



Economic Commission for Europe**Inland Transport Committee****World Forum for Harmonization of Vehicle Regulations****Working Party on Noise and Tyres****Seventy-seventh session**

Geneva, 7–10 February 2023

Item 3 of the provisional agenda

UN Regulation No. 51 (Noise of M and N categories of vehicles)**Proposal for corrections to the 03 series of amendments to
UN Regulation No. 51****Submitted by the experts from the Informal Working Group on
Measurement Uncertainties, the Informal Working Group on
Additional Sound Emission Provisions and from the International
Organization for Standardization***

The text reproduced below includes editorial corrections and clarifications that has been prepared by the experts from the Informal Working Group on Measurement Uncertainties (IWG MU), the Informal Working on Additional Sound Emission Provisions (ASEP) and from the International Organization for Standardization (ISO). The proposed changes are based on the 03 series of amendment to UN Regulation No. 51 up to Supplement 7. The modifications are marked in bold for new or strikethrough for deleted characters.

* In accordance with the programme of work of the Inland Transport Committee for 2023 as outlined in proposed programme budget for 2023 (A/77/6 (Sect. 20), table 20.6), 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

Paragraph 2.24., amend to read:

"2.24. Table of symbols

...
$L_{crs(i)}$	dB(A)	Annex 3	3.1.3.4.1.2.	vehicle sound pressure level at constant speed test for gear i ; value to be reported and used for calculations to the first decimal place
$L_{crs(i+1)}$	dB(A)	Annex 3	3.1.3.4.1.2.	vehicle sound pressure level at constant speed test for gear $(i+1)$; value to be reported and used for calculations to the first decimal place
$L_{crs\ rep}$	dB(A)	Annex 3	3.1.3.4.1.2.	reported vehicle sound pressure level at constant speed test; value to be reported and used for calculations to the first decimal place
$L_{wot(i)}$	dB(A)	Annex 3	3.1.3.4.1.2.	vehicle sound pressure level at wide-open-throttle test for gear i ; value to be reported and used for calculations to the first decimal place
$L_{wot(i+1)}$	dB(A)	Annex 3	3.1.3.4.1.2.	vehicle sound pressure level at wide-open-throttle test for gear $(i+1)$; value to be reported and used for calculations to the first decimal place
$L_{wot\ rep}$	dB(A)	Annex 3	3.1.3.4.1.2.	reported vehicle sound pressure level at wide-open-throttle; value to be reported and used for calculations to the first decimal place
L_{urban}	dB(A)	Annex 3	3.1.3.4.1.2.	reported vehicle sound pressure level representing urban operation; value to be reported mathematically rounded to the nearest integer
...

"

Annex 3,

Paragraph 3.1.2.1.3., amend to read:

"3.1.2.1.3. Partial power factor k_p

The partial power factor k_p (see paragraph 3.1.3.4.1.2.) is used for the weighted combination of the test results of the acceleration test and the constant speed test for vehicles of category M_1 and N_1 and $M_2 \leq 3,500$ kg technically permissible maximum laden mass

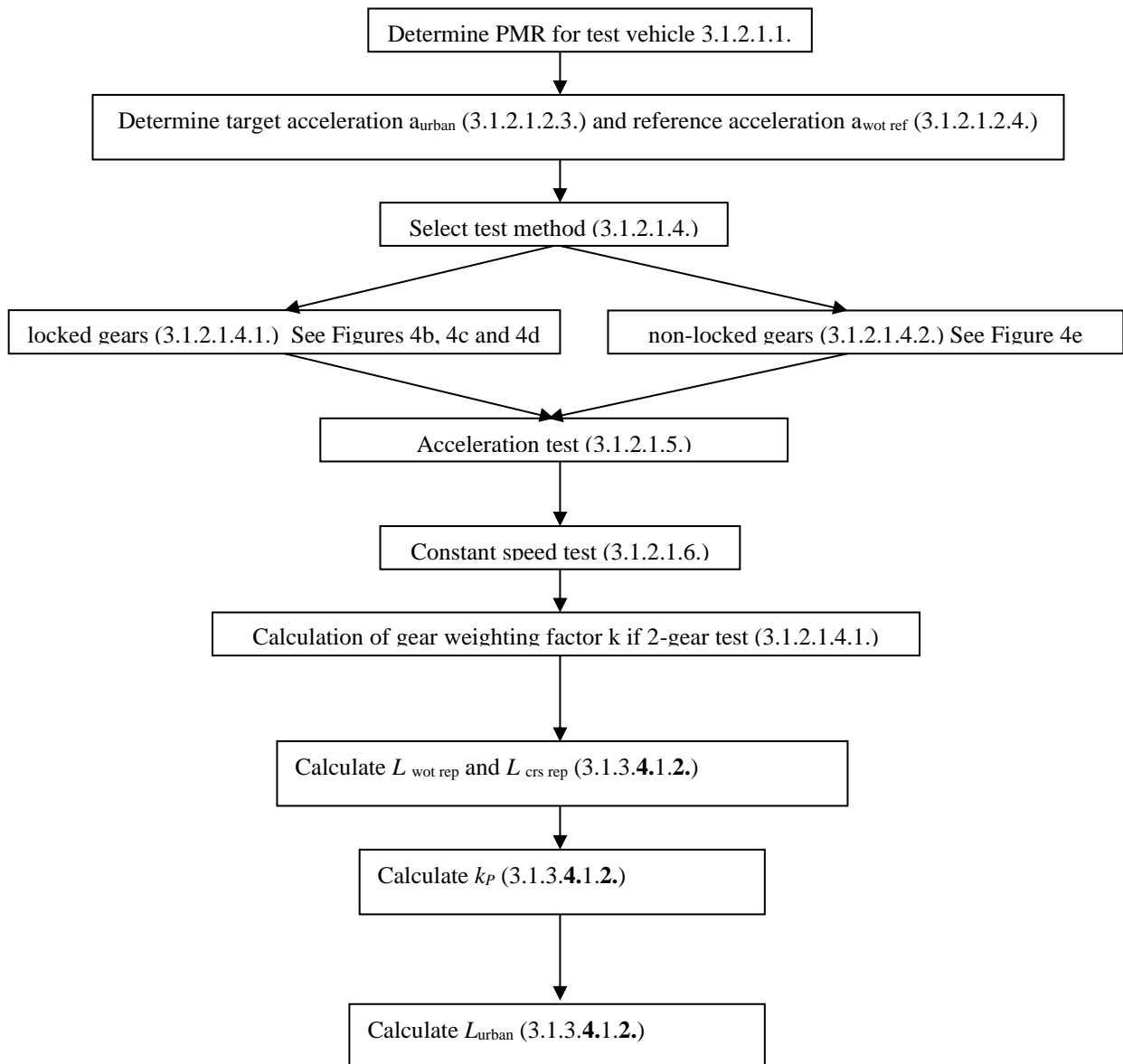
In cases other than a single gear test, $a_{wot\ ref}$ shall be used instead of $a_{wot\ test}$ (see paragraph 3.1.3.4.1.2.)."

Annex 3, Appendix 1,

Figure 4a, amend to read:

"Figure 4a

Flowchart for vehicles tested according to paragraph 3.1.2.1. of Annex 3 to this Regulation – L_{urban} computation

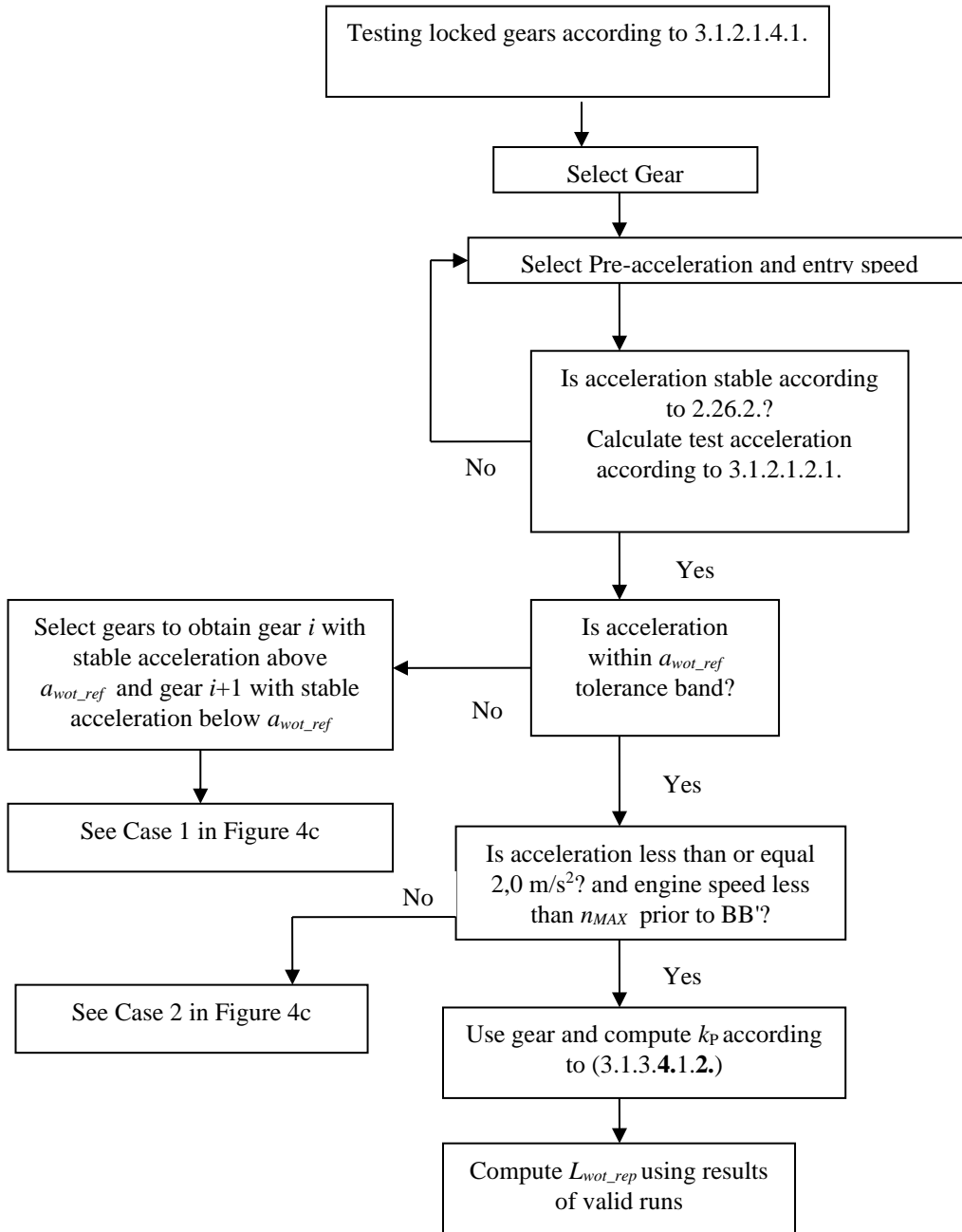


"

Figure 4b, amend to read:

"Figure 4b

Flowchart for vehicles tested according to paragraph 3.1.2.1. of Annex 3 to this Regulation - Gear selection using locked gear PART 1

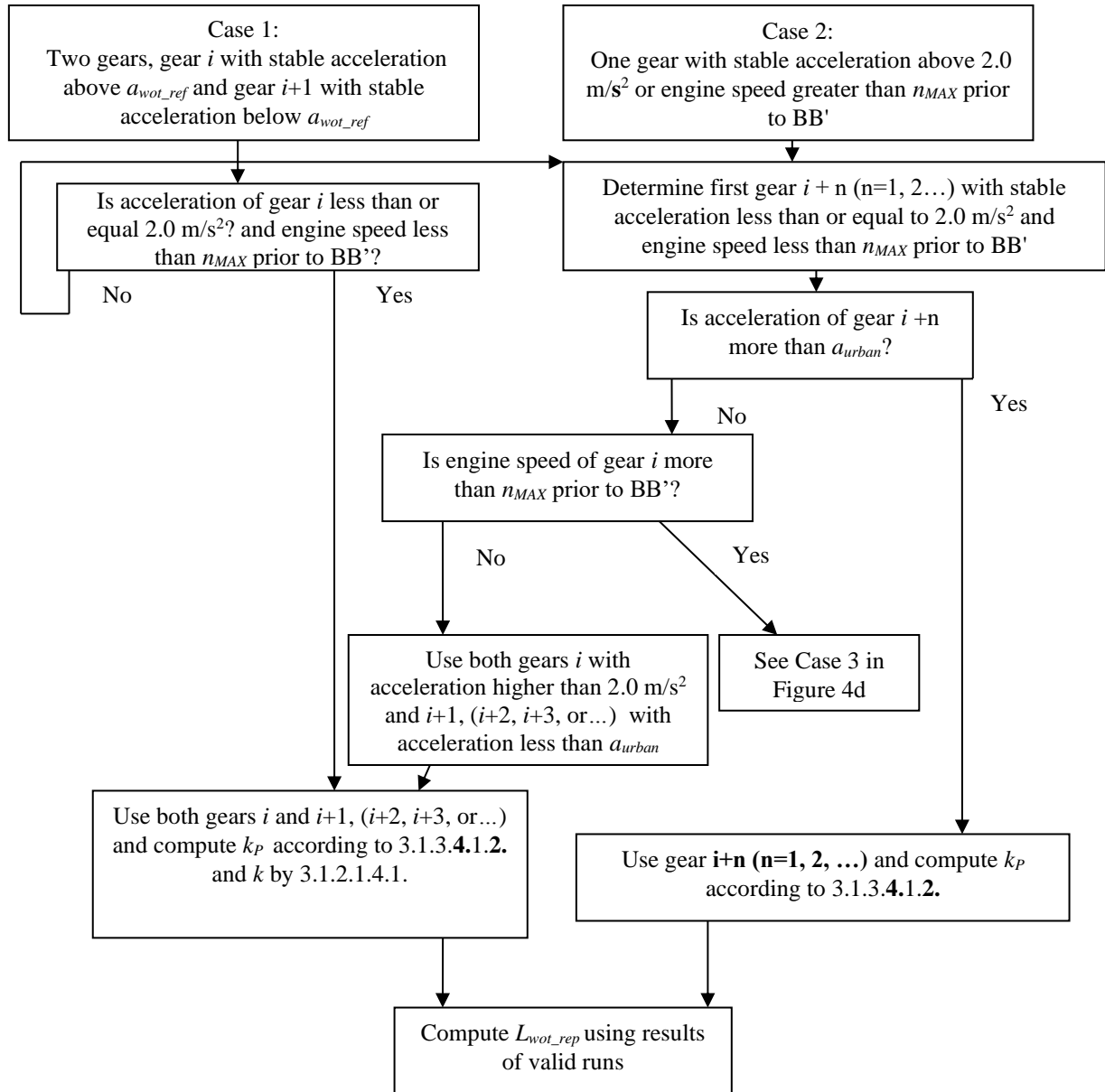


"

Figure 4c, amend to read:

"Figure 4c

Flowchart for vehicles tested according to paragraph 3.1.2.1. of Annex 3 to this Regulation – Gear selection using locked gear PART 2

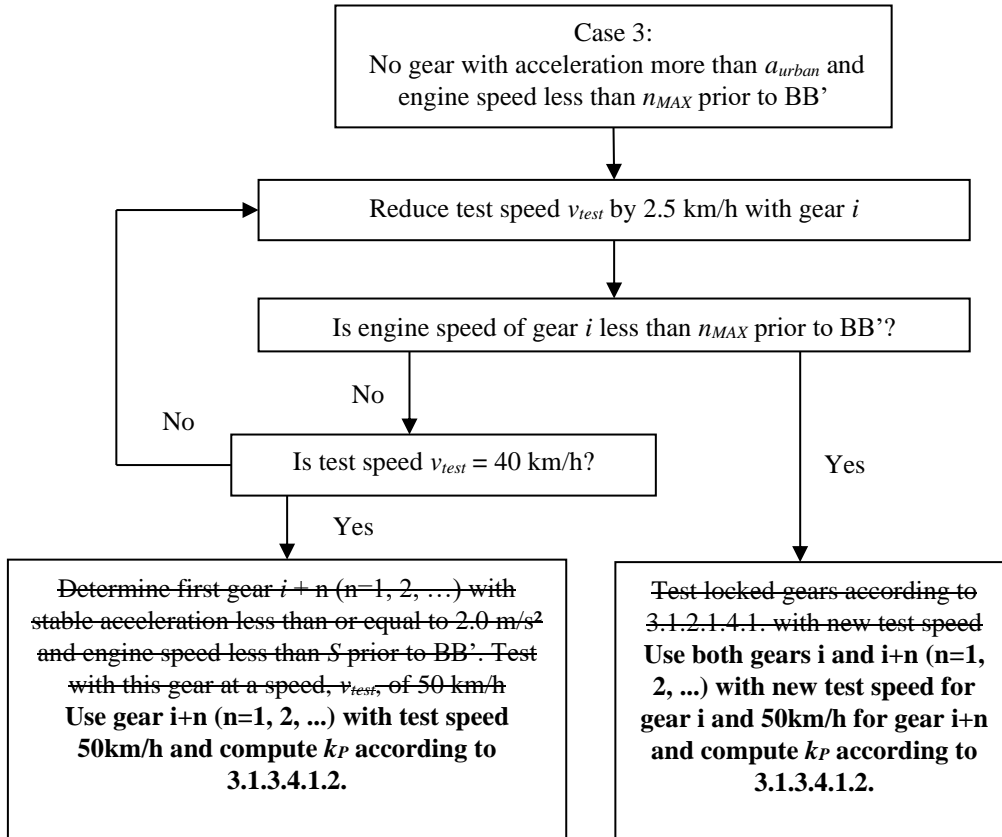


"

Figure 4d, amend to read:

"Figure 4d

Flowchart for vehicles tested according to paragraph 3.1.2.1. of Annex 3 to this Regulation – Gear selection using locked gear PART 3

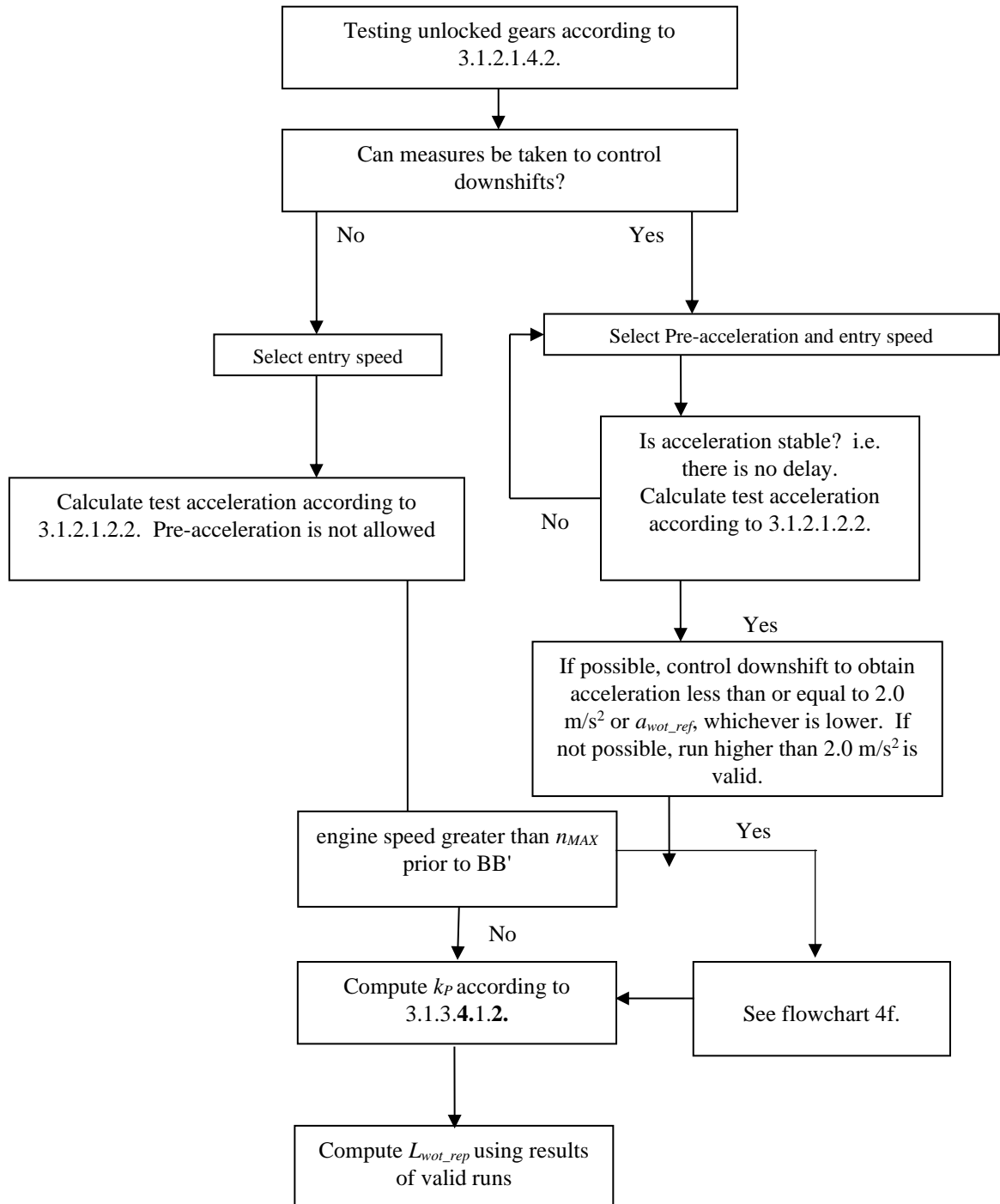


"

Figure 4e, amend to read:

"Figure 4e

Flowchart for vehicles tested according to paragraph 3.1.2.1. of Annex 3 to this Regulation Gear Selection using non-locked gears

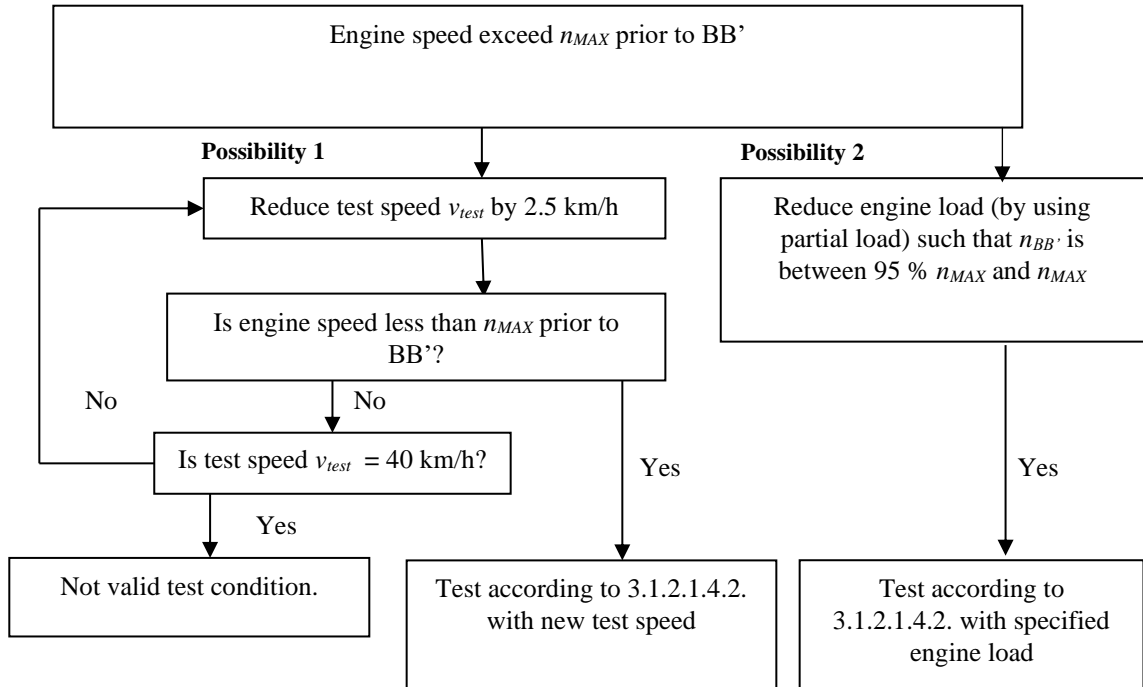


"

Figure 4f, amend to read:

“Figure 4f

Flowchart for vehicles tested according to paragraph 3.1.2.1.4.2. of Annex 3 to this Regulation – Gear Selection using non-locked gears



”

Appendix 2, paragraph 2., amend to read:

- "2. General (see the flowcharts in this Appendix 2, Figure 7a to Figure 7d-7c)
This Appendix provides correction for temperature and test track dependent on the tyre category and purpose.
For the correction, tyre rolling sound reference values are needed. Tyre rolling sound measurements shall be carried out according to the test procedure of Appendix 3 to Annex 3 of this regulation."

Annex 9, Appendix 4,

Formula 3.2.4.4.2. No.2, amend to read:

$$n_{CRSACC_ANCHOR} = (v_{TEST}/30-20) \times 1000$$

Formula 3.4. No.2, amend to read:

$$L_{PT_EXP} = \theta_{PT_HI} \times \lg \left(\frac{(n_{BB'_{TEST}} + n_{SHIFT_PT})}{(n_{BB'_{CRS_ANCHOR}} + n_{SHIFT_PT})} \right) + L_{REF_PT}$$

$$L_{PT_EXP} = \theta_{PT_HI} \times \lg((n_{BB'_{TEST}} + n_{SHIFT_PT}) / (n_{BB'_{CRS_ANCHOR}} + n_{SHIFT_PT})) + L_{REF_PT}$$

II. Justification

Paragraph 2.24.

1. The content of paragraph 3.1.3.1. was moved to paragraph 3.1.3.4.1.2. without any change when the measurement uncertainties and the real driving additional sound emission provisions (RD-ASEP) were introduced in Supplement 7. In the table of symbols, the references to this paragraph 3.1.3.1. need to be renumbered to 3.1.3.4.1.2., accordingly.

Annex 3, paragraph 3.1.2.1.3.

2. The content of paragraph 3.1.3.1. was moved to paragraph 3.1.3.4.1.2. without any change when RD-ASEP was introduced in Supplement 7. In paragraph 3.1.2.1.3., the reference to this paragraph 3.1.3.1. needs to be renumbered to 3.1.3.4.1.2., accordingly.

Annex 3, Appendix 1, Figures 4a to 4f

3. The content of paragraph 3.1.3.1. was moved to paragraph 3.1.3.4.1.2. without any change when RD-ASEP was introduced in Supplement 7. In the figures, references to this paragraph 3.1.3.1. need to be renumbered to 3.1.3.4.1.2., accordingly.

Additional clarifications

4. In Figure 4c, from the current wording in Annex 3, paragraph 3.1.2.1.4.1.(c), the addition of "i+n (n=1, 2, ...)" in the box "Use gear and compute k_p according to 3.1.3.4.1.2." was made for better understanding and clarification.

5. In Figure 4d, to avoid misinterpretation, the following modifications were made from the current wording in Annex 3, paragraph 3.1.2.1.4.1.(d) for clarification and better understanding:

- Adding "=" in the box "Is test speed v_{test} 40km/h".
- Replacing "Determine first gear $i + n$ ($n=1, 2, \dots$) with stable acceleration less than or equal to 2.0 m/s^2 and engine speed less than S prior to BB' . Test with this gear at a speed, v_{test} , of 50 km/h" by "Use gear $i+n$ ($n=1, 2, \dots$) with test speed 50km/h and compute k_p according to 3.1.3.4.1.2".
- Replacing "Test locked gears according to 3.1.2.1.4.1. with new test speed" by "Use both gears i and $i+n$ ($n=1, 2, \dots$) with new test speed for gear i and 50km/h for gear $i+n$ and compute k_p according to 3.1.3.4.1.2."

6. In Figure 4f, from the current wording in Annex 3, paragraph 3.1.2.1.4.2., the addition of “=” in the box “Is test speed v_{test} 40km/h” was made for better understanding and clarification.

Annex 3, Appendix 2, paragraph 2

7. The reference numbers for the figures have to be corrected: ‘Figure 7a to Figure 7c’ instead of ‘Figure 7a to Figure 7d’.

Annex 9, Appendix 4, formula 3.2.4.4.2. No.2

8. Because of the wrong copy/paste of the formula, it has to be adjusted to the existing wording in Annex 9, Appendix 1 as approved through the adoption of Supplement 7.

Annex 9, Appendix 4, Formula 3.4. No.2

9. The subscript characters have to be corrected and put at the ‘right’ level, i.e. all at the same level.
