Transmitted by the expert
from the Russian Federation

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PROPOSAL FOR DRAFT AMENDMENTS TO REGULATION No.117

Proposal:

Annex 6., Test procedure for measuring rolling resistance
Paragraph 1., item c), at the end add the following new words:

"determination of deceleration of the test drum and tyre assembly in approximate form Δω/Δt or in exact form dω/dt".

Justification:

At the previous 51st GRB session and at the 4th GRRF/GRB STD informal group the Russian Federation expert proposed to put the GRB attention on the ability to develop a deceleration method for tyre rolling resistance determination. The 4-th session of the STD informal group had recommended that the responsible ISO committee ISO/TC31/WG6 should look at the matter more closely and report back to UN/ECE at the occasion.

Previous proposal that touched the method required special knowledge in the field of tyre testing. The proposal presenting to 52nd GRB session also touches the deceleration but to the definition only and not connected with previous.

The well known by all certified specialists The Second Newton Law for rotational motion states:

$$I\frac{d\omega}{dt} = T \qquad (1)$$

where: I – is moment of inertia (in kilogram meters squared, for example);
ω – is angular speed (in radians per second);
t – is time (in seconds);
T – is moment of resistance (in Newton-meters).

The equation (1) is the bottom of the formulae 5.1.5 and 5.2.5 from Regulation No.117, Annex 6. But these formulae direct only approximate form of deceleration $\Delta\omega/\Delta t$, where $\Delta\omega$ and Δt are increments of angular speed and time consequently. The formulae 5.1.5 and 5.2.5 of Regulation No.117 have been carried over from old standards: ISO 8767 (1992) and ISO 9948 (1992) of last century and not permitted usage of the exact form: $d\omega/dt$.

The modern test equipment has passed the way of intensive development relatively to level of the 90th and it does not need to limit modern measurement capabilities by approximate form $\Delta\omega/\Delta t$ only. Consequently, the present Russian proposal touches the definition of deceleration and is realized in such simple form.

This proposal relates not only to the rolling resistance measurement. It touches every process (including those contained in Regulation No.117) and described by Law (1) or its well known form for translational displacement:

$$m\frac{dV}{dt} = F$$

where: m – is mass (in kilograms);
V – is speed (in meters per second);
t – is time (in seconds);
F – is force (in Newtons).

In connection with wide sphere of utilization of a base for the Russian proposal, we apply to the 52nd GRB session experts to support the permission to use in modern test practice the findings dω/dt pertained to I. Newton and G. Leibnitz.
