



**Transport Research Laboratory  
Impact Test Group**

## **DYNAMIC RESTRAINT TEST REPORT**

**Customer: Unwin Safety Systems/Radcliffe Rehabilitation Services**

test vehicle: Netti 3

test number: T0106

test type: ISO/CD 7176/19-1 DATE 15 JAN 1997

test speed: 48 (+2, - 0) km/h

test date: 9 December 1998

**If you have any questions relating to this test please  
contact your Project Manager:**

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# DYNAMIC RESTRAINT TEST FACILITY TEST REPORT

test date: 9 December 1998

TRL reference number: ITG 98095 (T0106)

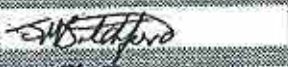

report date: 14 December 1998

author: J M Britchford

customer: Unwin Safety Systems/ Radcliffe Rehabilitation Services

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Approvals	
Project Manager	
QA/QC	

# DYNAMIC RESTRAINT TEST FACILITY TEST REPORT

Test No. T0106

Customer: Unwin Safety Systems/Radcliffe  
Rehabilitation Services

Date: 9/12/98  
Time: 1104hrs

Run No.: RCR01

## Test To be Conducted

Pulse Specification

ISO/CD 7176-19-1(January 97), Frontal impact

Wheel Chair

*Manufacturer:* Alu Rehabilitation AS  
*Model:* Netti 3  
*Mass:* 30.8kg  
*Configuration:* Forward Facing

Wheel Chair  
TieDown

*Manufacturer:* Unwin Safety Systems  
*Model:* 4pt tiedown WWR/ATF/K/R  
*Anchorage:* Unwin Low Profile Rail  
*Configuration:*

Occupant  
Restraint

*Manufacturer:* Unwin Safety Systems  
*Model:* Double Inertia Reel QIR/3H/ATF/WH

ATD

Low Cost  
*Mass:* 76kg

Sled Transducer

Endevco Uniaxle 723c No. EG10

Photography

Redlake 1000 frames/sec video

## Test Data

Sled

Velocity at impact 48.6 (km/h)  
Stopping distance 465 (mm)  
Peak Deceleration 25.4 (g)  
Mean Deceleration 20.0 ( $V^2/2gs$ )

For this test the results are in terms of the format defined in Section A.6 "Frontal Impact Performance Requirements" in ISO/CD 7176/19-1 draft working document dated 15/1/97.

REQUIREMENT of Section 6		RESULT
6.1/2	Did the ATD remain in the wheelchair and the wheelchair remain in an upright position on the sled?	Yes/Yes
6.3	Did any component with a mass in excess of 100gm detach?	No
6.4	Did any adjustable parts move from their pre-test positions?	No
6.5	Was there any leakage from the batteries?	N/A
6.6	Were the batteries retained in the W/C footprint?	N/A
6.7	Did any load bearing part of the wheelchair fracture completely?	No
6.8	Were any damaged surfaces less than 7mm wide?	No
6.9	Was the ATD released from the occupant restraint and removed from the wheelchair without the use of tools?	Yes
6.10	Was the tiedown system released from the sled without the use of tools?	Yes
6.11	Was the horizontal movement of the:	
	(i) wheelchair (X wc) < 200mm?	Yes - 119mm
	(ii) dummy knee (X knee) < 375mm?	Yes - 267mm
	(iii) dummy head (X head) < 650mm?	Yes - 512mm
6.12	Was the ratio of X knee/X wc > 1.1?	Yes - 2.2
6.13	Was the decrease of the mean H-point height < 20%?	Yes - 0%

## Conclusion

The system did meet the requirements of 6.1/2 to 6.13, and hence the system gave a satisfactory impact performance.

Analysed by	<i>J. B. [Signature]</i>
Date	14/12/98