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World Forum for Harmonization of Vehicle Regulations

Working Party on Noise

Fifty-fourth session

Geneva, 19-21 September 2011

Report of the Working Party on Noise on its fifty-fourth session (19-21 September 2011)

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I. Attendance

1. The Working Party on Noise (GRB) held its fifty-fourth session from 19 (afternoon) to 21 (morning) September 2011 in Geneva, under the Chairmanship of Mr. Ch. Theis (Germany). 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 and Amend.1): Belgium; Canada; China; Czech Republic; France; Germany; India; Italy; Japan; Netherlands; Norway; Poland; Republic of Korea; Russian Federation; Spain; Sweden; Switzerland; United Kingdom of Great Britain and Northern Ireland and United States of America (USA). Experts from the following non-governmental organizations also participated: European Association of Automobile Suppliers (CLEPA); International Motorcycle Manufacturers Association (IMMA); International Organization for Standardization (ISO); International Organization of Motor Vehicle Manufacturers (OICA). Upon the special invitation of the Chair, experts from the following non-governmental organizations participated: European Federation for Transport and Environment (T&E); European Tyre and Rim Technical Organization (ETRTO); International Motorcycling Federation (FIM); World Blind Union (WBU).

II. Adoption of the agenda (agenda item 1)

Documentation: ECE/TRANS/WP.29/GRB/2011/9 and Add.1

2. GRB considered and adopted the agenda ECE/TRANS/WP.29/GRB/2011/9, including Add.1, and amended agenda item 13:

"13. Other business

Definitions and acronyms in Regulations under GRB responsibilities on the basis of an initiative of the Working Party on Pollution and Energy"

III. Regulation No. 41 (Noise of motorcycles) (agenda item 2)

3. GRB noted the update of the references to ISO standards into the Regulation and agreed to defer discussion at its February 2012 session (see para. 4 of this report).

IV. Regulation No. 51 (Noise of M and N categories of vehicles) (agenda item 3)

A. Development

Documentation: Informal documents GRB-54-06 and GRB-54-13

4. The expert from ISO introduced GRB-54-06 on the review of ISO 362-1:2007 and ISO 10844:2011 standards. He sought cooperation with other GRB experts to prepare amendments to a number of Regulations under GRB responsibility, to adapt them to the technical progress and to insert proper transitional provisions. The Chair of GRB suggested that this update should concern Regulation Nos. 9, 41, 51, 59, 63, 92 and 117. GRB noted a number of comments and agreed to resume discussion on this agenda item at its February 2012 session on the basis of a concrete proposal including transitional provisions.

5. The expert from the Netherlands recalled the information (GRB-54-13) given at the thirty-sixth session of GRB concerning the significant site to site variation of low noise ISO tracks.

B. New sound limit values

Documentation: Informal documents GRB-54-01, GRB-54-03, GRB-54-14, GRB-54-15 and GRB-54-16

6. GRB noted the final report commissioned by the European Commission on vehicle noise limit values (VENOLIVA: GRB-54-01). The expert from Germany introduced GRB-54-03, proposing three stages of reducing vehicle noise limit values for measurement method B, linked to categories of vehicles and transitional provisions. He explained that the proposal was a compromise among environmental benefits, technical feasibility for vehicle manufacturers and cost burden for consumers. The expert from Austria on behalf of the expert from Germany fully supported the proposal. The expert from Norway requested efforts for more ambitious targets and that the Working Group on Pollution and Energy (GRPE) should provide clarification on the noise effects of cold start engine test requirements for the next session of GRB. The expert from Italy supported in principle the proposal. However, he stated that: (i) the additional transitional period in stage 1 for new vehicle registration would be an unnecessary burden for type approval authorities and (ii) for stage 3 a revision clause on limit values would be needed due to its long time span. Moreover, the expert from the United Kingdom also supported the proposal and underlined that the long time period between stages was welcome on the condition of respect to the high power sport cars where platform life is longer than conventional cars. The expert from the Netherlands welcomed the proposal (including vehicle classification) as a good basis for discussion and envisaged particularly stage 3. However, he added that further discussion was needed on limit values and proper time schedule for heavy duty vehicles. The experts from France and Sweden also supported the proposal as a first approach. Finally, the proposal tabled by the expert from Germany received in principle support from GRB experts as a realistic first step of discussion.

7. The expert from Japan introduced GRB-54-14 and GRB-54-16 proposing a review of subcategories of vehicles with respect to the new limit values. He also introduced GRB-54-15 proposing a categorization of Kei N₁ vehicles. GRB agreed to resume discussion on this subject at its February 2012 session on the basis of a revised proposal by the expert from Japan. Finally, the expert from the Netherlands volunteered, with the assistance of the expert from OICA, to prepare an informal consolidated version of Regulation No. 51 for the next GRB session, to facilitate future discussions on new limit values and subcategories of vehicles concerning measurement method B.

C. Additional sound emission provisions

Documentation: ECE/TRANS/WP.29/2011/64, ECE/TRANS/WP.29/GRB/2011/2, Informal documents GRB-53-27 and GRB-54-17

8. GRB noted the decision of the World Forum for Harmonization of Vehicle Regulations (WP.29) at its June 2011 session, to postpone the voting of ECE/TRANS/WP.29/2011/64 (superseding ECE/TRANS/WP.29/GRB/2011/2 and GRB-53-27) to a further session, awaiting a proposal for limit values to be submitted by GRB (see ECE/TRANS/WP.29/1091, para. 54).

9. The expert from the Netherlands, Chair of the informal working group on Additional Sound Emission Provisions (ASEP), introduced GRB-54-17 to recognize the work done by

the group. He concluded that further efforts should be made to solidify a policy proposal on limit values, as with the intended purpose.

V. Regulation No. 59 (Replacement silencing systems) (agenda item 4)

Documentation: Informal documents GRB-54-06 and GRB-54-09

10. The expert from CLEPA introduced GRB-54-09 proposing the inclusion of the additional sound emission provisions (ASEP) also into Regulation No. 59. The proposal received comments from GRB experts, such as the deletion of the proposed tolerance of 4 dB(A), unless technical rationales are provided for justification. GRB agreed to resume discussion at its February 2012 session on the basis of a revised proposal tabled by the expert from CLEPA.

VI. Regulation No. 92 (Replacement exhaust silencing systems for motorcycles) (agenda item 5)

Documentation: ECE/TRANS/WP.29/GRB/2011/10
Informal document GRB-54-04

11. Referring to the discussion at its previous GRB session, the expert from Italy introduced ECE/TRANS/WP.29/GRB/2011/10, proposing a revised version of Regulation No. 92 taking into account the recent revisions of Regulations Nos. 9, 41 and 63. GRB adopted ECE/TRANS/WP.29/GRB/2011/10 (amended by GRB-54-04), as amended by Annex II of this report. The secretariat was requested to submit the proposal to WP.29 and AC.1, for consideration and vote at their March 2012 sessions, as draft 01 series of amendments to Regulation No. 92.

VII. Regulation No. 117 (Tyre rolling noise and wet grip adhesion) (agenda item 6)

Documentation: ECE/TRANS/WP.29/GRB/2011/11,
ECE/TRANS/WP.29/GRRF/2011/12
ECE/TRANS/WP.29/GRRF/2011/29,
ECE/TRANS/WP.29/GRRF/2011/30,
Informal documents GRB-54-02, GRB-54-06, GRB-54-08,
GRB-54-10, GRB-54-12-Rev.1, GRRF-69-23, GRRF-71-29 and
GRRF-71-31

12. The expert from the Russian Federation introduced ECE/TRANS/WP.29/GRB/2011/11, aimed at improving the test provisions for measuring the rolling resistance of tyres. The proposal received several comments (GRB-54-02, GRB-54-08 and GRB-54-10 amongst others). The Chair of GRB introduced GRB-54-12-Rev.1 proposing to amend ECE/TRANS/WP.29/GRB/2011/11. He clarified that the proposal did not affect the existing methods but result in a further option to the deceleration method. GRB adopted ECE/TRANS/WP.29/GRB/2011/11 as reproduced by Annex III to this report. However, some GRB experts suggested further technical assessment of the proposed alternative method to the next GRB sessions. The secretariat was requested to submit the proposal to WP.29 and AC.1, for consideration at their March 2012 sessions, as draft Supplement 1 to the 02 series of amendments to Regulation No. 117.

13. GRB noted also the work progress of the Working Party on Brakes and Running Gear (GRRF) on matters of common interest with GRB (ECE/TRANS/WP.29/GRRF/2011/12, ECE/TRANS/WP.29/GRRF/2011/29, ECE/TRANS/WP.29/GRRF/2011/30, GRRF-69-23, GRRF-71-29 and GRRF-71-31). Particularly, GRB endorsed ECE/TRANS/WP.29/GRRF/2011/30, inserting a new definition of C3 class tyres adopted by GRRF at its September session.

VIII. Collective amendments to Regulations Nos. 41 (Noise of motorcycles), 51 (Noise of M and N categories of vehicles) and 59 (Replacement silencing systems) (agenda item 7)

14. GRB agreed to defer discussion on this agenda item to its February 2012 session, awaiting a concrete proposal from the expert of the Netherlands to harmonize the terminology used in the Regulations concerned.

IX. Exchange of information on national and international requirements on noise levels (agenda item 8)

Documentation: Informal document GRB-54-11

15. The expert from the Netherlands introduced GRB-54-11, showing a research initiative in his country on a road side noise inspection test with a roller-bench. The expert from FIM expressed concerns on the legal implications of this type of inspection test. The expert from IMMA supported the initiative as a contribution to possible pragmatic and successful law enforcement to cope moped noise issues, such as tampering. GRB agreed to resume consideration on this matter at its next session and expected to receive also information from the expert of Finland on a similar initiative in progress in her country.

X. Influence of road surface on tyre rolling sound emissions (agenda item 9)

16. GRB noted that no new information had been given under this agenda item.

XI. Quiet road transport vehicles (agenda item 10)

Documentation: Informal documents GRB-54-07 and GRB-54-18

17. The Chair of the informal working group on Quiet Road Transport Vehicles (QRTV), reported on the good progress (GRB-54-18) made by the group at its sixth and seventh meetings held in San Diego, California, USA on 15 May 2011 and in Osaka, Japan on 31 August 2011. He announced that the next meeting of the group was planned to be held in Baltimore, Maryland, USA on 18 October 2011. He clarified that the group was focusing on key elements such as definitions, applicability, type of sound produced, etc. He underlined the need of benchmarking on silent vehicles (i.e. establishing maximum sound level at speeds below 30 to 20 km/h). He added that vehicle speed and tires were fundamental in this process. Referring to the discussion during the last session of the Executive Committee of the 1998 Agreement (AC.3) (see ECE/TRANS/WP.29/1091, para. 112), the expert from the United States of America informed GRB that his country will co-sponsor, with Japan, a proposal for developing a UN GTR (through GRB/QRTV) to ensure harmonization with the current development of a proposed regulation in his country. He

added that according to the notice of intent (NOI) of the National Highway Traffic Safety Administration (NHTSA), an environmental assessment, together with a Notice of Proposed Rulemaking (NPRM) would be published in July 2012 (www.gpo.gov/fdsys/pkg/FR-2011-07-12/pdf/2011-17341.pdf). The Chair of the GRB presented his understanding of the USA timeline and questioned the very short time to finalize the performance requirements of the USA regulation and the UN GTR. The expert from the United States of America stated that the development of the draft UN GTR should follow the timeline of NHTSA rulemaking process and that probably the broad range of options that he believes will be initially proposed in the NPRM, would be reduced in the rulemaking process, easing GRB's task. The Chair of QRTV suggested that his understanding of the USA regulation process, meaningful discussions and alignment of the USA regulation and the UN GTR may be precluded by USA law regarding ex-parte discussions once the NPRM is issued.

18. The WBU expert, informed GRB about the perception needs of visually impaired people to locate a vehicle, its direction and speed. He added that specific noises (i.e.: acceleration, deceleration and idling) of internal combustion engine (ICE) vehicles were important information in identifying vehicle distance, as is also the case for vulnerable road users such as children and elderly people. In this respect, the Chair of QRTV informed GRB that his group was identifying criteria to have the most informative audible warning device.

19. The expert from the United Kingdom informed GRB about the project report of the Transport Research Laboratory (TRL) on the assessment of perceived safety risk from quiet electric and hybrid vehicles to vision-impaired pedestrians (www.dft.gov.uk/publications/trl-report-ppr525). Finally GRB noted an article (GRB-54-07) submitted by the expert from the Netherlands on effects of electric vehicles on road safety.

20. GRB agreed to resume discussion of this agenda item at its February 2012 session, awaiting the proposal for developing a UN GTR by Japan and United States of America and the outcome of the next meeting of informal working group on QRTV.

XII. Environmentally friendly vehicles (agenda item 11)

21. GRB noted the discussion on this subject held at the June 2011 session of WP.29 (see ECE/TRANS/WP.29/1091, para. 74) and that the venue and date of the next EFV conference would be confirmed at the November session of WP.29.

XIII. Election of officers (agenda item 12)

22. In compliance with Rule 37 of the Rules of Procedure (TRANS/WP.29/690 and Amend.1), GRB elected its officers on Wednesday afternoon. Mr. C. Theis (Germany) was unanimously re-elected Chair of GRB for the sessions scheduled in 2012.

XIV. Other business (agenda item 13)

Definitions and acronyms in Regulations under GRB responsibilities on the basis of an initiative of the Working Party on Pollution and Energy

Documentation: Informal document GRB-54-05

23. GRB was informed about the current intention of GRPE to list all definitions and acronyms currently in the Regulations on noise emissions under its responsibility to avoid misconception when used in other Regulations. In this respect it was noted that RESS acronym (Replacement Exhaust Silencing Systems) was also used by the Working Party on Passive Safety (GRSP) for Rechargeable Energy Storage Systems. GRB agreed to resume discussion at its February 2012 session on the basis of a proposal voluntarily prepared by the experts from OICA and ISO.

24. The expert from the Russian Federation introduced GRB-54-05, proposing a revision of the titles of Regulations under GRB responsibilities. The proposal received comments from GRB experts, such as to replace the word "noise" with "sound" in all the texts of Regulations. GRB agreed to resume discussion on this subject on the basis of a proposal jointly prepared by the experts from the Russian Federation and the Netherlands.

25. GRB also agreed to revise the scope of noise Regulations annexed to the 1958 Agreement, shown by categories of vehicles in the Consolidated Resolution on the Construction of Vehicles (R.E.3) with the intention to include especially L₆ and L₇ categories. Accordingly it was agreed to introduce a new agenda item on this subject in the agenda of the February 2012 session of GRB.

XV. Provisional agenda for the fifty-fifth session

26. The following provisional agenda was adopted for the fifty-fifth session of GRB, scheduled to be held in Geneva from 7 (starting at 2.30 p.m.) to 9 (concluding at 5.30 p.m.) February 2012:

1. Adoption of the agenda.
2. Regulation No. 41 (Noise of motorcycles): Development.
3. Regulation No. 51 (Noise of M and N categories of vehicles):
 - (a) Development;
 - (b) New limit values;
 - (c) Additional sound emission provisions.
4. Regulation No. 59 (Replacement silencing systems).
5. Regulation No. 92 (Replacement exhaust silencing systems for motorcycles).
6. Regulation No. 117 (Tyre rolling noise and wet grip adhesion).
7. Collective amendments:
 - (a) Regulations Nos. 41, 51 and 59;
 - (b) Regulations Nos. 9 and 63.

8. Exchange of information on national and international requirements on noise levels.
9. Influence of road surface on tyre rolling sound emissions.
10. Quiet Road Transport Vehicles.
11. Definitions and acronyms in Regulations under GRB responsibilities.
12. Proposal for amendments to Consolidated Resolution on the Construction of Vehicles.
13. Environmentally Friendly Vehicles.
14. Other business.

Annexes

Annex I

List of informal documents (GRB-54-...) distributed during the session

<i>Symbol Transmitted by</i>	<i>Agenda item</i>	<i>Language</i>	<i>Title</i>	<i>Follow-up</i>
1 EC	3(b)	E	VENOLIVA - Vehicle Noise Limit Values - Final Report	(c)
2 ETRTO	6	E	Comments on document GRB-53-11 - Proposal for draft amendments to Regulation No. 117 (Tyre rolling noise, wet grip adhesion and rolling resistance)	(a)
3 Germany	3(b)	E	German Position on new limit values for 03 series of amendments to Regulation No. 51(Noise emissions)	(c)
4 Germany	5	E	Proposal of changes to the Italian Proposal for the 01 series of amendments to Regulation No. 92 (RESS) ECE/TRANS/WP.29/GRB/2011/10	(a)
5 Russian Federation	13	E	Proposal for draft amendments to titles of the UNECE Regulations related to vehicle and tyre noise emissions	(a)
6 ISO	3(a) & 4	E	Discussion for draft amendments to Regulation Nos. 51, 59, and 117	(a)
7 The Netherlands	10	E	SWOV newsletter electric vehicles	(a)
8 ETRTO	6	E	ETRTO comments on ECE/TRANS/WP.29/GRB/2011/11	(a)
9 CLEPA	4	E	Draft proposal of amendments to Regulation No. 59 (Replacement Silencing Systems)	(a)

<i>Symbol Transmitted by</i>	<i>Agenda item</i>	<i>Language</i>	<i>Title</i>	<i>Follow-up</i>
10 ISO	6	E	Rolling Resistance Standards Work at ISO (TC31 WG6)	(a)
11 The Netherlands	8	E	Research into a new road side enforcement test for the noise emission of mopeds	(a)
12/ Rev.1 GRB Chair	6	E	Proposal of amendment to ECE/TRANS/WP.29/GRB/2011/11	(d)
13 The Netherlands	10	E	Increased site to site variation due to specially designed low noise ISO tracks	(a)
14 Japan	3(b)	E	Proposal for subcategories of CVs (N ₂ , N ₃ , M ₂ , M ₃)	(a)
15 Japan	3(b)	E	Kei-truck of N ₁	(a)
16 Japan	3(b)	E	Difference between TNO and OICA Analysis for M ₁ Sub Categories	(a)
17 The Netherlands	3(c)	E	Five years Additional Sound Emission Proposal (ASEP) Informal Working Group (Regulation No. 51)	(a)
18 Chair of QRTV	10	E	Chairman's Report to 54th Session of the GRB	(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

Amendments to Regulation No. 92

Amendments adopted to ECE/TRANS/WP.29/GRB/2011/10 (see para. 11 of the report)

...

Paragraph 6.2., amend to read:

"6.2. **Specifications regarding sound levels**

The acoustic efficiency of the RESS or components thereof shall be verified by means of the methods described in **Regulation Nos. 9, 41 or 63. In particular, for the application of this paragraph reference shall be made to the series of amendments to Regulation No. 92 which was in force at the time of type approval of the new vehicle.** When the RESS or its components is fitted to the motorcycle, moped or three-wheeled vehicle described in paragraph **3.3.(c)**, the sound level values obtained using the two methods (stationary and running vehicle) shall satisfy ~~one~~ of the following condition:

They shall not exceed the values measured in conformity with the requirements of paragraph **3.3.(c)**, for the same moped, motorcycle, or three-wheeled vehicle when fitted with the original silencing system during either the running test or the stationary test."

...

Paragraph 9.1., amend to read:

"9.1. The approval granted ... in paragraph **8.(b)** above ⁴.

..."

...

Annex III

Amendments to Regulation No. 117

Amendments adopted to ECE/TRANS/WP.29/GRB/2011/11 (see para. 12 of the report)

Annex 6

Paragraph 3.5., amend to read:

"3.5. Duration and speed.

When the deceleration method is selected, the following requirements apply:

- (a) **The deceleration j shall be determined in exact $d\omega/dt$ or approximate $\Delta\omega/\Delta t$ form, where ω is angular velocity, t – time;**
- (b) For duration Δt , the time increments shall not exceed 0.5 s;
- (c) Any variation of the test drum speed shall not exceed 1 km/h within one time increment."

Paragraph 4.6.2., amend to read:

"4.6.2. Deceleration method

The deceleration method follows the procedure below:

- (a) Remove the tyre from the test surface;
- (b) Record the deceleration of the test drum $\Delta\omega_{D0}/\Delta t$ and that of the unloaded tyre $\Delta\omega_{T0}/\Delta t^3$ **or record the deceleration of the test drum j_{D0} and that of the unloaded tyre j_{T0} in exact or approximate form in accordance with paragraph 3.5."**

Paragraph 5.1.5., amend to read:

"5.1.5. Deceleration method

Calculate the parasitic losses F_{pl} , in newton.

$$F_{pl} = \frac{I_D}{R} \left(\frac{\Delta\omega_{D0}}{\Delta t_0} \right) + \frac{I_T}{R_r} \left(\frac{\Delta\omega_{T0}}{\Delta t_0} \right)$$

Where:

- I_D is the test drum inertia in rotation, in kilogram meter squared,
- R is the test drum surface radius, in meter,
- ω_{D0} is the test drum angular speed, without tyre, in radians per second,
- Δt_0 is the time increment chosen for the measurement of the parasitic losses without tyre, in second,
- I_T is the spindle, tyre and wheel inertia in rotation, in kilogram meter squared,
- R is the tyre rolling radius, in metre,
- ω_{T0} is the tyre angular speed, unloaded tyre, in radian per second.

or

$$F_{pl} = \frac{I_D}{R} j_{D0} + \frac{I_T}{R_r} j_{T0}$$

Where:

- I_D** is the test drum inertia in rotation, in kilogram meter squared,
 R is the test drum surface radius, in meter,
 j_{D0} is the deceleration of the test drum, without tyre, in radians per second squared,
 I_T is the spindle, tyre and wheel inertia in rotation, in kilogram meter squared,
 R_r is the tyre rolling radius, in metre,
 j_{T0} is the deceleration of unloaded tyre, in radians per second squared."

Paragraph 5.2.5., amend to read:

"5.2.5. Deceleration method

The rolling resistance F_r , in newton, is calculated using the equation:

$$F_r = \frac{I_D}{R} \left(\frac{\Delta\omega_v}{\Delta t_v} \right) + \frac{RI_T}{R_r^2} \left(\frac{\Delta\omega_v}{\Delta t_v} \right) - F_{pl}$$

Where:

- I_D** is the test drum inertia in rotation, in kilogram metre squared,
 R is the test drum surface radius, in meter,
 F_{pl} represents the parasitic losses as calculated in paragraph 5.1.5.,
 Δt_v is the time increment chosen for measurement, in second,
 $\Delta\omega_v$ is the test drum angular speed increment, without tyre, in radian per second,
 I_T is the spindle, tyre and wheel inertia in rotation, in kilogram metre squared,
 R_r is the tyre rolling radius, in metre,
 F_r is the rolling resistance, in newton.

or

$$Fr = \frac{I_D}{R} j_V + \frac{RI_T}{R_r^2} j_V - F_{pl}$$

Where:

I_D is the test drum inertia in rotation, in kilogram metre squared,

R is the test drum surface radius, in meter,

F_{pl} represents the parasitic losses as calculated in paragraph 5.1.5.,

j_V is the deceleration of the test drum, in radians per second squared,

I_T is the spindle, tyre and wheel inertia in rotation, in kilogram metre squared,

R_r is the tyre rolling radius, in metre,

F_r is the rolling resistance, in newton."

Annex 6, Appendix 1

Paragraph 4, amend to read:

"4. Control accuracy

...

(d) time: +/- ~~0.02 s~~ **0.5 ms**

..."

Annex IV

GRB informal groups

Informal group	Chair(s)	Secretary
Motorcycle noise emissions (Regulation No. 41)	Mr. A. Erario (Italy) Tel: +39 06 4158 6228 Fax: +39 06 4158 3253 E-mail: antonio.erario@mit.gov.it	Mr. E. Segers (IMMA) Tel: +32 53725352 Fax: +32 53725350 E-mail: Erwin.segers@honda-eu.com
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