

**BSIS Proposed changes based on "ECE-TRANS-WP29-2019-28e.docx"**

0.6. The UN Regulation defines a test procedure which does not require actual turning manoeuvres; this is acceptable since the information signal needs to be present sufficiently early anyway. Experimental data shows that some turn manoeuvres of heavy vehicles, especially when turning into a narrow street, require a counter-turn that starts approximately 15 m before entering that street, so the test procedure included in this Regulation requires the information signal to be activated **15 m before the expected collision point** when the front of the vehicle is 15 m before the expected collision point.

**Met opmerkingen [SP1]:** True, this is more accurate. However, this is introductory text, so it should be fine as long as the text itself (below) is accurate.

2.11 "Warning signal" means an optical signal, acoustical signal, haptical signal or any combinations of these signals, with the purpose of informing the vehicle driver about system detects a potential collision ~~path~~ **bicycle**.

2.12 "Failure Warning signal" means an optical signal, **acoustical signal, haptical signal or any combinations of these signals** with the purpose of informing the vehicle driver about the system is not available **and shall be other than or clearly distinguishable from the information signal**.

**Met opmerkingen [SP2]:** Seems to be a change in content. Is it wanted that the failure warning could be in all possible modes?

2.8. "Last Point of Information (LPI)" means the **point vehicle position** at which the information signal shall have been given. It is the point preceding the expected turning motion of a vehicle towards a bicycle in situations where a collision could occur.

**Met opmerkingen [SP3]:** Both are accurate, I believe.

5.3.1.4. The BSIS shall give an information signal at last point of information, for a bicycle moving with a speed between 5 km/h and 20 km/h, at a lateral separation between bicycle and vehicle of between 0.9 and 4.25 metres, which could result in a collision between bicycle and vehicle with an impact position 0 to 6 m with respect to the vehicle front right corner, if typical steering motion would be applied by the vehicle driver.

The information signal shall not be visible before the first point of information. It shall be given between the first point of information and the last point of information. The first point of information may be calculated for any impact position by increasing with the difference between 6 m and impact position.

**It shall also give an information signal if a bicycle is detected at a lateral separation of between 0.25 up to 0.9 m longitudinally at least located at the most forward front wheel while driving straight.**

**Met opmerkingen [PA4]:** not clear from which point of the vehicle's external surface the distance shall be measured (the vehicle body width varies longitudinally). The reference point should be the most external edge of the vehicle body, mirrors excluded

**Met opmerkingen [SP5]:** There is a definition:

5.3.1.5. The vehicle manufacturer shall ensure that the number of false-positive warnings **of the information signal and warning signal** due to the detection of static non-VRU objects such as cones, traffic signs, hedges and parked cars shall be minimized. However, it may give an information signal when a collision is imminent.

5.3.1.7. The BSIS also shall provide the driver with a failure warning **signal** when there is a failure in the BSIS that prevents the requirements of this Regulation from being met. The **failure warning signal** shall be as specified in paragraph 5.6.1. This shall be tested in accordance with the provisions of paragraph 6.8. below (failure detection test).

2.14. "*Lateral separation*" means the distance between the vehicle and the bicycle at the near side of the vehicle where the vehicle and bicycle are parallel to each other. The distance is measured between the plane parallel to the median longitudinal plane of the vehicle and touching its lateral outer edge, disregarding the projection of devices for indirect vision, and the median longitudinal plane of the bicycle minus half of the bicycle width being 250 mm. The lateral outer edge of the vehicle is only to be regarded in the area between the vehicle's foremost point and up to 6 m rearward.

5.6.1. The failure warning **signal** referred to in paragraph 5.3.1.7. above shall be a yellow optical warning signal and shall be other than or clearly distinguishable from the information signal. The

**Met opmerkingen [SP6]:** Not needed; it is a sentence that is anyway not verifiable.

**Met opmerkingen [SP7]:** Not needed, since it should be clear that this paragraph addresses the failure warning.

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failure warning signal shall be visible by daylight and night and shall be easily verifiable by the driver from the driver's seat.

5.6.3. The **BSIS-optical** failure warning signals shall be activated with the activation of the vehicle master control switch. This requirement does not apply to **the failure** warning signals shown in a common space.

**Met opmerkingen [SP8]:** Should a failure warning not be only optical? Was that decided?

6.1. The manufacturer shall provide a documentation package which gives access to the basic design of the system and, if applicable, the means by which it is linked to other vehicle systems. The function of the system including its sensing and warning **signal** strategy shall be explained and the documentation shall describe how the operational status of the system is checked, whether there is an influence on other vehicle systems, and the method(s) used in establishing the situations which will result in a failure warning signal being displayed. The documentation package shall give sufficient information for the Type Approval Authority to identify the type of and to aid the decision-making on the selection of worst-case conditions.

6.4. ~~failure warning~~ **Information, warning and failure** signals verification test

**Met opmerkingen [SP9]:** True, this new headline seems to be accurate.

6.4.2. With the vehicle stationary, activate the information and warning signals as specified in paragraphs 5.4. and 5.5. and verify that the signals comply with the requirements specified in those paragraphs. **signal as specified in paragraph 5.4. and verify that the signal complies with the requirements specified in those paragraphs.**

**The warning signals should be activated in accordance with paragraph 5.5.3 and verify that the signal complies with the requirements specified in paragraphs. 5.5.1 and 5.5.2.**

**Met opmerkingen [SP10]:** This could probably also help to clarify.

6.5.5. Do not operate the direction indicators during the test **of the Information signal.** **The direction indicator can be used during the test in accordance with the warning signal strategy provided by the manufacturer and specified in paragraph 5.5.3."**

**Met opmerkingen [SP11]:** There is no test for the warning strategy...

6.7. The manufacturer shall demonstrate, to the satisfaction of the Technical Service and Type Approval Authority, through the use of documentation, simulation or any other means, that the **Blind Spot** Information signal is not activated, as described in paragraph 6.5.10., when the vehicle passes any other usual stationary object than the traffic sign. In particular, parked cars shall be addressed.

Table 1

Test cases

The following table details the test cases, using the following variables:

vvehicle	steady-state velocity of vehicle
vbicycle	steady-state velocity of bicycle
da	bicycle position when vehicle crosses line b
db	vehicle position when bicycle crosses line a
dc	vehicle position at last point of information

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$d_d$  vehicle position at first point of information ( $d_c + (6m - \text{Impact Position}) + 11.11 m$  for vehicle speeds of 10 km/h and  $d_c + (6m - \text{Impact Position}) + 22.22 m$  for vehicle speeds of 20 km/h)  
 $d_{bicycle}$  starting position of bicycle  
 $l_{corridor}$  length of vehicle corridor  
 $d_{corridor}$  width of vehicle corridor  
 $d_{lateral}$  lateral separation between bicycle and vehicle

**Met opmerkingen [SP12]:** Yes, it could help to delete this sentence for clarity.

The following variables do not specify test cases, but are given for information only (not influencing test parameters):

(a) Impact position [m], this specifies the impact position for which the values of  $d_a$  and  $d_b$  in Table 1 have been calculated ( $d_d$  is always calculated for either an impact position of 6 m or start of synchronized movement, in case of same speeds for vehicles and bicycle);

(b) Turn radius [m], this specifies the turn radius for which the values of  $d_a$  and  $d_b$  in Table 1 have been calculated.

**(c) impact position and turn radius are only considered for calculation of  $d_b$  (Line B). Line A solely depends on VRU velocity**

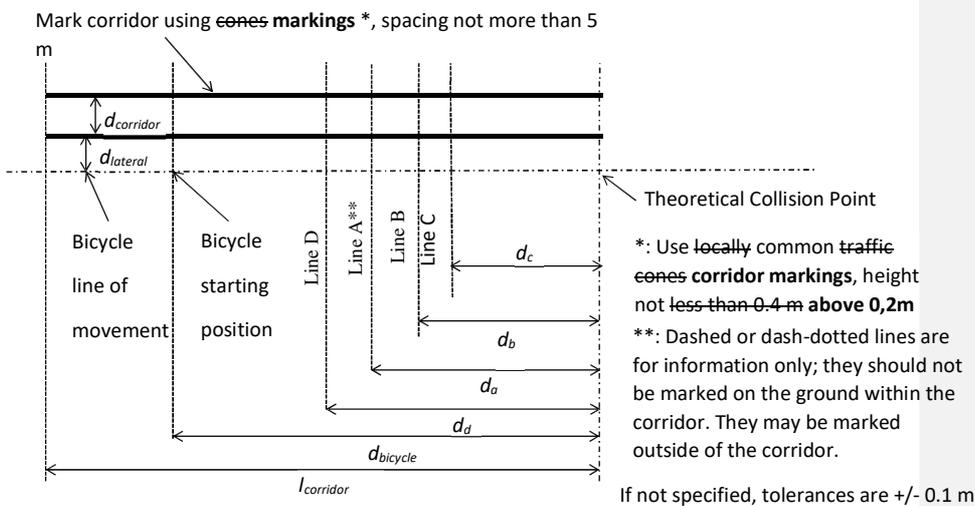
**Met opmerkingen [SP13]:** Is the calculation for  $d_a$  and  $d_b$  not given in the annex?

## Appendix 1

Figure 1

### Dynamic tests

**Met opmerkingen [SP14]:** This has been changed by the informal documents.



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Annex 3  
Ninth paragraph

The value  $d_c$  defines the last point of information. For vehicle speeds of ~~10~~ 5 km/h and higher, it is the maximum of two values:

the first value has been derived from physical test runs and characterizes at what distance from the collision point the heavy vehicle turn is started at the earliest and by turning towards the outside, the value is:

15 m.

The second value is the stopping distance, considering reaction time and the brake deceleration  $a$ , using the parameters deceleration and reaction time (5 m/s<sup>2</sup> and 1.4 seconds, respectively):