Reducing car CO2 emissions through the use of low rolling resistance tyres

Response to the public consultation of the European Commission on outline proposals for a new Regulation on Advanced Safety Features and Tyres

Part 2 of 2

October 2007

European Federation for
TRANSPORT and ENVIRONMENT

Reducing car CO2 emissions through the use of low rolling resistance tyres
Response to the public consultation of the European Commission on outline proposals for a new Regulation on Advanced Safety Features and Tyres

(Part 2 of 2)

October 2007

Contact
Aat Peterse, Policy Officer
aat.peterse@transportenvironment.org

Editeur responsable
Jos Dings, Director

T&E – European Federation for Transport and Environment AiSBL
Rue de la Pépinière, 1 | B-1000 Brussels | Belgium

www.transportenvironment.org

Note

In the framework of the public consultation on a proposal from the European Commission on vehicle tyres, T&E hereby submits a response addressing rolling resistance.

T&E has published a separate response concerning tyre noise.

This document is available to download from our website:
www.transportenvironment.org

Table of Contents

Summary

1. T&E welcomes the fact that the Commission, albeit years too late, has finally stated its intention to regulate tyre rolling resistance and tyre pressure monitoring systems.
2. Effective standards must be urgently introduced applying to original equipment, replacement and retreaded tyres for all road vehicles (C1, C2 and C3 tyres).
3. T&E deplores the lack of ambition of the proposed standards. The limit values suggested are far from technology-forcing. They are insufficient to make a real difference in the marketplace.
4. A 10 kg/tonne standard for C1 and C2 tyres is much more adequate as this at least ensures that a significant part of the market has to improve its performance.
5. Standards for 2016 are also needed to push innovation. As current 'best practice' tyres have a rolling resistance of about 7 kg/tonne, a 2016 limit value should at least be in that range.
6. Supporting instruments are necessary, including labelling, provision of consumer information and purchase incentive programmes.
7. Labels should contain the usual seven instead of the arbitrary four bands the Commission proposes. They should be equipped with the usual red-green colour codes to ease decision making. They should apply to all tyres, be adjusted for technological progress, and include an estimate of fuel cost savings over the lifetime of the car compared with the 'worst' G label tyre in order to strengthen the incentive and forge a link with the interests of the consumer. Today's best tyres should qualify for a B label rather than an A label in order to ensure a strong innovation incentive;
8. There is no justification to permit further allowances in rolling resistance limit values for extra-wide tyres intended for personal or commercial use.
9. T&E requests that the Commission introduce mandatory energy efficiency labelling. The "most efficient" category in these prescriptions should be beyond the performance of the best tyres of today, in order to pose an innovation challenge to the industry.
10. T&E strongly supports the introduction of accurate tyre pressure monitoring systems (TPMS) that detect deflation much earlier than the systems in the US, that are primarily designed to prevent dangerous levels of deflation.

Our overall conclusion is that the detailed requirements of the rolling resistance draft proposals are highly disappointing in the light of the EU's climate and energy efficiency targets. The proposed standards and labelling scheme should be drastically improved.

Background

The proposals on rolling resistance regulation and tyre pressure monitoring systems are considered part of the so-called 'integrated approach' to reducing the CO_2 emission levels of new cars, that was mentioned in the European Commission's Communication on CO_2 and Cars of February 2007[1]. In this 'approach' technical improvement of tyre rolling resistance is thought to be able to contribute, along with a wider use of biofuels, to the reduction of CO_2 emissions from new cars to the level of 120g/km CO_2 by the year 2012.

As noted in a report for the European Commission, so-called low rolling resistance tyres (LRRT) have been available and marketed as such for several years, and yet there has never been any official definition nor a standard for low rolling resistance. [2]

This contribution will be limited to a short presentation of our views on the contribution of low rolling resistance tyres (LRRT) to the reduction of CO_2 emissions.

The need to improve rolling resistance

T&E believes that all sources of energy efficiency and CO_2 emission reduction from vehicles should be exploited if the EU is to realise its overall CO_2 emission reduction targets.

Rolling resistance is determined mainly by the tyres of a vehicle and is directly correlated with fuel consumption and emissions of carbon dioxide of the vehicle they are mounted on. Rolling resistance of tyres is responsible for approximately 25% of CO2 emitted by cars.[3]

The CO_2 reduction potential from LRRT is upwards of 3%, with an additional 2.5% potential reduction to be achieved from the use of tyre pressure monitoring systems (TPMS). The potential for saving fuel by using LRRT is therefore considerable, as has been confirmed by estimates of the German Federal Environment Agency (UBA):[4]

City driving:	4-6%
Extra Urban:	3-5%
Motorway:	2-3%

[1] Results of the review of the Community Strategy to reduce CO 2 emissions from passenger cars and light-commercial vehicles - COM(2007) 19 final
www.ec.europa.eu/environment/co2/pdf/com_2007_19_en.pdf

[2] TNO, IEEP and LAT (2006): Review and analysis of the reduction potential and costs of technological and other measures to reduce CO2-emissions from passenger cars, Final report, contract nr. SI2.408212, Delft, October 31 2006.

[3] FEHRL (2006): Tyre/Road Noise, Volume 1, Final Report, Study S12 408210, report recently submitted to your Directorate-General by the Forum of European National Highway Research Laboratories (FEHRL study SI2.408210 Tyre/Road Noise)
Report: http://ec.europa.eu/enterprise/automotive/projects/report_tyre_road_noise1.pdf
Annexes: http://ec.europa.eu/enterprise/automotive/projects/report_tyre_road_noise2.pdf

[4] Dr Axel Friedrich, Umweltbundesamt Dessau, presentation to the 3rd Intelligent Tyre Technology conference, Frankfurt – 26-28 September 2007

European adoption of LRRT is estimated to equate to a reduction of 2.4 million tonnes per year of CO_2 by 2012 in the EU-15 alone, increasing to 5.3 million tonnes per year by 2020. This potential cannot be ignored. [5]

The rolling resistance of tyres can differ by as much as 50 percent. This implies there is great potential for a decrease in fuel consumption and CO_2 emissions by preventing the use of tyres with high rolling resistance and promoting LRRT through standards, labelling, consumer awareness actions and incentive schemes.

Real life examples analysed by MIT and a wealth of research undertaken by the car industry has shown that improved rolling resistance is also compatible with increased lifetime, noise reduction, and improved wet braking performance, and for no extra cost. [6]

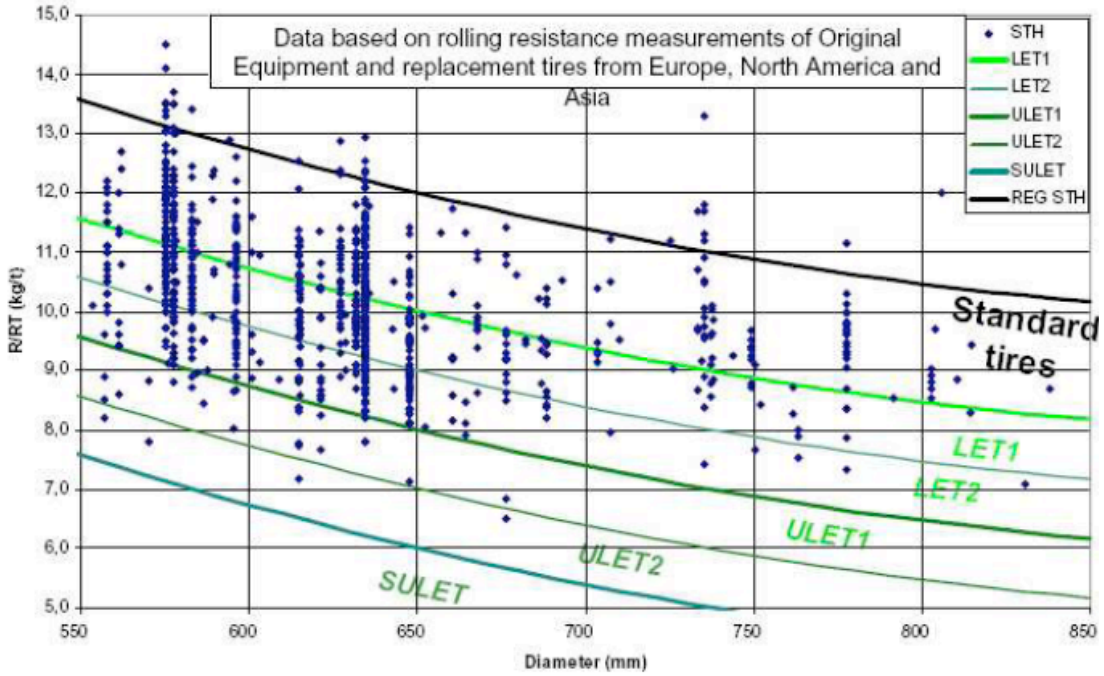
Consultation questions

Are the proposed rolling resistance limits in Annex 2 (a) sufficient and (b) realistic? Is there a viable alternative approach, for example 'trading off' noise requirements for rolling resistance requirements under certain circumstances?

The proposed limit values are certainly realistic (there is no question that they cannot be achieved) but certainly not sufficient if the EU is taking seriously its commitment to reduce greenhouse gas emissions by 2020 by at least 20% and to improve energy efficiency by 20% in the same timeframe.

The graph below shows result from a comprehensive set of measurements performed by Michelin.

[5] TNO et al, 2006, Review and analysis of the reduction potential and costs of technological and other measures to reduce CO2-emissions from passenger cars (Final report)
[6] MIT, 2000: On the road in 2020: A life-cycle analysis of new automobile technologies, Energy Laboratory Report, MIT EL 00-003, Massachusetts Institute of Technology



This graph shows that the proposed limit value of 13.5 kg/tonne for C1 (car) tyres would hardly remove any tyre from the market and be little more than a business-as-usual policy. If the Commission is serious about tackling CO_2 emissions from tyres and helping consumers to make fuel savings this is clearly not acceptable. A rolling resistance value of 10 kg/tonne by 2012 is also very feasible (it would be far from technology-forcing) and it would at least guarantee a significant improvement of the average performance of tyres over the next 5 to 10 years.

A set of second-stage limits that would enter into force by 2016 is also necessary in order to provide a long-term outlook. Given that tyres are coming to market with RR as low as 7 kg/tonne, a tightening to 8 kg/tonne by 2016 should be feasible.

However, a limit value alone is insufficient to stimulate real improvement, and so must be supported by a high-quality labelling scheme (see below).

Effective limit values are urgently needed for both rolling resistance and noise emissions (please see accompanying paper on tyre noise). Research has conclusively proven the technical feasibility to optimize both characteristics. Trade offs are not justifiable under any circumstances.

Labelling

Seven bands, all tyres, and fuel cost savings shown

The report for the Commission notes that, "*due to lack of information in the market, consumers are not aware about the LRRT characteristics*"[7]. It is a dangerous misconception amongst some consumers that LRRT perform worse in terms of safety or endurance. These misconceptions and the economic benefits to the driver

[7] TNO et al, 2006 pg 120

of using LRRT should be addressed in awareness campaigns, visually presented at the point of sale by an energy efficiency label (with information on fuel / money savings) and supported by national incentive schemes.

The regulation must require tyre manufacturers to publicly release information on rolling resistance performance, noise emissions and wet grip for every tyre model. This information should be presented in one label, to serve as an indicator of quality to all consumers.

Tyre purchasers also include public procurement officers, who are an important target market for environmentally friendly products, as are original equipment manufacturers (carmakers) who are increasingly urged to demonstrate environmental awareness.

The labelling scheme as outlined in the consultation paper is totally inadequate to achieve the objective of useful consumer information and we sincerely wonder why the Commission intends to choose such an ineffectual and inconsistent approach to labelling.

First, as outlined, over 75% of C1 tyres currently on the market would already fall into Band B. This demonstrates firstly that the standards are too lax to provide an incentive to innovate. The class boundaries outlined in the consultation paper appear, according to technical experts, to be based on the state of technology from the previous decade. The fact that the vast majority of today's models would already be in Band B conclusively proves that this classification is totally inadequate, and especially for 2012.

Second, clearly more than four bands will be necessary for an effective classification. That such a large proportion of the current market cluster into one band demonstrates that the band width is too generous, and that the classes must be further differentiated (1kg/t per band maximum).

If the energy (i.e. rolling resistance) part of the label were to be presented in bands, T&E strongly recommends using the seven-band A-G class energy efficiency labels that are also in use for white goods. There is really no justification for using four bands just for tyres and for no other consumer product. For many people this would represent an example of incomprehensible and inconsistent European policy.

Third, it is absolutely vital that the label contains an estimate of fuel cost savings that can be expected over the lifetime of the car, compared with a 'G label' (worst) tyre. A set of good tyres can easily save 5 per cent of fuel. Over a lifetime of approximately 50,000 km this implies that a set of good tyres can save some €200 on fuel compared to a set of bad tyres. This is convincing enough to deserve communication to the public.

Fourth, the system should encourage innovation. Many state-of-the-art tyres (tyres probably constructed at the beginning of this decade) already meet the requirements in the most advanced Band A. For any classification to be 'future proof' and have any hope of relevance in 2012, no tyre on the current market should meet the Band A standards. This will ensure that innovation is encouraged. Band A should therefore be in the order of 7kg/tonne for C1 and C2 vehicles. Technological development in relation to LRRT is rapid. The regulation should therefore foresee regular reviews to ensure standards and bands for the energy efficiency label are still relevant in terms of achieving overall CO2 emission reductions and stimulating further innovation.

Fifth, with regard to tyres for commercial use (C3), T&E insists that these are also subject to seven-band labelling, including an energy efficiency category and the measured rolling resistance value. Fleet owners or employees purchasing tyres for professional purposes should be made acutely aware of the money that can be saved by fitting LRRT.

Exemptions

Is there any justification for partial or complete exemption for particular categories of tyre from the rolling resistance requirements?

The exemption must be strictly limited to tyres for professional off-road use only. Yet another exemption for SUVs in environmental legislation (such as the one granted in the most recent EURO standard) must not be permitted under any circumstances.

Tyre Pressure Monitoring Systems (TPMS)

Should tyre pressure monitoring systems be made mandatory? What degree of accuracy is necessary for them to be effective in maintaining optimum tyre pressure?

T&E fully supports the proposal to make TPMS mandatory.

It is well known that deflated tyres can pose a safety risk, as well as increasing wear on the tyre, fuel consumption and CO2 and noise emissions. Under-inflation of tyres is a widespread hazard throughout Europe[8] and information campaigns have not yielded convincing results. The potential CO_2 saving from the introduction of TPMS in the EU-15 alone is estimated to be 9.6million tonnes per year by 2020. [9]

According to that same report, introduction of TPMS is seen to be cost-effective in relation to the fuel savings. The extra costs of such systems are expected to be offset by savings from the improved fuel efficiency of the vehicle. The report does not even consider ancillary benefits due to better tyre safety and durability.

T&E would like to see a level of accuracy able to detect and alert the driver to deflation as soon as possible, and well before a pressure level is reached which is critical to safety. US-level TPMS accuracy is certainly insufficient as these systems are exclusively designed to detect dangerous levels of under-inflation. As stated in the Consultation document, the sensitivity and accuracy of such systems should be good enough to provide the desired improvement and the text of the Regulation should ensure this.

[8] International Energy Agency, vehicle efficiency workshop conclusions, November 2005
[9] TNO et al, 2006