Certificate of testing

Crash Test according to ISO 7176-19 - 2008

Wheeled mobility devices for use in motor vehicles

This report serves solely as documentation for the test results. The tested objects have been selected by the client with out the assistance of Dahl Engineering.

Assignment:	Crash testing of wheel chair and WTORS according to ISO 7176-19 annex A and B
Date of testing:	14 January 2020
Test object:	Invacare Action Ampla (project XXL) with 4 point WTORS
Mass of wheelchair:	28,4 kg
Serial no:	not informed – (proto type)
WTORS:	Wheelchair restraint – Dahl 4 point WTORS with 3p. automatic occupant restraint #502379 which meeting the requirements set out in clause 4.1
Measuring:	Accelerometers mounted on the crash test sled measured the deceleration.
Photografi:	The test was filmed with a high speed camera at 500 fps. Still pictures, pre and post-test.

Sled deceleration and speed:	**Test results**
	See page with plotted graph and speed

Test Results

Section	Details	X if correct
5.21	**During the test**	
(a)	**Horisontal excursion limits**	
	Wheelchair point P ≤ 200 mm [Xwc]	51
	ATD knee ≤ 375 mm[Xknee]	240
	ATD front of head ≤ 650 mm [XheadF]	257
	ATD rear of head ≤ - 450 [XheadR]	* N/A
(b)	The knee excursion exceeded the wheelchair P point excursion	X
(c)	(Batteries on powered wheelchairs) did not move completely outside the wheel-chair footprint or move into the wheelchair user´s space or contact with ADT legs	X
5.2.2	**After the test**	
(a)	The wheelchair remained in an upright position on the platform	X
	The ADT remained in the wheelchair with its torso at an angle of not more than 45º to the vertical, when viewed from any direction	X
(b)	The were no visible signs of material failure on the wheelchair securing points	X
(c)	There were no components, fragments or accessories of the wheelchair with a mass of more than 100g that completely separated from the wheelchair	X
(d)	There were no fragmented or separated component, that may contact the occupant, produced with sharp edges less than radius 2 mm	X
(e)	There were no visible signs of failure on the wheelchairs primary load carrying components	X
(f)	There were no visible signs of failure on the wheelchairs seat adjusters	X
(g)	The ADT was removed from the wheelchair without the use of tools	X
(h)	The wheelchair was released from the tie-down system without the use of tools	X
(i)	The post test decrease of the mean H-point height is not more than 20%	X
(j)	Wheelchair and components did not cause partial or complete failure of the webbing of any of the WTORS assemblies during the test	X

* The wheelchair, satisfied the dynamic test requirements of ISO 7176-19:2008+A1:2015 as amended by EN12183:2014 clause 7.4 (5.2.1 a). Which means that if the wheelchair does not have a head restraint, the $X_{head,\,R}$ excursions limits of the ATD, shall not be measured.

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Thisted January 15th 2020

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