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## Economic Commission for Europe

### Inland Transport Committee

### World Forum for Harmonization of Vehicle Regulations

#### Working Party on Noise

#### Sixtieth session

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Item 2 of the provisional agenda

#### Regulation No. 28 (Audible warning devices)

### Proposal for amendments to Regulation No. 28

### Submitted by the expert from the International Organization of Motor Vehicle Manufacturers\*

The text reproduced below was prepared by the experts from the International Organization of Vehicle Manufacturers (OICA) in order to propose amendments to UN Regulation No. 28. The modifications to the current text are marked in bold for new and strikethrough for deleted characters.

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\* In accordance with the programme of work of the Inland Transport Committee for 2012–2016 (ECE/TRANS/224, para. 94 and ECE/TRANS/2012/12, programme activity 02.4), the World Forum will develop, harmonize and update Regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.

## I. Proposal

*Paragraph 14.4.*, amend to read:

"14.4. The A-weighted sound pressure level emitted by the device(s) fitted on the vehicle shall be measured at a distance of 7 m in front of the vehicle, the latter being placed on an open site<sup>1</sup>, on ground as smooth as possible, and, in case of devices supplied with direct current, with its engine stopped. **If the test voltage as specified in paragraph 6.2.3. cannot be reached, the test shall be performed on the vehicle with its engine warmed-up and at idle;**"

*Paragraph 14.8.*, amend to read:

"14.8. Measured under the conditions specified in paragraphs 14.2. to 14.7., the maximum sound-pressure level (14.7.) of the audible warning signal tested shall be at least:

- (a) equal to 83 dB (A) and not more than 112 dB (A) for the signals of motor cycles of a power less than or equal to 7 kW;
- (b) equal to ~~93~~ 87 dB (A) and at most 112 dB (A) for the signals of vehicles of categories M and N<sup>2</sup> and motor cycles of a power greater than 7 kW."

## II. Justification

### A. Paragraph 14.4.

1. The test voltages as specified in 14.2 and respectively in 6.2.3 cannot be reached by the vehicles' internal battery alone. The representative voltage for the operation of the horn is approximately reached, if the vehicle is warmed-up and can run at idle. Idle noise will not interfere with the measurement as it is more than 20 dB below the minimum required sound level.

### B. Paragraph 14.8.

2. OICA proposes to change the minimum sound level requirement for vehicles of category M and N and motorcycles of a power greater than 7 kW from 93 dB to 87 dB. The basis for this proposal has been an assessment of the existing regulations on the horn (Annex I). In most countries the requirements are much less specific. It is generally required that a vehicle shall be equipped with a horn and that this horn shall be audible in a free field at a certain distance (typically 60 m to 100 m distance). One country that uses this requirement is the United States of America (USA). According to a review by the Society of Automotive Engineers (SAE) the typical sound level emitted by the horn in the USA is for more than

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<sup>1</sup> The original footnotes will be renumbered and updated, where required, by the secretariat when preparing a consolidated version of this Regulation.

<sup>2</sup> As defined in the Consolidated Resolution on the Construction of Vehicles (R.E.3.), document ECE/TRANS/WP.29/78/Rev.2, para. 2. - [www.unece.org/trans/main/wp29/wp29wgs/wp29gen/wp29resolutions.html](http://www.unece.org/trans/main/wp29/wp29wgs/wp29gen/wp29resolutions.html)

sixty per cent of the products below 93 dB (A), when measured according to UN Regulation No. 28.

3. A more specific example is given by the Korean Motor Vehicle Safety Standard (KMVSS), Article 53 (latest revision from 2003); the horn shall emit a sound level of at least 90 dB (C) at 2 m distance. The frequency range is the same as in UN Regulation No. 28 (1,800 Hz to 3,550 Hz). The correction for A-weighting and the distance will lead to an equivalent minimum sound level of approximately 86 dB(A). The KMVSS Article 53 is deemed to be equivalent in the Free Trade Agreement between the Republic of Korea and the European Union.

4. None of these countries consider the horn to be too quiet. So it can be concluded that by choosing 87 dB(A) as a minimum sound level, the horn will still be sufficiently audible.

### III. Excerpts from UN Regulation No. 28 (paragraphs 6.2.3. and 14 consolidated)

...

6.2.3. The AWD shall be supplied with current, as appropriate, at the following voltages:

6.2.3.1. in the case of AWDs supplied with direct current, at a voltage measured at the terminal of the electric power source of 13/12 of the rated voltage.

6.2.3.2. in the case of AWDs supplied with alternating current, the current shall be supplied by an electric generator of the type normally used with this type of AWD. The acoustic characteristics of the AWD shall be recorded for electric generator speeds corresponding to 50%, 75% and 100% of the maximum speed indicated by the manufacturer of the generator for continuous operation. During this test, no other electrical load shall be imposed on the electric generator. The endurance test described in paragraph 6.3 shall be carried out at a speed indicated by the manufacturer of the equipment and selected from the above range.

...

#### 14. SPECIFICATIONS

The vehicle shall comply with the following specifications:

14.1. The audible warning device(s) (or system) fitted on the vehicle shall be of a type approved under this Regulation. Audible warning Devices of class II approved under this Regulation in its original form, and therefore not bearing the approval symbol II in their approval mark, may continue to be fitted to vehicles types submitted for approval pursuant to this Regulation;

14.2. The test voltage shall be as specified in paragraph 6.2.3. of the Regulation;

14.3. The sound pressure measurements shall be made in the conditions specified in paragraph 6.2.2. of this Regulation;

14.4. The A-weighted sound pressure level emitted by the device(s) fitted on the vehicle shall be measured at a distance of 7 m in front of the vehicle, the latter

being placed on an open site <sup>3</sup>, on ground as smooth as possible, and, in case of devices supplied with direct current, with its engine stopped. **If the test voltage as specified in paragraph 6.2.3. cannot be reached, the test shall be performed on the vehicle with its engine warmed-up and at idle;**

- 14.5. The microphone of the measuring instrument shall be placed approximately in the mean longitudinal plane of the vehicle;
- 14.6. The sound pressure level of the background noise and wind noise must be at least 10 dB (A) below the sound to be measured;
- 14.7. The maximum sound-pressure level shall be sought within the range of 0.5 and 1.5 m above the ground;
- 14.8. Measured under the conditions specified in paragraphs 14.2 to 14.7, the maximum sound-pressure level (14.7) of the audible warning signal tested shall be at least:
  - (a) equal to 83 dB (A) and not more than 112 dB (A) for the signals of motor cycles of a power less than or equal to 7 kW.
  - (b) equal to ~~93~~ 87 dB (A) and most 112 dB (A) for the signals of vehicles of category M and N 1/ and motor cycles of a power greater than 7 kW.

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<sup>3</sup> The original footnotes will be renumbered and updated, where required, by the secretariat when preparing a consolidated version of this Regulation.

## Annex I

### Examples of Countries that require the Installation of a Horn, but do not use UN Regulation No. 28

<i>Country</i>	<i>Regulation Code</i>	<i>Min Sound</i>	<i>Max Sound</i>	<i>Test Procedure</i>
Argentina	Decree 779/95 Art. 30	-	104 dB	IRAM Standard
Australia	ADR 42/04	-	-	-
Canada	Highway Traffic Act 1964, Chapter 14	-	-	<b>Audible at 200ft distance (60m) (under normal traffic conditions)</b>
Gulf Cooperation Council (GCC)	GSO 42/2003, Art. 26	88 dB(A)	125 dB(A)	Microphone at 2m distance and 1.25m height
Iceland	411/1993 Art. 13	-	-	-
Malaysia	L.N. 170/1959 24	-	-	-
Mexico	RTCPJF Art. 45	-	-	<b>Audible at 60m distance (under normal traffic conditions)</b>
New Zealand	Land Transport Rule 32017/5	-	-	<b>Audible at 100m distance (under normal traffic conditions)</b>
Republic of Korea	KMVSS Art. 53	90 dB(C)	-	Tested at <b>2m distance</b> ; min required Sound is 90 dB(C)
Saudi Arabia	M/49 Dec. 23, 1971 Art. 83	-	-	Horns shall not be used at all near mosques, hospitals nor schools; nor shall they be used within inhabited areas, except in cases of extreme necessity
Singapore	S 345/74 24	-	-	The instrument or apparatus fitted to a trailer under paragraph (3) or (4) shall not have a multi-tone or produce an unduly harsh, shrill, loud or alarming noise.
United States of America	49 CFR 393G § 393.81	-	-	<b>Connecticut: Audible at 200ft distance (60m)(under normal traffic conditions)</b>

## Annex II

### Figures

Figure 1

Top view of the front part of a vehicle with necessary equipment and the horns (green colour) installed behind the front bumper (light blue colour)

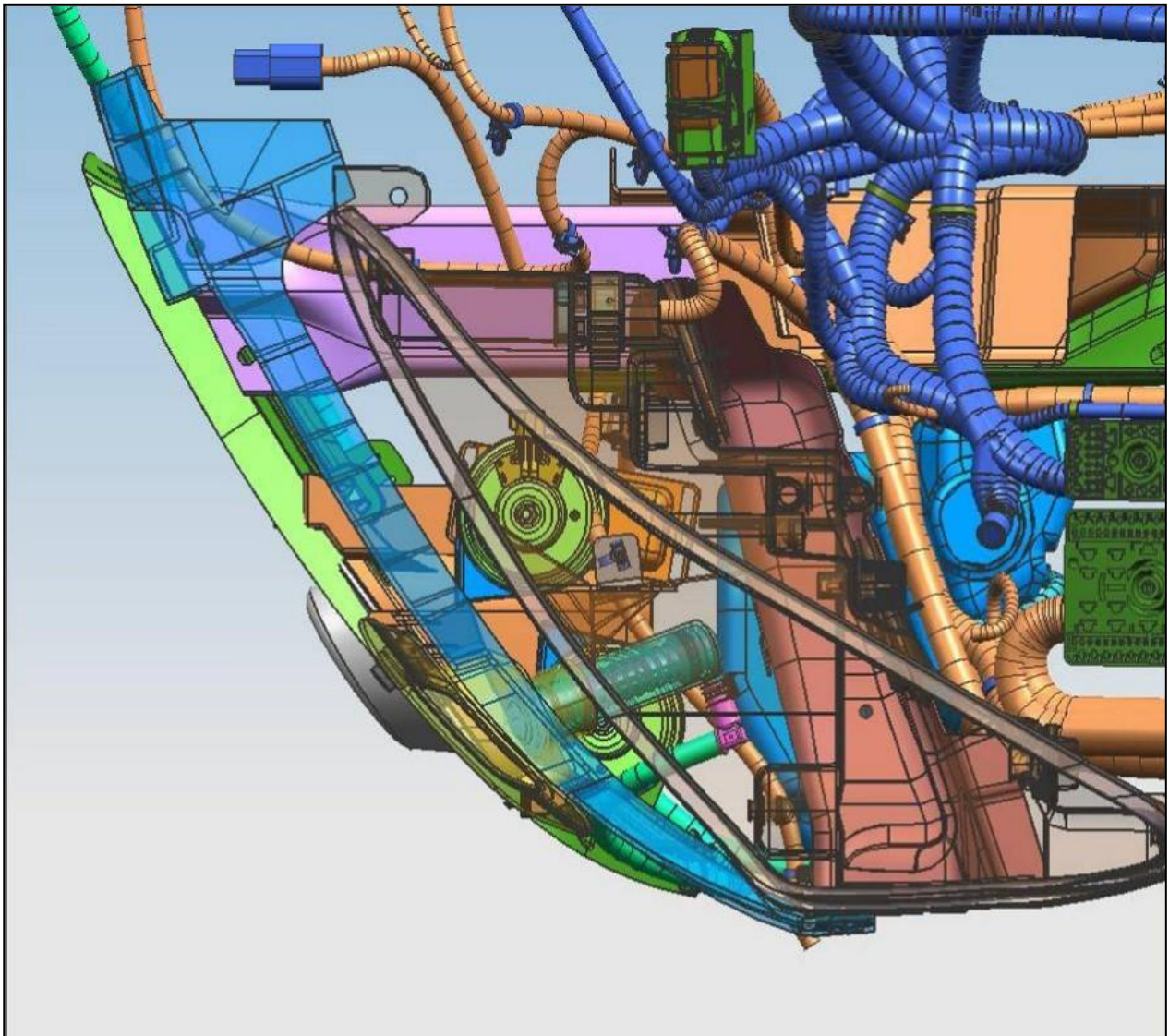


Figure 2  
Side view of the front part of a vehicle with necessary equipment and the horns  
(green/blue colour) installed behind the front bumper (light blue colour)

