

Inventory of the use of “sound”, “noise”, “silencer” in the GRB relevant regulations  
issued by the Netherlands  
Agenda item 9

## Introduction

On the request of GRB the Netherlands has made a short inventory of the use of the words “sound”, “noise”, “silencing system” and “noise- reduction system” in the GRB relevant regulations 9, 28 41 51 59 63 92 and 117. The rationale for this request was the discussion on document ECE/TRANS/WP.29/GRB/2008/5 (Proposal for draft amendments to Regulation No. 59). In this document the term silencing system was replaced consequently by the term noise reduction system. This gave birth to the question whether the GRB relevant regulations have a universal use of their acoustic terminology.

## Findings

### 1. Silencing system versus noise reduction system

In all the relevant regulations the term silencer or silencing system is used for tube based systems like intake and exhaust systems. The term noise reduction system is only used in R51 and includes intake silencers and may include for instance airfilters. It is not entirely clear whether more complex geometries like engine encapsulations are meant to be dealt with here.

The revision of the above mentioned document on R59 (ECE/TRANS/WP.29/GRB/2008/5/Rev.1) takes into account the wish of GRB to use an uniform terminology and reinstates the term (exhaust) silencing system. This is right because R59 is only dealing with replacement exhaust systems.

### 2. Noise versus sound

In all regulations these words are both used. Unfortunately there is no uniform systematic use of either of them. In most cases the term **sound** is used if it is desired, scientific or unknown; e.g. **sound** level meter, sound of audible warning signals, however the term **noise** level meter can be found as well.

In most cases the term **noise** is used if it is unwanted or disturbing. e.g background noise, wind noise, working party on noise.

In most regulations the term noise is also used for the emission of the products they deal with (cars, trucks, motorcycles). The two exceptions are R28 (audible warning signals) and R117 (tyres). These two regulations use the word sound for the emission of the product under investigation. However there are various examples where the regulation (by accident?) deviates from the general trend. (e.g. rolling sound and tyre/road noise)

## Conclusion and Recommendation

The short term motive for this action has meanwhile been resolved by the submission of the revised CLEPA-document ECE/TRANS/WP.29/GRB/2008/5/Rev.1. The universal use of the terminology (exhaust) silencing system has been reinstated. Only in R51 the terminology is different and always has been namely: “noise reduction system”

GRB may wish to debate on that.

GRB may also wish to debate on the use of the words “sound and noise” in their Regulations.

Examples taken from

E/ECE/324  
E/ECE/TRANS/505 } Rev.1/Add.50/Rev.1/Amend.3  
Regulation No. 51

Examples of the use of the word “noise”

OK

**UNIFORM PROVISIONS CONCERNING THE APPROVAL OF MOTOR VEHICLES  
HAVING AT LEAST FOUR WHEELS WITH REGARD TO THEIR NOISE EMISSIONS**

1.1. Acoustic measurements

The apparatus used for measuring the noise level must be a precision sound-level meter or equivalent measurement system meeting the requirements of class 1 instruments (inclusive of the recommended windscreen, if used). These requirements are described in "IEC 61672-1:2002:Precision sound level meters", second edition, of the International Electrotechnical Commission (IEC).

7.3.1. Elements of noise encapsulation as defined by the vehicle manufacturer

Not OK

and 15 dB(A), in order to calculate the test results the appropriate correction must be subtracted from the readings on the noise-level meter, as in the following table:

Should be sound-level meter

Examples of the use of the word “sound”

Not OK??

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2/ The tyre contribution for overall sound emission being important, this vehicle 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.

Should be noise emission and noise emission regulation

3.2.1. Sound level in the vicinity of vehicles

Should be noise level

OK

3.2.2. Acoustic measurements

A precision sound level meter, or equivalent measuring system, as defined in paragraph 1.1. of this annex shall be used for the measurements.

3.2.5.1. Nature and number of measurements

The maximum sound level expressed in A-weighted decibels (dB(A)) shall be measured during the operating period referred to in paragraph 3.2.5.3.2.1.

Examples of the word “silencer”

- 7.1. Exhaust silencer: .....
- 7.1.1. Manufacturer or authorized representative (if any) .....
- 7.2. Intake silencer: .....
- 7.2.1. Manufacturer or authorized representative (if any) .....
- 7.2.2. Model: .....
- 7.2.3. Type: ..... in accordance with drawing No.: .....

Examples of the wording “noise reduction system”

- 17. The following documents, bearing the approval number shown above, are annexed to this document:

.....  
.....  
drawings and/or photographs, diagrams and plans of the engine and of the noise reduction system;  
list of components, duly identified constituting the noise reduction system.

Examples taken from

- E/ECE/324
- E/ECE/TRANS/505 } Rev.2/Add.116/Rev.1
- Regulation No. 117

**UNIFORM PROVISIONS CONCERNING THE APPROVAL OF TYRES WITH REGARD TO ROLLING SOUND EMISSIONS AND TO ADHESION ON WET SURFACES**

- 2.3. "Rolling sound emission" means the sound emitted from the contact between the tyres in motion and the road surface.
- 1.1. Acoustic measurements  
The sound level meter or the equivalent measuring system, including the windscreen recommended by the manufacturer shall meet or exceed the requirements of Type 1 instruments in accordance with IEC 60651:1979/A1:1993, second edition.
- 2.3. Ambient noise
  - 2.3.1. The background sound level (including any wind noise) shall be at least 10 dB(A) less than the measured tyre rolling sound emission. A suitable windscreen may be fitted to the microphone provided that account is taken of its effect on the sensitivity and directional characteristics of the microphone.
  - 2.4.4.2. Recommendations to avoid parasitic noise:
    - (a) Removal or modification on the vehicle that may contribute to the background noise of the vehicle is recommended. Any removals or modifications shall be recorded in the test report;

however

front axle must be fitted with tyres of size suitable for the axle load and planed down to the minimum depth in order to minimize the influence of tyre/road contact noise

(b) For texture depth (TD):

When the surface is new;

When the noise testing starts (NB: not before four weeks after laying);

6.2. Documentation of vehicle noise tests conducted on the surface

In the document describing the vehicle noise test(s) it shall be stated whether all the requirements of this standard were fulfilled or not. Reference shall be given to a document according to paragraph 6.1. describing the results which verify this.

Examples taken from

ECE/TRANS/WP.29/GRB/2008/5/Rev.1

REGULATION No. 59

(Replacement silencing systems)

All the terms “noise reduction system” as mentioned in the original document where replaced by silencing system in the revised document on the request of GRB

examples

- 2.1. "Silencing system" means a complete set of components necessary for limiting the noise produced by the engine of a motor vehicle and its exhaust;
- 2.2. "Silencing system component" means one of the separate components which together form the silencing system (e.g. silencer proper, expansion chamber, resonator);
- 2.3. "Silencing system of different types" means silencing systems which differ significantly in such respects as:

Examples of the wording “sound”

- 6.2.3.3. [The following is an example of compliance statement: "(Name of the manufacturer) attests that the silencing system of this type complies with the requirements of paragraph [XX] of Regulation No. 51. (Name of the manufacturer) makes this statement in good faith, after having performed an appropriate engineering evaluation of the sound emission performance over the applicable range of operating conditions."]

17. Sound levels:

Vehicle in motion ..... dB(A) at steady speed before acceleration of ..... km/h

Vehicle stationary ..... dB(A) with engine running at ..... min<sup>-1</sup>

4. EVALUATION OF THE RESULTS

- 4.1. If the sound levels of the silencing system or component tested pursuant to paragraphs 1 and 2, measured in accordance with paragraph 6.2. above, do not exceed by more than 1 dB(A) the level measured during the type-approval tests of this type of considered to conform to the requirements of this Regulation.

Examples of the wording “noise”

6.2.2.2. (a) Measurement with running vehicle

**The value measured (before any rounding off to the nearest integer) shall not exceed by more than 1 dB(A) the noise value measured (before any rounding off to the nearest integer) on the vehicle referred to in paragraph 3.3.3. above, when this is fitted with a silencing system corresponding to the type fitted to the vehicle when submitted for type approval under Regulation No. 51.**

ECONOMIC COMMISSION FOR EUROPE

INLAND TRANSPORT COMMITTEE

World Forum for Harmonization of Vehicle Regulations

Working Party on Noise

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