

## **Draft Proposal for a new UN Regulation on uniform technical provisions concerning approval of a vehicle with regard to its Field of Vision Assistant**

### **Submitted by the Informal Working Group on Field of Vision Assistant (IWG-FVA)\***

The text reproduced below was prepared by the Informal Working Group on Field of Vision Assistant (IWG-FVA) to create a new UN Regulation on uniform technical prescriptions concerning approval of a vehicle with regard to its Field of Vision Assistant, in the frame of the process of splitting the UN Regulation No. 125 into two separate Regulations.

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\* In accordance with the programme of work of the Inland Transport Committee for 2020 as outlined in proposed programme budget for 2020 (A/74/6 (part V sect. 20) para 20.37), the World Forum will develop, harmonize and update UN Regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.

*Proposal for a new UN Regulation on Field of Vision Assistant systems, to read:*

**“UN Regulation No. [XXX] on uniform technical prescriptions concerning approval of a vehicle type with regard to its Field of Vision Assistant (FVA) systems**

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\*\* Page numbers will be added at a later stage.

## 0. Introduction (for information)

- 0.1. Obstructions range from physical parts of the vehicle architecture (e.g. A-pillars, heating wires, antenna wires, etc.) to other light projections that may hinder perception of outside scene in the driver's field of vision, known as the FVA. This Regulation addresses obstructions caused by the FVA and defines the conditions under which they are allowed also in the view of limiting distraction. Light reflections (that do not come from the FVA) are not considered as obstructions (e.g. glaring effect).
- 0.2. While driving, the information shall be driving related and safety relevant. FVA is causing obstructions in the transparent field of vision and may cause distraction. At the same time it can help the driver. It is important to find a good balance between the two.
- 0.3. Mandatory information (such as the vehicle speed) may only be displayed via FVA as secondary source of such information. This restriction is done because this information shall be permanently visible under all foreseeable weather conditions. At this stage it was not considered feasible to develop a test procedure able to check that the information is visible at all-time e.g. during heavy rain, fog, snowy background, heavy sunlight, night time.
- 0.4. External information sources are possible, but shall not change the performance of approved FVA: the vehicle manufacturer shall ensure that data that are provided by an external device (e.g. through smartphone applications), that are not part of the type approval, shall not be used nor change the FVA content.
- 0.5. Presented information in area 1 shall be temporary, as related to a dynamic traffic scenario, and optimized to reduce obstruction.
- 0.6. Presented information in area 2 may be static information such as the vehicle speed,
- 0.7. Manual adjustment of the FVA by the driver shall be possible, for an optimised contrast or a complete switch off if necessary. Switch off needs to be accessible with a command to answer driver's fast expected reaction of the system (in case of distraction/obstruction risk).
- 0.8. Automatic deactivation in case of electrical malfunction leading to excessive light projection is foreseen, in order to prevent e.g. potential full or partial obstruction of the field of vision.
- 0.9. Compared to UN R125, for this Regulation it was decided to simplify the areas in which information may be displayed, since the area S as we know from UN R125, does not apply for other vehicle categories but M1 and N1 and at the same time, area S was never developed to allow for systems like classic Head Up Displays, although area S was typically used for this purpose.

## 1. Scope

- 1.1. This Regulation applies to vehicles of category M and N<sup>1</sup> equipped with Field of Vision Assistant systems.
- 1.2. Its purpose is to ensure the Field of Vision Assistant helps the driver in performing his driving task while limiting obstruction and possible distraction caused by it. This Regulation is limited to the information visible to the driver in the forward field of vision.
- 1.3. This Regulation does not apply to vehicles without driver.

## 2. Definitions

- 2.1. "*Approval of a vehicle type*" means the full procedure whereby a Contracting Party to the Agreement certifies that a vehicle type meets the technical requirements of this Regulation.
- 2.2. "*Forward field of vision*" means 180 degree field of vision through the transparent area of the windscreen and other glazed surfaces.
- 2.3. "*Transparent area*" means that area of a vehicle windscreen or other glazed surface whose light transmittance measured at right angles to the surface is not less than 70 per cent. In the case of armoured vehicles the light transmittance factor is not less than 60 per cent.
- 2.4. "*Field of Vision Assistant (FVA)*" means visual information displayed on the vehicle windscreen or other glazed surface to support the awareness of the driver.
- 2.5. "*Vehicle type with regard to the Field of Vision Assistant*" means vehicles which do not differ in such essential aspects as:
  - 2.5.1. The type of technology used.
  - 2.5.2. The shape, dimensions, inclination and other characteristics of the windscreen, other glazed surfaces and their mountings as far as they affect the FVA.
- 2.6. "*Dynamic Driving Task (DDT)*" is the control and execution of all longitudinal and lateral movements of the vehicle.
- 2.7. "*Transition demand*" is a logical and intuitive procedure to transfer the Dynamic Driving Task (DDT) from the system (automated control) to the human driver (manual control). This request is given from the system to the human driver.
- 2.8. "*Transition phase*" means the duration of the transition demand.
- 2.9. "*Obstruction*" means physical parts or interference in the forward field of vision reducing perception of light transmittance with the exception of stray light, e.g. reflection from vehicle interior, sunlight glare.
- 2.10. "*E points*" means points representing the centres of the driver's eyes as defined in UN Regulation 125.
- 2.11. "*V points*" means points as defined in UN Regulation 125 whose position in the passenger compartment is determined as a function of vertical longitudinal planes passing through the centers of the outermost designated seating positions on the front seat and in relation to the "R" point and the design angle

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<sup>1</sup> As defined in the Consolidated Resolution on the Construction of Vehicles (R.E.3.), document ECE/TRANS/WP.29/78/Rev.6, para. 2. - <https://unece.org/transport/standards/transport/vehicle-regulations-wp29/resolutions>

of the seat-back, which points are used for verifying compliance with the field of vision requirements.

- 2.12. "Area 1" area intended for displaying dynamic information such as augmented reality.
- 2.13. "Area 2" area intended for displaying dynamic information as well as static information, e.g. speedometer, speed signs, etc. commonly known as Head-Up Display.
- 2.14. "Augmented reality" means the manner in which components of the digital world blend into a person's perception of the real world, not as a simple display of data, but through the integration of immersive sensations, which are perceived as [natural] parts of an environment.
- 2.15. "Vehicle Master Control Switch" means the device by which the vehicle's on-board electronics system is brought, from being switched off, as in the case where a vehicle is parked without the driver being present, to normal operation mode.

### 3. Application for approval

- 3.1. The application for approval of a vehicle type with regard to this Regulation shall be submitted by the manufacturer.
- 3.2. It shall be accompanied by an information document established in accordance with the model shown in Annex 1, and giving a description of the technical characteristics of the Field of Vision Assistant and the information provided by it.  
  
The necessary technical files relating to paragraph 5.3.7 shall be made available for discussion with the Type Approval Authority and/or Technical Service. Such files will be discussed on a confidential basis and will not be part of the information package other than a reference.
- 3.3. Vehicle(s) representative of the type(s) to be approved shall be submitted to the technical service responsible for conducting the approval tests.

### 4. Approval

- 4.1. If the vehicle type submitted for approval to this Regulation meets the requirements of this Regulation, approval of that type shall be granted.
- 4.2. An approval number shall be assigned to each type approved. Its first two digits (at present 00, corresponding to the Regulation in its original form) shall indicate the series of amendments incorporating the most recent major technical amendment made to the Regulation at the time of issue of the approval. The same Contracting Party shall not assign the same number to another type of vehicle or component as defined in this Regulation.
- 4.3. Notice of approval or of extension of approval of a type pursuant to this Regulation shall be communicated to the Contracting Parties to the Agreement applying this Regulation by means of a form conforming to the model in Annex 3 to this Regulation.
- 4.4. There shall be affixed, conspicuously and in a readily accessible place specified on the approval form, to every vehicle conforming to a vehicle type

approved under this Regulation, an international approval mark conforming to the model described in Annex 3, consisting of either:

- 4.4.1. A circle surrounding the letter "E" followed by:
- (a) The distinguishing number of the country which has granted approval;<sup>2</sup> and
  - (b) The number of this Regulation, followed by the letter "R", a dash and the approval number to the right of the circle prescribed in this paragraph;
- or
- 4.4.2. An oval surrounding the letters "UI" followed by the Unique Identifier.
- 4.5. The approval mark shall be clearly legible and be indelible.
- 4.6. The approval authority shall verify the existence of satisfactory arrangements for ensuring effective checks on conformity of production before type-approval is granted.

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<sup>2</sup> The distinguishing numbers of the Contracting Parties to the 1958 Agreement are reproduced in Annex 3 to the Consolidated Resolution on the Construction of Vehicles (R.E.3), document ECE/TRANS/WP.29/78/Rev.6 - <https://unece.org/transport/standards/transport/vehicle-regulations-wp29/resolutions>

## 5. Specifications

- 5.1. For information displayed in area 1, the provisions in paragraph 5.3. and in paragraph 5.4. apply.
- 5.2. For information displayed in area 2, the provisions of paragraph 5.3 and 5.5. apply.
- 5.3. Requirements for area 1 and for area 2  
 The information displayed by the FVA shall be driving related only and submitted to the provisions of paragraph 5.3.1 to 5.3.7, except:  
 - as long as the vehicle is parked or  
 - if the vehicle is performing the dynamic driving task (DDT) as described e.g. in UN Regulation 157.  
 In the latter case, non-driving related information shall disappear within 500ms upon initiation of a transition demand.
- 5.3.1. In the case the FVA displays information sourced external to the FVA subject to approval (e.g. external GNSS handheld device), this display shall respect the intended content (e.g. type, time, appearance, size, and colour) as described by the manufacturer in the Type Approval documentation. The fulfilment of the provisions of this paragraph shall be demonstrated by the manufacturer to the technical service.
- 5.3.2. The FVA shall aim to minimize the masking of objects. This requirement is deemed to be met if the displayed symbols do not cover a basic figure consisting of a rectangle of 2.6° height and 0.8° width by more than 35%, when measured in accordance with Annex 5.
- 5.3.3. It shall be possible for the driver to adjust the light intensity of the FVA.
- 5.3.4. It shall be possible for the driver to switch off the FVA by a deliberate action consisting of at least one manual option with maximum of 2 consecutive steps. Intuitive action (e.g. double press, swipe and press) is considered as a single step. This provision does not apply when the vehicle is in a backing event as defined in UN Regulation No. 158.
- 5.3.5. The part of the FVA, which in case of an electrically detectable failure affects the visual information as an identified risk considered in the safety approach, shall be deactivated automatically or brought to a safe state.
- 5.3.6. Information to the driver, mandated by any UN Regulations, shall not be replaced by information given via the FVA system. A duplication of such mandatory information via the FVA system is possible.
- 5.3.7. The vehicle manufacturer shall present the following documentation for type approval: A risk reduction analysis using functional safety standard such as ISO 26262 and safety of the intended functionality standard such as ISO 21448, which documents the risk to vehicle occupants caused by distraction and obstruction and documents the reduction of risk resulting from implementation of the identified risk mitigation functions or characteristics.
- 5.4 Additional requirements for area 1
- 5.4.1. When the vehicle master control switch is activated the FVA information shall be limited to:
- (a) Warning/Highlight hazardous traffic situation
  - (b) Warning/Highlight vulnerable road users or other road users which may be overseen

- (c) Information to maintain the distances to surrounding road users and infrastructure
- (d) Information to find and maintain the correct driveway and to follow the road instructions
- (e) Information to support driver's setting of the FVA
- (f) Warnings and information to the driver that require driver's immediate action or attention

Examples of visual information listed above are given in Appendix 1 of Annex 4.

5.4.2. The symbols and graphics shown by the FVA shall disappear when the underlying condition for their display does not exist anymore.

5.5. Additional requirements for area 2

5.5.1. [In addition to the general requirements under paragraph 5.3. and the additional requirements for area 1 under 5.3., FVA information in area 2 may also be non-driving related but in that case limited to:

- (a) Information on incoming telephone call
- (b) ...
- (c) ...

Examples of visual information listed above are given in Appendix 2 of Annex 4.]

5.5.2. The non-driving related symbols and graphics shown by the FVA in area 2 shall disappear when the underlying condition for their display does not exist anymore.

5.6. Paragraph 5.3., paragraph 5.4. and paragraph 5.5. are deemed to be fulfilled for vehicle types approved to UN R125.02 until [1 September 2026].

5.7. The values X and Y defining the area's 1 and 2 as described in Annex 5 are determined according to Annex 6.

5.8. For the use of symbols and colour appearance, reference is made to UN R121 and ISO 2575.

## **6. Modification of vehicle type and extension of approval**

6.1. Every modification of a vehicle or component type with regard to this Regulation shall be notified to the administrative department which approved the vehicle or component type. The department may then either:

6.1.1. consider that the modifications made are unlikely to have an appreciable adverse effect and that in any case the component or the vehicle still complies with the requirements, or

6.1.2. require a further report from the technical service responsible for conducting the tests.

6.2. Confirmation or refusal of approval, specifying the alteration, shall be communicated by the procedure specified in paragraph 4.3. above to the Contracting Parties to the Agreement applying this Regulation.

6.3. The competent authority issuing the extension of approval shall assign a serial number to each communication form drawn up for such an extension.



## **7. Conformity of production**

- 7.1. Procedures concerning conformity of production shall comply with those set out in the 1958 Agreement, Schedule 1 (E/ECE/TRANS/505/Rev.3) and meet the following requirements:
- 7.2. For each type of vehicle or component the tests prescribed in the relevant part(s) of this Regulation shall be carried out on a statistically controlled and random basis, in accordance with one of the regular quality assurance procedures;
- 7.3. The Type Approval Authority which has granted approval may at any time verify the conformity of control methods applicable to each production unit. The normal frequency of such inspections shall be once every two years.

## **8. Penalties for non-conformity of production**

- 8.1. The approval granted in respect of a vehicle/component type pursuant to this Regulation may be withdrawn if the requirements laid down in paragraph 7 above are not complied with.
- 8.2. If a Contracting Party to the Agreement applying this Regulation withdraws an approval it has previously granted, it shall forthwith so notify the other Contracting Parties applying this Regulation, by means of a form conforming to the model in Annex 2.

## **9. Production definitely discontinued**

If the holder of the approval completely ceases to manufacture a vehicle/component type approved in accordance with this Regulation, he shall so inform the authority which granted the approval. Upon receiving the relevant communication, that authority shall inform thereof the other Contracting Parties to the Agreement applying this Regulation by means of a form conforming to the model in Annex 2.

## **10. Names and addresses of Technical Services responsible for conducting approval tests, and of Type Approval Authorities**

The Contracting Parties to the Agreement applying this Regulation shall communicate to the United Nations secretariat the names and addresses of the technical services responsible for conducting approval tests and of the Type Approval Authorities which grant approval and to which forms certifying approval or extension or refusal or withdrawal of approval, issued in other countries are to be sent.

## Annex 1

### Information document

(Maximum format: A4 (210 mm x 297 mm))

**In accordance with paragraph 5. of Regulation No. [XXX] on uniform technical prescriptions concerning approval of a vehicle with regard to its Field of Vision Assistant (FVA).**

#### 1. General

- 1.2. Make (trade name of manufacturer): .....
- 1.2. Type: .....
- 1.3. Means of identification of type, if marked on the device (a): .....
- 1.3.1. Location of that marking: .....
- 1.4. Vehicle category: .....
- 1.5. Name and address of manufacturer:.....
- 1.6. Location of the UN approval mark: .....
- 1.7. Address(es) of assembly plant(s): .....

#### 2. Description of the Field of Vision Assistant (FVA)

- 2.1. A detailed technical description of the FVA:.....
- 2.2. Documentation as described in paragraph 5.3.6 (referenced and made available on request of the type approval authority).....
- 2.2. location, dimension and colours of symbols used in the FVA:.....
- 2.3. Method for switching off the FVA: .....

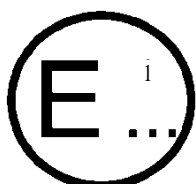
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<sup>(a)</sup> If the means of identification of type contains characters not relevant to describe the component or separate technical unit types covered in this information document, such characters shall be represented in the documentation by the symbol "?" (e.g. ABC??123??).

## Annex 2

### Communication

(Maximum format: A4 (210 x 297 mm))



issued by:

Name of administration:

.....  
 .....  
 .....

Concerning: <sup>2</sup>

- Approval granted
- Approval extended
- Approval refused
- Approval withdrawn
- Production definitively discontinued

of a vehicle type with regard to its Field of Vision Assistant pursuant to UN Regulation No. XXX

Approval No. ....

#### Section I

1. General
  - 1.1. Make (trade name of manufacturer):.....
  - 1.2. Type: .....
  - 1.3. Means of identification of type, if marked on the vehicle: <sup>3</sup>.....
  - 1.3.1. Location of that marking:.....
  - 1.4. Category of vehicle: <sup>4</sup> .....
  - 1.5. Name and address of manufacturer:.....
  - 1.6. Position of approval mark on the vehicle:.....

#### Section II

1. Additional information (where applicable): see addendum
2. Technical service responsible for carrying out the tests: .....
3. Date of test report: .....
4. Number of test report: .....
5. Remarks (if any): see addendum
6. Place:.....

<sup>1</sup> Distinguishing number of the country which has granted/extended/refused/withdrawn approval (see approval provisions in the Regulations).

<sup>2</sup> Strike out what does not apply.

<sup>3</sup> If the means of identification of type contains characters not relevant to describe the vehicle, component or separate technical unit types covered in this information document, such characters

<sup>4</sup> As defined in Annex 7 to the Consolidated Resolution on the Construction of Vehicles (R.E.3) (TRANS/WP.29/78/Rev.6, as amended).

7. Date:.....
8. Signature: .....
9. The index to the information package lodged with the approval authority, which may be obtained on request, is attached:.....

**Addendum**  
**to UN type approval certificate No. ...**

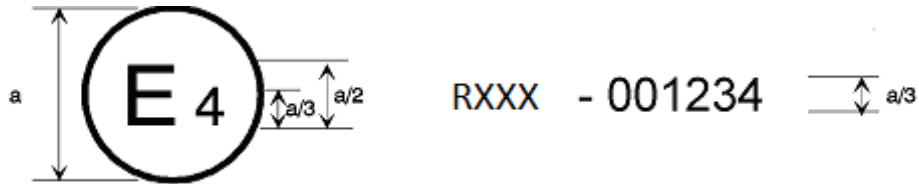
Concerning the type approval of a vehicle with regard to Regulation No. XXX

- 1. Additional information:.....
  - 1.1. Brief description of the Field of Vision Assistant: .....
  - 2. Remarks: .....
-

## Annex 3

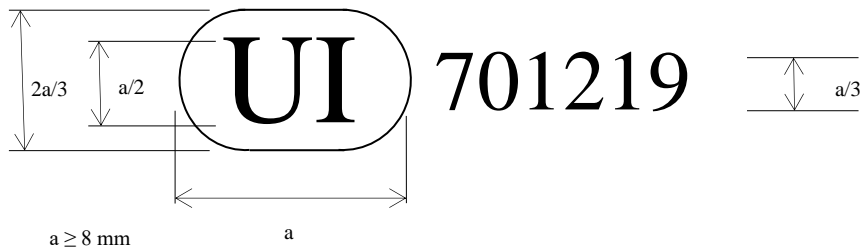
### Arrangements of approval marks

(see paragraphs 4.4. to 4.4.2. of this Regulation)



$a \geq 8 \text{ mm}$

The above approval mark affixed to a vehicle shows that the vehicle type concerned with regard to its FVA was approved in the Netherlands (E4) pursuant to Regulation No. [xxx] under approval No. 001234. The first two digits (00) of the approval number indicate that the approval was granted in accordance with the requirements of Regulation No. [xxx] in its original form.



The above Unique Identifier shows that the type concerned has been approved and that the relevant information on that type-approval can be accessed on the UN secure internet database by using 701219 as Unique Identifier. Any leading zeroes in the Unique Identifier may be omitted in the approval marking.

## Annex 4 – Appendix 1

### Field of Vision Assistant area 1

Examples of visual information as specified in paragraph 5.4.1:

	Examples
Warning/Highlight hazardous traffic situation	<p>Abrupt braking situations or other emergency cases</p> <p>Oncoming traffic in turning manoeuvres</p> <p>Oncoming Traffic Jam/vehicle break down.</p> <p>Vehicles leaving the lane or entering the own driving path</p>
Warning/highlight vulnerable road users or other road users which may be overseen	<p>Pedestrians</p> <p>Cyclists</p> <p>Crossing road users</p> <p>Road users in blind spot or road users covered by other objects</p> <p>Animals</p>
Information to maintain the distances to surrounding road users and infrastructure as well as information on the infrastructure	<p>Distance to vehicle in front / to side / to rear</p> <p>Lane keep assist, lane change assist, speed limits changes</p>
Information to find and maintain the correct driveway and to follow the road instructions	<p>Navigation Information, symbols and arrows during automatic lane change</p> <p>(Directions, Remaining distance to target, border crossings)</p> <p>Highlighting stop lines and pedestrian crosswalks</p>
Information to support driver's setting of the FVA	<p>Highlighting edges of the position of the FVA area during adjustment</p>
Warnings and information to the driver that require drivers immediate action	<p>Transition demand/ Hands-off warning</p> <p>Requests to stop the vehicle immediately due to safety relevant failures of the vehicle or its systems</p> <p>Requests to switch off systems immediately due to safety relevant failures.</p>

**Annex 4 – Appendix 2**

## Field of Vision Assistant area 2

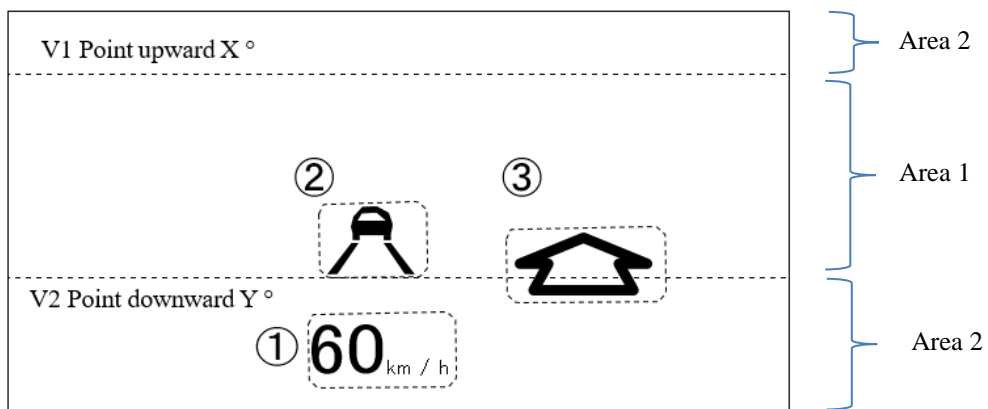
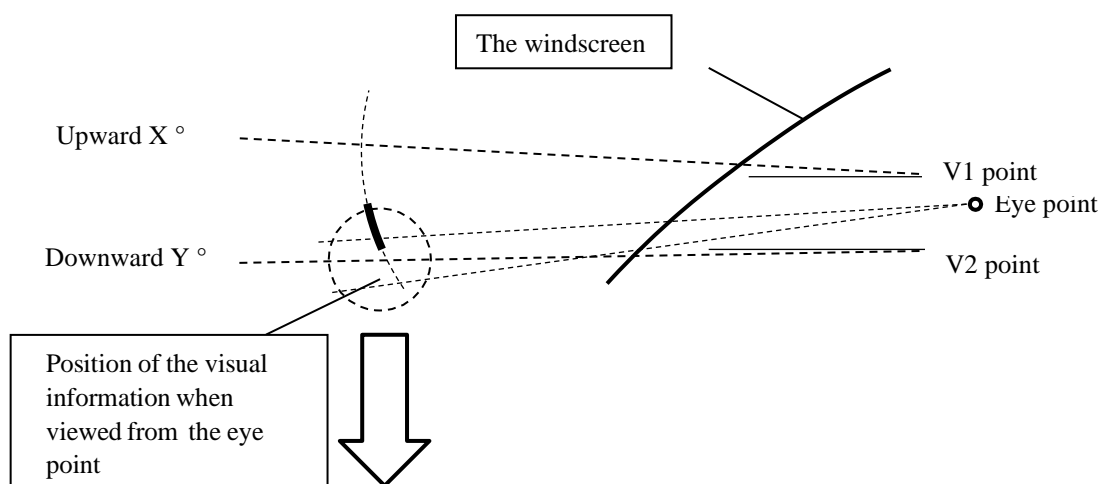
Examples of additional visual information as specified in paragraph 5.5.1:

	Examples
Information on incoming telephone call	Phone number or name of caller Phone symbol
...	
...	



## Annex 5

The target range:

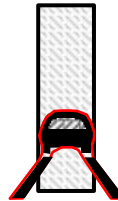
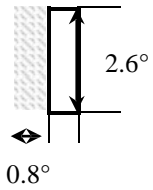


How to verify:

Calculate the ratio of the portion where the display region of each individual visual information item covers the basic figure to the entire basic figure (see below).

The basic figure should be checked everywhere within the transparent area of the windscreen up to  $X^\circ$  above the V1 point.

Basic figure



Area covered by the display region

Rectangle with height  $2.6^\circ$  and width  $0.8^\circ$

## Annex 6

Determination of the value “X” and Y”:

...“

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