



Test Report

This test report describes the test results of the below mentioned paragliding harness.

All the tests were carried out by:

Air Turquoise SA, official test laboratory of Switzerland.

para-test.com



paragliding by air turquoise

Standards

Tests were carried out in conformity with the following standards:

- 2. DV LuftGerPV §1, Nr. 7 c (*note: in what follows this will be abbreviated by "LTF")
- European Standard EN1651 September 1999 (*note in what follows this will be abbreviated by "EN")
- European Standard EN12491 September 2001 (*note in what follows this will be abbreviated by "EN12491")

Harness details

| | |
|--------------------------------|------------------|
| Manufacturer: | Air Heart |
| Harness model: | Passenger |
| Size: | M |
| Harness Weight: | 2.9 kg |
| Maximum certified pilot | 100 kg |
| Impact protection type: | Mousse bag 15 cm |
| Harness type: | ABS |

| | |
|---------------------------------------|------------------|
| Test responsible: | Alain Zoller |
| Test place: | Villeneuve |
| Test date: | July 25, 2014 |
| Test room temp & humidity: | 25.4° C; 55 %rel |
| Certification number EN: | PH 109.2014 |
| Certification number LTF: | GZ 000.0000 |

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Air Turquoise S.A. - Certification of paraglider equipment
 Tested in accordance with EN 1651:1999 and 2.DV LuftGerPV§1, Nr.7c

Prepared by RE
 Rev.0, 25.01.2011
 No. 71.9.3



Test summary

A. STRUCTURAL STRENGTH TESTS

A test plan was set up in order to execute the different tests in an efficient order. The table below summarizes this test plan together with the applicable standards and results.

| Test ID | TESTED ? | Standard Ref. | | TEST setup | Anchoring | | Forces | | Min. Test duration [sec] | Result |
|---------|----------|---------------|----------------|---------------------------|--------------------------|----------------------------|----------------|----------------|--------------------------|--------|
| | | EN | LTF | | Attach - ment points | Dummy | Req. Load in g | Min. force [N] | | |
| 1 | ✓ | 5.3.2.1 | 4.2.1.a | Default flying position | 2 main attachment points | Hip fixated | 6g | 6000 | 10 | OK |
| 2 | ✓ | 5.3.2.2 | | | | | 9g | 9000 | 5 | OK |
| 3 | | | 4.2.1.b | Default, landing position | 2 main att. points | Hip fixated, landing conf. | 6g | 6000 | 10 | n/a |
| 4 | ✓ | 5.3.2.7 | | | | | 15g | 15000 | 5 | OK |
| 5 | | | 4.2.1.a rescue | Rescue | 2 rescue att. Pnts. | Hip fixated | 9g | 9000 | 10 | n/a |
| 6 | | 5.3.2.4 | | | | | 15g | 15000 | 5 | n/a |
| 7 | | | 4.2.1.b rescue | Rescue, landing | | Hip fixated, landing conf. | 6g | 6000 | 10 | n/a |
| 8 | ✓ | 5.3.2.3 | | One riser | ONE main att. | 1 central hip fixation | 6g | 6000 | 10 | OK |
| 9 | | | 4.2.1.d | Towing | 2 main att. + 2 tow att. | None | 3g | 3000 | 10 | n/a |
| | | 5.3.2.5 | | | | | 5g | 5000 | | |
| 10 | ✓ | 5.3.2.6 | | Default, Negatif | One main att. | Head fix. | 4.5g | 4500 | 10 | OK |
| 11 | | | 4.2.1.c | Upside down | 2 main att. downw. | Head fix. | 6g | 6000 | 10 | n/a |
| 12 | | | 4.2.1.c rescue | Upside down rescue | 2 rescue att. downw. | | 6g | 6000 | 10 | n/a |

B. HARNESS PROTECTION SHOCK TEST

Most paraglider harnesses are equipped with a protection device that damps the shock on the pilot's spine during a hard landing.

Shock impact tests have to be executed on these harnesses in order to prove the damping characteristics of it.



| Test ID | TESTED ? | Standar | TEST setup | Anchoring | | Impact | | | Result | |
|------------------|----------|---------|-------------------------|---|-------|----------------|-----------------|--------------------|-----------------|--------------------|
| | | Ref.: | | Attach- | Dummy | Max. tolerated | Max Peak impact | Impact duration of | | Impact duration of |
| | | LTF | | ment | | peak | measured | + 38 g (if any) | + 20 g (if any) | |
| | | | | points | | in g | | recorded: | recorded: | |
| PRO TECT 1 | ✓ | 5.1.1 | Default flying position | Test dummy is attached to the harness like a pilot in flight. | | +50g | 39.75 | 2.46 | 17.29 | OK |

C. RESCUE DEPLOYMENT RESISTANCE TEST

The deployment of the rescue system has to be ensured in all circumstances of flight. This test is to verify whether the force needed to deploy is in between reasonable limits.

| Test ID | TESTED ? | Standar | TEST setup | Anchoring | | Force for single hand deployment | | | Result |
|--------------|----------|---------|-------------------------|---|-------|----------------------------------|-------|------------|--------|
| | | Ref. | | Attach- | Dummy | Min. | max. | Resistance | |
| | | LTF | | ment | | force | force | measured | |
| | | | | points | | [N] | [N] | [daN] | |
| Resc depl | | 6.1.5 | Default flying position | Test responsible is attached to the harness like a pilot in flight. (no dummy required) | | 20 N | 70 N | n/t | n/a |

D. RESCUE DEPLOYMENT STRAP STRENGTH TEST

The connection between handgrip and inner container has to have sufficient load capacity/structural strength in any situation that may arise during normal use. During this test is verified, whether this connection fulfill the requirements.

| Test ID | TESTED ? | Standard Ref. | TEST setup | Minimum force [N] | Min. Test duration [s] | Breaking resistance measured | Result |
|---------------|----------|---------------|------------|-------------------|------------------------|------------------------------|--------|
| | | EN 12491 | | | | | |
| | | LTF | | | | | |
| Resc strap | | 6.1.8 | 5.3.2 | 700N | 10 | n/t | n/a |



After careful examination as explained in above mentioned test reports (from page 2 to page 18), the undersigned persons declare that the harness:

**Air Heart
Passenger
M**

Complied with:

- **European Standard EN 1651 September 1999**
And / or (if tested)
- **European Standard EN 12491 March 2001**
And / or (if tested)
- **2. DV LuftGerPV §1, Nr. 7 c**

Villeneuve, July 25, 2014

Place, Date


Alain Zoller
www.para-test.com

Test responsible

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Annex: detailed test reports

Harness Test

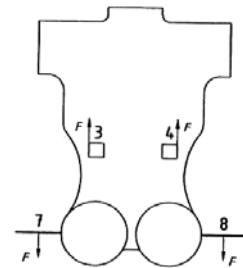
Test ID 1

Item: Passenger
Manufacturer: Air Heart
Test place & date: Villeneuve July 25, 2014
Test responsible: Alain Zoller
Temp. [°C] & Humidity: 25.4° C; 55 %rel
Maximum certified pilot weight [kg]: 100 kg

Standard: EN 1651 & 2. DV LuftGerPV §1, Nr. 7 c
Test standard §: 5.3.2.1 (EN) & 4.2.1 a (LTF DV)

Test setup: Default flying position
Anchoring: Attachment points: Both main riser attachments (3, 4)
Dummy: Default, hip fixed (7, 8)

Required load in g : 9g (EN: 6g)
Minimum load [N]: 9000 N (EN: 6000 N)
Required test load in kg: **900 kg**
Min. duration [s]: 10 s



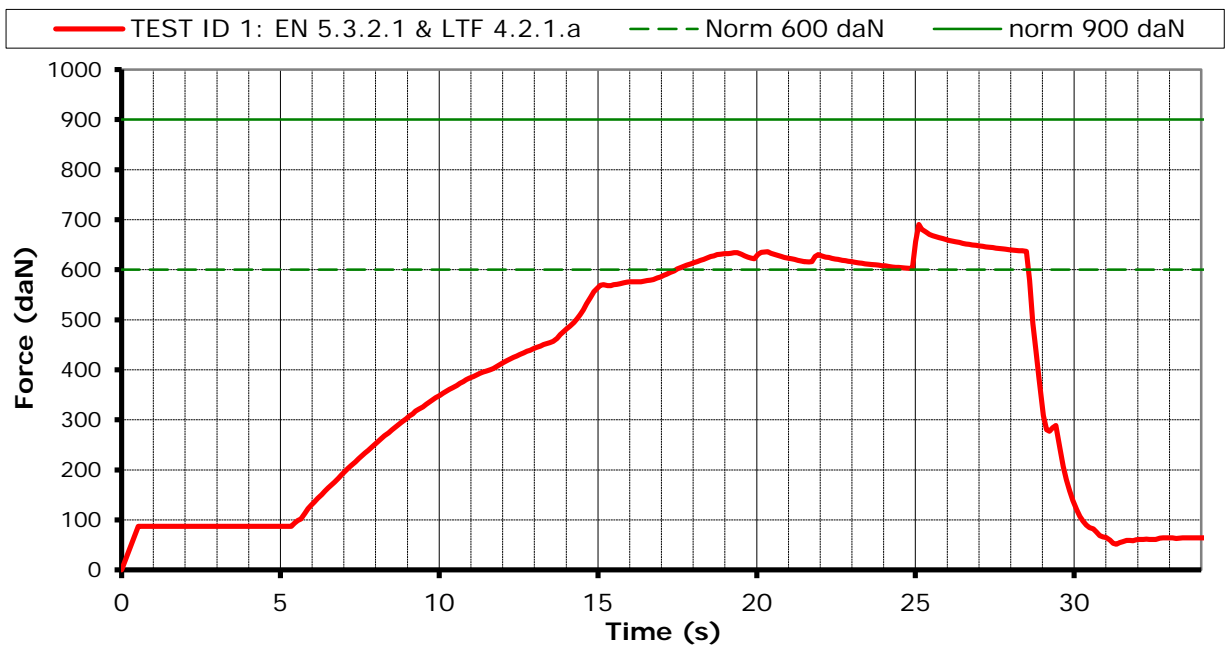
Results

Duration of maintained min. load [s]: **11.3 s**

Any signs of structural failure after this test: **No visible failure**

Test result: **Passed**

Graph:



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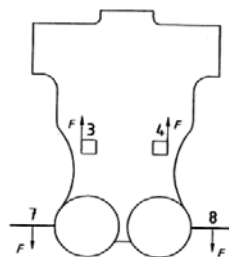
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Annex TEST ID 1
 Prepared by RE
 Rev.0, 25.01.2011
 No. 71.9.3



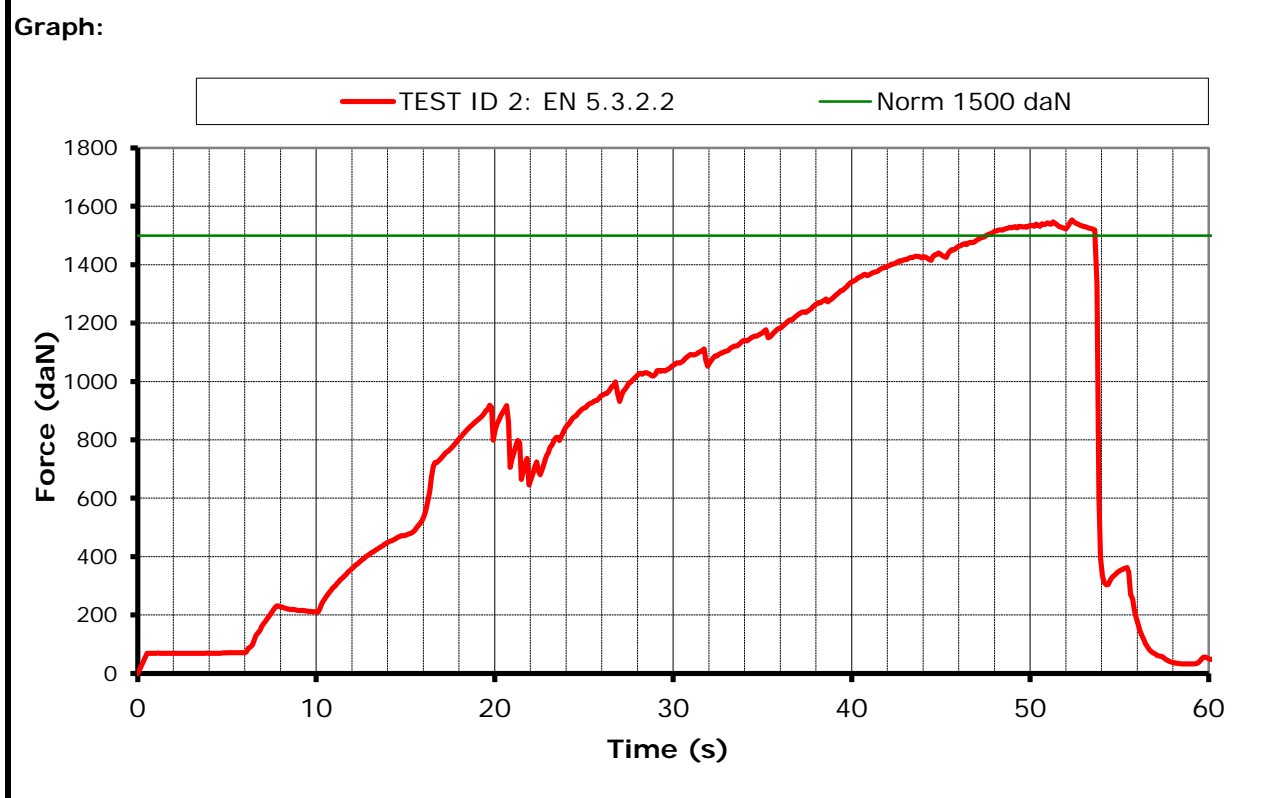
Harness Test **Test ID 2**

| | |
|---|---|
| Item: | Passenger |
| Manufacturer | Air Heart |
| Test place & date: | Villeneuve July 25, 2014 |
| Test responsible: | Alain Zoller |
| Temp. [°C] & Humidity: | 25.4° C; 55 %rel |
| Maximum certified pilot weight [kg]: | 100 kg |
| Standard | EN 1651 |
| Test standard §: | 5.3.2.2 |
| Test setup: | Default flying position |
| Anchoring: Attachment points: | Both main riser attachments (3, 4) |
| Dummy: | Default, hip fixed (7, 8) |
| Required load in g: | 15 g |
| Min load [N]: | 15 000 N |
| Required test load in kg: | 1500 kg |
| Min. duration [s]: | 5s |



Results

| | |
|---|---------------------------|
| Duration of maintained min. load [s]: | 6.0 s |
| Any signs of structural failure after this test: | No visible failure |
| Test result: | Passed |





Harness Test

Test ID 4

| | |
|--------------------------------------|--------------------------|
| Item: | Passenger |
| Manufacturer | Air Heart |
| Test place & date: | Villeneuve July 25, 2014 |
| Test responsible: | Alain Zoller |
| Temp. [°C] & Humidity: | 25.4° C; 55 %rel |
| Maximum certified pilot weight [kg]: | 100 kg |

Standard EN 1651

Test standard §: EN 5.3.2.7

Test setup: Flying position before landing: seat board (11) in landing position, leg straps (10) closed.

Anchoring: Attachment points: Both of the main riser attachments attached (3 and 4);

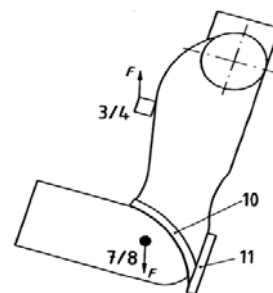
Dummy: Default, hip fixed (7, 8)

Required load in g: 15 g

Min load [N]: 15 000 N

Required test load in kg: **1500 kg**

Min. duration [s]: 5 s



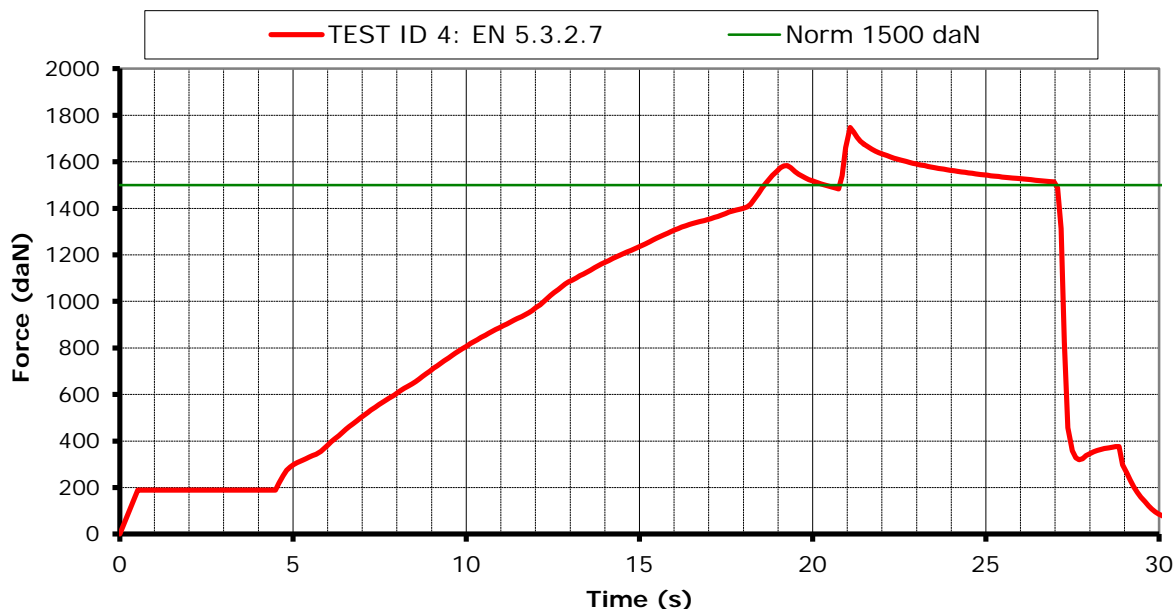
Results

Duration of maintained min. load [s]: **6.1 s**

Any signs of structural failure after this test: **No visible failure**

Test result: **Passed**

Graph:



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No. 71.9.3



Harness Test

Test ID 8

Item: Passenger
 Manufacturer: Air Heart
 Test place & date: Villeneuve July 25, 2014
 Test responsible: Alain Zoller
 Temp. [°C] & Humidity: 25.4° C; 55 %rel
 Maximum certified pilot weight [kg]: 100 kg

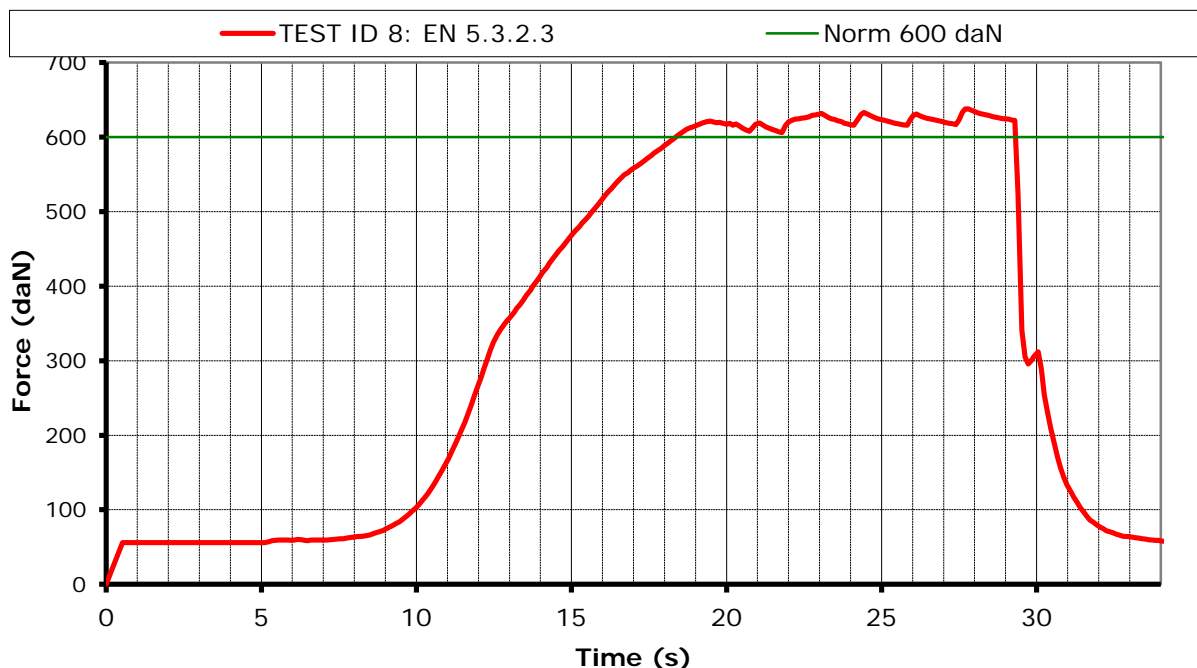
Standard: EN 1651
 Test standard §: 5.3.2.3
 Test setup: Only one riser attached
 Anchoring: Attachment points: One main riser attachments (3)
 Dummy: Hip fixed (7, 8 -> 12)
 Required load in g: 6 g
 Min load [N]: 6 000 N
 Required test load in kg: **600** kg
 Min. duration [s]: 10 s



Results

Duration of maintained min. load [s]: **10.5 s**
 Any signs of structural failure after this test: **No visible failure**
 Test result: **Passed**

Graph:



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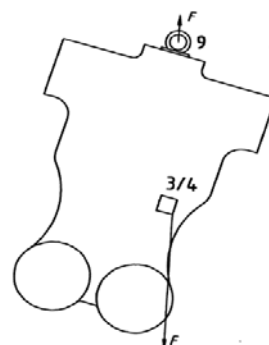


Harness Test

Test ID 10

| | |
|--------------------------------------|--------------------------|
| Item: | Passenger |
| Manufacturer | Air Heart |
| Test place & date: | Villeneuve July 25, 2014 |
| Test responsible: | Alain Zoller |
| Temp. [°C] & Humidity: | 25.4° C; 55 %rel |
| Maximum certified pilot weight [kg]: | 100 kg |

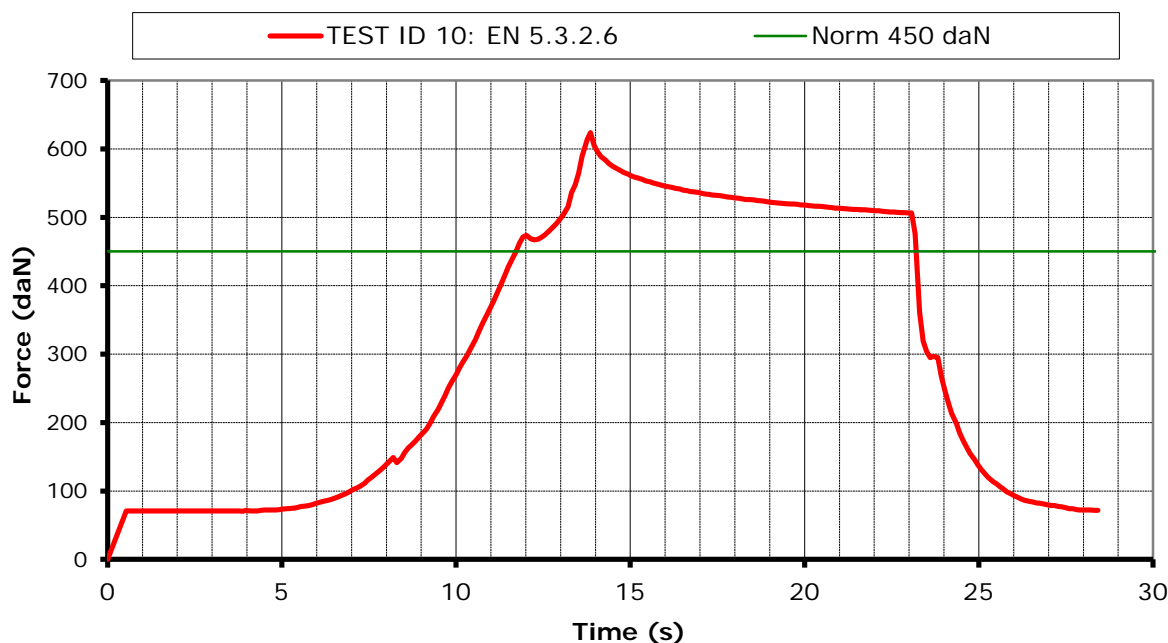
| | |
|-------------------------------|---|
| Standard | EN 1651 |
| Test standard §: | 5.3.2.6 |
| Test setup: | Normal flying position in NEGATIF |
| Anchoring: Attachment points: | ONE of the main riser attachments attached downwards(3 or 4); |
| Dummy: | Dummy anchored at the head position (9) |
| Required load in g: | 4.5 g |
| Min load [N]: | 4500 N |
| Required test load in kg: | 450 kg |
| Min. duration [s]: | 10 s |



Results

| | |
|--|---------------------------|
| Duration of maintained min. load [s]: | 11.3 s |
| Any signs of structural failure after this test: | No visible failure |
| Test result: | Passed |

Graph:



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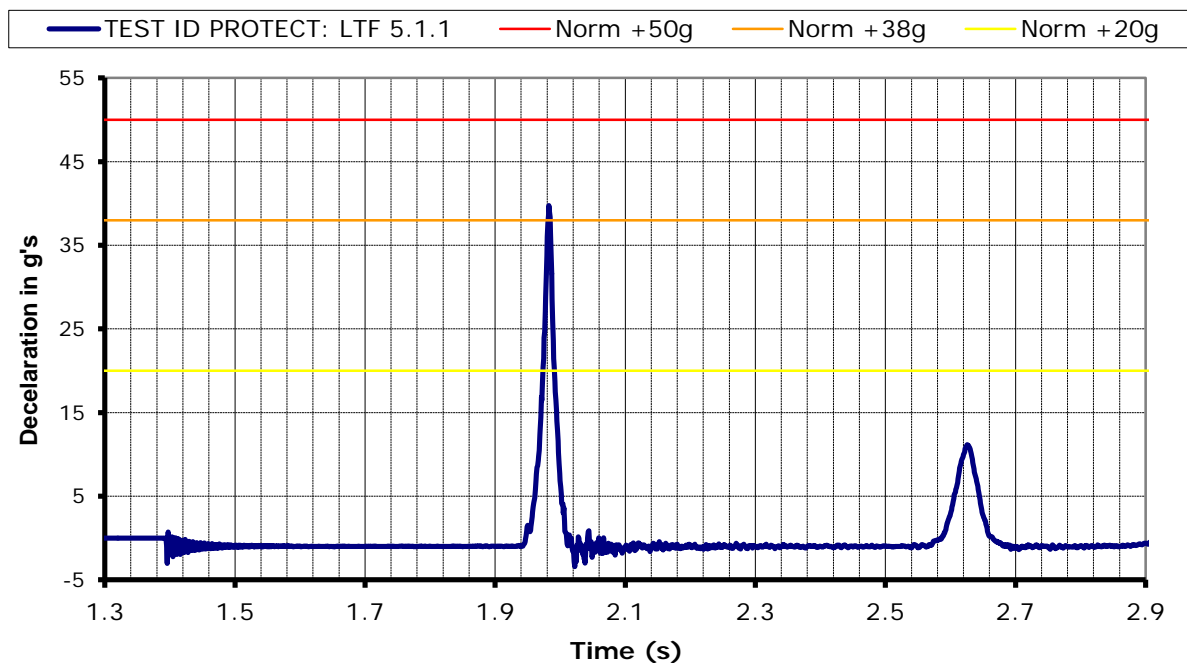
Annex TEST ID 10
Prepared by RE
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No. 71.9.3



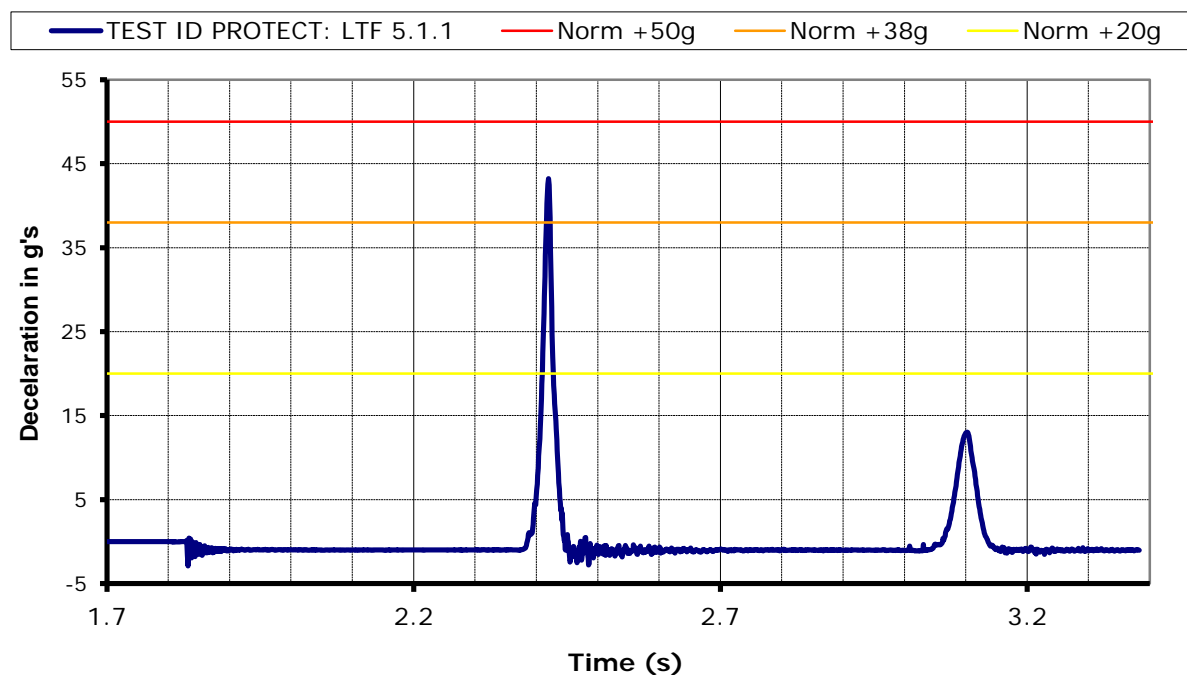
| Protector shock test | | Test ID Protect |
|--------------------------------------|---|---|
| Item: | Passenger | |
| Manufacturer | Air Heart | |
| Test place & date: | Villeneuve | July 25, 2014 |
| Test responsible: | Alain Zoller | |
| Temp. [°C] & Humidity: | 25.4° C; 55 %rel | |
| Maximum certified pilot weight [kg]: | 100 | kg |
| Standard | 2. DV LuftGerPV §1, Nr. 7 c | |
| Test standard §: | 5.1.1 | |
| Test setup: | Harness attached to protector test dummy, in a similar way like a real pilot in flight. Impact will be simulated by dropping the dummy from a certain height (with and without reserve). To simulate the "in-flight" conditions, the airbag is inflated with pressurized air equalling an airspeed of 7m/s. Inflation has to be stopped at least 5 sec before impact. Impact will be measured by an accelerometer mounted on the dummy. (Impact measured in g's) | |
| Requirements: | Minimum height: Impact requirements: Repetitions: | 1.65 m (between lowest point test dummy and impact surface) +50g as absolute maximum; +38g during less than 7 msec; +20g during less than 25 msec. The test will be performed 2 times, minimum 1 hour and maximum 2 hours after the first impact (with airbag protectors this pause is not necessary). The 2 Max-values should not differ more than 20% |
| Results | | |
| <u>Shock test 1:</u> | | |
| Impact at a height of 1.65m: | 39.75 | } $\Delta < 20\% ?$ |
| Impact duration of + 38 g (if any): | 2.46 | |
| Impact duration of +20 g (if any): | 17.29 | |
| <u>Shock test 2:</u> | | |
| Impact at a height of 1.65m: | 43.02 | } $\Delta < 20\% ?$ |
| Impact duration of + 38 g (if any): | 5.87 | |
| Impact duration of +20 g (if any): | 16.63 | |
| Test Result: | Passed | |



Graph 1:



Graph 2:



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Annex TEST ID Protect 1
 Prepared by RE
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 No. 71.9.3