Proposal for a supplement to the 03 and to the 04 series of amendments to UN Regulation No. 79 (Steering equipment)

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The text reproduced below was prepared by the experts from the European Association of Automotive Suppliers (CLEPA) and the International Organization of Motor Vehicle Manufacturers (OICA) and is based on informal document GRVA-16-08. The document will amend ECE/TRANS/WP.29/GRVA/2023/21 by an extended justification and additional paragraph. The proposed amendments aim to clarify provisions on Automatically Commanded Steering Function (ACSF) of category A. The modifications to the exiting text of the Regulation are indicated in bold for new characters.

I. Proposal

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."

Paragraphs 5.6.1.2.10, insert to read:

5.6.1.2.10   **In the case that the 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).**

II. Justification

1.   The proposal aims to clarify the provisions for ACSF of category A Remote Controlled Parking (RCP) for vehicle combinations. The current definition for RCP S_{RCPmax} sets a maximum limit of 6m distance to the motor vehicle, which is insufficient in situations where the operation is supervised by the driver located behind the vehicle combination. Therefore in cases of a vehicle combination the RCP S_{RCPmax} must be related to the whole vehicle combination for proper monitoring of the parking process.

2.   In reverse parking / manoeuvring-situations this condition offers safety advantages, as the driver can see better what is behind the trailer.

3.   All paragraphs providing requirements for a Remote-Controlled Parking system remain unchanged and applicable to the vehicle combination, which contributed to the idea of safety.

4.   Most notably, collision avoidance and obstacle detection in the manoeuvring area as required by paragraph 5.6.1.1.4. is to be proven during the approval process.

5.   The demonstration of safe system behaviour under fault and non-fault conditions and appropriate measures to allow adequate sensor visibility of the manoeuvring area remains to be subject to discussion and agreement between the manufacturer and the Technical Service and shall be described in Annex 6.

6.   Dealing with overhanging cargo should not be solved technically via homologation-regulations, but remains under the driver's responsibility for such assistance function, when driving reverse, with or without a trailer. This is regulated via international behavioural law (19. Convention on Road Traffic. Vienna, 8 November 1968), reflected by all signing countries a national law (e.g. art. 30 "loading vehicles", see excerpt below in italics) and also similar national drivers behavioural law for countries, which have not signed, e.g. via the driving school and official driving license and driver license test accordingly.

Article 30 Loading of vehicles….

*2. **Every load on a vehicle shall be so arranged and, if necessary, stowed as to prevent it from:***

*(a) **endangering persons or causing damage to public or private property, more particularly by trailing on or falling on to the road;***

(b) obstructing the driver's view or impairing the stability or driving of the vehicle;

(c) causing noise, raising dust, or creating any other nuisance which can be avoided;

(d) masking lights, including stop lights and direction-indicators, reflex reflectors, registration numbers and the distinguishing sign of the State of registration with which, under this Convention or under domestic legislation, the vehicle is required to be equipped, or masking signals given by arm in accordance with Article 14, paragraph 3 or Article 17, paragraph 2, of this Convention.

3. All accessories, such as cables, chains and sheets, used to secure or protect the load shall be drawn tight around the load and be firmly fastened. All accessories used to protect the load shall satisfy the requirements laid down for the load in paragraph 2 of this Article.

4. Loads projecting beyond the front, rear or sides of the vehicle shall be clearly marked in all cases where their projection might not be noticed by the drivers of other vehicles; at night, a white light and a white reflecting device shall be used for such marking at the front and a red light and a red reflecting device at the rear. More particularly, on power-driven vehicles: (a) loads projecting more than one metre (3 feet 4 inches) beyond the front or rear of the vehicle shall always be marked;

(b) loads projecting laterally beyond the outer edge of the vehicle in such a way that their lateral outer edge is more than 0.4-0 m (16 inches) from the outer edge of the vehicle's front position (side) light shall be marked at the front at night, and loads projecting in such a way that their lateral outer edge is more than 0.40 m (16 inches) from the outer edge of the vehicle's red rear position (side) light shall be similarly marked at the rear at night.

5. Nothing in paragraph 4 of this Article shall be construed as preventing Contracting Parties or sub-divisions thereof from prohibiting, restricting, or

subjecting to special authorization, load projections as referred to in the aforesaid paragraph 4.

7. The amendment aims to open the remote function to motor vehicles and coupled trailer of all categories. The following safety / security aspects are essential:

7.1 Motor vehicle-trailer communication does not exist on light trailers O1 / O2 and probably won't be included ever, because there is no need and normally no electronic control unit ECU at such small trailer.

7.2 Such communication indeed exists on HCVs (ISO 11992) but it has justifiably not been updated for RCP trailer low speed functions. It would also lead to a fixed installation in the trailer and towing vehicle of special connecting devices and a sensor, which would lead to be the trailer part of the homologation-process. Such effort leads not to more safety, the safety is addressed by the towing vehicle only. ISO 11992 is addressing HCVs only and would need a time-consuming update for low speed RCP, if the regulation R79 would enforce ISO 11992.

RCP should be open for simple car/trailer-combinations, possibly daily changing of the towing vehicle with another trailer and therefore technology neutral without a specified data communication or just using a camera at the roof of a N1-vehicle backwards – since this is the use-case. There are already secure and proven technologies on the market for the communication with an additional sensor (not ISO 11992).

7.3 The function is similar to ACSF A without remote control, with possibly longitudinal and lateral control. Sufficient sensor-view is needed in order to avoid any collision, also moving backwards the area between trailer and vehicle and beyond the trailer. In case of RCP: it is always longitudinal and lateral control and such function needs a means to detect an obstacle and has to avoid any collision for the direction of travel: it is mandatory to fulfil 5.6.1.1.4..

7.4 The towing vehicle handles the entire functionality completely independently without an electronic control unit ECU ("logic") in the trailer: it evaluates sensor data on the rear of the motor vehicle and, if necessary, an additional sensor on the trailer and derives a safe trajectory for the vehicle combination without collision and controls lateral and longitudinal movement, as already possible for RCP without mentioning a trailer. All necessary components, possibly "external", like a mobile-phone-app or additional sensor, are part of its UN-R79-approval.

7.5 Annex 6 CEL is relevant in order to document the function description and how the vehicle/trailer-combination is able to detect objects and avoid collisions, e.g. by mentioning an additional mobile sensor to be mounted at the trailer or other adequate solutions, e.g. via scanning the relevant area / trajectory and how the max. 6m around the vehicle combination will not be exceeded and the test will also be done by the Technical Service in order to check the max. 6m-remote-distance.

7.6 Opening the regulation without too detailed specification is a way to gain experience for industry, only high market penetration/volumes would justify developing detailed requirements. For the trailer, many "technology-open"-variants are possible in order to enable the towing vehicle for such a function: e.g. mount a camera to the trailer backside sending the video data to the towing vehicle using wireless communication.

7.7 Paragraph 5.6.1.2.7. perfectly works with a vehicle-combination, no need for change.

7.8   When manoeuvring backwards with a trailer combination without this assistance function, a second person already has to back up behind the trailer in some cases. The driver can replace the second person with the new function and achieve more safety because misunderstandings between the driver and the second person are avoided. The responsibility of the driver is at any time to ensure the safety of the driveway.

Figure 1

- **Illustration of the situation for the vehicle combination and the driver and of the "specified maximum RCP operating range (S_{RCPmax})" in this case**

    - S_{RCPmax}= 6m around the contour of the vehicle combination