Transport Research Laboratory
Impact Test Group

DYNAMIC RESTRAINT TEST REPORT

Customer:	**Invacare Ltd**
test vehicle:	Apollo Indoor
test number:	25LM04
test type:	ISO/DIS 7176/19 December(1999)
test speed:	48 km/h
test date:	7 September 2000

If you have any questions relating to this test please contact the Impact Test Group Manager:
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DYNAMIC RESTRAINT TEST FACILITY TEST REPORT

Test No. 25LM04
Date: 07/09/00

Customer: Invacare Ltd
Run No.: T0792

Test To be Conducted

Pulse Specification	ISO/DIS 7176/19-1 (Dec 1999), Frontal impact	
Wheelchair	*Manufacturer:*	Invacare Ltd
	Model:	Apollo Indoor
	Serial No.	
	Mass:	51kg
	Configuration:	Forward facing
Wheelchair Tiedown	*Manufacturer:*	Koller
	Model:	4 pt karabiner
	Anchorage	Koller Rail
Occupant Restraint	*Manufacturer*	Koller
	Model:	Constant Force
ATD	Hybrid II	
	Mass:	75 kg
Sled Transducer	Endevco Uniaxle Type 7232c *Serial number:* EH50(left) A58B (right)	
Photography	Redlake 1000 frames/sec video	

Test Data

Sled	Velocity at impact	48.2	km/h
	Stopping distance	510	mm
	Resultant Peak Deceleration	23.7	g

For this test the results are in terms of the format defined in Sections 7.1 Test Report and 7.6 "Frontal Impact Test" in ISO/DIS 7176/19-1 discussion document dated Dec 1999

Requirements of Section 5			Result
5.3.1.a	Was the horizontal movement of the:	(i) wheelchair (X wc) < 200mm?	Yes *79*
		(ii) dummy knee (X knee) < 375mm?	Yes *356*
		(iii) dummy head (X head) < 650mm?	Yes *347*
5.3.1.b	Was the ratio of X knee/X wc > 1.1?		Yes *4.5*
5.3.1.d	(i)	Did the batteries move completely outside of the wheelchair footprint? *Note: Battery cover broke but held the batteries in place.*	No
	(ii)	Did the battery contact the back of the ATD legs?	No
5.3.2.a	(i)	Did the wheelchair remain in an upright position on the test platform?	Yes
	(ii)	Did the ATD remain in the wheelchair with its torso at an angle of less than 45 deg when viewed from any direction?	Yes
			Front = *1°* Side = *30°*
5.3.2.b	Did the wheelchair securement points show visible signs of material failure?		No
5.3.2.c	For manual tiedowns: Did the securement points show any deformation or distortion to prevent manual disengagement and removal tiedown end fittings?		No
5.3.2.d	Did any components, fragments or accessories with a mass in excess of 100gm completely detach from the wheelchair? *Note: LHS leg rest swung around 180°.*		No
5.3.2.e	Did any fragmented or separated component that may contact the occupant produce sharp edges with a radius less than 2mm?		No
5.3.2.f	Was the ATD removed from the wheelchair without the use of tools?		Yes
5.3.2.g	Was the wheelchair released from the tiedown system without the use of tools?		Yes
5.3.2.h	Was the decrease of the mean H-point height < 20%		Yes

Conclusion: The system met the requirements of Sections 5.3.1 and 5.3.2 and thus gave a satisfactory impact performance.

Pass/Fail:	PASS

Analysed by:	A. Arregui	Date:	12.09.2000