

Proposal for amendments to UN Regulation No. 58 (Rear underrun protection)

The text reproduced below has been prepared by the expert from CLCCR to introduce amendments in document ECE/TRANS/WP.29/GRSG/2015/17. The modifications to the text in that document are marked in **bold** for new or ~~strikethrough~~ for deleted characters.

I. Proposal 1

Paragraph 16.4. first section, amend to read:

"16.4. ... diminished by the largest ~~recorded~~ **total deformation including both** plastic and elastic deformation **measured and recorded during the test at** any of the points where the test forces ~~have been~~ **are** applied ..."

Paragraph 16.4. second section, amend to read:

"16.4. ... shall not exceed 300 mm measured ~~at the point of the maximum section height~~ **to the rear of the** cross-member ..."

Paragraph 16.4. third section, amend to read:

"16.4. ... diminished by the largest ~~recorded~~ **total deformation including both** plastic and elastic deformation **measured and recorded during the test at** any of the points where the test forces ~~have been~~ **are** applied ..."

Paragraph 25.3. first section, amend to read:

"25.3. ... not exceed 400 mm measured ~~at the point of the maximum section height~~ **to the rear of the** cross-member according to paragraph 25.4. ~~after~~ **during the test when** the test forces ~~have been~~ **are** applied."

Paragraph 25.3. second section, amend to read:

"25.3. ... not exceed 300 mm measured ~~at the point of the maximum section height~~ **to the rear** of the cross-member according to paragraph 25.4. ~~after~~ **during the test when** the test forces ~~have been~~ **are** applied."

Paragraph 25.3. third section, amend to read:

"25.3. ... the maximum horizontal distance is reduced to 200 mm before and 300 mm ~~after~~ **during the test when** the test forces ~~have been~~ **are** applied."

Proposal 2

Paragraph 16.4., amend to read:

"16.4. ... measured at any of the points where the test forces ~~have been~~ **are** applied (Annex 1, item 8).

For Vehicles of categories N₂ with a gross vehicle weight exceeding 8 t, N₃, O₃ and O₄, either equipped with a platform lift system or designed as a tipping vehicle, the device 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 the platform lift system mechanism, does not exceed 400 mm diminished by the largest recorded plastic

Comment [M1]: This is the term used in the new Annex 6. This section doesn't only apply to trailers.

and elastic deformation (paragraph 7.3. of Part I) measured at any of the points where the test forces have been applied (Annex 1, item 8).

In any case nonstructural protrusions such as tail lamps and those of less than 50 mm of size in any direction ..."

Paragraph 25.3., amend to read:

"25.3. ... after the test forces ~~have been~~ are applied.

For Vehicles of categories N₂ with a gross vehicle weight exceeding 8 t, N₃, O₃ and O₄, either equipped with a platform lift system or designed as a tipping vehicle, the device 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 the platform lift system mechanism, does not exceed 400 mm diminished by the largest recorded plastic and elastic deformation (paragraph 7.3. of Part I) measured at any of the points where the test forces have been applied (Annex 1, item 8).

In any case nonstructural protrusions such as tail lamps and those of less than 50 mm of size in any direction ..."

Comment [M2]: As proposed for 16.4.

II. Justification proposal 1

In order for the regulation to be consistent about what deformations to use some alterations to the text proposed are needed. Focus is put to that the total maximum deformation during the test is used.

Justification proposal 2

Vehicles with platform lift and vehicles being built with a tipping body are excluded in the third section of paragraph 16.4. (25.3.) those vehicles need further clarifications. I.e.:

- for the N₂+8t & N₃ vehicles it is unclear what is meant with the "... the same requirement as above applies" is it also meant to be read as: "including any platform system",
- for the O₃ and O₄ vehicles, it is not mentioned, or unclear what the requirements for vehicles of categories O₃ and O₄ should be.

In order to address this, a new section needs to be added to the paragraph 16.4. (25.3.)

The change according to this proposal opens an option to the tail-lift manufacturer to design a stronger RUP beam that would enable the mounting on the lifting arm. Without this possibility a separate RUP installation would be necessary. However there are no such separate installations available that are compatible with the operating space of the lifting arms. On longer platforms of cantilever lifts, the platform can protrude to 330 mm behind the vehicle body. If 300 mm needs to be fulfilled (not counting deformation), bumpers that stick 100 to 150 mm behind the vehicle body would have to be built to fulfill these requirements. Bumpers sticking out more than 100mm behind the vehicle body can cause damage at the loading docks, incompatibility with forklifts (Kooi-Aap etc.).

Further detailed justification proposal 2

Please find hereby the conclusion and motivation of tail lift industry

- with regard to the depth of the bumper under the vehicle, there are two issues that are important:
 - (i) The nominal value that the bumper can sit under the vehicle after deformation; and
 - (ii) The design parameters before / after deformation.

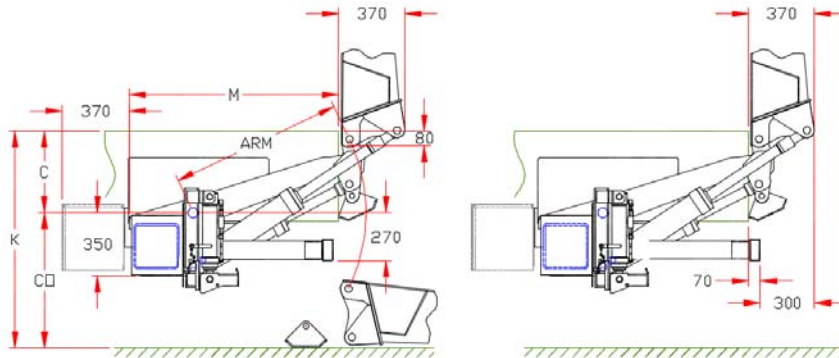
On (i) it is important that the nominal value after deformation remains 400 mm

On (ii) the text should keep the nominal value after deformation as design and verification parameter. If the maximum value is 400 mm after deformation, we believe that the text should leave it up to the manufacturer to design a weaker bumper that measures for instance 300 mm before deformation and deforms 100 mm while being tested; or if he designs a stronger bumper that measures for instance 350 mm before deformation, and only deforms 50 mm while being tested. In other words, if the legislator imposes a maximum after deformation, why also give us a minimum before deformation.

So there are a number of important reasons why the 300 mm parameter will not work out for the tail lift business.

See argumentation below:

There are tail lifts commercially offered in Europe and across the world, that have platforms protruding behind the rear point of the vehicle body by more than 300 mm. In the case of this DH-LSU.90 7500-9000 kg it can be 370 mm for instance. With a rule of 300 mm before deformation, that would mean that the bumper bar sticks out 70 mm behind the vehicle body, which is shown in the drawing below.



This is not desirable for a number of reasons:

- The more the bumper bar is mounted towards the rear, and closer to the ground, the higher the risk that bumpers will get continuously damaged and knocked off in more difficult driving conditions, e.g. logistic parks with loading docks under slope, sea ferries, intermodal train access etc.
- Cantilever lifts are extremely popular in heavy distribution (supermarkets, drinks and food distribution etc.) to unload / deliver merchandise to the shops in the streets. Yet

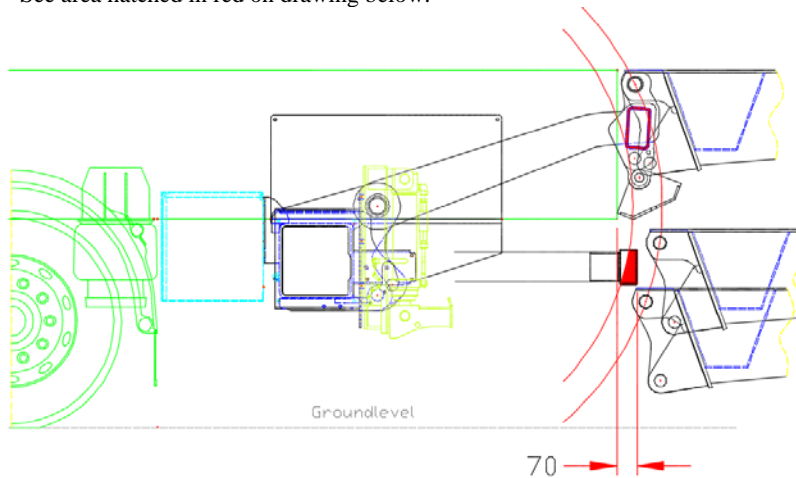
such vehicles are often loaded at the loading docks, whereby the platforms are stowed in a briefcase under the loading docks. Some loading docks are well designed and quite "gentle" for this type of docking. Many docks however are built in thousands different ways with buffers and protrusions etc. on numerous positions. Considering that vehicle docking is already one of the main causes of damage and repair cost for transport companies today, the cost and burden will explode if bumpers will stick out from the back of vehicles. The budget for dock versus tail lift harmonization is very often not available due to financial stress and restrictions. The incentives for such harmonization is very often completely absent since in a lot of cases the owners of the docks and warehouses are different than fleet operator / transport companies.



- Certain applications foresee the combination of a tail lifts with a take-on-board fork lift (Kooi-Aap, Moffet, etc.). This combination is no longer possible if the bumper sticks out behind the vehicle of the body.



- The next area of problems, which cannot be solved technically, is the reinforcement elements needed on all tail lifts, between the lift arms. When the bumper bar moves out behind the vehicle body, manufacturers will hit very rapidly impossible circumstances where that crucial torsion bar between the lift arms hits the bumper bar. See area hatched in red on drawing below.



- Other point again, is that the radius that the lift arm will describe in comparison to the bumper, is going to depend on the mounting height, which in itself is influenced by many other parameters such as available space etc. When the mounting situation is unfavorable, the front inboard edge of the platform will again hit the bumper bar. See also drawing above.
