ACEA Tyre Performance Study

Rationales and Background Information

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GENEVA

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KEY FIGURES ABOUT THE INDUSTRY

**13.3 million** Europeans work in the automotive sector

**3.4 million** jobs in automotive manufacturing

**€413 billion** in tax revenues (EU15)

**€53.8 billion** in R&D spending, largest private investor

**€90.3 billion** positive net trade contribution
Some Headlines:

- 70,000 hospital admissions
- 16,000 premature deaths

A new report was presented by WHO on 10 October 2018 in Basel.

Effects of environmental noise in Europe:

In the EU, more than 100 million citizens are affected by noise levels above 55 dB. This is the threshold at which negative effects on human health can be observed. This means that 70,000 hospital admissions and 16,000 premature deaths are caused each year due to environmental noise.

This exposure data implies that 14.1 million adults are severely annoyed by environmental noise. 5.9 million adults are highly sleep disturbed. 69,000 hospital admissions and 15,900 cases of premature mortality occur annually due to environmental noise.

NOISE – A CHALLENGE FOR SOCIETY

Noise in Europe conference - 24 April 2017

Among the main statements, discussion points and conclusions:

• Seeing the numerous health effects of noise and the **significant health costs of 50-100 billion Euros per year**, more EU action has been claimed, which would include a better implementation of Environmental Noise Directive.
• ........
• More stringent noise standards introduced at international and EU level should be supported, but also balanced against other measures, such as road surfaces and, around airports, appropriate urban planning.
• Regulating noise at source was seen as key.
• Further tightening of the sound limit values has to consider also the impact on safety.
• A new road quality initiative would help to ensure quieter traffic.
• Guidance on choosing the right noise reduction measures would be very useful.
New WHO noise guidelines for Europe released on 10 October 2018 “strongly” recommend more severe noise limits:

- The new values for the night level change from the 2009 interim target of $L_{night,\text{outside}}$ value of 55 dB to the new strong recommendation of 45 dB, so 10 dB lower.


NB These “strong” recommendations are based mainly on “moderate quality evidence “extracted from selected existing literature, without any new basic research evidence. The approach has been questioned, eg in the aviation sector:

NOISE – NEW LIMITS TARGETED

Stricter limit values demanded also at UN ECE

Stricter limits on tyres regarding

- Rolling Sound
- Rolling Resistance
- Wet Grip

are requested by Member States, eg the Netherlands, to the European Union and the UN ECE Working Party on Noise (GRB) (see ECE/TRANS/WP.29/GRB/2019/3)
Stricter limit values on tyres in two steps

### Rolling Resistance (UN Regulation No.117)

<table>
<thead>
<tr>
<th>Tyre Type</th>
<th>Current limit values (kg/ton)</th>
<th>Suggestion Stage 3</th>
<th>Suggestion Stage 4</th>
<th>Total reduction Stage 2 to Stage 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>(\leq 10.5)</td>
<td>- 1.5 kg/ton</td>
<td>- 1.0 kg/ton</td>
<td>- 2.5 kg/ton</td>
</tr>
<tr>
<td>C2</td>
<td>(\leq 9.0)</td>
<td>- 1.0 kg/ton</td>
<td>- 1.0 kg/ton</td>
<td>- 2.0 kg/ton</td>
</tr>
<tr>
<td>C3</td>
<td>(\leq 6.5)</td>
<td>- 0.5 kg/ton</td>
<td>- 0.5 kg/ton</td>
<td>- 1.0 kg/ton</td>
</tr>
</tbody>
</table>

### Wet Grip Index (UN Regulation No.117)

<table>
<thead>
<tr>
<th>Tyre Type</th>
<th>Current limit values (G)</th>
<th>Suggestion Stage 3</th>
<th>Suggestion Stage 4</th>
<th>Total reduction Stage 1 to Stage 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>(\geq 1.1 (1.0; 0.9))</td>
<td>+ 0.35</td>
<td>+ 0.15</td>
<td>+ 0.5</td>
</tr>
<tr>
<td>C2</td>
<td>(\geq 0.95 (0.85))</td>
<td>+ 0.30</td>
<td>+ 0.10</td>
<td>+ 0.4</td>
</tr>
<tr>
<td>C3</td>
<td>(\geq 0.80 (0.65))</td>
<td>+ 0.30</td>
<td>+ 0.10</td>
<td>+ 0.4</td>
</tr>
</tbody>
</table>

### Rolling Sound (UN Regulation No.117)

<table>
<thead>
<tr>
<th>Tyre Type</th>
<th>Current limit values (dB(A))</th>
<th>Suggestion Stage 3</th>
<th>Suggestion Stage 4</th>
<th>Total reduction Stage 2 to Stage 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1A - E</td>
<td>70 - 74</td>
<td>- 1 dB(A)</td>
<td>- 2 dB(A)</td>
<td>- 3 dB(A)</td>
</tr>
<tr>
<td>C2</td>
<td>72 - 74</td>
<td>- 1 dB(A)</td>
<td>- 1 dB(A)</td>
<td>- 2 dB(A)</td>
</tr>
<tr>
<td>C3</td>
<td>73 - 77</td>
<td>- 2 dB(A)</td>
<td>- 2 dB(A)</td>
<td>- 4 dB(A)</td>
</tr>
</tbody>
</table>

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ECE/TRANS/WP.29/GRB/2019/3
NOISE LIMITS BASED ON EVIDENCE

Stricter limit values for noise should be based on evidence

We acknowledge that

The European Commission launched a Call for Tender according to Article 11 (Revision Clause) of Regulation (EU) No. 540/2014

- Ref: EC No 688/PP/2018/FC – Call for Tender
- Work package 7: Noise emissions

- Assessment of sound level limits of light duty vehicles. This includes, amongst others, a survey of the state-of-the-art sound emission level values and their technical verification, as well as corresponding drafting proposals as input to future legislative texts. The study might address specifically the rolling noise of tyres, this being considered the most important factor contributing to vehicles’ sound emission even from vehicle speed of 40 km/h.

ACEA questions an approach based only on literature studies, especially if this is done by a selective evaluation of papers.

ACEA strongly recommends that the survey should be done according to sound statistical methodology and in an unbiased way.
Why is a study needed?

**Stricter limit values are focusing only on the 3 labelled performance parameters, i.e.:**

- Rolling Sound (coast-by) ← Health Protection
- Rolling Resistance ← Environmental Protection (CO₂ emission reduction)
- Wet Grip ← Safety (braking distance, handling)

**while affecting also**

- Longitudinal & Lateral Aquaplaning
- Rolling Sound (during acceleration)
- Dry Grip
- Snow Performance
- Dry Handling
- Wear Life

Is it possible to optimize for rolling sound without compromising other parameters essential for vehicle safety and CO₂ reduction?

→ A Tyre Performance Study is needed and has been commissioned by ACEA
Targets for Tyre Performance Study

This study has the aim to find out if lowering the rolling sound limit affects other parameters essential for vehicle regarding safety and CO2 reduction.

This study will investigate in a first step tyres of Class C1

- Tyre type: Normal tyre
- Tyre dimension: 205/55 R16
- Tyre specification: 16 different tyre models
- Tyre manufacturer: 11 different brands
TYRE PERFORMANCE STUDY

Targets for Tyre Performance Study

• This study will investigate the following tyre performance parameter:
  o **Rolling sound** measured at 50 km/h, 70 km/h and 90 km/h according to UN Regulation No.117
  o **Coast-by sound** according to UN Regulation No.51.03
  o **Sound under acceleration** according to UN Regulation No.51.03
  o **Wet Grip** according to UN Regulation No.117
  o **Rolling resistance** according to UN Regulation No.117
  o **Dry grip** according to UN Regulation No.13H
  o **Longitudinal aquaplaning** according to VDA test procedure E08-VDA
  o **Lateral aquaplaning** according to VDA test procedure E05-VDA
  o **Dry handling** according to a test procedure proposed by ETRTO
TYRE PERFORMANCE STUDY

Summary and timeline of the study

• **This study is needed:**
  
  o To **demonstrate** the interaction between tyre performance parameters
  
  o To **find out** if there is no negative interaction between the parameters (see FEHRL study by TRL in 2006 and others)
  
  o To **provide** the European institutions (EP, Commission, Council), the UNECE Working Party on Noise and Tyres (GRBP) and the public the necessary information regarding the reasonable tyre rolling sound reduction possible **without compromising the other performance parameters essential for vehicle safety and CO2 reduction**

• **This study will start in February 2019**, in order to be able to present the results of this study at the 70th session of GRBP in September 2019 as a contribution to the discussion regarding GRBP’s main subject for its future work (see GRB-69-03)
THANK YOU FOR YOUR ATTENTION

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