INSPEC
TESTING SERVICES

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Test Report

ANSI Z359.11-2021
Full Body Harnesses

Report no:	2.24.08.25
Customer:	Frontline Fall protection Inc. 6 Lee Blvd Malvern PA 19355 U.S.A
Manufacturer: **as advised by the Customer**	Frontline Fall protection Inc.
Customer orders:	T/1090 and T/1361A
Orders received:	29 Nov. 2022 and 5 July 2024 respectively
Model:	100VTB-UN-AM
Dates of tests:	15 Mar. 2023 to 27 Apr. 2023 and 12 August 2024

Signed:

Steven Sum, Laboratory Manager

Issued: 15 August 2024

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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.

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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 test - Lanyard parking attachment	**Pass**
3.2	**Attachment Element Requirement**	
3.2.1	**Dorsal**	**Pass**
3.2.1.3.1	Dynamic Feet-First test	**Pass**
3.2.1.3.2	Dynamic Head-First test	**Pass**
3.2.1.3.3	Static Feet-First test	**Pass**
3.2.1.3.4	Visual Indicator test	**Pass**
3.2.2	**Sternal**	
3.2.2.3.1	Dynamic Feet-First test	
3.2.2.3.2	Static Feet-First test	
3.2.2.3.3	Visual Indicator test	
3.2.3	**Frontal**	
3.2.3.1.1	Dynamic Feet-First test	
3.2.3.1.2	Static Feet-First test	
3.2.4	**Shoulder**	
3.2.4.1.1	Static Feet-First test	
3.2.5	**Waist, Rear**	
3.2.5.2.1	Static Feet-First test	
3.2.6	**Hip**	
3.2.6.1.1	Static Feet-First test	
3.2.7	**Suspension Seat**	
3.2.7.1.1	Static Feet-First test	
3.3	**Component Requirements**	**Ltd**
3.3.1.1	Load bearing straps - width	**Pass**
3.3.1.2	Strap tensile test	**Pass**
3.3.1.5	Strap tensile test (after abrasion)	**Pass**
3.3.3.1	Connecting Components (except soft loop attachments)	**NAs**
3.3.3.3	Strap tensile test - soft loops attachments	
	Strap tensile test – soft loops attachment (after abrasion)	
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	Date received	INSPEC specimen no.
Shoulder straps (orange), part no. 599#	15 m	11 Mar. 2023	2L05904A to 04J (cut into 10 equal lengths)
Leg strap (black), part no. 64#	15 m		2L05903A to 03J (cut into 10 equal lengths)
Chest strap and back strap (black), part no. 10#	15 m		2L05902A to 02J (cut into 10 equal lengths)
Full body harness, model 100VTB-UN-AM	06		2L06501 to 2L06506

Procedures

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

Testing was performed in accordance with ANSI Z359.11-2021 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 2L06502 was assessed.

3.1.2	The specimen permanently incorporated a dorsal attachment element.	**Pass**
	The specimen did not incorporate other attachment elements.	
	The specimen incorporated a load bearing sub-pelvic strap.	**Pass**
3.1.3	Shoulder straps on the full body harness came together at the dorsal location and were crossed and attached with a (D-ring) connector.	**Pass**
	Testing of the (D-ring) connector was not requested.	**NAs**
3.1.4	The specimen permanently incorporated a back-strap as a mean to control the separation of the shoulder straps on the back of the full body harness.	**Pass**
	When the specimen 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 / 3.1.5.1	The specimen was not equipped with modular components or assemblies.	**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 visual indicators at the dorsal area.	**Pass**
	Both visual indicators deployed during dynamic testing defined in section 3.2.1.3.1 and 3.2.1.3.2 when attached to the dorsal attachment element.	**Pass**
	It was visually possible to inspect both visual indicators.	**Pass**
3.1.7.1	The specimen was not equipped with other visual 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 2L06501 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 85.4 pounds. This value was less than the maximum 120 pounds permitted. **Pass**

Specimen 2L06502 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 corporate sternal attachment elements. **NAp**

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

3.2 Attachment Element Requirements

3.2.1 Dorsal

Specimen 2L06502 was assessed.

The dorsal attachment element was located as shown in Fig. 2 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 using the dorsal attachment element, 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 2L06502 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 9 degrees. This value was less than the maximum 30 degrees permitted.	**Pass**
Both visual indicators deployed visibly and permanently.	**Pass**

Full body harness stretch was 7.7 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 2L06503 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 9 degrees. This value was less than the maximum 30 degrees permitted.	**Pass**
Both visual indicators deployed visibly and permanently.	**Pass**

3.2.1.3.3 Static Feet-First Test

Specimen 2L06504 was assessed.

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

3.2.1.3.4 Fall Arrest Indicator Test

Specimen 2L06505 was assessed.

When tested in accordance with 4.3.6.1, using the dorsal attachment element, both visual indicators deployed visibly and permanently.	**Pass**

3.3 Components Requirements

3.3.1 Load Bearing Straps

Specimen 2L06501 was assessed.

3.3.1.1	The minimum widths of the load bearing straps were 1.73 inches (44 mm). This is more than the minimum 1-625 inches (41 mm) specified.	**Pass**
3.3.1.2	Strap specimens 2L05902A to 02E, 2L05903A to 03E and 2L05904A to 04E withstood the tensile tests 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 to prevent fraying.	**Pass**
3.3.1.5	Following abrasion conditioning, strap specimens 2L05902F to 02J, 2L05903F to 03J and 2L05904F to 04J withstood the tensile tests of 3,600 pounds applied for 1-minute without breaking.	**Pass**
3.3.1.6	Straps in contact with metal connectors at attachment elements were protected from wear. Plastic sleeves were used.	**Pass**
	Straps in contact with tongue buckles were protected from wear. Grommets were used.	**Pass**
3.3.1.7	The spacing between holes centres of adjacent eyelets for buckle and eyelet type adjusters used in the specimen was 1.81 inches (46 mm). This is more than the minimum 1.125 inches (29mm) and less the maximum 2 inches (50mm) allowed.	**Pass**

3.3.2 Thread and Stitching

Specimen 2L06501 was assessed.

3.3.2.1	The material and characteristics of threads 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 white colour. This contrasted with the orange and black colours of the load bearing straps.	**Pass**

3.3.3 Connecting Components

Specimen 2L06501 was assessed.

3.3.3.1	Testing of connecting components was not requested.	**NAs**
3.3.3.2	Soft loop attachment was 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

Markings in English were provided electronically and used for assessment.

5.1.1	-	Markings shall be in English.	**Pass**
5.1.2		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**
		When pressure-sensitive labels are used, they shall comply with the applicable provision of the reference in Section 7.2.1 Mfr to certify.	**NAs**
		When labels are concealed, a permanent marking shall be visible to the unaided eye that describes how to access the labels.	**NAs**
	a.	The material of construction; [Polyester]	**Pass**
	b.	The size or range of sizes;	**Pass**
	c.	Part number and/or model designation; [100VTB-UN-AM]	**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**
	h.	A label permanently attached to the lanyard parking attachment which either state “Park Lanyard Here. See instructions.” verbally or conveys this by means of a pictogram.	**Pass**
5.1.3	i.	If the harness stretch measurement for the frontal attachment exceeds 18 inches (457 mm) in 3.2.3.1.1, then harness shall include a warning with the stated stretch out distance.	**NAp**
	j	If the FBH includes an integrated D-ring extender, a warning shall be included on the D-ring extender that increased free fall should be considered when using this product.	**NAp**
	k.	Applicable pictogram in Figure 12 with a minimum height of 0.8 inches (20 mm) or applicable pictograms from CSA Z259.10-18 Figure 1 – Figure 8. [the heights of the pictograms were not measured]	**Ltd**
	l.	A label as defined in Figure 11a:	**Ltd**
		1. The label shall be placed in a prominent location on the full body harness;	**Pass**
		2. 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**
		3. 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 11a and 11b.	**NAp**

5.2 Instruction Requirements

User Instructions in English were provided electronically and used for assessment.

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.	**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_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.	An illustration demonstrating the load indicator before and after deployment.	**Pass**
j.	Reproduction of printed information on all markings.	**Pass**
k.	Inspection procedures (including frequency) required to assure the equipment is in serviceable condition and operating correctly.	**Pass**
l.	Criteria for discarding equipment that fails inspection.	**Pass**
m.	Procedures for cleaning, maintenance and storage.	**Pass**
n.	Reference to ANSI/ASSE Z359.11 (full body harnesses) and applicable regulations governing occupational safety.	**Pass**
o.	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	Design Requirements		Not applicable
3.1.3	Connector		See Test Report
3.1.5.1	Modular Components		See Test Report
3.1.5.2	Attachment Element Extender	Length	±0.1 inches
3.1.8	Connecting Subsystem Combinations		See Test Report
3.1.10	Lanyard Parking Attachment Element	Static Feet-First test	±3.4%
3.2	Attachment Element Requirement		Not applicable
3.2.1.3.1	Dorsal attachment element	Dynamic Feet-First test	±3.4%
3.2.1.3.2		Dynamic Head-First test	±3.4%
3.2.1.3.3		Static strength test	See Note 1
		Slippage	±1.3%
3.2.1.3.4		Visual Indicator test	See Note 1
3.2.2.3.1	Sternal attachment element	Dynamic Feet-First test	±3.4%
3.2.2.3.2		Static strength test	See Note 1
3.2.2.3.2		Slippage	±1.3%
		Visual Indicator test	See Note 1
3.2.3.1.1	Frontal attachment element	Dynamic Feet-First test	±3.4%
3.2.3.1.2		Static strength test	See Note 1
		Slippage	±1.3%
3.2.4.1.1	Shoulder attachment element	Static strength test	See Note 1
		Slippage	±1.3%
3.2.5.2.1	Waist, Rear attachment element	Static strength test	See Note 1
		Slippage	±1.3%
3.2.6.1.1	Hip attachment element	Static strength test	See Note 1
		Slippage	±1.3%
3.2.7.1.1	Suspension Seat attachment element	Static strength test	See Note 1
		Slippage	±1.3%

Clause	Test		Uncertainty
3.3	Component Requirements		Not applicable
3.3.1.1	Load Bearing Straps	Width	±0.1 inch
3.3.1.2		Static strength test	See Note 1
3.3.1.5		Static strength test (after abrasion)	See Note 1
3.3.1.7		Buckle & eyelet type adjusters (Spacing)	±0.1 inch
3.3.3.1	Connecting components (except soft loop attachments)		See Test Report
3.3.3.3	Soft loop attachments	Static strength test	See Note 1
		Static strength test (after abrasion)	See Note 1
5	Markings and Instructions		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 100VTB-UN-AM

INSPEC Testing Services' specimen 2L06501 **12 August 2024**

INSPEC
TESTING SERVICES

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ANAB Certificate number AT-1725

Test Report

ANSI Z359.13-2013 (R2022) Personal Energy Absorbers and Energy Absorbing Lanyards

Report no: 2.24.08.26

Customer: Frontline Fall Protection Inc.
6 Lee Blvd.
Malvern
PA 19355
U.S.A

Manufacturer:
as advised by the Customer Frontline Fall Protection Inc.

Customer order: T/0739 and T/1361A

Order received: 12 March 2020 and 5 July 2024 respectively

Model: LIS61S-AM

Dates of tests: 19 Mar. 2020 to 21 May 2020 and 30 July 2024

Signed:
Steven Sum, Laboratory Manager

Issued: 3 August 2024

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

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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	**Pass**
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 lbs - abraded)	
3.2.8	Static test for wrap-around lanyards (5000 lbs)	
3.2.9	Static test for Y-lanyards	
3.2.10.1	Dynamic test for Y-lanyards (Single connection)	
3.2.10.2	Dynamic test for Y-lanyards (Dual connection)	
3.2.10.3	Dynamic test for Y-lanyards (Hip connection)	
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 Energy absorbing lanyard, model 1858020	01		2F14902
6 ft Free Fall Shock absorber lanyard, model LIS61S-AM	02	20 January 2020	2H03801 to 2H03802

Procedures

The specimens detailed within the submission 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 manufacturer made the following declarations:

1) Model 1858020 is a single leg variant of twin leg energy absorbing lanyards 1858020Y

2) Models 1858020 and LIS61S-AM are identical products. Model 1858020 incorporates forged connectors. Model LIS61S-AM incorporates pressed connectors.

To avoid duplicate testing, performance testing results of model 1858020Y are shared across to model LIS61S-AM.

Result details

3.1.5 Deployment indicator

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

3.1.6 Activation force

Specimens 2F15001, 2F15002 and 2F15003 were assessed.

The specimens showed no signs 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

Specimen 2F14902 was assessed.

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

3.2.1 Materials

Specimen 2F14902 was assessed.

Tubular webbing was used on the construction of the energy absorbing lanyard.

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 2F14902 was assessed.

The energy absorbing lanyard was constructed of webbing.

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

3.2.2.2 Webbing terminations

Specimen 2F14902 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 white 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. The method used was looped webbing. **Pass**

d) The ends of the webbing were hot-cut so as to prevent unravelling. **Pass**

3.2.4 Dynamic performance test - Ambient dry condition

Specimens 2F15013, 2F15014 and 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 (4kN) 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 (8kN) permitted.
See Annex 1 for the plots 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 (1.2m) permitted.

3.2.5 Dynamic performance test - Ambient wet condition

Specimens 2F15004, 2F15005 and 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 (5kN) 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 (8 kN) permitted.
See Annex 1 for the plots 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 (1.2m) permitted.

3.2.5 Dynamic performance test - Cold dry condition

Specimens 2F15007, 2F15008 and 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 (5kN) 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 (8kN) 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 (1.2m) 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 (5kN) 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 (8kN) 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 (1.2m) permitted.

3.2.6 Static strength

Specimens 2F15013, 2F15014 and 2F15015 were assessed.

The specimens withstood the tensile tests of 5,000 pounds applied for 1-minute without breaking. **Pass**

5 Marking and Reference Literature

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**
	Marking labels provided electronically were used for assessment.	
	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; [LIS61S-AM]	**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]	**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 Personal Energy Absorbers and Energy Absorbing Lanyards

	Personal energy absorbers and energy absorbing lanyards shall be marked to identify:	
	· the fiber used in the material of construction; [Polyester]	**Pass**
	· the length; [6 feet]	**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 the texts were assessed]	**Ltd**
	· 6 ft FF personal energy absorbers shall be in black print on a contrasting white background;	**Pass**
	· 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 General Instruction Requirements

User Instructions in English were provided electronically and used for assessment.

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.

5.3.1	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 falls inspection;	**Pass**
	· procedures for cleaning, maintenance, and storage;	**Pass**
	· reference to the ANSI/ASSE Z359.13, *Personal Energy Absorbers and Energy Absorbing Lanyards*, 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 Personal Energy Absorbers

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
3.1.5	Deployment indicator		Not applicable
3.1.6	Activation force		See Note 1
	Permanent elongation		±0.5%
3.2	Personal Energy Absorber Component, if fitted		See INSPEC report
3.2.1	Materials		Not applicable
3.2.2	Terminations		Not applicable
3.2.3	Connectors		See INSPEC report
3.2.4	Dynamic performance (ambient dry)	Force	±3%
		Deployment distance	±1mm
3.2.5	Dynamic performance (various conditions)	Force	±3%
		Deployment distance	±1mm
3.2.6	Static test (single lanyard)	Strength	See Note 1
		Slippage	±2.1%
3.2.7	Abrasion test (wrap-around energy absorbing lanyards)		See Note 1
3.2.8	Static strength (wrap-around energy absorbing lanyards)		See Note 1
3.2.9	Static strength (Y-lanyards)		See Note 1
3.2.10.1	Dynamic test, Y-lanyards (Single connection)	Force	±3%
		Deployment distance	±1mm
3.2.10.2	Dynamic test, Y-lanyards (Dual connection)	Force	±3%
3.2.10.3	Dynamic test, Y-lanyards (Hip connection)		See Note 1
5	Marking and Reference Literature		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 assessments against the pass/fail criteria.

ANNEX

This Annex comprises two sections.

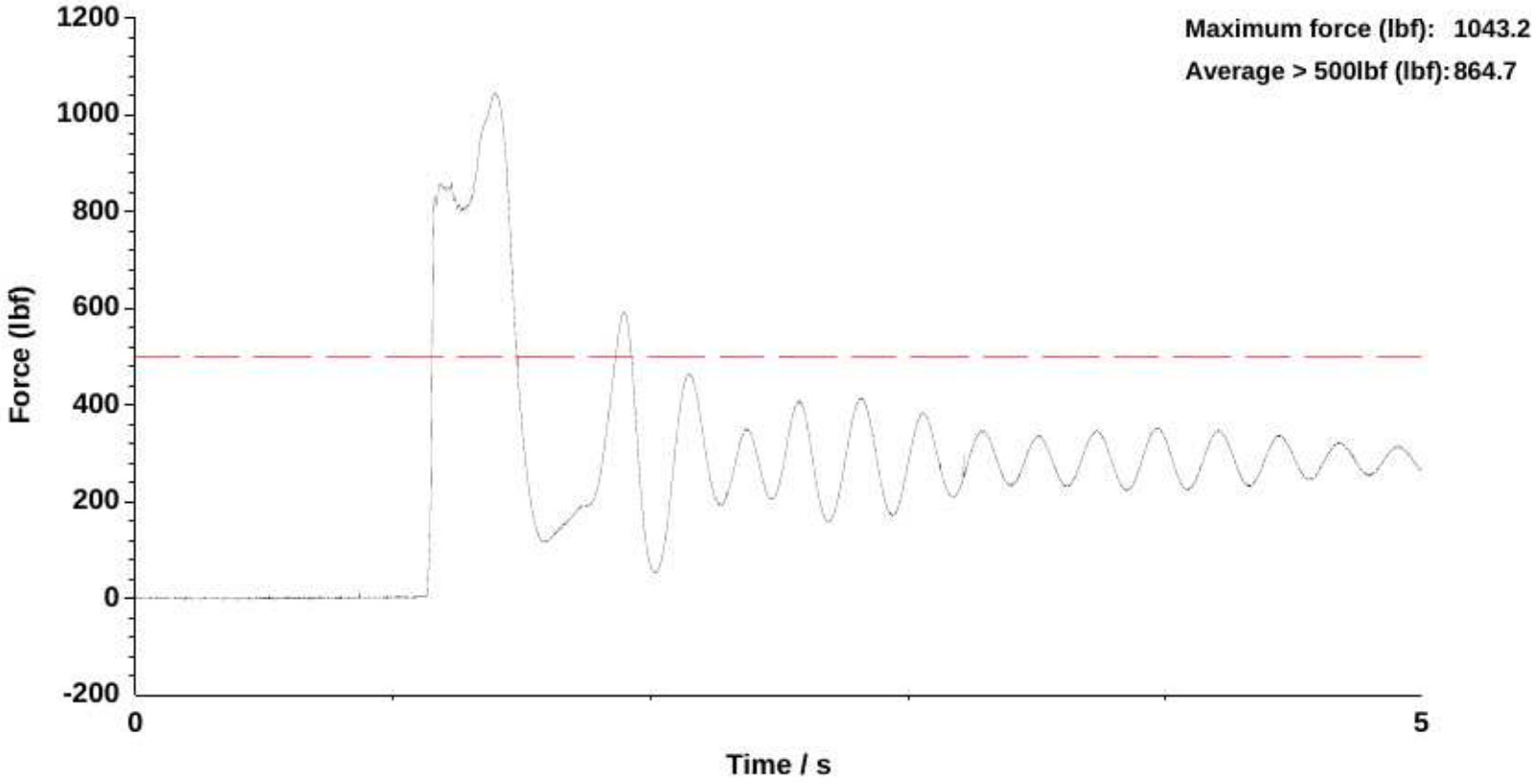
1. Plots of arrest force versus time. (12 pages)

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

END OF REPORT

INSPEC Technical Services

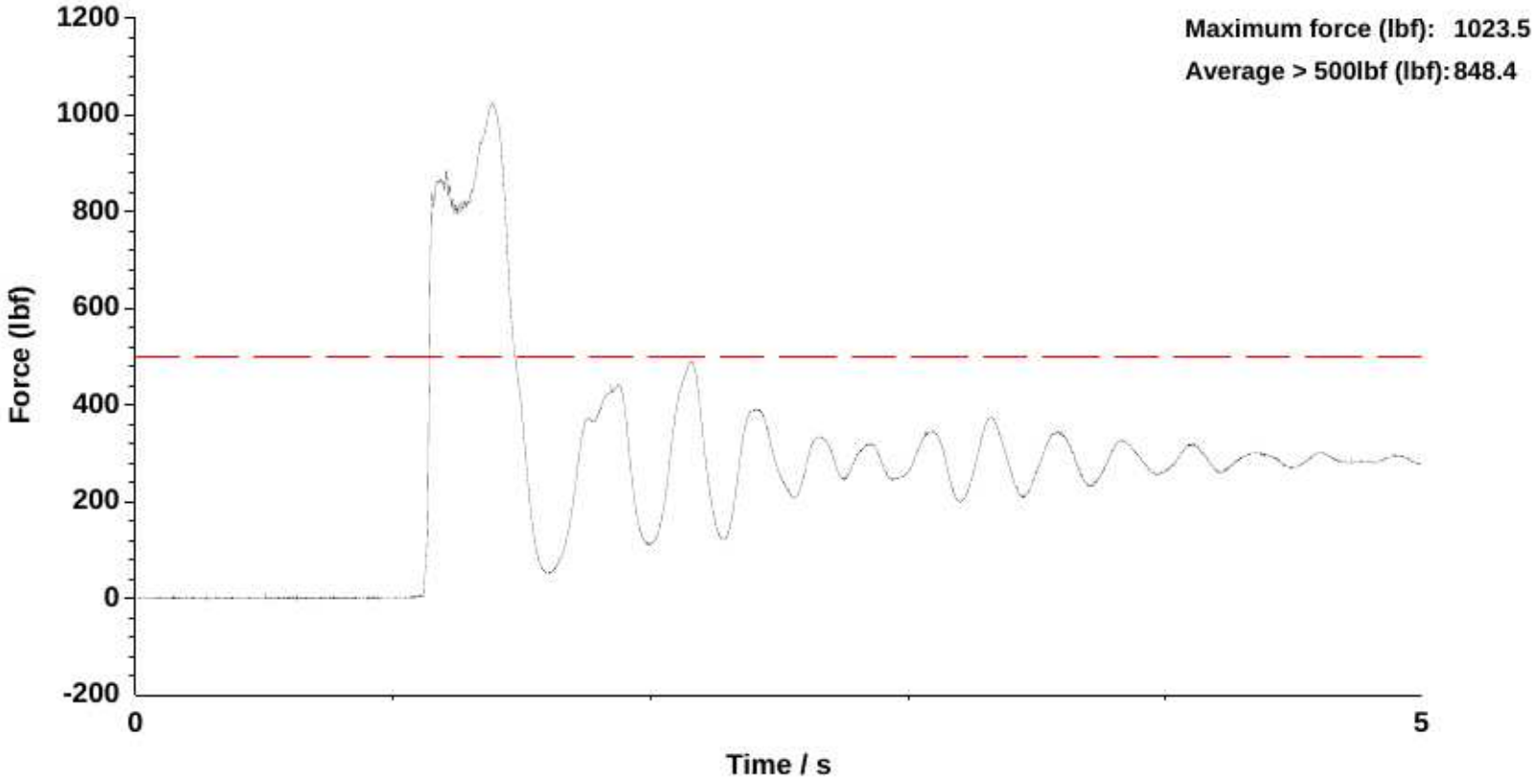
Technician:	SS
Standard	ANSI Z359.13:2013 EA Lanyard
Sample / File name:	2F15004
Drop item	Drop weight, US-128 kg
Orientation/Attachment Point:	Centre eyebolt
Time and Date of Test:	19:01 06/11/18



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

INSPEC Technical Services

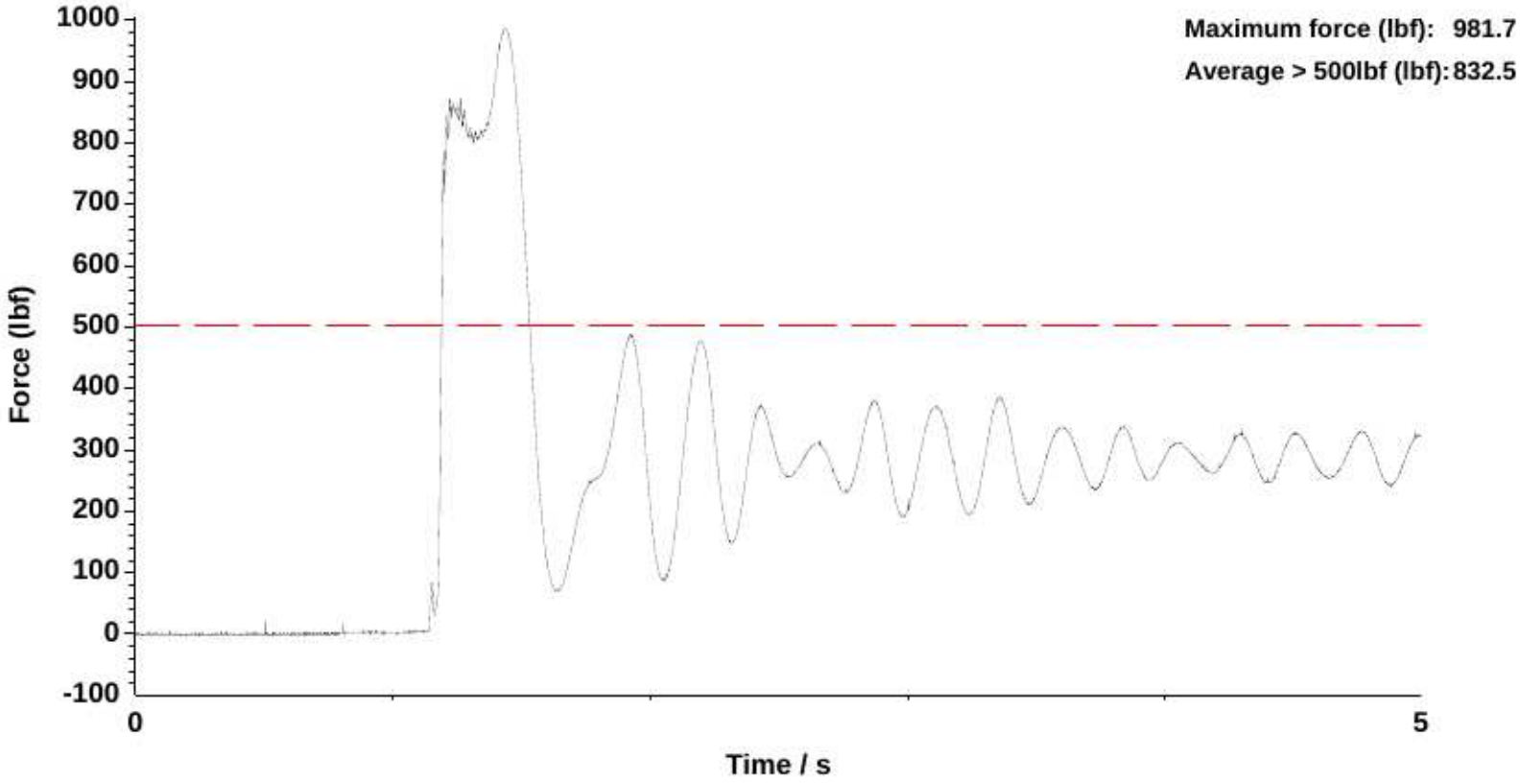
Technician:	SS
Standard	ANSI Z359.13:2013 EA Lanyard
Sample / File name:	2F15005
Drop item	Drop weight, US-128 kg
Orientation/Attachment Point:	Centre eyebolt
Time and Date of Test:	19:08 06/11/18



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

INSPEC Technical Services

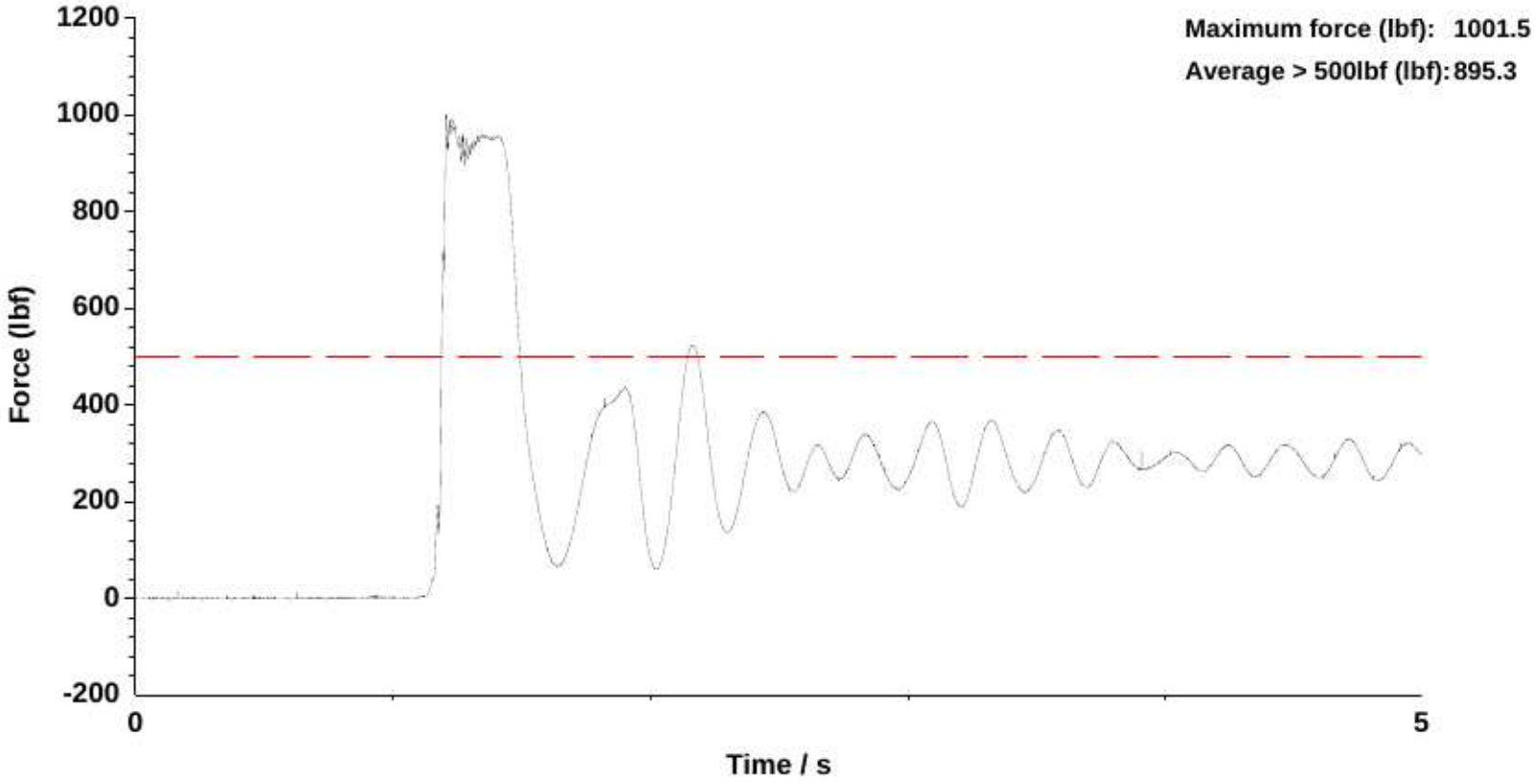
Technician:	SS
Standard	ANSI Z359.13:2013 EA Lanyard
Sample / File name:	2F15006
Drop item	Drop weight, US-128 kg
Orientation/Attachment Point:	Centre eyebolt
Time and Date of Test:	19:14 06/11/18



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

INSPEC Technical Services

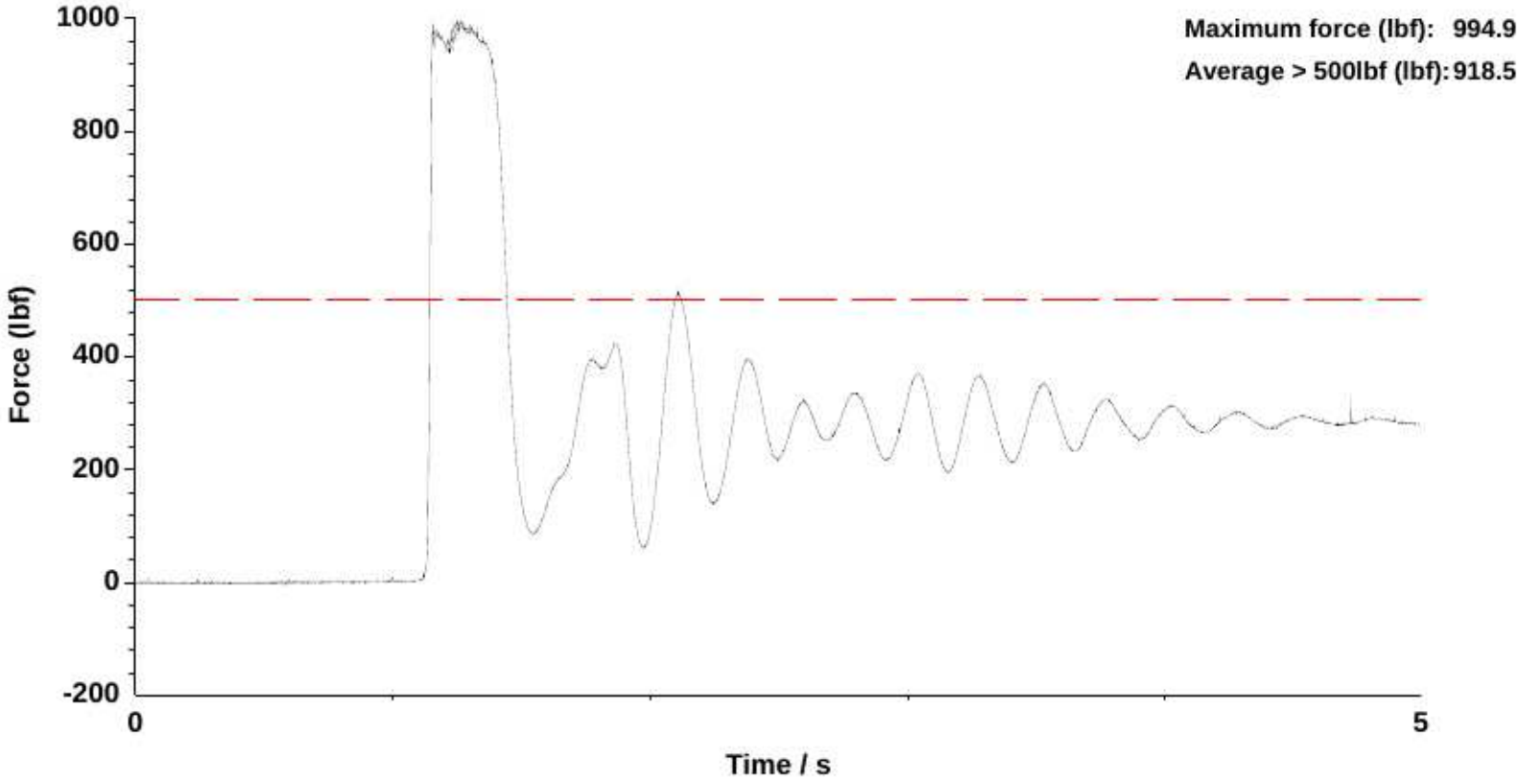
Technician:	SS
Standard	ANSI Z359.13:2013 EA Lanyard
Sample / File name:	2F15007
Drop item	Drop weight, US-128 kg
Orientation/Attachment Point:	Centre eyebolt
Time and Date of Test:	18:21 06/11/18



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

INSPEC Technical Services

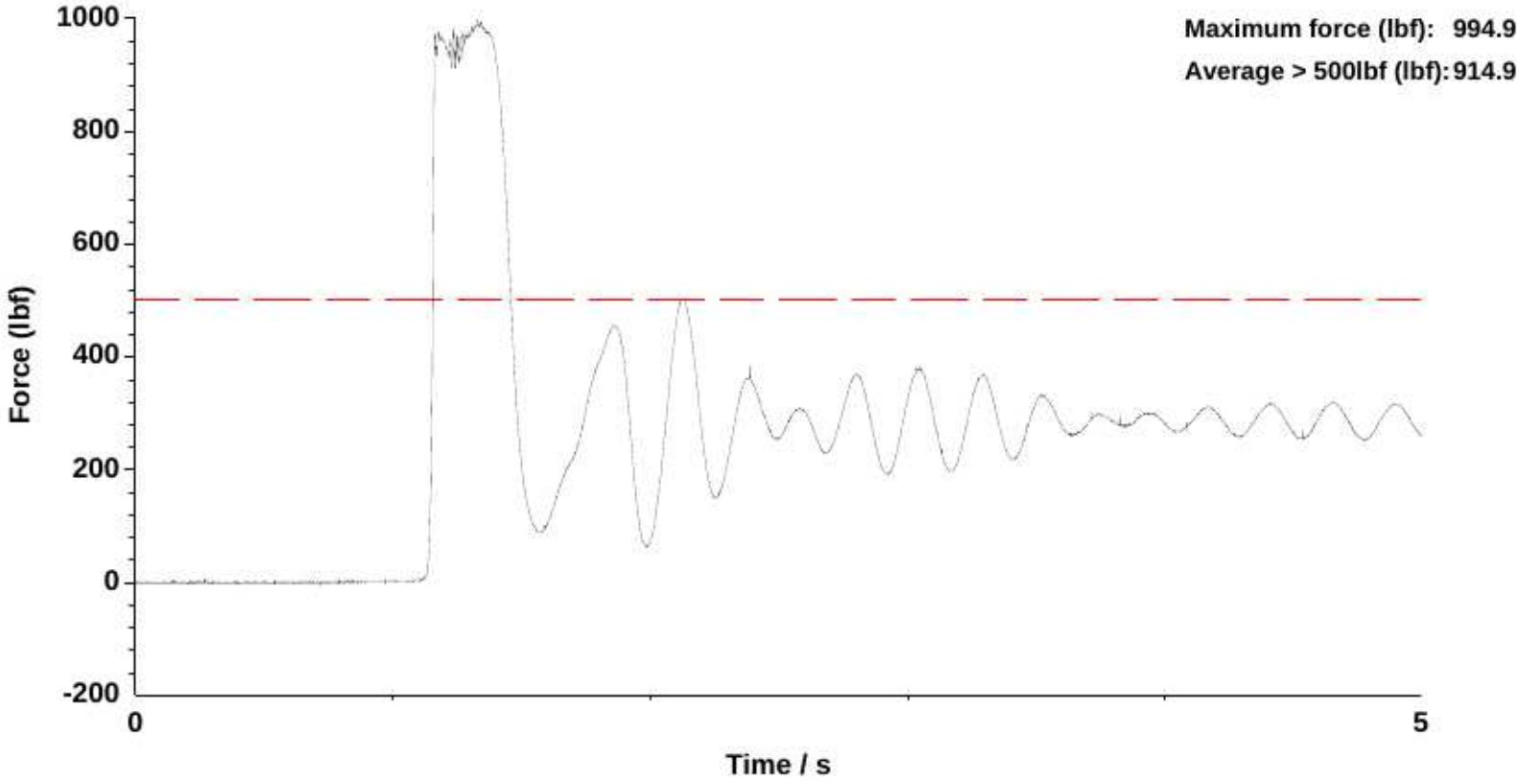
Technician:	SS
Standard	ANSI Z359.13:2013 EA Lanyard
Sample / File name:	2F15008
Drop item	Drop weight, US-128 kg
Orientation/Attachment Point:	Centre eyebolt
Time and Date of Test:	18:27 06/11/18



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

INSPEC Technical Services

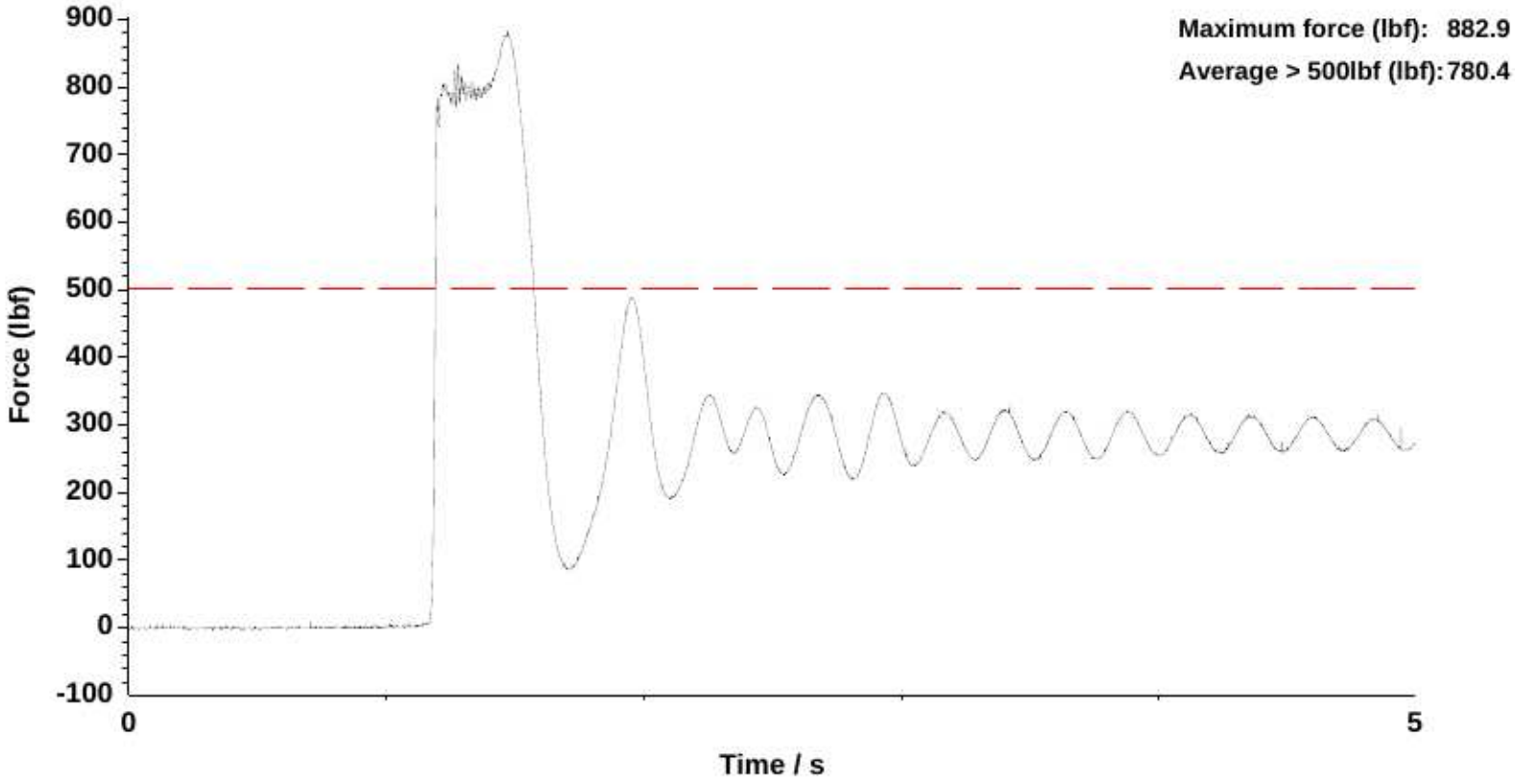
Technician:	SS
Standard	ANSI Z359.13:2013 EA Lanyard
Sample / File name:	2F15009
Drop item	Drop weight, US-128 kg
Orientation/Attachment Point:	Centre eyebolt
Time and Date of Test:	18:34 06/11/18



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

INSPEC Technical Services

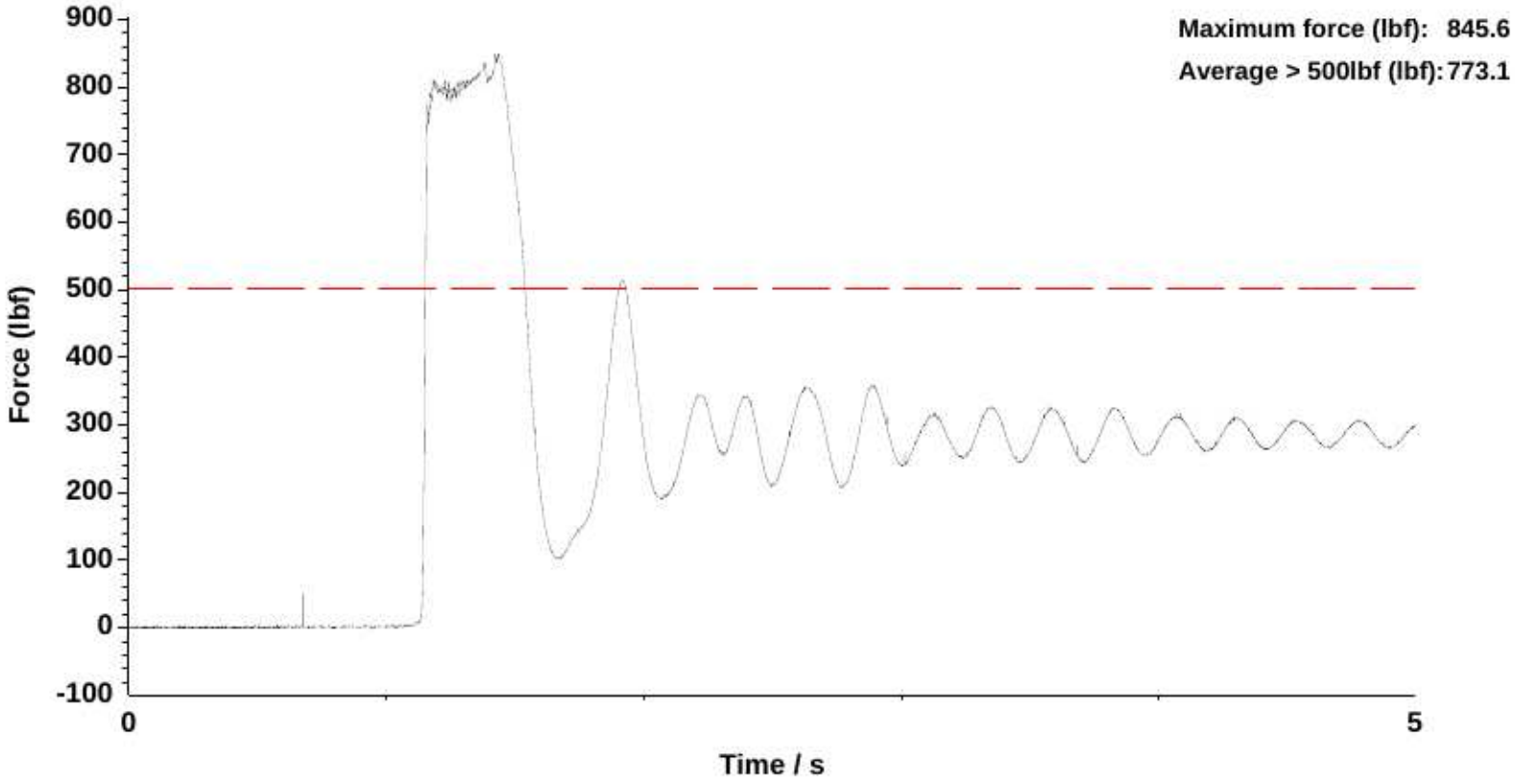
Technician:	SS
Standard	ANSI Z359.13:2013 EA Lanyard
Sample / File name:	2F15010
Drop item	Drop weight, US-128 kg
Orientation/Attachment Point:	Centre eyebolt
Time and Date of Test:	18:40 06/11/18



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

INSPEC Technical Services

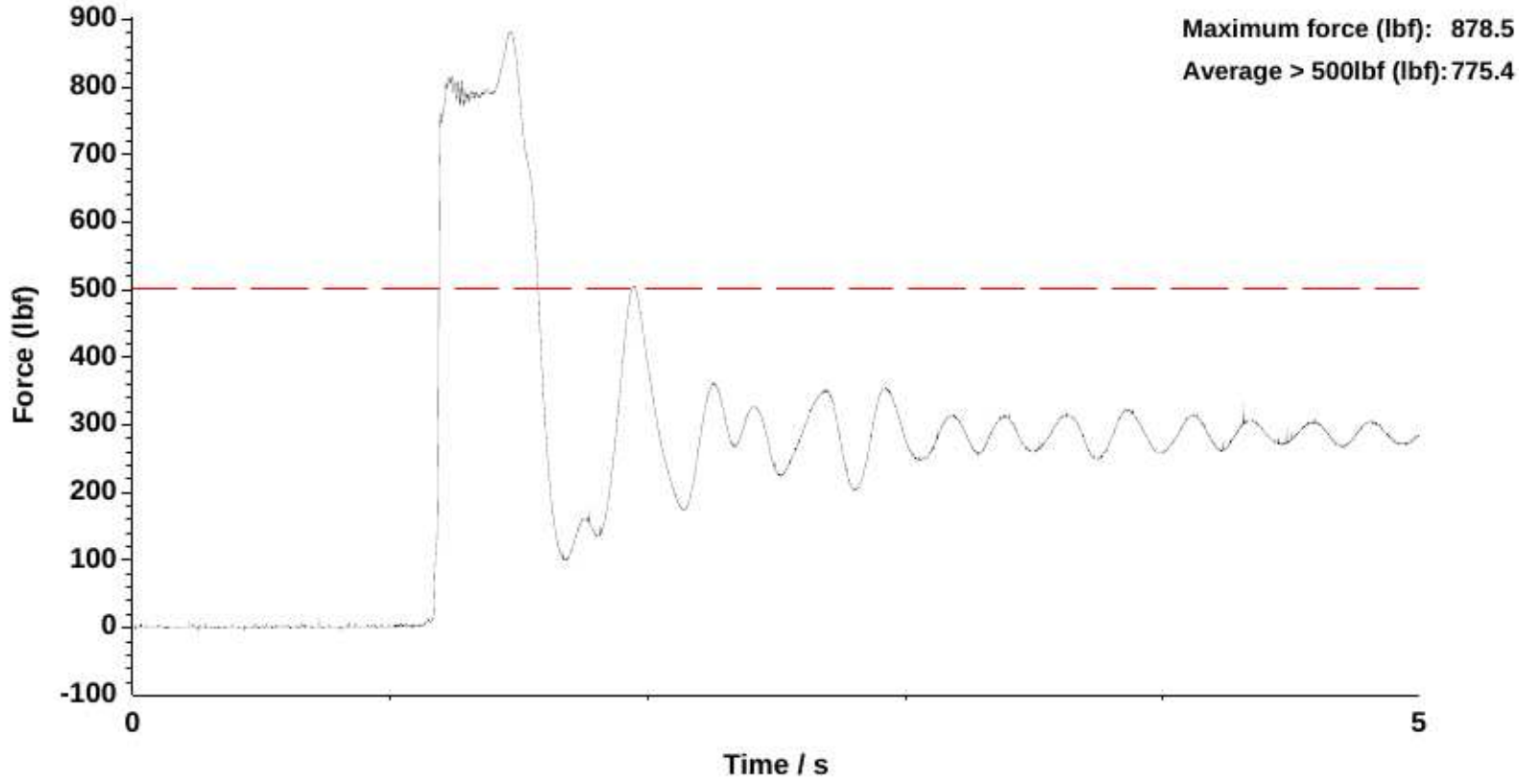
Technician:	SS
Standard	ANSI Z359.13:2013 EA Lanyard
Sample / File name:	2F15011
Drop item	Drop weight, US-128 kg
Orientation/Attachment Point:	Centre eyebolt
Time and Date of Test:	18:48 06/11/18



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

INSPEC Technical Services

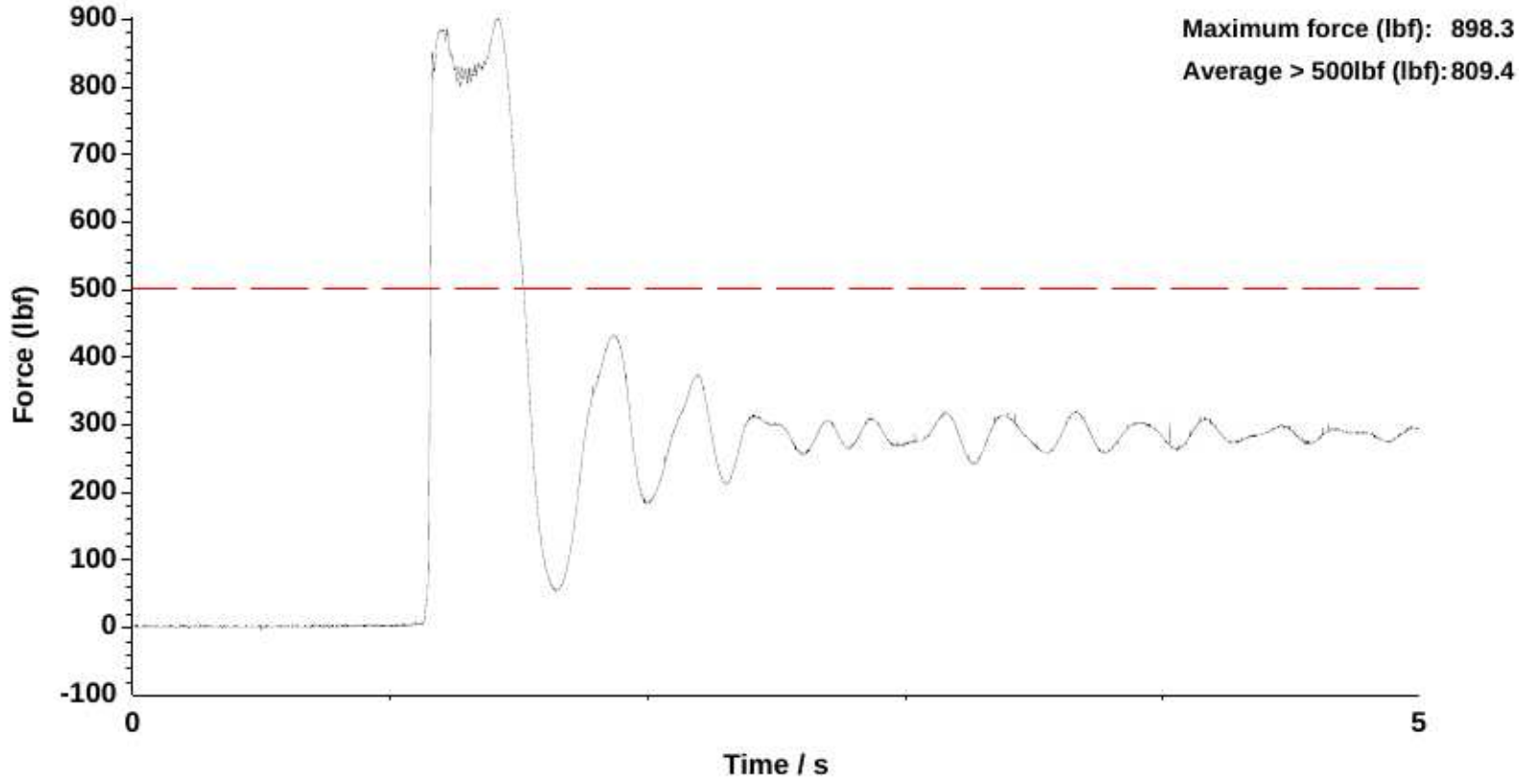
Technician:	SS
Standard	ANSI Z359.13:2013 EA Lanyard
Sample / File name:	2F15012
Drop item	Drop weight, US-128 kg
Orientation/Attachment Point:	Centre eyebolt
Time and Date of Test:	18:54 06/11/18



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

INSPEC Technical Services

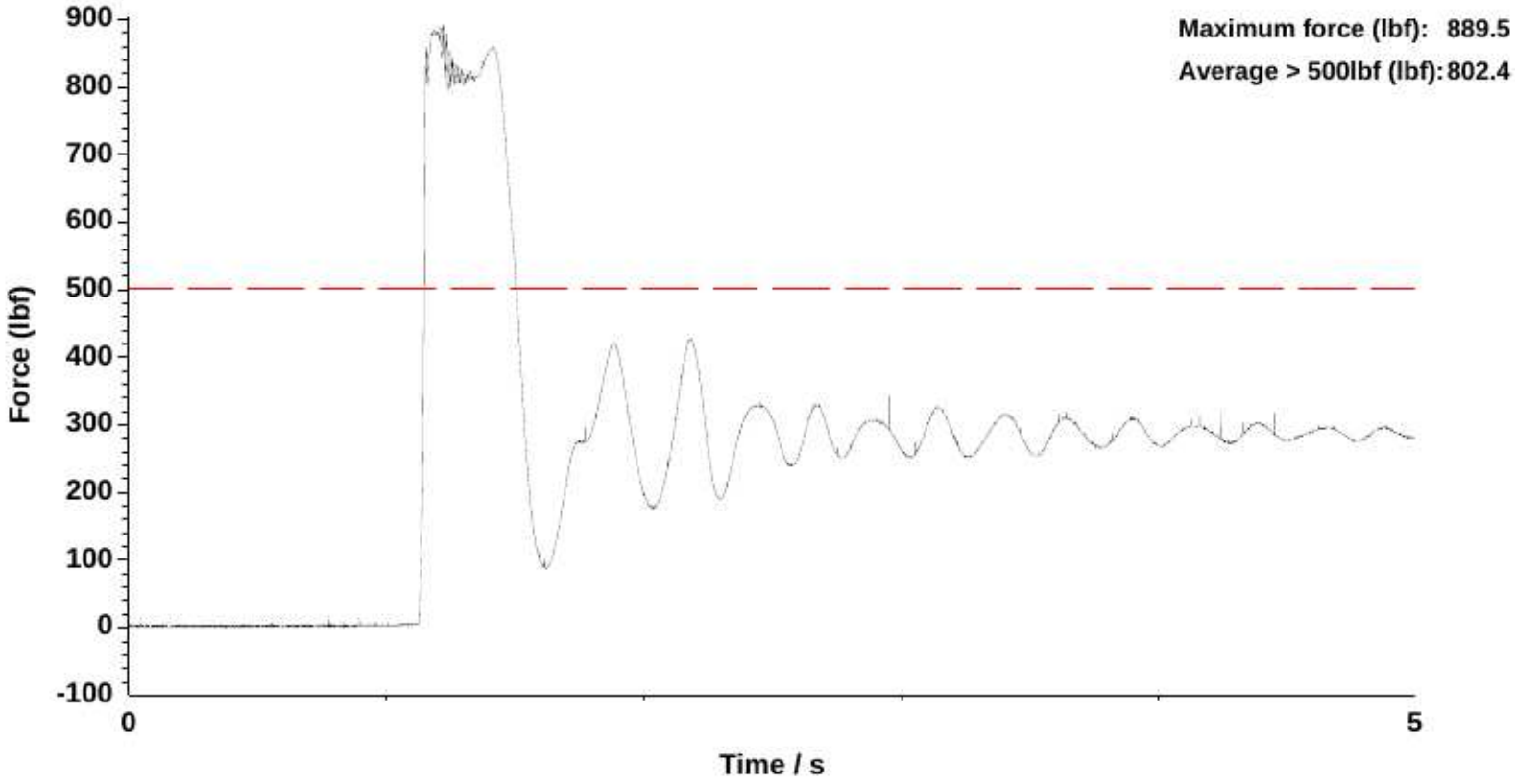
Technician:	SS
Standard	ANSI Z359.13:2013 EA Lanyard
Sample / File name:	2F15013
Drop item	Drop weight, US-128 kg
Orientation/Attachment Point:	Centre eyebolt
Time and Date of Test:	17:31 06/11/18



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

INSPEC Technical Services

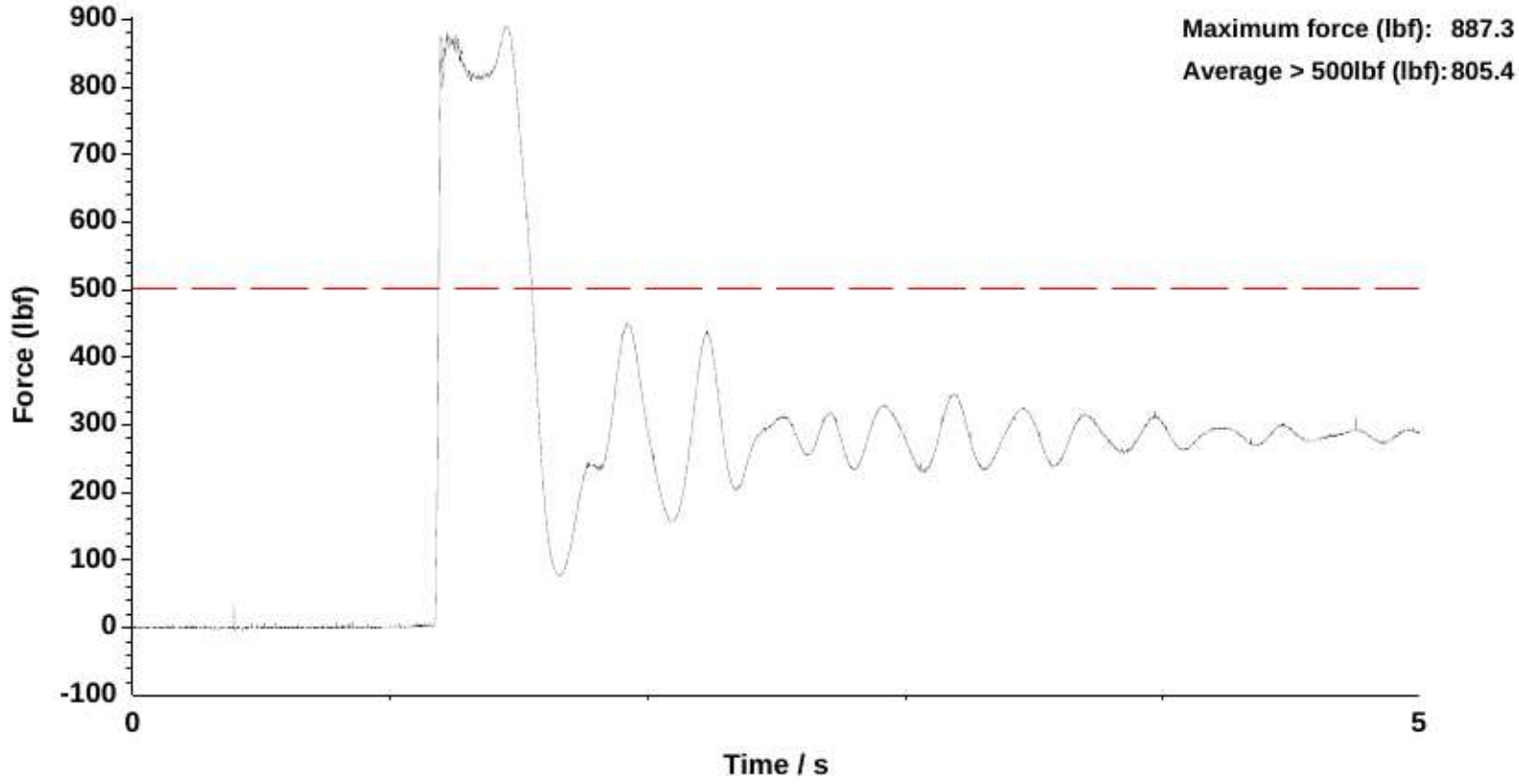
Technician:	SS
Standard	ANSI Z359.13:2013 EA Lanyard
Sample / File name:	2F15014
Drop item	Drop weight, US-128 kg
Orientation/Attachment Point:	Centre eyebolt
Time and Date of Test:	17:39 06/11/18



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.

Frontline Fall Protection Inc. –
Shock absorber lanyard, model LIS61S-AM

INSPEC Testing Services' specimen 2H03801 **12 August 2024**