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Presented by the Expert from Germany

Conditional Use of Top Tether Anchorage in the ISOFIX Proposals (Reg. 14, 16, 44)

The existing ISOFIX proposals aim to introduce ISOFIX into regulations 14, 16 and 44 requiring a mandatory top tether for universal child restraint systems (CRS).

Germany proposes to amend the existing ISOFIX proposals with the intention to allow universal ISOFIX CRS with only two lower anchorages under the condition that the seating cushion of the vehicle seating position proves more stiffness than the seating cushion on the ECE–R44 test bench.

Justification:

The mandatory top tether is a construction requirement which does not take account of the many vehicles equipped with only two lower ISOFIX anchorages where the CRS have proved to meet the requirements of Reg. 44 on the vehicle seating cushion (special category until now).

This construction requirement does also not take into account that on the Reg. 44 test bench many ISOFIX CRS have met the requirements of Reg. 44 with only the two lower anchorages although the seating cushion of the test bench is less stiff than most of the seating cushions in vehicles.

This construction requirement should therefore be replaced by a performance requirement where sufficient stiffness of the vehicle seating cushion (see below) would allow to resign from a top tether use in this seating position.

Proposal of a stiffness test for seating cushions:

A suitable device for testing seating cushion stiffness is the “static force application device” (SFAD), see [figure 1](#); it is already described in the existing ISOFIX Reg. 14 proposal.

In a German test series the SFAD was used respective to [figure 1](#) in 8 German vehicle types from 3 different manufacturers. The cushion compressions were measured with forces of 500 N and mostly 1000 N. The same was done on the Reg. 44 test bench and the compressions were compared, [figure 2](#). The test bench cushion proved to be softer than the 8 vehicle seating cushions. Additionally the test bench seating cushion is much thicker than the vehicle seating cushions.

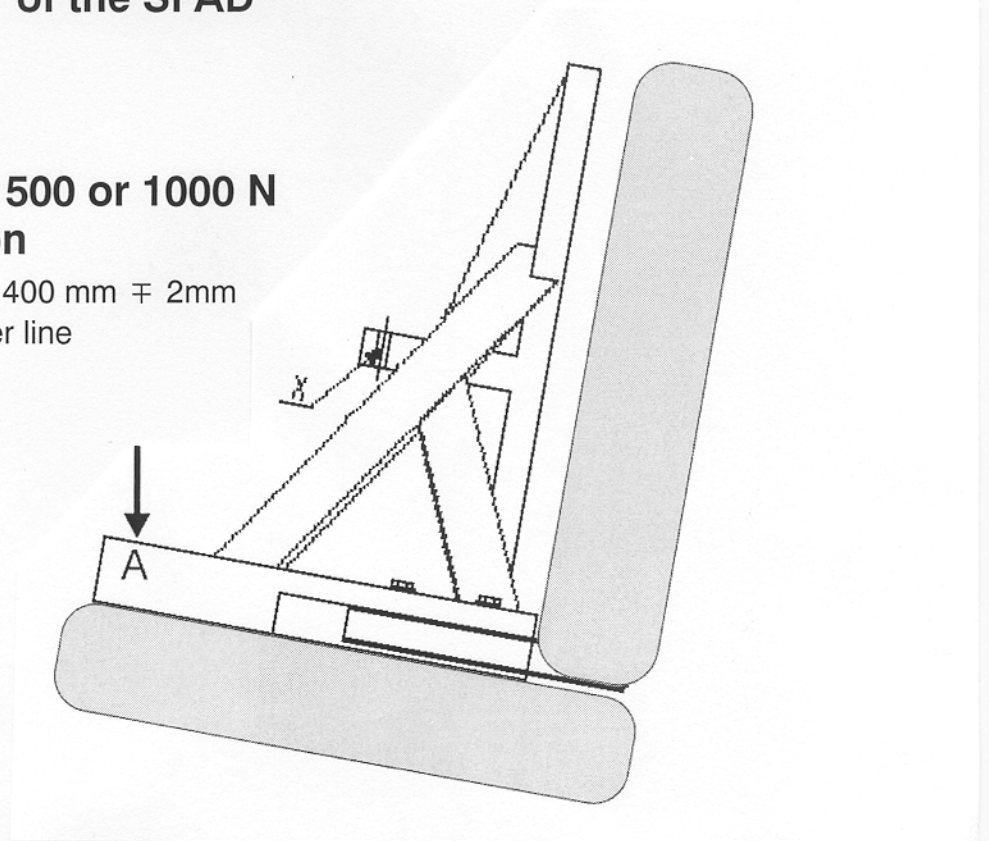
Conclusion: We propose the test of [figure 1](#) with 500 N at the vehicle seating cushion with the requirement that a compression of less than 55 mm (taken from the test bench) shall allow to resign from a top tether anchorage. An ISOFIX test on the test bench would then be conservative in respect to the performance of the CRS in the vehicle.

Remark: All ISOFIX CRS shall be equipped with top tethers for their possible use.

**Measurement of the stiffness of
seating cushions by means
of the SFAD**

**Load point A with 500 or 1000 N
in vertical direction**

Point A has a distance of $400 \text{ mm} \pm 2 \text{ mm}$
from the anchorage center line



Measure compression Z

