

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.

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**.

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.

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.

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).

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 [PA1]: 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

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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.

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

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.

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."

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:

vehicle	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

- dd 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)
- dbicycle starting position of bicycle
- lcorridor length of vehicle corridor
- dcorridor width of vehicle corridor
- dlateral lateral separation between bicycle and vehicle

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

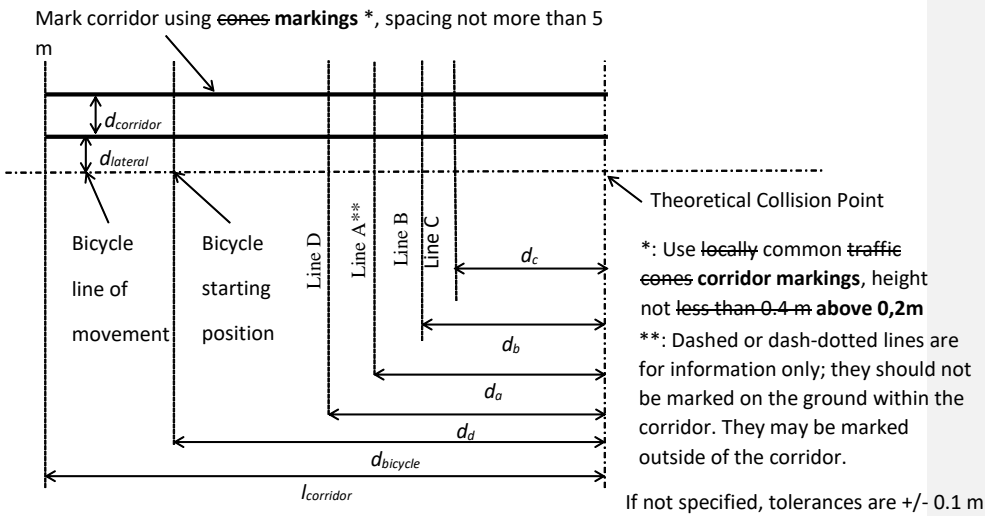
- (a) Impact position [m], this specifies the impact position for which the values of d_a and d_b in Table 1 have been calculated (d_d is always calculated for either an impact position of 6 m or start of synchronized movement, in case of same speeds for vehicles and bicycle);
- (b) Turn radius [m],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

Appendix 1

Figure 1

Dynamic tests



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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/s² and 1.4 seconds, respectively):