

# VRU-Proxi Reversing Motion

Task Force

Reference document: *After IWG VRU-Proxi-11-09 (OICA & Japan) ECE-TRANS-WP.29-GRSG-2019-16e Update.docx*

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# Backing event

## ➤ Definition update

- 15.1.1 Backing event starts when the vehicle is in Active vehicle mode and the vehicle's direction selector is placed from forward or neutral in reverse by the driver or a system, and ends at the manufacturer's choosing, when the vehicle forward motion reaches:
- » (a) a speed of **maximum** 16 km/h, or
  - » (b) a distance of **maximum** 10 meters travelled, or
  - » (c) a continuous duration of **maximum** 10 seconds, or
  - ~~» (d) the vehicle's direction selector is not placed in reverse.~~

- 15.1.1.1 The Backing event only ends at one of the three conditions described above. If for example, the chosen end of the backing event is a continuous duration of 5 seconds, there is no restriction for distance travelled and speed at this 5 second mark.**



# RVC deactivation

## 16.1.1.4. Deactivation

The rear-view image shall remain visible during the backing event until either, the driver modifies the view, or the vehicle direction selector is removed from the reverse position.

**Modifying the view means to switch to other camera views**

**Rear-view image deactivation does NOT equate to end of backing event unless it occurs simultaneous to one of the three conditions described in 15.1.1, e.g Rear-view image deactivation immediately at gear selector out of reverse is NOT the end of the backing event – backing event is still in effect.**



# RVC response time

- 12.9 “Active vehicle mode” means the vehicle mode when:
  - ~~Application of pressure to the accelerator pedal (or activation of an equivalent control) or release of the brake system will cause the power train to move the vehicle~~
  - **The powertrain moves the vehicle, on release of the brake system AND in some cases by application of pressure to the accelerator pedal (or activation of an equivalent control).**
  - ~~All the systems and components are fully Booted Up & Active.~~
  
- 16.1.2.1. ~~Response time~~ **Device readiness (system availability)**

The rear-view image meeting the requirements described in 15.2. shall be displayed within **provided after a maximum of 2.0 seconds after start of the backing event, when tested according to Annex XX** ~~when the backing event starts.~~

- **Annex XX: Testing procedure for the determination of the “Response time”.**

## Test procedure **conditions**

- The vehicle shall be left in a **parked parking** status until it is ensured that all electronic systems are de-activated; or for a minimum of 30 minutes. **The test may start with the door opening or with**
- **It is permissible for the test person or equipment to be already situated within the vehicle. ~~If the driver door had been opened the door shall be closed again.~~**
- Ensure the vehicle gear selector is in neutral or forward gear.
- **The test may start with opening the driver door. Once the door is opened, it shall be closed again.**

## Test procedure

- Put the vehicle into the active vehicle mode. This action shall initiate/start the first timer.
- Wait for a minimum of 6 sec
- Start the backing event by selecting the reverse gear. If it is not possible to put the vehicle into reversing mode 6 sec after being put into active vehicle mode, the backing event shall be started as soon as technically possible. Initiate/start the second timer.
- Record the response time on second timer until the rear view is completely visible on the display.

# Close Proximity Rear-View Field of Vision

## ➤ New requirement to be added


- 15.2.1 When tested under the conditions defined in Annex 9 the requirement for close-proximity rear-view field of vision shall be considered to be satisfied if the defined field of vision can be seen:
  - 15.2.1.1 via the direct view from the driver's looking back ocular points; or
  - 15.2.1.2 via the direct view from the driver's looking back ocular points combined with a close-proximity rear-view mirror installed at the rear end of the vehicle supporting this direct view; or
  - ...
  - 15.2.1.6 The options 15.2.1.1 and 15.2.1.2 only apply to the vehicle categories M1 and N1.**



# Requirements exemption

- How do we consider these use case regarding reversing safety requirements?





# Close Proximity Rear-View Field of Vision requirement

➤ § 1.3 from Annex 9 to be moved to 15.2

## Annex 9

### 1.3. Requirements

(a) for the test objects in the first row (Test objects A, B, and C):

A 0.15 m x 0.15 m area or the top of the test object shall be visible at at least one position on each test object.

(b) for the test objects in the second row (Test objects D, E, and F) and the third row (Test objects G, H, and I);

The whole ~~height of the~~ test object shall be seen.



# Detection system requirement

➤ New § to be inserted

17.2.1. [The system shall have at least two kinds of information signal selected from audible, optical, and haptics.]

~~17.2.1. The system shall have both audible and optical information.~~

**17.2.1.1 One of the information signals may be deactivated manually by the driver**





# Detection system requirement

➤ New § to be inserted

## 17.2.4 Optical information

~~If the optical information is selected, it shall be always visible to the driver.~~

In the case optical information is placed on a monitor used for other information such as meter cluster display or other displays, overlay is allowed and shall comply with the overlay requirements of the RVC in 16.1.1.3. of this regulation.



# Annex 9

## ➤ 1.2. Test object locations and orientations

Place the test objects at the locations specified in (a) to (h) and illustrated in Figure B. Measure the distances shown in Figure B from a test object to another test object or other object from the cylindrical centre (axis) of the test object as viewed from above. Each test object shall be oriented so that its axis is vertical.

- (a) Place test objects A, B, and C so that their centres are in a transverse vertical plane that is 0.3 m to the rear of a transverse vertical plane tangential to the rearmost surface of the rear bumper.
- (b) Place test object B so that its centre is in a longitudinal vertical plane passing through the vehicle's longitudinal centreline.
- (c) Place test objects D, E, and F so that their centres are in a transverse vertical plane that is 1.5 m to the rear of a transverse vertical plane tangential to the rearmost surface of the rear bumper.
- (d) Place test object E so that its centre is in a longitudinal vertical plane passing through the vehicle's longitudinal centreline.
- (e) Place test objects G, H, and I so that their centres are in a transverse vertical plane that is 3.5 m to the rear of a transverse vertical plane tangential to the rearmost surface of the rear bumper.
- (f) Place test object H so that its centre is in a longitudinal vertical plane passing through the vehicle's longitudinal centreline.
- (g) Place test objects A, D, and G so that their outermosts are in a longitudinal vertical plane tangential to the left-side outermost surface of the vehicle.
- (h) Place test objects C, F, and I so that their outermosts are in a longitudinal vertical plane tangential to the right-side outermost surface of the vehicle.

~~Test object locations can be added between A to I by the Technical Service.~~



# Object size

- Requirements to be added in section 16:

**16.XXX**      **When the rearview image is measured in accordance with the procedure XXX, the calculated visual angle subtended by the horizontal width of:**

**(a) All three test objects at the last row specified in 15.2 shall average not less than 5 minutes of arc; and**

**(b) Each individual test object shall not be less than 3 minutes of arc.**

- Annex XX to be created to detail Procedure XXX



# Overlays

- 16.1.1.3. Overlay requirements within the ~~minimum~~ required field of vision  
Overlays shall display only rearward driving-related visual information or safety-related information. Overlays for other purposes of information **in the minimum required field of vision are not allowed.** ~~shall be considered as an obstruction—  
regardless of their transparency.~~



# Requirements for detection systems

17.3. ~~Dynamic p~~Performance of object detection **system**

17.34.1. Detection latency

The detection latency, **for at least one of the information signals as defined in 17.2.1**, ~~as measured according to paragraph 2.2. of Annex 10.~~ shall not exceed 0.6 s, **when measured according to paragraph 1.2 of Annex 10.**

~~17.4.2~~ ~~Response time~~

~~The signal meeting the requirements of Annex 10 of this Regulation shall be given to the driver within 2.0 seconds when the backing event starts.~~



# Test Methods for Detection Systems

## ➤ 1.2. Test conditions **preparation**

- ~~The testing environment and test object shall be as per paragraph 23. of this annex.~~ One test object shall be used. The distance from the rear edge to the test object and the position of the test object are selected by the manufacturer to ensure the detection of the test object. The test object shall be located in the detectable grids within the rear horizontal area in paragraph 25. of this annex. The test vehicle in the initial state shall be with the detection system in the activated state, which is declared [by the manufacturer OR in the owner's manual] and shall be in the parking condition. Here, the parking condition means that the P (park) position is selected in the case of vehicles equipped with automatic transmissions, whereas it means the neutral gear being selected and the parking brake being engaged in the case of vehicles equipped with manual transmissions.