



东风乘用车

制动控制系统



东风乘用车

Brake Control System



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

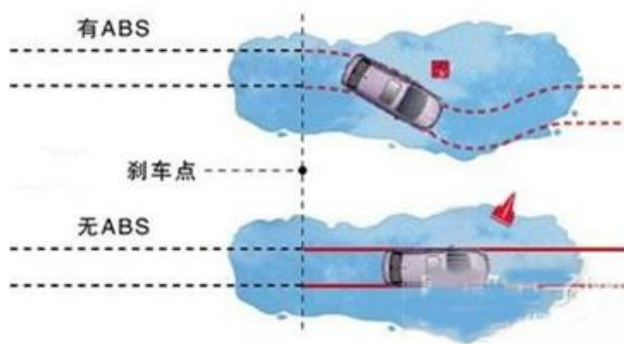


1. Familiar with the composition of E70 brake control system and functions of its components
2. Familiar with the working principle of the E70 brake control system
3. Troubleshooting of the E70 brake control system
4. Master the removal and refitting and replacement methods and precautions of the E70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

一、E70制动控制系统概述



采用ABS+EBD+ESC配置，以优异的性能保证湿滑路面制动时车身的稳定性



制动车辆控制更可靠

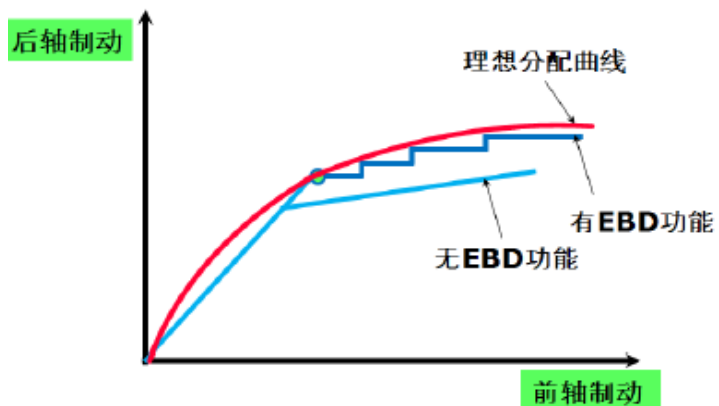
国际先进ABS



EBD



制动更平稳

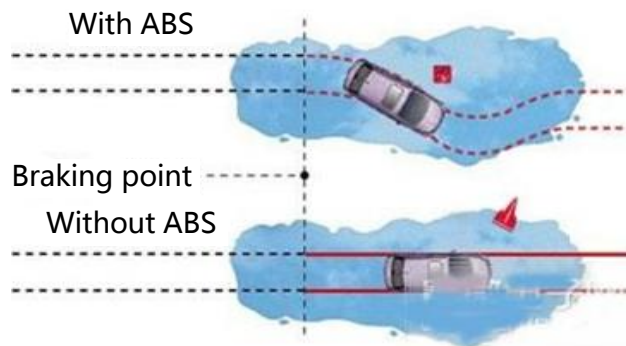


制动距离最大缩短，更安全

I. Overview of E70 brake control system



ABS+EBD+ESC configuration ensures excellent stability of the body during braking on the slippery road with excellent performance.

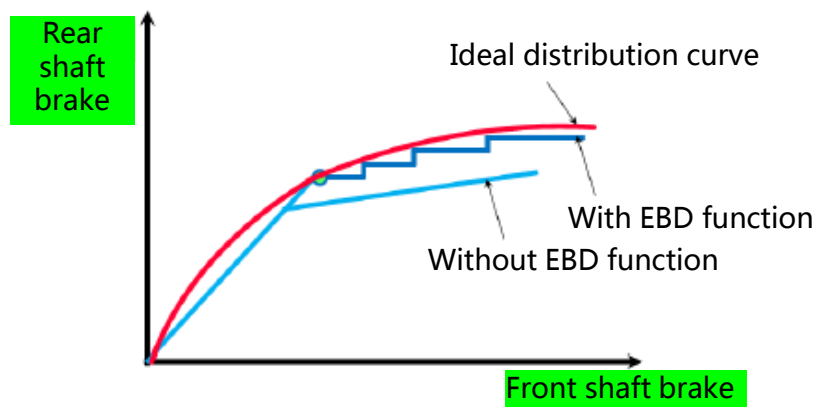


International advanced ABS + EBD =

Brake vehicle control is more reliable

Braking is smoother

The braking distance is shortened to the maximum and is safer.



一、E70制动控制系统概述



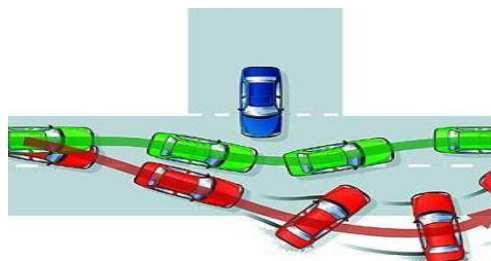
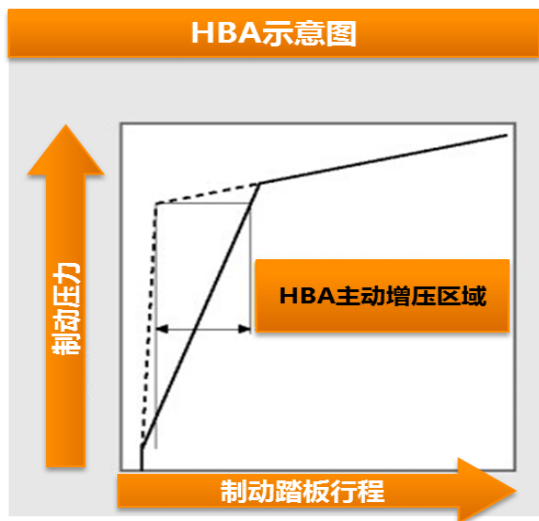
采用ABS+EBD+ESC配置，以优异的性能保证湿滑路面制动时车身的稳定性

HBA液压制动辅助，通过识别驾驶员制动意图及制动力、真空度，必要时辅助驾驶员提升制动响应及制动减速度。

AYC功能借助ESC控制发动机扭矩及制动系统，在驾驶员在紧急避让时避免车辆侧滑。

HBA：在紧急制动的情况下，通过ESC主动建压，提升制动系统响应速度，快速建立制动减速度

AYC车辆稳定性控制



I. Overview of E70 brake control system



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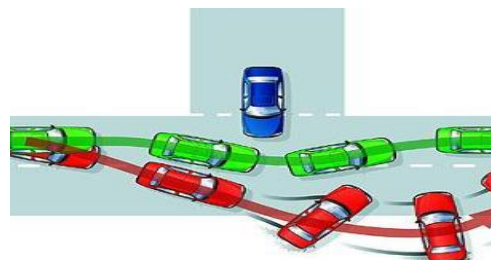
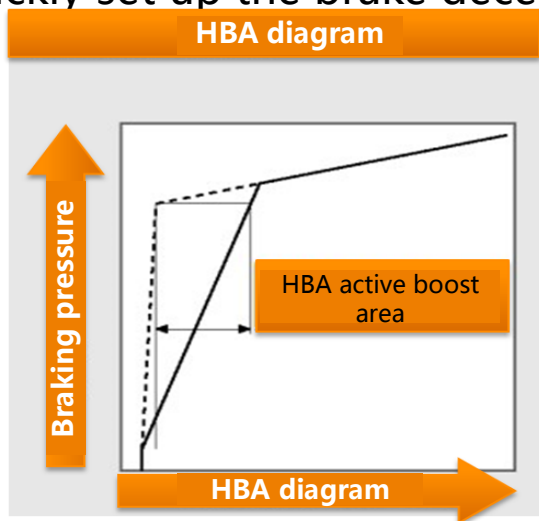
ABS+EBD+ESC configuration ensures excellent stability of the body during braking on the slippery road with excellent performance.

Hydraulic Brake Assist (HBA): it assists the driver to increase the brake response and brake deceleration when necessary by identifying the driver's braking intention and braking force, as well as vacuum.

Active Yaw Control (AYC): it can control the engine torque and braking system with the help of the ESC to prevent the vehicle from slipping during emergency avoidance.

HBA: In the case of emergency braking, the ESC actively builds pressure to increase the response speed of the brake system and quickly set up the brake deceleration.

AYC controls the vehicle stability.



一、E70制动控制系统概述



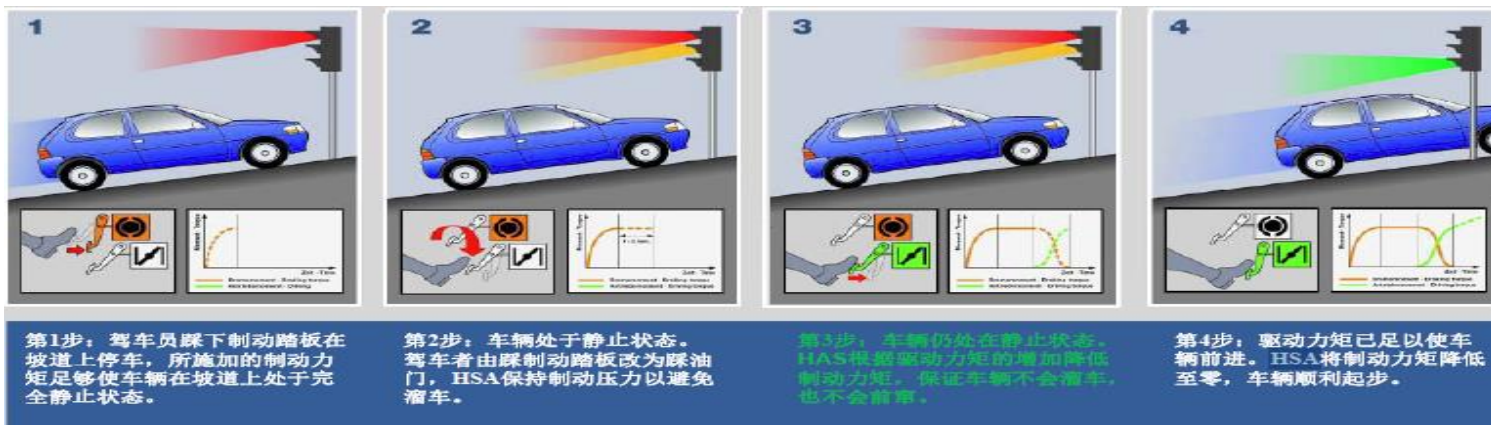
采用ABS+EBD+ESC配置，以优异的性能保证湿滑路面制动时车身的稳定性

TCS功能保证湿滑路面起步/加速时，控制驱动轮输出扭矩，防止打滑，保证行驶方向稳定性。

HAS功能，辅助驾驶员轻松、安心完成坡道起步驾驶

TCS：监控每一个车轮的信号，并通过对制动压力和（或）发动机扭矩的控制，将驱动轮的滑移保持在使车辆的稳定性和加速度保持在最优的状态。

HAS：适用于4%-30%的坡道，使车辆在坡道上保持1.5-2秒，新手也能轻松驾驭上坡停车起步。



I. Overview of E70 brake control system



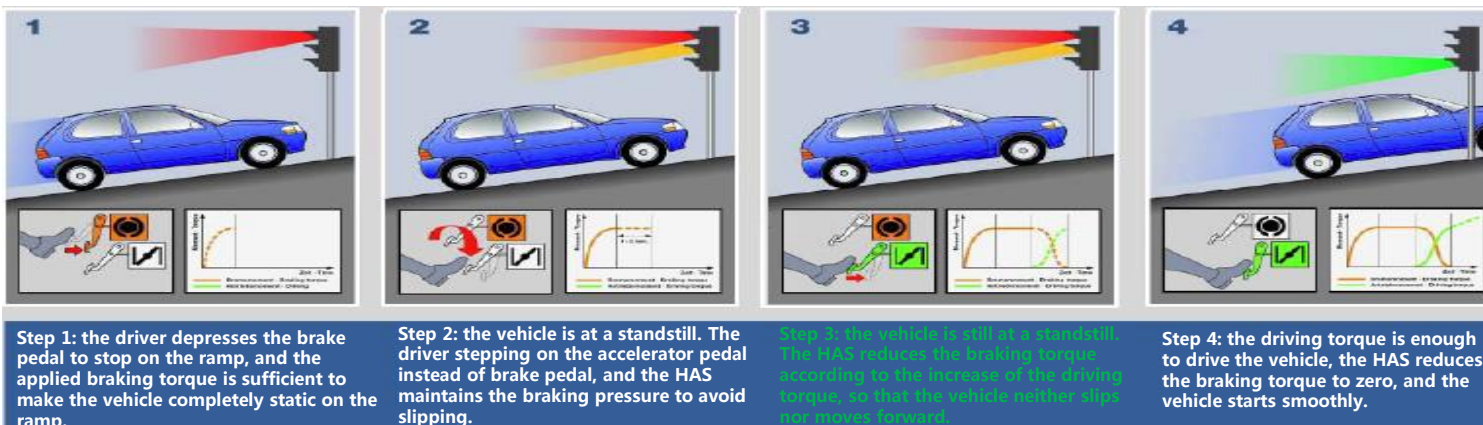
ABS+EBD+ESC configuration ensures excellent stability of the body during braking on the slippery road with excellent performance.

The Traction Control System (**TCS**) ensures that the output torque of the drive wheel is controlled during the start/acceleration on the slippery road to prevent slipping and to ensure the stability in the driving direction.

Hill Start Assist (**HAS**): it assists the driver to complete the hill start in an ease manner.

TCS: It monitors the signal of each wheel and controls the brake pressure and/or engine torque to maintain the slip of the drive wheel to the extent that the stability and acceleration of the vehicle are kept in an optimal state.

HAS: It is suitable for 4%-30% hill. The vehicle can stay on the hill for 1.5-2 s, even if a novice driver can easily start the vehicle on uphill.



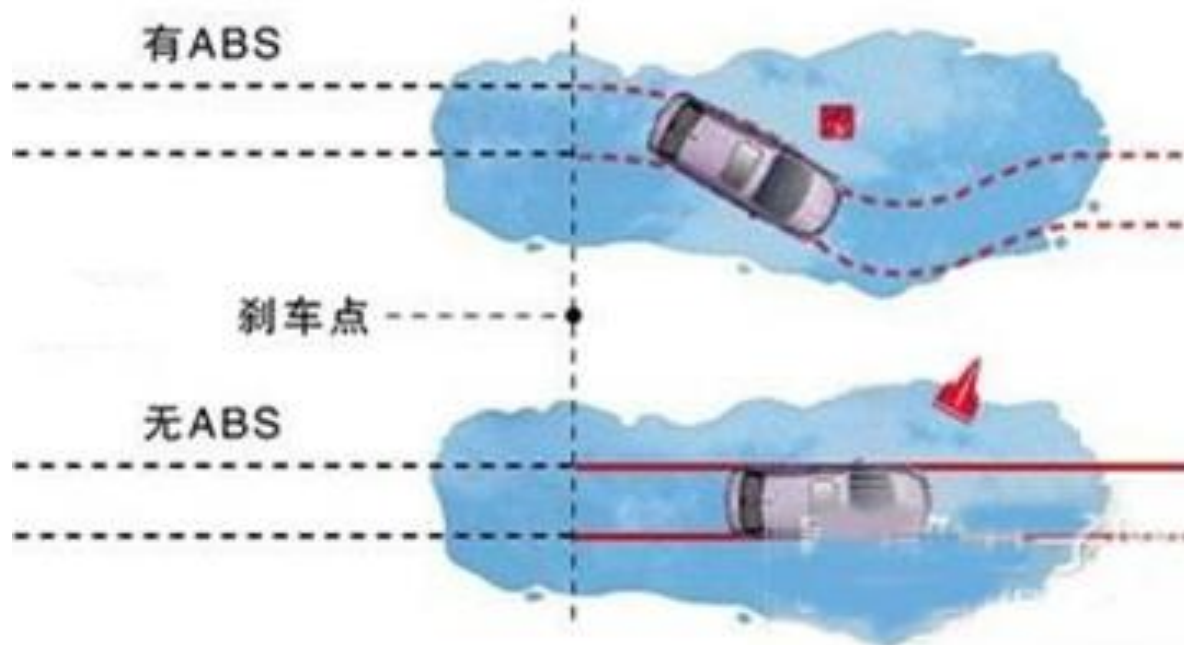
一、E70制动控制系统概述



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ABS 功能

- 防抱死制动系统在制动时检测车轮的旋转，能通过电子控制防止4轮锁死，提高突然制动时操作的稳定性。同时还提高了回避障碍时的操作灵活性。
- 可以使用专用诊断仪进行电气系统诊断。



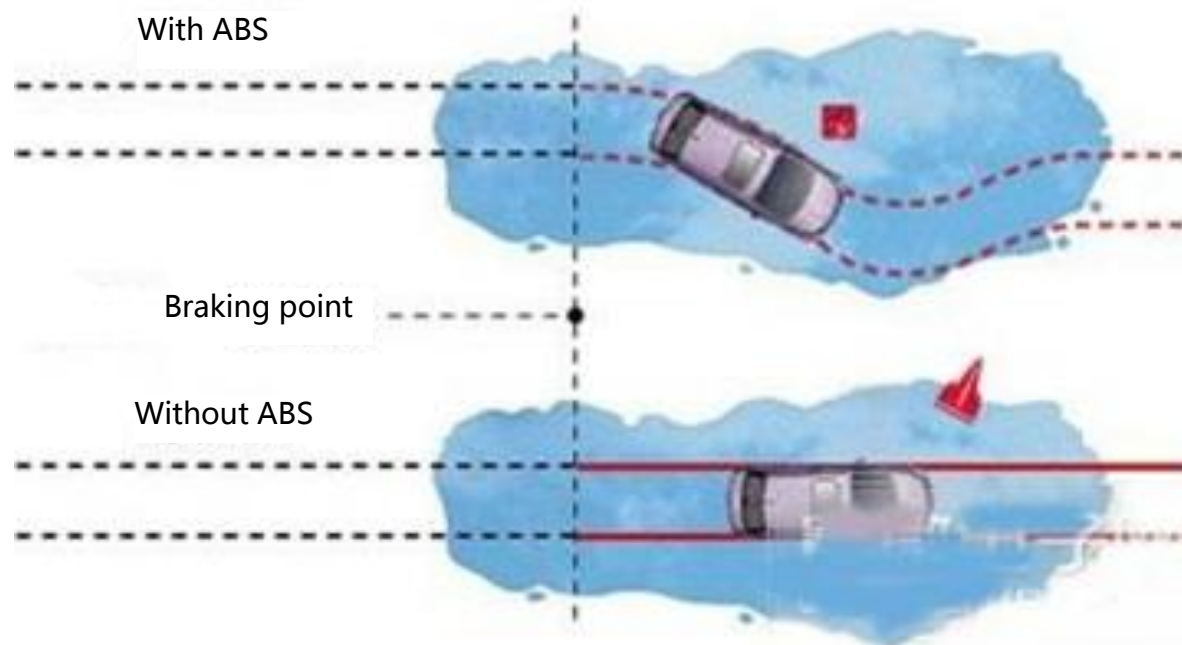
I. Overview of E70 brake control system



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ABS Function

- The anti-lock braking system has the function of wheel rotation detection during braking, and it can prevent 4-wheel locking via the electronic control unit, so as to enhance the stability in the case of sudden braking. And also improve the operating flexibility during obstacle avoidance.
- Special scan tool may be used to perform electrical system diagnosis.



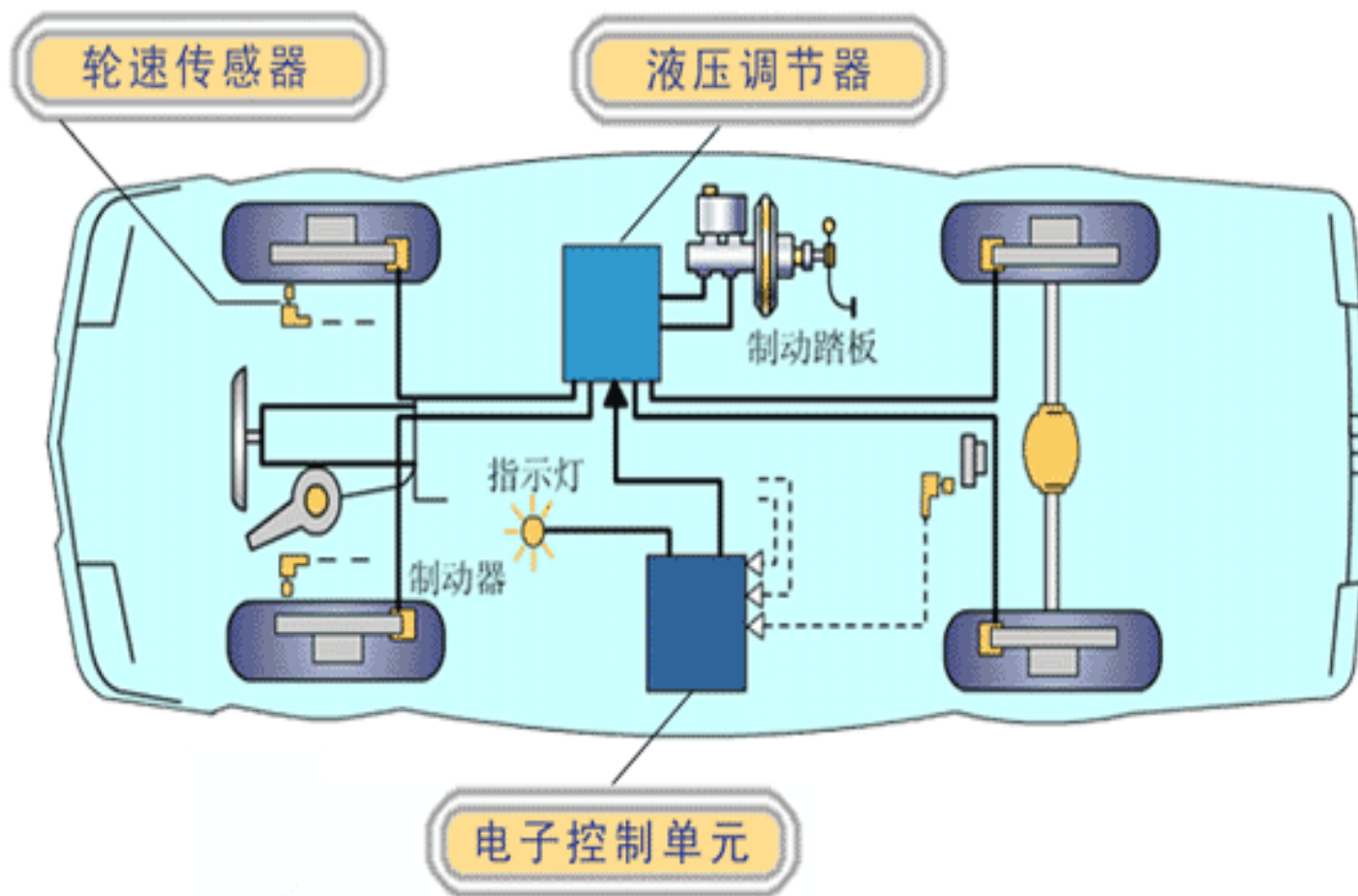
一、E70制动控制系统概述



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ABS系统的组成

主要由传感器、制动压力调节器(液压单元)和电子控制器（电控单元）组成



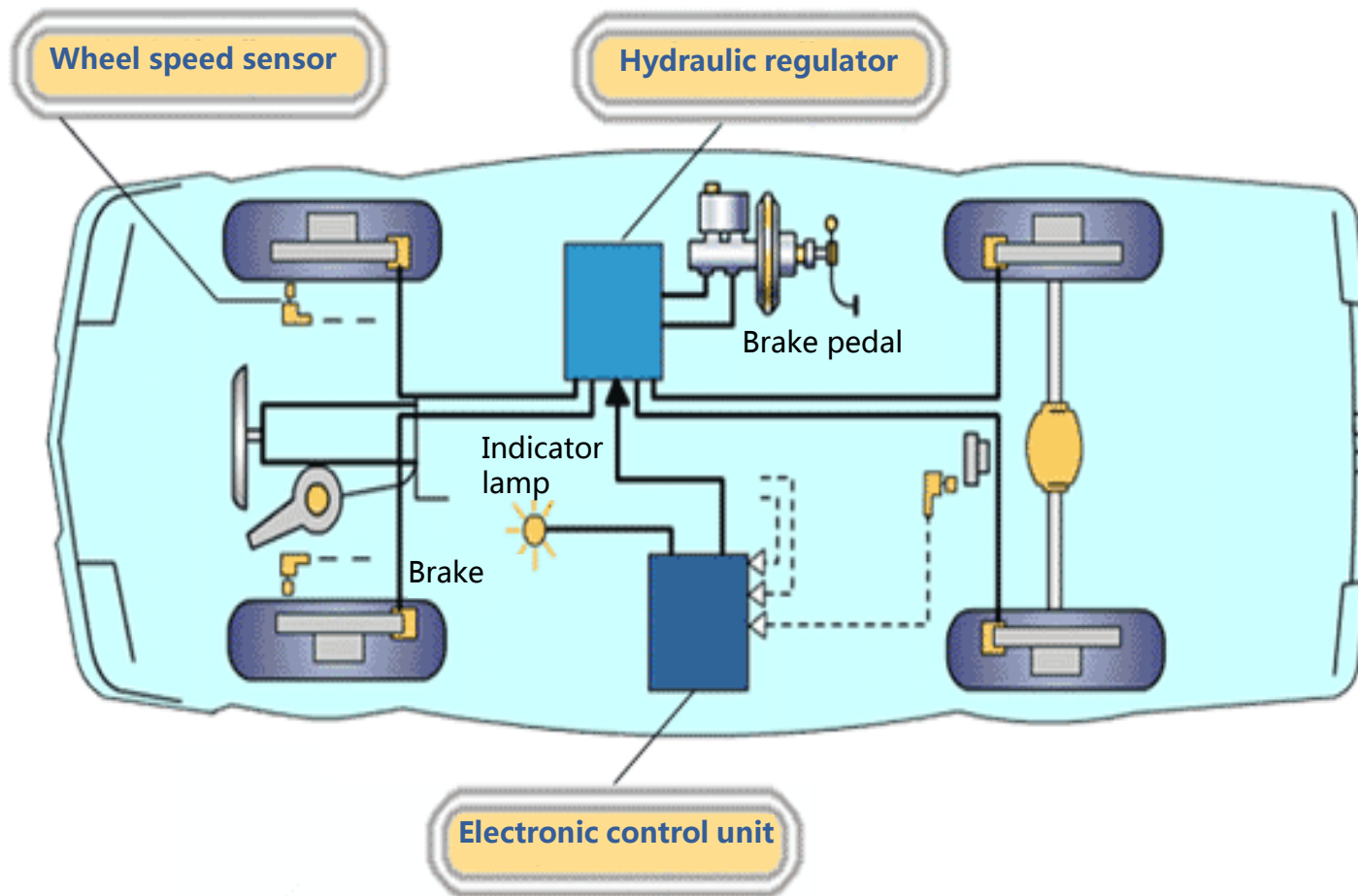
I. Overview of E70 brake control system



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Composition of ABS system

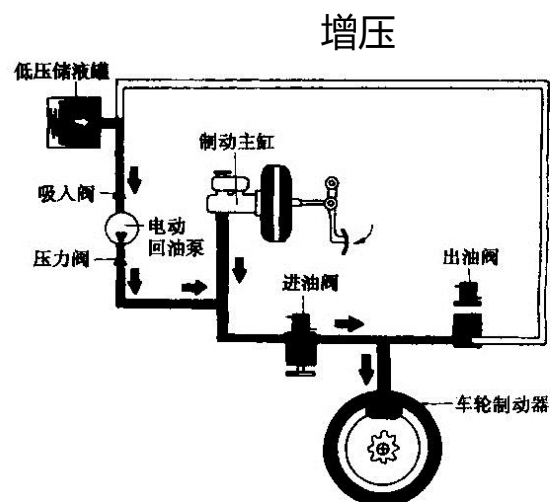
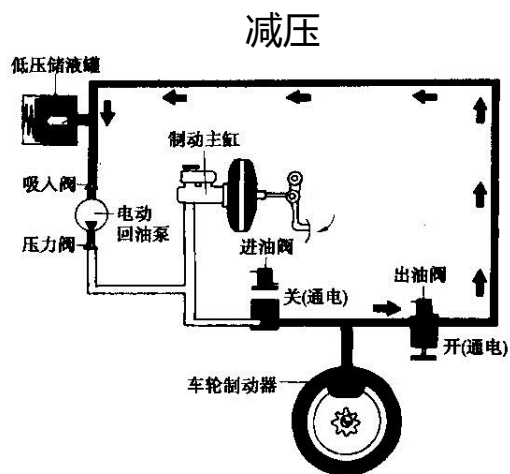
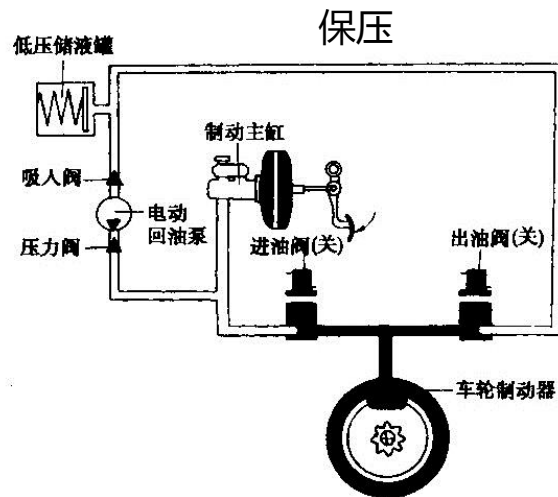
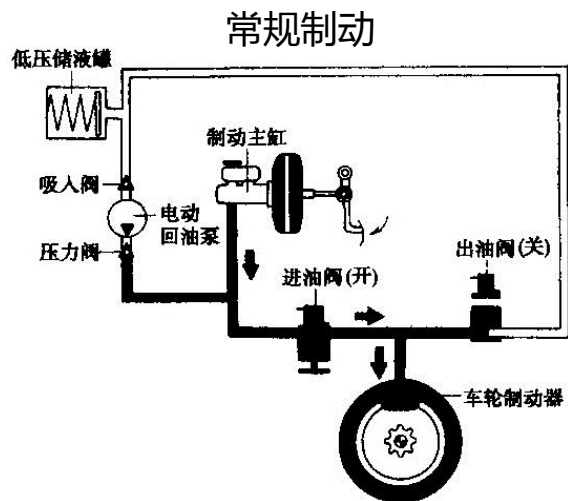
It mainly composed of sensor, brake pressure regulator (hydraulic unit) and electronic controller (electronic control unit).



一、E70制动控制系统概述



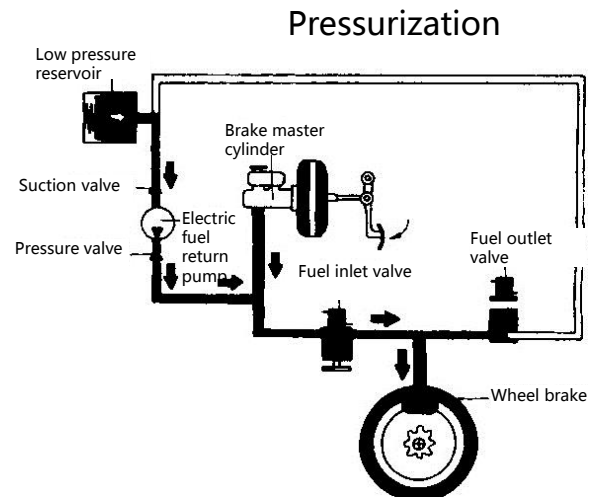
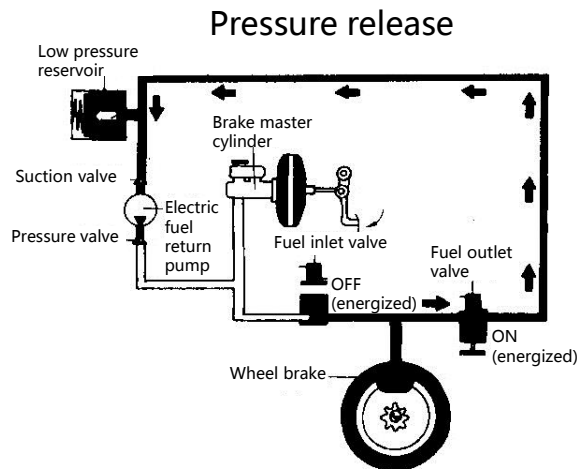
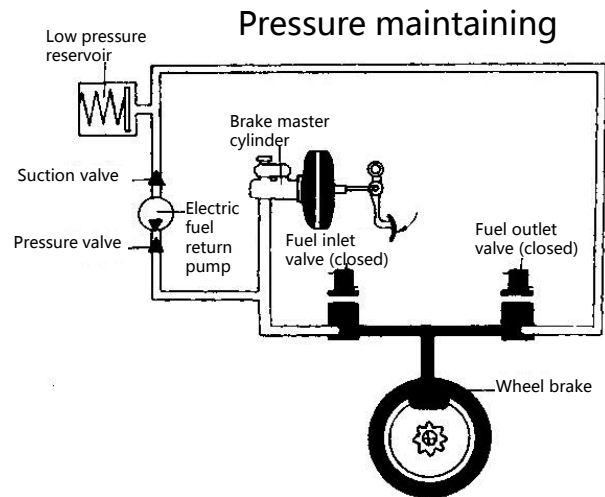
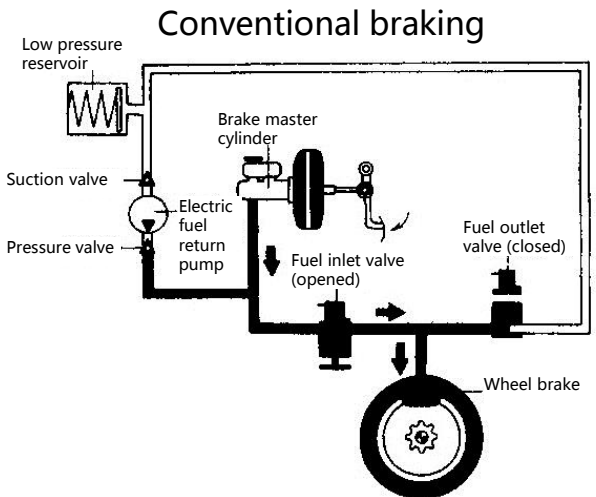
ABS工作过程



I. Overview of E70 brake control system



ABS working process



一、E70制动控制系统概述



安全-失效模式状态

如果ABS 发生电气故障，ABS 警告灯将点亮。同时，ABS 变为下列“安全-失效”模式功能中的一种状态。

如果发生常规制动系统故障，制动警告灯将点亮。

对于ABS 故障，车辆状态与未配备ABS 系统的车辆状态一样。

ABS警告灯



制动警告灯



I. Overview of E70 brake control system



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Safety-failure Mode Status

If ABS electrical fault occurs, the ABS warning lamp will come on. At the same time, ABS changes to one of the following "Safety - failure" mode functions.

If the conventional brake system fault occurs, the brake warning lamp will come on.

For ABS fault, the vehicle status is the same as that of vehicle without a ABS system.

ABS warning lamp



Brake warning lamp

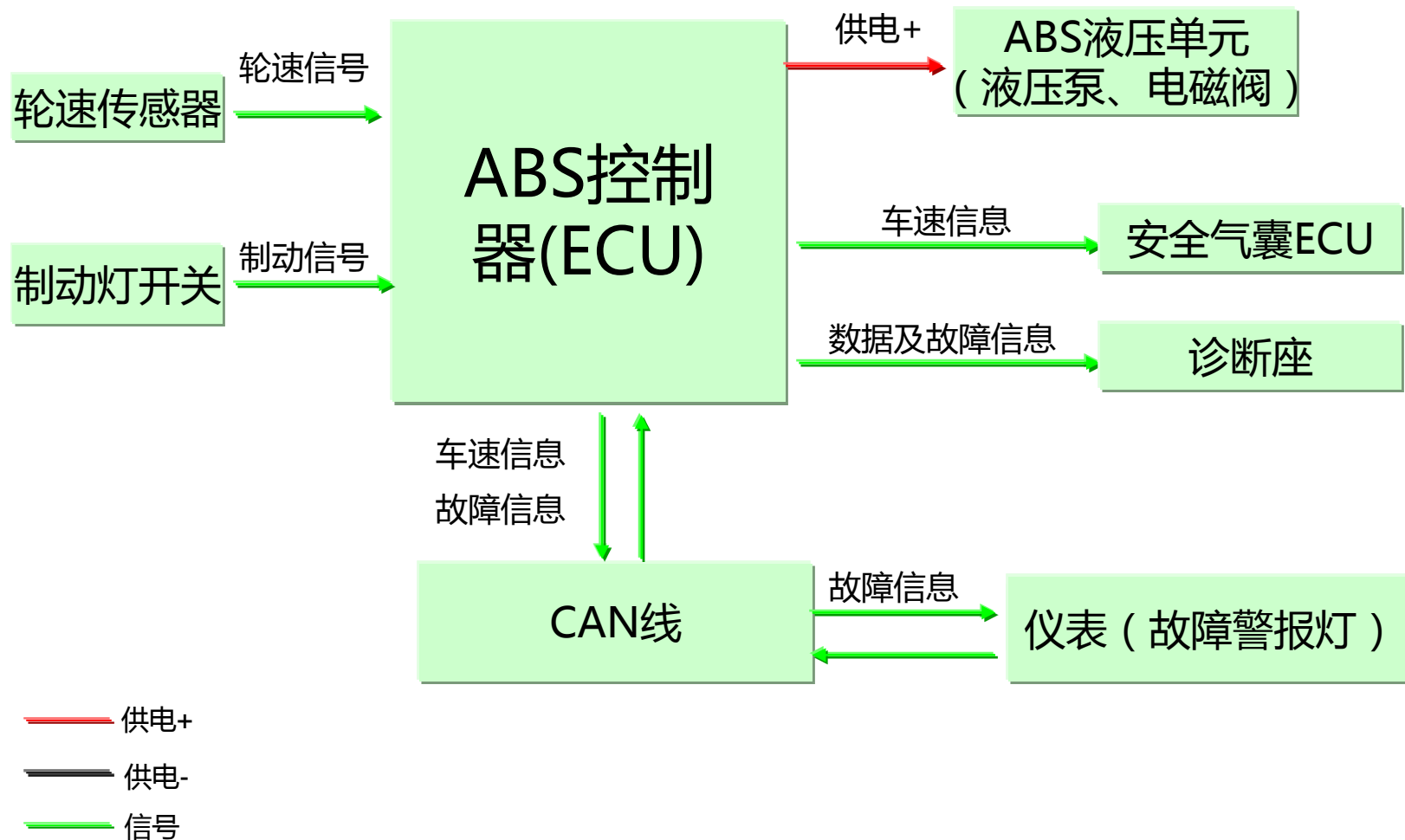


二、E70制动控制系统工作原理及电路图



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ABS+EBD（出租车）控制的基本原理及电路图分析

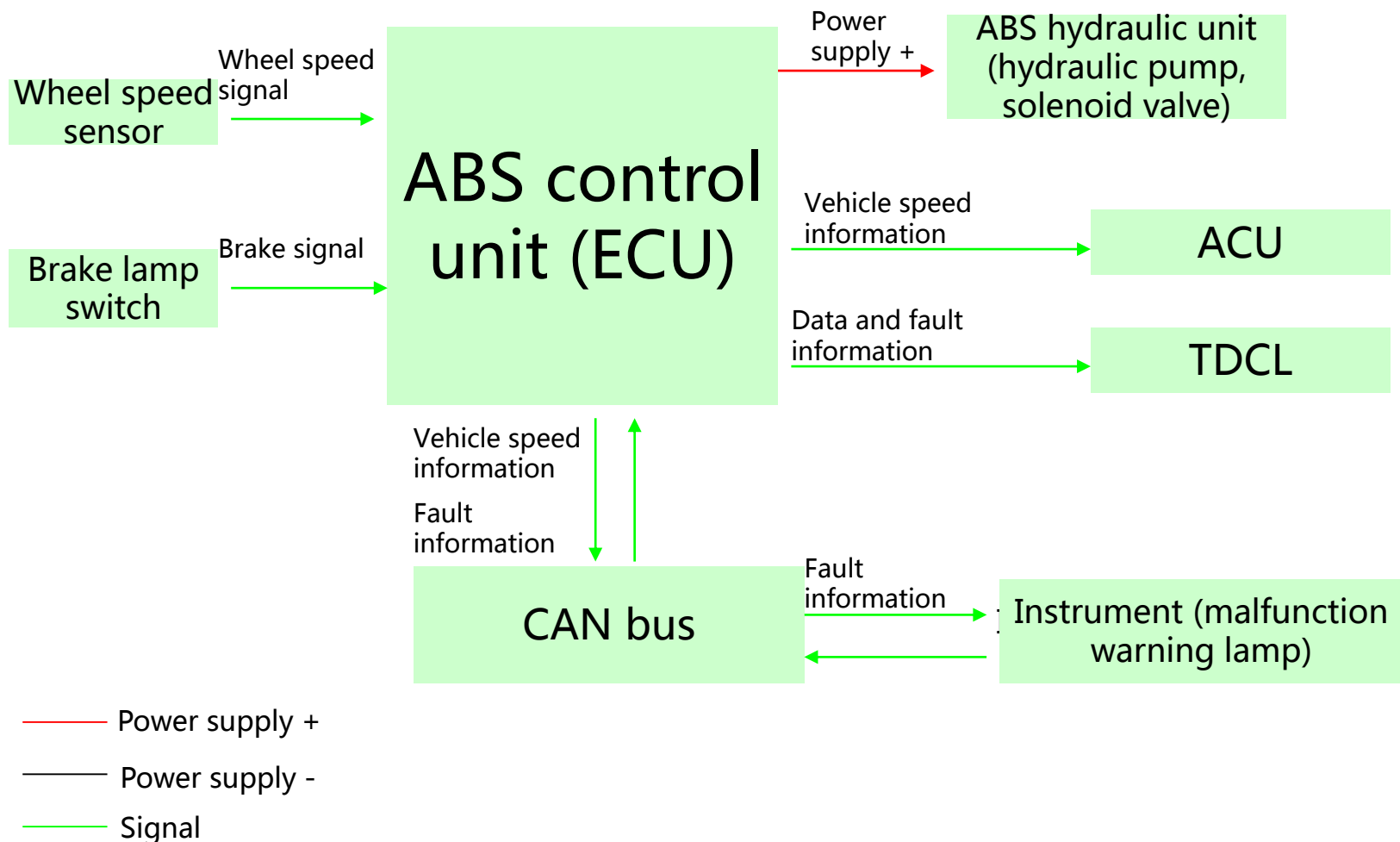


II. Working principle and circuit diagram of E70 brake control system



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Analysis of working principle and circuit diagram of ABS+EBD (taxi) control

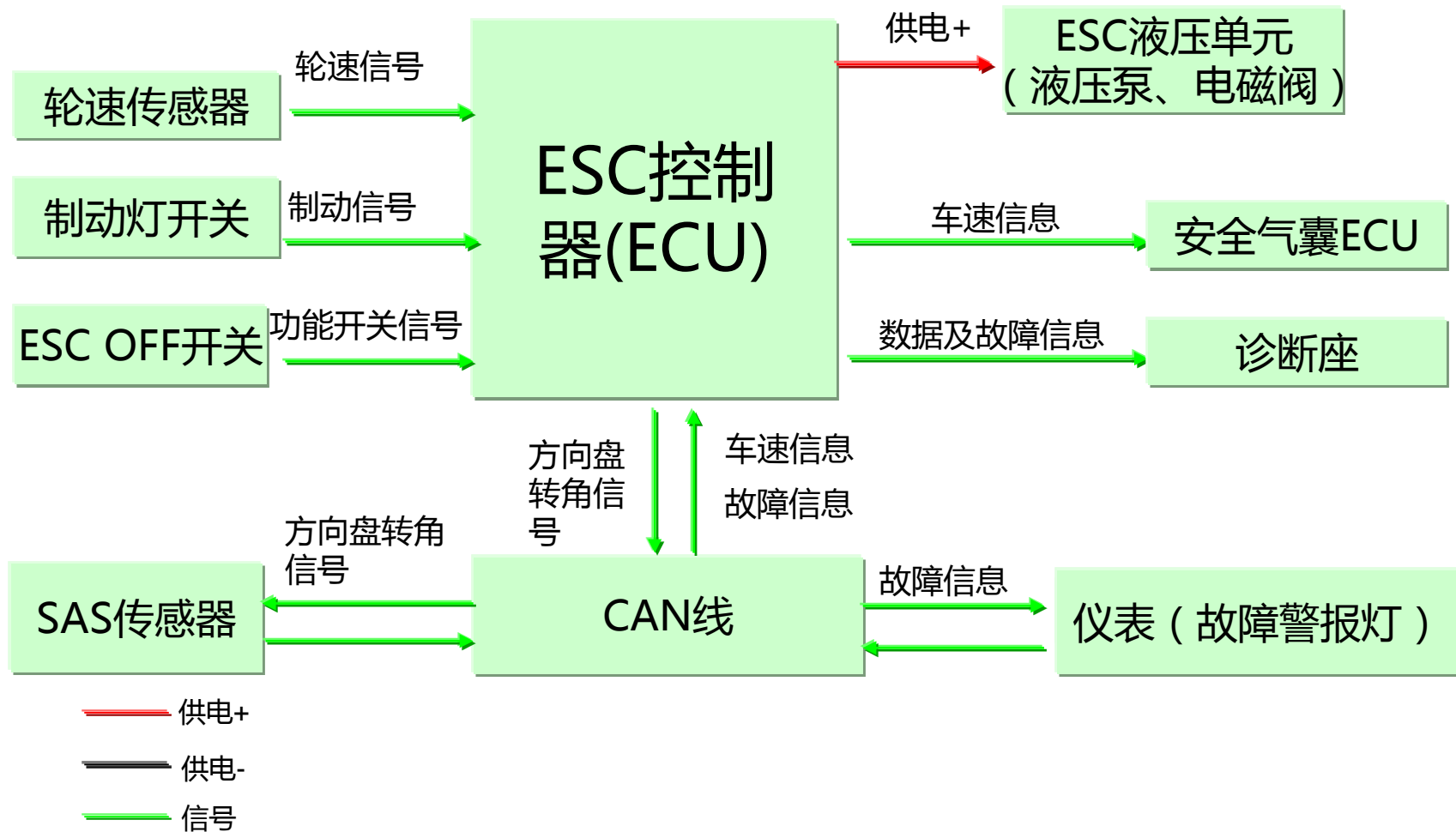


二、E70制动控制系统工作原理及电路图



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ABS+EBD+ESC(私家车)控制的基本原理及电路图分析

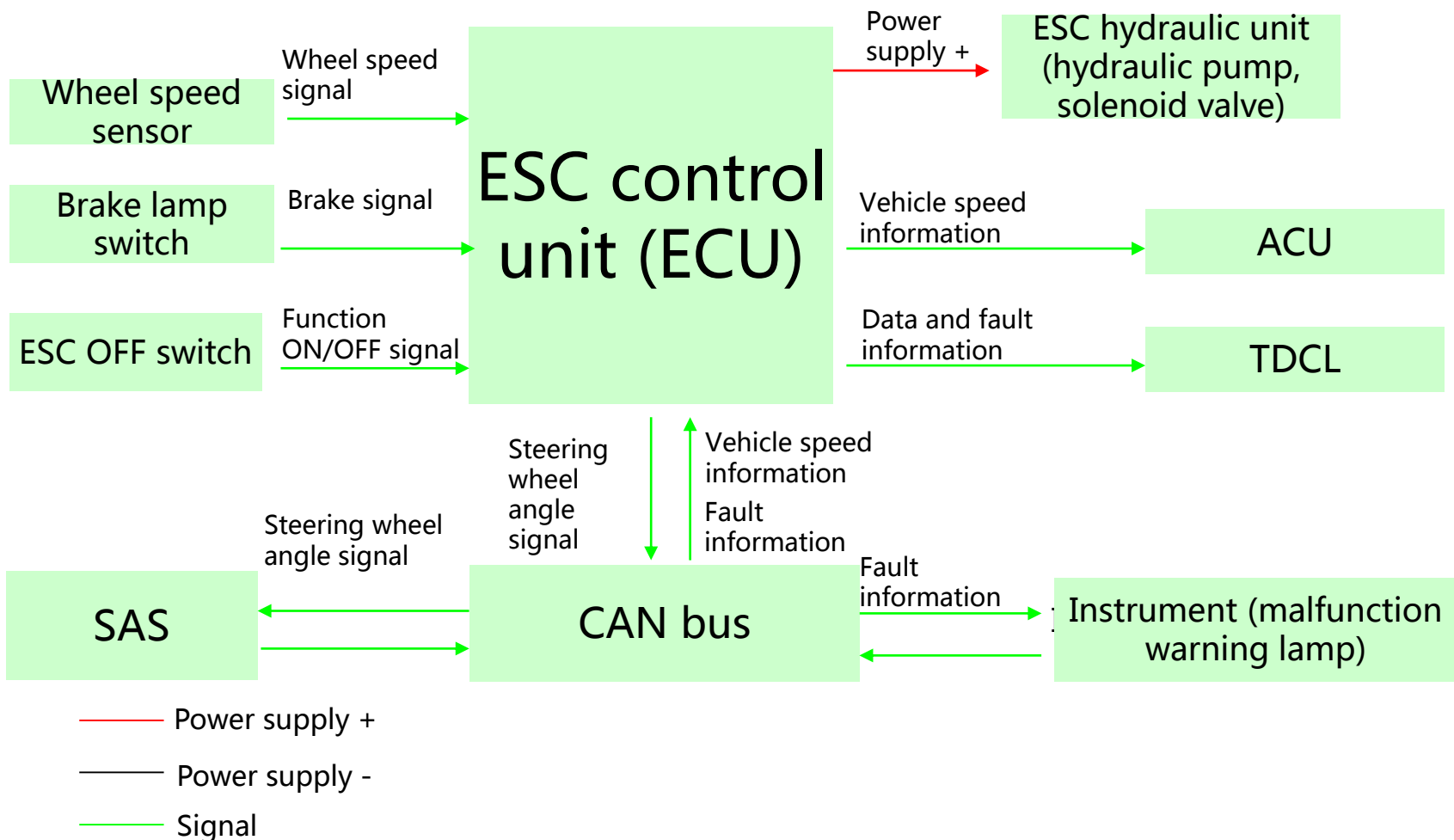


II. Working principle and circuit diagram of E70 brake control system



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Analysis of working principle and circuit diagram of ABS+EBD+ESC (private car) control



二、E70制动控制系统工作原理及电路图

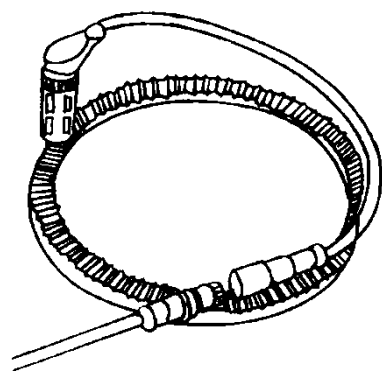


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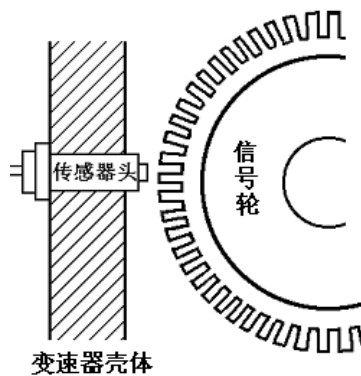
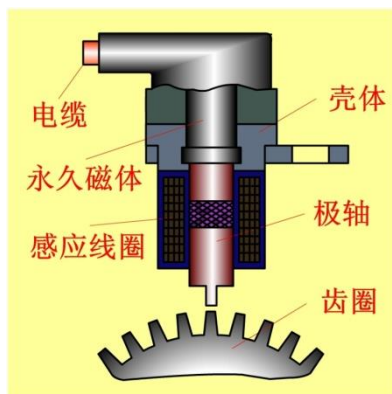
轮速传感器的工作原理及检测方法

原理：电磁感应式传感器

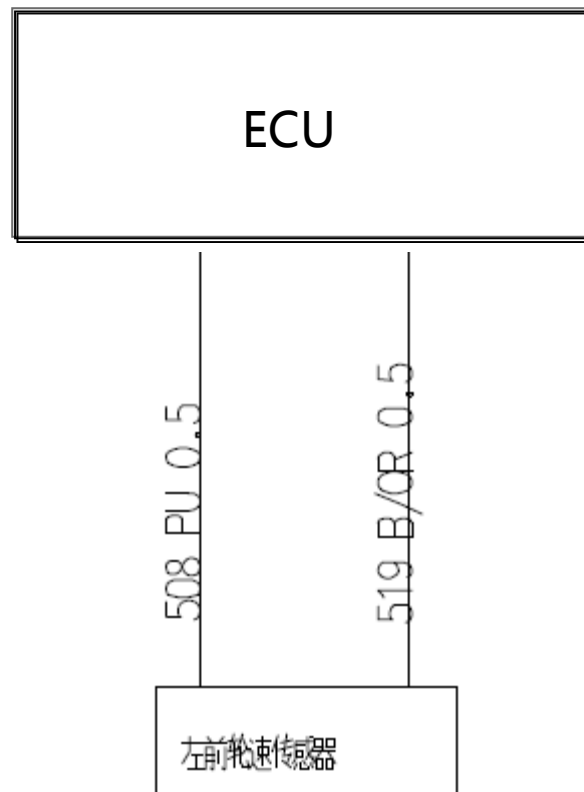
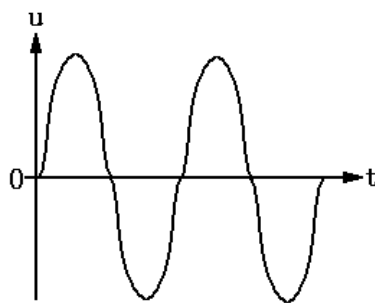
检测：万用表测量传感器电阻，工作时可使用诊断仪读取数据流



轮速传感器外形



变速器壳体



II. Working principle and circuit diagram of E70 brake control system

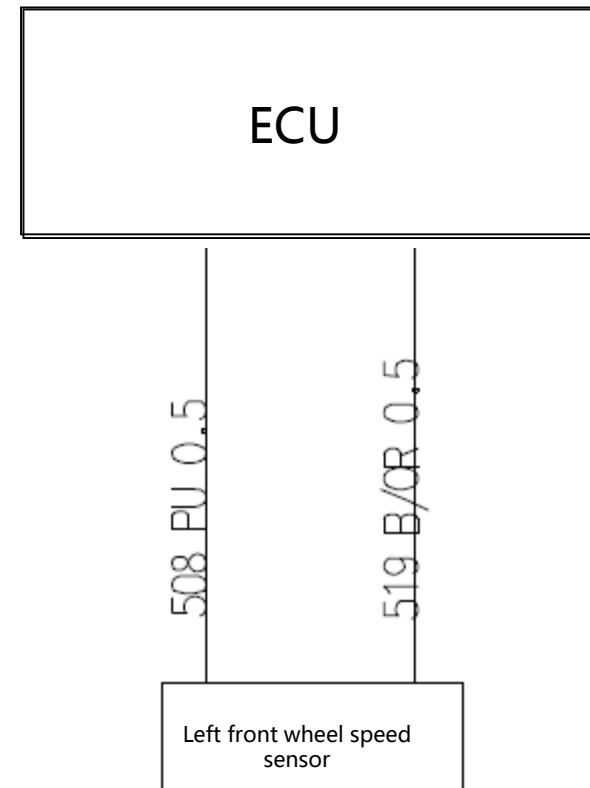
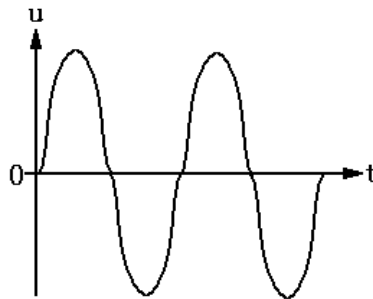
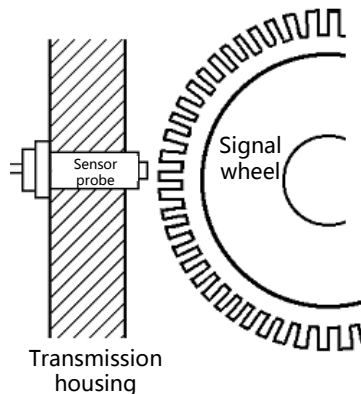
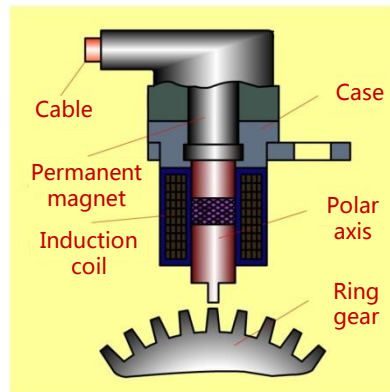
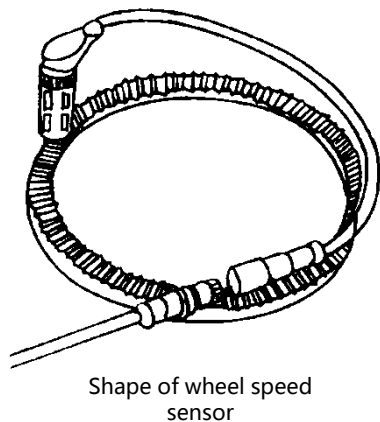


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Working principle and detection method of wheel speed sensor:

Principle: electromagnetic induction sensor

Detection: The multimeter measures the resistance of the sensor, and the data stream can be read by the scan tool during operation.

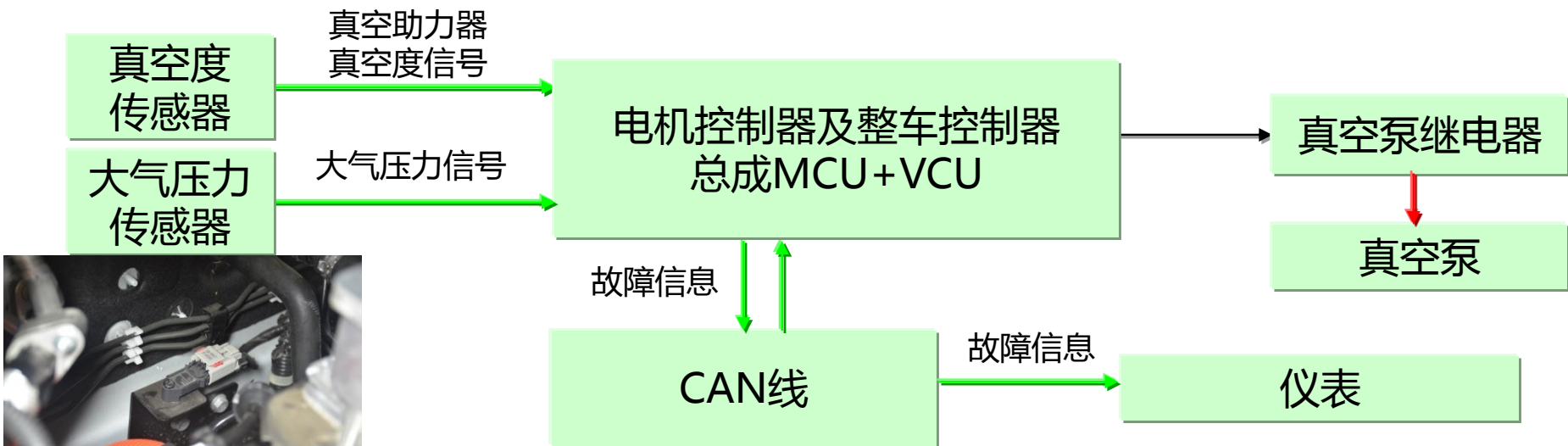


二、E70制动控制系统工作原理及电路图



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真空泵控制的基本原理及电路图分析



— 供电+
— 供电-
— 信号



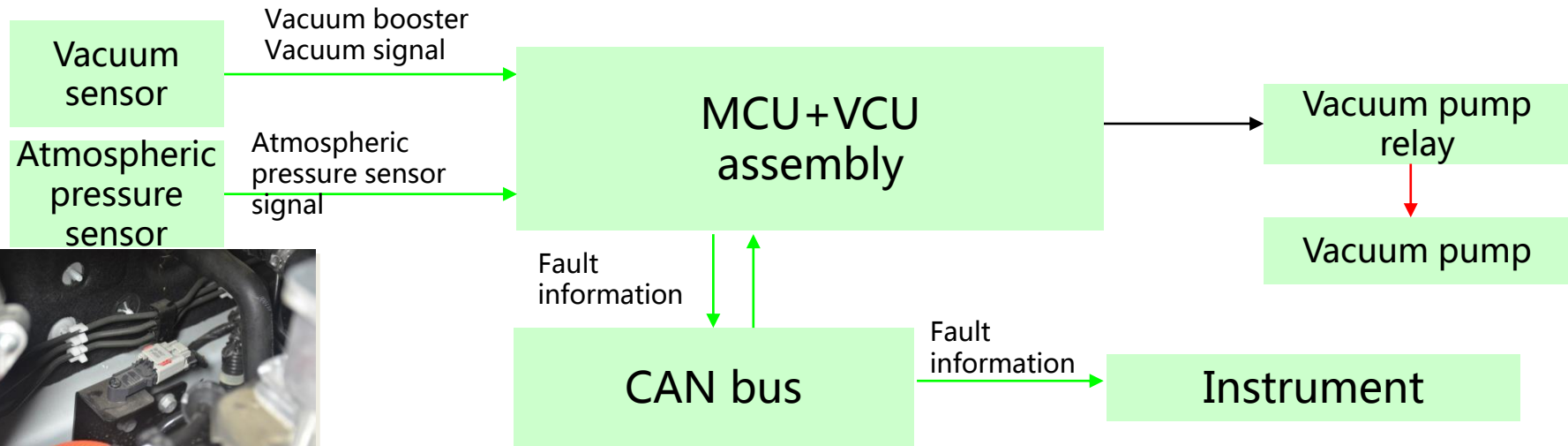
真空度不足且车辆行驶一段时间报警灯闪烁，车辆限速，仪表会有报警提示信息

II. Working principle and circuit diagram of E70 brake control system



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Analysis of working principle and circuit diagram of vacuum pump control



The warning lamp will flash, the vehicle speed will be limited, and alarm messages will be displayed on by the instrument panel in the case of insufficient vacuum and the vehicle being traveling for a while.

- Power supply +
- Power supply -
- Signal

二、E70制动控制系统工作原理及电路图



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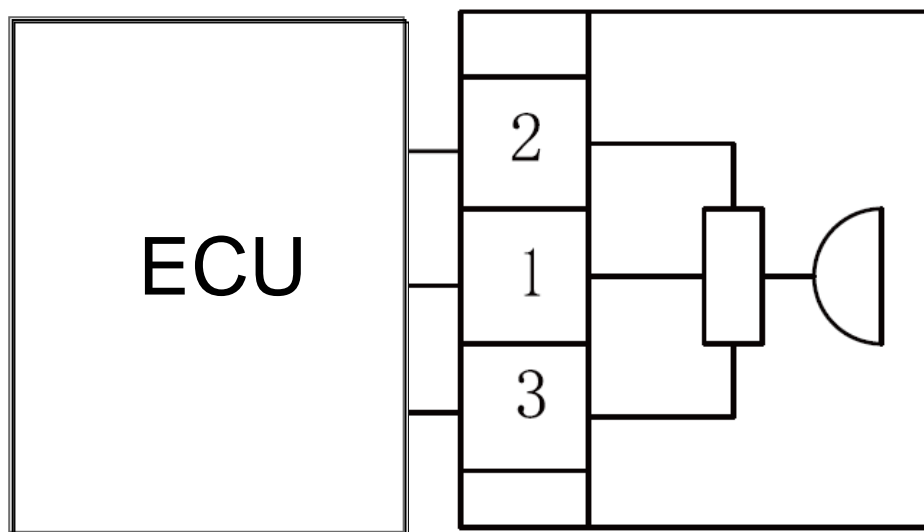
真空度传感器的工作原理及检测方法：

原理：压力膜片滑变电阻式传感器

检测：万用表测量传感器电阻，测量传感器5V供电及接地



真空压力传感器
Brake Vacuum



II. Working principle and circuit diagram of E70 brake control system

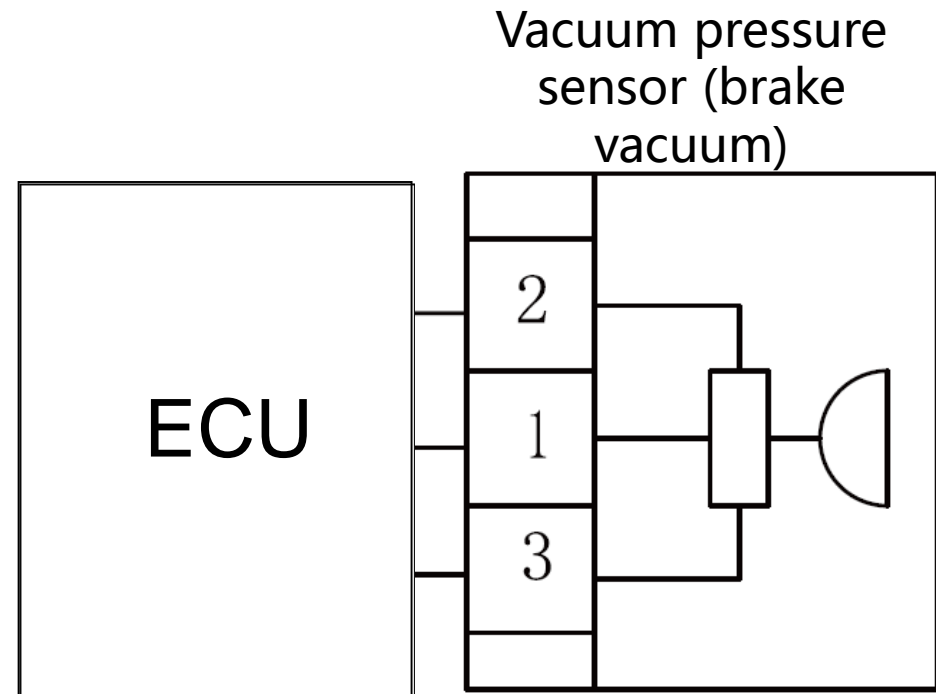


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Working principle and detection method of vacuum sensor:

Principle: Pressure diaphragm slip resistance sensor

Detection: The multimeter measures the resistance, 5 V power supply and grounding of the sensor.



三、E70制动控制系统维修注意事项



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- 在拆装系统电器元件和线束插接器时**必须脱开蓄电池负极线缆**。
- 电子控制装置或传感器等受到碰撞敲击极容易引起损坏，因此，要注意保护电子控制装置免受碰撞和敲击。
- 确保电子控制装置及其电路部分接地良好，防止插接器、端子等部位被油、水等污染。
- 系统中的车轮转速传感器，电子控制装置和制动压力调节装置都是不可修复的，如果发生损坏，应该进行整体更换。
- 在对制动液压系统进行过维修以后，或者在使用过程中发觉制动踏板变软时，应按照正确的方法和顺序对制动系统进行排气。
- 必须使用东风乘用车公司规定型号规格的轮胎，不同型号的轮胎将影响制动效果。

III. Precautions for service of E70 brake control system



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- When removing or refitting the system electrical components and wire harness connectors, **always disconnect battery negative cable.**
- The electronic control unit or sensor etc. may be easily damaged due to being impacted or knocked, so pay attention to prevent the electronic control unit from being impacted or knocked.
- Ensure that the electronic control unit and its circuits are grounded well, and prevent the connector, terminal and other positions from being contaminated by oil or water etc.
- The wheel speed sensor, electronic control unit and brake pressure regulator in the system are unrepairable, so if damage occurs, please replace them respectively in a whole.
- After servicing the brake hydraulic system, or if the brake pedal is felt soft in use, please bleed the brake system in accordance with the correct methods and sequence.
- Always use the tire specified by Dongfeng Passenger Vehicle Company, for different types of tires may affect the braking effect.