

Official Journal of the European Union

L 277



English edition

Legislation

Volume 59

13 October 2016

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EN

Acts whose titles are printed in light type are those relating to day-to-day management of agricultural matters, and are generally valid for a limited period.

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II

(Non-legislative acts)

REGULATIONS

COMMISSION DELEGATED REGULATION (EU) 2016/1788

of 14 July 2016

amending Regulation (EU) No 167/2013 of the European Parliament and of the Council as regards the list of requirements for vehicle EU type-approval, and amending and correcting Commission Delegated Regulations (EU) No 1322/2014, (EU) 2015/96, (EU) 2015/68 and (EU) 2015/208 with regard to vehicle construction and general requirements, to environmental and propulsion unit performance requirements, to vehicle braking requirements and to vehicle functional safety requirements

(Text with EEA relevance)

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Regulation (EU) No 167/2013 of the European Parliament and of the Council of 5 February 2013 on the approval and market surveillance of agricultural and forestry vehicles ⁽¹⁾, and in particular Articles 17(5), 18(4), 19(6), 20(8), 27(6), 28(6), 49(3), 53(12), 60(1) and Articles 61 and 70 thereto,

Whereas:

- (1) As Article 27(3) of Regulation (EU) No 167/2013 allows for the use of virtual testing methods as an alternative to the physical tests performed by designated technical services, and considering that such virtual testing methods reduce considerably the burden on manufacturers and are particularly easy to apply with regard to dimensional checking, further requirements should be added to the list of requirements which may be subject to virtual testing set out in Annex III to Commission Delegated Regulation (EU) No 1322/2014 ⁽²⁾.
- (2) In order to improve the accuracy, the technical requirements related to the measuring apparatus for the driver-perceived noise level set out in Annex XIII to Delegated Regulation (EU) No 1322/2014 should be updated to technical progress.
- (3) To ensure consistency it is necessary to provide further conditions for EU component type-approval of a seat in Annex XIV to Delegated Regulation (EU) No 1322/2014.
- (4) For the purposes of clarity and accuracy, further requirements on the information to be included in the operator's manual in accordance with Annex XXII to Delegated Regulation (EU) No 1322/2014 should be added, in particular with regard to the information on how to fix the three-point hitch laterally and vertically for road travel, on instructions and specific warnings on the reduced dimensions of the protective device for a power take-off Type 3 and on the greasing intervals.
- (5) Due to their technical design, vehicles of category T or C with a hydrostatic drive controlled by the right foot and vehicles of category C with a maximum design speed of less than 15 km/h referred to in Annex XXIII to Delegated Regulation (EU) No 1322/2014 regarding control devices should be exempted from the requirement of having clutch, brake and accelerator pedals with the same function and arrangement as those of a motor vehicle.

⁽¹⁾ OJ L 60, 2.3.2013, p. 1.

⁽²⁾ Commission Delegated Regulation (EU) No 1322/2014 of 19 September 2014 supplementing and amending Regulation (EU) No 167/2013 of the European Parliament and of the Council with regard to vehicle construction and general requirements for the approval of agricultural and forestry vehicles (OJ L 364, 18.12.2014, p. 1).

- (6) To improve the accuracy, the requirements for the safe start of the engine set out in Annex XXIII to Delegated Regulation (EU) No 1322/2014 should be improved and adapted to the particularities of certain vehicle designs.
- (7) To ensure consistency with Delegated Regulation (EU) No 1322/2014, requirements for control devices related to virtual terminals, set out in Annex X to Commission Delegated Regulation (EU) 2015/208 ⁽¹⁾ regarding requirements on driver information systems, should be moved to Annex XXIII to Delegated Regulation (EU) No 1322/2014 regarding requirements on control devices.
- (8) For the purposes of consistency and simplification, the marking requirements for the flexible hydraulic hoses set out in Annex XXIV to Delegated Regulation (EU) No 1322/2014 regarding protection against other mechanical hazards should be harmonised with standard ISO 17165-1:2007 currently used by hose manufacturers.
- (9) To ensure consistency it is necessary to include in the scope of Annex XXIX to Delegated Regulation (EU) No 1322/2014 regarding protection against hazardous substances, any tractor fitted with a cab, including those fitted with cabs of level 1, even if they do not provide any protection.
- (10) In order to ensure that the meaning of the term 'cab' is understood in the same way, a definition for 'cab' should be introduced in Delegated Regulation (EU) 2015/208. The definition should be based on the internationally recognised standard EN 15695-1:2009.
- (11) The calculation of tractors' maximum theoretical speed set out in Annex III to Delegated Regulation (EU) 2015/208 should take into account the latest technical developments regarding engine control.
- (12) The conditions for fulfilment of ISO requirements set out in Annex VII to Delegated Regulation (EU) 2015/208 regarding field of vision and windscreen wipers do not expressly include conditions regarding direct and indirect vision. Conditions regarding direct and indirect vision should be expressly stated in that Annex to ensure that the ISO requirements are fulfilled uniformly.
- (13) Lighting installations referred to in Annex XII to Delegated Regulation (EU) 2015/208 should comply with certain stricter requirements for fast tractors, to increase their safety.
- (14) Control devices, providing the driver with haptic information, have protruding edges. In order to protect vehicle occupants while retaining the possibility to provide haptic information, it is necessary to introduce specific requirements for those devices in Annex XIII to Delegated Regulation (EU) 2015/208.
- (15) Specific requirements should be introduced in Annex XIV to Delegated Regulation (EU) 2015/208 for the exterior and accessories of agricultural and forestry vehicles, due to the particular purpose of certain exterior configurations.
- (16) The requirements for cab heating and cooling in Annex XVII to Delegated Regulation (EU) 2015/208 should be compatible with the requirements of Annex XXIX to Delegated Regulation (EU) No 1322/2014 regarding the pressure level and the air flow.
- (17) It is necessary to improve the visibility of the registration plates referred to in Annex XIX to Delegated Regulation (EU) 2015/208.
- (18) Certain requirements for the fuel tanks in Annex XXV to Delegated Regulation (EU) 2015/208 should be aligned with the latest technical developments set out in the United Nations Economic Commission for Europe (UNECE) Regulation No 34.
- (19) Due to particular dimensions of T2 tractors, it is necessary to adapt the length of platform specified in Annex XXVIII to Delegated Regulation (EU) 2015/208.
- (20) The towing device requirements in Annex XXIX to Delegated Regulation (EU) 2015/208 need to be adapted to take into account the latest technical developments.

⁽¹⁾ Commission Delegated Regulation (EU) 2015/208 of 8 December 2014 supplementing Regulation (EU) No 167/2013 of the European Parliament and of the Council with regard to vehicle functional safety requirements for the approval of agricultural and forestry vehicles (OJ L 42, 17.2.2015, p. 1).

- (21) Additional definitions are necessary in relation to tracks in Annex XXXIII to Delegated Regulation (EU) 2015/208. It is also necessary to update a number of the existing definitions to take into account the latest technical developments.
- (22) Additional terms and requirements are necessary in relation to mechanical couplings in Annex XXXIV to Delegated Regulation (EU) 2015/208, to ensure the consistency of tests on both towing vehicle (tractor) and towed vehicle (trailer or interchangeable towed equipment). Number of the terms and requirements in relation to mechanical couplings need to be adapted to avoid the use of the same terms in different contexts.
- (23) Certain terms and requirements related to braking of agricultural and forestry vehicles in Annex I to Commission Delegated Regulation (EU) 2015/68 ⁽¹⁾ should be aligned with the latest technical developments regarding construction and fitting of brakes.
- (24) Braking tests set out in Annex II to Delegated Regulation (EU) 2015/68 should be aligned with the latest technical developments regarding the braking behaviour and performance and with corresponding requirements of UNECE Regulation No 13.
- (25) Additional definitions in relation to alternative braking tests are necessary and certain terms and requirements concerning alternative braking tests set out in Annex VII to Delegated Regulation (EU) 2015/68 should be clarified to fully align with the requirements laid down in UNECE Regulation No 13.
- (26) Certain terms and requirements related to braking of agricultural and forestry vehicles with hydrostatic drive set out in Annex IX to Delegated Regulation (EU) 2015/68 should be aligned with the latest technical developments regarding the performance of brakes installed in such vehicles.
- (27) The requirements in Annex XII to Delegated Regulation (EU) 2015/68 for electronically controlled braking systems on certain tractors should be adapted to avoid failures to the greatest possible degree and to increase braking performance.
- (28) The definitions regarding engine pollutant emissions set out in Commission Delegated Regulation (EU) 2015/96 ⁽²⁾ should be aligned with the corresponding definitions used in relation to non-road mobile machinery. It is also necessary to fully align the requirements in relation to non-road mobile machinery set out in that Regulation with the requirements set out in Directive 97/68/EC of the European Parliament and of the Council ⁽³⁾ and with UNECE Regulation No 96.
- (29) In order to improve the readability and clarity of Delegated Regulation (EU) No 1322/2014, Delegated Regulation (EU) 2015/96, Delegated Regulation (EU) 2015/68 and Delegated Regulation (EU) 2015/208, it is necessary to correct some editorial mistakes, contradictions and wrong references.
- (30) Annex I to Regulation (EU) No 167/2013 regarding requirements for vehicle EU type-approval should allow laying down functional safety requirements for additional vehicle categories where that is necessary.
- (31) Regulation (EU) No 167/2013 should therefore be amended accordingly.
- (32) Delegated Regulation (EU) No 1322/2014, Delegated Regulation (EU) 2015/96, Delegated Regulation (EU) 2015/68 and Delegated Regulation (EU) 2015/208 should therefore be amended and corrected accordingly.

⁽¹⁾ Commission Delegated Regulation (EU) 2015/68 of 15 October 2014 supplementing Regulation (EU) No 167/2013 of the European Parliament and of the Council with regard to vehicle braking requirements for the approval of agricultural and forestry vehicles (OJ L 17, 23.1.2015, p. 1).

⁽²⁾ Commission Delegated Regulation (EU) 2015/96 of 1 October 2014 supplementing Regulation (EU) No 167/2013 of the European Parliament and of the Council as regards environmental and propulsion unit performance requirements of agricultural and forestry vehicles (OJ L 16, 23.1.2015, p. 1).

⁽³⁾ Directive 97/68/EC of the European Parliament and of the Council of 16 December 1997 on the approximation of the laws of the Member States relating to measures against the emission of gaseous and particulate pollutants from internal combustion engines to be installed in non-road mobile machinery (OJ L 59, 27.2.1998, p. 1).

- (33) Given that Regulation (EU) No 167/2013, Delegated Regulation (EU) No 1322/2014, Delegated Regulation (EU) 2015/96, Delegated Regulation (EU) 2015/68 and Delegated Regulation (EU) 2015/208 are already applicable and that the amendments to those acts include number of corrections, this Regulation should enter into force as soon as possible,

HAS ADOPTED THIS REGULATION:

Article 1

Amendments to Regulation (EU) No 167/2013 on the approval and market surveillance of agricultural and forestry vehicles

Annex I to Regulation (EU) No 167/2013 is amended in accordance with Annex I to this Regulation.

Article 2

Amendments to Delegated Regulation (EU) No 1322/2014

Delegated Regulation (EU) No 1322/2014 is amended in accordance with Annex II to this Regulation.

Article 3

Amendments to Delegated Regulation (EU) 2015/96

Delegated Regulation (EU) 2015/96 is amended as follows:

(1) Article 2 is amended as follows:

(a) the first sentence and the introductory sentence are replaced by the following:

‘For the purposes of this Regulation, the definitions in Annex XXXIII to Commission Delegated Regulation (EU) 2015/208 (*) shall apply. The following definitions shall also apply:

(*) Commission Delegated Regulation (EU) 2015/208 of 8 December 2014 supplementing Regulation (EU) No 167/2013 of the European Parliament and of the Council with regard to vehicle functional safety requirements for the approval of agricultural and forestry vehicles (OJ L 42, 17.2.2015, p. 1).’

(b) point (2) is replaced by the following:

‘(2) “pollutant exhaust emissions after-treatment system” means the passage of exhaust gases through a device or system whose purpose is to chemically or physically alter the emitted pollutants prior to their release to the atmosphere, including catalysts, particulate traps or any other component, system or separate technical unit for the reduction or treatment of the engine gaseous and particulate matter exhaust pollutant emissions;’

(c) points (4) and (5) are replaced by the following:

‘(4) “pollution control device” means a component, system or separate technical unit which is part of the pollutant exhaust emissions after-treatment system;

(5) “replacement pollution control device” means a component, system or separate technical unit intended to replace, partially or fully, a pollutant exhaust emissions after-treatment system on a vehicle type-approved in accordance with Regulation (EU) No 167/2013 and this Regulation;’

(d) point (12) is replaced by the following:

‘(12) “net power” means the engine power obtained on a test bench at the end of the crankshaft or its equivalent at the corresponding engine speed with the auxiliaries, listed in Table 1 of Annex 4 to UNECE Regulation No 120, 01 series of amendments (*), determined under reference atmospheric conditions.

(*) OJ L 166, 30.6.2015, p. 170 ;

(2) Article 4 is amended as follows:

(a) paragraph 2 is replaced by the following:

‘2. The type-approval regarding exhaust pollutant emissions and external sound level requirements may be extended by the type-approval authorities to different vehicle variants, versions and engine types and families, provided that the vehicle variant, version, propulsion unit and pollution control system parameters have an identical performance or remain within the levels specified in Article 19(3) and (4) of Regulation (EU) No 167/2013.’

(b) in paragraph 3, points (a) and (b) are replaced by the following:

‘(a) the parameters of the engine type or engine family, as set out in Annex II to Directive 97/68/EC and in point 9.1 of Annex I to this Regulation;

(b) the engine’s pollutant exhaust emissions after-treatment system, as described in point 6.10 of Annex I to Directive 97/68/EC and point 9.1.10 of Annex I to this Regulation and point 3.3 of Annex II to this Regulation;’

(c) in paragraph 4, points (d), (e) and (f) are replaced by the following:

‘(a) as regards the reference fuels, the requirements set out in Annex 7 to UNECE Regulation No 120, 01 series of amendments or Annex V to Directive 97/68/EC;

(b) as regards pollution control devices and replacement pollution control devices, the requirements set out in Appendix 5 of Annex III to Directive 97/68/EC;

(c) as regards test equipment, the requirements set out in Annex III to Directive 97/68/EC.’

(3) in Article 7, paragraph 2 is replaced by the following:

‘2. In addition to the requirements referred to in the first paragraph, for an alternative type-approval to be recognised as equivalent to an approval under this Regulation, the manufacturer shall provide non-discriminatory access to vehicle repair and maintenance information as required by Chapter XV of Regulation (EU) No 167/2013 and Article 8 of Commission Delegated Regulation (EU) No 1322/2014 (*).

(*) Commission Delegated Regulation (EU) No 1322/2014 of 19 September 2014 supplementing and amending Regulation (EU) No 167/2013 of the European Parliament and of the Council with regard to vehicle construction and general requirements for the approval of agricultural and forestry vehicles (OJ L 364, 18.12.2014, p. 1).’

(4) Article 9 is replaced by the following:

‘Article 9

Measurement of the external sound level

1. The technical services shall measure the external sound level of agricultural and forestry vehicles of category T equipped with pneumatic tyres and of category C equipped with track belts in motion, for type-approval purposes, in accordance with the test conditions and methods set out in point 1.3.1 of Annex III.

2. The test conditions and methods set out in point 1.3.2 of Annex III shall also be carried out for stationary agricultural and forestry vehicles of categories T and C equipped with track belts and the results shall be recorded by the technical services in accordance to the provisions of point 1.3.2.4 of Annex III.

3. The technical services shall measure the external sound level of agricultural and forestry vehicles of category C equipped with track chains, for type-approval purposes, in accordance with the stationary test conditions and methods set out in point 1.3.2 of Annex III.

4. The test conditions and methods set out in point 1.3.3 of Annex III shall be carried out for agricultural and forestry vehicles of category C equipped with track chains and the results shall be recorded by the technical services.'

(5) Article 10 is replaced by the following:

'Article 10

Requirements on propulsion unit performance

For the evaluation of propulsion unit performance of agricultural and forestry vehicles, measurements of net power, engine torque and specific fuel consumption shall be carried out in accordance with UNECE Regulation No 120, 01 series of amendments.'

(6) in Article 11(4), the first sentence is replaced by the following:

'For the purposes of type-approval, the dates set out in Articles 9(3c), 9(3d) and 9(4a) of Directive 97/68/EC shall, for agricultural and forestry vehicles of categories T2, T4.1 and C2, as defined in Article 4(3), (6) and (9) of Regulation (EU) No 167/2013 and equipped with engines of categories L to R, be postponed for 3 years.'

(7) Article 12 is replaced by the following:

'Article 12

EU type-approval procedures

Without prejudice to Article 11, if a manufacturer so requests, national authorities may not, on grounds relating to emissions of vehicles, refuse to grant EU type-approval or national type-approval for a new type of vehicle or engine, or prohibit the registration, sale or entry into service of a new vehicle and the sale or use of new engines, where the vehicle or engines concerned comply with Regulation (EU) No 167/2013 and Commission Implementing Regulation (EU) 2015/504 (*).

(*) Commission Implementing Regulation (EU) 2015/504 of 11 March 2015 implementing Regulation (EU) No 167/2013 of the European Parliament and of the Council with regard to the administrative requirements for the approval and market surveillance of agricultural and forestry vehicles (OJ L 85, 28.3.2015, p. 1).'

(8) in Article 14, paragraph 1 is replaced by the following:

'1. By way of derogation from Article 4(1), concerning the pollutant emissions, Member States shall allow the placing on the market of a limited number of vehicles fitted with engines meeting the requirements of Article 9 of Directive 97/68/EC under a flexibility scheme, in accordance to the provisions of Annex V to this Regulation, at the request of the manufacturer, and on condition that an approval authority has granted the relevant permit for entry into service.'

(9) Annexes I to IV are amended in accordance with Annex III to this Regulation.

Article 4

Amendments to Delegated Regulation (EU) 2015/68

Delegated Regulation (EU) 2015/68 is amended as follows:

(1) Article 2 is amended as follows:

(a) the first sentence and the introductory sentence are replaced by the following:

'For the purposes of this Regulation, the definitions in Article 2 and Annexes XII and XXXIII to Commission Delegated Regulation (EU) 2015/208 (*) shall apply. The following definitions shall also apply:

(*) Commission Delegated Regulation (EU) 2015/208 of 8 December 2014 supplementing Regulation (EU) No 167/2013 of the European Parliament and of the Council with regard to vehicle functional safety requirements for the approval of agricultural and forestry vehicles (OJ L 42, 17.2.2015, p. 1).'

(b) point (5) is replaced by the following:

‘(5) “transmission” means the combination of components comprised between the control device and the brake, excluding the control lines, supply lines and supplementary lines between tractors and towed vehicles, and linking them functionally through mechanical, hydraulic, pneumatic or electric means or through the use of a combination of those means; where the braking power is derived from or assisted by a source of energy independent of the driver, the reserve of energy in the system is likewise part of the transmission;’

(c) point (17) is deleted;

(d) the following points (37) and (38) are added:

‘(37) “energy source” means a device that provides the energy required to actuate the brakes, either directly or indirectly through an energy storage device;

(38) “energy storage device” means a device that stores the energy provided by the energy source to apply or release the brakes.’

(2) Annexes I to V, VII, VIII, IX, XI, XII and XIII are amended in accordance with Annex IV to this Regulation.

Article 5

Amendments to Delegated Regulation (EU) 2015/208

Delegated Regulation (EU) 2015/208 is amended as follows:

(1) Article 2 is amended as follows:

(a) point (5) is replaced by the following:

‘(5) “Tyres normally fitted” means the type or types of tyre provided by the manufacturer on the vehicle type in question and specified in the information document the template of which is set out in Article 2 of Commission Implementing Regulation (EU) 2015/504 (*);

(*) Commission Implementing Regulation (EU) 2015/504 of 11 March 2015 implementing Regulation (EU) No 167/2013 of the European Parliament and of the Council with regard to the administrative requirements for the approval and market surveillance of agricultural and forestry vehicles (OJ L 85, 28.3.2015, p. 1).’

(b) point (6) is replaced by the following:

‘(6) “Tracks normally fitted” means the type or types of track provided by the manufacturer on the vehicle type in question and specified in the information document the template of which is set out in Article 2 of Implementing Regulation (EU) 2015/504;’

(c) point (12) is replaced by the following:

‘(12) “Laden vehicle” means a vehicle loaded at its technically permissible maximum laden mass;’

(d) the following point (13) is added:

‘(13) “cab” means the operator enclosure which surrounds the operator by means of a physical barrier and prevents the free passage of external air into the area of the operator.’

(2) in Article 5, paragraph 3 is replaced by the following:

‘3. The measurement methods and test results shall be reported to the approval authority in the test report format set out in Article 9 of Implementing Regulation (EU) 2015/504.’

(3) Annexes I, III, V, VII, X, XII to XV, XVII, XIX, XX, XXII, XXV to XXXI, XXXIII and XXXIV are amended in accordance with Annex V to this Regulation.

*Article 6***Entry into force**

This Regulation shall enter into force on the day following that of its publication in the *Official Journal of the European Union*.

This Regulation shall be binding in its entirety and directly applicable in all Member States.

Done at Brussels, 14 July 2016.

For the Commission

The President

Jean-Claude JUNCKER

ANNEX I

Annex I to Regulation (EU) No 167/2013 is amended as follows:

(1) in row 'Nr 6', in the cell corresponding to the column 'Regulatory act reference', the following abbreviation is inserted:

'RVFSR';

(2) in row 'Nr 9', the entry corresponding to vehicle category T3a is replaced by 'X';

(3) in row 'Nr 17', the entry corresponding to vehicle category T3b is replaced by 'X';

(4) in row 'Nr 23', the entries corresponding to vehicle categories T3a and T3b are replaced by 'X';

(5) in row 'Nr 30', the entries corresponding to vehicle categories Ca and Cb are replaced by 'X';

(6) in row 'Nr 34', in the cell corresponding to vehicle category T3b, the following letter is inserted:

'X'.

ANNEX II

Annexes III, V, VIII, IX, X, XIII to XVIII, XXI to XXIV, XXVI and XXIX to Delegated Regulation (EU) No 1322/2014 are amended as follows:

(1) Annex III is amended as follows:

(a) in point 5.2, Table 1 is replaced by the following:

Table 1

List of requirements which may be subject to virtual testing

Delegated act reference	Annex No	Requirements	Restrictions/comments
Regulation (EU) No 1322/2014	IX	continuous or interrupted roll over behaviour in case of a laterally overturning narrow track tractor with a protective frame mounted in front of the driver's seat	Section B4
Regulation (EU) No 1322/2014	XV	Requirements applying to operating space and to access to the driving position	Only requirements related to dimensions and positioning
Regulation (EU) 2015/208	VII	Requirements on the field of vision and windscreen wipers	Only requirements related to dimensions, positioning and visibility
Regulation (EU) 2015/208	IX	Requirements on rear view mirrors	Only requirements related to dimensions, positioning and visibility
Regulation (EU) 2015/208	XII	Requirements on lighting installation	Only requirements related to dimensions, positioning and visibility in point 5 and 6 (with the exception of colorimetric or photometric requirements)
Regulation (EU) 2015/208	XIII	Requirements on vehicle occupant protection, including interior fittings, head restraints, seat belts, vehicle doors	Part 2 Only requirements related to dimensions, including detailed shape, and positioning
Regulation (EU) 2015/208	XIV	Requirements on vehicle exterior and accessories	Only requirements related to dimensions, including detailed shape, and positioning'

(b) point 6.2.2 is replaced by the following:

'6.2.2. Validation process of the mathematical model

The mathematical model shall be validated in comparison with the actual test conditions. A physical test shall be conducted for the purposes of comparing the results obtained when using the mathematical model with the results of a physical test. Comparability of the test results shall be proven. For that purpose, manufacturers shall provide the technical service with a correlation report containing the information on the mathematical model and the correlation between the results obtained with such model and those obtained in the physical tests in accordance with the scheme set out in point 6.1. A validation report, confirming the compliance of the mathematical model, shall be drafted by the manufacturer or by the technical service and submitted to the approval authority. Any change made to the mathematical model or to the software 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 Figure 1 of point 7.'

- (c) the following points 6.2.7 and 6.2.8 are inserted:

‘6.2.7. Approval process when using virtual testing

The compliance with the requirements set out in Table 1 of point 5.2. may be demonstrated by virtual testing procedures only if these are carried out in accordance with a mathematical model validated in accordance with the requirements set out in point 6.2.2. The applicability and restrictions of the model shall be agreed with the technical services and shall be subject to the approval of the approval authority.

6.2.8. Virtual testing test report

A test report of the virtual testing results shall be provided by the technical service. The test report should be coherent with the correlation report and the validation report and shall include at least the following elements: the building of a virtual prototype, the simulation inputs and the simulation results related to the technical requirements.’

- (2) Annex V is amended as follows:

- (a) the following point 4.4 is inserted:

‘4.4. Point 4.1.2 shall apply from 1.7.2021.

However, manufacturers of vehicles of R- and S-category that do not employ diagnostic tools or a physical or wireless communication with the on-board electronic control unit(s) for the purposes of diagnostics or reprogramming of their vehicles are exempted from the obligations set out in point 4.1.2.’

- (b) point 6.2 is replaced by the following:

‘6.2. Vehicles, systems, components and separate technical units covered by point 6.1 shall be listed on the manufacturer’s repair and maintenance information website.’

- (c) in Appendix 1, point 2.5 and points 2.5.1 to 2.5.4 are replaced by the following:

‘2.5. Reprogramming and diagnostics of control units for the purposes of recalibration after a repair or loading software to a replacement ECU or recoding or reinitialising replacement parts or components, must allow the use of non-proprietary hardware.

2.5.1. Reprogramming and diagnostics (PC-VCI communication interface) shall be conducted in accordance with either ISO 22900-2, SAE J2534 or TMC RP1210 from 1.7.2021;

However, the first paragraph shall apply from 1.7.2023 to the following manufacturers:

- (a) manufacturers of vehicles of R- and S-category;
- (b) manufacturers of vehicles of T- and C-category whose production is below the limits set out in point 6.1 of this Annex;
- (c) manufacturers of systems, components or separate technical units whose production is below the limits set out in point 6.1 of this Annex.

2.5.2. Ethernet, serial cable or Local Area Network (LAN) interface and alternative media like Compact Disc (CD), Digital Versatile Disc (DVD) or solid state memory device may also be used, but on the condition that no proprietary communication software (e.g. drivers or plug-ins) and hardware is required. For the validation of the compatibility of the manufacturer-specific application and the vehicle communication interfaces (VCI) complying to ISO 22900-2, SAE J2534 or TMC RP1210, the manufacturer shall offer either a validation of independently developed VCIs or the information, and loan of any special hardware, required for a VCI manufacturer to conduct such validation himself. The conditions set out in Article 55 of Regulation (EU) No 167/2013 shall apply to fees for such validation or information and hardware.

2.5.3. Co-existence of vehicle manufacturers’ software shall be ensured from 1.7.2021;

However, the first paragraph shall apply from 1.7.2023 to the following manufacturers:

- (a) manufacturers of vehicles of R- and S-category;

(b) manufacturers of vehicles of T- and C-category whose production is below the limits set out in point 6.1 of this Annex;

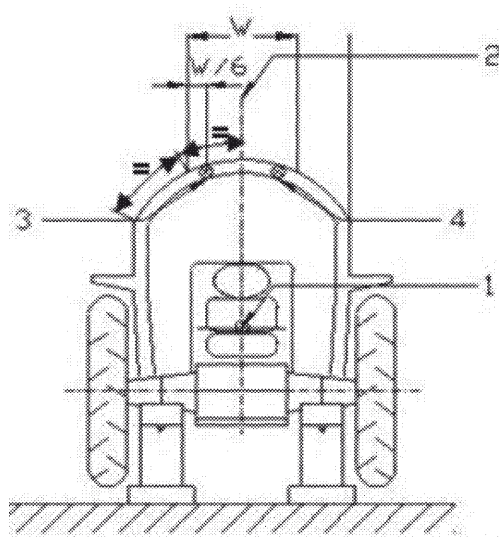
(c) manufacturers of systems, components or separate technical units whose production is below the limits set out in point 6.1 of this Annex.

2.5.4. To ensure communication between the vehicle and diagnostic tools, the following standards shall apply for the physical diagnostic connectors between VCI and vehicle: SAE J1939-13, ISO 11783-2, ISO 15031-3 and ISO 13400-4.

(3) in Annex VIII, figure 4.3.b is replaced by the following:

'Figure 4.3.b

Two-post ROPS



KEY:

1 – Seat index point (SIP).

2 – SIP, longitudinal centre-plane.

3 – Point of second longitudinal load application, front or rear.

4 – Point of longitudinal load application, rear or front.'

(4) in section B1 of Annex IX, point 3.1.4.3.3 is replaced by the following:

'3.1.4.3.3. The computer programme (BASIC) for determining the continuous or interrupted roll-over behaviour of a laterally overturning narrow-track tractor with a front-mounted roll-over protective structure is described in section B4, with examples 6.1 to 6.11.'

(5) in section B2 of Annex X, point 4.2.1.6 is replaced by the following:

'4.2.1.6. Additional impact tests

If cracks or tears which cannot be considered negligible appear during an impact test, a second, similar test, but with a height of fall of:

$$H' = (H \times 10^{-1}) (12 + 4a) (1 + 2a)^{-1}$$

shall be performed immediately after the impact tests causing these tears or cracks to appear, "a" being the ratio of the permanent deformation (Dp) to the elastic deformation (De):

$$a = Dp/De$$

as measured at the point of impact. The additional permanent deformation due to the second impact shall not exceed 30 per cent of the permanent deformation due to the first impact.

In order to be able to carry out the additional test, it is necessary to measure the elastic deformation during all the impact tests.'

(6) Annex XIII is amended as follows:

(a) point 1.3 is replaced by the following:

'1.3. Measuring apparatus

A precision quality sound level meter shall be used meeting the requirements of the International Electrotechnical Commission Standards IEC 61672-1:2013 Electroacoustics - Sound level meters - Part 1: Specifications. Measurement shall be carried out with a frequency weighting network in conformity with curve A and set to give slow response as is described in the IEC publication.'

(b) the following points 1.3.1, 1.3.2 and 1.3.3 are inserted:

'1.3.1. The equipment shall be calibrated frequently and, if possible, before each measuring session.

1.3.2. An adequate technical description of measuring equipment shall be given in the test report.

1.3.3. In the case of variable readings, the average of the maximum values shall be taken.'

(c) in point 2.2.1, the second paragraph is replaced by the following:

'The microphone diaphragm must face forward and the centre of the microphone must be 790 mm above and 150 mm forward of the Seat Reference Point (S) described in Appendix 8 to Annex XIV. Excessive vibration of the microphone must be avoided.'

(d) in point 3.2.1, the second paragraph is replaced by the following:

'The microphone diaphragm must face forward and the centre of the microphone must be 790 mm above and 150 mm forward of the Seat Reference Point (S) described in Appendix 8 to Annex XIV. Excessive vibration of the microphone must be avoided.'

(7) Annex XIV is amended as follows:

(a) in the table of point 1.14, the first row is replaced by the following:

'Class I	tractors having an unladen mass of up to 3 600 kg.'
----------	---

(b) in point 2.6.2, the first indent is replaced by the following:

'— for length measurements: $\pm 0,5 \%$,';

(c) point 3.5.3.2.7 is replaced by the following:

'3.5.3.2.7. The measurements at the point of seat attachment and on the seat itself shall be made during the same run.

For measuring and recording the vibrations, an accelerometer, a measuring amplifier and a magnetic tape recorder, electronic system for data acquisition or direct-reading vibration meter shall be used. The specifications laid down in points 3.5.3.3.2 to 3.5.3.3.6 shall apply to those instruments.'

(d) point 3.5.3.3.4 is replaced by the following:

'3.5.3.3.4. Magnetic tape recorder or electronic data acquisition system

If a tape recorder or electronic system for data acquisition is used, it must have a maximum reproduction error of $\pm 3,5 \%$ in a frequency range of 1 to 80 Hz, including change of tape speed during replay for analysis.'

(e) the following section 4 is added:

'4. Additional conditions for EU component type-approval of a seat

To be granted EU component type-approval, a seat shall, in addition to fulfilling the requirements set out in sections 2 and 3, satisfy the following conditions:

(a) the range of adjustment as a function of the driver's mass extends from at least 50 to 120 kg;

(b) the change in the angle of inclination measured during the lateral stability test does not exceed 5°;

- (c) neither of the two values set in point 3.5.3.3.7.2 exceed $1,25 \text{ m/s}^2$;
- (d) the ratio referred to in points 3.5.7.4 and 3.5.7.5 does not exceed the value of 2;
- (f) in Appendix 5, footnote (2) is replaced by the following:
- ‘(2) The rearward inclination of the surface of the fitted seat cushion must be 3° to 12° in relation to the horizontal when measured with the loading device in accordance with Appendix 8. The choice of the angle of inclination within this class depends on the position when seated.’
- (g) in Appendix 8, the following point 2.1 is added:
- ‘2.1. Positioning of the seat
- For the purposes of Annex XV, the seat reference point (S) shall be obtained with the seat set in the rearmost longitudinal position and at the mid-point of the height adjustment range. Seats having a suspension system, whether or not adjustable according to the driver’s weight, must be set at the mid-point of the suspension travel.’
- (8) Annex XV is amended as follows:

- (a) in the table of point 4.2, the third row is replaced by the following:

‘height clearance:	125 mm minimum,’
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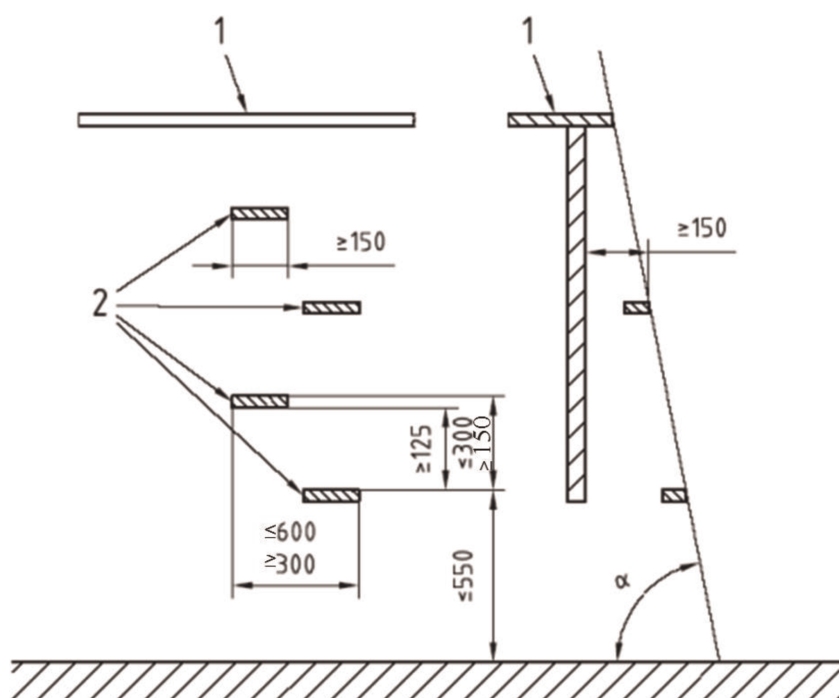
- (b) in point 4.2.1, the second sentence is replaced by the following:

‘The vertical and horizontal distance between consecutive steps shall not be less than 150 mm; however, a tolerance of 20 mm between stages is allowed.’

- (c) in Appendix 1, Figure 6 is replaced by the following:

‘Figure 6

(Source:EN ISO 4254-1 No. 4.7)



(9) in Annex XVI, in point 1, Table 1 is amended as follows:

(a) the second row is replaced by the following:

‘ISO 500-1:2014(*)	X	–	X ₁₎	X ₁₎	X ₁₎	X’
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(b) footnote (***) is deleted;

(10) in Annex XVII, point 2.6 is replaced by the following:

‘2.6. The following securing devices shall be firmly attached either to the tractor mounting or to the protective device:

(a) devices to secure quick-release mounting components;

(b) components of protective devices which open without the aid of tools.’

(11) in Annex XVIII, point 3.4 is replaced by the following:

‘3.4. Test result

Condition of acceptance

Permanent deformation of any system component and anchorage area is acceptable under the action of the forces specified in points 3.1 and 3.2. However, there shall be no failure allowing release of the seat belt system, seat assembly, or the seat adjustment locking mechanism.

The seat adjuster or locking device need not be operable after application of the test load.’

(12) in Annex XXI, point 2.2 is replaced by the following:

‘2.2. The parts of the exhaust pipe which can be reached by the operator during normal operation of the tractor, as described in point 6.1 of Annex XVII, must be protected by means of segregation, guards or grids, so as to avoid the possibility of accidental contact with hot surfaces.’

(13) Annex XXII is amended as follows:

(a) in point 2, point (ag) is replaced by the following:

‘(ag) information about the location of the greasing points, the safe greasing process and greasing intervals (daily/monthly/yearly);’

(b) in point 3, point (g) is replaced by the following:

‘(g) information about the maximum lift capacity of the three-point lifting mechanism and information on how to fix the three-point lifting mechanism laterally and vertically for road travel;’

(c) in point 3, point (l) is replaced by the following:

‘(l) information about using implements with power take-off drive shafts and that the technically possible inclination of the shafts depend on the shape and size of the master shield and clearance zone, including instructions and specific warnings relating to:

(i) coupling and releasing the power take-offs,

(ii) use of tools or machines coupled to the rear power take-off,

(iii) if applicable, use of PTO type 3 with reduced dimensions and the consequences and risks caused by the reduced dimension of the protective guard;’

(14) Annex XXIII is amended as follows:

(a) in point 1.2, the first sentence is replaced by the following:

‘Control devices must satisfy the corresponding applicable requirements set out in points 1.2.1 to 1.2.4 as regards the installation, location, operation and identification of control devices.’

(b) in point 1.2.3, the second paragraph is replaced by the following:

'In order to avoid confusing the driver, the clutch, brake and accelerator pedals shall have the same function and arrangement as those of a motor vehicle, except for:

- (a) vehicles equipped with a straddle seat and handlebars, which are deemed to comply with the requirements of EN 15997:2011 for throttle control and manual clutch control,
- (b) vehicles of category T or C requiring a sustained activation of the right pedal to keep them in motion (e.g. vehicles fitted with a throttle pedal and a continuous variable transmission, or vehicles fitted with two pedals for forward and reverse direction and a hydrostatic transmission),
- (c) vehicles of category C with a maximum design speed of less than 15 km/h and fitted with hand-operated levers for controlling differential steering.'

(c) point 2.1 is replaced by the following:

'2.1. The symbols used for identification of control devices shall comply with the requirements set out in section 1 of Annex XXVI.'

(d) point 3.1.1 is replaced by the following:

'3.1.1. In the case of a vehicle fitted with hydrostatic transmission or a transmission with a hydrostatic component, the requirement laid down in point 3.1 that the engine cannot be started unless the clutch mechanism is disengaged shall be construed as that the engine cannot be started unless the transmission control is in neutral position or depressurized.'

(e) point 3.2 is replaced by the following:

'3.2. In case that an operator standing on the ground (e.g. tractor's side), can start the engine and fulfil simultaneously the requirements guaranteeing the safe start of the engine in accordance with point 3.1, one additional control device shall be activated to start the engine.'

(f) the following point 3.3 is inserted:

'3.3. The terminals of the starter motor shall be protected in order to prevent shunting its solenoid by means of simple tools (e.g. a screwdriver).'

(g) point 7.3 is replaced by the following:

'7.3. It shall always be possible to shut off the PTO from the driving position. This requirement shall also apply to the associated PTO external control device(s), if fitted. The shut off shall be always an override control device.'

(h) point 7.4 is replaced by the following:

'7.4. Additional requirements for the PTO external control device(s), if fitted';

(i) the following point 12 is added:

'12. Virtual terminals

Control devices related to virtual terminals shall meet the requirements set out in Annex B of ISO 15077:2008.'

(15) Annex XXIV is amended as follows:

(a) point 1.3 is replaced by the following:

'1.3. Flexible hydraulic hoses must be clearly identifiable and indelibly marked in accordance with the requirements set out in paragraph 13 of ISO 17165-1:2007.'

(b) point 4.2 is replaced by the following:

'4.2. Greasing points shall be clearly identified on the vehicle with symbols, pictorials, pictograms or colour coding and its location and instructions of use shall be indicated in the operator's manual.'

(16) Annex XXVI is amended as follows:

(a) section 3 is replaced by the following:

‘3. Hydraulic couplings

Hydraulic valves and the couplers on the hydraulic valves at the rear, front or sides of tractors, as well as the flow direction and the mode of operation, shall be identified by colour coding and/or numerals to be stated on durable labels resistant to oil, fuel, wear and chemical agents, such as fertilizers; its location, identification and instructions of use shall be indicated in the operator's manual.’

(b) section 5 is replaced by the following:

‘5. Additional warning signals with regard to braking

Tractors shall be equipped with optical brake failure and defect warning signals, in accordance with points 2.2.1.29.1.1 to 2.2.1.29.2.1 of Annex I to Commission Delegated Regulation (EU) 2015/68 (*)

(*) Commission Delegated Regulation (EU) 2015/68 of 15 October 2014 supplementing Regulation (EU) No 167/2013 of the European Parliament and of the Council with regard to vehicle braking requirements for the approval of agricultural and forestry vehicles (OJ L 17, 23.1.2015, p. 1).’

(17) in Annex XXIX, section 2 is replaced by the following:

‘2. Requirements for the cabin

2.1. Vehicles of categories T and C fitted with a cab shall comply with the standard EN 15695-1:2009.

2.2. Vehicles of categories T and C, declared by the manufacturer to provide protection against hazardous substances shall be fitted with a cab of level 2, 3 or 4 according to the definition and complying with the requirements set out in the standard EN 15695-1:2009 (e.g. for a vehicle providing protection against plant protection products that produce vapours which can expose the operator to a risk or harm, the cabin shall be of level 4).’

ANNEX III

Annexes I to IV to Delegated Regulation (EU) 2015/96 are amended as follows:

(1) Annex I is amended as follows:

(a) points 2.2 and 2.3 are replaced by the following:

‘2.2. The application for type-approval shall be accompanied by the information folder in accordance with Articles 2 and 6 of Implementing Regulation (EU) 2015/504.

2.3. An engine conforming to the engine type or parent engine characteristics described in Annexes I and II to Directive 97/68/EC shall be submitted to the technical service responsible for conducting the approval tests.’

(b) in section 4, the third paragraph is replaced by the following:

‘Type-approval information documents shall be in accordance with Article 2 of Implementing Regulation (EU) 2015/504.’

(c) section 6 is replaced by the following:

‘6. Conformity of production

In addition to the provisions in Article 28 of Regulation (EU) No 167/2013, Article 7 of Delegated Regulation (EU) No 1322/2014 and Annex IV to Delegated Regulation (EU) No 1322/2014 the conformity of production of engines shall be checked in accordance with the provisions of section 5 of Annex I to Directive 97/68/EC.’

(d) section 8 is replaced by the following:

‘8. Market surveillance

Having regard to Article 7 of Regulation (EU) No 167/2013, market surveillance shall be performed in accordance with Articles 4, 6 and 10 of Implementing Regulation (EU) 2015/504 and Annexes III, V and IX to Implementing Regulation (EU) 2015/504.’

(e) the Appendix is amended as follows:

(i) in section 1, point (c) is replaced by the following:

‘(c) the EU type-approval mark in accordance with Article 5 of Implementing Regulation (EU) 2015/504.’

(ii) point 6 is replaced by the following:

‘6. The exact location of the engine marks shall be declared in the information document, in accordance with Article 2 of Implementing Regulation (EU) 2015/504.’

(2) Annex II is amended as follows:

(a) points 2.1.2 and 2.1.3 are replaced by the following:

‘2.1.2. It shall be accompanied by the information document, in accordance with Article 2 of Implementing Regulation (EU) 2015/504.

2.1.3. The manufacturer shall submit an agricultural and forestry vehicle engine conforming to the engine type or parent engine characteristics in accordance with Annex I to this Regulation and Annex II to Directive 97/68/EC to the technical service responsible for conducting the approval tests.’

(b) point 2.2.2 is replaced by the following:

‘2.2.2. It shall be accompanied by the information document in accordance with Article 2 of Implementing Regulation (EU) 2015/504 and a copy of the EU type-approval certificate for the engine or engine family and, if applicable, for systems, components and separate technical units which are installed in the agricultural and forestry vehicle type.’

(c) points 3.2.1 and 3.2.2 are replaced by the following:

‘3.2.1. intake depression shall not exceed the maximum allowable intake depression specified for the type-approved engine;

3.2.2. exhaust back pressure shall not exceed the maximum allowable back pressure specified for the type-approved engine;’

(d) the following point 3.2.3 is inserted:

‘3.2.3. particular conditions for the installation of the engine in the vehicle according to the type-approval certificate of the engine.’

(e) section 4 is replaced by the following:

‘4. Approval

Any agricultural and forestry vehicle type fitted with an engine for which an EU type-approval certificate has been issued in accordance with Annex I to this Regulation or an equivalent type-approval certificate, in accordance with Annex IV to this Regulation, shall be issued with an EU type-approval certificate in accordance with Annex V of Implementing Regulation (EU) 2015/504.’

(3) Annex III is amended as follows:

(a) point 1.3.1.1 is replaced by the following:

‘1.3.1.1. The steady speed before approaching line AA shall be three-quarters of the maximum design speed (v_{max}) as declared by the manufacturer which can be attained in the highest gear used for road movement.’

(b) in point 1.3.1.2.3, the second sentence is replaced by the following:

‘Should that result exceed the maximum permissible sound level for the category of agricultural and forestry vehicle tested by at least 1 dB(A), two further measurements shall be made.’

(c) in the first paragraph of point 1.3.2.4, the second and third sentences are replaced by the following:

‘The engine speed shall be recorded in accordance with the provisions of Article 9. The state of loading of the agricultural and forestry vehicle shall also be recorded.’

(d) point 1.3.3 is replaced by the following:

‘1.3.3. External sound testing provisions for C-category vehicles with track chains in motion

For agricultural and forestry vehicles of C category equipped with track chains, the noise in motion shall be measured with vehicles with their unladen mass in running order travelling at a constant speed of 5 km/h (+/- 0,5 km/h), with the engine at rated speed over a layer of humid sand as specified by paragraph 5.3.2 of ISO 6395:2008. The microphone shall be situated in accordance with the provisions of point 1.3.1. The measured noise value shall be recorded in the test report.’

(4) Annex IV is replaced by the following:

‘ANNEX IV

Recognition of alternative type-approvals

The following type-approvals and, where applicable, the approval marks are recognised as being equivalent to an approval under this Regulation:

1. for engine categories H, I, J and K (stage IIIA) specified in Article 9(3a) and (3b) of Directive 97/68/EC,
 - 1.1. type-approvals in accordance with points 3.1, 3.2 and 3.3 of Annex XII to Directive 97/68/EC;
 - 1.2. Stage IIIA type-approvals in accordance with Directive 97/68/EC;
2. for engine categories L, M, N and P (stage IIIB) specified in Article 9(3c) of Directive 97/68/EC,
 - 2.1. type-approvals in accordance with points 4.1, 4.2 and 4.3 of Annex XII to Directive 97/68/EC;
 - 2.2. Stage IIIB type-approvals in accordance with Directive 97/68/EC;
3. for engine categories Q and R (stage IV) specified in Article 9(3d) of Directive 97/68/EC,
 - 3.1. type-approvals in accordance with points 5.1 and 5.2 of Annex XII to Directive 97/68/EC.
 - 3.2. Stage IV type-approvals in accordance with Directive 97/68/EC;
 - 3.3. type-approvals in accordance with the 04 series of amendments of UNECE Regulation No 96 for power bands Q and R of paragraph 5.2.1 in that UN Regulation.’

ANNEX IV

Annexes I to V, VII, VIII, IX, XI, XII and XIII to Delegated Regulation (EU) 2015/68 are amended as follows:

(1) Annex I is amended as follows:

(a) points 1.3, 1.4 and 1.5 are deleted;

(b) point 2.1.1 is replaced by the following:

‘2.1.1. Braking components and parts’

(c) points 2.1.1.1 and 2.1.1.2 are replaced by the following:

‘2.1.1.1. The braking components and parts shall be so designed, constructed and fitted as to enable the vehicle in normal use, despite the vibration to which it may be subjected, to comply with the requirements set out in this Annex.

2.1.1.2. In particular, the braking components and parts shall be so designed, constructed and fitted as to be able to resist the corrosion and ageing phenomena to which it is exposed.’

(d) point 2.1.1.4 is replaced by the following:

‘2.1.1.4. It is not permitted to fit any adjustable valves that would allow the performance of the braking system to be changed by the user of the vehicle such that, in service, it is not subject to the requirements of this Regulation. An adjustable valve that can only be operated by the manufacturer through the use of special tools or the provision of a tamper proof seal shall be permitted provided that the user of the vehicle is not able to adjust this valve or that any user adjustment is readily identifiable by enforcement authorities.’

(e) points 2.1.1.5.1, 2.1.1.5.2 and 2.1.1.5.3 are replaced by the following:

‘2.1.1.5.1. If vehicles of category Ra with a maximum design speed not exceeding 30 km/h and vehicles of category Sa cannot be equipped for technical reasons with an automatic load sensing device, they may be equipped with a device having at least three discrete settings for the control of the braking forces.

2.1.1.5.2. In the special case that a towed vehicle of category Ra with a maximum design speed not exceeding 30 km/h and vehicles of category Sa allows by design that only two discrete loading conditions ‘unladen’ and ‘laden’ can be realized then the vehicle may have only two discrete settings for the control of the braking forces.

2.1.1.5.3. S-category vehicles which do not contain any other load, except a payload from consumable material of maximum 10 % of the sum of technically permissible masses per axle.’

(f) point 2.1.2.3 is replaced by the following:

‘2.1.2.3. Parking braking system

The parking braking system shall enable the vehicle to be held stationary on an up or down gradient even in the absence of the driver, the working parts of the braking system being then held in the locked position by a purely mechanical device. The driver shall be able to achieve this braking action from his driving seat, subject, in the case of a towed vehicle, to the requirements of point 2.2.2.10.

The towed vehicle service braking system (pneumatic or hydraulic) and the parking braking system of the tractor may be operated simultaneously, provided that the driver is able to check, at any time, that the parking braking system performance of the vehicle combination, obtained by the purely mechanical action of the tractor’s parking braking system, is sufficient.’

(g) in the first paragraph of point 2.1.5.1.3, the first sentence is deleted;

(h) point 2.1.8.1.2 is replaced by the following:

‘2.1.8.1.2. In a braking system which incorporates a device that modulates the air pressure in the brake transmission as referred to in point 6.2 of Appendix I to Annex II, located in the pressure line upstream and downstream of this device at the closest accessible position. If this device is pneumatically controlled an additional test connection is required to simulate the laden condition. Where no such device is fitted, a single pressure test connection, equivalent to the downstream connector mentioned in point 2.1.5.1 of this Annex, shall be provided. These test connections shall be so located as to be easily accessible from the ground or within the vehicle.’

(i) in point 2.2.1.1, the third paragraph is replaced by the following:

‘For category Tb tractors: if the differential braking function is activated, it shall not be possible to travel at speeds exceeding 40 km/h or at speeds in excess of 40 km/h the differential braking function shall be disabled. These two operations shall be ensured by automatic means.’

(j) point 2.2.1.2.6.1 is replaced by the following:

‘2.2.1.2.6.1. where the service braking system is actuated by the muscular energy of the driver assisted by an energy source or one or more energy reserves, the secondary braking performance shall, in the event of failure of that assistance, be capable of being ensured by the muscular energy of the driver assisted by the energy reserves, if any, which are unaffected by the failure, the force applied to the control device not exceeding the prescribed maxima.’

(k) point 2.2.1.6.1 is replaced by the following:

‘2.2.1.6.1. Performance of hydraulic lines and hose assemblies in case of vehicles with one braked axle and an automatic engagement of the drive to all other axles during braking

The hydraulic lines of hydraulic transmission shall be capable of a burst pressure at least four times the maximum normal service pressure (T) specified by the vehicle manufacturer. Hose assemblies shall comply with ISO Standards 1402:2009, 6605:2002 and 7751: 1997+A1:2011.’

(l) in point 2.2.1.7, the second sentence is deleted.

(m) in the first paragraph of point 2.2.1.10, the first sentence is replaced by the following:

‘It shall be possible for the wear of the service brakes to be compensated by means of a system of manual or automatic adjustment.’

(n) in the first paragraph of point 2.2.1.10.1, the first sentence is replaced by the following:

‘Automatic wear adjustment devices, if fitted, shall, after heating followed by cooling, be capable of free running as laid down in point 2.3.4 of Annex II following the Type-I test specified in point 2.3 of that Annex.’

(o) in point 2.2.1.11.1, the following second paragraph is added:

‘In hydraulic braking systems, where the type of fluid used for hydraulic transmission is common with the fluid used in other appliances of the vehicle in a common tank, it is also permitted to detect the correct level of fluid with a device which needs the container to be opened.’

(p) in point 2.2.1.11.2, the following second paragraph is added:

‘In hydraulic braking systems, where the type of fluid used for hydraulic transmission is common with the fluid used in other appliances of the vehicle in a common tank, detection of a pressure drop in the hydraulic transmission to a certain value as specified by the manufacturer is also permitted.’

- (q) in point 2.2.1.11.3, the second sentence is replaced by the following:

'The symbol shall be affixed within 100 mm of the filling ports of the fluid reservoirs, in accordance with the requirements laid down in Article 24 of Delegated Regulation (EU) 2015/208.'

- (r) point 2.2.1.13 is replaced by the following:

'2.2.1.13. Tractors of category Tb with maximum design speed exceeding 60 km/h

Without prejudice to the requirements of point 2.1.2.3, where the use of an auxiliary energy source is essential for the operation of a braking system, the energy reserve shall be such as to ensure that, should the engine stop, or in the event of a failure of the means by which the energy source is driven, the braking performance remains sufficient to bring the vehicle to a halt in the prescribed conditions. In addition, if the muscular energy applied by the driver to the parking braking system is reinforced by some aid, the actuation of the parking braking system shall be ensured in the event of failure of that aid, if necessary by using a reserve of energy independent of that normally supplying such aid. This reserve of energy may be that intended for the service braking system.'

- (s) point 2.2.1.17.3 is replaced by the following:

'2.2.1.17.3. In the event of a failure in one of the control lines connecting two vehicles equipped according to point 2.1.4.1.2 of this Annex, the control line not affected by the failure shall automatically ensure the braking performance prescribed for the towed vehicle in point 3.2.1 of Annex II.'

- (t) point 2.2.1.18.6 is replaced by the following:

'2.2.1.18.6. In the case of a failure (e.g. fracture or leak) in the control line, the pressure in the supplementary line shall fall to 1 000 kPa within the following two seconds after the service brake control device has been fully actuated. In addition, when the service brake control device is released, the supplementary line shall be re-pressurised (see also point 2.2.2.15.2).'

- (u) in point 2.2.1.18.9, the first sentence is replaced by the following:

'Tractors towing vehicles of categories R or S which can only comply with the braking performance requirements of the service braking system, parking braking system or automatic braking system with the assistance of energy stored in a hydraulic energy storage device shall be equipped with an ISO 7638:2003 connector in order to be able to indicate the low level of stored energy on the towed vehicle, received by the latter, as laid down in point 2.2.2.15.1.1 by the separate warning signal via pin 5 of the electrical connector conforming to ISO 7638:2003 specified in point 2.2.1.29.2.2. (see also point 2.2.2.15.1).'

- (v) point 2.2.1.20 is replaced by the following:

'2.2.1.20. If point 3.1.3.4 of Annex II can only be fulfilled by complying with the conditions specified in point 3.1.3.4.1.1 of Annex II then:'

- (w) point 2.2.1.25.1 is deleted;

- (x) point 2.2.1.26.1.2 is replaced by the following:

'2.2.1.26.1.2. In the case of an electrical failure in the control device or a break in the wiring within the electric control transmission external to the electronic control unit(s), excluding the energy supply, it shall remain possible to apply the parking braking system from the driver's seat and thereby be capable of holding the laden vehicle stationary on an 8 % up or down gradient.'

- (y) point 2.2.1.26.3 is replaced by the following:

'2.2.1.26.3. Alternatively to the parking brake performance requirements according to points 2.2.1.26.1.2 and 2.2.1.26.2.1.2, the alternatives set out in points 2.2.1.26.3.1 and 2.2.1.26.3.2 are also allowed.'

2.2.1.26.3.1 an automatic actuation of the parking braking system is allowed when the vehicle is stationary, provided that the performance referred to in points 2.2.1.26.1.2 and 2.2.1.26.2.1.2 is achieved and, once applied, the parking braking system remains engaged independently of the status of the ignition (start) switch. In this alternative, the parking braking system shall be automatically released as soon as the driver starts to set the vehicle in motion again.

2.2.1.26.3.2 applying the brakes of the parking braking system from the driver's seat by an auxiliary control device and thereby be capable of holding the laden vehicle stationary on an 8 % up or down gradient. In this case, also the requirements of point 2.2.1.26.7 shall be met.'

(z) in point 2.2.1.26.5, the third paragraph is replaced by the following:

'Where actuation of the parking braking system is normally indicated by a separate warning signal, satisfying all the requirements of 2.2.1.29.4 this signal shall be used to satisfy the requirement for a red signal set out in the first and the second paragraphs of this point.'

(aa) points 2.2.1.29.1.1 and 2.2.1.29.1.2 are replaced by the following:

2.2.1.29.1.1. A red warning signal, in accordance with the requirements laid down in Annex XXVI of Delegated Regulation (EU) No 1322/2014 indicating failures within the vehicle braking equipment, as specified in other points of this Annex and in Annexes V, VII, IX and XIII, which preclude achievement of the prescribed service braking performance or the functioning of at least one of two independent service braking circuits.

2.2.1.29.1.2. Where applicable, a yellow warning signal, in accordance with the requirements laid down in Article 29 of Delegated Regulation (EU) No 1322/2014 indicating an electrically detected defect within the vehicle braking equipment, which is not indicated by the warning signal mentioned in point 2.2.1.29.1.1.'

(bb) in point 2.2.1.29.2, the first sentence is replaced by the following:

'Tractors equipped with an electric control line and/or authorized to tow a vehicle equipped with an electric control transmission, shall be capable of providing a separate warning signal, in accordance with the requirements laid down in Article 29 of Delegated Regulation (EU) No 1322/2014 to indicate a defect within the electric control transmission of the braking equipment of the towed vehicle.'

(cc) in point 2.2.1.29.2.1, the third sentence is replaced by the following:

'Alternatively, instead of utilizing the warning signal specified in point 2.2.1.29.1.1 of this Annex and the accompanying warning signal referred to in this point, a separate red warning signal, in accordance with the requirements laid down in Article 29 of Delegated Regulation (EU) No 1322/2014, may be provided in the tractor to indicate such a failure within the braking equipment of the towed vehicle.'

(dd) in point 2.2.2.1, the first sentence is replaced by the following:

'Vehicles of categories R1a, S1a do not need to be fitted with a service braking system. Vehicles of categories R1b and S1b, where the sum of the technically permissible masses per axle does not exceed 750 kg, do not need to be fitted with a service braking system.'

(ee) in point 2.2.2.2, the first sentence is replaced by the following:

'Vehicles of categories R1b and S1b, where the sum of the technically permissible masses per axle exceeds 750 kg, and R2 shall be equipped with a service braking system either of the continuous or semi-continuous or of the inertia type.'

(ff) point 2.2.2.3.1.3 is deleted;

(gg) in point 2.2.2.15.1.1, the first paragraph is replaced by the following:

‘When the pressure in the hydraulic energy storage devices falls below a pressure declared by the vehicle manufacturer in the information folder where the prescribed braking performance(s) is (are) not ensured this low pressure shall be indicated to the driver by the separate warning signal specified in point 2.2.1.29.2.2 via pin 5 of the electrical connector conforming to ISO 7638:2003.’

(hh) in point 2.2.2.18, the first sentence of the second paragraph is replaced by the following:

‘Those vehicles shall be marked in indelible form, in accordance with the requirements laid down in Article 24 of Delegated Regulation (EU) 2015/208, to indicate the functionality of the braking system when the ISO 7638:2003 connector is connected and disconnected.’

(2) Annex II is amended as follows:

(a) point 1.2 is replaced by the following:

‘1.2. ‘adhesion utilization curve’ means the characteristic curve of the braking force ratio without rolling resistance and normal reaction of road surface on a given axle under braking plotted against the braking rate of the vehicle.’

(b) in point 2.1.4.2, the second paragraph is replaced by the following:

‘The behaviour of vehicles of categories Tb, R2b, R3b, R4b and S2b on a road on which adhesion is reduced, shall meet the relevant requirements of Appendix 1 of this Annex or, if the vehicle is equipped with ABS, the requirements of Annex XI.’

(c) point 2.2.2.2 is replaced by the following:

‘2.2.2.2. To check compliance with the requirements of point 2.2.1.2.4 of Annex I, a Type-0 test shall be carried out with the engine disconnected at the initial speed of 30 km/h.

On application of the control of the parking brake system, the mean fully developed deceleration and the deceleration immediately before the vehicle stops shall not be less than $1,5 \text{ m/s}^2$. The same requirement applies in case of auxiliary control mentioned in point 2.2.1.2.4 of Annex I.

The test shall be carried out with the laden vehicle. The force exerted on the braking control device shall not exceed the specified values.’

(d) in point 2.3.1.4, the following sentence is added:

‘As an alternative, it is also allowed to perform the test with the engine disconnected, where applicable, during brake applications.’

(e) point 2.3.2.1 is replaced by the following:

‘2.3.2.1. The service braking system of vehicles of categories R1, R2, S1, R3a, R4a and S2a; and of vehicles of categories R3b and S2b, where the sum of the technically permissible masses per axle does not exceed 10 000 kg, shall be tested in such a manner that, the vehicle being laden, the energy input to the brakes is equivalent to that recorded in the same period of time when the laden vehicle being tested is driven at a steady speed of 40 km/h on a 7 % down-gradient for a distance of 1,7 km.

Alternatively, this requirement is deemed to be fulfilled for vehicles of categories R3a, R4a, S2a and for vehicles of categories R3b and S2b, where the sum of the technically permissible masses per axle does not exceed 10 000 kg, when these vehicles have passed the Type-III test according to point 2.5.’

(f) point 2.3.4.2 is replaced by the following:

‘2.3.4.2. It is ascertained that when the vehicle is driven at a constant speed of $v = 60 \text{ km/h}$ or the maximum design speed of the towed vehicle, whichever is the lower, with the brakes released the asymptotic temperatures shall not exceed a drum/disc temperature increase of 80°C , then the residual brake moments are regarded as acceptable.’

- (g) point 2.5.3 is replaced by the following:

‘2.5.3. R3b and S2b where the sum of the technically permissible masses per axle does not exceed 10 000 kg.’

- (h) point 3.1.1.2 is amended as follows:

- (i) the first paragraph is replaced by the following:

‘In the case of a tractor authorized to tow an unbraked vehicle of categories R or S, the required minimum combination performance, as required in point 3.1.1.2.1, shall be attained with the unbraked towed vehicle coupled to the tractor and with the unbraked towed vehicle laden to the maximum mass declared by the tractor manufacturer.’

- (ii) the last sentence in the third paragraph is replaced by the following:

‘ P_{M+R} = combination mass (mass P_M + declared unbraked towed vehicle mass P_R)’

- (i) in the second paragraph of point 3.1.3.3, the following indent is added:

‘— During the cooling period, the parking braking system shall not be re-adjusted manually.’

- (j) in point 3.1.3.3, the following fourth paragraph is added:

‘The hot static parking braking system test may be omitted if the parking braking system acts purely on braking surfaces not used during service braking.’

- (k) in point 3.1.3.4, the second paragraph is replaced by the following:

‘In the case that this requirement cannot be met due to physical limitations (e.g. limited available tyre/road adhesion for the tractor to generate sufficient braking forces or in the case that the purely mechanical parking braking system performance of the tractor as prescribed in point 3.1.3.1 is not sufficient to hold the combination) it is deemed to be fulfilled when the alternative requirement set out in point 3.1.3.4.1 of this Annex in connection with point 2.2.1.20 of Annex I is complied with.’

- (l) points 3.1.3.4.1, 3.1.3.4.1.1 and 3.1.3.4.1.2 are replaced by the following:

‘3.1.3.4.1. The requirement of point 3.1.3.4 is considered to be fulfilled when the conditions set out in point 3.1.3.4.1.1 are met in the case of a towed vehicle with service brake, or when the conditions set out in point 3.1.3.4.1.2 are met in the case of an unbraked or inertia-braked towed vehicle.’

3.1.3.4.1.1. Even with the tractor engine not rotating, the combination at the maximum permissible mass remains stationary on the prescribed gradient when the activation of a single control device by the driver, from his driving seat, has applied the tractor parking braking system and the towed vehicle service braking system or only the tractor parking braking system.

3.1.3.4.1.2. The tractor parking braking system can hold stationary the tractor connected to an unbraked or inertia-braked towed vehicle having a mass equal to the highest ‘combination mass P_{M+R} ’ mentioned in the test report. This mass shall be determined as follows:

(a) in the case of unbraked towed vehicle: P_{M+R} = combination mass (mass P_M + declared unbraked towed vehicle mass P_R) according to point 3.1.1.2;

(b) in the case of an inertia braked towed vehicle: P_{M+R} = combination mass (mass P_M + declared inertia-braked towed vehicle mass as specified by the manufacturer).

P_M = mass of the tractor (if applicable, including any ballast or supporting load or both of them).’

(m) in point 3.2.1.3, the fifth paragraph is replaced by the following:

‘The test speed is 60 km/h or the maximum design speed of the towed vehicle, whichever is the lower.’

(n) point 3.2.3 is replaced by the following:

‘3.2.3. Automatic braking system

The automatic braking performance in the event of a failure, as described in points 2.2.1.17.1 and 2.2.1.18.5 of Annex I, when testing the laden vehicle from a speed of 40 km/h or 0,8 v_{max} (whichever is lower), shall not be less than 13,5 % of the maximum stationary wheel load. Wheel-locking at performance levels above 13,5 % is permitted.’

(o) Appendix 1 is amended as follows:

(i) point 1.1.3 is replaced by the following:

‘1.1.3. However, vehicles of the categories mentioned in point 1.1.1 and in point 1.1.2 both equipped with an anti-lock braking system of category 1 or 2 (tractors) and category A or B (towed vehicles) fulfilling the relevant requirements of Annex XI shall also fulfil all the relevant requirements of this Appendix with the following exceptions or conditions:’

(ii) the following points 1.1.5 and 1.1.6 are inserted:

‘1.1.5. The requirements of this Appendix apply to the braking equipment fitted with the largest diameter tyres intended by the manufacturer for that vehicle type.

1.1.6. Compliance with the adhesion utilisation and compatibility requirements associated with diagrams 1, 2 and 3 of this Appendix shall be demonstrated by calculation.’

(iii) section 3 is replaced by the following:

‘3. **Requirements for tractors of category T**

3.1. Two-axle tractors

3.1.1. For k values between 0,2 and 0,8:

$$z \geq 0,10 + 0,85 (k - 0,20)$$

The provisions laid down in this point do not affect the requirements of Annex II relating to the braking performance. However, if, in tests made under the provisions of this point, braking performances are obtained which are higher than those prescribed in Annex II, the provisions relating to the adhesion utilization curves shall be applied within the areas of diagram 1 defined by the straight lines $k = 0,8$ and $z = 0,8$.

3.1.2. For all braking rates between 0,15 and 0,30:

3.1.2.1. The adhesion utilization curves for each axle are situated between two lines parallel to the line of ideal adhesion utilization given by the equation $k = z \pm 0,08$ as shown in diagram 1 and the adhesion utilization curve for the rear axle for braking rates $z > 0,3$ complies with the relation:

$$z \geq 0,3 + 0,74 (k - 0,38).$$

3.1.3. For tractors authorised to tow vehicles of category R3b, R4b and S2b fitted with compressed-air braking systems:

- 3.1.3.1. When tested with the energy source stopped, the supply line blocked off, a reservoir of 0,5 litre capacity connected to the pneumatic control line and the system at cut-in and cut-out pressures, the pressure at full application of the braking control device shall be between 650 and 850 kPa at the coupling heads of the supply line and the pneumatic control line, irrespective of the load condition of the vehicle.
- 3.1.3.2. For vehicles equipped with an electric control line, a full application of the control device of the service braking system shall provide a digital demand value corresponding to a pressure between 650 and 850 kPa (see ISO 11992:2003 including ISO 11992-2:2003 and its Amd.1:2007).
- 3.1.3.3. These values shall be demonstrably present in the tractor when the latter is uncoupled from the towed vehicle. The compatibility bands in the diagrams specified in points 3.1.6, 4.1 and 4.2, should not be extended beyond 750 kPa and/or the corresponding digital demand value (see ISO 11992:2003 including ISO 11992-2:2003 and its Amd.1:2007).
- 3.1.3.4. It shall be ensured that at the coupling head of the supply line, a pressure of at least 700 kPa is available when the system is at cut-in pressure. This pressure shall be demonstrated without applying the service brakes.
- 3.1.4. For tractors authorised to tow vehicles of category R3b, R4b and S2b fitted with hydraulic braking systems:
- 3.1.4.1. When tested with the energy source at idling speed and of 2/3 of maximum engine speed, a control line of the towed vehicle simulator (point 3.6 of Annex III) connected to the hydraulic control line. At full application of the braking control device the pressures shall be between 11 500 and 15 000 kPa at the hydraulic control and shall be between 1 500 and 3 500 kPa at the supplementary line, irrespective of the load condition of the vehicle.
- 3.1.4.2. These values shall be demonstrably present in the tractor when uncoupled from the towed vehicle. The compatibility bands in the diagrams specified in points 3.1.6, 4.1 and 4.2, should not be extended beyond 13 300 kPa.
- 3.1.5. Verification of the requirements of points 3.1.1 and 3.1.2
- 3.1.5.1. In order to verify the requirements of points 3.1.1 and 3.1.2, the manufacturer shall provide the adhesion utilisation curves for the front and rear axles calculated by the formulae:

$$f_1 = \frac{T_1}{N_1} = \frac{T_1}{F_1 + z \cdot \frac{h}{E} \cdot P \cdot g}$$

$$f_2 = \frac{T_2}{N_2} = \frac{T_2}{F_2 - z \cdot \frac{h}{E} \cdot P \cdot g}$$

The curves shall be plotted for both the following load conditions:

- 3.1.5.1.1. Unladen, not exceeding the minimum mass declared by the manufacturer in the information document;
- 3.1.5.1.2. Laden; where provision is made for several possibilities of load distribution, the one whereby the front axle is the most heavily laden shall be the one considered.
- 3.1.5.2. Special requirements in the case of tractors where all axles are permanently rigidly connected (100 % locking rate) by the all-wheel drive or are automatically connected during braking by the all-wheel drive (100 % locking rate)

- 3.1.5.2.1. The mathematical verification pursuant to point 3.1.5.1 is not required.
- 3.1.5.3. Tractors with permanent all-wheel drive other than covered by point 3.1.5.2.
 - 3.1.5.3.1. If it is not possible, for vehicles with permanent all-wheel drive or in the condition when the all-wheel drive is connected during braking, to carry out the mathematical verification pursuant to point 3.1.5.1, the manufacturer may instead verify by means of a wheel lock sequence test that, lockup of the front wheels occurs either simultaneously with or before the lockup of the rear wheels.
 - 3.1.5.4. However, for tractors which automatically apply the all-wheel drive when the braking is initiated above a vehicle speed of 20 km/h but not automatically connect the all-wheel drive when the service braking system is applied at speeds not exceeding 20 km/h, then it is not required to show compliance with point 3.1.5.1 for the condition when the all-wheel drive is not connected during braking.
 - 3.1.5.5. Procedure to verify the requirements set out in point 3.1.5.3
 - 3.1.5.5.1. The wheel lock sequence test shall be conducted with the laden and the unladen vehicle on road surfaces having an adhesion level such that wheel locking on the first axle occurs at braking rates between 0,55 and 0,8 from the initial test speed specified in point 3.1.5.5.2.
 - 3.1.5.5.2. Test speed:

0,9 v_{max} , but not exceeding 60 km/h.
 - 3.1.5.5.3. The pedal force applied may exceed the permissible actuation forces pursuant to point 3.1.1 of Annex II.
 - 3.1.5.5.4. Pedal force is applied and increased such that the second wheel on the vehicle shall reach lockup between 0,5 and 1 s after initiating the brake application, until lockup of both wheels on one axle occurs (additional wheels may also lock during the test, e.g. in the case of simultaneous lockup).
 - 3.1.5.5.4.1. If it is not possible during the laden test to reach lockup of the second wheel within a period of 1 s, this test may be omitted under the condition that wheel-locking under the conditions as prescribed in point 3.1.5.5.4 can be demonstrated during the unladen test.

If also in the unladen test it is not possible to reach lockup of the second wheel within a period of 1 s, a third, decisive test shall be carried out on road surfaces with a coefficient of adhesion of not more than 0,3 from a test speed of 0,8 v_{max} km/h, but not exceeding 60 km/h.
 - 3.1.5.5.4.2. For the purpose of the tests according to point 3.1.5.5, a simultaneous lockup of the front and rear wheels refers to the conditions when the time interval between the first occurrence of lockup of the last (second) wheel on the rear axle and the first occurrence of lockup of the last (second) wheel on the front axle does not exceed 0,3 second.
- 3.1.6. Tractors authorized to draw towed vehicles
 - 3.1.6.1. The permissible relationship between the braking rate T_M/F_M and the pressure p_m shall lie within the areas shown on diagram 2 for all pressures between 20 and 750 kPa (in the case of compressed air braking system) and 350 and 13 300 kPa (in the case of hydraulic braking system).
- 3.2. Tractors with more than two axles

The requirements of point 3.1 shall apply to vehicles with more than two axles. The requirements of point 3.1.2 with respect to wheel lock sequence shall be considered to be met if, in the case of braking rates between 0,15 and 0,30, the adhesion utilised by at least one of the front axles is greater than that utilised by at least one of the rear axles.'

(iv) point 6.1 is replaced by the following:

‘6.1. Vehicles which meet the requirements of this Appendix by means of a device mechanically controlled by the suspension of the vehicle shall be marked in accordance with the requirements laid down in Article 24 of Delegated Regulation (EU) 2015/208 and with the appropriate data to show the useful travel of the device between the positions corresponding to vehicle unladen and laden states, respectively, and any further information to enable the setting of the device to be checked.’

(v) in point 6.3, the second sentence is replaced by the following:

‘An example of the markings for a mechanically controlled device in a vehicle fitted with compressed-air or hydraulic braking system is provided in accordance with the requirements laid down in Article 5 of Commission Implementing Regulation (EU) 2015/504 (*).

(*) Commission Implementing Regulation (EU) 2015/504 of 11 March 2015 implementing Regulation (EU) No 167/2013 of the European Parliament and of the Council with regard to the administrative requirements for the approval and market surveillance of agricultural and forestry vehicles (OJ L 85, 28.3.2015, p. 1).’

(vi) the title of Diagram 2 is replaced by the following:

‘Permissible relationship between braking rate T_M/F_M and the coupling head pressure p_m for tractors of categories T and C with compressed air or hydraulic braking systems’

(3) Annex III is amended as follows:

(a) point 3.6.2.1.2.1 is deleted;

(b) in point 1.1 of Appendix 2, the description of symbol A is replaced by the following:

‘A = hydraulic accumulator (pre-charge pressure: 1 000 kPa)’

(4) Annex IV is amended as follows:

(a) in point 1.2.2.1 of part A, the third sentence is replaced by the following:

‘The initial pressure shall be stated in the information folder.’

(b) part B is amended as follows:

(i) in point 1.2.2.1, the third sentence is replaced by the following:

‘The initial energy level shall be stated in the information folder.’

(ii) in point 1.3.2.1, the third sentence is replaced by the following:

‘The initial energy level shall be stated in the information folder.’

(c) part C is amended as follows:

(i) in point 1.1.1, the following paragraph is added:

‘Energy storage devices used as pulsation dampers in hydraulic braking systems where the prescribed service braking performance is achieved by an energy source, are not considered as energy accumulation devices in the sense of this Annex.’

(ii) point 2.1.3 is replaced by the following:

‘2.1.3. Interpretation of results

The time t shall not exceed 30 s in the case of tractors to which the coupling of a towed vehicle is not authorised.’

(5) in Annex V, point 2.2.1 is replaced by the following:

‘2.2.1. response time requirements as laid down in section 6 of Annex III;’

(6) Annex VII is amended as follows:

(a) the title is replaced by the following:

‘Alternative test requirements for vehicles for which tests equivalent to Type-I, Type-II or Type-III tests have been carried out’

(b) sections 1 and 2 are replaced by the following:

1. Definitions

For the purposes of this Annex:

- 1.1. ‘subject towed vehicle’ means a towed vehicle representative of the towed vehicle type for which type-approval is sought;
- 1.2. ‘identical’ means parts having identical geometric and mechanical characteristics and the materials used for the components of the vehicles;
- 1.3. ‘reference axle’ means an axle for which there is a test report;
- 1.4. ‘reference brake’ means a brake for which there is a test report;
- 1.5. ‘nominal test mass’ means the mass of a disc or drum which the manufacturer specifies for the disc or drum, respectively, with which the relevant test is carried out by the Technical Service;
- 1.6. ‘actual test mass’ means the mass measured by the Technical Service prior to the test;
- 1.7. ‘brake input threshold torque’ means the input torque necessary to produce a measurable brake torque;
- 1.8. ‘declared brake input threshold torque’ means the brake input threshold torque declared by the manufacturer and which is representative for the brake;
- 1.9. ‘declared external diameter’ means the external diameter of a disc declared by the manufacturer which is representative external diameter for the disc;
- 1.10. ‘nominal external diameter’ means the external diameter which the manufacturer specifies for the disc on which the relevant test is carried out by the Technical Service;
- 1.11. ‘actual external diameter’ means the external diameter of a disc measured by the Technical Service prior to the test;
- 1.12. ‘effective length of the cam shaft’ means the distance from the centre line of the S-cam to the centre line of the operating lever;
- 1.13. ‘brake factor’ means the input to output amplification ratio of the brake.

2. General requirements

Type-I and/or Type-II or Type-III tests, set out in Annex II, need not be performed on a vehicle and its systems submitted for approval in the following cases:

- 2.1. The vehicle concerned is a tractor or a towed vehicle which, as regards tyres, braking energy absorbed per axle, and mode of tyre fitting and brake assembly, is identical with respect to braking with a tractor or a towed vehicle which:
 - 2.1.1. Has passed the Type-I and/or Type-II or Type-III test; and
 - 2.1.2. Has been approved, with regard to the braking energy absorbed, for mass per axle not lower than that of the vehicle concerned.
- 2.2. The vehicle concerned is a tractor or a towed vehicle whose axle or axles are, as regards tyres, braking energy absorbed per axle, and mode of tyre fitting and brake assembly, identical with respect to braking with an axle or axles which have individually passed the Type-I and/or Type-II or Type-III test for masses per axle not lower than that of the vehicle concerned, provided that the braking energy absorbed per axle does not exceed the energy absorbed per axle in the reference test or tests carried out on the individual axle.
- 2.3. The vehicle concerned is a tractor equipped with an endurance braking system, other than the engine brake, identical with an endurance braking system already tested under the following conditions:
 - 2.3.1. The endurance braking system shall, by itself, in a test carried out on a gradient of at least 6 per cent (Type-II test), have stabilised a vehicle whose maximum mass at the time of the test was not less than the maximum mass of the vehicle submitted for approval;
 - 2.3.2. It shall be verified in the above test that the rotational speed of the rotating parts of the endurance braking system, when the vehicle submitted for approval reaches a road speed of 30 km/h, is such that the retarding torque is not less than that corresponding to the test referred to in point 2.3.1.
- 2.4. The vehicle concerned is a towed vehicle equipped with air operated S-cam or disc brakes which satisfy the verification requirements of Appendix 1 relative to the control of characteristics compared to the characteristics given in a report for a reference axle as shown in the test report. Other brake designs from air operated S-cam or disc brakes may be approved upon presentation of equivalent information.'

(c) section 4 is replaced by the following:

'4. Type-approval certificate

Where the foregoing requirements are applied, the type approval certificate shall include the following particulars:

- 4.1. In the case under point 2.1 of this Annex, the approval number of the vehicle subjected to the Type-I and/or Type-II or Type-III test of reference shall be entered.
- 4.2. In the cases under point 2.2 of this Annex, Table I in the template set out in Annex V to Implementing Regulation (EU) 2015/504 shall be completed.
- 4.3. In the cases under point 2.3 of this Annex, Table II in the template set out in Annex V to Implementing Regulation (EU) 2015/504 shall be completed.
- 4.4. If point 2.4 of this Annex is applicable, Table III in the template set out in Annex V to Implementing Regulation (EU) 2015/504 shall be completed.'

(d) Appendix 1 is amended as follows:

(i) section 2 is replaced by the following:

‘2. Symbols used in this Annex are explained in the following table:

2.1. Symbols

P = part of the vehicle mass borne by the axle under static conditions

F = normal reaction of road surface on the axle under static conditions = $P \cdot g$

F_R = total normal static reaction of road surface on all wheels of towed vehicle

F_e = test axle load

P_e = F_e / g

g = acceleration due to gravity: $g = 9.81 \text{ m/s}^2$

C = brake input torque

C_0 = brake input threshold torque. This torque may be determined by extrapolation of measurements within a range not exceeding 15 per cent braking rate or other equivalent methods

$C_{0,\text{dec}}$ = declared brake input threshold torque

C_{max} = maximum brake input torque

R = dynamic tyre rolling radius. As an alternative for vehicles of categories Ra and Sa, the static loaded radius, as specified by the tyre manufacturer, may be used instead of the dynamic tyre rolling radius

T = brake force at tyre/road interface

T_R = total brake force at tyre/road interface of the towed vehicle

M = brake torque = $T \cdot R$

z = braking rate = T/F or $M/(R \cdot F)$

s = actuator stroke (working stroke plus free stroke)

3.7.1.5. Base part of test report number;

3.7.1.6. Example of the identifiers:

Axle Manufacturer and/or make ABC

ID1-XXXXXX

ID2-YYYYYY

ID3-11111

ID4-ZZZZZZZ

3.7.2. A non-integrated automatic brake adjustment device shall carry in a visible position at least the following identification information grouped together, in a legible and indelible manner:

3.7.2.1. Manufacturer and make or one of the two, as applicable

3.7.2.2. Type

3.7.2.3. Version

3.7.3. The make and type of each brake lining or pad shall be visible when the lining or pad is mounted on the brake shoe or back plate in a legible and indelible manner.

3.7.4. Identifiers

3.7.4.1. Axle identifier

The axle identifier categorizes an axle in terms of its braking force/torque capability as stated by the axle manufacturer.

The axle identifier shall be an alphanumeric number consisting of the four characters 'ID1-' followed by a maximum of 20 characters.

3.7.4.2. Brake identifier

The brake identifier shall be an alphanumeric number consisting of the four characters 'ID2-' followed by a maximum of 20 characters.

A brake with the same identifier is a brake which does not differ with regard to the following criteria:

- (a) type of brake;
- (b) base material with respect to calliper housing, brake carrier, brake disc and brake drum;
- (c) dimensions with the suffix 'e' according to the test report;
- (d) the basic method used within the brake to generate the braking force;
- (e) in the case of disc brakes, the friction ring mounting method: fixed or floating;
- (f) brake factor B_F ;
- (g) different brake characteristics with respect to the requirements of Annex VII which are not covered by point 3.7.4.2.1 of this Appendix.

3.7.4.2.1. Differences allowed within the same brake identifier

The same brake identifier may include different brake characteristics with regard to the following criteria:

- (a) increase in maximum declared brake input torque $C_{\max}$;
- (b) deviation of declared brake disc and brake drum mass m_{dec} : ± 20 per cent;
- (c) method of attachment of the lining / pad on the brake shoe / back plate;
- (d) in the case of disc brakes, increase of maximum stroke capability of the brake;
- (e) effective length of the cam shaft;
- (f) declared threshold torque $C_{0,\text{dec}}$;
- (g) ± 5 mm from the declared external diameter of the disc;
- (h) type of cooling of the disc (ventilated/non-ventilated);
- (i) hub (with or without integrated hub);
- (j) disc with integrated drum – with or without parking brake function;
- (k) geometric relationship between disc friction surfaces and disc mounting;
- (l) brake lining type;
- (m) material variations (excluding changes in base material referred to in point 3.7.4.2.) for which the manufacturer confirms that such a material variation does not change the performance with respect to the required tests;
- (n) back plate and shoes.

3.7.4.3. Fe identifier

The Fe identifier indicates the test axle load. It shall be an alphanumeric number consisting of the four characters 'ID3-' followed by the Fe value in daN, without the daN unit identifier.

3.7.4.4. Test report identifier

The test report identifier shall be an alphanumeric number consisting of the four characters 'ID4-' followed by the base part of the test report number.

3.7.5. Automatic brake adjustment device (integrated and non-integrated)

3.7.5.1. Types of automatic brake adjustment device

The same type of automatic brake adjustment device does not differ with regard to the following criteria:

- (a) body: base material ;
- (b) maximal permitted brake shaft moment;
- (c) adjustment operating principle.

3.7.5.2. Versions of automatic brake adjustment device, with respect to the adjustment behaviour

Automatic brake adjustment devices within a type that have an impact on the running clearance of the brake are considered to be different versions.'

(iv) point 3.8 is replaced by the following:

'3.8. Test criteria

In the case that a new test report, or a test report extension, is required for a modified axle or brake within the limits specified in the information document the following criteria are used to determine the necessity for further testing taking into account worst case configurations agreed with the Technical Service.

Abbreviations used in the subsequent table	
CT (complete test)	Test: 3.5.1.: Supplementary cold performance test 3.5.2.: Fade test (Type-I test) (*) 3.5.3.: Fade test (Type-III test) (*)
FT (fade test)	Test: 3.5.1. Supplementary cold performance test 3.5.2. Fade test (Type-I test) (*) 3.5.3. Fade test (Type-III test) (*)
(*) If applicable	
Differences according to point 3.7.4.2.1	Test criteria
(a) Increase in maximum declared brake input torque $C_{\max}$	Change allowed without additional testing
(b) Deviation of declared brake disc and brake drum mass m_{dec} : ± 20 per cent	CT: The lightest variant shall be tested; if the nominal test mass for a new variant deviates less than 5 per cent from a previously tested variant with a higher nominal value then the test of the lighter version may be dispensed with. The actual test mass of the test specimen may vary ± 5 per cent from the nominal test mass.
(c) Method of attachment of the lining / pad on the brake shoe / back plate	The worst case specified by the manufacturer and agreed by the Technical Services conducting the test
(d) In the case of disc brakes, increase of maximum stroke capability of the brake	Change allowed without additional testing
(e) Effective length of the cam shaft	The worst case is considered to be the lowest cam shaft torsional stiffness and shall be verified by either: (i) FT; or (ii) Change allowed without additional testing if by calculation the influence with respect to stroke and braking force can be shown. In this case the test report shall indicate the following extrapolated values: s_e , C_e , T_e , T_e/F_e .

Differences according to point 3.7.4.2.1	Test criteria
(f) Declared threshold torque $C_{0,dec}$	It shall be checked that the brake performance remains within the corridors of Diagram 1
(g) ± 5 mm from the declared external diameter of the disc	The worst case test is considered the smallest diameter The actual external diameter of the test specimen may vary ± 1 mm from the nominal external diameter specified by the axle manufacturer.
(h) Type of cooling of the disc (ventilated/non-ventilated)	Each type shall be tested
(i) Hub (with or without integrated hub)	Each type shall be tested
(j) Disc with integrated drum – with or without parking brake function	Testing is not required for this feature
(k) Geometric relationship between disc friction surfaces and disc mounting	Testing is not required for this feature
(l) Brake lining type	Each type of brake lining
(m) Material variations (excluding changes in base material referred to in point 3.7.4.2.) for which the manufacturer confirms that such a material variation does not change the performance with respect to the required tests	Test not required for this condition
(n) Back plate and shoes	Worst case test conditions (**): Back plate: minimum thickness Shoe: lightest brake shoe

(**) No test is required if the manufacturer can demonstrate that a change does not affect the stiffness.

3.8.1. If an automatic brake adjustment device deviates from a tested one according to points 3.7.5.1 and 3.7.5.2, an additional test according to point 3.6.2 is necessary.'

(7) Annex VIII is amended as follows:

(a) point 2.2.18 is replaced by the following:

'2.2.18. s: effective (useful) travel of control device in millimetres, determined as required by point 10.4.'

(b) point 2.2.23 is replaced by the following:

'2.2.23. M*: braking torque as specified by the manufacturer. This braking torque shall produce at least the prescribed braking force B*.'

(c) point 2.2.24 is replaced by the following:

'2.2.24. R: Dynamic tyre rolling radius. As an alternative for vehicles of categories Ra and Sa, the static loaded radius, as specified by the tyre manufacturer, may be used instead of the dynamic tyre rolling radius.'

(d) point 5.5 is replaced by the following:

'5.5. In the case of inertia braking system on multi-axled drawbar towed vehicles, the loss of travel so referred to in point 10.4.1 shall be measured.'

(e) section 9 is replaced by the following:

‘9. Test reports

Applications for the approval of towed vehicles equipped with inertia braking systems shall be accompanied by the test reports relating to the control device and the brakes and the test report on the compatibility of the inertia type control device, the transmission device and the brakes of the towed vehicle, these reports including at least the particulars prescribed in Article 9 of Implementing Regulation (EU) 2015/504.’

(f) in point 10.3.1, the second paragraph is replaced by the following:

‘To check whether these conditions are complied with the following inequalities shall be applied:’

(g) point 10.3.1.1 is replaced by the following:

‘10.3.1.1. In mechanical-transmission inertia braking systems:

$$\left[\frac{B \cdot R}{\rho} + n P_0 \right] \frac{1}{(D^+ - K) \cdot \eta_H} \leq i_H ,$$

(h) point 10.3.1.2 is replaced by the following:

‘10.3.1.2. In hydraulic-transmission inertia braking systems:

$$\left[\frac{B \cdot R}{n \cdot \rho'} + P_0 \right] \frac{1}{(D^* - K) \cdot \eta_H} \leq \frac{i_h}{F_{HZ}} ,$$

(i) point 10.4.3.2 is replaced by the following:

‘10.4.3.2. in hydraulic-transmission inertia braking systems:

$$\frac{i_h}{F_{HZ}} \leq \frac{s'}{2s_{B^*} \cdot nF_{RZ} \cdot i'_g}$$

$$\text{and } \frac{s'}{i_H} \leq s_{Hz} ,$$

(j) the following points 10.4.4, 10.4.4.1, 10.4.4.1.1, 10.4.4.1.2, 10.4.4.2, 10.4.4.2.1, 10.4.4.2.2, 10.4.5, 10.4.5.1, 10.4.5.2, 10.4.5.3 and 10.4.5.4 are inserted:

‘10.4.4. When the towed vehicle moves rearward the following inequalities shall be applied:

10.4.4.1. In mechanical-transmission inertia braking systems:

$$10.4.4.1.1. \frac{s'}{i_H} \leq s_r$$

$$10.4.4.1.2. 0,08 \cdot g \cdot G_A \cdot R \leq n \cdot M_r$$

10.4.4.2. In hydraulic-transmission inertia braking systems:

$$10.4.4.2.1. \frac{s'}{F_{Hz}} \leq V_r$$

$$10.4.4.2.2. 0,08 \cdot g \cdot G_A \cdot R \leq n \cdot M_r$$

10.4.5. Checks when an overload protector within the meaning of point 3.6. is fitted

The following inequalities shall be applied:

10.4.5.1. where the overload protector is mechanical on the inertia control device:

$$\frac{n \cdot P^*}{i_{H1} \cdot \eta_{H1} \cdot P'_{max}} \geq 1.2$$

10.4.5.2. where the overload protector is hydraulic on the inertia control device:

$$\frac{P^*}{P'_{max}} \geq 1.2$$

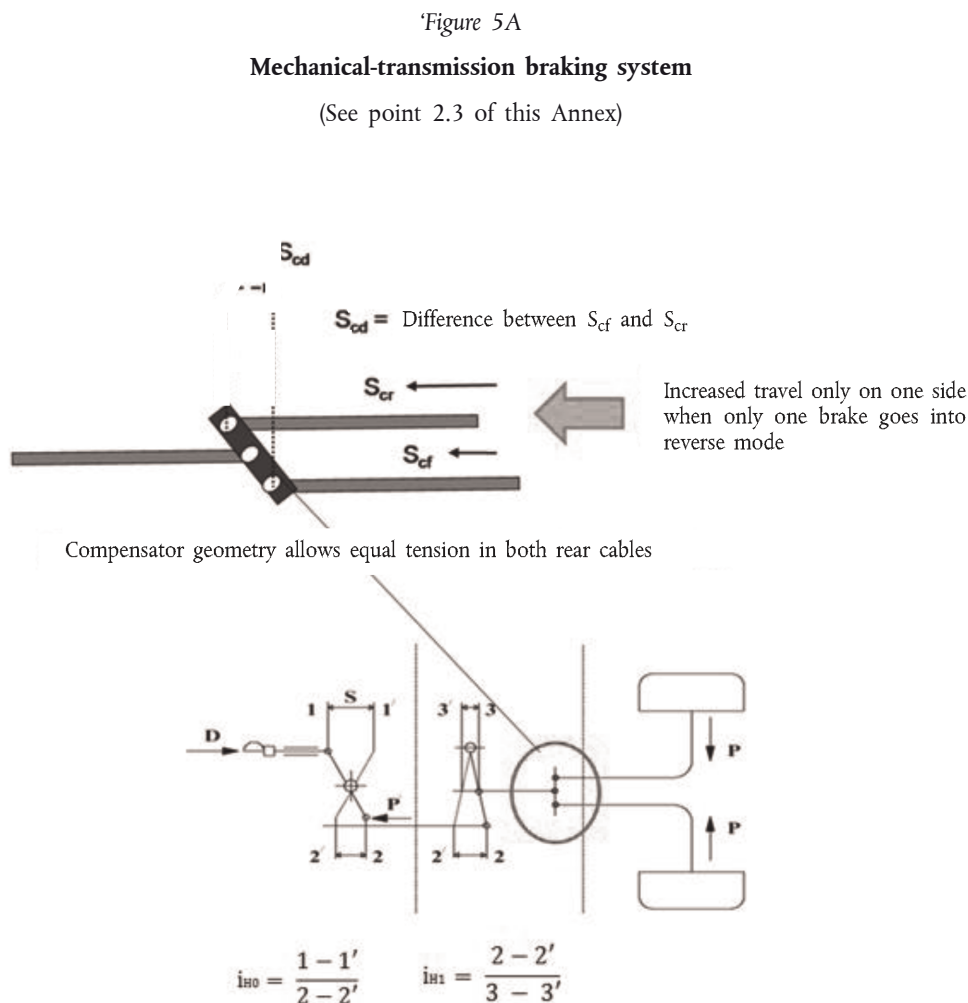
10.4.5.3. if the overload protector is on the inertia control device:

$$\frac{D_{op}}{D^*} \geq 1.2$$

10.4.5.4. if the overload protector is fitted on the brake:

$$\frac{M_{op}}{B \cdot R} \geq 1.2$$

(k) in Appendix 1, Figure 5A is replaced by the following:



1.2 Control device

1.3 Transmission

1.4 Brakes”;

(8) Annex IX is amended as follows:

(a) point 5.2.2.2 is deleted;

(b) the following point 5.2.3.1 is inserted:

‘5.2.3.1. If, in the case of a hydrostatic drive, the vehicle cannot be stopped on a gradient, then it is permissible to operate the parking braking system to stop the vehicle from residual creep speed to standstill. For this purpose the parking braking system has to be designed such that it is possible for it to be actuated during driving.’;

(c) point 5.3.4 is replaced by the following:

‘5.3.4. The braking force distribution of the service brake system shall be designed in such a way that during braking there is no significant moment around the vertical axis of the vehicle if the limit of adhesion between tyres and road on homogeneous road surfaces is not attained.’

- (d) in point 5.3.12, the second sentence is replaced by the following:

'This shall be demonstrated by compliance with the technical requirements laid down in accordance with the relevant provisions of Article 19 of Delegated Regulation (EU) 2015/208.'

- (e) in point 6.1.2.2, the first paragraph is replaced by the following:

'Lift-off of an axle is permissible for vehicles of Class I and Class II at a deceleration exceeding 4,5 m/s². However, the driving stability shall be preserved.'

- (f) in point 6.2.2, the second sentence is replaced by the following:

'In the case of Class III vehicles this sequence shall be automatic, using only the service brake control device.'

- (g) in the Table of point 6.4.4.2, the fifth row is replaced by the following:

'Friction braking system	80	60'
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- (h) in the second paragraph of point 6.5.2, the second sentence is replaced by the following:

'In the case of Class III vehicles this sequence shall be automatic, using only the parking brake control device.'

- (9) Annex XI is amended as follows:

- (a) in point 4.4, the second sentence is replaced by the following:

'That requirement shall be demonstrated by compliance with the technical requirements laid down in Article 19 of Delegated Regulation (EU) 2015/208.'

- (b) in Appendix 3, point 1.1 is replaced by the following:

'1.1. The prescribed braking rate referred to in point 5.3.5 of this Annex may be calculated by reference to the measured coefficient of adhesion of the two surfaces on which this test is carried out.'

The two surfaces shall satisfy the conditions set out in point 5.3.4. of this Annex.'

- (10) Annex XII is amended as follows:

- (a) in point 3.1, the first sentence is replaced by the following:

'The electric control line of the tractor shall provide information as to whether the requirements of point 2.2.1.16.3 of Annex I can be satisfied by the electric control line, without assistance from the pneumatic control line.'

- (b) point 3.3.3 is replaced by the following:

'3.3.3. when the electric control signal has exceeded the equivalent of 100 kPa for more than 1 second, the towed vehicle shall verify that a pneumatic signal is present; should no pneumatic signal be present, the driver shall be warned from the towed vehicle by the separate yellow warning signal specified in point 2.2.1.29.2 of Annex I.'

- (c) in point 3.4, the first sentence is replaced by the following:

'A towed vehicle may be equipped as described in point 2.1.4.1.3 of Annex I, provided that it can only be operated in conjunction with a tractor with an electric control line which satisfies the requirements of point 2.2.1.16.3 of Annex I.'

- (d) in point 3.5.3, the first sentence is replaced by the following:

‘When the tractor is equipped according to point 2.1.4.1.3 of Annex I or, if it satisfies the requirements of point 2.2.1.16.3 of Annex I without assistance from the pneumatic control line, point 2.1.4.1.2 of Annex I, the actuation of the parking braking system on the tractor shall actuate a braking system on the towed vehicle via the electric control line.’

- (e) in the first paragraph of point 4.1.3, the second sentence is replaced by the following:

‘When the prescribed service braking performance can no longer be achieved (red warning signal), failures resulting from a loss of electrical continuity (e.g. breakage, disconnection) shall be signalled to the driver as soon as they occur, and the prescribed residual braking performance shall be fulfilled by operating the service braking control device in accordance with point 3.1.4 of Annex II.’

- (f) in point 4.1.10, the first sentence is replaced by the following:

‘In the case of a failure in the electric control transmission of a towed vehicle, electrically connected via an electric control line only, according to point 2.1.4.1.3 of Annex I, braking of the towed vehicle shall be ensured according to point 2.2.1.17.2.1 of Annex I.’

- (g) in point 4.2.2, the third paragraph is replaced by the following:

‘For towed vehicles, electrically connected via an electric control line only, according to point 2.1.4.1.3 of Annex I, and fulfilling the requirements set out in point 2.2.1.17.2.2 of Annex I with the performance prescribed in point 3.2.3 of Annex II, it is sufficient that the provisions of point 4.1.10 of this Annex are invoked, when a braking performance of at least 30 % of the prescribed performance for the service braking system of the towed vehicle can no longer be ensured, by either providing the ‘supply line braking request’ signal via the data communication part of the electric control line or by the continuous absence of this data communication.’

- (h) in point 3.2.2.2.1.4 of Appendix 2, the second sentence is replaced by the following:

‘After the braking system has checked that no defects that require identification by the red warning signal are present the message referred to in this point shall be set to 00_b.’

- (11) Annex XIII is amended as follows:

- (a) point 1.2 is deleted;

- (b) the title and first paragraph of section 3 are replaced by the following:

‘3. Alternative requirements

As an alternative to the requirements of sections 1 and 2, hydraulic connection of the single line type installed on tractors shall fulfil all the requirements of this section, in addition to the provisions of point 2.1.’

- (c) point 3.9 is replaced by the following:

‘3.9. Braking valve and energy source shall be marked in accordance with the requirements laid down in Article 24 of Delegated Regulation (EU) 2015/208.’

ANNEX V

Annexes I, III, V, VII, X, XII to XV, XVII, XIX, XX, XXII, XXV to XXXI, XXXIII and XXXIV to Delegated Regulation (EU) 2015/208 are amended as follows:

(1) Annex I is amended as follows:

(a) above the row with Regulation Number 3, the following row is inserted:

'1	Lighting installation	Incorporating all valid text up to 02 series of amendments	OJ L 177, 10.7.2010, p. 1	T and C';
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(b) above the row with Regulation Number 7, the following row is inserted:

'6	Lighting, light signalling devices and their light sources	Supplement 18 to the 01 series of amendments Corrigendum 1 to Supplement 18 Supplement 19 to the 01 series of amendments	OJ L 177, 10.7.2010, p. 40	T, C, R and S';
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(c) above the row with Regulation Number 10, the following row is inserted:

'8	Lighting installation	Incorporating all valid text up to 05 series of amendments Corrigendum 1 to Revision 4 of the Regulation	OJ L 177, 10.7.2010, p. 71	T and C';
----	-----------------------	---	----------------------------	-----------

(d) above the row with Regulation Number 21, the following row is inserted:

'20	Lighting installation	Incorporating all valid text up to 03 series of amendments	OJ L 177, 10.7.2010, p. 170	T and C';
-----	-----------------------	--	-----------------------------	-----------

(e) above the row with Regulation Number 25, the following row is inserted:

'23	Lighting, light signalling devices and their light sources	Supplement 17 to the original version of the Regulation	OJ L 4, 7.1.2012, p. 18	T, C, R and S'
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(f) above the row with Regulation Number 79, the following row is inserted:

'77	Lighting installation	Supplement 14 to the original version of the Regulation	OJ L 4, 7.1.2012, p. 21	T, C, R and S';
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(2) in Annex III, point 2.6 is replaced by the following:

‘2.6. In order for approval authorities may calculate their maximum theoretical speed, the manufacturer shall specify as a guide the gear ratio, the actual forward movement of the powered wheels corresponding to one complete revolution, and the rpm at maximum power output or the cut-off initiation speed under full load with the throttle fully open, whichever is higher, and the speed governor, if fitted, adjusted as laid down by the manufacturer. The maximum theoretical speed shall be calculated without the tolerances referred to in point 2.5.’

(3) Annex V is amended as follows:

(a) section 1 is replaced by the following:

1. Definitions

For the purposes of this Annex, the definitions in section 1 of Annex XXXIII shall apply. The following definitions shall also apply:

(b) point 2.3 is amended as follows:

(i) the first sentence is replaced by the following:

‘The requirements set out in point 2.2 are not applicable to C-category tractors with steel track chains equipped with differential steering.’

(ii) the third sentence is replaced by the following:

‘If the steering system is combined with the braking system, the requirements laid down in Commission Delegated Regulation (EU) 2015/68 (*) shall apply.’

(*) Commission Delegated Regulation (EU) 2015/68 of 15 October 2014 supplementing Regulation (EU) No 167/2013 of the European Parliament and of the Council with regard to vehicle braking requirements for the approval of agricultural and forestry vehicles (OJ L 17, 23.1.2015, p. 1).’

(c) in point 3.4.1.1 the fourth sentence is replaced by the following:

‘Without prejudice to the requirements laid down in Delegated Regulation (EU) 2015/68, if there is a hydraulic connection between the hydraulic steering equipment and the hydraulic braking equipment, and if both are supplied from the same energy source, the force required to activate the steering equipment shall not exceed 40 daN if either of the systems should fail.’

(4) in Annex VII, point 2 is replaced by the following:

‘2. The part concerning the vision beside the tractor, in ISO 5721-2:2014 on the field of vision to the side and to the rear of agricultural tractors. The requirements of point 5.1.3 of ISO 5721-2:2014 may be fulfilled by a combination of direct and indirect view.’

(5) Annex X is replaced by the following:

‘ANNEX X

Requirements on driver information systems

1. Definitions

“Virtual terminals” means electronic on-board information systems with display screens that provide an operator with visual information on the performance of the vehicle and its systems, and that allow the operator to monitor and control various functions via a touch screen or keypad.

2. Requirements

2.1 Driver information systems shall be designed so as to minimize distraction of the driver whilst conveying the necessary information

2.2 Information provided in a non-language format on a digital screen shall meet the requirements of ISO 3767: part 1 (1998 +A2:2012) and part 2 (2008).'

(6) Annex XII is amended as follows:

(a) section 3 is replaced by the following:

'3. Approval

The templates of the documents referred to in points 2.1 to 2.4, to be submitted during the EU type-approval process, shall be those set out in Annex I of Implementing Regulation (EU) 2015/504.'

(b) section 4 is replaced by the following:

'4. Approval number and markings

Each vehicle approved in accordance with the requirements set out in this Annex shall be assigned an approval number and marking, in accordance with the model set out in Annex IV of Implementing Regulation (EU) 2015/504.'

(c) points 6.1 and 6.1.1 are replaced by the following:

'6.1. Main-beam headlamps (UNECE Regulations Nos 1, 8, 20, 98, 112 and 113, as referenced in Annex I to this Regulation)

6.1.1. Presence: Mandatory for tractors with maximum design speed exceeding 40 km/h. Optional for other tractors. Main-beam headlamps are prohibited on R- and S-category vehicles. Main-beam head lamps, as prescribed in UNECE Regulation No 1, as referenced in Annex I, are only allowed on tractors with maximum design speed not exceeding 40 km/h. Main-beam head lamps, as prescribed in UNECE Regulations Nos 1, 8 and 20, as referenced in Annex I, are only allowed on new tractor types until 31 December 2020 and are only allowed on new tractors until 31 December 2022.'

(d) point 6.2 is replaced by the following:

'6.2. Dipped-beam headlamps (UNECE Regulations Nos 1, 8, 20, 98, 112 and 113, as referenced in Annex I to this Regulation)';

(e) point 6.2.1 is replaced by the following:

'6.2.1. Presence: Tractors shall be equipped with dipped-beam headlamps. Dipped-beam headlamps are prohibited on R- and S-category vehicles. Dipped-beam head lamps, as prescribed in UNECE Regulation No 1, as referenced in Annex I, are only allowed on tractors with maximum design speed not exceeding 40 km/h. Dipped-beam head lamps, as prescribed in UNECE Regulations Nos 1, 8 and 20, as referenced in Annex I, are only allowed on new tractor types until 31 December 2020 and are only allowed on new tractors until 31 December 2022.'

(f) point 6.25.5.1.2 is replaced by the following:

'6.25.5.1.2. The other two retro-reflectors shall keep within a maximum height of 2 500 mm above the ground and shall comply with point 6.25.5.1.'

(7) Annex XIII is amended as follows:

(a) in section 1, the second paragraph is replaced by the following:

‘Definitions for the protection of drive components, in accordance with the requirements laid down in Article 20 of Commission Delegated Regulation (EU) No 1322/2014 (*), are valid for this Annex.

(*) Commission Delegated Regulation (EU) No 1322/2014 of 19 September 2014 supplementing and amending Regulation (EU) No 167/2013 of the European Parliament and of the Council with regard to vehicle construction and general requirements for the approval of agricultural and forestry vehicles (OJ L 364, 18.12.2014, p. 1).’

(b) in Part 2, point 1.1 is replaced by the following:

‘1.1. Interior parts of the passenger compartment excluding the side doors, with all doors, windows and access lids in the closed position’;

(c) in point 1.1.3.2 of Part 2, the following sentence is added:

‘This requirement shall not apply to parts of control devices and of casings between their switches, which protrude less than 5 mm, but the outward facing angles of such parts shall be blunted, save where such parts protrude less than 1,5 mm.’

(d) in point 3.1 of Part 2, the second paragraph is replaced by the following:

‘If the panels and components, etc., are covered with materials softer than 60 Shore A hardness, the procedure for the measuring of projections described in the first paragraph shall apply only after the removal of such materials.’

(e) in section 4 of Part 2, the heading is replaced by the following:

‘Apparatus and procedure for application of points 1.1.3 and 1.1.4’;

(f) Part 4 is replaced by the following:

PART 4

Seat belts

The requirements laid down in Article 21 of Delegated Regulation (EU) No 1322/2014 shall apply.’

(8) Annex XIV is replaced by the following:

‘ANNEX XIV

Requirements on vehicle exterior and accessories

1. Definitions

For the purposes of this Annex, the definitions in section 1 of Annex XII and in section 1 of Annex XXXIII shall apply. The following definitions shall also apply:

- 1.1. “External surface” means the outside of the vehicle including wheels, tracks, doors, bumpers, bonnet, access means, tanks, mudguards, exhaust system.
- 1.2. “Radius of curvature” means the radius of the arc of a circle which comes closest to the rounded form of the component under consideration.
- 1.3. “Extreme outer edge” of the vehicle means, in relation to the sides of the vehicle, the plane parallel to the median longitudinal plane of the vehicle coinciding with its outer lateral edge, account not being taken of the projection:
 - (a) of tyres near their point of contact with the ground, and connections for tyre pressure gauges and tyre inflating/deflating devices/ducts;
 - (b) of any anti-skid devices which may be mounted on the wheels;
 - (c) of rear-view mirrors, including their support;

- (d) of side direction indicator lamps, end outline marker lamps, front and rear position (side) lamps, parking lamps, retro-reflectors, signalling panels and SMV rear marking plates;
- (e) of articulation structures on foldable ROPS of T2, C2, T3 and C3 category tractors;
- (f) of mechanical, electrical, pneumatic or hydraulic connections, and their supports on the sides of tractors.

2. Scope

- 2.1. This Annex shall apply to those parts of the external surface which, with the vehicle in the laden condition, equipped with tyres of the highest diameter or set of tracks of the highest vertical dimension, for which it is approved, with all doors, windows and access lids etc., in the closed position, are:
 - 2.1.1. at a height of less than 0,75 m, the parts forming only at the sides of the vehicle the extreme outer edge in each vertical plane perpendicular to the length axis of the vehicle, with the exemption of those parts with distance greater than 80 mm from the side extreme outer edge of the vehicle and towards its median longitudinal plane, when the vehicle is equipped with the tyres or set of tracks, described in point 2.1, giving the least track width; if more than one tyre or set of tracks, described in point 2.1, exist, the one giving the minimum vehicle width shall be considered;
 - 2.1.2. at the sides and at a height between 0,75 and 2 m, all parts, except:
 - 2.1.2.1. the parts that cannot be contacted by a sphere with a diameter of 100 mm, when approaching horizontally in each vertical plane perpendicular to the length axis of the vehicle; the displacement of the sphere shall not exceed 80 mm, starting from the extreme outer edge of each of the left and right side of the vehicle and towards its median longitudinal plane, when the vehicle is equipped with the tyres or set of tracks, described in point 2.1, giving the least track width; if more than one tyre or set of tracks, described in point 2.1, exist, the one giving the minimum vehicle width shall be considered;
- 2.2. The purpose of these provisions is to reduce the risk or seriousness of bodily injury to a person hit by the exterior of the vehicle or brushing against it in the event of a collision. This is valid both when the vehicle is stationary and in motion.
- 2.3. This annex does not apply to exterior rear-view mirrors, including their support.
- 2.4. This Annex does not apply neither to the track chains nor to the parts of the tracks that are inside of the vertical plane formed by the extreme outer edge of the track belt or track chain of vehicles of category C.
- 2.5. This Annex does not apply to the parts of the wheels and of the wheel guards that are inside of the vertical plane formed by the exterior lateral wall of the tyres.
- 2.6. This Annex does not apply to steps and rungs, including their support, mentioned in points 3.3. and 4.2. of Annex XV to Delegated Regulation (EU) No 1322/2014.
- 2.7. This annex does not apply to mechanical, electrical, pneumatic or hydraulic connections, including their supports, mounted on the sides of tractors.
- 2.8. This annex does not apply to articulation structures on foldable ROPS of T2, C2, T3 and C3 category tractors.

3. Requirements

- 3.1. The external surface of the vehicle shall not exhibit, directed outwards, any pointed or sharp parts, rough surfaces, or any projections of such shape, dimensions, direction or hardness as to be likely to increase the risk or seriousness of bodily injury to a person hit by the external surface or brushing against it in the event of a collision.

- 3.2. The external surfaces on each side of the vehicle shall not exhibit, directed outwards, any parts likely to catch on pedestrians, cyclists or motor cyclists.
- 3.3. No protruding part of the external surface shall have a radius of curvature less than 2,5 mm or each external part with edges shall be positioned with respect to the longitudinal axis so that the outside face of such part shall be flat and without edges and on a plane parallel with the vertical plane containing the longitudinal axis. This requirement shall not apply to parts of the external surface which protrude less than 5 mm, but the outward facing angles of such parts shall be blunted, save where such parts protrude less than 1,5 mm.
- 3.4. Protruding parts of the external surface, made of a material of hardness not exceeding 60 shore A, may have a radius of curvature less than 2,5 mm. The hardness measurement by the Shore A procedure may be replaced by a hardness value declaration from the manufacturer of the component.
- 3.5. Vehicles equipped with hydro-pneumatic, hydraulic or pneumatic suspension or a device for automatic levelling according to load shall be tested with the vehicle in the laden condition.
- 3.6. For connecting structures on ROPS of T2, C2, T3 and C3 category tractors only point 3.1 shall apply.
- 3.7. For side direction indicator lamps, end outline marker lamps, front and rear position (side) lamps, parking lamps, retro-reflectors, signalling panels, working lamps, SMV rear marking plates, including their supports, only points 3.1 and 3.2 shall apply.
- 3.8. Exposed implements on vehicles of categories R and S that have sharp edges or teeth when set in road transport mode and that are already covered by Directive 2006/42/EC are exempted from complying with points 3.1 to 3.5. For exposed areas of any other part of vehicles of categories R and S with maximum design speed exceeding 60 km/h, points 3.1 to 3.5 shall apply. For exposed areas of any other part of vehicles of categories R and S with maximum design speed not exceeding 60 km/h, only points 3.1 and 3.2 shall apply.

(9) in Annex XV, Part 2 is amended as follows:

(a) points 1.1.1 and 1.1.2 are replaced by the following:

‘1.1.1. The application for approval of a vehicle type, with regard to its electromagnetic compatibility pursuant to Articles 24 and 26 of Regulation (EU) No 167/2013 and Annex I to Implementing Regulation (EU) 2015/504 shall be submitted by the vehicle manufacturer.

1.1.2. The vehicle manufacturer shall submit the information document, the model of which is set out in Annex I to Implementing Regulation (EU) 2015/504.’

(b) in point 1.1.4, the second sentence is replaced by the following:

‘This vehicle shall represent the vehicle type specified in the information document set out in Article 2 of Implementing Regulation (EU) 2015/504.’

(c) in point 1.2.1, the first sentence is replaced by the following:

‘The application for approval of a type of ESA with regard to its electromagnetic compatibility pursuant to Articles 24 and 26 of Regulation (EU) No 167/2013 and Article 2 of Implementing Regulation (EU) 2015/504 shall be submitted by the vehicle manufacturer or by the manufacturer of the ESA.’

(d) point 1.2.2 is replaced by the following:

‘1.2.2. The vehicle manufacturer shall submit the information document, the model of which is set out in Annex I to Implementing Regulation (EU) 2015/504.’

(e) point 1.2.6 is replaced by the following:

‘1.2.6. Where applicable, any restrictions on use shall be identified. Any such restrictions shall be included in the information document referred to in Article 2 of Implementing Regulation (EU) 2015/504 or in the EU type-approval certificate referred to in Annex V of Implementing Regulation (EU) 2015/504.’

(f) point 2.1 is replaced by the following:

‘2.1. Every ESA conforming to a type approved pursuant to this Regulation shall bear an EU type-approval mark in accordance with Article 5 of Implementing Regulation (EU) 2015/504 and Annex XX to this Regulation.’

(g) point 3.3.2.4 is replaced by the following:

‘3.3.2.4. Notwithstanding the limits defined in points 3.3.2.1, 3.3.2.2 and 3.3.2.3, if, during the initial step described in point 1.3 of Part 4, the signal strength measured at the vehicle broadcast radio antenna is less than 20 dB microvolts/m (10 microvolts/m) over the frequency range 88 to 108 MHz, then the vehicle shall be deemed to comply with the limits for narrowband emissions and no further testing shall be required.’

(10) in Annex XVII, points 1.1 and 1.2 are replaced by the following:

‘1.1. Tractors with cab shall be fitted with a heating system which complies with this Annex. Tractors with cab may be fitted with air conditioning systems. Where fitted, such systems shall comply with this Annex.

1.2. The heating system, in combination with the cab ventilation, shall be able to defrost and demist the wind-screen. Heating and cooling systems shall be tested in accordance with sections 8 and 9, paragraphs 8.1.1 to 8.1.4 and 9.1.1 to 9.1.4 of ISO 14269-2:2001, respectively. During the test, system controls shall be set according to the manufacturer’s specifications. The test reports shall be included into the information document.’

(11) Annex XIX is amended as follows:

(a) point 2.6.1 is replaced by the following:

‘2.6.1. If the height of the upper edge of the plate from the ground surface does not exceed 1,20 m, the plate shall be visible in the whole space included within the following four planes:

- (a) the two vertical planes touching the two lateral edges of the plate and forming an angle measured outwards to the left and to the right of the plate of 30° to the longitudinal median plane of the vehicle;
- (b) the plane touching the upper edge of the plate and forming an angle measured upwards of 15° to the horizontal;
- (c) the horizontal plane through the lower edge of the plate.’

(b) the following point 2.6.1.a is inserted:

‘2.6.1.a. If the height of the upper edge of the plate from the ground surface exceeds 1,20 m, the plate shall be visible in the whole space included within the following four planes:

- (a) the two vertical planes touching the two lateral edges of the plate and forming an angle measured outwards to the left and to the right of the plate of 30° to the longitudinal median plane of the vehicle;

(b) the plane touching the upper edge of the plate and forming an angle measured upwards of 15° to the horizontal;

(c) the plane touching the lower edge of the plate and forming an angle measured downwards of 15° to the horizontal.'

(c) point 2.6.2 is replaced by the following:

'2.6.2. No structural element, even when fully transparent, shall be located in the space described in points 2.6.1 and 2.6.1a.'

(12) Annex XX is amended as follows:

(a) points 2.1 and 2.2 are replaced by the following:

'2.1. All agricultural or forestry vehicles shall be provided with the plate and inscriptions described in the following points. The plate and inscriptions shall be attached by the manufacturer.

2.2. All components or separate technical units conforming to a type approved pursuant to Regulation (EU) No 167/2013 shall bear an EU type-approval mark described in point 6 of this Annex or a mark provided in Article 34(2) of that Regulation and set out in Article 5 of Implementing Regulation (EU) 2015/504.'

(b) points 3.1 and 3.2 are replaced by the following:

'3.1. A statutory plate, modelled as set out in Annex IV to Implementing Regulation (EU) 2015/504, shall be firmly attached in a conspicuous and readily accessible position on a part normally not subject to replacement during normal use, regular maintenance or repair (e.g. due to accident damage). It shall show clearly and indelibly the information specified in the model for the EU type-approval mark set out in Annex IV to Implementing Regulation (EU) 2015/504.

3.2. The manufacturer may give additional information below or to the side of the prescribed inscriptions, outside a clearly marked rectangle enclosing only the information required by Annex IV of Implementing Regulation (EU) 2015/504.'

(c) point 4.3 is replaced by the following:

'4.3. It shall be marked on the chassis or other similar structure, where possible on the front right-hand side of the vehicle.'

(d) section 5 is replaced by the following:

5. Characters

The characters specified in the model for the EU type-approval mark set out Annex IV to Implementing Regulation (EU) 2015/504 shall be used for the markings referred to in sections 3 and 4.'

(e) in section 6, the first sentence is replaced by the following:

'Every separate technical unit or component, conforming to a type in respect of which EU separate technical unit or component type-approval has been granted in accordance with Chapter V of Regulation (EU) No 167/2013, shall bear an EU separate technical unit or component type-approval mark, pursuant to Article 34(2) of that Regulation and in accordance with Article 5 of Implementing Regulation (EU) 2015/504.'

(13) Annex XXII is amended as follows:

(a) in point 1, the second paragraph is replaced by the following:

'For the purposes of this Annex, definitions of 'drawbar towed vehicle' and 'rigid drawbar towed vehicle', set out in Article 2 of Delegated Regulation (EU) 2015/68, shall apply.

The following definitions shall also apply:'

(b) point 1.2 is replaced by the following:

‘1.2. ‘Technically permissible maximum mass per axle’ means the mass corresponding to the maximum permissible static vertical load transmitted to the ground by the wheels of the axle or track undercarriages, on the basis of the construction features of the axle and of the vehicle and their design performances irrespective from the load capacity of the tyres or tracks.’

(c) point 2.3.2 is replaced by the following:

‘2.3.2. For vehicles of categories R and S imposing a significant static vertical load on the tractor (rigid drawbar towed vehicle and centre-axle towed vehicle), the maximum permissible mass of the vehicle shall be considered to be the sum of the maximum permissible masses per axle and shall be applicable for type-approval purposes, instead of the corresponding maximum permissible mass mentioned in the third column of Table 1. The significant static vertical load on the tractor shall be taken into account in the type-approval of the tractor as laid down in point 2.3.1.’

(14) in section 3 of Annex XXV, the second paragraph is replaced by the following:

‘If necessary, measure(s) for charge dissipation shall be provided. However, no charge dissipation system is required for fuel tanks designed for containing a fuel with a flash point of at least 55 °C. The flash point shall be determined in accordance with ISO 2719:2002.’

(15) in Annex XXVI, section 1 is replaced by the following:

‘1. General

Vehicles of category R covered by this Regulation shall be designed so as to provide effective protection against underrunning from the rear by vehicles of categories M₁ and N₁ (*). They shall comply with the requirements set out in sections 2 and 3 of this Annex, shall be granted a type-approval certificate set out in Annex V to Implementing Regulation (EU) 2015/504 and the EU type-approval mark, set out in point 5.2 of Annex IV to that Regulation, shall be affixed to the rear protective structure.

(*) As defined in Part A of Annex II to Directive 2007/46/EC.’

(16) in Annex XXVII, points 2.4.1.1 and 2.4.1.2 are replaced by the following:

‘2.4.1.1. on a drawbar trailer: not more than 500 mm to the rear of the transverse vertical plane tangential to the rearmost part of the tyre on the wheel immediately forward of the guard;

2.4.1.2. on a rigid drawbar trailer or centre-axle trailer: in the area forward of the transverse plane passing through the centre of the front axle but not more than the front of the bodywork, if any, to ensure the normal manoeuvrability of the trailer.’

(17) in Annex XXVIII, section 7 is replaced by the following:

‘7. Length of the platform for tractors of categories T4.3 and T2

7.1. For tractors of category T4.3, the length of the platform shall not exceed 2,5 times the maximum front or rear track of the tractor, whichever is the larger.

7.2. For tractors of category T2, the length of the platform shall not exceed 1,8 times the maximum front or rear track of the tractor, whichever is the larger.’

(18) Annex XXIX is amended as follows:

(a) in section 3, the first paragraph is replaced by the following:

‘The towing device shall be of the slotted-jaw type or a winch suitable for its application. The opening at the centre of the locking pin shall be 60 mm + 0,5/- 1,5 mm and the depth of the jaw measured from the centre of the pin shall be 62 mm - 0,5 / +5 mm.’

(b) section 5 is replaced by the following:

‘5. Instructions

The correct use of the towing device shall be explained in the Operator’s manual, in accordance with the requirements laid down in Article 25 of Delegated Regulation (EU) No 1322/2014.’

(19) Annex XXX is amended as follows:

(a) point 2.2.4.3 is replaced by the following:

‘2.2.4.3. The relevant information concerning load and speed indices as well as the applicable tyre inflation pressures shall be stated clearly in the instruction manual of the vehicle in order to ensure that suitable replacement tyres with an appropriate load capacity shall be fitted when necessary, once the vehicle has been put into service.’

(b) point 2.2.6.2 is replaced by the following:

‘2.2.6.2. In case of “Improved Flexion Tyre” or “Very High Flexion Tyre” classified in category of use “Tractor – Drive wheel” (marked with prefix IF or VF) operated at speeds up to a maximum speed of 10 km/h fitted to a vehicle equipped with a “Front end loader”, the maximum load on a tyre shall not exceed 1,40 times the load corresponding to the load index marked on the tyre and the relevant reference pressure shall be increased by 80 kPa.’

(c) point 2.2.6.3 is replaced by the following:

‘2.2.6.3. Where tyres classified in category of use “Tractor – Drive wheel” are marked with speed symbols D or A8 and fitted to agricultural trailers operating at speeds between 25 km/h and 40 km/h, the maximum load on a tyre shall not exceed 1,20 times the load corresponding to the load index marked on the tyre.’

(20) in Annex XXXI, point 1.1 is replaced by the following:

‘1.1. Tb and Rb category vehicles shall be equipped with wheel guards (parts of the bodywork, mudguards, etc.).’

(21) Annex XXXIII is amended as follows:

(a) points 1.1, 1.2 and 1.3 are replaced by the following:

‘1.1. “Track undercarriage” means a system comprising at least two of the following items: track rollers, track idler and track driver, with a continuous track chain or track belt running around them.

1.2. “Track rollers” means the cylinders in the track undercarriage that transmit the mass of the vehicle and track undercarriage to the ground via the track belt or track chain.

1.3. “Track belt” means a continuous flexible rubber like belt, reinforced internally to enable the tractive forces.’

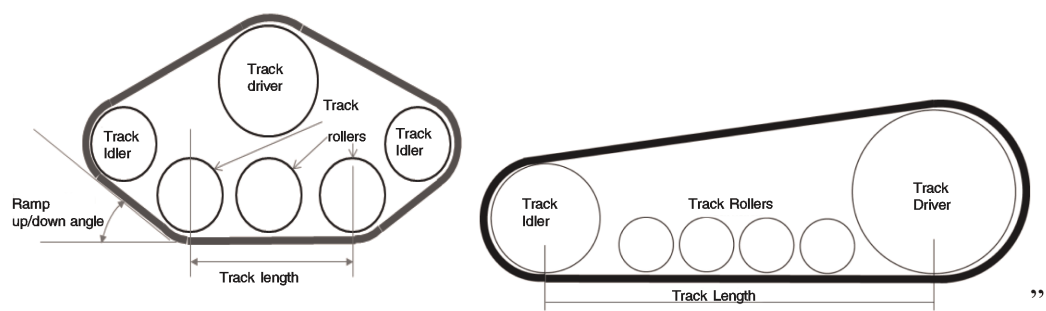
(b) the following points 1.6, 1.7, 1.8 and 1.9 are inserted:

‘1.6. “Track idler” means sprockets or pulleys in the track undercarriage that do not transmit torque to the track belt or track chain, their main function being the tensioning of the track chain or track belt; track idlers may also create the ramp up/down angles in the track geometry.

1.7. “Track driver” means the sprocket or cage wheel in the track undercarriage that transmit torque from the vehicle drive system to the track belt or track chain.

1.8. “Track chain” means a continuous metallic chain which engages with the track driver and where each link is with a transversal metallic track shoe, the latter optionally padded with a rubber strip for road surface protection.

1.9. Figures illustrating definitions set out in points 1.2, 1.6 and 1.7:



(c) points 2.1.1, 2.1.2 and 2.1.3 are replaced by the following:

‘2.1.1. Vehicles with maximum design speed not exceeding 15 km/h shall be equipped either with track chains or with track belts.

2.1.2. Vehicles with a maximum design speed exceeding 15 km/h and not exceeding 40 km/h shall be equipped with track belts only.

2.1.3. Vehicles with a maximum design speed exceeding 40 km/h shall be equipped with track belts only.’

(d) points 3.1 and 3.2 are replaced by the following:

‘3.1. Vehicles with a maximum design speed of not less than 15 km/h shall be equipped with track belts.

3.2. Track undercarriages shall be non-damaging to roads. Vehicles with track undercarriages are non-damaging to roads if the limits set out in points 3.3 to 3.5 are not exceeded and the contact surface of the track undercarriage with the road pavement is composed of an elastomeric material (such as rubber, etc.).’

(e) point 3.3.1 is replaced by the following:

‘3.3.1. Track chains’;

(f) point 3.3.1.2 is replaced by the following:

‘3.3.1.2. For vehicles with a combination of wheeled axles and tracks, the load acting through the wheeled axles with the vehicle in the laden condition shall be measured using suitable weigh pads and subtracted from the overall maximum permissible mass to calculate P. Alternatively, the manufacturer’s declared maximum combined load for the track undercarriages may be substituted for the maximum permissible vehicle mass.’

(g) point 3.3.2 is replaced by the following:

‘3.3.2. Track belts’;

(h) point 3.3.2.2 is replaced by the following:

‘3.3.2.2. For vehicles with a combination of wheeled axles and tracks, the load acting through the wheeled axles with the vehicle in the laden condition shall be measured using suitable weigh pads and subtracted from the overall maximum permissible mass to calculate P. Alternatively, the manufacturer’s declared maximum combined load for the track undercarriages may be substituted for the maximum permissible vehicle mass.’

- (i) points 3.9.1.1 and 3.9.1.2 are replaced by the following:

‘3.9.1.1. For vehicles with only one track undercarriage at each side, the steering function shall be performed by changing the speed between the left-hand side and right-hand side track undercarriages.

3.9.1.2. For vehicles with two track undercarriages at each side, the steering function shall be performed by articulation of the front and rear part of the vehicle around a central vertical axis or by pivoting of two opposite or all four track undercarriages.’

- (j) point 3.9.2.1 is replaced by the following:

‘3.9.2.1. The steering function shall be performed by articulation of the front and rear part of the vehicle around a central vertical axis or by articulation of all track undercarriages.’

- (22) Annex XXXIV is amended as follows:

- (a) point 1.3 is replaced by the following:

‘1.3. “Reference centre of mechanical coupling on tractor” means the point on the pin axis which is equidistant from the wings in the case of a fork and the point resulting from the intersection of the plane of symmetry of the hook with the generatrix of the concave part of the hook at the level of contact with the ring when this is in the traction position.’

- (b) the following point 1.3.a is inserted:

‘1.3.a. “Reference centre of mechanical coupling on towed vehicle” means, for coupling devices with a cylindrical or rounded head, the point of intersection between the vertical axis passing through the centre of the device hole and the centreline plane of the cylindrical or rounded device head, and, for coupling devices with spherical head, the point of the geometric centre of the spherical cavity.’

- (c) point 1.4 is replaced by the following:

‘1.4. “Height above ground of mechanical coupling on tractor” means the distance between the horizontal plane through the reference centre of the mechanical coupling on tractor and the horizontal plane on which the wheels of the tractor are resting.’

- (d) point 2.2 is replaced by the following:

‘2.2. The mechanical coupling components on the vehicle shall conform to the dimensional and strength requirements in point 3.1 and point 3.2 and the requirements for the vertical load on the coupling point in point 3.3.’

- (e) in point 2.6, the first paragraph is replaced by the following:

‘For mechanical couplings on tractors, the drawbar ring shall be capable of tilting horizontally at least 60° on both sides of the longitudinal axis of a non-built-in coupling device. In addition, vertical mobility of 20° upwards and downwards is required at all times. (See also Appendix 1.)’

- (f) points 2.7 and 2.8 are replaced by the following:

‘2.7. For mechanical couplings on tractors, the jaw shall permit the drawbar rings to swivel axially at least 90° to the right or left around the longitudinal axis of the coupling with a fixed braking momentum of between 30 and 150 Nm.

The towing hook, no-swivel clevis coupling, ball coupling and pin (piton) coupling shall allow the drawbar ring to swivel axially at least 20° to the right or left around the longitudinal axis of the coupling.

2.8. For mechanical couplings on tractors, in order to prevent unintentional uncoupling from the hitch ring, the distance between the towing hook or ball head or pin (piton) tip and the keeper (clamping device) shall not exceed 10 mm at the maximum design load.’

- (g) in point 3.3.1, the second sentence is replaced by the following:

‘However, it shall not exceed 3 000 kg, except for the ball coupling, where the maximum value shall not exceed 4 000 kg.’

- (h) in point 3.4.1, the first paragraph is replaced by the following:

‘For mechanical couplings on tractors, all tractors with a technically permissible maximum laden mass exceeding 2,5 tonnes shall be fitted with a trailer coupling having a ground clearance satisfying one of the following relations:’

- (i) points 4.1 and 4.2 are replaced by the following:

‘4.1. A vehicle representative of the vehicle type to be approved, on which a coupling device, duly approved, is mounted is submitted to the technical services responsible for conducting the type-approval tests.

4.2. The technical service responsible for conducting the type-approval tests checks whether the approved type of coupling device is suitable for mounting on the type of vehicle for which type-approval is requested. In particular, it ascertains that the attachment of the coupling device corresponds to that which was tested when the EU component type-approval was granted.’

- (j) in point 4.3, the second indent is replaced by the following:

‘— a short technical description of the coupling device specifying the kind of construction and the material used,’

- (k) points 4.5.2 and 4.5.3 are replaced by the following:

‘4.5.2. it is suitable for mounting on the type of vehicle for which the extension of the EU type-approval is requested;

4.5.3. the attachment of the coupling device on the vehicle corresponds to that which was presented when EU component type-approval was granted.’

- (l) point 4.6 is replaced by the following:

‘4.6. A certificate, which template is set out in Annex V of Implementing Regulation (EU) 2015/504, is annexed to the EU type-approval certificate for each type-approval or type-approval extension which has been granted or refused.’

- (m) point 4.7 is replaced by the following:

‘4.7. If the application for EU type-approval for a type of vehicle is made at the same time as the request for EU component type-approval for a coupling device on a vehicle for which EU type-approval is requested, then points 4.1 and 4.2 are unnecessary.’

- (n) point 5.1.2 is replaced by the following:

‘5.1.2. EU component type-approval mark conforming to the model set out in Annex IV of Implementing Regulation (EU) 2015/504;’

- (o) the following section 8 is added:

‘8. The following vehicles may be fitted with couplings intended to be connected with the three-point hitch or the lower link arms of the tractor:

(a) vehicles of category Sa;

(b) interchangeable towed equipment of category Ra intended mainly to process materials in the meaning of Article 3 (9) of Regulation (EU) No 167/2013;

- (c) vehicles of category Ra of a difference of laden and unladen mass of less than 2 tons.

If the vehicles referred to in the first paragraph are fitted with couplings intended to be connected with the three-point hitch or the lower link arms of the tractor, the parts of these systems shall meet the dimensional requirements of section 5 of ISO 730:2009, Amd.1: 2014.

The manufacturer's calculations or test results on the strength of the parts of the couplings, as part of compliance with Directive 2006/42/EC, shall be provided to the technical service, instead of the test results in point 3.2 of this Annex. The technical service shall verify the accuracy of the manufacturer's calculations or test results. Appropriate information with regard to safe coupling and fixing of the lower links vertically and laterally as well as the material quality of the spare parts and the permissible play shall be given in the operator's manual.'

- (p) Appendix 1 is amended as follows:

- (i) the parts entitled 'Mechanical coupling types on tractors' and 'Mechanical coupling types on towed vehicles' are replaced by the following:

'Mechanical couplings on agricultural and forestry vehicles

Mechanical couplings on tractors

"Clevis mechanical coupling": see Figures 1 and 2.

"No-swivel clevis mechanical coupling": see Figure 1d.

"Towing hook": see Figure 1 – "Hitch-hook dimensions" in ISO 6489-1:2001.

"Tractor drawbar": see Figure 3.

"Ball mechanical coupling": see Figure 4.

"Pin (piton) mechanical coupling": see Figure 5.

Tractor drawbar dimensions shall comply with those of the following categories of ISO 6489-3:2004:

Category (0) (pin 18); compatible with ISO 5692-3, shape W (22 mm hole).

Category (1) (pin 30); compatible with ISO 5692-3, shape X (35 mm ring); ISO 5692-2:2002 (40 mm hole); ISO 8755:2001 (40 mm hole).

Category (2) (pin 30); compatible with ISO 5692-3, shape X (35 mm ring); ISO 5692-2:2002 (40 mm hole); ISO 8755:2001 (40 mm hole).

Category (3) (pin 38); compatible with ISO 5692-1:2004 (50 mm ring); ISO 5692-3:2011 shape Y (50 mm hole); ISO 20019:2001.

Category (4) (pin 50); compatible with ISO 5692-3:2011 shape Z (68 mm hole).

Mechanical couplings on towed vehicles

"Hitch rings" according to ISO 5692-1:2004 (50 mm hole, 30 mm ring diameter).

"Hitch rings" according to ISO 20019:2001 (50 mm hole centre, 30 to 41 mm ring diameter).

"Swivel hitch rings" according to ISO 5692-3:2011.

“Coupling rings” according to ISO 5692-2:2002 (40 mm socket).

“Drawbar eye” according to ISO 8755:2001 (40 mm hole).

“Drawbar eye” according to ISO 1102:2001 (50 mm hole).

“Coupling device” according to ISO 24347:2005 (80 mm ball diameter).’

(ii) the title of Figure 4 is replaced by the following:

‘Ball coupling (corresponding to ISO 24347:2005)’

(iii) the title of Figure 5 is replaced by the following:

‘Pin (piton) coupling (corresponding to ISO 6489-4:2004)’

(iv) Table 2 is replaced by the following:

Table 2

Coupling component on the tractor	Coupling component on the towed vehicle
Corresponding to ISO 6489-1:2001 (towing hook)	Corresponding to ISO 5692-1:2004 (hitch ring, 50 mm hole centre, 30 mm ring diameter) or to ISO 20019:2001 (hitch ring, 50 mm hole centre, 30 to 41 mm ring diameter) or to ISO 5692-3:2011 (swivel hitch rings; compatible only with shape Y, 50 mm hole)
Corresponding to ISO 6489-5:2011 (no-swivel clevis coupling)	Corresponding to ISO 5692-3:2011 (swivel hitch rings)
Corresponding to ISO 6489-2:2002 (clevis coupling)	Corresponding to ISO 5692-2:2002 (coupling ring, 40 mm socket) or to ISO 8755:2001 (40 mm drawbar eye) or to ISO 1102:2001 (50 mm drawbar eye, compatible only with ISO 6489-2:2002, shape A – non-automatic)
Corresponding to ISO 6489-3:2004 (drawbar)	Appropriate coupling mentioned in this column that fits the drawbar dimensions of the tractor mentioned in this Appendix or corresponding to Sa vehicles’ hitch rings and attachment to tractor drawbars according to ISO 21244:2008.
Corresponding to ISO 24347:2005 (ball mechanical coupling)	Corresponding to ISO 24347:2005 (80 mm ball diameter)
Corresponding to ISO 6489-4:2004 (piton coupling)	Corresponding to ISO 5692-1:2004 (hitch ring, 50 mm hole centre, 30 mm ring diameter) or to ISO 5692-3:2011 (swivel hitch rings; compatible only with shape Y, 50 mm hole);

(q) Appendix 2 is amended as follows:

(i) in point 3.1, the first, the second and the third paragraphs are replaced by the following:

‘The test force shall be applied to the mechanical couplings being tested beneath an angle formed by the position of the vertical test load F_v vis-à-vis the horizontal test load F_h in the direction of the median longitudinal plane passing from top front to bottom rear.

The test force shall be applied at the usual point of contact between the mechanical coupling on the tractor and the corresponding one on the towed vehicle.

The play between the mechanical coupling on the tractor and the corresponding one on the towed vehicle shall be kept to a minimum.'

- (ii) in point 3.1, the fifth paragraph is replaced by the following:

'Should the design of the mechanical coupling (e.g. excessive play, towing hook) make it impossible to carry out the test with an alternating test load, the test load may also be applied on a rising basis in the direction of traction or pressure, whichever is the greater.'

- (iii) the following point 3.3 is added:

'3.3. Load application

For components of the mechanical coupling on tractor or towed vehicle, the load is applied using the components of one corresponding mechanical coupling on respectively towed vehicle or tractor as permitted by the combinations listed in Table 2 of Appendix 1.'

- (r) Appendix 3 is amended as follows:

- (i) point 1.2 is replaced by the following:

'1.2. Test preparation

The tests shall be carried out on a special machine, with the mechanical coupling and any structure coupling it to the body of the vehicle attached to a rigid structure by means of the same components used to mount it on the vehicle.'

- (ii) in point 1.4.2, the first paragraph is replaced by the following:

'The data recorded for plotting the load/deformation curve under traction, or the graph of that curve provided by the printer linked to the traction machine, shall be based on the application of increasing loads only, starting from 500 daN, in relation to the reference centre of the mechanical coupling on tractor or towed vehicle.'

- (iii) in point 1.5, the first paragraph is replaced by the following:

'The test referred to in point 1.4.2 shall be preceded by a test in which a load of three times the maximum permissible vertical force (in daN, equal to $g \cdot S/10$) recommended by the manufacturer is applied in a gradually increasing manner, starting from an initial load of 500 daN, to the reference centre of the mechanical coupling on tractor or towed vehicle.'

COMMISSION IMPLEMENTING REGULATION (EU) 2016/1789**of 7 September 2016****amending Implementing Regulation (EU) 2015/504 with regard to the administrative requirements for the approval and market surveillance of agricultural and forestry vehicles****(Text with EEA relevance)**

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Regulation (EU) No 167/2013 of the European Parliament and of the Council of 5 February 2013 on the approval and market surveillance of agricultural or forestry vehicles ⁽¹⁾, and in particular Article 22(4), Article 25(2) and (3), Article 27(1), Article 33(2), Article 34(3), Article 35(4) and Article 53(8) thereof,

Whereas:

- (1) Commission Implementing Regulation (EU) 2015/504 ⁽²⁾ lays down, inter alia, the templates for certain documents that are drawn up in the context of the approval and market surveillance of agricultural and forestry vehicles. It is necessary for the purposes of clarity and comprehensiveness that additional information on the maximum towable mass of the rear three-point lifting mechanism be indicated in the information document and in the certificate of conformity.
- (2) In order to better identify a vehicle's category or subcategory, the maximum and minimum track width of each tyre combination should be stated in the information document.
- (3) In order to increase the consistency and completeness of the information provided, the information
- (4) The certificate of conformity should be simplified in order to reduce the burden on manufacturers.
- (5) The information in the test results sheet related to braking should be extended and improved for the purposes of clarity and consistency.
- (6) In order to provide assistance to the technical services when drawing up braking test reports, specific templates for those test reports should be provided.
- (7) In order to improve the readability and clarity of the text, certain changes should be made to provisions containing contradictions or redundant information and certain references should be amended.
- (8) Implementing Regulation (EU) 2015/504 should therefore be amended accordingly.
- (9) In order to allow additional time for manufacturers and national authorities to achieve a timely application of the amendments provided for in this Regulation, this Regulation should enter into force as a matter of urgency, especially taking into account that Regulation (EU) No 167/2013 became applicable on 1 January 2016 and that related administrative requirements will become compulsory with regard to all new vehicles registered or placed on the market as from 1 January 2018.
- (10) The measures provided for in this Regulation are in accordance with the opinion of the committee referred to in Article 69(1) of Regulation (EU) No 167/2013,

⁽¹⁾ OJ L 60, 2.3.2013, p. 1.

⁽²⁾ Commission Implementing Regulation (EU) 2015/504 of 11 March 2015 implementing Regulation (EU) No 167/2013 of the European Parliament and of the Council with regard to the administrative requirements for the approval and market surveillance of agricultural and forestry vehicles (OJ L 85, 28.3.2015, p. 1).

HAS ADOPTED THIS REGULATION:

Article 1

Implementing Regulation (EU) 2015/504 is amended as follows:

- (1) Annex I is amended in accordance with Annex I to this Regulation;
- (2) Annex II is amended in accordance with Annex II to this Regulation;
- (3) Appendix 1 to Annex III is amended in accordance with Annex III to this Regulation;
- (4) Annex IV is amended in accordance with Annex IV to this Regulation;
- (5) Annex V is amended in accordance with Annex V to this Regulation;
- (6) Annex VII is amended in accordance with Annex VI to this Regulation;
- (7) Annex VIII is amended in accordance with Annex VII to this Regulation.

Article 2

This Regulation shall enter into force on the day following that of its publication in the *Official Journal of the European Union*.

This Regulation shall be binding in its entirety and directly applicable in all Member States.

Done at Brussels, 7 September 2016.

For the Commission
The President
Jean-Claude JUNKER

ANNEX I

Annex I to Implementing Regulation (EU) 2015/504 is amended as follows:

(1) in the list of appendices, the row relating to Appendix 8 is replaced by the following:

'8	Model information document relating to EU type-approval of a type of (or a type of a vehicle with regard to) the installation of rear-view mirrors as a system'	
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(2) Part A is amended as follows:

(a) in point 1.1., the following point (j) is added:

'(j) For vehicles of categories T2, T3 and T4.3 equipped with foldable ROPS with an automatic locking system, a certificate of the manufacturer stating that the preliminary test has been done according to the test procedure set out in point 5.5. of Part B3 of Annex IX to Commission Delegated Regulation (EU) No 1322/2014 (*).

(*) Commission Delegated Regulation (EU) No 1322/2014 of 19 September 2014 supplementing and amending Regulation (EU) No 167/2013 of the European Parliament and of the Council with regard to vehicle construction and general requirements for the approval of agricultural and forestry vehicles (OJ L 364, 18.12.2014, p. 1).'

(b) in point 2., in the Explanatory notes relating to the information folder sheet, explanatory note (5) is amended as follows:

'(5) For engines indicate the information relative to the engine type or the engine family type, as applicable without the type-approval extension number.'

(3) Part B is amended as follows:

(a) in point 3.1., Table 1-1 is replaced by the following:

'Table 1-1

Lists of systems, components and separate technical units which may be subject to an EU type-approval

LIST I — Environmental and propulsion unit performance requirements

Appendix	System or component/separate technical unit (STU)	Commission Delegated Regulation (EU) 2015/96 (*) Annex number	As amended by and/or at the stage of implementation
1	System: installation of an engine/engine family	II	
2	System: external sound level	III	
3	Component/STU: engine/engine family	I	

LIST II — Vehicle functional safety requirements

Appendix	System or component/separate technical unit (STU)	Commission Delegated Regulation (EU) 2015/208 Annex number	As amended by and/or at the stage of implementation
4	System: driver information	X	

5	System: installation of lighting and light-signalling devices	XII	
6	System: electro-magnetic compatibility	XV	
7	System: installation of audible warning device(s)	XVI	
8	System: installation of rear-view mirrors	IX	
9	System: installation of crawler undercarriage	XXXIII	
10	STU: electro-magnetic compatibility of electrical / electronic sub-assemblies	XV	
11	Component/STU: ballast masses	XXIII	
12	Component/STU: lateral and/or rear protective structure	XXVI / XXVII	
13	Component: tyre	XXX	
14	Component/STU: mechanical coupling	XXXIV	

LIST III — Vehicle braking requirements

Appendix	System or component/separate technical unit (STU)	Commission Delegated Regulation (EU) 2015/68 (**) Annex number	As amended by and/or at the stage of implementation
15	System: braking	II	

LIST IV — Vehicle construction and general type-approval requirements

Appendix	System or component/separate technical unit (STU)	Commission Delegated Regulation (EU) No 1322/2014 Annex number	As amended by and/or at the stage of implementation
16	System: driver's exposure to noise level	XIII	
17	System: seat-belt anchorages	XVIII	
18	System: protection against hazardous substances	XXIX	
19	STU: roll-over protective structure (ROPS)	VI / VII / VIII / IX / X	

20	STU: falling objects protective structure (FOPS)	XI	
21	Component/STU: driver's seat	XIV	
22	Component/STU: safety belts	XIX	
23	STU: protection against penetrating objects (OPS)	XX	

(*) Commission Delegated Regulation (EU) 2015/96 of 1 October 2014 supplementing Regulation (EU) No 167/2013 of the European Parliament and of the Council as regards environmental and propulsion unit performance requirements of agricultural and forestry vehicles (OJ L 16, 23.1.2015, p. 1).

(**) Commission Delegated Regulation (EU) 2015/68 of 15 October 2014 supplementing Regulation (EU) No 167/2013 of the European Parliament and of the Council with regard to vehicle braking requirements for the approval of agricultural and forestry vehicles (OJ L 17, 23.1.2015, p. 1).'

(b) point 5 is amended as follows:

(i) entry 1.6.1.1. is deleted;

(ii) the following entry 1.6.3. is inserted:

'1.6.3. The vehicle identification number of the type begins with:';

(iii) entry 2.5.1. is replaced by the following:

'2.5.1. Type-approval of: engine type/engine family⁽⁴⁾;

(iv) entry 3.3. is replaced by the following:

'3.3. Axles and wheels';

(v) entry 4.1.2.1.2. is replaced by the following:

'4.1.2.1.2. In the case of a rigid drawbar or centre-axle R- or S-category vehicle indicate the vertical load on the front coupling point (S): kg';

(vi) entry 4.1.2.2. is replaced by the following:

'4.1.2.2. Mass(es) and tyre(s)

Tyre combination No	Axle No	Tyre dimension incl load capacity index & speed category symbol	Rolling radius(1) [mm]	Tyre Load rating per tyre [kg]	Maximum permissible mass per axle [kg] (*)	Maximum permissible mass of the vehicle [kg] (*)	Maximum permissible vertical load on the coupling point [kg] (*) (**) (***)	Track width [mm]	
								Minimum	Maximum
1	1	...		...	...	...	...	...	...
	2	...		...	...	...	...	...	...
	...	...		...	...	...	...	...	...
2	1	...		...	...	...	...	...	...
	2	...		...	...	...	...	...	...
	...	...		...	...	...	...	...	...
...	1	...		...	...	...	...	...	...

Tyre combination No	Axle No	Tyre dimension incl load capacity index & speed category symbol	Rolling radius(1) [mm]	Tyre Load rating per tyre [kg]	Maximum permissible mass per axle [kg] (*)	Maximum permissible mass of the vehicle [kg] (*)	Maximum permissible vertical load on the coupling point [kg] (*) (**)	Track width [mm]	
								Minimum	Maximum
	2	...		...	...	...	...	...	...
	...	...		...	...	...	...	...	...

(*) According to the tyre specification.

(**) Load transmitted to the reference centre of the coupling under static conditions, irrespective to the coupling device; if the maximum permissible vertical load on the coupling point depending on the coupling is indicated in this table, expand the table at the right side and indicate the identification of the coupling device in the header of the column; for R- or S-category vehicles this column(s) concerns the rear coupling devices if there is such a device.

(***) Value to be provided only if the maximum permissible vertical load on the coupling point is lower than indicated in entries 38.3 and 38.4;

(vii) entry 4.1.2.4. is deleted;

(viii) entry 4.1.3. is replaced by the following:

‘4.1.3. Technically permissible towable mass(es) for T- or C-category vehicles for each chassis/ braking configuration of the R- or S-category vehicle (for R- and S-category vehicles, indicate the maximum permissible load(s) on the rear coupling point):

R- and S category vehicle	Drawbar	Rigid drawbar	Centre-axle
Brake			
Unbraked (*)	 kg	 kg	 kg
Inertia-braked	 kg	 kg	 kg
Hydraulic braked	 kg	 kg	 kg
Pneumatic braked	 kg	 kg	 kg

(*) Calculated using the partially laden condition defined by the tractor manufacturer in agreement with the technical service set out in point 3.1.1.2 of Annex II to Commission Delegated Regulation (EU) 2015/68.’

(ix) entry 4.1.4. is replaced by the following:

‘4.1.4. Total technically permissible mass(es) of the tractor (T- or C-category vehicle) and towed vehicle (R- or S-category vehicle) combination for each chassis/braking configuration of the R- or S-category vehicle:

R- and S category vehicle	Drawbar	Rigid drawbar	Centre-axle
Brake			
Unbraked	 kg	 kg	 kg
Inertia-braked	 kg	 kg	 kg
Hydraulic braked	 kg	 kg	 kg
Pneumatic braked	 kg	 kg	 kg’;

(x) entries 4.1.5. to 4.1.5.3. are deleted;

(xi) entry 4.2.1.3. is replaced by the following:

‘4.2.1.3. Height (in running order)⁽³³⁾;

(xii) the following entries 4.2.1.3.1. and 4.2.1.3.2. are inserted after entry 4.2.1.3.:

‘4.2.1.3.1. Maximum mm

4.2.1.3.2. Minimum mm’;

(xiii) entry 5.1.2.2. is deleted;

(xiv) entry 5.6. is replaced by the following:

‘5.6. Actual forward movement of powered wheels corresponding to one complete revolution of the wheel: mm’;

(xv) entries 6.6. and 6.7. are replaced by the following:

‘6.6. Rated speed: min⁻¹

6.7. Maximum torque speed: min⁻¹;

(xvi) entry 6.18., including all its sub-entries, is replaced by the following:

‘6.18. **Fuel feed for diesel engines**

6.18.1. *Feed pump*

6.18.1.1 Pressure⁽⁷⁾ ... kPa or characteristic diagram:

6.18.2. *Injection system*

6.18.2.1. Pump

6.18.2.1.1. Make(s): ...

6.18.2.1.2. Type(s): ...

6.18.2.1.3. Delivery: ... and ... mm³⁽⁷⁾ per stroke or cycle at full injection at pump speed of: rpm (rated) and: rpm (maximum torque) respectively, or characteristic diagram:

6.18.2.1.3.1. Method used: on engine/on pump bench⁽⁴⁾

6.18.2.2. Injection advance:

6.18.2.2.1. Injection advance curve⁽⁷⁾:

6.18.2.2.2. Timing⁽⁷⁾: ...

6.18.2.3. Injection piping:

6.18.2.3.1. Length: ... mm

6.18.2.3.2. Internal diameter: ... mm

6.18.2.4. Injector(s)

6.18.2.4.1. Make(s) ...

6.18.2.4.2. Type(s): ...

6.18.2.4.3. Opening pressure⁽⁷⁾: kPa, or characteristic diagram:

6.18.2.5. Governor

6.18.2.5.1. Make(s) ...

6.18.2.5.2. Type(s): ...

6.18.2.5.3. Speed at which cut-off starts under full load⁽⁷⁾: min⁻¹

6.18.2.5.4. Maximum no-load speed⁽⁷⁾: min⁻¹

- 6.18.2.5.5. Idling speed⁽⁷⁾: min⁻¹
- 6.18.2.6. Cold-start system
- 6.18.2.6.1. Make(s): ...
- 6.18.2.6.2. Type(s): ...
- 6.18.2.6.3. Description: ...;
- (xvii) entry 6.19.4.2. is replaced by the following:
- ‘6.19.3.2. Type(s): ...’;
- (xviii) entry 7.1.1. is replaced by the following:
- ‘7.1.1. Combustion cycle: positive ignition/compression ignition⁽⁴⁾’;
- (xix) entries 8.6. and 8.7. are replaced by the following:
- ‘8.6. Rated speed: min⁻¹
- 8.7. Maximum torque speed: min⁻¹’;
- (xx) entry 8.12.2., including all its sub-entries, is replaced by the following:
- ‘8.12.2. Air
- 8.12.2.1. Blower: yes/no⁽⁴⁾
- 8.12.2.1.1. Characteristics of the blower.
- 8.12.2.1.2. Drive ratio(s) (if applicable):’;
- (xxi) entry 8.17., including all its sub-entries, is replaced by the following:
- ‘8.17. **Measures taken against air pollution**
- 8.17.1. Device for recycling crankcase gases: yes/no⁽⁴⁾
- 8.17.2. Additional anti-pollution devices (if any):
- 8.17.2.1. Catalytic converter: yes/no⁽⁴⁾
- 8.17.2.1.1. Make:
- 8.17.2.1.2. Type
- 8.17.2.1.3. Number of catalytic converters and elements
- 8.17.2.1.4. Dimensions and volume of the catalytic converter(s):
- 8.17.2.1.5. Type of catalytic action
- 8.17.2.1.6. Total charge of precious metals:
- 8.17.2.1.7. Relative concentration:
- 8.17.2.1.8. Substrate (structure and material):
- 8.17.2.1.9. Cell density:
- 8.17.2.1.10. Type of casing for the catalytic converter(s):
- 8.17.2.1.11. Location of the catalytic converter(s) (place(s) and maximum/minimum distance(s) from engine:
- 8.17.2.1.12. Normal operating range: K
- 8.17.2.1.13. Consumable reagent (where appropriate)
- 8.17.2.1.13.1. Type and concentration of reagent needed for catalytic action:
- 8.17.2.1.13.2. Normal operational temperature range of reagent: K

- 8.17.2.1.13.3. International standard (if applicable):
- 8.17.2.1.14. NO_x sensor: yes/no⁽⁴⁾
- 8.17.2.1.15. Oxygen sensor: yes/no⁽⁴⁾
- 8.17.2.1.15.1. Make:
- 8.17.2.1.15.2. Type
- 8.17.2.1.15.3. Location:
- 8.17.2.1.16. Air injection: yes/no⁽⁴⁾
- 8.17.2.1.16.1. Type: pulse air/air pump/other⁽⁴⁾ (if other specify:)
- 8.17.2.1.17. EGR: yes/no⁽⁴⁾
- 8.17.2.1.17.1. Characteristics (cooled/uncooled, high pressure/low pressure, etc.):
- 8.17.2.1.18. Particulate trap: yes/no⁽⁴⁾
- 8.17.2.1.18.1. Dimensions and capacity of the particulate trap:
- 8.17.2.1.18.2. Type and design of the particulate trap:
- 8.17.2.1.18.3. Location (place(s) and maximum/minimum distance(s) from engine:
- 8.17.2.1.18.4. Method or system of regeneration, description and/or drawing:
- 8.17.2.1.18.5. Normal operating temperature range: K and pressure range:kPa
- 8.17.2.1.19. Other systems: yes/no⁽⁴⁾
- 8.17.2.1.19.1. Description and operation:;

(xxii) entry 8.18., including all its sub-entries, is replaced by the following:

8.18. Fuel feed for diesel engines

- 8.18.1. *Feed pump*
- 8.18.1.1. Pressure⁽⁷⁾ kPa or characteristic diagram:
- 8.18.2. *Injection system*
- 8.18.2.1. *Pump*
- 8.18.2.1.1. Make(s): ...
- 8.18.2.1.2. Type(s): ...
- 8.18.2.1.3. Delivery: ... and ...mm³⁽⁷⁾ per stroke or cycle at full injection at pump speed of: ... rpm (rated) and: ... rpm (maximum torque) respectively, or characteristic diagram:
- 8.18.2.1.3.1. Method used: on engine/on pump bench⁽⁴⁾
- 8.18.2.2. *Injection advance:*
- 8.18.2.2.1. Injection advance curve⁽⁷⁾:
- 8.18.2.2.2. Timing⁽⁷⁾:
- 8.18.2.3. *Injection piping:*
- 8.18.2.3.1. Length: ... mm
- 8.18.2.3.2. Internal diameter: ... mm
- 8.18.2.4. *Injector(s)*

- 8.18.2.4.1. Make(s) ...
- 8.18.2.4.2. Type(s): ...
- 8.18.2.4.3. Opening pressure⁽⁷⁾: ... kPa, or characteristic diagram:
- 8.18.2.5. Governor
- 8.18.2.5.1. Make(s) ...
- 8.18.2.5.2. Type(s): ...
- 8.18.2.5.3. Speed at which cut-off starts under full load⁽⁷⁾: min⁻¹
- 8.18.2.5.4. Maximum no-load speed⁽⁷⁾: min⁻¹
- 8.18.2.5.5. Idling speed⁽⁷⁾: min⁻¹
- 8.18.2.6. Cold-start system
- 8.18.2.6.1. Make(s): ...
- 8.18.2.6.2. Type(s): ...
- 8.18.2.6.3. Description: ...;

(xxiii) entry 8.19. is replaced by the following:

‘8.19. **Fuel feed for petrol engines**;

(xxiv) entry 9., including all its sub-entries, is replaced by the following:

- ‘9. ENERGY STORAGE DEVICE(S)⁽¹¹⁾
- 9.1. Description: battery/capacitor/flywheel/generator⁽⁴⁾
- 9.2. Identification number:
- 9.3. Kind of electrochemical couple:
- 9.4. Energy stored
- 9.4.1. For battery, voltage: and capacity: Ah in 2h
- 9.4.2. For capacitor: ... J
- 9.4.3. For flywheel/generator⁽⁴⁾: ... J
- 9.4.3.1. Flywheel moment of inertia: ... kg m²
- 9.4.3.1.1. Additional moment of inertia if no gear is engaged: ... kg m²
- 9.5. Charger: on-board/external/without⁽⁴⁾;

(xxv) entry 10.4.4.1. is replaced by the following:

‘10.4.4.1. Exhaust noise-abatement device containing fibrous materials: yes/no⁽⁴⁾;

(xxvi) entry 11., including all its sub-entries, is replaced by the following:

- ‘11. DRIVE-TRAIN AND CONTROL⁽¹³⁾
- 11.1. Brief description and schematic drawing of the vehicle drive-train and its control system (gear shift control, clutch control or any other element of drive-train):
- 11.2. **Transmission**
- 11.2.1. Brief description and schematic drawing of gear shift system(s) and its control: ...
- 11.2.2. Diagram and or drawing of the transmission system:
- 11.2.3. Type of transmission: mechanical/hydraulic/electric/other⁽⁴⁾ (if other specify)

11.2.4. Brief description of the electrical/electronic components (if any):

11.2.5. Location relative to the engine:

11.2.6. Method of control:

11.2.7. Transfer box: with/without⁽⁴⁾

11.2.8. Type of gear shift system(s)⁽²⁴⁾:

11.3. Clutch (if any)

11.3.1. Brief description and schematic drawing of the clutch and its control system:

11.3.2. Maximum torque conversion:

11.4. Gear ratios

Gear	Internal gearbox ratios (ratios of engine to gearbox output shaft revolutions)	Internal transfer box ratios (ratios of engine to transfer box output shaft revolutions)	Final drive ratio(s) (ratio of gearbox output shaft to driven wheel revolutions)	Total gear ratios	Ratio (engine speed/vehicle speed) for manual transmission only
Maximum for CVT (*)					
1					
2					
3					
Minimum for CVT (*)					
Reverse					
1					
...					

(*) Continuously variable transmission

11.5. Differential lock

11.5.1. Differential lock: yes/no/optional⁽⁴⁾;

(xxvii) entry 22.3.1. is replaced by the following:

‘22.3.1. Photographs, drawings and/or an exploded view of the interior fittings, showing the parts in the passenger compartment and the materials used (with the exception of interior rear view mirrors), arrangement of controls, seats and their rear parts, head restraints, roof and opening roof, doors and window winders and other non-specified fittings:’;

(xxviii) entry 25.5.2. is replaced by the following:

‘25.5.2. Rated voltage or air pressure: V / kPa(4)’;

(xxix) entry 28., including all its sub-entries, is replaced by the following:

‘28. REAR REGISTRATION PLATE(S) SPACE

28.1. Location of registration plate(s) (indicate variants where necessary; drawings may be used as appropriate):

- 28.1.1. Height above road surface, upper edge:mm
- 28.1.2. Height above road surface, lower edge:mm
- 28.1.3. Distance of the centre line from the longitudinal median plane of the vehicle:mm
- 28.1.4. Dimensions (length x width):mm xmm
- 28.1.5. Inclination of the plane to the vertical:degr.
- 28.1.6. Angle of visibility in the horizontal plane:degr.'

(xxx) entry 29., including all its sub-entries, is replaced by the following:

- '29. BALLAST MASSES
- 29.1. Detailed technical description (including photographs or drawings with dimensions) of the ballast masses and how they are mounted on the tractor:
- 29.2. Number of sets of ballast masses:
- 29.2.1. Number of components on each set: Set 1: Set 2:Set
- 29.3. Mass of the components on each set: Set 1:kg Set 2:kg Set:.....kg
- 29.3.1. Total mass of each set: Set 1:kg Set 2:kg Set:.....kg
- 29.4. Total mass of ballast masses:kg
- 29.4.1. Distribution of these masses among the axles:kg
- 29.5. Material(s) and method of construction:';

(xxxi) entry 38.5. is replaced by the following:

'38.5. Description of the mechanical coupling:

Type (according to Appendix 1 of Annex XXXIV to Commission Delegated Regulation (EU) 2015/208):	...
Make:	...
Manufacturer's type designation:	...
Maximum horizontal load/D-Value ⁽⁴⁾ ⁽⁴⁴⁾ :	 kg/kN ⁽⁴⁾
Towable mass (T) ⁽⁴⁾ ⁽⁴⁴⁾ :	 tonnes
Maximum permissible vertical load on the coupling point (S) ⁽⁴⁴⁾ :	... kg
Photographs and scale drawings of the coupling device. These drawings shall in particular show the required dimensions in detail as well as the measurements for mounting the device.	
Short technical description of the coupling device specifying the type of construction and the material used.	
Type of Test	Static/Dynamic ⁽⁴⁾
(EU) type-approval mark or -number of	...';
— drawbar eyes, coupling heads or similar coupling devices that shall be attached to the mechanical coupling (in the case of hinged or rigid drawbars)	
— type-approval mark or -number of mechanical couplings that shall be attached to the ladder frame /trailer hitch support (if restricted to certain types):	

(xxxii) the following entry 39.2. is inserted:

‘39.2. Maximum towable mass⁽¹⁶⁾: kg’;

(xxxiii) entry 43.1. is replaced by the following:

‘43.1. Brief description of the braking system(s) installed on the vehicle⁽⁵⁵⁾:’;

(xxxiv) entry 43.3. is deleted;

(xxxv) entry 43.6., including all its sub-entries, is replaced by the following:

‘43.6. **Towed vehicle braking devices**

43.6.1. Towed vehicle braking control system technology: Hydraulic / Pneumatic / Electric/None⁽⁴⁾

43.6.2. Towed vehicle-brake actuating device (description, characteristics):

43.6.3. Description of the connectors, couplings and safety devices (including drawings, sketches and the identification of any electronic parts):

43.6.4. Connections type: Single line/Two-lines/None⁽⁴⁾

43.6.4.1. Supply pressure Hydraulic: Single line: kPa Two lines: kPa

43.6.4.2. Supply pressure Pneumatic: Two lines: kPa

43.6.5. Presence of ISO 7638:2003 connector⁽¹⁵⁾: yes/no⁽⁴⁾;

(xxxvi) before the heading ‘E. Information on vehicle construction’, the following entries are inserted:

‘43.A. TOWED VEHICLE AXLE AND BRAKE INFORMATION DOCUMENT WITH RESPECT TO THE ALTERNATIVE TYPE I AND TYPE III PROCEDURE

43.A.1. General

43.A.1.1. Name and address of axle or vehicle manufacturer:

43.A.2. Axle data

43.A.2.1. Manufacturer (name and address):

43.A.2.2. Type/variant:

43.A.2.3. Axle identifier: ID1-

43.A.2.4. Test axle load (F_e): daN

43.A.2.5. Wheel and brake data according to the following figures 1A and 1B

43.A.3. Brake

43.A.3.1. General information

43.A.3.1.1. Make:

43.A.3.1.2. Manufacturer (name and address):

43.A.3.1.3. Type of brake (e.g. drum / disc):

43.A.3.1.3.1. Variant (e.g. S-cam, single wedge etc.):

43.A.3.1.4. Brake identifier: ID2-

43.A.3.1.5. Brake data according to the figures 2A and 2B:

43.A.3.2. Drum brake data

43.A.3.2.1. Brake adjustment device (external/integrated):

43.A.3.2.2. Declared maximum brake input torque C_{max} : Nm

- 43.A.3.2.3. Mechanical efficiency: $\eta =$
- 43.A.3.2.4. Declared brake input threshold torque $C_{0,dec}$: Nm
- 43.A.3.2.5. Effective length of the cam shaft: mm
- 43.A.3.3. Brake drum
- 43.A.3.3.1. Max diameter of friction surface (wear limit) mm
- 43.A.3.3.2. Base material:
- 43.A.3.3.3. Declared mass: kg
- 43.A.3.3.4. Nominal mass: kg
- 43.A.3.4. Brake lining
- 43.A.3.4.1. Manufacturer and address
- 43.A.3.4.2. Make
- 43.A.3.4.3. Type
- 43.A.3.4.4. Identification (type identification on lining)
- 43.A.3.4.5. Minimum thickness (wear limit) mm
- 43.A.3.4.6. Method of attaching friction material to brake shoe:
- 43.A.3.4.6.1. Worst case of attachment (in the case of more than one):
- 43.A.3.5. Disc brake data
- 43.A.3.5.1. Connection type to the axle (axial, radial, integrated, etc.):
- 43.A.3.5.2. Brake adjustment device (external/integrated):
- 43.A.3.5.3. Max. actuation stroke: mm
- 43.A.3.5.4. Declared maximum input force Th_{Amax} : daN
- 43.A.3.5.4.1 $C_{max} = Th_{Amax} \cdot l_e$: Nm
- 43.A.3.5.5. Friction radius: $r_e =$ mm
- 43.A.3.5.6. Lever length: $l_e =$ mm
- 43.A.3.5.7. Input/output ratio (l_e/e_e): $i =$
- 43.A.3.5.8. Mechanical efficiency: $\eta =$
- 43.A.3.5.9. Declared brake input threshold force $Th_{A0,dec}$: N
- 43.A.3.5.9.1. $C_{0,dec} = Th_{A0,dec} \cdot l_e$: Nm
- 43.A.3.5.10. Minimum rotor thickness (wear limit): mm
- 43.A.3.6. Brake disc data
- 43.A.3.6.1. Disc type description:
- 43.A.3.6.2. Connection/mounting to the hub:
- 43.A.3.6.3. Ventilation (yes/no):
- 43.A.3.6.4. Declared mass: kg
- 43.A.3.6.5. Nominal mass: kg
- 43.A.3.6.6. Declared external diameter: mm
- 43.A.3.6.7. Minimum external diameter: mm

- 43.A.3.6.8. Inner diameter of friction ring: mm
- 43.A.3.6.9. Width of ventilation channel (if appl.): mm
- 43.A.3.6.10. Base material:
- 43.A.3.7. Brake pad data
- 43.A.3.7.1. Manufacturer and address:
- 43.A.3.7.2. Make:
- 43.A.3.7.3. Type:
- 43.A.3.7.4. Identification (type identification on pad back plate):
- 43.A.3.7.5. Minimum thickness (wear limit): mm
- 43.A.3.7.6. Method of attaching friction material to pad back plate:
- 43.A.3.7.6.1. Worst case of attachment (in the case of more than one):

Figure 1A

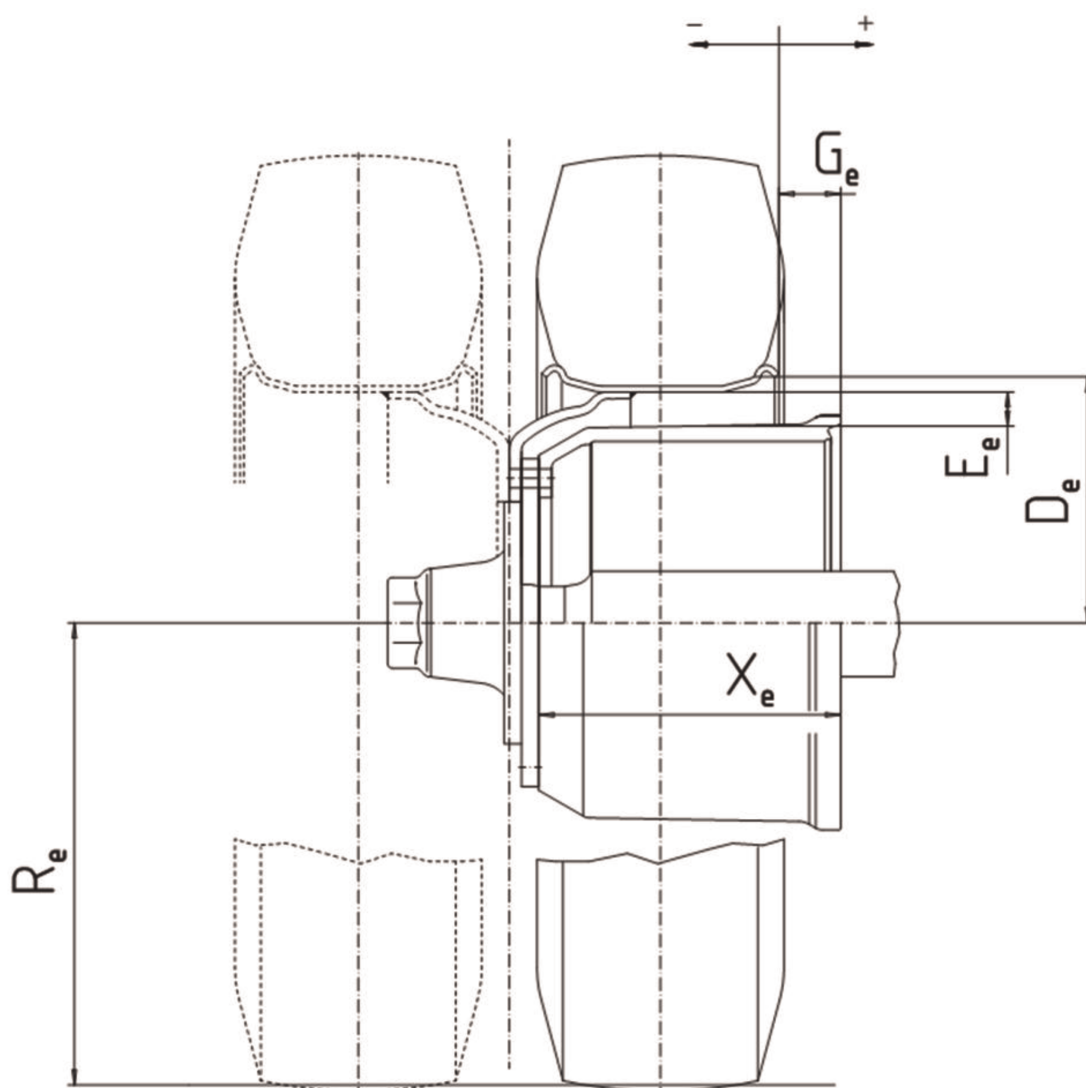


Figure 1B

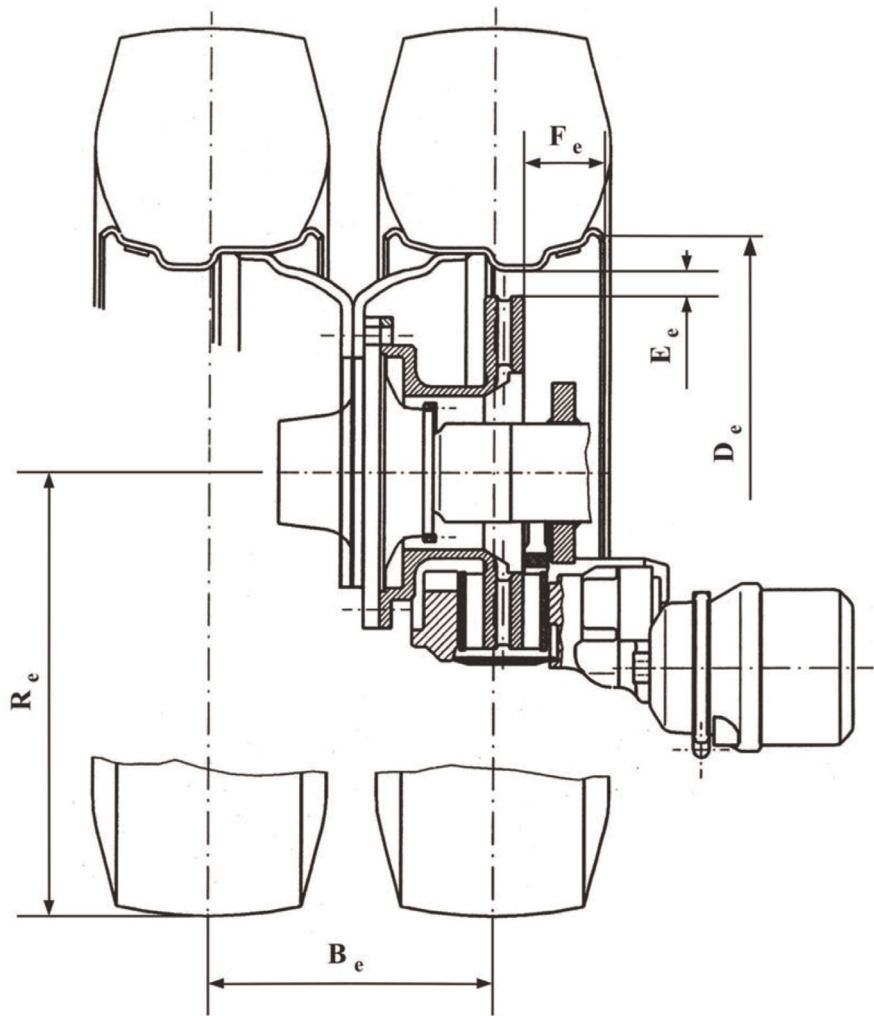
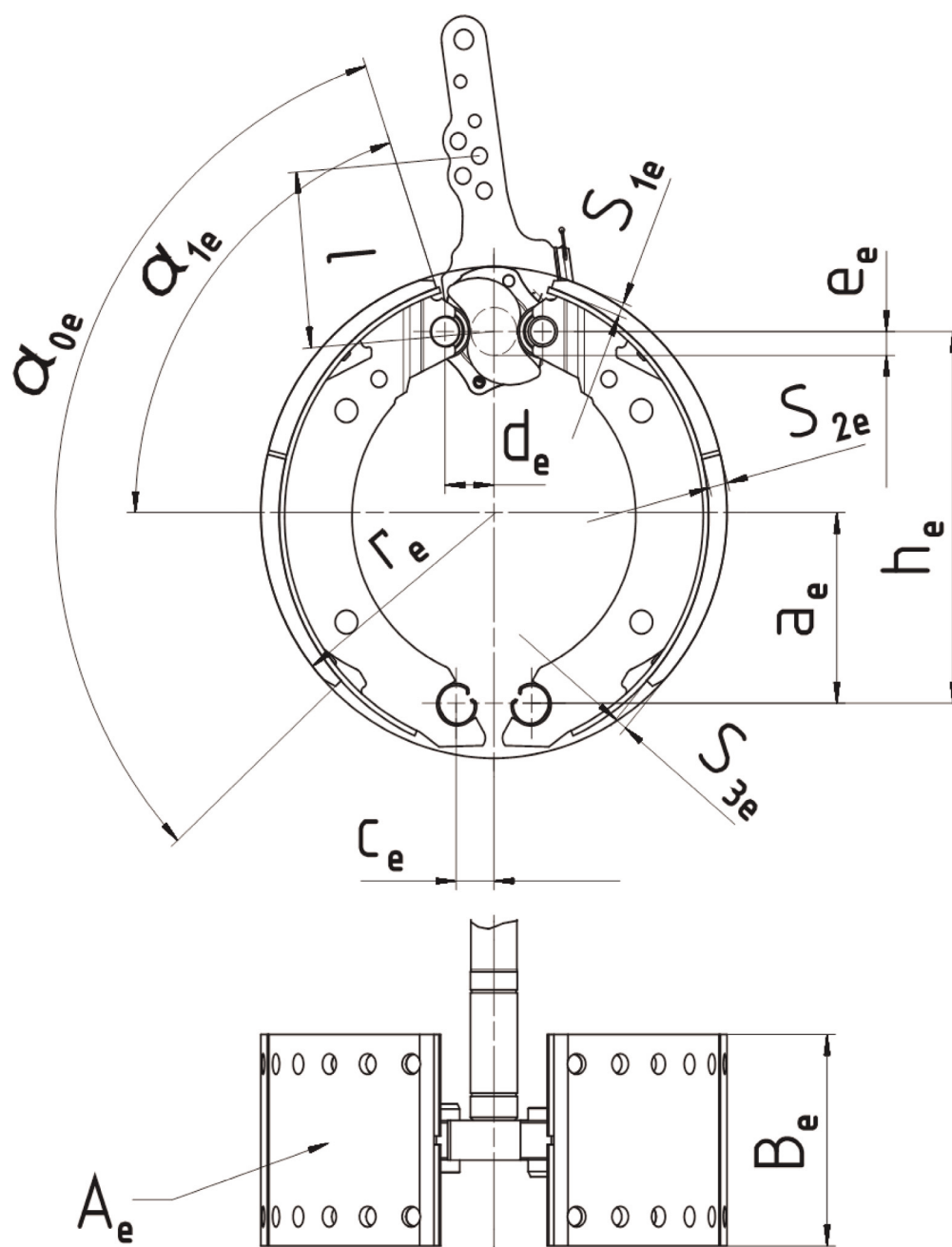


Figure 2A



(xxxvii) entries 45.6.3.1. to 45.6.3.4. are replaced by the following:

- ‘45.6.3.1. SAE J1939-13 (Serial control and communications vehicle network): yes/no⁽⁴⁾
- 45.6.3.2. ISO 11783-2 (Tractors and machinery for agriculture and forestry – Serial control and communications data network): yes/no⁽⁴⁾
- 45.6.3.3. ISO 15031-3 (Road vehicles – Communication between vehicle and external equipment for emissions-related diagnostics): yes/no⁽⁴⁾
- 45.6.3.4. ISO 13400-4 (Road vehicles – Diagnostic communication over Internet Protocol (DoIP))⁽⁴⁾: yes/no⁽⁴⁾;

(xxxviii) entry 46.2.1. is replaced by the following:

- ‘46.2.1. In the case of roll bar: foldable/not foldable⁽⁴⁾;

(xxxix) entry 46.2.2., including all its sub-entries, is replaced by the following:

- ‘46.2.2. In the case of foldable roll bar:
 - 46.2.2.1. Folding operation: non-assisted / partially assisted / fully assisted⁽⁴⁾
 - 46.2.2.2. In case of non-assisted or partially assisted folding operation:
 - 46.2.2.2.1. Hand-operated foldable ROPS: with tools/ without tools⁽⁴⁾
 - 46.2.2.2.2. Photographs and detailed technical drawings showing the grasping area and a lateral and top view of the accessible zones. Dimensions and maximum forces for actuating the ROPS must figure on the drawings:
 - 46.2.2.3. In case of partially assisted or fully assisted folding operation, brief description of the assistance devices as well as of their control devices, if any, and their location:
 - 46.2.2.4. Locking mechanism: manual/automatic⁽⁴⁾
 - 46.2.2.4.1. For manual locking mechanisms, brief description of the locking mechanism and of its ergonomic design to avoid pinching or shearing hazards and to limit the force required for its operation:
 - 46.2.2.4.2. For automatic locking mechanisms,
 - 46.2.2.4.2.1. Brief description of the locking mechanism, its control devices, if any, and their location:
 - 46.2.2.4.2.2. Manufacturers’ certificate set out in Note 2 of point 5.5. of Part B3 of Annex IX to Commission Delegated Regulation (EU) No 1322/2014: yes/no⁽⁴⁾;

(xxxx) entry 49.4.1. is replaced by the following:

- ‘49.4.1. Position of the driving seat: left/right/centre⁽⁴⁾;

(xxxxi) entry 49.5., including all its sub-entries, is replaced by the following:

- ‘49.5. **Passenger seat(s)**
 - 49.5.1. Number of passenger seats:
 - 49.5.2. Location and arrangement⁽⁸⁾:
 - 49.5.3. Dimensions of the passenger seat(s):
 - 49.5.4. Main characteristics of the passenger seat(s):
 - 49.5.5. Requirements under standard EN 15694:2009 (Agricultural and forestry tractors. Passenger seat. Requirements and test procedures) are met with relevant documentation included in the information document: yes/no/not applicable⁽⁴⁾

- 49.5.6. Requirements under standard EN 15997:2011 (All terrain vehicles (ATVs - Quads). Safety requirements and test methods) on passenger seats for ATV Type II vehicle are met with relevant documentation included in the information document: yes/no/not applicable⁽⁴⁾;

(xxxxii) entry 51.2., including all its sub-entries, is replaced by the following:

‘51.2. **Main power take-off**

51.2.1. Position: front/rear/other⁽⁴⁾ (if other specify:)

51.2.2. Revolutions per minute: min⁻¹

51.2.2.1. Ratio of power take-off revolutions to that of the engine:

51.2.3. Optional: Power at the power take-off (PTO) at the rated speed(s) (in accordance with OECD Code 2⁽⁵⁷⁾ or ISO 789-1:1990 (Agricultural tractors – Test procedures – Part 1: Power tests for power take-off))

Rated speed PTO (min ⁻¹)	Corresponding engine speed (min ⁻¹)	Power (kW)
1-540	...	...
2-1 000	...	...
540E		
1 000E		

51.2.4. Power take-off guard (description, dimensions, drawings, photographs):

(xxxxiii) entry 51.2.3. is replaced by the following:

‘51.3.3. Optional: Power at the power take-off (PTO) at the rated speed(s) (in accordance with OECD Code 2⁽⁵⁷⁾ or ISO 789-1:1990 (Agricultural tractors – Test procedures – Part 1: Power tests for power take-off))

Rated speed PTO (min ⁻¹)	Corresponding engine speed (min ⁻¹)	Power (kW)
1-540	...	...
2-1 000	...	...’
540E		
1 000E		

(xxxxiv) entry 54.3. is replaced by the following:

‘54.3. **Number and position of safety belts and seats on which they can be used, please fill out table below:**

Safety belt configuration and associated information

			Complete EU type-approval mark / ECE type-approval mark	Variant, if applicable	Belt adjustment device for height (indicate yes/no/optional)
Driver's seat	{	L			
		C			
		R			

			Complete EU type-approval mark / ECE type-approval mark	Variant, if applicable	Belt adjustment device for height (indicate yes/no/optional)
Passenger seat 1	{	L			
		C			
		R			
Passenger seat ...	{	L			
		C			
		R			

L = left, C = centre, R = right;

(xxxxv) entry 57., including all its sub-entries, is replaced by the following:

- ‘57. DRIVER-OPERATED CONTROL DEVICES INCLUDING IDENTIFICATION OF CONTROL DEVICES, TELL-TALES AND INDICATORS
- 57.1. Photographs and/or drawings of the arrangement of symbols and controls, tell-tales and indicators:
- 57.2. **Controls, tell-tales and indicators for which, when fitted, identification is mandatory, and symbols to be used for that purpose**

Symbol No	Device	Control / indicator available (*)	Identified by symbol (*)	Where (**)	Tell-tale available (*)	Identified by symbol (*)	Where (**)
1	Dipped-beam head lamps						
2	Main-beam head lamps						
3	Position (side) lamps						
4	Front fog lamps						
5	Rear fog lamp						
6	Headlamp levelling device						
7	Parking lamps						
8	Direction indicators						
9	Hazard warning						
10	Windscreen wiper						
11	Windscreen washer						
12	Windscreen wiper and washer						

Symbol No	Device	Control / indicator available (*)	Identified by symbol (*)	Where (**)	Tell-tale available (*)	Identified by symbol (*)	Where (**)
13	Headlamp cleaning device						
14	Windscreen demisting and defrosting						
15	Rear window demisting and defrosting						
16	Ventilating fan						
17	Diesel pre-heat						
18	Choke						
19	Brake failure						
20	Fuel level						
21	Battery charging condition						
22	Engine coolant temperature						
23	Malfunction indicator light (MI)						

(*) x = yes

– = no or not separately available

o = optional.

(**) d = directly on control, indicator or tell-tale

c = in close vicinity.

57.3. Controls, tell-tales and indicators for which, when fitted, identification is optional, and symbols which shall be used if they are to be identified

Symbol No	Device	Control / indicator available (*)	Identified by symbol (*)	Where (**)	Tell-tale available (*)	Identified by symbol (*)	Where (**)
1	Parking brake						
2	Rear window wiper						
3	Rear window washer						

Symbol No	Device	Control / indicator available (*)	Identified by symbol (*)	Where (**)	Tell-tale available (*)	Identified by symbol (*)	Where (**)
4	Rear window wiper and washer						
5	Intermittent wind-screen wiper						
6	Audible warning device						
7	Hood						
8	Seat belt						
9	Engine oil pressure						
10	Unleaded petrol						
11	...						
12							

(*) x = yes

– = no or not separately available

o = optional.

(**) d = directly on control, indicator or tell-tale

c = in close vicinity.

- 57.4. Brief description and schematic drawing of the locations, displacement, methods of operation and colour coding of the various control devices in the interior of the vehicle and showing for tractors without enclosed cab, how the accessibility to internal control devices from the ground has been avoided:
- 57.5. Brief description and schematic drawing of the locations, displacement, methods of operation and colour coding of the various control devices in the exterior of the vehicle and indicating the front and the rear hazard zones in accordance with Appendix 1 of Annex XXIII to Commission Delegated Regulation (EU) No 1322/2014:
- 57.6. Requirements under Annexes A and C of standard ISO 15077:2008 (Tractors and self-propelled machinery for agriculture – Operator controls – Actuating forces, displacement, location and method of operation) are met with relevant documentation included in the information document: yes/no⁽⁴⁾
- 57.7. Requirements under paragraph 4.5.3 of standard ISO 4254-1:2013 (Agricultural machinery – Safety – Part 1: General requirements), with the exception of fingertip operation control devices, are met with relevant documentation included in the information document: yes/no⁽⁴⁾
- 57.8. Requirements under standard EN 15997:2011 (All terrain vehicles (ATVs - Quads). Safety requirements and test methods) on throttle control and manual clutch control are met with relevant documentation included in the information document: yes/no/not applicable⁽⁴⁾
- 57.9. For vehicles of T- and C-category, requirements under standard ISO 10975:2009 (Tractors and machinery for agriculture – Auto-guidance systems for operator-controlled tractors and self-propelled machines – Safety requirements) are met with relevant documentation included in the information document: yes/no/not applicable⁽⁴⁾;

(c) Appendix 1 is amended as follows:

(i) entry 2.5.1. is replaced by the following:

‘2.5.1. Type-approval of: engine type/engine family⁽⁴⁾;

(ii) entry 5.1.2.2. is deleted;

(iii) entries 6.6. and 6.7. are replaced by the following:

‘6.6. Rated speed: min⁻¹

6.7. Maximum torque speed: min⁻¹;

(iv) entry 6.18., including all its sub-entries, is replaced by the following:

‘6.18. **Fuel feed for diesel engines**

6.18.1. *Feed pump*

6.18.1.1 Pressure⁽⁷⁾ kPa or characteristic diagram:

6.18.2. *Injection system*

6.18.2.1. *Pump*

6.18.2.1.1. Make(s): ...

6.18.2.1.2. Type(s): ...

6.18.2.1.3. Delivery: ... and mm³⁽⁷⁾ per stroke or cycle at full injection at pump speed of: rpm (rated) and: ... rpm (maximum torque) respectively, or characteristic diagram:

6.18.2.1.3.1. Method used: on engine/on pump bench⁽⁴⁾

6.18.2.2. *Injection advance:*

6.18.2.2.1. Injection advance curve⁽⁷⁾:

6.18.2.2.2. Timing⁽⁷⁾:

6.18.2.3. *Injection piping:*

6.18.2.3.1. Length: ... mm

6.18.2.3.2. Internal diameter: ... mm

6.18.2.4. *Injector(s)*

6.18.2.4.1. Make(s) ...

6.18.2.4.2. Type(s): ...

6.18.2.4.3. Opening pressure⁽⁷⁾: ... kPa, or characteristic diagram:

6.18.2.5. *Governor*

6.18.2.5.1. Make(s) ...

6.18.2.5.2. Type(s): ...

6.18.2.5.3. Speed at which cut-off starts under full load⁽⁷⁾: min⁻¹

6.18.2.5.4. Maximum no-load speed⁽⁷⁾: min⁻¹

6.18.2.5.5. Idling speed⁽⁷⁾: min⁻¹

6.18.2.6. *Cold-start system*

6.18.2.6.1. Make(s): ...

6.18.2.6.2. Type(s): ...

6.18.2.6.3. Description: ...;

(v) entry 7.1.1. is replaced by the following:

‘7.1.1. Combustion cycle: positive ignition/compression ignition⁽⁴⁾;

(vi) entries 8.6. and 8.7. are replaced by the following:

‘8.6. Rated speed: min⁻¹

8.7. Maximum torque speed: min⁻¹;

(vii) entry 8.12.2., including all its sub-entries, is replaced by the following:

‘8.12.2. Air

8.12.2.1. Blower: yes/no⁽⁴⁾

8.12.2.1.1. Characteristics of the blower.

8.12.2.1.2. Drive ratio(s) (if applicable):’;

(viii) entry 8.17., including all its sub-entries, is replaced by the following:

‘8.17. **Measures taken against air pollution**

8.17.1. Device for recycling crankcase gases: yes/no⁽⁴⁾

8.17.2. Additional anti-pollution devices (if any):

8.17.2.1. Catalytic converter: yes/no⁽⁴⁾

8.17.2.1.1. Make:

8.17.2.1.2. Type

8.17.2.1.3. Number of catalytic converters and elements

8.17.2.1.4. Dimensions and volume of the catalytic converter(s):

8.17.2.1.5. Type of catalytic action

8.17.2.1.6. Total charge of precious metals:

8.17.2.1.7. Relative concentration:

8.17.2.1.8. Substrate (structure and material):

8.17.2.1.9. Cell density:

8.17.2.1.10. Type of casing for the catalytic converter(s):

8.17.2.1.11. Location of the catalytic converter(s) (place(s) and maximum/minimum distance(s) from engine:

8.17.2.1.12. Normal operating range:K

8.17.2.1.13. Consumable reagent (where appropriate)

8.17.2.1.13.1. Type and concentration of reagent needed for catalytic action:

8.17.2.1.13.2. Normal operational temperature range of reagent: K

8.17.2.1.13.3. International standard (if applicable):

8.17.2.1.14. NOx sensor: yes/no⁽⁴⁾

8.17.2.1.15. Oxygen sensor: yes/no⁽⁴⁾

8.17.2.1.15.1. Make:

8.17.2.1.15.2. Type

8.17.2.1.15.3. Location:

8.17.2.1.16. Air injection: yes/no⁽⁴⁾

- 8.17.2.1.16.1. Type: pulse air/air pump/other(4) (if other specify:)
- 8.17.2.1.17. EGR: yes/no⁽⁴⁾
- 8.17.2.1.17.1. Characteristics (cooled/uncooled, high pressure/low pressure, etc.):
- 8.17.2.1.18. Particulate trap: yes/no⁽⁴⁾
- 8.17.2.1.18.1. Dimensions and capacity of the particulate trap:
- 8.17.2.1.18.2. Type and design of the particulate trap:
- 8.17.2.1.18.3. Location (place(s) and maximum/minimum distance(s) from engine:
- 8.17.2.1.18.4. Method or system of regeneration, description and/or drawing:
- 8.17.2.1.18.5. Normal operating temperature range: K and pressure range: kPa
- 8.17.2.1.19. Other systems: yes/no⁽⁴⁾
- 8.17.2.1.19.1. Description and operation:
- (ix) entry 8.18., including all its sub-entries, is replaced by the following:
- ‘8.18. **Fuel feed for diesel engines**
- 8.18.1. *Feed pump*
- 8.18.1.1 Pressure⁽⁷⁾ kPa or characteristic diagram:
- 8.18.2. *Injection system*
- 8.18.2.1. *Pump*
- 8.18.2.1.1. Make(s):
- 8.18.2.1.2. Type(s):
- 8.18.2.1.3. Delivery: and mm³⁽⁷⁾ per stroke or cycle at full injection at pump speed of: rpm (rated) and: rpm (maximum torque) respectively, or characteristic diagram:
- 8.18.2.1.3.1. Method used: on engine/on pump bench⁽⁴⁾
- 8.18.2.2. *Injection advance:*
- 8.18.2.2.1. Injection advance curve⁽⁷⁾:
- 8.18.2.2.2. Timing⁽⁷⁾:
- 8.18.2.3. *Injection piping:*
- 8.18.2.3.1. Length: mm
- 8.18.2.3.2. Internal diameter: mm
- 8.18.2.4. *Injector(s)*
- 8.18.2.4.1. Make(s)
- 8.18.2.4.2. Type(s):
- 8.18.2.4.3. Opening pressure⁽⁷⁾: kPa, or characteristic diagram:
- 8.18.2.5. *Governor*
- 8.18.2.5.1. Make(s)
- 8.18.2.5.2. Type(s):
- 8.18.2.5.3. Speed at which cut-off starts under full load⁽⁷⁾: min⁻¹
- 8.18.2.5.4. Maximum no-load speed⁽⁷⁾: min⁻¹

- 8.18.2.5.5. Idling speed⁽⁷⁾: min⁻¹
- 8.18.2.6. Cold-start system
- 8.18.2.6.1. Make(s):
- 8.18.2.6.2. Type(s):
- 8.18.2.6.3. Description:';
- (x) entry 8.19. is replaced by the following:
- ‘8.19. **Fuel feed for petrol engines**’;
- (d) Appendix 2 is amended as follows:
- (i) entry 2.5.1. is replaced by the following:
- ‘2.5.1. Type-approval of: engine type/engine family⁽⁴⁾’;
- (ii) entry 5.1.2.2. is deleted;
- (iii) entry 10.4.4.1. is replaced by the following:
- ‘10.4.4.1. Exhaust noise-abatement device containing fibrous materials: yes/no⁽⁴⁾’;
- (e) Appendix 3 is amended as follows:
- (i) the following entry 2.2.4. is inserted:
- ‘2.2.4. For components and separate technical units, location and method of attachment of the type-approval mark(s) (if available)⁽¹⁹⁾:’;
- (ii) entry 2.5.1. is replaced by the following:
- ‘2.5.1. Type-approval of: engine type/engine family⁽⁴⁾’;
- (iii) entries 6.6. and 6.7. are replaced by the following:
- ‘6.6. Rated speed: min⁻¹
- 6.7. Maximum torque speed: min⁻¹’;
- (iv) entry 6.18., including all its sub-entries, is replaced by the following:
- ‘6.18. **Fuel feed for diesel engines**
- 6.18.1. *Feed pump*
- 6.18.1.1 Pressure⁽⁷⁾ ... kPa or characteristic diagram:
- 6.18.2. *Injection system*
- 6.18.2.1. Pump
- 6.18.2.1.1. Make(s): ...
- 6.18.2.1.2. Type(s): ...
- 6.18.2.1.3. Delivery: ... and mm³⁽⁷⁾ per stroke or cycle at full injection at pump speed of: ... rpm (rated) and: rpm (maximum torque) respectively, or characteristic diagram:
- 6.18.2.1.3.1. Method used: on engine/on pump bench⁽⁴⁾
- 6.18.2.2. Injection advance:
- 6.18.2.2.1. Injection advance curve⁽⁷⁾:
- 6.18.2.2.2. Timing⁽⁷⁾:
- 6.18.2.3. Injection piping:
- 6.18.2.3.1. Length: ... mm
- 6.18.2.3.2. Internal diameter: ... mm

- 6.18.2.4. Injector(s)
- 6.18.2.4.1. Make(s) ...
- 6.18.2.4.2. Type(s): ...
- 6.18.2.4.3. Opening pressure⁽⁷⁾: ... kPa, or characteristic diagram:
- 6.18.2.5. Governor
- 6.18.2.5.1. Make(s) ...
- 6.18.2.5.2. Type(s): ...
- 6.18.2.5.3. Speed at which cut-off starts under full load⁽⁷⁾: min⁻¹
- 6.18.2.5.4. Maximum no-load speed⁽⁷⁾: min⁻¹
- 6.18.2.5.5. Idling speed⁽⁷⁾: min⁻¹
- 6.18.2.6. Cold-start system
- 6.18.2.6.1. Make(s): ...
- 6.18.2.6.2. Type(s): ...
- 6.18.2.6.3. Description: ...;
- (v) entry 6.19.4.2. is replaced by the following:
 - '6.19.3.2. Type(s):';
- (vi) entry 7.1.1. is replaced by the following:
 - '7.1.1. Combustion cycle: positive ignition/compression ignition⁽⁴⁾;
- (vii) entries 8.6. and 8.7. are replaced by the following:
 - '8.6. Rated speed: min⁻¹
 - 8.7. Maximum torque speed: min⁻¹;
- (viii) entry 8.12.2., including all its sub-entries, is replaced by the following:
 - '8.12.2. Air
 - 8.12.2.1. Blower: yes/no⁽⁴⁾
 - 8.12.2.1.1. Characteristics of the blower.
 - 8.12.2.1.2. Drive ratio(s) (if applicable):';
- (ix) entry 8.17., including all its sub-entries, is replaced by the following:
 - '8.17. **Measures taken against air pollution**
 - 8.17.1. Device for recycling crankcase gases: yes/no⁽⁴⁾
 - 8.17.2. Additional anti-pollution devices (if any):
 - 8.17.2.1. Catalytic converter: yes/no⁽⁴⁾
 - 8.17.2.1.1. Make:
 - 8.17.2.1.2. Type
 - 8.17.2.1.3. Number of catalytic converters and elements
 - 8.17.2.1.4. Dimensions and volume of the catalytic converter(s):
 - 8.17.2.1.5. Type of catalytic action
 - 8.17.2.1.6. Total charge of precious metals:
 - 8.17.2.1.7. Relative concentration:

- 8.17.2.1.8. Substrate (structure and material):
 - 8.17.2.1.9. Cell density:
 - 8.17.2.1.10. Type of casing for the catalytic converter(s):
 - 8.17.2.1.11. Location of the catalytic converter(s) (place(s) and maximum/minimum distance(s) from engine:
 - 8.17.2.1.12. Normal operating range:K
 - 8.17.2.1.13. Consumable reagent (where appropriate)
 - 8.17.2.1.13.1. Type and concentration of reagent needed for catalytic action:
 - 8.17.2.1.13.2. Normal operational temperature range of reagent: K
 - 8.17.2.1.13.3. International standard (if applicable):
 - 8.17.2.1.14. NO_x sensor: yes/no⁽⁴⁾
 - 8.17.2.1.15. Oxygen sensor: yes/no⁽⁴⁾
 - 8.17.2.1.15.1. Make:
 - 8.17.2.1.15.2. Type
 - 8.17.2.1.15.3. Location:
 - 8.17.2.1.16. Air injection: yes/no⁽⁴⁾
 - 8.17.2.1.16.1. Type: pulse air/air pump/other⁽⁴⁾ (if other specify:)
 - 8.17.2.1.17. EGR: yes/no⁽⁴⁾
 - 8.17.2.1.17.1. Characteristics (cooled/uncooled, high pressure/low pressure, etc.):
 - 8.17.2.1.18. Particulate trap: yes/no⁽⁴⁾
 - 8.17.2.1.18.1. Dimensions and capacity of the particulate trap:
 - 8.17.2.1.18.2. Type and design of the particulate trap:
 - 8.17.2.1.18.3. Location (place(s) and maximum/minimum distance(s) from engine:
 - 8.17.2.1.18.4. Method or system of regeneration, description and/or drawing:
 - 8.17.2.1.18.5. Normal operating temperature range: K and pressure range:kPa
 - 8.17.2.1.19. Other systems: yes/no⁽⁴⁾
 - 8.17.2.1.19.1. Description and operation:;
- (x) entry 8.18., including all its sub-entries, is replaced by the following:

8.18. Fuel feed for diesel engines

8.18.1. Feed pump

8.18.1.1 Pressure⁽⁷⁾ kPa or characteristic diagram:

8.18.2. Injection system

8.18.2.1. Pump

8.18.2.1.1. Make(s):

8.18.2.1.2. Type(s):

8.18.2.1.3. Delivery: ... and ... mm³⁽⁷⁾ per stroke or cycle at full injection at pump speed of: ... rpm (rated) and: rpm (maximum torque) respectively, or characteristic diagram:

- 8.18.2.1.3.1. Method used: on engine/on pump bench⁽⁴⁾
- 8.18.2.2. Injection advance:
 - 8.18.2.2.1. Injection advance curve⁽⁷⁾:
 - 8.18.2.2.2. Timing⁽⁷⁾:
- 8.18.2.3. Injection piping:
 - 8.18.2.3.1. Length: mm
 - 8.18.2.3.2. Internal diameter: mm
- 8.18.2.4. Injector(s)
 - 8.18.2.4.1. Make(s)
 - 8.18.2.4.2. Type(s):
 - 8.18.2.4.3. Opening pressure⁽⁷⁾: kPa, or characteristic diagram:
- 8.18.2.5. Governor
 - 8.18.2.5.1. Make(s)
 - 8.18.2.5.2. Type(s):
 - 8.18.2.5.3. Speed at which cut-off starts under full load⁽⁷⁾: min⁻¹
 - 8.18.2.5.4. Maximum no-load speed⁽⁷⁾: min⁻¹
 - 8.18.2.5.5. Idling speed⁽⁷⁾: min⁻¹
- 8.18.2.6. Cold-start system
 - 8.18.2.6.1. Make(s):
 - 8.18.2.6.2. Type(s):
 - 8.18.2.6.3. Description:';

(xi) entry 8.19. is replaced by the following:

'8.19. Fuel feed for petrol engines';

(f) in Appendix 7 entry 25.5.2. is replaced by the following:

'25.5.2. Rated voltage or air pressure: V / kPa⁽⁴⁾;

(g) in Appendix 8, the title is replaced by the following:

'Appendix 8

Model information document relating to EU type-approval of a type of (or a type of a vehicle with regard to) the installation of rear-view mirrors as a system'

(h) Appendix 9 is amended as follows:

(i) entry 3.3. is replaced by the following:

'3.3. Axles and wheels';

(ii) entry 4.1.2.1.2. is replaced by the following:

'4.1.2.1.2. In the case of a rigid drawbar or centre-axle R- or S-category vehicle indicate the vertical load on the front coupling point (S): kg';

(iii) entries 4.1.2.2. and 4.1.2.4. are deleted;

(iv) entry 4.1.3. is replaced by the following:

‘4.1.3. Technically permissible towable mass(es) for T- or C-category vehicles for each chassis/ braking configuration of the R- or S-category vehicle (for R- and S-category vehicles, indicate the maximum permissible load(s) on the rear coupling point):

R- and S category vehicle	Drawbar	Rigid drawbar	Centre-axle
Brake			
Unbraked (*)	 kg	 kg	 kg
Inertia-braked	 kg	 kg	 kg
Hydraulic braked	 kg	 kg	 kg
Pneumatic braked	 kg	 kg	 kg

(*) Calculated using the partially laden condition defined by the tractor manufacturer in agreement with the technical service set out in point 3.1.1.2 of Annex II to Commission Delegated Regulation (EU) 2015/68.’

(v) entry 4.1.4. is replaced by the following:

‘4.1.4. Total technically permissible mass(es) of the tractor (T- or C-category vehicle) and towed vehicle (R- or S-category vehicle) combination for each chassis/braking configuration of the R- or S-category vehicle:

R- and S category vehicle	Drawbar	Rigid drawbar	Centre-axle
Brake			
Unbraked	 kg	 kg	 kg
Inertia-braked	 kg	 kg	 kg
Hydraulic braked	 kg	 kg	 kg
Pneumatic braked	 kg	 kg	 kg’;

(vi) entries 4.1.5. to 4.1.5.3. are deleted;

(i) Appendix 10 is amended as follows:

(i) the following entry 2.2.4. is inserted:

‘2.2.4. For components and separate technical units, location and method of attachment of the type-approval mark(s) (if available)⁽¹⁹⁾:’;

(ii) entry 24.1. is replaced by the following:

‘24.1. Schedule describing all projected combinations of relevant vehicle electrical/electronic systems or ESAs, body styles⁽⁶⁰⁾, variations in body material, general wiring arrangements, engine variations, left-hand/right-hand drive versions and wheelbase versions:.....’;

(j) Appendix 11 is amended as follows:

(i) the following entry 2.2.4. is inserted:

‘2.2.4. For components and separate technical units, location and method of attachment of the type-approval mark(s) (if available)⁽¹⁹⁾:’;

(ii) entry 29., including all its sub-entries, is replaced by the following:

- ‘29. BALLAST MASSES
- 29.1. Detailed technical description (including photographs or drawings with dimensions) of the ballast masses and how they are mounted on the tractor:
- 29.2. Number of sets of ballast masses:
- 29.2.1. Number of components on each set: Set 1: Set 2: Set:.....
- 29.3. Mass of the components on each set: Set 1:kg Set 2:kg Set kg
- 29.3.1. Total mass of each set: Set 1:kg Set 2: kg Set kg
- 29.4. Total mass of ballast masses:kg
- 29.4.1. Distribution of these masses among the axles: kg
- 29.5. Material(s) and method of construction:’;

(k) Appendix 12 is amended as follows:

(i) the following entry 2.2.4. is inserted:

‘2.2.4. For components and separate technical units, location and method of attachment of the type-approval mark(s) (if available)⁽¹⁹⁾:’;

(l) Appendix 13 is amended as follows:

(i) the following entry 2.2.4. is inserted:

‘2.2.4. For components and separate technical units, location and method of attachment of the type-approval mark(s) (if available)⁽¹⁹⁾:’;

(m) Appendix 14 is amended as follows:

(i) the following entry 2.2.4. is inserted:

‘2.2.4. For components and separate technical units, location and method of attachment of the type-approval mark(s) (if available)⁽¹⁹⁾:’;

(ii) entry 38.1. is replaced by the following:

‘38.1. Photographs and dimensional drawings of the mechanical coupling, its installation on the vehicle and its coupling with the device installed on the towed vehicle:’;

(iii) entry 38.5. is replaced by the following:

‘38.5. Description of the mechanical coupling:

Type (according to Appendix 1 of Annex XXXIV to Commission Delegated Regulation (EU) 2015/208):	...
Make:	...
Manufacturer's type designation:	...
Maximum horizontal load/D-Value ⁽⁴⁾⁽⁴⁴⁾ :	 kg/kN ⁽⁴⁾
Towable mass (T) ⁽⁴⁾⁽⁴⁴⁾ :	 tonnes
Maximum permissible vertical load on the coupling point (S) ⁽⁴⁴⁾ :	... kg

Photographs and scale drawings of the coupling device. These drawings shall in particular show the required dimensions in detail as well as the measurements for mounting the device.	
Short technical description of the coupling device specifying the type of construction and the material used.	
Type of Test	Static/Dynamic ⁽⁴⁾
(EU) type-approval mark or -number of — drawbar eyes, coupling heads or similar coupling devices that shall be attached to the mechanical coupling (in the case of hinged or rigid drawbars) — type-approval mark or -number of mechanical couplings that shall be attached to the ladder frame /trailer hitch support (if restricted to certain types);	...;

(n) Appendix 15 is amended as follows:

(i) entry 3.3. is replaced by the following:

‘3.3. Axles and wheels;’

(ii) entry 4.1.2.1.2. is replaced by the following:

‘4.1.2.1.2. In the case of a rigid drawbar or centre-axle R- or S-category vehicle indicate the vertical load on the front coupling point (S): kg;’

(iii) entry 4.1.2.4. is deleted;

(iv) entry 4.1.3. is replaced by the following:

‘4.1.3. Technically permissible towable mass(es) for T- or C-category vehicles for each chassis/ braking configuration of the R- or S-category vehicle (for R- and S-category vehicles, indicate the maximum permissible load(s) on the rear coupling point):’

R- and S category vehicle	Drawbar	Rigid drawbar	Centre-axle
Brake			
Unbraked (*)	 kg	 kg	 kg
Inertia-braked	 kg	 kg	 kg
Hydraulic braked	 kg	 kg	 kg
Pneumatic braked	 kg	 kg	 kg

(*) Calculated using the partially laden condition defined by the tractor manufacturer in agreement with the technical service set out in point 3.1.1.2 of Annex II to Commission Delegated Regulation (EU) 2015/68.’

(v) entry 4.1.4. is replaced by the following:

‘4.1.4. Total technically permissible mass(es) of the tractor (T- or C-category vehicle) and towed vehicle (R- or S-category vehicle) combination for each chassis/braking configuration of the R- or S-category vehicle:

R- and S category vehicle	Drawbar	Rigid drawbar	Centre-axle
Brake			
Unbraked	 kg	 kg	 kg
Inertia-braked	 kg	 kg	 kg
Hydraulic braked	 kg	 kg	 kg
Pneumatic braked	 kg	 kg	 kg;

(vi) entries 4.1.5. to 4.1.5.3. are deleted;

(vii) entry 5.1.2.2. is deleted;

(viii) entries 6.6. and 6.7. are replaced by the following:

‘6.6. Rated speed: min⁻¹

6.7. Maximum torque speed: min⁻¹;

(ix) the following entries 7., 7.1. and 7.1.1. are inserted:

‘7. ESSENTIAL CHARACTERISTICS OF THE ENGINE FAMILY

7.1. Common parameters⁽⁵⁶⁾

7.1.1. Combustion cycle: positive ignition/compression ignition⁽⁴⁾;

(x) entry 9., including all its sub-entries, is replaced by the following:

‘9. ENERGY STORAGE DEVICE(S)⁽¹¹⁾

9.1. Description: battery/capacitor/flywheel/generator⁽⁴⁾

9.2. Identification number:

9.3. Kind of electrochemical couple:

9.4. Energy stored

9.4.1. For battery, voltage: and capacity: Ah in 2h

9.4.2. For capacitor: J

9.4.3. For flywheel/generator⁽⁴⁾: J

9.4.3.1. Flywheel moment of inertia: kg m²

9.4.3.1.1. Additional moment of inertia if no gear is engaged: kg m²

9.5. Charger: on-board/external/without⁽⁴⁾;

(xi) entry 11., including all its sub-entries, is replaced by the following:

‘11. DRIVE-TRAIN AND CONTROL⁽¹³⁾

11.1. Brief description and schematic drawing of the vehicle drive-train and its control system (gear shift control, clutch control or any other element of drive-train):

11.2. **Transmission**

11.2.1. Brief description and schematic drawing of gear shift system(s) and its control:

11.2.2. Diagram and or drawing of the transmission system:

11.2.3. Type of transmission: mechanical/hydraulic/electric/other⁽⁴⁾ (if other specify)

11.2.4. Brief description of the electrical/electronic components (if any):

11.2.5. Location relative to the engine:

11.2.6. Method of control:

11.2.7. Transfer box: with/without⁽⁴⁾

11.2.8. Type of gear shift system(s)⁽²⁴⁾:

11.3. Clutch (if any)

11.3.1. Brief description and schematic drawing of the clutch and its control system:

11.3.2. Maximum torque conversion:

11.4. Gear ratios

Gear	Internal gearbox ratios (ratios of engine to gearbox output shaft revolutions)	Internal transfer box ratios (ratios of engine to transfer box output shaft revolutions)	Final drive ratio(s) (ratio of gearbox output shaft to driven wheel revolutions)	Total gear ratios	Ratio (engine speed/vehicle speed) for manual transmission only
Maximum for CVT (*)					
1					
2					
3					
Minimum for CVT*					
Reverse					
1					
...					

(*) Continuously variable transmission

11.5. Differential lock

11.5.1. Differential lock: yes/no/optional⁽⁴⁾;

(xii) entry 43.1. is replaced by the following:

'43.1. Brief description of the braking system(s) installed on the vehicle⁽⁵⁵⁾:';

(xiii) entry 43.3. is deleted;

(xiv) entry 43.6., including all its sub-entries, is replaced by the following:

'43.6. Towed vehicle braking devices

43.6.1. Towed vehicle braking control system technology: Hydraulic / Pneumatic / Electric/None⁽⁴⁾

43.6.2. Towed vehicle-brake actuating device (description, characteristics):

43.6.3. Description of the connectors, couplings and safety devices (including drawings, sketches and the identification of any electronic parts):

43.6.4. Connections type: Single line/Two-lines/None⁽⁴⁾

43.6.4.1. Supply pressure Hydraulic: Single line: kPa Two lines: kPa

43.6.4.2. Supply pressure Pneumatic: Two lines: kPa

43.6.5. Presence of ISO 7638:2003 connector⁽¹⁵⁾: yes/no⁽⁴⁾;

(xv) the following entries are added:

- '43.A TOWED VEHICLE AXLE AND BRAKE INFORMATION DOCUMENT WITH RESPECT TO THE ALTERNATIVE TYPE I AND TYPE III PROCEDURE
- 43.A.1. General
 - 43.A.1.1. Name and address of axle or vehicle manufacturer:
 - 43.A.2. Axle data
 - 43.A.2.1. Manufacturer (name and address):
 - 43.A.2.2. Type/variant:
 - 43.A.2.3. Axle identifier: ID1-
 - 43.A.2.4. Test axle load (Fe): daN
 - 43.A.2.5. Wheel and brake data according to the following figures 1A and 1B
 - 43.A.3. Brake
 - 43.A.3.1. General information
 - 43.A.3.1.1. Make:
 - 43.A.3.1.2. Manufacturer (name and address):
 - 43.A.3.1.3. Type of brake (e.g. drum / disc):
 - 43.A.3.1.3.1. Variant (e.g. S-cam, single wedge etc.):
 - 43.A.3.1.4. Brake identifier: ID2-
 - 43.A.3.1.5. Brake data according to the figures 2A and 2B:
 - 43.A.3.2. Drum brake data
 - 43.A.3.2.1. Brake adjustment device (external/integrated):
 - 43.A.3.2.2. Declared maximum brake input torque $C_{\max}$: Nm
 - 43.A.3.2.3. Mechanical efficiency: η =.....
 - 43.A.3.2.4. Declared brake input threshold torque $C_{0,\text{dec}}$: Nm
 - 43.A.3.2.5. Effective length of the cam shaft: mm
 - 43.A.3.3. Brake drum
 - 43.A.3.3.1. Max diameter of friction surface (wear limit) mm
 - 43.A.3.3.2. Base material:
 - 43.A.3.3.3. Declared mass: kg
 - 43.A.3.3.4. Nominal mass: kg
 - 43.A.3.4. Brake lining
 - 43.A.3.4.1. Manufacturer and address
 - 43.A.3.4.2. Make
 - 43.A.3.4.3. Type
 - 43.A.3.4.4. Identification (type identification on lining)
 - 43.A.3.4.5. Minimum thickness (wear limit) mm
 - 43.A.3.4.6. Method of attaching friction material to brake shoe:

- 43.A.3.4.6.1. Worst case of attachment (in the case of more than one):
- 43.A.3.5. Disc brake data
- 43.A.3.5.1. Connection type to the axle (axial, radial, integrated, etc.):
- 43.A.3.5.2. Brake adjustment device (external/integrated):
- 43.A.3.5.3. Max. actuation stroke: mm
- 43.A.3.5.4. Declared maximum input force Th_{Amax} : daN
- 43.A.3.5.4.1 $C_{max} = Th_{Amax} \cdot l_e$: Nm
- 43.A.3.5.5. Friction radius: $r_e =$ mm
- 43.A.3.5.6. Lever length: $l_e =$ mm
- 43.A.3.5.7. Input/output ratio (l_e/e_e): $i =$
- 43.A.3.5.8. Mechanical efficiency: $\eta =$
- 43.A.3.5.9. Declared brake input threshold force $Th_{A0,dec}$: N
- 43.A.3.5.9.1. $C_{0,dec} = Th_{A0,dec} \cdot l_e$: Nm
- 43.A.3.5.10. Minimum rotor thickness (wear limit): mm
- 43.A.3.6. Brake disc data
- 43.A.3.6.1. Disc type description:
- 43.A.3.6.2. Connection/mounting to the hub:
- 43.A.3.6.3. Ventilation (yes/no):
- 43.A.3.6.4. Declared mass: kg
- 43.A.3.6.5. Nominal mass: kg
- 43.A.3.6.6. Declared external diameter: mm
- 43.A.3.6.7. Minimum external diameter: mm
- 43.A.3.6.8. Inner diameter of friction ring: mm
- 43.A.3.6.9. Width of ventilation channel (if appl.): mm
- 43.A.3.6.10. Base material:
- 43.A.3.7. Brake pad data
- 43.A.3.7.1. Manufacturer and address:
- 43.A.3.7.2. Make:
- 43.A.3.7.3. Type:
- 43.A.3.7.4. Identification (type identification on pad back plate):
- 43.A.3.7.5. Minimum thickness (wear limit): mm
- 43.A.3.7.6. Method of attaching friction material to pad back plate:
- 43.A.3.7.6.1. Worst case of attachment (in the case of more than one):

Figure 1A

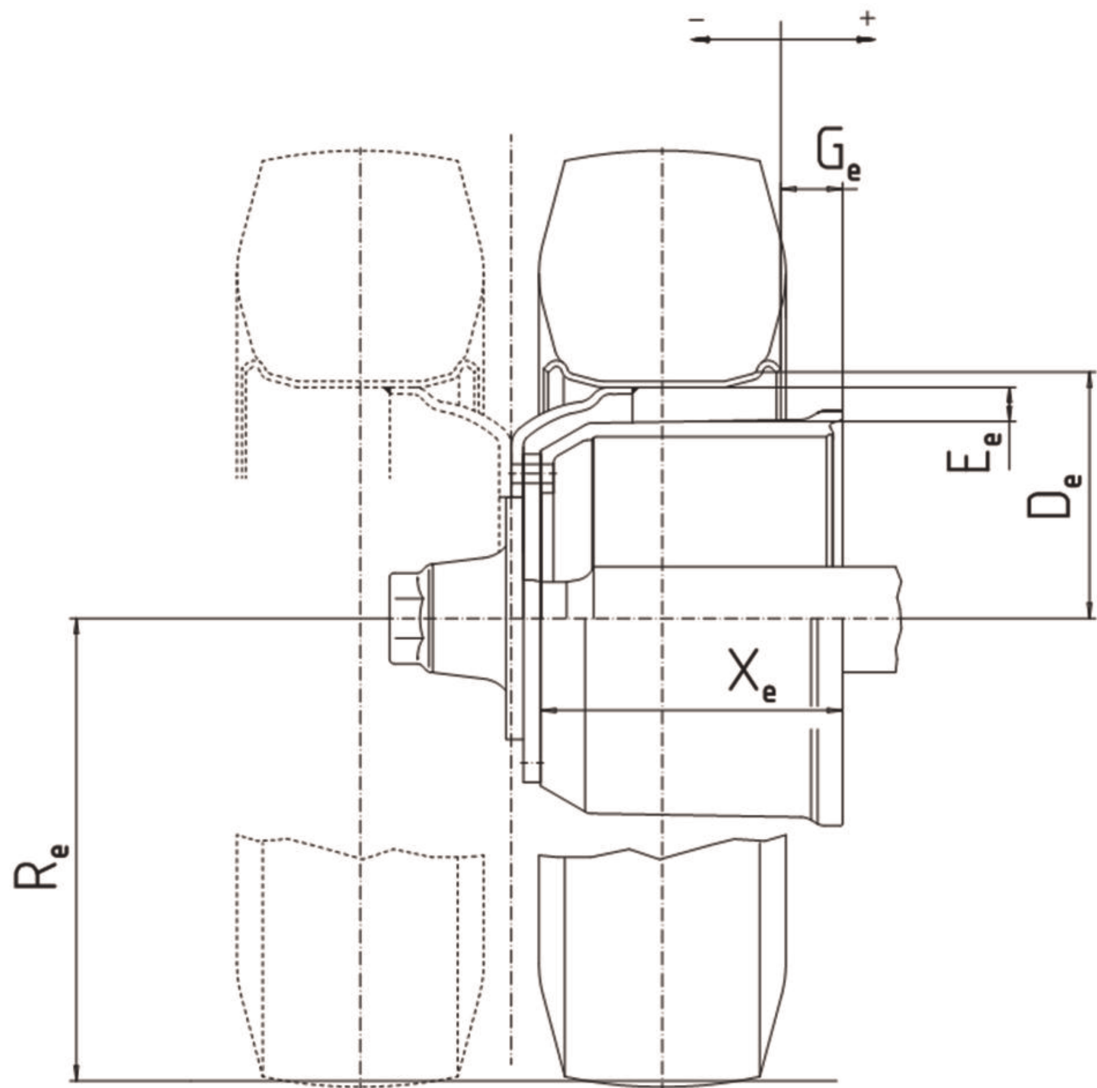


Figure 1B

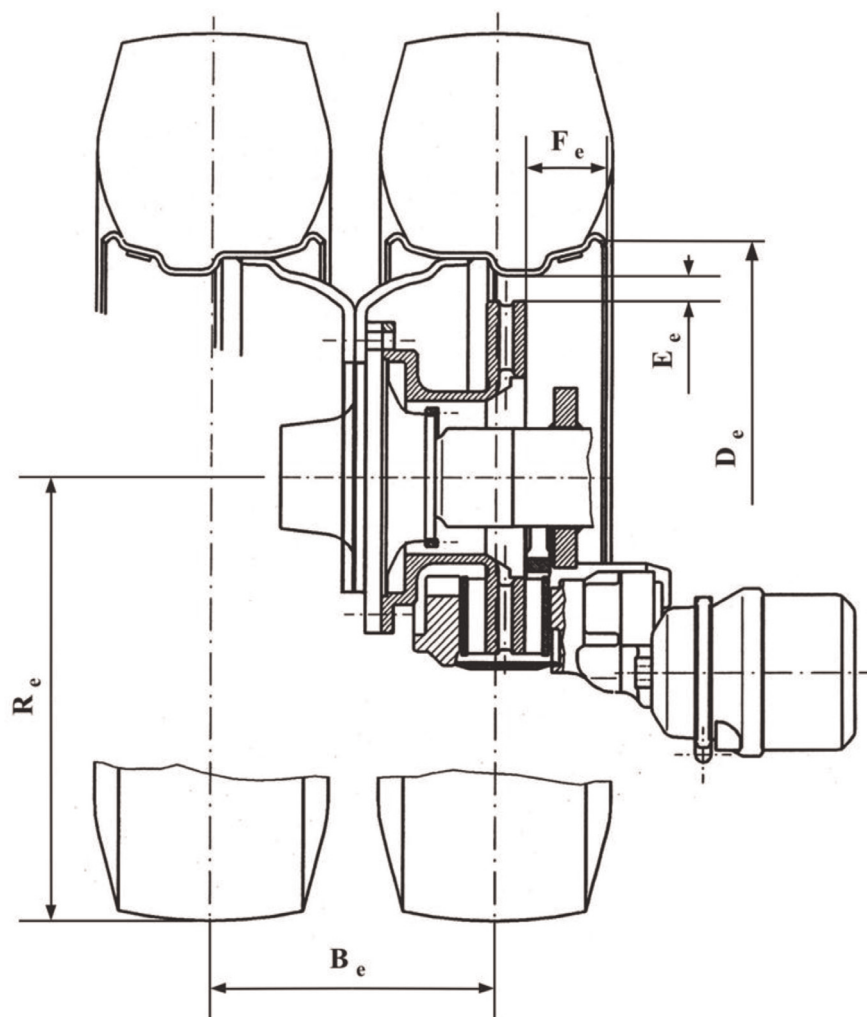
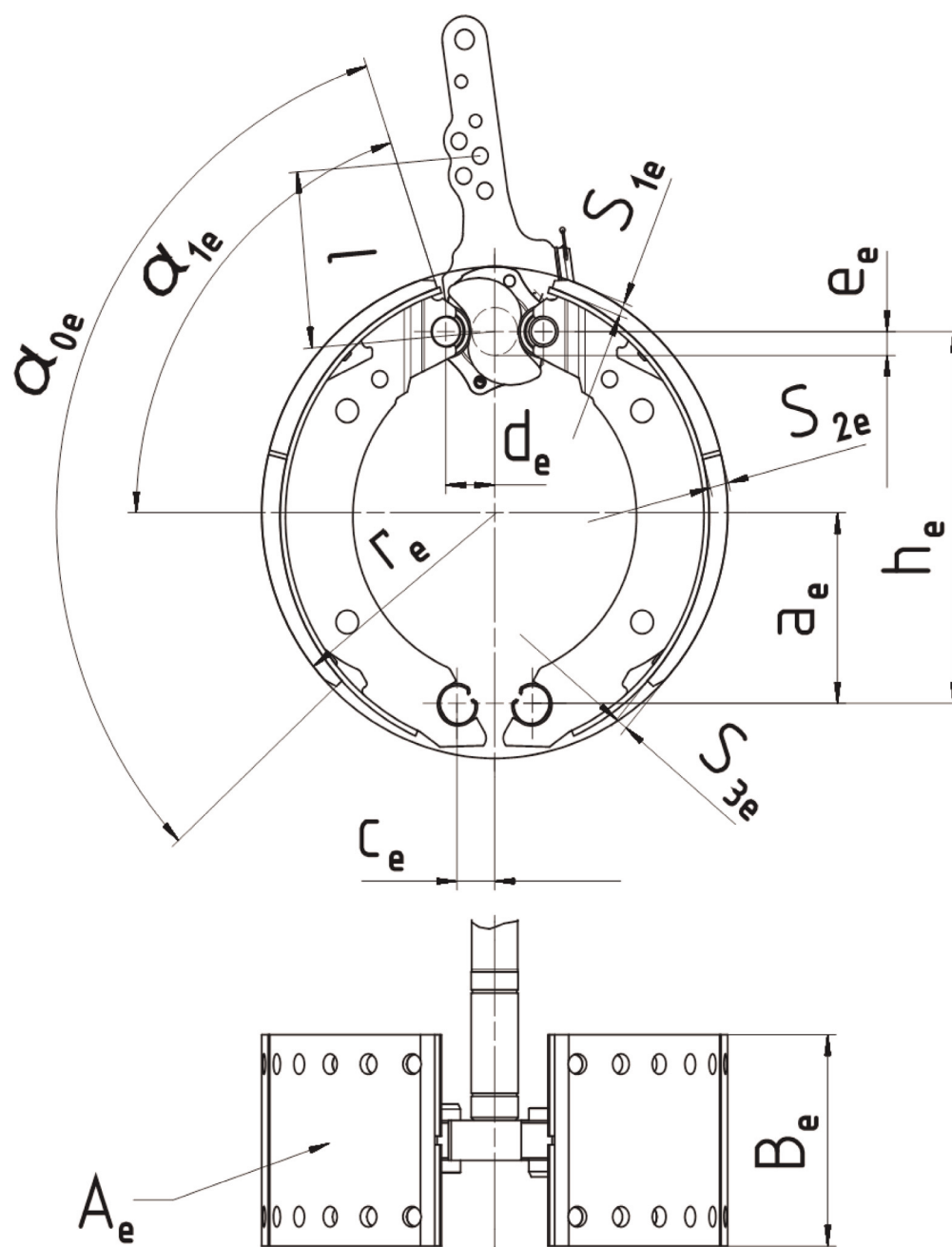


Figure 2A



(o) Appendix 19 is amended as follows:

(i) the following entry 2.2.4. is inserted:

‘2.2.4. For components and separate technical units, location and method of attachment of the type-approval mark(s) (if available)⁽¹⁹⁾:’;

(ii) entry 46.2.1. is replaced by the following:

‘46.2.1. In the case of roll bar: foldable/not foldable⁽⁴⁾’;

(iii) entry 46.2.2., including all its sub-entries, is replaced by the following:

‘46.2.2. In the case of foldable roll bar:

46.2.2.1. Folding operation: non-assisted / partially assisted / fully assisted⁽⁴⁾

46.2.2.2. In case of non-assisted or partially assisted folding operation:

46.2.2.2.1. Hand-operated foldable ROPS: with tools/ without tools⁽⁴⁾

46.2.2.2.2. Photographs and detailed technical drawings showing the grasping area and a lateral and top view of the accessible zones. Dimensions and maximum forces for actuating the ROPS must figure on the drawings:

46.2.2.3. In case of partially assisted or fully assisted folding operation, brief description of the assistance devices as well as of their control devices, if any, and their location:

46.2.2.4. Locking mechanism: manual/automatic⁽⁴⁾

46.2.2.4.1. For manual locking mechanisms, brief description of the locking mechanism and of its ergonomic design to avoid pinching or shearing hazards and to limit the force required for its operation: ...

46.2.2.4.2. For automatic locking mechanisms,

46.2.2.4.2.1. Brief description of the locking mechanism, its control devices, if any, and their location:

46.2.2.4.2.2. Manufacturers’ certificate set out in Note 2 of point 5.5. of Part B3 of Annex IX to Commission Delegated Regulation (EU) No 1322/2014: yes/no⁽⁴⁾’;

(p) in Appendix 20, the following entry 2.2.4. is inserted:

‘2.2.4. For components and separate technical units, location and method of attachment of the type-approval mark(s) (if available)⁽¹⁹⁾:’;

(q) Appendix 21 is amended as follows:

(i) the following entry 2.2.4. is inserted:

‘2.2.4. For components and separate technical units, location and method of attachment of the type-approval mark(s) (if available)⁽¹⁹⁾:’;

(ii) entry 49.4.1. is replaced by the following:

‘49.4.1. Position of the driving seat: left/right/centre⁽⁴⁾’;

(r) Appendix 22 is amended as follows:

(i) the following entry 2.2.4. is inserted:

‘2.2.4. For components and separate technical units, location and method of attachment of the type-approval mark(s) (if available)⁽¹⁹⁾:’;

(ii) entry 54.3. is replaced by the following:

‘54.3. **Number and position of safety belts and seats on which they can be used, please fill out table below:**

Safety belt configuration and associated information

			Complete EU type-approval mark / ECE type-approval mark	Variant, if applicable	Belt adjustment device for height (indicate yes/no/optional)
Driver's seat	{	L			
		C			
		R			
Passenger seat 1	{	L			
		C			
		R			
Passenger seat ...	{	L			
		C			
		R			

L = left, C = centre, R = right;

(s) in Appendix 23, the following entry 2.2.4. is inserted:

‘2.2.4. For components and separate technical units, location and method of attachment of the type-approval mark(s) (if available)⁽¹⁹⁾:’;

(r) Appendix 24 is replaced by the following:

‘Appendix 24

Manufacturer's declaration on anti-tampering of powertrain and speed-limitation device

Manufacturer's declaration on anti-tampering of powertrain and speed-limitation device

A duly-completed version of this statement shall be included in the information folder.

The undersigned: [..... (full name and position)]

2.3. Company name and address of manufacturer:

2.3.2. Name and address of the manufacturer's authorised representative (if any) ⁽¹⁾:

Hereby declares that:

2.1. Make(s) (trade name(s) of manufacturer:

2.4.1. Type ⁽²⁾:

2.4.2. Variant(s) ⁽²⁾:

- 2.4.3. Version(s) ⁽²⁾:
- 2.4.4 Commercial name(s) (if available):
- 2.4.5. Category, subcategory and speed index of vehicle ⁽³⁾:

Will not market interchangeable components which could involve an increase in the propulsion performance of the vehicle variant

Place: Date:

Signature: Name and position in the company:

Explanatory notes relating to Appendix 24

(Footnote markers, footnotes and explanatory notes not to be stated on the Manufacturer's declaration)

- ⁽¹⁾ Delete the entry if not applicable.
- ⁽²⁾ Indicate the alphanumeric code Type-Variant-Version or "TVV" allocated to each type, variant and version as set out in point 2.3 of Part B of Annex I to this Regulation. For the identification of variant and versions it may be employed the matrix set out in point 2.2 of Part B of Annex I to this Regulation.
- ⁽³⁾ Classified according to Article 4 of Regulation (EU) No 167/2013, the coding shall be indicated, e.g. "T4.3a" for a low-clearance tractor with a maximum design speed below or equal to 40 km/h.'

(s) the explanatory notes relating to the information document are amended as follows:

(i) explanatory note (9) is replaced by the following:

'(9) Indicate fuel type by the following codes:

P: petrol

B5: diesel

E5: petrol E5

M: mixture (for two stroke engines)

O: other.'

(ii) the following explanatory note (11) is inserted:

'(11) Excluding SLI batteries that supply electric energy for starting, lighting and ignition.'

(iii) explanatory note (14) is replaced by the following:

'(14) 'A': for a three-point belt;

'B': for a lap belt;

'S': for special types of belt (in this case provide specific information on the nature of these types under observation in entry 53.4.1.);

'Ar', 'Br' or 'Sr': for a belt incorporating an inertia reel retractor;

'Are', 'Bre' and 'Sre': for a belt equipped with an inertia reel retractor and an energy-absorption device on at least one anchorage.'

(iv) the following explanatory notes (15) and (16) are inserted:

'(15) Only applicable to T- and C-category vehicles authorized to tow R- or S-category vehicles if fitted with a hydraulic energy storage device.'

'(16) Indicate the maximum towable mass on the lower link arms of the rear three-point lifting mechanism or the rear three-point lifting mechanism itself, as declared by the manufacturer.'

(v) explanatory note (24) is replaced by the following:

‘(24) Indicate the type of gear shift system(s) by the following codes:

A: automatic

M1: manual

M2: manual automated

C: continuous variable transmission (CVT)

W: wheel-hub engine

O: other (indicate...);

(vi) explanatory note (26) is replaced by the following:

‘(26) Indicate the layout of the cylinders by following codes:

LI: in line

V: in V

O: opposed-cylinder engine

S: single-cylinder engine

R: rotatory piston engine. ’;

(vii) explanatory note (48) is replaced by the following:

‘(48) For R- and S-category vehicles indicate the overhang of the front coupling point. ’;

(viii) explanatory note (49) is replaced by the following:

‘(49) For engines indicate the information relative to the engine type or the engine family type, as applicable without the type-approval extension number.’

(ix) explanatory note (52) is replaced by the following:

‘(52) When the tractor is fitted with different optional seats or has a reversible driver’s position (reversible seat and steering wheel), the dimensions in relation to the seat index points (SIP 1, SIP 2, etc.) shall be measured for each case.’

ANNEX II

In Annex II to Implementing Regulation (EU) 2015/504, in the explanatory notes relating to Annex II, explanatory note (4) is replaced by the following:

- ‘(4) For engines indicate the information relative to the engine type or the engine family type, as applicable without the type-approval extension number.’
-

ANNEX III

Appendix 1 to Annex III to Implementing Regulation (EU) 2015/504 is amended as follows:

(1) Section 2 is amended as follows:

(a) Model 1 is amended as follows:

(i) under the heading 'General construction characteristics', entry 3.4.4. is replaced by the following:

'3.4.4. Steering by^(33a):

- changing the speed between the left-hand side and right-hand side track trains: yes/no⁽¹⁾
- pivoting of two opposite or all four track trains: yes/no⁽¹⁾
- articulation of the front and rear part of the vehicle around a central vertical axis: yes/no⁽¹⁾
- articulation of the front and rear part of the vehicle around a central vertical axis and changing the direction of the wheels on the wheeled axle: yes/no⁽¹⁾;

(ii) under the heading 'General construction characteristics', entries 37.2. and 3.4.2. (Type of chassis) are deleted;

(iii) under the heading 'Constructions characteristics for special purposes', entry 58.3. is replaced by the following:

'58.3. Vehicle equipped with a cab classified for protection against hazardous substances of category: 2/3/4⁽¹⁾⁽³⁵⁾ and a Dust filter/ Aerosol filter/ Vapour filter⁽¹⁾⁽³⁶⁾ with regard to protection against hazardous substances⁽³³ⁿ⁾.';

(iv) under the heading 'Masses', entry 4.1.2.2. is replaced by the following:

'4.1.2.2. Mass(es) and tyre(s)

Tyre combination No	Axle No	Tyre dimension incl load capacity index & speed category symbol	Rolling radius ⁽¹⁾ [mm]	Tyre Load rating per tyre [kg]	Maximum permissible mass per axle [kg] (*)	Maximum permissible mass of the vehicle [kg] (*)	Maximum permissible vertical load on the coupling point [kg] (*) (**) (***)	Track width [mm]	
								Minimum	Maximum
1	1	...		...	...	...	...	...	...
	2	...		...	...	...	...	...	...
	...	...		...	...	...	...	...	...
2	1	...		...	...	...	...	...	...
	2	...		...	...	...	...	...	...
	...	...		...	...	...	...	...	...
...	1	...		...	...	...	...	...	...

Tyre combination No	Axle No	Tyre dimension incl load capacity index & speed category symbol	Rolling radius ⁽¹⁾ [mm]	Tyre Load rating per tyre [kg]	Maximum permissible mass per axle [kg] (*)	Maximum permissible mass of the vehicle [kg] (*)	Maximum permissible vertical load on the coupling point [kg] (*) (**) (***)	Track width [mm]	
								Minimum	Maximum
	2	...		...	...	...	...	...	...
	...	...		...	...	...	...	...	...

(*) According to the tyre specification.

(**) Load transmitted to the reference centre of the coupling under static conditions, irrespective to the coupling device; if the maximum permissible vertical load on the coupling point depending on the coupling is indicated in this table, expand the table at the right side and indicate the identification of the coupling device in the header of the column; for R- or S-category vehicles this column(s) concerns the rear coupling devices if there is such a device.

(***) Value to be provided only if the maximum permissible vertical load on the coupling point is lower than indicated in entries 38.3 and 38.4;

(v) under the heading 'Masses', entries 4.1.3. and 4.1.4. are replaced by the following:

4.1.3. Technically permissible towable mass(es) for each chassis/ braking configuration of the R- or S-category vehicle:

R- and S category vehicle	Drawbar	Rigid drawbar	Centre-axle
Brake			
Unbraked	 kg	 kg	 kg
Inertia-braked	 kg	 kg	 kg
Hydraulic braked	 kg	 kg	 kg
Pneumatic braked	 kg	 kg	 kg

4.1.4. Total technically permissible mass(es) of the tractor (T- or C-category vehicle) and towed vehicle (R- or S-category vehicle) combination for each chassis/braking configuration of the R- or S-category vehicle:

R- and S category vehicle	Drawbar	Rigid drawbar	Centre-axle
Brake			
Unbraked	 kg	 kg	 kg
Inertia-braked	 kg	 kg	 kg
Hydraulic braked	 kg	 kg	 kg
Pneumatic braked	 kg	 kg	 kg';

(vi) under the heading 'Masses', entry 4.1.5.1. is deleted;

(vii) all entries under the heading 'Ballast masses' are replaced by the following:

29.2. Number of sets of ballast masses:

29.2.1. Number of components on each set: Set 1: Set 2: Set ...

29.4. Total mass of ballast masses:kg’;

(viii) under the heading ‘Main dimensions’, entry 4.2.1.3. is replaced by the following:

‘4.2.1.3. Height (in running order)⁽³³⁾: maximum mm minimum mm’;

(ix) under the heading ‘Main dimensions’, entry 4.2.2.8. is replaced by the following:

‘4.2.2.8. Track width⁽¹⁷⁾: Maximum: Axle 1 mm Axle 2 mm Axle mm

Minimum: Axle 1 mm Axle 2 mm Axle mm’;

(x) under the heading ‘General powertrain characteristics’, entry 5.1.1.3. is replaced by the following:

‘5.1.1.1. Declared maximum design vehicle speed: km/h’;

(xi) under the heading ‘General powertrain characteristics’, entry 5.1.2.2. is replaced by the following entry 5.1.2.1.:

‘5.1.2.1. Declared rearward maximum design vehicle speed: km/h’;

(xii) under the heading ‘Engine’, entry 2.2.2. is replaced by the following:

‘2.2.2. Type-approval number without extension:’;

(xiii) under the heading ‘Engine’, entry 2.5.4.1. is deleted;

(xiv) under the heading ‘Engine’, the following entry 7.1.1. is added:

‘7.1.1. Combustion cycle: positive ignition/compression ignition⁽¹⁾’;

(xv) under the heading ‘Gearbox’, entries 11.4.1., 11.5. and 11.5.1. are deleted;

(xvi) under the heading ‘Gearbox’, the following entry 11.2.8. is added:

‘11.2.8. Type of gear shift system(s)⁽²²⁾:’;

(xvii) all entries under the heading ‘Braking’ are replaced by the following:

‘43.4.6. Electronic braking system: yes/no/optional⁽¹⁾

43.5.1. Braking transmission : mechanical/ hydrostatic without power assistance / power – assisted / fully powered transmission⁽¹⁾

43.5.3. Locking of left and right braking controls:

43.6.1. Towed vehicle braking control system technology: Hydraulic / Pneumatic / Electric/None⁽¹⁾

43.6.4. Connections type: Single line/Two-lines/None⁽¹⁾

43.6.4.1. Supply pressure Hydraulic: Single line: kPa Two lines: kPa

43.6.4.2. Supply pressure Pneumatic: Two lines: kPa

43.6.5. Presence of ISO 7638:2003 connector^(33p): yes/no⁽¹⁾;

(xviii) under the heading 'Rollover protective structure (ROPS)', entry 46.1. is replaced by the following:

'46.1. Equipment of ROPS: compulsory/optional/standard⁽¹⁾;

(xix) under the heading 'Rollover protective structure (ROPS)', entries 46.2.1. and 46.2.2. are replaced by the following:

'46.2.1. In the case of roll bar: foldable/not foldable⁽¹⁾

46.2.2. In the case of foldable roll bar:

46.2.2.1. Folding operation: non-assisted / partially assisted / fully assisted⁽¹⁾;

46.2.2.2.1. Hand-operated foldable ROPS: with tools/ without tools⁽⁴⁾

46.2.2.4. Locking mechanism: manual/automatic⁽¹⁾;

(xx) under the heading 'Seating positions (saddles and seats)', entry 49.5.1. is replaced by the following:

'49.5.1. Number of passenger seats:';

(xxi) the heading 'Load platform(s)', including all entries under that heading, is replaced by the following:

'Load platform(s)'^(33d)

33.1.1. Length of the load platform(s): mm

33.1.2. Width of load platform(s): mm

33.1.3. Height of load platform(s) above the ground: mm

33.2. Safe load carrying capacity of load platform declared by manufacturer: kg';

(xxii) the heading 'Lighting and light-signalling devices' and entry 21.1. are deleted;

(xxiii) under the heading 'Mechanical couplings', entry 38.4. is replaced by the following:

'38.3. Rear mechanical coupling

Type (according to Appendix 1 of Annex XXXIV to Commission Delegated Regulation (EU) 2015/208):	...	...	...
Make:	...	...	...
Manufacturer's type designation:	...	...	...
(EU) type-approval mark or -number:	...	...	...

Maximum horizontal load/D-Value ⁽⁴⁾⁽⁴⁴⁾ :			 kg/kN ⁽⁴⁾	 kg/kN ⁽⁴⁾	 kg/kN ⁽⁴⁾
Towable mass (T) ⁽⁴⁾⁽⁴⁴⁾ :			 tonnes	 tonnes	 tonnes
Maximum permissible vertical load on the coupling point ⁽⁴⁴⁾ :			... kg	... kg	... kg
Position of coupling point ⁽⁶²⁾	height above ground,	minimum	... mm	... mm	... mm
		maximum	... mm	... mm	... mm
	distance from vertical plane passing through the axis of the rear axle	minimum	... mm	... mm	... mm
		maximum	... mm	... mm	... mm';

(xxiv) under the heading 'Three-point lifting mechanism', the following entry 39.2. is added:

'39.2. Maximum towable mass⁽²³⁾: kg';

(xxv) all entries under the heading 'Power take-off(s)' are replaced by the following:

'51.2. Main PTO: Position: front/rear/other⁽¹⁾ (if other specify:)

51.3. Secondary PTO⁽³³⁾: Position: front/rear/other⁽¹⁾ (if other specify:.....)

51.2.3. Optional⁽³³⁾: Power at the power take-off (PTO) at the rated speed(s) [in accordance with OECD Code 2⁽²⁶⁾ or ISO 789-1:1990 (Agricultural tractors — Test procedures — Part 1: Power tests for power take-off)]

Rated speed PTO (min ⁻¹)	Corresponding engine speed (min ⁻¹)		Power (kW)	
	Main PTO	Secondary PTO ⁽³³⁾	Main PTO	Secondary PTO ⁽³³⁾
1-540	...	...	...	...
2-1 000	...	...	...	...
540E	...	...	...	...
1 000E';	...	...	...	...

(b) Model 2 is amended as follows:

(i) under the heading 'Masses', entry 4.1.2.1.2. is replaced by the following:

'4.1.2.1.2. Vertical load on the front coupling point (S)^(33h):kg kg

(ii) under the heading 'Masses', entry 4.1.2.2. is replaced by the following:

'4.1.2.2. Mass(es) and tyre(s)

Tyre combination No	Axle No	Tyre dimension incl load capacity index & speed category symbol	Rolling radius ⁽¹⁾ [mm]	Tyre Load rating per tyre [kg]	Maximum permissible mass per axle [kg] (*)	Maximum permissible mass of the vehicle [kg] (*)	Maximum permissible vertical load on the coupling point [kg] (*) (**) (***)	Track width [mm]	
								Minimum	Maximum
1	1	...		...	...	...	...	...	...
	2	...		...	...	...	...	...	...
	...	...		...	...	...	...	...	...
2	1	...		...	...	...	...	...	...
	2	...		...	...	...	...	...	...
	...	...		...	...	...	...	...	...
...	1	...		...	...	...	...	...	...
	2	...		...	...	...	...	...	...
	...	...		...	...	...	...	...	...

(*) According to the tyre specification.

(**) Load transmitted to the reference centre of the coupling under static conditions, irrespective to the coupling device; if the maximum permissible vertical load on the coupling point depending on the coupling is indicated in this table, expand the table at the right side and indicate the identification of the coupling device in the header of the column; for R- or S-category vehicles this column(s) concerns the rear coupling devices if there is such a device.

(***) Value to be provided only if the maximum permissible vertical load on the coupling point is lower than indicated in entries 38.3 and 38.4;

(iii) under the heading 'Masses', entry 4.1.3. is replaced by the following:

'4.1.3. Maximum permissible load(s) on the rear coupling point for towing a second R- or S-category vehicle for each chassis/ braking configuration of the mentioned second vehicle^(33e);

R- and S category vehicle Brake	Drawbar	Rigid drawbar	Centre-axle
Unbraked	 kg	 kg	 kg
Inertia-braked	 kg	 kg	 kg
Hydraulic braked	 kg	 kg	 kg
Pneumatic braked	 kg	 kg	 kg';

(iv) under the heading 'Masses', entry 4.1.5.2. is deleted;

(v) under the heading 'Main dimensions', entry 4.2.1.3. is replaced by the following:

'4.2.1.3. Height (in running order)⁽³³⁾: maximum mm minimum mm';

(vi) under the heading 'Main dimensions', entry 4.2.2.8. is replaced by the following:

'4.2.2.8. Track width⁽¹⁷⁾: Maximum: Axle 1 mm Axle 2 mm Axle mm

Minimum: Axle 1 mm Axle 2 mm Axle mm';

(vii) all entries under the heading 'Braking' are replaced by the following:

- '43.4.6. Electronic braking system: yes/no/optional⁽¹⁾
- 43.5.1. Braking transmission: mechanical/ hydrostatic without power assistance / power – assisted / fully powered transmission⁽¹⁾
- 43.6.1. Towed vehicle braking control system technology: Hydraulic / Pneumatic / Electric/None⁽¹⁾
- 43.6.4. Connections type: Single line/Two-lines/None⁽¹⁾
- 43.6.4.1. Supply pressure Hydraulic: Single line: kPa Two lines: kPa
- 43.6.4.2. Supply pressure Pneumatic: Two lines: ... kPa;

(viii) the heading 'Load platform(s)', including all entries under that heading, are replaced by the following:

'Load platform(s)'^(33d)

- 33.1.1. Length of the load platform(s):..... mm
- 33.1.2. Width of load platform(s):..... mm
- 33.1.3. Height of load platform(s) above the ground:..... mm
- 33.2. Safe load carrying capacity of load platform declared by manufacturer: kg;

(ix) the heading 'Lighting and light-signalling devices' and entry 21.1. are deleted;

(c) the explanatory notes relating to Appendix 1 are amended as follows:

(i) explanatory notes (20) to (23) are replaced by the following:

'(20) Indicate fuel type by the following codes:

P: petrol

B5: diesel

E5: petrol E5

M: mixture (for two stroke engines)

O: other.

(21) Indicate the layout of the cylinders by following codes:

LI: in line

V: in V

O: opposed-cylinder engine

S: single-cylinder engine

R: rotatory piston engine.

(22) Indicate the type of gear shift system(s) by the following codes:

A: automatic

M1: manual

M2: manual automated

C: continuous variable transmission (CVT)

W: wheel-hub engine

O: other (indicate...)

(23) Indicate the maximum towable mass on the lower link arms of the rear three-point lifting mechanism or the rear three-point lifting mechanism itself, as declared by the manufacturer.'

(ii) explanatory note (24) is deleted;

(iii) explanatory note (33) is replaced by the following:

'(33) Delete this entry of the certificate of conformity if not applicable to the vehicle.'

(iv) explanatory note (33d) is replaced by the following:

'(33d) Only applicable to vehicles fitted with load platform(s).'

(v) the following explanatory note (33p) is inserted:

'(33p) Only applicable to T- and C-category vehicles authorized to tow R- or S-category vehicles if fitted with a hydraulic energy storage device.'

(vi) explanatory note (37) is deleted.

ANNEX IV

Annex IV to Implementing Regulation (EU) 2015/504 is amended as follows:

(1) point 2.1.1. is replaced by the following:

‘2.1.1. The information on the plate shall be clearly legible, indelible and shall contain the following information in the order given below and in accordance with one of the two alternative models set out in Appendix 1:’

(2) point 2.1.1.8. is replaced by the following:

‘2.1.1.8. Technically permissible towable mass(es) for each chassis/ braking configuration of the towed R- or S-category vehicle in accordance with entry 4.1.3 of the information document data entries laid down in Part B of Annex I to this Regulation⁽²⁾, in the following format: “B-1” unbraked, “B-2” inertia braked, “B-3” hydraulic braked, “B-4” pneumatic braked, “T-1” drawbar, “T-2” rigid drawbar, “T-3” centre-axle;’

(3) point 4.1.1.8. is replaced by the following:

‘4.2.1.8. Technically permissible towable mass(es) for each chassis/ braking configuration of the towed R- or S-category vehicle in accordance with entry 4.1.3 of the information document data entries laid down in Part B of Annex I to this Regulation⁽²⁾, in the following format: “B-1” unbraked, “B-2” inertia braked, “B-3” hydraulic braked, “B-4” pneumatic braked, “T-1” drawbar, “T-2” rigid drawbar, “T-3” centre-axle;’

(4) Appendix 1 is replaced by the following:

‘Appendix 1

Examples of the statutory plate

1. MODEL A for a T1b-category vehicle

SOFIA TRAKTOR WERKE.			
T1b			
e6*167/2013*01223			
5DRH123UPAX000001			
5 590 kg			
A-1: 2 390 kg			
A-2: 3 200 kg			
	T-1	T-2	T-3
B-1	3 000 kg	4 000 kg	2 000 kg
B-2	3 000 kg	4 000 kg	2 000 kg
B-3	6 000 kg	8 000 kg	4 000 kg
B-4	12 000 kg	15 000 kg	9 000 kg

2. MODEL B alternative to MODEL A for a T1b-category vehicle

SOFIA TRAKTOR WERKE. T1b e6*167/2013*01223 5DRH123UPAX000001 5 590 kg A-1: 2 390 kg A-2: 3 200 kg		T-1	T-2	T-3
	B-1	3 000 kg	4 000 kg	2 000 kg
	B-2	3 000 kg	4 000 kg	2 000 kg
	B-3	6 000 kg	8 000 kg	4 000 kg
	B-4	12 000 kg	15 000 kg	9 000 kg

3. MODEL C for stage 1 of a C2a-category vehicle

JEAN NICOLE TRACTORS Ltd. C2a STAGE 1 e3*167/2013*14863 ZFS159000AZ000055 820 kg A-1: 366 kg S-2: 454 kg P: 255 kPa				
	T-1	T-2	T-3	
B-1	1 000 kg	2 000 kg	1 000 kg	
B-2	1 000 kg	2 000 kg	1 000 kg	
B-3	2 000 kg	3 000 kg	2 000 kg	
B-4	4 000 kg	5 000 kg	4 000 kg	

4. MODEL D alternative to MODEL C for stage 1 of a C2a-category vehicle

JEAN NICOLE TRACTORS Ltd. C2a STAGE 1 e3*167/2013*14863 ZFS159000AZ000055 820 kg A-1: 366 kg S-2: 454 kg P: 255 kPa		T-1	T-2	T-3
	B-1	1 000 kg	2 000 kg	1 000 kg
	B-2	1 000 kg	2 000 kg	1 000 kg
	B-3	2 000 kg	3 000 kg	2 000 kg
	B-4	4 000 kg	5 000 kg	4 000 kg

5. MODEL E for a rigid drawbar R2a-category vehicle

REMORQUES HENSCHLER SA.			
R2a			
e12*167/2013*00053			
YA9EBS37009000005			
2 050 kg			
A-0: 1 100 kg			
A-1: 850 kg			
A-2: 1 200 kg			
	T-1	T-2	T-3
B-1	1 000 kg	1 000 kg	1 000 kg
B-2	1 000 kg	1 000 kg	1 000 kg
B-3	2 000 kg	2 000 kg	2 000 kg
B-4	2 000 kg	2 000 kg	2 000 kg

6. MODEL F alternative to MODEL E for a rigid drawbar R2a-category vehicle

REMORQUES HENSCHLER SA. R2a e12*167/2013*00053 YA9EBS37009000005 2 050 kg A-0: 1 100 kg A-1: 850 kg A-2: 1 200 kg'.		T-1	T-2	T-3
	B-1	1 000 kg	1 000 kg	1 000 kg
	B-2	1 000 kg	1 000 kg	1 000 kg
	B-3	2 000 kg	2 000 kg	2 000 kg
	B-4	2 000 kg	2 000 kg	2 000 kg

ANNEX V

Annex V to Implementing Regulation (EU) 2015/504 is amended as follows:

(1) in Appendix 1, in section III, entry 2.1. is replaced by the following:

‘2.1. The approval is granted in accordance with Article 35 of Regulation (EU) No 167/2013 and the validity of the approval is thus limited to dd/mm/yyyy⁽⁶⁾.’

(2) Appendix 2 is amended as follows:

(a) in section III, entry 4.1. is replaced by the following:

‘4.1. The approval is granted in accordance with Article 35 of Regulation (EU) No 167/2013 and its validity is thus limited to dd/mm/yyyy⁽⁶⁾.’

(b) Section 2 is replaced by the following:

‘SECTION 2

This EU type-approval concerns incomplete and completed vehicles, variants or versions.

1. Previous stage(s) approval(s) for the vehicles.

Stage	EU type-approval number	Dated	Applicable to (as appropriate)	Variants and versions which are complete or completed (as appropriate) ⁽⁹⁾
1 (base vehicle)				
2				

2. List of requirements applicable to the approved incomplete vehicle type, variant, taking account of the scope and latest amendment to each of the regulatory acts listed below⁽¹⁰⁾.

Item	Subject	Regulatory act reference	As amended by and/or stage of implementation	Applicable to variants
				,

(3) in Appendix 4, in section III, entry 2.1. is replaced by the following:

‘2.1. The approval is granted in accordance with Article 35 of Regulation (EU) No 167/2013 and the validity of the approval is thus limited to dd/mm/yyyy⁽⁶⁾.’

(4) in Appendix 5, in section III, entry 2.1. is replaced by the following:

‘2.1. The approval is granted in accordance with Article 35 of Regulation (EU) No 167/2013 and the validity of the approval is thus limited to dd/mm/yyyy⁽⁴⁾.’

—

ANNEX VI

In Annex VII to Implementing Regulation (EU) 2015/504, in Appendix 1, point 4 is replaced by the following:

4. Braking performance

Measured according to Annex II to Commission Delegated Regulation (EU) 2015/68, as last amended by Commission Delegated Regulation (EU) .../...⁽¹⁾⁽³⁾

Table I

	Axles of the vehicle			Reference axles		
	Static mass (P) ¹	Braking force needed at wheels	Speed	Test mass (P _d) (*)	Braking force developed at wheels	Speed
	kg	N	km/h	kg	N	km/h
Axle 1						
Axle 2						
Axle 3						
Axle 4						

(*) See point 2.1. of Appendix 1 to Annex VII of Regulation (EU) 2015/68.

Table II

Total mass of the vehicle submitted for approval	kg
Braking force needed at wheels	N
Retarding torque needed at main shaft of endurance braking system	Nm
Retarding torque obtained at main shaft of endurance braking system (according to diagram)	Nm

Table III

Reference axle	Report No.	Date
..... (copy attached)		
	Type-I	Type-III
Braking force per axle (N) (See point 4.2.1. of Appendix 1 to Annex VII to Regulation (EU) 2015/68)		
Axle 1	T ₁ = % F _e	T ₁ = % F _e
Axle 2	T ₂ = % F _e	T ₂ = % F _e
Axle 3	T ₃ = % F _e	T ₃ = % F _e
Predicted actuator stroke (mm) (See point 4.3.1.1. of Appendix 1 to Annex VII to Regulation (EU) 2015/68)		
Axle 1	s ₁ =	s ₁ =
Axle 2	s ₂ =	s ₂ =
Axle 3	s ₃ =	s ₃ =

Average thrust output (N) (See point 4.3.1.2. of Appendix 1 to Annex VII to Regulation (EU) 2015/68)			
Axle 1 Axle 2 Axle 3	Th _{A1} = Th _{A2} = Th _{A3} =	Th _{A1} = Th _{A2} = Th _{A3} =	
Braking performance (N) (See point 4.3.1.4. of Appendix 1 to Annex VII to Regulation (EU) 2015/68)			
Axle 1 Axle 2 Axle 3	T ₁ = T ₂ = T ₃ =	T ₁ = T ₂ = T ₃ =	
	Type-0 subject towed vehicle test result (E)	Type-I hot (predicted)	Type-III hot (predicted)
Braking performance of vehicle (See points 2.3.3, 2.4.3 and 2.5.5 of Annex II to Regulation (EU) 2015/68)			'

ANNEX VII

Annex VIII to Implementing Regulation (EU) 2015/504 is amended as follows:

(1) Point 1.1. is replaced by the following:

‘1.1. For each of the regulatory acts listed in Annex I to Regulation (EU) No 167/2013, the template of the test reports shall be drawn up by the technical service in accordance with its rules of good practice.’

(2) the following points 3.3. to 3.4.2. are added:

‘3.3. Test reports on braking

The models of the test reports for braking are set out in Appendices 1 to 5.

3.4. Additional information to be stated in model test report form for the alternative procedures for Type-I and Type-III tests for towed vehicle brakes (Annex VII, Appendix 1 to Regulation (EU) 2015/68) set out in Appendix 1

3.4.1. Test report number

The test report number consists of two parts: a base part and a suffix which identifies the issue level of the test report.

3.4.1.1. The base part, consisting of a maximum of 20 characters, and suffix shall be clearly separated from each other using e.g. a dot or slash.

3.4.1.2. The base part of the test report number shall only cover brakes with the same brake identifier and the same brake factor.

3.4.2. Test code

In addition to the test report number a “test code” consisting of up to eight characters (e.g. ABC123) shall indicate the test results applicable to the identifiers and the test specimen, which is described by the details given in point 3.7. of Appendix 1 to Annex VII to Regulation (EU) 2015/68.’

(3) the following Appendices 1 to 5 are added:

‘Appendix 1

Model test report form for the alternative procedures for Type-I and Type-III tests for towed vehicle brakes (Annex VII, Appendix 1 to Regulation (EU) 2015/68)

Test Report No.

Base part: ID4-

Suffix:

1. General

1.1. Axle manufacturer (name and address):

1.1.1. Make of axle manufacturer:

1.2. Brake manufacturer (name and address):

1.2.1. Brake identifier ID2-:

1.2.2. Automatic brake adjustment device: integrated/non-integrated (*)

1.3. Manufacturer’s Information Document:

2. Test Record

The following data has to be recorded for each test:

2.1. Test code:

- 2.2. Test specimen: (precise identification of the variant tested related to the Manufacturer's Information Document.)
- 2.2.1. Axle
- 2.2.1.1. Axle identifier: ID1-
- 2.2.1.2. Identification of tested axle:
- 2.2.1.3. Test axle load (Fe identifier): ID3- daN
- 2.2.2. Brake
- 2.2.2.1. Brake identifier: ID2-
- 2.2.2.2. Identification of tested brake:
- 2.2.2.3. Maximum stroke capability of the brake (**):
- 2.2.2.4. Effective length of the cam shaft³:
- 2.2.2.5. Material variation as per point 3.8 (m) of Appendix 1 to Annex VII to Regulation (EU) 2015/68:
- 2.2.2.6. Brake drum / disc (*)
- 2.2.2.6.1. Actual test mass of disc / drum (*):
- 2.2.2.6.2. Nominal external diameter of disc (**):
- 2.2.2.6.3. Type of cooling of the disc ventilated/non-ventilated (*)
- 2.2.2.6.4. With or without integrated hub (*)
- 2.2.2.6.5. Disc with integrated drum – with or without parking brake function (*) (**)
- 2.2.2.6.6. Geometric relationship between disc friction surfaces and disc mounting:
- 2.2.2.6.7. Base material:
- 2.2.2.7. Brake lining or pad (*)
- 2.2.2.7.1. Manufacturer:
- 2.2.2.7.2. Make:
- 2.2.2.7.3. Type:
- 2.2.2.7.4. Method of attachment of the lining / pad on the brake shoe / back plate (*):
- 2.2.2.7.5. Thickness of back plate, weight of shoes or other describing information (Manufacturer's Information Document) (*):
- 2.2.2.7.6. Base material of brake shoe / back plate (*):
- 2.2.3. Automatic brake adjustment device (not applicable in the case of integrated automatic brake adjustment device) (*)
- 2.2.3.1. Manufacturer (name and address):
- 2.2.3.2. Make:
- 2.2.3.3. Type:
- 2.2.3.4. Version:
- 2.2.4. Wheel(s) (dimensions see Figures 1A and 1B in the information document of towed vehicle axle and brake with respect to the alternative procedures for Type I and Type III tests)
- 2.2.4.1. Reference tyre rolling radius (R_e) at test axle load (F_e):

2.2.4.2. Data of the fitted wheel during testing:

Tyre size	Rim size	X_e (mm)	D_e (mm)	E_e (mm)	G_e (mm)

2.2.5. Lever length l_e :

2.2.6. Brake actuator

2.2.6.1. Manufacturer:

2.2.6.2. Make:

2.2.6.3. Type:

2.2.6.4. (Test) Identification number:

2.3. Test results (corrected to take account of rolling resistance of $0,01 \cdot F_e$ and $0,02 \cdot F_e$ respectively)

2.3.1. In the case of vehicles of categories

— R1, R2, S1

— 'R3a/R4a/S2a' (***)

— 'R3b/R4b/S2b' where the sum of the technically permissible masses per axle does not exceed 10 000 kg (***)

Depending on the maximum design speed and assumed rolling resistance of 0,01 or 0,02 in the following Tables A to C apply:

2.3.1.1 Considered rolling resistance coefficient $R = 0,01$ (covering also towed vehicles specified in point 2.3.1. above with a maximum design speed exceeding 40 km/h)

Table A: Applicable for all towed vehicle as specified in paragraph 2.3.1 above Test type	0	I	
Appendix 1 to Annex VII of Regulation (EU) 2015/68, point:	3.5.1.4.	3.5.2.2. or 3.5.2.3.	3.5.2.4.
Test speed	40	40	40
Brake actuator pressure p_e		—	
Braking time	—	2,55	—
Brake force developed T_e			
Brake efficiency T_e/F_e			
Actuator stroke s_e		—	
Brake input torque C_e		—	
Brake input threshold torque $c_{0,e}$			

2.3.1.2 Considered rolling resistance coefficient $R = 0,02$ (covering towed vehicles Ra and Sa specified in point 2.3.1. above with a maximum design speed not exceeding 40 km/h)

Table B: Alternative test procedure applicable for all towed vehicle of categories Ra and Sa Test type	0	I	
Annex VII, Appendix 2, paragraph:	3.5.1.4.	3.5.2.2. or 3.5.2.3.	3.5.2.4.

Table B: Alternative test procedure applicable for all towed vehicle of categories Ra and Sa Test type	0	I	
Test speed	40	40	40
Brake actuator pressure p_e		—	
Braking time	—	2,55	—
Brake force developed T_e			
Brake efficiency T_e/F_e			
Actuator stroke s_e		—	
Brake input torque C_e		—	
Brake input threshold torque $C_{0,e}$			

- 2.3.1.3 Considered rolling resistance coefficient $R = 0,02$ (covering towed vehicles Ra and Sa specified in point 2.3.1. above with a maximum design speed not exceeding 30 km/h)

Table C: Alternative test procedure in the case of towed vehicle with $v_{\max} \leq 30$ km/h Test type	0	I	
Appendix 1 to Annex VII of Regulation (EU) 2015/68, point:	3.5.1.4.	3.5.2.2. or 3.5.2.3.	3.5.2.4.
Test speed	30	30	30
Brake actuator pressure p_e		—	
Braking time	—	3,90	—
Brake force developed T_e			
Brake efficiency T_e/F_e			
Actuator stroke s_e		—	
Brake input torque C_e		—	
Brake input threshold torque $C_{0,e}$			

- 2.3.2. In the case of vehicles of categories

- 'R3a/R4a/S2a' (***)
- 'R3b/R4b/S2b' where the sum of the technically permissible masses per axle does not exceed 10 000 kg (***)
- R3b/R4b/S2b' where the sum of the technically permissible masses per axle exceeds 10 000 kg

Test type	0	III	
Appendix 1 to Annex VII of Regulation (EU) 2015/68, point:	3.5.1.4.	3.5.3.1.	3.5.3.2.
Test speed initial km/h	60		60
Test speed final km/h			

Test type	0	III	
Brake actuator pressure p_e		—	
Number of brake applications -	—	20	—
Duration of braking cycle s	—	60	—
Brake force developed T_e daN			
Brake efficiency T_e/F_e -			
Actuator stroke s_e mm		—	
Brake input torque C_e Nm		—	
Brake input threshold torque $C_{0,e}$ Nm		—	

3. Application range

The application range specifies the axle/brake variants that are covered in this test report, by showing which variables are covered by the individual test codes.

4. This test has been carried out and the results reported in accordance with Appendix 1 to Annex VII to Regulation (EU) 2015/68.

At the end of the test described in point 3.6. of Appendix 1 to Annex VII of Regulation (EU) 2015/68, the requirements of point 2.2.2.8.1. of Annex I to Regulation (EU) 2015/68 were deemed to be fulfilled / not fulfilled (*).

Technical Service (****) carrying out the test

Signed:

Date:

5. Approval Authority (****)

Signed:

Date:

(*) Strike out what does not apply.

(**) Applies to disc brakes only.

(***) Where these vehicles have been subject to the Type III test (compare point 2.3.1. or 2.3.2.+).

(****) To be signed by different persons even when the Technical Service and Approval Authority are the same or alternatively a separate Approval Authority authorization issued with the report.

Appendix 2

Model test report form for an alternative automatic brake adjustment device as prescribed in point 3.7.5. of Appendix 1 to Annex VII to Regulation (EU) 2015/68

Test report No.

1. Identification

1.1. Axle:

Make:

Type:

Model:

Test axle load (F_e identifier): ID3- daN

Test Report No. for the alternative procedures for Type-I and Type-III tests for towed vehicle brakes (Annex VII, Appendix I to Regulation (EU) 2015/68)

1.2. Brake:

Make:

Type:

Model:

Brake lining:

Make/Type:

1.3. Actuation:

Manufacturer:

Type (cylinder/diaphragm) (*):

Model:

Lever length (l): mm

1.4. Automatic brake adjustment device:

Manufacturer (name and address):

Make:

Type:

Version:

2. Record of test results

2.1. Performance of the automatic brake adjustment device

2.1.1. Hot performance of service braking systems determined according to the test defined in point 3.6.2.1. (a) of Appendix 1 to Annex VII of Regulation (EU) 2015/68: per cent

or

Actuator stroke s_A determined according to the test defined in point 3.6.2.1. (b) of Appendix 1 to Annex VII of Regulation (EU) 2015/68: mm

2.1.2. Free running according to point 3.6.3. of Appendix 1 to Annex VII of Regulation (EU) 2015/68: yes / no (*)

3. Name of Technical Service/Type Approval Authority (*) conducting the test:

4. Date of test:

5. This test has been carried out and the results reported in accordance with paragraph 3.6.2 of Appendix 1 to Annex VII of Regulation (EU) 2015/68

6. At the end of test mentioned in point 5 the requirements of point 2.2.2.8.1. of Annex I to Regulation (EU) 2015/68 were deemed to be: Fulfilled / Not fulfilled (*)

7. Technical Service (**) carrying out the test

Signed:

Date:

8. Approval Authority (**)

Signed:

Date:

(*) Strike out what does not apply.

(**) To be signed by different persons even when the Technical Service and Approval Authority are the same or alternatively a separate Approval Authority authorization issued with the report.

Appendix 3

Test report on inertia-braking system control device

1. Manufacturer
2. Make
3. Type
4. Characteristics of towed vehicles for which control device intended by manufacturer:
 - 4.1. mass $G'_A = \text{kg}$
 - 4.2. permissible static vertical force at towing-device head N
 - 4.3. towed vehicle with rigid drawbar/multi-axled towed vehicle with pivoted drawbar (*)
5. Brief description
(List of attached plans and dimensioned drawings)
6. Diagram showing principle of control
7. Travel $s = \dots$ mm
8. Reduction ratio of control device:
 - 8.1. with mechanical transmission device (*)
 $i_{Ho} = \text{from } \dots \text{ to } \dots$ (**)
 - 8.2. with hydraulic transmission device (*)
 $i_h = \text{from } \dots \text{ to } \dots$ (**)
 $F_{HZ}^{(**)} = \dots$ cm
 Travel of master cylinder $s_{Hz} \dots$ mm
 Spare travel of master cylinder $s''_{Hz} \dots$ mm
9. Test results:
- 9.1. Efficiency
 with mechanical transmission device (*) $\eta_H = \dots$
 with hydraulic transmission device (*) $\eta_H = \dots$
- 9.2. Supplementary force $K = \dots$ N
- 9.3. Maximum compressive force $D_1 = \dots$ N
- 9.4. Maximum tractive force $D_2 = \dots$ N
- 9.5. Force threshold $K_A = \dots$ N
- 9.6. Loss of travel and spare travel:
 where the position of the drawing device has an effect (*) $s_o = \text{mm } \dots$
 with a hydraulic-transmission device (*) $s'' = s''_{Hz} \cdot i_h = \dots$ mm
- 9.7. Effective (useful) travel of control $s' = \dots$ mm
- 9.8. An overload protector according to point 3.6. of Annex VIII of Regulation (EU) 2015/68 is provided/not provided (*)
- 9.8.1. If the overload protector is fitted before the transmission lever of the control device

- 9.8.1.1. Threshold force of the overload protector $D_{op} = \dots\dots\dots$ N
- 9.8.1.2. Where the overload protector is mechanical (*) max. force which the inertia control device can develop
 $P'_{max}/i_{Ho} = P_{op_max} = \dots\dots\dots$ N
- 9.8.1.3. Where the overload protector is hydraulic (*) the pressure which the inertia control device can develop
 $P'_{max}/i_h = P_{op_max} = \dots\dots\dots$ N/cm²
- 9.8.2. If the overload protector is fitted after the transmission lever of the control device
- 9.8.2.1. Threshold force on the overload protector where the overload protector is mechanical (*) $D_{op} \cdot i_{Ho} = N$
 where the overload protector is hydraulic (*) $D_{op} \cdot i_h = \dots\dots\dots$ N
- 9.8.2.2. Where the overload protector is mechanical (*)
 max force which the inertia control device can develop
 $P'_{max} = P_{op_max} = \dots\dots\dots$ N
- 9.8.2.3. Where the overload protector is hydraulic (*)
 the pressure which the inertia control device can develop
 $P'_{max} = P_{op_max} = \dots\dots\dots$ N/cm²
10. The control device described above complies/does not comply (*) with the requirements of points 3, 4 and 5 of Annex VIII of Regulation (EU) 2015/68.
 Signed: $\dots\dots\dots$ Date: $\dots\dots\dots$
11. This test has been carried out and the results reported in accordance with relevant provisions of Annex VIII of Regulation (EU) 2015/68.
 Technical Service (***) carrying out the test
 Signed: $\dots\dots\dots$ Date: $\dots\dots\dots$
12. Approval Authority (***)
 Signed: $\dots\dots\dots$ Date: $\dots\dots\dots$

(*) Strike out what does not apply.

(**) State lengths whose ratio was used to determine i_{Ho} or i_h .

(***) To be signed by different persons even when the Technical Service and Approval Authority are the same or alternatively a separate Approval Authority authorization issued with the report.

Appendix 4

Test report on the brake

1.	Manufacturer	
2.	Make	
3.	Type	
4.	Permissible 'maximum mass' per wheel G_{Bo} = kg	
5.	Braking torque M^* (as specified by the manufacturer according to point 2.2.23. of Annex VIII of Regulation (EU) 2015/68) = Nm	
6.	Dynamic tyre rolling radius	
	R_{min} = m;	R_{max} = m
7.	Brief description (List of plans and dimensioned drawings)	
8.	Diagram showing principle of brake	
9.	Test result:	
	<i>mechanical brake (*)</i>	<i>hydraulic brake (*)</i>
9.1.	Reduction ratio i_g = (**) (***)	9.1.A. Reduction ratio i'_g = (***)
9.2.	Lift (application travel) s_B = mm	9.2.A. Lift (application travel) s_B = m
9.3.	Prescribed lift (prescribed application travel) s_{B^*} = mm	9.3.A. Prescribed lift (prescribed application travel) s_{B^*} = mm
9.4.	Retraction force P_o = N	9.4.A. Retraction pressure p_o = N/cm ²
9.5.	Coefficient (characteristic) ρ = m	9.5.A. Coefficient (characteristic) ρ' = m
9.6.	An overload protector according to point 3.6. of Annex VIII of Regulation (EU) 2015/68 is/is not provided ⁴	
9.6.1.	Braking torque activating the overload protector M_{op} = Nm	9.6.1.A. Braking torque activating the overload protector M_{op} = Nm
9.7.	Force for M^* P^* = N	9.7.A. Pressure for M^* p^* = N/cm ²

9.8.A. Surface area of wheel cylinder
 $F_{RZ} = \dots \text{ cm}^2$

9.9.A. (for disk brakes)
 Fluid volume absorption
 $V_{60} = \dots \text{ cm}^3$

9.10. Service brake performance when the towed vehicle moves rearwards (see figures 6 and 7 of Appendix 1 to Annex VIII of Regulation (EU) 2015/68)

9.10.1. Maximum Fig 6 braking torque $M_r = \dots \text{ Nm}$

9.10.1.A Maximum Fig 7 braking torque $M_r = \dots \text{ Nm}$

9.10.2. Maximum permissible travel $s_r = \dots \text{ mm}$

9.10.2.A Maximum permissible fluid volume absorbed $V_r = \dots \text{ cm}^3$

9.11. Further brake characteristics when the towed vehicle moves rearwards (see figures 6 and 7 of Appendix 1 to Annex VIII of Regulation (EU) 2015/68)

9.11.1. Brake-retraction force $P_{or} = \dots \text{ N}$

9.11.1.A Brake-retraction pressure $p_{or} = \dots \text{ N/cm}^2$

9.11.2. Brake characteristic $\rho_r = \dots \text{ m}$

9.11.2.A Brake characteristic $\rho'_r = \dots \text{ m}$

9.12. Tests according to point 7.5. of Annex VIII of Regulation (EU) 2015/68, if applicable (corrected to take account of the rolling resistance corresponding to $0,01 \cdot g \cdot G_{Bo}$)

9.12.1. Brake test Type-0

Test speed = $\dots \text{ km/h}$

Braking ratio = $\dots \%$

Control force = $\dots \text{ N}$

9.12.2. Brake test Type-I

Test speed = $\dots \text{ km/h}$

Sustained braking ratio = $\dots \%$

Braking time = $\dots \text{ minutes}$

Hot performance = $\dots \%$

(expressed as a per cent of the above Type-0 test result in point 9.12.1.)

Control force = $\dots \text{ N}$

10. The above brake does / does not (*) conform to the requirements of paragraphs 3 and 6 of the testing conditions for vehicles fitted with inertia braking systems described in Annex VIII of Regulation (EU) 2015/68.

The brake may / may not (*) be used for an inertia braking system without an overload protector.

Date: $\dots$

Signature: $\dots$

11. This test has been carried out and the results reported in accordance with relevant provisions of Annex VIII of Regulation (EU) 2015/68.

Technical Service (****) carrying out the test

Date:

Signature:

12. Approval Authority (****)

Date:

Signature:

(*) Strike out what does not apply.

(**) State lengths used to determine i_g or i'_g

(***) State lengths whose ratio was used to determine i_{Ho} or i_h .

(****) To be signed by different persons even when the Technical Service and Approval Authority are the same or alternatively a separate Approval Authority authorization issued with the report.

5.3. $100 \cdot D_2 / (g \cdot G_A) = \dots\dots\dots$

5.4. $G'A = \dots\dots\dots$ kg

5.5. $G_B = n \cdot G_{Bo} = \dots\dots\dots$ kg

5.6. Braking torque of the brakes $n \cdot M^* / (B \cdot R) = \dots\dots\dots$

5.6.1. An overload protector within the meaning of point 3.6. of Annex VIII of Regulation (EU) 2015/68 is / is not (*) fitted on the inertia control device / on the brakes (*)

5.6.1.1 where the overload protector is mechanical on the inertia control device (*)

$n \cdot P^* / (i_{H1} \cdot \eta_{H1} \cdot P'_{max}) = \dots\dots\dots$

5.6.1.2 where the overload protector is hydraulic on the inertia control device (*)

$p^* / p'_{max} = \dots\dots\dots$

5.6.1.3 if the overload protector is on the inertia control device:

threshold force $Dop/D^* = \dots\dots\dots$

5.6.1.4 if the overload protector is fitted on the brake:

threshold torque $n \cdot Mop / (B \cdot R) = \dots\dots\dots$

5.7. Inertia braking system with mechanical transmission device (*)

5.7.1. $i_H = i_{Ho} \cdot i_{H1} = \dots\dots\dots$

5.7.2. $\eta_H = \eta_{Ho} \cdot \eta_{H1} = \dots\dots\dots$

5.7.3. $\left[\frac{B \cdot R}{\rho} + n \cdot P_o \right] \cdot \frac{1}{(D^* - K \cdot \eta_H)} = \dots\dots\dots$

5.7.4. $\frac{s'}{s_B \cdot i_g} = \dots\dots\dots$

5.7.5. Ratio $s'/i_H = \dots\dots\dots$

when the towed vehicle moves rearward

5.7.6. For the braking torque when the towed vehicle moves rearward including rolling resistance

$0,08 \cdot g \cdot G_A \cdot R = \dots\dots\dots$ Nm

5.8. Inertia braking system with hydraulic transmission device (*)

5.8.1. $i_h/FHZ = \dots\dots\dots$

5.8.2. $\left[\frac{B \cdot R}{n \cdot \rho'} + p_o \right] \cdot \frac{1}{(D^* - K \cdot \eta_H)} = \dots\dots\dots$

5.8.3. $\frac{s'}{2s_B \cdot n \cdot F_{RZ} \cdot i_{g'}} = \dots\dots\dots$

5.8.4. $s/i_h = \dots\dots\dots$

5.8.5. Ratio $s'/FHZ = \dots\dots\dots$

when the towed vehicle moves rearward

5.8.6. For the braking torque when the towed vehicle moves rearward including rolling resistance

$0,08 \cdot g \cdot G_A \cdot R = \dots\dots\dots$ Nm

6. Differential travel at park brake compensator

6.1.1. Maximum permissible compensator travel (forward) scf = $\dots\dots\dots$ mm

6.1.2. Maximum permissible compensator travel (rearward) scr = $\dots\dots\dots$ mm

6.1.3. Maximum permissible differential compensator travel scd = $\dots\dots\dots$ mm

7. The inertia braking system described above complies/does not comply (*) with the requirements of points 3. to 10. of Annex VIII of Regulation (EU) 2015/68.

Signature: $\dots\dots\dots$

Date: $\dots\dots\dots$

8. This test has been carried out and the results reported in accordance with relevant provisions of Annex VIII of Regulation (EU) 2015/68.

Technical Service (***) carrying out the test

Signature: $\dots\dots\dots$

Date: $\dots\dots\dots$

(*) Strike out what does not apply.

(**) State lengths used to determine i_g or i'_g

(***) To be signed by different persons even when the Technical Service and Approval Authority are the same or alternatively a separate Approval Authority authorization issued with the report'.

ISSN 1977-0677 (electronic edition)
ISSN 1725-2555 (paper edition)



Publications Office of the European Union
2985 Luxembourg
LUXEMBOURG

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