



RDW

Improvement of boosters in Regulation No.129

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Contents

- Introduction
- Ideas and approach
- Borderline booster
- Encountered problems, and
- Possible solutions
- ,

Introduction

- A manufacturer has presented a booster to RDW the Vehicle Authority of the Netherlands, for type approval, which is designed according a new principle.
- Regular boosters lift the child to have the lap belt and the diagonal belt of the adult 3 point belt in a good position.
- This booster does not really lift (boost) the child but instead it uses webbing guides to guide the lap strap and uses an adjustable strap with a clip to give guidance to the diagonal belt.
- As a consequence a number of items raise problems.



Ideas and approach

- R.129 (and R.44) should be more precise to prevent problems with borderline boosters.
- This booster will be used as a checkup.
- R.129 (and R.44) must be understood by everybody in the same way.
- Where needed proposals are suggested to upgrade safety and to make sure there will be a level playing field for all.



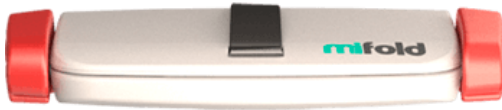
Borderline booster I

The booster below will be used for a check up of the regulation.

The showed pictures below can be found via:

<http://www.mifold.com/how-it-works/>

①



②



③



Borderline booster II

Below is a picture of a video (59th sec) on internet that can be found via:
<https://www.indiegogo.com/projects/mifold-the-grab-and-go-booster-seat#/>



Encountered problems

wrt main load-bearing contact point I

- First encountered problem is that the main load-bearing contact point and its 150 mm distance has been wrongly handled.
- R.44, par.6.1.8. and R.129, par.6.1.3.4. state both: *CRS/ECRS*, shall have a main load-bearing contact point, between the *CRS/ECRS* and the adult safety-belt. This point shall not be less than 150 mm from the Cr axis when measured with the child restraint on the dynamic test bench installed in accordance with *Annex 21 to this R.44/par.7.1..3.5.2.2. of R.129*, without a dummy. This shall apply to all adjustment configurations.
- The reason behind is, the hard buckle/tongue-combination must have enough space (allowed via R16, Annex17, Appendix 1), otherwise there is the danger of degradation of the restraining process of the lap belt.



Encountered problems

wrt main load-bearing contact point II

- The picture shows that the belt will be on the 150 mm distance.



- However one must realize that the webbing guide of the CRS that helps to realize this 150 mm is within the 150 mm distance.
- This causes incompatibility between the adult belt and this CRS (with possible problems as not properly restraining the CRS and hard contacts (between these moulded parts!))

Encountered problems

wrt main load-bearing contact point III

- The sentence “This point shall not be less than 150 mm from the Cr axis when measured with the child restraint on the dynamic test bench installed in accordance with *Annex 21 to this R.44/par.7.1..3.5.2.2. of R.129*, without a dummy” , must make clear that any means of the CRS/ECR that will help to influence the lie of the lap belt must also be outside the zone marked by the 150 mm.
- In this particular case, hard contact between buckle/tongue-combination and webbing guide can cause problems such as e.g. not enough restraining and/or, a CRS that will take an oblique position and/or breakage.



Encountered problems

wrt transmitting of loads through the pelvis I

- This second encountered problem is demonstrated by as well the left picture of the video (here the CRS makes that the lap strap does not hold the pelvis, the lap strap is completely over the thighs), as the right picture of the actual test where the lap belt used for CRS testing is still completely before the H-point of the dummy.



- Videos will show that in the beginning of the impact the child is not held back at the pelvis and only after some time (in this case of a pure frontal sled impact) the process of holding the child at its pelvis starts effectively.



Encountered problems

wrt transmitting of loads through the pelvis II



KB6694_001_Side View.avi



Encountered problems

wrt transmitting of loads through the pelvis III



KB6694_001_Side View.avi

- Video
- R.44, par.6.2.2. and R.129, par.6.2.1.6. state both in almost similar wording: ... shall positively guide the "lap strap" to ensure that the loads transmitted by the "lap strap" are transmitted through the pelvis. Furthermore R.129, par.6.2.1.6. states extra: The shoulder portion of the adult belt shall be positively guided to ensure that the child torso and neck do not escape.
- These sentences should be improved such that it is clear that holding the pelvis must be from the beginning of the impact, and holding the pelvis must not be dependent from the direction of force.
- In this particular case, because it is a frontal sled impact, after shifting forwards of the child, the restraining process starts but the impact energy has to be consumed over a shorter time of the



Encountered problems

wrt lie of belts completely different from that of the test-trolley I

- This problem is not yet completely handled in R129, but in R44 there are two paragraphs nominated, however these need to be improved!
- R44: par.6.2.12. The fixed buckle should not be allowed to pass through the fixure points of booster seats, or to permit a lie completely different from that of the test-trolley.
- R44: par.7.2.2.1. Wherever the buckle is in contact with the child, it shall not be narrower than the minimum width of strap as specified in paragraph 7.2.4.1.1 below.



Encountered problems

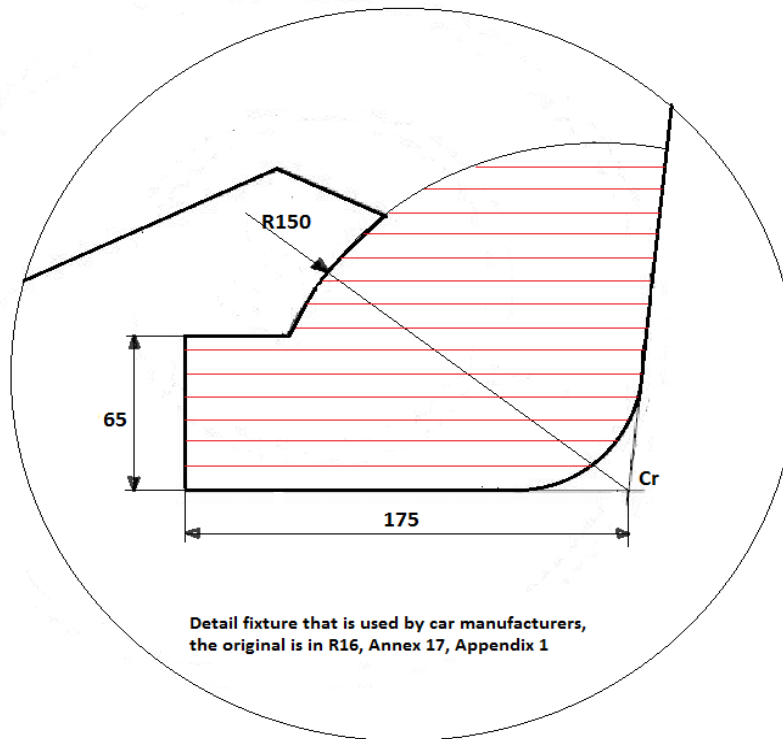
wrt lie of belts completely different from that of the test-trolley II

- The picture in a car shows that buckle/tongue combinations can use the full zone that is allowed via Reg.16, Annex 17, Appendix 1 (=fixture); this will certainly be the case with buckles on stalks.
- The arrangement on the test trolley at the side what should represent the buckle/tongue- combination is really different; completely flexible.
- There is no good check on 6.2.12. (e.g, buckles on stalks) and 7.2.2.1. (e.g. twisted buckle makes buckles surface narrower than minimum strap width!



Encountered problems

wrt lie of belts completely different from that of the test-trolley III



Car manufacturers utilize R16, Annex 17, Appendix I, so can use the red faded zone.

However R44 and R129 are written such that Child restraint manufacturers have to respect only the 150 mm.

So, low boosters, only fulfilling $R=150$ mm cause incompatibility, this must be improved!



Encountered problems

wrt being foldable

R44, par.2.1.3.2. "Booster cushion" means a firm cushion!

CRS cushion is not considered as being firm, folds between backrest and seat cushion OK but not in booster cushion itself

Any fold, one or a higher number, makes the booster cushion being regarded as not firm.



Thank you for your attention

