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## Economic Commission for Europe

Inland Transport Committee

### World Forum for Harmonization of Vehicle Regulations

#### 198th session

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Item 4.12.3 of the provisional agenda

#### 1958 Agreement:

Consideration of additional proposals for amendments  
to existing UN Regulations submitted by the  
Working Parties subsidiary to the World Forum, if any

### Proposal for the 05 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 twenty-third session (ECE/TRANS/WP.29/GRVA/23, para. 23). It is based on: ECE/TRANS/WP.29/GRVA/2025/41 as amended by informal document GRVA-23-16. 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 March 2026 sessions.

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\* In accordance with the programme of work of the Inland Transport Committee for 2026 as outlined in proposed programme budget for 2026 (A/80/6 (Sect. 20), table 20.7), 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:

...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 was 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 has been 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 at very low speeds. As a final step, it is expected to replace the reference to compliance with the applicable regulatory requirements in the geographical area(s) where the ADS can operate with a reference to a UN Regulation on the approval of vehicles with regard to their ADS.

It was previously ...

*Paragraph 1.2.4.*, shall be deleted:

*Paragraph 2.3.*, amend to read:

2.3.     *"Steering equipment"* means all the equipment the purpose of which is to determine the direction of movement of the vehicle.

The steering equipment consists of:

The steering control, if any,

The steering transmission,

The steered wheels,

The energy supply, if any.

*Paragraph 2.3.2.*, amend to read:

2.3.2.    *"Steering transmission"* means all components which form a functional link between the steering control and/or ADS (as applicable), and the road wheels.

The transmission is...

*Paragraph 2.3.4.*, amend to read:

2.3.4.    *"Advanced Driver Assistance Steering System"* means a system, additional to the main steering system, that provides assistance to a driver in steering the vehicle but in which the driver remains at all times in primary control of the vehicle. It comprises one or both of the following functions:

*Paragraph 2.5.1.1.3.*, amend to read:

2.5.1.1.3.   *"Full-power steering equipment"* in which the steering is controlled by a driver and the steering forces are provided solely by one or more energy supplies;

*Insert new paragraph 2.5.1.1.4.*, to read:

2.5.1.1.4.   *"ADS steering equipment"* in which the steering is controlled by an ADS and the steering forces are provided solely by one or more energy supplies.

*Paragraphs 2.15. and 2.16.*, amend to read:

2.15.    The *"effect of ageing"* is quantifying the irreversible degradation of the performance of an electrical storage device of a full power steering system or ADS steering equipment, due to e.g., the effects of time, use, and environmental exposure.

2.16. "*Energy Management System*" means, an electrical device(s), being part of, or used by, a full power steering system or ADS steering equipment, that monitors critical variables that impact on the performance and state of the electrical storage device(s) (e.g., voltage, temperature, internal resistance, effect of ageing, state of charge, power consumption, charging cycles, etc.) and deduces the actual capability of the devices to fulfil the performance requirements of this Regulation."

*Insert new paragraph 3.2.4., to read:*

3.2.4. In the case of vehicles equipped with an ADS, an overview of the transmission links between the ADS and the steering equipment.

*Paragraph 5.1.1., amend to read:*

5.1.1. The steering system shall ensure easy and safe handling of the vehicle up to its maximum design speed or in case of a trailer up to its technically permitted maximum speed. The vehicle shall meet the requirements of paragraph 6.2. in the case of motor vehicles and of paragraph 6.3. in the case of trailers. If a vehicle is fitted with an auxiliary steering system, it shall also meet the requirements of Annex 4. Trailers equipped with hydraulic steering transmissions shall comply also with Annex 5.

*Insert new paragraphs 5.1.1.1. to 5.1.1.3., to read:*

5.1.1.1. Except in the case of vehicles of categories X and Y<sup>1</sup>, there shall be a tendency to self-centre when tested in accordance with paragraph 6.2. with intact steering equipment.

5.1.1.2. The steering control of vehicles of categories X and Y, if fitted, and their associated transmission are only required to comply with this regulation insofar as:

5.1.1.2.1. The direction of operation of the steering control shall correspond to the intended change of direction of the vehicle.

5.1.1.2.2. Paragraphs 5.1.5. and 5.1.11. shall apply.

5.1.1.2.3. Paragraph 5.3.1.3. shall apply whilst the steering control is in use.

5.1.1.2.4. The steering control shall be located such that the driver is able to operate the vehicle safely (e.g. with an adequate view of the driving environment).

5.1.1.2.5. If the steering control is made by a remote-control device in close proximity to the vehicle, the requirements of paragraph 5.7. (with the exception of paragraph 5.7.1.13. and paragraphs 5.7.1.16. to 5.7.1.21.) shall apply.

5.1.1.3. It shall be ensured through technical means that the speed of vehicles of categories X and Y cannot exceed 6 km/h whilst the vehicle is being manually driven.

*Paragraph 5.1.2., amend to read:*

5.1.2. It shall be possible to travel along a straight section of road without unusual steering correction by the driver or ADS, and without unusual vibration in the steering system at the maximum design speed of the vehicle.

*Paragraph 5.1.5., amend to read:*

5.1.5. The effectiveness of the steering equipment, including the electrical control lines, shall not be adversely affected by magnetic or electric fields. This shall be demonstrated by fulfilling the technical requirements and respecting the transitional provisions of Regulation No. 10 by applying the following series of amendments (or later), as applicable:

(a) The 03 series of amendments for vehicles without a coupling system for charging the Rechargeable Electric Energy Storage System (traction batteries);

- (b) The 04 series of amendments for vehicles with a coupling system for charging the Rechargeable Electric Energy Storage System (traction batteries);
- (c) The 07 series of amendments for vehicles equipped with an ADS.

*Paragraph 5.4.*, amend to read:

5.4. **Warning signals**

The requirements of this section related to warning signals to the driver shall not apply whilst an ADS feature is active. Requirements of paragraph 5.8.3. shall apply instead.

*Insert new paragraph 5.5.3.*, to read:

5.5.3. For vehicles of categories X and Y, suitable means shall be provided (e.g. a test mode, manual controls) to enable the performance of the necessary physical checks described in paragraph 5.5.1.

*Paragraph 5.7.1.*, amend to read:

5.7.1. Vehicles of category M<sub>1</sub> and N<sub>1</sub> meeting the requirements of Category G<sup>1</sup>, as well as vehicles of categories X and Y, may be equipped with RCM provided the system fulfils the following requirements.

*Paragraph 5.8.*, amend 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 shall fulfil the following requirements.

*Paragraph 5.8.3.*, amend to read:

5.8.3. Whilst an ADS feature is active, warning signals (e.g. failure status) and other information intended for the driver as described in this UN Regulation shall be transmitted to the ADS.

The means by which it is ensured that existing detected faults are transmitted to the ADS before an ADS feature becomes active (e.g. previously detected faults which remain present) shall be documented by the manufacturer and demonstrated in accordance with Annex 6.

*Insert new paragraph 5.8.4.*, to read:

5.8.4. Without prejudice to the requirements of other applicable regulations, the steering control and transmission links between the steering control and steering equipment may be disabled or disconnected whilst an ADS feature is active.

*Insert new paragraph 5.8.5.*, to read:

5.8.5. Notwithstanding the provisions of sections 5.1.6 and 5.6, Advanced Driver Assistance Steering Systems shall not be active, or be able to be activated, whilst an ADS feature is active.

*Insert new paragraphs 5.8.6. to 5.8.6.3.*, to read:

5.8.6. Whilst the vehicle is in a manual driving mode (if applicable), the steering system is classified according to paragraphs 2.5.1.1.1. to 2.5.1.1.3. and shall meet all requirements of this regulation relevant to that classification. Whilst an ADS Feature is active, the steering equipment is classified as ADS Steering Equipment according to paragraph 2.5.1.1.4. and shall meet all applicable requirements of this regulation, and the following additional requirements.

5.8.6.1. ADS Steering Equipment with electrical energy transmission shall meet the following additional requirements:

5.8.6.1.1. If any ADS Feature can operate at speeds above 10 km/h, there shall be an energy management system meeting the requirements of paragraph 5.3.3.6.7.

5.8.6.1.1.1. A warning signal shall be transmitted to the ADS no later than when the effect of ageing on the electrical storage device(s) is such that its performance is not sufficient to fulfil the specifications defined by the manufacturer according to paragraph 5.8.6.3.

5.8.6.1.1.2. The energy management system shall continuously transmit the state of the electrical storage device(s) to the ADS.

5.8.6.2. ADS Steering Equipment with non-electrical energy transmission shall meet the following additional requirement:

5.8.6.2.1. The level of stored energy in the energy reservoir(s) shall be continuously transmitted to the ADS.

5.8.6.3. The manufacturer shall document and demonstrate according to Annex 6 how, in case of a failure of the energy supply (including the energy source, if any), energy transmission or control transmission, the system is able to fulfil the specifications defined by the manufacturer. These specifications shall be defined in terms of a sequence (or sequences) of manoeuvres which can be performed, considering all relevant effects which could negatively impact the performance of the steering system (e.g. temperature, ageing effects of the electrical storage devices). The requirements of paragraph 6 for an intact system shall be satisfied until the vehicle speed is below 10 km/h.

The performance shall be assessed by the Technical Service at the time of type approval.

*Paragraph 6.1.4.*, amend to read:

6.1.4. In the case of any systems that use electrical energy for part or all of the energy supply, all performance tests shall be carried out under conditions of actual or simulated electrical load of all essential systems or system components which share the same energy supply. Essential systems shall comprise at least the following, where fitted: lighting systems, windscreens wipers, powertrain management systems, braking systems and automated driving systems.

*Paragraph 6.2.*, amend to read:

6.2. Provisions for motor vehicles

Paragraph 6.2.1. applies to all motor vehicles, both whilst being manually driven and whilst any ADS feature is active.

Paragraphs 6.2.2. to 6.2.5. do not apply to vehicles of categories X and Y, nor to vehicles of other categories whilst an ADS feature is active.

Paragraphs 6.2.6. and 6.2.7. apply only whilst an ADS feature is active.

*Insert new paragraphs 6.2.6. to 6.2.9.*, to read:

6.2.6. The measurement of steering time of vehicles equipped with an ADS, with intact steering equipment, whilst the ADS is active.

6.2.6.1. The vehicle shall be driven from straight ahead into a spiral at a speed of 10 km/h. The time shall be measured from the start of steering motion until the position of the steered wheels corresponds to a turning radius of 12 m. One steering movement shall be made to the right and one to the left.

6.2.6.2. The maximum permitted steering time with intact steering equipment is 4 seconds.

6.2.7. The measurement of steering time of vehicles equipped with an ADS, with a failure in the steering equipment, whilst the ADS is active.

6.2.7.1. The test described in paragraph 6.2.6. shall be repeated with a failure in the steering equipment. The steering time shall be measured from the start of steering motion until the position of the steered wheels corresponds to the turning radius of 20 m.

6.2.7.2. The maximum permitted steering time with a failure in the steering equipment is 4 s, except for Categories M<sub>3</sub> and N<sub>3</sub> where the maximum permitted steering time is 6 s.

6.2.8. If the turning radii specified in paragraphs 6.2.6.1. or 6.2.7.1. are not attainable (because the steering angle available to the ADS is limited, or because full lock is reached), the maximum attainable steering angle shall be used, and the maximum permitted steering time shall be adjusted according to the following formula.

$$\text{Maximum permitted steering time} = \frac{r}{\text{Attainable turning radius}} \times t$$

In the case of intact steering equipment:

r = 12 m (or the full lock turning radius for vehicles of categories M<sub>3</sub> and N<sub>3</sub> if 12 m radius is not attainable)

t = 4 s

In the case of a failure in the steering equipment:

r = 20 m

t = 6 s in the case of vehicles of Categories M<sub>3</sub> and N<sub>3</sub>  
4 s in all other cases

6.2.9. The tests described in paragraphs 6.2.6. and 6.2.7. shall be conducted using a method subject to agreement between the manufacturer and the Technical Service, in order to demonstrate that the steering actuator(s) can achieve the specified steering times.

The manufacturer shall demonstrate that the test activation method accurately replicates ADS steering performance, and a detailed description of the method used shall be included in the test report. The steering demand made shall be recorded in the test report alongside the results of each test.

In the case that the vehicle has full power steering in the manual driving mode, the tests described in paragraphs 6.2.6. and 6.2.7. are not required to be performed if the manufacturer can demonstrate that the steering performance available to the ADS is equivalent to that available in the manual mode.

*Insert new paragraph 12.4. and subparagraphs, to read:*

12.4. Transitional provisions applicable to the 05 series of amendments

12.4.1. As from the official date of entry into force of the 05 series of amendments, no Contracting Party applying this Regulation shall refuse to grant or refuse to accept UN type approvals under this regulation as amended by the 05 series of amendments.

12.4.2. As from 1 September 2027, Contracting Parties applying this Regulation shall not be obliged to accept UN type approvals to the preceding series of amendments, first issued after 1 September 2027.

12.4.3. Until 1 September 2029, Contracting Parties applying this Regulation shall continue to accept UN type approvals to the preceding series of amendments to this Regulation, first issued before 1 September 2029.

12.4.4. As from 1 September 2029, Contracting Parties applying this Regulation shall not be obliged to accept type approvals issued to the preceding series of amendments to this Regulation.

12.4.5. Notwithstanding paragraphs 12.4.2. and 12.4.4., Contracting Parties applying this UN Regulation shall continue to accept UN type approvals issued according to any of the preceding series of amendments to this UN Regulation, for vehicles which are not affected by the provisions introduced with the 05 series of amendments, provided the transitional provisions in these respective previous series of amendments foresee this possibility.

12.4.6. Until 1 September 2030, type approvals according to the 05 series of amendments to this UN Regulation may be granted to new vehicle types equipped with an Automated Lane Keeping System as defined in UN Regulation No. 157, for vehicles not complying with the requirements of paragraph 5.8. with respect to that Automated Lane Keeping System (ALKS).

12.4.7. Contracting Parties applying this Regulation shall continue to accept UN type approvals for vehicle types equipped with an Automated Lane Keeping System as defined in UN Regulation No. 157, for vehicles not complying with the requirements of paragraph 5.8. with respect to that Automated Lane Keeping System (ALKS), first issued before 1 September 2030.

*Paragraphs 12.4. and 12.4.1. (former), renumber as paragraphs 12.5. and 12.5.1.*

*Footnote 1, amend to read:*

As defined in the Consolidated Resolution on the Construction of Vehicles (R.E.3.), document ECE/TRANS/WP.29/78/Rev.8, para.2  
<https://unece.org/transport/standards/transport/vehicleregulations-wp29/resolutions>

*Annex 1, insert new paragraphs 5.6.1. to 5.6.3., to read:*

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

5.6.1. If applicable, description of the disconnection or disablement of the steering control while an ADS feature is active:

5.6.2. For vehicles of categories X and Y, description of the operation of the manual steering control, if fitted:

5.6.3. Description of the specifications defined by the manufacturer according to paragraph 5.8.6.3. (i.e. the sequence(s) of manoeuvres that can be performed under failure conditions):

*Annex 3, insert new paragraph 1.4., to read:*

1.4. For vehicles of categories X and Y, tests shall be conducted using a method subject to agreement between the manufacturer and the Technical Service, ensuring that the evaluation accurately reflects real-world ADS braking performance.

Wherever this annex details a control being actuated or a force being applied, that shall be understood as a braking demand being made. The manufacturer shall demonstrate that the test activation method accurately replicates ADS braking performance, and a detailed description of the method used shall be included in the test report. The braking demand made shall be recorded in the test report alongside the results of each test.

For vehicles equipped with an ADS, other than those of categories X and Y, the tests in this annex shall be performed at least using the relevant manual brake control. Tests need not be performed in ADS mode, providing that the manufacturer can demonstrate to the Technical Service that the same brake performance can be achieved when equivalent braking demands are made by the ADS. However, testing to verify this shall be performed at the discretion of the Technical Service.

*Annex 4, paragraph 2.3.1., amend to read:*

2.3.1. Except for parts of ASE not considered susceptible to breakdown as specified in paragraph 5.3.1.1. of this Regulation, the following failure of ASE shall be clearly brought to the attention of the driver or transmitted to the ADS, as applicable:

*Annex 7, paragraph 2.1.2., amend to read:*

2.1.2. The user manual shall include information to advise the user on the electrical energy available for the trailer steering system and that the electrical interface

shall not be connected when the current requirement marked on the trailer exceeds that which can be supplied by the towing vehicle.

*Annex 7, paragraph 3.5., amend to read:*

3.5. Failure warning:

Failures within the electric control transmission of the steering system shall be directly displayed to the driver or transmitted to the ADS, as applicable.

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