



东风乘用车

# 电器概述



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# Overview



- 1、掌握E70保险丝继电器盒的位置分布
- 2、掌握E70电源分配工作原理
- 3、掌握E70车身控制器及整车控制器的工作原理
- 4、掌握E70CAN线系统工作原理

# Objectives



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1. Master the location of the E70 fuse relay box
2. Master the Principle of E70 power distribution
3. Master the working principle of the E70 BCM and the VCU
4. Master the working principle of E70 CAN bus system

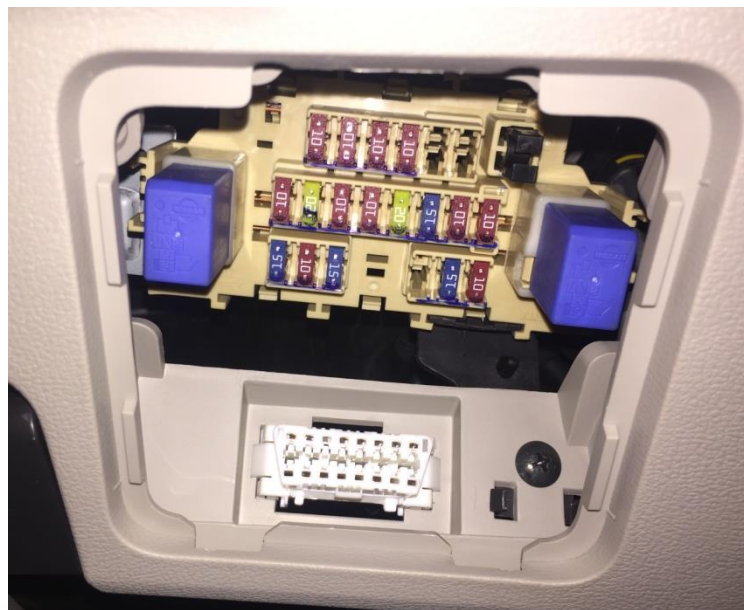


# 一、E70保险丝继电器盒位置分布

E70有两个常用的常规电器保险丝继电器盒，位置分别在发动机舱左前及驾驶室方向盘下方位置，诊断接口在驾驶员方向盘下部。



前舱保险丝继电器盒



驾驶舱保险丝继电器盒

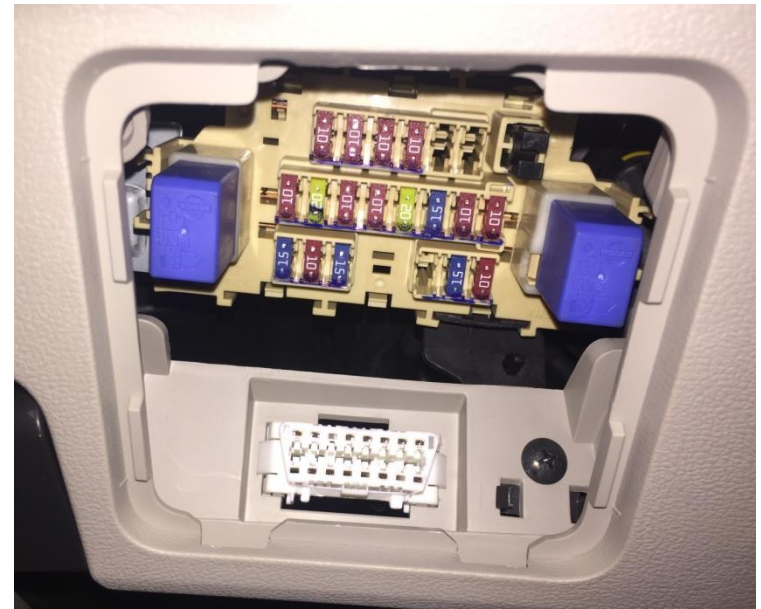
# I. Location of E70 fuse relay box



The E70 has two commonly-used conventional electrical fuse relay boxes located in the left front of the engine compartment and below the steering wheel in the cab. The diagnostic interface is located below the steering wheel.



Engine compartment fuse relay box

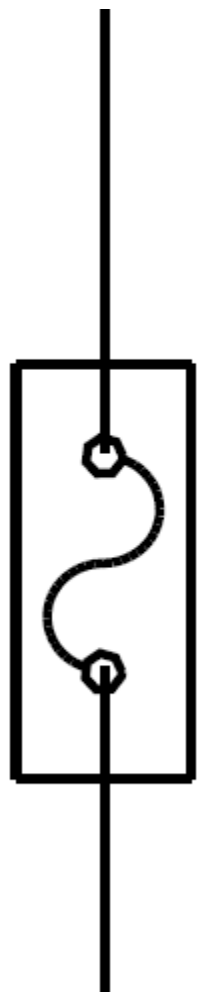


Cab fuse relay box

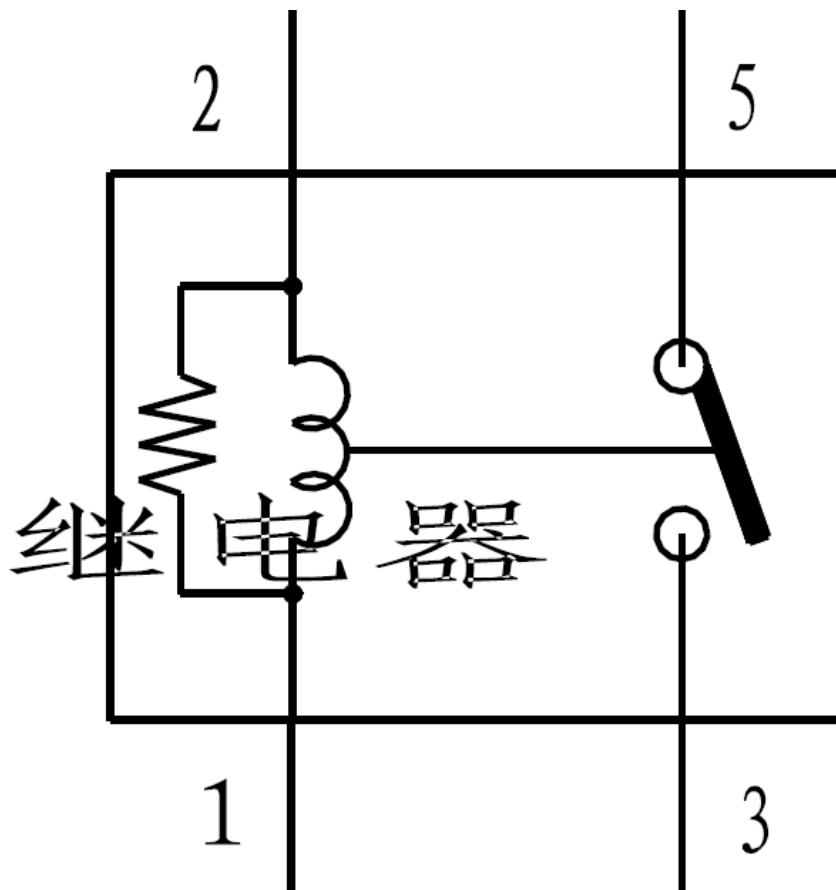
# 一、E70保险丝继电器盒位置分布



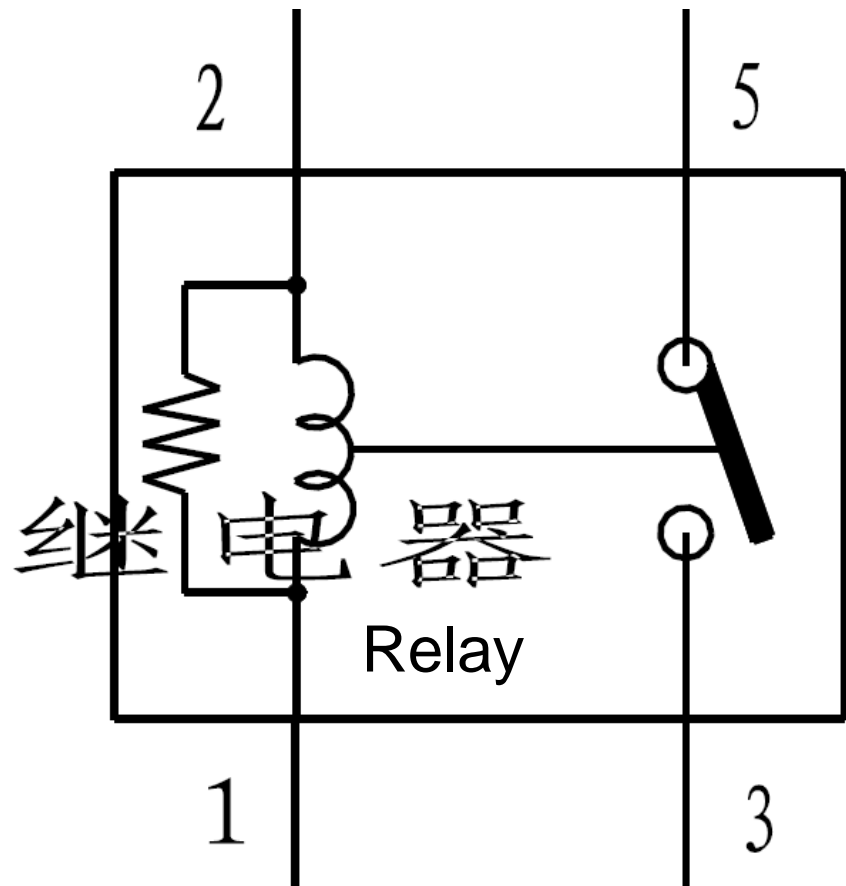
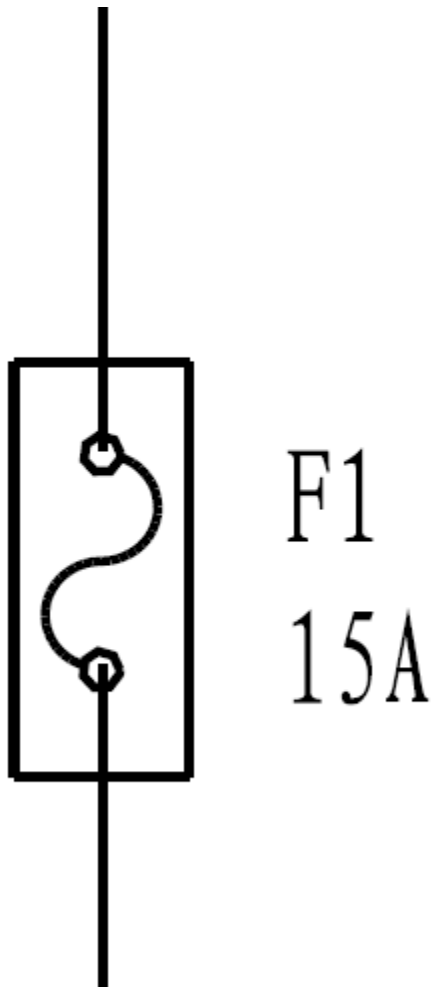
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F1  
15A



# I. Location of E70 fuse relay box



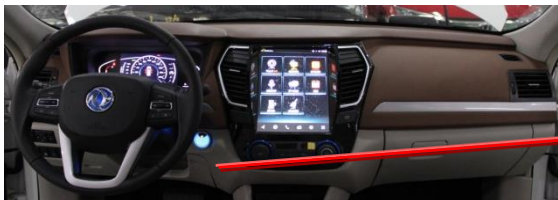


## 二、E70电源分配工作原理



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E70点火具有OFF、ACC、IG、ST四个档位，E0级出租车为普通钥匙，配用的是传统机械点火开关，E0级私家车和E1级车型为智能钥匙+按键的组合，是依靠智能钥匙控制模块（PEPS，主驾驶仪表台下部）来完成电源分配的。

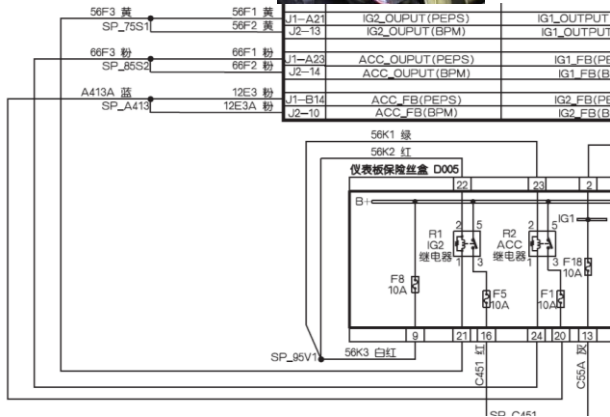


点火开关(CA00)



		OFF	ACC	IG	ST
1	B		○	○	○
5	ACC		○	○	○
3	IG1			○	○
6	IG2			○	○
2	ST				○
	R				○

机械点火开关



智能点火按键

E70与传统车一样，低压电路采取负极搭铁连接的方式

## II. Principle of E70 power distribution



OFF, ACC, IG and ST are provided for E70 ignition. The **E0 class taxi** is equipped with a common key and a traditional mechanical ignition switch. The **E0 class private car and the E1 class** models equipped with smart key + buttons, of which the power distribution is completed with the help of the smart key control module (PEPS, the lower part of the instrument panel facing the driver).

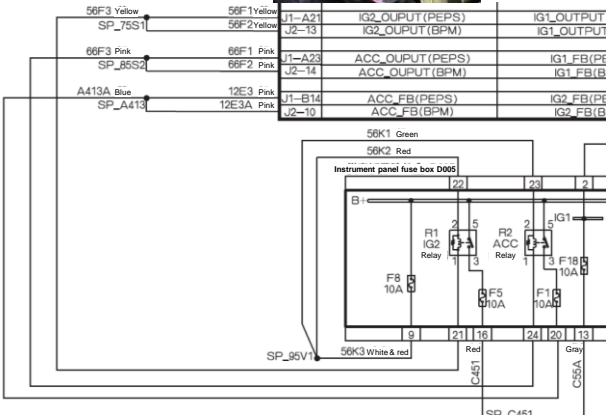


Ignition switch (CA00)



		OFF	ACC	IG	ST
1	B				
5	ACC				
3	IG1				
6	IG2				
2	ST				
	R				

Mechanical ignition switch



Smart ignition switch

Like the traditional vehicles, the E70 is designed with negative grounding for the low voltage circuit.

### 三、E70车身控制器（BCM）工作原理



E70车身控制器布置（BCM）在仪表台副驾下部，绝大多数低压电器由它进行控制。



### III. Working principle of E70 BCM



The E70 BCM is located in the lower part of the instrument panel facing the front passenger, and controls most of the low voltage units.





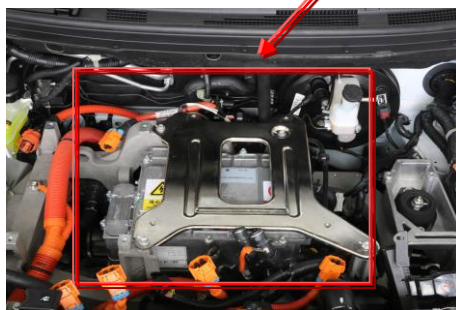
## 四、E70整车控制器（VCU）工作原理



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E70整车控制器（VCU），具有收集驾驶操纵信息及控制真空助力泵的作用，此控制器将其收集的相关信息通过CAN线传递给高压系统，作为高压系统工作的参考信息，同时还可将高压系统的信息传给低压仪表显示。

自主电机的车型整车控制器与电机控制器（MCU）集成为一体。



自主电机车型的集成式VCU

## IV. Working principle of E70 VCU



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The E70 VCU has the functions of collecting driving control information and controlling the vacuum booster pump. The unit transmits the collected information to the high voltage system through the CAN bus as reference information for the operation of the high voltage system, as well as the information of the high voltage system to the low voltage meter for display.

The VCU of the model with the independently-developed motor is integrated with the MCU



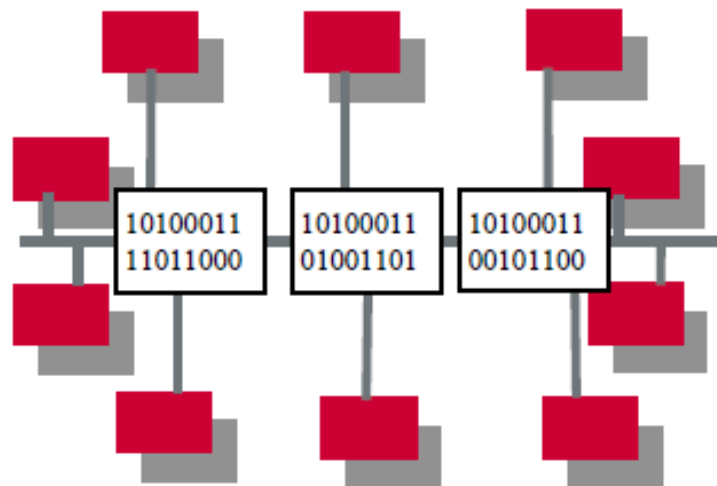
Integrated VCU of the model with the independently-developed motor

## 五、CAN线系统工作原理

利用计算机网络技术，将车载控制模块通过车载网络连接起来，实现数据信息的高效传输。目前应用最为广泛的是控制器局域网（Controller Area Network），即所谓的 CAN BUS系统。E70采用了这种连接方式



传统方式



CAN线方式

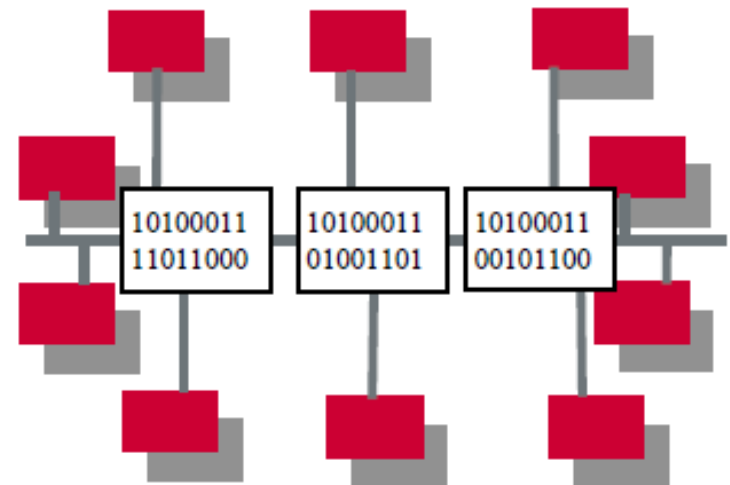
## V. Working principle of CAN bus system



Using computer network technology, the vehicle control module is connected through the vehicle network to achieve efficient transmission of data information. Currently, the most widely used network is the Controller Area Network, the so-called CAN BUS system. E70 employs this connection method.



Traditional method



CAN bus method



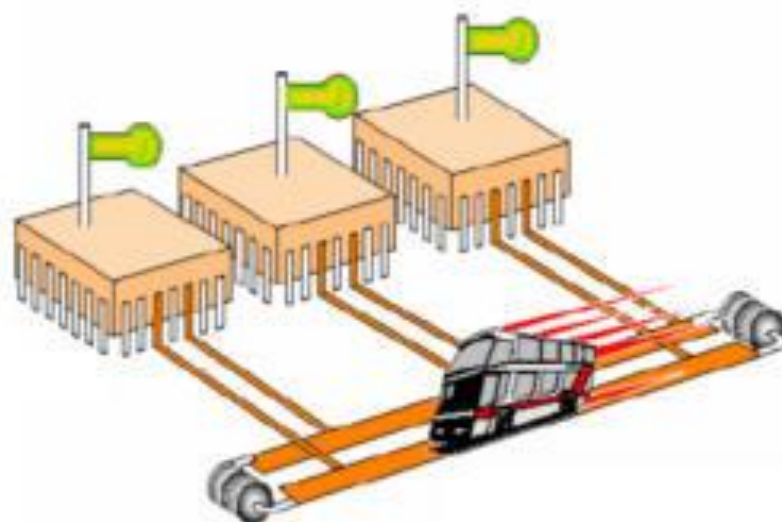
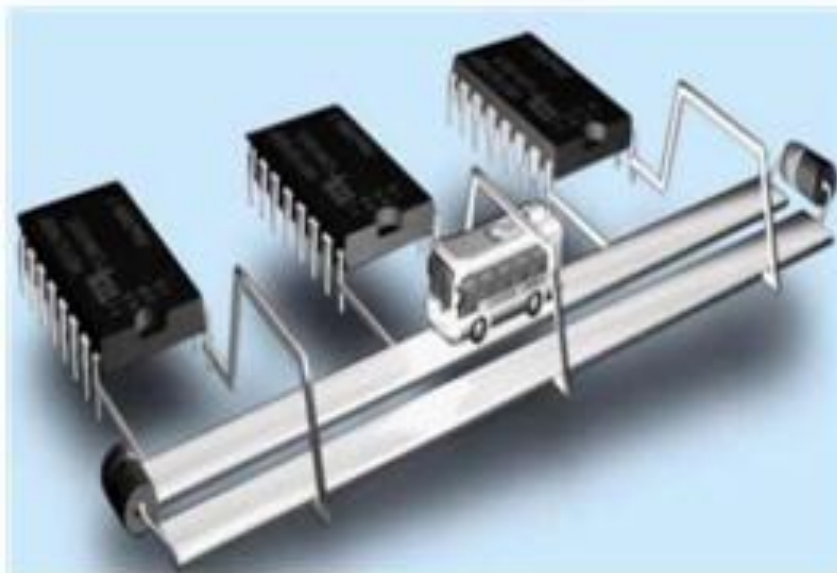
# 五、CAN线系统工作原理



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## CAN BUS系统的优点：

- 1、数据传输速度较快
- 2、系统可靠性高
- 3、减少线束，降低成本

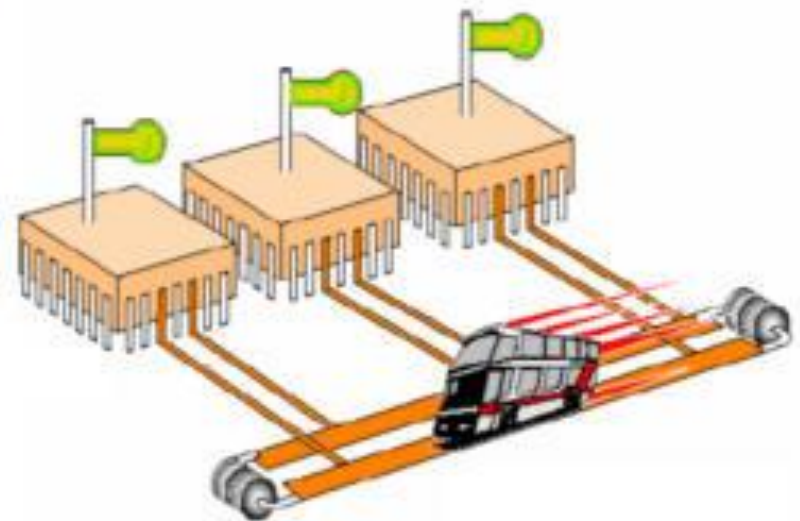
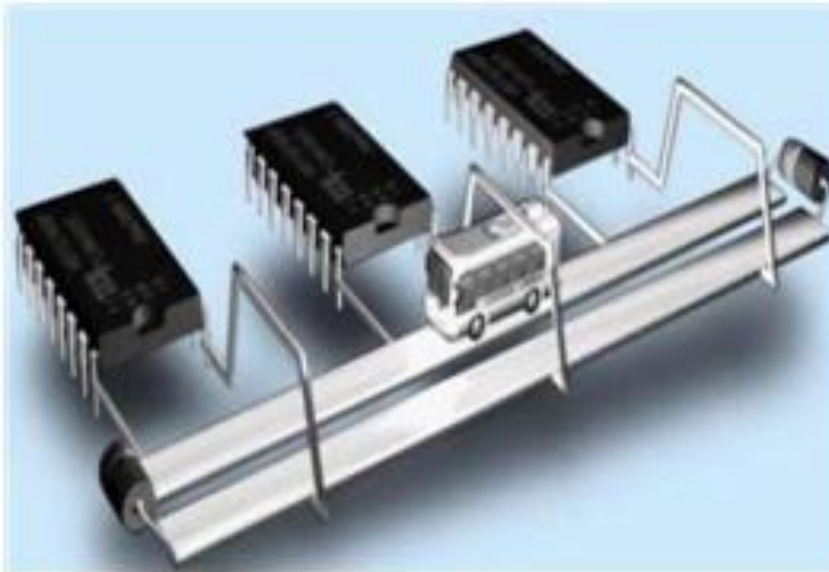


## V. Working principle of CAN bus system



### Advantages of CAN BUS system:

1. Faster data transmission
2. High system reliability
3. Reduced wire harnesses and costs

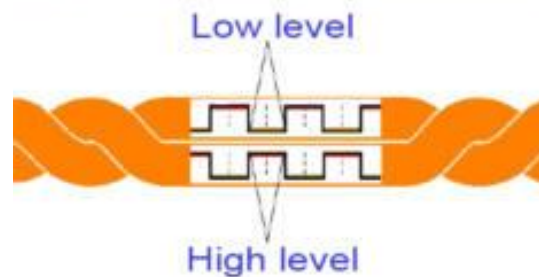
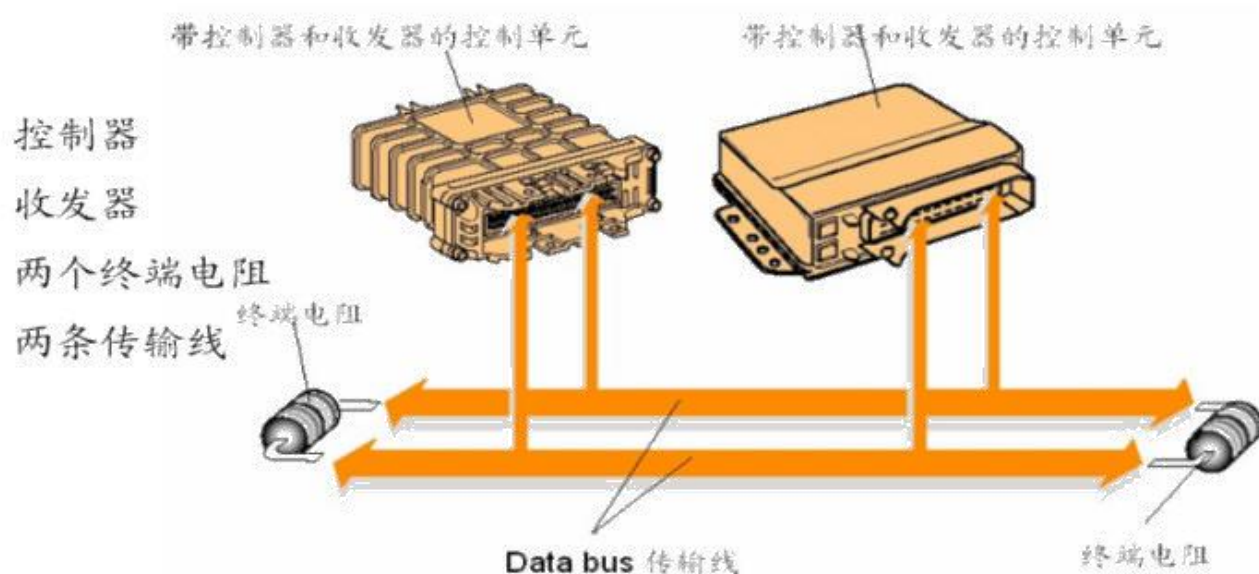




## 五、CAN线系统工作原理

### 系统组成：

CAN BUS数据总线系统主要由控制器、收发器、终端电阻和传输线等组成。除数据传输线外，其它元件都置于控制单元内部。



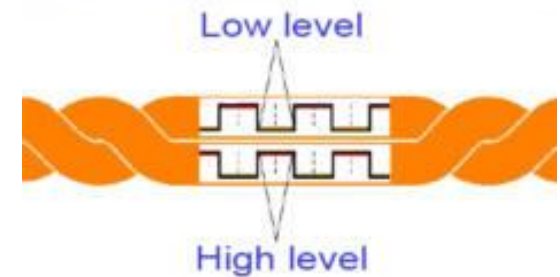
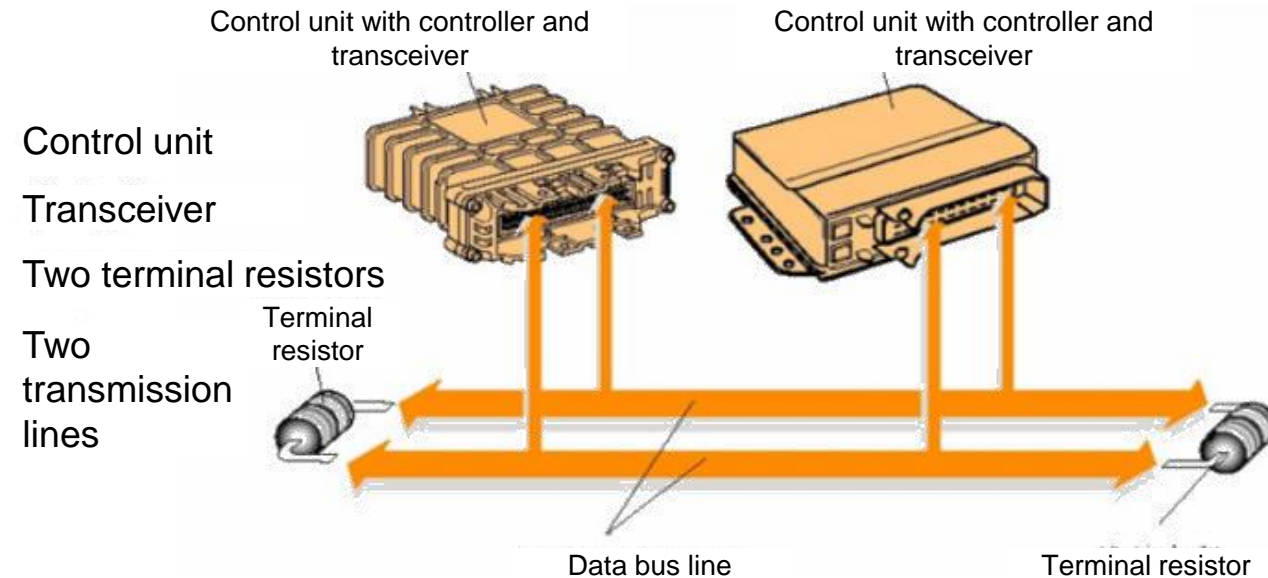
# V. Working principle of CAN bus system



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## System composition:

The CAN BUS system is mainly composed of a controller, a transceiver, a terminating resistor and transmission lines. In addition to the data transmission line, other components are located inside the control unit

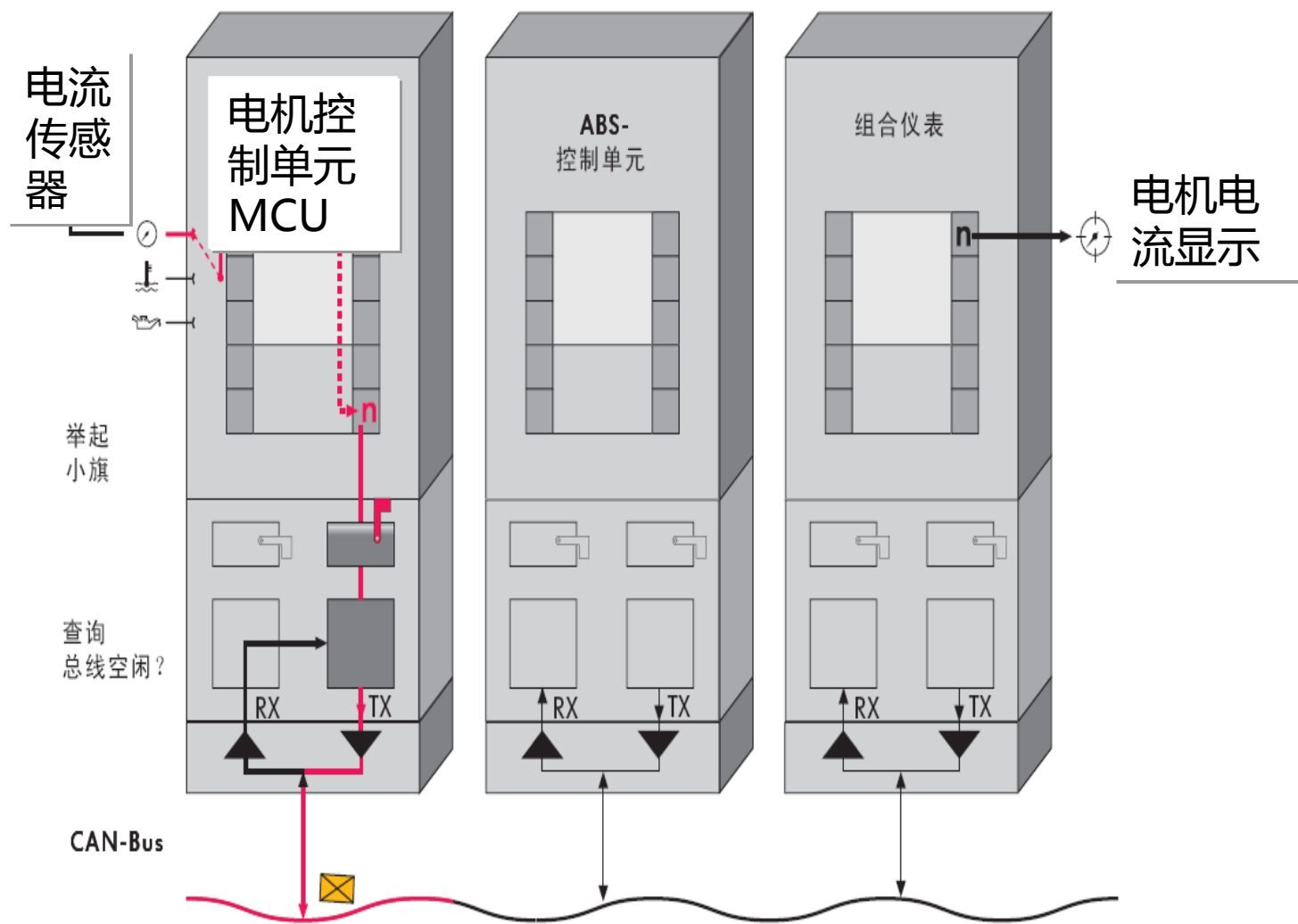


# 五、CAN线系统工作原理



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## 信息交换的原理：

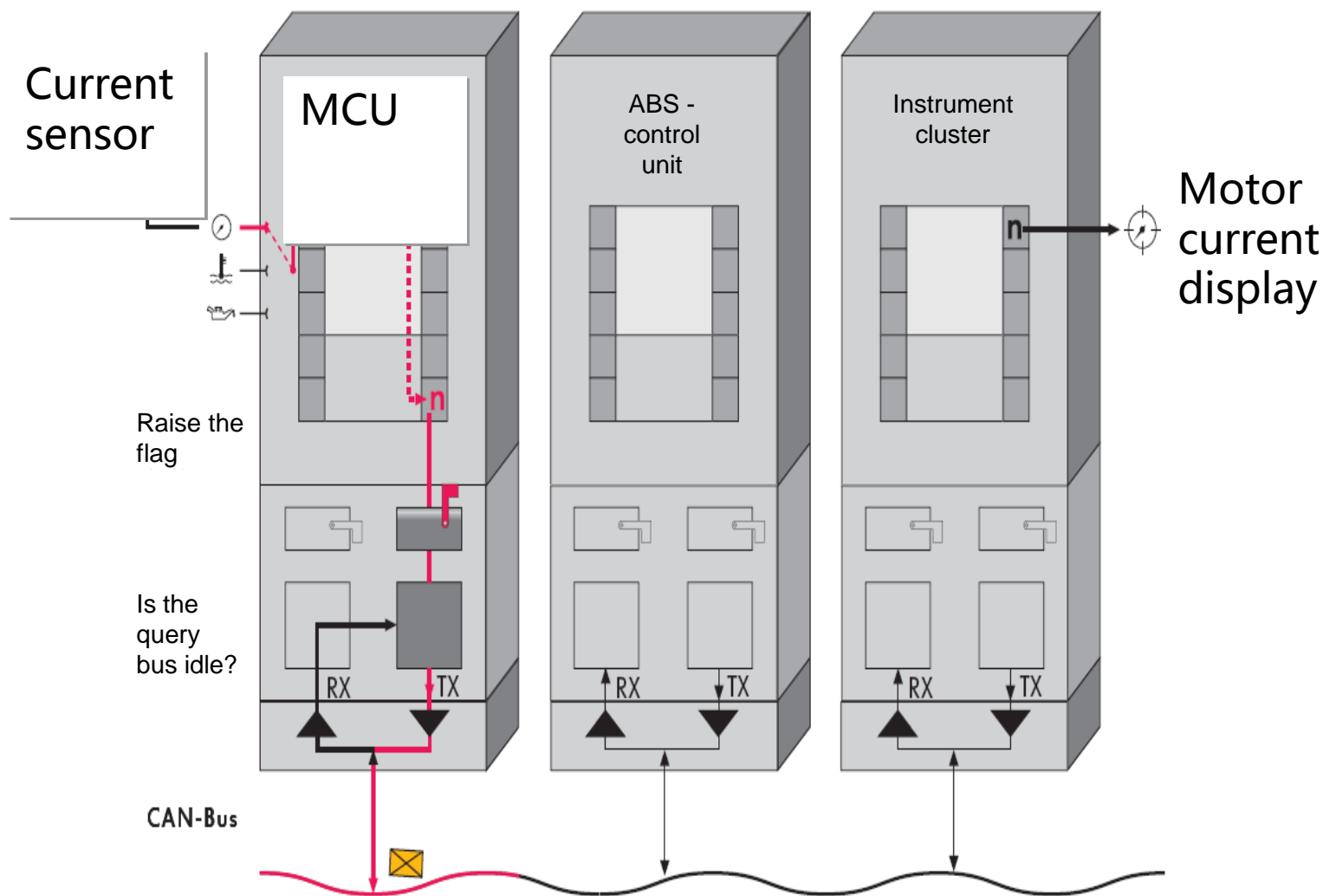


## V. Working principle of CAN bus system



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### Principle of information exchange:



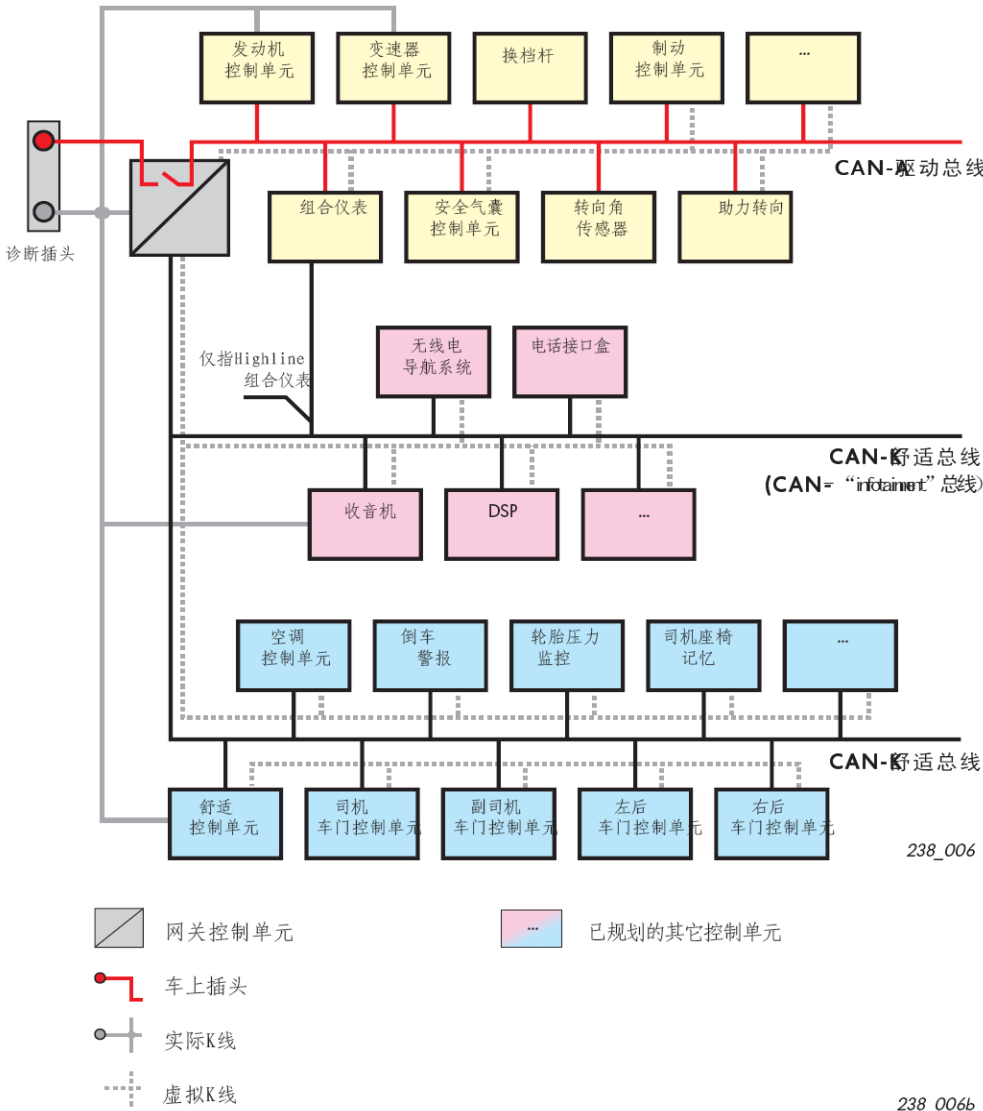
# 五、CAN线系统工作原理



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## 车内网络连接原理：

如果系统内有几种不同的CAN线时，需要有一个模块起到网关的功能，对几种总线之间的信息传输速率和识别代号进行转换，从而实现信息的可靠、迅速和实时传输，完成控制单元对相应模块功能的控制。



238\_006

238\_006b



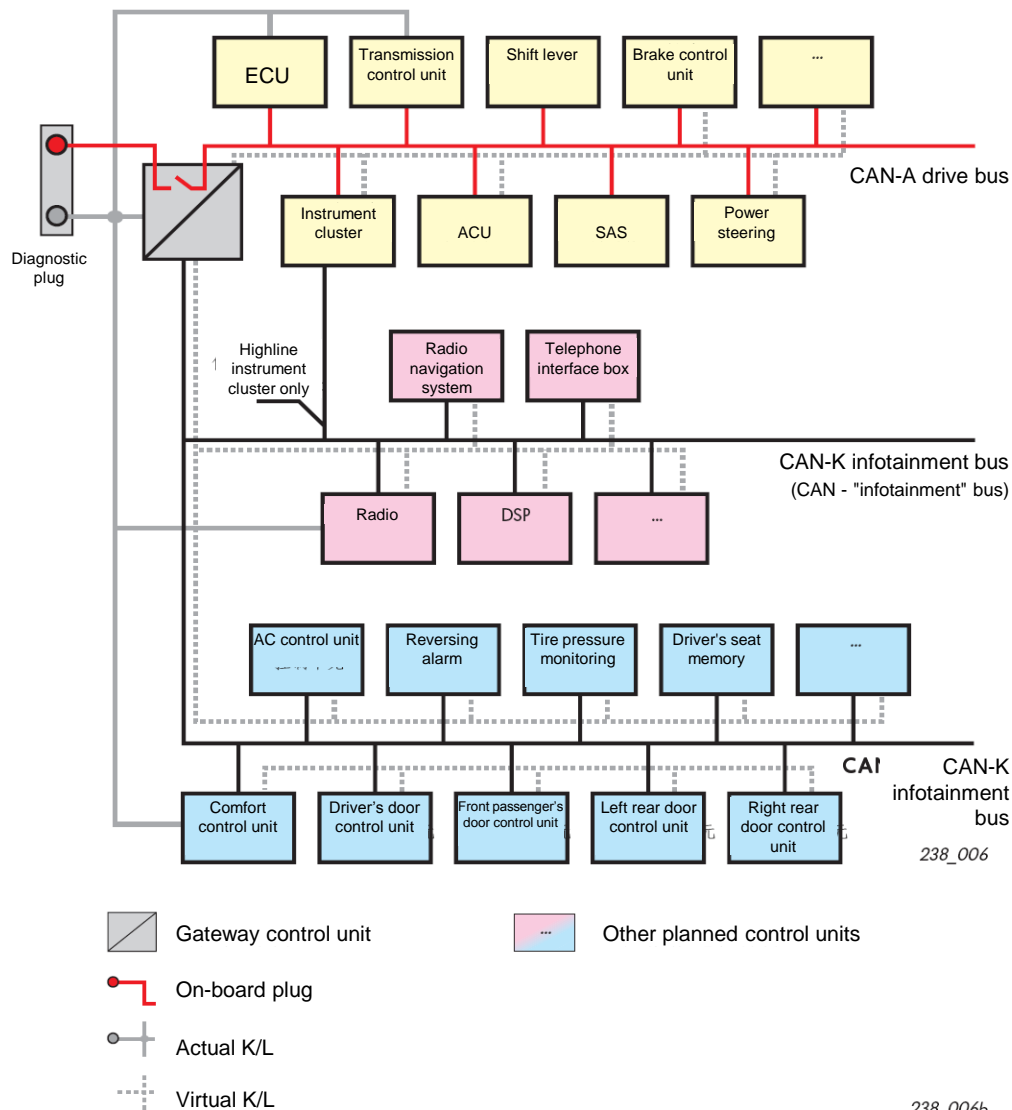
# V. Working principle of CAN bus system



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## Principle of interior network connection:

If there are several different CAN lines in the system, a module needs to function as a gateway to convert the information transmission rate and identification code between several buses, thereby realizing reliable, rapid and real-time transmission of information. The control unit can therefore control the function of the corresponding module.

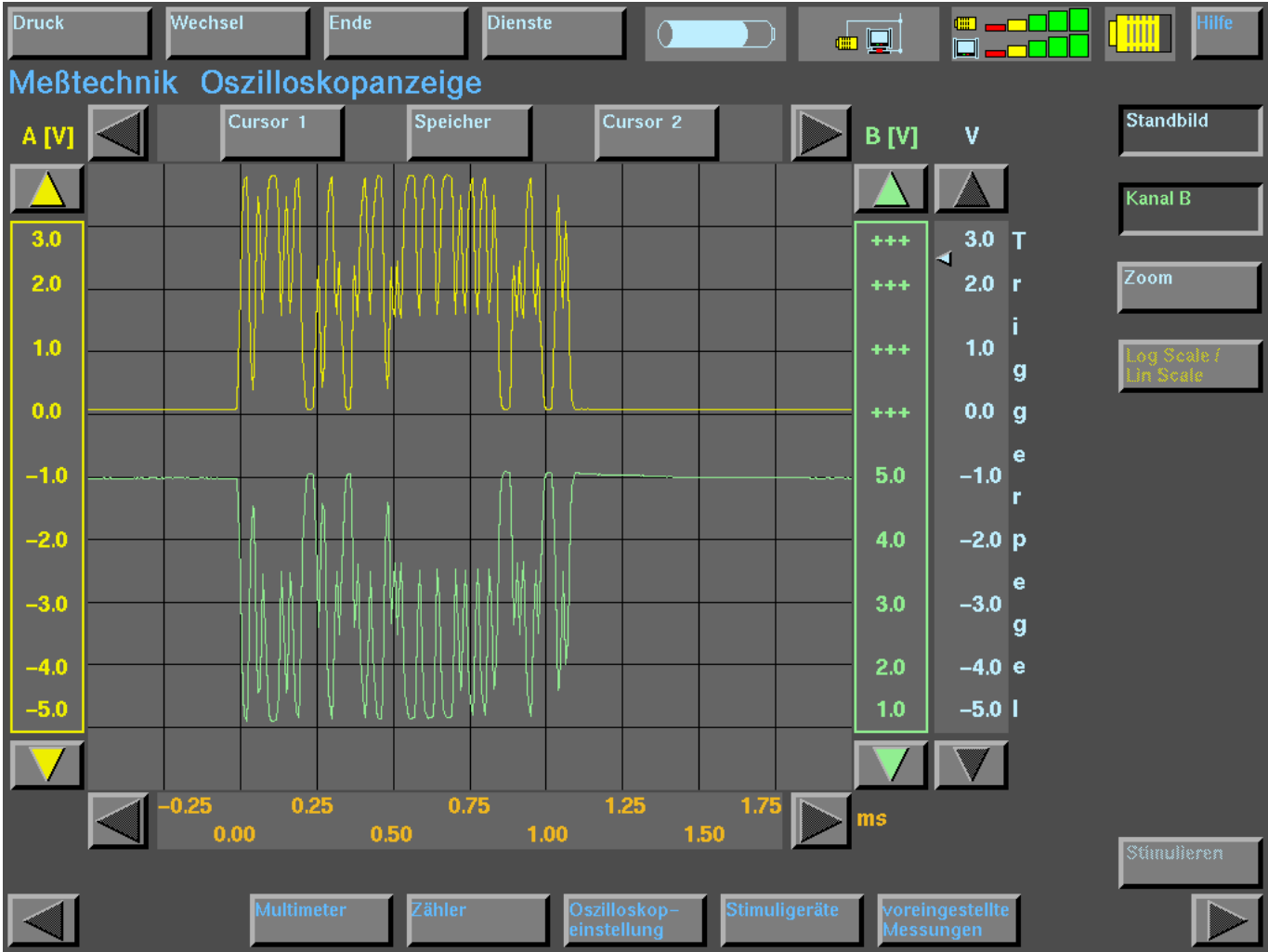




# 五、CAN线系统工作原理



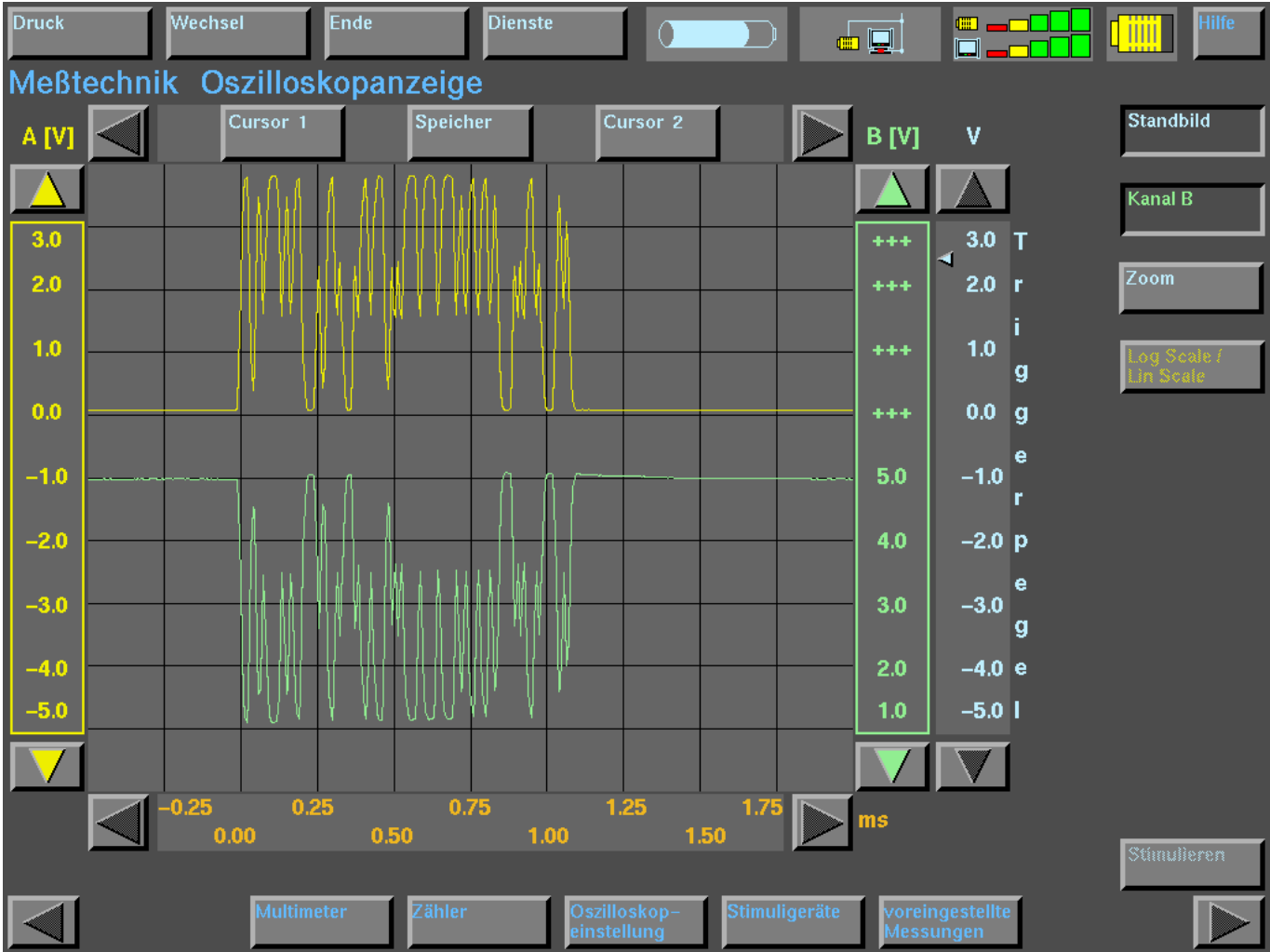
数据波形：



# V. Working principle of CAN bus system



## Data waveform:



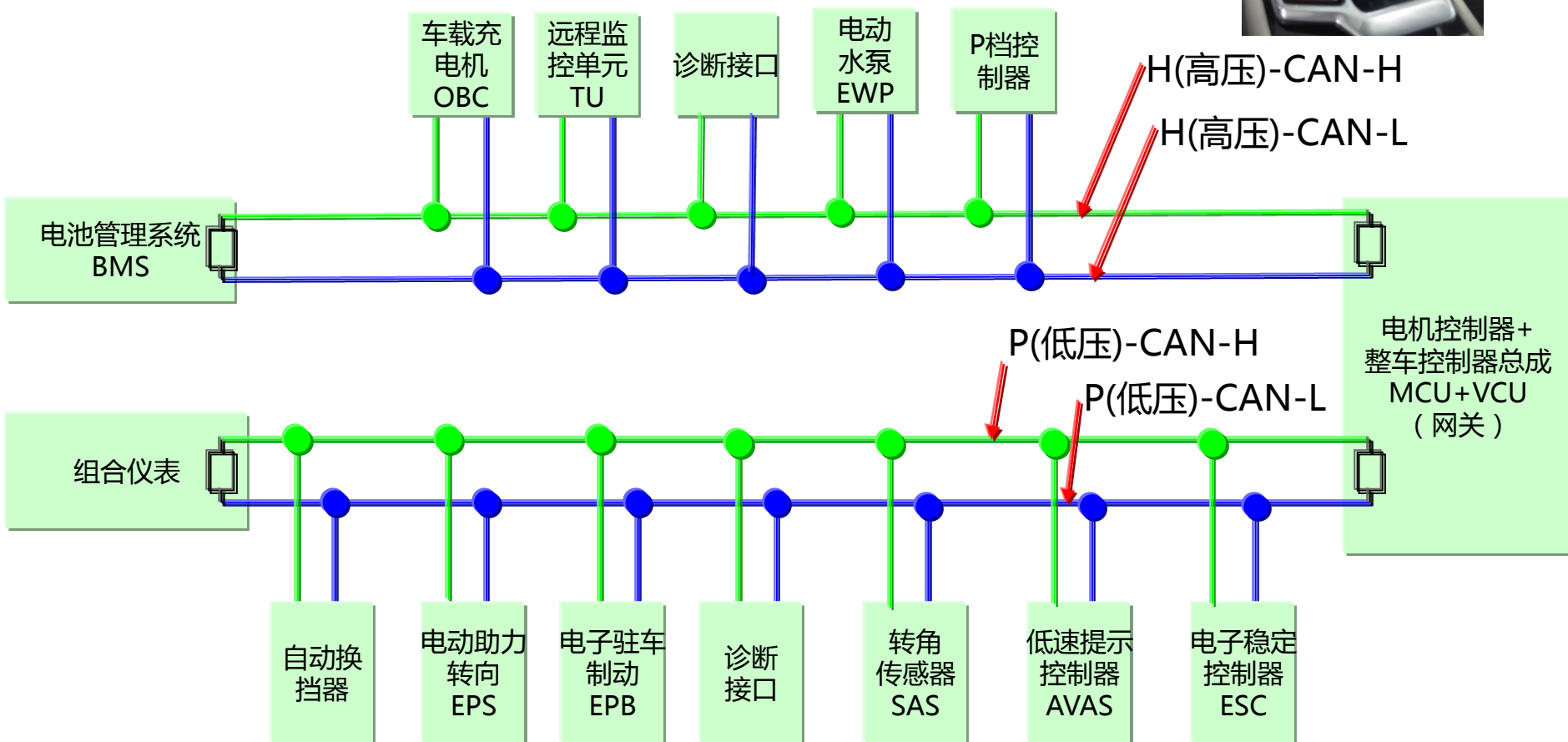
# 五、CAN线系统工作原理



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## E70 CAN线系统工作原理（自主电机车型）

三组CAN的传输速率（H-CAN、P-CAN、B-CAN）均为500K/S

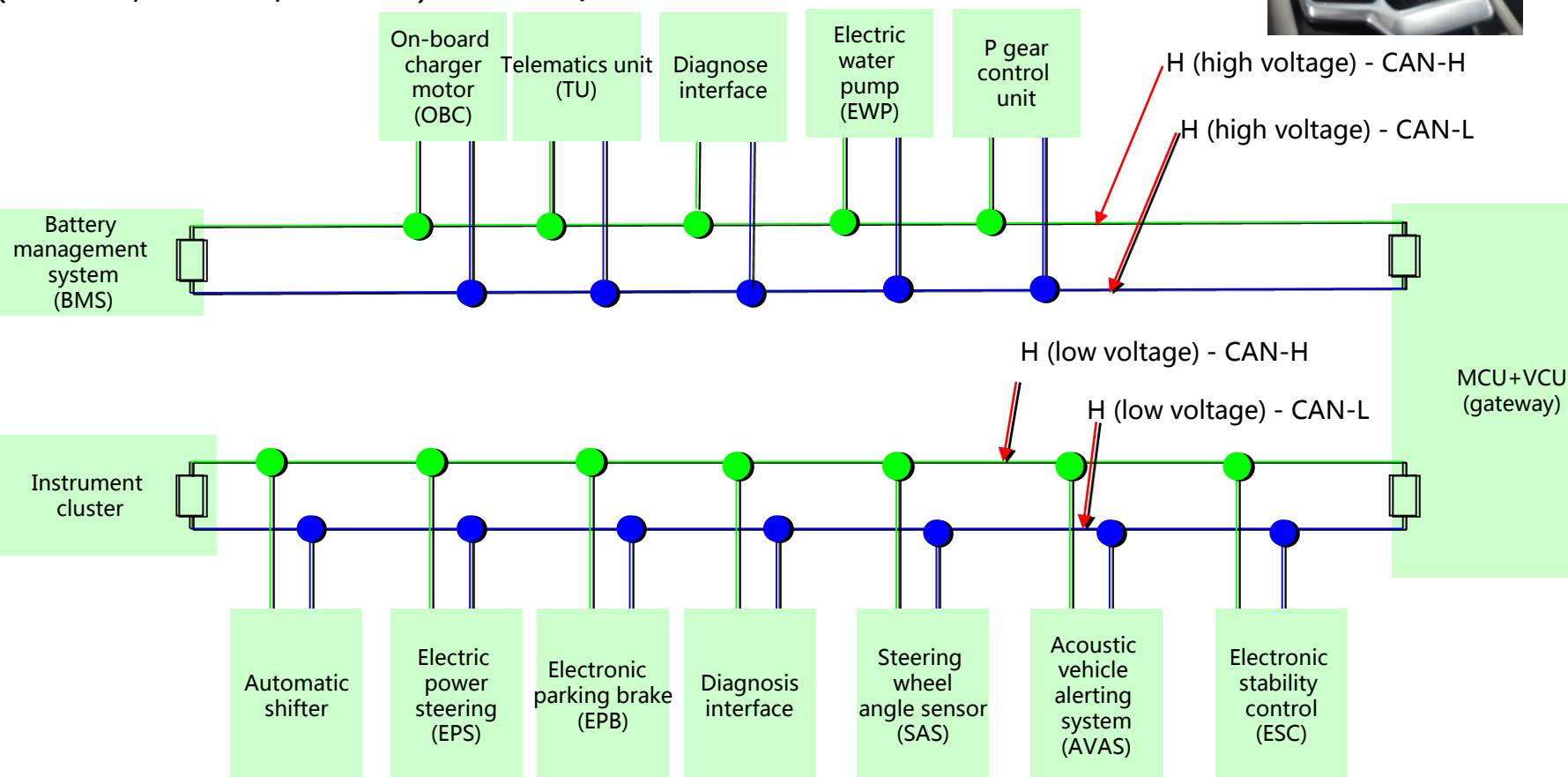




## V. Working principle of CAN bus system

### Working principle of E70 CAN bus system (model with independently-developed motor)

The transmission rate of three groups of CAN  
(H-CAN, P-CAN, B-CAN) is 500 K/S.



# 五、CAN线系统工作原理



东风乘用车

## E70 CAN线系统工作原理（自主电机车型）

三组CAN的传输速率（H-CAN、P-CAN、B-CAN）均为500K/S



P(低压)-CAN-H

P(低压)-CAN-L

自动换挡器

电动助力转向 EPS

诊断接口

电子驻车制动 EPB

转角传感器 SAS

低速提示控制器 AVAS

电子稳定控制器 ESC

电机控制器+  
整车控制器  
总成  
MCU+VCU

组合仪表  
(网关)

B(车身)-CAN-H

B(车身)-CAN-L

车身控制器  
BCM

诊断接口

电池冷却控制器 BCU

BYD 压缩机

智能进入控制器 PEPS

空调控制器

音响控制器 MP5

T-BOX 车联网控制器

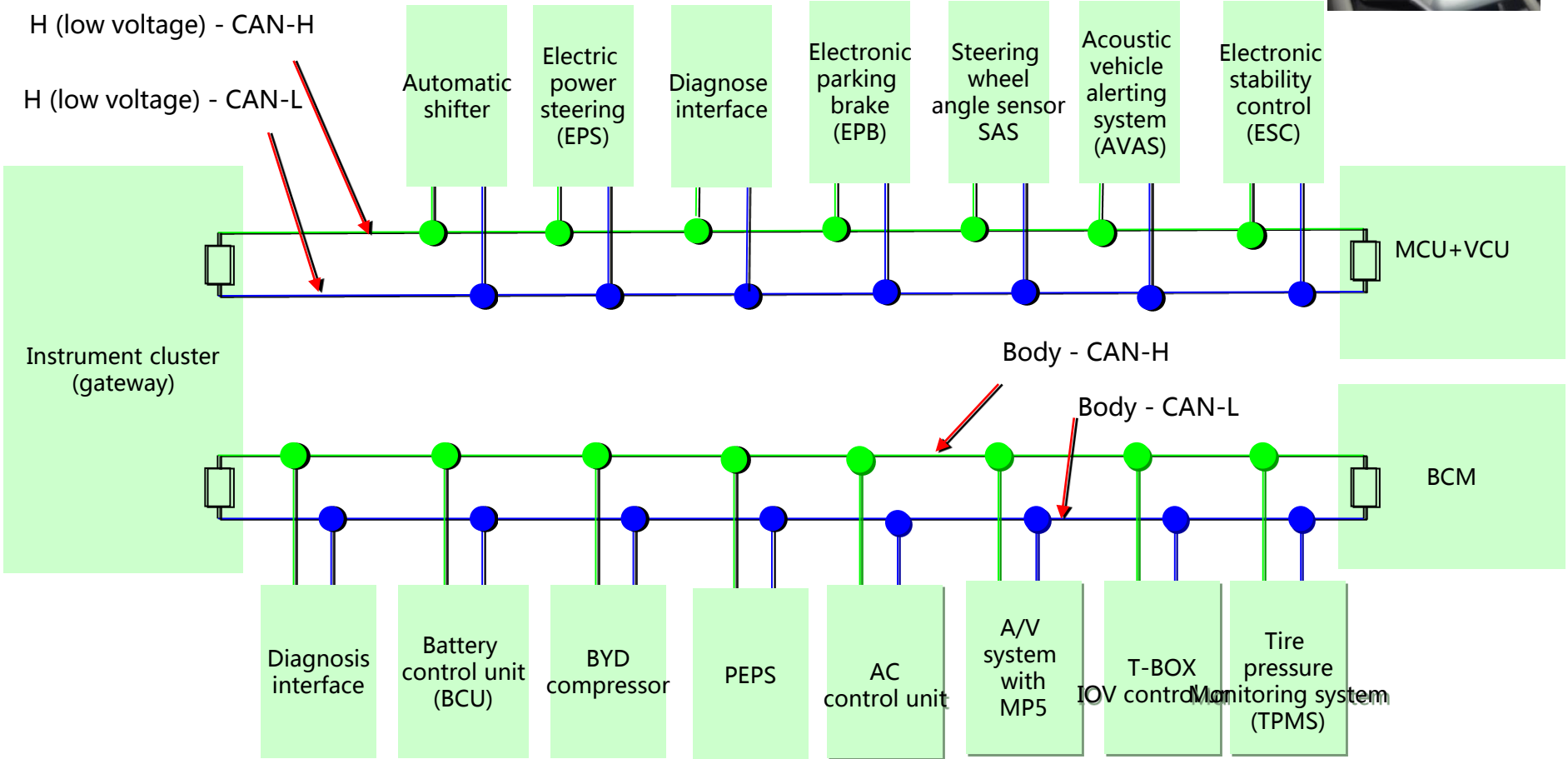
胎压监测单元 TPMS

# V. Working principle of CAN bus system



## Working principle of E70 CAN bus system (model with independently-developed motor)

The transmission rate of three groups of CAN (H-CAN, P-CAN, B-CAN) is 500 K/S.





按照要求完成E70的CAN网络通信任务单



Complete the E70 CAN network communication task list as required.