X6000电器系统操作培训
Training on operation of X6000 electrical system

◆ X6000车型介绍
Introduction to X6000 model

- 节油 Fuel-saving
- 安全 Safe
- 舒适 Comfortable
- 高效 Efficient
- 智能 Intelligence

◆ 车辆识别码
VIN

●整车铭牌位于驾驶室左门框下方，记载了车辆形式、主要重量参数、发动机型号及VIN码。
The vehicle nameplate is located under LH door frame of the cab and records the vehicle model, main weight parameters, engine model and VIN.
●车辆识别代码位于车架右纵梁外侧前部。
VIN is located on the outside front of RH side rail of the frame.

●潍柴发动机铭牌位于发动机缸体左侧。
The Weichai engine nameplate is located on LH side of the engine block.
●康明斯发动机铭牌位于发动机缸体右侧。
The Cummins engine nameplate is located on RH side of the engine block.

◆ 钥匙（2把遥控钥匙+1把机械钥匙）
Keys (2 remote control keys + 1 mechanical key)

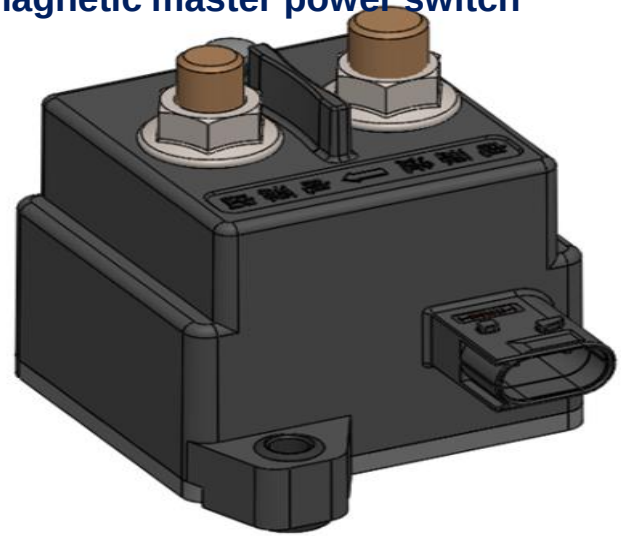
遥控钥匙
Remote key

机械钥匙
Mechanical key

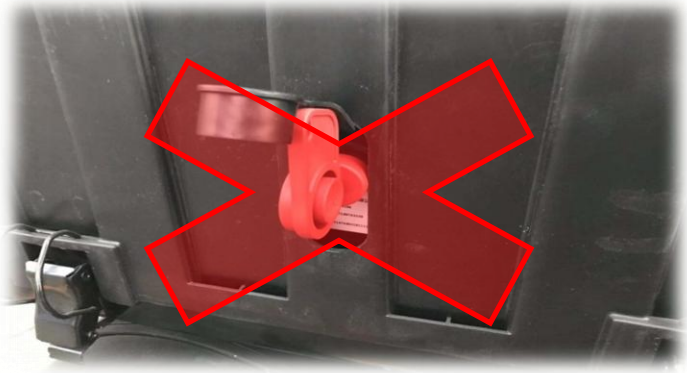
●车门锁、油箱锁、尿素箱锁三锁合一
Door lock, fuel tank lock, and urea tank lock all in one

■按下上方按钮，可把折叠钥匙片弹出，钥匙片具有普通机械钥匙的功能。
Press the upper button to bounce the folding key, which has the function of an ordinary mechanical key.
■请您保管好钥匙，如有遗失，请立即前往陕汽特约服务站废除已丢失遥控钥匙的权限，并匹配新的遥控钥匙。
Please keep your key safe. If it is lost, please immediately go to a Shaanxi Automobile authorized service station to cancel the authority of the lost remote key and obtain a new remote key.

◆ 电磁电源总开关
Electromagnetic master power switch



告别寒冷的冬天下车去断电的痛苦！
Say goodbye to the pain of getting out of your vehicle to cut off the power in the cold winter!



优势及特点：
Advantages and features:

□替代传统电瓶大闸开关，操作简单快捷。当钥匙插入整车时，电磁式电源总开关闭合，整车上30电；
It replaces the traditional battery gate switch and is simple and fast to operate. When the key is inserted, the electromagnetic master power switch is closed, and the vehicle is powered on with 30 voltage;

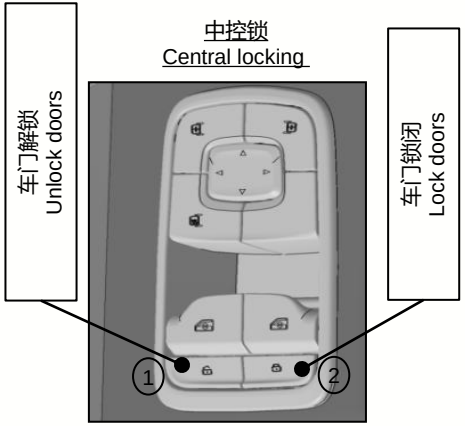
□整车熄火后，BCM延时控制切断整车电源，保证各相关零件复位，不会造成整车静态功率的消耗；
After the vehicle stops, the BCM delays to cut off the power supply of the vehicle to ensure that all relevant parts are reset, not causing the static power consumption of the vehicle;

□产品防护性能高，产品控制电路具有保护功能，产品寿命长，负载能力强。
The product has high protective performance, the product control circuit has protective functions, and the product has a long life and strong load capacity.

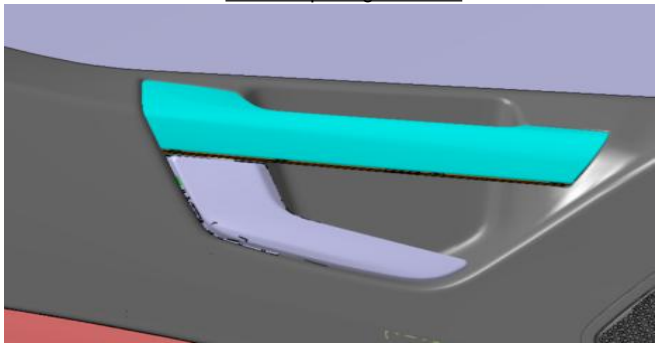
◆ 开关车门
Open and close doors

车门锁
Door lock

中控锁
Central locking



强制开启功能
Forced opening function



注意事项:
Notes:

■左右车门均带内强开功能，当车辆遇到紧急情况时，通过操作左右车门内把手，车门就能打开，实现车上人员的逃生功能。
Both LH and RH doors have an internal forced opening function. When the vehicle encounters an emergency, the doors can be opened by operating the inner handles of LH/RH doors to realize the escape function of the passengers on the vehicle.
■请切勿在车门关闭好之前起步，否则将有发生意外事故的危险。
Please do not start before the door is closed, otherwise there is a risk of an accident.

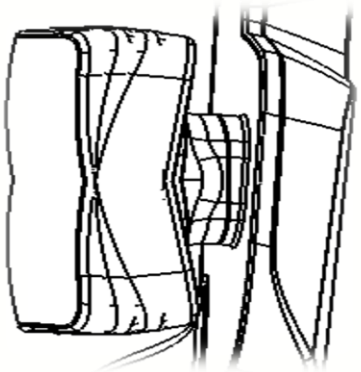
◆ 方向盘调节
Steering wheel adjustment

方向盘前、后、上、下调整，方便通过、舒适驾驶！
The steering wheel can be adjusted forward, backward, up and down for easy passing and comfortable driving!

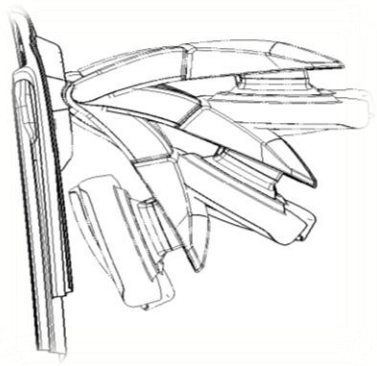
◆ 后视镜调节
Rearview mirror adjustment

后视镜调节
Rearview mirror adjustment

广角镜调节
Wide angle lens adjustment



后视镜折叠
Folding mirror

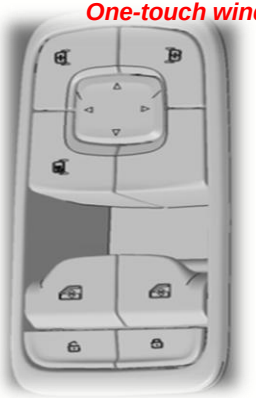


注：
Note:
遇障碍物时可手动进行折叠。
It can be folded manually when encountering obstacles.

注：
Note:
⑤是记忆功能按钮（选配）
⑤ is the memory function button (optional)

◆ 车窗和天窗
Windows and sunroofs

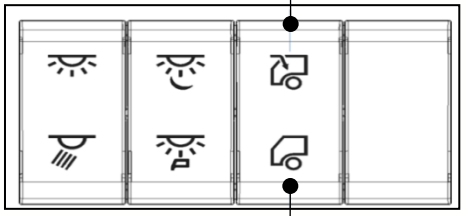
一键升降车窗
One-touch window lifting and lowering



主驾侧
Driver's side

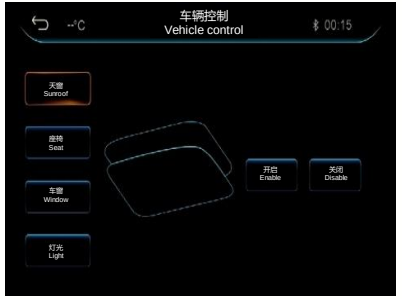
副驾侧
Co-driver side

自动天窗
Auto sunroof



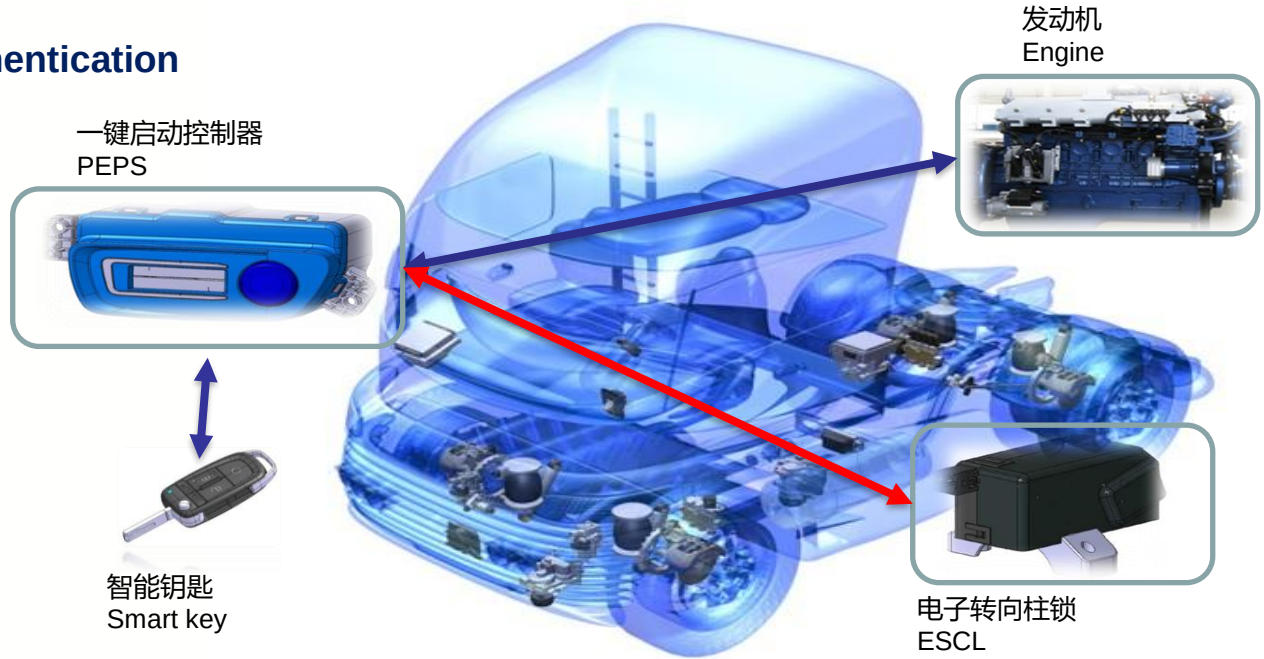
高架箱
Overhead box

智能车辆控制
Intelligent vehicle control



多媒体处
MMI

◆ 防盗认证
Anti-theft authentication



■发动机防盗

■Engine immobilizer

由近场钥匙认证技术，VCU认证，双重认证组成的IMMO认证体系，采用高安全级别的AES加密算法。

The IMMO authentication system is composed of near-field key authentication and VCU authentication, and adopts high-security AES encryption algorithm.

■ESCL（电子转向柱锁）控制功能

■ESCL control function

采用高安全级别的AES加密算法的ESCL认证；根据驾驶需要，自动控制电子转向柱锁开、闭锁的功能。

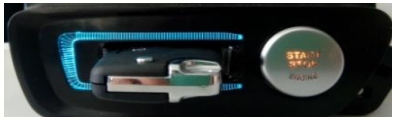
It adopts ESCL authentication of high-security AES encryption algorithm, and according to driving needs, can automatically control the on/off of ESCL.

◆ 一键启动 PEPS

插入钥匙 Insert the key

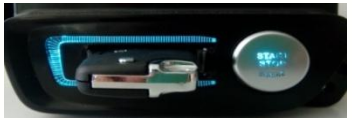
- 室内顶灯
  Interior dome lamp
- 防盗系统
  Anti-theft system
- 喇叭
  Speaker
- 小灯（位置灯）
  Clearance lamp (position lamp)
- 制动灯
  Braking lamp
- 危机报警灯
  Hazard warning lamp
- 驾驶翻转
  Cab tilting

多媒体上电 Power on MMI



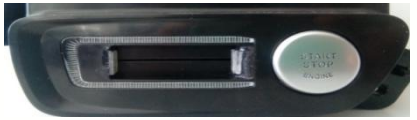
- 电调座椅
  Electric seat
- 音响系统
  Audio system
- 雨刮喷水系统
  Wiper sprinkler system
- 点烟器
  Cigar lighter
- 座椅加热
  Heated seat
- 玻璃升降电机
  Window lifting motor
- 电动天窗等
  Electric sunroof etc.

仪表上电 Power on IC



- 后视镜调节
  Rearview mirror adjustment
- 组合仪表
  Instrument cluster
- 安全气囊
  Safety airbag
- 定速巡航系统
  ACC
- 环境监控
  EVM
- 大灯及各控制系统
  Headlamps and various control systems
- 电加热除霜
  Electric heating/defrosting
- 空调。
  A/C.

整车下电 Power off the vehicle



- 延时5分钟后整车彻底断电
  After a delay of 5 min, the vehicle is completely powered off.

电源分层管理，各个上电状态下的整车可用电器
Power supply hierarchical management, available electrical systems for the vehicle in different power-on states

驾驶室概览
Overview of cab

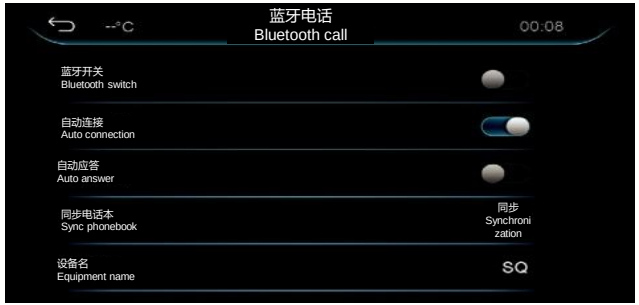
◆ 多功能方向盘
Multifunctional steering wheel

①蓝牙电话接听/挂断
① Answer/hang up Bluetooth phone calls
②频道+/快进
② Channel+/fast forward
③向上-音量增加，
③ Up - volume increase,
向下-音量减小，
Down - volume decreases,
按压-音频源切换。
Press - audio source switching.
④频道-/快退
④ Channel-/fast backward
⑤语音开启/关闭
⑤ Voice on/off

⑥仪表/多媒体切换键
⑥ IC/MMI switch key
⑦快捷键-车辆信息
⑦ Shortcut key - vehicle information
⑧向上-功能界面，
⑧ Up - Function interface,
向下-360°环视，
Down around view,
按压-确认当前选择。
Press - to confirm the current selection.
⑨快捷键-燃油经济性
⑨ Shortcut key - fuel economy
⑩退出键
⑩ Exit key

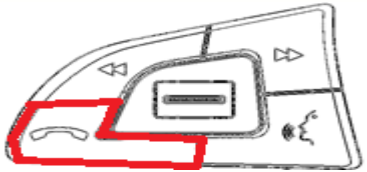
◆ 左组合按键
LH combination key

蓝牙电话
Bluetooth call



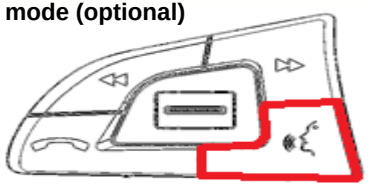
- “蓝牙开关”选项可以打开或者关闭蓝牙系统
"Bluetooth switch" option can turn on or off the bluetooth system
- “自动连接”可根据个人爱好设置,若设置为开启状态,在一定的范围内主机自动和手机进行连接。
"Auto connection" can be set according to personal preferences. If set to on, the host will automatically connect to the mobile phone within a certain range.
- “自动应答”选项打开时，在有电话呼入后，电话自动转入到蓝牙模式下进行应答。
When the "Auto Answer" option is on, the phone will automatically switch to Bluetooth mode to answer the incoming call.

当手机与多媒体内置蓝牙建立电话功能连接后，
When the mobile phone is connected with the multimedia built-in Bluetooth,
多媒体进入电话拨号界面。可通过触摸界面拨打
Multimedia enters the phone dialing interface.
或接听电话。
You can dial or answer a call via touch screen.

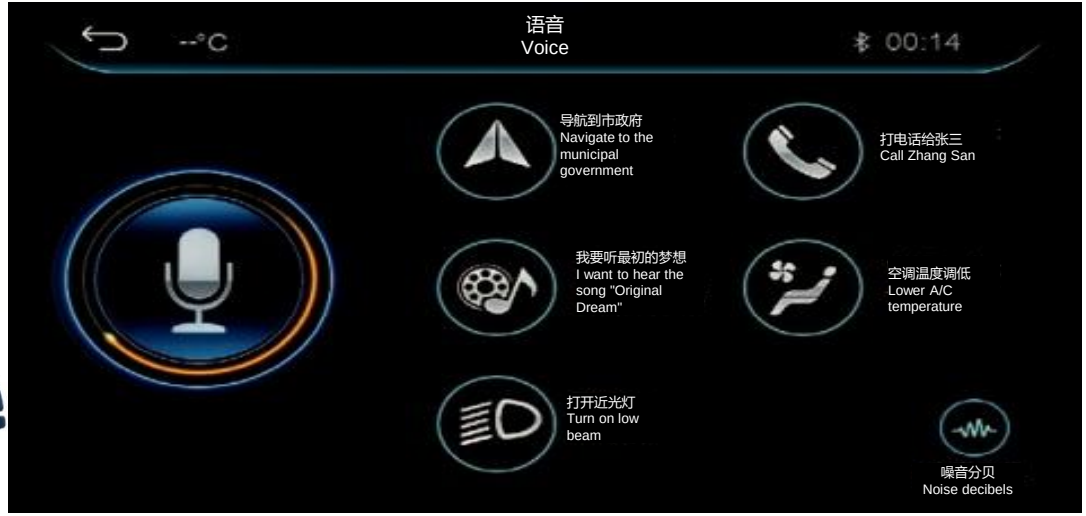


◆ 左组合按键
LH combination key

语音模式（选配）
Voice mode (optional)



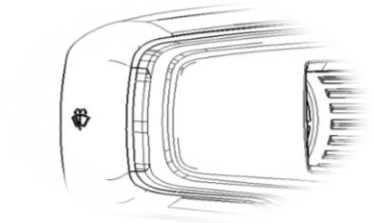
◆通过方向盘上的语音键或者点击语音界面左面话筒图标可以进入语音模式。
You can enter voice mode through the voice key on the steering wheel or by clicking the microphone icon on the LH side of the voice interface.
◆语音模式下，说出相应的指令。比如说出“导航到市政府”，此时主机会做出响应“即将为你导航到市政府”，无需手动，多媒体自动进入导航模式。
In voice mode, you can speak the corresponding command. For example, if you say "Navigate to the municipal government", at this time the host will respond "Navigate to the municipal government for you soon", without manual operation, MMI will automatically enter the navigation mode.

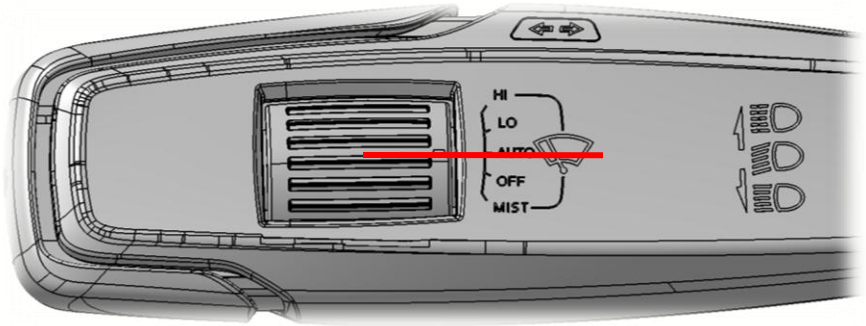


语音模式下可执行的指令
Executable commands in voice mode
□导航系统
Navigation system
□蓝牙电话
Bluetooth call
□音乐点播
Music on demand
□空调模式
A/C mode
□灯光控制
Light control
□噪音检测
Noise detection

◆ 组合开关
Combination switch

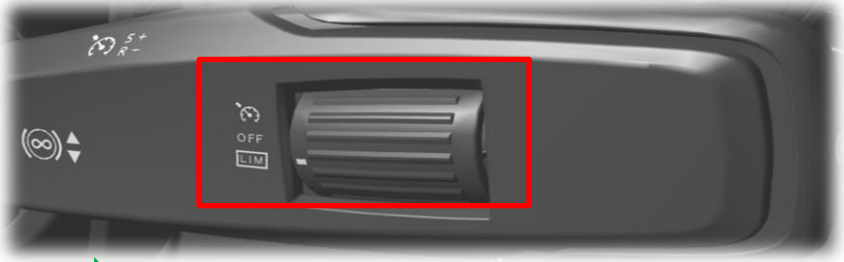
自动雨刮
Auto wiper

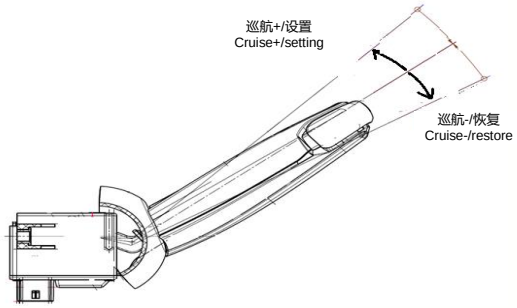




- 自动雨刮被激活后，至少刮动一次进行自检。
  After the auto wiper is activated, perform a self-test by wiping at least once.
- 雨刮将根据前挡风玻璃雨量大小自动刮刷。
  The wiper will automatically work according to the amount of rain on the front windshield.
- 向着开关手柄轴向按一下按钮，则出现一个喷淋刮水循环。
  Press the button axially toward the switch handle, and a spray wiping cycle will appear.

◆ 组合开关
Combination switch





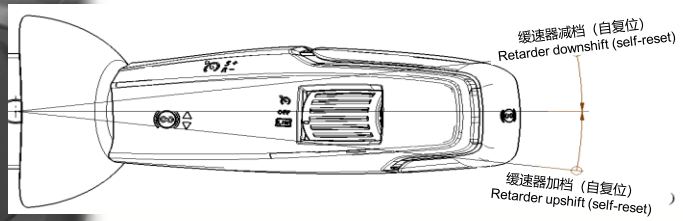
使用方法
Operation methods

1.将滚轮开关打到巡航控制开关处，控制车速至拟巡航的速度（≥40km/h），将组合开关上抬，可进入巡航模式；
1. Turn the roller switch to ACC switch, control the vehicle speed to the desired cruising speed (≥40km/h), and lift the combination switch to enter ACC mode;
2. 在巡航过程中，使用巡航+（上抬组合开关）或巡航-（下压组合开关），可实现巡航车速调整，调幅2km/h；
2. During cruising, use ACC + (lift up the combination switch) or ACC - (press down the combination switch) to adjust the vehicle speed, with an amplitude of 2km/h;
3.当离合、制动、辅助制动、车速任一条件不满足时，自动退出巡航，再次满足需求时，通过巡航+或巡航-都可
3. When any of the conditions of clutch, brake, auxiliary brake, and vehicle speed are not met, ACC will automatically exit, and when the requirements are met again, ACC can be accessed through
以再次进入巡航；
ACC+ or ACC-;
4.想退出巡航时，可以将滚轮拨回“OFF”档。
4. When you want to exit ACC, you can turn the roller back to the "OFF" position.

◆ 组合开关
Combination switch

进入条件：
Access conditions:
1.转速＞1000rpm
1. Engine speed＞1000rpm
2.非空档
2. Gears other than N
3.离合未踩下
3. The clutch is not depressed
4.无油门踏板输入
4. No accelerator pedal input

辅助制动
Assisted brake



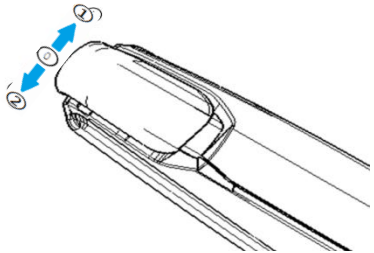
使用方法
Operation methods

1.将右侧开关按照图示方向后拉、前推可以增加或减小辅助制动档位，同时仪表符号　　动态变化*（配置不同，档位不同，无缓速器时仅有2档；有缓速器时，有5档；除恒速档外，其他档位越高，制动力越大）*
1. Pull the RH switch back or push forward in the direction as shown in the figure to increase or decrease the assisted braking gear. At this time, the instrument symbol changes dynamically (different configurations vary from their gears, and there is only 2 gears without retarder; when using the retarder, there are 5 gears; except for the constant speed gear, the higher the other gears, the higher the braking force)
2.直接下发组合开关端头可直接进入最高档；
2. Directly sending the combination switch terminal can directly enter the highest gear;
3.恒速档：选配缓速器时，1档是恒速档，主要适用于下长坡过程，通过辅助制动稳定车速，而不用频繁踩刹车；
3. Constant speed gear: When the retarder is used, the 1st gear is a constant speed gear, which is mainly suitable for the process of going down a long slope, and the vehicle speed can be stabilized through auxiliary braking without frequently stepping on the brake;
4.按照图示方向前推开关，直至仪表不显示辅助制动档位图标。
4. Push the switch forward in the direction as shown until the instrument does not display the assisted brake gear icon.

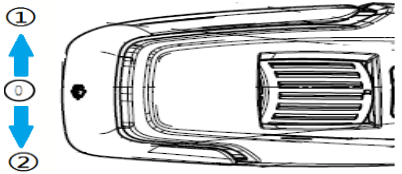
◆ 灯光控制
Light control

灯光控制（自动灯光）
Lighting control (auto lighting)

① 自动档：位置灯或近光灯将根据光线强弱情况，自动开启或关闭
Auto gear: The position light or low beam will be automatically turned on or off according to the light intensity
② 位置灯
Position lamp
③ 近光灯
Low beam



① 超车灯
Overtaking lamp
② 远光灯
High beam

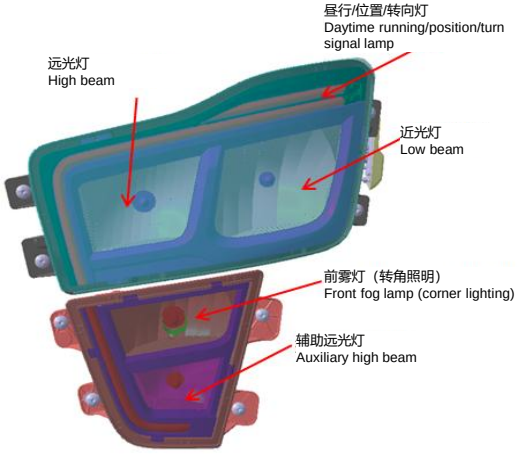


① 左转向灯
LH turn signal lamp
② 右转向灯
RH turn signal lamp

◆ 灯光控制
Light control

灯光高度可调
Light level adjustable

灯光调节开关可使车辆在不同装载、加速或减速等工况下的灯光远近适宜的位置。
The light adjustment switch can make the light far and near the appropriate position of the vehicle under different loading, acceleration or deceleration and other working conditions.



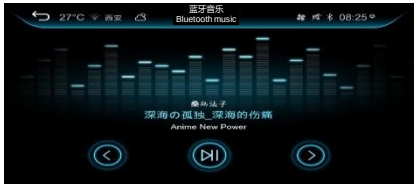
多媒体
Multi-media

多媒体娱乐
Multimedia entertainment

智能控制
Intelligent control

智能提示
Intelligent tips

收音机
Radio

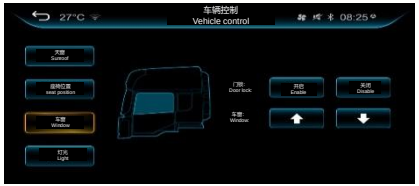


蓝牙音乐
Bluetooth music

视频播放
Video playback

语音识别控制
Voice recognition control

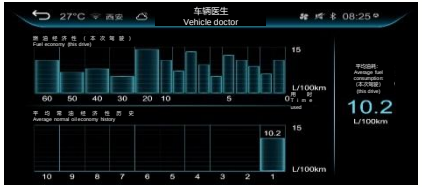
空调控制
A/C control



门窗/灯光控制
Door/window light control

360环视
360 around view

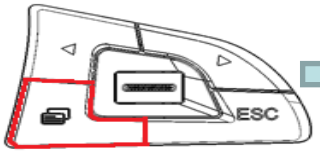
驾驶行为分析
Driving behavior analysis

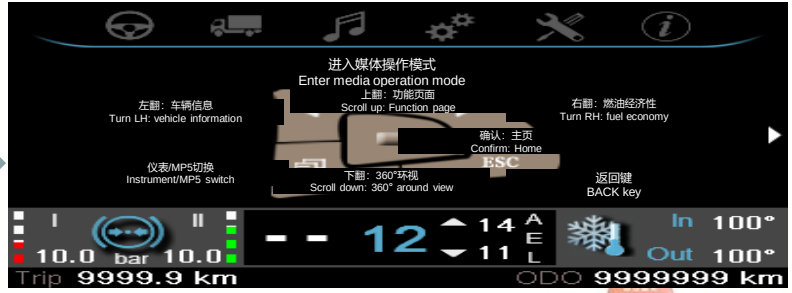


车辆医生
Vehicle doctor

◆ 环境监控 EVM

环境监控系统（选配）
EVM (optional)

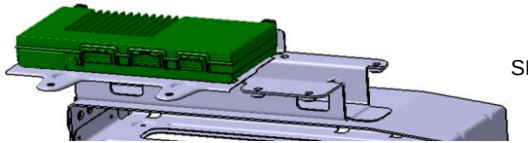




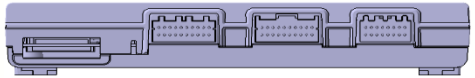
◆ 环境监控 EVM

环境监控视频回放（选配）
Environmental monitoring video playback (optional)

存储路径：日期→小时→分钟
Storage path: date→hour→minute



SD存放位
SD storage position

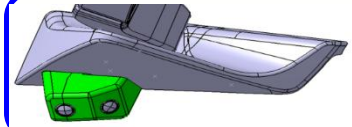


●系统存储介质为SD卡，视频默认时长5min，存储视频可直接播放；
The system storage medium is SD card, the default video duration is 5 min, and the stored video can be played directly;

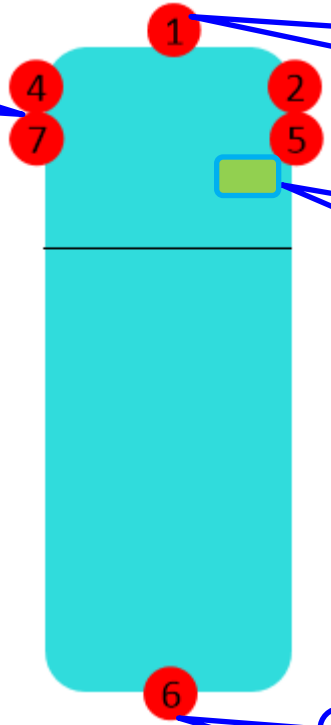
●若控制器内无存储卡，点击“视屏回放”时显示屏上显示“请安装SD卡”的字样，并且在显示画面左上角“ ”图标闪烁。
If there is no memory card in the controller, when you click “Video Playback”, the words “Please install SD card” will be displayed on the display screen, and the “ " icon will flash in LH upper corner of the display screen.

●视频正常录制时，屏幕左上角“ ”图标闪烁。
When the video is recorded normally, the “ " icon in LH upper corner of the screen flashes.

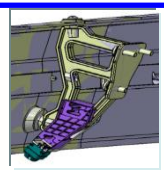
◆ 环境监控摄像头位置
EVM camera position



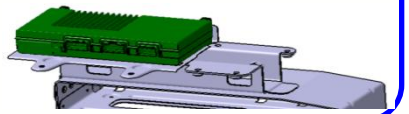
2、4、5、
7在后视镜底座
7 on the mirror base



遮阳罩中间
Middle of sun visor



控制器在仪表台右侧控制器支架，最上面一层。
The controller is on RH controller bracket of the dashboard, the top layer.



1、2、3、4、5、7为主车主车摄像头。
1, 2, 3, 4, 5, 7 are the main cameras of the tractor.
6为挂车摄像头，原车配备随车发送视频线束，用户可自行加装。
6 is the trailer camera. The vehicle is equipped with video harness, and the user can install it by himself.

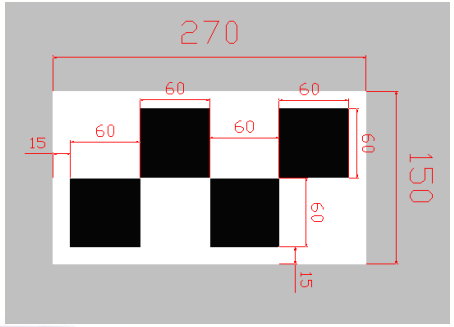
当360°环视视频图像模糊时，可能是摄像头部位沾染污渍，可以根据模糊画面找到对应的摄像头位置进行适当擦洗。
When the AVM video image is blurred, the camera part is stained. You can find the corresponding camera position according to the blurred picture and wipe it clean.

倒车摄像头，车辆尾梁处或随车发送。
Reversing camera is located at the tail beam of the vehicle or delivered with the vehicle.

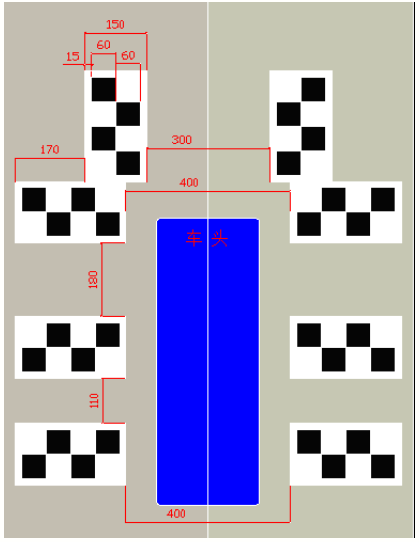
环境监控标定
EVM calibration

标定场地使用60cm棋盘格标定板
The calibration site uses a 60cm checkerboard calibration plate.

颜色为黑色与白色；
Colors are black & white;
▶ 黑白格标定板尺寸要一致，布局误差应小于5mm；
▶ The size of the black & white grid calibration plates shall be consistent, and the layout error shall be less than 5mm;
▶ 材质要求：喷绘哑光黑白油漆或铺设麻面瓷砖，确保不能反射光线
▶ Material requirements: spray matte black and white paint or lay pockmarked ceramic tiles to ensure that no light is reflected



长度6-12米的车辆，标定场地空间需求为20×10米。
For vehicles with a length of 6-12 m, the calibrated site space shall be 20×10 m.

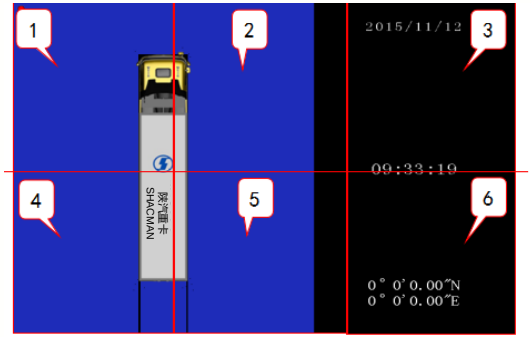


摄像头安装类型为5+1路方案的车辆，标定板采用如上图2所示的8块黑白格子布局；车长6-7米，标定板布局尺寸按图，标定板之间前后垂直，左右平行对齐；前端两块标定板和后端两块标定板对齐，左边两块标定板和右边两块标定板对齐
For vehicles with a camera installation type of 5+1 routes, the calibration plate uses an 8-block black & white grid layout as shown in Figure 2 above; the vehicle is 6-7 m long, and the calibration plate layout dimensions are as shown in the figure. The calibration plates are vertical at front and rear and parallel on LH/RH; the two calibration plates on the front end are aligned with the two calibration plates on the rear end, and the two calibration plates on LH are aligned with the two calibration plates on RH.
摄像头到地面无直射光线或反射光线
There is no direct light or reflected light from the camera to the ground

环境监控标定
EVM calibration

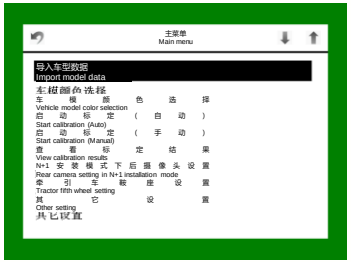
进入如图界面后，依次点击屏幕1、4、6、3、2、5区域，进入环视标定系统主菜单界面

After entering the interface as shown in the figure, click the screen areas 1, 4, 6, 3, 2 & 5 in sequence to enter the main menu interface of AVM calibration system



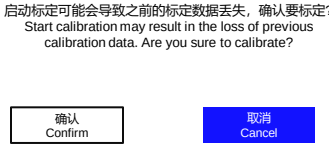
点击“导入车型数据”，挑选与当前标定车辆相对应的车型

Click "Import vehicle model data" and select the vehicle model corresponding to the currently calibrated vehicle.



点击“启动标定（自动）”，弹出对话框；点击“确认”，即进入自动标定过程；点击“取消”或无操作等待10秒，即退出；

Click "Start Calibration (Auto)" to pop up a dialog box; click "OK" to enter the auto calibration process; click "Cancel" or wait for 10 s without any operation to exit;



进入自动标定后，待标定完成会弹框提示标定结果，如提示标定成功，可点击主菜单“查看标定结果”目录，进入子目录菜单，点击“查看摄像头标定参数”；进入摄像头标定结果参数界面，仔细观察各摄像头标定结果参数，如果显示某个摄像头像素误差≥1.5，需排查原因调整后重新标定（逐一排查摄像头参数是否正确、场地环境是否合理）；

After entering auto calibration, a box will pop up to prompt the calibration result when the calibration is completed. If the calibration is successful, you can click the "View Calibration Results" directory in the main menu, enter the sub-directory menu, click "View Camera Calibration Parameters"; enter the camera calibration result parameter interface, and carefully check the calibration result parameters of each camera. If the pixel error of a certain camera is ≥1.5, you need to check the cause and adjust it before recalibrating (check whether the camera parameters are correct one by one and whether the site environment is reasonable);

注意：启动标定前确认标定板周围无人员或其他立体遮挡物，有遮挡可能会导致标定失败；标定过程中不可打开车门，不可晃动车辆，不可切断设备电源，人员不可在标定板上走动；一旦进入标定就无法退出或暂停，直至标定结束。

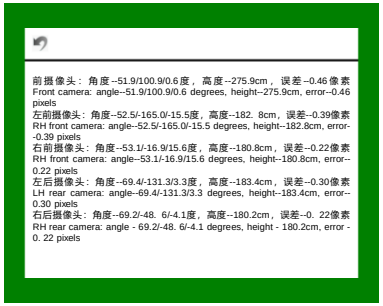
Note: Before starting the calibration, make sure there are no people or other three-dimensional obstructions around the calibration plate. Blockage may cause the calibration failure. During the calibration process, do not open the door, shake the vehicle, cut off the power supply of the equipment, and people are not allowed to walk on the calibration plate; After entering calibration, you cannot exit or pause until the calibration is completed.

标定失败可能存在的问题

Possible problems with calibration failure

序号 S/N	可能存在问题 There may be a problem	解决方案 Solution
1	摄像头角度安装是否正确 Check whether the camera is installed at an appropriate angle	检查摄像头外壳若出现没扣紧、装歪现象重新安装 Check whether the camera housing is not fastened or installed improperly, and if yes, reinstall it
2	车辆是否有摆正停在布局内 Check whether the vehicle is properly parked within the layout	查看车辆停放位置若没摆正重新停放 Check the parking position of the vehicle and park it again if it is not in the correct position.
3	图像较为模糊是，摄像头镜头膜是否有撕下 If the image is blurry, check whether the camera lens film has been torn off.	检查各摄像头有无镜头膜没撕 Check whether the lens film of each camera is not torn off
4	布局内是否有立体障碍物、地面是否有积水、玻璃等类似的反光物、灯光亮度是否均匀 Check whether there are three-dimensional obstacles in the layout, whether there is water on the ground, glass and other similar reflective objects, and whether the lighting brightness is uniform.	检查标定布局场地若出现障碍物、积水、曝光等调整后重新标定 Check whether there are obstacles, water, exposure, etc. in the calibration layout site, adjust and re-calibrate
5	侧前/侧后摄像头接反 Side front/side rear camera is connected reversely	检查摄像头尾线的航空头是否接错，纠正过来 Check whether the aviation plug of the camera tail line is wrongly connected, and adjust if necessary

◆ 环境监控标定
EVM calibration



如提示某摄像头标定失败，需排查此摄像头和相对应的标定板是否正常，并确认配对是否正确，做相应调整后重新标定；如重新标定还是失败，可选择手动标定。
If it prompts that the calibration of a camera fails, you need to check whether the camera and the corresponding calibration plate are normal, check whether the pairing is correct, make corresponding adjustments and then recalibrate; if the recalibration still fails, you can choose manual calibration.
自动标定成功就无需执行。
If the auto calibration is successful, there is no need for manual calibration.
若自动标定失败且排查不到异常，可进行手动标定，详细操作如下：
If the auto calibration fails and no abnormality is found, manual calibration can be performed. The detailed operation is as follows:
主菜单界面，点击“启动标定（手动）”目录，弹出对话框，图10弹框界面点击“确认”，即进入前摄像头手动标定界面，图10弹框界面弹框点击“取消”或无操作等待10秒，即退出提示界面；
On the main menu interface, click the "Start Calibration (Manual)" directory, and a dialog box will pop up. Click "Confirm" on the pop-up interface in Figure 10 to enter the manual calibration interface for the front camera. Click "Cancel" on the pop-up interface in Figure 10 or make no operation. Wait 10 s to exit the prompt interface;

界面左侧为当前摄像头抓拍的图像，图像上有四个小“十”字光标，绿色“十”字光标为当前可操作点；界面右侧小图像，是当前可操作点周围局部放大图；将四个“十”字光标”移动到标定板上相对应的黑格角点位置，即完成当此摄像头的标定。
The LH side of the interface is the image captured by the current camera. There are four small "Cross" cursors on the image, and the green "Cross" cursor is the current operable point; the small image on the RH side of the interface is a partial detail around the current operable point; Move the four "Cross" cursors to the corresponding black grid corner positions on the calibration plate to complete the calibration of the current camera.
角点1为左上方两个黑格相交的点，角点2为左下方两个黑格相交的点，角点3为右上方两个黑格相交的点，角点4为右下方两个黑格相交的点，此四个角点无顺序要求，单需要放置在相应的四个点中。
Corner point 1 is the point where the two black boxes on the upper LH intersect, corner point 2 is the point where the two black boxes on the lower LH intersect, corner point 3 is the point where the two black boxes on the upper RH intersect, and corner point 4 is the two black boxes on the lower RH. There is no order requirement for the four corner points, but the cursor must be placed within the four points.
点击“换角点”，切换当前可操作的“十”字光标，进行移动标定。
Click "Change Corner Point" to switch the currently operable "Cross" cursor for mobile calibration.
绿色“十”字光标移动找角点方法：在手动标定界面下，手指直接点击图像中角点位置，绿色“十”字光标就会移动到触摸点，再通过界面中的“上”“下”“左”“右”触摸按键，进行移动微调。
The method of moving the green "Cross" cursor to find the corner point: In the manual calibration interface, directly click the corner point position in the image with your finger, and the green "Cross" cursor will move to the touch point, and then use the "Up", "Down", "Left" and "Right" buttons in the interface to perform motion fine-tuning.

环境监控维修
EVM maintenance

360左侧按键无法点击（变灰）
Failure to click the button on the LH side of EVM (grayed out)

Can连接故障
CAN connection failure

找到360控制器检查控制器表面标签，确认软件版本号是否为“V1.0.0”（仅针对DZ9K189595920）
Find the EVM controller and check the label on the surface to confirm whether the software version number is "V1.0.0" (for DZ9K189595920 only)

是
Yes

软件版本为旧版本，更换主机或者选择软件升级,软件升级联系：陈工15980863013获软件包及升级指导
The software version is an old version. Please change the host or upgrade the software upgrade. For software upgrade, please contact Chen Gong on 15980863013 for software package and upgrade guidance.

否
No

将A端P电源线拔出，使筋用表检查A端口电源线端子CAN总线是否电压电压值一般在2.5V左右
Unplug the A-port P power cord, and use a multimeter to check whether the voltage of the A-port power cord terminal CAN bus is around 2.5V.

否
No

Can总线若测量无电压，则为can线接触异常，
If no voltage is measured on the CAN bus, CAN bus may be in poor contact.

是
Yes

CAN线接入异常，CAN线非我司供应，需联系电工排查相应的CAN节点或can线是否松开
The CAN bus is in poor contact. The CAN bus is not supplied by our company. You need to contact the electrician to check whether the corresponding CAN node or CAN bus is loose.

控制器can模块失效，更换控制器
If the controller CAN module fails, replace the controller

结束
End

尾梁摄像头无图像
No image from tail beam camera

尾梁摄像头无画面
No picuture on tail beam camera

请确认尾梁摄像头是否为原厂件
Please confirm whether the tail beam camera is a genuine part

是
Yes

通过中控屏点击“货箱内部”，确认货箱内部是否有画面（画面为尾梁摄像头画面）
Click "Cargo Box Interior" on the central control screen to confirm whether there is an image of cargo box interior (the tail beam camera image)

是
Yes

检查尾梁摄像头的安装位置线束，此为货箱内部的接线与尾梁摄像头预留的线束接错导致
Check the harness at the installation position of the tail beam camera. This is caused by a misconnection between the wire inside the cargo box and the harness reserved for the tail beam camera.

否
No

检查尾梁摄像头到360控制器端的线束是否有松开或者被压断
Check whether the harness from the tail beam camera to AVM is loose or broken.

是
Yes；

将线束安装调整致正确位置，检查画面
Adjust the harness to the correct installation position and check the picture

否
No

用正常的摄像头（此摄像头可以是车上安装的360摄像头中的任意一个）更换尾梁摄像头，确认画面是否恢复
Replace the tail beam camera with a normal camera (this camera can be any 360 camera installed on the vehicle) and confirm whether the picture is restored.

是
Yes

摄像头问题，更换摄像头
If teh camera is faulty, replace it

否
No

控制器问题，更换360控制器
If the controller is faulty, replace it

无SD卡或SD卡格式异常
No SD card is available or SD card format is abnormal

无SD卡或SD卡异常
No SD card is available or SD card is abnormal

打开控制器卡槽，检查里面是否有50卡或5卡槽是否有正确插入
Open the controller card slot and check if there is a 50 card or the card is inserted into the slot correctly

否
No

是
Yes

拔出SD卡检查卡是否有外观损坏
Pull out the SD card and visually check whether there is any damage to the card

是
Yes

需采购一张SD卡插入，卡容量依据客户需求，容量≤1T
A SD card needs to be purchased and inserted. The card capacity is based on customer needs, and the capacity shall be ≤1T

否
No

手动格式化：通过点击屏幕按键“146325”进入菜单，点击“格式化存储卡”
Manual formatting: Enter the menu by clicking the screen button "146325" and click "Format Memory Card"

否
No

自动格式化：插入后等待2分钟，检查显示屏左上角是否变为“红点”
Auto formatting: wait 2 min after inserting, and check whether the upper LH corner of the display changes to a "Red Dot"

是
Yes

结束
End

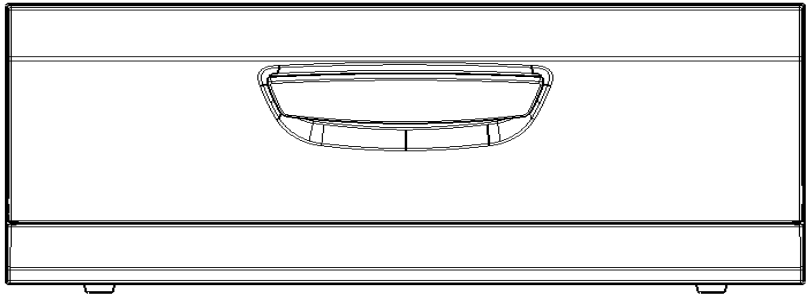
◆ 饮水机
Water dispenser

饮水机（选配）
Water dispenser (optional)

开机待机：开机时拨动控制盒电源开关键至ON状态，蜂鸣 器响一声，此时整机处于待机状态；
Startup and standby: When starting the equipment, turn the power switch of the control box to the ON state, the buzzer will sound once, and the equipment is in the standby state at this time;
关机：将控制盒电源开关键拨动至OFF状态，系统会先退水，退税完成后关机；
Shutdown: Turn the power switch of the control box to the OFF state, the system will recess the water first, and then stop;
融冰：环境温度低于2度时，饮水机自动启动融冰功能，饮水机整体预热，其他功能暂时无效，融冰结束后正常工作。
Ice melting: When the ambient temperature is lower than 2 degrees, the water dispenser automatically starts the ice melting function, and the water dispenser is preheated as a whole. Other functions are temporarily disabled and work normally after the ice melting is completed.
加热：按下加热键键，可启动或停止加热。
Heating: Press the heating button to start or stop heating.
常温键：按下常温键，系统将切换为常温水状态。
Normal temperature button: press the normal temperature button, the system will switch to the normal temperature water state.
出水键：按住出水键，系统将启动接水动作；
Water yield button: Press and hold the water yield button, the system will start the action of receiving water;
接水操作：将水杯置于杯架上，使用出水键开启或停止接水；
Water receiving operation: Place the water cup on the cup holder and use the water yield button to start or stop water receiving;
将水杯杯壁（非透明杯）插入红外感应凹槽内，启动自动接水操作，杯子移开后水流即刻停止。
Insert the cup wall (non-transparent cup) into the infrared sensor groove, start the auto water receiving operation, and the water flow will stop immediately after the cup is removed.
加水：将储水器盖拧开把接好的饮用水倒入储水器的高水位线处（注意水时请勿超过高水位线，以免车头翻转时水
Add water: Unscrew the water reservoir cover and pour the connected drinking water into the high water level of the water reservoir (remember not to exceed the high water level to prevent water from overflowing
从容器注意水口溢出）。
when the cab is tilted).

◆ 冰箱
Refrigerator

冰箱（选配）
Refrigerator (optional)



- **使用方法**
  Operation methods
- 采用电子温控旋钮控制冰箱的温度，旋钮位于冰箱左上方（需要将门打开）。
  The temperature of the refrigerator is controlled by an electronic temperature control knob, which is located on the upper LH side of the refrigerator (the door needs to be opened).
- 调节范围：箭头从小到大。
  Adjustment range: arrow from small to large.
- OFF：表示停机，不工作。
  OFF: It indicates that the equipment is stopped and does not work.
- 指示灯：停机时指示灯熄灭，工作时指示灯亮起蓝色，冰箱故障时指示灯闪烁。
  Indicator lamp: The indicator lamp goes out when it is stopped, lights up blue when it is working, and flashes when the refrigerator is faulty.

ADR系统
ADR system

1. ADR系统是什么?
1. What is the ADR system?

主要适用于石油油罐车、液化气运输车、化学易燃易爆品车，军用弹药车以及这些车辆所处的仓库环境，如军火库或粉尘车间等等。车辆正常断电后依然有电存在，通过一般电源开关断电时有可能产生电弧，而在上述环境下，一旦产生电弧，就极易产生爆炸，所以在国外，特别是欧洲，都要求这些车辆必须安装紧急电源切断系统（ADR系统）以规避由此引发的安全隐患。其二是在极端紧急情况下，如危险品车辆在行驶过程中遇上无法避免的碰撞，司机先紧急刹车，在预计的有限时间内将紧急电源开关打开，这样车辆在碰撞之前就会处于完全断电的状态，即使相互碰撞了，也不会轻易产生电弧造成爆炸，消除碰撞所造成的电源线短路而发生的车辆起火的隐患。
It is mainly suitable for petroleum tank trucks, liquefied gas transport trucks, chemical flammable and explosive trucks, military ammunition trucks and the warehouse environments where these vehicles are located, such as arsenals or dust workshops, etc. There is still electricity after the vehicle is powered off normally. Arcs may occur when the power is off through a general power switch. In the above environment, once an arc occurs, it is extremely easy to explode. Therefore, in foreign countries, especially in Europe, these vehicles must be installed with emergency power cut-off system (ADR system) to avoid potential safety hazards. The second is that in extreme emergencies, such as a dangerous goods vehicle encountering an unavoidable collision while driving, the driver must brake urgently and turn on the emergency power switch within the estimated limited time, so that the vehicle will be in full safety before the collision. In the power-off state, even if they collide with each other, arcs will not easily cause explosions, eliminating the risk of vehicle fires caused by short circuits in power lines caused by collisions.

2. 使用ADR系统的作用?
2. What is the role of ADR system?

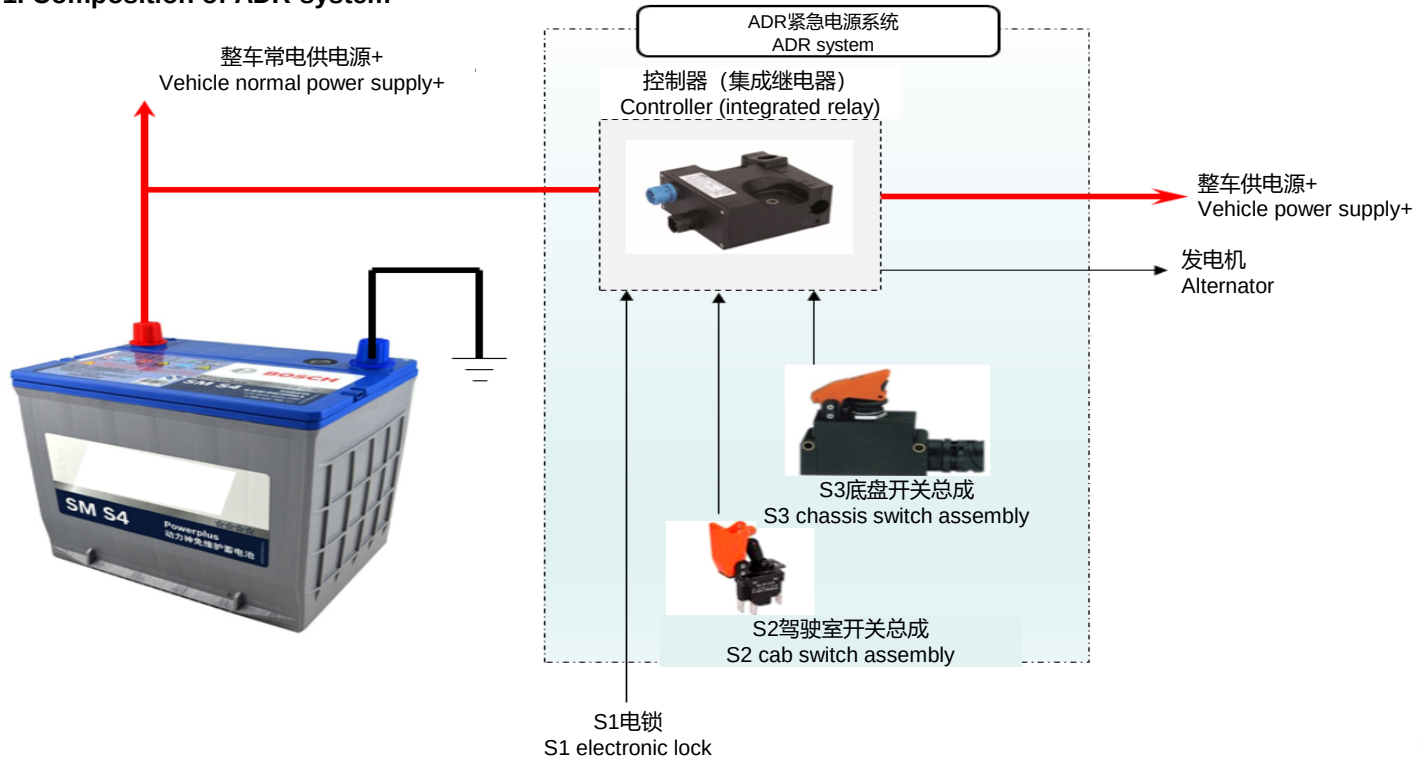
① 危险品运输车辆若出现的碰撞等紧急情况，可快速的切断整车电源（3s）；
① If there is an emergency such as a collision in a dangerous goods transport vehicle, the power supply of the vehicle can be quickly cut off (3s);

② ADR 2015 /ECE R105危险品运输协议：强制要求配装紧急电源切断系统。
② ADR 2015 /ECE R105 Dangerous Goods Transport Agreement: It is mandatory to equip with ADR system.

ADR系统
ADR system

二、ADR系统组成及控制逻辑
II. Composition and control logic of ADR system

1. ADR系统组成
1. Composition of ADR system



ADR系统
ADR system

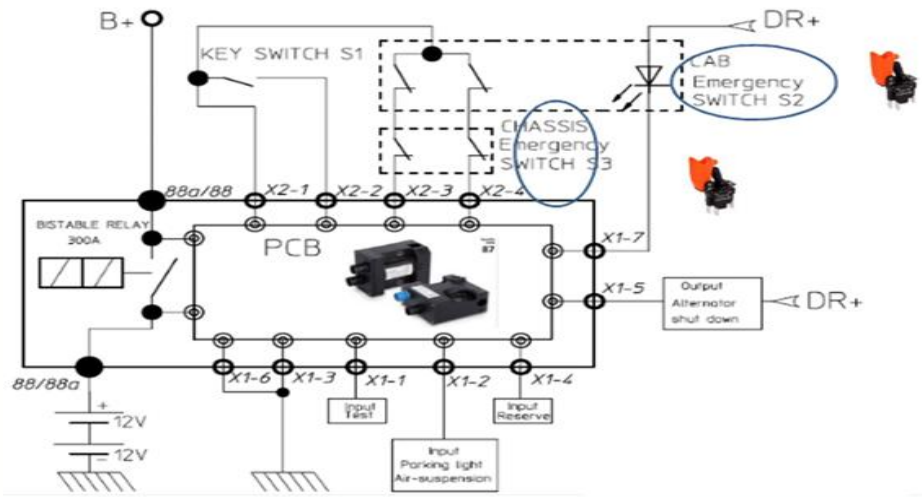
二、ADR系统组成及控制逻辑
II. Composition and control logic of ADR system

2. ADR系统控制电气原理
2. Control electrical principle of ADR system

- 正常停车：正常行驶状态下，S2/S3闭合，停车时，先关闭车钥匙，然后关闭S1，
- Normal parking: In normal driving state, S2/S3 is closed, when parking, first turn off the vehicle key, then turn off S1,

过5min后，继电器断开，整个车身断电。
After 5 min, the relay is disconnected and the ehicle body is powered off.

- 紧急停车：紧急状态下（车辆行驶中），断开S2或S3，3S后，继电器断开，整车身断电。
- Emergency stop: In an emergency state (vehicle running), disconnect S2 or S3, after 3 s, the relay is disconnected, and the vehicle is powered off.
- 误操作不停车：当正常行驶状态下，车钥匙打开，误操作关闭S1，ECU不响应。
- No stop due to misoperation: When the vehicle key is turned on during normal driving, S1 is turned off due to misoperation, and the ECU does not respond.



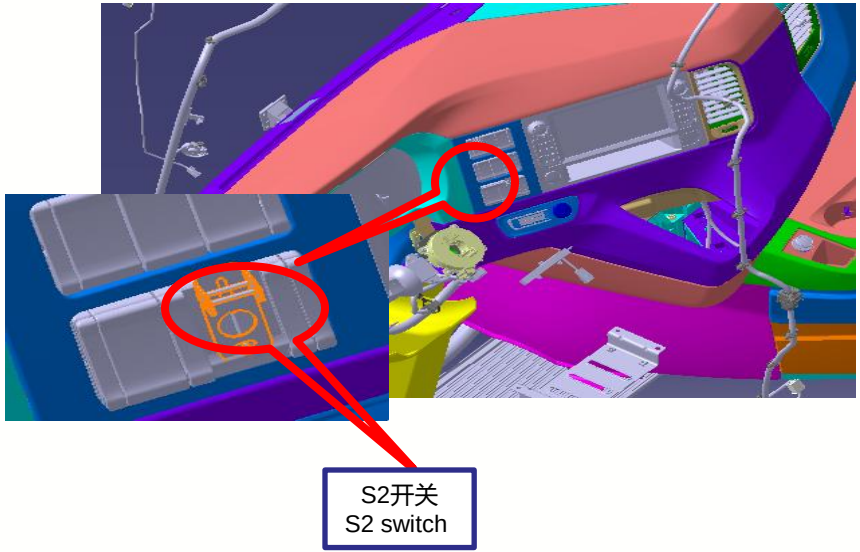
X1-1	测试端口（预留） Test port (reserved)
X1-2	输入端口（预留） Input port (reserved)
X1-3	电源地GND Power GND
X1-4	输入端口（预留） Input port (reserved)
X1-5	输出端口、主触点闭合输出低电平 This is the output port where low level is output when main contact is closed
X1-6	电源地GND Power GND
X1-7	工作指示灯驱动端口，常规输出低电平，系统故障输出脉冲电平 This is the work indicator lamp drive port where low level is output in general circumstances, and pulse level is output when the system is faulty
X2-1	电源+ Power supply +
X2-2	电锁开关信号，高有效 Electric lock switch signal, active-high
X2-3	紧急电源切断开关信号，低有效 Emergency power cut-off switch signal, active-low
X2-4	紧急电源切断开关信号，低有效 Emergency power cut-off switch signal, active-low

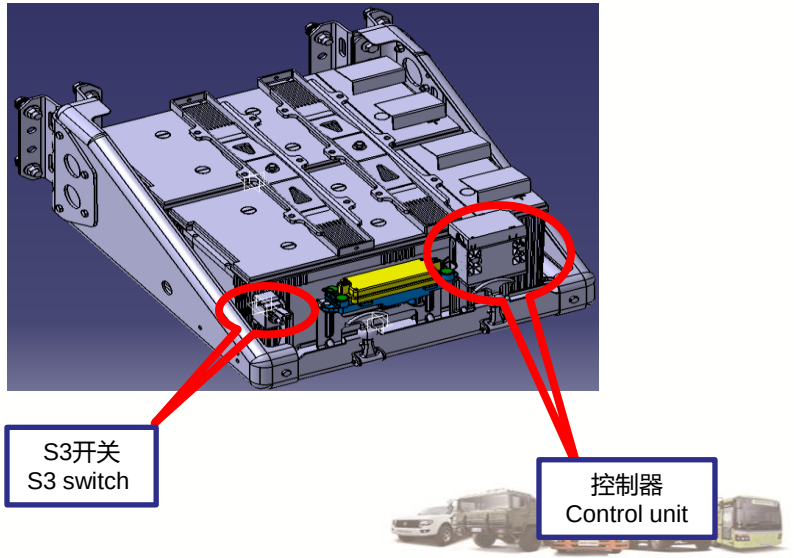
ADR系统
ADR system

三、ADR系统安装要求III. Installation requirements for ADR system

1. ADR系统安装 1. Installation of ADR system

① 控制单元安装位置：应紧靠汽车电瓶
① Installation position of control unit: shall be close to the vehicle battery
② S1安装位置：驾驶室仪表板空域处
② Installation position of S1: in the airspace of the dashboard of the cab
③ S2安装位置：驾驶室内不容易误操作碰到的地方，如仪表板左下方。
③ Installation location of S2: An area in the cab that is not easily touched by misoperation, such as the lower LH side of the dashboard.
④ S3安装位置：最好在牵引车和挂之间左下方，或者电瓶箱附近。
④ Installation location of S3: preferably on the lower LH side between the tractor and the trailer, or near the battery box.





ADR系统
ADR system

四、ADR系统操作方法及注意事项
IV. Operation method and precautions of ADR system

1. ADR系统操作方法
1. How to operate the ADR system

a、汽车正常运行。司机进驾驶仓，按S1至“开”的状态（S2/S3必须接通），当司机插入车钥匙启动，汽车开始正常运行。停车后，司机旋转车钥匙关闭发动机，并关闭汽车所有用电器后，然后按S1至“关”的状态，延时5min后，整车电源关闭。
a. The vehicle is running normally. The driver enters the cab and turns S1 to the "ON" state (S2/S3 must be connected). When the driver inserts the vehicle key to start, the vehicle starts running normally. After parking, the driver turns the vehicle key to stop the engine and all consumers of the vehicle, and then turns S1 to the "OFF" state. After a delay of 5 min, the power of the whole car is turned off.
b、汽车在危险状态需要紧急断电，这时断开S2或S3, 3S后车身断电。
b. When the vehicle is in a dangerous state and needs to be powered off in an emergency, disconnect S2 or S3 and power off the body after 3 s.
左下图为S2/S3正常工作状态，右下图为S2/S3紧急断开状态。
The lower LH picture shows the normal working state of S2/S3, and the lower RH picture shows the emergency disconnection state of S2/S3.

正常工作
Normal work

紧急断开
Emergency disconnection

2. ADR系统使用注意事项
2. Precautions for operating the ADR system

a、不允许用手接触接插件端子
a. It is not allowed to touch the connector terminals with hands
b、跌落于地的产品可能有隐性损坏，不得再使用
b. Products dropped to the ground may be damaged and may not be used again.

ADR系统
ADR system

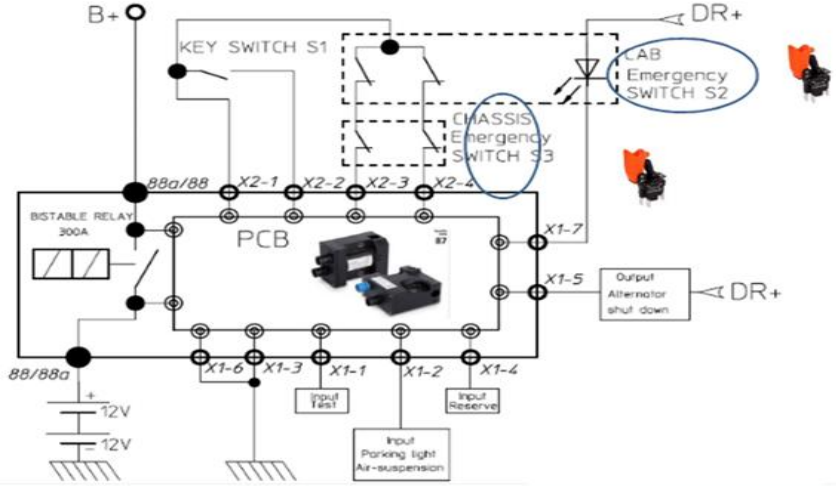
五、ADR系统常见故障处理方法
V. Troubleshooting of common faults of ADR system

1. ADR系统故障提示
1. Fault prompt of ADR system

① 当S2/S3两开关触点状态不一致的时候，内部某个触点接触不良的时候，L灯会亮，表示有故障。
① When the contact state of the two switches S2/S3 is inconsistent, or an internal contact is in poor contact, the L light will light up, indicating a fault.
② 如果继电器有故障不工作，L灯会亮。
② If the relay is faulty and does not work, the L lamp will be on.

2. ADR系统故障处理
2. Troubleshooting of ADR system

• “L”指示灯常亮时，请立即到维修站进行检修，以确保ADR系统正常工作。
• When the “L” indicator lamp is constantly on, please go to the maintenance station for inspection immediately to ensure that the ADR system is working properly.
• 启动汽车前，请确保S2/S3开关为闭合状态
• Before starting the vehicle, make sure the S2/S3 switch is closed
• 在紧急状态下断开了S2/S3开关，闭合之前请确认先关闭车钥匙和一般电源总开关S1。
• When the S2/S3 switch is disconnected in an emergency, please make sure to turn off the vehicle key and the general power switch S1 before closing.



发动机电子机油尺
Engine electronic oil dipstick

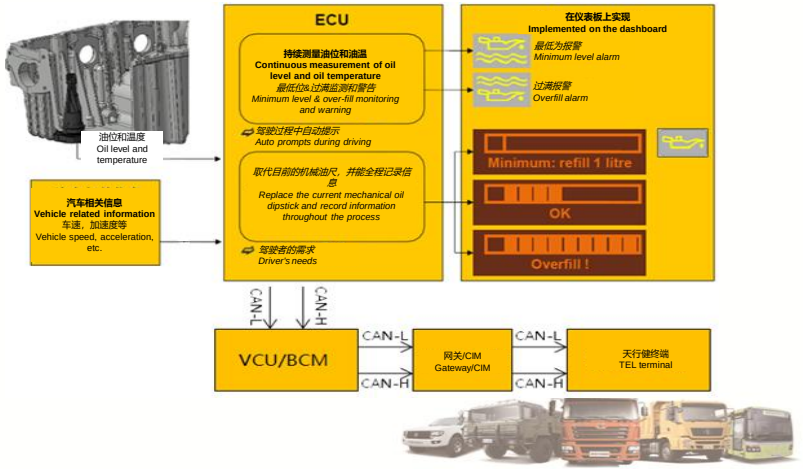
一、电子机油尺作用
I. Function of electronic oil dipstick

1.什么是电子机油尺
1.What is an electronic oil dipstick?

发动机电子机油尺（带油温检测）是使发动机的机油液位和机油温度能够通过该机油尺进行检测，液位和温度信息通过油尺检测发送给控制器，控制器通过总线把信息发送至仪表进行显示。该电子机油尺可用以替代传统的机械油尺,也可作为油温检测。
The engine electronic oil dipstick (with oil temperature detection) enables the engine oil level and oil temperature to be detected through the oil dipstick, and the liquid level and temperature information is sent to the controller through the oil dipstick detection, and the controller sends the information to the instrument display. The electronic oil dipstick can be used to replace the traditional mechanical oil dipstick, and can also be used as oil temperature detection.

2. 电子机油尺的组成
2. Composition of electronic oil dipstick

温度传感器
Temperature sensor
+
液位传感器
Liquid level sensor
=



发动机电子机油尺
Engine electronic oil dipstick

二、电子机油尺控制逻辑
II. Control logic of electronic oil dipstick

1. 电子机油尺控制原理
1. Control principle of electronic oil dipstick

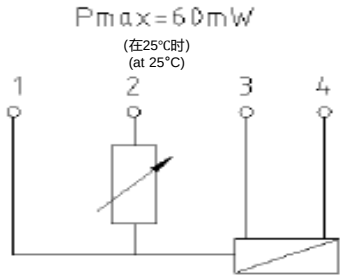
驻车状态下：车辆平稳后，电子机油尺通过电加热原理，计算出发动机当前液位高度，通过前期数据标定，将发动机内机油量显示在仪表上，方便对发动机内机油总量的监控。

In the parking state: after the vehicle is stable, the electronic oil dipstick calculates the current fluid level of the engine through the principle of electric heating. Through previous data calibration, the amount of oil in the engine is displayed on the instrument to facilitate monitoring of the total amount of oil in the engine.

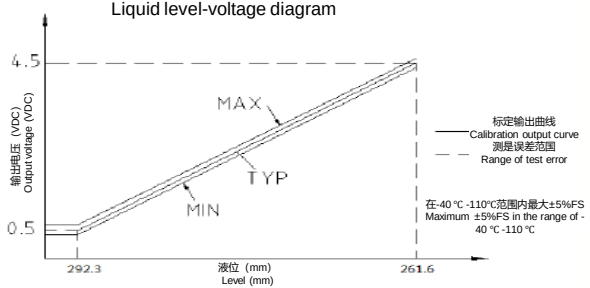
行车过程中：电子机油尺通过分析传感器热敏电阻信号，计算出当前发动机内机油温度，当机油温度过高时，及时在仪表上进行反馈提示。

During driving: The electronic oil dipstick calculates the current oil temperature in the engine by analyzing the sensor thermistor signal. When the oil temperature is too high, it will provide prompt feedback on the instrument.

电路简图
Circuit diagram



液位高度-电压图
Liquid level-voltage diagram



R-T表R-T table

温度 (℃) Temperature (℃)	Rmin(Ω)	Rnom(Ω)	Rmax(Ω)	温度 (℃) Temperature (℃)	Rmin(Ω)	Rnom(Ω)	Rmax(Ω)
-40	300050	336500	377090	55	2811.5	2986.2	3168.5
-35	217660	242590	270360	60	2340.5	2488	2641.9
-30	159680	177000	196150	65	1957.8	2083	2213.6
-25	118280	130370	143740	70	1645.5	1752	1863.3
-20	88517	97070	106470	75	1390.2	1481.4	1576.4
-15	66845	72929	79615	80	1179.5	1258	1339.7
-10	50950	55330	60115	85	1004.6	1072.3	1142.9
-5	39148	42315	45775	90	859.08	917.7	978.75
0	30338	32650	35164	95	737.57	788.52	841.53
5	23692	25388	27231	100	635	680	725
10	18645	19900	21258	105	549.72	588.59	628.99
15	14775	15708	16716	110	477.07	511.2	546.65
20	11793	12490	13242	115	415.36	445.41	476.62
25	9467.3	10000	10563	120	362.85	389.3	416.85
30	7620.4	8057	8511.6	125	318.27	341.7	366.02
35	6171.8	6531.3	6906.2	130	280.01	300.9	322.49
40	5028.9	5327	5637.5	135	246.84	265.44	284.72
45	4120.6	4368.7	4627.5	140	218.21	234.8	252.01
50	3395.1	3603	3819.5				

发动机电子机油尺
Engine electronic oil dipstick

三、电子机油尺故障问题处理及注意事项
III. Troubleshooting and precautions of electronic oil dipstick

1. 电子机油尺测量注意事项（仪表提示机油液位低）
1. Precautions for electronic oil dipstick measurement (the instrument indicates that the oil level is low)

1.停车时车辆处于坡道会影响液位测量输出的准确性，建议司机将车辆停在较平稳路面上。
1. Parking the vehicle on a slope will affect the accuracy of the liquid level measurement output. It is recommended that the driver park the vehicle on a stable road.
2.电子机油尺在整车下电10min后采集一次液位信号。由于发动机回油速率较慢，10min存在部分机油未能回流，因此建议每当车辆静置时间超过6小时后，司机在发动机启动前通过多功能方向盘对液位进行一次刷新测量。
2. The electronic oil dipstick collects a fluid level signal 10 min after the vehicle is powered off. Due to the slow oil return rate of the engine, part of the oil fails to return within 10 min. Therefore, it is recommended that the driver perform a refresh measurement of the fluid level through the multi-functional steering wheel before starting the engine every time the vehicle is left idle for more than 6 h.
3.若车辆平稳情况下仍报液位低，则可能出现烧机油或漏油问题，建议及时排查，并补充机油。
3. If the liquid level is still reported to be low when the vehicle is stable, there may be oil burning or oil leakage. It is recommended to check the oil in time and replenish it.

2. 电子机油尺刷新方法
2. How to refresh the electronic oil dipstick

多功能方向盘选择到机油状态界面，当右上角显示“刷新机油”时，点击多功能方向盘中的OK键进行当前液位刷新。
Select the oil state interface from the multi-functional steering wheel, and when the upper RH corner displays "Refresh oil", click the OK button on the multi-functional steering wheel to refresh the current oil level.

弯道照明系统
Curve lighting system

一、弯道照明说明及使用说明
I. Curve lighting instructions and instructions for use

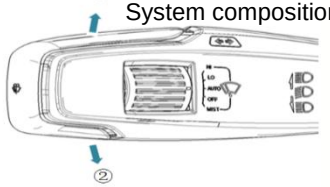
采用相应侧的前雾灯实现该功能，当0<车速≤40km/h，灯光开关位于II档时，左（右）转向开关信号可以开启弯道照明功能，相应一侧的左（右）前雾灯点亮，同时弯道照明工作状态指示。

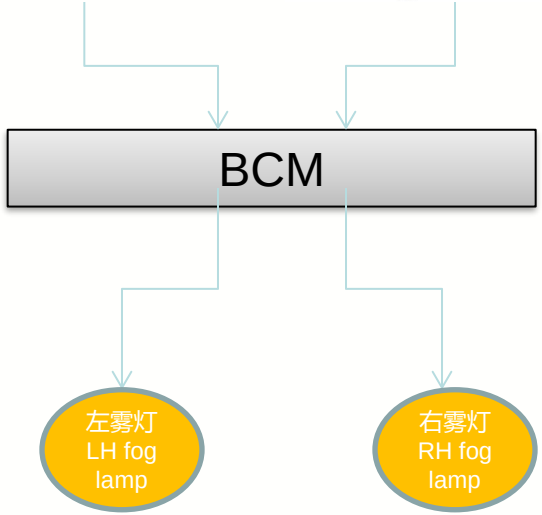
Use the front fog lamp on the corresponding side to realize this function. When 0 < vehicle speed ≤ 40km/h and the light switch is in the II position, the LH (RH) steering switch signal can turn on the curve lighting function. The LH (RH) front fog lamp on the corresponding side will come on. The working state of the curved lighting is indicated at the same time.

弯道照明系统
Curve lighting system

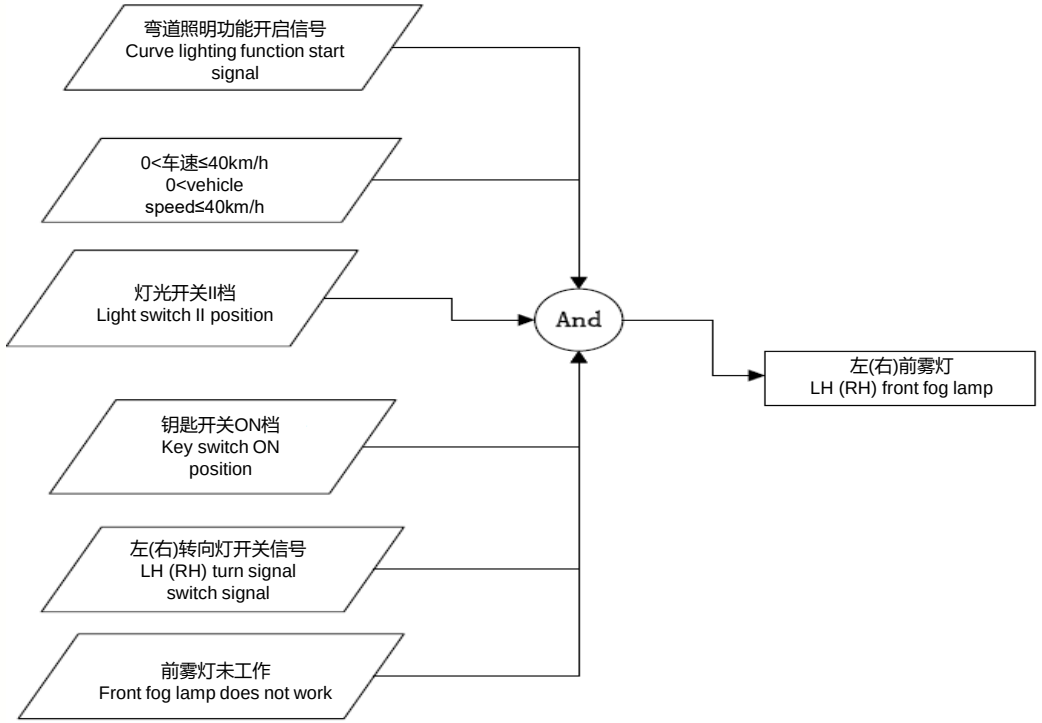
二、弯道照明系统组成及控制逻辑
II. Composition and control logic of curve lighting system

① 系统组成
System composition



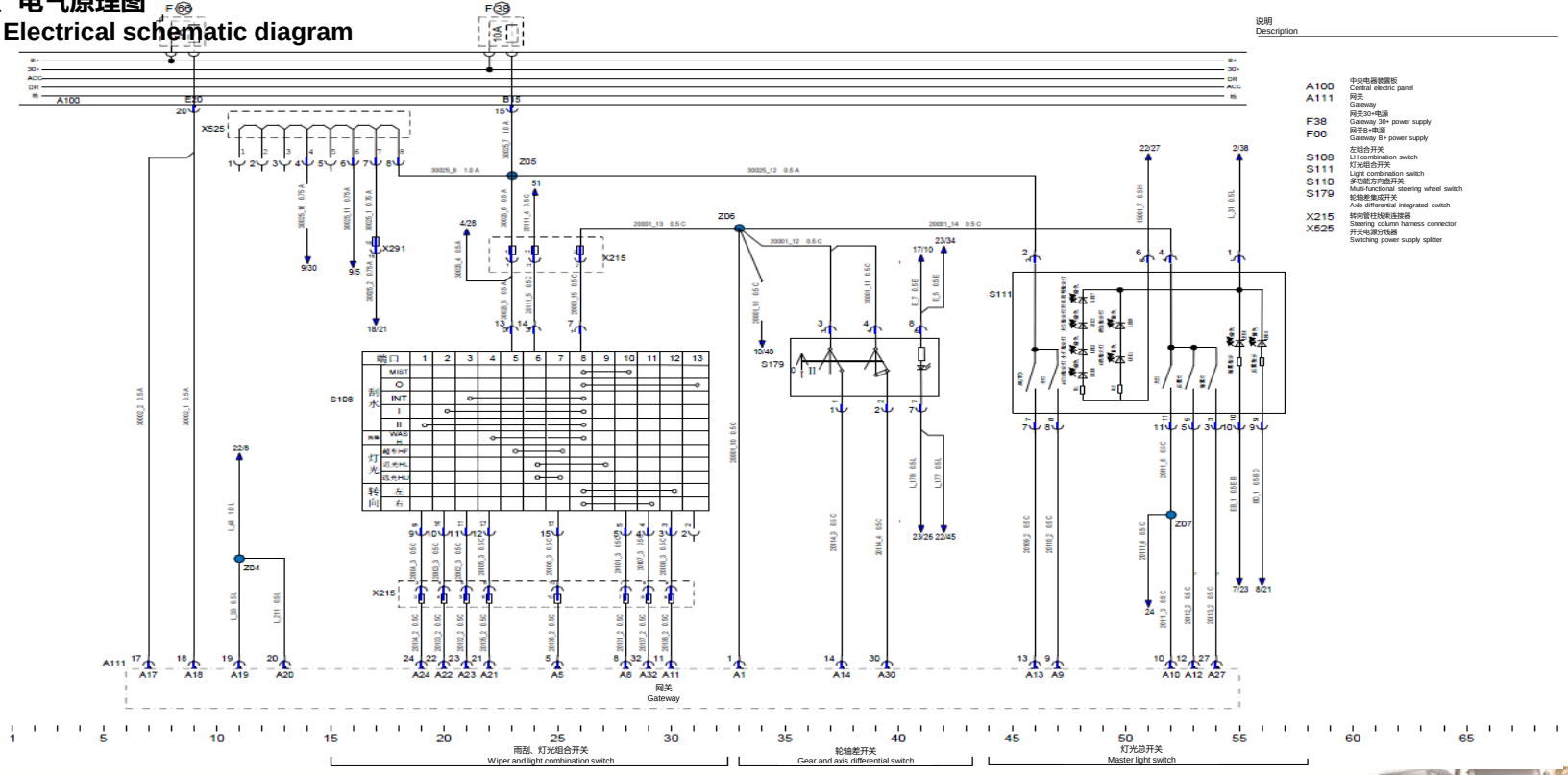


控制逻辑
Control logic



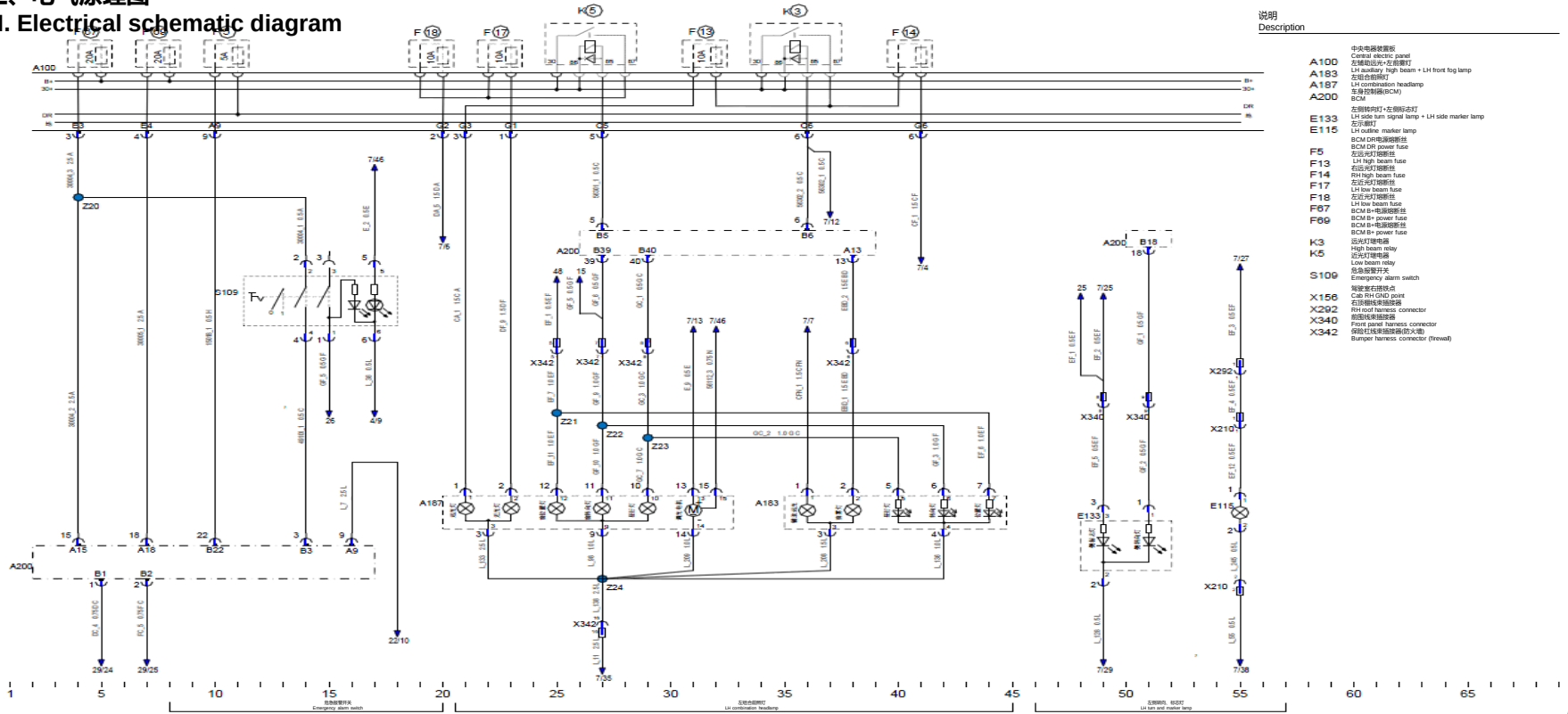
弯道照明系统
Curve lighting system

三、电气原理图
III. Electrical schematic diagram



弯道照明系统
Curve lighting system

三、电气原理图
III. Electrical schematic diagram



说明
Description

A100	中央电器装置板 Central electric panel
A183	左辅助远光+左前雾灯 LH auxiliary high beam + LH front fog lamp
A187	左组合前照灯 LH combination headlamp
A200	BCM 左侧转向灯+左侧标志灯 LH side turn signal lamp + LH side marker lamp
E133	左示廓灯 LH outline marker lamp
E115	BCM DR电源熔断丝 BCM DR power fuse
F5	左远光灯熔断丝 LH high beam fuse
F13	右远光灯熔断丝 RH high beam fuse
F14	左近光灯熔断丝 LH low beam fuse
F17	右近光灯熔断丝 LH low beam fuse
F18	BCM B+电源熔断丝 BCM B+ power fuse
F67	BCM B+电源熔断丝 BCM B+ power fuse
F69	远光灯继电器 High beam relay
K3	近光灯继电器 Low beam relay
K5	危急报警开关 Emergency alarm switch
S109	驾驶室右搭铁点 Cab RH GND point
X156	右顶棚线束插接器 RH roof harness connector
X292	前围线束插接器 Front panel harness connector
X340	保险杠线束插接器(防火墙) Bumper harness connector (firewall)
X342	

弯道照明系统
Curve lighting system

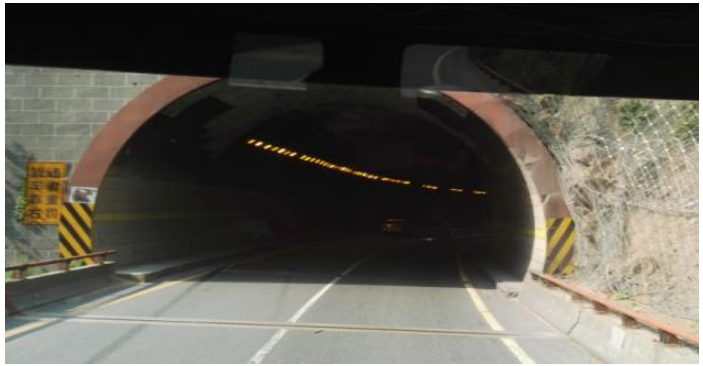
四、故障处理
IV. Troubleshooting

1	左前雾灯对地短路故障 LH front fog lamp short to ground	左前雾灯对地短路故障 LH front fog lamp short to ground	请检查左前雾灯线路是否破损 Please check whether LH front fog lamp circuit is damaged
2	左前雾灯开路故障 LH front fog lamp open circuit	左前雾灯开路故障 LH front fog lamp open circuit	请检查左前雾灯线路是否断路，灯泡是否烧毁 Please check whether LH front fog lamp circuit is open and whether the bulb is burnt-out
3	右前雾灯对地短路故障 RH front fog lamp short to ground	右前雾灯对地短路故障 RH front fog lamp short to ground	请检查右前雾灯线路是否破损 Please check whether RH front fog lamp circuit is damaged
4	右前雾灯开路故障 RH front fog lamp open circuit	右前雾灯开路故障 RH front fog lamp open circuit	请检查右前雾灯线路是否断路，灯泡是否烧毁 Please check whether RH front fog lamp circuit is open and whether the bulb is burnt-out

自动灯光雨刮系统
Auto light and wiper system

一、自动灯光雨刮介绍
I. Introduction to auto light and wiper system

自动灯光开启及关闭
Auto light on/off



自动雨刮系统
Auto wiper system

1. 根据雨量、车速高低，自动调节刮速。
It automatically adjusts the wiping speed according to the amount of rain and the speed of the vehicle.
2. 4种敏感度，满足不同人群对视野需求。
4 kinds of sensitivities are available to meet the vision needs of different groups of people.
3. 降低雨天行车工作。
Reduce the driving work in rainy days.
4. 保证行车安全。
Ensure the driving safety.

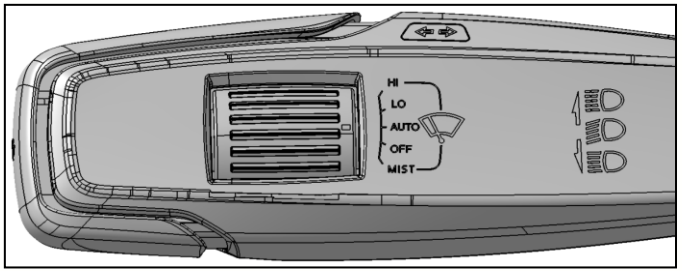
自动灯光雨刮系统
Auto light and wiper system

1.1使用方法
1.1 How to use

自动灯光的使用
Use of auto light

➢如图，把灯光总开关旋转到位置①，接通自动灯光档开关。
As shown in the figure, turn the master light switch to position ①, and turn on the auto light switch.

➢此时位置灯 或近光灯 将根据光线强弱情况，自动开启或关闭。
And the position lamp or the low beam will be automatically turned on or off according to the light intensity.



①

自动雨刮的使用
Use method of auto wipers
➢如图，把组合开关旋转到位置①，接通自动雨刮开关。
As shown in the figure, turn the combination switch to position ①, and turn on the auto wiper.
➢此时雨刮将被激活，至少刮动一次。自检完成。
At this point the wipers will be activated and wipe at least once. BIT completed.
➢雨刮将根据前挡风玻璃雨量大小自动刮刷。
The wiper will automatically work according to the amount of rain on the front windshield.

自动雨刮敏感度调节
Auto wiper sensitivity adjustment
➢使用仪表菜单开关选择进入车身控制。
Use the IC menu switch to access body control.
➢进入自动雨刮敏感度调节。
Enter auto wiper sensitivity adjustment.
➢根据驾驶员个人使用习惯进行1-2-3-4级别选择（依次敏感度增加）。
Select 1-2-3-4 levels according to the driver's personal usage habit (sensitivity increases in sequence).

1.2使用注意事项
1.2 Precautions for use

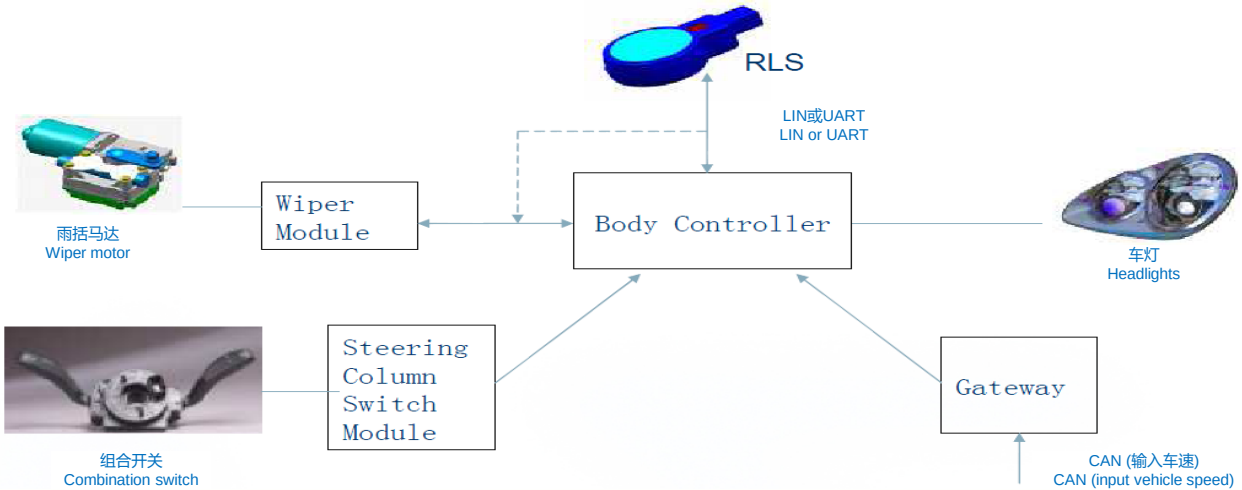
警告！
Warning!

当雾天、雨雪天气等条件，驾驶员应根据需要使用手动打开大灯、前雾灯、后雾灯！
In conditions such as foggy, rainy or snowy, the driver should manually turn on the headlights, front fog lamps, and rear fog lamp as needed!
打开自动雨刮档前，请确保雨刮器未结冰！
Before turning on the auto wiper, make sure the wiper blades are not frozen!

自动灯光雨刮系统
Auto light and wiper system

二、原理介绍
II. Introduction to principle

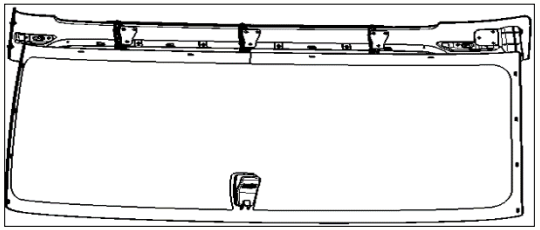
自动灯光系统是当灯光开关处于AUTO档，雨量光线传感器发送自动开启或关闭位置灯和近光灯的LIN信号，并由BCM最终执行开关灯指令。
The automatic light system is the light switch in the AUTO position, the rain light sensor sends a LIN signal to automatically turn on or off the position lamp and the low beam, and the BCM finally executes the light switch command.
自动雨刮系统是当雨刮开关处于AUTO档，雨量光线传感器发送雨刮间歇、低速和高速的LIN信号，并由BCM最终执行不同间歇频率或低速或高速指令。
The auto wiper system is when the wiper switch is in the AUTO position, the rain light sensor sends LIN signals of wiper intermittent, low speed and high speed, and the BCM finally executes different intermittent frequency or low speed or high speed commands.



自动灯光雨刮系统
Auto light and wiper system

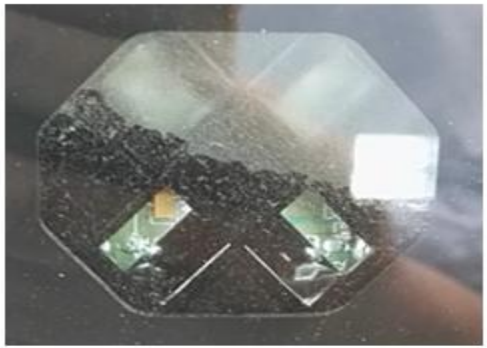
三、结构特点及更换安装注意事项
III. Structural characteristics and precautions for replacement and installation

传感器支架粘胶应均匀，雨量光线传感器安装方式为卡接，传感器安装卡接到位。安装后检查传感器与玻璃之间不应存在气泡。
The adhesive on the sensor bracket should be even, the rainfall light sensor installation method is clip, and the sensor shall be clipped well. There should be no air bubbles between the sensor and the glass after installation.



合格完：全贴实玻璃
Passed: fully bonded to glass.

不合格：全部未贴合玻璃
Unqualified: all are not bonded to glass.



不合格：部分未贴合玻璃
Unqualified: partial are not bonded to glass.

自动灯光雨刮系统
Auto light and wiper system

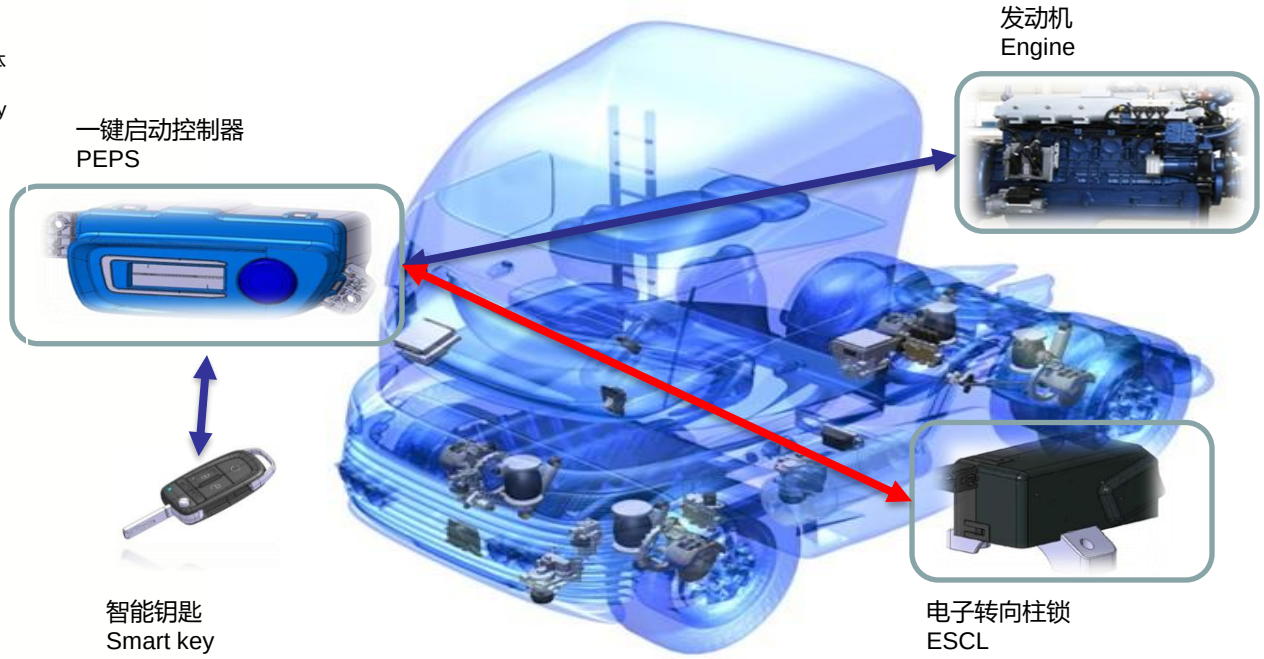
四、故障处理
IV. Troubleshooting

1	自动雨刮不工作 Auto wiper not working	开关未使能 Switch not enabled	检查开关信号输入 Check switch signal input
2	自动雨刮不工作 Auto wiper not working	传感器安装不到位 The sensor is not installed properly	请检查传感器安装 Please check sensor installation
3	自动雨刮不工作 Auto wiper not working	线束连接 Harness connection	请检查线束连接 Please check harness connection
4	灯光开启、雨刮频率不舒适 The lights are on and the wiper frequency is uncomfortable.	敏感度未适配 Sensitivity not adapted	从仪表调整敏感度 Adjust sensitivity from IC

一键启动系统
PEPS system

一、一键启动功能介绍
I. Introduction to PEPS

1、发动机防盗
1. Anti-theft engine
由近场钥匙认证技术，VCU认证，双重认证组成的IMMO认证体系，采用高安全级别的AES加密算法。
The IMMO authentication system is composed of near-field key authentication and VCU authentication, and adopts high-security AES encryption algorithm.
2、ESCL（电子转向柱锁）控制功能
2. ESCL control function
采用高安全级别的AES加密算法的ESCL认证；根据驾驶需要，自动控制电子转向柱锁开、闭锁的功能。
It adopts ESCL authentication of high-security AES encryption algorithm, and according to driving needs, can automatically control the on/off of ESCL.
3、应急起动
3. Emergency start
在一键启动机械开关出现故障的情况下，采用遥控钥匙无线通讯及CAN网络辅助通讯，应急起动发动机的功能。
In the event that the PEPS mechanical switch fails, the remote key wireless communication and CAN network-assisted communication are used to emergency start the engine.
4、远程起动辅助
4. Remote starting assistance
响应车联网系统下发的远程起动辅助命令，通过CAN网络完成远程认证，自动切换整车电源状态，配合远程起动。
It responds to the remote starting assistance command issued by the IoV system, completes remote authentication through the CAN network, automatically switches the vehicle power supply status, and remote starting.



一键启动系统
PEPS system

二、使用方法
II. Use method

一键启动/熄火钥匙
PEPS key

① 钥匙插入：钥匙插入到卡槽内，直到卡槽指示灯亮起。
① Key insertion: insert the key into the key slot until the indicator lamps on.

② 按键进入ACC电源模式：按一下一键启动熄火按键，按键指示灯琥珀色常亮，车辆进入ACC电源上电状态。
② Press the button to enter the ACC power mode: PEPS-stop button, the key indicator lamp shall be amber and constantly on, then the vehicle enters the ACC power-on

③ 按键进入ON电源模式：在ACC电源状态下，按一下一键启动熄火按键，按键指示灯冰蓝色常亮，车辆进入ON电源上电状态。
③ Press the button to enter the ON mode: in the ACC power state, press the PEPS-stop button, the key indicator lamp will be blue and constantly on, and the vehicle will enter the ON state.

⑥ 熄火：车辆启动状态下，按一下一键启动熄火按键，发动机熄火，车辆进入ACC电源上电状态，按键指示灯琥珀色常亮。拔出钥匙，按键指示灯熄灭，车辆进入OFF状态。
⑥ Flame off: when the vehicle is started, press the PEPS-stop button, the engine is turned off, the vehicle enters the ACC power-on state, and the key indicator lamp is constantly on in amber. Pull out the key, the key indicator lamp goes out and the vehicle enters the OFF state.

⑤ 启动：在ON电源状态下，踩住刹车踏板，按住一键启动熄火按键，按键指示灯冰蓝色闪烁，发动机启动后，松开一键启动熄火按键，按键指示灯冰蓝色常亮。
⑤ Start: in the ON power state, step on the brake pedal, press and hold the PEPS-stop button, the key indicator lamp is ice blue and flashes. After the engine starts, release the PEPS-stop button, the key indicator lamp is ice blue and constantly on.

④ 按键进入OFF模式：在ON电源状态下，按一下一键启动熄火按键，按键指示灯熄灭，车辆进入OFF状态。
④ Press the button to enter OFF mode: in the ON state, press the PEPS-stop button, then the key indicator lamp goes out, and the vehicle enters the OFF state.

警告！
Warning!

- 行车过程中切勿关闭点火钥匙开关。
  Do not turn off the ignition key switch while driving.

一键启动系统
PEPS system

二、系统组成、结构特点
II. System compositions and structural features

一键启动控制系统由一键启动模块（PSU）和电子转向柱锁（ESCL）模块组成，可以在不操作智能钥匙的情况下，实现自动认证钥匙合法性，自动解锁转向柱，一键启动和关闭发动机等功能。驾驶员将智能钥匙插入一键启动模块卡槽内，如果钥匙合法，系统自动解锁转向柱和发动机。在符合启动条件的情况下，踩住制动踏板，按下一键启动熄火按键即可启动发动机；在符合熄火条件下，按下一键启动熄火按键可熄火发动机。包含功能如下:

The PEPS control system consists of a PSU and an ESCL module, which can automatically verify the legality of the key and automatically unlock the steering column, PEPS and turn off the engine without operating the smart key. The driver inserts the smart key into the key slot of the PSU, and if the key is legal, the system automatically unlocks the steering column and the engine. When the starting conditions are met, step on the brake pedal and press the PEPS-stop button to start the engine; when the flame-out conditions are met, press the PEPS-stop button to stop the engine. It contains the following functions:

1、一键启动
1. PEPS

2、ESCL控制
2. ESCL control

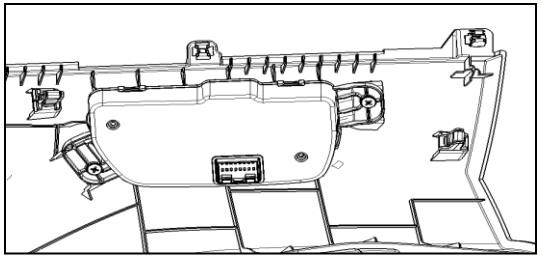
3、钥匙应急启动/熄火
3. Emergency key start/stop

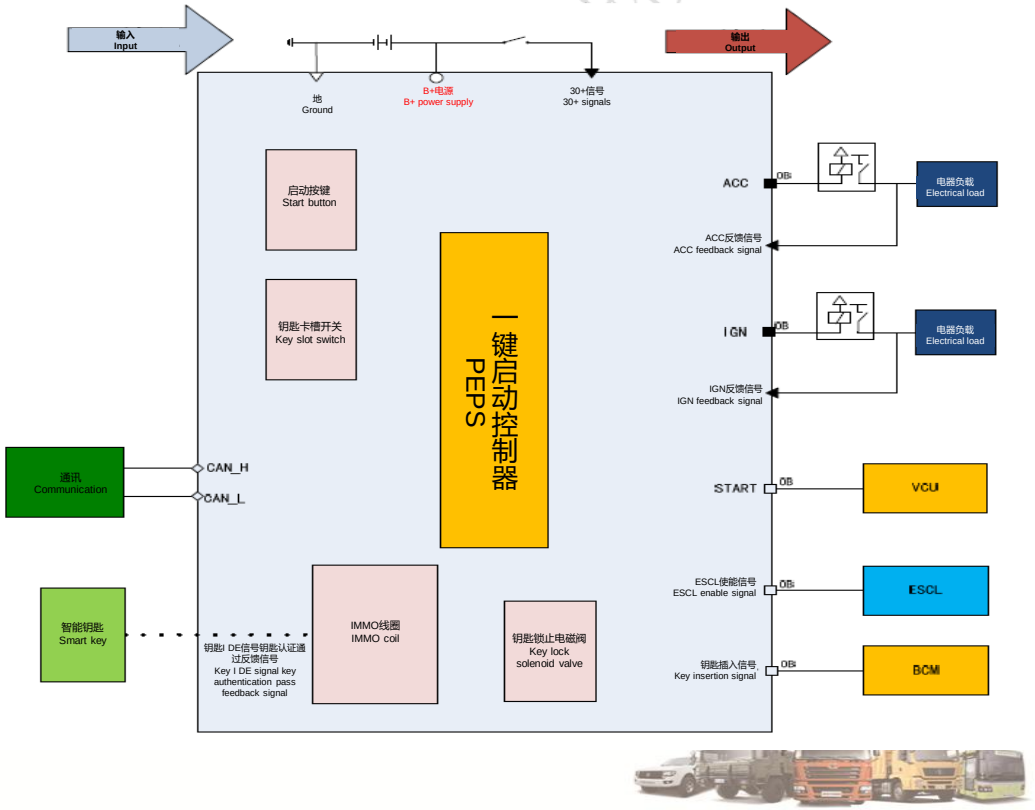
4、远程启动熄火
4. Remote start/stop

5、显示功能
5. Display function

6、故障应急处理功能
6. Emergency processing fault function

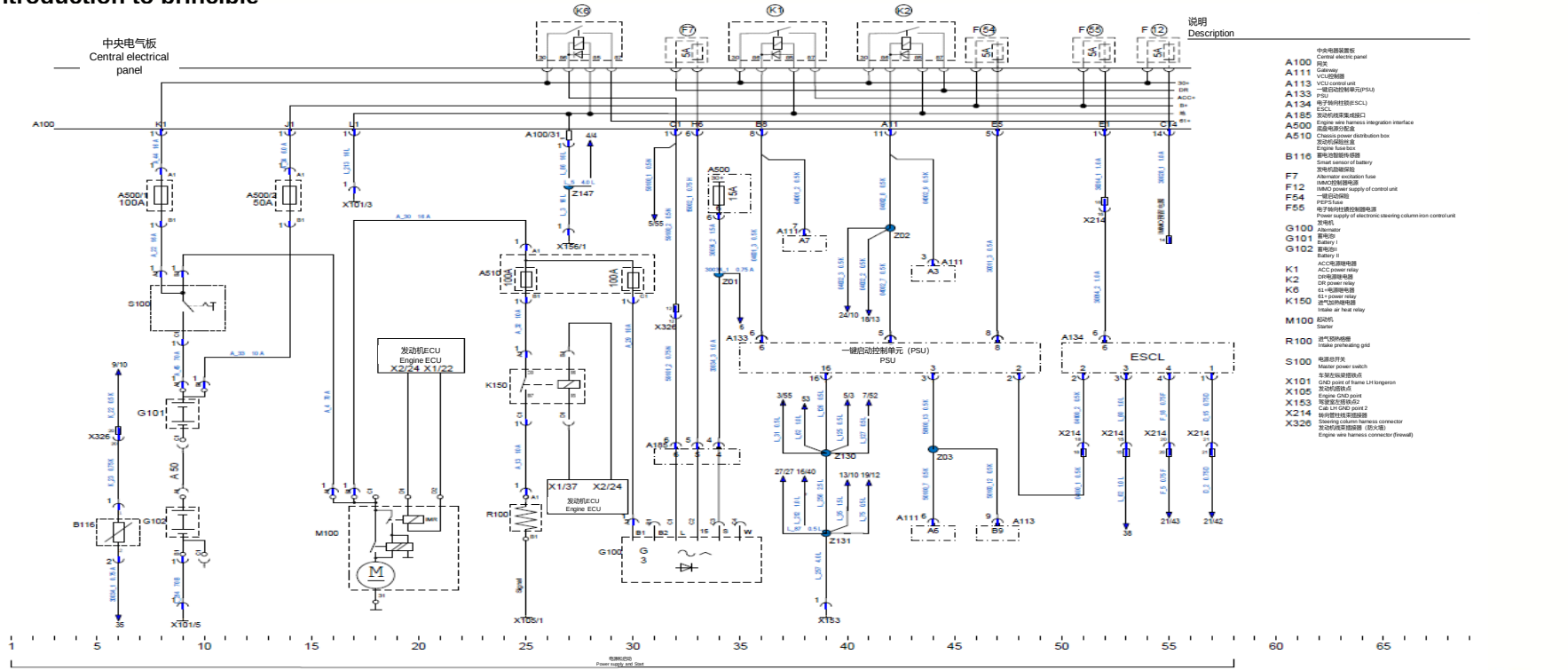
一键启动采用螺钉固定在仪表台上。
The PEPS is fixed on the dashboard with screws.





一键启动系统
PEPS system

三、原理介绍
III. Introduction to principle



一键启动系统
PEPS system

四、故障处理
IV. Troubleshooting

序号 S/N	故障描述 Fault description	诊断仪码 Diagnostic code	故障显示 Fault display	维修指导 Maintenance guide
83	蓄电池供电过压 Overvoltage of battery power supply	P13 00 80	蓄电池供电过压 Overvoltage of battery power supply	1.查找蓄电池故障 2.查找线束故障 1. Find the battery fault 2. Find the harness fault
84	蓄电池供电欠压 Undervoltage of battery power supply	P13 00 81	蓄电池供电欠压 Undervoltage of battery power supply	1.查找蓄电池故障 2.查找线束故障 1. Find the battery fault 2. Find the harness fault
85	EEPROM故障 EEPROM fault	P13 00 82	EEPROM故障 EEPROM fault	更换PSU控制器 Replace PSU control unit
86	ECU RAM故障 ECU RAM fault	P13 00 83	ECU RAM故障 ECU RAM fault	更换PSU控制器 Replace PSU control unit
87	ECU ROM故障 ECU ROM fault	P13 00 84	ECU ROM故障 ECU ROM fault	更换PSU控制器 Replace PSU control unit
88	功能Limphome故障 Limphome fault	P13 00 85	功能Limphome故障 Limphome fault	维修有信号交互控制器的故障或自身故障，便可恢复正常模式 The normal mode can be restored by repairing signal interaction control unit fault or the function fault
89	ACC开路/对电源短路/对地短路故障 ACC open circuit/short to power/short to ground	P13 00 86	ACC开路/对电源短路/对地短路故障 ACC open circuit/short to power/short to ground	请检查PSU ACC继电器或ACC线连接或ACC反馈线连接 Please check the PSU ACC relay or ACC circuit connection or ACC feedback circuit connection
90	ON开路/对电源短路/对地短路故障 ON open circuit/short to power/short to ground	P13 00 87	ON开路/对电源短路/对地短路故障 ON open circuit/short to power/short to ground	请检查PSU ON继电器或ON线连接或ON反馈线连接 Please check the PSU ON relay or ON circuit connection or ON feedback circuit connection
91	Start开路/对电源短路/对地短路故障 Start open circuit/short to power/short to ground	P13 00 88	Start开路/对电源短路/对地短路故障 Start open circuit/short to power/short to ground	请检查PSU Start继电器或ON线连接或ON反馈线连接 Please check PSU Start relay or ON circuit connection or ON feedback circuit connection
92	ESCL使能信号线开路/对电源短路/对地短路故障 ESCL enable signal line open circuit/short to power/short to ground	P13 00 89	ESCL使能信号线开路/对电源短路/对地短路故障 ESCL enable signal line open circuit/short to power/short to ground	请检查PSU ESCL_EN线连接 Please check PSU ESCL_EN circuit connection
93	接收TCO1（0x0CFE6CEE）报文超时故障 Receiving TCO1 (0x0CFE6CEE) message timeout fault	U10 0B 80	接收TCO1（0x0CFE6CEE）报文超时故障 Receiving TCO1 (0x0CFE6CEE) message timeout fault	1.请确定网关、仪表或行驶记录仪正常工作（有行驶记录仪就先检查行驶记录仪，无的话就检查仪表）； 2.请确保网关和天行健间连接can线状态正确； 3.如果无行驶记录仪，请检查网关和仪表间连接can线状态是否正确，线束有无破损； 4.如果有行驶记录仪，请检查网关和行驶记录仪间连接can线状态是否正确，线束有无破损； 1. Please make sure that the GW, IC or driving recorder is working properly (check the driving recorder first if there is a driving recorder, if not, check the IC); 2. Please make sure that the status of the CAN bus status connecting the GW and TEL is correct; 3. If there is no driving recorder, please check whether the state of the CAN line connecting the GW and the IC is correct, and whether the wiring harness is damaged; 4. If there is a driving recorder, please check whether the state of the connecting CAN bus between the GW and the driving recorder is correct, whether the wiring harness is damaged;
94	PSU CAN Bus off	U10 0B 81	PSU CAN Bus off	检查E网段CAN线是否破损或断路，或者网络负载率过大 Check whether the CAN bus of the E network segment is damaged or open circuit, or the network load rate is too large
95	接收ESCL1（0x10FF0E13）报文超时故障 Receiving ESCL1 (0x10FF0E13) message timeout fault	U10 0B 82	接收ESCL1（0x10FF0E13）报文超时故障 Receiving ESCL1 (0x10FF0E13) message timeout fault	1.请确保电子转向柱锁正常工作； 2.请检查一键启动和电子转向柱锁连接can线是否状态正确，线束有无破损； 1. Please ensure that the ESCL is working properly; 2. Please check whether the CAN bus connecting the PEPS and ESCL is in correct state and whether the wiring harness is damaged;
96	与整车控制器失去通信 Lost communication with VCU	U10 0B 83	与整车控制器失去通信故障 Lost communication with VCU fault	检查IMMO与整车控制器之间的CAN线是否接触良好 Check whether the CAN bus between IMMO and VCU is in good contact
97	与钥匙认证失败 Key authentication failure	U10 0B 84	与钥匙认证失败 Key authentication failure	检查钥匙是否已经匹配，并且是合法的 Check if the key already matches and is valid.
98	与整车控制器认证失败 VCU authentication failure	U10 0B 85	与整车控制器认证失败 VCU authentication failure	检查PSU与整车控制器之间的CAN线是否接触良好 Check whether the CAN bus between the PSU and the VCU is in good contact
99	接收ESCL1（0x10FF0E13）报文超时故障 Receiving ESCL1 (0x10FF0E13) message timeout fault	U10 0B 82	接收ESCL1（0x10FF0E13）报文超时故障 Receiving ESCL1 (0x10FF0E13) message timeout fault	1.请确保电子转向柱锁正常工作； 2.请检查一键启动和电子转向柱锁连接can线是否状态正确，线束有无破损； 1. Please ensure that the ESCL is working properly; 2. Please check whether the CAN bus connecting the PEPS and ESCL is in correct state and whether the wiring harness is damaged;
100	与整车控制器失去通信 Lost communication with VCU	U10 0B 83	与整车控制器失去通信故障 Lost communication with VCU fault	检查IMMO与整车控制器之间的CAN线是否接触良好 Check whether the CAN bus between IMMO and VCU is in good contact
101	与钥匙认证失败 Key authentication failure	U10 0B 84	与钥匙认证失败 Key authentication failure	检查钥匙是否已经匹配，并且是合法的 Check if the key already matches and is valid.
102	与整车控制器认证失败 VCU authentication failure	U10 0B 85	与整车控制器认证失败 VCU authentication failure	检查PSU与整车控制器之间的CAN线是否接触良好 Check whether the CAN bus between the PSU and the VCU is in good contact

LED大灯
LED headlight

一、功能介绍
I. Introduction to functions

LED大灯基础大灯
LED headlight Basic headlight

自动识别光线开关灯具
Lamps with auto-recognition light switch
全LED光源，亮度提高高20%，照明距离提升50%，寿命提高100倍，功耗降低70%。
All-LED light source, the brightness is increased by 20%, the lighting distance is increased by 50%, the life span is increased by 100 times, and the power consumption is reduced by 70%.

电源监控系统
Power monitoring system

一、电源监控系统作用
I. Functions of power monitoring system

1.什么是电源监控系统?
1. What is the power monitoring system?

电源监控系统是在最恶劣的条件下也能以高解析度和精确度测量电池电压、电流和温度，并能够依据所测量的参数在电池的整个使用寿命中准确地预测电池的充电状态（SOC）、健康状态（SOH）和功能状态（SOF）。这些参数定期或实时根据要求通过LIN总线传送至BCM，以便仪表可直观显示电池的SOC、SOH、SOF 状态，实现智能功能。
The power monitoring system can measure battery voltage, current and temperature with high resolution and accuracy under the harshest conditions, and can accurately predict the SOC, SOH and SOF throughout the battery's service life based on the measured parameters. These parameters will be sent to the BCM through the LIN bus periodically or in real time according to requirements, so that the IC can visually display the SOC, SOH, SOF status of the battery and realize the intelligent function.

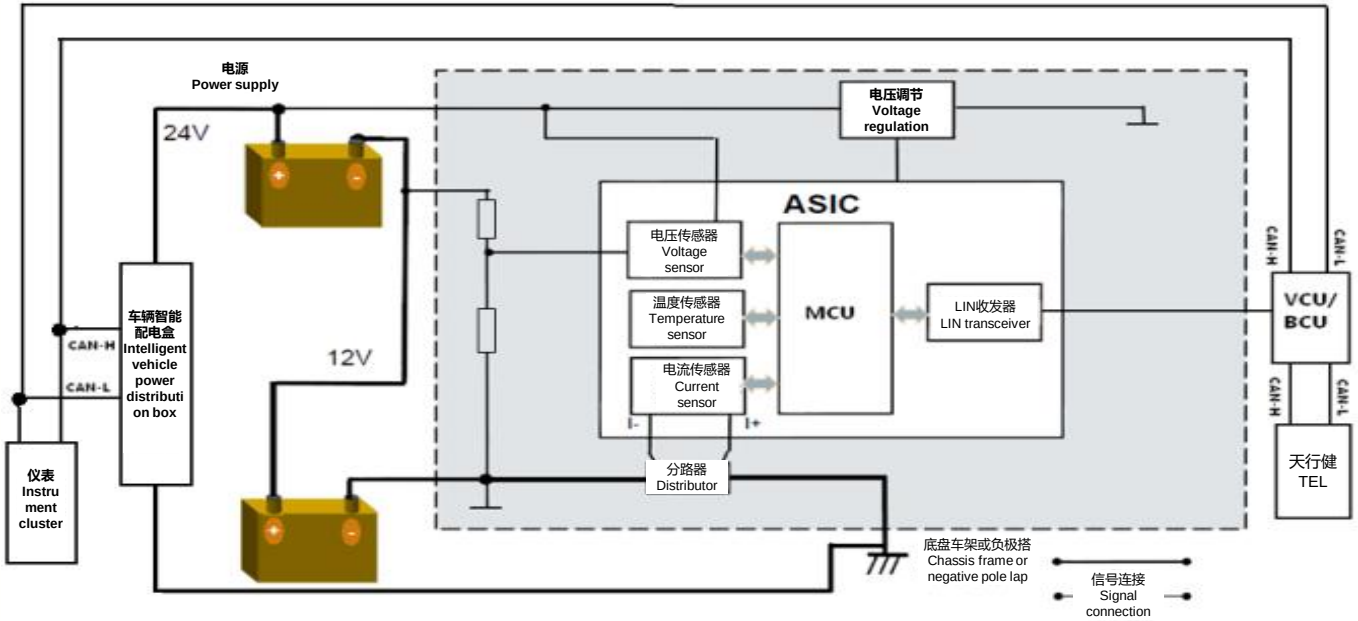
2.为什么要使用电源管理系统?
2. Why to use a power management system?

① 通过SOC，对整车充放电性能进行监控；
① To monitor the charging and discharging performance of the vehicle through SOC
② 通过SOH，对蓄电池健康状态进行监控，及时更换蓄电池以防造成整车故障；③ 通过SOF，进行下一次启动能力判断，为启停项目做技术储备。
② To monitor the health state of the battery through SOH, and replace the battery in time to prevent vehicle fault; ③ To judge the next start-up ability and make technical reserves for the start-stop project through SOF.

电源监控系统
Power monitoring system

二、电源管理系统组成及控制逻辑
II. Compositions and control logic of power management system

1. 电源管理系统组成
1. Compositions of power management system

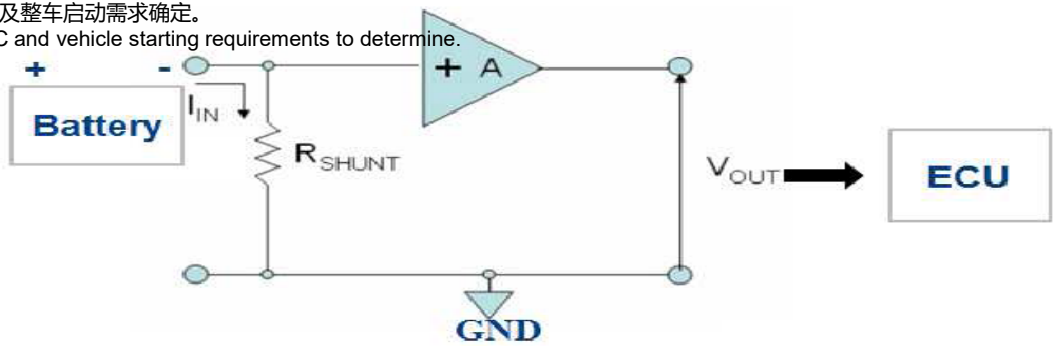


电源监控系统
Power monitoring system

二、电源管理系统组成及控制逻辑
II. Compositions and control logic of power management system

2. 电源管理系统控制原理
2. Principle of power management system control

- 电压测量：蓄电池传感器直接测量蓄电池端电压。
- Voltage measurement: directly measure the battery terminal voltage by using the battery sensor.
- 电流测量：利用分流电阻计算蓄电池干路电流。
- Current Measurement: calculate battery trunk current by using shunt resistance.
- 温度测量：温度传感器外加温度补偿计算蓄电池内部液体温度。
- Temperature measurement: calculate the battery internal liquid temperature by using the temperature sensor and temperature compensation.
- SOC：安时积分法、端电压和内阻共同分析。
- SOC: analyze by using ampere-hour integral method, terminal voltage and internal resistance.
- SOH：利用拟合好的曲线进行分析计算。
- SOH: use the fitted curve for analysis and calculation.
- SOF：由SOC及整车启动需求确定。
- SOF: use SOC and vehicle starting requirements to determine.

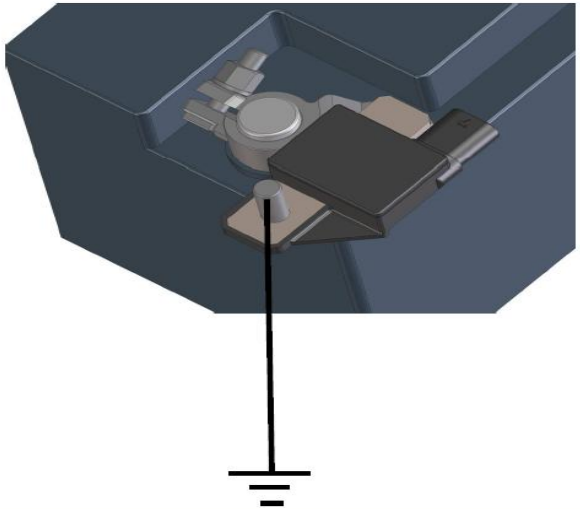


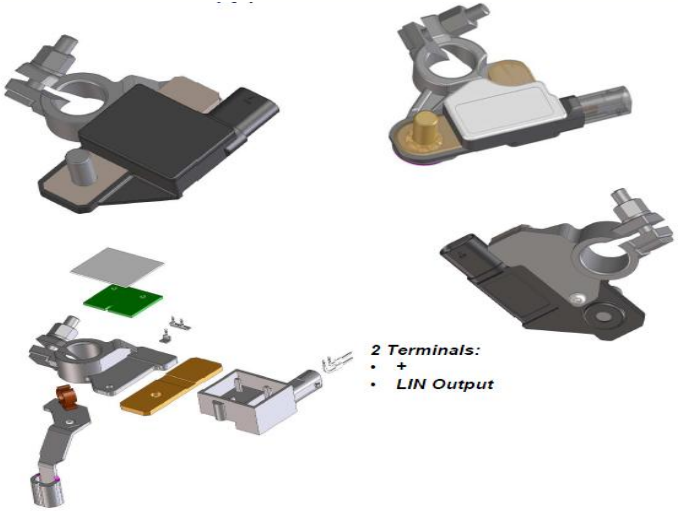
电源监控系统
Power monitoring system

三、电源监控系统安装要求
III. Installation requirements for power monitoring system

1. 电源监控系统安装
1. Installation of power monitoring system

① 布置在蓄电池负极柱上打紧。
① Lay it on the negative pole of the battery and tighten it.
② LIN输出，2孔插接器。
② LIN output, 2-pin connector.
③ 蓄电池负极搭铁西安与传感器柱头相连。
③ Connect the negative battery ground to the sensor post.





EBS系统
EBS

一、 EBS系统作用
I. Functions of EBS

1.什么是EBS系统?
1. What is the EBS?

EBS**系统**：电子制动系统
EBS system: electronic brake system

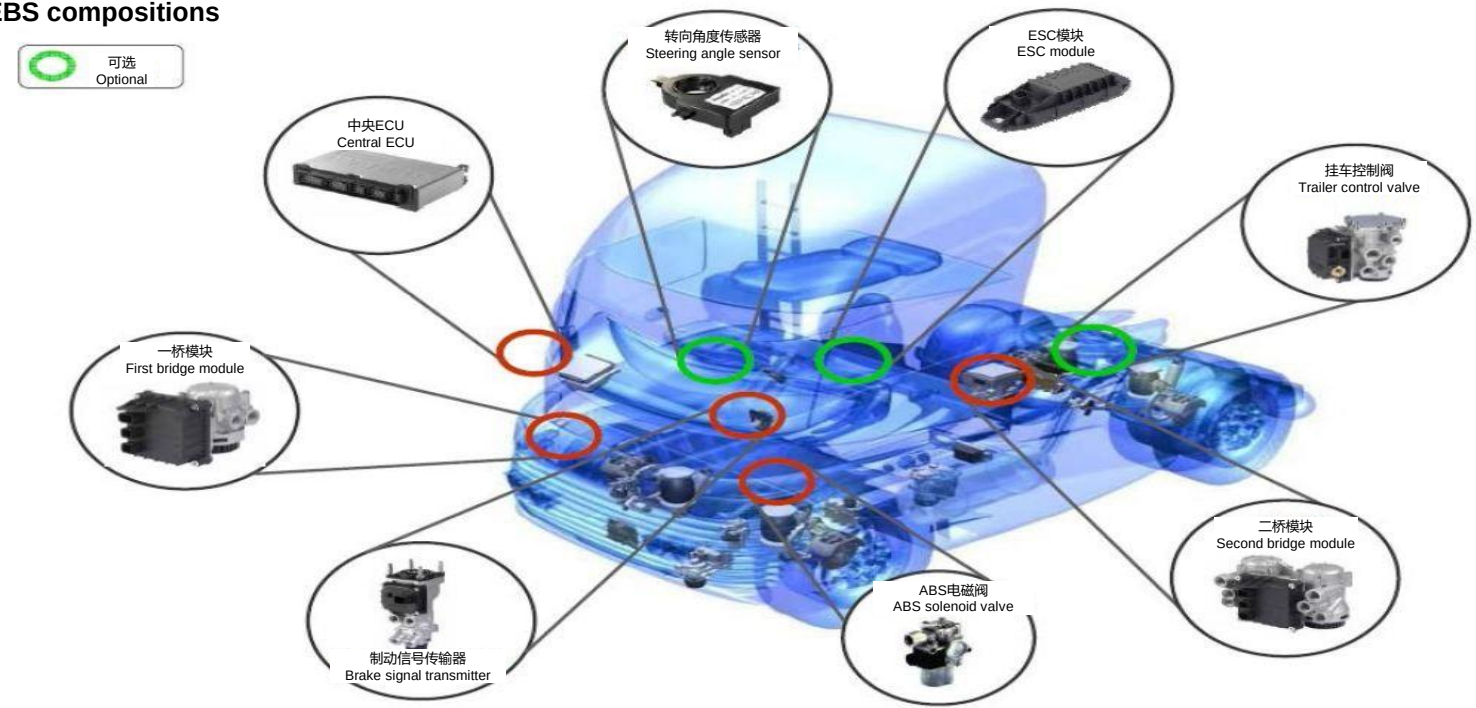
是通过电子信号控制制动力大小，而不是由传统的先导气来控制制动力大小。
The braking force is controlled through electronic signals instead of pilot air in traditional way.
EBS集成了电控气动制动、制动防抱死和牵引力控制等功能，同时作为一个开放的车辆控制平台，仅需增加少量部件，就可在EBS的基础上扩展功能，如电子稳定系统（ESC/ESP）、自适应巡航（ACC）、自动紧急制动（AEB）等先进车辆控制系统。
EBS integrates electro-pneumatic braking, anti-lock braking and traction control functions. As an open vehicle control platform, only a few components are added to expand functions on the basis of EBS, such as ESC/ESP, ACC, AEB and other advanced vehicle control systems.

2.为什么要使用EBS系统?
2. Why to use EBS system?

ABS 功能；ASR 功能；坡道辅助功能；制动力分配调节功能；减速度控制功能；
ABS; ASR; hill assist; braking force distribution adjustment; deceleration control;
摩擦片磨损控制功能；辅助制动功能；挂车控制功能；外部请求制动功能。
Friction plate wear control; assisted brake; trailer control; external request brake.

二、EBS系统组成及控制逻辑
II. Compositions and control logic of EBS

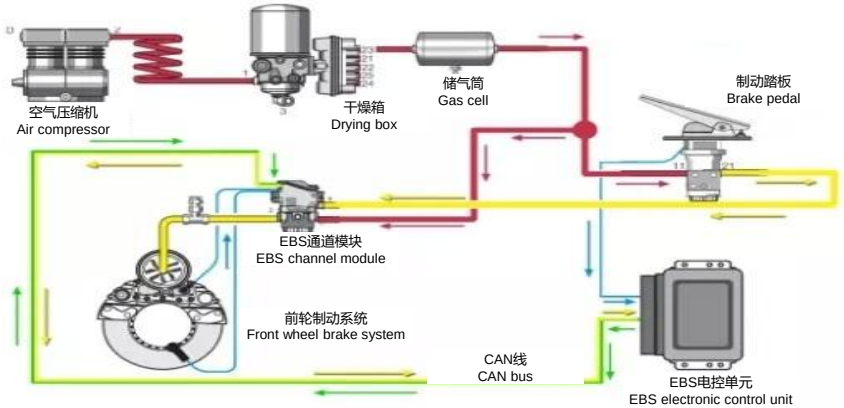
1. EBS系统组成
1. EBS compositions



二、EBS系统组成及控制逻辑
II. Compositions and control logic of EBS

2. EBS系统控制原理
2. EBS control principle

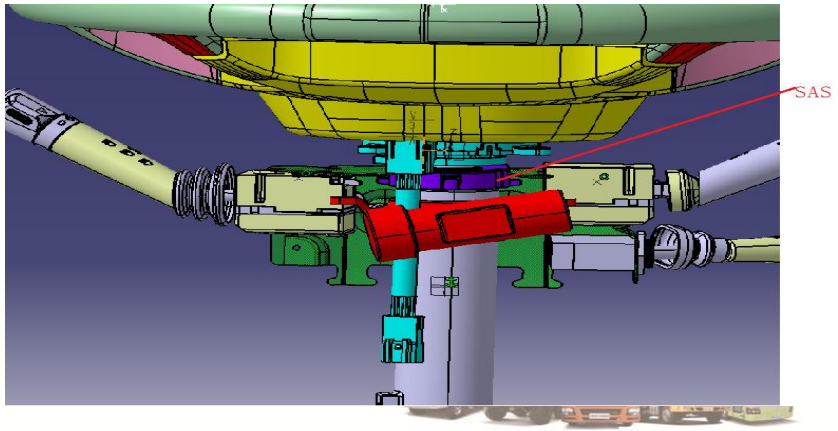
EBS系统既有气回路又有电回路
The EBS has both a pneumatic circuit and an electrical circuit
踩下制动踏板，踏板上有传感器检测踏板百分比，数据通过蓝色的电路传到EBS控制单元，控制单元处理这个数据后通过CAN线输出到EBS通道模块，告诉模块该工作了，模块就打开电磁阀，制动开始工作。
When the brake pedal is depressed, there is a sensor on the pedal to detect the pedal percentage. The data is transmitted to the EBS control unit through the blue circuit. The control unit processes this data and outputs it to the EBS channel module through the CAN bus to tell the module that it is time to work. The module opens the solenoid valve and the brake starts to work.



三、EBS系统安装要求
III. EBS installation requirements

1. EBS系统安装
1. EBS installation

SAS传感器直接安装于转向柱上，为了避免非线性，必须定位在转向杆的中心位置，为了避免不同心，机械接口的设计必须保证传感器只能以相对中心位置微小的偏差来安装。
The SAS sensor is directly installed on the steering column. In order to avoid nonlinearity, it must be located in the center of the steering column. In order to avoid eccentricity, the design of the mechanical interface must ensure that the sensor can only be installed with a slight deviation from the center position.
必须确保传感器所有接触的表面至少覆盖一层薄的油膜，并且标签本身也要涂上油脂。SAS上得三个安装夹片必须全都紧紧地固定到转向柱的非转动部分。建议使用自锁螺丝（带有垫圈的螺纹M4，最大扭矩2.5Nm）。
It must be ensured that all surfaces in contact with the sensor are covered with at least a thin film of oil, and that the label itself is also greased. All three mounting clips on the SAS must be securely fastened to the non-rotating part of the steering column. It is recommended to use self-locking screws (thread M4 with washers, and max torque 2.5 Nm).
在任何重装过程后，都需要对SAS零位的重新标定。
Re-calibration of the SAS zero position is required after any reassembly processes.
SAS传感器安装后需要对其进行校准。
SAS sensor needs to be calibrated after installation.
校准是通过CAN发送合适的校准请求来操作的。
Calibration is operated by sending appropriate calibration requests via CAN.



四、EBS系统操作方法及注意事项
IV. EBS operation method and precautions

1. EBS系统操作方法
1. EBS operation method

采用EBS控制器厂家的专业工具（软、硬件），对整车总质量、轴距、传感器、警告灯、气路压力、发动机型号、变速器型号进行标定，并按其调试说明调试。
Use the professional tools (software and hardware) of the EBS control unit manufacturer to calibrate the vehicle's total mass, wheelbase, sensors, warning lights, air pressure, engine model, and transmission model, and debug according to its instructions.

2. EBS系统使用注意事项
2. Precautions for using EBS

EBS系统功能正常，组合仪表中对应的EBS指示灯熄灭。
The EBS functions properly and the corresponding EBS indicator lamp in the instrument cluster goes out.
如果系统有故障，仪表中的EBS指示灯点亮。
If there is a fault with the system, the EBS indicator lamp in the IC lights up.

五、EBS系统故障处理
V. EBS system fault handling

1. EBS系统故障提示
1. EBS fault prompts

EBS系统故障主要有控制器故障、桥模块故障、轮速传感器故障、转角传感器故障、线束故障等。

EBS faults mainly include control unit faults, axle module faults, wheel speed sensor faults, SAS faults, harness faults, etc.

2. EBS系统故障处理
2. EBS system fault handling

根据仪表报出的故障码，查询故障码手册，从而解决和排除故障。

According to the fault code reported by the IC, consult the DTC manual to solve and eliminate the fault.

环境监控系统
EVM

一、环境监控系统作用
I. The role of EVM

环境监控系统主要是以影像的方式，在仪表台多媒体显示屏上呈现车辆周围的环境情况，消除驾驶员的视觉盲区，提高驾驶安全性。

The EVM mainly uses images to present the environment around the vehicle on the multimedia display on the dashboard, to eliminate the driver's visual blind spots and improving driving safety.

本系统主要有行车影像、倒车影像、挂车结合影像、货厢内部影像、360°环视影像以及视频存储功能。

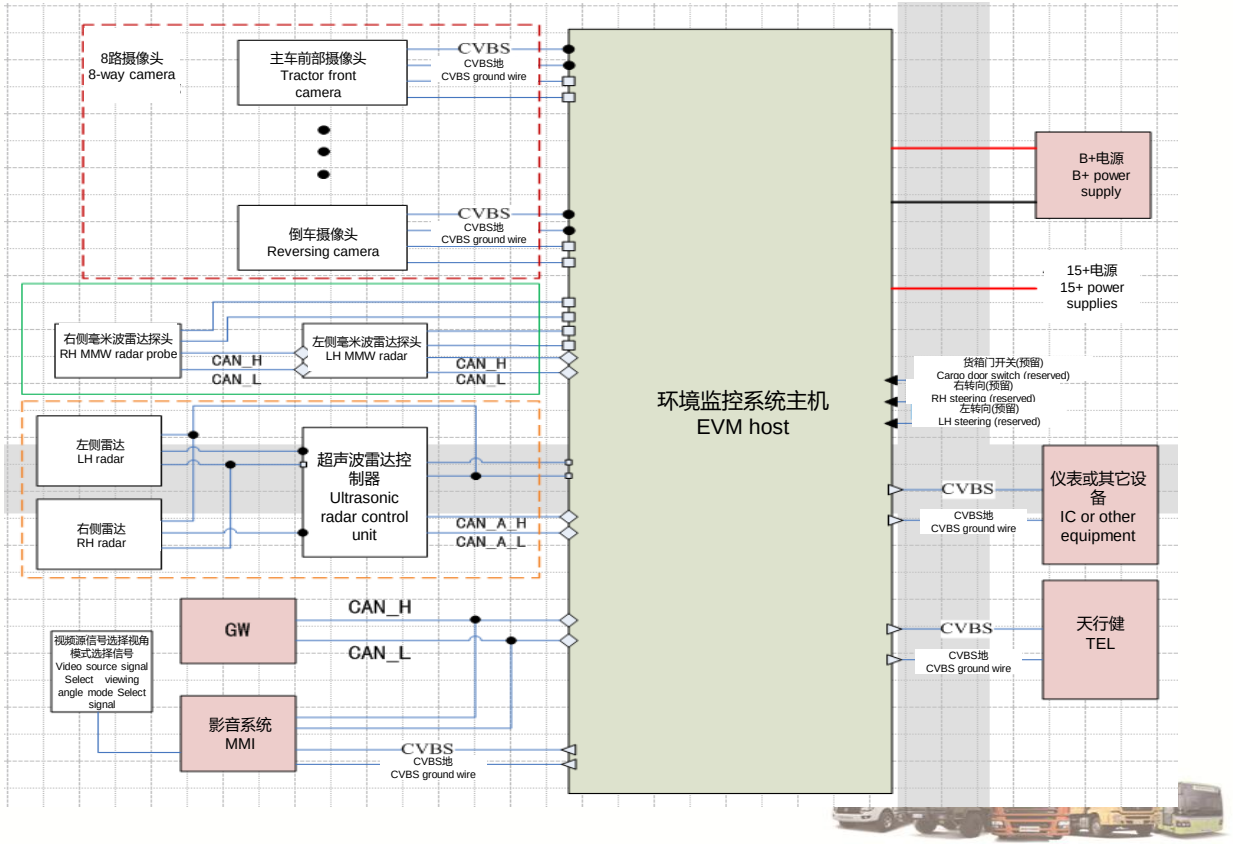
This system mainly has driving image, reversing image, trailer connection image, cargo compartment interior image, AVM image and video storage function.

环境监控系统
EVM

二、环境监控系统组成及工作逻辑
II. The compositions and work logic of the EVM

系统组成
System composition

- 1 控制器 Control unit
- 8 摄像头 Camera
- 2 毫米波雷达 MMW radar
- or
- 2 超声波雷达 Ultrasonic radar



环境监控系统
EVM

二、环境监控系统组成及工作逻辑
II. The compositions and work logic of the EVM

工作逻辑
Work logic

在多媒体显示屏上进入环境监控显示界面后，环境监控系统所有功能界面即可实现。
After entering the EVM display interface on the multimedia display screen, all functional interfaces of the EVM can be realized.
1、手动模式：点击屏幕左侧的功能按钮“360°环视”、“行车”……相应功能的画面即可显示。
1. Manual mode: click the function buttons "AVM", "driving", etc. on the LH of the screen to display the corresponding functions.

2、自动模式：
2. Auto mode:
车辆上电后，系统默认显示“360°环视”画面，车辆正常行驶，当车速 > 20km/h时，自动切换为“行车”画面。显示屏任何界面下，车辆挂倒档时，自动显示“倒车”画面，即倒车影像功能。
After the vehicle is powered on, the system displays the AVM screen by default. The vehicle is driving normally. When the vehicle speed is > 20 km/h, it automatically switches to the "driving" screen. In any interface of the display screen, when the vehicle is in engage R, the "reversing" screen will automatically be displayed, that is, the reversing image function.

环境监控系统
EVM

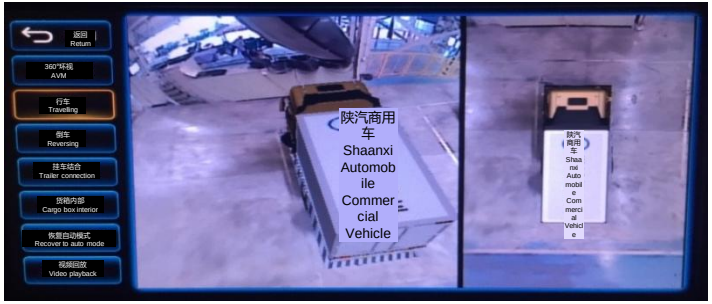
二、环境监控系统组成及工作逻辑
II. The compositions and work logic of the EVM

工作逻辑
Work logic

3、转向切换：在“360°环视”、“行车”、“倒车”功能画面下，打左/右转向时，画面自动切换为转向时的相应画面。
3. Steering switching: In the AVM, "driving" and "reversing" function screens, when LH/RH turn, the screen automatically switches to the corresponding screen when turning.

4、恢复自动模式：
4. Restore to auto mode:
手动操作优先级高于自动模式，系统处于自动模式时，手动操作屏幕即进入手动模式，点击“恢复自动模式”按钮系统又进入自动模式。
The manual operation is prioritized over auto mode. When the system is in auto mode, the manual operation screen will enter manual mode. Click the "Restore auto mode" button and the system will enter auto mode again.

行车时左转
LH turn while driving



行车时右转
RH turn while driving

二、环境监控系统组成及工作逻辑
II. The compositions and work logic of the EVM

工作逻辑
Work logic

5、视频回放：
5. Video playback:

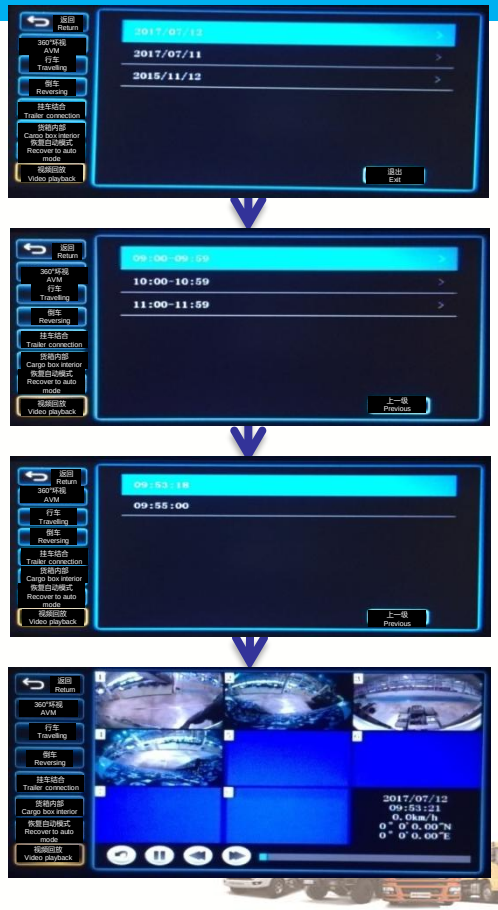
系统存储介质为SD卡，存储视频可在显示屏上直接播放。存储层级为日期→小时→分钟，视频默认时长5min。点击屏幕依次操作即可。
The system storage medium is an SD card, and the stored video can be played directly on the display. The storage tier is date → hour → minute, and the default video duration is 5 minutes. Click on the screen to operate in sequence.

若控制器内无存储卡，点击“视屏回放”时显示屏上显示“请安装SD卡”的字样，并且在显示画面左上角“  ”图标闪烁。

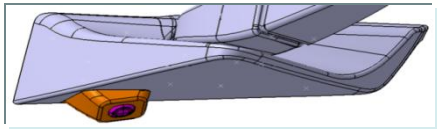
If there is no memory card in the controller, when you click “Video Playback”, the words “Please install SD card” will be displayed on the display screen, and the “  ” icon will flash in LH upper corner of the display screen.

视频正常录制时，屏幕左上角“  ”图标闪烁。

When the video is recorded normally, the “  " icon in LH upper corner of the screen flashes.

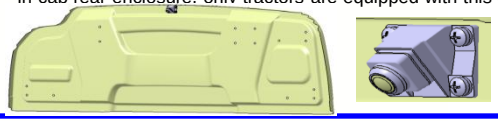


三、系统安装位置 III. System installation location

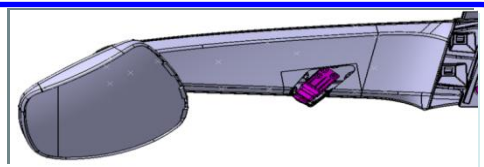


2、4在
2, 4 are in
后视镜
Rearview mirror
底座
base

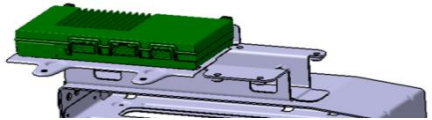
驾驶室后围，仅牵引车配置此摄像头
In cab rear enclosure. onlv tractors are equipped with this camera

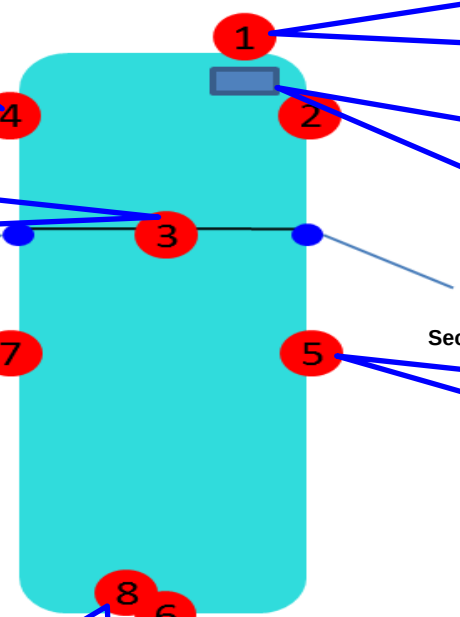


前下
Anterior
lower
视镜
mirror

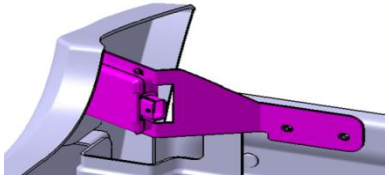


控制器在仪表台右侧控制器支架，最上面一层。
The controller is on RH controller bracket of the dashboard, the top layer.





主雷达
Main radar



翼子板
Fender
后方，
rear,
侧防护
Side guard
内部。
internal.

副雷达
Secondary radar

5、7号摄像头在货厢两侧，最上方的位置。
Cameras 5 and 7 are located at the top of two sides of the cargo compartment.

货物监控功能，货厢门内部，上方。
Cargo monitoring function, inside cargo compartment door, above.

倒车摄像头，车辆尾梁处或货厢最后端。
Reversing camera is located at the tail beam of the vehicle or at the very end of the cargo compartment.

四、故障处理
IV. Troubleshooting

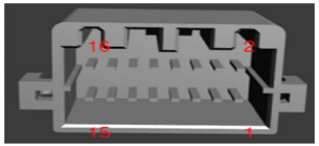
1、显示屏上进入环境监控界面后，只显示左侧一列功能按钮，右侧图像区域全是黑色。
1. After entering the EVM interface on the display screen, only a column of LH function buttons is displayed, and the RH image area is all black.
排查方法：检查环境监控控制器电源情况，A插接器的1、2、6号针脚。
Troubleshooting method: Check the power supply of the EVM control unit, and 1, 2 and 6 pins of the A connector.
若电源供电正常，请检查环境监控控制器至多媒体显示屏的视频线是否完好，环境监控C17、C18针脚。
If the power supply is normal, please check whether the video cable from the EVM control unit to the multimedia display is intact and the EVM C17 and C18 pins.
2、显示屏上进入环境监控界面后，右侧图像区域仅显示部分图像。
2. After entering the EVM interface on the display screen, only part of the image is displayed in the RH image area.
排查方法：部分摄像头未接入控制器，点击屏幕上的画面，按照图像显示模式排查出故障摄像头位置，进一步检查故障摄像头连接线。
Troubleshooting method: if cameras are not connected to the control unit, click the screen, find out the location of the faulty camera according to the image display mode, and further check the connection line of the faulty camera.
3、显示画面模糊不清晰。
3. Display screen is fuzzy and unclear.
排查方法：清理摄像头镜头，保持镜头清洁。
Troubleshooting method: clean the camera lens and keep it clean.

四、故障处理
IV. Troubleshooting

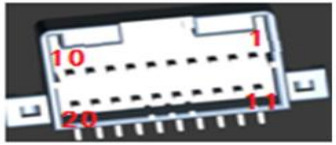
4、挂倒档，倒车影像不自动切换。
4. When on the engage R, the reversing image does not switch automatically.
排查方法：倒车信号、转向信号以CAN报文的形式输入给环境监控控制器，首先排查CAN线通讯是否正常？检查控制器上其它CAN报文信号是否可以正常接收，如时间、经纬度信号。
Troubleshooting method: the reversing signal and turn signal are input to the EVM control unit in the form of CAN messages. First check whether the CAN bus communication is normal. Check whether other CAN message signals on the control unit can be received normally, such as time, longitude and latitude signals.
若所有报文信号都无法接收请先维修CAN总线。
If no message signals can be received, please repair the CAN bus first.
若其它报文信号可以正常接收，请检查倒档信号、转向信号的线路问题。
If other message signals can be received normally, please check the circuit of reverse gear signal and turn signal.
5、360°环视画面拼合紊乱
5. The AVM is disordered.
排查方法：请检查各路摄像头连接入控制器的通道是否正确，具体请参考控制器针脚定义。
Troubleshooting method: please check whether the channel of each camera connected to the control unit is correct. For details, please refer to the pin definition of the control unit.
若各摄像头连接通道无误，则需重新标定360°环视画面。
If the connection channels of each camera are correct, the AVM needs to be recalibrated.

环境监控系统
EVM

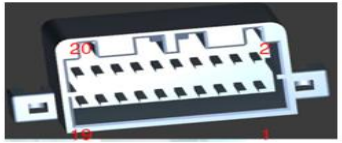
环境监控控制器针脚定义
EVM pin definition



A



B



C

针脚号 Pin number	功能描述 Description of function	信号特性 Signal characteristics	针脚号 Pin number	功能描述 Description of function	信号特性 Signal characteristics
A1	电源B+ Power supply B+	+24V常电输入 +24 V normal voltage input	B13	BBC2_+12V	倒车摄像头+12V电源 Reversing camera +12V power supply
A2	地 Ground	GND	B14	BBC2_CVBS	倒车摄像头视频输入 Reversing camera video input
A3	货厢门开关信号 Cargo compartment door switch signal	开关输入(高有效) Switch input (active-high)	B15	BLC3_+12V	挂车/车厢左摄像头+12V电源 Trailer/compartment LH camera +12 V power supply
A4	右转向信号 RH turn signal	开关输入(高有效) Switch input (active-high)	B16	BLC3_CVBS	挂车/车厢左摄像头视频输入 Trailer/compartment LH camera video input
A5	左转向信号 LH turn signal	开关输入(高有效) Switch input (active-high)	B17	IC4_+12V	货厢内摄像头+12V电源 Cargo compartment camera +12 V power supply
A6	钥匙开关ON档 Key switch ON position	开关输入 Switch input	B18	IC4_CVBS	货厢内摄像头视频输入 Video input in cargo compartment camera
A7	CAN总线高位 CAN bus high level	CAN_H	B19	仪表_CVBS IC_CVBS	输出至仪表CVBS视频 Output to IC CVBS video
A8	CAN总线低位 CAN bus low level	CAN_L	B20	仪表_CVBS_GND IC_CVBS_GND	输出至仪表CVBS地信号 Output to IC CVBS ground signal
A9			C1	FC1_+12V	前摄像头+12V电源 Front camera +12 V power supply
A10			C2	FC1_GND	前摄像头地 Front camera GND
A11	左雷达地 LH radar ground		C3	FC1_CVBS	前摄像头视频输入 Front camera video input
A12	左雷达12V电源输出 LH radar 12 V power output	电源输出 Power output	C4	FC1_CVBS_GND	前摄像头视频地 Front camera video GND
A13	右雷达地 RH radar ground		C5	RC2_+12V	右摄像头+12V电源 RH camera +12V power supply
A14	右雷达12V电源输出 RH radar 12 V power output	电源输出 Power output	C6	RC2_GND	右摄像头地 RH camera GND
A15	雷达CAN总线高位 Radar CAN bus high bit	CAN2_H	C7	RC2_CVBS	右摄像头视频输入 RH camera video input
A16	雷达CAN总线低位 Radar CAN bus low bit	CAN2_L	C8	RC2_CVBS_GND	右摄像头视频地 RH camera video GND
B1	BRC1_GND	挂车/车厢右摄像头地 Trailer/compartment RH camera ground	C9	BC3_+12V	后摄像头+12V电源 Rear camera +12 V power supply
B2	BRC1_CVBS_GND	挂车/车厢右摄像头视频地 Trailer/compartment RH camera video ground	C10	BC3_GND	后摄像头地 Rear camera
B3	BBC2_GND	倒车摄像头地 Reversing camera GND	C11	BC3_CVBS	后摄像头视频输入 Rear camera video input
B4	BBC2_CVBS GND	倒车摄像头视频地 Reversing camera video GND	C12	BC3_CVBS_GND	后摄像头视频地 Rear camera video ground
B5	BLC3_GND	挂车/车厢左摄像头地 Trailer/compartment LH camera	C13	LC4_+12V	左摄像头+12V电源 LH camera +12 V power supply
B6	BLC3_CVBS GND	挂车/车厢左摄像头视频地 Trailer/compartment LH camera video ground	C14	LC4_GND	左摄像头地 LH camera GND
B7	IC4_GND	货厢内摄像头地 Camera in cargo compartment ground	C15	LC4_CVBS	左摄像头视频输入 LH camera video input
B8	IC4_CVBS_GND	货厢内摄像头视频地 Camera video in the cargo compartment ground	C16	LC4_CVBS_GND	左摄像头视频地 LH camera video ground
B9			C17	MP5_CVBS	输出至MP5 CVBS视频 Output to MP5 CVBS video
B10			C18	MP5_CVBS_GND	输出至MP5 CVBS地信号 Output to MP5 CVBS ground signal
B11	BRC1_+12V	挂车/车厢右摄像头12V电源 Trailer/compartment RH camera 12 V power supply	C19	天行健_CVBS TEL_CVBS	输出至天行健CVBS视频 Output to TEL CVBS video
B12	BRC1_CVBS	挂车/车厢右摄像头视频输入 Trailer/carriage RH camera video input	C20	天香健_CVBS_GND TEL_CVBS_GND	输出至天行健CVBS地信号 Output to TEL CVBS ground signal

TPMS系统
TPMS

一、 TPMS系统作用
I. Functions of TPMS system

1.什么是TPMS系统?
1. What is the TPMS system?

TPMS **系统**：胎压监测系统
TPMS system: tire pressure monitoring system

实时地对轮胎气压、温度进行自动监测，对轮胎漏气和气压异常进行报警，以保障行车安全，是驾驶员和乘车人员的生命安全保障预警系统。
It automatically monitors tire pressure and temperature in real time, and alarms for tire leakage and abnormal air pressure to ensure driving safety. It is a life safety warning system for drivers and passengers.

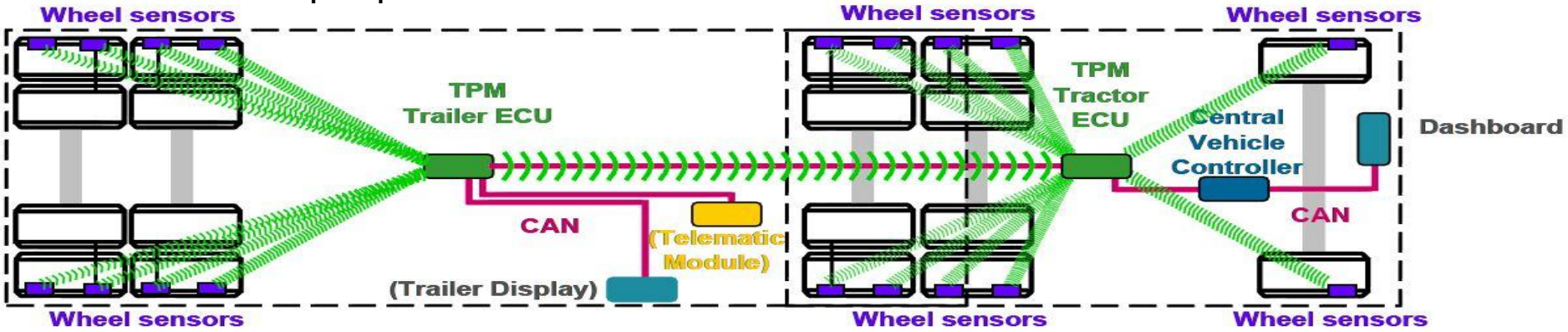
2.为什么要使用TPMS系统?
2. Why to use TPMS system?

□保持推荐的轮胎压力，可以延长轮胎寿命
It can maintain the recommended tire pressure to extend tire service life
□预防轮胎爆胎，可减低交通事故和人员伤害的风险
It prevents tire blowouts, reducing the risk of traffic accidents and personal injury
□可保证车辆安全稳定运行，并可以缩短制动距离
It can ensure the safe and stable operation of the vehicle and shorten the braking distance
□轮胎恒压性可以降低油耗
The constant tire pressure can reduce fuel consumption
□车辆点火时会自行启动
The vehicle will auto start when ignited
□可以识别气压过低或过高、可区分是正常卸载还是泄露
It can identify whether the air pressure is too low or too high, and whether it is normal unloading or leakage

TPMS系统
TPMS

二、TPMS系统组成及控制逻辑
II. Compositions and control logic of TPMS

2. TPMS系统控制原理
2. TPMS control principle



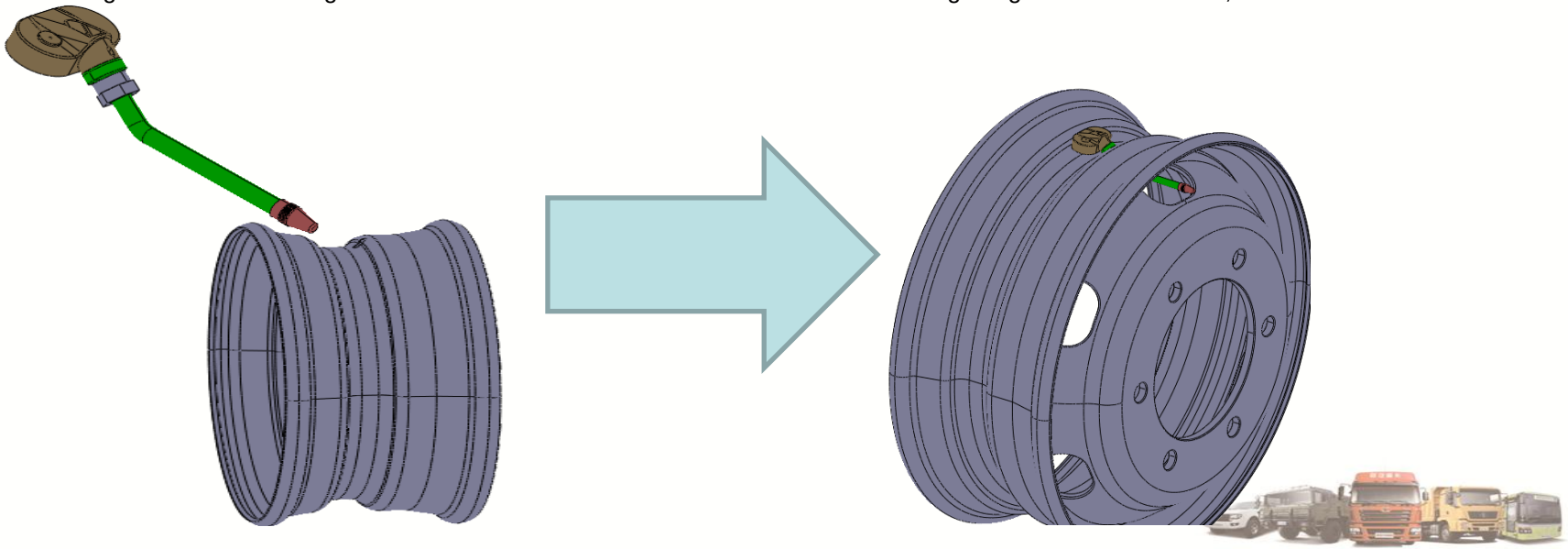
每个车轮模块独立的监测轮胎气压
无线传输胎压信息给ECU
ECU分析轮胎压力曲线并和参数化的临界值进行比对
通过CAN总线发送胎压信息给仪表进行显示
挂车ECU通过无线RF或CAN总线发送挂车的胎压信息给主车ECU
仪表或显示器显示胎压信息或报警信息给驾驶员

TPMS系统
TPMS

三、TPMS系统安装要求
III. TPMS installation requirements

1. TPMS系统安装
1. TPMS installation

- 采用六角螺母与气门嘴专用配对连接，通过一定的扭力将传感器固定在轮毂上；
  Hexagon nuts are used to connect with the valve, and the sensor is fixed on the hub through a certain torque;
- 设计使气门嘴与传感器的角度安装符合轮毂设计角度；
  It is designed to make the angle installation of the valve and sensor conform to the design angle of the wheel hub;



四、TPMS系统操作方法及注意事项
IV. TPMS operation method and precautions

1. TPMS系统操作方法
1. TPMS operation method

采用TPMS控制器厂家的专业工具（软、硬件），并按其调试说明调试。
Use professional tools (software and hardware) from the TPMS control unit manufacturer and debug according to their debugging instructions.

2. TPMS系统使用注意事项
2. Precautions for using TPMS

TPMS系统功能正常，组合仪表中对应的TPMS指示灯熄灭。
The TPMS functions normally, and the corresponding TPMS indicator lamp in the instrument cluster goes out.
如果系统有故障，仪表中的TPMS指示灯点亮。
If there is a fault with the system, the TPMS indicator lamp in the IC lights up.

五、TPMS系统故障处理
V. TPMS fault handling

1. TPMS系统故障提示
1. TPMS system fault prompts

TPMS系统故障主要有控制器故障、桥模块故障、轮速传感器故障、转角传感器故障、线束故障等。
TPMS fault mainly mainly include control unit faults, axle module faults, wheel speed sensor faults, SAS faults, harness faults, etc.

2. TPMS系统故障处理
2. TPMS fault handling

根据仪表报出的故障码，查询故障码手册，从而解决和排除故障。
According to the fault code reported by the IC, consult the DTC manual to solve and eliminate the fault.

车道偏离系统
LDWS

一、车道偏离系统作用
I. Functions of LDWS

LDWS是一种先进的车载电子安全系统，主要适用于高速公路、城市快速路等高等级道路，主要目标为辅助驾驶员保持车道，避免偏出车道而造成的交通事故。系统综合了图像感知、危险预估，危险报警等多项高新技术，当车辆因驾驶员疏忽、疲劳等原因被动偏离或即将偏离车道时，系统能够自动发出偏离预警或警告直至驾驶员纠正行驶方向。

LDWS is an advanced vehicle electronic safety system, mainly suitable for high-level roads such as highways and urban expressways. Its main goal is to assist drivers in maintaining lanes and avoid traffic accidents caused by deviating from the lanes. The system integrates many high-tech technologies such as image perception, danger prediction, and danger alarm. When the vehicle passively deviates or is about to deviate from the lane due to driver negligence, fatigue, etc., the system can automatically issue a deviation warning or alarm until the driver corrects the driving direction.

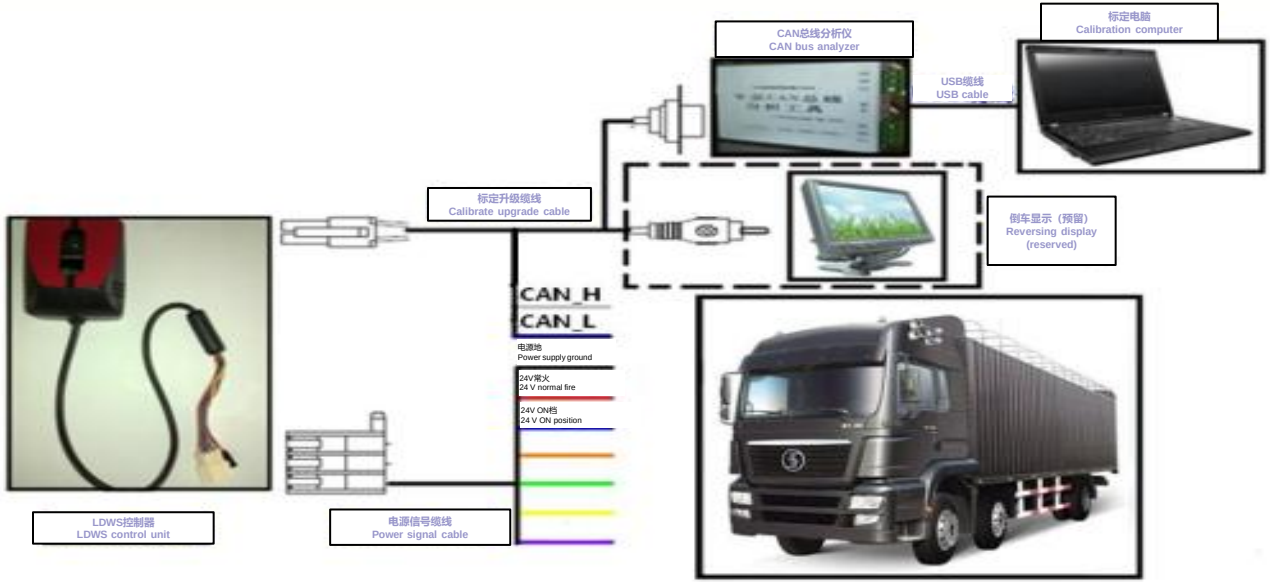
车道偏离系统
LDWS

二、车道偏离系统组成及工作逻辑
II. Compositions and work logic of LDWS

系统组成
System composition

1 控制器
Control unit

8 摄像头
Camera



二、车道偏离系统组成及工作逻辑
II. Compositions and work logic of LDWS

工作逻辑
Work logic

当钥匙处于ON 档时，LDWS 系统默认为开启状态，可以通过仪表上的关断开关进行功能屏蔽。系统会根据当前车速状况做出判断，当车速小于60km/h 时，系统处于待机状态，当车速大于等于60km/h 时，系统开始通过摄像头侦测车道线，当车辆前轮偏离到预警区域，且识别到无左转向灯开关信号，右转向灯开关信号及刹车信号时，系统启动预警，当车轮压线后，系统启动报警，LDWS 图像报警信号通过CAN 总线发送给仪表和网关，仪表只做出相应的光提醒驾驶员修正车道，同时，车载扬声器通过网关接受到的LDWS 图像报警信号，做出语音提醒驾驶员修正车道，当车身位置回到安全报警区域以外时，系统解除报警，同时，扬声器发出的语音提醒警报解除。

When the key is in the ON position, the LDWS system is on by default, and the function can be blocked through the off switch on the IC. The system will make a judgment based on the current vehicle speed. When the vehicle speed is less than 60 km/h, the system is in standby mode. When the vehicle speed is greater than or equal to 60 km/h, the system starts to detect the lane line through the camera. When the front wheel of the vehicle deviates from the warning area, And when it recognizes that there is no LH/RH turn signal lamp or brake signal, the system starts an early warning. When the wheel rolls on the solid line, the system starts an alarm. The LDWS image alarm signal is sent to the instrument and the gateway through the CAN bus. The instrument only The corresponding light is issued to remind the driver to correct the lane. At the same time, the car speaker receives the LDWS image alarm signal through the gateway, and makes a voice to remind the driver to correct the lane. The voice reminder alarm from the speaker is dismissed.

车道偏离系统
LDWS

二、车道偏离系统组成及工作逻辑
II. Compositions and work logic of LDWS

工作逻辑
Work logic

1.LDWS提供一种易被感知的触觉报警和听觉报警。

1. LDWS provides an easy-to-perceive tactile alarm and audible alarm.

2.当车辆因驾驶员疏忽、疲劳等原因被动偏离车道达到一定阈值时，系统能够自动发出偏离警告，提醒驾驶员。

2. When the vehicle passively deviates from the lane and reaches a certain threshold due to driver negligence, fatigue, etc., the system can auto issue a departure warning to remind the driver.

3.车辆换道打转向灯或踩刹车的情况下能抑制报警。

3. The alarm can be suppressed when the vehicle changes lanes and turns on the turn signal lamp or brakes.

4.系统在低速（小于启动车速时）情况下处于standby状态（低功耗），可以不识别车道，不对驾驶员产生勿扰。

4. The system is in standby state (low power consumption) at low speed (less than the starting speed), and does not recognize lanes and will not disturb the driver.

二、车道偏离系统组成及工作逻辑
II. Compositions and work logic of LDWS

工作逻辑
Work logic

功能逻辑：
Functional logic:
1.车道偏离预警（功能预留）
1. LDWS (function reserved)
1.1 左侧车道偏离预警
1.1 LH LDWS warning
激活条件（同时满足）：
Activation conditions (to be satisfied at the same time):
1) 钥匙 ON 档有效；
1) The ON position of the key is valid;
2) 车速≥60km/h；
2) Vehicle speed ≥ 60 km/h;
3) 0 < TLC < 2.5s;
3) 0 < TLC < 2.5 s;
4) 左转向灯开关信号无效；
4) The LH turn signal lamp switch is invalid;
执行动作：
Execute action:
1) LDWS 图像报警信号有效（0x18FF14E8 第1 字节3、4、5 位，置001），
1) The LDWS image alarm signal is valid (bits 3, 4, and 5 of the first byte of 0x18FF14E8, set to 001),
仪表显示左侧车道预警信号（仪表显示左侧线警示标志）。
The IC shows the LH lane warning signal (the IC shows the LH lane warning signal).
退出条件：
Exit conditions:
1) 车速＜55km/h；
1) Vehicle speed < 55 km/h;
2) 左转向灯开关信号有效（0x18FFC825 第2 字节1、2 位，置01）；
2) The LH turn signal lamp is valid (bits 1 and 2 of the second byte of 0x18FFC825, set to 01);
3) 刹车开关状态有效（0x18FEF100 第4 字节5、6 位，置01）；
3) The brake switch state is valid (bits 5 and 6 of the 4th byte of 0x18FEF100, set to 01);
4) 钥匙 ON 档失效；
4) The ON position of the key is invalid;
退出动作（与退出条件逐条对应）：
Exit actions (corresponding to the exit conditions one by one):
1) 系统进入待机状态；
1) The system enters standby state;
2) 系统预警信号抑制（LDWS 图像报警信号左侧预压线被抑制:信号不可
2) System warning signal suppression (the LH preload line of the LDWS image alarm signal is suppressed: the signal is disabled
能出现0x18FF14E8 第1 字节3、4、5 位，置001）；
may appears in bits 3, 4, and 5 of the first byte of 0x18FF14E8, set to 001);
3) 系统预警信号抑制（系统进入待机状态）；
3) System warning signal suppression (the system enters standby state);
4) 系统关闭；
4) System shutdown;

2.1 左侧车道偏离报警
2.1 LH LDWS warning
激活条件（同时满足）：
Activation conditions (to be satisfied at the same time):
1) 钥匙 ON 档有效；
1) The ON position of the key is valid;
2) 车速≥60km/h；
2) Vehicle speed ≥ 60 km/h;
3) TLC=0s；
3) TLC = 0 s;
4) 左转向灯开关信号无效；
4) The LH turn signal lamp switch is invalid;
执行动作：
Execute action:
1) LDWS 图像报警信号有效（0x18FF14E8 第1 字节3、4、5 位，置010）；
1) The LDWS image alarm signal is valid (bits 3, 4, and 5 of the first byte of 0x18FF14E8, set to 010);
仪表显示左侧车道报警信号（仪表显示压线报警左侧线闪烁信号）。
The IC displays the LH lane alarm signal (the iIC displays the LH lane flashing signal alarm of rolling on the solid line).
2) 扬声器发出左侧已压线警报提示声音。
2) The speaker emits an alarm sound that LH rolls on the solid line.
退出条件：
Exit conditions:
1) 车速＜55km/h；
1) Vehicle speed < 55 km/h;
2) 左转向灯开关信号有效（0x18FFC825 第2 字节1、2 位，置01）；
2) The LH turn signal lamp is valid (bits 1 and 2 of the second byte of 0x18FFC825, set to 01);
3) 刹车开关状态有效（0x18FEF100 第4 字节5、6 位，置01）；
3) The brake switch state is valid (bits 5 and 6 of the 4th byte of 0x18FEF100, set to 01);
4) 钥匙 ON 档失效；
4) The ON position of the key is invalid;
退出动作（与退出条件逐条对应）：
Exit actions (corresponding to the exit conditions one by one):
1) 系统进入待机状态；
1) The system enters standby state;
2) 系统报警信号抑制（LDWS 图像报警信号左侧报警压线被抑制:信号不
2) System alarm signal suppression (the LH alarm of rolling on the solid line of the LDWS image alarm signal is suppressed: the signal is disabled
可能出现0x18FF14E8 第1 字节3、4、5 位，置010）；
may appear in bits 3, 4, and 5 of the first byte of 0x18FF14E8, set to 010);
3) 系统报警信号抑制（系统进入待机状态）；
3) System alarm signal suppression (the system enters standby state);
4) 系统关闭；
4) System shutdown;

三、系统安装位置
III. System installation location

车道偏离控制器通过3颗自攻螺钉与支架固定，要求安装紧固牢靠，如图47、图48。
The LDWS control unit is fixed to the bracket by 3 self-tapping screws, and the installation is required to be fastened and secure, as shown in Figure 47 and Figure 48.

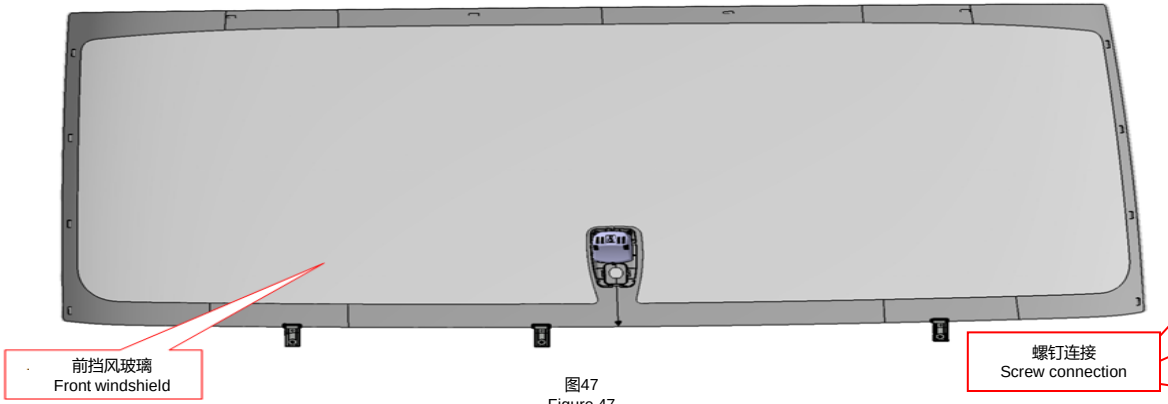
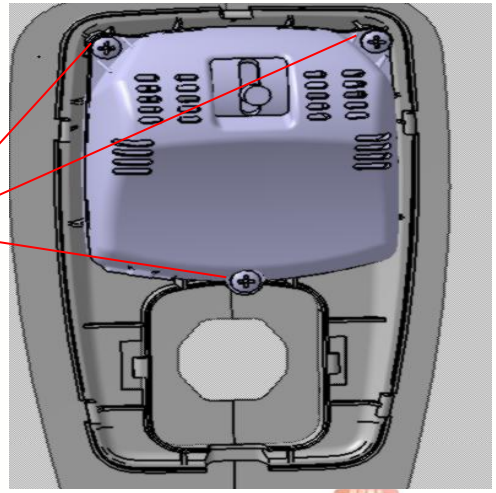


图47
Figure 47



车道偏离系统
LDWS

四、故障处理
IV. Troubleshooting

序号 S/N	故障描述 Fault description	故障显示 Fault display	维修指导 Maintenance guide
1	LDWS CAN Bus off	LDWS CAN Bus off	请检查车身网段CAN线是否破损或断路，或者网络负载率过大 Please check whether the CAN bus of the body network segment is damaged or disconnected, or the network load rate is too large
2	接收Switch1（ID:0x18FFC825）报文超时故障 Receive Switch 1 (ID: 0x18FFC825) message timeout fault	接收Switch1（ID:0x18FFC825）报文超时故障 Receive Switch 1 (ID: 0x18FFC825) message timeout fault	1.请确保网关正常工作；2.请检查网关和车道偏离连接can线是否状态正确，线束有无破损； 1. Please ensure that the gateway is working properly; 2. Please check whether the gateway and the LDWS connection CAN bus are in correct state and whether the wiring harness is damaged;
3	CANH线断路（预留） CANH bus open circuit (reserved)	CANH线断路（预留） CANH bus open circuit (reserved)	请检查CANH总线连接 Please check the CANH bus connection
4	CANL线断路（预留） CANL bus open circuit (reserved)	CANL线断路（预留） CANL bus open circuit (reserved)	请检查CANL总线连接 Please check the CANL bus connection
5	CANH线短接电源（预留） CANH bus short to power supply(reserved)	CANH线短接电源（预留） CANH bus short to power supply(reserved)	请检查CANH总线连接 Please check the CANH bus connection
6	CANH短接地（预留） CANH short to ground (reserved)	CANH短接地（预留） CANH short to ground (reserved)	请检查CANH总线连接 Please check the CANH bus connection
7	CANL线短接电源（预留） CANL bus short to power supply (reserved)	CANL线短接电源（预留） CANL bus short to power supply (reserved)	请检查CANL总线连接 Please check the CANL bus connection
8	CANL短接地（预留） CANL short to ground (reserved)	CANL短接地（预留） CANL short to ground (reserved)	请检查CANL总线连接 Please check the CANL bus connection
9	CANH短接CANL（预留） CANH short to CANL (reserved)	CANH短接CANL（预留） CANH short to CANL (reserved)	请检查CANH总线连接 Please check the CANH bus connection
10	接收IC_TCO1（ID:0xOCFE6CEE）报文超时故障 Receive IC_TCO1 (ID: 0xOCFE6CEE) message timeout fault	接收TCO1（ID:0xOCFE6CEE）报文超时故障 Receive TCO1 (ID: 0xOCFE6CEE) message timeout fault	1.请确定网关、仪表正常工作； 2.请确保网关和天行健间连接can线状态正确； 3.请检查网关和仪表间连接can线状态是否正确，线束有无破损； 1. Please make sure the gateway and IC are working properly; 2. Please ensure that the CAN bus connecting the gateway and TEL is in correct status; 3. Please check whether the connection status of the CAN bus between the gateway and the IC is correct and whether the wiring harness is damaged;
11	接收IC1（ID:0x18FF4E17）报文超时故障 Receiving IC1 (ID: 0x18FF4E17) message timeout fault	接收IC1（ID:0x18FF4E17）报文超时故障 Receiving IC1 (ID: 0x18FF4E17) message timeout fault	1.请确定网关、仪表正常工作； 2.请确保网关和天行健间连接can线状态正确； 3.请检查网关和仪表间连接can线状态是否正确，线束有无破损； 1. Please make sure the gateway and IC are working properly; 2. Please ensure that the CAN bus connecting the gateway and TEL is in correct status; 3. Please check whether the connection status of the CAN bus between the gateway and the IC is correct and whether the wiring harness is damaged;
12	接收EMS_CCVS（ID:0x18FEF100）报文超时故障 Receiving EMS_CCVS (ID: 0x18FEF100) message timeout fault	接收EMS_CCVS（ID:0x18FEF100）报文超时故障 Receiving EMS_CCVS (ID: 0x18FEF100) message timeout fault	1.请确保网关、整车控制器、发动机能够正常工作，若不正常请及时更换； 2.请确保网关和车道偏离间连接can线状态正确； 3. 请确保网关和整车控制器间连接can线状态正确； 4. 请确保整车控制器和发动机系统间连接can线状态正确； 1. Please ensure that the gateway, VCU and engine can work normally, if not, please replace them in time; 2. Please ensure that the CAN bus connecting the gateway and LDWS is in correct status; 3. Please ensure that the connection status of the CAN bus between the gateway and the VCU is correct; 4. Please ensure that the connection between the VCU and the EMS is in correct status;
13	EEPROM故障 EEPROM fault	EEPROM故障 EEPROM fault	请更换LDWS控制器 Please replace the LDWS control UNIT
14	ECU RAM故障 ECU RAM fault	ECU RAM故障 ECU RAM fault	请更换LDWS控制器 Please replace the LDWS control UNIT
15	ECU ROM故障 ECU ROM fault	ECU ROM故障 ECU ROM fault	请更换LDWS控制器 Please replace the LDWS control UNIT
16	摄像头传感器对地短路故障 Camera sensor short to ground	摄像头传感器对地短路故障 Camera sensor short to ground	请检查摄像头传感器线束是否破损 Please check whether the camera sensor harness is damaged
17	摄像头传感器对电源短路故障 Camera sensor short to power	摄像头传感器对电源短路故障 Camera sensor short to power	请检查摄像头传感器线束是否破损 Please check whether the camera sensor harness is damaged
18	摄像头传感器断路故障 Camera sensor open circuit	摄像头传感器断路故障 Camera sensor open circuit	请检查摄像头传感器线束是否破损 Please check whether the camera sensor harness is damaged
19	摄像头未标定故障 Camera uncalibration fault	摄像头未标定故障 Camera uncalibration fault	请返厂或4S店标定 Please return to factory or 4S shop for calibration
20	功能limphome故障 Function limphome fault	功能limphome故障 Function limphome fault	请维修有信号交互控制器的故障或自身故障，便可恢复正常模式 Please repair the fault of the signal interaction control unit or its own fault, and then the normal mode can be restored.

疲劳监控系统
EMS

一、疲劳监控系统作用
I. Function of TMS

疲劳监控系统是一款基于机器视觉技术的驾驶辅助预警系统。系统利用摄像头采集到的驾驶员的面部图像，采用数字信号处理器进行实时分析，通过疲劳算法检测驾驶员的疲劳及注意力分散等不安全状态，及时发出预警信息，最大程度地避免由于疲劳驾驶引起的交通危险情况。
The TMS is a driving assistance early warning system based on machine vision technology. The system uses the driver's facial image collected by the camera and uses a digital signal processor for real-time analysis. It uses a fatigue algorithm to detect unsafe conditions such as driver fatigue and distraction, and issues early warning information in a timely manner to minimize the risk of fatigue driving. resulting in traffic hazards.

◘ 摄像头:
Camera:

- 用于采集驾驶员的面部图像，并将采集到的面部图像输出给控制器进行处理
  Used to collect the driver's facial image and output the collected facial image to the control unit for processing
- 内置补光LED，用于确保在低照度情况下（夜晚/进入山洞等）摄像头对驾驶员面部图像的有效采集
  Built-in fill-in LED shall be used to ensure the camera can effectively capture the driver's facial image in low-illumination situations (at night/entering a cave, etc.)

◘ 控制器:
Control unit:

- 对采集的驾驶员面部图像进行图像处理，进行疲劳状态判别指标的计算，确保在复杂道路环境下识别结果的可靠性
  Perform image processing on the collected driver's facial image, and calculate the fatigue state discrimination index to ensure the reliability of the recognition results in complex road environments
- 输出摄像头采集的视频信息
  Output the video information collected by the camera
- 向CAN总线发送驾驶员疲劳驾驶信息
  Send driver's fatigue driving information to CAN bus

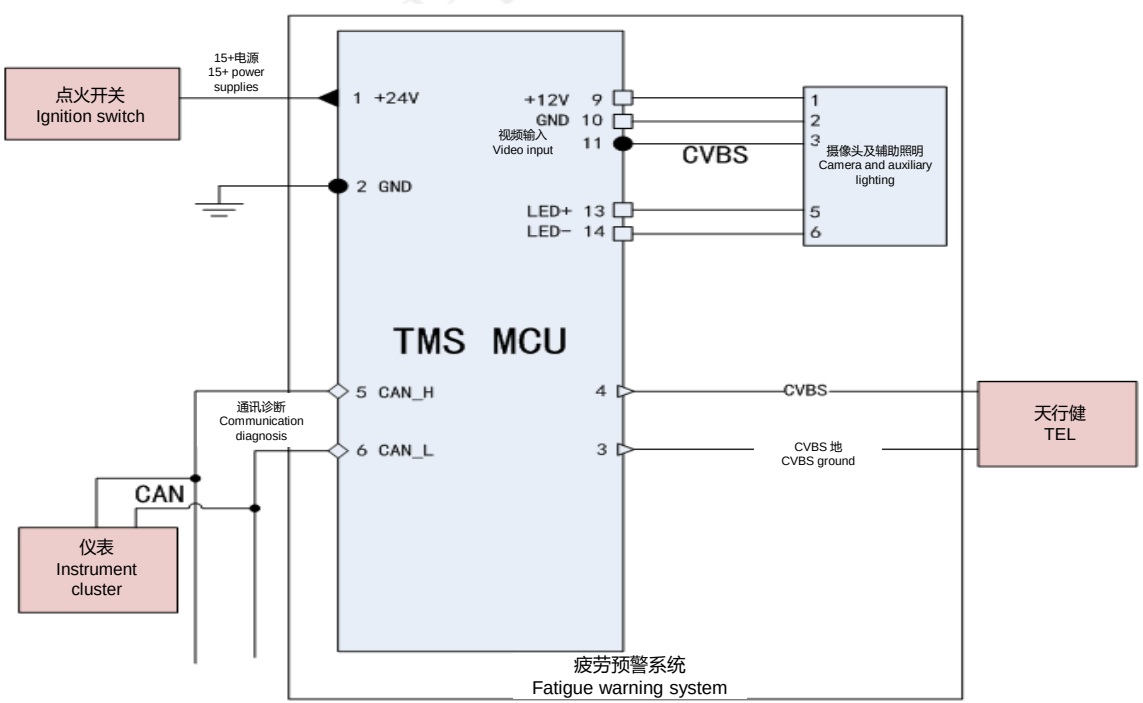
疲劳监控系统
EMS

二、疲劳监控系统组成及工作逻辑
II. Composition and work logic of the TMS

系统组成
System composition

1 控制器
Control unit

1 摄像头
Camera



疲劳监控系统
EMS

二、疲劳监控系统组成及工作逻辑
II. Composition and work logic of the TMS

系统组成
System composition

疲劳驾驶预警系统是基于机器视觉技术的驾驶辅助预警系统。系统使用图像传感器采集驾驶员的面部信息，采用高速数字信号处理器进行图像的处理与分析，基于疲劳检测算法对驾驶员的疲劳及注意力分散等不安全状态进行实时监控、及时发出预警信息，最大程度地避免由于疲劳驾驶引起的交通危险情况。

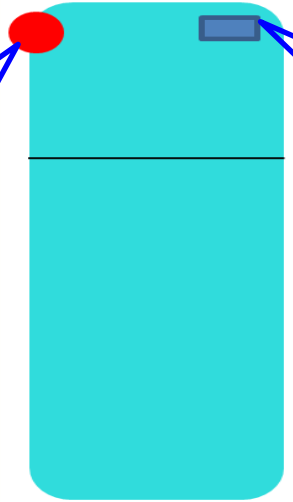
The fatigue driving warning system is a driving assistance warning system based on machine vision technology. The system uses the image sensor to collect the driver's facial information, and uses a high-speed digital signal processor to process and analyze the image. Based on the fatigue detection algorithm, the driver's fatigue and distraction and other unsafe states shall be monitored in real time, and early warning information shall be issued in time in order to avoid dangerous traffic situations caused by fatigue driving to the greatest extent.

15上电，主机接收到来自CAN总线的车速信息（车速大于10km/小时）时，启动摄像头工作，使用补光摄像头全天候采集驾驶员面部信息，采用高鲁棒性疲劳检测算法对驾驶员疲劳驾驶及注意力分散状态进行实时监控。当主机检测到驾驶员疲劳驾驶或注意力分散状态时，输出报警信息，将从CAN 总线获取的实时信息，包括车速、里程、车辆行驶方向、高程、纬度、经度、时间等信息，叠加在视频中输出。

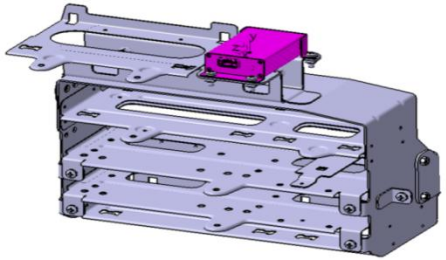
Power on with 15 voltage, when the host computer receives the vehicle speed information from the CAN bus (vehicle speed is greater than 10 km/h), it will start the camera to work, using the supplementary light camera to collect the driver's facial information around the clock and detecting the driver's fatigue driving and distraction status for real-time monitoring with the highly robust fatigue detection algorithm . When the host computer detects that the driver is driving fatigued or distracted, it will output an alarm message and superimpose the real-time information obtained from the CAN bus, including vehicle speed, mileage, vehicle driving direction, elevation, latitude, longitude, time, etc., on the video in the output.

三、疲劳监控系统安装位置
III. Installation location of TMS

摄像头装配在驾驶员侧A柱上
The camera is mounted on the A-pillar on the driver's side

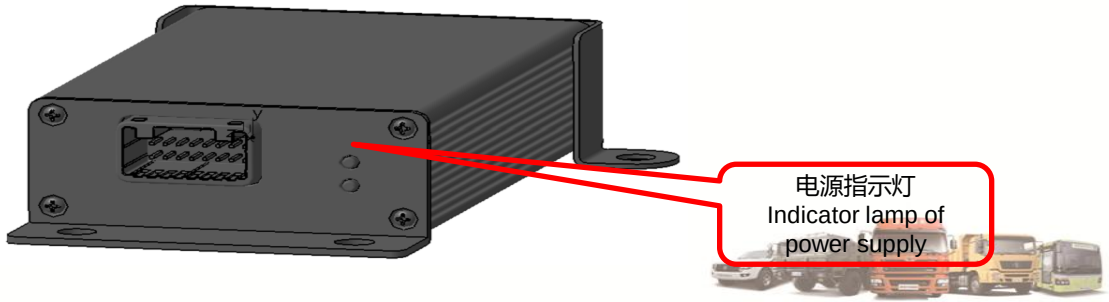


控制器在仪表台右侧控制器支架，最上面一层。
The controller is on RH controller bracket of the dashboard, the top layer.

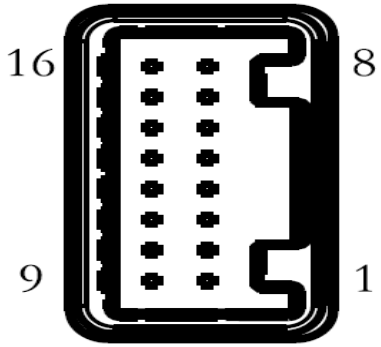


四、常见故障处理
IV. Common fault handling

故障现象：疲劳时不报警。
Fault phenomenon: No alarm when fatigued.
排查方法：观察红外补光灯是否点亮？不点亮时为白色，点亮时能看到明显的红色但不会刺眼。
Troubleshooting method: Check whether the infrared fill light lights up or not. It shall be white if not. Obvious red color, which is not dazzling, shall be seen if yes.
若红外补光灯不亮，检查控制器电源情况，观察控制器上电源指示灯是否点亮（绿色）。
If the infrared fill light does not light up, check the power supply of the control unit and observe whether the power indicator lamp on the control unit is on (green).
若控制器上电源指示灯不亮，请检查控制器供电线路。
If the power indicator lamp on the control unit does not light up, please check the power supply circuit of the controller.
若系统供电情况均正常，请排查CAN网络线路及组合仪表。
If the system power supply is normal, please check the CAN network lines and instrument cluster.



疲劳监控控制器针脚定义
TMS control unit pin definition



针脚号 Pin number	定义 Definition	针脚号 Pin number	定义 Definition
1	15+	9	DC 12V
2	GND	10	GND_Camera
3	GND_Video	11	Video_IN
4	Vedio_OUT	12	N/A
5	CAN_H	13	LED+
6	CAN_L	14	LED-
7	N/A	15	N/A
8	N/A	16	N/A

车辆智能诊断系统
Vehicle intelligent diagnosis system

车辆智能诊断系统
Vehicle intelligent diagnosis system

车辆智能诊断系统，通过整车电控系统对车辆运行状态进行实时监控，当有系统存在异常时，该异常现象或故障内容通过声音、灯光报警或者文字直接显示在仪表或者多媒体显示屏上，提高车辆故障排除的效率；同时该故障信息也会记录在电控系统内部，以供车辆维修时进行查询。

The vehicle intelligent diagnosis system monitors the vehicle operating state in real time through the vehicle electronic control system. When there is an abnormality in the system, the abnormality or fault content is directly displayed on the instrument or multimedia display through sound, light alarm or text, improving the efficiency of vehicle troubleshooting; at the same time, the fault information will also be recorded inside the electronic control system for query during vehicle maintenance.

整车实时的故障信息可以通过仪表\多媒体，进行显示、提示或查询：

The real-time fault information of the whole vehicle can be displayed, prompted or queried through the IC\MMI:

整车上电，仪表自检完毕后，会显示车辆当前存在故障。
After the vehicle is powered on and the BIT of the instrument is completed, it will display the current faulty of the vehicle.

通过多媒体，可以对当前车辆存在的故障进行查询。
Through MMI, the faults existing in the current vehicle can be queried.

车辆智能诊断系统
Vehicle intelligent diagnosis system

智能诊断信息提示---仪表
Intelligent diagnostic message prompt---IC

当车辆有控制器有故障信息时，仪表界面会提示报警且驾驶员进入此菜单中依次浏览各个故障信息。
When the vehicle control unit has fault information, the instrument interface will prompt an alarm and the driver will enter this menu to browse each fault information in sequence.

通过仪表\多媒体切换按键，进入到仪表操作界面，操作左右按键进入到故障诊断主菜单，即可查看车辆实时故障。
Through the IC\MMI switch key, enter the instrument operation interface, operate the LH/RH key to enter the main fault diagnosis menu, and view real-time vehicle faults.

故障诊断主菜单
Fault diagnosis menu

仪表\多媒体切换按键
IC\MMI switch key

操作多媒体
Operate MMI

操作仪表
Operate IC

车辆智能诊断系统
Vehicle intelligent diagnosis system

智能诊断信息提示---多媒体
Intelligent diagnostic message prompt --- MMI

点击多媒体右侧的主菜单，进入多媒体主界面，点击主界面下发的子功能菜单，车辆进入子功能页面 。
Click the main menu on the RH of the MMI to enter the main multimedia interface. Click the sub-function menu issued by the main interface to enter the sub-function page.

车辆智能诊断系统
Vehicle intelligent diagnosis system

智能诊断信息提示---多媒体
Intelligent diagnostic message prompt --- MMI

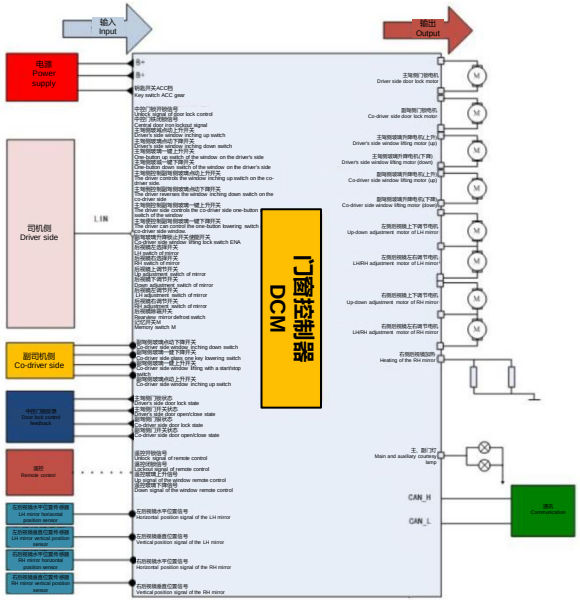
车辆医生分别有：车辆信息、燃油经济性、维保服务、故障查询、车辆帮助等选项，选择故障查询，进入故障查询子菜单，可以选当前故障或历史故障查询，进行一步获取故障及其维修方法的相关信息。
Vehicle doctor includes: vehicle information, fuel economy, maintenance services, fault query, vehicle help and other options. Select fault query to enter the fault query submenu. You can select current fault or history fault query to obtain information about faults and repairs in one step.

门窗控制系统
DCM

门窗控制系统功能介绍
Function introduction of DCM

门窗控制器实现门锁的开闭锁控制、门锁电机热保护、中控门锁反馈信号输出、自动落锁控制、门窗玻璃的升降控制、后视镜的调节、后视镜除霜、门灯功能。
The DCM realizes door unlock/lock control, door lock motor thermal protection, central door lock feedback signal output, automatic lock control, door window lifting control, mirror adjustment, mirror defrosting, courtesy lamp function.

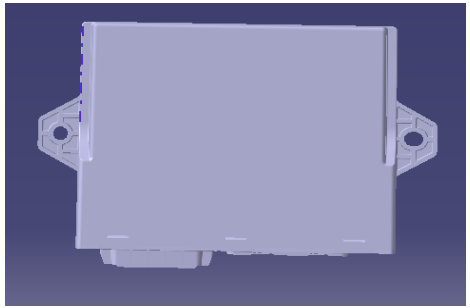
门窗控制系统有门控开关、门窗控制器及门锁电机、门窗电机和后视镜组成，附带有遥控。
The DCM consists of door control switch, DCM controller, door lock motor, door and window motor and mirror, with a remote control.
控制器原理如右图所示：
The control unit principle is shown on RH:

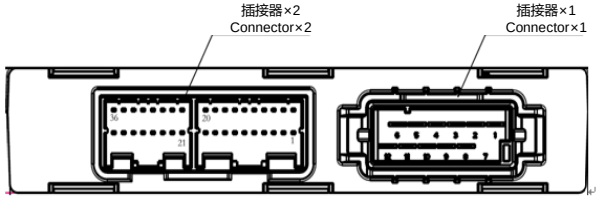


门窗控制系统
DCM

门窗控制系统功能造型及接口定义
DCM functional modeling and interface definition

门窗控制器实现零部件、插接器定义示意图如下，
The schematic diagram of the DCM to realize the parts and the definition of the connector is as follows,
针脚定义见右图。
See the figure on the RH for the pin definition.





插接器 Connector	针脚 Pin	定义 Definition	备注 Remarks
插接器A 对插编号: DZ9M259121082 Connector A Number of terminal of plug-in connector: DZ9M259121082	A-1	副驾驶侧车窗驱动输出正转(上升) Co-driver side window drive output forward(rising)	
	A-2	地2 Grounding 2	数字地 Digitally
	A-3	地1 Place 1	数字地 Digitally
	A-4	/	
	A-5	驾驶员侧门锁驱动输出正转(闭锁) Driver's side door lock drive output forward (lockout)	
	A-6	电源1(门窗电源) Power supply 1 (door and window power supply)	25A保险 25 A fuse
	A-7	/	
	A-8	副驾驶侧车窗驱动输出反转(下降) Co-driver side window drive output reverse(down)	
	A-9	驾驶员侧丰窗驱动输出正转(上升) Driver's side window drive output forward (up)	
	A-10	驾驶员侧丰窗驱动输出反转(下降) Driver's side window drive output reverse (down)	
	A-11	/	
	A-12	电源2(门锁电源) Power supply 2 (door lock power supply)	15A保险 15 A fuse
插接器B 对插编号: DZ9M259121084 Connector B Number of terminal of plug-in connector: DZ9M259121084	B-1	副驾驶侧门锁驱动输出反转(开锁) Co-driver side door lock drive output reverse (unlock)	
	B-2	/	
	B-3	副驾驶侧门锁驱动输出正转(闭锁) Co-driver side door lock drive output forward (lockout)	
	B-4	驾驶员侧门锁状态 Driver's side door lock state	
	B-5	/	
	B-6	/	
	B-7	/	
	B-8	/	
	B-9	/	
	B-10	/	
	B-11	副驾驶侧门锁状态 Co-driver side door lock state	
	B-12	副驾驶侧门开关状态 Co-driver side door switch state	
	B-13	驾驶员侧门开关状态 Driver's side door open/close state	
	B-14	/	
	B-15	/	
	B-16	副驾驶侧门窗开关 Co-driver side door and window switch	模拟信号输入 Analog signal input
	B-17	AGND	模拟地 Simulated
	B-18	/	
	B-19	/	
	B-20	驾驶员侧门锁驱动输出反转(开锁) Driver's side door lock drive output reverse (unlock)	
插接器C 对插编号: DZ9M259121085 Connector C Number of terminal of plug-in connector: DZ9M259121085	C-1	CANL	
	C-2	LIN	
	C-3	/	
	C-4	/	
	C-5	/	
	C-6	/	
	C-7	/	
	C-8	主副门灯 Main and accessory courtesy lamp	
	C-9	预留外接天线 Reserved external antenna	
	C-10	CANH	
	C-11	/	
	C-12	/	
	C-13	/	
	C-14	/	
	C-15	/	
	C-16	点火开关 ignition switch	

1、故障案例——门窗控制器
1. Fault case - DCM

◆ **1.1遥控功能失效**

1.1 The remote control functional failure

先确认使用条件：拔出钥匙下整车电、左右车门关闭（门灯不亮、仪表上无门开显示），再次尝试使用遥控。

First confirm the conditions of use: pull out the key to power off the whole vehicle, close the LH and RH doors (the courtesy lamps are not on, and there is no door open display on the IC), and try to use the remote control again.

1.若遥控无效，使用诊断仪，根据操作提示匹配遥控；

1. If the remote control is invalid, use a diagnostic unit and match the remote control according to the operation prompts;

2.若匹配不成功，拔掉副驾侧中央控制面板上DCM保险，然后插牢，重复步骤1；

2. If the matching is unsuccessful, unplug the DCM fuse on the co-driver side center control panel, then plug it in firmly and repeat step 1;

3.若遥控匹配未成功，建议更换新遥控进行匹配。

3. If the remote control matching fails, it is recommended to replace it with a new remote control for matching.

◆ 匹配过程如下：

The matching process is as follows:

a.上ON档电；

a. POR to ON position;

b.连接诊断仪，进入特殊诊断界面，进行遥控匹配；

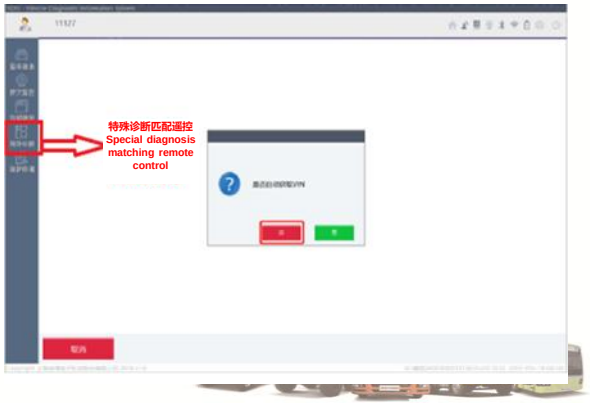
B. Connect the diagnostic unit, enter the special diagnosis interface, and perform remote control matching;

c.匹配成功后，再次试验功能，若恢复功能，则故障排除；

c. After successful matching, test the function again. If the function is restored, the fault shall be eliminated;

d.若仍未恢复，则更换门窗控制器，重新匹配后，功能正常。

d. If it still does not recover, replace theDCM. After rematching, the function will be normal.



1、故障案例——门窗控制器
1. Fault case - DCM

◆ **1.2门窗升降困难**
1.2 Difficulty in lifting doors and windows

1.若操作玻璃升降时，听到主驾门护板内有继电器吸合声音（啪嗒声），但玻璃升降困难，建议检查门窗胶条、导轨的装配正常。若不正常，调整后再次操作玻璃升降；
1. If you hear the sound of relay pull-in (snap) in the guard panel of the main driver's door when operating the window lifting, and the window is difficult to lift up and down, it is recommended to check the assembly of the door and window rubber strips and guide rails. If it is abnormal, adjust and operate the window lifting again;
2.若情况仍然存在，拆除门护板，查看胶条处是否变形、灰尘堆积，清理调整后，再次操作；
2. If the situation still exists, remove the door guard, check whether the rubber strip is deformed or dust accumulates. After cleaning and adjusting it, operate again;
3. 处理玻璃升降困难时，可在胶条、导轨处涂抹润滑液，有助解决问题。
3. When there is difficulty in window lifting, lubricating fluid shall be applied on the rubber strip and guide rail to help solve the problem.

1、故障案例——门窗控制器
1. Fault case - DCM

◆ **1.3电动后视镜调节失效（主驾后视镜）**
1.3 Electric mirror adjustment failure (driver's mirror)

1.先检查门控开关，操作升降玻璃和开闭锁，若无动作，则更换门控开关，若有动作，进行下一步；
1. First check the door control switch, operate the lifting window, make unlock/lock operation. If there is no action, replace the door control switch. If there is action, go to the next step;
2.拆除后视镜下护壳，检查后视镜上下调节端与公共端、左右调节端与公共端，用万用表测量是否导通，若不导通，则检查后视镜内部线路，若导通进行下一步；
2. Remove the lower protective shell of the mirror, check the upper and lower adjustment terminals of the mirror and the common terminal, the LH/RH adjustment terminals and the common terminal, and use a multimeter to measure whether there is continuity. If not, check the internal circuit of the mirror. If yes, go to the next step;
3.钥匙ON档电，操作门控开关调节，操作上下时，测量上下调节端与公共端是否有电压24V，操作左右时，测量左右调节端与公共端是否有24V电压，若有电压，则检测后视镜内部线路，若无电压，则进行下一步；
3. Power on the key to ON position, operate the door control switch to adjust. When making up-down operations, measure whether there is a voltage of 24 V between the up -down adjustment terminals and the common terminal. When making LH/RH operations, measure whether there is a voltage of 24 V between the LH/RH adjustment terminals and the common terminal. If there is voltage, then detect the internal circuit of the mirror. If no, go to the next step;
4.拆除主驾门护板，测量DCM的后视镜输出针脚电压，操作上下时，测量主驾公共端X2-23，上下X2-33针脚，是否有输出电压24V，若无电压，则更换DCM；操作左右时，测量主驾公共端X2-23，上下X2-26针脚，是否有输出电压24V，若无电压，则更换DCM。
4. Remove the driver's door guard, measure the output pin voltage of the mirror of the DCM. When making up-down operations, measure the main driver's common terminal X2-23, up-down X2-33 pins to see whether there is an output voltage of 24 V. If there is no voltage, replace the DCM; when making LH/RH operations, measure the common terminal X2-23 of the driver, the up-down X2-26 pins to see whether there is an output voltage of 24 V. If there is no voltage, replace the DCM.

1、故障案例——门窗控制器
1. Fault case - DCM

◆ **1.4电动后视镜调节失效（副驾后视镜）**
1.4 Electric mirror adjustment failure (co-driver mirror)

1.先检查门控开关，操作升降玻璃和开闭锁，若无动作，则更换门控开关，若有动作，进行下一步；
1. First check the door control switch, operate the lifting window, make unlock/lock operation. If there is no action, replace the door control switch. If there is action, go to the next step;
2.拆除后视镜下护壳，检查后视镜上下调节端与公共端、左右调节端与公共端，用万用表测量是否导通，若不导通，则检查后视镜内部线路，若导通进行下一步；
2. Remove the lower protective shell of the mirror, check the upper and lower adjustment terminals of the mirror and the common terminal, the LH/RH adjustment terminals and the common terminal, and use a multimeter to measure whether there is continuity. If not, check the internal circuit of the mirror. If yes, go to the next step;
3.钥匙ON档电，操作门控开关调节，操作上下时，测量上下调节端与公共端是否有电压24V，操作左右时，测量左右调节端与公共端是否有24V电压，若有电压，则检测后视镜内部线路，若无电压，则进行下一步；
3. Power on the key to ON position, operate the door control switch to adjust. When making up-down operations, measure whether there is a voltage of 24 V between the up -down adjustment terminals and the common terminal. When making LH/RH operations, measure whether there is a voltage of 24 V between the LH/RH adjustment terminals and the common terminal. If there is voltage, then detect the internal circuit of the mirror. If no, go to the next step;
4.拆除主驾门护板，测量DCM的后视镜输出针脚电压，操作上下时，测量主驾公共端X2-24，上下X2-34针脚，是否有输出电压24V，若无电压，则更换DCM；操作左右时，测量主驾公共端X2-23，上下X2-25针脚，是否有输出电压24V，若无电压，则更换DCM。
4. Remove the driver's door guard, measure the output pin voltage of the mirror of the DCM. When making up-down operation, measure the driver's common terminal X2-24, up-down X2-34 pins to see whether there is an output voltage of 24 V. if there is no voltage, replace the DCM; when making LH/RH operation, measure the driver common terminal X2-23 and the up-down X2-25 pins to see if there is an output voltage of 24 V. If there is no voltage, replace the DCM.

1、故障案例——门窗控制器
1. Fault case - DCM

◆ **1.5电动后视镜加热失效（主/副驾后视镜）**
1.5 Electric mirror heating failure (driver/co-driver side mirror)

1.先检查门控开关，操作升降玻璃和开闭锁，若无动作，则更换门控开关，若有动作，进行下一步；
1. First check the door control switch, operate the lifting window, make unlock/lock operation. If there is no action, replace the door control switch. If there is action, go to the next step;
2.拆除后视镜下护壳，检查后视镜加热正负极，用万用表测量是否导通，若不导通，则检查后视镜内部线路，若导通进行下一步；
2. Remove the lower protective shell of the mirror, check the mirror heating positive and negative poles, and use a multimeter to measure whether there is continuity. If not, check the internal circuit of the mirror. If it yes, go to the next step;
3.钥匙ON档电，操作门控开关调节，后视镜加热正负极是否有电压24V，则进行下一步；
3. Power on the key to ON position, operate the door control switch to adjust. If there is a voltage of 24 V on the mirror heating positive and negative poles, go to the next step;
4.拆除主驾门护板，测量DCM的后视镜加热输出针脚电压，测量X1-11及X2-23（左后视镜），或X1-11及X2-24（右后视镜），若无电压，则更换DCM。
4. Remove the driver's door guard, measure the output pin voltage of DCM mirror heating, measure X1-11 and X2-23 (LH mirror), or X1-11 and X2-24 (RH mirror). If no voltage, replace DCM.

逆变电源
Inverter power supply

◆ **日常功能检查使用及维护**
Daily functional inspection, use and maintenance

车辆在上30电时逆变电源可工作，逆变电源正常工作时指示灯绿色常亮。
The inverter power supply can work when the vehicle is powered on with 30 voltage, and the indicator lamp is constantly on green when the inverter power supply is working normally.

◆ **注意事项**
Cautions

1、发动机熄火后，长时间使用或未使用用电器时不拔插头会导致蓄电池亏电， 影响启动，建议启动发动机后使用。
1. After the engine is turned off, using the consumers for a long time or not unplugging it will cause the battery loss, which affects the start. It is recommended to use after starting the engine.
2、请勿使用功率超过1200W的用电器。
2. Please do not use consumers with a power exceeding 1200 W.

逆变电源
Inverter power supply

◆ 常见故障排查
Common troubleshooting

1、逆变电源黄灯常亮：表示功率过载，使用用电器功率请不要超过1200W；

1. The yellow lamp of the inverter power supply is constantly on: It means the power is overloaded. Please do not use consumers with a power exceeding 1200 W;

2、逆变电源黄灯闪烁：逆变电源温度过高，请停止使用，降温后恢复正常使用；

2. The yellow lamp of the inverter power supply flashes: High temperature of the inverter power supply, please stop using it and resume normal use after cooling down;

3、逆变电源红灯常亮：请检查逆变电源或用电有无漏电问题；

3. The red light of the inverter power supply is constantly on: Please check whether there is any leakage problem in the inverter power supply or electricity consumption;

4、逆变电源红灯闪烁：蓄电池电压低，请启动车辆充电或停止使用；

4. The red light of the inverter power supply flashes: Low the battery voltage, please start chargi

5、逆变电源不工作：

5. The inverter power supply does not work:

①检查蓄电池电压是否低于23.5V；

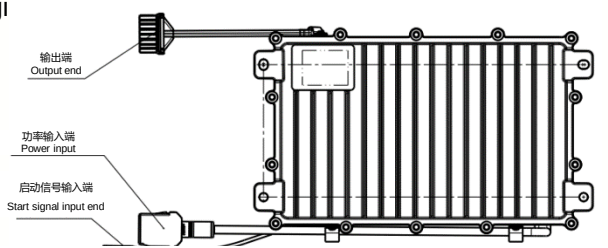
① Check whether the battery voltage is lower than 23.5 V;

②按照针脚定义检查启动信号输入端是否为24V；

② Check whether the start signal input terminal is 24 V according to the pin definition;

③检查线束是否有开短路问题。

③ Check whether there is any open or short circuit problem in the wiring harness.



插接器针脚定义 Connector pin definition				
启动信号输入端DZ9X259121201 Start signal input terminal DZ9X259121201				
PIN1	ACC		PIN2	空 Null

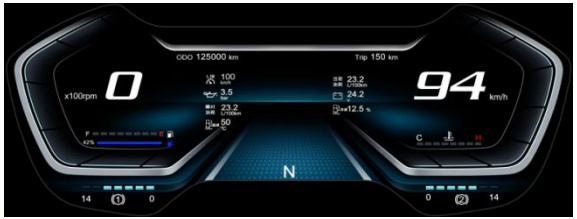
组合仪表系统
Combination instrument system

1.组合仪表组成
1. Composition of instrument cluster

组合仪表安装在汽车驾驶室内方向盘前的仪表台面板中，是驾驶员与汽车主要的交互界面，为驾驶员提供所需的汽车运行参数、故障、里程等信息，并通过驾驶员在其界面中的操作来控制部分整车功能的电器件。

The instrument cluster is installed in the dashboard panel in front of the steering wheel in the cab of the car. It is the main interface between the driver and the vehicle, providing with information like vehicle operation parameters, fault, and mileage. The operation is used to control the electrical devices of some vehicle functions.

经典主题
Classic theme



科技主题
Science and technology theme

运动主题
Sports theme

①转速表 ②报警显示区域 ③行车电脑显示区域
① Tachometer ② Alarm display area ③ ECU display area
④车速表 ⑤燃油表 ⑥水温表
④ Speedometer ⑤ Fuel gauge ⑥ Water temperature gauge

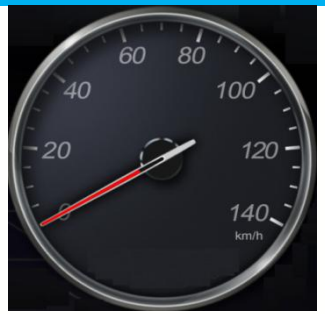
2.液晶显示屏
2. LCD display

液晶显示信息主要包括：短里程（Trip）、总里程（ODO）、当前油耗、综合油耗、发动机累计油耗、发动机工作时间、档位信息、机油压力、电池电压、尿素液位、保养设置、故障信息等。

The LCD display information mainly includes: short mileage (Trip), total mileage (ODO), current fuel consumption, comprehensive fuel consumption, cumulative engine fuel consumption, engine operating time, position information, oil pressure, battery voltage, urea level, maintenance settings, fault Information etc.

组合仪表系统
Combination instrument system

3.指针说明
3. Pointer description
3.1 车速表
3.1 Speedometer
车辆行驶时，车速表开始工作。
When the vehicle is moving, the speedometer shall start working.
显示范围为0 ~ 140km/h。
The display range is 0 ~ 140km/h.



3.2 转速表
3.2 Tachometer
发动机启动时，转速表开始工作。
When the engine starts, the tachometer shall start working.
显示范围为0 ~ 30×100rpm。
The display range is 0 ~ 30×100rpm.
转速表经济区域：绿色区域代表最经济区间，红色区域代表高油耗区域；仪表根据对应发动机到达相应的经济区域时亮起相对应颜色的色块。
Tachometer economical zone: The green area represents the most economical zone, and the red area represents the high fuel consumption area; the IC lights up the corresponding color block when the corresponding engine reaches the corresponding economical zone.

3.3 燃油表
3.3 Fuel Gauge
指示燃油箱存油量。刻度盘E表示燃油箱的油量为空，刻度盘F表示燃油箱的油量为满。
It indicates fuel tank level. Dial E indicates that the fuel tank is empty, and dial F indicates full.
点火钥匙打到IGN ON档时，燃油表开始工作。
When the ignition key is turned to IGN ON position, the fuel gauge shall start working.
显示范围为0 ~ 100%。
The display range is 0 to 100%.
当整车的燃料低于13%时，燃油低报警灯点亮，蜂鸣器鸣响5s。此时应尽早添加燃油。
When the vehicle's fuel is lower than 13%, the low fuel alarm lamp shall light up and the buzzer shall sound for 5 seconds. At this time, fuel should be added as soon as possible.

组合仪表系统
Combination instrument system

3.4 水温表
3.4 Water temperature gauge

指示发动机冷却液的温度。 刻度盘C表示发动机冷却液温度低，刻度盘H表示发动机冷却液温度高。
It indicates engine coolant temperature. Dial C indicates the engine coolant temperature is low, and Dial H indicates that the engine coolant temperature is high.
钥匙开关打到2档，水温表开始工作。
When the key switch is turned to the gear 2, the water temperature gauge shall start to work.
显示范围为40 ～ 120℃。
The display range is 40 to 120°C.
当水温高于发动机报警点时，水温过高指示灯常亮，
When the water temperature is higher than the engine alarm temperature, the high water temperature indicator lamp shall be constantly on.
STOP紧急停车报警灯同时被点亮，蜂鸣器一直鸣响。
The STOP emergency parking alarm lamp shall be illuminated at the same time, and the buzzer shall keep sounding.

组合仪表系统
Combination instrument system

4.指示灯说明
4.Indicator lamp description

报警灯名称 Alarm lamp name	符号 Symbols	颜色 Color
主车左转向指示灯 Tractor LH turn steering indicator lamp		绿色 Green
挂车左转向指示灯 Trailer LH turn steering indicator lamp		绿色 Green
EDC诊断指示灯 EDC diagnosis indicator lamp		红色 Red
远光灯 High beam		蓝色 Blue
OBD报警灯 OBD alarm lamp		黄色 Yellow
进气预热指示灯 Intake air preheating indicator lamp		黄色 Yellow
冷却温度高指示灯 High cooling temperature indicator lamp		红色 Red
冷却液位低指示灯 Low coolant level indicator lamp		红色 Red
EDC维修指示灯 EDC maintenance indicator lamp		黄色 Yellow
机油压力低指示灯 Low oil pressure indicator lamp		红色 Red
排气制动指示灯 Exhaust brake indicator lamp		黄色 Yellow
变速箱维修指示灯 Transmission maintenance indicator lamp	NCD	黄色 Yellow
NCD指示灯 NCD indicator lamp		黄色 Yellow
前轮差速指示灯 Front wheel differential indicator lamp	EBS	绿色 Green
EBS红灯 EBS red lamp	EBS	红色 Red
EBS黄灯 EBS yellow lamp		黄色 Yellow
后轮转向报警灯 Rear wheel steering alarm lamp		红色 Red
ESC关闭指示灯 ESC off indicator lamp		黄色 Yellow
主车ABS指示灯 Tractor ABS indicator lamp		黄色 Yellow

报警灯名称 Alarm lamp name	符号 Symbols	颜色 Color
车厢举升指示灯 Boxcar lifting indicator lamp		红色 Red
制动气压低指示灯 Low brake air pressure indicator lamp		红色 Red
燃油油量低指示灯 Low fuel volume indicator lamp		黄色 Yellow
维修指示灯 Maintenance indicator lamp		黄色 Yellow
尿素液位低指示灯 Low urea level indicator lamp		黄色 Yellow
胎压报警指示灯 Tire pressure alarm indicator lamp		黄色 Yellow
盘式制磨损指示灯 Disc wear indicator lamp	STOP	黄色 Yellow
紧急停车灯 Emergency stop lamp		红色 Red
驻车制动指示灯 Parking brake indicator lamp		红色 Red
前摄像头故障 Front camera fault		黄色 Yellow
变速箱故障指示灯 Transmission fault indicator lamp		红色 Red
轴差工作指示灯 Axis difference working indicator lamp	AUTO HOLD	黄色 Yellow
自动驻车指示灯 Auto parking indicator lamp		黄色 Yellow
驻车独立制动灯 Independent parking brake lamp		黄色 Yellow
负载转移指示灯 Load transfer indicator lamp		黄色 Yellow
疲劳驾驶指示灯 Fatigue driving indicator lamp		黄色 Yellow
超速报警指示灯 Overspeed alarm indicator lamp		黄色 Yellow
碰撞报警指示灯 Collision alarm indicator lamp		黄色 Yellow

报警灯名称 Alarm lamp name	符号 Symbols	颜色 Color
AEB系统关闭 AEB system shutdown		黄色 Yellow
ECAS工作指示灯 ECAS indicator lamp		黄色 Yellow
缓速器工作指示灯 Retarder indicator lamp		绿色 Green
轮差工作指示灯 Wheel differential indicator lamp		黄色 Yellow
浮动桥指示灯 Floating bridge indicator lamp		绿色 Green
变速箱油温高灯 Transmission high oil temperature lamp		红色 Red
驾驶室翻转指示灯 Cab tilting indicator lamp		红色 Red
挂车右转向指示灯 Trailer RH turn steering indicator lamp		绿色 Green
主车右转向指示灯 Tractor RH turn steering indicator lamp		绿色 Green
变速箱低档指示灯 Transmission low gear indicator lamp		绿色 Green
蓄电池充电指示灯 Battery charge indicator lamp		红色 Red
停车取力指示灯 Parking power take-off indicator lamp		黄色 Yellow
空滤器阻塞指示灯 Air filter clogging indicator lamp		黄色 Yellow
行车取力指示灯 Driving power take-off indicator lamp		黄色 Yellow
巡航状态指示灯 Cruise state indicator lamp		绿色 Green
分动器高档指示灯 Transfer case high range indicator lamp		绿色 Green
分动器低档指示灯 Transfer case low range indicator lamp		红色 Red
安全带未系指示灯 Seat belt not fastened indicator lamp		红色 Red
全轮驱动指示灯 All-wheel drive indicator lamp		黄色 Yellow

报警灯名称 Alarm lamp name	符号 Symbols	颜色 Color
挂车ABS指示灯 Trailer ABS indicator lamp		黄色 Yellow
ASR指示灯 ASR indicator lamp		黄色 Yellow
前雾灯 Front fog lamp		绿色 Green
后雾灯 Rear fog lamp		黄色 Yellow
主营门开指示灯 Driver door open indicator lamp		黄色 Yellow
副驾门开指示灯 Co-driver door open indicator lamp		黄色 Yellow
小灯 Clearance lamp		绿色 Green
日间行车灯 DRL		绿色 Green
自适应前照工作灯 Adaptive headlamp		绿色 Green
室内照明灯 Interior lamp		黄色 Yellow
钥匙电量低指示灯 Key low battery indicator lamp		黄色 Yellow
ESP工作灯 ESP working lamp		黄色 Yellow
坡道提示指示灯 Ramp warning indicator lamp		黄色 Yellow
发动机防盗指示灯 Engine anti-theft indicator lamp		红色 Red
ACC巡航指示灯 ACC cruise indicator lamp		绿色 Green
ACC巡航故障灯 ACC cruise fault lamp		黄色 Yellow
DPF再生指示灯 DPF regeneration indicator lamp		红色 Red
DPF禁止再生灯 DPF regeneration inhibit lamp		红色 Red
整车信息指示灯 Vehicle information indicator lamp		黄色 Yellow

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Combination instrument system

5.液晶显示说明

5. LCD display description

5.1 液晶屏显示界面模式

5.1 LCD screen display interface mode

液晶屏显示界面总共分为两种模式：仪表操作模式以及多媒体操作模式。驾驶员通过下图所示的仪表/多媒体操作按键进行仪表及多媒体的操作，方向盘上电默认为仪表操作模式。方向盘分为“上”、“下”、“左”、“右”四方向操作按键以及中间确认键及右下角返回键。

The LCD display interface is divided into two modes: IC operation mode and MMI operation mode. The driver operates the instrument and multimedia through the instrument/multimedia operation buttons shown in the figure below. The steering wheel defaults to the instrument operation mode when it is powered on. The steering wheel is divided into 'Up', 'Down', 'LH' and 'RH' four direction operation buttons, OK key in the middle and BACK key in the lower right corner.

“上” “下”按键主要在在菜单界面中上下翻动二级菜单。

The 'Up' and 'Down' keys are mainly used to scroll up and down the secondary menu in the menu interface.

“左” “右”按键主要在菜单界面中左右翻动一级菜单。

The LH/RH keys are mainly used to scroll the first-level menu LH and RH in the menu interface.

行驶界面中按下“确认”键可以进入菜单界面，二级菜单中可以根据提示按“确认”键进行功能操作。每按一次“返回键”则返回上一级界面，或者取消主界面中弹出式报警。

Press OK key in the driving interface to enter the menu interface, and press OK key to perform functional operations in the secondary menu according to the prompts. Each time you press Back key, you will return to the previous interface, or cancel the pop-up alarm in the main interface.

仪表操作模式
IC operation mode

多媒体操作模式
MMI operation mode

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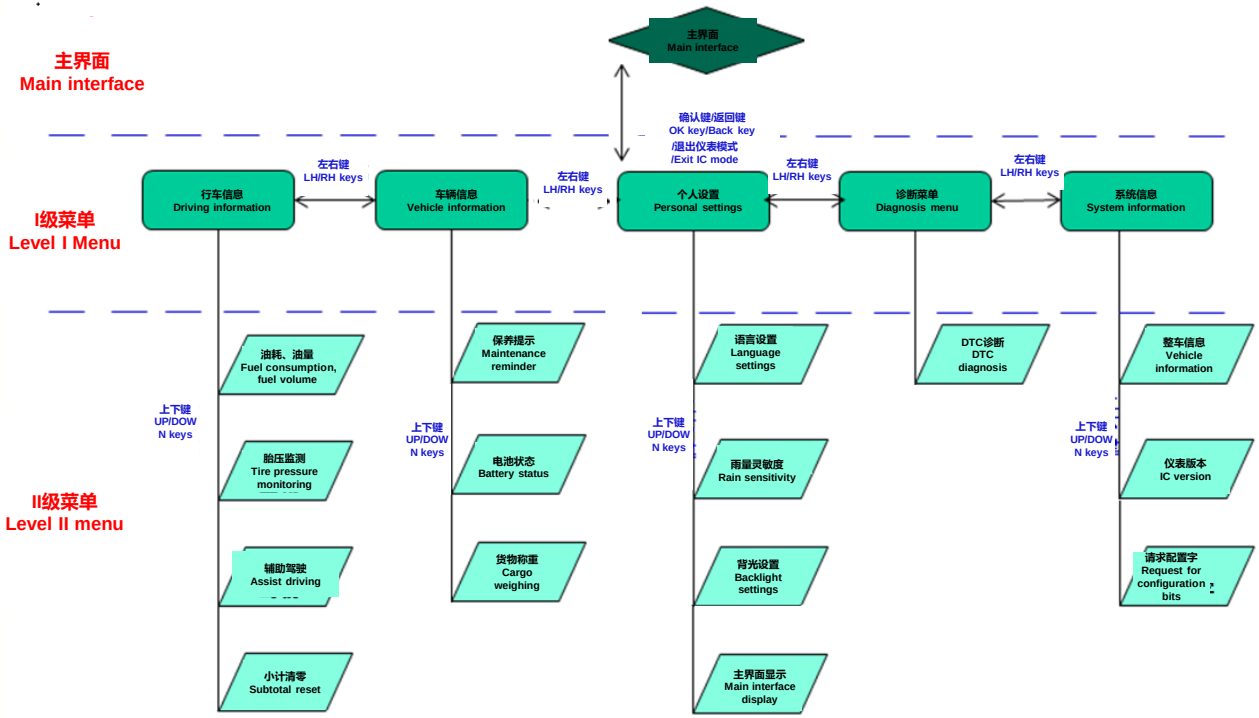
5.2 组合仪表操作方法
5.2 How to operate the instrument cluster

显示屏界面分为三个等级，上电后进入到主界面，可以查看行驶中基本的整车信息，并且通过方向盘按键进入到子菜单中分别浏览对应的信息及报警。
The display interface is divided into three levels. After powering on, you will enter the main interface, where you can view basic vehicle information while driving, and enter the submenu through the steering wheel keys to browse the corresponding information and alarms.



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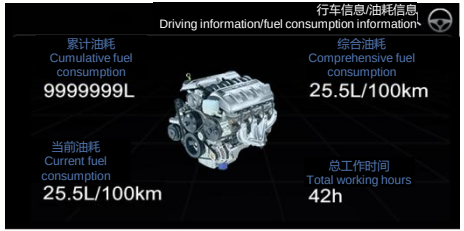
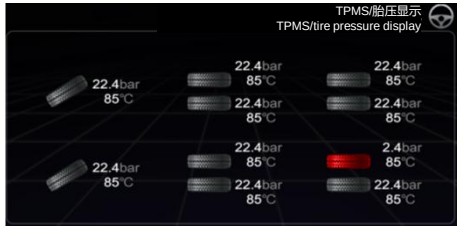
5.3 行车信息：包括油耗信息、胎压显示、辅助驾驶、智能驾驶、清零操作。
5.3 Driving information: including fuel consumption information, tire pressure display, assist driving, intelligent driving, and clearing operations.

油耗信息：仪表能够实时显示当前油耗、综合油耗、发动机累计燃油消耗量。
Fuel consumption information: The IC can display the current fuel consumption, comprehensive fuel consumption and cumulative fuel consumption of the engine in real time.
胎压显示：当车辆配置胎压监测系统时，仪表能够实时显示各个轮胎的压力和温度，并进行胎压异常报警。
Tire pressure display: When the vehicle is equipped with a TPMS, the IC can display the pressure and temperature of each tire in real time, and give an alarm for abnormal tire pressure.
辅助驾驶：当车辆装配智能驾驶系统时，通过仪表能够进行系统的开启/关闭操作。
Assist driving: When the vehicle is equipped with an intelligent driving system, the system can be turned on/off through the IC.
清零操作：对短里程、当前油耗、综合油耗、干燥筒更换提示里程等进行清零。
Reset operation: reset the short mileage, current fuel consumption, comprehensive fuel consumption, and mileage for replacement of the drying cylinder.





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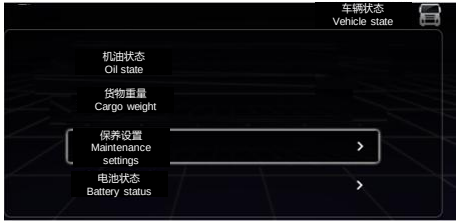
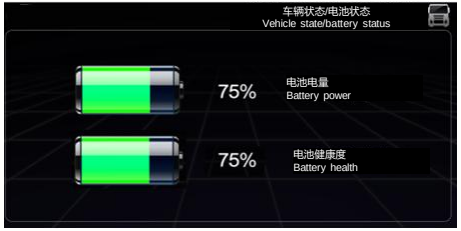
5.4 车辆状态：包括货物重量、保养设置、电池状态。
5.4 Vehicle state: including cargo weight, maintenance settings, and battery status.
货物重量：当车辆配置称重系统时，仪表可以显示当前货物的重量。
Cargo weight: When the vehicle is equipped with a weighing system, the IC can display the current weight of the cargo.
保养设置：通过菜单可以进行保养里程和提示里程的设置。
Maintenance settings: Service cycle and reminder mileage settings can be set through the menu.
电池状态：当车辆配置蓄电池传感器时，仪表可以显示电池电量和电池健康度的百分比。
Battery status: When the vehicle is equipped with a battery sensor, the IC can display the percentage of battery power and battery health.





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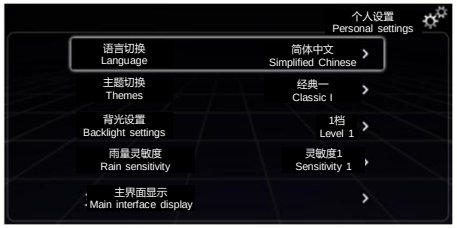
5.5 个人设置：包括语言设置、主题切换、背光设置、雨量灵敏度、主界面显示。
5.5 Personal settings: including language setting, theme switching, backlight setting, rain sensitivity, and main interface display.
语言设置：根据当地对语言显示的需求，进行语言种类的设置。
Language setting: The language type shall be set according to the local demand for language display.
主题切换：用户可以根据个人喜好，在线切换“经典”、“科技”、“运动”不同的显示风格。
Theme switching: Owners can switch online between "Classic", "Technology" and "Sports" based on personal preferences.
背光设置：当自动背光功能失效时，可以切换为手动背光进行背光的调节。
Backlight settings: When the automatic backlight function fails, you can switch to manual backlight for backlight adjustment.
雨量灵敏度：用户能够根据当前雨量的大小进行雨刮灵敏度的设置。
Rain sensitivity: Owners can set the wiper sensitivity based on the current amount of rain.
主界面显示：用户可以选择自己关注的信息，做为主界面显示的内容。
Main interface display: Owners can choose the information they care about as the content displayed on the main interface.



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5.6 诊断信息：查看当前故障码详细信息。
5.6 Diagnostic message: View current DTC details.

5.7 系统设置：包括整车信息、版本信息、请求配置字界面。
5.7 System settings: including vehicle information, version information, and request configuration bit interface.
整车信息：能够查看当前车辆的K值、发动机类型、变速箱类型等参数。
Vehicle information: You can check the K value, engine type, transmission type and other parameters of the current vehicle.
版本信息：能够查看仪表的软硬件版本信息。
Version information: You can view the software and hardware version information of the IC.
请求配置字：当整车的电气零部件更换后，需在仪表中进行请求配置字的操作。
Request configuration bits: When the electrical parts of the vehicle are replaced, the operation of requesting configuration bits needs to be performed in the IC.

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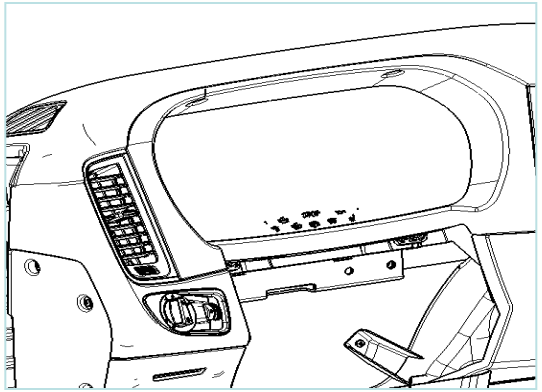
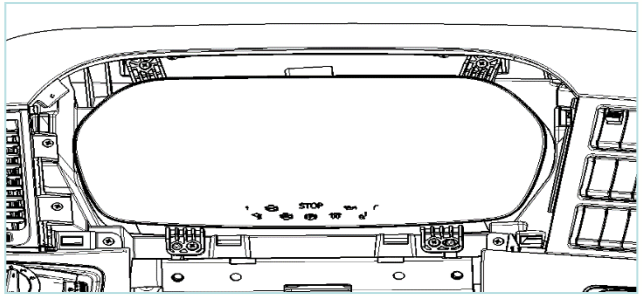
6.故障排查
6. Troubleshooting
6.1 组合仪表拆卸
6.1 Remove the instrument cluster
①接上仪表背面的蓝色和绿色插接器，再拧上固定仪表的4个螺钉；
① Connect the blue and green connectors on the back of the IC, and then tighten the 4 screws that fix the IC;
②固定仪表台面罩，再拧上面罩的两个螺钉即可。
② Fix the dashboard panel and tighten the two screws of the panel.





组合仪表系统
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6.2 故障现象：车速表无指示。
6.2 Fault phenomenon: The speedometer has no indication.
6.2.1工具准备：万用表
6.2.1 Tools: multimeter
6.2.2原因分析及排查方法
6.2.2 Cause analysis and troubleshooting

症状 Symptoms	原因分析 Cause analysis	排查方法 Troubleshooting method
车速表无指示 Speedometer shows no indication	组合仪表内部指针卡死 The pointer inside the instrument cluster is stuck	钥匙电源打到2档，当车速指针无法正常进行自检，更换仪表。 Turn the key power to the second position. If the speed pointer cannot perform the BIT normally, replace the IC.
	车速传感器的供电电源异常 The power supply of the vehicle speed sensor is abnormal	用万用表测量车速传感器的供电电源是否是12V。 Use a multimeter to measure whether the power supply of the vehicle speed sensor is 12V.
	车速传感器地线异常 The ground wire of the vehicle speed sensor is abnormal	用万用表测量车速传感器地线是否正常接地。 Use a multimeter to measure whether the ground wire of the vehicle speed sensor is properly grounded.
	车速传感器信号线到仪表端连接异常 Abnormal connection between the vehicle speed sensor signal line and the IC end	用万用表测量车速传感器信号线到仪表端是否连接正常。 Use a multimeter to measure whether the signal line of the vehicle speed sensor is properly connected to the IC terminal.

6.2.3车速表无指示排查方法
6.2.3 Troubleshooting of speedometer without indication
排查步骤1：钥匙电源打到2档，观察指针能够正常自检。
Step 1: Turn the key to the second position, and observe whether the pointer can perform the BIT normally.
a.钥匙电源关闭；
a. The key power supply is turned off;
b.钥匙电源打到2档，观察指针能否正常自检；
b. Turn the key to the second position and observe whether the pointer can perform the BIT normally;
c.车速指针卡滞，无法正常进行自检，则更换仪表。
c. The speed pointer is stuck and cannot perform BIT normally, then replace the IC.
d.如果指针无卡滞现象，按照如下步骤在进行排查。
d. If the pointer is not stuck, follow the steps below for further troubleshooting.
排查步骤1：检查车速传感器与仪表连接。
Step 1: Check the connection between the vehicle speed sensor and the meter.
a.钥匙电源打到2档；
a. Turn the key to thw second position;

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b.拔掉车速传感器端的行驶记录仪电缆，用万用表测量1号针脚的供电是否是12V，如果供电异常，更换仪表；供电正常，按照如下步骤在进行排查。
b. Remove the cable of the driving recorder at the end of the vehicle speed sensor, and use a multimeter to measure whether the power supply of pin 1 is 12V. If the power supply is abnormal, replace the IC; if the power supply is normal, follow the steps below for further troubleshooting.
c.钥匙电源关闭，拔掉车速传感器端的行驶记录仪电缆，用万用表测量2号针脚与底盘打铁是否正常，如异常，检查驾驶室搭铁点；如正常，按照如下步骤在进行排查。
c. Turn off the key, remove the driving recorder cable at the vehicle speed sensor end, and use a multimeter to measure whether the connection between pin 2 and the chassis is normal. If abnormal, check the cab GND point; if normal, follow the steps below for further troubleshooting.
d.钥匙电源关闭，拔掉车速传感器端的行驶记录仪电缆，用万用表测量3号针脚与仪表端的车速信号线连接是否正常，如异常，检查防火墙处驾驶室和底盘的插接器连接；以上检查都正常下，更换仪表。
d. Turn off the key, remove the driving recorder cable at the speed sensor end, and use a multimeter to measure whether the connection between pin 3 and the vehicle speed signal line at the IC end is normal. If abnormal, check the connector connection between the cab and the chassis at the firewall. If the above all are normal, replace the IC.
6.3组合仪表黑屏
6.3 Instrument cluster screen turns black
6.3.1工具准备：万用表
6.3.1 Tools: multimeter
6.3.2原因分析及排查方法
6.3.2 Cause analysis and troubleshooting

症状 Symptoms	原因分析 Cause analysis	排查方法 Troubleshooting method
组合仪表黑屏 Black screen in instrument cluster	1、仪表供电故障； 1. IC power supply fault; 2、液晶屏故障； 2. LCD screen fault; 3、仪表内部电路故障。 3. IC internal circuit fault.	1、检查仪表蓝色接插件B5（15+电）与B6（B+电）电源供电是否正常； 1. Check whether the power supply of blue connectors B5 (15+ voltage) and B6 (B+ voltage) of the IC is normal; 检查蓝色插接器B1接地是否牢靠； Check whether the blue connector B1 is firmly grounded; 2、上电15+电后打开双闪，听仪表是否发出转向提示音； 2. After powering on for 15+ voltage, turn on the double flashing and listen to whether the IC emits a steering signal sound; 3、转向提示音若正常提示，液晶未显示。 3. If the steering signal sound is normal, the LCD will not display it.

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6.3.3组合仪表黑屏排查方法
6.3.3 Troubleshooting of black screen of the instrument cluster
排查步骤：检查仪表供电系统
Troubleshooting steps: Check the IC power supply system
a.钥匙电源打到2档；
a. Turn the key to thw second position;
b.检查仪表接插件B5（15+电）与B6（B+电）电源供电是否正常，如异常，检查整车供电系统；如正常，按照如下步骤在进行排查。
b. Check whether the power supply of the IC connectors B5 (15+voltage) and B6 (B+voltage) is normal. If abnormal, check the vehicle power supply system; if normal, follow the steps below for further troubleshooting.
c.钥匙电源关闭，检查仪表接插件B1与驾驶室打铁是否牢靠，如果异常检查驾驶室打铁点；如正常，按照如下步骤在进行排查。
c. Turn off the key, check whether the IC connector B1 and the cab ground are secure. If abnormal, check the cab GND point; if normal, follow the steps below for further troubleshooting.
d. 钥匙电源打到2档，打开双闪，观察仪表是否发出转向提示音。如转向提示音正常提示，液晶未显示，则更换仪表。
d. Turn the key to the 2nd position, turn on the hazard warning lamps, and observe whether the IC gives a turning prompt sound. If the turning prompt sound is normal but the LCD does not display, replace the IC.
6.4机油压力指示不准确
6.4 Inaccurate oil pressure
6.4.1工具准备：诊断仪
6.4.1 Tools: diagnostic unit
6.4.2原因分析及排查方法
6.4.2 Cause analysis and troubleshooting

症状 Symptoms	原因分析 Cause analysis	排查方法 Troubleshooting method
机油压力指示不准 Engine oil pressure indication is inaccurate	仪表中发动机类型设置错误 Wrong engine type setting in the IC	在仪表菜单中查看发动机类型与实际发动机类型是否一致 Check whether the engine type is consistent with the actual engine type in the IC menu

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6.4.3原因分析及排查方法
6.4.3 Cause analysis and troubleshooting
排查步骤：在仪表中检查设置的发动机类型。
Steps: Check the set engine type in the IC.
a.钥匙电源打到2档；
a. Turn the key to thw second position;
b.在仪表菜单“系统信息/整车信息”中查看发动机类型与实际发动机类型是否一致，如不一致拨打400热线，更改配置字后通过诊断仪重新下发配置字。
b. Check whether the engine type is consistent with the actual engine type in the IC menu "System Information/Vehicle Information". If not, call the hotline, change the configuration bits and re-issue the configuration bits through the diagnostic unit.
6.5仪表报车辆网络故障
6.5 The IC displays vehicle network fault
6.5.1工具准备：诊断仪、万用表
6.5.1 Tools: diagnostic unit, multimeter
6.5.2原因分析及排查方法
6.5.2 Cause analysis and troubleshooting

症状 Symptoms	原因分析 Cause analysis	排查方法 Troubleshooting method
仪表报车辆网络故障 The IC displays vehicle network fault	仪表与网关之间的CAN线连接异常 The CAN bus connection between the IC and the gateway is abnormal.	用万用表测量仪表与网关之间CAN线的连接状态 Use a multimeter to measure the connection status of the CAN bus between the IC and the gateway
	网关与发动机之间的CAN线连接异常 The CAN bus connection between the gateway and the engine is abnormal	用万用表测量网关与发动机之间CAN线的连接状态 Use a multimeter to measure the connection status of the CAN bus between the gateway and the engine
	B_CAN终端电阻异常 Abnormal B_CAN terminal resistance	用万用表测量仪表CAN_H和CAN_L之间的电阻是否是60欧姆 Use a multimeter to measure whether the resistance between CAN_H and CAN_L is 60 ohms.

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6.5.3原因分析及排查方法
6.5.3 Cause analysis and troubleshooting
排查步骤1：仪表与网关之间的CAN线连接检查。
Step 1: Check the CAN bus connection between the IC and the gateway.
a.钥匙电源关闭；
a. The key power supply is turned off;
b.用万用表测量仪表与网关之间的CAN线是否开路，CAN_H和CAN_L之间是否短路；
b. Use a multimeter to measure whether the CAN bus between the IC and the gateway is open and whether there is a short circuit between CAN_H and CAN_L;
排查步骤2：网关与发动机之间的CAN线连接检查。
Step 2: Check the CAN bus connection between the gateway and the engine.
a.钥匙电源关闭；
a. The key power supply is turned off;
b.用万用表测量网关与发动机之间的CAN线是否开路，CAN_H和CAN_L之间是否短路；
b. Use a multimeter to measure whether the CAN bus between the gateway and the engine is open and whether there is a short circuit between CAN_H and CAN_L;
排查步骤3： B_CAN终端电阻检查。
Step 3: Check the terminal resistance of B_CAN.
a.钥匙电源关闭；
a. The key power supply is turned off;
b.用万用表测量仪表CAN_H和CAN_L之间的电阻是否是60欧姆；
b. Use a multimeter to measure whether the resistance between CAN_H and CAN_L is 60 ohms;
c.如以上都无问题更换仪表。
c. If there is no fault with the above, replace the IC.

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6.6 组合仪表接口定义
6.6 Definition of instrument cluster interfaces

蓝色：
Blue:

序号 S/N	名称 Description	信号属性 Signal attributes	信号描述 Signal description
B-1	仪表电源- IC power supply-	B+电源-输入 B+ power supply - input	GND
B-2	传感器地 Sensor grounding	传感器回路地 Sensor loop ground	GND
B-3	轴差速锁指示灯 Axle differential lock indicator lamp	数字量输入 Digital quantity input	低有效 Active-low
B-4	轮差速锁指示灯 Wheel differential lock indicator lamp	数字量输入 Digital quantity input	低有效 Active-low
B-5	仪表电源+ IC power supply+	15+电源输入 15+ power supply input	24V钥匙电源 24V key power supply
B-6	蓄电池电源+ Battery power supply+	B+电源输入 B+power supply input	24V常电 24V normal voltage
B-7	行车取力 Driving power takeoff	数字量输入 Digital quantity input	高有效 Active-high
B-8	停车取力 Parking power takoff	数字量输入 Digital quantity input	低有效 Active-low
B-9	ADR工作异常指示灯 ADR fault indicator lamp	数字量输入 Digital quantity input	硬线，低电平或悬空无效，脉冲信号有效 Hardwire, low level or hovering invalid, pulse signal valid
B-10	燃气泄漏传感器1报警信号 Gas leak sensor 1 alarm signal	数字量输入 Digital quantity input	硬线、低有效 Hardwire, active-low
B-11	燃气泄漏传感器2报警信号 Gas leak sensor 2 alarm signal	数字量输入 Digital quantity input	硬线、低有效 Hardwire, active-low
B-12	全轮驱动工作指示信号 All-wheel drive operation indicator signal	数字量输入 Digital quantity input	硬线，低有效 Hardwire, active-low
B-13	分动器低档位信号 Transfer case low gear signal	数字量输入 Digital quantity input	硬线、低有效 Hardwire, active-low
B-14	挂车ABS指示 Trailer ABS indication	数字量输入 Digital quantity input	硬线、低有效 Hardwire, active-low
B-15	蜂鸣器外部输入- Buzzer external input -	数字量输入 Digital quantity input	硬线、低有效 Hardwire, active-low
B-16	油量传感器信号（预留） Fuel volume sensor signal (reserved)	模拟量输入 Analog input	电阻信号 Resistance signal
B-17	CNG气量传感器信号 CNG gas volume sensor signal	模拟量输入 Analog input	电压信号 Voltage signal
B-18	气压1传感器信号 Air pressure 1 sensor signal	模拟量输入 Analog input	电压信号 Voltage signal
B-19	气压2传感器信号 Air pressure 2 sensor signal	模拟量输入 Analog input	电压信号 Voltage signal
B-20	车速传感器信号 Vehicle speed sensor signal	数字量输入 Digital quantity input	脉冲信号 Pulse signal
B-21	车速信号输出1 Vehicle speed signal output 1	脉冲信号输出 Pulse signal output	硬线，脉冲信号 Hardwire, pulse signal
B-22	车速信号输出2 Vehicle speed signal output 2	脉冲信号输出 Pulse signal output	硬线，脉冲信号 Hardwire, pulse signal
B-23	车速信号输出C3 Vehicle speed signal output C3	脉冲信号输出 Pulse signal output	硬线，脉冲信号 Hardwire, pulse signal
B-24	12V电源输出1 12V power output 1	模拟量输出 Analog output	12V电源输出/100mA 12V power output/100mA
B-25	5V电源输出 5V power output	模拟量输出 Analog output	5V电源输出/100mA 5V power output/100mA
B-26	12V电源输出2 12V power output 2	模拟量输出 Analog output	12V电源输出/2A 12V power output/2A
B-27			
B-28			
B-29	CAN1_m		
B-30	CAN1_H	ICAN_H	CAN+
B-31	CAN1_L	ICAN_L	CAN-
B-32	喷淋壶液位低报警 Washer fluid reservoir level low	数字量输入 Digital quantity input	硬线、低有效 Hardwire, active-low

绿色：
Green:

序号 S/N	名称 Description	信号属性 Signal attributes	信号描述 Signal description
G-1	安全带 Seat belt	数字量输入 Digital quantity input	硬线、低有效 Hardwire, active-low
G-2	驾驶室翻转 Cab tilting	数字量输入 Digital quantity input	硬线、低有效 Hardwire, active-low
G-3	车厢举升 Cab tilt	数字量输入 Digital quantity input	硬线、低有效 Hardwire, active-low
G-4	副驾驶安全带（预留） Co-driver seat belt (reserved)	数字量输入 Digital quantity input	硬线、低有效 Hardwire, active-low
G-5	冷却液位低 Coolant level low	数字量输入 Digital quantity input	硬线、低有效 Hardwire, active-low
G-6	空滤器堵塞 Blockage of air filter	数字量输入 Digital quantity input	硬线、低有效 Hardwire, active-low
G-7	变速器低档指示 Transmission low gear indicator	数字量输入 Digital quantity input	硬线、低有效 Hardwire, active-low
G-8	电池充电 Battery charging	数字量输入 Digital quantity input	硬线、低有效 Hardwire, active-low
G-9	驱动桥1机油温度传感器信号 Drive axle 1 oil temperature sensor signal	模拟量输入 Analog input	硬线、电阻信号 Hardwire, resistance signal
G-10	驱动桥1机油液位传感器信号 Drive axle 1 oil level sensor signal	模拟量输入 Analog input	硬线、电压信号 Hardwire, voltage signal
G-11	驱动桥2机油温度传感器信号 Drive axle 2 oil temperature sensor signal	模拟量输入 Analog input	硬线、电阻信号 Hardwire, resistance signal
G-12	驱动桥2机油液位传感器信号 Drive axle 2 oil level sensor signal	模拟量输入 Analog input	硬线、电压信号 Hardwire, voltage signal
G-13	转向机油温度传感器信号 Steering oil temperature sensor signal	模拟量输入 Analog input	硬线、电阻信号 Hardwire, resistance signal
G-14	转向机油液位报警器信号 Steering oil level alarm signal	数字量输入 Digital quantity input	硬线、低有效 Hardwire, active-low
G-15	盘式制动器磨损报警 Disc brake wear alarm	数字量输入 Digital quantity input	硬线、高或悬空有效，低无效 Hardwire, active-high or hovering valid, active-low
G-16	发动机机油温度传感器信号 Engine oil temperature sensor signal	模拟量输入 Analog input	硬线、电阻信号 Hardwire, resistance signal
G-17	发动机机油液位传感器信号 Engine oil level sensor signal	模拟量输入 Analog input	硬线、电压信号 Hardwire, voltage signal
G-18	CAN2_m		
G-19	CAN2_H	ICAN_H	CAN+
G-20	CAN2_L	ICAN_L	CAN-
G-21			
G-22	预留1 Reserve 1	数字量输出 Digital output	硬线、低有效、无效为悬空 Hardwire, active-low, hovering invalid
G-23	主车驻车气室气压 Tractor parking air reservoir pressure	模拟量输入 Analog input	电压信号 Voltage signal
G-24	挂车控制气室气压 Trailer control air reservoir pressure	模拟量输入 Analog input	电压信号 Voltage signal
G-25	前轮轮间差速锁指示灯 Front wheel differential lock indicator lamp	数字量输入 Digital quantity input	硬线、低有效 Hardwire, active-low
G-26	作业 Work	数字量输入 Digital quantity input	硬线、高有效 Hardwire, active-high
G-27	分动器高档指示 Transfer case high gear indicator	数字量输入 Digital quantity input	硬线、低有效 Hardwire, active-low
G-28	燃油切换开关 Fuel switch	数字量输入 Digital quantity input	硬线、低有效 Hardwire, active-low
G-29	自动驻车回路气压 Auto parking circuit air pressure	模拟量输入 Analog input	电压信号 Voltage signal
G-30	预留3 Reserve 3	数字量输入 Digital quantity input	硬线、低有效 Hardwire, active-low
G-31	预留4 Reserve 4	数字量输出 Digital output	硬线、低有效、无效为悬空 Hardwire, active-low, hovering invalid
G-32			

The End

Thanks! !