Note:

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

Wiring Diagram

Ⓐ



1. Instrument wiring, 2. Front turn signal wiring, 3. Headlamp wiring

Ⓑ-rear

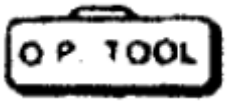
1 Start relay, 2 Auxiliary relay, 3 Flasher, 4 ECU, 5 Fuse box, 6 Battery, 7 Tail lamp rear turn signal wiring, 8 OBD interface

Ⓑ-front

1 Battery, 2 Fuel filter, 3 Handle switch wiring, 4 Voltage regulating rectifier, 5 Ignition coil

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.		5 0 N.m 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 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.

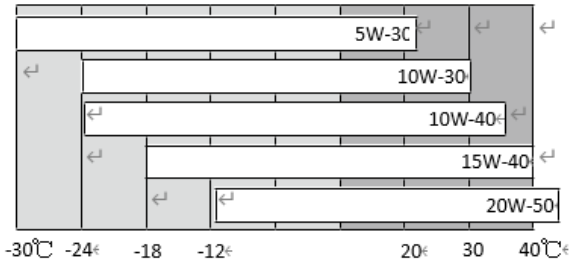
Besides, it also introduces the parts of the motorcycle. Engine oil is an important factor affecting engine performance and service life. It must be used according to regulations. It is not allowed to use common engine oil, gear oil, vegetable oil, etc. The engine is filled with SJ-10W/40 grade oil when it is sold out of the factory. When changing the engine oil, please drain the original engine oil in the crankcase, clean it with washing kerosene, and then add new engine oil according to the regulations. 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, 0.9L; if replace the fine filter, 1L; if open the middle tank, 1.15L. 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

Choose the viscosity according to the temperature			
Low temperature	Fuel economy	High temperature	Lubricity performance at high

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.	<table><tr><td>performance</td><td></td><td>performance</td><td>temperature</td></tr><tr><td></td><td>Low temperature start-up</td><td></td><td>Noise reduction performance at high temperature</td></tr></table> 

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.

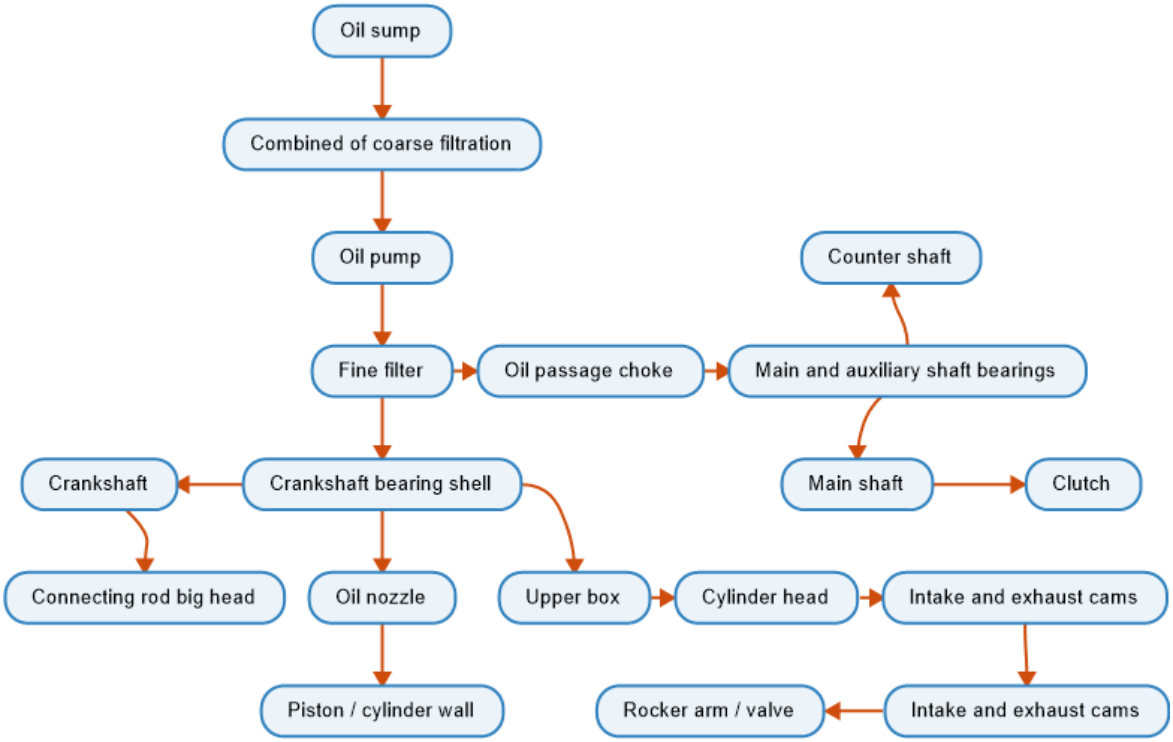
All oils not specified in this manual shall adopts common oils. All sliding surfaces and cables not shown in this figure shall be coated with oil or grease.

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.

Lubrication of engine

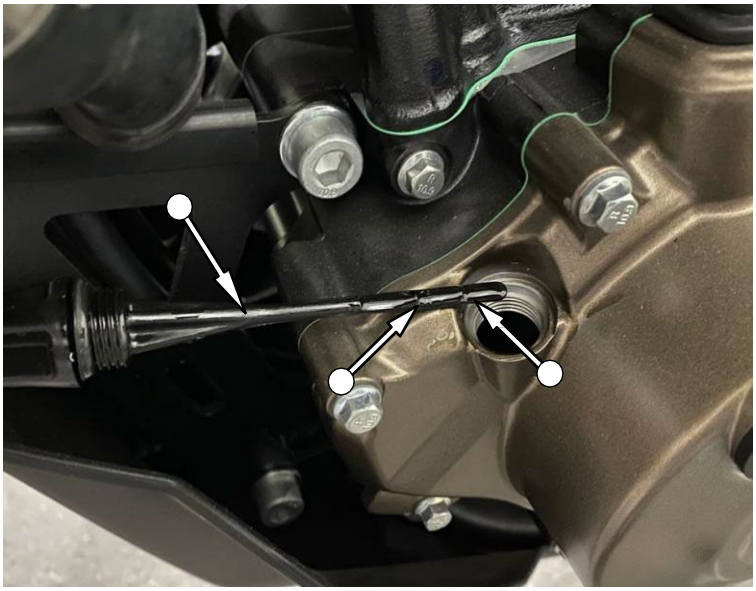
Engine lubrication system diagram



Inspection of engine oil

Support the motorcycle on a flat surface with a special clamp, 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.

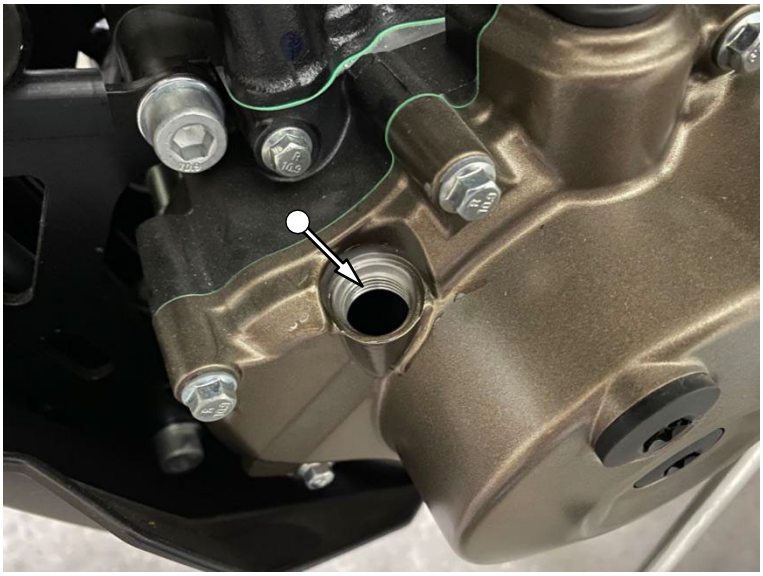
Method: Remove Oil level gauge plug, slowly inject the oil with a funnel, and check the oil capacity in the engine with the oil dipstick until the oil level reaches the middle and upper limit of oil level gauge. Then install the oil level gauge and tighten it.



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

Replacement of oil

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 Oil filling port

Replacement of oil filter

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

Oil filter cover

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 XSM_XTM two wheeled motorcycle. The technical requirements for checking and adjustment are also introduced.

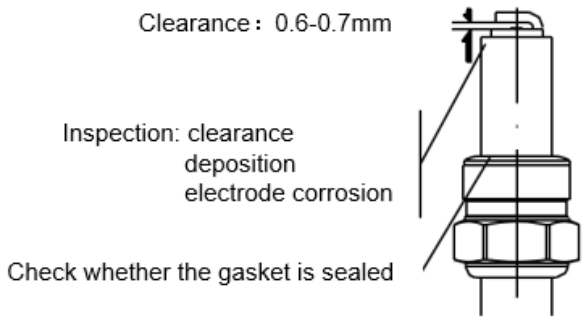
 Notes:

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

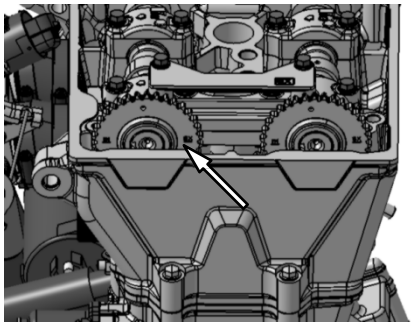
Technical Specifications	Vehicle Body

Engine Spark plug NGK CR9EB The spark plug gap is 0.6~0.7mm Valve clearance (cold state) IN: 0.10~0.15mm EX:0.20~0.25mm Idle speed 1700 r/min ± 100r/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 25~35 mm Tire pressure Front wheel 1.9 bar (190 kPa) (27.56 PSI) Rear wheel 2.1 bar (210 kPa) (30.46 PSI) Tire size Front wheel: 100/80-17 52H/90/90-21 54M Rear wheel: 130/70-17 62H/120/80-18 64M

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 gap with a feeler gauge. The electrode clearance of spark plug is 0.6~0.7mm. 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.	

Timing phase	Coolant
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).	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. 
	Check whether the coolant in the accumulator is between the upper and lower marking lines. If it is too little, replenish it in time.
Lubricating oil Use a special fixture to support the motorcycle on the flat ground, so that the engine is in a horizontal position and does not tilt. Visually check whether the oil level in the oil window on the right crankcase cover is between the upper and lower marking lines. When the engine oil is too little, it shall be replenished 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.

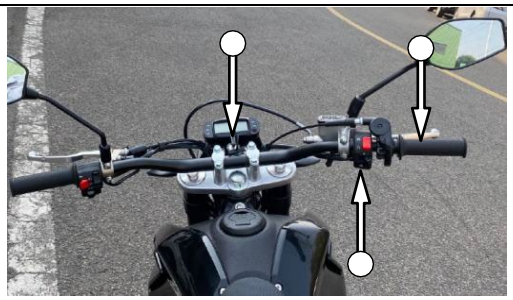
Accumulator filling port

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 leakaged or damaged, replace it. If the accumulator is empty, check the coolant level of the radiator. Turn the radiator cap

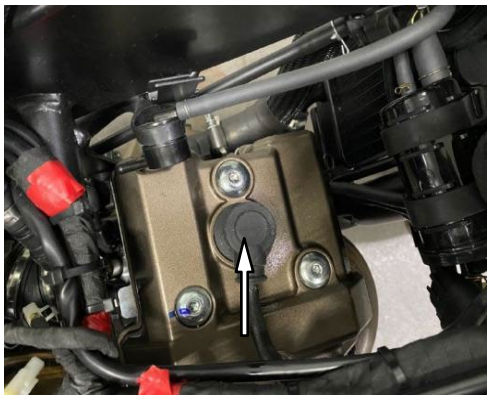
Cylinder pressure

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.



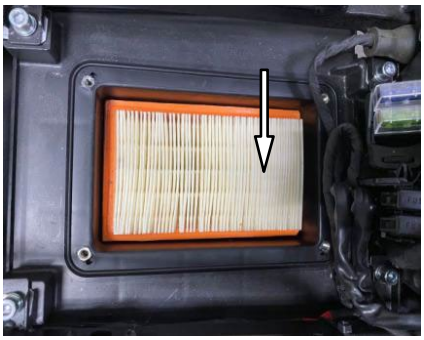
1 Turn the key clockwise, 2 Fully open the throttle handle, 3 Press the electric start

counterclockwise to see if the coolant level reaches the bottom of the neck of the radiator injection port. If not, add coolant.	button
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.	 Remove the spark plug and test the cylinder pressure The main reasons for low cylinder pressure are as follows: Incorrect valve clearance adjustment Valve leakage Cylinder head seal washer ablation Worn piston rings or cylinders 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	
Cleaning and replacement of air filter element	
1. Open the seat cushion lock with the key and remove the seat cushion. 2. Remove the fixing bolts of the ECU	Notes: 1. Remove the filter element and check whether the filter element is normal. The filter element is a paper filter element, and

mounting bracket and take out the ECU.

3. Loosen the fastening screws of the air cleaner cover and take out the air cleaner cover

4. Remove the air filter cover and filter cartridge.



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.

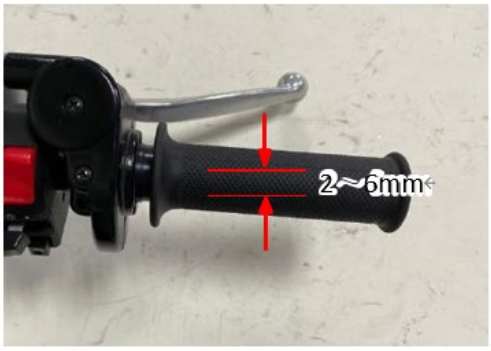
Throttle control

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

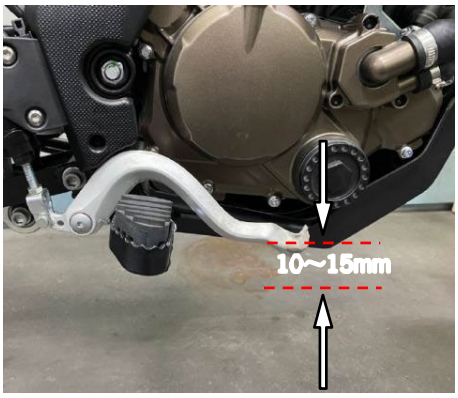
Idle speed

Note:

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

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.	
	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 1700r/min ±100r/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 tube 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 can not be in place, separate the throttle control line from the throttle body, loosen the lock nut B, and adjust the larger stroke	

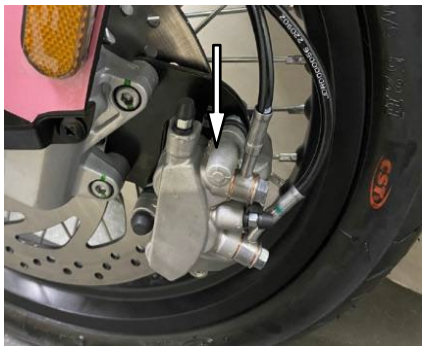
range. After adjustment, tighten the lock nut B. Check whether the throttle can rotate smoothly from full open to full close in any position. If there is hysteresis, adjust or replace it.  Lock nut B	
Braking system Check the free stroke of the front brake handle. The free stroke of the brake handle is 5-10 mm.	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
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.	

<table>
<tr><td> 
</td><td>1 Upper limit line 2 lower limit line

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.</td></tr>
<tr><td></td><td></td></tr>
<tr><td colspan="2">Vacuum filling method of brake fluid:</td></tr>
<tr><td>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

  </td><td>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</td></tr>
</table>

<table>
<tr><td>Rear brake caliper body</td><td rowspan="2">changes will occur and the braking performance will be reduced.

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</td></tr>
<tr><td>2. Open the brake cylinder cover and fill the brake fluid.

Front brake cylinder cover

Rear brake cylinder cover</td></tr>
<tr><td colspan="2"></td></tr>
<tr><td>Running System</td><td>Clutch operating line</td></tr>
<tr><td>Size and pressure of tire</td><td rowspan="2">Check the free stroke of the clutch handle.

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 nut to adjust to a suitable free stroke. Then tighten the lock nut and</td></tr>
<tr><td>Check the tire pressure with a tire pressure gauge to see if it meets the recommended tire pressure requirements.</td></tr>
</table>

Note:

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

install the protective rubber sleeve.

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

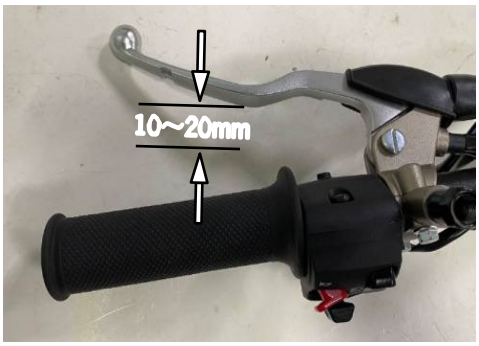
Rough adjustment: First remove the clutch operation line at the handle end, then remove the clutch control arm at the engine end, rotate the clutch control arm to a suitable angle, then install it, install the clutch operation line, and finally adjust it to a suitable free stroke according to the fine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

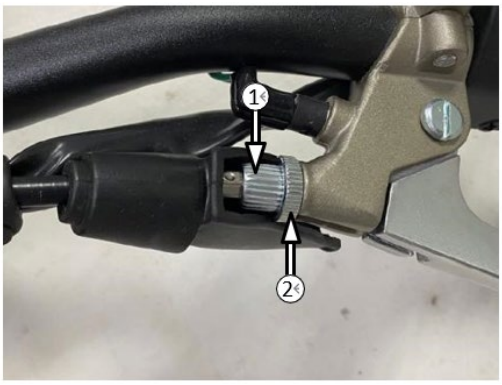
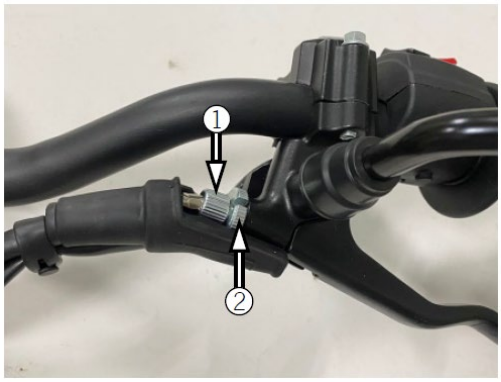
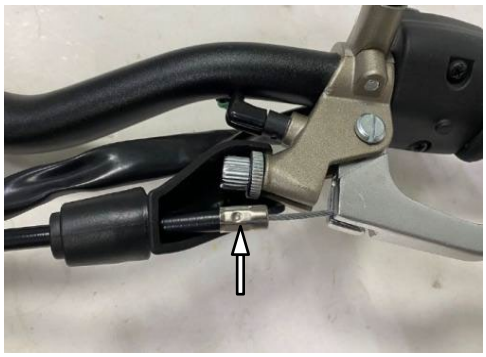
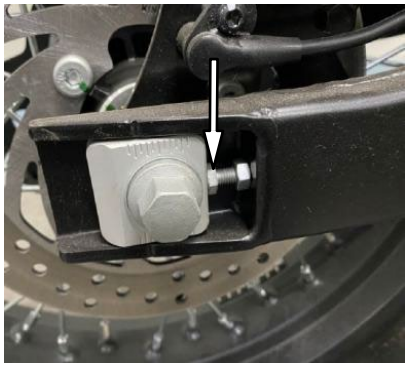
Note:

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.

Tire size and recommended tire pressure

Tire size	Front tire		Rear tire	
	100/80-17 90/90-21		130/70-17 120/80-18	
Cold tire pressure	Single		Double	
	Front tire	Rear tire	Front tire	Rear tire
	190kPa	210kPa	200kPa	220kPa



	
If the tire pressure does not meet the specified requirements, check the tire for cuts, embedded nails or other sharp objects.	 1 Adjust nut, 2 Lock nut
 Remove the clutch operating line	 Chain adjuster adjusting nut
	**Note:** **The marking on the chain adjusters on both sides must be consistent.** **Warning:**

Adjust clutch operating line

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: 25~35 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

The rear axle nut must be tightened with a tightening torque of 70~80 N.m.

Cleaning and inspection of chain

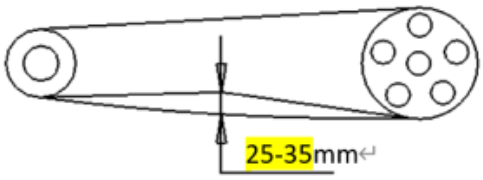
Clean the drive chain with cleaning fluid to remove dust and soil, and then air dry to check whether the chain is worn or broken. If it is damaged, replace the chain. Then install the chain and apply the special lubricant for the chain; Check the worn condition of large and small chain wheels. If the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

Note:

The chain of the car is connected by locking plate. During installation, the open end of the spring clip of the chain joint should be opposite to the movement direction of the chain.



Sagging degree

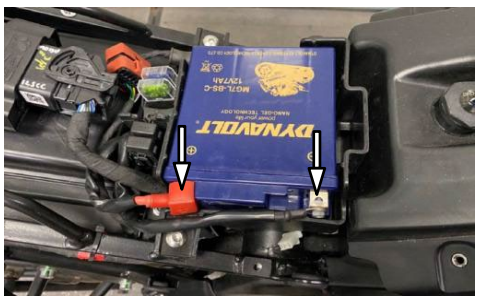
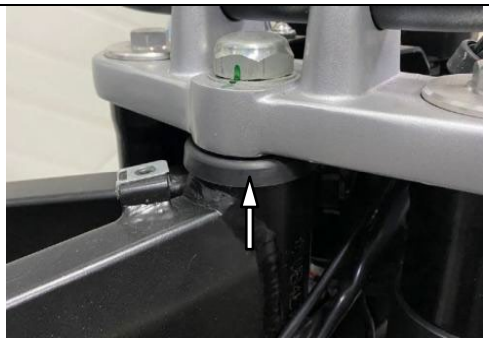
Battery

<table>
<tr><td>Disassembly of battery</td><td>Riser steering bearing</td></tr>
<tr><td>Open the seat cushion lock, remove the front and rear seat cushions, and remove the battery cover fixing bolts. When disassembling the battery connection wire, remove the negative battery wire first and then the positive wire.

Clean the positive and negative pole of the battery and the external surface of the battery.</td><td>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. If the steering handle can not rotate freely, and there is axial movement or stagnation, adjust the adjusting nut of the front fork riser.</td></tr>
<tr><td>Installation of battery

Install in reverse order. When connecting the electrode wire, the positive pole must be connected first.</td><td rowspan="2"> 
Support the front wheel</td></tr>
<tr><td>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.</td></tr>
<tr><td> 
Remove the seat cushion

  </td><td> 
Front fork riser adjusting nut

Suspension System

Front suspension

Put the front brake in the braking state and</td></tr>
</table>

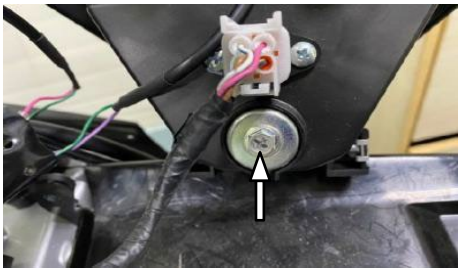
Remove the electrode wire

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

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.

Fuel system

This section describes the knowledge of the fuel system.

1 Fuel tank, 2 Fuel injector, 3 High pressure pipe,

4 Fuel filter valve body, 6 Fuel pump, 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

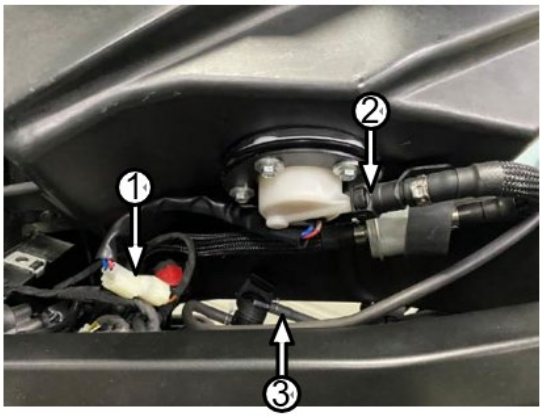
Throat diameter is equal to Φ32mm.

Idle speed 1700r/min±100 r/min

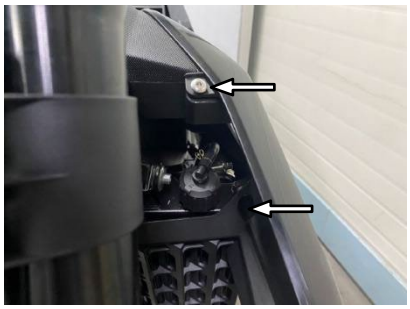
The free stroke of throttle handle is 2~6mm

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 pump failure; 9. Injector failure (blockage).
Disassembly and installation of fuel tank **Disassembly steps:** 1. Open the seat cushion lock and remove the front and rear seat cushions.	4. Remove the connector ① of the fuel sensor. Remove the fuel pipe② .Remove the fuel dump valve oil pipe ③.



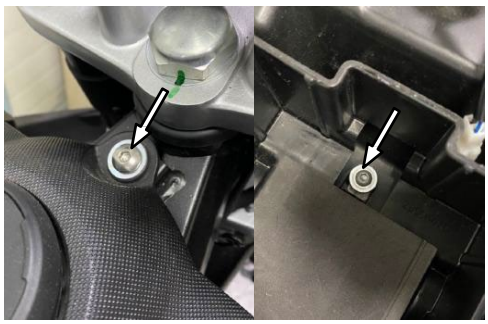
2. Remove 8 M5 × 9 connecting bolts and 6 ST 3.5 × 9. 5 tapping screws from the left and right fuel tank covers, and remove the left and right fuel tank covers.



5. Remove the fuel tank.

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 steps

<table>
<tr>
<td>  </td>
<td rowspan="2">are reverse to the removal steps. During installation, pay attention to the routing of fuel pump control line, and strictly follow the wiring diagram. Pay attention to avoid fuel pipeline pollution.</td>
</tr>
<tr>
<td>3. Remove one front M6 × 25 fixing bolt and one rear M6 × 30 fixing bolt of the oil tank assembly.
  </td>
</tr>
</table>

Disassembly / installation of fuel tank

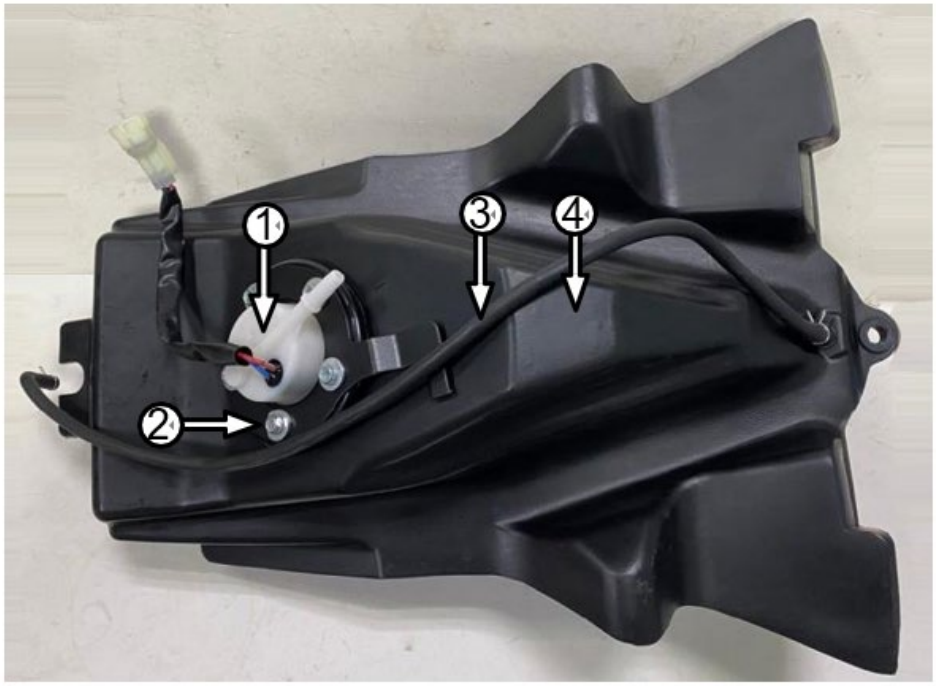
Sequence	Procedure	Quantity	Remark
	Disassembly sequence		The installation sequence is reverse to the disassembly sequence
1	Seating washer	1	
2	Left fuel tank cover	1	
3	Right oil tank cover	2	
4	Fuel tank	2	
5	Middle part of tail cover	1	
6	Right tail cover	1	
7	Right tail cover	1	

Disassembly and assembly of fuel tank

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

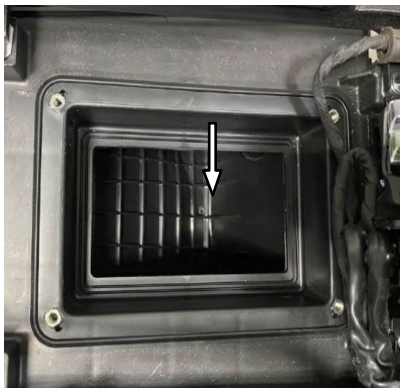
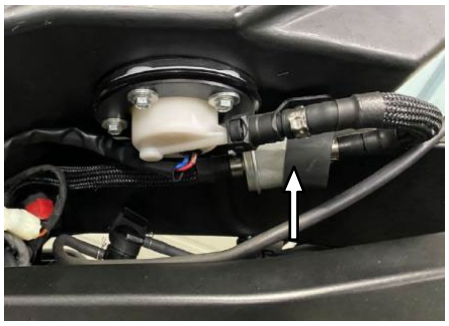
The assembly procedures are in reverse order to the disassembly procedures.

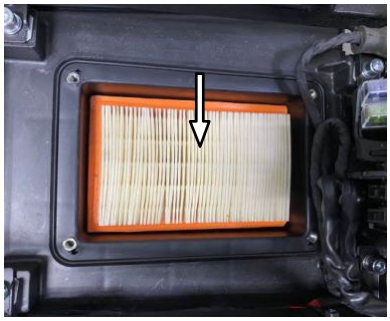
Pay attention to the oil outlet of the oil pump towards the front of the fuel tank during assembly.



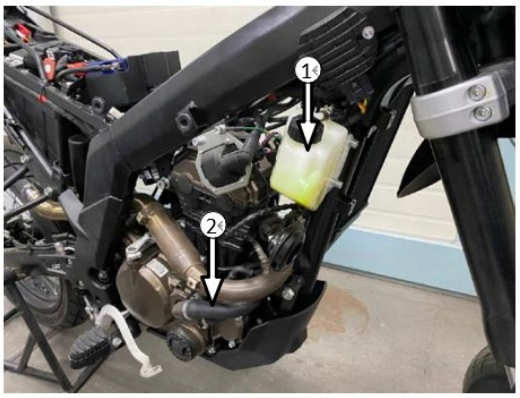
Sequence	Procedure	Quantity	Remark
	Disassembly sequence		The installation sequence is reverse to the disassembly sequence
1	Fuel pump assembly	1	
2	Bolt M5 × 18	5	
3	Fuel evaporation pipe	1	
4	Fuel tank	1	

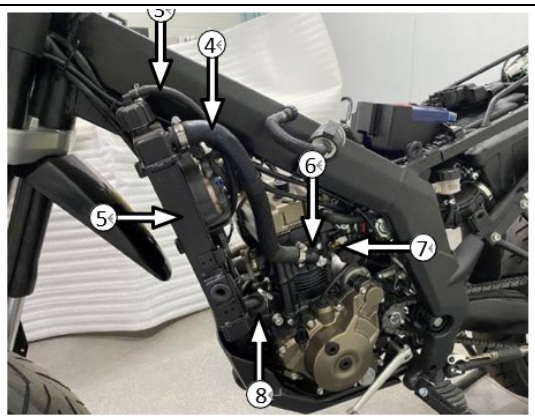
Replacement of fuel filter

Replacement cycle: 15000km. Tools: flat type screw driver. ⚠ **Note:** **Do not pull the liquid level sensor and float rod assembly hard during installation and disassembly.**	 Filter cavity
Disassembly procedures of filter:	
Press the inverted buckle of the filter and pull out the filter. 	
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.	
	

Set screw	
 Take out the filter element	

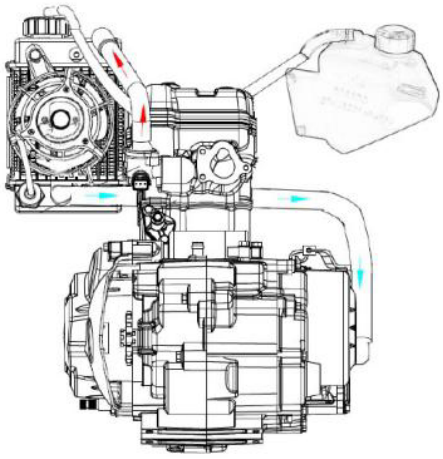
Cooling system





1 Auxiliary water tank, 2 Water cooler outlet pipe, 3 Connection hose of auxiliary water tank, 4 Water inlet pipe of water cooler,

5 Radiator, 6 Thermostat, 7 Temperature sensor, 8 Water cooler outlet pipe



HOT FLUID

COOL FLUID

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		100kPa	/
Opening temperature of thermostat valve	Start to boil	80℃	/
	Fully boiling	95℃	/
	Full boiling (95 ℃)	7-10mm	/
Coolant parameters	Boiling point	Not less than 108 ℃	/
	Freezing point	Not higher than -40 ℃	/

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.

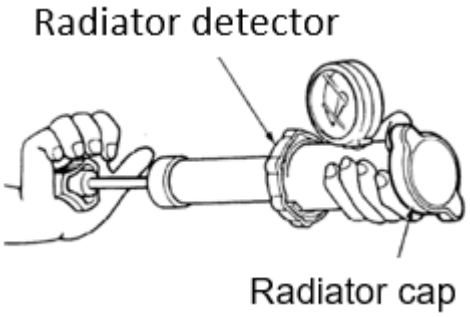
For the lowest temperature in the use area, the mixture ratio with about - 5 ℃ shall be selected.

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;	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;

<table>
<tr><td>8. The water pump is abnormal;

9. The cable is short circuited.</td><td>3. Damage and deterioration of water pipe.</td></tr>
<tr><td>Inspection of performance

Inspection of radiator cap</td><td> 
</td></tr>
<tr><td>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</td><td rowspan="2">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: 100kPa. 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</td></tr>
<tr><td>Note:

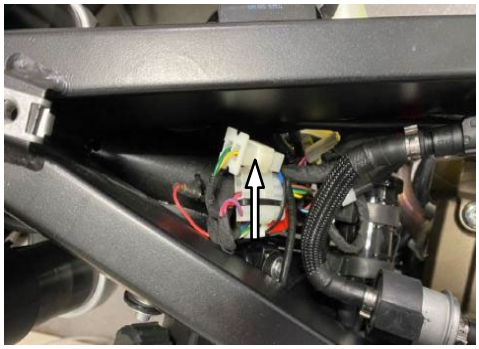
When installing the cap on the detector, first coat the sealing surface with water.

Valve opening pressure of radiator cap: 100 kPa</td></tr>
</table>

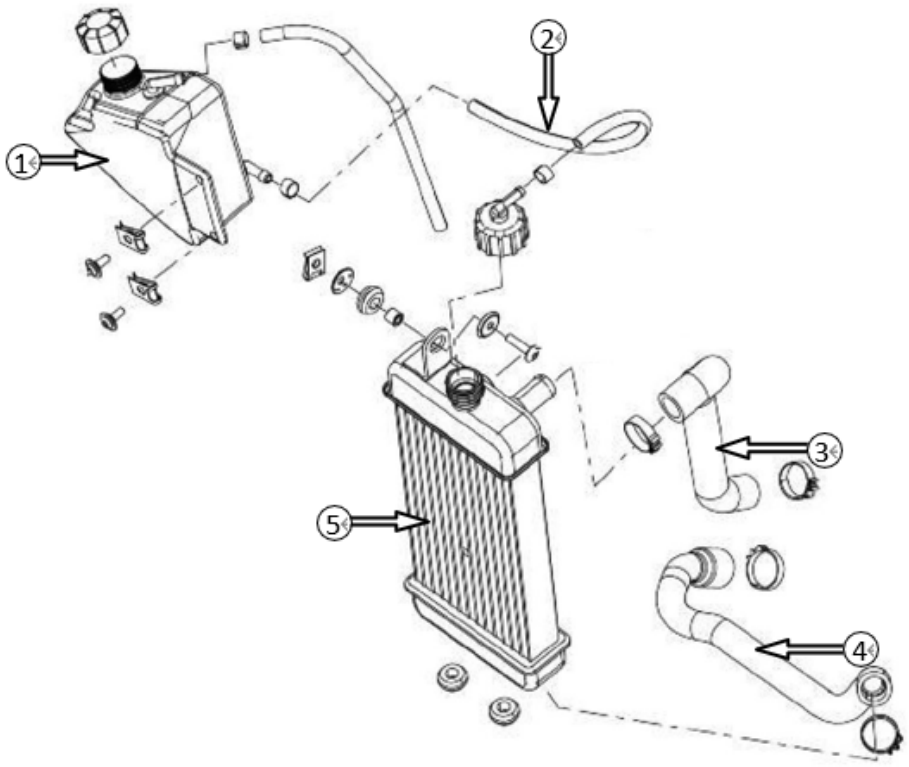
Radiator

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 fan power cord connector. 	
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



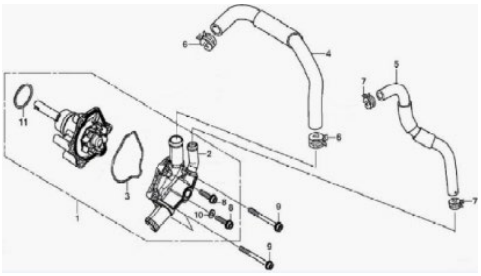
Sequence	Procedure	Quantity	Remark
	Disassembly sequence		The assembly sequence is reverse to the disassembly sequence
1	Auxiliary water tank	1	
2	Connection hose of auxiliary water tank	1	
3	Water pump inlet pipe	1	
4	Water inlet pipe of water cooler	1	
5	Water cooler	1	

Water pump

Disassembly and assembly of water pump	Inspection 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. 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.	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 If the turbine of the water pump is damaged, or the water pump leaks beyond repair, please replace it with a new one.

/

Disassembly/ installation of water pump

	Sequence	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		
	11	O-shaped seal washer	1	

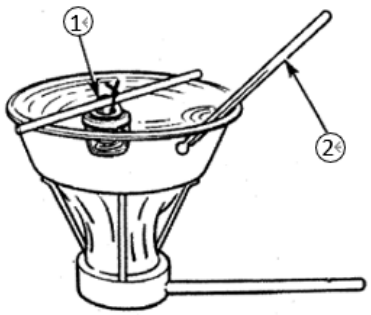
Thermostat

Disassembly and assembly of thermostat	Inspection of thermostat

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

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	80
Full boiling temperature	95
Degree of full boiling	7-10mm

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 95 ℃ for about 5 minutes before measurement.

Cooling electrical system

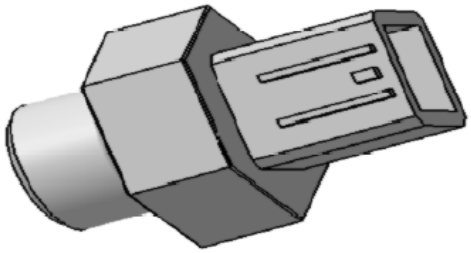
Overview

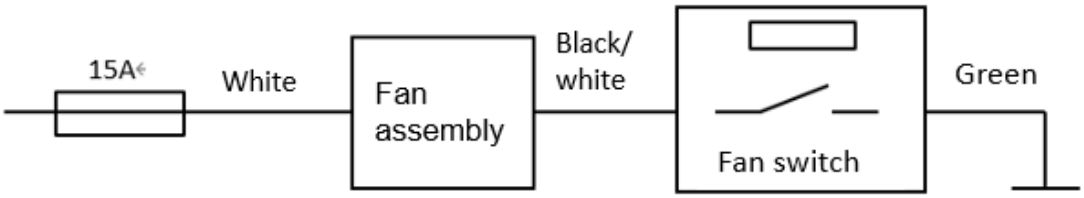
When the working temperature of the engine reaches a limit, the cooling water will circulate through the radiator, and the temperature will continue to rise. Turn on the fan switch on the radiator, turn on the power supply of the fan, and the fan will rotate to take away the engine heat of the cooling 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





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 92 ℃ ± 3 ℃, close 89 ℃ ± 3℃

Rated working current: DC 12V 5A.

3. Possible failures

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 ≥ 400m^3 / h;

Motor speed (4500 ± 400）r/min；

Rated working current ≤ 1.4A;

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

3. Possible failures

Fan motor open circuit failure;

Fan motor short circuit failure;

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

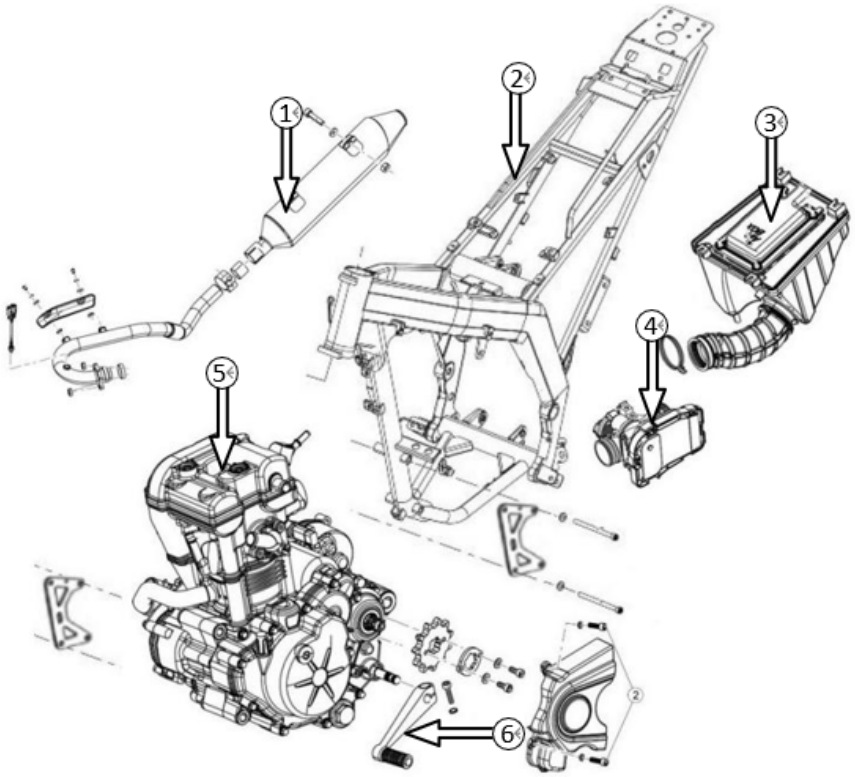
The joint between fan leaf and motor shaft slips;

The bracket is broken.

Failure phenomenon	Possible causes	Solutions:
The water temperature has given an alarm, but the fan still	Line break;	Connection repair;
	Open circuit failure of fan switch;	Replace the fan switch;

doesn't work	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 Muffler, 2 Frame, 3 Air filter, 4 Throttle body, 5 Engine, 6 Transmission pedal

Disassembly and Installation of Engine

Maintenance Instructions	Installation of engine
Disassembly of engine	

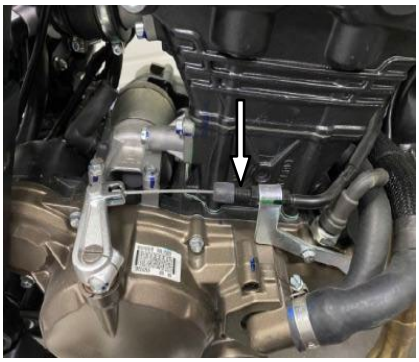
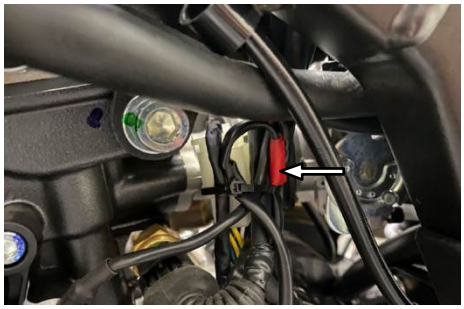
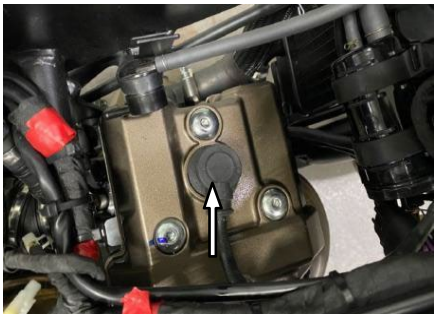
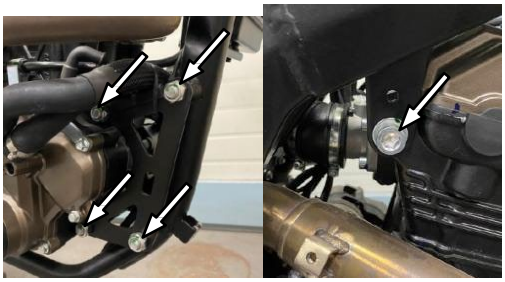
Maintenance Instructions

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	Specifications Engine net weight 35 kg Engine oil quantity: Add 1.15L to the broken engine oil tank and 1.15L to the

engine, it is not necessary to disassembly the engine from the frame. Before removing the engine, the motorcycle shall 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.	daily maintenance Cooling water capacity 1550ml Important torque figures Engine suspension bolt M10：37~45 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).	Remove the starting motor wire and engine grounding wire 

<table>
<tr><td>  </td><td></td></tr>
<tr><td>Disassembly of clutch cable.
  </td><td>Remove the output line, gear display line and switch line of the magneto.
  </td></tr>
<tr><td>Remove the ignition coil spark plug cap.
  </td><td>Remove 4 bolts of M10×100 from the front of the engine cradle to the frame, 2 bolts of M10×25 from the top to the frame, and the rear fork to the frame connecting shaft.
 
  </td></tr>
<tr><td>Disassemble the gearshift subassembly and remove the left rear cover, and remove the drive chain</td><td><table><tr><td>Sequence</td><td>Procedure</td><td>Quantity</td><td>Remark</td></tr></table></td></tr>
</table>

Disassembly the engine

	Disassembly sequence		The installation sequence is reverse to the disassembly sequence
1	Closure panel, fuel tank, radiator, muffler, air filter, etc		Refer to relevant chapters
2	Variable speed control components	1	
3	Left rear cover	1	
4	Bolt M10×100	4	
5	Bolt M10×255	2	
6	Flat fork shaft M12×1.25×258	1	
7	Nut M12	1	

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 Frame, 4 Closure panel, 5 Muffler

Maintenance Instructions	Disassembly / installation of rear fender
Troubleshooting	Disassembly/ installation of exhaust muffler

Closure panel, headlamp and instrument	Rear lamp assembly

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.

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 cover, headlamp and instrument

1. Support the motorcycle with side bracket on the flat ground and remove the cushion.	2. Remove the closure panel mounting bolts. Remove the closure panel. Pay attention to handle with care, do not scratch the decorative surface.

<table>
<tr>
<td>  </td>
<td>  </td>
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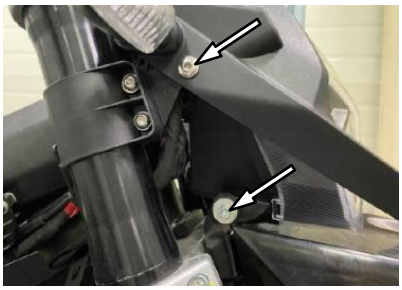
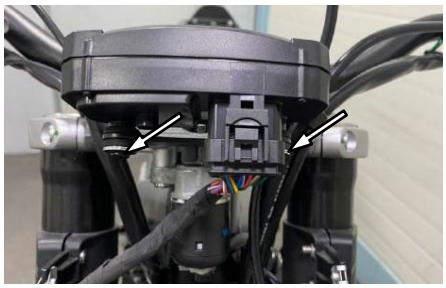
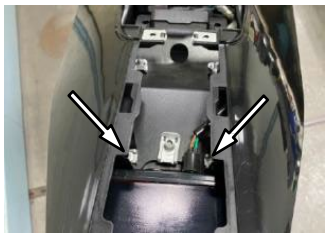
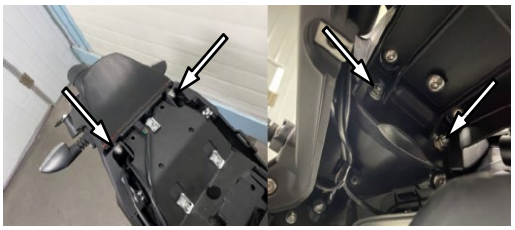
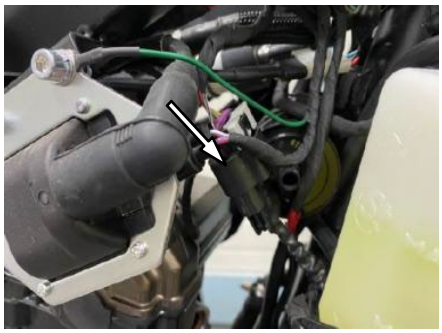
<tr>
<td>3. Remove the headlight combination fixing screws, two M59 hexagonal screws, two M516 hexagonal screws, remove the headlight combination, remove the headlight fixing screws, two S T3.85/3.05X20, get the headlight.
 
  </td>
<td>1. Unscrew the left and right body cover fixing screws 4 M6 × 14 hexagonal screws, 2 M5 × 9 hexagonal screws, remove the left and right body cover.

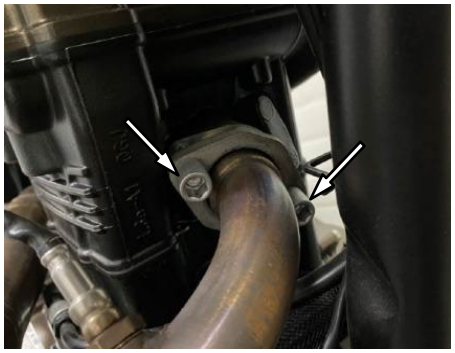
Disassembly / installation of rear tail lamp

1. Unscrew the rear inner fender fixing screws two 4.2 × 16 self-tapping screws, six M5 × 9 hexagonal screws, two M6 × 16 hexagonal screws, remove the rear inner fender.
 
  </td>
</tr>
<tr>
<td>4. Remove the instrument panel assembly mounting screws and two hexagonal socket flat head screws M5 × 20。 Unplug the instrument plug, remove the instrument</td>
<td>2. Remove the middle of the tail cover 2 M5 × 9 hexagonal screws, remove the middle of the tail cover, unscrew the left and right tail cover fixing screws 2 M5 × 9</td>
</tr>
</table>

cluster, remove the screws connecting the instrument and bracket, and two self tapping screws ST4.8 × 13. Remove the instrument panel.  	hexagonal screws, remove the left and right tail cover.   
Installation procedures of closure panel, headlamp and instrument: The installation steps of the closure panel headlamp and instrument are in the reverse order of the disassembly. Pay attention not to scratch the closure panel 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.**	3. Remove the four M5 fixing nuts from the rear tail light and take out the tail light. 

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 in the reverse order of disassembly.** 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:** Make sure the muffler is completely cooled before operation, otherwise it will cause scald.
2. Remove 3 M5 × 16 inner hexagon socket step screws from the fixing screws of the lower shroud assembly. 	
3. Remove two connecting nuts M 8 × 19 between silencer and engine exhaust port, and two connecting bolts M 8 × 1. 25 × 30 between silencer and frame, and remove silencer.	

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

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.

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 figures

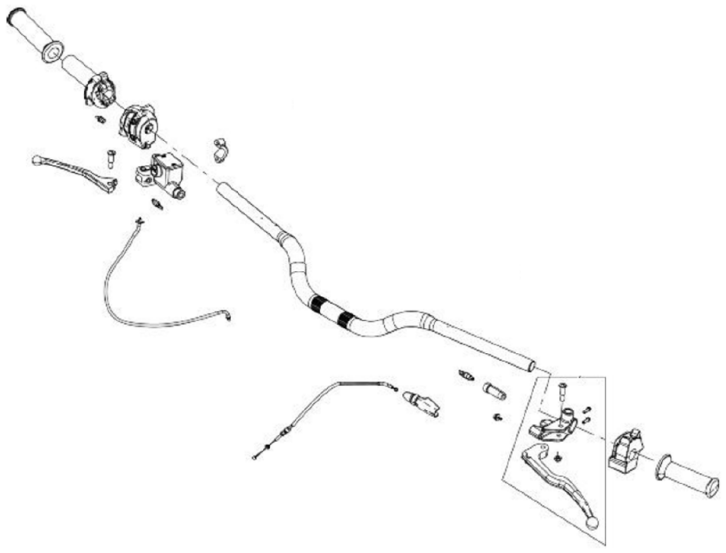
Front axle	70~80 N.m	Upper connecting plate fastening cap nut	45~55 N.m
Handlebar fixing bolt	20~24 N.m	Steering column fixing frame nut	95~125 N.m
Fixing bolts of upper and lower connecting plates	20~24 N.m	Fastening screw of front brake disc	10~12 N.m

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;	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.

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; **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	T**he suspension is too hard** 1. The hydraulic oil level is too high or the fluid type is wrong. 2. Bending of front shock absorption 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



Note:

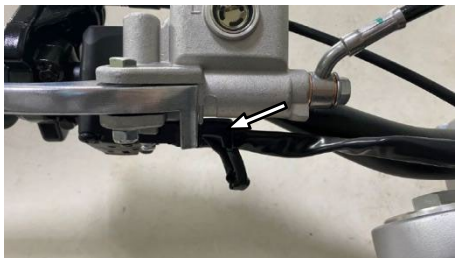
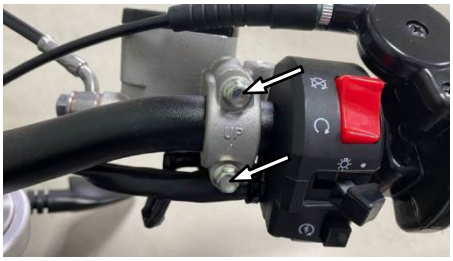
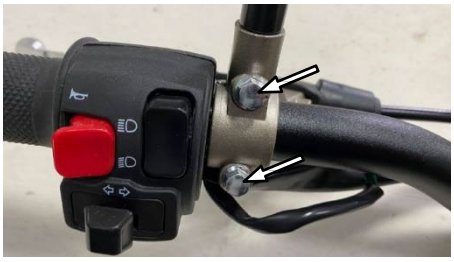
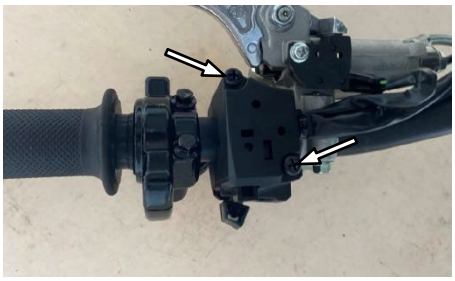
The front brake master cylinder shall be hoisted with steel wire rope, and its height shall be at least the same as that of the original installation position, so as to prevent air from invading the master cylinder and affecting the braking performance. It is forbidden to twist the brake hose.

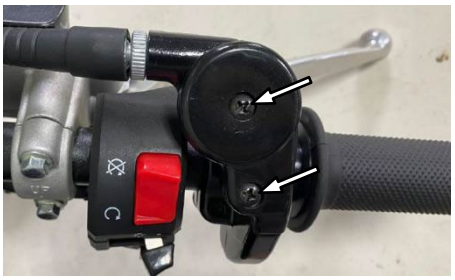
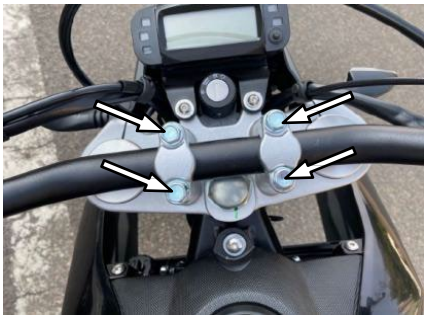
When assembling clutch handle and front brake cylinder block, the opening shall be aligned with the marking point of handlebar.

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 off the clutch switch plug. 
2. Remove the front brake master cylinder clip bolt. 	6. Remove the clutch handle bolt. 
3. Remove the right combined switch screw. 	7. Remove the left combined switch screw. 

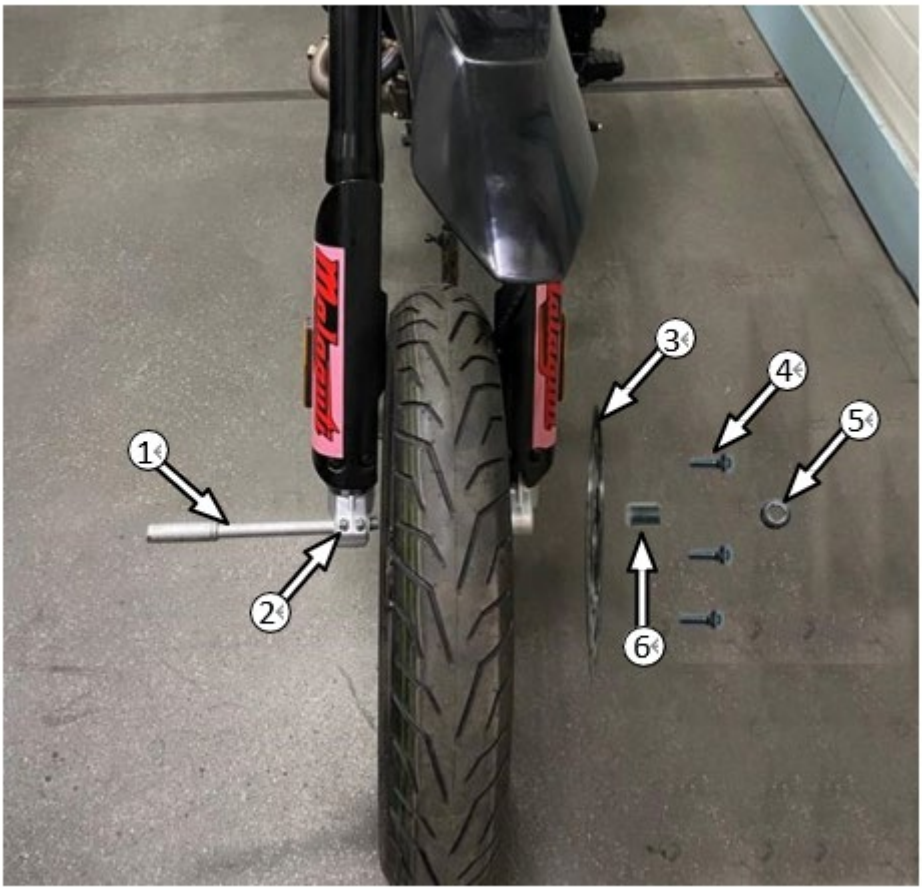
4. Remove the fixing screw of throttle cable. 	8. Remove the handlebar clip fixing bolt. 

Maintenance requirements

Sequence	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	1	
8	Left handlebar	2	
9	Clutch handle bolt	2	Note: Tighten the upper bolt first, then the lower bolt

10	Clutch handle	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)
11	Left combined 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
12	Left combined switch	1	
13	Throttle cable	1	Note: do not bend or twist the throttle cable
14	Fuel feeder	1	
15	Right combined 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 combined switch	1	
17	Handle tube mounting bolt M8 × 40	4	
18	Handlebar	1	

Front wheel disassembly/ assembly



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

Note:

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

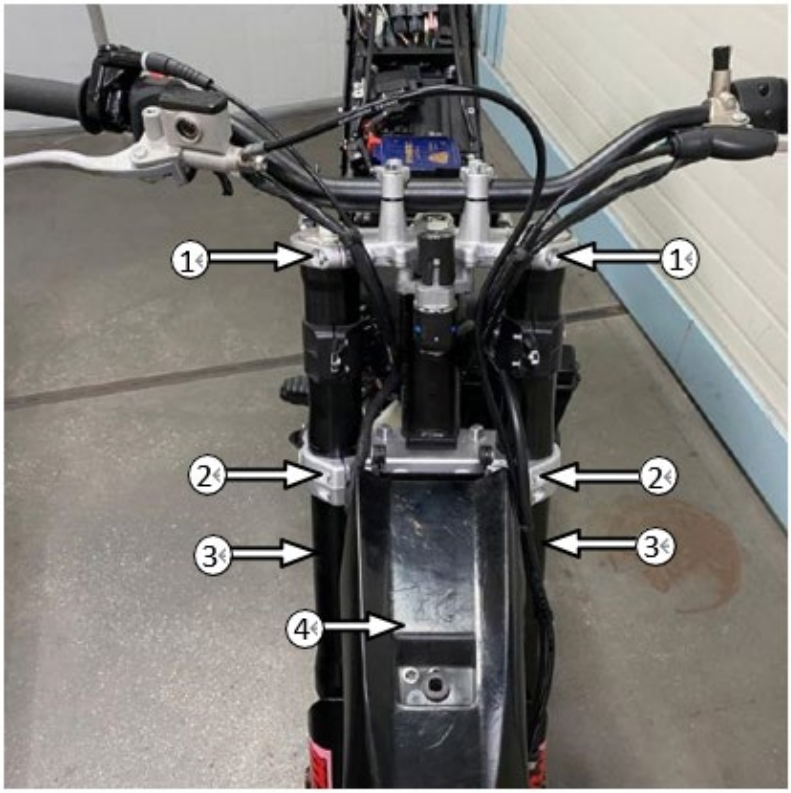
When the brake caliper is removed, do not pull the brake handle to avoid difficulties when assembling the front wheel.

The vehicle bearing shall be replaced in a complete set.

Maintenance requirements

Sequence	Procedure	Quantity	Remark
Disassembly sequence		The installation sequence is reverse to the disassembly sequence	
1	Front axle nut	1	Tightening torque: 70-80N.m
2	Front axle nut bolt	2	8-10N.m Tightening torque: 8-10N.m
3	Front axle	1	Apply lithium grease
4	Front wheel left bushing	1	Apply lithium grease during assembly
5	Front brake disc bolts	3	Tightening torque: 10-12N.m
6	Front brake disc assembly	1	

Front suspension disassembly/assembly



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

Note:

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.

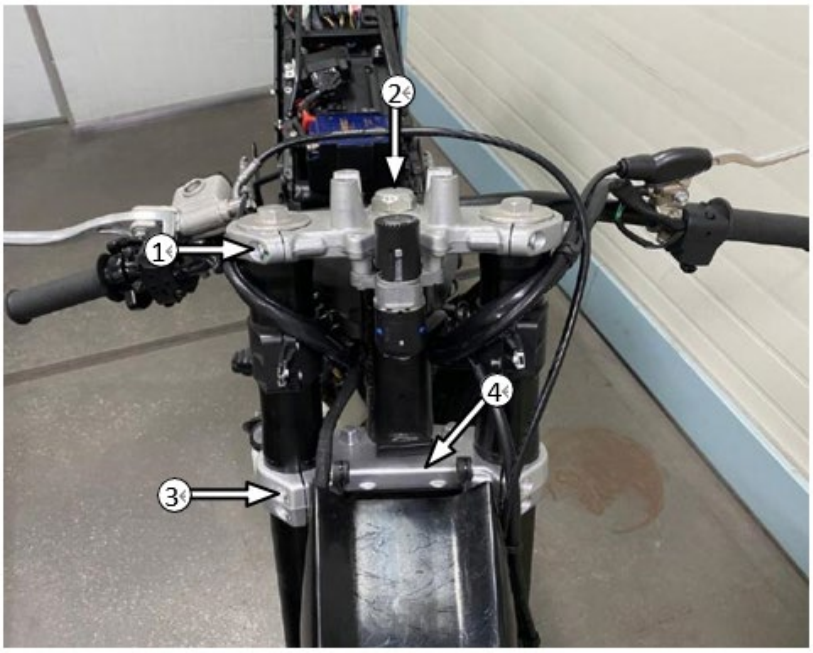
When the brake caliper is removed, do not pull the brake handle to avoid difficulties when assembling the front wheel.

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

Maintenance requirements

Sequence	Procedure	Quantity	Remark
Disassembly sequence		The installation sequence is reverse to the disassembly sequence	
1	Brake caliper bolt	2	Tightening torque: 22-24N.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
4	Front fender bolts	4	Crossed pan head combination bolt M6×16
5	Front fender	1	
6	Lower connecting plate mounting bolt	4	Hexagon socket bolt M8x30, just loosen it
7	Mounting bolt of upper connecting plate	2	Hexagon socket bolt M8x30, just loosen it.Caution! Don't drop it.
8	Front shock absorber	2	

Disassembly/assembly of steering column



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

Note:

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

Sequence	Procedure	Quantity	Remark

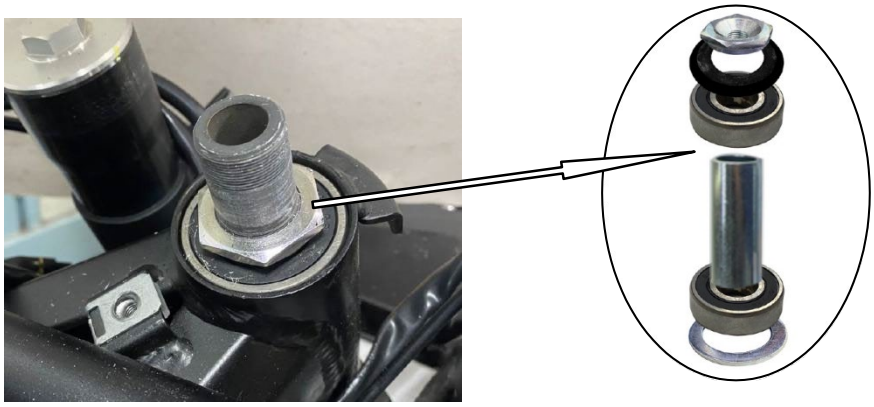
Disassembly sequence		The installation sequence is reverse to the disassembly sequence	
1	Upper connecting plate locking cap nut	1	Assembly torque: 45-55N.m
2	Steering column gasket	1	
3	Upper connecting plate damping bolt M8 ×30	2	
4	Upper connecting plate	1	
5	Ignition switch lock screw	2	Hexagon socket screw M8X20
6	Combined ignition switch components	1	
7	Lower connecting plate damping bolt M8×30	4	Torsion force of left and right front shock absorber: 19.6~23.5N.m;
8	Steering column adjusting nut	1	The assembly torque is 95~125N.m. Turn the steering column 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	

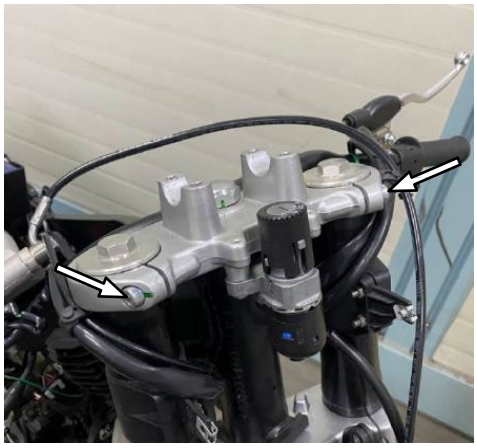
Assembly of directional column

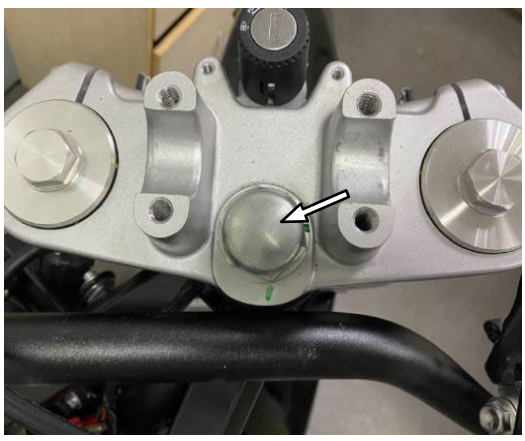
Apply enough lithium grease on the surface of bearing roller.

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 110N.m → rotate it three times in the left and right direction → adjust the bolt back 60 ° → finally tighten it to 100N.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 19.6~23.5N•m, the direction column can rotate flexibly without clamping and interference within the maximum angle range.







Front brake

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. When disassembling the master cylinder, pay attention to it. First, make sure 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;	**The brake handle is not flexible** 1. The brake system is blocked 2. The piston of brake caliper is stuck and worn.

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. 12. The brake disc is warped and deformed. 13. Pipeline is polluted.	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.

Front brake caliper components removal/assembly

1 Front brake caliper bolt, 2 Front brake caliper, 3 Front brake disc

Note:

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.

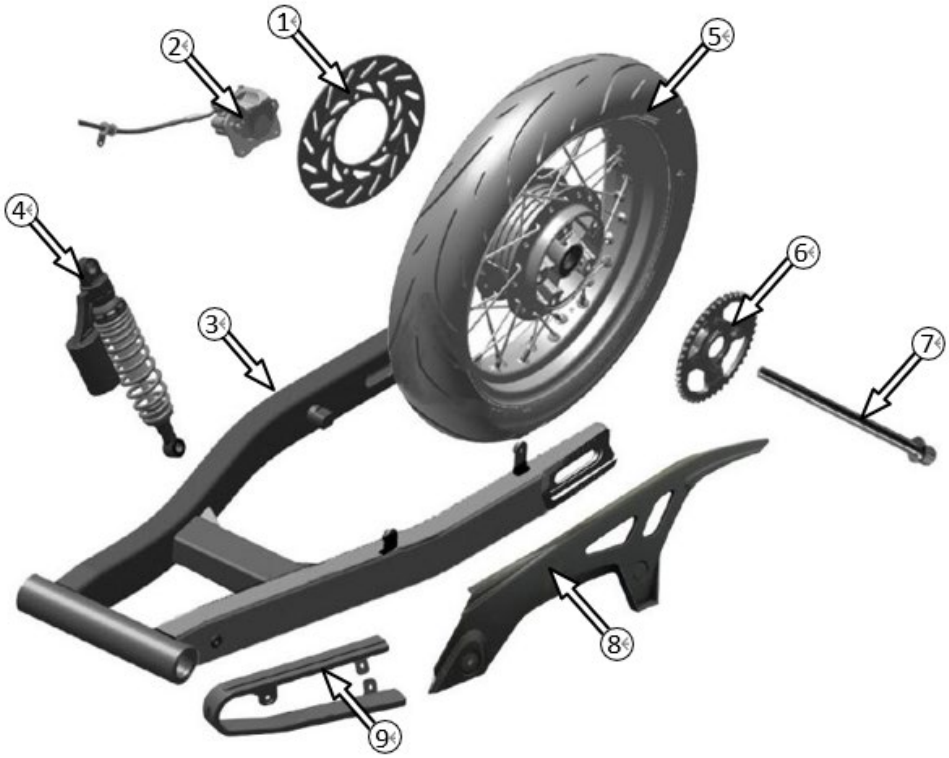
Do not clean the brake components with air duct or dry brush in case of inhaling friction plate dust and causing respiratory discomfort. For repair and maintenance, please go to specialized maintenance centers.

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

Sequence	Procedure	Quantity	Remark
Disassembly sequence		The installation sequence is reverse to the disassembly sequence	
1	Brake caliper bolt M8×25	2	Tightening torque: 22-24N.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 box 9. 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 link. 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 figures

Fastening nut on rear axle shaft: 70~80N.m

Nut on rear fork shaft: 70~80N.m

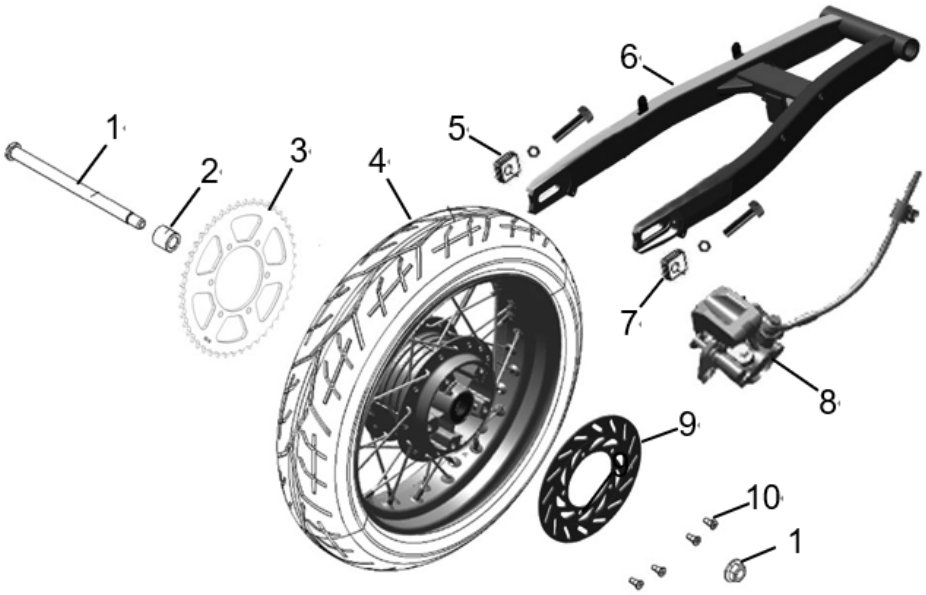
Rear damping rocker arm M12 bolt & nut: 70~80 N.m

Fastening screw of rear brake disc 20~25 N.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 regulator; 5. Damaged wheel sleeve. Noise Loose fasteners.	**Difficulty in turning the wheel.** 1. Damaged wheel bearing and shaft sleeve; 2. Incorrect wheel installation; 3. Bent rear axle 3. Rear brake friction plate can not reset **Abnormal suspension** 1. The damping spring is too hard or too soft ; 2. Damaged rear fork bearing; 3. Bent shock absorber.

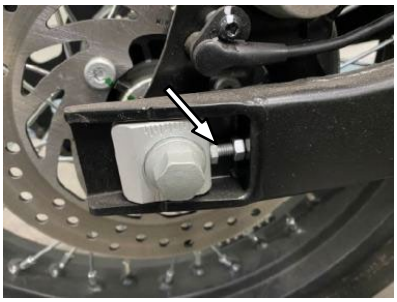
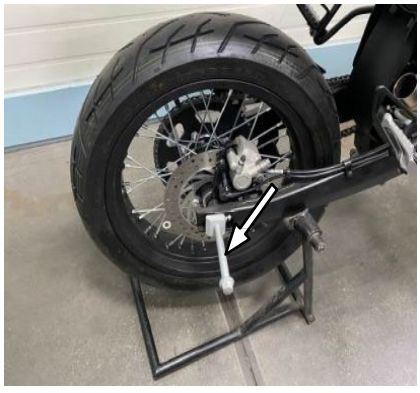
Rear wheel

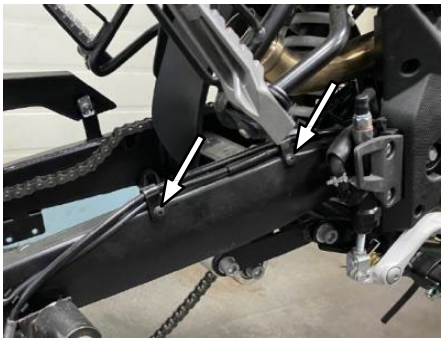


1. Rear axle shaft 2. Rear wheel left sleeve 3. Chain wheel 4. Rear tire assy. 5. Chain left adjuster 6. Rear fork assembly

7. Chain right adjuster 8. Rear brake caliper body 9. Rear brake disc 10. Rear brake disc bolt 11. Rear axle nut

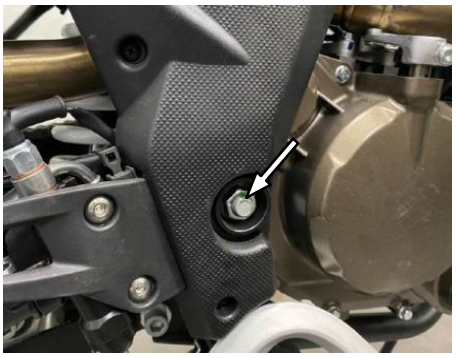
Disassembly steps of rear wheel

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. 	**Rear 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. 
6. Take out the left rear wheel bushing. 	3. Pull the rear brake caliper body backward out of the suspension position. 
7. 7. Remove the six M8×30 fastening bolts of the chain wheel and take out the chain wheel to get the rear wheel.	4. Remove the rear shock absorber and flat fork connecting bolt M10×(38+16).

8. Take out the disc of rear disc brake.

5. Loosen the flat fork shaft nut and pull out the flat fork shaft from the left side to pull out the flat fork backward.

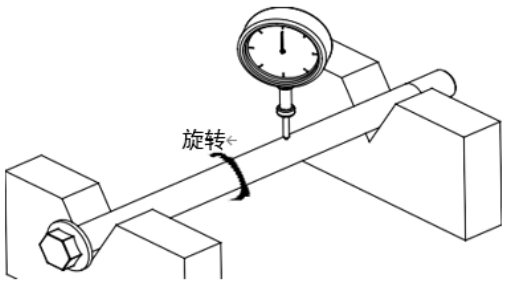


⚠ **Note:**

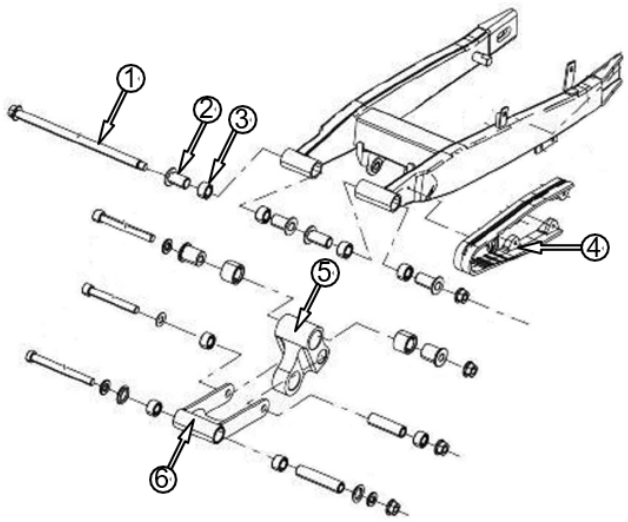
When removing the brake caliper body, make sure that the rear brake caliper body is lower than the rear brake cylinder body to prevent air from entering the cylinder body reducing the braking performance. And after removing the rear brake caliper body, if it does not need to be replaced, do not step on the rear brake pedal.

Warning:

Tighten the flat fork shaft fastening nut to the

specified torque of 70~80N.m. **Removal/installation of flat fork** 	
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.	



Sequence	Procedure	Quantity	Remark
	Decomposition sequence		The assembly sequence is reverse to the disassembly sequence
1	Flat fork shaft	1	
2	Flat fork shaft bushing	4	When assembling, make sure that the shaft sleeve rotates flexibly
3	Needle bearing (HK1814-RS)	4	Apply lithium grease on the needle roller during installation
4	Chain guard	1	
5	Rear shock absorber lower mounting seat	1	Apply lithium grease on the needle roller during installation

6	Rear rocker arm	1	

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;

BB. 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	

Overview

Power supply system is the premise of vehicle electrical system, which can provide sufficient power for other electrical subsystems. It includes: charging, storing and discharging. Power supply system is characterized by large power supply capacity, up to 172W. It consists of the following parts:

Magneto

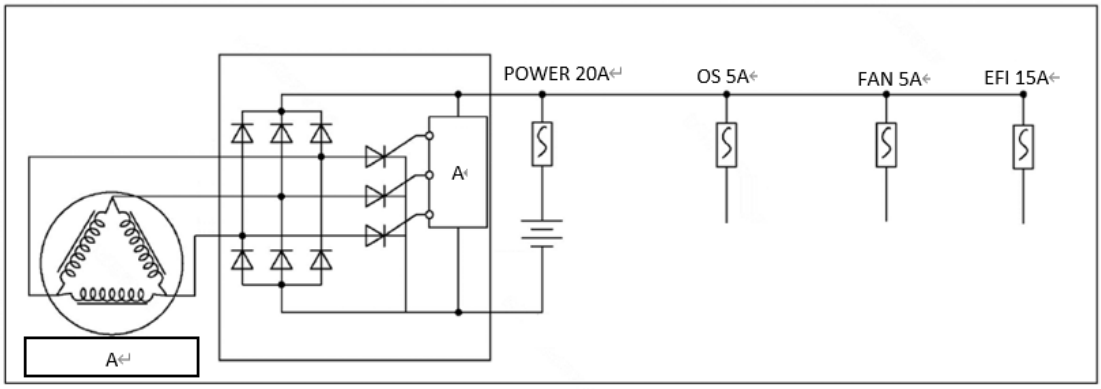
Voltage regulating rectifier

Battery

Combined ignition switch

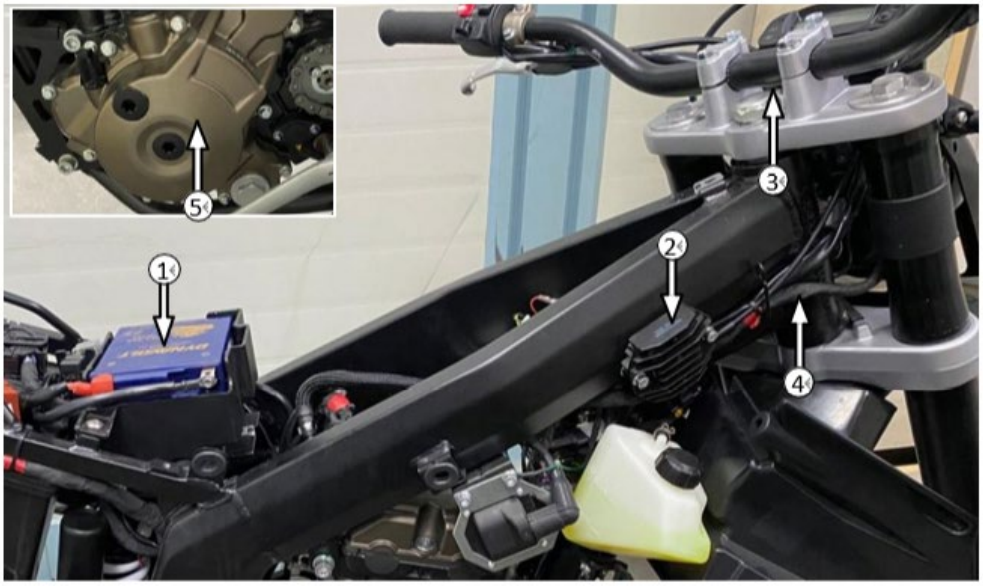
Fuses

Circuit diagram



1 Charging winding of magneto, 2 Control loop

Parts layout

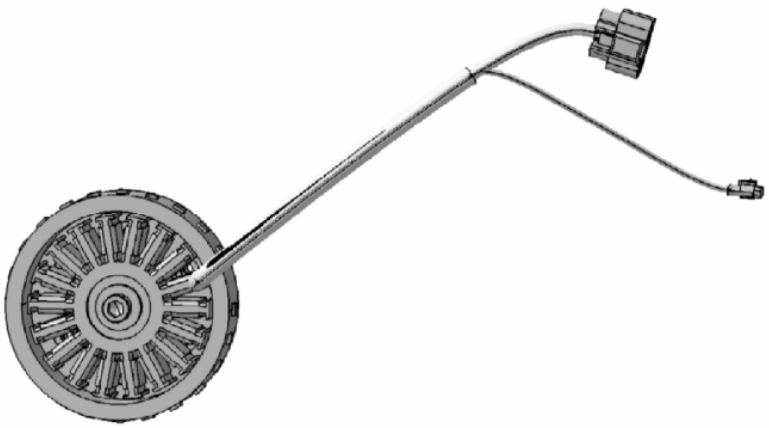


1 Battery, 2 Voltage regulating rectifier, 3 Ignition switch, 4 Main electrical harness, 5 Magneto

Introduction of main components

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;

Stator winding has a total of 18 poles, which connect according to three-phase △ and the winding resistance value of each phase is 0.3-0.5 Ω; horsepower: 172W/5000r/min (cold state) (maximum attenuation of hot engine is 8%).

4. Failure mode rotor magnetic steel is broken;

Faded magnetic properties of the magnetic steel;

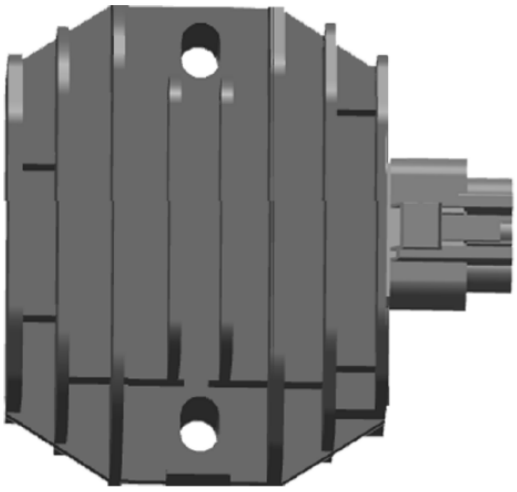
Stator winding short circuit to ground; Stator winding inter-turn short circuit;

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; Adjustment voltage: 14.5V ± 0.5V;

Working current: 18A.

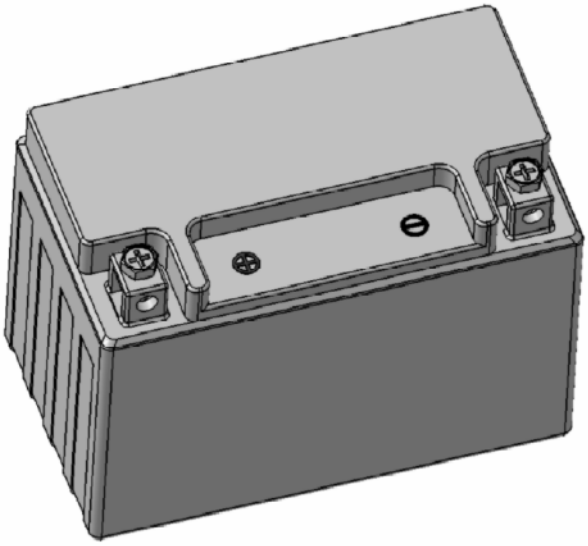
4. Possible failures

Out-of-control voltage regulator circuit, causing overcharge to the battery;

The rectifier circuit is open circuit or short circuit, and battery cannot be charged or is not charged enough; The outgoing line is short circuit or open circuit.

Battery

1. Outline drawing



2. Working principle

The two materials, lead (negative) and lead dioxide (positive), can generate 2V when immersed in the electrolyte, and up to 12~13V when 6 single cells are connected in series. 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/7Ah;

10HR rated capacity: 7Ah（25℃±2℃）;

High rate discharge performance (- 10 ℃) 72A: duration more than 90s; voltage greater than 9.3V after 5s.

4. Possible failures

Polarized plates leading to reduced capacity, failure to provide the energy required for starting and reduced charging performance; Leakages cause corrosion of electrode;

Too much internal resistance, serious self-discharge phenomenon, voltage below 5V.

Body controller

1. Outline drawing

2. Working principle

The ignition lock cylinder with double slot and 8-tooth key is the main switch of the whole vehicle power supply. It is also the head direction lock.

3. Basic parameter switch menu

Line color / Gear	Orange	Blue	Red and white	Green	Key	Locking tab
					Cannot be withdrawn	Not protrude
					Can be withdrawn	Not protrude
					Can be withdrawn	Protrude

The inter-opening rate of switch key should be no more than 0.1%;

Rated working current of switch: 12A.

4. Possible failures

Invalid lock cylinder, causing inflexible switch or failure to open the switch with the key;

Failure of the switch contact, causing the failure of the switch;

The contact short circuit between the switch contact and the shell, causing the main fuse to burn out and the whole vehicle has no power;

Open circuit or short circuit to ground of outgoing line;

Failure in the locking tab, causing failure in the front direction lock.

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;

Each fork and terminal shall be riveted firmly and connected well; The conduit pipe and tape shall be tightly wrapped without looseness;

All connectors and corresponding electrical and electronic equipment shall be reliably connected.

4. Possible failures

Failure assembly of the terminal and connector and loose;

Damaged wire sheath short circuit to ground or short circuit with adjacent wires; Rusted connection at the forks is unreliable or broken;

Instantaneous failure and poor contact of wire head or wire (most instantaneous electrical failures are caused by this); The fuse is in poor contact or burnt out;

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	Solutions:
No power for the whole vehicle: No electricity in the whole car, i.e., when the key is turned on, there is no display on the instrument, and other electrical functions cannot be performed.	The main fuse is blown out;	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	Too long storage of the whole vehicle	Charge with DC stabilized voltage charger
	Vehicle charging circuit fault or too large	Check the charging circuit and

	vehicle quiescent current	quiescent current of the whole vehicle
	Decaying battery capacity, battery does not store power, battery self discharge	To replace the battery
The battery is not fully charged.	The regulator rectifier lead wire and the main cable or magneto are not well connected	Plug in again
	Open circuit or short circuit of main cable	Repair or replace
	Magneto failure	Replace the magneto rotor
	Failed voltage regulating rectifier	Replace the voltage regulating rectifier.
	Batteries failing to store power	To replace the 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, start the motor rotation, drive 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;

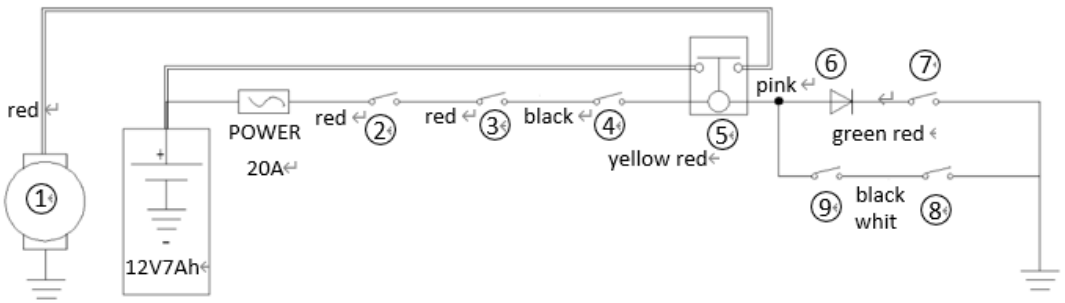
Starter relay

Battery;

Start switch and flameout switch;

Neutral switch, side bracket switch and clutch switch.

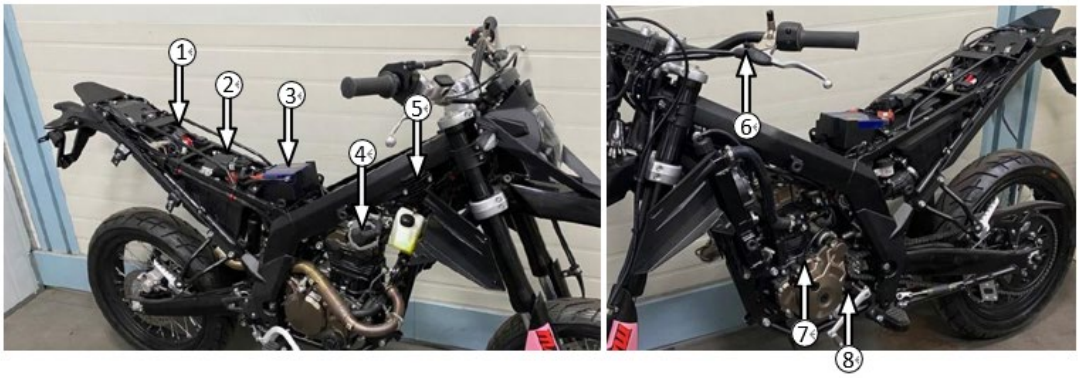
Circuit diagram



1 Starting motor, 2 Ignition switch, 3 Flameout switch, 4 Electric starting switch, 5 Start relay,

6 Isolation diode, 7 Neutral switch, 8 Side bracket switch, 9 Clutch switch

Parts layout



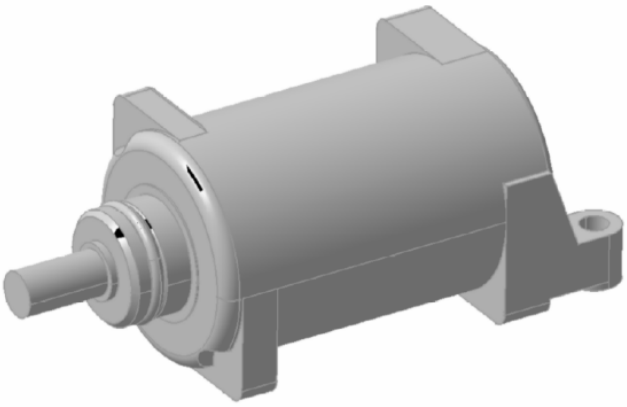
1 Start relay, 2 ECU, 3 Battery, 4 Ignition coil, 5 Rectifier,

6 Clutch switch, 7 Magneto harness, 8 Gear switch

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 starting 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

Stator has four magnetic steels with four poles in total, and four carbon brushes;
Specification: 12V650W;

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

4. Failure mode

Motor open circuit failure;

Excessive wear of carbon brushes;

Broken stator magnetic steel;

Faded magnetic properties of the magnetic steel;

Frictional short circuit between the enameled wire of the rotor winding and the stator;

If the bearing is failure, the motor runs with a strange noise.

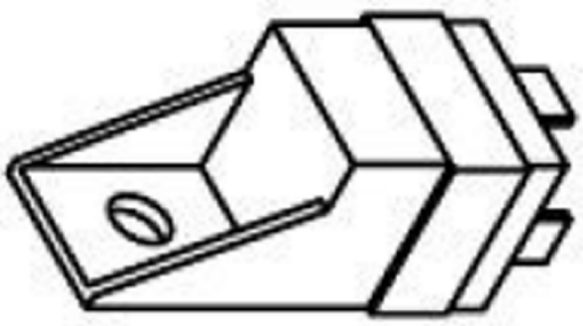
Poor oil seal, short circuit failure of oil inlet in Motor;

Poor waterproof, and the water inlet performance of Motor decreases.

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

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: DC80A;

Closing voltage: ≥DC7.4V;

Released voltage: ≤DC4.0V;

Contact voltage drop: below 0.5V (at 80A);

Coil current: below 300mA.

4. Possible failures

The coil or lug is open and the contact cannot be absorbed.

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 combined switch, gear switch)

1. Outline drawing

	
Left combined switch	Right combined switch

 Gear switch	

2. Switch function

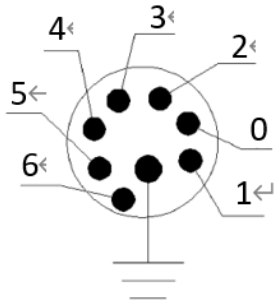
Left combined switch functions

	Orange	Gray	Light blue	Red orange	White	Blue	Black	Light green
⇦	○	○						
⇨		○	○					
				○	○			
				⬭		⬭		
							○	○

Right combined switch functions

	Brown yellow	Green	Yellow and red	Red orange	Black
	○	○			
	○		○		
				○	○

Gear switch functions	Gear 1 (Pink) Gear 0 (Green and red) Gear 2 (Pink and black) Gear 3 (Green and black) Gear 4 (Red and white) Gear 5 (Grey and blue) Gear 6 (Purple)



3. Possible failures

Broken switch position pin, rotating on the handle tube during use;

No sense of being in place or weak the 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 of the side bracket switch lead wire, break or open circuit.

Switch worn, vibrated, and corroded by water.

Main fault diagnosis

Failure phenomenon	Possible causes	Solutions:
Starter relay does not pull in: press the start button, do not hear the sound of relay pull in, start motor does not turn.	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;
	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;
	The flameout switch is broken;	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	The battery voltage is too low;	Charge the battery;
	Loose thick wire connector;	Fasten the connector;

not run.	Motor open circuit failure;	Replace the motor;
	Open circuit between pole contacts of start relay;	Replace the starter relay.
	Motor short circuit failure;	Replace the motor;
	Engine stuck and motor locked.	Check the engine.
Motor speed 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.

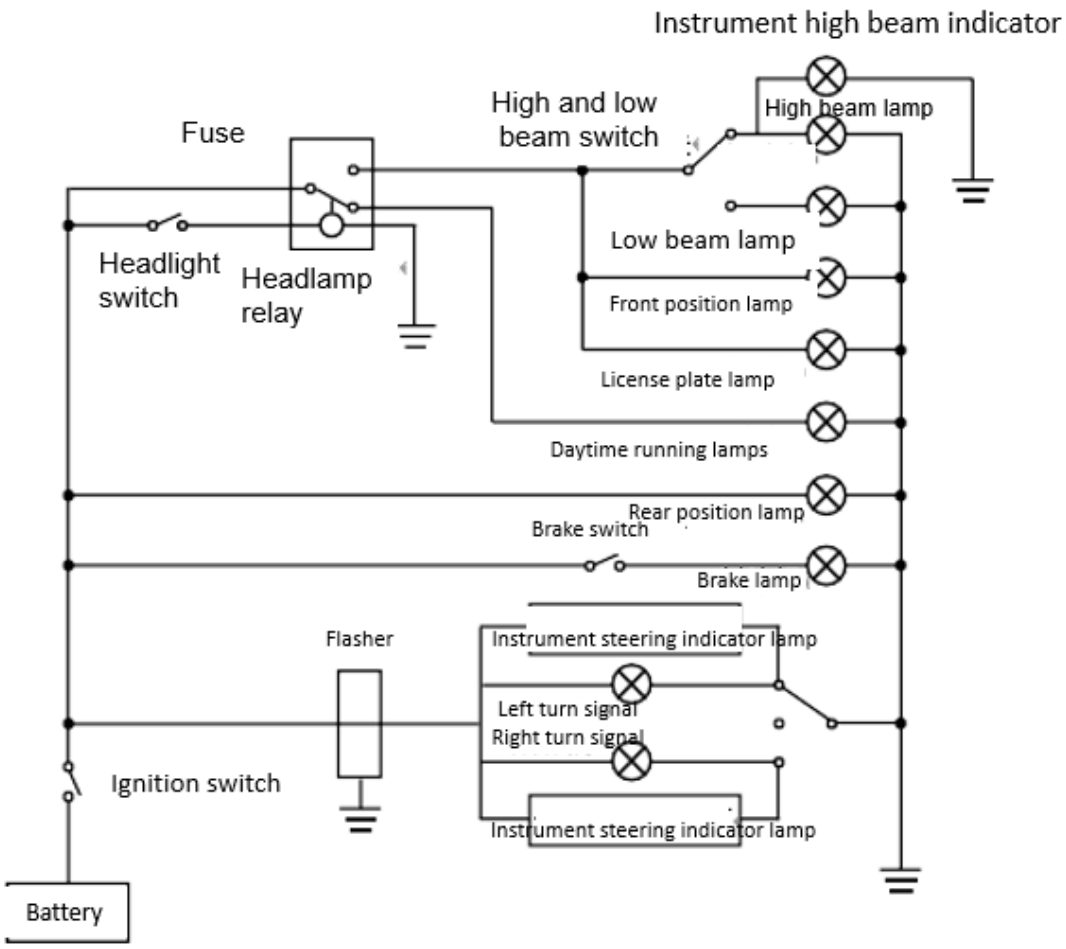
Horn system:

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.

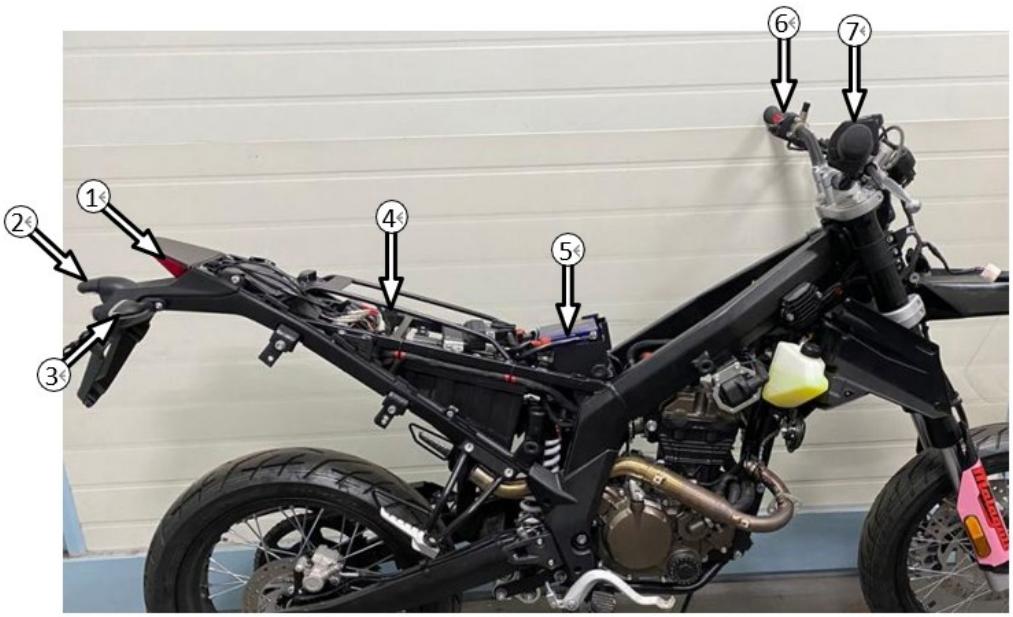
Components:

- Headlamp (including daytime running lamp)
- Combined rear taillights
- Turn signals
- Horn
- Headlamp relay
- Flasher
- Front brake lamp switch
- Rear brake lamp switch
- Left and right combined switch

Circuit diagram



Parts layout



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

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 can not be dazzling.

3. Basic parameters

Headlamp power: LED 12V 36W (high beam), 12V 19W (low beam);

Position lamp power: LED 12V 13W.

4. Possible failures

Lamp bead failure;

Water or dust in the lamp;

Loose PCB welding;

Smeared glass slide of lamp shell;

Lamp line open circuit or short circuit;

The mirror deformed at high temperature;

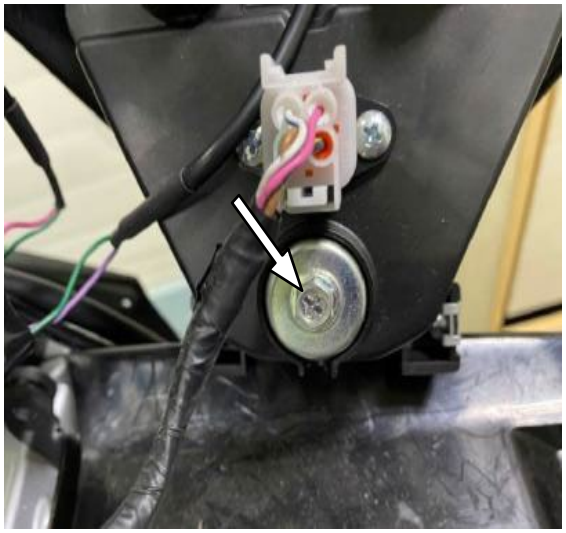
Broken or loose baffle;

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 car cannot be adjusted left and right.



Combined rear taillights

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 power: LED 12V 1.5W;

Brake lamp bead power: LED 12V8.4W.

4. Possible failures

Lamp bead failure;

Loose lamp holder;

Lamp line open circuit or short circuit;

Water or dust in the lamp;

Scratched or damaged lamp glass;

The reflection block falls off.

License plate signal lamp

1. Outline drawing

2. Working principle

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

License plate lamp bead power: 12V 5W;

4. Possible failures

Lamp bead failure;

Loose circuit board;

Lamp line open circuit or short circuit;

Water or dust in the lamp;

Scratched or damaged lamp glass;

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 white light by the lamp glass.

3. Basic parameters Front turn signal lamp bead power: LED 1W.

4. Possible failures

Lamp bead failure;

Loose lamp holder;

Lamp line open circuit or short circuit;

Water or dust in the lamp;

Scratched or damaged lamp glass;

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 white light by the lamp glass.

3. Basic parameters Front turn signal lamp bead power: LED 1W.

4. Possible failures

Lamp bead failure;

Loose lamp holder;

Lamp line open circuit or short circuit;

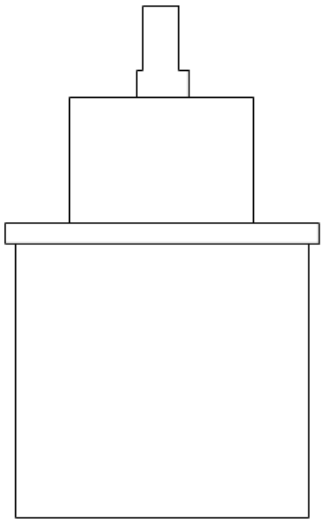
Water or dust in the lamp;

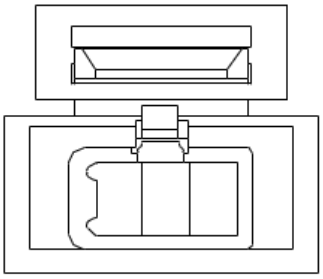
Scratched or damaged lamp glass;

Loose or broken handle.

Flasher

1. Outline drawing



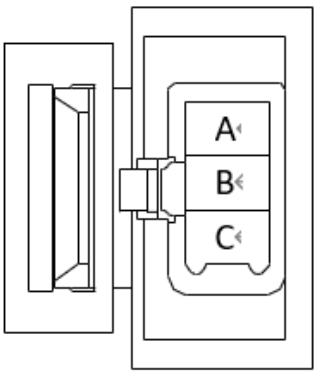


2. Working principle

The electronic flasher controls the on-off of the high-power FET through an IC chip, and outputs a certain frequency voltage to make the turn signal light up. If a turn signal is disconnected, the flash frequency will be significantly increased. The flasher also has the function of short-circuit self-protection, and beeps when it is protected.

3. Basic parameters

Working voltage: 12V, working load: 1.8W × 2+0.1W
flash frequency: (85 ± 10) times/min.



A Power supply B Negative pole C Ground wire

4. Pin function

The turn signal cannot be turned on;

The interference triggers the relay by mistake;

The turn signal lamp cannot flash;

Short circuit protection is triggered by interference;

Relay failure;

5. Possible failures

The turn signal cannot be turned on;

The interference triggers the relay by mistake;

Turn signal cannot flash;

Short circuit protection is triggered by interference;

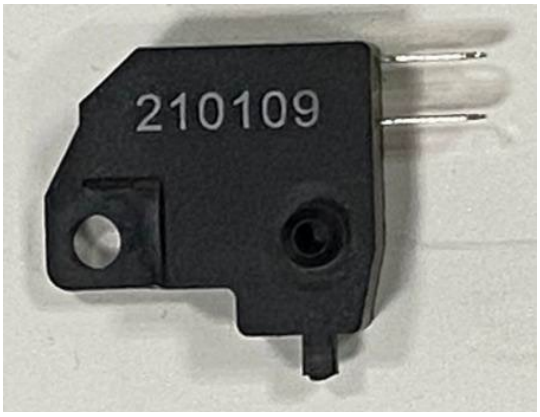
Relay failure;

When one turn-signal lamp is disconnected, flash rate has no obvious change;

The pin is rusted and cannot be connected.

Front brake light 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, compress the spring, make the contact leave the conductive spring, the circuit is disconnected, and the brake light goes out.

3. Basic parameters

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

4. Possible failures

The contact and shrapnel are rusted and in poor contact;

The switch is stuck and the guide rod cannot act;

The leading out insert is broken or rusted.

Rear brake switch

1. Outline drawing

2. Working principle

The pull rod of the rear brake light switch is connected with the brake pedal through the spring. When the brake pedal is pressed, the brake pull rod moves downward, and the contact also moves down. It contacts with the two contact shrapnel at the same time. When the circuit is connected, 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 is separated from the two contact shrapnel, the circuit is disconnected, and the brake light goes out.

3. Basic parameters

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

4. Possible failures

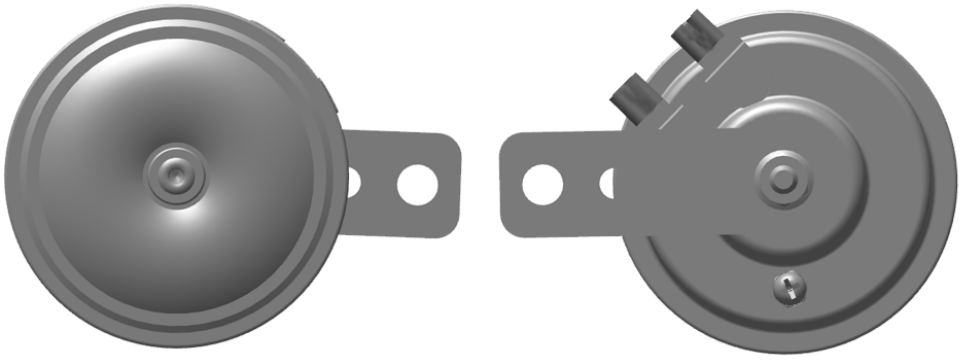
The contact and shrapnel are rusted and in poor contact;

The switch is stuck, and the pull rod cannot move;

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. 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: 105~115 dB

4. Possible failures

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	Solutions:
Headlamp does not light up:	Engine not started;	Start the engine;

The high beam lamp cannot be turned on; The low beam lamp cannot be turned on; None of them can work.	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 does not turn on reliably	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 is not on; 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 turn on: The front steering 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;
	The left turn signal switch fails;	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 does not light up	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 on;
	Failure of rear brake light switch;	Adjust and replace the rear brake light on;
	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

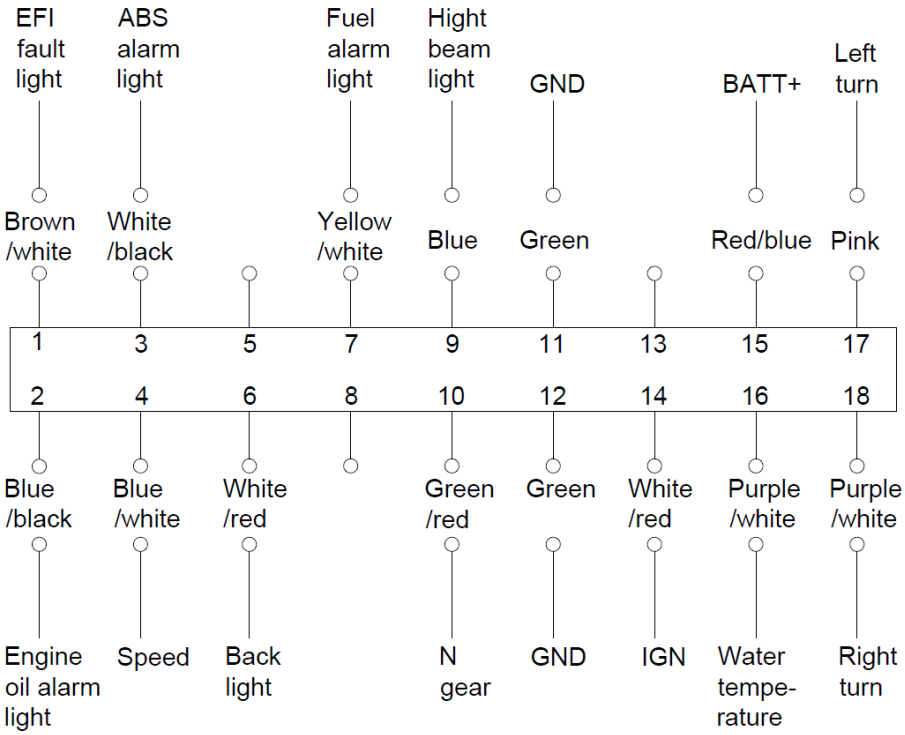
Oil level sensor

Gear switch

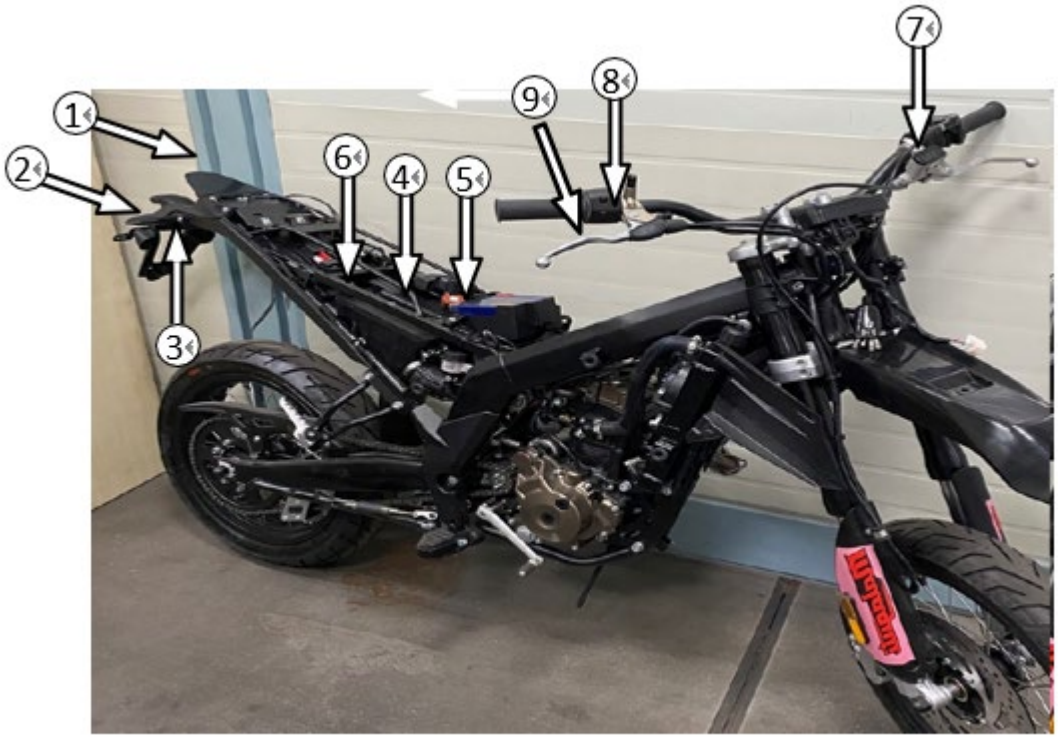
Signal switch

ECU

System schematic diagram



Parts layout



1 Combined tail lamp, 2 License plate lamp, 3 Rear right turn signal lamp, 4 ECU, 5 Battery,

6 Flasher, 7 Left combination switch, 8 Right combination switch, 9 Front brake switch

Introduction of main components

Instrument assembly

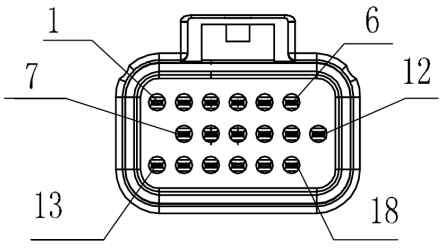
1. Outline drawing

2. Working principle

CPULCDLED

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	14	IGN+

2	Oil alarm	15	BATT+
3	ABS alarm	16	Water temperature
4	Vehicle speed signal	17	Turn left
5	/	18	Turn right
6	Backlight	19	
7	Oil level alarm	20	
8	/	21	
9	High beam	22	
10	N gear	22	
11	GND	24	
12	GND	25	
13	/	26	

4. Basic functions

The display contents of the instrument include: vehicle speed, steering indicator, high beam indicator, neutral indicator, oil level alarm indicator, engine water temperature indicator, neutral display, clock display, oil level alarm display, cumulative mileage display, subtotal mileage display, EMS fault code display, and backlight.

5. Possible failures

Some functions cannot be displayed correctly;

The operation button can't adjust the clock and switch the mode;

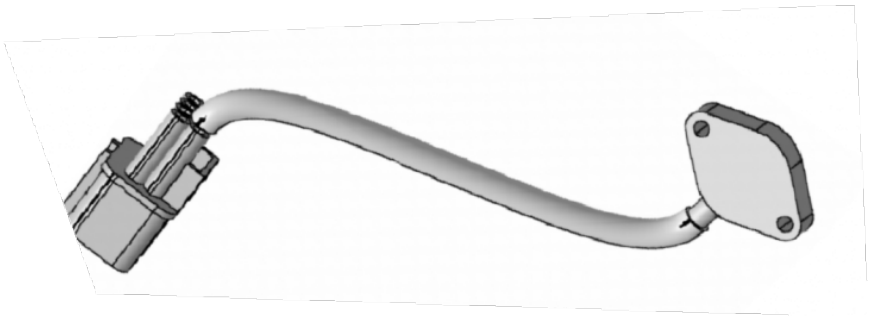
Water in the instrument;

Shell mechanical vibration rupture;

The surface is discolored or scratched.

Gear switch

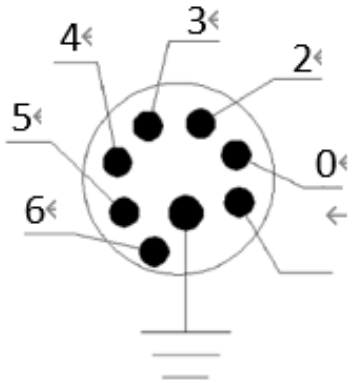
1. Outline drawing



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

	Gear 1 (Pink) Gear 0 (Green and red) Gear 2 (Pink and black) Gear 3 (Green and black) Gear 4 (Red and white) Gear 5 (Grey and blue) Gear 6 (Purple)

4. Possible failures

Contact wear to poor contact;

The gear switch vibrates or the press fit is broken;

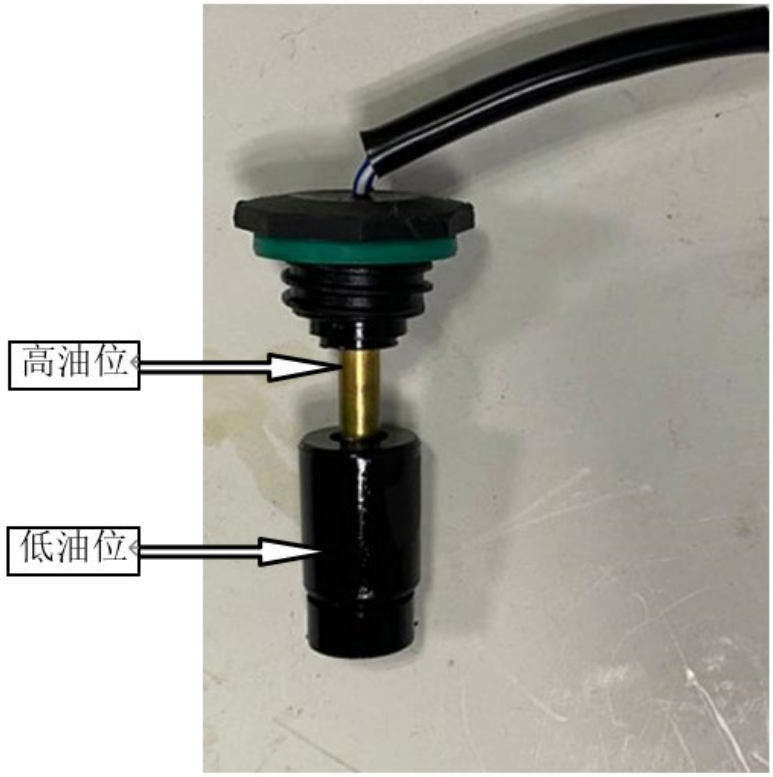
The gear switch is loose;

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. Float, floating rod, and magnetic core form a switch, and the oil level changes to drive the float up and down. When the float rises by more than 2.5mm from the lowest end, it is in the off state (the light is off).

3. Possible failures

Float falling off;

Poor contact between contact piece and thick film circuit board;

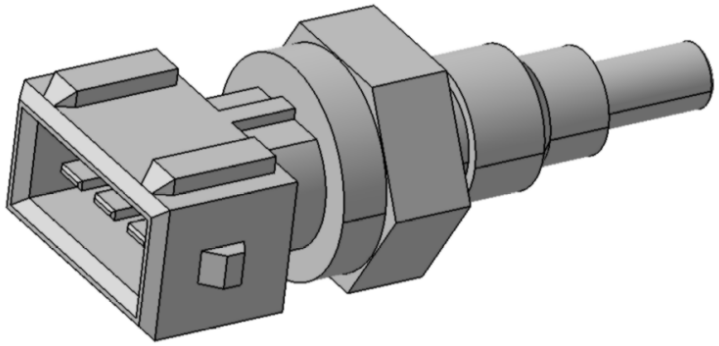
The stent was broken;

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

Display segment	Temperature value (℃)	Determining resistance value Ω	Resistance value error Ω
1	49~51	767≤R≤830	±25
2	63~65	451≤R≤485	±25
3	74~76	296≤R≤317	±15

4	89~91	188≤R≤200	±15
5	98~100	131≤R≤138	±3
6	116~118	83≤R≤88	±1

Main fault diagnosis

Failure phenomenon	Possible causes	Solutions:
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;	1.5mm Reduce the distance to 1.5mm;
	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.	Re-plug 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.	Re-plug or repair.
Gear indication fault: No gear indication; Wrong gear indication.	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.	Re-plug 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.
False alarm of voltage warning lamp The voltage warning lamp cannot	Poor wiring or open circuit;	Re-plug or repair;
	Instrument failure.	Instrument failure.

give an alarm		
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 information that ECU should display information	Poor wiring or open circuit;	Re-plug or repair;
	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 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 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

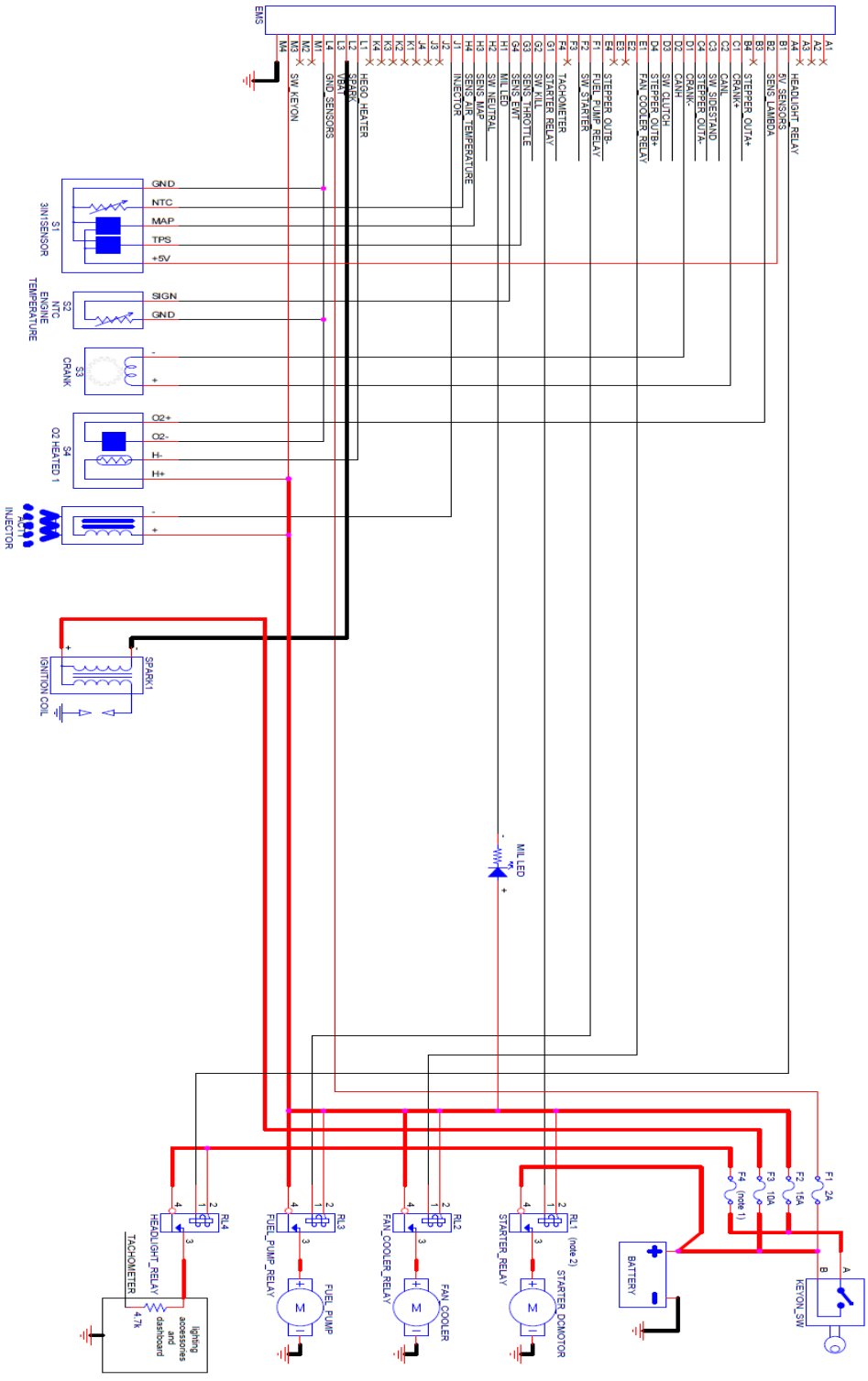
1. The fault diagnosis of EFI system can be carried out through the malfunction indicator lamp of the vehicle instrument, and a special diagnostic instrument can also be used to communicate with the ECU of the whole vehicle to carry out EFI system fault diagnosis and read fault codes.

2. Turn on the key switch for fault diagnosis.

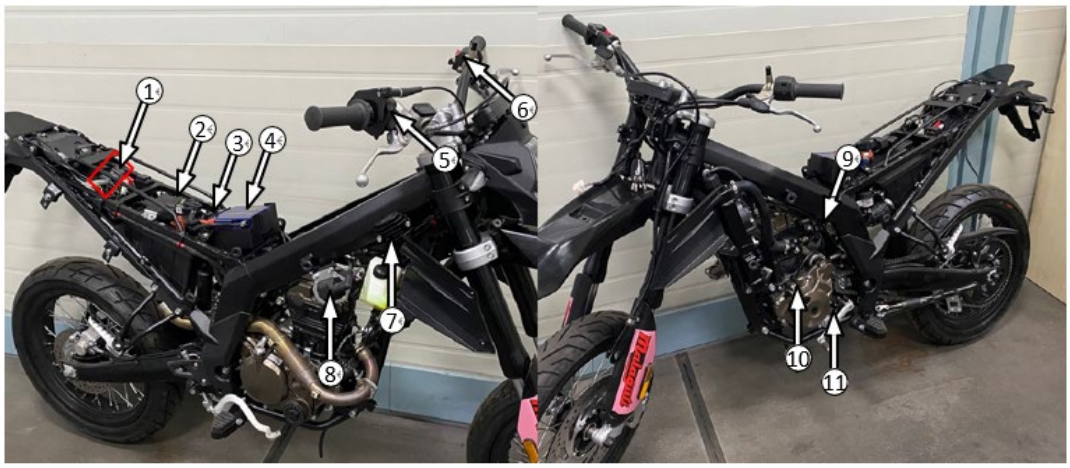
3. If the throttle position is adjusted, it is necessary to turn off the key switch and restart the engine for idle position self-learning.

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



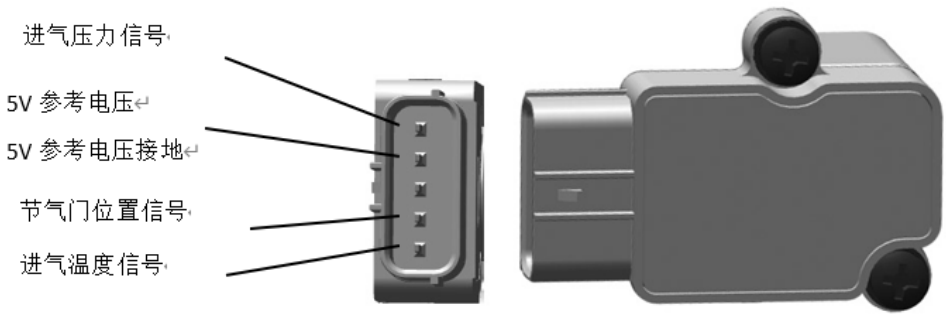
1 start relay/auxiliary relay, 2 ECU, 3 fuse box, 4 battery, 5 right combination switch,

6 left combination switch, 7 voltage regulating rectifier, 8 ignition coil, 9 three-in-one sensor, 10 magneto, 11 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 a vacuum chamber, and the other side is introduced into the intake manifold pressure, so the higher the absolute pressure in the intake manifold, the greater the deformation of the diaphragm, which 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)

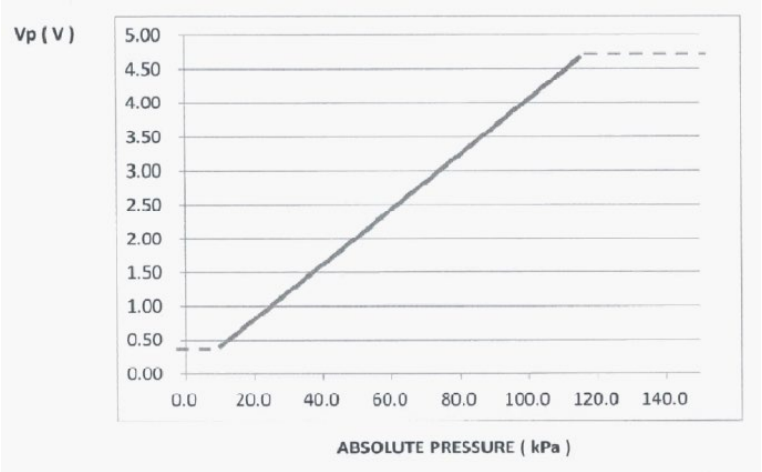
Working temperature range: - 40 ℃ ~ 125 ℃

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

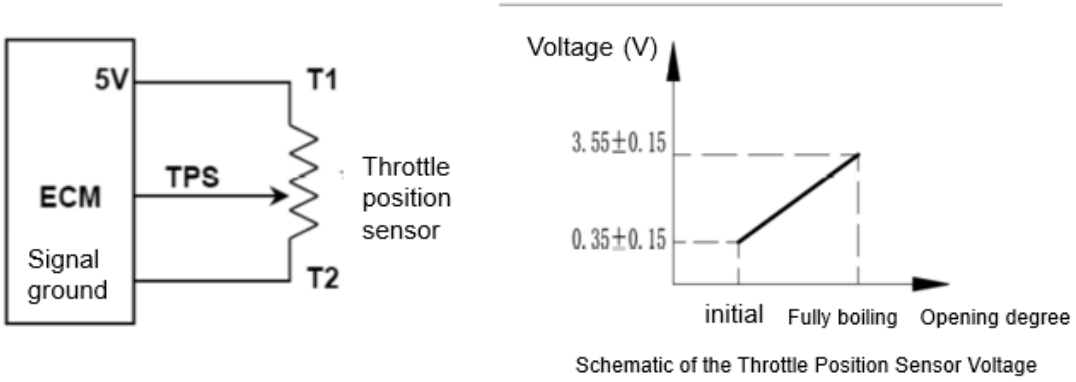
Measurement range: 7%~93% (from idle to full open)

Throttle position sensor reference voltage: 5V ± 0.1V

When the throttle is fully closed, the normal output is 12% ± 5% of the reference voltage

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:



Schematic of the Throttle Position Sensor Voltage

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

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

4. Possible failures

The sensor probe is blocked by foreign matters;

Air leakage failure of sensor connection;

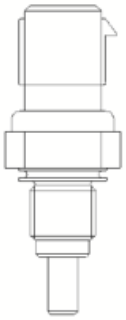
Sensor short circuit or open circuit failure;

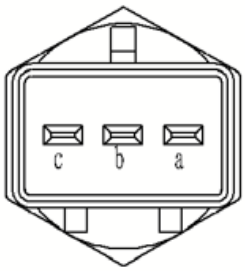
The sensor fails to feed water;

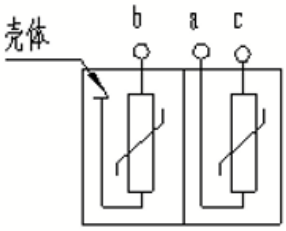
Mechanical failure of sensor.

Engine temperature sensor

1. Outline drawing







Shell

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. Possible failures

The resistance is not accurate;

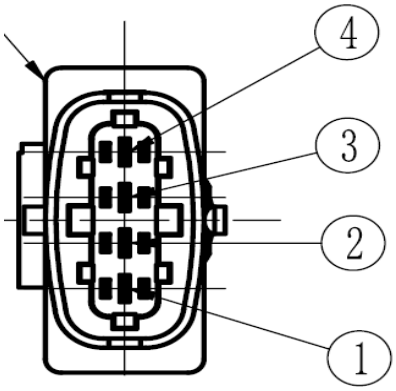
Sensor open circuit or short circuit.

Engine temperature sensor temperature curve R-T table

ECU通道电阻(a~c) ECU passageway resistance				仪表通道电阻(b~壳体) Instrument passageway resistance (b~housing)	
温度 Temperature	标准电阻 Standard resistance	电阻精度 Resistance precision	温度精度 Temperature precision	温度 Temperature	标准电阻 Standard resistance
(℃)	(Ω)	(±%)	(±?)	(℃)	(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	Use
1	purple	Heating positive
2	white	Heating negative
3	Black	Oxygen sensor signal
4	grey	Signal ground

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;

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, heater current at 450 ℃ exhaust : 0.52^{A}±0.10^{A}

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. Possible failures

Heating element failure;

Sensor element failure;

The ceramic tube was broken;

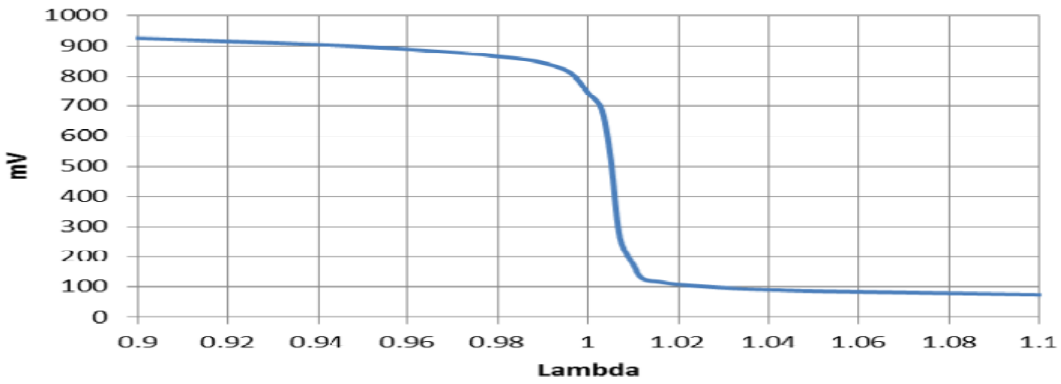
Heating circuit short circuit or open circuit;

Sensor circuit short circuit or open circuit.

Exhaust temperature 850 ℃, characteristic parameters of oxygen sensor:

Amount	New	250 hours of durability	650 hours of durability
Exhaust temperature	850℃	850℃	850℃
When λ=0.97（CO=1%） Sensing element voltage (mV)	≥720	≥700	≥700
When λ=1.10 Sensing element voltage (mV)	≤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 250 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. Possible failures

The oil pump cannot rotate;

Failure of oil pressure regulator;

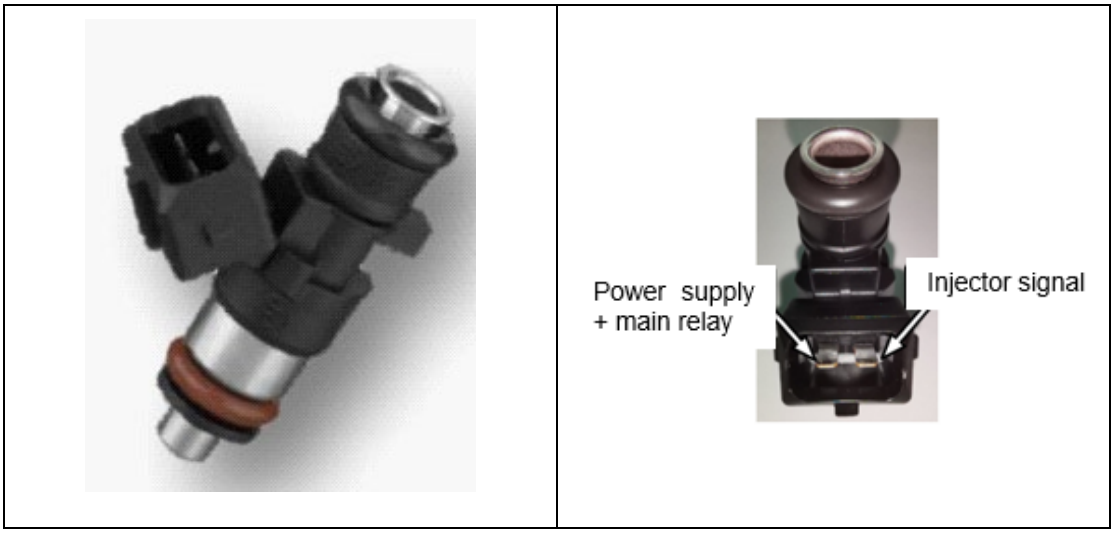
Support vibration failure;

Fuel pump short circuit or open circuit;

Poor sealing of sealing ring.

Fuel injector

1. Outline drawing and pin definition



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 injector directly receives the output control voltage signal from the engine electronic control module (ECM), that is, the ECM directly drives the solenoid coil to control the opening and closing time 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: 12.5Ω±0.8Ω

Normal working voltage: 9 ~ 15V

Storage temperature: - 40 ~ 70℃

T The deviation of fuel flow from 20℃ shall not exceed 5% temperature.	-40		+45	℃
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	6		16	V
Insulation resistance	1			MΩ
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. Possible failures

The fuel injector is blocked;

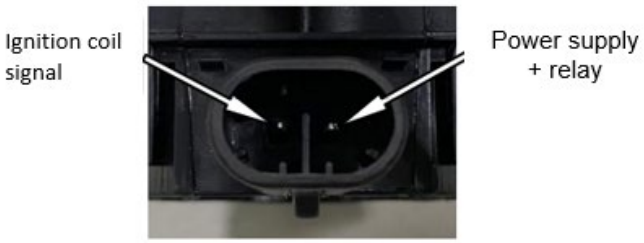
Open circuit or short circuit of electromagnetic coil;

Fuel injector vibration failure;

Poor sealing of sealing ring.

Ignition coil

1. Outline drawing and pin definition



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: 0.55Ω±0.08Ω；

Secondary coil resistance: 3.1 kΩ±9%；

Primary coil inductance: 4.5±1mH；

Secondary coil inductance: 12.5±2H；

Insulation resistance: under normal temperature, the insulation resistance between ignition coil shell and spark plug cap copper sleeve is greater than 1000MΩ；

4. Possible failures

Open circuit of primary winding;

Breakdown and short circuit of secondary winding;

Surface discharge.

High voltage connecting line

1. Outline drawing

2. Working principle

High voltage connecting wire is a device connecting ignition coil and spark plug. It consists of spark plug cap, high voltage wire and ignition coil connector cap.

3. Possible failures

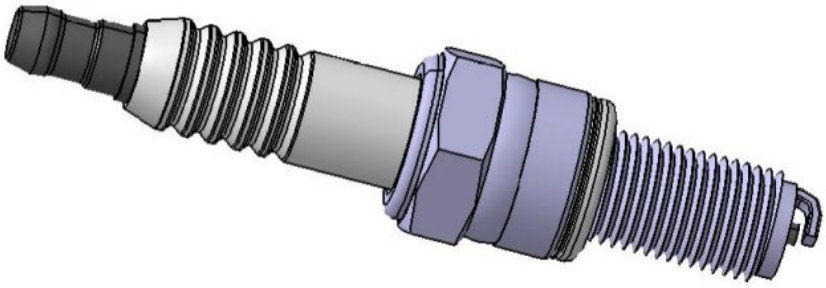
The connection of high voltage wire with spark plug cap and ignition coil connector cap is loose;

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: CR9EB(NGK);

There is a resistance of 3-6kΩ inside the spark plug

4. Possible failures

Serious carbon deposition on spark plug;

The spark plug electrode is ablated;

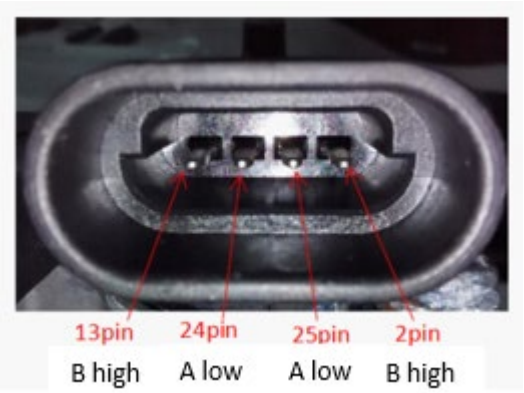
The spark plug insulator is broken;

The spark plug is overheated;

The spark plug leaks

Idle stepper motor

1. Outline drawing and pin definition



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. Possible failures

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.

Storage temperature: -40 ℃ ~ 105℃

Working temperature: - 20℃～85℃

4. Possible failures

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:

Open the power supply

Connect malfunctioning tool.

Read the historical malfunctioning and clear the historical malfunctioning

Close the power and turn it on again.

Start run the machine at idling speed for 2min (if it can't start, press the start button 5s) and perform 2~3 times of acceleration and deceleration operation.

Read the current malfunctioning with a scan tool.

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	Solutions:
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 the air filter, throttle body or intake pipe;
	No spark or abnormal spark;	
	The fuse is blown;	Replace fuse;
	300r/min The starting speed is lower than 300r / min;	Check the starting system;
	Poor contact of high voltage connecting wire;	Reconnection;
	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;	Re-plug or replace the oil pump relay;
	The fine filter is blocked or the oil pump fails;	Replace the 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 intake pressure sensor or hose:
	Incorrect ignition timing:	Readjust ignition timing;
	The fuel is deteriorated or contains water.	Replace the qualified fuel.
The engine idles unsteadily or does not idle, the return oil stalls	Insufficient engine cylinder pressure;	Check the mechanical part of the engine;
	The air filter is blocked or the throttle body and intake pipe leak;	Repair the 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;	Reconnection;
	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;

Failure phenomenon	Possible causes	Solutions:
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 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 during acceleration or the reaction is slow during flameout acceleration Poor performance and powerlessness during acceleration Engine vomiting, unstable speed	Engine mechanical failure;	Maintain the mechanical part of engine;
	Air filter blocked or throttle body, intake pipe leakage;	Repair air filter, throttle body or intake pipe:
	exhaust system and three-way catalytic converter 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.

Malaguti

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