

## **Tire-SafeGuard** Tire Pressure Monitoring System

### **TPM-W Models**

### **Operator's Manual**

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## **1. Introduction**

*Tire-Safeguard* is a wireless tire pressure monitoring system. This valuable addition to your vehicle will help you drive safer. *Tire-Safeguard* automatically monitors your vehicle tires, and will immediately alert you of abnormal tire pressure and/or temperature, providing a timely warning to you in order for you to take corrective action. In addition, *Tire-Safeguard's* digital display makes tire pressure maintenance easy. You will no longer need to manually check the tires with a pressure gauge. Consequently, your tires can easily be kept in optimal operating condition. The resulting benefits are obvious: reduced uneven tire wear, reduced severe tire damages, reduced air loss related tire failures, increased tire life, improved fuel efficiency, improved vehicle braking and handling. Best of all, *Tire-Safeguard* will help you drive with enhanced vehicle safety and with less worry of flat tires and blowouts.

## **2. Tire Pressure Monitoring System (TPMS) Overview**

The major components of *Tire-Safeguard* TPMS are: one sensor-transmitter per tire, a receiver, and a display. For the rim-mounted model, the sensor-transmitter is affixed inside the tire on the wheel with a stainless-steel band. The sensor-transmitter automatically and continuously monitors the tire and, periodically, transmits out RF



signals with the current tire pressure and temperature readings. Upon detection of abnormal tire pressure and/or temperature, the sensor-transmitter will immediately issue a warning signal. The receiver captures the signals from the sensor-transmitters and forwards them to the display unit.

### 3. The Display

The display unit is the interface between the TPMS and the user. The display has a graphical representation of the vehicle with tire icons on the left side of the screen, a thermometer icon and temperature reading on the upper right, and a tire status icon and pressure reading on the lower right side.



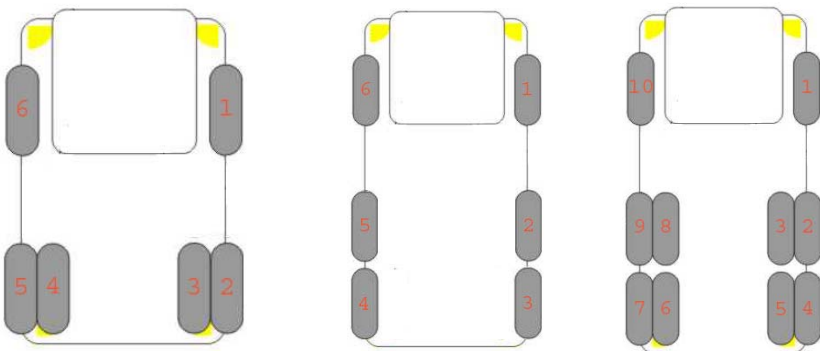
There is a status lamp on the right side of the display. Below the status lamp there is a control button. *Pressing the control button will display individual tire pressure and temperature readings; a darken tire icon on the vehicle graphic indicates the associated tire location.*

On the right edge of the display unit there is a button for programming the system. Detail description of the set up procedures will be described in a later section.

#### 3.1 Operation

When the vehicle power is on the status lamp will light up. The display will show the current tire pressure and temperature one-by-one from tire No. 1 to the last tire. The display then turns off and only the status light remains lit. Normally the light is in green color. When the TPMS detects a low tire pressure situation or when any tire is rapidly losing air, the lamp turns to red and an audible warning signal will be issued. For other tire pressure and/or temperature abnormality, the status light would be in yellow.

The order of tire information display for different vehicles is as follows:

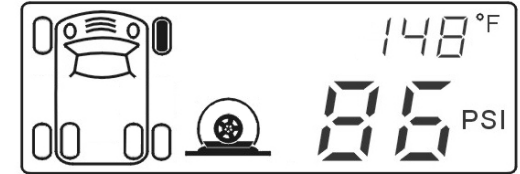


#### 3.2 Warnings

Upon detection of abnormal tire pressure and/or temperature the system will display one of the following warnings. The display lasts 8 seconds and then will switch to a screen as shown in *Abnormal Situation Display* (described in the next section). For severe warnings (low pressure and rapid pressure change) the system will also sound an 8-second alarm.

##### Low pressure or blowout

The tire icon is hollow; indicating tire pressure is low or tire is rapidly losing 3+ PSI of air within a number of seconds.



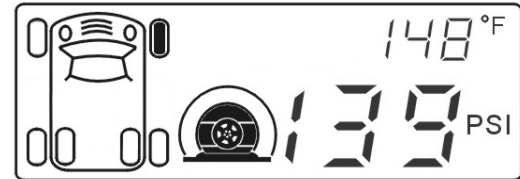
##### Slow air leak

The tire icon is 2/3 full; indicating tire pressure depletion of 3 PSI or more within 2 to 10 minutes.



##### High tire pressure

The tire icon is full with an outer shell; indicating the tire pressure is too high.



##### High temperature

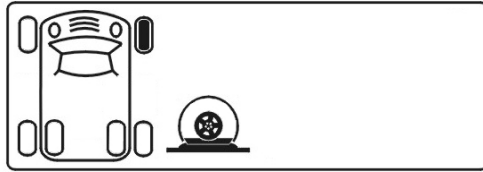
The high-temp icon is visible; indicating tire temperature is too high.



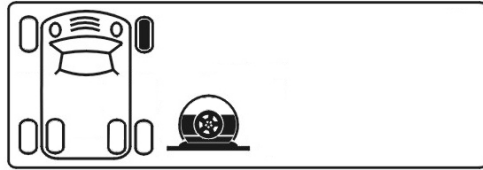
#### 3.3 Abnormal Situation Display

A persistent abnormal tire situation (with possibly several tire abnormalities) will cause one of the following warnings to be displayed. The warnings are listed below in the order of precedence for display selection (from multiple abnormalities) by the system.

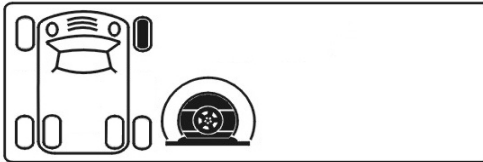
Low tire pressure  
(Highest priority)



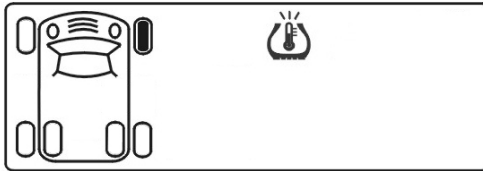
Slow air leak



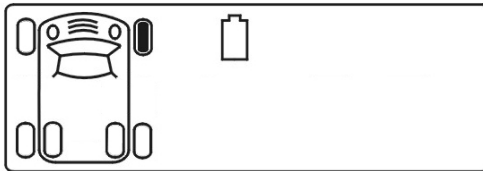
High tire pressure



High temperature



Low Battery



No Sensor Signal  
(Lowest priority)



### 3.4 Display Control

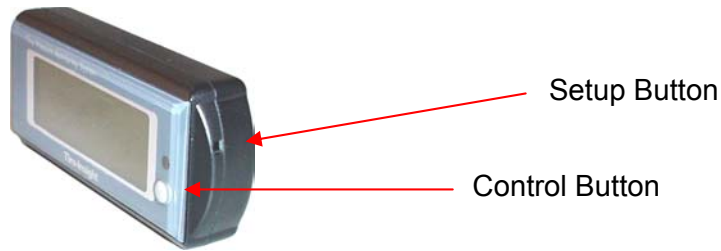
- A warning will continue to be displayed until the cause of the warning is corrected.
- When multiple warnings occurred, the higher priority warning will be displayed first.
- *Pressing the Control Button for 3 seconds will clear the warning display.*
- If the abnormal situation persists, however, warnings will be displayed again even after the display was cleared.
- The system continues to monitor the tires even after the vehicle is turned off. When the vehicle's power is turned back on, the current tire information is displayed.

### 4. Warning Threshold Set Up

The user can adjust the warning threshold for tire pressure and temperature, as follows:

- Press and hold down the Setup Button located on the side of the Display. While holding down the Setup Button, turn the vehicle's power on. After 3 seconds the system enters the Warning Setup Mode. Release the Setup Button.
- The first screen is for setting up the Low Pressure warning threshold. Pressing the Setup Button again brings up the next screen (High Pressure).
- While in a setup screen, the Control Button on the front panel is used to change the threshold setting. Pressing and holding down the Control Button advances the setting rapidly.
- While in a setup screen, pressing the Setup Button exits the setup. While in the last screen (High Temperature), pressing the Setup Button exits the Warning Setup Mode and saves the new settings for all screens.
- Turning vehicle's power off before exiting the last screen always cancels the setup.

## 5. Retrain System after Tire Change and/or Rotation

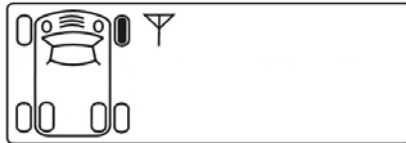


After the tires have been changed and/or rotated the system must be retrained to display the correct tire locations, as follows:

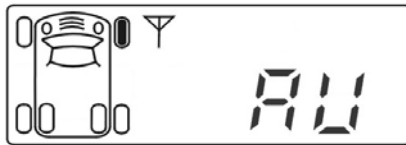
### 5.1 Retrain System for All Tires

- Press and hold down the Setup Button. Turn on vehicle power. After 6 seconds the system enters the **Manual Setup** screen of the Tire Setup Select Mode. Release the Setup Button.
- Pressing the Control Button at this point will change the screen to the **Auto-Setup** mode, which shows two extra letters: AU. Pressing the Control Button again goes back to the **Manual Setup** screen.

**Manual Setup** Screen:



**Auto-Setup** Screen:



- Press the Setup Button at a screen selects that particular setup mode; the #1 tire indicator starts blinking.
- **Manual Setup Steps -**
  - Release 3 PSI or more of air from the #1 tire. This triggers its sensor to send out a signal. Upon receiving the signal, the system sets up this tire as the #1 tire location. The system then moves on to the #2 tire.

- Repeat the above step for the remaining tires (The setup order must always be from tire #1, #2, ..., to the last tire). After successfully retraining the last tire the system exits the **Manual Setup** mode automatically.
- A simply way of retraining is: put the system to retraining mode, follow the setup order and release air from each tire for 20 seconds without needing to look at the display. After working on the last tire the retraining will be completed.
- Refill tires to the proper air pressure.
- Turning vehicle power off before finishing always cancels the setup.
- **Auto-Setup -**
  - The **Auto-Setup** mode is specially developed to support our external valve-stem mounted sensors. Using this mode to set up internal sensors would lead to incorrect sensor assignment to a wrong tire location. Therefore please use **Manual Setup** for the rim mounted sensor.

### 5.2 Retrain System for Some Tires

- To retrain system for tire rotation or replacement with less than all the tires, get into the **Manual Setup** screen as described above, press the Control Button to move the blinking icon to the desire tire location, and then release the associated tire air as described earlier to set it up.
- Note that each skipped tire will retain its previous location assignment.
- If there are more tire setup then press the Control Button again for moving the blinking icon to the next desire tire location, and then repeat set up procedure.
- Press the Control Button passing the last tire icon to exit the setup and save the new setting.
- Turning vehicle power off before finish always cancels the setup.