

Distr.  
GENERAL

TRANS/WP.29/GRRF/2002/23  
5 July 2002

Original: ENGLISH

ECONOMIC COMMISSION FOR EUROPE

INLAND TRANSPORT COMMITTEE

World Forum for Harmonization of Vehicle Regulations (WP.29)

Working Party on Brakes and Running Gear (GRRF)  
(Fifty-second session, 16-18 September 2002,  
agenda item 5.)

PROPOSAL FOR DRAFT AMENDMENT TO REGULATION No. 79

(Steering equipment)

Transmitted by the Expert from the United Kingdom

Note: The text reproduced below was prepared by the expert from the United Kingdom in order to address the concerns raised during the fifty-first session, mainly related to automatic or partially automatic control of vehicle steering. This document refers to document TRANS/WP.29/GRRF/2005/5.

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Note: This document is distributed to the Experts on Brakes and Running Gear only.

**A. PROPOSAL**

Paragraph 1.4., amend to read:

"1.4. Automatically commanded steering systems capable of resulting in a turning radius less than [500m] shall only be approved for use in traffic situations below a maximum speed of [30]km/h."

Paragraph 1.5., should be deleted.

Paragraphs 1.6. and 1.7. (former), renumber as paragraphs 1.5. and 1.6.

Paragraph 2.3.3., amend to read:

"2.3.3. "Autonomous steering" means the function within a complex electronic control system that causes the vehicle to follow a defined path, or alter its path, in response to signals initiated and transmitted from off-board the vehicle."

Paragraph 2.3.4., amend to read:

"2.3.4. "Automatically commanded steering" means the function within a complex electronic control system whereby actuation of the steering system may result from automatic evaluation of signals initiated on board the vehicle in order to assist the driver in following a particular path or in low speed manoeuvring."

Paragraph 2.3.5., amend to read:

"2.3.5. "Corrective steering" means the function within a complex electronic control system whereby minor changes to the steering angle of one or more wheels may result from the automatic evaluation of signals initiated on board the vehicle in order to influence vehicle dynamic behaviour rather than affect the basic chosen path of the vehicle.

Corrective steering also includes systems that warn the driver of a deviation from the ideal path of the vehicle, or of an unseen hazard, by means of a tactile warning transmitted through the steering control."

Paragraph 5.1.9., amend to read:

"5.1.9. Control systems

The requirements of annex 6 shall be applied to the safety aspects of all complex electronic vehicle control systems ~~which that~~ provide, or form part of, the control transmission of the steering function, including those ~~which that~~ utilise the steering system for automatically commanded steering or corrective steering.

However, systems or functions ~~which that~~ use the steering system as a means of achieving a higher ~~stability~~ level objective, are subject to annex 6 only in so far as they have a direct effect on the steering system. If such systems are provided, they shall not be deactivated during type approval testing of the steering system."

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## B. JUSTIFICATION

Document TRANS/WP.29/GRRF/2002/5, which was the outcome of several meetings of an ad hoc group, was presented to the fifty-first session of GRRF by the Chairman of the group, Mr. W. Maeder. The subsequent discussion raised concerns on certain issues, particularly related to automatic or partially automatic control of vehicle steering, and the United Kingdom would like to propose the following amendments to address these concerns.

Ref. to paragraph 1.4.:

Justification: This amendment would allow the approval and use of "Lane Keeping" systems for major highway use, that is, for roads that are essentially "straight".

Ref. to paragraph 1.5.:

No longer necessary as this issue is explained in the general part of the Justification.

Furthermore, the United Kingdom suggests clarifying the rationale behind the Regulation and proposes to introduce the following paragraph, if GRRF agrees.

## 0. INTRODUCTION

The intention of the Regulation is to establish uniform provisions for the layout and performance of steering systems fitted to vehicles used on the road. Traditionally, the major requirement has been that the main steering system comprises a positive mechanical link between the steering control, normally the steering wheel, and the road wheels in order to determine the path of the vehicle. The mechanical link, if amply dimensioned, has been regarded as not being liable to failure.

Advancing technology, coupled with the wish to improve occupant safety by elimination of the mechanical steering column and the production advantages associated with easier transfer of the steering control between left and right hand drive vehicles, has led to a review of the traditional approach and the Regulation is now amended to take account of these issues. Accordingly, it will now be possible to have steering systems in which there is not any positive mechanical connection between the steering control and the road wheels.

The technology will also allow steering to be influenced or controlled by sensors and signals generated either on or off-board the vehicle and this has led to concerns regarding the absence of any internationally agreed data transmission protocols with respect to off-board or external control of steering. The Regulation addresses these concerns in two ways:

(a) by prohibiting the general approval of systems where the steering can be controlled by external signals, for example, transmitted from roadside beacons or active devices embedded into the road surface. Such systems, which may not require the presence of a driver, have been defined as "Autonomous Steering" and may be approved only on a national basis. To allow cross border transit

traffic, nationally approved systems would need to be rendered ineffective if the appropriate signal was not being received.

(b) by allowing the approval of systems where the driver essentially remains in overall control of the vehicle but may be helped by the steering system being influenced by signals generated on-board the vehicle. These systems may be "Automatically Commanded Steering", for example, using passive infrastructure devices to assist in keeping the vehicle on an ideal path (Lane Keeping), to assist in manoeuvring the vehicle at low speed in confined spaces or to assist in coming to rest at a pre-defined point (bus stop guidance). Alternatively, they may be "Corrective Steering" systems that, for example, warn the driver of any deviation from an ideal path (Lane Departure Warning), or correct the steering angle of one or more wheels to improve the dynamic behaviour or stability of the vehicle.

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