
***Changes to legislation:** There are outstanding changes not yet made to Regulation (EU) 2018/858 of the European Parliament and of the Council. 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](#)*

Regulation (EU) 2018/858 of the European Parliament and of the Council of 30 May 2018 on the approval and market surveillance of motor vehicles and their trailers, and of systems, components and separate technical units intended for such vehicles, amending Regulations (EC) No 715/2007 and (EC) No 595/2009 and repealing Directive 2007/46/EC (Text with EEA relevance)

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ANNEX VIII

**CONDITIONS FOR THE USE OF VIRTUAL TESTING METHODS
BY A MANUFACTURER OR A TECHNICAL SERVICE**

1. Objectives and scope

This Annex lays down provisions concerning virtual testing in accordance with Article 30(7).

2. List of regulatory acts

| | Subject | Regulatory act reference |
|-----|---|---|
| 3B | Rear underrun protective devices (RUPDs) and their installation; rear underrun protection (RUP) | Regulation (EC) No 661/2009 UN Regulation No 58 |
| 6A | Vehicle access and manoeuvrability (steps, running boards and handholds) | Regulation (EC) No 661/2009 Regulation (EU) No 130/2012 |
| 6B | Door latches and door retention components | Regulation (EC) No 661/2009 UN Regulation No 11 |
| 8A | Devices for indirect vision and their installation | Regulation (EC) No 661/2009 UN Regulation No 46 |
| 12A | Interior fittings | Regulation (EC) No 661/2009 UN Regulation No 21 |
| 16A | External projections | Regulation (EC) No 661/2009 UN Regulation No 26 |
| 20A | Installation of lighting and light-signalling devices on vehicles | Regulation (EC) No 661/2009 UN Regulation No 48 |
| 27A | Towing device | Regulation (EC) No 661/2009 Regulation (EU) No 1005/2010 |
| 32A | Forward field of vision | Regulation (EC) No 661/2009 UN Regulation No 125 |
| 35A | Windscreen wiper and washer systems | Regulation (EC) No 661/2009 Regulation (EU) No 1008/2010 |
| 37A | Wheel guards | Regulation (EC) No 661/2009 |

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| | | |
|-----|---|---|
| | | Regulation (EU) No 1009/2010 |
| 42A | Lateral protection of goods vehicles | Regulation (EC) No 661/2009 UN Regulation No 73 |
| 48A | Masses and dimensions | Regulation (EC) No 661/2009 Regulation (EU) No 1230/2012 |
| 49A | Commercial vehicles with regard to their external projections forward of the cab's rear panel | Regulation (EC) No 661/2009 UN Regulation No 61 |
| 50A | Mechanical coupling components of combinations of vehicles | Regulation (EC) No 661/2009 UN Regulation No 55 |
| 50B | Close-coupling device (CCD); fitting of an approved type of CCD | Regulation (EC) No 661/2009 UN Regulation No 102 |
| 52A | M ₂ and M ₃ vehicles | Regulation (EC) No 661/2009 UN Regulation No 107 |
| 52B | Strength of the superstructure of large passenger vehicles | Regulation (EC) No 661/2009 UN Regulation No 66 |
| 57A | Front underrun protective devices (FUPDs) and their installation; front underrun protection (FUP) | Regulation (EC) No 661/2009 UN Regulation No 93 |

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Appendix 1

General conditions for the use of virtual testing methods

1. Virtual test pattern

The following scheme shall be used as basis structure for describing and conducting virtual testing:

- (a) purpose;
- (b) structure model;
- (c) boundary conditions;
- (d) load assumptions;
- (e) calculation;
- (f) assessment;
- (g) documentation.

2. Fundamentals of computer simulation and calculation

2.1. Mathematical model

The mathematical model shall be supplied by the manufacturer. It shall reflect the complexity of the structure of the vehicle, system, component or separate technical unit to be tested in relation to the requirements of the relevant regulatory act and its boundary conditions.

The same provisions shall apply for testing components or separate technical units independently from the vehicle.

2.2. Validation process of the mathematical model

The mathematical model shall be validated against the actual test conditions.

To that effect a physical test shall be conducted to compare the results obtained when using the mathematical model with the results of a physical test. Comparability of the test results shall be proven. The manufacturer or the technical service shall draft a validation report and submit it to the approval authority.

Any change to the mathematical model or to the software that is likely to invalidate the validation report shall be brought to the attention of the approval authority, which may require that a new validation process is conducted.

The flow chart of the validation process is shown in Appendix 3.

2.3. Documentation

The manufacturer shall make available to the technical service and document the data and auxiliary tools used for simulation and calculation.

3. Tools and support

The manufacturer shall supply the technical service at its request with the necessary tools to conduct the virtual testing, including appropriate software, or provide that technical service access to these tools.

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The manufacturer shall also provide appropriate support to the technical service.

The access and support provided by the manufacturer to a technical service does not exempt the technical service from its obligations regarding the skills of its personnel, the payment of licence rights and confidentiality.

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Appendix 2

Specific conditions for the use of virtual testing methods

1. List of regulatory acts

| | Regulatory act reference | Annex and paragraphs | Specific conditions |
|-----|--|---|--|
| 3B | Regulation (EC) No 661/2009 UN Regulation No 58 | Paragraphs 2.3, 7.3. and 25.6 of UN Regulation No 58. | Dimensions and resistance to forces. |
| 6A | Regulation (EC) No 661/2009 Regulation (EU) No 130/2012 | Annex II, Part 1 and 2 of Regulation (EU) No 130/2012. | Dimensions of steps, running boards and handholds. |
| 6B | Regulation (EC) No 661/2009 UN Regulation No 11 | Annex 3 of UN Regulation No 11. Annex 4, paragraph 2.1. of UN Regulation No 11. Annex 5 of UN Regulation No 11. | Tensile strength tests and resistance of latches to acceleration. |
| 8A | Regulation (EC) No 661/2009 UN Regulation No 46 | Paragraph 15.2.4. of UN Regulation No 46. | Prescribed fields of vision of rear-view mirrors. |
| 12A | Regulation (EC) No 661/2009 UN Regulation No 21 | (a) Paragraphs 5. to 5.7. of UN Regulation No 21. | (a) Measurement of all radii of curvature and of all projections except for those requirements where a force has to be applied in order to check compliance with the provisions. |
| | | (b) Paragraph 2.3. of UN Regulation No 21. | (b) Determination of the head-impact zone. |
| 16A | Regulation (EC) No 661/2009 | Paragraph 5.2.4. of UN Regulation No 26 | Measurement of all radii of curvature |

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| | | | |
|-----|---|---|--|
| | UN Regulation No 26 | All provisions in paragraphs 5 (General requirements) and 6 (Particular requirements) of UN Regulation No 26. | and of all projections except for those requirements where a force has to be applied in order to check compliance with the provisions. |
| 20A | Regulation (EC) No 661/2009 UN Regulation No 48 | Paragraph 6. (Individual specifications), and Annexes 4, 5 and 6 to UN Regulation No 48. | The test drive provided for in paragraph 6.22.9.2.2 shall be performed on a real vehicle. |
| 27A | Regulation (EC) No 661/2009 Regulation (EU) No 1005/2010 | Annex II, point 1.2. of Regulation (EU) No 1005/2010. | Tractive and compressive static force. |
| 32A | Regulation (EC) No 661/2009 UN Regulation No 125 | Paragraph 5 (Specifications) of UN Regulation No 125. | Obstructions and field of vision. |
| 35A | Regulation (EC) No 661/2009 Regulation (EU) No 1008/2010 | Annex III, points 1.1.2. and 1.1.3. of Regulation (EU) No 1008/2010. | Determination of the swept area only. |
| 37A | Regulation (EC) No 661/2009 Regulation (EU) No 1009/2010 | Annex II, point 2. of Regulation (EU) No 1009/2010. | Verification of the dimensional requirements. |
| 42A | Regulation (EC) No 661/2009 UN Regulation No 73 | Paragraph 12.10 of UN Regulation No 73. | Resistance under a horizontal force and deflection measurement. |
| 48A | Regulation (EC) No 661/2009 Regulation (EU) No 1230/2012 | (a) Annex I, Part B, points 7 and 8 of Regulation (EU) No 1230/2012. | (a) Check of compliance with the manoeuvrability requirements including manoeuvrability of vehicles fitted with lift- or loadable axles. |
| | | (b) Annex I, Part C, | (b) Measurement of the |

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|-----|---|--|--|
| | | points 6 and 7 of Regulation (EU) No 1230/2012. | maximum rear swing-out. |
| 49A | Regulation (EC) No 661/2009 UN Regulation No 61 | Paragraphs 5 and 6 of UN Regulation No 61. | Measurement of all radii of curvature and of all projections except for those requirements where a force has to be applied in order to check compliance with the provisions. |
| 50A | Regulation (EC) No 661/2009 UN Regulation No 55 | (a) Annex 5 'Requirements for mechanical coupling devices' of UN Regulation No 55. | (a) All provisions of paragraphs 1 to 8 included. |
| | | (b) Annex 6, paragraph 1.1. of UN Regulation No 55. | (b) Strength tests on mechanical couplings of simple design may be replaced by virtual tests. |
| | | (c) Annex 6, paragraph 3 of UN Regulation No 55. | (c) Paragraphs 3.6.1. (Strength test), 3.6.2. (Resistance to buckling) and 3.6.3. (Resistance to bending moment) only. |
| 52A | Regulation (EC) No 661/2009 UN Regulation No 107 | Annex 3 of UN Regulation No 107. | Paragraph 7.4.5. (calculation method). |

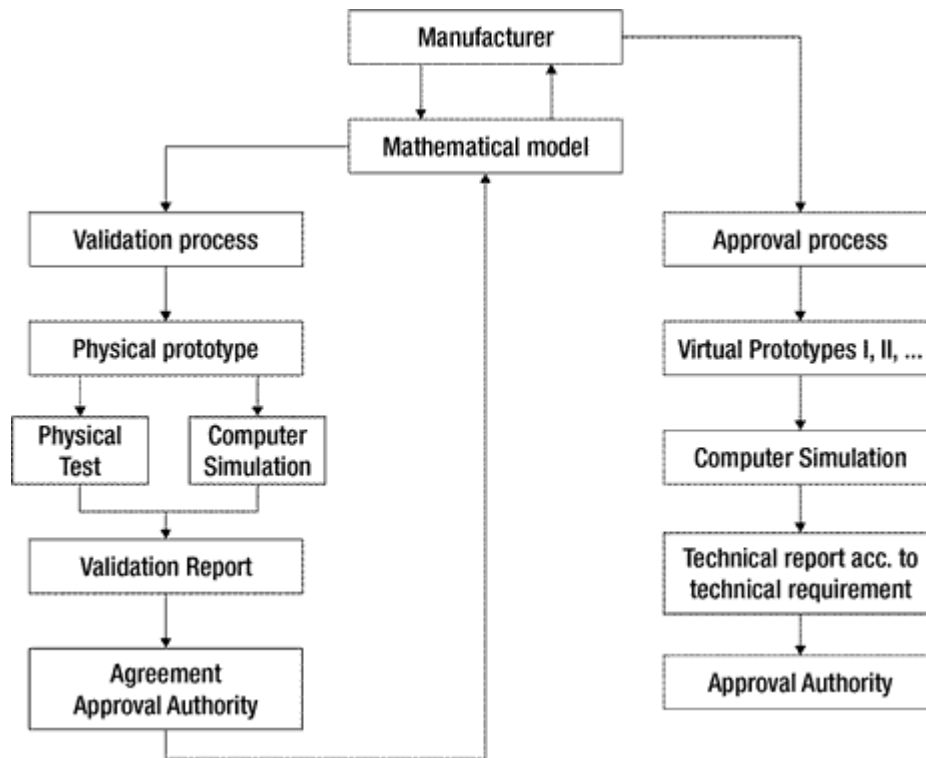
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|-----|--|--|--|
| 52B | Regulation (EC) No 661/2009 UN Regulation No 66 | Annex 9 of UN Regulation No 66. | Computer simulation of rollover test on complete vehicle as an equivalent approval method. |
| 57A | Regulation (EC) No 661/2009 UN Regulation No 93 | Annex 5, paragraph 3 of UN Regulation No 93. | Resistance under a horizontal force and deflection measurement. |

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F¹ Appendix 3

Validation process



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

- Art. 68(3A)(3B) inserted by [S.I. 2024/504 reg. 19\(b\)](#)