

# Test Report

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

**Report no:** 2.23.01.07

**Customer:** Frontline Fall Protection Inc.  
2303 NW 84th Ave.  
Miami  
Florida 33122  
U.S.A

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

**Customer orders/  
Dates received:** T/0790 (16 September 2020)  
T/1034 (2 August 2022)

**Model:** 110CTB

**Dates of tests:** 26 Oct. 2020 to 17 Dec.2020 and 9 Jan. 2023

**Signed:**



Steven Sum, Laboratory Manager

**Issued:** 12 January 2023

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### **Conditions**

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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.

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

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

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**Summary of assessment**

<b>Clause</b>	<b>Requirement</b>	<b>Assessment (See Key)</b>
3.1	Design requirements	Ltd
3.1.10	Static Feet First – Lanyard parking attachment element	Pass
<b>3.2</b>	<b>Attachment Element Requirement</b>	
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	
<b>3.3</b>	<b>Component Requirements</b>	
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	NAs
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.

**Submissions details****Submission 01**

<b>Product</b>	<b>Quantity</b>	<b>Dates received</b>	<b>INSPEC specimen no. (2H196+)</b>
Full body harness, model 110CTB	19	27 Nov. 2020	01-19
Leg straps, part # 10	15 m	30 Sept. 2020	20A - 20J (cut into 10 equal lengths)
Shoulder straps, part # 588	15 m		21A - 21J (cut into 10 equal lengths)

**Submission 02**

<b>Product</b>	<b>Quantity</b>	<b>Date received</b>	<b>INSPEC specimen no. (2H196+)</b>
Shoulder straps, part # 588	15 m	30 Nov. 2020	22A - 22J (cut into 10 equal lengths)

**Procedures**

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

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

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

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

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

Specimen 2H19604 was assessed.

3.1.1	The specimen permanently incorporated a dorsal attachment element.	<b>Pass</b>
	<i>The specimen did incorporate other attachment element. The other attachment element was located at the Hip.</i>	
3.1.2	The specimen did incorporate a load bearing sub-pelvic strap.	<b>Pass</b>
3.1.3	All shoulder straps on the specimen came together at the dorsal location and were crossed and attached with a connector (D-ring).	<b>Pass</b>
	Testing of the D-ring was not requested.	<b>NAs</b>
3.1.4	The specimen permanently incorporated a back-strap as a mean to control the separation of the shoulder straps at the back of the full body harness.	<b>Pass</b>
	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.	<b>Pass</b>
3.1.5	The specimen was not equipped with modular components or assemblies.	<b>NAp</b>
3.1.5.1	Not applicable.	<b>NAp</b>
3.1.5.2	The specimen was not equipped with an attachment element extender; therefore this clause is not applicable.	<b>NAp</b>
3.1.6	The specimen was not integrated into a vest or garment.	<b>NAp</b>
3.1.7	The specimen was equipped with two fall arrest indicators.	<b>Pass</b>
	Both fall arrest indicators deployed during dynamic testing defined in section 3.2 when attached to the dorsal attachment element.	<b>Pass</b>
	It was visually possible to inspect the fall arrest indicators.	<b>Pass</b>
3.1.7.1	The specimen was not equipped with fall arrest indicators at the other attachment element.	<b>NAp</b>
3.1.8	The specimen was not equipped with connecting subsystem combinations.	<b>NAp</b>
3.1.9	The specimen did include strap retainers (keepers) which served to control the loose ends of straps.	<b>Pass</b>

### 3.1.10 Static Feet First Test - Lanyard Parking Attachment Element

Specimens 2H19601 to 2H19603 were assessed.

Each specimen was equipped with two lanyard parking attachment elements. Both lanyard parking attachment elements did not differ in design.

During the static feet-first tests, the lanyard parking attachment elements disengagement loads were 85.4, 89.9 and 89.9 pounds respectively. These values were less than the maximum 120 pounds permitted.

**Pass**

Specimen 2H19604 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 along the vertical centreline of the full body harness.

**Pass**

3.1.13 The specimen did not incorporate a sternal attachment element.

**NAp**

3.1.14 The specimen did include a sub-pelvic strap therefore this clause is not applicable.

**NAp**

## 3.2 Attachment Element Requirements

### 3.2.1 Dorsal

Specimen 2H19604 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 was specified in the User Instructions to be used in travel restraint or rescue.

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

**Pass**

### 3.2.1.3 Dorsal Attachment Element Requirements

#### 3.2.1.3.1 Dynamic Feet First Test

Specimen 2H19604 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 6 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 14.4 inches. Full body harness stretch stated in the manufacturer's instructions was 15 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**

Specimen 2H19605 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 8 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 14.0 inches. Full body harness stretch stated in the manufacturer's instructions was 15 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**

Specimen 2H19606 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 7 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 13.8 inches. Full body harness stretch stated in the manufacturer's instructions was 15 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 2H19607 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. These values were less than the maximum 30 degrees permitted. **Pass**

Both fall arrest indicators deployed visibly and permanently. **Pass**

Specimen 2H19608 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 10 degrees. These values were less than the maximum 30 degrees permitted. **Pass**

Both fall arrest indicators deployed visibly and permanently. **Pass**

Specimen 2H19609 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. These values were 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

Specimens 2H19610, 2H19611 and 2H19612 were assessed.

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

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

The straps to which "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

Specimens 2H19613, 2H19614 and 2H19615 were assessed.

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

**3.2.6 Hip**

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**

Specimens 2H19616, 2H19617 and 2H19618 were assessed.

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

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

The straps to which "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**

### 3.3 Components Requirements

#### 3.3.1 Load Bearing Straps

Specimen 2H19601 was assessed.

- |         |  |             |
|---------|--|-------------|
| 3.3.1.1 | The minimum width of the load bearing straps was 43 mm. This is more than the minimum 41 mm specified.   | <b>Pass</b> |
| 3.3.1.2 | Strap specimens 2H19620A to 20E and 2H19622A to 22E withstood the tensile tests of 5,000 pounds applied for 1-minute without breaking.   | <b>Pass</b> |
| 3.3.1.3 | The material and characteristics of load-bearing straps were not assessed. Manufacturer to certify.  | <b>NAs</b>  |
| 3.3.1.4 | The ends of load bearing straps were hot-cut so as to prevent fraying.   | <b>Pass</b> |
| 3.3.1.5 | Following abrasion conditioning, strap specimens 2H19620F to 20J and 2H19622F to 22J withstood the tensile tests of 3,600 pounds applied for 1 minute without breaking.                              | <b>Pass</b> |
| 3.3.1.6 | Straps in contact with the metal connectors at the dorsal and hip attachment elements were protected from wear. White plastic sleeves were used.   | <b>Pass</b> |
|         | Straps in contact with tongue buckles were protected from wear. Grommets were used.  | <b>Pass</b> |
| 3.3.1.7 | The spacing between holes centres of adjacent eyelets for buckle and eyelet type adjusters used in the specimen was 46 mm. This is more than the minimum 29 mm and less the maximum 50 mm specified. | <b>Pass</b> |

#### 3.3.2 Thread and Stitching

- |         |   |            |
|---------|---|------------|
| 3.3.2.1 | The material and characteristics of thread used was not assessed. Manufacturer to certify.                | <b>NAs</b> |
| 3.3.2.2 | All types of stitching were not assessed. Manufacturer to certify.  | <b>NAs</b> |
| 3.3.2.3 | Color contrast between threads used for sewing the harness and the load bearing straps were not assessed. | <b>NAs</b> |

#### 3.3.3 Connecting Components

Specimen 2H19601 was assessed.

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

## 5 Marking and Instructions

### 5.1 Marking Requirements

5.1.1	-	Markings shall be in English.	<b>Pass</b>
	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. <i>Marking labels were provided electronically and used for assessment.</i>	-
5.1.2	b	When pressure-sensitive labels are used, they shall comply with the applicable provision of the reference in Section 7.6. Mfr to certify.	<b>NAs</b>
	c	When labels are concealed, a permanent marking shall be visible to the unaided eye that describes how to access the labels.	<b>NAs</b>
	a	The material of construction; [Polyester]	<b>Pass</b>
	b	The size or range of sizes; [L/XL]	<b>Pass</b>
	c	Part number and/or model designation; [110CTB]	<b>Pass</b>
	d	The month and year of manufacture;	<b>Pass</b>
	e	The manufacturer's name or logo; [FRONTLINE]	<b>Pass</b>
	f	An identifying number, unique to each individual FBH produced by the manufacturer;	<b>Pass</b>
	g	A warning to follow Mfr instructions included with the equipment at the time of shipment from the Mfr.	<b>Pass</b>
5.1.3	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.	<b>Pass</b>
	i	A label as defined in Figure 10a and 10b.	<b>Ltd</b>
	a)	The label shall be placed in a prominent location on the FBH	<b>Pass</b>
	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.	<b>Pass</b>
	c)	The border surrounding the label text shall be no closer than 0.4 inches (10 mm) from any other markings on the FBH	<b>NAP</b>
	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.	<b>NAP</b>

## 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 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.        | <b>Pass</b> |
| b)           | A statement that the Mfr's instructions shall be provided to the users.   | <b>Pass</b> |
| c)           | Manufacturer's name, address and telephone number.  | <b>Pass</b> |
| d)           | Manufacturer's part number and/or model designation for the equipment.  | <b>Pass</b> |
| e)           | Intended use and purpose of the equipment.  | <b>Pass</b> |
| 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. | <b>Pass</b> |
| g)           | Proper method of use and limitations of the equipment.  | <b>Pass</b> |
| h)           | Illustrations showing locations and markings on the equipment.  | <b>Pass</b> |
| i)           | Reproduction of printed information on all markings.  | <b>Pass</b> |
| j)           | Inspection procedures (including frequency) required to assure the equipment is in serviceable condition and operating correctly.   | <b>Pass</b> |
| k)           | Criteria for discarding equipment that fails inspection.  | <b>Pass</b> |
| l)           | Procedures for cleaning, maintenance and storage.   | <b>Pass</b> |
| m)           | Reference to ANSI/ASSE Z359.11 (Full Body Harnesses) and applicable regulations governing occupational safety.  | <b>Pass</b> |
| n)           | Acceptable use for all attachment elements (see Annex A)  | <b>Pass</b> |
| <b>5.2.3</b> | Instructions shall require that only the equipment Mfr, or persons or entities authorized in writing by the Mfr, make repairs to the equipment.   | <b>Pass</b> |
| <b>5.2.4</b> | 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.      | <b>Pass</b> |
| <b>5.2.5</b> | Instructions shall require the user to have a rescue plan and means at hand to implement it when using the FBH for fall arrest.   | <b>Pass</b> |

**5.2.6** Instructions shall provide warnings against:

- |    |   |             |
|----|---|-------------|
| a) | Altering equipment  | <b>Pass</b> |
| b) | Misusing equipment  | <b>Pass</b> |
| c) | Using combinations of components or sub-systems, or both, which may affect or interfere with the safe function of each other.   | <b>Pass</b> |
| 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. | <b>Pass</b> |
| e) | Using the equipment around moving machinery and electrical hazards.   | <b>Pass</b> |
| f) | Using the equipment near sharp edges or abrasive surfaces.  | <b>Pass</b> |
| g) | Exposure to light (UV degradation)  | <b>Pass</b> |

**Estimates of the uncertainty of measurement**

Clause	Test	Uncertainty	
3.1.1	Dorsal attachment	See Note 1	
3.1.2	Sub-pelvic strap	See Note 1	
3.1.3	Shoulder straps	See Note 1	
	Connector	See report	
3.1.4	Waist belt or back strap – control of separation of shoulder straps	See Note 1	
3.1.5	Modular components or assemblies, as appropriate	See Note 1	
3.1.5.1	Modular components.	See report	
3.1.5.2	Attachment element extender	Length	±0.04 inches
3.1.6	Full body harness integrated into a vest	See Note 1	
3.1.7	Fall Arrest Indicator	See Note 1	
3.1.8	Harness with attached connecting subsystem combinations	See report	
3.1.9	Strap retainers (keepers)	See Note 1	
3.1.10	Lanyard parking attachment element - Disengagement load	±3.4%	
3.1.11	Support – shoulders/upper torso	See Note 1	
3.1.12	Location of single point attachment	See Note 1	
3.1.13	Sternal attachment – bilateral elements	See Note 1	
3.1.14	Sub-pelvic straps	See Note 1	
3.2.1	Dorsal attachment element	See Note 1	
3.2.1.3.1	Dorsal attachment element	Dynamic Feet First	±3.4%
3.2.1.3.2		Dynamic Head First	±3.4%
3.2.1.3.3	Dorsal attachment element	Static strength	See Note 1
		Slippage	±1.3%
3.2.1.3.4	Fall Arrest Indicator test – dorsal attachment	See Note 1	
3.2.2	Sternal attachment element	See Note 1	
3.2.2.3.1	Sternal attachment element	Dynamic Feet First	±3.4%
3.2.2.3.2	Sternal attachment element	Static strength	See Note 1
		Slippage	±1.3%
3.2.2.3.3	Fall Arrest Indicator test – sternal attachment	See Note 1	
3.2.3	Frontal attachment element	See Note 1	
3.2.3.1.1	Frontal attachment element	Dynamic Feet First	±3.4%
3.2.3.1.2	Frontal attachment element	Static strength	See Note 1
		Slippage	±1.3%
3.2.4	Shoulder attachment element	See Note 1	

3.2.4.1.1	Shoulder attachment element	Static strength	See Note 1
		Slippage	±1.3%
3.2.5	Waist, Rear attachment element		See Note 1
3.2.5.2.1	Waist, Rear attachment element	Static strength	See Note 1
		Slippage	±1.3%
3.2.6	Hip attachment element		See Note 1
3.2.6.1.1	Hip attachment element	Static strength	See Note 1
		Slippage	±1.3%
3.2.7	Suspension Seat attachment element		See Note 1
3.2.7.1.1	Suspension Seat attachment element	Static strength	See Note 1
		Slippage	±1.3%
3.3.1.1	Straps	Width	±1.3%
3.3.1.2	Straps	Static strength	See Note 1
3.3.1.3	Straps – material and characteristics		Not applicable
3.3.1.4	Straps - terminations		See Note 1
3.3.1.5	Straps (after abrasion)	Static strength	See Note 1
3.3.1.6	Straps – contact with metal connectors		See Note 1
3.3.1.7	Buckle & eyelet type adjusters	Spacing	±0.02 mm
3.3.2.1	Threads and stitching – material		See Note 1
3.3.2.2	Lock stitching		Not applicable
3.3.2.3	Stitching – contrasting colour		See Note 1
3.3.3.1	Connecting components (except soft loops)		See report
3.3.3.2	Soft loop attachments		See Note 1
3.3.3.3	Soft loop	Static strength	See Note 1
	Soft loop (after abrasion)	Static strength	See Note 1
3.3.3.4	Soft loop attachments – protection from wear		See Note 1
5.1	Marking requirements		See Note 1
5.2	Instructions requirements		See Note 1

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

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

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

# ANNEX

This Annex comprises one section.

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

END OF REPORT

Frontline Fall Protection Inc. –  
Full body harness, model 110CTB

