
WLTP UNR Development (based on WLTP-28-09e)

Proposals in discussion within WLTP Sub Group EV – Revision 6





Proposals for amendment

Update/amendment to include extrapolation for PEVs, define interpolation range for PEVs

Intention of the proposal:

- No extrapolation defined for PEVs, no interpolation range defined for PEVs
- Proposal adds this option and shall define value up for interpolation and extrapolation range

Feedback during meeting on October 16th:

- Support on the concept but still for discussion required on the values “minimum interpolation range”, “maximum interpolation range”, “maximum allowed extrapolation range”; also on the question if the vehicle M concept shall also be applicable for PEVs
- Therefore decision: text to be inserted in working document of UNR WLTP but in square brackets
- SG EV will prepare an informal document for January addressing all open questions

Updated version and draft text included in document: [191016 Extrapolation OVC-HEV interpolation extrapolation PEV.docx](#)

Conclusion with WLTP SG EV after web-audio on October 16th, 2019:

- Supported and shall go into UNR WLTP first edition
- Shall go into UNR WLTP first edition, but in square brackets (“[...]”)
- For the moment, proposal in Square brackets; active feedback until October 21st required to remove “[...]”
- Not supported at the current stage, put on hold for a later stage



Proposals for amendment

Update/amendment of calculation formula of $M_{CO_2,weighted}$, $FC_{weighted}$, $EC_{AC,weighted}$, EAER

Intention of the proposal:

- Weighted CO₂ mass emission is currently based on declared CS CO₂ and measured CD CO₂ mass emission
- In case of a “golden” measurement of the CD-test during type approval, the manufacturer runs into the risk that a vehicle measured by a third party is not matching the “golden” measurement
- Solution is to use in case of the weighted CO₂ mass emission also the declared value of the CD CO₂ mass emission
- Following equations need to be adjusted in addition: $FC_{weighted}$, $EC_{AC,weighted}$, EAER

Feedback during meeting on October 16th:

- JPN supports the proposal; but final feedback until October 21st if square brackets on this topic can be removed
- EC supports the proposal
- It need to be taken care within the transitional provisions for UNR that this change is only affecting future type approvals (task for transposition task force)

Latest version: Draft text: [191016 M Co2 weighted etc Annex 6 7 8 for declared value implementation phase alignment.docx](#)

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Proposals for amendment

Update/amendment of adjustment of phase specific range values

Intention of the proposal:

- There is currently no alignment of the phase specific range values based on the ratio between declared total cycle value and measured total cycle value
- Currently, it is not allowed to align the phase values (see paragraph 1.2.4.3. of Annex 6)
- Proposal is adding this with the intention that the phase specific values fit to the total cycle values (see table A8/10 and A8/11)

Feedback during meeting on October 16th :

- EC supports the proposal but still wants to check why 1.2.4.3. of Annex 6 was inserted
- JPN supports the proposal but still wants to check why 1.2.4.3. of Annex 6 was inserted
- Remark for DC: This topic is put in square brackets for the moment, [...] will be either removed or kept depending on feedback

Draft text: [191016 M Co2 weighted etc Annex 6 7 8 for declared value implementation phase alignment.docx](#)

Conclusion with WLTP SG EV after web-audio on October 16th, 2019:

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- Shall go into UNR WLTP first edition, but in square brackets (“[...]”)
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- Not supported at the current stage, put on hold for a later stage



Proposals for amendment

Adding a procedure for OVC-FCHVs

Intention of the proposal:

- No procedure in GTR describes how to test an OVC-FCHV; proposal is adding the text portions which are describing this procedure
- OVC-FCHV procedure is based on the procedure for OVC-HEVs, replacing CO₂ by H₂

Feedback during meeting on October 16th:

- Manufacturer stated that the proposed concept is not touching the reference method and candidate method approach which is already in force in GTR#15. This will not be addressed in this proposal
- JPN supports concept but states that it is too premature to incorporate it into UNR WLTP first edition (especially still concerns regarding accuracy of H₂ flowmeter measurement)
- EC supports the proposal but also needs further internal discussion
- Final feedback of EC and JPN shall be provided by October 21st
- ACEA EV members requested to provide more evidence and data, bilateral exchange possible:
[Further justification H2 measurement GTR 15 Annex 8 - Appendix 7 OVC-FCHV.pdf](#) ← **Link added to data/evidence slides**
- Proposal will be put in square brackets and depending on feedback removed or kept or content within square brackets removed

Latest version: [190611 Proposal OVC FCHVs first draft.docx](#); [190611 Test procedure for OVC-FCHV's explanation slides.pdf](#)

Conclusion with WLTP SG EV after web-audio on October 16th, 2019:

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Proposals for amendment

Adding a definition for NOVC-FCHVs and OVC-FCHVs*

Intention of proposal:

- No definition in GTR for NOVC-FCHVs and OVC-FCHVs*
- Proposal is adding these definitions which are at least required for NOVC-FCHVs which are already in the GTR

Feedback during meeting on October 16th:

- JPN supports the proposal to add the definition(s)
- EC supports the proposal to add the definition(s)
- Both definitions shall go in the UNR WLTP but the definition for OVC-FCHVs in square brackets

Latest version: [190611 Proposal OVC FCHVs first draft.docx](#); [190611 Test procedure for OVC-FCHV's explanation slides.pdf](#)

* Definition for OVC-FCHVs only required if procedure for these vehicles is going into the UN R WLTP

Conclusion with WLTP SG EV after web-audio on October 16th, 2019:

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Proposals for amendment

Exempt humidity measurement for PEVs, NOVC-FCHVs and OVC-FCHVs*

Intention of proposal:

- Humidity measurement and tracking important in the context of pollution emission measurement
- In case of PEVs, NOVC-FCHVs and OVC-FCHVs*, no pollutant emission need to be measured as there are no pollutant emissions, so proposal is to exempt humidity measurement for those vehicles

Feedback during meeting on October 16th:

- JPN supports the proposal
- EC supports the proposal
- JPN: Draft text need to be provided as soon as possible or at least the location where the text shall be incorporated for a placeholder

Draft text proposal for UNR: <to be provided>

* OVC-FCHVs only required if procedure for these vehicles is going into the UN R WLTP

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Proposals for amendment

COP-procedure for OVC-HEVs: REESS preconditioning in case of complete CD-test

Intention of proposal:

- A REESS mounted into a new car first needs to learn where its SoC boundaries are; this needs at least a discharge and charge event but best is to ask the manufacturer recommendation (see run-in for PEVs according to Annex 8)
- Without this “preconditioning”, the full battery capacity would not be available for the COP-test ($EC_{AC,CD}$ in COP would be greater than $EC_{AC,CD}$ in Type Approval and vehicle would fail, but would pass with preconditioning)
- Proposal adds the requirement of a run in case of the complete CD-test during COP;
- Alternatively, a REESS preconditioning factor may be determined and provided by the manufacturer for this vehicle family/category

Feedback during meeting on October 16th :

- Proposal is understood but stated that it is only a rare case
- Proposed text has been reworded during the meeting and can be seen on the next slide
- Text will be incorporated into the COP UNR document with square brackets

Covered in Draft text proposal for UNR: see next slide; [191010 - Draft UNR WLTP CoP requirements-v1_JPN_Nick_MaN_MaN2.docx](#)

Conclusion with WLTP SG EV after web-audio on October 16th, 2019:

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Proposals for amendment

COP-procedure for OVC-HEVs: REESS preconditioning in case of complete CD-test

5.3.1.1. Charge-Depleting Type 1 test procedure

The vehicle shall be tested according to the charge-depleting Type 1 test procedure as described in paragraph 3.2.4. of Annex B8. During this test, the electric energy consumption $EC_{AC,CD}$ shall be determined according to step 9 of Table A8/8 of Annex B8.

[If deemed necessary, manufacturer shall demonstrate that preconditioning of the traction REESS in advance of the COP procedure is required. In such a case, at the request of the manufacturer and with approval of the approval authority, preconditioning of the traction REESS shall be done in advance of the COP procedure according to manufacturers recommendation.]



Proposals for amendment

COP-procedure for OVC-HEVs: REESS preconditioning in case of complete CD-test

Current agreement within WLTP Sub Group EV on electric consumption verification of OVC-HEV

Additions in red

Homologation	COP Test		
ICE operation in first cycle @CD condition	Test Cycle	Values to be evaluated (individual veh. values)	
No	CD-Test	EC_AC_CD	Preconditioning of REESS required: According to OEM recommendation or application of determined PreCo-factor*
	First Cycle only	EC_DC_first	
Yes	CD-Test	EC_AC_CD	Preconditioning of REESS required: According to OEM recommendation or application of determined PreCo-factor*

*PreCo-Factor = Reflecting the effect of a REESS which is not preconditioned and therefore has not its full capacity

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Postponed topics





Proposals for amendment

Update/amendment to include extrapolation for OVC-HEVs

Intention of the proposal:

- Extrapolation is defined for OVC-HEVs but to avoid mistakes in the extrapolation two additional aspects need to be considered, to ensure that the extrapolation is right and correct
 - By extrapolation below VL, the amount of CD-cycles need to be identical between VL and the extrapolated vehicle below VL; if VL was not able to drive CD in pure electric operation, also no pure electric operation for the extrapolated vehicle below VL allowed
 - By extrapolation above VH, the amount of CD-cycles need to be identical between VH and the extrapolated vehicle above VH; if VH was able to drive CD in pure electric operation until SoC_{min} , also pure electric operation for the extrapolated vehicle above VH required

Decision during meeting on October 16th 2019:

- JPN and EC stated that not necessary to include it now, can be done later
- Topic put on hold for the moment, will be deleted from the document, but can be added via informal document for January GRPE

Latest version: [190930 WLTP-GTR-Proposals EV extrapolation OVC-HEVs.pdf](#)

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Proposals for amendment

Update/amendment of the wording of nominal voltage

Intention of proposal:

- Nominal voltage is a fixed voltage value which is not taking care of the voltage decrease of a REESS
- For PEV test procedures, nominal voltage is not allowed at all; but still for the CD-test of an OVC-HEV
- Proposal limits the application of nominal voltage to the CS-conditions of an OVC-HEV and to the low voltage REESSs of PEVs and OVC-HEVs under CD conditions
- For low voltage REESS, nominal voltage application should be allowed in any case as these REESS are small and the voltage decrease over SoC is small

Feedback during meeting on October 16th :

- EC supports the proposal
- JPN understand the proposal but cannot support the integration of the proposal into UNR WLTP first edition
- Topic will be discussed again at a later stage

Latest version: [190903 ACEA TF EV proposal nominal voltage with comment and changes.docx](#)

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Proposals for amendment

Alternative option for COP testing of PEVs

Intention of proposal:

- JAMA is proposing an alternative method (option) to the existing COP procedure (first cycle of the PEV test procedure for DC energy consumption confirmation) as in current procedure, vehicle is coming out of the test with a high SoC because procedure is starting with a fully charged battery and only one cycle is being driven
- If vehicle is shipped by plane, there is a requirement to have a maximum SoC of 30% which means that for those vehicles, the manufacturer needs to discharge the REESS down to this level
- Alternative procedure is following the same methodology like the existing procedure but starting with lower SoC and therefore avoiding this discharge of the REESS after the first cycle

Feedback during meeting on October 16th :

- General concern on timeline
- Decision to postpone discussion to a later stage

Presentation describing proposal: [PEV Test Procedure for COP_JAMA.pdf](#)

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Proposals for amendment

CO2 correction factor determination (Annex 8) – Drafting issue in §4.1.1.3.

Intention of the proposal:

- Removing redundant text in paragraph 4.1.1.3., no content change
- KCO2 is mentioned in the formula and in the legend below the formula
- Text see next slide
- Task for the drafting coordinator?

Feedback:

- New proposal
- Not discussed yet
- No feedback available yet

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Proposals for amendment

CO2 correction factor determination (Annex 8 App. 2) – Drafting issue in §4.1.1.3.

- 4.1.1.3. If the correction of the charge-sustaining CO₂ mass emission is required according to paragraph 1.1.3. of Appendix 2 to this annex or in the case that the correction according to paragraph 1.1.4. of Appendix 2 to this annex was applied, the CO₂ mass emission correction coefficient shall be determined according to paragraph 2. of Appendix 2 to this annex. The corrected charge-sustaining CO₂ mass emission shall be determined using the following equation:

$$M_{\text{CO}_2,\text{CS}} = M_{\text{CO}_2,\text{CS,nb}} - K_{\text{CO}_2} \times EC_{\text{DC,CS}}$$

where:

$M_{\text{CO}_2,\text{CS}}$ is the charge-sustaining CO₂ mass emission of the charge-sustaining Type 1 test according to Table A8/5, step No. 3, g/km;

$M_{\text{CO}_2,\text{CS,nb}}$ is the non-balanced CO₂ mass emission of the charge-sustaining Type 1 test, not corrected for the energy balance, determined according to Table A8/5, step No. 2, g/km;

$EC_{\text{DC,CS}}$ is the electric energy consumption of the charge-sustaining Type 1 test according to paragraph 4.3. of this annex, Wh/km;

K_{CO_2} is the CO₂ mass emission correction coefficient according to paragraph 2.3.2. of Appendix 2 to this annex, (g/km)/(Wh/km).