

DCM门窗控制系统 DCM

2023年4月
April 2023



DCM门窗控制系统
DCM

一、架构原理

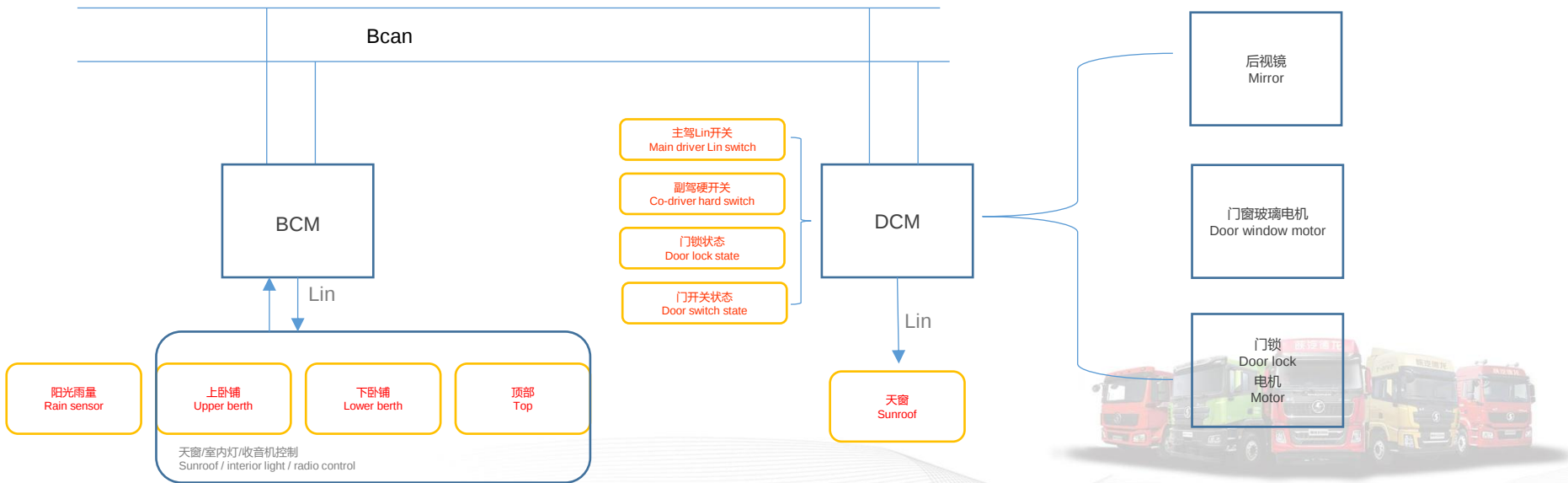
I. Architecture principle

架构：此部分主要介绍主要控制器所在网络，并点出涉及的其他交互控制器或开关。

Architecture: this section mainly introduces the network for the main control unit, and points out other interaction control units or switches that are involved.

门窗控制系统以DCM为核心，接收主驾驶侧的Lin控开关、副驾侧的硬线开关输入、接收门锁状态、门开关状态信号，驱动控制后视镜、玻璃升降、门锁闭合、踏步灯等，并承担路由天窗开启Can转Lin的功能。

DCM as the center, the system receives the Lin control switch on the main driver's side, the hardwire switch input on the co-driver side, the door lock status and door switch status signals; it drives and controls the rearview mirror, window lifting, door lock closing, and step lights. etc., and undertakes the function of turning on Can to Lin of the routing sunroof.



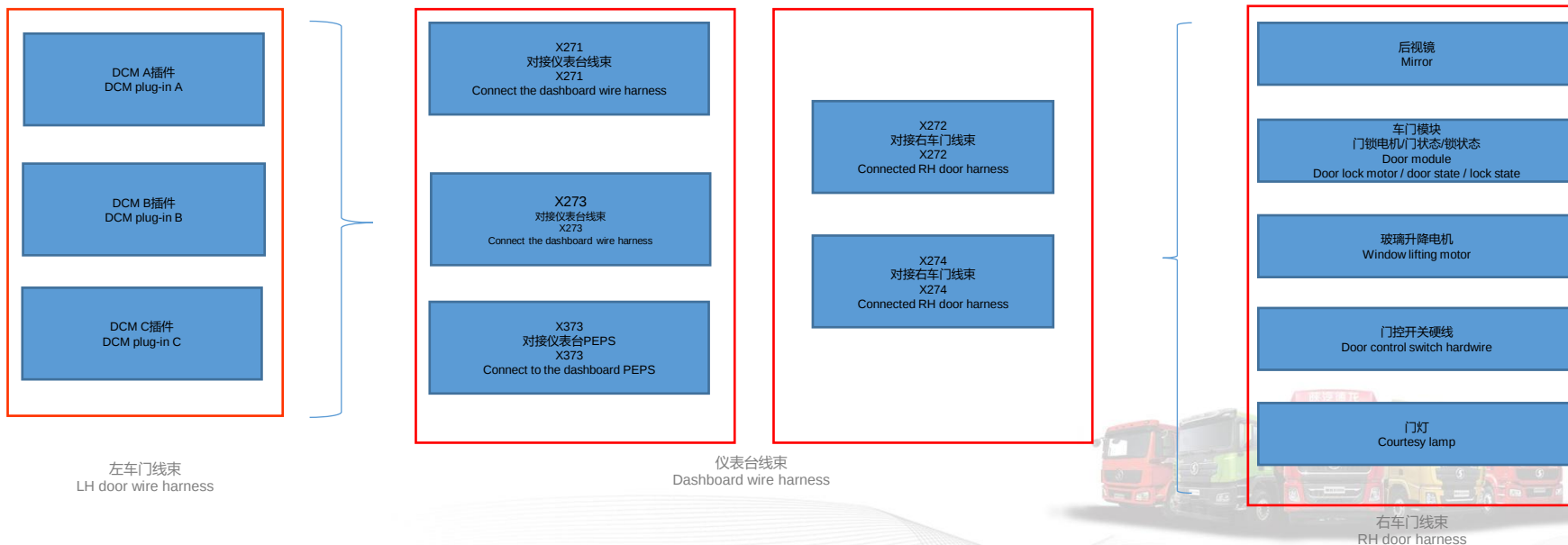
DCM门窗控制系统
DCM

一、架构原理

I. Architecture principle

线束结构：门窗系统主节点DCM在左车门线束中，安装于左侧车门，线束直接接左侧相关的门、窗、后视镜控制，包括（左门锁电机、主门控开关、左门窗玻璃电机、左电动后视镜调节、左电动后视镜记忆、左门灯）。右侧门窗系统，通过XX271和X273连接至仪表台线束，仪表台线束中转于右侧，连接右侧车门线束，对接插件未X272 和X274，对接内容与左侧对应。

Wire harness structure: the main node DCM of the door and window system is installed in the LH door wire harness, and installed in the LH door. The wire harness directly connects to relative LH door, window and rearview mirror control, including the LH door lock motor, main door control switch, LH door window motor, LH electric rearview mirror adjustment, LH electric rearview mirror memory, LH courtesy lamp. The RH door and window system is connected to the dashboard harness through XX271 and X273, which is transferred to the right side and connected to the LH door wire harness, The connector plug-ins are X272 and X274, with the connected content corresponding to LH.



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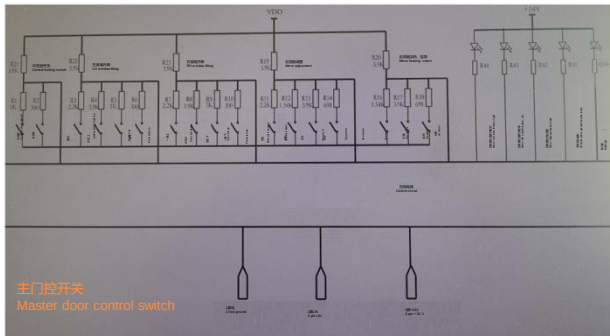
I. Architecture principle

功能定义：重点子健系统介绍、管脚定义。

Function definition: introduction of key subsystems and pin definition.

控制器管脚定义
Definition of control pin

连接器 Connector	针脚 Pin	定义 Definition	备注 Remarks
连接器A Connector A 对插编号: DZ9M2591210 82 Plug-in terminal number: DZ9M2591210 82	A-1	副驾驶侧车窗驱动输出正转 (上升) Co-driver's side window drive outputs forward moving (rising)	
	A-2	搭铁 Grounding 2	数字地 Digitally
	A-3	地1 Place 1	数字地 Digitally
	A-4	/	
	A-5	驾驶员侧车窗驱动输出正转 (闭锁) Driver's side door lock drive outputs forward moving (lockout)	
	A-6	电源1 (门锁电源) 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's side window drive outputs reverses moving (descending)	
	A-9	驾驶员侧车窗驱动输出正转 (上升) Driver's side window drive outputs forward moving (rising)	
	A-10	驾驶员侧车窗驱动输出反转 (下降) Driver's side window drive outputs reverse moving (descending)	
	A-11	后视镜除霜驱动及除霜状态指示灯驱动 Mirror defroster drive & defrosting status indication lamp drive	
	A-12	电源2 (门锁电源) Power supply 2 (door lock power supply)	15A保险 15 A fuse
连接器B Connector B 对插编号: DZ9M259121 084 Plug-in terminal number: DZ9M2591210 84	B-1	副驾驶侧车窗驱动输出反转 (门锁) Co-driver's side door lock drive outputs reverse moving (door lock)	
	B-2	/	
	B-3	副驾驶侧车窗驱动输出正转 (闭锁) Co-driver's side door lock drive outputs forward moving (lockout)	
	B-4	驾驶员侧车窗锁状态 Driver's side door lock state	模拟信号输入 Analog signal input
	B-5	左后视镜垂直位置信号 Vertical position signal of the LH mirror	模拟信号输入 Analog signal input
	B-6	右后视镜水平位置信号 Horizontal position signal of the RH mirror	模拟信号输入 Analog signal input
	B-7	右后视镜垂直位置信号 Vertical position signal of the RH mirror	模拟信号输入 Analog signal input
	B-8	/	
	B-9	/	
	B-10	/	
	B-11	副驾驶侧车窗锁状态 Co-driver side door lock state	模拟信号输入 Analog signal input
	B-12	副驾驶侧车门开关状态 Co-driver side door switch state	模拟信号输入 Analog signal input
	B-13	驾驶员侧车门开关状态 Driver's side door open status	模拟信号输入 Analog signal input
	B-14	/	
	B-15	左后视镜水平位置信号 Horizontal position signal of the LH mirror	模拟信号输入 Analog signal input
	B-16	副驾驶侧门锁开关 Co-driver side door and window switch	模拟信号输入 Analog signal input
	B-17	AGAN	模拟信号 Simulated
	B-18	/	
	B-19	/	
	B-20	驾驶员侧车窗驱动输出反转 (开锁) Driver's side door lock drive outputs reverse moving (unlock)	

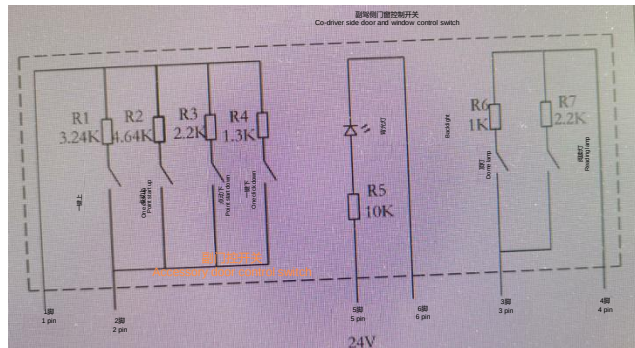


连接器C Connector C 对插编号: DZ9M259121085 Plug-in terminal number: DZ9M259121085	C-1	CANL
	C-2	LIN
	C-3	驾驶员侧后视镜左右调节驱动 Driver's side rearview mirror L/RH adjustment drive
	C-4	副驾驶侧后视镜左右调节驱动 Co-driver's side rearview mirror L/RH adjustment drive
	C-5	副驾驶侧后视镜公共端 Co-driver's side rearview mirror common terminal
	C-6	驾驶员侧后视镜公共端 Driver's side rearview mirror common terminal
	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	副驾驶侧后视镜上下调节驱动 Co-driver's side rearview mirror up and down adjustment drive
	C-12	驾驶员侧后视镜上下调节驱动 Driver's side rearview mirror up and down adjustment drive
	C-13	/
	C-14	/
	C-15	/
	C-16	门灯开关 Door switch

PIN脚定义:
PIN definition:

天窗电机
Sunroof motor

PIN NO	描述 Description	说明 Description
1	+BAT	Imax ≤ 11A Imax ≤ 11A
2	GND	Imax ≤ 11A Imax ≤ 11A
3	LIN	LIN BUS
4	IGN	高电平触发 High level division
5	GLOSE	低电平触发 Low level trigger
6	UP/OPEN	低电平出发 Low level start



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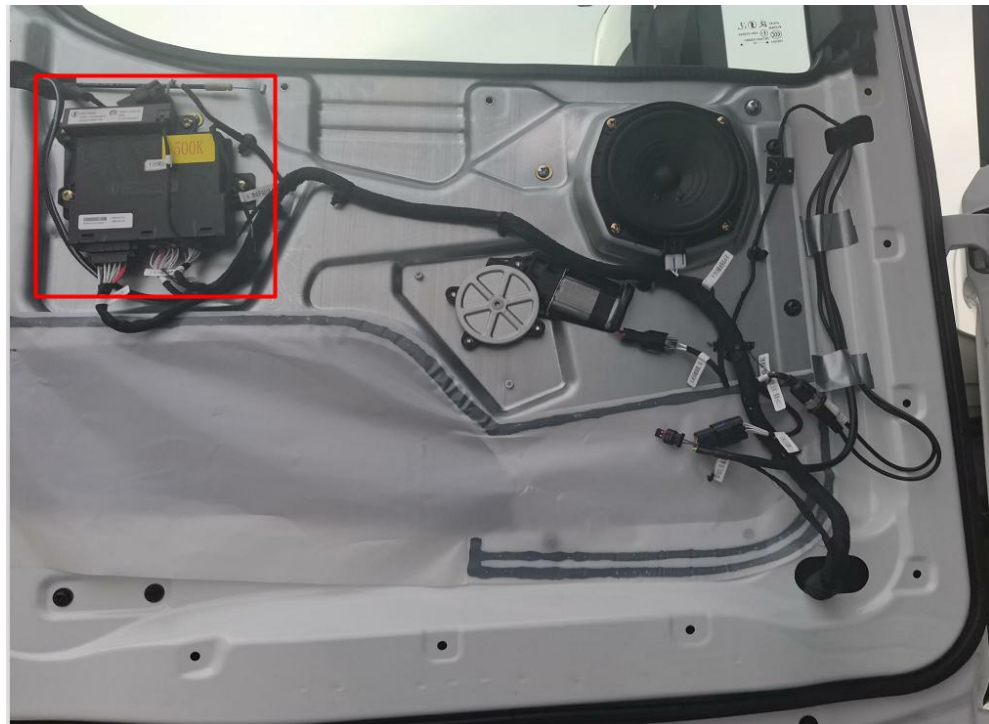
I. Architecture principle

安装布置:

Installation arrangement:

DCM控制器安装于左侧车门内部。

The DCM control unit is installed inside the LH door.



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门控开关:

Door control switch:

左右对称, 但左侧可以实现后视镜控制、室内灯控制, 不同点在于, 左主门控开关是Lin控开关, 只接电、地、Lin; 右侧是硬线开关, 需要DCM输入模拟地, 经过内部电阻控制, 输出模拟信号进入DCM, DCM根据电阻变化判断命令指令主门控实现中控锁开关、左右玻璃升降、后视镜调整、加热、选择等功能; 副门控开关只能控制本侧的玻璃升降, 多一项本侧灯光(顶灯和阅读灯)控制, 灯光控制信号均来自BCM回馈至BCM。

The LH and RH are symmetrical, but LH can realize rearview mirror control and indoor light control. The difference lies in that the LH main door control switch is a Lin-controlled switch, which only connects to power, ground and Lin; the RH is a hardwire switch that requires DCM input simulated ground, which is controlled by the internal resistance and outputs analog signals into the DCM. The DCM judges the orders, commands and the main door control to implement functions such as central lock switch, LH/RH window lifting, rearview mirror adjustment, heating, selection, etc., according to changes of the resistance; the auxiliary door control switch can only monitor window lifting of this side, with one more control of lighting (dome lamp and reading lamp) on this side, the signals of which all come from BCM and feedback to BCM.



DCM门窗控制系统
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二、功能逻辑

II. Functional logic

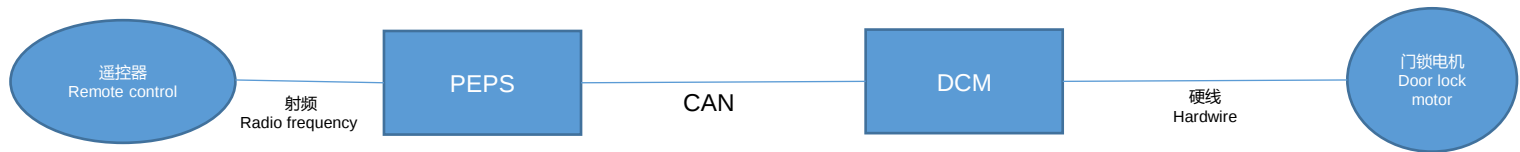
配置字管理功能：电动后视镜调节、后视镜及座椅记忆、电动后视镜除霜、紧急启动熄火

Configuration bits management functions: electric rearview mirror adjustment, rearview mirror and seat memory, electric rearview mirror defrosting, emergency start and flameout

门窗控制器，实现车门的开闭锁控制、门锁电机热保护、门及锁状态反馈、门窗玻璃升降，后视镜上下/左右调节、后视镜除霜。后视镜记忆、门灯控制等功能。

DCM realizes door unlock / lock control, door lock motor thermal protection, door and lock status feedback, door window lifting, rearview mirror up / down / LH / RH adjustment, rearview mirror defrosting, rearview mirror memory, courtesy lamp control and other functions.

- 遥控闭锁开锁：通过遥控器和PEPS射频通讯，再由PEPS和DCM进行Can通讯，最终实现凯苏闭锁指令。
Remote control lockout and unlock: with the remote control and PEPS radio frequency communication, and Can communication between PEPS and DCM, Kaisu lockout command is finally achieved.



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II. Functional logic

门锁控制：包括门锁的开启锁控制，以及门锁状态反馈输出。

Door lock control: including the unlock / lock control, and the feedback output of the door lock state.

控制电机正反转，电机运行带动锁止机构，机构输出锁的状态给DCM，
门开闭状态开关是单独开关，集成在门锁系统之内。

Control the forward and reverse rotation of the motor. The motor operates and drives the locking mechanism, which outputs the lock status to the DCM.

The door switch for opening and closing states is a separate switch integrated inside the door lock system.

接控制来源包括 多媒体屏、PEPS系统、本地开关等，但本地开关优先级最高。

Direct control sources include multimedia screens, PEPS systems, local switches, etc., but the local switch has the highest priority.

闭锁原则：门关有效，且锁未闭合锁止。

Lockout principle: the door is closed effectively and the lock is not closed and locked.

开锁原则：门为关闭状态，锁已闭合。 Unlock principle: the door is in an OFF status and the lock is closed.

机械闭锁（同闭）：所有车门均为关闭状态、主驾门锁状态从无效变为有效

Mechanical lockout (same with closed): all doors are closed, and the main driver's door lock status changes from invalid to valid.

机械开锁（同开）：所有车门均为关闭状态、主驾门锁状态从有效变为无效

Mechanical unlock (same with opening): all doors are closed, and the driver's door lock status changes from valid to invalid



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二、功能逻辑

II. Functional logic

玻璃升降控制

Window lifting control

DCM输出两根单独线束，直接接玻璃电机，通过颠倒两根线束正负电压，实现正转与反转，表现为玻璃上升与下降。

The DCM outputs two separate wire harnesses, which directly connect to the window motor. By inverting the positive and negative voltages of the two wire harnesses, the forward and reverse rotations are realized, displaying window lifting and descending.

主驾玻璃升降：ACC电有效，且期间电机驱动电流异常，也会停止上升。

Main driver window lifting: with effective ACC power and abnormal motor drive current during the period, it will also stop rising.

副驾玻璃升降：条件类似主驾，但副驾一键升窗，可以通过主驾、也可以通过副驾执行。

Co-driver window lifting: with the similar conditions as those of the main driver, but the one-key window lifting of the co-driver can be performed by both the main driver and the co-driver.

钥匙关闭后手动升降：ACC档断电90S内仍可以通过主驾或副驾的玻璃上升开关控制。

Manual lifting after turning off with the key: within 90 s of the ACC gear power off, it can still be controlled with the window lifting switch of the main driver or the co-driver.

多媒体升降玻璃：可以通过多媒体软开关升降玻璃。

MMI lifting window: the window can be lifted with the MMI soft switch.

PEPS升降玻璃：分为一键上升和一键下降。需要PEPS和DCM认证。

PEPS lifting window: it is divided into one-key lifting and one-key descending, and PEPS and DCM certification are required.



DCM门窗控制系统
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二、功能逻辑

II. Functional logic

后视镜控制

Mirror control

包括左右两个后视镜的左右、上下调节。

Including the LH / RH and up / down adjustment of the two LH / RH rearview mirrors.

后视镜控制开关属于门控开关，HD平台随车型不同有两种开关，自复位式和自锁式。

通过开关发送的标志信号识别，标志信号平台类型为2时表示L平台自锁式开关，其他为自复位开关。

The rearview mirror control switch refers to a door control switch. The HD platform is provided with two types of switches depending on the vehicle model, self-resetting and self-locking.

It is identified with the sign signal sent by the switch. When the sign signal platform type is 2, it means the self-locking switch of the L platform, and others are self-resetting switches.

左后视镜上下左右调节：ACC电有效、左后视镜选择开关有效且右选择开关无效；

Up / down and LH / RH adjustment of LH rearview mirror: valid ACC power, valid LH rearview mirror selecting switch, and invalid RH selecting switch;

调节：分为左右调节、上下调节，一共三个针脚，一个公共端，一个上下驱动，一个左右驱动，公共端与另两个通过正反电瓶信号实现不同调节（上下左右）功能。

上控制：上下电机高有效、公共端低有效；**下控制：**上下电机低有效、公共端高有效。

左控制：左右电机置低、公共端置高；**右控制：**左右电机置高，公共端置低。

Adjustment: it is divided into LH / RH adjustment, up / down adjustment, with a total of three pins, one common terminal, one up / down drive, and one LH / RH drive; the common terminal with the other two achieves different adjustment (up, down, LH, and RH) functions through positive and negative battery signals.

Up control: active-high for the upper and lower motors, and active-low for the common terminal; **Down control:** active-low for the upper and lower motors, and active-high for the common terminal.

LH control: set the LH/RH motors low and set the common terminal high; **RH control:** set the LH/RH motors high and set the common terminal low.

且上下电机驱动电流异常，也会退出上下控制。

In addition, if the drive current of the upper and lower motors is abnormal, they will also exit the upper and lower control.

右视镜上下左右控制：与左后视镜一样，区别在与选择开关只能选择右后视镜。

Up / down and LH / RH control of RH rearview mirror: it is the same as the LH mirror, with the difference in that the selecting switch only selects the RH rearview mirror.

*多媒体上有后视镜选择，操作原理与门控开关一致。

*There is a rearview mirror option on the multimedia, with the same operating principle as the door control switch.



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二、功能逻辑

II. Functional logic

倒车时后视镜自动调节:

Automatic adjustment of the rearview mirror during reversing:

针对右后视镜, 主要是上下调节, 也可以左右调节。

倒车时可以驱动后视镜调节位置增大倒车视野, 调节的位置, 程序中有默认设置, 还可以通过自学习适应不同车辆驾驶员, 最终仍可以恢复出厂设置。该功能在退出倒挡后自动恢复之前的位置, 过程中不涉及车速条件。

As for the RH mirror, it is mainly up / down adjusted, but can also be LH / RH adjusted.

During reversing, drive the mirror adjustment position to increase the reversing field of vision. The adjusted position is set by default in the program, or it can be adapted to different vehicle drivers through self-learning, and eventually be restored to factory settings. This function automatically restores to the previous position after exiting the reversing gear, the process of which does not involve the vehicle speed conditions.

针对普通后视镜和记忆后视镜两种硬件, 实现方式不一样。两种后视镜通过有无后视镜位置反馈信号区分(硬线模拟量信号)。

As for the two hardware types of ordinary mirror and memory mirror, the implementation methods are different. The two mirror types are distinguished by the position feedback signal of the mirrors (hardwire analog signal).

该功能起作用时, 不能有选择门控开关、多媒体开关对后视镜选择, 仅针对右视镜。

When the function is effective, do not select the door control switch and the multimedia switch for the rearview mirror, but it is only for the RH mirror.

注: 在带挂车或者驾驶员不习惯该功能时, 可以通过多媒体关闭。

Note: when driving with a trailer or the driver is not accustomed to this function, it can be turned off with multimedia.



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二、功能逻辑

II. Functional logic

后视镜除霜

Mirror defrosting

根据开关不同逻辑略有不同：

The logic is slightly different depending on the different switches:

自复位式开关：后视镜加热开关有效后，最长工作15min，期间开关再次有效也会退出加热。

Self-resetting switch: when the rearview mirror heating switch is effective, it works for 15 minutes at most, during which period it will exit heating even if the switch becomes effective again.

自锁式开关：后视镜加热选择有效后1min内，选择信号无效，取消加热；否则后视镜持续加热，但最多也只加热15min。

Self-locking switch: within 1 minute after the rearview mirror heating selection is effective, stop heating when the selecting signal is invalid; otherwise, the mirror continues heating, with but 15 minutes at most.

加热：只输出加热正极线束控制，负极接地。

Heating: it only outputs heating with positive wire harness control, the negative harness being grounded.

在发动机启动瞬间加热停止后续再恢复，具体识别是后视镜加热过程中，如果ACC从有效变无效（停止加热），在10S之内，监测与Start信号有效，会保留前加热时间。

In the moment of engine start, the heating stops and then resumes. The specific identification is that during the mirror heating process, the previous heating time shall be retained with the effective monitoring and Start signal within 10 s, if ACC changes from valid to invalid (stop heating).

后视镜记忆

Mirror memory

通过开关或者命令报文，根据后视镜模拟量输入，记忆当前位置，在需要时通过一键复位，直接恢复到默认位置。

The current position will be kept in memory according to the mirror analog input, by means of switches or command messages. When necessary, it will directly restore to the default position with the one-key reset.



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二、功能逻辑

II. Functional logic

遥控器控制

Control by the remote control

遥控目前主要是车门开闭锁、升降玻璃，门控模块自带接收天线，可以接收来自遥控器的RKE信号，完成匹配验证后，可执行相应功能。

At present, the remote control is mainly used for door unlock / lock and window lifting. The door control module is provided with a self-contained receiving antenna, which receives RKE signals from the remote control. After the matching verification is completed, the corresponding functions can be executed.

闭锁: ACC无效，按下遥控500ms至3S，且门锁未锁；但执行闭锁高驱2S后或者驱动电流大于3A超过500ms，都会自带退出。

Lockout: when ACC is invalid, press the remote control for 500 ms to 3 s, and the door lock is unlocked; but after executing the lock high drive for 2 s or the drive current is greater than 3 A for over 500 ms, it will automatically exit by itself.

开锁: ACC无效，按下遥控500ms至3S。

开闭锁亮灯: 开闭锁时DCM还会同时发送报文给BCM，用于驱动左右转向灯闪烁。

Unlock: as for invalid ACC, press the remote control for 500 ms to 3 s.

Unlock / lock light up: during unlock / lock, DCM will send messages to BCM at the same time for driving flashing of the LH / RH turn signal lamp.

一键升降玻璃

One-click lifting the window

ACC无效，闭锁或开锁信号连续有效3S以上。

When ACC is invalid, the lockout or unlock signal will be continuously valid for more than 3 seconds.

控制玻璃升降的同时，会驱动LIN的天窗工作。

While controlling the window lifting, it will also drive the LIN sunroof to work.

门灯控制

Courtesy lamp control

DCM输出1根单独线束，控制门灯电源，其地线公共用。

DCM outputs 1 separate wire harness to control the power supply of the courtesy lamp, with its ground wire for common use.

