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ANKOM
2005 -02- 0 8

Crash test according to ISO-7176-19 and ISO-10542

Assignment

Crash testing of wheelchair according to ISO-7176-19 and ISO-10542.

Test object

Wheelchair	Invacare Action 3 fixback
Serial number	
Class	B
Locking system	Unwin strap system
Dummy	Hybrid III dummy, mass 76.5 kg

Date of arrival

The test objects arrived at SP on 04 January 2005. The test objects have been selected by the client without SP's assistance. The test results showed in this report refer only to the tested objects.

Date of testing

The test was performed on 04 January, 2005.

Measuring

The deceleration was measured by two accelerometers mounted on the trolley.
The test was filmed with a high-velocity camera (1000 frames a second).
The measurement uncertainty when determining the deceleration was better than $\pm 5\%$ ($g = 9.81 \text{ m/s}^2$).

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Accuracy of measurement

Accuracy of measurement	EXACTNESS (+/-)	INSTABILITY FACTOR
Sensor	0,50%	0,50%
Transvers.	0,80%	0,46%
Temperature	0,15%	0,09%
Power Supply	0,40%	0,23%
Gain	0,10%	0,06%
A/D- conversion	0,02%	0,01%
Zero leeway	0,10%	0,06%
	SQUARESUM	0,53%
	ROOTSQUARESUM	0,73%
	KONF. 95% (k=2)	1,46%

The reported expanded uncertainty of measurement is stated as the combined standard uncertainty of measurement multiplied by the coverage factor $k = 2$, which for a normal distribution corresponds to a coverage probability of approximately 95 %.

Temperature

Dummy	19,9
Test room	20,1

Results

Test:

Velocity: 50.0 km/h

Retardation distance: 635 mm

Retardation pulse according to acceleration curves in appendix.

Locking device Unwin strapsystem with wheelchair model Invacare Action 3 with fix backrest and Hybrid III crash test dummy.

The strapsystem withstands the test with small deformations. The seat back of the wheelchair was bent back 3° at the rebound of the dummy. The movement of the dummy is approved according to specification in ISO-7176-19 and ISO 10542. No other fractures or apparent deformations were noted on the wheelchair or anchorage points.

The system fulfils the requirements according to ISO-10542 and ISO-7176-19.

Retardation distance:

Movements of dummy	Result
Knee	250 mm
Head frontal	360 mm
Head rear	320 mm
Wheelchairpoint	200 mm
Xknee/Xwc > 1.1	1.1
Buckle opening force	30.2 N



Before test



Before test

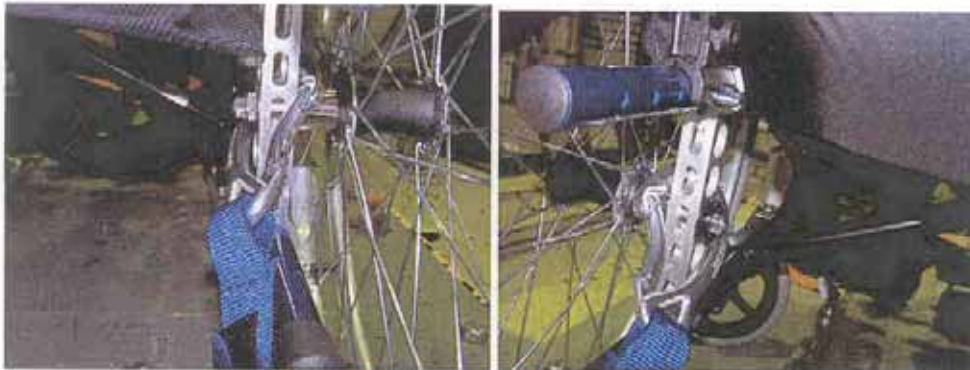


After test



After test





After test

Description of the wheelchair**Action3 – Fixed backrest**

Wheelchair dimensions :

Seat height : 46 cm

Seat width : 43 cm

Seat depth : 40 cm

Self propulsion wheelchair

7° fixed backrest 43 cm height with standard nylon padded upholstery

Nylon Seat upholstery with velcro straps

80° straight swing in/swing out hanger with flip up footplate

Dismantable armrest

8" solid front wheel

24" pneumatic rear wheel with spoked rim

Standard rear wheel position

Push to lock brakes

Buckle belt fixed on frame tube

SP Swedish National Testing and Research Institute
Building Technology and Mechanics - Transport and Vehicle Technology



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Appendices

Appendix Retardation pulses