



东风乘用车

# 电子驻车制动系统



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# Electronic Parking Brake (EPB)



- 1、熟悉E70电子驻车制动系统的组成及各部件的功用
- 2、熟悉E70电子驻车制动系统的工作原理
- 3、能对E70电子驻车制动系统进行电路的故障诊断与排除
- 4、掌握E70电子驻车制动系统相关部件的拆装更换方法及注意事项



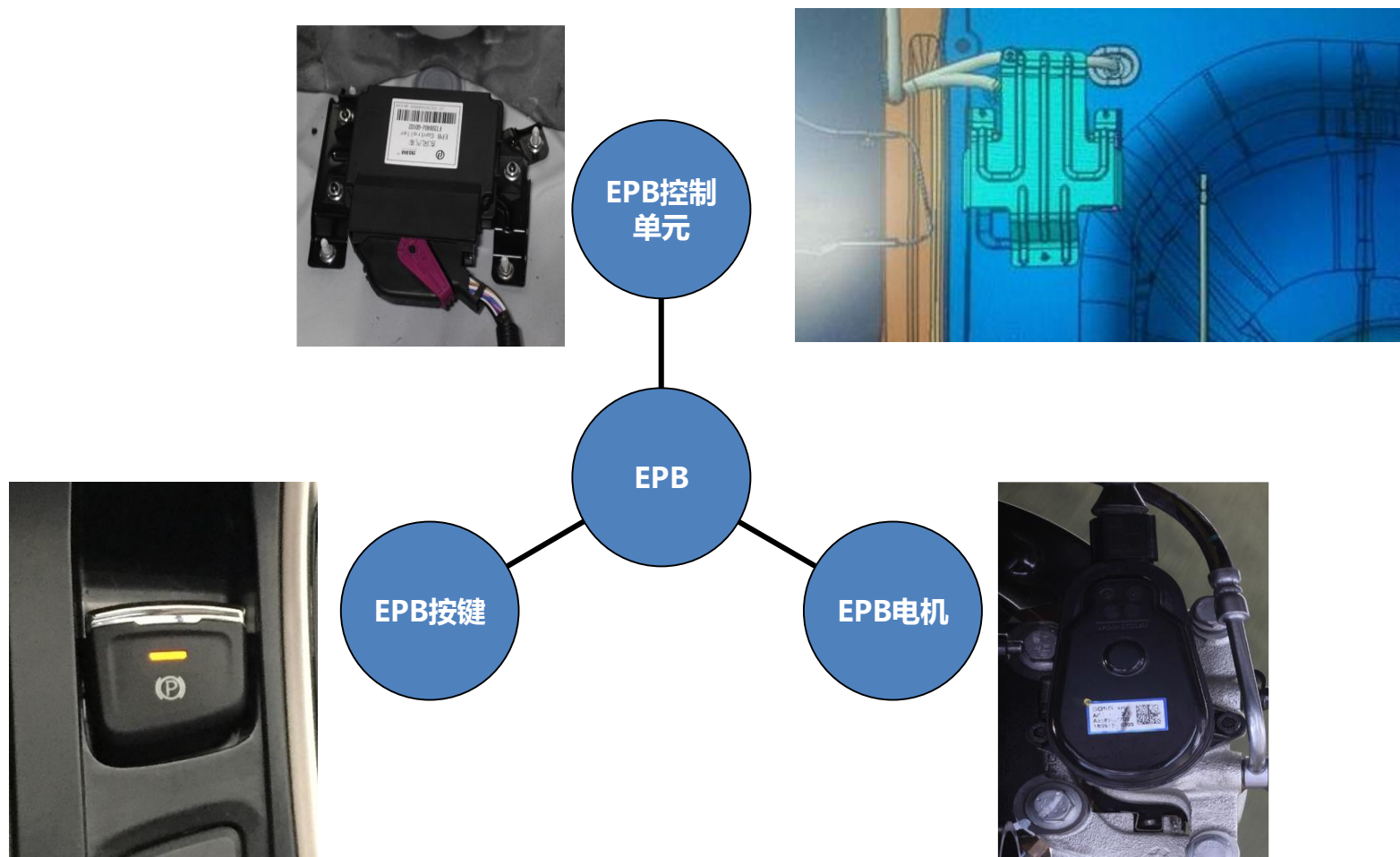
1. Familiar with the composition of E70 EPB and functions of its components
2. Familiar with the working principle of the E70 EPB
3. Troubleshooting of the E70 EPB
4. Master the removal and refitting and replacement methods and precautions of the E70 EPB

# 一、 E70电子驻车制动系统概述



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## EPB电子驻车制动系统结构组成

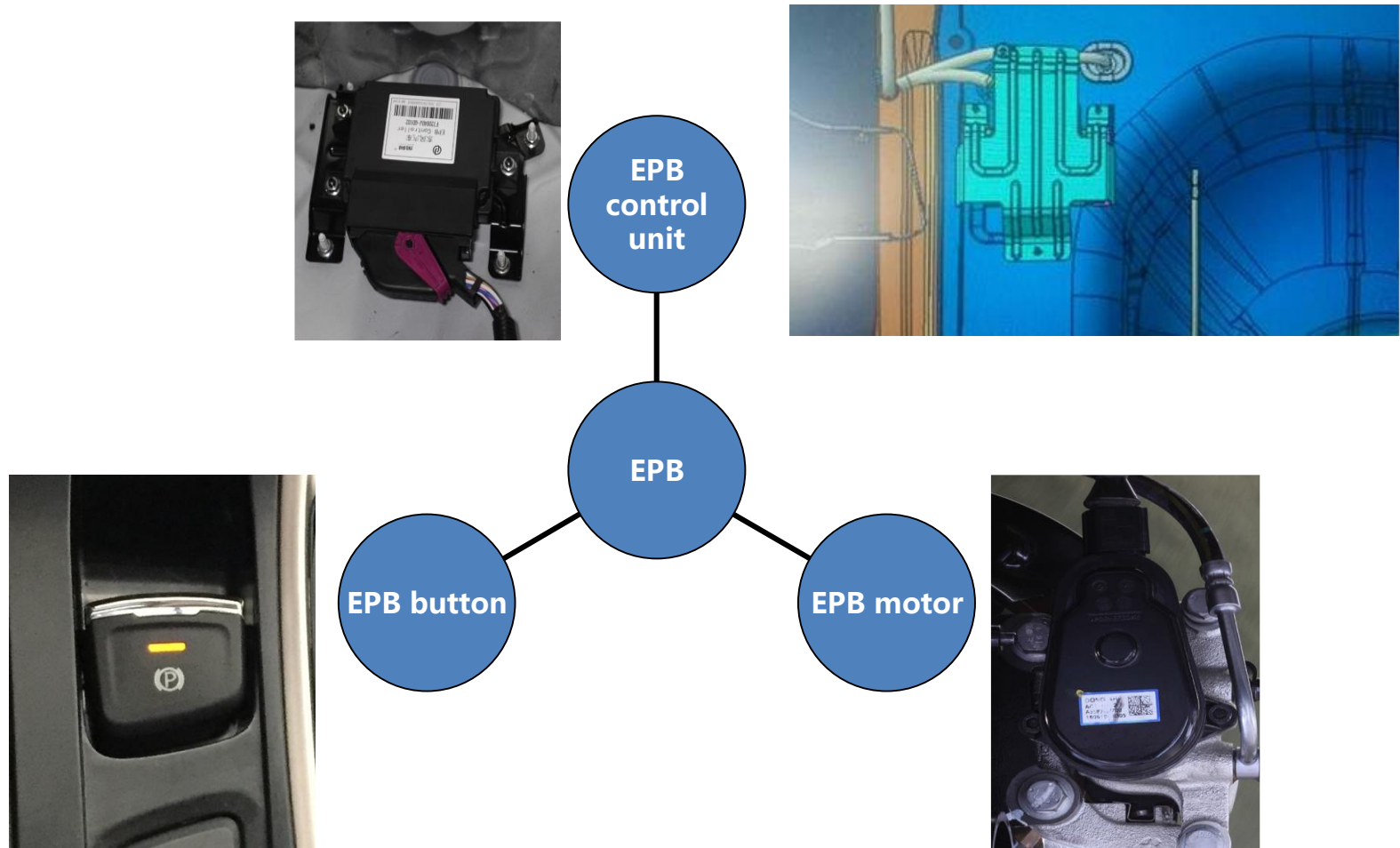


# I. Overview of E70 EPB



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## Composition of EPB



# 一、 E70电子驻车制动系统概述



## EPB使用介绍

拉起EPB：向上拉起EPB开关后再松开制动踏板。 保证EPB状态灯点亮。

释放EPB，在满足下列条件下按下EPB开关：

- (1)点火开关位于ON档位。
- (2)踩下制动踏板。
- (3)按下EPB开关。 保证EPB状态灯熄灭。



EPB状态灯

# I. Overview of E70 EPB



## Introduction to EPB use

Pull up the EPB: Pull up the EPB switch and release the brake pedal. Ensure that the EPB status lamp is on.

Release the EPB and press the EPB switch if the following conditions are met:

- (1) The ignition switch is turned to the ON position.
- (2) The brake pedal is depressed.
- (3) The EPB switch is pressed. Ensure that the EPB status lamp is off.



EPB status lamp



# 一、 E70电子驻车制动系统概述



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## EPB功能介绍

### 手动驻车

车辆停稳后，可拉动控制开关启用驻车制动，EPB根据不同的坡道或车辆状态，提供不同等级的驻车力。

### 手动释放

接通点火开关，踩下制动踏板，按下控制开关可解除驻车制动；若不踩制动踏板，则无法释放。

### 自动驻车

车辆停稳后，关闭点火开关时自动启用驻车制动。

注：禁止自动驻车功能：按下EPB开关，迅速关闭点火开关（3秒内），则自动驻车不执行。

### 自动释放

启动ready后，选择D 档或R 档，然后踩下加速踏板，车辆开始移动时，驻车制动自动解除。

# I. Overview of E70 EPB



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## Introduction to EPB function

### **Manual parking**

After the vehicle is stopped, the parking brake can be activated by pulling the control switch. The EPB will provide different levels of parking force depending on the slope or vehicle status.

### **Manual release**

When the ignition switch is turned on, the brake pedal is depressed, and the control switch is pressed, parking brake can be released; if the brake pedal is not depressed, the parking brake can not be released.

### **Automatic parking**

After the vehicle is stopped, the parking brake will be automatically activated when the ignition switch is turned off.

Note: to deactivate the automatic parking function, press the EPB switch and quickly turn off the ignition switch (within 3 s).

### **Automatic release**

After start ready, set the gear lever to D gear, M gear or R gear, and then depress the accelerator pedal. After the vehicle moves, the parking brake will be released automatically.



# 一、E70电子驻车制动系统概述

## EPB功能介绍

### 动态紧急制动

如果车辆行车制动系统发生了故障或在异常情况下，拉起控制开关并保持，将实施驻车制动停止车辆；当释放开关时，驻车即释放。

### 维修释放（完全释放）

车辆上电，踩下刹车踏板，按下EPB开关持续10s(这时仪表上EPB黄色故障警告灯闪烁)，在5s内再按一次开关，EPB电机完全释放（此时黄色故障警告灯常亮）。

### 维修释放解除

车辆上电，踩下刹车踏板，向上拉起EPB开关持续10s(这时仪表上EPB黄色故障警告灯闪烁)，在5s内再拉一次开关，EPB电机维修释放解除（此时黄色故障警告灯熄灭）。



EPB故障警告灯

# I. Overview of E70 EPB



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## Introduction to EPB function

### Dynamic emergency brake

If the service brake system has any fault or any abnormality occurs, pull up and hold the control switch to apply the parking brake so as to stop the vehicle. When the switch is released, the parking brake will also be released.

### Service release (complete release)

When the vehicle is powered on, press the brake pedal, press and hold the EPB switch for 10 s (the EPB yellow malfunction warning lamp on the instrument panel will flash), and press the switch again within 5 s, the EPB motor will be completely released (the yellow malfunction warning lamp is always on).

### Service release disabled

When the vehicle is powered on, press the brake pedal, pull up and hold the EPB switch for 10 s (the EPB yellow malfunction warning lamp on the instrument panel will flash), pull up the switch again within 5 s, the EPB motor service release will be disabled (the yellow malfunction warning lamp is off).



EPB malfunction warning lamp



# 一、 E70电子驻车制动系统概述

## EPB功能介绍

**其他功能（这些功能不需要驾驶员专门操作，EPB自动执行）：**

### 再夹紧功能

当驻车力小于目标值或者车辆发生移动或溜车时，EPB系统会实施再夹紧动作。

### 恶意操作

用户连续拉起、释放EPB开关超过20次,EPB进入保护模式，驻车指示灯闪烁10s，在此期间EPB无法操作。

### 降阶模式（某些传感器信号失效时）

#### 降级驻车

轮速信号失效，车辆无法判断是否运动，进入降阶驻车模式：驻车时间延长到5s，且在整个过程中，开关需保持拉起。

#### 降级释放

当制动踏板和主缸压力信号失效时，需长按开关释放驻车。

# I. Overview of E70 EPB



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## Introduction to EPB function

**Other functions (these functions do not need to be operated specifically by the driver, and will be automatically performed by the EPB):**

### **Re-clamping function**

When the parking force is less than the target value or the vehicle moves or slips, the EPB system will perform the re-clamping.

### **Malicious operation**

If the user continuously pulls up and releases the EPB switch more than 20 times, the EPB will enter the protection mode, and the parking indicator lamp will flash for 10 s; in this case, the EPB cannot be operated.

### **Reduced-order mode (some sensor signals fail)**

#### **Downgraded parking**

If the wheel speed signal fails, the vehicle cannot judge whether it can move or enter the reduced-order parking mode: the parking time will be extended to 5 s, and the switch needs to be pulled up and held during the whole process.

#### **Downgraded release**

When the brake pedal and the master cylinder pressure signal fail, press and hold the switch to release the parking.

# 一、 E70电子驻车制动系统概述



## 人工紧急解锁

当车辆在停车断电情况下，EPB电子驻车制动器处于夹紧抱死状态，重新上电后按下EPB电子驻车开关，如未能解除车辆制动状态，需采取紧急措施解除EPB制动器夹紧抱死状态。

EPB电子驻车制动器有两种紧急解除制动的方法，请严格按照规定方法操作。

现象	故障原因	措施
车辆上电后，按下EPB开关未能解除制动	开关/线束故障	A
	控制单元故障	
	MGU（ EPB电机 ）故障	B
特别说明： ①当无法直接判断故障原因时，先采取A措施尝试解除制动，若A措施无效，则采取B措施； ②当车辆亏电时先采取A措施尝试解除制动，若A措施无效，则采取B措施。		

# I. Overview of E70 EPB



## Manual emergency unlocking

When the vehicle is powered off, the EPB will be in the clamping and lock state. After the vehicle is powered on again, press the EPB switch. If the vehicle brake is not released, emergency measures should be taken to remove the clamping and lock of the EPB.

EPB is designed with two methods of emergency braking, please operate in strict accordance with the prescribed methods.

Symptom	Fault cause	Countermeasures
After the vehicle is powered on, pressing the EPB switch fails to release the brake.	Switch/wire harness fault	A
	Control unit fault	
	MGU (EPB motor) fault	B
Special note: ① When it is not possible to directly determine the cause of the fault, first take the measure A to try to release the brake. If the measure A fails to achieve the desired effect, take the measure B; ② In case of low battery, first take the measure A to try to release the brake. If the measure A fails to achieve the desired effect, take the measure B;		



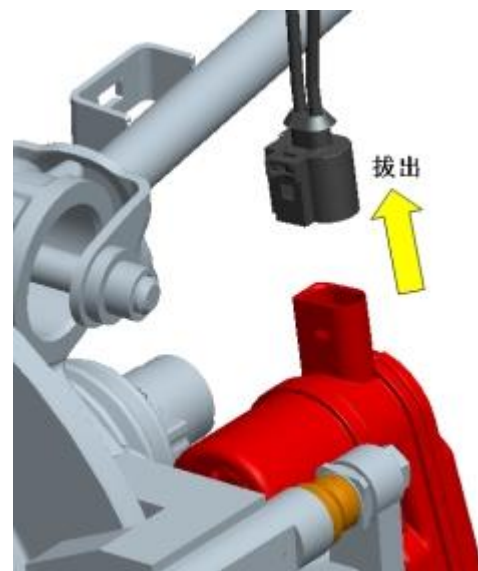
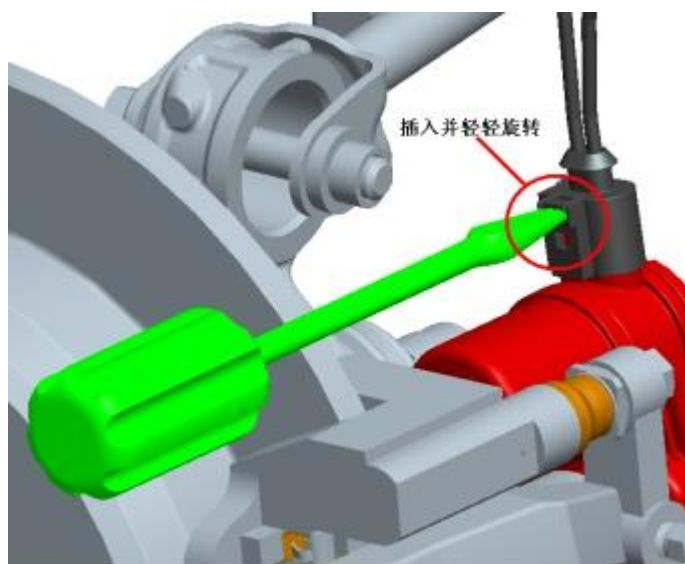


# 一、E70电子驻车制动系统概述

## 人工紧急解锁

### 步骤：

- 用千斤顶顶起车身，卸下两后车轮，（若用举升机则无需卸下车轮）；
- 用平口螺丝刀插入EPB接头护套的锁止口（见下图），轻轻旋转平口螺丝刀，当听到‘嗒’的一声时表示锁止卡扣已松开，此时可拔出线束接头；



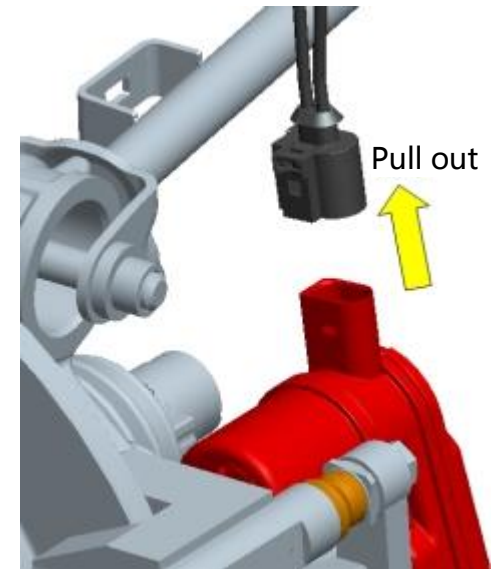
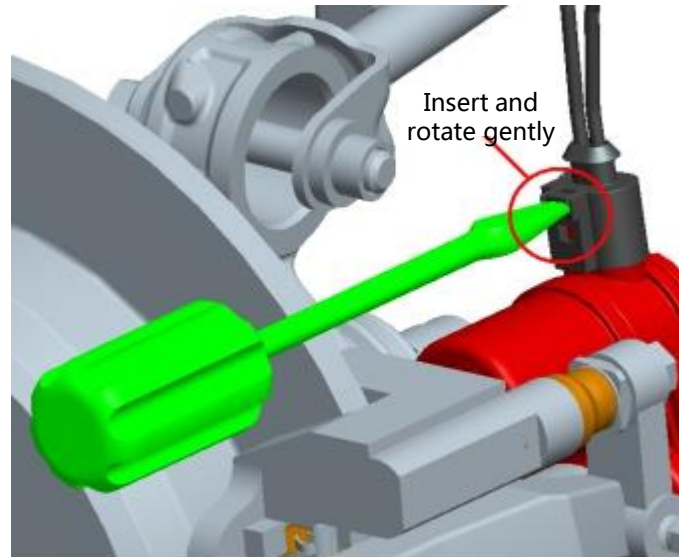
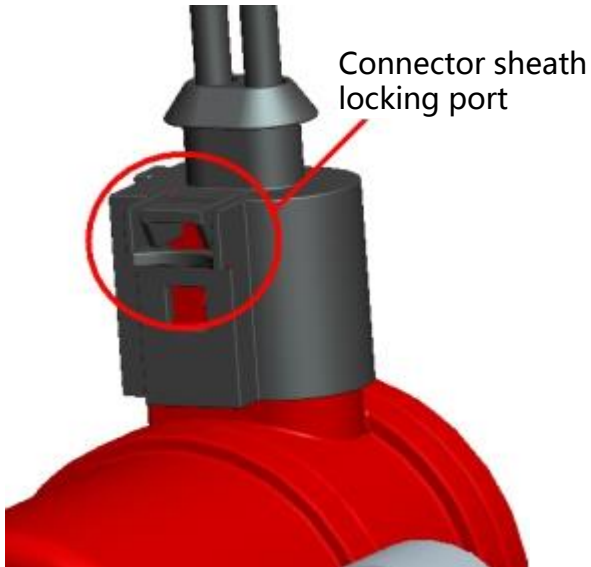
# I. Overview of E70 EPB



## Manual emergency unlocking

### Steps:

- Use a jack to jack up the vehicle body and remove the two rear wheels (it will not be necessary to remove the wheel if a lift is used);
- Insert a slotted screwdriver into the locking port of the EPB connector sheath (see the figure below). Gently rotate the slotted screwdriver. When you hear a click, the lock buckle has been released. At this time, the wire harness connector can be pulled out;





# 一、E70电子驻车制动系统概述

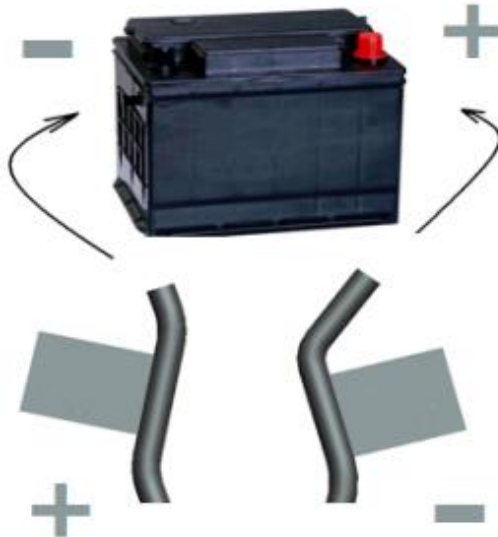
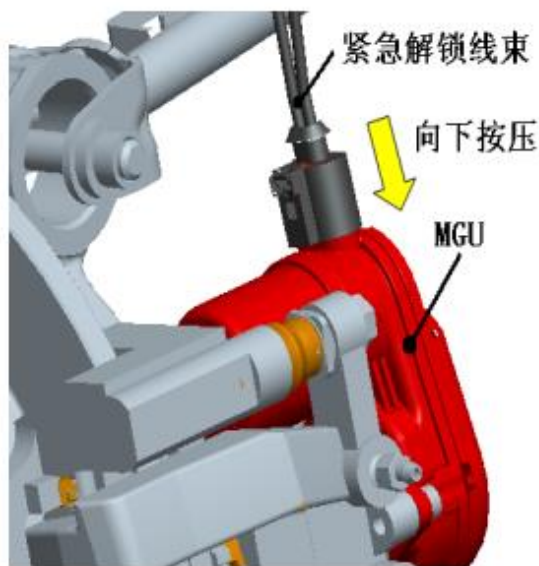
## 人工紧急解锁

### 措施 A:

1.将紧急解锁线束（长 5.5m）的护套插入，MGU 插口按压线束接头护套，当听到‘嗒’的一声时表示护套锁止卡扣已到位上紧；

2.根据紧急解锁线束上的正负极标识按如下图  
示接上车载电源，当接通电源正负极时，  
MGU 开始工作，MGU 会发出电机和  
齿轮转动的声音，此时持续通电约 2s，  
制动状态即被解除；

3.拆下紧急解锁线束护套，将原  
车线束还原，按压线束接头护  
套听到‘嗒’的一声时，表示  
护套锁止卡扣已到位上紧；



### 注意事项

- 1.线束与车载电源正负极应避免接反；
- 2.制动状态解除时间严格控制在约 2S，不可长时间持续通电，避免损坏零件；
- 3.驻车释放时，请注意使车辆处于平坦位置，防止车辆溜坡

# I. Overview of E70 EPB



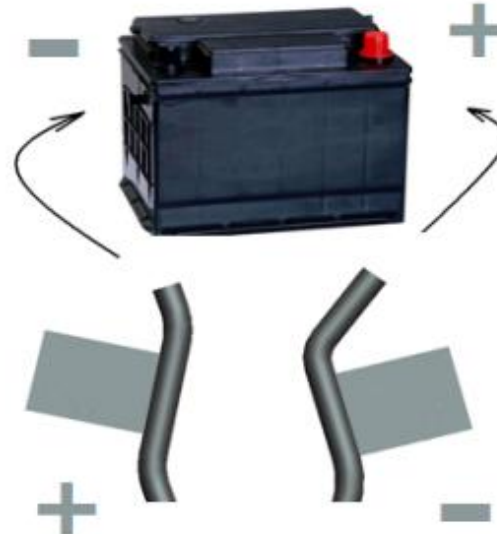
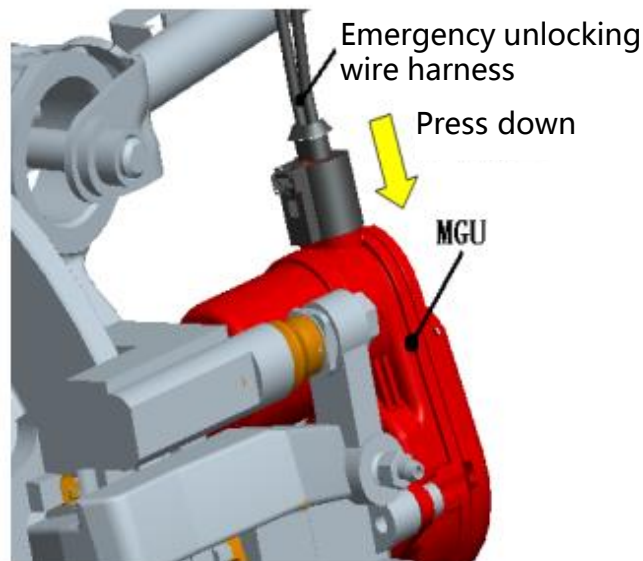
## Manual emergency unlocking

### Countermeasure A:

1. Insert the emergency unlocking wire harness (length: 5.5m) and press the wire harness connector sheath with the MGU socket. When a "click" sound is heard, the sheath locking clip has been tightened;

2. The positive and negative signs on the emergency unlocking wire harness are connected to the on-board power supply as shown below. When the positive and negative poles of the power supply are connected, the MGU will start to work, and the MGU will sound the rotation of the motor and the gear, and energizing will last about 2 s, and 2 s later the braking state will be released;

3. Remove the emergency unlocking wire harness sheath and restore the original wire harness. When the wire harness connector sheath is pressed with a "click" sound heard, it indicates that the sheath locking clip is in place.



### Precautions

1. Avoid reversely connecting the wire harness to the positive and negative poles of the vehicle power supply;
2. The braking state release time is strictly controlled to about 2 s, and it is not allowed to continue energizing for a long time to avoid damage to the parts;
3. When the parking is released, please pay attention to keeping the vehicle in a flat position to prevent the vehicle from slipping.



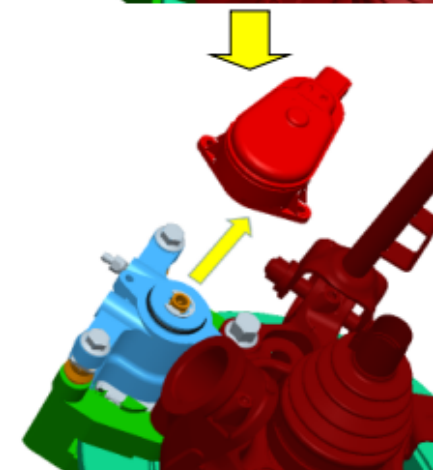
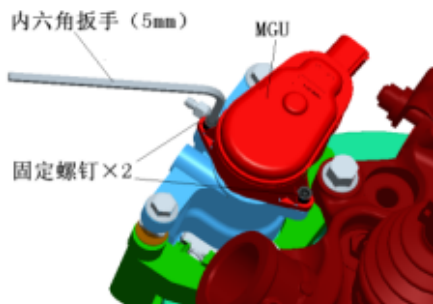


# 一、E70电子驻车制动系统概述

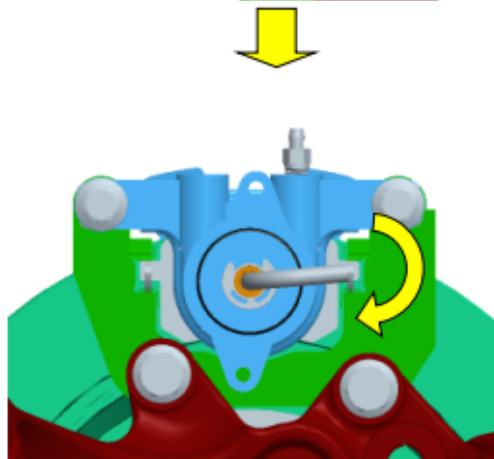
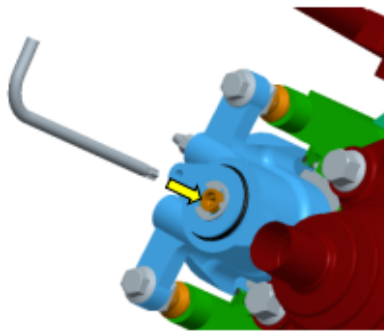
## 人工紧急解锁

### 措施 B:

1.使用内六角扳手（5mm）将两个固定螺钉逐一拧松取下，然后取下 MGU；



2.将花型内六角扳手（T40）如图示方向插入传动机构的孔内，顺时针旋转 2-3 圈，制动状态即被解除；



3.手动解除制动状态后，重新安装 MGU，拧紧固定螺钉。



### 注意事项

- 1.务必使用规定型号的工具，避免损坏零件，影响正常功能；
- 2.还原 MGU 时，注意压入力度适中，勿强行压入，避免损坏零件；
- 3.请检查 MGU 与钳体配合面是否充分贴合，如未贴合，不能安装固定螺钉，不能尝试用拧紧螺钉方式压紧配合面，否则会损坏 MGU；此时可取下 MGU 重新安装直至贴合后，方可拧紧固定螺钉；
- 4.固定螺钉拧紧力矩为 7-9Nm，确保螺钉无松动，MGU 和卡钳贴合面无间隙。

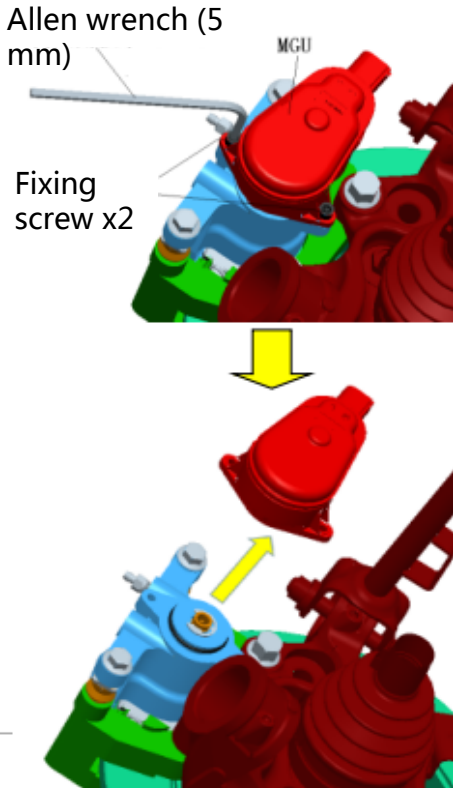
# I. Overview of E70 EPB



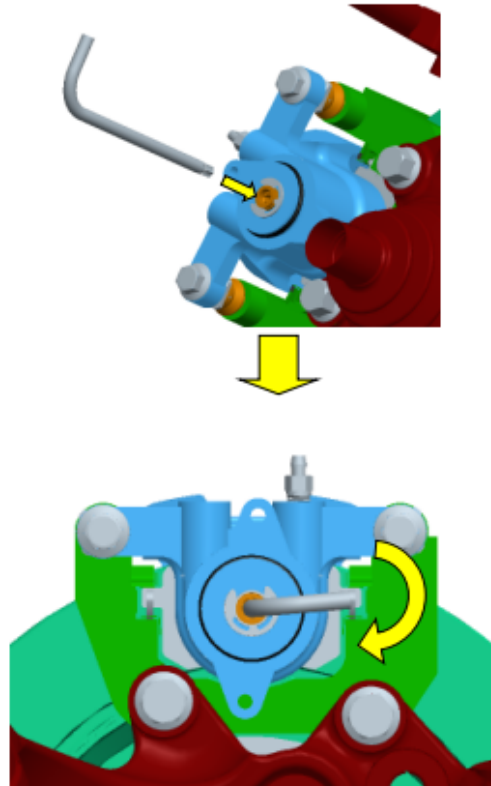
## Manual

### Countermeasure B:

1. Use an Allen wrench (5mm) to loosen the two fixing screws one by one, and then remove the MGU;



2. Insert the Torx Allen wrench (T40) into the hole of the drive mechanism as shown in the figure, and rotate it 2-3 times clockwise to release the brake;



3. After the brake is released manually, reinstall the MGU and tighten the fixing screws.



#### Precautions

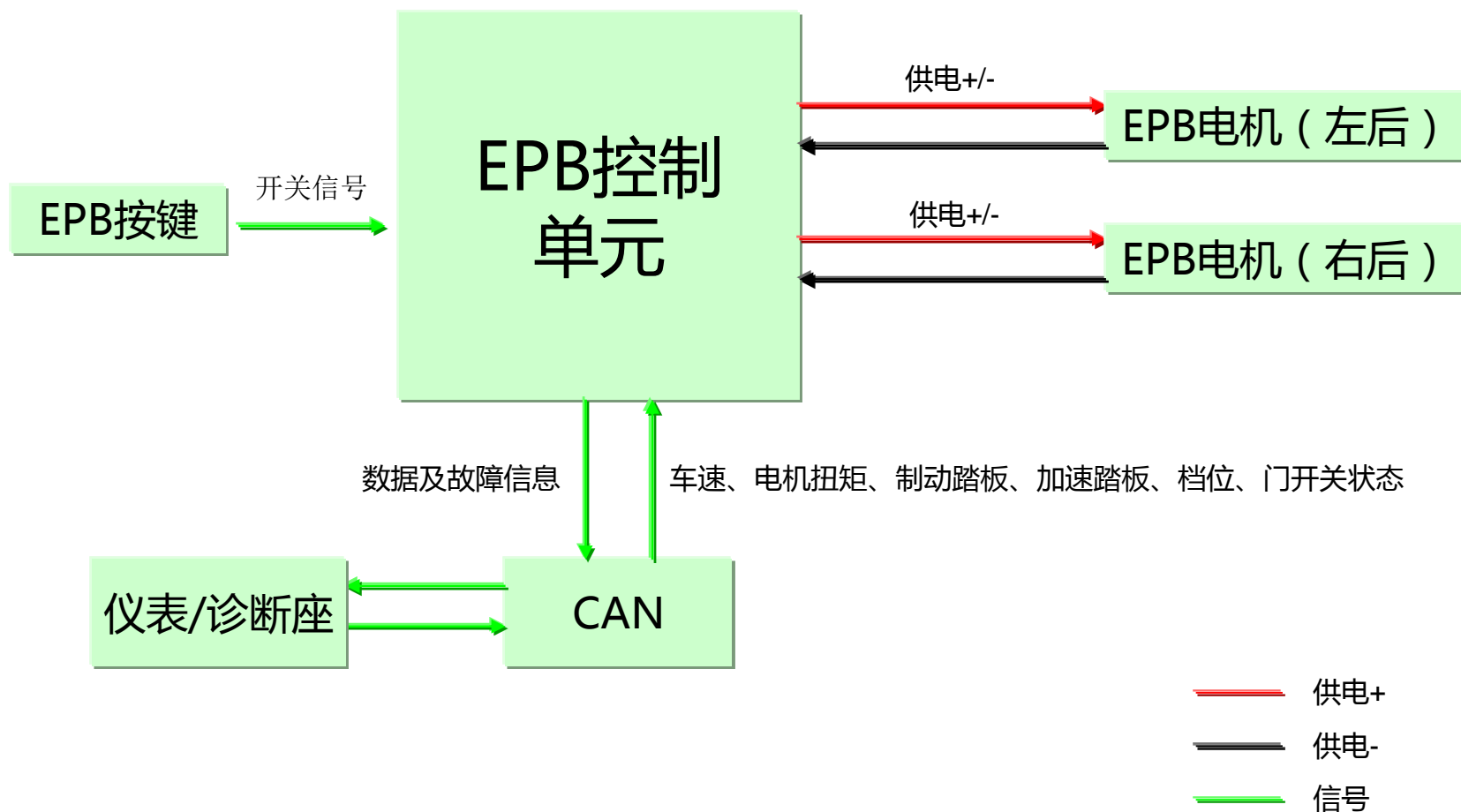
1. Always use the specified tool to avoid damage to the parts and affect normal functions;
2. When restoring the MGU, press it with moderate force to avoid damage to the parts;
3. Please check whether the mating surfaces of the MGU and the caliper body are fully fitted. If not, the fixing screws cannot be installed. Do not try to press the mating surface by tightening the fixing screws. Otherwise, the MGU will be damaged. At this time, the MGU can be removed and reinstalled until the mating surface is fully fitted. After tightening, the fixing screws can be tightened;
4. The tightening torque of the fixing screws is 7-9 Nm. Ensure that the screws are not loose, and no gap is found between the mating surfaces of the MGU and the caliper.

## 二、 E70电子驻车制动系统工作原理及电路图



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### E70电子驻车制动系统的基本原理及电路图分析

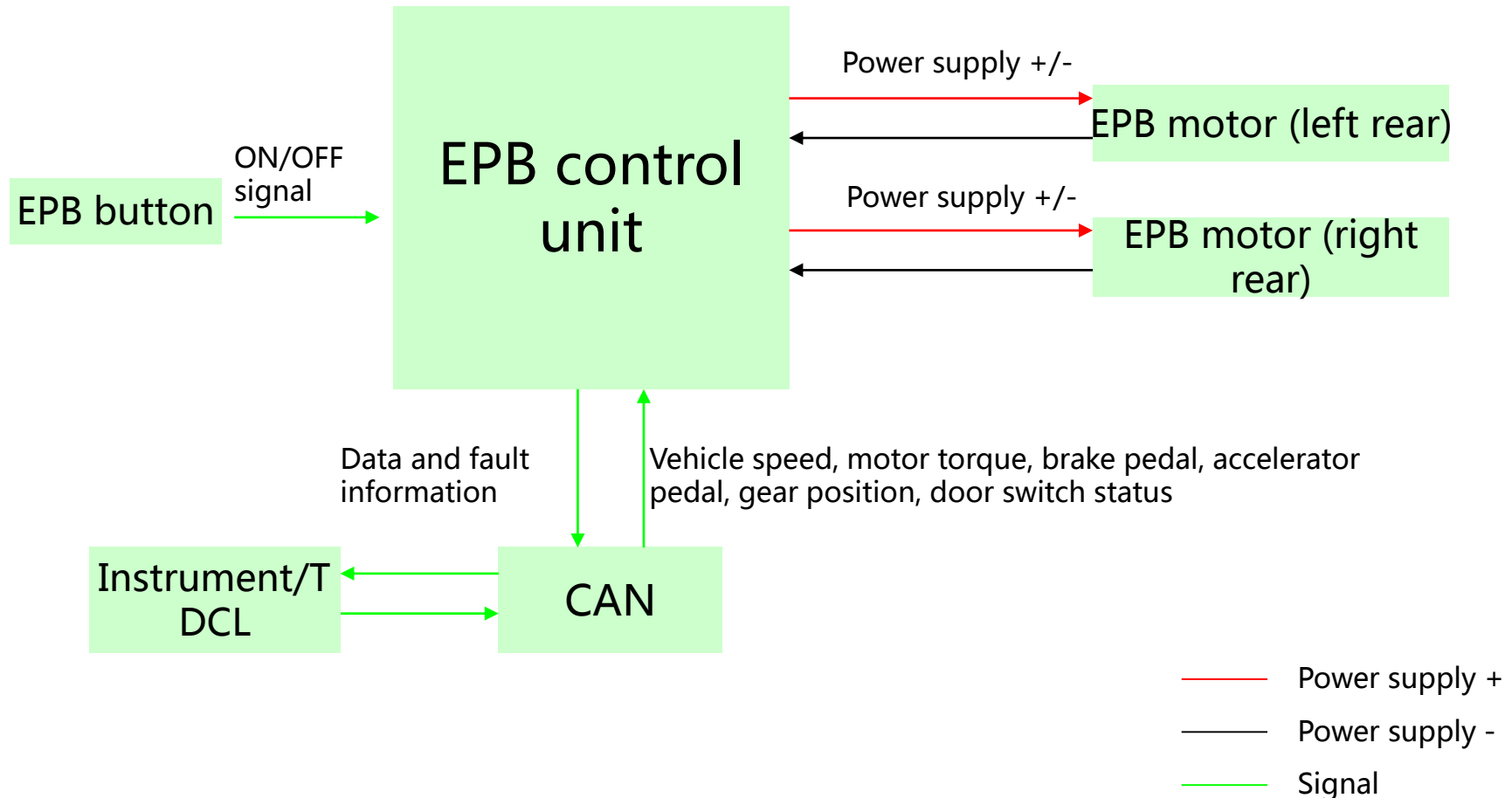


## II. Working principle and circuit diagram of E70 EPB



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### Analysis of working principle and circuit diagram of E70 EPB





### 三、 E70电子驻车制动系统维修注意事项



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- 在更换EPB控制单元（内部含坡度传感器）时需使用诊断仪进行EPB坡度标定以及EPB初始化
- 在使用诊断仪进行EPB坡度标定以及EPB初始化时，需要在水平路面上进行
- 需要进行EPB系统人工解锁时，需严格按照规定的方法进行操作。



### III. Precautions for service of E70 EPB



- Use the scan tool for EPB slope calibration and EPB initialization when replacing the EPB control unit (with a slope sensor inside).
- EPB slope calibration and EPB initialization by using the scan tool shall be carried out on the level road.
- Manual unlocking of the EPB must be operated in strict accordance with the prescribed method.





- 1、在实车上进行EPB各项功能的操作
- 2、使用诊断仪进行EPB系统的相关操作
- 3、在实车上进行EPB人工紧急解锁的相关操作



1. Perform EPB functions in the physical vehicle.
2. Use the scan tool to perform EPB related operations.
3. Perform the manual emergency unlocking of the EPB in the physical vehicle.