

# Tyre Pressure Monitoring Systems For Caravans



**TyrePal**  
A WSL COMPANY  
TYRE PRESSURE MONITORING SYSTEMS

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## The Importance of Tyres and Tyre Pressure Monitoring

### Why Correct Tyre Pressures are Important

It is often not appreciated how important tyres are for any vehicle – they are, literally, the only contact a vehicle has with the road. We know so much that is happening whilst we drive - engine oil level and temperature, outside air temperature, washer bottle level etc. but in most cases we have no information about what our tyres are doing when we drive. The contact patch of a tyre is about the size of a handprint and that is for a correctly inflated tyre. An over- or under-inflated tyre has an even smaller contact patch.

A correctly inflated tyre wears its tread evenly and maximises tyre life. Over-inflation not only leads to a reduced contact patch but leads to uneven tyre wear. Under-inflation is even more dangerous as it:

- Reduces grip
- Reduces cornering ability
- Increases braking distance
- Increases tyre wear
- Increases fuel consumption

Continental Tyres say that a tyre under-inflated by just 6psi will wear 30% faster and increases fuel consumption by between 10% and 20%.

In safety checks carried out in by Bridgestone Tyres conducted on over 52,000 cars in 15 EU countries they found that 81% of motorists were driving on under-inflated tyres. A report by the RAC Foundation puts the figure at up to 90% of vehicles.

### Adverse Environmental Effect

Road transport is the source of 22% of all UK CO<sub>2</sub> emissions each year. Vehicles having correctly inflated tyres could significantly reduce this. Research by Michelin reveals that poor tyre pressure maintenance is costing UK motorists more than £440 million, wasting more than 370 million litres of fuel and pumping an additional 1 million tonnes of CO<sub>2</sub> into the atmosphere. In addition they calculate that 700,000 tyres are being wasted through unnecessary wear.

### Caravans & Motorhomes

Correct tyre inflation is important for all vehicles but is absolutely critical for caravans and especially twin-axle caravans.

## Why Caravans?

Caravans have relatively basic suspension and the tyres, to a large extent, act as the main shock absorbers. On a 2-wheel caravan each wheel has to support about half the weight of the caravan although at certain times it is possible for much more than half the weight of the caravan to be carried by the wheel on one side – caravans with single axles often carry as much weight on 2 wheels as a small/medium size car carries on 4 wheels.

If you are towing a caravan, tyre pressures are particularly important, because the connection via the tow-ball means you can't get any feel for what your tyres are doing whilst you are driving. A simple puncture can easily develop into a blow-out with disastrous consequences.

It is vitally important for twin-axle caravans as they can have a problem with one of their tyres and remain blissfully unaware of it. This can lead to extensive damage inside the caravan caused by the flailing tyre.

## Blow-outs

Most people describe a tyre blow-out as a sudden and unpredictable thing but that is not how 99.9% of blow-outs happen. A blow-out is the end result of a series of events that can be detected much earlier. Often it begins with a puncture that may be caused by a nail or screw in the tyre – the driver will be unaware of it at this early stage. But as the tyre begins to deflate, there is more friction with the road and the tyre temperature rises. As the tyre temperature rises so the tyre wall begins to overheat. Ultimately the tyre wall can't take the heat and the sidewall collapses, with the catastrophic loss of all the air.

Now all this takes place with little clue for the driver, and in the case of towing a car, caravan or trailer absolutely no clue. Maybe if the puncture happens in a car or motorhome you may feel something but many people have no feeling for this.

## Consequential Damage

But there is sometimes consequential damage with a blow-out which often shocks people. Because caravans have plastic wheel arches and manufacturers tend to route their services like cables and pipes over the wheel arch, when a tyre bursts the steel bands inside act like a strimmer and shred everything in their path with devastating consequences.

## Insurance Evidence

A survey by The Caravan Club insurer found that of their road traffic accident claims:

- 33% resulted from a tyre blow-out
- 33% resulted from collisions with other road users
- 14% were caused by wheel loss
- 9% were caused by detachment of the unit from the tow vehicle
- 9% as a result of a snaking incident
- 2% due to unidentified causes.

So tyre blow-outs were the equal main cause of the claims made by caravanners.

### Checking Tyre Pressures

So maintaining correct tyre pressures is important for safety, economics and the environment but how can a motorist keep check on them? A visual check is no good, checking them before a journey is good but punctures don't happen when the vehicle is parked.

### Tyre Pressure Monitoring Systems (TPMS)

The only way to keep check of tyre pressures whilst driving is to use a tyre pressure monitoring system (TPMS), which shows effectively, real-time information on tyre pressures and in many cases, temperatures.

#### Indirect TPMS (iTPMS)

Indirect TPMS utilizes wheel speed sensors in the ABS system located at each wheel position. The indirect method of identifying an under-inflated tyre is based on the fact that a tyre's overall diameter (total height) is reduced when the tyre loses air. When one tyre is "smaller," or under-inflated, it must spin faster to keep up with the "larger," or properly inflated, tyres. If a problem is detected, a yellow warning indicator light will illuminate on the dashboard.

The system has to distinguish this tiny effect from differences caused by cornering and other aspects of normal driving, and early systems required as much as 20 minutes driving to establish a pattern.

The main disadvantages of indirect systems are that they remain rather inaccurate and are slow to respond. Crucially, they are not able to detect a condition where the pressure of all tyres changes simultaneously – a common situation as tyres gradually lose air through diffusion or when pressure changes due to seasonal temperature variation. Also they can't show the actual tyre pressures because that is not what they are measuring.

Indirect TPMS technology is gradually being phased out, but is still used by some car manufacturers as it can use parts in common with the antilock brake (ABS) system and is therefore relatively cheap to implement.

#### Direct TPMS (dTPMS)

Direct systems use individual sensors for each tyre and transmit data to a central receiver that provides information for the driver. These systems overcome most of the problems associated with indirect systems. They can detect small changes in pressure, including those that occur in all tyres simultaneously. Response can be rapid, with real-time updates even when the vehicle is stationary.

Sensors with a battery-powered transmitter are either located inside the tyre (internal sensor), or in a special valve cap (external sensor). Typically, the sensors also provide temperature data.

## Legislation

The European Union passed legislation in March 2009 that means that approved systems have to be fitted to all new cars sold in the EU from 1 November 2014. But bizarrely the legislation does not apply to caravans or motorhomes.

## The TyrePal Solution

A TyrePal system is a direct tyre pressure monitoring system which continuously monitors the pressure and temperature of your tyres – and warns you when things are going wrong. The TyrePal sensors measure the pressure and temperature of your tyres every six seconds while you are actually driving.

The sensors will monitor:

- Low pressure causing excessive tyre wear and fuel consumption and possibly a blow out
- High pressure affecting road holding, braking distance and tyre wear
- Overheating – a potential fire or blowout

Apart from giving you warning before a blowout, tyre pressure monitoring can save money by reducing tyre wear and fuel consumption. It can also help to reduce CO2 emissions.

TyrePal alerts you before a condition becomes critical.

## How it works

Sensors on each tyre continuously measure the pressure and temperature of the tyres. They transmit the information wirelessly to a monitor that displays information and sounds an alarm for any abnormality.

## Caravan Solutions

Some caravans such as Bailey Unicorn caravans are now manufactured with TPMS Ready wheels. This means that the wheels are pre-fitted with internal TPMS sensors and all that's needed is to purchase a monitor. For caravans that are not supplied TPMS Ready, you will need external sensors that are simply screwed onto the tyre valves in place of the standard dust caps. Additional external sensors can be fitted to the car wheels to provide a complete system covering both the car and the caravan.

- If you have TPMS Ready wheels and just want TPMS on the caravan, simply purchase a **TC215/OEK** monitor kit.





- If you have a TPMS Ready caravan, and want to check on all tyres on the car and caravan using the same monitor. Simply purchase a **TC215/OEK** monitor plus a **TC215/ESK** kit with as many sensors as required to cover the car's wheels.



- If your caravan is not fitted with TPMS Ready wheels, you can use external sensors on just the caravan or on both car and caravan to provide full direct tyre pressure monitoring. In this case, purchase the **TC215B** tyre pressure monitoring kit with as many sensors as required.

