

REPORT OF TEST

Issued by : NEL

Certificate No. : MTIM

Date of Issue : 6 December 2007



NEL
East Kilbride,
Glasgow, G75 0QF, UK.

Tel No. 01355 220222.
Fax No. 01355 272999

Authorised Signatories:

D Hare, L Hunter

Customer Arresta Safety Products, 29 Chorley Road, Adlington, Chorley, Lancashire, PR6 9LH.

Project No. PPE700000 **NEL Test Mark** MTIM

Specimen received date 20 November 2007 **Date of Test** 21 November 2007

Specimen Description: Arresta-Rail guided type fall arrester on a rigid rail anchor line. A detailed description of the system, outlining component parts, is included in Appendix I.

Object of Test Testing was carried out to determine the ability of the fall arrest system to arrest falls under different fall postures when using anthropometric test dummies of different weights (71 kg and 100 kg). This included the test dummy falling from the ladder backwards (fall-back test), from a sit position (sit-back test), from a climbing position with feet placed on vertically adjacent rungs (climb-fall test) and from an upright position with both feet placed off the ladder (fall-down test).

Method of Test The system was mounted in a strictly vertical orientation and positioned mid-span of the ladder rungs. An anthropometric test dummy was attached to the fall arrester via the thoral D ring of an EN361 CE approved full body fall arrest harness. The test dummy was raised as far above the fall arrester as the coupling would allow and set to the desired fall posture. Thereafter, the dummy was released to fall freely via an overhead quick release mechanism. Appendix II describes the fall postures used during tests.

Test Results Test results are contained in Appendix III.

Comments The Arresta-Rail Fall Arrest Safety System successfully locked on and arrested falls when tested with both a 71 kg and 100 kg anthropomorphic test dummy. In all tests, the fall distance of the test dummy measured at the harness attachment point ranged between 0.42 and 0.89 metres.

Distribution

Arresta Safety Products	1
NEL	1

Tested by D. Hare

APPENDIX I – SYSTEM DESCRIPTION

SYSTEM DESCRIPTION

The Arresta-Rail Fall Arrest Safety System comprised of a 6 m run of galvanised steel **Arresta-Rail channels – Part No: SL8801** (2 x 3 m lengths linked via **Splice kit – Part No: SL8860**) complete with slotted fixing points. The rail was mounted on the rungs of a steel ladder which forms part on NEL's vertical systems test rig PPE2 via **Rung Brackets – Part No: SL8810** at intervals of 5 rungs. A **Slip-Grip Traveller Part No: SL8888A** guided fall arrester complete with webbing energy absorber and captive twist lock karabiner completed the system. The test dummies were fitted with an **AR-Harness** 2-point full body harness with the thoral attachment point used for connection to the guided fall arrester.

Figure 1 shows the ladder and rail mounted on NEL Test rig PPE2. Figure 2 shows a **Rung Bracket – Part No.: SL8810** in situ. Figure 3 shows the **Slip-Grip Traveller Part No: SL8888A** guided fall arrester mounted on the rail and attached to the thoral Dee of the **A-R harness**.

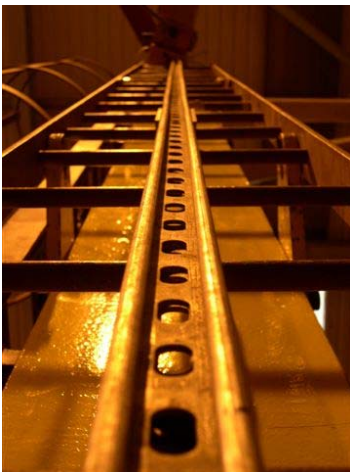


FIGURE 1
ARRESTA RAIL MOUNTED
ON STEEL RUNG LADDER
TEST RIG PPE2



FIGURE 2
RAIL/LADDER Rung Fixing
Bracket – Part No. SL8810



FIGURE 3
GUIDED FALL ARRESTER
MOUNTED ON RAIL

HARNESS EMPLOYED DURING TESTS

A-R harness - 2 Point Full Body Harness



Front View



Rear View

NEL Test Mark: MTIM

Page 2 of 11

This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

QC5/JAN01

APPENDIX II - DESCRIPTION OF TEST DUMMY FALL POSTURES

FALL-BACK TEST

With both legs straight the dummy's feet are placed on same ladder rung at either side of the fall arrest line. With the dummy's spine in a vertical attitude adjacent to the ladder, both arms/hands are left to hang freely at either side. See Appendix III, Figure 1.

SIT-BACK TEST

Both feet are placed on the same ladder rung at either side of the fall arrest line and both thighs are set almost perpendicular to the ladder. With the dummy's spine in a near vertical attitude, both arms/hands are left to hang freely at either side. See Appendix III, Figure 3.

CLIMBING FALL TEST

For the Climb Fall test the dummy was positioned with the feet staggered between two vertically adjacent ladder rungs with the lower leg set straight and the upper leg bent posture and the hands hanging freely. See Appendix III, Figure 5.

FALL-DOWN TEST

With the dummy in a vertical attitude, both hands are positioned on the same ladder rung at either side of the rail, with both legs hanging freely off the ladder. See Appendix III, Figure 7.

APPENDIX III - TEST SET-UP AND TEST RESULTS

TEST 1: FALL-BACK TEST WITH 71 KG ANTHROPOMETRIC DUMMY

Test Equipment:

Ladder:	Industrial Steel Ladder Part of NEL Test Rig PPE2
Rail:	Arresta-Rail Channels (Ladder fixings every 5 rungs)
Rail Joint Piece:	Splice kit
Guided arrester:	Slip-Grip Traveller
Rail/Ladder:	Rung Brackets
Harness:	2-point full body fall arrest harness
Arrest Point:	Thorax Attachment

Arresta Rail	Ref. No.
	N/A
	SL8801
	SL8860
	SL8888A
	SL8810
	AR-Harness

Pre-Test Measurements:

Horizontal distance from ladder rung to harness front waist attachment point pre test: 120 mm
Vertical distance from harness front waist attachment point to centre of traveller spindle: 340 mm
Vertical distance from harness attachment point to floor before release (B): 4.50 m

Post-Test Measurements:

Vertical distance from harness attachment point to floor after release (A): 3.74 m
Vertical displacement of dummy: B-A = 0.76 m
Vertical displacement of trolley on rail: 50 mm
Absorber pack deployment: 25 mm
Comments: Dummy held clear of floor.



FIGURE 1
TEST 1: FALL-BACK TEST
PRE- DROP FALL POSITION



FIGURE 2
TEST 1: FALL-BACK TEST
POST- DROP REST POSITION

TEST 2: SIT-BACK TEST WITH 71 KG ANTHROPOMETRIC DUMMY

Test Equipment:

Ladder:	Industrial Steel Ladder Part of NEL Test Rig PPE2
Rail:	Arresta-Rail Channels (Ladder fixings every 5 rungs)
Rail Joint Piece:	Splice kit
Guided arrester:	Slip-Grip Traveller
Rail/Ladder:	Rung Brackets
Harness:	2-point full body fall arrest harness
Arrest Point:	Thorax Attachment

Ref. No.

N/A
SL8801
SL8860
SL8888A
SL8810
AR-Harness

Pre-Test Measurements:

Horizontal distance from ladder rung to harness thorax attachment point pre test: 300 mm
Vertical distance from harness thorax attachment point to centre of traveller spindle: 270 mm
Vertical distance from harness attachment point to floor before release (B): 4.26 m

Post-Test Measurements:

Vertical distance from harness attachment point to floor after release (A): 3.73 m
Vertical displacement of dummy: B-A = 0.53 m
Vertical displacement of trolley on rail: 5 mm
Absorber pack deployment: 25 mm
Comments: Dummy held clear of floor.



FIGURE 3
TEST 2: SIT-BACK TEST
PRE- DROP FALL POSITION



FIGURE 4
TEST 2: SIT-BACK TEST
POST- DROP REST POSITION

TEST 3: CLIMB-FALL TEST WITH 71 KG ANTHROPOMETRIC DUMMY

Test Equipment:

Ladder:	Industrial Steel Ladder Part of NEL Test Rig PPE2
Rail:	Arresta-Rail Channels (Ladder fixings every 5 rungs)
Rail Joint Piece:	Splice kit
Guided arrester:	Slip-Grip Traveller
Rail/Ladder:	Rung Brackets
Harness:	2-point full body fall arrest harness
Arrest Point:	Thorax Attachment

Ref. No.

N/A
SL8801
SL8860
SL8888A
SL8810
AR-Harness

Pre-Test Measurements:

Horizontal distance from ladder rung to harness thorax attachment point pre test: 300 mm
Vertical distance from harness thorax attachment point to centre of traveller spindle: 260 mm
Vertical distance from harness attachment point to floor before release (B): 4.29 m

Post-Test Measurements:

Vertical distance from harness attachment point to floor after release (A): 3.71 m
Vertical displacement of dummy: B-A = 0.58 m
Vertical displacement of trolley on rail: 40 mm
Absorber pack deployment: 25 mm
Comments: Dummy held clear of floor in an inverted posture.



FIGURE 5
TEST 3: CLIMB-FALL TEST
PRE- DROP FALL POSITION



FIGURE 6
TEST 3: CLIMB-FALL TEST
POST- DROP REST POSITION

TEST 4: FALL-DOWN TEST WITH 71 KG ANTHROPOMETRIC DUMMY

Test Equipment:

Ladder:	Industrial Steel Ladder Part of NEL Test Rig PPE2
Rail:	Arresta-Rail Channels (Ladder fixings every 5 rungs)
Rail Joint Piece:	Splice kit
Guided arrester:	Slip-Grip Traveller
Rail/Ladder:	Rung Brackets
Harness:	2-point full body fall arrest harness
Arrest Point:	Thorax Attachment

Ref. No.

N/A
SL8801
SL8860
SL8888A
SL8810
AR-Harness

Pre-Test Measurements:

Horizontal distance from ladder rung to harness thorax attachment point pre test: 145 mm
Vertical distance from harness thorax attachment point to centre of traveller spindle: 360 mm
Vertical distance from harness attachment point to floor before release (B): 4.72 m

Post-Test Measurements:

Vertical distance from harness attachment point to floor after release (A): 3.89 m
Vertical displacement of dummy: B-A = 0.83 m
Vertical displacement of trolley on rail: 55 mm
Absorber pack deployment: 55 mm
Comments: Dummy held clear of floor.



FIGURE 7
TEST 4: FALL DOWN TEST
PRE- DROP FALL POSITION



FIGURE 8
TEST 4: FALL DOWN TEST
POST- DROP REST POSITION

TEST 5: FALL-BACK TEST WITH 100 KG ANTHROPOMETRIC DUMMY

Test Equipment:

Ladder:	Industrial Steel Ladder Part of NEL Test Rig PPE2
Rail:	Arresta-Rail Channels (Ladder fixings every 5 rungs)
Rail Joint Piece:	Splice kit
Guided arrester:	Slip-Grip Traveller
Rail/Ladder:	Rung Brackets
Harness:	2-point full body fall arrest harness
Arrest Point:	Thorax Attachment

Ref. No.

N/A
SL8801
SL8860
SL8888A
SL8810
AR-Harness

Pre-Test Measurements:

Horizontal distance from ladder rung to harness thorax attachment point pre test: 305 mm
Vertical distance from harness thorax attachment point to centre of traveller spindle: 255 mm
Vertical distance from harness attachment point to floor before release (B): 4.67 m

Post-Test Measurements:

Vertical distance from harness attachment point to floor after release (A): 4.05m
Vertical displacement of dummy: B-A = 0.62 m
Vertical displacement of trolley on rail: 50 mm
Absorber pack deployment: 30 mm
Comments: Dummy held clear of floor.



FIGURE 9
TEST 5: FALL BACK TEST
PRE- DROP FALL POSITION



FIGURE 10
TEST 5: FALL BACK TEST
POST- DROP REST POSITION

TEST 6: SIT-BACK TEST WITH 100 KG ANTHROPOMETRIC DUMMY

Test Equipment:

Ladder:	Industrial Steel Ladder Part of NEL Test Rig PPE2
Rail:	Arresta-Rail Channels (Ladder fixings every 5 rungs)
Rail Joint Piece:	Splice kit
Guided arrester:	Slip-Grip Traveller
Rail/Ladder:	Rung Brackets
Harness:	2-point full body fall arrest harness
Arrest Point:	Thorax Attachment

Ref. No.

N/A
SL8801
SL8860
SL8888A
SL8810
AR-Harness

Pre-Test Measurements:

Horizontal distance from ladder rung to harness thorax attachment point pre test: 395 mm
Vertical distance from harness thorax attachment point to centre of traveller spindle: 125 mm
Vertical distance from harness attachment point to floor before release (B): 4.41 m

Pre-Test Measurements:

Vertical distance from harness attachment point to floor after release (A): 3.99 m
Vertical displacement of dummy: $B-A = 0.42$ m
Vertical displacement of trolley on rail: 12 mm
Absorber pack deployment: 35 mm
Comments: Dummy held clear of floor.



FIGURE 11
TEST 6: SIT BACK TEST
PRE- DROP FALL POSITION



FIGURE 12
TEST 6: SIT BACK TEST
POST- DROP REST POSITION

TEST 7: CLIMB-FALL TEST WITH 71 KG ANTHROPOMETRIC DUMMY

Test Equipment:

Ladder:	Industrial Steel Ladder Part of NEL Test Rig PPE2
Rail:	Arresta-Rail Channels (Ladder fixings every 5 rungs)
Rail Joint Piece:	Splice kit
Guided arrester:	Slip-Grip Traveller
Rail/Ladder:	Rung Brackets
Harness:	2-point full body fall arrest harness
Arrest Point:	Thorax Attachment

Ref. No.

N/A
SL8801
SL8860
SL8888A
SL8810
AR-Harness

Pre-Test Measurements:

Horizontal distance from ladder rung to harness thorax attachment point pre test: 280 mm
Vertical distance from harness thorax attachment point to centre of traveller spindle: 275 mm
Vertical distance from harness attachment point to floor before release (B): 4.45 m

Post-Test Measurements:

Vertical distance from harness attachment point to floor after release (A): 3.74 m
Vertical displacement of dummy: $B-A = 0.71$ m
Vertical displacement of trolley on rail: 70 mm
Absorber pack deployment: 25 mm
Comments: Dummy held clear of floor.



FIGURE 13
TEST 7: CLIMB-FALL TEST
PRE- DROP FALL POSITION



FIGURE 14
TEST 7: CLIMB-FALL TEST
POST- DROP REST POSITION

TEST 8 FALL-DOWN TEST WITH 100 KG ANTHROPOMETRIC DUMMY

Test Equipment:

Ladder:	Industrial Steel Ladder Part of NEL Test Rig PPE2
Rail:	Arresta-Rail Channels (Ladder fixings every 5 rungs)
Rail Joint Piece:	Splice kit
Guided arrester:	Slip-Grip Traveller
Rail/Ladder:	Rung Brackets
Harness:	2-point full body fall arrest harness
Arrest Point:	Thoral Attachment

Ref. No.

N/A
SL8801
SL8860
SL8888A
SL8810
AR-Harness

Pre-Test Measurements:

Horizontal distance from ladder rung to harness thoral attachment point pre test: 210 mm
Vertical distance from harness thoral attachment point to centre of traveller spindle: 320 mm
Vertical distance from harness attachment point to floor before release (B): 4.70 m

Pre-Test Measurements:

Vertical distance from harness attachment point to floor after release (A): 3.81 m
Vertical displacement of dummy: $B-A = 0.89$ m
Vertical displacement of trolley on rail: 55 mm
Traveller Absorber extension: 130 mm.
Comments: Dummy held clear of floor.



FIGURE 15
TEST 8: FALL DOWN TEST
PRE- DROP FALL POSITION



FIGURE 16
TEST 8: FALL DOWN TEST
POST- DROP REST POSITION

END OF REPORT