



C L E P A
*European Association of
Automotive Suppliers*

Lower tether anchorages (LTA)

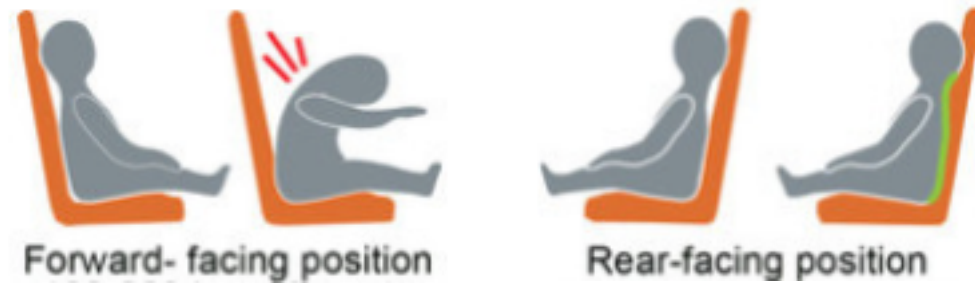
June 22, 2017.



RWF enhanced CRS

RWF transport should be facilitated in UN R129 till the age of 7 years

- RWF transport of children till the age of 4 years is proven to be safer in frontal impact.
- Especially in Sweden there is strong consumer demand to transport children as long as possible rear facing (till 7 years): there is a large product offer of RWF R44-04 CRS till group 2 (25 kg.)





RWF enhanced CRS

What is needed to facilitate rearward facing transport of children till the age of 7 (25 kg.)

- To facilitate the RWF transport of children till a weight of 25 kg. **belt installation of RWF CRS** for toddlers is necessary to 'avoid' the weight limitation of 33 kg. of child and CRS together (defined for ISOfix installed CRS)
- To be able to facilitate belt mounted RWF CRS for toddlers in vehicles, there is a need for **anti rotation devices**, mounted on the CRS



Anti rotation devices

Anti rotation devices to stop rear facing movements

- **Anti rotation bars** can be effective to stop rotation upwards and to the rear:
 - For infant seats (low point of gravity and low weight of the child)
 - For ISOfix seats since the isofix arms can slide in to reduce the rotation (and act like a pivot point)
- The effect of anti rotation bars is however limited:
 - The vehicle cushions are soft
 - With higher points of gravity and higher weights of children it's not effective enough to avoid head contact with the vehicle roof or the headrest of vehicle seat with only an **Anti rotation bar**



r129 Rear impact with Q3 and isofix installation



Anti rotation devices

Anti rotation devices to stop rear facing movements

- **Lower tether straps** are very effective and necessary to stop rotation upwards:
 - Can **stop 'all' rotation** in a rear impact very effective and contribute to a very safe crash performance of all RWF toddler seats
- Lower tether straps are effective and necessary **to avoid head contact** with the vehicle roof or the headrest of vehicle seat for RWF toddler CRS



r44-04 Rear impact with P6 during impact: all injury criteria very well within the limits and rotation is stopped



Lower tether anchorages (LTA)

Lower tether straps

- Lower strap connection points can be integrated in vehicles at the end of the rails of front vehicle seats (separate bracket or fully integrated hole)
- ISO/TC22/SC36/WG 2 prepares **ISO 13216-4 Lower Tether Anchorage specification**
- By adopting LTA, according the ISO standard as an option in R14, we can avoid undefined LTA installation which is common in today's practice



Example of LTA according ISO 13216



Examples of LTA in the practice of today when no standardized LTA is available



Lower tether anchorages (LTA)

Approach to make LTA usage possible for Specific vehicle belted CRS (in combination with a support leg):

- Make lower strap connection points possible at the end of the rails of front vehicle seats according **ISO 13216-4 Lower Tether Anchorage specification** (so include this as an option in R14)
- Allow the usage of LTA in UN r129 only at i-Size vehicle positions: this assures a well defined vehicle floor strength: Clepa will submit support leg loading information to justify the loading of the vehicle floor.
- Misuse approach in UN r129 should be similar to the usage of top tethers and/or support legs
- Define LTA anchorage points on the test trolley
- Allow LTA for specific vehicle belted ECRS but also for specific vehicle ISOfix ECRS, since this can also give advantages for the interference with the vehicle