

# The Beru Tire Monitoring System from Prevest

by Larry Plachno  
Photos courtesy of Prevest



While tires are statistically the most likely reason for a bus parked at the side of the road and out-of-service, tires have not received as much attention as they deserved in the past. The new tire monitoring systems now available are making a major step forward in this area. Now available on new Prevest seated coaches, the Beru Tire Monitoring System is probably the most sophisticated and most useful of the tire monitoring systems currently available on the bus market.

I feel that it is a step in the right direction that bus people are paying more attention to tires in recent years. Tires deserve more credit that most people give them, yet they are often ignored. We all know we should check the air in our tires every morning but how many of us really do that? Yet, tires are usually the single biggest reason for buses pulled over at the side of the road. Moreover, with the increasing price of fuel, keeping your tires properly inflated can make a significant difference in fuel economy.

One of the most important new developments in the area of bus tires is the avail-

ability of tire monitoring systems. There are now several different systems on the market. While they vary in both operation and results, most will monitor both tire pressure and tire temperature. This provides the driver with a warning of a tire blow out so that immediate action can be taken. It also lets the driver know when tire pressure is low or tire temperature is high so that action can be taken before a major problem occurs.

Prevest introduced the Beru tire monitoring system on its new seated coaches in 2008. The system was developed by Beru, a specialized German manufacturer, and has been

used for quite some time on Formula One racing cars as well as luxury autos such as Audi, BMW, Porsche and Lamborghini. At this point the Beru system is not an aftermarket product but an OEM system that is integrated into the new coach as it is built. While the Beru system is not the least expensive system on the market, our research suggests that it is probably the most sophisticated and most useful of the tire monitoring systems we have seen.

## Installation

Like all of these tire monitoring systems, the Beru system starts with a sensor and

transmitter. Some of the simpler systems use external sensors that screw on to the valve stems. The SmarTire sensor is wrapped to the inside of the wheel with a band. Beru uses a high strength potted plastic casing that is screwed to the valve inside the wheel. The special screws that are used for this are powder-coated and can only be used once. Inside the sensor/transmitter is a small battery that should last for about five years.

There are typically nine sensors provided per coach: two for the steering tires, four for the drive tires and two for the tag/bogie tires. The ninth sensor/transmitter goes on your spare tire. There is an alternate seven-sensor system for those who have double-width drive tires.

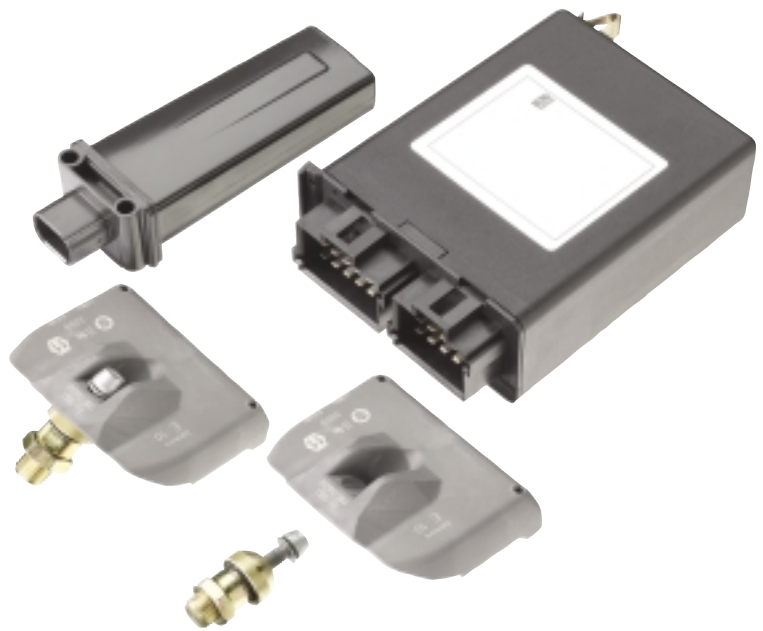
The next part of the system is similar to some other tire monitoring systems. There are three antennas to pick up the radio signals from the tires. As you might expect, each antenna is mounted adjacent to one of the three axles of the coach. Wires run from the antennas to an electronic control module that effectively controls the system. This, in turn, is wired into a display on the dash of the coach.

When the system is first installed, or when tires are changed, information has to be entered so that the electronic control module knows which sensor is in which tire position. At that same time, there are also some parameters that must be entered to get optimum use of the system.

What makes the Beru system so special? In my opinion, there are several key factors that set it apart from other tire monitoring systems. One is that it is totally digital. This makes it more modern and reliable than some of the other systems that still use analog components.

A second factor that makes a big difference, is that the Beru system samples the tire pressure and temperature every minute regardless of whether you are parked or driving. Some of the other tire monitoring systems sample considerably less frequently. One popular system samples the tire only once every 15 minutes when parked and every three to four minutes when moving. Hence, this frequent sampling gives the Beru system two major advantages. One is that it lets you know much sooner if you have a problem. The second advantage is that you can get a pre-trip tire pressure reading a minute after starting your engine – before your air is up and before you drive off.

The third factor that impressed me is the easy-to-read dash display for the driver. This also provides an alarm system, lets you modify your parameters within reason, and even lets you select your preferred language and units of measure.



Here are some of the standard components used on the Beru Tire Monitoring System. At the upper left is one of the three antennas that pick up signals from the sensors and send this information to the Tire Pressure Monitoring System Receiver. At the upper right is the Tire Pressure Monitoring System Receiver that accepts data from the antennas, controls the system, and sends information to the display unit on the dash. At the bottom of the photo are two of the sensors that are mounted inside each tire.



This photo shows the Beru Tire Monitoring System display mounted on this Prevost bus dash on the left side of the steering wheel. In normal operation, the driver can see the condition of all tires at one glance. In the event of either a pressure or temperature problem, the system will notify the driver.

### Pre-Trip Check and Parameters

One of the reasons why I like the Beru system is its marvelously easy-to-read display. The top part of the display has a simple diagram of your axles and tires: two on the first axle, four on the second axle, and two on the third axle. Displayed next to each wheel/tire is the pressure or temperature of

that particular tire. Your spare tire is also shown below the third axle. In the event that the system does not have a reading from a particular tire, it shows two dashes (--). The bottom part of the display shows warning messages or options.

When you first turn your coach on, the Beru Tire Monitoring System display comes

to life and goes into its Pre-Trip Check. Initially, the nine tires are shown with dashes since there are no readings. When the system gets information from each of the sensor/transmitters as they “report in,” the dashes are replaced by numbers. Since they report in every minute, you should have a complete tire check before your air pressure comes up.

In normal pressure deviation mode, the system shows positive and negative numbers to indicate how many pounds of pressure each tire varies from the pre-set target pressures. There is also a gauge pressure mode that displays the actual tire pressures. Hence, one of the biggest advantages of the Beru system is that your driver gets an accurate reading of all tires a minute after starting the coach – without having to walk around the coach with a tire gauge, and regardless of the weather. If one tire reads low or high, he can take appropriate action.

There are several options and parameters that should be set before you use the system. They can be changed from time to time as needed. Basic questions include whether you want tire temperatures shown in fahrenheit (°F) or celsius (°C). Do you want messages in English or French? You can also control your backlight and contrast settings.

You must also set target pressures for your tires. This is the cold tire pressure you want for each wheel position. The “Pres-



One of the major advantages of the Beru Tire Monitoring System is that the driver can monitor all of the coach tires from his seat while the bus is moving or standing still. There no longer is a need to walk around the coach with a tire gauge to check the tires. This photo of a Prevost “H” series coach was taken in Quebec.

sure Deviations” screen will show pounds per square inch above or below this number. The factory sets recommended pressures but the system can be set as much as 30 percent higher or 20 percent lower to suit your special needs which can include seasonal differences, unusual loads, or just personal preference.

You also are given an opportunity to adjust your alarm settings. What deviation in pounds per square inch from your target pressures should generate an alarm? What tire temperature should generate a high temperature alarm? Do you want a audible sound (a beep) when the system indicates an alarm? You even have the option of hearing a sound when you press keys on the dash display.

Noteworthy is the fact that you can also check your antenna status as well as the life remaining on your sensor batteries. The battery life display generates numbers from 100 down to 1 showing percentage of battery life remaining. This gives you ample warning when you will need to replace a battery.

### Alarms and Operation while Driving

When doing the pre-trip inspection, if all the tires are within limits on pressure you will get a “Tire Pressures: OK” display. If there is a problem, the system will generate four basic alarms; two are considered non-critical while two are considered critical. It might be mentioned that whenever the system generates an alarm, it places a blinking rectangle around the offending pressure or temperature so the driver can spot it immediately without having to take his eyes off the road to search the display.

One non-critical alarm is “System Error, not all tires monitored.” This indicates that the system has failed to receive a reading from one or more tires. Figures for the missing tire are shown as two dashes inside of a blinking rectangle. The second non-

The easy-to-read display is a major feature of the Beru Tire Monitoring System. The illustration on the left shows how the display looks when you start the coach and the Beru System goes into its pre-trip check. In this illustration two tires have already “checked in” and show their deviation from your set pressure. The illustration on the right shows how the display should look when you are going down the road. In this situation the display shows tire pressure deviation from your set pressure, but it can also show temperatures or pressures.



critical alarm is "Pressures Not Optimal, Readjust at Next Stop." A blinking rectangle will appear around the offending tire pressure. This means that the pressure on one tire has deviated far enough from the target number to generate an alarm. However, the deviation is small enough so that driving can be continued until the next stop. With the non-critical alarms, the driver can touch a key on the display to acknowledge the warning and stop the rectangle from blinking.

There are two critical alarms. One is "Stop, Flat Tire." This alarm is generated when a tire's pressure falls substantially below the target pressure. The second critical alarm is: "Stop, High Temperature." As you have already guessed, this alarm indicates that one of your tires has exceeded your temperature alarm temperature. The blinking rectangle will continue blinking until the error condition disappears, even if you touch a key.

In normal operation while driving, the Beru display shows the "Pressure Deviation" screen where each tire's pressure is shown as the number of pounds either above or below your target settings. This is updated every minute by the sensors. By pressing a key, the driver can view actual pressures or actual temperatures. Watching temperatures occasionally could let the driver know about a potential heat prob-

The Beru Tire Monitoring System offers numerous advantages to the driver and coach owner. It watches for underinflation, the leading cause of blowouts, and keeps tire pressures at optimum levels. The system also extends tire life, increases coach uptime, and helps drivers to monitor tires. This photo of a Prevost coach was taken in the Tampa area.



lem from bearings or brakes. In the event that an alarm is triggered, the alarm wording appears at the bottom of the display while a blinking rectangle appears around the offending figure. In the event of a "Stop, High Temperature" alarm, the display figures will change from pressure to temperature.

#### Advantages of the System

There are several advantages of the Beru Tire Monitoring System including the following:

- It will help improve coach safety by preventing heat buildup due to underinflation, a leading cause of blowouts and tread separation.
- Keeping tire pressures at optimum levels also enhances fuel savings and helps reduce wear, which extends tire life.
- Since tire failure is a main cause of vehicle breakdowns, this system will increase coach uptime, keeping your coach on the road.
- It lets drivers and mechanics know what tire pressures are desired.

There are four particular advantages that I feel are very noteworthy. One is that the Beru system saves the time and effort of checking tire pressures manually yet warns the driver about a tire problem before he leaves the yard or garage. The second is that in many cases, the system will warn a driver about a minor tire problem early enough so that he can take action and thus prevent it from turning into a major problem or an out-of-service bus with passengers at the side of the road.

The third advantage is that you get accurate tire readings without the necessity of kneeling in mud or gravel with your air gauge. The fourth advantage is that checking tire pressures manually can often cause problems with valves sticking and failing to close properly. With the Beru system, the pressure is sampled without the need to activate the valve or use a tire gauge.

Additional information on the Beru Tire Monitoring System is available from your Prevost representative. □

From the October 2008 issue of:



## National Bus Trader

*The Magazine of Bus Equipment for the United States and Canada*

9698 W. Judson Road  
Polo, Illinois 61064  
(815) 946-2341  
www.busmag.com  
adv@busmag.com