

**Economic and Social Council**Distr.: General  
8 March 2023

Original: English

---

**Economic Commission for Europe**

Inland Transport Committee

**World Forum for Harmonization of Vehicle Regulations**

Working Party on Automated/Autonomous and Connected Vehicles

**Sixteenth session**

Geneva, 22-26 May 2023

Item 8(a) of the provisional agenda

**UN Regulations Nos. 13, 13-H, 139, 140 and UN GTR No. 8:****Electronic Stability Control****Proposal for amendments to UN Regulation No. 140  
(Electronic Stability Control (ESC) Systems)****Submitted by the expert from the International Organization of  
Motor Vehicle Manufacturers\***

The text reproduced below was prepared by the expert from the International Organization of Motor Vehicle Manufacturers (OICA) and is based on informal document GRVA-15-55. The modifications to the existing text of the Regulation are marked in **bold** for new or ~~striethrough~~ for deleted characters.

---

\* In accordance with the programme of work of the Inland Transport Committee for 2023 as outlined in proposed programme budget for 2023 (A/77/6 (part V sect. 20) para 20.6), 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.



## I. Proposal

*Paragraph 9.9.4.*, amend to read:

“9.9.4. The steering amplitude of the final run in each series is the greater of 6.5 A or 270 degrees, provided the calculated magnitude of 6.5 A is less than or equal to 300 degrees. If any 0.5 A increment, up to 6.5 A, is greater than 300 degrees, the steering amplitude of the final run shall be 300 degrees.

If the above calculated steering amplitude of the final run is greater than the maximum operable steering wheel angle determined by design of the steering system, the final angle amplitude for the series test shall be greater than 98 per cent of the maximum operable angle.

**In case that saturation of the front tyres happens before the above calculated magnitude angle, this angle may be used as the final steering amplitude, but only if this angle is greater or equal to 6.5 A.”**

## II. Justification

1. The torque required at the steering wheel to perform the test and reach the fixed amplitude, i.e., the fixed steering wheel angular speed meeting 0.7 Hz sine frequency, is much higher for low steering gear ratio steering systems than for high steering gear ratios. Meeting the criteria produces also much more wheel steer.

2. The vehicle behaviour (yaw rate, lateral acceleration and thus trajectory) is similar for all amplitudes above approximately seven to eight A (i.e., more than seven times the steering wheel angle corresponding to 0.3 g), because the front tyres are “saturated” (i.e. they lose adhesion). More steer of the tyres doesn’t provide more lateral force, so the yaw rate and the lateral acceleration don’t increase. Further increasing the steering wheel amplitude after the front tyres reach saturation doesn’t provide more information on the vehicle behaviour.

3. Vehicles equipped with steering equipment with significant lower steering gear ratio are expected to be introduced soon on the market. Without amendments to the paragraphs above, the steering wheel torque applied may become excessive to achieve the 270 degrees sine amplitude at 0.7 Hz (not reachable by conventional steering robots).

---