Transmitted by the representative of ETRTO

Informal document No. **WP29-149-10**
(149th WP29, 10-13 November 2009,
agenda item 4.2.38.)

Considerations on the draft amendments to existing Regulations
Proposal for the 02 series of amendments to Regulation No. 64
(Temporary-use spare wheels/tyres)

BACKGROUND

At its sixty-six session in September, GRRF discussed the remaining open items of document ECE/TRANS/WP.29/2009/129. The result of the discussion are reported in documents ECE/TRANS/WP.29/2009/129/Corr.2.

PROPOSALS

Annex 5 Paragraph 2.5.2 , amend to read:

….. until the deflated tyres are at P_{warm} – 20 per cent plus a further deflation of 7 kPa, **or are at the minimum pressure to carry the vehicle load P_{min}, whichever is higher**, namely P_{test}.

Justification:

Tyre industry wants to emphasize that, for tyre durability reasons, when the tyre deflates by air diffusion and is going below the minimum cold inflation pressure of the tyre (P_{min}) needed to carry the vehicle load, such situation is not acceptable. Such a pressure condition may be met over a period of several months, allowing tyres to operate below P_{min}, which means over deflected, i. e. overstressed.

The request for P_{min} as real lowest threshold, when deflating, is based on the knowledge of the failure behavior of pneumatic tyres. As a matter of fact, the lower is the tyre inflation pressure, the higher is the tyre deflection, and the wider is the resulting footprint area. Generally, the footprint area should be sufficient in order to transfer the required braking and cornering forces (this would be impossible with a too narrow footprint) - but on the other side the tyre deflation should not be too high, because this would result in an structural overstress condition, compromising the tyre long term or even short term integrity, depending on the cases.

Therefore, based on the consolidated knowledge of the failure behavior of pneumatic tyres, the tyre industry prescribes in its standards the international harmonized minimum pressure for carrying the load $P_{min,}$ as the real lowest threshold which can never be exceeded. P_{min} is specific for every tyre size and taken as one of the key references by the vehicle industry for the selection of the proper tyre type to be fitted to any given vehicle.

Annex 5 Paragraph 2.5.1 and 2.5.2, amend to read

> Following a stabilization period, **which must be as short as possible**, the pressure P_{test} shall be rechecked and adjusted if necessary.

Justification:
It was discussed and approved that the deflation procedure is made in a two step way, reducing the pressure in a first step to P_{test}, wait for one to five minutes and then readjust to P_{test}. As OICA themselves have written in document WP29/148/02, the temperature of rim and tyre will warm up the internal air temperature and lead to an increase of pressure of 3 to 14 kPa. A tyre pressure readjustment means therefore another reduction by 3 to 14 kPa, which cannot be observed in a real case behavior and would only further reduce the threshold used in the type approval test.
To avoid this temperature increase the tyre industry asks to specify the shortest time to adjust the tyre pressure to P_{test}.

Counting together all these adjustments makes the following result for the worst case:

VW Golf

$P_{recommended}$	= 200 kPa
expected P_{warm}	= 220 kPa
- 20% (44 kPa)	= 176 kPa
- 14 kPa (defl. proc.)	= 162 kPa
- 7 kPa (thermal)	= 155 kPa
delta	= 65 kPa
	➔ **30% below P_{warm}!**

A more realistic estimation would set the warm-up effect due to the rim to a value of 5 kPa, according to the Tyre Industry experience: even in this case, the figure lies much higher than originally intended:

$P_{recommended}$	= 200 kPa
expected P_{warm}	= 220 kPa
- 20% (44 kPa)	= 176 kPa
- 5 kPa (defl. proc.)	= 171 kPa
- 7 kPa (thermal)	= 164 kPa
delta	= 56 kPa
	➔ **25% below P_{warm}!**

Additional considerations on the impact on CO_2 emissions

The tyre industry wants to emphasize that the European General Safety Regulation 661/2009 was issued to increase the safety and environmental aspects:

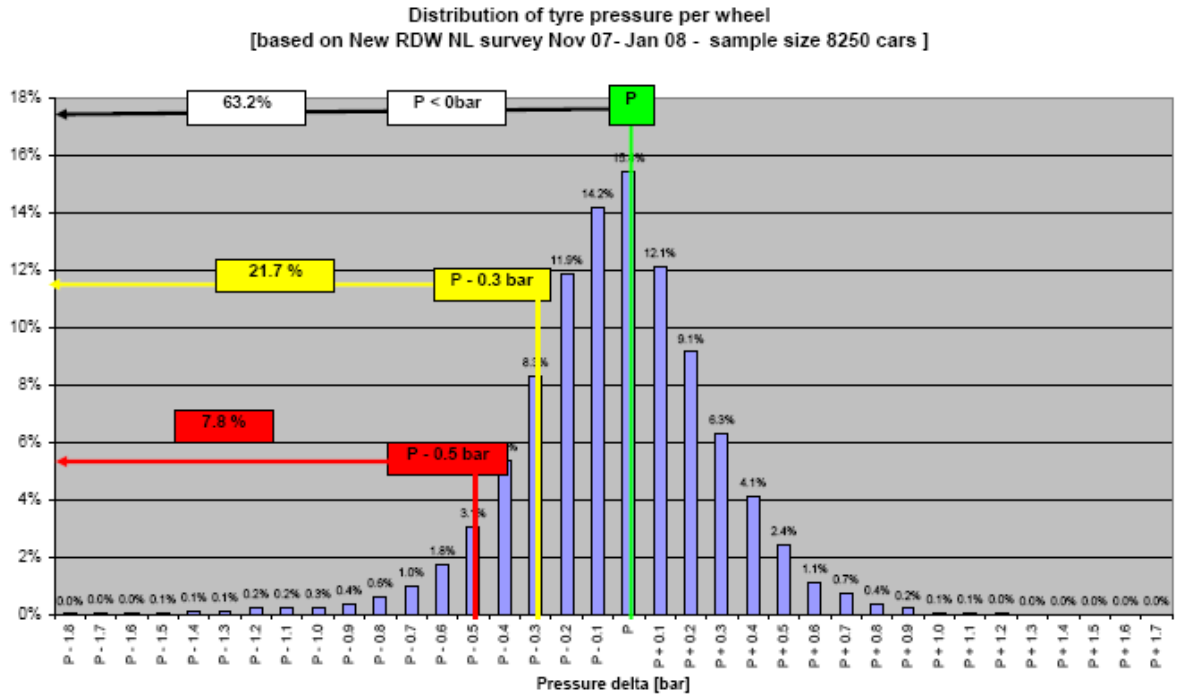
"6. It is appropriate to set out requirements regarding both the general safety of motor vehicles and the environmental performance of tyres, due to the availability of tyre pressure monitoring systems which enhance at the same time the safety and environmental performance of tyres."

The TPMS threshold of 25 to 30% effectively does not sufficiently contribute to the CO2 saving targeted by the EU GSR.

Reason:

Only few vehicles with severe under-inflation would be recognized by TPMS systems set with a 25% to 30% threshold, and the significant number of less under-inflated vehicles (whose under-inflation is included between this 25% to 30% threshold and the ETRTO recommended threshold of 20%) would not be covered.

In the report TPM 03-02 the adhoc working group of GRRF evaluated the impact of different thresholds on the amount of under–inflation cases covered by a TPMS. Changing the threshold from 50 kPa to 30 kPa nearly triples the population involved. There are few vehicles running on strongly deflated tyres, but many cars do show slight under-inflation. Only when you can cover them all, you will get the maximum of benefit.



The study[(1)] of the Fundación Cidaut, conducted for the European Parliament'Committee on Internal Market and Consumer Protection came to the following conclusion:
"A safety threshold warning, when a tyre reaches 0.3 bar of underinflation or even 0.2 bar, should be implemented in TPMS. This warning is important in order to make drivers inflate their tyres to the pressure for which they were designed."
References: [(1)] www.endseurope.com/docs/81128a.pdf

ETRTO restates that, in the future, a TPMS in the vehicle will certainly lead the driver to rely on its warning and therefore to further reduce his tyre pressure maintenance, as long as no warning occurs. Hence, only an accurate working TPMS with moderate thresholds will help to increase the safety and reduce the CO2-emissions.

We are aware of the problems with nuisance warnings, when the systems are using too tight limits, which the consumer cannot verify in reality. But we are not fixed to a certain technology and we believe, that the next years will bring for sure improvements in accuracy and warning strategy.
