PRESENTATION OF

INTERNATIONAL ORGANIZATION OF MOTOR VEHICLE MANUFACTURERS

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(51th GRB, 15-17 February, agenda item 4)
Noise Emission of Moving Vehicles in Urban Areas

Remarks to New Noise Legislation
ECE R51.02 Method B
Category M2 > 3500 kg, M3, N2 and N3

51st GRB
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Pass-By R51.03
Overall Noise Level $L_{\text{PassBy R51.03}}$

R51.03 value mathematical rounded

- **DRIVE**
  - All drive tyres are between 80-86 dB(A)

- **STEER**
  - Steer tyres are between 79-82 dB(A)

SPL in dB(A)

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<th>Manuf. 1</th>
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Source: ETRTO
Tyre Influence During WOT Test

Tyre noise contribution of four different vehicles
(Final values are rounded according to ECE R51.02 Method B)

Tyre Noise Contribution  (Rib tyre = 0 dB(A))

Source: CRP-085, 2005
Influence of torque at 20 m

Source: MAN (2008)

Tyre Noise (w/o Propulsion Noise)

\( V_{20\ m} = 36 \ km/h \) for all measured points

0,65 dB/1000 Nm (Traction Tyres)

0,12 dB/1000 Nm (Normal Rib Tyres)

Increase of rolling noise under torque

\( a_{urban} \)

Torque at the drive axle (Nm)

Tyre Noise Level, \( \Delta \ dB(A) \)

Source: MAN (2008)
ECE R51.02 Method B: HCV Noise Sources

Example: Balanced system for 81 dB(A)
ECE R51.02 Method B: HCV Noise Sources

Example: Unbalanced system for 81 dB(A)
Change of Engine output (power, torque) for typical long haulage trucks (1980 – 2009)

Anstieg der maximalen Drehmomente für typische Fernverkehrsfahrzeuge

Source: MAN
Noise Emission in Real Traffic (residential areas)

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

- 6%
- 48%

- Residential 30 km/h
- 7:00 to 19:00

Fleet share propulsion noise rolling noise total noise percentage of vehicles/noise emission energy

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

Noise Emission in Real Traffic (residential areas)
Conclusion

- 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
REFERENCES


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

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