



东风乘用车

胎压监测系统



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Tire Pressure Monitoring System



- 1、熟悉E70胎压监测系统的组成及各部件的功用
- 2、熟悉E70胎压监测系统的工作原理
- 3、能对E70胎压监测系统进行电路的故障诊断与排除
- 4、掌握E70胎压监测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 TPMS and functions of its components
2. Familiar with the working principle of the E70 TPMS
3. Troubleshoot the E70 TPMS
4. Master the removal and refitting and replacement methods and precautions of the E70 TPMS

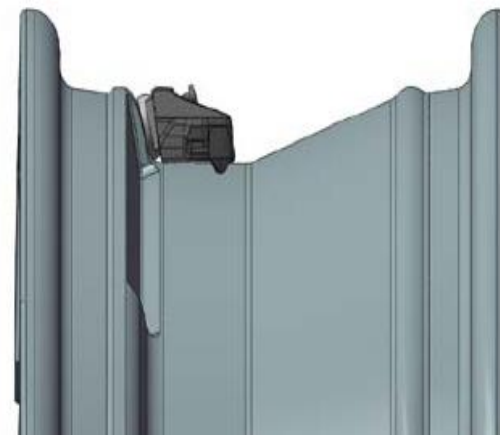
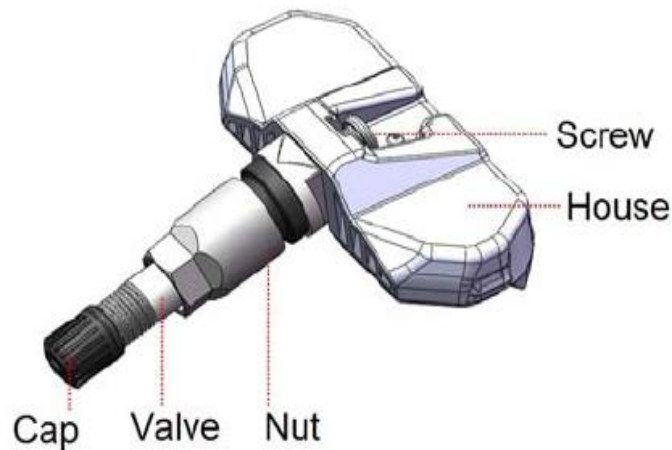


一、 E70胎压监测系统概述

TPMS胎压监测系统结构组成

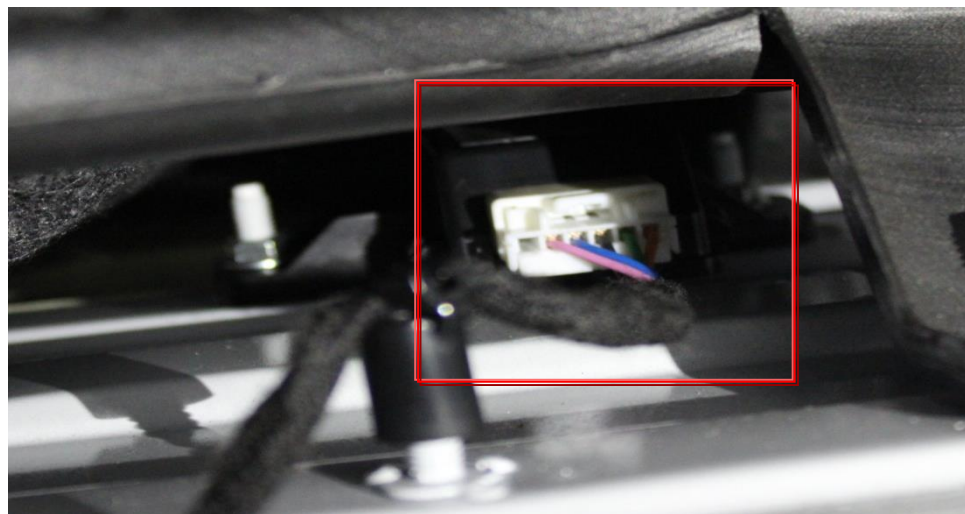
传感器

传感器通过和气门嘴连接的方式固定到轮辋上。



控制器

控制器安装在副驾座椅下方。



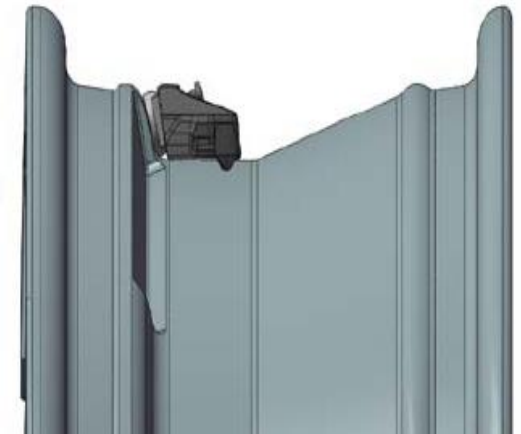
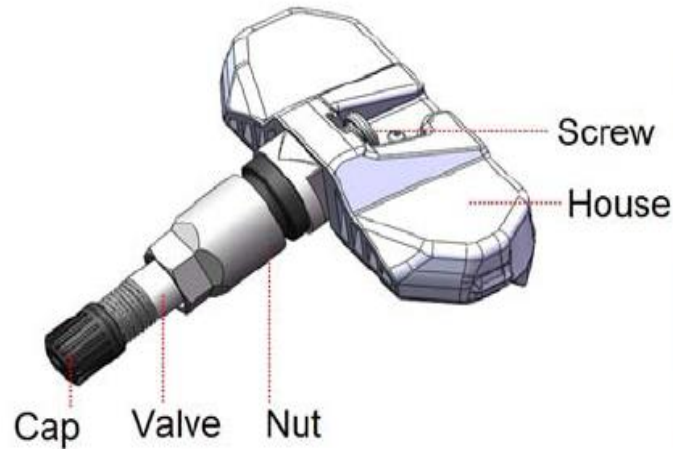
I. Overview of E70 TPMS



Composition of TPMS

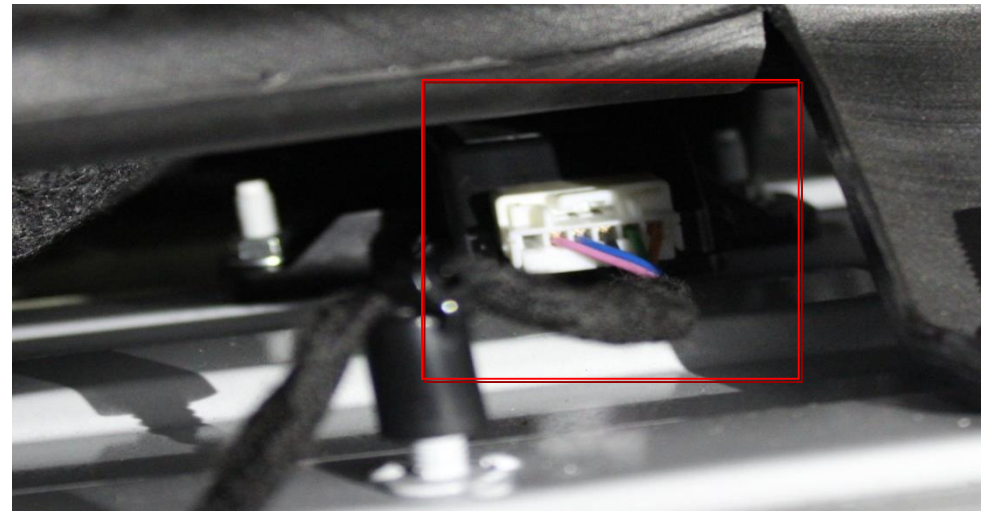
Sensor

The sensor is fixed to the rim by connecting with the valve.



Control unit

The control unit is installed below the front passenger's seat.





一、 E70胎压监测系统概述

轮胎气压监测模块包括传感器、接收机。

传感器安装在汽车轮胎内，用于检测汽车轮胎气压和温度的大小；

控制器隐藏安装于车身内，用于接收传感器信号，并将轮胎数据信息通过CAN总线传输给仪表进行显示。

系统目的：

对轮胎气压进行实时检测，预防由于轮胎气压过高或过低所引发的行车事故。

随时掌握轮胎气压状况，保证对轮胎的正常使用，减少轮胎由于缺气或气压过高所引起的非正常损耗进而延长轮胎的使用寿命。

避免轮胎缺气状态下行驶，降低不必要的燃油消耗。

I. Overview of E70 TPMS



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Tire pressure monitor module includes sensors and receivers.

Sensors are installed inside tires to detect tire pressure and temperature.

The control unit is hiddenly installed inside the vehicle body to receive sensor signals and send tire data to the instrument panel for display through the CAN bus.

Purposes:

To conduct real-time monitoring for the tire pressure to prevent driving accidents caused by too high or too low tire pressure.

To keep abreast of tire pressure to ensure the normal use of tires, to reduce abnormal losses caused by flat tires or too high tire pressure, thus prolonging the service life of tires.

To avoid driving when tires are flat to reduce unnecessary fuel consumption.



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一、E70胎压监测系统概述

系统功能

轮胎压力实时监测

轮胎温度实时监测

轮胎过压报警

轮胎欠压报警

轮胎高温报警

轮胎漏气报警

胎压监测系统故障报警

全面监控行车过程中的轮胎信息，保障行车安全



胎压监测系统报警指示灯

优势

报警信息精确、丰富、直观、快速；

技术点说明

车轮内置4个独立的胎压传感器总成。



轮胎压力

轮胎温度

I. Overview of E70 TPMS



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System function

Real-time monitoring of tire pressure

Real-time monitoring of tire temperature

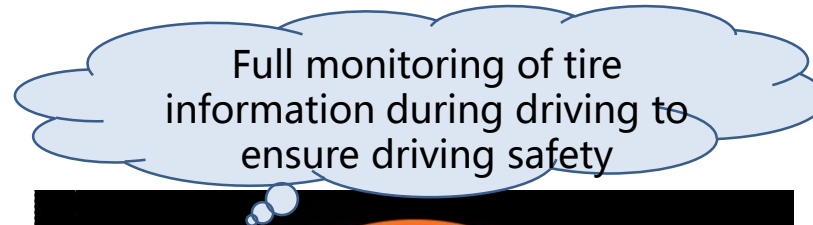
High tire pressure alarm

Low tire pressure alarm

High tire temperature alarm

Tire air leakage alarm

TPMS malfunction alarm



Tire pressure monitoring system warning lamp

Advantages

Accurate, rich, intuitive and fast display of alarm information

Technical description

Four independent tire pressure sensor assemblies are built in the wheel.



Tire pressure

Tire temperature



一、E70胎压监测系统概述

TPMS系统自检

开机自检

点火开关或者钥匙打到ON档开始进行TPMS自检，在10秒内应可以显示所有轮胎信息(采用熄火前的数据，为节约熄火耗电，熄火状态下关闭接收监控)，如果轮胎有异常，发出报警信息，点亮TPMS故障灯。

运行

TPMS系统在ON打开后，始终保持工作状态。正常情况下，仪表不做任何显示。如需查看当前的轮胎信息，可以通过仪表分页按键进行手动切换至胎压界面，显示当前轮胎数据信息。如果轮胎出现异常，则仪表点亮胎压报警指示灯，同时仪表显示屏弹出胎压界面，显示轮胎信息，故障信息位置进行闪烁。弹出故障信息界面后10秒，仪表退出胎压界面，返回原先界面，但胎压报警指示灯常亮，直至故障解除。车辆上电后，轮胎气压监测系统自动进入正常工作模式，仪表所显示胎压\胎温值为上次历史状态值，并非当前状态值，当车辆以大于30km/h速度行驶1分钟后，才能显示实时的当前胎压\胎温值。

I. Overview of E70 TPMS



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Self-inspection of TPMS

Self inspection with power on

TPMS self-inspection will begin when the ignition switch or key is turned to "ON", and all tire information shall be shown within 10 s (use the data before shutdown, and turn off the receiver monitor during shutdown to reduce power consumption). In case of tire fault, alarm message will be sent, and TPMS malfunction warning lamp will come on.

Run

TPMS keeps working after it is switched ON. In normal cases, the instrument does not display anything. Current tire information can be acquired by manually switching to the tire pressure interface through the instrument panel paging button. In case of tire fault, the tire pressure alarm lamp on the instrument panel will come on, and the instrument panel display screen will pop up the tire pressure interface, displaying tire information, and the fault information location will flash. 10 s after the pop-up of fault information interface, the instrument panel will exit the tire pressure interface, and back to the previous interface, but tire pressure alarm lamp remains on until the fault is eliminated. **After the vehicle is powered on, the TPMS will automatically enter the normal working mode. The tire pressure/temperature value displayed by the instrument panel is the last historical state value other than the current state value. When the vehicle travels at a speed greater than 30 km/h for 1 min, the current real-time tire pressure/temperature value can be displayed.**



一、E70胎压监测系统概述

当一键启动开关处于“ON”档，仪表可显示四个车轮的温度、压力数据。（车辆静止时常显，车辆运行状态下显示5秒钟返回车辆状态页面）



- 某个轮胎气压 $\geq 2.8\text{bar}$
- 某个轮胎气压在30秒钟内下降超过0.16bar
- 某个轮胎气压 $\leq 1.7\text{bar}$
- 某个轮胎温度 $\geq 85^{\circ}\text{C}$
- 车速 $\geq 30\text{km/h}$ 时，控制器连续10分钟未收到某个轮胎的信号
- 某个轮胎传感器电量低于设定值

此时轮胎故障报警灯点亮。且仪表组合屏会显示文字提醒“××轮漏气、××轮压力过低、××轮压力过高、××轮温度过高、××胎压传感器故障、××胎压传感器电池电量低”，且蜂鸣器鸣响。

如果车辆行驶速度 $< 30\text{km/h}$ ，胎压监测系统可能不会被激活，此时，胎压相关信息显示及报警灯显示可能不会更新。

I. Overview of E70 TPMS



When the start-stop switch is turned to "ON", the instrument panel can display temperature and pressure of 4 wheels. (When the vehicle stops running, temperature and pressure will be always displayed; when the vehicle is running, instrument panel will back to the vehicle status interface after 5 min display.)



- Pressure of a tire ≥ 2.8 bar
 - Pressure decrease of a tire within 30 s exceeds 0.16 bar
 - Pressure of a tire ≤ 1.7 bar
 - Temperature of a tire $\geq 85^{\circ}\text{C}$
 - When the vehicle speed ≥ 30 km/h, the control unit will receive no signal from a tire for 10 consecutive min
 - Battery power of a tire sensor is lower than the setting value
- At this moment, the tire fault alarm lamp will come on. Additionally, the instrument cluster will display text "Air Leakage of Tire XX, Too Low Pressure of Tire XX, Too High Pressure of Tire XX, Too High Temperature of Tire XX, Pressure Sensor Fault of Tire XX, Low Battery Power of a Pressure Sensor for Tire XX" for reminding, and the buzzer will beep.
- If the vehicle speed < 30 km/h, the tire pressure monitoring system may not be activated; at this time, the tire pressure messages and alarm lamps display may not be updated.

一、 E70胎压监测系统概述



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传感器ID学习

学习目的

建立传感器与控制器之间的通信联系

将传感器与轮胎位置进行对应

下述情况需要进行学习

新车下线

更换轮胎

装配有传感器的轮胎顺序发生变化

学习类别

利用工具学习

漏气学习

I. Overview of E70 TPMS



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ID learning of sensor

Purpose

Establish communication links between the sensor and the control unit

Correspond the sensor to the tire position

Learning is necessary for the following cases.

New vehicle off the assembly line

Replacement of tires

The order of the tires equipped with sensors changes

Learning category

Learning with tools

Air leakage learning

一、 E70胎压监测系统概述



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传感器ID利用工具学习

学习步骤：

- 1、利用工具 “learn ID” 命令依次激活左前轮、右前轮、右后轮、左后轮传感器获取对应ID；
- 2、点火钥匙置于ON档；将工具连接至整车OBD口
- 3、通过工具 “write ID” 命令获取的4个轮胎ID写入控制器中，工具提示写入成功；
- 4、利用工具在激活4个轮胎传感器，更新胎压显示界面当前轮胎状态信息；

注：
步骤1中 获取轮胎ID顺序为 “左前、右前、右后、左后” ，不可调换。



学习手柄

I. Overview of E70 TPMS



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Sensor ID learning with tools

Learning steps:

1. Use the tool "learn ID" command to sequentially activate the left front wheel, the right front wheel, the right rear wheel, and the left rear wheel sensors to obtain the corresponding ID;
2. Turn the ignition switch to the ON position; connect the tool to the OBD interface of the vehicle;
3. The four tire IDs obtained by the tool "write ID" command are written into the control unit, and the tool gives a tip of successful writing;
4. Use the tool to activate 4 tire sensors to update the current tire status information in the tire pressure display interface.

Note:

Sequence of tire ID in Step 1 is "left front, right front, right rear and left rear", which can not be changed.



Learning handle

一、E70胎压监测系统概述

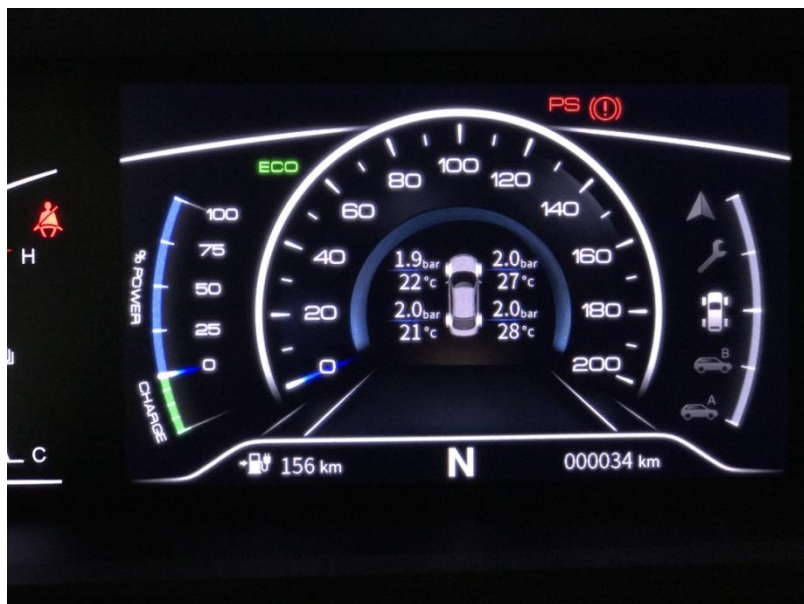


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传感器ID漏气学习

通过按压多功能方向盘上的分页切换按键，使显示屏切换为多功能设置，按OK键确认
拨动上下选项切换按键，选中轮胎信息，按OK键确认

在胎压信息显示界面，长按OK键，可进入胎压学习



I. Overview of E70 TPMS

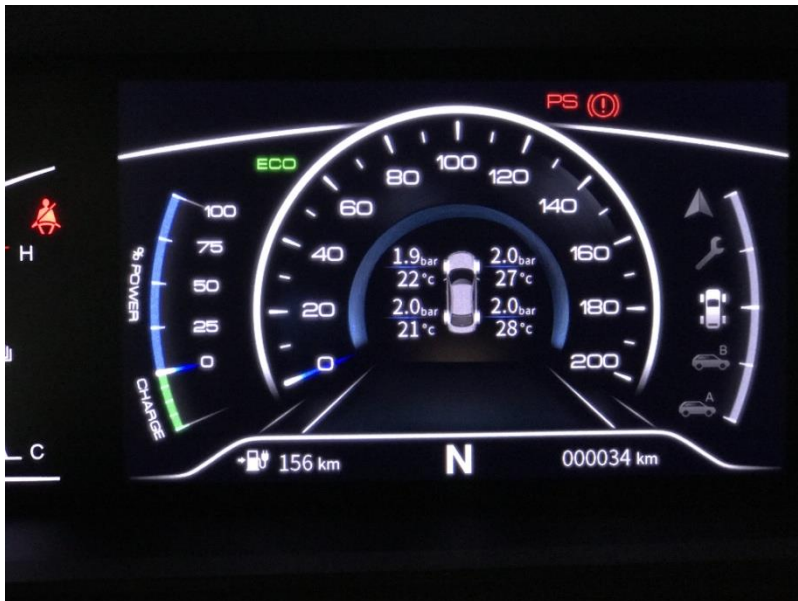


ID air leakage learning of sensor

Press the paging button on the multi-function steering wheel to switch the display to multi-function settings, and press OK to confirm.

Toggle the up and down button to select the tire information, and press OK to confirm.

Press and hold OK in the tire pressure information display interface to enter the tire pressure learning.



一、 E70胎压监测系统概述



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学习步骤：

- 1、点火钥匙置于ON档；
- 2、调节仪表分页开关至胎压信息显示界面，长按OK键约3~5秒，进入胎压系统学习模式；
- 3、给左前轮放气，30秒内漏气超过8.25kPa，控制器完成左前轮ID学习，此时仪表显示“左前轮学习完毕”，蜂鸣器蜂鸣一声；
- 4、按步骤3，依次完成右前轮、右后轮、左后轮的学习，完成后仪表显示“胎压学习成功”；



胎压信息
显示界面

注：

上述学习过程应在240秒内完成，超时TPMS控制器自动退出学习模式，没有学习到的轮胎ID置为无效，仪表上无信息显示；
轮胎学习顺序为“左前、右前、右后、左后”，不可调换。

I. Overview of E70 TPMS



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Learning steps:

1. Turn the ignition switch to the ON position;
2. Adjust the instrument panel paging switch to the tire pressure information display interface, and press and hold the key at the end of light combination switch for 3 to 5 s to enter tire pressure system learning mode;
3. Deflate the left front wheel, and ID learning of left front wheel is completed by the controller when air leakage exceeds 8.25 kPa within 30 s, then the instrument will display "Left Front Wheel Learning Completed" and buzzer will beep once;
4. Conduct learning of right front wheel, right rear wheel and left rear wheel in sequence according to Step 3, and the instrument will display "Tire Pressure Learning Completed" after completion.



Tire information display interface

Note:

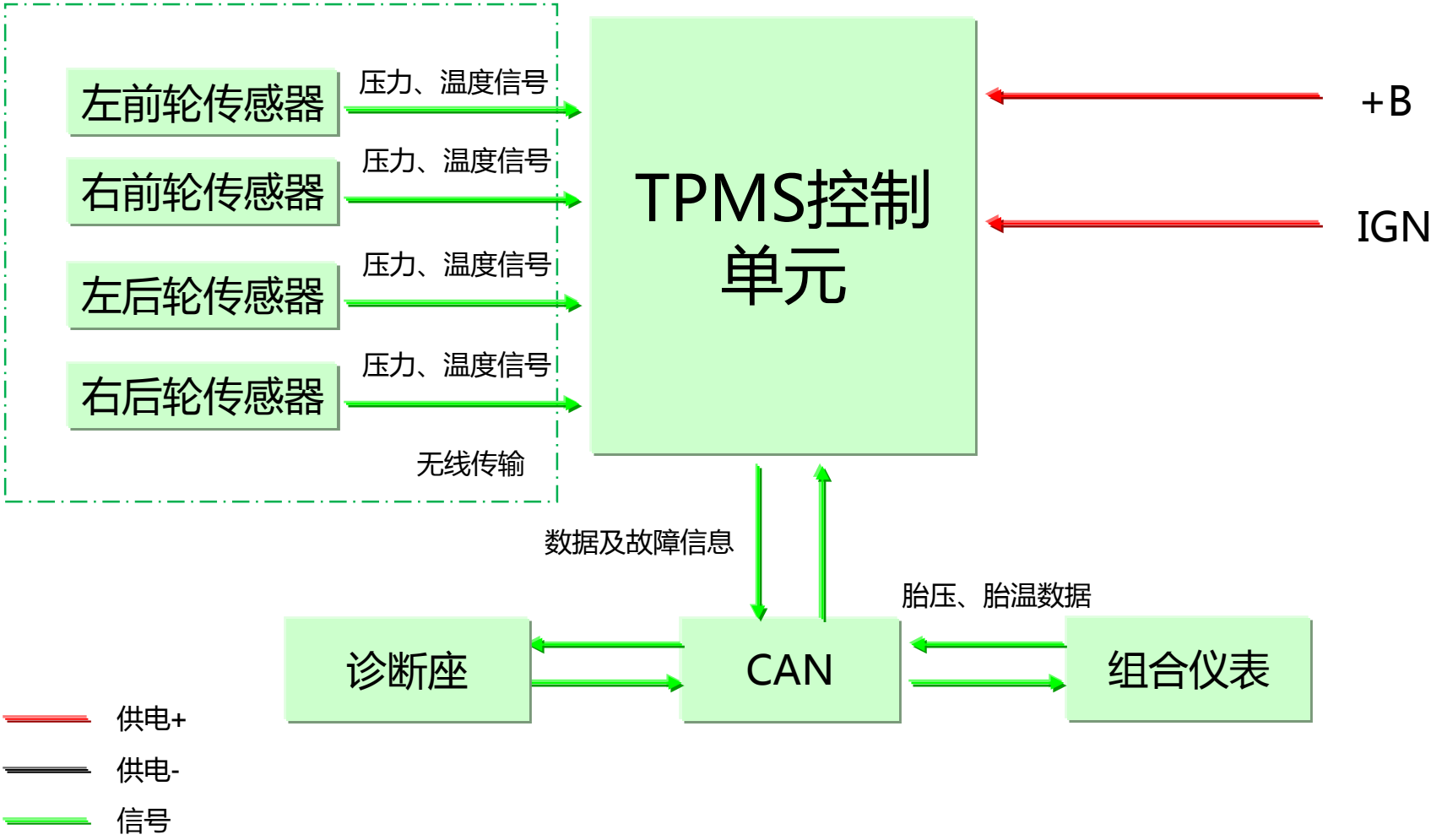
The above learning shall be completed within 240 s, or TPMS control unit will exit the learning mode automatically. IDs of tires that have not been learned are invalid and there is no information displayed by the instrument panel;
Sequence of tire learning is "left front, right front, right rear and left rear", which can not be changed.

二、 E70胎压监测系统工作原理及电路图



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E70胎压监测系统的基本原理及电路图分析

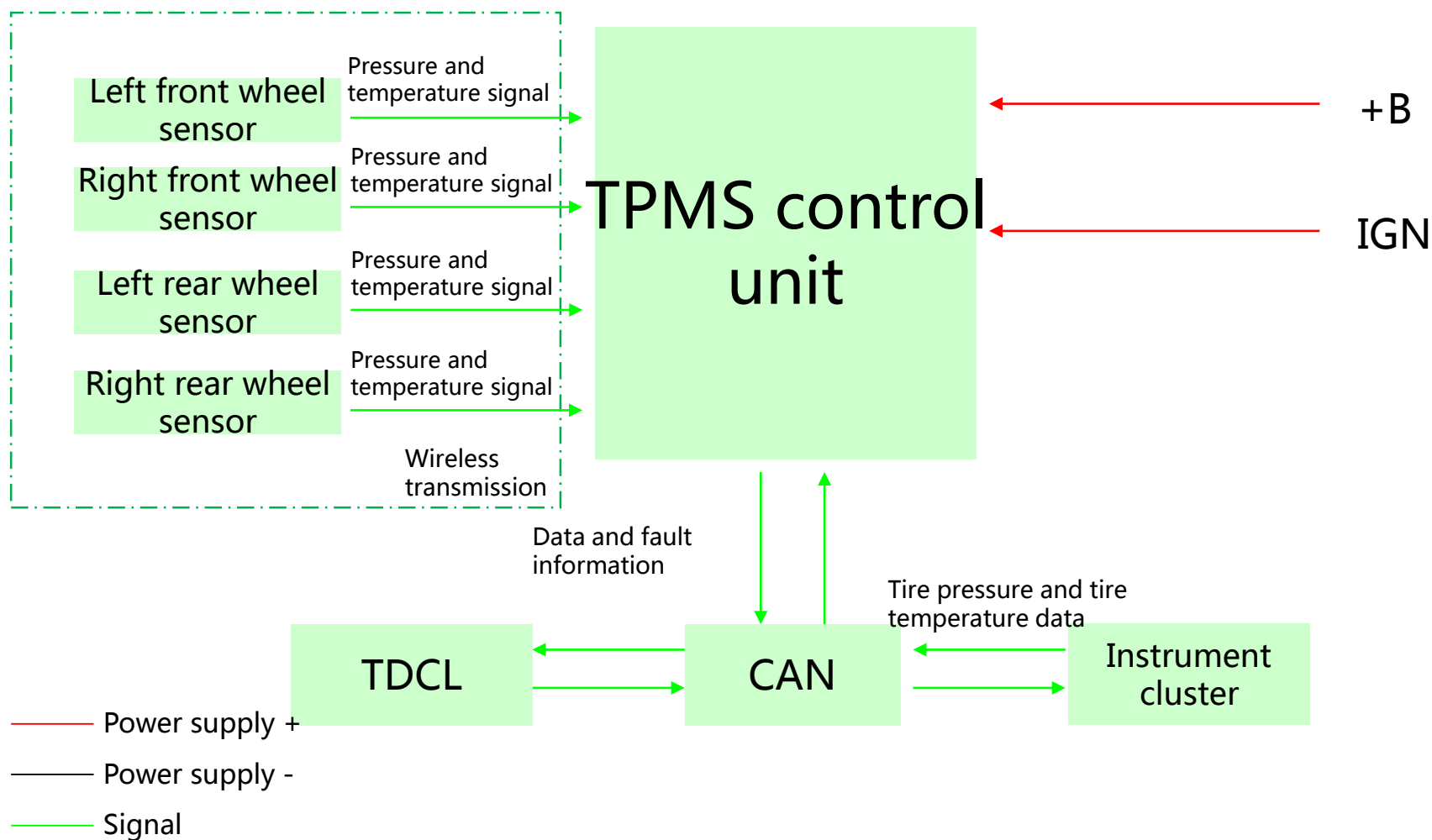


II. Working principle and circuit diagram of E70 TPMS



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Analysis of working principle and circuit diagram of E70 TPMS





- 1、在实车上进行TPMS系统查看的操作
- 2、在实车上进行TPMS系统初始化的相关操作



1. View TPMS in the physical vehicle.
2. Perform the initialization of the TPMS in the physical vehicle.