b.Alert TPMS versus real time

b.Alert®

White paper

All TPMS technology claims to reduce the cost of tires in terms of fuel comsumption and tire wear.

However, one needs to be able to execute the maintenance. It takes a lot of man power to check all tires or to inflate them.

In this sense, a TPMS systeem needs to be a Tire Pressure Management System and not a Tire Pressure Measurement System.

Tires can account for over a third of a vehicle's maintenance cost. Regularly checking tire pressure is an essential maintenance procedure and is also one of the most difficult to enforce. Drivers and maintenance personnel will often assume that if a few are ok then the rest will be as well and in some cases they will skip this procedure entirely.

From statistics, inflating tires is relevant from only 0.2 bar below the intended level. This is less than the 0.5 bar most people use, but it already accounts for an important cost. On average a tire which is normally used will need inflation 2 times a year.

There are 2 issues:

- The pressure in a tire changes in function of the time it has been driving. So, measurements need to be done "cold", which implies that you do not always know that inflation is needed, although it is
- The labor cost to check all tires for instance weekly is not feasible

Every real time TPMS system only gives the momentaneous pressure and is in this sense very ineffective for maintenance purposes.

b.Alert TPMS is a system based on communication of the TPMS unit on a truck of trailer to a server. On the server, the historical data are stored for analysis. With this analysis of the last 24 hours we know when and how the lowest pressures were reached. The decision to inflate or not, and how much, is taken on this basis.

A TPMS system needs to help to reduce the inflation work. b.Alert has 2 options:

- a list is created every day or every week, in function of the location, of all tires that need inflation. In this way the mechanics only have to go to these tires and can ignore all others. Every week it will be ca 4.5% of the tires, every day it will be 0.7% of the tires.
- A computer screen of hand held computer is delivered. The number of the truck/trailer is entered. The list of tires is that need inflation is given, with the pressure needed at that moment.

The b.Alert TPMS system distributes the workload over the year in a way that only the minimum effort is needed.

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Cost of underinflated tires

Statistically speaking, vehicles are more likely than not to be running on under-inflated tyres.

Rolling resistance caused by under-inflated tyres is costing Europeans £2.4 billion, two billion tons of wasted fuel and 4.8 million tons of additional and unnecessary CO2 emissions every year. Under-inflated tires are also dangerous due to excessive shear stress in the tire shoulder and heat build-up from sidewall bending. Low tyre pressure affects handling, stability, breaking effectiveness and leads to tire failure resulting in accidents, injuries and death.

Bridgestone estimates that 12.2 million tires in Europe are removed from circulation each year because of premature wear. Correctly inflated tires will extend the life of the tread, reduce fuel consumption and improve safety.

Amount of Under-inflation		Wasted Fuel	Added Tyre Wear
0.2 bar	3 psi	+1%	+10%
0.4 bar	6 psi	+2%	+30%
0.6 bar	9 psi	+4%	+45%

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example

Take for instance a fleet of 100 trucks and 200 trailers: 1800 tires.

- Checking the pressure of a tire manually: ca 5 min for a tire. total work: 150 hours or 18.75 working days on a Saturday: not realistic
- Checking the pressure on the TPMS system of the truck:
- Checking in the truck 10 minutes (opening door, climbing into the cabin, starting the truck, reading out the different pressures on the screen. 100 trucks: 1000 minutes or 16.6 hours or 2 working days.
- If the trucks are coupled with the trailers: 100 truck/trailer combinations. With a 3 times a year under inflation, every week about 3/52 or 69 tires need inflation at 5 minutes per tire. This implies ca 346 minutes or 6 hours of work.
- The question is what the values are for the trailers as they do not have a truck coupled. At least 100 trailers have no truck coupled, so they need to be checked manually at 5 minutes per tire: 3000 minutes or 50 hours or 6.25 man-days
- In total: 72 hours or 9 working days: realistic?
- B.Alert TPMS tire management: option 1: inflation on Saturday on the yard.
- You start with a list of the tires that need inflation.
- 100 trucks, 200 trailers: 1800 tires. 3/52 need inflation: 104.
- At 5 min/tire: 519 minutes or 8.6 hours: 1 man
- B.Alert TPMS tire management: option 2: the driver has to inflate when he enters the yard every day.
- Based on a year of 200 days and 12 tires he has a chance of 18% that he will have to inflate a tire.
- So, once a week he will have to work 5 minutes to inflate a tire! If this is combined with a visit to the cleaning station on the yard, he can do this easily during cleaning, and instead of waiting he inflates. Extra