WLTP GTR#15 Amend#6

Overview square brackets SG EV needs to provide input
One additional new topic
Status: 20.04.2020

Link the latest version of the informal document updating the working document (GTR#15Amd#6):

https://wiki.unece.org/display/trans/GTR15+Amnd+6+Drafting

Square bracket topic in WD of WLTP GTR#15 Amend#6

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; high voltage REESS under CD condition are not allowed to use nominal voltage

Final status:

- It was agreed by SG EV during the meeting on April 8th to follow JPN proposal (with 60V threshold)
- Only remark: Last line in Table A8.App3/1 („break-off criteria judgment…“) shall be deleted from the proposal

Discussion basis:

- Current text in square brackets → working document: Annex 8, Appendix 3, paragraph 3.2.
- Proposal JPN: 200315_JPN_input_REESS voltage measurement.docx (complete paragraph 3)

Conclusion within WLTP SG EV:

- [X] Shall go into GTR#15 Amd#6
- [ ] Shall not go into GTR#15 Amd#6, topic shall be further postponed

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Square bracket topic in WD of WLTP GTR#15 Amend#6

Proposal 1 in the context of the CO_2 correction factor application of NOVC-HEVs

Intention of the proposal:

- Proposal is to give the manufacturer the option to use a worst case approach based on the generic approach from pure ICE vehicles
- These proposals will reduce unnecessary testing without any additional value

Current status:

- JPN understands and supports the intention of the proposal but is not able to support it without academic explanation
- EC is in principle ok, unless there exists doubt that a worse K_{CO2} (than the generic approach one) could exist for certain vehicles
- Feedback during the meeting on April 8th, that the generic approach is a required option with respect to reproducibility as it might be challenging in case of powerful HEVs to get a reproducible CO2 correction factor if the factor is determined via measurements according to Annex 8 Appendix 2. This case needs to be taken into consideration in context of the worst case discussion

Discussion basis:

Working document: Annex 8, Appendix 2a

Supporting documents from ACEA EV:

200402_Generic approach_CO2_correction_NOVC-HEV.pptx

200310_Generator_Efficiency_Example_BRS_Broschuere_RZ_en.pdf

Conclusion within WLTP SG EV:

- ☐ Shall go into GTR#15 Amd#6
- ☐ Shall not go into GTR#15 Amd#6, topic shall be further postponed

Link the latest version of the informal document updating the working document (GTR#15Amd#6):

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Square bracket topic in WD of WLTP GTR#15 Amend#6

Proposal 2 in the context of the CO_2 correction factor application of OVC- and NOVC-HEVs

Intention of the proposal:

- Manufacturer should be able to group several interpolation families into one K_{CO2} family
- This proposals will reduce unnecessary testing without any additional value

Current status:

- JPN supports the concept of making the family wider, however, it should be well justified from the technical view points
- EC supports the concept of having the same family criteria as the CoP family
- JPN and EC will come back to SG EV with a final feedback in the next WLTP SG EV web-audio

Discussion basis:

K_{CO2} correction factor family proposal for (N)OVC-HEVs based on COP family concept

Supporting documents from ACEA EV:

200402_K_CO2_factor family proposal (based on COP family concept)_(N)OVC-HEV.pptx

Conclusion within WLTP SG EV:

- ☐ Shall go into GTR#15 Amd#6
- ☐ Shall not go into GTR#15 Amd#6, topic shall be further postponed

Link the latest version of the informal document updating the working document (GTR#15Amd#6):

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Square bracket topic in WD of WLTP GTR#15 Amend#6

Expected number of cycles in CD mode for OVC-HEV

Intention of the proposal:

- It is not clear what need to be done in the case of a borderline OVC-HEV which reaches in one test the expected numbers of CD cycles but in another test one cycle more or one cycle less than the expected number of CD cycles
- Proposal is providing a solution how to deal with this situation

Current status:

- EC agrees that a solution is needed and supports the concept of declaring the number of CDC cycles and voiding the test if the number is different, but EC is also open to a more elegant solution to solve this problem.
- JPN is not able to support if the test was treated as an invalid test (reason: same scenario as other parameter should be applied)
- Proposed wording in [...] in the working document would need further amendment (also authorities should be able to request a repetition of the test on their request)
- Further, during the meeting on April 2nd, a specific use case has been introduced and explained (number of CD cycles less than the expected number) and a possible problem has been addressed (see link below)

Discussion basis:

Working document: Annex 6, paragraph 1.2.3.4., 1.2.3.5. and 1.2.3.6. (ACEA EV text proposal)

ACEA EV provided an explanation based on an example: 200402_Expected Number of CD Cycles example_rev1.pptx

Conclusion within WLTP SG EV:

- ☐ Shall go into GTR#15 Amd#6
- ☐ Shall not go into GTR#15 Amd#6, topic shall be further postponed

Link the latest version of the informal document updating the working document (GTR#15Amd#6):

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New topic to be addressed in WD of WLTP GTR#15 Amend#6

NEW

Charge-Depleting Fuel Efficiency calculation in case of pure electric CD cycles

Background of the proposal:

- In the case of an OVC-HEV which performed at least one CD cycle or all CD cycles in pure electric operation, calculation of FE_{CD} according to the calculation scheme in paragraph 4.2.2. in Annex 8 is producing invalid values
- Paragraph 4.2.2. of Annex 8 is referring regarding the FE calculation of each cycle to paragraph 6 of Annex 7 where under sub-paragraph 6.14.1. this calculation is described
- 6.14.1. says: $FE = \frac{100}{FC}$ ➔ if FC is "zero" ➔ invalid value for FE ➔ ....

Current status:

- Topic not discussed yet
- Solution required until June GRPE

Discussion basis:

Screenshots of Annex 8, Paragraph 4.2.2. and of Annex 7, Paragraph 6.14. on the next slide

Conclusion within WLTP SG EV:

☐ Shall go into GTR#15 Amd#6

☐ Shall not go into GTR#15 Amd#6, topic shall be further postponed

Link the latest version of the informal document updating the working document (GTR#15Amd#6):

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New topic to be addressed in WD of WLTP GTR#15 Amend#6

Charge-Depleting Fuel Efficiency calculation in case of pure electric CD cycles

NEW

6.14. Calculation of fuel efficiency (FE)

This paragraph is applicable for the 3-phase WLTP test only:

6.14.1. FE = 100/FC

where

FC is the fuel consumption of a specific fuel, l/100 km (or m³ per 100 km in the case of natural gas or kg/100 km in the case of hydrogen);

FE is fuel efficiency; km/l (or km/m³ in the case of natural gas, or km/ kg in the case of hydrogen).

For 3-phase WLTP test

The charge-depleting fuel efficiency FE_{CD} shall be calculated using the following equation:

$$FE_{CD} = \frac{R_{CDA}}{\sum_{c=1}^{n-1} d_c \times \frac{1}{FE_{CD,c}} + d_n \times \frac{k_{CD}}{FE_{CD,n}}}$$

where:

FE_{CD} is the charge-depleting fuel efficiency, km/l;

R_{CDA} actual charge-depleting range defined in paragraph 4.4.5. of this Annex, km;

$FE_{CD,c}$ is the fuel efficiency for cycle c of the charge-depleting Type 1 test, determined according to paragraph 6. of Annex B7, km/l;

c is the index number for the considered cycle;

n is the number of applicable WLTP test cycles driven up to the end of the transition cycle according to paragraph 3.2.4.4. of this annex

d_c is the distance driven in the applicable WLTP test cycle c of the charge-depleting Type 1 test, km;

d_n is the distance driven in the applicable WLTP test cycle n of the charge-depleting Type 1 test, km;

k_{CD} $kcd = \frac{MCO2,CS-MCO2,CD,n,}{MCO2,CS-MCO2,CD,ave,n-1}$

Link the latest version of the informal document updating the working document (GTR#15Amd#6):

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Square bracket topic in WD of WLTP GTR#15 Amend#6

Low Temp Test Procedure

Current status of EV low temp topics can be seen in the latest version of the Excel Sheet:

→ 20xxyy_Status Square bracket topics_Amd#6 WD.xlsx

Latest version of the Excel Sheet can be found on the UNECE wiki in the following folder:

https://wiki.unece.org/display/trans/Optional+annex+Low+T+-+Drafting

BACK UP

Link the latest version of the informal document updating the working document (GTR#15Amd#6):

https://wiki.unece.org/display/trans/GTR15+Amnd+6+Drafting

X

Possible input for WLTP GTR#15 Amend#6

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
- Proposals adds this option and shall define value for interpolation and extrapolation range

Status after IWG IMD, Brussels, February 20th:

- Support on the concept but still 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
- JPN and EC position has not changed since January where they stated that without concrete proposal and justification
- As position has not changed : Shall not go into GT#15 Amd#6 and shall be further postponed (unless further justification provided)

Updated version and draft text included in document: 191016_Extrapolation_OVC-HEV_interpolation extrapolation PEV.docx

Conclusion within WLTP SG EV:

- ☐ Shall go into GTR#15 Amd#6
- ☒ Shall not go into GTR#15 Amd#6, topic shall be further postponed

Link the latest version of the informal document updating the working document (GTR#15Amd#6):

https://wiki.unece.org/display/trans/GTR15+Amnd+6+Drafting

X

Possible input for WLTP GTR#15 Amend#6

Update/amendment to 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

Status after IWG IMD, Brussels, February 20th:

- JPN and EC position has not changed since January where they stated that this is not necessary to include now, can be done later
- As position has not changed : Shall not go into GT#15 Amd#6 and shall be further postponed

Latest version: 190930_WLTP-GTR-Proposals_EV_extrapolation_OVC-HEVs.pdf

Conclusion within WLTP SG EV:

- ☐ Shall go into GTR#15 Amd#6
- ☒ Shall not go into GTR#15 Amd#6, topic shall be further postponed

Link the latest version of the informal document updating the working document (GTR#15Amd#6):

https://wiki.unece.org/display/trans/GTR15+Amnd+6+Drafting

X

Possible input for WLTP GTR#15 Amend#6

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

Status after IWG IMD, Brussels, February 20th:

- Topic can be skipped and will be further postponed

Presentation describing proposal: PEV Test Procedure for COP_JAMA.pdf

Conclusion within WLTP SG EV:

- ☐ Shall go into GTR#15 Amd#6
- ☒ Shall not go into GTR#15 Amd#6, topic shall be further postponed