

第四章：电气系统

PART4 ELECTRICAL SYSTEM

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电器部件的位置 POSITION OF ELECTRIC COMPONENTS



① Battery

② ---

③ ---

④ Rectifier

⑤ Flash Relay

⑥ Start Relay

⑦ Ignition Coil

⑧ Magnetic motor coil

⑨ Switch, Side Stand

电器部件的位置 POSITION OF ELECTRIC COMPONENTS



⑩ Horn

⑪ Brake Switch, Front

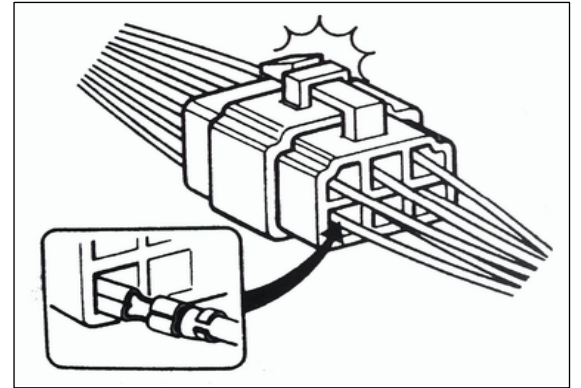
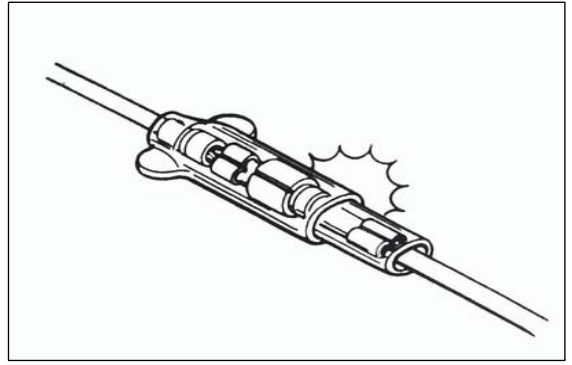
⑫ Brake Switch, Rear

⑬ starting motor

维修注意事项 Maintenance Note

接插件 Plug-in unit

- 当打开一个接插件时，请捏住接头，不要拉导线。
When open a plug-in unit, please pinch the connector, do not pull the wire.
- 当连接一个接插件时，将插件上凸台卡在凹槽内。
When connect a plug-in unit, please fix the boss in the groove.
- 松查插件的松紧度、腐蚀和外套的损坏情况。
Check the tightness, corrosion and cover damage of the plug-in unit.

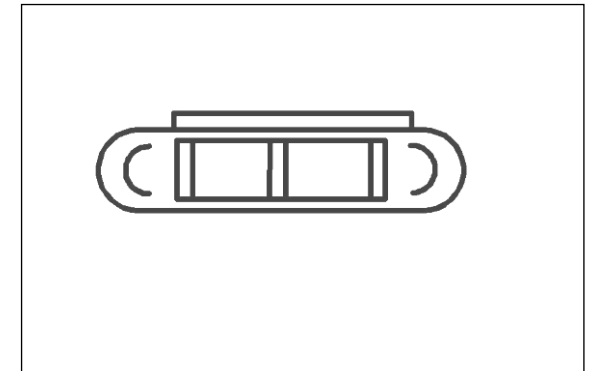


保险管 Protective Tube

- 保险管烧坏后必须查清其原因，纠正后换上新的保险管。
Please find out the reason if protective tube is broken, and replace it after solving the problem
- 不要使用负载不同的保险管。

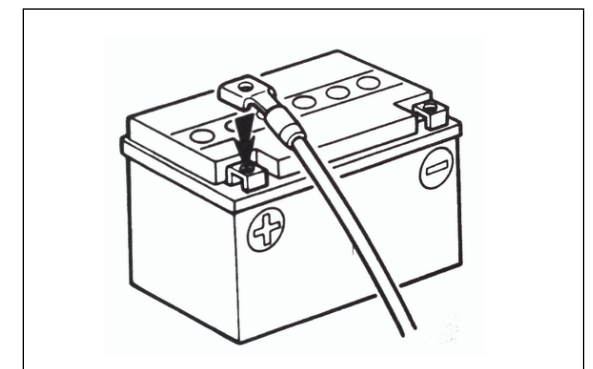
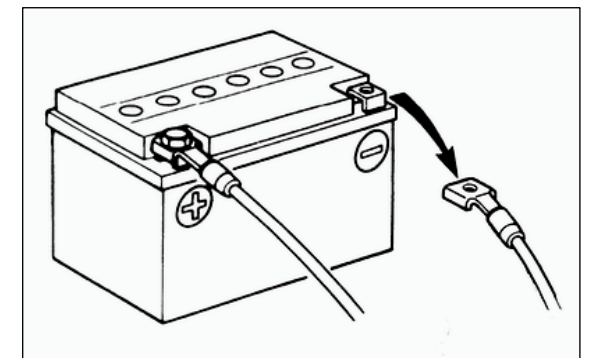
Do not use a different load protective tube.

- 不得使用其它任何物品代替保险管。
Do not use any other items to replace the protector tube.



蓄电池的连接 Battery Connection

- 当维护或维修需要拆卸电池时，请先将负⊖极接线柱拆除。
 - 当安装电池时，请先安装正⊕极接线柱。
 - 如果接线柱发现腐蚀，用沙纸清理干净。
 - 安装后在接线柱上涂适量凡士林或润滑脂，防止接线柱氧化、腐蚀。
 - 接线柱的保护套必须遮掩严实、不得外露。
 - 严禁将电池正负极短路、倒置放置。
 - If the battery is required to get removed by maintenance or repair, please dismantle the negative terminal ⊖ first.
 - When install the battery, please install the positive terminal ⊕ first.
 - If the terminal has become corrosive, please clean it with sand paper.
 - Please coat the terminal with Vaseline or grease to protect the terminal from oxidation、corrosion.
 - Terminal protective cover must be enveloped fully, and can not be exposed.
- Do not invert the positive and negative pole of battery, or put upside down.



维修说明 Maintenance instructions

- 电气系统主要有点火系统、充电和照明系统、起动系统、开关、灯具部分组成。
- The main electrical system consists of ignition system,charging and lighting system, starter systems, switches and lamps.
- 如电气出现故障时，利用万用表检查测量其部件的通断关系及电压和电流，确定故障原因。
- When electrical problem happens, use a multimeter to measure the conduction of the components , voltage and current,then fix the cause.
- 为了测量读数的准确性，测量电压、电流和电阻值时建议使用数显式万用表。
- For the reading accuracy, please measure voltage, current and resistance value by digital multimeter.
- 测量导通关系时可以使用指针式万用表。
- Can use pointer multimeter when measure the conduction.



下表为电气原理图中标注的线色标记相对应的用途及其极性：
The following table shows the function of color mark for electrical schematic and polarity.

序 NO.	线 色 标 记 COLOR MARK	线 色 名 称 COLOR	功 能 / 用 途 FUNCTION	极 性 POLARITY
1	R	Red 红	电池正极 BATTERY +	+
2	BK	Black 黑	电路正极 BATTERY -	+
3	G	Green 绿	导线负极 WIRING +	—
4	GBK	Green Black 绿黑	ECU 负极 ECU -	—
5	W	White 白	大灯近光 LOW BEAM	+
7	B	Blue 蓝	大灯远光 HIGH BEAM	+
8	Br	Brown 棕	前后位置灯 F&R POSTION LIGHT	+
9	Gr	Gray 灰	闪光器出线 FLASH RELAY WIRE	+
10	O	Orange 橙	左转向灯线 LEFT TURNING LIGHT WIRE	+
11	Lb	Light blue 浅蓝	右转向灯线 RIGHT TURNING LIGHT WIRE	+
12	Lg	Light Green 浅绿	喇叭线 HORN WIRE	—
13	YR	Yellow Red 黄红	继电器线 RELAY WIRE	+
14	GY	Green Yellow 绿黄	制动灯线 BRAKING LIGHT CBALR	+
15	BW	Blue White 蓝白	触发线圈线 TOUCH COIL WIRE +	+
16	GW	Green White 绿白	触发线圈线 TOUCH COIL WIRE —	—
17	Y	Yellow 黄	照明线圈线 LIGHTING COIL WIRE	+
18	P	Pink 粉红	充电线圈线 CHARGING COIL WIRE	+
19	Lg R	Light green Red 浅绿红	空挡线 NEUTRAL WIRE	—
20	BKW	Black White 黑白	熄火线 ON-OFF SWITCH WIRE	—
21	YW	Yellow White 黄白	油位计线 FUEL LEVEL GAUGE WIRE	—
22	V	Violet 紫	故障灯线 WARING LIGHT WIRE	—
23	YBK	Yellow Black 黄黑	档位显示 GEAR INDICATOR	—

磁电机 Generator

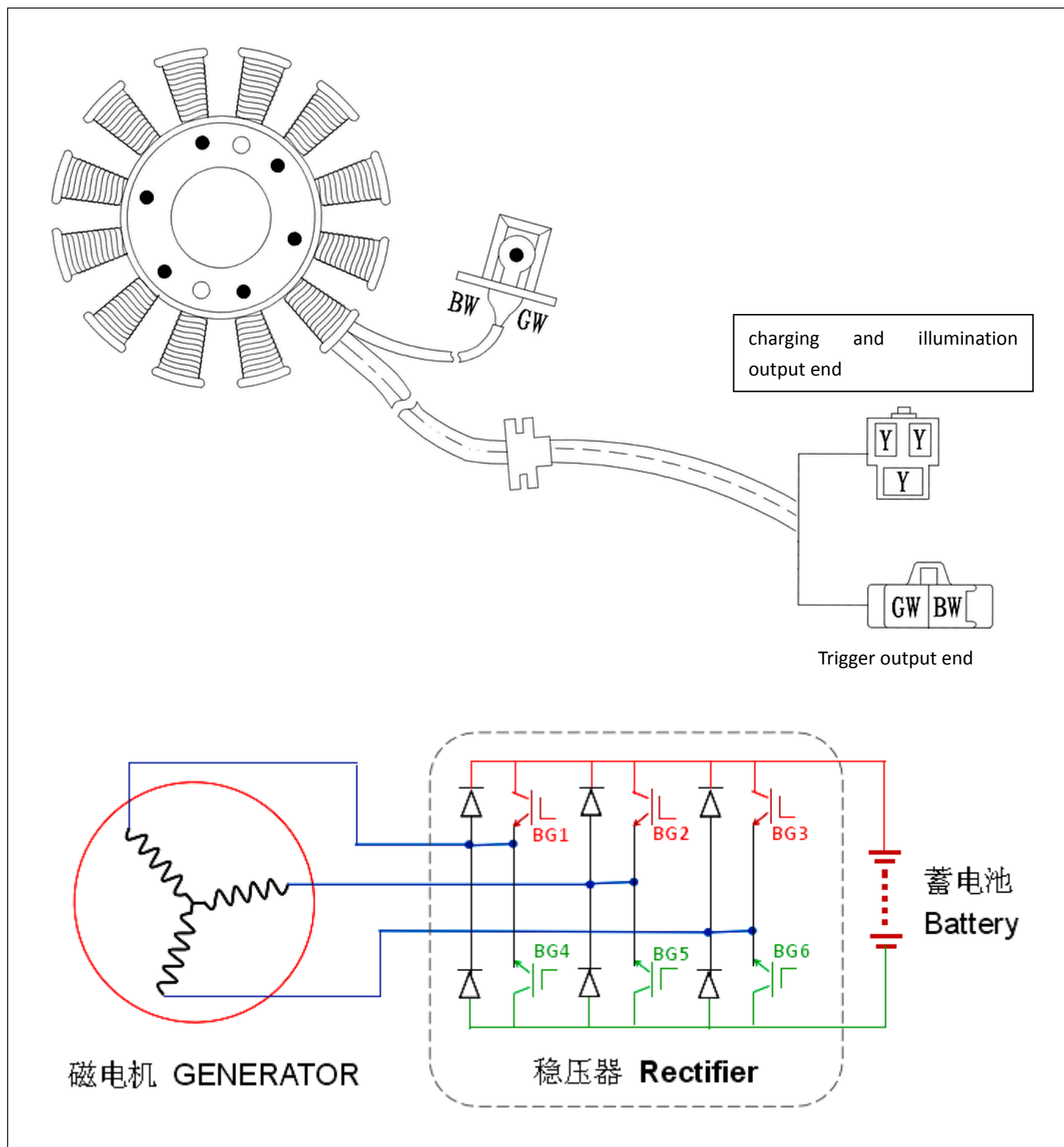
工作原理 Working Principle

1、本车采用的是：12V12 极全直流飞轮式磁电机

This vehicles uses 12V 12 poles full DC flywheel type generator

2、飞轮式磁电机是由：飞轮、线圈、触发组成。

The flywheel generator consists of flywheel, coil and trigger.

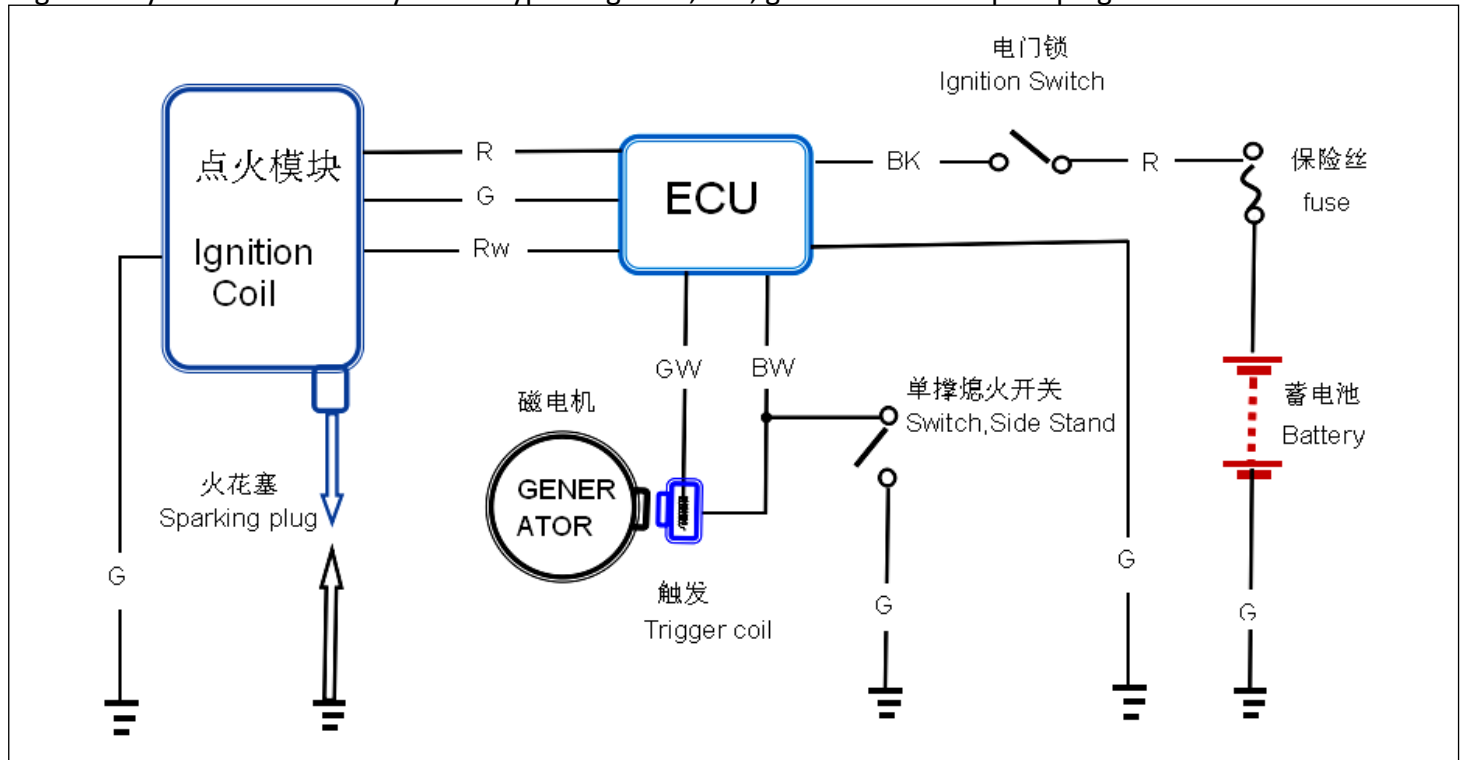


点火系统 Ignition System

工作原理 Working Principle

点火系统由飞轮式磁电机、ECU、点火模块和火花塞组成。

Ignition system consists of fly-wheel type magnetor, ECU, ignition unit and spark plug.



如图所示 As the drawing shows:

1. 当飞轮上的凸台转至触发线圈凸台位置时，触发线圈蓝/白色（BW）线和绿/白色（GW）线向 ECU 发出脉冲信号，ECU 经过处理后通过红/白线（RW）线向高压包发出点火信号。

When the boss on the fly wheel turns to trigger coil boss, the trigger coil wires BLUE/WHITE and GREEN/WHITE send the pulse signal to ECU, then ECU will send the ignition signal to ignition coil through wire RED/WHITE after treatment.

2. 高压包将低电压脉冲转化为高压脉冲输出给火花塞。

Ignition coil will change the low voltage pulse into high voltage pulse output to the spark plug.

3. 反复持续的高压脉冲通过火花塞间隙发出火花，从而点燃气缸内的混合气。

Sustained high voltage pulse comes out the spark from spark plug gap, igniting the mixed gas in the cylinder.

4. 熄火方式 Cutoff method: 电门锁 ON/OFF switch: 断路熄火，断开 CDI 的电源 open circuit, Cut the CDI electricity

单撑熄火 Side stand switch: 短路熄火，脉冲信号线与地线短路. short circuit, pulse signal wire and earth wire

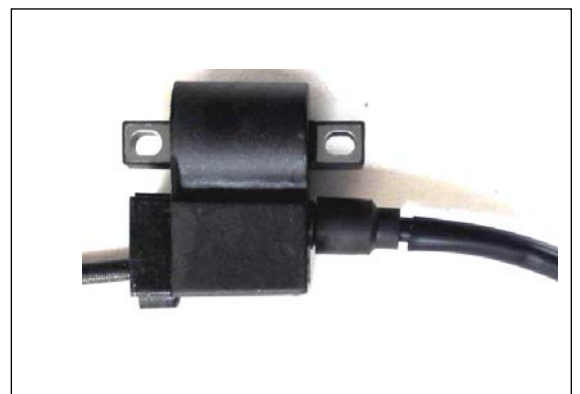
高压包 Ignition Coil

- 本车使用的是：集成式高压包；

This vehicle uses Integrated ignition coil

- CDI 和高压包集成于一体。

CDI and ignition coil are integrated



拆卸高压包 Remove the ignition coil

- 先拆卸左护板和座垫（详见 6-5）。

Remove the left shield and seat (details please check page 6-5)

- 用 M8 套筒拆除电池支架；

Remove the battery bracket by M8 sleeve

- 用 M10 套筒拆除稳压器固定螺母；

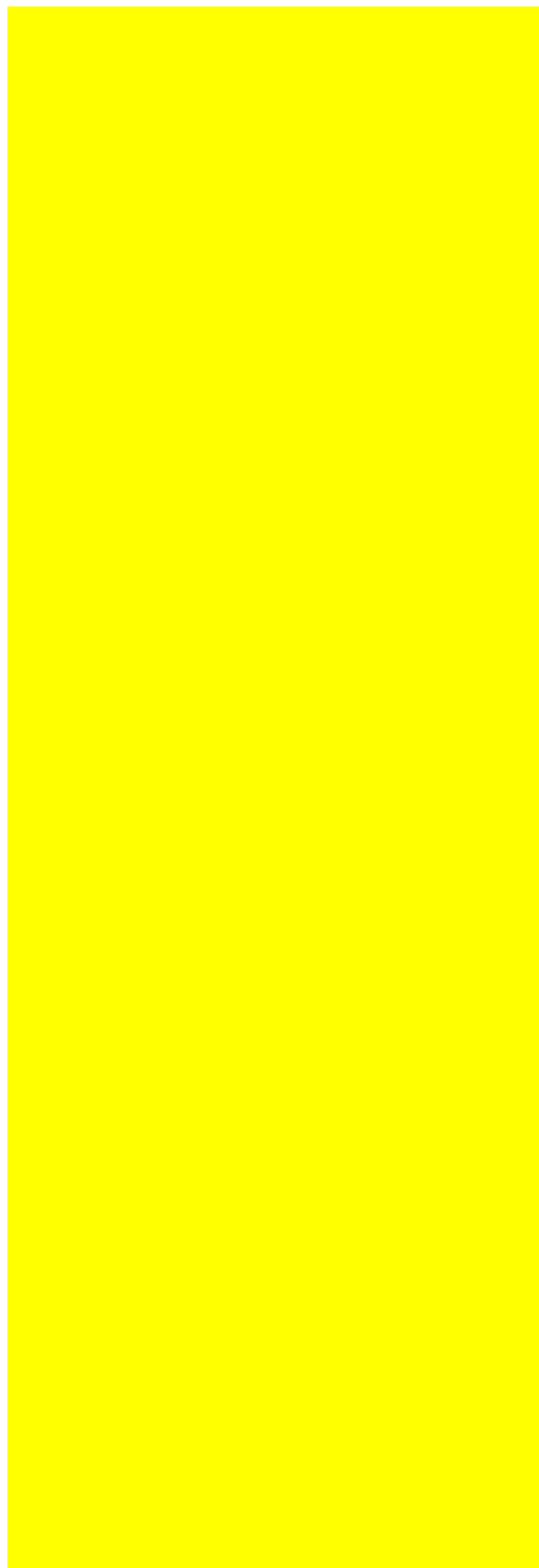
Remove the fixing nut of rectifier by M10 sleeve

- 断开高压包与导师线的插件；

Cut the ignition coil from the plug-in unit of the wiring harness

- 取出高压包；

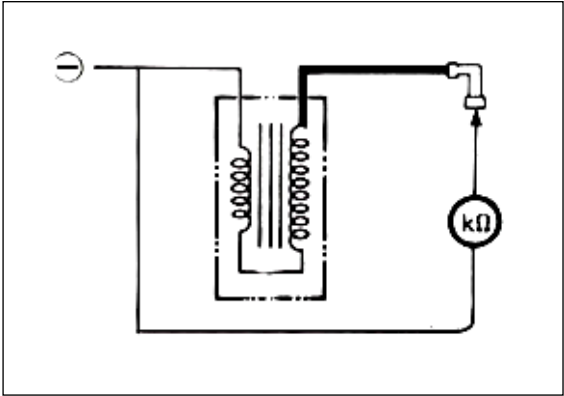
Remove the ignition coil



检查 Inspection

高压包电阻值 Ignition coil resistance value

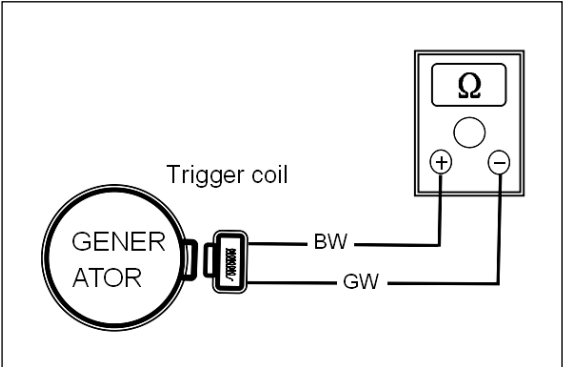
- 拔出高压包。
Remove the ignition coil
- 万用表调至欧姆“KΩ”档位。
Adjust the multimeter to “KΩ” position
- 万用表正极与高压线一端相连；
负极与地线一端相连；
Connecting the positive pole of multimeter with one end of ignition coil wire, and negative pole with another end of earth wire
- 测量高压包电阻包括初级线圈和次级线圈的阻值。
Measure the resistance value of the primary coil and second coil



次级线圈阻值 resistance value of second coil	3.8 KΩ ±10%
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触发线圈电阻 Trigger coil resistance

- 断开磁电机接插件。disconnect the plug-in unit of magneto
- 万用表调至欧姆“Ω”档位。
Adjust the multimeter to “Ω”
- 万用表正极与触发线圈蓝/白色（BW）线相连，
负极与触发线圈绿/白色（GW）线相连。
测量出触发线圈的电阻。
Connect the positive pole of multimeter with trigger coil wire Blue/White, and the negative pole with trigger coil wire GREEN/WHITE. Then measure the value for Trigger coil resistance.



触发线圈电阻 resistance of trigger coil	102~160 Ω
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火花塞点火 Spark plug ignition

- 拆下火花塞。 Remove the spark plug
- 在火花塞帽连接上火花塞，并接触缸头。
Connect the spark plug with the spark plug cap, and touch the cylinder head.
- 按下电起动按钮，查看火花塞点火情况。
火花塞火花：应连续不间断且火花不能散开。
Press the e-starter button, check the spark plug ignition.
Spark of spark plug should keep consistent and cannot get loose



故障排除 Trouble shooting

Make sure the main switch is switched on, and the side stand is off(not touching the ground)

确认电锁已打开，单撑处于收起位置

Spark plug cannot work

火花塞不点火

Check whether there is spark from the ignition coil output

检查高压包出线是否有火花

YES

Spark plug problem

● 火花塞故障

NO

Check whether the NO.3 green indicator on the ECU is lighted

检查ECU上的3号绿色指示灯是否启亮。

NO

Trigger coil problem

Line problem between trigger coil and ECU

● 触发线圈故障。
● 触发线与ECU之间线路故障。

YES

更换高压包 replace a new ignitioncoil

OK

Ignition coil problem

● 高压包故障。

NO

检查高压包与ECU之间线路

OK

Line problem

● 线路故障。

Check the line between ignition coil and ECU

NO

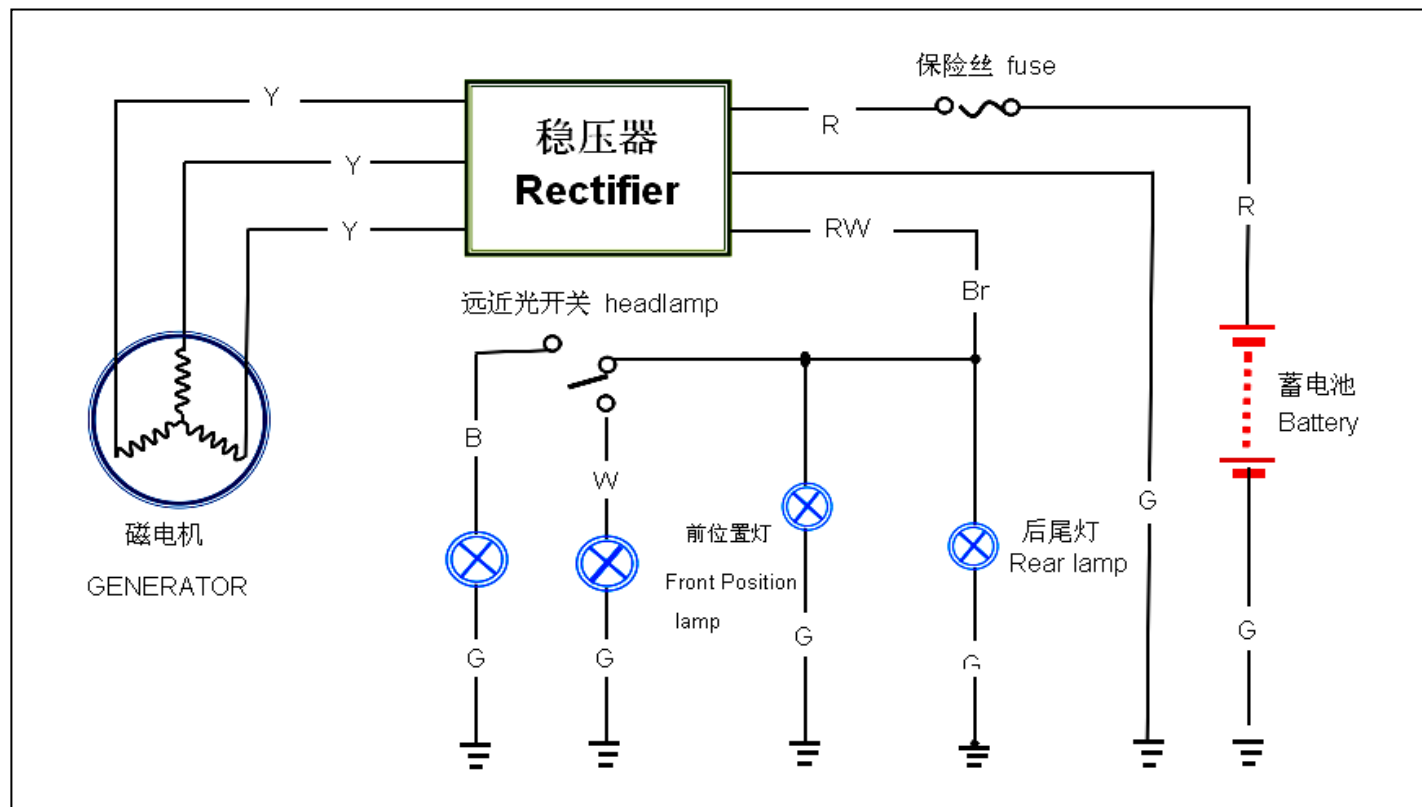
● ECU 故障。ECU PROBLEM

充电和照明系统 Charging & Lighting System

工作原理 Working Principle

充电和照明系统由飞轮式磁电机、稳压器、蓄电池、照明灯具组成。

Charging and lighting system consists of flywheel generator, rectifier, battery and lighting lamps



如图所示 As the drawing shows:

1.当磁电机飞轮转动时，磁场切割线圈产生直流电压。

When Magneto flywheel rotates, the magnetic field is cutting coil and producing DC voltage

2.充电照明线圈的黄色（Y）线将直流电压提供给稳压器稳压整流。

The Yellow wire of charging and lighting coil supply DC voltage to rectifier in order to regulate the voltage.

3.稳压器将稳压整流后电流通过：红色（R）线向蓄电池充电，红/白色（RW）线向照明系统供电。

Rectifier sends the current after regulating voltage to battery charging through Red wire and lighting system through Red/White wire.

4.当发动机运转时，前后位置灯和大灯会启亮且无法关闭。

When the engine is running, the front&rear position light and front lamp will work automatically and cannot be switched off

稳压器 Rectifier

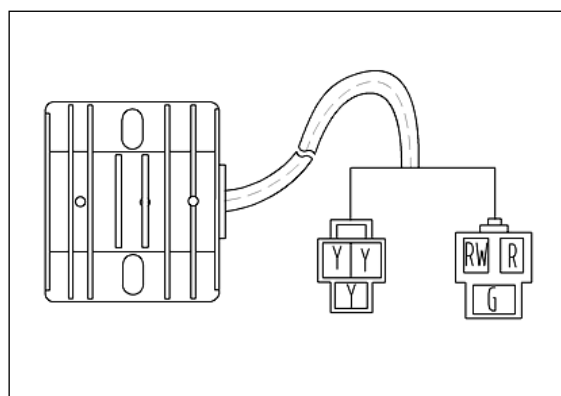
• 本车使用的是：12V 直流双输出稳压器。

This model uses 12V DC double output rectifier

• 最大充电电压为 the Max. charging voltage: $14.5 \pm 0.5V$ 。

• 大灯常亮在稳压器中控制，红/白色（RW）线在发动机运转时才会产生电压和电流。

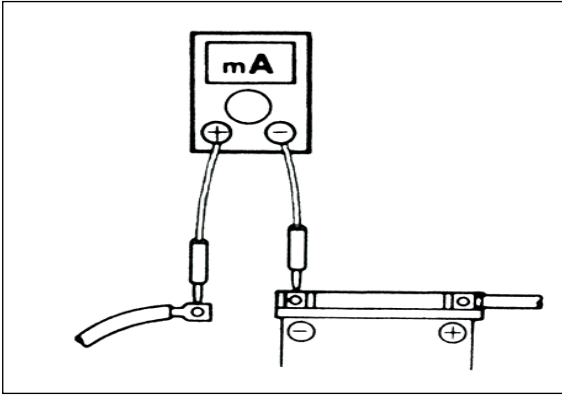
AHO(automatic headlamp on) is controlled by rectifier, the Red/White wire only produces voltage and current when the engine is running



检查 Inspection

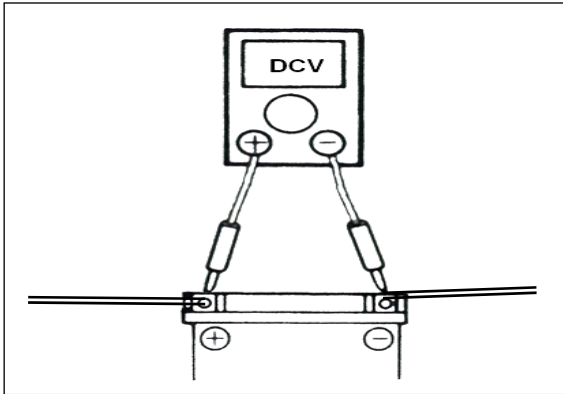
蓄电池泄漏电检查 Leakage of battery electricity

- 打开座垫。
 - 将电锁转到 OFF 位置。
 - 断开电池负⊖极导线。
 - 将万用表连接在电池和电池连接导线之间。
- 如读数超过 1mA 说明有明显的泄漏现象。
- Open the seat
 - Turn off the ignition switch
 - Disconnect the battery negative ⊖ pole wire.
 - Connect the multimeter between the battery and the battery wire.
- If the reading exceeds 1mA, then it means there is obvious leakage



蓄电池放电检查 Battery discharge inspection

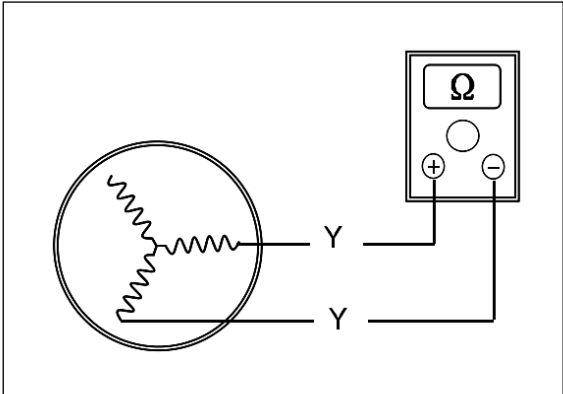
- 起动发动机并将转速保持在 5000r/min。
 - 将大灯开关打开到 位置，远近光调至远光位置。
 - 用万用表检查电池⊕和⊖间的直流电压。
- 如读数低于 13.5V 或高于 15.0V，检查磁电机线圈和稳压器。
- Start the engine and keep the RPM at 5000r / min.
 - Turn on the headlight switch, adjust to high beam position.
 - Check the DC voltage of battery between ⊕ and ⊖ by multimeter.
- If the reading is less than 13.5V or higher than 15.0V, please check the magneto coil and rectifier.



5000r/min 时充电电压	13.5V~15.0 V
5000r/min charging voltage	

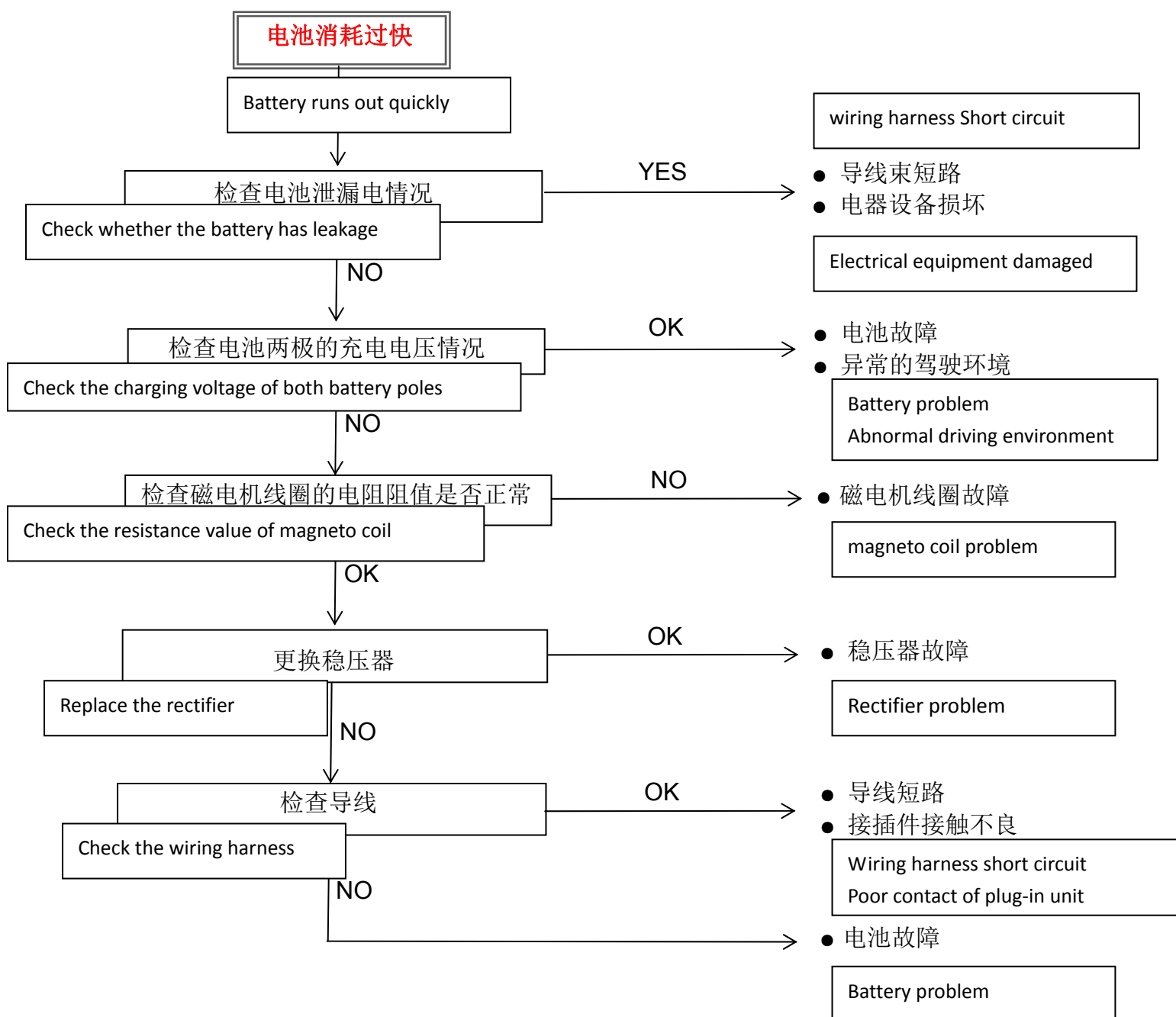
线圈电阻 Coil resistance

- 断开磁电机接插件。
- Disconnect the magneto plug-in units.
- 万用表调至欧姆“Ω”档位。
- Turn the multimeter to “Ω” position.
- 万用表分别与线圈粉色（P）线和黄色（Y）线相连。
- 测量出充电和照明线圈的电阻。
- Connect the multimeter with Pink wire and Yellow wire of the coil. Then measure the resistance of the charging and lighting coil.



线圈电阻值	0.4~0.9 Ω
Resistance value of coil	

故障排除 Troubleshooting

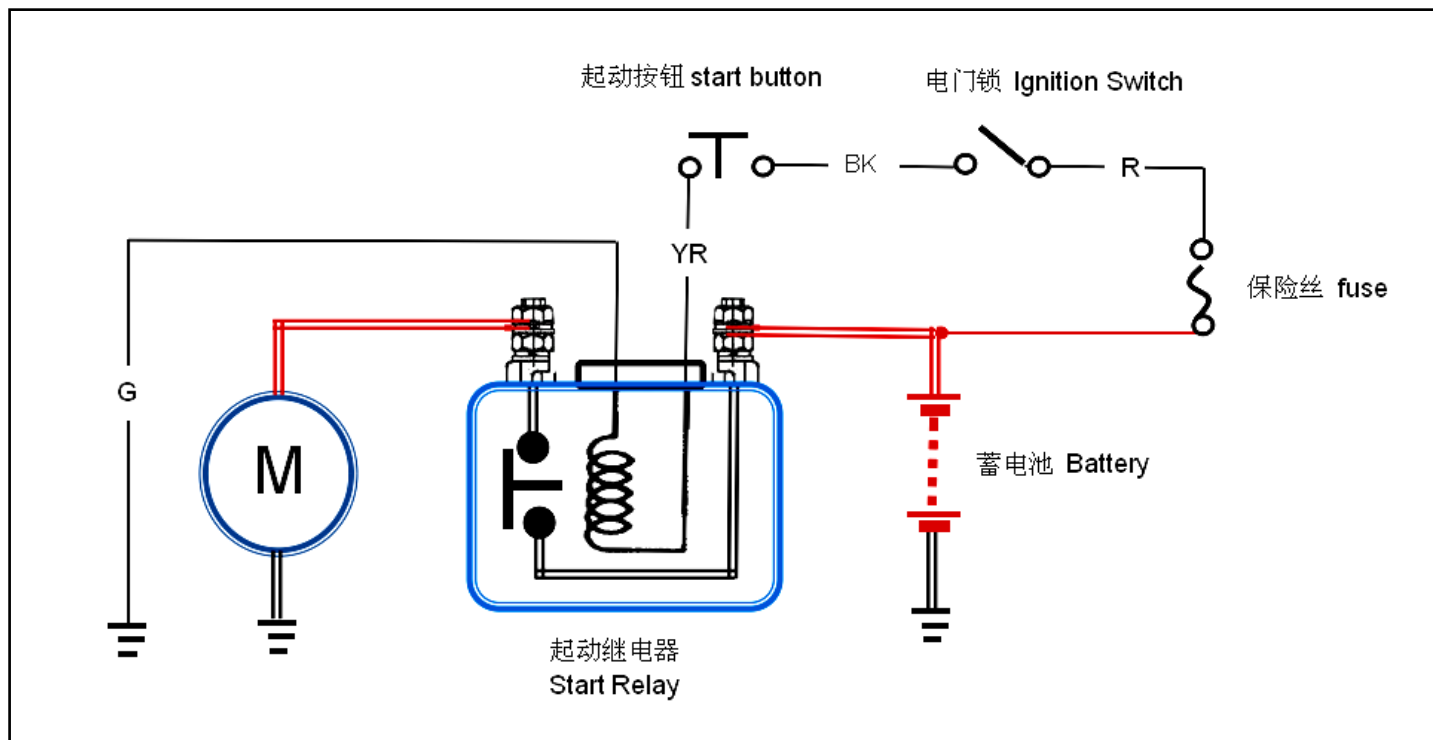


起动系统 Starting System

工作原理 Working principle

起动系统由起动马达、蓄电池、继电器、起动开关组成。

Starting system consists of starting motor, battery, start relay and starting switch.



如图所示 As the drawing shows:

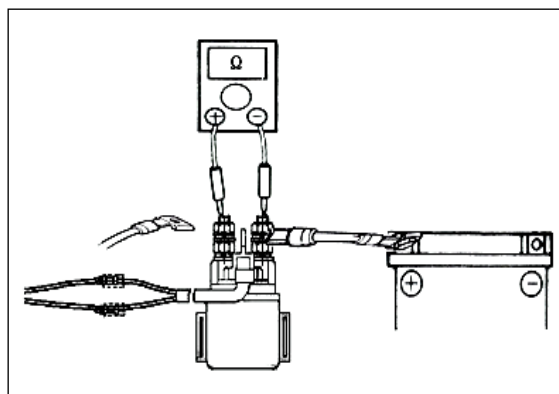
- 1、继电器是用低电流控制高电流的一种开关。
 - 2、由起动按钮控制继电器吸合将继电器两个接线柱接通实现马达工作，起动发动机。
 - 3、继电器黄红（YR）线是控制火线输入。
- 1, the relay is a switch which low current controls high current.
 2, the start button controls start relay. Connect the two terminals , engine will be start.
 3, Yellow-red (YR) wire of start reply controls the input of Fire wire.

检查 Inspection

起动继电器 Start Reply

- 打开座垫、拆下油箱。
 - 断开起动马达红色正极线。
 - 将电锁转到 ON 位置。
 - 万用表调至欧姆“Ω”档位
 - 将万用表连接在继电器接线柱之间。
 - 按下起动按钮，检查接线柱的导通性。
- 如不导通，说明继电器故障，应更换继电器。

- Open the seat and remove the fuel tank
- Disconnect the red positive wire of starter motor.
- Turn the ignition switch to ON position.
- Turn the multimeter to "Ω" position.
- Connect the multimeter between the two terminals of relay.
- Press the start button, check the conduction of terminals.
- If it cannot get conductive, that means the start relay has problem and should be replaced



拆卸继电器 Remove start relay

- 先拆卸左护板和座垫（详见 6-4）。

Remove left shield and seat (details please check page 6-4)

- 将电池 ⊕ 极接线柱拆除；

Remove the wire connecting terminal of battery ⊕ pole

- 拆除继电器与电池相连的红色线；

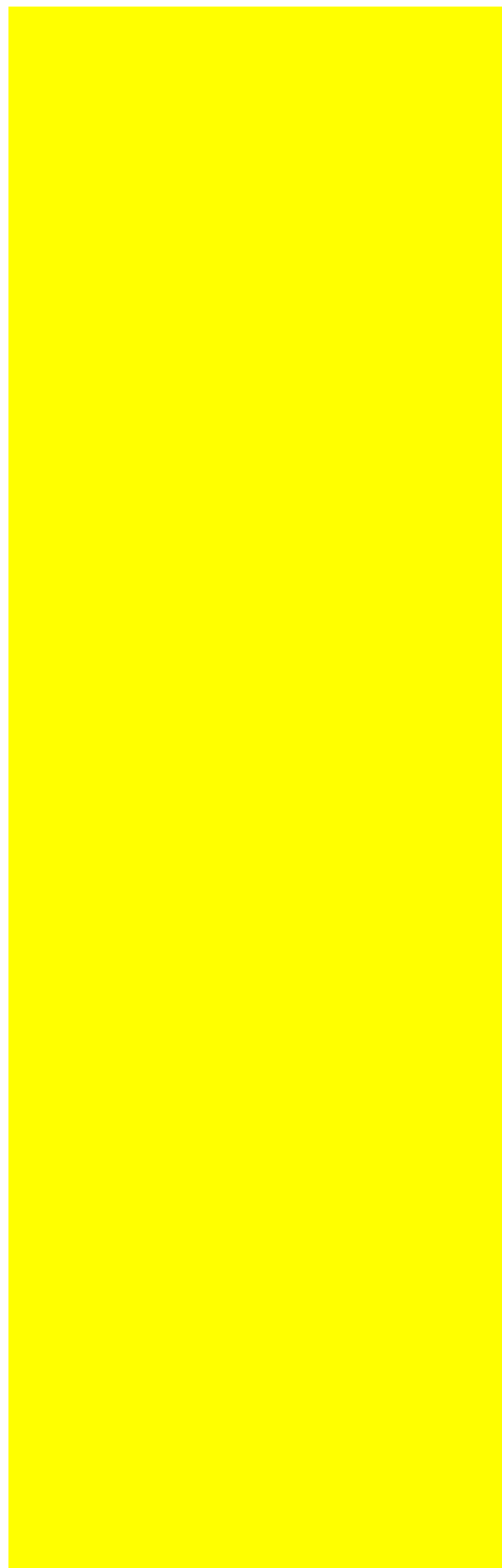
Remove the red wire connecting the start relay and battery

- 拆除继电器与起动马达相连的红/白线；

Remove the red/white wire connecting the start relay and starting motor

- 取出继电器；

Take out the start relay



起动马达 Starting motor

- 拆下左曲轴箱盖和起动齿轮卡簧挡圈（详见 3-18 页）。

Remove the circlip of the left crankcase cover and pinion kick start.(details please check the page 3-18)

- 拆下起动马达连接线。

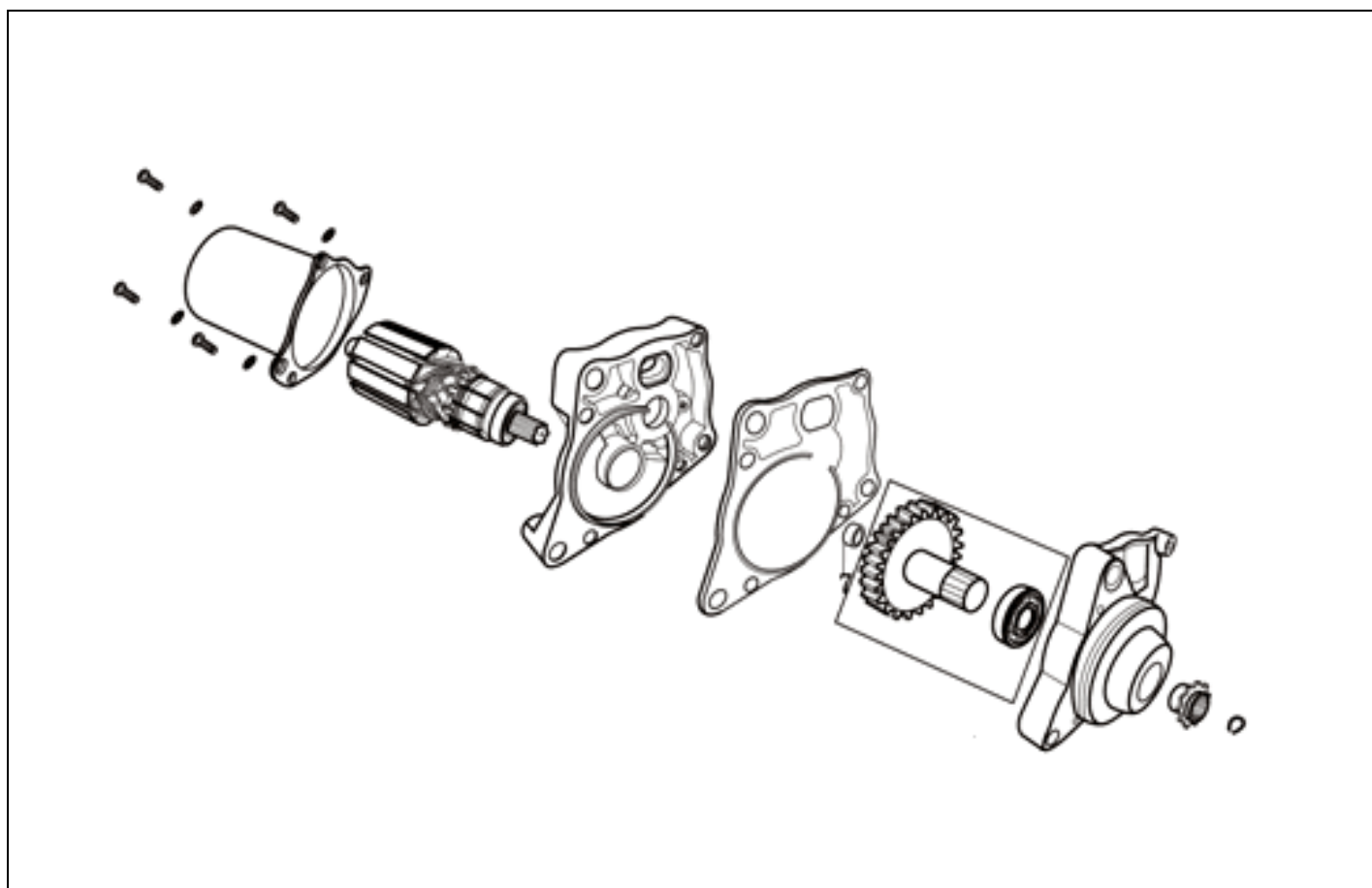
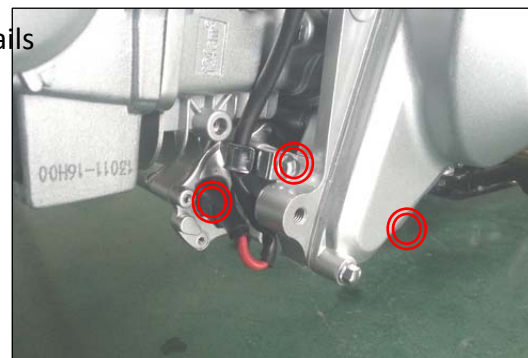
Remove the starting motor connecting wire.

- 拆下起动马达。

Remove the starting motor.

- 如下图所示分解起动马达。

Please check the following drawing for starting motor breakdown



检查碳刷 Carbon brushes inspection

检查碳刷的非正常磨损、裂纹或端面的平滑度。

如发现碳刷破损或磨损严重，应予以更换。

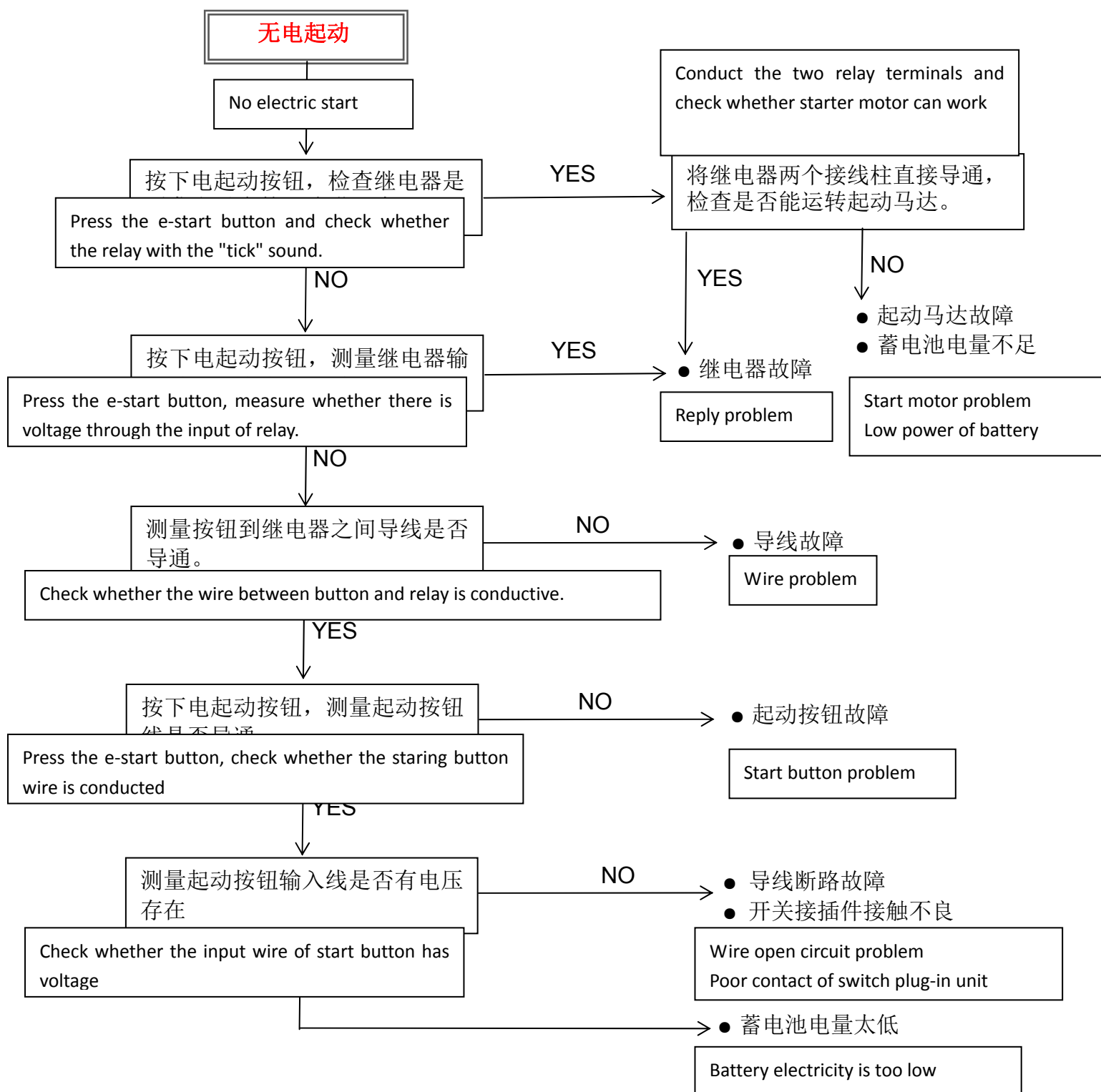
Check the abnormal wear, cracks or smoothness of the end

If carbon brushes are found with damage or overworn, then

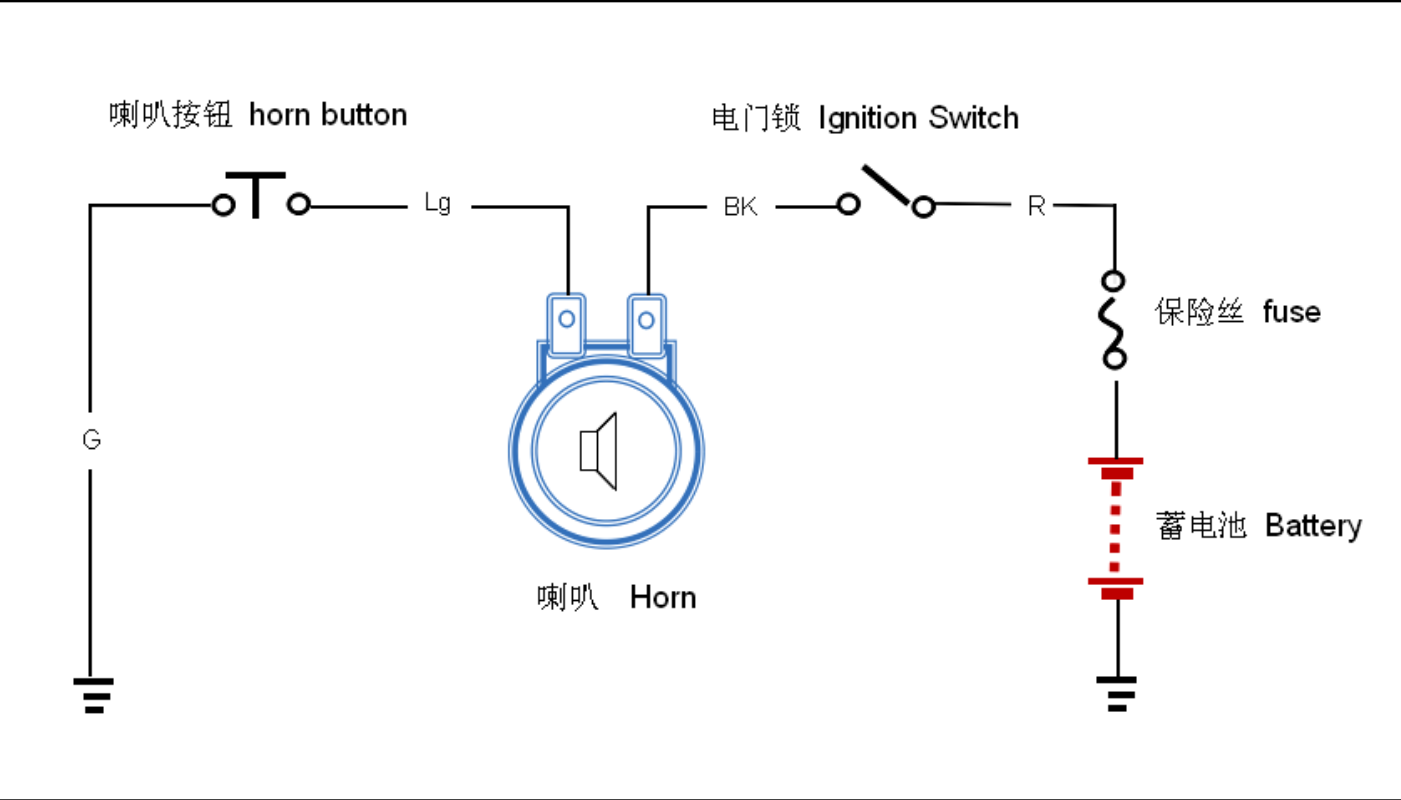
it should be replaced.



故障排除 Trouble shooting



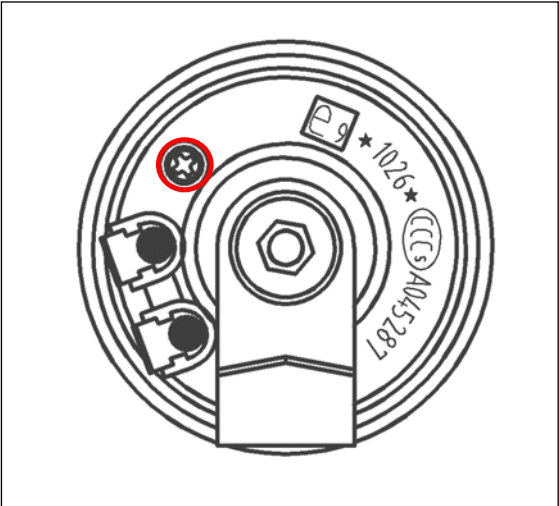
喇叭Horn



技术参数 Parameter	
电压 Voltage	12V
电压范围 Voltage Range	9V ~ 14.5V
电流 Current	1.5A max
分贝值 dB	95 ~ 115 dB
频繁 Frequency	440Hz±30Hz

音质调整 Adjust the voice quality

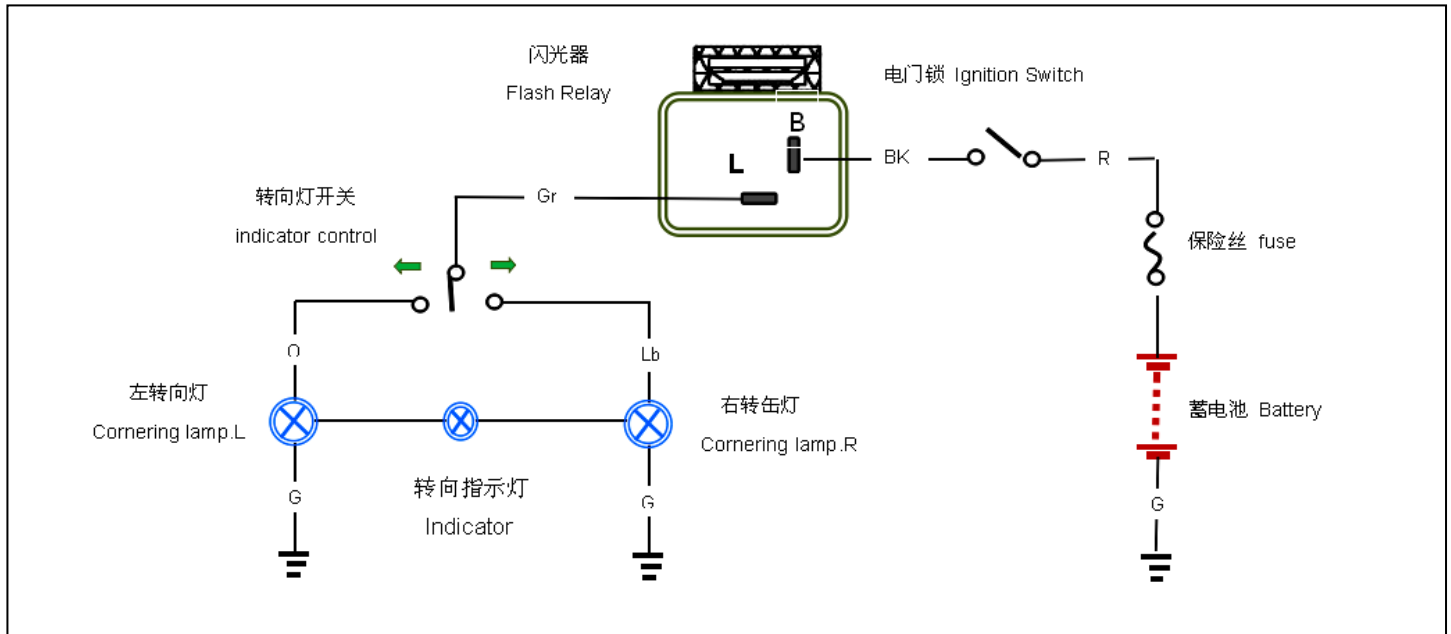
- 松开喇叭调节螺钉锁紧螺母，
Loose the locking nut of horn adjusting screw
- 用十字螺丝刀轻轻旋转调节螺钉，边调节边按下喇叭按钮，使喇叭音质调至最佳状态后，停止旋转调节螺钉。
Adjust the screw by rotating the cross screwdriver gently, while adjusting, press the horn button, until get the best voice quality of the horn
- 调整完成后，锁紧调节螺钉锁紧螺母。



闪光器 Flash Relay

闪光器是串联在转向信号灯线路中的一个闪烁装置。

Flash relay is a flash equipment in the series connection of turning signal line.



1、闪光器的闪烁次数在 90 次/分钟左右，限值范围为 60~120 次/分钟是合格的。

The flashing frequency is around 90 times per min, and the limit range is 60-120 times per min..

2、闪光器的功率为：普通灯为 10W×2（前转向灯+后转向灯）。

LED 灯为 0.1~150W。

The power of flash relay is : normal lamp 10W×2（front turning light+rear turning light）

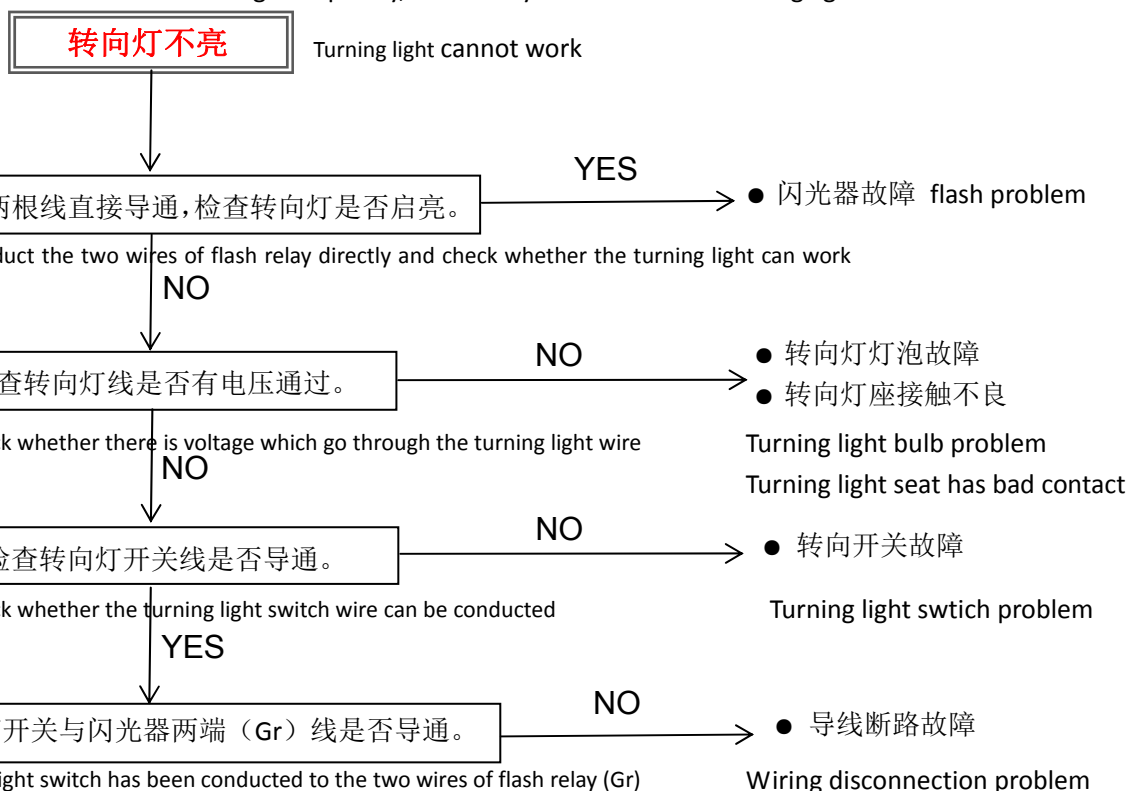
LED lamp 0.1~150W

3、闪光器随着功率变化，闪光频率会随之变化。功率变小闪光频率变大，功率变大闪光频率变小。

With the change of the power, the flashing frequency will change also. If the power is less then the flashing frequency is big, vice versa

故障排除 Trouble shooting

- 如转向灯或指示灯出现高频率闪烁，可能是其中一个转向灯灯泡损坏。
- If turning light or indicator flashes with high frequency, most likely the bulb of one turning light is broken



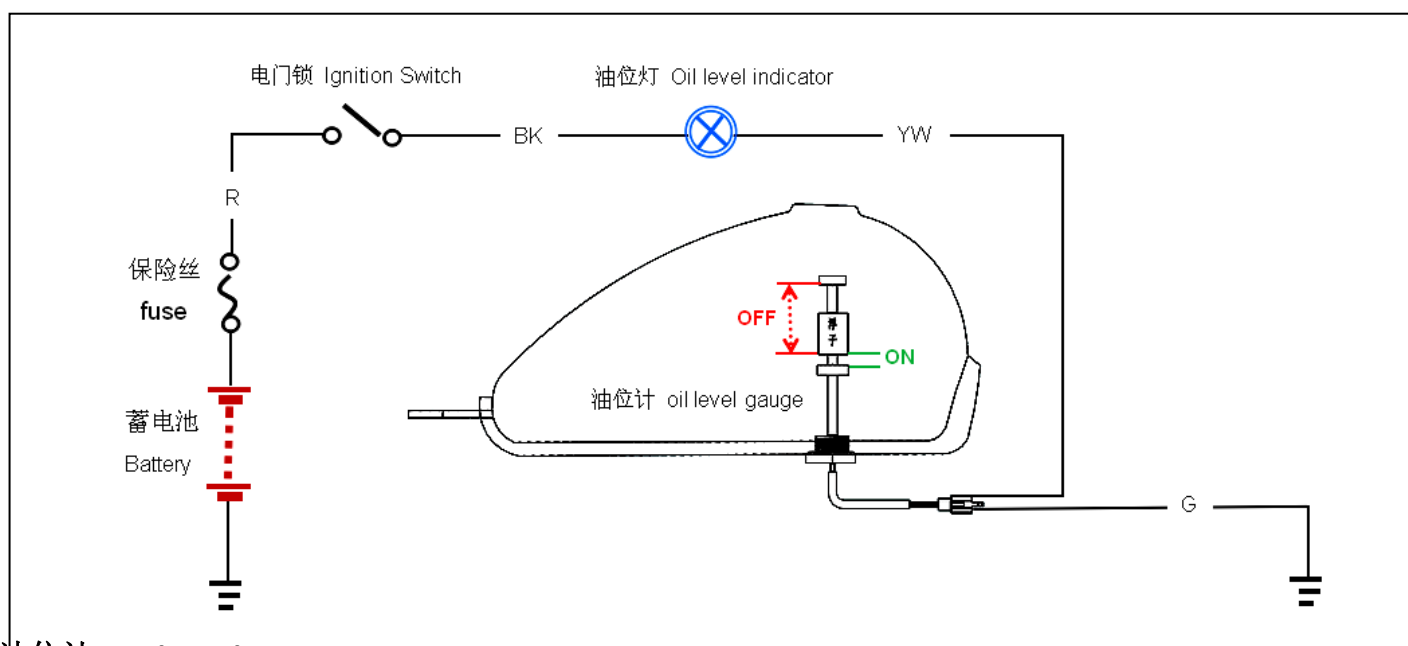
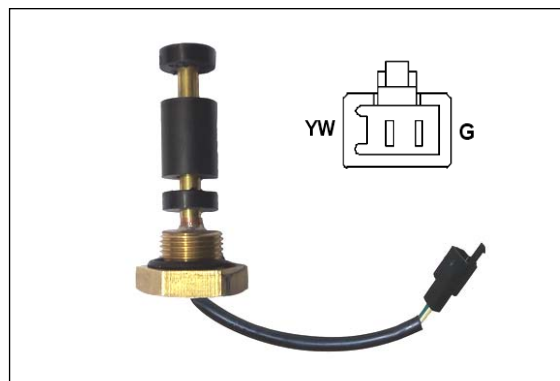
Check whether the turning light switch has been conducted to the two wires of flash relay (Gr)

Wiring disconnection problem

油位计 Fuel Level Gauge

- 1、油位计采用磁感应式。
- 2、浮子在底部 2mm 范围内接通，点亮油位指示灯。
- 3、油位指示灯为 LED12V20mA，油位计负载不得超过 3W。

- 1.the fuel level gauge is magnetic induction type.
- 2.the float is conducted within 2mm at bottom, lighting the fuel level indicator.
- 3.the fuel level indicator is LED12V20mA, and the load of fuel level gauge should not exceed 3W.



检查油位计 Fuel Level Gauge Inspection

- 拆下座垫和油箱、拆下油位计。
Remove the seat and fuel tank, then remove the fuel level gauge.

- 断开油位计线接插件。
Disconnect the wire plug-in unit of fuel level gauge.

- 万用表调至欧姆“Ω”档位
turn the multimeter to "Ω" position. .

- 将万用表连接在油位计的两根导线之间。
Connect a multimeter between the two wires of fuel level gauge.

- 将油位计如图所示方向放置。
Fix the fuel level gauge as the direction on the attached drawing here

- 用手上下移动浮子，检查其导通性
move up and down the float by hand, check the conduction.

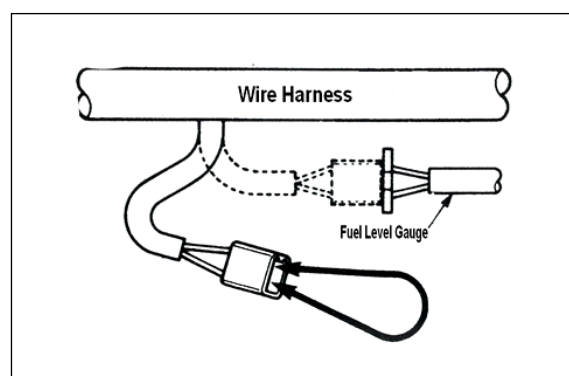
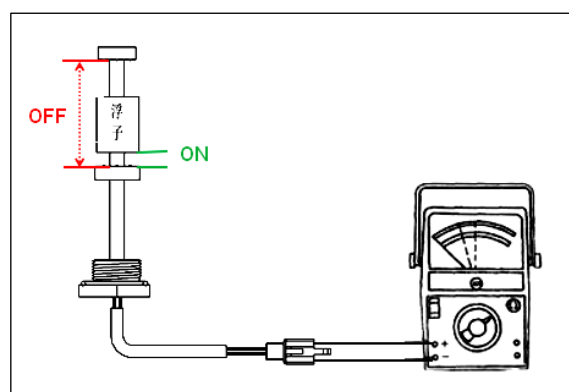
如浮子在底部 2mm 范围内有不导通现象，或浮子在底部 2mm 以上范围内有导通现象，说明油位计存在故障，应更换油位计。

If the float cannot get conducted within 2mm at the bottom, or the float is conducted above 2mm from the bottom, then it means the fuel level gauge has problem, and needs to be replaced.

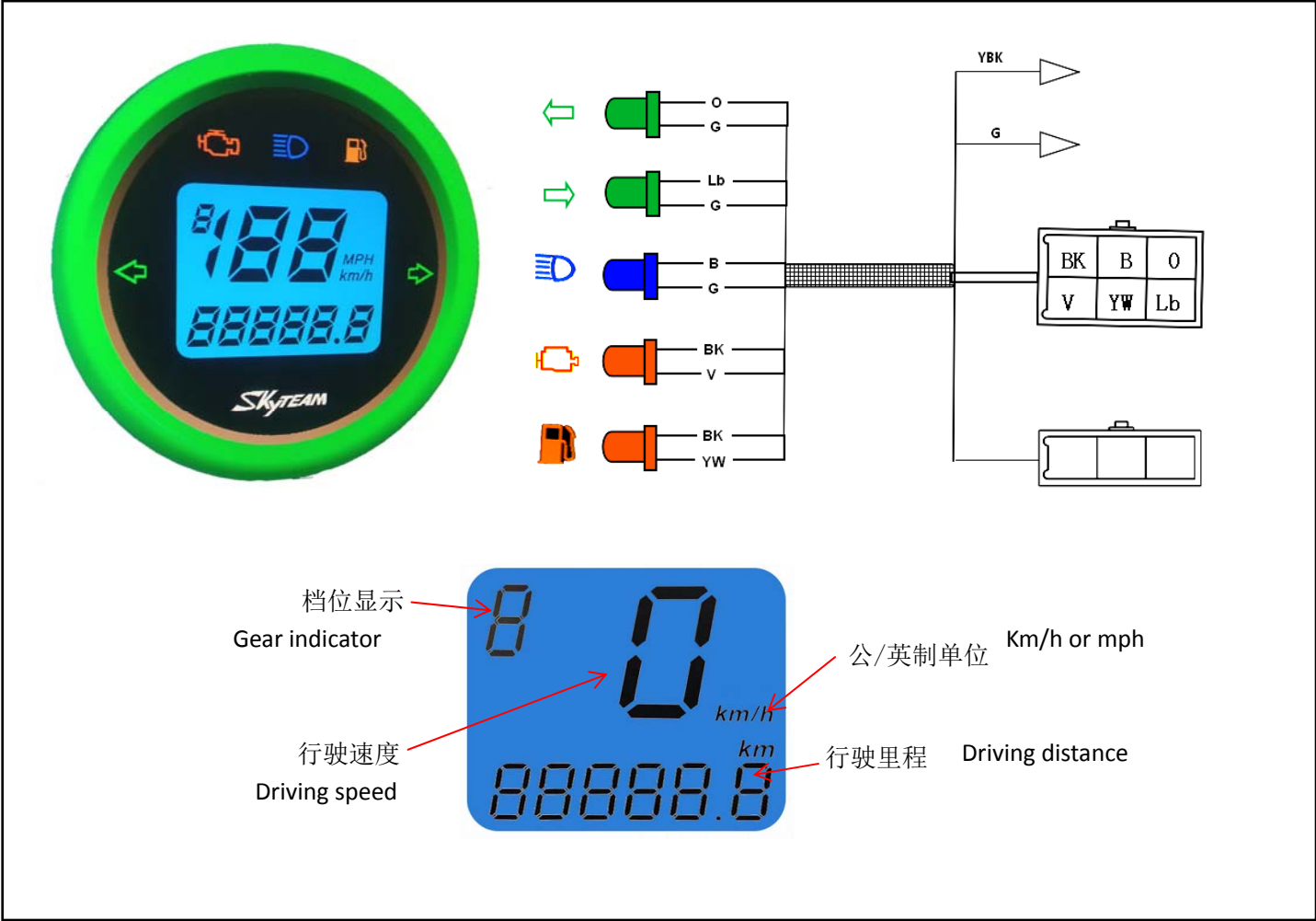
故障排除 Trouble shooting

断开油位计连接线，如图将导线束上的油位计两根线导通，检查油位指示灯是否被点亮。如指示灯点亮说明指示灯线路正常，油位计存在故障。如指示灯未点亮，请更换灯泡或检查修理线路连接。

Disconnect the fuel level gauge wire, and connect the two wires of fuel level gauge as the drawing shows here, check whether the fuel level indicator is lighted. If the indicator can be lighted, that means, the wiring can work well, and the problem is from the fuel level gauge; otherwise, please replace the bulb or check the wiring connection



仪表总成 Speedometer Assy.



- 1、远光指示灯、转向指示灯：控制火线（+）进入，实现点亮功能。
High beam indicator,turning indicator: control the entrance of fire wire (+), so the lighting function can be available
- 2、空档指示灯、油位指示灯、故障指示灯：控制地线（-）进入，实现点亮功能。
Neutral indicator,fuel indicator,fault indicator: control the entrance of ground wire(-),so the lighting function can be available
- 3、公英制单位切换：接通电源后 30S 内,起动发动机利用远近光开关操作 5 次上可切换公英制。
Change of KM/H/MPH: can change KM/H/MPH by pressing the high/low beam switch by 5 times within 30s once the electricity connected
- 4、切换公英制单位时，车速和里程自动同步切换。
When change KM/H / MPH, both speed and driving distance will be changed at the same time

拆卸仪表 how to disassemble the speedometer

- 用十字螺丝刀拆下大灯壳上的 2 个固定螺栓:。

螺栓规格: 十字沉头 M5×16。

Remove the 2 fixing bolts on the front lamp cover by cross screwdriver

Bolt size: cross recessed countersunk head M5×16

- 拔掉仪表连接线插件。

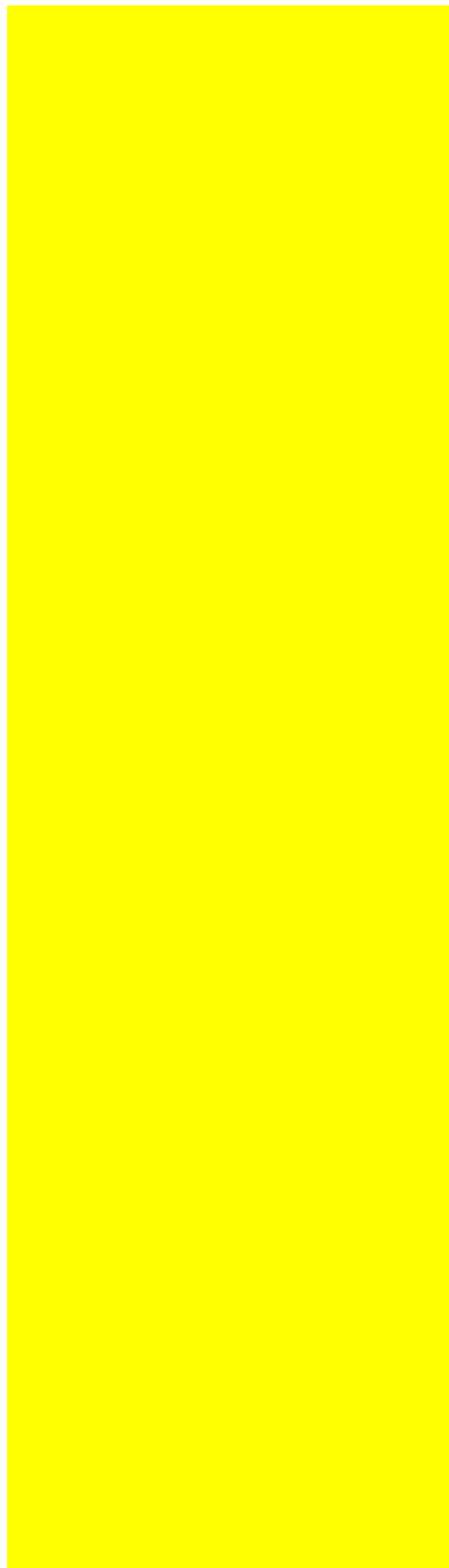
Disconnect the plug-in unit of speedometer cable

- 用尖钳拆下仪表固定拉簧。

Remove the fixing spring by sharp nose pliers

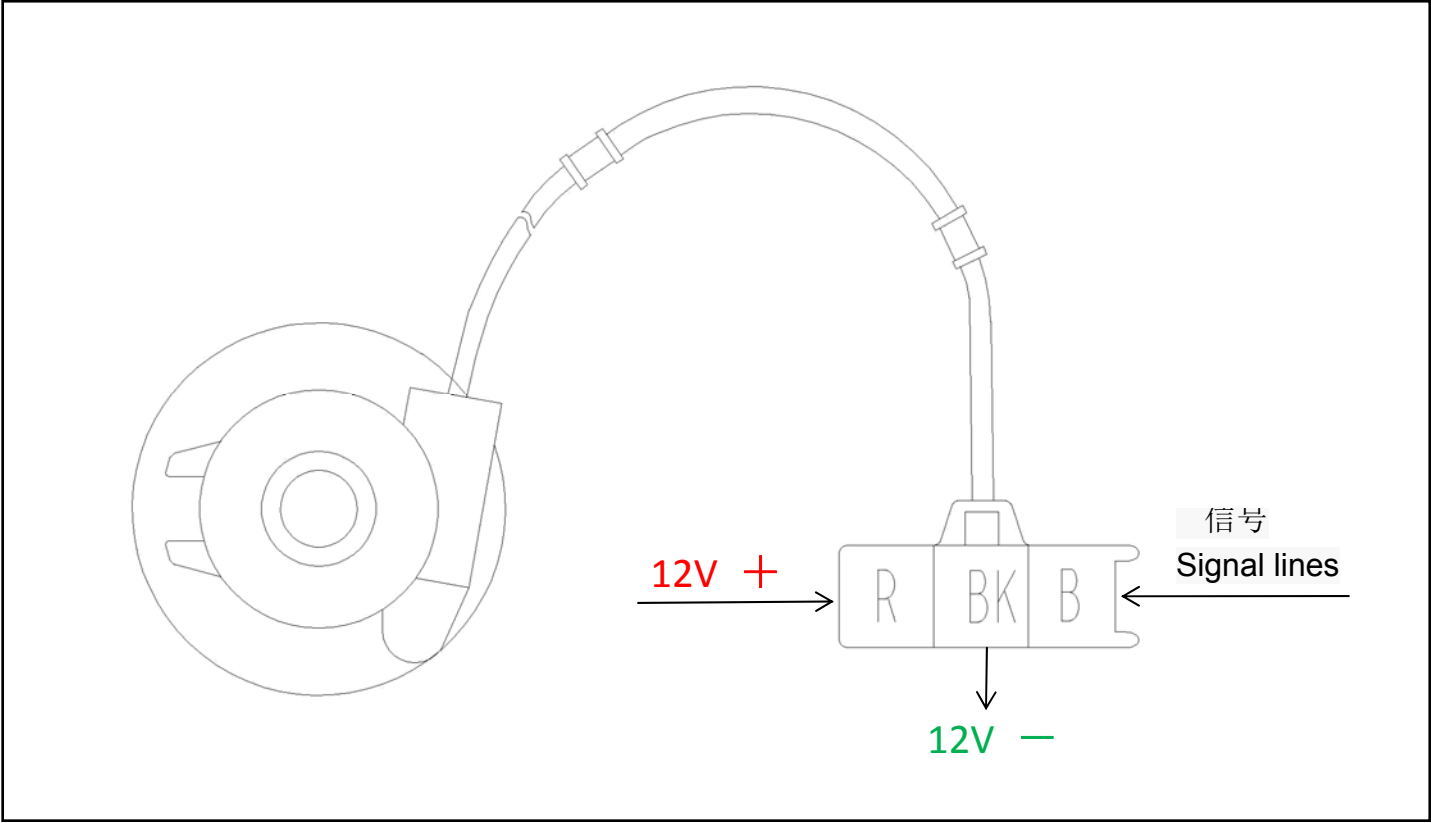
- 用手捏住仪表向上拔出仪表。

Hold the speedometer by fingers and pull out



计速传感器Speed sensor

本车型采用的是霍尔传感器计速传感器 This model uses the Hall sensor type



线色标记 cable color mark	线 色 cable color	功 能 function
R	Red 红	电源 electricity source +
BK	Black 黑	电源 electricity source -
B	Blue 蓝	信号线 signal cable

计速传感器的工作原理：

1、计速器内部的塑料转轮上有 4 个磁性方块，传感器通过感应转轮上方块的磁场，将其转化为脉冲电压输出。

There are 4 magnetic square pieces on the plastic rotating wheel inside the sensor, and the sensor transfers the pulse voltage output through the induction of the magnetic field on the top of the rotating wheel.

2、计速传感器感应 4 个磁性方块表示为轮子旋转一圈。

If the sensor responds the 4 magnetic square pieces, then it means the wheel has been rotated by one circle

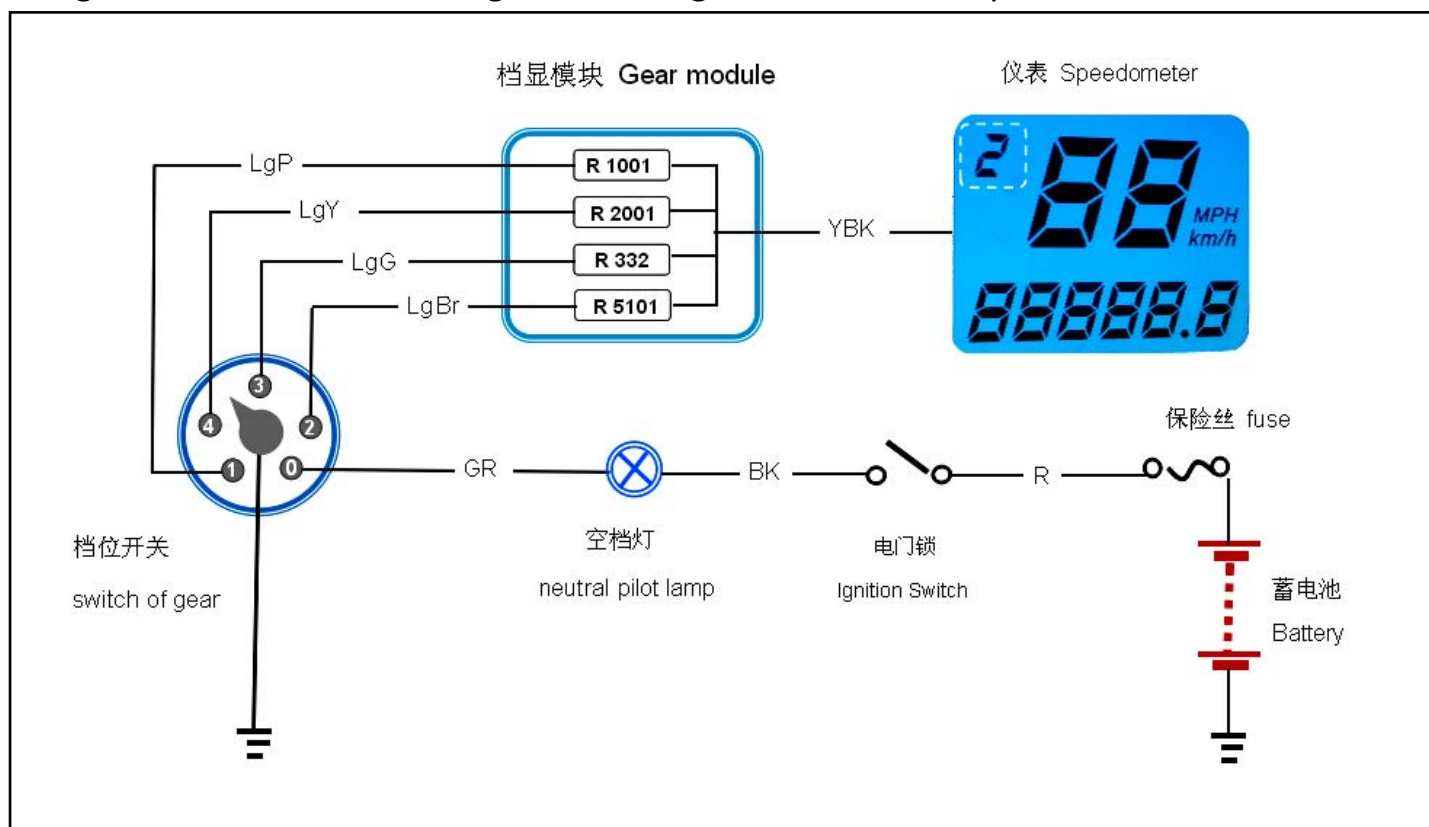
注意 Warning:
* 该电子计速器为 12V 供电。
This speed sensor is with 12V power supply

档位显示 Gear Indicator

工作原理 Working Principle

档位显示是由：档位开关、档位模块、仪表组成。

The gear indicator consists of gear switch, gear module and speedometer.



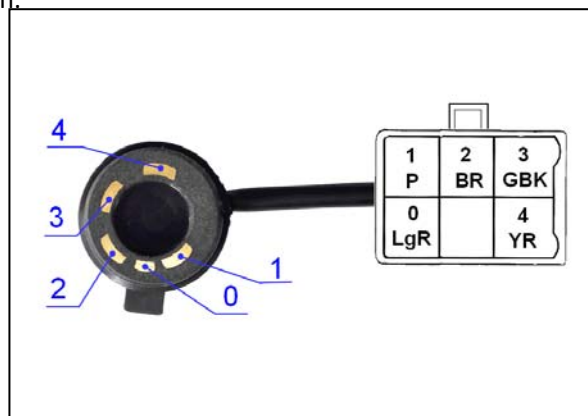
- 1、档位开关位于发动机小链轮上方的位置。
- 2、档位开关触头与变速鼓相连接，换档时触头上的触点与开关上的触点相通。
- 3、档位开关将档位接地信号传递给档位模块。
- 4、档显模块将接地信号转化为电阻信号上传给仪表，从而实现档显功能。
- 5、仪表显示屏上显示：1、2、3、4 档位数字，没有档位信号时为空白显示。
- 6、当档位开关位于空档位置时，空档指示灯启亮。

1. The gear switch is located in top of the front sprocket on engine.
2. The gear switch contact are connected to durm comp,gearshift. The contact point on the contact is connected to the contact point on the switch when shifting.
3. The gear switch passes the gear ground-connected signal to the gear module.
4. In order to achieve the file display function, the module module converts the ground-connected signal into a resistance signal to the speedmeter
5. The display screen shows the gear: 1, 2, 3, 4. And it is blank when there is no gear signal.
6. The neutral indicator is working when gear switch in the neutral position.

检查 CHECK

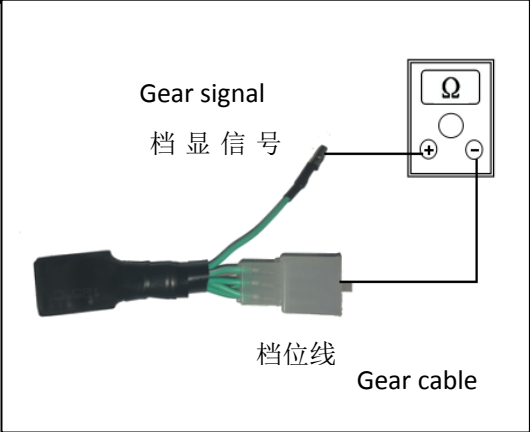
档位开关检查 check gear switch

- 断开档位开关接插件。
- 万用表调至欧姆 “Ω” 档位。
- 万用表分别测量：档位开关触点与对应的 1、2、3、4 档位的线是否接通。
- Disconnect the gear switch connector.
- Turn the multimeter to "Ω" position.
- Measured the gear switch contact point whether connected by multimeter: on the lines of 1,2,3,4 gears.



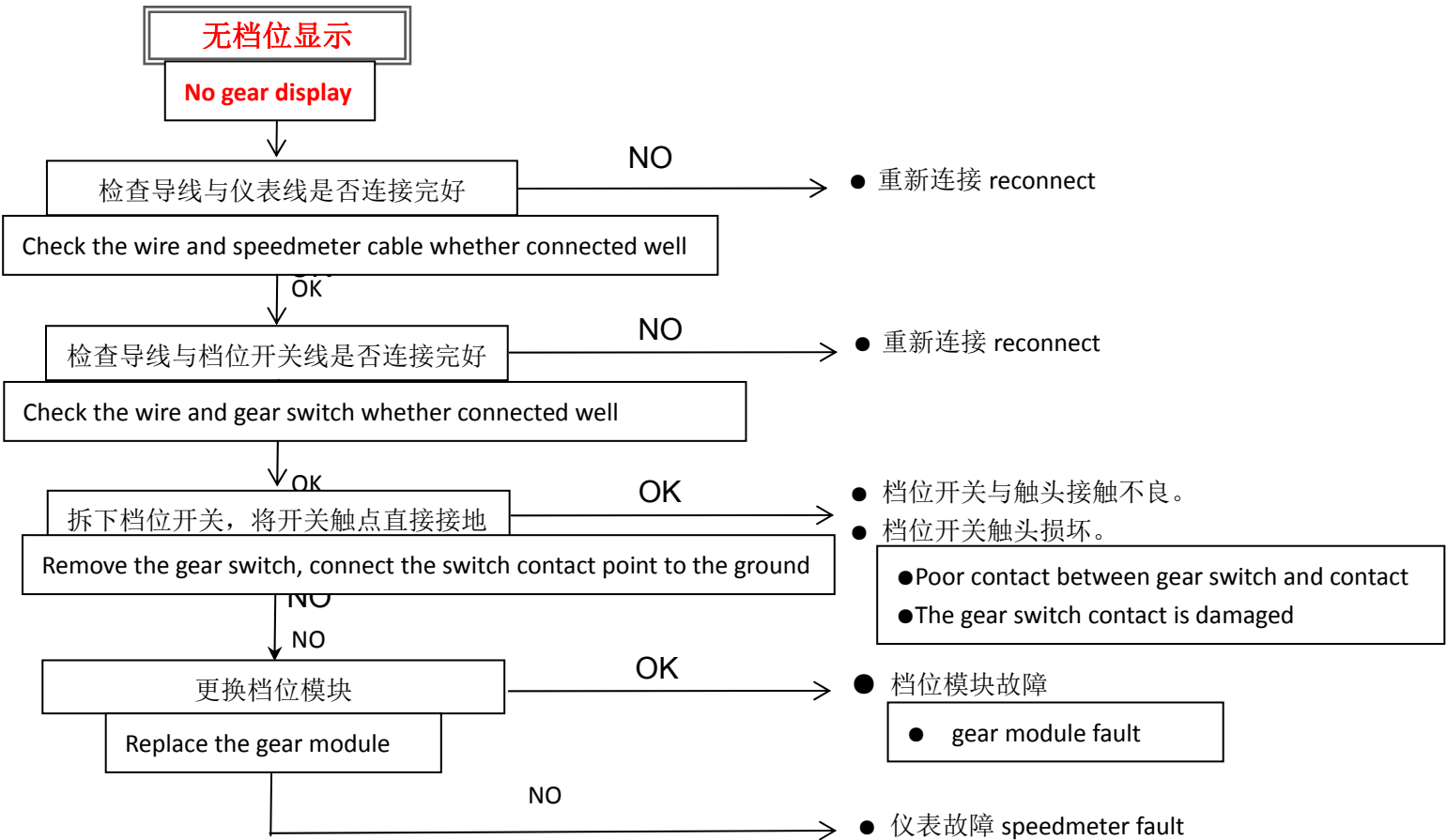
档显模块 Gear Module

- 断开档显模块接插件。
- 电子万用表调至欧姆 “Ω” 档位。
- 万用表测量：档显信号线分别与 1、2、3、4 档线之间的电阻值。
- Disconnect the gear switch connector.
- Turn the multimeter to "Ω" position.
- Measured the resistance by multimeter: between gear signal line and 1,2,3,4 gear position lines.



档位线 Gear position line	线色标记	电阻型号	电阻值
Gear 1: Light green powder line	Lg P	1001	1000Ω
Gear 2: light green brown line	Lg Br	2001	2000Ω
Gear 3: Light green green line	Lg G	332	3300 Ω
Gear 4: Light green yellow line	Lg Y	5101	5100 Ω

故障排除 Trouble shooting

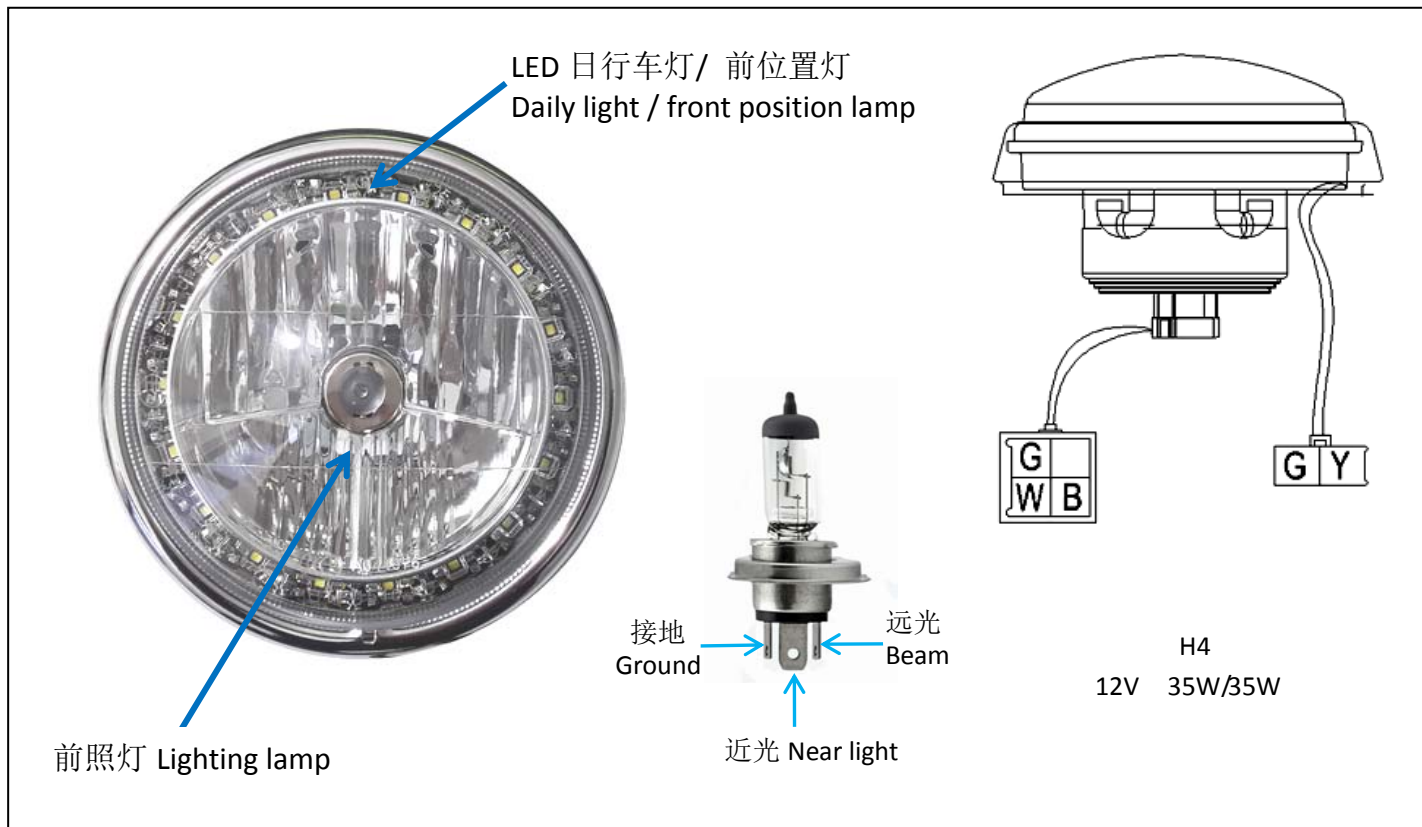


灯具部分 Lamps

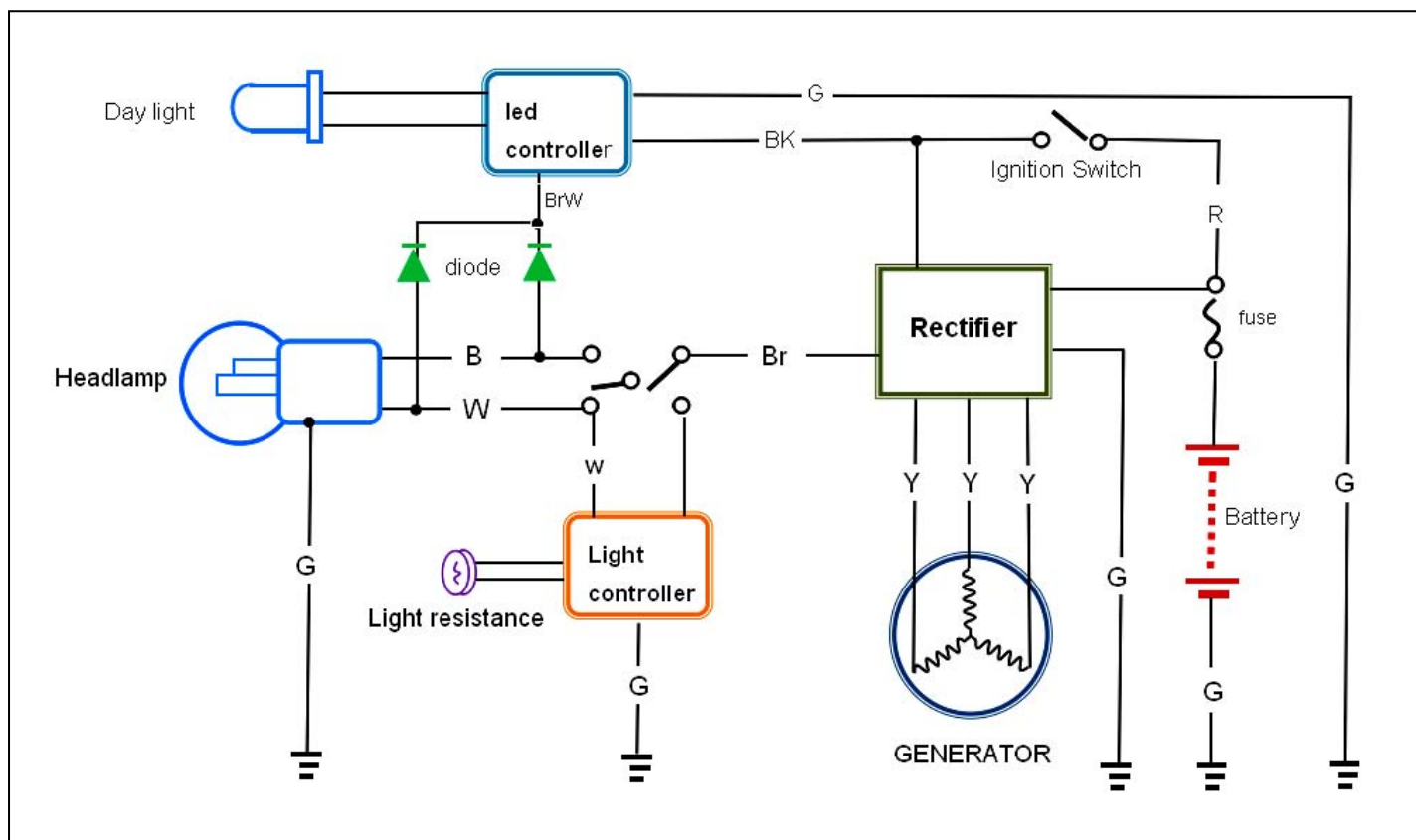
前大灯（带 LED 日行灯为例） Headlight (with LED daytime running light as an example)

带 LED 日行灯的前大灯是由：远光灯、近光灯、前位置灯、日行车灯组成。

The headlight with LED daytime running light consist of high beam, low beam, front position light and day running light.



工作原理图 WORKING PRINCIPLE

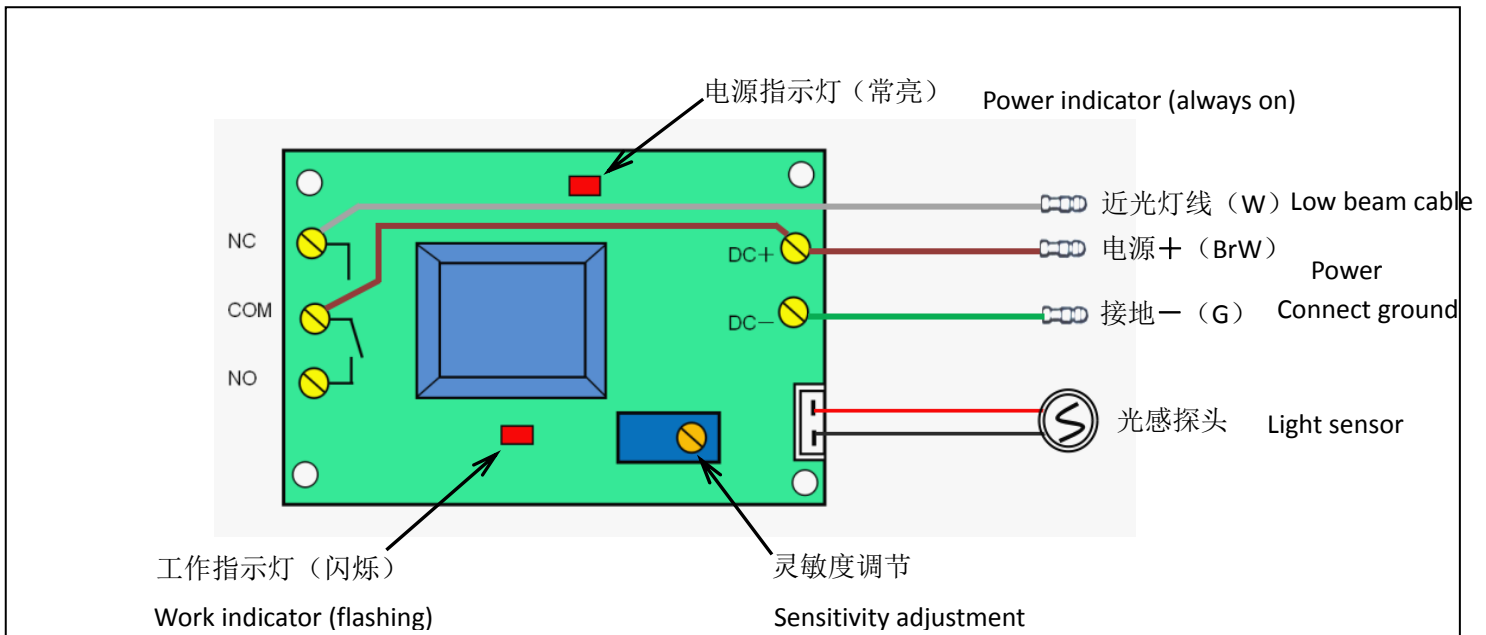


如图所示：As the photo shows:

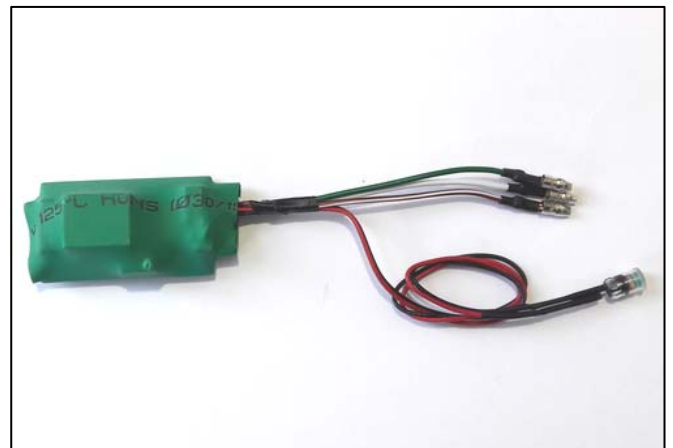
- 1、大灯：发动机启动后稳压器工作，红/白（RW）/棕（Br）线经过大灯开关分别给大灯和光控控制器供电。
- 2、日行灯：当接通电源后，LED 灯启亮为强光模式。
- 3、前位置灯：当大灯启亮时，LED 灯切换为弱光模式。
- 4、当大灯启亮时：电流从远光灯蓝（B）线或近光灯白（W）线经过二极管到棕/白（BrW）线到达 LED 控制器，控制器将日行灯电流降低，使日行灯灯光变暗当作前位置灯使用。
- 5、增加二极管是为了：开启远光或近光时都能有电源信号到 LED 控制器，且远近光互不干涉。
- 6、大灯开启有两种模式：
手动模式—利用远近光开关操作；
自动模式—当光线变弱或进入涵洞时大灯近光会自动启亮。
当大灯开关拉于“●”关闭档位上，大灯自启才会起效。

1. Headlamps: the regulator begin to work after engine star, Red White line/Brown line supply the power to the headlamps and light control controller respectively through the headlamp switch.
2. Daytime running light: When the power has been connected, the LED light switch to high light mode.
3. Front position lamp: When the headlights light on, the LED lights switch to low light mode.
4. when the headlight is on, current from the high beam blue (B) line or low beam white (W) line to the brown/white (BrW) line through the diode, reach the LED controller. The controller will reduce the current of daytime running light, so that the daytime light will be dim, and to be a front position light.
5. The reason for increase the diode: in order to have power signal in LED controller no matter open the high beam light or low beam light, and the high beam or low beam do not interfere with each other.
6. there are two modes of headlight on: Manual mode - operation by high/low beam switch; Automatic mode - When the light becomes weak or enters the culvert, the headlight will automatically turn on. When the headlamp switch on "●" close the gear, headlight automatic system will start work.

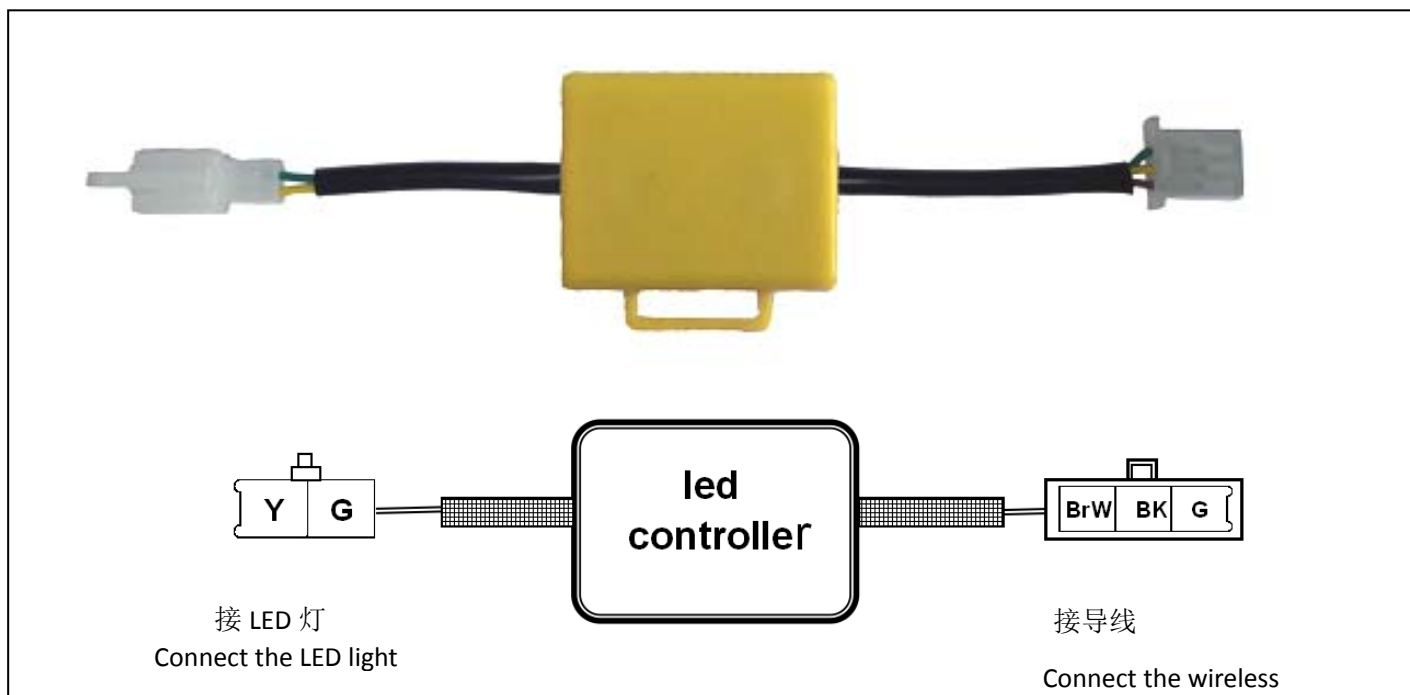
光感控制器（自动大灯控制器） Light sensor controller (automatic headlight controller)



- 光控接收探头位于大灯壳正上方。
- 光控模块位于大灯壳内。
- 灵敏度调节：逆时针旋转为减少感光阈值，顺时针旋转为增加感光阈值。
- 延时：为了避免感光阈值在零界点时近光频繁的开启或关闭，当光线变亮时近光延时 5S 后才会熄灭。
- Light-operated sensor on the top of the headlamp housing.
- Light-operated module in the headlamp housing.
- Sensitivity adjustment: rotate it in counterclockwise to reduce the value of light-sensitive valve, rotate it in clockwise to increase the value of light-sensitive valve.
- Delay: In order to avoid the low beam light turned on/off frequently when light-sensitive valve at the zero boundary. The low beam light will be turn off delayed for 5 seconds when the light becoming brighter.

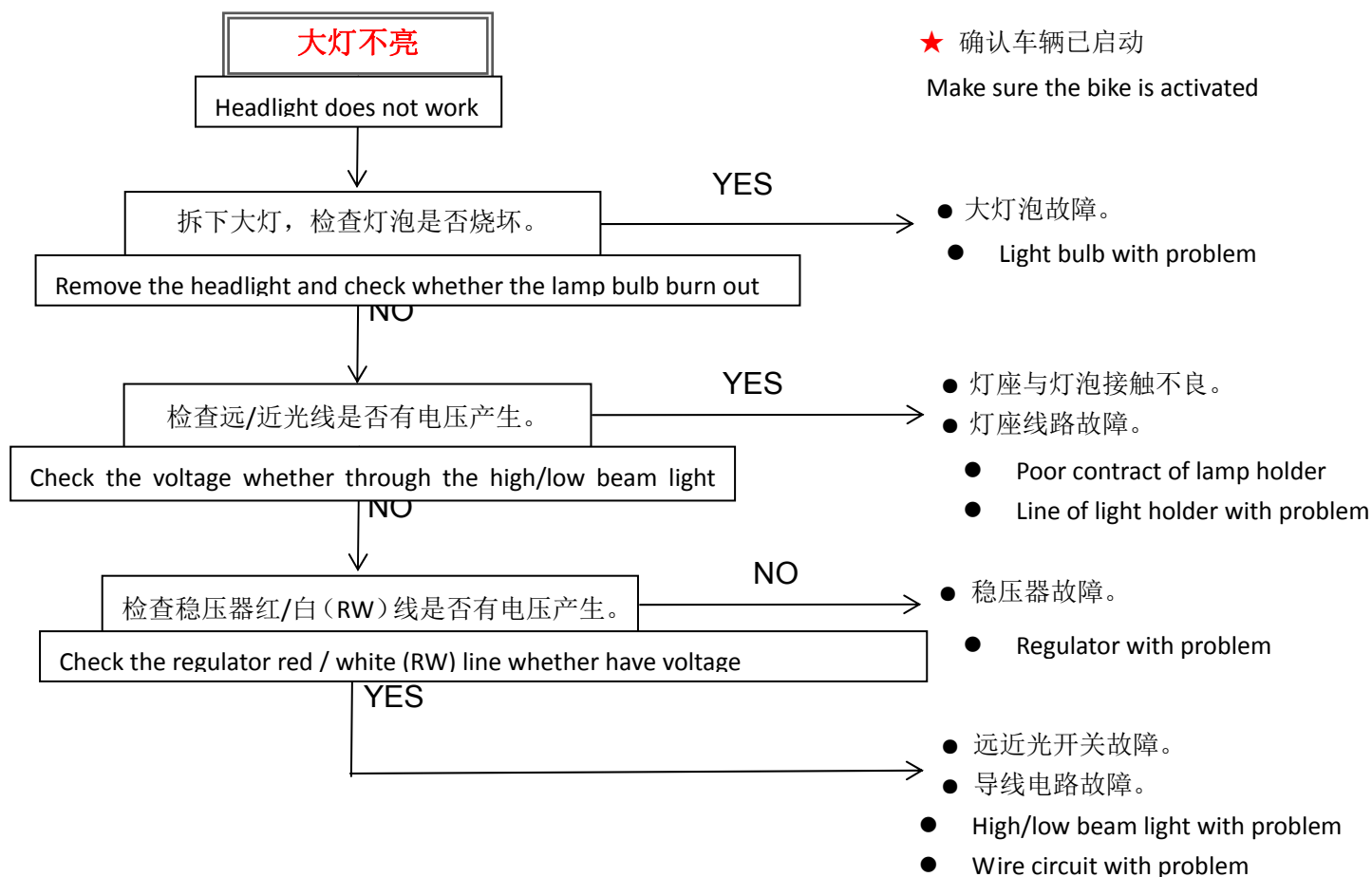


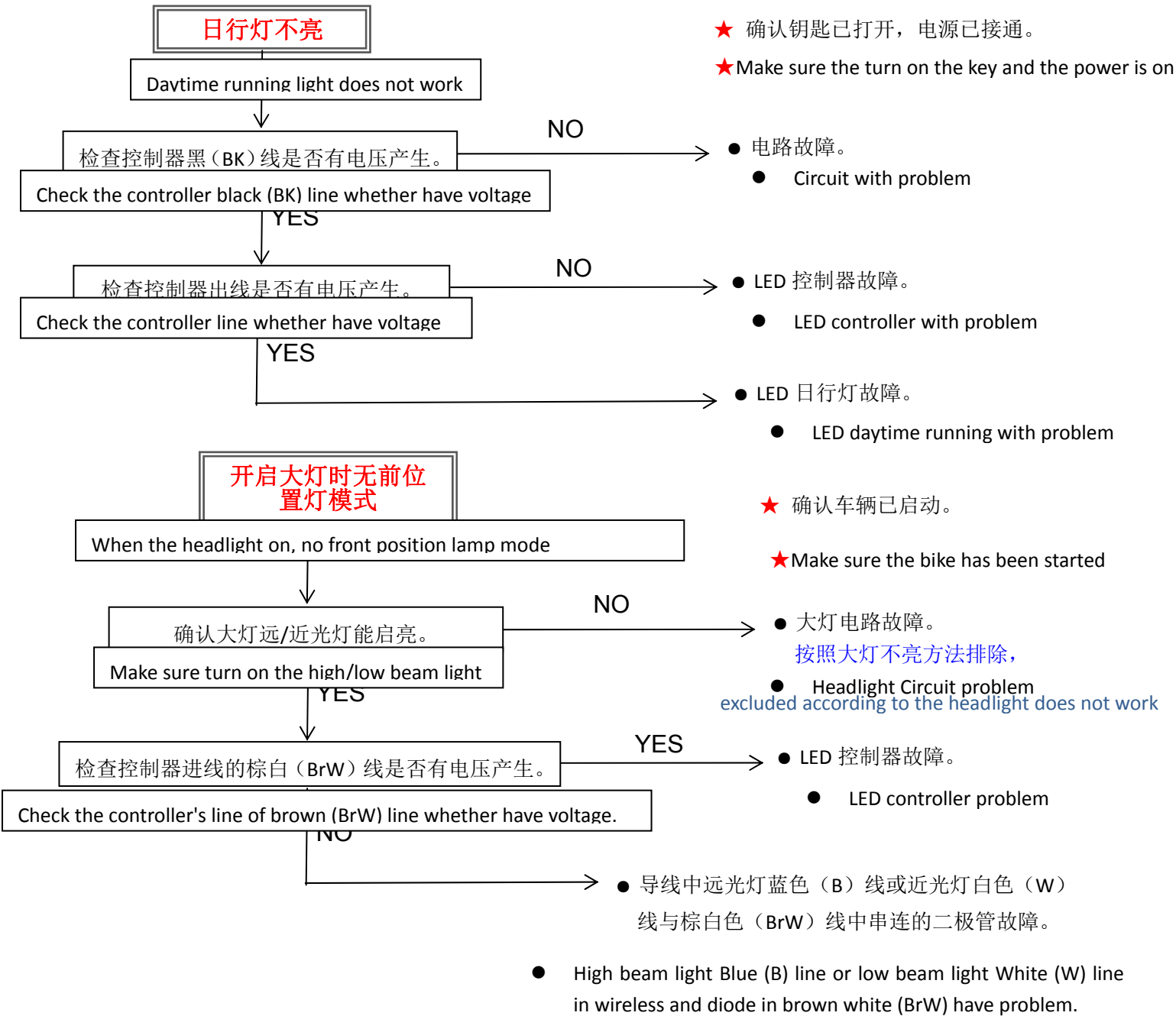
日行灯控制器 daytime running light controller



- 1、棕白(BrW)线：为位置灯，即为弱光模式；
- 2、黑色(BK)线：为日行车灯，即为强光模式
- 3、当大灯启亮时，日行灯自动切换为位置灯。
1. brown white (BrW) line: the position light, that is, weak light mode;
2. black (BK) line: the day running light, that is, strong light mode
3. when the headlight on, the daytime running light automatically switch to position light.

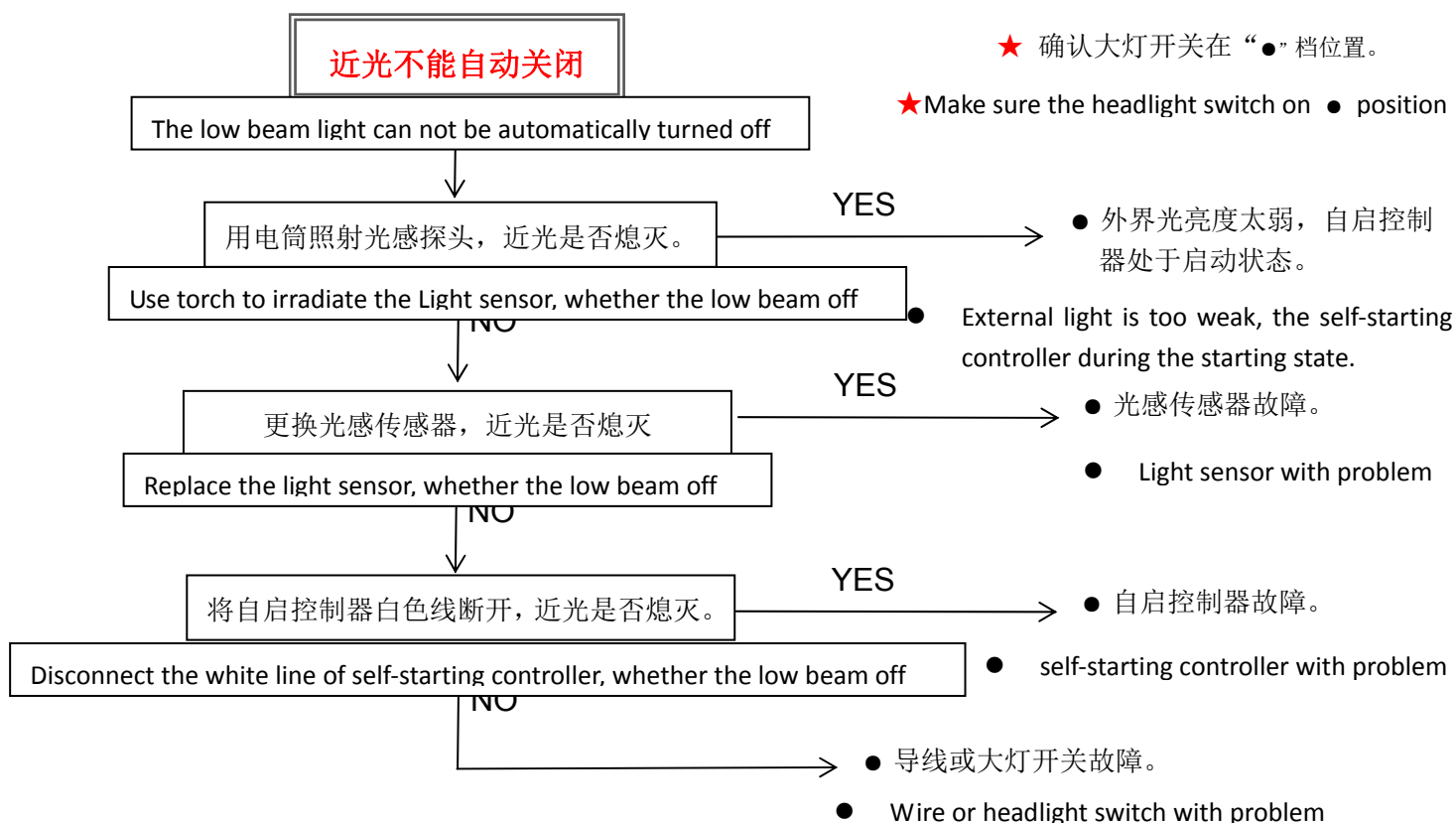
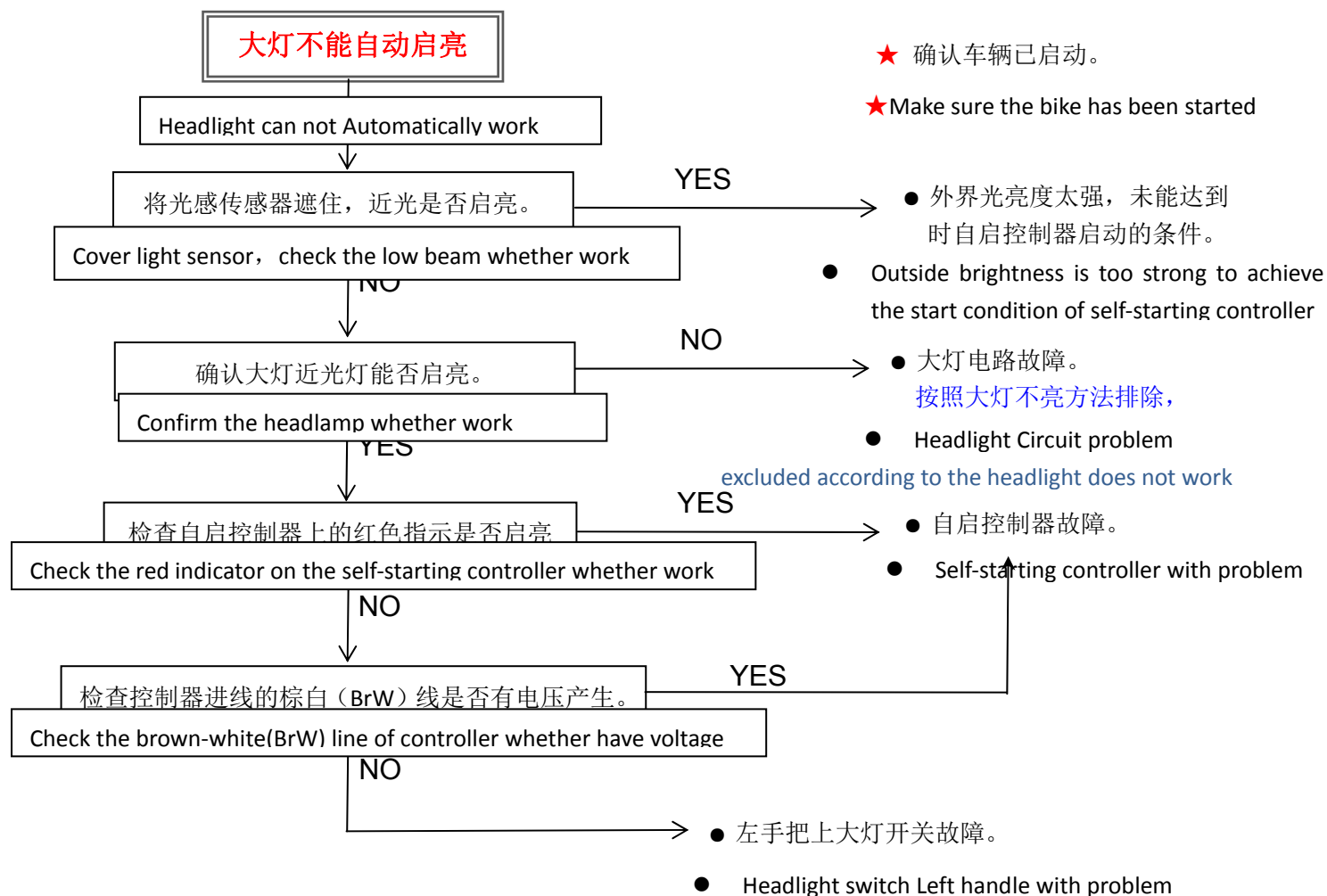
故障排除 Trouble shooting





导线上的二极管故障会导致以下问题出现： A diode fault on the wire can caused the following problems:

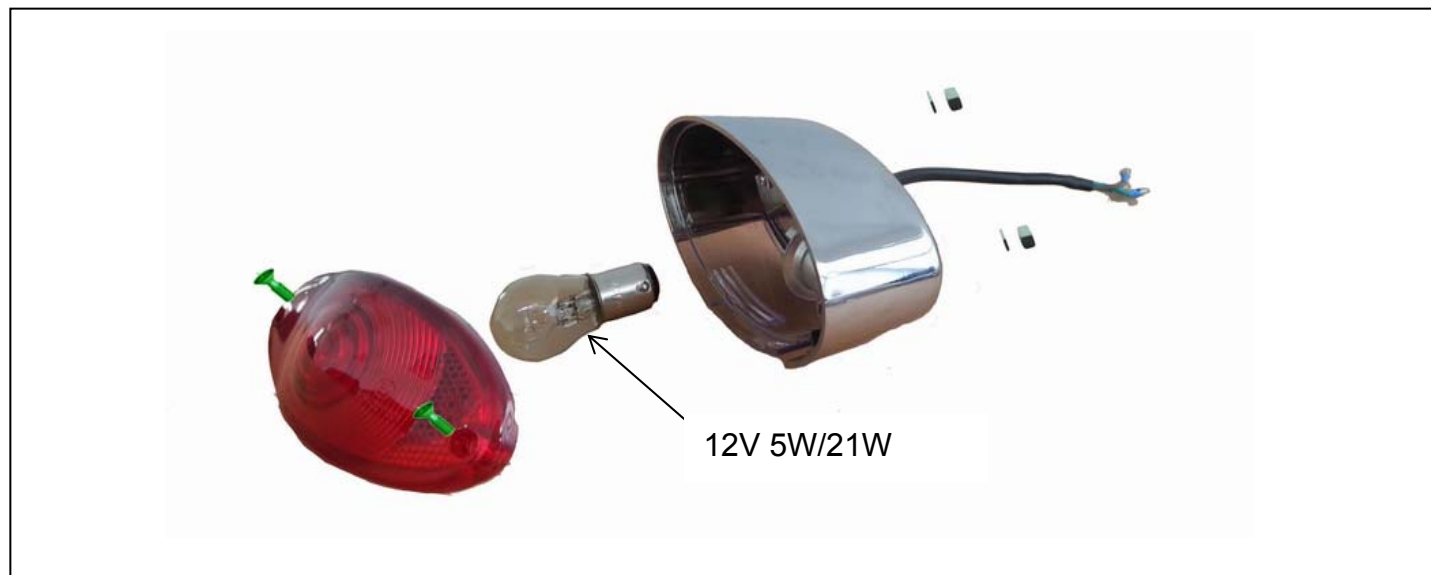
	故障现象 Trouble Description	故障排除 Trouble shooting	故障原因 Trouble Reason
1	turn the high beam light on, the position light does not work	Diode pblem on In series of Blue(B) line of high beam light and brown-white(BrW) line	Diode open circuit
2	turn the low beam light on, the high beam light is turn on at the same time		Diode Two-way conduction
3	turn the low beam light on, the position light does not work	Diode problem on In series of White(W) line of low beam light and brown-white(BrW) line	Diode open circuit
4	turn the high beam light on, the low beam light is turn on at the same time		Diode Two-way conduction



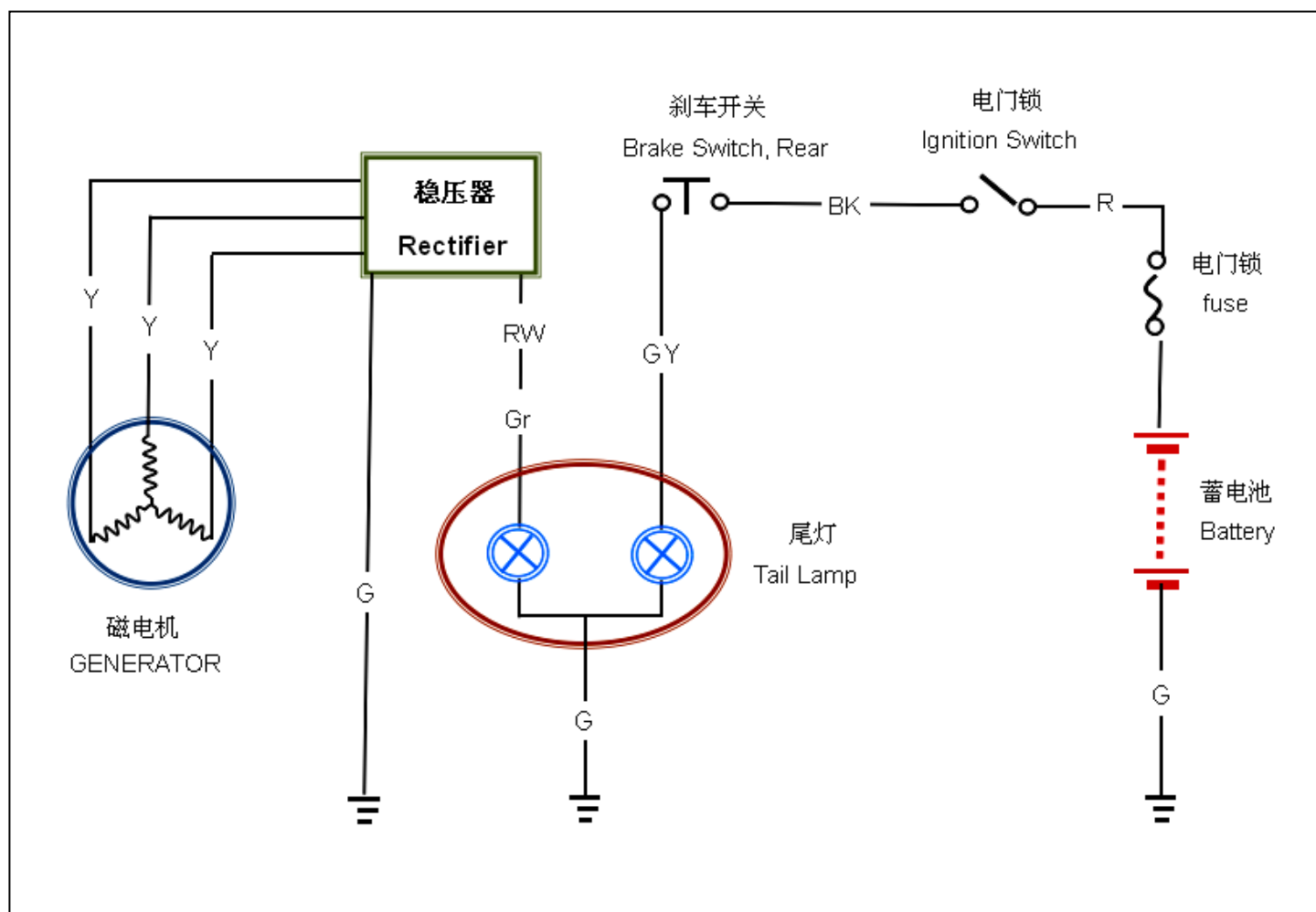
尾灯Taillight

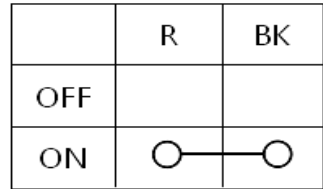
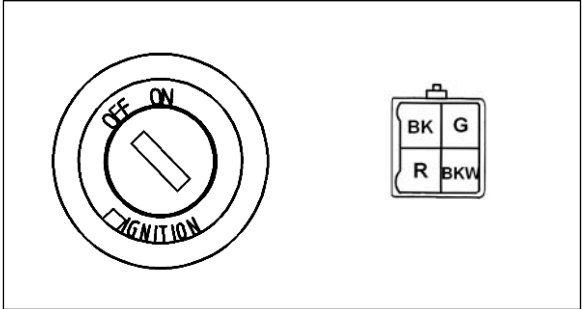
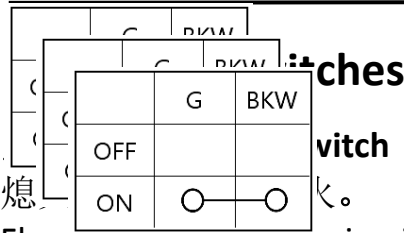
后尾灯是由：后位置灯、刹车灯、后牌照灯组成。

The tail light is consist of: rear position light, brake light, and light for license plate.

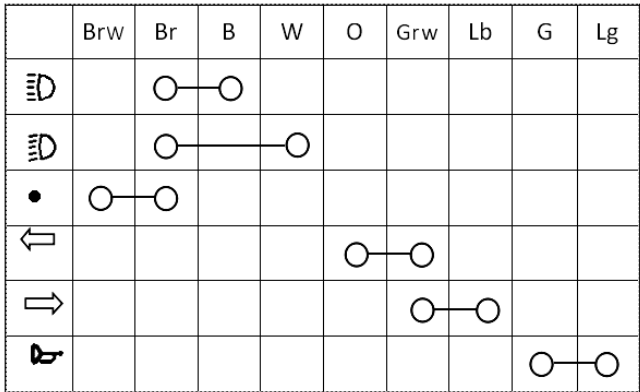
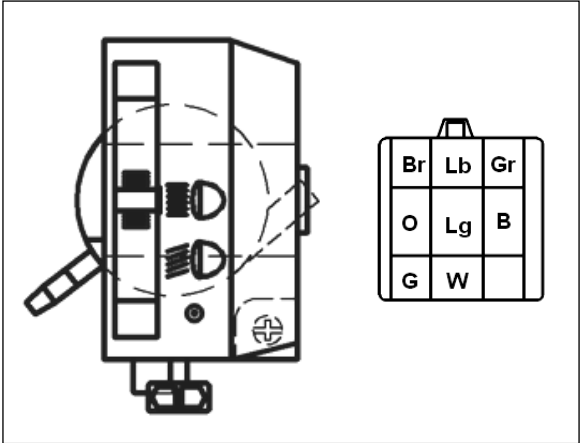


工作原理图 Working Principle

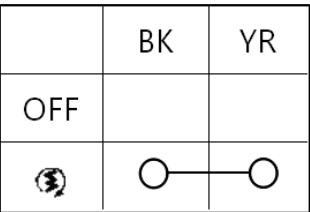




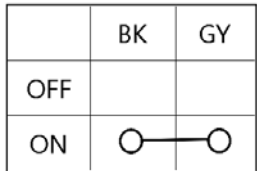
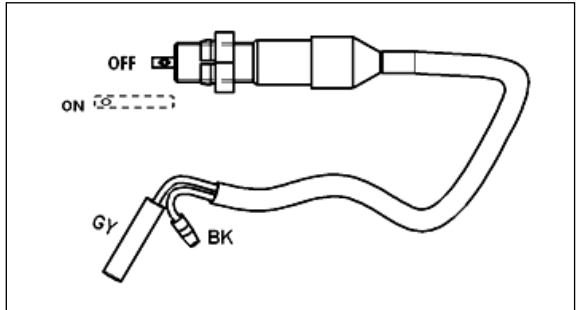
左手把开关 **left handle switch**



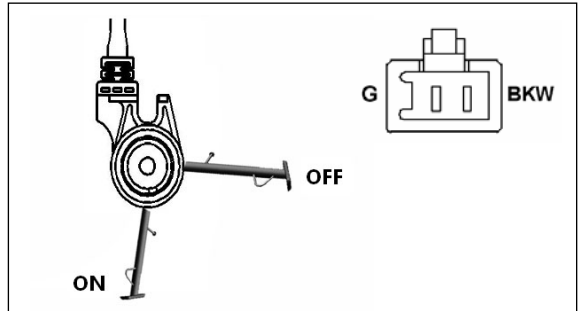
右手把开关 **right handle switch**



制动开关 **brake switch**



单撑熄火开关 **side stand switch**



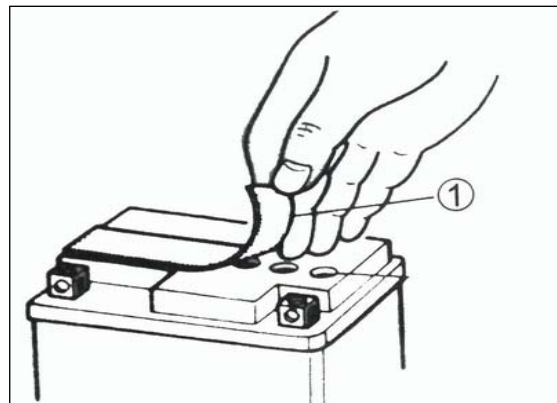
蓄电池 Battery

初次使用 Initial use

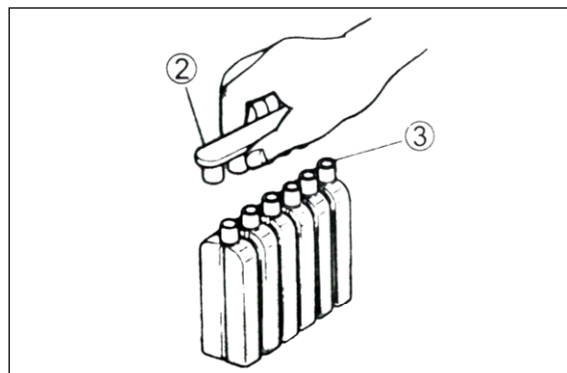
本部分以免维护铅酸电池为例。

As non- maintain lead-acid battery for example.

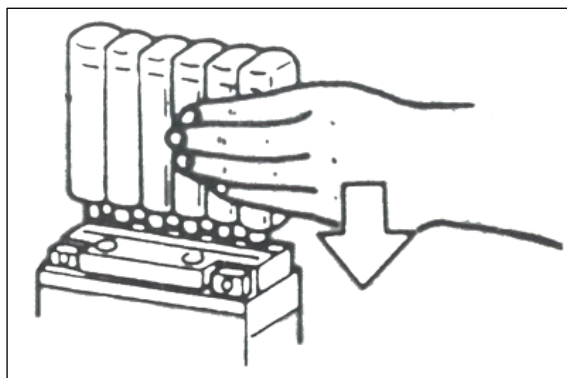
- 取下密封蓄电池注液孔的铝条①。
- Remove the aluminum seal ① of injection hole for battery



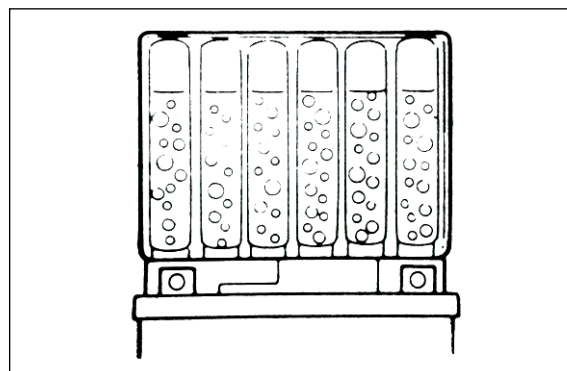
- 从电解液瓶子上取下蓄电池注液孔密封盖②。
- * 注意：不要撕下或刺穿电解液瓶上的密封铝条③。
- Remove the sealing cap ② of battery injection hole from the electrolyte bottle.
- * Note: Do not tear or puncture aluminum seal ③ of electrolyte bottle.



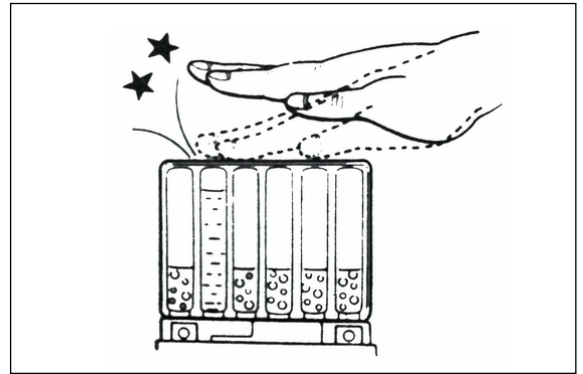
- 将电解液瓶子①瓶口朝下对准蓄电池加液口，用力向下按压。
- Put down the electrolyte bottle ①, align with the port of battery, press down firmly.



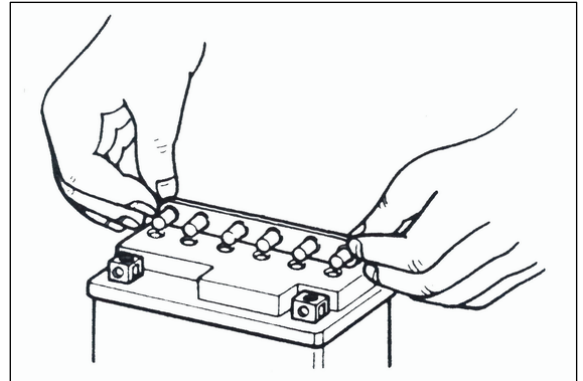
- 保持这个位置 10 分钟左右，确认每个电解液小格中的电解液全部注入蓄电池内。
- Hold this position for about 10 minutes, Make sure that all the electrolyte of each cell injected into the battery.



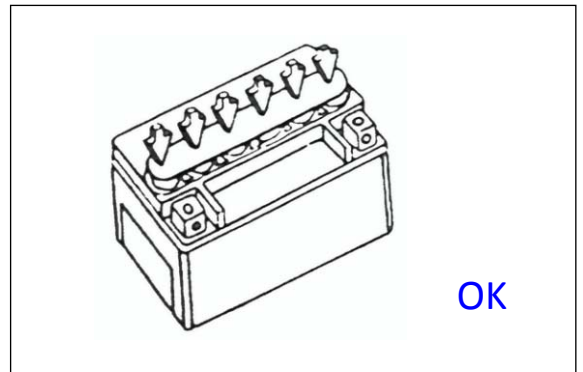
- 如果其中任意一个小格中的电解液没有注入蓄电池，则需要用手拍打瓶子底部，促使电解液能顺利流入蓄电池内。
- If any of them not injected into the battery. We need to flapping bottom of the bottle by hand, so that can make the electrolyte into the battery smoothly.



- 待所有的电解液全部注入蓄电池。
- 等待 20 分钟左右，取下电解液瓶子。
- 将密封盖②安装在蓄电池上。
- All the electrolyte injected to battery.
- Wait for 20 minutes, remove the electrolyte bottle.
- Install the sealing cap ② on the battery.



- 安装密封盖时应将 6 个塞子同时向下按压。
- 如果加液过程中不慎有电解液碰触在蓄电池上，用水冲洗后擦干净。
- When installing sealing cap, it should be press down six plugs all simultaneously.
- If some electrolyte touch the battery, clean it by water.

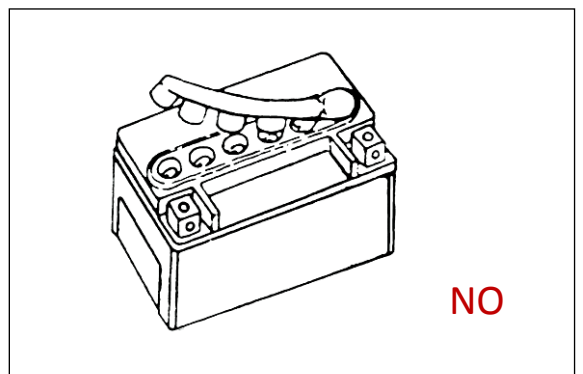


注意：

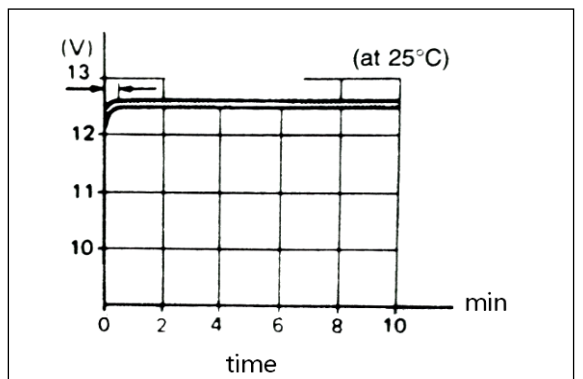
- * 该方法只适用于免维护铅酸电池，一旦加液后无需再补充加液
- * 胶体电池和锂电池无需加液。

Note:

- * This method only use to non-maintenance lead-acid battery, without refill once added the electrolyte.
- * Gel battery and lithium battery without add electrolyte.



- 用万用表测量蓄电池的电压，如图所示，蓄电池电压应超过 12.5V（DC）。如果蓄电池电压低于规定值，请充电。
- Measured the voltage of battery by multimeter, as shown, the voltage value should exceed 12.5V (DC). If the voltage value less than value limit, please charge it.



维护 maintenance

检查蓄电池壳体表面，如壳体存在污损或电解液泄漏，请更换蓄电池。如果发现接线柱有白色酸性粉状物质，请用砂纸清理。

Check the surface of battery housing case, if the case with defacement or electrolyte-leak, please replace the battery. If you find the white acidic powdery substance in the terminal, please clean it by sand paper.

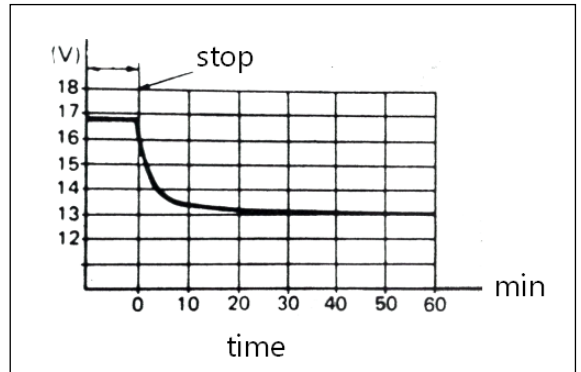
补充电操作 charging operation

- 用万用表测量蓄电池的电压，如蓄电池电压低于 12V (DC)，则需要补充充电。

充电时间：0.6A 电流充电 5~10 小时，
3A 电流补电 1 小时。

Measured the voltage of battery by multimeter, if the voltage less than 12V (DC), you need to charge it.

Charging time: 0.6A current, charging 5 to 10 hours, 3A current, charging for 1 hour.

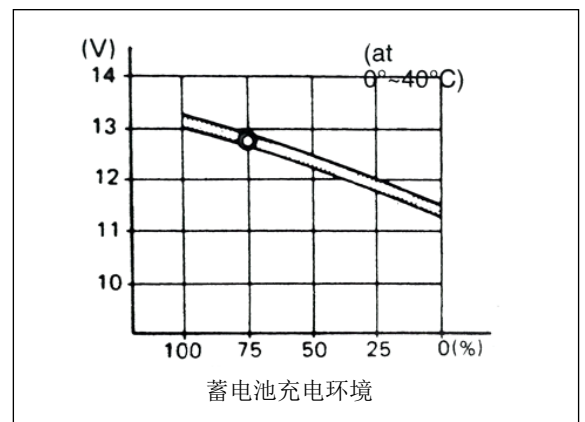


注意：NOTE:

- * 当需要补充充电时，请从摩托车上取下蓄电池。
- * 充电时，不要取下蓄电池密封盖。
- * 在任何时候不允许充电电流超过 3A。
- * When you need charge the battery, please remove the battery from the motorcycle.
- * When charging the battery, do not remove the sealing cap of

- 充电后至少 30 分钟后，用万用表测量蓄电池的电压。
- 如蓄电池电压低于 12.5V (DC)，请重新充电。
- 再次重新充电后，蓄电池电压低于 12.5V (DC)，请更换蓄电池。
- 当蓄电池长期不用时，请定时测量它的电压，当摩托车超过一个月不使用时（特别是冬季），请测量蓄电池电压，至少一个月一次。

- measure the voltage by multimeter after 30 minutes of charge the battery.
- If the voltage less than 12.5V (DC), please recharge the battery.
- If the voltage less than 12.5V (DC) after charged the battery, please replace the battery.
- For the long-term non-use of battery, please measure the voltage regularly. if the motorbike not use for one month (especially in winter), please measure the voltage at least once a month.



安装蓄电池 Install the battery

- 拆下左护罩；
- Remove the left cover
- 装上电池，并将接线柱朝外侧方向；
- 装上电池攀带；
- Install the battery and move the wire connecting terminal of battery to backward direction;
- Put on the battery band.
- 先将导线上红色电源正极线与电池红色“+”极相连接；
- 将红色保护套装好；
- Connect the red power positive wire and battery red“+”pole;
- Put on the red protection case
- 再将导线上绿色电源负极线和起动马达绿色负极线与电池黑色“—”极相连接；
- 将黑色保护套装好；
- then connect the green power negative wire, starting motor green negative wire and battery black“—”pole;
- Put on the black protection case

- 装上左护罩
- Install the left cover

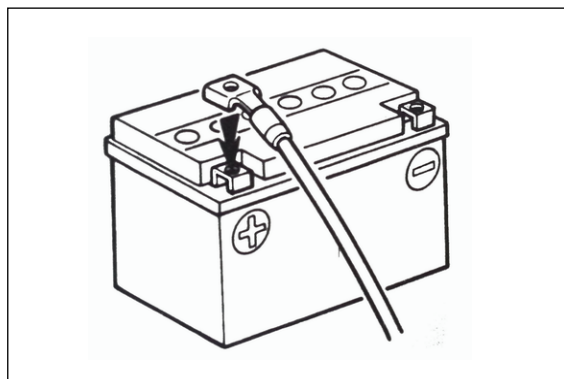
注意：NOTE:

* 当安装电池时，请先安装正 \oplus 极接线柱，再安装负 \ominus 极接线柱，
* 安装后可以在接线柱上涂适量凡士林或润滑脂，防止接线柱氧化、腐蚀。

* When installing the battery, please install the positive \oplus ,

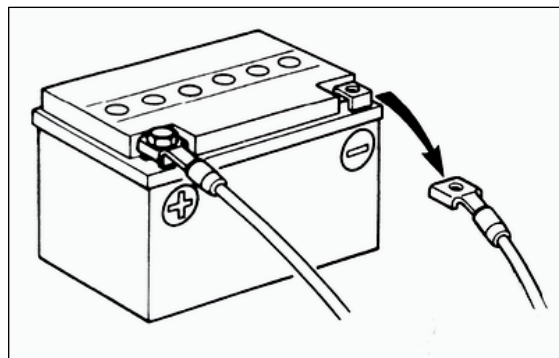
then install the negative \ominus pole ;

* Please coated the terminal with Vaseline or grease, to protect the terminal from oxidation and corrosion.

**注意：NOTE:**

* 当维护或维修需要拆卸电池时，请先将负 \ominus 极接线柱拆除，然后再拆除 \oplus 极接线柱。

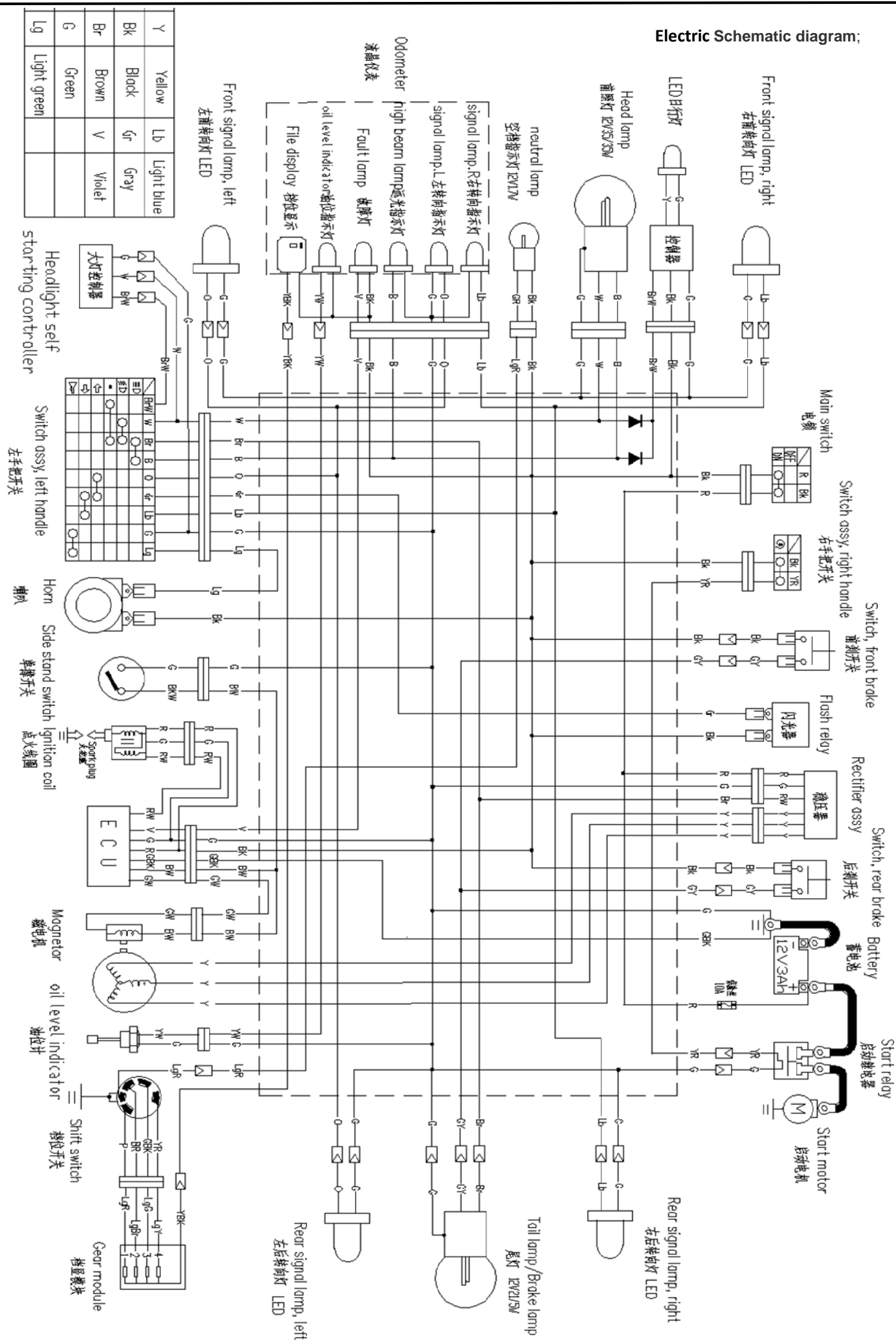
* When maintenance or need to remove the battery please disconnect the wire connecting terminal of battery \ominus pole first, then disconnect the wire connecting terminal of battery \oplus pole.

**警告：Warning:**

* 禁止将电池 \oplus 极和 \ominus 极直接导通，会对电池造成极大的伤害，也可能会导致起火。

* Do not connect the battery \oplus pole to \ominus pole directly, it will damage to the battery and cause a fire.

Electric Schematic diagram;



电喷系统 PART5: EFI SYSTEM

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电喷简介 Introduction of Fuel Injection

电喷也主就是电子燃油喷射控制系统（简称 EFI 或 EGI 系统），以一个电子控制装置（又称电脑或 ECU）为控制中心，利用安装在发动机不同部位上的各种传感器，测得发动机的各种工作参数，按照在电脑中设定的控制程序，通过控制喷油器，精确地控制喷油量，使发动机在各种工况下都能获得最佳浓度的混合气。

Fuel injection is Electronic fuel injection control system(is short for EFI or EGI system),use an electronic control device (also known as computer or ECU) as a control center, and variety of sensors on different parts of the engine, to measured the various operating parameters of engine, according to the control program setting in the computer, through controlling the injector, adjust the fuel injection precisely, so that the engine can get the best concentration of the mixture in a variety of conditions.

电喷系统的优势 Advantages of EFI system

1、达到排放要求 to meet the emission requirement

精确控制喷油量，从而控制空燃比,为触媒提供最佳废气浓度,满足法规限值的要求。

Precisely control the fuel injection, thereby controll the air-fuel ratio, provide the best exhaust gas concentration for catalyst, so that to meet the requirements of the limits of the regulation.

各种传感器的数据保证了电喷系统可以适应发动机在不同工况下，确保废气在最佳状态。

A variety of sensor data keep that the EFI system adapt to the engine in different conditions, to ensure that the exhaust under the best condition

电喷系统可以随发动机和车辆老化进行自动修正，保证排放耐久性达标。

The EFI system can be modified automatically with the aging of the engine and vehicle, to ensure the durability of emissions standards.

2、改善使用性能 Improve the performance

对各种工况精确补偿(低温启动、急加急减速、海拔高度等),使用性更好,容易启动,加速顺畅,过度平滑；可以适应高寒、高温和高海拔地区的使用。

Compensation for various conditions accurately(Low temperature start, emergency acceleration and emergency deceleration, altitude, etc.), so that make it better to use, easy to start, smooth to accelerate, over-smoothing;

可以根据不同需要对车辆的动力性、经济性进行控制。

It can be controlled according to the different demands of the vehicle's dynamic,economy.

3、提高经济性 Improve the economy

合理给油，降低油耗。Reasonable to supply the fuel, reduce fuel consumption.

本车使用的电喷系统 EFI system on this bike

SKYTEAM 自 2013 年就开始与朗杰电子有限公司开展战略合作，共同开发摩托车电喷系统，该系统主要特点有：SKYTEAM started strategic cooperation with this EFI Electronics Co., Ltd. Since 2013, to developing the motorcycle EFI system together, the main features of this system are:

(1)高集成度，连接简化，系统可靠性提高，可以耐极端恶劣环境，是目前国内唯一能用于越野赛车的电喷系统。

(1)high integration, simplified connection, improved system reliability, it can bear the extremely harsh environment,it is the only one EFI sytem can be used for off-road racing motorcycles in the domestic market;

(2)超低功耗，即使断开蓄电池，电喷系统也能照常工作；

(2) Ultra-low power consumption, even if disconnect the battery, EFI system can be work as usual;

(3)操控性能刚柔并济，将驾驶平顺性和加速瞬间爆发力做到完美统一；

(3) Control performance is couple hardness with softness, to make the ride smoothly and explosive of acceleration perfect unified;

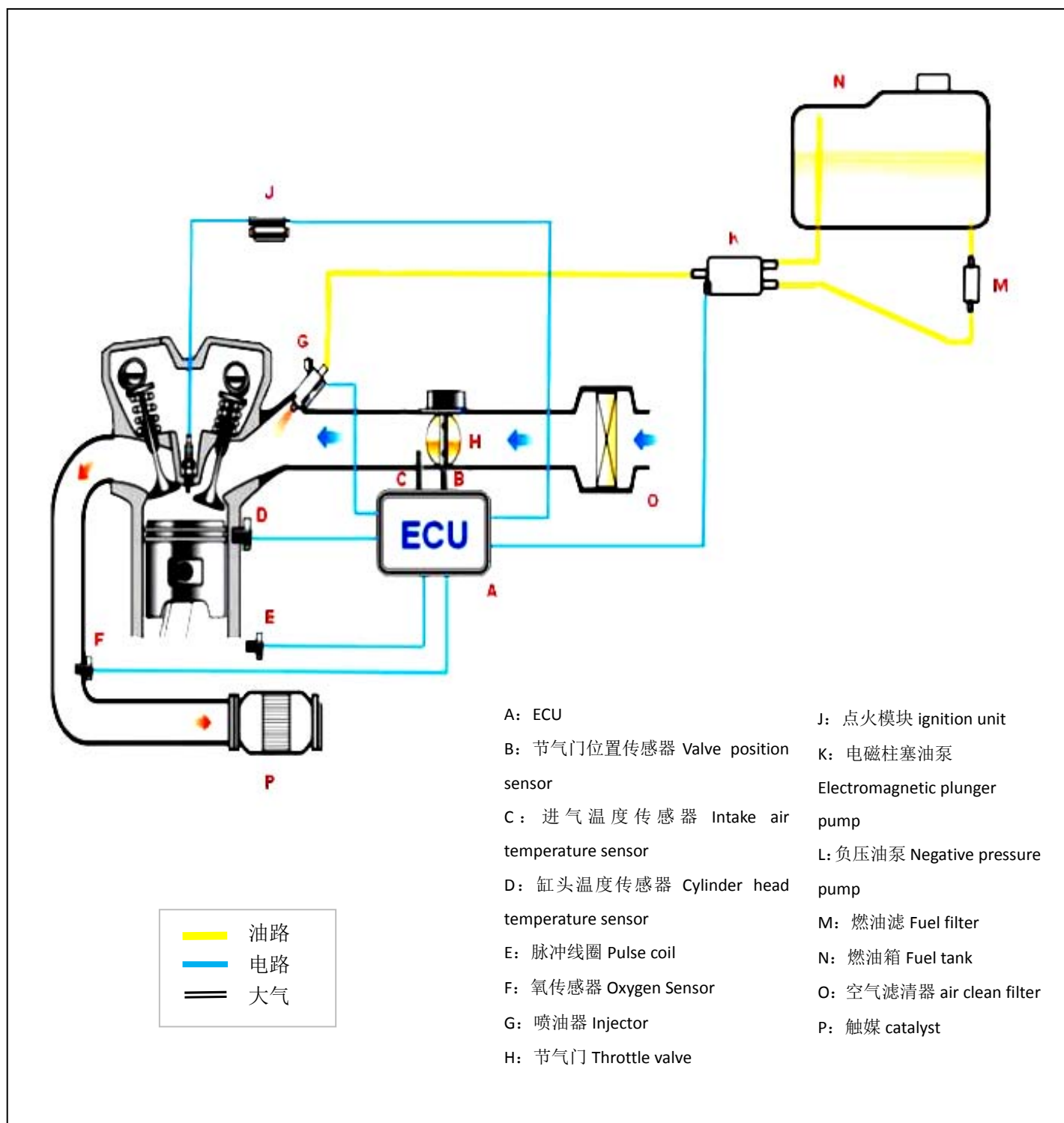
(4)超低油耗，比化油器节油 20%以上；

(4) Ultra-low fuel consumption, more than 20% fuel savings than carburetor;

(5)满足欧洲 IV 和未来的排放法规的要求；

(5) Meet the requirements of Euro IV and regulations of emission in the future.

电喷系统工作原理图 EFI system working principle diagram

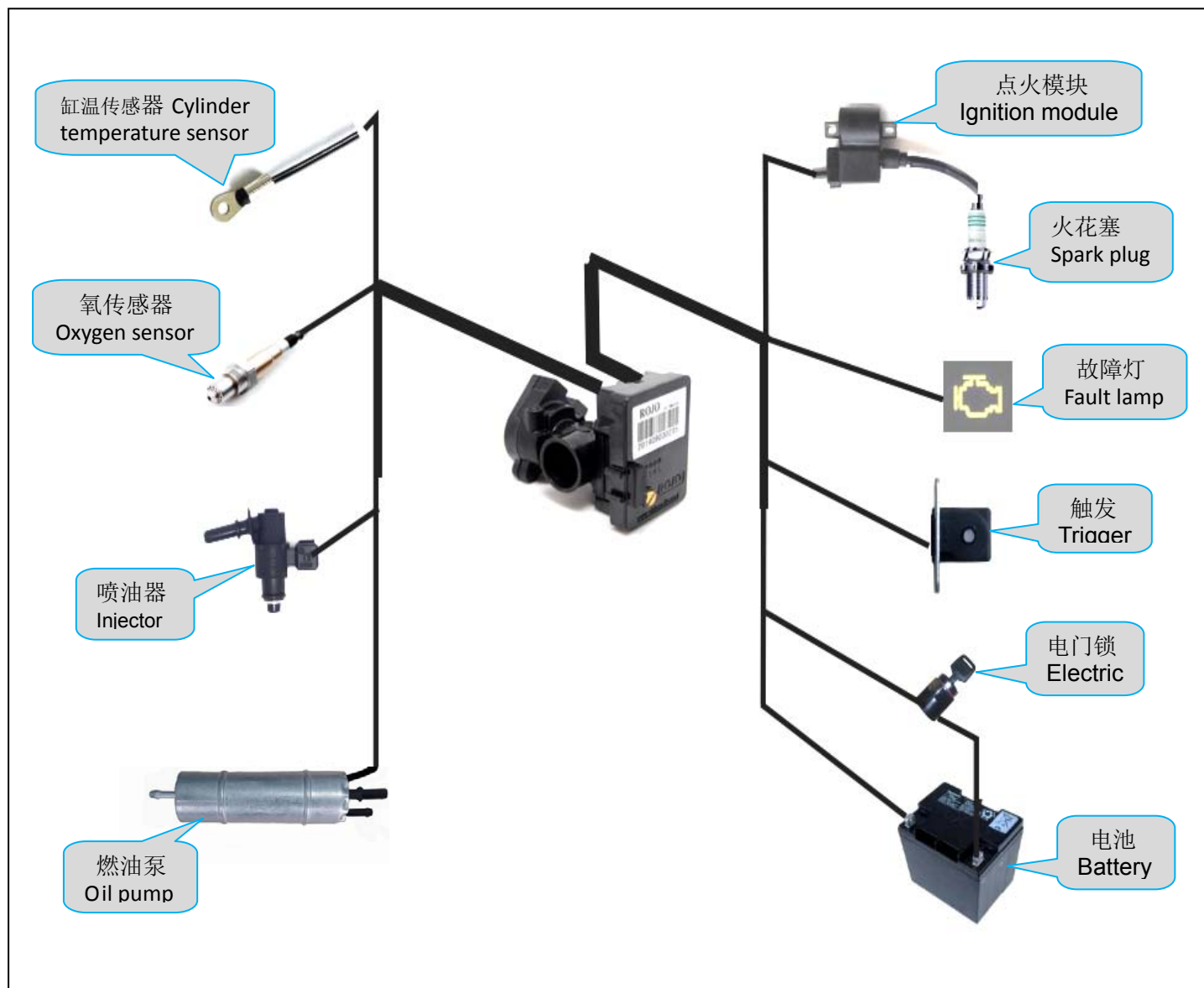


- 本电喷系统采用了开环和闭环两种工作模式。The EFI system uses open-loop and closed-loop two modes of operation.
- 开环模式：当发动机起动时系统采用开环工作模式，也就是 ECU 匹配时所设定的参数数据，当氧传感起效后，ECU 自动切换到闭环模式。●Open- loop mode: the system uses open-loop mode of operation when the engine started, that is the setting parameters for ECU matched , the ECU automatically switches to closed-loop mode when the oxygen sensing star the work.
- 闭环模式：闭环模式下氧传感器起着至关重要的作用，氧传感器实时监测排放中的氧含量并上传 ECU 分析，判断空燃比是否过浓还是过稀来控制喷油器的喷油量，使空燃比处于最佳的状态。●Closed-loop mode: oxygen sensor plays a vital role, the oxygen sensor monitors the oxygen value constantly in the emissions and upload to ECU for analysis, Control the fuel injection of the injector by determining the air-fuel ratio whether too thick or too thin.
- 当氧传感器失效时，ECU 自动切换到开环模式，使车辆能够继续行驶至维修站。●When the oxygen sensor does not work, the ECU automatically switches to open-loop mode, So that the bike will continue to ride to the maintenance station.

电喷系统基本结构 Basic structure of EFI system

电喷系统主要有三个部分：EFI system has three main parts:

- 1、控制器：ECU。1.Controller: ECU
- 2、传感器：节气门位置传感器、缸头温度传感器、进气温度传感器、氧传感器、触发传感器。
2.Sensors: Throttle Position Sensors, Cylinder Head Temperature Sensors, Intake Temperature Sensors, Oxygen Sensors, Trigger Sensors
- 3、执行器：喷油器、燃油泵、点火模块。3.Actuator: injector, fuel pump, ignition module.



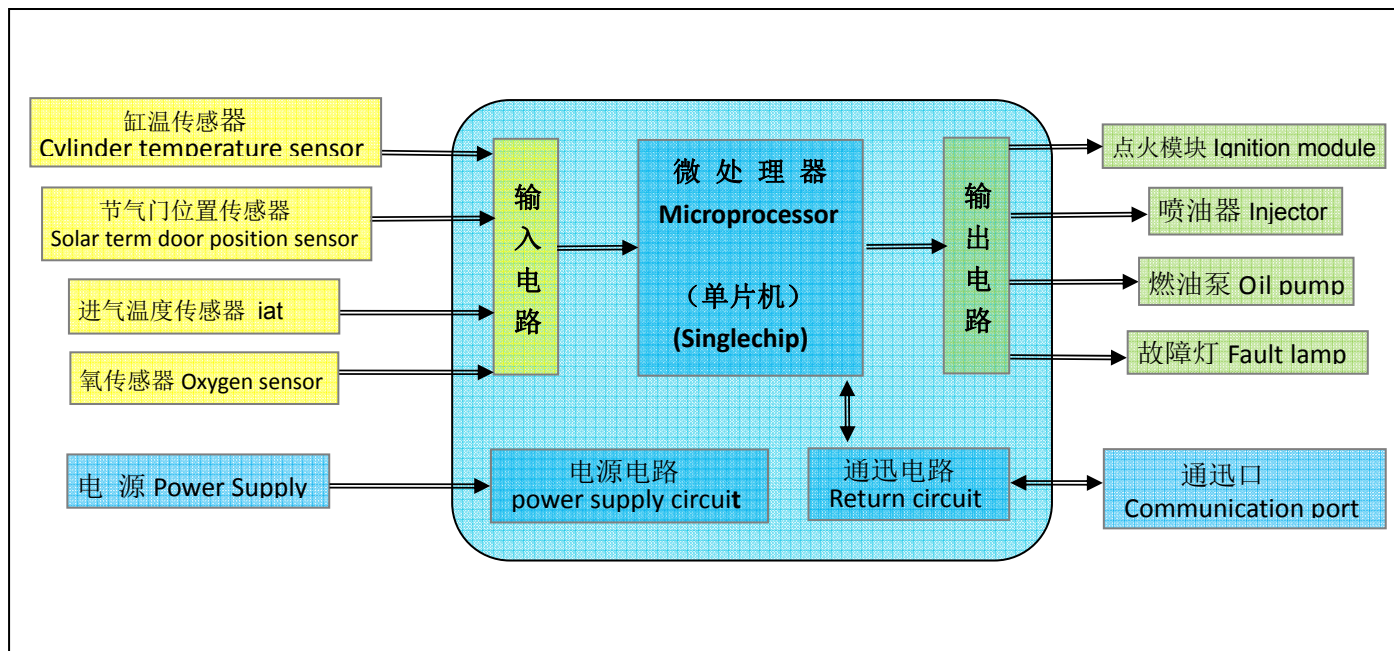
电喷系统部件的作用：The function of EFI components:

- 1、控制器：系统运作、数据采集、数据分析运算、执行器控制，在系统中好比人的“大脑”。
1. Controller: System operation, data acquisition, data analysis operations, actuator control, in the system like people's "brain."
- 2、传感器：对相关部位的工作环境实时监控、采集数据上传 ECU，在系统中好比人的“耳目”。
2. Sensor: the relevant monitoring the parts of the working environment constantly, data collection and upload to ECU, in the system like people's "eyes and ears."
- 3、执行器：替 ECU 执行相关部件的喷油和点火操作，在系统中好比人的“四肢”。
3. Actuator: take ECU to implement the fuel injection and ignition operation for related components, in the system like people's "limbs."

ECU

ECU 是发动机的燃油喷射系统里的一个电子控制单元（Electronic Control Unit），它是由输入电路、微处理器和输出电路等三部分组成。

ECU is an electronic control unit that in the fuel injection system of an engine. It consists of three parts, an input circuit, a microprocessor, and an output circuit.



ECU 的原理及功能 The principle and function of ECU

1、输入电路接受传感器和其它装置输入的信号，对信号进行过滤处理和放大，然后转换成一定伏特的输入电流。从传感器送到 ECU 输入电路的信号既有模拟信号也有数字信号，输入电路中的转换器可以将模拟信号转换为数字信号，然后传递给微处理器。

1.The input circuit accepts sensors and signals from other devices, filtered and amplified the signals, and then converted into a certain volt of the input current. The signals sent from the sensor to the ECU input circuit have both analog and digital signals, the converter in the input circuit converts the analog signal into a digital signal, then pass it to the microprocessor.

2、微处理器将上述已经预处理过的信号进行运算处理，并将处理数据送至输出电路。

2. The microprocessor processes the already processed signal and sends the processing data to the output circuit.

3、ECU 具有运算与控制的功能，发动机在运行时，它采集各传感器的信号，进行运算，并将运算的结果转变为控制信号，控制执行器的工作。

3. ECU has the function of operation and control,when the engine is working,it collects the signal of each sensor,to perform operations, and transforms the result of the operation into a control signal,control the work of the actuator.

4、ECU 实行对存储器（ROM、RAM）、输入/输出接口和其它外部电路的控制；存储器 ROM 中存放的程序是经过精确计算和大量实验取的数据为基础，这个固有程序在发动机工作时，不断地与采集来的各传感器的信号进行比较和计算。把比较和计算的结果控制发动机的点火、空燃比、怠速等多项参数的控制。

4. The ECU performs control the memory (ROM, RAM), the input / output interface and other external circuits; The program stored in the memory ROM is based on accurate calculations and a large number of experimental data, when the engine is in operationing, this inherent program is continually compared and calculated with the signals collected by the sensors. It control the ignition, air-fuel ratio, idle and many other parameters of the engine after comparison and calculation.

5、ECU 具有故障自诊断和保护功能，当系统产生故障时，它还能在 RAM 中自动记录故障代码并采用保护措施从上述的固有程序中读取替代程序来维持发动机的运转，使车辆能开到修理厂。

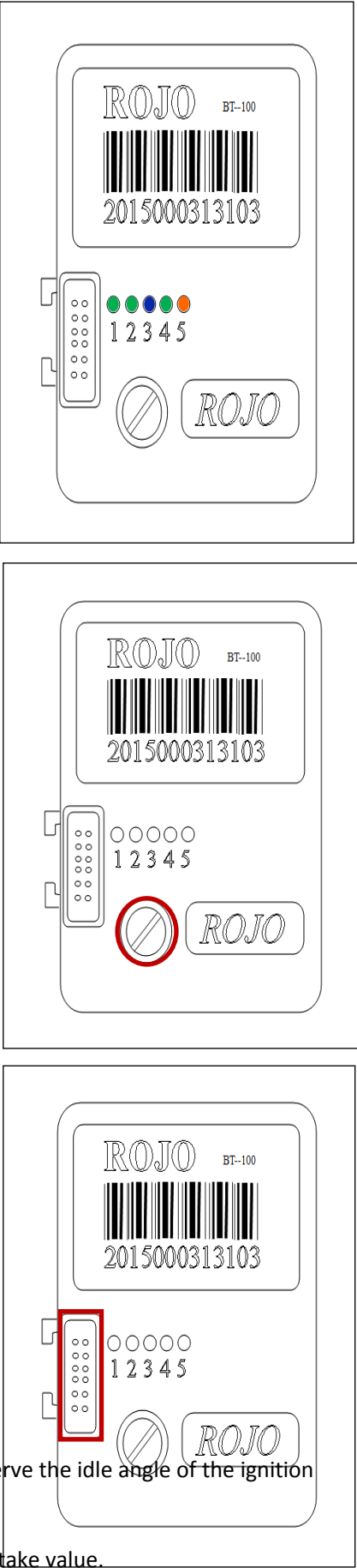
5. ECU has self-Trouble shooting and Protective function, when the system problem, it can automatically record the fault code in RAM, read the replacement procedure from the inherent program to keep the the engine working by Protective function, so that the bike can ride to the repair shop.

ECU 端口 ECU port

指示灯 Indicator

ECU 面板共有 5 个指示灯，前面的 4 个灯为信号指示灯，后面的 1 个黄色为故障指示灯。ECU panel totally has five lights, in front of the four lights are signal indicators, the last yellow one is a fault indicator.

灯 light	指示内容 indicator content	正常表现 Correct performance	灯灭表现 light off
1	油泵指示灯 fuel pump indicator	打开电门锁，亮 2~3 秒 open the main lock, and it's lighted for 2-3 seconds	常灭：驱动信号不能到达油泵 light off for a long time: the drving signal cannot reach fuel pump
2	喷油器指示灯 injector indicator	发动机运转后闪烁 flash after the engine running	常灭：驱动信号不能到达喷油器。light off for a long time:the driving signal cannot reach injector
3	点火指示灯 Ignition indicator	发动机运转后闪烁 flash after the engine running	常灭：说明无点火信号输出。1、2、3 灯都灭说明无角标信号输入 Light off for a long time: no ignition signal output.If all the 1,2,3 lights are extinguished, then it means there is no crank angle signal imput.
4	氧传感器指示灯 lambda sensor indicator	停机时：用于显示油门位置，油门在最小或最大位置时灯亮 when the vehicle stops, it shows the throttle position, the indicator is lighted when the throttle is at min. or max. position.	不亮则说明油门标定错误 If not lighted, then it means wrong throttle calibration
		发动机运转时：指示氧传电压，热机后明暗交替，1~3 次/秒 when the engine is running, it shows the lambda voltage; after warming, light and dark alternate, 1-3 times/second	常灭：表示没有氧传信号，没有进入闭环模式 Light off for a long time::means no lambda signal, and hasn't entered the ring close mode
5	故障信号 faults signal	电门锁开启亮 2~3 秒，然后熄灭 it's lighted for 2-3 seconds when open the main switch, then extinguish	常亮：说明系统存在故障 If lighted for a long time, it means the system has fault 发动机运转时：时亮时灭，则说明 ECU 受到干扰 when the engine is running, sometimes lighted and sometimes extinguished, it means ECU is interfered



怠速进气量调节螺钉 Idle intake air adjustment screw

● 通过手机 APP 观察怠速时的点火提前角（详见 5-16），合理值应在 8°~13° 之间。to observe the idle angle of the ignition through the mobile phone APP (see 5-16), a reasonable value should be between 8° ~ -13°.

● 如果过于提前（比如 5°），逆时针旋转调整螺钉，加大怠速进气量；

If it is too early (such as 5°), rotate the adjustment screw in counterclockwise to increase the idle intake value.

● 如果过于置后（比如 -15°），顺时针旋转怠速调整螺钉，减小怠速进气量。

If it is too late (such as -15 °), rotate the adjustment screw in clockwise to decrease the idle intake value.

通讯口 Communication port

● 连接电脑可以软件升级、参数修改、数据读取。

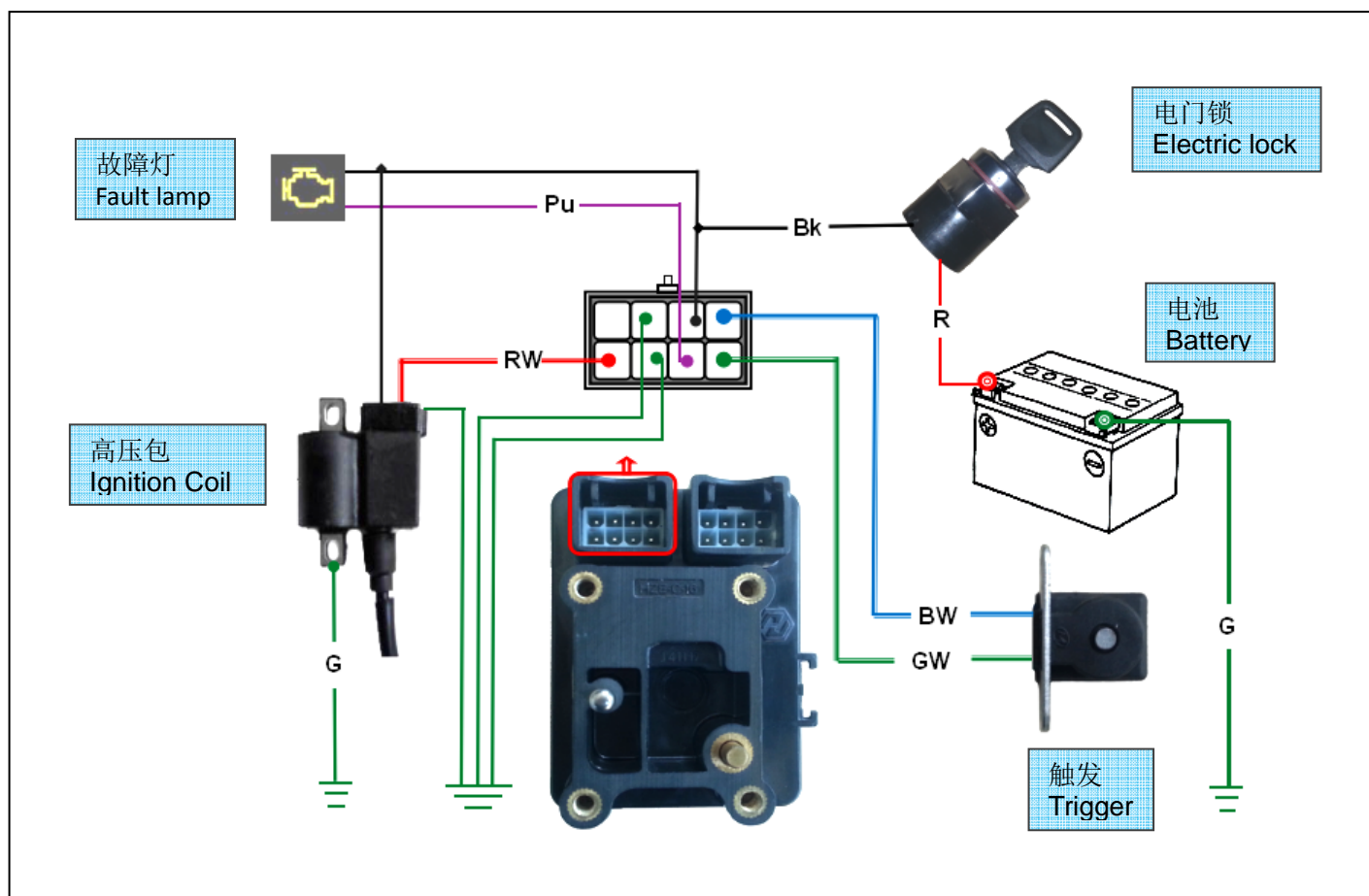
Connected the computer can be upgrade the software, modified parameters, read the data.

● 连接诊断仪可以查看实时数据、故障诊断、读取和消除故障代码。

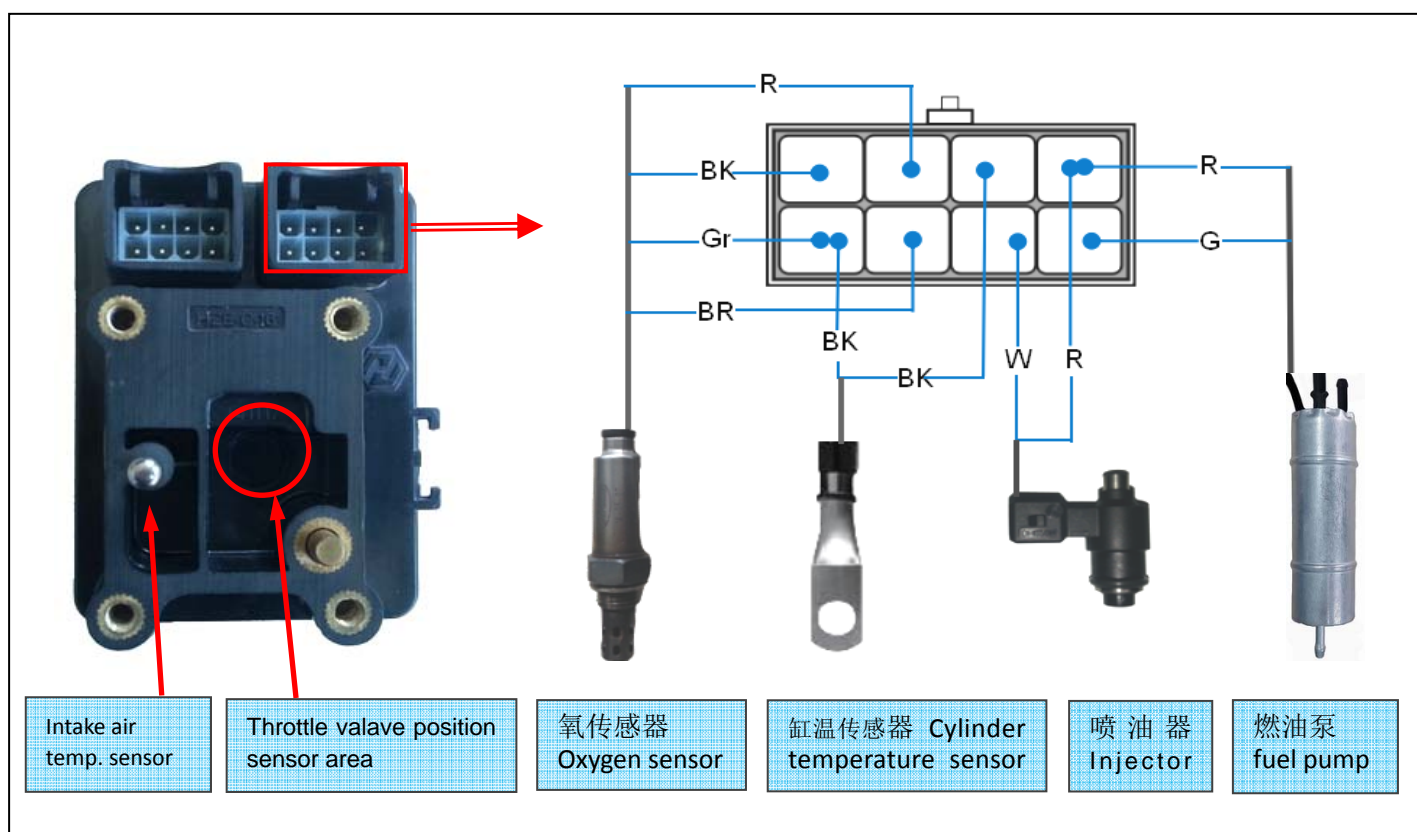
Connected the diagnostic tool to check the real-time data, trouble shooting, read and eliminate fault codes.

ECU 接线端口 ECU wiring end

导线连接口 Wire connection end (because the ECU system has been upgraded, here we have both old and new version)



传感器、执行器连接口 Sensor, actuator connection end



传感器 sensor

传感器主要有：节气门位置传感器、进气温度传感器、缸头温度传感器、氧传感器、触发传感器组成。在系统中好比人的“耳目”，对相关部位的工作环境实时监控、采集数据上传 ECU。

The sensors consist of throttle position sensor, intake air temperature sensor, cylinder head temperature sensor, oxygen sensor, trigger sensor.

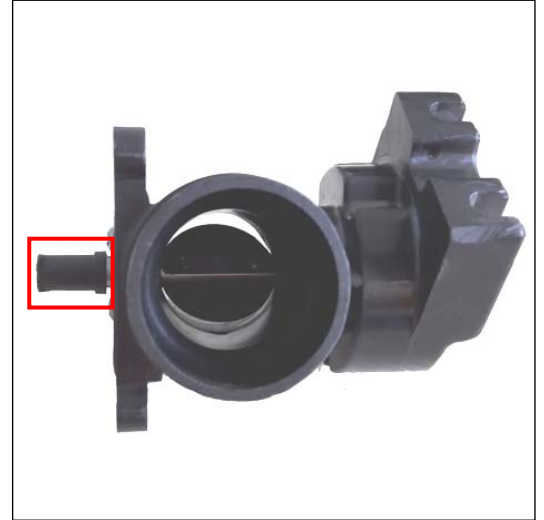
节气门位置传感器 Throttle valve position sensor

- 传感器磁性探头位于节气阀左侧。

The sensor magnetic probe is located on the left side of the throttle valve.

- 实时监控节气门开度位置，ECU 通过节气门开度分析、判断此时的进气流量，使 ECU 能够精确的控制喷油量。

Constantly monitor throttle opening position, ECU will analyze, determine the intake air flow through the throttle opening angle, so that the ECU can accurately control the value of fuel injection.



进气温度传感器 Intake air temperature sensor

- 进气温度传感器集成于 ECU 中。是能感受温度并转换成可用输出信号的传感器。

The intake air temperature sensor is integrated in the ECU. It is a sensor that can sense the temperature and convert it into an available output signal.

- 实时监控使用环境是否在高温或低温状态下，将温度转换成数字信号传递给 ECU 分析、判断，使 ECU 能够精确的控制喷油量。Constantly monitor the use of the environment whether at high temperature or low temperature condition, converts the temperature into a digital signal to the ECU, ECU will analyze, judge it, so that the ECU can accurately control the value of fuel injection.



缸头温度传感器 Cylinder head temperature sensor

- 缸头温度传感器位于缸头上左铡位置，是能感受温度并转换成可用输出信号的传感器。

The cylinder head temperature sensor is located in the left position of the cylinder head, which feel the temperature and convert it into usable output signal.

- 实时监测发动机温度，并转化为数字信号传递给 ECU 分析、判断引擎是否处于冷起动状态，使 ECU 能够精确的控制喷油量，获得最佳的启动性能。

constantly monitor of the engine temperature, and converted it to digital signals to the ECU, ECU will analyze, judge it whether the engine is in a cold start situation, so that the ECU can accurately control the value of fuel injection, get the best start performance.



氧传感器 Oxygen Sensor

- 氧传感器是闭环电喷中必不可少的最要元件。它对环保有着具大的贡献。

Oxygen sensor is the most important element in closed-loop EFI. It has a great contribution to environmental protection.

- 由于混合气的空燃比一旦偏离理论空燃比，三元催化器对 CO、HC 和 NOx 的净化能力将急剧下降，故在排气管中安装氧传感器，用以检测排气中氧的浓度，并向 ECU 发出反馈信号，再由 ECU 控制喷油器喷油量的增减，从而将混合气的空燃比控制在理论值附近。

once the air-fuel ratio of the mixture is deviated from the theoretical air-fuel ratio, the purification capacity of three-way catalytic converter for CO, HC and NOx will drop sharply, so install the oxygen sensor in the exhaust pipe, used to detect the concentration of oxygen in the exhaust, and sent the feedback signal to the ECU, then ECU control the fuel injection volume of injector whether increase or decrease, Thereby it control the air-fuel ratio of the mixture close to the theoretical value.

- 电喷为获得高排气净化率，降低排气中（CO）一氧化碳、（HC）碳氢化合物和（NOx）氮氧化合物成份，必须利用三元催化器。但为了能有效地使用三元催化器，必须精确地控制空燃比，使它始终接近理论空燃比。催化器安装在排气管与消声器之间。In order to obtain high exhaust gas purification rate, reduce the exhaust (CO) carbon monoxide, (HC) hydrocarbons and (NOx) nitrogen oxide components,EFI must use the three-way catalyst converter. However, in order to be use the three-way catalyst effectively, it is necessary to precisely control the air-fuel ratio so that it is always close to the theoretical air-fuel ratio. The catalyst is installed between the exhaust pipe and the muffler.

- 氧传感器具有一种特性，在理论空燃比（14.7：1）附近它输出的电压有突变。这种特性被用来检测排气中氧气的浓度并反馈给 ECU，以控制空燃比。当实际空燃比变高，在排气中氧气的浓度增加而氧传感器把混合气稀的状态（小电动势：0 伏）通知 ECU。当空燃比比理论空燃比低时，在排气中氧气的浓度降低，而氧传感器的状态（大电动势：1 伏）通知（ECU）电脑。

The oxygen sensor has a characteristic that there is a sudden change in the output voltage near the theoretical air-fuel ratio (14.7: 1). This characteristic is used to detect the concentration of oxygen in the exhaust gas and feed back to the ECU to control the air-fuel ratio. When the actual air-fuel ratio becomes higher, the concentration of oxygen in the exhaust gas been increased, the oxygen sensor informs the rare mixed gas situation to the ECU (small electromotive force: 0 volt). When the air-fuel ratio is lower than the theoretical air air-fuel ratio, the oxygen concentration in the exhaust gas is reduced, so the oxygen sensor informs the situation (large electromotive force: 1 volt) to ECU.

- ECU 根据来自氧传感器的电动势差别判断空燃比的低或高，并相应地控制喷油持续的时间。但是，如氧传感器有故障使输出的电动势不正常，（ECU）电脑就不能精确控制空燃比。所以氧传感器还能弥补由于机械及电喷系统其它部件磨损而引起空燃比的误差。可以说是电喷系统中唯一有“智能”的传感器。

According to the difference of electromotive force from the oxygen sensor, ECU to determine the air-fuel ratio whether low or high, and control the duration of the fuel injection accordingly. However, if the oxygen transmitter has problem,the the output of the electromotive force will be not normal, then the computer(ECU)can not accurately control the air-fuel ratio. So the oxygen sensor can make up for the air-fuel ratio error, which caused by wear of mechanical and other parts of the EFI system. It can be said the only "smart" sensor in EFI system.

- 传感器的作用是测定发动机燃烧后的排气中氧是否过剩的信息，即氧气含量，并把氧气含量转换成电压信号传递到发动机计算机，使发动机能够实现以过量空气因数为目标的闭环控制；确保三元催化转化器对排气中的碳氢化合物（HC）、一氧化碳（CO）和氮氧化合物（NOX）三种污染物都有最大的转化效率，最大程度地进行排放污染物的转化和净化。

The function of the sensor is to measure the oxygen in the exhaust gas whether excess after combustion of the engine, is oxygen value. The oxygen content is converted into a voltage signal and send it to computer. So that the engine can achieve the closed-loop control by excessive air factor as the goal. To ensure that the three-way catalytic converter have the greatest conversion efficiency for (HC), carbon oxide (CO) and nitrogen oxides (NOX) in the exhaust gas. It can maximize the conversion and purification to emissions of pollutants.

- 本车采用四线加热型氧传感器。The car bike use four-wire heating type oxygen sensor.
- 安装螺纹为 M14×1.25。The mounting thread is M14 × 1.25.

警告：Warning:

* 严禁私自拆除氧传感，

否则会导致发动机性能不稳定、油耗增大等现象。

Do not remove the oxygen sensor, otherwise it will lead to unstable engine performance, increased fuel consumption and so on.



执行器 Actuator

执行器主要有：喷油器、燃油泵、点火器组成。

The actuator mainly consists of fuel injector, fuel pump, ignition component.

在系统中好比人的“四肢”替 ECU 完成相关部件喷油和点火操作。

In the system like people's "limbs", to complete the fuel injection and ignition operation of relevant parts for ECU.

喷油器 Injector

- 喷油器在发动机每转两圈工作一次。

The injector works once every two rounds of the engine.

- 喷油器也就是常闭型电子流量阀，是由 ECU 送达的脉冲信号通过控制开启的时间来精确控制喷油量。

● The injector is a normally closed type electronic flow valve, it is pulse signal which delivered by the ECU, precisely control the value of fuel injection by controlling the opening time.

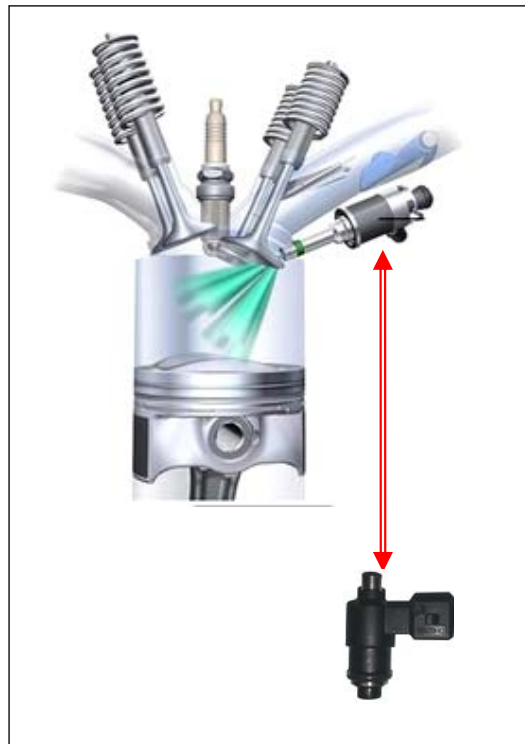
- 喷射供油的最大优点就是燃油供给控制十分精确，让引擎在任何状态下都能有正确的空燃比，不仅让引擎保持运转顺畅，也使其尾气排放能符合环保法规的要求。

The biggest advantage of fuel injection supply is very accurate for fuel supply control, so that the engine in any condition can be correct air-fuel ratio, not only keep the engine running smoothly, but also to make its emissions to meet the requirements of environmental regulations.

警告：Warning:

* 严禁私自更换喷油器，必须使用同型号的喷油器。

It is strictly forbidden to replace the injector, it must be use the same type of injector.

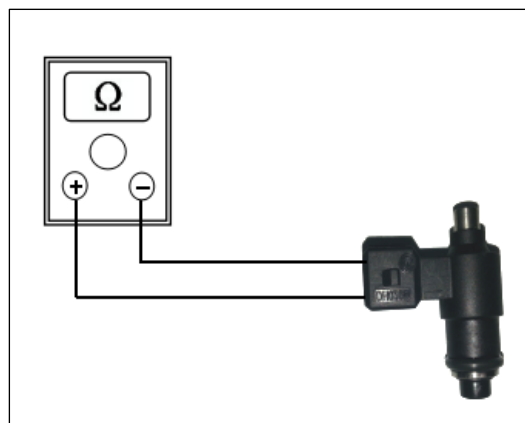


检查 Inspection

喷油器电阻值 Injector resistance

- 拔掉喷油器插件。
- 万用表调至欧姆“Ω”档位。
- 测量出喷油器的电阻。
- Disconnect the injector plug-in unit
- Adjust Multimeter to “Ω”
- Measure the injector resistance

喷油器电阻值 Injector resistance	12 ~ 17 Ω
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标定油门开度 Calibrated throttle opening

1、 标定油门开度的目的：是为了让节气阀体的阀门开度位置与 ECU 记忆的开度位置相匹配。

the purpose of calibrating the throttle opening:to match the throttle body valve opening position and ECU memory opening position.

3、 节气门开度的大小控制着进量的大小，为了让 ECU 精确的掌握进量的信息从而来实时的控制喷油量。因为油门开度标定的准确性直接影响电喷系统的稳定性，所以准确的油门标定是至关重要的。

the size of the throttle opening control the size of the volume, in order to allow the ECU to get information of intake volume and constantly control volume of fuel injection. Because the accuracy of the throttle opening calibration directly affects the stability of the EFI system.

4、 油门开度的标定在出厂前已完成标定程序，在系统正常情况下无需做油门开度的标定。

Calibration of throttle opening has been completed calibration process before leaving the factory. In the normal system, it does not need to do the throttle opening calibration.

5、 当车辆出现高怠速，拉油门熄火的现象时，应检查油门位置是否正确。

6、 When the vehicle appears high idle, flameout after pull the throttle, please check the throttle position whether correct.

油门开度的确认方法 Confirmation of throttle angle

。用钥匙使电门锁打开至“ON”档；

Turn on the ignition switch to "ON" by key;

。不起动发动机，油门在复位状态，ECU 上 4 号灯是点亮的；

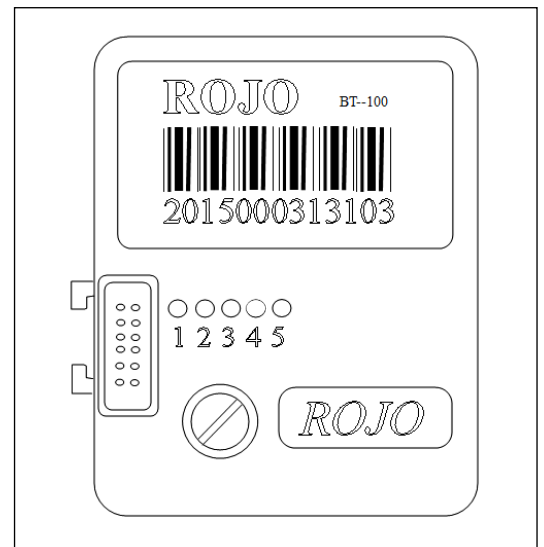
Does not start the engine, the throttle in the reset state, No.4 light on ECU is lighting;

。在油门全开的环境下，ECU 上 4 号灯也是点亮的；

In the case of throttle fully open, No.4 light on ECU is lighting too;

。如果有不亮的现情况，则油门需要重新标定，

If there is no light on the situation, the throttle need to re-calibration.



油门开度的标定方法 Calibration method of throttle angle

。用钥匙使电门锁关闭至“OFF”档。

Turn off the ignition switch to "OFF" by key.

。将油门手柄旋转至最大开度时保持不动。

Rotate the throttle grip to the biggest angle and keep it

。再将电门锁打开至“ON”档。

Turn on the ignition switch to "ON" by key

。待故障灯熄灭或电子燃油泵停止发出“吱...吱...吱...”声音后，松开油门手柄到最小开度。

When the fault light off or the electronic fuel pump stopped and sending "squeak ... squeak ..." ,loose the throttle grip to the smallest angle.

。然后使电门锁关闭至“OFF”档，即标定结束。

Then turn off the ignition switch to "OFF", that is calibration end.



注意：Warning

1.标定前得检查油门拉线有无空行程，能否放到底，能否拉到底。

Before the calibration,it need to check the throttle cable whether no empty trip,pull it well.

2.在拉油门到底时要固定不能动，否则标定无法进入。

Keep Rotate the throttle to the end without any move, otherwise it can not enter the calibration.

3.油门标定动作同时也是恢复出厂设置动作，因此做完此动作后要安排做一次快速自习，这样发动机性能才能达到最佳。Throttle calibration action is also the factory reset, so make a quick self-learning after doing this action, the engine performance could be the best.

恢复出厂设置 Factory reset

1、重新标定油门开度也就是恢复出厂设置。

Re-calibration throttle angle is to be factory reset.

2、恢复出厂设置后要安排做一次快速自学习，这样发动机性能才能达到最佳。

make a quick self-learning after factory reset, the engine performance could be the best.

快速自学习 Quick self-learning

1、当电喷车出现油耗高，动力差，容易熄火现象时，可尝试进行一次快速自学习。

When the EFI bike become high fuel consumption, poor power, easy to flameout, try a quick self-learning.

2、高海拔地区用户，使用前，建议安排一次快速自学习。

if in the high altitude area, it is recommended that to make a quick self-learning before it may used.

3、学习成功后，此时动力应该是最佳状态，如果感觉还有问题，可以重复学习，直至达到理想状态。

the power should be the best condition after the successful learning, if there is another problem, you can repeat the learning until it reach the ideal condition.

4、快速自学习有两种学习方式：There are two ways of quick self-learning:

一种是利用电脑调试软件上学习（详见 5-22 页）

One is learning on computer by debugging software.(see 5-22)

另一种为调试模式下学习，进入调试模式如下：

The other is learning under the debug mode, enter the debug mode is as follows:

- 拉油门到最大开度，然后打开电门锁，两秒钟左右放开油门，此时仪表故障灯点亮，表示成功进入调试模式。

Rotate the throttle to the biggest angle, and turn on the ignition switch, then release the throttle grip after 2 seconds. When the fault indicator keeps lighting, it means successfully entered the debug mode.

- 启动发动机，拉油门热机 10 秒左右，然后放油门到怠速位置，此时怠速自学习开始，学习完毕后仪表故障灯会熄灭。

Start the engine, rotate the throttle for warming the machine about 10 seconds, and rotate the throttle to the idle position, then begin to idling self-learning, the fault indicator will be off after learning.

- 拉油门进入下一个学习点，学习点共 5 个，对应的油门开度（百分比表示）分别是 0、8%、25%、50%、100%，油门在学习点附近仪表故障灯会亮起，此时稳住油门不动，直至学习完毕灭灯。

Rotate the throttle into the next learning point, totally 5 point, the corresponding throttle angle (percent presentation) is 0,8%, 25%, 50%, 100%, the fault indicator will lighting when throttle near the learning point,keep the throttle without any move at this time until the learning light completely off.

- 当学习完成后，发动机会自动熄火，关闭钥匙结束自学习过程。

After learning, the engine will turn off automatically, close the key and finish the learning process.

5、注意事项 Note

- 在怠速学习过程中观察发动机转速，应该在 1400 到 1800 转之间，如果太低则逆时针调整怠速气量螺钉，太高则顺时针调整气量螺钉，边调整边观察转速的变化。见图

Observe the engine speed in the idle learning process, it should be between 1400 rpm to 1800 rpm, adjust the idle air volume screw in counterclockwise if it is too low, adjust the idle air volume screw in clockwise if it is too high, adjusting the screw as well as observationing the speed.

- 学习时排气管较热，最好有风机冷却，在没有风机冷却的情况下，可以中间安排停机冷却，学学停停，直至把全部点学完。

Exhaust pipe is hot when learning, it is better to have a fan for cooling. You can arrange the short break if without the fan. Learn alternates with rest until finish all the 5 points.

注意：Warning

因为恢复出厂设置要安排做一次快速自学习，所以在系统没有出现异常时，不要随意的进入恢复出厂设置模式。Because to factory reset needs a quick self-learning. Do not enter the factory reset at random if there is no system problem.

故障灯 fault indicator

- 本系统有两个故障灯，分别位于仪表盘右侧和 ECU 面板上的第 5 个红包指示灯。

The system has two fault indicators, one on the right side of the speedometer, other one is the fifth red indicator on the ECU panel.

- 当电喷系统检测到执行器和传感器出现故障时，故障灯将会启亮。

When the EFI system detects that the actuator and sensor are fault, the fault indicator will lighting.

- 本系统中故障灯存在两种亮灯模式：正常模式、诊断模式：

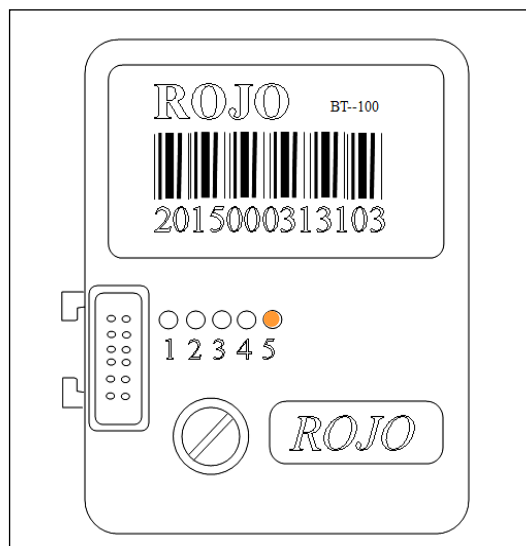
There are two lighting modes in the system: normal mode, diagnostic mode:

1. 正常模式也就是不闪亮模式，当接通电源时故障灯启亮 5-6 秒，然后熄灭，当出现故障时故障灯常亮。

Normal mode is not flashing mode, the fault indicator lighting for 5-6 seconds when connect the power, and then light off. The fault indicator lighting when there is problem.

2. 诊断模式也就是闪灯模式，当出现故障时故障灯会闪烁，根据闪灯次数判断相应的故障内容。

The diagnostic mode is flashing mode, the fault light will flash ing when there is problem. To determine the fault content according to the number of flashing.



诊断模式 Diagnosis mode

当故障灯常亮，且没有 OBT 诊断仪时，可以进入诊断模式判断相应的故障问题：

When the fault indicator keeps lighting, and there is no OBD diagnosis tool, we can diagnose the fault by entering diagnosis mode:

- 用钥匙使电门锁打开至“ON”档。
- Turn on the main switch to “ON” by key

- 在 1 秒内将油门手柄旋转到最大开度 2 次，进入诊断模式，
- Rotate the throttle grip to the biggest angle twice within 1 second, then enter the diagnosis mode



故障灯 闪烁相对应的故障内容 Fault Check List(based on the indicator flashes)

根据仪表盘或 ECU 上的故障灯闪烁次数判定故障内容：

存在单个故障时，重复闪相同故障码：比如闪 5 下，停 1 秒，又闪 5 下，停 1 秒，不停重复，则属于“角标传感器”故障；同时存在多个故障时，循环闪故障码，不断重复，比如闪 5 下，停 1 秒，闪 8 下，停 1 秒，又闪 5 下，停一秒，再闪 8 下，不停重复，则说明同时有“角标传感器”故障，和“喷油器”故障。

Fix the fault by the flashes of the indicator on speedometer or ECU:

Single fault, flash the same fault code repeatedly, e.g., flash 5 times, stop for 1 second, then flash 5 times again, stop for 1 second, repeatedly, then that means it's angle sensor fault ; multi fault, flash the fault codes in circle repeatedly, e.g., flash 5 times, stop for 1 second, flash 8 times, stop for 1 second, then flash 5 times again, stop for 1 second, then flash 8 times, repeatedly, that it means “angle sensor” fault and “injector” fault

NEW VERSION WITH THE THIRD INDICATOR IN BLUE			
闪灯次数 flash times	故障对象 Fault	故障内容 Fault content	故障排除 Solution
2	角标传感器 Angle sensor	无角标信号，角标信号受干扰 No Angle signal, the angle signal is interfered	1、是否更换了无电阻的火花塞？ Whether use the spark plug without resistance? 2、是否更换了无电阻的火花塞帽？ Whether use the spark plug cap without resistance?
3	节气门位置传感器 throttle valve sensor	超出合理范围 over the reasonable range	按照“油门标定或恢复出厂设置”步骤重新标定，或更换节气门体， Reset according to the steps from “ throttle Re-calibration or factory reset”, or change throttle valve body
4	氧传感器 Lambda sensor	1、氧加热开路或短路； The lambda heating is open circuit or short circuit 2、氧信号过高 lambda signal is too high; 3、在氧传感器起效之后，信号为 0 Signal is 0 when the lambda sensor starts to work	检查氧传感器插件，尝试更换氧传感器 check the lambda sensor plug-in unit, and try to change the lambda sensor
5	缸头温度 Temperature of cylinder head	超出合理范围 over the reasonable range	检查缸温传感器插件或更换缸温传感器 Check the plug-in unit of cylinder temperature sensor or change cylinder temperature sensor
6	进气温度 temperature of air in	超出合理范围 over the reasonable range	更换 ECU，或连同节气门体一起更换 Change ECU, or change together with throttle valve body
7	电池电压 battery voltage	电压超出 15.6V voltage is over 15.6V	尝试断开稳压器插头，如故障消失，则更换稳压器 Try to cut the rectifier plug, if the fault solved, then change rectifier
8	喷油器 injector	开路或者短路 open circuit or short circuit	检查接插件，尝试更换喷油器 Check the plug-in unit, and try to change the injector
9	油泵 fuel pump	开路或者短路 open circuit or short circuit	检查接插件，尝试更换油泵 Check the plug-in unit, and try to change the fuel pump
10	点火输出 ignition output	开路 open circuit	检查接插件，尝试更换点火模块 Check the plug-in unit, and try to change the ignition module
11	ECU	软件损坏 software damage	检查火花塞和火花帽电阻，换 ECU Check the resistance of spark plug and spark plug cap, change ECU
12	电磁干扰 electromagnet ic interference	系统受到干扰 system is interfered	同闪码“2”排除干扰源 Eliminate the interference source same as flash code “2”

故障诊断 Fault Diagnosis

当故障灯启亮时，则说明电喷系统出现故障，需要进行检查和维修，方法如下：

When the fault indicator is lighted, then it means the fuel injection system has problem, which requires check and repair. The methods are as follows (totally 3 methods),

故障诊断一共有 3 种方法，1. 通过 OBT 诊断端口：用故障诊断仪读出故障代码；

2. 通过手机 APP 诊断：用外置蓝牙连接手机 APP 读出故障代码；

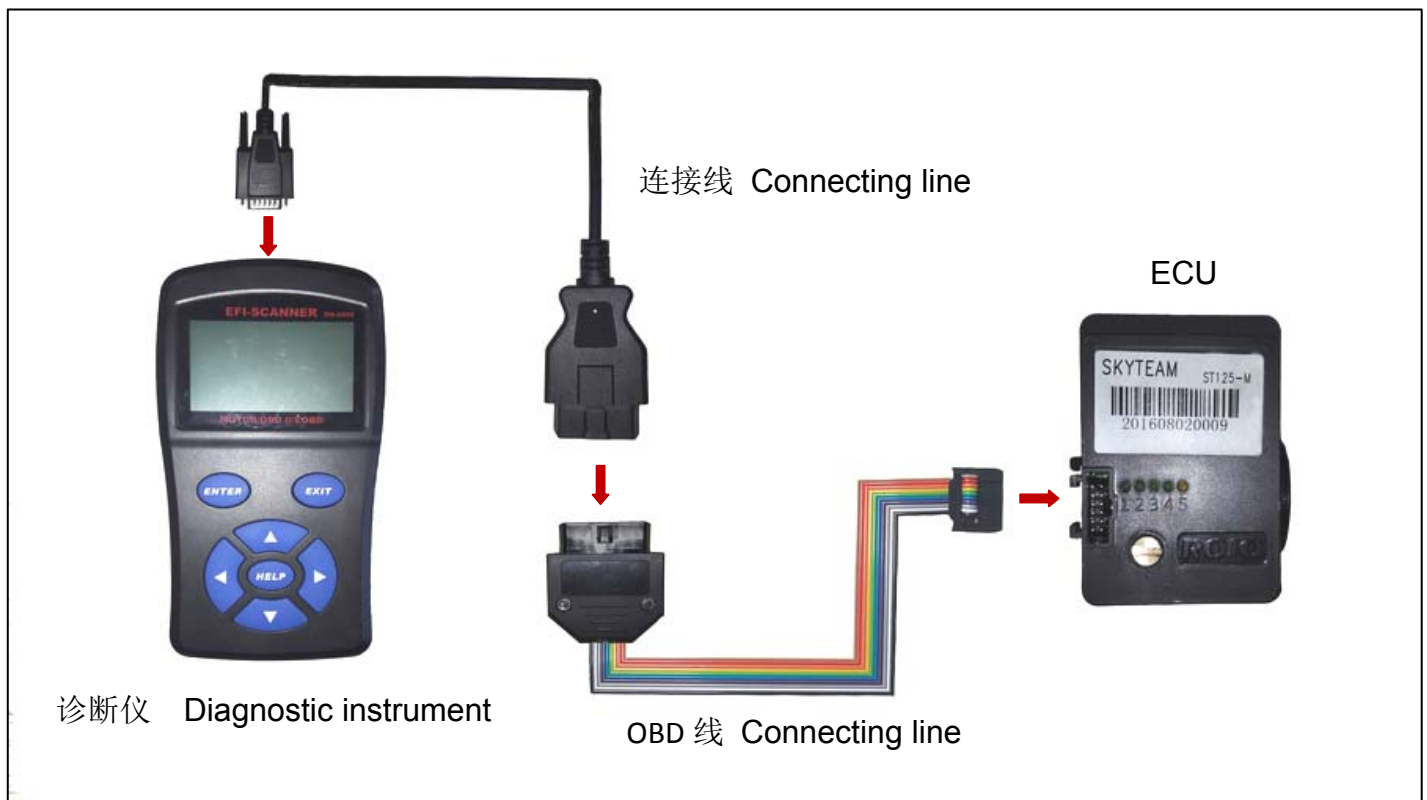
3. 进入诊断模式诊断：观察故障灯闪烁次数，对照检查表找出故障内容。

1. Use the diagnosis tool to read the fault code through OBD diagnosis end.

2. Use bluetooth plus the mobile phone APP to reach the fault code.

3. After entering the diagnosis mode, then we should check the flash frequency of the fault indicator, and find out the fault on the check list.

OBD Diagnosis

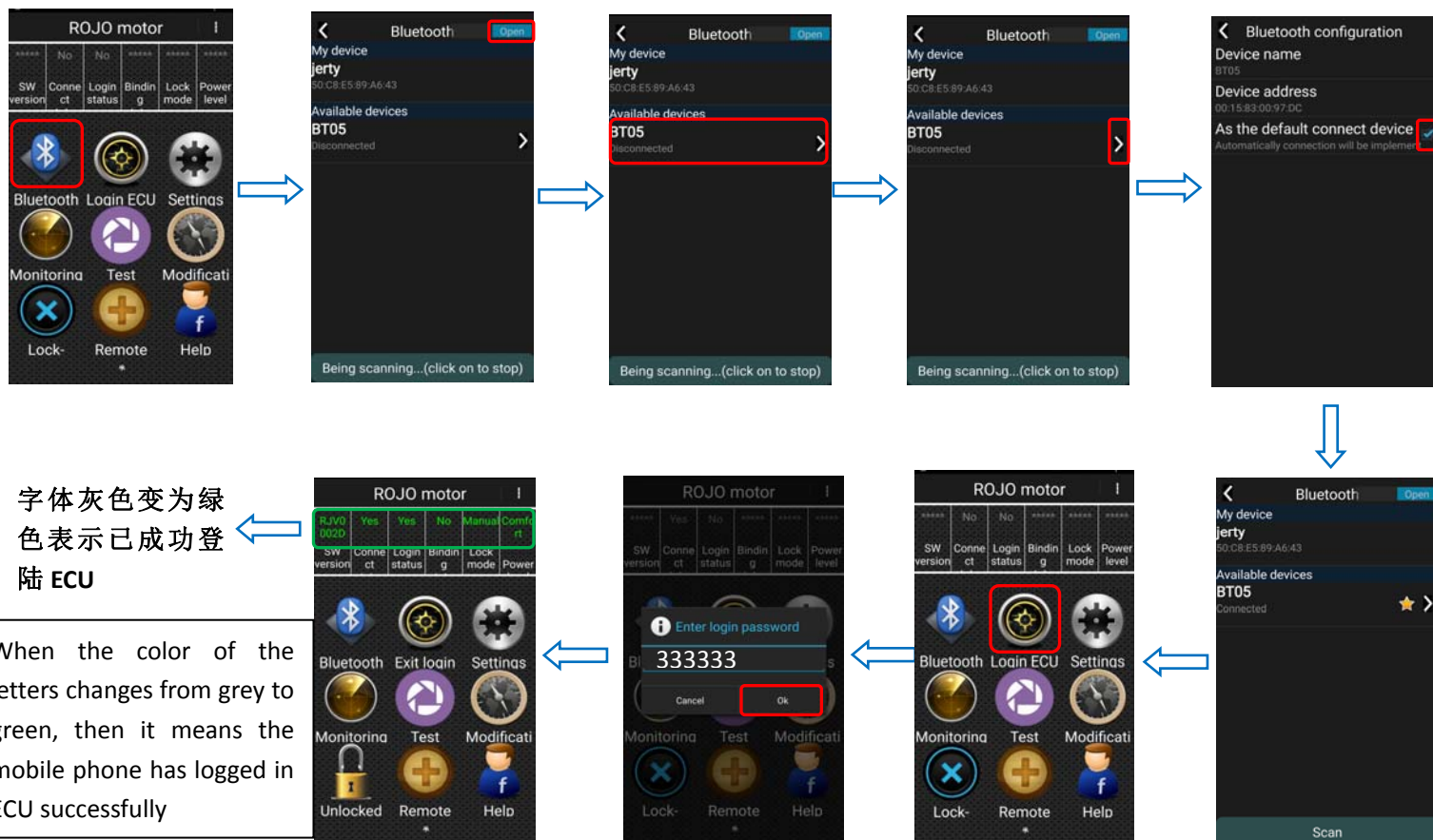
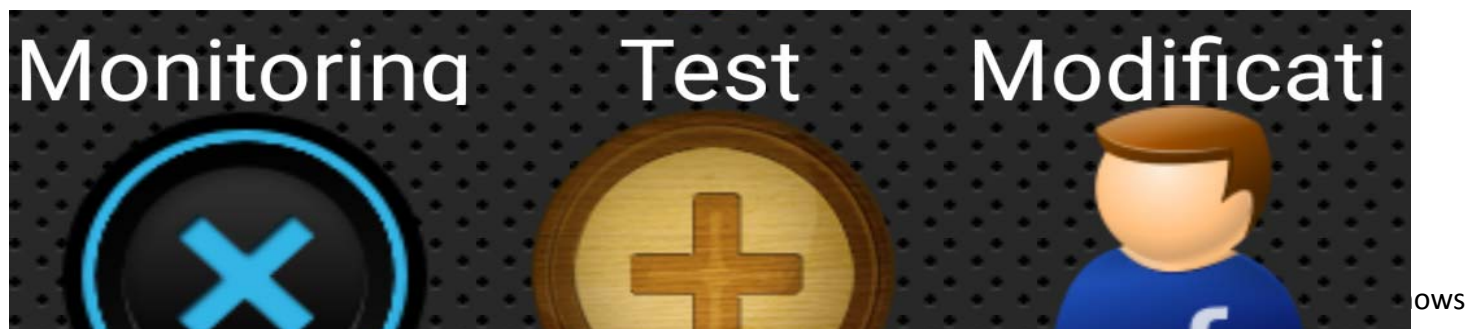


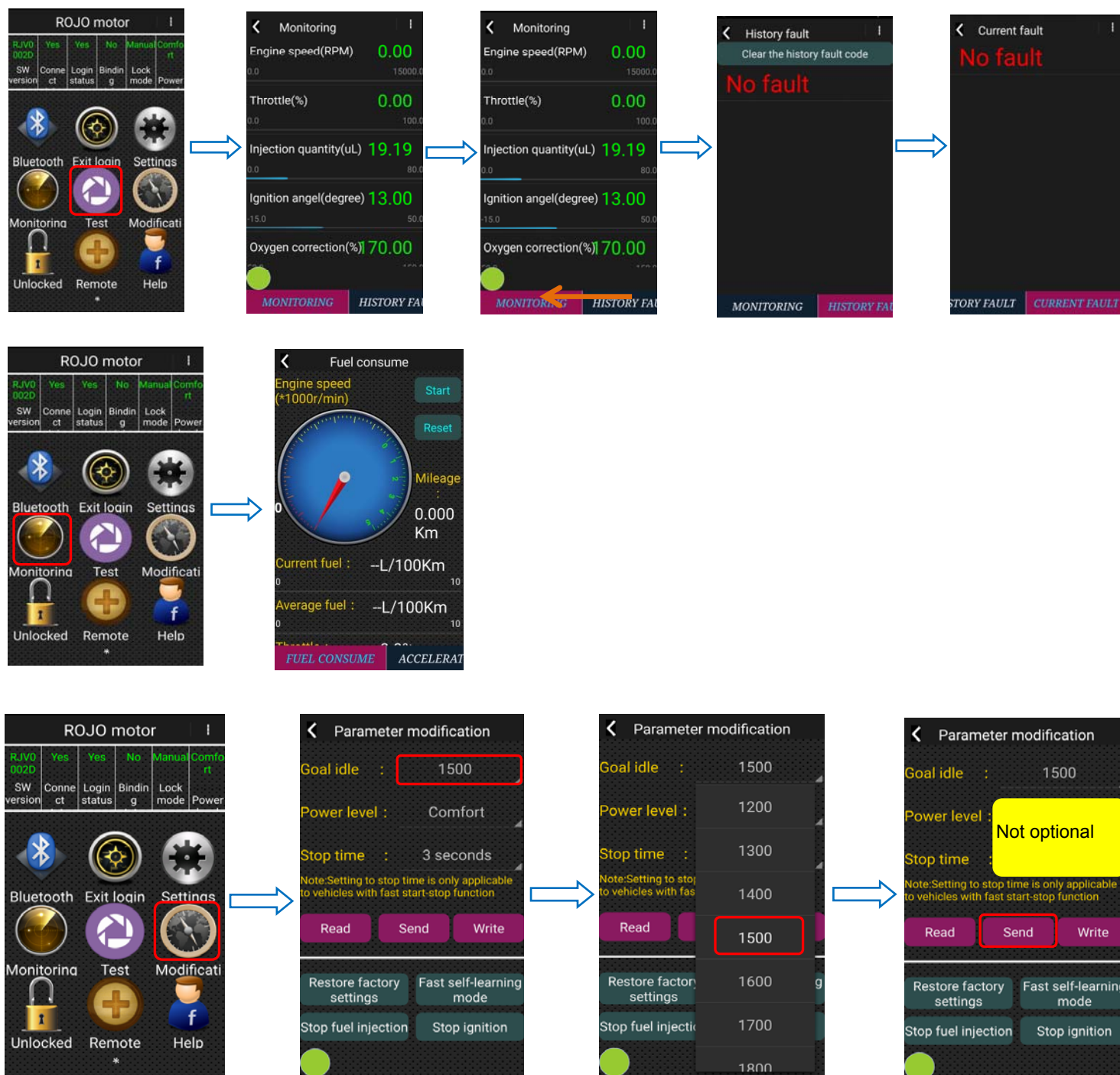
- 用钥匙使电门锁关闭至“OFF”档；
- Turn off the main switch to “OFF” by key
- 将诊断仪用连接线使之与 ECU 通讯端口相连接（如图）；
- Connect the diagnosis tool with ECU communications end by connecting wire
- 打开电门锁至“ON”档；
- Turn on the main switch to “ON”
- 诊断仪的使用步骤详见“诊断仪说明书”。
- The detailed using steps of diagnosis tool please check the user’s manual of diagnosis tool

故障代码对照表 Fault Code Check

Fault code 故障码	DTC naming 故障名称	Fault detection criteria 故障检测标准
P0110	Intake Air Temperature Sensor 1 Circuit 进气温度电路故障	The signal voltage is more than the specified value 1 or less than specified value 2. 信号电压大于指定值1, 或者小于指定值2
P0115	Engine Coolant Temperature Sensor 1 Circuit 缸头温度传感器电路故障	The signal voltage is more than the specified value 1 or less than specified value 2 信号电压大于指定值1, 或者小于指定值2
P0118	Engine Coolant Temperature Sensor 1 Circuit High 缸头温度信号过高	The signal voltage is more than the specified Value. 信号电压大于指定值
P0121	Throttle Position Sensor Circuit Range 节气门位置传感器信号信号超范围	TPS 信号大于 4.95V, 或者小 0.05V
P0132	O2 Sensor Circuit High Voltage 氧传感器信号过高	The signal voltage is more than the specified value. 氧信号电压大于指定值
P0133	Slow reaction from O2 Sensor 氧传感器响应慢	The time from low voltage to high voltage is more than the specified value. 从低电压到高电压所用的时间大于指定值
P0335	Crankshaft Position Sensor "A" Circuit 曲轴位置传感器电路故障	Resistance between input and ground is greater than the specified value 输入端与地之间的电阻大于指定值
P0336	Crankshaft Position Sensor "A" Circuit Performance 曲轴位置传感器信号性能 置传感器信号性能	positive pulses numbs are not equal to negative pulses numbers. 正脉冲个数不等于负脉冲个数

手机 APP 诊断 Diagonose by Mobile phone





主要故障速查表 Fault check list

分类 category	故障源 Fault source	故障现象 Fault phenomenon	故障灯 Fault indicator	故障机理和排除方法 Cause and Solution
气路 Air supply	怠速气量过低 air volumn is too low at idling	容易熄火 easy cutoff	Fault indicator flashes twice, idle speed is too low	idle pass is blocked, wash by detergent
	进气管螺钉松动 screw of pipe inlet is loose	容易熄火 easy cutoff		too much air, thin fuel and air mixture, tight
油路 Fuel supply	油泵压力不足 pressure of fuel pump is not enough	容易熄火 easy cutoff 加速无力 weak accelaration		insufficient injecting volumn, fuel atomization is not good, replace the pump
	负压泵供油量不足 fuel supply from the vacuum pump is not enough	容易熄火 easy cutoff 加速无力 weak accelaration		fuel pump is hard to get cool, air blocked, replace the vacuum pump
	管路弯折不通畅 the hose is bended and the fuel cannot go through smoothly	容易熄火 easy cutoff 加速无力 weak accelaration		air blocked during engine warming, elimincate the bend
	喷油器滴漏或者长喷 Injector drips or spays for a long time	启动困难 hard to start 加速无力 weak accelaration		fuel and air mixture is too thick, replace the injector
	喷油器喷孔或滤网堵塞 Block in the injector hole or filter net	启动困难 hard to start off 容易熄火 easy cutoff 加速无力 weak accelaration		Injecting volumn is too small, replace the fuel filter, wash or replace the injector
点火 Ignition	点火模块故障 ignition unit fault	启动困难 hard to start off 容易熄火 easy cutoff 加速无力 weak accelaration		no spark or weak spark, replace
	火花塞失效 spark plug is invalid	启动困难 hard to start off 容易熄火 easy cutoff		no spark or weak spark, replace
	火花塞或火花帽无电阻 no resistance on the spark plug or spark plug cap	容易熄火 easy cutoff	故障灯闪 13 下 fault indicator flashes 13 times	interfere with the working of ECU, replace the spark plug or spark plug cap with resistance
电路 Electricity supply	电瓶接线端子接触不良 bad contact of battery connecting terminal	启动困难 hard to start off		unsteady electricity supply by ECU, tight
	线束和接插件故障 fault of wiring harness and plug-in unit	容易熄火 easy cutoff	故障灯闪烁 fault indicator flashes	Influence the receiving and sending of signal, eliminate the loose problem
	整流器故障 rectifier fault	容易熄火 easy cutoff 加速无力 weak accelaration	故障灯闪 7 下 fault indicator flashes 7 times	Voltage fluctuates too much, which interferes or damage ECU and battery, replace
发动机 Engine	气门间隙过小 the vavle clearance is too small	启动困难 hard to start off 容易熄火 easy cutoff		The valve cannot get fully closed, and the pressure in the cylinder is low, enlarge the clearance
传感器 Sensor	缸头温度传感器失效 the cylinder head temperature sensor is invalid	启动困难 hard to start off	故障灯闪 2 下 fault indicator flashes 2 times	Fuel is not enough by cool start, check plug or replace
	氧浓度传感器失效 O2 concentrations is invalid	容易熄火 easy cutoff 加速无力 weak accelaration	故障灯闪 4 下 fault indicator flashes 4 times	the closed loop of injecting volumn is invalid, result in the fault injectin volumn, chech the plug, replace the sensor
	磁电机间隙大于 1mm magnetor clearance is over 1mm	启动困难 hard to start off	故障灯闪 5 下 fault indicator flashes 5 times	insufficient voltage at low speed angle signal , reduce the clearance
	磁电机间隙小于 0.5mm magnetor clearance is less than 1mm	容易熄火 easy cutoff 加速无力 weak accelaration	故障灯闪 5 下 fault indicator flashes 5 times	noise wave of high speed Crank angle signal, enlarge clearance
ECU	自学错误 Memory fault	启动困难 hard to start off		because of abnormal O2 sensor, reset
	软件或硬件损坏 damage on software and hardware	容易熄火 easy cutoff 加速无力 weak accelaration	故障灯闪 12 下 fault indicator flashes 12 times	spark plug cap, spark plug or rectifier is not qualified, which results in the damage of ECU software or hardware

燃油供给系统原理 Fuel supply system principle... 6—1

燃油泵 ...fuel pump..... 6—2

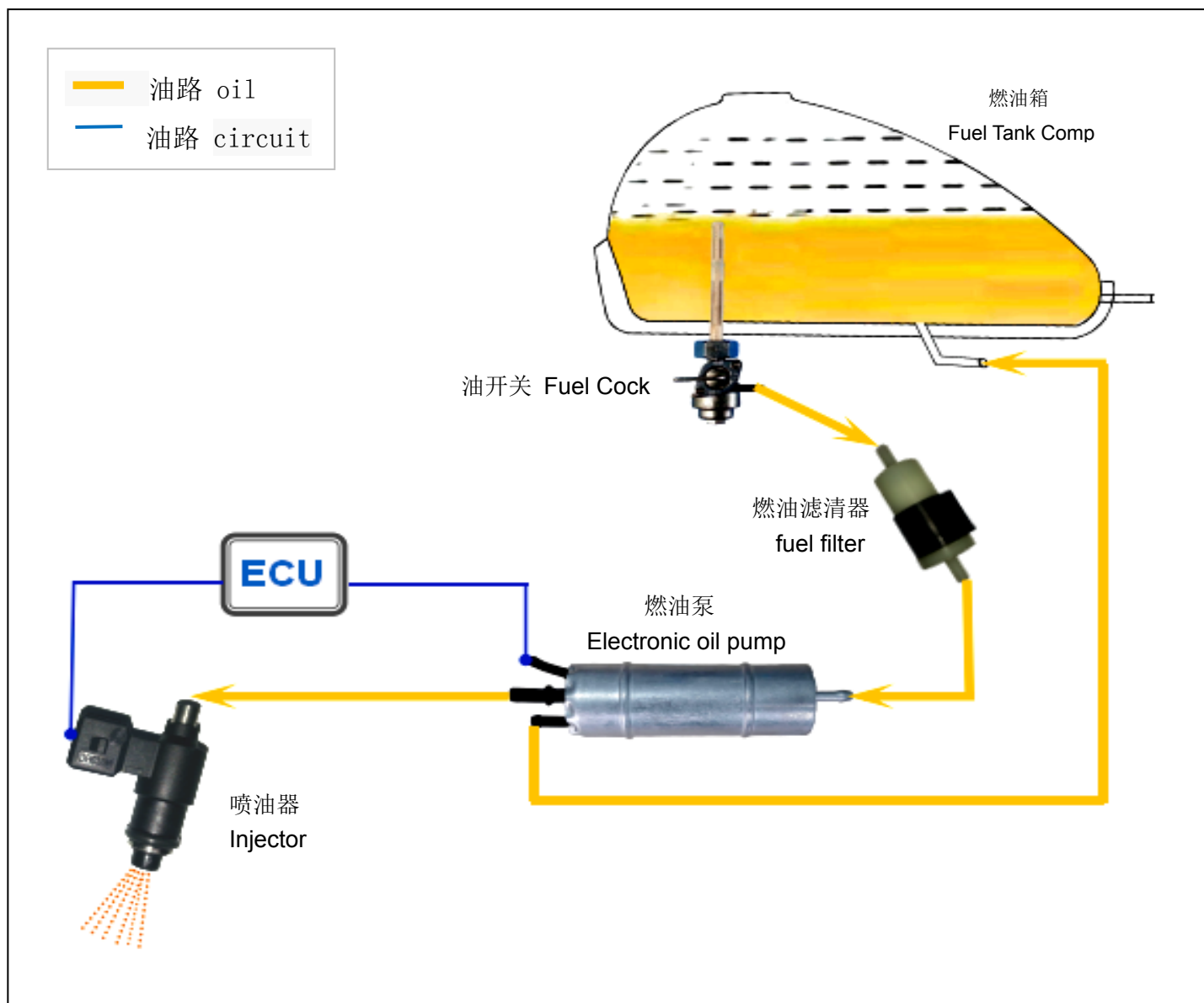
故障排除 ...Trouble shooting..... 6—3

燃油箱 ...Fuel Tank Comp..... 6—4

燃油供给系统 Fuel Supply System

电喷燃油供给系统主要有：油箱、燃油滤清器、负压燃油泵、电子恒压燃油泵、喷油器组成。

EFI fuel supply system mainly consist of: fuel tank, fuel filter, negative pressure fuel pump, electronic constant pressure fuel pump, fuel injector.



电喷燃油供给系统的原理：The principle of EFI fuel supply system:

- 油箱内燃油经过燃油开关 → 燃油滤清 → 燃油泵 → 喷油器。

Fuel in the fuel tank through fuel cock → fuel filter → Electric oil pump → Injector.

- ECU 控制燃油泵：使低压燃油转换为恒压高压燃油。

ECU control the Electric oil pump: Convert the Low Pressure Fuel to Constant High Pressure Fuel

- ECU 控制喷油器：喷油的时间，实现精确喷油的目的。

ECU control the injector: Control the time of fuel injection and realize the purpose of precise injection.

燃油泵 Fuel pump

- 本油泵为高转速转子油泵；

The fuel pump is a high speed rotor fuel pump

- 正常情况下，每次打开钥匙，油泵会发出 5 秒左右的
然后停止。

Under normal situation, every time turn on the key, the oil pump will work for about 5 seconds and then stop.

- .油泵将低压燃油转换为高压燃油，，内部设有泄压阀，
在压力达到限值时，泄压后的燃油会从回油口排出。

The fuel pump converts the low pressure fuel into high pressure fuel, there is pressure-relief valve inside,when the pressure reaches the limit, the pressure-relief fuel will be discharged from the fuel return port.

- “ ”进油口：连接过滤器；

↑ fuel in port: connection to the fuel filter

- “ ”回油口：连接油箱；

↑ fuel return port:connection to the fuel tank

- “ ”出油口：连接喷油器。

↑ fuel out port: connection to the injector



警告：Warning:

* 本燃油泵进油和回油不能接反，请按照燃油泵壳体上的标识正确连接。

Please connection the fue in and fuel out in correctly, according to the marks on the fuel pump housing.

* 本燃油泵冷却方式是通过燃油冷却，禁止将进油口和回油口对接，否则会造成油泵过热，也可能导致油泵损坏。

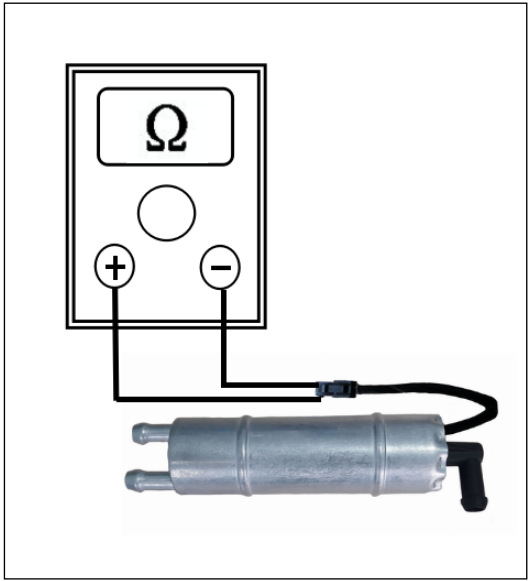
The working principle of fuel pump is through the oil cooling. It is forbidden to connect the fuel in port to the fuel return port. Otherwise it will cause the pump to overheat. It may also caused damage on the fuel pump.

检查 Inspection

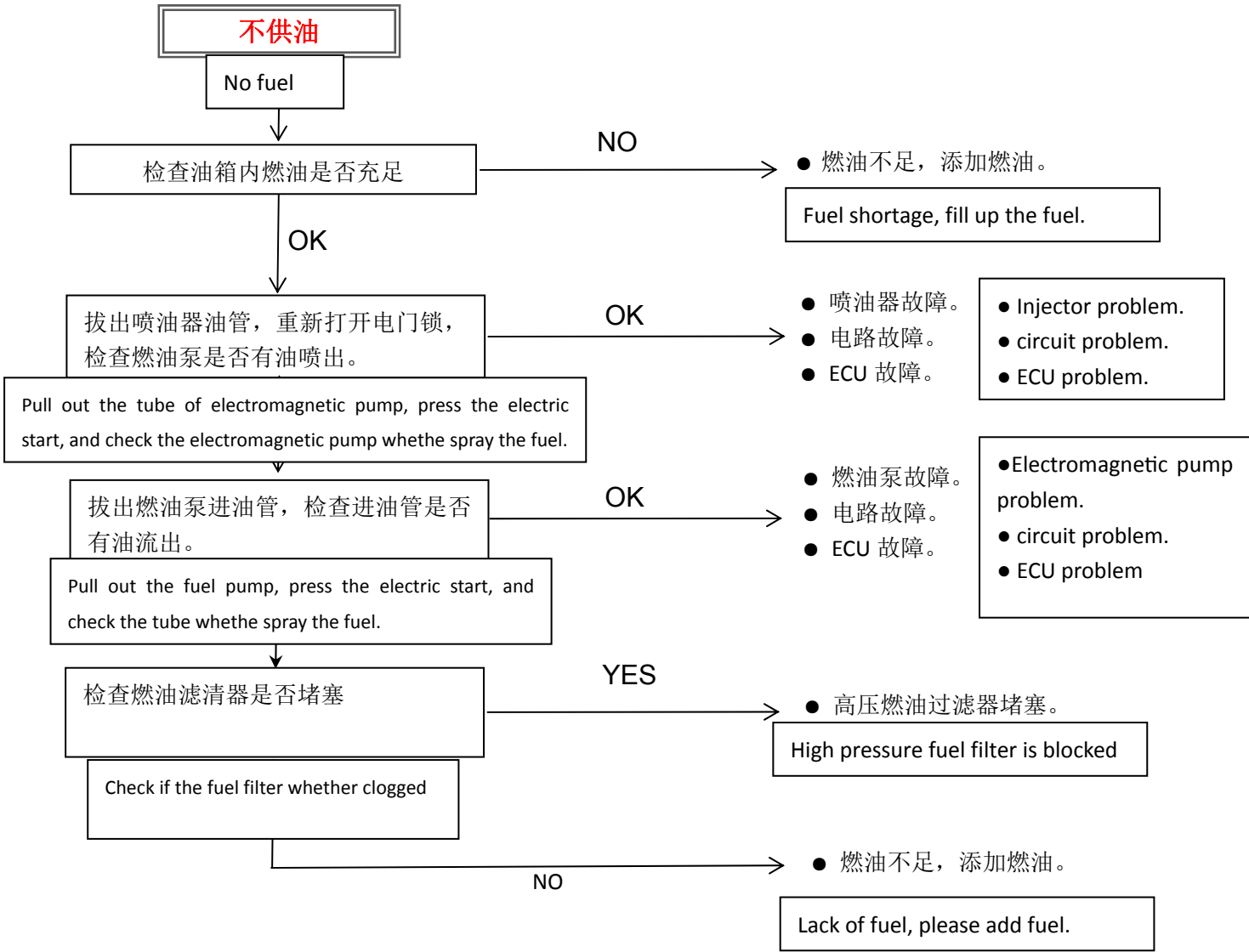
电磁燃油泵电阻值 Resistance of Electromagnetic Pump

- 拔掉电磁燃油泵插件。
- 万用表调至欧姆 “Ω” 档位。
- 测量出电磁燃油泵的电阻。
- Disconnect the plug in unit of electromagnetic fuel pump
- Adjust Multimeter to “Ω”
- Measure the resistance of electromagnetic fuel pump

电磁燃油泵电阻值 Resistance of electromagnetic	1.2 ~ 1.7 Ω
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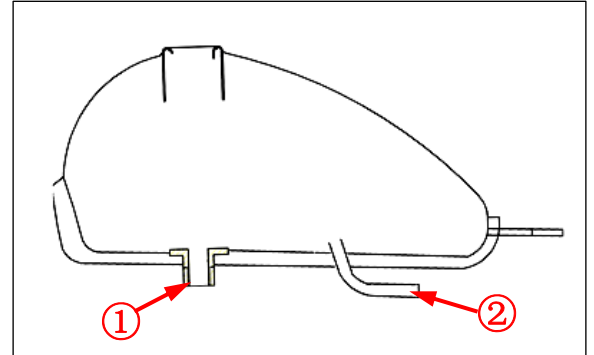


故障排除



燃油箱 fuel tank

- 接口①为燃油输出，连接燃油开关。
- 接口②为回油嘴，连接燃油泵回油口；
- Interface①is the fuel output, and connection to the fuel switch.
- Interface②is the oil nozzle, and connection to the fuel pump return port.

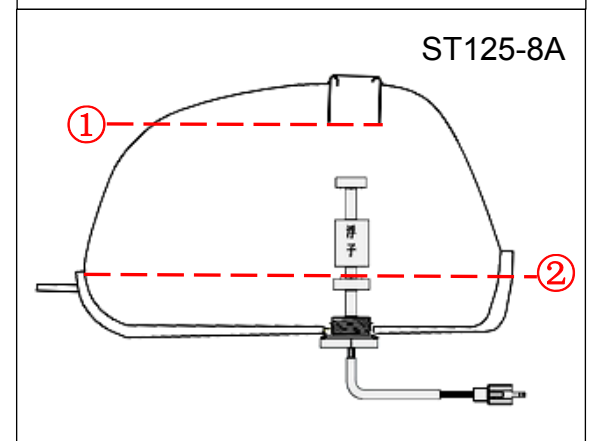
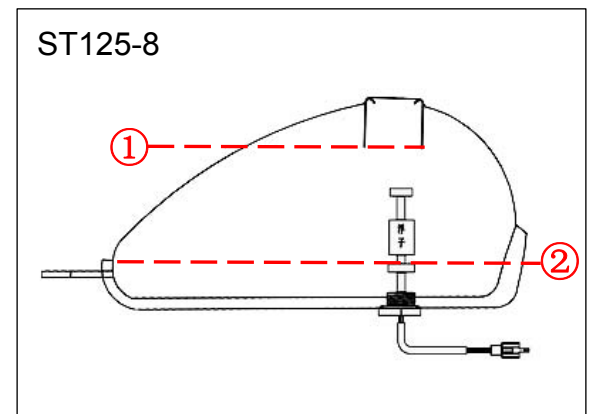


- 燃油加油量：由于本车安装了燃油蒸发系统，加油量不得超过液面①的位置；
- 当燃油消耗至液面②位置时，仪表上燃油警示灯启亮，此时所剩燃油的容量约为：ST125-8: 1.4 L

ST125-8A: 1.8 L

- Fuel refueling amount: Since the vehicle is equipped with a fuel evaporation system, the refueling amount must not exceed the position of liquid level①.
- When the fuel is consumed to the position of level②, the fuel warning light which on the speedometer is lights up, and the remaining fuel capacity is about: ST125-8: 1.4 L

ST125-8A: 1.8 L



- 用 M17 扳手拆除后左右减上方的 M10 盖形螺母；
- Remove the M10 nuts on left and right rear shocks by M17 wrench
- 用 M10 套筒拆除座垫前固定螺栓：
螺栓规格：法兰 M8×100。
- 取出座垫；
- Remove the front mounting bolts of the seat by the M10 sleeve:
Bolt specification: flange M8×100
- Remove the seat
- 断开电磁燃油泵与油箱连接油管；
- Disconnect the electromagnetic fuel pump from the tank connection oil pipe
- 断开倾倒阀与油箱连接油管；
- Disconnect the Dump valve with the fuel tank connection pipe

- 断开电磁燃油泵与油箱连接油管；
- Disconnect the electromagnetic fuel pump from the tank connection oil pipe

- 断开倾倒阀与油箱连接油管；
- Disconnect the Dump valve with the fuel tank connection pipe

注意：NOTE:

- * 断开油管时，先用尖嘴钳夹住油管，然后再拨出油管，再用螺栓堵塞油管，使燃油流不出来；
- * 断开油管时，请做好相应标识，以防止装配时造成错装。

When you disconnect the oil pipe, firstly use the needle nose clamp to clamp the pipe, and then pull out the pipe, and then block the pipe with the bolt, so that the fuel will not come out;

When disconnect the pipe, make the mark on it to prevent the mistake during assembly.

重新安装燃油箱 Reinstall the fuel tank

重新安装燃油箱的顺序与拆卸相反。

The assembly sequence is contrary to dismantling.