PRESENTATION OF

INTERNATIONAL ORGANIZATION OF MOTOR VEHICLE MANUFACTURERS

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Noise Emission of Moving Vehicles in Urban Areas

Proposal for Change of the Wording in §2.2.2 for the Tyres to be Used for the Test

ECE R51.02 Method B

52nd GRB
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Conclusion
( Informal document No. GRB-51-20)

- The new noise test method for HCV according to ISO 362-1:2007 is designed under the circumstance that tyre road noise can be neglected

Because:

- The tyre road noise contribution for HCV during driving in urban areas is of no importance according to all studies made

- The new noise test procedure for HCV according to ISO 362-1:2007 is rather sensitive to the choice of the tyres

- The new noise test method for HCV according to ISO 362-1:2007 addresses the most important noise sources during driving in urban areas by the WOT test
2.2.2. The tyres to be used for the test shall be representative for the axle and shall be selected by the vehicle manufacturer and recorded in Annex 9. They shall correspond to one of the tyre sizes designated for the vehicle as original equipment. The tyre is or will be commercially available on the market at the same time as the vehicle \footnote{2}. The tyres shall be inflated to the pressure recommended by the vehicle manufacturer for the test mass of the vehicle. The tyres shall have a tread depth of at least 80 per cent of the full tread depth.

\footnote{2} The tyre contribution for overall sound emission being important, this Regulation has taken into account the tyre/road sound emission regulations. Snow tyres and special tyres according to UNECE Regulation No. 117 shall be excluded during type-approval- and COP-measurements on request of the manufacturer.
Proposal for a Change

2.2.2. The tyres to be used for the test shall be representative for the vehicle and shall be selected by the vehicle manufacturer and recorded in Annex 9. They shall correspond to one of the tyre sizes designated for the vehicle as original equipment. The tyre is or will be commercially available on the market at the same time as the vehicle. The tyres shall be inflated to the pressure recommended by the vehicle manufacturer for the test mass of the vehicle. The tyres shall have a tread depth of at least 80 per cent of the full tread depth.

2/ The tyre contribution for overall sound emission being important, this Regulation has taken into account the tyre/road sound emission regulations. Traction tyres, snow tyres and special use tyres according to UNECE Regulation No. 117 as amended by the 02 series of amendments (2010) shall be excluded during type-approval- and COP-measurements on request of the manufacturer.
Noise Emission in Real Traffic (residential areas)

EU-Projekt WG8 Traffic Noise Calculation Study (TRL & RWTÜV 2004)

- Residential 30 km/h
- Rolling noise
- Propulsion noise
- Total noise

To be simulated by Method B

- Motorcycles
- Scooters
- Trailer trucks
- Rigid trucks
- Light duty vehicles
- Cars

6%
48%
7:00 to 19:00
Noise Emission in Real Urban Traffic (0 km/h to 60 km/h)

T/R Noise is dominating:
> 60 km/h for commercial vehicles

Source: M+P
GRB34-Inf09
Change of Engine output (power, torque) for typical long haulage trucks (1980 – 2010)

Graph showing the increase in maximum torque for typical long-distance trucks (1980-2010). Key points:
- 1980: 1800 Nm
- 1995: 3200 Nm
- 2009: 3500 Nm
- 2010: 3500 Nm

Source: MAN
Influence of torque at 20 m
(Informal document No. GRB-51-20)

Tyre Noise (w/o Propulsion Noise)

- $V_{20m} = 36$ km/h for all measured points

Trend to $\Delta$ dB

- 0.12 dB/1000 Nm (Normal Rib Tyres)
- 0.65 dB/1000 Nm (Traction Tyres)

Increase of rolling noise under torque

Torque at the drive axle (Nm)
Comparison:
Traction Tyres vs Normal Tyres
Analysis: 90% to 95% range of frequency distribution

Source: ACEA, Data delivered to EC monitoring data base during monitoring period 2007-2010
Noise Emission of HCV in Urban Areas

Most important noise sources simulated by Method B

- Tyre/Road
- Exhaust
- Engine
- Powertrain
- Intake
- Differential
- Hub Reduction
- Gearbox
- Propeller shaft
Proposal for a Change

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2/ The tyre contribution for overall sound emission being important, this Regulation has taken into account the tyre/road sound emission regulations. Traction tyres, snow tyres and special use tyres according to UNECE Regulation No. 117 as amended by the 02 series of amendments (2010) shall be excluded during type-approval- and COP-measurements on request of the manufacturer.
REFERENCES


- EU-Project WG8 Traffic Noise Calculation Study (TRL & RWTÜV 2004)

- Investigation on Noise Emission of Vehicles in Road Traffic (TÜV Nord 2005)

- Informal document No. GRB-51-20 (OICA 2010)