

CHILD SAFETY RESTRAINTS AND TETHER STRAPS: AUSTRALIAN REAL WORLD CRASH PERFORMANCE

In 1977, Australia introduced a requirement in Australian Design Rule 34 for the supply of anchor points in the vehicle to allow the installation of child restraints with upper tether straps.

Michael Henderson *et al* studied performance of child restraints in real world crashes in Australia.

Results underline the effectiveness of these systems:

- Most children in child restraints with shoulder harness and top tether survived crashes without injury, or minor injury
 - the sample included children who were uninjured in very severe crashes where other occupants sustained injuries
 - in a sample of 38 children, four cases survived frontal or near frontal crashes at $\Delta V > 60$ km/h; a further five escaped injury in frontal crashes with ΔV between 50 km/h and 60 km/h.
- Although children with severe or fatal injuries were oversampled in this study, only three children in child restraints sustained injuries above AIS2; one of these was killed
 - in all three cases, the restraint was incorrectly installed
 - two cases involved multiple installation faults, including failure to fasten the tether strap;
 - one case involved only an unfastened tether strap (this was a side impact by an articulated truck into a small passenger sedan (ΔV 28 mph).

Because of the top tether requirement, child restraints in Australia are almost always fitted in the rear. This provides two indirect benefits, apart from the direct benefit of the tether:

- potential conflicts with airbags are eliminated
- the greater intrinsic safety of the rear seating position.

In conclusion, there has been NO field data in Australia to suggest that the upper tether strap has caused any head or neck injuries. There is anecdotal evidence that even with a misuse situation with the adult seatbelt around the child restraint, the presence of an upper tether has significantly reduced the injury risk to the child.

Therefore, Australia strongly supports the mandatory requirement for upper tether straps in ECE Regulations as soon as possible.