

Technical Report No. 70052940

2003-09-30

Client: Ulrich Alber GmbH & Co. KG
Sigmaringer Str. 100

D-72458 Albstadt

Manufacturing location: Ulrich Alber GmbH & Co. KG
Sigmaringer Str. 100

D-72458 Albstadt

Test object: electrically driven wheelchair
type: Adventure A10
max. user weight: 140 kg

Test specifications: EN 12184: 1999 (with regard to)
ISO/FDIS 7176-2: 2001
ISO/FDIS 7176-4: 1997
ISO/FDIS 7176-6: 2001
ISO 7176-8: 1997 (chapter: 10.4)

Purpose of examination: Extension test of the electrically driven wheelchair
type: Adventure A10 (12 km/h version) to the already certified
product (Z1 03 05 11048 005) according to the test specifications.

Test result: The test subject was found to be in compliance with the test
specifications.

This technical report may only be quoted in full. Any use for advertising purposes must be granted in writing. This report is the result of a single examination of the object in question and is not generally applicable evaluation of the quality of other products in regular production.

1 Description of the product

1.1 Function

The presented wheelchair type: Adventure A10 is an electrically driven wheelchair with the class of use B, using indoor and outdoor. The max. load of the wheelchair is 140 kg.



1.2 Technical Data

product:	electrically driven wheelchair
type:	Adventure A10
class of use:	class B, rear-wheel drive
total height:	935 mm
total length:	1172 mm
total width:	680 mm
max. load:	140 kg
max. speed:	12 km/h
electro-motor:	brushless, electronically commutate d.c. motors
driving controller:	Adventure A10
batteries:	Frank Electronic GmbH type: MP22-12 C (4 x 12 V, 22 Ah)
battery charger:	Soneil, model: 2412SRF-B, 24 VDC, 6 A

2 Order

2.1 Date of Purchase Order

2003-8-25

2.2 Date of receipt of test subject

2003-08-25 (PM-03 0457) wheelchair „Adventure A10“ 12 km/h version
2003-09-01 (PM-03 0472) 2 driving wheels

3 Performed tests

1. Determination of dynamic stability of electrically driven wheelchairs according to ISO/FDIS 7176-2: 2001
2. Determination of the theoretical distance according to ISO/FDIS 7176-4: 1997 (E)
3. Determination of maximum speed, acceleration and retardation of electrically driven wheelchairs according to ISO/FDIS 7176-6: 2001(E)
4. Testing of the fatigue strength according to ISO 7176-8: 1997 (chapter: 10.4)

4 Results

Road performance features	Test procedure	Requirements class of use		
		A	B	C
Dynamic stability	ISO 7176-2	Min. inclination		
Starting forward on uphill slope		3°	6°	10°
Stopping after travelling forward on uphill slope		3°	6°	10°
Stopping when travelling forward down slope		3°	6°	10°
Stopping when travelling backward down slope		3°	6°	10°
Turning on a downhill slope		No tilting over the equilibrium state.		

	Requirement fulfilled
Dynamic Stability according to ISO/FDIS 7176-2: 2001	
Starting forward on uphill slope: 6°	n.a. <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Remark <input checked="" type="checkbox"/> detected : 10°
Stopping after travelling forward on uphill slope: 6°	n.a. <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Remark <input checked="" type="checkbox"/> detected : 10°
Stopping when travelling forward down slope: 6°	n.a. <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Remark <input checked="" type="checkbox"/> detected : 10°
Stopping when travelling backward down slope: 6°	n.a. <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Remark <input checked="" type="checkbox"/> detected : 10°
Turning on a downhill slope	n.a. <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Remark <input checked="" type="checkbox"/>


	Requirement fulfilled																												
<p>Reach (according to ISO 7176-4)</p> <p>Min. reach (information from table 2, page 30-31):</p> <p>Class A: 15 km</p> <p>Class B: 25 km</p> <p>Class C: 35 km</p> <p>Brake acceleration (according to ISO 7176-6) (table 3: road performance features, EN 12184, page 32)</p> <p>The rearward and forward mean brake acceleration on the plane shall be $a \geq 1,5 \text{ m/s}^2$. The top value of the negative acceleration shall not exceed 4 m/s^2.</p> <p>Note: If the mean acceleration is too much for the supply of certain handicaps, a deviation from is possible.</p> <p>Performance: surface dry, hard, plain</p> <p>Brake distance (according to ISO 7176-6) (table 3: road performance features, EN 12184, page 32)</p> <p>Test of the max. horizontal brake distance depending on the wheelchair's max. speed (not depending on the wheelchair class).</p> <p>Performance: surface dry, hard, plain</p> <p>Number: 3 times in rearward as well as backward direction</p> <p>Mean value: 2,35 m</p>	<p>n.a. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Remark <input type="checkbox"/></p> <p>n.a. <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Remark <input checked="" type="checkbox"/> detected: 48 km</p> <p>n.a. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Remark <input type="checkbox"/></p> <p>n.a. <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Remark <input checked="" type="checkbox"/></p> <p>acceleration: $2,42 \text{ m/s}^2$ retardation: $2,76 \text{ m/s}^2$</p> <table border="1"> <thead> <tr> <th>v [km/h]</th> <th>s [m]</th> <th>v [km/h]</th> <th>s [m]</th> </tr> </thead> <tbody> <tr> <td>4,0</td> <td>0,6</td> <td>10,0</td> <td>2,0</td> </tr> <tr> <td>5,0</td> <td>0,8</td> <td>11,0</td> <td>2,2</td> </tr> <tr> <td>6,0</td> <td>1,0</td> <td>12,0</td> <td>2,5</td> </tr> <tr> <td>7,0</td> <td>1,2</td> <td>13,0</td> <td>2,8</td> </tr> <tr> <td>8,0</td> <td>1,5</td> <td>14,0</td> <td>3,2</td> </tr> <tr> <td>9,0</td> <td>1,7</td> <td>15,0</td> <td>3,5</td> </tr> </tbody> </table> <p>n.a. <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Remark <input checked="" type="checkbox"/></p> <p>$v_{\max} = 11,79 \text{ km/h}$</p>	v [km/h]	s [m]	v [km/h]	s [m]	4,0	0,6	10,0	2,0	5,0	0,8	11,0	2,2	6,0	1,0	12,0	2,5	7,0	1,2	13,0	2,8	8,0	1,5	14,0	3,2	9,0	1,7	15,0	3,5
v [km/h]	s [m]	v [km/h]	s [m]																										
4,0	0,6	10,0	2,0																										
5,0	0,8	11,0	2,2																										
6,0	1,0	12,0	2,5																										
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8,0	1,5	14,0	3,2																										
9,0	1,7	15,0	3,5																										

	Requirement fulfilled
<p>Fatigue test (ISO 7176-8, section 10)</p> <p>Two-Drum-Test</p> <p>The reference drum surface shall run at 1,0 m/s ± 0,1 m/s. The test is finished, when the drum had run 200.000 revolutions or any higher figure claimed by the manufacturer.</p> <p>Inspection of the construction after completed load test</p> <ul style="list-style-type: none"> no permanent deformation, which reduces the function and safety. no loose connections no obvious tears inspection of welded seems and soldered spots 	<p>n.a. <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Remark <input type="checkbox"/></p> <p>n.a. <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Remark <input type="checkbox"/></p> <p>n.a. <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Remark <input type="checkbox"/></p> <p>n.a. <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Remark <input type="checkbox"/></p> <p>n.a. <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Remark <input type="checkbox"/></p>

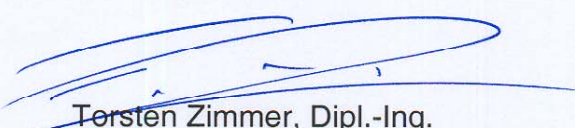
4 Summary

The test subject was found to be in compliance with the test specifications.

TÜV PRODUCT SERVICE GMBH

i.A. 
Dipl.-Ing. Michael Kese
Rehabilitation

report checked


Torsten Zimmer, Dipl.-Ing.