

Submitted by the expert from Germany

Informal document GRSP-62-35
(62nd GRSP, 12-15 December 2017
agenda item 26(g))

UN-Regulation No. 80

Comparative study between static and dynamic test procedure

Julian Ott

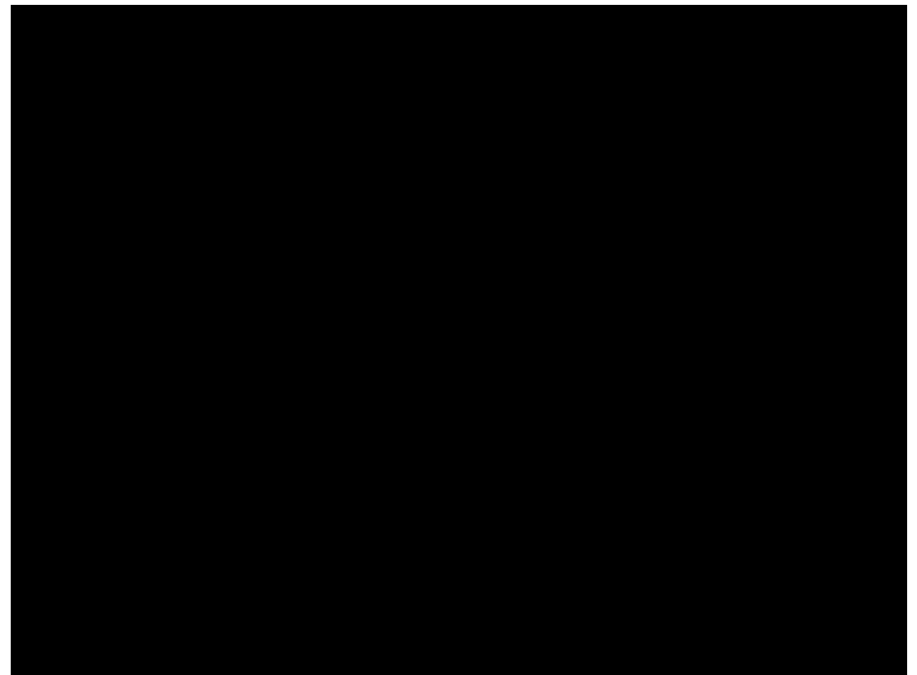
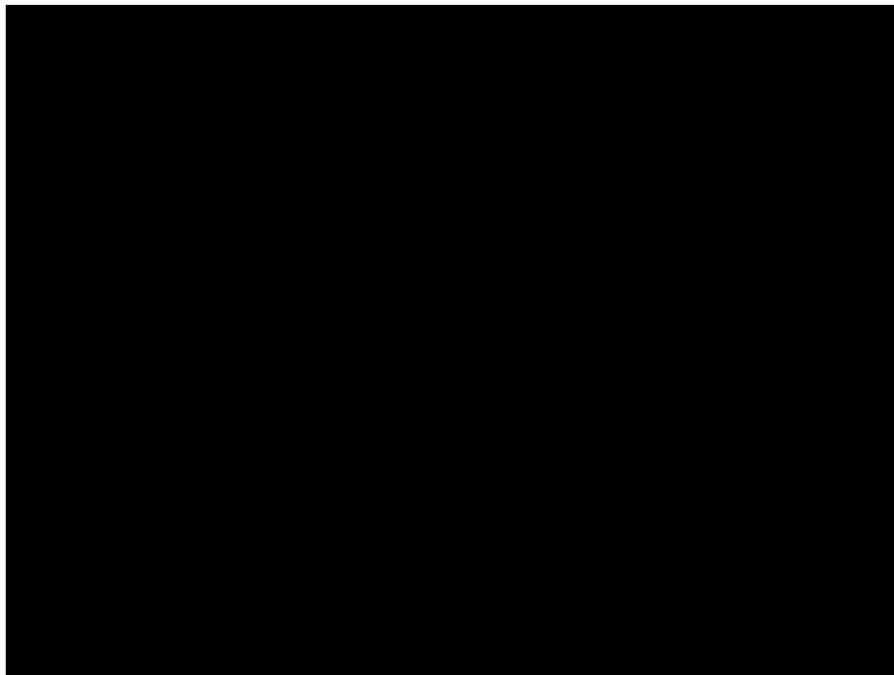
November 2017

Bundesanstalt für Straßenwesen

Goal of UN Regulation No. 80:

- the occupant is correctly retained by the seat in front of him (and/or by the use of a safety belt – dynamic only).
- the seat and the seat anchorages are strong enough.
- after an impact the occupant is not seriously injured

Are these tests equivalent?



The current UN-Regulation No. 80 allows to approve large passenger vehicle seats and their anchorage according to two different test procedures.

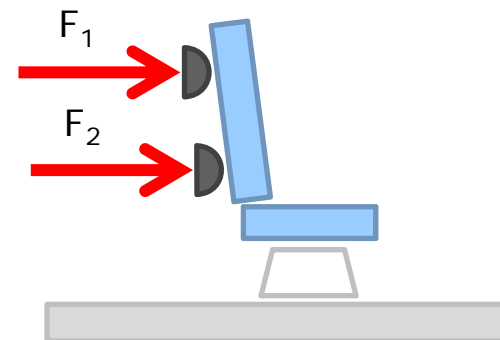
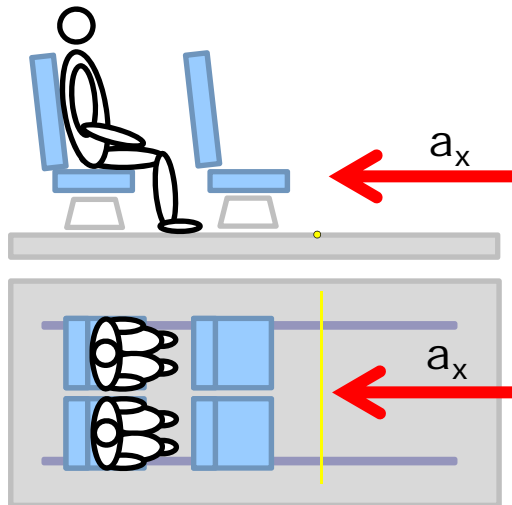
Appendix 1 (dynamic)

- sled test with 50%ile Dummy (HII or HIII), 30-32km/h, 8-12g
- Test 1 (without belt)
- Test 2 (with belt)

or

Appendix 5 (static)

- defined forces applied to the backrest at two locations



- Tests have been conducted
 - according to test procedure R80 Appendix 1 (dynamic) and Appendix 5 (static)
 - different seats
 - at different labs.
- All seats are equipped with quick clamping systems

Seat	Test procedure	Belt	Test-No.	Remarks
A	Dynamic (Appendix 1)	unbelted	R-80_17_01	
		unbelted	R80-1-1-01	
		2-point belt	R80-1-2-02	
		Seat only	R-80_17_02	not part of R80
		Seat only	R80-1-1-05	not part of R80
	Static (Appendix 5)	-	R-80-d-17_01	
		-	179421190_002	
B	Dynamic (Appendix 1)	unbelted	R80-1-1-03	
		unbelted	R80-1-1-04	
	Static (Appendix 5)	-	179421190_001	
C	Dynamic (Appendix 1)	unbelted	R-80_17_03	
	Static (Appendix 5)	-	R-80-d-17_02	

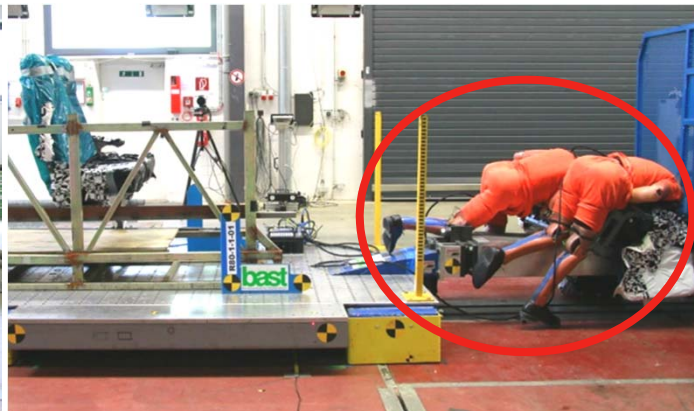
Results – Dynamic Test 1

R80-1-1-01 - Seat A

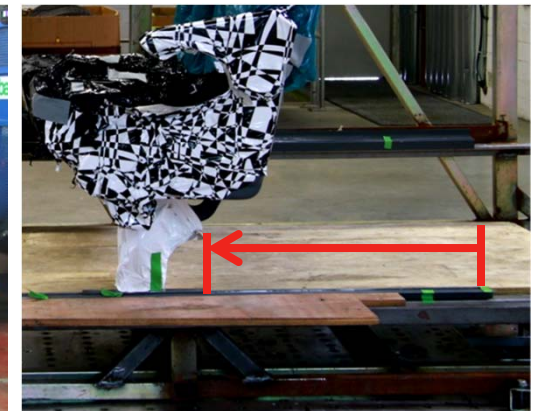
- Tested according to R80 – Appendix 1, Test 1 (unbelted)
- Observations:
 - Auxiliary seat slides 600mm (but still in seat track)
 - Test seat slides without any load of the dummies completely out of the seat track
- seat mountings are not strong enough to hold the seat in place
- Occupants are not restrained by the test seat
- Dummy values are below the thresholds but serious injuries are likely



Pre-test



Post-test



Sliding distance of auxiliary seat

R80-1-2-02 - Seat A

- Tested according to R80 – Appendix 1, Test 2 (belted)
- Observations:
 - Auxiliary seat detaches completely from the seat track
 - Test seat slides without any load of the dummies completely out of the seat track
- seat mountings are not strong enough to hold the seat in place
- Occupants are not restrained by the test seat
- Dummy values are below the thresholds but serious injuries are likely



Pre-test



Post-test -Dummies

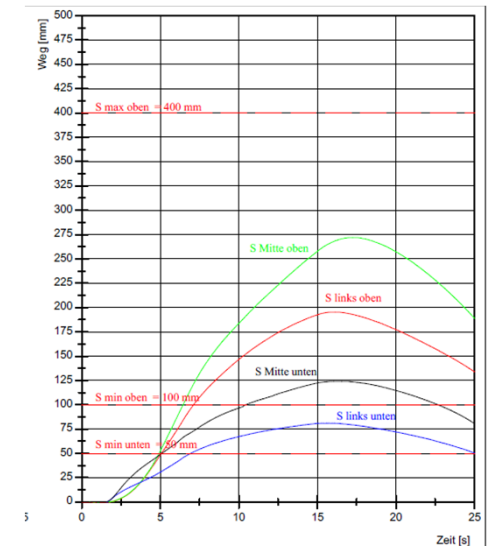
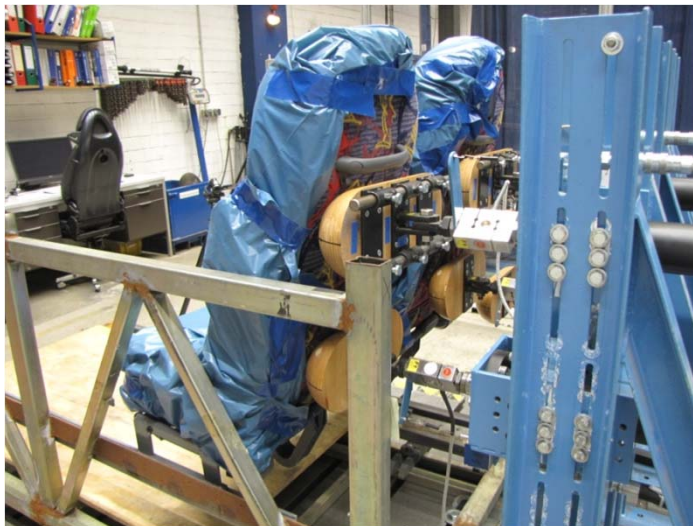
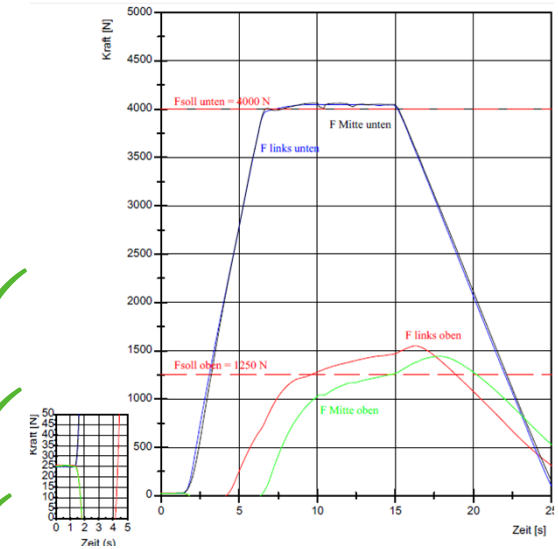


Post-test - overview

Results – Static Test

179421190_002 – Seat A

- Tested according to R80 – Appendix 5
- Observations:
 - Seat stays in place, no failure
 - The maximum displacement at F_1 is below the threshold of 400mm
 - The minimum displacement at F_1/ F_2 is above the threshold of 100/50mm



The statically (appendix 5) tested seats, when tested according to the dynamic test, collapsed in the dynamic tests

→ Goal of UN Regulation No. 80 is not achieved when tested statically

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Proposal: delete static test according to Appendix

In addition it has been observed that the static test procedure:

- does not consider dynamic effects like:
 - oscillation
 - inertia
 - mass and mass distribution of the seat
 - detaching of accessories
 - detaching/sliding/failure of clamp connection and locking
- does only partially take into account the different installation situation of the seat (lateral and vertical offset of seats, etc.).

the dynamic test procedure:

- Does not limit the sliding of the seat anchorage

Thank you for your attention!

Results - Summary



Seat	Test procedure	Belt	Test-No.	Resistance of seat/seat mountings	Occupants restraint	Occupant load
A	Dynamic (Appendix 1)	unbelted	R-80_17_01	test seat slides ~240mm and detaches partly; auxiliary seat slides ~100mm*)	excursion below threshold	values above threshold
		unbelted	R80-1-1-01	test seat slides out of seat track; auxiliary seat slides ~600mm	not restrained	values below threshold
		2-point belt	R80-1-2-02	test seat slides out of seat track; auxiliary seat detaches	not restrained	values below threshold
	Other	Seat only	R-80_17_02	seat slides ~655mm	-	-
		Seat only	R80-1-1-05	seat slides ~665mm	-	-
	Static (Appendix 5)	-	R-80-d-17_01	seat slides ~20mm	correctly restrained	sufficient deformation
-		179421190_002	seat does not move	correctly restrained	sufficient deformation	
B	Dynamic (Appendix 1)	unbelted	R80-1-1-03	test seat slides ~39mm	Dummy excursion below threshold	values below threshold
		unbelted	R80-1-1-04	test seat slides ~16mm	excursion below threshold	values below threshold
	Static (Appendix 5)	-	179421190_001	Seat does not move	correctly restrained	sufficient deformation
C	Dynamic (Appendix 1)	unbelted	R-80_17_03	test seat slides (~340mm)	excursion below threshold	values below threshold
	Static (Appendix 5)	-	R-80-d-17_02	seat does not move	correctly restrained	sufficient deformation

*) seat sliding influenced due to tape on seat track