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Test Report

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

Report no: 2.19.03.40

Client: Jinhua Jech Tools Co., Ltd
No. 1448 Tongxi Road, Bailongqiao Town
Jinhua City 321025
Zhejiang
China

Manufacturer: Jinhua Jech Tools Co., Ltd

Client order: T/0497

Order received: 7 May 2018

Models: JE520017 (Fall arrester)
3210-25FT (Single Anchor Lifeline, 25 ft)
3210-50FT (Single Anchor Lifeline, 50 ft)
3210-100FT (Single Anchor Lifeline, 100 ft)

Dates of tests: 2 July 2018 to 31 July 2018

Signed:

Steven Sum, Laboratory Manager

Issued: 27 March 2019

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)	
		Submission	01	02
3.1	**Single Anchor Lifeline Components**			
3.1.1	Integral connectors		NAs	
3.1.2	Rope characteristics		NAs	
3.1.3	Elastic elongation		Pass	
3.1.4	Rope diameter		Pass	
3.1.5	Rope fabrication		NAs	
3.1.6	Materials		NAs	
3.1.7	Lifelines supplied with factory terminations	Breaking strength	Pass	
3.1.8.1		Spliced	NAp	
3.1.8.2		Stitched	Ltd	
3.1.8.3		Swaged	NAp	
3.1.9	Breaking strength - lifeline supplied without factory termination			
3.1.10	Dual purposes / rope access or descent control applications		NAp	
3.1.11	Residual static strength		Pass	
3.1.12.1	Wire rope lifeline	Breaking strength		
3.1.12.2		Construction		
3.1.12.3		Factory terminations		
3.2	**Fall arrester Components**			
3.2.1	Integral connectors		NAs	
3.2.2	Non-integral energy absorber and energy absorbing lanyards			
3.2.3	Integral lanyards			
3.2.4	Locking (fall stopping) function		Pass	
3.2.5	Dynamic performance (manual override)		Pass	
3.2.6	Open with two consecutive and deliberate actions		Pass	
3.2.7	Knot or hitch		Pass	
3.2.8	Integral rings and openings		NAs	
3.2.9	Static strength		Pass	
3.2.10	Dynamic performance - ambient		Pass	
	Dynamic performance - hot		Pass	
	Dynamic performance - cold		Pass	
	Dynamic performance - wet			Pass

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

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 01

Product	Quantity	Date received	INSPEC specimen no. (2F069+)
Fall arrester, model JE520017	03 pcs	14 May 2018	01 – 03
Fall arrester with Single Anchor Lifeline, model 3210-25FT	21 sets		04 – 23
Fall arrester with Single Anchor Lifeline, model 3210-50FT	01 pc		24

Submission details 02

Product	Quantity	Date received	INSPEC specimen no. (2F069+)
Fall arrester with Single Anchor Lifeline, model 3210-25FT	06 sets	26 July 2018	25 - 30

Procedures

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

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

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

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

The client made the following declarations:

Single anchor lifelines, model 3210-25FT, 3210-50FT and 3210-100FT are designed and constructed using the same method. The materials of the lifelines are the same. Only the lengths of the lifelines are different.

Result details

3 Design requirements

3.1 Single Anchor Lifeline Components

3.1.1 Connectors

Specimen 2F06904 was assessed.

Testing of integral connectors was not requested	NAs

3.1.2 Rope characteristics

This clause was not assessed. Manufacturer to certify.	NAs

3.1.3 Elastic elongation

Specimen 2F06924 was assessed.

The elastic elongation of the specimen was 6.3% at a load of 1800 pounds. This was not greater than the 10% permitted.	Pass

3.1.4 Rope diameter

Specimen 2F06924 was assessed.

The minimum nominal diameter measured was 0.55 inch. This value is more than 0.433 inch permitted.	Pass

3.1.5 Rope fabrication

This clause was not assessed. Manufacturer to certify.	NAs

3.1.6 Materials

This clause was not assessed. Manufacturer to certify.	NAs

3.1.7 Lifeline supplied with factory termination – Breaking strength

Specimens 2F06904 to 2F06906 were assessed.

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

3.1.8 Single anchor lifelines supplied with a factory termination

3.1.8.1 Spliced terminations

There were no splice eye terminations. NAp

3.1.8.2 Stitched terminations

Specimen 2F06904 was assessed.

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

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

c) The rope was black colour with yellow straps. Threads used for sewing the rope were white colour. This contrasted with the colour of the rope. Pass

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

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

3.1.8.3 Swaged terminations

There were no swaged eye terminations. NAp

3.1.10 Dual purposes – rope access / descent control applications

Not claimed. NAp

3.1.11 Residual static strength

Specimens 2F06910 to 2F06912 were assessed.

Following the dynamic performance tests, each single anchor lifeline withstood the tensile test of 1,800 pounds applied for 1 minute without breaking. Pass

3.2 Fall Arrester Components

3.2.1 Connectors

Specimen 2F06901 was assessed.

The fall arrester incorporated an energy absorber with a integral snaphook.

The testing of the snaphook was not requested. NAs

3.2.4 Locking (fall stopping) function

Specimen 2F06910 was assessed.

During the dynamic performance test in 3.2.10, the locking features of the fall arrester activated without any intervention. Pass

3.2.5 Dynamic performance (Manual override)

Specimens 2F06907 to 2F06909 were assessed.

During the dynamic performance manual override tests,

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

The total fall distances were:

Specimen 2F06907 – 5.7 ft Pass
Specimen 2F06908 – 5.2 ft Pass
Specimen 2F06909 – 5.4 ft Pass

These values were less than the maximum 11 feet permitted.

The average arrest forces were:

Specimen 2F06907 – 764 pounds. Pass
Specimen 2F06908 – 804 pounds. Pass
Specimen 2F06909 – 812 pounds. Pass

These values were less than the maximum 900 pounds permitted.

The maximum arrest forces were:

Specimen 2F06907 – 949 pounds.
Specimen 2F06908 – 1120 pounds. Pass
Specimen 2F06909 – 1008 pounds. Pass
Pass

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

See Annex 1 for the plots of force versus time.

Specimen 2F06901 was assessed.

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

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

3.2.8 No mating connectors were provided by the manufacturer. NAs

3.2.9 Static strength

Specimens 2F06901 to 2F06903 were assessed.

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

3.2.10 Dynamic performance - Ambient

Specimens 2F06910 to 2F06912 were assessed.

During the dynamic performance tests,

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

The total fall distances were:

Specimen 2F06910 – 5.0 ft Pass
Specimen 2F06911 – 5.1 ft Pass
Specimen 2F06912 – 5.2 ft Pass

These values were less than the maximum 11 feet permitted.

The average arrest forces were:

Specimen 2F06910 – 797 pounds. Pass
Specimen 2F06911 – 806 pounds. Pass
Specimen 2F06912 – 810 pounds. Pass

These values were less than the maximum 900 pounds permitted.

The maximum arrest forces were:

Specimen 2F06910 – 1160 pounds. Pass
Specimen 2F06911 – 1085 pounds. Pass
Specimen 2F06912 – 993 pounds. Pass

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

See Annex 1 for the plots of force versus time.

3.2.10 Dynamic performance – Hot conditioning test

Specimens 2F06913 to 2F06915 were assessed.

During the dynamic performance tests,

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

The total fall distances were:

Specimen 2F06913 – 5.2 ft Pass
Specimen 2F06914 – 5.3 ft Pass
Specimen 2F06915 – 5.2 ft Pass

These values were less than the maximum 11 feet permitted.

The average arrest forces were:

Specimen 2F06913 – 824 pounds. Pass
Specimen 2F06914 – 826 pounds. Pass
Specimen 2F06915 – 838 pounds. Pass

These values were less than the maximum 900 pounds permitted.

The maximum arrest forces were:

Specimen 2F06913 – 1074 pounds. Pass
Specimen 2F06914 – 1109 pounds. Pass
Specimen 2F06915 – 1129 pounds. Pass

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

See Annex 1 for the plots of force versus time.

3.2.10 Dynamic performance – Cold conditioning test

Specimens 2F06916 to 2F06918 were assessed.

During the dynamic performance tests,

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

The total fall distances were:

Specimen 2F06916 – 4.8 ft	Pass
Specimen 2F06917 – 4.9 ft	Pass
Specimen 2F06918 – 4.8 ft	Pass

These values were less than the maximum 11 feet permitted.

The average arrest forces were:

Specimen 2F06916 – 880 pounds.	Pass
Specimen 2F06917 – 879 pounds.	Pass
Specimen 2F06918 – 874 pounds.	Pass

These values were less than the maximum 900 pounds permitted.

The maximum arrest forces were:

Specimen 2F06916 – 1142 pounds.	Pass
Specimen 2F06917 – 1142 pounds.	Pass
Specimen 2F06918 – 1085 pounds.	Pass

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

See Annex 1 for the plots of force versus time.

3.2.10 Dynamic performance – Wet conditioning test

Specimens 2F06925 to 2F06927 were assessed.

During the dynamic performance tests,

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

The total fall distances were:

Specimen 2F06925 – 5.2 ft	Pass
Specimen 2F06926 – 5.2 ft	Pass
Specimen 2F06927 – 5.3 ft	Pass

These values were less than the maximum 11 feet permitted.

The average arrest forces were:

Specimen 2F06925 – 850 pounds.	Pass
Specimen 2F06926 – 846 pounds.	Pass
Specimen 2F06927 – 845 pounds.	Pass

These values were less than the maximum 900 pounds permitted.

The maximum arrest forces were:

Specimen 2F06925 – 1116 pounds.	Pass
Specimen 2F06926 – 1149 pounds.	Pass
Specimen 2F06927 – 1171 pounds.	Pass

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

See Annex 1 for the plots of force versus time.

3.2.11 Function test

Specimens 2F06922 to 2F06924 were assessed.

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

3.2.12 Residual static strength

Specimens 2F06910 to 2F06912 were assessed.

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

3.2.13 Corrosion resistance

Specimens 2F06922 to 2F06924 were assessed.

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

Estimates of the uncertainty of measurement

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

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

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

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

ANNEX

This Annex comprises two sections.

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

2. Plot of arrest force versus time. (15 pages)

END OF REPORT

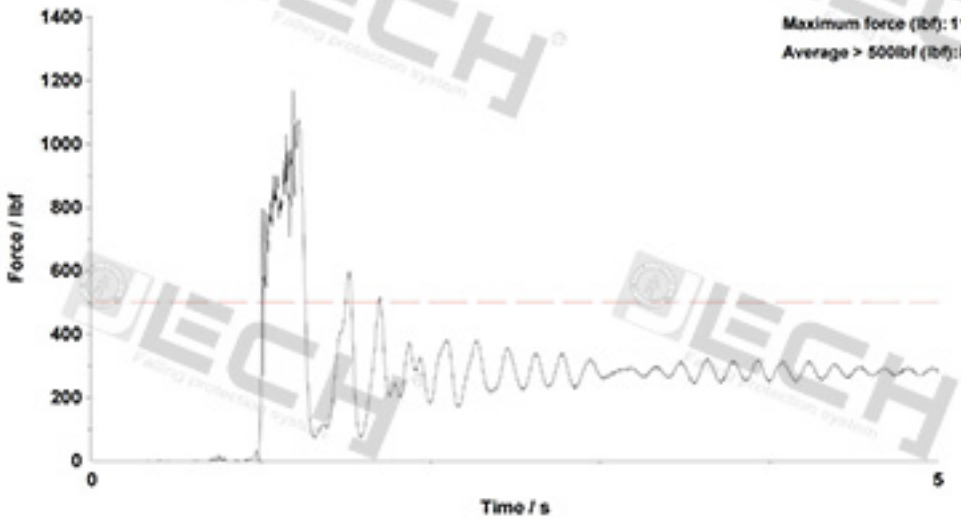
Jinhua Jech Tools Co., Ltd – Single Anchor Lifeline, model 3210-25FT
and Fall arrester, model JE520017

INSPEC Testing Services' specimen 2F06904 27 July 2018

Jinhua Jech Tools Co., Ltd – Single Anchor Lifeline, model 3210-25FT and Fall arrester, model JE520017

INSPEC Technical Services

Technician:	SS/Lu
Standard	ANSI Z359.15:2014 Fall arrester and lifeline
Sample / File name:	2F06927
Drop item	Drop mass, 128 kg, US
Orientation/Attachment Point:	Centre eyebolt
Time and Date of Test:	15:49 31/07/18

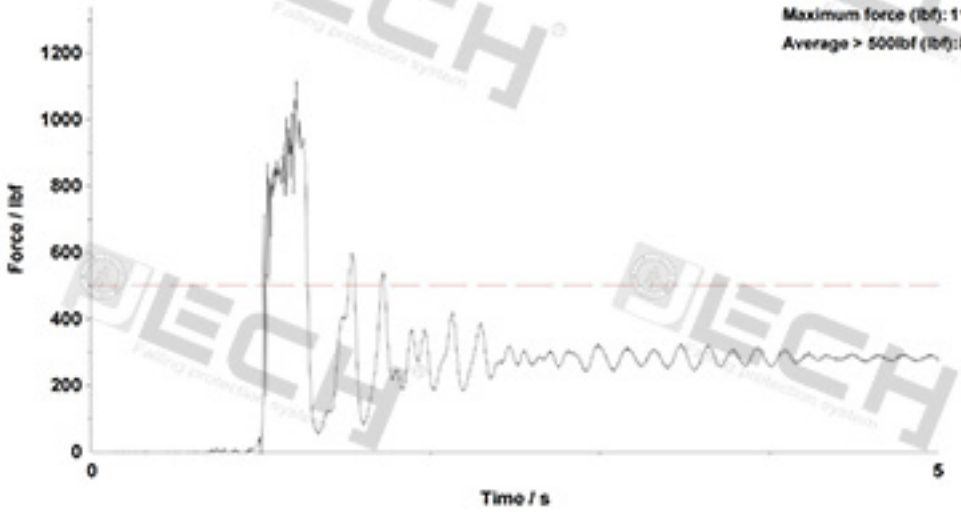


Results do not achieve full ANAB status until a formal test report has been issued.

Jinhua Jech Tools Co., Ltd – Single Anchor Lifeline, model 3210-25FT and Fall arrester, model JE520017

INSPEC Technical Services

Technician:	SS/Lu
Standard	ANSI Z359.15:2014 Fall arrester and lifeline
Sample / File name:	2F06926
Drop item	Drop mass, 128 kg, US
Orientation/Attachment Point:	Centre eyebolt
Time and Date of Test:	15:38 31/07/18

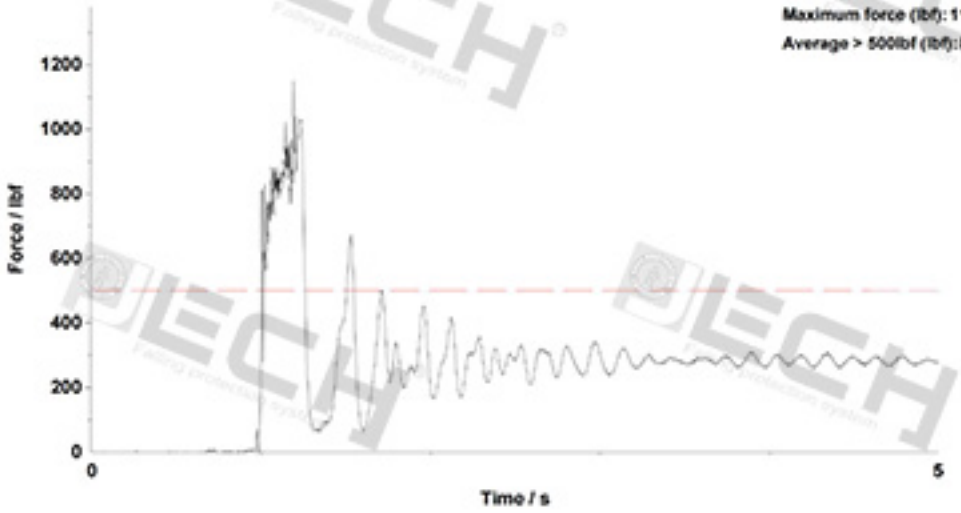


Results do not achieve full ANAB status until a formal test report has been issued.

Jinhua Jech Tools Co., Ltd – Single Anchor Lifeline, model 3210-25FT and Fall arrester, model JE520017

INSPEC Technical Services

Technician:	SS/Lu
Standard	ANSI Z359.15:2014 Fall arrester and lifeline
Sample / File name:	2F06925
Drop item	Drop mass, 128 kg, US
Orientation/Attachment Point:	Centre eyebolt
Time and Date of Test:	15:27 31/07/18

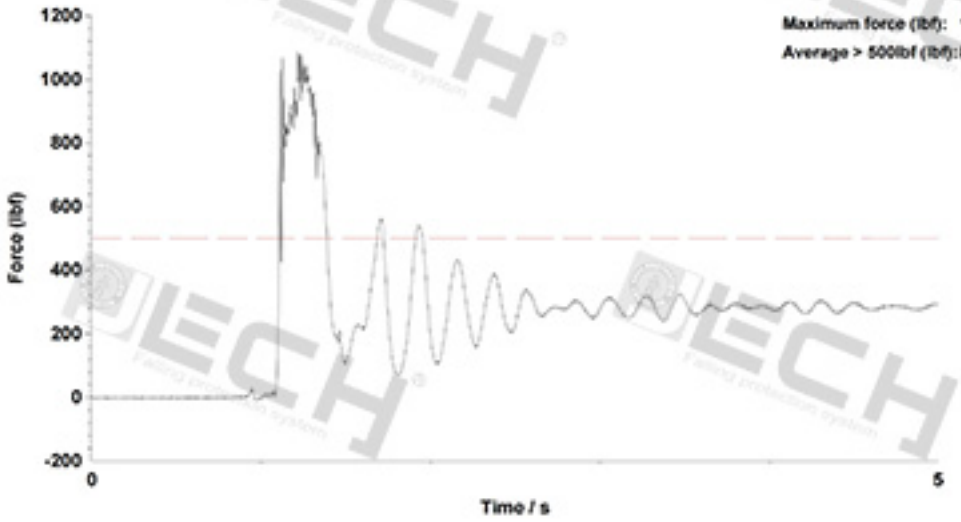


Results do not achieve full ANAB status until a formal test report has been issued.

Jinhua Jech Tools Co., Ltd – Single Anchor Lifeline, model 3210-25FT and Fall arrester, model JE520017

INSPEC Technical Services

Technician:	SS/Tan
Standard	ANSI Z359.15:2014 Lifeline & fall arrester
Sample / File name:	2F06918
Drop item	US drop weight - 128 kg
Orientation/Attachment Point:	Center eyebolt
Time and Date of Test:	15:12 04/07/18



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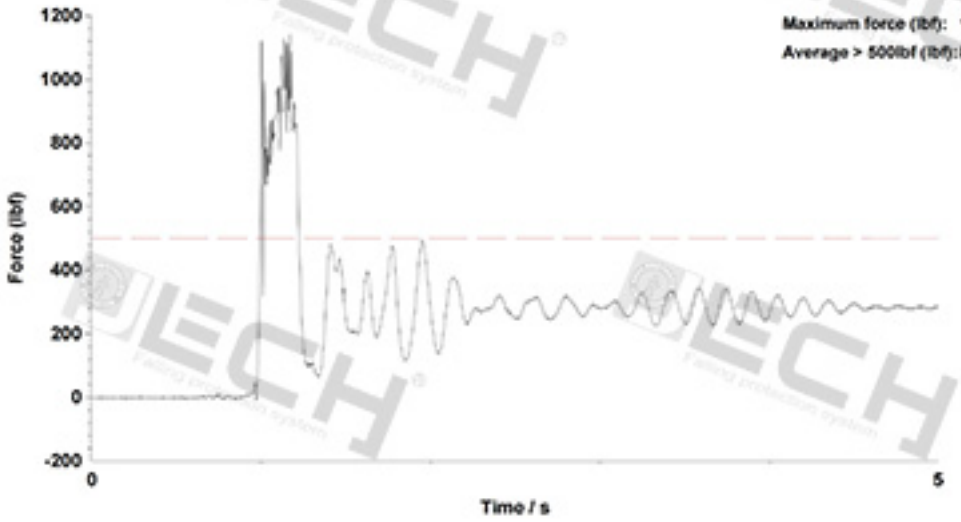
Jinhua Jech Tools Co., Ltd – Single Anchor Lifeline, model 3210-25FT and Fall arrester, model JE520017

INSPEC Technical Services

Technician:	SS/Tan
Standard	ANSI Z359.15:2014 Lifeline & fall arrester
Sample / File name:	2F06917
Drop item	US drop weight - 128 kg
Orientation/Attachment Point:	Center eyebolt
Time and Date of Test:	15:05 04/07/18



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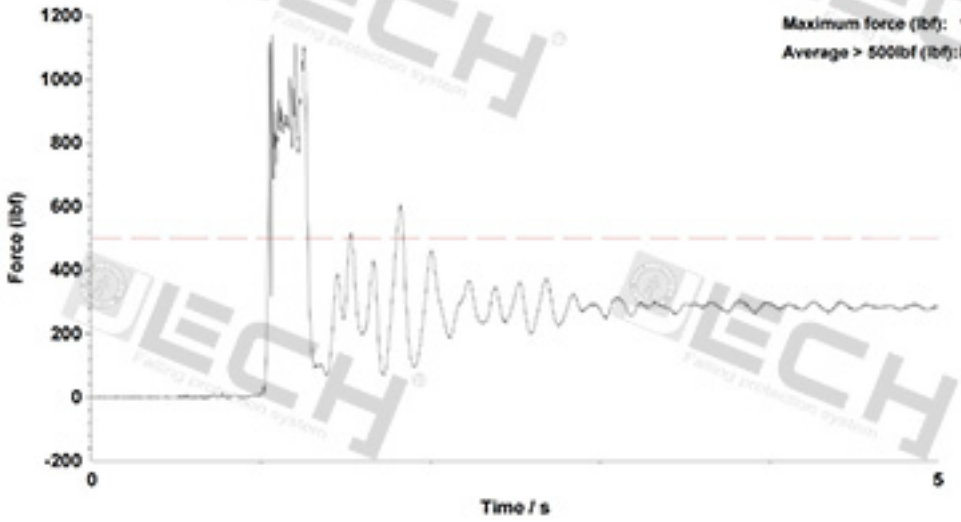
Jinhua Jech Tools Co., Ltd – Single Anchor Lifeline, model 3210-25FT and Fall arrester, model JE520017

INSPEC Technical Services

Technician:	SS/Tan
Standard	ANSI Z359.15:2014 Lifeline & fall arrester
Sample / File name:	2F06916
Drop item	US drop weight - 128 kg
Orientation/Attachment Point:	Center eyebolt
Time and Date of Test:	14:56 04/07/18



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Jinhua Jech Tools Co., Ltd – Single Anchor Lifeline, model 3210-25FT and Fall arrester, model JE520017

INSPEC Technical Services

Technician:	SS/Tan
Standard	ANSI Z359.15:2014 Lifeline & fall arrester
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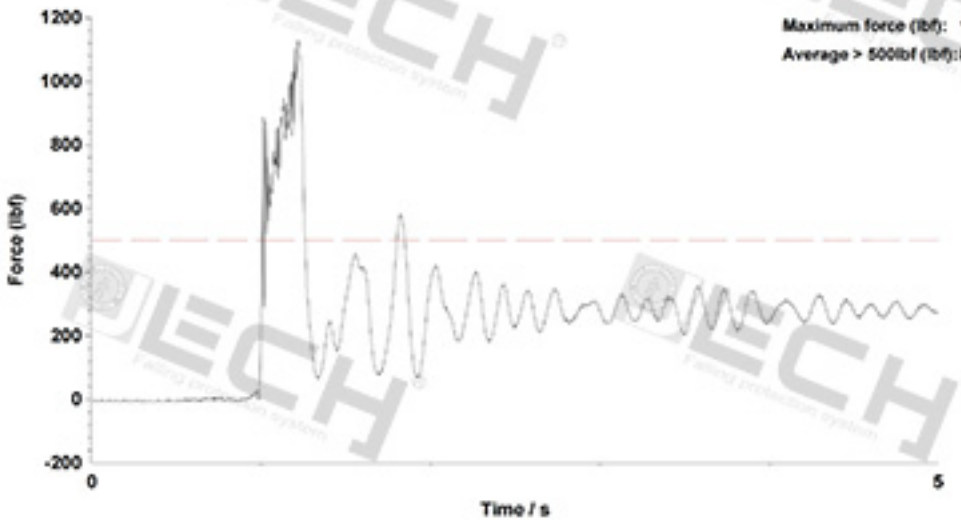
Drop item	US drop weight - 128 kg
Orientation/Attachment Point:	Center eyebolt
Time and Date of Test:	14:43 04/07/18



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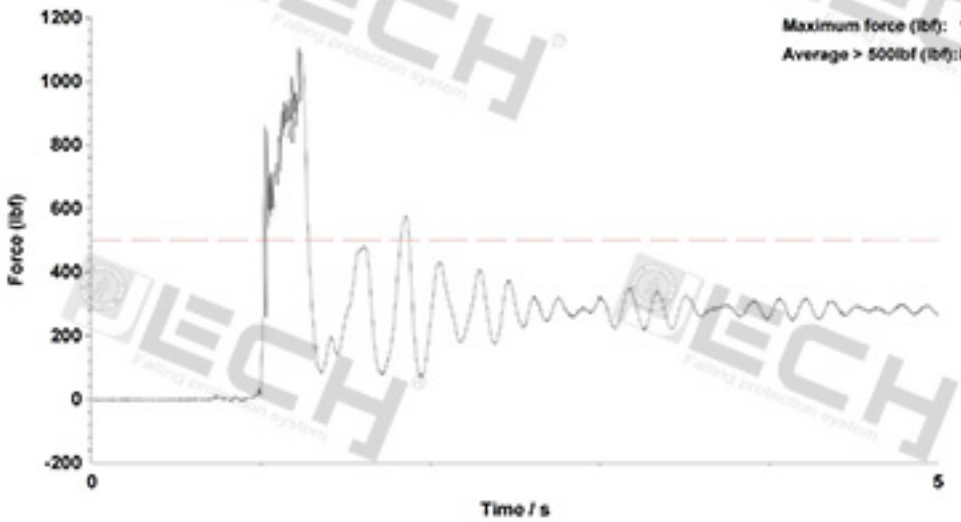
Jinhua Jech Tools Co., Ltd – Single Anchor Lifeline, model 3210-25FT and Fall arrester, model JE520017

INSPEC Technical Services

Technician:	SS/Tan
Standard	ANSI Z359.15:2014 Lifeline & fall arrester
Sample / File name:	2F06914
Drop item	US drop weight - 128 kg
Orientation/Attachment Point:	Center eyebolt
Time and Date of Test:	14:34 04/07/18



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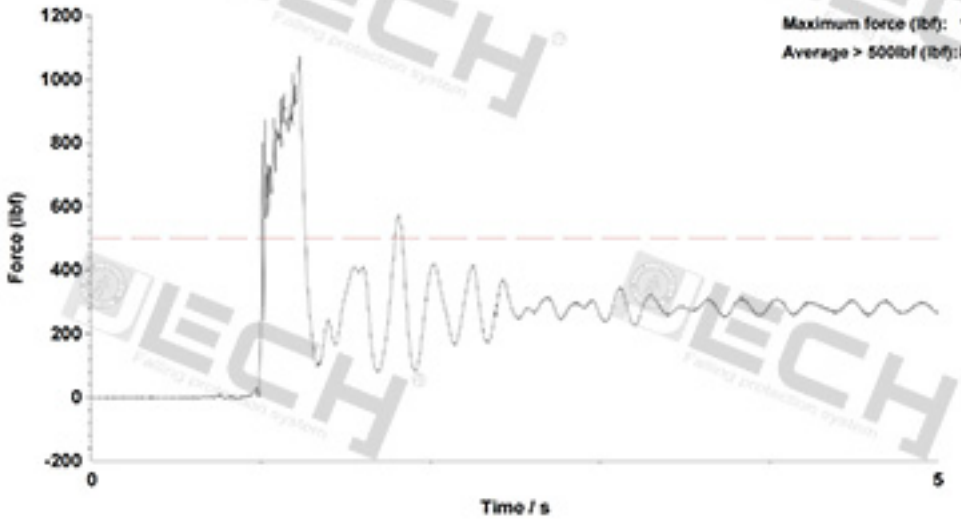
Jinhua Jech Tools Co., Ltd – Single Anchor Lifeline, model 3210-25FT and Fall arrester, model JE520017

INSPEC Technical Services

Technician:	SS/Tan
Standard	ANSI Z359.15:2014 Lifeline & fall arrester
Sample / File name:	2F06913
Drop item	US drop weight - 128 kg
Orientation/Attachment Point:	Center eyebolt
Time and Date of Test:	14:21 04/07/18



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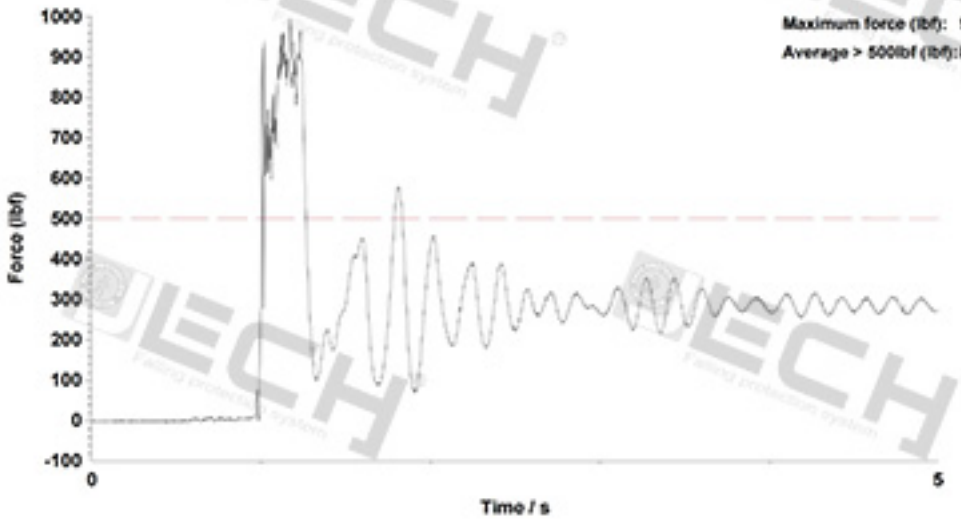
Jinhua Jech Tools Co., Ltd – Single Anchor Lifeline, model 3210-25FT and Fall arrester, model JE520017

INSPEC Technical Services

Technician:	SS/TAN
Standard	ANSI Z359.15:2014 Lifeline and Fall arrester
Sample / File name:	2F06912
Drop item	US drop weight - 128 kg
Orientation/Attachment Point:	Center eyebolt
Time and Date of Test:	14:22 02/07/18



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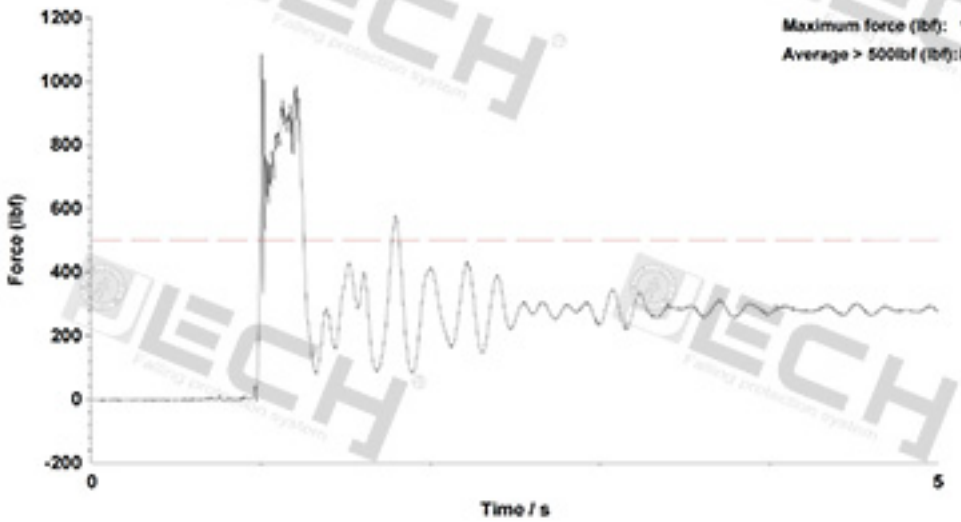
Jinhua Jech Tools Co., Ltd – Single Anchor Lifeline, model 3210-25FT and Fall arrester, model JE520017

INSPEC Technical Services

Technician:	SS/TAN
Standard	ANSI Z359.15:2014 Lifeline and Fall arrester
Sample / File name:	2F06911
Drop item	US drop weight - 128 kg
Orientation/Attachment Point:	Center eyebolt
Time and Date of Test:	14:10 02/07/18



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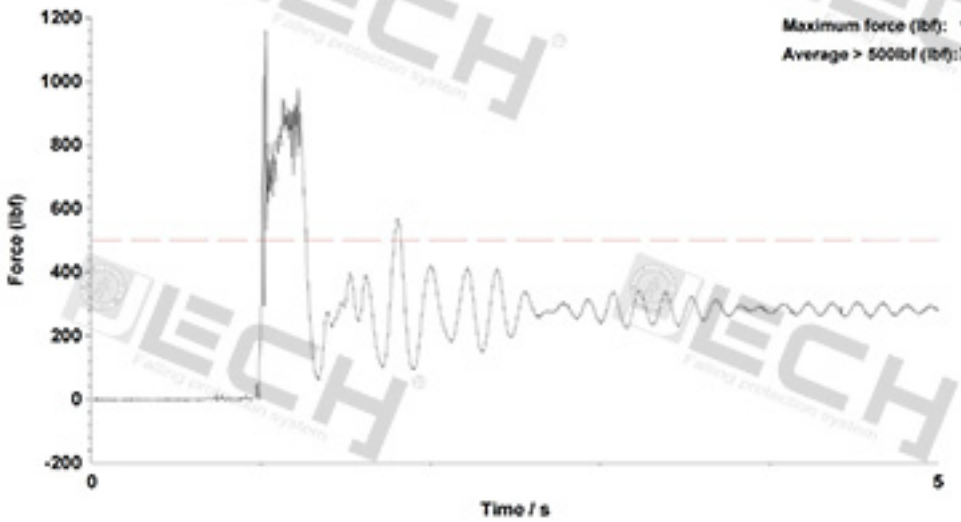
Jinhua Jech Tools Co., Ltd – Single Anchor Lifeline, model 3210-25FT and Fall arrester, model JE520017

INSPEC Technical Services

Technician:	SS/TAN
Standard	ANSI Z359.15:2014 Lifeline and Fall arrester
Sample / File name:	2F06910
Drop item	US drop weight - 128 kg
Orientation/Attachment Point:	Center eyebolt
Time and Date of Test:	13:55 02/07/18



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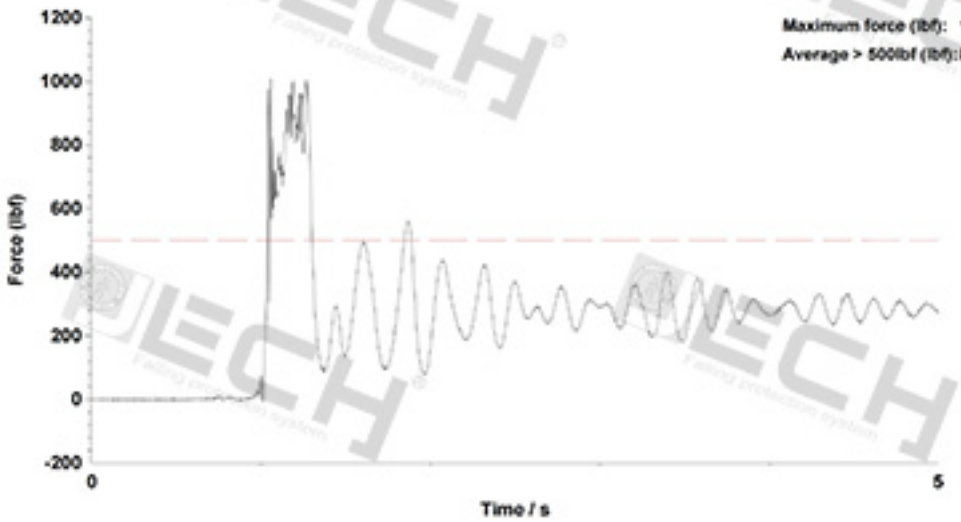
Jinhua Jech Tools Co., Ltd – Single Anchor Lifeline, model 3210-25FT and Fall arrester, model JE520017

INSPEC Technical Services

Technician:	SS/TAN
Standard	ANSI Z359.15:2014 Lifeline and Fall arrester
Sample / File name:	2F06909
Drop item	US drop weight - 128 kg
Orientation/Attachment Point:	Center eyebolt
Time and Date of Test:	15:04 02/07/18



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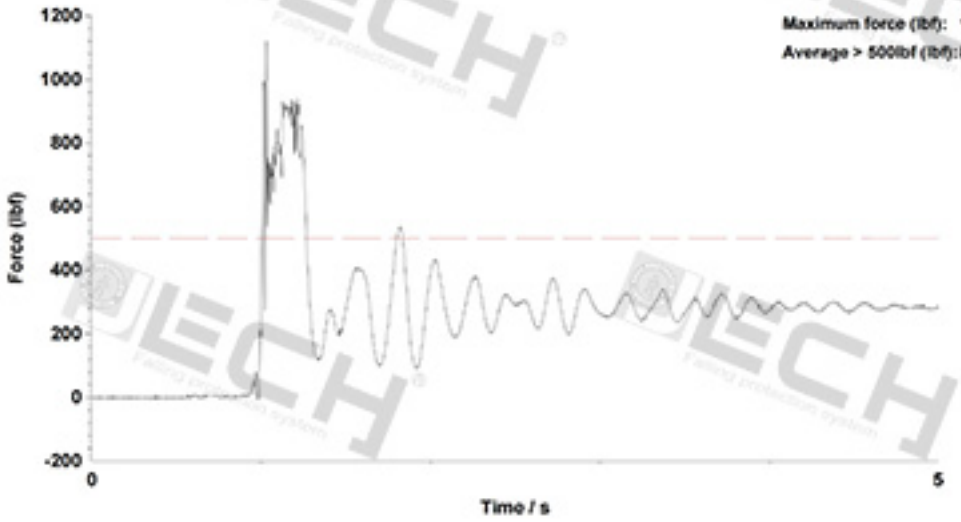
Jinhua Jech Tools Co., Ltd – Single Anchor Lifeline, model 3210-25FT and Fall arrester, model JE520017

INSPEC Technical Services

Technician:	SS/TAN
Standard	ANSI Z359.15:2014 Lifeline and Fall arrester
Sample / File name:	2F06906
Drop item	US drop weight - 128 kg
Orientation/Attachment Point:	Center eyebolt
Time and Date of Test:	15:34 02/07/18

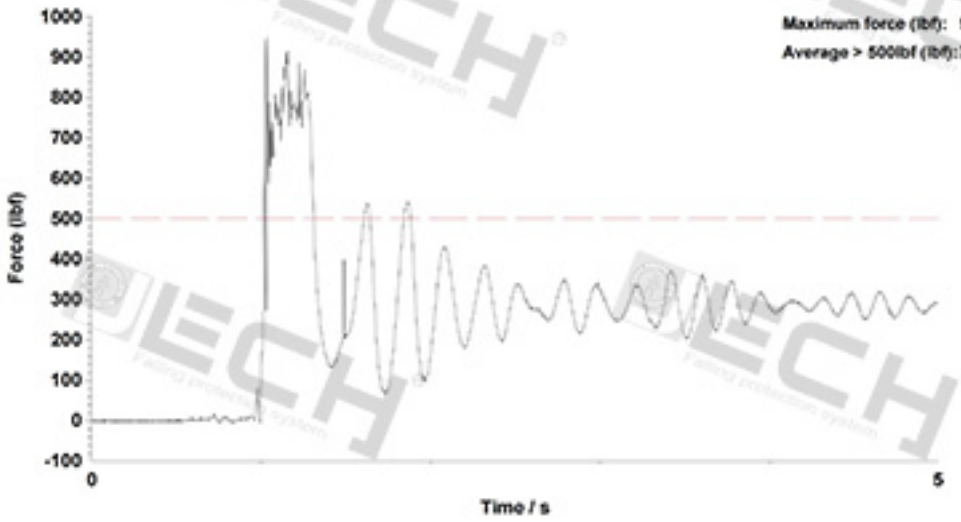


Results do not achieve full ANAB status until a formal test report has been issued.

Jinhua Jech Tools Co., Ltd – Single Anchor Lifeline, model 3210-25FT and Fall arrester, model JE520017

INSPEC Technical Services

Technician:	SS/TAN
Standard	ANSI Z359.15:2014 Lifeline and Fall arrester
Sample / File name:	2F06907
Drop item	US drop weight - 128 kg
Orientation/Attachment Point:	Center eyebolt
Time and Date of Test:	14:50 02/07/18



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