



# GLORY NEW 580 TRAINING

--ESC (Electronic Stability Control System)



# Contents

01

BDC System

02

Hands-free Tailgate System



# Contents

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**BDC System**

02

Hands-free Tailgate System



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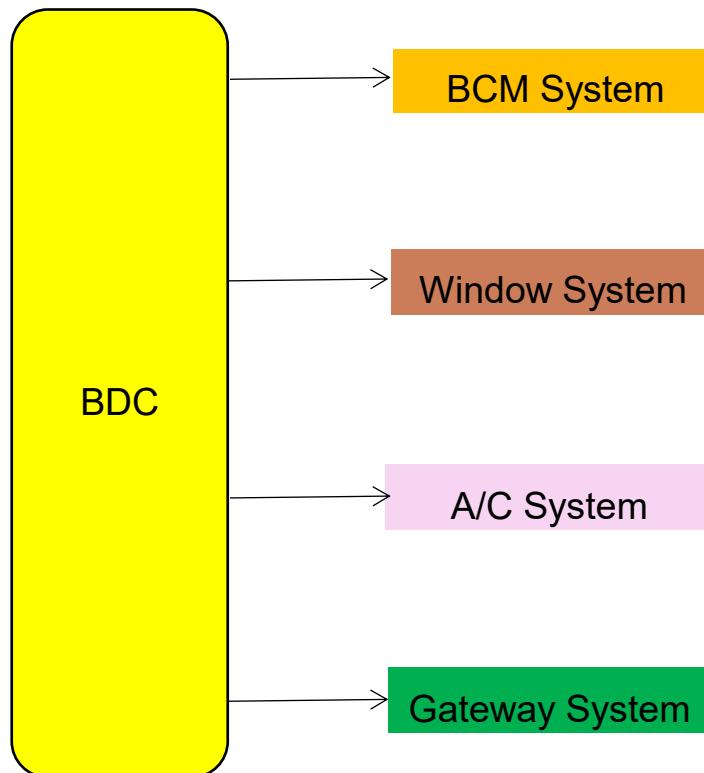
# Course Objectives

- **Describe the features of the BDC function of Glory New 580**
- **Master the composition of the BDC system of Glory New 580**

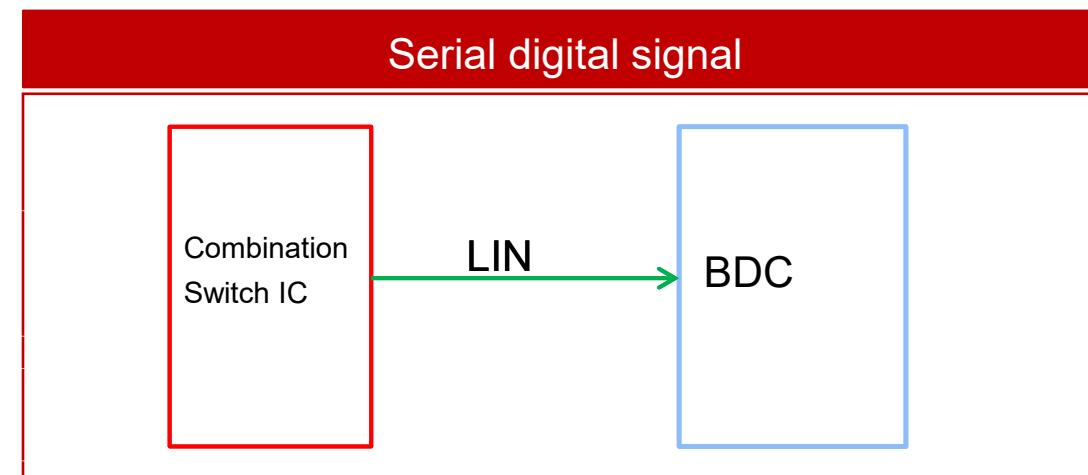
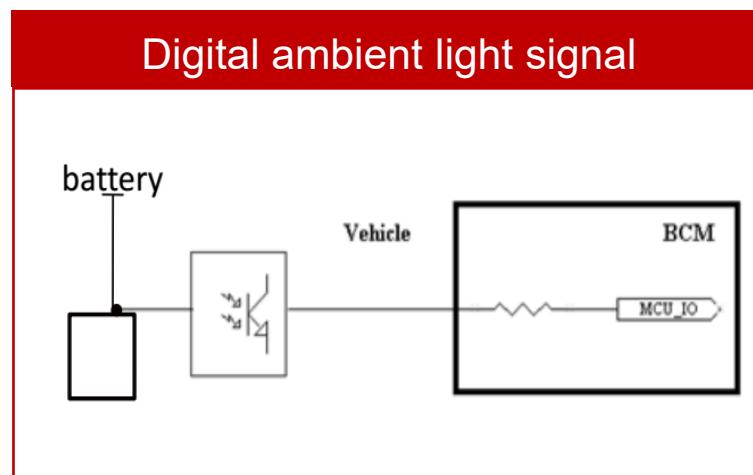
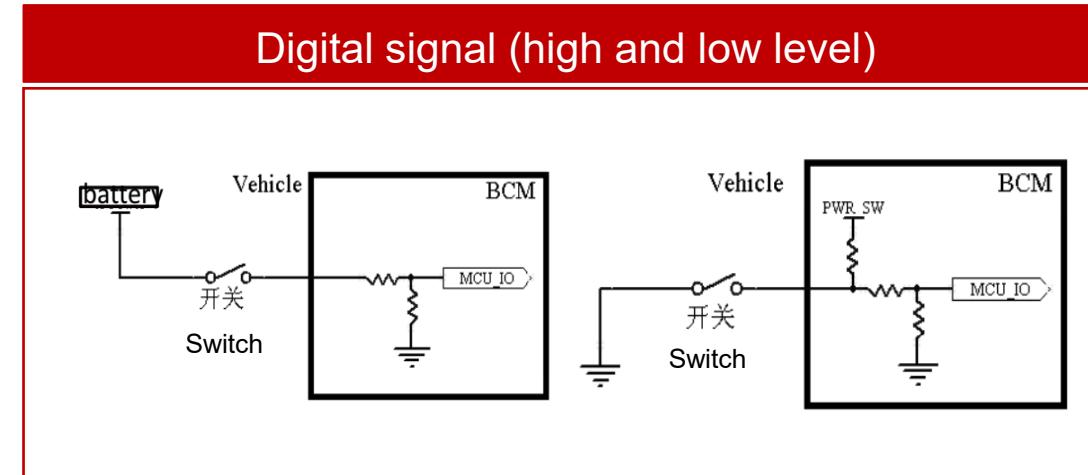
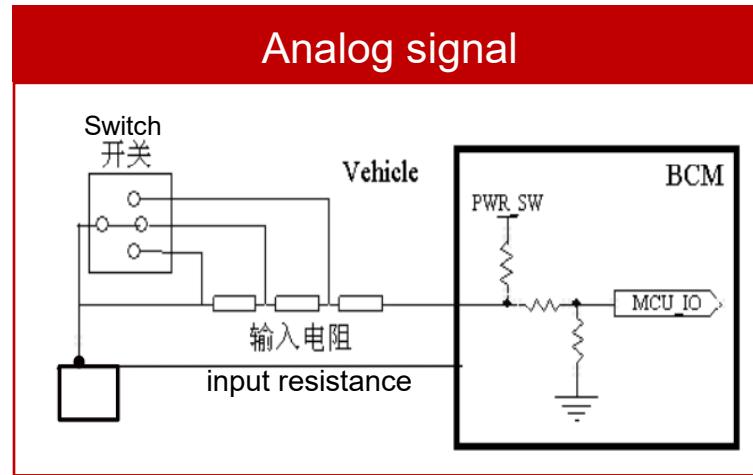
## 1. BDC Overview

Compared with the old 580, the BDC system of Glory New 580 includes BCM system functions, window system functions, A/C system functions and gateway system functions.

## 2. BDC System Functional Topology :



## 3、Main Signal Type Received by BDC



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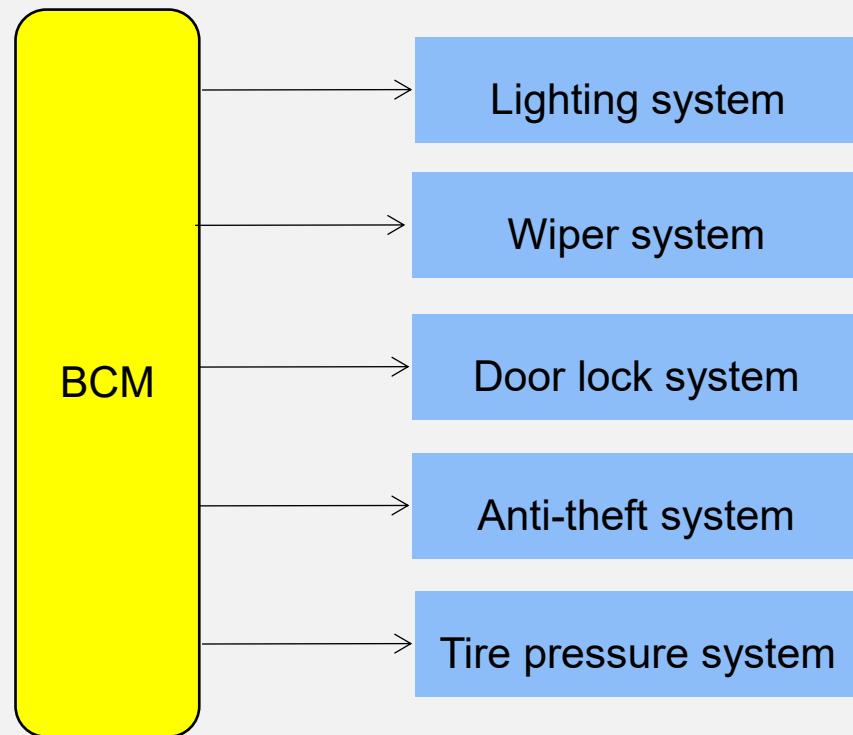


## Course Objectives

- **Describe the composition of the BCM system of Glory new 580**
- **Master the working process of the lighting system of Glory new 580**
- **Master the working process of the windshield wiper system of Glory New 580**

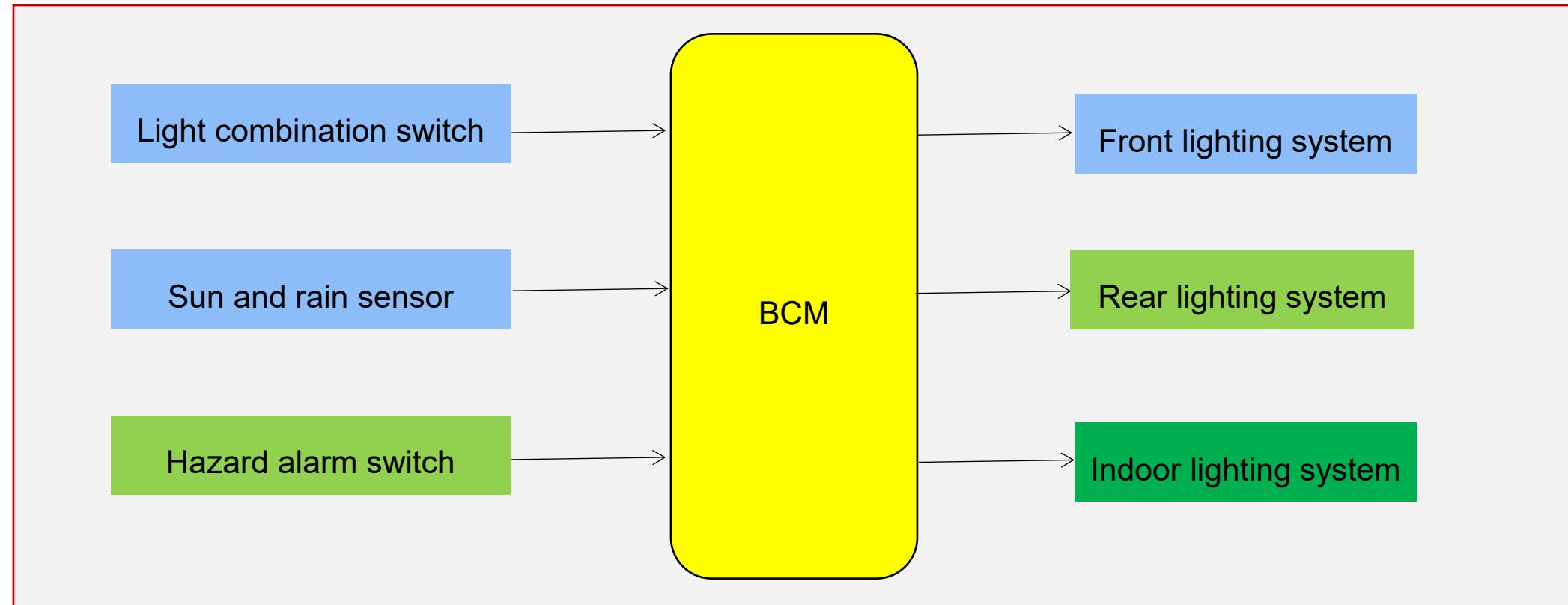
## I . BCM system function

The functions of the BCM system are the same as those of the old 580. The topology diagram is as follows:



## II . Lighting system structure and function

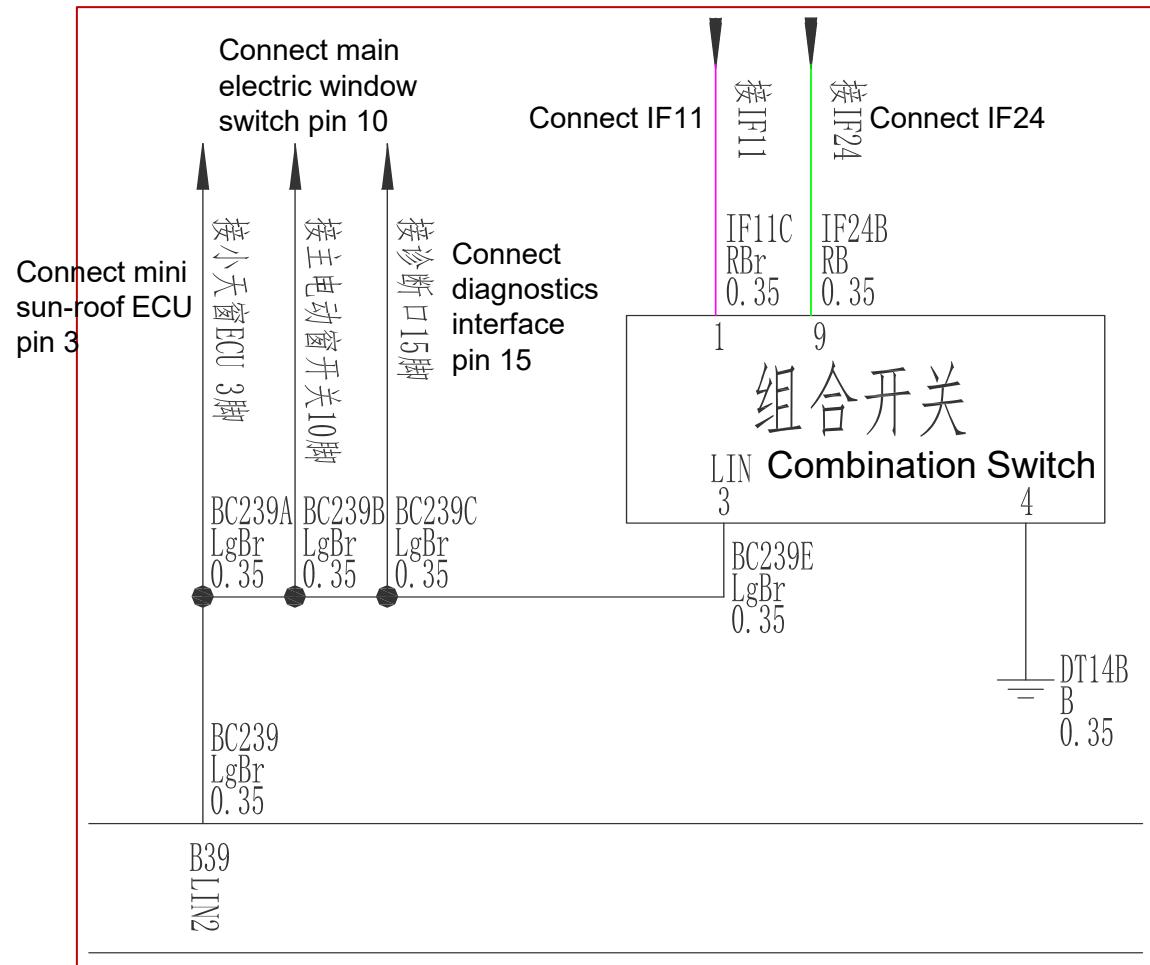
The function of the lighting system is divided into lighting part, warning part and switch control part. The lighting part is divided into external lighting (high and low beams, reversing lights, license plate lights), internal lighting (front and rear reading lights, vanity mirror lights, trunk lights); front warning (daytime running lights, small lights, turn signals , hazard warning lights), rear warning (small lights, fog lights, brake lights, turn signals, hazard warning lights).



### 1. Light switch structure and function operation



### 2. Light switch circuit diagram

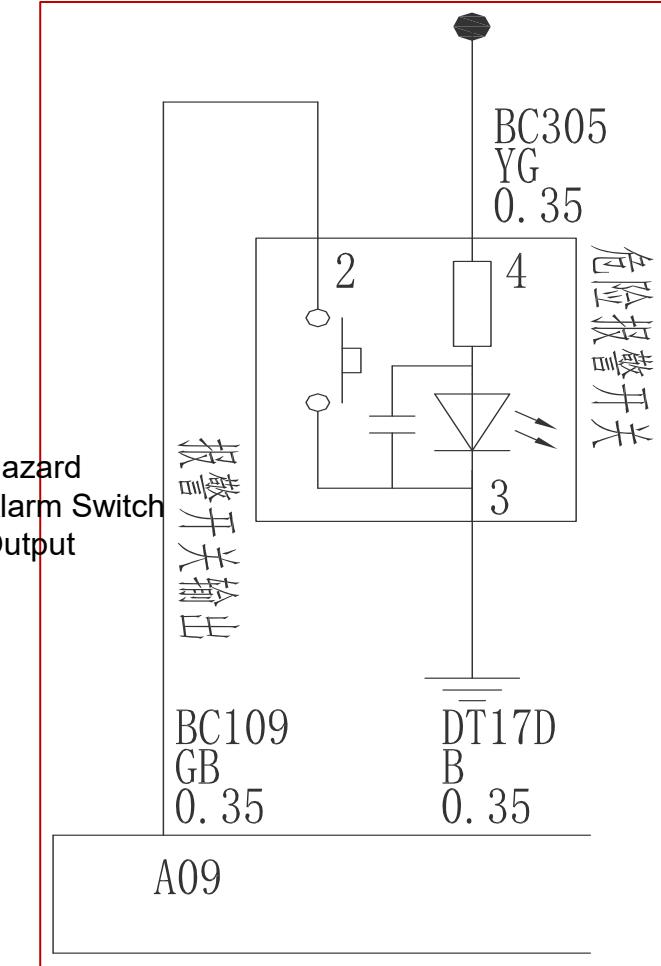


Combination switch connector



Sun and rain sensor

### 3. Hazard alarm switch

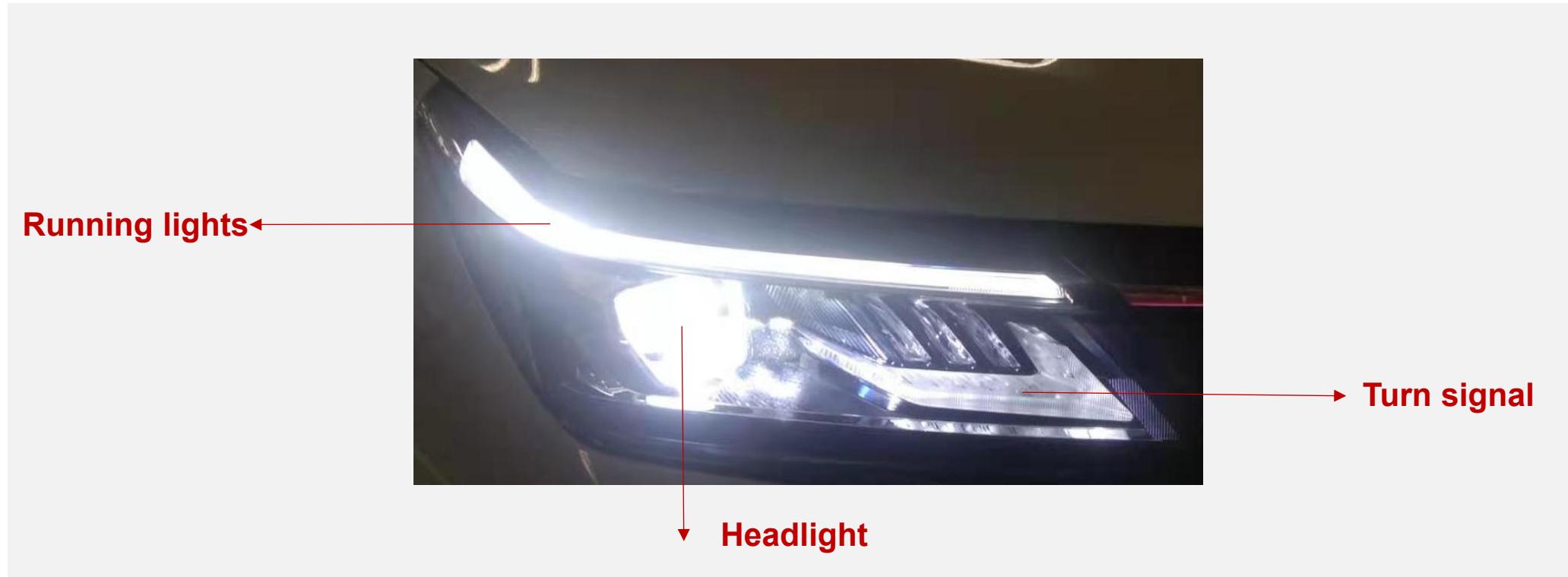


#### 4. Front lighting system

The front lighting system consists of two parts: lighting and warning

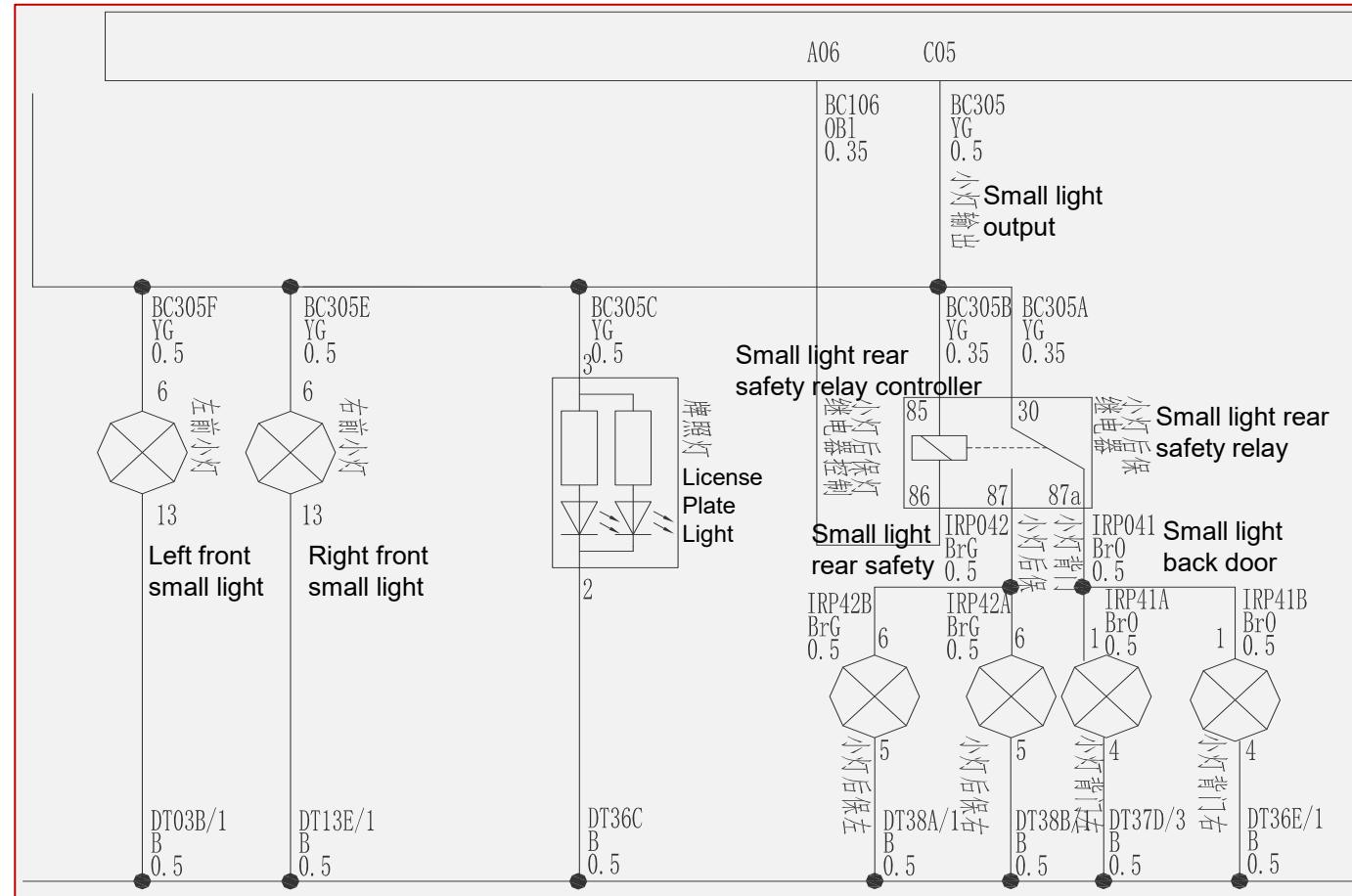
Lighting: headlights (high beam + low beam)

Warning: turn signals and running lights (small lights + daytime running lights)



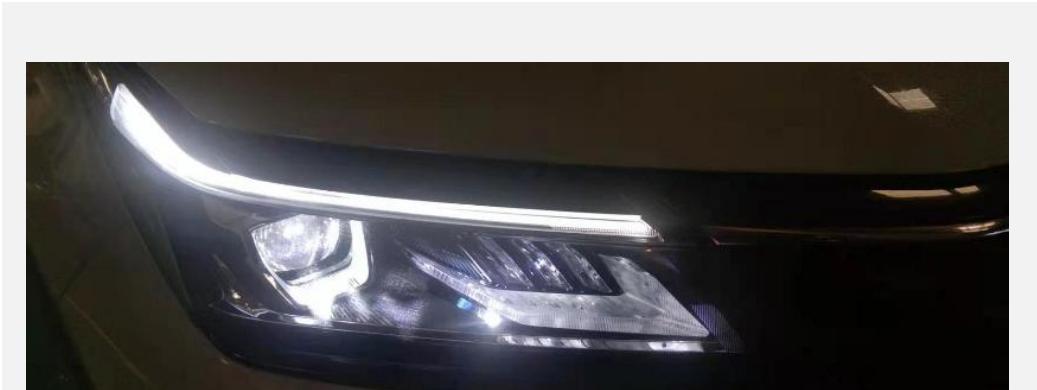
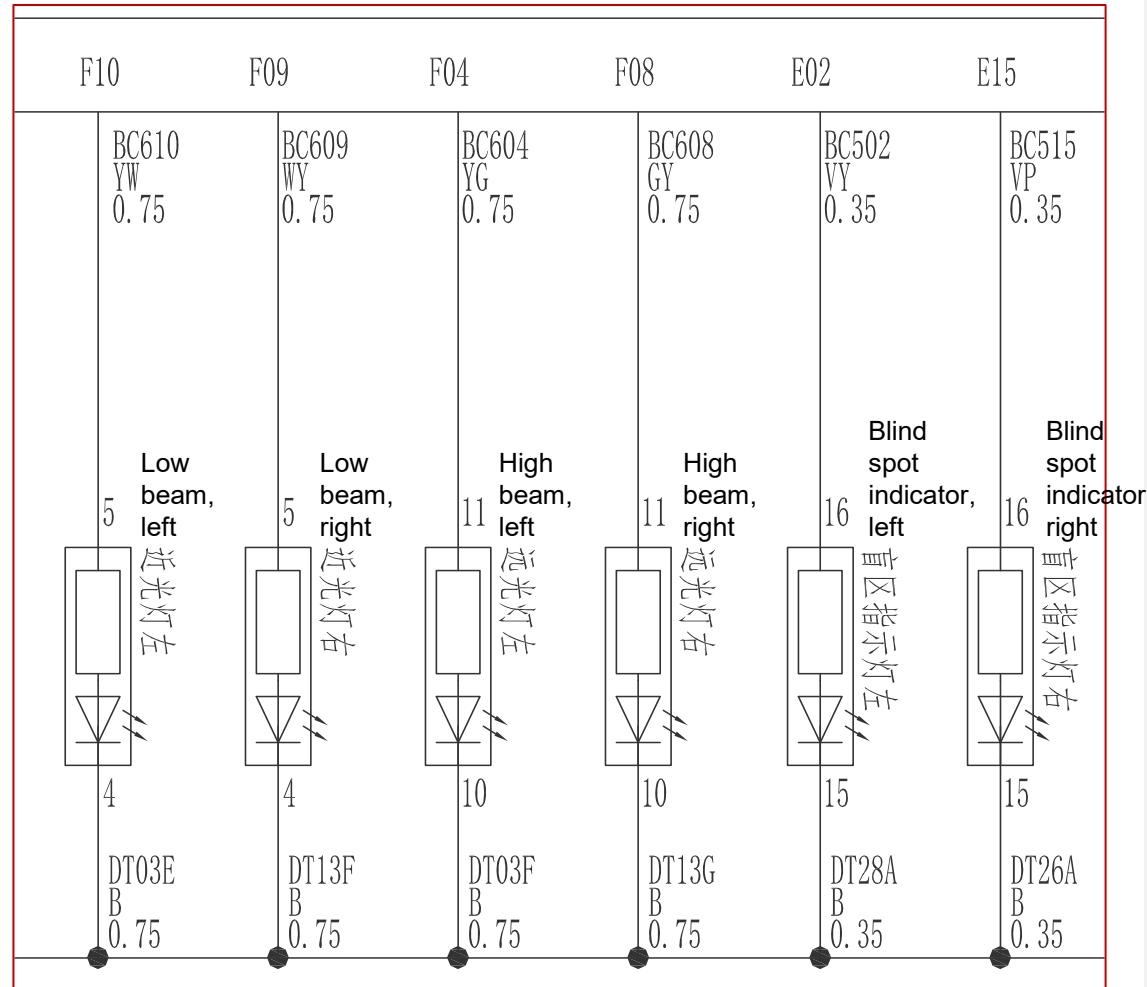
## 5. Front lighting system circuit diagram

## 5-1 Small light circuit



Small light

## 5-2 High and low beam circuit diagram

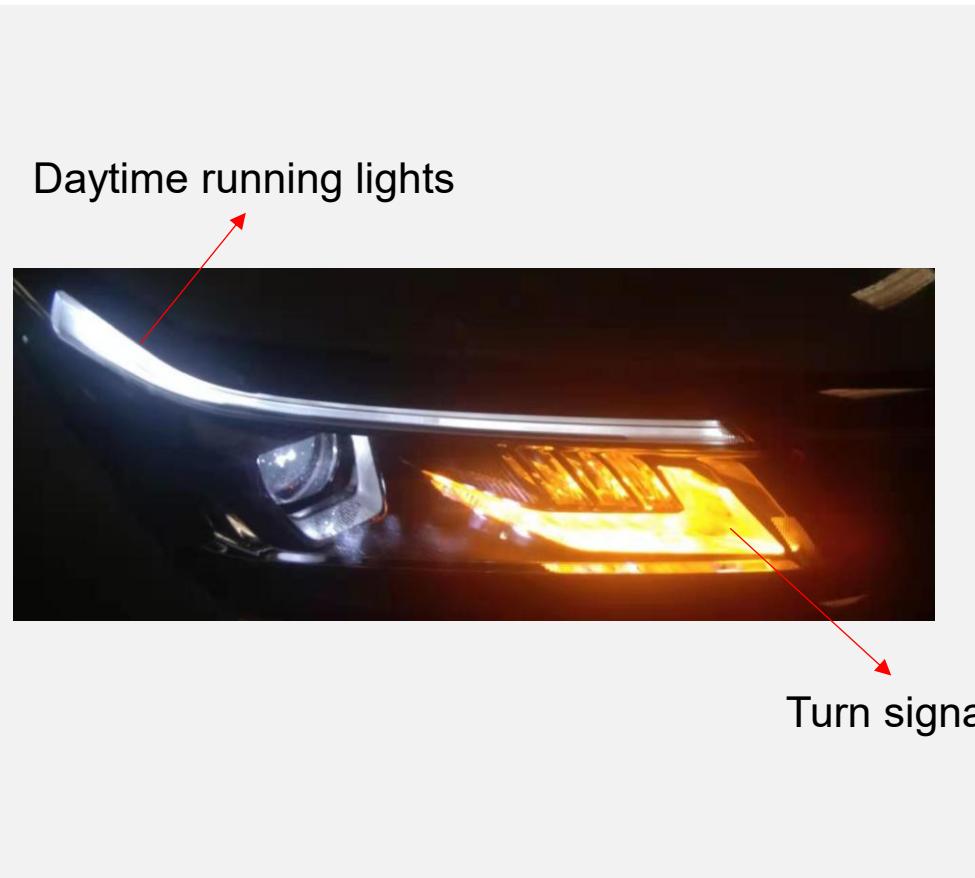
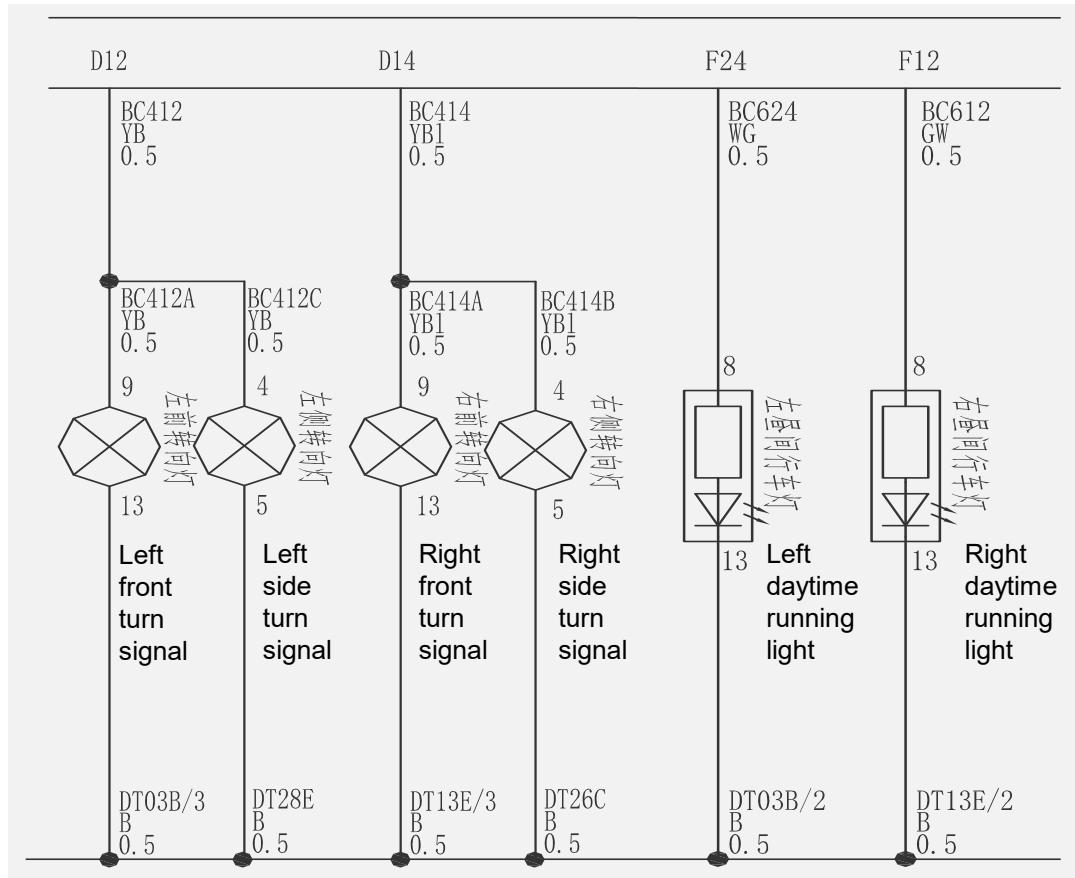


Low beam

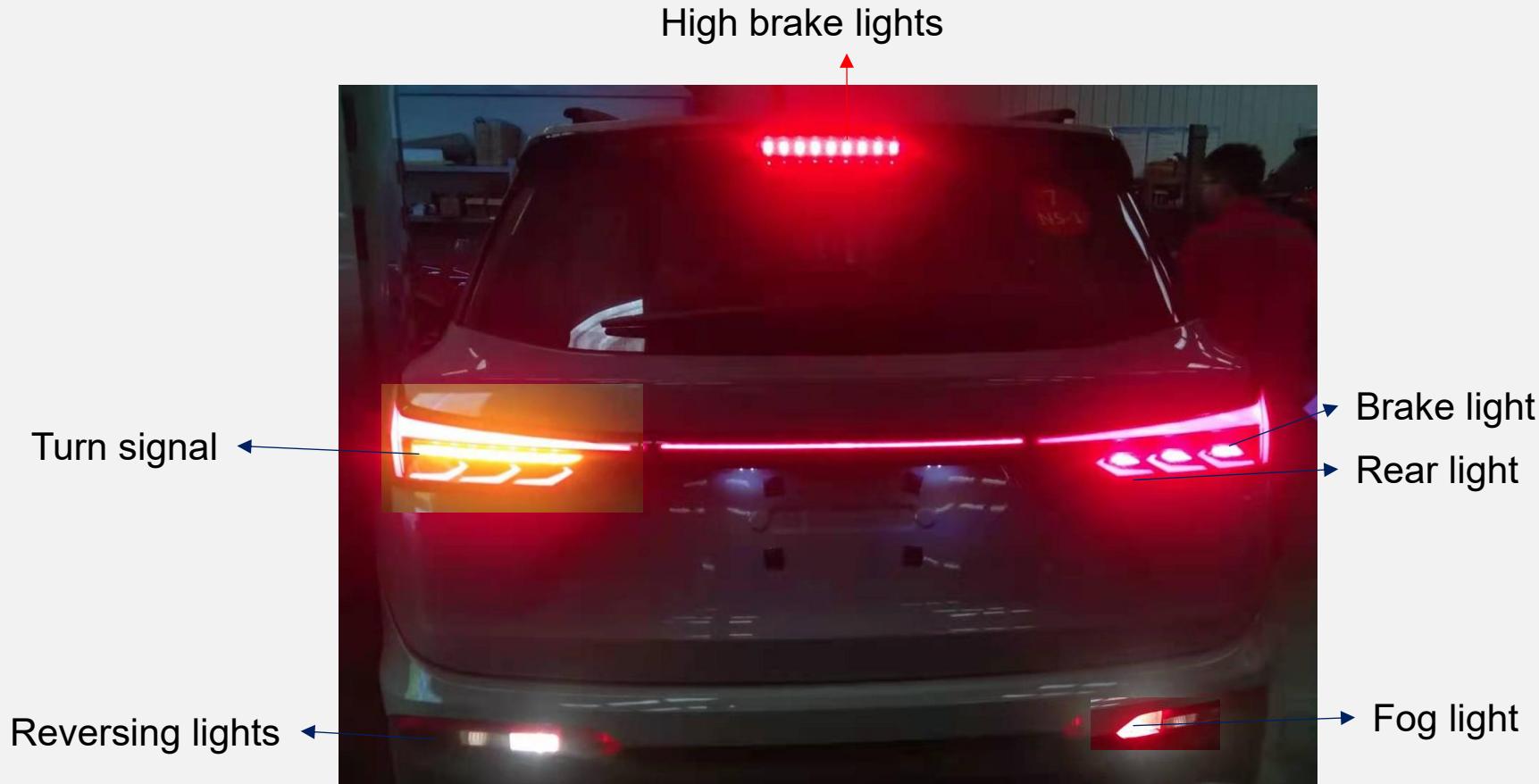


High beam

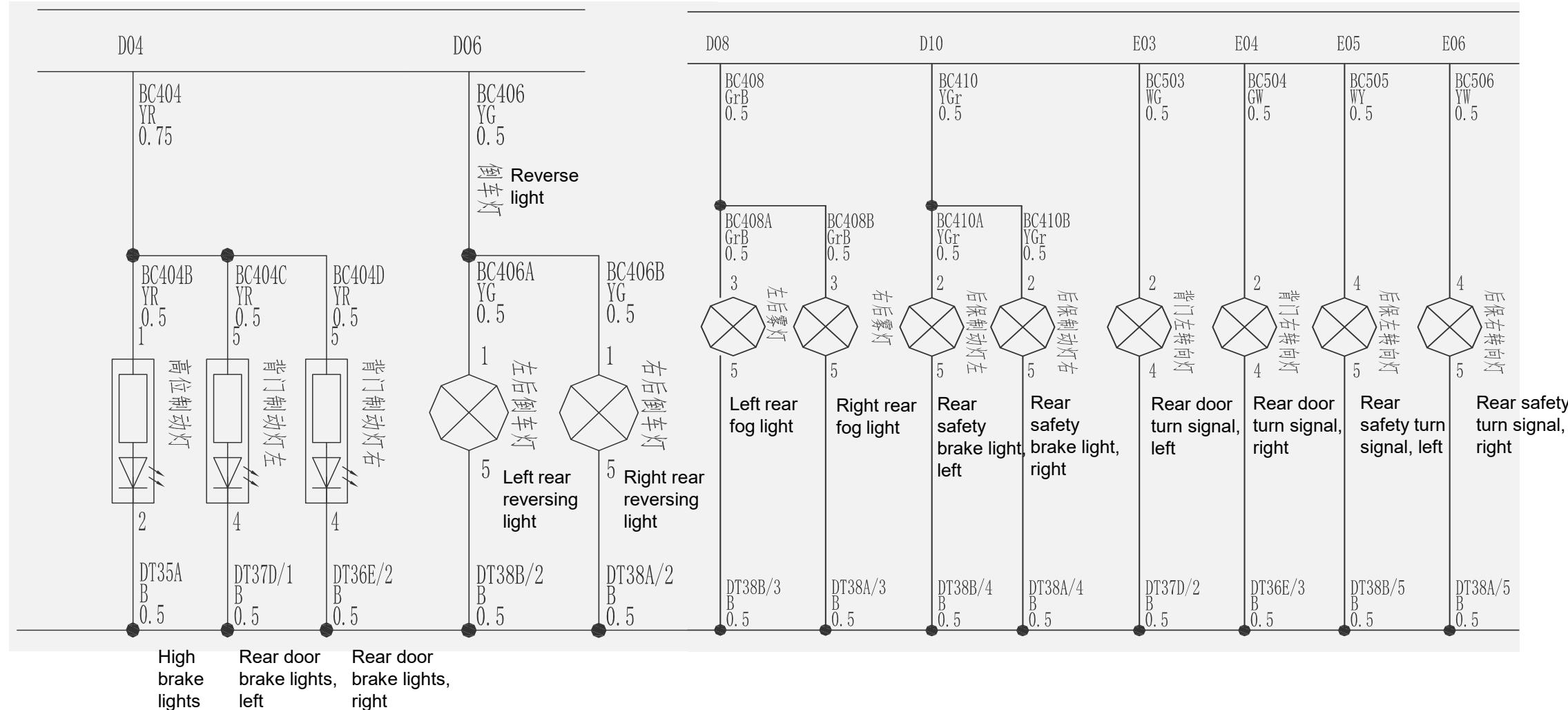
## 5-3 Turn signal circuit diagram



#### 6. Rear lighting system



## 7. Rear lighting system circuit diagram



#### 8. Indoor lighting system



Front reading light



Vanity mirror light

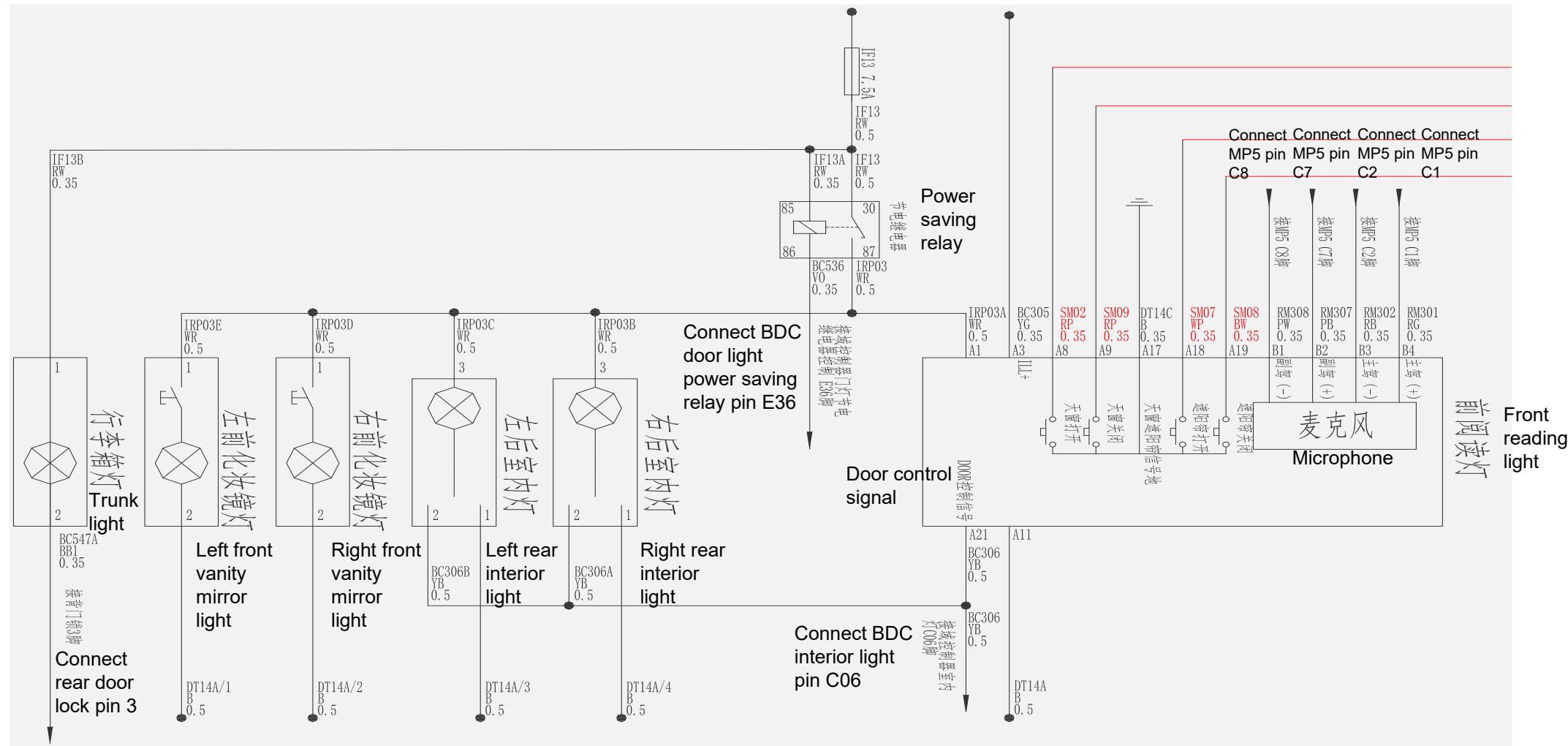


Rear reading light



Trunk light

## 9. Indoor lighting system circuit diagram

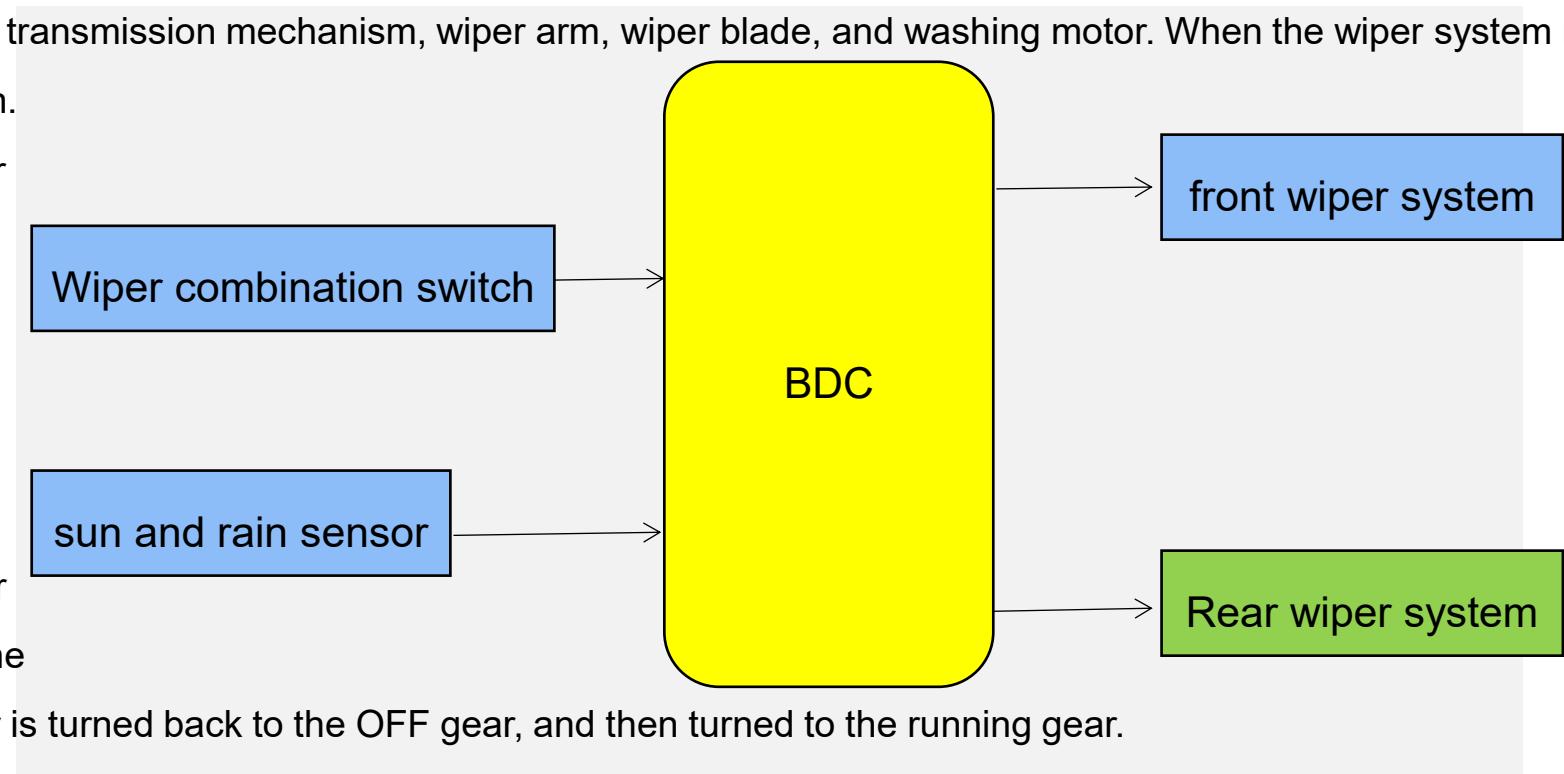


## III. Wiper system

## 1. Wiper system structure and function

The function of the wiper system is divided into front wiper and washing, rear wiper and washing, sunlight and rain sensor and combination switch control part. The front wiper system includes wiper motor, wiper transmission mechanism, wiper arm, wiper blade, and washing motor; the rear wiper system includes rear wiper motor, wiper transmission mechanism, wiper arm, wiper blade, and washing motor. When the wiper system is working, there is a blocking protection function.

When the front/rear wiper is running, the wiper homing signal remains invalid for 8 seconds and does not change or the wiper homing signal remains valid for 3 seconds and does not change, it is deemed that the wiper is blocked. Then, the BCM will turn off the wiper output. It will be turned on until the power gear is switched from the OFF to the ON gear, or the



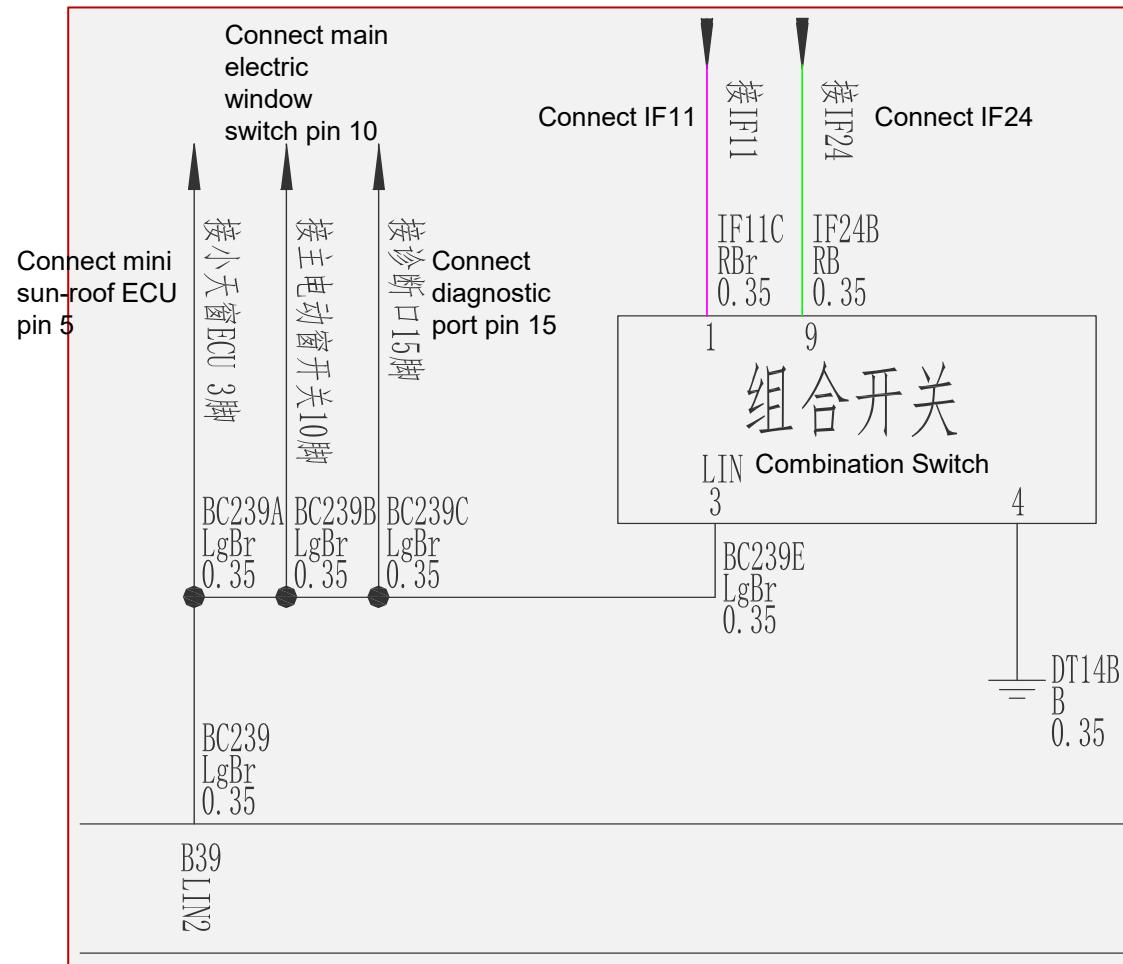
vehicle power gear is ON, the front wiper gear is turned back to the OFF gear, and then turned to the running gear.

Maintenance gear: The power is in the ACC gear, the wiper switch is turned to the jog gear, and the wiper is moved to the maintenance position.

## 2. Wiper switch structure and function operation



## 3. Wiper switch circuit diagram



Sun and rain sensor

#### 4. Wiper transmission mechanism and function

##### **Wiper motor:**

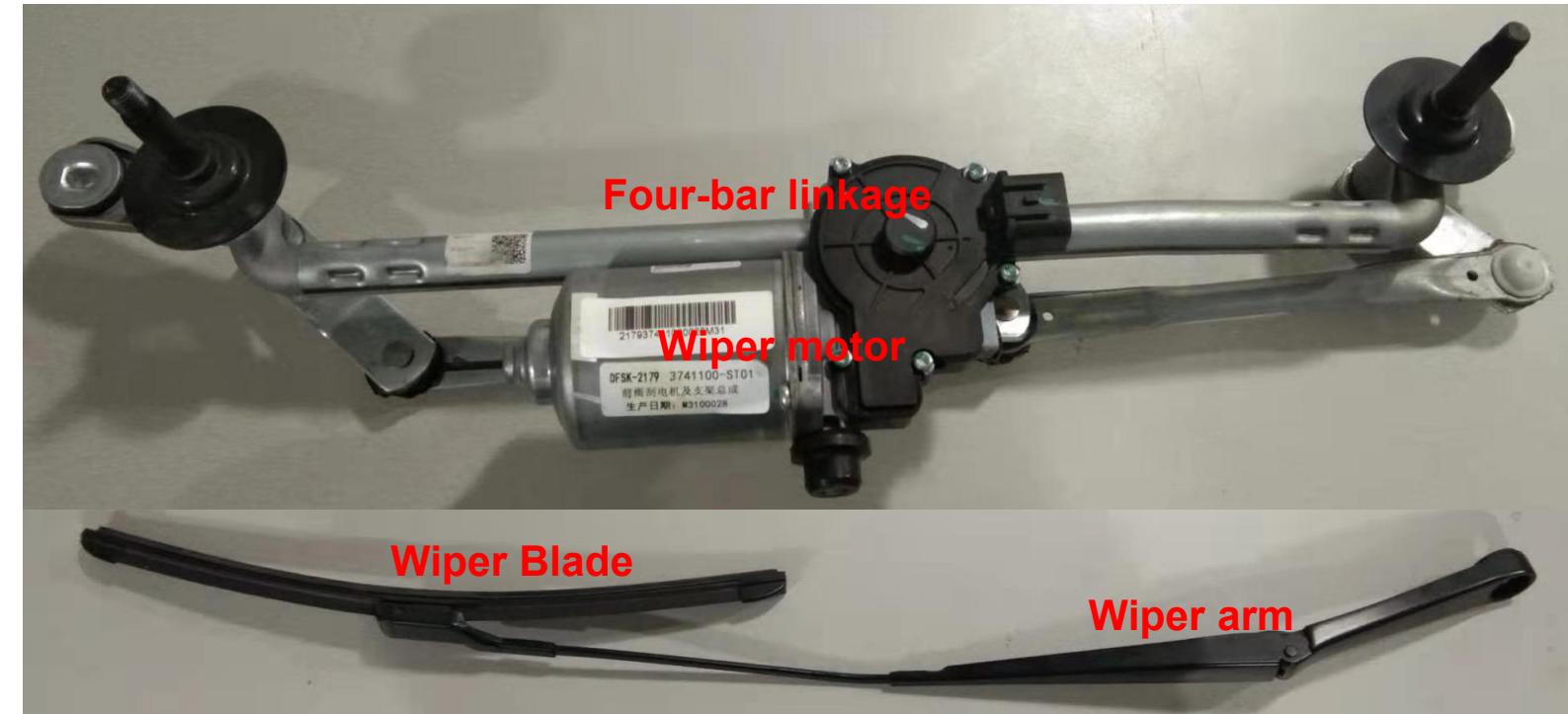
Convert electrical energy into mechanical kinetic energy.

##### **Transmission mechanism:**

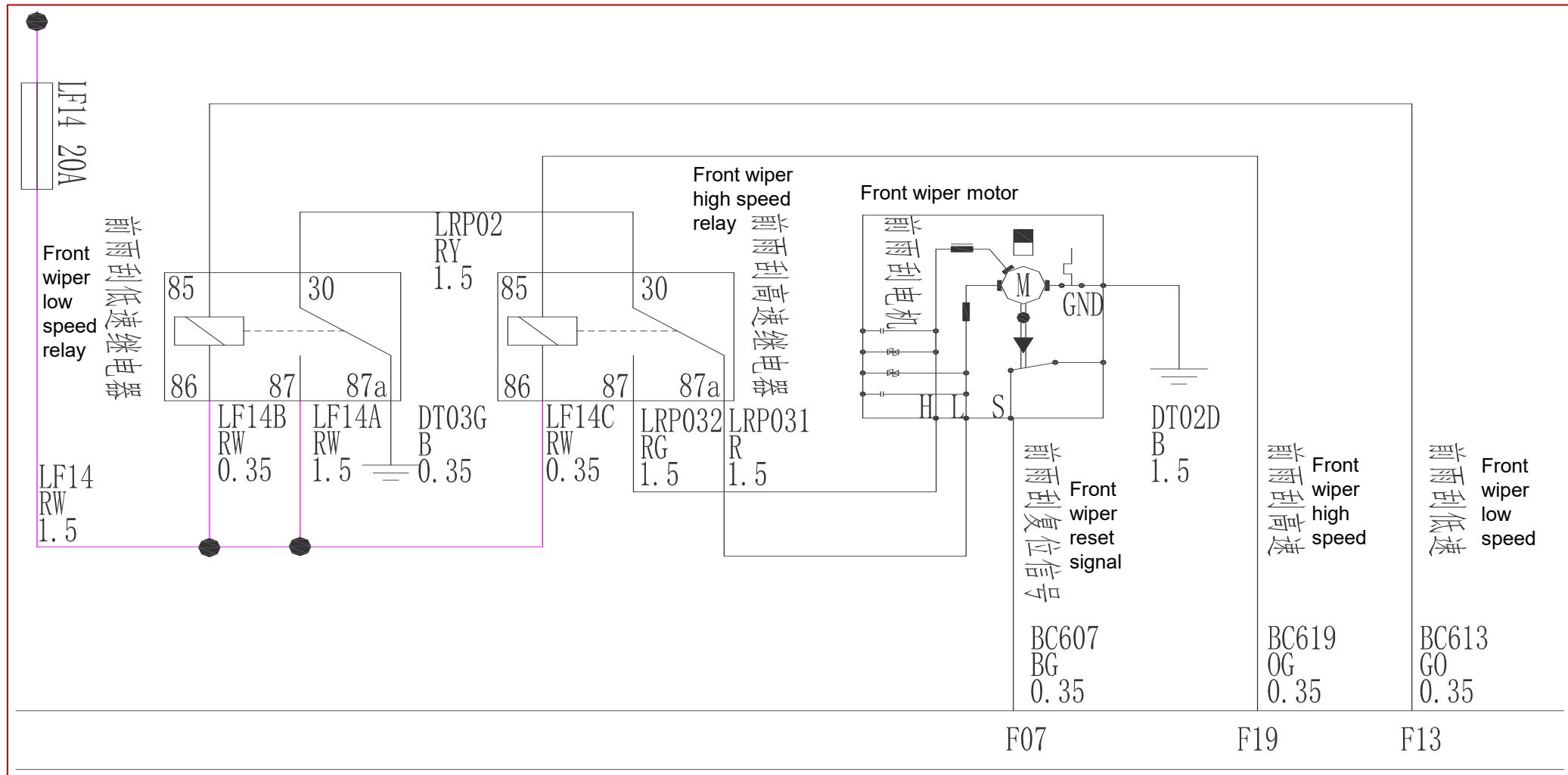
The rotary motion is converted into reciprocating motion by using the working principle of the four-bar linkage mechanism.

##### **Wiper Blades:**

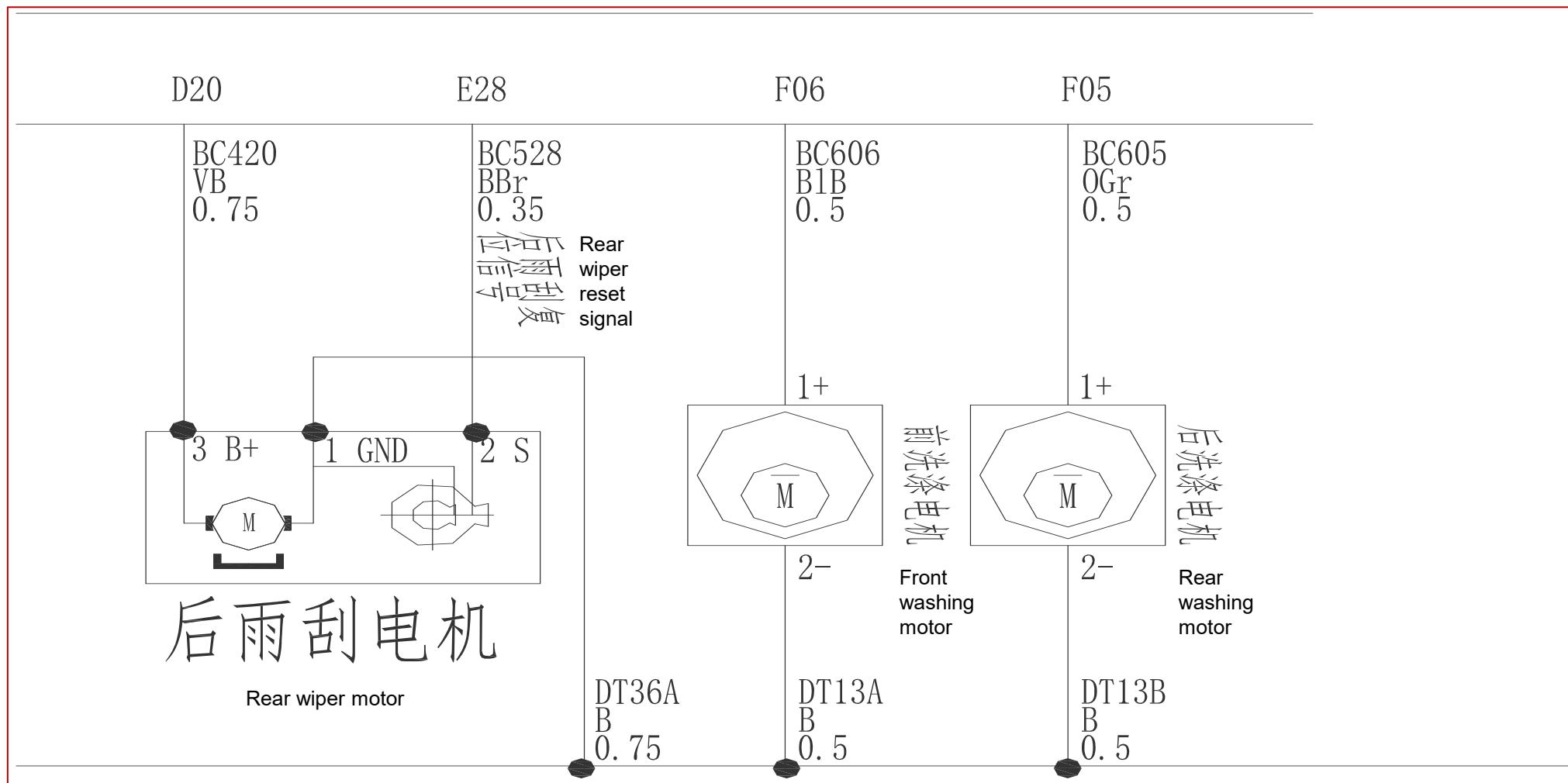
Wipe the windshield.



## 5. Front wiper circuit diagram



## 6. Rear wiper circuit diagram

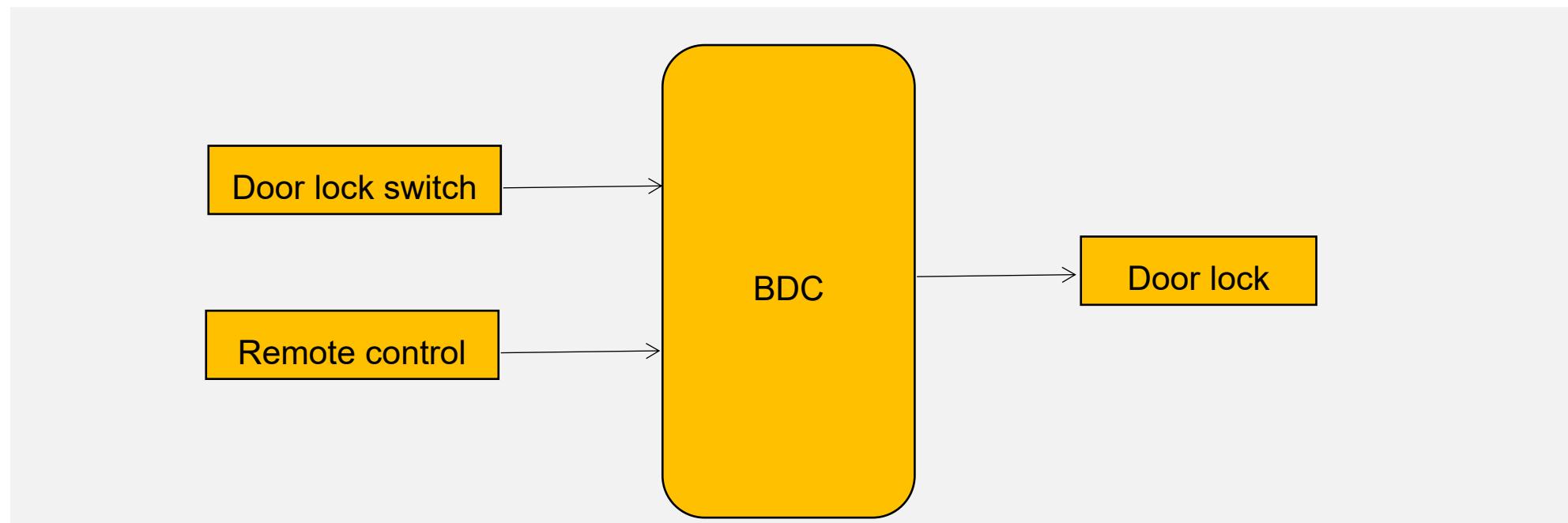


## IV. Door lock system

### 1. Door lock system function and structure

The main function of the door lock system is to control the door locking and unlocking. The door lock control system has a thermal protection function. When the door lock is unlocked for 10 consecutive times within 10s, the BDC enters the lock motor thermal protection state. After that, the door lock will become invalid, and it will not respond to any unlocking action (except collision unlocking) within the following 30s. After the 30s timer expires, the door lock will return to normal.

Door lock system structure:

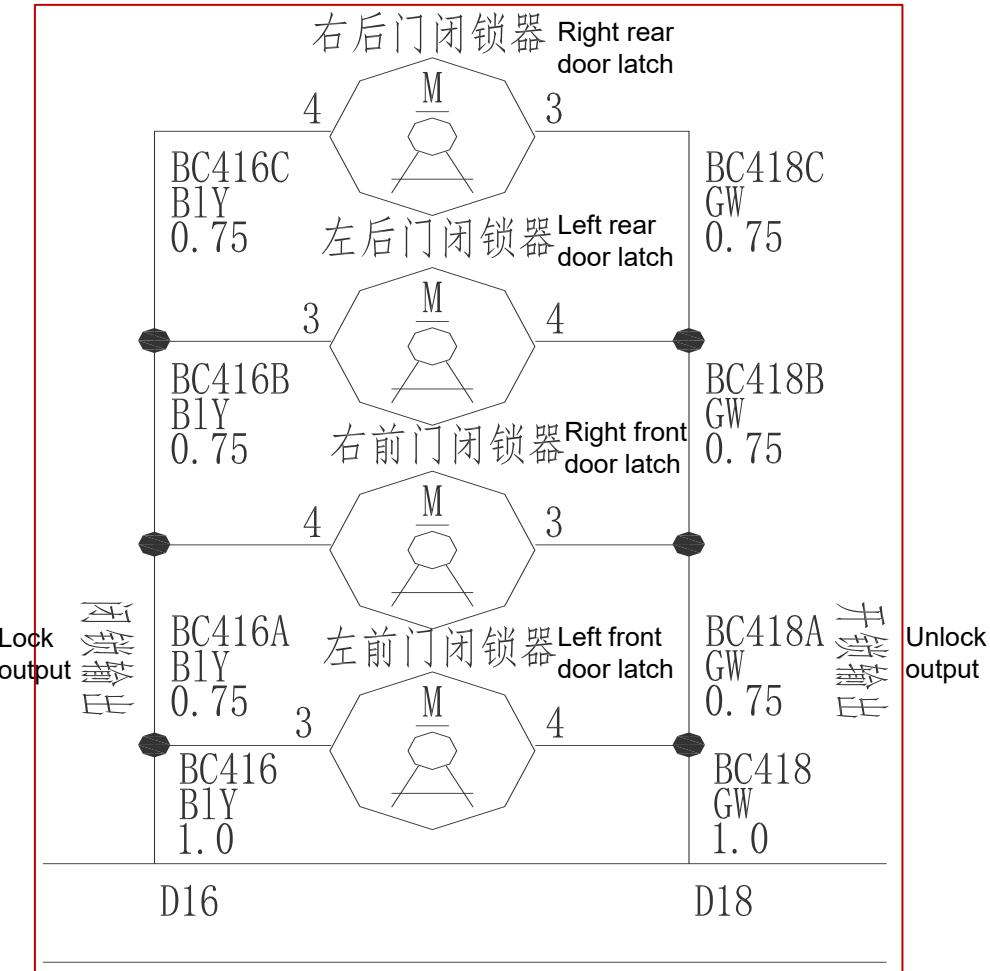
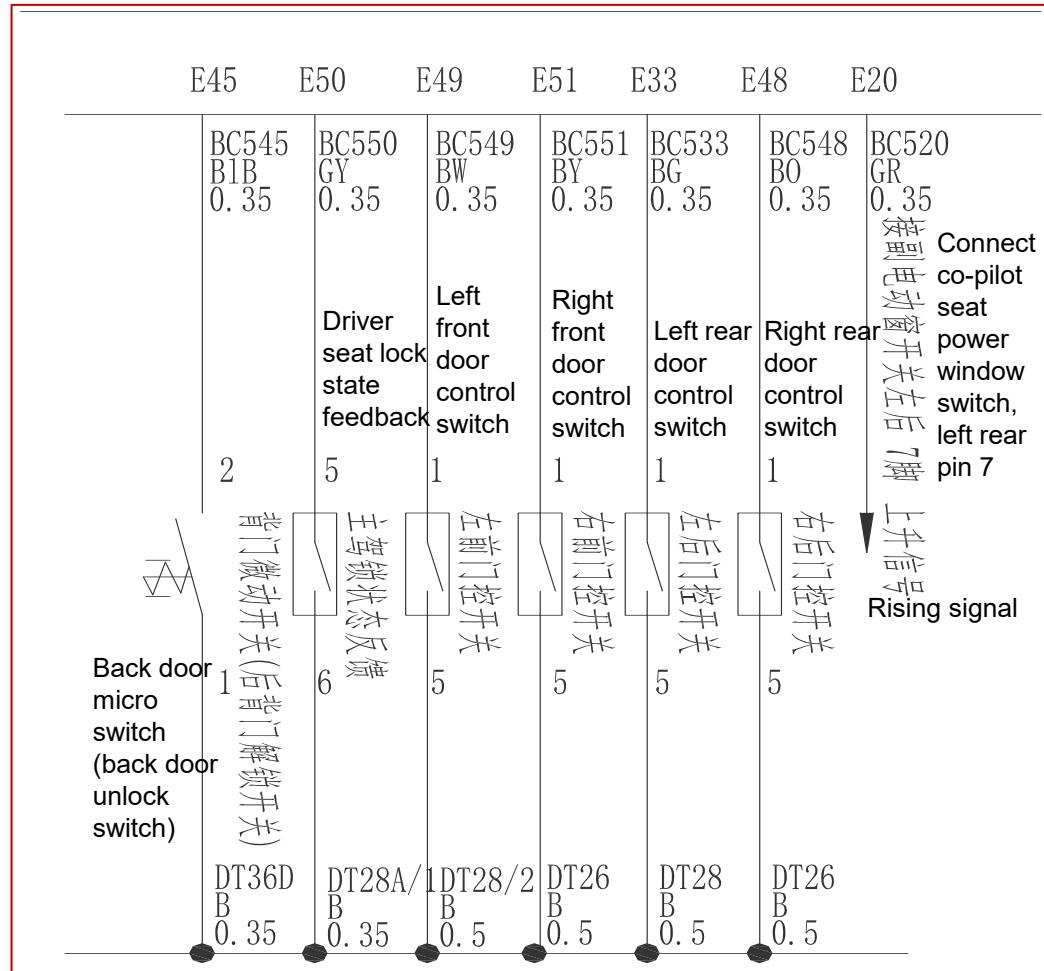


## 2. Door lock control switch

The function of the door lock control switch is to transfer human's open and close signal to the BDC, and the BDC controls the door lock motor to work.



## 3. Door lock control system circuit diagram



**V. Anti-theft system****1. Anti-theft system structure and function**

Anti-theft system functions are mainly divided into two categories:

Body anti-theft: use the remote control to open and close the door remotely;

Engine anti-theft: Use remote control to power-on vehicle and release the engine anti-theft, so that the engine computer can control the engine operation.

Anti-theft system composition: remote control, antenna, BDC;

Remote control function: car search

▷ Key form 1: Short press the car search button to turn on the car search function;

▷ Key form 2: Press the lock button twice to turn on the car search function.

Unlock

▷ Press the unlock button to unlock the front and rear doors, the lights will flash when unlocking.

Lock

▷ Close all doors, press the lock button, and the entire vehicle doors are locked.

Electric back door

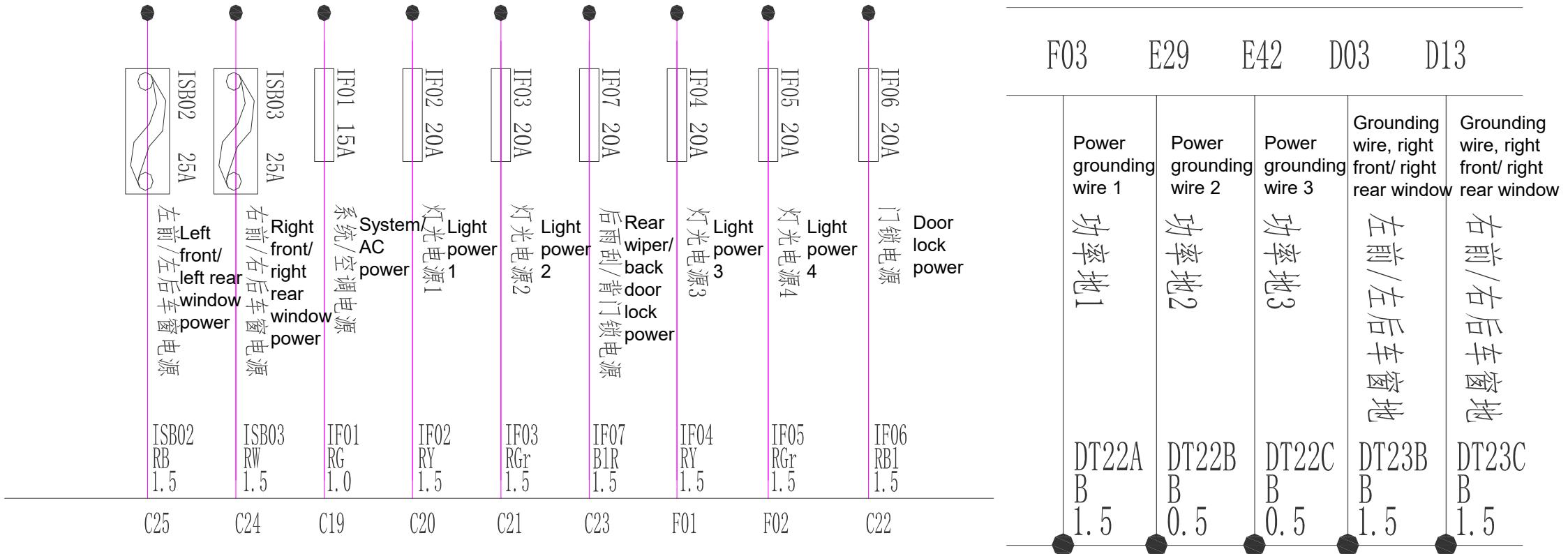
▷ If the vehicle is equipped with a electric back door, press the door button on the remote key back twice to open (when the back door is fully closed) or close (when the back door is open) the door;

▷ A short press of the back door button on remote control key stops the back door movement during the opening/closing process.

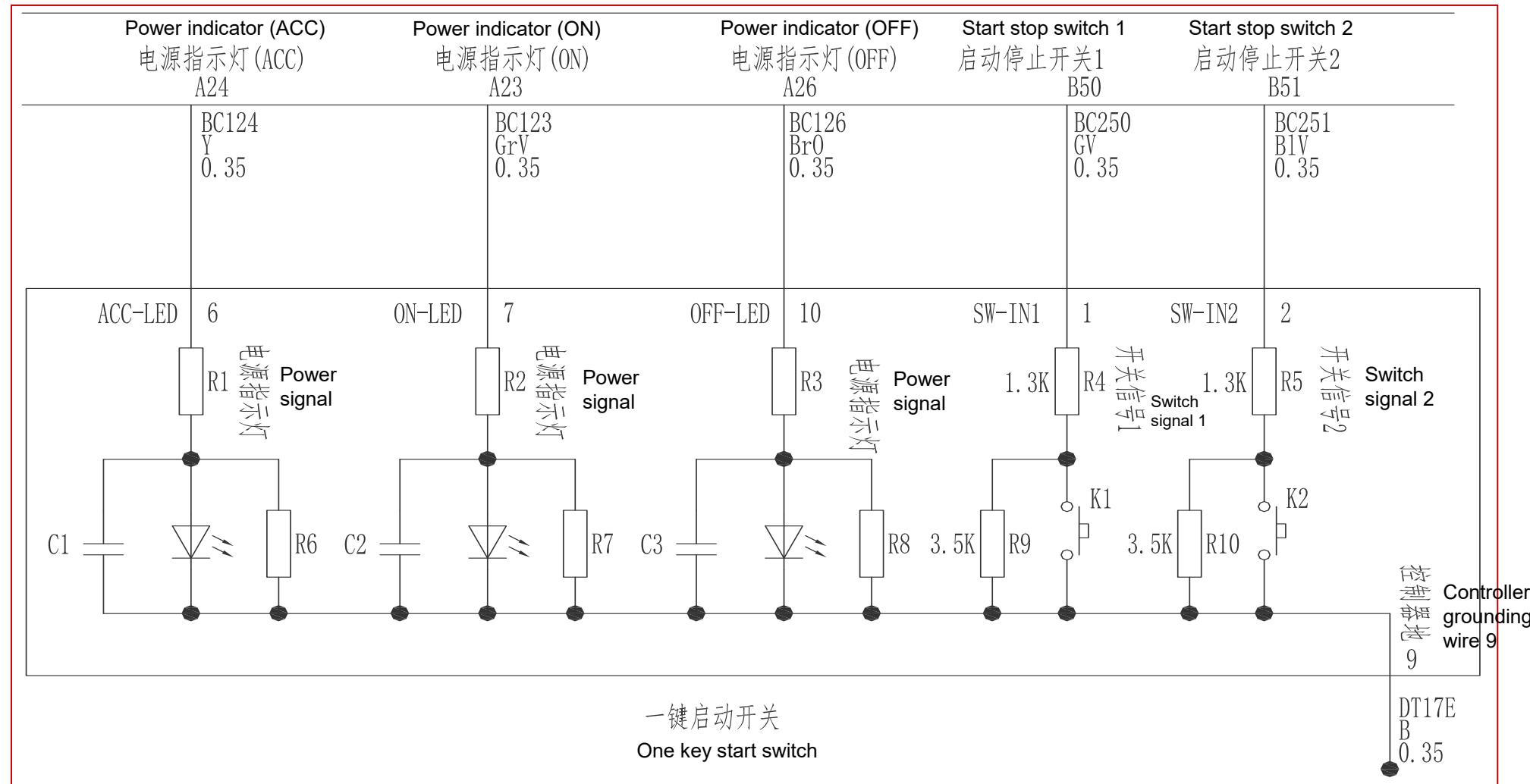


## 2. Power system power-on process circuit

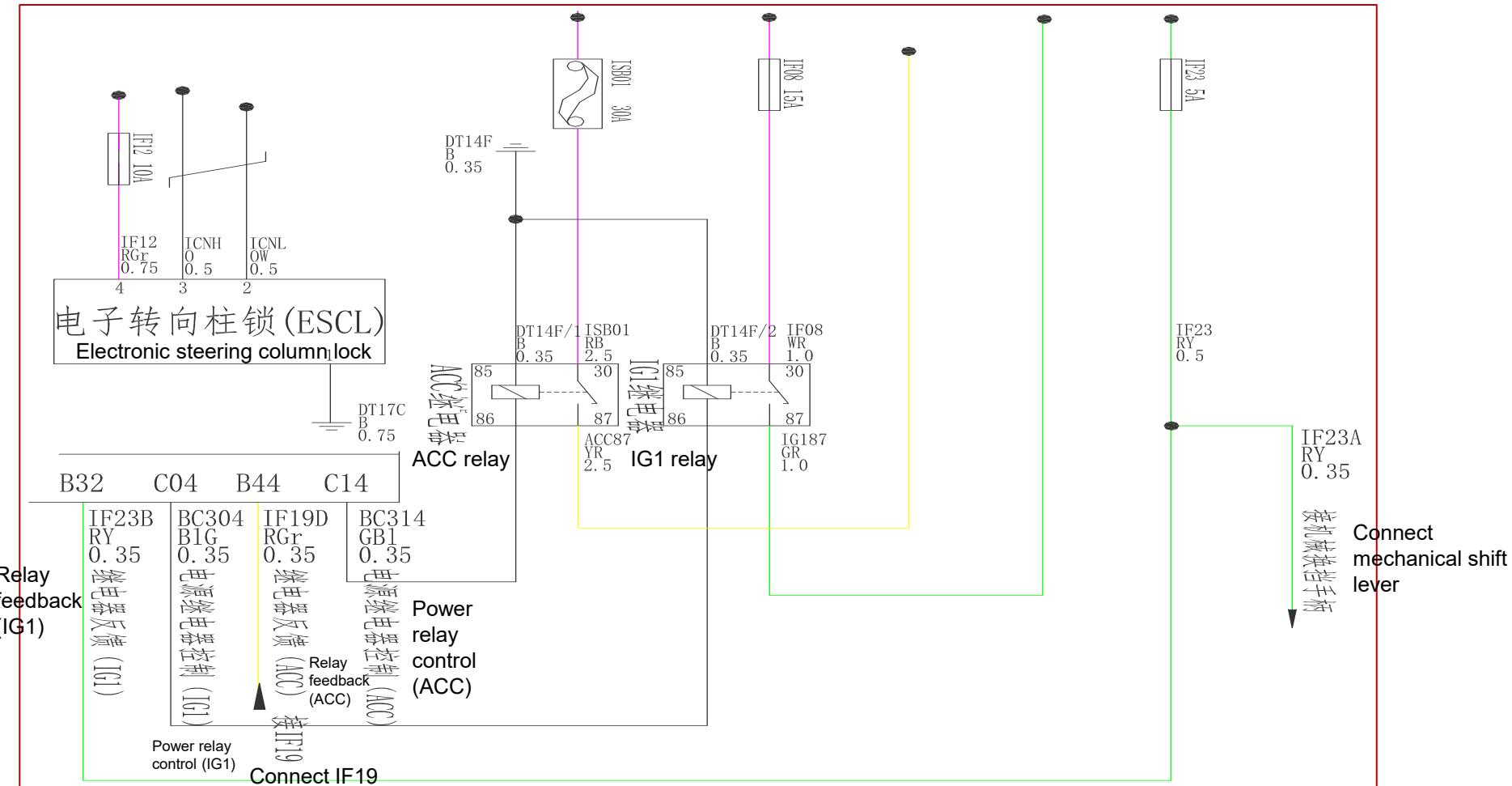
After the BDC receives confirmation that the anti-theft is released, press the one-key start button to release the steering column locking mechanism and control the relays ACC and IG1 to work, and the whole car is powered on.



## 2. Power system power-on process circuit



## 2. Power system power-on process circuit



## 3. Anti-theft system fault code

Fault Code DTC	DTC Description	Triggering Condition	Possible Fault Reason	Maintenance Suggestion
U007388	PT CAN main line is closed	PT CAN main line is closed	Main line fault (short or open)	Check PTCAN main line
U007488	CH CAN main line is closed	CH CAN main line is closed	Main line fault (short or open)	Check CHCAN main line
U007688	Info CAN main line is closed	Info CAN main line is closed	Main line fault (short or open)	Check Info CAN main line
U023087	Lost signal with PLG	Lost signal with PLG	PLG is damaged or its wiring harness is blocked	Check PLG node harness
B102011	Front left turn signal circuit short circuit	When the front left turn signal is turned on, the circuit current of the front left turn signal is too large, $t > 150ms$ Lamp_On	Front left turn signal circuit short circuit	Check the front left turn signal wiring
B102013	Front left turn signal circuit open circuit	When the front left turn signal is turned on, the circuit current of the front left turn signal is too small, $t > 150ms$	Front left turn signal circuit open circuit	Check the front left turn signal wiring

Fault Code DTC	DTC Description	Triggering Condition	Possible Fault Reason	Maintenance Suggestion
B102111	Front right turn signal line short circuit	When the front right turn signal is turned on, the circuit current of the front right turn signal is too large, $t > 150ms$	Front right turn signal line short circuit	Check the front right turn signal wiring
B102113	Front right turn signal circuit open circuit	When the front right turn signal is turned on, the circuit current of the front left turn signal is too small, $t > 150ms$	Front right turn signal circuit open circuit	Check the front right turn signal wiring
B103011	Back door left turn signal circuit short circuit	When the left turn signal of the back door is turned on, the circuit current of the left turn signal of the back door is too large, $t > 150ms$	Back door left turn signal circuit short circuit	Check the back door left turn signal wiring
B103013	Back door left turn signal circuit open circuit	When the left turn signal of the back door is turned on, the circuit current of the left turn signal of the back door is too small, $t > 150ms$	Back door left turn signal circuit open circuit	Check the back door left turn signal wiring
B103111	Back door right turn signal circuit short circuit	When the back door right turn signal is turned on, the circuit current of the back door right turn signal is too large, $t > 150ms$	Back door right turn signal circuit short circuit	Check the back door right turn signal wiring
B103113	Back door right turn signal circuit open circuit	When the back door right turn signal is turned on, the circuit current of the back door right turn signal is too small, $t > 150ms$	Back door right turn signal circuit open circuit	Check the back door right turn signal wiring

Fault Code DTC	DTC Description	Triggering Condition	Possible Fault Reason	Maintenance Suggestion
B103211	Rear protection left turn signal circuit short circuit	When the rear protection left turn signal is turned on, the circuit current of the rear protection left turn signal is too large, $t > 150ms$	Rear protection left turn signal circuit short circuit	Check rear protection left turn signal wiring
B103213	Rear protection left turn signal circuit open circuit	When the rear protection left turn signal is turned on, the circuit current of the rear protection left turn signal is too small, $t > 150ms$	Rear protection left turn signal circuit open circuit	Check rear protection left turn signal wiring
B103311	Rear protection right turn signal circuit short circuit	When the rear protection right turn signal is turned on, the circuit current of the rear protection right turn signal is too large, $t > 150ms$	Rear protection right turn signal circuit short circuit	Check rear protection right turn signal wiring
B103313	Rear protection right turn signal circuit open circuit	When the rear protection right turn signal is turned on, the circuit current of the rear protection right turn signal is too small, $t > 150ms$	Rear protection right turn signal circuit open circuit	Check rear protection right turn signal wiring
B102311	Small light shorted to ground	When the small light is turned on, the current of the small light harness is too large, $t > 150ms$	Small light shorted to ground	Check small light harness
B102313	Small light harness open circuit	When the small light is turned on, the current of the small light harness is too small, $t > 150ms$	Small light harness open circuit	Check small light harness

Fault Code DTC	DTC Description	Triggering Condition	Possible Fault Reason	Maintenance Suggestion
B102411	Logo projection lamp wiring harness shorted to ground	When the Logo projection lamp is turned on, the current in the wiring harness of the Logo projection lamp is too large, $t>150ms$	Logo projection lamp wiring harness short circuit	Detect Logo projection light harness
B102511	Rear fog light shorted to ground	When the rear fog lamp is turned on, the current of the rear fog lamp wiring harness is too large, $t>150ms$	Rear fog light harness short circuit	Check the rear fog light harness
B102513	Rear fog lights circuit open	When the rear fog lamp is turned on, the current of the rear fog lamp wiring harness is too small, $t>150ms$	Rear fog light harness open circuit	Check the rear fog light harness
B102611	Left daytime running light shorted to ground	When the daytime running light (left) is turned on, the daytime running light (left) harness current is too large, $t>150ms$	Daytime running light (left) harness short circuit	Inspection daytime running light (left) harness
B103611	Right daytime running light shorted to ground	When the right daytime running light is turned on, the current of the right daytime running light harness is too large, $t>150ms$	Right daytime running light harness short circuit	Check the right daytime running light harness
B103613	Right daytime running light circuit open	When the right daytime running light is turned on, the current of the right daytime running light harness is too small, $t>150ms$ Lamp_On	Right daytime running light harness open circuit	Check the right daytime running light harness

Fault Code DTC	DTC Description	Triggering Condition	Possible Fault Reason	Maintenance Suggestion
B102711	Back door high brake lamp shorted to ground	When the back door high brake lamp is turned on, the harness current of it is too large, $t>150ms$	Back door high brake lamp harness short circuit	Inspect the back door high brake lamp harness
B102713	Back door high brake lamp open circuit	When the back door high brake lamp is turned on, the harness current of it is too small, $t>150ms$	Back door high brake lamp harness open circuit	Inspect the back door high brake lamp harness
B102811	Rear brake light shorted to ground	When the rear brake light is turned on, the current of the rear brake light harness is too large, $t>150ms$	Rear brake light harness short circuit	Check rear brake light harness
B102911	Left blind spot indicator shorted to ground	When the left blind spot indicator light is turned on, the harness current of the left blind spot indicator light is too large, $t>150ms$	Left blind spot indicator light harness short circuit	Check the left blind spot indicator harness
B102A11	Right blind spot indicator short to ground	When the right blind spot indicator light is turned on, the harness current of the right blind spot indicator light is too large, $t>150ms$	Right blind spot indicator light harness short circuit	Check the right blind spot indicator harness
B103811	Reversing lights shorted to power	When the reversing light is turned on, the reversing light harness current is too large, $t>150ms$	Reversing light harness short circuit	Check the wiring harness between the BCM Port of the reversing light and the relay

Fault Code DTC	DTC Description	Triggering Condition	Possible Fault Reason	Maintenance Suggestion
B103813	Reversing light open circuit	When the reversing light is turned off, the reversing light harness is disconnected, t>150ms	Reversing light harness open circuit	Check the wiring harness between the BCM Port of the reversing light and the relay
B103911	Left front fog lamp shorted to power	When the left front fog lamp is turned on, the wiring harness current of the left front fog lamp is too large, t>150ms	Left front fog lamp wiring harness short circuit	Check the wiring harness between the left front fog lamp BCM Port and the relay
B103913	Left front fog light open	When the left front fog lamp is turned off, the left front fog lamp wiring harness is disconnected, t>150ms	Left front fog lamp wiring harness open circuit	Check the wiring harness between the left front fog lamp BCM Port and the relay
B103C11	Low beam shorted to power	When the low beam is turned on, the current of the low beam is too large, t>150ms	Low beam harness short circuit	Check the wiring harness between the low beam BCM Port and the relay
B103C13	Low beam open circuit	When the low beam is turned off, the low beam is disconnected, t>150ms	Low beam harness open circuit	Check the wiring harness between the low beam BCM Port and the relay
B103D11	High beam shorted to power	When the high beam is turned on, the current of the high beam harness is too large, t>150ms	High beam harness short circuit	Detect the wiring harness between the high beam BCM Port and the relay

Fault Code DTC	DTC Description	Triggering Condition	Possible Fault Reason	Maintenance Suggestion
B103D13	High beam open circuit	When the high beam is turned off, the high beam harness is disconnected, $t>150ms$	High beam harness open circuit	Check the wiring harness between the BCM Port of the high beam and the relay
B103E11	Right front fog lamp shorted to power	When the right front fog lamp is turned on, the wiring harness current of the right front fog lamp is too large, $t>150ms$	Right front fog lamp wiring harness short circuit	Check the wiring harness between the right front fog lamp BCM Port and the relay
B103E13	Right front fog light open circuit	When the right front fog lamp is turned off, the right front fog lamp wiring harness is disconnected, $t>150ms$	Right front fog lamp wiring harness open circuit	Check the wiring harness between the right front fog lamp BCM Port and the relay
B104171	Front wiper motor blocked	The front wiper low-speed or high-speed output is valid, and the front wiper homing signal remains invalid for more than 8s or remains valid for more than 3s	Wiper stuck or home switch faulty	Check whether the front wiper reset switch harness or the front wiper is stuck
B104271	Rear wiper motor blocked	The rear wiper output is valid, and the rear wiper homing signal remains invalid for more than 8s or remains valid for more than 3s	Wiper stuck or home switch faulty	Check whether the rear wiper reset switch harness or rear wiper is stuck
B104211	Brake light shorted to power	When the brake light is turned on, the brake light harness current is too large, $t>150ms$	Brake light harness short circuit	Check the wiring harness between the brake light BCM Port and the relay

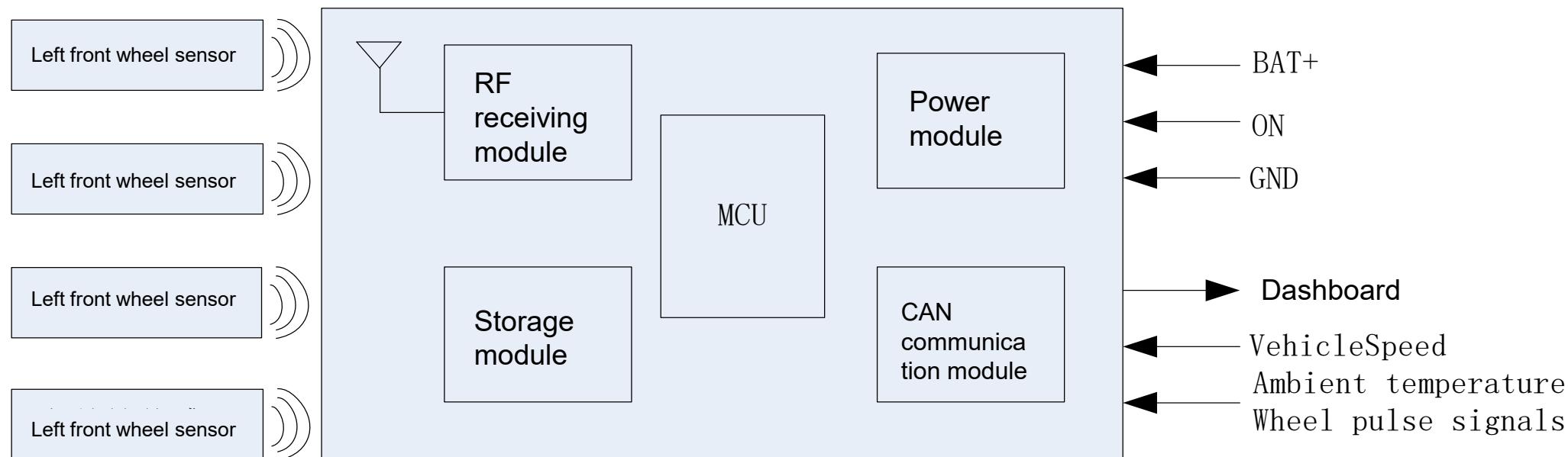
Fault Code DTC	DTC Description	Triggering Condition	Possible Fault Reason	Maintenance Suggestion
B104213	Brake light open circuit	When the brake lights are turned off, the brake light harness is disconnected, $t > 150ms$	Brake light harness open circuit	Check the wiring harness between the brake light BCM Port and the relay
B101449	Sunroof internal failure	Sunroof failure	Sunroof failure	Check sunroof
B101683	Sunroof LIN bus communication failure	Sunroof LIN communication failure	Sunroof LIN communication failure	Check sunroof LIN bus
B103087	Sunshade LIN bus communication failure	Sunshade LIN bus communication failure	Sunshade LIN bus communication failure	Check sunroof LIN bus
B103096	Sunshade internal failure	Sunshade internal failure	Sunshade internal failure	Check the sunshade
B101796	Left front window switch failure	Left front window switch failure	Left front window switch failure	Check left front window switch

Fault Code DTC	DTC Description	Triggering Condition	Possible Fault Reason	Maintenance Suggestion
B101B96	Driver's door window switch LIN bus communication failure	Driver door's door window switch LIN bus communication failure	Driver's door window switch LIN bus communication failure	Check the driver's door window switch LIN bus
B131096	Window anti-pinch LIN bus communication failure	Window anti-pinch LIN bus communication failure	Window anti-pinch switch failure	Check window anti-pinch LIN bus
B132596	Wiper switch failure	Wiper switch failure	Wiper switch failure	Check wiper switch system
B132696	Light switch failure	Light switch failure	Light switch failure	Check light switch
B141096	Sunlight and rain sensor LIN bus communication failure	Sunlight and rain sensor LIN bus communication failure	Sunlight and rain sensor failure	Check sunlight and rain sensor LIN bus
B161096	Combination switch LIN bus line communication failure	Combination switch LIN bus line communication failure	Combination switch internal failure	Check combination switch module

## VI. Tire pressure system

### 1. Tire pressure monitoring system structure and function

When the ignition gear is in the ON gear, the BDC receives the high-frequency 433.92MHz signal sent by the TPMS sensor, and transmits the four tire pressure and temperature information through the CAN bus, and judges the low/high pressure alarm, high temperature alarm, rapid air leakage alarm, sensor battery power and sensor loss alarm, then send them to dashboard. The dashboard will display and light the alarm indicator according to the information on the CAN.



#### 2. TPMS sensor signal receiving control:

When the BDC does not learn the TPMS sensor, the BDC does not receive the data sent by the TPMS sensor, and the BDC does not alarm or record the DTC. After the BDC successfully learns the TPMS, it needs to receive the TPMS signal and make an alarm logic judgment in any ignition gear (except when the gear is on OFF or ACC, the sensor signal loss alarm judgment is not made). When the ignition gear is in OFF or ACC, the TPMS alarm signal is received, and the alarm network signal is required to be updated when the ignition gear is switched to ON gear or START. If the BDC receives the information sent by the tire pressure sensor and the verification code is correct, it will first check the frame header and ID of the sensor. If the frame header belongs to the vehicle, the pressure, temperature, and flag information will be processed effectively; If the verification code is incorrect or the ID does not belong to the vehicle, the information will be discarded and the sensor information will continue to be monitored.

#### 3. TPMS pressure and temperature display control:

The tire pressure value sent by the sensor is in KPa, and the range is 100Kpa~450Kpa. Since the tire pressure value on the CAN is one decimal place, it is calculated by rounding. That is, the BDC sends the tire pressure of each wheel through the tire pressure signal `BCM_xxxx_TyrePressure`. The tire pressure range is between 1.0bar and 4.5bar;

The BDC sends the temperature value of each tire to the CAN network through the wheel temperature signal `BCM_xxxx_TyreTemperature`.

#### 4. TPMS low pressure/high pressure/high temperature/low battery/sensor loss alarm control:

If there is an alarm signal when the ignition gear is on ACC or OFF, the BDC needs to update the alarm network signal after the ignition gear is turned to ON or START (the tire pressure is connected when it is OFF, and the tire pressure information must be sent out before going to sleep. Update the tire pressure value after waking up);

#### 5. The priority of the alarm signal:

Low pressure alarm > high temperature alarm > high pressure alarm > sensor low battery alarm;

**6. Tire pressure system fault code:**

Fault Code	Fault Description
B10F087	Left front tire pressure signal lost
B10F187	Right front tire pressure signal lost
B10F287	Left rear tire pressure signal lost
B10F387	Right rear tire pressure signal lost
B10F084	Left front tire pressure sensor battery low
B10F184	Right front tire pressure sensor battery low
B10F284	Left rear tire pressure sensor battery low
B10F384	Right rear tire pressure sensor battery low



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# Course Objectives

- Explain the functional characteristics of the window system of Glory New 580
- Master the control principle of window system of Glory New 580
- Master the method of analyzing the circuit diagram of the window system of Glory New 580

### 1. Window system structure and function

The main functions of the window system are the manual (pointing gear) lifting and automatic (automatic gear) lifting and lowering functions of the glass. When the operating time of the window motor is too long, the BCM will enter the window thermal protection state, and the window lift function will be invalid, and the window will not operate until the temperature of the window motor returns to normal.

#### During raising window with anti-pinch function:

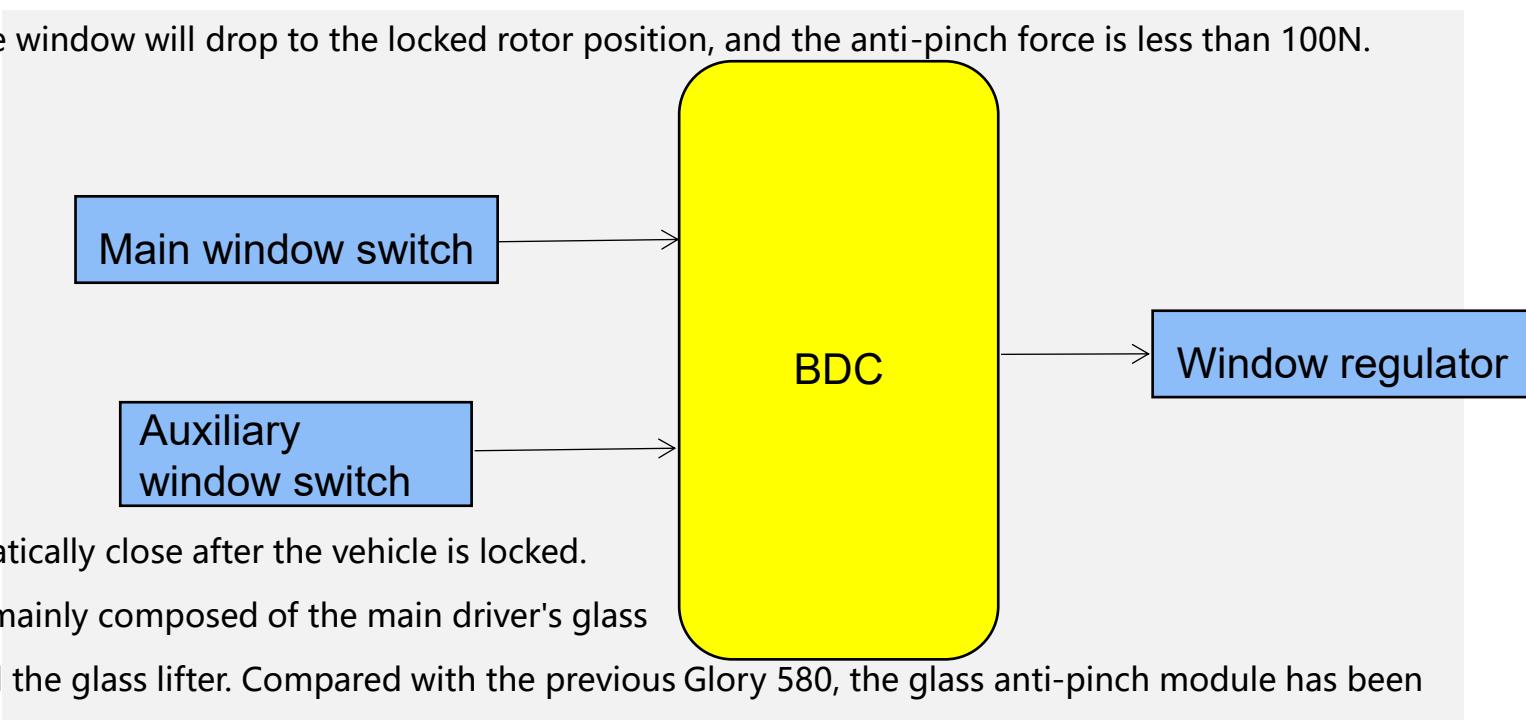
- ▷ When encountering an obstacle in the anti-pinch area, the window motor is reversed, and the window is lowered by a distance of 150mm;
- ▷ If the window movement travel is less than 150mm, the window will drop to the locked rotor position, and the anti-pinch force is less than 100N.

#### Remote control operation

Open the windows: When the whole vehicle is powered off, long press the unlock button of the remote control key, the vehicle will lower the four-door windows after the vehicle is unlocked;

Close the windows: When the vehicle is powered off, long press the lock button on the remote control key, the vehicle will control the four-door windows to automatically close after the vehicle is locked.

The structure of the window system is relatively simple, mainly composed of the main driver's glass lift control switch, the auxiliary door glass lift switch, and the glass lifter. Compared with the previous Glory 580, the glass anti-pinch module has been cancelled, and the anti-pinch function is concentrated in the BDC.



## 2. Main window switch

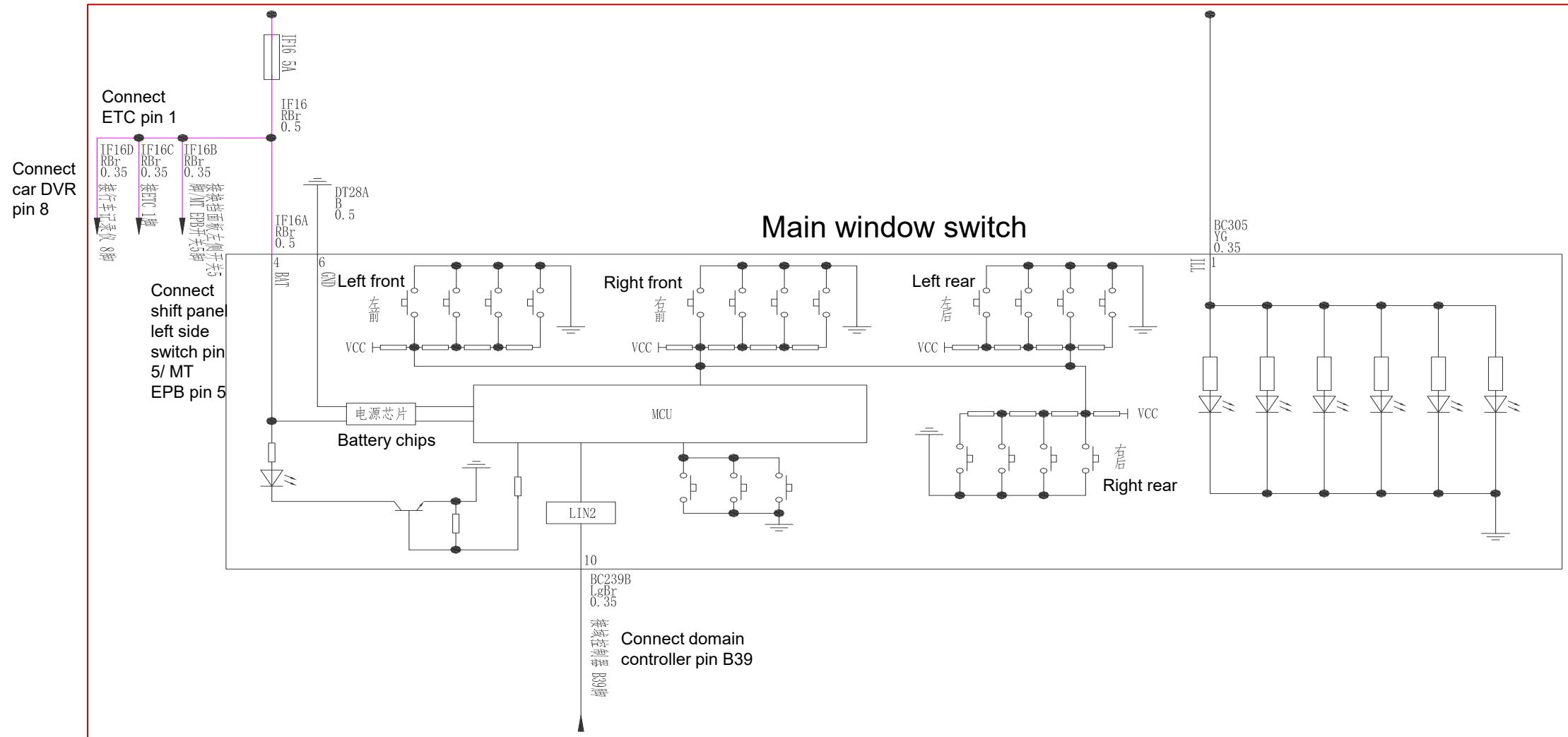
The main window switch function is mainly to control the manual or automatic lifting and lowering of the glass and locking the auxiliary window.

### Window anti-pinch function learning:

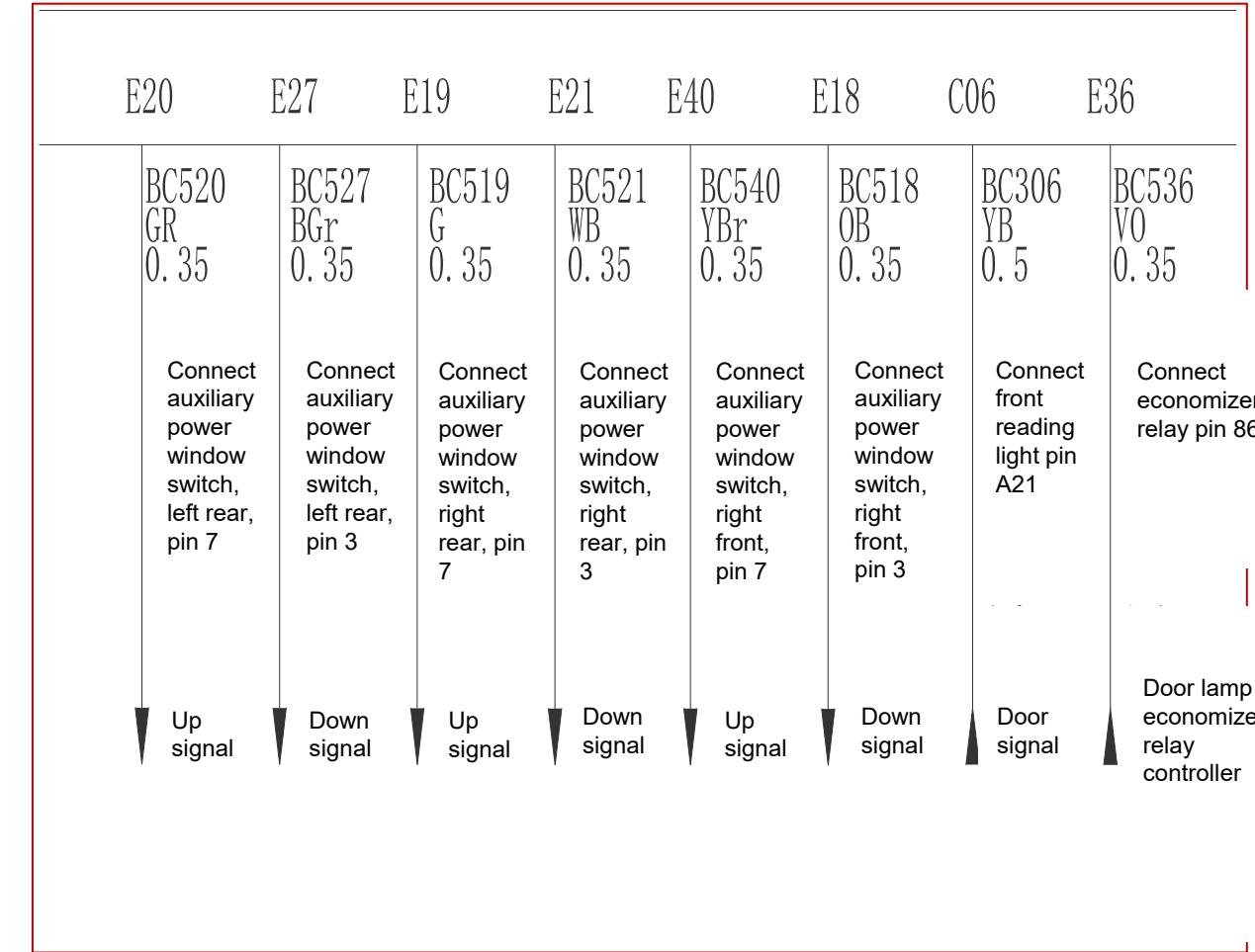
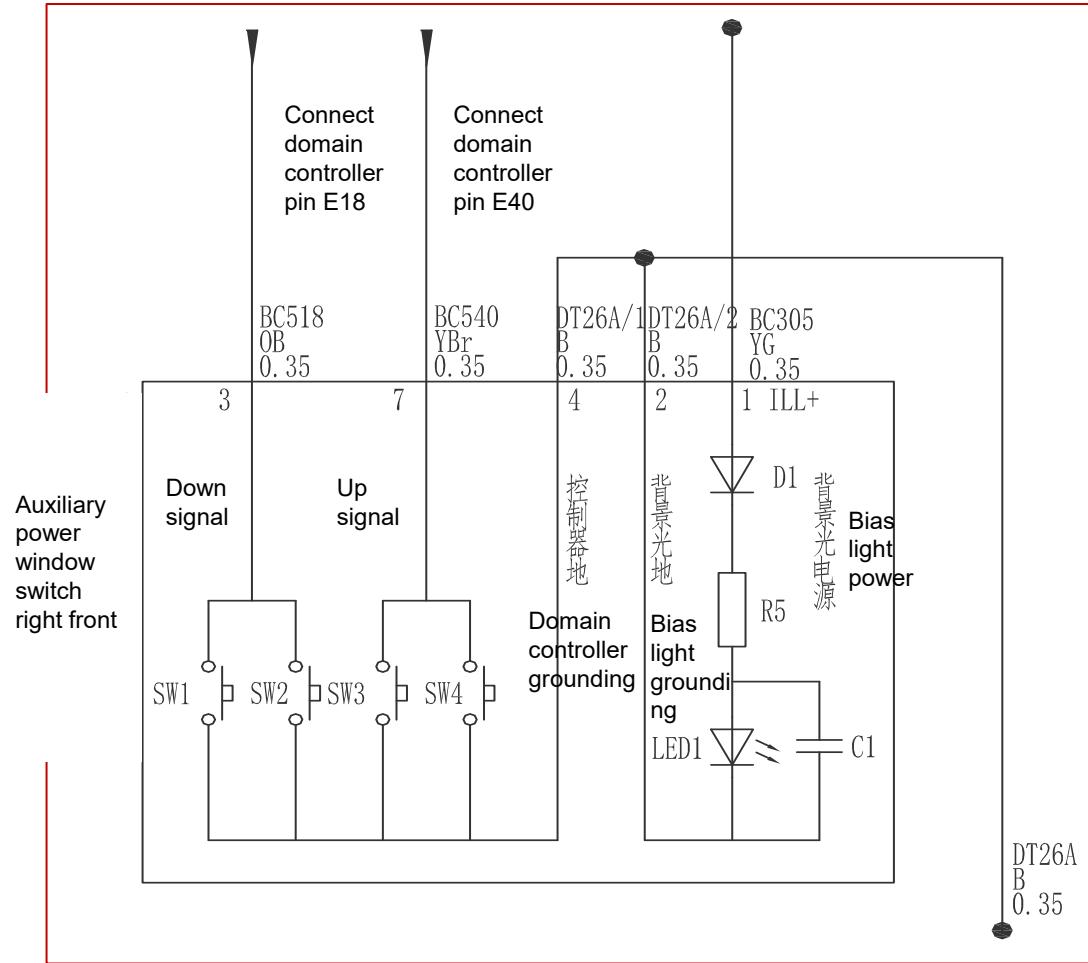
Release the brake pedal, press the one-button start switch twice (the indicator light turns green), operate the left front (left rear/right front/right rear) window up button to raise the window glass to the top, then release the button, and operate the up button again to raise the window to the top and lock the rotor for 2S. Then manually lower the window to the end, and then manually raise the window to the top. The completion of the above actions means that the left front (left rear/right front/right rear) window has been successfully learned.



### 3. Main window switch circuit diagram

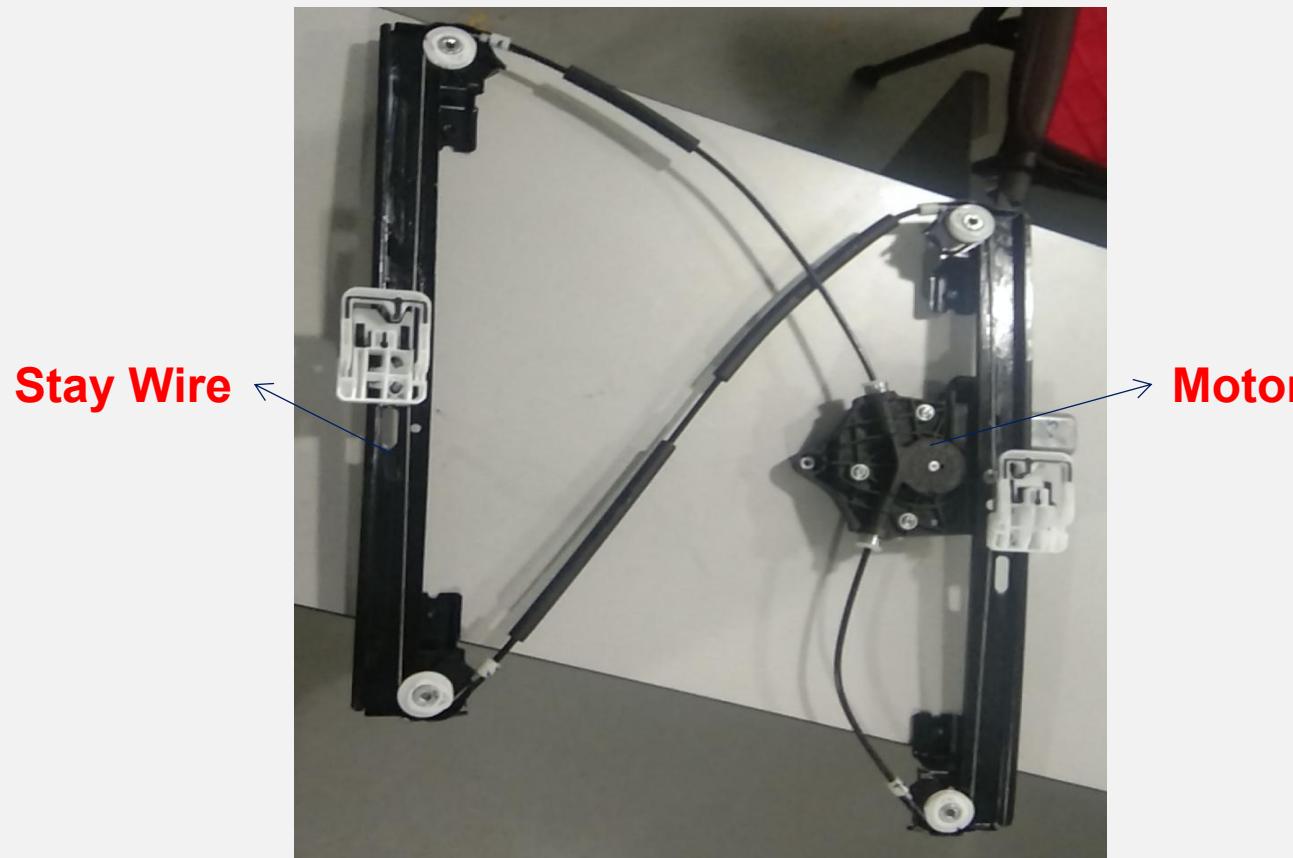


## 3. Circuit diagram of auxiliary window switch

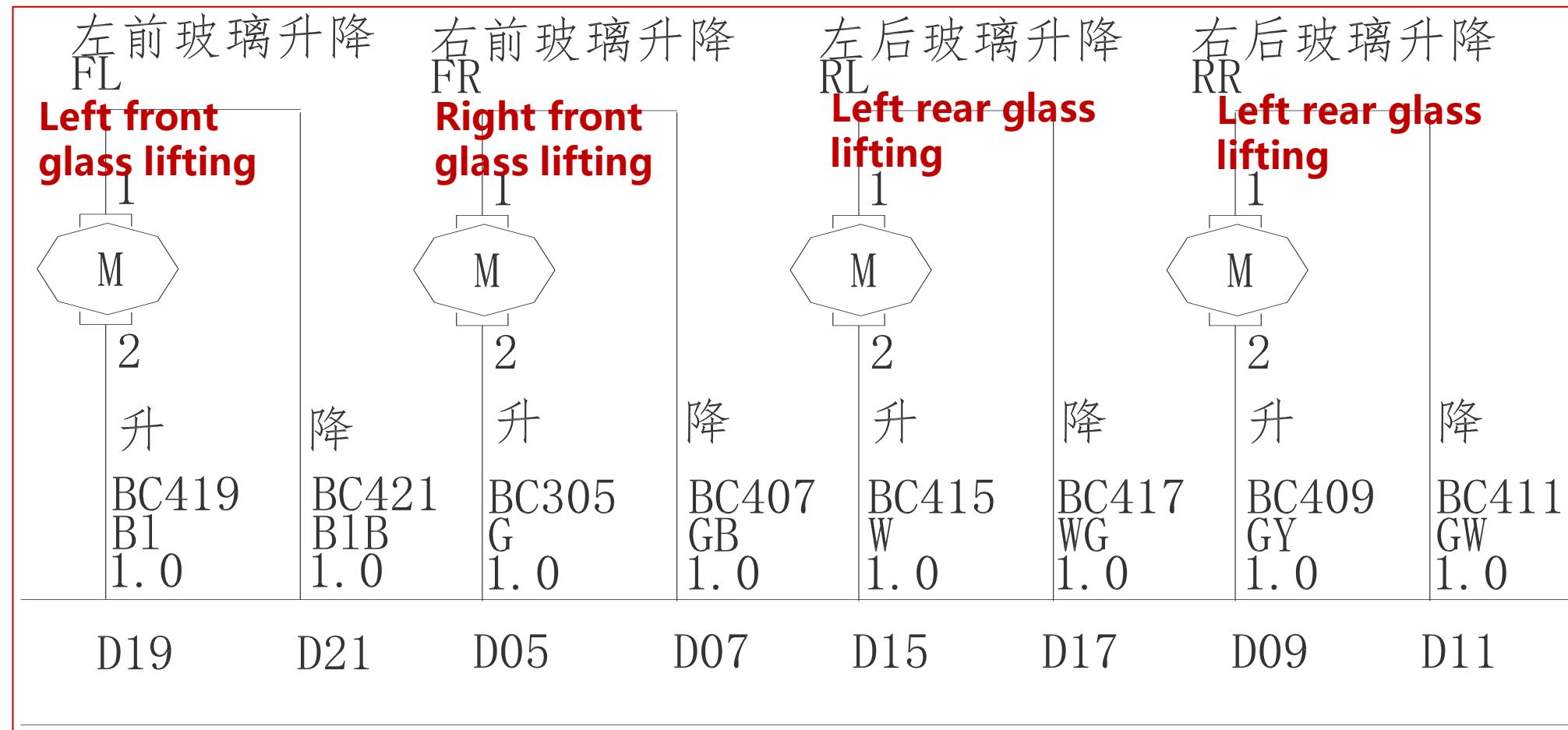


#### 4. Window Regulator

The function of the window regulator is to drive the stay wire through the operation of the motor, so as to make the glass rise and fall.



## 5. Circuit diagram of glass lifter



## 6. Window system fault code

DTC	Fault code description	Repair advice
B131096	Window anti-pinch LIN bus communication failure	Detect window anti-pinch LIN bus
B131110	Window anti-pinch module voltage is abnormal	Check the battery
B131211	Left front window button short circuit	Check the left front window buttons
B131311	Right front window button short circuit	Check the right front window button
B131411	Left rear window button short circuit	Check the left rear window button
B131511	Right rear window button short circuit	Check the right rear window button
B131610	Left front window motor output fault	Check the left front window motor
B131710	Right front window motor output fault	Check the right front window motor
B131810	Left rear window motor output fault	Check the left rear window motor
B131910	Right rear window motor output fault	Check the right rear window motor
B131A96	Left front window resistance is too large	Check the left front window
B131B96	Right front window resistance is too large	Check the right front window
B131C96	Left rear window resistance is too large	Check the left rear window
B131D96	Right rear window resistance is too large	Check the right rear window
B132096	Left front motor position signal error	Check the left front window motor
B132196	Right front motor position signal error	Check the right front window motor
B132296	Left rear motor position signal error	Check the left rear window motor
B132396	Right rear motor position signal error	Check the right rear window motor
B132496	Window anti-pinch controller internal fault	Check the window anti-pinch controller



## Table of CONTENTS

- 01 BDC overview
- 02 BCM system
- 03 Window system
- 04 Air Conditioning System
- 05 Gateway system



## Course targets

- **State the functional characteristics of the new Glory 580 air-conditioning**
- **Master the control principle of new Glory 580 air conditioning system**
- **Master the method of analyzing the circuit diagram of the new Glory 580 air-conditioning system**

### 1. Structure and function of air conditioning system

According to the functions of the air-conditioning system, it is mainly divided into two categories: cooling and heating. The ultimate goal is to provide drivers with a comfortable driving environment and reduce fatigue.

According to the control system, it is also divided into two categories: electric air conditioning system and automatic air conditioning system

The electric air conditioning system control is divided into 4 states: OFF state, MANU state, DEF state and MAX A/C state.

The automatic air conditioning system control is divided into 4 states:

OFF state, DEF state, AUTO state, MANU status.

Basic functions include air volume adjustment, temperature adjustment, OFF function, front defrost function, rear defrost and mirror heating function, mode switching function, internal and external circulation function, pressure Compressor (A/C) function, automatic function (AUTO), etc.

The vehicle has the smart health mode. After entering the smart mode, the active ventilation function, air conditioning self-drying function, regular ventilation function, automatic intelligent purification and automatic internal and external circulation switch are enabled by default

Air conditioning system structure: refrigeration system, heating system, air supply system electronic control system and other components. We mainly talk about the functions of the electronic control system here.



#### 2. Automatic air conditioning system control

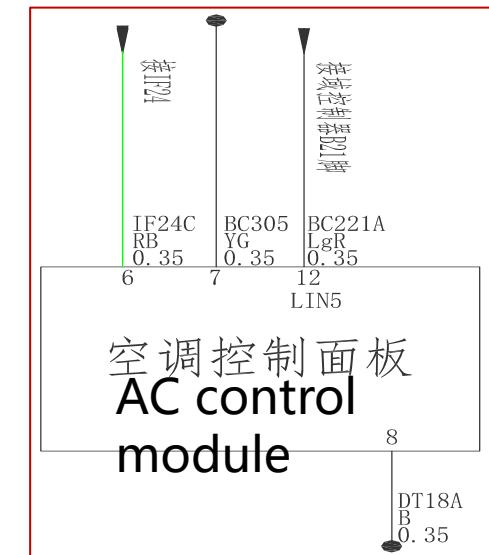
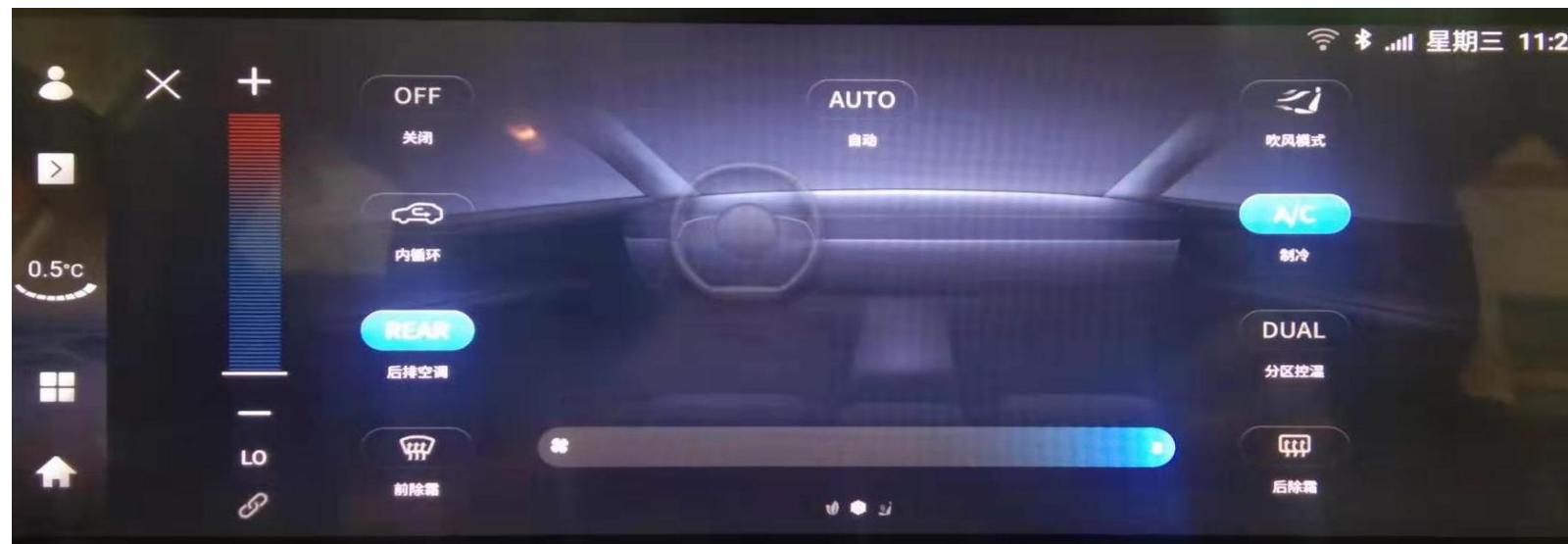
After the air conditioner switch panel and the central control panel are powered on, press the "Auto" button on the switch panel, and the BDC enters the automatic control state. At this time, the compressor is turned on, and the blower, cooling and heating actuators, mode actuators and circulation actuators are all under automatic control.

Automatic control principle:

TD (thermal equivalent): [AMB (outside temperature), INCAR (inner temperature), EVAP (evaporator), WATER (water temperature)] and SET (set) comparison value.

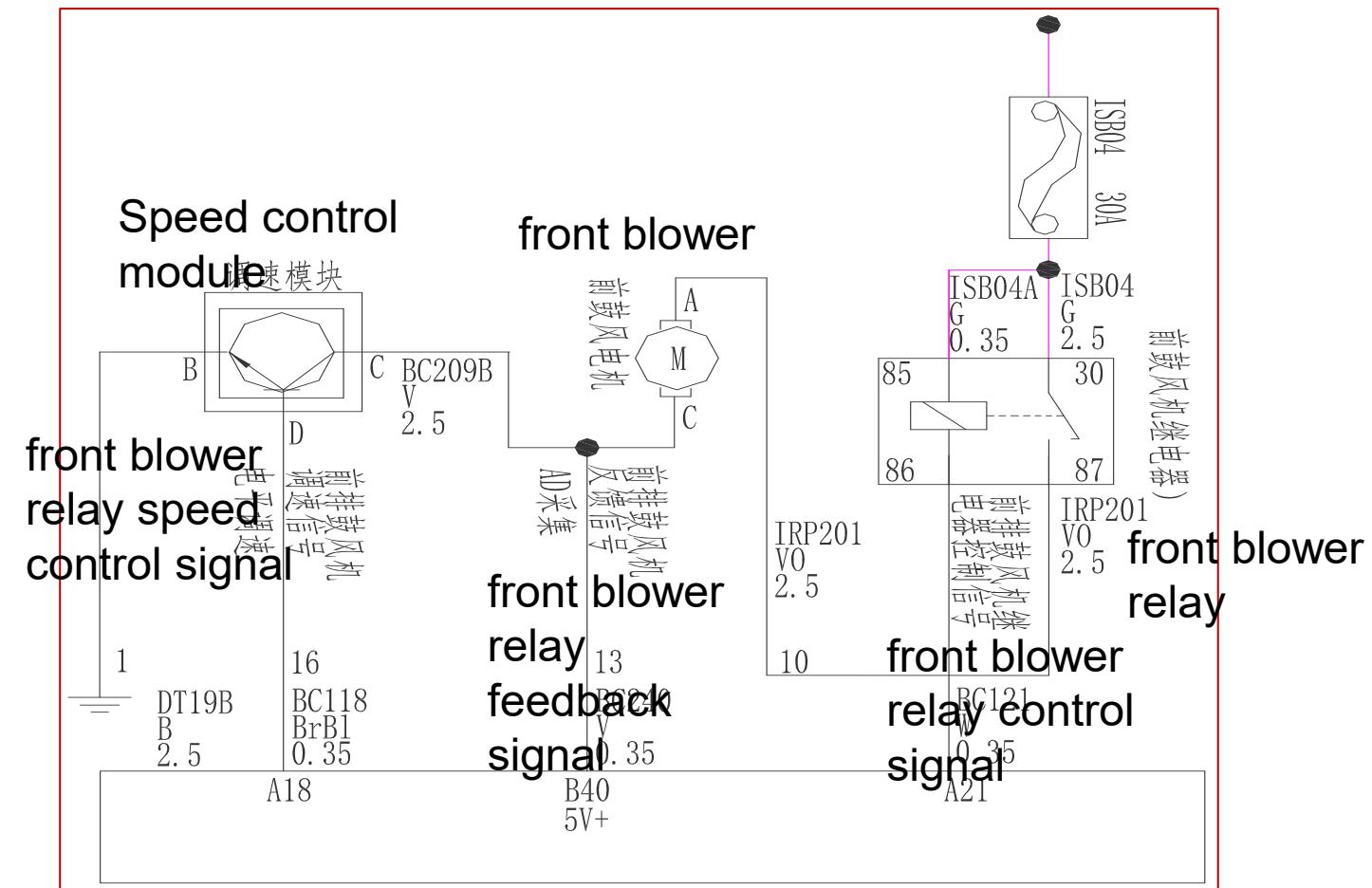
The controller calculates the current thermal equivalent (TD) by collecting the temperature of all sensors and the set temperature of the user to determine whether it is cooling or heating at present.

All automatic controls are determined by the current thermal equivalent (TD) in the car. When TD is 0, it means the heat balance in the car; when TD is a positive number, it means excess heat in the car; when TD is negative, it means insufficient heat in the car .



### 3. Air conditioning system function - blower control

After turning on the air-conditioning system, short press the "Air Volume Decrease or Increase" button, and the air volume will decrease or increase by one step. The minimum air volume is 1 gear, and the maximum is 8 gear air volume.



### 4. Air conditioning system function - compressor control

When the AC, AUTO, and defrost buttons are operated, the compressor control is performed according to the following two points:

#### (1) Evaporator temperature sensor protection:

When the evaporator temperature is less than or equal to 0°C, the BDC does not issue an AC request, but the AC indicator light is on;

When the evaporator temperature is greater than or equal to 4°C, the BDC sends an AC request, and the AC indicator light is on;

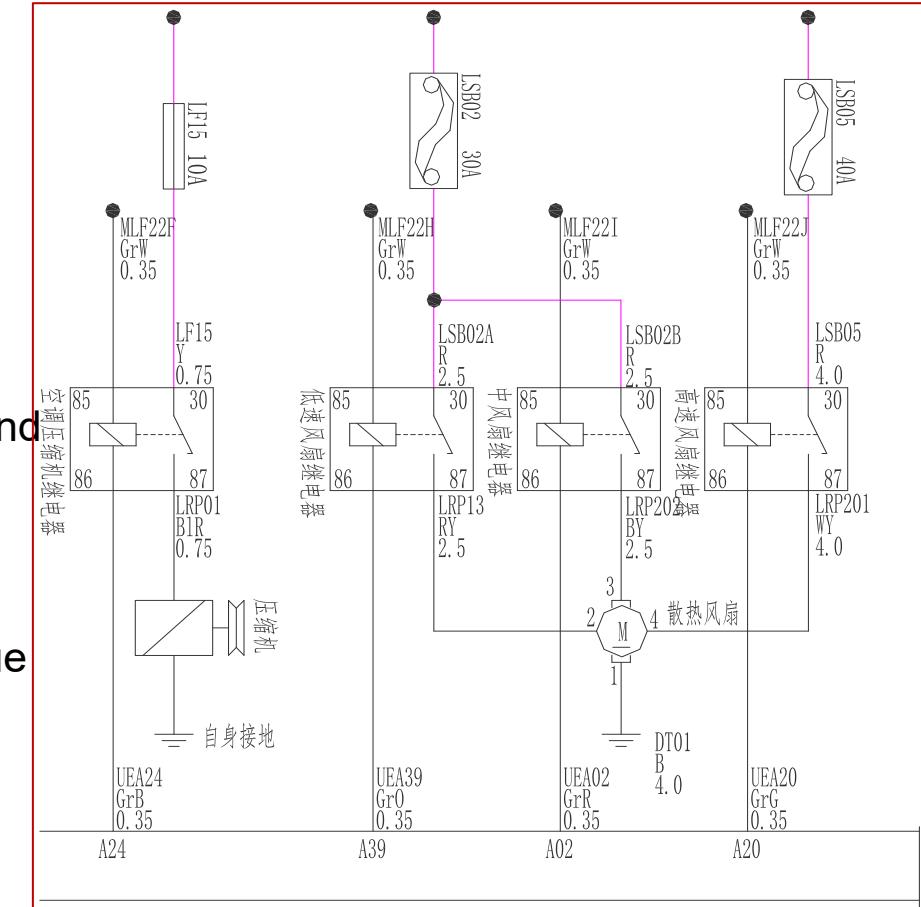
When  $0^{\circ}\text{C} < \text{evaporator temperature} < 4^{\circ}\text{C}$ , the BDC keeps the AC request state, and the AC indicator light is on.

#### (2) Protection of outside temperature sensor

When the outside temperature is less than or equal to 0°C, the BDC does not issue an AC request, but the AC indicator light is on;

When the outside temperature is greater than or equal to 3°C, the BDC sends an AC request, and the AC indicator light is on;

When  $0^{\circ}\text{C} < \text{outside temperature} < 3^{\circ}\text{C}$ , the BDC keeps the AC request state, and the AC indicator light is on.

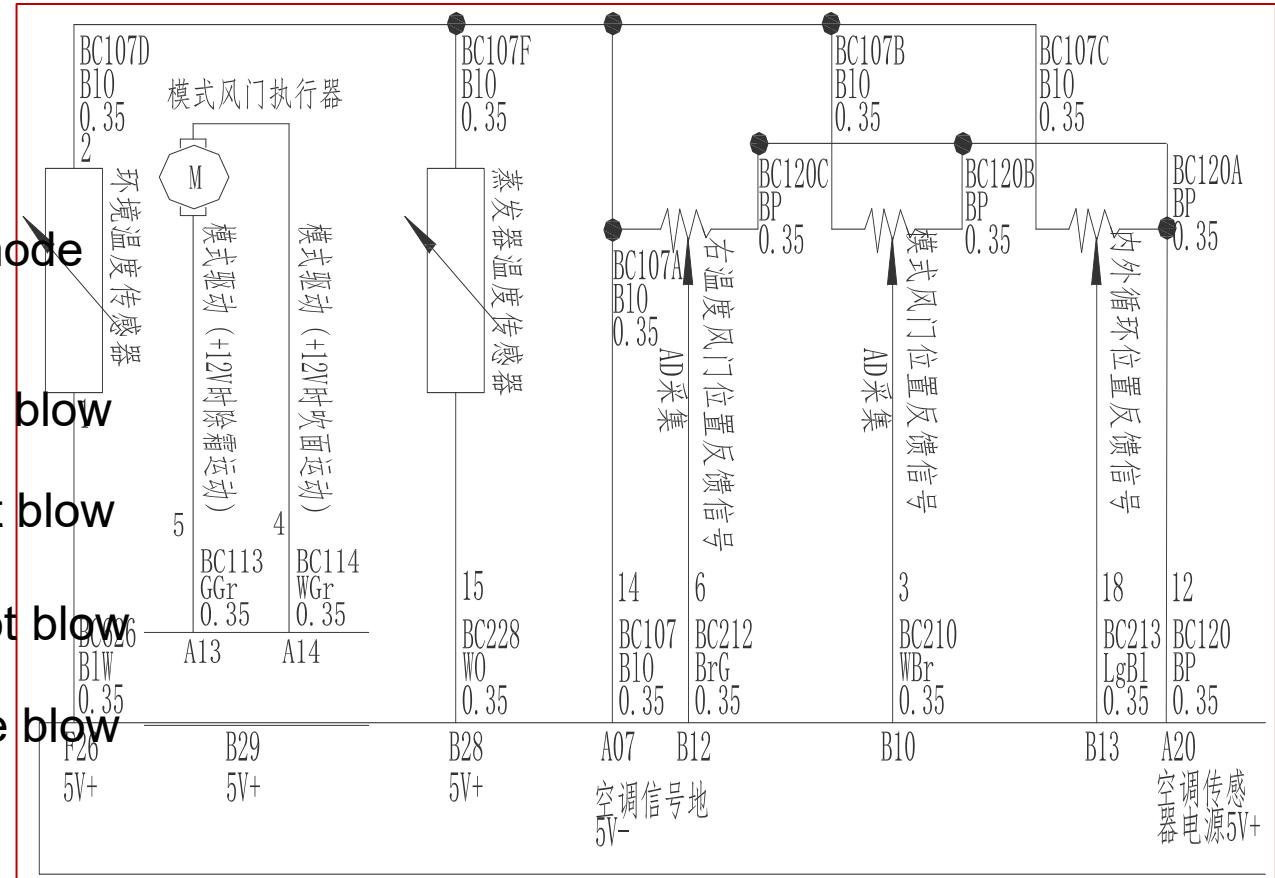


### 5. The function of the air conditioning system is to control the air blowing mode.

When the air conditioner control switch is in the AUTO state, the blowing mode is determined by the current thermal equivalent (TD).

热当量 (TD)	吹风模式 Blowing mode
TD>-3	吹脚 → 吹面/吹脚 Foot blow - Face blow/foot blow
TD>1.4	吹面/吹脚 → 吹面 Face blow/foot blow - Foot blow
TD<0.2	吹面 → 吹面/吹脚 Face blow - Face blow/foot blow
TD<-5	吹面/吹脚 → 吹脚 Face blow/foot blow- Face blow

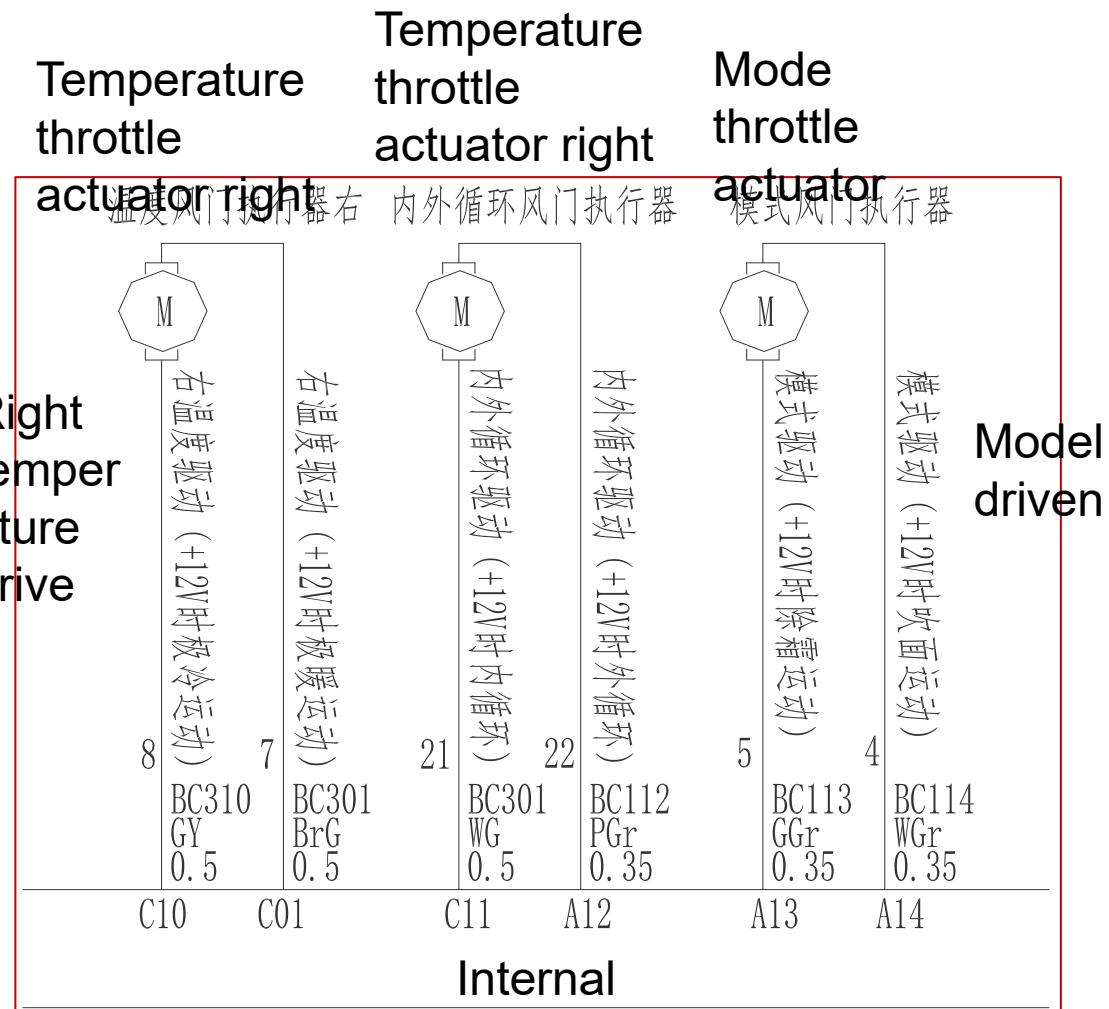
When the user presses the mode button, the air outlet mode will be changed, and the system will no longer automatically control the air outlet mode.



### 6. Mode damper actuator

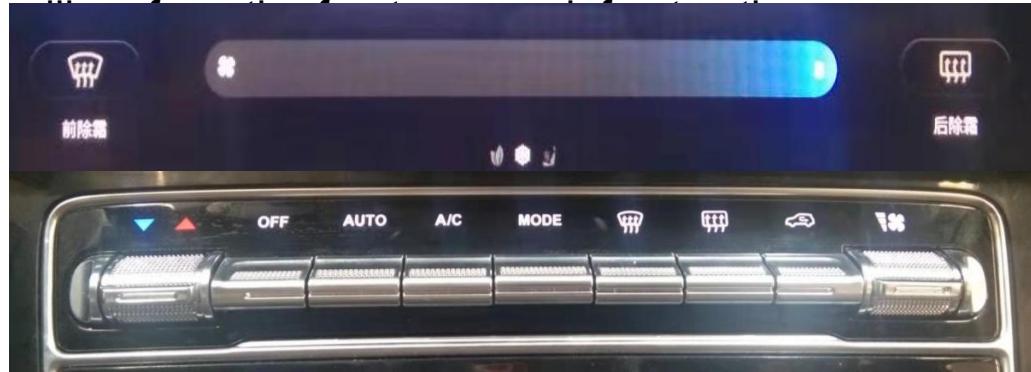
#### Mode Damper Actuator Function:

Adjust the position of the mode damper and change the direction of the air outlet. There are four air outlet positions: face blowing, face blowing/foot blowing, foot blowing, foot blowing/defrosting.

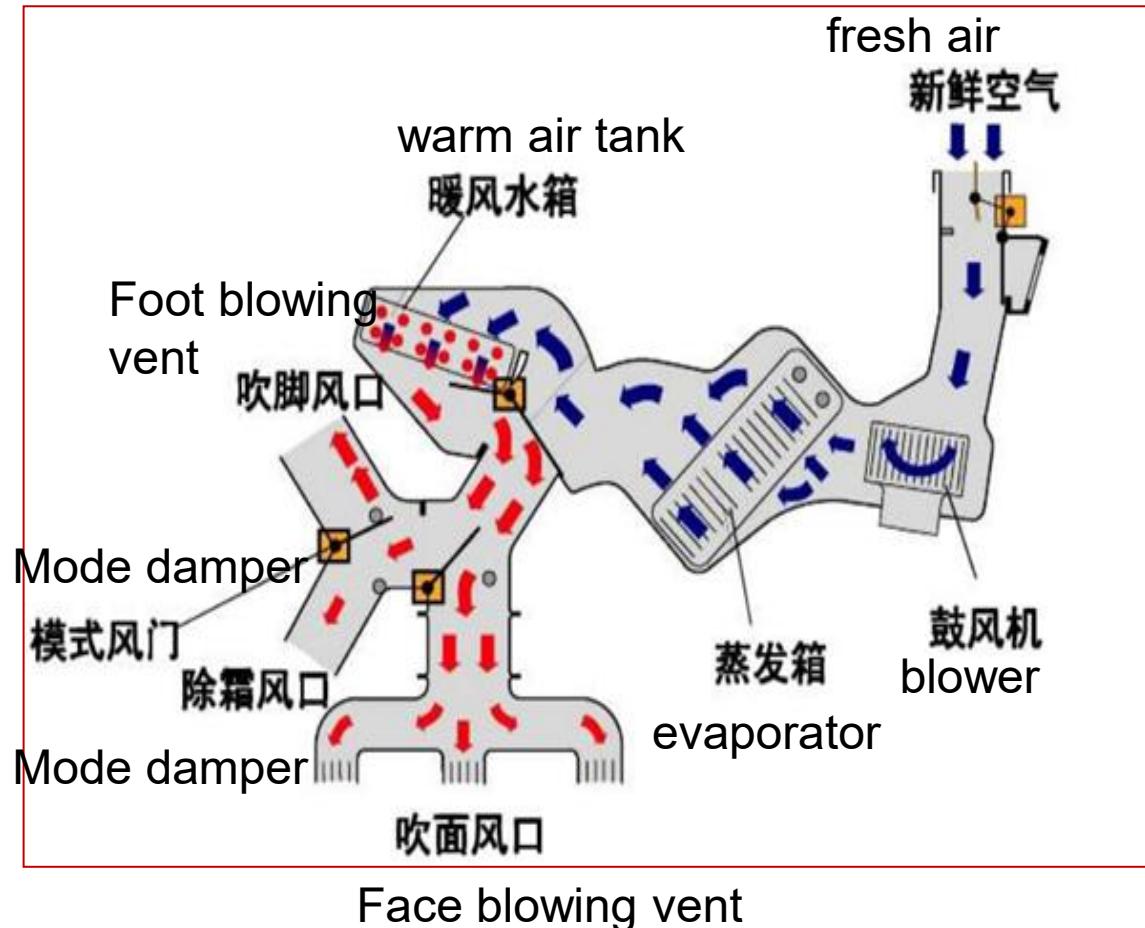


## 7. Defrost mode control

Front and rear defrost: After pressing the front or rear defrost button, the air conditioner controller

**Position sensor detection:**

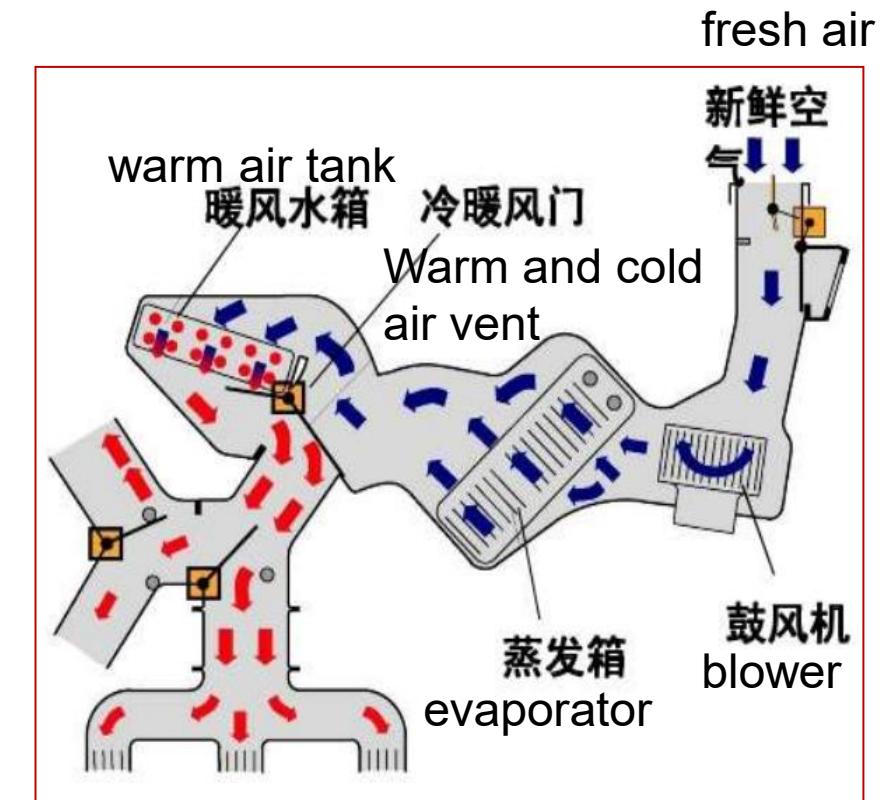
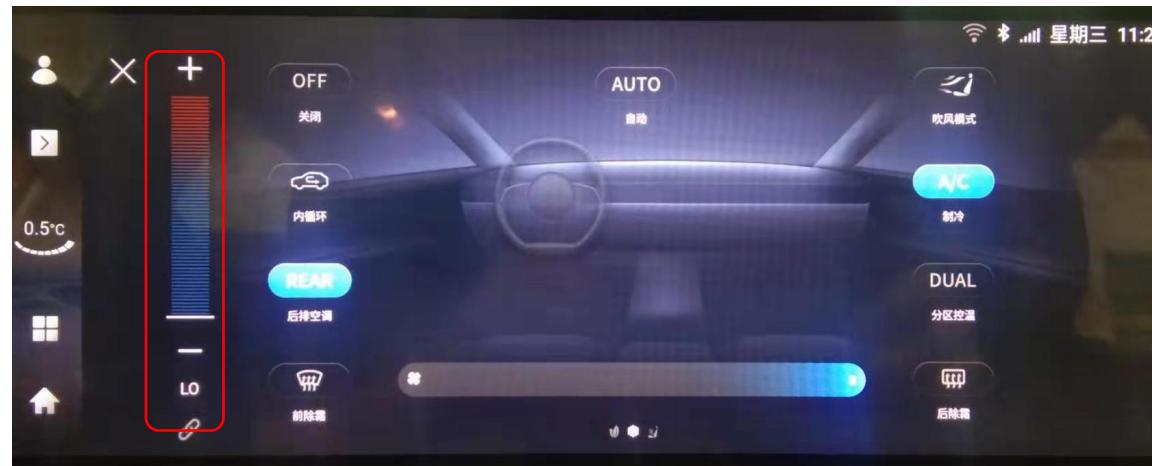
The micro-motor in the BDC control mode actuator acts, the motor drives the mode damper to move, and also drives the position sensor displacement change, and the BDC locates the damper position through the change of the signal.



## 9. Cooling and heating air door control

Hot and cold air door actuator function:

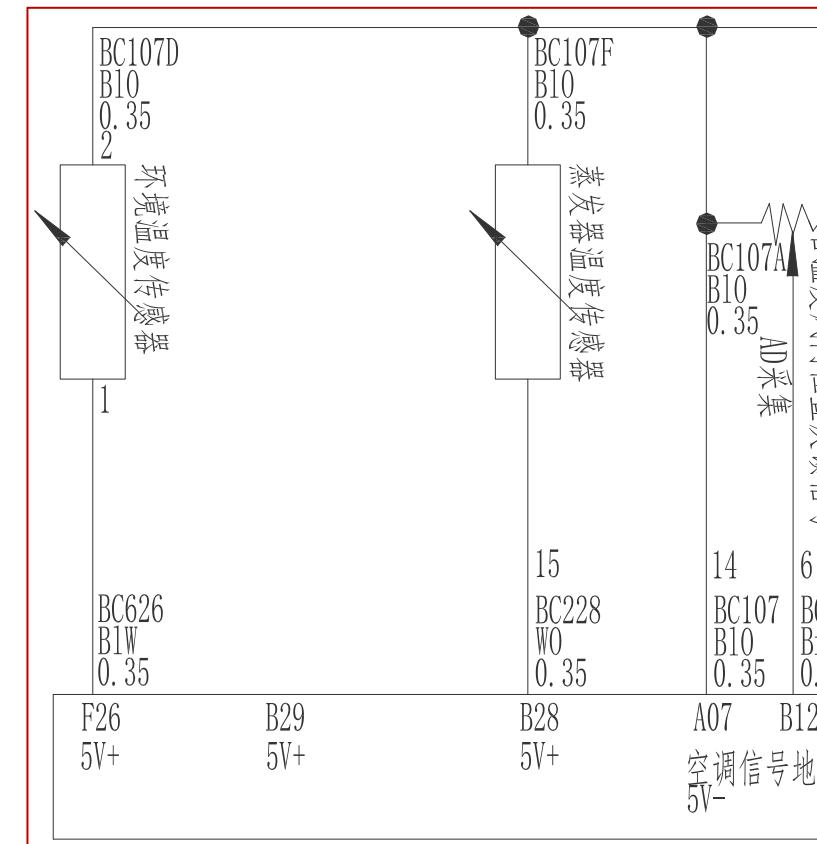
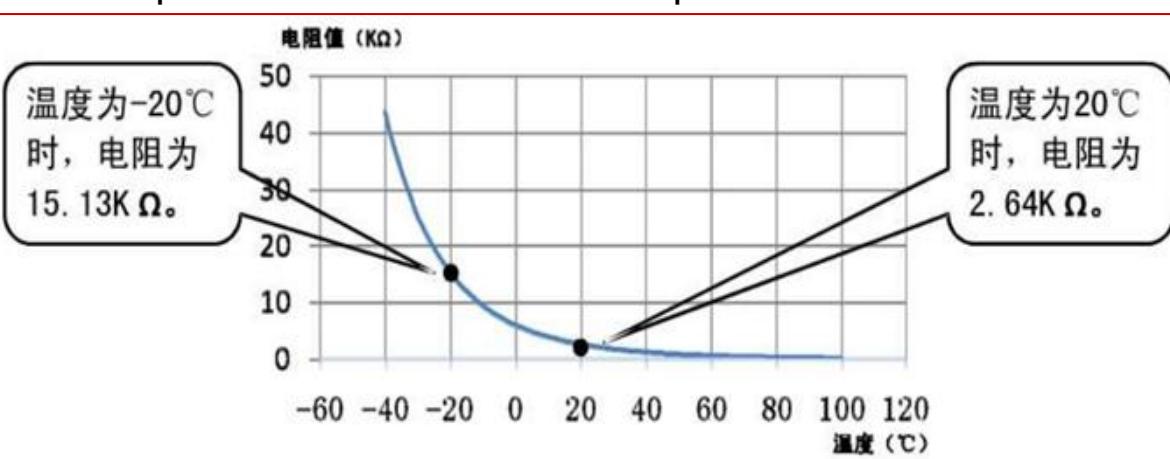
Adjust the position of the temperature damper to change the air outlet temperature.



#### 10. Ambient temperature sensor

The function of the outdoor temperature sensor:

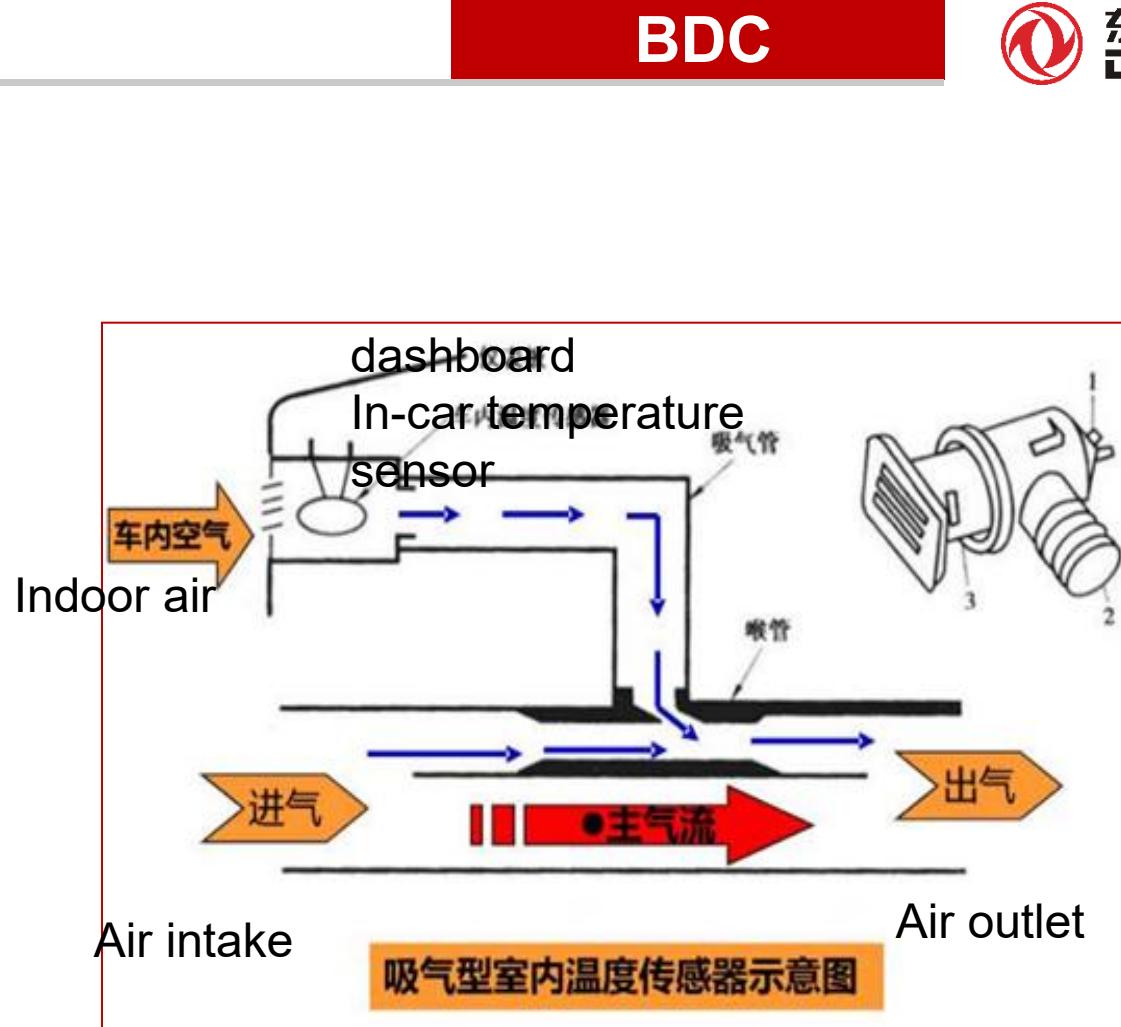
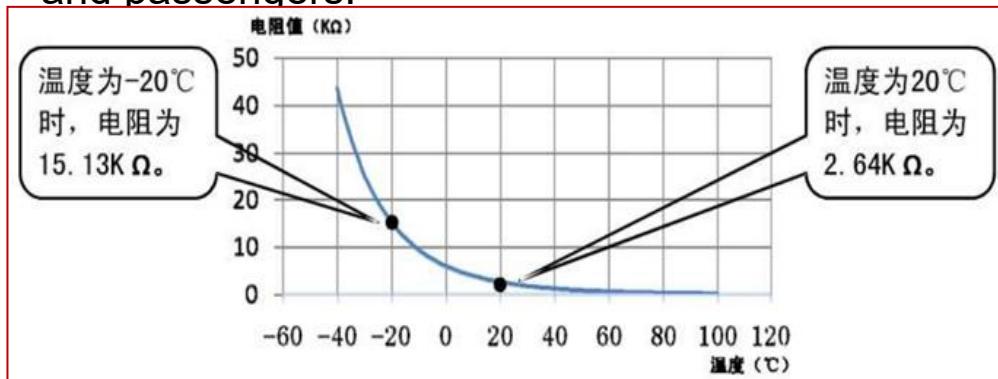
The outdoor temperature sensor is one of the signal input components of the automatic air conditioning system, which is used to detect the ambient temperature. The air-conditioning controller adjusts the temperature of the air outlet, the air volume of the air outlet, and the position of the mode damper according to the outdoor temperature, and controls the work of the compressor to maintain the temperature in the car.



## 11. Cold and warm air door control

## Indoor temperature sensor function:

The indoor temperature sensor is one of the signal input components of the automatic air-conditioning system. It is used to detect the temperature in the car and feed it back to the air-conditioning controller. The air conditioner controller regulates the air temperature and air volume of the air outlet, so that the temperature is controlled within the comfort range of the driver and passengers.



Schematic diagram of aspirated indoor temperature sensor

## 8. Internal and external circulation control

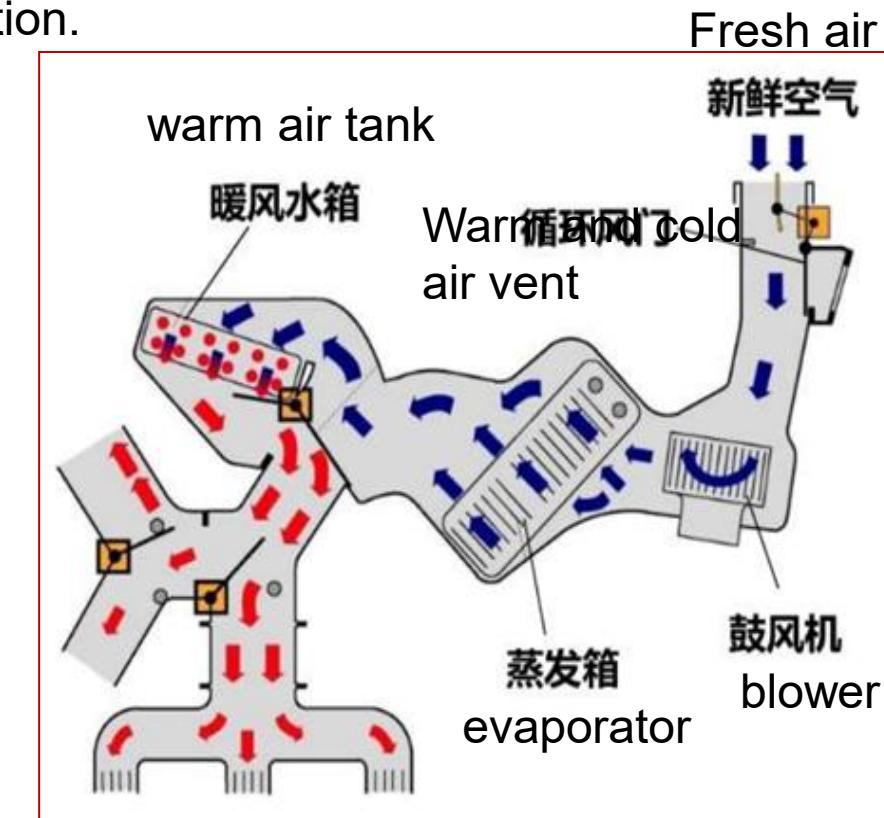
Circulating damper actuator function:

Adjust the position of the internal and external circulation dampers, the internal circulation and the external circulation.



Position sensor detection:

BDC controls the action of the micro-motor in the internal and external circulation actuator, the motor drives the damper to move, and also drives the displacement of the position sensor to change, and the BDC locates the position of the internal and external circulation damper through the change of the signal.



## 12. Three-state pressure switch

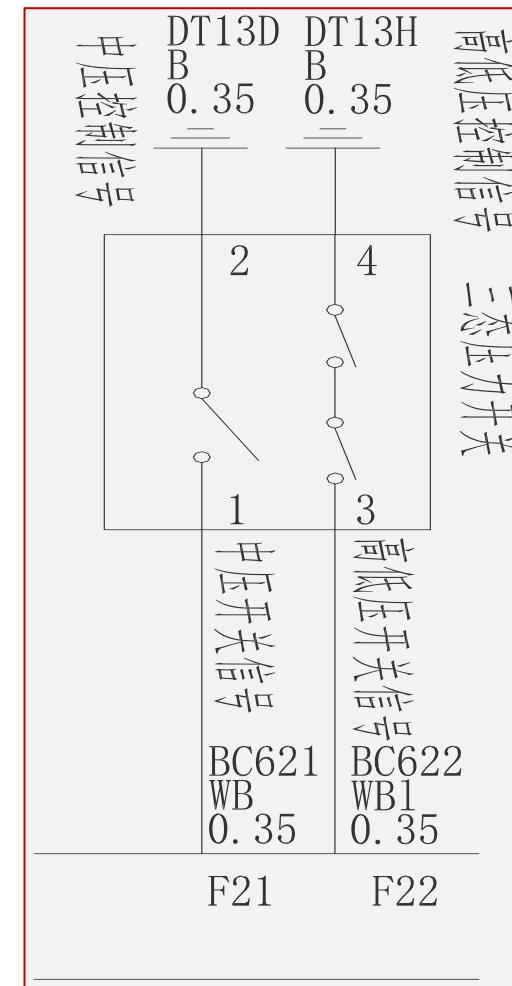
## Three-state pressure switch function:

prevent the system from being damaged by overpressure when the pressure in the air conditioning system is too high, When the system leaks, prevent the compressor from being damaged by the refrigerant oil leakage when the compressor continues to run.

When the system pressure exceeds the high and low setting range of the pressure switch, the pressure switch will cut off the compressor.

When the system pressure exceeds the medium pressure value, the pressure switch will make the electronic fan work in high gear.

high pressure	OFF : $3.14\pm0.2$ MPa
medium pressure	OFF:1.25MPa
low pressure	ON:1. 52MPa



## 12. Air conditioning system fault code

DTC	Fault code description	Repair advice
U007300	bus off	Check the bus transceiver, check if CAN H, CAN L is normal
U010087	EMS lost	Check EMS Node Status
U012187	ABS lost	Check ABS node status
U014087	BCM lost	Check BCM Node Status
U021487	PEPS is lost	Check PEPS Node Status
U018687	RRM lost	Check RRM Node Status
B111717	Battery voltage overvoltage	Check battery status
B111716	Battery voltage undervoltage	Check battery status
B170171	Mixed wind motor stalled	Check the mixing motor
B170112	Hybrid motor feedback short circuit to the power supply	Check the feedback harness
B170111	Hybrid motor feedback short circuit to the ground	Check the feedback harness
B170371	Mode Damper Motor Stalled	Check the mode damper Motor
B170312	Mode damper motor feedback shorted to power	Check the feedback harness
B170311	Mode damper motor feedback short to ground	Check the feedback harness
B170411	In-car temperature sensor short circuit to ground	Check the sensor input harness
B170415	The temperature sensor in the car is shorted to the power supply	Check the sensor input harness
B170514	Sunlight sensor shorted to ground	Check the sensor input harness
B170512	The positive sensor is shorted to the power supply	Check the sensor input harness
B170611	Evaporator temperature sensor short circuit to ground	Check the sensor input harness
B170615	Evaporator temperature sensor shorted to power	Check the sensor input harness
B170711	The ambient temperature sensor is shorted to ground	Check the sensor input harness
B170715	The ambient temperature sensor is shorted to the power supply	Check the sensor input harness
B170811	5V output shorted to ground	Check the 5V output harness
B170A92	Blower feedback abnormal	Check blower status



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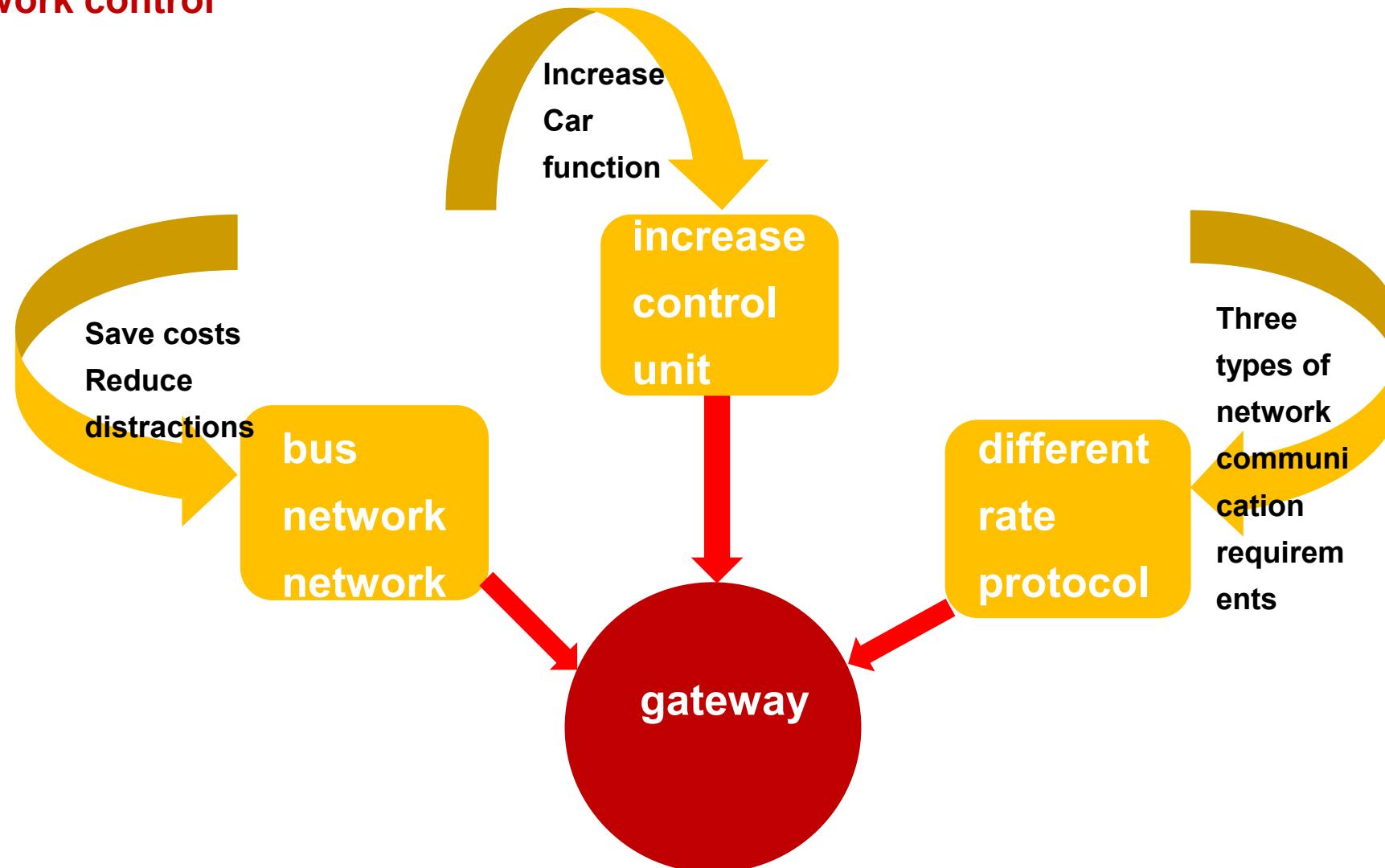
- 01 BDC overview**
- 02 BCM system**
- 03 window system**
- 04 Air Conditioning System**
- 05 Gateway system**



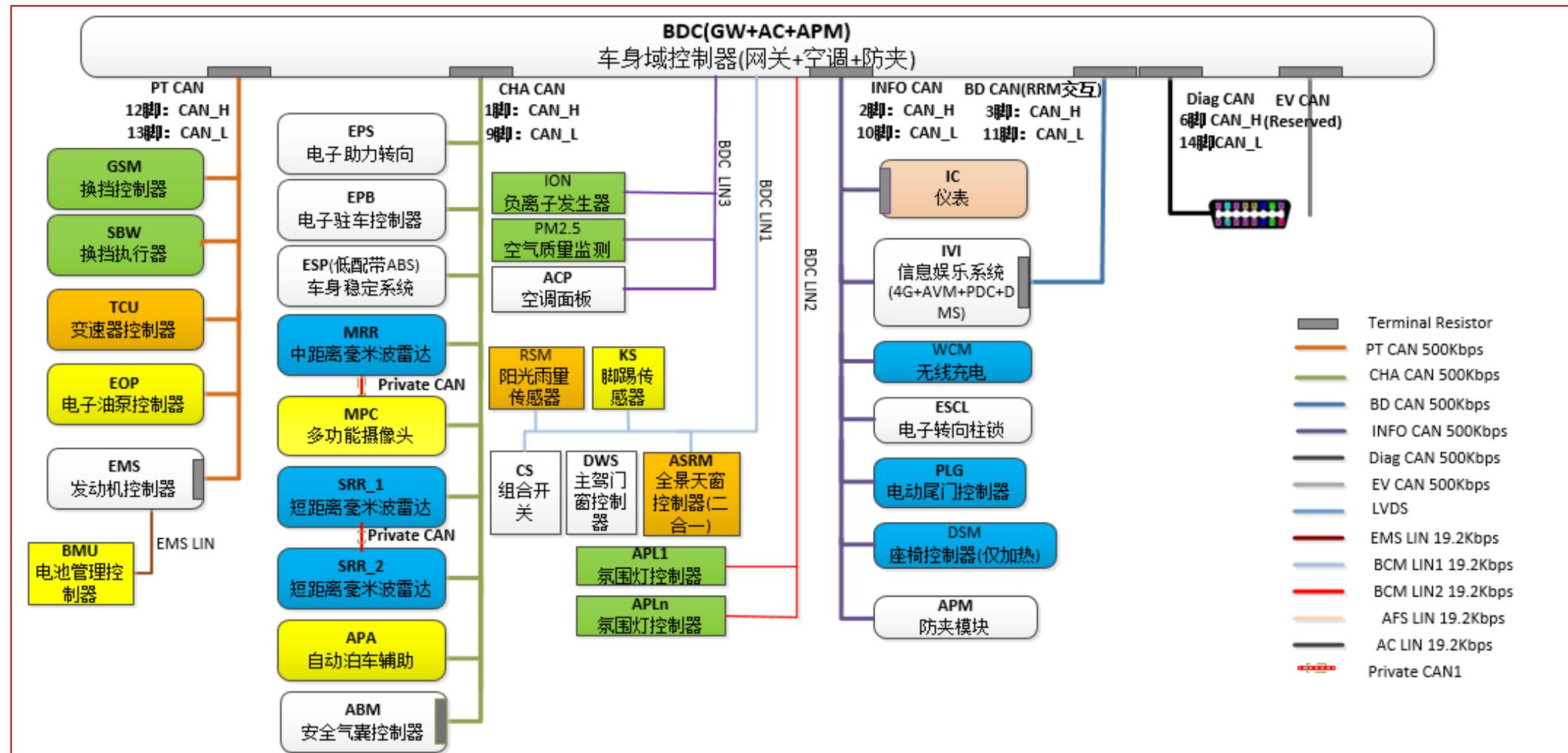
## Course targets

- Tell the characteristics of the Glory  
580PLUS BDC network system
- Master the detection method of Glory  
580PLUS BDC diagnostic seat

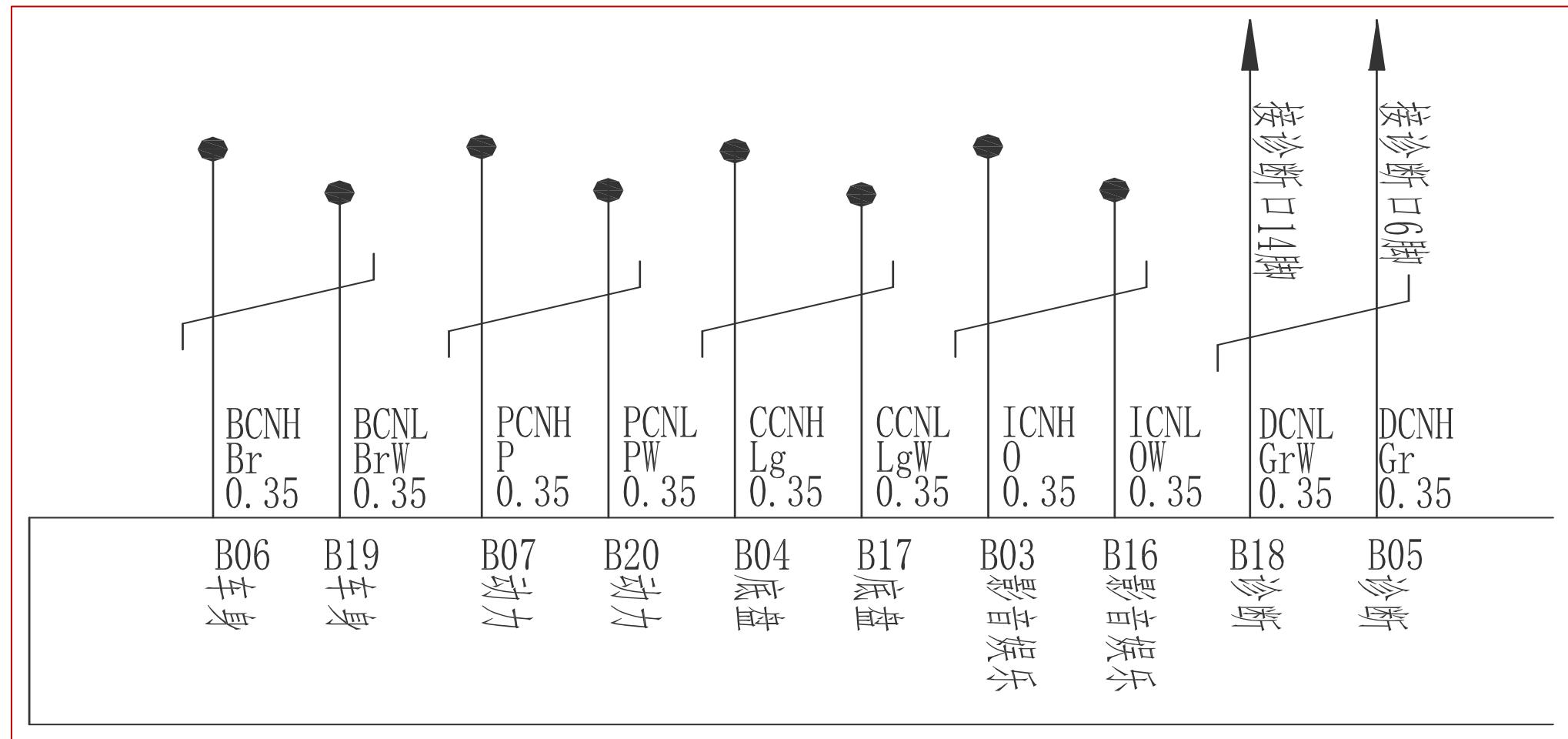
### 1. Network control



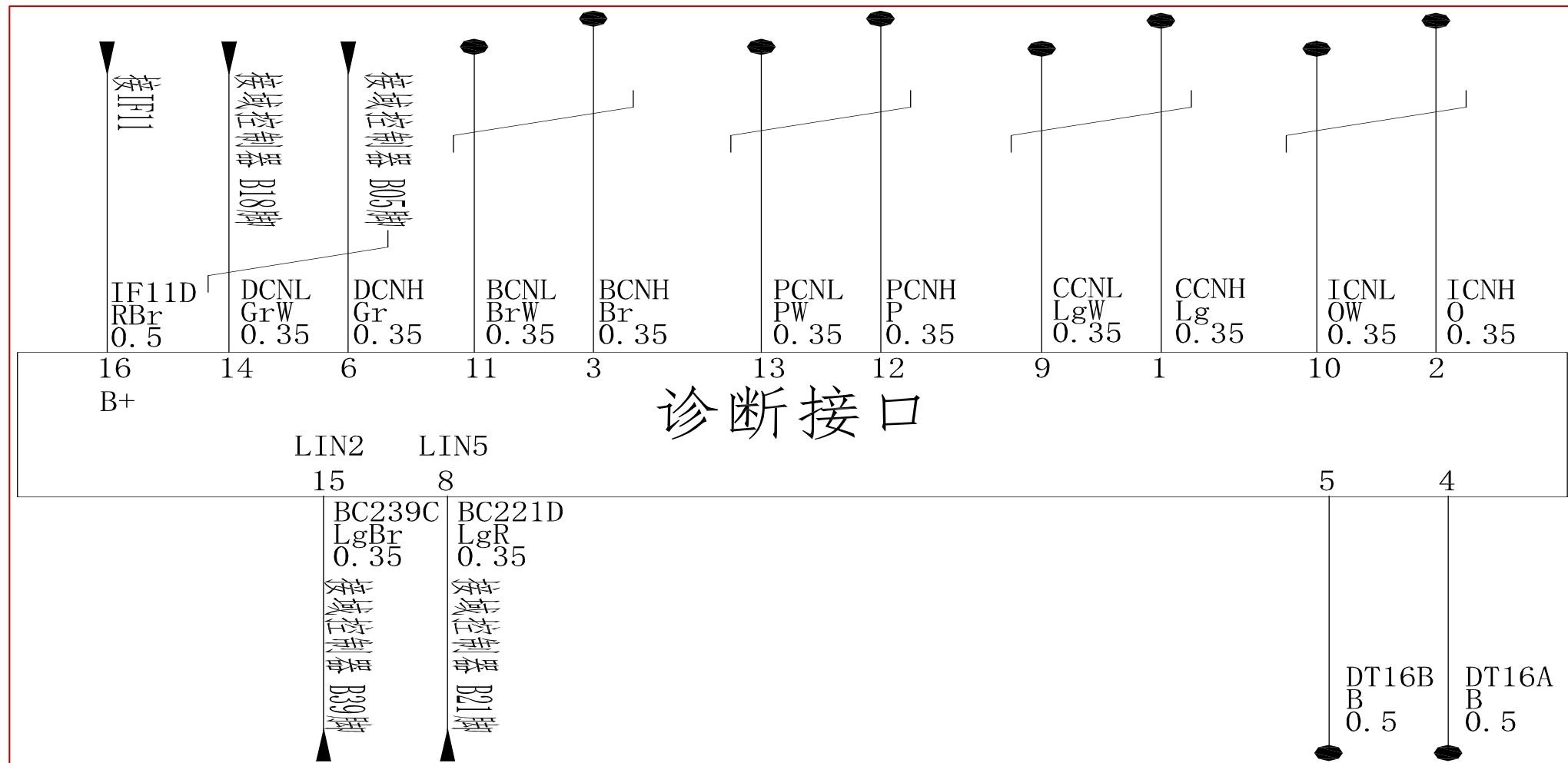
### 2. Network topology



## 3. Network Control



## 4. Diagnostic connector



## 5. Gateway system fault code

diagnostic trouble code	Fault code description	Repair advice
U007288	PT-CAN segment bus closed	Check CAN bus
U007388	Body-CAN segment bus is closed	Check CAN bus
U007487	PT-CAN segment CAN NOACK	Check CAN bus
U007587	Body-CAN segment CAN NOACK	Check CAN bus
U100687	Body-CAN segment limphome	Check CAN bus
U120387	LIN no communication	Check if the controller is online and LIN bus line
U010087	Lost communication with EMS	Check CAN bus, check EMS components
U012187	Lost communication with ABS	Check CAN bus, check ABS components
U013187	Lost communication with EPS	Check CAN bus, check EPS components
U012887	Lost communication with EPB	Check CAN bus, check EPB components
U010187	Lost communication with TCU	Check CAN bus, check TCU components
U015587	Lost communication with IC	Check CAN bus, check IC components
U011687	Lost communication with AC	Check CAN bus, check AC components
U012087	Lost communication with PEPS	Check CAN bus, check PEPS components
U014187	Lost communication with ESP	Check CAN bus, check ESP components
U012687	Lost communication with SAS	Check CAN bus, check SAS components

C O N T E N T S

01

BDC system

02

**Electric tailgate system**



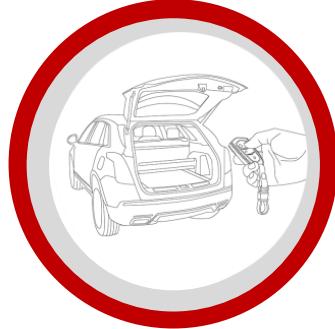
# Electric tailgate system

## Table of CONTENTS

- 01 Features of electric tailgate**
- 02 Composition of the electric tailgate**
- 03 Operation Guide for Electric Tailgate**
- 04 Repair Guide for Electric Tailgate**

## Course targets

- Be able to tell the characteristics of the electric tailgate
- Be able to understand the composition of the electric tailgate
- Master the maintenance method of electric tailgate



### Six core functions

Hand-pull and pull-down, parking monitoring, intelligent anti-pinch, intelligent adjustment, manual integration, quick installation.



### All series double rod electric suction

Double electric struts to enhance the support for the tailgate and prevent the tailgate from being deformed



### Ultra-quiet motor

Ultra-quiet motor, CVT design, built-in original shock absorption system

**The electric tailgate is a practical configuration commonly found in luxury top models. The driver can control the opening and closing of the trunk tailgate through the remote control key, pressing the vehicle**

## ➤ 2, the composition of the electric tailgate

PLG



### 1. The composition of the electric tailgate



remote key



switch



Electric tailgate control module

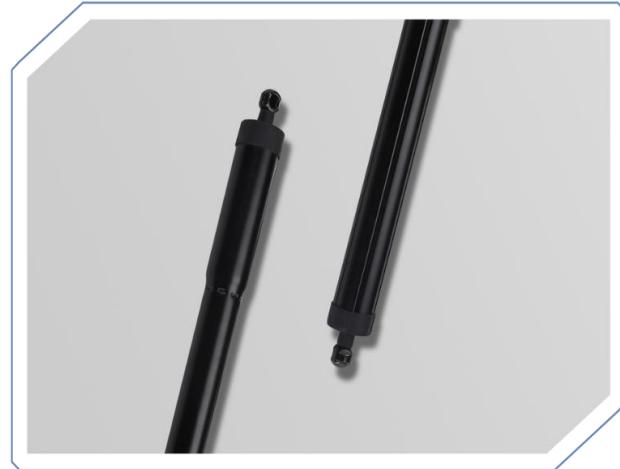


strut



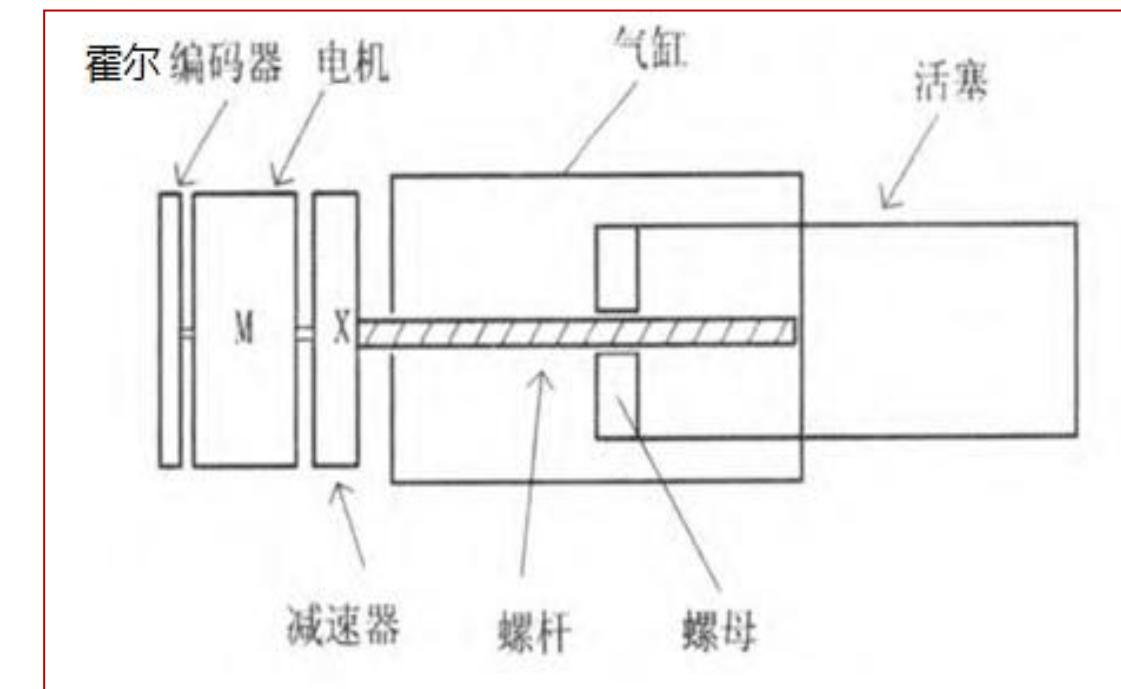
Kick sensor

#### 2. The whole series of double-rod motors



Composed of oil-gas spring and silent motor, it can reach 600,000 fatigue life.

The built-in hall sensor detects the position of the strut motor.



#### 3. Unlock motor/suction motor



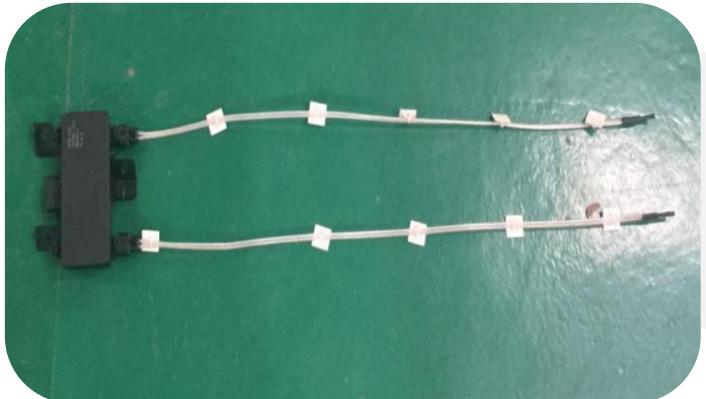
The unlocking motor performs the unlocking action, which is composed of a motor and three position switches, which detect the positions of the pawl, half-lock and full-lock respectively.

The pull-in motor performs the electric suction effect of the tailgate, pulls the tailgate to lock through the cable, and has a built-in position detection switch.

#### 4. Kick module



The kick sensor is a kind of intelligent sensor, it communicates with BCM through the Lin bus, it sends the signal of the capacity change between the capacitor and the ground to the BCM, the BCM performs the unlocking, and the BCM sends the CAN signal to the ERD (electric tailgate) The controller, the opening and tensioning is performed by the electric tailgate controller.



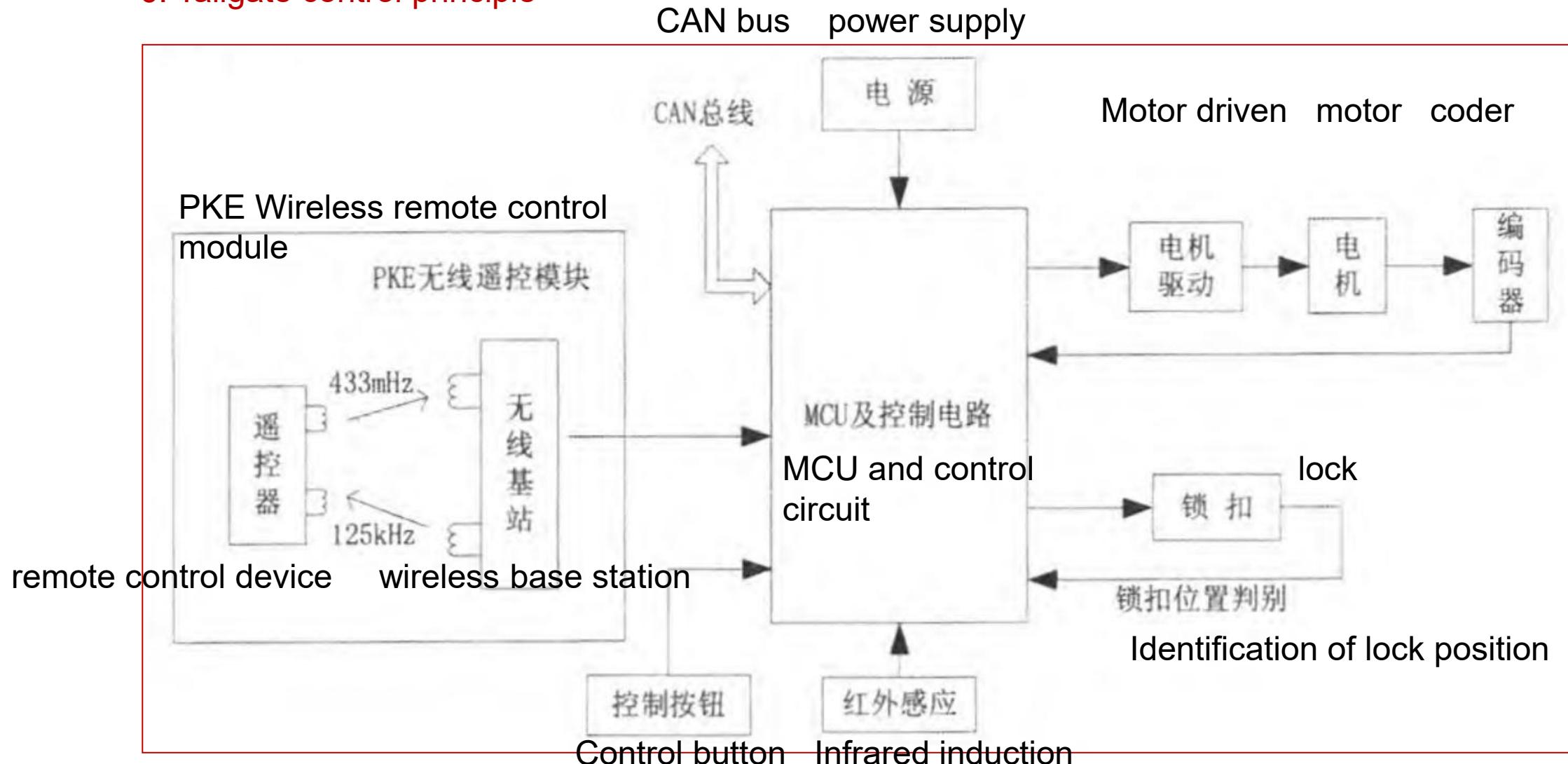
The kick sensor module is installed on the inside of the rear bumper and senses the change in capacity through two capacitive probes.

#### 5. Tailgate control module

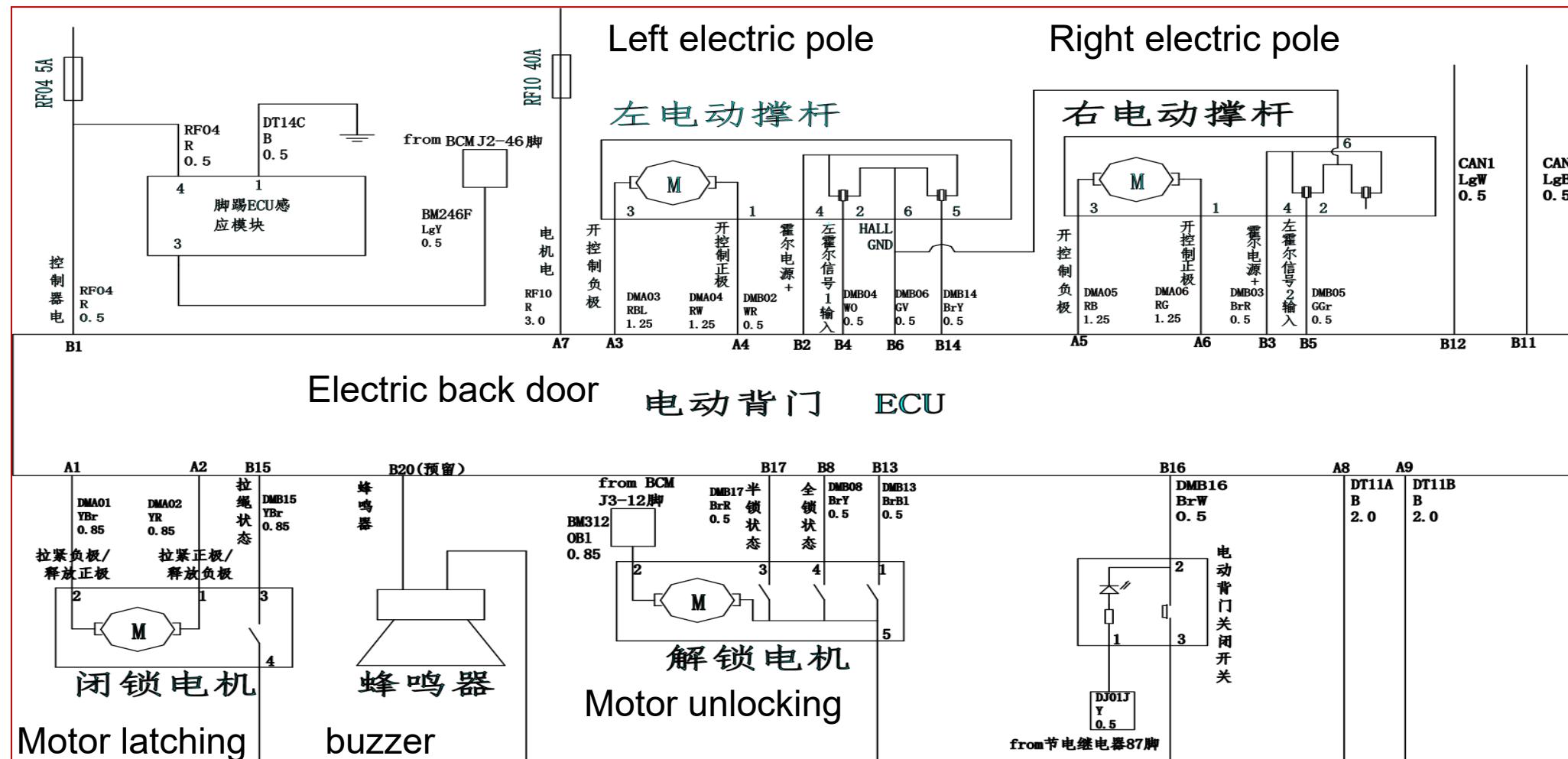


The electric controller is installed in the left rear vent hole, which is powered by battery power and connected to the body network.

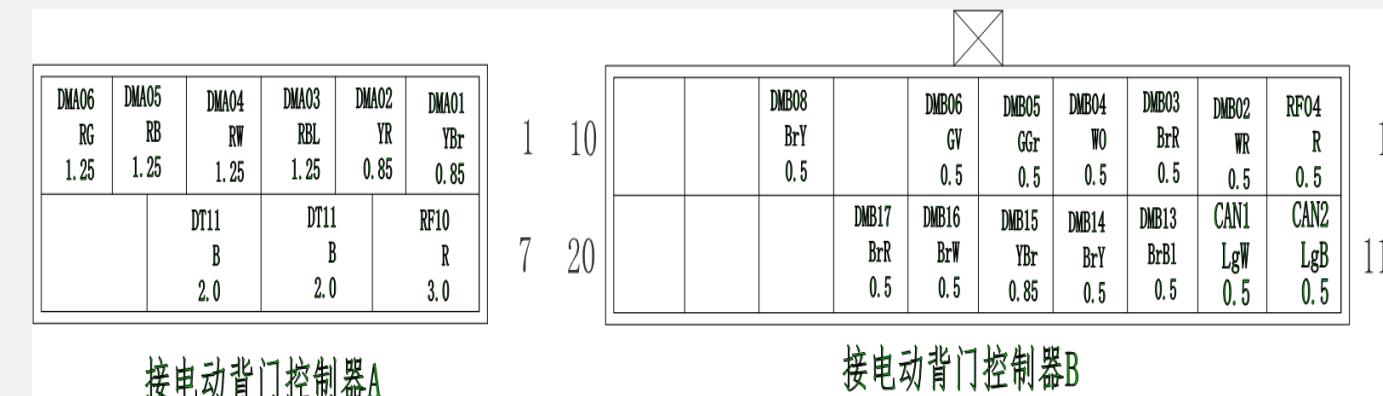
#### 6. Tailgate control principle



## 7. System circuit diagram



#### 8. Terminal arrangement

DMA06 RG 1.25	DMA05 RB 1.25	DMA04 RW 1.25	DMA03 RBL 1.25	DMA02 YR 0.85	DMA01 YBr 0.85
		DT11 B 2.0	DT11 B 2.0	RF10 R 3.0	

		DMB08 BrY 0.5		DMB06 GV 0.5	DMB05 GGr 0.5	DMB04 W0 0.5	DMB03 BrR 0.5	DMB02 WR 0.5	RF04 R 0.5
1	10			DMB17 BrR 0.5	DMB16 BrW 0.5	DMB15 YBr 0.85	DMB14 BrY 0.5	DMB13 BrBl 0.5	CAN1 LgW 0.5
7	20								CAN2 LgB 0.5

接电动背门控制器A

接电动背门控制器B

Connect to electric back door controller A\B

## 2, the composition of the electric tailgate

PLG



### 9. Terminal function

terminal	color	Terminal function
A1	YBr	Tighten Negative / Release Positive
A2	THE	Tighten positive/release negative
A3	RBL	Extend the negative pole/retract the positive pole (left pole)
A4	RW	Open the positive pole / retract the negative pole (left pole)
A5	RB	Extend the negative pole/retract the positive pole (right pole)
A6	RG	Open the positive pole/retract the negative pole (right pole)
A7	R	Motor power+B
A8	B	Ground wire
A9	B	Ground wire
A10		

terminal	color	Terminal function
B1	R	Controller Power+B
B2	WR	Left Hall sensor power supply is positive
B3	BrR	Right Hall sensor power supply is positive
B4	WO	Left Hall sensor signal 1 input
B5	GGr	Right Hall sensor signal 1 input
B6	Teache r	Left and right hall sensors are grounded
B7		
B8	BrY	Full lock state (full lock disconnected)
B9		

## 9. Terminal function

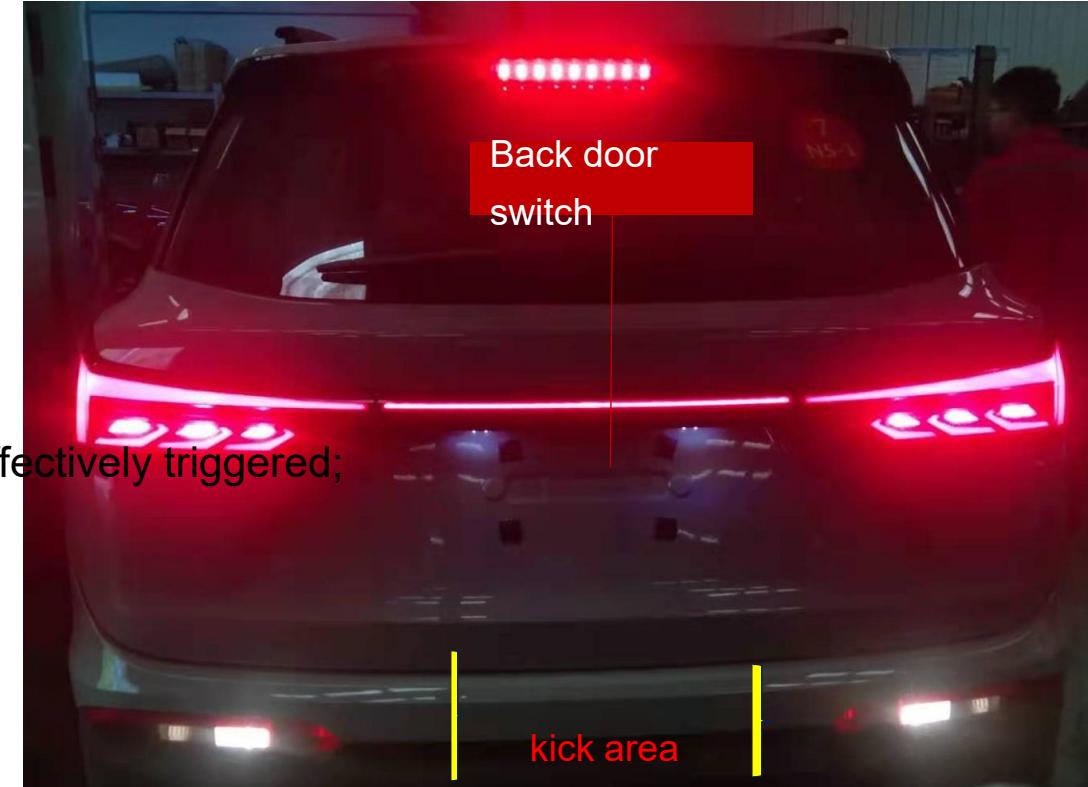
terminal	color	Terminal function
B11	LgB	Body-CANL
B12	LgW	Body-CANH
B13	BrBL	Pawl state (snap-to-open)
B14	BrY	Left Hall sensor signal 2 input
B15	YBr	Pull rope state (pull and disconnect)
B16	BrW	Electric back door closing switch
B17	BrR	Half-lock state (half-lock disconnected)
B18		
B19		
B20		

premise:

- 1) The power gear is in the non-ON gear or
- 2) When the power gear is in ON gear, the transmission gear is in P gear (automatic gear), N gear (manual gear) and the vehicle speed is less than 5km/h, the electric tailgate can normally respond to the opening or closing signal;
- 3) Effective conditions for the kick function: the remote control key is within 0.5m near the back door (the PEPS signal is effective) and an effective kick is completed

#### ◆Electric back door open

1. **The whole vehicle is locked.** The remote control key is required to be within 0.5m behind the back door for opening outside the car (operation a, b, and c), and the remote control key is not required for opening in the car (operation d). The tailgate can be opened electrically by:
  - a) Press the back door open switch;



b) The kick function is effectively triggered;

- c) Long press the remote key back door switch;
- d) Press the central control back door switch of the instrument, as shown in Figure 3.
- e) Voice control to open the back door



**2. The whole car is unlocked.** The back door can be opened electrically by:

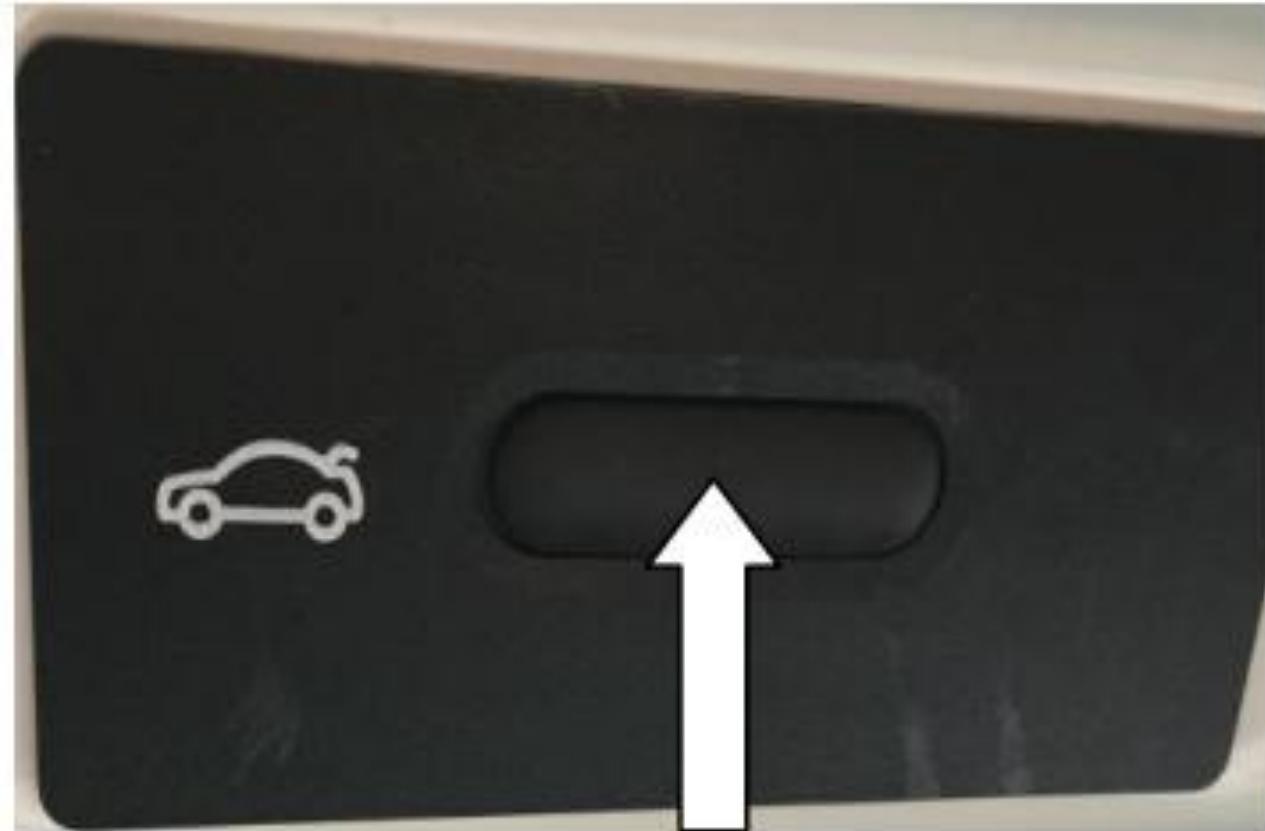
- a) Press the back door open switch; b) The kick is effectively triggered;
- c) Long press the remote control key back door switch; d) Press the instrument central control back door switch;

When the tailgate is opened, the tailgate headlight flashes and the buzzer sounds until the tailgate is opened to the maximum position, the trunk light stops flashing, and the buzzer stops beeping.

Open process hover. When the back door is opened,

- a) Press the back door open switch;
- b) Short press the back door inward switch (as shown in Figure 4);
- c) Press the central control back door switch of the instrument;

- d) The kick is effectively triggered;
- e) Short press the remote key back door switch, The back door will hover at the current position immediately, and the buzzer will beep for a long time (duration 1S). If a, b, c, d are executed again And long press the remote key back door switch to operate, the back door will move in the reverse direction, with the tailgate headlights flashing and the buzzer beeping, until the anti-pinch is triggered or the back door is completely closed.



#### ◆ Electric back door closing

1. The back door is open, and the back door can be closed electrically by the following methods:

- a) Press the back door open switch;
- b) Short press the back door inside open switch;
- c) The kick is effectively triggered;
- d) Long press the remote key back door switch;
- e) Press the central control back door switch of the instrument;
- f) Voice control to close the back door

□ When the tailgate is closed, the tailgate headlight flashes and the buzzer sounds until the tailgate is completely closed, the trunk light stops flashing, and the buzzer stops beeping.

2. Hover during closing. When the back door is closed,

- a) Press the back door open switch;
- b) Short press the back door inside open switch;
- c) Press the central control back door switch of the instrument;
- d) The kick is effectively triggered;
- e) Short press the remote key back door switch,

The back door immediately hovers at the current position, and the buzzer beeps for a long time (duration 1S). If the operations a, b, c, and d are performed again, the back door will move in the reverse direction, with the tailgate headlights flashing and the buzzer beeping until the anti-pinch is triggered or the back door is fully opened; if the remote control key is pressed for a long time, Then the back door continues to perform the closing action, with the tailgate headlight flashing and the buzzer beeping, until the anti-pinch is triggered or the back door is completely closed.

#### ◆ Electric back door anti-pinch function

In order to avoid personal injury or accidents, the electric back door is equipped with an anti-pinch function. During the opening or closing process of the electric back door, when the back door encounters a large resistance, the anti-pinch function will be triggered.

- 1) When the anti-pinch is triggered during the opening process, the back door hovers at the current position;
- 2) Trigger the anti-pinch during the closing process, and trigger the anti-pinch during the closing process;
- 3) Triggering anti-pinch during the opening or closing process is regarded as triggering hovering.

When the anti-pinch is triggered, the buzzer sounds three times.

#### ◆ Tailgate opening height learning

The user can adjust the maximum opening angle of the electric back door according to the usage conditions or usage habits. The specific operation method is: after the back door is opened, manually or electrically open the back door to the required height, press and hold the back door open switch for more than 3S, and hear a long beep (2S) from the buzzer, it means that the height learning is successful. At this time, close the back door.

When the back door is opened electrically again, the back door will open to the learning height and stop.

1. Removal and installation of door lock Removal of door lock

1) Remove the door lock decorative cover, as shown in Figure 1;



- 2) Remove the back door trim panel;
- 3) Remove the door lock installation standard (10# sleeve);
- 4) Take out the harness end connector (2 pieces)
- 5) Remove the door lock from the back door.

#### Door lock installation

- 1) Put the door lock into the back door installation position;
- 2) Connect the wiring harness connector to the door lock to ensure reliable assembly of the connector (the sound of "click" means it is in place);
- 3) Install the door lock standard and pre-tighten it;
- 4) Install the back door trim panel;
- 5) Install the door lock trim cover.

2. Dismantling of electric struts and dismantling of installation struts
  - 1) Open the back door to the maximum position;
  - 2) Remove the waterproof cover of the strut, as shown in Figure 2



- 3) Take out the connector at the wire harness end of the strut;
- 4) Support the back door with your hands or tools, and remove the strut (first take the strut at the door end, and then take the strut at the body end).

#### Installation of struts

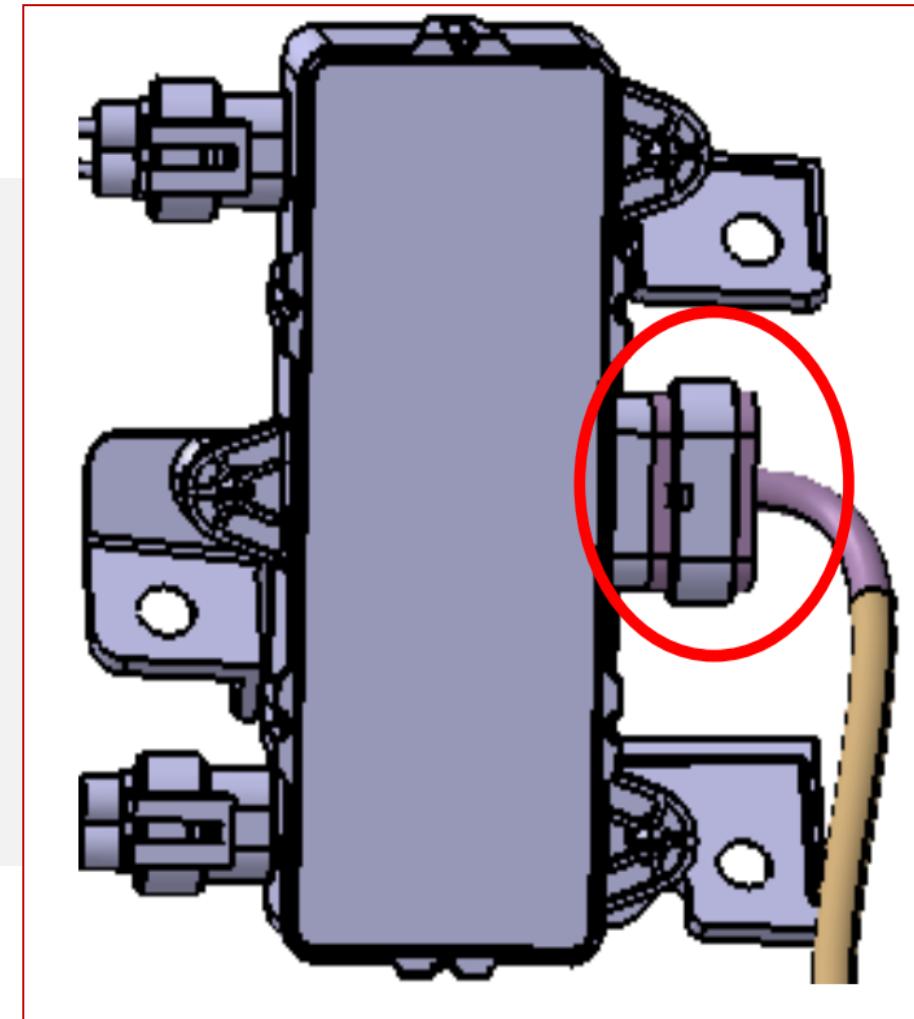
- 1) Support the back door to the maximum opening position by hand or tool;
- 2) Install the electric strut, first install the body end strut (the end with the wiring harness), and then install the door end strut.
- 3) Insert the strut connector into the installation hole of the waterproof cover, and connect it to the harness connector (if you hear a "click", it means the assembly is in place);
- 4) Install the strut waterproof cover.

Notice! Do not disassemble the electric strut to prevent injury by the internal high pressure spring.

### 3. Removal and installation of the kick sensor

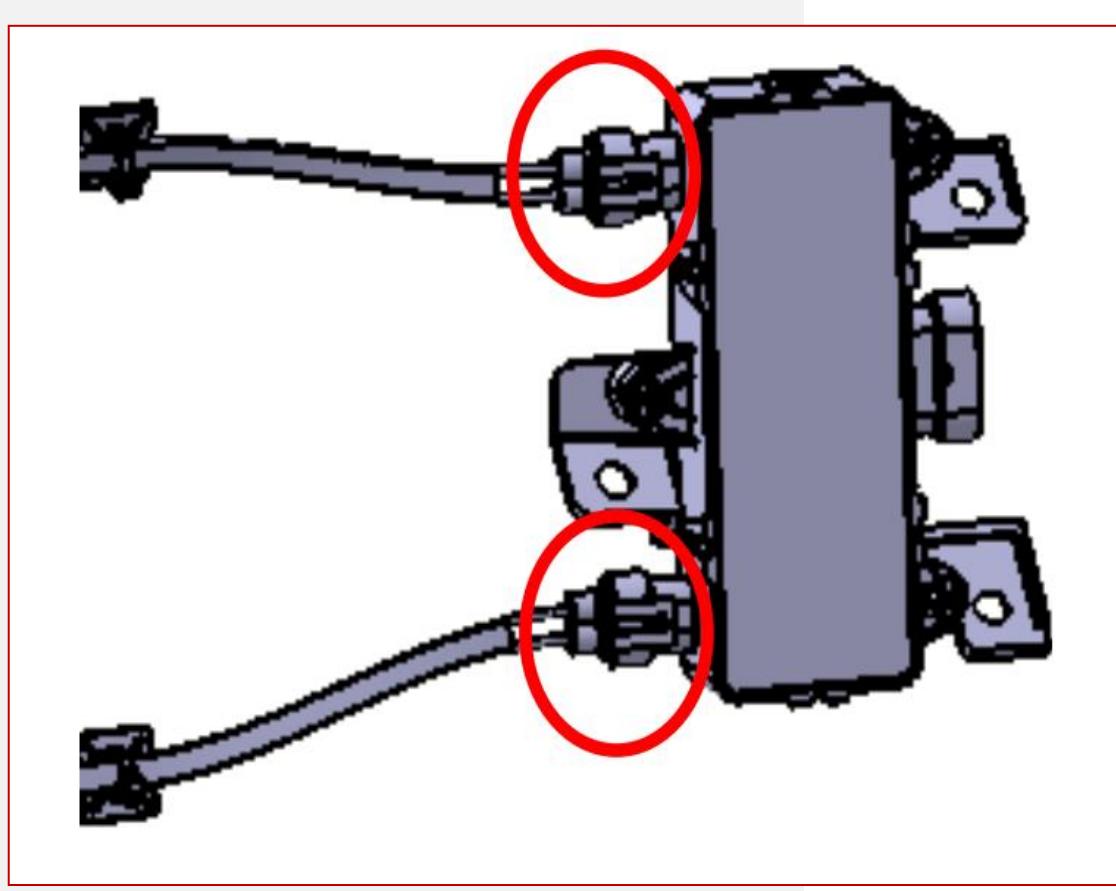
#### Removal of the kick sensor

- 1) Remove the rear bumper;
- 2) Remove the connector at the harness end of the kick controller, as shown in Figure 3;
- 3) Take out the kick controller from the rear bumper,
- 4) Remove the kick sensor antenna



## Installation of the kick sensor

- 1) Insert the kick sensor antenna into the kick sensor controller to ensure the assembly is in place, as shown in Figure 4;
- 2) Install the kick sensor controller on the rear bumper;
- 3) Paste the sensor antenna to the rear cover;
- 4) Insert the wire harness end connector into the kick controller;
- 5) Install the bumper.



#### 4. Removal and installation of the back door controller (ECU)

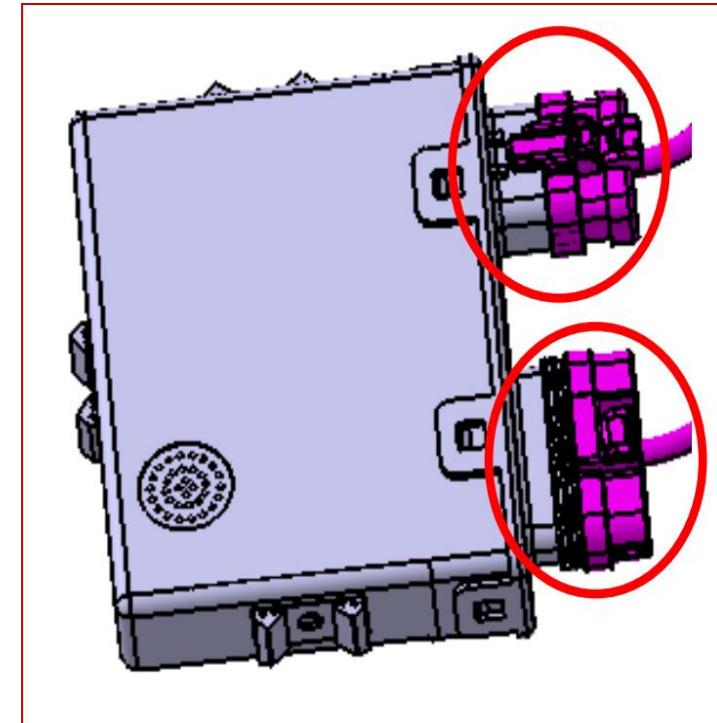
Removal of the back door controller

1) Remove the ventilation cover from the rear side panel (left), as shown in Figure 5;

2) Take out the wiring harness connectors (2 connectors) of the back door ECU, as shown in

Figure 6;

3) Remove the ECU from the back door controller mounting plate;



### Installation of the back door controller

- 1) Install the back door CEU on the back door controller mounting plate;
- 2) Connect the wiring harness connector to the ECU terminal of the back door, and it should be facing the ECU terminal when plugging in (the sound of "click" means the assembly is in place);
- 3) Install the ventilation cover to the rear side trim panel.



### Electric back door fault code

show code	describe
B111717	Digital power circuit voltage is high
B111716	Digital power circuit voltage is low
B150017	Motor power circuit voltage is high
B150116	Motor power circuit voltage is low
B150200	PCS adhesion
B150300	Electrical error of left electric strut motor
B150400	Right side pole motor electrical error
B150500	Left electric pole overcurrent
B150600	Right side pole overcurrent
B150700	Electric pole Hall power supply error
B150800	Electric strut Hall abnormality
B150900	Electric strut Hall1 abnormal
B150A00	Electric strut Hall2 abnormal
B150B00	Latch Motor Electrical Error

show code	describe
B150C00	PCM control timeout
B150D00	PCM control recovery timeout
B151000	The lock block full lock position is abnormal
B151100	The half-lock position of the lock block is abnormal
B151200	Abnormal closing speed of the back door
B151300	The back door is open for too long
B151400	The back door is closed for too long
B151500	Internal relay sticking
B151600	Abnormal power-on reset
B151700	Left and right struts are inconsistent
U014087	BCM communication lost
U012287	ESP communication lost
U007588	CAN bus failure
U100587	Network management limp home



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