

GENUINE OEM PRODUCT

Application Models: Tractor Trailers, Travel Trailers, Fifth Wheel R V's, & Utility Trailers

- Thank you for choosing genuine Valor TPMS products engineered specifically for your Tractor Trailer, Straight Truck, RV Travel Trailer, Fifth Wheel, or Utility Trailer. This product is designed specifically for OEM's and aftermarket installations.



User's Manual for TPMS-203-RVT

The Second Edition "OEM"

▲ Please read this Manual carefully before using this product.

▲ TPMS-203-RVT has been developed specifically to address the challenges of tire pressure and temperature monitoring on large multi-wheeled Industrial vehicles, trailers, and recreational vehicles.

▲ TPMS-203-RVT is designed to monitor tire pressure and temperature. It is not designed to provide warning of sudden critical tire damage and blowout caused by external effects. The driver should react promptly to any warning and correct the problem.

▲ Tires can fail for other reasons besides low pressure, high temperature or overloading. Always be on the alert for any other tire problems as indicated by unusual noises, vibrations, uneven tread wear, or bulges on the tire! If any of these symptoms occur, have the tires checked immediately by a tire professional!

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ATTENTION

Default values have been assigned to each sensor for the following:

Baseline Pressure – default value, **MUST** be reset by user according to SCIP

Low Pressure Warning – -20% deviation from baseline pressure

High Pressure Warning – +30% deviation from baseline pressure

High Temperature Warning – set to alarm at 176°F

Leakage Warning – air lost is more than 4.8PSI in 16 seconds

The sensors supplied with the TPMS system installed on your trailer are designed specifically for rating of the tires as listed below.

| Part No. | Tire Load Rating | Standard Cold Inflation Pressure | Low Pressure Warning Limit | High Pressure Warning Limit |
|--------------|------------------|----------------------------------|--------------------------------|--------------------------------|
| 44104 | C | 50 | 20% decrease from set pressure | 30% increase from set pressure |
| 44106 | D | 65 | 20% decrease from set pressure | 30% increase from set pressure |
| 44108 | E | 80 | 20% decrease from set pressure | 30% increase from set pressure |
| 110302040232 | F+ | 110 | 20% decrease from set pressure | 30% increase from set pressure |

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PART I INTRODUCTION

1.1 Integrated Display

The display monitors pressure and temperature information of each tire continuously. It can report 3 axles with up to 12 tire's data as well as allowing the baseline pressure to be set to suit different axle loading requirements. When a trailer with the Valor trailer box is connected to the truck the display can report up to 6 axles with 24 wheels.



| Controls and Indicators | Functions |
|--|--|
| Axle Switch | Press it to cycle through each axle |
| Pressure & Temperature Switch | Press it to switch from pressure to temperature readings |
| Axle Indicator | Display cycles through six axles |
| Bar | Pressure unit (PSI supplied in North America) |
| °F | Temperature unit (Fahrenheit supplied in North America) |
| | Leakage icon |
| | Abnormality icon: low / high pressure and high temperature |
| Switch | Turns display on or off |
| Buzzer | Gives audible alert for tire issues |
| Set Key | Press it to set baseline pressures |
| ID Chip Slot | ID chips are used to register Chip's ID code into the display to recognize wheel positions |
| Mini USB Port | To download data from display via RS232 cable |

Part II OPERATION

2.1 Getting Started

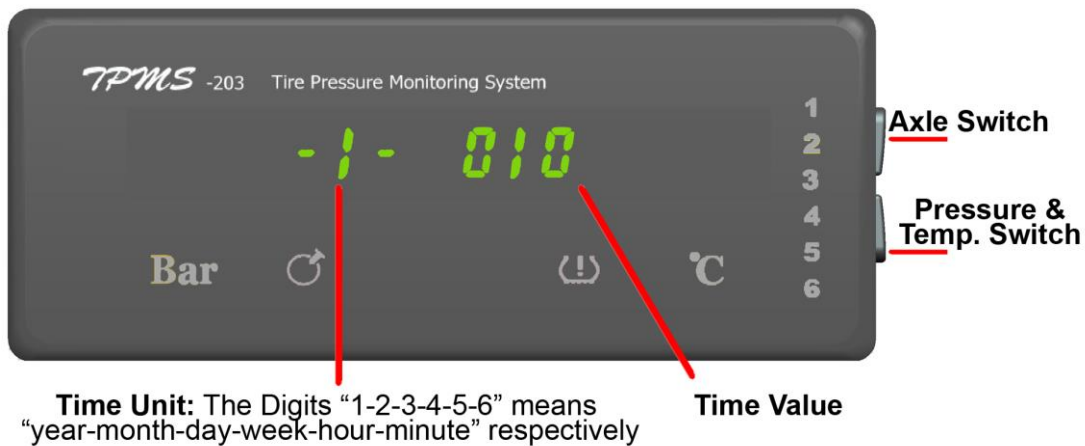
The screen will remain “000” until the data from its sensor is received. After data from all sensors is received the display will cycle through the axles, displaying pressure or temperature, at 5 second intervals or until an alert or warning condition is detected. The display supplied with your unit has been calibrated in Degrees Fahrenheit (F) and Pounds per Square Inch (PSI). If a tire location does not have a chip the position will not show anything.

2.2 Time Setting

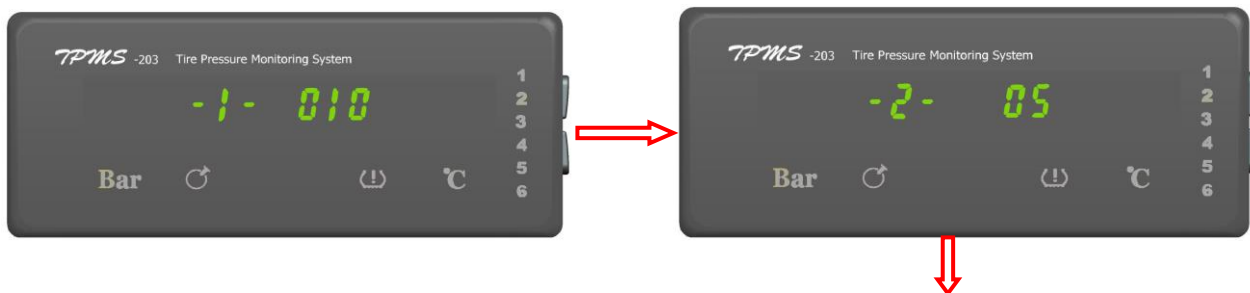
Managing the tire data can be very important. This system can store significant amounts of data that can be downloaded to your computer. You can see the data details via our **PressureAgent** software.

It's important to set time (local time) in the system so that you know when the incident happened.

2.2.1 Press the **Axle Switch** for 8 seconds to get into Time Setting Mode and you will hear the display beep.



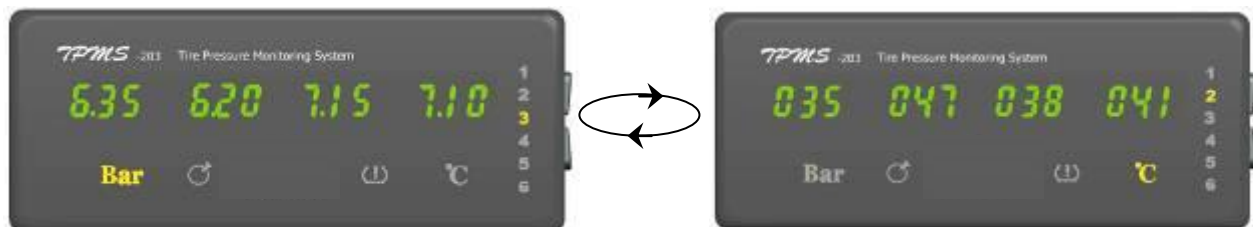
2.2.2 Press the **Axle Switch** swiftly to look up the time “year-month-day-week-hour-minute” value circularly. The following time is **22:57, Tuesday, May 25, 2010**.





2.2.3 Press the **Pressure & Temp. Switch** to change the time value.

2.2.4 Press the Axle Switch for 8 seconds to exit time setting mode and you will hear the display beep.



2.3 Setting Baseline Pressure

--- The display has the ability to have the baseline pressure set for each wheel. The factory setting for the baseline pressure is set at 87.5 PSI. It **must** be reset once the system is installed or a sensor is changed.

--- To set the baseline, simply inflate the tires to the correct operational pressure.

--- locate the set Key (shown below) on the back of the unit located next to the power button. Depress the Set Key and hold for 5 seconds until a “Beep” is heard. This confirms that the baseline pressure has been reset.

--- To confirm the new baseline setting press the set button quickly and the display will show the baseline settings.



2.4 Checking Tire Conditions

--- After data from all of the sensors is received, the display will show each axle's data for 5 seconds and automatically shift to next axle if all tires are normal. You can also press the Axle Switch to shift axles quickly.

--- The display will automatically go to any axle with a wheel issue. When there are multiple wheel issues the display will scroll between the axles with the problems.

--- If the pressure warning and temperature warning exist in the same axle, the display will just show the pressure warning of this axle.

--- Press the "Pressure & Temperature Switch" to switch from pressure to temperature.

--- If no data is received from the tire in 20 minutes it will show up as dashes on the display.

2.5 Data Download & Management

The integrated display unit can read up to 24 wheels' data at one time and store more than 8000 lines of data, on a first in first out basis. This data can be downloaded two different ways.

- It can be downloaded by connecting to a **hand tool** via a download cable. The hand tool has a SD card slot. Data can be stored on the SD card and transferred to the desktop later.
- It can be transferred to your laptop computer via an RS232 connector cable. This cable is not supplied with the system but can be purchased separately. The cable comes with software for viewing and monitoring tire conditions.

Part III WARNINGS



Warning indicates that you are operating your vehicle in a dangerous condition. When the abnormality icon  illuminates, STOP AND CHECK your tire(s) as soon as safely possible and inflate them to the proper pressure.

The system has four types of warning modes

- 20% below the baseline pressure for the Low Pressure Warning;
- 30% above the baseline pressure for the High Pressure Warning;
- 4.78PSI is lost from the tire in 16 seconds for the Leakage Warning;
- Temperature in the tire is over 176°F for the High Temperature Warning.

3.1 Low Pressure Warning

When actual pressure in the tire is 20% lower than baseline pressure: ①Display shows the tire position, axle number and current tire pressure of the abnormal tire; ②Warning beep; ③Abnormality icon appears; ④The abnormal tire position flashes.



The figure above shows tire “1B” and “2A” are under-inflated. The display just shows axle1 and axle2 until the problems are corrected (1 bar is equal to 14.5 psi, 4.5 bar is 65 psi).

3.2 High Pressure Warning

When the actual tire pressure is 30% higher than the baseline pressure: ①Display shows the current tire pressure, the position & axle number with the abnormal tire; ②Warning beep; ③Abnormality icon appears; ④The digits of abnormal tire position flash.



The figure above shows tire “3B” is over-inflated and tire “3A” is under-inflated. The display just shows axle 3 until the problems are corrected.

3.3 Leakage Warning

When 4.78PSI is lost from the tire in 16 seconds: ①Display shows the tire location and tire pressure; ②Warning beep; ③Leakage icon appears; ④The digits of abnormal tire position flash.



The figure above shows tire “2C” is leaking and tire “1A” is over heating (88 degrees C is equivalent to 190 degrees F). The display just shows axle1 and axle2 until the problems are corrected.

3.4 High Temperature Warning

When the tire temperature is higher than 176°F: ①Display shows the temperature of the tire, the position and the axle number with abnormal tire; ②Warning beep; ③Abnormality icon appears; ④The digits of the abnormal tire position flash.



The figure above shows tire "1A" is over heating. The display just shows axle1 until the problem is corrected.

Note:

A high temperature condition can occur due to multiple issues. The most common are under inflation or overloading. The third most common issue causing high temperature is a mechanical problem such as a brake that is dragging or a wheel bearing that is starting to malfunction. In all cases if a temperature warning is shown on the display caution should be taken, the vehicle should be slowed down and pulled over when safe to do so. Once in a safe location use the display, by manually moving to the pressure mode, to check the tire pressure. If the pressure is ok then proceed to the wheel and visually check the tires for damage. Although it will be difficult to see, visually inspect the brakes and axle end (bearing) for obvious issues. If no damage is visible and the temperature has lowered so that the display is not in a warning mode, it may be possible to "limp" home or to a location where a qualified technician can perform a detailed inspection.

Part IV WHEEL ROTATION

There are two methods to re-identify rotated tires' position:

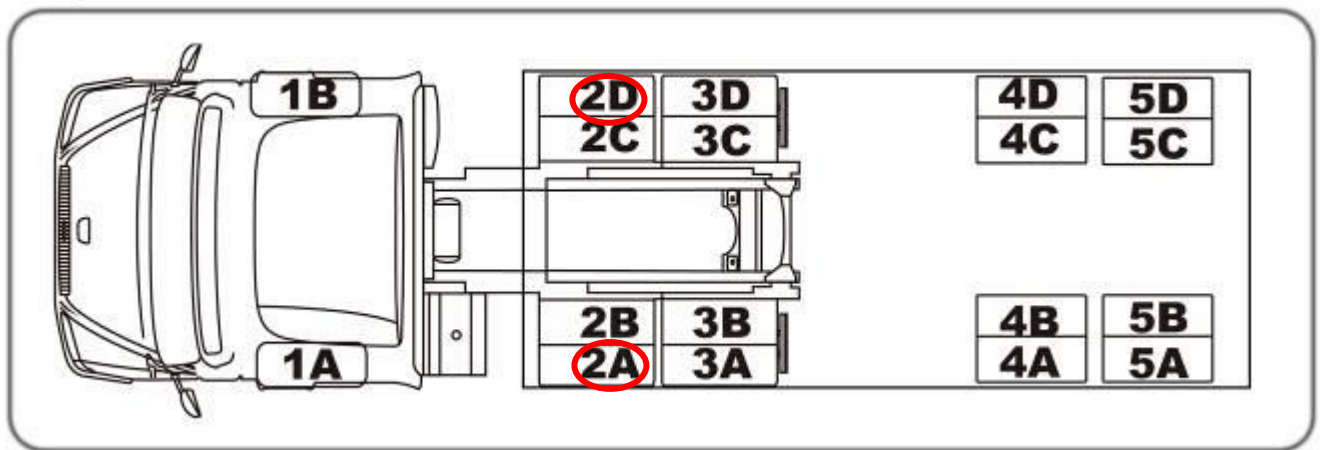
1. Use TPMS Smart Tool; or
2. Rotate ID chips.

4.1 Use TPMS Smart Tool

If you have a TPMS Smart Tool, you can use it to wirelessly erase and rewrite the ID code in the ID chip after tire rotation (See 6.4 in the separate manual of TPMS Smart Tool).

4.2 Change ID Chip Position

Thanks to our unique ID chip technology, when you change wheels or rotate them, you simply move the corresponding chips in. Just change corresponding ID chips' position and restart the display and trailer ID box. Take an 18-wheel vehicle for example.



Rotate the wheels in position “2A” and “2D”



Change their corresponding ID chips' position, restart display.



PART V TROUBLE SHOOTING

| Problems | Possible Reasons | Solutions |
|---|--|---|
| Both pressure value and temperature value of all tires are “000” | Antenna connection problem | Check antenna connection |
| | Broken antenna | Replace antenna |
| | There is something wrong with display | Use a pair of sensor & ID chip and TPMS Smart Tool to confirm. If it doesn't work, replace it |
| The pressure and temperature values are “000” at one or more sensor locations | Sensor problem | Use TPMS Smart Tool to check sensor |
| | Problems with antenna connection | Check antenna connection |
| | Antenna location | The antenna may have shifted. Replace it to the original position |
| | ID chip not inserted correctly or not functioning | Check the ID chip and make sure it is inserted correctly. If required use the Smart Tool to reprogram the ID chip |
| The pressure value is “000”, but temperature value is normal. | Failed sensor | Replace the sensor |
| No values shown on the display and all icon indicators are off | Display is turned off | Turn on display |
| | Power cord is not properly installed or the inline 1 amp fuse has failed | Check power cord connection and the fuse |
| | The display has failed | Replace display |
| No values shown on the display, but icon indicators are on | ID chips missing | Check the ID chips |
| | System failure | Restart the system |
| | Surrounding interference | Leave the area and system should work |
| | Sensor problem | Use the Smart Tool to check the sensor |
| Dash “----” shows on the display | ID chip problem | Pull out the ID chip and plug it back in. If the problem still exists, go to the step below. |
| | | Remove the chip and code it to the sensor with the Smart Tool. If you cannot code the chip replace the chip. |

| | | |
|--|--|---|
| The data does not refresh | System failure | Restart the system. |
| The display continues to show unusual codes | | |
| Values are not being received at a tire location after a sensor was replaced or a spare tire was installed. | The ID chip for the sensor at that location was not changed in the back of the display | Replace the old ID chip with the new one that came with the new sensor. Restart the system and set baseline pressure. |
| (High or low) Pressure Warning is activated at more or all sensor locations after the installation is complete | Didn't setup the baseline pressure | Setup the baseline pressure. |
| The display is continuously buzzing | The ground wire may not be connected properly | Connect the ground wire. |
| | The on/off switch has failed | Replace the display. |

PART VI PRODUCT SPECIFICATIONS

Display

Power Consumption: 130 mW (Regular); 230mW (Max)

Power Supply: DC 12/24 Volt

Weight: 231g (8.15 oz.)

Dimensions: 15.5 x 6.2 x 2.3 cm (6.1 x 2.4 x 0.9 inch)

Operating Temperature Range: -40°C to 85°C (-40°F to 185°F)

Pressure Resolution: ± 0.01 Bar (0.1PSI)

Temperature Resolution: 1°C (1°F)

Sensor

Weight: 70g (2.47 oz.)

Dimensions: 8.3 x 3.1 x 2.5 cm (3.27 x 1.22 x 0.98")

Operating Temperature Range: -40°C to 125°C (-40°F to 257°F)

Pressure Accuracy: ± 0.25 Bar / 3.7 PSI (at 0°C ~50°C)

Temperature Accuracy: $\pm 3^\circ\text{C}$ (5.4 °F)

Battery Life: 5 years at 20 hours driving per day

Maximum Range: 13Bar (188PSI)

Frequency: 315MHz OR 433.92MHz

PART VII CERTIFICATES

8.1 FCC's authentication announcement

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.

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. You can test that if this equipment does cause harmful interference to radio or television reception by turning the equipment off and on.

8.2 European regulations announcements

This device complies with all European Electromagnetic compatibility regulations (95/54/EC and EN300 220-1). The equipment has been tested and found to comply with the above regulations; and in addition, it meets the requirements for low powered sensors/receivers as defined by the relevant radio approval authority. The regulations are designed to provide reasonable protection against harmful interference or susceptibility.

8.3 CE directive announcement

This device complies with the essential protection requirements of Council Directive 89/336/EEC on the approximation of the law of the Member states relating to electromagnetic compatibility. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device can accept any interference received, including interference that may cause undesired operation.

PART VIII WARRANTY POLICY

Warranty Statement

Shanghai Baolong Automotive Corporation (“VALOR HK”) warrants to end user of its products specified below that its products are free from defects in material and workmanship under normal use and service for the applicable warranty period as described in the Warranty Period section of this Policy. Subject to the conditions and limitations set forth below, VALOR HK will, at its option, either repair or replace any part of its products that proved defective by reason of improper workmanship or materials. Repaired parts or replacement products will be either new or refurbished to be functionally equivalent to new. If VALOR HK is unable to repair or replace the product, it will refund the current value of the product at the time the warranty claim is made.

Limitation of Liability

This warranty covers substantial manufacturer’s defects in workmanship and materials. It does not cover any damage to this product that results from improper installation, accident, abuse, misuse, insufficient or excessive electrical supply, abnormal mechanical or environmental conditions, or any unauthorized disassembly, repair, or modification. This limited warranty also does not apply to any product on which the original identification information has been altered, obliterated or removed, has been sold as second-hand.

Products are considered to be monitoring devices and are not to be considered as safety devices. This limited warranty covers only repair, replacement or refund for defective VALOR HK products. All other express or implied warranties, liability for incidental, special, consequential or any other damages including but not limited to, economic loss, lost revenue, lost profits, or loss of use or damage to other property, hereby are expressly disclaimed regardless of whether they were reasonably foreseeable, or whether seller had knowledge that they could occur.

Responsibility

The end user will provide the dealer with dated proof of purchase and access to claimed parts for return. VALOR HK warranty will be honored by the authorized distributor or dealer from which the Product was purchased. Authorized dealers are to contact their regional VALOR HK distributor with warranty claims and questions. Dealers will provide distributor with dated proof of purchase, claimed parts for return upon request, and a completed Warranty Claim Form (Appendix 1). The distributor will be responsible for administering the warranty as per the claims procedure.

Note: Any product returned for warranty without a completed Warranty Claim Form (Appendix 1) will be excluded without consideration.

Exclusive Agreement

This Limited Warranty is a complete and exclusive statement which applies to the VALOR HK TPMS. There are no express or implied warranties beyond those expressly stated above. No employee, agent, distributor, dealer or other person is authorized to give any warranties on behalf of VALOR HK, except as authorized just in writing.

Warranty Period

The term of VALOR HK warranty for its products is warranted against defects in material or workmanship that result in a product failure under normal use during a period of 12 months following the date of purchase. Dated proof of purchase is required.

Remedy

The exclusive remedy for retail system determined by VALOR HK to be defective within such period shall, at the sole option of VALOR HK, be

- (1) The repair or replacement of such defective product, OR
- (2) The refund of the current value (not more than the purchase value) of the product at the time the warranty claim is made.

Products replaced under warranty are covered hereunder by the remaining portion of the original warranty period or 12 months, whichever is greater.

VALOR HK obligation to satisfy a warranty claim is subject to the following conditions:

- (1) Dated proof of purchase is provided
- (2) All such claims must be submitted to VALOR HK no later than sixty (60) days from the date of the failure (the date VALOR HK receives the complaint), and must be accompanied by a Warranty Claim Form (Appendix 1). **No product will be accepted for warranty unless accompanied by a completed Warranty Claim Form (Appendix 1).**
- (3) Some pictures of defective product/part are helpful for remedy.
- (4) If requested by VALOR HK, the product involved shall be returned, freight prepaid, to VALOR HK for examination; and
- (5) Products shipped to VALOR HK must be properly packaged to prevent damage in transit.

Claims Procedure

Warranty claims will only be accepted from an authorized VALOR HK distributor. The following procedure must be followed when making a warranty claim:

- 1. If you suspect a product defect, contact VALOR HK distributor for assistance in verifying the problem.
- 2. If a defect is found, provide VALOR HK distributor with Warranty Claim Form along with some pictures of defective parts if possible prior to removing suspected warranty parts.
- 3. VALOR HK distributor will transform the material above by fax or email to VALOR HK customer service.
- 4. VALOR HK customer service will gather information and refer the claim to technical service as required.
- 5. Technical service will assist in troubleshooting, and subsequently determine whether a warranty claim is required.
- 6. If the warranty claim is approved, customer service will issue return authorization to distributor, who will return the defective products or parts.
- 7. Product shall be returned, freight prepaid, to VALOR HK along with dated proof of purchase, some pictures and a completed Warranty Claim Form (Appendix 1) to the following location:

Valor HK

4320 Harvester Road, Burlington, ON. Canada L7L 5S4

8. VALOR HK will ship distributor repaired or new product/part without any charge.

All claims submitted must include:

- (1) Dated proof of purchase is provided
- (2) All such claims must be submitted to VALOR HK no later than sixty (60) days from the date of the failure (the date VALOR HK receives the complaint),
- (3) A Warranty Claim Form (Appendix 1)
- (4) Some pictures of defective product/part are helpful for remedy.
- (5) If requested by VALOR HK, the product involved shall be returned, freight prepaid, to VALOR HK for examination;
- (6) Products shipped to VALOR HK must be properly packaged to prevent damage in transit.

9. VALOR HK reserves the right to reject a warranty claim for any or all of the following reasons:

- (1) Dated proof of purchase is not provided;
- (2) Claims is submitted to VALOR HK over sixty (60) days from the date of the failure (the date VALOR HK receives the complaint);
- (3) No or incomplete Warranty Claim Form (Appendix 1)
- (4) Product was not returned for inspection as requested
- (5) Product inspection does not indicate a failure
- (6) Failure occurred beyond warranty period
- (7) Product damage in transit.

Return Requirements of Defective Parts

Be sure the parts are properly identified and packed

- (1) Each part must be accompanied by a completed Warranty Claim Form (Appendix 1). **No product will be accepted for warranty without a completed Warranty Claim Form (Appendix 1).**
- (2) When shipping parts for several different claims together, do not mix the parts in the same container, box, etc. This could cause confusion in performing a failure analysis, a delay in claim processing, and possible rejection of the claim.
- (3) Pack the parts carefully to avoid shipping damage which could distort or mask the true cause of the failure. Parts lost from broken boxes, damaged shipping containers, or negligence in packaging may result in rejection of the claim.
- (4) Corrosion or rust that prevents proper inspection, or prevents identification of the primary failure, may result in rejection of the claim.
- (5) Rejected parts will be returned to distributor at distributor's expense if the distributor wishes the parts returned.
- (6) Return all parts prepaid to the correct designated location.

Effective Date

This warranty shall become effective October 1st, 2009. This warranty supersedes all past warranties expressed by VALOR HK and may not be changed, altered or modified in any way except in writing by VALOR HK.

| Appendix 1 Warranty Claim Form | | |
|--|----------------|------------------|
| Customer: | | Distributor: |
| Product Information | | |
| S/N(on top of the display): | | |
| Date of Purchase: | | Date of Claim: |
| Vehicle Information | | |
| Year: | Brand: | Model: Mileage: |
| The Standard Cold Inflation Pressure | | |
| Tires Layout (how many axles, how many tires on each axle): | | |
| Length of Vehicle: | | |
| Usage information | | |
| Power connection | Cigarette plug | Hardwire/battery |
| Did you accelerate the speed from 0 to 25km/h fastly | Yes | No |
| Did you ever change the original sensor? | Yes | No |
| Did you do tire repair recently? | Yes | No |
| Detailed Description of Defective Part | | |
| What problems happen when driving or stopping? What shows on display? (pressure, temperature backlight, icon, buzzer) | | |
| Frequency of Problem | Rare | Very often |
| Other Description: | | |
| Distributor Signature: | | |
| Parts Needed to be Replaced (Must be returned to VALOR HK) | | |
| Part Name and S/N Number | Quantity | |
| | | |
| | | |
| | | |
| <p align="center">Important</p> <p align="center">Claim must be submitted within 60 days after failure</p> <p align="center">Fill out one claim form for each claim</p> <p align="center">Dated proof of purchase is provided</p> <p align="center">Some pictures of defective product/part are helpful for remedy.</p> | | |