

Transmitted by the experts from Russian Federation

PROPOSED AMENDMENTS TO UNECE REGULATIONS NOS. 30 AND 54
REGARDING MANUFACTURER'S INFORMATION
ON ROLLING RESISTANCE COEFFICIENT

Note: This document has been prepared in accordance with the decision of GRRF adopted at its 57th session (document TRANS/WP.29/GRRF/57, para. 29) taking in consideration the discussion held between ETRTO and the Russian Federation experts.

A. BACKGROUND

The experts of Russian Federation, ETRTO and the working group ISO TC 31 WG.6 have completed all recommendations of the previous sessions of GRRF. Acceptance of final wordings of the amendment to Regulations Nos. 30 and 54 depends on the specific point of view of the ETRTO experts. Besides informing of consumers about value of rolling resistance coefficient (C_r) of type-approved tyres, the experts of ETRTO set themselves an additional task: to develop a Reference Method for Rolling Resistance Measurement based on ISO 18164, which provides reduction of discrepancy of C_r values obtained by different methods (force, torque or deceleration) to the level of 2-5%. This problem is not only a hard one, but very probably, insoluble, which follows from generality of regression analysis. Offered elaboration of Russian Federation proposal focused on elimination the difficulties in acceptance of final wordings of the amendments to the Regulations Nos. 30 and 54.

B. PROPOSAL

Regulations No. 30:

Insert new paragraph 4.1.15. to read:

"4.1.15. rolling resistance coefficient according to ISO 8767 (ISO 18164 after its issuance) with indication of method used (force, torque or deceleration), test machine drum diameter, tyre load and inflation pressure, test speed.

Note: Specified value of rolling resistance coefficient is not a subject for comparison with that obtained by other methods except method specified by an applicant with the observation of indicated test conditions."

Regulations No. 54:

Insert new paragraph 4.1.14 to read:

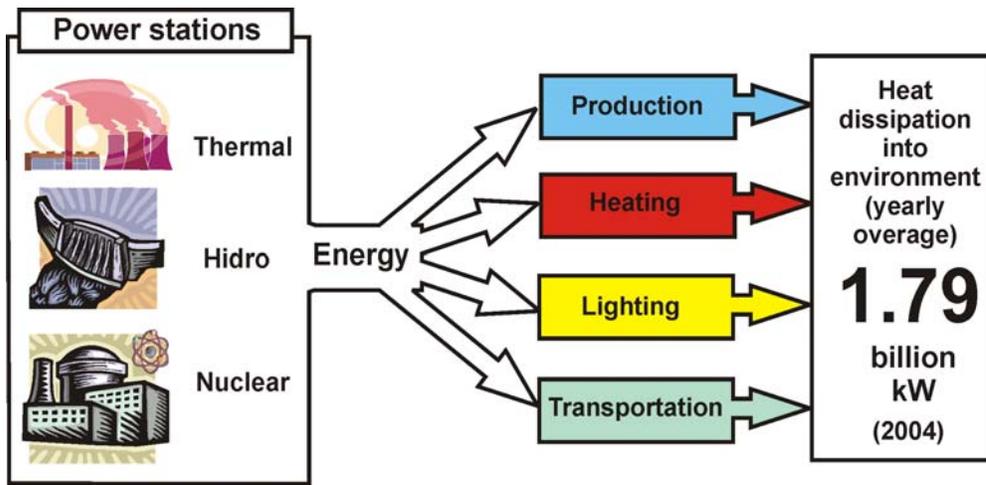
"4.1.14. rolling resistance coefficient according to ISO 9948 (ISO 18164 after its issuance) with indication of method used (force, torque or deceleration), test machine drum diameter, tyre load and inflation pressure, test speed.

Note: Specified value of rolling resistance coefficient is not a subject for comparison with that obtained by other methods except method specified by an applicant with the observation of indicated test conditions."

C. JUSTIFICATION

An urgency of introduction of tyre rolling resistance control is challenged by nobody now. ETRTO underlined that "European Union as stated in Directive 2001/43/EC, and several countries or states are being considering the introduction of regulations on the rolling resistance of tyres. In addition, the enhancement of international cooperation increases the need for exchanges about tyre rolling resistance." (Informal Document No. GRRF-56-24)

At the present time there are 6.4 billion inhabitants and 3.9 billion tyres in use on the Earth. Each inhabitant accounts 4.0 tyres in USA and 3.0 tyres in France, Germany, Italy, Japan. 3.9 billion tyres used in present World can make a chain of 2.67 million km long. This is 19 times longer than the distance between the Earth and the Moon or 66 times longer than the equator's length. As a result, the warm effects of rolling tyres and industry are comparable as it shown by diagram below.



Tyre type	World fleet [billion]	R. R. power at 36 km/h [billion kW]
Cars $C_r=0.009$	2.5	0.68
Light trucks and buses $C_r=0.007$	0.9	0.32
Commercial vehicles $C_r=0.005$	0.5	0.63

Heat dissipation into environment
1.63 billion kW

The comparison of country's heat dissipation as a result of electricity consumption and of the tyre rolling resistance in million kW is presented in the next table.

Region/Country	Annual Average Electric Power (E)	Rolling Resistance Power (T) at Speed 36 km/h	Rolling Speed of parity [km/h]: T=E
North America	537	910	21
Europe	531	514	37
US	392	726	19
Japan	122	198	22
RF	100	59	61
Germany	64	76	30
France	62	72	31
UK	41	50	30
Italy	31	74	15

Typically, the share of total rolling resistance power in modern countries is 40-50% of total automotive fleet power whereas engine internal power losses, not depended from external load, add up to 18-20% only. However an automotive engine is the subject of EURO-3 and EURO-4

requirements, whereas tyre rolling resistance is out of international control. This is large uniqueness of the situation in this field.

Tire rolling resistance as an object of GRRF examination is an extraordinary. Consuming power comparable with industry power tyre fleet generates negative effects. Annually per each inhabitant of developed country fall on, up to: 1.5 kW – heat dissipation, 750 kg – pollutants, 6 kg – tyre dust, 1000 kg – carbon dioxide (CO₂). Standardizing of tyre rolling resistance is urgent. The first step on this way is manufacturers' rolling resistance declarations.

It must be underlined that rolling resistance power is the main and the only cause of physic-mechanical destruction of a tyre, leading to accumulative damage. It concerns all driving modes: acceleration, braking, steady and curvilinear movement. This power is directly linked with the mechanical safety parameters, determined by the “speed-load” type tests. All major tyre manufacturers while announcing parameters of their new models with 15-20% decreased rolling resistance also report 20-30% increase of durability. Rolling resistance of a tyre reacts to decrease of its quality parameters that make tyre breakdown more likely: force non-uniformity, unbalance, and hidden mechanical defects.

Taking into consideration the importance of the consumer information about tyre rolling resistance as a parameter directly connected with safety, it is expedient to utilize the potential of the measurement methods abilities, provided by ISO 8767 and ISO 9948 standards and in the near future – ISO 18164, which will replace them. It is necessary to take into account that denying of suitability of the standard for the purpose of approval discriminates this international document.

The tyre manufacturers are not limited in choice of the testing methods from ISO standards they approved and therefore are not handicapped with its adaptation. The progress reached by tyre manufacturers is provided by using equipment and methods they have available. Therefore it is logical to place at the tyre manufacturers disposal an opportunity to announce in the homologation documents the data obtained by the traditional methods used by those manufacturers. The vehicle manufacturers working with the particular tyre suppliers already have got the full opportunity to monitor the tyre quality changes by such stable methods. Comparison of the data obtained by the different tyre manufacturers using the different methods can be made by vehicle manufacturers by using indoor bench and road vehicle tests.

Maintenance of comparability of results received by different methods using drum test machine can be considered as a separate difficult task.

The tyre manufacturers at this stage can be protected from incorrect comparison of tyre rolling resistance data by the proposed wordings of amendment to the Regulations Nos. 30 and 54.

Acceptance of the given alternative proposals would allow to approach the beginning of more steadfast UNECE bodies attention to the global process of ecologically dangerous effect by vehicle tyres on Earth nature and its inhabitants. It would also allow preventing occurrence of wrong consumer's opinion that working bodies of UNECE and tyre manufacturers detain even quit careful steps in this actual direction. It would allow more thoroughly carry out the development of rolling resistance determination reference method proposed by ETRTO.

And it is very important that it would exclude discrimination of ISO 18164 as the standard accepted by all countries but allegedly not suitable for practical purposes.
