Declaration of Conformity

In Accordance with ANSI/ISEA 125-2014 and ANSI/ASSP Z359.7-2019

Declaration #: DOC-UFL206101
Declaration Date: 08/13/2019

Item #: UFL206101

Description: KStrong® 4.5 - 6 ft. Elasticated design shock absorbing lanyard with snap hooks (ANSI)

Brand Name: KStrong

Manufacturer: KStrong

Address: 18505 Intercontinental Crossing, Houston, TX 77073

Additional Items Conforming Under this Declaration (If Applicable):

KStrong declares that the product(s) listed above is in conformity with the requirements of the following performance standard(s):

ANSI Z359.13-2013

Conformity Assessment Method in accordance with ANSI/ISEA 125-2014

- ○ **Level 1:** KStrong Lab Outside the Scope of ISO/IEC Standard 17025:2017
- ○ **Level 2:** KStrong Lab Within the Scope of ISO/IEC Standard 17025:2017
- ● **Level 3:** Independent 3rd Party Lab accredited to ISO/IEC Standard 17025:2017

Supporting Documentation: KS-Test-UFL206101.pdf

This Certificate is a guarantee that the above standard(s) was met by the requirements of such standard. Testing was performed under normal operation mode. The results of testing apply only to the particular sample tested and the specific test carried out. This Certificate is only issued for products which have passed the testing requirements of listed standard(s).

Authorized Signature:

Chad McBride
Chief Operating Officer - KStrong

ISO 17025 Accredited Test Laboratory

INSPEC Technical Services (Kunshan) Co Ltd
8 Jin Yang East Road,
Lu Jia Zhen Kunshan, Jiangsu, China
Tel: +86 (512) 5011 2646
email: testing@inspec.asia
www.inspec-international.com

INSPEC Technical Services (Kunshan) Co Ltd • 8 Jin Yang East Road • Lu Jia Zhen • Kunshan • Jiangsu • China
Email: testing@inspec.asia Website: www.inspec-international.com
Tel: +86 (512) 5011 2646 Fax: +86 (512) 5011 2656

Test Report

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

Report no: 2.19.08.10

Client: KSTRONG LLC
17330 Preston Road
#200 D Dallas
TX 7525
U.S.A

Manufacturer: KSTRONG LLC

Client orders: T/0289 (15 March 2016)
T/0609 (22 July 2019)

Model: UFL206101

Dates of tests: 12 July 2016 to 10 August 2016, and 9 August 2019

Signed: **Issued:** 13 August 2019

Steven Sum, Laboratory Manager

Conditions

This report may be reproduced and distributed to your clients, provided that it is reproduced and distributed in full.

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.

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)
3.1.5	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	NAs
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	Pass
3.2.7	Static test for wrap-around lanyards (3600 lbf – abraded)	
3.2.8	Static test for wrap-around lanyards (5000 lbf – unabraded)	
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	Date received	INSPEC specimen no. (2D100+)
Elasticated Internal shock absorbing lanyard, model UFL206101	16	6 July 2016	01 to 16

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.

5 Labels and User Instructions were supplied electronically and used for assessment.

Result details

3.1.5 Deployment indicator

Subsequent to the testing of specimens 2D10004 to 2D10006 against 3.2.4, it became obvious that the energy absorbing lanyards had been activated. Pass

3.1.6 Activation force

Specimens 2D10001, 2D10002 and 2D10003 were assessed.

The specimens showed no sign of activation when subjected to the 450 pounds static force. Pass

The permanent elongation of the specimen 2D10001, following the test, was 0.94 inches. This is less than the maximum 2 inches permitted. Pass

The permanent elongation of the specimen 2D10002, following the test, was 0.98 inches. This is less than the maximum 2 inches permitted. Pass

The permanent elongation of the specimen 2D10003, following the test, was 0.94 inches. This is less than the maximum 2 inches permitted. Pass

3.2 Personal Energy Absorbing Lanyard Component

Specimens 2D04701 to 2D04715 were assessed.

The specimens had energy absorbing ability that satisfied the design and testing requirements of this standard. (See detail results below) Ltd

3.2.1 Materials

Specimen 2D10001 was assessed.

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 2D10001 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 2D10001 was assessed.

a) Lock stitches sewn on all stitched eye termination straps was 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 webbing were white colour. This contrasted with the red / black colour of the webbing. Pass

c) The webbing was protected at load-bearing connector elements. Pass

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

3.2.3 Connectors

Specimen 2D10001 was assessed.

It incorporated two integrally attached connectors (snaphooks).

Testing of the connectors was not requested. NAs

3.2.4 Dynamic performance test – Ambient dry condition (average arrest force)

Specimens 2D10004 to 2D10006 were assessed.

During the dynamic performance tests, the average arrest force of the specimens were recorded as follows:

Specimen 2D10004 was 733 pounds.	Pass
Specimen 2D10005 was 734 pounds.	Pass
Specimen 2D10006 was 734 pounds.	Pass

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

3.2.4 Dynamic performance test – Ambient dry condition (maximum arrest force)

Specimens 2D10004 to 2D10006 were assessed.

During the dynamic performance tests, the maximum arrest force of the specimens were recorded as follows:

Specimen 2D10004 was 865 pounds.	Pass
Specimen 2D10005 was 839 pounds.	Pass
Specimen 2D10006 was 854 pounds.	Pass

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

3.2.4 Dynamic performance test – Ambient dry condition (deployment distance)

Specimens 2D10004 to 2D10006 were assessed.

During the dynamic performance tests, the deployment distance of the specimens were recorded as follows:

Specimen 2D10004 was 40.5 inches.	Pass
Specimen 2D10005 was 42.3 inches.	Pass
Specimen 2D10006 was 42.4 inches.	Pass

These values are less than the maximum 48 inches permitted.

3.2.5 Dynamic performance test - Ambient wet condition (average arrest force)

Specimens 2D10007 to 2D10009 were assessed.

During the dynamic performance tests, the average arrest force of the specimens were recorded as follows:

Specimen 2D10007 was 781 pounds.	Pass
Specimen 2D10008 was 775 pounds.	Pass
Specimen 2D10009 was 781 pounds.	Pass

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

3.2.5 Dynamic performance test - Ambient wet condition (maximum arrest force)

Specimens 2D10007 to 2D10009 were assessed.

During the dynamic performance tests, the maximum arrest force of the specimens were recorded as follows:

Specimen 2D10007 was 861 pounds.	Pass
Specimen 2D10008 was 887 pounds.	Pass
Specimen 2D10009 was 894 pounds.	Pass

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

3.2.5 Dynamic performance test - Ambient wet condition (deployment distance)

Specimens 2D10007 to 2D10009 were assessed.

During the dynamic performance tests, the deployment distance of the specimens were recorded as follows:

Specimen 2D10007 was 36.3 inches.	Pass
Specimen 2D10008 was 36.9 inches.	Pass
Specimen 2D10009 was 35.0 inches.	Pass

These values are less than the maximum 48 inches permitted.

3.2.5 Dynamic performance test - Cold dry condition (average arrest force)

Specimens 2D10010 to 2D10012 were assessed.

During the dynamic performance tests, the average arrest force of the specimens were recorded as follows:

Specimen 2D10010 was 869 pounds.	Pass
Specimen 2D10011 was 879 pounds.	Pass
Specimen 2D10012 was 885 pounds.	Pass

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

3.2.5 Dynamic performance test - Cold dry condition (maximum arrest force)

Specimens 2D10010 to 2D10012 were assessed.

During the dynamic performance tests, the maximum arrest force of the specimens were recorded as follows:

Specimen 2D10010 was 1013 pounds.	Pass
Specimen 2D10011 was 1021 pounds.	Pass
Specimen 2D10012 was 1039 pounds.	Pass

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

3.2.5 Dynamic performance test - Cold dry condition (deployment distance)

Specimens 2D10010 to 2D10012 were assessed.

During the dynamic performance tests, the deployment distance of the specimens were recorded as follows:

Specimen 2D10010 was 28.4 inches.	Pass
Specimen 2D10011 was 28.7 inches.	Pass
Specimen 2D10012 was 29.8 inches.	Pass

These values are less than the maximum 48 inches permitted.

3.2.5 Dynamic performance test - Hot dry condition (average arrest force)

Specimens 2D10013 to 2D10015 were assessed.

During the dynamic performance tests, the average arrest force of the specimens were recorded as follows:

Specimen 2D10013 was 716 pounds.	Pass
Specimen 2D10014 was 715 pounds.	Pass
Specimen 2D10015 was 707 pounds.	Pass

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

3.2.5 Dynamic performance test - Hot dry condition (maximum arrest force)

Specimens 2D10013 to 2D10015 were assessed.

During the dynamic performance tests, the maximum arrest force of the specimens were recorded as follows:

Specimen 2D10013 was 832 pounds.	Pass
Specimen 2D10014 was 837 pounds.	Pass
Specimen 2D10015 was 795 pounds.	Pass

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

3.2.5 Dynamic performance test - Hot dry condition (deployment distance)

Specimens 2D10013 to 2D10015 were assessed.

During the dynamic performance tests, the deployment distance of the specimens were recorded as follows:

Specimen 2D10013 was 46.8 inches.	Pass
Specimen 2D10014 was 42.1 inches.	Pass
Specimen 2D10015 was 42.5 inches.	Pass

These values are less than the maximum 48 inches permitted.

3.2.6 Static strength

Specimens 2D10004 to 2D10006 were assessed.

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

Labels were supplied electronically and 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; [UFL206101] Pass

· year of manufacture; Pass

· manufacturer's name or logo; [KSTRONG] 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 Energy absorbing lanyards shall be marked to identify:

· the fiber used in the material of construction; [Polyester; Nylon; Steel] 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"] Pass

· restriction, if any, on the types of components, subsystems, or systems with which the energy absorber is designed to be used; Pass

· 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; [the size and color of the label was not assessed] Ltd

· 6 ft FF personal energy absorbers shall be in black print on a contrasting white background; NAs

· 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

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. *User instructions were supplied electronically in English and used for assessment.*	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 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;	Pass
· 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			See Note 1
3.1.6	Activation force			See Note 1
	Permanent elongation			0.33%
3.2.1	Materials			-
3.2.2	Terminations			-
3.2.3	Connectors			See report
3.2.4	Dynamic performance – ambient dry	Force		1.7%
		Deployment distance		1mm
3.2.5	Dynamic performance – various conditions	Force		1.7%
		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		1.7%
		Deployment distance		1mm
3.2.10.2	Dynamic test, Y-lanyards only - Dual connection		Force	1.7%
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.

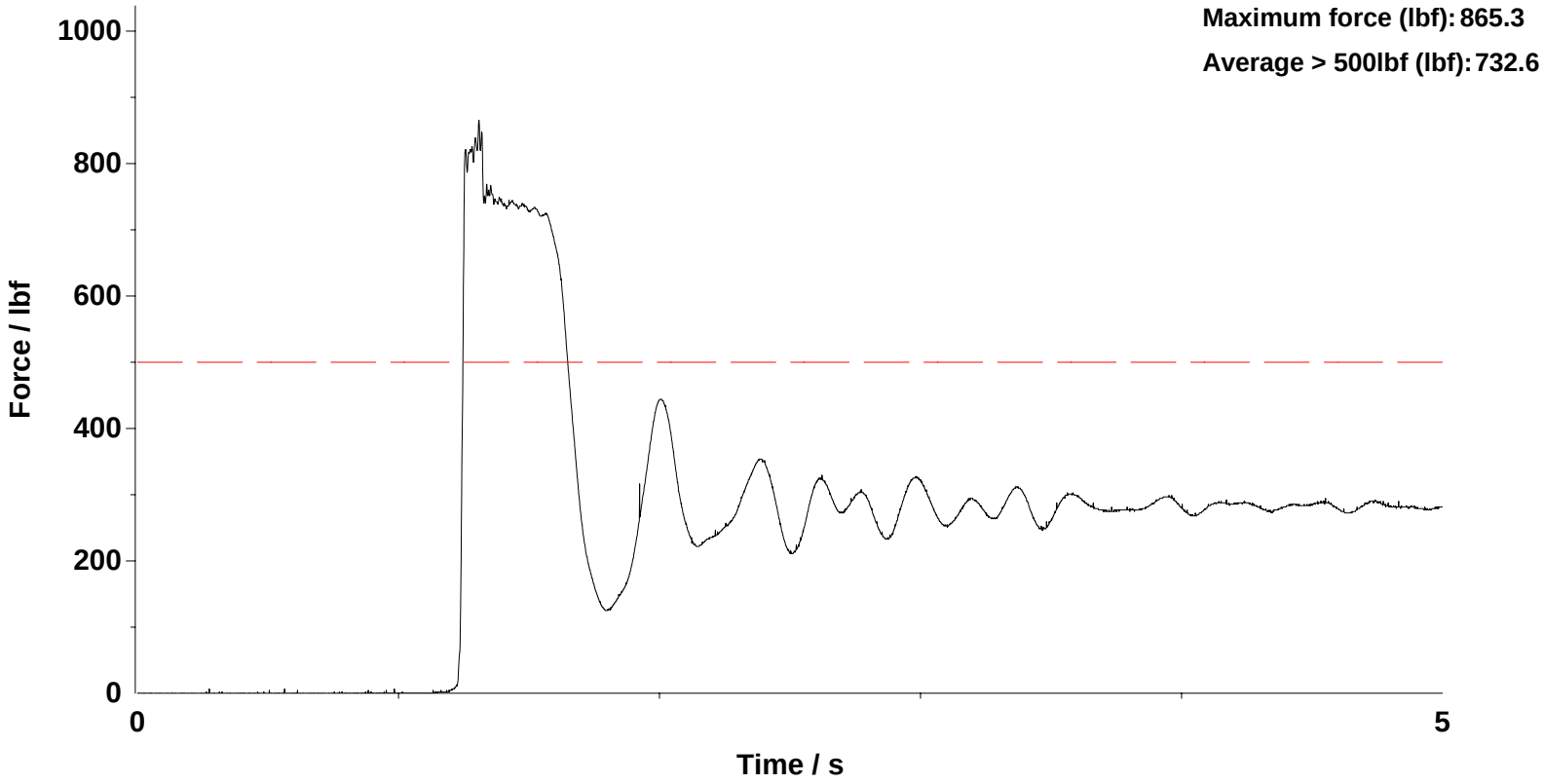
1. Plots of arrest force versus time. (12 pages)

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

END OF REPORT

INSPEC Technical Services

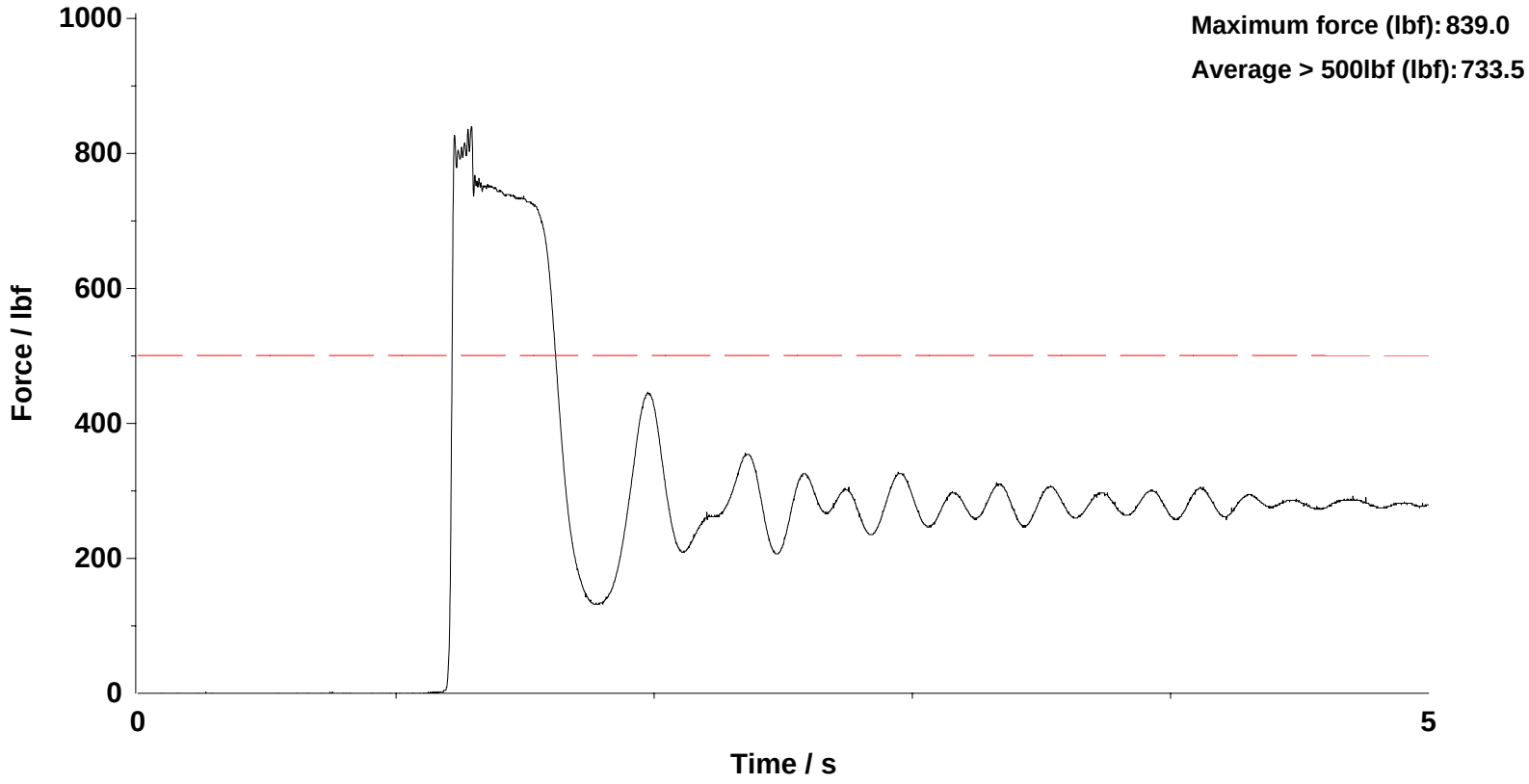
Technician:	TAN
Standard	ANSI Z359.13:2013 Energy absorbing lanyard
Sample / File name:	2D10004
Drop item	Drop weight, US - 128 kg
Orientation/Attachment Point:	Centre eyebolt
Time and Date of Test:	10:52 05/08/16



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

INSPEC Technical Services

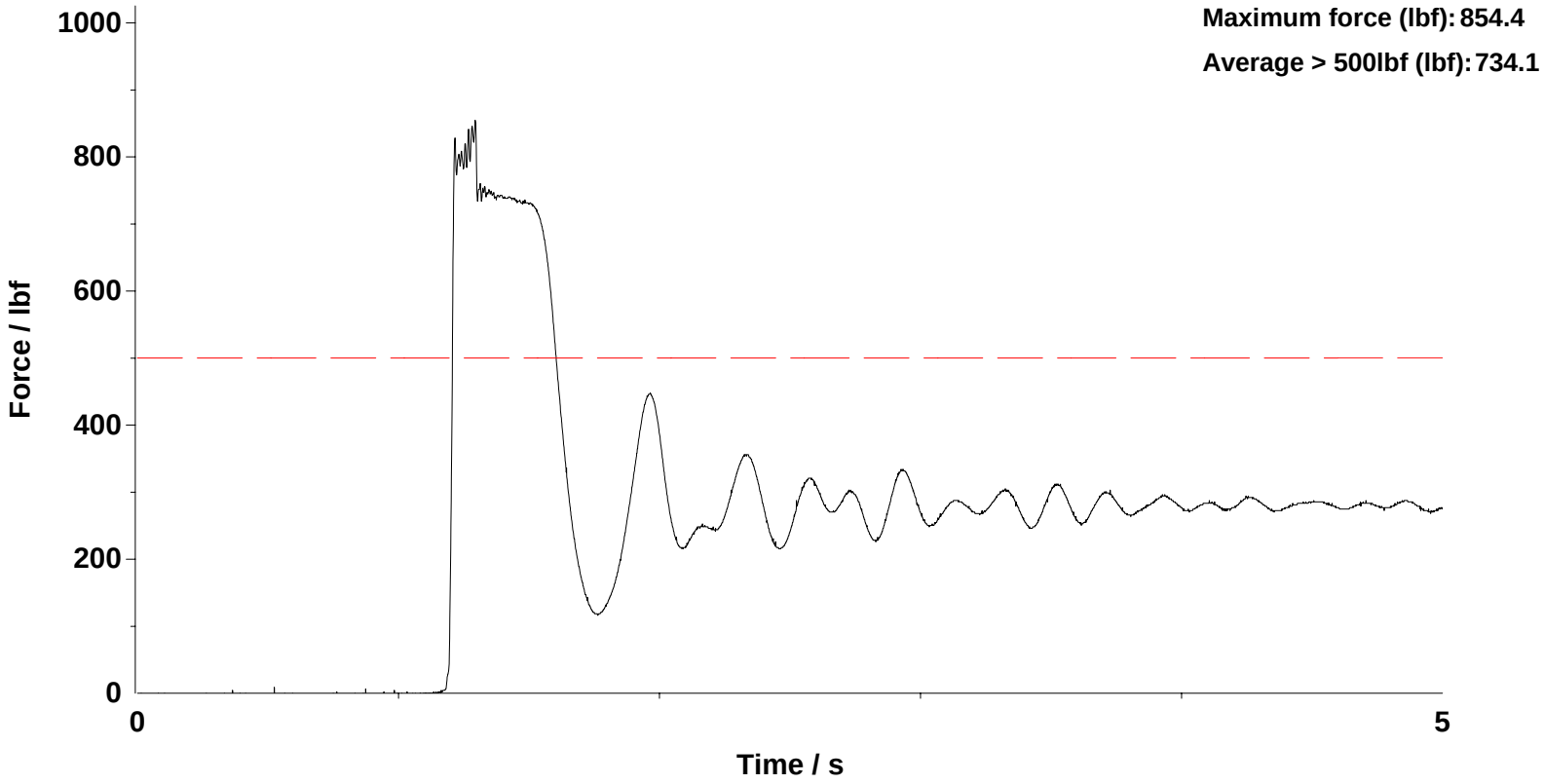
Technician:	TAN
Standard	ANSI Z359.13:2013 Energy absorbing lanyard
Sample / File name:	2D10005
Drop item	Drop weight, US - 128 kg
Orientation/Attachment Point:	Centre eyebolt
Time and Date of Test:	12:12 05/08/16



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

INSPEC Technical Services

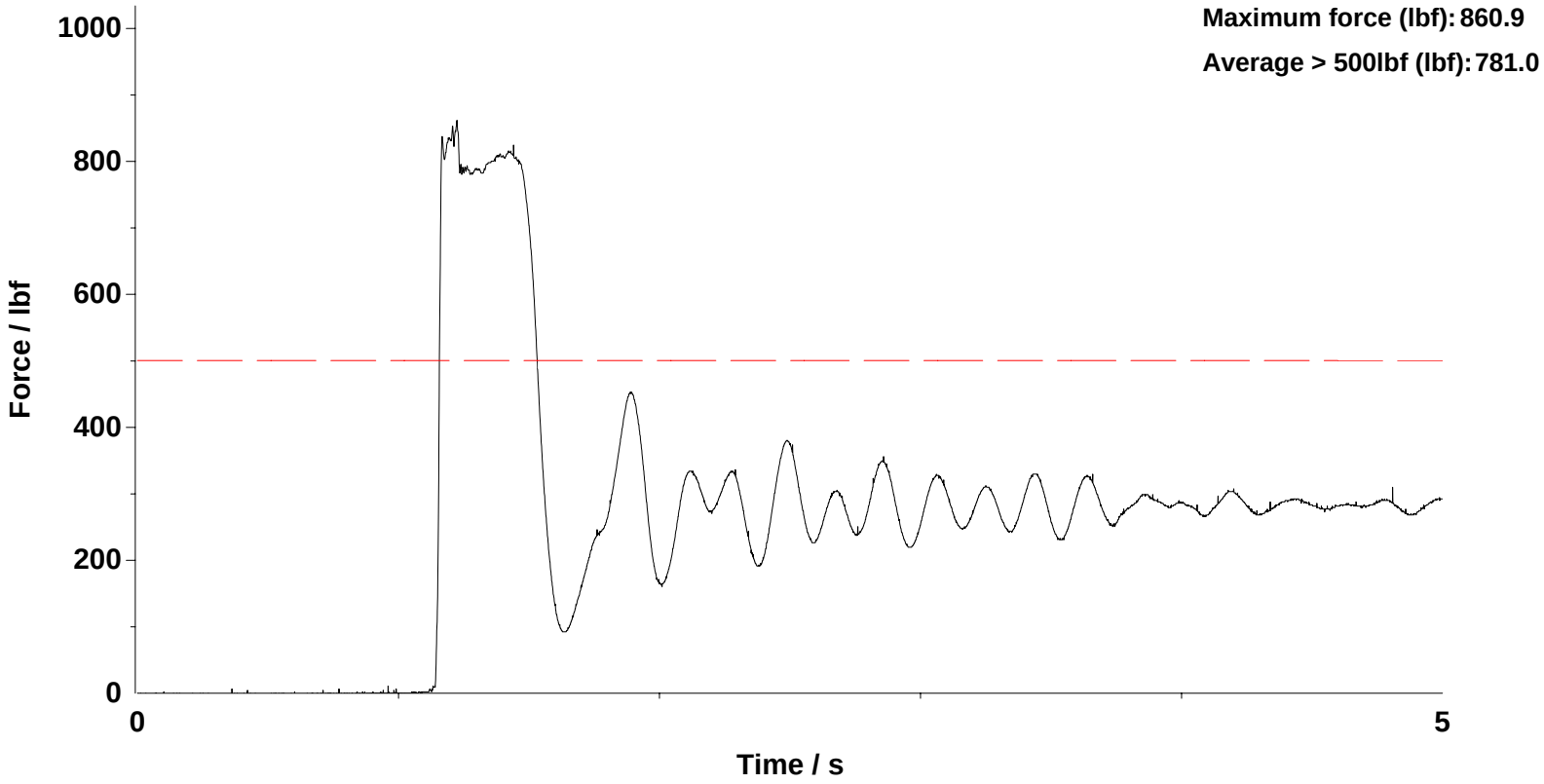
Technician:	TAN
Standard	ANSI Z359.13:2013 Energy absorbing lanyard
Sample / File name:	2D10006
Drop item	Drop weight, US - 128 kg
Orientation/Attachment Point:	Centre eyebolt
Time and Date of Test:	12:21 05/08/16



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

INSPEC Technical Services

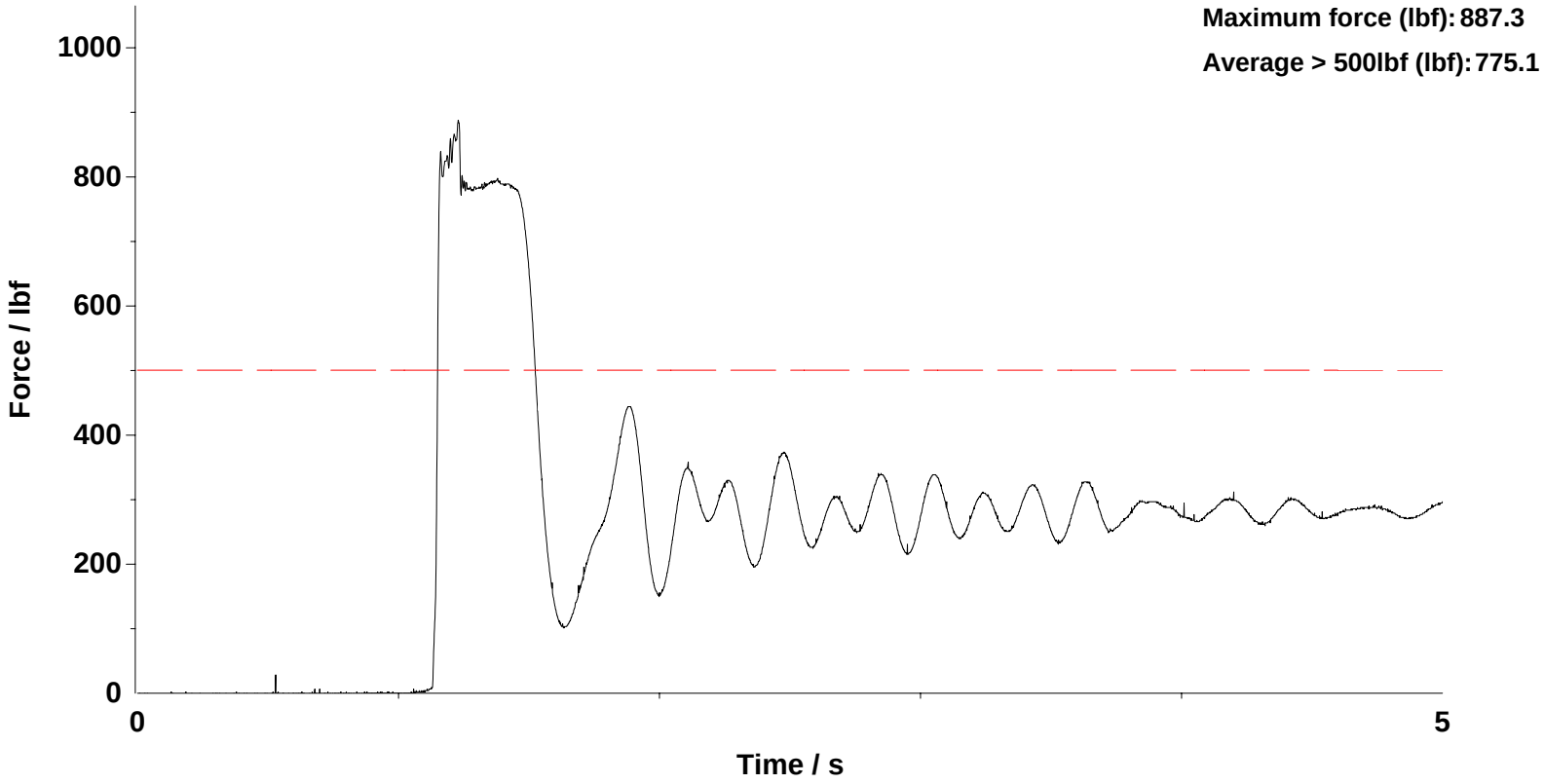
Technician:	TAN
Standard	ANSI Z359.13:2013 Energy absorbing lanyard
Sample / File name:	2D10007
Drop item	Drop weight, US - 128 kg
Orientation/Attachment Point:	Centre eyebolt
Time and Date of Test:	16:59 05/08/16



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

INSPEC Technical Services

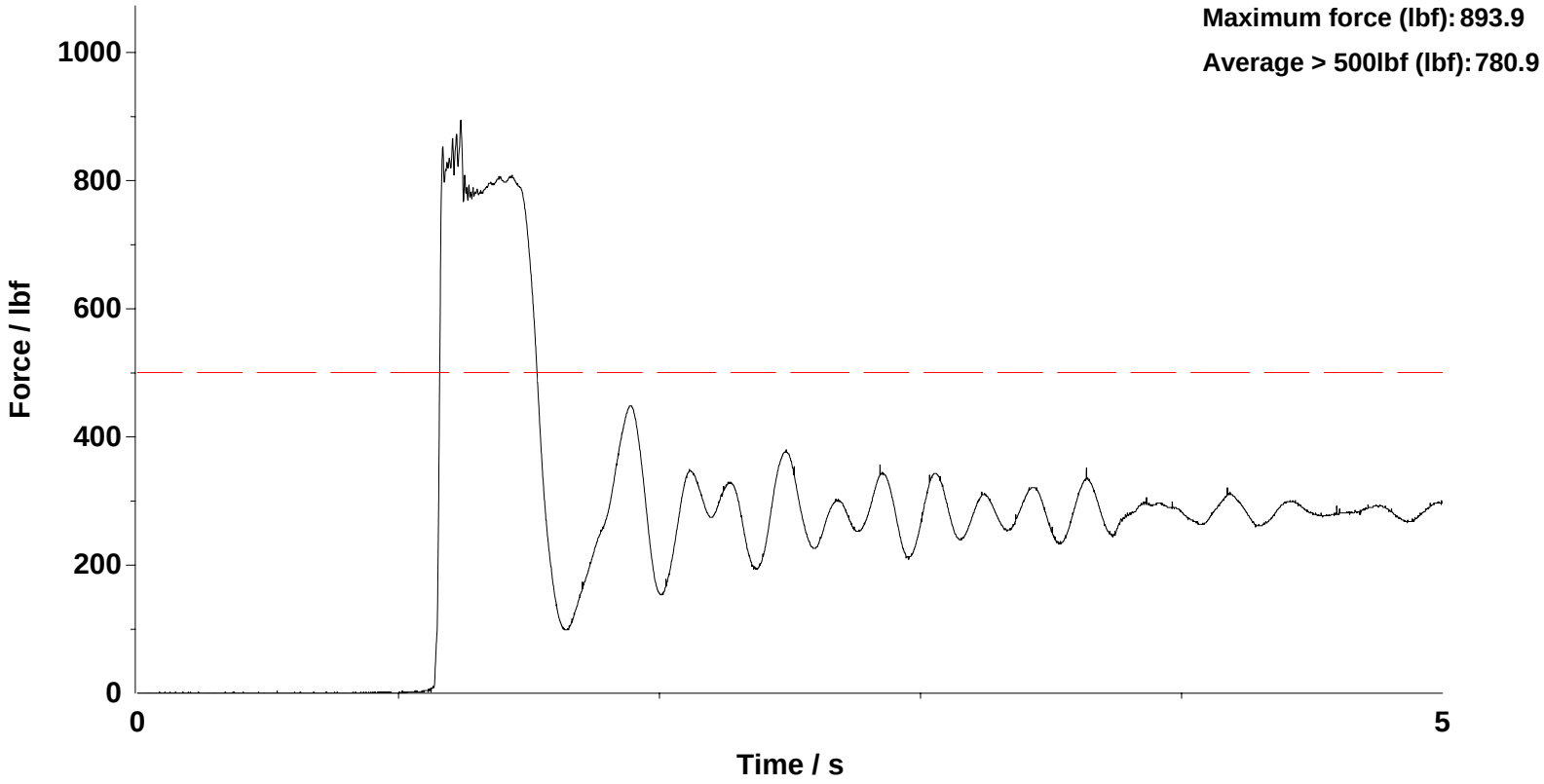
Technician:	TAN
Standard	ANSI Z359.13:2013 Energy absorbing lanyard
Sample / File name:	2D10008
Drop item	Drop weight, US - 128 kg
Orientation/Attachment Point:	Centre eyebolt
Time and Date of Test:	17:05 05/08/16



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

INSPEC Technical Services

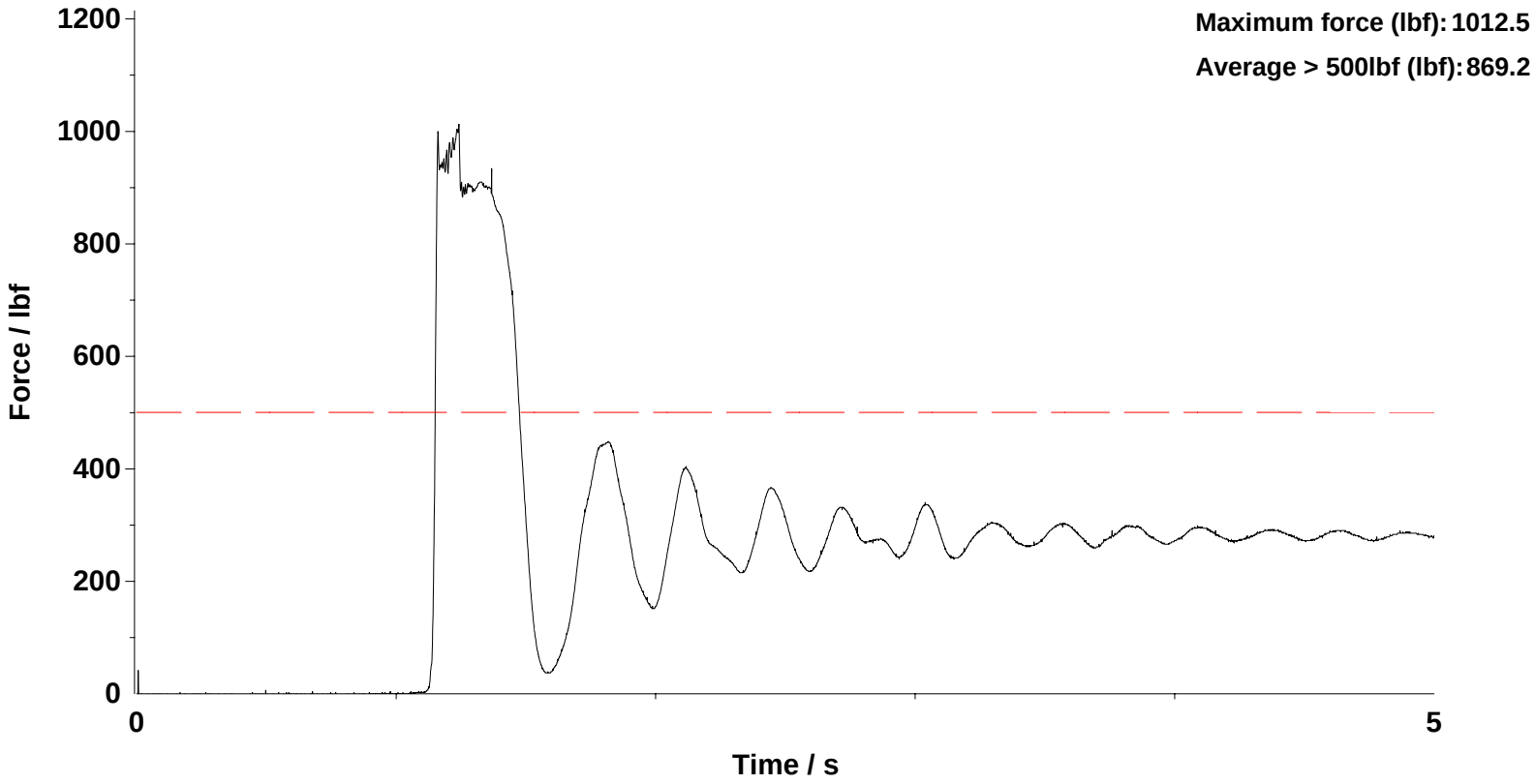
Technician:	TAN
Standard	ANSI Z359.13:2013 Energy absorbing lanyard
Sample / File name:	2D10009
Drop item	Drop weight, US - 128 kg
Orientation/Attachment Point:	Centre eyebolt
Time and Date of Test:	17:11 05/08/16



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

INSPEC Technical Services

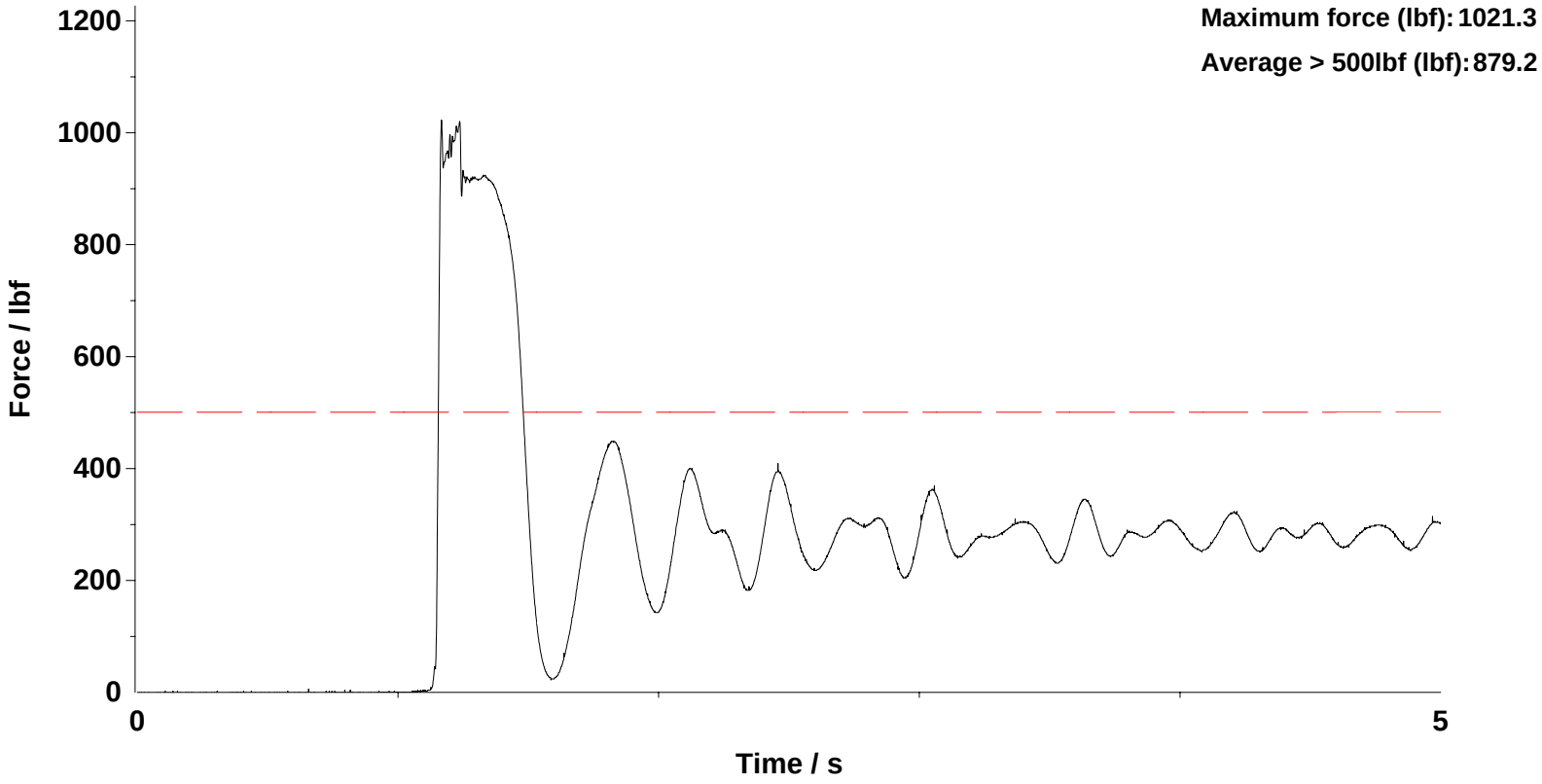
Technician:	TAN
Standard	ANSI Z359.13:2013 Energy absorbing lanyard
Sample / File name:	2D10010
Drop item	Drop weight, US - 128 kg
Orientation/Attachment Point:	Centre eyebolt
Time and Date of Test:	16:41 05/08/16



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

INSPEC Technical Services

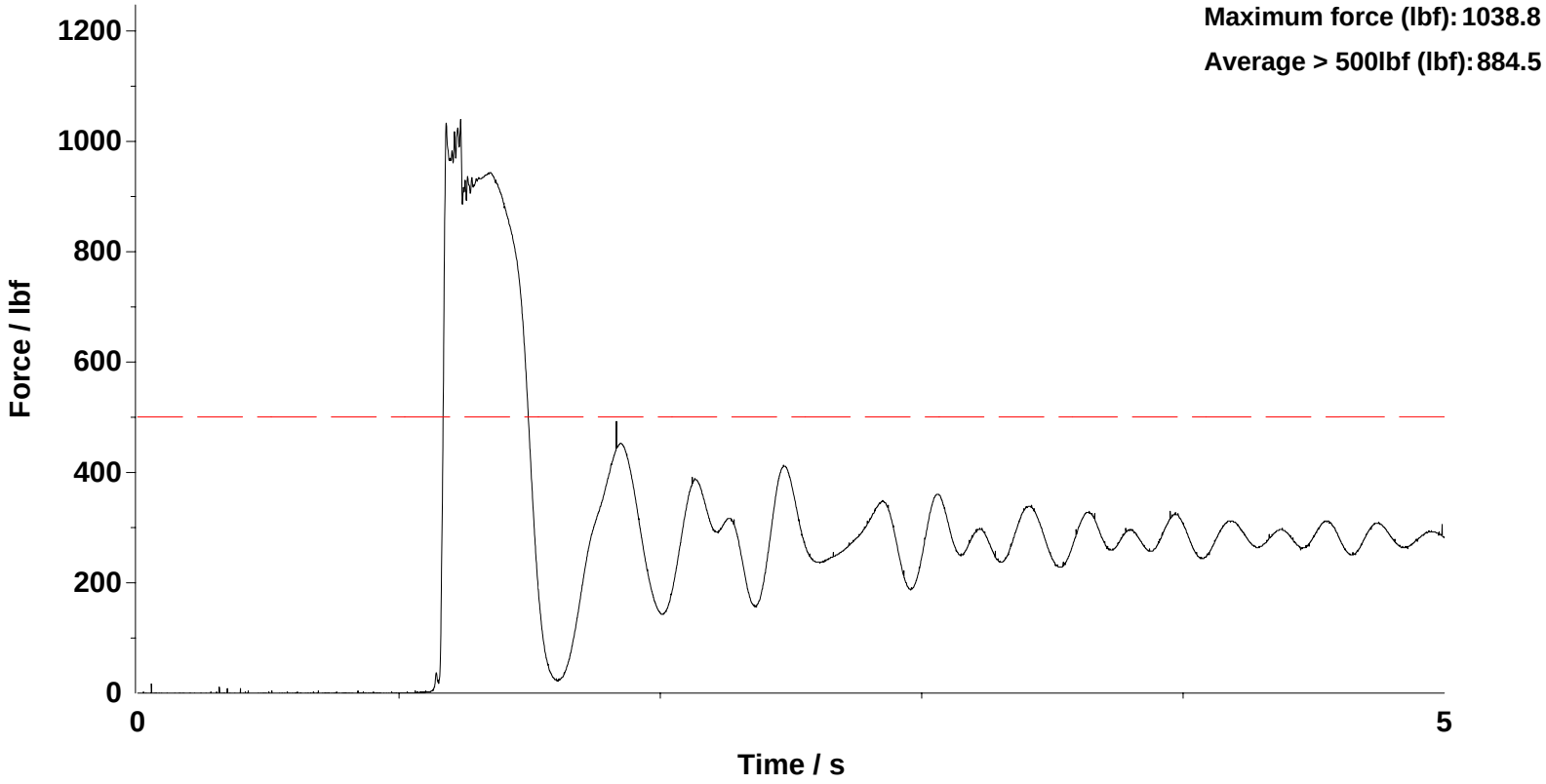
Technician:	TAN
Standard	ANSI Z359.13:2013 Energy absorbing lanyard
Sample / File name:	2D10011
Drop item	Drop weight, US - 128 kg
Orientation/Attachment Point:	Centre eyebolt
Time and Date of Test:	16:47 05/08/16



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

INSPEC Technical Services

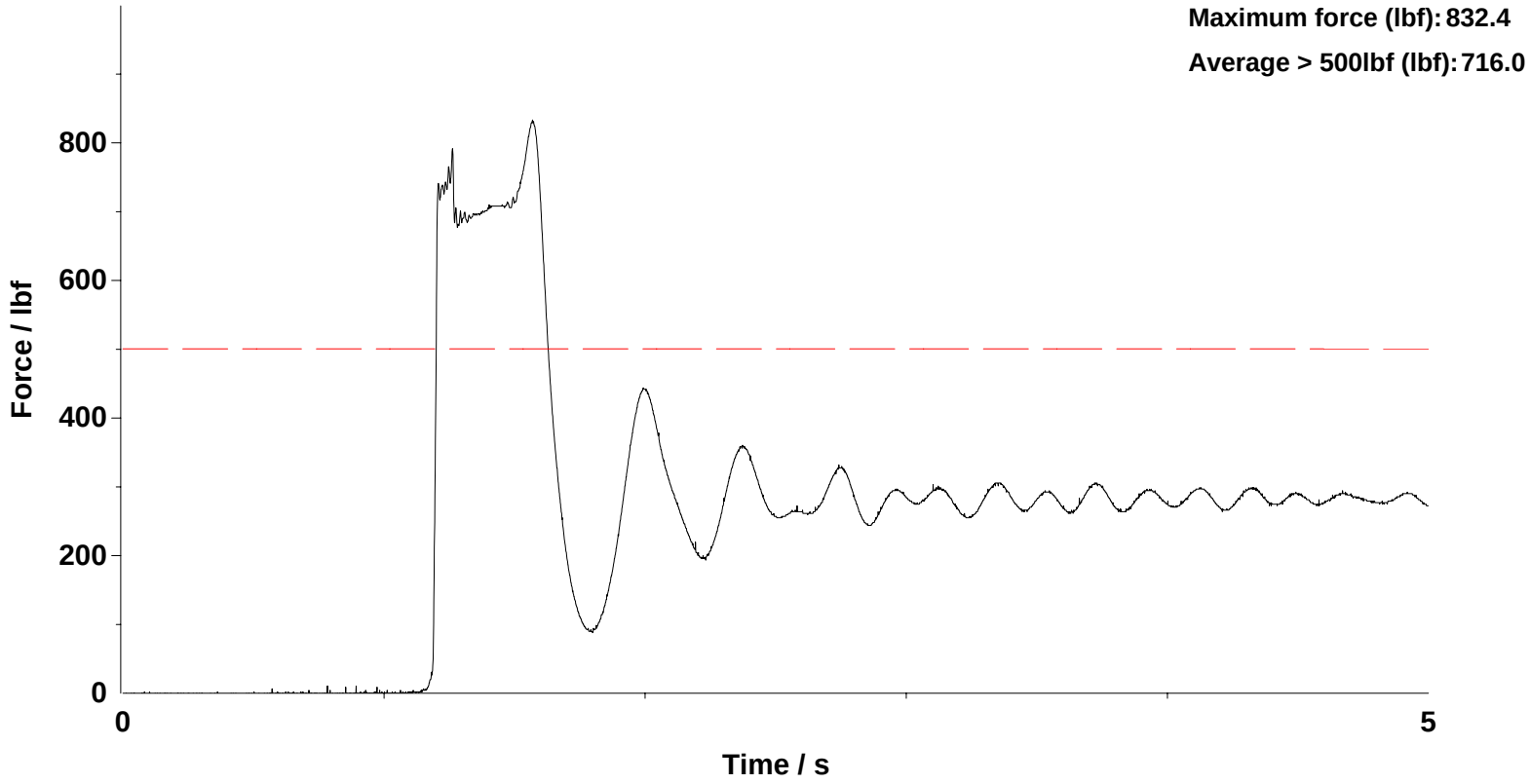
Technician:	TAN
Standard	ANSI Z359.13:2013 Energy absorbing lanyard
Sample / File name:	2D10012
Drop item	Drop weight, US - 128 kg
Orientation/Attachment Point:	Centre eyebolt
Time and Date of Test:	16:52 05/08/16



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

INSPEC Technical Services

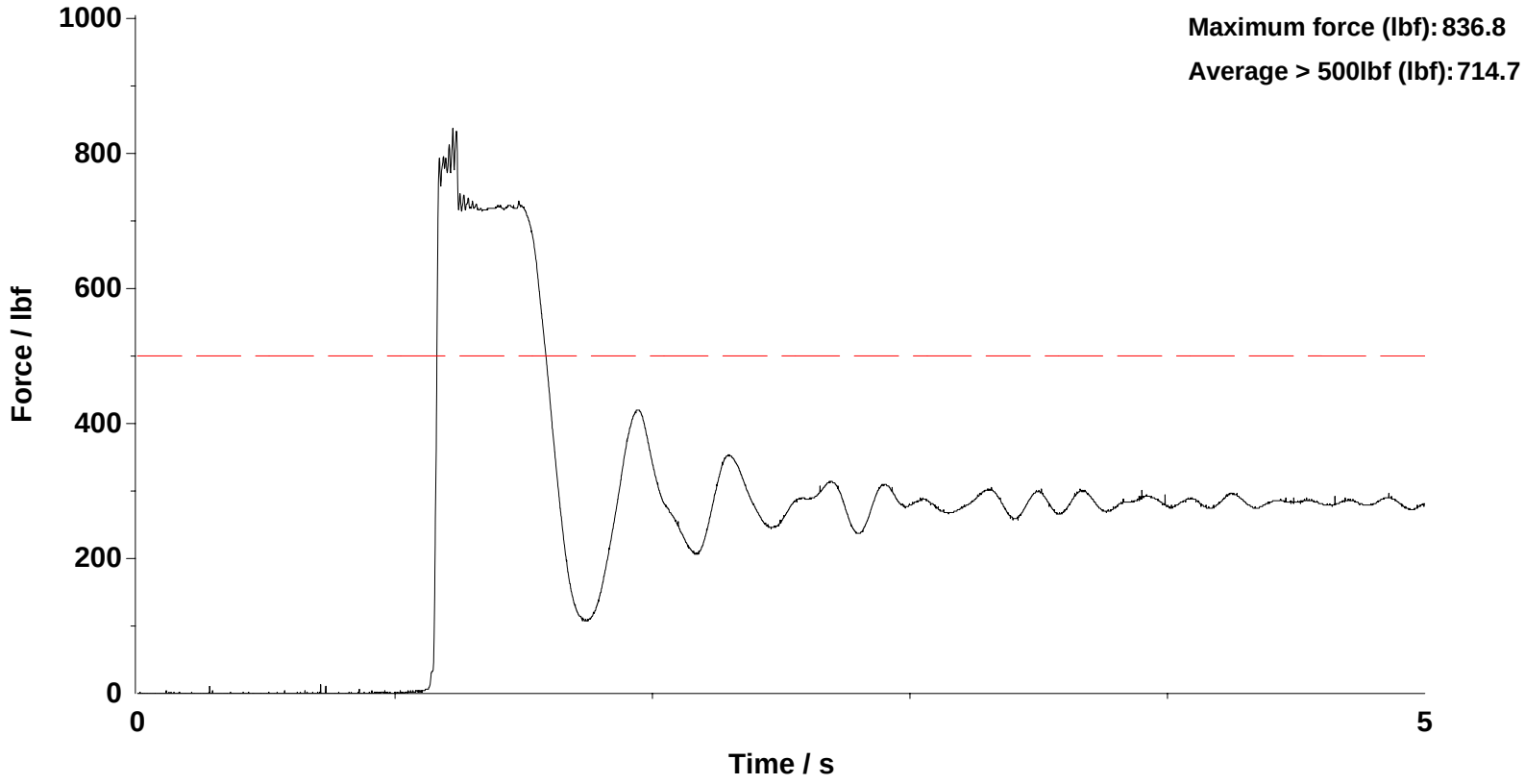
Technician:	TAN
Standard	ANSI Z359.13:2013 Energy absorbing lanyard
Sample / File name:	2D10013
Drop item	Drop weight, US - 128 kg
Orientation/Attachment Point:	Centre eyebolt
Time and Date of Test:	15:41 05/08/16



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

INSPEC Technical Services

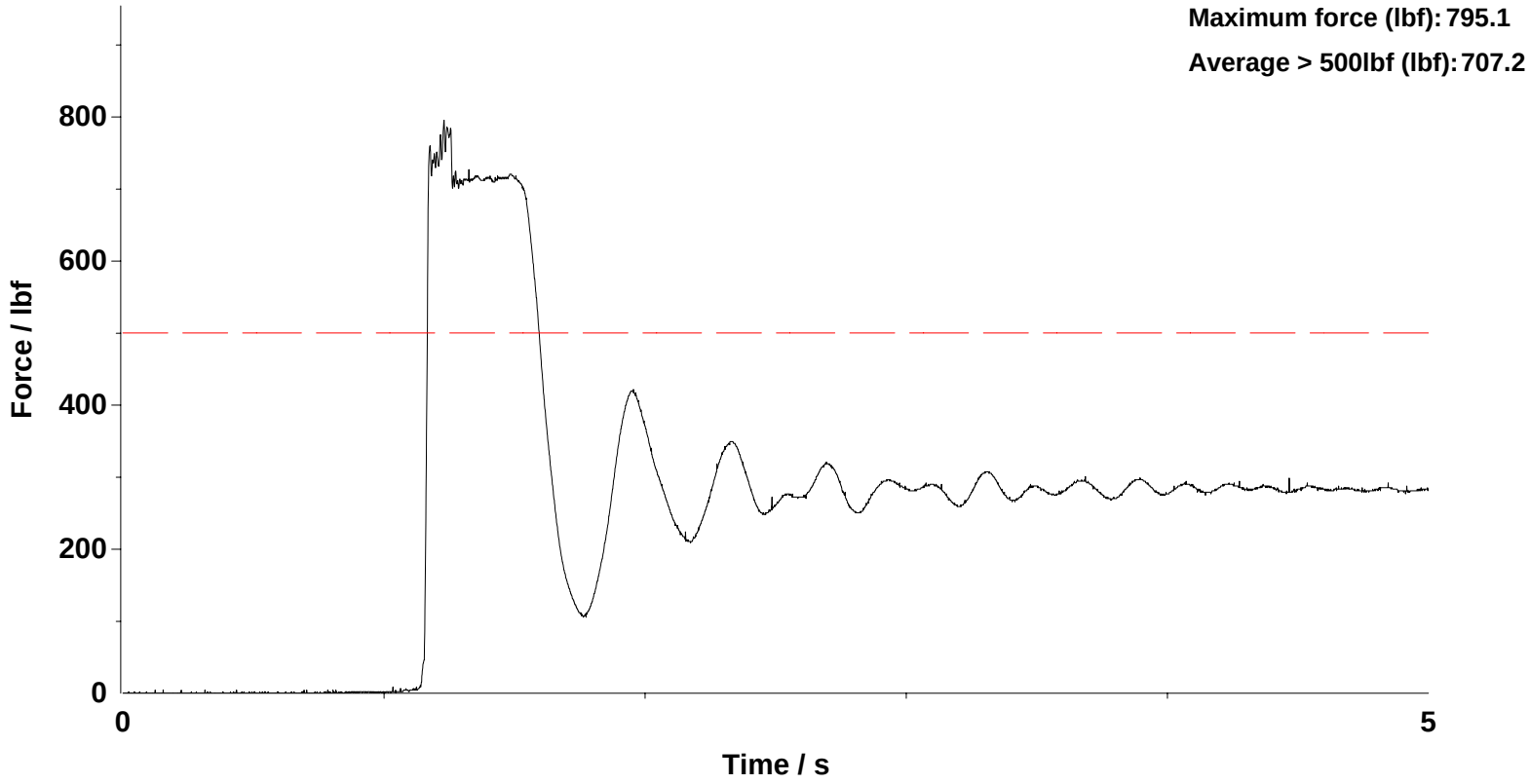
Technician:	TAN
Standard	ANSI Z359.13:2013 Energy absorbing lanyard
Sample / File name:	2D10014
Drop item	Drop weight, US - 128 kg
Orientation/Attachment Point:	Centre eyebolt
Time and Date of Test:	16:33 05/08/16



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

INSPEC Technical Services

Technician:	TAN
Standard	ANSI Z359.13:2013 Energy absorbing lanyard
Sample / File name:	2D10015
Drop item	Drop weight, US - 128 kg
Orientation/Attachment Point:	Centre eyebolt
Time and Date of Test:	16:26 05/08/16



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

KSTRONG LLC – Energy absorbing lanyard,
model UFL206101