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## Economic Commission for Europe

### Inland Transport Committee

### World Forum for Harmonization of Vehicle Regulations

#### 193rd session

Geneva, 25–28 June 2024

Item 4.8.7 of the provisional agenda

#### 1958 Agreement:

Consideration of draft amendments to existing

UN Regulations submitted by GRVA

## Supplement 11 to the 03 series of amendments to UN Regulation No. 79 (Steering equipment)

### Submitted by the Working Party on Automated/Autonomous and Connected Vehicles\*

The text reproduced below was adopted by the Working Party on Automated/Autonomous and Connected Vehicles (GRVA) at its eighteenth session (ECE/TRANS/WP.29/GRVA/18, paras. 35 and 85). It is based on ECE/TRANS/WP.29/GRVA/2023/21 as amended by GRVA-18-51 and on ECE/TRANS/WP.29/GRVA/2024/10 as amended by GRVA-18-32. It is submitted to the World Forum for Harmonization of Vehicle Regulations (WP.29) and to the Administrative Committee (AC.1) for consideration at their June 2024 sessions.

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\* In accordance with the programme of work of the Inland Transport Committee for 2024 as outlined in proposed programme budget for 2024 (A/78/6 (Sect. 20), table 20.5), the World Forum will develop, harmonize and update UN Regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.

*Introduction*, amend to read:

## "Introduction

...unforeseen object in the road.

Advances in technology have enabled the possibility for vehicles to be operated by an Automated Driving System (ADS) without the need for any human driver. As an initial step, this Regulation has been adapted to allow the approval of vehicles with an ADS where those vehicles are also equipped with manual driving controls. It is expected that in the manual driving mode the technical requirements can be applied as they would be for a conventional vehicle. In the automated driving mode, it is important that the requirements of Annex 6 are applied appropriately to the transmission links between the ADS and the steering equipment and, in the absence of a driver, that any faults in the steering equipment are identified by and/or transmitted to the ADS. It is also important that an ADS is only permitted to control the steering equipment if the ADS complies with the applicable regulatory requirements in the geographical area(s) where it can operate. In a second step, the Regulation will be further adapted to allow for the approval of automated vehicles which do not have manual steering controls, or which only have manual controls for use in limited circumstances such as vehicle recovery.

It was previously anticipated that future technology would also allow steering to be influenced or controlled by sensors and signals generated either on or off-board the vehicle. This had led to several concerns regarding responsibility for the primary control of the vehicle and the absence of any internationally agreed data transmission protocols with respect to off-board or external control of steering. Therefore, the Regulation does not permit the general approval of systems that incorporate functions by which the steering can be controlled by external signals, for example, transmitted from roadside beacons or active features embedded into the road surface, unless these functions meet the definition of an ADS. Such systems, which do not require the presence of a driver, but which are not ADS, have been defined as 'Autonomous Steering Systems'.

This Regulation also prevents..."

*Insert a new paragraph 1.2.4., to read:*

- "1.1. This Regulation applies to the steering equipment of vehicles of Categories M, N and O.<sup>1</sup>
- 1.2. This Regulation does not apply to:
  - 1.2.1. Steering equipment with a purely pneumatic transmission;
  - 1.2.2. Autonomous Steering Systems as defined in paragraph 2.3.3;
  - 1.2.3. Steering systems exhibiting the functionality defined as ACSF of Categories B2, D or E in paragraphs 2.3.4.1.3., 2.3.4.1.5., or 2.3.4.1.6., respectively, until specific provisions are introduced in this Regulation;
  - 1.2.4. Vehicles of Categories M and N which are not equipped with manual steering controls intended for use during normal operation."

*Paragraph 2.3.1., amend to read:*

- "2.3.1. 'Steering control' means the part of the steering equipment directly actuated by a driver which controls its operation, but which may also operate without direct intervention of the driver (e.g. due to action by an Advanced Driver Assistance Steering System or ADS). For steering equipment in which the steering forces are provided solely or partly by the muscular effort of the driver the steering control includes all parts up to the point where the steering effort is transformed by mechanical, hydraulic or electrical means;"

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<sup>1</sup> As defined in the Consolidated Resolution on the Construction of Vehicles (R.E.3), document ECE/TRANS/WP.29/78/Rev.7, para. 2 - <https://unece.org/transport/standards/transport/vehicleregulations-wp29/resolutions>

Paragraph 2.3.3., amend to read:

"2.3.3. 'Autonomous Steering System' means a system, other than an ADS, that incorporates a function within a complex electronic control system that causes the vehicle to follow a defined path or to alter its path in response to signals initiated and transmitted from off-board the vehicle. The driver will not necessarily be in primary control of the vehicle."

Paragraphs 2.4.8. and 2.4.9., amend to read:

"2.4.8. 'Remote Controlled Parking (RCP)' means an ACSF of category A, actuated by the driver, providing parking or low speed manoeuvring. The actuation is made in close proximity to the vehicle or the vehicle combination.

2.4.9. 'Specified maximum RCP operating range ( $S_{RCPmax}$ )' means the maximum distance between the nearest point of the motor vehicle or of the contour of both vehicles in case of vehicle combination and the remote control device or alternatively the driver (for systems based on detection of driver position and movement), up to which ACSF is designed to operate."

Paragraph 5.6.1.2.10., insert to read:

5.6.1.2.10 In the case that RCP is designed to operate in combination with a trailer, the manufacturer shall demonstrate to the Technical Service:

- How the safety of this operation is ensured;
- How  $S_{RCPmax}$  is enforced for different trailer lengths;
- How sensing is achieved with the trailer in place; and
- How additional sensing capabilities are implemented (if applicable).

Insert new paragraphs 2.10., 2.11. and 2.11.1., to read:

"2.10. (reserved)

2.11. 'Automated Driving System (ADS)' means the vehicle hardware and software that are collectively capable of performing the entire Dynamic Driving Task (DDT) on a sustained basis.

2.11.1. 'Dynamic Driving Task (DDT)' means the real-time operational and tactical functions required to operate the vehicle."

Paragraph 5.1.3., amend to read:

"5.1.3. The direction of operation of the steering control shall correspond to the intended change of direction of the vehicle and there shall be a continuous relationship between the steering control deflection and the steering angle. These requirements do not apply to systems that incorporate an automatically commanded or corrective steering function, to steering being controlled by an ADS, or to ASE.

These requirements may also not necessarily apply in the case of full power steering when the vehicle is stationary, during low-speed manoeuvres at speeds up to a maximum speed of 15km/h and when the system is not energised."

Insert new paragraphs 5.8., 5.8.1., 5.8.2., 5.8.2.1., 5.8.3. and 5.8.3.1., to read:

"5.8. Special Provisions for vehicles equipped with an Automated Driving System

The steering equipment of any vehicle equipped with an Automated Driving System, other than Automated Lane Keeping Systems as defined in UN Regulation No. 157, shall fulfil the following requirements.

5.8.1. An ADS may control the vehicle's steering equipment providing that the ADS is designed to comply with relevant national and/or international technical regulations and relevant national legislation governing operation, and providing that its activation is restricted by technical means to the jurisdiction(s) where these apply. Compliance with this requirement shall be declared by the manufacturer at the time of the application for approval.

- 5.8.2. Compliance with the applicable performance requirements of this UN Regulation whilst the ADS is active shall be demonstrated in accordance with Annex 6.
- 5.8.2.1. The transmission links between the ADS and the steering equipment (excluding the ADS itself), are subject to the requirements of Annex 6.
- 5.8.3. Whilst the ADS is active, detected faults as described in paragraph 5.4. of this UN Regulation shall be transmitted to the ADS.
- 5.8.3.1. Notwithstanding paragraph 5.4.1.1., faults which impair the steering function, and which can under manual driving conditions be detected by a driver due to vibration in the steering system or an increase in the steering force, shall be detected by the steering system and transmitted to the ADS unless the ADS itself is capable of detecting or sensing the presence of these faults."

*Annex 1, insert a new item 5.6., to read:*

- "5.6. Vehicle is equipped with an ADS: yes/no"
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