Opportunities to install Rearfacing belt installed CRS with lower tethers in vehicles

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Rearfacing belt installed CRS with lower tethers

- Existing installation methods Lower tether anchorages
  - Integrated lower tether anchorages
  - Retrofit lower tether anchorages
  - Lower tether anchor straps
- Additional new installation opportunities Lower tether anchorages
  - Top tether anchorage

Existing and new Lower tether installation methods

Integrated lower tether anchorages

Retrofit lower tether anchorages

Lower tether anchor straps

Top tether anchorage point

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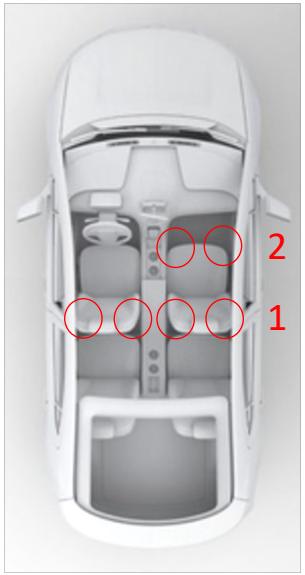
Lower tether anchorage positions



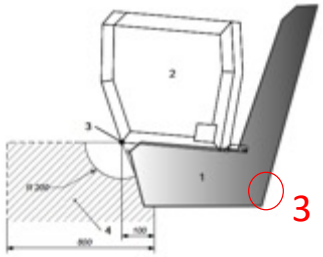
lower tether anchorage positions

Lower tether anchorage positions

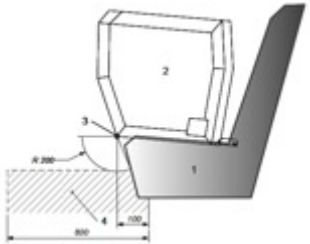
1. Recommended: 4 positions at the end of the rails
2. Option: 2 additional positions at the front of the passenger seat rail

Access zone allows also a lower tether anchorage at the front side of the rail for installation of a CRS In the passenger seat

3. Top tether if available in the access zone



Access zone front seat



Access zone rear seat

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Integrated lower tether anchorages

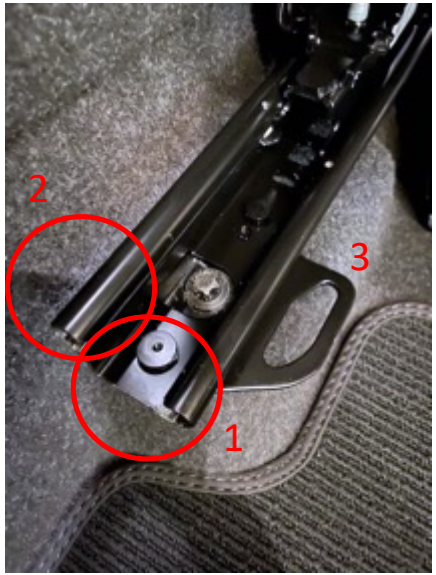
Integrated lower tether anchorages

Integrated lower tether anchorages

Requirements are well defined in ISO 13216-4:2020

- Area where to locate (access zones)
- Strength requirements

Integrated lower tether anchorages

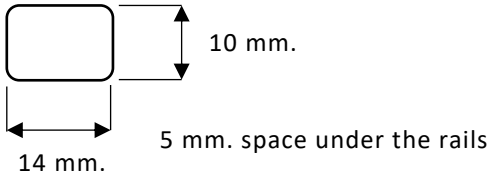


Integrated lower tether anchorages

Integrated lower tether anchorages

Several options to integrate LT anchorage in the rail

1. Slot at the end of the rail giving access to the specified LT hook
2. Slot in the sidewall of the rail giving access to the specified LT hook
3. Additional plate aside of the rail giving access to the specified LT hook



Slot dimensions for integration in the rail

Specified lower tether hook

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Retrofit lower tether anchorages

Retrofit lower tether anchorages

Conditions to use retrofit lower tether anchorages

Rail must be strong enough to hold 2.500 N at the installation point

They will be easy to install under the following conditions:

- Accessible rail with:
  - At least **3 mm. space** between rail and floor
  - Available **hole with 6 mm. diameter** as far as possible to the backside of the rail (preferred hole will be 8 mm. radius)
  - 4 mm. height available for the bolt head
- CRS installation in the passenger seat can be possible when the retrofit LT anchorage can also be installed at the front side of the rail

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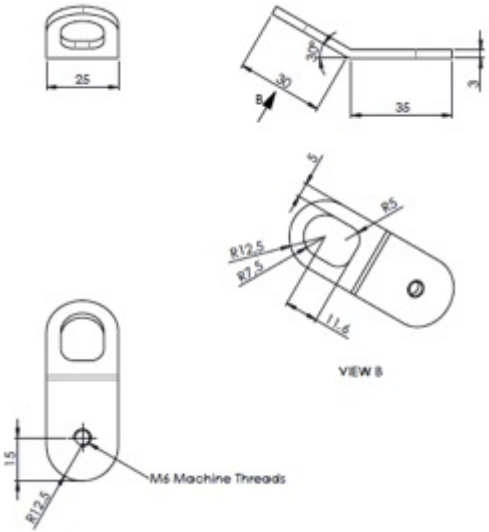
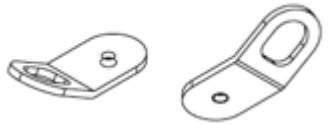
Retrofit lower tether anchorages

Retrofit lower tether anchorages

Standard retrofit lower tether anchorages

Based on guideline in ISO 13216-4:2020





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Retrofit lower tether anchorages

Retrofit lower tether anchorages

Conditions to use retrofit lower tether anchorages

Car manufacturers should be responsible to define the positions on the rails where a retrofit LT anchorage can be mounted and that this fulfils the requirements:

Recommended position (1) at the end of the rails, but also possible more to the front (2) as long as it's in the LT access zone

Recommended dimensions to mount standard retrofit LT anchorage:

- At least **3 mm. space** between rail and floor
- Available **hole with 6 mm. diameter** as far as possible to the backside of the rail (preferred hole will be 8 mm. radius)
- 4 mm. height available for the bolt head

Retrofit lower tether anchorages

Retrofit lower tether anchorages

Conditions to use retrofit lower tether anchorages

CRS manufactures (or other suppliers) are responsible for the retrofit LT anchorage, fulfilling strength conditions and able to access with a standardised LT hook

Recommended dimensions:

- **3 mm.** thick steel plate
- **M6 bolt**, length 10 mm.
- M8 would be better, but M6 gives access to more car rails in the actual car fleet

lower tether hook

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Retrofit lower tether anchorages

Rails without holes

Challenges in the car fleet of today

- Rails without holes (minority of the car fleet)
- Limited space between rails and floor (3 mm. or even less) > most cars have 5 mm., but some have 3 mm., and some no space at all
- Small holes (6 or 5 mm.) or no holes > most cars have 8 mm., but some have 6 mm or 5 mm., and some no holes at all

Retrofit lower tether anchorages

Limited access with electric vehicle seats

Challenges in the car fleet of today

- More luxury electric vehicle seats limit the access to the rails; this will require additional installation work

Top tether anchor straps

Top tether anchorage point

Can the top tether anchorage be an additional connection possibility as LT anchorage point ?

- More and more passenger seats have Top tether anchorages, always positioned at the bottom side of rear side of the vehicle seat
- If the Top tether anchorage is located in the defined LTA zone, it's an extra accessible opportunity to connect LT straps
- A 'Top tether spreader' accessory can facilitate the connection of 2 LT straps

Top tether spreader

Lower tether anchor straps

Lower tether anchor straps

Conditions to use lower tether straps

- LT anchor strap (incl. all parts) must be strong enough to hold 2.500 N
- Easy to install under the following conditions:
  - Accessible rail with preferable 3 mm. space between rail and floor
- No electric wires or other equipment under the vehicle seat

Installation with LT straps works really well today, it would be good to have this possibility for situations where retrofit LT anchorages don’t work