

Proposal for amendments regarding GRVA-12-52

Modifications to the existing text of UN-Regulation No. 157 are in **bold** for new or ~~strikethrough~~ for deleted characters.

Modifications to GRVA-12-52 are in **green bold** for new or ~~green strikethrough~~ for deleted characters.

Amendments **highlighted yellow** are still to be confirmed.

I. Proposal

Annex 5

Annex 5, Paragraph 2.7., amended to read:

2.7. A “passable object” is such an object, that may be **rolled driven over** without causing an unreasonable risk to the vehicle occupants or other road users.

Annex 5, Paragraph 4.6.1., amended to read (removal of square brackets):

4.6.1. The test shall demonstrate that the ALKS is capable of detecting another road user within the forward detection area up to the declared forward detection range and a vehicle beside within the lateral detection area up to at least the full width of the adjacent lane. **If the ALKS is capable of performing lane changes, it shall additionally demonstrate that the ALKS is capable of detecting another vehicle within the front, side and rearward detection range as declared in paragraphs 7.1., 7.1.1.1., 7.1.2.1. and 7.1.3.]**

Annex 5, Paragraph 4.6.2.2., amended to read (removal of square brackets):

[4.6.2.2. The requirements of this paragraph apply to the system, if the ALKS is capable to perform a LCP.

The test for the forward detection range shall be executed at least when approaching a PTW target positioned 9m to the side(s) to which the ALKS performs a LCP, measured from the centre of the ALKS vehicle.]

Annex 5, Paragraph 4.6.3.2.- 4.6.5.1., amended to read (removal of square brackets):

[4.6.3.2 The requirements of this paragraph apply to the system, if the ALKS is capable to perform a LCP.

The test for the lateral detection range shall be executed at least with:

- (a) a PTW target approaching the ALKS vehicle 9m to the left side of the ALKS, measured from the centre of the ALKS vehicle;
- (b) a PTW target approaching the ALKS vehicle 9m to the right side of the ALKS, measured from the centre of the ALKS vehicle.

4.6.4. Reward detection range

4.6.4.1. The requirements of this paragraph apply to the system, if the ALKS is capable to perform a LCP.

The test for the rear detection range shall be executed at least with:

- (a) a PTW approaching the ALKS from the rear within an area 9m to the left of the ALKS vehicle, measured from the centre of the ALKS vehicle;

- (b) a PTW approaching the ALKS from the rear within an area 9m to the right of the ALKS vehicle, measured from the centre of the ALKS vehicle.

4.6.5. Direction indicator status detection range

4.6.5.1. The provisions of this paragraph apply to the ALKS that has a capability of detecting the direction indicator status of another vehicle.

The test for the detection area of direction indicator shall be executed at least with:

- (a) an activation of direction indicator of a vehicle positioned at random within the area declared in paragraph 7.1.4. of this Regulation;
- (b) different types of vehicles, including passenger car and PTW.]

Annex 6

Annex 6, Paragraph 2.1., to be deleted:

~~2.1. “Emergency operation” means the operation outside the operational limits specified by the manufacturer, when safety systems come into action in order to prevent or mitigate possible damage.~~

Annex 6, Paragraph 2.3., to be deleted:

~~2.3. “Dense traffic conditions” means that ALKS operations have the main objective to maintain a safe distance from the surrounding vehicles. In this case the average speed shall be greater than or equal to 15 km/h and lower than or equal to [55] km/h.~~

Annex 6, Paragraphs 2.4. and 2.5., amended to read:

2.4. “Free flow traffic conditions” means that ALKS operations are not heavily affected on a continuous basis by the behaviour of the surrounding vehicles. ~~In this case the average speed shall be greater than [90] km/h and lower than or equal to either the system maximum speed or the road maximum allowed, whichever lowest.~~

2.5. “Congested traffic conditions” means that ALKS operations are affected on a continuous basis by the behaviour of the surrounding vehicles, but the ALKS is still able to keep a decreased, but approximately constant speed (i.e. continuous vehicle following operation). In this case the vehicle average speed shall be greater than [55] km/h ~~and lower than or equal to [90] km/h.~~

Annex 6, Paragraph 2.6., inserted to read:

2.6. “Saturated traffic conditions” means that ALKS operations are affected on a continuous basis by the behaviour of the surrounding vehicles but the ALKS is still able to keep a decreased, but approximately constant speed (i.e. continuous vehicle following operation). In this case the average speed shall be greater than or equal to 15 km/h and lower than or equal to [55] km/h.

Annex 6, Paragraph 4.2., amended to read:

4.2. If applicable to the system’s ODD, the composition of the public road test shall allow the verification of the system ~~on~~

motorway in free-flow, congested condition and on motorway congested saturated traffic conditions.

Annex 6, Paragraph 5., amended to read:

Category	Type of scenario	Mandatory / Recommended	Main reference requirements (non-exhaustive list)	
Prevention of activation when the system is outside of its technical boundaries	On a section of highway that is not suitable	Mandatory	6.2.3.	
	In an urban environment	Mandatory		
	On a normally suitable road when other conditions (e.g. weather/time of day) are not met	Recommended		
System override by the driver	Intervention made by the steering wheel	Mandatory	6.3.1.	
	Intervention made by the acceleration pedal	Mandatory	6.3.3. and 6.3.4.	
	Intervention made by the brake pedal	Mandatory	6.3.2. and 6.3.4.	
No violation of traffic rules	Adheres to speed limits	Mandatory	5.1.2	
	Repeated changes in speed limit above 60 km/h	Mandatory	5.1.2 and 5.2.3	
	Exposure to different road signs which require system reaction (at least [3] different times)	Mandatory		
	Sufficient distance to vehicle in front	Mandatory	5.2.3.3	
	Does not cross solid lane markings where lane change is prohibited	Recommended	5.1.2 and 5.2.1	
Response to road events	Tunnel	Recommended	5.4.2.1	
	End of motorway	Recommended		
	Work zone	Recommended	§ 5.4.2.1 or 5.4.2.2	
	Toll station	Recommended	5.4.2.1	
	Reacts to closed lane	Recommended	5.4.2.1 or 5.4.2.2	
	Emergency vehicle approaching	Recommended	5.4.2.2	
	Change in environmental conditions	Recommended		
Response to other road users within the frontal and lateral detection range	Response to the acceleration and deceleration of a lead vehicle	Mandatory	5.2.5	
	PTW as lead vehicle	Recommended		
	HDV as lead vehicle	Mandatory		
	Another vehicle merging at an entry lane	Mandatory		
	Another vehicle merging at an ending lane	Free flow and congested dense traffic conditions		Mandatory
		Saturated Congested traffic conditions (repetition of at least [10] times)		Recommended

	Another vehicle merging with little longitudinal distance between the vehicles	Recommended		
	Cut-out of another vehicle (e.g. at highway exit)	Mandatory	5.2.5 and 5.2.3.3	
	The ALKS approaching stop and go traffic situations with different initial speeds (at least [10] situations)	Mandatory		
Lane Keeping	Lane keeping on roads with different lane curvature	Mandatory	5.2.1	
	Another vehicle driving close beside in the adjacent lane	Recommended	5.2.2	
Lane changing performed by the system	The ALKS performing lane change in the adjacent (target) lane with and without surrounding traffic	Mandatory	5.2.6	
	Merging at motorway entry	Mandatory		
	Merging at lane end	Free flow and congested dense traffic conditions		Mandatory
		Saturated Congested traffic conditions (repetition of at least [10] times)		Mandatory

Annex 6, Paragraph 6.1., amended to read:

- 6.1. The test, or combination of tests, shall be such that allows recording the ALKS operation including:
- (a) at least [5] operating hours in saturated dense traffic conditions; and, if applicable to the system's ODD,
 - (b) at least [10] operating hours in free-flow traffic conditions.

II. Justification

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