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Date: 17/04/2014		**Test Report : TR2014027**	Page 1 of 8
Department	**Height Safety**	Test: Static pull test on life vest toggle handles	**Ref: QSI 20140417-01**

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Test specification: Test to determine the breaking strength of the jacket release cord handles and the minimum force required to activate the actuator unit.

Test items: Safe Defence
Seven (7) Black corded handles
0ne (1) Actuator unit

Date of test: 11/04/2014

Checked by: Tanya Edmonds Date: 17/04/2014
Compliance Manager

Prepared & approved by Jason Myburgh Date: 17/04/2014
Quality Laboratory Manager

Signatory: Jason Myburgh

Aim

This test was done in order to determine the breaking strength of the Safe Defence rip cord handle used on the rescue vests, as well as the force needed to release the actuator unit on the vest.

The following table covers the test program conducted;

Designation	Test	Description
Static pull the cord and handle until destruction	Perform a static pull test until destruction, record the point of destruction.	**TEST 1** Set the lanyard between an anchor point and load cell and perform a pull test until the unit of cord breaks.
Static pull the cord and handle until destruction	Sew extra line of stitching just above the press stud and perform a static pull test until destruction, record the point of destruction.	**TEST 2** Set the lanyard between an anchor point and load cell and perform a pull test until the unit of cord breaks.
Apply a force onto the actuator to determine the release force for the unit to function.	Attach the unit onto the load cell and pull down to release the actuator unit.	**TEST 3** Test the actuator unit by giving a downward tug on the cord handle to determine the force at which the actuator will release.

Conclusion

The Safe Defence toggle handles as provided broke at a force of 24kg on average out of the six (6) tested.
The actuator unit released at 1 kg and broke out the plastic housing at 2kg.

Assessment

Test 1

Test Number	Description	Break Force Recorded
ST2014-83	Toggle number 1	17 Kg
ST2014-84	Toggle number 2	18 Kg
ST2014-85	Toggle number 3	23 Kg
ST2014-86	Toggle number 4	36 Kg
ST2014-87	Toggle number 5	20 Kg
ST2014-88	Toggle number 6	31 Kg
	Average	**24 Kg**

Refer to appendix 1 for graphs

Test 2

Test Number	Description	Break Force Recorded
ST2014-89	Toggle with one extra stitch above press stud	53 Kg

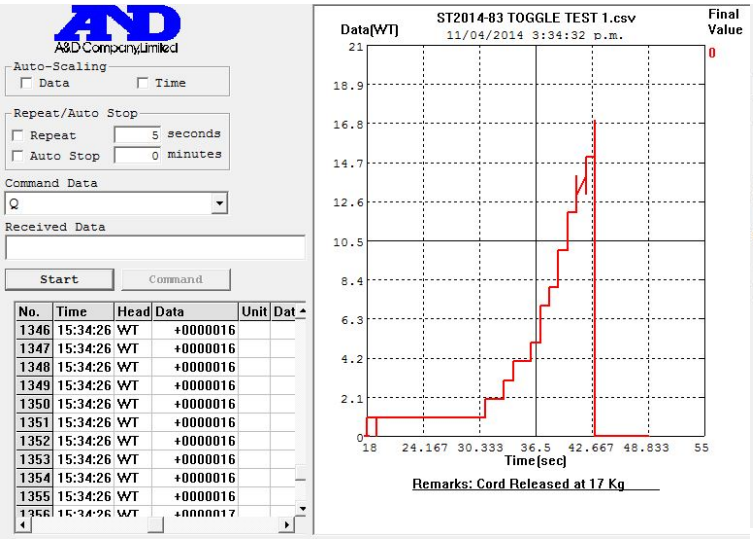
The extra stitching added additional strength and allowed the cord to hold up to 53 Kg. (Refer to appendix 2)

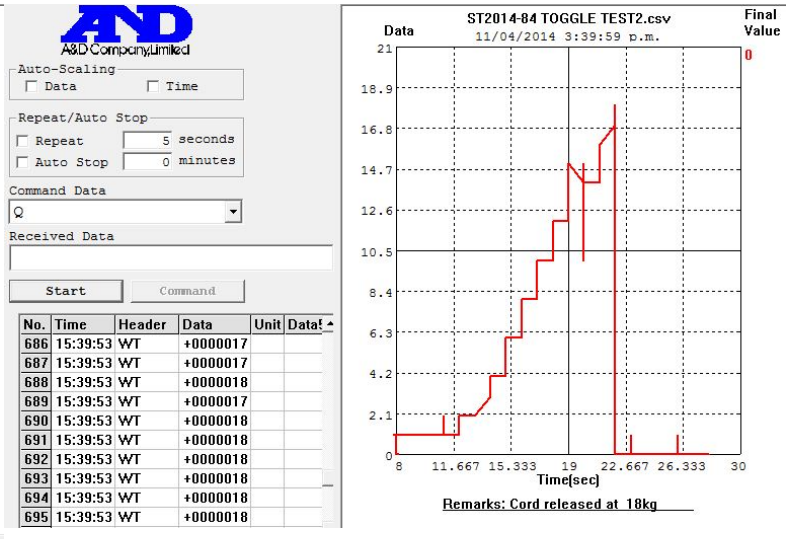
Test 3

Test Number	Description	Force Recorded
ST2014-91	Actuator pull test	1 Kg

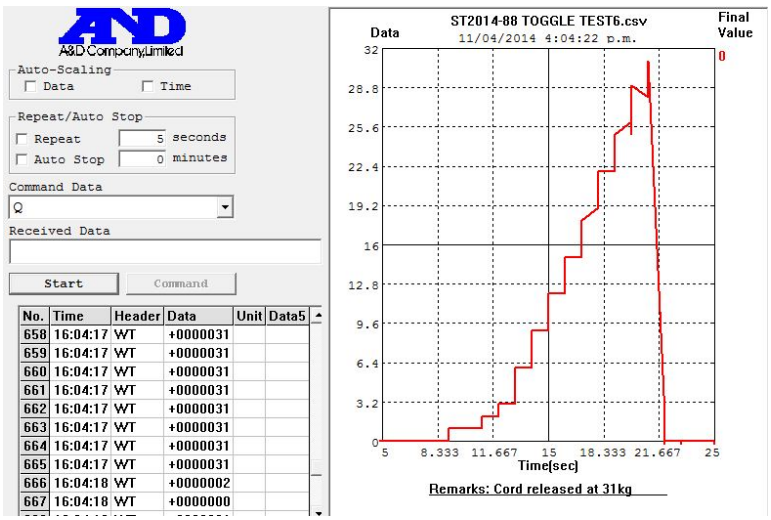
As per the graph, we had 2 readings, one at 1Kg and one at 2Kg when the cord reached the end of the swivel cycle and snapped out the plastic holder. Our test cell can only read in 1 Kg increments and the actuator could have released at a lower weight and logged in at 1Kg. (Refer to appendix 3)

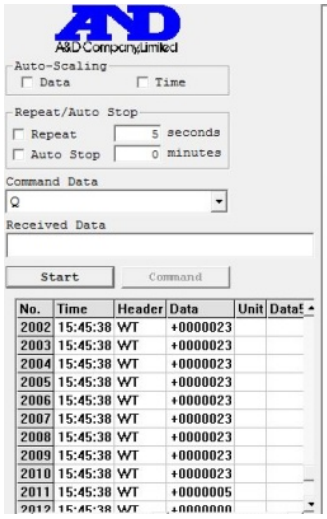
Appendix 1 (Standard handle as supplied)

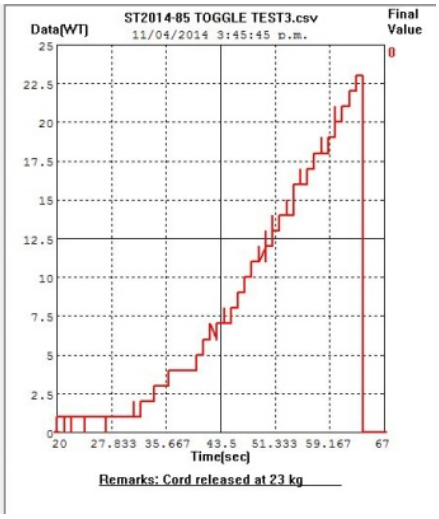


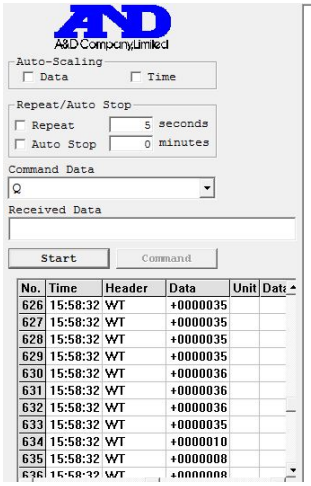


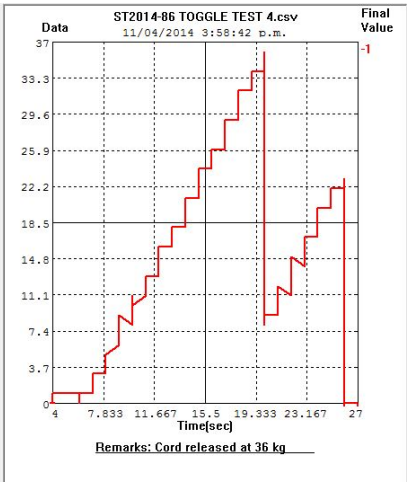
Appendix 1 (Standard handle as supplied continued)

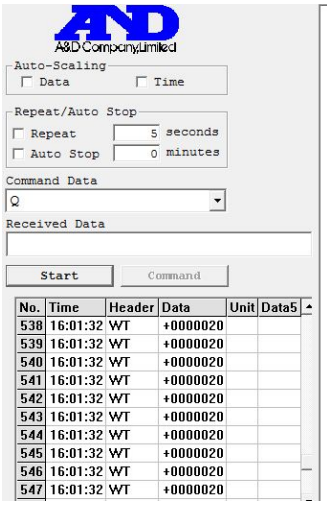


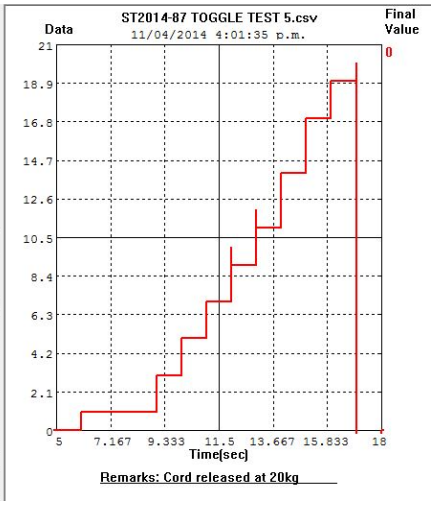




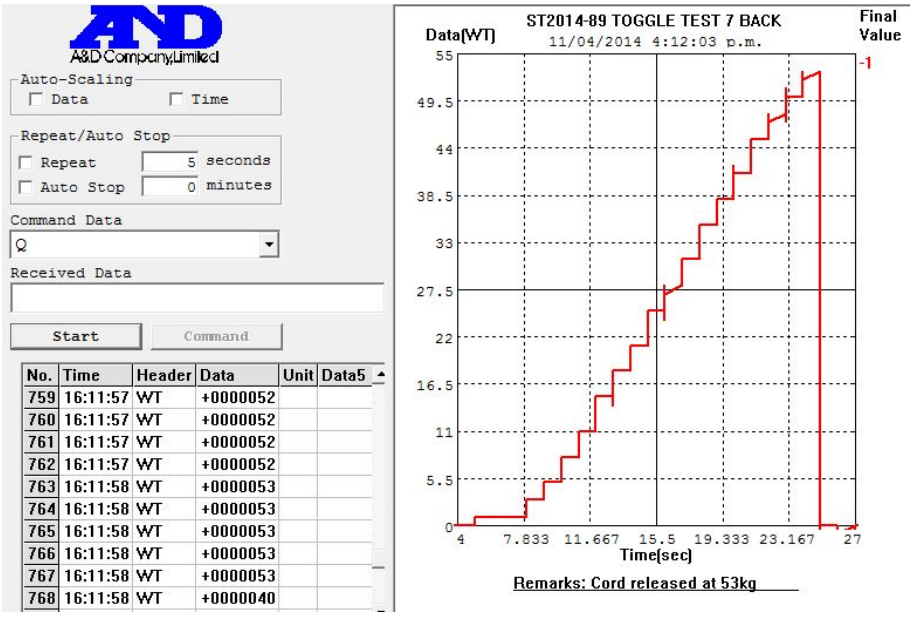




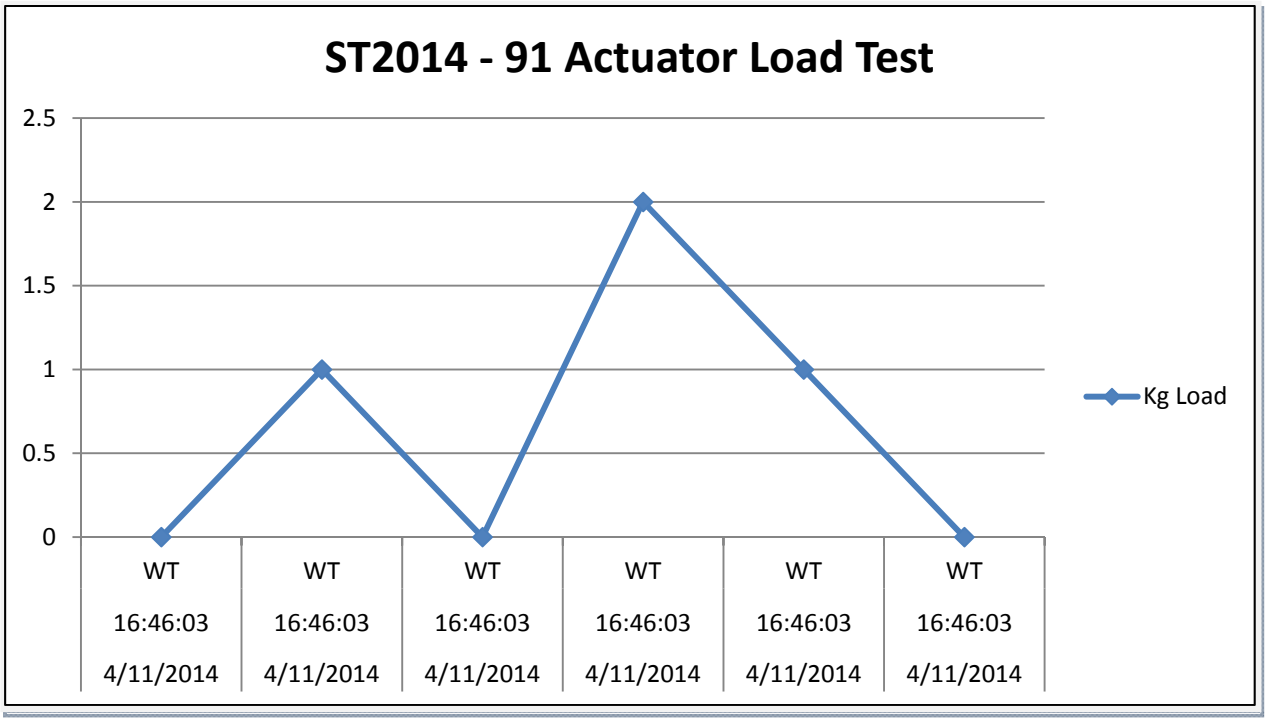




Appendix 2 (Handle with extra back tac)



Appendix 3 (Actuator unit)



Graph needed to be plotted in XL as all readings took place in .03 of a second.
Unit snapped out of plastic housing at 2kg as it was not the complete unit fixed in the vest.

Appendix 4 (Pictures)

1. Standard toggle handle as provided to QSI for testing

2. Setup of pull test unit to generate consistent pull test results, cross head speed set to 120mm / minute

Appendix 4 (Pictures continued)

3. Cord released from one of the sides from underneath the press stud on all six tests.

4. The additional stitch prevented the cord from pulling out from underneath the press stud and added an additional 20kg's strength to the units.

Appendix 4 (Pictures continued)

5. Actuator was activated by pulling it by hand, it clipped out of the black plastic housing at 2kg force due to the sudden pull exerted on the unit.
   Due to the cost of the unit only one unit was needed to gauge the force required to activate it.