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**Economic Commission for Europe****Inland Transport Committee****World Forum for Harmonization of Vehicle Regulations****Working Party on Noise****Sixty-eighth session**

Geneva, 12–14 September 2018

Item 4 (a) of the provisional agenda

**UN Regulation No. 51 (Noise of M and N categories of vehicles):****Development****Proposal for Supplement 5 to the 03 series of amendments to  
UN Regulation No. 51 (Noise of M and N categories of  
vehicles)****Submitted by the Informal Working Group on Additional Sound  
Emission Provisions\***

The text reproduced below was prepared by the Informal Working Group (IWG) on Additional Sound Emission Provisions (ASEP) to update and revise Supplement 4 to the 03 series of amendments to UN Regulation No. 51. The proposed amendments are based on draft Supplement 4 to the 03 series of amendments to UN Regulation No. 51, which was adopted by the Working Party on Noise at its sixty-seventh session (ECE/TRANS/WP.29/GRB/2018/2, Informal document GRB-67-17 and ECE/TRANS/WP.29/2018/63). The modifications are marked in bold for new or strikethrough for deleted characters.

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\* In accordance with the programme of work of the Inland Transport Committee for 2018–2019 (ECE/TRANS/274, para. 123 and ECE/TRANS/2018/21/Add.1, Cluster 3), the World Forum will develop, harmonize and update UN Regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.



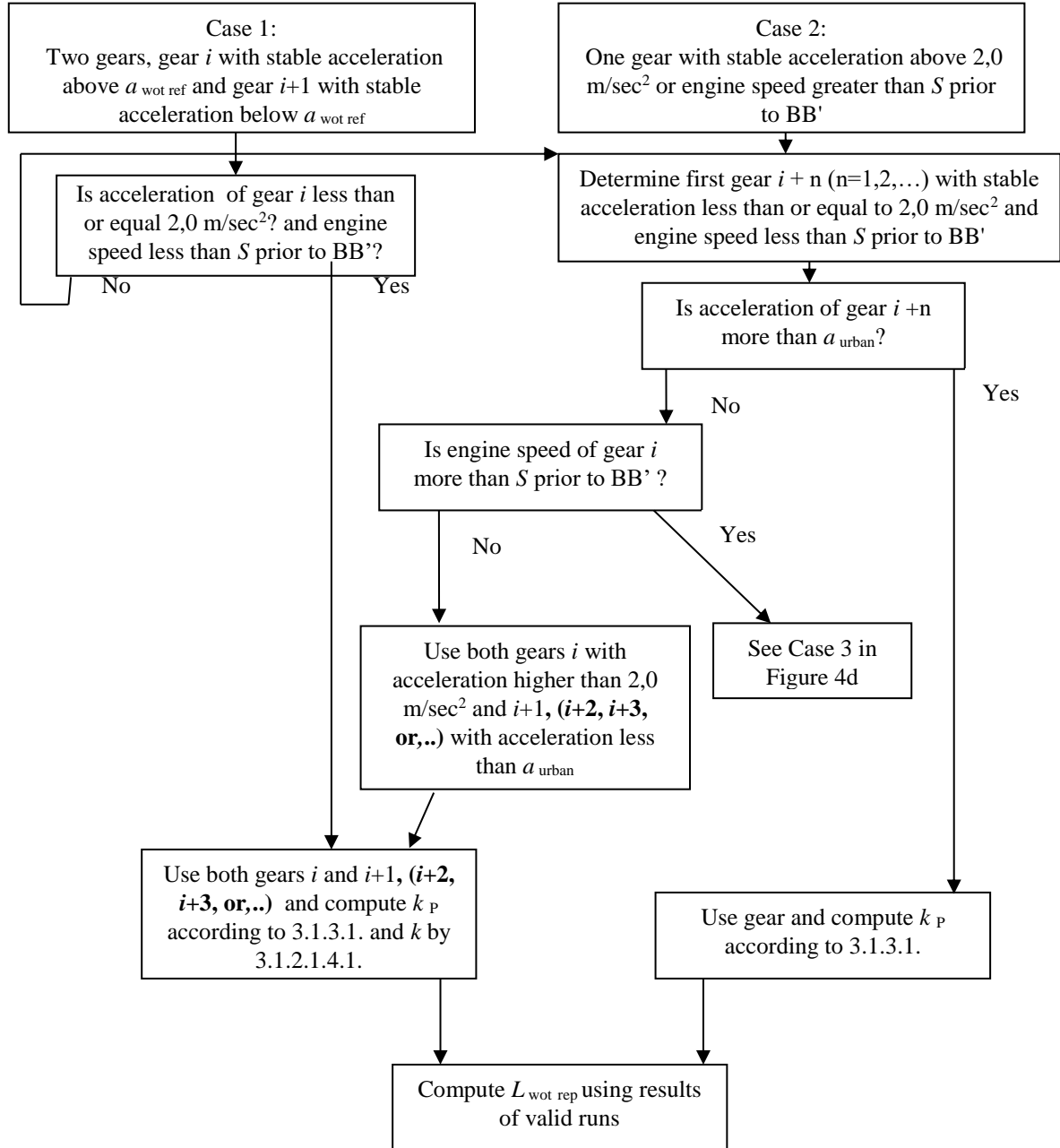
# I. Proposal

Appendix to Annex 3, Figure 3c, amend to read:

“Figure 3c

Flowchart for vehicles tested according to paragraph 3.1.2.1. of Annex 3 to this Regulation

– Gear selection using locked gear PART 2”



Appendix to Annex 3, Table 1, amend to read:

"Table 1. Examples for Devices and Measures to Enable a Vehicle Tested within the Acceleration Boundaries

No.	Impact	Sub No.	Measure	Additional Requirements
1	Lock of a discrete gear ratio	1*	A discrete gear ratio can be locked by the driver	none
		2	A discrete gear ratio is available onboard, but is not available to the driver. Locking can be activated by the manufacturer with an on board (hidden) function or with an external device	none
2	Controlled gear shift management: Applicable to transmissions which cannot be locked, or where no locked gear provides a valid test result	1*	Kickdown is deactivated	none
		2	Gear shift change(s) can happen during the test, gear shift is controlled by activation of an internal function or external device	Acceleration** shall be between $a_{urban}$ and $a_{wot,ref}$ , not exceeding 2.0 m/s <sup>2</sup> .
3	Defined partial load driving****	1	Acceleration is limited by a mechanical device	<b>Defined</b> acceleration** shall be between $a_{urban}$ and $a_{wot,ref}$ , not exceeding 2.0 m/s <sup>2</sup> . <b>For ASEP**, the anchor point parameter are calculated by:</b>
		2	External Programming for partial load acceleration****	$L_{anchor} = (L_{test} - k_p * L_{crs}) / (1 - k_p)$ with $k_p = 1 - a_{test} / a_{wot,ref}$ <b>and <math>a_{wot,ref}</math> according to 3.1.2.1.2.4. but not higher than 2.0 m/s<sup>2</sup></b> $n_{anchor} = n_{bb,test} * 3.6 / v_{bb,test} * (a_{wot,ref} * (20 + 2 * l_{veh}) + 192,9)^{0,5}$
4	Mixed Solution (Mode): This measure will be a mix of the above solutions combined in a specific mode	1*	Mode is available onboard and can be selected by the driver	none
		2	Mode is available onboard and can only be activated by the manufacturer with a hidden function or an external device	none
		3	Mode is not available onboard, an external software overrides the internal software	Acceleration** shall be between $a_{urban}$ and $a_{wot,ref}$ , not exceeding 2.0 m/s <sup>2</sup> .

\* Comment: This is a standard situation, already covered by the Regulation text.

\*\* Applicable to vehicles of category M<sub>1</sub>, N<sub>1</sub> and M<sub>2</sub> ≤ 3,500 kg.

\*\*\* Partial load shall be achieved by simulation of the travel restriction of the accelerator. It is not allowed to interfere with the engine control management.

\*\*\*\* Applicable ~~only to Pure Electric Vehicle (PEV) as defined in UN R83.07 Revision 5, paragraph 2.30.~~ to vehicles of category M<sub>1</sub>, N<sub>1</sub> and M<sub>2</sub> ≤ 3,500 kg, for the further calculation of L<sub>urban</sub> in Annex 3 the sound level measured under partial load shall replace the sound level under wide open throttle.

The achieved acceleration under partial load during the test shall be used for the calculation of the part power factor  $k_p$  instead of  $a_{wot\ ref}$ .

The test procedure and the data processing follow the same principle. Although it is tested in partial load, symbols  $x_{wot}$  (e.g.  $L_{wot}$ ,  $a_{wot}$ , ...) shall be used. ”

*Annex 7, paragraph 5.2, amend to read:*

“5.2. The determination of gear  $\alpha$  is as follows:

$\alpha = 3$  for ~~all~~ manual transmission and for automatic transmission tested in locked position with up to 5 gears;

$\alpha = 4$  for **manual transmission and for** automatic transmission tested in locked position with 6 or more gears. If the acceleration calculated from AA to BB + vehicle length in gear 4 exceeds  $1.9\text{ m/s}^2$ , the first higher gear  $\alpha > 4$  with an acceleration lower than or equal to  $1.9\text{ m/s}^2$  shall be chosen.

For vehicles tested under non-locked condition, the gear ratio for further calculation shall be determined from the acceleration test result in Annex 3 using the reported engine speed and vehicle speed at line BB'.”

## II. Justification

*Appendix to Annex3, Figure 3c*

1. The proposed change aligns the flowchart with the amendment to paragraph 3.1.2.1.4.1 (c) of Supplement 3 to the 03 series of amendments to UN Regulation No. 51.

*Appendix to Annex 3, Table 1*

2. At the sixty-seventh session of GRB, the expert from OICA proposed amendments to UN Regulation No. 51 with the aim to ensure transparency during the type approval process in situations where the manufacturer could either use mechanical or electronic devices to control the gear shift, or take measures to avoid accelerations greater than  $2.0\text{ m/s}^2$  (ECE/TRANS/WP.29/GRB/2018/2 and GRB-67-17). The proposal agreed by GRB was limited to pure electric vehicles only (ECE/TRANS/WP.29/GRB/65, Annex III). In this working document, IWG ASEP proposes extension to all vehicles. The proposed change aligns the flowchart with the amendment to paragraph 3.1.2.1.4.1 (c) of Supplement 3 to the 03 series of amendments to UN Regulation No. 51.

*Annex 7, paragraph 5.2.*

3. This proposal aligns the principle of testing between automatic and manual transmission having more than 5 gears. This compensates the progress of technology towards more fuel efficient and environmentally friendly vehicles leading to higher number of gears. It avoids that a vehicle design offered as manual and automatic transmission is tested at very different condition just because of the transmission design.