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SATRA reference: SPC0297606 /2018 Issue 2 Ext 1

Your reference:

Date of report: 25 February 2021

Samples received: 10 August 2020

Date(s) work carried out: Between 22 September & 8 October 2020

TEST DATA EXTENSION REPORT

Subject: Testing of an anchorage connector described as “RO01” in accordance with ANSI Z359.18-2017 type A

This is an extension of report SPC0297606 /2018 Issue 2 dated 16th October 2020

Report signed by: Mohammed Rahman
Position: PPE Technologist
Department: Safety Product Testing

WORK REQUESTED

Samples of anchorage connector described as “RO01”, were received by SATRA on the 10th August 2020, for testing in accordance with ANSI Z359.18 - 2017

CONCLUSIONS

SAMPLE REFERENCE	STANDARD	CLAUSE / PROPERTY	SUB CLAUSE	PASS / FAIL
RO01	ANSI Z359.18 - 2017	3.1 Design Requirements	3.1.1 & 3.1.2 Connection Points	PASS
			3.1.3 Metallic Materials	Not fully assessed
			3.1.4 Textiles and Other Synthetic Materials	N/A
			3.1.5 Other requirements	PASS
		3.2 Performance Requirements	3.2.1 Static Strength Requirements	PASS
			3.2.2 Dynamic Strength Requirements	PASS
			3.2.3 Residual Strength Requirements	PASS
			3.2.4 Serviceability Load Requirements	N/A
			3.2.5 Corrosion Test Requirements	PASS

TESTING

Testing was carried out in accordance with ANSI Z359.18 – 2017 between the 22nd September & 8th October 2020

For the purposes of testing, the anchorage connector was installed into a simulated substrate with the following details:

Simulated pitched roof apex made of pine with dimensions of 147mm wide x 99mm thick x 1205mm long, secured using 100mm coach screws passing through a steel frame. The anchorage connector was fixed using 32 twisted nails measuring 92mm length & 3.8mm diameter

The anchorage connector was tested in 1 direction, down the length of the roof structure

Samples were tested as received, and were not subject to any pre-conditioning processes other than those stated in individual test clauses

Figure 1 – Anchorage connector described as “RO01” showing direction of test

Figure 2 – Anchorage connector described as “RO01” with black coating

TEST RESULTS

Table 1 – Testing of anchorage connector described as “RO01” in accordance with ANSI Z359.18 – 2017

ANSI Z359.18 – 2017 CLAUSE / TEST	ANSI Z359.18 – 2017 REQUIREMENT	RESULT / COMMENT	UoM (See note 1)	PASS / FAIL
3.1 Design Requirements – 3.1.1 & 3.1.2 Connection Points	3.1.1 Connection points shall meet the following requirements:			
	a) A connection point shall support only one user or system at a time	The anchorage connector supports 1 user at a time		PASS
	b) A connection point eye on a Type T anchorage connector shall be a closed eye with a minimum 1 inch inside radius	Not applicable – anchorage connector is type A		N/A
	c) Except for cinching anchorage connectors, anchorage connectors shall not have closed loops that are not intended for, or could be mistaken for, a connection point	The anchorage connector does not have any closed loops that could be mistaken for a connection point		PASS
	d) Anchorage connectors that include an operable gate, rings, buckles, adjusters or other hardware covered by ANSI/ASSE Z359.12 shall use hardware that complies with the requirements of ANSI/ASSE Z359.12	D-ring is compliant with ANSI/ASSE Z359.12 as per certificate of compliance provided by the manufacturer	N/A	PASS
	e) Multiple connection points shall only be permitted on tripod and davit style anchorage connectors	Not applicable – only 1 connection point is present		N/A
	3.1.2 Anchorage connector surfaces that can come in contact with other components shall be free of burrs, pits, sharp corners and roughness that could accelerate cutting or abrading of the components	The anchorage connector is free from any sharp edges and burrs which could accelerate cutting or abrading of components		PASS

ANSI Z359.18 – 2017 CLAUSE / TEST	ANSI Z359.18 – 2017 REQUIREMENT	RESULT / COMMENT	UoM (See note 1)	PASS / FAIL
3.1 Design Requirements - 3.1.3 Metallic Materials	3.1.3.1 Corrosion resistance – All hot-dip galvanised steel shall conform with ASTM A123/A123M.	Not assessed		Not assessed
	3.1.3.2.1 For type A and Type T, load-bearing metallic materials used in anchorage connectors shall maintain adequate toughness at temperatures between -30 degrees F (-34 degrees C) and +130 degrees F (+54 degrees C) or be engineered to account for the reduced toughness at low temperatures. Adequate toughness is defined as no more than a 10% drop in energy absorption between representative material specimens conditioned at 30 degrees F (-34 degrees C) and +130 degrees F (+54 degrees C) undergoing a recognised impact test. The manufacturer may provide published data for fracture toughness at these temperatures as evidence that adequate toughness is maintained. Metallic components that have been tested and certified as meeting ANSI/ASSE Z359.12, are deemed to comply with 3.1.3.2	Not assessed	N/A	Not assessed

ANSI Z359.18 – 2017 CLAUSE / TEST	ANSI Z359.18 – 2017 REQUIREMENT	RESULT / COMMENT	UoM (See note 1)	PASS / FAIL
3.1 Design Requirements - 3.1.3 Metallic Materials (continued)	3.1.3.2.2 For Type D anchorage connectors, the manufacturer shall clearly label the anchorage connector with a minimum service temperature of -10 degrees F (-23 degrees C) if load-bearing parts are made of the following materials:	Not applicable – anchorage connector is type A		N/A
	Aluminium: All Alloys acceptable Steel: Commonly used Chrome-moly alloys, ASTM 4130-4140. Low alloy high strength structural steels, ASTM A572, A588, A709 and A992 Stainless steel: All SAE Grade 300 series stainless steels. Hardenable SAE Grade 400 series stainless steels. This includes alloys, 410, 416, 422, 440C. Precipitation hardening stainless steel, 17-4	Not assessed		Not assessed
	If load-bearing parts are made of any other materials, the manufacturer shall clearly label the lower temperature limit to 10 degrees F	Not assessed	N/A	Not assessed
	3.1.3.2.3 Where a Type D anchorage connector is allowed to be used in temperatures below -10 degrees F (-23 degrees C), a qualified person shall verify the anchorage connector will perform as specified per the manufacturer's instructions. Materials analysis or testing data shall be provided upon request	Not applicable – anchorage connector is type A		N/A
	3.1.3.3 Hardware finishes shall be clean and free of scale, rust and deposits of foreign matter other than applied protective coatings	The anchorage connector is clean and free from scale, rust and deposits of foreign matter		PASS

ANSI Z359.18 – 2017 CLAUSE / TEST	ANSI Z359.18 – 2017 REQUIREMENT	RESULT / COMMENT	UoM (See note 1)	PASS / FAIL
3.1 Design Requirements - 3.1.3 Metallic Materials (continued)	3.1.3.4 When steel components are welded, the welding shall meet ANSI/AWS D1.1. When aluminium components are welded, the welding shall meet ANSI/AWS D1.2 When stainless steel components are welded, the welding shall meet ANSI/AWS D1.6	Not assessed	N/A	Not assessed
	3.1.3.5 The manufacturer shall provide or specify fasteners for connecting an anchorage connector to an anchorage in its intended application. The manufacturer shall supply complete specifications for fasteners in user's instructions	Fasteners have been provided for use by the manufacturer Not assessed – user instructions and specifications not provided		PASS Not assessed
3.1 Design Requirements – 3.1.4 Textiles and Other Synthetic Materials	3.1.4.1 Textiles shall not contain natural fibers Components shall be made from pure, non-recycled synthetic material, having the strength, aging, abrasion and heat resistance characteristics equivalent or superior to polyamide or polyester. Synthetic materials other than those stated herein are permitted only when it can be demonstrated by testing that all requirements of this standard are met and, additionally, that the durability, reliability and other properties pertinent to the intended uses have been evaluated and determined suitable by testing. Mark any restrictions on the use of such materials on the anchorage connector	Not applicable – no textile components	N/A	N/A

ANSI Z359.18 – 2017 CLAUSE / TEST	ANSI Z359.18 – 2017 REQUIREMENT	RESULT / COMMENT	UoM (See note 1)	PASS / FAIL
3.1 Design Requirements – 3.1.4 Textiles and Other Synthetic Materials (continued)	3.1.4.2 if a subsystem uses stitching for connection of load-bearing components, the equipment manufacturer shall produce the stitching and cutting and meet the following requirements: a) Use lock stitching b) Secure the ends of threads by backstitching, overlapping stitching or other methods c) Threads used for sewing shall be physically compatible with the webbing and of a quality comparable to that of the webbing d) Hot-cut or fuse thermoplastic materials, cord, tape and webbing to prevent fraying e) The thread colour or shade shall contrast with that of the webbing to facilitate visual inspection	Not applicable – no textile components	N/A	N/A
3.1 Design Requirements – 3.1.5 Other Requirements	3.1.5.1 Other load bearing materials used in anchorage connectors shall meet the performance requirements of this standard 3.1.5.2 Integrally connected components to which another standard in the ANSI Z359 series exists, shall meet the requirements of that standard	Not applicable – no other load bearing materials D-ring is compliant with ANSI/ASSE Z359.12 as per certificate of compliance provided by the manufacturer	N/A	N/A PASS

ANSI Z359.18 – 2017 CLAUSE / TEST	ANSI Z359.18 – 2017 REQUIREMENT	RESULT / COMMENT	UoM (See note 1)	PASS / FAIL
3.2 Performance Requirements – 3.2.1 Static Strength Requirements	Type A & T – The anchorage connector shall be capable of resisting a static load of at least 5,000 pounds (22.2kN). The anchorage connector may deform provided that, where operable gates are used, the deformation shall not create a separation of more than 1/8 inch (3mm) between the gate and the body Type D – The anchorage connector shall be capable of resisting a static load of the greater of 1.5 times the maximum arrest force in the dynamic strength test and 2,700 pounds (12.0kN), but not greater than 5,000 pounds (22.2kN). The anchorage connector may deform provided that, where operable gates are used, the deformation shall not create a separation of more than 1/8 inch (3mm) between the gate and the body	Sample 1 Anchorage Type: A Static load required: 5,000 pounds / 22.2kN Force held for 3 minutes without failure	± 0.54%	PASS
		Sample 2 Anchorage Type: A Static load required: 5,000 pounds / 22.2kN Force held for 3 minutes without failure		
		Sample 3 Anchorage Type: A Static load required: 5,000 pounds / 22.2kN Force held for 3 minutes without failure		
3.2 Performance Requirements – 3.2.2 Dynamic Strength Requirements	Type A, T & D – The anchorage connector shall successfully arrest the test weight. The anchorage connector may deform provided that, where operable gates are used, the deformation shall not create a separation of more than 1/8 inch (3mm) between the gate and the body	Sample 1 128kg test mass held Peak arrest force: 20.4kN	± 0.18%	PASS
		Sample 2 128kg test mass held Peak arrest force: 20.6kN		
		Sample 3 128kg test mass held Peak arrest force: 19.6kN		

ANSI Z359.18 – 2017 CLAUSE / TEST	ANSI Z359.18 – 2017 REQUIREMENT	RESULT / COMMENT	UoM (See note 1)	PASS / FAIL
3.2 Performance Requirements – 3.2.3 Residual Strength Requirements	Type A, T & D – The anchorage connector shall successfully arrest the drop of the test weight and maintain the test weight in suspension for at least 1 minute. The anchorage connector may deform provided that, where operable gates are used, the deformation shall not create a separation of more than 1/8 inch (3mm) between the gate and the body	Sample 1 128kg test mass held. Following test mass left suspended for 1 minute without failure Peak arrest force: 21.5kN Sample 2 128kg test mass held. Following test mass left suspended for 1 minute without failure Peak arrest force: 21.7kN Sample 3 128kg test mass held. Following test mass left suspended for 1 minute without failure Peak arrest force: 20.7kN	± 0.98%	PASS
3.2 Performance Requirements – 3.2.4 Serviceability Load Requirements	Type A – There is no serviceability load requirement for Type A anchorage connectors Type T and D – Any cracking, breaking or permanent deformation of load bearing parts of the anchorage connector visible to the unaided eye shall constitute test failure	Not applicable – anchorage connector is type A	Type T ± 0.417% Type D ± 1.07%	N/A

ANSI Z359.18 – 2017 CLAUSE / TEST	ANSI Z359.18 – 2017 REQUIREMENT	RESULT / COMMENT	UoM (See note 1)	PASS / FAIL
3.2 Performance Requirements – 3.2.5 Corrosion Test Requirements	Type A & Type D anchorage connectors that include ferrous metal load-bearing components made of materials other than stainless steel or hot-dipped galvanised steel shall pass the 48 hour corrosion test. The presence of red rust, visible to the unaided eye, or other evidence of corrosion of the base metal shall constitute failure of the salt spray test. Post-test presence of white scale on hardware surface is permitted. Components that have had salt spray testing in accordance with another Z359 standard need not be tested for corrosion under this standard Type T anchorage connectors that include ferrous metal load-bearing components made of materials other than stainless steel or hot-dipped galvanised steel shall pass the 500 hour corrosion test. The presence of red rust, visible to the unaided eye, or other evidence of corrosion of the base metal shall constitute failure of the salt spray test. Post-test presence of white scale on hardware surface is permitted	Corrosion test in accordance with ASTM B117-18 - 24 hours Neutral Salt Spray, followed by 1 hour drying, followed by a further 24 hours exposure Temperature: 35 °C Fall out rate: 1.86 ml/hr pH of test solution: 6.6 Specific gravity of test solution: 1.036 See note 3 White and grey scaling present on rivets of roof anchors, and light scaling present on D-rings. Device function is not affected	See table 2	PASS

ADDITIONAL INFORMATION / NOTES

Table 2 – Additional uncertainty of measurement information (see note 1)

CLAUSE	TEST / COMPONENT	UoM (see note 1)
3.2.5 Corrosion resistance	Temperature	± 0.99 °C
	Fall-out rate of collected solution	± 2.25 ml (± 0.04 ml/hour for 24 hours)
	Specific gravity of collected solution	± 0.0010 g/ml
	pH value of collected solution	± 0.1
	Angle of sample mounting (if applicable)	± 1.44°

Note 1 – 'UoM' denotes estimated Uncertainty of Measurement for stated test results. This uncertainty value is based on a standard uncertainty multiplied by a coverage factor k = 2, which provides for a confidence level of approximately 95%

Note 2 – The test results would meet the requirements of the standard if uncertainty of measurement is not taken into account. However, one or more values would fall outside the acceptable limits / requirements if uncertainty (as stated in UoM column) is applied and, therefore, the final result may be considered to fail the requirements of the specification

Note 3 – Specific gravity of test solution was found to exceed the tolerances specified in ASTM B117-18. This was not considered to significantly influence results however

TERMS AND CONDITIONS FOR THE SALE OF GOODS AND/OR THE PROVISION OF SERVICES

1. GENERAL

1.1 Work done, Services undertaken or the sale of Goods are subject to the terms and conditions detailed below and (subject to clause 5.2) all other conditions, warranties and representations, expressed or implied by statute relating thereto are hereby excluded.

1.2 SATRA Technology Centre Limited, its subsidiaries and associated companies (hereinafter referred to as "SATRA") may perform Services for or supply Goods to persons or entities (public, private or governmental) issuing instructions (hereinafter termed the "Client"). Each also known individually as a Party, or jointly as Parties.

1.3 These terms and conditions will apply to the Contract between SATRA and the Client to the exclusion of any other terms which the Client may seek to impose or which may be implied by trade, custom, practice or course of dealing

1.4 Unless otherwise agreed in writing no party other than the Client is entitled to provide instructions or information relating to the Goods or Services required or to the delivery of goods, results, reports or certificates.

1.5 All references in these terms and conditions to:

(a) the "Contract" is the contract between SATRA and the Client for the supply of Goods or Services which is made subject to these terms and conditions; and
(b) "Services" are the work or services to be supplied or performed under the Contract (including where relevant the supply of software, components and consumables); and
(c) "Goods" are the equipment, consumables or other physical items sold under the Contract (including documents, drawings or other information required in order to operate the equipment).

1.6 All drawings, descriptive matter, specifications and advertising material (including brochures and catalogues) are issued or published with the sole purpose of giving an indication of the goods or services being described and shall not form part of the Contract.

1.7 Where SATRA and the Client agree that the sale of Goods shall be governed by Incoterms 2010 (or any subsequent revision thereto) then the sale shall be governed by the relevant Incoterms mode of transport which is agreed by SATRA and the Client.

2. FEES AND PAYMENT

2.1 Where SATRA has agreed to perform the Services or supply the Goods on the basis of credit then payment terms are net 21 days from date of invoice, unless otherwise specified and may require part payment prior to delivery of the Services or Goods. In the event of the Client failing to make payment as agreed SATRA will be entitled to withhold delivery of the Goods or Services or cancel the Contract. SATRA reserves the right to charge interest on any overdue payments at a rate of 1.5% per month accruing on a daily basis from the date the invoice is due until the date payment is received.

2.2 Where the provision of Services or the sale of Goods is subject to a proforma invoice then SATRA shall not be obliged to start working on the provision of the Goods or Services until after payment in full has been made as cleared funds to SATRA.

2.3 SATRA reserves the right to charge for any and all expenses incurred as a result of performing the Services required by the Client. Although SATRA will try and provide an estimate of such expenses these may change as a result of circumstances out of SATRA's control.

2.4 Unless otherwise agreed in writing, the price for the Goods or Services shall be the price set in the order acknowledgement. SATRA shall not be bound by any price quoted which is not in writing. Prices for the sale of Goods include packing cases and materials but not carriage or installation which will be quoted separately and as agreed with the Client.

2.5 Quotations are valid from the date of issue for a period of 90 days unless otherwise specified or agreed in writing.

2.6 Should the Client become insolvent, bankrupt, subject to an administration order, enter into liquidation or receivership, or make arrangements with creditors SATRA reserves the right to cancel the Contract and terminate the supply of the Goods or Services. Where the Contract with SATRA is terminated all outstanding monies due from the Client to SATRA shall be immediately payable, and any materials supplied by SATRA to the Client returned. Termination of the Contract shall be without prejudice to any of SATRA's accrued rights.

2.7 All invoices issued by SATRA are payable in full. The Client is responsible for payment of withholding and any other taxes and all import duties. Payments made to SATRA shall not be reduced by such amounts.

2.8 The Client shall not be entitled to withhold or defer payment due to SATRA as a result of any dispute or counter claim that it may allege against SATRA.

2.9 SATRA reserves the right to bring action against the Client in order to collect unpaid fees, including court action. All fees associated with such actions shall be paid for by the Client including legal fees and related costs.

2.10 Where unforeseen costs arise as a result of provision of the Goods or carrying out the Services SATRA shall inform the Client immediately but reserves the right to charge additional costs to cover said costs and expenses.

3. INTELLECTUAL PROPERTY RIGHTS

3.1 All intellectual property rights belonging to a Party prior to entry into the Contract shall remain with that Party. Nothing in this Contract shall allow transfer of any intellectual property rights from one Party to the other.

3.2 In the event of certification services the use of certification marks by the Client may be subject to national and international laws and regulations. The responsibility for the use of these certification marks lies solely with the Client.

3.3 All intellectual property rights in reports, drawings, graphs, charts, photographs or any other material (in whatever medium) produced by SATRA pursuant to this Contract shall belong to SATRA. The Client shall have the right to use said material in accordance with the terms of this Contract.

3.4 The Client agrees and acknowledges that SATRA retains any and all propriety rights in concepts, ideas and inventions that may arise during the preparation or provision of any report (including any deliverables provided by SATRA to the Client) and the provision of the Services to the Client.

3.5 All intellectual property rights in any software supplied to the Client shall belong to SATRA or SATRA's licensors. With respect to the sale of SATRA Timeline, SATRASUMM and SATRA Visionstitch, provided that the Client is a member of SATRA and has paid its annual Smartcare fee then the Client will be entitled to use the software for its own internal use and will be entitled to receive minor software upgrades and fixes. SATRA may however terminate the supply of software upgrades and fixes for older versions of software which it no longer considers viable to support. The Client's rights to use the software and receive software upgrades and fixes will terminate if the Client has not paid its annual Smartcare fee. Major upgrades are not included within the entitlement to upgrades but may be offered by SATRA from time to time for an additional fee.

3.6 SATRA shall observe all statutory provisions with regard to data protection including but not limited to the provisions of the Data Protection Act 2018 and the EU General Data Protection Regulation (GDPR) Regulation (EU) 2016/679. To the extent that SATRA processes or gets access to personal data in connection with the Services or otherwise in connection with this Contract, it shall take all reasonable technical and organisational measures to ensure the security of such data (and guard against unauthorised or unlawful processing, accidental loss, destruction or damage to such data).

4. SUSPENSION OR TERMINATION OF SERVICES

4.1 Cancellation by the Client of orders for Goods or Services will only be acceptable by prior agreement with SATRA and a charge will usually be made.

4.2 SATRA shall not be liable for any delay or failure in providing the Goods or Services due to circumstances beyond its reasonable control (including any failure by the Client to comply with its obligations). If any such circumstances arise which prevent SATRA from delivering the Goods or completing the Services, then SATRA will be entitled to cancel or reschedule the delivery of Goods or Services at its discretion. In the event of cancellation SATRA will be entitled to retain all fees paid by the Client for Goods or Services already supplied but will refund to the Client any fees paid by the Client for Goods or Services which have not yet been supplied. The Client will not be liable for any non-refundable expenses already incurred by SATRA in relation to Goods or Services not yet supplied unless the cancellation is due to the Clients failure to comply with its obligations under the Contract.

5. LIABILITY AND INDEMNIFICATION

5.1 Reports are issued on the basis of information, documents and or samples submitted to SATRA by the Client, or on behalf of the Client and are provided solely for the benefit of the Client who is responsible for acting as it sees fit on the basis of such reports and findings. Subject to clause 5.2, neither SATRA nor any of its employees, agents or subcontractors shall be liable to the Client or any third party for any actions taken or not taken on the basis of such findings and reports, nor for any incorrect results arising as a result of unclear, erroneous, incomplete, misleading or false information provided to SATRA.

5.2 Nothing in these terms and conditions shall limit or exclude SATRA's liability for:

(a) death or personal injury caused by its negligence or the negligence of its employees or agents;
(b) fraud or fraudulent misrepresentation;
(c) breach of the terms implied by Section 12 of the Sale of Goods Act 1979;
(d) defective products under the Consumer Protection Act 1987; or
(e) any other liability which cannot be limited or excluded by applicable law.

5.3 Subject to clause 5.2 SATRA shall not be liable to the Client whether in contract, tort (including negligence), breach of statutory duty or otherwise arising under or in connection with the Contract for loss of profits, sales, contracts, anticipated savings, loss or damage to goodwill or any indirect or consequential loss.

5.4 Subject to clause 5.2 SATRA's total aggregate liability to the Client, whether in contract, tort (including negligence), breach of statutory duty or otherwise arising under or in connection with the Contract shall be limited to the total amount of fees for the Services or the price of the Goods (excluding any value added tax or other sales tax or expenses) payable by the Client to SATRA under the Contract or £100,000 whichever is the lower figure.

6. MISCELLANEOUS

6.1 If any one or more provisions of these conditions are found to be illegal or unenforceable in any respect, the validity, legality and enforceability of the remaining provisions shall not in any way be affected or impaired thereby.

6.2 During the course of providing the Goods or Services and for a period of one year thereafter the Client shall not directly or indirectly entice, encourage or make any offer to SATRA's employees to leave their employment with SATRA.

6.3 The use of SATRAs corporate name or registered marks for advertising purposes is not permitted without SATRA's prior written authorisation.

6.4 All reports and documentation which are supplied to the Client under the Contract remain the property of SATRA until paid in full. Under no circumstances will a Client's purchase order override SATRA's retention of title in accordance with this clause.

6.5 The Client acknowledges that in entering into this Contract it has not relied on any representation, warranty, collateral contract or other assurance (except those set out or referred to in these terms and conditions) made by or on behalf of SATRA or any other party before entering into the Contract. The Client waives all rights and remedies that, but for this clause, might otherwise be available to it in respect of any such representation, warranty, collateral contract or other assurance.

6.6 All provisions of the Contract that limit or exclude the liability of SATRA are intended also to be for the benefit of SATRA's holding company (called SATRA, and being a company limited by guarantee and incorporated in England and Wales with company number 00153475), and shall accordingly be enforceable by such holding company as well as or instead of by SATRA, and on the basis that any limit on the liability of SATRA shall apply to it and to such holding company in the aggregate.

7. CONFIDENTIALITY

7.1 Unless specifically excluded in the terms of an individual contract between SATRA and the Client, the following shall apply to all deliverables including, reports, advice, drawings, photographs, specifications, data or other forms of media.

7.2 Deliverables referred to in clause 7.1 shall not be disclosed to third parties or used in litigation without the consent of SATRA.

7.3 Where SATRA has given consent to disclosure of any service deliverables referred to in clause 7.1, the Client shall draw the attention of the third party to these terms of business and the basis on which SATRA undertakes testing, reporting and advising. The Client shall indemnify SATRA for any failure to do so.

7.4 The service deliverables referred to in clause 7.1 are submitted to the Client as confidential documents. Confidentiality shall continue to apply after completion of the business, but shall cease to apply to information or knowledge which has come into the public domain through no breach of this Contract by the Client.

7.5 The Client shall not disassemble, remove parts or carry out any form of analysis on goods or materials sold by SATRA for the purposes of reverse engineering or obtaining information on the construction, content or composition of the item without the consent of SATRA.

8. AMENDMENT

8.1 No amendment to this Contract shall be effective unless it is in writing, expressly stated to amend this Contract and signed by an authorised signatory of both Parties.

9. DISPUTE RESOLUTION

9.1 If there should be a dispute between the parties to this Agreement they undertake to act with goodwill and to use all reasonable endeavours to resolve that dispute.

9.2 Failure to resolve any dispute by discussions between the parties shall, in the first instance, be referred to a mediator for resolution. The parties shall attempt to agree upon the appointment of a mediator, upon receipt, by either of them, of a written notice to concur in such appointment. Should the parties fail to agree within 21 days, either party, upon giving written notice, may apply to the President or the Vice President, for the time being, of the Chartered Institute of Arbitrators, for the appointment of a mediator.

9.3 Should the mediation fail, in whole or in part, either party may, upon giving written notice, and within twenty-eight days thereof, apply to the President or the Vice President, for the time being, of the Chartered Institute of Arbitrators, for the appointment of a single arbitrator, for final resolution. The arbitrator shall have no connection with the mediator or the mediation proceedings, unless both parties have consented in writing. The arbitration shall be governed by both the Arbitration Act 1996 and the Controlled Cost Rules of the

TERMS AND CONDITIONS FOR THE SALE OF GOODS AND/OR THE PROVISION OF SERVICES

Chartered Institute of Arbitrators (2000 Edition), or any amendments thereof, which Rules are deemed to be incorporated by reference into this clause. The seat of the arbitration shall be England and Wales.

9.4 The laws of England shall govern the interpretation of this Contract. Subject to clauses 9.1, 9.2 and 9.3 any dispute arising out of or in connection with the Contract shall be subject to the exclusive jurisdiction of the courts of England. However, the Party obtaining a judgement in such courts shall be entitled to enforce it in any court it chooses.

10. PROVISION OF SERVICES

10.1 SATRA shall provide Services using reasonable care and skill and in accordance with the Clients specific instructions and as confirmed by SATRA as part of the Contract review process.

10.2 Estimates for completion of the Services are made in good faith and date from receipt of a written order, payment of a proforma invoice if required, full information and samples to enable SATRA to proceed. While SATRA will make every effort to fulfil them, such estimates are subject to unforeseen events and if not achieved, cannot give rise to any claim. Time will not be of the essence in relation to the performance of the Services.

10.3 Results given in test reports or certificates refer only to samples submitted for analysis to SATRA. A satisfactory test report in no way implies that the product tested is approved by SATRA and no warranty is given as to the performance of the product tested.

10.4 SATRA may delegate all or part of the Services to a subcontractor and the Client authorises SATRA to disclose all information required to undertake the Services.

10.5 Where the Client requests SATRA to witness testing of other services being undertaken by a third party the Client agrees that SATRAs sole responsibility is to be present at the time of the work and to forward the results or confirm that the service has been undertaken. The Client agrees that unless otherwise agreed SATRA is not responsible for the condition or calibration of any equipment unless provided by SATRA.

10.6 Unless otherwise agreed in advance, test samples will be retained for 6 weeks from the date of the final report after which time they will be disposed of and SATRA shall cease to have any responsibility for such samples.

Where the nature of the samples or the Services undertaken results in specialist disposal then SATRA reserves the right to pass the cost of such disposal onto the Client. Storage for longer periods may be possible only if agreed in advance and may incur a storage charge payable by the Client.

Where practical and agreed in advance, samples may be returned at the Client's expense. However, samples are in most instances partially or fully destroyed as part of the work undertaken and SATRA cannot guarantee that samples will be returned in an "as new" condition.

10.7 Where SATRA receives documents reflecting engagements between the Client and third parties or documents belonging to third parties, such documents shall be considered as being for information only and shall not release the Client from any or all obligations to SATRA.

10.8 SATRA reserves the right to make changes to the Services, provided that such changes do not materially affect the nature or quality of the provision of these Services or where they are necessary in order to ensure that any applicable laws or safety requirements are complied with.

10.9 The Client acknowledges that SATRA by providing the Services, neither takes the place of the Client or any third party or releases them from any of their obligations.

11. CLIENT RESPONSIBILITIES RELATING TO THE PROVISION OF SERVICES

11.1 The Client shall provide sufficient samples, information, instructions and documents as required to enable SATRA to carry out the Services in accordance with the methods, standards or other specifications as agreed.

11.2 Where applicable the Client shall allow access by members of SATRA staff to such premises where the Services are to be performed and provide any specialist equipment and personnel.

11.3 The Client shall inform SATRA in advance of any known hazards, dangers or other safety matters relating to samples submitted to SATRA or on site visits made by SATRA.

11.4 Where the Client fails to comply with any of its responsibilities SATRA reserves the right to suspend any Services until such time as the Client has complied and may require the Client to reimburse SATRA the amount of any additional costs arising from the suspension.

12. DELIVERY AND NON-DELIVERY OF GOODS

12.1 Delivery dates for the supply of the Goods are approximate only and not guaranteed. Time of delivery is not of the essence of the Contract and SATRA shall not be liable for any delay in delivery of Goods.

12.2 Should expedited delivery be requested and agreed, SATRA shall be entitled to make additional charges to cover overtime or any other additional costs.

12.3 Delivery of the Goods shall take place at such location as SATRA and the Client agree. If the Client agrees to collect the Goods from SATRA's premises, then delivery will take place at those premises in which case the consignment of Goods as recorded by SATRA upon dispatch shall be evidence of the Goods received by the Client unless the Client can provide conclusive evidence to the contrary.

12.4 SATRA shall not be liable for the non-delivery of Goods (even if caused by SATRA) unless the Client provides written notice of non-delivery in accordance with clause 13.2. Liability for non-delivery of Goods shall in any event be limited to replacing the Goods within a reasonable time frame or the issue of a credit note to the value of the Goods not delivered.

12.5 Should delivery of the Goods be suspended or delayed by the Client for any reason SATRA reserves the right to charge for storage and for all expenses incurred, including loss of or wastage of resources that cannot otherwise be used. If the delay extends beyond 30 days SATRA shall be entitled to immediate payment for any Goods that are ready for delivery, and any other additional costs.

12.6 If for any reason the Client fails to accept delivery of any of the Goods when they are ready for delivery, or SATRA is unable to deliver the Goods on time because the Client has not provided appropriate instructions, documents, licenses or authorisations then risk in the Goods shall pass to the Client, the Goods and/or Services shall be deemed to have been delivered; and SATRA may store the Goods until delivery, whereupon the Client shall be liable for all related costs and expenses (including, without limitation, storage and insurance).

13. RISK/TITLE OF GOODS

13.1 Subject to clause 12.6 the risk in the Goods will transfer to the Client on delivery of the Goods unless SATRA and the Client have agreed that the sale of the Goods will be governed by Incoterms 2010 (or any subsequent revision thereto) in which case risk will transfer to the Client in accordance with the Incoterms mode of transport which is agreed by SATRA and the Client.

13.2 The Company shall not accept responsibility for loss or damage in transit unless:

a) In the case of sales where delivery of Goods is made in the United Kingdom SATRA is notified by the Client within 10 days of the invoice date of non-arrival of Goods and within 3 days of the invoice date of receipt of Goods damaged in transit; or

b) In all other cases the Client notifies SATRA on the non-arrival or damage in transit within a reasonable period of time as determined by SATRA.

13.3 Title to the Goods shall not pass to the Client until the earlier of when: -

a) SATRA receives payment in full (in cash or cleared funds) for the Goods and any other Goods that SATRA has supplied to the Client in which case title to the Goods shall pass at the time of payment of all such sums; and

b) the Client resells the Goods in accordance with clause 13.5 in which case title shall pass to the Client immediately before the time at which the resale by the Client occurs.

13.4 Until ownership of Goods has passed to the Client, the Client shall:

a) hold the Goods as SATRA's bailee;

b) store the Goods (at no cost to SATRA) separately from all other goods belonging to the Client or any third party in such a way that they remain readily identifiable as SATRA's property (including where the Goods have been sold to a 3rd party);

c) not destroy, deface or obscure any identifying mark or packaging on or relating to the Goods; and

d) maintain the Goods in satisfactory condition and keep them insured on SATRA's behalf for their full price against all risks to the reasonable satisfaction of SATRA. The Client shall obtain an endorsement of SATRA's interest in the goods on its insurance policy. On request the Client shall allow SATRA to inspect such Goods and shall produce the policy of insurance.

13.5 The Client may resell the Goods before ownership has passed to it solely on condition that sale shall be effected in the ordinary course of the Client's business at full market value.

13.6 If before title to the Goods passes to the Client, the Client becomes subject to any of the events referred to in clause 2.6 then without limiting any other right or remedy SATRA may have:

a) the Client's right to resell the Goods or use them in the ordinary course of its business ceases immediately; and

b) SATRA may at any time require the Client to deliver up all Goods in its possession that have not been resold or irrevocably incorporated into another product; and

c) if the Client fails to do so promptly SATRA may exercise its rights under clause 13.7.

13.7 The Client grants SATRA, its agents and employees an irrevocable licence at any time to enter any premises where the Goods are or may be stored in order to inspect them, or, where the Client's right to possession has terminated, to recover them.

13.8 On termination of the Contract, howsoever caused, SATRA's (but not the Client's) rights contained in this clause 13 shall remain in effect.

14. PATENTS

14.1 SATRA gives no indemnity against any claim of infringement of Letters Patent, Registered Design, Trade Mark or Copyright by the use of or sale of any article or material supplied to the Client. If its use is impossible without infringement of Letters Patent, Registered Design, Trade Mark or Copyright published at the date of the contract, SATRA will refund to the Client the purchase price of the said article or material provided that it is returned to SATRA free of charge. The Client warrants that any design or instruction furnished or given by the Client shall not be such as will cause SATRA to infringe any Letters Patent, Registered Design, Trade Mark or Copyright in the execution of the Client's order.

15. WARRANTY OF GOODS

15.1 SATRA warrants that on delivery and for a period of 12 months from the date of delivery or within the shelf life of the Goods (whichever is the shorter period) the Goods shall be free from defects in design, material and workmanship.

16. DEFECTIVE GOODS

16.1 Subject to clauses 16.6 and 16.7 if:

a) the Client gives notice in writing to SATRA in accordance with clause 16.3 and during the period referred to in clause 15.1 that the Goods do not comply with the warranty in that clause; and

b) SATRA is given a reasonable opportunity of examining such Goods; and

c) the Client (if asked to do so by SATRA) returns such Goods to SATRA's place of business then SATRA will, at its option, repair or replace the defective Goods or refund the price of the defective Goods in full. SATRA reserves the right to repair the Goods at the Client's premises.

16.2 The Client must inspect all Goods upon delivery. Failure to do so may result in further charges being applied in the event of a return.

16.3 If Goods are found to be faulty, defective or damaged the Client must inform SATRA in writing as soon as reasonably possible and in any event within 10 working days of the fault, damage or defect being discovered.

16.4 Without prejudice to clause 16.1 if no notice of rejection has been received by SATRA within 3 months of delivery, the Client shall be deemed to have accepted the Goods.

16.5 SATRA will pay the reasonable costs of carriage, packaging and insurance for any defective Goods which are returned by the Client provided that SATRA is liable under clause 16.1 to repair or replace the defective Goods. If SATRA determines that the Goods are not defective or if SATRA is not liable to repair or replace the Goods due to the circumstances under clauses 16.6 or 16.7 then the Client will be responsible for the payment of such costs.

16.6 SATRA shall not be under any liability to repair or at its option replace or pay for the repair or replacement of any Goods which are found to be defective if:

a) the defect is caused or substantially caused by wear and tear, overloading, misuse, neglect, modification or attempted modification carried out by any organisation other than by SATRA or their approved agents, or use with ancillary equipment not approved in writing by SATRA, or default in proper maintenance or cleaning; or

b) the Client authorises or carries out any repair or replacement of any Goods without first affording SATRA a reasonable opportunity to replace or repair them; or

c) the Client has breached any of the terms of the Contract under which the Goods were supplied; or

d) the Goods have been manufactured to a design or specification or in compliance with other information provided by the Client and the defect has arisen as a result of that design, specification or information;

16.7 Where Goods or parts of Goods are not manufactured by SATRA then SATRA shall be liable for defects only to the extent that SATRA obtains redress from the manufacturer or supplier thereof provided that:

a) SATRA shall not be obliged to take any step to attempt to obtain such redress except at the request and expense of the Client and upon provision by the Client of a full indemnity as to costs for which SATRA may thereby become liable;

b) nothing in this condition 16.7 shall have effect as to impose upon SATRA any additional liability or obligations other than those referred to in condition 16.1.

16.8 Except as provided in clause 16.1 SATRA shall have no liability to the Client arising from any failure of the Goods to comply with the warranty in clause 15.1.

Terms and conditions – September 2019

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Test Report

Personal Fall Arrest Equipment
ANSI/ASSE Z359.11-2014
Full Body Harness

Report no:	2.20.09.11
Client:	Frontline Fall Protection Inc. 2023 NW 84th Ave Miami Florida 33122 U.S.A
Manufacturer:	Frontline Fall Protection Inc.
Client order:	T/0807
Order received:	8 September 2020
Model:	100VTB-UN P
Dates of tests:	6 December 2019 to 9 January 2020, and 22 September 2020

Signed:

Steven Sum, Laboratory Manager

Issued: 25 September 2020

Conditions

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Specimens will be disposed of four weeks from the date of this report, unless otherwise instructed.

Opinions, comments and interpretations expressed in this report are shown in italics.

Copies of INSPEC interpretations referenced in this report are available upon request.

Tests marked ☒ are not included in our ANAB Scope of Accreditation.

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Summary of assessment *

Clause	Requirement	Assessment (See Key)
3.1	Design requirements	Ltd
3.1.10	Static Feet First – Lanyard parking attachment element	Pass
3.2	**Attachment Element Requirement**	
3.2.1	Dorsal	Pass
3.2.1.3.1	Dynamic Feet First	Pass
3.2.1.3.2	Dynamic Head First	Pass
3.2.1.3.3	Static Feet First	Pass
3.2.1.3.4	Fall Arrest Indicator	Pass
3.2.2	Sternal	
3.2.2.3.1	Dynamic Feet First	
3.2.2.3.2	Static Feet First	
3.2.2.3.3	Fall Arrest Indicator	
3.2.3	Frontal	
3.2.3.1.1	Dynamic Feet First	
3.2.3.1.2	Static Feet First	
3.2.4	Shoulder	
3.2.4.1.1	Static Feet First	
3.2.5	Waist, Rear	
3.2.5.2.1	Static Feet First	
3.2.6	Hip	
3.2.6.1.1	Static Feet First	
3.2.7	Suspension Seat	
3.2.7.1.1	Static Feet First	
3.3	**Component Requirements**	
3.3.1	Load bearing straps	Ltd
3.3.1.2	Strap tensile test	Pass
3.3.1.5	Strap tensile test (after abrasion conditioning)	Pass
3.3.2	Thread and Stitching	Ltd
3.3.3	Connecting Components	NAs
3.3.1.2	Strap tensile test (soft loops)	
3.3.1.5	Strap tensile test (soft loops - after abrasion conditioning)	

Clause	Requirement	Assessment (See Key)
5.1	Marking requirements	Ltd
5.2	Instructions requirements	Ltd

Key

	Shading shows the clauses requested. Any other clauses were not requested.
Pass	Requirement satisfied.
Ltd	Testing requested was insufficient completely to verify compliance with the clause. Refer to the "Result details" section for more information.
Fail	Requirement not satisfied. Refer to the "Result details" section for more information.
NAs	Assessment not carried out.
NAp	Requirement not applicable.
NT	Requested but not tested due to early termination following failure.

* Assessment relates only to those specimens which were tested and are the subject of this report.

Submission details

Product	Quantity	Dates received	INSPEC specimen no.
Webbing, part no. No.64	15 m	22 February 2019	2G04201A to 01J (cut into 10 pieces)
Webbing, part no. No.802	15 m	13 November 2019	2G20701A to 01J (cut into 10 pieces)
Full body harness, model 100VTB-UN P	06		2G20702 to 07

Procedures

The specimens detailed within the submissions above were used for the tests covered by this report.

Testing was performed in accordance with ANSI Z359.11-2014 unless otherwise specified below. Reference should be made to the standard when reading this report.

Unless stated otherwise, specimens were tested in the condition as received by INSPEC.

Testing was performed at INSPEC's laboratory in Kunshan, China.

Result details

3 Requirements

3.1 Design Requirements

Specimen 2G20702 was assessed.

3.1.1	The specimen permanently incorporated a dorsal attachment element.	Pass
	The specimen did not incorporate other attachment elements.	
3.1.2	The specimen did incorporate a load bearing sub-pelvic strap.	Pass
3.1.3	All shoulder straps on the specimen came together at the dorsal location and were crossed and attached with a connector (D-ring).	Pass
	Testing of the connector (D-ring) was not requested.	NAs
3.1.4	The specimen permanently incorporated a back strap as means of controlling the separation of the shoulder straps on the back of the full body harness.	Pass
	When specimen 2G20702 was mounted on to the torso as per manufacturer's instructions, some portion of the back strap was located between datum levels G and K.	Pass
3.1.5	The specimen was not equipped with modular components or assemblies.	NAp
3.1.5.1	This clause was not applicable.	NAp
3.1.5.2	The specimen was not equipped with an attachment element extender; therefore this clause is not applicable.	NAp
3.1.6	The specimen was not integrated into a vest or garment.	NAp
3.1.7	The specimen was equipped with two fall arrest indicators.	Pass
	Both fall arrest indicators deployed during dynamic testing defined in section 3.2.	Pass
	It was possible visually to inspect the fall arrester indicators.	Pass
3.1.7.1	The specimen was not equipped with other fall arrest indicators.	NAp
3.1.8	The specimen was not equipped with connecting subsystem combinations.	NAp
3.1.9	The specimen did include strap retainers (keepers) which serve to control the loose ends of straps.	Pass

3.1.10 Static Feet First Test - Lanyard Parking Attachment Element

Specimen 2G20702 was assessed.

The specimen was equipped with two lanyard parking attachment elements.

There was no lanyard parking attachment elements differing in design.

During the static feet first test, the lanyard parking attachment element disengagement load was 78.7 pounds. This value was less than the maximum 120 pounds permitted. Pass

Specimen 2G20702 was assessed.

3.1.11 It was not possible to remove elements of the full body harness that support the shoulders / upper torso from those that support the legs / lower torso. Pass

3.1.12 The dorsal attachment element was located laterally within “zero” inch of the vertical centreline of the full body harness. Pass

3.1.13 The specimen did not consist of a sternal attachment element. NAp

3.1.14 The specimen did include a sub-pelvic strap. NAp

3.2 Attachment Element Requirements

3.2.1 Dorsal

The dorsal attachment element of specimen 2G20703 was located in the dorsal area shown in figure 4 of the standard. Pass

The dorsal attachment element was specified in the User Instructions to be used for fall arrest. Pass

3.2.1.1 The dorsal attachment was specified in the User Instructions to be used in travel restraint or rescue.

3.2.1.2 During the dynamic performance test, it was confirmed that the design of the full body harness directed the load through the shoulder straps supporting the user and around the thighs. Pass

3.2.1.3 Dorsal Attachment Element Requirements

3.2.1.3.1 Dynamic Feet First Test

Specimen 2G20703 was assessed.

During the dynamic feet first test, the test torso was not released.	Pass
The harness did support the test torso for a period of five minutes post fall.	Pass
During this period, the angle of the test torso to vertical was 5 degrees. This value is less than the maximum 30 degrees permitted.	Pass
Both fall arrest indicators deployed visibly and permanently.	Pass

Full body harness stretch was 8.6 inches.

Full body harness stretch stated in the manufacturer's instructions was 18 inches.

Full body harness stretch shall not exceed 18 inches, or that which is stated in the manufacturer's instructions, whichever is less was satisfied.	Pass

3.2.1.3.2 Dynamic Head First Test

Specimen 2G20704 was assessed.

During the dynamic head first test, the test torso was not released.	Pass
The harness did support the test torso for a period of five minutes post fall.	Pass
During this period, the angle of the test torso to vertical was 8 degrees. This value is less than the maximum 30 degrees permitted.	Pass
Both fall arrest indicators deployed visibly and permanently.	Pass

3.2.1.3.3 Static Feet First Test

Specimen 2G20705 was assessed.

During the static feet first test, the test torso was not released from the harness.	Pass
During the static feet first test, all adjusters did not slip.	Pass
The straps to which buckle and eyelet adjusters were fitted did not tear.	Pass
Other straps of the full body harness did not show signs of tearing.	Pass

3.2.1.3.4 Fall Arrest Indicator Test

Specimen 2G20706 was assessed.

When tested using the dorsal attachment element, the fall arrest indictors deployed visibly and permanently.	Pass

3.3 Components Requirements

3.3.1 Load Bearing Straps

3.3.1.1	The minimum width of the load bearing straps of specimen 2G20702 was 44 mm. This is more than the minimum 41 mm specified.	Pass
3.3.1.2	The straps 2G04201A to 2G04201E and 2G20701A to 2G20701E withstood a tensile test of 5,000 pounds applied for 1 minute without breaking.	Pass
3.3.1.3	The material and characteristics of load-bearing straps were not assessed. Manufacturer to certify.	NAs
3.3.1.4	The ends of load bearing straps were hot-cut so as to prevent fraying.	Pass
3.3.1.5	Following abrasion conditioning, the straps 2G04201F to 2G04201J and 2G20701F to 2G20701J withstood a tensile test of 3,600 pounds applied for 1 minute without breaking.	Pass
3.3.1.6	Straps in contact with metal connector (D-ring) at the dorsal attachment element were protected from wear. A plastic sleeve as used.	Pass
3.3.1.7	The spacing between holes centre of adjacent eyelets for buckle and eyelet type adjusters was 1.69 inch. This is more than the minimum 1.125 inch and less the maximum 2 inches specified.	Pass

3.3.2 Thread and Stitching

Specimen 2G20702 was assessed.

3.3.2.1	The material and characteristics of thread used was not assessed. Manufacturer to certify.	NAs
3.3.2.2	All types of stitching were not assessed. Manufacturer to certify.	NAs
3.3.2.3	Threads used for sewing the harness were black and orange colours. These contrasted with the orange and black colours of the load bearing straps.	Pass

3.3.3 Connecting Components

Specimen 2G20702 was assessed.

3.3.3.1	Testing of connecting components was not requested.	NAs
3.3.3.2	Soft loop attachments were not used.	NAp
3.3.3.3	Soft loop attachment was not used.	NAp
3.3.3.4	Soft loop attachment was not used.	NAp

5 Marking and Instructions

Electronic copy of markings was assessed. Results are given below.

5.1 Marking Requirements

5.1.1	-	Warnings shall be in English.	Pass
	a	The legibility and attachment of required markings shall be designed to endure for the life of the component, subsystem or system been marked. Mfr to certify.	NAs
5.1.2	b	When pressure-sensitive labels are used, they shall comply with the applicable provision of the reference in Section 7.6. Mfr to certify.	NAs
	c	When labels are concealed, a permanent marking shall be visible to the unaided eye that describes how to access the labels.	Pass
	a	The material of construction; “Polyester”	Pass
	b	The size or range of sizes; “L-XL”	Pass
	c	Part number and/or model designation; “100VTB-UN P”	Pass
	d	The month and year of manufacture;	Pass
	e	The manufacturer’s name or logo; “FRONTLINE”	Pass
	f	An identifying number, unique to each individual FBH produced by the manufacturer;	Pass
	g	A warning to follow Mfr instructions included with the equipment at the time of shipment from the Mfr.	Pass
5.1.3	h	A label permanently attached to the lanyard parking attachment which either states “Park Lanyard Here. See instructions.” verbally or conveys this by means of a pictogram.	Pass
	i	A label as defined in Figure 10a and 10b. *“Only contents were assessed”*	Ltd
		a) The label shall be placed in a prominent location on the FBH	Pass
		b) If the label is part of a label pack or book, the label shall be placed so that the user will see it first.	Pass
		c) The border surrounding the label text shall be no closer than 0.4 inches (10 mm) from any other markings on the FBH	NAs
		d) The label may be modified to include the mark of the qualification body, and may include a part number located on the label outside of the border as needed by the manufacturer as defined in figure 10a and 10b.	NAp

5.2 Instruction Requirements

The instructions to users have been assessed as detail below, with reference only to the relevant requirements of the Standard.

INSPEC Technical Services has not assessed these instructions with respect to claims made by the manufacturer outside of these requirements, and therefore accepts no responsibility for the legitimacy of any such claims.

5.2.1	Instructions shall be provided to the user in English, and affixed to the equipment at the time of shipment from the manufacturer. *User instructions were supplied electronically in English and used for assessment.*	NAs
5.2.2	**Instructions shall contain the following information:**	
a)	Annex A in its entirety, either incorporated in the Mfr's instructions, as an appendix to the Mfr's instructions, or separately provided with the product along with the Mfr's instructions.	Pass
b)	A statement that the Mfr's instructions shall be provided to the users.	Pass
c)	Manufacturer's name, address and telephone number.	Pass
d)	Manufacturer's part number and/or model designation for the equipment.	Pass
e)	Intended use and purpose of the equipment.	Pass
f)	Length of FBH Stretch H_s, and warning to include other factors such as D-ring/ connector length, setting of the user's body and all other contributing elements when calculating fall clearance.	Pass
g)	Proper method of use and limitations of the equipment.	Pass
h)	Illustrations showing locations and markings on the equipment.	Pass
i)	Reproduction of printed information on all markings.	Pass
j)	Inspection procedures (including frequency) required to assure the equipment is in serviceable condition and operating correctly.	Pass
k)	Criteria for discarding equipment that fails inspection.	Pass
l)	Procedures for cleaning, maintenance and storage.	Pass
m)	Reference to ANSI/ASSE Z359.11 (Full Body Harnesses) and applicable regulations governing occupational safety.	Pass
n)	Acceptable use for all attachment elements (see Annex A)	Pass
5.2.3	Instructions shall require that only the equipment Mfr, or persons or entities authorized in writing by the Mfr, make repairs to the equipment.	Pass
5.2.4	Instructions shall require the user to remove equipment from service if it has been subjected to the forces of arresting a fall and will include information on inspection of load indicators.	Pass
5.2.5	Instructions shall require the user to have a rescue plan and means at hand to implement it when using the FBH for fall arrest.	Pass

5.2.6 Instructions shall provide warnings against:

a)	Altering equipment	Pass
b)	Misusing equipment	Pass
c)	Using combinations of components or sub-systems, or both, which may affect or interfere with the safe function of each other.	Pass
d)	Exposing the equipment to chemicals, heat, flames or other environmental conditions, which may produce a harmful effect and to consult the manufacturer in case of doubt.	Pass
e)	Using the equipment around moving machinery and electrical hazards.	Pass
f)	Using the equipment near sharp edges or abrasive surfaces.	Pass
g)	Exposure to light (UV degradation)	Pass

Estimates of the uncertainty of measurement

Clause	Test		Uncertainty
3.1.1	Dorsal attachment		See Note 1
3.1.2	Sub-pelvic strap		See Note 1
3.1.3	Shoulder straps		See Note 1
	Connector		See report
3.1.4	Waist belt or back strap – control of separation of shoulder straps		See Note 1
3.1.5	Modular components or assemblies, as appropriate		See Note 1
3.1.5.1	Modular components.		See report
3.1.5.2	Attachment element extender	Length	±0.04 inches
3.1.6	Full body harness integrated into a vest		See Note 1
3.1.7	Fall Arrest Indicator		See Note 1
3.1.8	Harness with attached connecting subsystem combinations		See report
3.1.9	Strap retainers (keepers)		See Note 1
3.1.10	Lanyard parking attachment element - Disengagement load		±3.4%
3.1.11	Support – shoulders/upper torso		See Note 1
3.1.12	Location of single point attachment		See Note 1
3.1.13	Sternal attachment – bilateral elements		See Note 1
3.1.14	Sub-pelvic straps		See Note 1
3.2.1	Dorsal attachment element		See Note 1
3.2.1.3.1	Dorsal attachment element	Dynamic Feet First	±3.4%
3.2.1.3.2		Dynamic Head First	±3.4%
3.2.1.3.3	Dorsal attachment element	Static strength	See Note 1
		Slippage	±1.3%
3.2.1.3.4	Fall Arrest Indicator test – dorsal attachment		See Note 1
3.2.2	Sternal attachment element		See Note 1
3.2.2.3.1	Sternal attachment element	Dynamic Feet First	±3.4%
3.2.2.3.2	Sternal attachment element	Static strength	See Note 1
		Slippage	±1.3%
3.2.2.3.3	Fall Arrest Indicator test – sternal attachment		See Note 1
3.2.3	Frontal attachment element		See Note 1
3.2.3.1.1	Frontal attachment element	Dynamic Feet First	±3.4%
3.2.3.1.2	Frontal attachment element	Static strength	See Note 1
		Slippage	±1.3%
3.2.4	Shoulder attachment element		See Note 1

3.2.4.1.1	Shoulder attachment element	Static strength	See Note 1
		Slippage	±1.3%
3.2.5	Waist, Rear attachment element		See Note 1
3.2.5.2.1	Waist, Rear attachment element	Static strength	See Note 1
		Slippage	±1.3%
3.2.6	Hip attachment element		See Note 1
3.2.6.1.1	Hip attachment element	Static strength	See Note 1
		Slippage	±1.3%
3.2.7	Suspension Seat attachment element		See Note 1
3.2.7.1.1	Suspension Seat attachment element	Static strength	See Note 1
		Slippage	±1.3%
3.3.1.1	Straps	Width	±1.3%
3.3.1.2	Straps	Static strength	See Note 1
3.3.1.3	Straps – material and characteristics		Not applicable
3.3.1.4	Straps - terminations		See Note 1
3.3.1.5	Straps (after abrasion)	Static strength	See Note 1
3.3.1.6	Straps – contact with metal connectors		See Note 1
3.3.1.7	Buckle & eyelet type adjusters	Spacing	±0.02 inches
3.3.2.1	Threads and stitching – material		See Note 1
3.3.2.2	Lock stitching		Not applicable
3.3.2.3	Stitching – contrasting colour		See Note 1
3.3.3.1	Connecting components (except soft loops)		See report
3.3.3.2	Soft loop attachments		See Note 1
3.3.3.3	Soft loop	Static strength	See Note 1
	Soft loop (after abrasion)	Static strength	See Note 1
3.3.3.4	Soft loop attachments – protection from wear		See Note 1
5.1	Marking requirements		See Note 1
5.2	Instructions requirements		See Note 1

Note 1 The acceptance criterion for this test is a straightforward “Pass/Fail”, rather than a numerical value. Consequently, as there is no value to be reported, uncertainty has not been reported either.

Note 2 The uncertainty value is based on a standard uncertainty multiplied by a coverage factor k = 2, which provides for a confidence level of approximately 95%. Values expressed as a percentage (%) are relative.

Note 3 It should be noted that the above values have not been taken into account when making assessment to the pass/fail criteria.

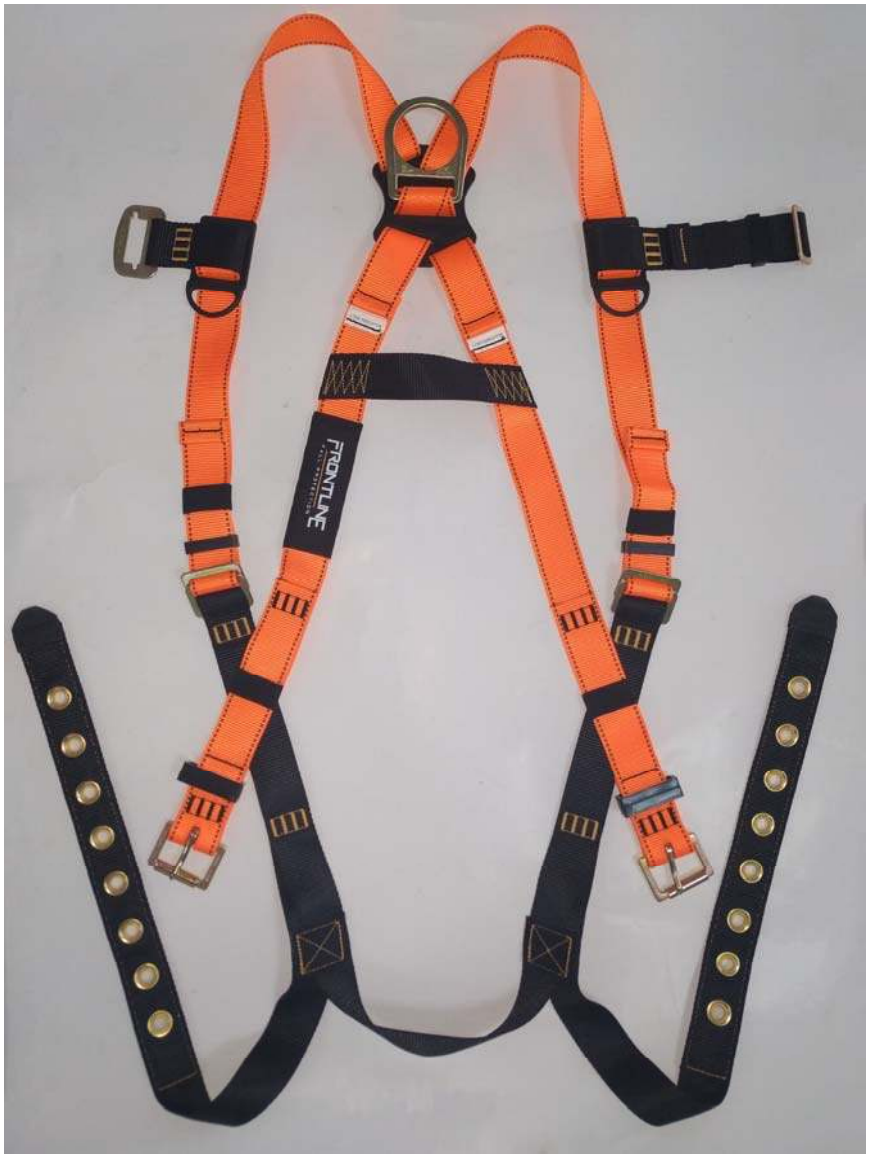
ANNEX

This Annex comprises one section.

1. Photograph of the product tested. (1 page)

END OF REPORT

Frontline Fall Protection Inc. –
Full body harness, model 100VTB-UN P



Photograph provided by manufacturer 7 September 2020

INSPEC TESTING SERVICES

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Test Report

Personal Fall Arrest Equipment
ANSI/ASSE Z359.11-2014
Full Body Harness

Report no: 2.21.12.12

Customer: Frontline Fall Protection Inc.
2023 NW 84th Ave,
Miami,
Florida 33122,
U.S.A.

Manufacturer: Frontline Fall Protection Inc.

Customer order: T/0921

Order received: 20 July 2021

Models: 110VTB

Dates of tests: 20 December 2021 to 23 December 2021

Signed: 

Issued: 24 December 2021

Steven Sum, Laboratory Manager

Conditions

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Specimens will be disposed of four weeks from the date of this report, unless otherwise instructed.

Opinions, comments and interpretations expressed in this report are shown in italics.

Copies of INSPEC interpretations referenced in this report are available upon request.

Tests marked ☒ are not included in our ANAB Scope of Accreditation.

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Summary of assessment *

Clause	Requirement	Assessment (See Key)
3.1	Design requirements	**Ltd**
3.1.10	Static Feet First – Lanyard parking attachment element	**Pass**
3.2	**Attachment Element Requirement**	
3.2.1	Dorsal	**Pass**
3.2.1.3.1	Dynamic Feet First	**Pass**
3.2.1.3.2	Dynamic Head First	**Pass**
3.2.1.3.3	Static Feet First	**Pass**
3.2.1.3.4	Fall Arrest Indicator	**Pass**
3.2.2	Sternal	
3.2.2.3.1	Dynamic Feet First	
3.2.2.3.2	Static Feet First	
3.2.2.3.3	Fall Arrest Indicator	
3.2.3	Frontal	
3.2.3.1.1	Dynamic Feet First	
3.2.3.1.2	Static Feet First	
3.2.4	Shoulder	
3.2.4.1.1	Static Feet First	
3.2.5	Waist, Rear	
3.2.5.2.1	Static Feet First	
3.2.6	Hip	
3.2.6.1.1	Static Feet First	
3.2.7	Suspension Seat	
3.2.7.1.1	Static Feet First	
3.3	**Component Requirements**	
3.3.1	Load bearing straps	**Ltd**
3.3.1.2	Strap tensile test	**Pass**
3.3.1.5	Strap tensile test (after abrasion conditioning)	**Pass**
3.3.2	Thread and Stitching	**NAs**
3.3.3	Connecting Components	**NAs**
3.3.1.2	Strap tensile test (soft loops)	
3.3.1.5	Strap tensile test (soft loops - after abrasion conditioning)	

Clause	Requirement	Assessment (See Key)
5.1	Marking requirements	**Ltd**
5.2	Instructions requirements	**Ltd**

Key

	Shading shows the clauses requested. Any other clauses were not requested.
Pass	Requirement satisfied.
Ltd	Testing requested was insufficient completely to verify compliance with the clause. Refer to the "Result details" section for more information.
Fail	Requirement not satisfied. Refer to the "Result details" section for more information.
NAs	Assessment not carried out.
NAp	Requirement not applicable.
NT	Requested but not tested due to early termination following failure.

* Assessment relates only to those specimens which were tested and are the subject of this report.

Submission details

Product	Quantity	Dates received	INSPEC specimen no.
Shoulder straps, part no. No. 588	15 m	22 Feb. 2019	2G04201A to 01J (cut into 10 pieces)
Leg straps, part no. No. 10	15 m	13 Nov. 2019	2G20701A to 01J (cut into 10 pieces)
Full body harness, model 110VTB	06		2G20702 to 07

Procedures

The specimens detailed within the submissions above were used for the tests covered by this report.

Testing was performed in accordance with ANSI Z359.11-2014 unless otherwise specified below. Reference should be made to the standard when reading this report.

Unless stated otherwise, specimens were tested in the condition as received by INSPEC.

Testing was performed at INSPEC's laboratory in Kunshan, China.

Result details

3 Requirements

3.1 Design Requirements

Specimen 2G20702 was assessed.

3.1.1	The specimen permanently incorporated a dorsal attachment element.	**Pass**
	The specimen did not incorporate other attachment elements.	
3.1.2	The specimen did incorporate a load bearing sub-pelvic strap.	**Pass**
3.1.3	All shoulder straps on the specimen came together at the dorsal location and were crossed and attached with a connector (D-ring).	**Pass**
	Testing of the connector (D-ring) was not requested.	**NAs**
3.1.4	The specimen permanently incorporated a back-strap as means of controlling the separation of the shoulder straps on the back of the full body harness.	**Pass**
	When specimen 2G20703 was mounted on to the test torso as per manufacturer's instructions, some portion of the back strap was located between datum levels G and K.	**Pass**
3.1.5	The specimen was not equipped with modular components or assemblies.	**NAp**
3.1.5.1	This clause was not applicable.	**NAp**
3.1.5.2	The specimen was not equipped with an attachment element extender; therefore this clause is not applicable.	**NAp**
3.1.6	The specimen was not integrated into a vest or garment.	**NAp**
3.1.7	The specimen was equipped with two fall arrest indicators.	**Pass**
	Both fall arrest indicators deployed during dynamic testing defined in section 3.2.	**Pass**
	It was possible visually to inspect the fall arrester indicators.	**Pass**
3.1.7.1	The specimen was not equipped with other fall arrest indicators.	**NAp**
3.1.8	The specimen was not equipped with connecting subsystem combinations.	**NAp**
3.1.9	The specimen did include strap retainers (keepers) which serve to control the loose ends of straps.	**Pass**

3.1.10 Static Feet First Test - Lanyard Parking Attachment Element

Specimen 2G20702 was assessed.

The specimen was equipped with two lanyard parking attachment elements. Both lanyard parking attachment elements did not differ in design.

During the static feet-first test, the lanyard parking attachment element disengagement load was 78.7 pounds. This value was less than the maximum 120 pounds permitted. **Pass**

Specimen 2G20702 was assessed.

3.1.11 It was not possible to remove elements of the full body harness that support the shoulders / upper torso from those that support the legs / lower torso. **Pass**

3.1.12 The dorsal attachment element was located laterally along the vertical centreline of the full body harness. **Pass**

3.1.13 The specimen did not consist of a sternal attachment element. **NAp**

3.1.14 The specimen did include a sub-pelvic strap. **NAp**

3.2 Attachment Element Requirements

3.2.1 Dorsal

The dorsal attachment element of specimen 2G20703 was located in the dorsal area shown in figure 4 of the standard. **Pass**

The dorsal attachment element was specified in the User Instructions to be used for fall arrest. **Pass**

3.2.1.1 The dorsal attachment was specified in the User Instructions to be used in travel restraint or rescue.

3.2.1.2 During the dynamic performance test, it was confirmed that the design of the full body harness directed the load through the shoulder straps supporting the user and around the thighs. **Pass**

3.2.1.3 Dorsal Attachment Element Requirements

3.2.1.3.1 Dynamic Feet First Test

Specimen 2G20703 was assessed.

During the dynamic feet-first test, the test torso was not released.	**Pass**
The harness did support the test torso for a period of five minutes post fall.	**Pass**
During this period, the angle of the test torso to vertical was 5 degrees. This value is less than the maximum 30 degrees permitted.	**Pass**
Both fall arrest indicators deployed visibly and permanently.	**Pass**

Full body harness stretch was 8.6 inches.

Full body harness stretch stated in the manufacturer's instructions was 18 inches.

Full body harness stretch shall not exceed 18 inches, or that which is stated in the manufacturer's instructions, whichever is less was satisfied.	**Pass**

3.2.1.3.2 Dynamic Head First Test

Specimen 2G20704 was assessed.

During the dynamic head-first test, the test torso was not released.	**Pass**
The harness did support the test torso for a period of five minutes post fall.	**Pass**
During this period, the angle of the test torso to vertical was 8 degrees. This value is less than the maximum 30 degrees permitted.	**Pass**
Both fall arrest indicators deployed visibly and permanently.	**Pass**

3.2.1.3.3 Static Feet First Test

Specimen 2G20705 was assessed.

During the static feet-first test, the test torso was not released from the harness.	**Pass**
During the static feet-first test, all adjusters did not slip.	**Pass**
The straps to which buckle and eyelet adjusters were fitted did not tear.	**Pass**
Other straps of the full body harness did not show signs of tearing.	**Pass**

3.2.1.3.4 Fall Arrest Indicator Test

Specimen 2G20706 was assessed.

When tested using the dorsal attachment element, the fall arrest indictors deployed visibly and permanently.	**Pass**

3.3 Components Requirements

3.3.1 Load Bearing Straps

3.3.1.1	The minimum width of the load bearing straps of specimen 2G20702 was 44 mm. This is more than the minimum 41 mm specified.	**Pass**
3.3.1.2	The straps 2G04201A to 2G04201E and 2G20701A to 2G20701E withstood a tensile test of 5,000 pounds applied for 1 minute without breaking.	**Pass**
3.3.1.3	The material and characteristics of load-bearing straps were not assessed. Manufacturer to certify.	**NAs**
3.3.1.4	The ends of load bearing straps were hot-cut so as to prevent fraying.	**Pass**
3.3.1.5	Following abrasion conditioning, the straps 2G04201F to 2G04201J and 2G20701F to 2G20701J withstood a tensile test of 3,600 pounds applied for 1-minute without breaking.	**Pass**
3.3.1.6	Straps in contact with metal connector (D-ring) at the dorsal attachment element were protected from wear. A plastic sleeve was used.	**Pass**
	Straps in contact with tongue buckles were protected from wear. Grommets were used.	**Pass**
3.3.1.7	The spacing between holes centre of adjacent eyelets for buckle and eyelet type adjusters was 1.69 inch. This is more than the minimum 1.125 inch and less the maximum 2 inches specified.	**Pass**

3.3.2 Thread and Stitching

Specimen 2G20702 was assessed.

3.3.2.1	The material and characteristics of thread used was not assessed. Manufacturer to certify.	**NAs**
3.3.2.2	All types of stitching were not assessed. Manufacturer to certify.	**NAs**
3.3.2.3	Threads used for stitching the load bearing straps shall have a contrasting color to the load bearing straps to facilitate visual inspection was not assessed.	**NAs**

3.3.3 Connecting Components

Specimens 2G20702 and 2G20708 were assessed.

3.3.3.1	Testing of connecting components was not requested.	**NAs**
3.3.3.2	Soft loop attachments were not used.	**NAp**
3.3.3.3	Soft loop attachment was not used.	**NAp**
3.3.3.4	Soft loop attachment was not used.	**NAp**

5 Marking and Instructions

5.1 Marking Requirements

5.1.1	-	Warnings shall be in English.	**Pass**
	a	The legibility and attachment of required markings shall be designed to endure for the life of the component, subsystem or system been marked. Mfr to certify.	**NAs**
		Markings were provided electronically and used for assessment.	
5.1.2	b	When pressure-sensitive labels are used, they shall comply with the applicable provision of the reference in Section 7.6. Mfr to certify.	**NAs**
	c	When labels are concealed, a permanent marking shall be visible to the unaided eye that describes how to access the labels.	**Pass**
	a	The material of construction; “Polyester”	**Pass**
	b	The size or range of sizes;	**Pass**
	c	Part number and/or model designation; “110VTB”	**Pass**
	d	The month and year of manufacture;	**Pass**
	e	The manufacturer’s name or logo; “FRONTLINE”	**Pass**
	f	An identifying number, unique to each individual FBH produced by the manufacturer;	**Pass**
	g	A warning to follow Mfr instructions included with the equipment at the time of shipment from the Mfr.	**Pass**
5.1.3	h	A label permanently attached to the lanyard parking attachment which either states “Park Lanyard Here. See instructions.” verbally or conveys this by means of a pictogram. [only the texts were assessed]	**Ltd**
	i	A label as defined in Figure 10a and 10b. [only the texts were assessed]	**Ltd**
		a) The label shall be placed in a prominent location on the FBH	**NAs**
		b) If the label is part of a label pack or book, the label shall be placed so that the user will see it first.	**NAs**
		c) The border surrounding the label text shall be no closer than 0.4 inches (10 mm) from any other markings on the FBH	**NAs**
		d) The label may be modified to include the mark of the qualification body, and may include a part number located on the label outside of the border as needed by the manufacturer as defined in figure 10a and 10b.	**NAp**

5.2 Instruction Requirements

The instructions to users have been assessed as detail below, with reference only to the relevant requirements of the Standard.

INSPEC Technical Services has not assessed these instructions with respect to claims made by the manufacturer outside of these requirements, and therefore accepts no responsibility for the legitimacy of any such claims.

5.2.1	Instructions shall be provided to the user in English, and affixed to the equipment at the time of shipment from the manufacturer. *User instructions were supplied electronically in English and used for assessment.*	**Ltd**
5.2.2	**Instructions shall contain the following information:**	
a)	Annex A in its entirety, either incorporated in the Mfr's instructions, as an appendix to the Mfr's instructions, or separately provided with the product along with the Mfr's instructions.	**Pass**
b)	A statement that the Mfr's instructions shall be provided to the users.	**Pass**
c)	Manufacturer's name, address and telephone number.	**Pass**
d)	Manufacturer's part number and/or model designation for the equipment.	**Pass**
e)	Intended use and purpose of the equipment.	**Pass**
f)	Length of FBH Stretch $H_{\mathbf{s}}$, and warning to include other factors such as D-ring/ connector length, setting of the user's body and all other contributing elements when calculating fall clearance.	**Pass**
g)	Proper method of use and limitations of the equipment.	**Pass**
h)	Illustrations showing locations and markings on the equipment.	**Pass**
i)	Reproduction of printed information on all markings.	**Pass**
j)	Inspection procedures (including frequency) required to assure the equipment is in serviceable condition and operating correctly.	**Pass**
k)	Criteria for discarding equipment that fails inspection.	**Pass**
l)	Procedures for cleaning, maintenance and storage.	**Pass**
m)	Reference to ANSI/ASSE Z359.11 (Full Body Harnesses) and applicable regulations governing occupational safety.	**Pass**
n)	Acceptable use for all attachment elements (see Annex A)	**Pass**
5.2.3	Instructions shall require that only the equipment Mfr, or persons or entities authorized in writing by the Mfr, make repairs to the equipment.	**Pass**
5.2.4	Instructions shall require the user to remove equipment from service if it has been subjected to the forces of arresting a fall and will include information on inspection of load indicators.	**Pass**
5.2.5	Instructions shall require the user to have a rescue plan and means at hand to implement it when using the FBH for fall arrest.	**Pass**

5.2.6 Instructions shall provide warnings against:

a)	Altering equipment	**Pass**
b)	Misusing equipment	**Pass**
c)	Using combinations of components or sub-systems, or both, which may affect or interfere with the safe function of each other.	**Pass**
d)	Exposing the equipment to chemicals, heat, flames or other environmental conditions, which may produce a harmful effect and to consult the manufacturer in case of doubt.	**Pass**
e)	Using the equipment around moving machinery and electrical hazards.	**Pass**
f)	Using the equipment near sharp edges or abrasive surfaces.	**Pass**
g)	Exposure to light (UV degradation)	**Pass**

Estimates of the uncertainty of measurement

Clause	Test		Uncertainty
3.1.1	Dorsal attachment		Not applicable
3.1.2	Sub-pelvic strap		Not applicable
3.1.3	Shoulder straps		Not applicable
	Connector		See test report
3.1.4	Waist belt or back strap – control of separation of shoulder straps		Not applicable
3.1.5	Modular components or assemblies, as appropriate		Not applicable
3.1.5.1	Modular components.		See test report
3.1.5.2	Attachment element extender	Length	±0.04 inches
3.1.6	Full body harness integrated into a vest		Not applicable
3.1.7	Fall Arrest Indicator		Not applicable
3.1.8	Harness with attached connecting subsystem combinations		See test report
3.1.9	Strap retainers (keepers)		Not applicable
3.1.10	Lanyard parking attachment element - Disengagement load		±3.4%
3.1.11	Support – shoulders/upper torso		Not applicable
3.1.12	Location of single point attachment		Not applicable
3.1.13	Sternal attachment – bilateral elements		Not applicable
3.1.14	Sub-pelvic straps		Not applicable
3.2.1	Dorsal attachment element		Not applicable
3.2.1.3.1	Dorsal attachment element	Dynamic Feet First	±3.4%
3.2.1.3.2		Dynamic Head First	±3.4%
3.2.1.3.3	Dorsal attachment element	Static strength	See Note 1
		Slippage	±1.3%
3.2.1.3.4	Fall Arrest Indicator test – dorsal attachment		See Note 1
3.2.2	Sternal attachment element		Not applicable
3.2.2.3.1	Sternal attachment element	Dynamic Feet First	±3.4%
3.2.2.3.2	Sternal attachment element	Static strength	See Note 1
		Slippage	±1.3%
3.2.2.3.3	Fall Arrest Indicator test – sternal attachment		See Note 1
3.2.3	Frontal attachment element		Not applicable
3.2.3.1.1	Frontal attachment element	Dynamic Feet First	±3.4%
3.2.3.1.2	Frontal attachment element	Static strength	See Note 1
		Slippage	±1.3%
3.2.4	Shoulder attachment element		Not applicable

3.2.4.1.1	Shoulder attachment element	Static strength	See Note 1
		Slippage	±1.3%
3.2.5	Waist, Rear attachment element		Not applicable
3.2.5.2.1	Waist, Rear attachment element	Static strength	See Note 1
		Slippage	±1.3%
3.2.6	Hip attachment element		Not applicable
3.2.6.1.1	Hip attachment element	Static strength	See Note 1
		Slippage	±1.3%
3.2.7	Suspension Seat attachment element		Not applicable
3.2.7.1.1	Suspension Seat attachment element	Static strength	See Note 1
		Slippage	±1.3%
3.3.1.1	Straps	Width	±1.3%
3.3.1.2	Straps	Static strength	See Note 1
3.3.1.3	Straps – material and characteristics		Not applicable
3.3.1.4	Straps - terminations		Not applicable
3.3.1.5	Straps (after abrasion)	Static strength	See Note 1
3.3.1.6	Straps – contact with metal connectors		Not applicable
3.3.1.7	Buckle & eyelet type adjusters	Spacing	±0.02 inches
3.3.2.1	Threads and stitching – material		Not applicable
3.3.2.2	Lock stitching		Not applicable
3.3.2.3	Stitching – contrasting colour		Not applicable
3.3.3.1	Connecting components (except soft loops)		See test report
3.3.3.2	Soft loop attachments		Not applicable
3.3.3.3	Soft loop	Static strength	See Note 1
	Soft loop (after abrasion)	Static strength	See Note 1
3.3.3.4	Soft loop attachments – protection from wear		Not applicable
5.1	Marking requirements		Not applicable
5.2	Instructions requirements		Not applicable

Note 1 The acceptance criterion for this test is a straightforward “Pass/Fail”, rather than a numerical value. Consequently, as there is no value to be reported, uncertainty has not been reported either.

Note 2 The uncertainty value is based on a standard uncertainty multiplied by a coverage factor k = 2, which provides for a confidence level of approximately 95%. Values expressed as a percentage (%) are relative.

Note 3 It should be noted that the above values have not been taken into account when making assessment to the pass/fail criteria.

ANNEX

This Annex comprises one section.

1. Photograph of the product tested. (1 page)

END OF REPORT

Frontline Fall Protection INC. –
Full body harness, model 110VTB

Photograph provided by manufacturer 24 December 2021

INSPEC Technical Services (Kunshan) Co Ltd • 8 Jin Yang East Road • Lu Jia Zhen • Kunshan • Jiangsu • China
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Test Report

ANSI Z359.15-2014
Single Anchor Lifelines and Fall Arresters
(Qualification Testing)

Report no: 2.20.12.38

Client: Frontline Fall Protection Inc.
2023 NW 84th Ave
Miami
Florida 33122
U.S.A

Manufacturer: Frontline Fall Protection Inc.

Client orders: T/0564 (19 January 2019)
T/0807 (8 September 2020)

Models: RGSU58ES (Fall arrester)
VLP25R3L (Single anchor lifeline, 25 ft)
VLP30R3L (Single anchor lifeline, 30 ft)
VLP50R3L (Single anchor lifeline, 50 ft)
VLP75R3L (Single anchor lifeline, 75 ft)
VLP100R3L (Single anchor lifeline, 100 ft)
VLP125R3L (Single anchor lifeline, 125 ft)
VLP150R3L (Single anchor lifeline, 150 ft)
VLP200R3L (Single anchor lifeline, 200 ft)

Dates of tests: 10 April 2019 to 27 September 2019, and 9 December 2020

Signed: 

Issued: 11 December 2020

Steven Sum, Laboratory Manager

Conditions

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Copies of INSPEC interpretations referenced in this report are available upon request.

Tests marked ☒ are not included in our ANAB Scope of Accreditation.

This report has been provided in accordance with our standard Terms of Business, which can be viewed at, and printed from:

http://inspec-international.com/ToB.pdf

If you have difficulty accessing the Terms of Business, you may contact us for a copy.

Summary of assessment*

Clause	Requirement		Assessment (see key)
3.1	**Single Anchor Lifeline Components**		
3.1.1	Integral connectors		NAs
3.1.2	Rope characteristics		NAs
3.1.3	Elastic elongation		Pass
3.1.4	Rope diameter		Pass
3.1.5	Rope fabrication		NAs
3.1.6	Materials		NAs
3.1.7	Lifelines supplied with factory terminations	Breaking strength	Pass
3.1.8.1		Spliced	NAp
3.1.8.2		Stitched	Ltd
3.1.8.3		Swaged	NAp
3.1.9	Breaking strength - lifeline supplied without factory termination		
3.1.10	Dual purposes / rope access or descent control applications		NAp
3.1.11	Residual static strength		Pass
3.1.12.1	Wire rope lifeline	Breaking strength	
3.1.12.2		Construction	
3.1.12.3		Factory terminations	
3.2	**Fall arrester Components**		
3.2.1	Integral connectors		NAs
3.2.2	Non-integral energy absorber and energy absorbing lanyards		NAp
3.2.3	Integral lanyards		Ltd
3.2.4	Locking (fall stopping) function		Pass
3.2.5	Dynamic performance (manual override)		Pass
3.2.6	Open with two consecutive and deliberate actions		Pass
3.2.7	Knot or hitch		Pass
3.2.8	Integral rings and openings		NAp
3.2.9	Static strength		Pass
3.2.10	Dynamic performance - ambient		Pass
	Dynamic performance - hot		Pass
	Dynamic performance - cold		Pass
	Dynamic performance - wet		Pass
3.2.11	Function test		Pass

3.2.12	Residual static strength	Pass
3.2.13	Corrosion resistance	Pass
5.1 / 5.2	Marking requirements	Ltd
5.3 / 5.4	Instruction requirements	Ltd

Key

	Shading shows the clauses requested. Any other clauses were not requested.
Pass	Requirement satisfied.
Ltd	Testing requested was insufficient completely to verify compliance with the clause. Refer to the "Result details" section for more information.
Fail	Requirement not satisfied. Refer to the "Result details" section for more information.
NAs	Assessment not carried out.
NAp	Requirement not applicable.
NT	Requested but not tested due to early termination following failure.

* Assessment relates only to those specimens which were tested and are the subject of this report.

Submission details

Product	**Quantity**	**Date received**	**INSPEC specimen no.** (2G043+)
Fall arrester, model RGSU58ES	21 sets	7 March 2019	01-21
Single Anchor Lifeline (7m)			
Fall arrester, model RGSU58ES with Single Anchor Lifeline, model VLP50R3L	01 set		22

Procedures

The specimens detailed within the submissions above were used for the tests covered by this report.

Testing was performed in accordance with ANSI Z359.15-2014 unless otherwise specified below. Reference should be made to the standard when reading this report.

Unless stated otherwise, specimens were tested in the condition as received by INSPEC.

Testing was performed at INSPEC's laboratory in Kunshan, China.

The client made the following declarations:

Single anchor lifelines are available in different lengths. They have the same design and are constructed using the same material. Only the lengths are different.

For the purpose of testing, 7m length Single Anchor Lifelines were provided.

Result details

3 Design requirements

3.1 Single Anchor Lifeline Components

3.1.1 Connectors

Specimen 2G04322 was assessed.

Testing of integral connectors was not requested — NAs

3.1.2 Rope characteristics

This clause was not assessed. Manufacturer to certify. — NAs

3.1.3 Elastic elongation

Specimens 2G04319 to 2G04321 were assessed.

The elastic elongation of the single anchor lifeline was 6.2% at a load of 1800 pounds. This was not greater than the 10% permitted. — Pass

3.1.4 Rope diameter

Specimens 2G04319 to 2G04320 were assessed.

The minimum nominal diameter measured was 0.63 inches. This value is more than 0.433 inch permitted. — Pass

3.1.5 Rope fabrication

This clause was not assessed. Manufacturer to certify. — NAs

3.1.6 Materials

This clause was not assessed. Manufacturer to certify. — NAs

3.1.7 Lifeline supplied with factory termination – Breaking strength

Specimens 2G04316 to 2G04318 were assessed.

All specimens withstood the tensile tests of 5,000 pounds applied for 1 minute without breaking. — Pass

3.1.8 Single anchor lifelines supplied with a factory termination

3.1.8.1 Spliced terminations

There were no splice eye terminations. — NAp

3.1.8.2 Stitched terminations

Specimen 2G04322 was assessed.

a) Lock stitches sewn on all stitched eye termination rope was not assessed. Manufacturer to certify. NAs

b) The material and characteristics of thread used was not assessed. Manufacturer to certify. NAs

c) Colour of threads used for sewing the rope and the colour of the rope were not assessed. NAs

d) A properly sized thimble was incorporated as part of the formed eye termination. Pass

e) The ends of the rope were hot-cut to prevent from unravelling. Pass

3.1.8.3 Swaged terminations

There were no swaged eye terminations. NAp

3.1.10 Dual purposes – rope access / descent control applications

Not claimed. NAp

3.1.11 Residual static strength

Specimens 2G04301 to 2G04303 were assessed.

Following the dynamic performance tests, all specimens withstood the tensile test of 1,800 pounds applied for 1 minute without breaking. Pass

3.2 Fall Arrester Components

3.2.1 Connectors

Specimen 2G04322 was assessed.

The fall arrester incorporated a snaphook.

The testing of the snaphook was not requested. NAs

3.2.2 Non-integral energy absorber and energy absorbing lanyards

There was no non-integral energy absorber or energy absorbing lanyards. NAp

3.2.3 Lanyards integral to fall arresters

3.2.3.1 Characteristics

This clause was not assessed. Manufacturer to certify these characteristics NAs

3.2.3.2 Lanyards termination

Specimen 2G04322 was assessed.

The specimen was terminated by stitching.

The terminations satisfied 3.1.8.2, as appropriate (see below). Ltd

3.1.8.2 Stitched terminations

Specimen 2G04322 was assessed.

a) Lock stitches sewn on all stitched eye termination straps were not assessed. Manufacturer to certify. NAs

b) The material and characteristics of thread used was not assessed. Manufacturer to certify. NAs

c) Colour of threads used for sewing the lanyard and the colour of the lanyard were not assessed. NAs

d) This clause is not applicable to the type of lanyard tested. NAp

e) The ends of the lanyard were hot-cut so as to prevent unravelling. Pass

3.2.3.3 Static strength

Specimens 2G04316 to 2G04318 were assessed.

The specimens withstood the tensile test of 3,600 pounds applied for 1 minute without breaking. Pass

3.2.3.4 Connectors

Specimen 2G04322 was assessed.

The specimen included a snaphook. Testing of the snaphook was not requested NAs

3.2.3.5 Deployment indicator or warning flag

Subsequent to the testing of specimens 2G04301 against 3.2.10, it became obvious that the energy absorber had been activated. Pass

3.2.4 Locking (fall stopping) function

Specimen 2G04313 was assessed.

During the dynamic performance test in 3.2.5, the locking features of the fall arrester activated without any intervention. Pass

3.2.5 Dynamic performance (Manual override)

Specimens 2G04313 to 2G04315 were assessed.

During the dynamic performance manual override tests,

The fall arrester arrested the fall, and holds the load for a minimum of 1-minute without moving further down the lifeline. Pass

The total fall distances were:

Specimen 2G04313 – 10.0 ft Pass
Specimen 2G04314 – 10.7 ft Pass
Specimen 2G04315 – 10.6 ft Pass

These values were less than the maximum 11 feet permitted.

The average arrest forces were:

Specimen 2G04313 – 731 pounds Pass
Specimen 2G04314 – 760 pounds Pass
Specimen 2G04315 – 762 pounds Pass

These values were less than the maximum 900 pounds permitted.

The maximum arrest forces were:

Specimen 2G04313 – 907 pounds Pass
Specimen 2G04314 – 951 pounds Pass
Specimen 2G04315 – 997 pounds Pass

These values were less than the maximum 1,800 pounds permitted.

See Annex 1 for the plots of force versus time.

Specimen 2G04322 was assessed.

3.2.6 Two consecutive and deliberate actions were required to open the fall arrester. Pass

3.2.7 The fall arrester did not include a knot or hitch. Pass

3.2.8 No mating connectors were provided by the manufacturer. NAp

3.2.9 Static strength

Specimens 2G04316 to 2G04318 were assessed.

The specimens withstood the tensile test of 3,600 pounds applied for 1 minute without release the load. Pass

3.2.10 Dynamic performance - Ambient

Specimens 2G04301 to 2G04303 were assessed.

During the dynamic performance tests,

The fall arrester locked on the lifeline and remains locked, holding the test weight for a minimum of 1-minute until released. Pass

The total fall distances were:

Specimen 2G04301 – 11.0 ft Pass
Specimen 2G04302 – 10.4 ft Pass
Specimen 2G04303 – 10.7 ft Pass

These values were less than the maximum 11 feet permitted.

The average arrest forces were:

Specimen 2G04301 – 784 pounds Pass
Specimen 2G04302 – 787 pounds Pass
Specimen 2G04303 – 792 pounds Pass

These values were less than the maximum 900 pounds permitted.

The maximum arrest forces were:

Specimen 2G04301 – 1006 pounds Pass
Specimen 2G04302 – 1032 pounds Pass
Specimen 2G04303 – 1030 pounds Pass

These values were less than the maximum 1,800 pounds permitted.

See Annex 1 for the plots of force versus time.

3.2.10 Dynamic performance – Hot conditioning test

Specimens 2G04304 to 2G04306 were assessed.

During the dynamic performance tests,

The fall arrester locked on the lifeline and remains locked, holding the test weight for a minimum of 1-minute until released. Pass

The total fall distances were:

Specimen 2G04304 – 10.5 ft Pass
Specimen 2G04305 – 10.7 ft Pass
Specimen 2G04306 – 10.6 ft Pass

These values were less than the maximum 11 feet permitted.

The average arrest forces were:

Specimen 2G04304 – 756 pounds Pass
Specimen 2G04305 – 759 pounds Pass
Specimen 2G04306 – 783 pounds Pass

These values were less than the maximum 900 pounds permitted.

The maximum arrest forces were:

Specimen 2G04304 – 1076 pounds Pass
Specimen 2G04305 – 1045 pounds Pass
Specimen 2G04306 – 1094 pounds Pass

These values were less than the maximum 1,800 pounds permitted.

See Annex 1 for the plots of force versus time.

3.2.10 Dynamic performance – Cold conditioning test

Specimens 2G04307 to 2G04309 were assessed.

During the dynamic performance tests,

The fall arrester locked on the lifeline and remains locked, holding the test weight for a minimum of 1-minute until released. Pass

The total fall distances were:

Specimen 2G04307 – 9.7 ft Pass
Specimen 2G04308 – 10.3 ft Pass
Specimen 2G04309 – 9.9 ft Pass

These values were less than the maximum 11 feet permitted.

The average arrest forces were:

Specimen 2G04307 – 815 pounds Pass
Specimen 2G04308 – 793 pounds Pass
Specimen 2G04309 – 803 pounds Pass

These values were less than the maximum 900 pounds permitted.

The maximum arrest forces were:

Specimen 2G04307 – 953 pounds Pass
Specimen 2G04308 – 971 pounds Pass
Specimen 2G04309 – 947 pounds Pass

These values were less than the maximum 1,800 pounds permitted.

See Annex 1 for the plots of force versus time.

3.2.10 Dynamic performance – Wet conditioning test

Specimens 2G04310 to 2G04312 were assessed.

During the dynamic performance tests,

The fall arrester locked on the lifeline and remains locked, holding the test weight for a minimum of 1-minute until released. Pass

The total fall distances were:

Specimen 2G04310 – 10.1 ft Pass
Specimen 2G04311 – 10.2 ft Pass
Specimen 2G04312 – 9.9 ft Pass

These values were less than the maximum 11 feet permitted.

The average arrest forces were:

Specimen 2G04310 – 835 pounds Pass
Specimen 2G04311 – 881 pounds Pass
Specimen 2G04312 – 865 pounds Pass

These values were less than the maximum 900 pounds permitted.

The maximum arrest forces were:

Specimen 2G04310 – 1250 pounds Pass
Specimen 2G04311 – 1256 pounds Pass
Specimen 2G04312 – 1245 pounds Pass

These values were less than the maximum 1,800 pounds permitted.

See Annex 1 for the plots of force versus time.

3.2.11 Function test

Specimens 2G04319 to 2G04321 were assessed.

The specimens travelled up and down the lifeline without assistance. Pass

3.2.12 Residual static strength

Specimens 2G04301 to 2G04303 were assessed.

Following the dynamic performance tests, the fall arrester did not move down the lifeline when a tensile force of 660 pounds was applied for 1 minute. Pass

3.2.13 Corrosion resistance

Specimens 2G04319 to 2G04321 were assessed.

Following the salt spray test, there was no evidence of corrosion of the base metal and the fall arrester operated as intended. Pass

5 Markings and Instructions

5.1 General Marking Requirements

5.1.1 Markings shall be in English. Pass

5.1.2 The legibility and attachment of required markings shall endure for the life of the fall arrester or single anchor lifeline being marked was not assessed. NAs

The marking labels were provided electronically and use for assessment.

When pressure sensitive labels are used, they shall comply with the applicable provision of reference UL 969-89, Marking and Labelling Systems. This requirement was not assessed. Manufacturer to certify. NAs

5.2 Specific Marking Requirements

5.2.1 Fall arresters shall be marked with the following:

· Part number or model designation; [RGSU58ES] Pass

· Year of manufacture; Pass

· Manufacturer's name or logo; [FRONTLINE] Pass

· Capacity rating; [130-310lbs] Pass

· Serial number; Pass

· Standard number "Z359.15"; Pass

· Warning to follow the manufacturer's instructions included with the equipment at time of shipment from the manufacturer; Pass

· The direction of use of the fall arrester on its single anchor lifeline; Pass

· The proper size(s) and type(s) of single anchor lifeline with which the fall arrester is intended to be used; [5/8 inch] Pass

· Warning to use only manufacturer approved lanyards according to instructions. Pass

5.2.2 Single anchor lifelines shall be marked to identify:

· The fiber used in the material of construction; [Nylon] Pass

· The diameter of lifeline; [5/8 inch] Pass

· The length of the lifeline; Pass

· The model of fall arrester(s) acceptable for use with the lifeline; [RGSU58ES] Pass

· The need to avoid contact with sharp edges and abrasive surfaces; Pass

· Standard number "Z359.15"; Pass

· Serial number; Pass

· Part number or model designation; Pass

· Year of manufacture; Pass

· Manufacturer's name or logo. [FRONTLINE] Pass

5.2.3 Integral lanyards shall be marked to identify:

· The material used in lanyard construction;	NAp
· The length of the lanyard;	NAp
· The need to avoid contact with sharp edges and abrasive surfaces;	NAp
· The need to make only compatible connections;	NAp
· The average arrest force, maximum free fall distance, maximum deployment distance and capacity;	NAp
· Standard number “Z359.15”;	NAp
· Serial number;	NAp
· Part number or model designation;	NAp
· Year of manufacture;	NAp
· Manufacturer’s name or logo.	NAp

5.3 General Instruction Requirements

5.3.1	Instructions shall be provided to the user, printed in English and affixed to the equipment at the time of shipment from the manufacturer.	NAs
5.3.2	Instructions shall contain the following information:	
	· A statement that the manufacturer's instructions shall be provided to users;	Pass
	· Manufacturer's name, address and telephone number;	Pass
	· Manufacturer's part number or model designation for the equipment;	Pass
	· Intended use and purpose of the equipment;	Pass
	· Proper method of use and limitations on use of the equipment;	Pass
	· Illustrations showing locations of markings on the equipment;	Pass
	· Reproduction of printed information on all markings;	Pass
	· Inspection procedures required to assure the equipment is in serviceable condition and operating correctly;	Pass
	· Anchorage requirements;	Pass
	· Criteria for discarding and retiring equipment which fails inspection;	Pass
	· Procedures for cleaning, maintenance and storage;	Pass
	· A reference chart that indicates the clearance requirements of the system according to the fall	Pass
5.3.3	Instructions shall require that only the equipment manufacturer, or persons or entities authorized in writing by the manufacturer, shall make repairs to equipment.	Pass
5.3.4	Instructions shall require the user to remove equipment from field service if it has been subject ed to the forces of arresting a fall.	Pass
5.3.5	Instructions shall require the user to have a rescue plan and the means at hand to implement it when using the equipment.	Pass
5.3.6	Instructions shall provide warnings regarding:	
	· Altering the equipment;	Pass
	· Misusing the equipment;	Pass
	· Using combinations of fall arresters, lanyards, lifelines, which may affect or interfere with the safe function of each other;	Pass
	· Exposing the equipment to chemicals which may produce a harmful effect and to consult the manufacturer in cases of doubt;	Pass
	· Using the equipment around moving machinery and electrical hazards;	Pass
	· Using the equipment near sharp edges and abrasive surfaces, as well as the need for abrasion protection;	Pass
	· Other warnings deemed necessary by the manufacturer.	Pass

5.4 Specific Instruction Requirements

5.4.1 Fall Arresters. In addition to the requirements in 5.3, instructions for fall arresters shall include:

· Acceptable lanyards, by make and model, for use with the fall arrester;	Pass
· How to attach the lanyard to the fall arrester;	NAp
· The maximum allowable free fall distance;	Pass
· Proper method of connection to the full body harness (frontal and/or dorsal connection);	Pass
· Warnings that the fall arrester shall be attached to no more than one lifeline;	Pass
· Warnings that the fall arrester shall be attached to no more than one user;	Pass
· Warnings to avoid exposure to physical and chemical hazards which the fall arrester is not designed to withstand;	Pass
· Instructions to not manipulate or hold the fall arrester body or lever, but to move the fall arrester up/down by the lanyard;	Pass
· The maximum arrest distance and clearance requirement when dynamically tested in accordance with the requirements of this standard;	Pass
· The proper size, construction and type of single anchor lifelines with which the fall arrester is intended to be used;	Pass
· Warnings to emphasize that anchoring be above the user to prevent pendulum fall;	Pass
· Warnings to emphasize use is not suitable when the user is positioned on an unstable surface, fine grain material or particulate solids such as sand or coal;	Pass
· Information for determining total fall distance including lifeline elongation;	Pass
· Capacity range of 130 to 310 pounds;	Pass
· Standard number “Z359.15”.	Pass

5.4.2 Single Anchor Lifelines. In addition to the requirements in 5.3, instructions for single anchor lifelines shall include:

· The material used in the single anchor lifeline construction;	Pass
· Proper method of coupling the single anchor lifeline to anchorage connectors and anchorages with which it is intended to be used and to adjacent components of the system;	Pass
· The minimum static strength;	Pass
· Warnings that only one fall arrester be attached to the single anchor lifeline;	Pass
· Warnings that only one user can be attached to the single anchor lifeline;	Pass
· Warnings to avoid exposure to physical and chemical hazards which the single anchor lifeline is not designed to withstand;	Pass
· Warnings using the equipment near sharp edges and abrasive surfaces and the need for abrasion protection;	Pass
· Warnings to avoid swing fall hazards encountered when the anchorage is not directly overhead;	Pass
· The proper fall arrester, by make and model, with which the single anchor lifeline is intended to be used;	Pass
· The percentage of stretch of the lifeline when loaded to 900 pounds (4 kN);	Pass
· Capacity range of 130 to 310 pounds;	Pass
· Lifeline melting point;	Pass
· Standard number “Z359.15”;	Pass
· If permissible by the manufacturer, specific directions how to cut damaged sections from the lifelines and how to re-label non-terminated lifelines according to 5.2.2;	NAp
· Direction how to stabilize the lower end of the lifeline with a weight or alternative method directed by the manufacturer;	Pass
· Direction(s) regarding placement of a rope stop to prevent the fall arrester inadvertently traveling off the end of the lifeline.	Pass

Estimates of the uncertainty of measurement

Clause	Test		Uncertainty
3.1.1	Connectors		See report
3.1.2	Rope to meet clause 7.2.1		-
3.1.3	Elastic elongation		± 0.5%
3.1.4	Rope diameter		± 0.001 inches
3.1.5	Rope fabrication		-
3.1.6	Material characteristics		-
3.1.7	Breaking strength - lifeline supplied with factory termination		See Note 1
3.1.8	Single anchor lifelines supplied with a factory termination		-
3.1.9	Breaking strength – lifeline supplied without factory termination		See Note 1
3.1.10	Dual purposes – Rope access / Descent control applications		-
3.1.11	Residual static strength		See Note 1
3.1.12.1	Breaking strength – wire rope lifeline		See Note 1
3.1.12.2	Diameter and construction		± 0.001 inches
3.1.12.3	Factory terminations		-
3.2.1	Connectors		See report
3.2.2	Non-integral energy absorber and energy absorbing lanyards		See report
3.2.3.3	Breaking strength – lanyards integral to fall arresters		See Note 1
3.2.3.4	Integral connectors – lanyards integral to fall arresters		See report
3.2.4	Locking		-
3.2.5	Dynamic performance (Manual override)	Force	± 3.0%
		Fall distance	± 0.04 inches
3.2.8	Integral rings and openings		-
3.2.9	Static strength		See Note 1
3.2.10	Dynamic performance – ambient	Force	± 3.0%
		Fall distance	± 0.04 inches
	Dynamic performance – various conditions	Force	± 3.0%
		Fall distance	± 0.04 inches
3.2.11	Function test		-
3.2.12	Residual static strength		± 1.7%
3.2.13	Corrosion resistance		-
5.1 / 5.2	Marking requirements		See Note 1
5.3 / 5.4	Instruction requirements		See Note 1

Note 1 The acceptance criterion for this test is a straightforward “Pass/Fail”, rather than a numerical value. Consequently, as there is no value to be reported, uncertainty has not been reported either.

Note 2 The uncertainty value is based on a standard uncertainty multiplied by a coverage factor k = 2, which provides for a confidence level of approximately 95%. Values expressed as a percentage (%) are relative.

Note 3 It should be noted that the above values have not been taken into account when making assessment to the pass/fail criteria.

ANNEX

This Annex comprises two sections.

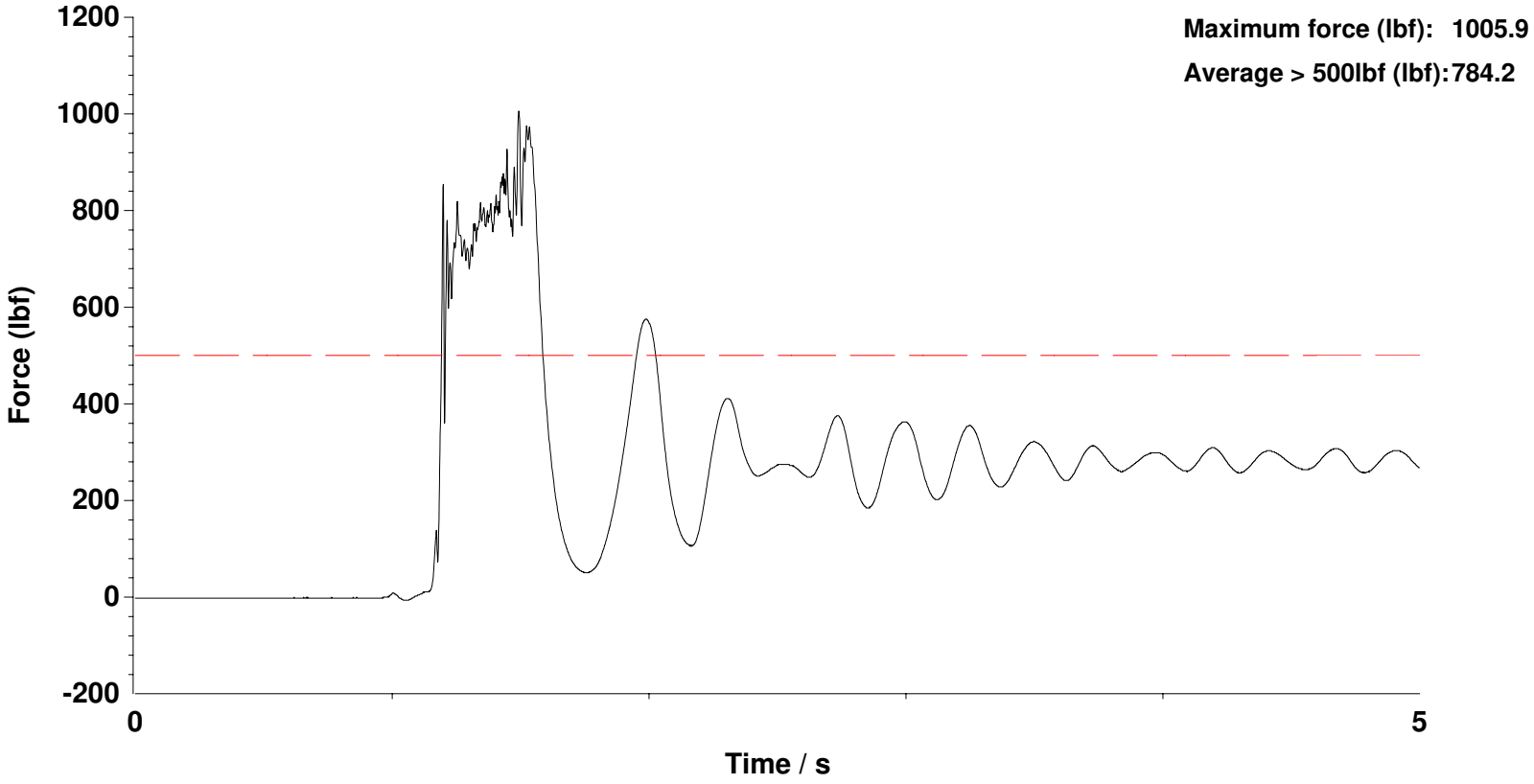
1. Plots of arrest force versus time. (15 pages)

2. Photograph of the product tested. (1 page)

END OF REPORT

INSPEC Technical Services

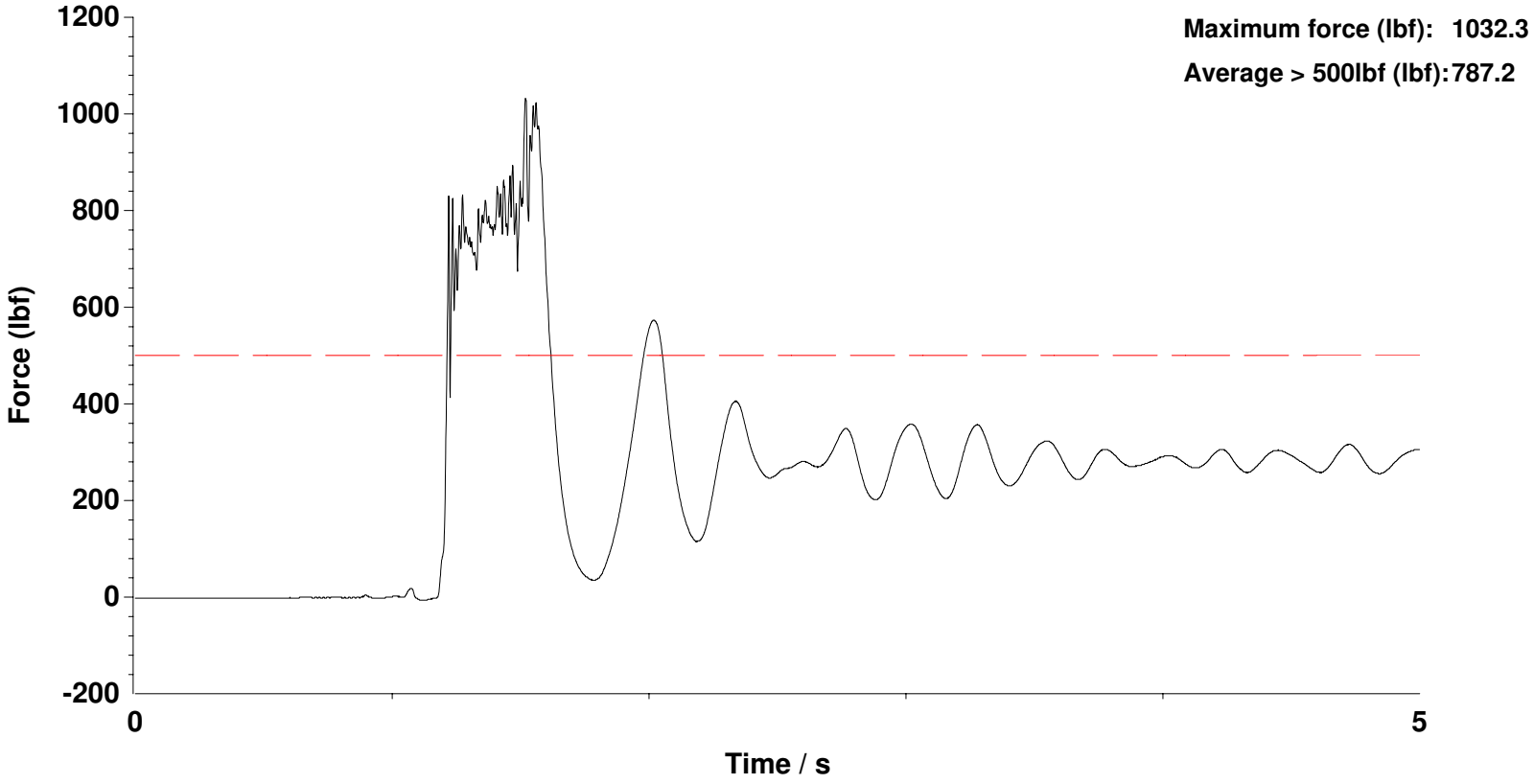
Technician:	LJ/SS
Standard	ANSI Z359.15-2014 Single Anchor Lifeline & Fall arrester
Sample / File name:	2G04301
Drop item	Drop mass 128 kg U.S
Orientation/Attachment Point:	Centre eyebolt
Time and Date of Test:	15:58 30/04/19



Results do not achieve full ANAB status until a formal test report has been issued.

INSPEC Technical Services

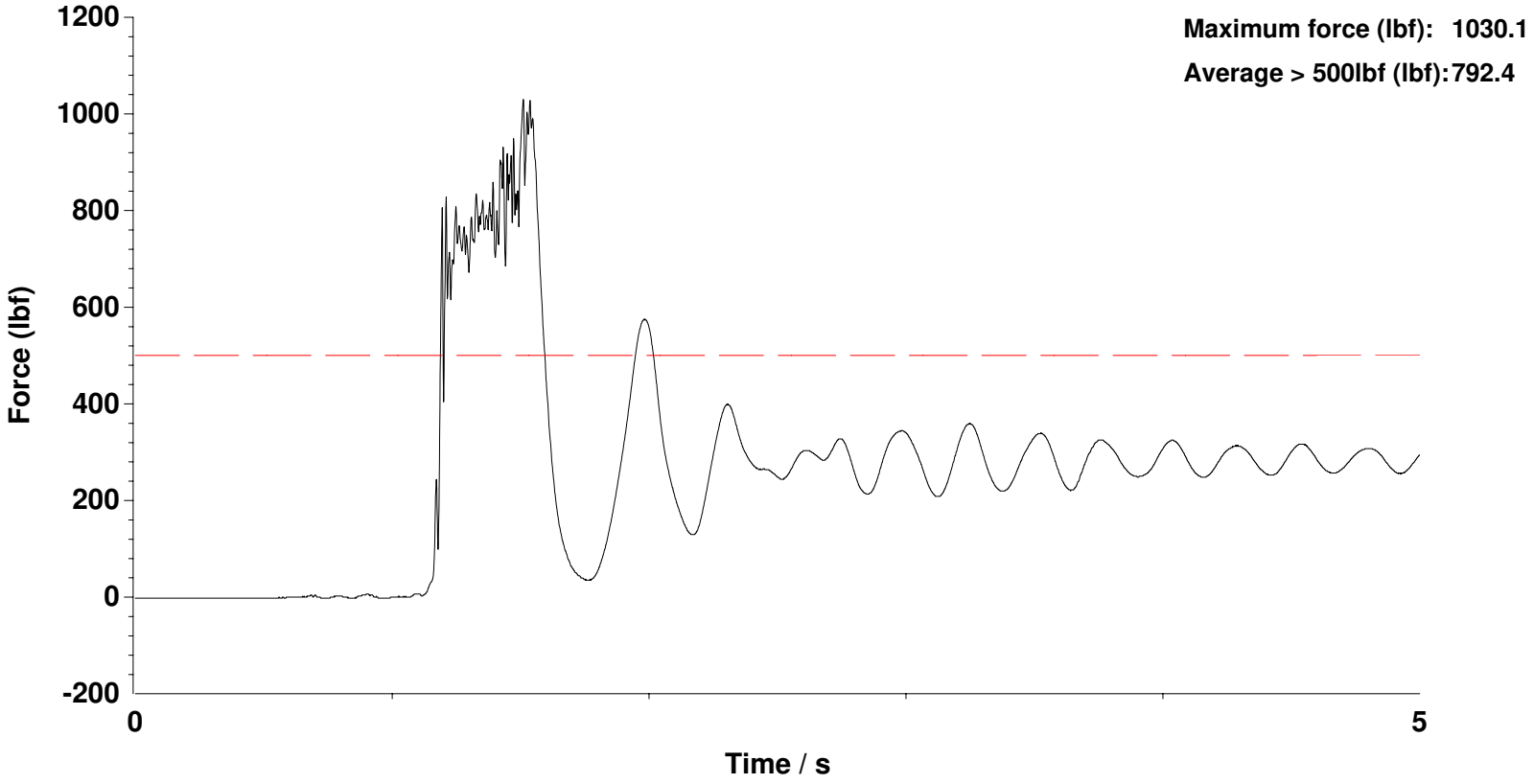
Technician:	LJ/SS
Standard	ANSI Z359.15-2014 Single Anchor Lifeline & Fall arrester
Sample / File name:	2G04302
Drop item	Drop mass 128 kg U.S
Orientation/Attachment Point:	Centre eyebolt
Time and Date of Test:	16:08 30/04/19



Results do not achieve full ANAB status until a formal test report has been issued.

INSPEC Technical Services

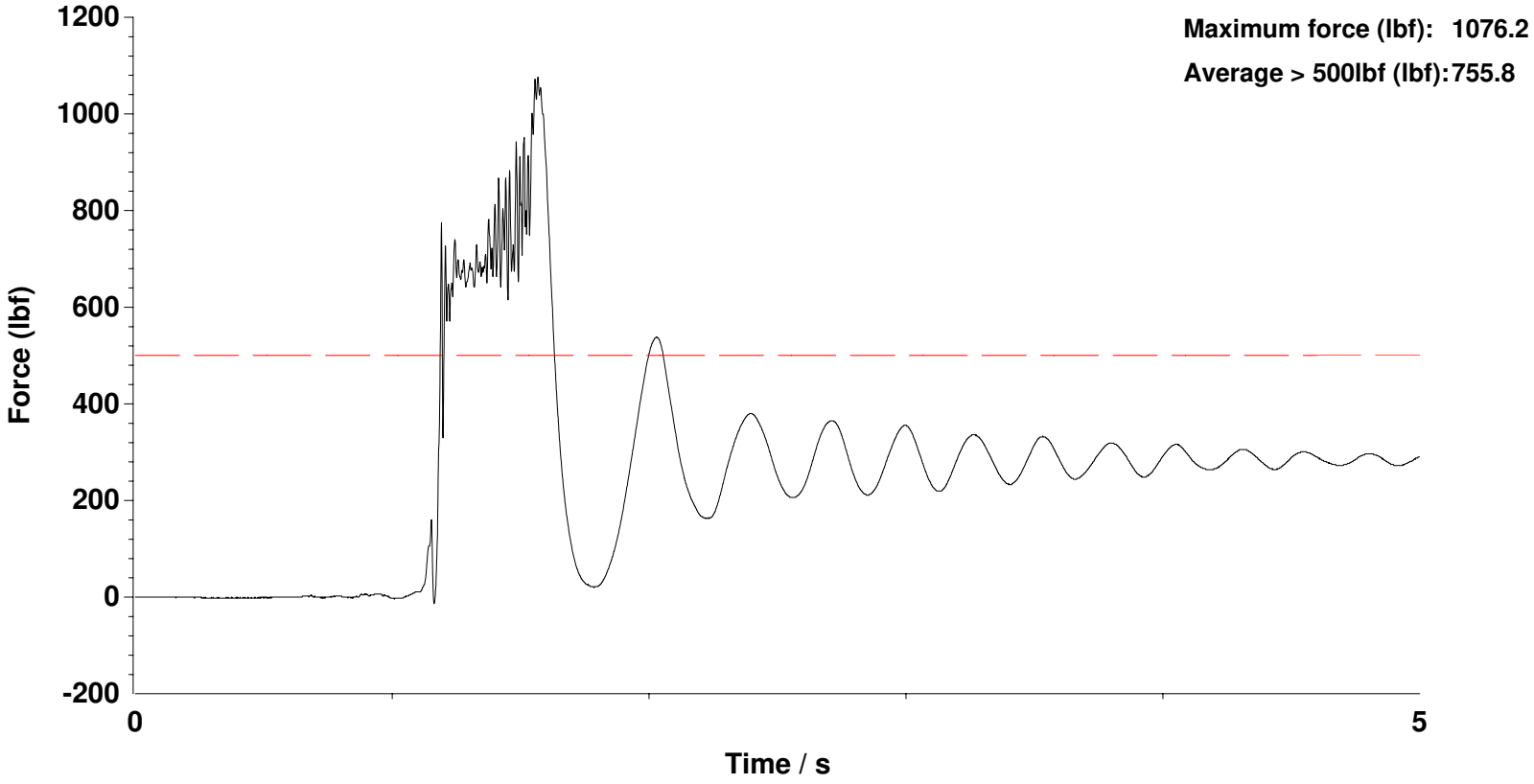
Technician:	LJ/SS
Standard	ANSI Z359.15-2014 Single Anchor Lifeline & Fall arrester
Sample / File name:	2G04303
Drop item	Drop mass 128 kg U.S
Orientation/Attachment Point:	Centre eyebolt
Time and Date of Test:	16:17 30/04/19



Results do not achieve full ANAB status until a formal test report has been issued.

INSPEC Technical Services

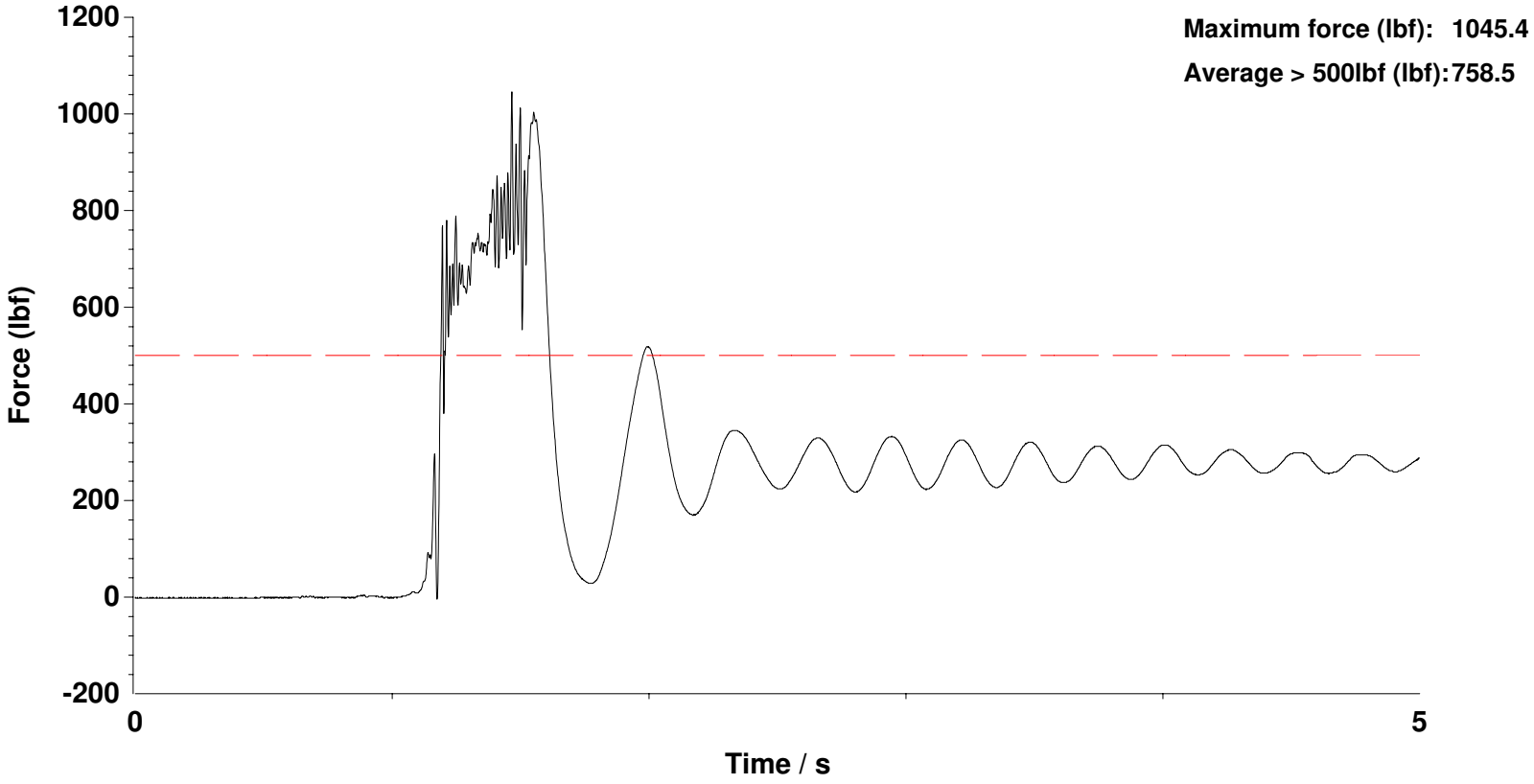
Technician:	LJ/SS
Standard	ANSI Z359.15-2014 Single Anchor Lifeline & Fall arrester
Sample / File name:	2G04304
Drop item	Drop mass 128 kg U.S
Orientation/Attachment Point:	Centre eyebolt
Time and Date of Test:	16:28 30/04/19



Results do not achieve full ANAB status until a formal test report has been issued.

INSPEC Technical Services

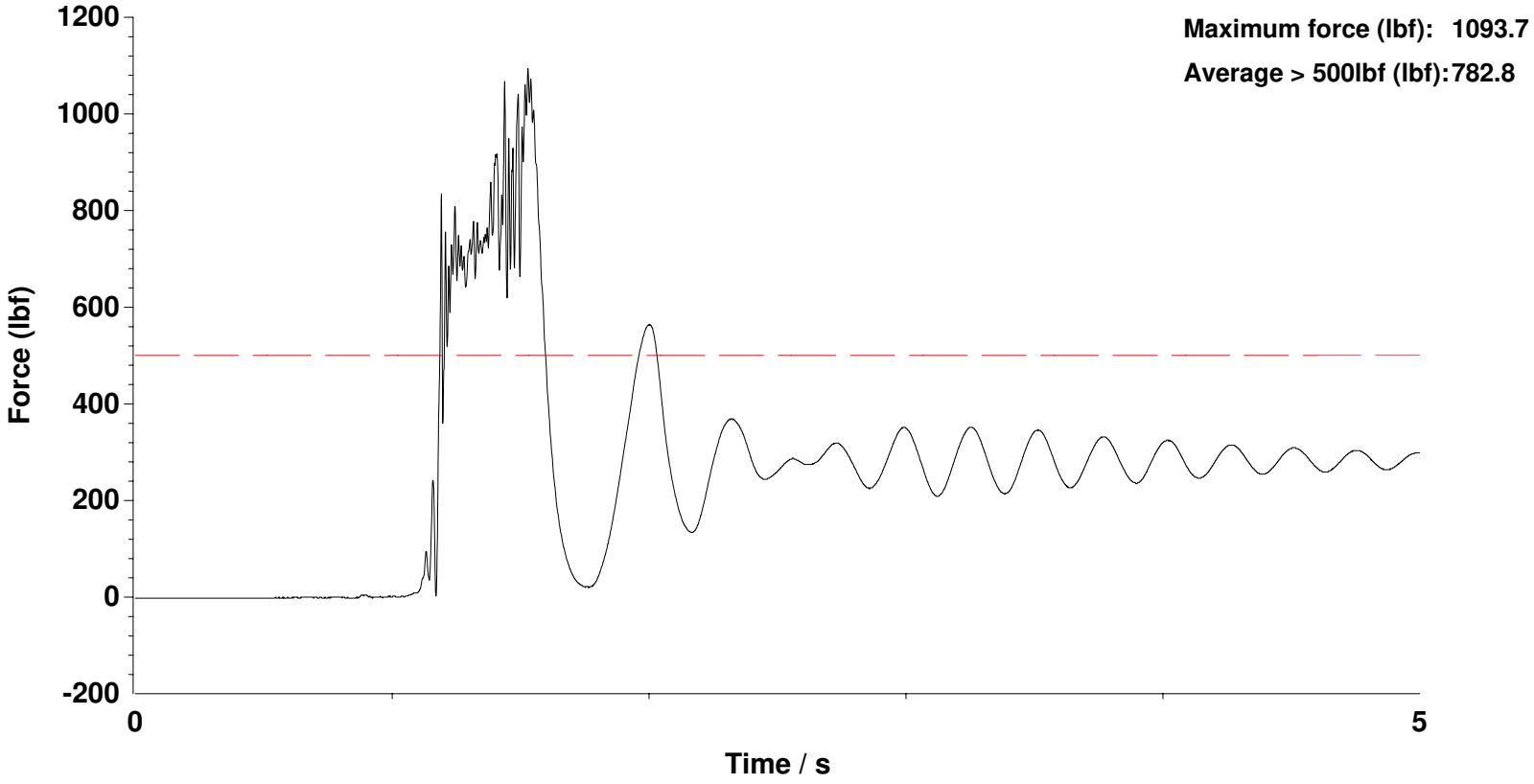
Technician:	LJ/SS
Standard	ANSI Z359.15-2014 Single Anchor Lifeline & Fall arrester
Sample / File name:	2G04305
Drop item	Drop mass 128 kg U.S
Orientation/Attachment Point:	Centre eyebolt
Time and Date of Test:	16:37 30/04/19



Results do not achieve full ANAB status until a formal test report has been issued.

INSPEC Technical Services

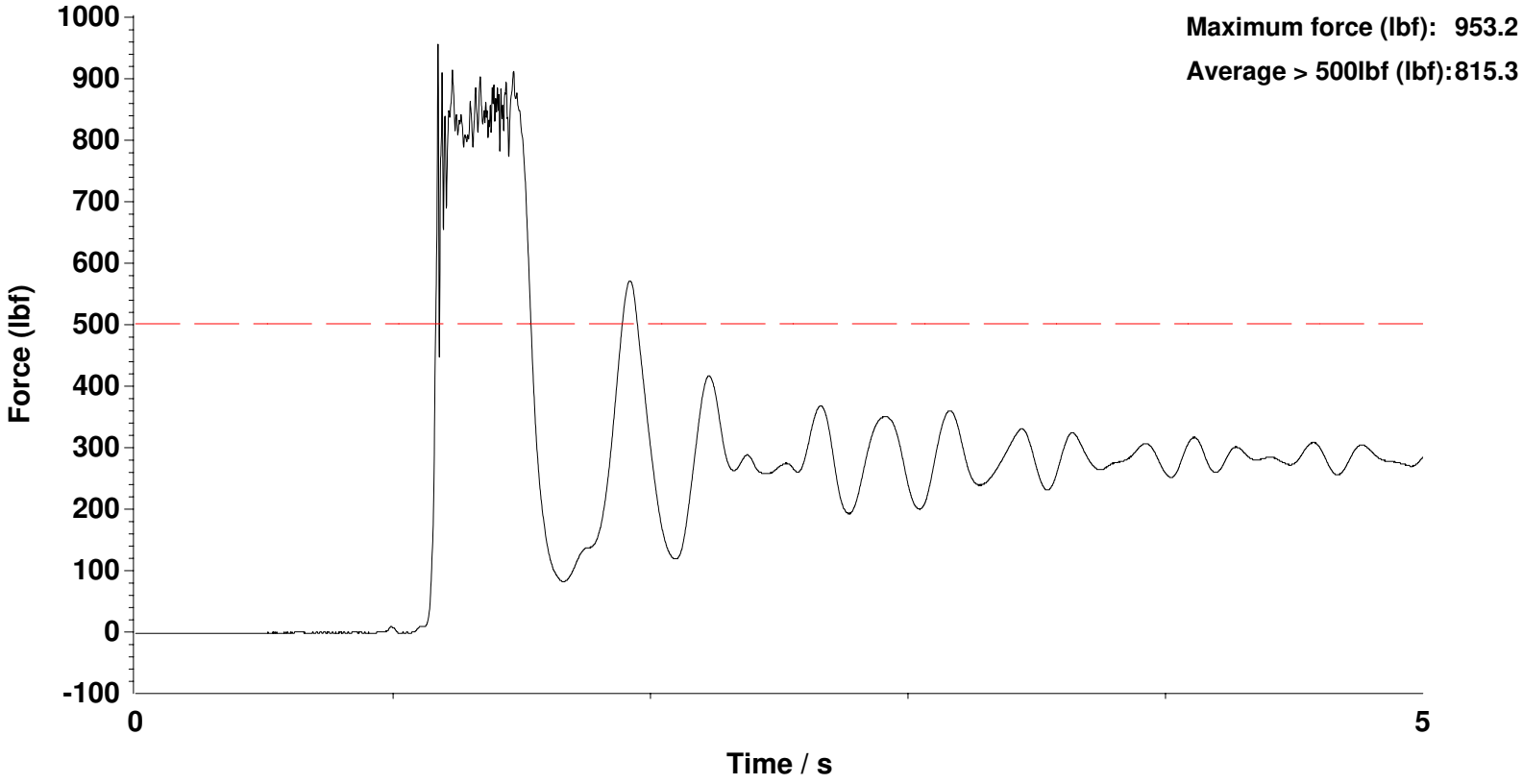
Technician:	LJ/SS
Standard	ANSI Z359.15-2014 Single Anchor Lifeline & Fall arrester
Sample / File name:	2G04306
Drop item	Drop mass 128 kg U.S
Orientation/Attachment Point:	Centre eyebolt
Time and Date of Test:	16:43 30/04/19



Results do not achieve full ANAB status until a formal test report has been issued.

INSPEC Technical Services

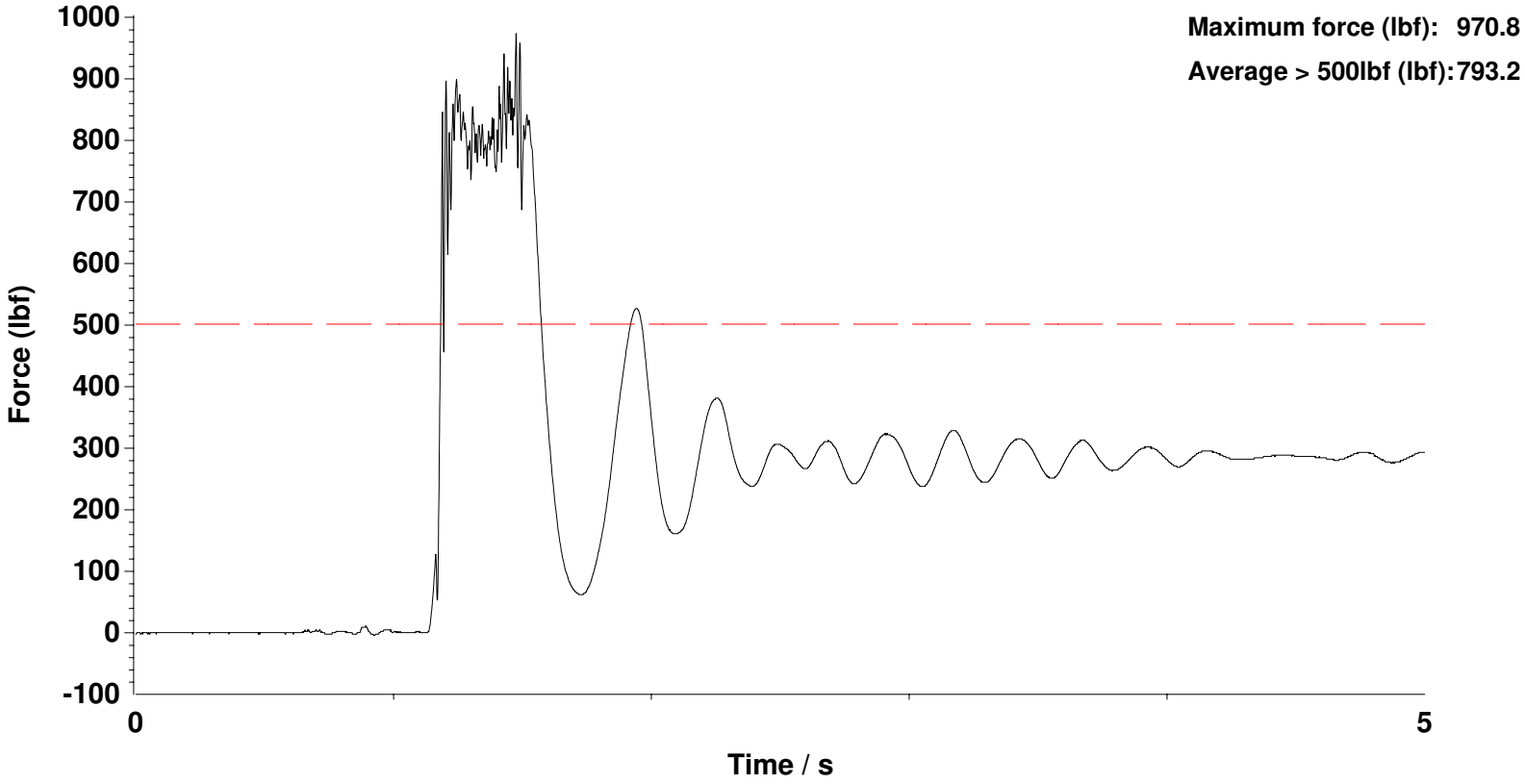
Technician:	LJ/SS
Standard	ANSI Z359.15-2014 Single Anchor Lifeline & Fall arrester
Sample / File name:	2G04307
Drop item	Drop mass 128 kg U.S
Orientation/Attachment Point:	Centre eyebolt
Time and Date of Test:	16:49 30/04/19



Results do not achieve full ANAB status until a formal test report has been issued.

INSPEC Technical Services

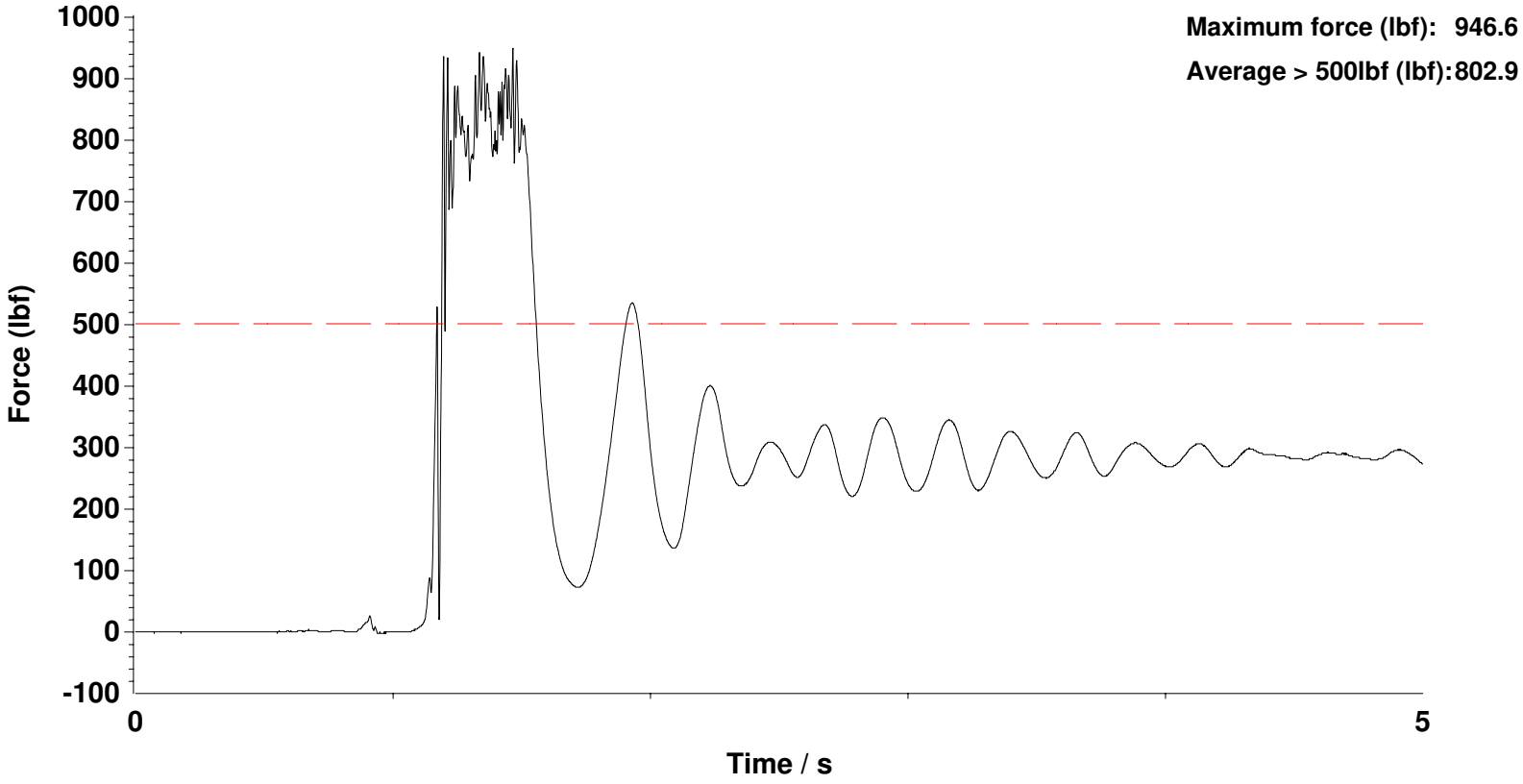
Technician:	LJ/SS
Standard	ANSI Z359.15-2014 Single Anchor Lifeline & Fall arrester
Sample / File name:	2G04308
Drop item	Drop mass 128 kg U.S
Orientation/Attachment Point:	Centre eyebolt
Time and Date of Test:	16:56 30/04/19



Results do not achieve full ANAB status until a formal test report has been issued.

INSPEC Technical Services

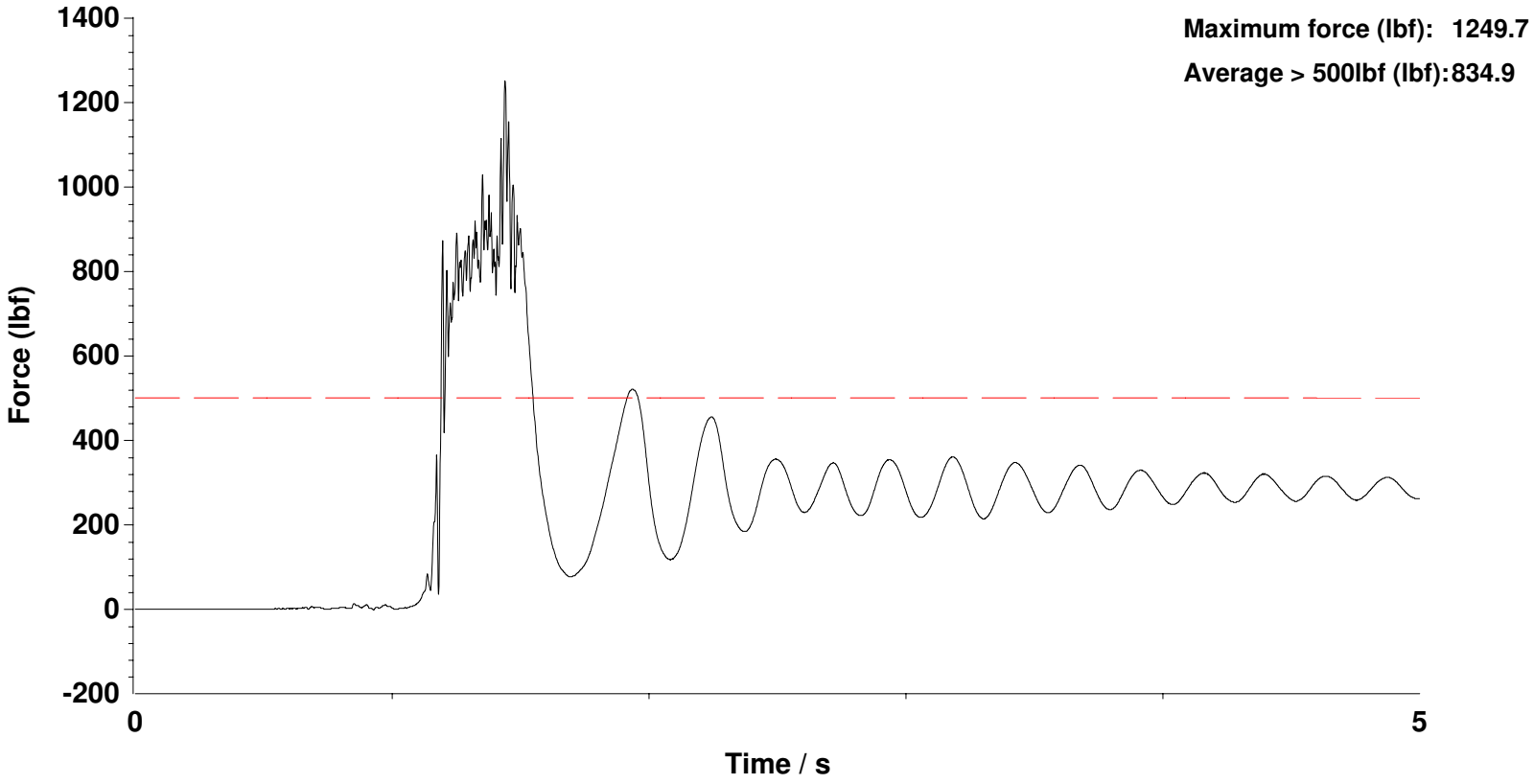
Technician:	LJ/SS
Standard	ANSI Z359.15-2014 Single Anchor Lifeline & Fall arrester
Sample / File name:	2G04309
Drop item	Drop mass 128 kg U.S
Orientation/Attachment Point:	Centre eyebolt
Time and Date of Test:	17:02 30/04/19



Results do not achieve full ANAB status until a formal test report has been issued.

INSPEC Technical Services

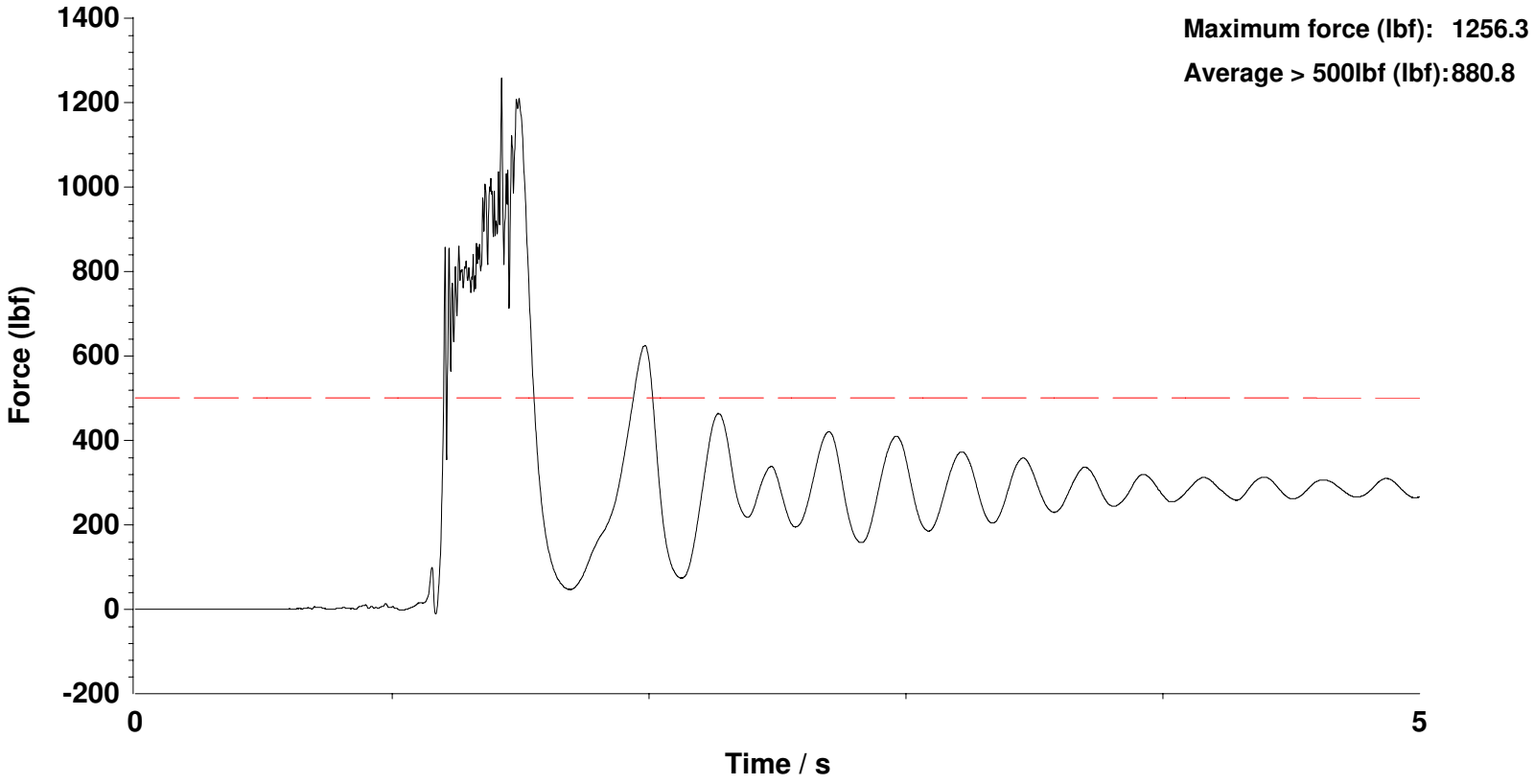
Technician:	LJ/SS
Standard	ANSI Z359.15-2014 Single Anchor Lifeline & Fall arrester
Sample / File name:	2G04310
Drop item	Drop mass 128 kg U.S
Orientation/Attachment Point:	Centre eyebolt
Time and Date of Test:	17:15 30/04/19



Results do not achieve full ANAB status until a formal test report has been issued.

INSPEC Technical Services

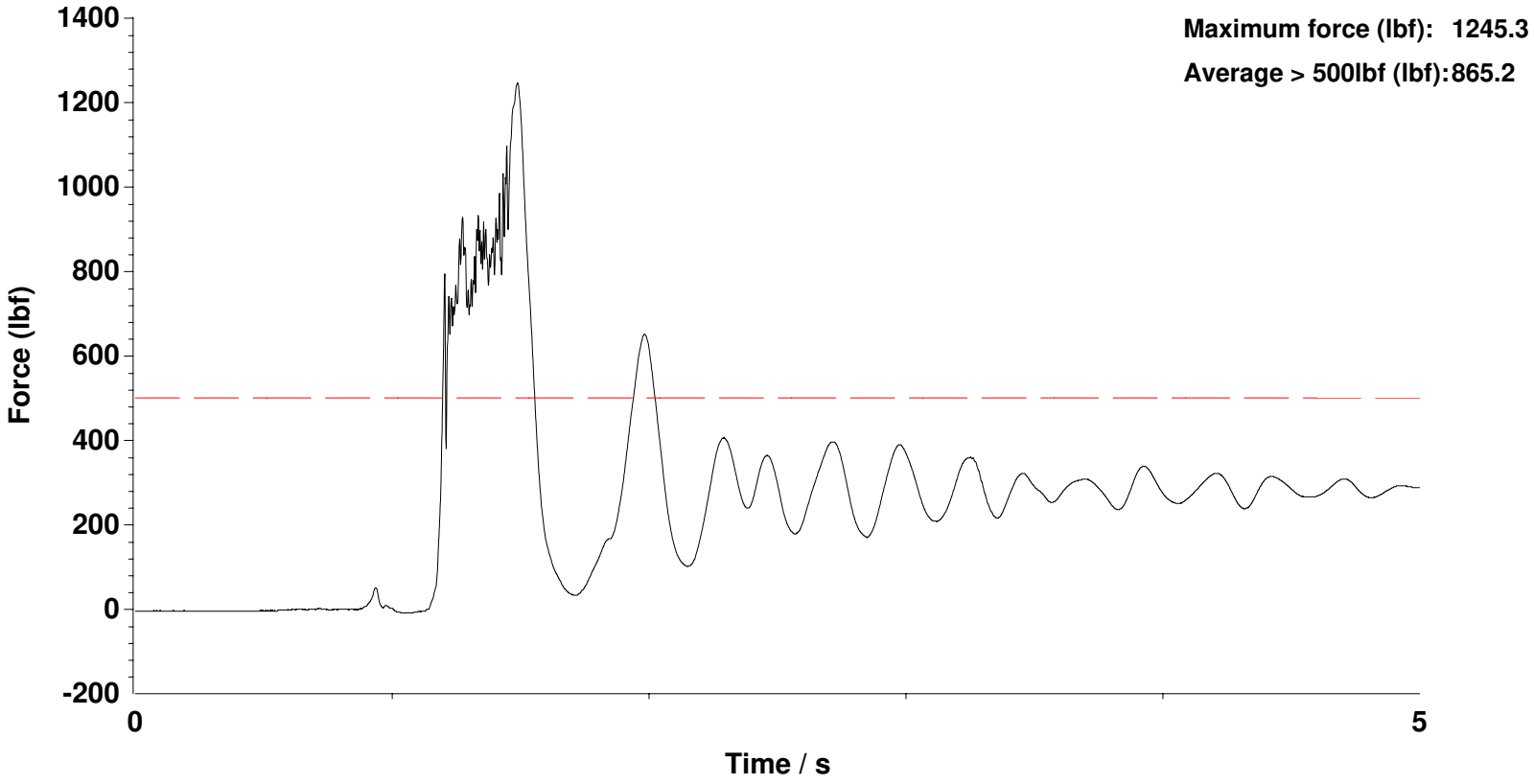
Technician:	LJ/SS
Standard	ANSI Z359.15-2014 Single Anchor Lifeline & Fall arrester
Sample / File name:	2G04311
Drop item	Drop mass 128 kg U.S
Orientation/Attachment Point:	Centre eyebolt
Time and Date of Test:	17:22 30/04/19



Results do not achieve full ANAB status until a formal test report has been issued.

INSPEC Technical Services

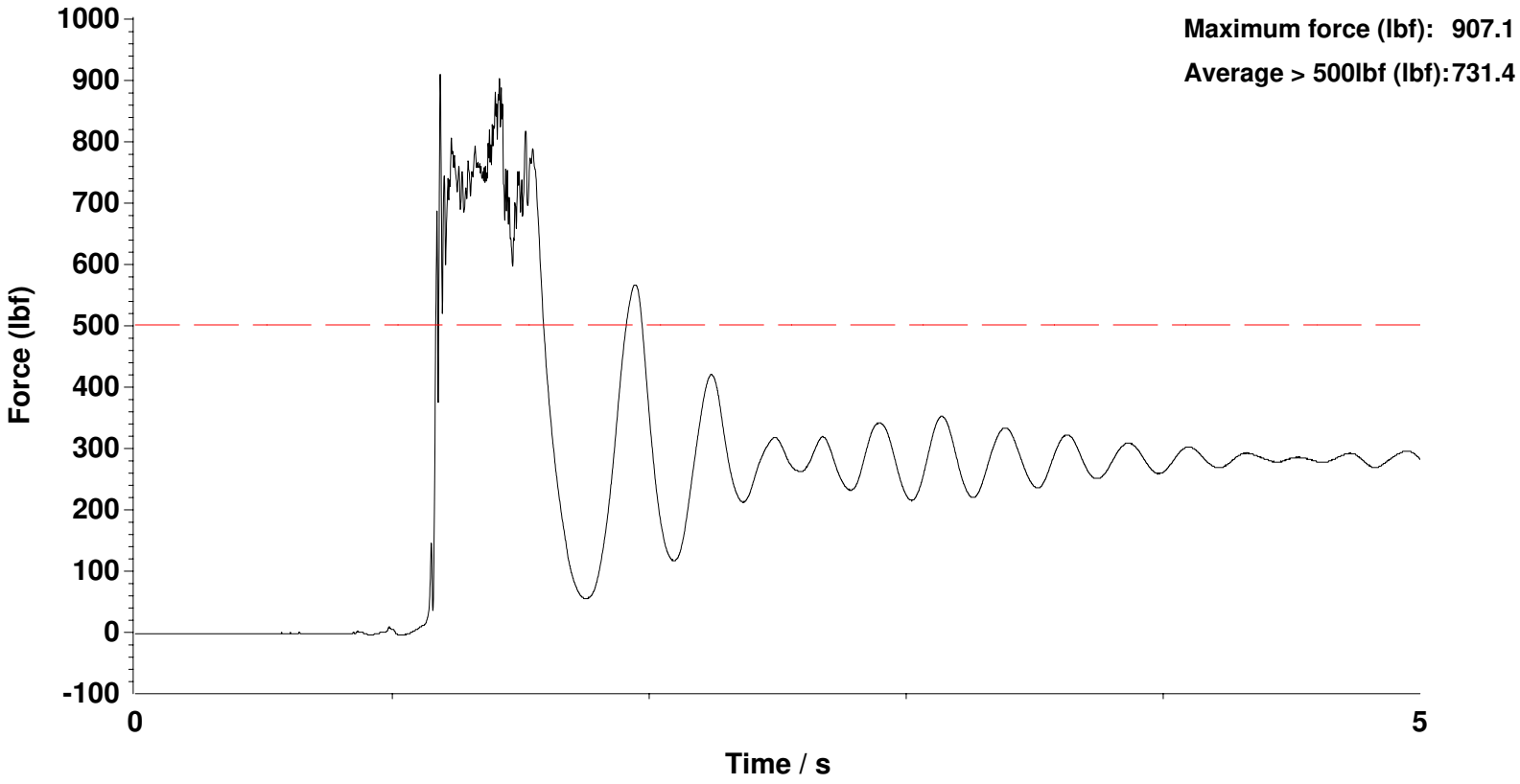
Technician:	LJ/SS
Standard	ANSI Z359.15-2014 Single Anchor Lifeline & Fall arrester
Sample / File name:	2G04312
Drop item	Drop mass 128 kg U.S
Orientation/Attachment Point:	Centre eyebolt
Time and Date of Test:	17:09 30/04/19



Results do not achieve full ANAB status until a formal test report has been issued.

INSPEC Technical Services

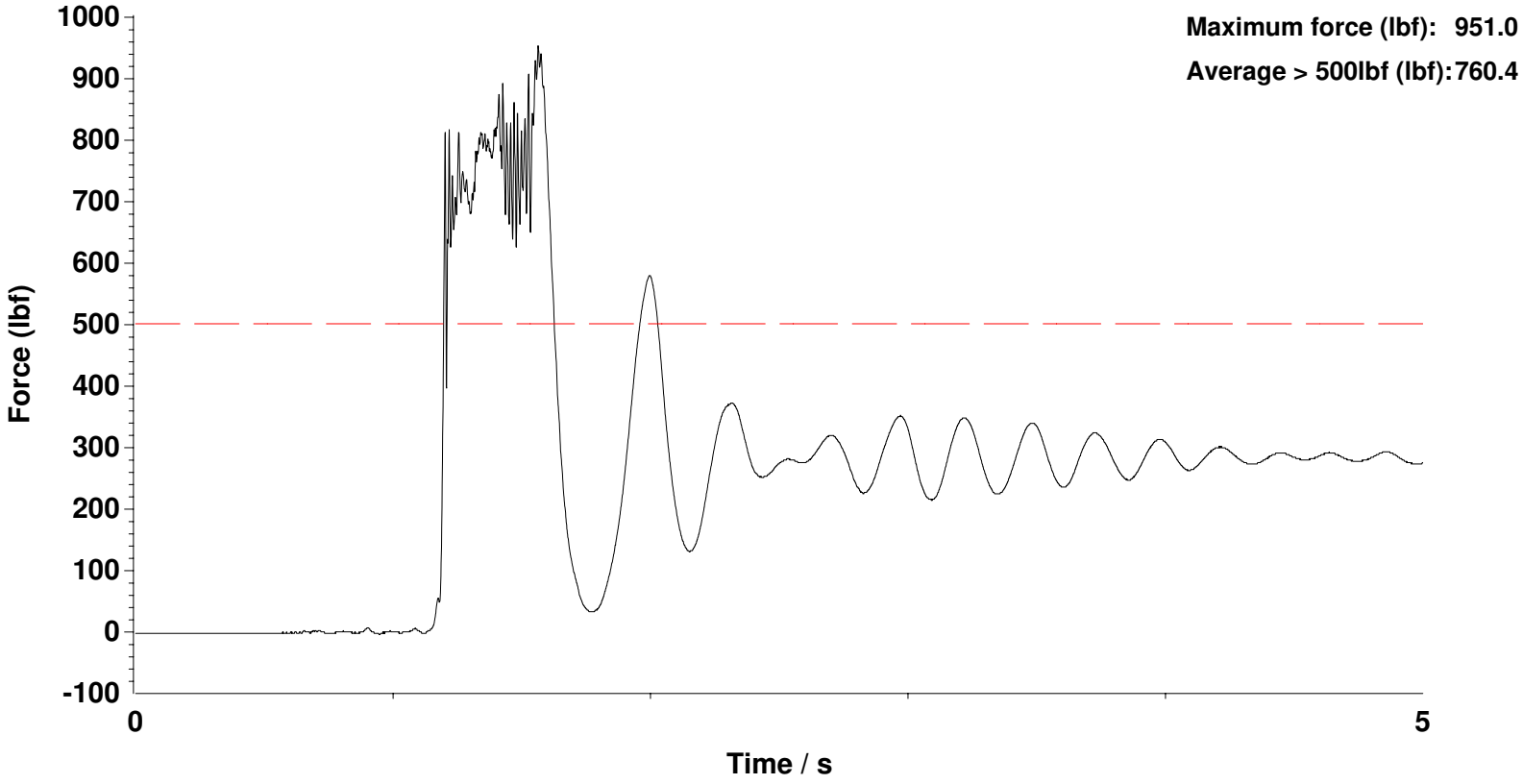
Technician:	SS/LJ
Standard	ANSI Z359.15-2014 Single anchor lifeline+FA
Sample / File name:	2G04313
Drop item	Drop weight, U.S
Orientation/Attachment Point:	Centre eyebolt
Time and Date of Test:	18:47 30/04/19



Results do not achieve full ACLASS status until a formal test report has been issued.

INSPEC Technical Services

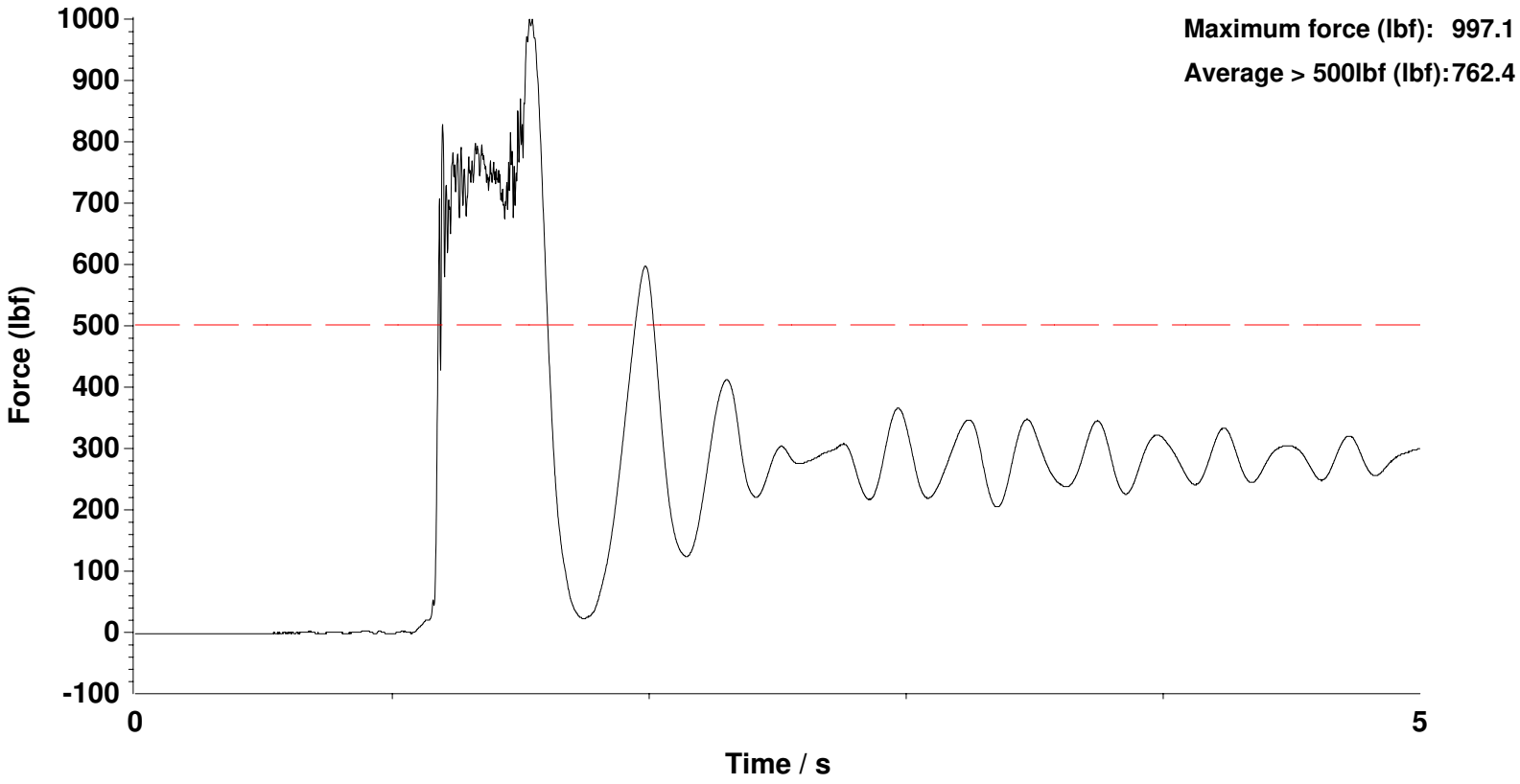
Technician:	SS/LJ
Standard	ANSI Z359.15-2014 Single anchor lifeline+FA
Sample / File name:	2G04314
Drop item	Drop weight, U.S
Orientation/Attachment Point:	Centre eyebolt
Time and Date of Test:	18:57 30/04/19



Results do not achieve full ACLASS status until a formal test report has been issued.

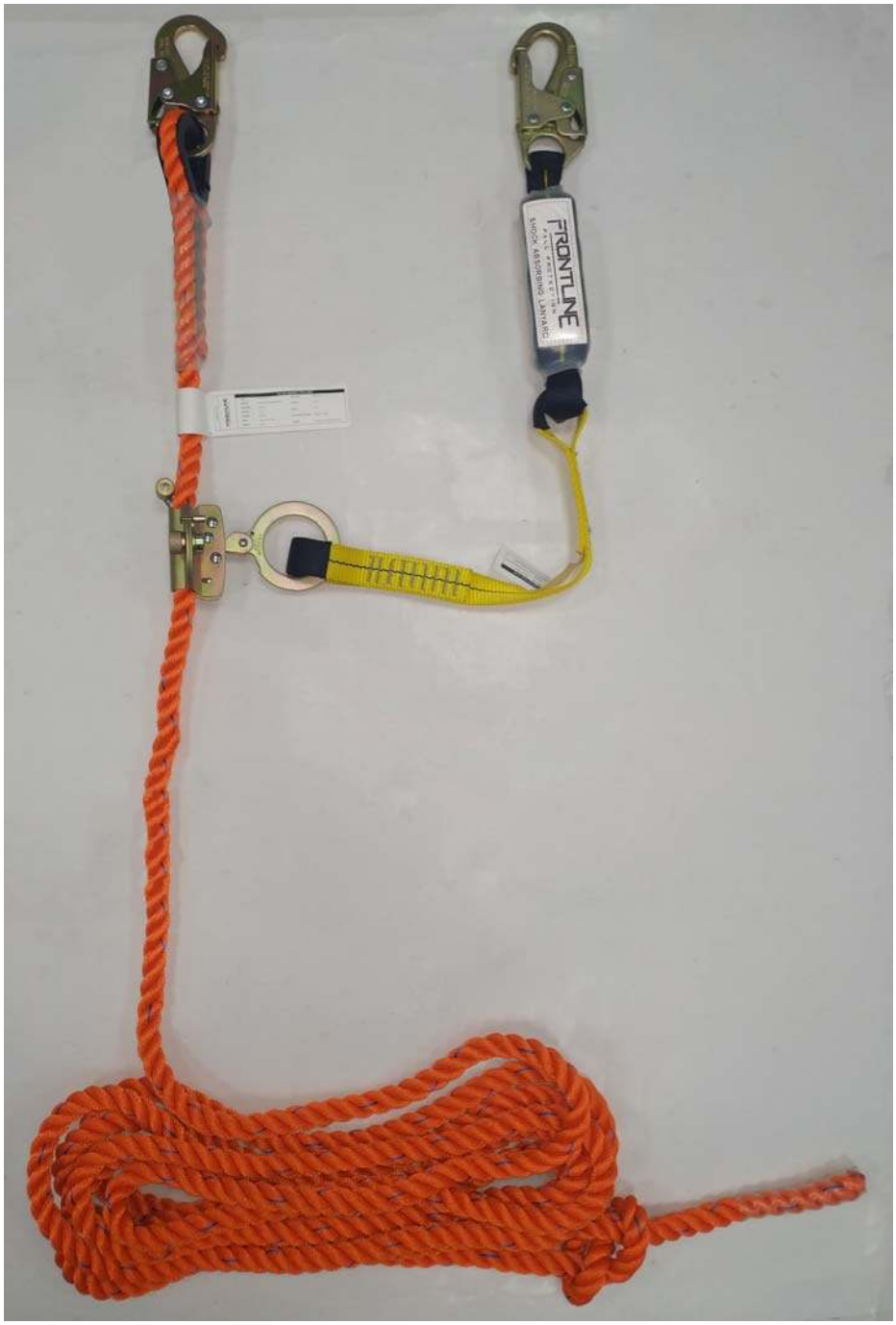
INSPEC Technical Services

Technician:	SS/LJ
Standard	ANSI Z359.15-2014 Single anchor lifeline+FA
Sample / File name:	2G04315
Drop item	Drop weight, U.S
Orientation/Attachment Point:	Centre eyebolt
Time and Date of Test:	19:05 30/04/19



Results do not achieve full ACLASS status until a formal test report has been issued.

Frontline Fall Protection Inc. –
Fall arrester, model RGSU58ES with Single Anchor Lifeline



Photograph provided by manufacturer 10 December 2020