

TYRE PRESSURE MONITORING SYSTEMS

Do they really
protect your tyres
or are they simply
full of hot air?

BY GRANT & LINDA HANAN



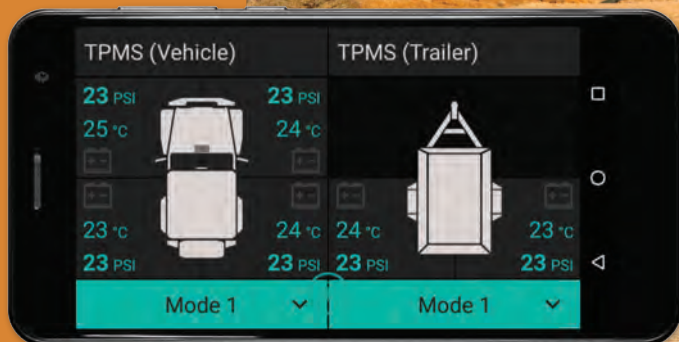
Scan QR code to
watch Grant and
Linda's video on
tyre pressure
monitoring systems.

When you outlay big coin for 4WD tyres, imagine how you'd feel if one or more were completely written off on their first trip. It's fair to say that if you're like us, you'd probably be quite peeved when it could have potentially been avoided with a TPMS.

So what is a TPMS? Let's look at them in more detail, and how this type of system can help protect your rubber.

WHAT IS A TPMS?

In simple terms, a TPMS or Tyre Pressure Monitoring System are sensors which detect tyre pressures. Some systems measure tyre temperatures as well. All this information is provided in real time via some sort of signal, alarm or display device in the vehicle's cabin.



ARB's TPMS is incorporated ▲
into its LINX system.

The whole idea behind a TPMS is to provide the driver with an early warning of a potentially hazardous tyre situation. This could be something to do with either the inflation pressure or the tyre temperature (or both). There are also different kinds of TPMS on the market. They're not something new, and some high-end vehicles have them fitted as OE from the vehicle manufacturer. As an alternative, they're also available as an aftermarket product. Speaking from first hand experience, we found out the hard way that not all TPMS systems are equal after being let down twice in the middle of nowhere.

HOW THEY WORK

The system has sensors/transmitters that are fitted to your wheel and tyre combination. Each has a small replaceable battery which provides power to small electronic circuits. These sensors measure both pressure and temperature and the



A damaged external sensor let us down on this occasion.

output is transmitted via a wireless signal. This signal is then picked up by a powered, receiver/monitor display that's located inside the vehicle cabin for the driver to view. Some brands also use small aerials that are generally located under the vehicle to assist in boosting the wireless signal to reach inside the cabin. Using the in-vehicle display is how the driver can



see what pressure and/or temperature the vehicles' tyres are at in real time. Like any display, it's only good if you are constantly observing the output. And as this isn't always possible, the monitor display can be programmed with a series of alarms that can flash or make a sound. These are designed to alert the driver to look at the display to determine what has triggered the alarm, i.e. a change in tyre pressure or temperature.

TPMS COMPONENTS

There are a number of components which make up the system, starting with the way they're fitted to the rim - externally or internally.

EXTERNAL

These types of sensors screw on to the end of the tyre valve stem and replace the valve cap. Anti-theft types are also available in this style that prevent the sensors from being unscrewed. Depending on the type of valve stem used and the position of the sensor, the negative is they can be prone to damage when tracks are overgrown. The small lithium batteries that are used with this style of tyre sensor can be replaced at any time.



External sensors are labelled to assist with fitment location, eg front right.



Some external sensor systems come with anti-theft devices.

INTERNAL

This style has a clamp type of sensor transmitter which is fitted on the inside of the rims and tyres. As they're fitted internally, there is less risk of the transmitter being knocked about or being removed accidentally. Like the external style, each of the internal transmitters contains a lithium battery. However, the major difference here is the tyre needs to be removed to change it. Although this style is our preferred type, we would generally review and replace the batteries at the time when we have new tyres fitted if necessary.



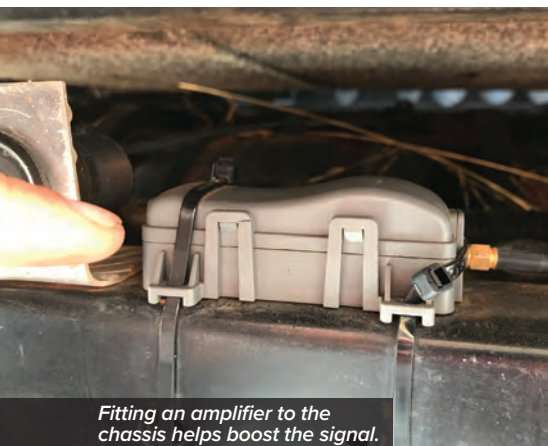
Fitting internal sensors is a DIY job.



We like to fit the sensors in the same location on all rims.

ANTENNAS/RF BOOSTERS

While not all brands will supply these within their kits, most will have them as an extra option that can be purchased separately. These antennas are strategically placed under the vehicle to pick up the information. Some models just amplify and boost the radio signal so it can reach the monitor inside the cabin. Other models use antenna cables that are routed under the vehicle through a series of joiners and splitters. These then feed into the digital receiver display unit located inside the cabin. Having this combination of antennas

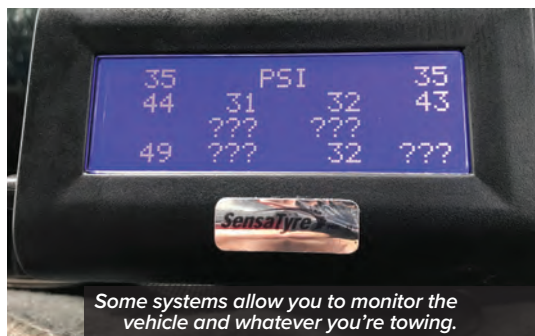


Fitting an amplifier to the chassis helps boost the signal.

and cables helps eliminate any issues and disturbances which can happen when you're relying solely on a radio signal. An example of this could be from something like a trailer tyre that has to reach a longer distance to the driver's position in the cabin.

MONITORS/DISPLAYS

These come in all shapes and sizes and can have numerous features. Primarily, their function is to show the real time pressure and temperature of individual tyres, and to alert you when things change. They require some form of power which could simply be AA batteries, a 12 volt system, or solar. You then pre-programme the unit and set alarm pressures and temperature thresholds to suit your circumstances. An alarm will activate should the system reach these settings giving you time to investigate further. The higher end models have more display settings to be able to record a lot more than just your four vehicle road tyres. And you can set thresholds and alarms for something like trailer wheels and tyres that are different to those settings on your vehicle.



Some systems allow you to monitor the vehicle and whatever you're towing.



This display unit uses solar rather than using a 12v connection.

WHAT TO LOOK FOR

An entry level aftermarket kit generally comes with four external type valve sensors and a 12v cig socket display. At the other end of the market, the kit has more programming ability. Each tyre sensor/transmitter now has a unique code and alarm setting thresholds that can be personalised separately. This includes programming when the alarm sounds so the display will flash to indicate which tyre has had a dramatic change in pressure or temperature. Some kits will be capable of monitoring not just the tyres on your vehicle, but also on multiple trailer set ups when each is hitched to your vehicle. This incorporates caravans, camper trailers and boat trailers.

TPMS ADVOCATES

We've been strong supporters of using TPMS, especially when our current Sensatyre system has been able to accommodate up to 14 internal sensor

transmitters that are installed across our vehicle and trailers. We're very impressed with this set-up as it includes spare tyres as well. To help boost the signal, there's two under-vehicle antennas that are fitted to our 79 series LandCruiser given that we tow. One of these is fitted at the vehicle's rear while another is inside the engine bay on the side rail. Both have been joined using the cables and joiners/splitters provided with the kit. A final connection has been made to the suction cap digital 12v powered display unit that's located on the vehicle dashboard. We've been using this system in our vehicle and trailers for many years now, and it's copped a good workout along some serious terrain. During that time, it's done exactly what it's supposed to do. It's alerted us when we've taken on a puncture, yet still given us enough time to stop and fit plugs while there's ample pressure left in the tyre. But the temperature feature has also alerted us when tyres are beginning to heat up at speed on gravel roads. We like the fact we've got time to



The sensor helped us get on to this repair before it became a major problem.

make adjustments to tyre pressures to protect them from overheating and risking delamination. We've also found the digital display is very intuitive and allows us to set alarms individually for all 14 tyres. This is a real bonus! It means we can set different pressures on our tyres depending on the loads we're carrying or towing, plus our speed.

Just a note – we mentioned earlier that not all systems are equal, and we've tried a few different brands with mixed results. In our case, the issue has been the reliability of the transmitted signal to the monitor when a change has occurred in the tyre. Radio signals can be influenced by all sorts of things. These can include humidity in the air and other radio noise in the vehicle. But there's plenty of other factors as well. Vehicle insulating shields such as window tint and sound deadening mats can cause issues, and simple things like the way and

what you pack inside your vehicle can also be contributors. As every vehicle is set up differently, our advice is to speak to the reseller of the TPMS to see if you can test that their system works with your set-up before outlaying any coin.

SUMMING UP

Getting a puncture at any time is a real pain in the butt. But getting it in the middle of nowhere and not knowing you have a puncture until it's way too late is far more than that. Having a reliable TPMS provides assurance when transmitters are providing real time information regardless of what speeds, terrain and conditions you're putting your wheels and tyres through. In some cases, a TPMS could just be the difference between fixing a tyre to get going or having to sit things out until help arrives. I know which option we'd prefer!



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