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Working Party on Noise

Sixtieth session

Geneva, 1-3 September 2014

Report of the Working Party on Noise on its sixtieth session

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I. Attendance

1. The Working Party on Noise (GRB) held its sixtieth session from 1 to 3 September 2014 in Geneva. The meeting was chaired by Mr. S. Ficheux (France). Experts from the following countries participated in the work following Rule 1(a) of the Rules of Procedure of the World Forum for Harmonization of Vehicle Regulations (WP.29) (TRANS/WP.29/690, Amend. 1 and Amend. 2): Austria; Belgium; China; France; Germany; Hungary; India; Italy; Japan; Netherlands; Norway; Poland; Republic of Korea; Russian Federation; Spain; Sweden; Switzerland; United Kingdom of Great Britain and Northern Ireland. Experts from the European Commission (EC) participated. Experts from the following non-governmental organizations also participated: European Tyre and Rim Technical Organisation (ETRTO); International Motorcycle Manufacturers Association (IMMA); International Organization for Standardization (ISO); International Organization of Motor Vehicle Manufacturers (OICA) and World Blind Union (WBU).

II. Adoption of the agenda (agenda item 1)

Documentation: ECE/TRANS/WP.29/GRB/2014/3

2. GRB considered and adopted the agenda.

III. Regulation No. 28 (Audible warning devices): Development (agenda item 2)

Documentation: ECE/TRANS/WP.29/GRB/2014/4, Informal document GRB-60-16

3. Through a presentation (GRB-60-16), the expert from OICA introduced ECE/TRANS/WP.29/GRB/2014/4 proposing amendments to UN Regulation No. 28, in particular, a reduction the prescribed sound level of the audible warning device from 93 to 87 dB(A). While the expert from the Republic of Korea supported this proposal, the experts from India and IMMA requested a study reservation. GRB agreed to revert to this issue at its January 2015 session.

IV. Regulation No. 41 (Noise of motorcycles): Development (agenda item 3)

Documentation: Informal document GRB-60-06

4. The expert from IMMA proposed to complete a table containing all symbols used in this UN Regulation with the symbols related to the additional sound emission provisions (ASEP) test (GRB-60-06). GRB adopted this proposal as reproduced in Annex II to this report and requested the secretariat to submit it to WP.29 and the Administrative Committee of the 1958 Agreement (AC.1) for consideration and vote at their March 2015 sessions.

V. Regulation No. 51 (Noise of M and N categories of vehicles) (agenda item 4)

A. Development

Documentation: ECE/TRANS/WP.29/GRB/2014/5, Informal documents GRB-60-01, GRB-60-10-Rev.1, GRB-60-15, GRB-60-17

5. On behalf of the Informal Working Group (IWG) on UN Regulations Nos. 51 and 59, the expert from OICA introduced a revised proposal for the 03 series of amendments to UN Regulation No. 51 (ECE/TRANS/WP.29/GRB/2014/5). He explained that the text of this proposal was harmonized, as far as possible, with European Union (EU) Regulation No. 540/2014 on the sound level of motor vehicles and of replacement silencing systems, including a three-phase reduction of the sound level limits. GRB noted that, following the entry into force of phase 2 for new types of vehicles, EU would undertake a detailed study to review the limits of phase 3 and to correct these values, if deemed to be necessary. Other Contracting Parties were invited to conduct similar studies in the future and to transmit their outcomes to GRB. GRB stressed the importance of aligning the timeline for introduction of phases 1-3 of the 03 series of amendments to UN Regulation No. 51 with the step-by-step entry into force of the above EU Regulation. For this reason, GRB agreed that all transitional provisions of paragraph 11. of the proposal should refer to specific dates. Finally, GRB adopted the proposal, as amended by Annex III to this report, and mandated the secretariat to submit it to WP.29 and AC.1 for consideration and vote at their March 2015 sessions.

6. The expert from Japan suggested that references to ISO 10844:2011 be put in square brackets for the time being and requested GRB to revert to this issue at the next session.

7. The expert from OICA briefly introduced some additional elements which had been identified by IWG on UN Regulations Nos. 51 and 59 for further consideration and possible inclusion into the 03 series of amendments to UN Regulation No. 51 (GRB-60-01). The expert from ISO informed GRB about a new version of ISO 10844:2014 which added a few editorial modifications to the previous version ISO 10844:2014 without changes in the fundamental requirements (GRB-60-17). The expert from China introduced GRB-60-10-Rev.1 and GRB-60-15 in which he suggested higher limit values and a new classification for vehicles of a specific category available on the Chinese market. GRB requested the IWG on UN Regulations Nos. 51 and 59 to consider all these additional aspects and to prepare proposals for the next session, if necessary.

B. Additional sound emission provisions

Documentation: ECE/TRANS/WP.29/2011/64

8. GRB noted that the additional sound emission provisions contained in ECE/TRANS/WP.29/2011/64 had been incorporated into the revised proposal for the 03 series of amendments to UN Regulation No. 51 (ECE/TRANS/WP.29/GRB/2014/5) and decided to remove ECE/TRANS/WP.29/2011/64 from the agenda.

VI. Regulation No. 59 (Replacement silencing systems) (agenda item 5)

Documentation: ECE/TRANS/WP.29/GRB/2014/6, Informal document GRB-60-01

9. On behalf of the IWG on UN Regulations Nos. 51 and 59, the expert from OICA presented a revised proposal for the 02 series of amendments to UN Regulation No. 59 (ECE/TRANS/WP.29/GRB/2014/6 and GRB-60-01). He pointed out that this proposal was also aligned with EU Regulation No. 540/2014 on the sound level of motor vehicles and of replacement silencing systems. GRB adopted this proposal, as amended by Annex IV to the present report, and mandated the secretariat to submit it to WP.29 and AC.1 for consideration and vote at their March 2015 sessions.

VII. Regulation No. 92 (Replacement exhaust silencing systems for motorcycles) (agenda item 6)

10. No new information was given under this agenda item.

VIII. Regulation No. 117 (Tyre rolling noise and wet grip adhesion) (agenda item 7)

Documentation: ECE/TRANS/WP.29/GRB/2014/7,
ECE/TRANS/WP.29/GRB/2014/8

11. The expert from the Russian Federation introduced some clarifications to be included in UN Regulation No. 117, on data processing for the measurement method of tyre deceleration value obtained in differential form $d\omega/dt$ (ECE/TRANS/WP.29/GRB/2014/7). GRB adopted this proposal, as amended by Annex V to this report, and requested the secretariat to submit it to WP.29 and AC.1 for consideration and vote at their March 2015 sessions.

12. The expert from ERTRO introduced ECE/TRANS/WP.29/GRB/2014/8 to propose new time measurement accuracy for instrumentation involved in the rolling resistance method (Annex 6 to the UN Regulation). The expert from Japan reiterated his reservation that the proposed accuracy might be too strict and asked GRB to postpone the consideration of this item to the next session. The expert from the Russian Federation agreed with this suggestion. GRB recalled that this issue had already been discussed several times and felt that a final decision should be taken at the next session. Meanwhile, experts from Japan, Russian Federation, ETRTO, as well as from other Contracting Parties were invited to finalize their consultations.

IX. Collective amendments (agenda item 8)

Additional provisions for Regulations Nos. 9, 63 and 92

Documentation: Informal document GRB-60-07

13. The expert from IMMA proposed to include the latest version of ISO 10844 on test tracks in UN Regulations Nos. 9, 41 and 63 and to introduce transitional provisions for passing from ISO 10844:1994 to ISO 10844:2011 (GRB-60-07). GRB supported the objective of this proposal and noted that new test tracks based on ISO 10844:2011 could also be used for extension of approvals granted under the previous series of amendments to UN Regulation No. 41. GRB invited IMMA, with the assistance of the secretariat, to revise this proposal using ECE/TRANS/WP.29/GRB/2014/2 as an example and to re-submit it as an official proposal to the January 2015 session of GRB.

X. Exchange of information on national and international requirements on noise levels (agenda item 9)

Documentation: Informal documents GRB-60-03, GRB-60-08 and Add.1, GRB-60-13, GRB-60-14

14. The expert from the Netherlands presented the outcome of a study (GRB-60-08 and Add.1) of the shifts in tyre sound emission levels in his country between 2007 and 2013, i.e. before and after the revision of tyre noise limits in 2009 (EC/661/2009 and UN Regulation No. 117). The study addressed the most common C1, C2 and C3 tyres in terms of size and manufacturer. The reductions in tyre sound levels between 2007 and 2013 were found to be respectively 1.5, 1.4 and 1.1 dB(A) for C1, C2 and C3 tyres.

15. The expert from the Netherlands informed GRB about the results of two studies (GRB-60-03, GRB-60-13, GRB-60-14) commissioned by the Dutch Ministry of Infrastructure and Environment with a view to assessing cost savings that could be achieved in the Netherlands and EU by a switch from currently used tyres to high-performance tyres with A-labels on each parameter of the EU tyre label: energy efficiency, wet grip and noise (so called 'triple-A' tyres). According to the studies, moving towards 'triple-A' tyres could bring considerable potential benefits for the society in terms of energy, safety and noise reduction, which were estimated to be around 1 billion Euros in the Netherlands and 34 billion Euros in EU per year. In addition, individual consumers could also benefit from substantial fuel cost savings.

16. As a first reaction, the experts from ETRTO and OICA pointed out the rather theoretical character of some assumptions used for these studies, as well as the fact that 'triple-A' tyres were not yet available on the market. The expert from the Netherlands added that a common objective of these studies, together with the one mentioned in paragraph 22 above, was to shift the society to better tyres, either by introducing stricter limits or by raising the awareness of tyre labels. Finally, GRB agreed to include this issue in the agenda of its next session and invited experts to submit their comments for discussion.

17. The expert from the Russian Federation informed GRB that, as from January 2015, a new regional regulation on internal noise would come into force in the Russian Federation and other countries of the Customs Union. Detailed information on this regulation, together with the internal noise limits, will be presented at the next session of GRB. He recalled a GRB recommendation to develop, with ISO, a test method for interior noise and pointed out that this work had not yet started due to a lack of financing. GRB took note of this information.

XI. Influence of road surface on tyre rolling sound emissions (agenda item 10)

Documentation: Informal documents GRB-60-04 and Add.1

18. The expert from the Netherlands introduced GRB-60-04 and Add.1 in which he pointed out that, under urban driving conditions, the rolling noise dominates the overall noise production and is influenced by the properties of the road surface (like surface texture, acoustical absorption and air-pumping). Thus, improving the surface properties would result in a lower rolling noise level. According to the expert, quiet road surfaces are a valuable measure to reduce traffic noise, either on their own or in combination with other noise reducing strategies, and generally demonstrate a positive cost/benefit ratio.

19. The Chair stressed the importance of the tyre-road interaction for sound emissions and noted that, for the time being, GRB has no mandate for regulating road surfaces. GRB agreed to resume this discussion at its next session and looked forward to new studies and presentations on the issue.

XII. Quiet Road Transport Vehicles (agenda item 11)

Documentation: Informal document GRB-60-11-Rev.1

20. The Chair informed GRB about the proposal of the technical sponsors of IWG on Quiet Road Transport Vehicles (QRTV) for GTR to develop a draft UN Regulation on QRTV under the 1958 Agreement in parallel to a draft GTR on QRTV (ECE/TRANS/WP.29/1110, para. 100). GRB agreed with this proposal and decided, subject to WP.29 consent, to establish an IWG to develop a UN Regulation on QRTV under the 1958 Agreement and adopted the Terms of Reference (ToR) (GRB-60-11-Rev.1), as reproduced in Annex VI to this report. The new IWG should work in close cooperation with IWG QRTV for GTR, with the aim to draft the above mentioned UN Regulation based on audible alerts for the safety of vulnerable road users. GRB agreed that the scope of a new UN Regulation would initially cover electric and hybrid electric vehicles of categories M and N. In a second phase, the scope may be extended.

XIII. Definitions and acronyms in Regulations under the responsibility of GRB (agenda item 12)

Documentation: Informal documents GRB-57-12, GRB-57-18

21. GRB reviewed GRB-57-12 and GRB-57-18 containing definitions and acronyms in Regulations under the responsibility of GRB and requested OICA and IMMA to update these documents based on the 03 series of amendments to UN Regulation No. 51 and the 02 series of amendments to UN Regulation No. 59 adopted at the present session (see paras. 5 and 9 above), so that the final versions could be approved at the January 2015 session of GRB.

XIV. Proposal for amendments to the Consolidated Resolution on the Construction of Vehicles (agenda item 13)

Documentation: ECE/TRANS/WP.29/GRSG/2014/25,
Informal document GRB-60-02

22. GRB was informed that the Working Party on Lighting and Light-Signalling (GRE) had identified the need to introduce definitions for new categories of vehicles into the Consolidated Resolution on the Construction of Vehicles (R.E.3), such as agricultural trailers and towed machinery. GRB noted several alternative proposals for the new definitions (ECE/TRANS/WP.29/GRSG/2014/25 and GRB-60-02) and invited experts to transmit their comments and suggestions, if any, to the secretariat.

XV. Development of the International Whole Vehicle Type Approval (IWVTA) system and involvement of the Working Parties (GRs) in it (agenda item 14)

Documentation: ECE/TRANS/WP.29/2014/53, ECE/TRANS/WP.29/2014/82,

Informal document WP.29-163-10

23. On behalf the GRB Ambassador to IWVTA, the expert from EC reported on the progress made on Revision 3 of the 1958 Agreement and on the development of UN Regulation No. 0. At its June 2014 session, WP.29 had agreed to freeze the work on Revision 3 and to resume its consideration in November 2014 on the basis of political and legal guidance that the Contracting Parties had been requested to provide, in particular, on outstanding issues of proxy voting and the three-fourth or the four-fifth majority required for taking decisions. WP.29 had also approved a questionnaire on IWVTA which was subsequently distributed. The latest draft of Revision 3 of the 1958 Agreement is contained in ECE/TRANS/WP.29/2014/53 and ECE/TRANS/WP.29/2014/82.

24. The secretariat presented draft guidelines on amendments to UN Regulations (WP.29-163-10), including a new term "version of a UN Regulation" and a common commencement date (1 September each year) recommended for new series of amendments to all UN Regulations listed in the annex of UN Regulation No. 0. In this respect, the Chair recalled that for the 03 series of amendments to UN Regulation No. 51, the date of entry into force of phase 1 was fixed on 1 July 2016, in order to synchronize it with the entry into force of EU Regulation No. 540/2014 on the sound level of motor vehicles and of replacement silencing systems (see para. 5 above).

XVI. Highlights of the March and June 2014 session of WP.29 (agenda item 15)

Documentation: ECE/TRANS/WP.29/1108, ECE/TRANS/WP.29/1110,
Informal document GRB-60-05

25. The secretariat reported on the highlights of the 162nd and 163rd sessions of WP.29 (ECE/TRANS/WP.29/1108, ECE/TRANS/WP.29/1110, GRB-60-05).

XVII. Exchange of views regarding the future work of GRB (agenda item 16)

Documentation: Informal document GRB-60-09

26. The expert from ISO informed GRB about a new standard ISO 362-3 on indoor testing of pass-by noise (GRB-60-09). The objective of this new standard is to provide a basis for the official recognition of an indoor-pass-by-test for type approval of road vehicles of categories M and N. GRB noted that the indoor testing according to ISO 362-3 does not depend on climatic conditions and could become an alternative to the outdoor testing as described in ISO 362-1. GRB decided to revert to this issue at the next session and invited all experts of GRB, as well as of the IWG on UN Regulations Nos. 51 and 59, to consider if a reference to ISO 362-3 could be incorporated into UN Regulation No. 51.

XVIII. Other business (agenda item 17)

27. No issues were considered under this agenda item.

XIX. Provisional agenda for the sixty-first session (agenda item 18)

28. For its sixty-first session, scheduled to be held in Geneva from 27 (starting at 2.30 p.m.) to 29 (concluding at 5.30 p.m.) January 2015, GRB noted that the deadline for the submission of official documents to the secretariat was 31 October 2014, twelve weeks prior to the session. The following provisional agenda was adopted:

1. Adoption of the agenda.
2. Regulation No. 28 (Audible warning devices).
3. Regulation No. 41 (Noise of motorcycles): Development.
4. Regulation No. 51 (Noise of M and N categories of vehicles):
 - (a) Development;
 - (b) Additional sound emission provisions.
5. Regulation No. 59 (Replacement silencing systems).
6. Regulation No. 92 (Replacement exhaust silencing systems for motorcycles).
7. Regulation No. 117 (Tyre rolling noise and wet grip adhesion).
8. Collective amendments: Additional provisions for Regulations Nos. 9, 63 and 92.
9. Exchange of information on national and international requirements on noise levels.
10. Influence of road surface on tyre rolling sound emissions.
11. Quiet road transport vehicles.
12. Definitions and acronyms in Regulations under the responsibility of GRB.
13. Proposal for amendments to the Consolidated Resolution on the Construction of Vehicles.
14. Development of the International Whole Vehicle Type Approval (IWVTA) system and involvement of the Working Parties (GRs) in it.
15. Highlights of the November 2014 session of WP.29.
16. Exchange of views regarding the future work of GRB.
17. Other business.
18. Provisional agenda for the sixty-second session.

XX. Election of officers (agenda item 19)

29. In compliance with Rule 37 of the Rules of Procedure (TRANS/WP.29/690 and ECE/TRANS/WP.29/690/Amend.1), GRB called for the election of officers. The representatives of the Contracting Parties, present and voting, elected unanimously Mr. Serge Ficheux (France) as Chair and Mr. Andrei Bocharov (Russian Federation) as Vice-Chair for the sessions of GRB scheduled in the year 2015.

Annex I

List of informal documents (GRB-60-...) distributed during the session

<i>Symbol</i>	<i>Transmitted by</i>	<i>Agenda item</i>	<i>Language</i>	<i>Title</i>	<i>Follow-up</i>
1	IWG on Regulations Nos. 51 and 59	4 (a)	E	Proposal for additional amendments to ECE/TRANS/WP.29/GRB/2014/5	(a)
2	European Commission	13	E	Proposal for amendments to the Consolidated Resolution on the Construction of Vehicles (R.E.3)	(a)
3	Netherlands	9	E	Potential benefits of Triple-A tyres in the Netherlands	(c)
4	Netherlands	10	E	Quiet road surfaces (leaflet)	(c)
4-Add.1	Netherlands	10	E	Quiet road surfaces (presentation)	(c)
5	Secretariat		E	General information and highlights WP.29	(a)
6	IMMA	3	E	Proposal for amendments to Regulation No. 41 "Noise emission of motorcycles"	(d)
7	IMMA	8	E	Proposal for amendments to Regulations Nos. 9, 41 and 63	(b)
8	Netherlands	9	E	Tyre noise limits of EC/661/2009 and Regulation No. 117: Evaluation based on sold tyres in the Netherlands	(c)
8-Add.1	Netherlands	9	E	Shifts in tyre sound levels between 2007 and 2013 (presentation)	(c)
9	ISO	16	E	Indoor testing of pass-by noise	(c)
10-Rev.1	China	4 (a)	E	Proposal for micro-van and micro-truck	(a)
11-Rev.1	Chair	11	E	Terms of Reference of IWG on a QRTV Regulation under 1958 Agreement	(d)

<i>Symbol</i>	<i>Transmitted by</i>	<i>Agenda item</i>	<i>Language</i>	<i>Title</i>	<i>Follow-up</i>
12	Netherlands	9	E	Shifts in tyre sound levels between 2007 and 2013	(c)
13	Netherlands	9	E	Potential benefits of Triple-A tyres in the European Union (EU)	(c)
14	Netherlands	9	E	Triple-A tyres: potential benefits for environment, noise, safety and economy of the Netherlands and EU	(c)
15	China	4 (a)	E	Proposal for a harmonized M ₁ classification and limits	(a)
16	OICA	2	E	Assessment on the minimum sound level of the horn	(a)
17	ISO	4 (a)	E	ISO 10844:2014: Comparison to 2011 version	(a)

Notes:

- (a) Consideration completed or superseded
- (b) Continue consideration at the next session with an official symbol
- (c) Continue consideration at the next session as informal document
- (d) Adopted and to be submitted to WP.29

Annex II

Adopted amendments to Regulation No. 41 (Noise emissions of motorcycles)

Paragraph 2.13., table, amend to read:

<i>Symbol</i>	<i>Units</i>	<i>Explanation</i>	<i>Reference</i>
AA'	–	virtual line on the test track	Annex 4 – Figure 1
a_{wot}	m/s^2	calculated acceleration	Annex 3 – 1.4.2.
$a_{wot,ref}$	m/s^2	prescribed reference acceleration	Annex 3 – 1.3.3.3.1.2.
a_{urban}	m/s^2	prescribed target acceleration	Annex 3 – 1.3.3.3.1.2.
BB'	–	virtual line on the test track	Annex 4 – Figure 1
CC'	–	virtual line on the test track	Annex 4 – Figure 1
k	–	gear weighting factor	Annex 3 – 1.4.3.
k_p	–	partial power factor	Annex 3 – 1.4.4.
L	dB(A)	sound pressure level	Annex 3 – 1.4.6.
$L_{wot(i)}$	dB(A)	L at wot condition	
l_{pA}	m	pre-acceleration length	Annex 3 – 1.3.3.1.1.
m_{kerb}	kg	kerb mass of the vehicle	2.6.
m_t	kg	test mass of the vehicle	Annex 3 – 1.3.2.2.
n	min^{-1}	measured engine speed	
$n_{pp'}$	min^{-1}	engine speed at PP'	Annex 7 – 2.6.
n_{idle}	min^{-1}	engine speed at idle	–
$n_{wot(i)}$	min^{-1}	$n_{pp'}$ measured at $L_{wot(i)}$ detection	Annex 7 – 2.6.
PP'	–	virtual line on the test track	Annex 4 – Figure 1
PMR	–	power-to-mass ratio index	2.9.
P_n	kW	rated maximum net power	2.7.
S	min^{-1}	rated engine speed	2.8.

<i>Symbol</i>	<i>Units</i>	<i>Explanation</i>	<i>Reference</i>
v	km/h	measured vehicle speed	–
v _{max}	km/h	maximum speed	2.10.
v _{test}	km/h	prescribed test speed	Annex 3 – 1.3.3.1.1.

Annex III

Adopted amendments to ECE/TRANS/WP.29/GRB/2014/5

Paragraph 1., first sentence, amend to read:

"1. Scope

This Regulation contains provisions on the sound emitted by motor vehicles and applies to vehicles of categories M and N.¹

..."

Paragraph 2.2.1.3. (new), amend to read:

"2.2.1.34. ~~The transmission system, the number of gears and ratios;~~ **Rated maximum net power and corresponding rated engine speed(s); however if the rated maximum net power and the corresponding rated engine speed differ only due to different engine mappings, these vehicles may be regarded as from the same type;**"

Paragraphs 2.11.1. and 2.11.2., amend to read:

"2.11.1. ~~In the case of vehicles of categories M₁, N₁ and M₂ ≤ 3,500 kg technically permissible maximum laden mass:~~

- (a) For front engine vehicles: the front end of the vehicle;
- (b) For mid-engine vehicles: the centre of the vehicle;
- (c) For rear engine vehicles: the rear end of the vehicle.

2.11.2. ~~In the case of vehicles of categories M₂ > 3,500 kg technically permissible maximum laden mass, M₃, N₂, N₃:~~

The border of the engine closest to the front of the vehicle."

Insert a new paragraph 3.2.5., to read:

"3.2.5. **A technical information document including the information as outlined in Annex 1.**"

Paragraph 3.4., replace "rated maximum power" with "rated maximum net power".

Paragraph 5.2., delete "which entered into force on **1 September 2015** ~~18 April 1995~~".

Paragraph 6.2.2., table, amend to read:

"

Vehicle Category	Vehicles used for the carriage of passengers	Phase 1	Phase 2	Phase 3
M ₁	PMR ≤ 120	72	70	68
	120 < PMR ≤ 160	73	71	69
	PMR > 160	75	73	71
	PMR > 200, no. of seats ≤ 4, R-point height < 450mm from the ground	75	74	72
M ₂	M ≤ 2.5 t	72	70	69
	2.5 t < M ≤ 3.5 t	74	72	71

	$M > 3.5 \text{ t}; P_n \leq 135 \text{ kW}$	75	73	72
	$M > 3.5 \text{ t}; P_n > 135 \text{ kW}$	75	74	72
M ₃	$P_n \leq 150 \text{ kW}$	76	74	73
	$150 \text{ kW} < P_n \leq 250 \text{ kW}$	78	77	76
	$P_n > 250 \text{ kW}$	80	78	77
<i>Vehicle Category</i>	<i>Vehicles used for the carriage of goods</i>	<i>Phase 1</i>	<i>Phase 2</i>	<i>Phase 3</i>
N ₁	$M \leq 2.5 \text{ t}$	72	71	69
	$M > 2.5 \text{ t}$	74	73	71
N ₂	$P_n \leq 135 \text{ kW}$	77	75	74
	$P_n > 135 \text{ kW}$	78	76	75
N ₃	$P_n \leq 150 \text{ kW}$	79	77	76
	$150 \text{ kW} < P_n \leq 250 \text{ kW}$	81	79	77
	$P_n > 250 \text{ kW}$	82	81	79

"

Paragraph 6.2.2.2., replace "1 dB" with "1 dB(A)".

Paragraph 6.2.2.4., replace "2dB" with "2 dB(A)".

Paragraph 6.2.2.5., delete "kW/t".

Paragraphs 6.2.3., 6.2.3.2., 6.2.3.3., replace "Annex 8" with "Annex 7".

Paragraph 6.2.3.3., replace "Appendix 1" with "the Appendix".

Paragraph 11., amend to read:

"11. Transitional provisions

11.1. As from the official date of entry into force of the 03 series of amendments to this Regulation, no Contracting Party applying this Regulation shall refuse to grant or refuse to accept type-approvals under this Regulation as amended by the 03 series of amendments.

11.2. Transitional Provisions for Phase 1 (see paragraph 6.2.2. above)

11.2.1. As from 1 July 2016, Contracting Parties applying this Regulation shall grant type-approvals only if the vehicle type to be approved meets the requirements of phase 1 (see paragraph 6.2.2. above) of this Regulation as amended by the 03 series of amendments.

As from the official date of entry into force of the 03 series of amendments, Contracting Parties applying this Regulation shall grant type approvals to the vehicle type which meets the requirements of phase 2 or phase 3 of this Regulation as amended by the 03 series of amendments.

11.2.2. Contracting Parties applying this Regulation shall not refuse to grant extensions of type approvals for existing types which have been granted according to the 02 series of amendments to this Regulation.

11.2.3. Until 1 July 2022, no Contracting Party applying this Regulation shall refuse national or regional type approval of a vehicle type-approved to the 02 series of amendments to this Regulation.

- 11.2.4. As from 1 July 2022, Contracting Parties applying this Regulation shall not be obliged to accept for the purpose of national or regional type approval, a vehicle type approved to the preceding series of amendments to this Regulation.
- 11.2.5. Even after the date of entry into force of the 03 series of amendments to this Regulation, Contracting Parties applying this Regulation may continue – for national or regional purposes – granting type approvals and extensions of type approvals to the preceding series of amendments to this Regulation.
- 11.3. Transitional Provisions for Phase 2 (see paragraph 6.2.2. above)
- 11.3.1. As from 1 July 2020 for vehicle types other than N₂ and as from 1 July 2022 for vehicles types of category N₂, Contracting Parties applying this Regulation shall grant type approvals only if the vehicle type to be approved meets the requirements of phase 2 (see paragraph 6.2.2. above) of this Regulation as amended by the 03 series of amendments.
- Furthermore, as from the official date of entry into force of the 03 series of amendments, Contracting Parties applying this Regulation shall grant type approvals to the vehicle type which meets the requirements of phase 3 of this Regulation as amended by the 03 series of amendments.
- 11.3.2. Contracting Parties applying this Regulation shall not refuse to grant extensions of type approvals for existing types which have been granted according to phase 1 (see paragraph 6.2.2. above) or the 02 series of amendments to this Regulation.
- 11.3.3. Until 1 July 2022 for vehicle types other than N₂ and as from 1 July 2023 for vehicles types of category N₂, no Contracting Party applying this Regulation shall refuse national or regional type approval of a vehicle type-approved to phase 1 (see paragraph 6.2.2. above) or the 02 series of amendments to this Regulation.
- 11.3.4. As from 1 July 2022 for vehicle types other than N₂ and as from 1 July 2023 for vehicles types of category N₂, Contracting Parties applying this Regulation shall not be obliged to accept for the purpose of national or regional type approval, a vehicle type approved to phase 1 (see paragraph 6.2.2.1. above) or the preceding series of amendments to this Regulation.
- 11.3.5. Even after the date of entry into force of the 03 series of amendments to this Regulation, Contracting Parties applying this Regulation may continue – for national or regional purposes – granting type approvals and extensions of type approvals to phase 1 (see paragraph 6.2.2. above) or the preceding series of amendments to this Regulation.
- 11.4. Transitional Provisions for Phase 3 (see paragraph 6.2.2. above)
- 11.4.1. As from 1 July 2024 for vehicle types other than N₂, N₃ and M₃ and as from 1 July 2026 for vehicles types of category N₂, N₃ and M₃, Contracting Parties applying this Regulation shall grant type-approvals only if the vehicle type to be approved meets the requirements of phase 3 (see paragraph 6.2.2. above) of this Regulation as amended by the 03 series of amendments.

- 11.4.2. Contracting Parties applying this Regulation shall not refuse to grant extensions of type approvals for existing types which have been granted according to phase 2 according to paragraph 6.2.2. above.
- 11.4.3. Until 1 July 2026 for vehicle types other than N₂, N₃ and M₃ and as from 1 July 2027 for vehicles types of category N₂, N₃ and M₃, no Contracting Party applying this Regulation shall refuse national or regional type approval of a vehicle type-approved to phase 2 according to paragraph 6.2.2. above.
- 11.4.4. As from 1 July 2026 for vehicle types other than N₂, N₃ and M₃ and as from for vehicles types of category N₂, N₃ and M₃, Contracting Parties applying this Regulation shall not be obliged to accept for the purpose of national or regional type approval, a vehicle type approved to phase 2 according to paragraph 6.2.2. above.
- 11.4.5. Even after the date of entry into force of the 03 series of amendments to this Regulation, Contracting Parties applying this Regulation may continue – for national or regional purposes – granting type approvals and extensions of type approvals to phase 1 or phase 2 (see paragraph 6.2.2. above) or the preceding series of amendments to this Regulation.
- 11.5. Notwithstanding the transitional provisions above, Contracting Parties whose application of this Regulation comes into force after the date of entry into force of the most recent series of amendments are not obliged to accept type approvals which were granted in accordance with any of the preceding series of amendments to this Regulation.
- 11.6. Until 30 June 2019 vehicles with a serial hybrid drive train which have a combustion engine with no mechanical coupling to the power train are excluded from the requirements of paragraph 6.2.3. above.
- 11.7. Until 30 June 2019 Contracting Parties applying this Regulation can continue to grant approvals using test sites which comply with the specifications of the preceding series of amendments to this Regulation as an alternative to Annex 3, paragraph 2.1. of this Regulation."

Annex 1,

Addendum to the communication form No. ..., paragraph 1.1.3., amend to read:

"1.1.3. **Rated maximum net power: kW at min -1
or maximum continuous rated power (electric motor) kW²**"

Technical information document,

Footnote 7, replace "to 100 per cent" with "to 90 per cent".

Insert a new paragraph 3.2.1. to read:

"3.2.1. **Specific engine information"**

Numbering, replace 3.2.1.2.3. with 3.2.1.2.1. and 3.2.1.8. with 3.2.1.4.

Paragraph 3.4.4.3., amend to read:

"3.4.4.3. **Rated maximum net power: kW"**

Annex 3,

Paragraph 1.2. (new), replace "IEC 942:1988" with IEC "60942:2003"

Paragraph 2.2.1., table, replace twice "engine power" with "engine maximum net power"

Paragraph 3.1.1., second indent, amend to read:

"3.1.1. ...
Two lines, AA' and BB', parallel to line PP' and situated respectively 10 m ± 0.05 m forward and 10 m ± 0.05 m rearward of line PP' shall be marked out on the test runway.
 ..."

Paragraph 3.1.2.1., first indent, amend to read:

"3.1.2.1. **Vehicles of category M₁, M₂ ≤ 3,500 kg technically permissible maximum laden mass, N₁**
 ..."

Paragraph 3.1.2.1.1., replace "point 3.2.1. of this Annex" with "paragraph 2.2.1. of this Annex".

Paragraph 3.1.2.1.2., second indent, amend to read:

"3.1.2.1.2. ...
Acceleration calculations are applicable to M₁, N₁ and M₂ ≤ 3,500 kg technically permissible maximum laden mass categories only.
 ..."

Paragraph 3.1.2.1.2., second indent, amend to read:

"3.1.2.1.2. ...
The partial power factor k_P (see paragraph 3.1.3.1.) is used for the weighted combination of the test results of the acceleration test and the constant speed test for vehicles of category M₁ and N₁ and M₂ ≤ 3,500 kg technically permissible maximum laden mass
 ..."

Paragraph 3.1.2.2., amend to read:

"3.1.2.2. **Vehicles of categories M₂ > 3,500 kg technically permissible maximum laden mass, M₃, N₂, N₃**

The path of the centreline of the vehicle shall follow line CC' as closely as possible throughout the entire test, from the approach to line AA' until the rear of the vehicle passes line BB'. The test shall be conducted without a trailer or semi-trailer. If a trailer is not readily separable from the towing vehicle the trailer shall be ignored when considering the crossing of line BB'. If the vehicle incorporates equipment such as a concrete mixer, a compressor, etc., this equipment shall not be in operation during the test. The test mass of the vehicle shall be according to the table of paragraph 2.2.1.

Target conditions of category M₂ > 3,500 kg technically permissible maximum laden mass, N₂:

When the reference point passes line BB', the engine speed $n_{BB'}$ shall be between 70 and 74 per cent of speed S, at which the engine develops its rated maximum net power, and the vehicle speed shall be 35 km/h ± 5 km/h. Between line AA' and line BB' a stable acceleration condition shall be ensured.

Target conditions of category M₃, N₃:

When the reference point passes line BB', the engine speed n_{BB'} shall be between 85 and 89 per cent of speed S, at which the engine develops its rated maximum net power, and the vehicle speed shall be 35 km/h ± 5 km/h. Between line AA' and line BB' a stable acceleration condition shall be ensured."

Paragraph 3.1.3.1., first indent, amend to read:

"3.1.3.1. Vehicles of categories M₁, N₁ and M₂ ≤ 3,500 kg technically permissible maximum laden mass

..."

Paragraph 3.1.3.2., first indent, amend to read:

"3.1.3.2. Vehicles of categories M₂ > 3,500 kg technically permissible maximum laden mass, M₃, N₂, N₃

..."

Paragraph 3.2.5.3.2.1., amend to read:

"3.2.5.3.2.1. Target engine speed

The target engine speed is defined as:

- (a) 75 per cent of the **rated** engine speed S for vehicles with a rated engine speed ≤ 5.000 min⁻¹;
- (b) 3.750 min⁻¹ for vehicles with a rated engine speed above 5.000 min⁻¹ and below 7.500 min⁻¹;
- (c) 50 per cent of the **rated** engine speed S for vehicles with a rated engine speed ≥ 7.500 min⁻¹.

If the vehicle cannot reach the engine speed as stated above, the target engine speed shall be 5 per cent below the maximum possible engine speed for that stationary test."

Annex 4 (new), paragraphs 1.3.5. and 1.3.6., amend to read:

"1.3.5. Engine speed shall be 75 per cent of the **rated engine speed (S) at which the engine develops **rated** maximum **net** power.**

1.3.6. The power indicated by the dynamometer shall be 50 per cent of the full-throttle power measured at 75 per cent of **rated engine speed (S)."**

Annex 7,

Paragraphs 3.2.1. and 3.2.2., replace "dB" with "dB(A)"

Paragraph 5.3., amend to read:

"5.3. Calculation of L_{ref}

$$L_{ref} = L_{anchor_k} + Slope_k * (n_{ref_k} - n_{anchor_k}) / 1,000$$

L_{ref} shall be less than or equal to 76 dB(A).

For vehicles fitted with a manual gear box having more than four forward gears and equipped with an engine developing a rated

maximum net power greater than 140 kW (according to Regulation No. 85) and having a maximum-power/maximum-mass ratio greater than 75, L_{ref} shall be less than or equal to 79 dB(A).

For vehicles fitted with an automatic gear box having more than four forward gears and equipped with an engine developing a rated maximum net power greater than 140 kW (according to Regulation No. 85) and having a maximum-power/maximum-mass ratio greater than 75, L_{ref} shall be less than or equal to 78 dB(A)."

Paragraph 6.2., point (g), replace "dB" with "dB(A)".

Annex IV

Adopted amendments to ECE/TRANS/WP.29/GRB/2014/6

Paragraph 1., amend to read:

"1. Scope

This Regulation covers **exhaust** replacement silencing systems for vehicles of categories M₁ and N₁.¹"

Paragraph 2.9.2., amend to read:

"2.9.2. "Rated maximum net power" P_n, which means the engine power expressed in kW and measured by the method pursuant to Regulation No. 85; however, if the rated maximum net power and the corresponding rated engine speed differs only due to different engine mappings, these vehicles may be regarded as from the same type;"

Insert a new paragraph 3.2.4., to read:

"3.2.4. An information document according to the Appendix of Annex 1."

Paragraph 3.3.4., amend to read:

"3.3.4. ~~When applicable, a~~ separate engine and components of at least the same cylinder capacity and **rated maximum net power as that of the above-mentioned vehicle-, **when applicable**. The engine will be equipped with the necessary means to run the tests specified under paragraph 6.3.4.1. and/or paragraph 6.4.3."**

Paragraphs 6.2.3., 6.2.3.1. and 6.2.3.2., amend to read:

"6.2.3. Further to the requirements of Annex 3 of the 03 series of amendments to Regulation No. 51, any exhaust replacement silencing system, or components thereof, shall fulfil the applicable specifications of Annex 7 of the 03 series of amendments to Regulation No. 51. For exhaust replacement silencing systems intended for vehicles type approved under the former series of the UN Regulation No. 51, the requirements of Annex 7 of the 03 series of amendments to Regulation No. 51 as well as the specifications of paragraphs 6.2.3.1. to 6.2.3.2. below do not apply.

6.2.3.1. Where the exhaust replacement silencing system, or components thereof, is a system or components with variable geometry, in the application for type-approval the manufacturer shall provide a statement in conformity with the Appendix to Annex 7 of the 03 series of amendments to Regulation No. 51 that the exhaust silencing system type to be approved complies with the requirements of paragraph 6.2.3. of this Regulation. The approval authority may require any relevant test to verify the compliance of the exhaust silencing system type to the additional sound emission provisions.

6.2.3.2. Where the exhaust replacement silencing system, or components thereof, is not a system with variable geometry, it is sufficient in the application for type-approval that the manufacturer provides a statement in conformity with the Appendix to Annex 7 of the 03 series of amendments to Regulation No. 51 that the exhaust silencing system

type to be approved complies with the requirements of paragraph 6.2.3. of this Regulation."

Paragraphs 6.3.4.1. and 6.3.4.2., amend to read:

"6.3.4.1. Test method with engine

The measurements shall be conducted on the engine referred to in paragraph 3.3.4. above coupled to a dynamometer. With the throttle completely open, the bench shall be adjusted so as to obtain the **rated** engine speed (*S*) corresponding to the rated maximum **net** power of the engine.

For the measurement of back pressure, the distance at which the pressure tap shall be placed from the exhaust manifold is indicated in Annex 4 to this Regulation.

6.3.4.2. Test method with vehicle

The measurements shall be carried out on the vehicle referred to in paragraph 3.3.3. above. The test shall be conducted either on the road or on a roller dynamometer.

With the throttle completely open, the engine shall be loaded so as to obtain the **rated** engine speed (**S**) corresponding to the rated maximum **net** power of the engine (~~engine speed *S*~~).

For the measurement of back pressure, the distance at which the pressure tap shall be placed from the exhaust manifold is indicated in Annex 4 to this Regulation."

Paragraph 6.4.1., amend to read:

"6.4.1. General

Sound absorbing fibrous materials may be used in **exhaust** silencing systems or components thereof only if:

- (a) The exhaust gas is not in contact with the fibrous materials; or if
- (b) The **exhaust** silencing system or the components thereof are of the same design family as systems or components for which it has been proven, in the course of the type approval process in accordance with the requirements of this Regulation, that they are not subject to deterioration.

Unless one of these conditions is fulfilled, the complete **exhaust** silencing system or component thereof shall be submitted to conventional conditioning using one of the three installations and procedures described below.

For the purposes of (b) above, a family of exhaust silencing system or exhaust silencing system components thereof shall be considered as being of the same design family when all of the following characteristics are the same:

- (a) the presence of net gas flow of the exhaust gases through the absorbing fibrous material when in contact with that material;**
- (b) the type of the fibres;**
- (c) where applicable, binder material specifications;**

- (d) average fibre dimensions;
- (e) minimum bulk material packing density in kg/m³;
- (f) maximum contact surface between the gas flow and the absorbing material."

Paragraph 6.4.1.3.6., amend to read:

"6.4.1.3.6. Engine speed shall be 75 percent of the speed (*S*) at which the engine develops **its rated** maximum **net** power."

Paragraph 6.4.1.3.7., amend to read:

"6.4.1.3.7. The power indicated by the dynamometer shall be 50 percent of the full-throttle **rated maximum net** power measured at 75 percent of **rated** engine speed (*S*)."

Annex 1,

Item 11., amend to read:

"11. ~~Engine~~**Rated maximum net** power (kW ECE): "

Item 15., amend to read:

"15. ~~Rated M~~**Rated maximum net** power: "

Items 17.1. and 17.2., amend to read:

"17.1. Vehicle in motion: ~~dB~~**dB(A)** at steady speed before acceleration of km/h

17.2. Vehicle stationary: ~~dB~~**dB(A)** with engine running at min⁻¹"

Appendix 1, delete the number of the Appendix.

Appendix, item 1.6.3., amend to read:

"**1.6.3. Rated maximum net power (g):** kW at
min -1 or maximum continuous rated power (electric motor):
 kW"

Appendix, item 3.2., delete "EU".

Annex 6,

Paragraph 1. (g) (v), amend to read: "**rated maximum net power**".

Paragraph 2., delete "EU".

Annex V

Adopted amendments to ECE/TRANS/WP.29/GRB/2014/7

Annex 6, new Appendix 5, paragraph 1, first indent, amend to read:

- "1. **Record dependency "distance-time" of rotating body decelerated from peripheral with a speed range such as 82 to 78 km/h or 62 to 58 km/h dependent on tyre class (Annex 6, paragraph 3.2., table 1) in a discrete form (figure 1) for a rotating body:**
- ..."

Annex 6, new Appendix 5, paragraph 1, note 1, amend to read:

- " **Note 1: The lower speed of the recording range may be reduced down to 60 km/h when test speed is 80 km/h and 40 km/h when the test speed is 60 km/h.**"

Annex VI

Draft Terms of Reference of GRB Informal Working Group (IWG) on a Quiet Road Transport Vehicles (QRTV) Regulation under the 1958 Agreement

A. Introduction

1. Following ECE/TRANS/WP.29/1110, para. 100, this proposal establishes Terms of Reference for a new IWG on QRTV Regulation under the 1958 Agreement in parallel to developing QRTV GTR.
2. The aim of the group is to propose a new Regulation based on audible alert for safety of vulnerable road users.
3. IWG on QRTV Regulation shall work in close cooperation with IWG QRTV for GTR.

B. Objective of IWG on QRTV Regulation

4. The scope and purpose of the Regulation is based on the QRTV GTR (ECE/TRANS/WP.29/AC.3/33, part IV). This Regulation will initially cover electric and hybrid electric vehicles of categories M and N. In a second phase, the scope may be extended.
5. IWG on QRTV Regulation shall develop harmonized test procedures for evaluating the conformity of potential audible sound characteristics and mechanisms.
6. IWG on QRTV Regulation shall take into account documents developed by IWG QRTV for GTR.
7. IWG on QRTV Regulation shall report to GRB.

C. Rules of Procedure

8. IWG on QRTV Regulation is open to all participants of GRB. However, it is recommended that a maximum of two technical experts per country and organization participate in this group.
9. IWG will be chaired by Germany and co-chaired by France and Japan. OICA will act as Secretary.
10. The working language will be English.
11. All documents and/or proposals must be submitted to the Secretary of IWG in a suitable electronic format at least one week before the session.
12. An agenda and the latest draft document will be circulated to all members of IWG in advance of all scheduled meetings.
13. All IWG documentation will be made available on the dedicated UNECE website.

D. Timeline

14. The aim of IWG is to present an informal document for consideration during the sixty-first session of GRB in January 2015. The final objective of IWG is to present a working document for consideration during the sixty-second session of GRB in September 2015.

Annex VII

GRB informal groups

<i>Informal group</i>	<i>Chair(s) and Co-chair(s)</i>	<i>Secretary</i>	<i>Expiry date of the mandate [pending WP.29 decision]</i>
Quiet road transport vehicles (QRTV) for GTR	Mr. Ezana Wondimneh (USA) Tel: +1 202 366 21 17 E-mail: Ezana.wondimneh@dot.gov Mr. Ichiro Sakamoto (Japan) Tel:+81 422 41 66 18 Fax:+81 422 76 86 04 E-mail: i-saka@ntsel.go.jp	Mr. Nickolas Kakizis (Directorate General Enterprise and Industry, European Commission) Tel:+32 2 298 87 32 Fax: +32 2 296 96 37 E-mail: nickolas.kakizis@ec.europa.eu	November 2015
Regulation No. 51 and Regulation No. 59	Mr. Nickolas Kakizis (Directorate General Enterprise and Industry, European Commission) Tel:+32 2 298 87 32 Fax: +32 2 296 96 37 E-mail: nickolas.kakizis@ec.europa.eu	Mr. Hans-Martin Gerhard (OICA) Tel: +49 711 911 82 868 Fax: +49 711 911 82 006 E-mail: hans-martin.gerhard@porsche.de	February 2015
[QRTV Regulation under 1958 Agreement]	Mr. Bernd Schüttler (Germany) Tel: +49 228 99300 4372 Fax: +49 228 99300807 4372 E-mail: bernd.schuetzler@bmvi.bund.de Mr. Louis-Ferdinand Pardo (France) Tel: +33 1 69 80 17 66 Fax: +33 1 69 80 17 09 E-mail: louis-ferdinand.pardo@utaceram.com Mr. Ichiro Sakamoto (Japan) Tel:+81 422 41 66 18 Fax:+81 422 76 86 04 E-mail: i-saka@ntsel.go.jp	Mr. Hanns-Peter Bietenbeck (OICA) Tel: +49 221 903 24 09 Fax: +49 221 903 25 46 E-mail: hbietenb@ford.com	[September 2015]