



Test Report No: TR2018-002
Date: 12/02/2018



PRSH1196FR Harness

QSI Safety

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QSI laboratory tested the "PRSH1196FR Harness" to determine the compliance with the dynamic & static test requirements of AS/NZS 1891:2007

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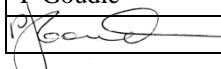
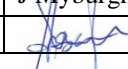
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EXECUTIVE SUMMARY

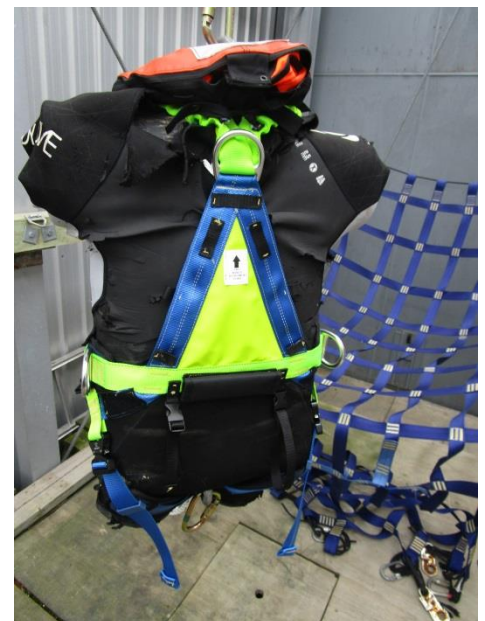
- **Objectives**

The PRSH1196FR Harness is a Flame Retardant Rescue Swimmers Harness; an integrated item to the life jacket as part of a helicopter external personnel lifting device. This is a full harness worn by a person when suspended outside a helicopter from the winch hook.

This harness has been designed by QSi as per the requirements from Poseidon NZ Limited and manufactured for testing at QSi. Date requested: 30/09/2016 from original request and subsequent modification from standard raw materials to FR raw materials over the course of the research and development period.

PRSH1196FR Harness: (As per customer requirements)

- A lightweight swimmers harness to be integrated with a life jacket
- Change webbing from elasticated to normal on legs
- 25mm chest strap with plastic buckle
- Leg relief pads 5cm longer
- Use all alloy components
- Use more durable elastic
- Additional floating loops and dome tie backs
- Gear loops at front- one each side
- Cordura attachment loops
- **Flame retardant raw materials**



TEST PROGRAM TABLE;

Designation / Attachment Points	Test	Description
Front Neck (Front Attachment Dummy Head Up)	Compliance to Appendix D	TEST 1 Dynamic Drop Test DT2017-91
Front Groin (Front Attachment Dummy Head Down)	Compliance to Appendix D	TEST 2 Dynamic Drop Test DT2017-92
Rear Neck (Back Attachment Dummy Head Up)	Compliance to Appendix D	TEST 3 Dynamic Drop Test DT2018-01
Rear Groin (Back Attachment Dummy Head Down)	Compliance to Appendix D	TEST 4 Dynamic Drop Test DT2018-02
Pole Strap Attachments	Compliance to Appendix E	TEST 5 Dynamic Drop Test DTP2018-03
Front Groin	Compliance to Appendix C	TEST 6 Static Test ST2018-04
Front Neck	Compliance to Appendix C	TEST 7 Static Test ST2018-05
Rear (Dorsal) Groin	Compliance to Appendix C	TEST 8 Static Test ST2018-06
Rear (Dorsal) Neck	Compliance to Appendix C	TEST 9 Static Test ST2018-07
Pole Strap Attachments	Compliance to Appendix F	TEST 10 Static Test STP2018-08

Table 1.

Assessment

Test number 1:- DT2017-91 (PRSH1196FR Harness Front Neck)

The PRSH1196FR Harness was attached to the dummy in the head up position. Using the front attachments the dummy was attached to the load cell. The dummy was then dropped from a height of 1.8m to simulate a fall arrest situation.

Test Specimen Details

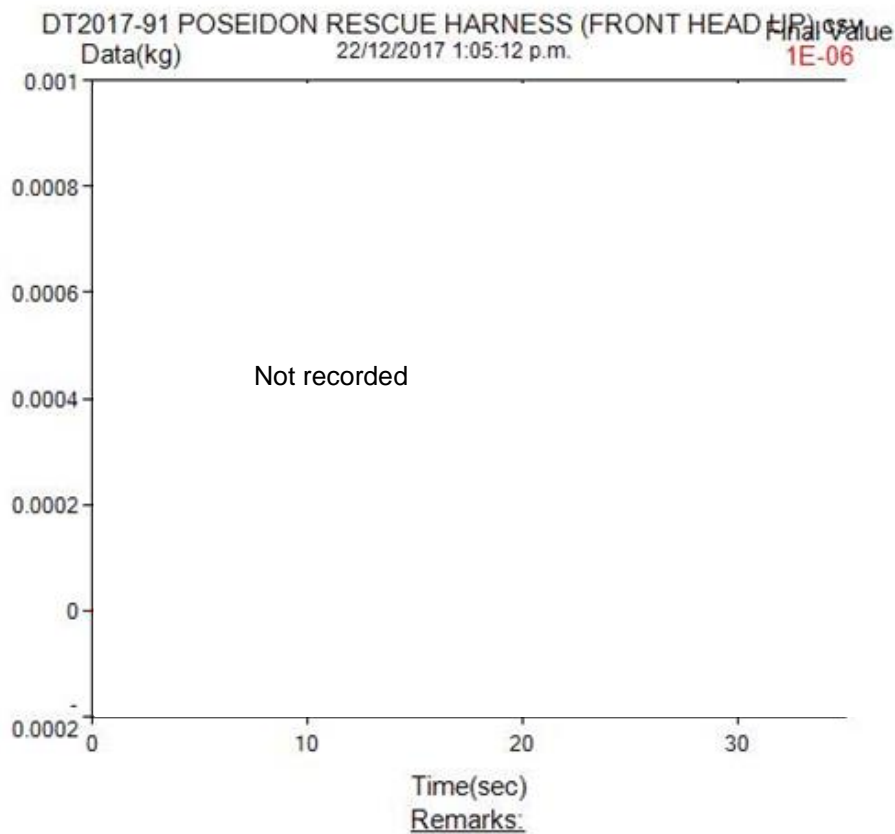
Specimen Number	Description	Model	Serial No:	Date of Manufacture
2017/12/22-01	Swimmers Harness for Poseidon	PRSH1196FR	155551	12/2017
2017/12/22-02	SPR 12mm/2000mm	12mm testing rope (1950-2050mm)	160809	12/2017

Test Result Details

Test Number	Specimen Number	Device Attachment Point	Drop Height (m)	Drop Force (kN)	Slippage (mm)	Dummy retained	Components Assessment	Result
DT2017-091	2017/12/22-01	Front Neck	3.8	unrecorded	7.6mm	Yes	Intact	Pass

Assessment: The PRSH1196FR Harness was able to withstand a dynamic drop, with a minimal amount of slippage and one positioning stitch pattern compromised (not load bearing) but not completely broken.





Graph 1. DT2017-091

Test number 2:- DT2017-092 (PRSH1196FR Harness Front Groin)

The PRSH1196FR Harness was attached to the dummy in the head down position. Using the front attachments the dummy was attached to the load cell. The dummy was then dropped from a height of 1.8m to simulate a fall arrest situation.

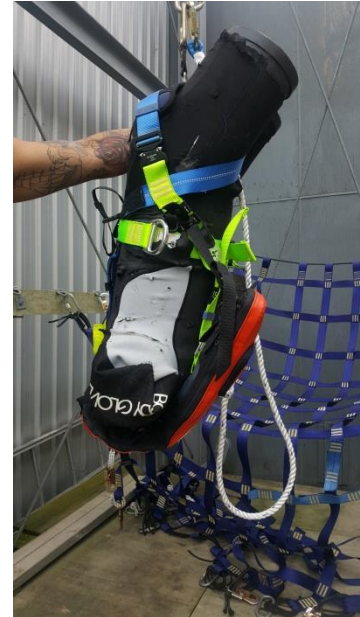
Test Specimen Details

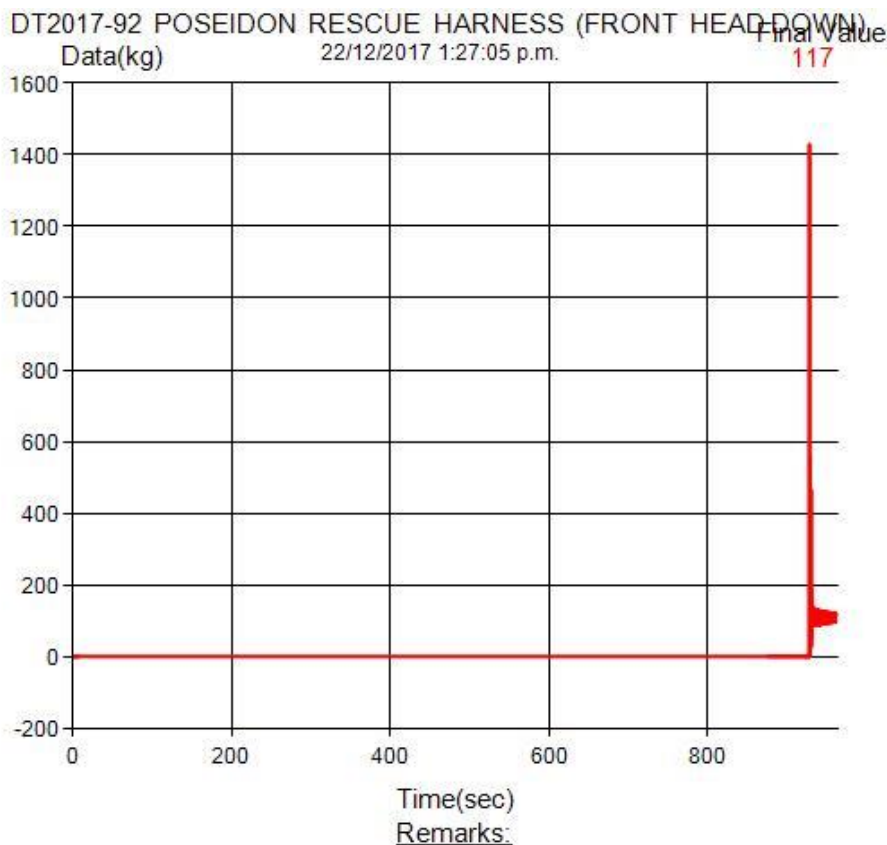
Specimen Number	Description	Model	Serial No:	Date of Manufacture
2017/12/22-01	Swimmers Harness for Poseidon	PRSH1196FR	155551	12/2017
2017/12/22-03	SPR 12mm/2030mm	12mm testing rope (1950-2050mm)	160808	12/2017

Test Result Details

Test Number	Specimen Number	Device Attachment Point	Drop Height (m)	Drop Force (kN)	Slippage (mm)	Dummy retained	Components Assessment	Result
DT2017-092	2017/12/22-01	Front Groin	3.8	1428kg 14.00kN	15.2mm	Yes	Intact	Pass

Assessment: The PRSH1196FR Harness was able to withstand a dynamic drop test when using the front groin attachment point with a small amount of slippage and positioning stitch only breakage.





Graph 2. DT2017-092

Test number 3:- DT2018-01 (PRSH1196FR Harness Rear Neck)

The PRSH1196FR Harness was attached to the dummy in the head up position. Using the rear attachments the dummy was attached to the load cell. The dummy was then dropped from a height of 1.8m to simulate a fall arrest situation.

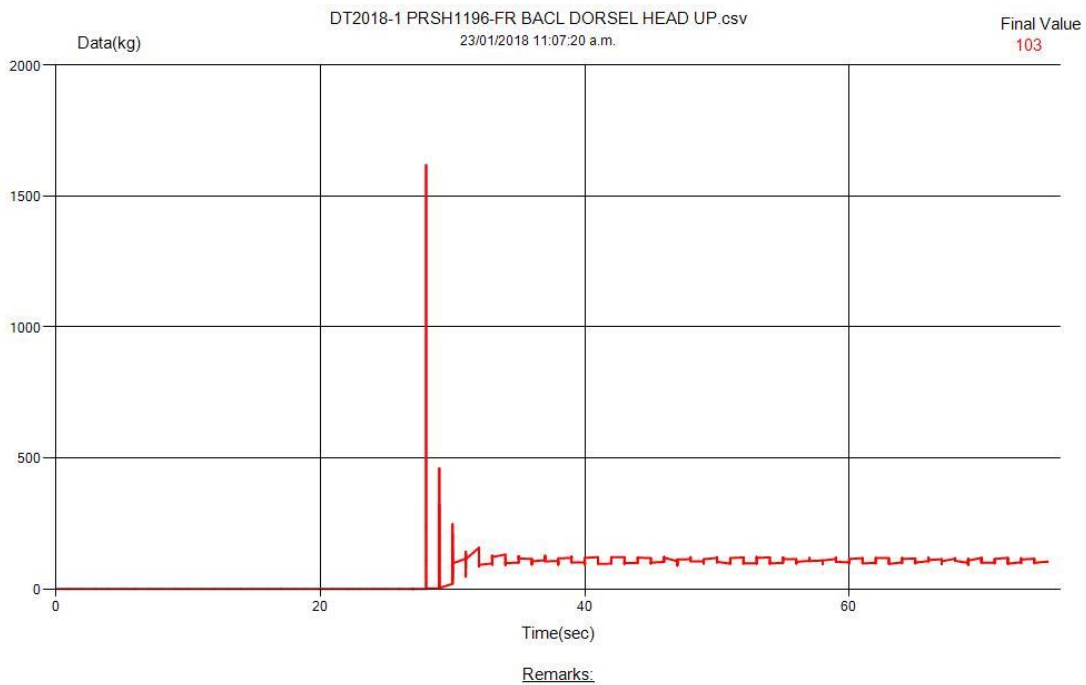
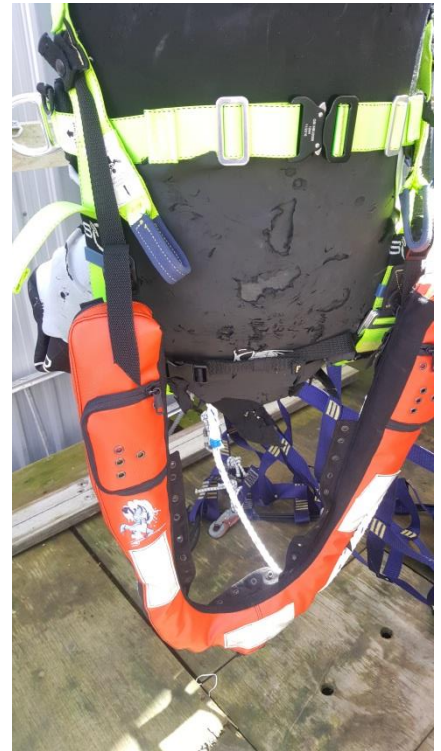
Test Specimen Details

Specimen Number	Description	Model	Serial No:	Date of Manufacture
2018/01/23-01	Swimmers Harness for Poseidon	PRSH1196FR	155552	01/2018
2018/01/23-02	SPR 12mm/2050mm	12mm testing rope (1950-2050mm)	160813	01/2018

Test Result Details

Test Number	Specimen Number	Device Attachment Point	Drop Height (m)	Drop Force (kN)	Slippage (mm)	Dummy retained	Components Assessment	Result
DT2018-01	2018/01/23-01	Rear Head	3.8	1618kg 15.87kN	24.5mm	Yes	Intact	Pass

Assessment: The PRSH1196FR Harness was able to withstand a dynamic drop test when using the rear neck attachment point. The attachment component showed signs of intense stress but did not break. The life vest partially detached however it is noted that this was not a new unit and has been compromised from previous test situations.



Graph 3. DT2018-01

Test number 4:- DT2018-02 (PRSH1196FR Harness Rear Groin)

The PRSH1196FR Harness was attached to the dummy in the head down position. Using the rear attachments the dummy was attached to the load cell. The dummy was then dropped from a height of 1.8m to simulate a fall arrest situation.

Test Specimen Details

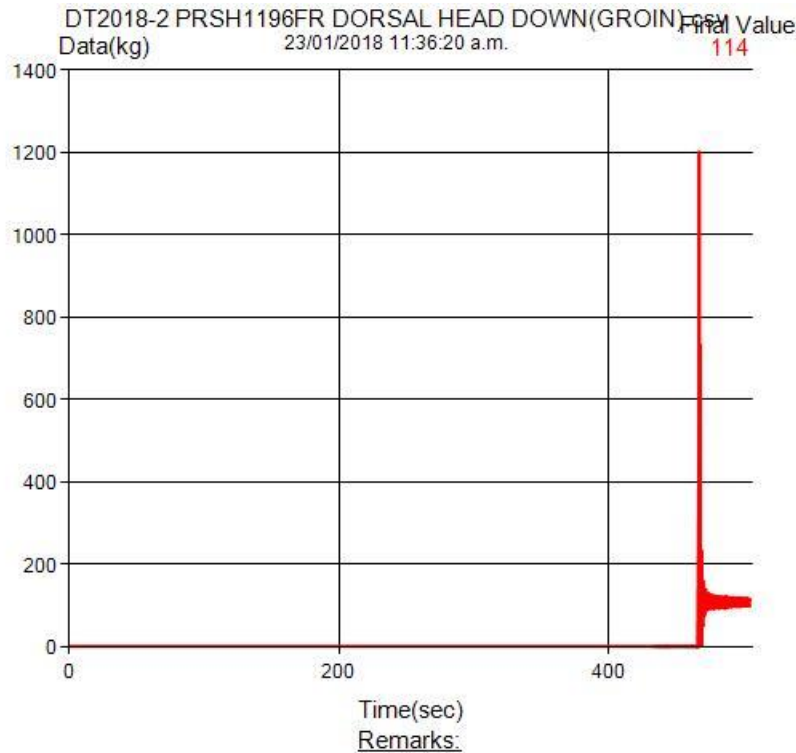
Specimen Number	Description	Model	Serial No:	Date of Manufacture
2018/01/23-01	Swimmers Harness for Poseidon	PRSH1196FR	155552	01/2018
2018/01/23-03	SPR 12mm/2020mm	12mm testing rope (1950-2050mm)	160814	01/2018

Test Result Details

Test Number	Specimen Number	Device Attachment Point	Drop Height (m)	Drop Force (kN)	Slippage (mm)	Dummy retained	Components Assessment	Result
DT2018-02	2018/01/23-01	Rear Groin	3.8	1201kg 11.78kN	16mm	Yes	Intact	Pass

Assessment: The PRSH1196FR Harness was able to withstand a dynamic drop test when using the rear groin attachment point with a small amount of slippage. The attachment component withheld the force and did not break (even though previously stressed). Again the life jacket partially detached with a view that this was due to the vest having previously under gone multiple tests.





Graph 4. DT2018-02

Test number 5:- DT2018-03 (PRSH1196FR Harness Pole Strap Attachments)

The PRSH1196FR Harness was attached to the dummy in the head up position. Using the pole strap attachments the dummy was attached to the load cell. The dummy was then dropped from a height of the pole strap to simulate a fall arrest situation.

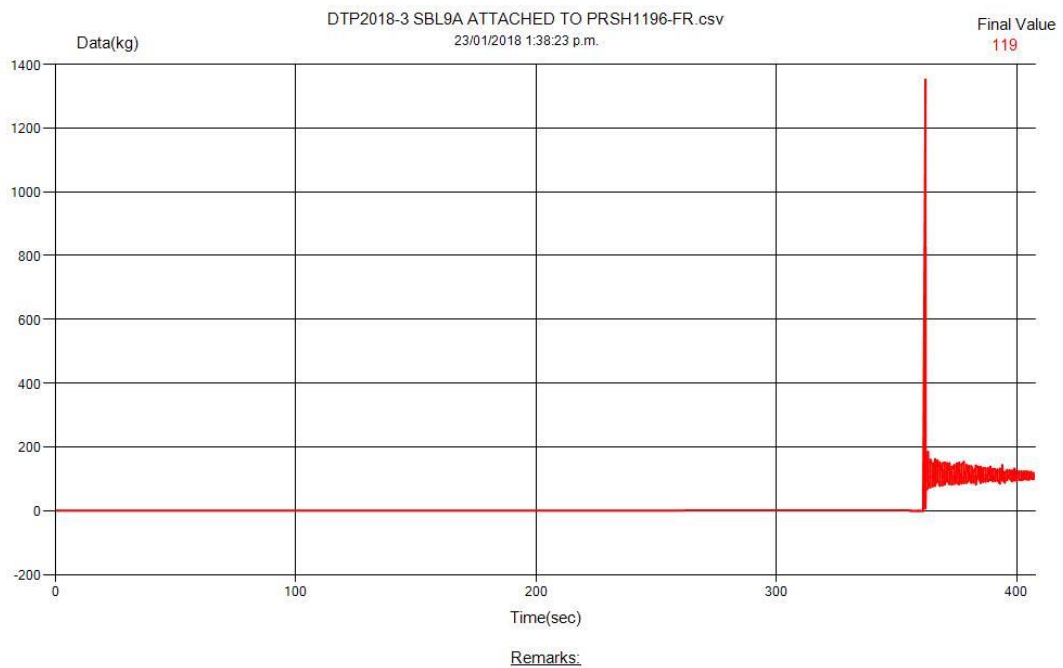
Test Specimen Details

Specimen Number	Description	Model	Serial No:	Date of Manufacture
2018/01/23-01	Swimmers Harness for Poseidon	PRSH1196FR	155552	01/2018
2018/01/23-04	2.5m Pole strap	SBL9A	123862	07/2014

Test Result Details

Test Number	Specimen Number	Device Attachment Point	Drop Height (m)	Drop Force (kN)	Slippage (mm)	Dummy retained	Components Assessment	Result
DT2018-03	2018/01/23-01	Pole Strap	3.8	1352kg 13.26kN	22mm	Yes	Intact	Pass

Assessment: The side attachment point on the PRSH1196FR was able to withstand a dynamic drop test with the SBL9A Pole Strap and retain the dummy securely with no failure of stitch patterns or failure of attachment hardware.



Graph 5. DT2018-03

Test number 6:- ST2018-04 (PRSH1196FR Front Groin Pull Up 15kN)

The PRSH1196FR Harness was attached to the dummy in the head up position. Using the front attachments the dummy was attached to the load cell in the static pull rig. A static load of 15kN was then applied.

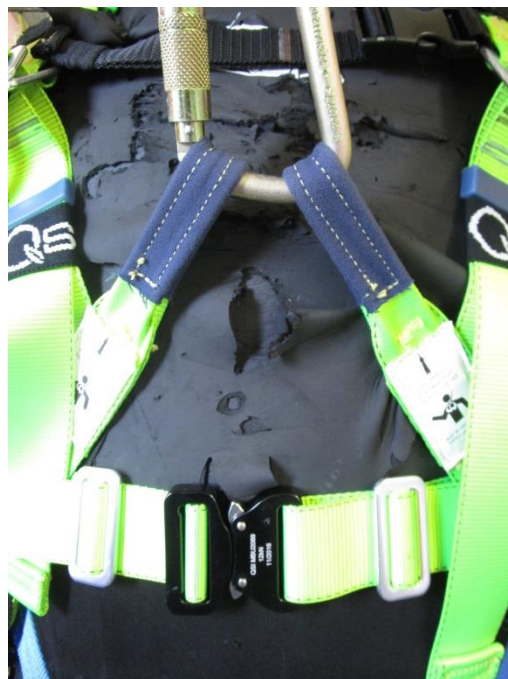
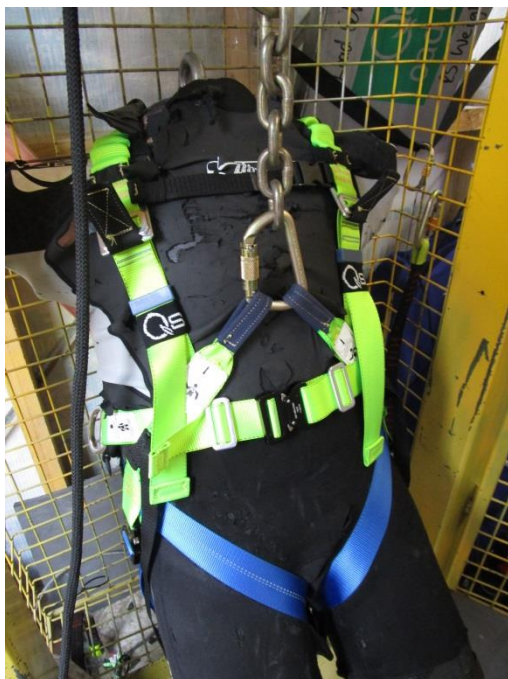
Test Specimen Details

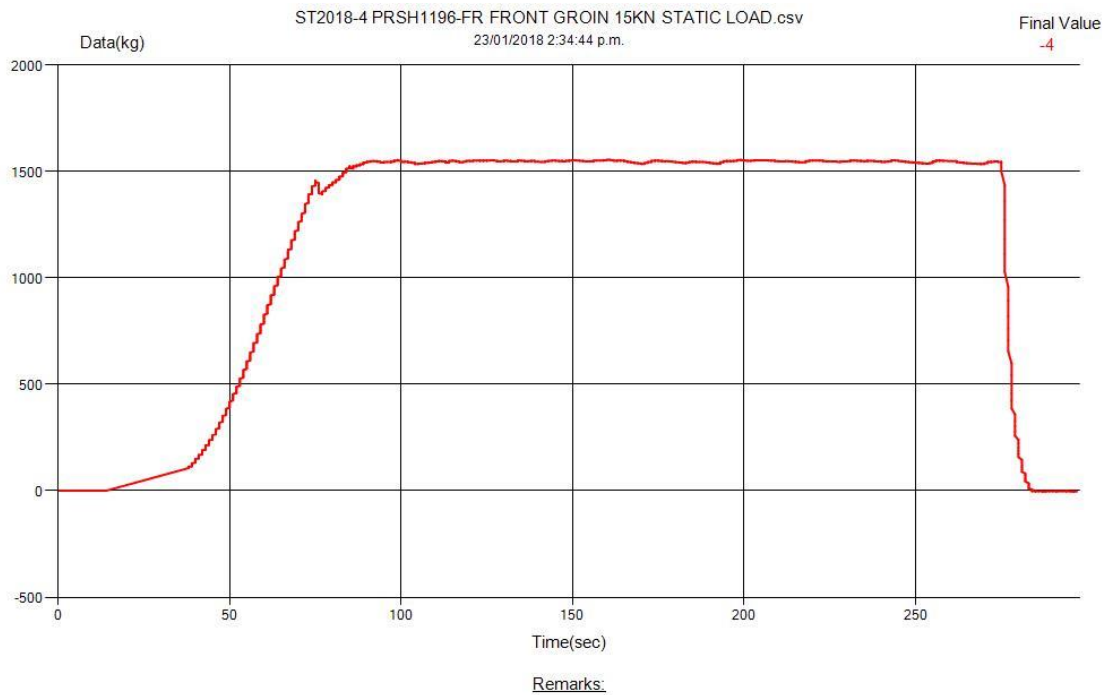
Specimen Number	Description	Model	Serial No:	Date of Manufacture
2018/01/23-01	Swimmers Harness for Poseidon	PRSH1196FR	155552	01/2018

Test Result Details

Test Number	Specimen Number	Device Attachment Point	Load Applied (kN)	Time (min)	Harness not release dummy	Webbing fracturing	Stitching breakage	Hardware assessment
ST2018-04	2018/01/23-01	Front Groin	15	3	Pass	Pass	Pass	Pass

Assessment: The PRSH1196FR Harness was able to withstand a static pull test when using the front groin attachment with no visible damage.





Graph 6. ST2018-04

Test number 7:- ST2018-05 (PRSH1196FR Front Neck Pull Down 10kN)

The PRSH1196FR Harness was attached to the dummy in the head down position. Using the front attachments the dummy was attached to the load cell in the static pull rig. A static load of 10kN was then applied.

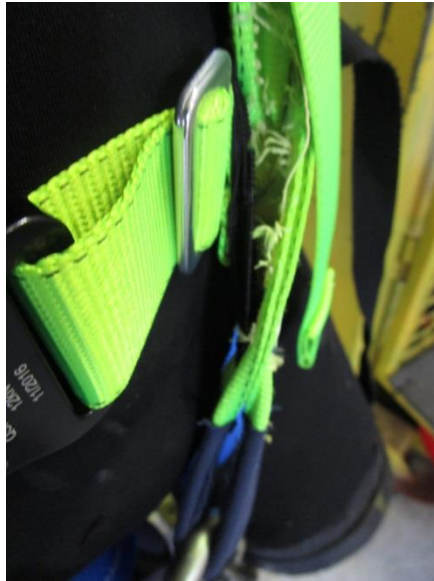
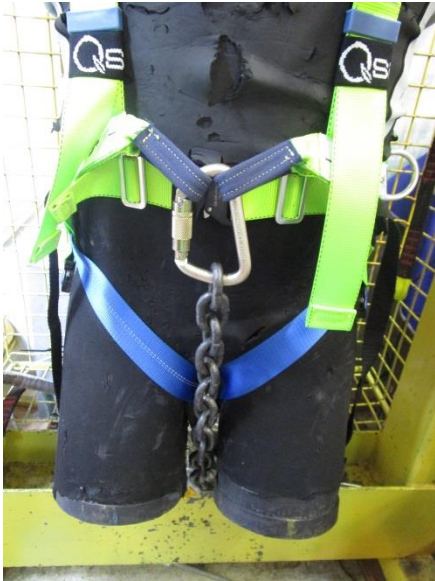
Test Specimen Details

Specimen Number	Description	Model	Serial No:	Date of Manufacture
2018/01/23-01	Swimmers Harness for Poseidon	PRSH1196FR	155552	01/2018

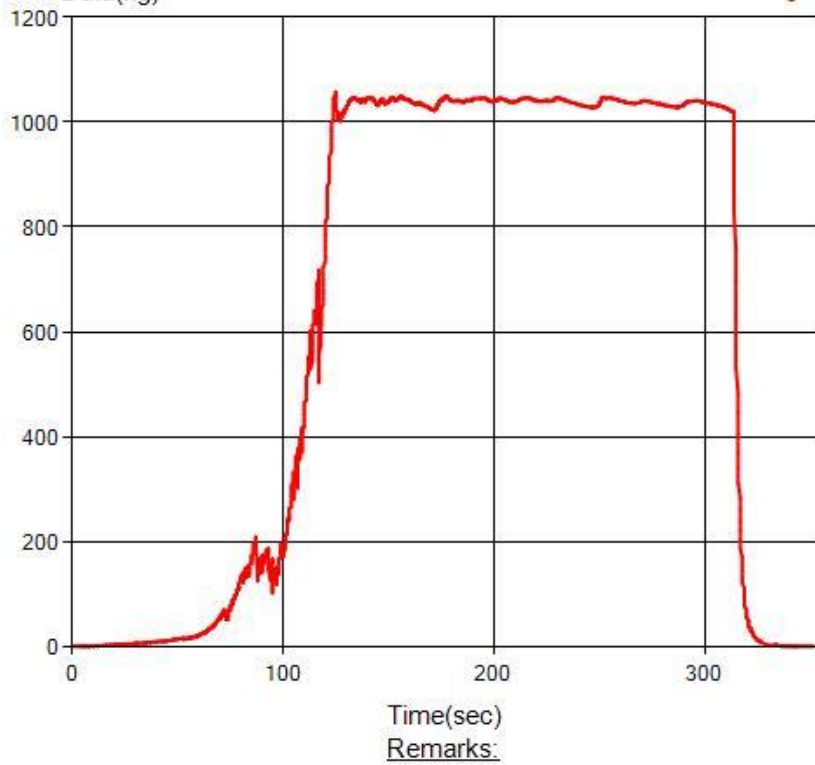
Test Result Details

Test Number	Specimen Number	Device Attachment Point	Load Applied (kN)	Time (min)	Harness not release dummy	Webbing fracturing	Stitching breakage	Hardware assessment
ST2018-05	2018/01/23-01	Front Neck	10	3	Pass	Pass	Pass	Pass

Assessment: The PRSH1196 Harness was able to withstand a static pull test when using the front neck attachment with minimal visible damage. Note the same harness from the dynamic testing was able to be used with no further stitch breakage.



ST2018-5 PRSH1196-FR FRONT NECK 10KN STATIC LOAD SPV
 Data(kg) 23/01/2018 2:49:32 p.m. Final Value 0



Graph 7. ST2018-05

Test number 8:- ST2018-06 (PRSH1196FR Dorsal Groin Pull Up 15kN)

The PRSH1196FR Harness was attached to the dummy in the head up position. Using the dorsal (rear) attachments the dummy was attached to the load cell in the static pull rig. A static load of 15kN was then applied.

Test Specimen Details

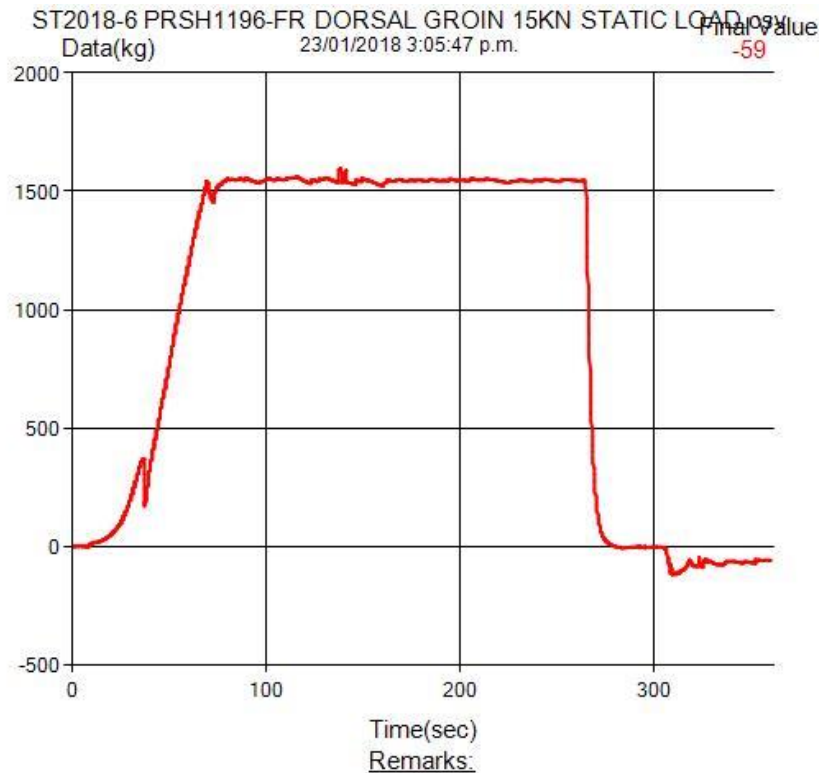
Specimen Number	Description	Model	Serial No:	Date of Manufacture
2018/01/23-01	Swimmers Harness for Poseidon	PRSH1196FR	155552	01/2018

Test Result Details

Test Number	Specimen Number	Device Attachment Point	Load Applied (kN)	Time (min)	Harness not release dummy	Webbing fracturing	Stitching breakage	Hardware assessment
ST2018-06	2018/01/23-01	Dorsal Groin	15	3	Pass	Pass	Pass	Pass

Assessment: The PRSH1196 Harness was able to withstand a static pull test when using the dorsal groin attachment point with no visible damage.





Graph 8. ST2018-06

Test number 9:- ST2018-07 (PRSH1196FR Dorsal Neck Pull Down 10kN)

The PRSH1196FR Harness was attached to the dummy in the head down position. Using the dorsal (rear) attachments the dummy was attached to the load cell in the static pull rig. A static load of 10kN was then applied.

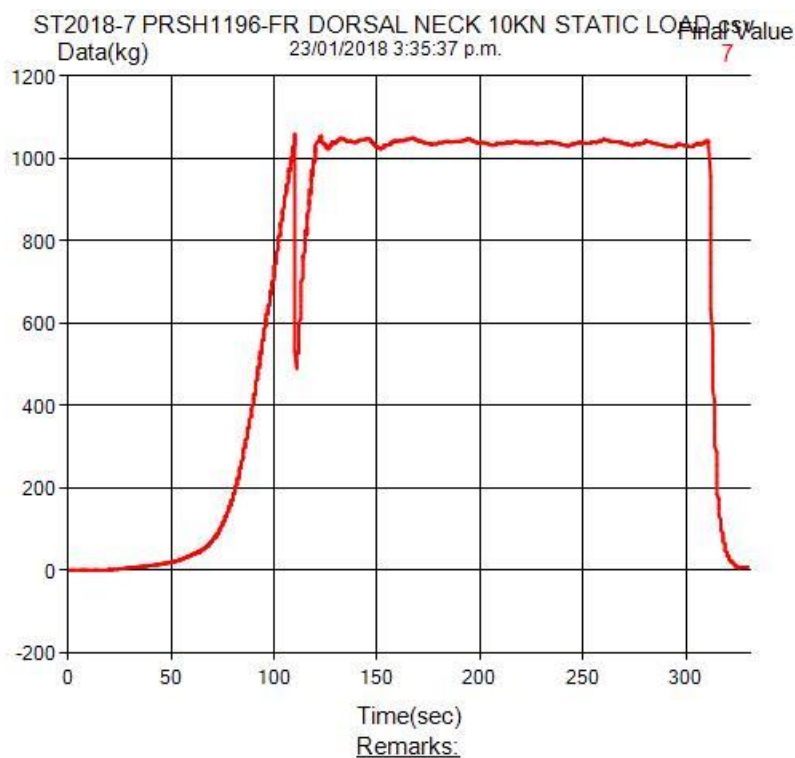
Test Specimen Details

Specimen Number	Description	Model	Serial No:	Date of Manufacture
2018/01/23-01	Swimmers Harness for Poseidon	PRSH1196FR	155552	01/2018

Test Result Details

Test Number	Specimen Number	Device Attachment Point	Load Applied (kN)	Time (min)	Harness not release dummy	Webbing fracturing	Stitching breakage	Hardware assessment
ST2018-07	2018/01/23-01	Dorsal Neck	10	3	Pass	Pass	Pass	Pass

Assessment: The PRSH1196FR Harness was able to withstand a static pull test when using the dorsal neck attachment point with no visible damage.



Graph 9. ST2018-07

Test number 10:- STP2018-08 (PRSH1196FR Pole Strap 12kN)

The PRSH1196FR Harness was attached to the large cylinder. The pole strap was attached to the small cylinder and connected to the load cell in the static pull rig. A static load of 12kN was then applied.

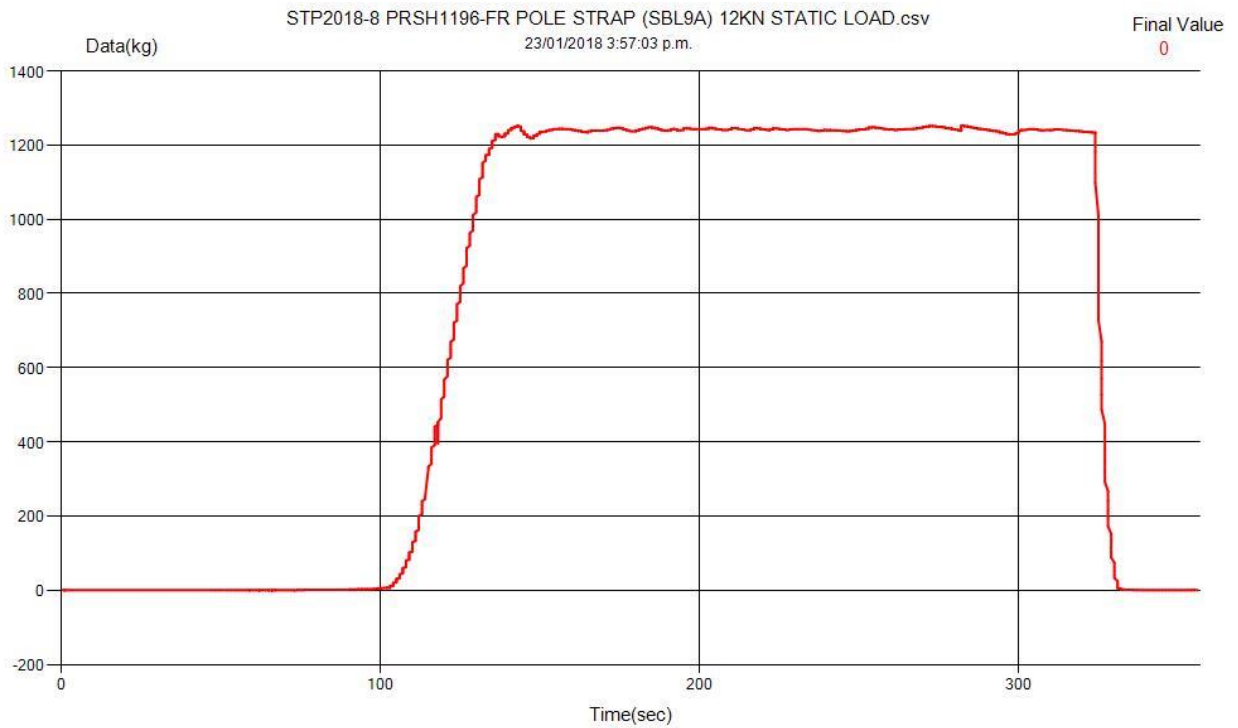
Test Specimen Details

Specimen Number	Description	Model	Serial No:	Date of Manufacture
2018/01/23-01	Swimmers Harness for Poseidon	PRSH1196FR	155552	01/2018
2018/01/23-04	Pole Strap	SBL9A	123862	07/2014

Test Result Details

Test Number	Specimen Number	Device Attachment Point	Load Applied (kN)	Time (min)	Harness not release dummy	Webbing fracturing	Stitching breakage	Hardware assessment
ST2018-08	2018/01/23-01	Pole Strap	12	3	Pass	Pass	Pass	Pass

Assessment: The side attachment point on the PRSH1196FR Harness was able to withstand a static pull test with the SBL9A Pole Strap successfully with no visible damage.



Remarks:

Graph 10. STP2018-08

Conclusion:

The PRSH1196FR Harness was able to demonstrate compliance with the dynamic test requirements of Appendix D of AS/NZS 1891.1:2007 when tested at the designated frontal and dorsal attachment points.

The PRSH1196FR Harness was able to demonstrate compliance with the static test requirements of Appendix C of AS/NZS 1891.1:2007 when tested at the designated frontal and dorsal attachment points.

The PRSH1196FR Harness in conjunction with the SBL9A Pole Strap was able to show compliance with the dynamic test (Appendix E) and the static test (Appendix F) of AS/NZS 1891.1:2007 requirements when tested at the designated pole strap rings.

The integrated Life Jacket of the PRSH1196 demonstrated successful inflation both automatically and manually post dynamic drop testing on the previous non-Flame Retardant version and the performance for this was not tested during this set of testing. The life jacket did detach when forced into upside down conditions due to the wear already on this device from the previous test round.

References:

AS/NZS 1891.1:2007 Industrial fall-arrest systems and devices Part 1: Harnesses and ancillary equipment

AS/NZS 1891.4:2009 Industrial fall-arrest systems and devices Part 4: Selection, use and maintenance

Conditions of Report

The test specimen(s) identified in this report were made to the client's specifications.

The results contained in this report are only applicable to the test specimen(s) designed and tested.

The tests as indicated in Table 1 were conducted as instructed by **QSI** representatives.

The author of this report may not necessarily be the testing officer.

The checking officer is independent of the author and has only performed checks for the transfer, correctness and completeness of data and the comprehension of this report.