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**Economic Commission for Europe****Inland Transport Committee****World Forum for Harmonization of Vehicle Regulations****Working Party on General Safety Provisions****106<sup>th</sup> session**

Geneva, 5–9 May 2014

Item 6 of the provisional agenda

**Regulation No. 58 (Rear underrun protection)****Proposal for the 03 series of amendments to Regulation No. 58  
(Rear underrun protection)****Submitted by the expert from Germany \***

The text reproduced below was produced by the expert from Germany to introduce more stringent requirements for rear underrun protection devices. This proposal supersedes ECE/TRANS/WP.29/GRSG/2013/27 (see report ECE/TRANS/WP.29/GRSG/84, para. 33). The modifications to the current text of UN Regulation No. 58 are marked in bold for new or strikethrough for deleted characters.

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\* In accordance with the programme of work of the Inland Transport Committee for 2012–2016 (ECE/TRANS/224, para. 94 and ECE/TRANS/2012/12, programme activity 02.4), the World Forum will develop, harmonize and update Regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.

## I. Proposal

List of Annexes, insert a reference to new Annexes 6 and 7, to read:

**"Annex 6 - Specific vehicles**

**Annex 7 - Requirements for different vehicle categories"**

Paragraph 1.2.3., shall be deleted.

Insert new paragraph 1.3., to read:

"1.3. Subject to the decision of the Type Approval Authority, vehicles where any RUPD (e.g. fixed, removable, foldable, adjustable, etc.) is incompatible with their use on traffic roads can be partly or fully exempted from this Regulation."

Paragraph 2.3., amend to read:

"2.3. Any vehicle .....

(c) ..... on either side, or

(d) **If, in case of vehicles of category G, the departure angle (ISO 612:1978) does not exceed:**

(i) 10° for vehicles of categories M<sub>1</sub>G and N<sub>1</sub>G;

(ii) 20° for vehicles of categories M<sub>2</sub>G and N<sub>2</sub>G; and

(iii) 25° for vehicles of categories M<sub>3</sub>G and N<sub>3</sub>G

over a width which is not shorter than that of the rear axle by more than 100 mm on either side (excluding any tyre bulging close to the ground).

Where there ..."

Paragraph 6.2., amend to read:

"6.2. An approval number shall be assigned to each type approved. Its first two digits (at present 02 03 corresponding to the 02 03 series of amendments) shall indicate the series of amendments incorporating ..."

Paragraphs 7.1. and 7.2., amend to read:

"7.1. ~~The section height of the cross member must not be less than 100 mm. The~~ **cross-member shall have a section height of at least 120 mm.** The lateral extremities of the cross-member ~~must shall~~ not bend ... less than 2.5 mm.

**For vehicles of categories M, N<sub>1</sub>, N<sub>2</sub>, O<sub>1</sub>, O<sub>2</sub>, vehicles of category G and vehicles fitted with a platform lift, the cross-member shall have a section height of at least 100 mm.**

7.2. The RUPD may be so designed to have several positions at the rear of the vehicle. In this event, there ~~shall must~~ be a ... operator to vary the position of the device ~~shall must~~ not exceed 40 daN.

**For RUPD that are designed to have several positions at the rear of the vehicle, a label shall be provided in the language(s) of the country where the device is sold.**

**Label minimum size: 60 x 120 mm**

**The label shall be placed clearly and permanently visible at the rear area of the vehicle next to the RUPD to inform the operator about the standard position of the RUPD to offer effective protection against under-running."**

*Paragraph 7.3.*, amend to read:

"7.3. The RUPD ~~must~~ **shall** offer ..... communication (Annex 1, item 8).

**The height above the ground of the points of application of the test forces depends on the section height of the cross-member and in any case the test forces shall be applied at the height of the horizontal centre line of the cross-member."**

*Paragraph 7.4.2.*, amend to read:

"7.4.2. The individual elements of the under run protection, including those outboard of the lift mechanism, where provided, ~~must~~ **shall** have an effective surface area, in each case, of at least ~~350~~ **420** cm<sup>2</sup>. **For cross-members with a section height of less than 120 mm, the effective surface area shall have at least 350 cm<sup>2</sup>.**

However, ....."

*Paragraph 15.2.*, amend to read:

"15.2. An approval number shall be assigned to each type approved. Its first two digits (at present ~~02~~ **03** corresponding to the ~~02~~ **03** series of amendments) shall indicate the series of amendments incorporating ....."

*Insert a new paragraph 16.1.*, to read:

**"16.1. For vehicles of the categories N<sub>2</sub>, N<sub>3</sub>, O<sub>3</sub> and O<sub>4</sub>, the ground clearance with respect to the underside of the protective device, even when the vehicle is unladen, shall not exceed:**

- (a) **450 mm or a departure angle according to ISO 612:1978 of 8°, whichever is less, for motor vehicles and trailers with hydropneumatic, hydraulic or pneumatic suspension or a device for automatic levelling according to load; and**
- (b) **500 mm or a departure angle according to ISO 612:1978 of 8°, whichever is less, for vehicles other than those in (a) above.**

**This requirement applies over the entire width of the motor vehicle or trailer and shall be such that the height above the ground of the points of application of the test forces applied to the device according to Part I of this Regulation and recorded in the type approval communication form (Annex 1, item 7) does not exceed:**

- (a) **510 mm for motor vehicles and trailers with hydropneumatic, hydraulic or pneumatic suspension or with a device for automatic levelling according to load; and**
- (b) **560 mm for vehicles other than those listed in subparagraph (a) above."**

*Paragraph 16.1. (former)*, renumber as paragraph 16.2. and amend to read:

**"16.2. For vehicles of categories M, N<sub>1</sub>, O<sub>1</sub> and O<sub>2</sub>, ~~The~~ ~~the~~ ground clearance with respect to the underside of the protective device ....."**

*Paragraphs 16.2. (former)*, renumber as paragraph 16.3.

Paragraph 16.3. (former), renumber as paragraph 16.4. and amend to read:

"16.4. The device ~~must~~ **shall** be so fitted that the horizontal distance between the rear of the **cross-member of the device** and the **most rearward point at the rear extremity of the vehicle**, including any platform lift ~~system mechanism~~, does not exceed **300 mm measured at the point of the maximum section height of the cross-member according to paragraph 7.1. and 400 mm** diminished by the recorded deformation ..... communication form. In measuring this distance, any part of the vehicle which is more than 2 m above the ground ~~when the vehicle is unladen~~ **for every loading condition of the vehicle** shall be excluded.

**For vehicles of categories O<sub>3</sub> and O<sub>4</sub>, without any platform lift system and not being designed as a tipping-trailer, the maximum horizontal distances are reduced to 200 mm before and 300 mm after the test forces have been applied.**

**In any case nonstructural protrusions of less than 50 mm of size in any direction, such as tail lights, rubber bumpers, resilient buffers, hinges and latches shall be excluded from the determination of the most rearward point at the rear extremity.**

**Before the application of the test forces, the maximum allowed horizontal distance of a single, a segmented or an inclined cross-member of a RUPD is 100 mm between the rear of the cross-member measured at the most forward point and the rear of the cross-member measured at the most rearward point, measured in the longitudinal plane of the vehicle."**

Insert a new paragraph 16.5., to read:

"16.5. **After the application of the test forces specified in Annex 5 for vehicles of the categories N<sub>2</sub>, N<sub>3</sub>, O<sub>3</sub> and O<sub>4</sub>, the maximum ground clearance of the protective device, even when the vehicle is unladen, shall at any point not exceed:**

- (a) **510 mm for motor vehicles and trailers with hydropneumatic, hydraulic or pneumatic suspension or with a device for automatic levelling according to load; and**
- (b) **560 mm for vehicles other than those listed in subparagraph (a) above."**

Paragraph 16.4. (former), renumber as paragraph 16.6.

Paragraph 24.2., amend to read:

"24.2. An approval number shall be assigned to each type approved. Its first two digits (at present ~~02~~ **03** corresponding to the ~~02~~ **03** series of amendments) shall indicate the series of amendments ....."

Paragraph 25.1., amend to read:

"25.1. **For vehicles of the categories N<sub>2</sub>, N<sub>3</sub>, O<sub>3</sub> and O<sub>4</sub>, the ground clearance with respect to the underside of the RUP, even when the vehicle is unladen, ~~must not exceed 550 mm over its entire width~~ **shall not exceed:****

- (a) **450 mm or a departure angle according to ISO 612:1978 of 8°, whichever is less, for motor vehicles and trailers with hydropneumatic, hydraulic or pneumatic suspension or with a device for automatic levelling according to load; and**

- (b) 500 mm or a departure angle according to ISO 612:1978 of 8°, whichever is less, for vehicles other than those listed in subparagraph (a) above.

This requirement applies over the entire width of the motor vehicle or trailer and shall be such that the height above the ground of the points of application of the test forces applied to the device according to Part I of this Regulation and recorded in the type approval communication form (Annex 1, item 7) does not exceed:

- (a) 510 mm for motor vehicles and trailers with hydropneumatic, hydraulic or pneumatic suspension or with a device for automatic levelling according to load; and
- (b) 560 mm for vehicles other than those listed in subparagraph (a) above."

*Insert a new paragraph 25.2., to read:*

"25.2. For vehicles of categories M, N<sub>1</sub>, O<sub>1</sub> and O<sub>2</sub>, the ground clearance with respect to the underside of the protective device, even when the vehicle is unladen, shall not exceed 550 mm over its entire width and shall be such that the height above the ground of the points of application of the test forces applied to the device according to Part I of this Regulation and recorded in the type approval communication form (Annex 1, item 7) does not exceed 600 mm."

*Paragraph 25.2. (former), renumber as paragraph 25.3. and amend to read:*

"25.3. The RUP ~~must~~ shall be situated as close to the rear of the vehicle as possible. The maximum horizontal distance between the rear of the device and the most rearward point at the rear extremity of the vehicle, including any platform lift system, does not exceed 300 mm measured at the point of the maximum section height of the cross-member according to paragraph 25.4.

For RUP for vehicles of categories O<sub>3</sub> and O<sub>4</sub>, without any platform lift system and not being designed as a tipping-trailer, the maximum horizontal distance is reduced to 200 mm.

In any case nonstructural protrusions of less than 50 mm of size in any direction, such as tail lights, rubber bumpers, resilient buffers, hinges and latches shall be excluded from the determination of the most rearward point at the rear extremity.

Before the application of the test forces the maximum allowed horizontal distance of a single, a segmented or an inclined cross-member of a RUPD is 100 mm between the rear of the cross-member measured at the most forward point and the rear of the cross-member measured at the most rearward point, measured in the longitudinal plane of the vehicle."

*Paragraph 25.3. (former), renumber as paragraph 25.4.*

Paragraphs 25.4. to 25.6. (former), renumber as paragraphs 25.5. to 25.7. and amend to read:

"25.5. ~~The section height of the RUP must not be less than 100 mm.~~ **The cross-member shall have a section height of at least 120 mm.** The lateral extremities of the cross-member ~~must shall~~ not bend ..... than 2.5 mm.

**For vehicles of the categories M, N<sub>1</sub>, N<sub>2</sub>, O<sub>1</sub>, O<sub>2</sub>, vehicles of category G and vehicles fitted with a platform lift, the cross-member shall have a section height of at least 100 mm.**

25.6. The RUP may be so designed to have several positions at the rear of the vehicle. In this event, there ~~must shall~~ be ..... position of the RUP ~~must shall~~ not exceed 40 daN.

**For RUPD that are designed to have several positions at the rear of the vehicle a label shall be provided in the language(s) of the country where the device is sold.**

**Label minimum size: 60 x 120 mm**

**The label shall be placed clearly and permanently visible at the rear area of the vehicle next to the RUPD to inform the operator about the standard position of the RUPD to offer effective protection against under-running."**

25.7. The RUP ~~must shall~~ offer ..... RUP and the **most rearward point at the rear extremity of the vehicle, including any platform lift system mechanism,** does not exceed ..... more than 2 m above the ground ~~when the vehicle is unladen must for every loading condition of the vehicle shall~~ be excluded.

**After applying the test forces specified in Annex 5 for vehicles of the categories N<sub>2</sub>, N<sub>3</sub>, O<sub>3</sub> and O<sub>4</sub>, the maximum ground clearance of the protective device, even when the vehicle is unladen, shall at any point not exceed:**

- (a) **510 mm for motor vehicles and trailers with hydropneumatic, hydraulic or pneumatic suspension or with a device for automatic levelling according to load; and**
- (b) **560 mm for vehicles other than those listed in subparagraph (a) above."**

Paragraphs 25.7. to 25.8.1. (former), renumber as paragraphs 25.8. to 25.9.1.

Paragraph 25.8.2. (former), renumber as paragraph 25.9.2. and amend to read:

"25.9.2. The individual elements of the underrun protection, including those outboard of the lift ~~system mechanism~~, where provided, ~~must shall~~ have an effective surface area, in each case, of **at least 420 cm<sup>2</sup>.** **For cross-members with a section height of less than 120 mm the effective surface area shall have at least 350 cm<sup>2</sup>.**

However, ..... are met."

Paragraphs 31.1. to 31.5., amend to read:

"31.1. As from the official date of entry into force of the ~~02~~ **03** series of amendments, no Contracting Party applying this Regulation ~~shall~~:

- (a) **Shall** refuse ... as amended by the ~~02~~ **03** series of amendments;
- (b) **Shall** refuse ... as amended by the ~~02~~ **03** series of amendments;

- (c) **May** prohibit ... as amended by the ~~02~~ **03** series of amendments.
- 31.2. **As from 1 September 2017** ~~Until 18 months after the date of entry into force of this Regulation as amended by the 02-03 series of amendments,~~ Contracting Parties applying this Regulation shall:
- (a) ... as amended by the ~~01~~ **02** series of amendments;
- (b) ... as amended by the ~~01~~ **02** series of amendments;
- (c) ... as amended by the ~~01~~ **02** series of amendments;
- (d) ... as amended by the ~~01~~ **02** series of amendments.
- 31.3. **As from 1 September 2017** ~~Starting 18 months after the date of entry into force of this Regulation as amended by the 02 series of amendments,~~ Contracting Parties applying this Regulation:
- (a) May refuse ... as amended by the ~~02~~ **03** series of amendments;
- (b) Shall grant ... as amended by the ~~02~~ **03** series of amendments;
- (c) May prohibit ... as amended by the ~~02~~ **03** series of amendments.
- 31.4. **As from 1 September 2018** ~~Until 48 months following the date of entry into force of this Regulation as amended by the 02 series of amendments,~~ Contracting Parties applying this Regulation shall:
- (a) Continue to grant ... as amended by the ~~01~~ **02** series of amendments;
- (b) Continue to accept ... as amended by the ~~01~~ **02** series of amendments.
- 31.5. **As from 1 September 2018** ~~As from 48 months after the date of entry into force of this Regulation as amended by the 02 series of amendments,~~ Contracting Parties applying this Regulation:
- (a) Shall grant ... as amended by the ~~02~~ **03** series of amendments;
- (b) May refuse national ... as amended by the ~~02~~ **03** series of amendments."

*Annex 4, through the text and figures of the annex, replace figures "02" by "03" (5 times).*

*Annex 5,*

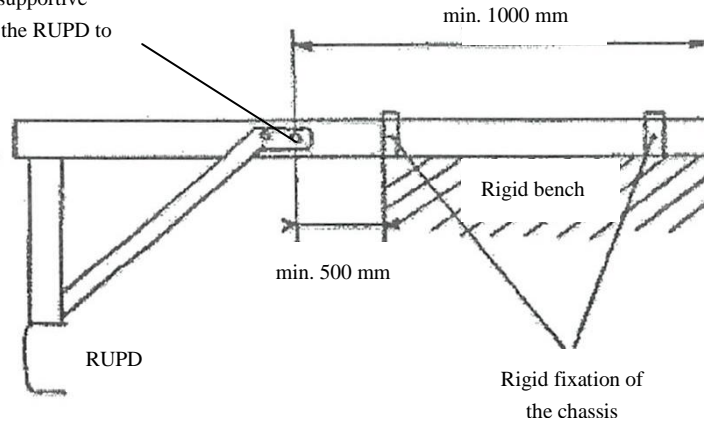
*Paragraph 1.1.3., shall be deleted.*

*Paragraph 1.2., amend to read:*

- "1.2. In the case of paragraphs 1.1.2., ~~and 1.1.3~~ the parts ..... of the vehicle chassis ~~or to the rigid test bench~~ shall be ..... on the vehicle. **The part of the chassis can be fixed on a rigid test bench as shown in Figure 1.**

**Figure 1**

Fixing of a supportive structure of the RUPD to the frame



Paragraph 1.3., amend to read:

"1.3. At the request ..... by calculation.

**The mathematical model shall be validated in comparison with the actual test conditions. To that effect, a physical test shall be conducted for the purposes of comparing the results obtained when using the mathematical model with the results of a physical test. Comparability of the test results shall be proven. A validation report shall be drafted by the manufacturer or by the technical service and submitted to the approval authority."**

Insert new paragraph 1.4., to read:

"1.4. **In case of a RUPD where the cross-member does not have a vertical flat surface of at least 50 per cent of the minimum section height of the cross-member according to paragraph 7.1. or 25.5. of this Regulation at the height of the points of application of the test forces according to paragraph 16.1. or 25.1., the manufacturer shall supply the Technical Service with a device that allows the application of horizontal test loads on the cross-member with the test equipment used by the Technical Service. The device shall not modify the dimensional and mechanical characteristics of the RUPD or increase its resistance during test. The device shall neither be rigidly fixed to the RUPD nor to the test equipment."**

Paragraphs 3.1. to 3.1.3., amend to read:

"3.1. The requirements of paragraphs 7.3. and 25.7.6 of this Regulation shall be verified by means of suitable test mandrels; the forces for tests prescribed in paragraphs 3.1.1. and 3.1.2. below shall be applied separately and consecutively, via a surface not more than 250 mm in height **(but covering the maximum section height of the cross-member or RUP, the exact height ~~must~~ shall be indicated by ..... at the vertical edges. The surface shall not be rigidly fixed to the RUPD or to the RUP and shall be articulated in all directions.** The height above the ground of the centre of the surface **~~must~~ shall be defined by ..... on a vehicle the height ~~must~~ shall not, however, exceed ~~600 mm~~ the height as specified in paragraphs 16.1. and 16.2. or as specified in paragraphs 25.1. and 25.2. of this Regulation**



when the vehicle is unladen. The order in which the forces are applied may be specified by the manufacturer.

- 3.1.1. A horizontal force of ~~400~~**180** kN or ~~50~~**85** per cent of the force ..... by the manufacturer.
- 3.1.2. In the cases defined in paragraphs 1.1.1. and 1.1.2. of this annex a horizontal force of ~~50~~**100** kN or ~~25~~**50** per cent of the force generated by the maximum mass of the vehicle, whichever is the lesser, shall be applied consecutively to two points located 300 + 25 mm from the longitudinal planes tangential to the outer edges of the wheels on the rear axle or of the RUPD, if it exceeds the width of the rear axle, and to a third point located on the line joining these two points, in the median vertical plane of the vehicle.
- 3.1.3. **Upon request of the manufacturer the force levels can be reduced to [80] per cent of the requirement given in paragraphs 3.1.1. to 3.1.2. for the vehicles listed in paragraphs 1.1. to 1.5. of Annex 6."**

Insert a new Annex 6, to read:

## "Annex 6

### Specific vehicles

1. Specific types of vehicles
- 1.1. Vehicles with tipping-bodies;
- 1.2. Vehicles fitted with a platform lift at the rear."

Insert a new Annex 7, to read:

## "Annex 7

### Requirements for different vehicle categories

Vehicle category or type of vehicle	Geometry referred to in paragraph:			Test force referred to in paragraph(s):
	Section height	Ground clearance:	Horizontal distance between the rear of the RUPD and the rear of the vehicle:	
M, N <sub>1</sub> , O <sub>1</sub> , O <sub>2</sub> , G	2.3./7.1./25.5.	2.3./16.2./25.2.	2.3./16.4./25.3.	2.3., A5/3.1.1. to 3.1.2.
N <sub>2</sub> , N <sub>3</sub>	7.1. or 25.5.	16.1./16.2. or 25.1./25.2.	16.4. or 25.3.	A5/3.1.1. to 3.1.2.
O <sub>3</sub> , O <sub>4</sub>	7.1. or 25.5.	16.1./16.2. or 25.1./25.2.	16.4. or 25.3.	A5/3.1.1. to 3.1.2.
Specific Vehicles (see Annex 6)	7.1. or 25.5.	16.1./16.2. or 25.1./25.2.	16.4. or 25.3.	A5/3.1.3.

*Note:* A reference such as A5/3.1.1 in the table indicates the annex (Annex 5) and paragraph (3.1.1.) of that annex, where the relevant vehicle or requirement is described and specified. A reference such as 2.3. in the table indicates paragraph (2.3.) of this Regulation, where the relevant requirement is specified."

## **II. Justification**

A detailed justification for the proposed amendments was provided at the 105<sup>th</sup> session of GRSG in informal document GRSG-105-23.

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