



东风乘用车

# 电动车窗、天窗和后视镜



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# Electric Windows, Sunroof, and Rearview Mirrors



- 1、熟悉E70电动车窗、天窗和后视镜的组成及各部件的功用
- 2、熟悉E70电动车窗、天窗和后视镜的工作原理
- 3、能对E70电动车窗、天窗和后视镜进行电路的故障诊断与排除
- 4、掌握E70电动车窗、天窗和后视镜相关部件的拆装更换方法及注意事项



1. Familiar with the compositions of the E70 electric windows, sunroof, and rearview mirrors and functions of their components
2. Familiar with the working principles of the E70 electric windows, sunroof, and rearview mirrors
3. Troubleshoot the E70 electric windows, sunroof, and rearview mirrors
4. Master the removal and refitting and replacement methods and precautions of the E70 electric windows, sunroof, and rearview mirrors

# 一、 E70电动车窗、天窗和后视镜概述



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**作用：**通过对车窗上下、天窗开关、后视镜片上下左右角度的电动调节，给驾驶员的操作提供便利

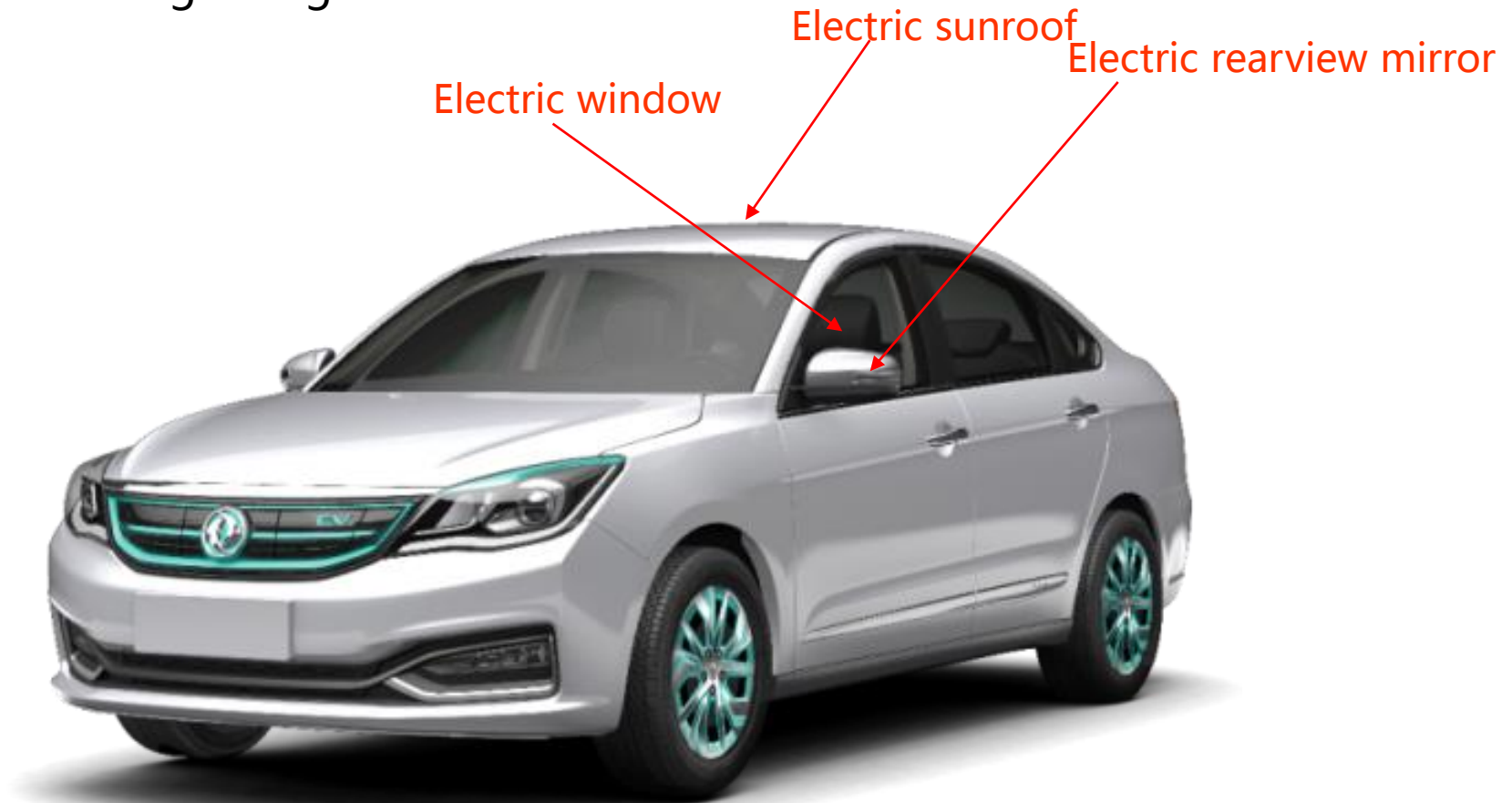


# I. Overview of E70 electric windows, sunroof, and rearview mirrors



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**Function:** Facilitate the operation of the driver through the electric adjustment of up and down of windows, opening and closing of the sunroof, and up and down and left and right angles of the rearview mirror lens.

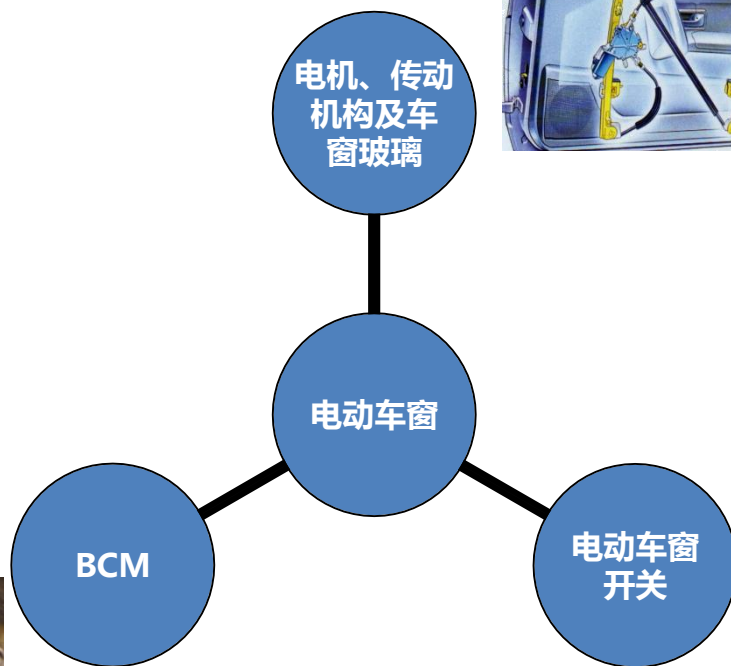


## 二、E70电动车窗结构特点



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### 电动车窗组成

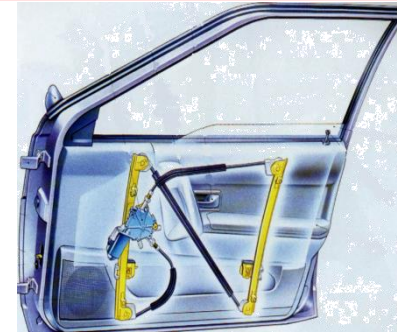
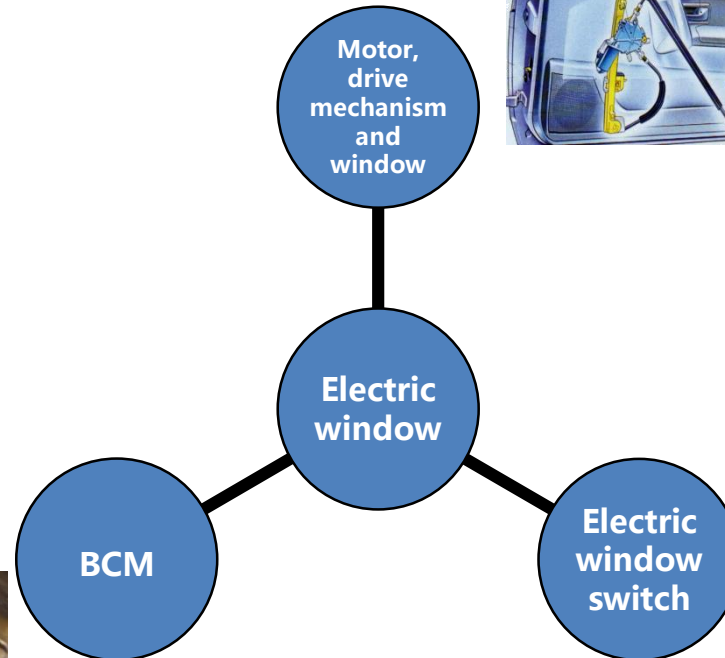


## II. Structure features of E70 electric windows



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### Composition of electric window





# 三、E70电动车窗工作原理及电路图



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## 一键升降电动防夹车窗

车窗自动防夹，当驾驶员侧电动车窗在上升过程中被障碍卡住时，车窗将自动下降150mm。

### 驾驶员侧电动车窗初始化

- ①将点火开关转至ON位置。
- ②将车窗玻璃停留在上升超过一半位置上。
- ③然后按住开关（第二档）将玻璃下降至极限位置并保持5 秒钟，
- ④抬起开关（第二档）将玻璃上升至极限位置并保持5 秒钟，初始化完成。



提示：断开蓄电池接线柱或电动车窗开关插头后，车窗一键升和防夹功能就会取消，需要执行模块初始化来激活。

### III. Working principle and circuit diagram of E70 electric windows



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#### Electric window with one-key control and anti-pinch function

The window is automatically anti-pinch, and when the driver's side electric window is caught by the obstacle during the lifting, the window will automatically drop by 150 mm.

Initialization of driver's side electric window

- ① Turn the ignition switch to "ON" position.
- ② Keep the window stopping at a position where more than half lifting has been realized.
- ③ Then press and hold the switch (second gear) to lower the window to the limit position and keep it for 5s.
- ④ Pull up the switch (second gear) to lift the window to the limit position and keep it for 5s; afterwards, the initialization is completed.



Tip: After disconnecting the battery terminal or the electric window switch plug, the one-key control and anti-pinch functions of the window will be deactivated and needs to be activated by the module initialization.

### 三、E70电动车窗工作原理及电路图

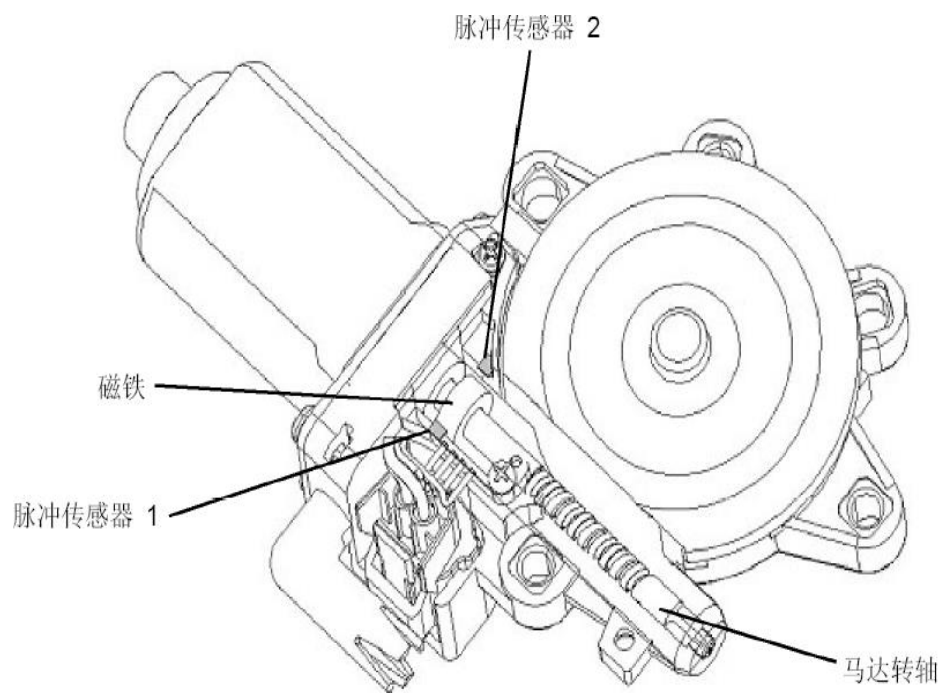


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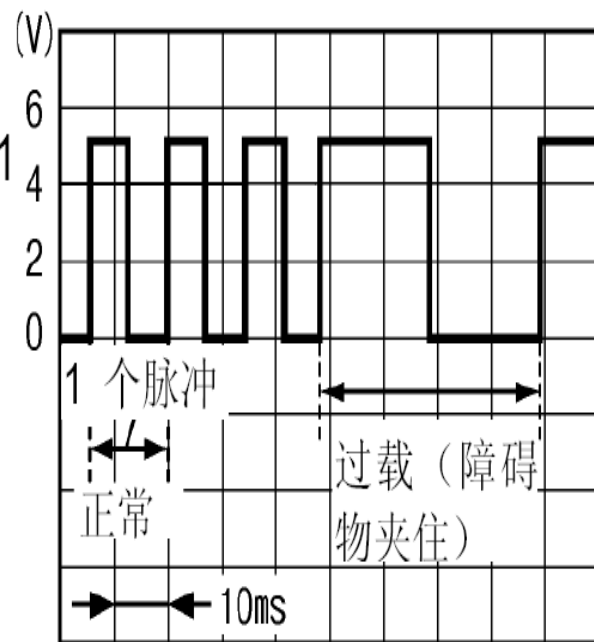
#### 障碍物检测机构

如果当驾驶员侧电动车窗上升时夹到障碍物，车窗将下降 150 mm。

安装了两个脉冲传感器来检测障碍物。



编码器信号 1  
(13 号端口)



### III. Working principle and circuit diagram of E70 electric windows

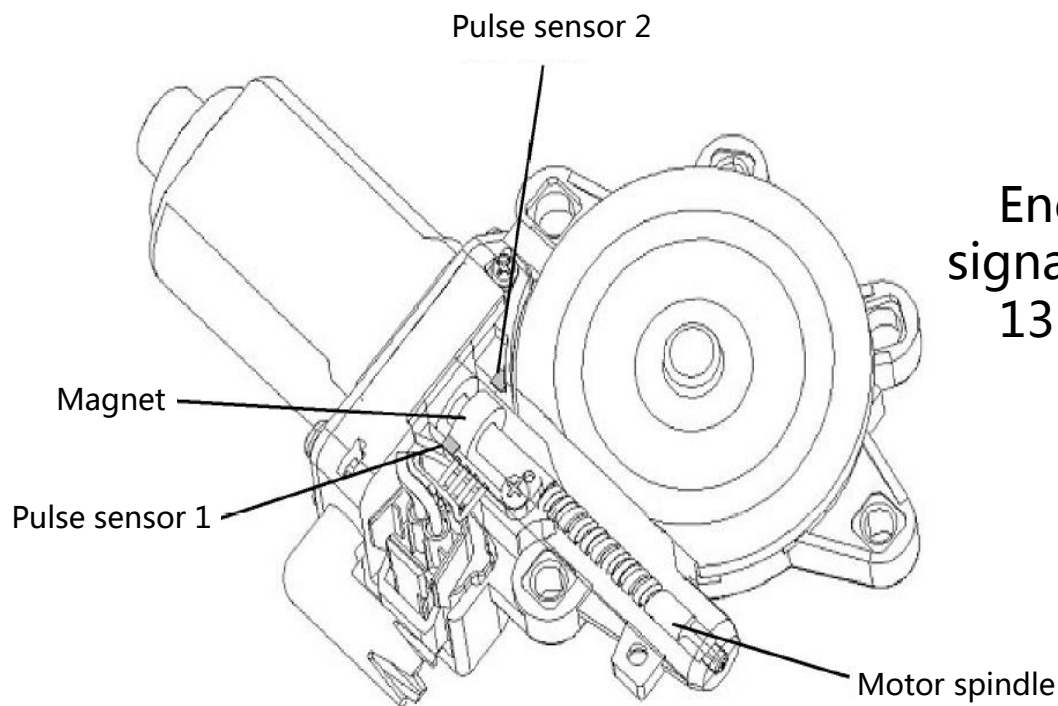


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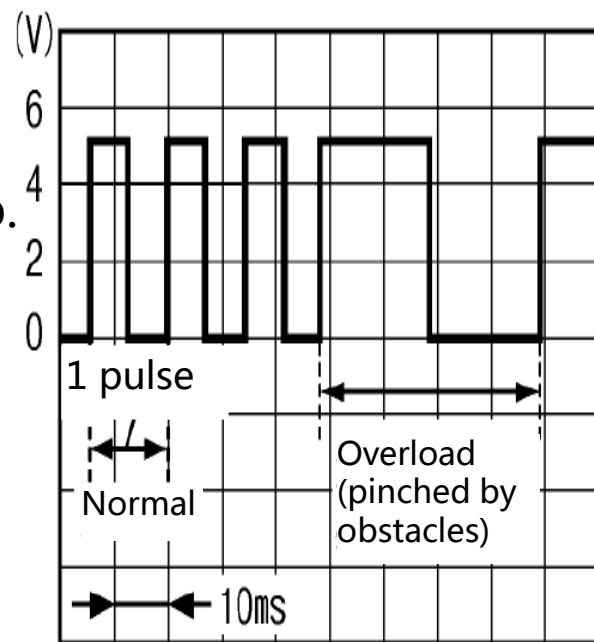
## Obstacle detection mechanism

When the driver's side electric window is caught by the obstacle during the lifting, the window will automatically drop by 150 mm.

Two pulse sensors are installed to detect obstacles.



Encoder signal 1 (No. 13 port)



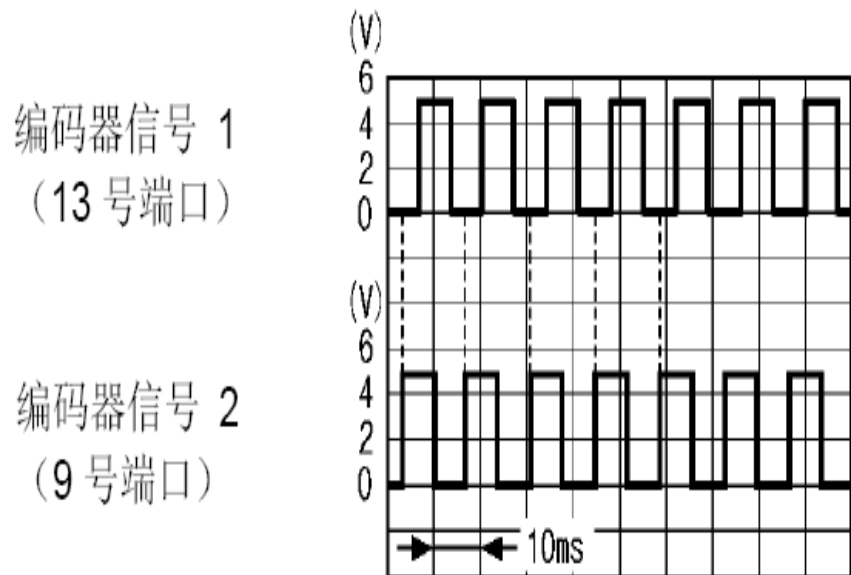
# 三、E70电动车窗工作原理及电路图



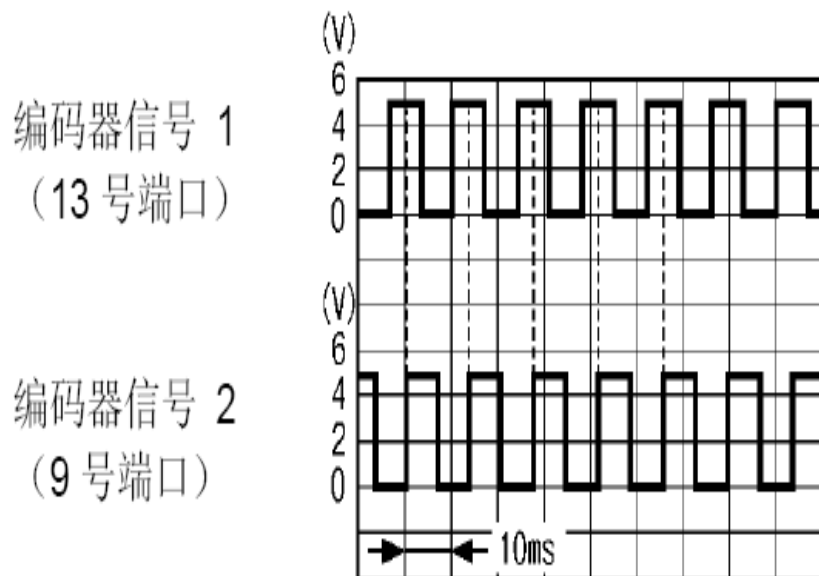
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## 障碍物检测功能

玻璃位置和玻璃运动方向信息确认。



当驾驶员侧车窗上升时  
(9 号端口的上升沿提前 1/4 个脉冲。)



当驾驶员侧车窗下降时  
(13 号端口的上升沿提前 1/4 个脉冲。)

## 失效模式

连续将驾驶员侧车窗自动升降10个来回以上，电动车窗可能进入失效控制状态。此时自动向上操作功能、障碍物检测功能消失。

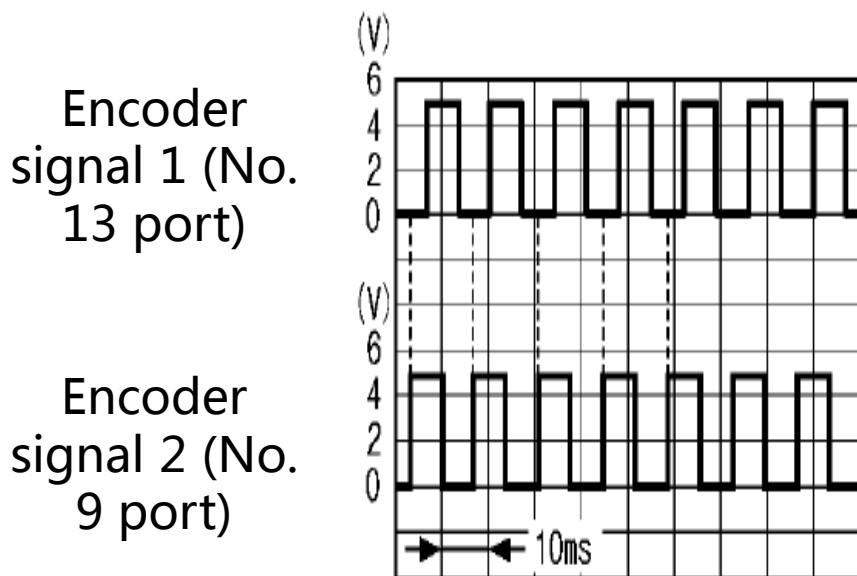
# III. Working principle and circuit diagram of E70 electric windows



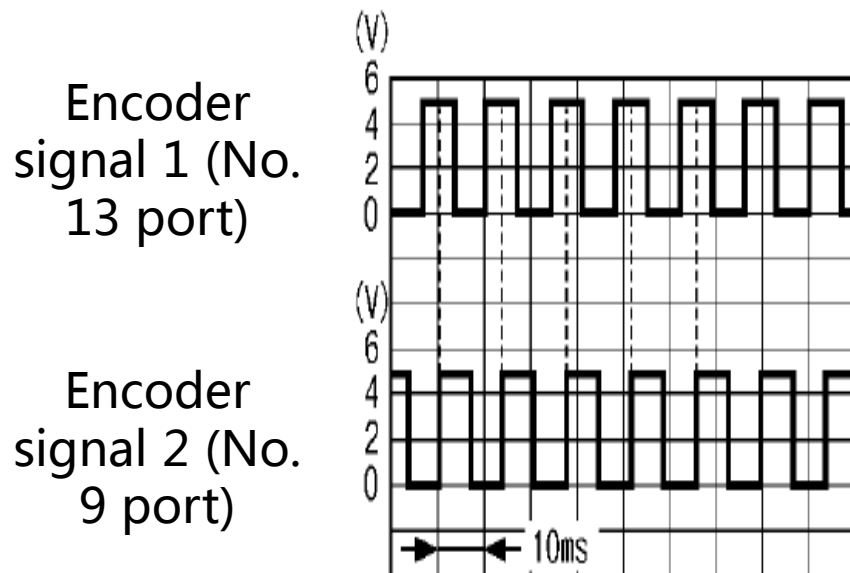
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## Obstacle detection function

Confirm position and movement direction information of window.



When the driver's side window rises  
(1/4 pulse ahead of the rising edge  
of No. 9 port)



When the driver's side window lowers  
(1/4 pulse ahead of the rising edge of  
No. 13 port)

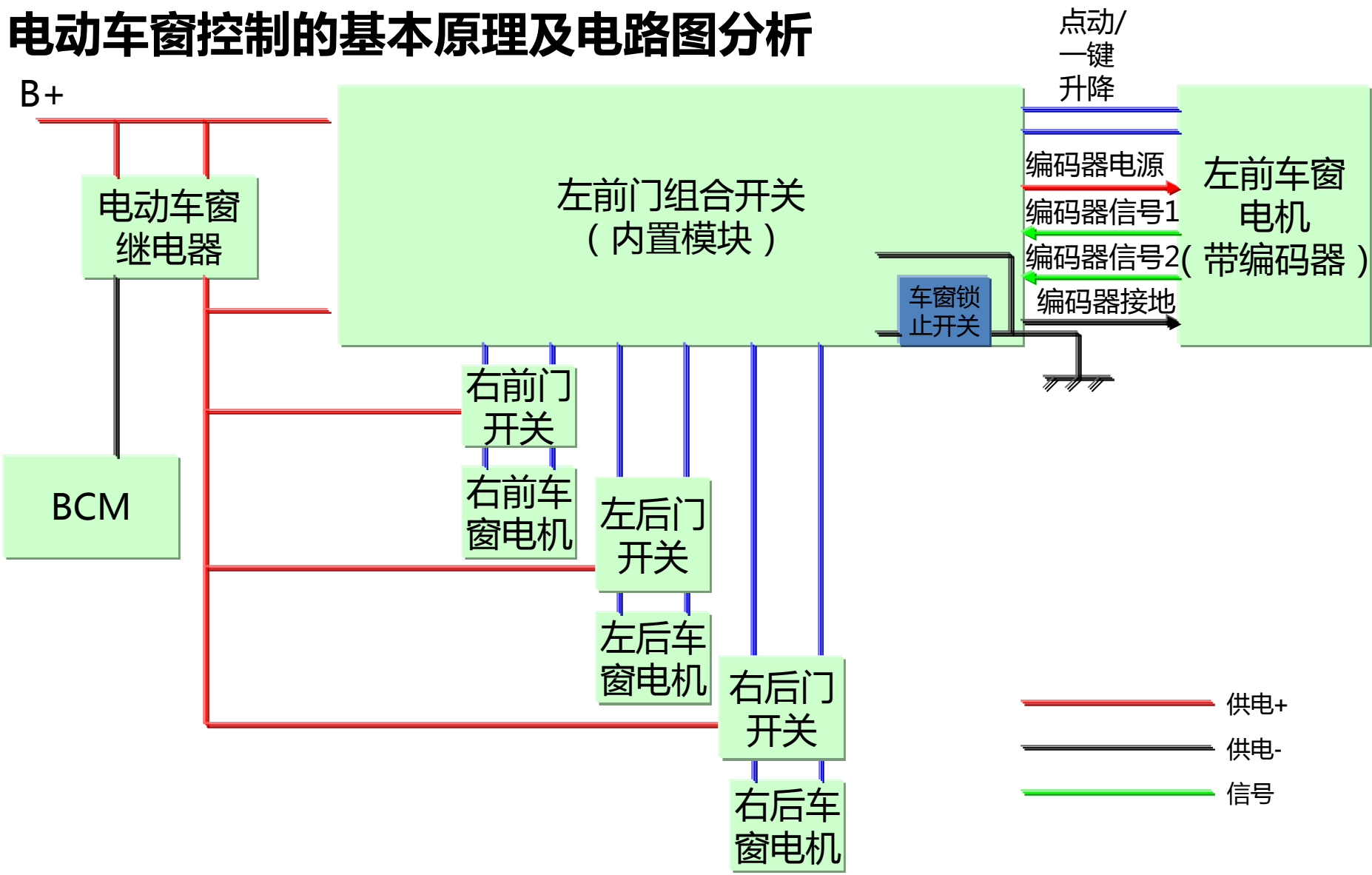
### Failure mode

If the driver's side window is automatically lifted and lowered back and forth more than 10 times, the electric window may enter the failure control state. At this time, the automatic upward operation function and the obstacle detection function disappear.

# 三、E70电动车窗工作原理及电路图



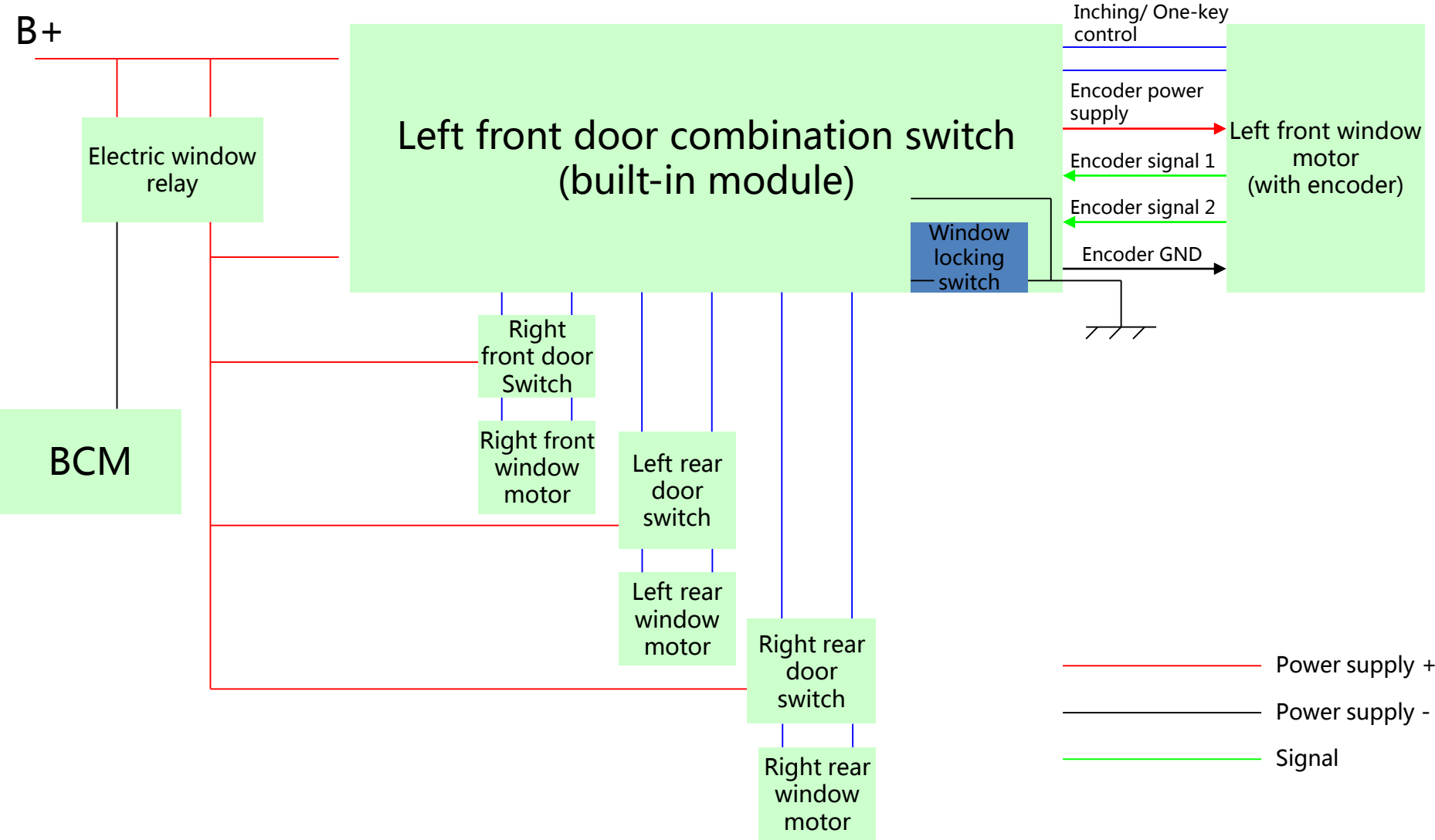
## 电动车窗控制的基本原理及电路图分析



# III. Working principle and circuit diagram of E70 electric windows



## Analysis of working principle and circuit diagram of electric window control

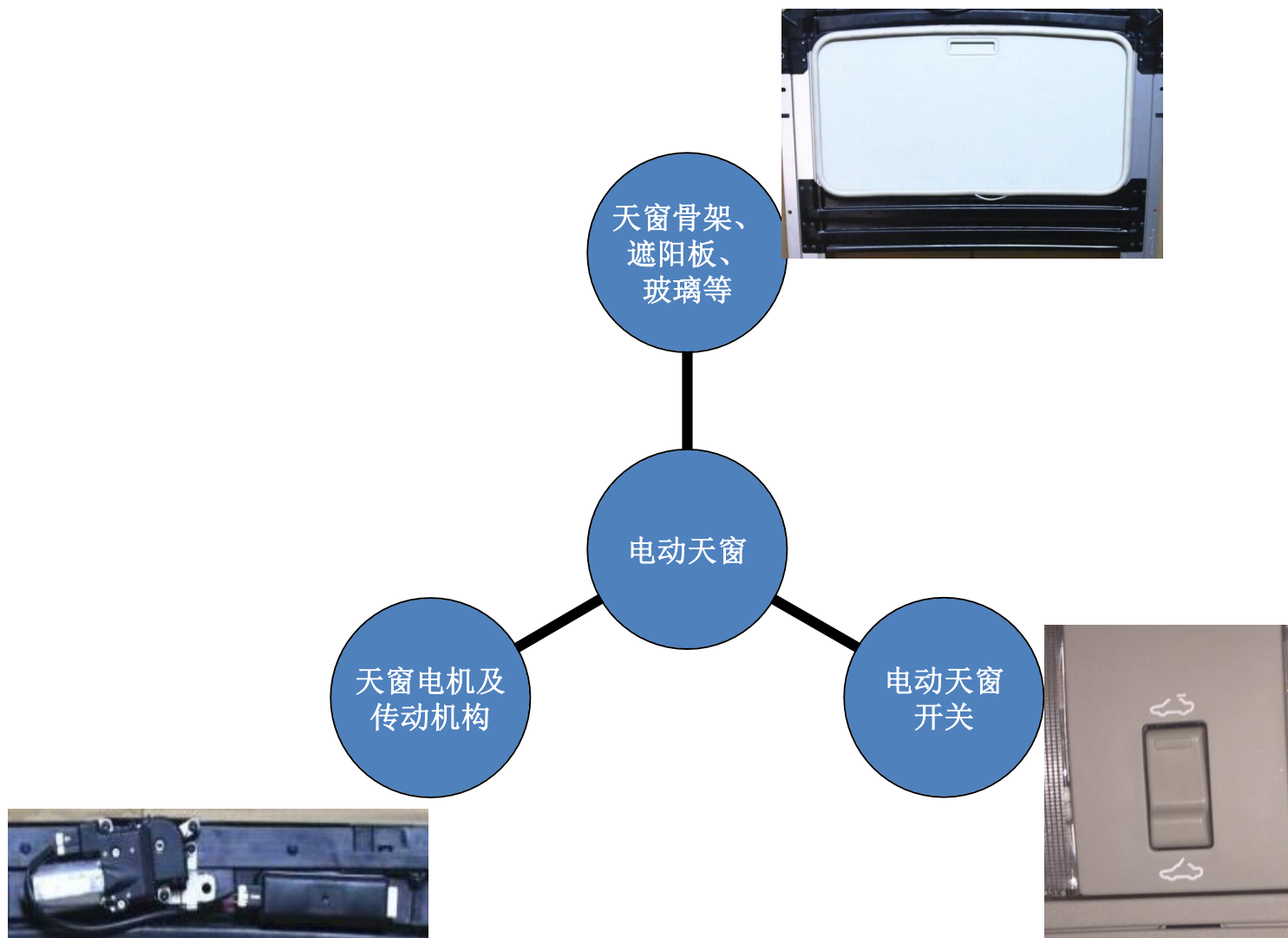




## 四、E70电动天窗结构特点



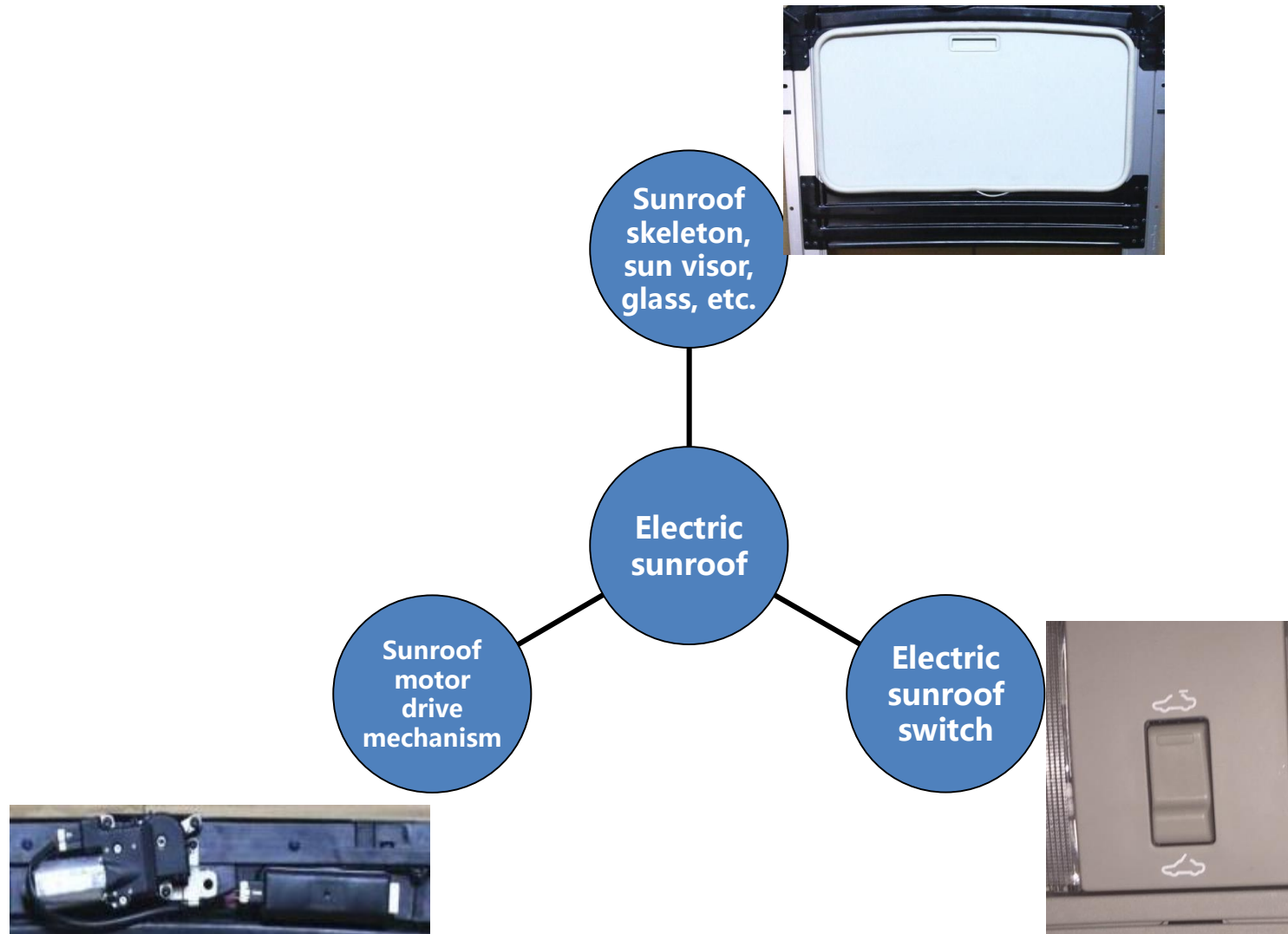
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# IV. Structure features of E70 electric windows



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### 一键开关电动防夹天窗

与驾驶员侧电动车窗原理类似，天窗电机内部带障碍物检测机构，以此来实现防夹功能。

电动天窗初始化：

如果天窗无法自动关闭或打开，执行以下步骤使天窗操作恢复正常。

- ① 按下向上倾斜开关并开始向上倾斜的操作。
- ② 将向上倾斜开关松开一下，然后再次按下并按住开关直到盖子滑上。
- ③ 玻璃盖将往向上倾斜的方向移动并随后机械停止，然后将自动完全关闭。  
(操作过程中需一直按住开关)
- ④ 再次松开开关，并在前 10 秒内按下向上倾斜开关。(按住开关)
- ⑤ 4 秒钟之后，玻璃盖将自动按照滑动开启 - 向上倾斜 - 向下倾斜的顺序进行操作。
- ⑥ 玻璃盖停止之后 0.5 秒，松开开关。(操作过程中需一直按住开关)
- ⑦ 如果滑动开关能正常操作，则初始化完毕。

## V. Working principle and circuit diagram of E70 electric sunroof



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### **Sunroof with one-key control and anti-pinch function**

Similar to the principle of the driver's side electric window, the sunroof motor has an obstacle detection mechanism inside to realize the anti-pinch function.

Initialization of electric sunroof:

The following procedures shall be followed to restore the sunroof when it can not be closed or opened automatically.

- ① Press the UPTILT switch to start uptilting.
- ② Release the UPTILT switch, and then press and hold the switch until the cover is slid to be closed.
- ③ The sunroof cover will move in the uptilt direction and then stop moving mechanically, and finally make full closing automatically. (keep holding the switch during this operation)
- ④ Release the switch again, and press the UPTILT switch within first 10 s. (Press and hold the switch)
- ⑤ 4 s later, the sunroof cover will automatically operate in the sequence of Sliding opening - Uptilting - Downtilting.
- ⑥ Release the switch within 0.5 s after the sunroof cover stops operating. (Keep holding the switch during this operation)
- ⑦ Initialization is deemed to be completed when the sliding switch can work normally.



### 天窗应急开启/关闭

天窗电机损坏或者其他紧急情况时，可以通过内六角扳手手动开启/关闭天窗。手动开启的位置如图：



天窗应急开启/关闭位置

## V. Working principle and circuit diagram of E70 electric sunroof



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### Sunroof emergency opening/closing

When the sunroof motor is damaged or in other emergency situations, the sunroof can be manually opened/closed with an Allen wrench. Position diagram of manual opening:



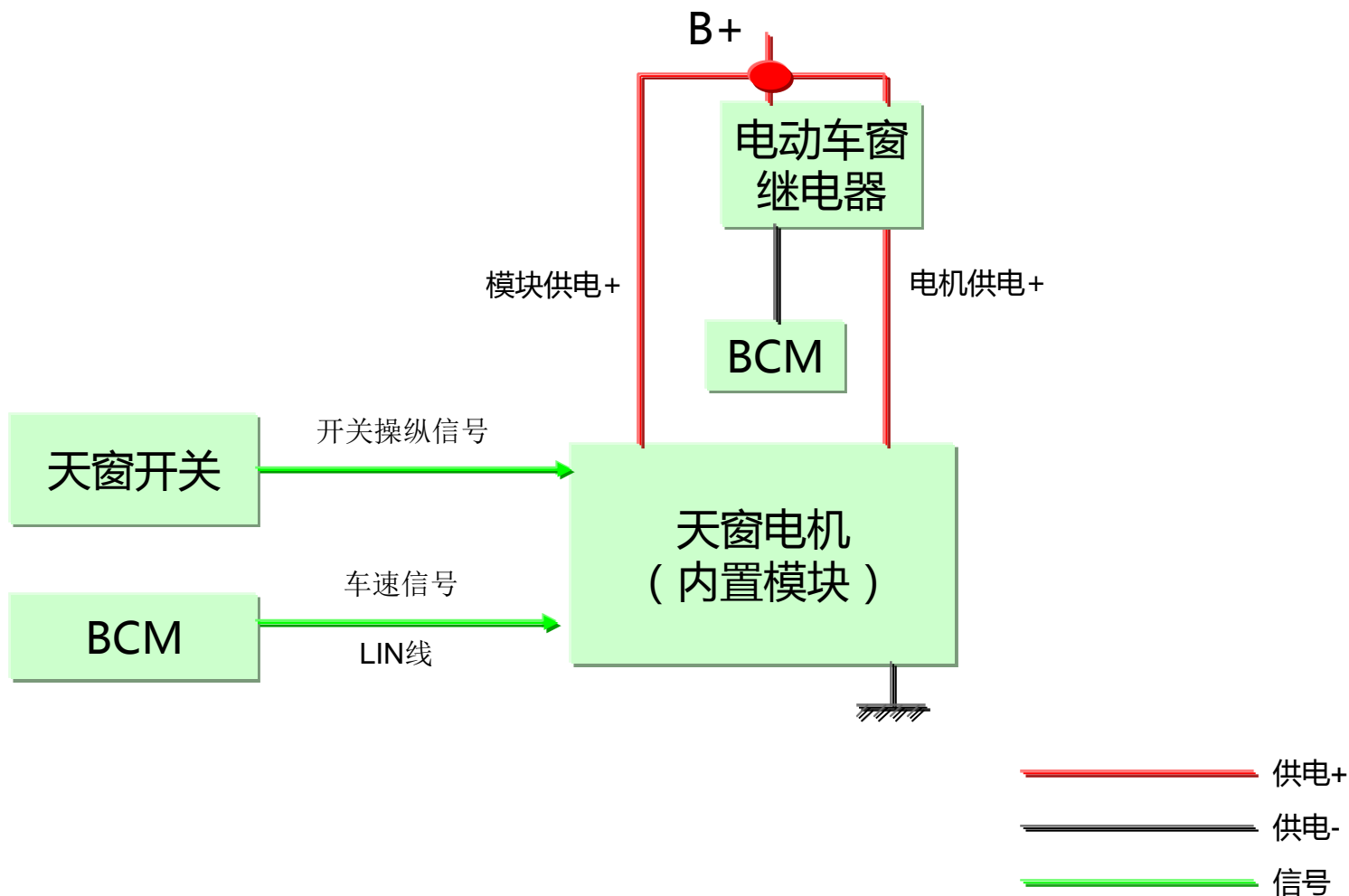
Sunroof emergency opening/closing position

# 五、E70电动天窗工作原理及电路图



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## 电动天窗控制的基本原理及电路图分析

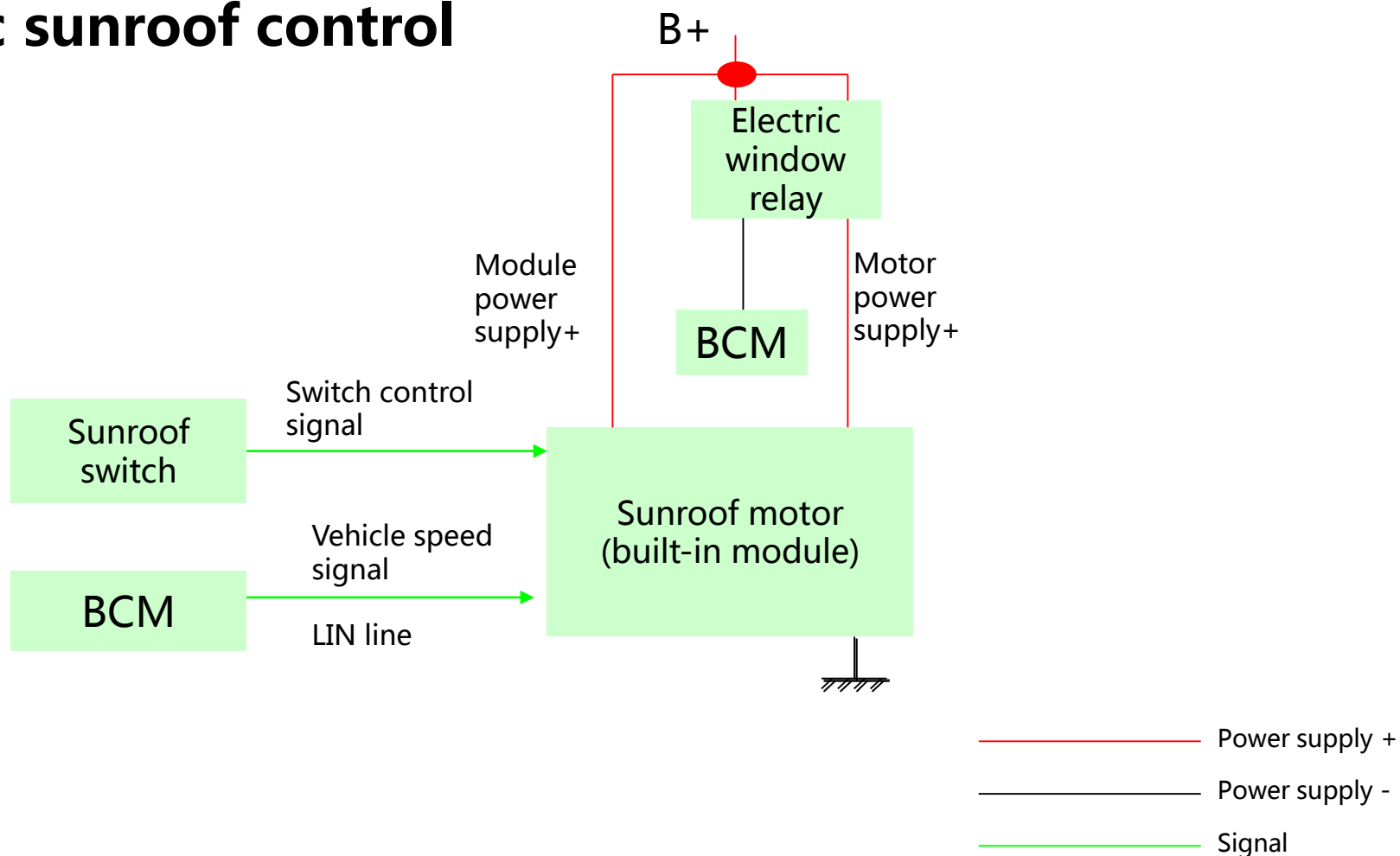


# V. Working principle and circuit diagram of E70 electric sunroof



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## Analysis of working principle and circuit diagram of electric sunroof control





## 六、E70电动后视镜结构特点



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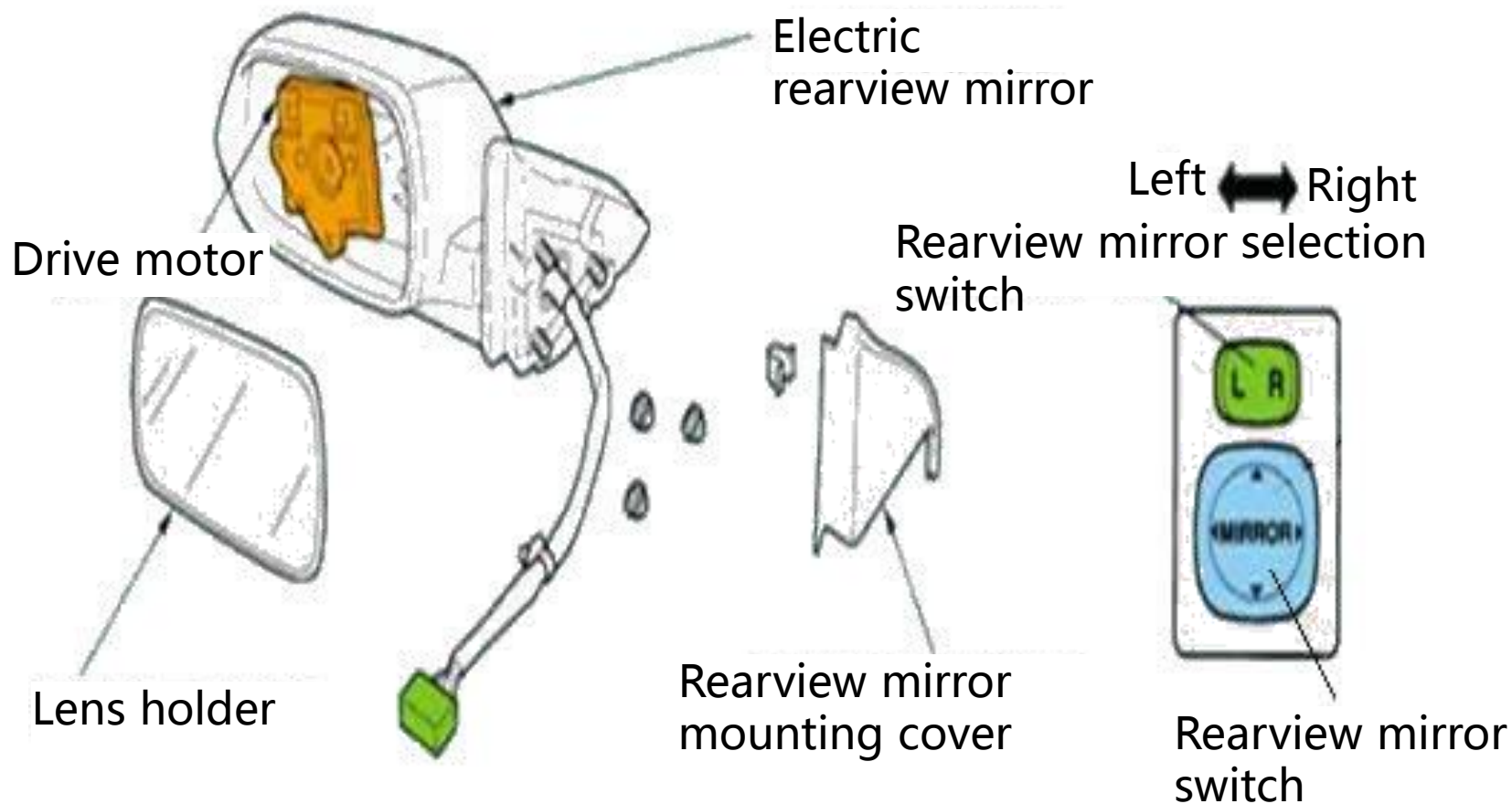
**电动后视镜组成：**开关、电机传动机构总成和后视镜总成等



## VI. Structure features of E70 electric rearview mirrors



**Composition of electric rearview mirrors:** switch, motor drive mechanism assembly, rearview mirror assembly, etc.

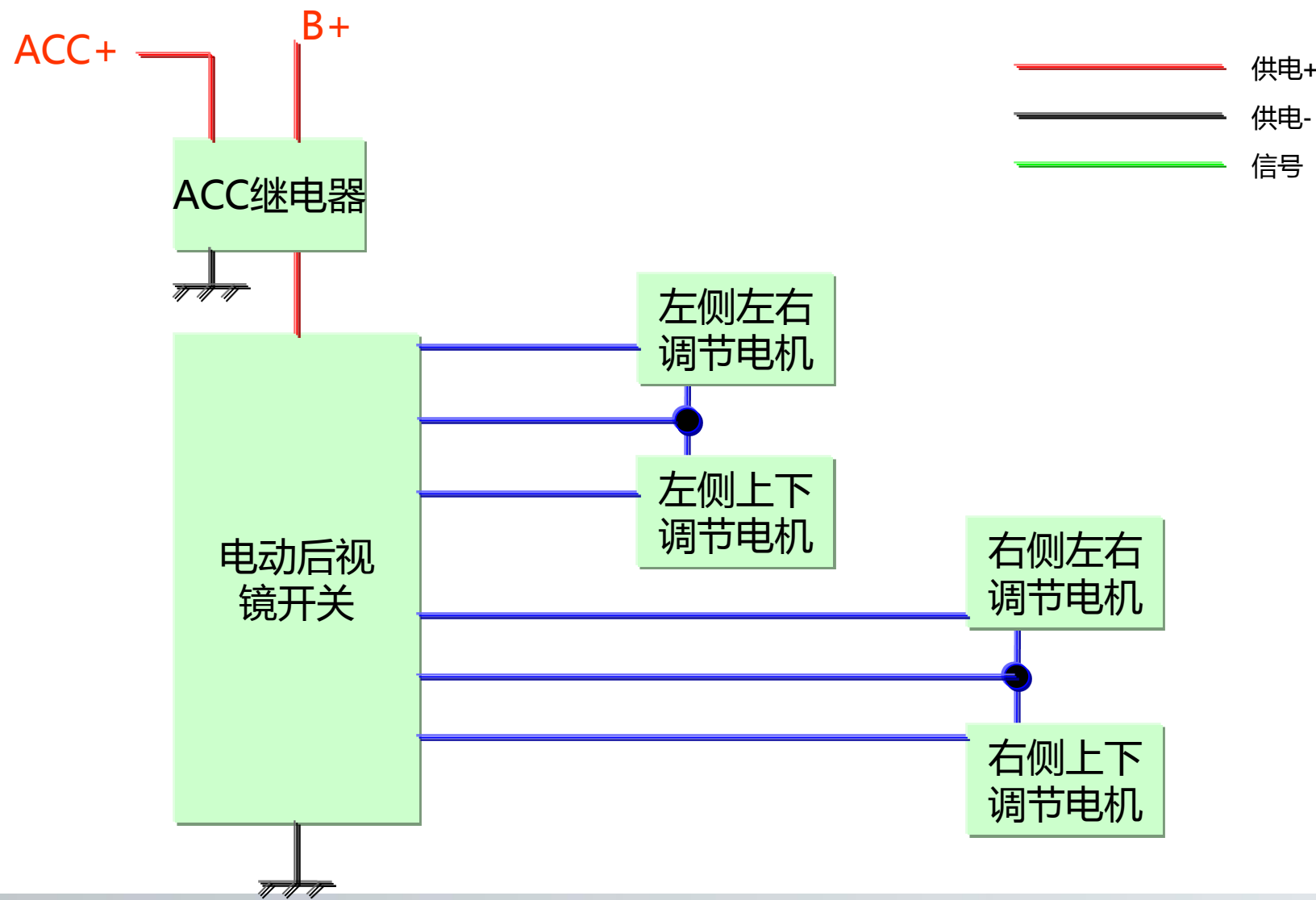


# 七、E70电动后视镜工作原理及电路图



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## 电动后视镜控制的基本原理及电路图分析



# VII. Working principle and circuit diagram of E70 electric rearview mirrors



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## Analysis of working principle and circuit diagram of electric rearview mirror control

