

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

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

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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.

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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. <i>The specimen did not incorporate other attachment elements.</i>	Pass
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). Testing of the connector (D-ring) was not requested.	Pass 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. 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 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. Both fall arrest indicators deployed during dynamic testing defined in section 3.2. It was possible visually to inspect the fall arrester indicators.	Pass Pass 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 indicators 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
		A label as defined in Figure 10a and 10b. <i>"Only contents were assessed"</i>	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
	i	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. NAs

User instructions were supplied electronically in English and used for assessment.

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.

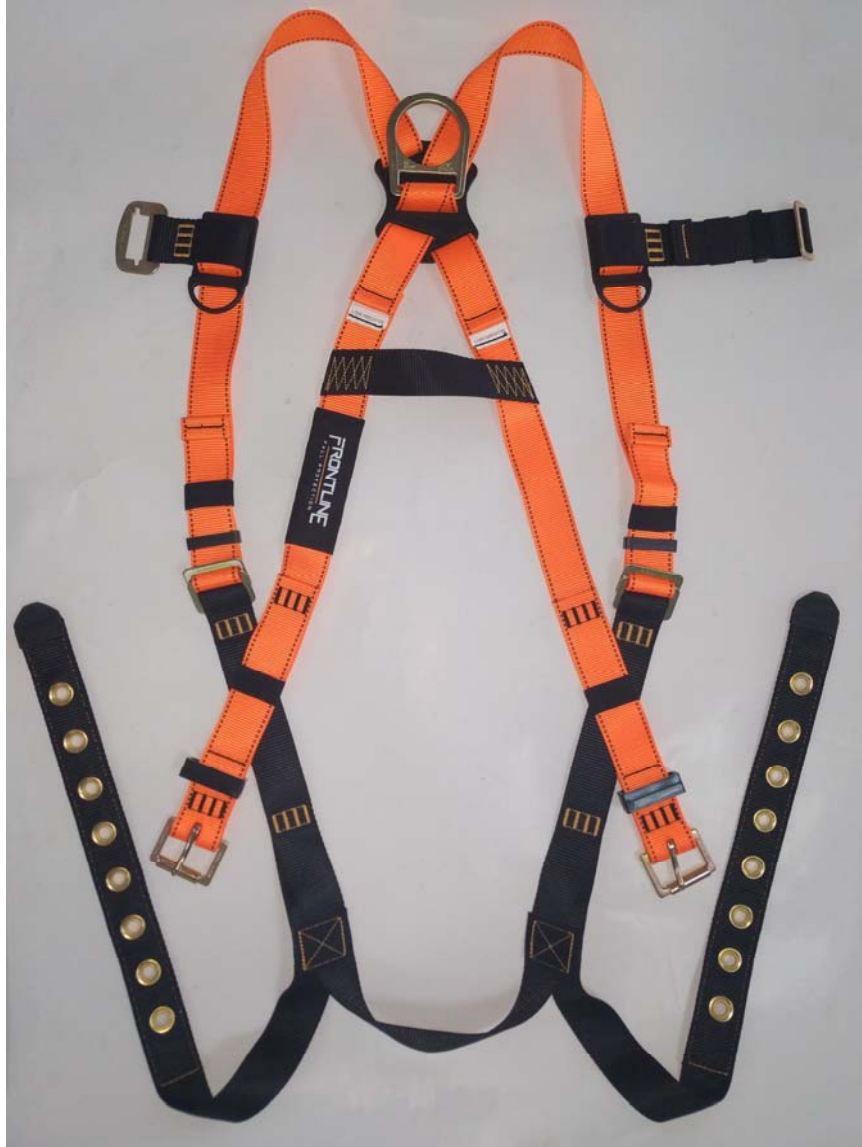
ANNEX

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



Test Report

Personal Fall Arrest Equipment ANSI Z359.13-2013 Energy Absorbing Lanyards

Report no: 2.20.12.37

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: LIS62R P

Dates of tests: 19 March 2020 to 21 May 2020 and 8 December 2020

Signed:



Steven Sum, Laboratory Manager

Issued: 8 December 2020

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

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<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)
3.1.5	Deployment indicator	Pass
3.1.6	Activation force	Pass
3.2	Energy absorber	Ltd
3.2.1	Material	NAs
3.2.2	Terminations	Ltd
3.2.3	Connectors	
3.2.4	Dynamic performance – ambient dry	
3.2.5	Dynamic performance – ambient wet	Pass
	Dynamic performance – cold dry	Pass
	Dynamic performance – hot dry	Pass
3.2.6	Static strength	
3.2.7	Static test for wrap-around lanyards (3600 lbf - abraded)	
3.2.8	Static test for wrap-around lanyards (5000 lbf)	
3.2.9	Static test for Y-lanyards	Pass
3.2.10.1	Dynamic test for Y-lanyards (Single connection)	Pass
3.2.10.2	Dynamic test for Y-lanyards (Dual connection)	Pass
3.2.10.3	Dynamic test for Y-lanyards (Hip connection)	Pass
5.1 / 5.2	Marking	Ltd
5.3 / 5.4	Instructions	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.
6 ft Free Fall Twin leg energy absorbing lanyard, model 1858020Y	21	16 October 2018	2F15001 to 2F15021
6 ft Free Fall Twin leg energy absorbing lanyard, model LIS62R P	02	20 January 2020	2H04101 to 2H04102

Procedures

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

Testing was performed in accordance with ANSI Z359.13-2013 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:

Models LIS62R P and 1858020Y are the same design and made of the same materials. The only difference is the connectors used.

To avoid duplicate testing, test results of model 1858020Y are shared with model LIS62R P in this report.

Result details**3.1.5 Deployment indicator**

Subsequent to the testing of specimen 2F15013 against 3.2.10.1, it became obvious that the energy absorber had been activated. Pass

3.1.6 Activation force

Specimens 2F15001 to 2F15003 were assessed.

It showed no sign of activation when subjected to the 450 pounds static force.

The permanent elongation of the specimens, following the tests were:

2F15001 - 0.51 inches.	Pass
2F15002 - 0.47 inches	Pass
2F15003 - 0.39 inches	Pass

These are less than the maximum 2 inches permitted.

3.2 Personal Energy Absorbing Lanyard Component

All specimens were assessed.

The specimen had an energy absorbing ability that satisfied the design and testing requirements of this standard. Ltd

3.2.1 Materials

Specimen 2F15001 was assessed.

Tubular webbings were used on the construction of the energy absorbing lanyards.

The materials used in the construction of this energy absorbing lanyard, and their characteristics, were not assessed. Manufacturer to certify. NAs

3.2.2 Terminations

Specimen 2F15001 was assessed.

The energy absorbing lanyards were constructed of webbing.

The end terminations satisfied 3.2.2.2, as appropriate (see below). Ltd

3.2.2.2 Webbing terminations

Specimen 2F15001 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 |
| | Threads used for sewing the lanyard were red colour. This contrasted with the black colour of the webbing. | Pass |
| c) | Webbings were protected from concentrated wear at interfaces with load-bearing connector elements. Looped webbing was used. | Pass |
| d) | The ends of the webbing were hot-cut so as to prevent unravelling. | Pass |

3.2.5 Dynamic performance test - Ambient wet condition

Specimens 2F15004 to 2F15006 were assessed.

During the dynamic performance tests, the average arrest force were:

2F15004 - 865 pounds.	Pass
2F15005 - 848 pounds.	Pass
2F15006 - 833 pounds.	Pass

These values are less than the maximum 1,125 pounds permitted.
See Annex 1 for the plot of force versus time.

During the dynamic performance tests, the maximum arrest force were:

2F15004 - 1043 pounds.	Pass
2F15005 - 1024 pounds.	Pass
2F15006 - 982 pounds.	Pass

These values are less than the maximum 1,800 pounds permitted.
See Annex 1 for the plot of force versus time.

During the dynamic performance tests, the deployment distance were:

2F15004 - 36.2 inches.	Pass
2F15005 - 34.4 inches.	Pass
2F15006 - 34.1 inches.	Pass

These values are less than the maximum 48 inches permitted.

3.2.5 Dynamic performance test - Cold dry condition

Specimens 2F15007 to 2F15009 were assessed.

During the dynamic performance tests, the average arrest force were:

2F15007 - 895 pounds.	Pass
2F15008 - 919 pounds.	Pass
2F15009 - 915 pounds.	Pass

These values are less than the maximum 1,125 pounds permitted.
See Annex 1 for the plot of force versus time.

During the dynamic performance tests, the maximum arrest force were:

2F15007 - 1002 pounds.	Pass
2F15008 - 995 pounds.	Pass
2F15009 - 995 pounds.	Pass

These values are less than the maximum 1,800 pounds permitted.
See Annex 1 for the plot of force versus time.

During the dynamic performance tests, the deployment distance were:

2F15007 – 29.3 inches.	Pass
2F15008 – 29.9 inches.	Pass
2F15009 – 30.7 inches.	Pass

These values are less than the maximum 48 inches permitted.

3.2.5 Dynamic performance test - Hot dry condition

Specimens 2F15010 to 2F15012 were assessed.

During the dynamic performance tests, the average arrest force were:

2F15010 - 780 pounds.	Pass
2F15011 - 773 pounds.	Pass
2F15012 - 775 pounds.	Pass

These values are less than the maximum 1,125 pounds permitted.
See Annex 1 for the plot of force versus time.

During the dynamic performance tests, the maximum arrest force were:

2F15010 - 883 pounds.	Pass
2F15011 - 846 pounds.	Pass
2F15012 - 879 pounds.	Pass

These values are less than the maximum 1,800 pounds permitted.
See Annex 1 for the plot of force versus time.

During the dynamic performance tests, the deployment distance were:

2F15010 – 40.2 inches.	Pass
2F15011 – 40.2 inches.	Pass
2F15012 – 38.2 inches.	Pass

These values are less than the maximum 48 inches permitted.

3.2.9 Static strength – Y-lanyards only

Specimens 2F15013 to 2F15015 were assessed.

Leg A withstood the tensile test of 5,000 pounds applied for 1 minute without breaking.	Pass
---	------

Specimens 2F15016 to 2F15018 were assessed.

Legs A and B withstood the tensile test of 5,000 pounds applied for 1 minute without breaking.	Pass
--	------

3.2.10.1 Dynamic test, Y-lanyards only – Single connection

Specimens 2F15013 to 2F15015 were assessed.

During the dynamic performance tests, the average arrest force were:

2F15013 - 809 pounds.	Pass
2F15014 - 802 pounds.	Pass
2F15015 - 805 pounds.	Pass

These values are less than the maximum 900 pounds permitted.
See Annex 1 for the plot of force versus time.

During the dynamic performance tests, the maximum arrest force were:

2F15013 - 898 pounds.	Pass
2F15014 - 890 pounds.	Pass
2F15015 - 887 pounds.	Pass

These values are less than the maximum 1,800 pounds permitted.
See Annex 1 for the plot of force versus time.

During the dynamic performance tests, the deployment distance were:

2F15013 – 36.8 inches.	Pass
2F15014 – 36.2 inches.	Pass
2F15015 – 37.0 inches.	Pass

These values are less than the maximum 48 inches permitted.

3.2.10.2 Dynamic test, Y-lanyards only - Dual connection

Specimens 2F15016 to 2F15018 were assessed.

During the dynamic tests, the maximum arrest force were:

2F15016 - 1788 pounds.	Pass
2F15017 - 1799 pounds.	Pass
2F15018 - 1794 pounds.	Pass

These values are less than the maximum 1,800 pounds permitted.
See Annex 1 for the plot of force versus time.

3.2.10.3 Dynamic test, Y-lanyards only - Hip connection

Specimens 2F15019 to 2F15021 were assessed.

During the dynamic tests, the nylon keepers were not broken.	NAP
--	-----

5.1 / 5.2 Marking

Markings were provided electronically and used for assessment. The detailed results of the assessment are given below.

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 component, subsystem or system being marked was not assessed. NAs

The legibility and attachment of required markings endured the duration of the testing performed.

Markings were printed on labels that were stitched on to the lanyard.

When pressure sensitive labels are used, they shall comply with the applicable provision of reference 8.5.1. This requirement was not assessed. Manufacturer to certify. NAs

5.1.3 Equipment shall be marked with the following:

- part number and model designation; [LIS62R P] Pass
- year of manufacture; Pass
- manufacturer's name or logo; [FRONTLINE] Pass
- capacity rating; [130-310 lbs] Pass
- serial number; Pass
- standard number; [ANSI Z359.13-2013] Pass
- warning to follow the manufacturer's instructions included with the equipment at time of shipment from the manufacturer. Pass

5.2 Specific Marking Requirements

5.2.1 Energy absorbing lanyards shall be marked to identify:

- the fiber used in the material of construction; "Polyester" Pass
- the length; "6 FT" Pass
- the need to avoid contact with sharp edges and abrasive surfaces; Pass
- the need to make only compatible connections; Pass
- the maximum elongation; "48 inches" Pass
- restriction, if any, on the types of components, subsystems, or systems with which the energy absorber is designed to be used; NAp
- the average arrest force, maximum free fall distance and capacity of the energy absorber on a separate label identical in size, color and content as figure 16a and 16b of the standard; *[Only contents were assessed]* Ltd
- 6 ft FF personal energy absorbers shall be in black print on a contrasting white background; *[Only contents were assessed]* Ltd
- 12 ft FF personal energy absorbers shall be in white print on a contrasting black background;; NAp

5.2.2 · In addition to 5.2.1, Y-lanyards that fail the Dynamic Hip Test detailed in 3.2.10, must include a warning label on both connecting ends of the lanyard specifically directing users how to safely store the unused leg of the lanyard. NAp

5.3 / 5.4 Instructions

Instructions were provided electronically and used for assessment. The detailed results of the assessment are given below.

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 and model designation for the equipment;	Pass
	· intended use and purpose of the equipment;	Pass
	· proper method of use and limitation 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
	· an illustration of how to calculate free fall distances;	Pass
	· criteria for discarding equipment which fails inspection;	Pass
	· procedures for cleaning, maintenance, and storage;	Pass
	· reference to the ANSI/ASSE Z359.13, <i>Personal Energy Absorbers and Energy Absorbing Lanyards</i> , standard and applicable regulations governing occupational safety.	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 subjected to the forces of arresting a fall.	Pass

5.4 Specific Instruction Requirements

5.4.1 In addition to general instruction the requirements, written instructions for personal energy absorbers shall include:

- the material used in the personal energy absorber construction; Pass
- the need to make only compatible connections and limitations of compatibility; Pass
- proper method of coupling the personal energy absorber to adjacent components of the system; Pass
- the maximum arrest force of the personal energy absorber when dynamically tested in accordance with the requirements of this standard; Pass
- the maximum elongation of the personal energy absorber when dynamically tested in accordance with the requirements of this standard. Pass
- a reference chart that indicates the deployment distance of the personal energy absorber according to the user weight and free fall distance; NAs
- a statement that indicates information necessary in designing fall protection systems shall be made available from the manufacturer. Pass
- manufacturers may provide designers of fall protection systems a representative graph(s) of the time history plot of the loading from a drop test. NAs

Estimates of the uncertainty of measurement

Clause	Test	Uncertainty	
3.1.1	Classifications	-	
3.1.2	Material	-	
3.1.3	Terminations	-	
3.1.4	Connectors	-	
3.1.5	Deployment indicator	See Note 1	
3.1.6	Activation force	See Note 1	
	Permanent elongation	0.40%	
3.1.7	Static strength	See Note 1	
3.1.8	Dynamic performance – ambient dry	Force	1.7%
		Deployment distance	1mm
3.1.9	Dynamic performance – various conditions	Force	1.7%
		Deployment distance	1mm
3.2	Personal Energy Absorber Component, if fitted	See report	
3.2.1	Materials	-	
3.2.2	Terminations	-	
3.2.3	Connectors	See report	
3.2.4	Dynamic performance – ambient dry	Force	± 3.0%
		Deployment distance	± 1mm
3.2.5	Dynamic performance – various conditions	Force	± 3.0%
		Deployment distance	± 1mm
3.2.6	Static strength – single lanyard	See Note 1	
	Static strength – slippage	± 2.1%	
3.2.7	Abrasion and Static strength - Wrap-around energy absorbing lanyards only	See Note 1	
3.2.8	Static strength - Wrap-around energy absorbing lanyards only	See Note 1	
3.2.9	Static strength - Y-lanyards only	See Note 1	
3.2.10.1	Dynamic test, Y-lanyards only - Single connection	Force	± 3.0%
		Deployment distance	± 1mm
3.2.10.2	Dynamic test, Y-lanyards only - Dual connection	Force	± 3.0%
3.2.10.3	Dynamic test, Y-lanyards only - Hip connection	See Note 1	
5.1 / 5.2	Marking	-	
5.3 / 5.4	Information	-	

- 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 assessments against the pass/fail criteria.

ANNEX

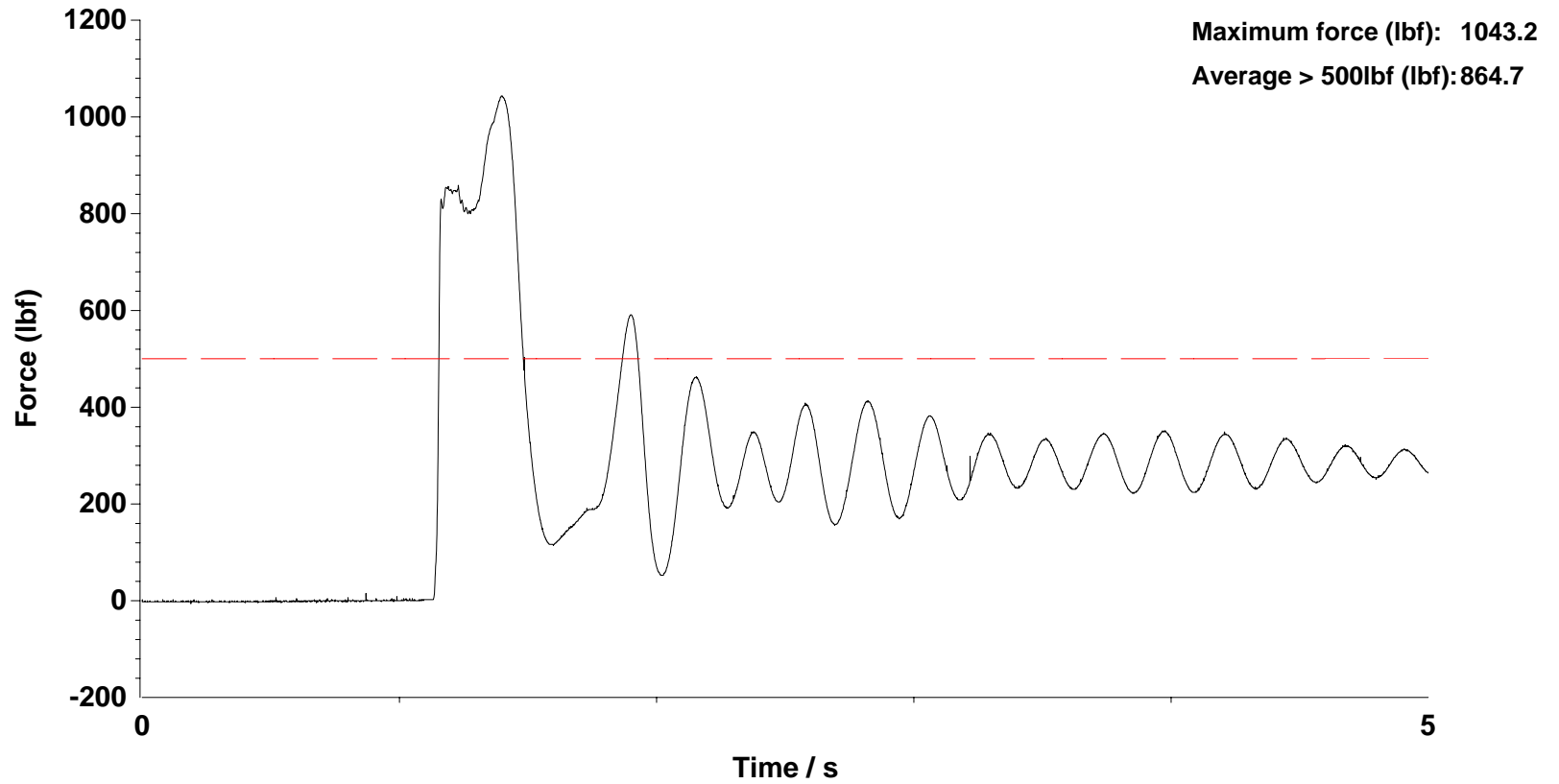
This Annex comprises two sections.

1. Plots of arrest force versus time. (15 pages)
2. Photograph of the product tested. (1 page)

END OF REPORT

INSPEC Technical Services

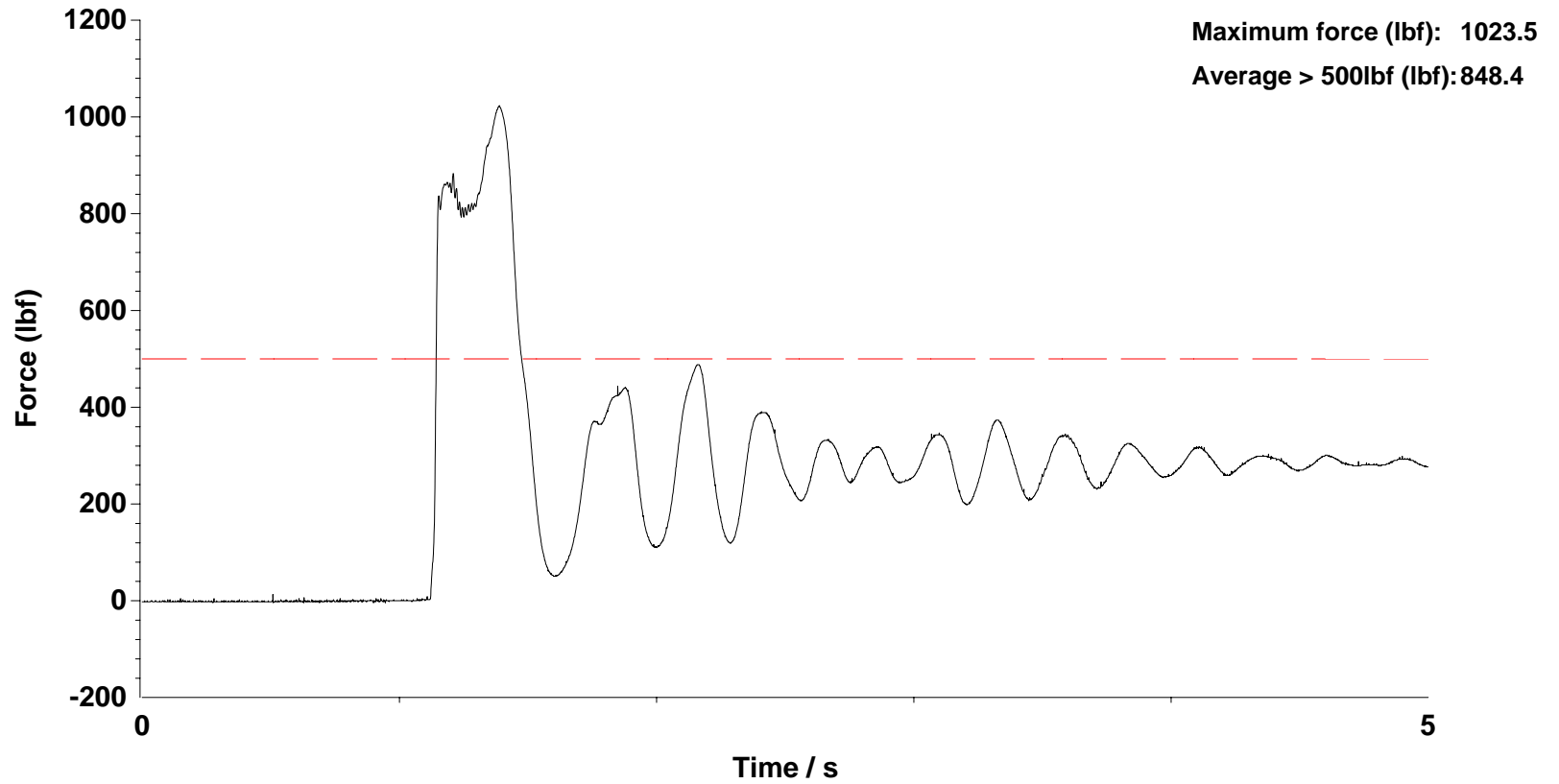
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Standard ANSI Z359.13:2013 EA Lanyard
Sample / File name: 2F15004
Drop item Drop weight, US-128 kg
Orientation/Attachment Point: Centre eyebolt
Time and Date of Test: 19:01 06/11/18



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

INSPEC Technical Services

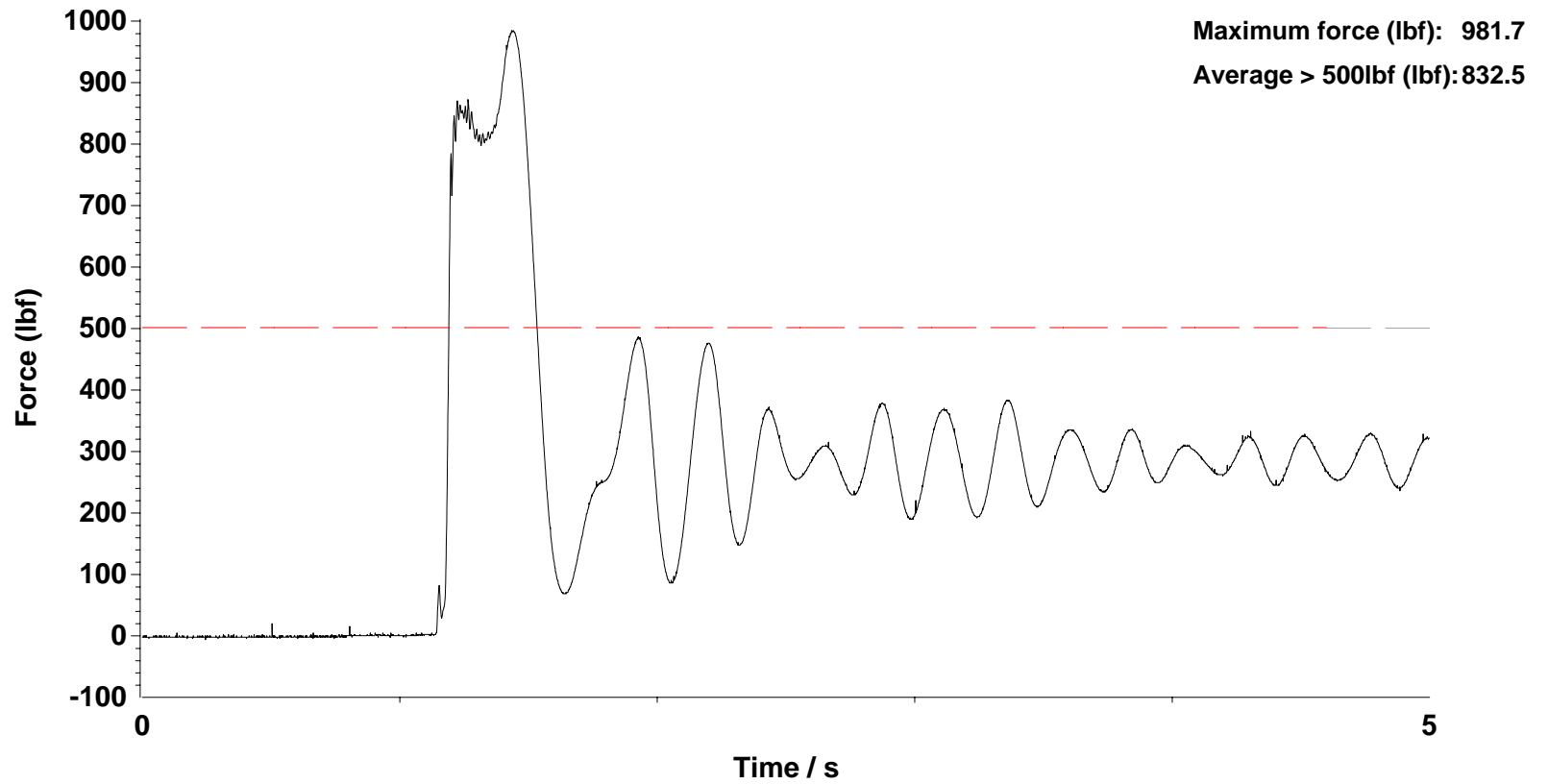
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Sample / File name: 2F15005
Drop item Drop weight, US-128 kg
Orientation/Attachment Point: Centre eyebolt
Time and Date of Test: 19:08 06/11/18



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

INSPEC Technical Services

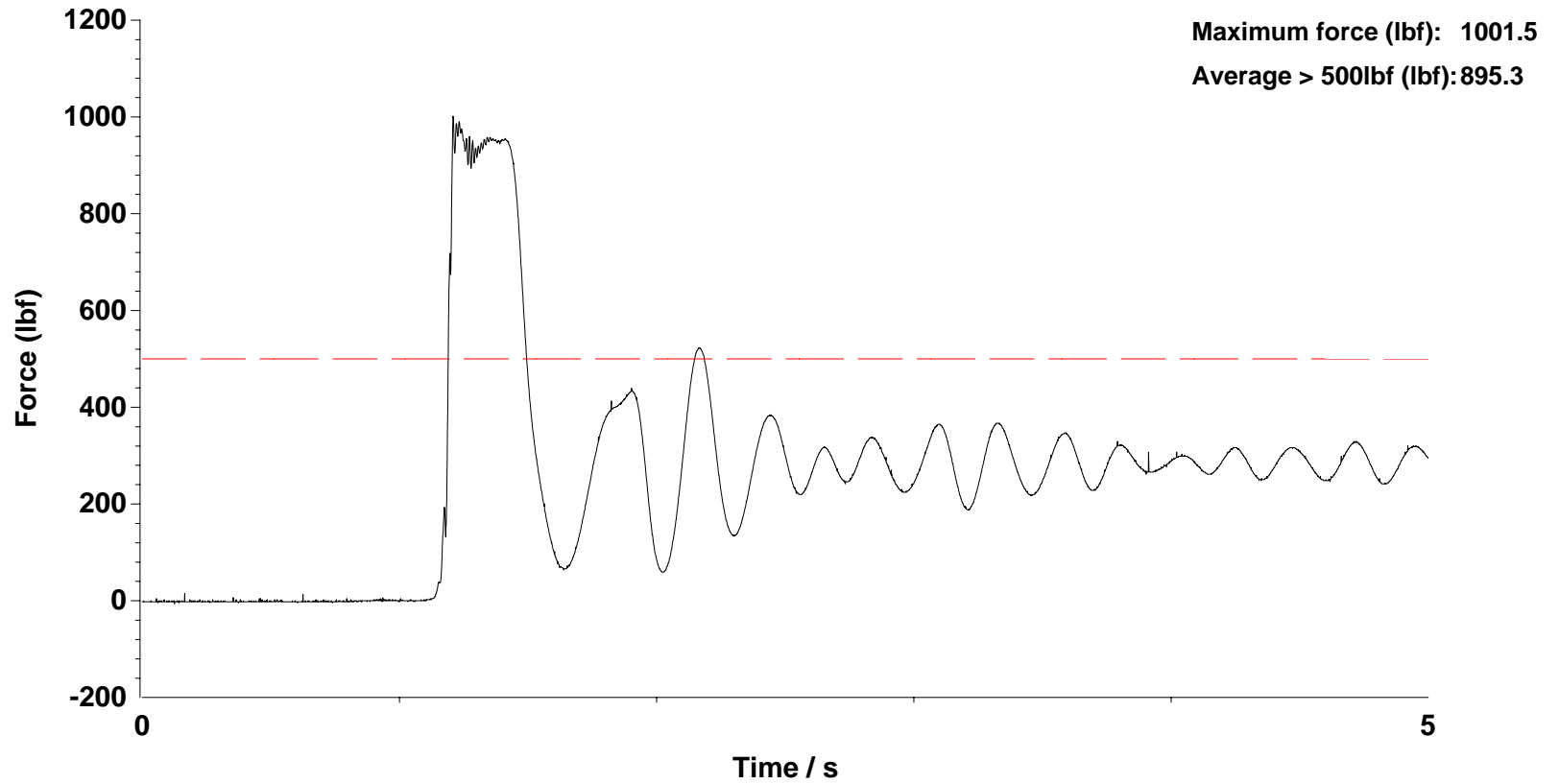
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Standard ANSI Z359.13:2013 EA Lanyard
Sample / File name: 2F15006
Drop item Drop weight, US-128 kg
Orientation/Attachment Point: Centre eyebolt
Time and Date of Test: 19:14 06/11/18



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

INSPEC Technical Services

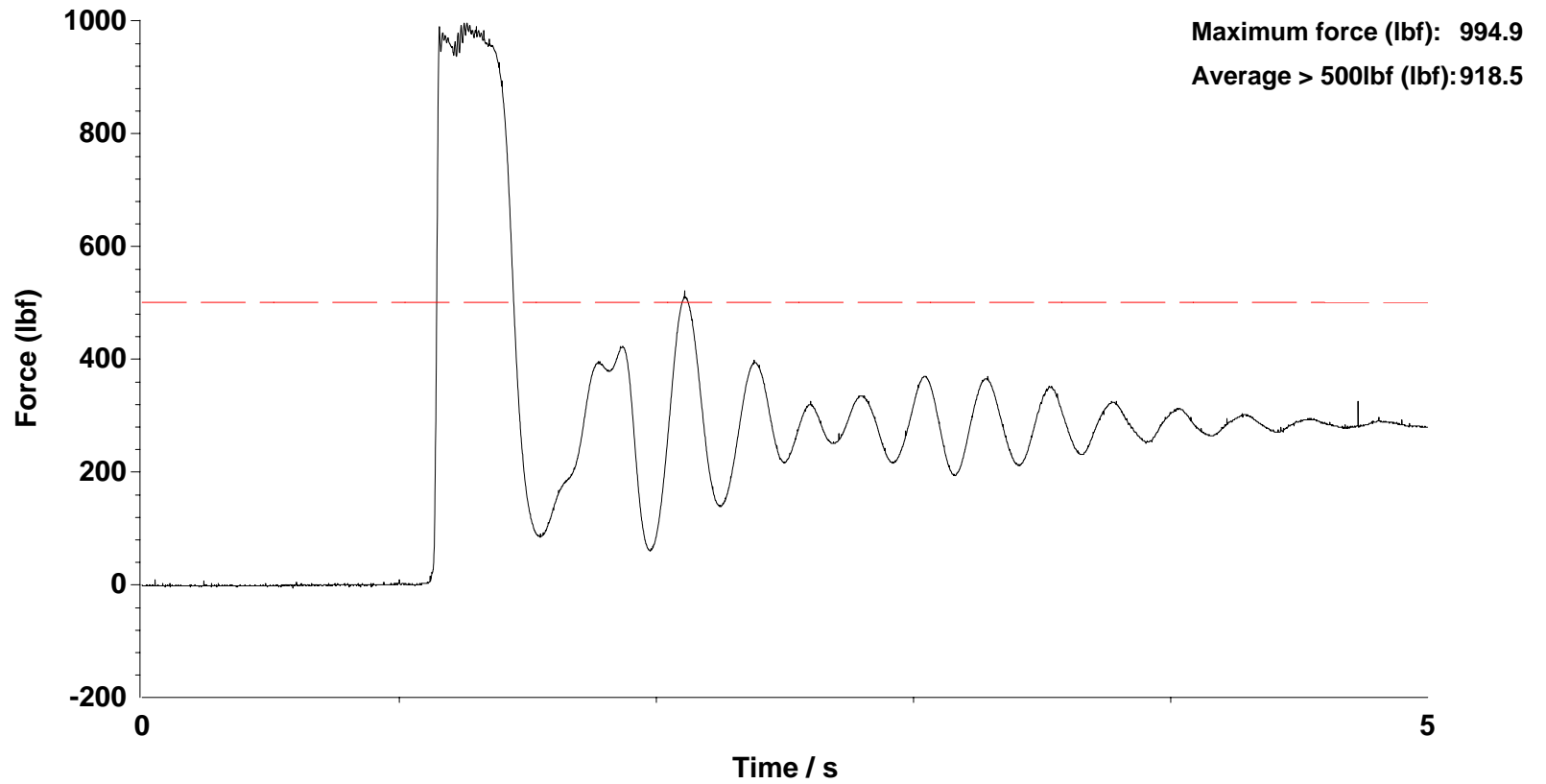
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Sample / File name: 2F15007
Drop item Drop weight, US-128 kg
Orientation/Attachment Point: Centre eyebolt
Time and Date of Test: 18:21 06/11/18



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

INSPEC Technical Services

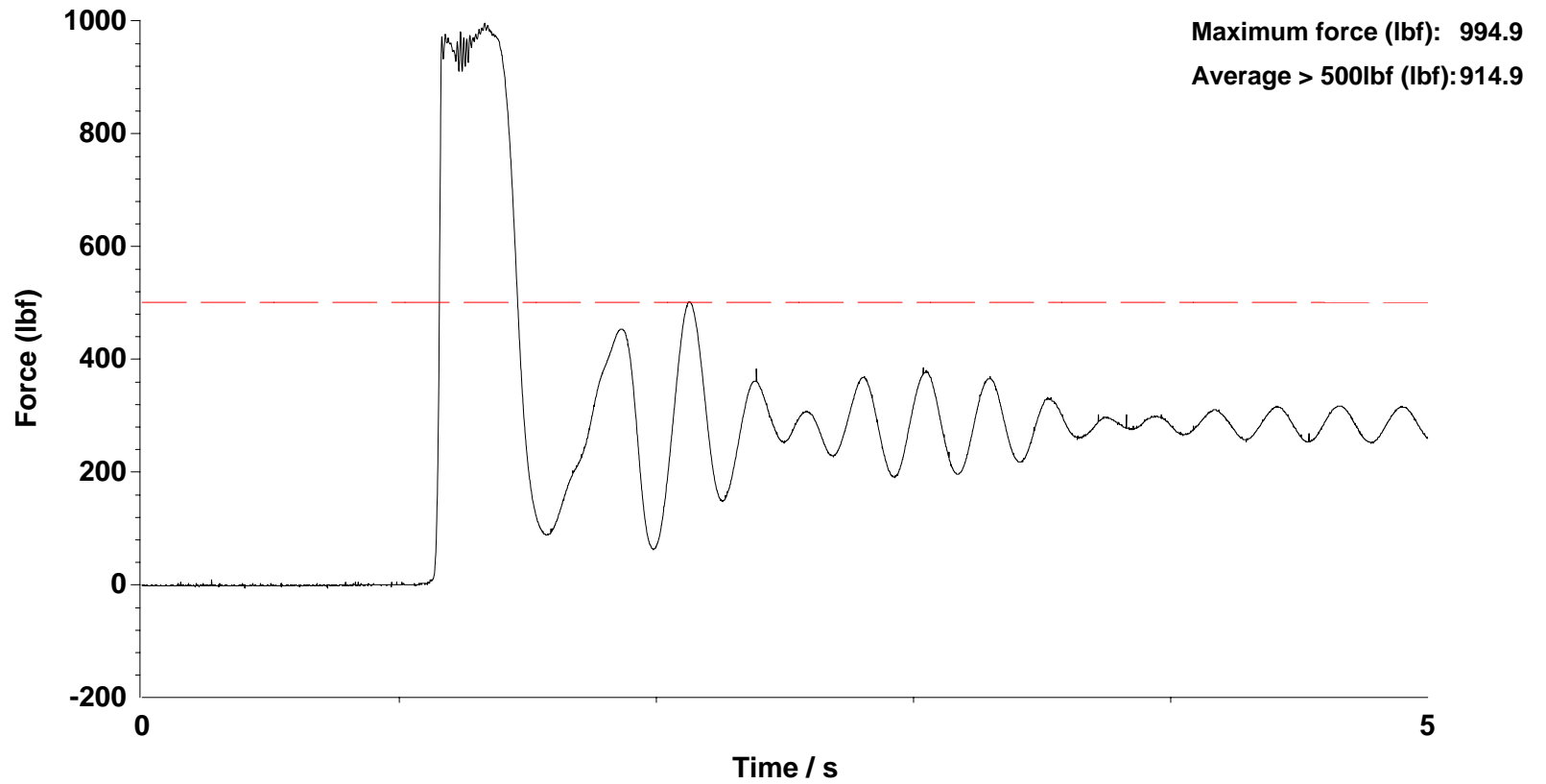
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Standard ANSI Z359.13:2013 EA Lanyard
Sample / File name: 2F15008
Drop item Drop weight, US-128 kg
Orientation/Attachment Point: Centre eyebolt
Time and Date of Test: 18:27 06/11/18



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

INSPEC Technical Services

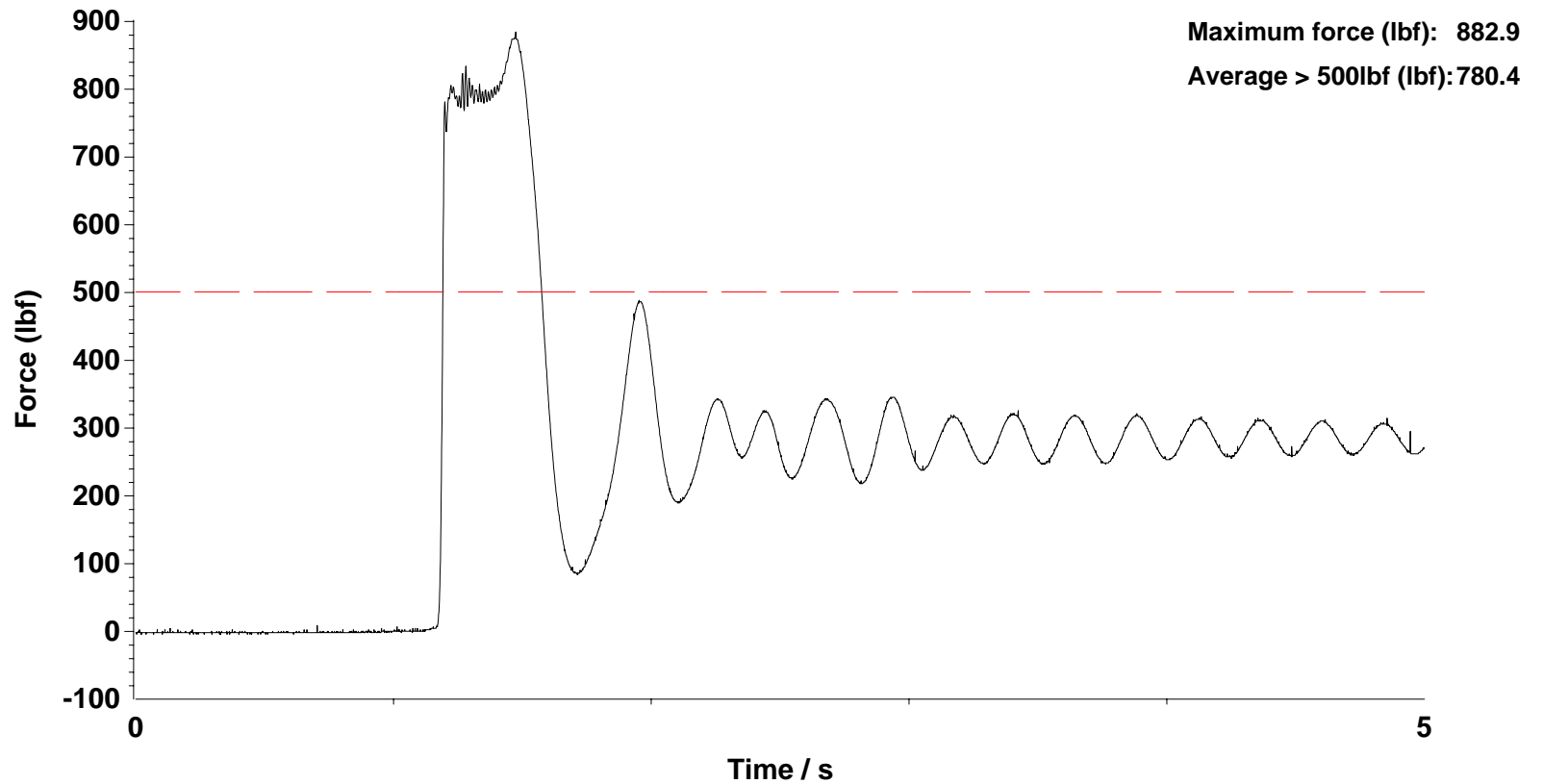
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Standard ANSI Z359.13:2013 EA Lanyard
Sample / File name: 2F15009
Drop item Drop weight, US-128 kg
Orientation/Attachment Point: Centre eyebolt
Time and Date of Test: 18:34 06/11/18



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

INSPEC Technical Services

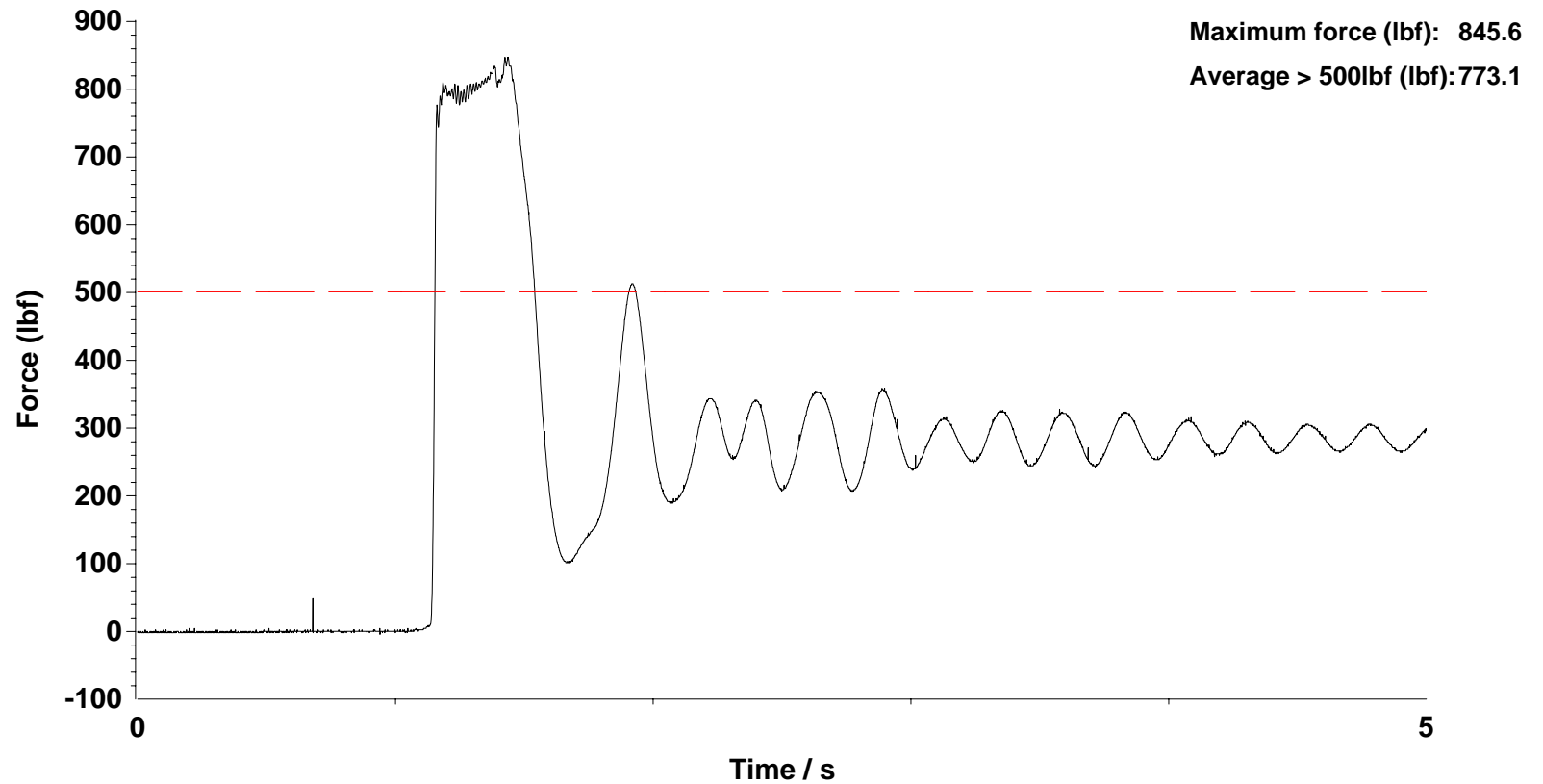
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Standard ANSI Z359.13:2013 EA Lanyard
Sample / File name: 2F15010
Drop item Drop weight, US-128 kg
Orientation/Attachment Point: Centre eyebolt
Time and Date of Test: 18:40 06/11/18



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

INSPEC Technical Services

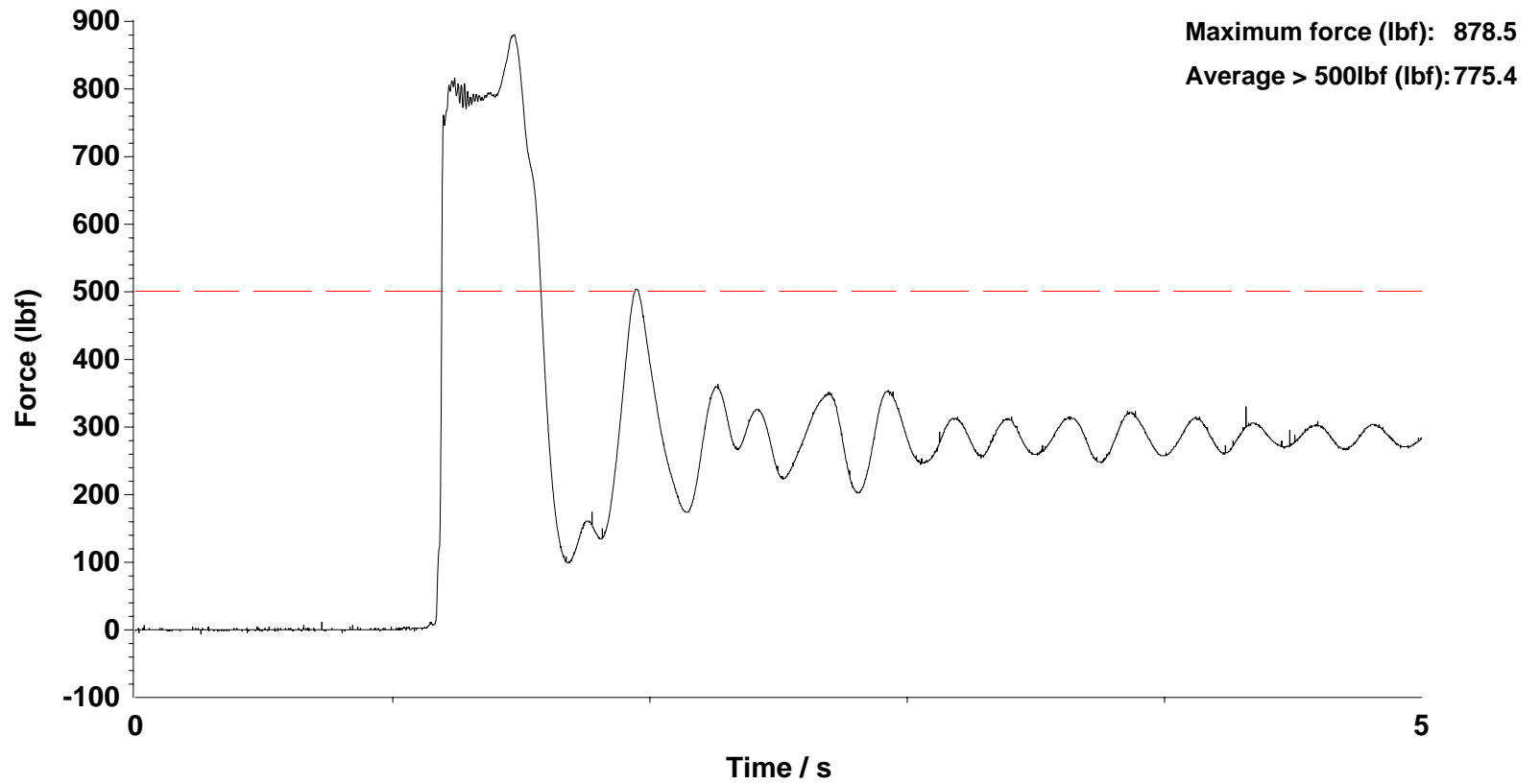
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Standard ANSI Z359.13:2013 EA Lanyard
Sample / File name: 2F15011
Drop item Drop weight, US-128 kg
Orientation/Attachment Point: Centre eyebolt
Time and Date of Test: 18:48 06/11/18



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

INSPEC Technical Services

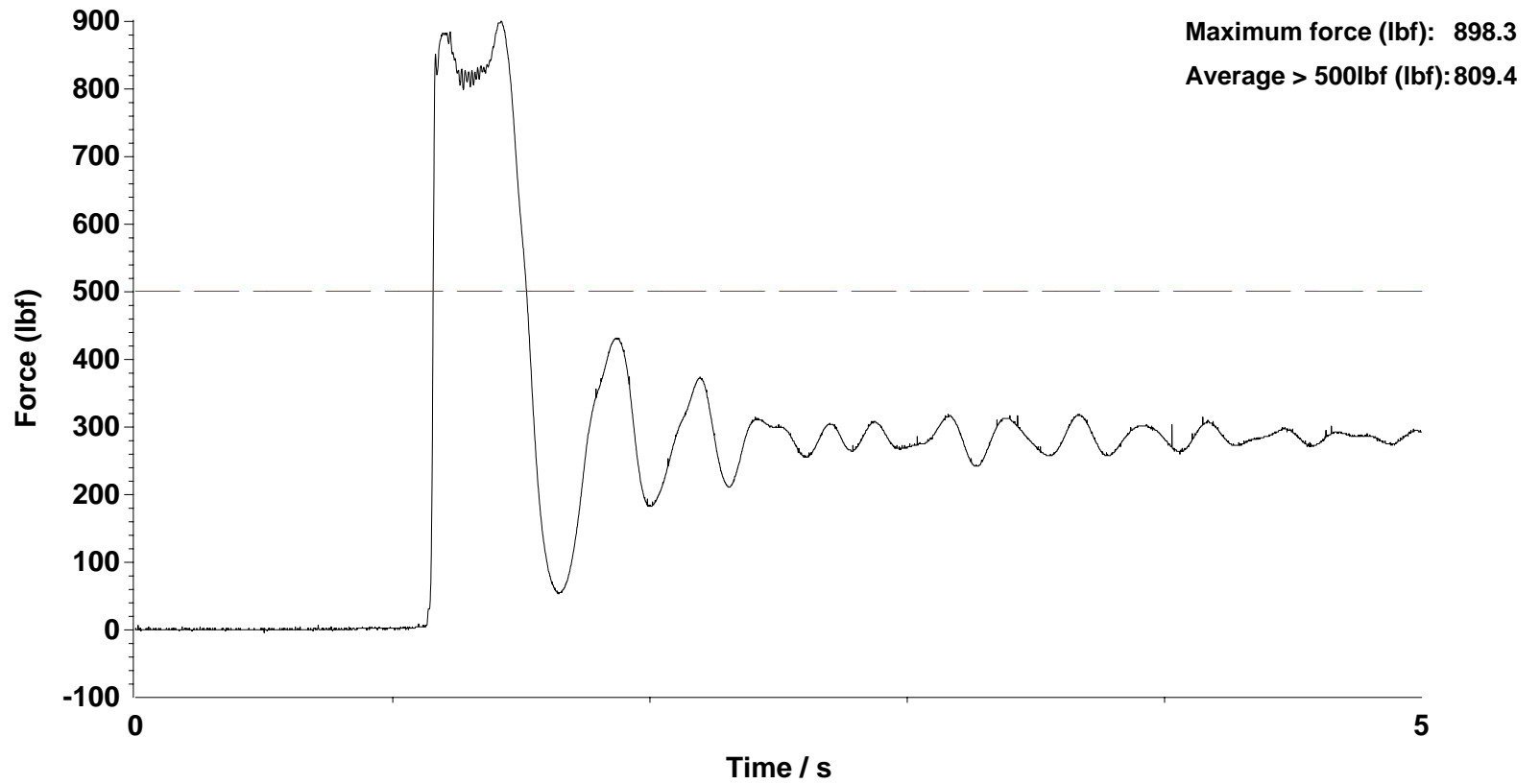
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Standard ANSI Z359.13:2013 EA Lanyard
Sample / File name: 2F15012
Drop item Drop weight, US-128 kg
Orientation/Attachment Point: Centre eyebolt
Time and Date of Test: 18:54 06/11/18



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

INSPEC Technical Services

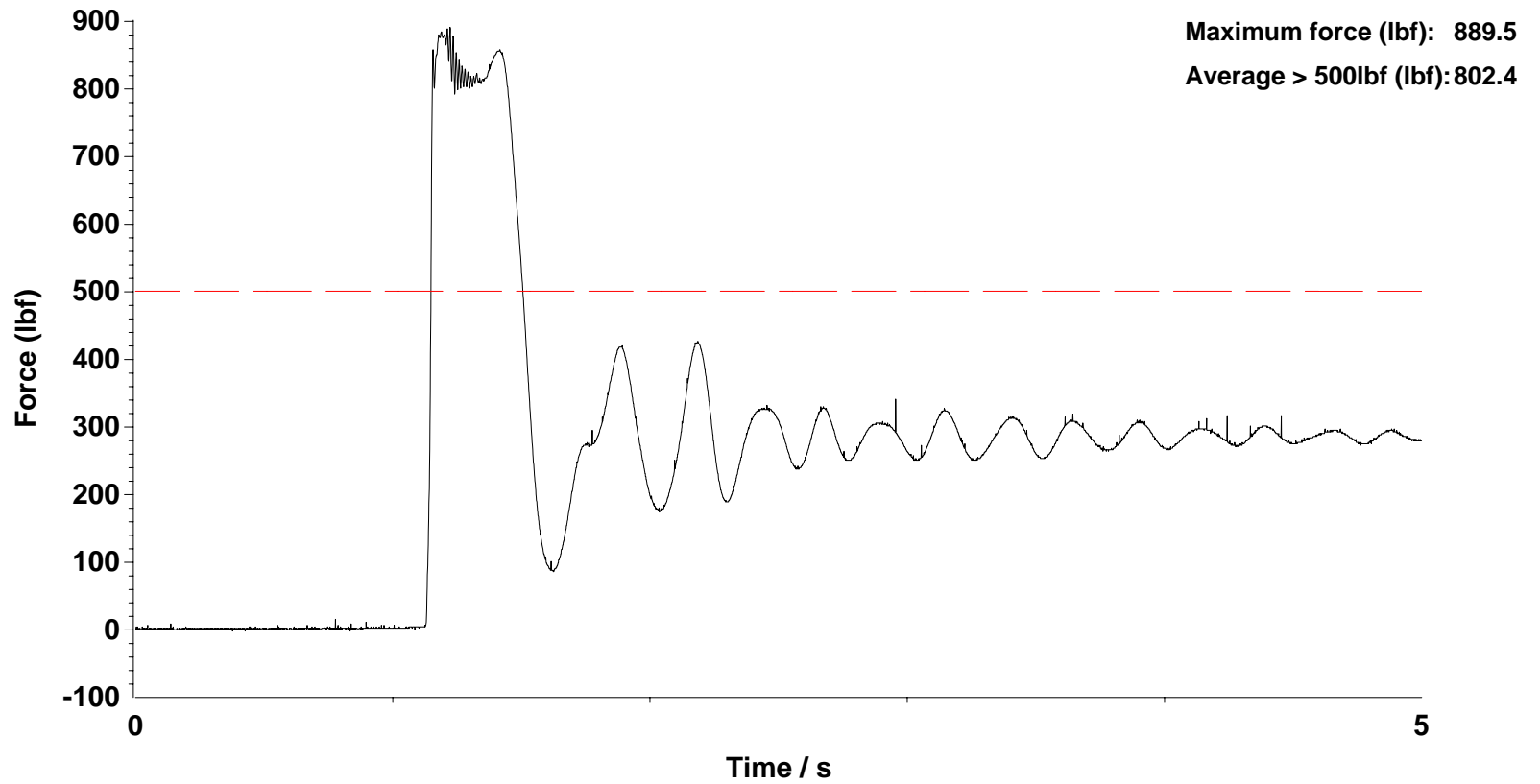
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Sample / File name: 2F15013
Drop item Drop weight, US-128 kg
Orientation/Attachment Point: Centre eyebolt
Time and Date of Test: 17:31 06/11/18



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

INSPEC Technical Services

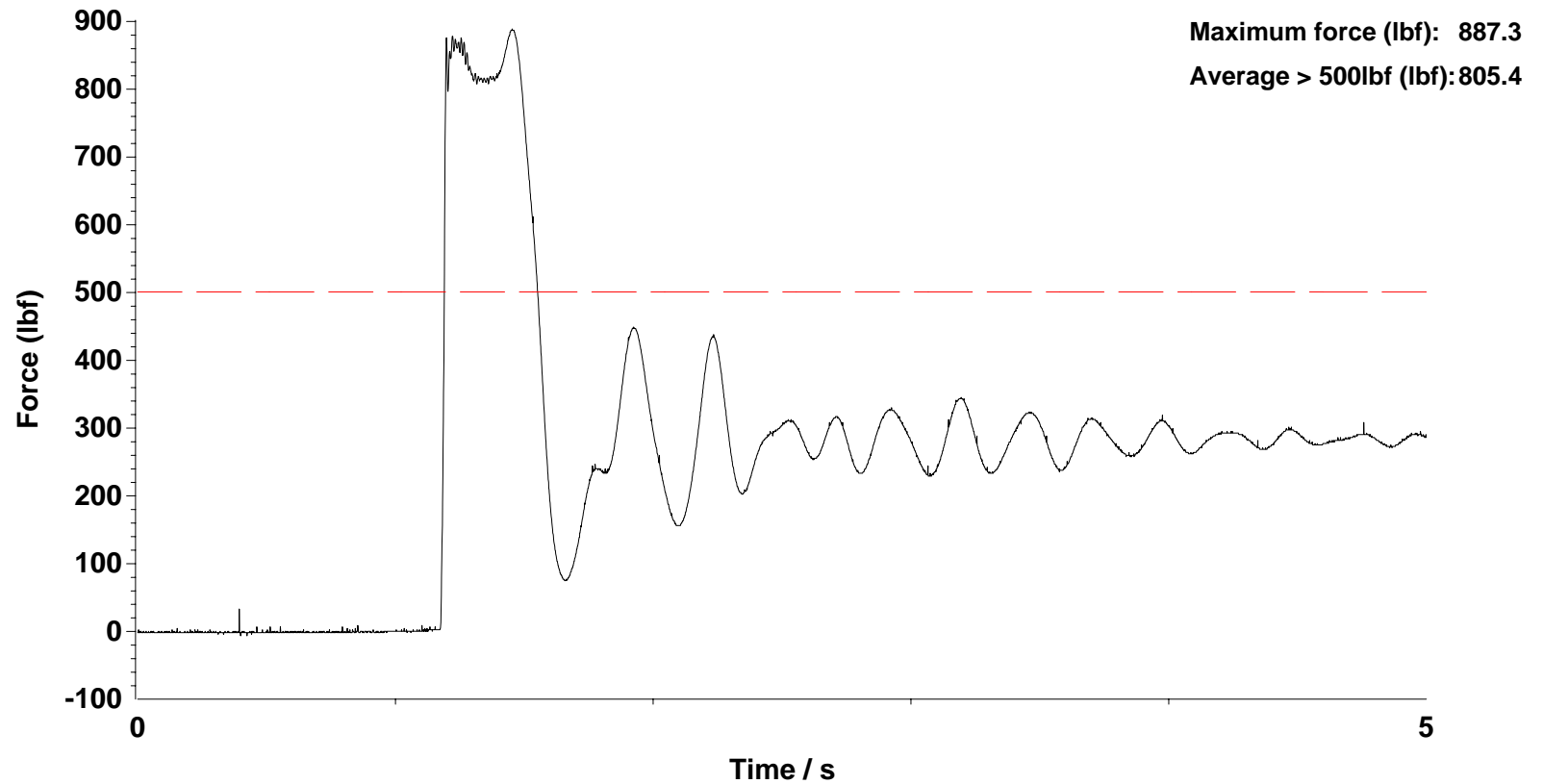
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Standard ANSI Z359.13:2013 EA Lanyard
Sample / File name: 2F15014
Drop item Drop weight, US-128 kg
Orientation/Attachment Point: Centre eyebolt
Time and Date of Test: 17:39 06/11/18



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

INSPEC Technical Services

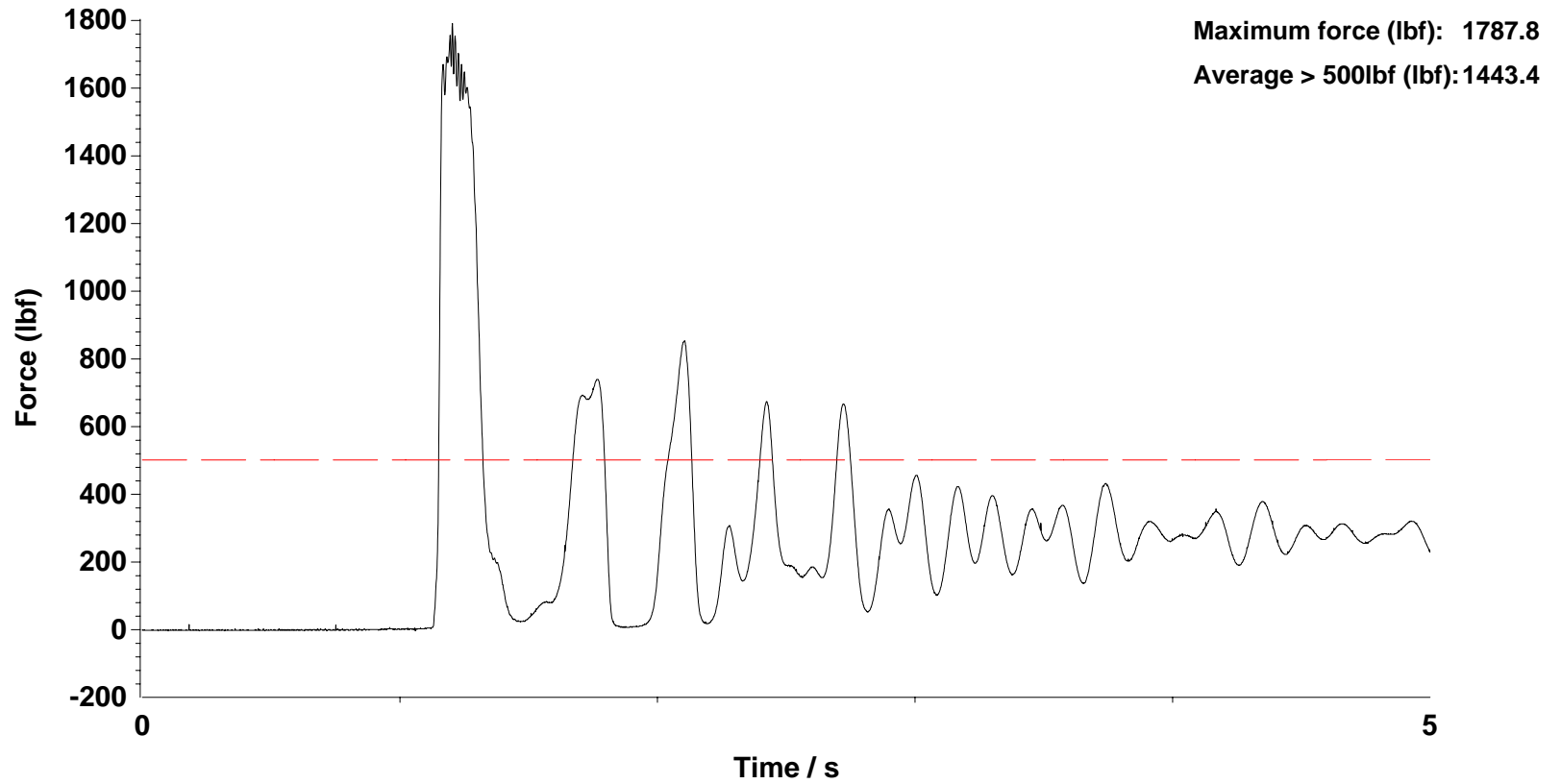
Technician: SS
Standard ANSI Z359.13:2013 EA Lanyard
Sample / File name: 2F15015
Drop item Drop weight, US-128 kg
Orientation/Attachment Point: Centre eyebolt
Time and Date of Test: 17:46 06/11/18



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

INSPEC Technical Services

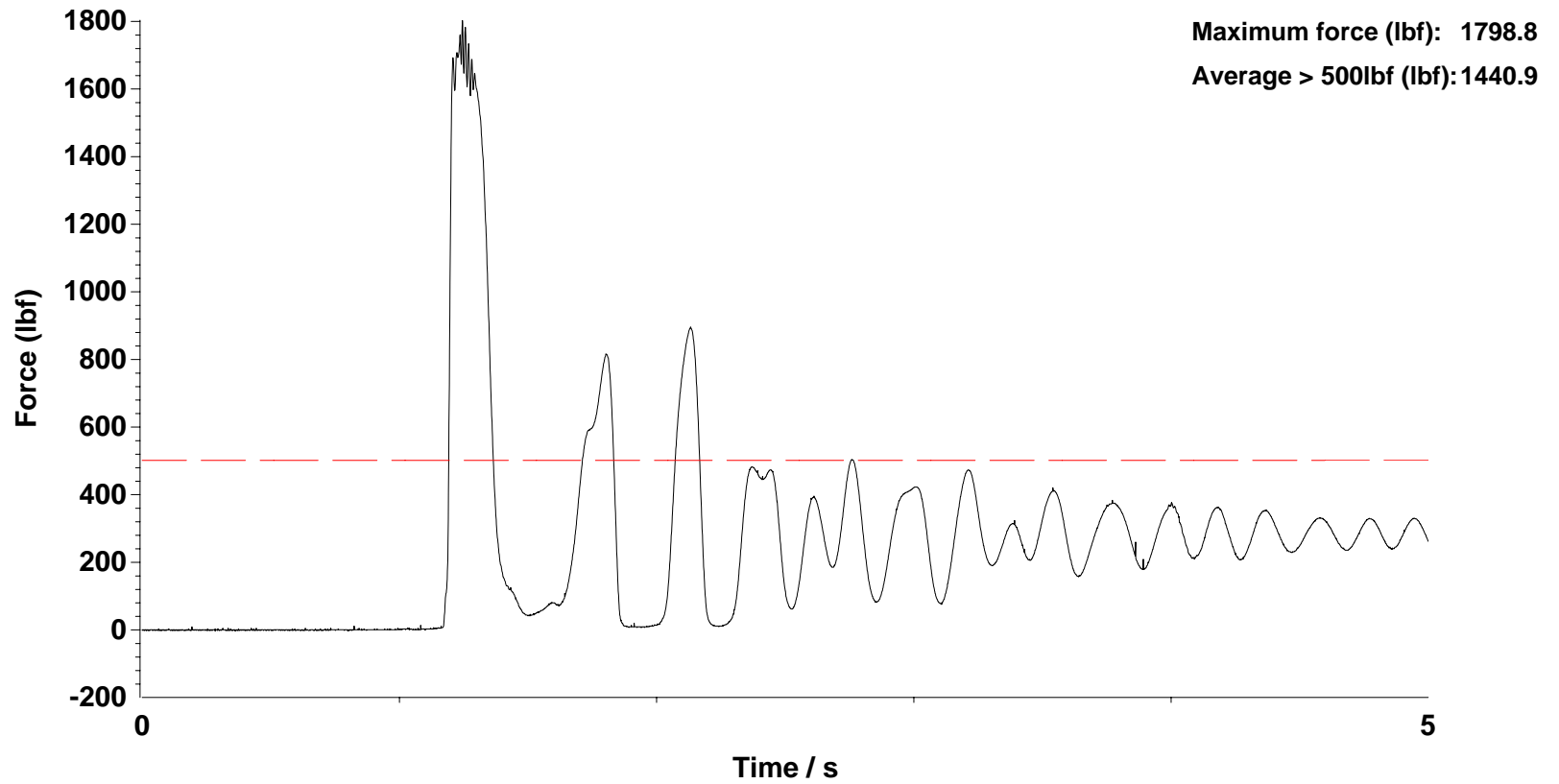
Technician: SS
Standard ANSI Z359.13:2013 EA Lanyard
Sample / File name: 2F15016
Drop item Drop weight, US-128 kg
Orientation/Attachment Point: Centre eyebolt
Time and Date of Test: 17:54 06/11/18



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

INSPEC Technical Services

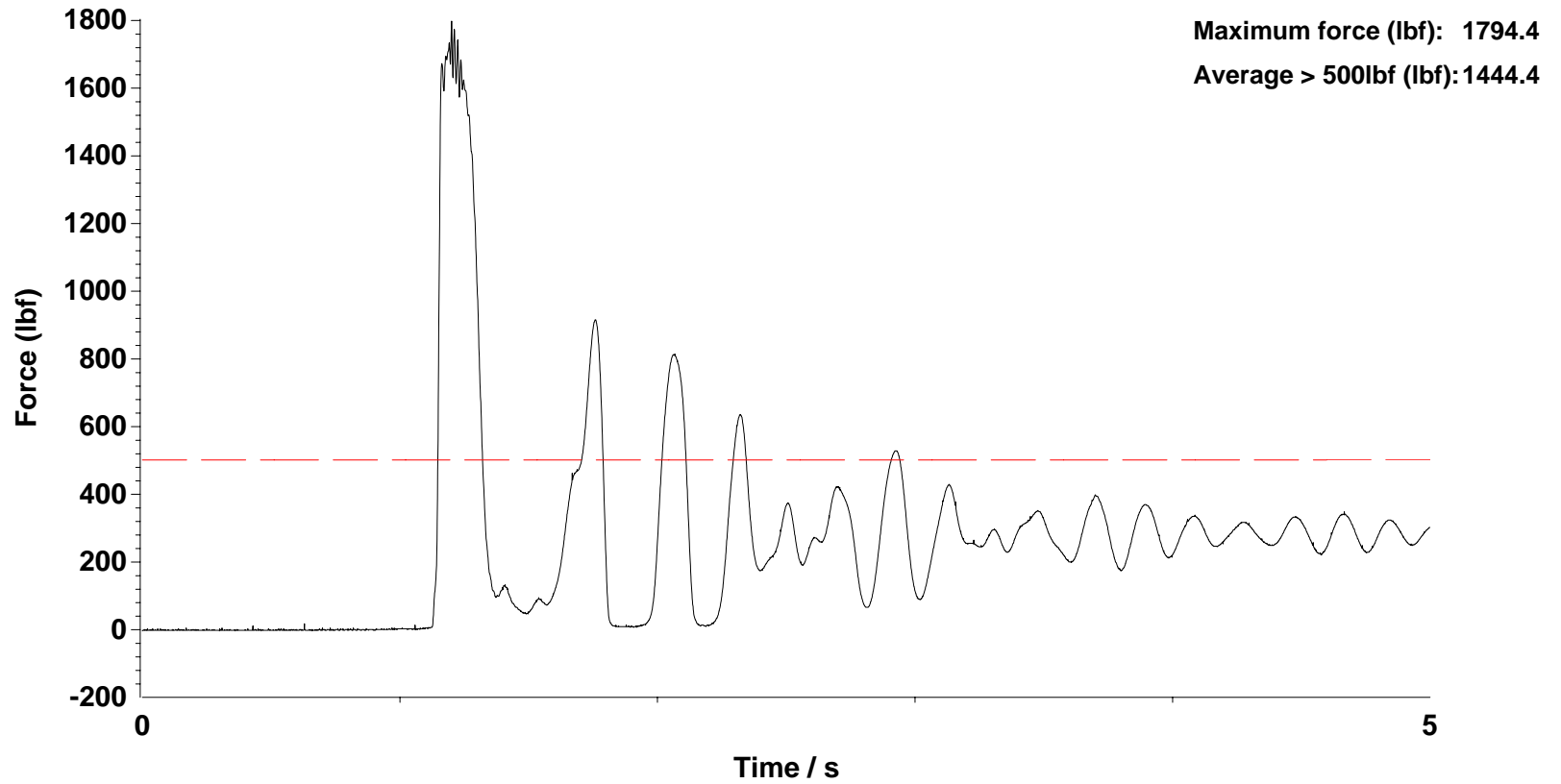
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Standard ANSI Z359.13:2013 EA Lanyard
Sample / File name: 2F15017
Drop item Drop weight, US-128 kg
Orientation/Attachment Point: Centre eyebolt
Time and Date of Test: 18:03 06/11/18



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

INSPEC Technical Services

Technician: SS
Standard ANSI Z359.13:2013 EA Lanyard
Sample / File name: 2F15018
Drop item Drop weight, US-128 kg
Orientation/Attachment Point: Centre eyebolt
Time and Date of Test: 18:09 06/11/18



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

Frontline Fall Protection Inc. –
6 ft Free Fall Twin leg Energy absorbing lanyard, model LIS62R P

