



2023/2590

22.11.2023

COMMISSION DELEGATED REGULATION (EU) 2023/2590

of 13 July 2023

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 certain motor vehicles with regard to their advanced driver distraction warning systems and amending 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⁽¹⁾, and in particular Article 4(6) and Article 6(6), point (a) 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 advanced driver distraction warning ('ADDW') systems. Annex II to that Regulation lays down requirements for the type-approval of motor vehicles with regard to the ADDW systems.
- (2) In accordance with Article 3, point (6), of Regulation (EU) 2019/2144, the ADDW system is a system that helps the driver to continue to pay attention to the traffic situation and that warns the driver when they are distracted. Taking into account the wide variety of drivers' characteristics, the variability of seating positions, and the relative market immaturity of existing technologies, the performance requirements for ADDW systems should be set at a level that is realistic and attainable with regard to the limited experience gathered from the systems on the market and the room needed for further innovation of these systems. At the same time, those requirements should be technology-neutral, in order to foster development of new technologies. Therefore, this Regulation focuses on warning drivers in cases of long visual distraction.
- (3) As next stage, the Commission will continue the work to further investigate, develop and adopt by July 2027 requirements which will follow the technological progress of ADDW systems, in accordance with Article 14 of Regulation (EU) 2019/2144. These progress include intermittent distraction, the assessment of types of driver distraction other than visual (e.g. cognitive distraction), driver's body movement (e.g. looking to the rear) and distraction avoidance by technical means.
- (4) This Regulation should set reasonable expectations for the range of driver characteristics and seating positions for which ADDW systems should be effective. Manufacturers should provide evidence that their ADDW system is effective across the defined range of driver characteristics and seating positions.
- (5) The table in Annex II to Regulation (EU) 2019/2144 containing the list of requirements referred to in Article 4(5) and Article 6(3) of that Regulation does not contain any reference to regulatory acts as regards the advanced driver distraction warning systems. It is therefore necessary to introduce a reference to this Regulation in that Annex. Regulation (EU) 2019/2144 should therefore be amended accordingly.

⁽¹⁾ OJ L 325, 16.12.2019, p. 1.

- (6) As the requirement for ADDW systems under Regulation (EU) 2019/2144 is to apply from 7 July 2024 (as described in Annex II of Regulation (EU) 2019/2144), this Regulation should apply from the same date.
- (7) 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 advanced driver distraction 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 Article 4(1), points (a) and (b) of Regulation (EU) 2018/858 of the European Parliament and of the Council ⁽²⁾.

Article 2

Technical requirements for the advanced driver distraction warning system

Technical requirements for the type-approval of motor vehicles with regard to the advanced driver distraction warning systems are laid down in Part 1 of Annex I.

Article 3

Specific test procedures for validation of advanced driver distraction warning system

Specific test procedures for validation of advanced driver distraction warning systems by the technical services are laid down in Part 2 of Annex I.

Article 4

Amendment to Regulation (EU) 2019/2144

Annex II to Regulation (EU) 2019/2144 is amended in accordance with Annex II to this Regulation.

Article 5

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 7 July 2024. However, from 1 January 2024, national authorities shall not refuse to grant EU type approval for a new type of vehicle or grant extension for an existing type of vehicle, where the vehicle concerned complies with this Regulation, if a manufacturer so requests.

⁽²⁾ Regulation (EU) 2018/858 of the European Parliament and of the Council of 30 May 2018 on the approval and market surveillance of motor vehicles and their trailers, and of systems, components and separate technical units intended for such vehicles, amending Regulations (EC) No 715/2007 and (EC) No 595/2009 and repealing Directive 2007/46/EC (OJ L 151, 14.6.2018, p. 1).

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

Done at Brussels, 13 July 2023.

For the Commission
The President
Ursula VON DER LEYEN

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ANNEX I

PART 1

TECHNICAL REQUIREMENTS FOR THE ADVANCED DRIVER DISTRACTION WARNING (ADDW) SYSTEMS**1. Definitions**

For the purposes of this Annex ⁽¹⁾, the following definitions apply:

- 1.1. 'vehicle type with regard to the ADDW system' means vehicles which do not differ in such essential respects as the characteristics and functionality of the ADDW system as well as the feedback system used to aid the driver;
- 1.2. 'non-nominal situation' means a situation where the ADDW system is affected by driver-, vehicle-, environment-related or other elements, and which remain within the system boundary limits declared in the manufacturer's documentation package described in Part 3 in this annex;
- 1.3. 'ocular reference point' means the unique eye reference used in vehicle design.

2. General technical requirements

- 2.1. An ADDW system shall determine when the driver's visual attention is not directed towards the driving tasks and alert the driver through the vehicle human-machine interface.
- 2.2. The ADDW system shall be designed to minimise the system error rate (false positive) under real driving conditions.

2.3. Privacy and data protection

- 2.3.1. The ADDW system shall function without relying on biometric personal data of any vehicle occupants. In this context, the biometric personal data is resulting from specific technical processing relating to the physical, physiological or behavioural characteristics of a natural person, which allow or confirm the unique identification of that natural person, such as facial images or dactyloscopic data. This requirement does not forbid the ADDW system to use data from the camera(s) equipped in the vehicle, it forbids the identification of the person by the ADDW system.
- 2.3.2. The ADDW system shall be designed in such a way that it shall only continuously record and retain data necessary for the system to function and operate within a closed-loop system.
- 2.3.3. Any processing of personal data shall be carried out in accordance with Union data protection law.

3. Specific technical requirements.**3.1. ADDW system control**

- 3.1.1. The ADDW system shall be automatically activated above the speed of 20 km/h, unless specified otherwise by the requirements laid down in points 3.1.2 to 3.1.6. The vehicle manufacturer may choose to set the automatic activation of the ADDW system at a lower speed.

A cumulative period of up to 1 minute of driving at speeds ≥ 20 km/h is permitted for the system to begin measuring the driver state and to calibrate itself.

- 3.1.2. It shall be possible for the driver to manually deactivate either the ADDW warning or the ADDW system, depending on which of the two possibilities (or both) the vehicle manufacturer chose to make possible.

⁽¹⁾ The definitions introduced in the Regulation (EU) 2019/2144 of the European Parliament and of the Council also apply for this Annex, notably definition (6) 'advanced driver distraction warning'.

3.1.3. The ADDW system may be automatically deactivated in the situations pre-defined by the manufacturer, specifically in situations:

- (a) when another system takes over the entire dynamic driving task on a sustained basis and is supported with an appropriate driver monitoring system;
- (b) when a driver-operated vehicle system, assisting a human driver in controlling the longitudinal and lateral motion on a sustained basis, is active and contains an appropriate driver monitoring system.

The ADDW system shall be automatically reactivated as soon as the conditions that led to its automatic deactivation are no longer present.

In this context, the dynamic driving task shall include all real time operational functions and tactical functions required to operate the vehicle, excluding strategic functions such as trip scheduling and selection of destinations and waypoints and including the following subtasks:

- (a) lateral vehicle motion control via steering (operational);
- (b) longitudinal vehicle motion control via acceleration and deceleration (operational);
- (c) monitoring the driving environment via object and event detection, recognition, classification, and response preparation (operational and tactical);
- (d) object and event response execution (operational and tactical);
- (e) manoeuvre planning (tactical);
- (f) enhancing conspicuity via lighting, sounding the horn, signalling or gesturing (tactical).

3.1.4. The ADDW system shall not be automatically deactivated under conditions laid down in point 3.5, but the ADDW system's distraction warnings may be automatically deactivated. The distraction warning emission should be automatically reactivated as soon as the conditions that led to its deactivation are no longer present.

3.1.5. The emission of distraction warnings by the ADDW system may be automatically deactivated under conditions in which other driving assistance system are warning about an imminent danger or a critical situation, but it is not a condition for automatic deactivation of the ADDW system. The distraction warning emission should be automatically reactivated as soon as the conditions that led to its deactivation are no longer present.

3.1.6. The ADDW system, including human-machine interface warnings, shall be automatically reinstated to normal operation mode upon each activation of the vehicle master control switch. Other automatic reinstatement conditions may be introduced and added by the vehicle manufacturer.

3.2. Environmental conditions

3.2.1. The ADDW system shall operate effectively during both day and night.

3.3 Monitoring driver distraction

3.3.1 The presence of the driver's gaze shall be monitored by the ADDW system in the areas of interest referred to in points 3.3.1.1 to 3.3.1.3.

The driver's gaze is considered to start from the ocular reference point defined as follows:

For M and N category vehicles, the ocular reference point shall be the centre of the driver's ocular points, as defined in UN Regulation 46 ^(*)(on devices for indirect vision). The coordinate of the eye point is, therefore, 635 mm vertically above point R of the driver's seat (the 'R' point being already established in relation to the fiducial marks defined by the vehicle manufacturer).

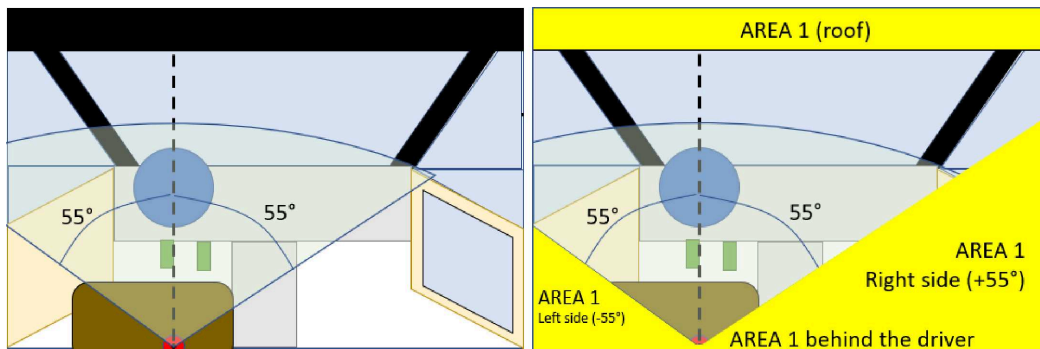
^(*) UN Regulation 46 on Devices for Indirect Vision:
<https://op.europa.eu/en/publication-detail/-/publication/780cbf09-1ec1-11e4-8c3c-01aa75ed71a1>.

Alternatively, for M₂, M₃, N₂ and N₃ category vehicles not based on an M₁ platform, the ocular reference point may be the eye point E2 as defined in UN Regulation No 167 on direct vision (⁹). Eye point E2 is a point representing the midpoint between the centre of the driver's left and right eye, E2 is defined by an offset from the accelerator heel point of 1 163,25 mm in the Z axis, and 678 mm rearward in the X axis. The position of E2 in the Y axis is on a vertical plane, parallel to the median longitudinal plane and passing through the centre of the driver's seat.

3.3.1.1. Area 1 is designated as overlap of the following zones:

- (a) the roof of the vehicle;
- (b) any area in the vehicle which is outside (with respect to the forward-looking direction of the driver considered at 0° of orientation) of the two vertical planes, one, rotated +55° (to the right) and one rotated -55° (to the left) in relation to the longitudinal direction of the vehicle, both planes intersecting in the ocular reference point as defined below.

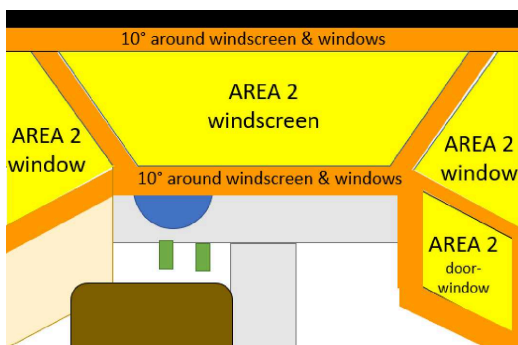
Pictures below are showing left-hand driving situation.



3.3.1.2. Area 2 is designated as union of the zones listed below:

- (a) the area of the windscreen and windows;
- (b) 10° around the area of the windscreen and windows as seen from the ocular reference point.

Picture below is showing left-hand driving situation.

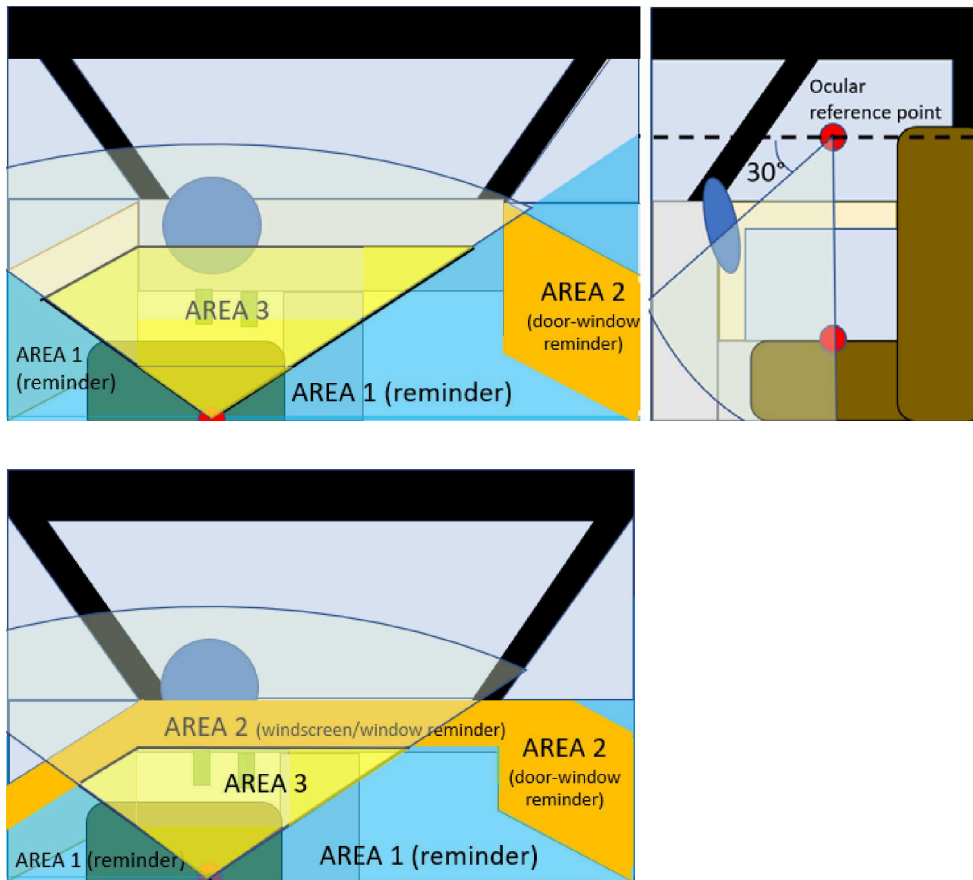


3.3.1.3. Area 3 is designated by any area below a plane, 30° downward from the driver's ocular reference point and by the interaction with Area 1 and Area 2 described hereafter.

- (a) by default, any area considered in Area 1 is excluded from Area 3;
- (b) by default, any area considered in Area 2 is excluded from Area 3;
- (c) the vehicle manufacturer can choose to include part of the area from Area 1 and/or Area 2 to the Area 3.

⁽⁹⁾ UN Regulation 167 on Direct Vision repository in 2022–2023 (publication in the *Official Journal of the European Union* will follow): https://unece.org/sites/default/files/2022-10/ECE_TRANS_WP.29_2022_140r1e.pdf.

Picture below is showing left-hand driving situation.



(the image at the bottom represents the case if Area 2 (windscreen plus 10°) lowest part is below the 30° vertical view angle)

3.3.1.4. Adding or excluding an area from another is always done from the perspective of the driver's ocular reference point. That means that it is the angular coordinate which must be used when projecting an area onto another one, and not the spatial coordinate.

After the projection is done, the spatial coordinate may be used to describe the resulting area and simplify its description.

3.3.2 Warning triggers and situations covered by the ADDW system

3.3.2.1. A warning shall be provided to the driver as soon as both of the following conditions apply:

- (a) vehicle's speed at 50 km/h or above;
- (b) the gaze of the driver in the Area 3 last for a maximum time of 3,5 seconds in the nominal situation. Non-nominal situations set out in Part 3, point 1.3, may extend the maximum nominal situation's time limit by additional 1,5 seconds.

Whenever the conditions listed in (b) are tested, they shall implement an additional buffer time to compensate for the technical measurement uncertainties.

3.3.2.2. A warning shall be provided to the driver as soon as both of the following conditions are verified:

- (a) vehicle's speed at 20 km/h or above;
- (b) the gaze of the driver in the Area 3 last for a maximum time of 6 seconds in the nominal situation. Non-nominal situations set out in Part 3, point 1.3, may extend the maximum nominal situation's time limit by additional 1,5 seconds.

Whenever the conditions listed in (b) are tested, they shall implement an additional buffer time to compensate for the technical measurement uncertainties.

- 3.3.2.3. The length of time during which the gaze of the driver is directed at the area 3 shall be counted when the ADDW system is activated. This length of time is measured regardless of the speed of the vehicle, as long as the ADDW system is activated and able to measure it.
- 3.3.2.4. The length of time during which the gaze of the driver is in area 3 shall not be reset due to possible image processing artefact or a short change of gaze direction 'in, out and back in' of the area 3. The allowed time tolerance for the events described shall be defined by the vehicle manufacturer, with a minimum time tolerance of 50 milliseconds (eye saccades).
- 3.3.2.5. The vehicle manufacturer may choose to set a lower minimum speed requirement in situations referred to in 3.3.2.1 and 3.3.2.2.
- 3.3.2.6. The vehicle manufacturer may implement additional warning strategies, based on additional input which help the system understanding the driver's behaviour, cognitive distraction or immediate environment within the vehicle.

3.4. **Human-machine interface requirements**

3.4.1. *Warning nature*

- 3.4.1.1. A visual warning shall be used by the ADDW system to inform the driver and an acoustic and/or a haptic warning shall be used by the ADDW system to alert the driver as soon as possible after occurrence of the trigger behaviour and may cascade and intensify until the trigger condition set out in points 3.3.2.1, 3.3.2.2 or 3.3.2.6 cease to be verified.

The warning is considered to start when the audio or haptic warning is presented to the driver.

- 3.4.1.2. The warning provided to the driver may be adapted to allow a warning strategy based on previous events, driver's behaviour, road conditions, weather and other relevant contextual information. Any adaptation to the warning must meet the technical criteria set out from points 3.4.2 to 3.4.4.2.

3.4.2. *Visual warning*

- 3.4.2.1. The visual warning shall be located so as to be readily visible and recognisable by the driver in daylight and at night-time can be used for any attentiveness alerts, provided that it will not confuse the driver.
- 3.4.2.2. The visual warning shall be a steady or flashing indication (e.g. tell-tale, pop-up message, etc.).

3.4.3. *Acoustic warning*

- 3.4.3.1. The acoustic warning shall be easily recognised by the driver.
- 3.4.3.2. A majority of the acoustic warning shall fall within the frequency spectrum of 200–8 000 Hz and the amplitude range of 50–90 dB. The vehicle manufacturer may adjust the amplitude depending on the surrounding noise level.
- 3.4.3.3. If speech alerts are utilised, the vocabulary used shall be consistent with any text used as part of the visual alert.
- 3.4.3.4. The audible portion of the alert shall last for at least the duration that allows the driver to understand it.

3.4.4. *Haptic warning*

- 3.4.4.1 The haptic warning shall be noticeable by the driver and be provided directly or indirectly through any interface expected to attract the attention of the driver back to the driving task.

3.5. **ADDW system failure warning**

3.5.1. *Permanent failures*

- 3.5.1.1 Upon detection of permanent failure in the ADDW system, a constant visual failure warning signal shall be provided.

- 3.5.1.2. There shall be at least one ADDW initial self-check completed before the ADDW is operational. Subsequently a failure warning signal shall be indicated to the driver in the case of an electrically detectable failure.

- 3.5.1.3. The system shall recognise a non-temporary sensor obscuration event and deliver the failure warning signal as laid down in point 3.5.1.1 which shall be displayed. A sensor obscuration event covers at a minimum in the event when no light is measured by the sensor when the ADDW system is activated.

- 3.5.1.4. Failures that activate the warning signal, but which are not detected when the ADDW is de-activated, shall be retained upon detection and continue to be displayed from start-up of the vehicle after each activation of the vehicle master control switch, for as long as the failure or defect remains.

3.5.2. *Temporary failures*

- 3.5.2.1. Upon detection of a temporary non-electrical failure condition, the failure warning signal as laid down in point 3.5.1 may be displayed.

- 3.5.2.2. An information shall be provided to the driver concerning the current limitation of the ADDW system and/or typical limitations of the ADDW system. The limitations concerned are the ones causing the ADDW system to temporarily functions inadequately because insufficient driver facial features are detectable due to excessive driver-, vehicle-, environment-related or other elements that affect the performance of the ADDW system and which may not be handled as a non-nominal situation. The vehicle manufacturer may use an active approach via an additional visual warning and/or a passive approach via written information.

3.6. **Provisions for periodic roadworthiness tests**

- 3.6.1. For the purpose of periodic roadworthiness tests of vehicles, it shall be possible to verify the following features of the ADDW system:

- (a) its correct operational status, by visible observation of the failure warning signal status following the activation of the vehicle master control switch and any bulb check. Where the failure warning signal is displayed in a common space (the area on which two or more information functions/symbols may be displayed, but not simultaneously), it must be checked first that the common space is functional prior to the failure warning signal status check;

- (b) its correct functionality and the software integrity, by the use of an electronic vehicle interface, such as the one laid down in point I(14) of Annex III of Directive 2014/45/EU of the European Parliament and of the Council ⁽⁴⁾, where the technical characteristics of the vehicle allow for it and the necessary data is made available. Vehicle manufacturers shall ensure to make available the technical information for the use of the electronic vehicle interface in accordance with Article 6 of Commission Implementing Regulation (EU) 2019/621 ⁽⁵⁾.

- 3.6.2. At the time of type-approval, the means to protect against simple unauthorised modification of the operation of the failure warning signal chosen by the vehicle manufacturer shall be confidentially outlined in the assessment of the technical documentation under Part 3. Alternatively, this protection requirement is fulfilled when a secondary means of checking the correct operational status of the ADDW system is available.

PART 2

TEST PROCEDURES FOR SPOT-CHECK TESTING OF ADDW SYSTEMS BY TYPE APPROVAL AUTHORITIES AND TECHNICAL SERVICES

1. **General requirements for spot-check testing**

- 1.1. Spot-check testing shall be conducted under conditions to ensure that the ADDW system is operational and able to display all the warnings. The conditions may be simulated to facilitate the testing.

1.2. **Testing apparatus**

- 1.2.1. Vehicle considered for the type approval set in its default configuration.

In this context, a default configuration applies for vehicle with moving parts (i.e. that the driver can change without need for external help) which can change the driver's visibility or access to more space within the front compartment (including the roof).

The default configuration for the test shall allow the driver to see and interact with the most fixation points in area 3 as set out in point 1.4.2 and minimise the environmental effect such as sunlight, wind and rain.

- 1.2.2. Equipment that is able to determine the displayed speed of the test vehicle (real or simulated) to ± 1 km/h to record and confirm the speeds requirement laid down in point 1.5.1.
- 1.2.3. Sufficient number of supplementary cameras that are located such as to provide an overview of the test conditions laid down in point 2.

1.3. **Testing sample**

- 1.3.1. Testing shall take place with at least one test driver in the driver's seat.

The test driver shall present the attributes laid down in points 1.3.1.1 to 1.3.1.4.

- 1.3.1.1. The test driver must be in a position that allows the driver's eyes, with their normal seat and steering wheel adjustment for driving, to be at the eye point of the ocular reference with a variability of position either, to the choice of the vehicle manufacturer:

- (a) ± 100 mm longitudinally and ± 50 mm vertically around the ocular reference point;

⁽⁴⁾ Directive 2014/45/EU of the European Parliament and of the Council of 3 April 2014 on periodic roadworthiness tests for motor vehicles and their trailers and repealing Directive 2009/40/EC (OJ L 127, 29.4.2014, p. 51).

⁽⁵⁾ Commission Implementing Regulation (EU) 2019/621 of 17 April 2019 on the technical information necessary for roadworthiness testing of the items to be tested, on the use of the recommended test methods, and establishing detailed rules concerning the data format and the procedures for accessing the relevant technical information (OJ L 108, 23.4.2019, p. 5).

- (b) based on a standard relevant for specifying the possible driver's eyepoint position around the ocular reference point, while ensuring coverage of an area of similar or larger size than described in (a) above.

1.3.1.2. No glasses or head accessory, including hat or mask.

1.3.1.3. No facial hair other than eyebrows.

1.3.1.4. Vehicle manufacturer may choose to allow one or more of the attributes set out in points 1.3.1.2 and 1.3.1.3 for the test drivers. Vehicle manufacturer may choose to enlarge the zone of possible position of the driver's eyes set out in point 1.3.1.1.

1.4. **Gaze fixation points**

1.4.1. The appropriate location of the fixation points to be tested shall be proposed by the vehicle manufacturer according to the geometrical and design constraints of the vehicle's cabin considered for the type approval.

1.4.2. Spot-check testing shall include at least one fixation point located in all of the following zones, if present in the vehicle, and, when possible, within Area 3 as set out in Part 1, point 3.3.1.3:

- (a) driver's left knee;
- (b) driver's right knee;
- (c) driver's lap;
- (d) passenger's footwell or similar location looking down toward the front lower area of the vehicle from left or right from the driver's seat;
- (e) passenger's seat surface or similar location looking down left or right from the driver's seat toward a surface intended to seat a passenger, store goods or allow passenger's movement in the vehicle;
- (f) glove box or similar location at 30° (vertical) from the other side (from the driver's side) of the front compartment of the vehicle;
- (g) air vents to the immediate left side of the driver;
- (h) air vents to the immediate right side of the driver;
- (i) instrument cluster, excluding the heads-up display nor a display crossing the base of the windscreen;
- (j) steering wheel, when equipped with buttons for interacting with the infotainment system or assistance systems;
- (k) gear shifter
- (l) heating, ventilation, and air conditioning controls;
- (m) infotainment display;
- (n) centre console, consisting of the forward zone near dashboard panel, if not covered by any other fixation point referred to from (a) to (m).

1.4.3. If the driver's position is at the centre of the front compartment or close to it and the 'other side (from the driver's side) of the front compartment of the vehicle' corresponds to two possible zones to the left and to the right of the driver's position, the technical services shall choose one of the following:

- (a) to split the gaze fixation into the 'left version' and the 'right version' of the fixation point;
- (b) only if there is more than one fixation point which can be split, to alternate by doing the 'left version' for a given fixation point and the 'right version' for another fixation point – so as to cover the left side and the right side at least once (for each side).

1.5. **Testing velocities**

1.5.1. All gaze fixation points shall be tested, at least, once between 20 and 35 km/h and once between 50 and 65 km/h.

1.6. **Environmental conditions**

1.6.1. The tests must be performed on the vehicle under real or simulated external condition of operation for day and night.

Systems not affected by daylight may be tested either in day or night conditions.

1.6.1.1. Where the testing is executed on a test track road environment:

- (a) day: testing shall start after sunrise and before sunset;
- (b) night: testing shall start after sunset and before sunrise.

1.6.1.2. In case of testing executed on a simulated road environment:

- (a) day: conditions diffuse with ambient light (ISO 15008: 2017);
- (b) night: condition of low ambient illumination under which the adaptation level of the driver is mainly influenced by the portion of the road ahead covered by the vehicle's own headlights and surrounding street lights, and display and instrument brightness (ISO 15008: 2017).

1.7. **Definition of temporal thresholds for warnings**

1.7.1. Primary threshold for emitting distraction warning:

A warning should be triggered in accordance with the requirements set out in points 3.3.2.1 and 3.3.2.2 of Part 1, where the gaze fixation points set out in Part 2, point 1.4.2 shall be the monitoring parameters.

2. **Procedure for spot-check testing**

2.1. The test driver shall be instructed on the functionality of the system. The instruction process shall be clearly documented in the evidence dossier supplied by the vehicle manufacturer to the type approval authorities and technical services in accordance with Part 3.

2.2. If the ADDW system should be calibrated for a period of time after its initialisation, calibration procedures shall take place during a baseline driving situation, with no parallel distracting activities.

2.3. **Testing of gaze fixation points**

2.3.1. Testing procedure shall detect occurrences of single, uninterrupted long-duration gazes by the driver away from the driving situation. Detecting those occurrences shall begin when both of the following conditions are met:

- (a) the vehicle registers the velocity to be tested, according to point 1.5.1;
- (b) the ADDW system assesses the driver as not distracted for at least 60 seconds.

2.3.2. The authority responsible for the type-approval may decide the sequence in which the fixation points are tested.

2.3.3. During the test, actions by the driver should be limited to those naturally expected from the fixation points considered.

- 2.3.4. All fixation points assigned to the zones set out in point 1.4.2 shall be tested.
- 2.3.5. For the measurement of each individual gaze fixation point, the start of the measurement is triggered as soon as the test driver is assessed by the system as not distracted for at least 15 seconds.
- 2.3.6. The vehicle manufacturer may provide information via the documentation, referred to in Part 3, to define the key behaviour/activities which will not be recognised as distracted actions for the purpose of that test.
- 2.3.7. The test driver is instructed to shift their gaze to one of the fixation points, applying the requirement from point 2.3.3 as well as possible.
- 2.3.8. The test driver maintains their gaze focused on the fixation point until a warning is emitted or until the expected time for a warning is passed by, at least, 3 seconds
- 2.3.9. After the measurement of each individual fixation point, the driver shall be assessed by the system as not distracted for at least 15 seconds before moving on to the next fixation point.

3. **Test results**

- 3.1. Measurements shall be treated as false negative when the driver maintains their gaze focused on a fixation point located inside Area 3 set out in Part 1, point 3.3.1.3 and under the condition set out in Part 1, point 3.3.2.1 and no distraction warning is emitted within 4 seconds (which includes a 0,5 second uncertainty buffer).

A measurement may be changed from false negative to 'not applicable' if an audio or haptic warning from a different vehicle's system has been triggered, within the expected time for an ADDW system, and is linked to the assessment of the driver's behaviour referred to in point 2.3.6.

- 3.2. Measurements shall be treated as false negative when the driver maintains their gaze focused on a fixation point located inside Area 3 set out in Part 1, point 3.3.1.3 and under the condition set out in Part 1, point 3.3.2.2 and no distraction warning is emitted within 6,5 seconds (which includes a 0,5 second uncertainty buffer).

A measurement may be changed from false negative to 'not applicable' if an audio or haptic warning from a different vehicle's system has been triggered, within the expected time for an ADDW system, and is linked to the assessment of the driver's behaviour referred to in point 2.3.6.

4. **Re-test procedure to filter imperfect human behaviour assessment**

- 4.1. The re-test procedure must be performed for a maximum of two times for each fixation point assessed as false negative in accordance with point 3.1, which was tested between 50 and 65 km/h, and must be performed for a maximum two times for a fixation point assessed as false negative in accordance with point 3.2, which was tested between 20 and 35 km/h.

- 4.2. The re-test procedure must follow the step of the test procedure set out in points 2.1 to 2.3.9, with the following adaptation:

- (a) the fixation point list includes only fixation points previously classified as false negative;
- (b) the test driver must perform a different action, related to a distracted behaviour, for each re-test of a given fixation point

The technical services may use the same or a different test driver, provided that the test driver fulfils the requirements set out in points 1.3.1.1 to 1.3.1.4.

5. **Final test results**

- 5.1. Measurements during the re-test procedure shall be treated as 'fail' if a fixation point is re-tested and assessed two times as a false negative in accordance with point 3.1, if tested between 50 and 65 km/h. A false negative re-assigned as 'not applicable' or true positive shall not be considered a false negative anymore and shall not generate a 'fail'. If a single re-test has been performed and it is a false negative, the second retest of the fixation point shall be performed.
- 5.2. Measurements during the re-test procedure shall be treated as 'fail' if a fixation point is re-tested and assessed two times as a false negative in accordance with point 3.2, if tested between 20 and 35 km/h. A false negative re-assigned as 'not applicable' or true positive shall not be considered a false negative anymore and shall not generate a 'fail'. If a single re-test has been performed and it is a false negative, the second retest of the fixation point shall be performed.

6. **Acceptance criteria**

6.1. **Verification of the fulfilment of all technical requirements for ADDW systems via spot-check testing**

6.1.1. Fail-criterion:

The ADDW system shall be considered to have failed the spot-check testing when amongst all gaze fixation points set out in Part 2, point 1.4.2, tested in accordance with the procedure set out in point 2, and possibly re-tested in accordance with point 4 one or more 'fail' measure is found, in accordance with point 5.

6.1.2. Pass-criterion:

The ADDW system shall be considered to have passed the spot-check testing when the fail criterion set out in point 6.1.1 is not met.

PART 3

PROCEDURES FOR ASSESSMENT OF TECHNICAL DOCUMENTATION BY THE VEHICLE MANUFACTURER TO BE PROVIDED TO THE APPROVAL AUTHORITIES AND TECHNICAL SERVICES

1. **Documentation package**

- 1.1. The vehicle manufacturer shall provide the approval authority and technical service a documentation package containing evidence of the performance of the ADDW system.
- 1.2. The documentation package shall cover the description of the system functionality, in accordance with point 2, as well as the validation process of the system, in accordance with point 3.
- 1.3. The vehicle manufacturer shall provide a description of the limitations of the system. These limitations may be, but are not limited to, driver-, vehicle- or environment-related elements, which may cause the ADDW system to have its performance degraded.
- 1.4. Within the described limitations of the system, the vehicle manufacturer shall provide information on assessments of the performance of the ADDW system based on repeated tests, describing how the system is able to monitor driver distraction and emit the corresponding warnings.
- 1.5. The documentation package shall be provided to the type approval authority and technical service prior to the execution of the spot-check testing set out in Part 2, point 2.

2. **ADDW system functionality**

- 2.1 The documentation package detailing how the ADDW system functions shall include the following:
- (a) an explanation of the system's activation, reactivation and deactivation functions, including the associated vehicle speed ranges;
 - (b) a list of all the system inputs containing all the metrics adopted for measuring driver distraction;
 - (c) a description of how the metrics function and monitor driving behaviour, including, if applicable, the relationship between primary and secondary/fall-back metrics;
 - (d) a description of the triggers in driving behaviour being monitored by the system;
 - (e) a description of the area around the ocular reference possible for the system and, if a reference to a standard is used, the area where the eyes of test driver are expected to be, as set out in Part 2, point 1.3.1.1(b).
 - (f) a description (textual description, illustration, technical drawing or any other sufficient means) of the area within the vehicle cabin that the system considers to be areas 1, 2, and 3, in accordance with Part 1, point 3.3.1, for assessing driver distraction;
 - (g) the zone(s) delimiting the placement of each of the gaze fixation points for spot-check testing within the vehicle cabin, in accordance with Part 2, point 1.4.2;
 - (h) a document detailing the components of the system's human-machine interface as well as their intended functionality, including the following:
 - (i) evidence of compliance with the ADDW human-machine interface requirements in accordance with Part 1, point 3.4, and justifications if the vehicle manufacturer chooses not to follow the recommendation set out in Part 1, point 3.4.3.2;
 - (ii) if applicable, a description of the strategy for repetition, cascading or escalation of the warning emission for the cases in which the driver fails to comply with the emitted distraction warnings;
 - (i) an explanation how the ADDW system may be tuned if the vehicle is adapted for a driver with special needs.

The documentation package shall also include a list with the description of the system limitations, accompanied by evidence on how the system's performance is affected within those limitations.

- 2.2. The list of system inputs shall only be provided to the approval authority or the technical service for the purpose of verifying the ADDW system for the type approval.
- 2.3. The list of any secondary metrics shall not be passed on from the technical service to the approval authority.

3. **ADDW system validation**

- 3.1. The documentation package detailing how the ADDW system has been validated within the range of the limitations set out in point 2.1(h) shall include the following:
- (a) evidence about the system's performance collected in repeated tests conducted with human drivers, including the information on the number and demographics of test participants assessed, comprising:
 - (i) inclusionary and exclusionary criteria that were used when selecting participants, ensuring that the system has been deemed effective, within its limitation ranges, for a representative part of the driving population in the Union;
 - (ii) a statement on the adequacy of the participants in respect of the targeted demography for the vehicle (for example, participants with a valid licence to drive the vehicle on which the ADDW system is installed);

- (b) a description of the test conditions assessed, including information on test repeatability and reproducibility;
 - (c) evidence that the system works effectively in weather and lighting conditions not limiting the system's operation.
- 3.2. If the validation was performed on another vehicle, the documentation shall contain information linking the validation process to the type-approval requirements for the vehicle.
- 3.3. If validation testing was performed in a driving simulator, the vehicle manufacturer shall document its limitations with regard to real-world open-road testing for the purpose of testing the ADDW system. Such documentation shall include the following:
- (a) a comparison of primary input data used for the ADDW system from the simulator and primary input data from the vehicle in real conditions;
 - (b) an analysis of the validity of the simulated validation's results.
- 3.4. If the validation was performed as part of research to establish compliance with the technical requirements or to improve the system's performance for type approval, the documentation shall contain information on the parameters, including acceptance ranges, used by the vehicle manufacturers to assure the type approval authorities that the ADDW system fulfils the requirements set out in this Regulation.
- 3.5. **Assessment by the technical service of the ADDW system documentation package and test report**
- 3.5.1 The technical service shall ensure that the ADDW system installed in the vehicle candidate for type-approval:
- (a) fulfils the technical criteria laid out in Part 1; and
 - (b) has passed the spot-check testing laid out in Part 2.
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ANNEX II

AMENDMENT TO REGULATION (EU) 2019/2144

In Annex II the row for requirement E3 is replaced by the following:

E3	Advanced driver distraction warning	Commission Delegated Regulation (EU) 2023/2590 (*)	Distraction avoidance by technical means may also be taken into consideration	C	C	C	C	C	C						
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(*) Commission Delegated Regulation (EU) 2023/2590 of 13 July 2023 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 certain motor vehicles with regard to their advanced driver distraction warning systems and amending that Regulation (OJ L, 2023/2590, 22.11.2023, ELI: http://data.europa.eu/eli/reg_del/2023/2590/oj).