

Test Report

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

Report no: 2.21.07.17

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

Manufacturer: Frontline Fall Protection Inc.

Client order: T/0894

Order received: 17 May 2021

Models: 100CTB (S)
100CTB (M/L)
100CTB (XL/2XL)
100CTB (3XL/4XL)

Dates of tests: 7 June 2021 to 29 July 2021

Signed:



Steven Sum, Laboratory Manager

Issued: 30 July 2021

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

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

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Summary of assessment *

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

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

Key

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

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

Submission 01 details

Product	Quantity	Date received	INSPEC specimen no.
Webbing, part no. 64	15 m	22 February 2019	2G04201A to 01J (cut into 10 pieces)

Submission 02 details

Product	Quantity	Date received	INSPEC specimen no.
Full body harness, model 100CTB, size S	07	2 June 2021	2J12101 to 07
Full body harness, model 100CTB, size M/L	01		2J12108
Full body harness, model 100CTB, size XL/2XL	01		2J12109
Full body harness, model 100CTB, size 3XL/4XL	01		2J12110
Webbing part no. 588	15 m		2J12111A to 11J (cut into 10 pieces)

Procedures

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

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

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

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

The manufacturer made the following declarations:

The 4 sizes of harness submitted for testing have the same construction. They are made of the same materials (hardware, webbing, threads), and have the same stitching patterns.

For the purpose of performance testing, size S harnesses were used because it fits the test torso.

Result details**3 Requirements****3.1 Design Requirements**

Specimens 2J12102, 2J12108, 2J12109 and 2J12110 were assessed.

3.1.1	Each specimen permanently incorporated a dorsal attachment element.	Pass
	<i>Each specimen did incorporate another attachment element. The other attachment element was located at the hip.</i>	
3.1.2	Each specimen did incorporate a load bearing sub-pelvic strap.	Pass
3.1.3	All shoulder straps on the specimens came together at the dorsal location and were crossed and attached with a connector (D-ring).	Pass
	Testing of the connector (D-ring) was not requested.	NAs
3.1.4	Each specimen permanently incorporated a waist-belt as a means of controlling the separation of the shoulder straps on the back of the full body harness.	Pass
	When the specimens were mounted on to the torso as per manufacturer's instructions, some portion of the waist-belt was located between datum levels G and K.	Pass
3.1.5	The specimens were not equipped with modular components or assemblies.	NAp
3.1.5.1	This clause was not applicable	NAp
3.1.5.2	The specimens were not equipped with an attachment element extender; therefore this clause is not applicable.	NAp
3.1.6	The specimens were not integrated into a vest or garment.	NAp
3.1.7	Each specimen was equipped with two fall arrest indicators at the dorsal area.	Pass
	Both fall arrest indicators deployed during dynamic testing defined in section 3.2 when attached to the dorsal attachment element.	Pass
	It was visually possible to inspect the fall arrester indicators.	Pass
3.1.7.1	The specimens were not equipped with fall arrest indicators on other attachment element.	NAp
3.1.8	The specimens were not equipped with connecting subsystem combinations.	NAp
3.1.9	The specimens 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 2J12101 was assessed.

The specimen was equipped with two lanyard parking attachment elements.

The two lanyard parking attachment elements did not differ in design.

During the static feet-first test, the lanyard parking attachment element disengagement loads was 94.4 pounds. This value was less than the maximum 120 pounds permitted. Pass

Specimens 2J12102, 2J12108, 2J12109 and 2J12110 were 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 along the vertical centreline of the full body harness. Pass

3.1.13 The specimens did not incorporate a sternal attachment element. NAp

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

3.1 Attachment Element Requirements**3.2.1 Dorsal**

Specimen 2J12102 was assessed.

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

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

3.2.1.1 The dorsal attachment, as specified in the User Instructions, may be used in travel restraint or rescue.

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

3.2.1.3 Dorsal Attachment Element Requirements**3.2.1.3.1 Dynamic Feet First Test**

Specimen 2J12102 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 4 degrees. This value is less than the maximum 30 degrees permitted. Pass

Both fall arrest indicators deployed visibly and permanently. Pass

Full body harness stretch was 11.4 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 2J12103 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 11 degrees. This value is less than the maximum 30 degrees permitted. Pass

Both fall arrest indicators deployed visibly and permanently. Pass

3.2.1.3.3 Static Feet First Test

Specimen 2J12104 was assessed.

During the static feet-first test, the test torso was not released from the harness. Pass

During the static feet-first test, all adjusters did not slip. Pass

The straps to which buckle and eyelet adjusters were fitted did not tear. Pass

All other straps did not show signs of tearing. Pass

3.2.1.3.4 Fall Arrest Indicator Test

Specimen 2J12105 was assessed.

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

3.2.6 Hip

Specimen 2J12106 was assessed.

The hip attachment elements were specified in the User Instructions to be used as a pair. Pass

The hip attachment elements were specified in the User Instructions to be used solely for work positioning or travel restraint. Pass

The hip attachment elements were specified in the User Instructions not to be used for fall arrest. Pass

3.2.6.1 Hip Attachment Element Requirements**3.2.6.1.1 Static Feet First Test**

Specimen 2J12106 was assessed.

During the static feet-first test, the test torso was not released from the harness. Pass

During the static feet-first test, all adjusters did not slip. Pass

The straps to which buckle and eyelet adjusters were fitted did not tear. Pass

All other straps did not show signs of tearing. Pass

3.3 Components Requirements

3.3.1 Load Bearing Straps

Specimens 2J12101, 2J12108, 2J12109 and 2J12110 were assessed.

- | | | |
|---------|--|------|
| 3.3.1.1 | The minimum widths of the load bearing straps were 44 mm. This is more than the minimum 41 mm specified. | Pass |
| 3.3.1.2 | Straps specimens [2G04201A to 01E and 2J12111A to 11E] 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 so as to prevent fraying. | Pass |
| 3.3.1.5 | Following abrasion conditioning, straps specimens [2G04201F to 01J and 2J12111F to 11J] 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 the tongue buckles were protected from wear. Grommets were used. | Pass |
| 3.3.1.7 | The spacing between holes centre of adjacent eyelets for buckle and eyelet type adjusters used in the specimens were 1.8 inches. This is more than the minimum 1.125 inch and less the maximum 2 inches specified. | Pass |

3.3.2 Thread and Stitching

Specimens 2J12101, 2J12108, 2J12109 and 2J12110 were assessed.

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

3.3.3 Connecting Components

Specimens 2J12101, 2J12108, 2J12109 and 2J12110 were assessed.

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

5 Marking and Instructions

Specimens 2J12101, 2J12108, 2J12109, 2J12110 were assessed. The detailed results of the assessment are given below.

5.1 Marking Requirements

5.1.1	-	Markings shall be in English.	Pass
	a	The legibility and attachment of required markings shall be designed to endure for the life of the component, subsystem or system been marked. Mfr to certify.	NAs
5.1.2		<i>Markings were legible and attached after testing completed.</i>	-
	b	When pressure-sensitive labels are used, they shall comply with the applicable provision of the reference in Section 7.6. Mfr to certify.	NAs
	c	When labels are concealed, a permanent marking shall be visible to the unaided eye that describes how to access the labels.	Pass
	a	The material of construction; [Polyester]	Pass
	b	The size or range of sizes; [S, M/L, XL/2XL, 3XL/4XL]	Pass
	c	Part number and/or model designation; [100CTB]	Pass
	d	The month and year of manufacture; [05/2021]	Pass
	e	The manufacturer's name or logo; [FRONTLINE]	Pass
	f	An identifying number, unique to each individual FBH produced by the manufacturer; [000001, 000002, 000004, 000005]	Pass
	g	A warning to follow Mfr instructions included with the equipment at the time of shipment from the Mfr.	Pass
5.1.3	h	A label permanently attached to the lanyard parking attachment which either states "Park Lanyard Here. See instructions." verbally or conveys this by means of a pictogram.	Pass
	i	A label as defined in Figure 10a and 10b.	Pass
	a)	The label shall be placed in a prominent location on the FBH	Pass
	b)	If the label is part of a label pack or book, the label shall be placed so that the user will see it first.	Pass
	c)	The border surrounding the label text shall be no closer than 0.4 inches (10 mm) from any other markings on the FBH	NAp
	d)	The label may be modified to include the mark of the qualification body, and may include a part number located on the label outside of the border as needed by the manufacturer as defined in figure 10a and 10b.	NAp

5.2 Instruction Requirements

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

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

- 5.2.1** Instructions shall be provided to the user in English, and affixed to the equipment at the time of shipment from the manufacturer. Ltd

User Instructions were provided electronically in English and used for assessment

5.2.2 Instructions shall contain the following information:

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

5.2.6 Instructions shall provide warnings against:

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

Estimates of the uncertainty of measurement

Clause	Test	Uncertainty	
3.1.1	Dorsal attachment	Not applicable	
3.1.2	Sub-pelvic strap	Not applicable	
3.1.3	Shoulder straps	Not applicable	
	Connector	See report	
3.1.4	Waist belt or back strap – control of separation of shoulder straps	Not applicable	
3.1.5	Modular components or assemblies, as appropriate	Not applicable	
3.1.5.1	Modular components.	See report	
3.1.5.2	Attachment element extender	Length	±0.1 inches
3.1.6	Full body harness integrated into a vest	Not applicable	
3.1.7	Fall Arrest Indicator	Not applicable	
3.1.8	Harness with attached connecting subsystem combinations	See report	
3.1.9	Strap retainers (keepers)	Not applicable	
3.1.10	Lanyard parking attachment element - Disengagement load	±3.4%	
3.1.11	Support – shoulders/upper torso	Not applicable	
3.1.12	Location of single point attachment	Not applicable	
3.1.13	Sternal attachment – bilateral elements	Not applicable	
3.1.14	Sub-pelvic straps	Not applicable	
3.2.1	Dorsal attachment element	Not applicable	
3.2.1.3.1	Dorsal attachment element	Dynamic Feet First	±3.4%
3.2.1.3.2		Dynamic Head First	±3.4%
3.2.1.3.3	Dorsal attachment element	Static strength	See Note 1
		Slippage	±1.3%
3.2.1.3.4	Fall Arrest Indicator test – dorsal attachment	See Note 1	
3.2.2	Sternal attachment element	Not applicable	
3.2.2.3.1	Sternal attachment element	Dynamic Feet First	±3.4%
3.2.2.3.2	Sternal attachment element	Static strength	See Note 1
		Slippage	±1.3%
3.2.2.3.3	Fall Arrest Indicator test – sternal attachment	See Note 1	
3.2.3	Frontal attachment element	Not applicable	
3.2.3.1.1	Frontal attachment element	Dynamic Feet First	±3.4%
3.2.3.1.2	Frontal attachment element	Static strength	See Note 1
		Slippage	±1.3%
3.2.4	Shoulder attachment element	Not applicable	

3.2.4.1.1	Shoulder attachment element	Static strength	See Note 1
		Slippage	±1.3%
3.2.5	Waist, Rear attachment element		Not applicable
3.2.5.2.1	Waist, Rear attachment element	Static strength	See Note 1
		Slippage	±1.3%
3.2.6	Hip attachment element		Not applicable
3.2.6.1.1	Hip attachment element	Static strength	See Note 1
		Slippage	±1.3%
3.2.7	Suspension Seat attachment element		Not applicable
3.2.7.1.1	Suspension Seat attachment element	Static strength	See Note 1
		Slippage	±1.3%
3.3.1.1	Straps	Width	±1.3%
3.3.1.2	Straps	Static strength	See Note 1
3.3.1.3	Straps – material and characteristics		Not applicable
3.3.1.4	Straps - terminations		Not applicable
3.3.1.5	Straps (after abrasion)	Static strength	See Note 1
3.3.1.6	Straps – contact with metal connectors		Not applicable
3.3.1.7	Buckle & eyelet type adjusters	Spacing	±0.1 mm
3.3.2.1	Threads and stitching – material		Not applicable
3.3.2.2	Lock stitching		Not applicable
3.3.2.3	Stitching – contrasting colour		Not applicable
3.3.3.1	Connecting components (except soft loops)		See report
3.3.3.2	Soft loop attachments		Not applicable
3.3.3.3	Soft loop	Static strength	See Note 1
	Soft loop (after abrasion)	Static strength	See Note 1
3.3.3.4	Soft loop attachments – protection from wear		Not applicable
5.1	Marking requirements		Not applicable
5.2	Instructions requirements		Not applicable

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

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

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

ANNEX

This Annex comprises one section.

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

END OF REPORT

Frontline Fall Protection Inc. –
Full body harness, model 100CTB (S)

