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Economic Commission for Europe**Inland Transport Committee****World Forum for Harmonization of Vehicle Regulations****Working Party on Brakes and Running Gear****Seventy-ninth session**

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Item 9(b) of the provisional agenda

Steering equipment – Lane Keeping Assist system (LKAS) and Parking Assist Systems (PAS)**Proposal for amendments to Regulation No. 79 (Steering equipment)****Submitted by the experts from LKAS small drafting group ***

The text reproduced below was prepared by the experts from the LKAS small drafting group to introduce new definitions and the related LKAS requirements in to the text of UN Regulation No. 79. It is based on Informal document GRRF-78-05. The modifications to the existing text of the Regulation are marked in bold for new or strikethrough for deleted characters.

* In accordance with the programme of work of the Inland Transport Committee for 2012–2016 (ECE/TRANS/224, para. 94 and ECE/TRANS/2012/12, programme activity 02.4), the World Forum will develop, harmonize and update Regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.

I. Proposal

Insert a new paragraph 2.3.4.2.1., to read:

"2.3.4.2.1. "Lane Keeping Assistance System (LKAS)" means a system which assists the driver in keeping the vehicle within the chosen lane, by influencing the lateral movement of the vehicle."

Insert new paragraphs 5.1.6.2. to 5.1.6.5., to read:

"5.1.6.2. The LKAS shall be designed so that excessive intervention of steering control (e.g. an excessive steering torque) is suppressed to ensure the steering operability by the driver and to avoid unexpected vehicle behaviour, during its operation.

The end of the intervention shall be such that the LKAS reduces its directional control to zero in a progressive manner, to ensure easy and safe handling of the vehicle, as defined in paragraph 5.1.1. The directional control fade-out strategy shall be at the discretion of the vehicle manufacturer.

The steering control effort necessary to override the directional control provided by the LKAS shall not exceed the value specified in paragraph 6.2.4.2. for an intact steering equipment.

5.1.6.3. When the LKAS is temporarily not available, for example due to inclement weather conditions, the system shall clearly inform the driver about the system status, except if the system is in the OFF mode, e.g. switched off. This exception does not affect the required warning in the case of a system malfunction.

5.1.6.4. The vehicle may be equipped with a means for the driver to activate or deactivate the LKAS.

5.1.6.5. The LKAS shall provide a means of detecting that the driver is likely to be no longer in primary control of the vehicle (e.g. by sensing the driver's input on the steering wheel). This means of detection is required to work when the system is available (i.e. ready to intervene or intervening).

When the LKAS is available and has detected that the driver is likely to be no longer in primary control of the vehicle, [until the driver takes primary control again / encouraging the driver to take primary control again / to call the driver's attention], effective warnings shall be given simultaneously or in a cascade involving at least two means out of optical, acoustic and appropriate haptic."

II. Justification

The part of bold of this justification reflects the discussion of LKAS ad-hoc meeting (23-24 Oct. 2014).

1. Discussions in LKAS Small Drafting Group (SDG), provided the above requirements.

2. Paragraph 2.3.4.2.1. is necessary to define LKAS and to introduce the related requirements in this Regulation.

3. Paragraph 5.1.6.2. on the safety of the steering system in association with the LKAS: the paragraph 5.1.6. in the current UN Regulation No. 79 prescribes that the LKAS shall not cause any deterioration in the performance of the basic steering system. However, it is necessary to further clarify its safety for maintaining driver control and for avoiding the driver confusion.

The proposed wording refers to the existing wording in UN Regulation No. 79 paragraph 5.1.1.: "The steering system shall ensure easy and safe handling of the vehicle up to its maximum design speed". This wording is achieving the intention pursued by current LKAS proposal per paragraph 5.1.6.2. of smooth fade out of the assistance effort.

Furthermore, this wording avoids any interpretation issue, since referring to existing UN Regulation No. 79 provisions. The last sentence of paragraph 5.1.6.2. provides specific requirements, completing the general requirement on "easy and safe handling of the vehicle".

4. Paragraph 5.1.6.3. is necessary to inform the driver about the LKAS operation status when LKAS is unable to function except if the system is in the OFF mode, e.g. switched off.

5. Paragraph 5.1.6.4. is necessary for the driver to opt for deactivation of the system. This paragraph clarifies that the vehicle may be equipped with a means for the driver to activate or deactivate LKAS.

6. Paragraph 5.1.6.5. was agreed within the SDG. The vehicle shall have at least one means to detect driver attention e.g. by sensing the driver's hands on the steering wheel, as the 1968 Vienna Convention requires that the driver is always in primary control of the vehicle. **The wording clarifies that the means of detecting that the driver is likely to be no longer in primary control of the vehicle is required only when the system is available (e.g. not in off mode or not available as defined in paragraph 5.1.6.3.).**

The LKAS ad-hoc group still could not decide at its October 2014 meeting about the three options indicated in square brackets. It is the intention of the group to table an informal document amending this particular paragraph, and promoting one of the three options, such that GRRF at its 79th session can rely on a clear recommendation from the ad-hoc group.
