

In a previous whitepaper we showed what the theoretical relationship between the temperature and pressure in a tyre.

This means that, depending on the temperature inside a tyre, the pressure measurement will be different and, therefore, it is necessary to know the temperature inside the tyre to obtain the right pressure.

We give some examples . For the examples, we always use 9 bar as an optimal pressure, at a reference temperature of 15 °C.

winter

Take as an example a tyre in the winter at 2 °C at the right pressure of 9 bar. During the summer, in the South at a temperature of 35°C the tyre will have a pressure of 10 bar at rest, while driving, with a temperature inside of 70 °C, it will arrive at a pressure of 11.2 bar. This implies that the risk of slipping increases and that the top pressure achieved in the tyre attains the security levels for the integrity of the tires .

summer

Of course one will get the inverse situation if you are in the summer. A tyre at rest at 35°C inflated till 9 bar, will result in the winter at 2°C in a pressure of only 8 bar. This has negative consequences for wear and for the fuel consumption. The only advantage is possibly a larger contact surface what for driving in snow is an advantage.

After driving

A tyre that has been driven for a long time will have, depending on the driving time, the outside temperature, the road surfaces, the speeds, a temperature between 35 and 80 °C on the inside. If the tyre is underinflated only with 0.5 bar relation to the intended 9 bar, a pressure of 9.6 to 11 bar will be measured.

With a regular measurement of pressure, with an inflation installation or with sensors, it will seem as if the pressure is more than within limits. One will even tend to reduce the pressure !

This example illustrates that with a simple manual control one will obtain too low pressures in a systematic way.

Sunny side vs. shadow side

A vehicle parkes for example with the left side in the sun and with the right side in the shadow. The temperature in the left tires is 35 °C, in the right tyre 20 °C. All tyres are neatly inflated up to 9 bar. The next day the vehicle drives on a straight highway, right side in the sun and left side in the shade. Obviously, the air in the tyres warm by the warming of the rubber of the wheels and, at lesser extent, by the radiance of the sun. Normal value could be 70 °C at the right side and 60 °C on the left side.

This will result in a pressure of 9.7 bar at the left side and 10.5 bar on the right side, an imbalance of almost a bar.

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