

Test Performance Form QD		Test Report : TR2014027
Document Owner: QSI Ltd	Approved for use by General Manager	Last Modified



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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
One (1) Actuator unit

Date of test: 11/04/2014

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

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

Signatory: Jason Myburgh



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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

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Test 2

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

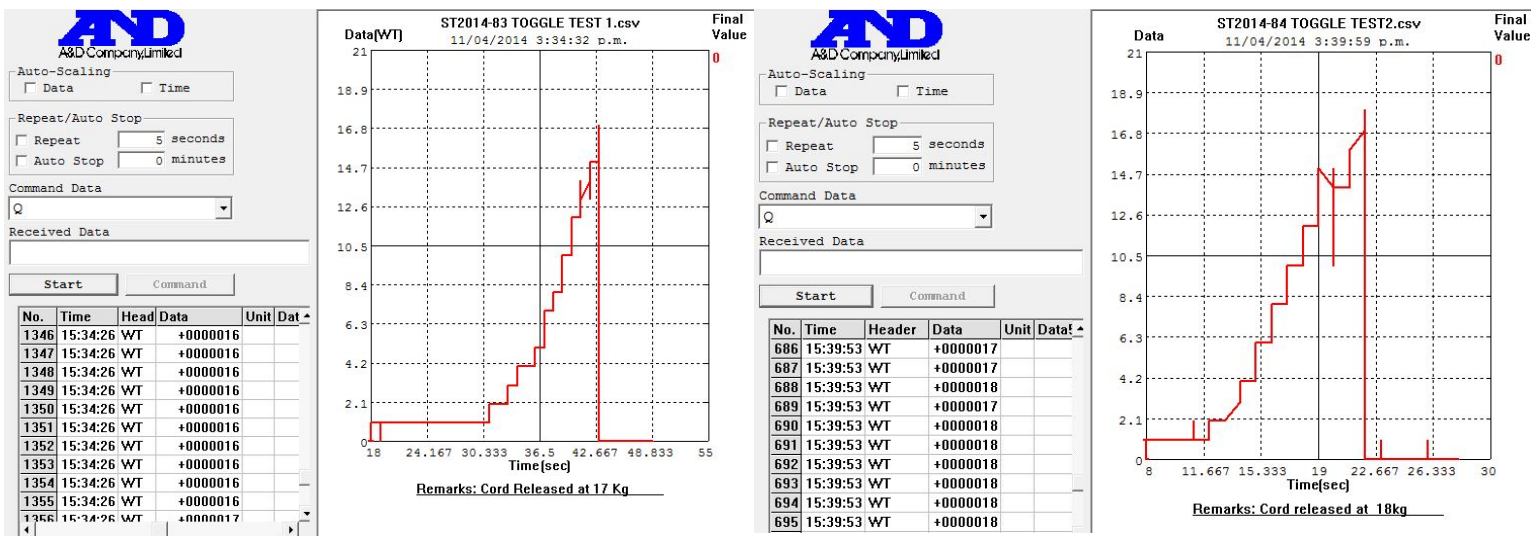
The extra stitching added additional strength and allowed the cord to hold up to 53 Kg. (Refer to appendix 2)

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)

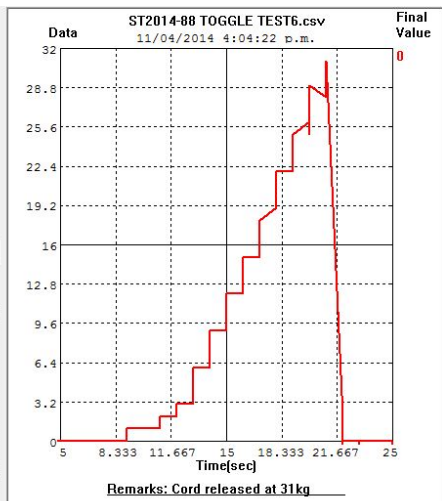
Appendix 1 (Standard handle as supplied)



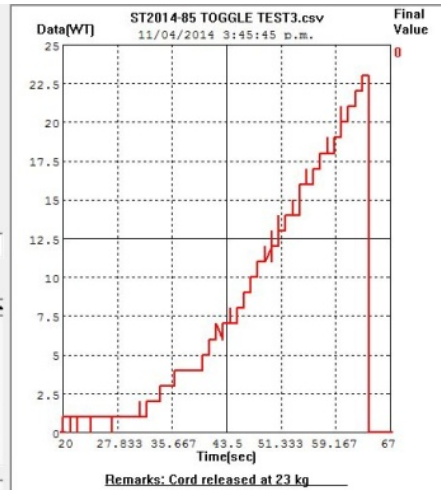
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Appendix 1 (Standard handle as supplied continued)

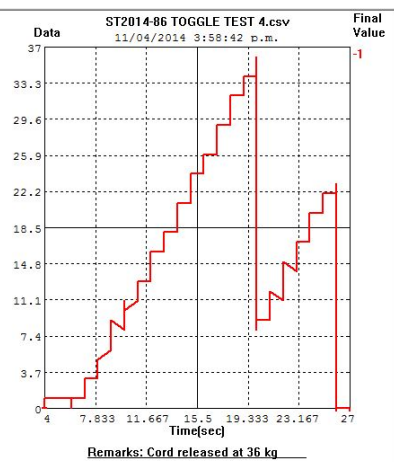
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660	16:04:17	WT	+0000031		
661	16:04:17	WT	+0000031		
662	16:04:17	WT	+0000031		
663	16:04:17	WT	+0000031		
664	16:04:17	WT	+0000031		
665	16:04:17	WT	+0000031		
666	16:04:18	WT	+0000002		
667	16:04:18	WT	+0000000		



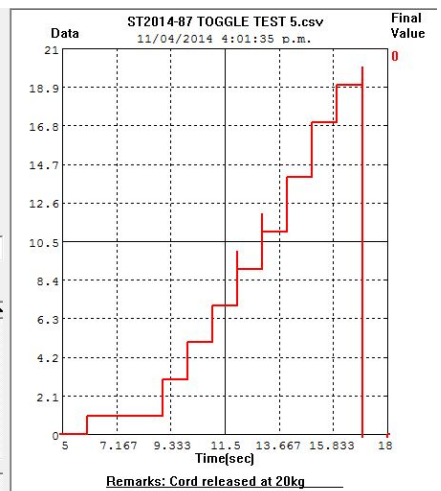
No.	Time	Header	Data	Unit	Data5
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2003	15:45:38	WT	+0000023		
2004	15:45:38	WT	+0000023		
2005	15:45:38	WT	+0000023		
2006	15:45:38	WT	+0000023		
2007	15:45:38	WT	+0000023		
2008	15:45:38	WT	+0000023		
2009	15:45:38	WT	+0000023		
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2011	15:45:38	WT	+0000005		
2012	15:45:38	WT	+0000000		



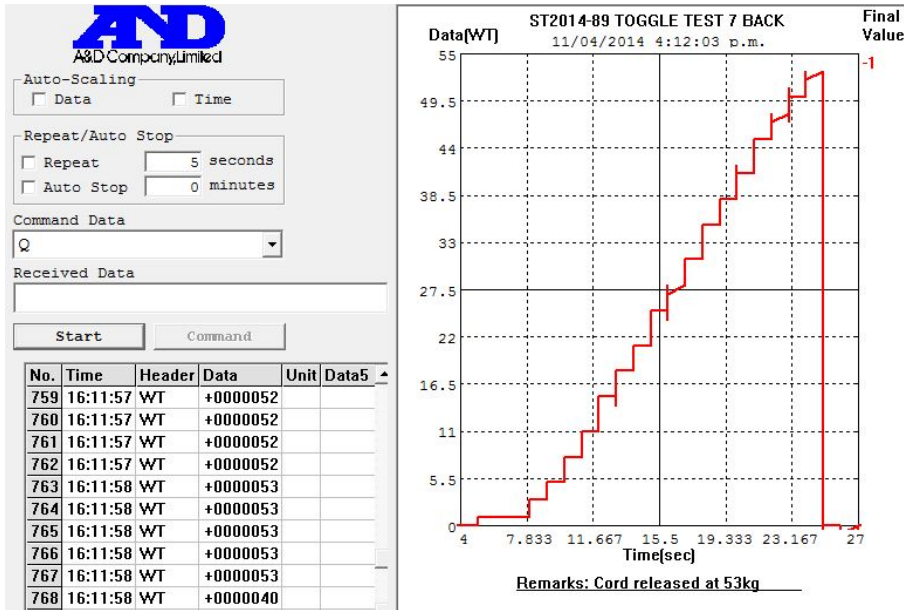
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628	15:58:32	WT	+0000035		
629	15:58:32	WT	+0000035		
630	15:58:32	WT	+0000035		
631	15:58:32	WT	+0000036		
632	15:58:32	WT	+0000036		
633	15:58:32	WT	+0000035		
634	15:58:32	WT	+0000010		
635	15:58:32	WT	+0000008		
636	15:58:32	WT	+0000000		



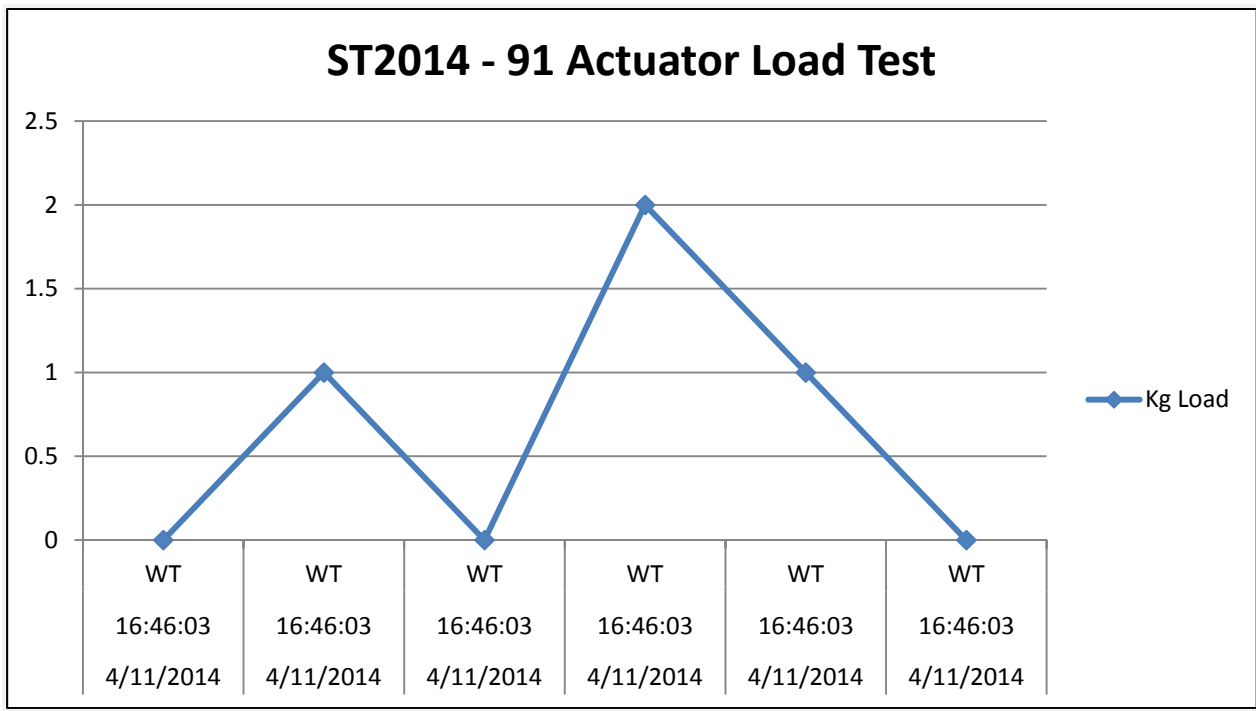
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543	16:01:32	WT	+0000020		
544	16:01:32	WT	+0000020		
545	16:01:32	WT	+0000020		
546	16:01:32	WT	+0000020		
547	16:01:32	WT	+0000020		



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.

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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



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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.



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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.

