Submitted by the experts from Germany

Informal document **GRSG-119-05**
(119th GRSG, 6-9 October 2020,
Agenda item 4b)

Suggestion for an amendment of UN Regulation No. 151 (Blind Spot Information Systems)

The text reproduced below was prepared by the expert from Germany to amend Regulation No. 151 to introduce an alternative test procedure without changing the requirements from the core text.

The modifications to Regulation 151 are marked in bold for new characters and strikethrough for deleted characters.

I Proposal

Paragraph 6.5.7., anemd to read:

"6.5.7. Verify if the Blind Spot Information signal has been activated before the vehicle crosses line C in Figure 1 of Appendix 1 to this Regulation, and if the Blind Spot Information signal has not been activated before the vehicle crosses line D in Figure 1.

Alternatively, the activation of the blind spot information signal may be checked using the test procedure as specified in Annex 4 to this regulation (driving robot test procedure). In this case, paragraph 6.5.7. may be skipped."

Paragraph 6.5.10., amend to read:

"6.5.10. The test is passed when the Blind Spot Information signal has been activated in all test cases as shown in Table 1 of Appendix 1 to this Regulation before the vehicle has crossed line C (see paragraph 6.5.7. above) **or the activation of the blind spot information signal has been verified using the test procedure as specified in Annex 4**, and the Blind Spot Information signal has not been activated in any test run when the vehicle passes the traffic sign (see paragraph 6.5.8. above).

[…]"

Insert a new Annex 4, to read:

Annex 4

Alternative Blind Spot Information Dynamic Test

0. Test concept and requirements for use

This alternative test procedure can be used to verify the conformity of the blind spot information system to paragraph 5.3.1.4 with regard to the activation timing as specified in paragraph 6.5.7. and 6.5.10.,

provided that the tests are performed with equipment that allows to control and measure the position of both the vehicle under test and the bicycle dummy with an absolute accuracy ot ± 0.1 m at all times. Typically, this equipment consists of driving robots, a robot-controlled platform for the bicycle dummy, and position measurement systems using a fusion of differential global navigation satellite systems and an inertial measurement unit. Note that the other requirements of paragraph 5.3.1.4., especially false positives and first point of information FPI, still need to be checked with the test procedure as specified in paragraph 6.5 and its subparagraphs.

The general concept is to perform a series of turning manoeuvres with the vehicle under test and the dynamic bicycle dummy according to the trajectories as provided in appendix 1 (part one of the test procedure) and any other trajectories that are relevant according to section 5 of this regulation with a pre-programmed collision (part two of the test procedure).

Since the position of both vehicles is known in advance at all times, it is possible to verify whether the information signal had been given in due time to allow the truck driver to avoid a collision. This can be assumed if the distance between the vehicle under test and the bicycle trajectory is more than *d* with

$$d = v_{vut} \cdot t_{react} - \frac{{v_{vut}}^2}{2 \cdot a_{brake}}$$

where the reaction time t_{react} shall be 1.4 s, the vehicle acceleration shall a_{brake} shall be -5 m/s² and the current speed of the vehicle under test (without any brake application as reaction to the bicycle dummy) shall be v_{vut}.

In case the conformity is proven (in other words, the information signal is given before a distance *d* between vehicle and bicycle path is reached), the test may be aborted to avoid damage to the test equipment.

1. Test procedure

1.1. Verify that the vehicle and the test track are in the condition as required per section 6 and its subparagraphs.

1.2. Test with pre-programmed trajectories

Perform [all] of the trajectories given in Table 1 in Appendix 1 to this annex. Calculate *d* according to the above equation during the test. Verify that the blind spot information signal has been activated at least *d* before the any point of the vehicle under test arrives at the bicycle path.

1.3 Test with other trajectories

1.3.1 Perform at least three different turning manoeuvres within the parameters as specified in section 5. The vehicle shall perform a full 90° turn. [elaborate on how the turn is defined]. Record the vehicle position and speed.

1.3.2. Add the bicycle trajectory in a way that a collision occurs between the vehicle under test and the bicycle between L=0 m and L=6 m.

1.3.3. Program the trajectories and perform the test. Verify that the information signal is activated appropriately.

Appendix 1

Example trajectory to check the idea

X [m]	Y [m]	t [s]	v [km/h]
-48,83	4,25	0,00	32,98
-44,27	4,23	0,50	32,65
-39,82	4,21	1,00	31,25
-35,61	4,20	1,50	29,45
-31,65	4,23	2,00	27,54
-27,94	4,29	2,50	25,89
-24,46	4,42	3,00	24,30
-21,21	4,64	3,50	22,64
-18,17	4,89	4,00	21,28
-15,27	5,15	4,50	20,75
-12,41	5,42	5,00	20,54
-9,53	5,68	5,51	20,10
-6,81	5,91	6,01	19,24
-4,20	6,06	6,51	18,30
-1,78	6,05	7,01	16,52
0,40	5,72	7,51	15,31
2,34	5,06	8,01	14,31
4,03	4,11	8,51	13,77
5,48	2,85	9,01	13,80
6,63	1,32	9,51	13,84
7,42	-0,41	10,01	13,63
7,88	-2,24	10,51	13,93
8,12	-4,20	11,01	14,61
8,13	-6,27	11,51	15,16
8,04	-8,41	12,01	15,92
8,00	-10,66	12,51	16,56
7,98	-13,04	13,01	17,72
7,88	-15,60	13,51	19,17
7,78	-18,38	14,01	20,86
7,69	-21,34	14,51	21,65
7,56	-24,50	15,03	22,12
7,47	-27,54	15,54	21,83
7,36	-31,00	16,10	21,71
7,29	-34,29	16,65	21,35
7,23	-37,33	17,17	20,52
7,20	-40,19	17,70	18,25

Submitted by the experts from Germany

Informal document **GRSG-119-05**
(119th GRSG, 6-9 October 2020,
Agenda item 4b)

II Justifications

The alternative test procedure allows to give the information signal later than specified in the original version of the regulation, yet still early enough for the driver to come to a comfortable stop after noticing the information signal.

See accompanying presentation GRSG-119-XX.