

List of issues related to all series of amendments to UN Regulation No. 154

GRPE 90th session



Current/amended text based on 02 series (applicable on 00, 01, 03 series as well)	
Current text	<p>6.2. For Level <u>1A</u></p> <p>The fuel consumption values shall be calculated from the emissions of hydrocarbons, carbon monoxide, and carbon dioxide using the results of step 6 for criteria emissions and step 7 for CO₂ of Table <u>A7/1</u>.</p>
Amended text	<p>6.2. For Level <u>1A</u></p> <p>The fuel consumption values shall be calculated from the emissions of hydrocarbons, carbon monoxide, and carbon dioxide using the results of step 6 for criteria emissions and step 7 for CO₂ of Table <u>A7/1</u> <u>in case of ICE or of Table A8/6 in case of <u>NOVC-HEV</u> and <u>OVC-HEV</u>.</u></p>



Editorial error in Table A8/5, Step 4c – „CS“ missing in index of process column

New topic – just editorial

Series: 00, 01, 02 and 03

Current/amended text based on 02 series (applicable on 00, 01, 03 series as well)

Current text

4c	Output step 4a	$M_{i,CS,c,4a}$, g/km; $M_{CO_2,CS,c,4a}$, g/km.	$M_{i,c,4c} = M_{i,c,4a}$ $M_{CO_2,c,4c} = M_{CO_2,c,4a}$	$M_{i,CS,c,4c}$; $M_{CO_2,CS,c,4c}$
			Calculate fuel efficiency ($FE_{c,4c \text{ temp}}$) according to paragraph 6.14.1. of Annex B7. $FE_{c,4c} = FE_{c,4c \text{ temp}}$	$FE_{c,4c}$, km/l;

Amended text

4c	Output step 4a	$M_{i,CS,c,4a}$, g/km; $M_{CO_2,CS,c,4a}$, g/km.	$M_{i,CS,c,4c} = M_{i,CS,c,4a}$ $M_{CO_2,CS,c,4c} = M_{CO_2,CS,c,4a}$	$M_{i,CS,c,4c}$; $M_{CO_2,CS,c,4c}$
			Calculate fuel efficiency ($FE_{c,4c \text{ temp}}$) according to paragraph 6.14.1. of Annex B7. $FE_{c,4c} = FE_{c,4c \text{ temp}}$	$FE_{c,4c}$, km/l;



Editorial error in Table A8/5, Step 5 – wrong reference

New topic – just editorial

Series: 00, 01, 02 and 03

Current/amended text based on 02 series (applicable on 00, 01, 03 series as well)

Current text	5 Result of a single test.	Output step 4b and 4c	$M_{CO_2,c,4c}$, g/km; $M_{CO_2,p,4}$, g/km.	For Level 1A: ATCT correction of $M_{CO_2,c,4c}$ and $M_{CO_2,p,4}$ in accordance with paragraph 3.8.2. of Annex B6a. For Level 1B: $M_{CO_2,c,5} = M_{CO_2,c,4c}$ $M_{CO_2,p,5} = M_{CO_2,p,4}$	$M_{CO_2,c,5}$, g/km; $M_{CO_2,p,5}$, g/km.
			$M_{i,c,4c}$, g/km; $FE_{c,4c}$, km/l;	Apply deterioration factors calculated in accordance with Annex C4 to the criteria emissions values. $FE_{c,5} = FE_{c,4c}$ ⊞	$M_{i,c,5}$, g/km; $FE_{c,5}$, km/l;

Amended text	5 Result of a single test.	Output step 4b and 4c	$M_{CO_2,c,4c}$, g/km; $M_{CO_2,p,4}$, g/km.	For Level 1A: ATCT correction of $M_{CO_2,c,4c}$ and $M_{CO_2,p,4}$ in accordance with paragraph 3.8.23. of Annex B6a. For Level 1B: $M_{CO_2,c,5} = M_{CO_2,c,4c}$ $M_{CO_2,p,5} = M_{CO_2,p,4}$	$M_{CO_2,c,5}$, g/km; $M_{CO_2,p,5}$, g/km.
			$M_{i,c,4c}$, g/km; $FE_{c,4c}$, km/l;	Apply deterioration factors calculated in accordance with Annex C4 to the criteria emissions values. $FE_{c,5} = FE_{c,4c}$ ⊞	$M_{i,c,5}$, g/km; $FE_{c,5}$, km/l;



Editorial error in Table A8/5, Step 7 – “according to”

New topic – just editorial

Series: 00, 01, 02 and 03

Current/amended text based on 02 series (applicable on 00, 01, 03 series as well)

		Current/amended text based on 02 series (applicable on 00, 01, 03 series as well)			
Current text	7 $M_{CO_2,CS}$ results of a Type 1 test for a test vehicle.	For Level 1A: Output step 6	$M_{CO_2,CS,c,6}$, g/km; $M_{CO_2,CS,p,6}$, g/km; $M_{CO_2,CS,c,declared}$, g/km.	Alignment of phase values. Paragraph 1.2.4. of Annex B6, and: $M_{CO_2,CS,c,7} = M_{CO_2,CS,c,declared}$	$M_{CO_2,CS,c,7}$, g/km; $M_{CO_2,CS,p,7}$, g/km.
		For Level 1B: Output step 5 Output step 6	$M_{CO_2,CS,c,5}$, g/km; $M_{CO_2,CS,p,5}$, g/km; $M_{CO_2,CS,c,declared}$, g/km.	Alignment of phase values. Paragraph 1.2.4. of Annex B6.	$M_{CO_2,CS,p,7}$, g/km.
Amended text	7 $M_{CO_2,CS}$ results of a Type 1 test for a test vehicle.	For Level 1A: Output step 6	$M_{CO_2,CS,c,6}$, g/km; $M_{CO_2,CS,p,6}$, g/km; $M_{CO_2,CS,c,declared}$, g/km.	Alignment of phase values: according to Paragraph—paragraph 1.2.4. of Annex B6, and: $M_{CO_2,CS,c,7} = M_{CO_2,CS,c,declared}$	$M_{CO_2,CS,c,7}$, g/km; $M_{CO_2,CS,p,7}$, g/km.
		For Level 1B: Output step 5 Output step 6	$M_{CO_2,CS,c,5}$, g/km; $M_{CO_2,CS,p,5}$, g/km; $M_{CO_2,CS,c,declared}$, g/km.	Alignment of phase values: according to Pp paragraph 1.2.4. of Annex B6.	$M_{CO_2,CS,p,7}$, g/km.



Annex B8 – Table A8/9 “g/km” missing in Output of Step 1

New topic – just editorial

Series: 00, 01, 02 and 03

Current/amended text based on 02 series (applicable on 00, 01, 03 series as well)

Current text

E/ECE/TRANS/505/Rev.3/Add.153/Rev.1/Amend.2

Step no.	Source	Input	Process	Output
	Output step 4, Table A8/8	$\dot{m}_{veh,L}$ $\dot{m}_{veh,H}$	Output in the case of CD is available for each CD test. Output in the case of CS is available once due to CS test averaged values.	$\dot{m}_{veh,H}$ $UF_{phase,j}$ $UF_{cycle,c}$ $M_{iCS,c,6}$ g/km; $M_{CO_2,CS,p}$
	Output step 8, Table A8/8	$UF_{phase,j}$ $UF_{cycle,c}$		
	Output step 6, Table A8/5	$M_{iCS,c,6}$ g/km;		
	Output	$M_{CO_2,CS,declared}$ g/km;		K_{CO_2} (g/km)/(Wh/km).

Amended text

E/ECE/TRANS/505/Rev.3/Add.153/Rev.1/Amend.2

Step no.	Source	Input	Process	Output
	Output step 4, Table A8/8	$\dot{m}_{veh,L}$ $\dot{m}_{veh,H}$	Output in the case of CD is available for each CD test. Output in the case of CS is available once due to CS test averaged values.	$\dot{m}_{veh,H}$ $UF_{phase,j}$ $UF_{cycle,c}$ $M_{iCS,c,6}$ g/km; $M_{CO_2,CS,p}$ g/km;
	Output step 8, Table A8/8	$UF_{phase,j}$ $UF_{cycle,c}$		
	Output step 6, Table A8/5	$M_{iCS,c,6}$ g/km;		
	Output	$M_{CO_2,CS,declared}$ g/km;		K_{CO_2} (g/km)/(Wh/km).



Annex B8 – Table A8/9 “g/km” missing, Step 3

New topic – just editorial

Series: 00, 01, 02 and 03

Current/amended text based on 02 series (applicable on 00, 01, 03 series as well)					
Current text	3	Output step 1	$M_{CO_2,CD,i}$, g/km; $\Delta E_{REESS,i}$, Wh; d_i , km; $n_{veh,i}$; R_{CDC} , km $M_{CO_2,CS,declared}$, g/km; $M_{CO_2,CS,D}$	Calculation of equivalent all-electric range according to paragraphs 4.4.4.1. and 4.4.4.2. of this annex, and actual charge-depleting range according to paragraph 4.4.5. of this annex. Output is available for each CD test. R_{CDA} shall be rounded according to paragraph 6.1.8. of this Regulation to the nearest whole number.	$EAER$, km; $EAER$, km; R_{CDA} , km.
Amended text	3	Output step 1	$M_{CO_2,CD,i}$, g/km; $\Delta E_{REESS,i}$, Wh; d_i , km; $n_{veh,i}$; R_{CDC} , km $M_{CO_2,CS,declared}$, g/km; $M_{CO_2,CS,D}$, g/km;	Calculation of equivalent all-electric range according to paragraphs 4.4.4.1. and 4.4.4.2. of this annex, and actual charge-depleting range according to paragraph 4.4.5. of this annex. Output is available for each CD test. R_{CDA} shall be rounded according to paragraph 6.1.8. of this Regulation to the nearest whole number.	$EAER$, km; $EAER$, km; R_{CDA} , km.



Current/amended text based on 02 series (applicable on 00, 01, 03 series as well)

Current text

Step no.	Source	Input	Process	Output
9 Result of an individual vehicle. Final test result.	Output step 5	AER_{dec} , km;	Interpolation of individual values based on input from vehicle low, medium and high according to paragraph 4.5. of this annex, and final rounding according to paragraph 6.1.8. of this Regulation. AER_{ind} , $AER_{city,ind}$, $EAER_{ind}$ and $EAER_{city,ind}$ shall be rounded to the nearest whole number. $MCO_{weighted,ind}$ shall be rounded to the nearest whole number. $EC_{weighted,ind}$ shall be rounded to the first place of decimal. $FC_{weighted,ind}$ shall be rounded to the first place of decimal. EC_{ind} and $EC_{city,ind}$ shall be rounded to the nearest whole number. Output is available for each individual vehicles. R_{CDC} shall be rounded according to paragraph 6.1.8. of this Regulation to the nearest whole number.	EC_{ind} , Wh/km; $EC_{city,ind}$, Wh/km; $EAER_{ind}$, km;
	Output step 8	$AER_{city,final}$, km; $MCO_{weighted,final}$, g/km; $FC_{weighted,final}$, 1/100 km; EC_{final} , Wh/km; $EC_{city,final}$, Wh/km; $EAER_{final}$, km; $EAER_{city,final}$, km;		For Level 1A, AER_{ind} , km; $AER_{city,ind}$, km; $MCO_{weighted,ind}$, g/km; $FC_{weighted,ind}$, 1/100 km; $EAER_{ind}$, km.
	Output step 4	AER-interpolation availability		
	Output step 1	R_{CDC}		

Amended text

Step no.	Source	Input	Process	Output
9 Result of an individual vehicle. Final test result.	Output step 5	AER_{dec} , km;	Interpolation of individual values based on input from vehicle low, medium and high according to paragraph 4.5. of this annex, and final rounding according to paragraph 6.1.8. of this Regulation. AER_{ind} , $AER_{city,ind}$, $EAER_{ind}$ and $EAER_{city,ind}$ shall be rounded to the nearest whole number. $MCO_{weighted,ind}$ shall be rounded to the nearest whole number. $EC_{weighted,ind}$ shall be rounded to the first place of decimal. $FC_{weighted,ind}$ shall be rounded to the first place of decimal. EC_{ind} and $EC_{city,ind}$ shall be rounded to the nearest whole number. Output is available for each individual vehicles. $R_{CDC,final}$ shall be rounded according to paragraph 6.1.8. of this Regulation to the nearest whole number.	EC_{ind} , Wh/km; $EC_{city,ind}$, Wh/km; $EAER_{ind}$, km;
	Output step 8	$AER_{city,final}$, km; $MCO_{weighted,final}$, g/km; $FC_{weighted,final}$, 1/100 km; EC_{final} , Wh/km; $EC_{city,final}$, Wh/km; $EAER_{final}$, km; $EAER_{city,final}$, km;		For Level 1A, AER_{ind} , km; $AER_{city,ind}$, km; $MCO_{weighted,ind}$, g/km; $FC_{weighted,ind}$, 1/100 km; $EAER_{ind}$, km.
	Output step 4	AER-interpolation availability		
	Output step 1	R_{CDC} , km.		



Table App1/1 → Paragraph number of headline to be changed: OLD 6.4. → NEW 7.

New topic – just editorial

Series: 00, 01, 02 and 03

	Current/amended text based on 02 series (applicable on 00, 01, 03 series as well)
Current text	<p>6. Verification of CoP on charge-depleting electric energy consumption of OVC-HEVs</p> <p>(...)</p> <p>6.4. The procedure for the final COP test results is shown in Table App1/1.</p> <hr/> <p>Table App1/1 Procedure for calculating final COP test results (CO₂ applicable for Level 1A only and FE applicable for Level 1B only)</p>
Amended text	<p>6. Verification of CoP on charge-depleting electric energy consumption of OVC-HEVs</p> <p>(...)</p> <p>76.4. The procedure for the final COP test results is shown in Table App1/1.</p> <hr/> <p>Table App1/1 Procedure for calculating final COP test results (CO₂ applicable for Level 1A only and FE applicable for Level 1B only)</p>

Justification:

- Table App1/1 currently under paragraph 6.4. which is limited only to EC of OVC-HEVs
- But Table App1/1 covers ALL vehicles
- Paragraph number to be changed in 7.



Annex B8 → EAER formula in 03 series to be amended ($R_{\text{CDC,ave}}$ changed into R_{CDC})

New topic – error correction

Series: 01, 03

Current/amended text based on 03 series (applicable on 01 series as well)

Current text

For 3-phase WLTP test;

$$\text{EAER} = \left(\frac{M_{\text{CO}_2,\text{CS,declared}} - M_{\text{CO}_2,\text{CD,avg}}}{M_{\text{CO}_2,\text{CS,declared}}} \right) \times R_{\text{CDC,ave}}$$

Justification:

- In 02 series, the formula is correct (see below)

For Level 1B;

$$\text{EAER} = \left(\frac{M_{\text{CO}_2,\text{CS,declared}} - M_{\text{CO}_2,\text{CD,avg}}}{M_{\text{CO}_2,\text{CS,declared}}} \right) \times R_{\text{CDC}}$$

Amended text

For 3-phase WLTP test;

$$\text{EAER} = \left(\frac{M_{\text{CO}_2,\text{CS,declared}} - M_{\text{CO}_2,\text{CD,avg}}}{M_{\text{CO}_2,\text{CS,declared}}} \right) \times R_{\text{CDC,ave}}$$



Amended text based on 02 series (applicable on 00, 01, 03 series as well)

k is the number of phases driven until the end of the transition cycle according to paragraph 3.2.4.4. of this annex.

In the case that the interpolation method is applied for CO₂, k shall be the number of phases driven up to the end of the transition cycle of vehicle L, $n_{veh,L}$. ~~for the application of both equations of this paragraph.~~

If the transition cycle number driven by vehicle H, $n_{veh,H}$, and, if applicable, by an individual vehicle within the vehicle interpolation family $n_{veh,ind}$ is lower than the transition cycle number driven by vehicle L, $n_{veh,L}$, the confirmation cycle of vehicle H and, if applicable, an individual vehicle shall be included in the calculation. The CO₂ emission of each phase of the confirmation cycle shall then be corrected to an electric energy consumption of zero ($EC_{DC,CD,j} = 0$) by using the CO₂ correction coefficient according to Appendix 2 to this annex.

Amended text

Justification:

- Special provision should only apply to weighted CO₂ but could be read as it also applies on criteria emissions
 - Blue underlined text and yellow underlined text are in contradiction
 - Furthermore, $M_{i,weighted}$ is not interpolated
- Proposal: delete yellow underlined text



Annex A1: Add EAER to information document as declared value

New topic – required

Series: 00, 01, 02 and 03

Amended text based on 02 series (applicable on 00, 01, 03 series as well)		
Amended text	3.5.7.3.2.	All Electric Range AER <u>and Equivalent All Electric Range</u> for OVC-HEVs and OVC-FCHVs (as applicable)
	3.5.7.3.2.1.	Vehicle high: <u>AER: ... km, EAER: ... km</u>
	3.5.7.3.2.2.	Vehicle low (if applicable): <u>AER: ... km, EAER: ... km</u>
	3.5.7.3.2.3.	Vehicle M (if applicable): <u>AER: ... km, EAER: ... km</u>

Justification:

- All declared values are part of information document
- To test report and certificate, it has been added but in information document missed

Comment to EU-COM:

- To avoid different information documents in 1151 and UN-R154, information document should be deleted from 1154, just reference to UN-R154



Annex B8 → $M_{CO_2,weighted}$ formula in O2 series to be amended

New topic – error correction

Series: 00, 01, 02 and 03

Amended text based on O2 series (applicable on 00, 01, 03 series as well)	
Amended text	$M_{CO_2,weighted} = \left(\sum_{j=1}^k UF_j \right)_{ave} \times M_{CO_2,CD,declared} + \left(1 - \left(\sum_{j=1}^k UF_j \right)_{ave} \right) \times M_{CO_2,CS,declared}$ <p>where:↵</p> <p>$M_{CO_2,weighted}$ is the utility-factor weighted charge-depleting CO₂ emission, g/km.↵</p> <p>$M_{CO_2,CD,declared}$ is the declared charge-depleting CO₂ emission according to Table A8/8, step no. 14, g/km.↵</p> <p>$M_{CO_2,CS,declared}$ is the declared charge-sustaining CO₂ emission according to Table A8/5, step no. 7, g/km.↵</p> <p>$\left(\sum_{j=1}^k UF_j \right)_{ave}$ is the average of the sum of utility factors of each charge-depleting test.↵</p> <p>j is the index number of the considered <u>phase</u>.↵</p> <p>k is the number of phases driven until the end of the transition cycle according to paragraph 3.2.4.4. of this annex.↵</p>

Justification:

- Ensure consistency between tables and formulas

Step no.	Source	Input	Process	Output
For Level 1A, 6	Output step 1	$M_{i,CD,j}$, g/km; $M_{CO_2,CD,j}$, g/km; n_{veh} ; $n_{veh,L}$; $UF_{phase,j}$; $M_{i,CS,c,6}$, g/km; $M_{CO_2,CS,declared}$, g/km. $M_{CO_2,CD,declared}$, g/km; $M_{CO_2,CD,ave}$, g/km;	<p>Calculation of weighted CO₂ mass emission and fuel consumption according to paragraphs 4.1.3.1. and 4.2.3. of this annex.</p> <p>Output is available for each CD test.</p> <p>In the case that the interpolation method is applied, $n_{veh,L}$ cycles shall be used. With reference to paragraph 4.1.2. of this annex, $M_{CO_2,CD,j}$ of the confirmation cycle shall be corrected according to Appendix 2 to this annex.</p> <p>In the case that the interpolation method is applied, the output is available for each vehicle H, vehicle L and, if applicable, vehicle M.</p>	$M_{CO_2,weighted}$, g/km; $FC_{weighted}$, l/100 km;

8 Interpolation family result. If the interpolation method is not applied, step No. 9 is not required and the output of	Output step 1	$AER_{city, ave}$, km;	For Level 1B Averaging EC and EC declaration. $EC_{p,final} = EC_{p,ave} \times \frac{EC_{dec}}{EC_{ave}}$	For Level 1B EC_{dec} , Wh/km; $EC_{p,final}$, Wh/km; $EAER_{final}$, km;
	Output step 6	$M_{CO_2,weighted}$, g/km; $FC_{weighted}$, l/100 km;		
	Output step 7	EC , Wh/km; EC_p , Wh/km;	For Level 1A and Level 1B Averaging and intermediate rounding according to paragraph 6.1.8. of this Regulation.	For Level 1A $AER_{city,final}$, km; $M_{CO_2,weighted,final}$, g/km; $FC_{weighted,final}$, l/100 km; EC_{final} , Wh/km; $EC_{p,final}$, Wh/km;
	Output step 3	$EAER$, km; $EAER_p$, km;		



Current/amended text based on 03 series (applicable on 02 series as well)	
Current text	<p>5.2. Test values of electric energy consumption (EC_{test-i})</p> <p>The DC electric energy consumption from the REESS(s) $EC_{DC,first,i}$ shall be determined according to step 4 of Table A8/10 of Annex B8 and, if available, applying a run-in factor as defined in paragraph 8.2.4. of this Regulation.</p>
Amended text	<p>5.2. Test values of electric energy consumption (EC_{test-i})</p> <p>The DC electric energy consumption from the REESS(s) $EC_{DC,first,i}$ shall be determined according to step 4 of Table A8/10 <u>and according to step 3 of Table A8/11</u> of Annex B8 and, if available, applying a run-in factor and/or test cell correction as defined in paragraph 8.2.4. of this Regulation.</p>

Justification:

- Verification of CoP on electric energy consumption of PEVs can be conducted according to Consecutive cycle Type 1 Test Procedure (Table A8/10) or Shortened Type 1 Test Procedure (Table A8/11).
- References for DC Electric energy consumption according to Shortened Type 1 Test Procedure (Table A8/11) should be included as well



Table App 1/1 → Reference missing for Shortened Type 1 Test Procedure for PEVs

New topic – just editorial

Series: 00, 01, 02 and 03

Current/amended text based on 03 series (applicable on 02 series as well)													
Current text	<table border="1"> <tr> <td colspan="4">For electric energy consumption</td> </tr> <tr> <td>Annex B8 Table A8/10 Step 4 for PEVs</td> <td>EC_{DC,first}, Wh/km;</td> <td>The electric energy consumption shall be multiplied with the run-in factor determined according to paragraph 8.2.4. of this</td> <td>EC_{test-i}, Wh/km;</td> </tr> </table>	For electric energy consumption				Annex B8 Table A8/10 Step 4 for PEVs	EC _{DC,first} , Wh/km;	The electric energy consumption shall be multiplied with the run-in factor determined according to paragraph 8.2.4. of this	EC _{test-i} , Wh/km;				
For electric energy consumption													
Annex B8 Table A8/10 Step 4 for PEVs	EC _{DC,first} , Wh/km;	The electric energy consumption shall be multiplied with the run-in factor determined according to paragraph 8.2.4. of this	EC _{test-i} , Wh/km;										
Amended text	<table border="1"> <tr> <td colspan="2"></td> <td>Regulation, if the factor is available.</td> <td></td> </tr> <tr> <td colspan="4">For electric energy consumption</td> </tr> <tr> <td>Annex B8 Table A8/10 Step 4 and Table A8/11 Step 3 for PEVs</td> <td>EC_{DC,first}, Wh/km;</td> <td>The electric energy consumption shall be multiplied with the run-in factor determined according to paragraph 8.2.4.</td> <td>EC_{test-i}, Wh/km;</td> </tr> </table>			Regulation, if the factor is available.		For electric energy consumption				Annex B8 Table A8/10 Step 4 and Table A8/11 Step 3 for PEVs	EC _{DC,first} , Wh/km;	The electric energy consumption shall be multiplied with the run-in factor determined according to paragraph 8.2.4.	EC _{test-i} , Wh/km;
		Regulation, if the factor is available.											
For electric energy consumption													
Annex B8 Table A8/10 Step 4 and Table A8/11 Step 3 for PEVs	EC _{DC,first} , Wh/km;	The electric energy consumption shall be multiplied with the run-in factor determined according to paragraph 8.2.4.	EC _{test-i} , Wh/km;										

Justification:

- Verification of CoP on electric energy consumption of PEVs can be conducted according to Consecutive cycle Type 1 Test Procedure (Table A8/10) or Shortened Type 1 Test Procedure (Table A8/11).
- Run-in factors should be applicable also for shortened type 1 test procedure energy consumption results



Current/amended text based on 01 series (applicable on 03 series as well)

Current text

2.1.1.5.2. Electric energy consumption of PEVs (if applicable)

Test 3 (if applicable)

Record test results in accordance with the table of Test 1

<i>EC (Wh/km)</i>	<i>Low</i>	<i>Medium</i>	<i>High</i>	<i>Extra High</i>	<i>City</i>	<i>Combined 4 phase cycle</i>	<i>Combined 3 phase cycle</i>
Averaging EC							
Final values EC							

Amended text

2.1.1.5.2. Electric energy consumption of PEVs (if applicable)

Test 3a – Results after 4 Phase cycle (if applicable)

Record test results in accordance with the table of Test 1

<i>EC (Wh/km)</i>	<i>Low 4 phase cycle</i>	<i>Medium 4 phase cycle</i>	<i>High 4 phase cycle</i>	<i>Extra High 4 phase cycle</i>	<i>City 4 phase cycle</i>	<i>Combined 4 phase cycle</i>
Averaging EC						
Final values EC						

Test 3b – Results after 3 Phase cycle (if applicable)

<i>EC (Wh/km)</i>	<i>Low 3 phase cycle</i>	<i>Medium 3 phase cycle</i>	<i>High 3 phase cycle</i>	<i>Combined 3 phase cycle</i>
Averaging EC				
Final values EC				

Information for COP - Results after 4 Phase cycle (if applicable)

	<i>Combined 4 phase cycle</i>
Electric Energy Consumption (Wh/km) $EC_{DC,COP}$	
AF_{EC}	

Information for COP - Results after 3 Phase cycle (if applicable)

	<i>Combined 3 phase cycle</i>
Electric Energy Consumption (Wh/km) $EC_{DC,COP}$	
AF_{EC}	

Justification:

Additional tables required as Low, Mid, High can be different for 3-phase and 4-phase because these are multiplied by the adjustment factor

- Adjustment factor is calculated from “combined value measured” and “combined value declared”

- Adjustment factor can be different between 3-phase and 4-phase

Note: Same rationale applies for COP values



Annex B6 → Table A6/1 footnote

New topic – just editorial

Series: 00 and 02

Current/amended text based on 00 series (applicable on 02 series as well)

Table A6/1 Applicable rules for a manufacturer's declared values (total cycle values)^(a) (as applicable)

Parameter	For 4 phase RLTP as per Annex B7	For 3 phase RLTP as per Annex B7	For 2 phase RLTP as per Annex B7	Electro-energetic consumption (kWh/kWh)	Active energy consumption (kWh/kWh)
Values stated according to Annex B5	M _{decl}	M _{decl}	M _{decl}	-	-
MDV-PEV ^(b)	-	FC _{MDV}	FC _{MDV}	-	-
MDV-NEV	M _{decl}	FC _{MDV}	FC _{MDV}	-	-
CVC-NEV	CD	M _{decl}	FC _{MDV}	For 4 phase RLTP as per Annex B7	AER
		CS	FC _{MDV}	For 4 phase RLTP as per Annex B7	AER
CVC-NEV	CD/CS weight ^(c)	M _{decl}	FC _{MDV}	For 4 phase RLTP as per Annex B7	AER
		CS	FC _{MDV}	For 4 phase RLTP as per Annex B7	AER
PEV	-	-	-	For 3 phase RLTP as per Annex B7	SAR

^(a) The declared value shall be the value to which the necessary corrections, as applicable, are applied
^(b) Rounding to 2 places of decimal according to paragraph 6.1.8. of this Regulation
^(c) Rounding to one place of decimal according to paragraph 6.1.8. of this Regulation

Current text

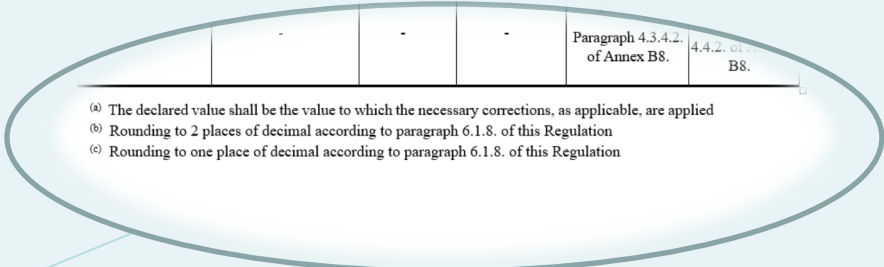


Table A6/1 Applicable rules for a manufacturer's declared values (total cycle values)^(a) (as applicable)

Parameter	For 4 phase RLTP as per Annex B7	For 3 phase RLTP as per Annex B7	For 2 phase RLTP as per Annex B7	Electro-energetic consumption (kWh/kWh)	Active energy consumption (kWh/kWh)
Values stated according to Annex B5	M _{decl}	M _{decl}	M _{decl}	-	-
MDV-PEV ^(b)	-	FC _{MDV}	FC _{MDV}	-	-
MDV-NEV	M _{decl}	FC _{MDV}	FC _{MDV}	-	-
CVC-NEV	CD	M _{decl}	FC _{MDV}	For 4 phase RLTP as per Annex B7	AER
		CS	FC _{MDV}	For 4 phase RLTP as per Annex B7	AER
CVC-NEV	CD/CS weight ^(c)	M _{decl}	FC _{MDV}	For 4 phase RLTP as per Annex B7	AER
		CS	FC _{MDV}	For 4 phase RLTP as per Annex B7	AER
PEV	-	-	-	For 3 phase RLTP as per Annex B7	SAR

^(a) The declared value shall be the value to which the necessary corrections, as applicable, are applied
^(b) Rounding to 2 places of decimal according to paragraph 6.1.8. of this Regulation
^(c) Rounding to one place of decimal according to paragraph 6.1.8. of this Regulation

Amended text

Parameter	For 4 phase RLTP as per Annex B7	For 3 phase RLTP as per Annex B7	For 2 phase RLTP as per Annex B7	Electro-energetic consumption (kWh/kWh)	Active energy consumption (kWh/kWh)
Values stated according to Annex B5	M _{decl}	M _{decl}	M _{decl}	-	-
MDV-PEV ^(b)	-	FC _{MDV}	FC _{MDV}	-	-
MDV-NEV	M _{decl}	FC _{MDV}	FC _{MDV}	-	-
CVC-NEV	CD/CS weight ^(c)	M _{decl}	FC _{MDV}	For Level 1B: EC _{WLTC}	EAER _{WLTC}
		CS	FC _{MDV}	For Level 1B: EC _{WLTC}	EAER _{WLTC}
PEV	-	-	-	EC _{WLTC}	PER _{WLTC}

^(a) The declared value shall be the value to which the necessary corrections, as applicable, are applied
^(b) Rounding to 2 places of decimal according to paragraph 6.1.8. of this Regulation
^(c) Rounding to one place of decimal according to paragraph 6.1.8. of this Regulation

ECE/TRANS/WP.29/GRPE/2024/25
 Figure A6/1
 Flowchart for the number of Type 1 tests

Justification:

- Separate declared values for 3 and 4 phased EC_{WLTC} and PER
- MDV table does not distinguish between 3 and 4 phase here
- Proposal: additional footnote
- Note: slightly different wording for Series 00 & 02



Annex B6 → Table A6/1 footnote

New topic – just editorial

Series: 01 and 03

Current/amended text based on 01 series (applicable on 03 series as well)

Current text

Table A6/1
Applicable rules for a manufacturer's declared values (total cycle values)^(a) (as applicable)

Parameter	For 4 phase WLTP test Agg. n (g/kWh)	For 3 phase WLTP test FC (g/kWh)	For 3 phase WLTP test FE (kWh/kWh)	Electric energy consumption (kWh/kWh)	of electric range (Equivalent electric range) (km)
Values tested according Annex B6 (g/kWh)	M _{CO2}	FC _{CO2}	FE _{CO2}	-	-
NOVC-PCHEV	-	FC _{CO2} Paragraph 4.1.1.1. of Annex B8	FE _{CO2} Paragraph 4.2.1.1. of Annex B8	-	-
NOVC-NBEV	M _{CO2} Paragraph 4.1.1. of Annex B8	-	FE _{CO2} Paragraph 4.1.1. of Annex B8	-	-
OVC-NBEV	CD	M _{CO2,CS} Paragraph 4.1.1.2. of Annex B8	FE _{CO2} Paragraph 4.1.1. of Annex B8	For 4 phase WLTP test EC _{CO2} Paragraph 4.1.1. of Annex B8	AER Paragraph 4.4.1.1. of Annex B8
		M _{CO2} Paragraph 4.1.1. of Annex B8	FE _{CO2} Paragraph 4.1.1. of Annex B8	-	-
CD/CS weight #	CD/CS weight #	-	-	For 3 phase WLTP test EC Paragraph 4.4.2. of Annex B8	EAER Paragraph 4.4.4.1. of Annex B8
		-	-	For 3 phase WLTP test EC Paragraph 4.4.2. of Annex B8	EAER Paragraph 4.4.4.1. of Annex B8
PEV	-	-	-	Paragraph 4.3.4.2. of Annex B8	Paragraph 4.4.2. of Annex B8

^(a) The declared value shall be the value to which the necessary corrections, as applicable, are applied
^(b) Rounding to 2 places of decimal according to paragraph 6.1.8. of this Regulation
^(c) Rounding to one place of decimal according to paragraph 6.1.8. of this Regulation

(a) The declared value shall be the value to which the necessary corrections, as applicable, are applied
 (b) Rounding to 2 places of decimal according to paragraph 6.1.8. of this Regulation
 (c) Rounding to one place of decimal according to paragraph 6.1.8. of this Regulation

Justification:

- Separate declared values for 3 and 4 phased EC_{WLTC} and PER
- MDV table does not distinguish between 3 and 4 phase here
- Proposal: additional footnote

Amended text

Table A6/1
Applicable rules for a manufacturer's declared values (total cycle values)^(a) (as applicable)

Parameter	For 4 phase WLTP test Agg. n (g/kWh)	For 3 phase WLTP test FC (g/kWh)	For 3 phase WLTP test FE (kWh/kWh)	Electric energy consumption (kWh/kWh)	of electric range (Equivalent electric range) (km)
Values tested according Annex B6 (g/kWh)	M _{CO2}	FC _{CO2}	FE _{CO2}	-	-
NOVC-PCHEV	-	FC _{CO2} Paragraph 4.1.1.1. of Annex B8	FE _{CO2} Paragraph 4.2.1.1. of Annex B8	-	-
NOVC-NBEV	M _{CO2} Paragraph 4.1.1. of Annex B8	-	FE _{CO2} Paragraph 4.1.1. of Annex B8	-	-
OVC-NBEV	CD	M _{CO2,CS} Paragraph 4.1.1.2. of Annex B8	FE _{CO2} Paragraph 4.1.1. of Annex B8	For 4 phase WLTP test EC _{CO2} Paragraph 4.1.1. of Annex B8	AER Paragraph 4.4.1.1. of Annex B8
		M _{CO2} Paragraph 4.1.1. of Annex B8	FE _{CO2} Paragraph 4.1.1. of Annex B8	-	-
CD/CS weight #	CD/CS weight #	-	-	For 3 phase WLTP test EC Paragraph 4.4.2. of Annex B8	EAER Paragraph 4.4.4.1. of Annex B8
		-	-	For 3 phase WLTP test EC Paragraph 4.4.2. of Annex B8	EAER Paragraph 4.4.4.1. of Annex B8
PEV	-	-	-	Paragraph 4.3.4.2. of Annex B8	Paragraph 4.4.2. of Annex B8

^(a) The declared value shall be the value to which the necessary corrections, as applicable, are applied
^(b) Rounding to 2 places of decimal according to paragraph 6.1.8. of this Regulation
^(c) Rounding to one place of decimal according to paragraph 6.1.8. of this Regulation
^(d) The declared value shall be provided for the 3 phase WLTP and 4 phase WLTP (as applicable)

	M _{CO2,CS} Paragraph 4.1.1.1. of Annex B8.	FC _{CO2} Paragraph 4.1.1.1. of Annex B8.	FE _{CO2} Paragraph 4.1.1.1. of Annex B8.	AER Paragraph 4.4.1.1. of Annex B8.
CD/CS weight #	-	-	-	EAER ^(d) Paragraph 4.4.4.1. of Annex B8
PEV	-	-	-	PER ^(d) Paragraph 4.4.2. of Annex B8.

- (a) The declared value shall be the value to which the necessary corrections, as applicable, are applied
 (b) Rounding to 2 places of decimal according to paragraph 6.1.8. of this Regulation
 (c) Rounding to one place of decimal according to paragraph 6.1.8. of this Regulation
 (d) The declared value shall be provided for the 3 phase WLTP and 4 phase WLTP (as applicable)



Annex B4 → Table A4/2

New topic

Series: [00] 01, [02], 03

Current/amended text based on 03 series (applicable on 01 series as well)

Current text

Table A4/2[¶]
Energy efficiency classes according to rolling resistance coefficients (RRC) for C1, C2 and C3 tyres and the RRC values to be used for those energy efficiency classes in the interpolation, kg/tonne[¶]

Energy efficiency class [¶]	Range of RRC for C1 tyres [¶]	Range of RRC for C2 tyres [¶]	Range of RRC for C3 tyres [¶]
1 [□]	$RRC \leq 6,5$ [□]	$RRC \leq 5,5$ [□]	$RRC \leq 4,0$ [□]
2 [□]	$6,6 \leq RRC \leq 7,7$ [□]	$5,6 \leq RRC \leq 6,7$ [□]	$4,1 \leq RRC \leq 5,0$ [□]
3 [□]	$7,8 \leq RRC \leq 9,0$ [□]	$6,8 \leq RRC \leq 8,0$ [□]	$5,1 \leq RRC \leq 6,0$ [□]
4 [□]	$9,1 \leq RRC \leq 10,5$ [□]	$8,1 \leq RRC \leq 9,0$ [□]	$6,1 \leq RRC \leq 7,0$ [□]
5 [□]	$RRC \geq 10,6$ [□]	$RRC \geq 9,1$ [□]	$RRC \geq 7,1$ [□]

Energy efficiency class [¶]	Value of RRC to be used for interpolation for C1 tyres [¶]	Value of RRC to be used for interpolation for C2 tyres [¶]	Value of RRC to be used for interpolation for C3 tyres [¶]
1 [□]	$RRC = 5,9$ [□]	$RRC = 4,9$ [□]	$RRC = 3,5$ [□]
2 [□]	$RRC = 7,1$ [□]	$RRC = 6,1$ [□]	$RRC = 4,5$ [□]
3 [□]	$RRC = 8,4$ [□]	$RRC = 7,4$ [□]	$RRC = 5,5$ [□]
4 [□]	$RRC = 9,8$ [□]	$RRC = 8,6$ [□]	$RRC = 6,5$ [□]
5 [□]	$RRC = 11,3$ [□]	$RRC = 9,9$ [□]	$RRC = 7,5$ [□]

Amended text

Table A4/2[¶]
Energy efficiency classes according to rolling resistance coefficients (RRC) for C1, C2 and C3 tyres and the RRC values to be used for those energy efficiency classes in the interpolation, kg/tonne[¶]

Energy efficiency class [¶]	Range of RRC for C1 tyres [¶]	Range of RRC for C2 tyres [¶]	Range of RRC for C3 tyres [¶]
1 [□]	$RRC \leq 6,5$ [□]	$RRC \leq 5,5$ [□]	$RRC \leq 4,0$ [□]
2 [□]	$6,6 \leq RRC \leq 7,7$ [□]	$5,6 \leq RRC \leq 6,7$ [□]	$4,1 \leq RRC \leq 5,0$ [□]
3 [□]	$7,8 \leq RRC \leq 9,0$ [□]	$6,8 \leq RRC \leq 8,0$ [□]	$5,1 \leq RRC \leq 6,0$ [□]
4 [□]	$9,1 \leq RRC \leq 10,5$ [□]	$8,1 \leq RRC \leq 9,0$ [□]	$6,1 \leq RRC \leq 7,0$ [□]
5 [□]	$RRC \geq 10,6$ [□]	$RRC \geq 9,1$ [□]	$RRC \geq 7,1$ [□]

Energy efficiency class [¶]	Value of RRC to be used for interpolation for C1 tyres [¶]	Value of RRC to be used for interpolation for C2 tyres [¶]	Value of RRC to be used for interpolation for C3 tyres [¶]
1 [□]	$RRC = 5,9$ [□]	$RRC = 4,9$ [□]	$RRC = 3,5$ [□]
2 [□]	$RRC = 7,1$ [□]	$RRC = 6,1$ [□]	$RRC = 4,5$ [□]
3 [□]	$RRC = 8,4$ [□]	$RRC = 7,4$ [□]	$RRC = 5,5$ [□]
4 [□]	$RRC = 9,8$ [□]	$RRC = 8,6$ [□]	$RRC = 6,5$ [□]
5 [□]	$RRC = 11,3$ [□]	$RRC = 9,9$ [□]	$RRC = 7,5$ [□]

[¶]Only for 4 phases WLTP calculations of individual vehicles: In case the actual RRC value is lower than this value, the actual rolling resistance value of the tyre or any higher value up to the RRC value indicated here shall be used for interpolation.

5	RRC = 11.3	RRC = 9.9	RRC = 7.5
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* Only for 4 phases WLTP calculations of individual vehicles: In case the actual RRC value is lower than this value, the actual rolling resistance value of the tyre or any higher value up to the RRC value indicated here shall be used for interpolation.

Justification:

- 4 phases calculation results of individual vehicles should be identical whatever the series of amendment.
- Proposal is to harmonize 01 and 03 series of amendment with provisions applicable to level 1A of 00 and 02 series when coming to Rolling Resistance of tires used for 4 phases calculation of individual vehicles.
- This would apply to 4 phases calculation only. No change for 3 phases calculation.
- The proposed modification results in a change for 01 and 03 series only. Retrofit in 00 and 02 series would be for harmonization of wording only.



Annex B8 → Deletion of “Level 1A only” in 1.4.2.2.

New topic – just editorial

Series: 00 and 02

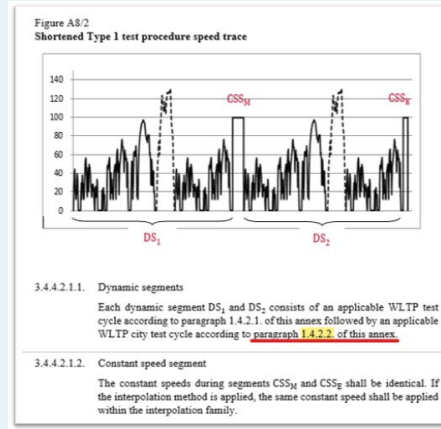
Current/amended text based on 02 series (applicable on 00 series as well)

Current text

1.4.2. Applicable test cycle

1.4.2.1. Applicable WLTP test cycle
The reference test cycle according to paragraph 1.4.1. of this annex shall be the applicable WLTP test cycle (WLTC) for the Type 1 test procedure.
In the case that paragraph 9. of Annex B1 is applied based on the reference test cycle as described in paragraph 1.4.1. of this annex, this modified test cycle shall be the applicable WLTP test cycle (WLTC) for the Type 1 test procedure.

1.4.2.2. Level 1A only
Applicable WLTP city test cycle
The Class 3 WLTP city test cycle (WLTC_{city}) is specified in paragraph 3.5. of Annex B1.



Amended text

1.4.2. → Applicable test cycle¶

1.4.2.1. → Applicable WLTP test cycle¶
The reference test cycle according to paragraph 1.4.1. of this annex shall be the applicable WLTP test cycle (WLTC) for the Type 1 test procedure.¶
In the case that paragraph 9. of Annex B1 is applied based on the reference test cycle as described in paragraph 1.4.1. of this annex, this modified test cycle shall be the applicable WLTP test cycle (WLTC) for the Type 1 test procedure.¶

1.4.2.2. → ~~Level 1A only¶~~
~~Applicable WLTP city test cycle¶~~
~~The Class 3 WLTP city test cycle (WLTC_{city}) is specified in paragraph 3.5. of Annex B1.¶~~

Justification:

- “Level 1A only” makes no sense in 1.4.2.2.
- It could lead to the interpretation in paragraph 3.4.2.1.1. that dynamic segment for Level 1B just consists out of applicable WLTP test cycle only as paragraph 1.4.2.2. is not applicable
- Furthermore, restriction to Level 1A not required in paragraph 1.4.2.2. because anyway stated in the whole calculation chapter that city cycle not applicable for Level 1B, e.g. in front of Table A8/11

Proposal:

- Delete “Level 1A only” in paragraph 1.4.2.2.