

Regulation (EU) No 540/2014 of the European Parliament and of the Council of 16 April 2014 on the sound level of motor vehicles and of replacement silencing systems, and amending Directive 2007/46/EC and repealing Directive 70/157/EEC (Text with EEA relevance)

Article 1

Subject matter

This Regulation establishes the administrative and technical requirements for the EU type-approval of all new vehicles of the categories referred to in Article 2 with regard to their sound level, and of replacement silencing systems and components thereof type-approved as separate technical units designed and constructed for vehicles of categories M₁ and N₁ with a view to facilitating their registration, sale and entry into service within the Union.

Article 2

Scope

This Regulation shall apply to vehicles of categories M₁, M₂, M₃, N₁, N₂ and N₃, as defined in Annex II to Directive 2007/46/EC, and to replacement silencing systems and components thereof type-approved as separate technical units designed and constructed for vehicles of categories M₁ and N₁.

Article 3

Definitions

For the purposes of this Regulation, the definitions laid down in Article 3 of Directive 2007/46/EC apply.

In addition, the following definitions also apply:

- (1) ‘type-approval of a vehicle’ means the procedure referred to in Article 3 of Directive 2007/46/EC with regard to sound levels;
- (2) ‘vehicle type’ means a category of motor vehicles which do not differ in essential respects such as:
 - (a) for vehicles of categories M₁, M₂ ≤ 3 500 kg, N₁ tested in accordance with point 4.1.2.1 of Annex II:
 - (i) the shape or materials of the bodywork (particularly the engine compartment and its soundproofing);
 - (ii) the type of engine (e.g. positive or compression ignition, two- or four-stroke, reciprocating or rotary piston), number and capacity of cylinders, number and type of carburettors or injection system, arrangement of valves, or the type of electric motor;

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- (iii) rated maximum net power and corresponding engine speed(s); however if the rated maximum power and the corresponding engine speed differs only due to different engine mappings, those vehicles may be regarded as of the same type;
- (iv) the silencing system;
- (b) for vehicles of categories $M_2 > 3\,500$ kg, M_3 , N_2 , N_3 tested in accordance with point 4.1.2.2 of Annex II:
 - (i) the shape or materials of the bodywork (particularly the engine compartment and its soundproofing);
 - (ii) the type of engine (e.g. positive or compression ignition, two- or four-stroke, reciprocating or rotary piston), number and capacity of cylinders, type of injection system, arrangement of valves, rated engine speed (S), or the type of electric motor;
 - (iii) vehicles having the same type of engine and/or different overall gear ratios may be regarded as vehicles of the same type.

However, if the differences in point (b) provide for different target conditions, as described in point 4.1.2.2 of Annex II, those differences shall be regarded as a change of type;

- (3) ‘technically permissible maximum laden mass’ (M) means the maximum mass allocated to a vehicle on the basis of its construction features and its design performance; the technically permissible laden mass of a trailer or of a semi-trailer includes the static mass transferred to the towing vehicle when coupled;
- (4) ‘rated maximum net power’ (P_n) means the engine power expressed in kW and measured by the UNECE method pursuant to UNECE Regulation No 85⁽¹⁾.

If the rated maximum net power is reached at several engine speeds, the highest engine speed shall be used;

- (5) ‘standard equipment’ means the basic configuration of a vehicle including all features that are fitted without giving rise to any further specifications on configuration or equipment level but equipped with all the features required under the regulatory acts mentioned in Annex IV or Annex XI to Directive 2007/46/EC;
- (6) ‘mass of the driver’ means a mass rated at 75 kg located at the driver's seating reference point;
- (7) ‘mass of a vehicle in running order’ (m_{r0}) means
 - (a) in the case of a motor vehicle:

the mass of the vehicle, with its fuel tank(s) filled to at least 90 % of its or their capacity/ies, including the mass of the driver, the fuel and liquids, fitted with the standard equipment in accordance with the manufacturer's specifications and, where they are fitted, the mass of the bodywork, the cabin, the coupling and the spare wheel(s) as well as the tools;
 - (b) in the case of a trailer:

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- the mass of the vehicle including the fuel and liquids, fitted with the standard equipment in accordance with the manufacturer's specifications, and, when they are fitted, the mass of the bodywork, additional coupling(s), the spare wheel(s) and the tools;
- (8) 'rated engine speed' (S) means the declared engine speed in min^{-1} (rpm) at which the engine develops its rated maximum net power pursuant to UNECE Regulation No 85 or, where the rated maximum net power is reached at several engine speeds, the highest one of those speeds;
- (9) 'power to mass ratio index' (PMR) means a numerical quantity calculated in accordance with the formula set out in point 4.1.2.1.1 of Annex II;
- (10) 'reference point' means one of the following points:
- (a) in the case of vehicles of categories M_1 and N_1 :
 - (i) for front engine vehicles, the front end of the vehicle;
 - (ii) for mid engine vehicles, the centre of the vehicle;
 - (iii) for rear engine vehicles, the rear end of the vehicle.
 - (b) in the case of vehicles of categories M_2 , M_3 , N_2 and N_3 , the border of the engine closest to the front of the vehicle.
- (11) 'target acceleration' means acceleration at a partial throttle condition in urban traffic as derived from statistical investigations;
- (12) 'engine' means the power source without detachable accessories;
- (13) 'reference acceleration' means the required acceleration during the acceleration test on the test track;
- (14) 'gear ratio weighting factor' (k) means a dimensionless numerical quantity used to combine the test results of two gear ratios for the acceleration test and the constant speed test;
- (15) 'partial power factor' (k_p) means a numerical quantity with no dimension used for the weighted combination of the test results of the acceleration test and the constant speed test for vehicles;
- (16) 'pre-acceleration' means the application of an acceleration control device prior to AA' for the purpose of achieving stable acceleration between AA' and BB' as referred to in Figure 1 of the Appendix to Annex II;
- (17) 'locked gear ratios' means the control of transmission such that the transmission gear cannot change during a test;
- (18) 'silencing system' means a complete set of components necessary for limiting the noise produced by an engine and its exhaust;
- (19) 'silencing system of different types' means silencing systems which significantly differ in respect of at least one of the following:
- (a) trade names or trade marks of their components;

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- (b) the characteristics of the materials constituting their components, except for the coating of those components;
 - (c) the shape or size of their components;
 - (d) the operating principles of at least one of their components;
 - (e) the assembly of their components;
 - (f) the number of exhaust silencing systems or components;
- (20) ‘design family of silencing system or silencing system components’ means a group of silencing systems, or components thereof, in which all of the following characteristics are the same:
- (a) the presence of net gas flow of the exhaust gases through the absorbing fibrous material when in contact with that material;
 - (b) the type of the fibres;
 - (c) where applicable, binder material specifications;
 - (d) average fibre dimensions;
 - (e) minimum bulk material packing density in kg/m³;
 - (f) maximum contact surface between the gas flow and the absorbing material;
- (21) ‘replacement silencing system’ means any part of the silencing system, or components thereof, intended for use on a vehicle, other than a part of the type fitted to the vehicle when submitted for EU type-approval pursuant to this Regulation;
- (22) ‘Acoustic Vehicle Alerting System’ (AVAS) means a system for hybrid electric and pure electric vehicles which provides sound to signal the vehicle's presence to pedestrians and other road users;
- (23) ‘point of sale’ means a location where vehicles are stored and offered for sale to consumers;
- (24) ‘technical promotional material’ means technical manuals, brochures, leaflets and catalogues, whether they appear in printed, electronic or online form, as well as websites, and the purpose of which is to promote vehicles to the general public.

Article 4

General obligations of Member States

1 Subject to the dates of phases of application set out in Annex III to this Regulation and without prejudice to Article 23 of Directive 2007/46/EC, Member States shall refuse, on grounds relating to the permissible sound level, to grant EU type-approval in respect of a type of motor vehicle which does not comply with the requirements of this Regulation.

2 From 1 July 2016, Member States shall refuse, on grounds relating to the permissible sound level, to grant EU type-approval in respect of a type of replacement silencing system, or components thereof, as a separate technical unit which does not comply with the requirements of this Regulation.

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Member States shall continue to grant EU type-approval, under the terms of Directive 70/157/EEC, to a replacement silencing system, or components thereof, as a separate technical unit intended for vehicles type-approved before the dates of phases of application set out in Annex III to this Regulation.

3 Subject to the dates of phases of application set out in Annex III to this Regulation, Member States shall, on grounds relating to the permissible sound level, consider certificates of conformity for new vehicles to be no longer valid for the purposes of Article 26 of Directive 2007/46/EC, and shall prohibit the registration, sale and entry into service of such vehicles where such vehicles do not comply with this Regulation.

4 Member States shall permit, on grounds relating to the permissible sound level, the sale and entry into service of a replacement silencing system, or components thereof, as a separate technical unit, if it conforms to a type in respect of which a EU type-approval has been granted in accordance with this Regulation.

Member States shall permit the sale and entry into service of replacement silencing systems, or components thereof, holding an EU type-approval as a separate technical unit under the terms of Directive 70/157/EEC intended for vehicles type-approved before the dates of phases of application set out in Annex III to this Regulation.

Article 5

General obligations of manufacturers

1 Manufacturers shall ensure that vehicles, their engine and their silencing system are designed, constructed and assembled so as to enable such vehicles, when in normal use, to comply with this Regulation, despite the vibration to which such vehicles are inherently subjected.

2 Manufacturers shall ensure that silencing systems are designed, constructed and assembled so as to be able to reasonably resist the corrosive phenomena to which they are exposed having regard to the conditions of use of vehicles, including regional climate differences.

3 The manufacturer shall be responsible to the approval authority for all aspects of the approval process and for ensuring conformity of production, whether or not the manufacturer is directly involved in all stages of the construction of a vehicle, system, component or separate technical unit.

Article 6

Additional sound emission provisions (ASEP)

1 This Article shall apply to vehicles of categories M₁ and N₁ equipped with an internal combustion engine fitted with original equipment manufacturer silencing systems, as well as to replacement silencing systems intended for such categories of vehicles in accordance with Annex IX.

2 Vehicles and replacement silencing systems shall meet the requirements of Annex VII.

3 Vehicles and replacement silencing systems shall be deemed to comply with the requirements of Annex VII, without further testing, if the manufacturer provides technical documents to the approval authority showing that the difference between the maximum and

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minimum engine speed of the vehicles at BB' as referred to in Figure 1 of the Appendix to Annex II, for any test condition inside the ASEP control range defined in point 2.3 of Annex VII, with respect to conditions set out in Annex II, does not exceed $0,15 \times S$.

4 The sound emission of the vehicle or replacement silencing system under typical on-road driving conditions, which are different from those under which the type-approval test set out in Annex II and Annex VII was carried out, shall not deviate from the test result in a significant manner.

5 The manufacturer shall not intentionally alter, adjust, or introduce any mechanical, electrical, thermal, or other device or procedure which is not operational during typical on-road driving conditions solely for the purpose of complying with the sound emission requirements under this Regulation.

6 In the application for type-approval, the manufacturer shall provide a statement, established in accordance with the model set out in the Appendix to Annex VII, that the vehicle type or replacement silencing system to be approved complies with the requirements of this Article.

7 Paragraphs 1 to 6 shall not apply to vehicles of category N_1 if one of the following conditions is met:

- a the engine capacity does not exceed 660 cm^3 and the power-to-mass ratio calculated by using the technically permissible maximum laden mass does not exceed 35;
- b the payload is at least 850 kg and the power-to-mass ratio calculated by using the technically permissible maximum laden mass does not exceed 40.

Article 7

Consumer information and labelling

Vehicle manufacturers and distributors shall endeavour to ensure that the sound level of each vehicle in decibels (dB(a)), measured in accordance with this Regulation, is displayed in a prominent position at the point of sale and in technical promotional material.

In the light of the experience gained in the application of this Regulation, the Commission shall, by 1 July 2018 carry out a comprehensive impact assessment on labelling conditions applicable to air and noise pollution levels and on consumer information. The Commission shall report on the findings of that assessment to the European Parliament and to the Council and, if appropriate, submit a legislative proposal.

Article 8

Acoustic Vehicle Alerting System (AVAS)

Manufacturers shall install AVAS meeting the requirements set out in Annex VIII in new types of hybrid electric and pure electric vehicles by 1 July 2019. Manufacturers shall install AVAS in all new hybrid electric and pure electric vehicles by 1 July 2021. Before those dates, where manufacturers choose to install AVAS in vehicles, they shall ensure that those AVAS comply with the requirements set out in Annex VIII.

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The Commission shall be empowered to adopt delegated acts in accordance with Article 10 in order to review Annex VIII and to include more detailed requirements on the performance of AVAS or of active safety systems, taking into account the UNECE work on that issue, by 1 July 2017.

Article 9

Amendment of the annexes

The Commission shall be empowered to adopt delegated acts in accordance with Article 10 to amend Annexes I, IV, VIII and X to adapt them to technical progress.

Article 10

Exercise of the delegation

1 The power to adopt delegated acts is conferred on the Commission subject to the conditions laid down in this Article.

2 The power to adopt delegated acts referred to in the second paragraph of Article 8 and in Article 9 shall be conferred on the Commission for a period of five years from 16 June 2014.

3 The delegation of power referred to in the second paragraph of Article 8 and in Article 9 may be revoked at any time by the European Parliament or by the Council. A decision to revoke shall put an end to the delegation of the power specified in that decision. It shall take effect the day following the publication of the decision in the *Official Journal of the European Union* or at a later date specified therein. It shall not affect the validity of any delegated acts already in force.

4 As soon as it adopts a delegated act, the Commission shall notify it simultaneously to the European Parliament and to the Council.

5 A delegated act adopted pursuant to the second paragraph of Article 8 or to Article 9 shall enter into force only if no objection has been expressed either by the European Parliament or by the Council within a period of two months of notification of that act to the European Parliament and the Council or if, before the expiry of that period, the European Parliament and the Council have both informed the Commission that they will not object. That period shall be extended by two months at the initiative of the European Parliament or of the Council.

Article 11

Revision clause

The Commission shall carry out and publish a detailed study on sound level limits by 1 July 2021. The study shall be based on vehicles meeting the latest regulatory requirements. On the basis of the conclusions of that study, the Commission shall, where appropriate, submit a legislative proposal.

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Article 12

Amendments to Directive 2007/46/EC

Annexes IV, VI and XI to Directive 2007/46/EC shall be amended in accordance with Annex XI to this Regulation.

Article 13

Transitional provisions

1 In order to check compliance of the test track as described in point 3.1.1 of Annex II, ISO 10844:1994 may be applied as an alternative to ISO 10844:2011 until 30 June 2019.

2 Vehicles with a serial hybrid drive train, which have a combustion engine with no mechanical coupling to the power train, shall be exempted from the requirements of Article 6 until 30 June 2019.

Article 14

Repeal

1 Without prejudice to the second subparagraph of Article 4(2) and the second subparagraph of Article 4(4), Directive 70/157/EEC is repealed with effect from 1 July 2027.

2 References to the repealed Directive shall be construed as references to this Regulation and shall be read in accordance with the correlation table set out in Annex XII to this Regulation.

Article 15

Entry into force

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

2 It shall apply from 1 July 2016.

3 Point 3.1.1 of Annex II shall apply from 1 July 2019.

4 Part B of Annex XI shall apply from 1 July 2027.

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

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- (1) Regulation No 85 of the Economic Commission for Europe of the United Nations (UN/ECE) — Uniform provisions concerning the approval of internal combustion engines or electric drive trains intended for the propulsion of motor vehicles of categories M and N with regard to the measurement of net power and the maximum 30 minutes power of electric drive trains ([OJ L 326, 24.11.2006, p. 55](#)).

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