# M195 TPMS Manual

# M195 轮胎压力监测系统说明书



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# REVISION HISTORY

| No. | Rev. | Date | Author | Chapter | Description Of Changes |
|---|---|---|---|---|---|
| 1 | 1.0 | 2021/11/30 | Jianliang Xu | All | First Edition |
| 2 | 2.0 | 2022/03/08 | Jianliang Xu | 5.2 | Launch interval |
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The Revision History shall be updated prior to release. The following information is required for each revision entry:

1. Reason revision was made- **Description Of Changes**
2. Revision History-**Rev.**
3. Section number-**Chapter**
4. Originator of change- **Author**
5. Date of change- **Date**

## 1. Scope

This document is the function description of TPMS (tire pressure monitoring system) of M195 model, which defines the function definition of tire pressure monitoring system and the CAN bus message communication content between tire pressure monitoring host and instrument.

## 2. Introduction

The tire pressure monitoring system is composed of sensor and ECU. The sensor automatically monitors the tire pressure, tire temperature and other information of the tire in real time and sends it to the ECU through RF signal. The ECU judges whether the tire data exceeds the threshold and gives an alarm.

The TPMS scheme of M195 model adopts one-way communication scheme, that is, there is only one-way information path from sensor to ECU.

## 3. TPMS Function introduction

TPMS automatically monitors the tire pressure, tire temperature and other information in real time through two sensor modules installed in the vehicle tire, and sends the tire pressure, tire temperature and other information to the host module in the form of high-frequency signal according to the specified transmission strategy. The host module sends the received information to meter through can message, and meter through vision The audible signal is displayed. When the tire pressure exceeds the threshold value, the host module sends an alarm message to meter for alarm, so as to improve the safety of vehicle driving. All control functions are integrated into the TPMS host module, and meter only displays tire pressure, tire temperature and alarm.

TPMS mainly includes the following functions：

1）Self-test Function；

2）High Pressure Warning；

3）Low Pressure Warning；

4）Very Low Pressure Warning；

5）Temperature Reporting；

6）Puncture Warning；

7）Sensor Low Voltage Warning；

8）Sensor Missing Warning；

9）Sensor Not Configured Warning；

The system structure block diagram is shown in Figure 1：

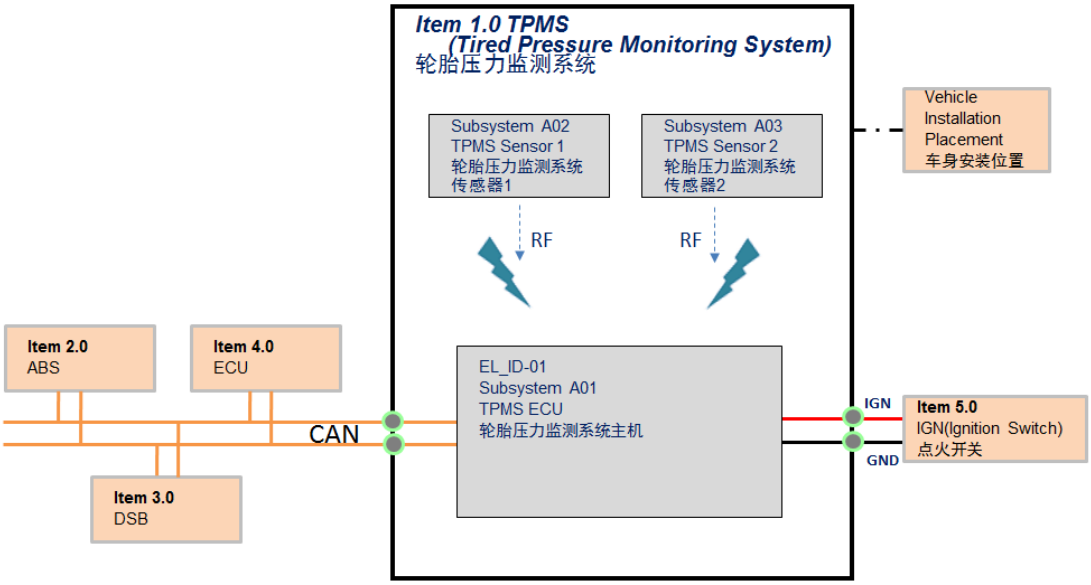


Figure 1：System Block Diagram

## 4. TPMS Instruction for Use

### 4.1 Systematic learning

Step 1: Power on. Power on the ECU and enter the working mode.

Step 2: Enter learning mode. Send command through CAN to make the ECU enter the learning mode.

Step 3: Activate the sensor. Use the activator to activate the sensor from front to rear.

Step 4: Learning is complete. After receiving the sensor information, the ECU writes the ID into EEPROM to complete the learning and automatically exit the learning mode.

### 4.2 Low Voltage Warning

When any sensor sends the message of low battery voltage, the corresponding bit of 310 message sent by ECU CAN is 01.

Example: when the front wheel battery voltage is low, the 310 message is: xx xx xx xx 01 xx xx xx.

The 310 message description is shown in Figure 2：

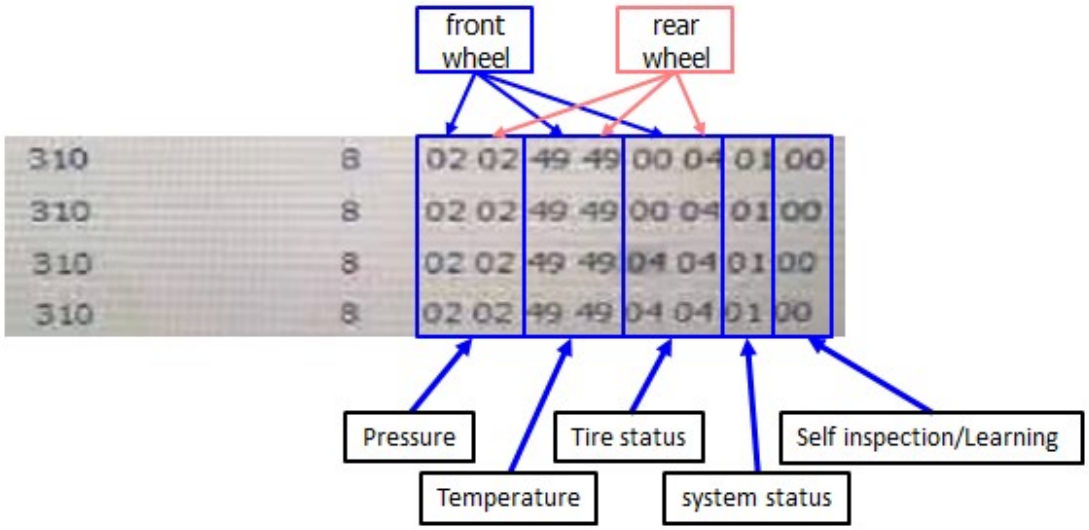


Figure 2： 310 Message Description

4.3 Pressure Warning

4.3.1 High Pressure Warning

When the pressure of any sensor is ≥2800mbar, the corresponding bit of 310 message sent by ECU CAN is 02.

4.3.2 Low Pressure Warning

When the pressure of any sensor is ≤2200mbar &＞2000mbar, the corresponding bit of 310 message sent by ECU CAN is 03.

4.3.3 Very Low Pressure Warning

When the pressure of any sensor is ≤2000mbar, the corresponding bit of 310 message sent by ECU CAN is 04.

4.3.4 Puncture Warning

When the pressure difference of any sensor twice within 180 seconds is greater than 200mbar / min，the corresponding bit of 310 message sent by ECU CAN is 05.

4.4 Sensor Missing Warning

When 30km/h＜ vehicle speed ＜200km/h and the ECU does not receive any information from the sensor within 600 seconds, the corresponding bit of 310 message sent by ECU CAN is 06.

4.5 Sensor Missing Detection

When 30km/h＜ vehicle speed ＜200km/h, and the ECU＞180s does not receive any information from the sensor, the corresponding bit of 310 message sent by ECU CAN is 07.

4.6 Sensor Not Configured Warning

When any sensor is not configured, the corresponding bit of 310 message sent by ECU CAN is 08.

4.7 Sensor learning status indication

One sensor per learning, the corresponding bit of 310 message sent by ECU CAN is 09.

4.8 Speed limit indication

When the speed of any wheel is greater than 200km / h, the corresponding bit of 310 message sent by ECU CAN is 0A.

4.9 Real time data transmission

When the system is powered on and started, the ECU send 310 message, and the definition is shown in Figure 2.

## 5. TPMS Parameters

5.1ECU Parameters

| Item | parameters |
|---|---|
| Typical Voltage | 12V |
| Operating Voltage | 9V～16V |
| CAN Voltage | 7V～18V |
| Active Current | ≤50mA |
| Operated Temperature | -20℃～80℃ |
| Storage Temperature | -40℃～95℃ |
| Receiving Sensitivity | ＜-80dBm（Reference value, the actual value shall be subject to the real vehicle calibration） |
| Receiving Frequency | 433.92±0.05MHz |
| Antenna Type | Planar antenna |
| CAN Rate | 500kbps |

5.2Sensor Parameters

| Item | parameters |
|---|---|
| Emission Frequency | 433.92±0.05MHz |
| Receiving Frequency | 125KHz |
| Working Mode | FSK |

| | |
|---|---|
| Operated Temperature | -40℃～110℃ |
| Storage Temperature | -40℃～125℃ |
| Typical Voltage | 3V（Built in button battery） |
| Operating Voltage | 2.3V～3.2V（Low Voltage＜2.6V） |
| Active Current | ≤14mA |
| Battery Life | 5years or 100000km |
| Antenna Type | Planar antenna |
| RF Intensity | 68dBuV≦RFp≦ 82dBuV @1m<br>58dBuV≦RFp≦ 73dBuV @3m |
| Pressure range | 0～700KPa |
| Pressure Accuracy | ±10kPa（-20～90℃） |
| Temperature Range | -40～110℃ |
| Temperature Accuracy | ±3℃（-20～70℃） |
| Launch interval | 180S（Normal mode） |

## 6. Other Information

6.1 Manufacturer

WHETRON ELECTRONICS(SUZHOU) CO.,LTD

NO.457,XIANGJIANG ROAD, HIGH NEW DISTRICT,SUZHOU, P.R. CHINA

6.2 Importer

Piaggio & C. S.p.A.

Viale Rinaldo Piaggio 25-56025, Pontedera, Pisa, Italy

6.3 Physical photos of products (laser information shall be subject to the actual situation)

6.4 This equipment is not suitable for use in locations where children are likely to be present.


Sensor

**Remark:**

A. FCC 15.19 Labelling requirements (All other devices)

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

B. FCC 15.21 Information to user

Please note that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

C. FCC 15.105 Information to the user (Class B)

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures: —Reorient or relocate the receiving antenna. —Increase the separation between the equipment and receiver. —Connect the equipment into an outlet on a circuit different from that to which the receiver is connected. —Consult the dealer or an experienced radio/TV technician for help.

D. IC RSS-Gen 8.4 User Manual Notice for Licence-Exempt Radio Apparatus

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions: (1) This device may not cause interference; and (2) This device must accept any interference, including interference that may cause undesired operation of the device. L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CN d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1)L'appareil ne doit pas produire de brouillage; (2)L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.