Regulation No. 117 (Tyre rolling noise and wet grip adhesion)

Proposal for amendments to ECE/TRANS/WP.29/2010/63

The text reproduced below was prepared by the expert from ETRTO to amend the note 9 page 6 of document ECE/TRANS/WP.29/2010/63 agreed at the last WP29 of June 2010.

Text deleted is shown by strikethrough and new text in bold font

A PROPOSAL

\[ \sigma_m \] can be estimated by measuring \( n \) times (where \( n \geq 5 \)) the whole procedure described section 4 of Annex 6 to this Regulation, for at least five the \( p \) alignment tyres (where \( p \geq 5 \)), assuming that the variances of the \( p \) alignment (where \( p \geq 5 \)) at least five tyres are homogeneous, as follows:

\[
\sigma_m = \sqrt{\frac{1}{n} \sum_{i=1}^{n} \sigma^2_{m,i}}
\]

\[
\sigma_m = \sqrt{\frac{1}{p} \sum_{i=1}^{p} \frac{\sigma^2_{m,i}}{n}}
\]

(corrected)

\[
\sigma_{m,i} = \sqrt{\frac{1}{n-1} \sum_{j=1}^{n} \left( C_{r,i,j} - \frac{1}{n} \sum_{j=1}^{n} C_{r,i,j} \right)^2}
\]

Where:

- \( i \) = either 1 or 5 corresponding to each of the tyres is the counter from 1 to \( p \) for the number of alignment tyres
- \( j \) = is the counter from 1 to \( n \) for the number of repetitions of each measurement for a given tyre
- \( n \) = is the number of repetitions of tyre measurements (\( n \geq 3 \))
- \( p \) = is the number of alignment tyres (\( p \geq 5 \)).

B JUSTIFICATION

This formula was extrapolated from ISO 28580, introducing a number of alignment tyres greater or equal to 5. However, there was a confusion between the number \( n \) of measurement repetitions (\( n \) greater or equal to 3) and the number of tyres (greater or equal to 5). This confusion was made both in the text : "measuring \( n \) times (where \( n \geq 5 \))" and in the first formula, giving the value of "\( \sigma_m \)" from the individual values "\( \sigma_{m,i} \)" obtained for each alignment tyre. In addition "\( i \)" index, for the tyres, was restricted to the values of 1 and 5, not taking into consideration all the 5 or more alignment tyres. To bring a remedy to this and correct the formula giving the value of "\( \sigma_m \)", it is proposed to set "\( i \)" as a counter varying from 1 to "\( p \)", where "\( p \)" is introduced as the number of alignment tyres.