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From: Secretary-General of the European Commission, signed by Ms Martine DEPREZ, Director

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To: Mr Jeppe TRANHOLM-MIKKELSEN, Secretary-General of the Council of the European Union

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Subject: COMMISSION DELEGATED REGULATION (EU) .../... of 23.4.2021 supplementing Regulation (EU) 2019/2144 of the European Parliament and of the Council by laying down detailed rules concerning the specific test procedures and technical requirements for the type-approval of motor vehicles with regard to their driver drowsiness and attention warning systems and amending Annex II to that Regulation

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Delegations will find attached document C(2021) 2639 final.

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Encl.: C(2021) 2639 final



Brussels, 23.4.2021  
C(2021) 2639 final

**COMMISSION DELEGATED REGULATION (EU) .../...**

**of 23.4.2021**

**supplementing Regulation (EU) 2019/2144 of the European Parliament and of the Council by laying down detailed rules concerning the specific test procedures and technical requirements for the type-approval of motor vehicles with regard to their driver drowsiness and attention warning systems and amending Annex II to that Regulation**

(Text with EEA relevance)

## **EXPLANATORY MEMORANDUM**

### **1. CONTEXT OF THE DELEGATED ACT**

Regulation (EU) 2019/2144 of the European Parliament and of the Council<sup>1</sup> mandates motor vehicles of categories M and N to be equipped with driver drowsiness and attention warning (DDAW) systems from 6 July 2022 for new types and from 7 July 2024 for all new vehicles. The DDAW is defined as a system that assesses the driver's alertness through vehicle systems analysis and, where needed, provides a warning to the driver. In particular, DDAW must detect or recognise the driving and/or steering pattern symptomatic of a driver exhibiting reduced alertness due to fatigue, and interact with and alert the driver via the vehicle's human-machine interface.

The Commission is empowered to lay down detailed rules concerning the specific test procedures and technical requirements for the type-approval of motor vehicles with regard to the driver drowsiness and attention warning. This Commission Delegated Regulation supplements Regulation (EU) 2019/2144 by laying down the respective technical requirements and test procedures. In particular, it provides for a reference scale to be used by type-approval authorities and technical services to measure driver drowsiness and a reference test procedure to be carried out with human participants.

### **2. CONSULTATIONS PRIOR TO THE ADOPTION OF THE ACT**

In the preparation of this act, the Commission carried out appropriate consultations with the Member States experts and stakeholders, which confirmed their general support.

### **3. LEGAL ELEMENTS OF THE DELEGATED ACT**

The legal basis of this delegated act is Article 4(6) and Article 6(6) of Regulation (EU) 2019/2144 of the European Parliament and of the Council.

Fatigue negatively affects driver's capability for safe and effective driving. It is estimated to be the cause for 10 to 25% of all road crashes in Europe<sup>2</sup>. Since the decrease of driver's alertness due to fatigue is mostly observed on long-distance driving with a constant speed, the safety potential of DDAW is expected when driving outside urban areas where the speed limit exceeds 70 km/h. For this reason, it is proposed that motor vehicles with design speed not exceeding 70 km/h would not be required to be fitted with driver drowsiness and attention warning systems.

Currently, there are no EURO NCAP<sup>3</sup> protocols for testing vehicle DDAW systems. The development of such systems is specific to research teams, car manufacturers and suppliers, therefore, the provisions of this Regulation cover the human machine interface aspect and the environment, where the DDAW must warn the driver.

Since DDAW systems assess the physical state of the driver through indirect means, it is not possible to fully test those systems through a set of defined tests or with a programmable

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<sup>1</sup> OJ L 325, 16.12.2019, p. 1.

<sup>2</sup>

[https://ec.europa.eu/transport/road\\_safety/specialist/knowledge/fatigue/fatigue\\_and\\_road\\_crashes/frequency\\_of\\_fatigue\\_related\\_crashes\\_en](https://ec.europa.eu/transport/road_safety/specialist/knowledge/fatigue/fatigue_and_road_crashes/frequency_of_fatigue_related_crashes_en)

<sup>3</sup> The European New Car Assessment Programme: <https://www.euroncap.com/en>

machine, which reproduces human behaviour. For this reason, it is proposed to apply the following test methods:

- (1) The vehicle manufacturer carries out validation tests with human participants, either in a simulated environment or in a test vehicle, and present to the approval authorities and technical services the technical documentation and the test results to be assessed as a compilation of successful drowsiness warning and failure to warn the driver. The vehicle manufacturer also proposes to the approval authority or technical service at least one test protocol for checking the capability of the DDAW system to provide a warning to the driver.
- (2) The approval authority or technical service assess the technical documentation and the results from the validation tests, performed by the vehicle manufacturer, and may re-run tests on predictable aspect of the DDAW system. The type-approval authorities or technical services perform the test protocol, prepared by the vehicle manufacturer, and deliver a PASS/FAIL depending on the ability of the DDAW system to provide a warning at least once during the testing.

The proposed performance requirements for tests run with human participants are based on statistical approach, taking into account either the average efficiency among the test subjects or the minimal efficiency for 95% of them. Level of drowsiness is measurement in accordance with the reference scale provided in this Regulation. However, vehicle manufacturers may choose to use an alternative measurement method, in which case it has to be duly documented and equivalence to the reference scale must be provided to the approval authority or the technical service.

This Commission Delegated Regulation also amends Annex II to Regulation (EU) 2019/2144 by adding a reference to this Regulation, which is the regulatory act establishing the specific requirements with regard to the driver drowsiness and attention warning systems.

**Commission Delegated Regulation (EU) .../... of 23.4.2021 supplementing Regulation (EU) 2019/2144 of the European Parliament and of the Council by laying down detailed rules concerning the specific test procedures and technical requirements for the type-approval of motor vehicles with regard to their driver drowsiness and attention warning systems and amending Annex II to that Regulation**

(Text with EEA relevance)

THE EUROPEAN COMMISSION,

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

Having regard to Regulation (EU) 2019/2144 of the European Parliament and of the Council of 27 November 2019 on type-approval requirements for motor vehicles and their trailers, and systems, components and separate technical units intended for such vehicles, as regards their general safety and the protection of vehicle occupants and vulnerable road users, amending Regulation (EU) 2018/858 of the European Parliament and of the Council and repealing Regulations (EC) No 78/2009, (EC) No 79/2009 and (EC) No 661/2009 of the European Parliament and of the Council and Commission Regulations (EC) No 631/2009, (EU) No 406/2010, (EU) No 672/2010, (EU) No 1003/2010, (EU) No 1005/2010, (EU) No 1008/2010, (EU) No 1009/2010, (EU) No 19/2011, (EU) No 109/2011, (EU) No 458/2011, (EU) No 65/2012, (EU) No 130/2012, (EU) No 347/2012, (EU) No 351/2012, (EU) No 1230/2012 and (EU) 2015/166<sup>1</sup>, and in particular Article 4(6) and point (a) of Article 6(6) thereof,

Whereas:

- (1) Article 6 of Regulation (EU) 2019/2144 requires motor vehicles of categories M and N to be equipped with certain advanced vehicle systems, including driver drowsiness and attention warning ('DDAW') systems. It lays down in its Annex II basic requirements for the type-approval of motor vehicles with regard to the driver drowsiness and attention warning systems.
- (2) Detailed rules are necessary concerning the specific test procedures and technical requirements for the type-approval of motor vehicles with regard to driver drowsiness and attention warning systems.
- (3) Fatigue negatively affects driver's physical, cognitive, psychomotor and sensory processing capabilities, which are needed for safe driving. Driver fatigue is a factor in 10-25 % of all road crashes in the Union.
- (4) In accordance with Article 3, point (5), of Regulation (EU) 2019/2144 the DDAW system is a system that assesses the driver's alertness through vehicle systems analysis and warns the driver if needed via the vehicle's human-machine interface.
- (5) DDAW systems are more effective outside the urban zones because the reduced driver alertness due to fatigue mostly occurs in long-distance driving at a constant speed. Moreover, constantly changing driving and steering pattern when driving within urban zones is difficult for assessment with the available technologies. Motor vehicles with a maximum design speed of 70 km/h or below should therefore be exempted from the obligation to be equipped with DDAW systems.

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<sup>1</sup> OJ L 325, 16.12.2019, p. 1.

- (6) The DDAW systems assess the human physical state through indirect means, such as system analysis and recognition of driving or steering pattern of a driver exhibiting reduced alertness due to drowsiness, therefore it is not possible to fully test those systems through a set of defined tests or with a programmable machine, which reproduces human behaviour. Instead, the manufacturer should perform validation testing with human participants and present the results to the approval authority together with at least one test protocol for checking the capability of the DDAW systems to produce a warning to the drowsy driver.
- (7) Taking into account the indirect nature of the measurement, the variability in the effects of human drowsiness and the relative immaturity of existing technologies, the performance requirements for DDAW systems should be set at a level that is realistic and attainable. At the same time, those requirements should be technology-neutral, in order to foster development of new technologies, therefore, the assessment of the performance of DDAW systems should be based on a statistical approach, taking into account either the average efficiency among the test subjects or the minimal efficiency for 95% of them. However, the use of the latter option should be preferred as it provides that the DDAW systems will perform equally effective to all drivers.
- (8) This Regulation should provide a reference scale to be used by manufacturers to measure driver drowsiness in the tests involving human participants. Where manufacturers choose to use an alternative measurement method, it should be duly documented and equivalence to the reference scale in this Regulation should be provided.
- (9) The table in Annex II to Regulation (EU) 2019/2144 containing the list of requirements referred to in Article 4(5) and Article 5(3) of that Regulation does not contain any reference to regulatory acts as regards driver drowsiness and attention warning systems. It is therefore necessary to introduce a reference to this Regulation in that Annex.
- (10) Regulation (EU) 2019/2144 should therefore be amended accordingly.
- (11) As Regulation (EU) 2019/2144 is to apply from 6 July 2022, this Regulation should apply from the same date.
- (12) The provisions of this Regulation are closely linked as they deal with rules concerning the specific test procedures and technical requirements for the type-approval of motor vehicles with regard to their driver drowsiness and attention warning systems. As a result of the rules laid down in this Regulation, it is necessary to add a reference to this Regulation in Annex II to Regulation (EU) 2019/2144. It is therefore appropriate to lay down those provisions in a single Delegated Regulation,

HAS ADOPTED THIS REGULATION:

#### *Article 1*

##### **Scope**

This Regulation applies to motor vehicles of categories M and N, as defined in points (a) and (b) of Article 4(1) of Regulation (EU) 2018/858 of the European Parliament and of the Council, with a maximum design speed above 70 km/h.

#### *Article 2*

##### **Technical requirements for the driver drowsiness and attention warning system**

Technical requirements for the approval of motor vehicles with regard to the driver drowsiness and attention warning systems are laid down in Part 1 of Annex I.

#### *Article 3*

##### **Procedures for validation of driver drowsiness and attention warning systems**

Test procedures for validation of driver drowsiness and attention warning systems by the manufacturer are laid down in Part 2 of Annex I.

#### *Article 4*

##### **Procedures for assessment of technical documentation and verification testing**

Procedures for assessment of the technical documentation provided by the manufacturer and for verification testing by the approval authorities and technical services are laid down in Part 3 of Annex I.

#### *Article 5*

##### **Amendment to Regulation (EU) 2019/2144**

Annex II to Regulation (EU) 2019/2144 of the European Parliament and of the Council is amended in accordance with Annex II to this Regulation.

#### *Article 6*

##### **Entry into force and application**

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

It shall apply from 6 July 2022.

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

Done at Brussels, 23.4.2021

*For the Commission*  
*The President*  
*Ursula VON DER LEYEN*