

Test Report

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

Report no: 2.21.12.12

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

Manufacturer: Frontline Fall Protection Inc.

Customer order: T/0921

Order received: 20 July 2021

Models: 110VTB

Dates of tests: 20 December 2021 to 23 December 2021

Signed:



Steven Sum, Laboratory Manager

Issued: 24 December 2021

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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	
3.2.6.1.1	Static Feet First	
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	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.

Submission details

Product	Quantity	Dates received	INSPEC specimen no.
Shoulder straps, part no. No. 588	15 m	22 Feb. 2019	2G04201A to 01J (cut into 10 pieces)
Leg straps, part no. No. 10	15 m	13 Nov. 2019	2G20701A to 01J (cut into 10 pieces)
Full body harness, model 110VTB	06		2G20702 to 07

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 2G20702 was assessed.

3.1.1	The specimen permanently incorporated a dorsal attachment element.	Pass
	The specimen did not incorporate other attachment elements.	
3.1.2	The specimen did incorporate a load bearing sub-pelvic strap.	Pass
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).	Pass
	Testing of the connector (D-ring) was not requested.	NAs
3.1.4	The specimen permanently incorporated a back-strap as means of controlling the separation of the shoulder straps on the back of the full body harness.	Pass
	When specimen 2G20703 was mounted on to the test torso as per manufacturer's instructions, some portion of the back strap was located between datum levels G and K.	Pass
3.1.5	The specimen was not equipped with modular components or assemblies.	NAp
3.1.5.1	This clause was not applicable.	NAp
3.1.5.2	The specimen was not equipped with an attachment element extender; therefore this clause is not applicable.	NAp
3.1.6	The specimen was not integrated into a vest or garment.	NAp
3.1.7	The specimen was equipped with two fall arrest indicators.	Pass
	Both fall arrest indicators deployed during dynamic testing defined in section 3.2.	Pass
	It was possible visually to inspect the fall arrester indicators.	Pass
3.1.7.1	The specimen was not equipped with other fall arrest indicators.	NAp
3.1.8	The specimen was not equipped with connecting subsystem combinations.	NAp
3.1.9	The specimen did include strap retainers (keepers) which serve to control the loose ends of straps.	Pass

3.1.10 Static Feet First Test - Lanyard Parking Attachment Element

Specimen 2G20702 was assessed.

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

During the static feet-first test, the lanyard parking attachment element disengagement load was 78.7 pounds. This value was less than the maximum 120 pounds permitted.

Pass

Specimen 2G20702 was assessed.

3.1.11 It was not possible to remove elements of the full body harness that support the shoulders / upper torso from those that support the legs / lower torso.

Pass

3.1.12 The dorsal attachment element was located laterally along the vertical centreline of the full body harness.

Pass

3.1.13 The specimen did not consist of a sternal attachment element.

NAp

3.1.14 The specimen did include a sub-pelvic strap.

NAp

3.2 Attachment Element Requirements**3.2.1 Dorsal**

The dorsal attachment element of specimen 2G20703 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 2G20703 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 5 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 8.6 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 2G20704 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 8 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 2G20705 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**

Other straps of the full body harness did not show signs of tearing. **Pass**

3.2.1.3.4 Fall Arrest Indicator Test

Specimen 2G20706 was assessed.

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

3.3 Components Requirements

3.3.1 Load Bearing Straps

- 3.3.1.1 The minimum width of the load bearing straps of specimen 2G20702 was 44 mm. This is more than the minimum 41 mm specified. **Pass**
- 3.3.1.2 The straps 2G04201A to 2G04201E and 2G20701A to 2G20701E withstood a tensile test 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, the straps 2G04201F to 2G04201J and 2G20701F to 2G20701J withstood a tensile test of 3,600 pounds applied for 1-minute without breaking. **Pass**
- 3.3.1.6 Straps in contact with metal connector (D-ring) at the dorsal attachment element were protected from wear. A plastic sleeve was used. **Pass**
- Straps in contact with 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 was 1.69 inch. This is more than the minimum 1.125 inch and less the maximum 2 inches specified. **Pass**

3.3.2 Thread and Stitching

Specimen 2G20702 was 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 stitching the load bearing straps shall have a contrasting color to the load bearing straps to facilitate visual inspection was not assessed. **NAs**

3.3.3 Connecting Components

Specimens 2G20702 and 2G20708 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 attachment was not used. **NAP**
- 3.3.3.4 Soft loop attachment was not used. **NAP**

5 Marking and Instructions

5.1 Marking Requirements

5.1.1	-	Warnings 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. <i>Markings were provided electronically and used for assessment.</i>	NAs
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.	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;	Pass
	c	Part number and/or model designation; "110VTB"	Pass
	d	The month and year of manufacture;	Pass
	e	The manufacturer's name or logo; "FRONTLINE"	Pass
	f	An identifying number, unique to each individual FBH produced by the manufacturer;	Pass
	g	A warning to follow Mfr instructions included with the equipment at the time of shipment from the Mfr.	Pass
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. [only the texts were assessed]	Ltd
		A label as defined in Figure 10a and 10b. [only the texts were assessed]	Ltd
	a)	The label shall be placed in a prominent location on the FBH	NAs
	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.	NAs
	i	c) The border surrounding the label text shall be no closer than 0.4 inches (10 mm) from any other markings on the FBH	NAs
		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
	<i>User instructions were supplied electronically in English and used for assessment.</i>	
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 test 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 test report	
3.1.5.2	Attachment element extender	Length	±0.04 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 test 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	±0.02 inches
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 test 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 110VTB

