

PROPOSAL TO AMEND REGULATION No. 79

Transmitted by the expert from the United Kingdom

Note: The text reproduced below is based on TRANS/WP.29/GRRF/2002/5/Rev.1 and TRANS/WP.29/GRRF/2002/5/Rev.1/Add.1.

The intention of this proposal is to amend the introduction section 0 and clarify the information contained within it whilst removing any reference to National provisions, which should not appear in a UNECE Regulation. It also re-instates "infrastructure devices" a term which was agreed at previous GRRF meetings to permit such devices that may constitute an embedded metal strip which is not part of the normal infrastructure and to revert to the previously agreed PTI arrangements.

Additionally a new paragraph 5.1.6.1. is proposed to ensure that when the "Automatically Commanded Steering" function becomes operational or ceases to be operational the driver shall be warned by means of a visual and another signal.

A. PROPOSAL

Paragraph 0 – Introduction, amend to read:

"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 contains 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 the new technologies. 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.

Systems whereby the driver remains in primary control of the vehicle but may be helped by the steering system being influenced by signals initiated on-board the vehicle are defined as "Advanced Driver Assistance Steering Systems". Such Systems can incorporate an "Automatically Commanded Steering Function", for example, using passive infrastructure devices to assist the driver in keeping the vehicle on an ideal path (Lane Guidance, Lane Keeping or Heading Control), to assist the driver in manoeuvring the vehicle at low speed

in confined spaces or to assist the driver in coming to rest at a pre-defined point (Bus Stop Guidance). Advanced Driver Assistance Steering Systems can also incorporate a “Corrective Steering Function” that, for example, warns the driver of any deviation from the chosen lane (Lane Departure Warning), corrects the steering angle to prevent departure from the chosen lane (Lane Departure Avoidance) or corrects the steering angle of one or more wheels to improve the vehicle’s dynamic behaviour or stability.

In the case of any Advanced Driver Assistance Steering System, the driver can, at all times, choose to override the assistance function by deliberate action, for example, to avoid an unforeseen object in the road.

It is anticipated that future technology will also allow steering to be influenced or controlled by sensors and signals generated either on or off-board the vehicle. This has 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 devices embedded into the road surface. Such systems, which do not require the presence of a driver, have been defined as “Autonomous Steering Systems”.

This Regulation also prevents the approval of positive steering of trailers using energy supply and electrical control from the towing vehicle as there are not any standards applicable to energy supply connectors or to control transmission digital information interchange. It is expected that at some time in the future, the International Standards Organization (ISO) Standard, ISO11992, will be amended to take account of transmission of steering control data.

Paragraph 1.2.3., should be deleted.

Paragraphs 1.2.4. and 1.2.5., renumber as paragraphs 1.2.3. and 1.2.4.

Section 2 - Definitions

Paragraphs 2.3.4.1. and 2.3.4.2., amend to read:

"2.3.4.1. "Automatically commanded steering function" means the function within a complex electronic control system where actuation of the steering system can result from automatic evaluation of signals initiated on-board the vehicle, possibly in conjunction with passive infrastructure devices, to generate continuous control action in order to assist the driver in following a particular path, in low speed manoeuvring or parking operations.

2.3.4.2. "Corrective steering function" means the discontinuous control function within a complex electronic control system whereby, for a limited duration, changes to the steering angle of one or more wheels can result from the automatic evaluation of signals initiated on-board

the vehicle, in order to maintain the basic desired path of the vehicle or to influence the vehicle's dynamic behaviour.

Systems that do not themselves positively actuate the steering system but that, possibly in conjunction with passive infrastructure devices, simply 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, are also considered to be corrective steering."

Insert new paragraph 5.1.6.1., to read:

"5.1.6.1. Whenever the Automatically Commanded Steering function becomes operational, this shall be indicated to the driver and the control action shall be automatically disabled if the vehicle speed exceeds the set limit of 10 km/h by more than 20% or the signals to be evaluated are no longer being received.

Any termination of control shall produce a short but distinctive driver warning by a visual signal and either an acoustic signal or by imposing a tactile warning signal on the steering control."

Paragraph 5.5.1., amend to read:

"5.5.1. As far as is practicable the steering equipment shall be so designed that, without disassembly, its operation can be checked with, if necessary, commonly used measuring instruments, methods or test devices."

B. Justification

Paragraph 1.2.3. is deleted as the Regulation now permits the approval of Automatically Commanded Steering Systems and the technical requirements are given in the new 5.1.6. paragraph. Paragraphs 2.3.4.1. and 2.3.4.2. have been amended to re-instate "devices" as mentioned in Section 0.

The new paragraph 5.1.6.1. refers to paragraph 5.2.6.1. contained in informal document No. 9, presented at the 54th session of GRRF, and deals with the automatic termination of the Automatically Commanded Steering function when the signal being evaluated for control is lost or the set speed limit exceeded. Since the speed limit is set at a very low value, it is reasonable to permit a small margin before cancelling the function.

Paragraph 5.5.1. has been amended to reflect the text in document TRANS/WP.29/GRRF/2002/5/Rev.1 and informal document No. 13 presented by OCIA at the 51st session of GRRF (4 - 8 February 2002). This was agreed after much debate in GRRF and deals generally with the operation of the steering equipment. To align it with Regulation No. 13 does not seem appropriate as the PTI provisions in that Regulation are designed to assess components that are designed to regularly wear out i.e. friction components - whereas steering components are not.
