

Commission Regulation (EU) 2017/1151 of 1 June 2017 supplementing Regulation (EC) No 715/2007 of the European Parliament and of the Council on type-approval of motor vehicles with respect to emissions from light passenger and commercial vehicles (Euro 5 and Euro 6) and on access to vehicle repair and maintenance information, amending Directive 2007/46/EC of the European Parliament and of the Council, Commission Regulation (EC) No 692/2008 and Commission Regulation (EU) No 1230/2012 and repealing Commission Regulation (EC) No 692/2008 (Text with EEA relevance)

**Changes to legislation:** There are outstanding changes not yet made to Commission Regulation (EU) 2017/1151. Any changes that have already been made to the legislation appear in the content and are referenced with annotations. (See end of Document for details) View outstanding changes

## [<sup>F1</sup>Appendix 6

### Textual Amendments

**F1** Substituted by Commission Regulation (EU) 2018/1832 of 5 November 2018 amending Directive 2007/46/EC of the European Parliament and of the Council, Commission Regulation (EC) No 692/2008 and Commission Regulation (EU) 2017/1151 for the purpose of improving the emission type approval tests and procedures for light passenger and commercial vehicles, including those for in-service conformity and real-driving emissions and introducing devices for monitoring the consumption of fuel and electric energy (Text with EEA relevance).

## CALCULATION OF THE FINAL RDE EMISSIONS RESULTS

### 1. Symbols, Parameters and Units

Index (k) refers to the category (t = total, u = urban, 1-2 = first two phases of the WLTP cycle)

$IC_k$	is the distance share of usage of the internal combustion engine for an OVC-HEV over the RDE trip
$d_{ICE,k}$	is the distance driven [km], with the internal combustion engine on for an OVC-HEV over the RDE trip
$d_{EV,k}$	is the distance driven [km], with the internal combustion engine off for an OVC-HEV over the RDE trip
$M_{RDE,k}$	is the final RDE distance-specific mass of gaseous pollutants [mg/km] or particle number [# /km]
$m_{RDE,k}$	is the distance-specific mass of gaseous pollutant [mg/km] or particle number [# /km] emissions, emitted over the complete RDE trip and prior to any correction in accordance with this Appendix
$M_{CO_2,RDE,k}$	is the distance-specific mass of CO <sub>2</sub> [g/km], emitted over the RDE trip
$M_{CO_2,WLTC,k}$	is the distance-specific mass of CO <sub>2</sub> [g/km], emitted over the WLTC cycle
$M_{CO_2,WLTC,CS,k}$	is the distance-specific mass of CO <sub>2</sub> [g/km], emitted over the WLTC cycle for an OVC-HEV vehicle tested on its charge sustaining mode
$r_k$	ratio between the CO <sub>2</sub> emissions measured during the RDE test and the WLTP test
$RF_k$	is the result evaluation factor calculated for the RDE trip
$RF_{L1}$	is the first parameter of the function used to calculate the result evaluation factor
$RF_{L2}$	is the second parameter of the function used to calculate the result evaluation factor

### 2. Calculation of the Final RDE emissions results

#### 2.1. Introduction

The trip validity shall be verified in accordance with point 9.2. of Annex IIIA. For the valid trips, the final RDE results are calculated as follows for vehicles with ICE, NOVC-HEV and OVC-HEV.

For the complete RDE trip and for the urban part of the RDE trip (k = t = total, k = u = urban):

$$M_{RDE,k} = m_{RDE,k} \cdot RF_k$$

The values of the parameter  $RF_{L1}$  and  $RF_{L2}$  of the function used to calculate the result evaluation factor are as follows:

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- Upon the request of the manufacturer and only for type approvals granted before 1 January 2020,

$$RF_{L1} = 1,20 \text{ and } RF_{L2} = 1,25;$$

in all other cases:

$$RF_{L1} = 1,30 \text{ and } RF_{L2} = 1,50;$$

The RDE result evaluation factors  $RF_k$  ( $k = t = \text{total}$ ,  $k = u = \text{urban}$ ) shall be obtained using the functions laid down in point 2.2. for vehicles with ICE and NOVC-HEV, and in point 2.3. for OVC-HEV. These evaluation factors shall be subject to review by the Commission and shall be revised as a result of technical progress. A graphical illustration of the method is provided in Figure App 6.1 below, while the mathematical formulas are found in Table App 6.1:

**Figure App 6.1** Function to calculate the result evaluation factor

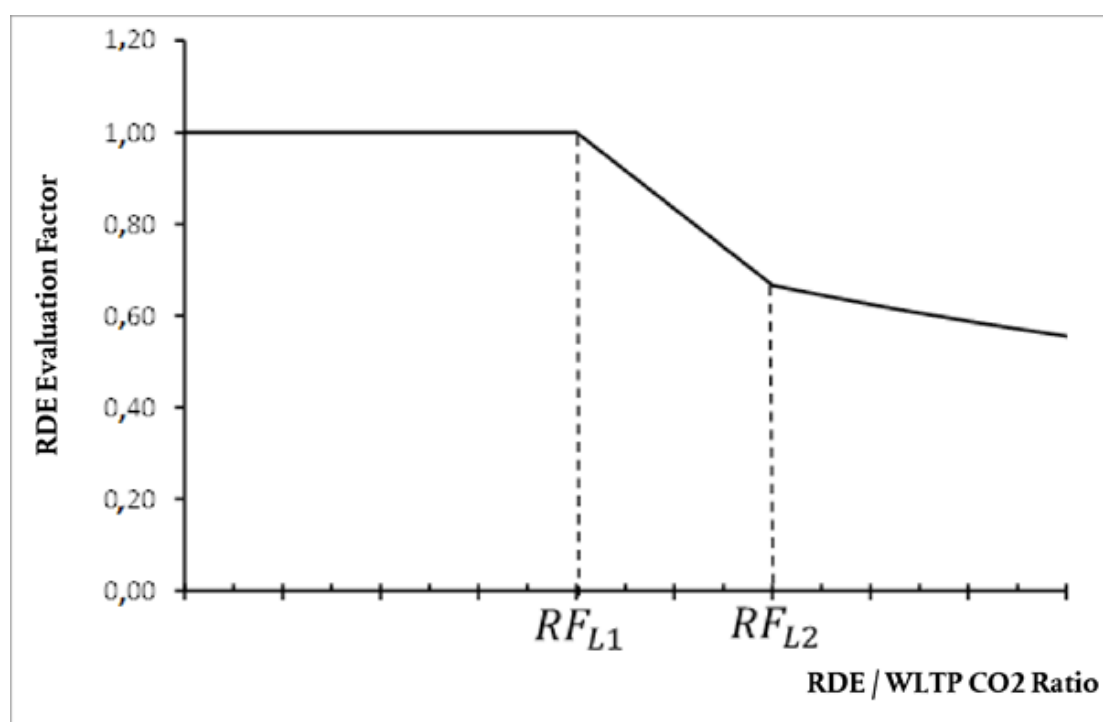


Table App 6.1

**Result evaluation factors calculation**

When:	Then the Result evaluation factor $RF_k$ is:	Where:
$r_k \leq RF_{L1}$	$RF_k = 1$	
$RF_{L1} < r_k \leq RF_{L2}$	$RF_k = a_1 r_k + b_1$	$a_1 = \frac{RF_{L2} - 1}{RF_{L2}(RF_{L1} - RF_{L2})}$ $b_1 = 1 - a_1 RF_{L1}$

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Table App 6.1

**Result evaluation factors calculation**

$r_k > RF_{L2}$	$RF_k = \frac{1}{r_k}$	
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2.2. RDE result evaluation factor for vehicles with ICE and NOVC-HEV

The value of the RDE result evaluation factor depends on the ratio  $r_k$  between the distance specific CO<sub>2</sub> emissions measured during the RDE test and the distance-specific CO<sub>2</sub> emitted by the vehicle over the WLTP test conducted in accordance with Sub-Annex 6 to Annex XXI of this Regulation, obtained from point 12 of the Transparency list 1 of Appendix 5 of Annex II with interpolation between vehicle H and vehicle L (if relevant) as defined in Sub-Annex 7 of Annex XXI, using Test mass and Road load coefficients (F0, F1 & F2) obtained from the Certificate of Conformity for the individual vehicle as defined in Annex IX. For the urban emissions, the relevant phases of the WLTP driving cycle shall be:

- for ICE vehicles the first two WLTP phases, i.e. the Low and the Medium speed phases,
- for NOVC-HEVs the whole WLTP driving cycle.

$$r_k = \frac{M_{CO_2,RDE,k}}{M_{CO_2,WLTP,k}}$$

2.3. RDE result evaluation factor for OVC-HEV

The value of the RDE result evaluation factor depends on the ratio  $r_k$  between the distance-specific CO<sub>2</sub> emissions measured during the RDE test and the distance-specific CO<sub>2</sub> emitted by the vehicle over the WLTP test conducted using the Charge Sustaining mode in accordance with Sub-Annex 6 to Annex XXI of this Regulation, obtained from point 12 of the Transparency list 1 of Appendix 5 of Annex II with interpolation between vehicle H and vehicle L (if relevant) as defined in Sub-Annex 7 of Annex XXI, using Test mass and Road load coefficients (F0, F1 & F2) obtained from the Certificate of Conformity for the individual vehicle as defined in Annex IX. The ratio  $r_k$  is corrected by a ratio reflecting the respective usage of the internal combustion engine during the RDE trip and on the WLTP test, to be conducted using the charge sustaining mode. The formula below shall be subject to review by the Commission and shall be revised as a result of technical progress.

For either the urban or the total driving:

$$r_k = \frac{M_{CO_2,RDE,k}}{M_{CO_2,WLTPA-CS,k}} \times \frac{0.85}{IC_k}$$

where  $IC_k$  is the ratio of the distance driven either in urban or total trip with the combustion engine on divided by the total urban or total trip distance:

$$IC_k = \frac{d_{ICE,k}}{d_{ICE,k} + d_{EV,k}}$$

With determination of combustion engine operation in accordance with Appendix 4 Paragraph 5.]

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**Changes and effects yet to be applied to the whole legislation item and associated provisions**

- Signature words omitted by [S.I. 2022/1273 reg. 80\(16\)](#)
- Annex 2 Part B point 7.7 omitted by [S.I. 2022/1273 reg. 81\(3\)\(b\)\(viii\)](#)
- Annex 2 Part B point 5.8 Table B.1 word substituted by [S.I. 2022/1273 reg. 81\(3\)\(b\)\(iv\)\(bb\)](#)
- Annex 2 Part A point 2.4 words inserted by [S.I. 2022/1273 reg. 81\(3\)\(a\)\(iii\)\(aa\)](#)
- Annex 2 Part B point 5.7.1 words inserted by [S.I. 2022/1273 reg. 81\(3\)\(b\)\(iii\)\(aa\)](#)
- Annex 2 Part B point 5 words omitted by [S.I. 2022/1273 reg. 81\(3\)\(b\)\(i\)\(aa\)](#)
- Annex 2 Part B point 5 words omitted by [S.I. 2022/1273 reg. 81\(3\)\(b\)\(i\)\(bb\)](#)
- Annex 2 Part B point 5 words omitted by [S.I. 2022/1273 reg. 81\(3\)\(b\)\(i\)\(cc\)](#)
- Annex 2 Part B point 5.9 heading words omitted by [S.I. 2022/1273 reg. 81\(3\)\(b\)\(v\)\(aa\)](#)
- Annex 2 Part B point 5.9 words omitted by [S.I. 2022/1273 reg. 81\(3\)\(b\)\(v\)\(bb\)](#)
- Annex 2 Part B point 7.9 words omitted by [S.I. 2022/1273 reg. 81\(3\)\(b\)\(viii\)](#)
- Annex 2 Appendix 1 table words omitted by [S.I. 2022/1273 reg. 81\(3\)\(c\)\(i\)](#)
- Annex 2 Part A point 2.1 words substituted by [S.I. 2022/1273 reg. 81\(3\)\(a\)\(i\)](#)
- Annex 2 Part A point 2.3 words substituted by [S.I. 2022/1273 reg. 81\(3\)\(a\)\(ii\)](#)
- Annex 2 Part A point 2.4 words substituted by [S.I. 2022/1273 reg. 81\(3\)\(a\)\(iii\)\(bb\)](#)
- Annex 2 Part A point 2.5 words substituted by [S.I. 2022/1273 reg. 81\(3\)\(a\)\(iv\)](#)
- Annex 2 Part A point 2.6 words substituted by [S.I. 2022/1273 reg. 81\(3\)\(a\)\(v\)](#)
- Annex 2 Part B point 5.1 words substituted by [S.I. 2022/1273 reg. 81\(3\)\(b\)\(ii\)](#)
- Annex 2 Part B point 5.7.1 words substituted by [S.I. 2022/1273 reg. 81\(3\)\(b\)\(iii\)\(bb\)](#)
- Annex 2 Part B point 5.8 words substituted by [S.I. 2022/1273 reg. 81\(3\)\(b\)\(iv\)\(aa\)](#)
- Annex 2 Part B point 5.10.1 words substituted by [S.I. 2022/1273 reg. 81\(3\)\(b\)\(vi\)](#)
- Annex 2 Part B point 7.6 words substituted by [S.I. 2022/1273 reg. 81\(3\)\(b\)\(vii\)](#)
- Annex 2 Part B point 7.10 words substituted by [S.I. 2022/1273 reg. 81\(3\)\(b\)\(x\)\(aa\)](#)
- Annex 2 Part B point 7.10 words substituted by [S.I. 2022/1273 reg. 81\(3\)\(b\)\(x\)\(bb\)](#)
- Annex 2 Part B point 7.11 words substituted by [S.I. 2022/1273 reg. 81\(3\)\(b\)\(xi\)\(aa\)](#)
- Annex 2 Part B point 7.11 words substituted by [S.I. 2022/1273 reg. 81\(3\)\(b\)\(xi\)\(bb\)](#)
- Annex 2 Appendix 1 table words substituted by [S.I. 2022/1273 reg. 81\(3\)\(c\)\(ii\)](#)
- Annex 2 Appendix 1 table words substituted by [S.I. 2022/1273 reg. 81\(3\)\(c\)\(iii\)](#)
- Annex 2 Appendix 1 table words substituted by [S.I. 2022/1273 reg. 81\(3\)\(c\)\(iv\)](#)
- Annex 2 Appendix 1 table words substituted by [S.I. 2022/1273 reg. 81\(3\)\(c\)\(v\)](#)
- Annex 1 Appendix 4 Addendum heading word substituted by [S.I. 2022/1273 reg. 81\(2\)\(j\)](#)
- Annex 1 Appendix 6 heading word substituted by [S.I. 2022/1273 reg. 81\(2\)\(l\)\(i\)](#)
- Annex 1 Appendix 6 point 1 word substituted by [S.I. 2022/1273 reg. 81\(2\)\(l\)\(i\)](#)
- Annex 1 Appendix 6 point 2.1 word substituted by [S.I. 2022/1273 reg. 81\(2\)\(l\)\(ii\)\(bb\)](#)
- Annex 1 Appendix 6 point 2.2 word substituted by [S.I. 2022/1273 reg. 81\(2\)\(l\)\(iii\)\(bb\)](#)
- Annex 1 Appendix 4 words inserted by [S.I. 2022/1273 reg. 81\(2\)\(i\)\(ii\)](#)
- Annex 1 Appendix 7 words inserted by [S.I. 2022/1273 reg. 81\(2\)\(m\)](#)
- Annex 1 Appendix 3 point 16.3 notes words omitted by [S.I. 2022/1273 reg. 81\(2\)\(h\)\(ii\)](#)
- Annex 1 Appendix 4s. 2 point 8 notes words omitted by [S.I. 2022/1273 reg. 81\(2\)\(i\)\(iii\)](#)
- Annex 1 Appendix 4 Addendum notes words omitted by [S.I. 2022/1273 reg. 81\(2\)\(k\)\(ii\)](#)
- Annex 1 Appendix 6 point 2.1 words omitted by [S.I. 2022/1273 reg. 81\(2\)\(l\)\(ii\)\(aa\)](#)

- Annex 1 Appendix 6 point 2.2 words omitted by S.I. 2022/1273 reg. 81(2)(l)(iii)(aa)
- Annex 1 Appendix 3 heading words substituted by S.I. 2022/1273 reg. 81(2)(g)(i)
- Annex 1 Appendix 3 point 3.2.18.1 words substituted by S.I. 2022/1273 reg. 81(2)(g)(i)
- Annex 1 Appendix 3 point 3.5.8 words substituted by S.I. 2022/1273 reg. 81(2)(g)(ii)
- Annex 1 Appendix 3 point 9.1 words substituted by S.I. 2022/1273 reg. 81(2)(g)(iii)
- Annex 1 Appendix 3 point 16.3 notes words substituted by S.I. 2022/1273 reg. 81(2)(h)(i)
- Annex 1 Appendix 4 heading words substituted by S.I. 2022/1273 reg. 81(2)(i)(i)
- Annex 1 Appendix 4 words substituted by S.I. 2022/1273 reg. 81(2)(i)(i)
- Annex 1 Appendix 4 Addendum notes words substituted by S.I. 2022/1273 reg. 81(2)(k)(i)
- Art. 2(2) words substituted by S.I. 2022/1273 reg. 80(2)(a)(i)
- Art. 2(2) words substituted by S.I. 2022/1273 reg. 80(2)(a)(ii)
- Art. 2(32c) words substituted by S.I. 2022/1273 reg. 80(2)(b)
- Annex 3A point 2.3 omitted by S.I. 2022/1273 reg. 81(4)(a)
- Annex 3A Appendix 6 point 2.1 word substituted by S.I. 2022/1273 reg. 81(4)(j)(i)(bb)
- Annex 3A Appendix 7 point 5.2 word substituted by S.I. 2022/1273 reg. 81(4)(k)(ii)(aa)
- Annex 3A Appendix 7 point 5.3 word substituted by S.I. 2022/1273 reg. 81(4)(k)(iii)
- Annex 3A point 7.4 words omitted by S.I. 2022/1273 reg. 81(4)(h)
- Annex 3A Appendix 7 point 5.2 words omitted by S.I. 2022/1273 reg. 81(4)(k)(ii)(bb)
- Annex 3A point 2.4 words substituted by S.I. 2022/1273 reg. 81(4)(b)
- Annex 3A point 3.1.3.2 words substituted by S.I. 2022/1273 reg. 81(4)(c)
- Annex 3A point 3.1.3.2.1 words substituted by S.I. 2022/1273 reg. 81(4)(d)
- Annex 3A point 6.4 words substituted by S.I. 2022/1273 reg. 81(4)(e)
- Annex 3A point 6.5 words substituted by S.I. 2022/1273 reg. 81(4)(f)
- Annex 3A point 6.9 words substituted by S.I. 2022/1273 reg. 81(4)(g)(i)
- Annex 3A point 6.9 words substituted by S.I. 2022/1273 reg. 81(4)(g)(ii)
- Annex 3A Appendix 5 point 4.4.2 words substituted by S.I. 2022/1273 reg. 81(4)(i)(i)
- Annex 3A Appendix 5 point 4.4.3 words substituted by S.I. 2022/1273 reg. 81(4)(i)(i)
- Annex 3A Appendix 5 point 4.4.3 words substituted by S.I. 2022/1273 reg. 81(4)(i)(ii)
- Annex 3A Appendix 6 point 2.1 words substituted by S.I. 2022/1273 reg. 81(4)(j)(i)(aa)
- Annex 3A Appendix 6 point 2.3 words substituted by S.I. 2022/1273 reg. 81(4)(j)(ii)
- Annex 3A Appendix 7 point 1 words substituted by S.I. 2022/1273 reg. 81(4)(k)(i)
- Art. 9(8)(a) words substituted by S.I. 2022/1273 reg. 80(9)(f)(i)
- Art. 9(8)(b) words substituted by S.I. 2022/1273 reg. 80(9)(f)(ii)(aa)
- Art. 9(8)(b) words substituted by S.I. 2022/1273 reg. 80(9)(f)(ii)(bb)
- Annex 11 Appendix 1 point 3.1.2 words omitted by S.I. 2022/1273 reg. 81(5)(c)(i)(aa)
- Annex 11 Appendix 1 point 3.1.2 words omitted by S.I. 2022/1273 reg. 81(5)(c)(ii)(aa)
- Annex 11 Appendix 1 point 3.1.2 words omitted by S.I. 2022/1273 reg. 81(5)(c)(ii)(bb)
- Annex 11 Appendix 1 point 3.1.2 words substituted by S.I. 2022/1273 reg. 81(5)(c)(i)(bb)
- Annex 13 Appendix 3 image substituted by S.I. 2022/1273 reg. 81(7)(k)(ii)
- Annex 13 Appendix 1 heading word substituted by S.I. 2022/1273 reg. 81(7)(i)
- Annex 13 Appendix 1 point 000.7 word substituted by S.I. 2022/1273 reg. 81(7)(i)
- Annex 13 Appendix 2 point 000.7 word substituted by S.I. 2022/1273 reg. 81(7)(j)(ii)

- Annex 13 Appendix 3 heading word substituted by S.I. 2022/1273 reg. 81(7)(k)(i)
- Annex 13 Appendix 3 words omitted by S.I. 2022/1273 reg. 81(7)(k)(iii)
- Annex 13 Appendix 2 words substituted by S.I. 2022/1273 reg. 81(7)(j)(i)
- Annex 14 Appendix 1 words inserted by S.I. 2022/1273 reg. 81(8)(b)
- Art. 15(5)(c) word substituted by S.I. 2022/1273 reg. 80(15)(e)