DOT/FAA/TC-14/5

Federal Aviation Administration
William J. Hughes Technical Center
Aviation Research Division
Atlantic City International Airport
New Jersey 08405

New and Repaired Aircraft Seat Belt Comparison Testing

August 2014

Final Report

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U.S. Department of Transportation
Federal Aviation Administration

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The Federal Aviation Administration William J. Hughes Technical Center Aviation Research Division COR was Allan Abramowitz.

16. Abstract

The Federal Aviation Administrative is investigating the need for an Airworthiness Directive of seat belt/restraint repairs on dynamic seats. This is a data report that shows the results of testing on new and repaired aircraft seat belts. The seat belts were repaired by replacing the webbing material. All hardware was kept intact. To minimize effects of the hardware, all hardware was new and unused. Two types of belts were tested: the original as a manufactured belt with the original equipment manufacturer (OEM) supplied webbing and a repaired belt that used webbing supplied by a repair station that may differ in properties from the OEM webbing. The test then assessed whether there were any differences between an OEM belt and a repaired belt in terms of belt loads, anchor point loads, and head path.

A follow-up report is being written that will analyze the test data and report the results.

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EXECUTIVE SUMMARY

The Federal Aviation Administrative is investigating the need for an Airworthiness Directive of seat belt/restraint repairs on dynamic seats. This is a data report that shows the results of testing on new and repaired aircraft seat belts. The seat belts were repaired by replacing the webbing material. All hardware was kept intact. To minimize effects of the hardware, all hardware was new and unused. Two types of belts were tested: the original as a manufactured belt with the original equipment manufacturer (OEM) supplied webbing and a repaired belt that used webbing supplied by a repair station that may differ in properties from the OEM webbing. The test then assessed whether there were any differences between an OEM belt and a repaired belt in terms of belt loads, anchor point loads, and head path. All tests used the 16g impact pulse identified in Title 14 of the Code of Federal Regulations Part 25.562 and a rigid seat with a 5-degree seat pan angle and 13-degree seat back angle. A one-inch-firm CF47 confor foam seat cushion was placed on the seat pan with a cloth cover and was clamped to prevent any sliding. Loads recorded include seat back forces, seat pan forces and moments, seat belt anchor forces, and seat belt load. A Hybrid II 50th percentile anthropomorphic test dummy was used and head acceleration and angular velocities were recorded. The seat belt anchorage points were adjusted to meet the various configurations and the corresponding belt angles.

A follow-up report is being written that will analyze the test data and report the results.

WICHITA STATE UNIVERSITY
NATIONAL INSTITUTE FOR AVIATION RESEARCH

Report No. CDL-FA14B-001

New and Repaired Aircraft Seat Belt Comparison Testing

2014 April 7

Prepared by:

Rob Huculak

Laboratory Manager, Crash Dynamics

Summary

To help decide whether there needs to be an Airworthiness Directive (AD) of seat belt/restraint repairs on dynamic seats, the Federal Aviation Administrative (FAA) has requested restraint systems be tested in various configurations. All tests have used the 16g impact pulse identified in Title 14 of the Code of Federal Regulations (CFR) 25.562 and a rigid seat with a 5-degree seat pan angle and 13-degree seat back angle. A one-inch-firm CF47 confor foam seat cushion was placed on the seat pan with a cloth cover and was clamped to prevent any sliding. Loads recorded include seat back forces, seat pan forces and moments, seat belt anchor forces, and seat belt load. A Hybrid II 50th percentile anthropomorphic test device (ATD) was used and head acceleration and angular velocities were recorded. The seat belt anchorage points were adjusted to meet the various configurations and the corresponding belt angles are shown in the table 1. A summary of the results are shown in table 2. Detailed results for each of the 12 tests configurations are shown in the appendix.

Table 1. FA14B Test Setup

Run Number	Configuration	Belt	SRP to SBA		Width	Seat Belt Angle	Seat Belt Offset
			X (in)	Z (in)	(in)	(deg)	(in)
1	1	New	0.5	-2.65	18	57.5	1.25
2	1	Repaired	0.5	-2.65	18	56.3	1.50
3	2	New	5.0	-2.8	18	73.8	0.25
4	2	Repaired	5.0	-2.8	18	73.9	0.25
5	4	New	3.0	-2.5	18	64.3	-1.00
6	4	Repaired	3.0	-2.5	18	63.2	-0.75
7	5	New	Offset		18	64.9	2.75
8	5	Repaired	Offset		18	65.3	3.00
9	3	New	2.5	-0.4	18	57.8	-2.00
10	3	Repaired	2.5	-0.4	18	57.5	-2.50
11	1	New	0.5	-2.65	18	57.4	1.75
12	1	Repaired	0.5	-2.65	18	57.0	1.75

SRP = Seat Reference Point

Table 2. FA14B Test Results

Run Number	Configuration	Belt	Maximum Belt Load	Time
			(lbf)	(sec)
1	1	New	1754.73	0.1591
2	1	Repaired	1569.62	0.1561
3	2	New	1979.26	0.1585
4	2	Repaired	1922.50	0.1595
5	4	New	2028.86	0.1532
6	4	Repaired	1835.66	0.1654
7	5	New	2051.48	0.1612
8	5	Repaired	1754.51	0.1533
9	3	New	2343.54	0.1550
10	3	Repaired	2129.62	0.1589
11	1	New	2005.65	0.1577
12	1	Repaired	1830.76	0.1589

Appendix

Detailed test results for each of the 12 test conditions.

CRASH DYNAMICS LABORATORY

Report No. CDL-FA14B-01-01

Requested by:

FAA

Final Test Report
FA14B-01

03/25/2014

Revision	Change	Date	Revised By
New		03/25/2014	Rob Huculak

Prepared and Reviewed by:

Rob Huculak
Laboratory Manager

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EXPORT CONTROLLED DATA. This document contains technical data whose export is restricted by the International Traffic in Arms Regulations (ITAR) or the Export Administration Regulations (EAR). Violations of these export laws are subject to severe criminal penalties.

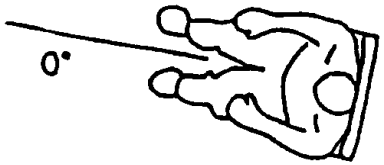
This test report is in accordance with ISO/IEC 17025:2005 requirements and all equipment standards used are traceable to the National Institute of Standards and Technology.
The information in this report relates only to the article under test and cannot be reproduced, except in full, without the written approval of the National Institute for Aviation Research.

Test Summary

The dynamic test (FA14B-01) was performed for FAA in accordance with 14 CFR 25.562 Test 2 on 03/25/2014.

Pulse Parameters	Required	Result	Pass/Fail
Minimum Peak Acceleration (g)	16	16.22	PASS
Minimum Velocity Change (ft/sec)	44	45.38	PASS
Maximum Rise Time (msec)	90	87.4	PASS
Minimum Velocity Change During Rise Time (ft/sec)	22	23.54	PASS
2g Offset	--	--	PASS

Test Orientation



ATD: H2 718 **Position: Config 1 - New Belt**

0 deg

Measured Seat Belt Angle	Measured Seat Belt Offset
57.48 deg	1.25 in

CRASH DYNAMICS LABORATORY

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Doc. No.: CDL-FA14B-01-01

Version: New

Report Date: 03/25/2014

Customer: FAA

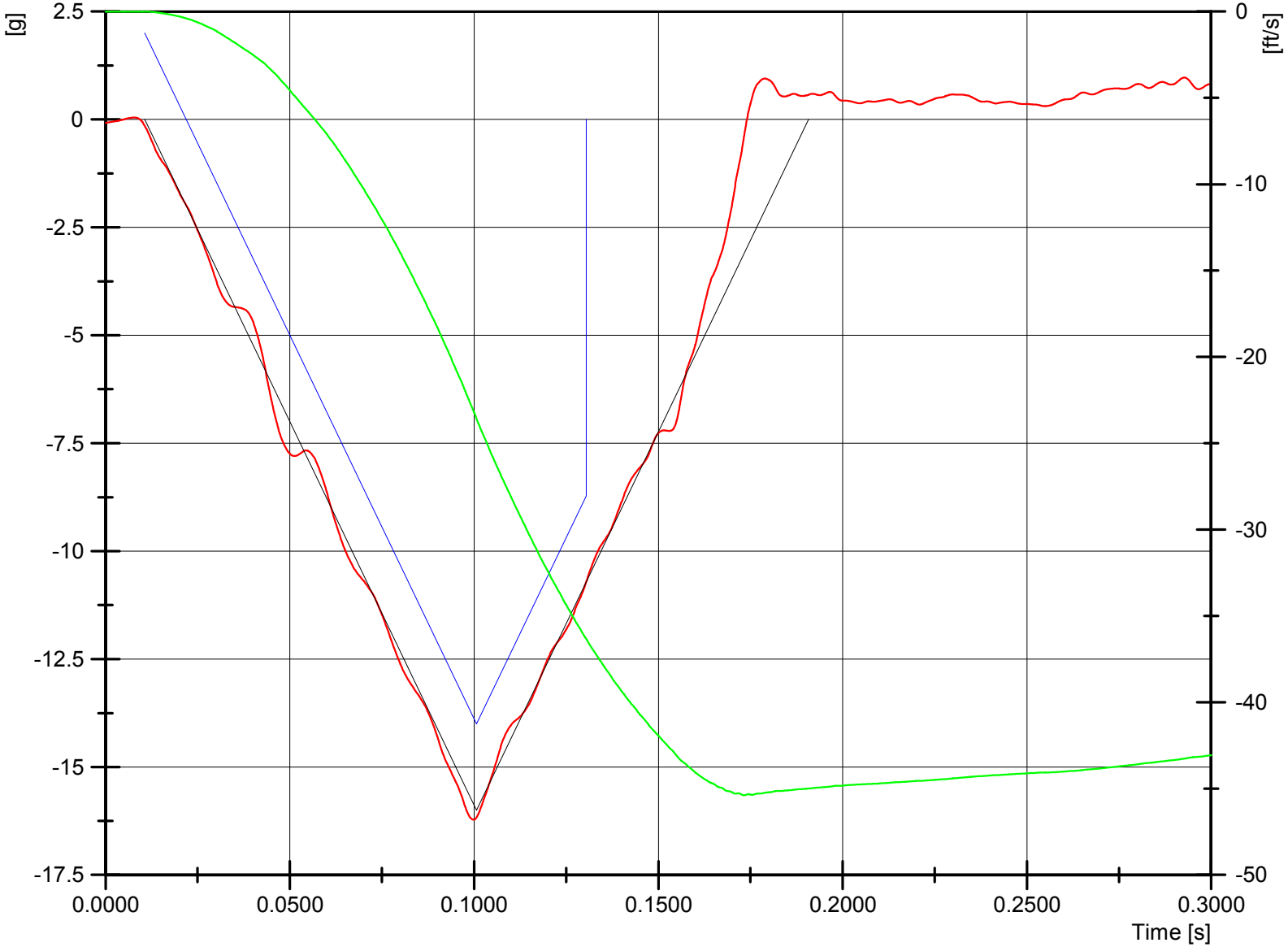
Test: FA14B-01

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/21/2013 10:25

Temperature	Relative Humidity
74.7°F	31.2%



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Test: FA14B-01

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/21/2013 10:25

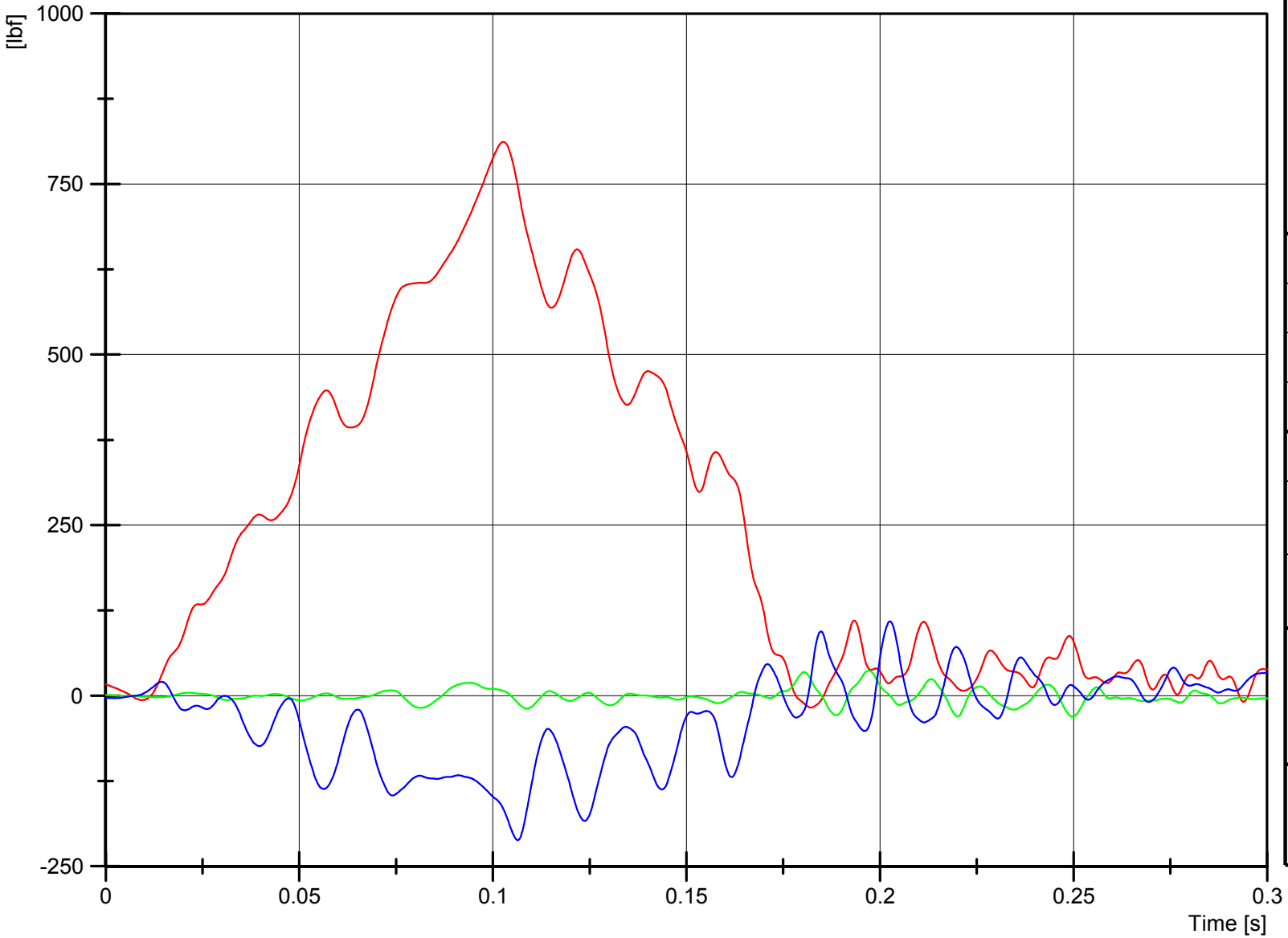
Comments:

Sled Acceleration | Sled Velocity | Ideal Pulse | Upper Limit

Maximum: 0.969 g Time: 0.2927 sec.
Minimum: -16.22 g Time: 0.0998 sec.
CFC: 60
Sensor Type: ENDEVCO 7290A-100
S/N: 29924
Sensitivity: 0.01919 V/EU
Cal. Due: 06/11/2014
Full Scale: 100 g
DAS Channel: 50
Ref. No.: 1
Polarity: R

Minimum: -45.38 ft/s Time: 0.1732 sec.

Pulse Requirement		Actual
Minimum Required Peak Acceleration:	16 g	16.22 g
Minimum Overall Velocity Change:	44 ft/s	45.38 ft/s
Maximum Rise Time:	90 msec	87.4 msec
Minimum Velocity Change Before Greq:	22 ft/s	23.54 ft/s



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Doc. No.: CDL-FA14B-01-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-01

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/21/2013 10:25

Comments:

Rigid Seat Seat Back Fx

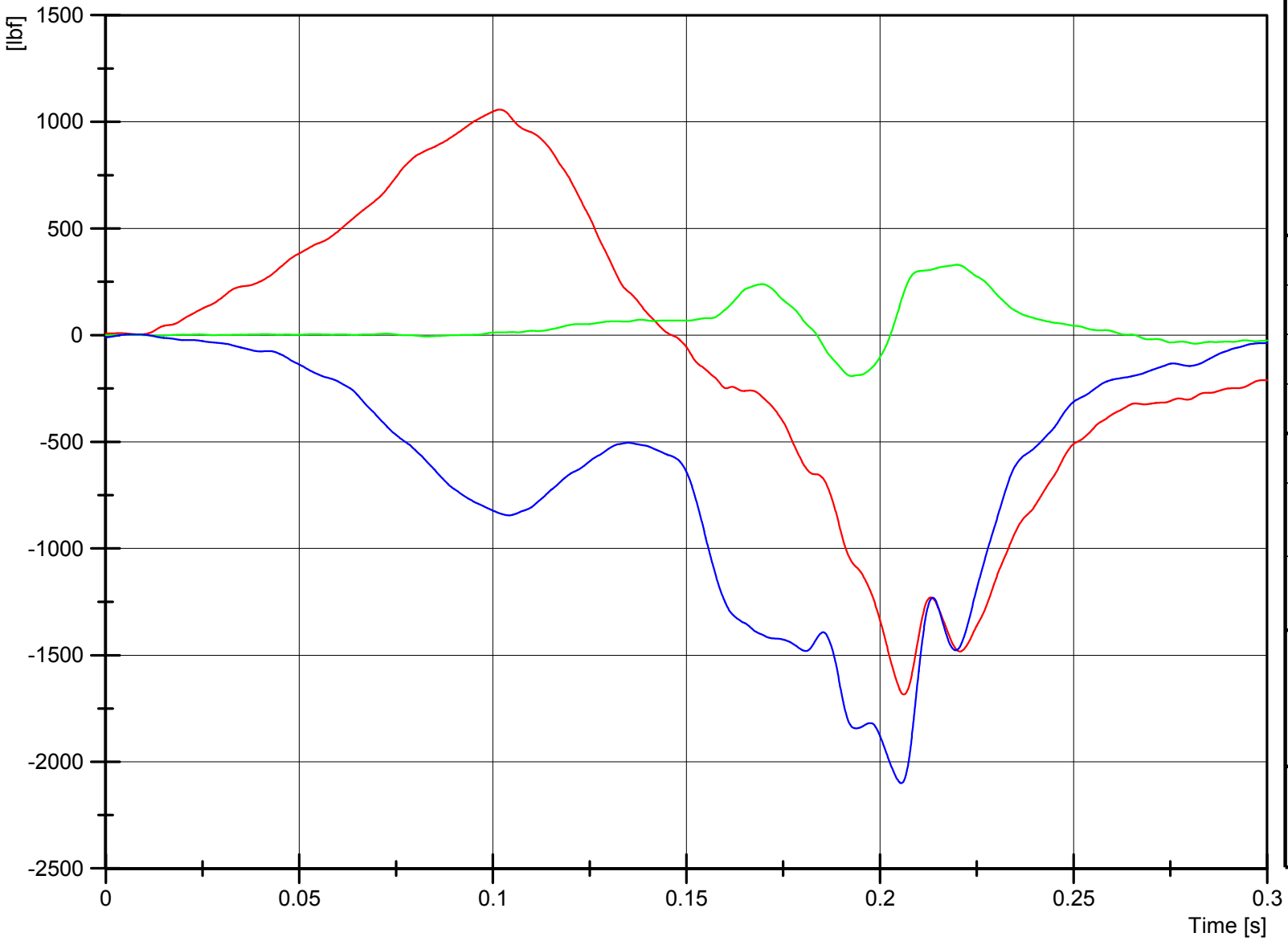
Maximum: 811.774 lbf Time: 0.1029 sec.
Minimum: -17.23 lbf Time: 0.1824 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC084FZ
Sensitivity: 1.176E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 12
Ref. No.: 15
Polarity: N

Rigid Seat Seat Back Fy

Maximum: 36.8242 lbf Time: 0.1973 sec.
Minimum: -30.52 lbf Time: 0.2499 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC084FY
Sensitivity: 2.733E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 11
Ref. No.: 14
Polarity: N

Rigid Seat Seat Back Fz

Maximum: 108.97 lbf Time: 0.2028 sec.
Minimum: -211.44 lbf Time: 0.1066 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC084FX
Sensitivity: 2.74E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 10
Ref. No.: 13
Polarity: R



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Report Date: 03/25/2014

Customer: FAA

Test: FA14B-01

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/21/2013 10:25

Comments:

Rigid Seat Seat Pan Fx

Maximum: 1056.68 lbf
Minimum: -1.69E+03 lbf
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083FX
Sensitivity: 2.768E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 13
Ref. No.: 10
Polarity: N

Time: 0.102 sec.
Time: 0.2064 sec.

Rigid Seat Seat Pan Fy

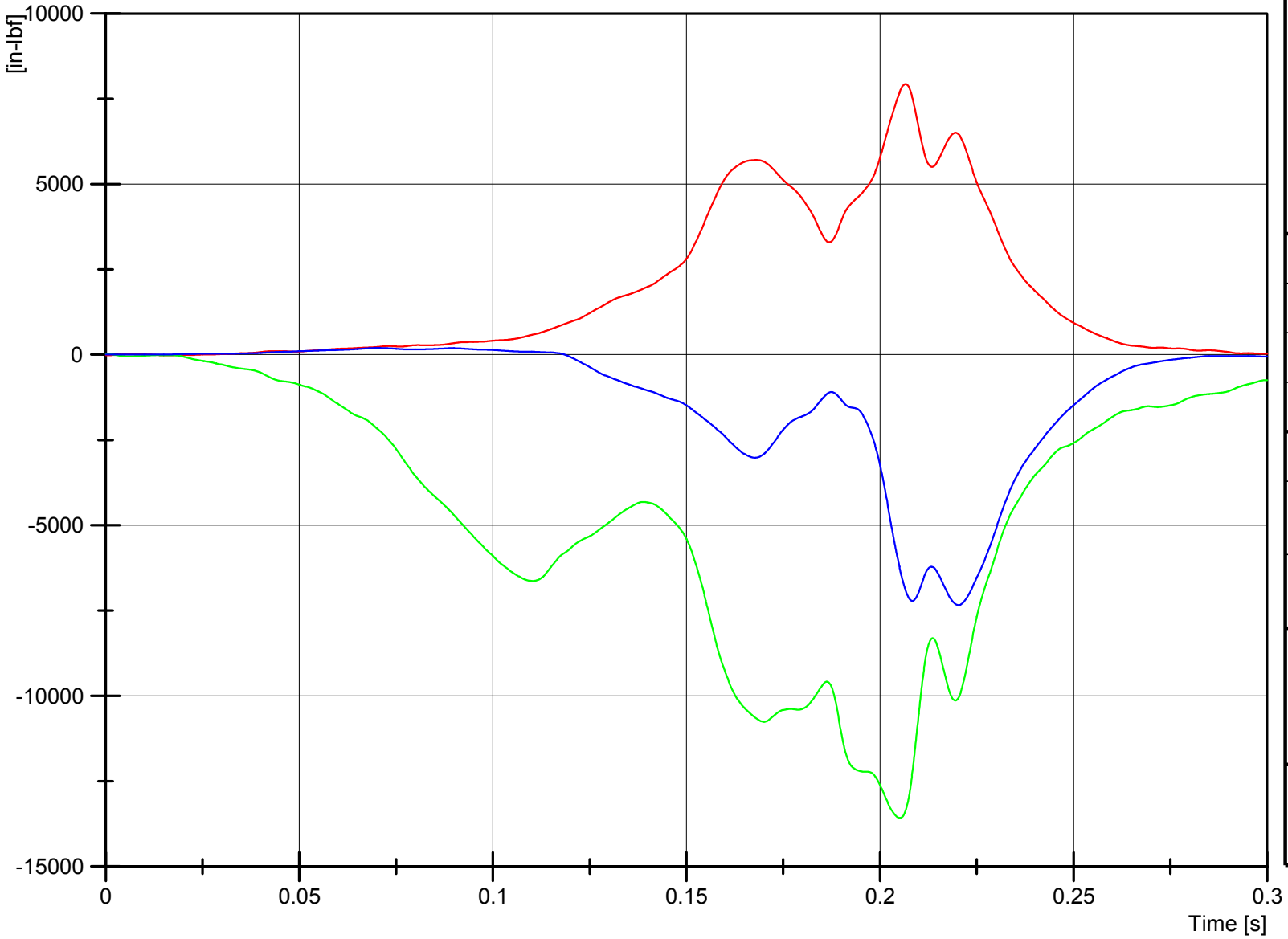
Maximum: 330.46 lbf
Minimum: -191.11 lbf
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083FY
Sensitivity: 2.764E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 14
Ref. No.: 11
Polarity: N

Time: 0.22 sec.
Time: 0.1928 sec.

Rigid Seat Seat Pan Fz

Maximum: 3.6547 lbf
Minimum: -2.10E+03 lbf
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083FZ
Sensitivity: 1.181E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 15
Ref. No.: 12
Polarity: N

Time: 0.0073 sec.
Time: 0.2057 sec.



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Doc. No.: CDL-FA14B-01-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-01

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/21/2013 10:25

Comments:

Rigid Seat Seat Pan Mx

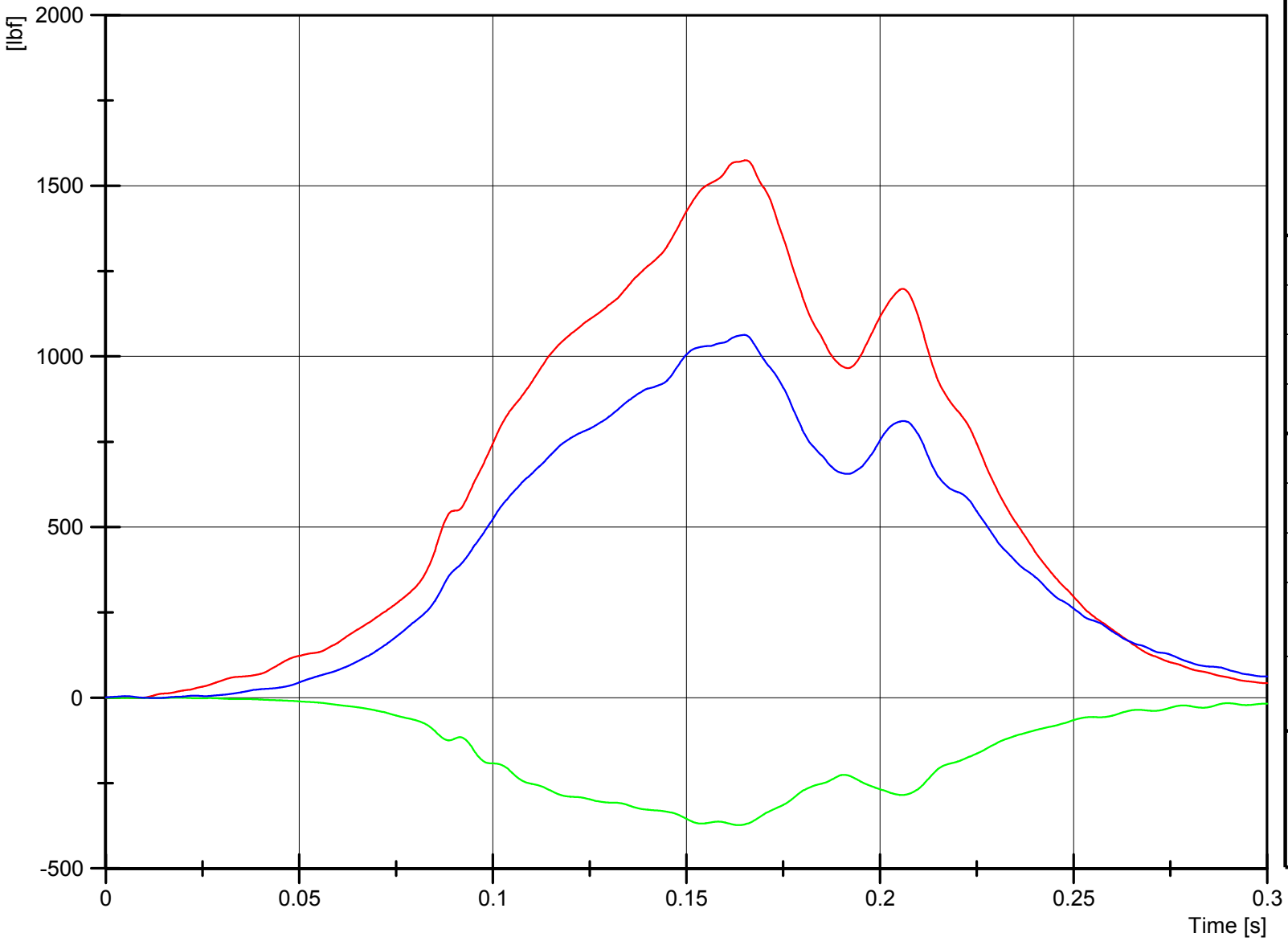
Maximum: 7937.10 in-lbf Time: 0.2068 sec.
Minimum: -21.35 in-lbf Time: 0 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083MX
Sensitivity: 7.03E-08 V/EU
Cal. Due: 02/13/2014
Full Scale: 25000 in-lbf
DAS Channel: 16
Ref. No.: 7
Polarity: N

Rigid Seat Seat Pan My

Maximum: 28.5616 in-lbf Time: 0 sec.
Minimum: -1.36E+04 in-lbf Time: 0.2053 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083MY
Sensitivity: 7.05E-08 V/EU
Cal. Due: 02/13/2014
Full Scale: 25000 in-lbf
DAS Channel: 17
Ref. No.: 8
Polarity: N

Rigid Seat Seat Pan Mz

Maximum: 199.885 in-lbf Time: 0.0704 sec.
Minimum: -7.34E+03 in-lbf Time: 0.2205 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083MZ
Sensitivity: 9.32E-08 V/EU
Cal. Due: 02/13/2014
Full Scale: 20000 in-lbf
DAS Channel: 18
Ref. No.: 9
Polarity: N



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Doc. No.: CDL-FA14B-01-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-01

Dummy: H2 718

Position: Config 1 - New Belt

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/21/2013 10:25

Rigid Seat Right Lap Fx

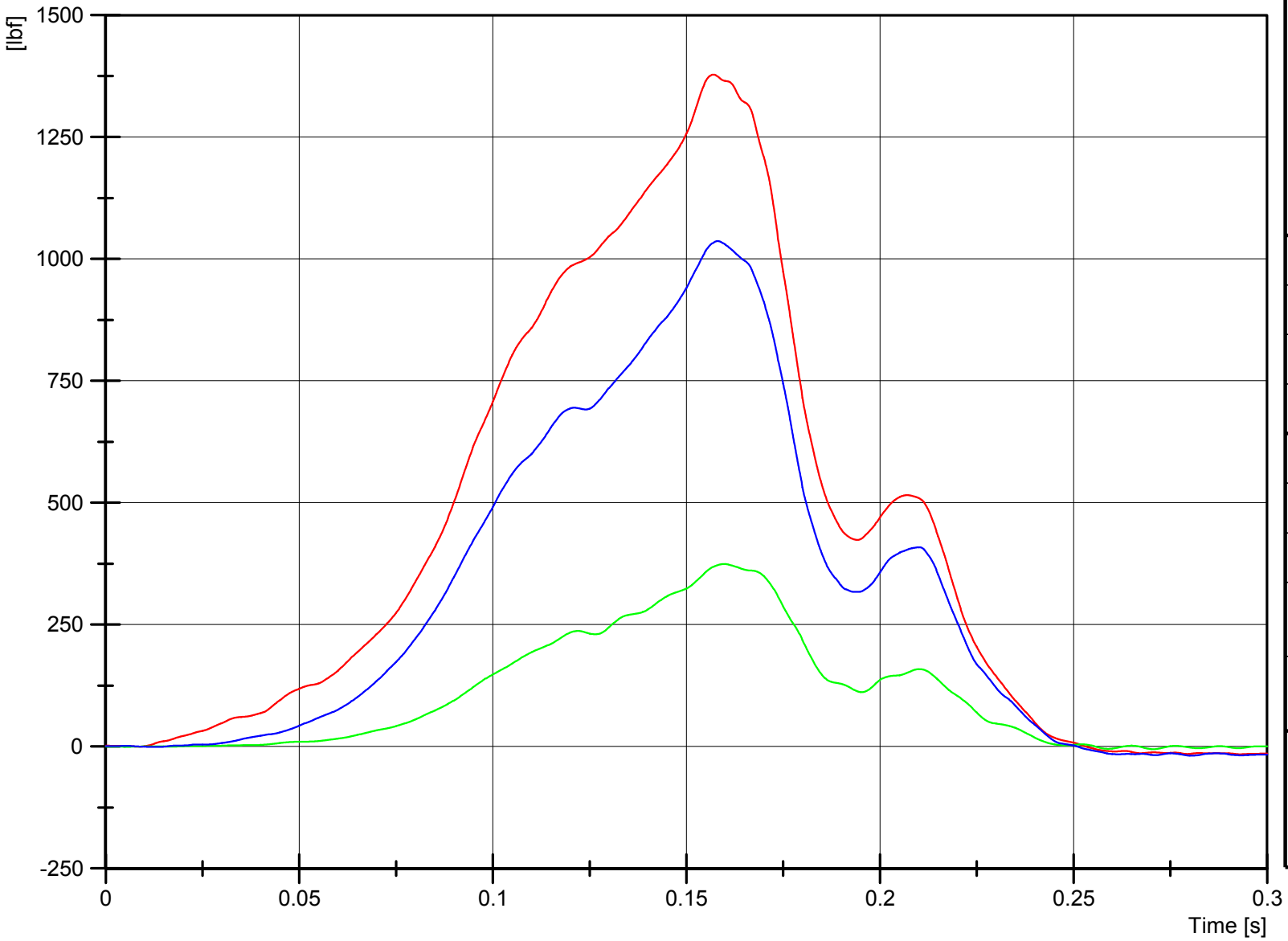
Maximum: 1574.84 lbf Time: 0.1655 sec.
Minimum: -0.6221 lbf Time: 0.0082 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC093FX
Sensitivity: 2.587E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 22
Ref. No.: 74
Polarity: N

Rigid Seat Right Lap Fy

Maximum: 0.5988 lbf Time: 0.0191 sec.
Minimum: -373.29 lbf Time: 0.1637 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC093FY
Sensitivity: 2.572E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 23
Ref. No.: 75
Polarity: N

Rigid Seat Right Lap Fz

Maximum: 1062.84 lbf Time: 0.1652 sec.
Minimum: -0.3418 lbf Time: 0.0137 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC093FZ
Sensitivity: 1.044E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 24
Ref. No.: 76
Polarity: N



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Doc. No.: CDL-FA14B-01-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-01

Dummy: H2 718

Position: Config 1 - New Belt

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/21/2013 10:25

Rigid Seat Left Lap Fx

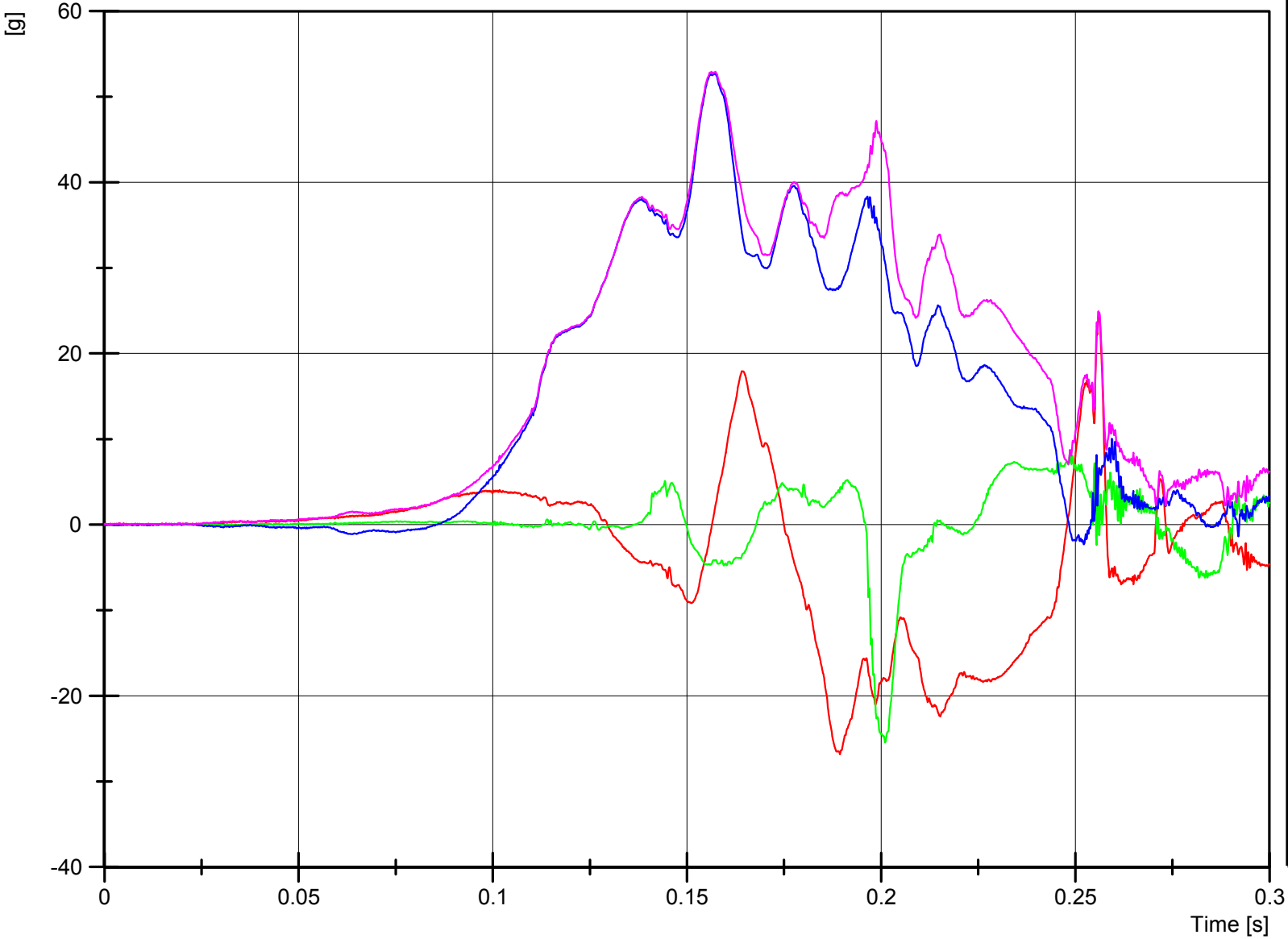
Maximum: 1378.28 lbf Time: 0.1571 sec.
Minimum: -15.57 lbf Time: 0.2932 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC094FX
Sensitivity: 2.587E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 19
Ref. No.: 77
Polarity: N

Rigid Seat Left Lap Fy

Maximum: 374.616 lbf Time: 0.1599 sec.
Minimum: -5.3382 lbf Time: 0.2708 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC094FY
Sensitivity: 2.572E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 20
Ref. No.: 78
Polarity: N

Rigid Seat Left Lap Fz

Maximum: 1036.79 lbf Time: 0.1583 sec.
Minimum: -18.40 lbf Time: 0.2806 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC094FZ
Sensitivity: 1.044E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 21
Ref. No.: 79
Polarity: N



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Doc. No.: CDL-FA14B-01-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-01

Dummy: H2 718

Position: Config 1 - New Belt

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/21/2013 10:25

Head Ax H2 718

Maximum: 24.3274 g Time: 0.2561 sec.
Minimum: -26.827 g Time: 0.1896 sec.
CFC: 1000
Sensor Type: Endevco 7264C
S/N: P47932
Sensitivity: 2.157E-05 V/EU
Cal. Due: 09/25/2014
Full Scale: 2000 g
DAS Channel: 25
Ref. No.: 22
Polarity: R

Head Ay H2 718

Maximum: 8.4244 g Time: 0.2488 sec.
Minimum: -25.43 g Time: 0.2012 sec.
CFC: 1000
Sensor Type: Endevco 7264C
S/N: P48149
Sensitivity: 2.603E-05 V/EU
Cal. Due: 09/25/2014
Full Scale: 2000 g
DAS Channel: 26
Ref. No.: 23
Polarity: R

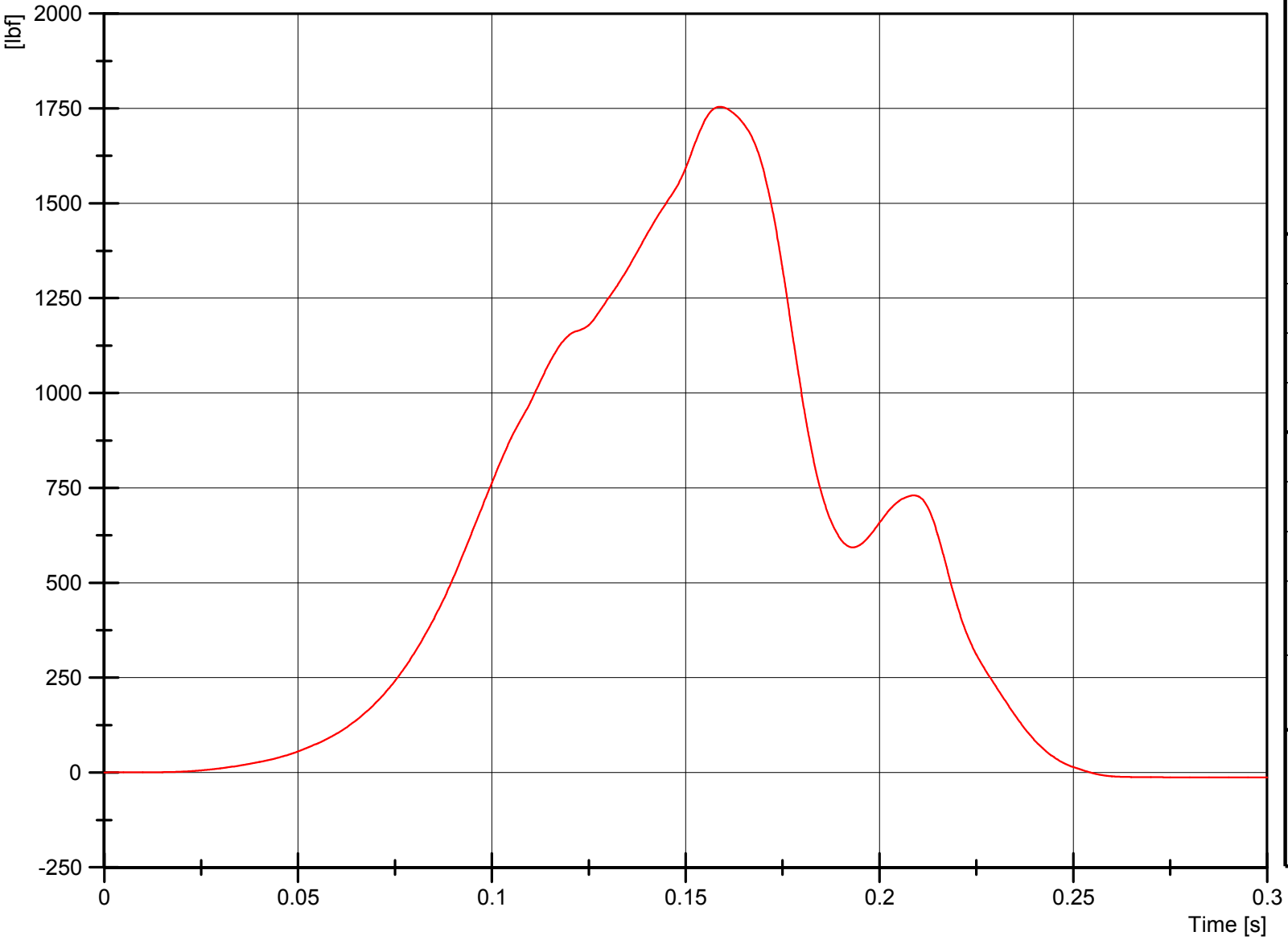
Head Az H2 718

Maximum: 52.7413 g Time: 0.1575 sec.
Minimum: -2.3105 g Time: 0.2524 sec.
CFC: 1000
Sensor Type: Endevco 7264C
S/N: P60367
Sensitivity: 1.782E-05 V/EU
Cal. Due: 09/25/2014
Full Scale: 2000 g
DAS Channel: 27
Ref. No.: 24
Polarity: R

Head Resultant H2 718

Maximum: 52.95 g Time: 0.1573 sec.

HIC: 808.9
T1: 114.3 msec.
T2: 238 msec.



Lap Belt Force H2 718

Maximum: 1754.73 lbf Time: 0.1591 sec.
Minimum: -12.608 lbf Time: 0.2812 sec.
CFC: 60
Sensor Type: Denton 3255
S/N: SBLC086
Sensitivity: 6.6006E-07 V/EU
Cal. Due: 05/16/2014
Full Scale: 3000 lbf
DAS Channel: 36
Ref. No.: 17
Polarity: N

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Doc. No.: CDL-FA14B-01-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-01

Dummy: H2 718

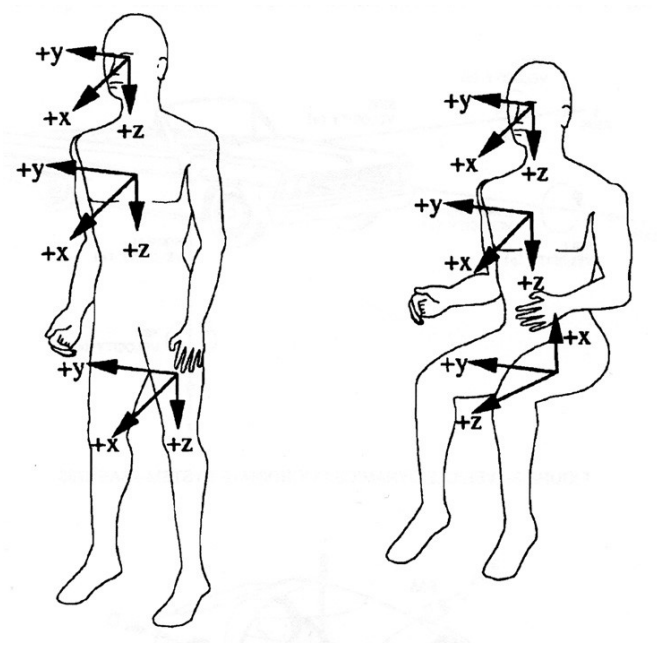
Position: Config 1 - New Belt

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/21/2013 10:25

J211/1 Sign Conventions



Upper Neck Load Cell:
+FX Head rearward, chest forward
+FY Head leftward, chest rightward
+FZ Head upward, chest downward
+MX Left ear toward left shoulder
+MY Chin toward sternum
+MZ Chin toward left shoulder

Lumbar Load Cell:
+FX Chest rearward, pelvis forward
+FY Chest leftward, pelvis rightward
+FZ Chest upward, pelvis downward
+MX Left shoulder toward left hip
+MY Sternum toward front of legs
+MZ Right shoulder forward, left shoulder rearward

Femur Load Cells:
+FZ Tension

Chest Displacement:
-DX Compression

Rib Dispacement:
-DY Compression

Belt Load Cells:
+FX Tension

Floor Load Cells:
+FX Test article forward
+FY Test article right
+FZ Test article up

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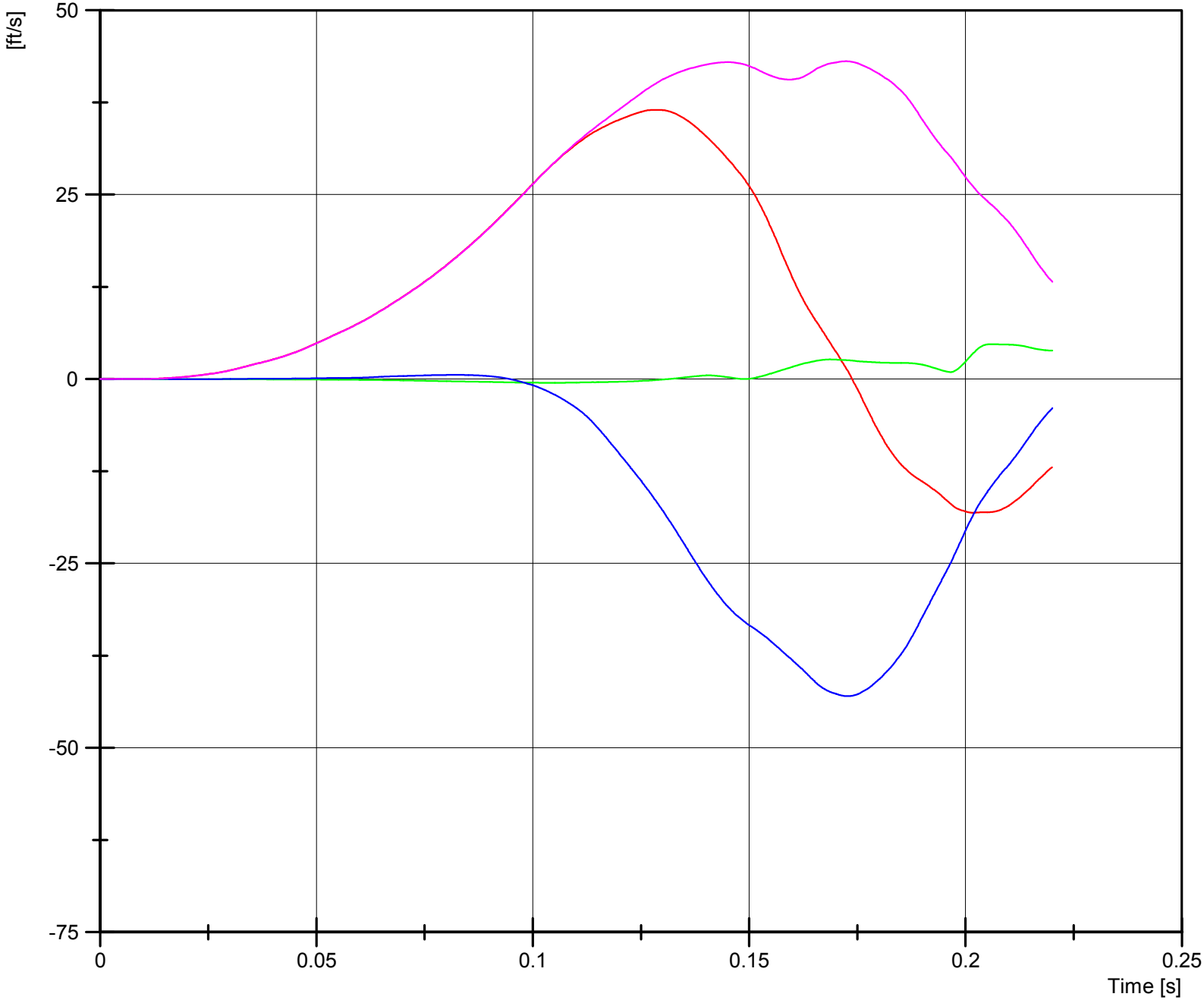

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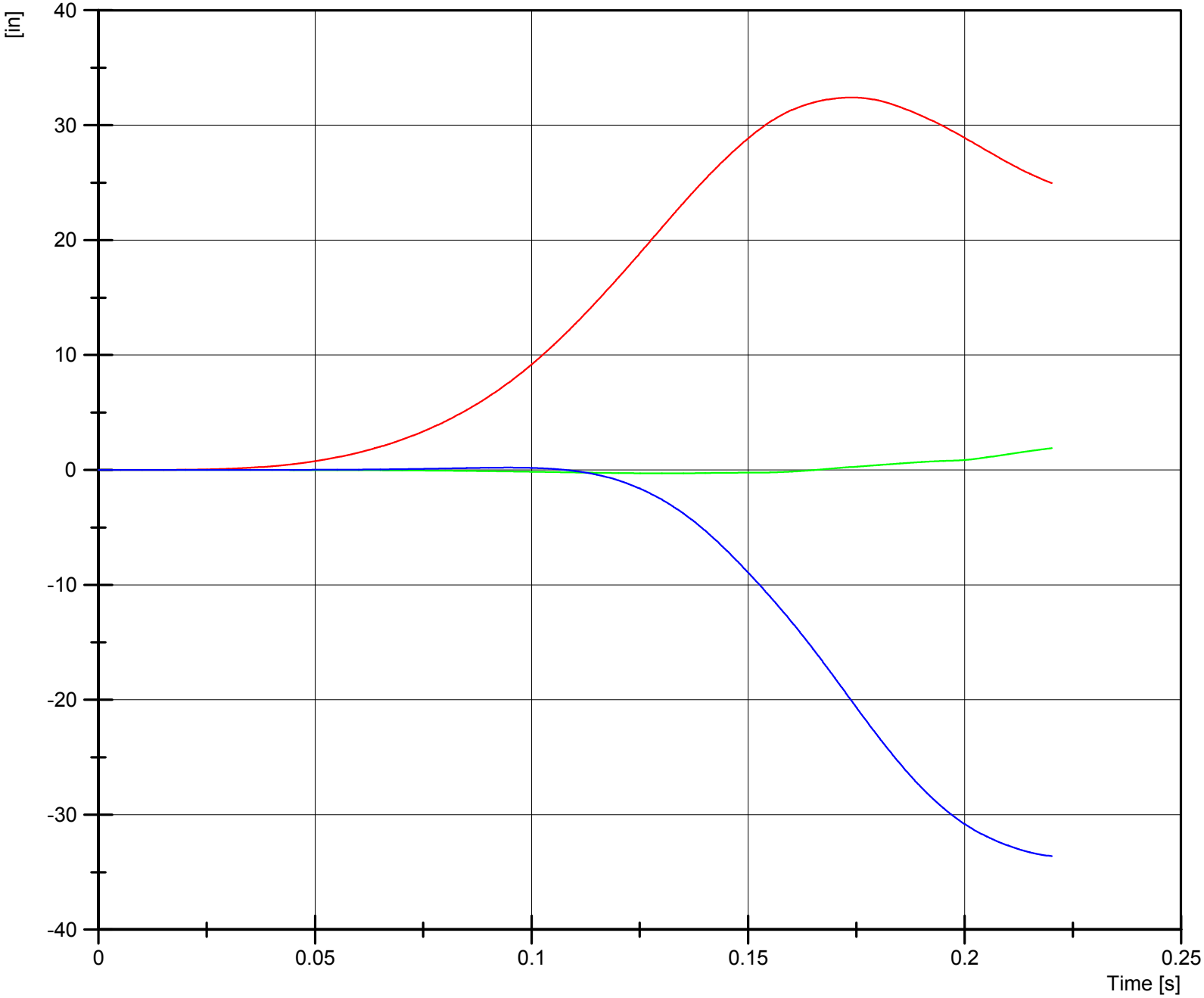
Comments:

Global Head Vx H2 718		Global Head Vy H2 718		Global Head Vz H2 718		Global Head Velocity Resultant H2 718	
Maximum: 36.51 ft/s	Time: 0.1291 sec.	Maximum: 4.73 ft/s	Time: 0.206 sec.	Maximum: 0.554 ft/s	Time: 0.0825 sec.	Maximum: 43.08 ft/s	Time: 0.1724 sec.
Minimum: -18.13 ft/s	Time: 0.2017 sec.	Minimum: -0.493 ft/s	Time: 0.1044 sec.	Minimum: -42.99 ft/s	Time: 0.1728 sec.	Minimum: 0 ft/s	Time: 0.0001 sec.



Global Head Dx H2 718 | Global Head Dy H2 718 | Global Head Dz H2 718

Maximum: 32.42 in	Time: 0.1739 sec.	Maximum: 1.89 in	Time: 0.2201 sec.	Maximum: 0.20 in	Time: 0.0947 sec.
Minimum: 0.00 in	Time: 0.0001 sec.	Minimum: -0.29 in	Time: 0.1313 sec.	Minimum: -33.60 in	Time: 0.2201 sec.

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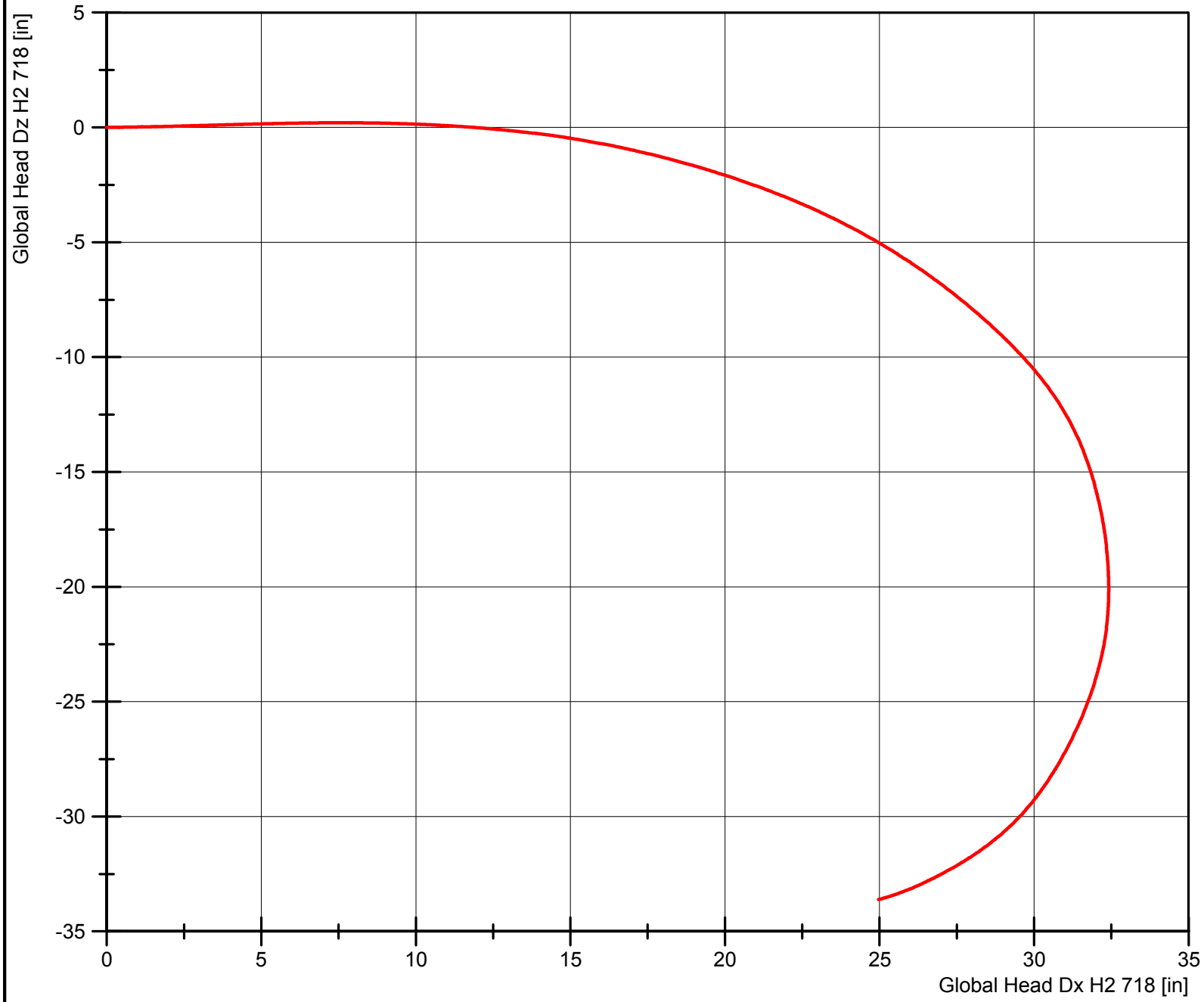
Test Date/Time: 11/21/2013 10:25

Comments:

Displacement values are calculated from Head Accelerations and Angular Velocities.
This method cannot be used to substitute photometric analysis.



Global Head Displacement XZ

X Maximum: 32.42 in **Time: 0.1739 sec.**

Z Value at X Maximum: -20.08 in

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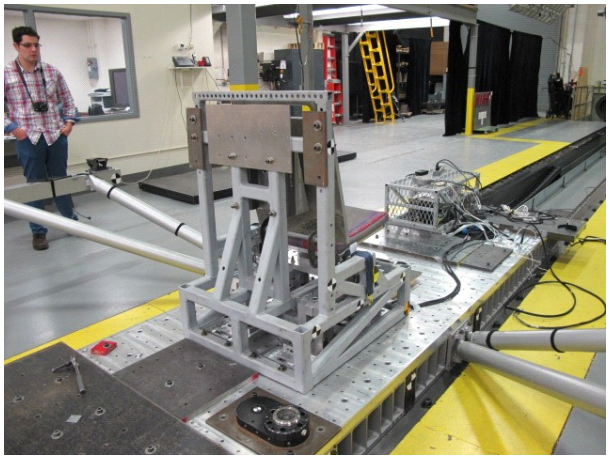

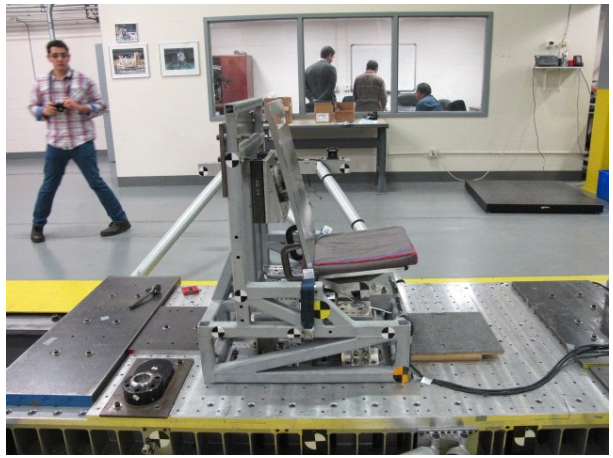

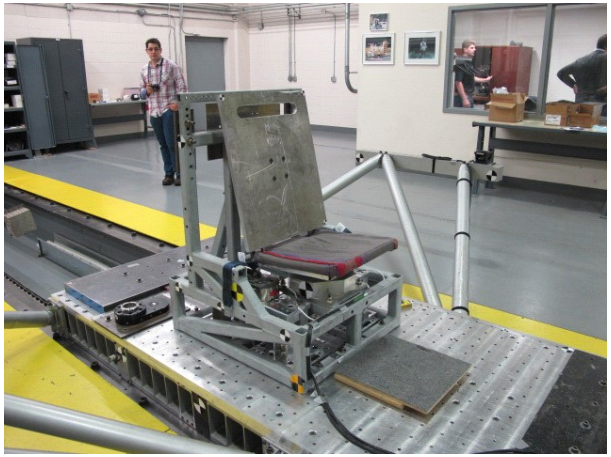

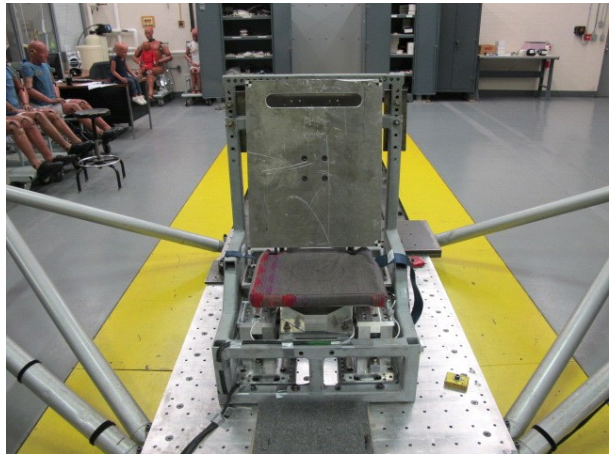

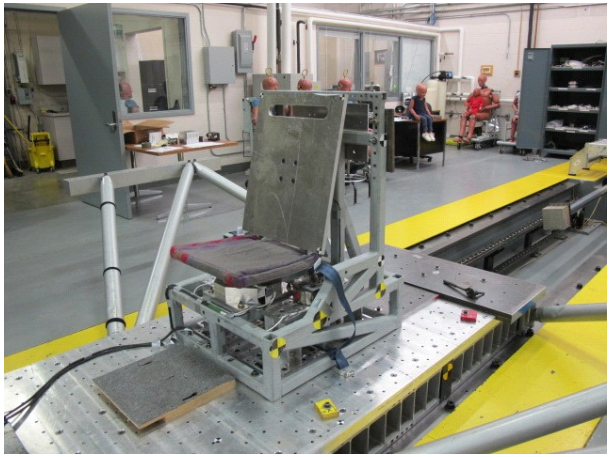

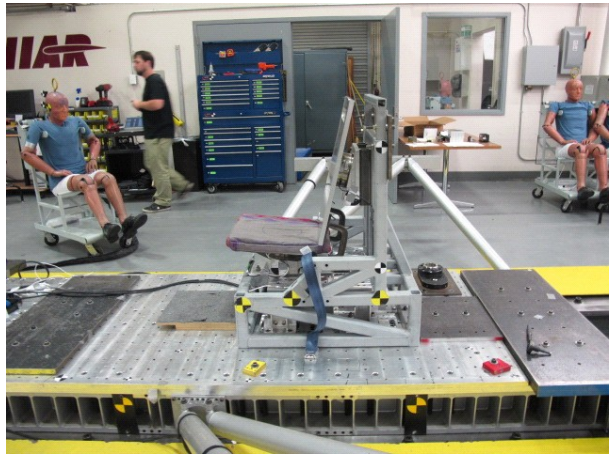

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Pretrigger Samples: 40960
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Comments:

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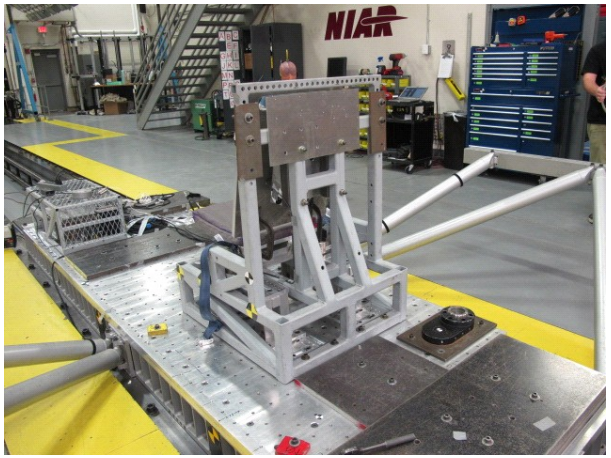

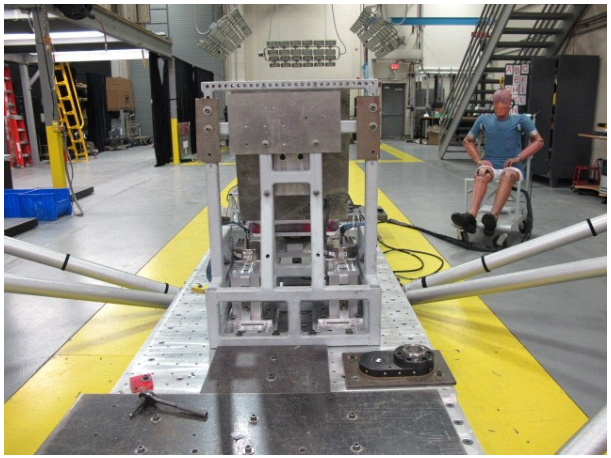

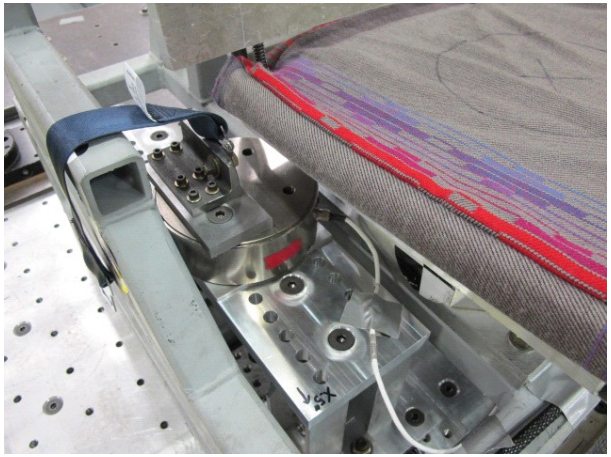

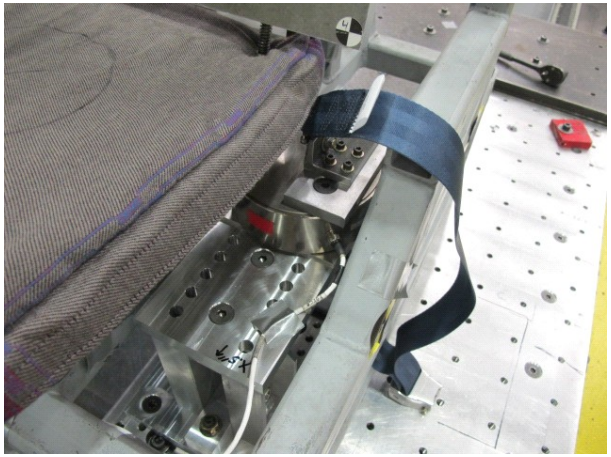

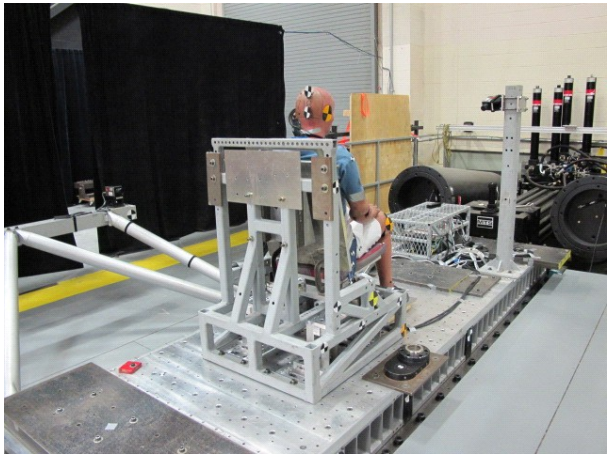

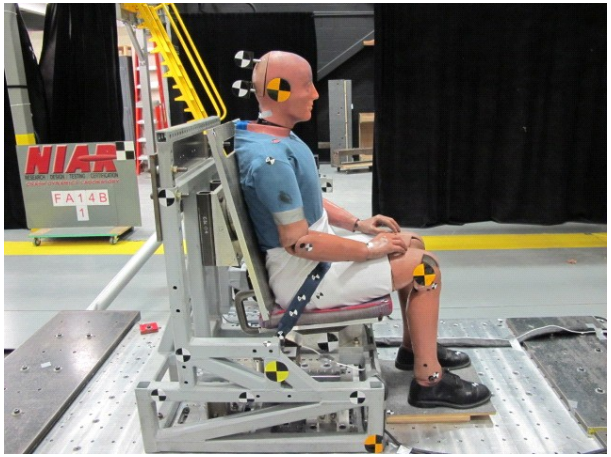

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Version: New

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Customer: FAA

Test: FA14B-01

Dummy: N/A

Position: N/A

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
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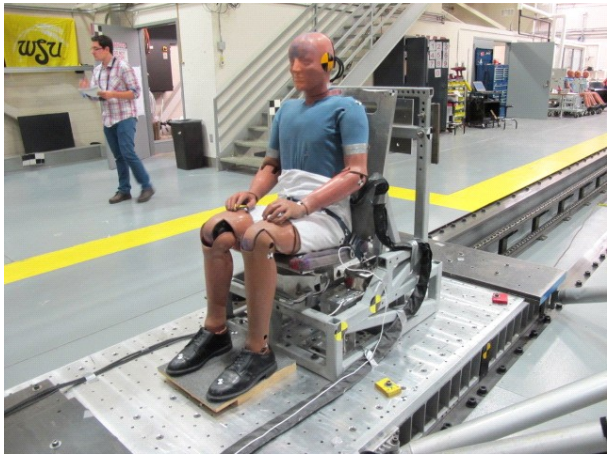
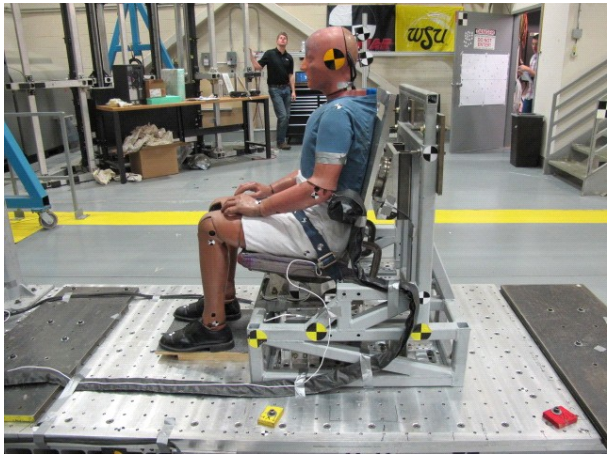
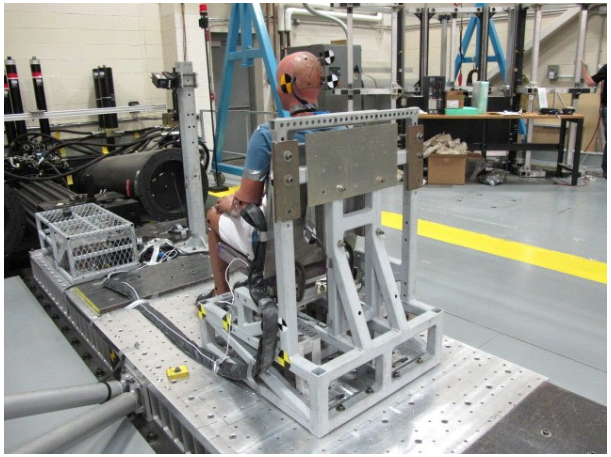
Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/21/2013 10:25

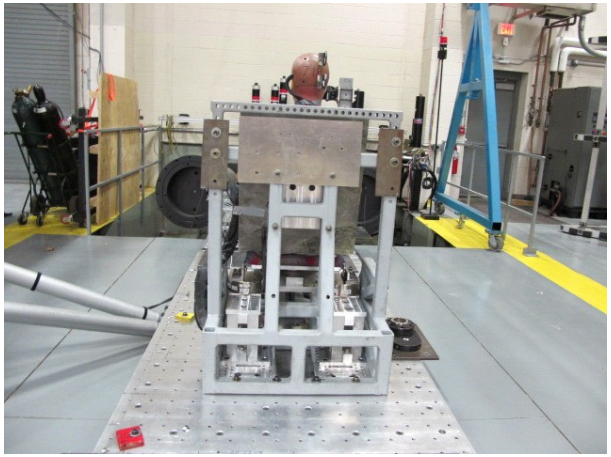
Comments:

Pre-test Photos









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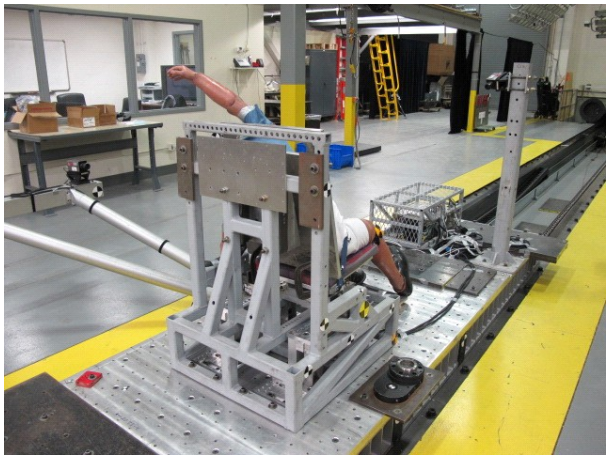

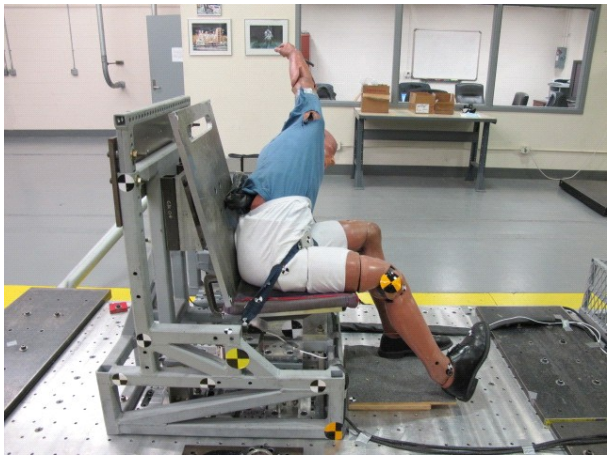

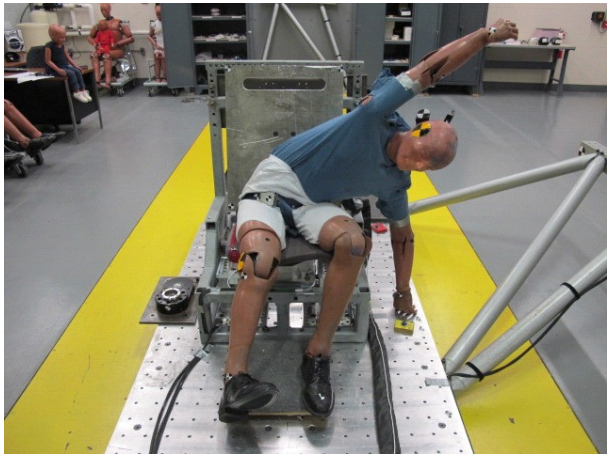

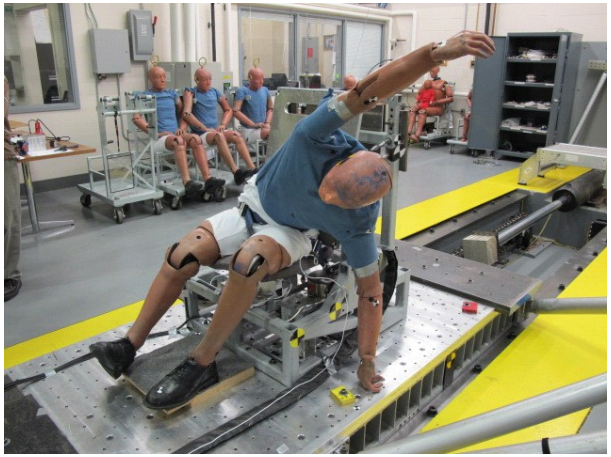

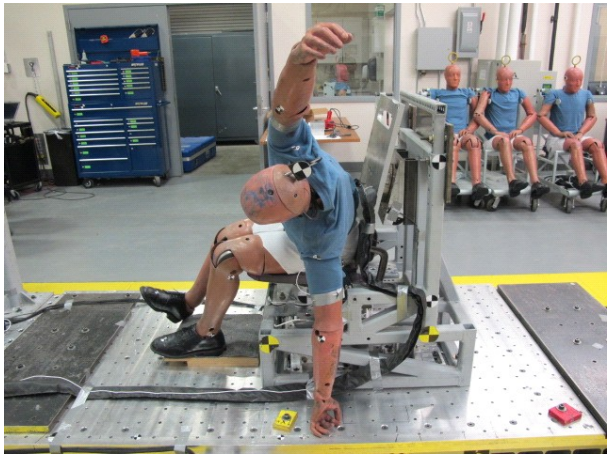

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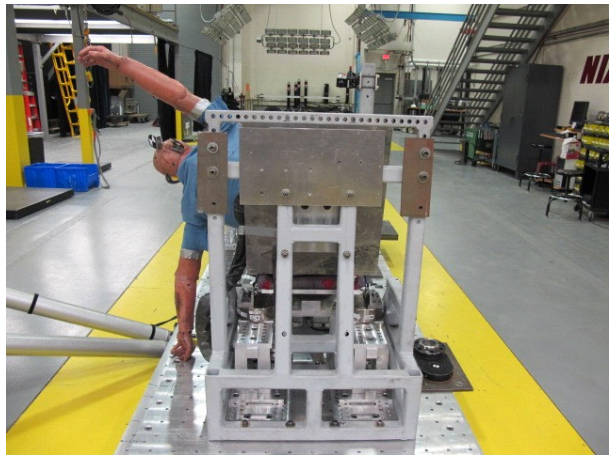

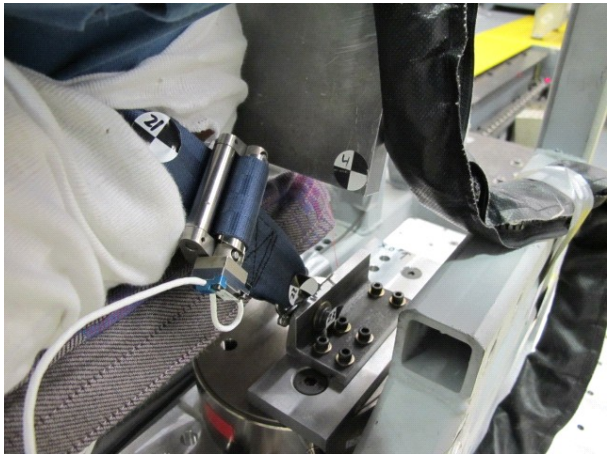

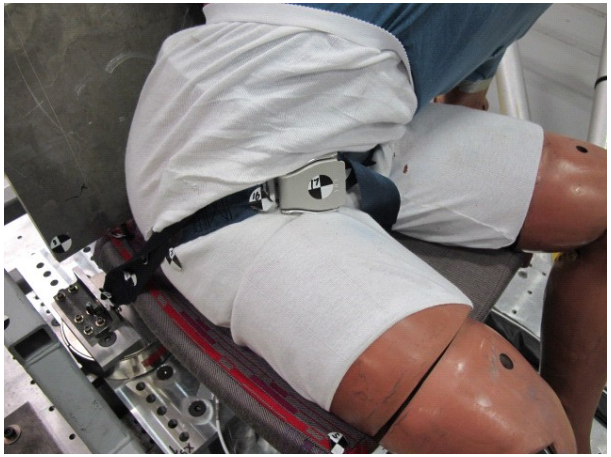

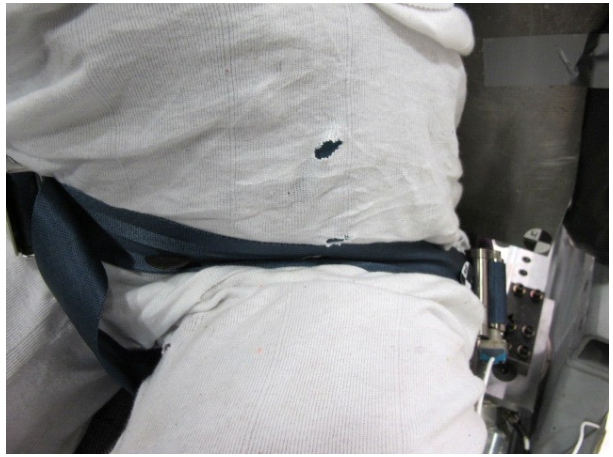

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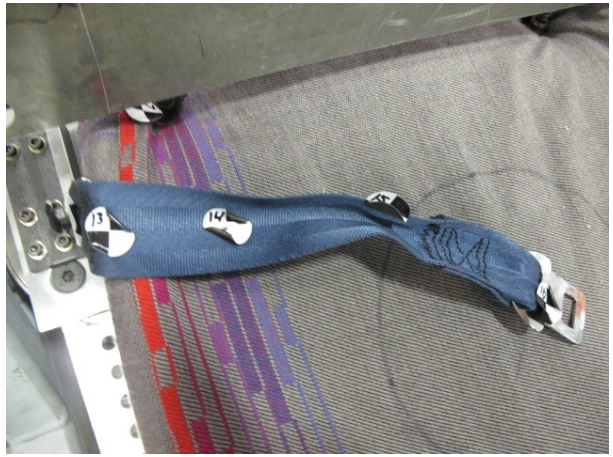

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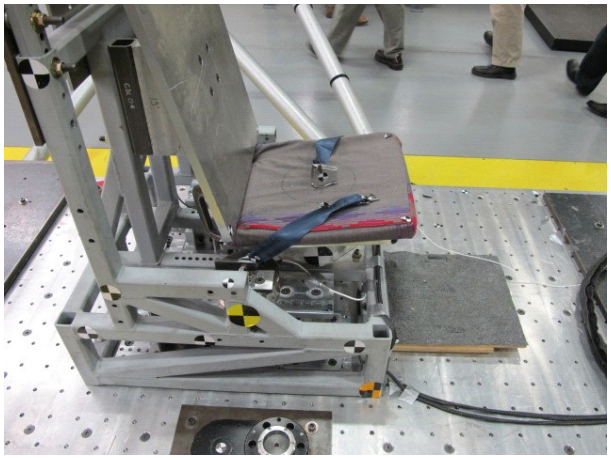

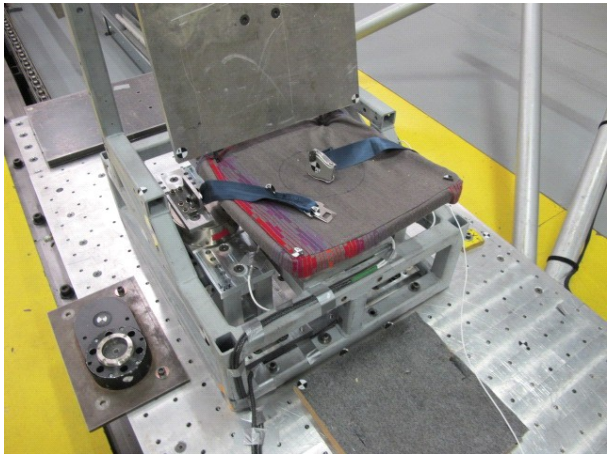

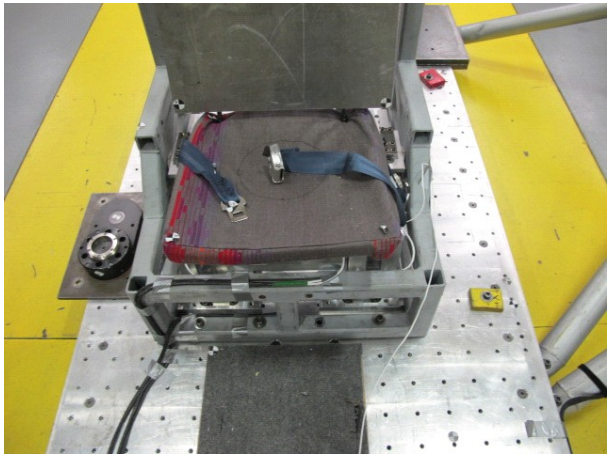

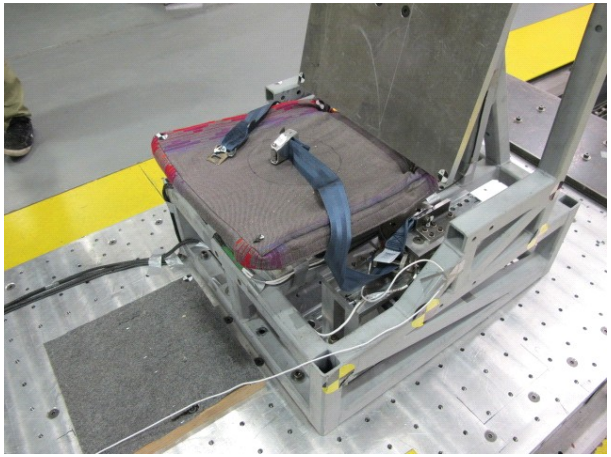

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CRASH DYNAMICS LABORATORY

Report No. CDL-FA14B-02-01

Requested by:

FAA

Final Test Report
FA14B-02

03/25/2014

Revision	Change	Date	Revised By
New		03/25/2014	Rob Huculak

Prepared and Reviewed by:

Rob Huculak
Laboratory Manager

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This test report is in accordance with ISO/IEC 17025:2005 requirements and all equipment standards used are traceable to the National Institute of Standards and Technology.
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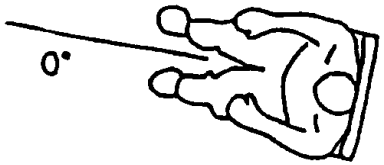
Test Summary

The dynamic test (FA14B-02) was performed for FAA in accordance with 14 CFR 25.562 Test 2 on 03/25/2014.

Pulse Parameters	Required	Result	Pass/Fail
Minimum Peak Acceleration (g)	16	16.17	PASS
Minimum Velocity Change (ft/sec)	44	45.43	PASS
Maximum Rise Time (msec)	90	88.8	PASS
Minimum Velocity Change During Rise Time (ft/sec)	22	22.9	PASS
2g Offset	--	--	PASS

Test Orientation



ATD: H2 718 **Position: Config 1 - Repaired Belt**

Measured Seat Belt Angle	Measured Seat Belt Offset
56.25 deg	1.50 in

0 deg

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Doc. No.: CDL-FA14B-02-01

Version: New

Report Date: 03/25/2014

Customer: FAA

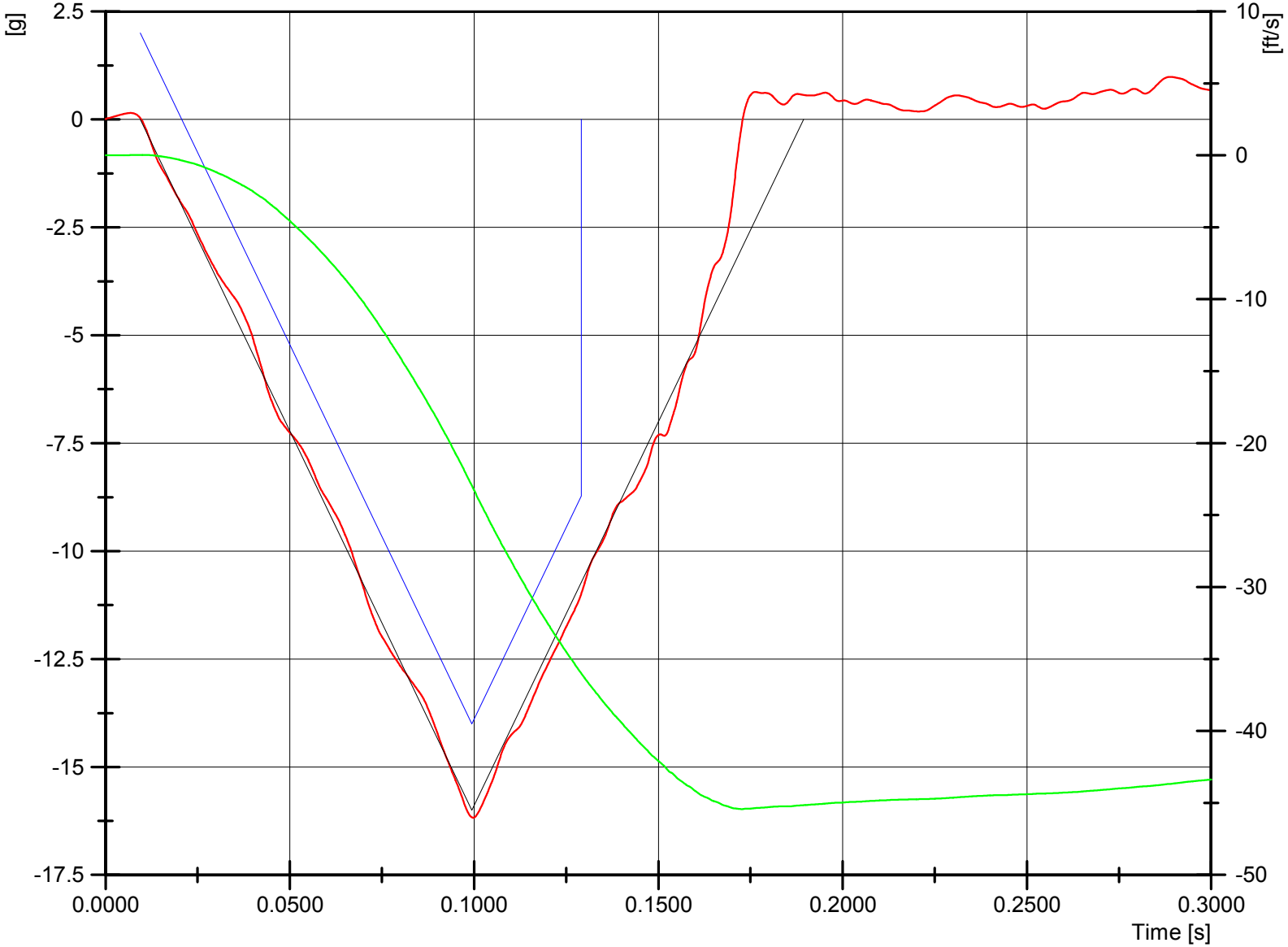
Test: FA14B-02

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/21/2013 12:57

Temperature	Relative Humidity
74.1°F	31.6%



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Rate: 10000
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Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/21/2013 12:57

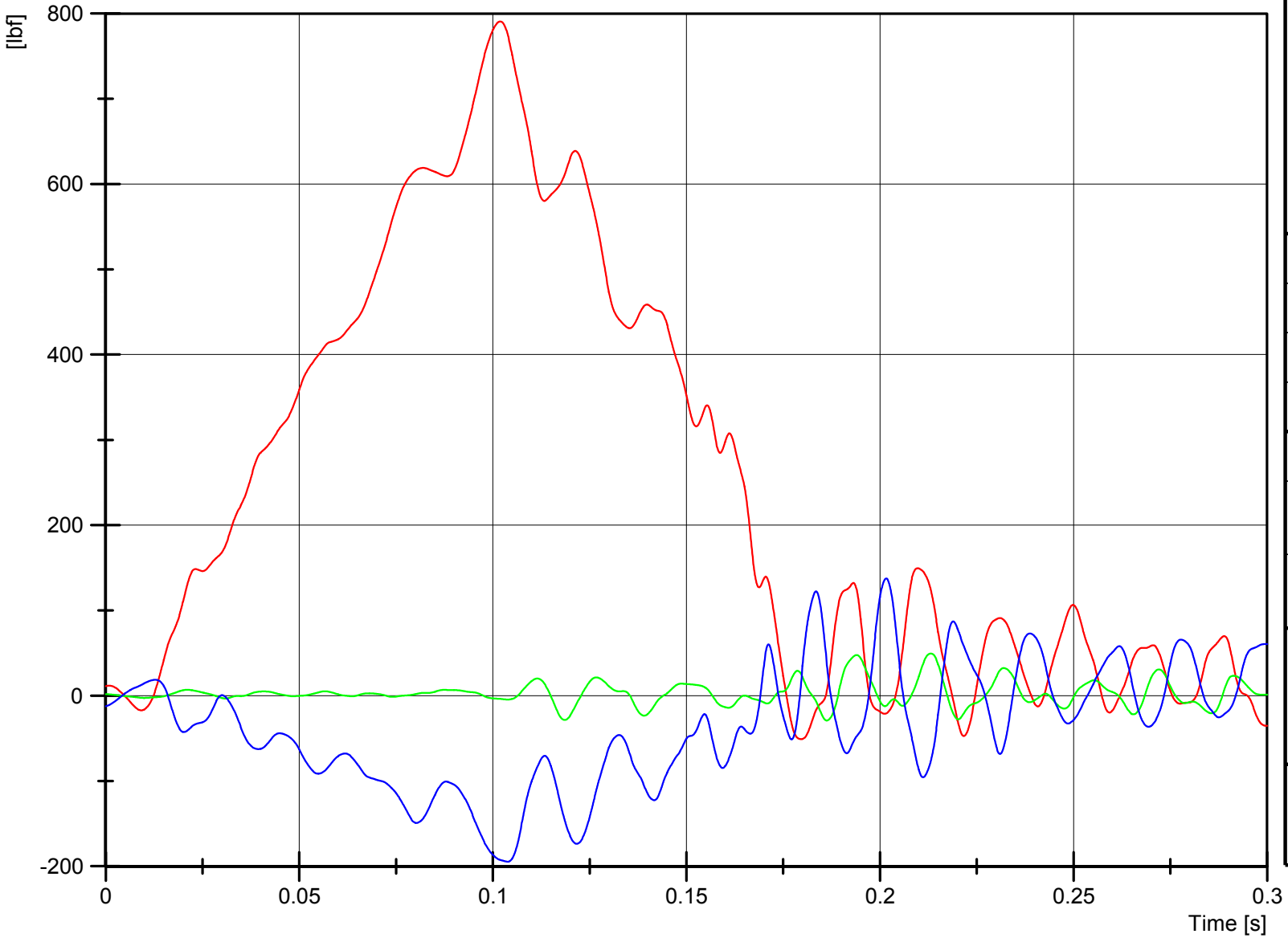
Comments:

Sled Acceleration | Sled Velocity | Ideal Pulse | Upper Limit

Maximum: 0.985 g Time: 0.2889 sec.
Minimum: -16.17 g Time: 0.0997 sec.
CFC: 60
Sensor Type: ENDEVCO 7290A-100
S/N: 29924
Sensitivity: 0.01919 V/EU
Cal. Due: 06/11/2014
Full Scale: 100 g
DAS Channel: 50
Ref. No.: 1
Polarity: R

Minimum: -45.43 ft/s Time: 0.1727 sec.

Pulse Requirement		Actual
Minimum Required Peak Acceleration:	16 g	16.17 g
Minimum Overall Velocity Change:	44 ft/s	45.43 ft/s
Maximum Rise Time:	90 msec	88.8 msec
Minimum Velocity Change Before Greq:	22 ft/s	22.9 ft/s



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Version: New

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Test: FA14B-02

Test Description:
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Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/21/2013 12:57

Comments:

Rigid Seat Seat Back Fx

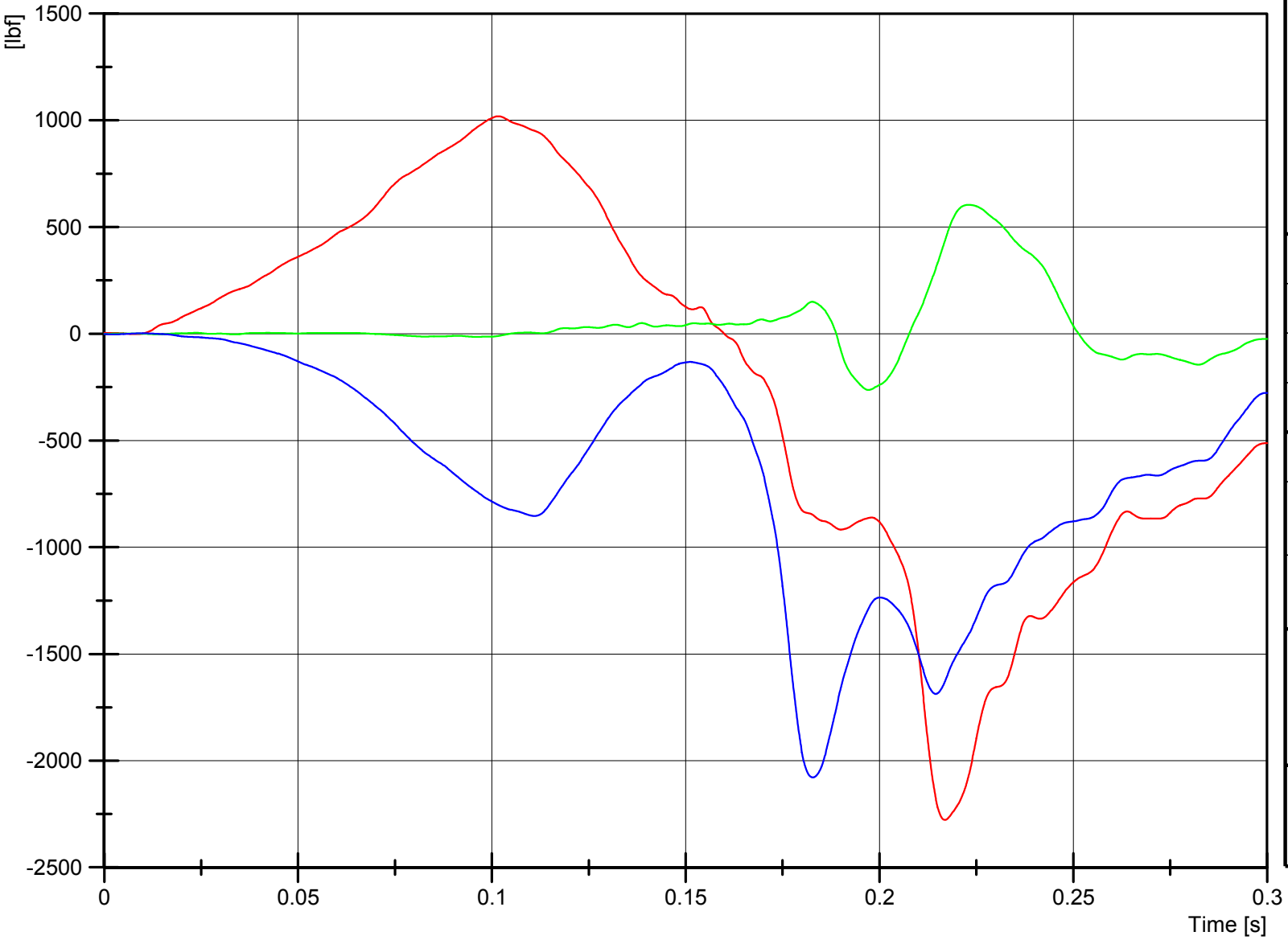
Maximum: 790.593 lbf Time: 0.1021 sec.
Minimum: -50.77 lbf Time: 0.1798 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC084FZ
Sensitivity: 1.176E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 12
Ref. No.: 15
Polarity: N

Rigid Seat Seat Back Fy

Maximum: 49.7369 lbf Time: 0.2133 sec.
Minimum: -28.91 lbf Time: 0.1865 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC084FY
Sensitivity: 2.733E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 11
Ref. No.: 14
Polarity: N

Rigid Seat Seat Back Fz

Maximum: 137.47 lbf Time: 0.2018 sec.
Minimum: -194.54 lbf Time: 0.104 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC084FX
Sensitivity: 2.74E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 10
Ref. No.: 13
Polarity: R



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Test Description:
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Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/21/2013 12:57

Comments:

Rigid Seat Seat Pan Fx

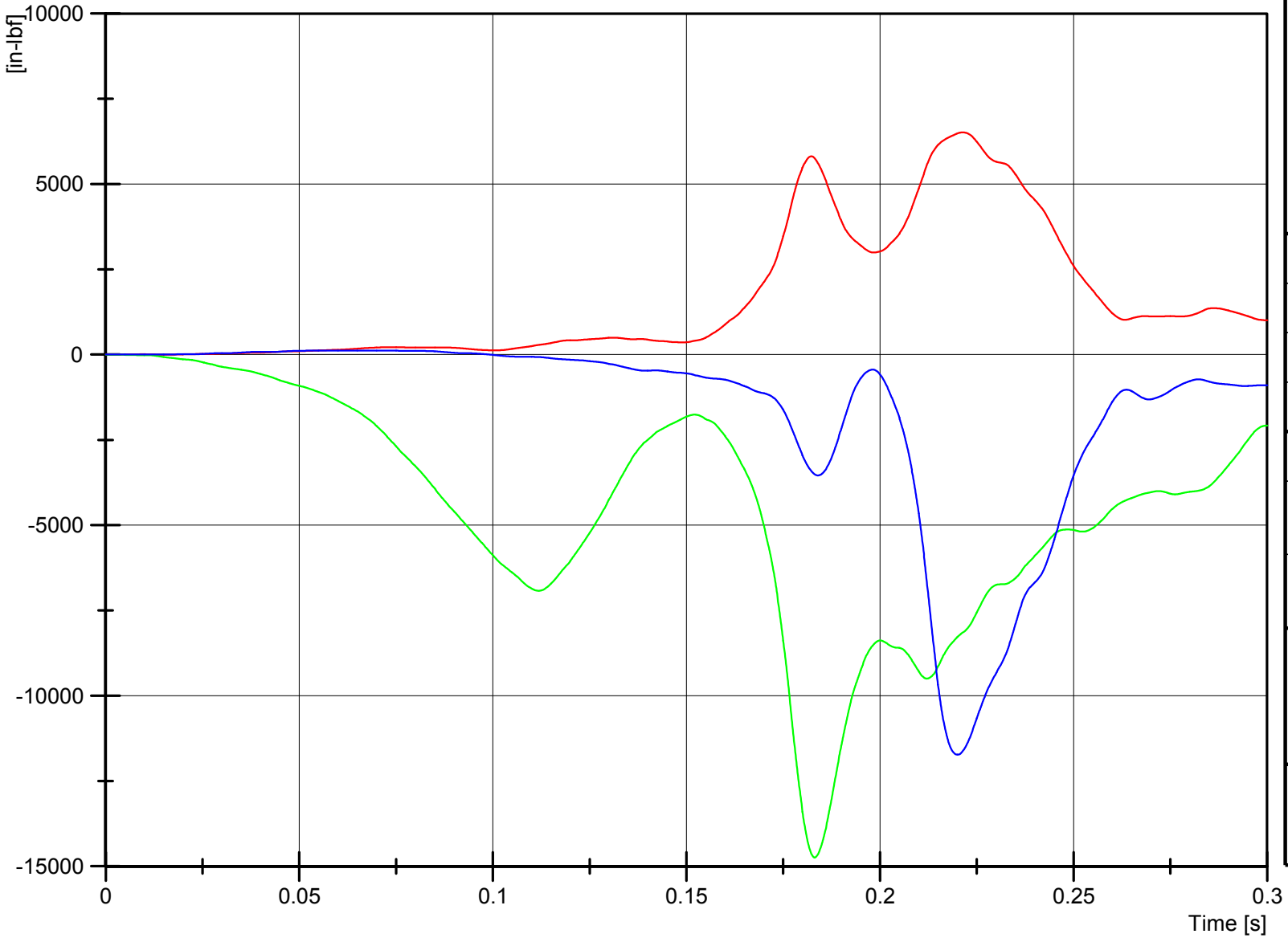
Maximum: 1019.24 lbf Time: 0.1019 sec.
Minimum: -2.28E+03 lbf Time: 0.2171 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083FX
Sensitivity: 2.768E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 13
Ref. No.: 10
Polarity: N

Rigid Seat Seat Pan Fy

Maximum: 604.16 lbf Time: 0.2232 sec.
Minimum: -263.70 lbf Time: 0.1974 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083FY
Sensitivity: 2.764E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 14
Ref. No.: 11
Polarity: N

Rigid Seat Seat Pan Fz

Maximum: 1.8063 lbf Time: 0.01 sec.
Minimum: -2.08E+03 lbf Time: 0.183 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083FZ
Sensitivity: 1.181E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 15
Ref. No.: 12
Polarity: N



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Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-02

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/21/2013 12:57

Comments:

Rigid Seat Seat Pan Mx

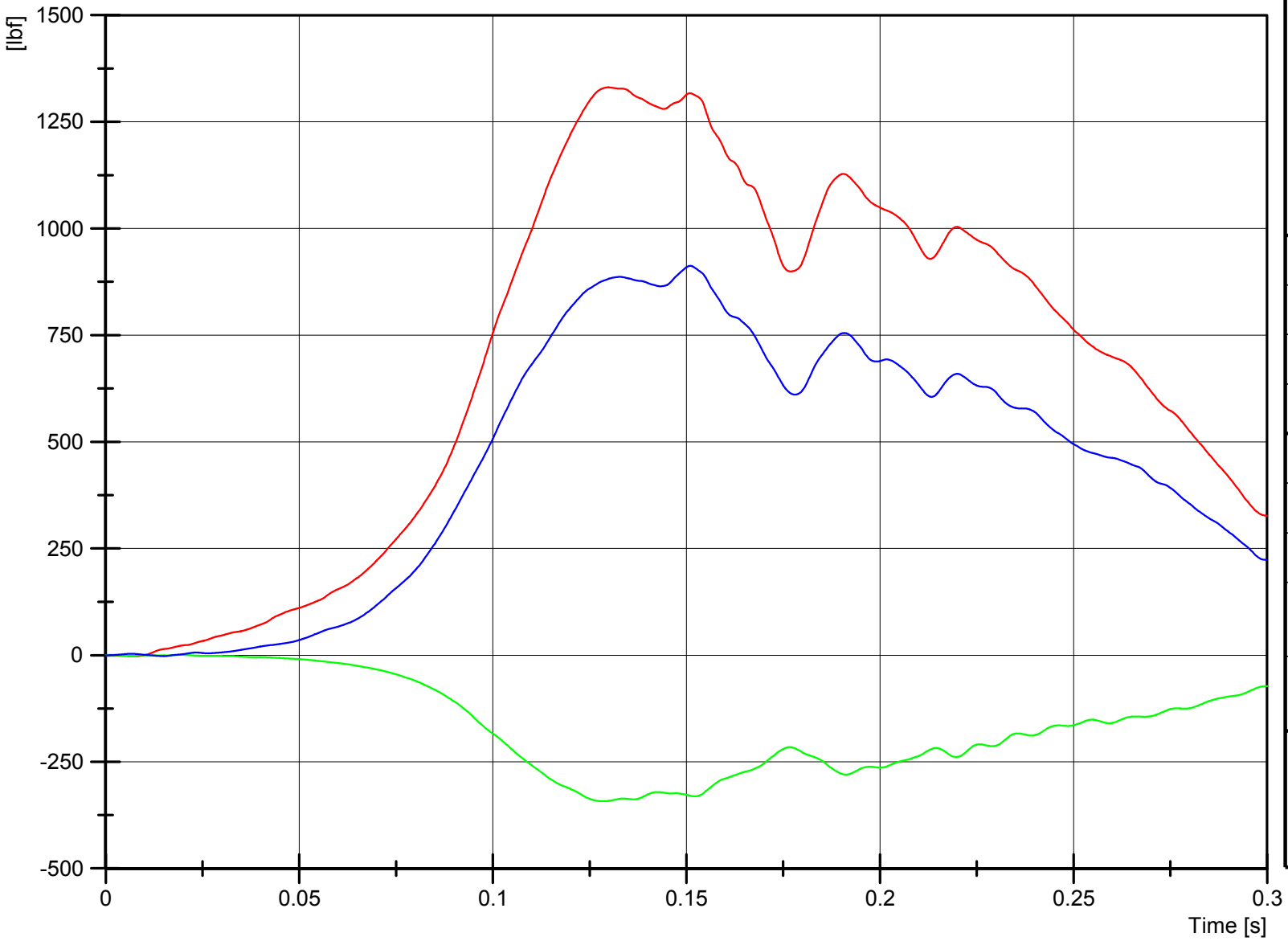
Maximum: 6514.02 in-lbf Time: 0.2216 sec.
Minimum: -5.4619 in-lbf Time: 0.0155 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083MX
Sensitivity: 7.03E-08 V/EU
Cal. Due: 02/13/2014
Full Scale: 25000 in-lbf
DAS Channel: 16
Ref. No.: 7
Polarity: N

Rigid Seat Seat Pan My

Maximum: -0.965 in-lbf Time: 0.0024 sec.
Minimum: -1.47E+04 in-lbf Time: 0.1833 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083MY
Sensitivity: 7.05E-08 V/EU
Cal. Due: 02/13/2014
Full Scale: 25000 in-lbf
DAS Channel: 17
Ref. No.: 8
Polarity: N

Rigid Seat Seat Pan Mz

Maximum: 123.44 in-lbf Time: 0.0641 sec.
Minimum: -1.17E+04 in-lbf Time: 0.2202 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083MZ
Sensitivity: 9.32E-08 V/EU
Cal. Due: 02/13/2014
Full Scale: 20000 in-lbf
DAS Channel: 18
Ref. No.: 9
Polarity: N



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Doc. No.: CDL-FA14B-02-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-02

Dummy: H2 718

Position: Config 1 - Repaired Belt

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/21/2013 12:57

Rigid Seat Right Lap Fx

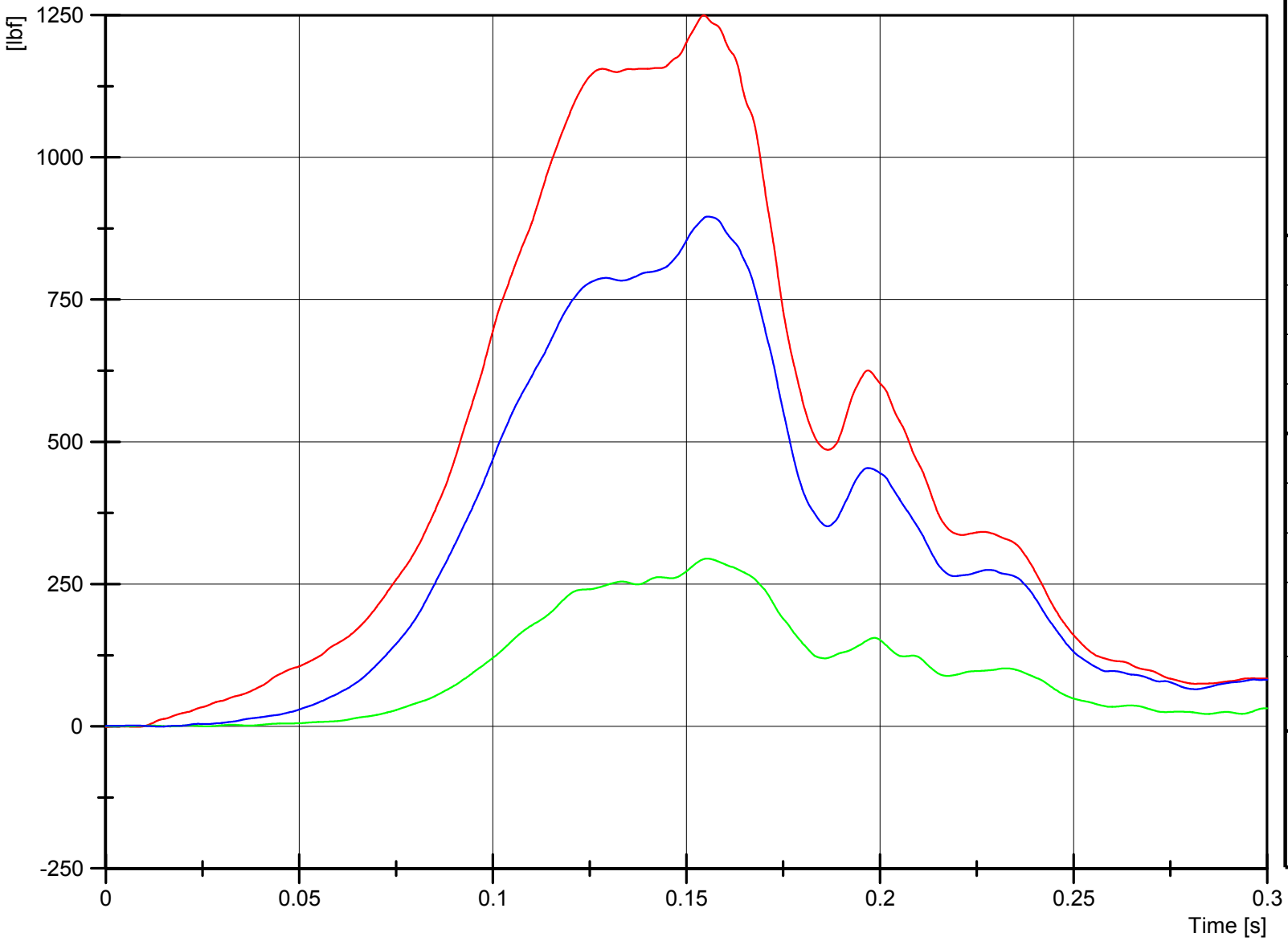
Maximum: 1330.38 lbf Time: 0.13 sec.
Minimum: -1.9887 lbf Time: 0.0077 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC093FX
Sensitivity: 2.587E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 22
Ref. No.: 74
Polarity: N

Rigid Seat Right Lap Fy

Maximum: 0.8606 lbf Time: 0.0198 sec.
Minimum: -341.99 lbf Time: 0.1288 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC093FY
Sensitivity: 2.572E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 23
Ref. No.: 75
Polarity: N

Rigid Seat Right Lap Fz

Maximum: 912.15 lbf Time: 0.1512 sec.
Minimum: -1.9287 lbf Time: 0.0151 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC093FZ
Sensitivity: 1.044E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 24
Ref. No.: 76
Polarity: N



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Doc. No.: CDL-FA14B-02-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-02

Dummy: H2 718

Position: Config 1 - Repaired Belt

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/21/2013 12:57

Rigid Seat Left Lap Fx

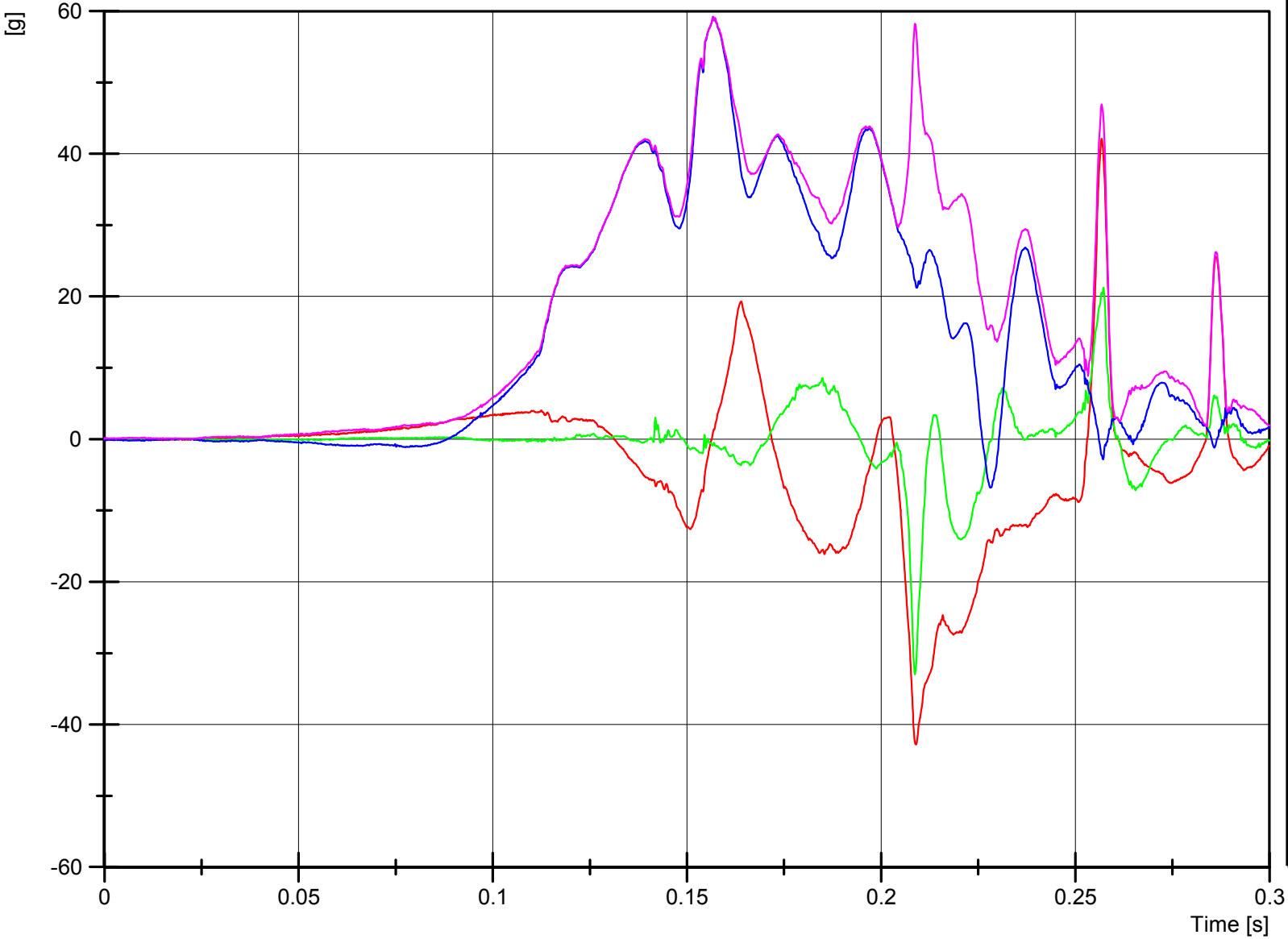
Maximum: 1249.99 lbf Time: 0.1547 sec.
Minimum: -1.6176 lbf Time: 0 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC094FX
Sensitivity: 2.587E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 19
Ref. No.: 77
Polarity: N

Rigid Seat Left Lap Fy

Maximum: 294.67 lbf Time: 0.1556 sec.
Minimum: -0.3722 lbf Time: 0.0169 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC094FY
Sensitivity: 2.572E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 20
Ref. No.: 78
Polarity: N

Rigid Seat Left Lap Fz

Maximum: 895.98 lbf Time: 0.1557 sec.
Minimum: -0.615 lbf Time: 0.0144 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC094FZ
Sensitivity: 1.044E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 21
Ref. No.: 79
Polarity: N



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Doc. No.: CDL-FA14B-02-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-02

Dummy: H2 718

Position: Config 1 - Repaired Belt

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/21/2013 12:57

Head Ax H2 718

Maximum: 42.1291 g Time: 0.257 sec.
Minimum: -42.85 g Time: 0.2092 sec.
CFC: 1000
Sensor Type: Endevco 7264C
S/N: P47932
Sensitivity: 2.157E-05 V/EU
Cal. Due: 09/25/2014
Full Scale: 2000 g
DAS Channel: 25
Ref. No.: 22
Polarity: R

Head Ay H2 718

Maximum: 21.2508 g Time: 0.2574 sec.
Minimum: -32.97 g Time: 0.2089 sec.
CFC: 1000
Sensor Type: Endevco 7264C
S/N: P48149
Sensitivity: 2.603E-05 V/EU
Cal. Due: 09/25/2014
Full Scale: 2000 g
DAS Channel: 26
Ref. No.: 23
Polarity: R

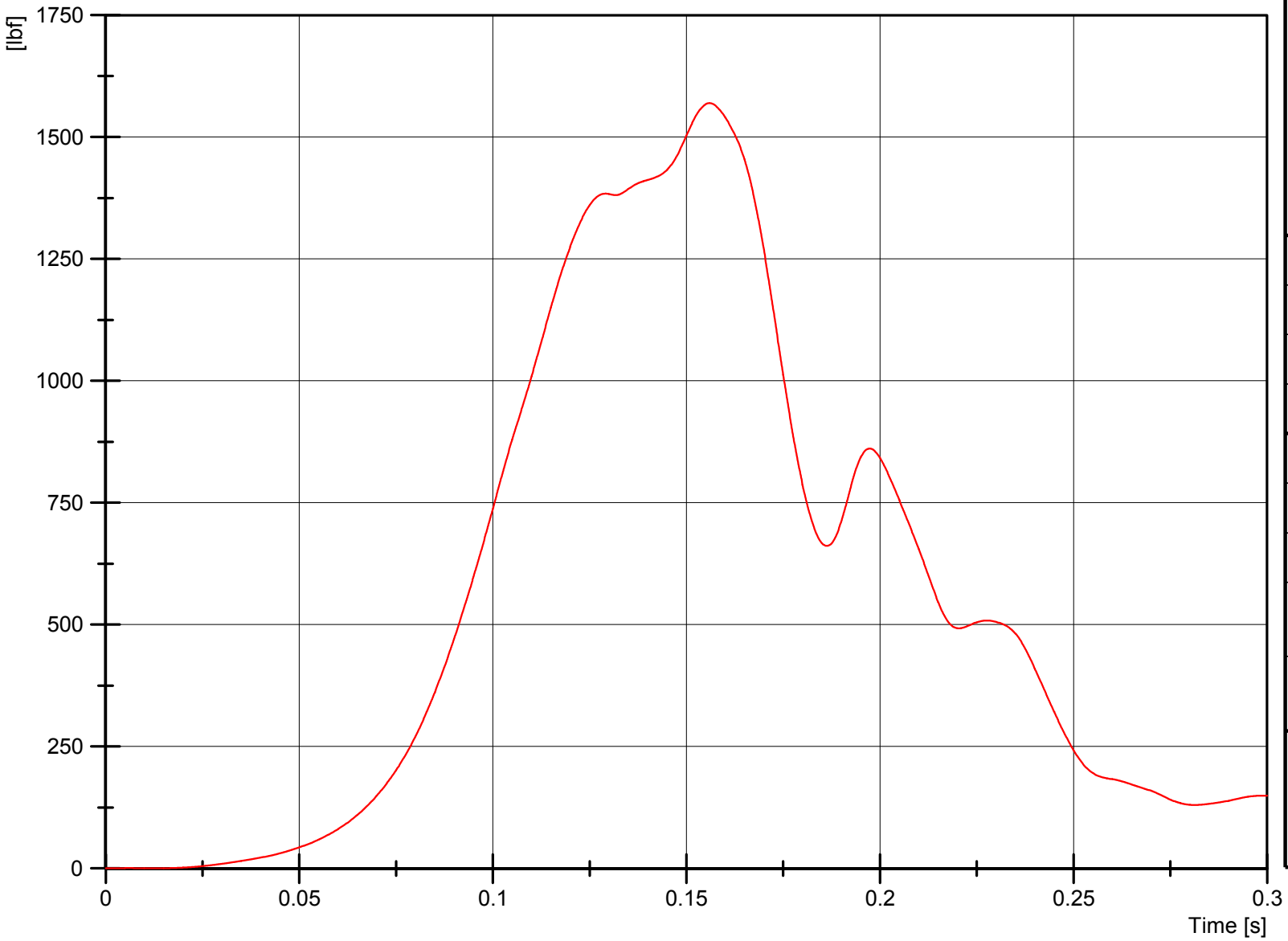
Head Az H2 718

Maximum: 59.1918 g Time: 0.1569 sec.
Minimum: -6.8329 g Time: 0.2283 sec.
CFC: 1000
Sensor Type: Endevco 7264C
S/N: P60367
Sensitivity: 1.782E-05 V/EU
Cal. Due: 09/25/2014
Full Scale: 2000 g
DAS Channel: 27
Ref. No.: 24
Polarity: R

Head Resultant H2 718

Maximum: 59.20 g Time: 0.1567 sec.

HIC: 945.2
T1: 116.9 msec.
T2: 224.8 msec.



Lap Belt Force H2 718

Maximum: 1569.62 lbf Time: 0.1561 sec.
Minimum: 0.5475 lbf Time: 0.0131 sec.
CFC: 60
Sensor Type: Denton 3255
S/N: SBLC086
Sensitivity: 6.6006E-07 V/EU
Cal. Due: 05/16/2014
Full Scale: 3000 lbf
DAS Channel: 36
Ref. No.: 17
Polarity: N

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Dummy: H2 718

Position: Config 1 - Repaired Belt

Test Description:
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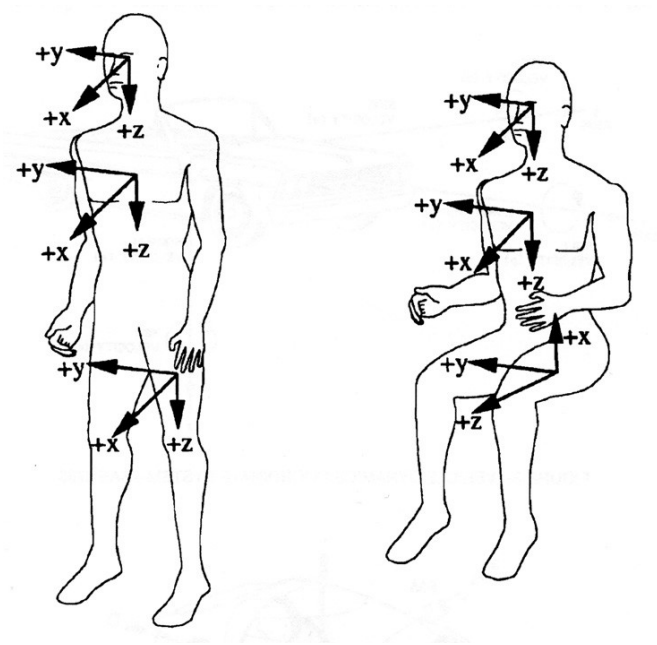
J211/1 Sign Conventions



Upper Neck Load Cell:
+FX Head rearward, chest forward
+FY Head leftward, chest rightward
+FZ Head upward, chest downward
+MX Left ear toward left shoulder
+MY Chin toward sternum
+MZ Chin toward left shoulder

Lumbar Load Cell:
+FX Chest rearward, pelvis forward
+FY Chest leftward, pelvis rightward
+FZ Chest upward, pelvis downward
+MX Left shoulder toward left hip
+MY Sternum toward front of legs
+MZ Right shoulder forward, left shoulder rearward

Femur Load Cells:
+FZ Tension

Chest Displacement:
-DX Compression

Rib Dispacement:
-DY Compression

Belt Load Cells:
+FX Tension

Floor Load Cells:
+FX Test article forward
+FY Test article right
+FZ Test article up

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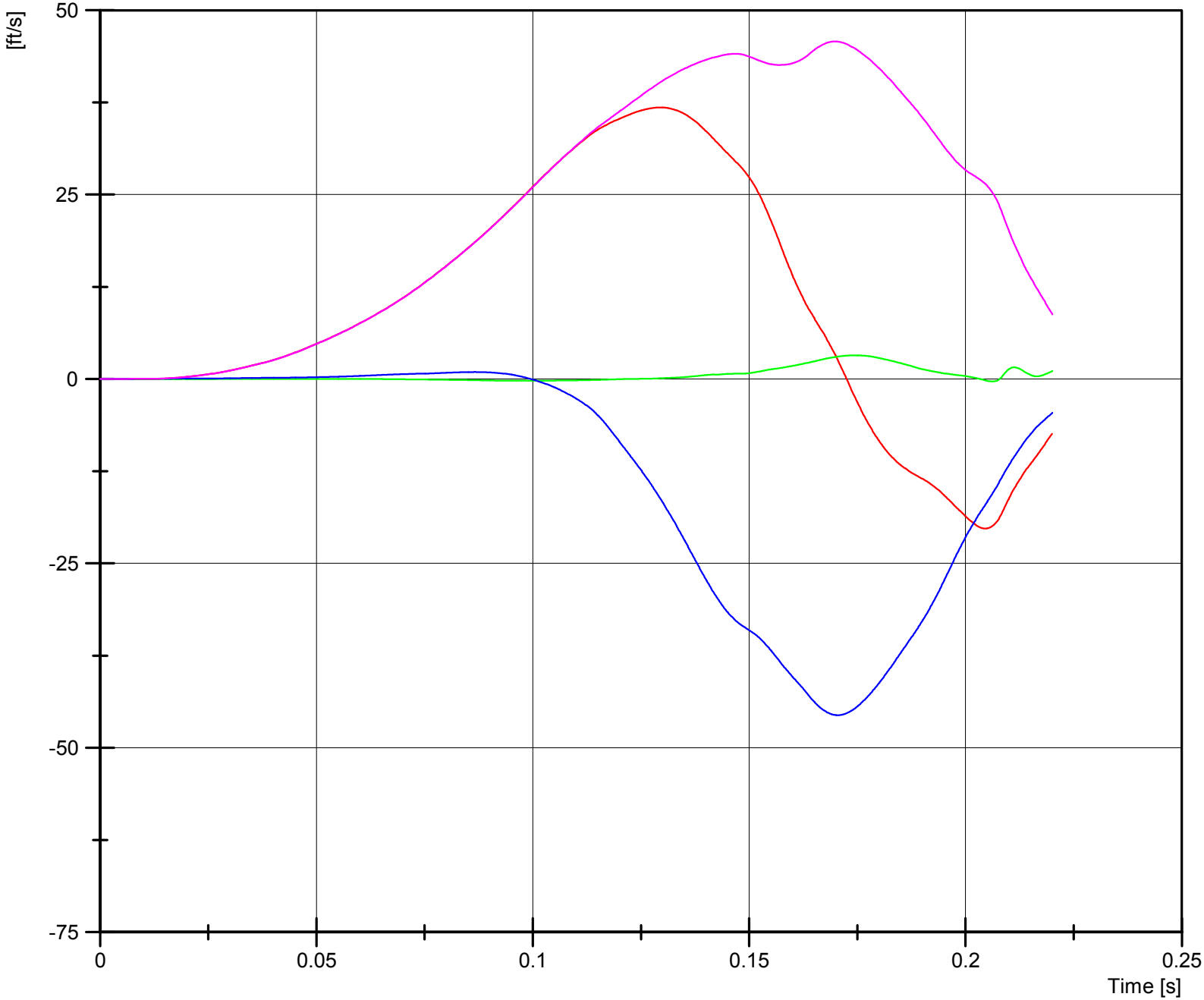

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Position: Config 1 - Repaired Belt

Test Description:
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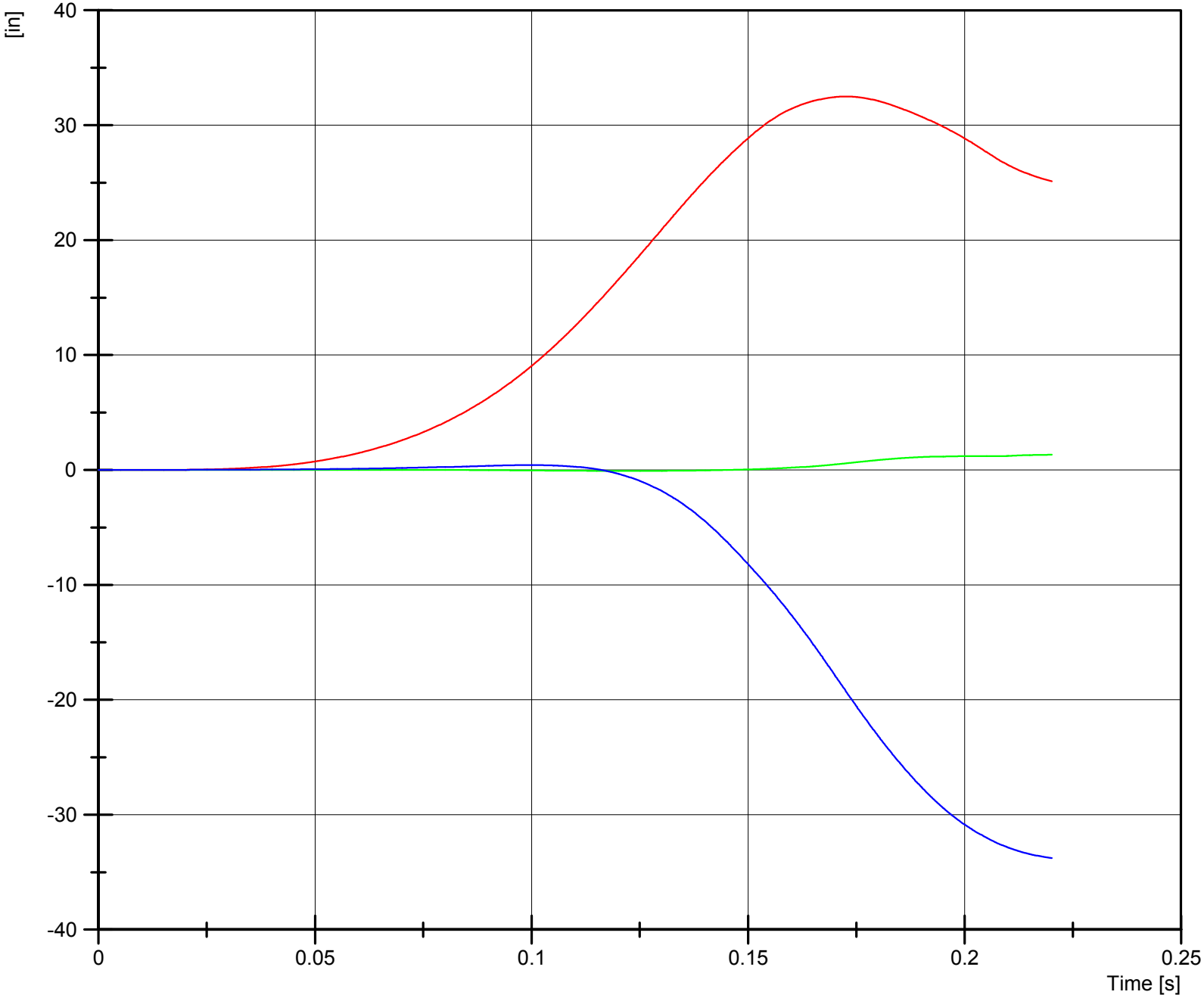
Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/21/2013 12:57

Comments:

Global Head Vx H2 718		Global Head Vy H2 718		Global Head Vz H2 718		Global Head Velocity Resultant H2 718	
Maximum: 36.84 ft/s	Time: 0.1295 sec.	Maximum: 3.20 ft/s	Time: 0.1749 sec.	Maximum: 0.966 ft/s	Time: 0.0867 sec.	Maximum: 45.77 ft/s	Time: 0.1699 sec.
Minimum: -20.26 ft/s	Time: 0.2046 sec.	Minimum: -0.301 ft/s	Time: 0.2061 sec.	Minimum: -45.57 ft/s	Time: 0.1705 sec.	Minimum: 0 ft/s	Time: 0.0001 sec.



Global Head Dx H2 718 | Global Head Dy H2 718 | Global Head Dz H2 718

Maximum: 32.50 in	Time: 0.1726 sec.	Maximum: 1.34 in	Time: 0.2201 sec.	Maximum: 0.43 in	Time: 0.0996 sec.
Minimum: -0.00 in	Time: 0.0128 sec.	Minimum: -0.08 in	Time: 0.1208 sec.	Minimum: -33.78 in	Time: 0.2201 sec.

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Customer: FAA

Test: FA14B-02

Dummy: H2 718

Position: Config 1 - Repaired Belt

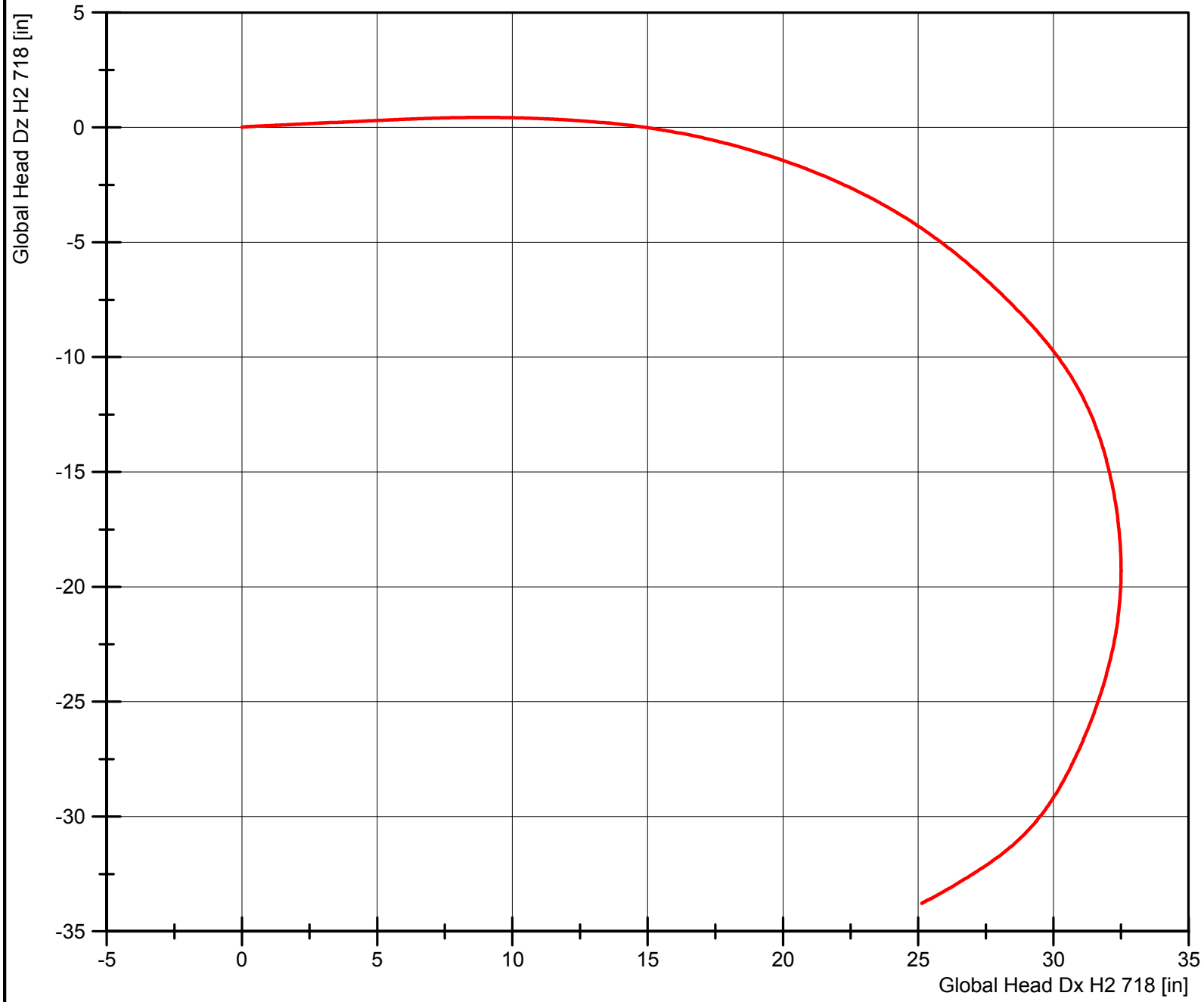
Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/21/2013 12:57

Comments:

Displacement values are calculated from Head Accelerations and Angular Velocities.
This method cannot be used to substitute photometric analysis.



Global Head Displacement XZ

X Maximum: 32.50 in **Time: 0.1726 sec.**

Z Value at X Maximum: -19.25 in

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Customer: FAA

Test: FA14B-02

Dummy: H2 718

Position: Config 1 - Repaired Belt

Test Description:
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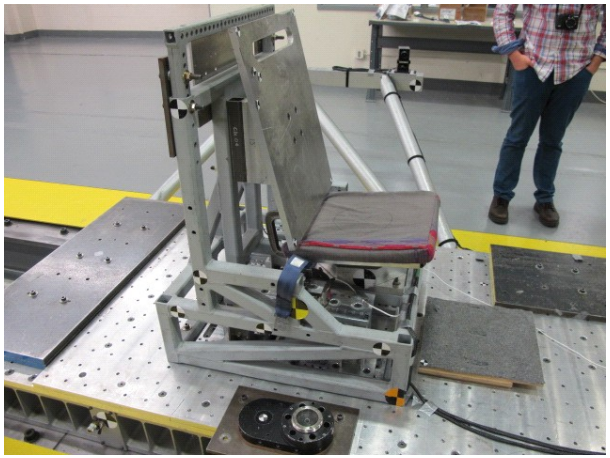
Pulse Name:
16g-07b

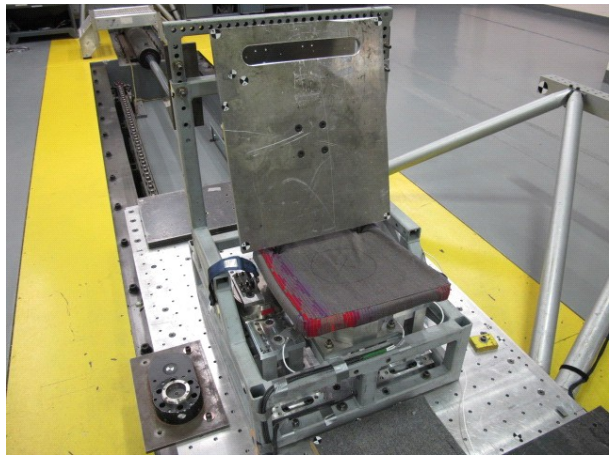
Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/21/2013 12:57

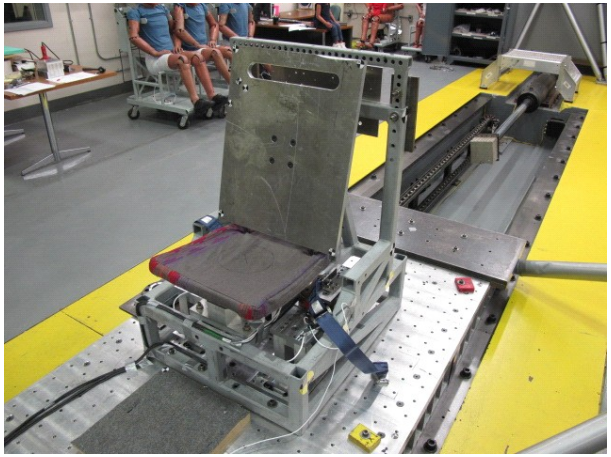
Comments:

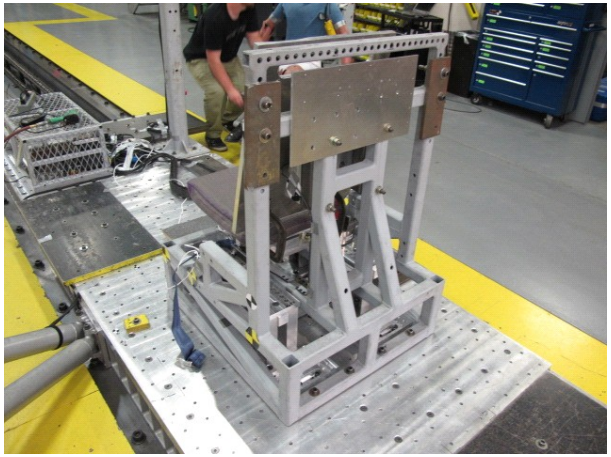
Displacement values are calculated from Head Accelerations and Angular Velocities.
This method cannot be used to substitute photometric analysis.

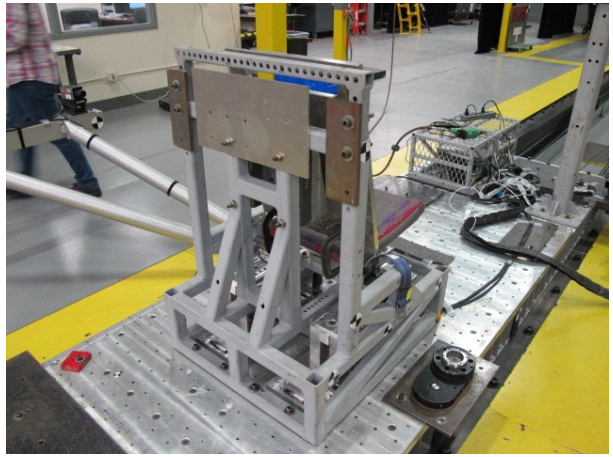
Pre-test Photos











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Doc. No.: CDL-FA14B-02-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-02

Dummy: N/A

Position: N/A

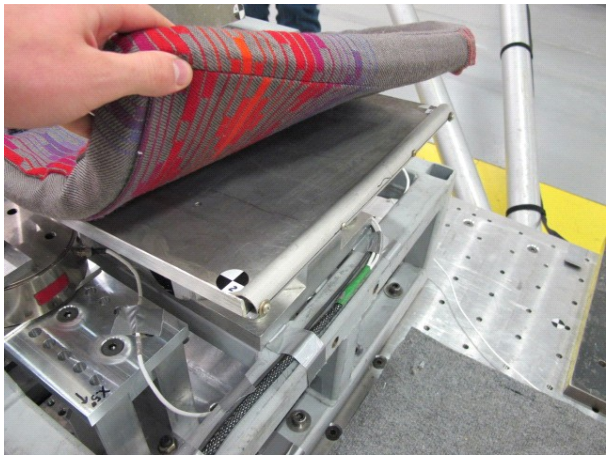
Test Description:
14 CFR 25.562 Test 2

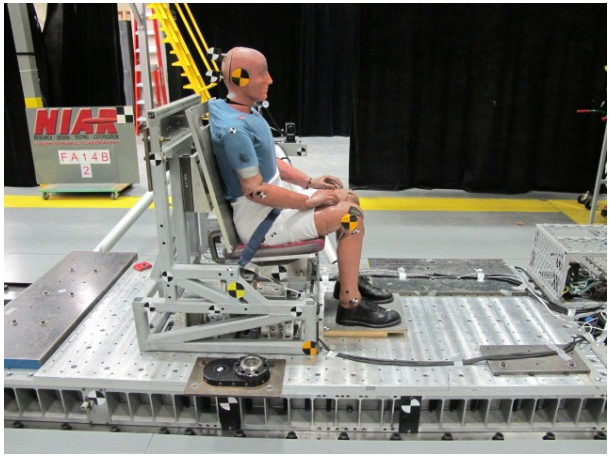
Pulse Name:
16g-07b

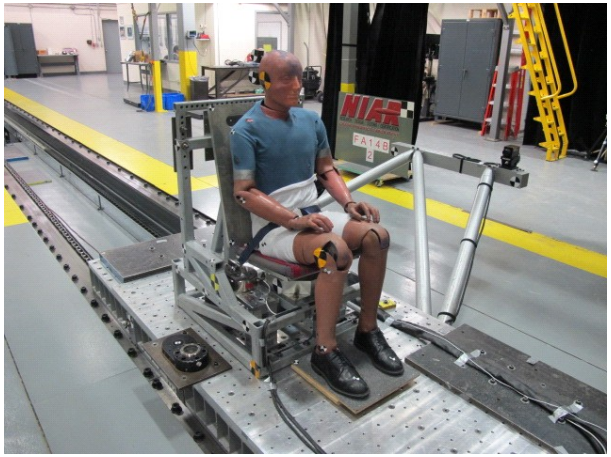
Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/21/2013 12:57

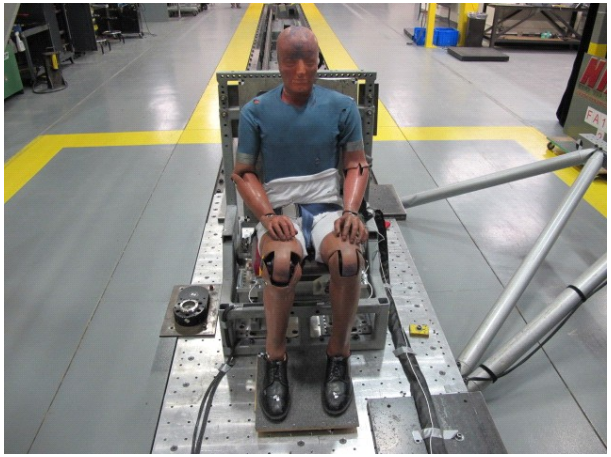
Comments:

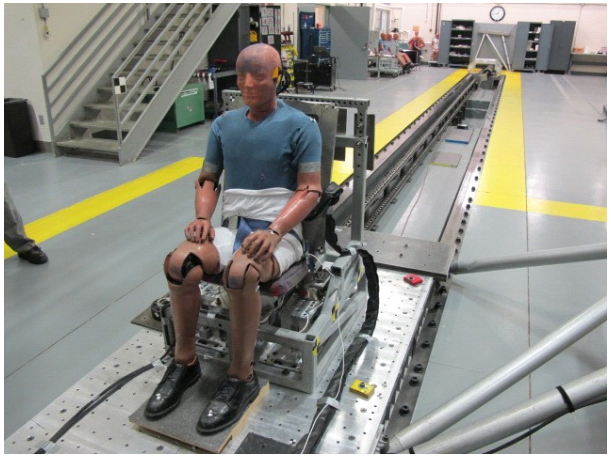
Pre-test Photos











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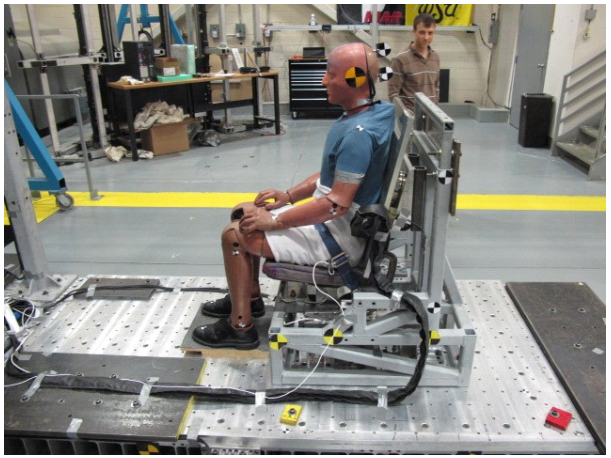

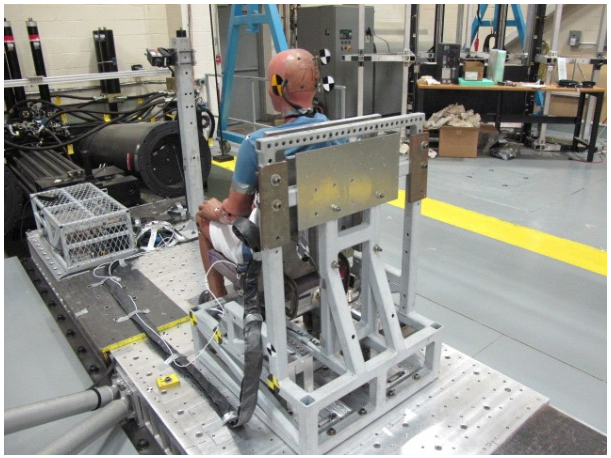

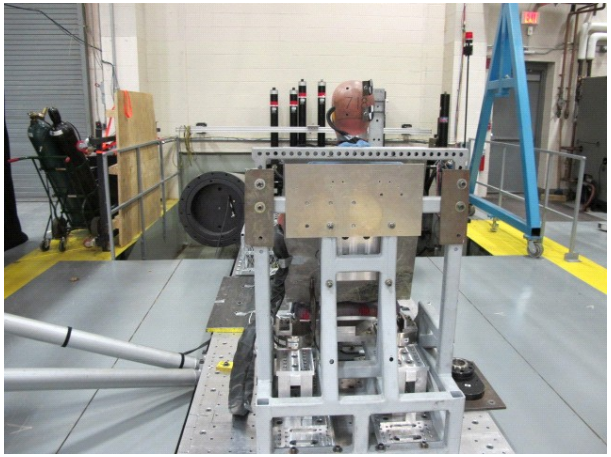

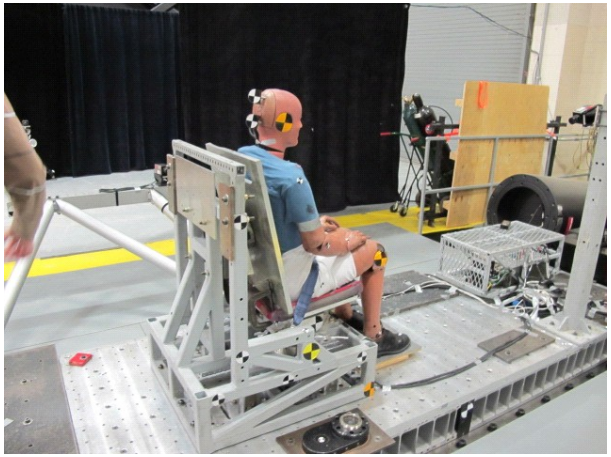

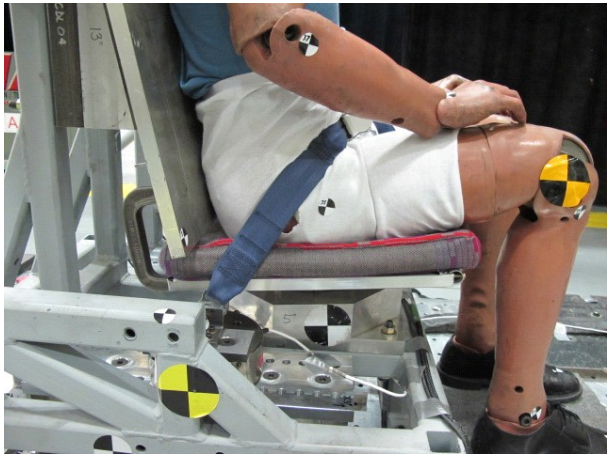

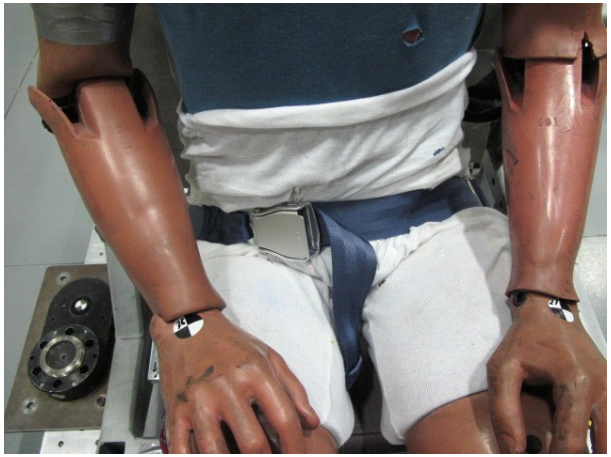

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Test Date/Time: 11/21/2013 12:57

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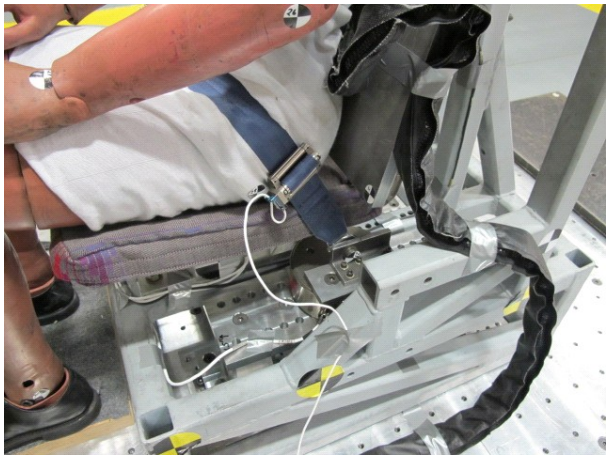
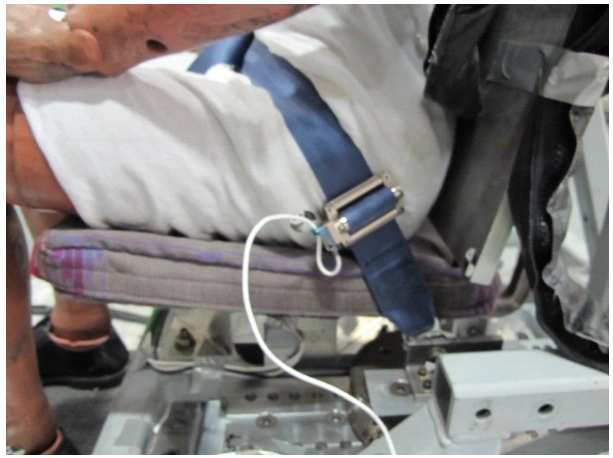
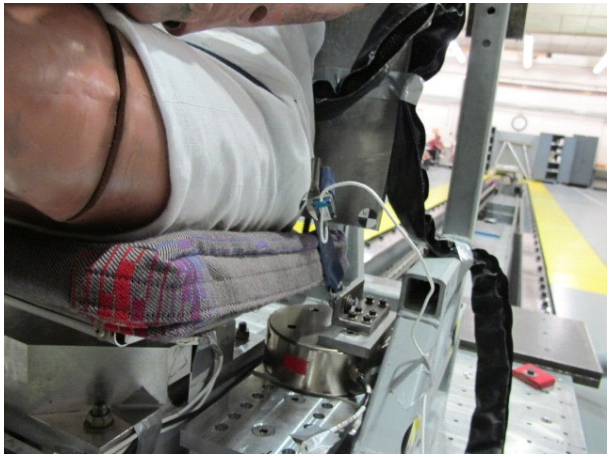
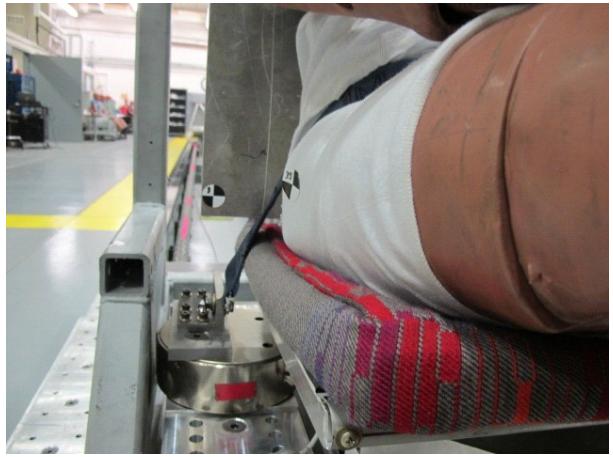
Pre-test Photos









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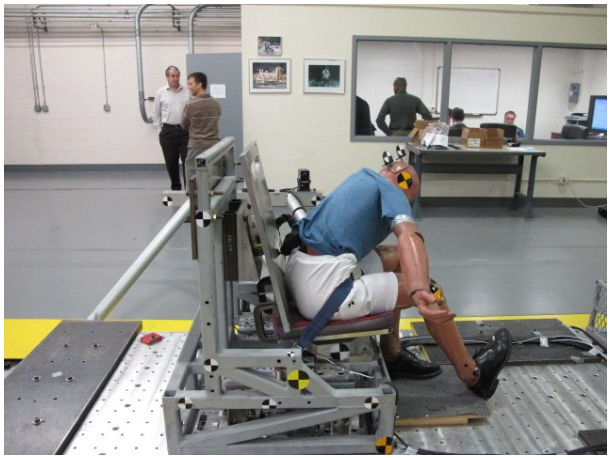

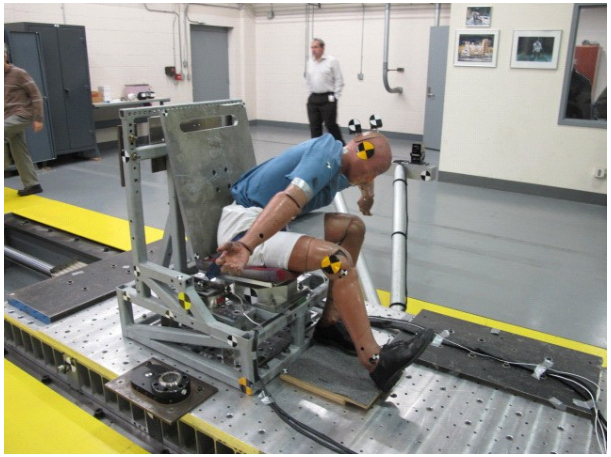

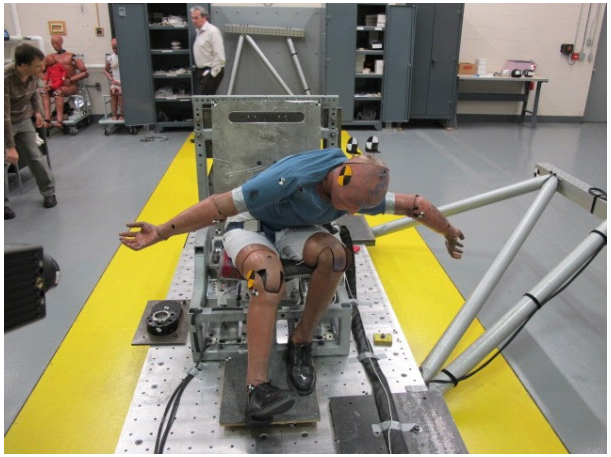

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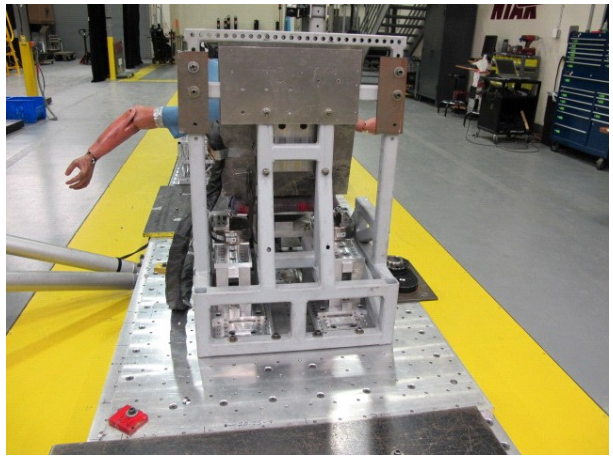

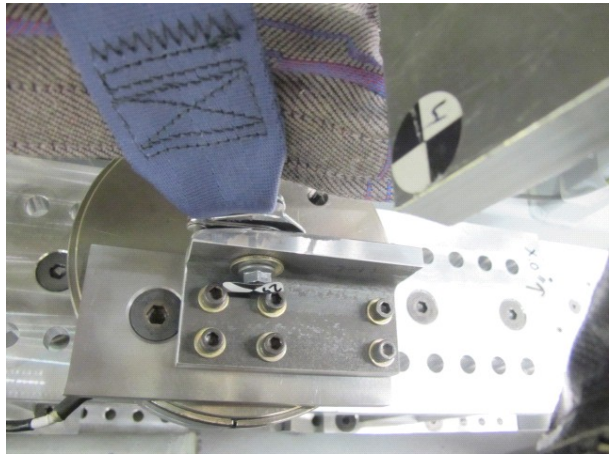

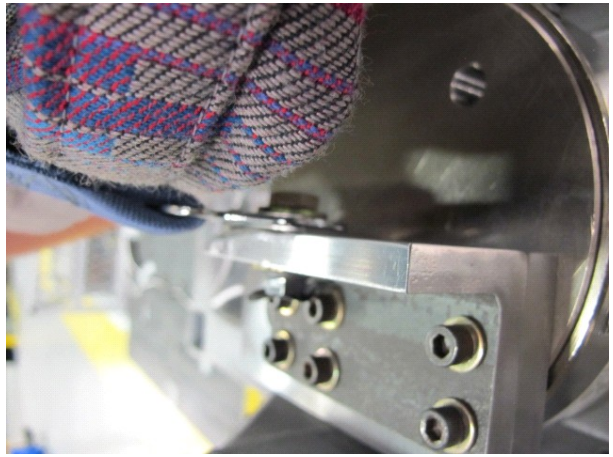

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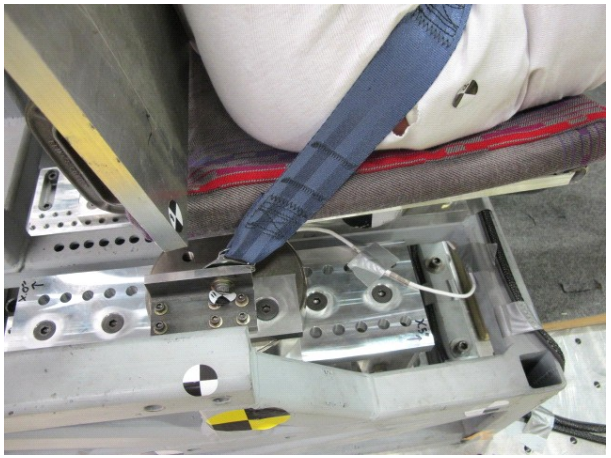

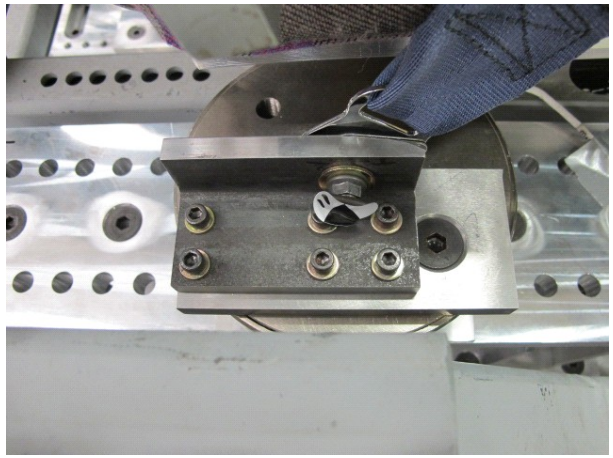

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Comments:

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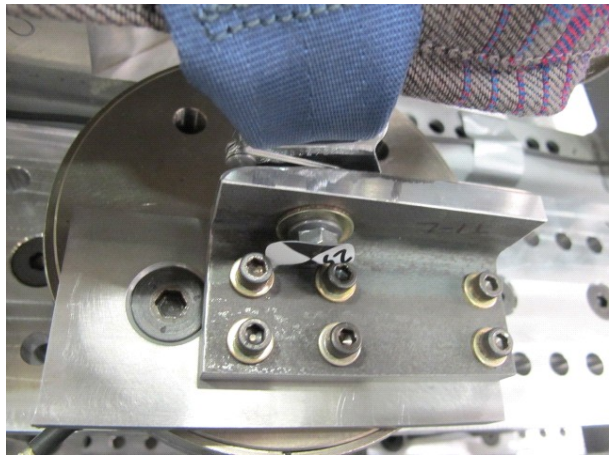

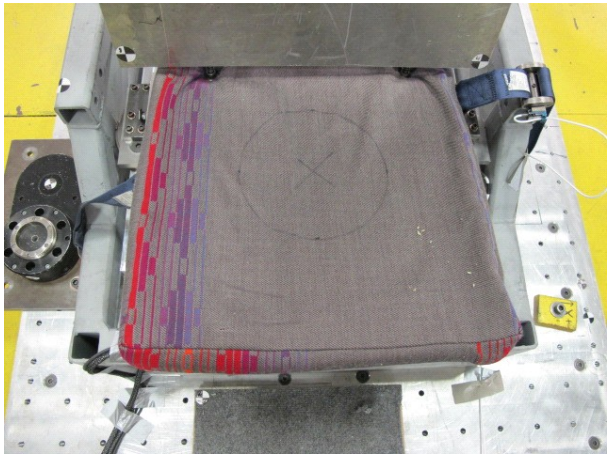

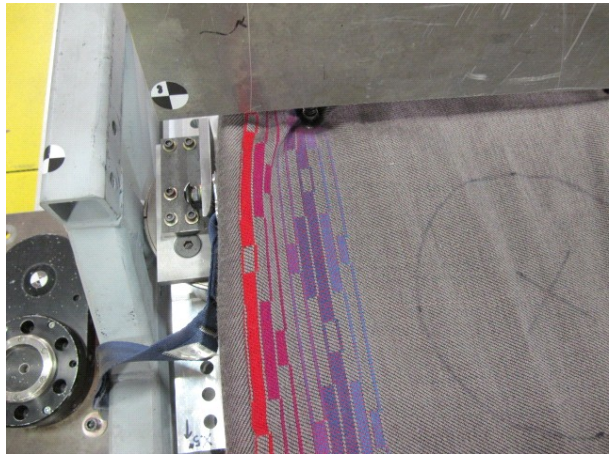

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Version: New

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Customer: FAA

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Dummy: N/A

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16g-07b

Rate: 10000
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Test Date/Time: 11/21/2013 12:57

Comments:

CRASH DYNAMICS LABORATORY

Report No. CDL-FA14B-03-01

Requested by:

FAA

Final Test Report
FA14B-03

03/25/2014

Revision	Change	Date	Revised By
New		03/25/2014	Rob Huculak

Prepared and Reviewed by:

Rob Huculak
Laboratory Manager

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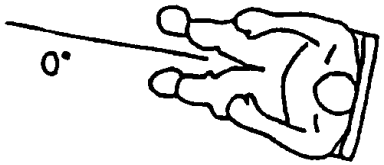
Test Summary

The dynamic test (FA14B-03) was performed for FAA in accordance with 14 CFR 25.562 Test 2 on 03/25/2014.

Pulse Parameters	Required	Result	Pass/Fail
Minimum Peak Acceleration (g)	16	16.09	PASS
Minimum Velocity Change (ft/sec)	44	45.4	PASS
Maximum Rise Time (msec)	90	88.9	PASS
Minimum Velocity Change During Rise Time (ft/sec)	22	22.89	PASS
2g Offset	--	--	PASS

Test Orientation



ATD: H2 718 **Position: Config 2 - New Belt**

0 deg

Measured Seat Belt Angle	Measured Seat Belt Offset
73.82 deg	0.25 in

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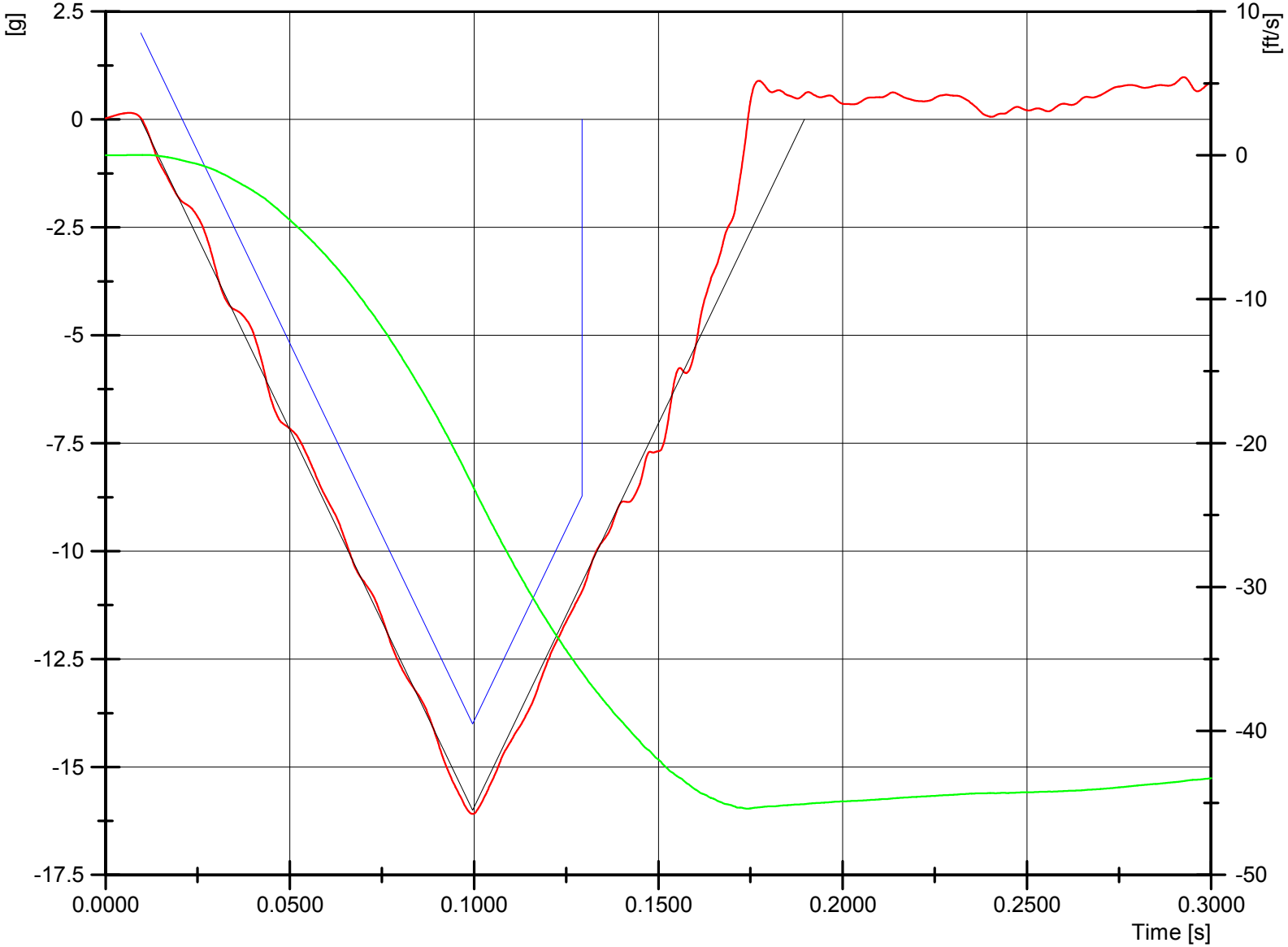
Test Date/Time: 11/21/2013 18:21

Temperature	Relative Humidity
72.8°F	28.8%



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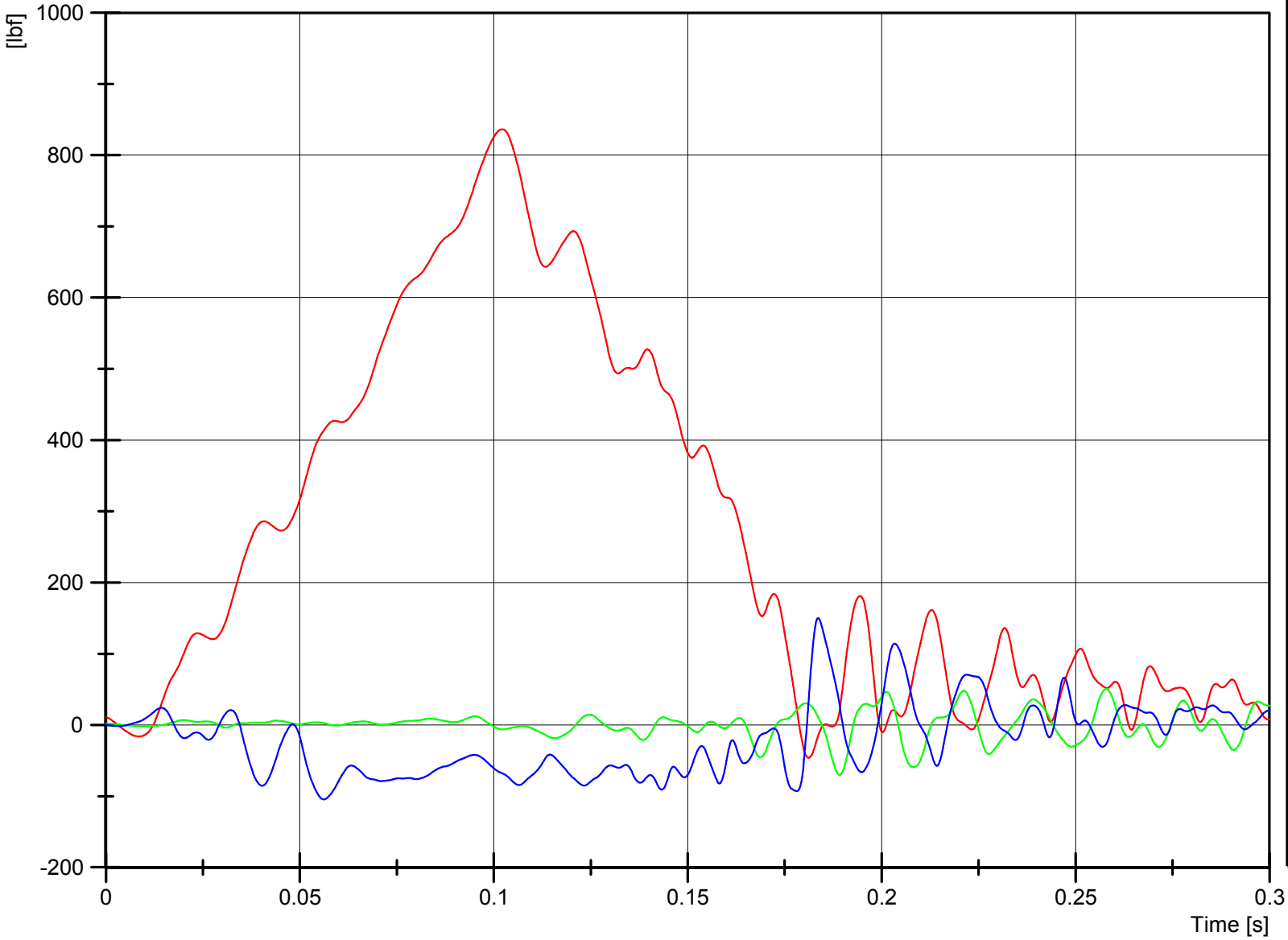
Comments:

Sled Acceleration | Sled Velocity | Ideal Pulse | Upper Limit

Maximum: 0.979 g Time: 0.2925 sec.
Minimum: -16.09 g Time: 0.0996 sec.
CFC: 60
Sensor Type: ENDEVCO 7290A-100
S/N: 29924
Sensitivity: 0.01919 V/EU
Cal. Due: 06/11/2014
Full Scale: 100 g
DAS Channel: 50
Ref. No.: 1
Polarity: R

Minimum: -45.40 ft/s Time: 0.1742 sec.

Pulse Requirement		Actual
Minimum Required Peak Acceleration:	16 g	16.09 g
Minimum Overall Velocity Change:	44 ft/s	45.4 ft/s
Maximum Rise Time:	90 msec	88.9 msec
Minimum Velocity Change Before Greq:	22 ft/s	22.89 ft/s



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Comments:

Rigid Seat Seat Back Fx

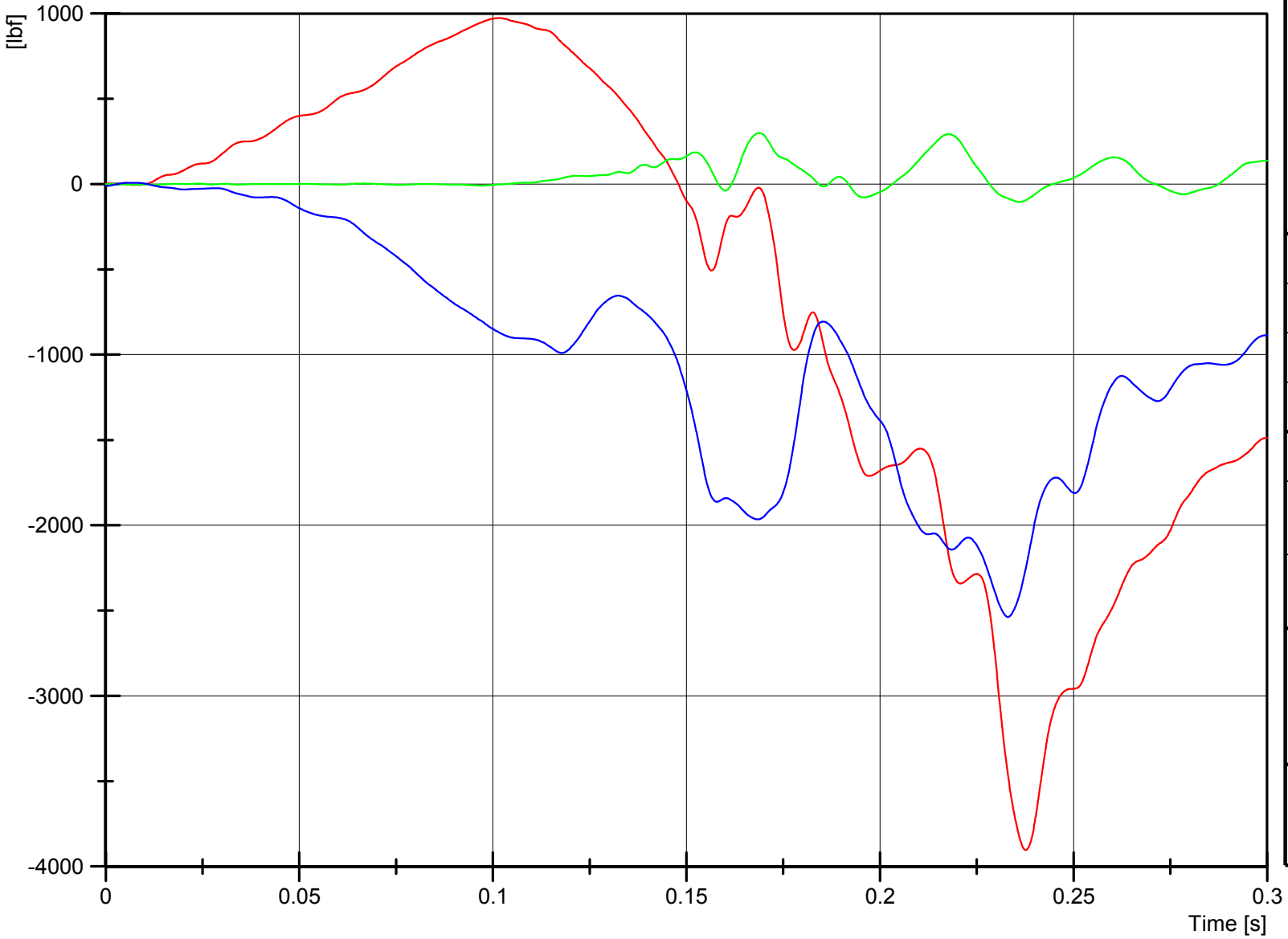
Maximum: 836.45 lbf Time: 0.1024 sec.
Minimum: -46.37 lbf Time: 0.1814 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC084FZ
Sensitivity: 1.176E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 12
Ref. No.: 15
Polarity: N

Rigid Seat Seat Back Fy

Maximum: 50.5957 lbf Time: 0.2581 sec.
Minimum: -70.19 lbf Time: 0.1894 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC084FY
Sensitivity: 2.733E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 11
Ref. No.: 14
Polarity: N

Rigid Seat Seat Back Fz

Maximum: 150.22 lbf Time: 0.1838 sec.
Minimum: -104.37 lbf Time: 0.0564 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC084FX
Sensitivity: 2.74E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 10
Ref. No.: 13
Polarity: R



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www.niar.wichita.edu

Doc. No.: CDL-FA14B-03-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-03

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/21/2013 18:21

Comments:

Rigid Seat Seat Pan Fx

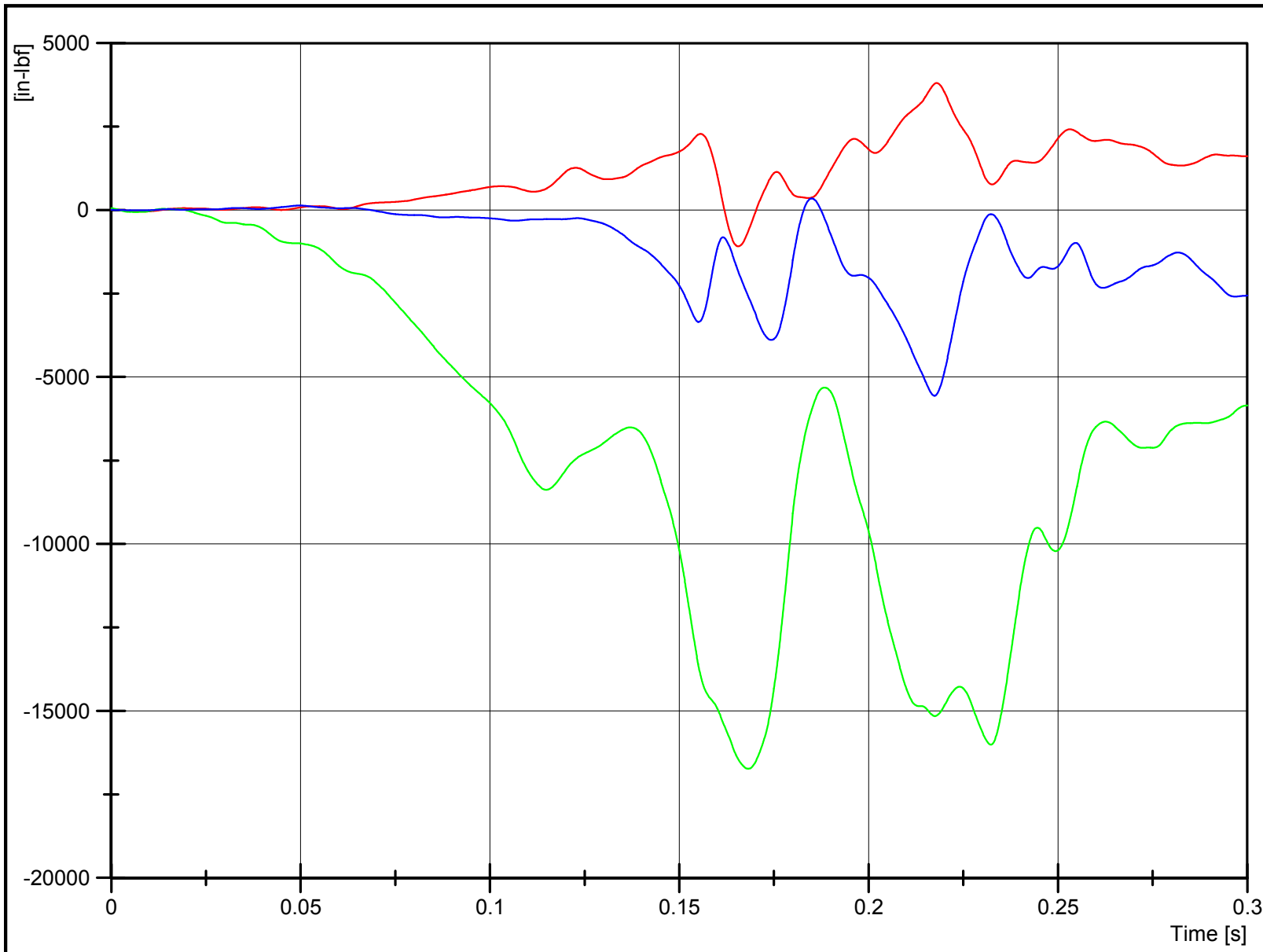
Maximum: 974.52 lbf Time: 0.1018 sec.
Minimum: -3.90E+03 lbf Time: 0.2378 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083FX
Sensitivity: 2.768E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 13
Ref. No.: 10
Polarity: N

Rigid Seat Seat Pan Fy

Maximum: 299.01 lbf Time: 0.169 sec.
Minimum: -104.17 lbf Time: 0.2362 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083FY
Sensitivity: 2.764E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 14
Ref. No.: 11
Polarity: N

Rigid Seat Seat Pan Fz

Maximum: 8.225 lbf Time: 0.0068 sec.
Minimum: -2.54E+03 lbf Time: 0.2332 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083FZ
Sensitivity: 1.181E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 15
Ref. No.: 12
Polarity: N



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Doc. No.: CDL-FA14B-03-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-03

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/21/2013 18:21

Comments:

Rigid Seat Seat Pan Mx

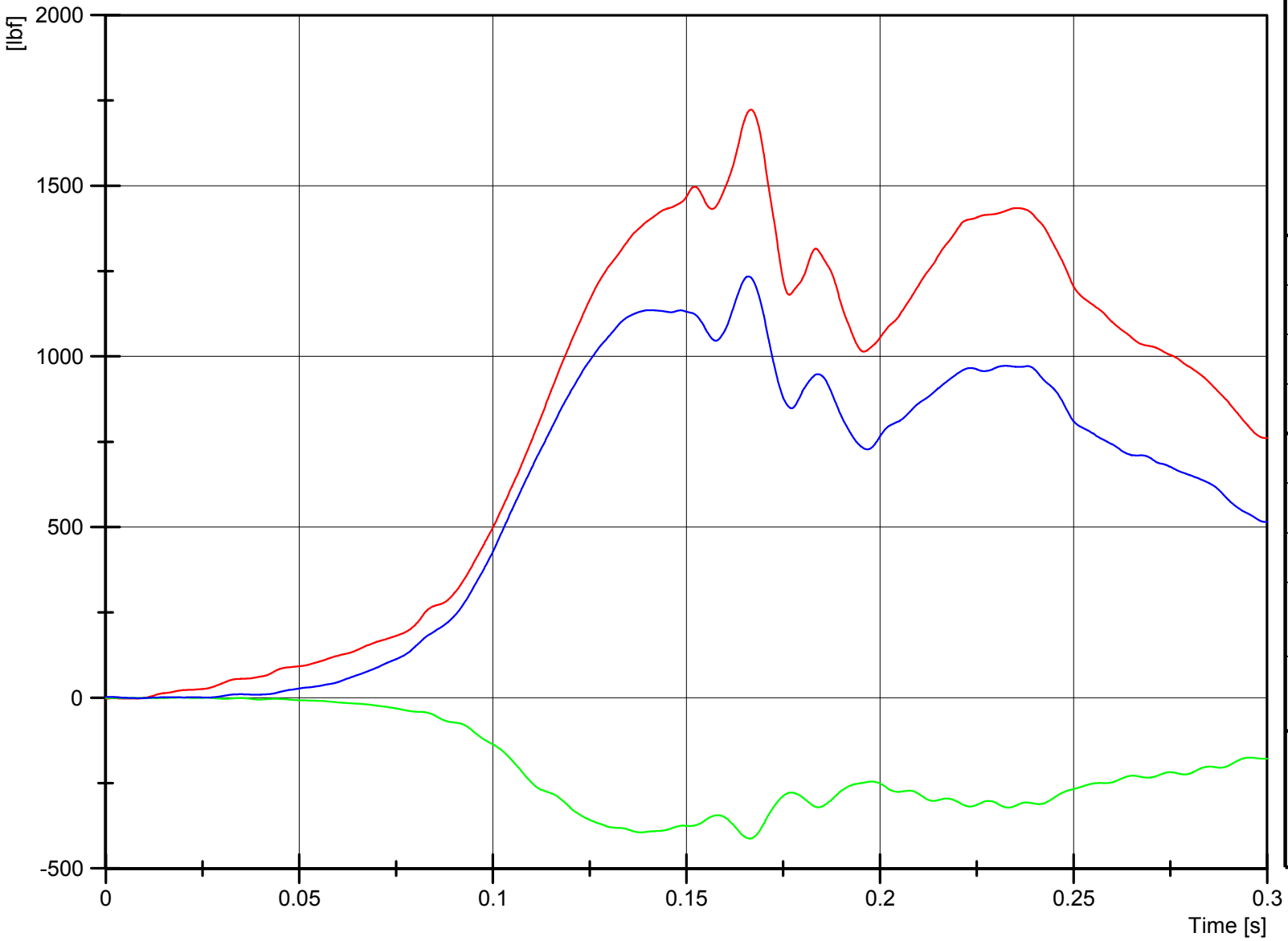
Maximum: 3803.48 in-lbf Time: 0.2182 sec.
Minimum: -1.09E+03 in-lbf Time: 0.1658 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083MX
Sensitivity: 7.03E-08 V/EU
Cal. Due: 02/13/2014
Full Scale: 25000 in-lbf
DAS Channel: 16
Ref. No.: 7
Polarity: N

Rigid Seat Seat Pan My

Maximum: 59.205 in-lbf Time: 0 sec.
Minimum: -1.67E+04 in-lbf Time: 0.1684 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083MY
Sensitivity: 7.05E-08 V/EU
Cal. Due: 02/13/2014
Full Scale: 25000 in-lbf
DAS Channel: 17
Ref. No.: 8
Polarity: N

Rigid Seat Seat Pan Mz

Maximum: 351.247 in-lbf Time: 0.1852 sec.
Minimum: -5.56E+03 in-lbf Time: 0.2176 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083MZ
Sensitivity: 9.32E-08 V/EU
Cal. Due: 02/13/2014
Full Scale: 20000 in-lbf
DAS Channel: 18
Ref. No.: 9
Polarity: N



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Doc. No.: CDL-FA14B-03-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-03

Dummy: H2 718

Position: Config 2 - New Belt

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/21/2013 18:21

Rigid Seat Right Lap Fx

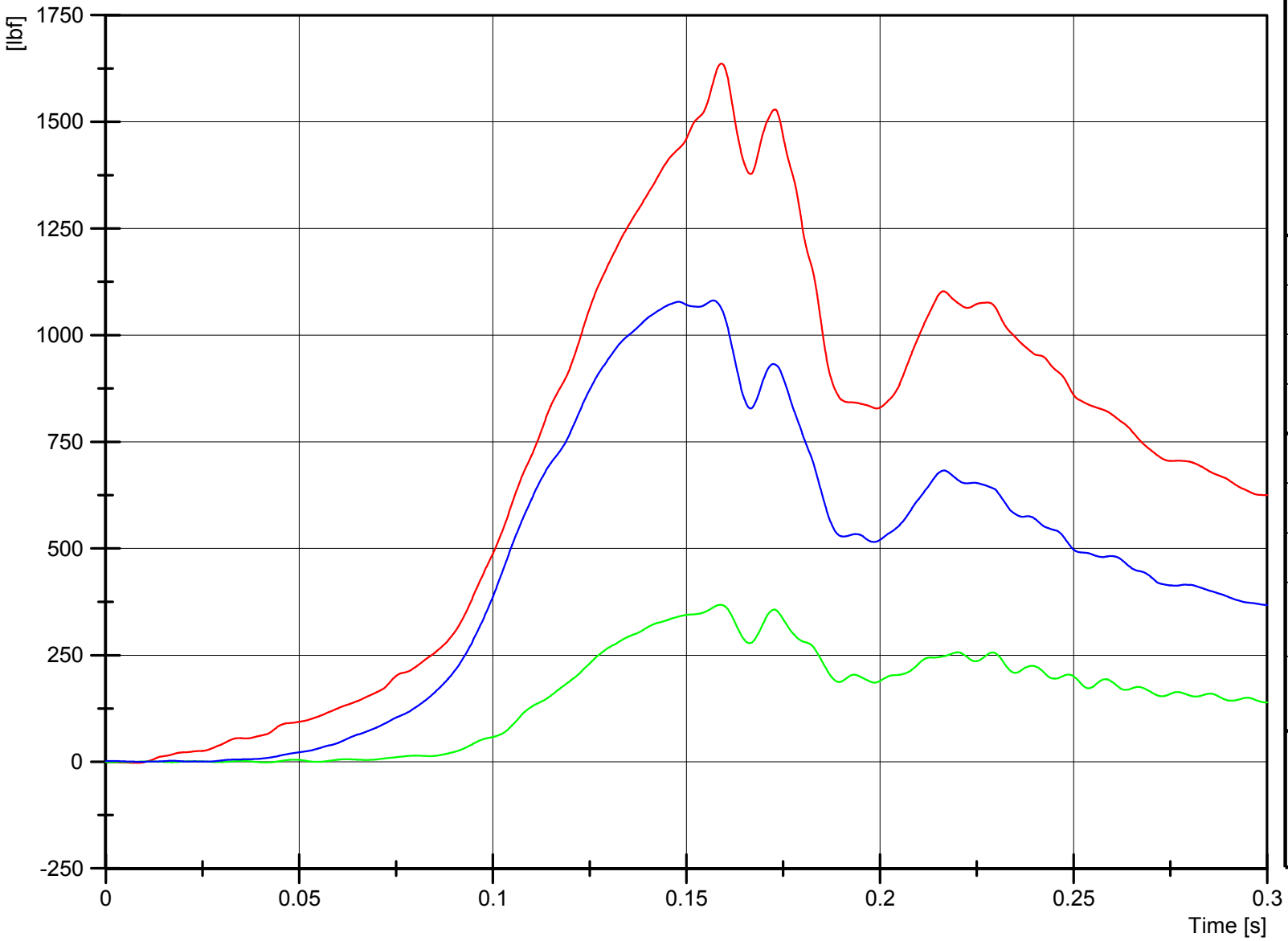
Maximum: 1722.68 lbf Time: 0.1669 sec.
Minimum: -2.2373 lbf Time: 0 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC093FX
Sensitivity: 2.587E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 22
Ref. No.: 74
Polarity: N

Rigid Seat Right Lap Fy

Maximum: 0.8781 lbf Time: 0.0194 sec.
Minimum: -412.44 lbf Time: 0.1666 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC093FY
Sensitivity: 2.572E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 23
Ref. No.: 75
Polarity: N

Rigid Seat Right Lap Fz

Maximum: 1234.88 lbf Time: 0.1662 sec.
Minimum: -0.9184 lbf Time: 0.0089 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC093FZ
Sensitivity: 1.044E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 24
Ref. No.: 76
Polarity: N



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Doc. No.: CDL-FA14B-03-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-03

Dummy: H2 718

Position: Config 2 - New Belt

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/21/2013 18:21

Rigid Seat Left Lap Fx

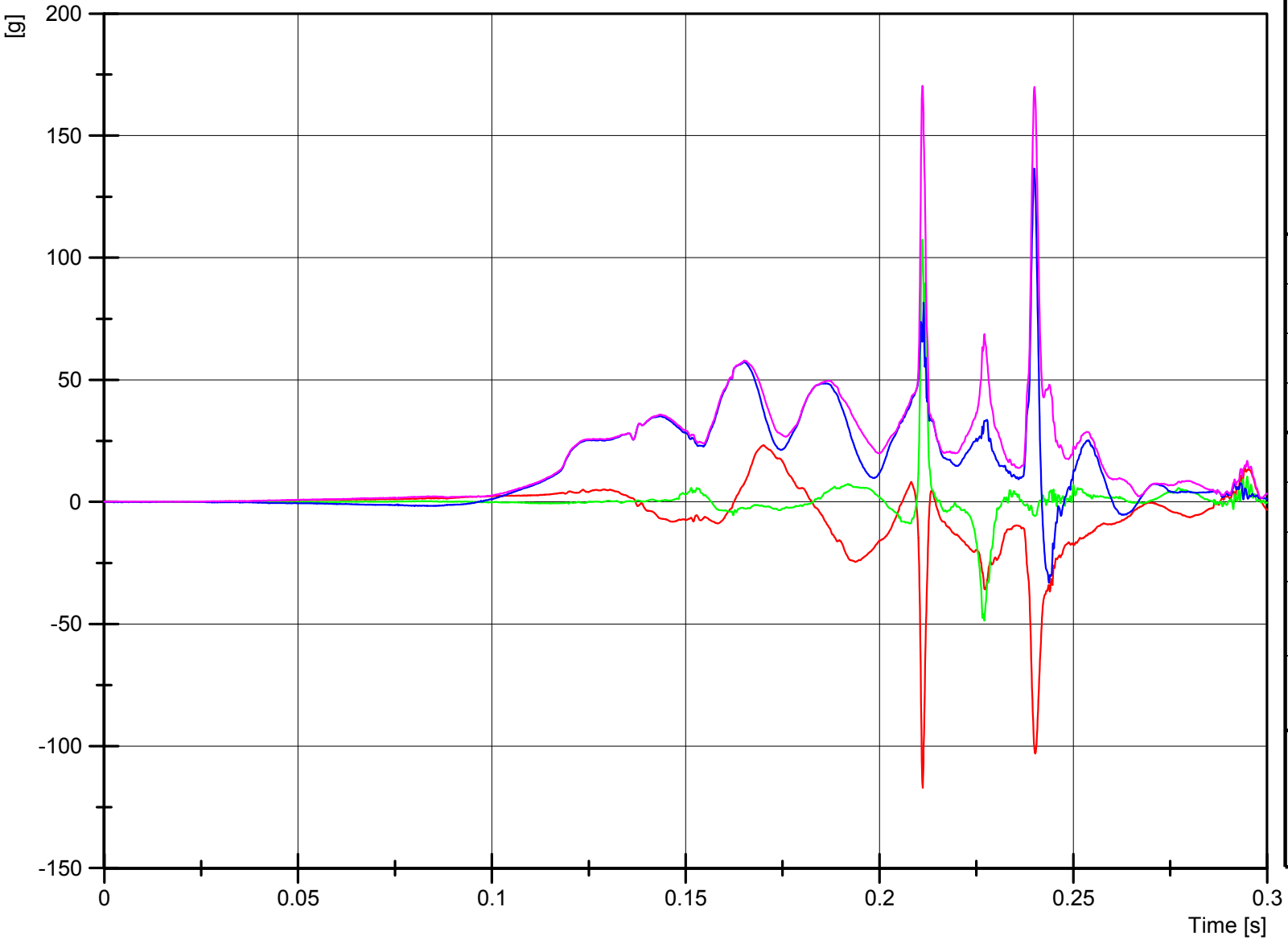
Maximum: 1636.62 lbf Time: 0.1592 sec.
Minimum: -2.5079 lbf Time: 0.0082 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC094FX
Sensitivity: 2.587E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 19
Ref. No.: 77
Polarity: N

Rigid Seat Left Lap Fy

Maximum: 367.97 lbf Time: 0.1589 sec.
Minimum: -1.409 lbf Time: 0.0416 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC094FY
Sensitivity: 2.572E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 20
Ref. No.: 78
Polarity: N

Rigid Seat Left Lap Fz

Maximum: 1081.05 lbf Time: 0.1571 sec.
Minimum: 0.2238 lbf Time: 0.0091 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC094FZ
Sensitivity: 1.044E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 21
Ref. No.: 79
Polarity: N



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Doc. No.: CDL-FA14B-03-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-03

Dummy: H2 718

Position: Config 2 - New Belt

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/21/2013 18:21

Head Ax H2 718

Maximum: 23.1485 g Time: 0.1703 sec.
Minimum: -117.11 g Time: 0.2113 sec.
CFC: 1000
Sensor Type: Endevco 7264C
S/N: P47932
Sensitivity: 2.157E-05 V/EU
Cal. Due: 09/25/2014
Full Scale: 2000 g
DAS Channel: 25
Ref. No.: 22
Polarity: R

Head Ay H2 718

Maximum: 107.45 g Time: 0.2112 sec.
Minimum: -48.65 g Time: 0.2272 sec.
CFC: 1000
Sensor Type: Endevco 7264C
S/N: P48149
Sensitivity: 2.603E-05 V/EU
Cal. Due: 09/25/2014
Full Scale: 2000 g
DAS Channel: 26
Ref. No.: 23
Polarity: R

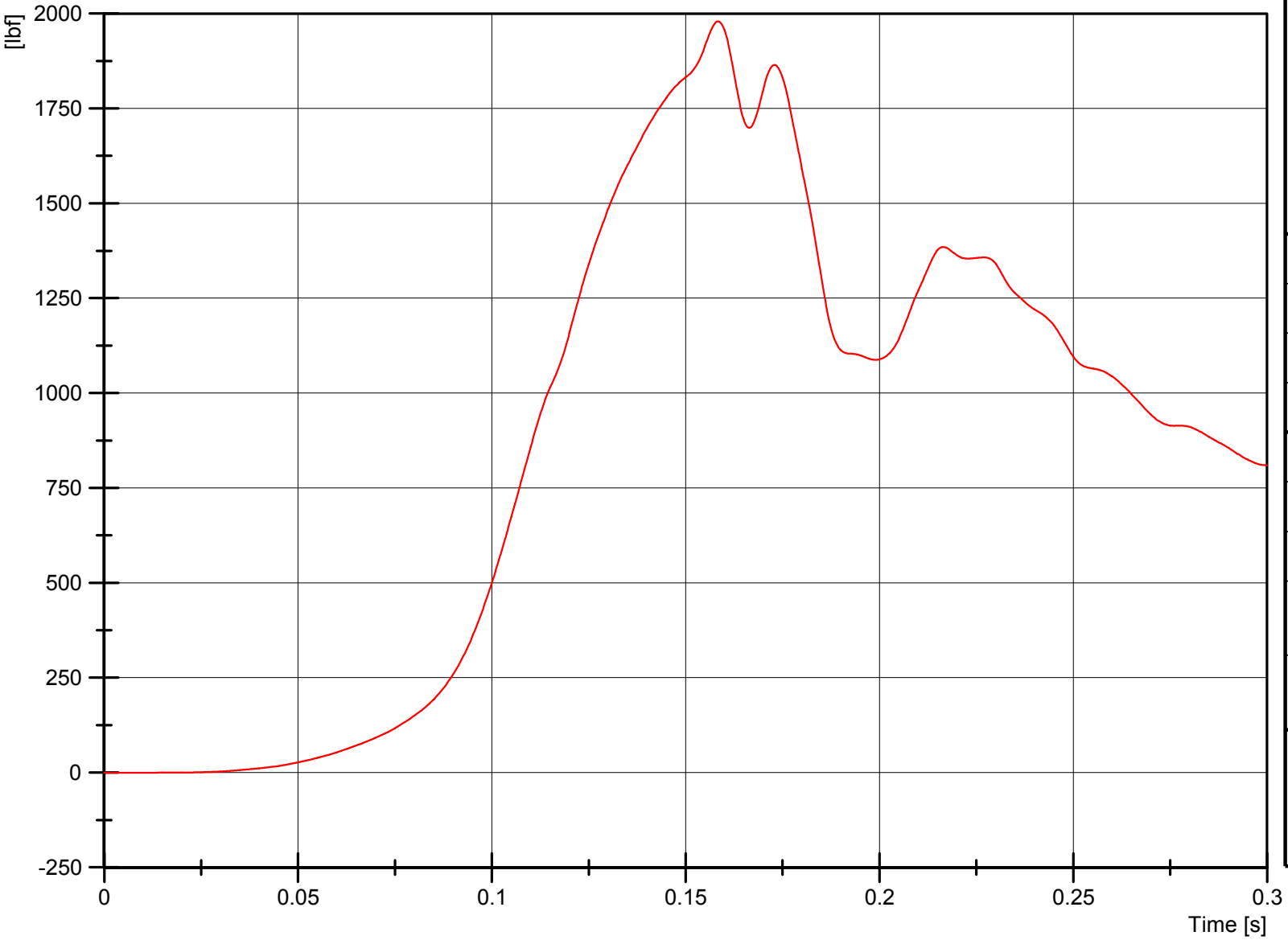
Head Az H2 718

Maximum: 136.595 g Time: 0.2401 sec.
Minimum: -33.10 g Time: 0.2439 sec.
CFC: 1000
Sensor Type: Endevco 7264C
S/N: P60367
Sensitivity: 1.782E-05 V/EU
Cal. Due: 09/25/2014
Full Scale: 2000 g
DAS Channel: 27
Ref. No.: 24
Polarity: R

Head Resultant H2 718

Maximum: 170.35 g Time: 0.2111 sec.

HIC: 1075.6
T1: 120.7 msec.
T2: 255.9 msec.



Lap Belt Force H2 718

Maximum: 1979.26 lbf Time: 0.1585 sec.
Minimum: -0.2823 lbf Time: 0.0053 sec.
CFC: 60
Sensor Type: Denton 3255
S/N: SBLC086
Sensitivity: 6.6006E-07 V/EU
Cal. Due: 05/16/2014
Full Scale: 3000 lbf
DAS Channel: 36
Ref. No.: 17
Polarity: N

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Doc. No.: CDL-FA14B-03-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-03

Dummy: H2 718

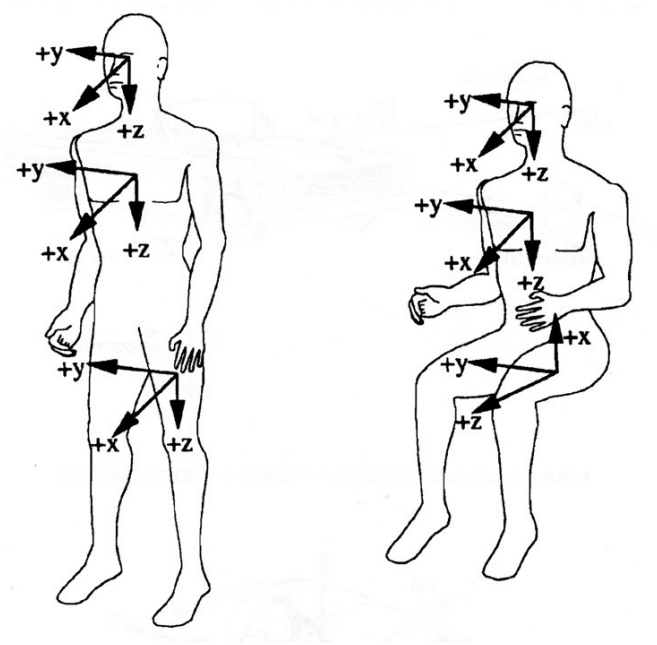
Position: Config 2 - New Belt

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/21/2013 18:21

J211/1 Sign Conventions



Upper Neck Load Cell:
+FX Head rearward, chest forward
+FY Head leftward, chest rightward
+FZ Head upward, chest downward
+MX Left ear toward left shoulder
+MY Chin toward sternum
+MZ Chin toward left shoulder

Lumbar Load Cell:
+FX Chest rearward, pelvis forward
+FY Chest leftward, pelvis rightward
+FZ Chest upward, pelvis downward
+MX Left shoulder toward left hip
+MY Sternum toward front of legs
+MZ Right shoulder forward, left shoulder rearward

Femur Load Cells:
+FZ Tension

Chest Displacement:
-DX Compression

Rib Dispacement:
-DY Compression

Belt Load Cells:
+FX Tension

Floor Load Cells:
+FX Test article forward
+FY Test article right
+FZ Test article up

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Doc. No.: CDL-FA14B-03-01

Version: New

Report Date: 03/25/2014

Customer: FAA

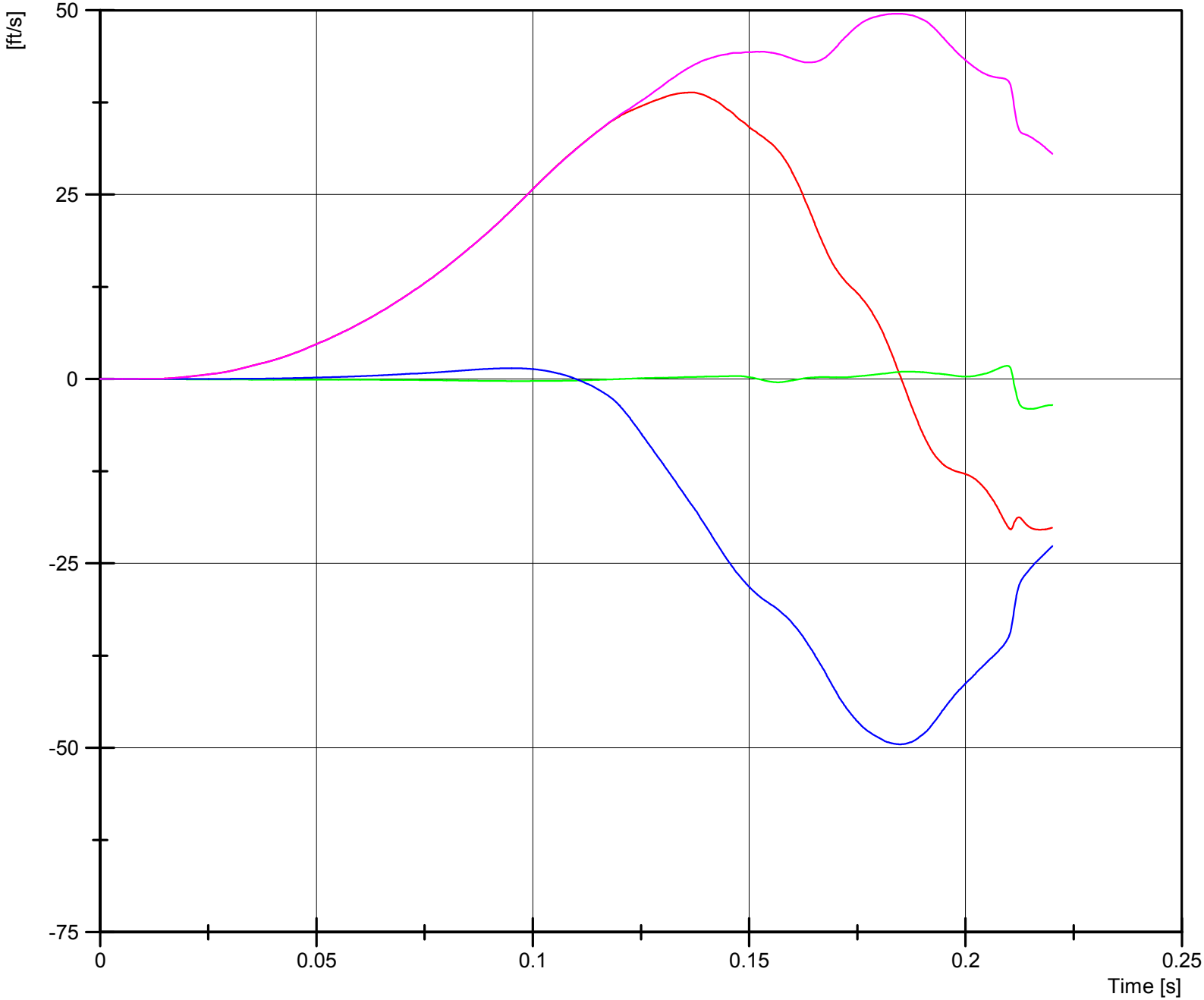
Test: FA14B-03

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/21/2013 18:21

Comments:



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Doc. No.: CDL-FA14B-03-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-03

Dummy: H2 718

Position: Config 2 - New Belt

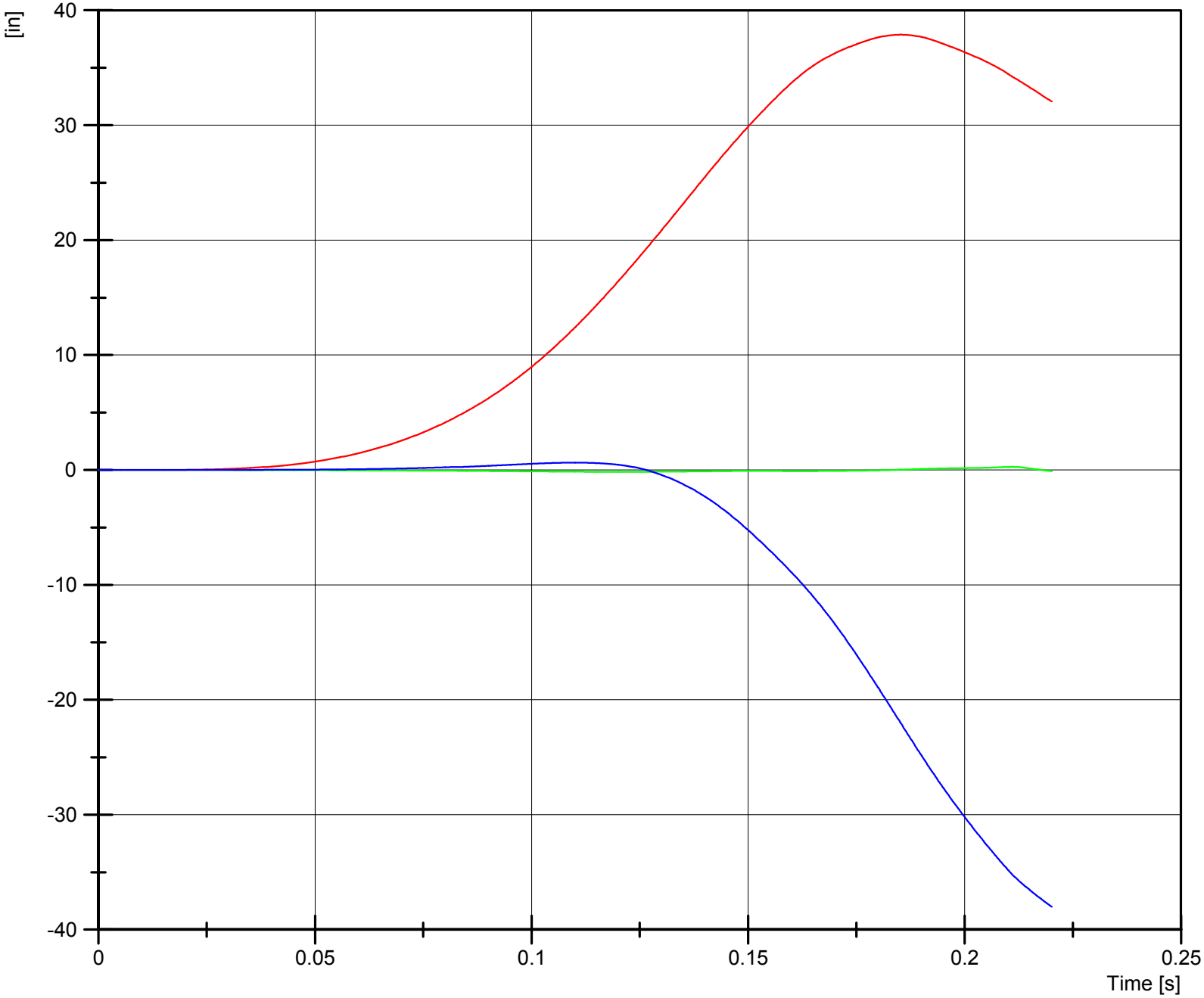
Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/21/2013 18:21

Comments:

Global Head Vx H2 718		Global Head Vy H2 718		Global Head Vz H2 718		Global Head Velocity Resultant H2 718	
Maximum: 38.87 ft/s	Time: 0.1369 sec.	Maximum: 1.78 ft/s	Time: 0.2096 sec.	Maximum: 1.48 ft/s	Time: 0.0948 sec.	Maximum: 49.54 ft/s	Time: 0.1845 sec.
Minimum: -20.40 ft/s	Time: 0.2171 sec.	Minimum: -4.04 ft/s	Time: 0.2149 sec.	Minimum: -49.52 ft/s	Time: 0.1849 sec.	Minimum: 0 ft/s	Time: 0.0001 sec.



Global Head Dx H2 718 | Global Head Dy H2 718 | Global Head Dz H2 718

Maximum: 37.88 in	Time: 0.1853 sec.	Maximum: 0.28 in	Time: 0.211 sec.	Maximum: 0.64 in	Time: 0.11 sec.
Minimum: -0.00 in	Time: 0.0128 sec.	Minimum: -0.16 in	Time: 0.1199 sec.	Minimum: -38.00 in	Time: 0.2201 sec.

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Doc. No.: CDL-FA14B-03-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-03

Dummy: H2 718

Position: Config 2 - New Belt

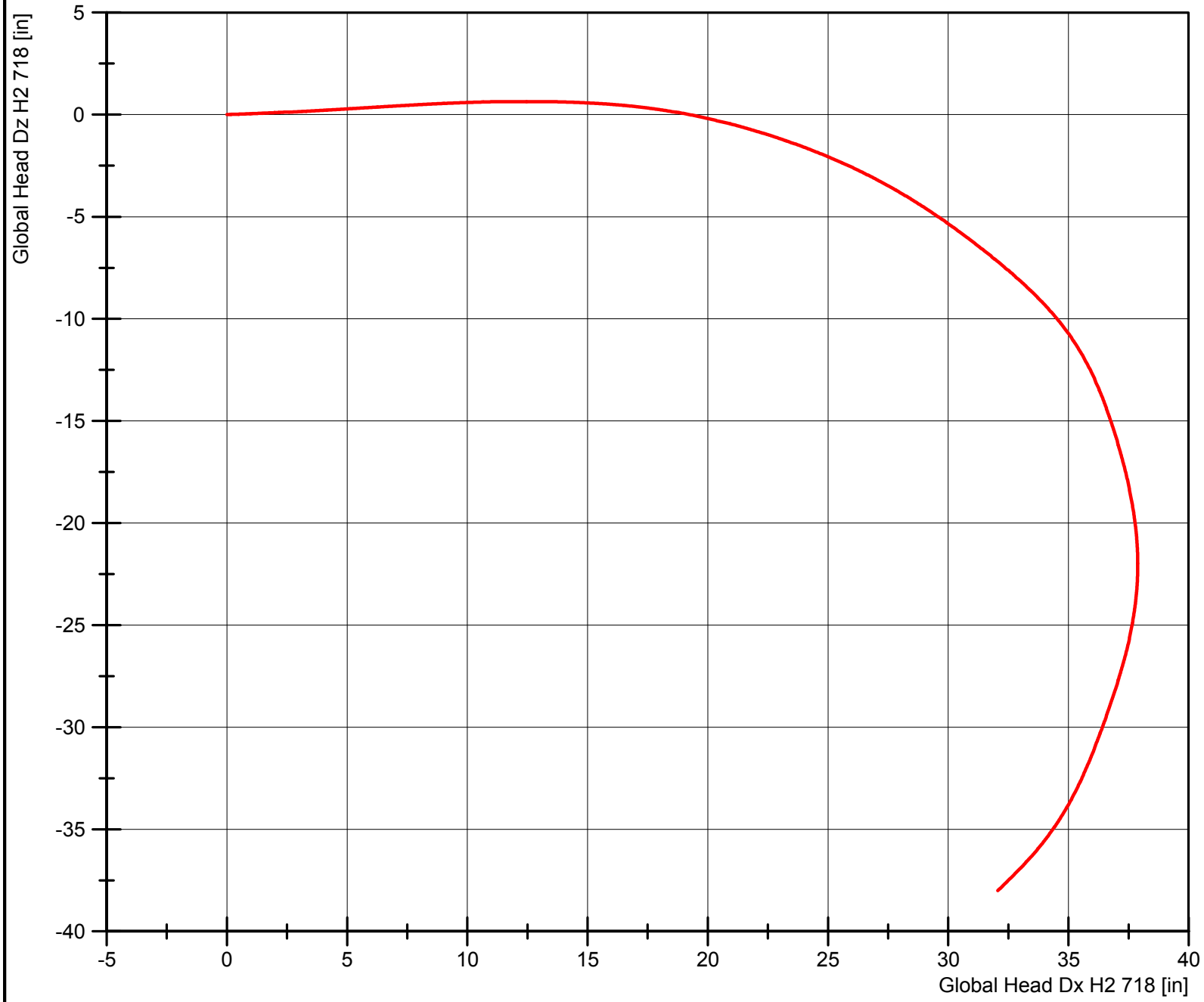
Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/21/2013 18:21

Comments:

Displacement values are calculated from Head Accelerations and Angular Velocities.
This method cannot be used to substitute photometric analysis.



Global Head Displacement XZ

X Maximum: 37.88 in **Time: 0.1853 sec.**

Z Value at X Maximum: -22.05 in

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Doc. No.: CDL-FA14B-03-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-03

Dummy: H2 718

Position: Config 2 - New Belt

Test Description:
14 CFR 25.562 Test 2

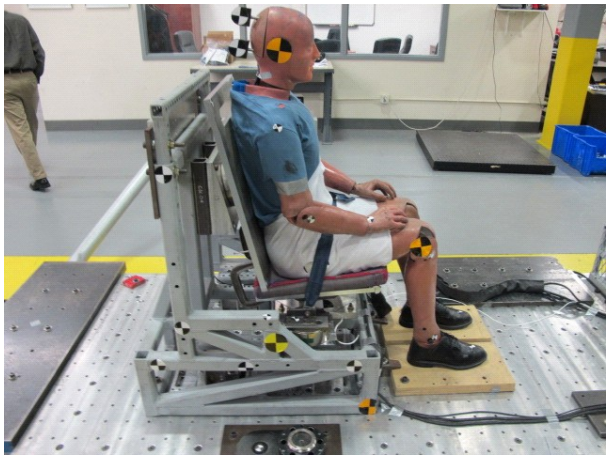
Pulse Name:
16g-07b

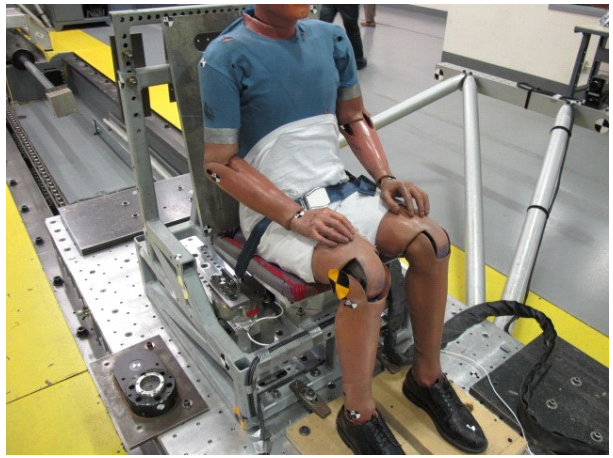
Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/21/2013 18:21

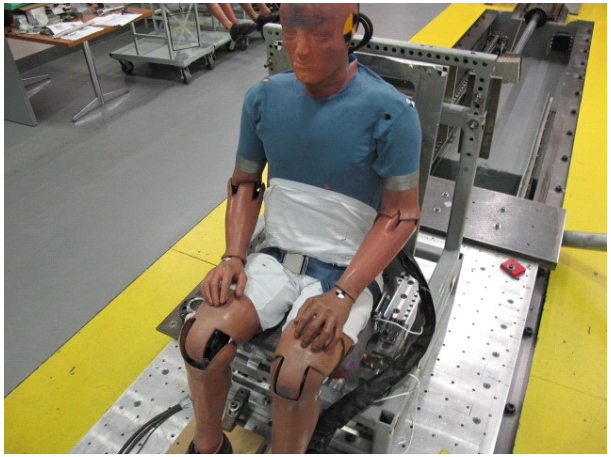
Comments:

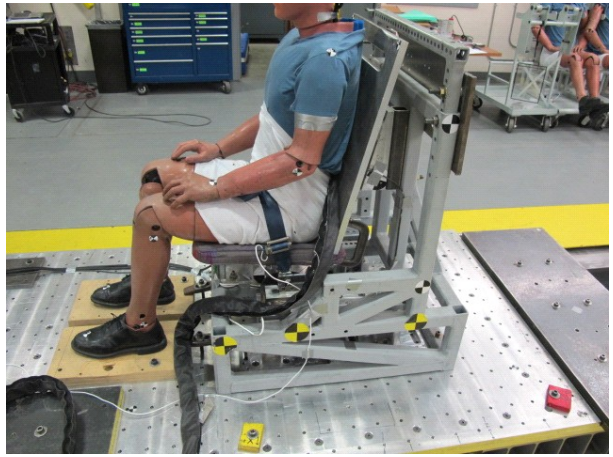
Displacement values are calculated from Head Accelerations and Angular Velocities.
This method cannot be used to substitute photometric analysis.

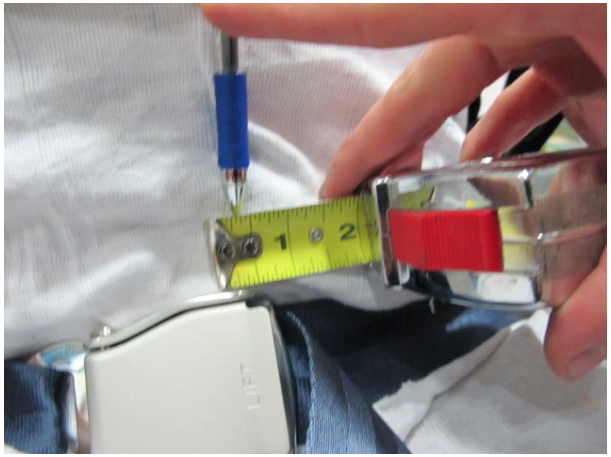
Pre-test Photos

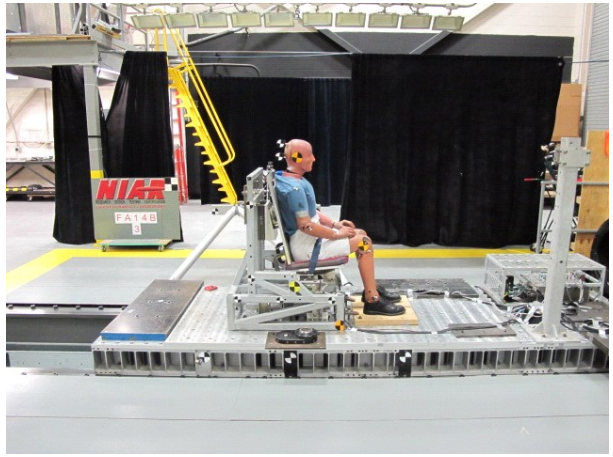












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Doc. No.: CDL-FA14B-03-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-03

Dummy: N/A

Position: N/A

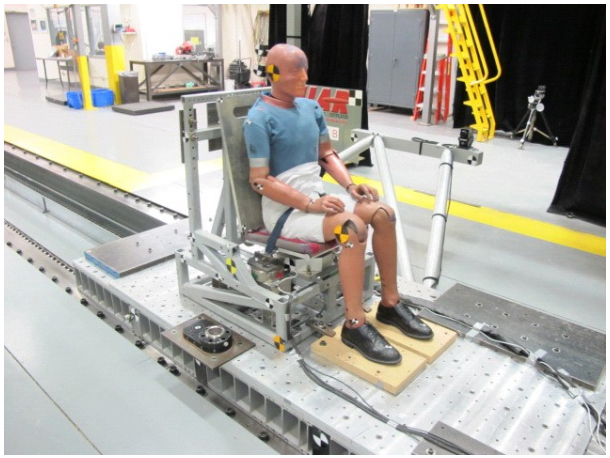
Test Description:
14 CFR 25.562 Test 2

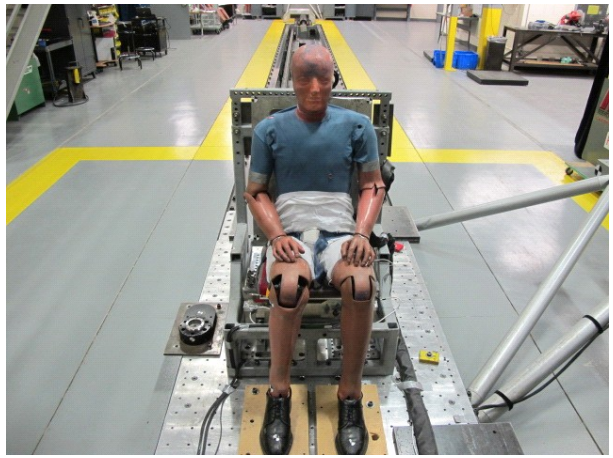
Pulse Name:
16g-07b

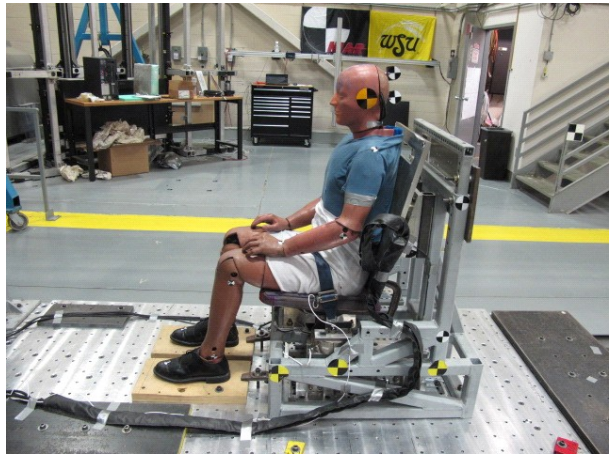
Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/21/2013 18:21

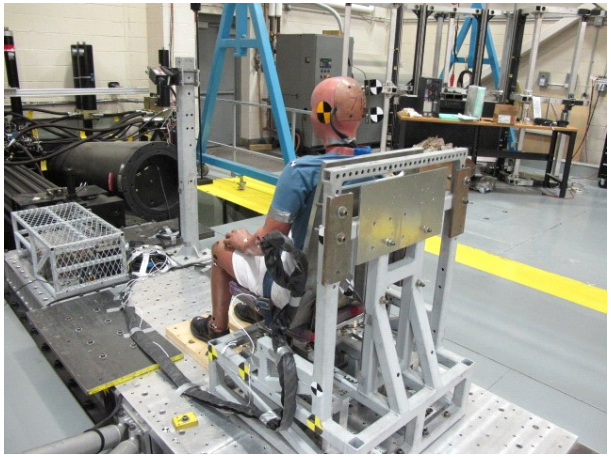
Comments:

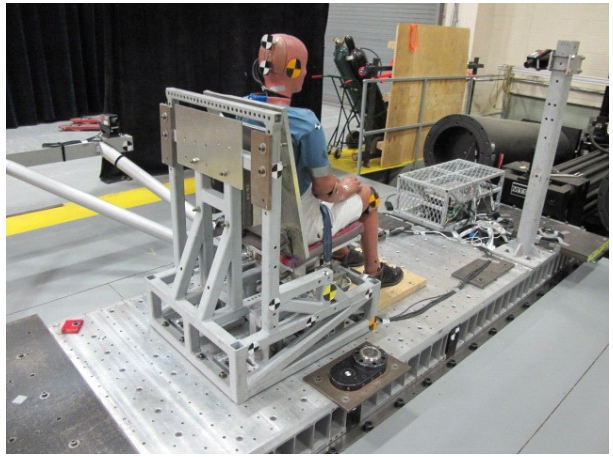
Pre-test Photos











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Doc. No.: CDL-FA14B-03-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-03

Dummy: N/A

Position: N/A

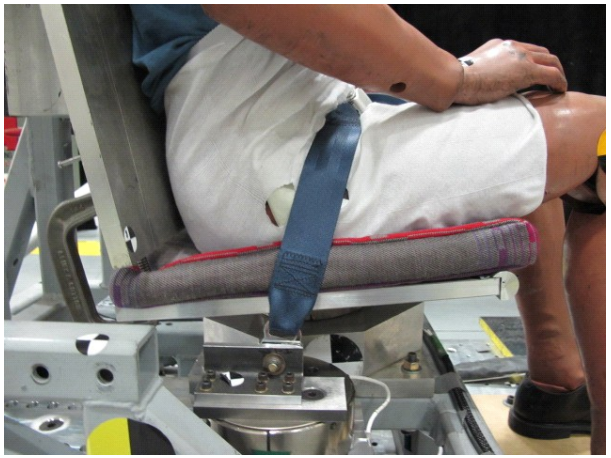
Test Description:
14 CFR 25.562 Test 2

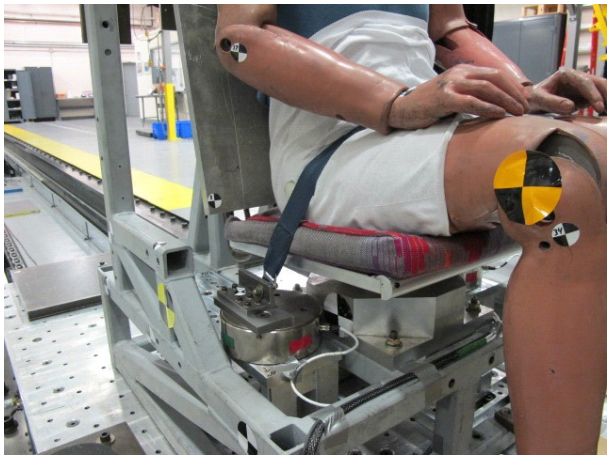
Pulse Name:
16g-07b

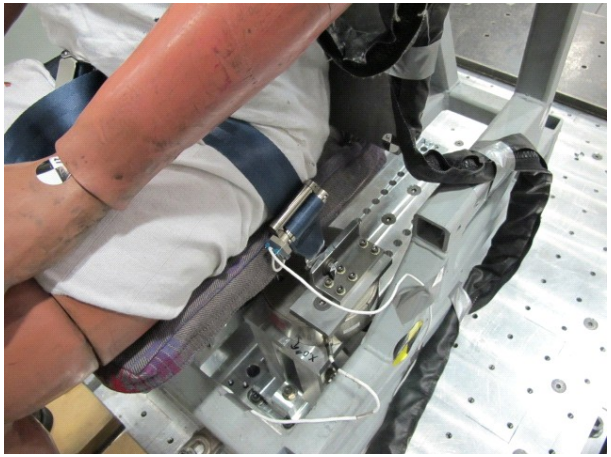
Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/21/2013 18:21

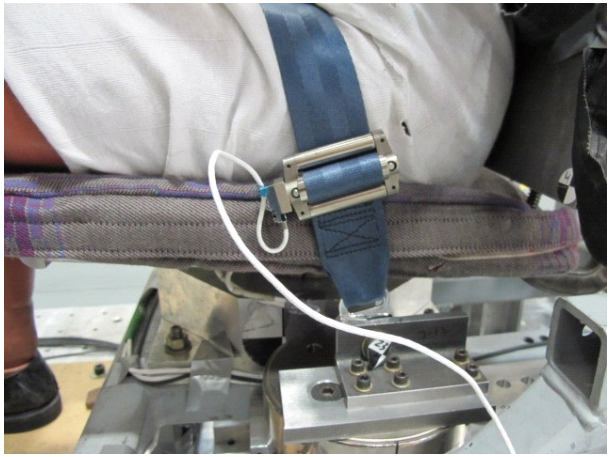
Comments:

Pre-test Photos









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www.niar.wichita.edu

Doc. No.: CDL-FA14B-03-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-03

Dummy: N/A

Position: N/A

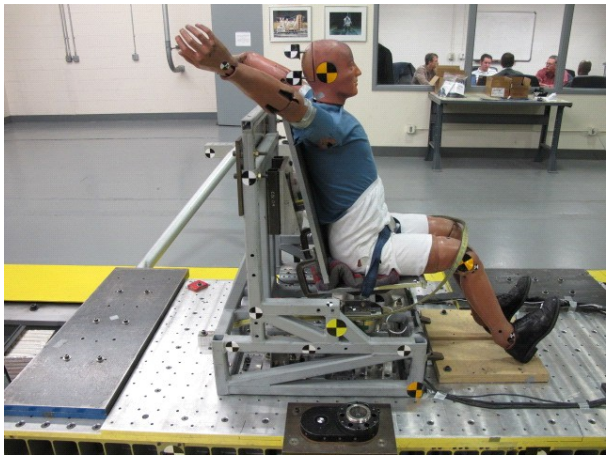
Test Description:
14 CFR 25.562 Test 2

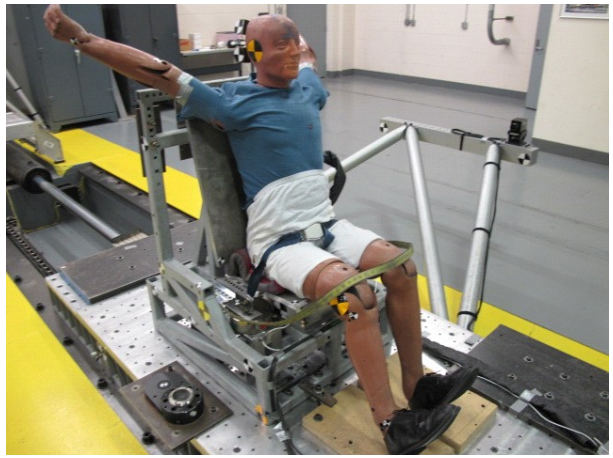
Pulse Name:
16g-07b

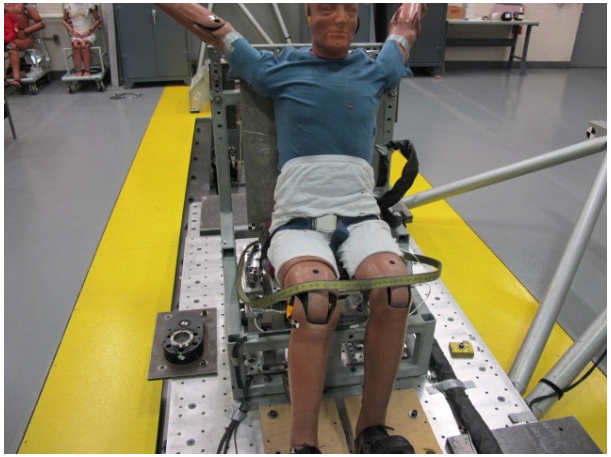
Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/21/2013 18:21

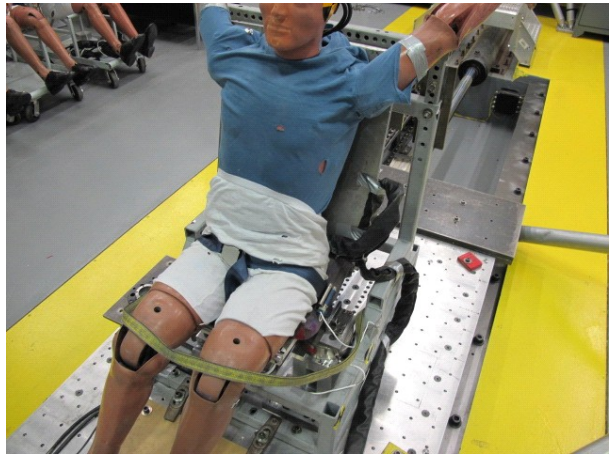
Comments:

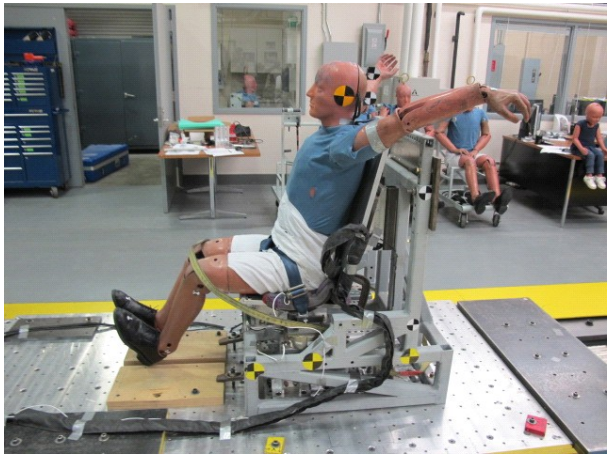
Post-test Photos

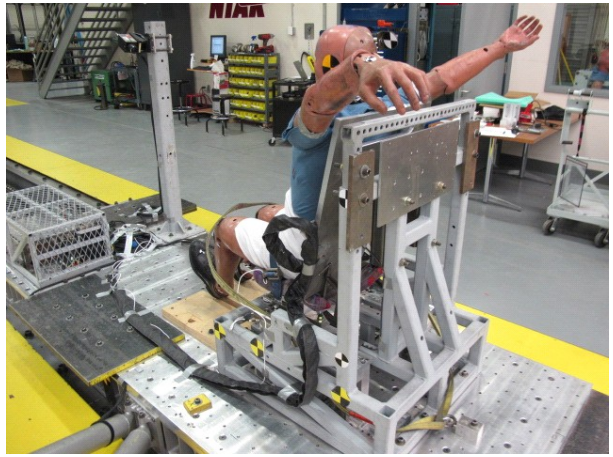












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Doc. No.: CDL-FA14B-03-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-03

Dummy: N/A

Position: N/A

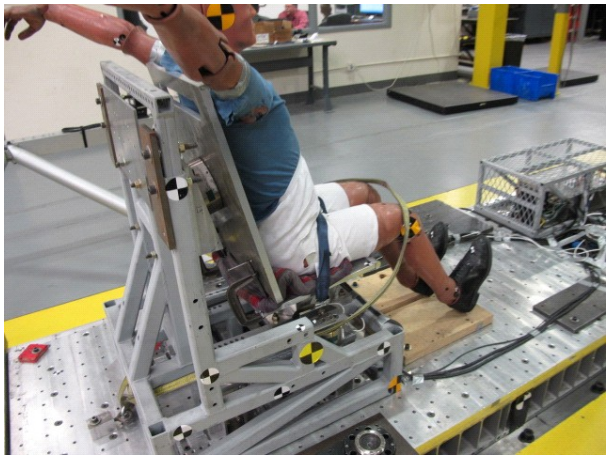
Test Description:
14 CFR 25.562 Test 2

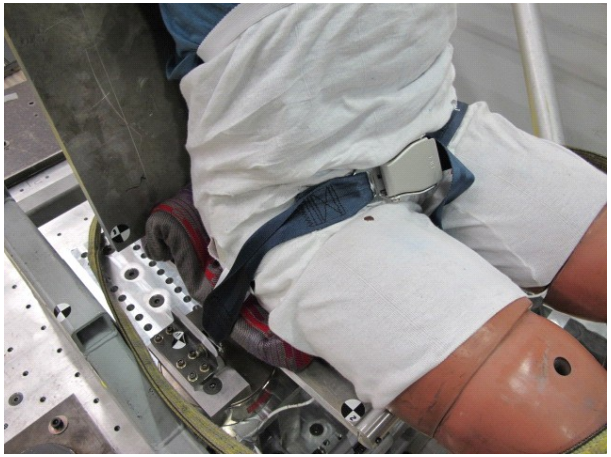
Pulse Name:
16g-07b

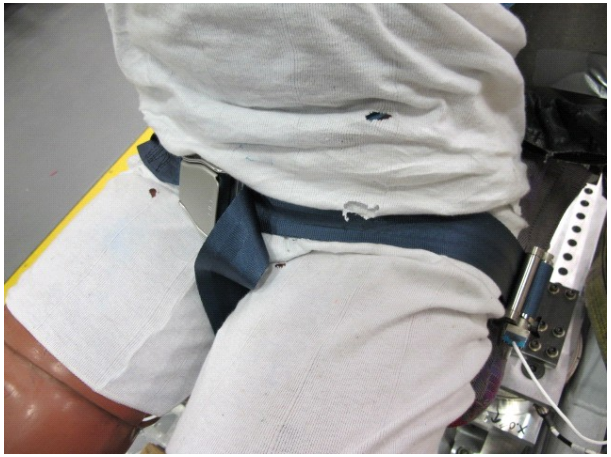
Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/21/2013 18:21

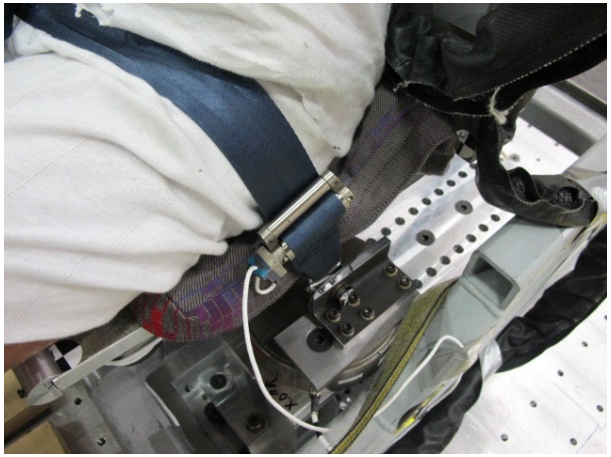
Comments:

Post-test Photos









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Doc. No.: CDL-FA14B-03-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-03

Dummy: N/A

Position: N/A

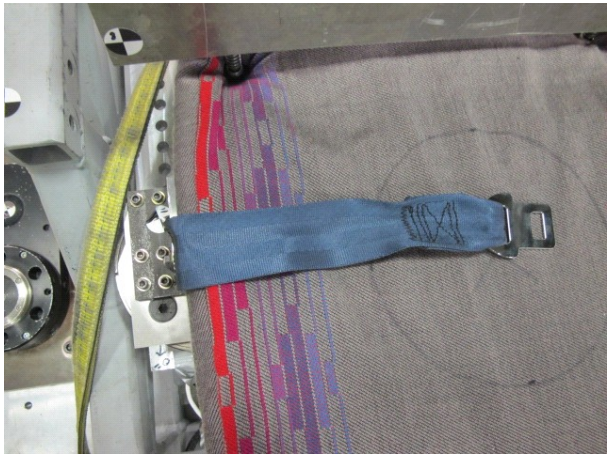
Test Description:
14 CFR 25.562 Test 2

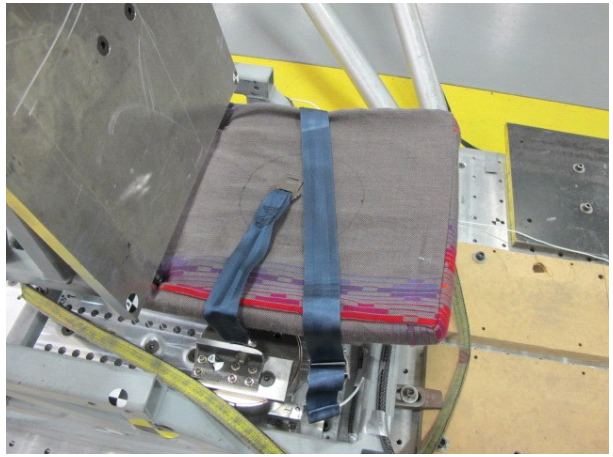
Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/21/2013 18:21

Comments:

Post-test Photos





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Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-03

Dummy: N/A

Position: N/A

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/21/2013 18:21

Comments:

CRASH DYNAMICS LABORATORY

Report No. CDL-FA14B-04-01

Requested by:

FAA

Final Test Report
FA14B-04

03/25/2014

Revision	Change	Date	Revised By
New		03/25/2014	Rob Huculak

Prepared and Reviewed by:

Rob Huculak
Laboratory Manager

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This test report is in accordance with ISO/IEC 17025:2005 requirements and all equipment standards used are traceable to the National Institute of Standards and Technology.
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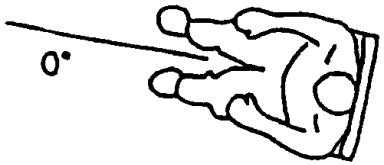
Test Summary

The dynamic test (FA14B-04) was performed for FAA in accordance with 14 CFR 25.562 Test 2 on 03/25/2014.

Pulse Parameters	Required	Result	Pass/Fail
Minimum Peak Acceleration (g)	16	16.07	PASS
Minimum Velocity Change (ft/sec)	44	45.29	PASS
Maximum Rise Time (msec)	90	88.3	PASS
Minimum Velocity Change During Rise Time (ft/sec)	22	23.24	PASS
2g Offset	--	--	PASS

Test Orientation



ATD: H2 718 **Position: Config 2 - Repaired Belt**

Measured Seat Belt Angle	Measured Seat Belt Offset
73.89 deg	0.25 in

0 deg

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Doc. No.: CDL-FA14B-04-01

Version: New

Report Date: 03/25/2014

Customer: FAA

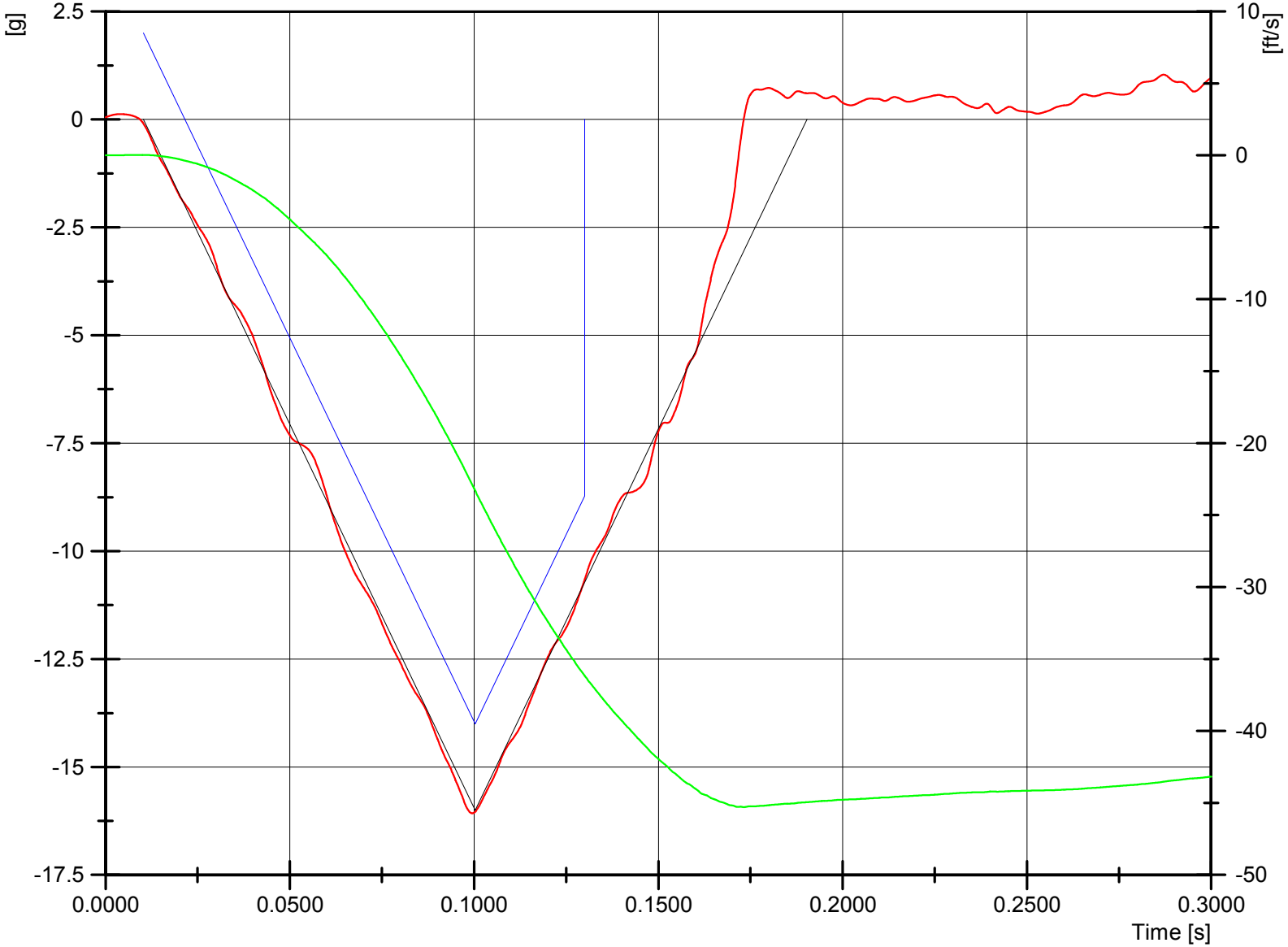
Test: FA14B-04

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 08:34

Temperature	Relative Humidity
73.5°F	27.5%



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Doc. No.: CDL-FA14B-04-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-04

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 08:34

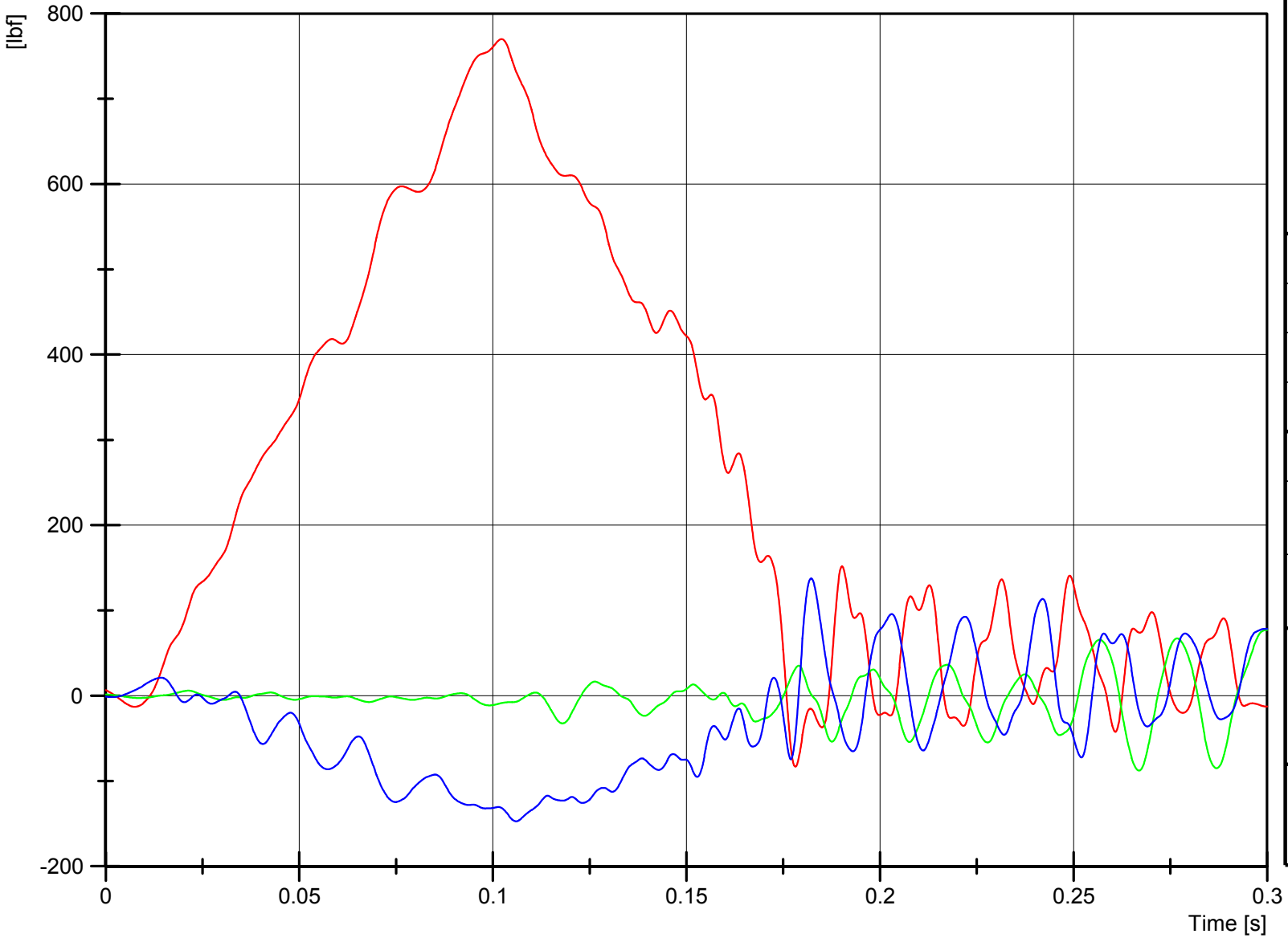
Comments:

Sled Acceleration | Sled Velocity | Ideal Pulse | Upper Limit

Maximum: 1.03 g Time: 0.2871 sec.
Minimum: -16.07 g Time: 0.0995 sec.
CFC: 60
Sensor Type: ENDEVCO 7290A-100
S/N: 29924
Sensitivity: 0.01919 V/EU
Cal. Due: 06/11/2014
Full Scale: 100 g
DAS Channel: 50
Ref. No.: 1
Polarity: R

Minimum: -45.29 ft/s Time: 0.1732 sec.

Pulse Requirement		Actual
Minimum Required Peak Acceleration:	16 g	16.07 g
Minimum Overall Velocity Change:	44 ft/s	45.29 ft/s
Maximum Rise Time:	90 msec	88.3 msec
Minimum Velocity Change Before Greq:	22 ft/s	23.24 ft/s



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Doc. No.: CDL-FA14B-04-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-04

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 08:34

Comments:

Rigid Seat Seat Back Fx

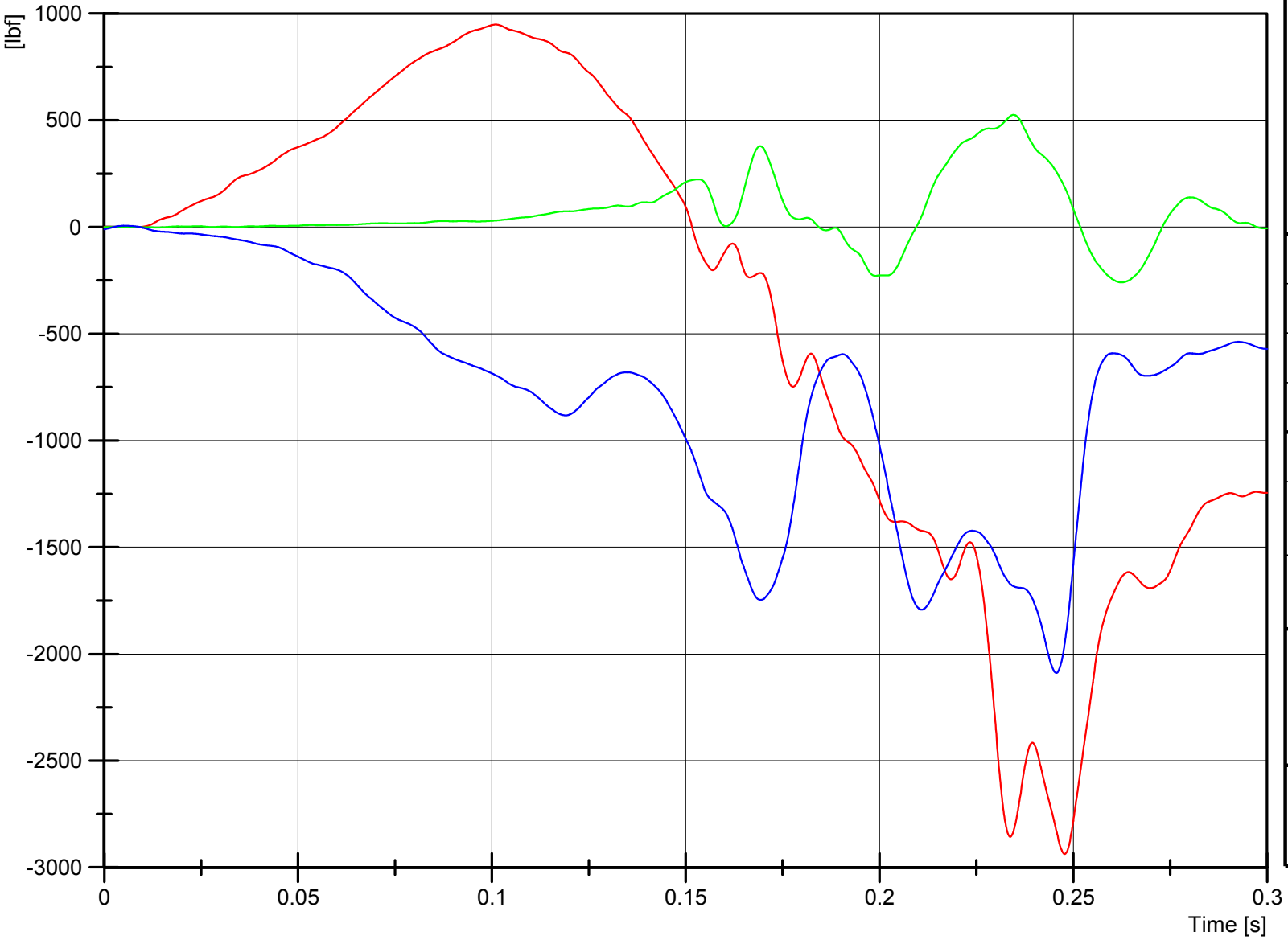
Maximum: 770.12 lbf Time: 0.1025 sec.
Minimum: -83.32 lbf Time: 0.1783 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC084FZ
Sensitivity: 1.176E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 12
Ref. No.: 15
Polarity: N

Rigid Seat Seat Back Fy

Maximum: 77.2206 lbf Time: 0.3001 sec.
Minimum: -87.77 lbf Time: 0.2671 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC084FY
Sensitivity: 2.733E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 11
Ref. No.: 14
Polarity: N

Rigid Seat Seat Back Fz

Maximum: 137.65 lbf Time: 0.1824 sec.
Minimum: -147.02 lbf Time: 0.1062 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC084FX
Sensitivity: 2.74E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 10
Ref. No.: 13
Polarity: R



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Doc. No.: CDL-FA14B-04-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-04

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 08:34

Comments:

Rigid Seat Seat Pan Fx

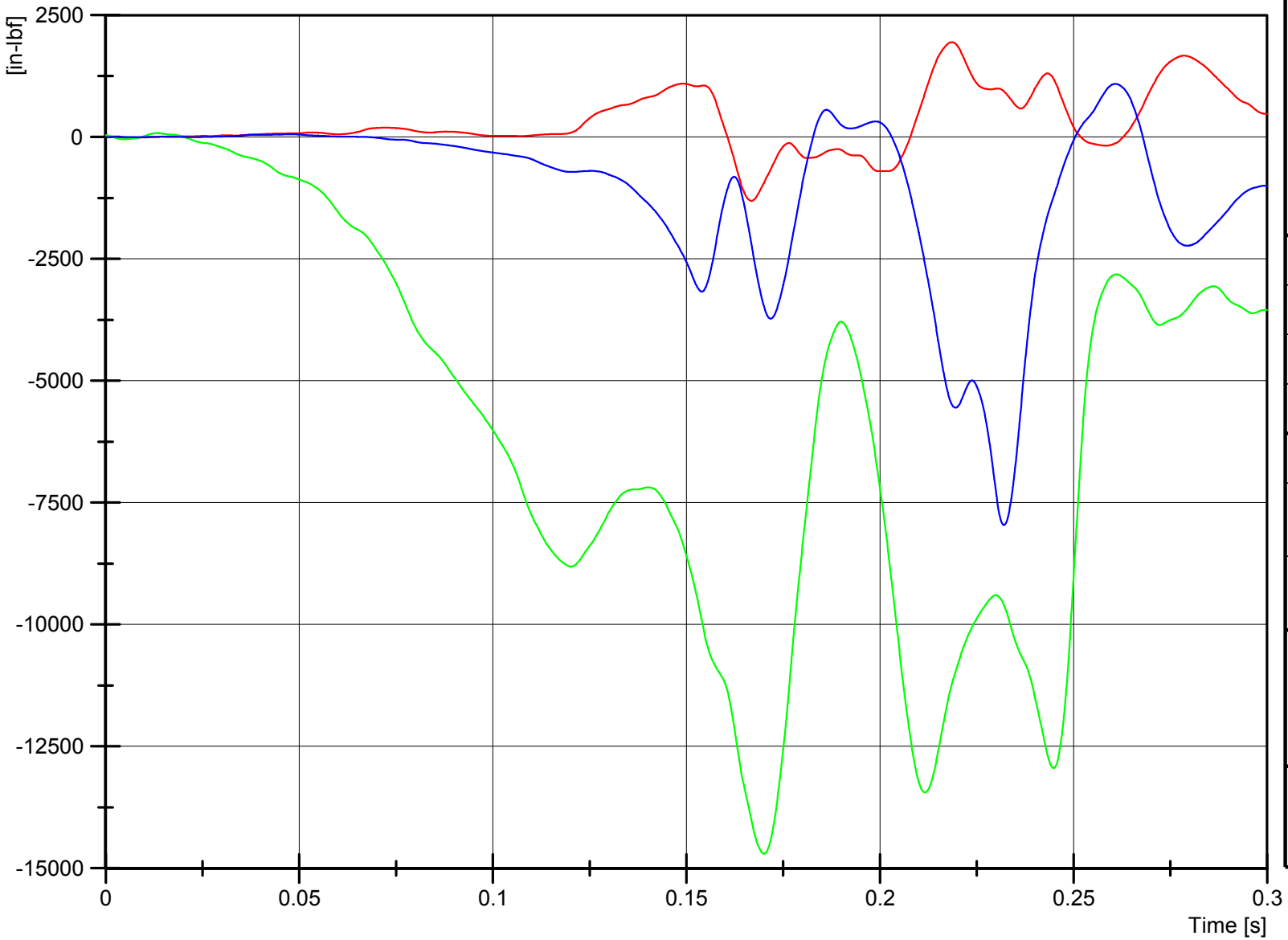
Maximum: 948.53 lbf Time: 0.1012 sec.
Minimum: -2.94E+03 lbf Time: 0.248 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083FX
Sensitivity: 2.768E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 13
Ref. No.: 10
Polarity: N

Rigid Seat Seat Pan Fy

Maximum: 525.45 lbf Time: 0.2348 sec.
Minimum: -259.13 lbf Time: 0.2626 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083FY
Sensitivity: 2.764E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 14
Ref. No.: 11
Polarity: N

Rigid Seat Seat Pan Fz

Maximum: 5.9658 lbf Time: 0.0055 sec.
Minimum: -2.09E+03 lbf Time: 0.2458 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083FZ
Sensitivity: 1.181E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 15
Ref. No.: 12
Polarity: N



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Doc. No.: CDL-FA14B-04-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-04

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 08:34

Comments:

Rigid Seat Seat Pan Mx

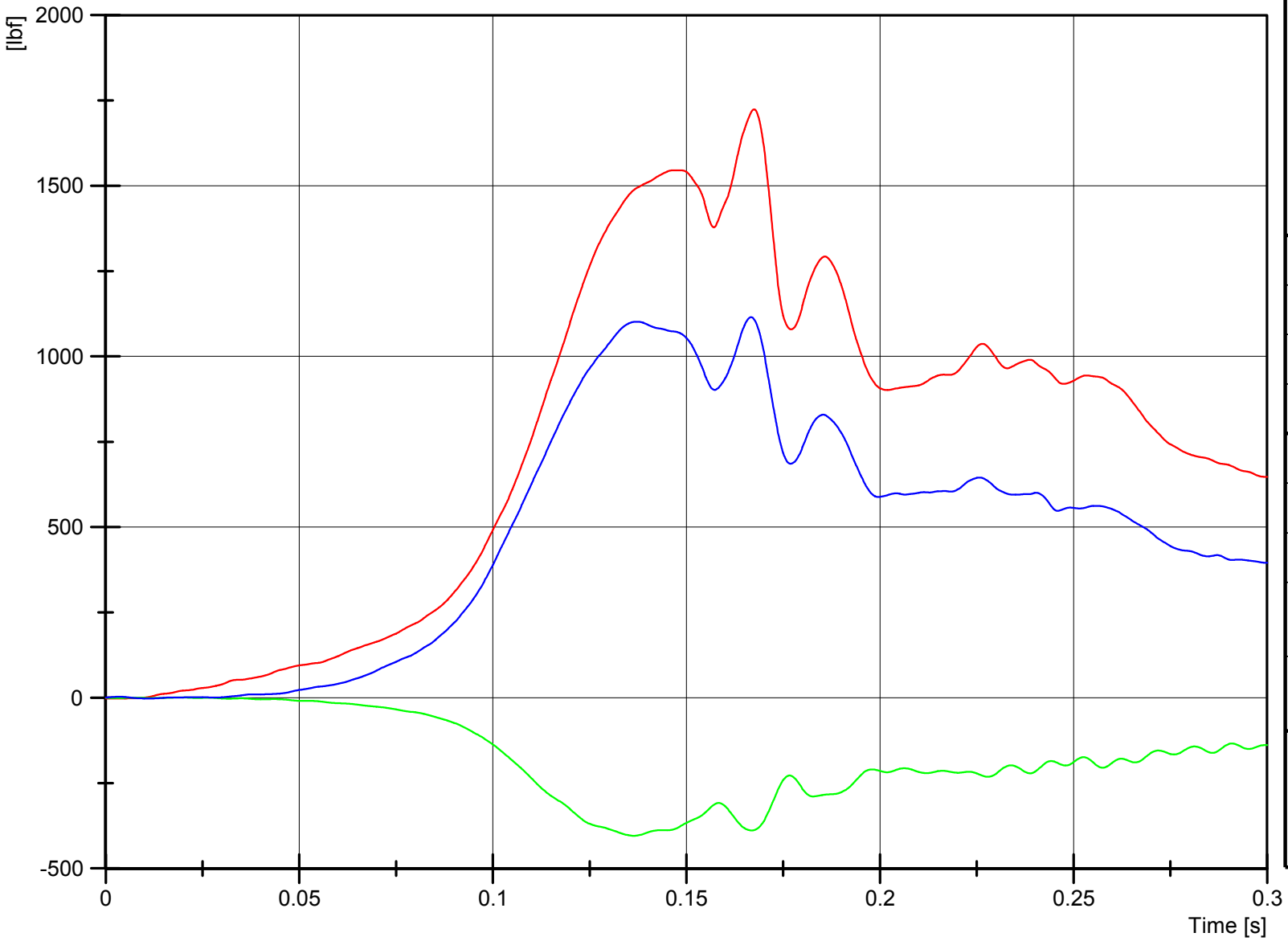
Maximum: 1947.52 in-lbf Time: 0.2188 sec.
Minimum: -1.31E+03 in-lbf Time: 0.167 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083MX
Sensitivity: 7.03E-08 V/EU
Cal. Due: 02/13/2014
Full Scale: 25000 in-lbf
DAS Channel: 16
Ref. No.: 7
Polarity: N

Rigid Seat Seat Pan My

Maximum: 80.3958 in-lbf Time: 0.0134 sec.
Minimum: -1.47E+04 in-lbf Time: 0.1703 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083MY
Sensitivity: 7.05E-08 V/EU
Cal. Due: 02/13/2014
Full Scale: 25000 in-lbf
DAS Channel: 17
Ref. No.: 8
Polarity: N

Rigid Seat Seat Pan Mz

Maximum: 1091.23 in-lbf Time: 0.261 sec.
Minimum: -7.96E+03 in-lbf Time: 0.2322 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083MZ
Sensitivity: 9.32E-08 V/EU
Cal. Due: 02/13/2014
Full Scale: 20000 in-lbf
DAS Channel: 18
Ref. No.: 9
Polarity: N



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Doc. No.: CDL-FA14B-04-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-04

Dummy: H2 718

Position: Config 2 - Repaired Belt

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 08:34

Rigid Seat Right Lap Fx

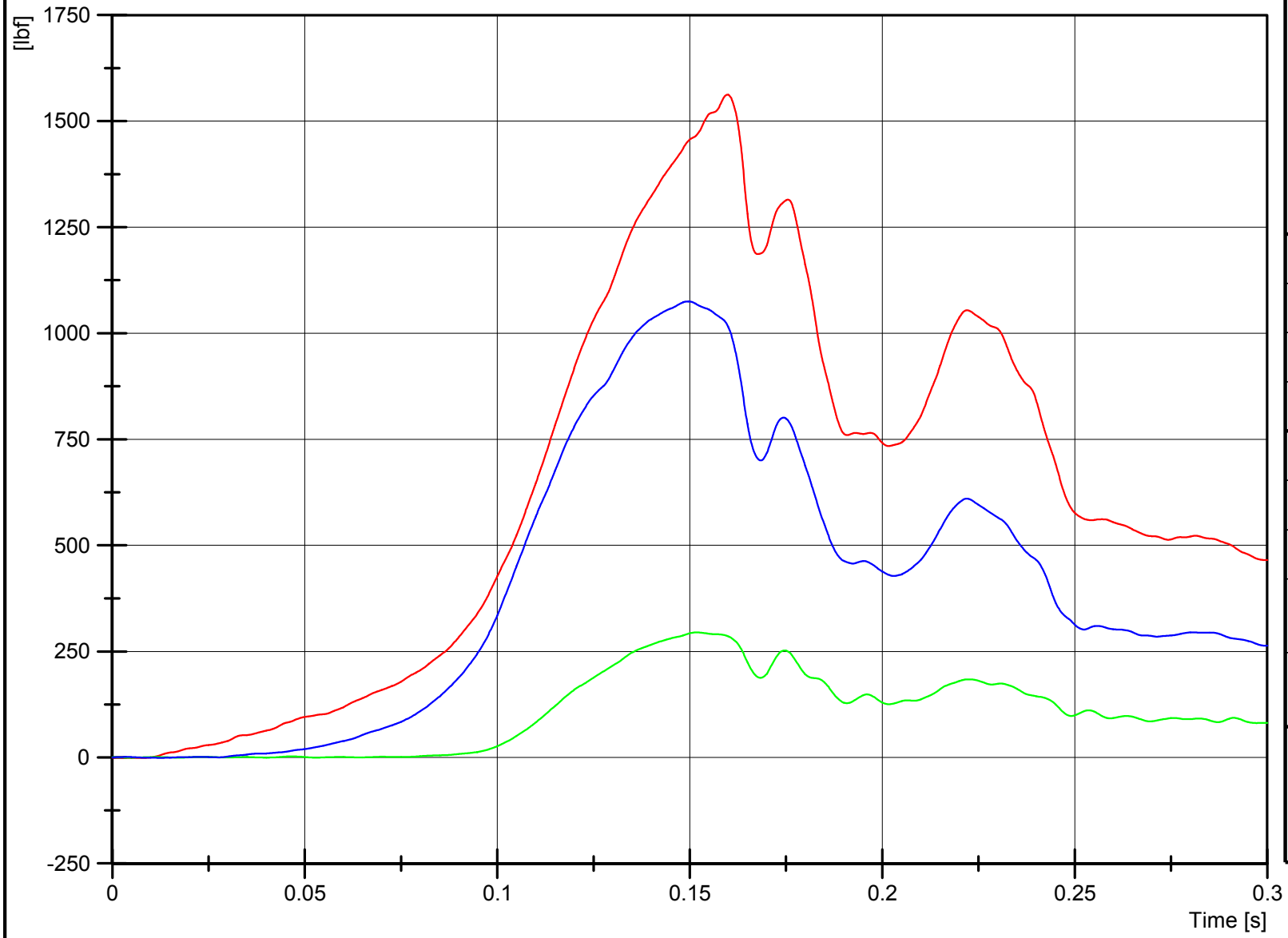
Maximum: 1724.25 lbf Time: 0.1677 sec.
Minimum: -2.0618 lbf Time: 0 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC093FX
Sensitivity: 2.587E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 22
Ref. No.: 74
Polarity: N

Rigid Seat Right Lap Fy

Maximum: 1.109 lbf Time: 0.0197 sec.
Minimum: -404.54 lbf Time: 0.1366 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC093FY
Sensitivity: 2.572E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 23
Ref. No.: 75
Polarity: N

Rigid Seat Right Lap Fz

Maximum: 1115.28 lbf Time: 0.1669 sec.
Minimum: -1.6645 lbf Time: 0.0116 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC093FZ
Sensitivity: 1.044E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 24
Ref. No.: 76
Polarity: N



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Doc. No.: CDL-FA14B-04-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-04

Dummy: H2 718

Position: Config 2 - Repaired Belt

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 08:34

Rigid Seat Left Lap Fx

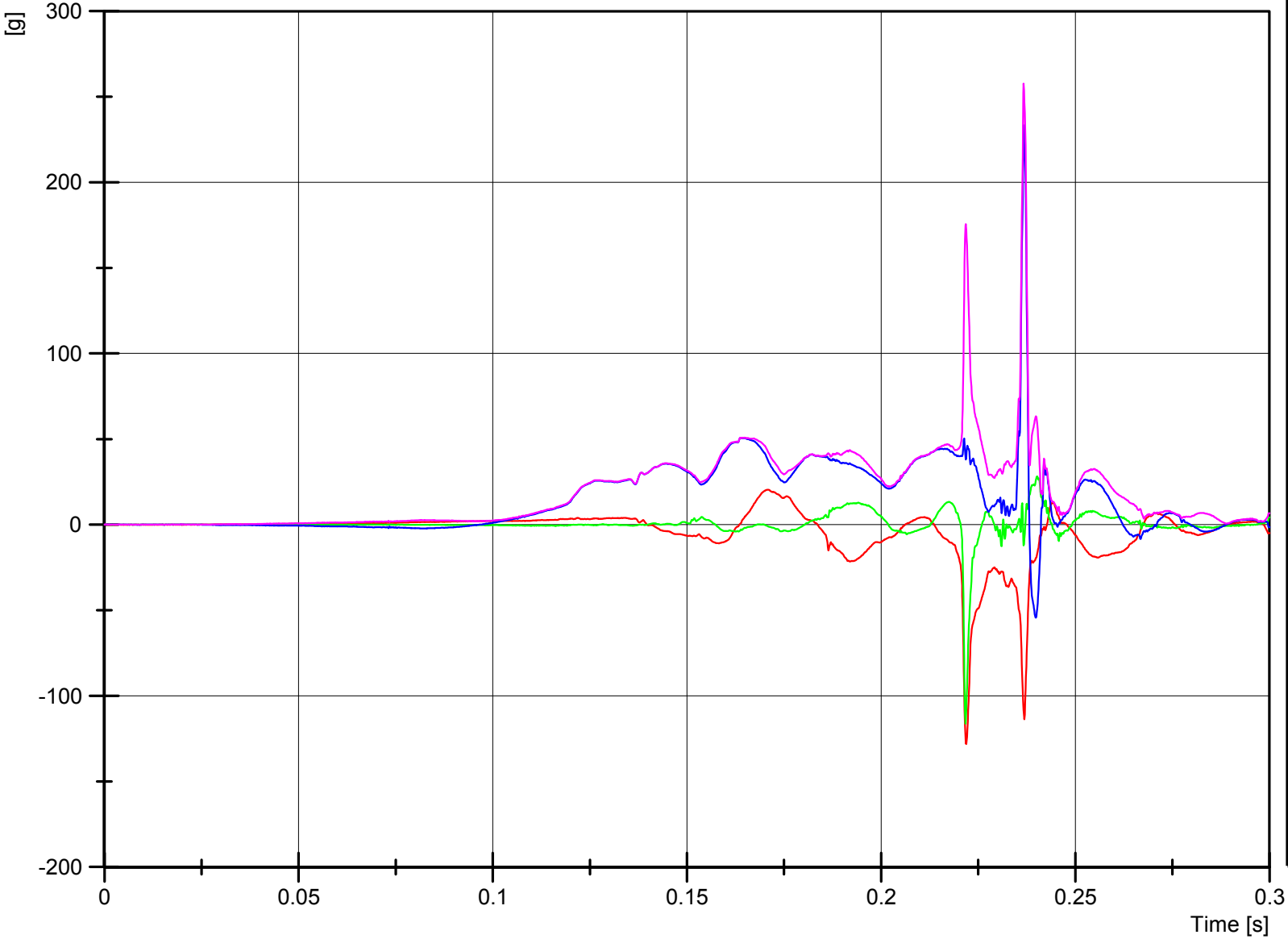
Maximum: 1562.60 lbf Time: 0.16 sec.
Minimum: -1.0904 lbf Time: 0.0053 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC094FX
Sensitivity: 2.587E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 19
Ref. No.: 77
Polarity: N

Rigid Seat Left Lap Fy

Maximum: 294.675 lbf Time: 0.152 sec.
Minimum: -0.5764 lbf Time: 0.0176 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC094FY
Sensitivity: 2.572E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 20
Ref. No.: 78
Polarity: N

Rigid Seat Left Lap Fz

Maximum: 1074.89 lbf Time: 0.1498 sec.
Minimum: -0.8963 lbf Time: 0.0127 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC094FZ
Sensitivity: 1.044E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 21
Ref. No.: 79
Polarity: N



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Doc. No.: CDL-FA14B-04-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-04

Dummy: H2 718

Position: Config 2 - Repaired Belt

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 08:34

Head Ax H2 718

Maximum: 20.4503 g Time: 0.1709 sec.
Minimum: -128.20 g Time: 0.2221 sec.
CFC: 1000
Sensor Type: Endevco 7264C
S/N: P47932
Sensitivity: 2.157E-05 V/EU
Cal. Due: 09/25/2014
Full Scale: 2000 g
DAS Channel: 25
Ref. No.: 22
Polarity: R

Head Ay H2 718

Maximum: 28.1424 g Time: 0.2404 sec.
Minimum: -116.27 g Time: 0.2219 sec.
CFC: 1000
Sensor Type: Endevco 7264C
S/N: P48149
Sensitivity: 2.603E-05 V/EU
Cal. Due: 09/25/2014
Full Scale: 2000 g
DAS Channel: 26
Ref. No.: 23
Polarity: R

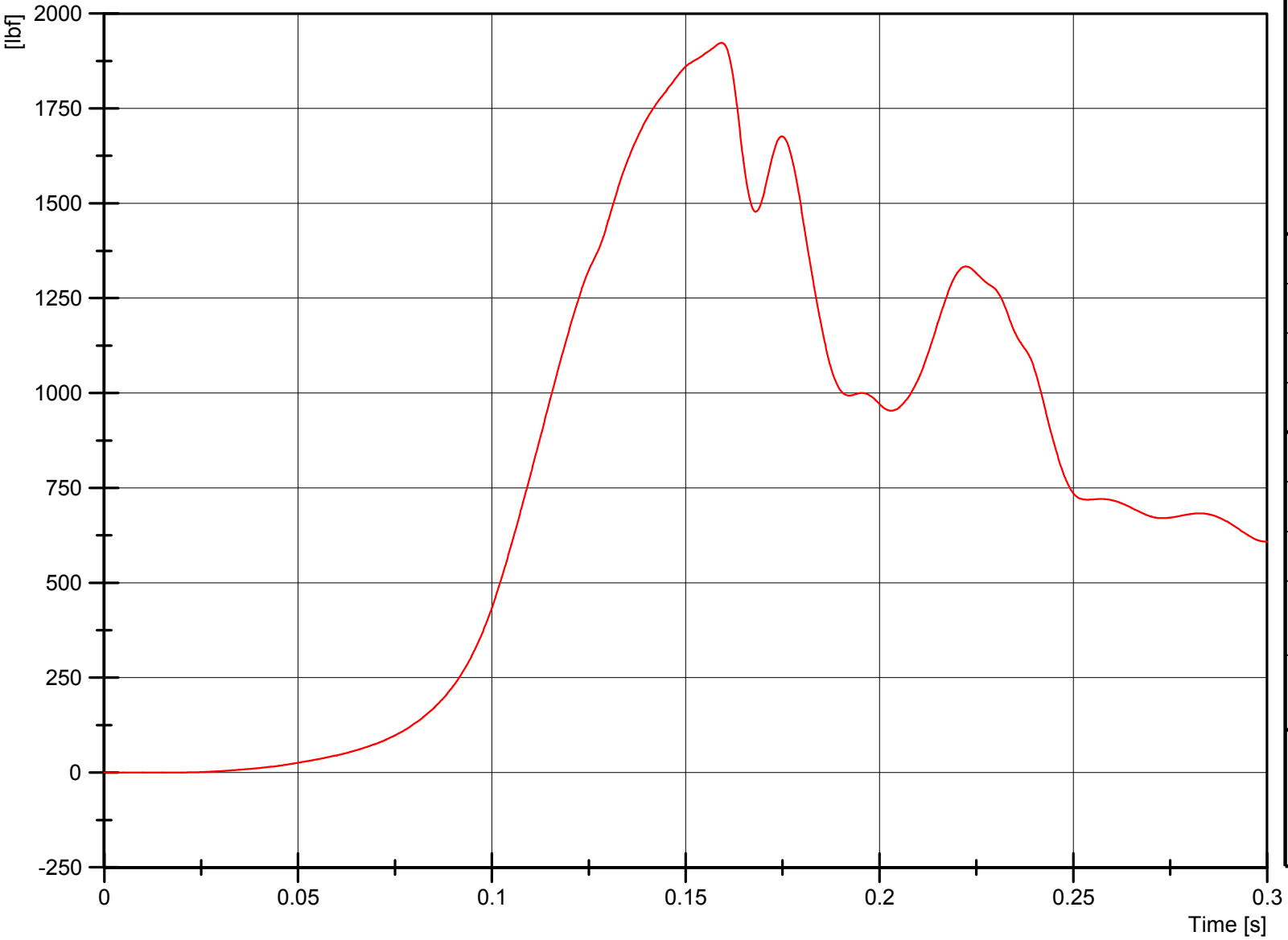
Head Az H2 718

Maximum: 233.45 g Time: 0.2369 sec.
Minimum: -54.34 g Time: 0.24 sec.
CFC: 1000
Sensor Type: Endevco 7264C
S/N: P60367
Sensitivity: 1.782E-05 V/EU
Cal. Due: 09/25/2014
Full Scale: 2000 g
DAS Channel: 27
Ref. No.: 24
Polarity: R

Head Resultant H2 718

Maximum: 257.74 g Time: 0.2367 sec.

HIC: 1288.7
T1: 125.1 msec.
T2: 243.1 msec.



Lap Belt Force H2 718

Maximum: 1922.50 lbf Time: 0.1595 sec.
Minimum: -0.0294 lbf Time: 0.0102 sec.
CFC: 60
Sensor Type: Denton 3255
S/N: SBLC086
Sensitivity: 6.6006E-07 V/EU
Cal. Due: 05/16/2014
Full Scale: 3000 lbf
DAS Channel: 36
Ref. No.: 17
Polarity: N

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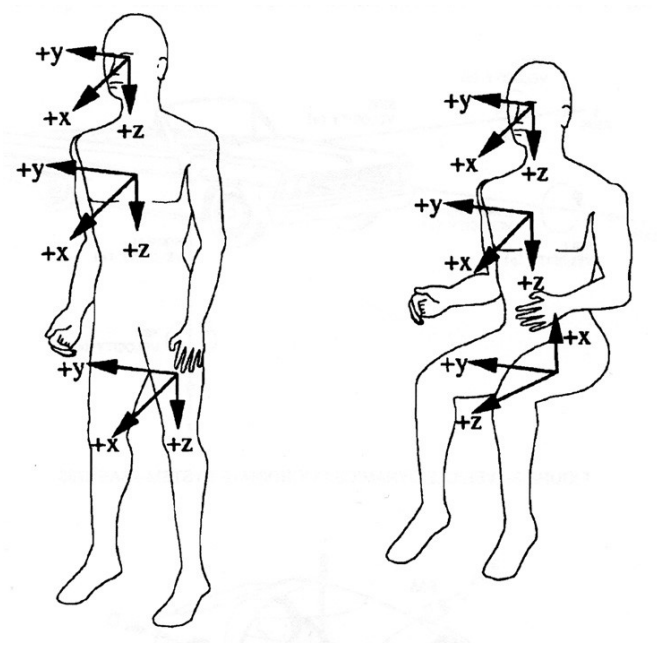
J211/1 Sign Conventions



Upper Neck Load Cell:
+FX Head rearward, chest forward
+FY Head leftward, chest rightward
+FZ Head upward, chest downward
+MX Left ear toward left shoulder
+MY Chin toward sternum
+MZ Chin toward left shoulder

Lumbar Load Cell:
+FX Chest rearward, pelvis forward
+FY Chest leftward, pelvis rightward
+FZ Chest upward, pelvis downward
+MX Left shoulder toward left hip
+MY Sternum toward front of legs
+MZ Right shoulder forward, left shoulder rearward

Femur Load Cells:
+FZ Tension

Chest Displacement:
-DX Compression

Rib Dispacement:
-DY Compression

Belt Load Cells:
+FX Tension

Floor Load Cells:
+FX Test article forward
+FY Test article right
+FZ Test article up

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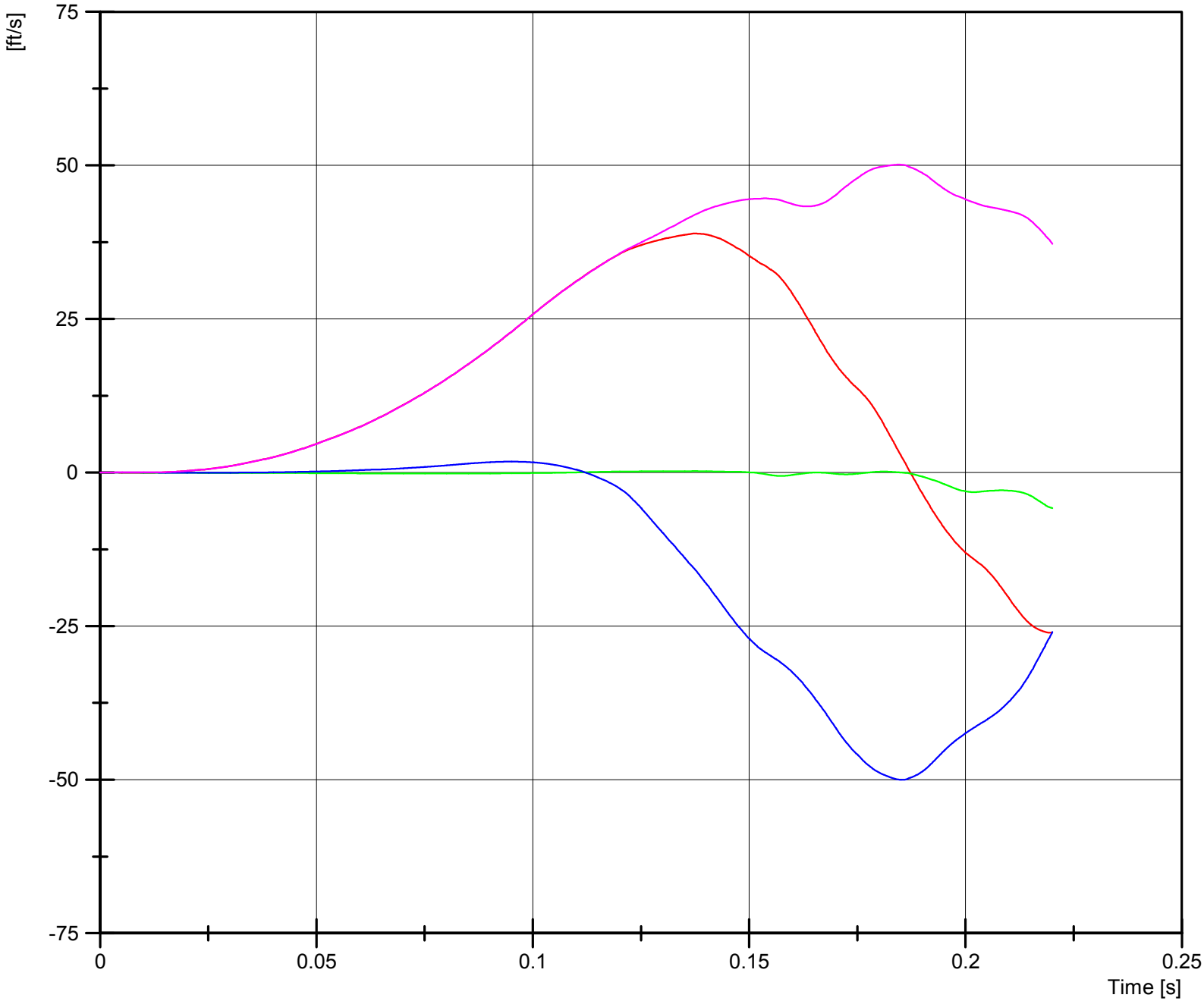

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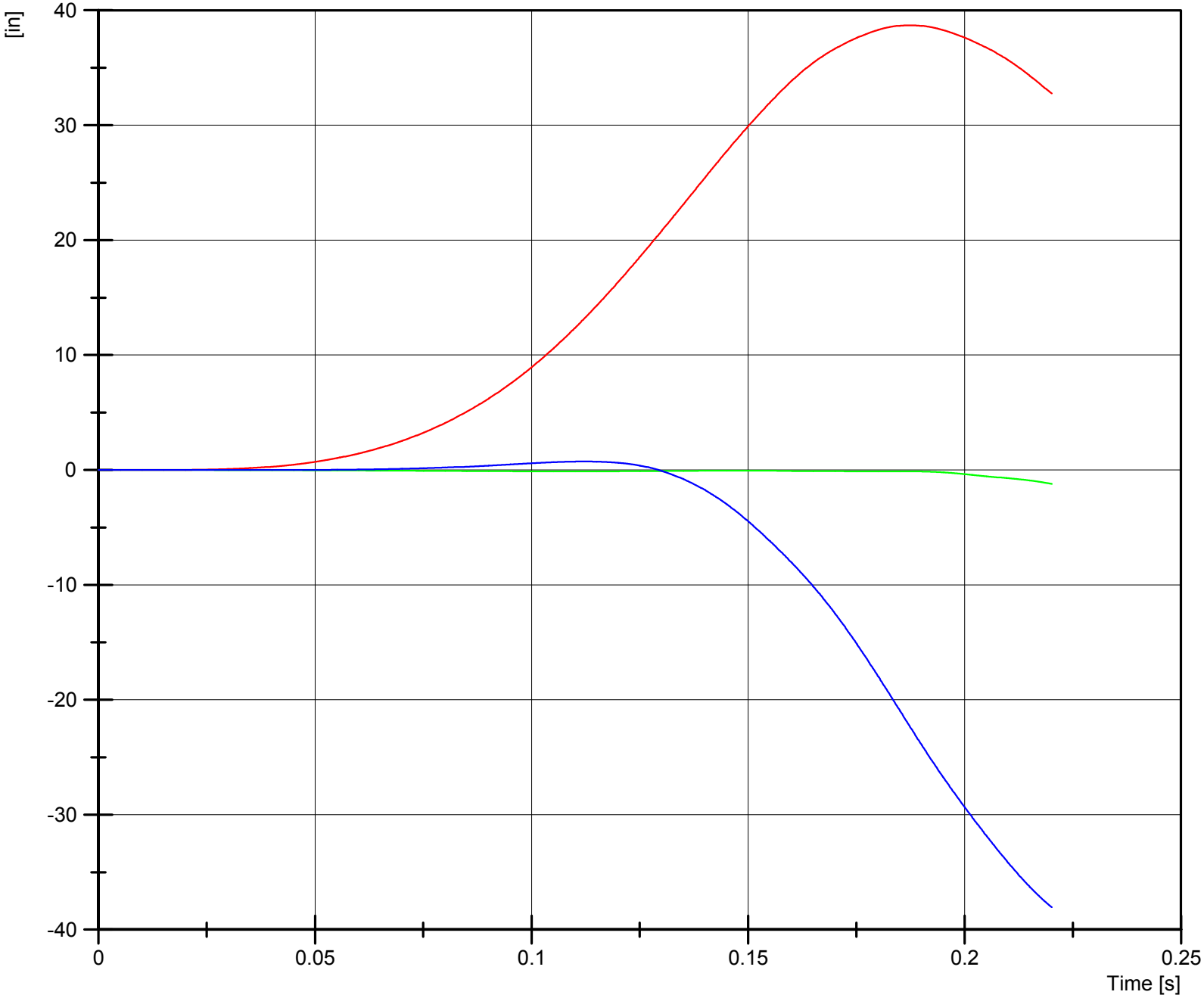
Comments:

Global Head Vx H2 718		Global Head Vy H2 718		Global Head Vz H2 718		Global Head Velocity Resultant H2 718	
Maximum: 38.92 ft/s	Time: 0.1374 sec.	Maximum: 0.215 ft/s	Time: 0.1375 sec.	Maximum: 1.77 ft/s	Time: 0.0948 sec.	Maximum: 50.10 ft/s	Time: 0.1846 sec.
Minimum: -26.06 ft/s	Time: 0.2195 sec.	Minimum: -5.78 ft/s	Time: 0.2201 sec.	Minimum: -50.01 ft/s	Time: 0.1854 sec.	Minimum: 0 ft/s	Time: 0.0001 sec.



Global Head Dx H2 718 | Global Head Dy H2 718 | Global Head Dz H2 718

Maximum: 38.70 in	Time: 0.1874 sec.	Maximum: 0.00 in	Time: 0.0001 sec.	Maximum: 0.74 in	Time: 0.1122 sec.
Minimum: -0.00 in	Time: 0.0137 sec.	Minimum: -1.21 in	Time: 0.2201 sec.	Minimum: -38.04 in	Time: 0.2201 sec.

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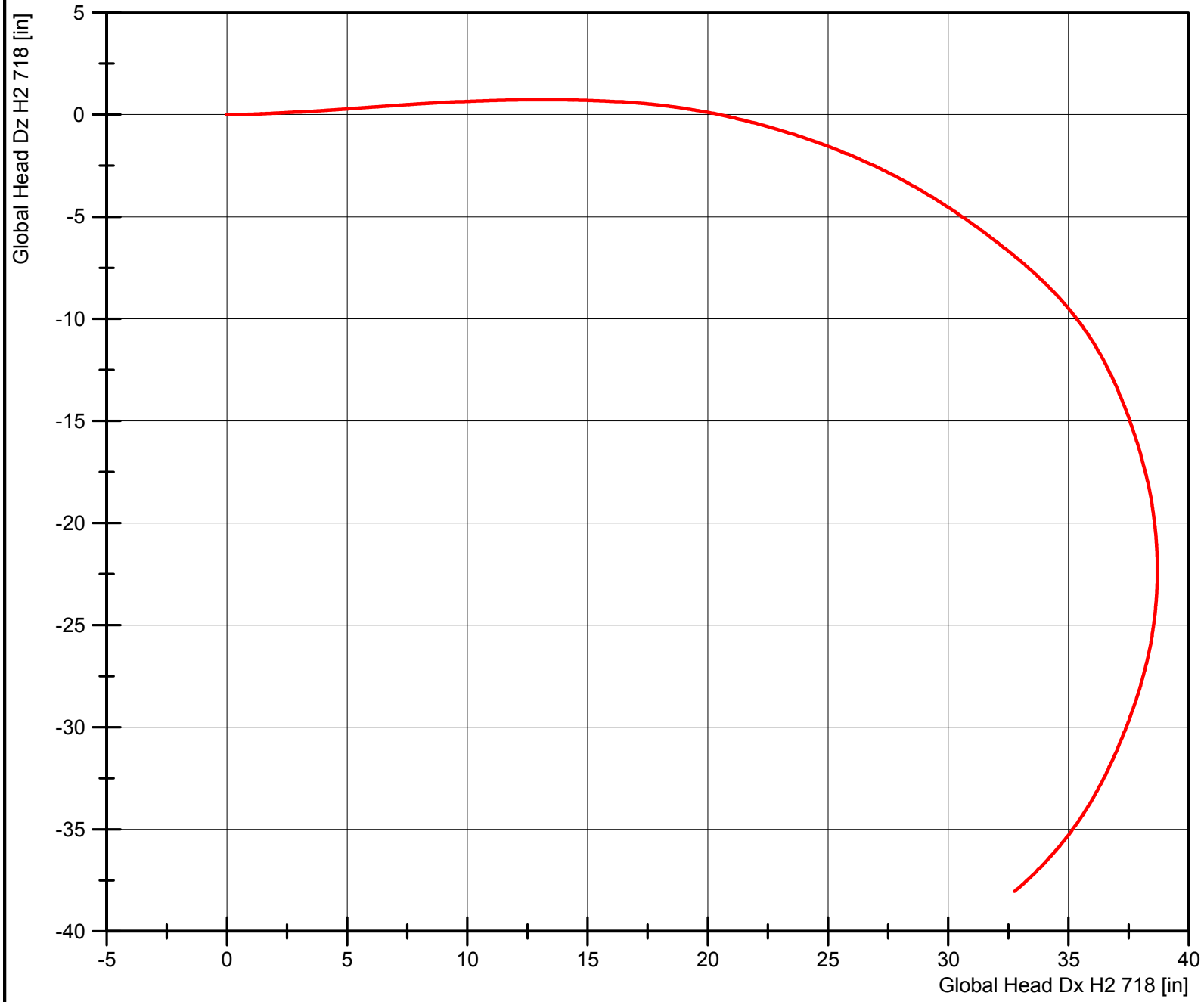
Test Date/Time: 11/22/2013 08:34

Comments:

Displacement values are calculated from Head Accelerations and Angular Velocities.
This method cannot be used to substitute photometric analysis.



Global Head Displacement XZ

X Maximum: 38.70 in **Time: 0.1874 sec.**

Z Value at X Maximum: -22.34 in

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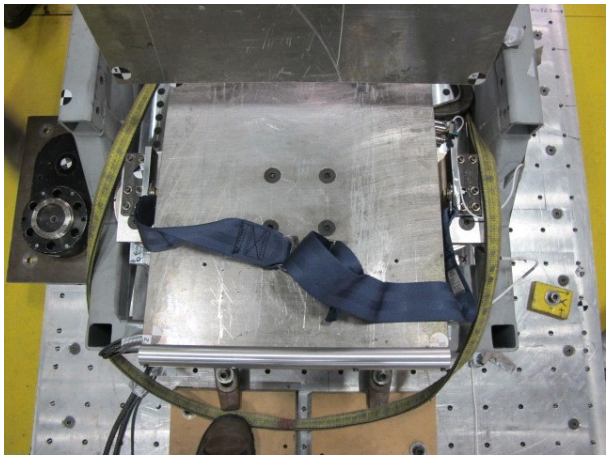
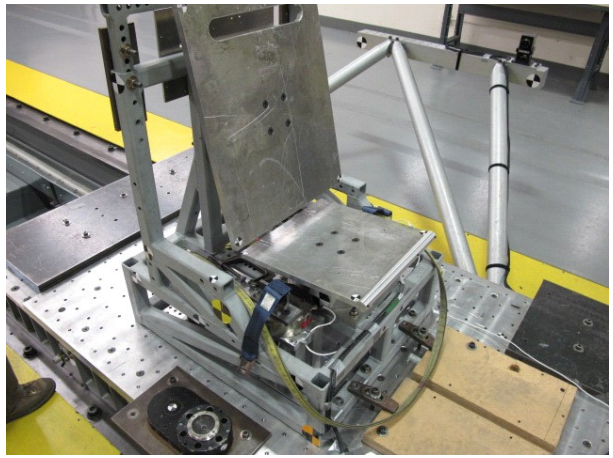
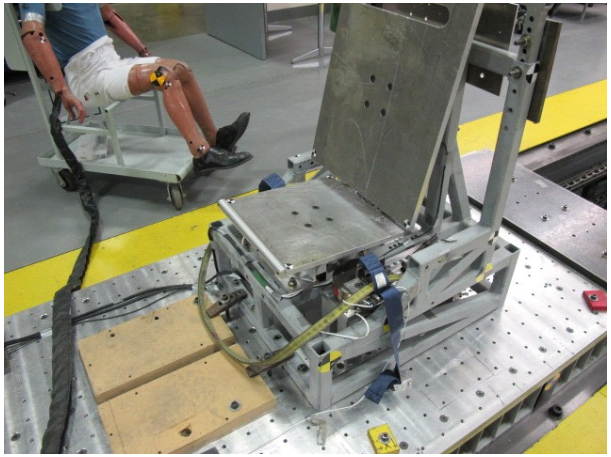
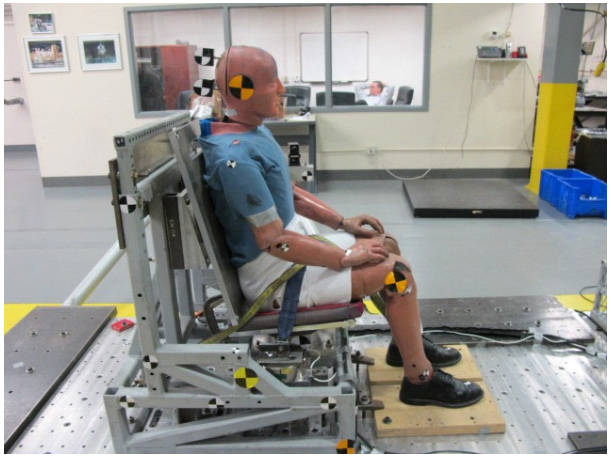
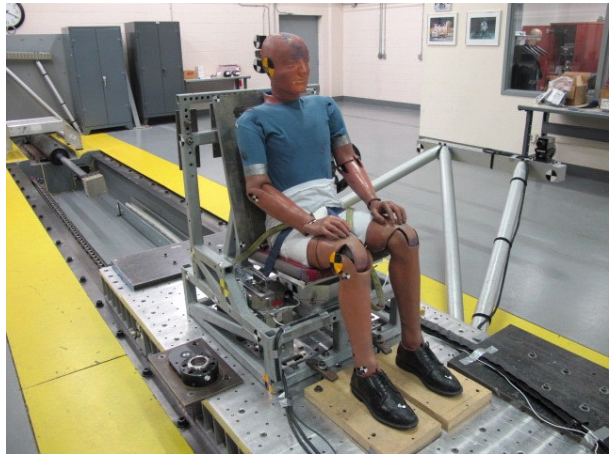
Pre-test Photos











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Dummy: N/A

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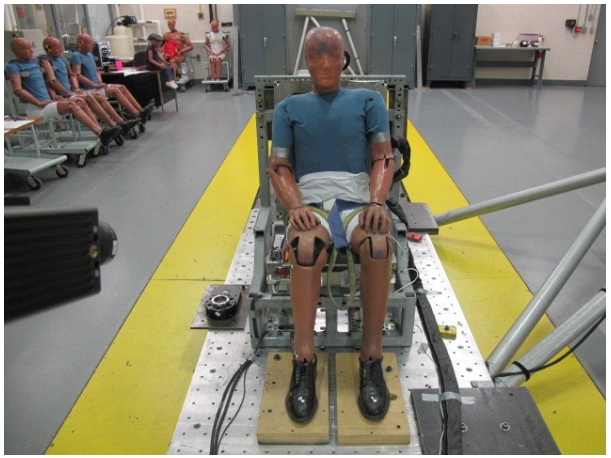

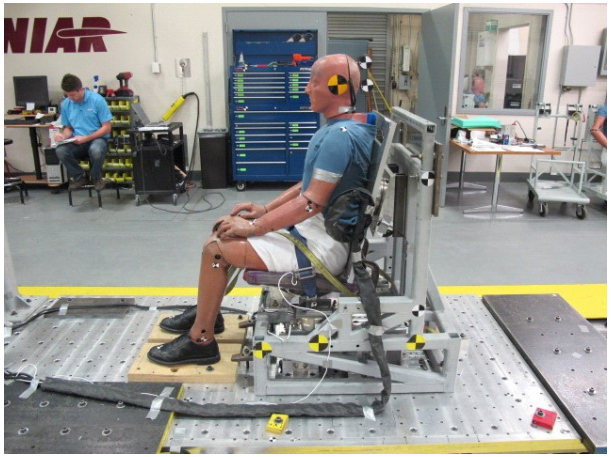

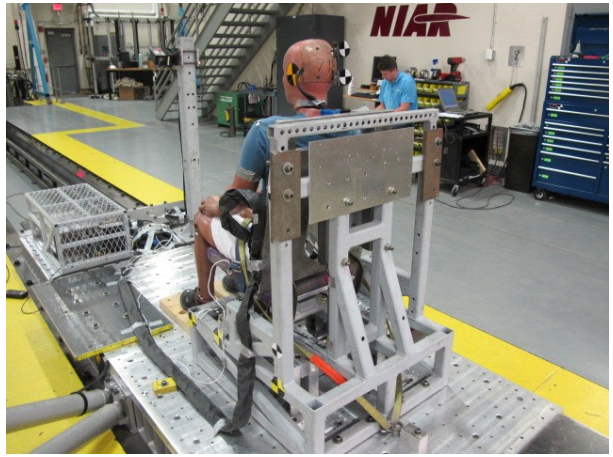

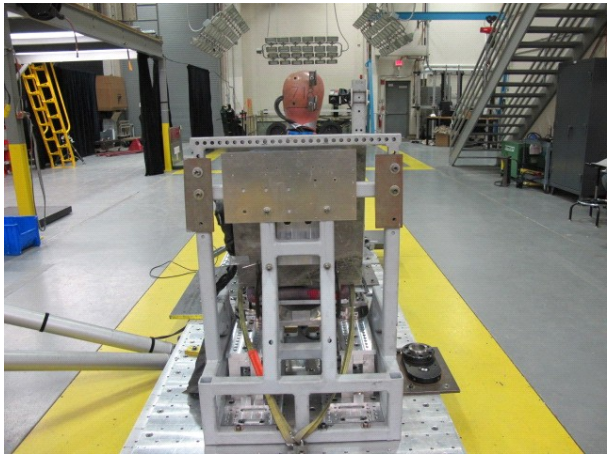

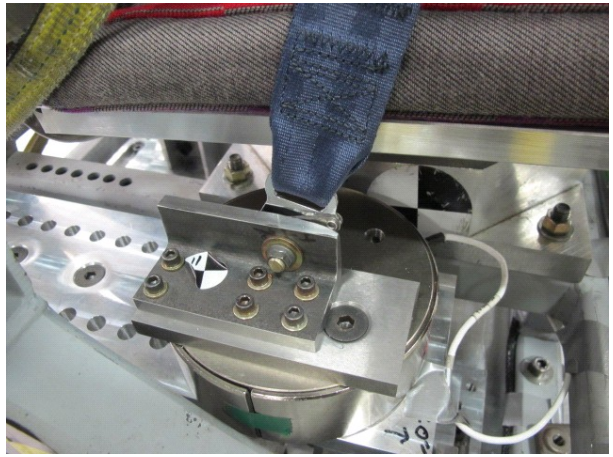

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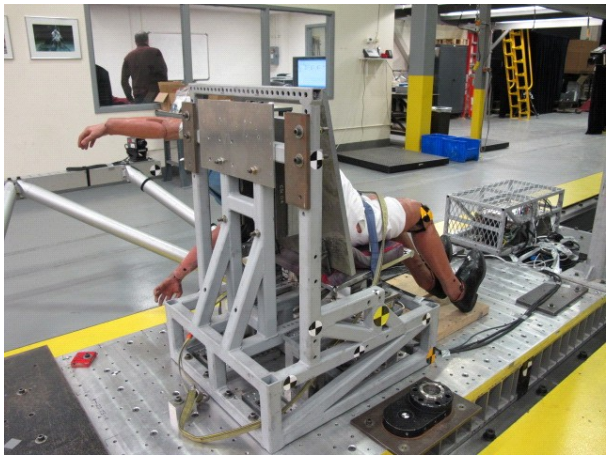

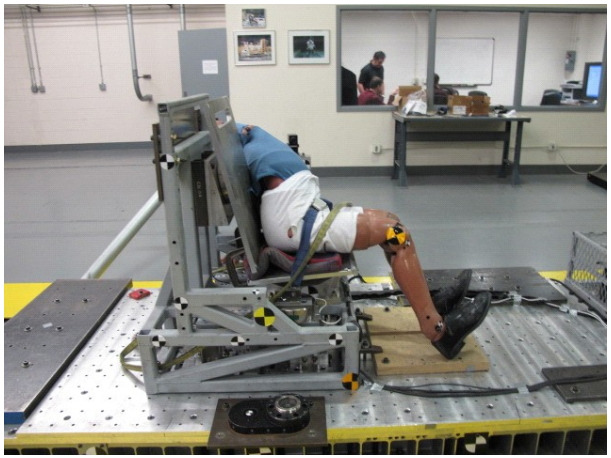

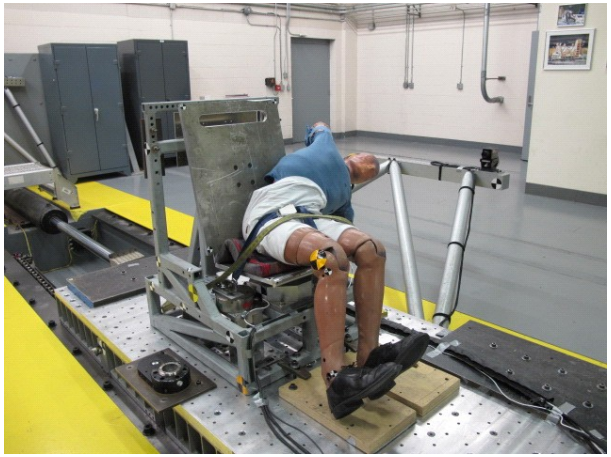

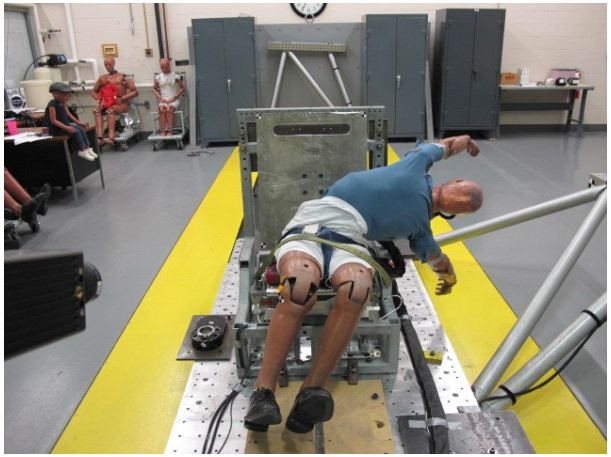

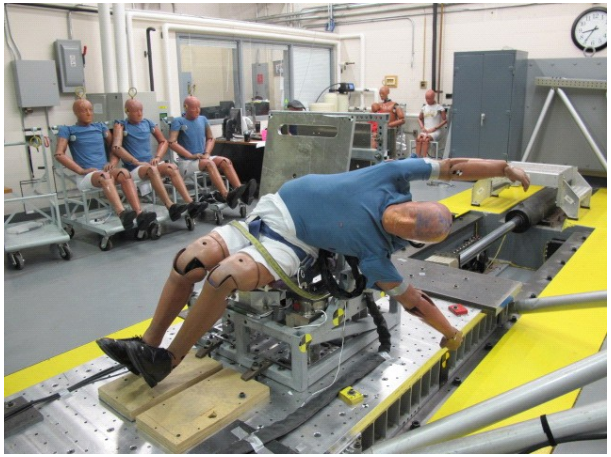

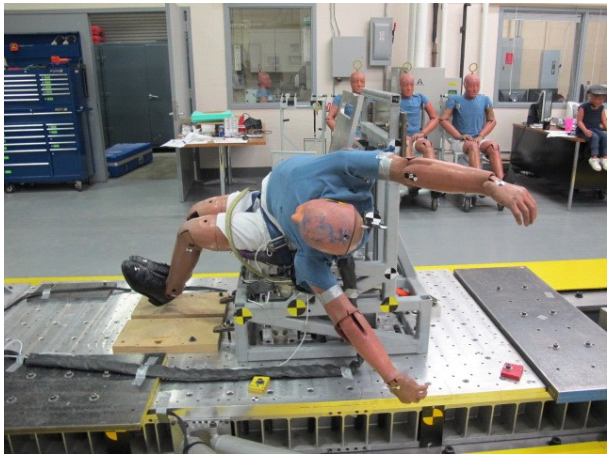

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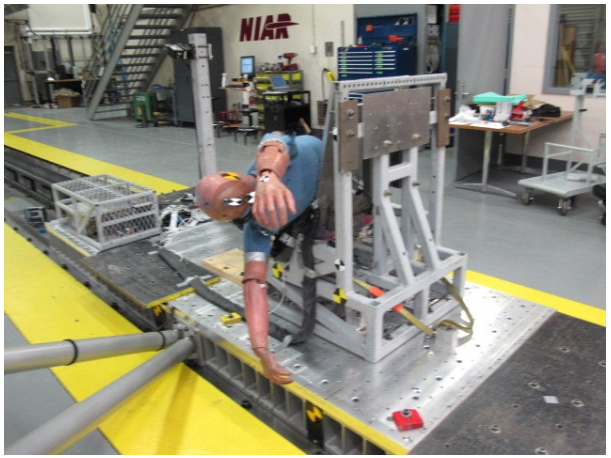

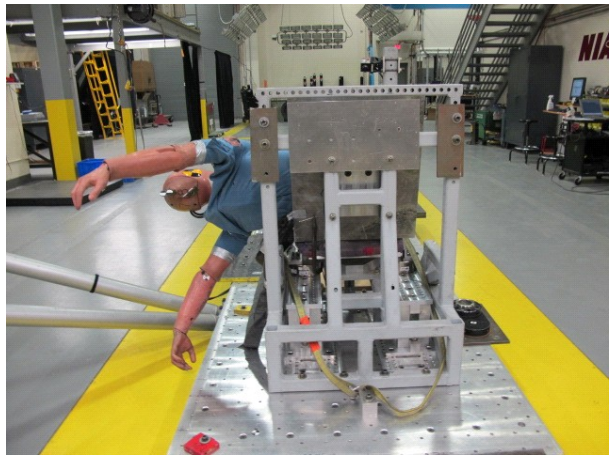

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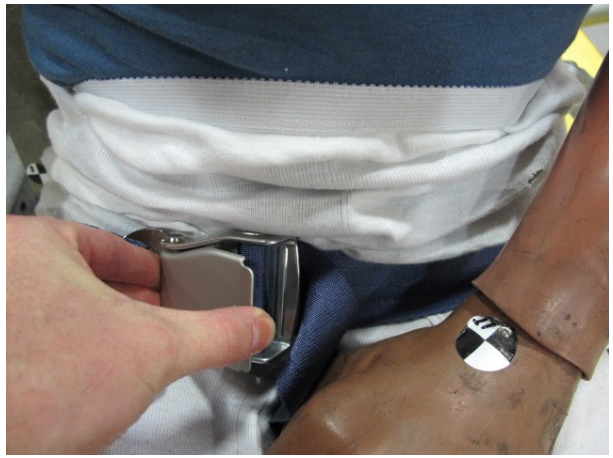

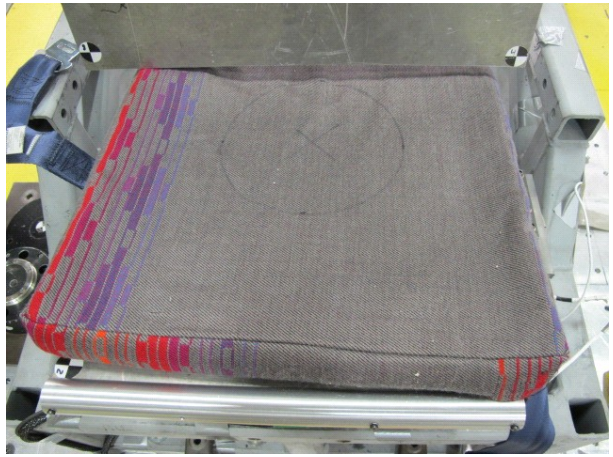

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CRASH DYNAMICS LABORATORY

Report No. CDL-FA14B-05-01

Requested by:

FAA

Final Test Report
FA14B-05

03/25/2014

Revision	Change	Date	Revised By
New		03/25/2014	Rob Huculak

Prepared and Reviewed by:

Rob Huculak
Laboratory Manager

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This test report is in accordance with ISO/IEC 17025:2005 requirements and all equipment standards used are traceable to the National Institute of Standards and Technology.
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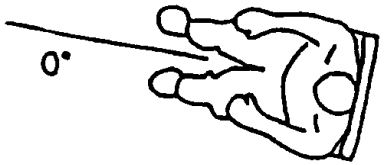
Test Summary

The dynamic test (FA14B-05) was performed for FAA in accordance with 14 CFR 25.562 Test 2 on 03/25/2014.

Pulse Parameters	Required	Result	Pass/Fail
Minimum Peak Acceleration (g)	16	16.1	PASS
Minimum Velocity Change (ft/sec)	44	45.49	PASS
Maximum Rise Time (msec)	90	89.5	PASS
Minimum Velocity Change During Rise Time (ft/sec)	22	22.88	PASS
2g Offset	--	--	PASS

Test Orientation



ATD: H2 718 **Position: Config 4 - New Belt**

0 deg

Measured Seat Belt Angle	Measured Seat Belt Offset
64.29 deg	-1.00 in

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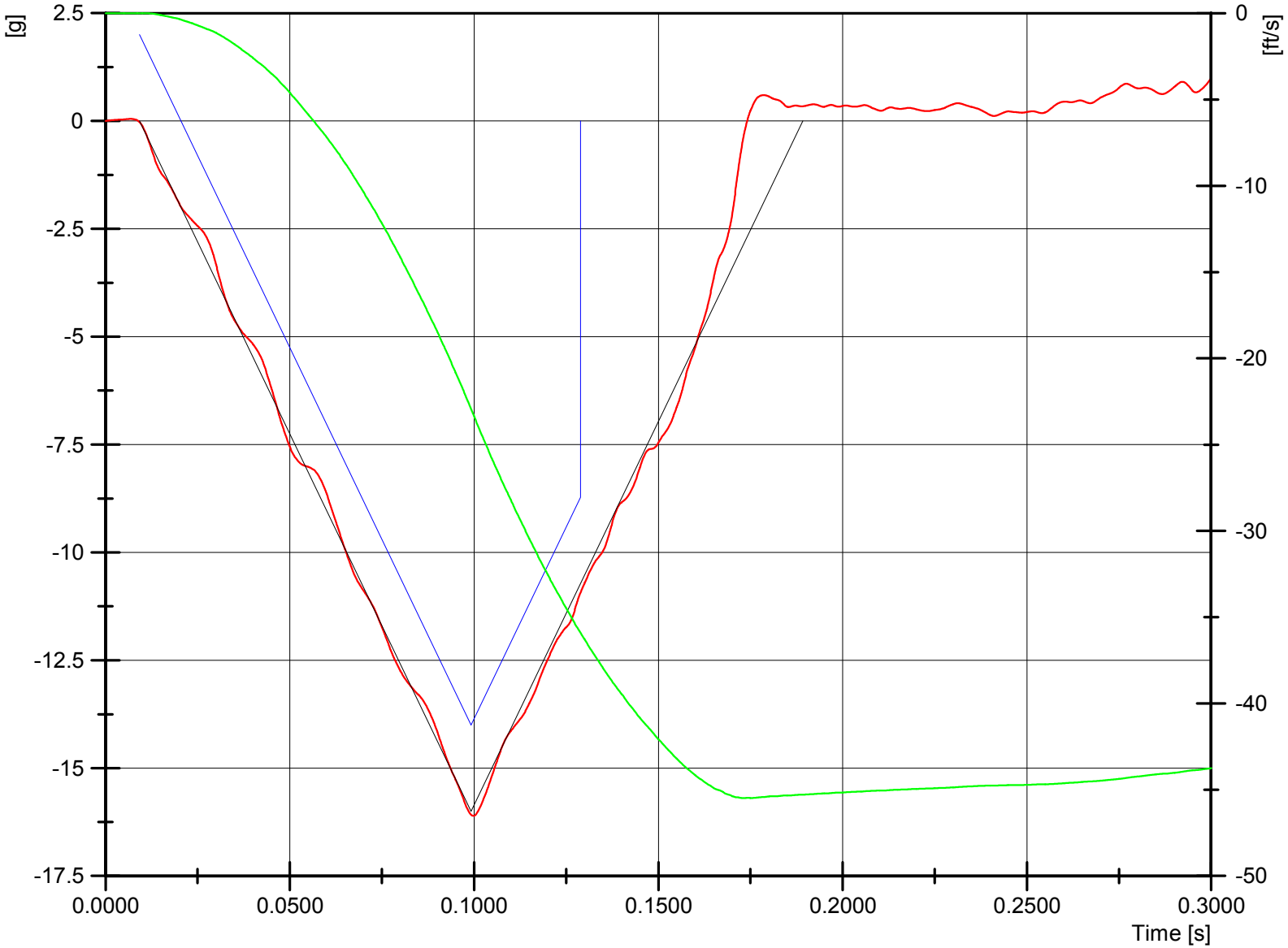
Temperature	Relative Humidity
72.3°F	28.6%



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Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 10:00

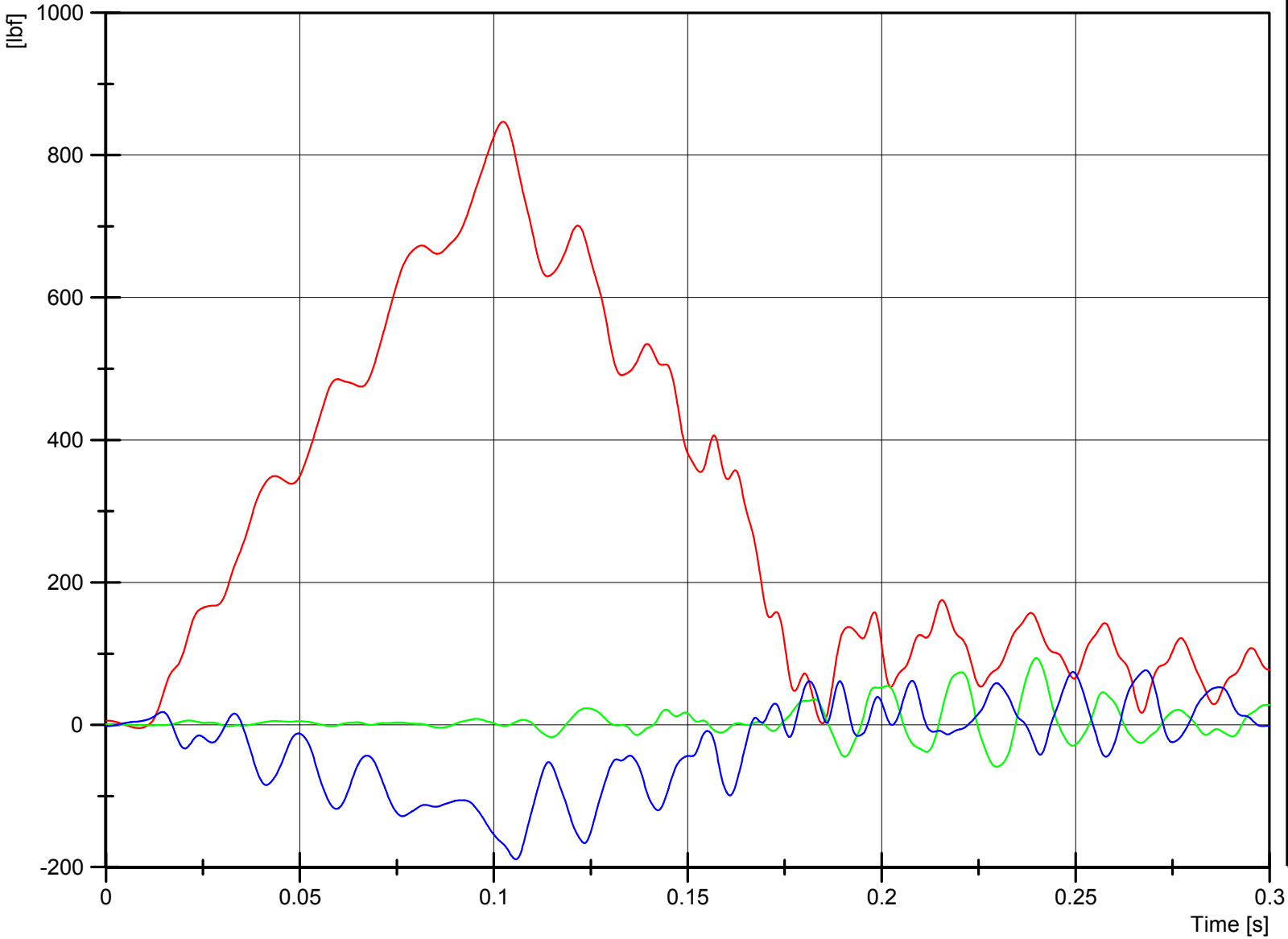
Comments:

Sled Acceleration | Sled Velocity | Ideal Pulse | Upper Limit

Maximum: 0.993 g Time: 0.3 sec.
Minimum: -16.10 g Time: 0.0998 sec.
CFC: 60
Sensor Type: ENDEVCO 7290A-100
S/N: 29924
Sensitivity: 0.01919 V/EU
Cal. Due: 06/11/2014
Full Scale: 100 g
DAS Channel: 50
Ref. No.: 1
Polarity: R

Minimum: -45.49 ft/s Time: 0.1731 sec.

Pulse Requirement		Actual
Minimum Required Peak Acceleration:	16 g	16.1 g
Minimum Overall Velocity Change:	44 ft/s	45.49 ft/s
Maximum Rise Time:	90 msec	89.5 msec
Minimum Velocity Change Before Greq:	22 ft/s	22.88 ft/s



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Doc. No.: CDL-FA14B-05-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-05

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 10:00

Comments:

Rigid Seat Seat Back Fx

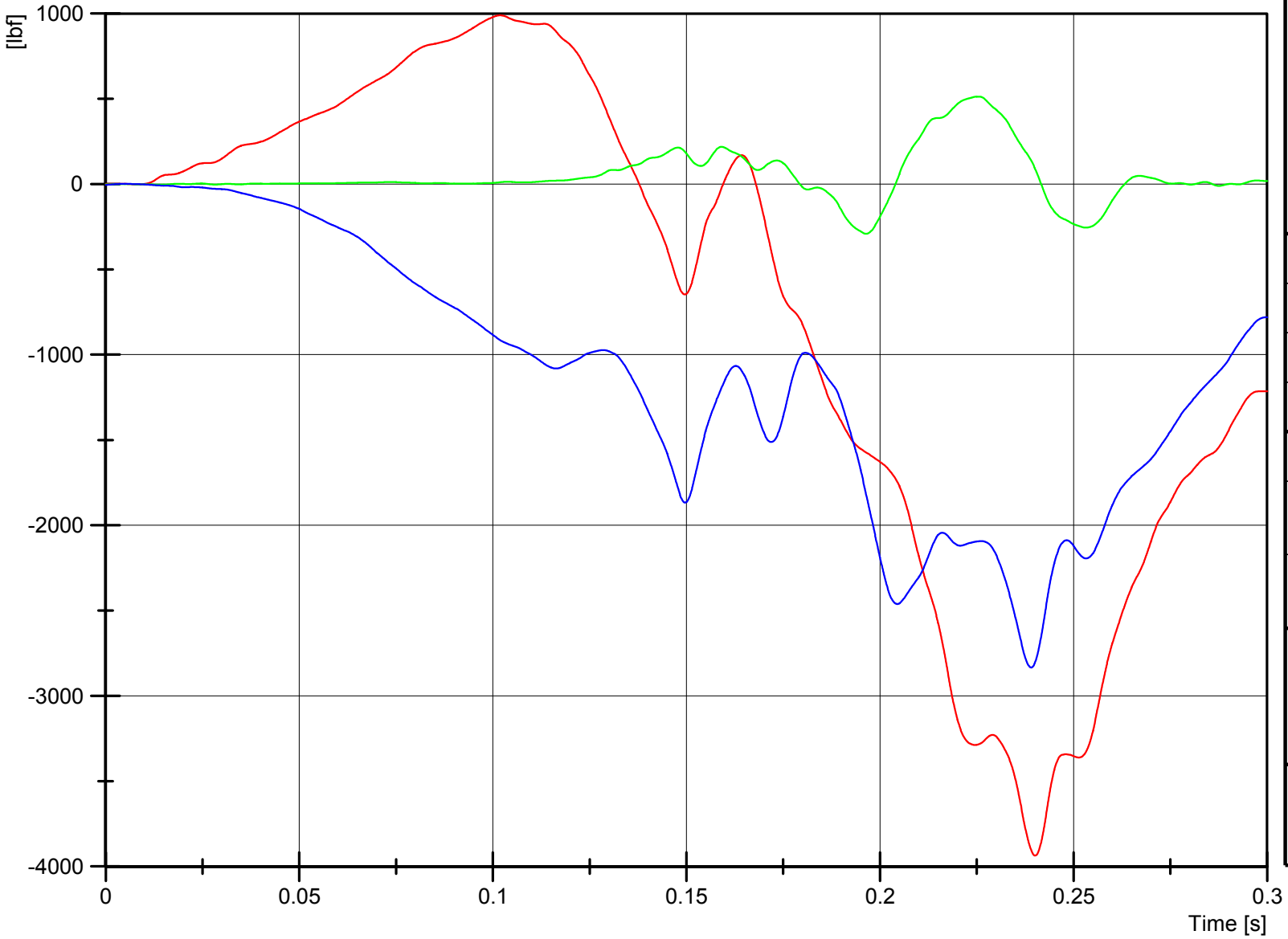
Maximum: 846.85 lbf Time: 0.1026 sec.
Minimum: -4.6012 lbf Time: 0.0087 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC084FZ
Sensitivity: 1.176E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 12
Ref. No.: 15
Polarity: N

Rigid Seat Seat Back Fy

Maximum: 93.8102 lbf Time: 0.24 sec.
Minimum: -58.99 lbf Time: 0.2298 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC084FY
Sensitivity: 2.733E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 11
Ref. No.: 14
Polarity: N

Rigid Seat Seat Back Fz

Maximum: 76.6787 lbf Time: 0.2683 sec.
Minimum: -188.92 lbf Time: 0.1059 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC084FX
Sensitivity: 2.74E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 10
Ref. No.: 13
Polarity: R



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Doc. No.: CDL-FA14B-05-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-05

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 10:00

Comments:

Rigid Seat Seat Pan Fx

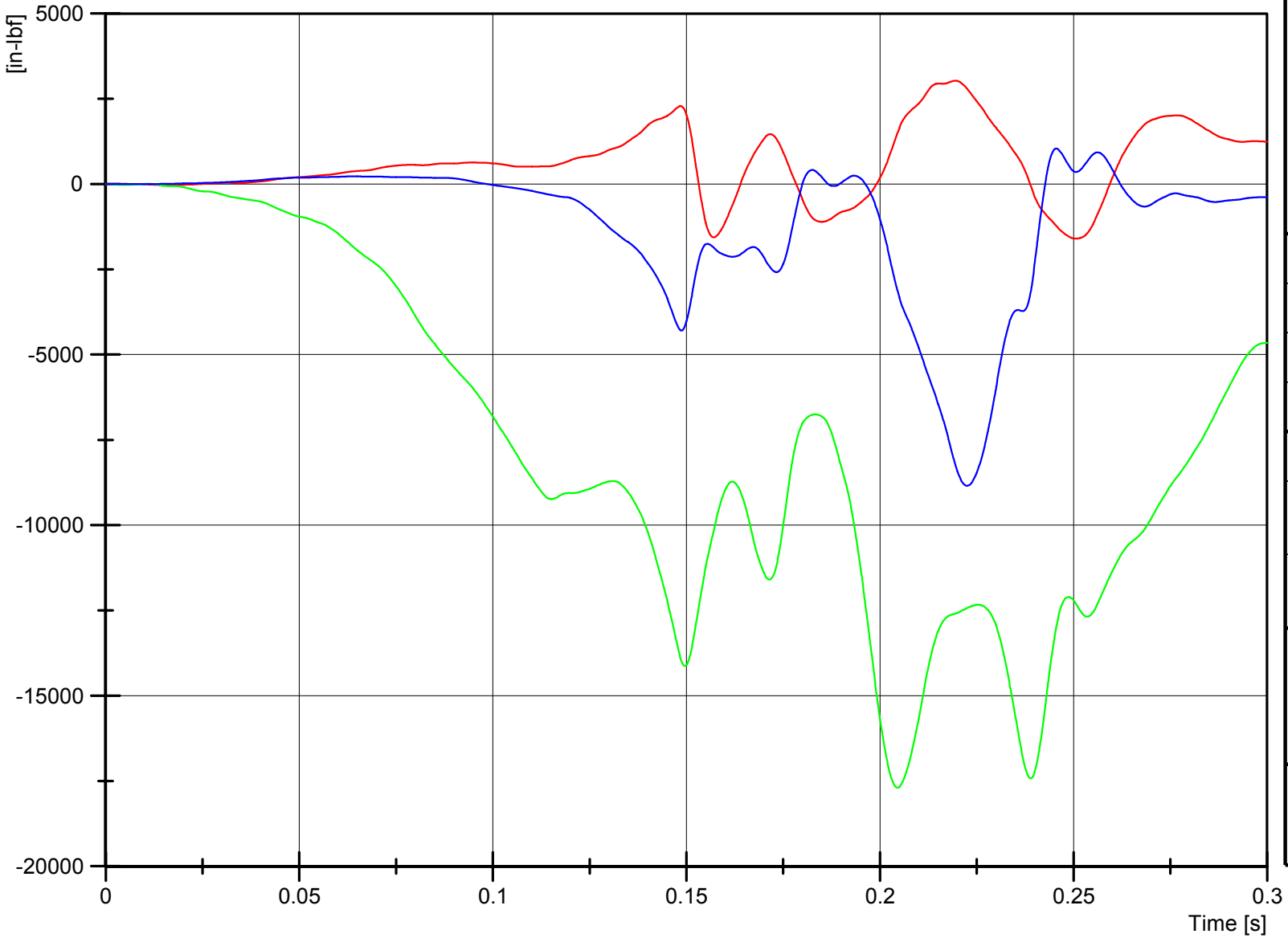
Maximum: 989.86 lbf Time: 0.1021 sec.
Minimum: -3.94E+03 lbf Time: 0.2403 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083FX
Sensitivity: 2.768E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 13
Ref. No.: 10
Polarity: N

Rigid Seat Seat Pan Fy

Maximum: 513.50 lbf Time: 0.2255 sec.
Minimum: -291.14 lbf Time: 0.1966 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083FY
Sensitivity: 2.764E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 14
Ref. No.: 11
Polarity: N

Rigid Seat Seat Pan Fz

Maximum: 2.01 lbf Time: 0.0052 sec.
Minimum: -2.83E+03 lbf Time: 0.2392 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083FZ
Sensitivity: 1.181E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 15
Ref. No.: 12
Polarity: N



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Doc. No.: CDL-FA14B-05-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-05

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 10:00

Comments:

Rigid Seat Seat Pan Mx

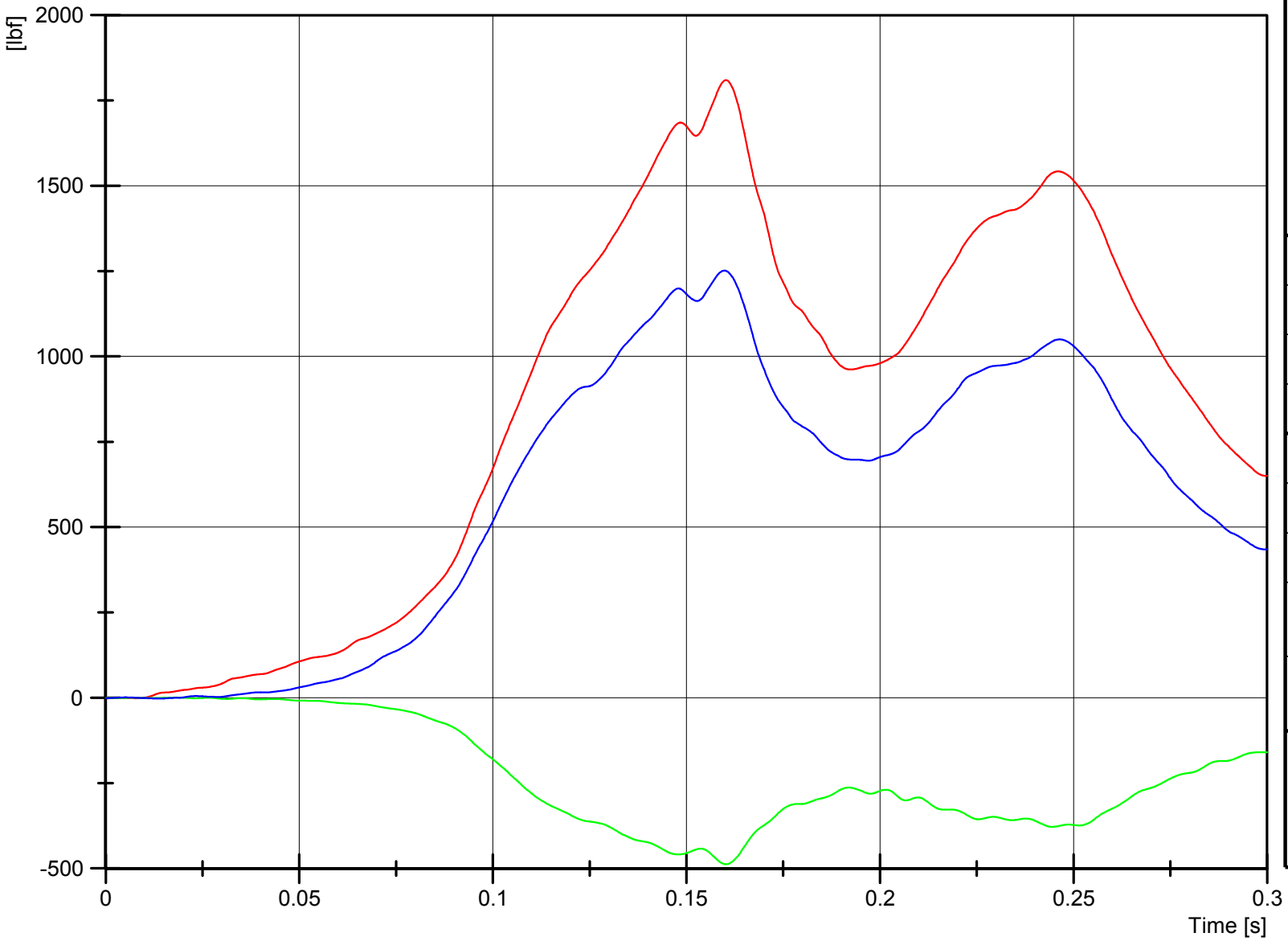
Maximum: 3030.51 in-lbf Time: 0.2197 sec.
Minimum: -1.60E+03 in-lbf Time: 0.2508 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083MX
Sensitivity: 7.03E-08 V/EU
Cal. Due: 02/13/2014
Full Scale: 25000 in-lbf
DAS Channel: 16
Ref. No.: 7
Polarity: N

Rigid Seat Seat Pan My

Maximum: 10.0095 in-lbf Time: 0.0115 sec.
Minimum: -1.77E+04 in-lbf Time: 0.2047 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083MY
Sensitivity: 7.05E-08 V/EU
Cal. Due: 02/13/2014
Full Scale: 25000 in-lbf
DAS Channel: 17
Ref. No.: 8
Polarity: N

Rigid Seat Seat Pan Mz

Maximum: 1045.18 in-lbf Time: 0.2457 sec.
Minimum: -8.84E+03 in-lbf Time: 0.2227 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083MZ
Sensitivity: 9.32E-08 V/EU
Cal. Due: 02/13/2014
Full Scale: 20000 in-lbf
DAS Channel: 18
Ref. No.: 9
Polarity: N



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Doc. No.: CDL-FA14B-05-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-05

Dummy: H2 718

Position: Config 4 - New Belt

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 10:00

Rigid Seat Right Lap Fx

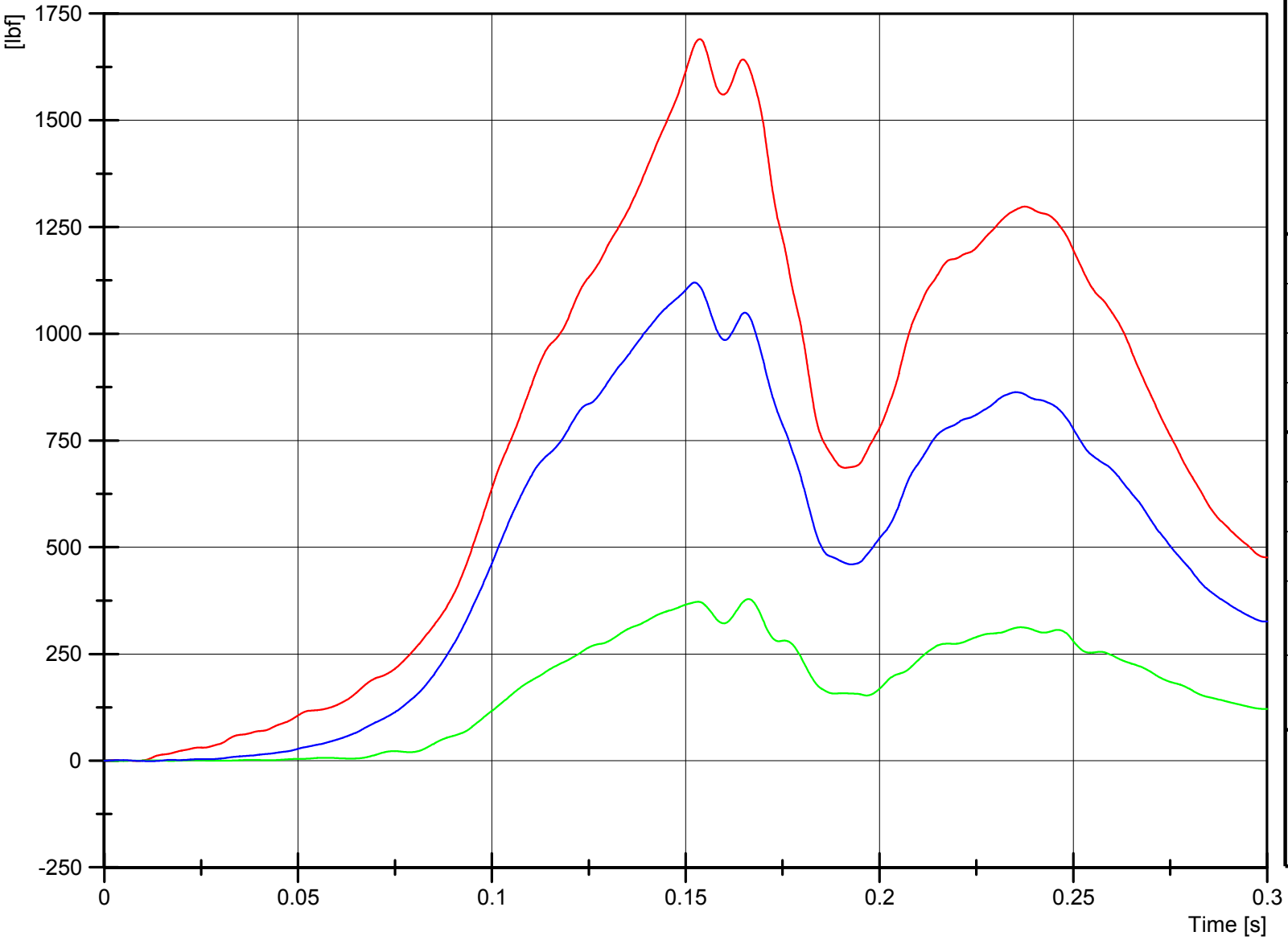
Maximum: 1809.50 lbf Time: 0.1604 sec.
Minimum: -1.1699 lbf Time: 0 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC093FX
Sensitivity: 2.587E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 22
Ref. No.: 74
Polarity: N

Rigid Seat Right Lap Fy

Maximum: 0.759 lbf Time: 0.0184 sec.
Minimum: -487.39 lbf Time: 0.1605 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC093FY
Sensitivity: 2.572E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 23
Ref. No.: 75
Polarity: N

Rigid Seat Right Lap Fz

Maximum: 1251.60 lbf Time: 0.16 sec.
Minimum: -2.0665 lbf Time: 0.0139 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC093FZ
Sensitivity: 1.044E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 24
Ref. No.: 76
Polarity: N



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Doc. No.: CDL-FA14B-05-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-05

Dummy: H2 718

Position: Config 4 - New Belt

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 10:00

Rigid Seat Left Lap Fx

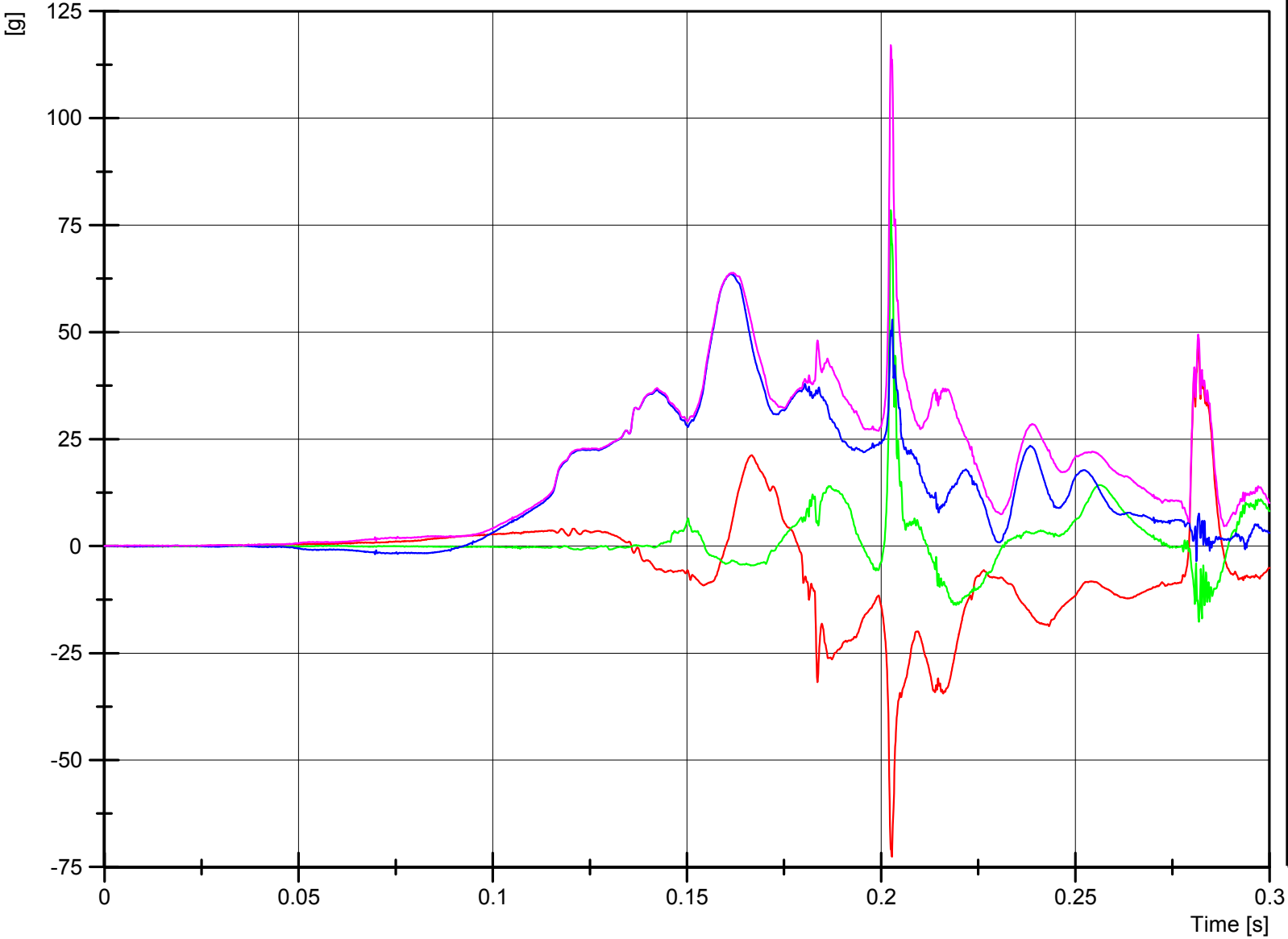
Maximum: 1690.29 lbf Time: 0.1538 sec.
Minimum: -0.4335 lbf Time: 0.0087 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC094FX
Sensitivity: 2.587E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 19
Ref. No.: 77
Polarity: N

Rigid Seat Left Lap Fy

Maximum: 378.25 lbf Time: 0.1664 sec.
Minimum: -0.4005 lbf Time: 0.0043 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC094FY
Sensitivity: 2.572E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 20
Ref. No.: 78
Polarity: N

Rigid Seat Left Lap Fz

Maximum: 1119.97 lbf Time: 0.1525 sec.
Minimum: -0.9344 lbf Time: 0.0124 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC094FZ
Sensitivity: 1.044E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 21
Ref. No.: 79
Polarity: N



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Doc. No.: CDL-FA14B-05-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-05

Dummy: H2 718

Position: Config 4 - New Belt

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 10:00

Head Ax H2 718

Maximum: 46.8705 g Time: 0.2818 sec.
Minimum: -72.59 g Time: 0.203 sec.
CFC: 1000
Sensor Type: Endevco 7264C
S/N: P47932
Sensitivity: 2.157E-05 V/EU
Cal. Due: 09/25/2014
Full Scale: 2000 g
DAS Channel: 25
Ref. No.: 22
Polarity: R

Head Ay H2 718

Maximum: 78.4638 g Time: 0.2027 sec.
Minimum: -17.73 g Time: 0.282 sec.
CFC: 1000
Sensor Type: Endevco 7264C
S/N: P48149
Sensitivity: 2.603E-05 V/EU
Cal. Due: 09/25/2014
Full Scale: 2000 g
DAS Channel: 26
Ref. No.: 23
Polarity: R

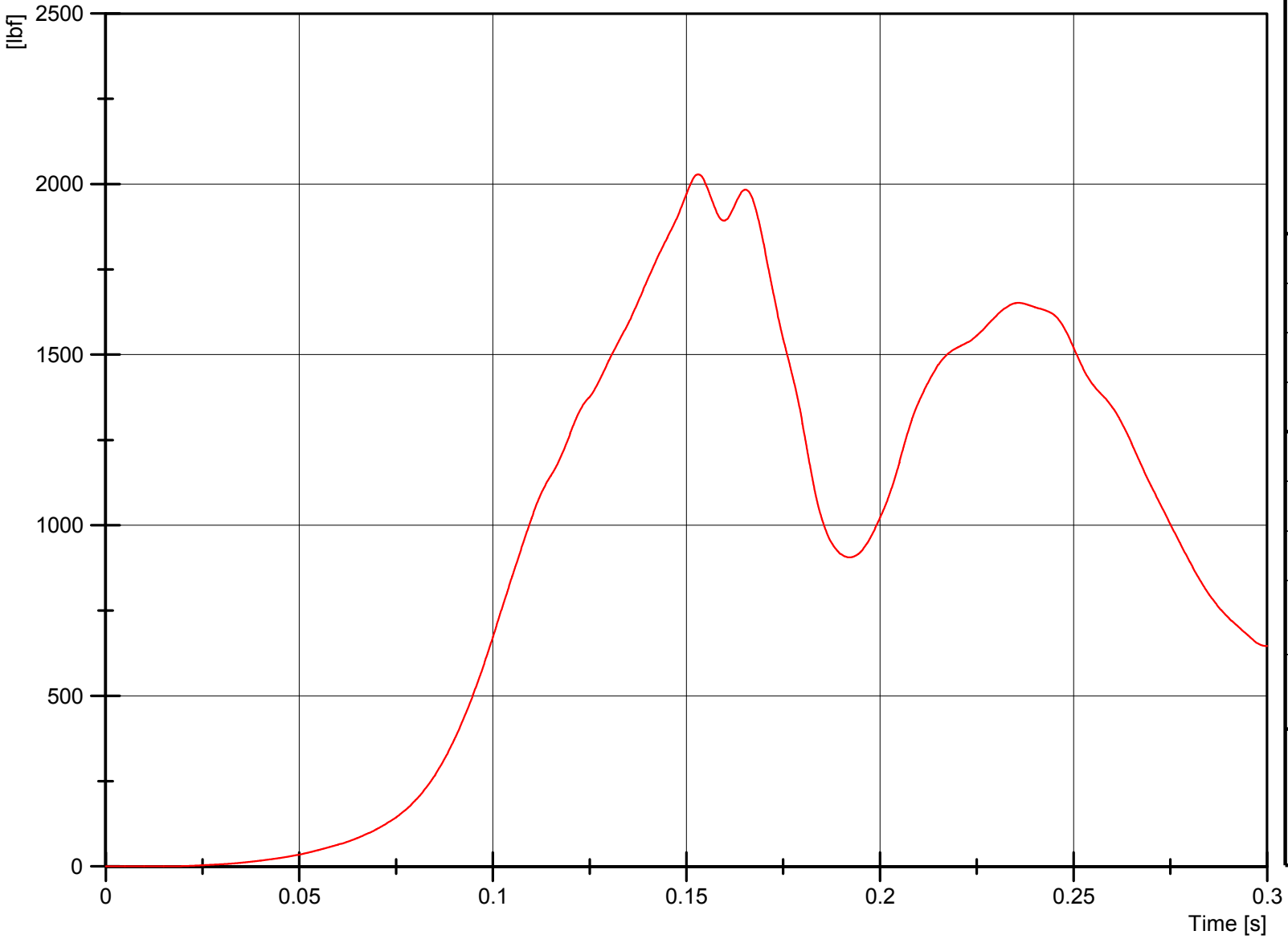
Head Az H2 718

Maximum: 63.6242 g Time: 0.1616 sec.
Minimum: -3.5278 g Time: 0.2814 sec.
CFC: 1000
Sensor Type: Endevco 7264C
S/N: P60367
Sensitivity: 1.782E-05 V/EU
Cal. Due: 09/25/2014
Full Scale: 2000 g
DAS Channel: 27
Ref. No.: 24
Polarity: R

Head Resultant H2 718

Maximum: 117.09 g Time: 0.2025 sec.

HIC: 849.1
T1: 120.7 msec.
T2: 223.4 msec.



Lap Belt Force H2 718

Maximum: 2028.86 lbf Time: 0.1532 sec.
Minimum: 0.2004 lbf Time: 0.0117 sec.
CFC: 60
Sensor Type: Denton 3255
S/N: SBLC086
Sensitivity: 6.6006E-07 V/EU
Cal. Due: 05/16/2014
Full Scale: 3000 lbf
DAS Channel: 36
Ref. No.: 17
Polarity: N

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Doc. No.: CDL-FA14B-05-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-05

Dummy: H2 718

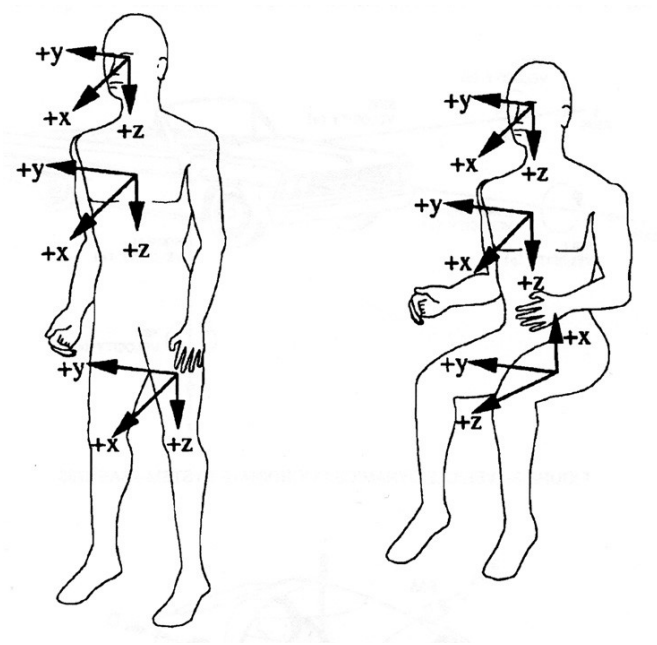
Position: Config 4 - New Belt

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 10:00

J211/1 Sign Conventions



Upper Neck Load Cell:
+FX Head rearward, chest forward
+FY Head leftward, chest rightward
+FZ Head upward, chest downward
+MX Left ear toward left shoulder
+MY Chin toward sternum
+MZ Chin toward left shoulder

Lumbar Load Cell:
+FX Chest rearward, pelvis forward
+FY Chest leftward, pelvis rightward
+FZ Chest upward, pelvis downward
+MX Left shoulder toward left hip
+MY Sternum toward front of legs
+MZ Right shoulder forward, left shoulder rearward

Femur Load Cells:
+FZ Tension

Chest Displacement:
-DX Compression

Rib Dispacement:
-DY Compression

Belt Load Cells:
+FX Tension

Floor Load Cells:
+FX Test article forward
+FY Test article right
+FZ Test article up

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Customer: FAA

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Test Description:
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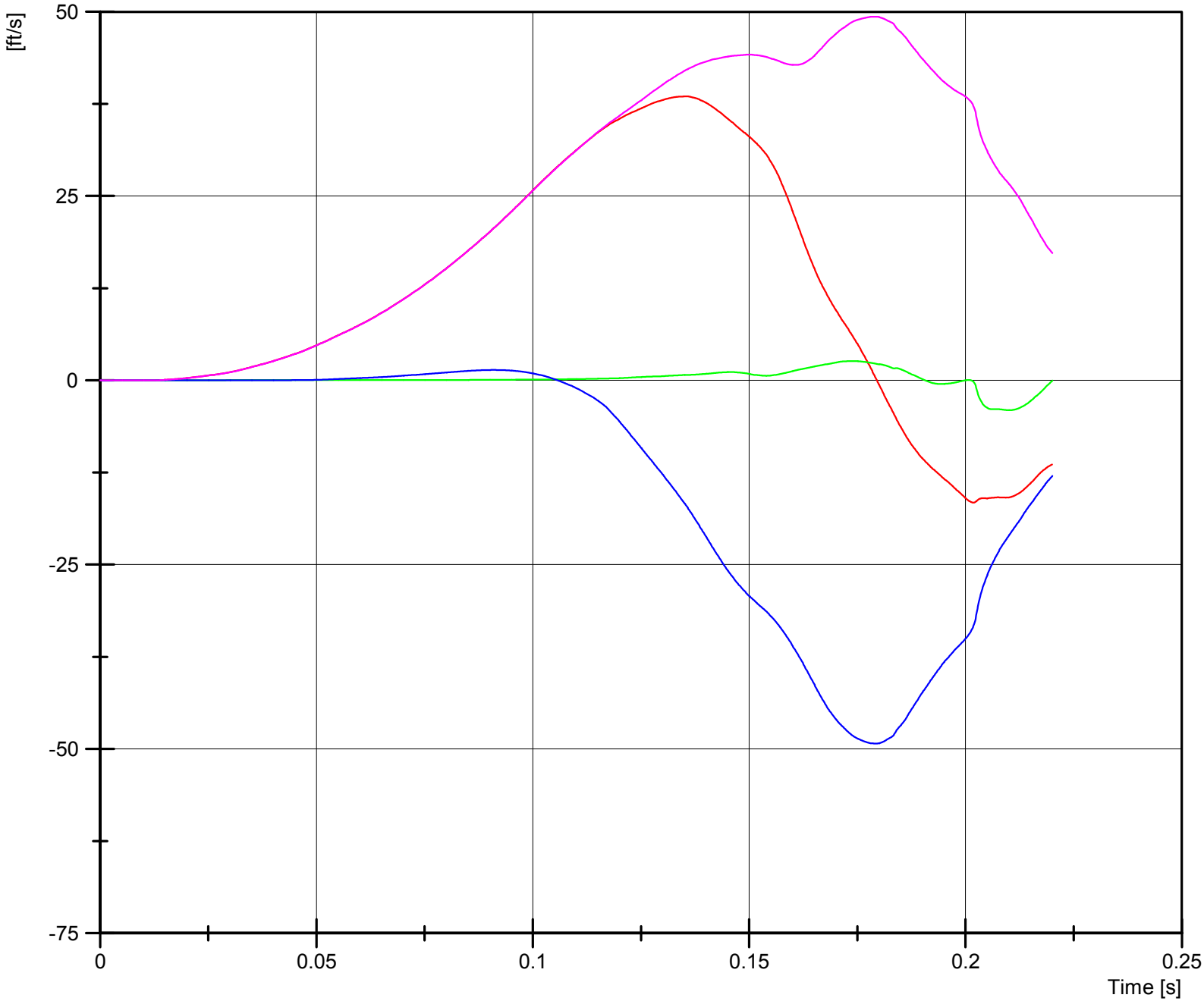
Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 10:00

Comments:



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Doc. No.: CDL-FA14B-05-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-05

Dummy: H2 718

Position: Config 4 - New Belt

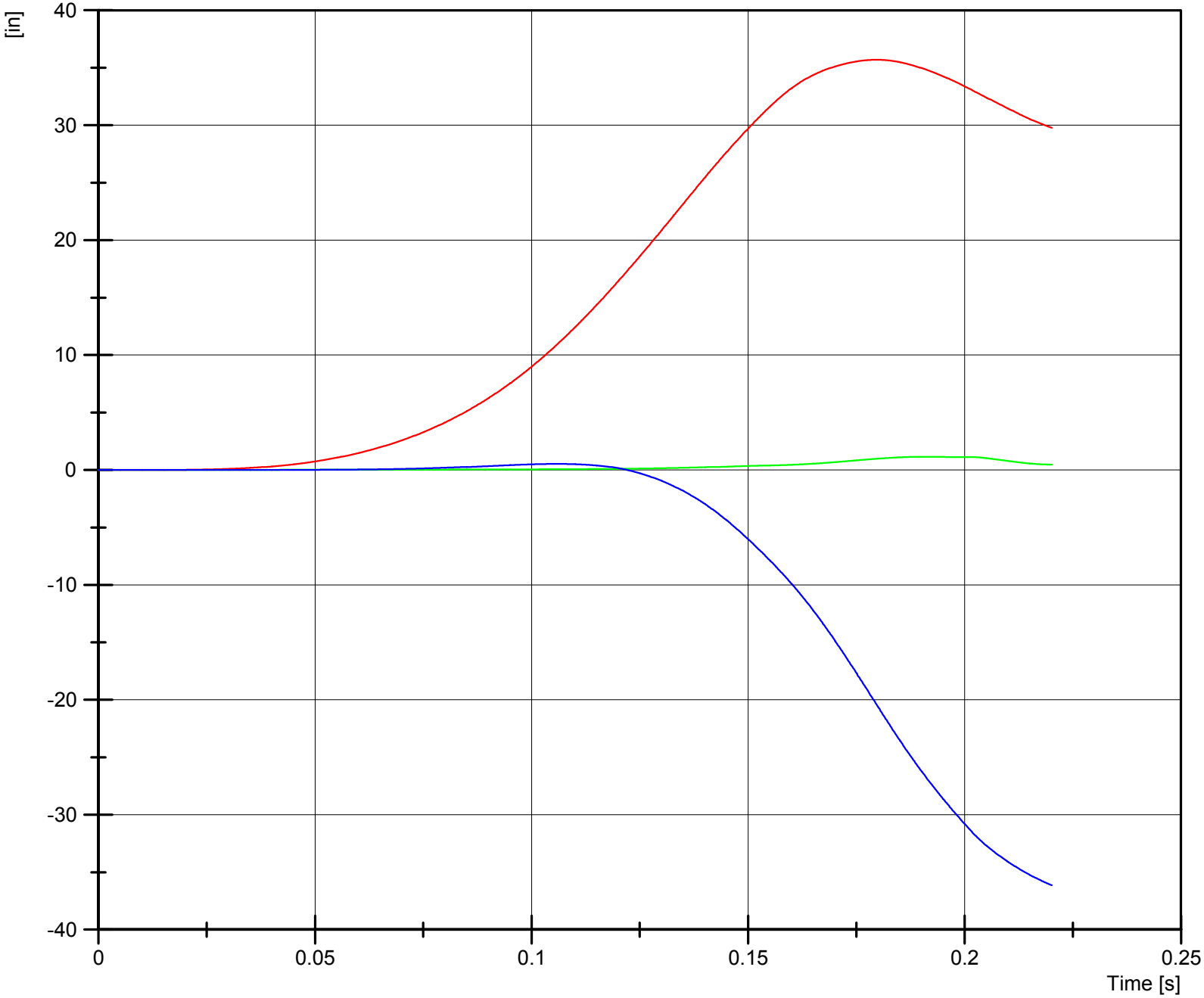
Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 10:00

Comments:

Global Head Vx H2 718		Global Head Vy H2 718		Global Head Vz H2 718		Global Head Velocity Resultant H2 718	
Maximum: 38.54 ft/s	Time: 0.1356 sec.	Maximum: 2.63 ft/s	Time: 0.1738 sec.	Maximum: 1.42 ft/s	Time: 0.0912 sec.	Maximum: 49.33 ft/s	Time: 0.179 sec.
Minimum: -16.59 ft/s	Time: 0.2018 sec.	Minimum: -4.05 ft/s	Time: 0.21 sec.	Minimum: -49.27 ft/s	Time: 0.1793 sec.	Minimum: 0 ft/s	Time: 0.0001 sec.



Global Head Dx H2 718 | Global Head Dy H2 718 | Global Head Dz H2 718

Global Head Dx H2 718		Global Head Dy H2 718		Global Head Dz H2 718	
Maximum: 35.69 in	Time: 0.1796 sec.	Maximum: 1.14 in	Time: 0.1907 sec.	Maximum: 0.53 in	Time: 0.1058 sec.
Minimum: -0.00 in	Time: 0.013 sec.	Minimum: -0.00 in	Time: 0.0004 sec.	Minimum: -36.13 in	Time: 0.2201 sec.

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Doc. No.: CDL-FA14B-05-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-05

Dummy: H2 718

Position: Config 4 - New Belt

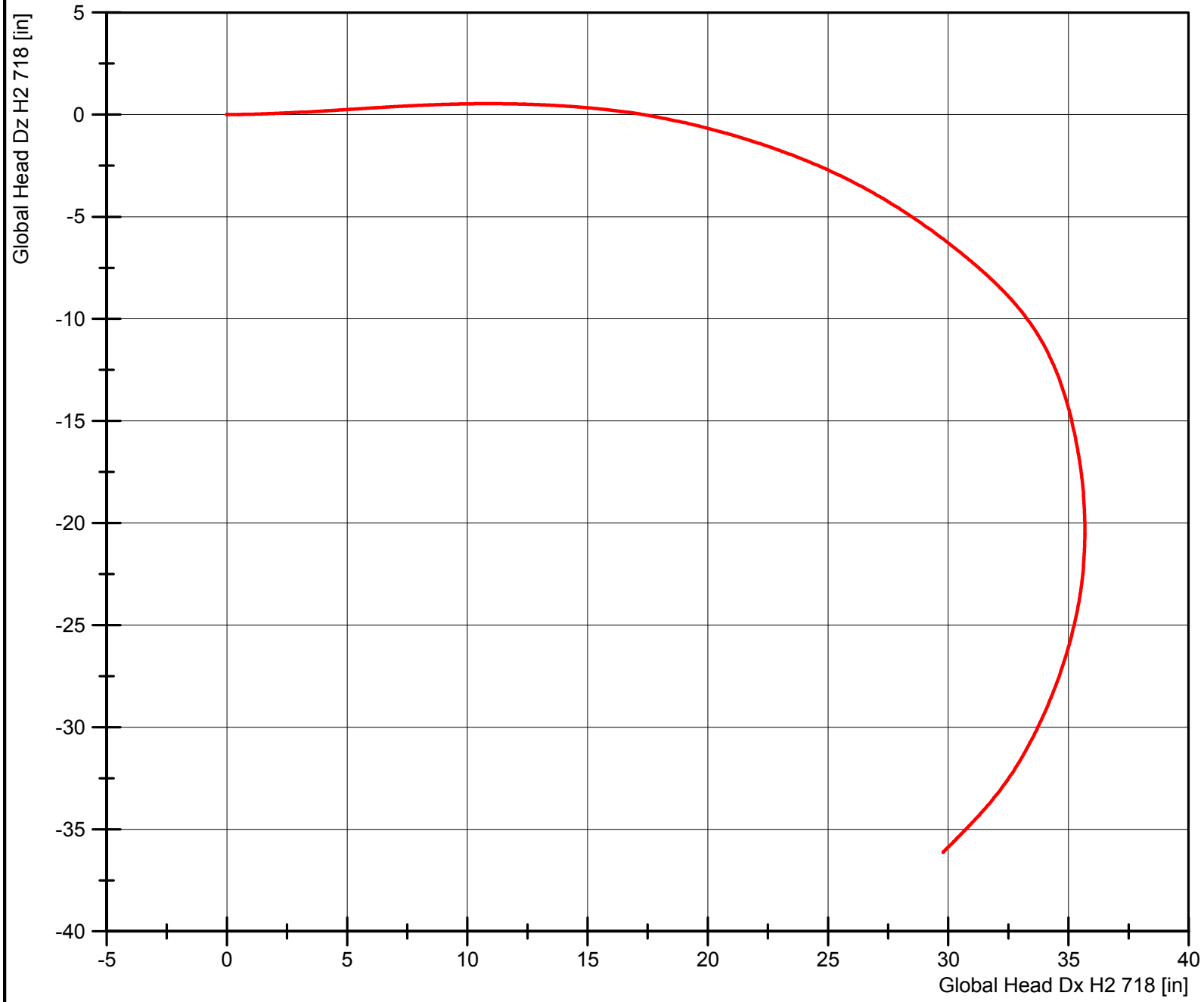
Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 10:00

Comments:

Displacement values are calculated from Head Accelerations and Angular Velocities.
This method cannot be used to substitute photometric analysis.



Global Head Displacement XZ

X Maximum: 35.69 in **Time: 0.1796 sec.**

Z Value at X Maximum: -20.36 in

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Doc. No.: CDL-FA14B-05-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-05

Dummy: H2 718

Position: Config 4 - New Belt

Test Description:
14 CFR 25.562 Test 2

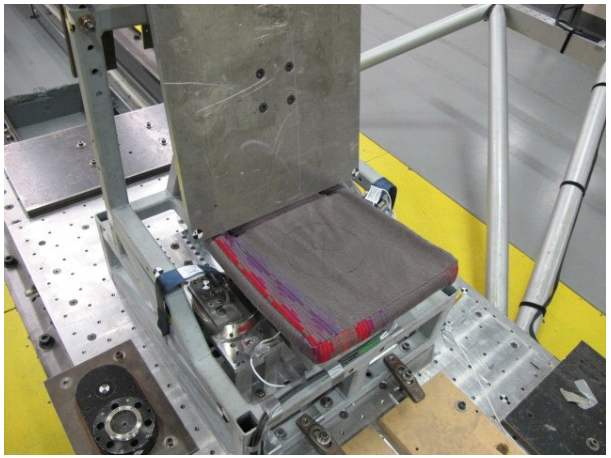
Pulse Name:
16g-07b

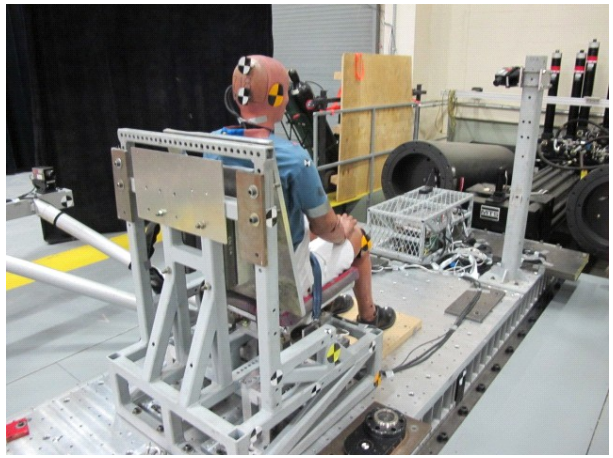
Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 10:00

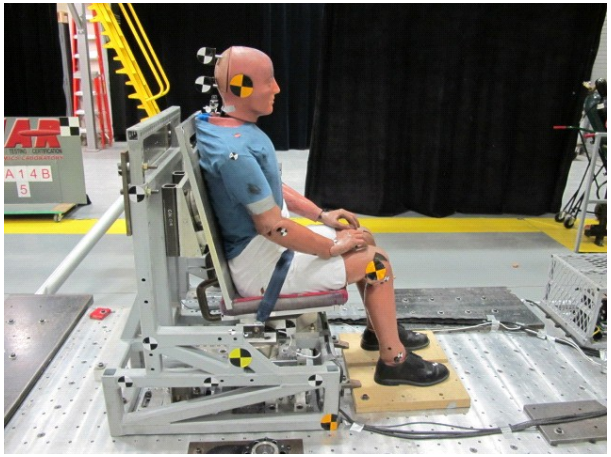
Comments:

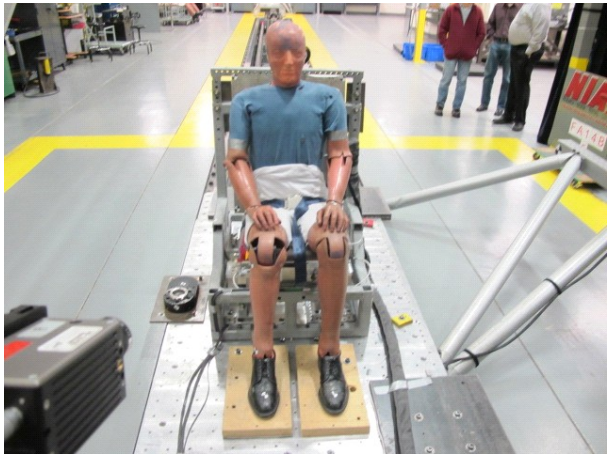
Displacement values are calculated from Head Accelerations and Angular Velocities.
This method cannot be used to substitute photometric analysis.

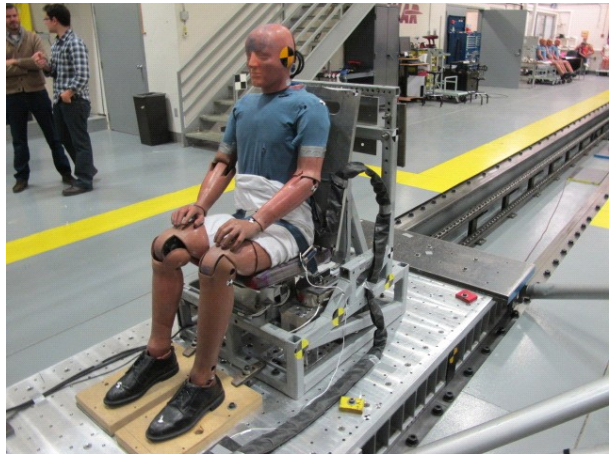
Pre-test Photos











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Doc. No.: CDL-FA14B-05-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-05

Dummy: N/A

Position: N/A

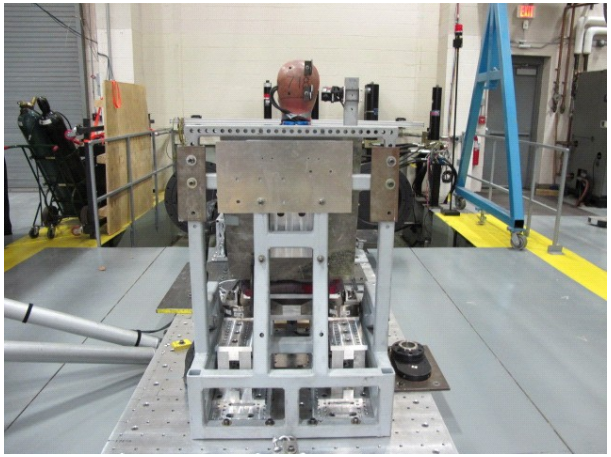
Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 10:00

Comments:

Pre-test Photos



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Doc. No.: CDL-FA14B-05-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-05

Dummy: N/A

Position: N/A

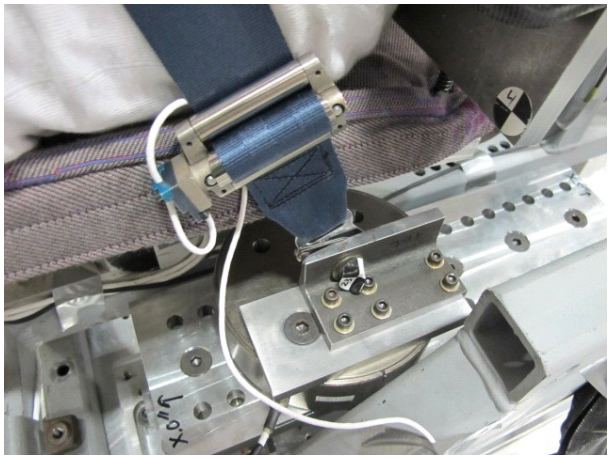
Test Description:
14 CFR 25.562 Test 2

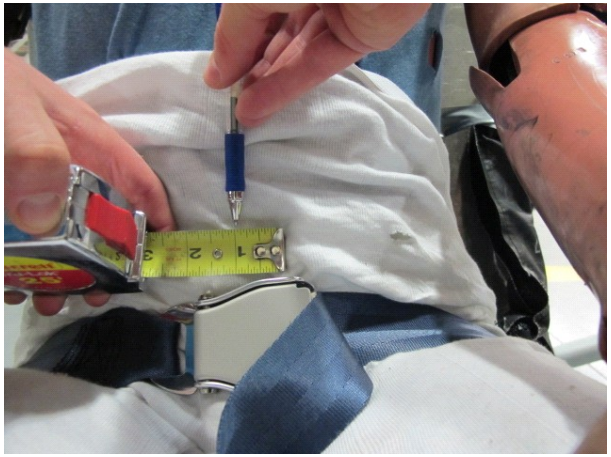
Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 10:00

Comments:

Pre-test Photos





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Doc. No.: CDL-FA14B-05-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-05

Dummy: N/A

Position: N/A

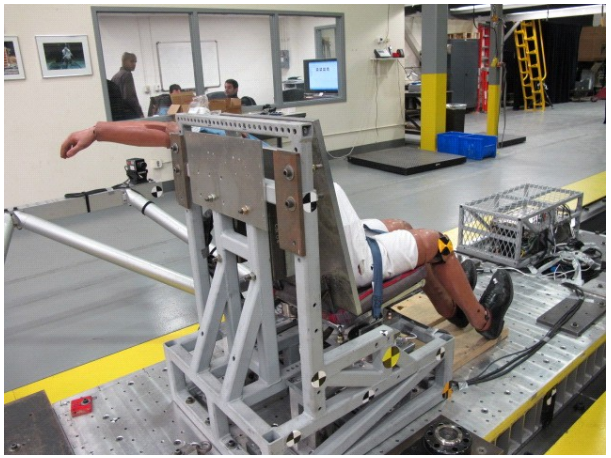
Test Description:
14 CFR 25.562 Test 2

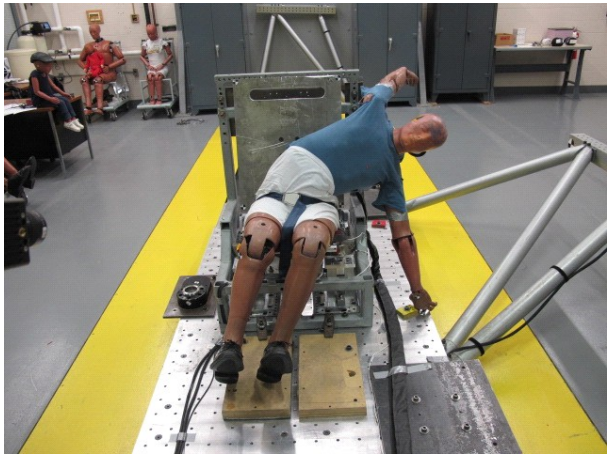
Pulse Name:
16g-07b

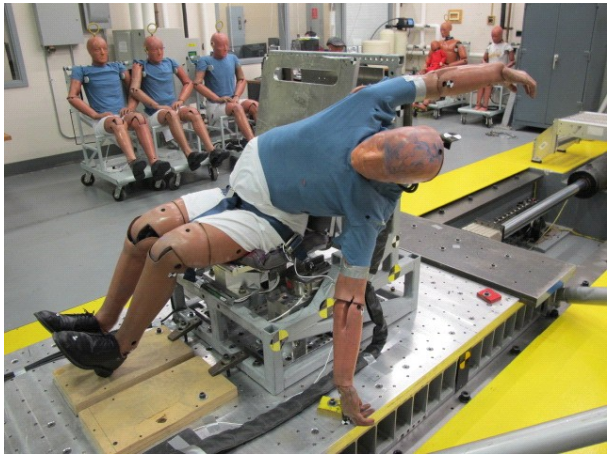
Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 10:00

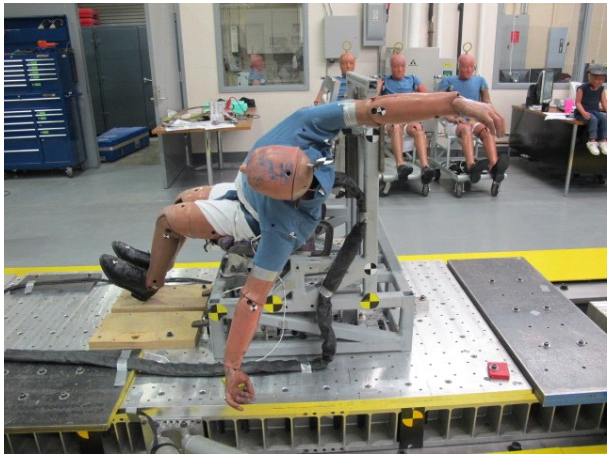
Comments:

Post-test Photos









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Doc. No.: CDL-FA14B-05-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-05

Dummy: N/A

Position: N/A

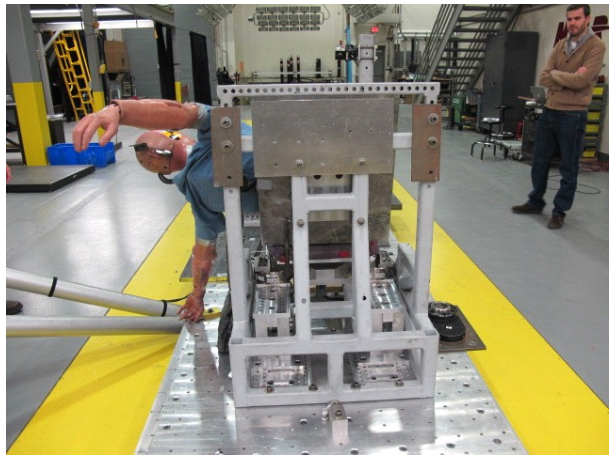
Test Description:
14 CFR 25.562 Test 2

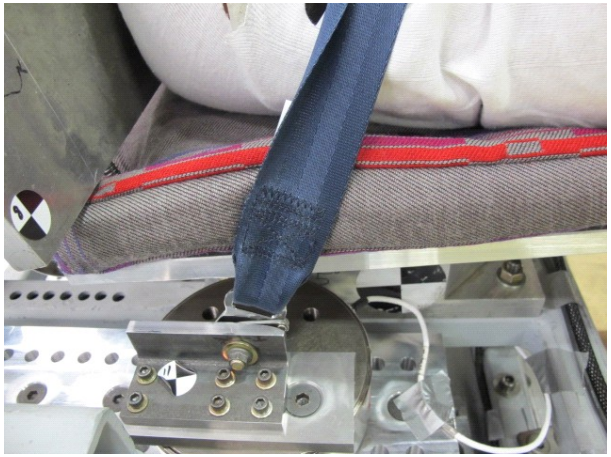
Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 10:00

Comments:

Post-test Photos





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Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-05

Dummy: N/A

Position: N/A

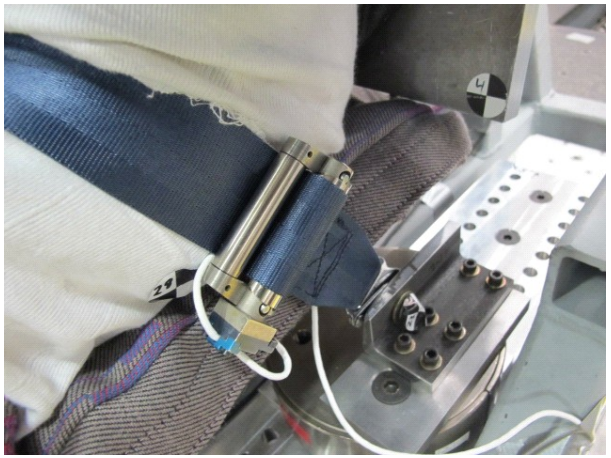
Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 10:00

Comments:

Post-test Photos



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Doc. No.: CDL-FA14B-05-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-05

Dummy: N/A

Position: N/A

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 10:00

Comments:

CRASH DYNAMICS LABORATORY

Report No. CDL-FA14B-06-01

Requested by:

FAA

Final Test Report
FA14B-06

03/25/2014

Revision	Change	Date	Revised By
New		03/25/2014	Rob Huculak

Prepared and Reviewed by:

Rob Huculak
Laboratory Manager

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This test report is in accordance with ISO/IEC 17025:2005 requirements and all equipment standards used are traceable to the National Institute of Standards and Technology.
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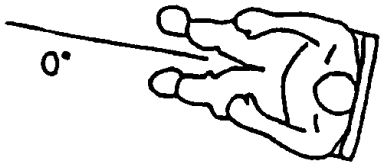
Test Summary

The dynamic test (FA14B-06) was performed for FAA in accordance with 14 CFR 25.562 Test 2 on 03/25/2014.

Pulse Parameters	Required	Result	Pass/Fail
Minimum Peak Acceleration (g)	16	16.05	PASS
Minimum Velocity Change (ft/sec)	44	45.27	PASS
Maximum Rise Time (msec)	90	89.9	PASS
Minimum Velocity Change During Rise Time (ft/sec)	22	22.74	PASS
2g Offset	--	--	PASS

Test Orientation



ATD: H2 718 **Position: Config 4 - Repaired Belt**

0 deg

Measured Seat Belt Angle	Measured Seat Belt Offset
63.23 deg	-0.75 in

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Doc. No.: CDL-FA14B-06-01

Version: New

Report Date: 03/25/2014

Customer: FAA

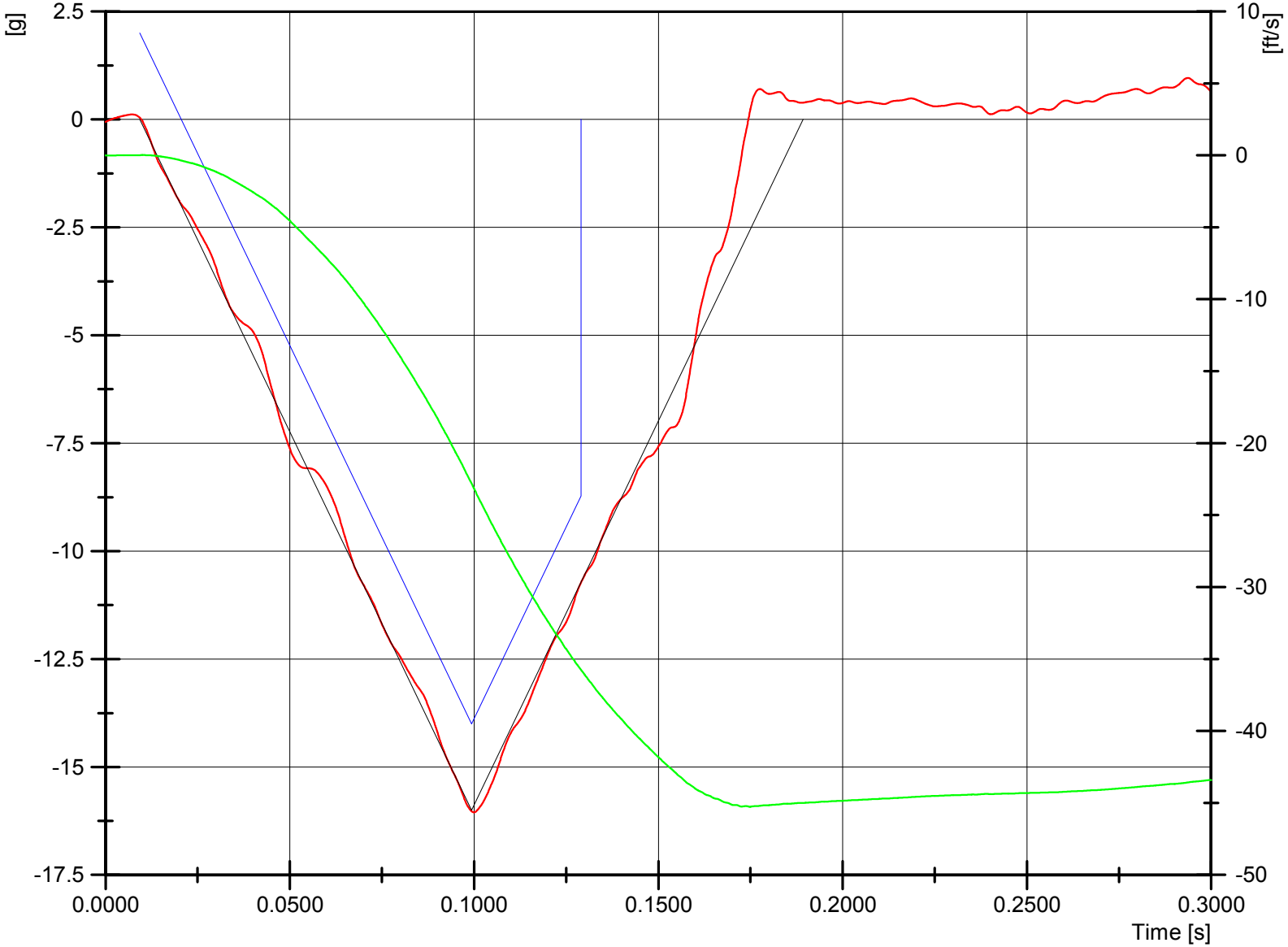
Test: FA14B-06

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 11:12

Temperature	Relative Humidity
73.6°F	28.8%



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Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-06

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 11:12

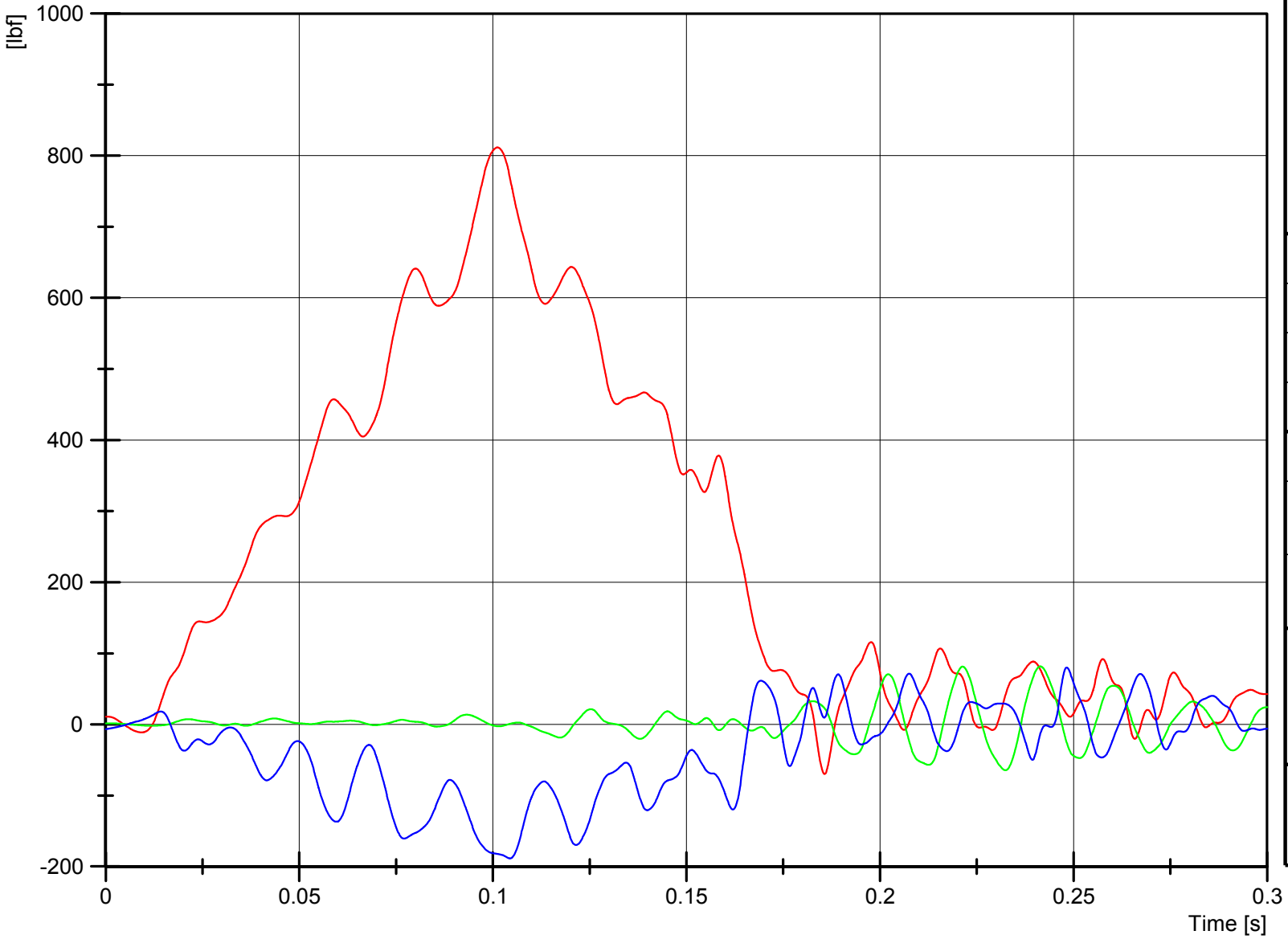
Comments:

Sled Acceleration | Sled Velocity | Ideal Pulse | Upper Limit

Maximum: 0.961 g Time: 0.2936 sec.
Minimum: -16.05 g Time: 0.1 sec.
CFC: 60
Sensor Type: ENDEVCO 7290A-100
S/N: 26724
Sensitivity: 0.01878 V/EU
Cal. Due: 06/11/2014
Full Scale: 100 g
DAS Channel: 37
Ref. No.: 1
Polarity: R

Minimum: -45.27 ft/s Time: 0.1749 sec.

Pulse Requirement		Actual
Minimum Required Peak Acceleration:	16 g	16.05 g
Minimum Overall Velocity Change:	44 ft/s	45.27 ft/s
Maximum Rise Time:	90 msec	89.9 msec
Minimum Velocity Change Before Greq:	22 ft/s	22.74 ft/s



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Doc. No.: CDL-FA14B-06-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-06

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 11:12

Comments:

Rigid Seat Seat Back Fx

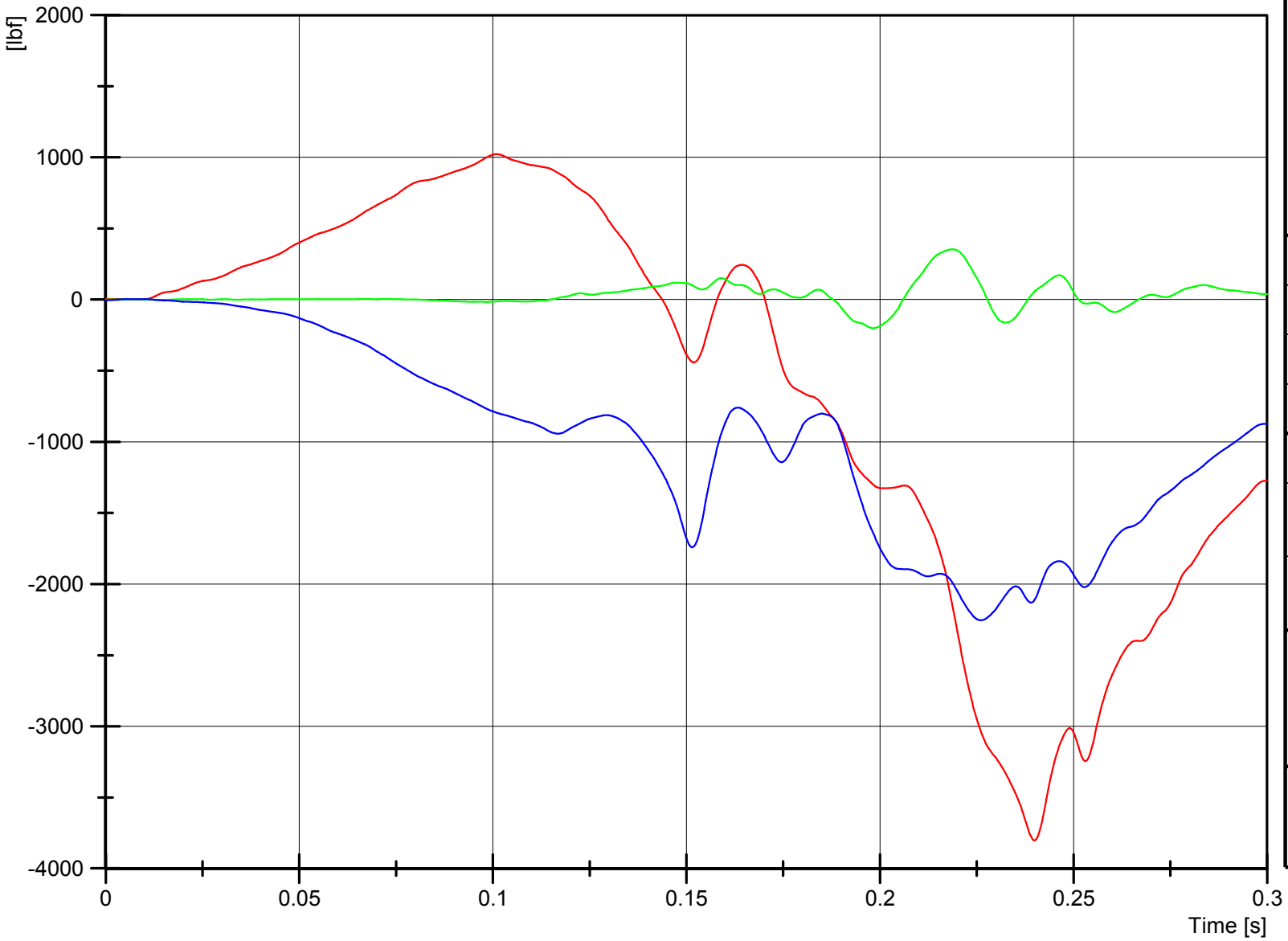
Maximum: 811.677 lbf Time: 0.1014 sec.
Minimum: -69.77 lbf Time: 0.1859 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC084FZ
Sensitivity: 1.176E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 12
Ref. No.: 15
Polarity: N

Rigid Seat Seat Back Fy

Maximum: 81.4224 lbf Time: 0.2416 sec.
Minimum: -64.55 lbf Time: 0.2326 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC084FY
Sensitivity: 2.733E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 11
Ref. No.: 14
Polarity: N

Rigid Seat Seat Back Fz

Maximum: 79.821 lbf Time: 0.2484 sec.
Minimum: -188.70 lbf Time: 0.1046 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC084FX
Sensitivity: 2.74E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 10
Ref. No.: 13
Polarity: R



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Doc. No.: CDL-FA14B-06-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-06

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 11:12

Comments:

Rigid Seat Seat Pan Fx

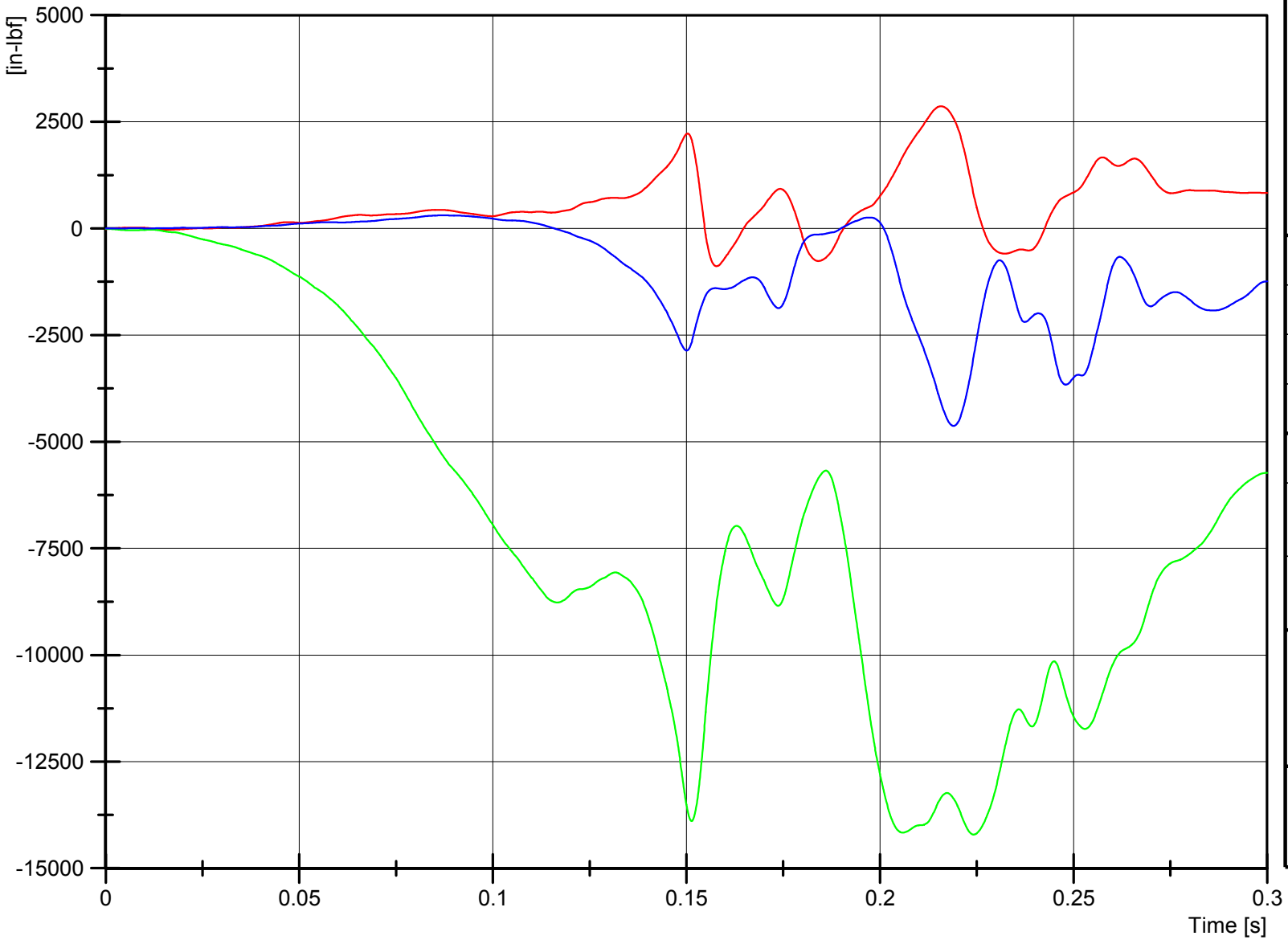
Maximum: 1021.92 lbf Time: 0.1011 sec.
Minimum: -3.80E+03 lbf Time: 0.2401 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083FX
Sensitivity: 2.768E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 13
Ref. No.: 10
Polarity: N

Rigid Seat Seat Pan Fy

Maximum: 353.70 lbf Time: 0.2189 sec.
Minimum: -200.78 lbf Time: 0.1984 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083FY
Sensitivity: 2.764E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 14
Ref. No.: 11
Polarity: N

Rigid Seat Seat Pan Fz

Maximum: 3.2609 lbf Time: 0.0091 sec.
Minimum: -2.25E+03 lbf Time: 0.2263 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083FZ
Sensitivity: 1.181E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 15
Ref. No.: 12
Polarity: N



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Doc. No.: CDL-FA14B-06-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-06

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 11:12

Comments:

Rigid Seat Seat Pan Mx

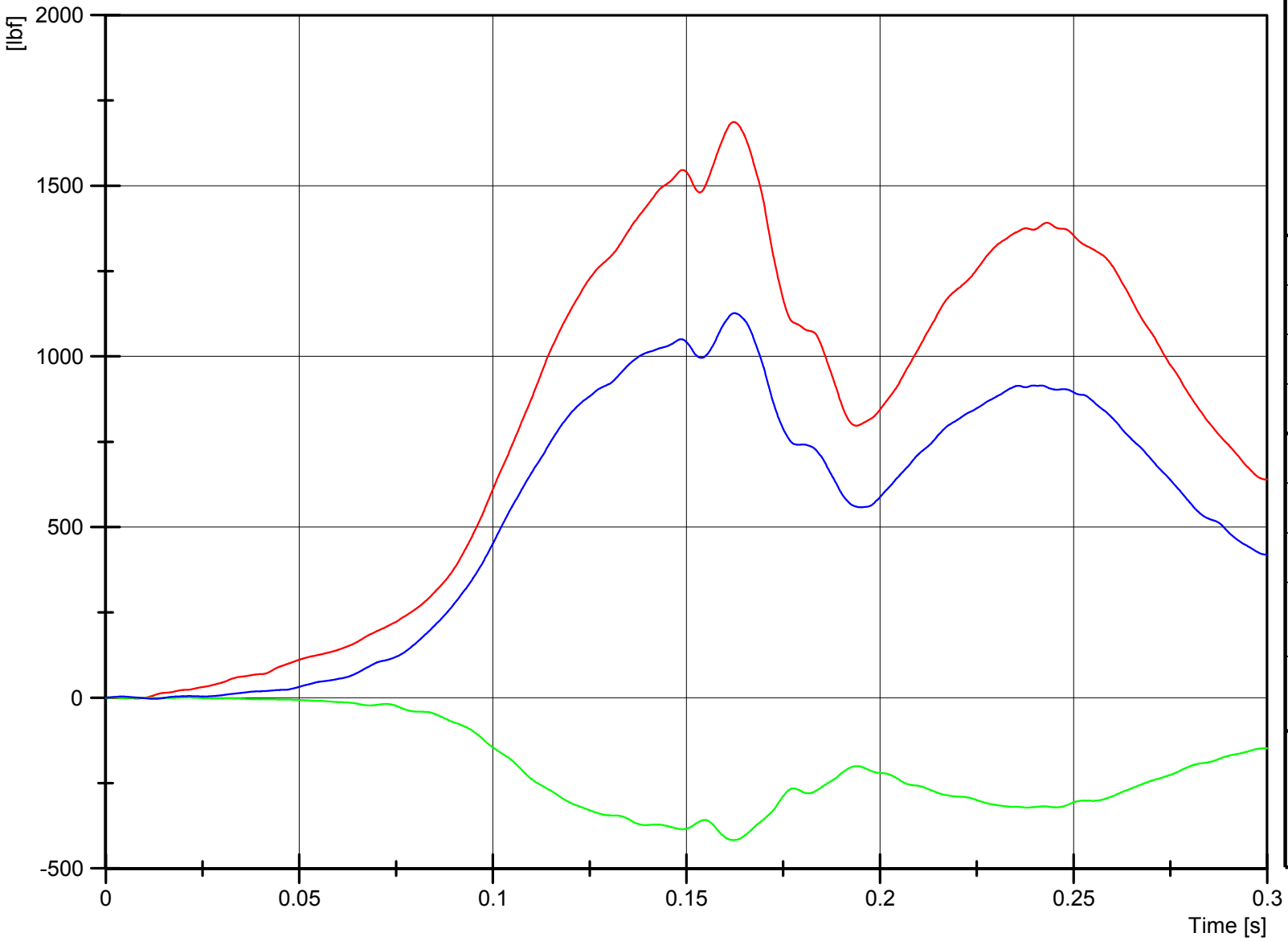
Maximum: 2866.25 in-lbf Time: 0.2159 sec.
Minimum: -887.60 in-lbf Time: 0.158 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083MX
Sensitivity: 7.03E-08 V/EU
Cal. Due: 02/13/2014
Full Scale: 25000 in-lbf
DAS Channel: 16
Ref. No.: 7
Polarity: N

Rigid Seat Seat Pan My

Maximum: -9.8125 in-lbf Time: 0.0005 sec.
Minimum: -1.42E+04 in-lbf Time: 0.2244 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083MY
Sensitivity: 7.05E-08 V/EU
Cal. Due: 02/13/2014
Full Scale: 25000 in-lbf
DAS Channel: 17
Ref. No.: 8
Polarity: N

Rigid Seat Seat Pan Mz

Maximum: 306.11 in-lbf Time: 0.0878 sec.
Minimum: -4.63E+03 in-lbf Time: 0.2192 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083MZ
Sensitivity: 9.32E-08 V/EU
Cal. Due: 02/13/2014
Full Scale: 20000 in-lbf
DAS Channel: 18
Ref. No.: 9
Polarity: N



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Doc. No.: CDL-FA14B-06-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-06

Dummy: H2 718

Position: Config 4 - Repaired Belt

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 11:12

Rigid Seat Right Lap Fx

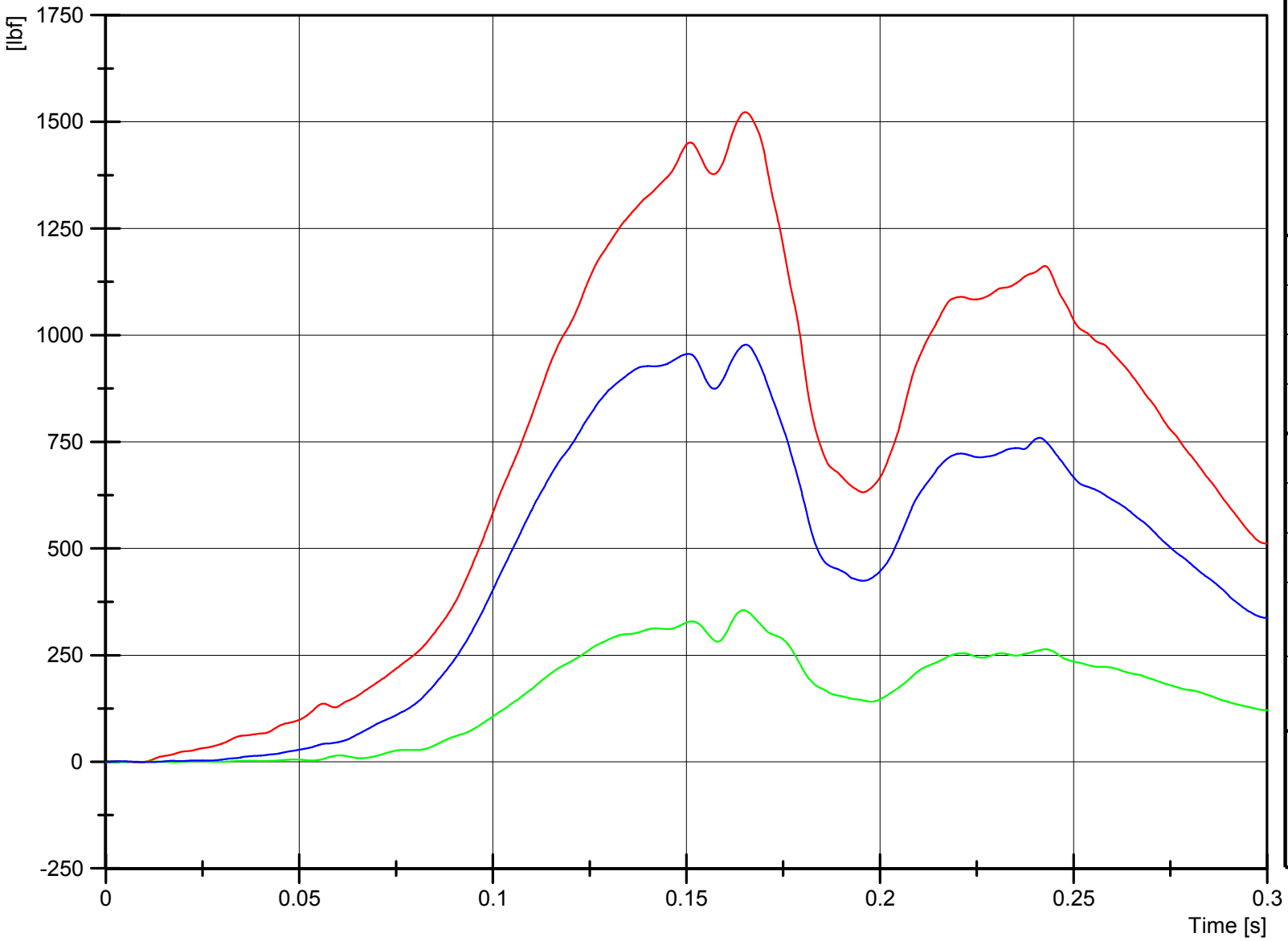
Maximum: 1686.42 lbf Time: 0.1624 sec.
Minimum: -1.5802 lbf Time: 0.0082 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC093FX
Sensitivity: 2.587E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 22
Ref. No.: 74
Polarity: N

Rigid Seat Right Lap Fy

Maximum: 1.159 lbf Time: 0.0211 sec.
Minimum: -416.82 lbf Time: 0.1624 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC093FY
Sensitivity: 2.572E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 23
Ref. No.: 75
Polarity: N

Rigid Seat Right Lap Fz

Maximum: 1126.84 lbf Time: 0.1626 sec.
Minimum: -2.8163 lbf Time: 0.0128 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC093FZ
Sensitivity: 1.044E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 24
Ref. No.: 76
Polarity: N



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Doc. No.: CDL-FA14B-06-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-06

Dummy: H2 718

Position: Config 4 - Repaired Belt

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 11:12

Rigid Seat Left Lap Fx

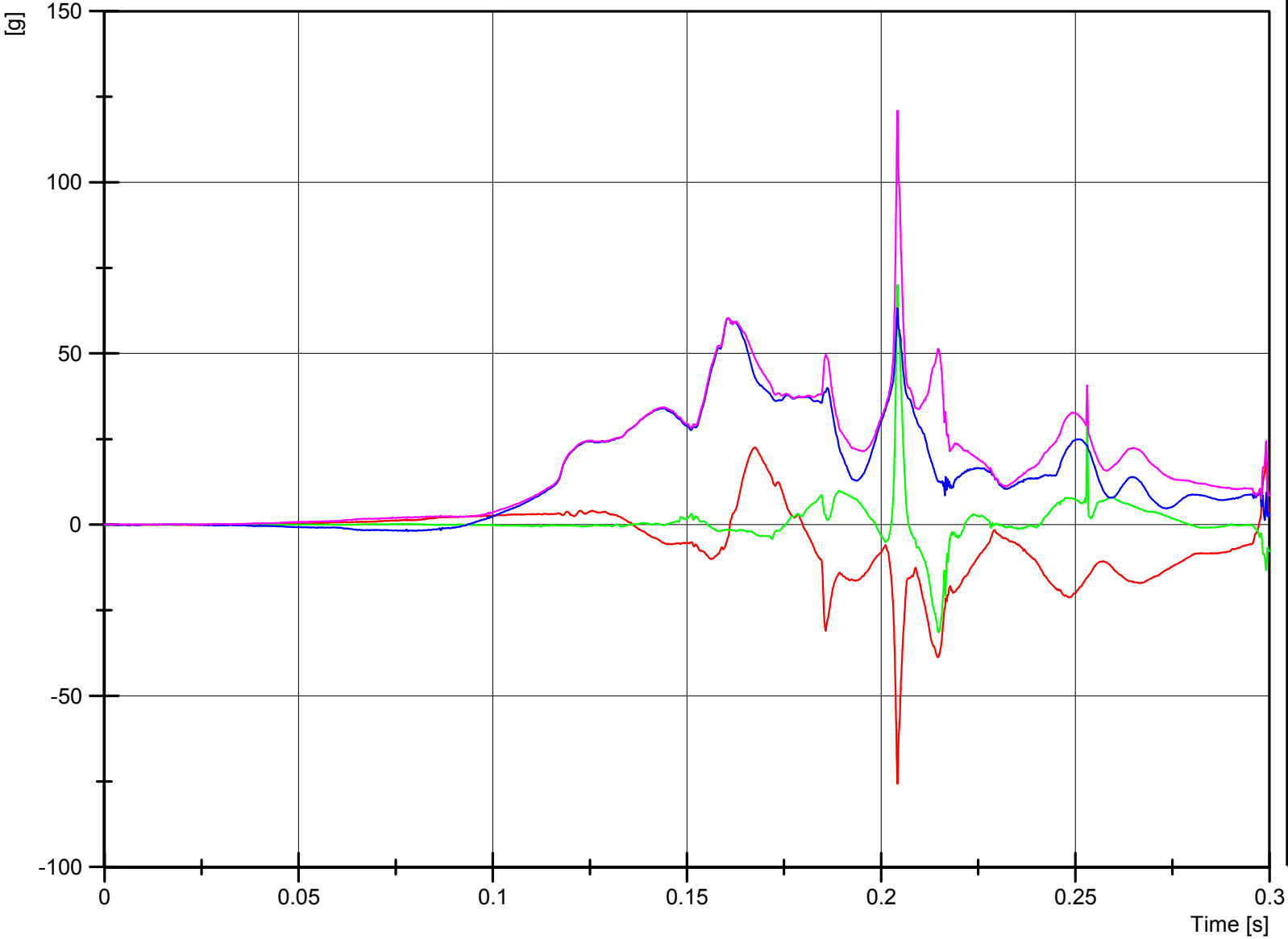
Maximum: 1522.51 lbf Time: 0.1654 sec.
Minimum: -1.1859 lbf Time: 0.0088 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC094FX
Sensitivity: 2.587E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 19
Ref. No.: 77
Polarity: N

Rigid Seat Left Lap Fy

Maximum: 355.60 lbf Time: 0.1649 sec.
Minimum: -0.5696 lbf Time: 0 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC094FY
Sensitivity: 2.572E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 20
Ref. No.: 78
Polarity: N

Rigid Seat Left Lap Fz

Maximum: 977.52 lbf Time: 0.1655 sec.
Minimum: -0.5224 lbf Time: 0.0115 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC094FZ
Sensitivity: 1.044E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 21
Ref. No.: 79
Polarity: N



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Doc. No.: CDL-FA14B-06-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-06

Dummy: H2 718

Position: Config 4 - Repaired Belt

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 11:12

Head Ax H2 718

Maximum: 22.5557 g Time: 0.1678 sec.
Minimum: -75.67 g Time: 0.2044 sec.
CFC: 1000
Sensor Type: Endevco 7264C
S/N: P47932
Sensitivity: 2.157E-05 V/EU
Cal. Due: 09/25/2014
Full Scale: 2000 g
DAS Channel: 25
Ref. No.: 22
Polarity: R

Head Ay H2 718

Maximum: 70.0097 g Time: 0.2044 sec.
Minimum: -31.48 g Time: 0.215 sec.
CFC: 1000
Sensor Type: Endevco 7264C
S/N: P48149
Sensitivity: 2.603E-05 V/EU
Cal. Due: 09/25/2014
Full Scale: 2000 g
DAS Channel: 26
Ref. No.: 23
Polarity: R

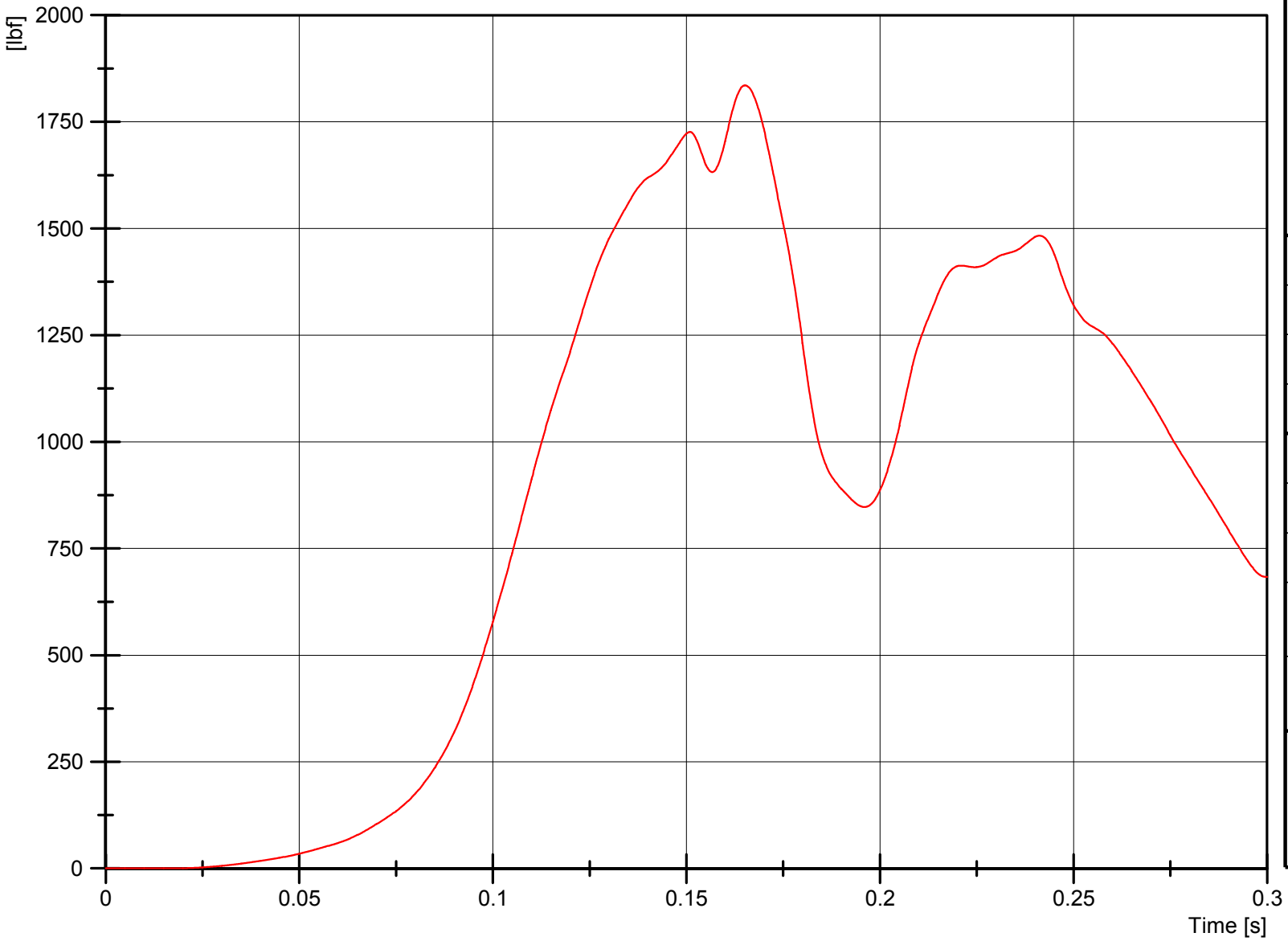
Head Az H2 718

Maximum: 63.2043 g Time: 0.2044 sec.
Minimum: -1.9107 g Time: 0.0782 sec.
CFC: 1000
Sensor Type: Endevco 7264C
S/N: P60367
Sensitivity: 1.782E-05 V/EU
Cal. Due: 09/25/2014
Full Scale: 2000 g
DAS Channel: 27
Ref. No.: 24
Polarity: R

Head Resultant H2 718

Maximum: 120.92 g Time: 0.2042 sec.

HIC: 813.2
T1: 118.5 msec.
T2: 268.9 msec.



Lap Belt Force H2 718

Maximum: 1835.66 lbf Time: 0.1654 sec.
Minimum: 0.1756 lbf Time: 0.0115 sec.
CFC: 60
Sensor Type: Denton 3255
S/N: SBLC086
Sensitivity: 6.6006E-07 V/EU
Cal. Due: 05/16/2014
Full Scale: 3000 lbf
DAS Channel: 36
Ref. No.: 17
Polarity: N

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www.niar.wichita.edu

Doc. No.: CDL-FA14B-06-01

Version: New

Report Date: 03/25/2014

Customer: FAA

Test: FA14B-06

Dummy: H2 718

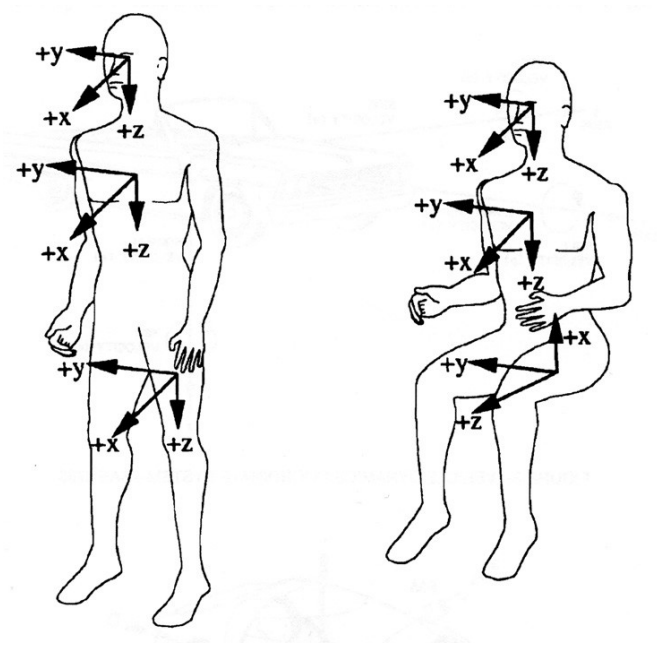
Position: Config 4 - Repaired Belt

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 11:12

J211/1 Sign Conventions



Upper Neck Load Cell:
+FX Head rearward, chest forward
+FY Head leftward, chest rightward
+FZ Head upward, chest downward
+MX Left ear toward left shoulder
+MY Chin toward sternum
+MZ Chin toward left shoulder

Lumbar Load Cell:
+FX Chest rearward, pelvis forward
+FY Chest leftward, pelvis rightward
+FZ Chest upward, pelvis downward
+MX Left shoulder toward left hip
+MY Sternum toward front of legs
+MZ Right shoulder forward, left shoulder rearward

Femur Load Cells:
+FZ Tension

Chest Displacement:
-DX Compression

Rib Dispacement:
-DY Compression

Belt Load Cells:
+FX Tension

Floor Load Cells:
+FX Test article forward
+FY Test article right
+FZ Test article up

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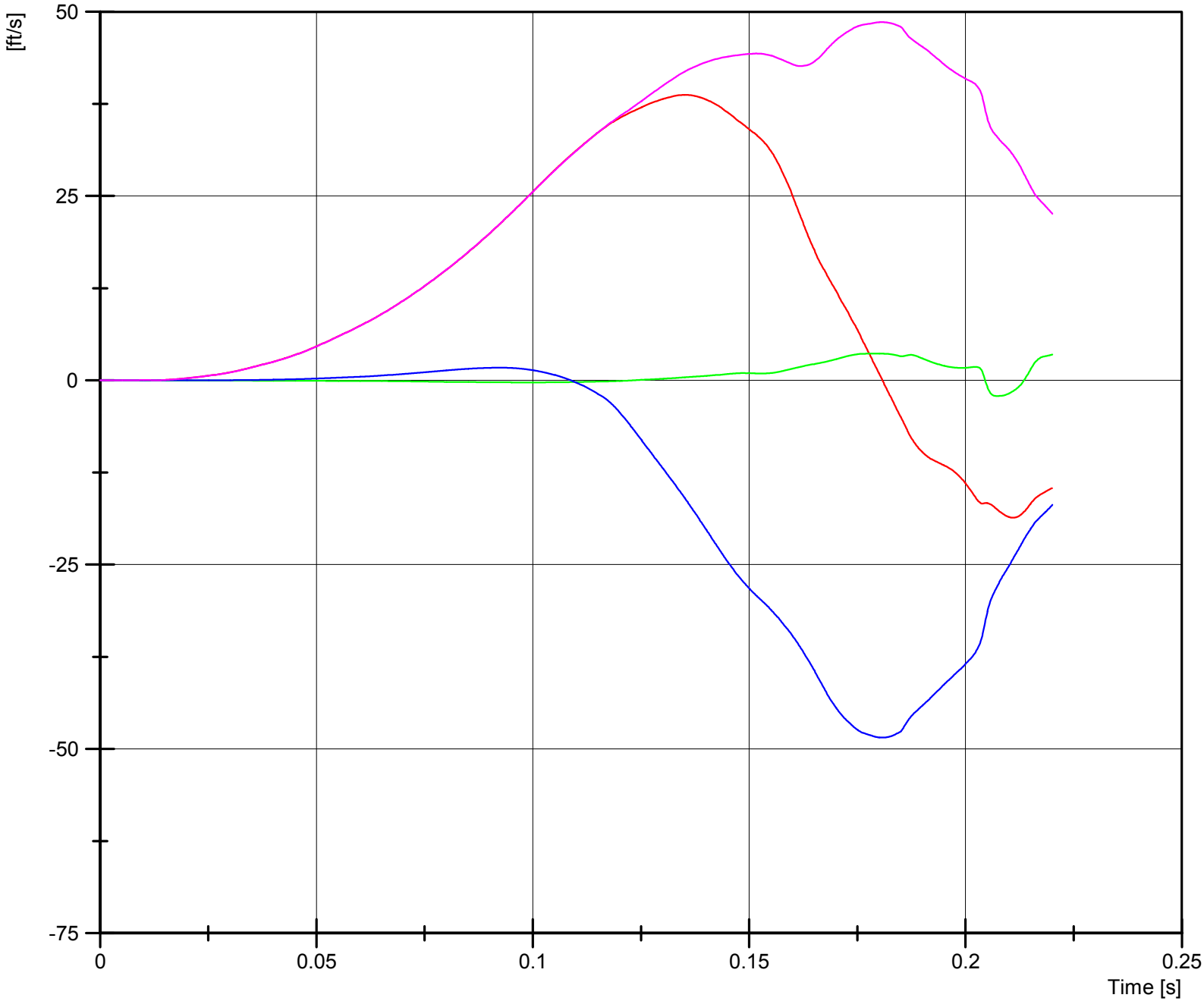

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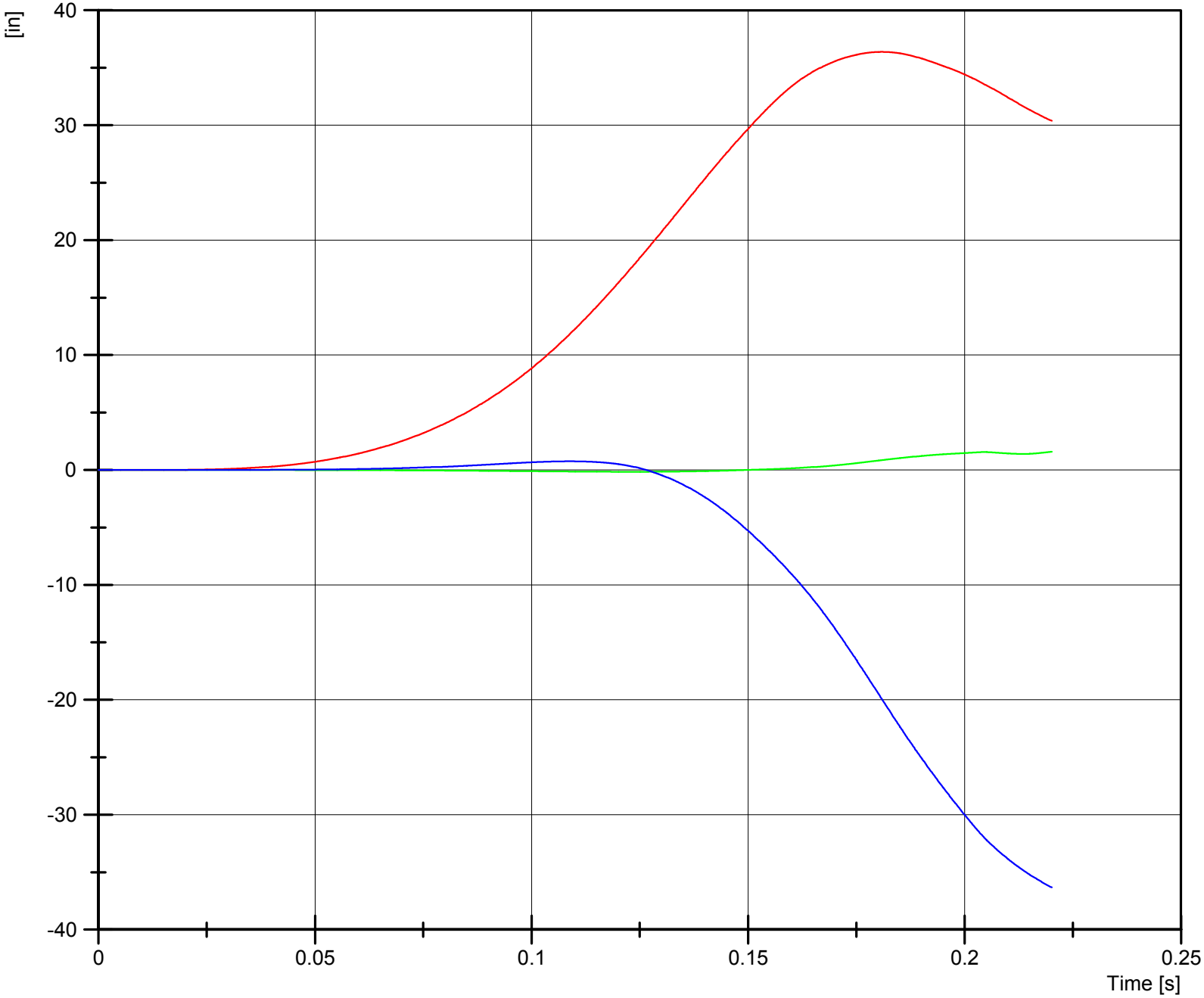
Comments:

Global Head Vx H2 718		Global Head Vy H2 718		Global Head Vz H2 718		Global Head Velocity Resultant H2 718	
Maximum: 38.71 ft/s	Time: 0.1355 sec.	Maximum: 3.66 ft/s	Time: 0.1802 sec.	Maximum: 1.72 ft/s	Time: 0.0923 sec.	Maximum: 48.59 ft/s	Time: 0.1806 sec.
Minimum: -18.63 ft/s	Time: 0.211 sec.	Minimum: -2.14 ft/s	Time: 0.2074 sec.	Minimum: -48.46 ft/s	Time: 0.1808 sec.	Minimum: 0 ft/s	Time: 0.0001 sec.



Global Head Dx H2 718 | Global Head Dy H2 718 | Global Head Dz H2 718

Maximum: 36.38 in	Time: 0.1809 sec.	Maximum: 1.59 in	Time: 0.2201 sec.	Maximum: 0.75 in	Time: 0.1088 sec.
Minimum: -0.00 in	Time: 0.0132 sec.	Minimum: -0.16 in	Time: 0.123 sec.	Minimum: -36.32 in	Time: 0.2201 sec.

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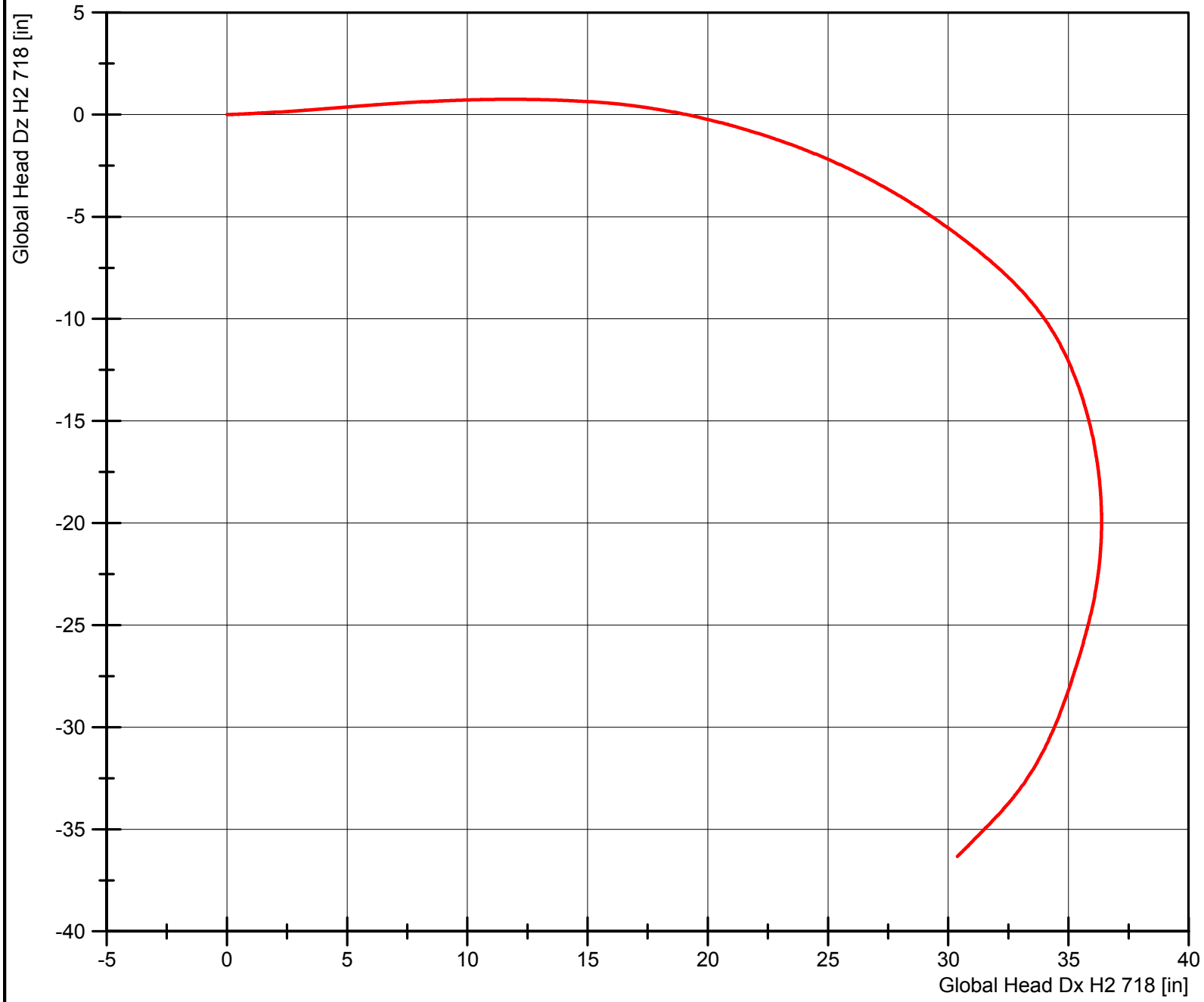
Comments:

Displacement values are calculated from Head Accelerations and Angular Velocities.
This method cannot be used to substitute photometric analysis.



Global Head Displacement XZ

X Maximum: 36.38 in **Time: 0.1809 sec.**

Z Value at X Maximum: -19.93 in

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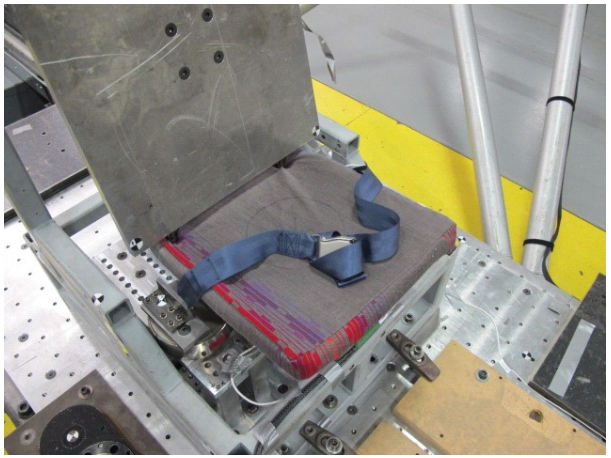

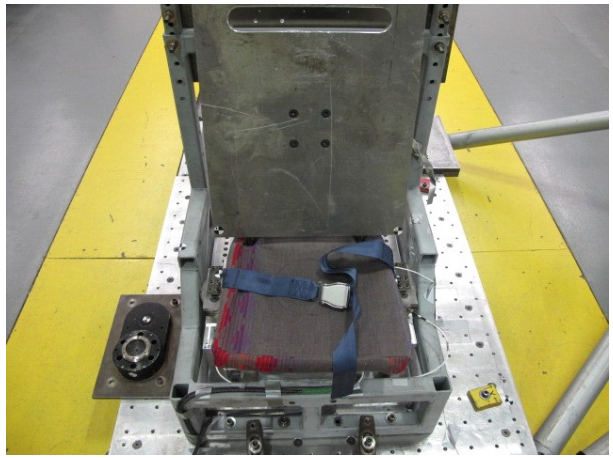

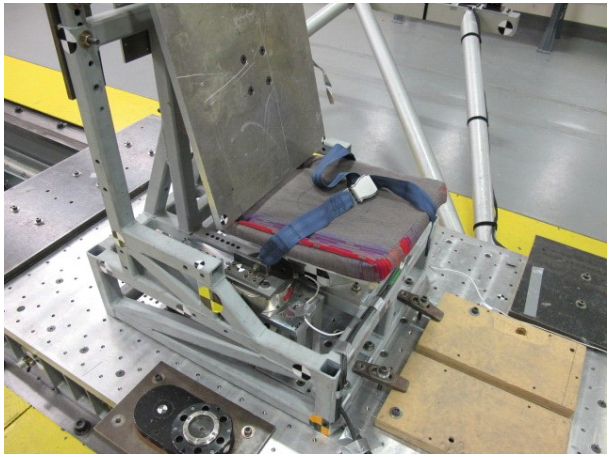

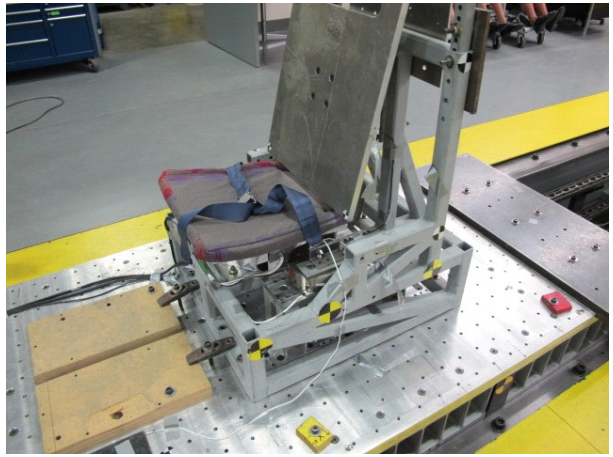

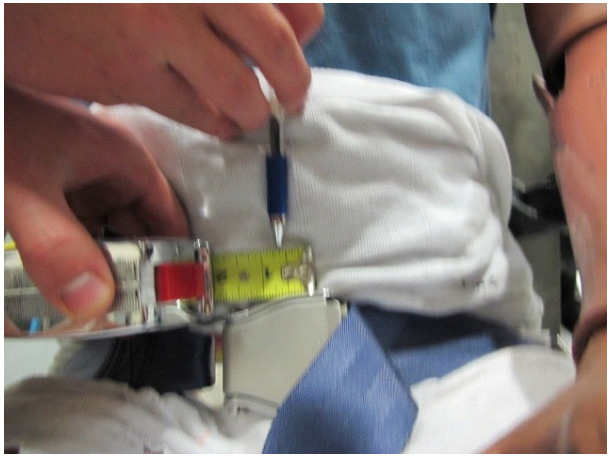

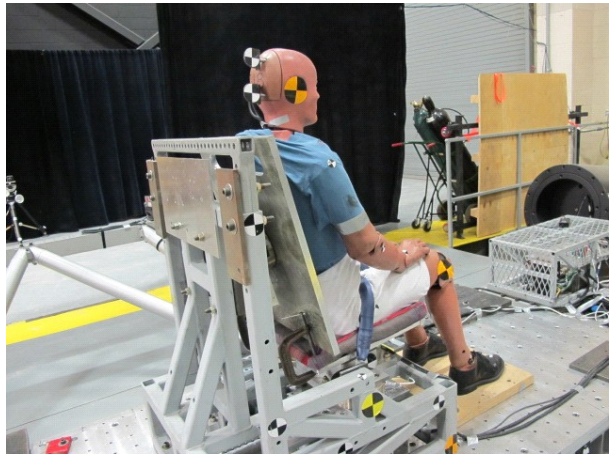

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Dummy: N/A

Position: N/A

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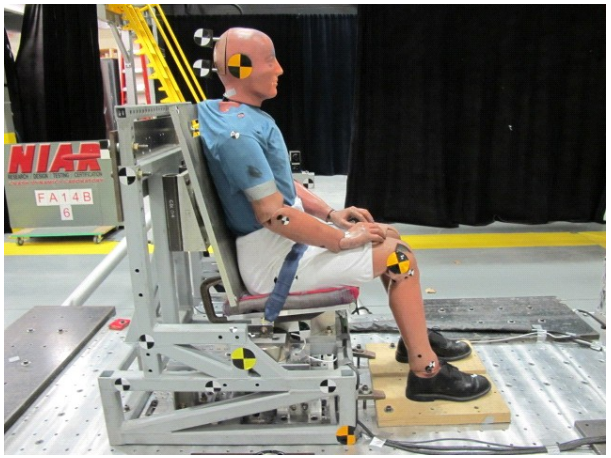

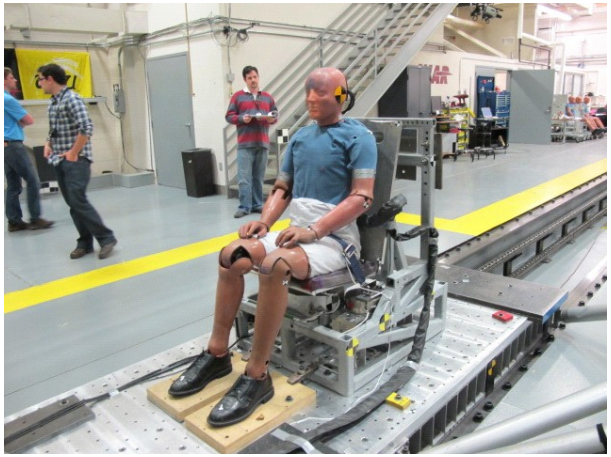

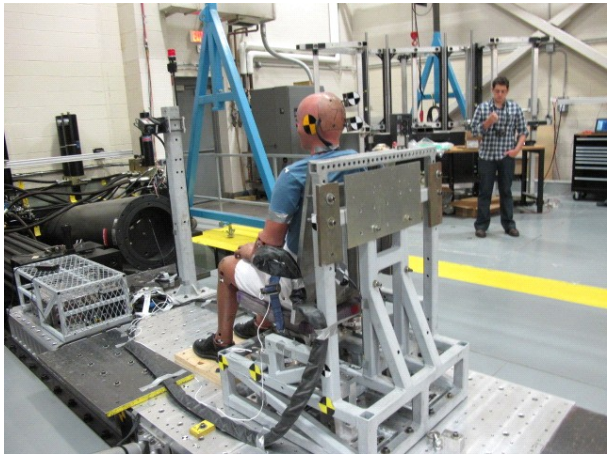

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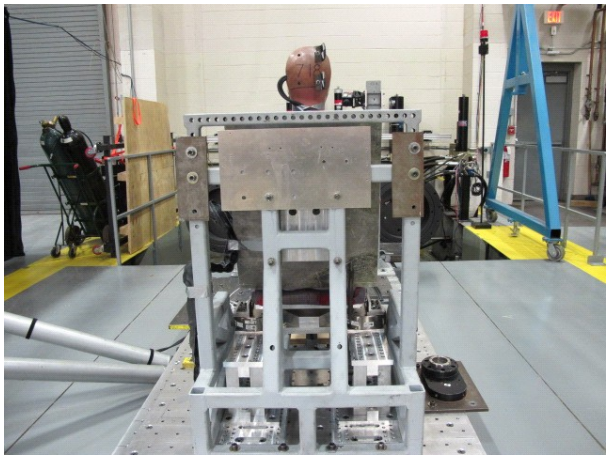

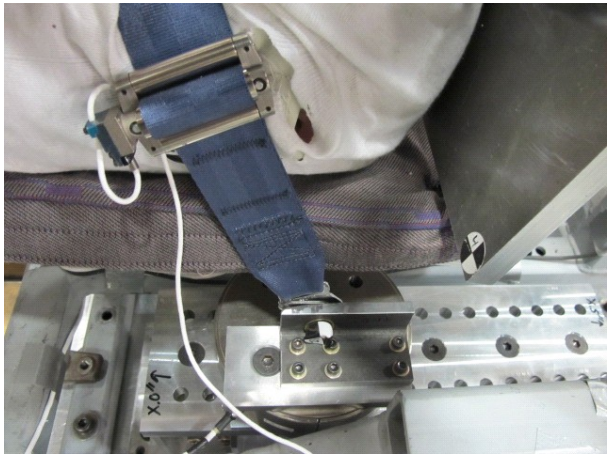

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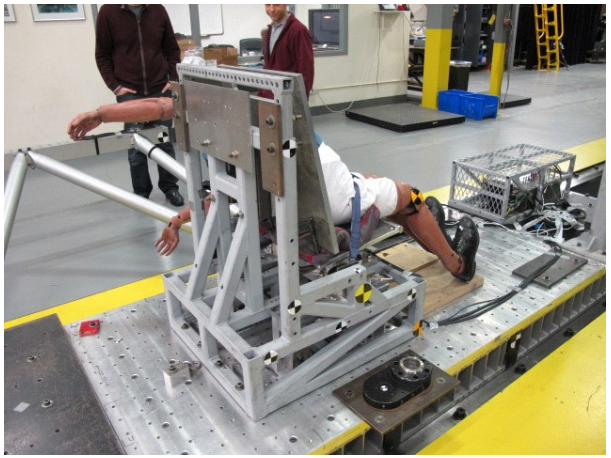

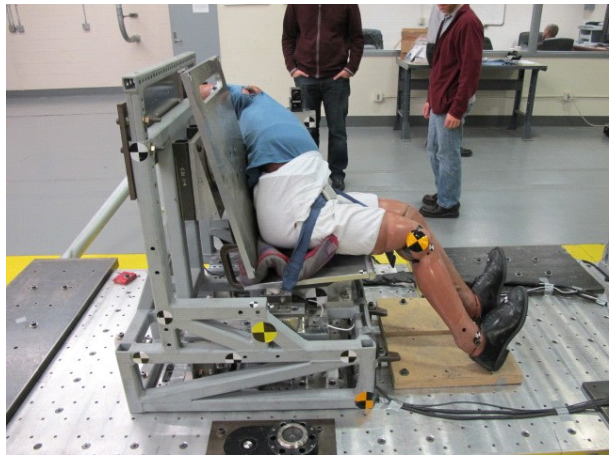

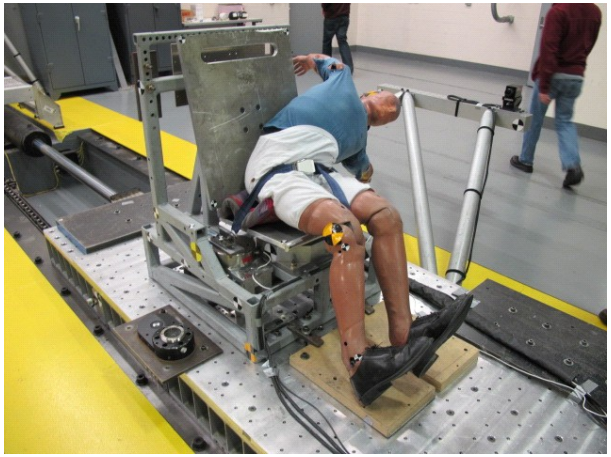

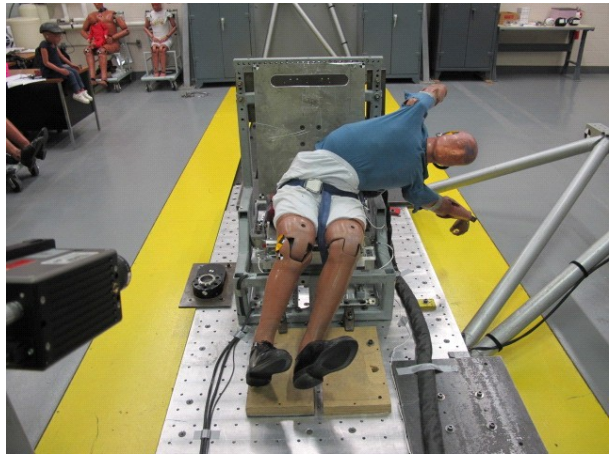

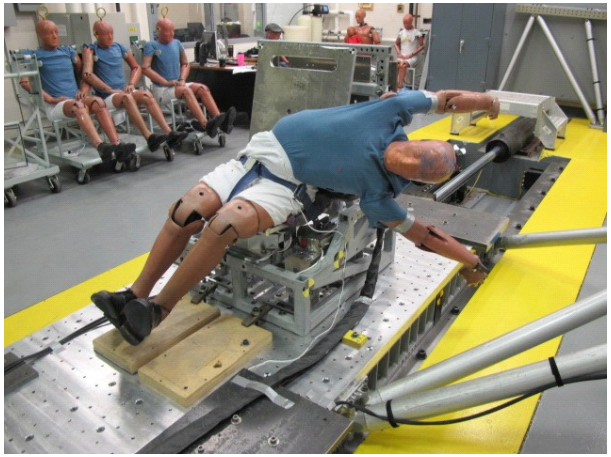

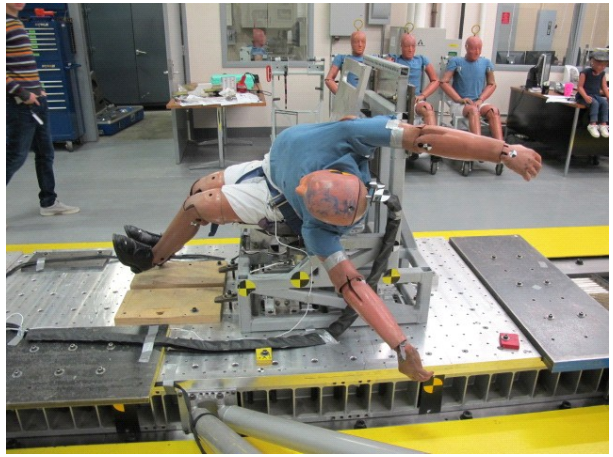

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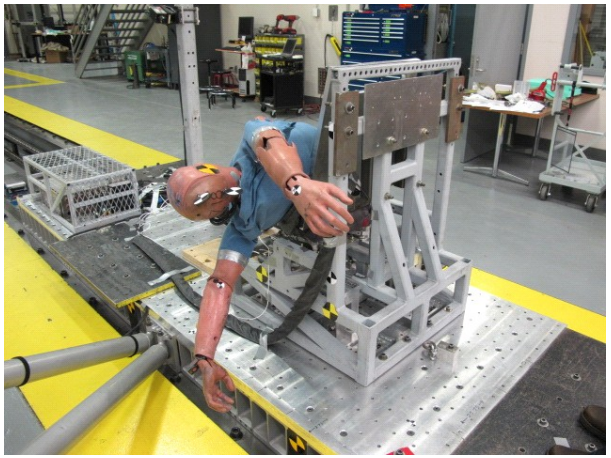

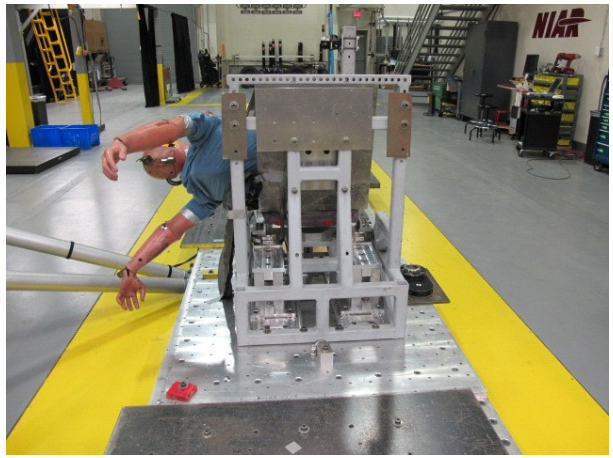

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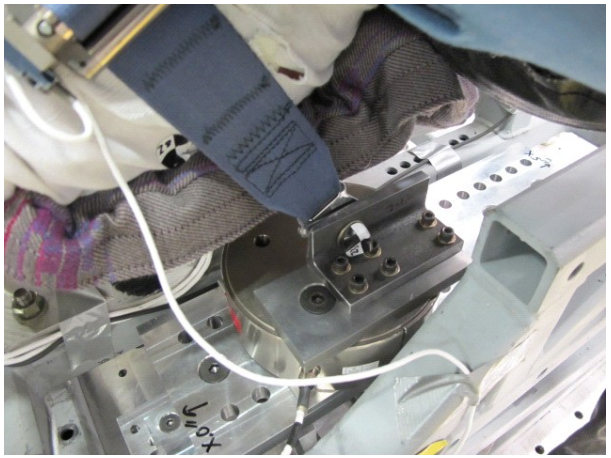

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Report No. CDL-FA14B-07-01

Requested by:

FAA

Final Test Report
FA14B-07

03/26/2014

Revision	Change	Date	Revised By
New		03/26/2014	Rob Huculak

Prepared and Reviewed by:

Rob Huculak
Laboratory Manager

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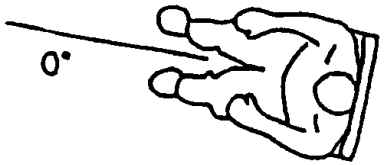
Test Summary

The dynamic test (FA14B-07) was performed for FAA in accordance with 14 CFR 25.562 Test 2 on 03/26/2014.

Pulse Parameters	Required	Result	Pass/Fail
Minimum Peak Acceleration (g)	16	16.12	PASS
Minimum Velocity Change (ft/sec)	44	45.6	PASS
Maximum Rise Time (msec)	90	89.8	PASS
Minimum Velocity Change During Rise Time (ft/sec)	22	22.67	PASS
2g Offset	--	--	PASS

Test Orientation



ATD: H2 718 **Position: Config 5 - New Belt**

0 deg

Measured Seat Belt Angle	Measured Seat Belt Offset
64.85 deg	2.75 in

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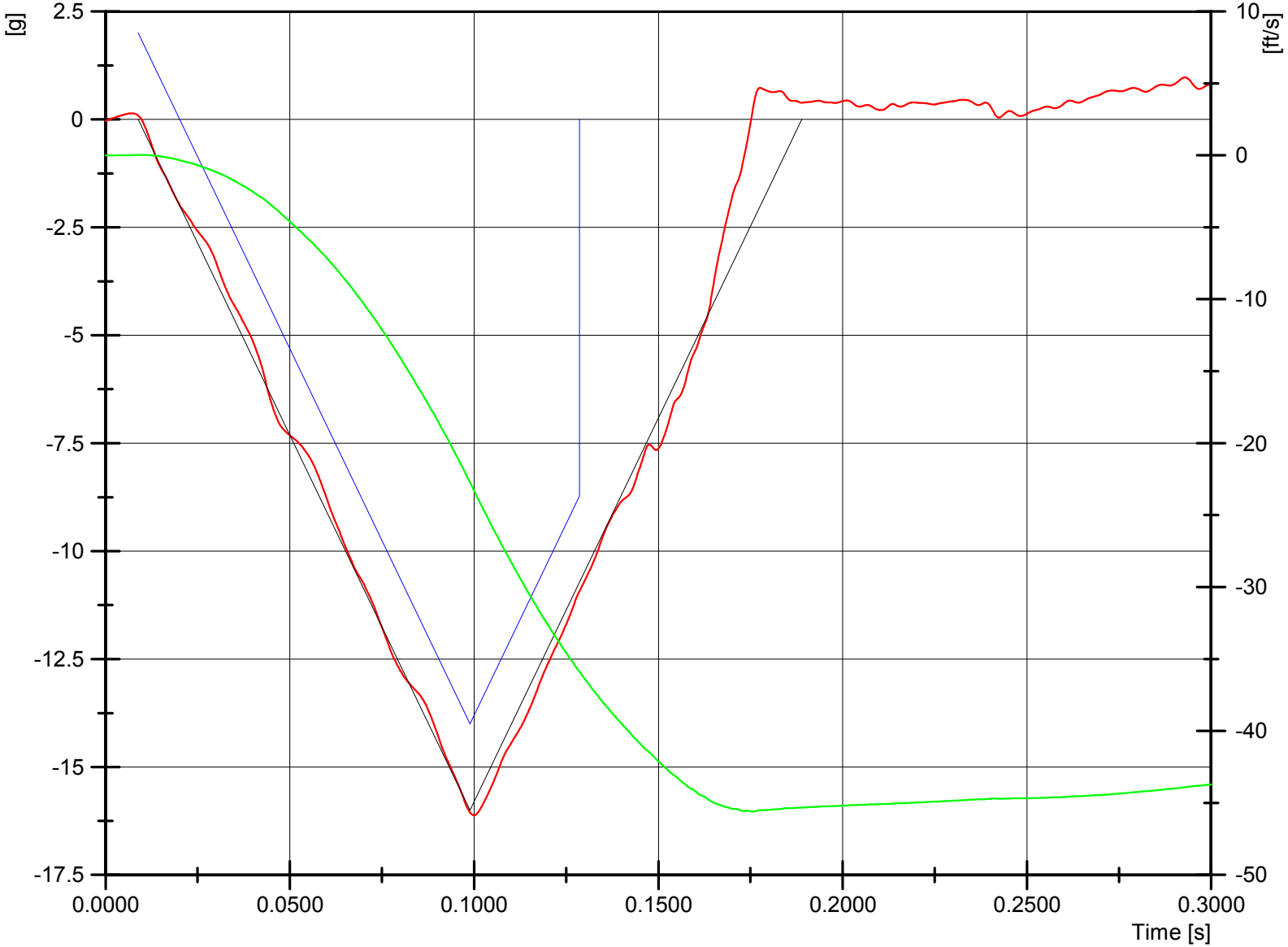
Temperature	Relative Humidity
72.8°F	28.9%



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Test Date/Time: 11/22/2013 14:03

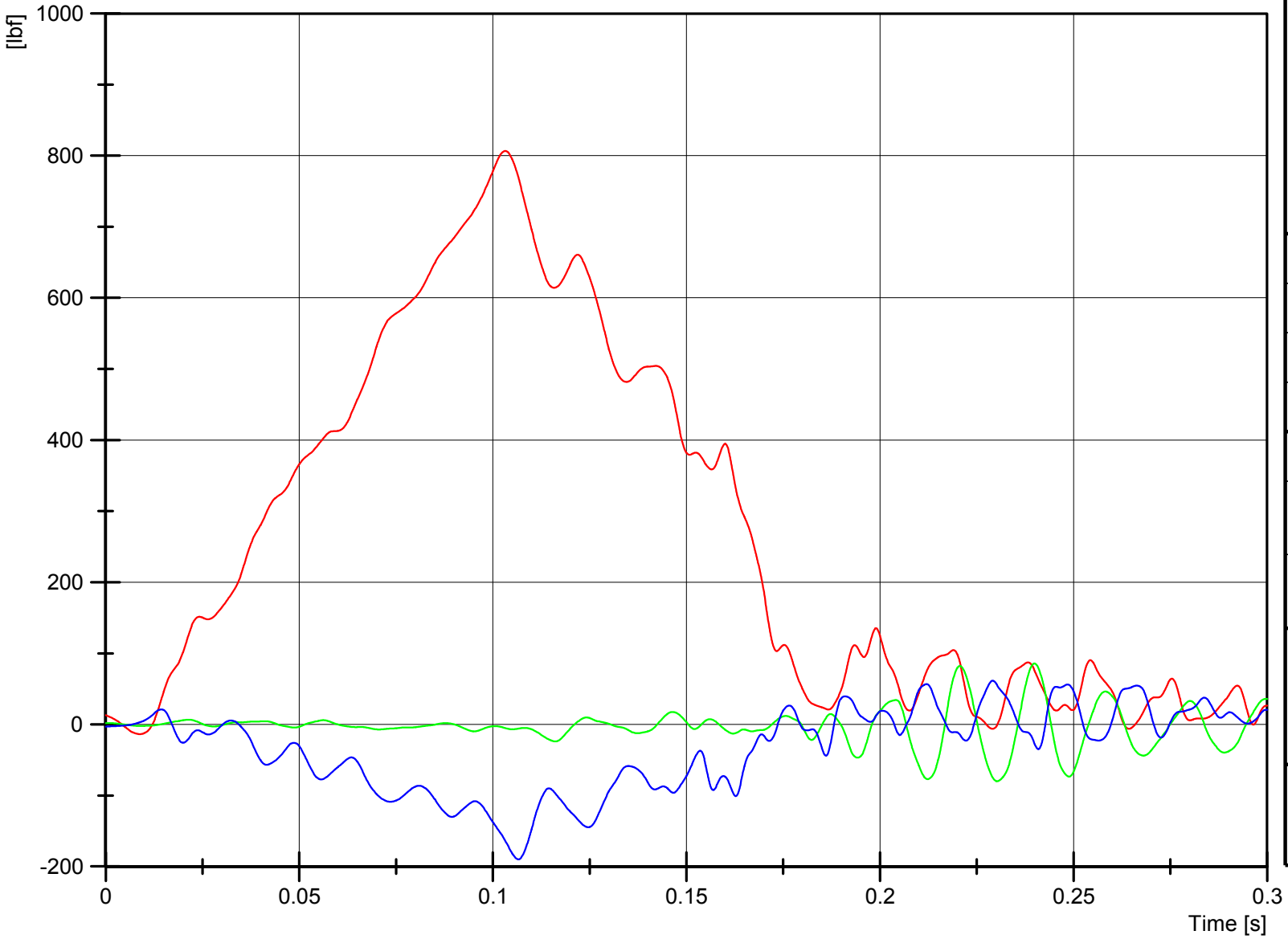
Comments:

Sled Acceleration | Sled Velocity | Ideal Pulse | Upper Limit

Maximum: 0.973 g Time: 0.2929 sec.
Minimum: -16.12 g Time: 0.1 sec.
CFC: 60
Sensor Type: ENDEVCO 7290A-100
S/N: 29924
Sensitivity: 0.01919 V/EU
Cal. Due: 06/11/2014
Full Scale: 100 g
DAS Channel: 50
Ref. No.: 1
Polarity: R

Minimum: -45.60 ft/s Time: 0.1756 sec.

Pulse Requirement		Actual
Minimum Required Peak Acceleration:	16 g	16.12 g
Minimum Overall Velocity Change:	44 ft/s	45.6 ft/s
Maximum Rise Time:	90 msec	89.8 msec
Minimum Velocity Change Before Greq:	22 ft/s	22.67 ft/s



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Comments:

Rigid Seat Seat Back Fx

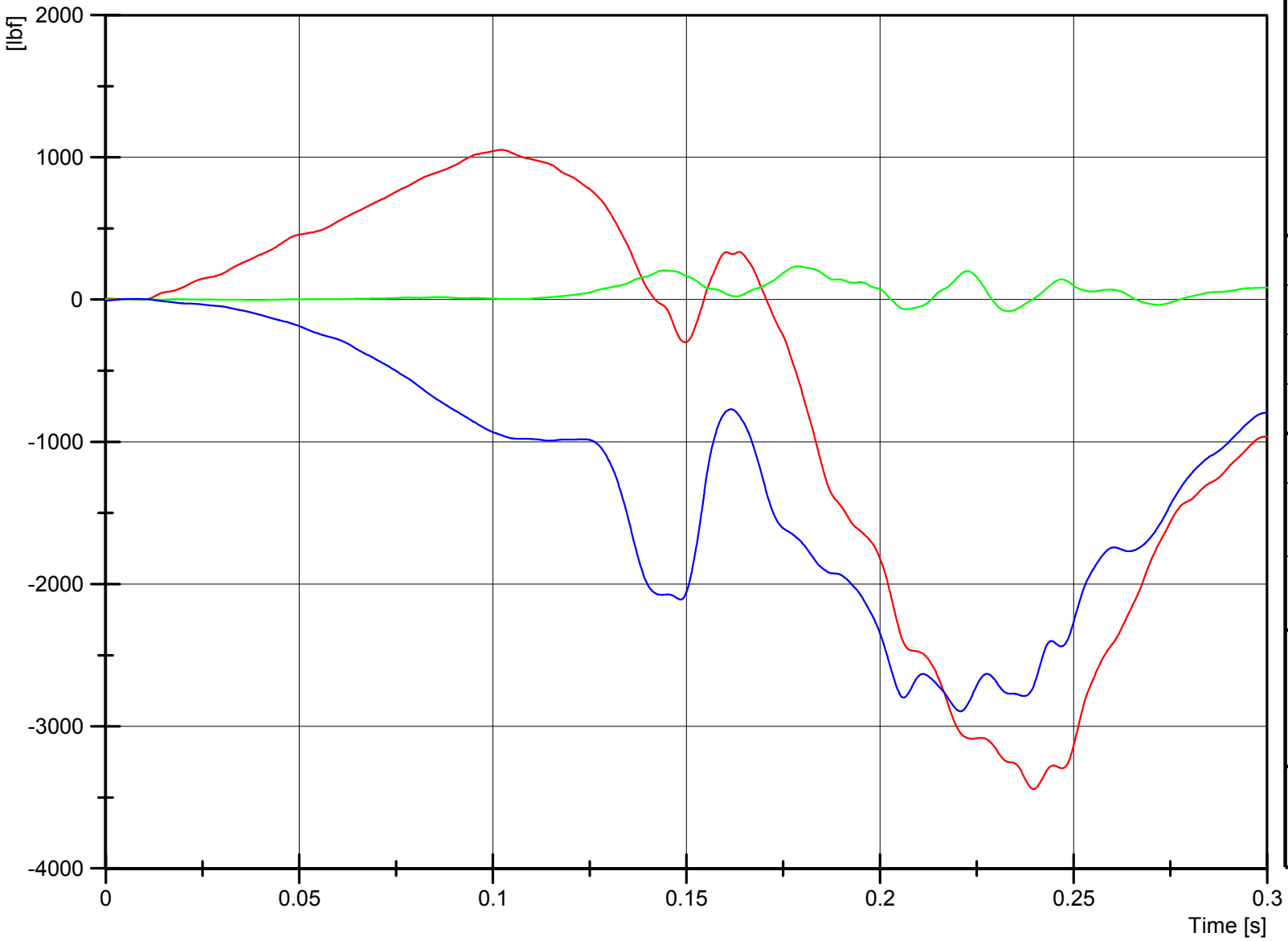
Maximum: 806.79 lbf Time: 0.1034 sec.
Minimum: -13.83 lbf Time: 0.009 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC084FZ
Sensitivity: 1.176E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 12
Ref. No.: 15
Polarity: N

Rigid Seat Seat Back Fy

Maximum: 85.9149 lbf Time: 0.2401 sec.
Minimum: -80.154 lbf Time: 0.2304 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC084FY
Sensitivity: 2.733E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 11
Ref. No.: 14
Polarity: N

Rigid Seat Seat Back Fz

Maximum: 61.4543 lbf Time: 0.2293 sec.
Minimum: -189.95 lbf Time: 0.1068 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC084FX
Sensitivity: 2.74E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 10
Ref. No.: 13
Polarity: R



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Doc. No.: CDL-FA14B-07-01

Version: New

Report Date: 03/26/2014

Customer: FAA

Test: FA14B-07

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 14:03

Comments:

Rigid Seat Seat Pan Fx

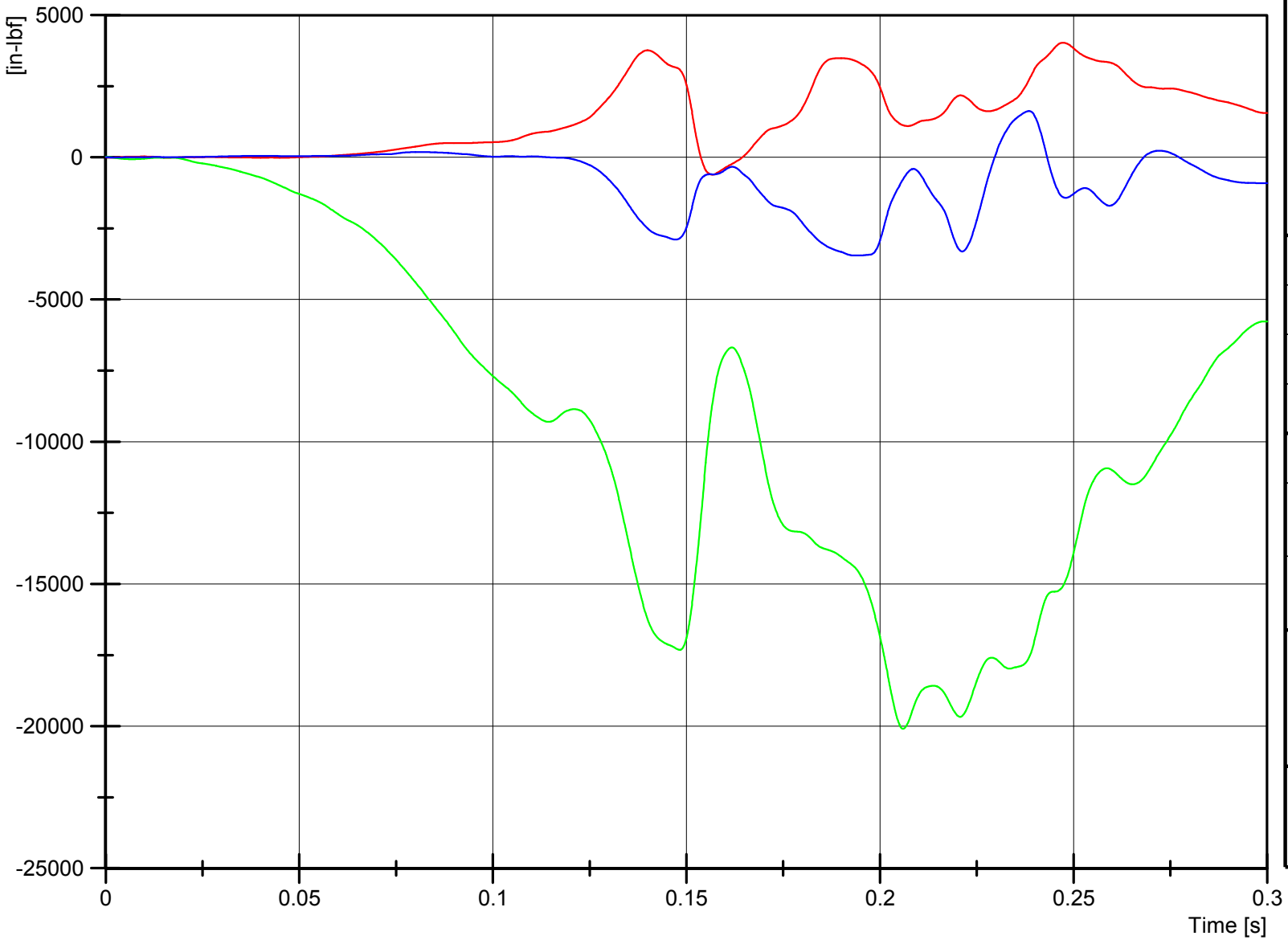
Maximum: 1052.96 lbf Time: 0.1023 sec.
Minimum: -3.44E+03 lbf Time: 0.2399 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083FX
Sensitivity: 2.768E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 13
Ref. No.: 10
Polarity: N

Rigid Seat Seat Pan Fy

Maximum: 233.21 lbf Time: 0.1792 sec.
Minimum: -82.52 lbf Time: 0.2334 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083FY
Sensitivity: 2.764E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 14
Ref. No.: 11
Polarity: N

Rigid Seat Seat Pan Fz

Maximum: 5.4359 lbf Time: 0.0076 sec.
Minimum: -2.89E+03 lbf Time: 0.221 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083FZ
Sensitivity: 1.181E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 15
Ref. No.: 12
Polarity: N



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Doc. No.: CDL-FA14B-07-01

Version: New

Report Date: 03/26/2014

Customer: FAA

Test: FA14B-07

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 14:03

Comments:

Rigid Seat Seat Pan Mx

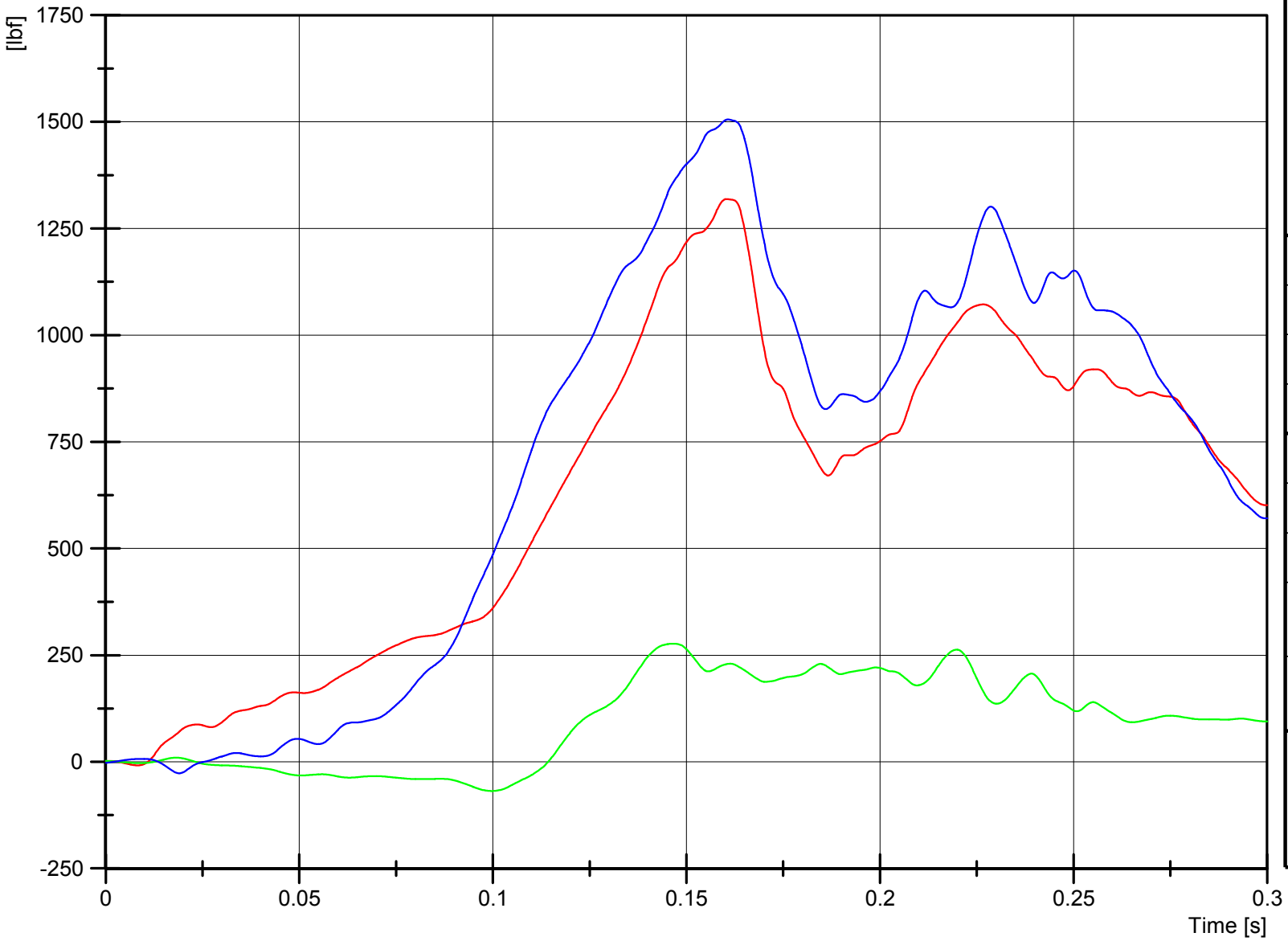
Maximum: 4026.72 in-lbf Time: 0.2475 sec.
Minimum: -605.45 in-lbf Time: 0.1569 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083MX
Sensitivity: 7.03E-08 V/EU
Cal. Due: 02/13/2014
Full Scale: 25000 in-lbf
DAS Channel: 16
Ref. No.: 7
Polarity: N

Rigid Seat Seat Pan My

Maximum: 20.0854 in-lbf Time: 0 sec.
Minimum: -2.01E+04 in-lbf Time: 0.2062 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083MY
Sensitivity: 7.05E-08 V/EU
Cal. Due: 02/13/2014
Full Scale: 25000 in-lbf
DAS Channel: 17
Ref. No.: 8
Polarity: N

Rigid Seat Seat Pan Mz

Maximum: 1625.48 in-lbf Time: 0.2387 sec.
Minimum: -3.45E+03 in-lbf Time: 0.1933 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083MZ
Sensitivity: 9.32E-08 V/EU
Cal. Due: 02/13/2014
Full Scale: 20000 in-lbf
DAS Channel: 18
Ref. No.: 9
Polarity: N



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Doc. No.: CDL-FA14B-07-01

Version: New

Report Date: 03/26/2014

Customer: FAA

Test: FA14B-07

Dummy: H2 718

Position: Config 5 - New Belt

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 14:03

Rigid Seat Right Lap Fx

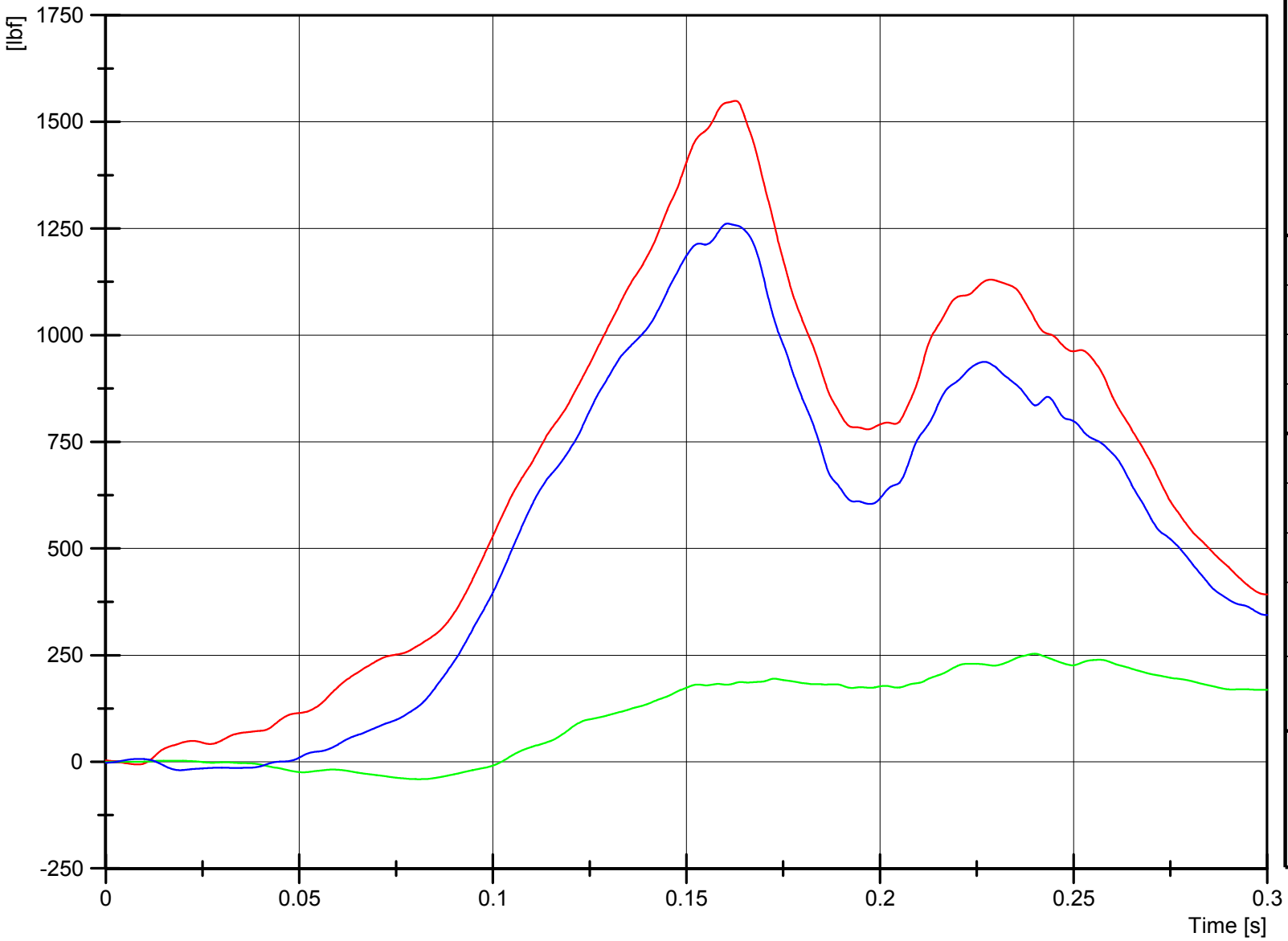
Maximum: 1318.68 lbf Time: 0.1606 sec.
Minimum: -8.1012 lbf Time: 0.0085 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC093FX
Sensitivity: 2.587E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 22
Ref. No.: 74
Polarity: N

Rigid Seat Right Lap Fy

Maximum: 277.11 lbf Time: 0.1468 sec.
Minimum: -68.61 lbf Time: 0.0999 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC093FY
Sensitivity: 2.572E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 23
Ref. No.: 75
Polarity: N

Rigid Seat Right Lap Fz

Maximum: 1505.72 lbf Time: 0.1609 sec.
Minimum: -26.88 lbf Time: 0.0192 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC093FZ
Sensitivity: 1.044E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 24
Ref. No.: 76
Polarity: N



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Doc. No.: CDL-FA14B-07-01

Version: New

Report Date: 03/26/2014

Customer: FAA

Test: FA14B-07

Dummy: H2 718

Position: Config 5 - New Belt

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 14:03

Rigid Seat Left Lap Fx

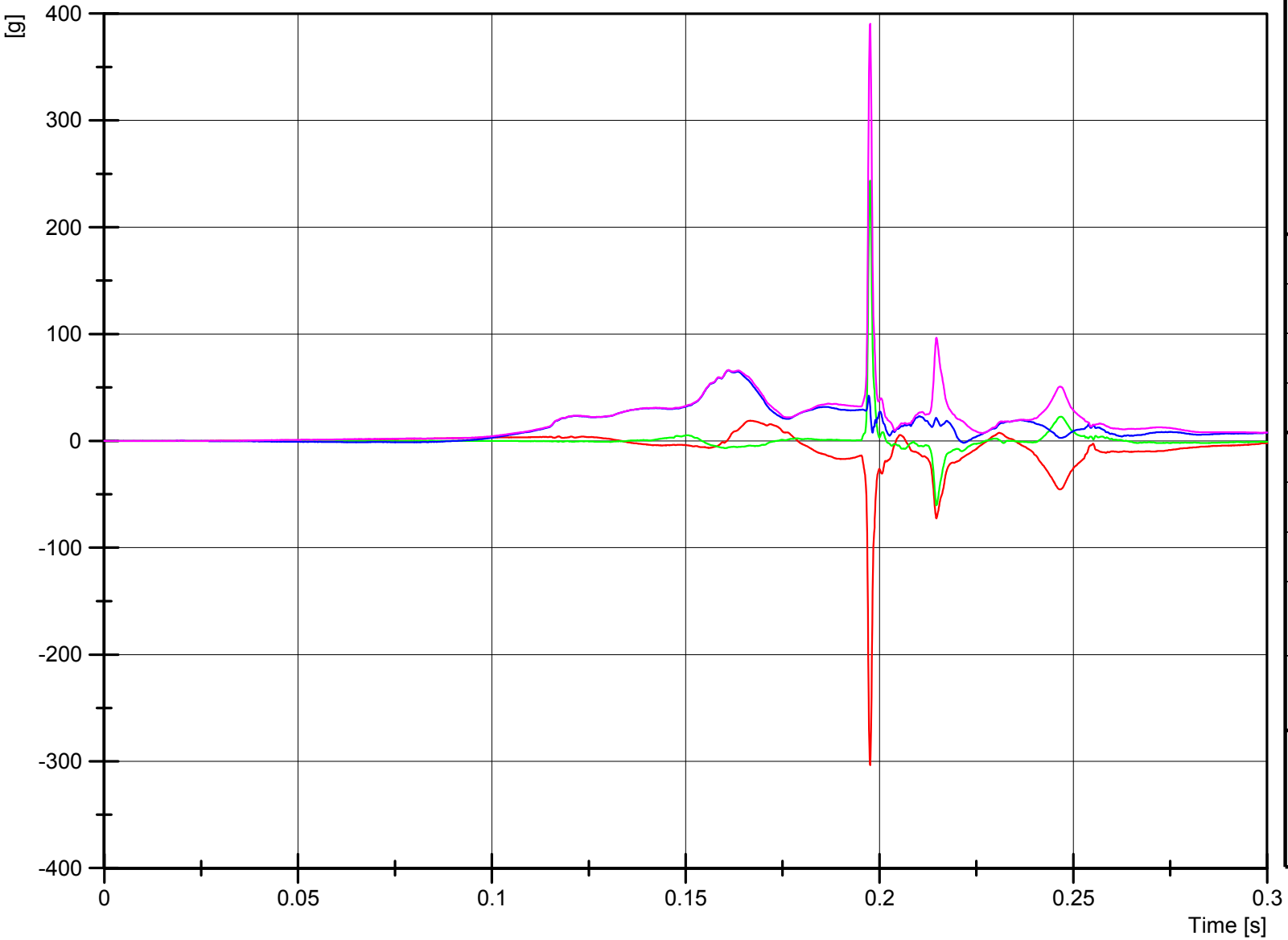
Maximum: 1549.11 lbf Time: 0.1628 sec.
Minimum: -6.1102 lbf Time: 0.0085 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC094FX
Sensitivity: 2.587E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 19
Ref. No.: 77
Polarity: N

Rigid Seat Left Lap Fy

Maximum: 253.60 lbf Time: 0.2402 sec.
Minimum: -40.93 lbf Time: 0.0811 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC094FY
Sensitivity: 2.572E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 20
Ref. No.: 78
Polarity: N

Rigid Seat Left Lap Fz

Maximum: 1261.30 lbf Time: 0.1608 sec.
Minimum: -19.75 lbf Time: 0.0194 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC094FZ
Sensitivity: 1.044E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 21
Ref. No.: 79
Polarity: N



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Doc. No.: CDL-FA14B-07-01

Version: New

Report Date: 03/26/2014

Customer: FAA

Test: FA14B-07

Dummy: H2 718

Position: Config 5 - New Belt

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 14:03

Head Ax H2 718

Maximum: 18.9803 g Time: 0.1669 sec.
Minimum: -303.53 g Time: 0.1978 sec.
CFC: 1000
Sensor Type: Endevco 7264C
S/N: P47932
Sensitivity: 2.157E-05 V/EU
Cal. Due: 09/25/2014
Full Scale: 2000 g
DAS Channel: 25
Ref. No.: 22
Polarity: R

Head Ay H2 718

Maximum: 243.71 g Time: 0.1978 sec.
Minimum: -60.25 g Time: 0.2149 sec.
CFC: 1000
Sensor Type: Endevco 7264C
S/N: P48149
Sensitivity: 2.603E-05 V/EU
Cal. Due: 09/25/2014
Full Scale: 2000 g
DAS Channel: 26
Ref. No.: 23
Polarity: R

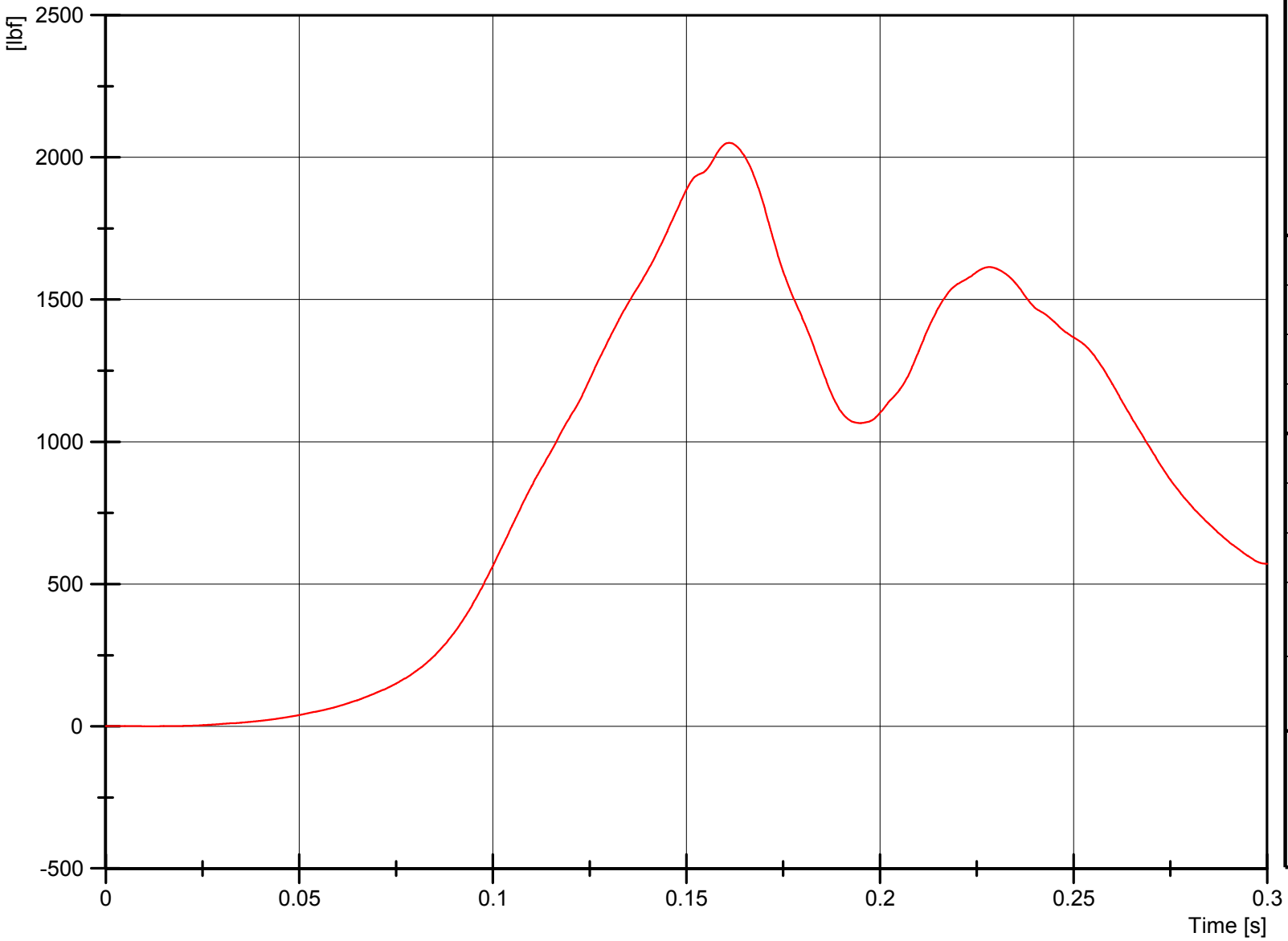
Head Az H2 718

Maximum: 66.029 g Time: 0.1613 sec.
Minimum: -1.6991 g Time: 0.222 sec.
CFC: 1000
Sensor Type: Endevco 7264C
S/N: P60367
Sensitivity: 1.782E-05 V/EU
Cal. Due: 09/25/2014
Full Scale: 2000 g
DAS Channel: 27
Ref. No.: 24
Polarity: R

Head Resultant H2 718

Maximum: 390.54 g Time: 0.1976 sec.

HIC: 1998.7
T1: 197 msec.
T2: 198.1 msec.



Lap Belt Force H2 718

Maximum: 2051.48 lbf Time: 0.1612 sec.
Minimum: -0.0071 lbf Time: 0.012 sec.
CFC: 60
Sensor Type: Denton 3255
S/N: SBLC086
Sensitivity: 6.6006E-07 V/EU
Cal. Due: 05/16/2014
Full Scale: 3000 lbf
DAS Channel: 36
Ref. No.: 17
Polarity: N

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Doc. No.: CDL-FA14B-07-01

Version: New

Report Date: 03/26/2014

Customer: FAA

Test: FA14B-07

Dummy: H2 718

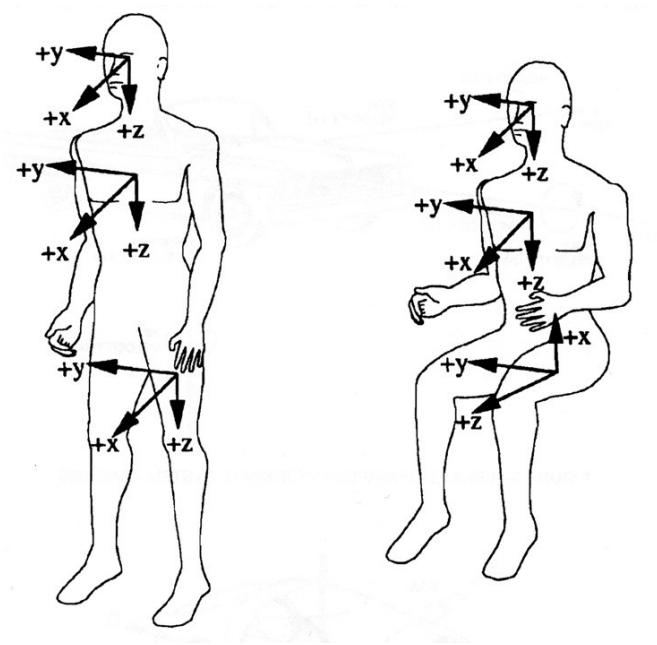
Position: Config 5 - New Belt

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 14:03

J211/1 Sign Conventions



Upper Neck Load Cell:
+FX Head rearward, chest forward
+FY Head leftward, chest rightward
+FZ Head upward, chest downward
+MX Left ear toward left shoulder
+MY Chin toward sternum
+MZ Chin toward left shoulder

Lumbar Load Cell:
+FX Chest rearward, pelvis forward
+FY Chest leftward, pelvis rightward
+FZ Chest upward, pelvis downward
+MX Left shoulder toward left hip
+MY Sternum toward front of legs
+MZ Right shoulder forward, left shoulder rearward

Femur Load Cells:
+FZ Tension

Chest Displacement:
-DX Compression

Rib Dispacement:
-DY Compression

Belt Load Cells:
+FX Tension

Floor Load Cells:
+FX Test article forward
+FY Test article right
+FZ Test article up

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Doc. No.: CDL-FA14B-07-01

Version: New

Report Date: 03/26/2014

Customer: FAA

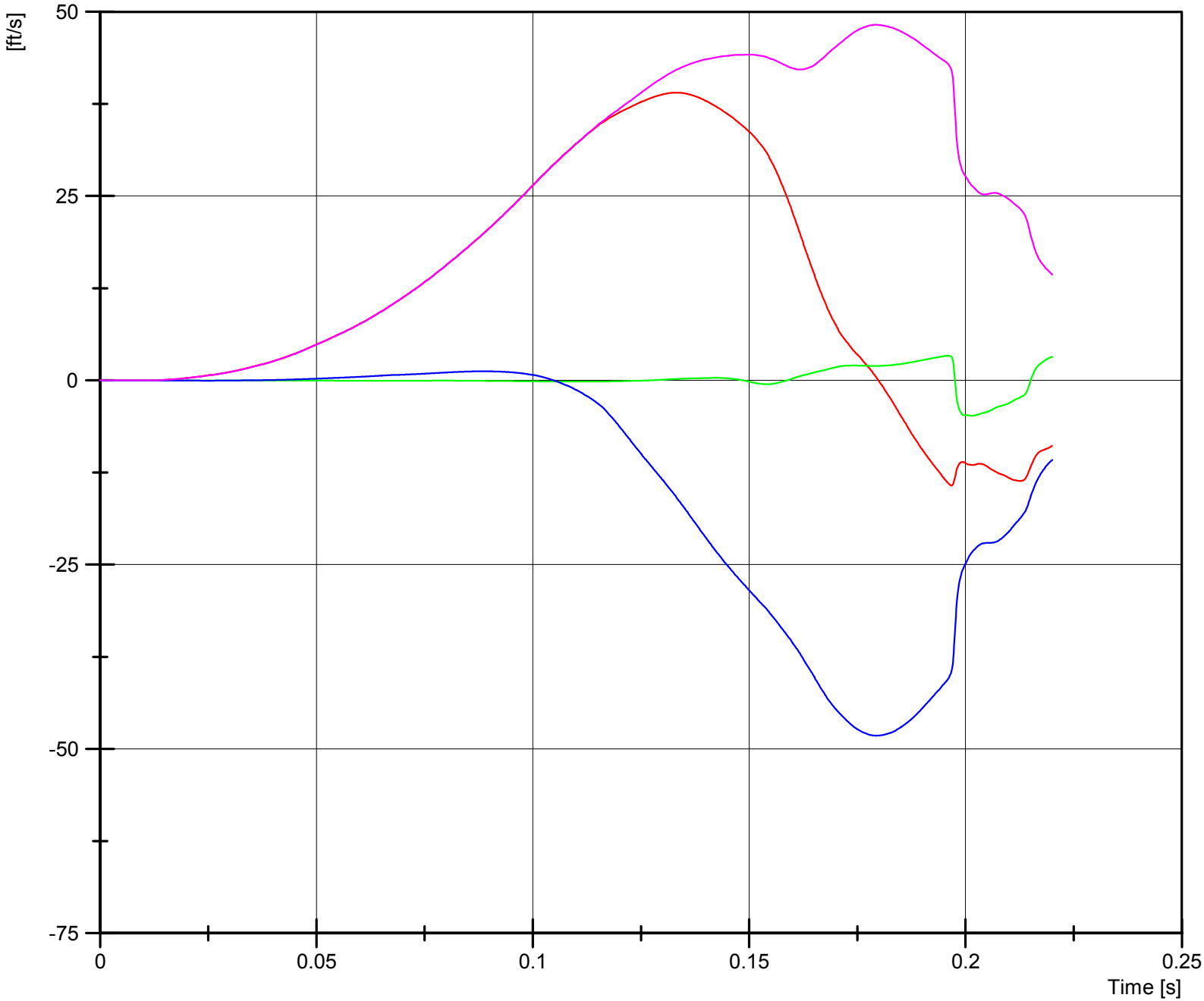
Test: FA14B-07

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 14:03

Comments:



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Doc. No.: CDL-FA14B-07-01

Version: New

Report Date: 03/26/2014

Customer: FAA

Test: FA14B-07

Dummy: H2 718

Position: Config 5 - New Belt

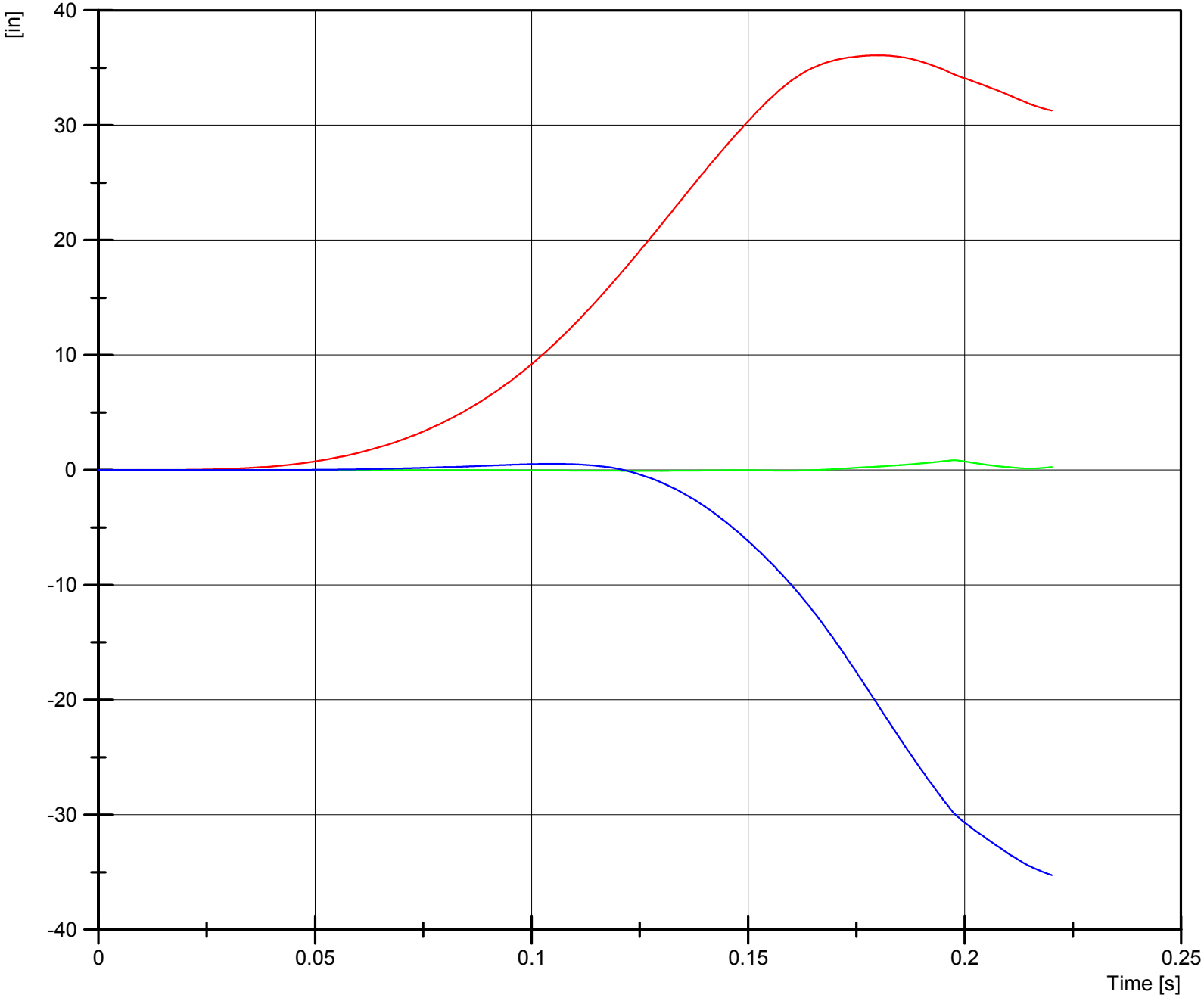
Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 14:03

Comments:

Global Head Vx H2 718		Global Head Vy H2 718		Global Head Vz H2 718		Global Head Velocity Resultant H2 718	
Maximum: 39.03 ft/s	Time: 0.1331 sec.	Maximum: 3.33 ft/s	Time: 0.1957 sec.	Maximum: 1.24 ft/s	Time: 0.0881 sec.	Maximum: 48.24 ft/s	Time: 0.1792 sec.
Minimum: -14.27 ft/s	Time: 0.1968 sec.	Minimum: -4.79 ft/s	Time: 0.2015 sec.	Minimum: -48.20 ft/s	Time: 0.1793 sec.	Minimum: 0 ft/s	Time: 0.0001 sec.



Global Head Dx H2 718 | Global Head Dy H2 718 | Global Head Dz H2 718

Maximum: 36.09 in	Time: 0.18 sec.	Maximum: 0.85 in	Time: 0.1976 sec.	Maximum: 0.54 in	Time: 0.1048 sec.
Minimum: -0.00 in	Time: 0.0129 sec.	Minimum: -0.08 in	Time: 0.1269 sec.	Minimum: -35.25 in	Time: 0.2201 sec.

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Doc. No.: CDL-FA14B-07-01

Version: New

Report Date: 03/26/2014

Customer: FAA

Test: FA14B-07

Dummy: H2 718

Position: Config 5 - New Belt

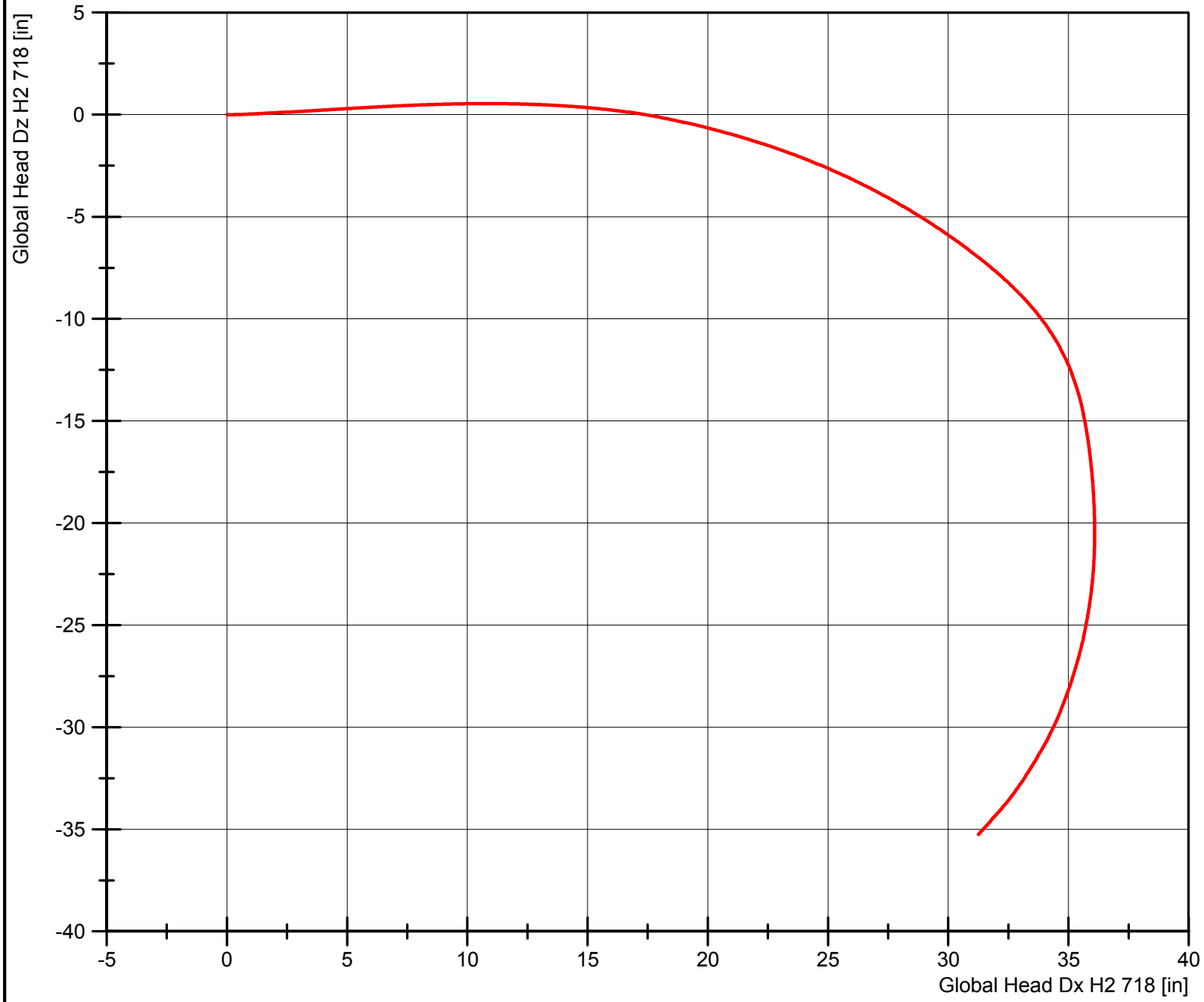
Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 14:03

Comments:

Displacement values are calculated from Head Accelerations and Angular Velocities.
This method cannot be used to substitute photometric analysis.



Global Head Displacement XZ

X Maximum: 36.09 in **Time: 0.18 sec.**

Z Value at X Maximum: -20.46 in

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Doc. No.: CDL-FA14B-07-01

Version: New

Report Date: 03/26/2014

Customer: FAA

Test: FA14B-07

Dummy: H2 718

Position: Config 5 - New Belt

Test Description:
14 CFR 25.562 Test 2

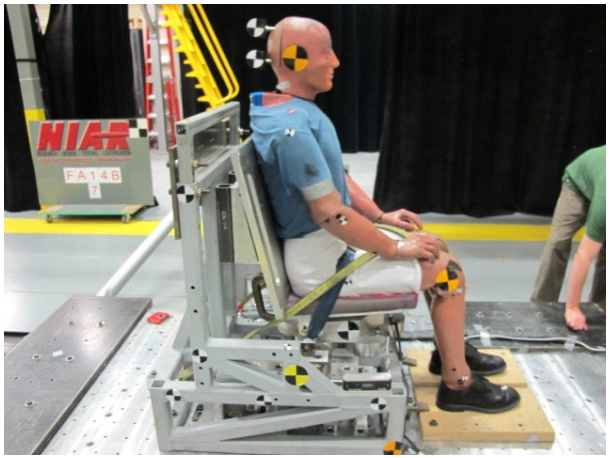
Pulse Name:
16g-07b

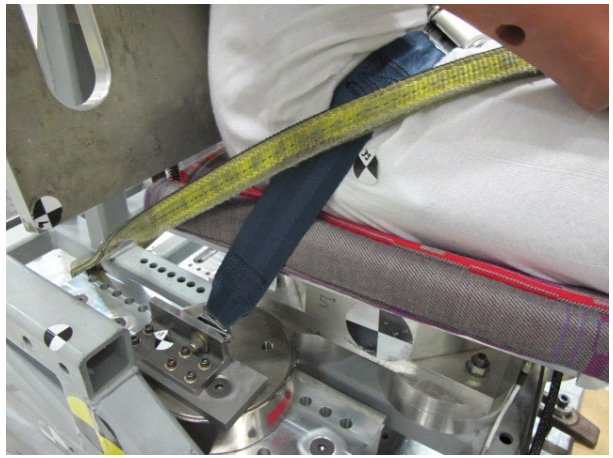
Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 14:03

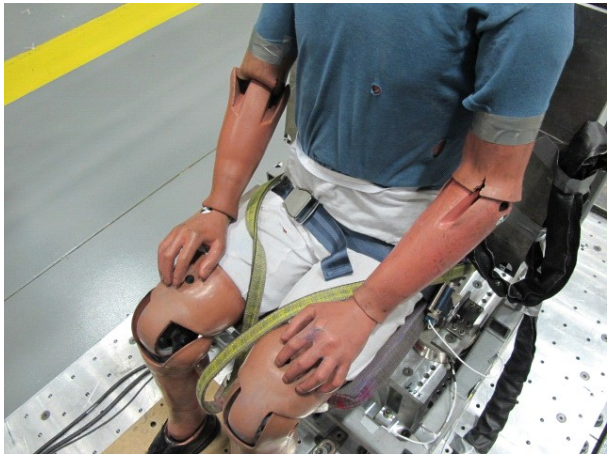
Comments:

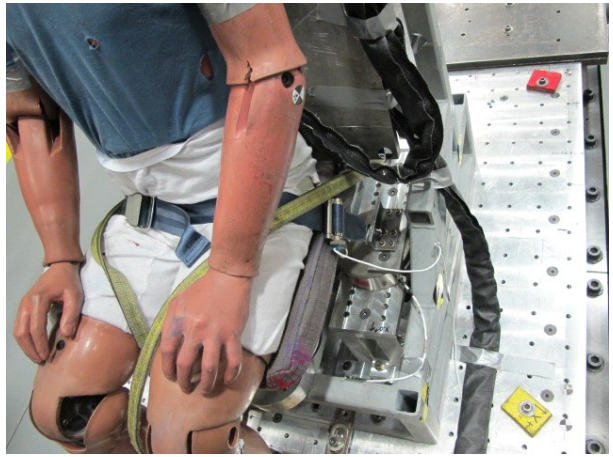
Displacement values are calculated from Head Accelerations and Angular Velocities.
This method cannot be used to substitute photometric analysis.

Pre-test Photos









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Doc. No.: CDL-FA14B-07-01

Version: New

Report Date: 03/26/2014

Customer: FAA

Test: FA14B-07

Dummy: N/A

Position: N/A

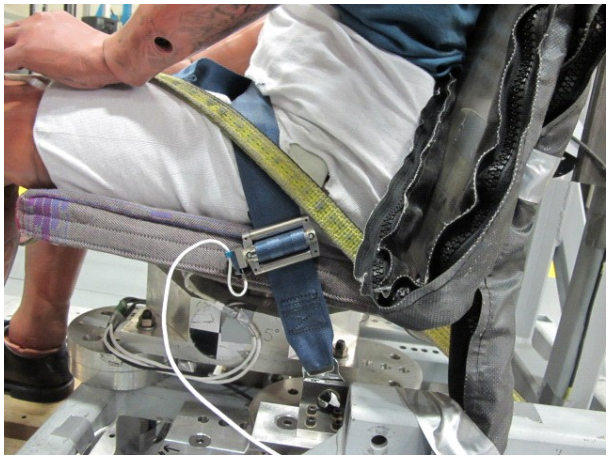
Test Description:
14 CFR 25.562 Test 2

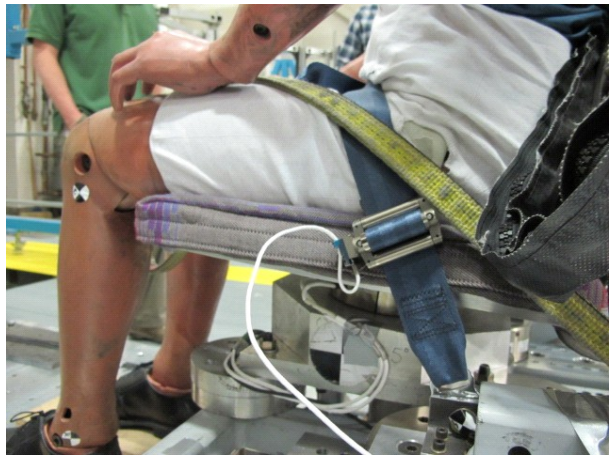
Pulse Name:
16g-07b

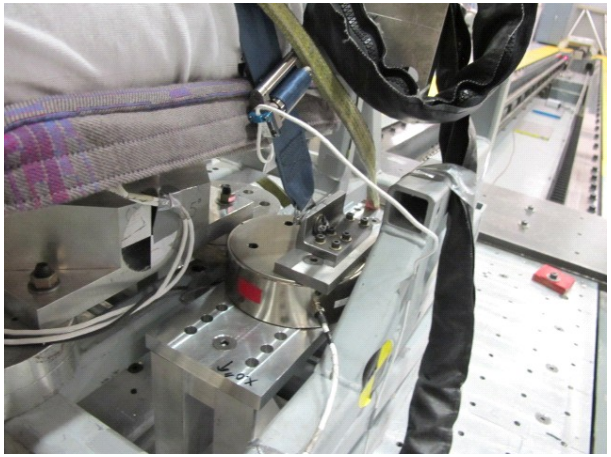
Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 14:03

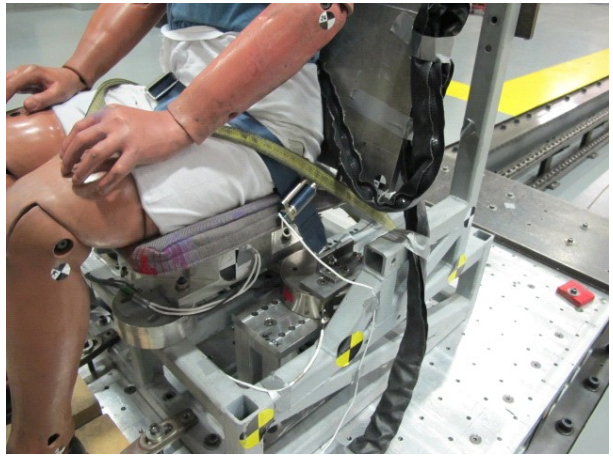
Comments:

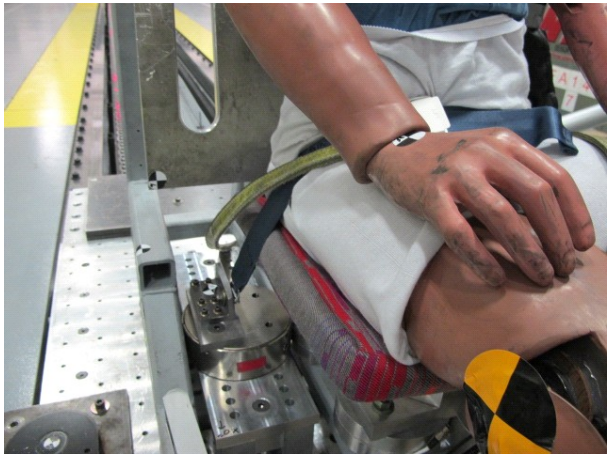
Pre-test Photos

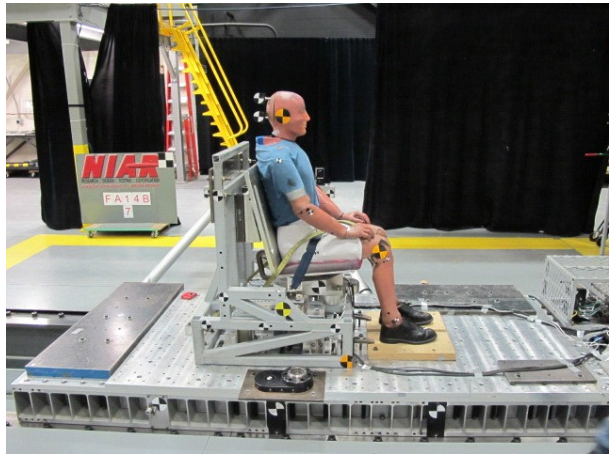












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Doc. No.: CDL-FA14B-07-01

Version: New

Report Date: 03/26/2014

Customer: FAA

Test: FA14B-07

Dummy: N/A

Position: N/A

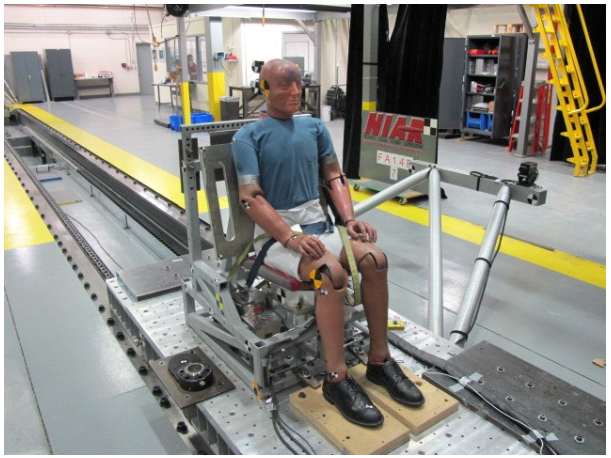
Test Description:
14 CFR 25.562 Test 2

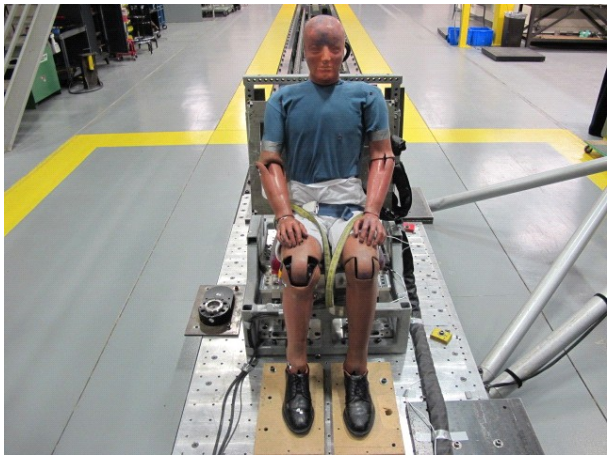
Pulse Name:
16g-07b

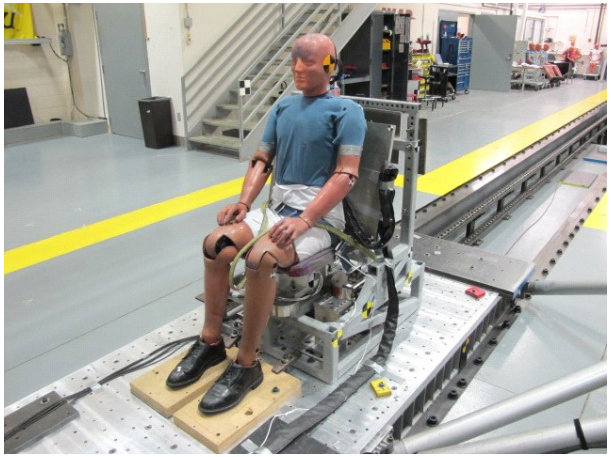
Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 14:03

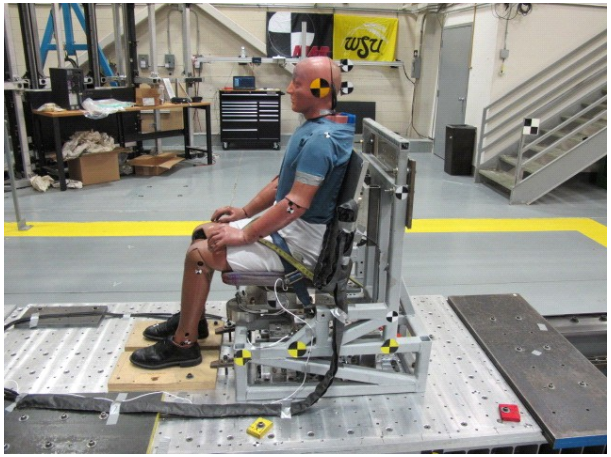
Comments:

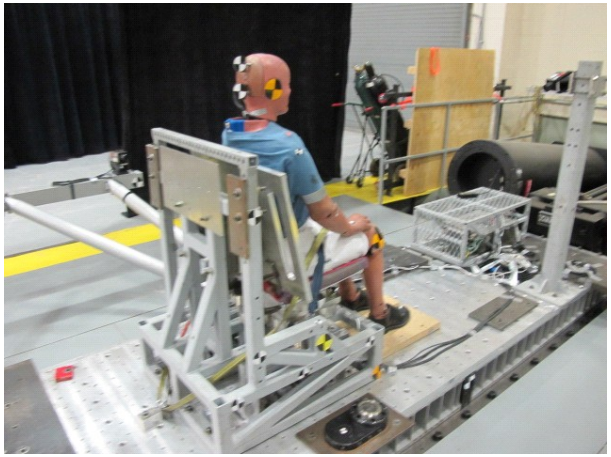
Pre-test Photos











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Tel: (316) 978-5239
Fax: (316) 978-3175
www.niar.wichita.edu

Doc. No.: CDL-FA14B-07-01

Version: New

Report Date: 03/26/2014

Customer: FAA

Test: FA14B-07

Dummy: N/A

Position: N/A

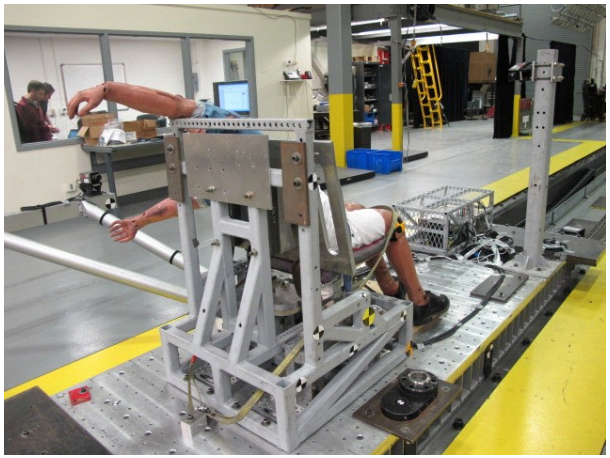
Test Description:
14 CFR 25.562 Test 2

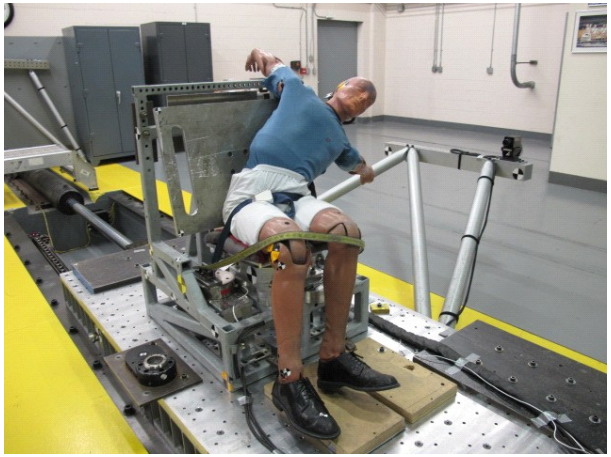
Pulse Name:
16g-07b

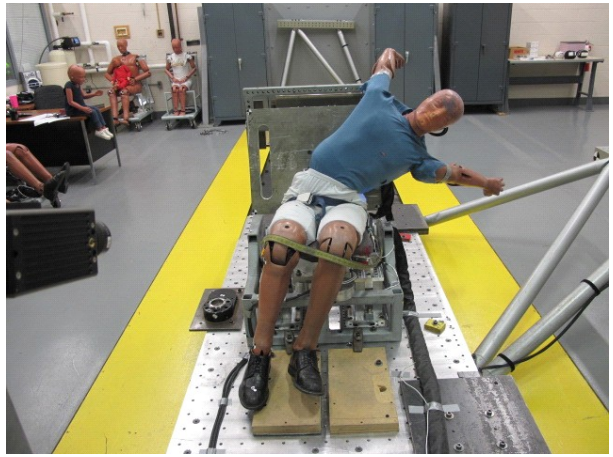
Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 14:03

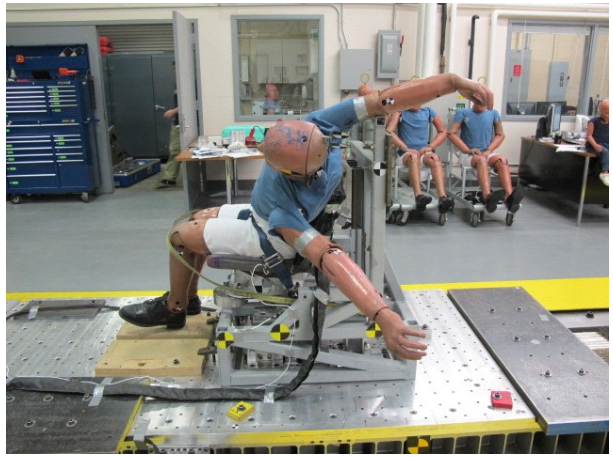
Comments:

Post-test Photos









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Version: New

Report Date: 03/26/2014

Customer: FAA

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Dummy: N/A

Position: N/A

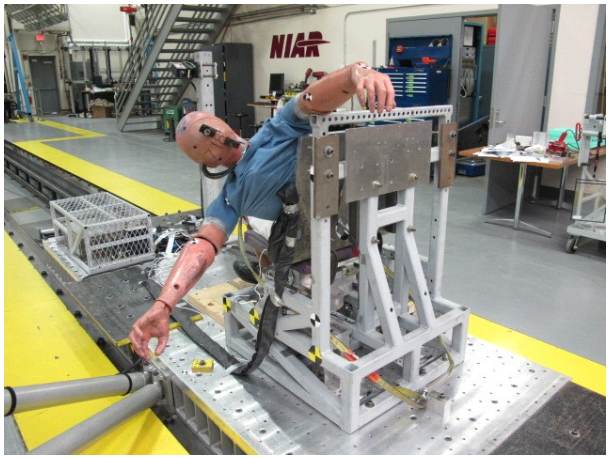
Test Description:
14 CFR 25.562 Test 2

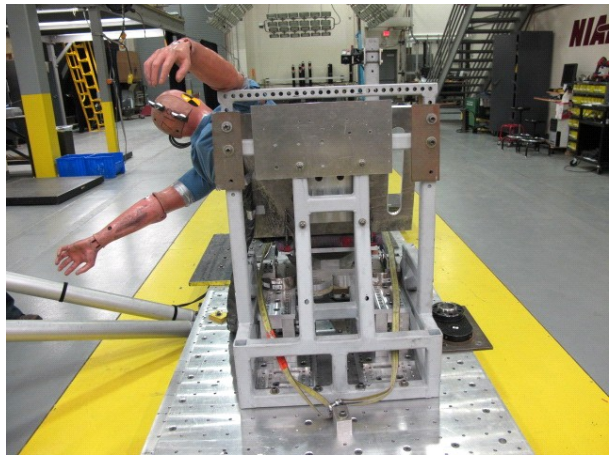
Pulse Name:
16g-07b

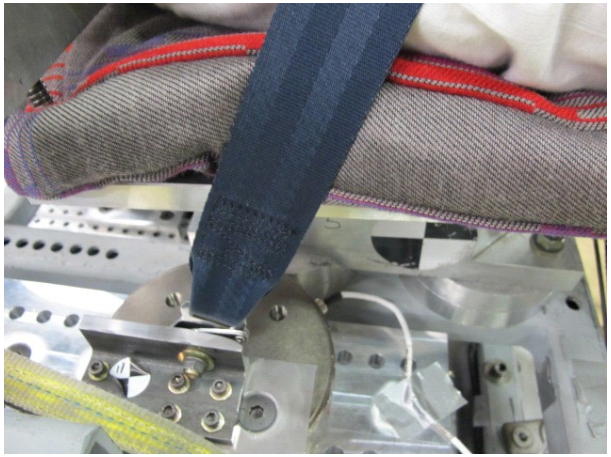
Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 14:03

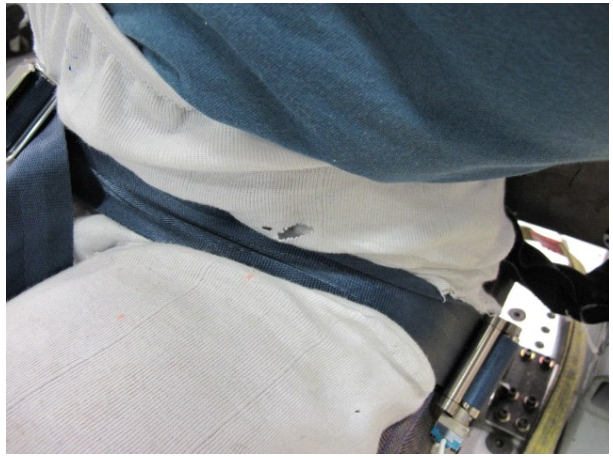
Comments:

Post-test Photos









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Pretrigger Samples: 40960
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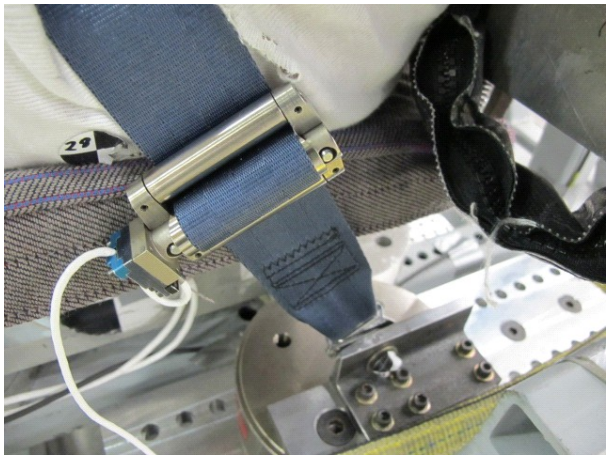
Comments:

Post-test Photos



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Version: New

Report Date: 03/26/2014

Customer: FAA

Test: FA14B-07

Dummy: N/A

Position: N/A

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Pulse Name:
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Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 14:03

Comments:

CRASH DYNAMICS LABORATORY

Report No. CDL-FA14B-08-01

Requested by:

FAA

Final Test Report
FA14B-08

03/26/2014

Revision	Change	Date	Revised By
New		03/26/2014	Rob Huculak

Prepared and Reviewed by:

Rob Huculak
Laboratory Manager

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This test report is in accordance with ISO/IEC 17025:2005 requirements and all equipment standards used are traceable to the National Institute of Standards and Technology.
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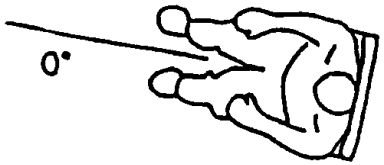
Test Summary

The dynamic test (FA14B-08) was performed for FAA in accordance with 14 CFR 25.562 Test 2 on 03/26/2014.

Pulse Parameters	Required	Result	Pass/Fail
Minimum Peak Acceleration (g)	16	16.11	PASS
Minimum Velocity Change (ft/sec)	44	46.12	PASS
Maximum Rise Time (msec)	90	87.6	PASS
Minimum Velocity Change During Rise Time (ft/sec)	22	24.21	PASS
2g Offset	--	--	PASS

Test Orientation



ATD: H2 718 **Position: Config 5 - Repaired Belt**

Measured Seat Belt Angle	Measured Seat Belt Offset
65.34 deg	3.00 in

0 deg

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Version: New

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Customer: FAA

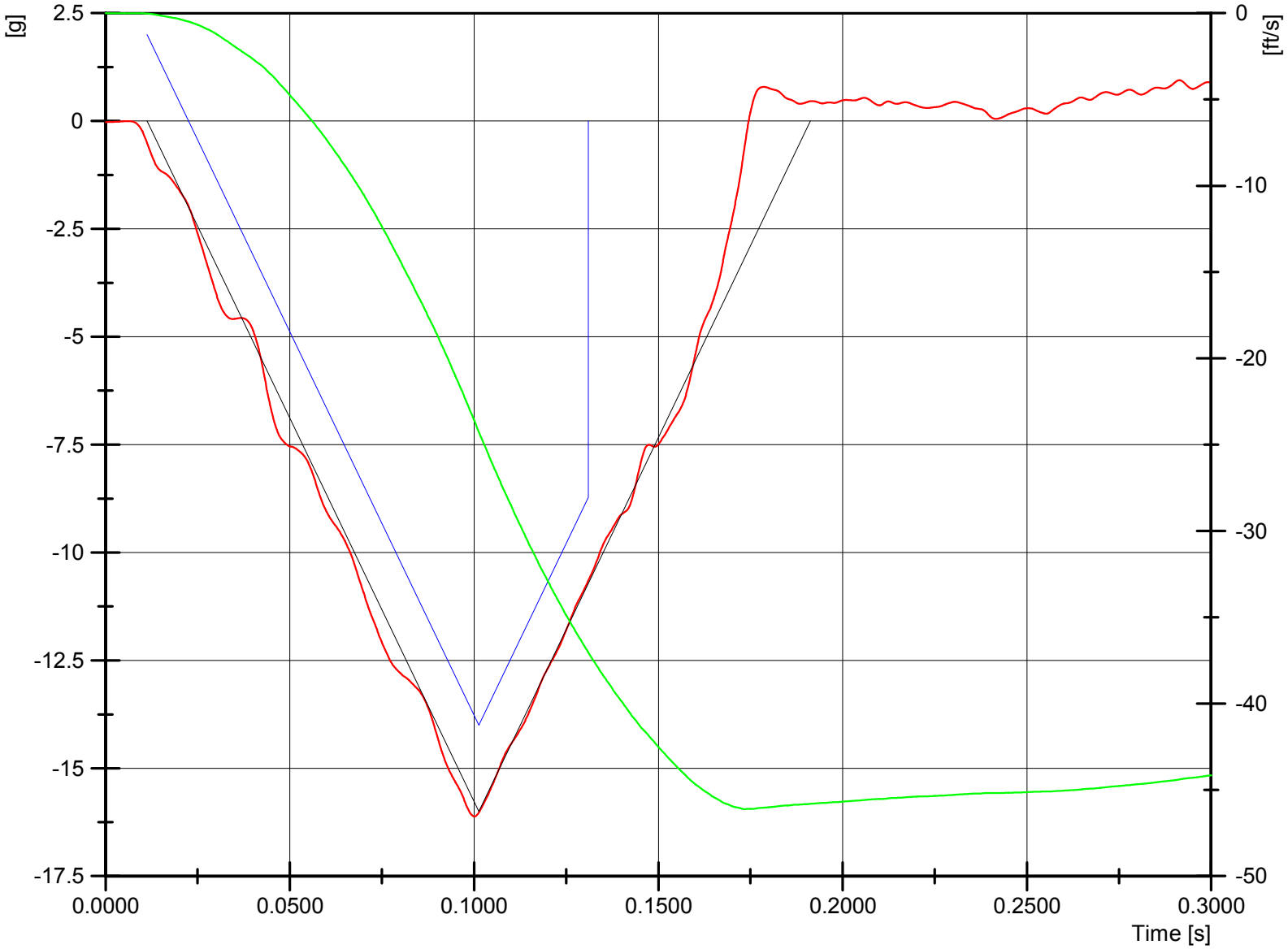
Test: FA14B-08

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 15:09

Temperature	Relative Humidity
72.4°F	27.7%



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Doc. No.: CDL-FA14B-08-01

Version: New

Report Date: 03/26/2014

Customer: FAA

Test: FA14B-08

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 15:09

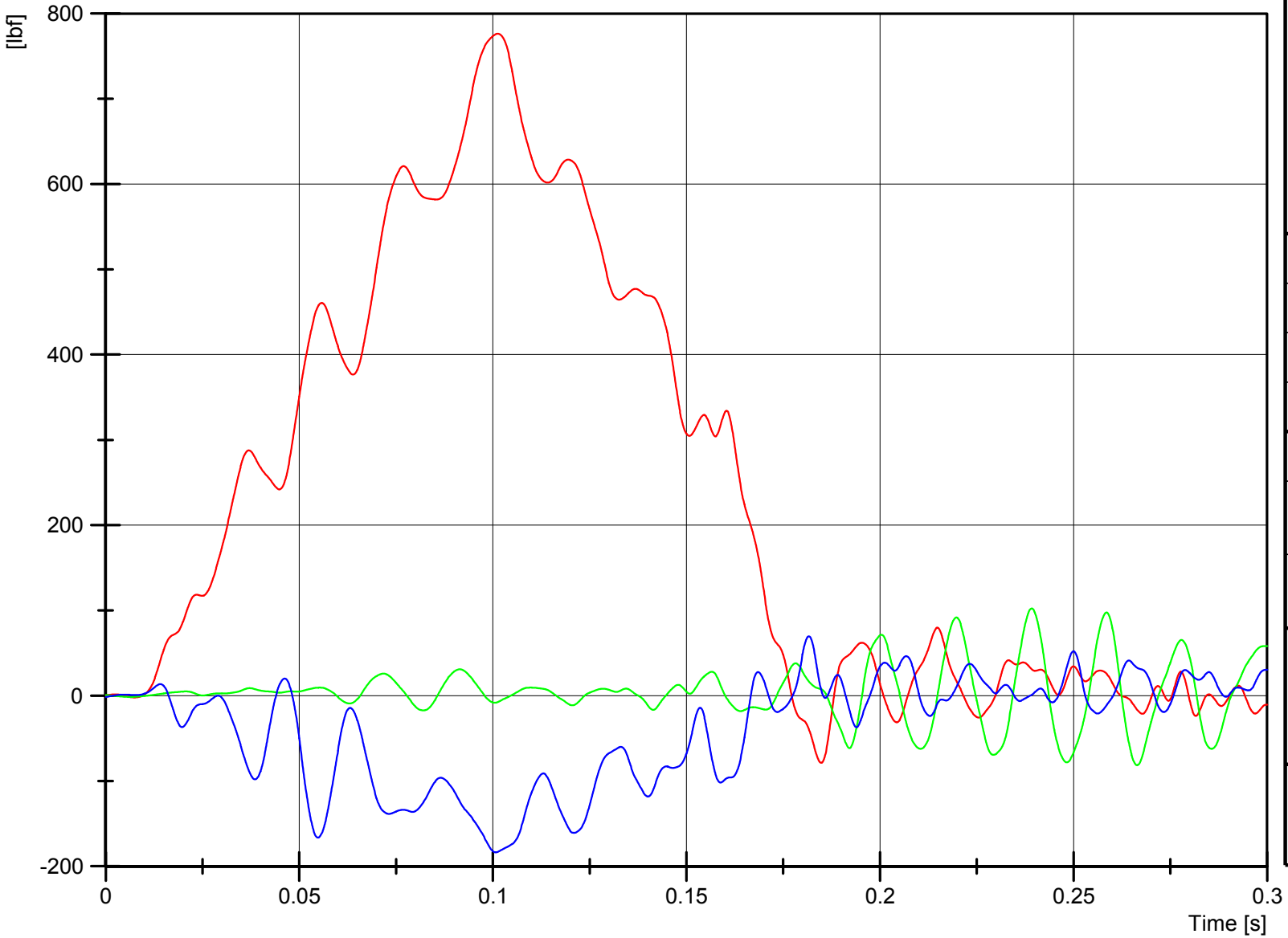
Comments:

Sled Acceleration | Sled Velocity | Ideal Pulse | Upper Limit

Maximum: 0.946 g Time: 0.2914 sec.
Minimum: -16.11 g Time: 0.1001 sec.
CFC: 60
Sensor Type: ENDEVCO 7290A-100
S/N: 29924
Sensitivity: 0.01919 V/EU
Cal. Due: 06/11/2014
Full Scale: 100 g
DAS Channel: 50
Ref. No.: 1
Polarity: R

Minimum: -46.12 ft/s Time: 0.1734 sec.

Pulse Requirement		Actual
Minimum Required Peak Acceleration:	16 g	16.11 g
Minimum Overall Velocity Change:	44 ft/s	46.12 ft/s
Maximum Rise Time:	90 msec	87.6 msec
Minimum Velocity Change Before Greq:	22 ft/s	24.21 ft/s



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Doc. No.: CDL-FA14B-08-01

Version: New

Report Date: 03/26/2014

Customer: FAA

Test: FA14B-08

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 15:09

Comments:

Rigid Seat Seat Back Fx

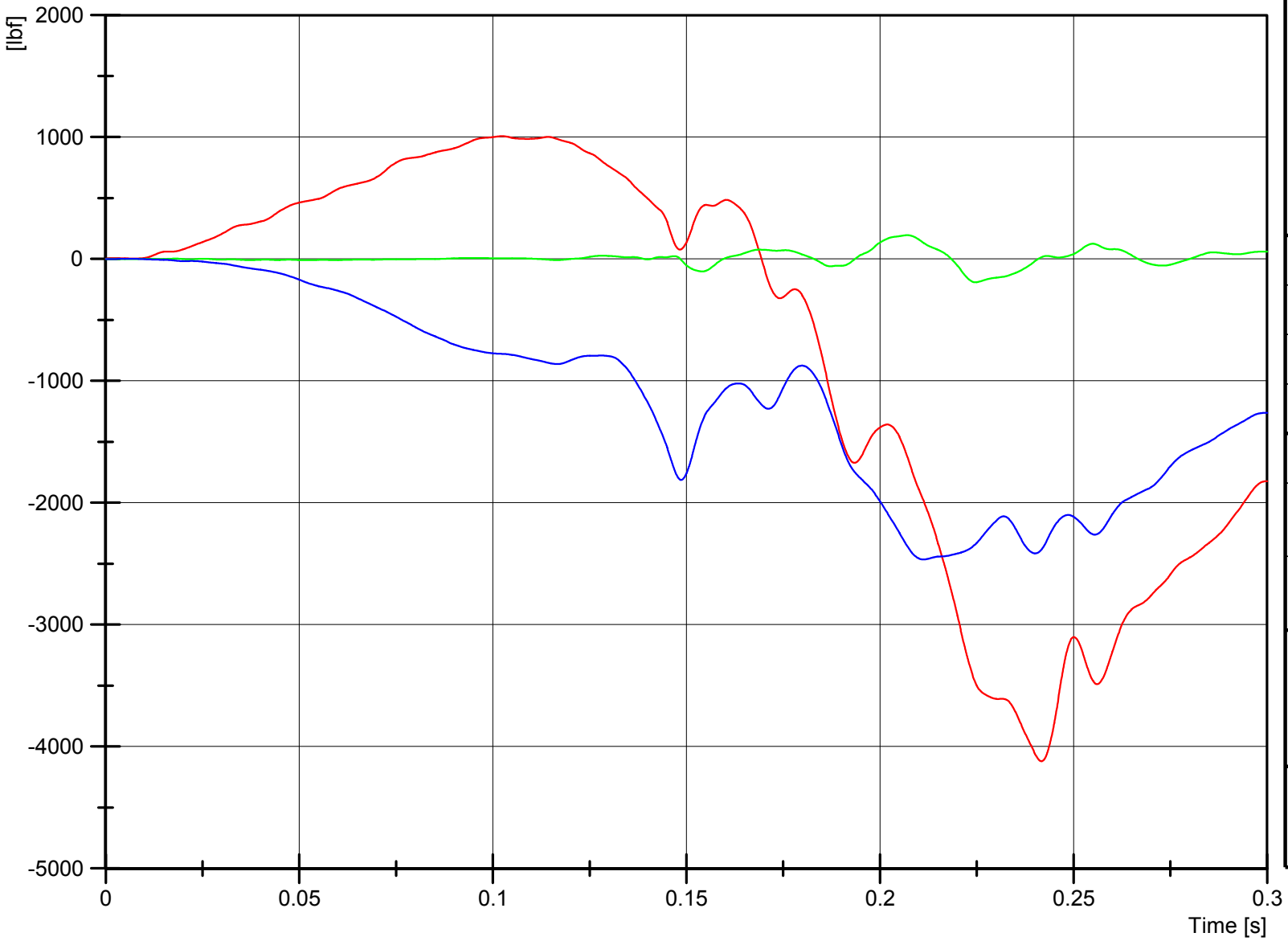
Maximum: 776.29 lbf Time: 0.1015 sec.
Minimum: -78.57 lbf Time: 0.185 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC084FZ
Sensitivity: 1.176E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 12
Ref. No.: 15
Polarity: N

Rigid Seat Seat Back Fy

Maximum: 102.512 lbf Time: 0.2394 sec.
Minimum: -81.30 lbf Time: 0.2666 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC084FY
Sensitivity: 2.733E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 11
Ref. No.: 14
Polarity: N

Rigid Seat Seat Back Fz

Maximum: 69.8011 lbf Time: 0.1818 sec.
Minimum: -183.51 lbf Time: 0.1009 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC084FX
Sensitivity: 2.74E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 10
Ref. No.: 13
Polarity: R



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Doc. No.: CDL-FA14B-08-01

Version: New

Report Date: 03/26/2014

Customer: FAA

Test: FA14B-08

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 15:09

Comments:

Rigid Seat Seat Pan Fx

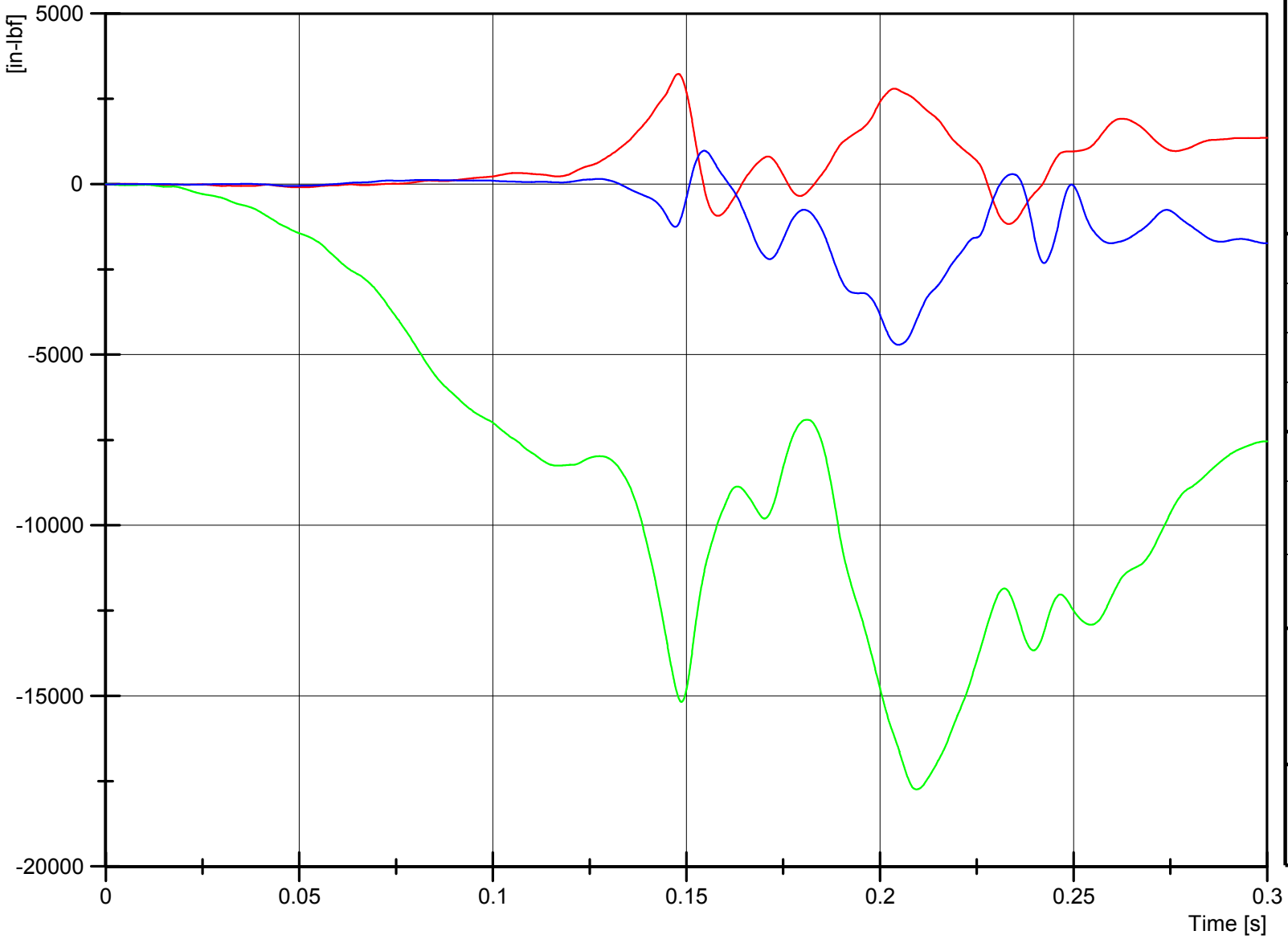
Maximum: 1006.85 lbf Time: 0.1026 sec.
Minimum: -4.12E+03 lbf Time: 0.2419 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083FX
Sensitivity: 2.768E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 13
Ref. No.: 10
Polarity: N

Rigid Seat Seat Pan Fy

Maximum: 194.641 lbf Time: 0.2072 sec.
Minimum: -191.56 lbf Time: 0.2248 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083FY
Sensitivity: 2.764E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 14
Ref. No.: 11
Polarity: N

Rigid Seat Seat Pan Fz

Maximum: 0.7857 lbf Time: 0.0062 sec.
Minimum: -2.47E+03 lbf Time: 0.2114 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083FZ
Sensitivity: 1.181E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 15
Ref. No.: 12
Polarity: N



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Doc. No.: CDL-FA14B-08-01

Version: New

Report Date: 03/26/2014

Customer: FAA

Test: FA14B-08

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 15:09

Comments:

Rigid Seat Seat Pan Mx

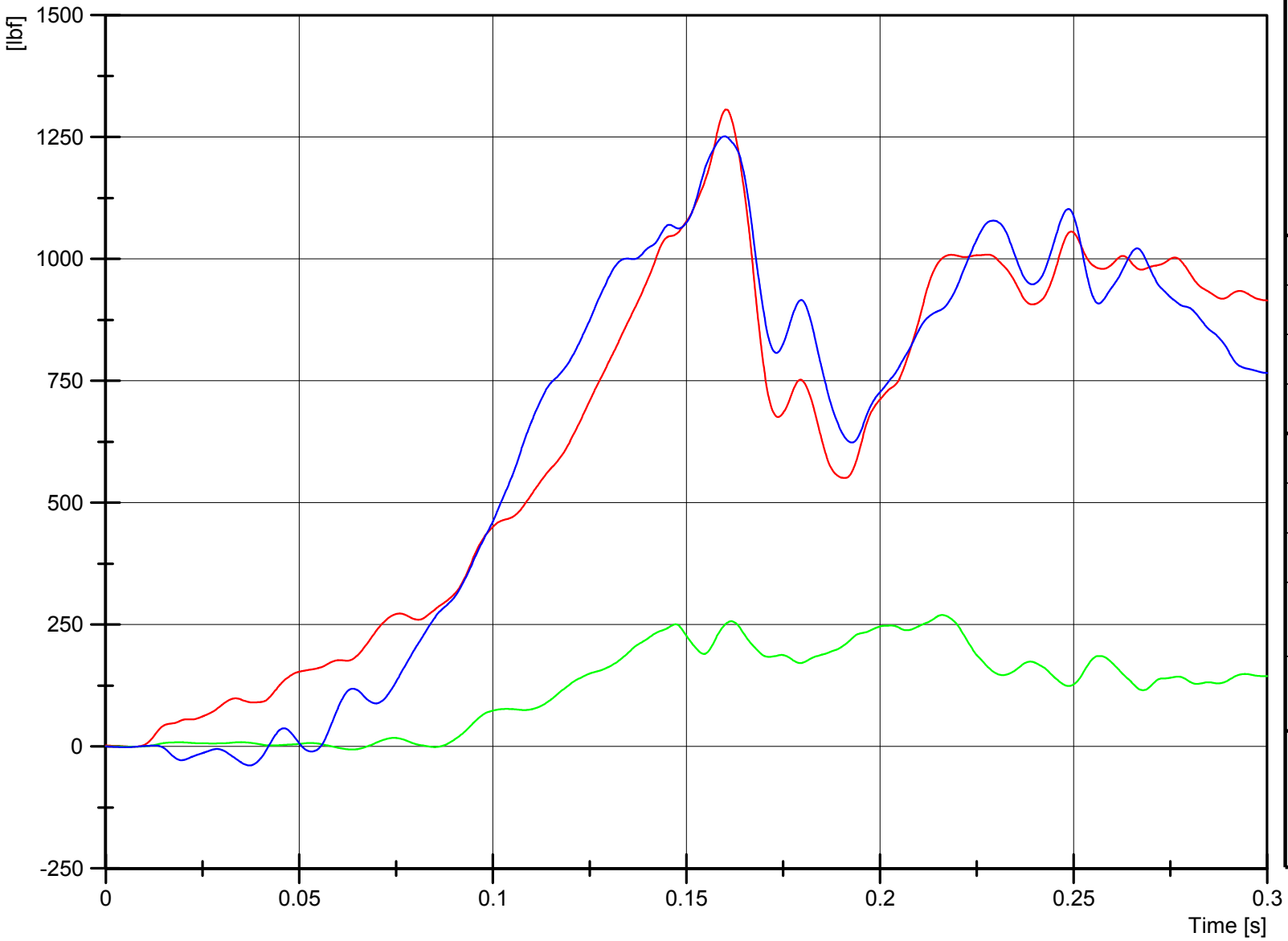
Maximum: 3233.45 in-lbf Time: 0.1481 sec.
Minimum: -1.17E+03 in-lbf Time: 0.2335 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083MX
Sensitivity: 7.03E-08 V/EU
Cal. Due: 02/13/2014
Full Scale: 25000 in-lbf
DAS Channel: 16
Ref. No.: 7
Polarity: N

Rigid Seat Seat Pan My

Maximum: 5.3861 in-lbf Time: 0 sec.
Minimum: -1.77E+04 in-lbf Time: 0.2096 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083MY
Sensitivity: 7.05E-08 V/EU
Cal. Due: 02/13/2014
Full Scale: 25000 in-lbf
DAS Channel: 17
Ref. No.: 8
Polarity: N

Rigid Seat Seat Pan Mz

Maximum: 982.121 in-lbf Time: 0.1548 sec.
Minimum: -4.71E+03 in-lbf Time: 0.205 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083MZ
Sensitivity: 9.32E-08 V/EU
Cal. Due: 02/13/2014
Full Scale: 20000 in-lbf
DAS Channel: 18
Ref. No.: 9
Polarity: N



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Doc. No.: CDL-FA14B-08-01

Version: New

Report Date: 03/26/2014

Customer: FAA

Test: FA14B-08

Dummy: H2 718

Position: Config 5 - Repaired Belt

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 15:09

Rigid Seat Right Lap Fx

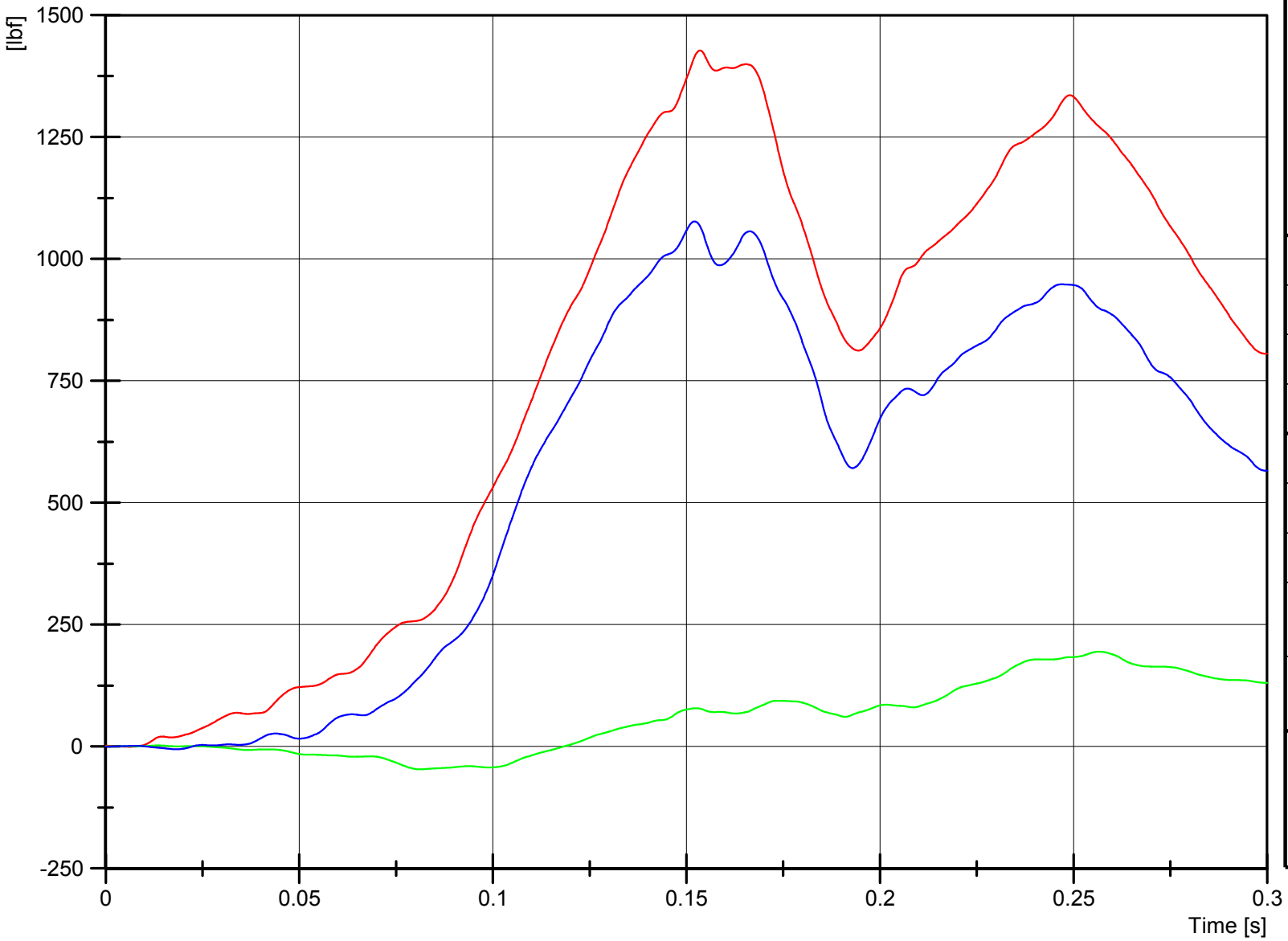
Maximum: 1306.58 lbf Time: 0.1605 sec.
Minimum: -0.4441 lbf Time: 0.0075 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC093FX
Sensitivity: 2.587E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 22
Ref. No.: 74
Polarity: N

Rigid Seat Right Lap Fy

Maximum: 269.71 lbf Time: 0.2163 sec.
Minimum: -6.0965 lbf Time: 0.0638 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC093FY
Sensitivity: 2.572E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 23
Ref. No.: 75
Polarity: N

Rigid Seat Right Lap Fz

Maximum: 1251.32 lbf Time: 0.16 sec.
Minimum: -38.50 lbf Time: 0.0374 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC093FZ
Sensitivity: 1.044E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 24
Ref. No.: 76
Polarity: N



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Doc. No.: CDL-FA14B-08-01

Version: New

Report Date: 03/26/2014

Customer: FAA

Test: FA14B-08

Dummy: H2 718

Position: Config 5 - Repaired Belt

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 15:09

Rigid Seat Left Lap Fx

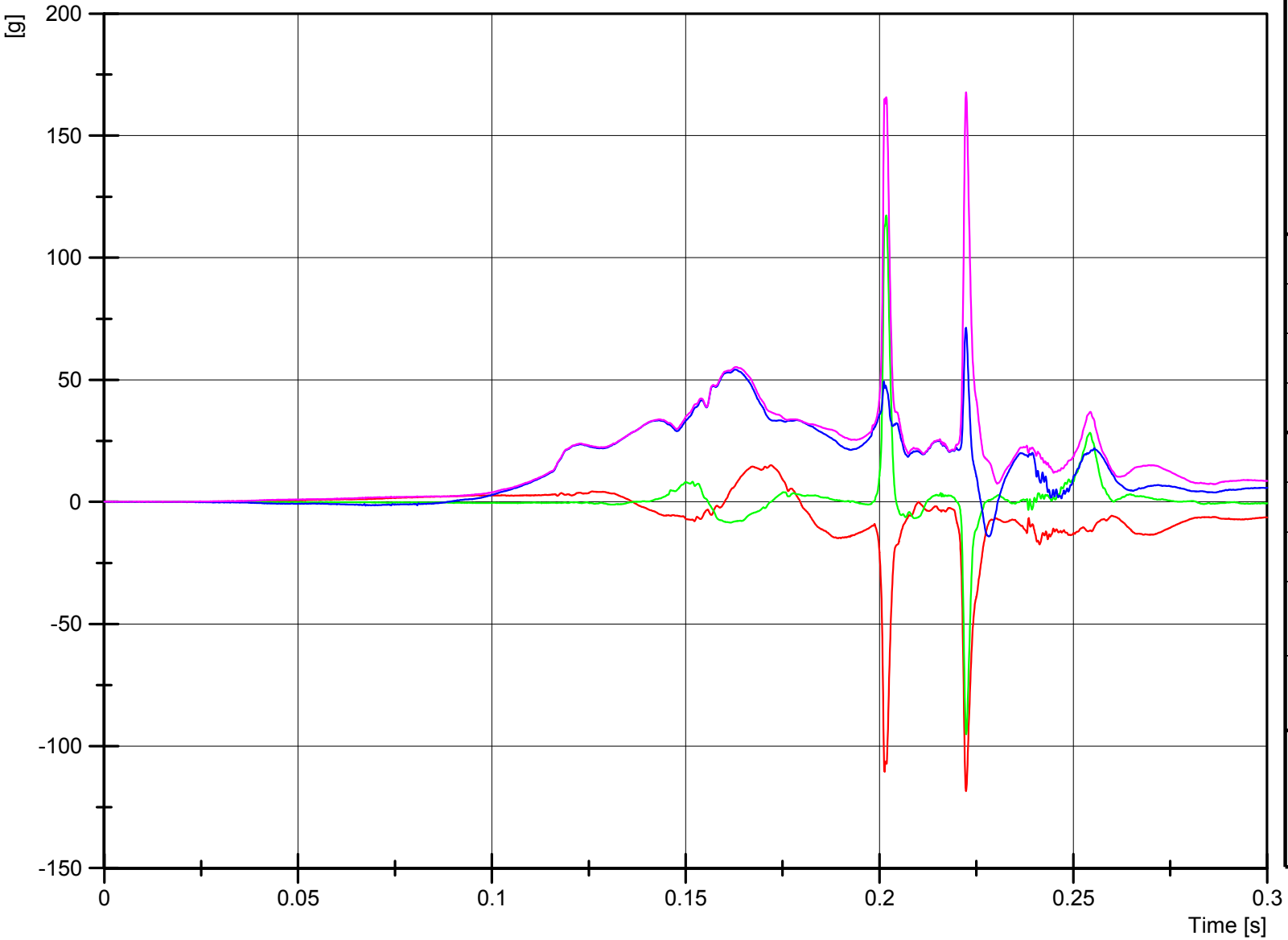
Maximum: 1427.65 lbf Time: 0.1537 sec.
Minimum: -0.551 lbf Time: 0.0065 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC094FX
Sensitivity: 2.587E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 19
Ref. No.: 77
Polarity: N

Rigid Seat Left Lap Fy

Maximum: 194.65 lbf Time: 0.2567 sec.
Minimum: -46.76 lbf Time: 0.0814 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC094FY
Sensitivity: 2.572E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 20
Ref. No.: 78
Polarity: N

Rigid Seat Left Lap Fz

Maximum: 1076.80 lbf Time: 0.1523 sec.
Minimum: -5.4982 lbf Time: 0.0185 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC094FZ
Sensitivity: 1.044E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 21
Ref. No.: 79
Polarity: N



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Doc. No.: CDL-FA14B-08-01

Version: New

Report Date: 03/26/2014

Customer: FAA

Test: FA14B-08

Dummy: H2 718

Position: Config 5 - Repaired Belt

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 15:09

Head Ax H2 718

Maximum: 15.0974 g Time: 0.1722 sec.
Minimum: -118.51 g Time: 0.2225 sec.
CFC: 1000
Sensor Type: Endevco 7264C
S/N: P47932
Sensitivity: 2.157E-05 V/EU
Cal. Due: 09/25/2014
Full Scale: 2000 g
DAS Channel: 25
Ref. No.: 22
Polarity: R

Head Ay H2 718

Maximum: 117.389 g Time: 0.2019 sec.
Minimum: -95.25 g Time: 0.2226 sec.
CFC: 1000
Sensor Type: Endevco 7264C
S/N: P48149
Sensitivity: 2.603E-05 V/EU
Cal. Due: 09/25/2014
Full Scale: 2000 g
DAS Channel: 26
Ref. No.: 23
Polarity: R

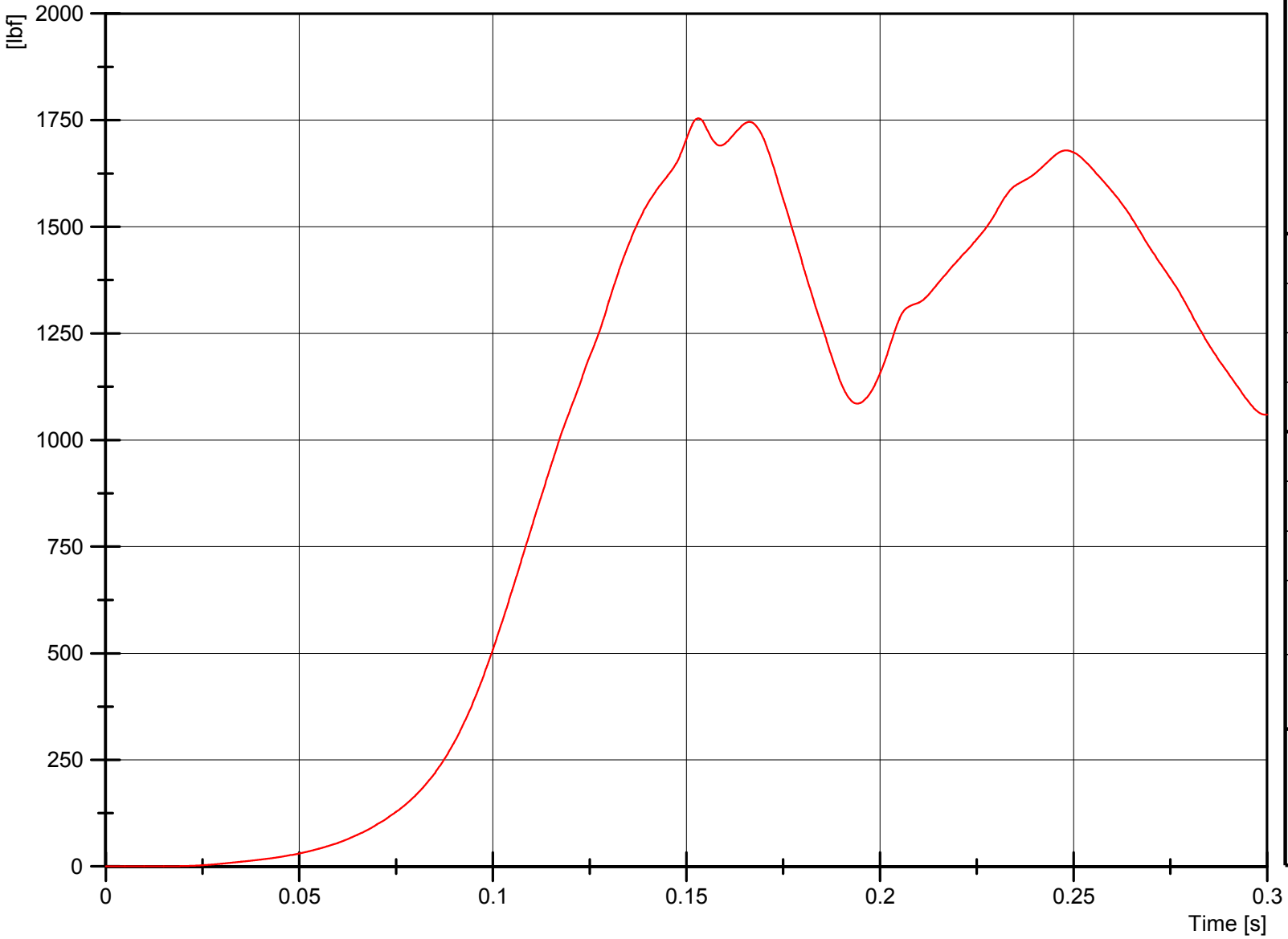
Head Az H2 718

Maximum: 71.3659 g Time: 0.2225 sec.
Minimum: -14.14 g Time: 0.2284 sec.
CFC: 1000
Sensor Type: Endevco 7264C
S/N: P60367
Sensitivity: 1.782E-05 V/EU
Cal. Due: 09/25/2014
Full Scale: 2000 g
DAS Channel: 27
Ref. No.: 24
Polarity: R

Head Resultant H2 718

Maximum: 167.82 g Time: 0.2223 sec.

HIC: 876.1
T1: 120 msec.
T2: 226.5 msec.



Lap Belt Force H2 718

Maximum: 1754.51 lbf Time: 0.1533 sec.
Minimum: 0.2654 lbf Time: 0.012 sec.
CFC: 60
Sensor Type: Denton 3255
S/N: SBLC086
Sensitivity: 6.6006E-07 V/EU
Cal. Due: 05/16/2014
Full Scale: 3000 lbf
DAS Channel: 36
Ref. No.: 17
Polarity: N

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Doc. No.: CDL-FA14B-08-01

Version: New

Report Date: 03/26/2014

Customer: FAA

Test: FA14B-08

Dummy: H2 718

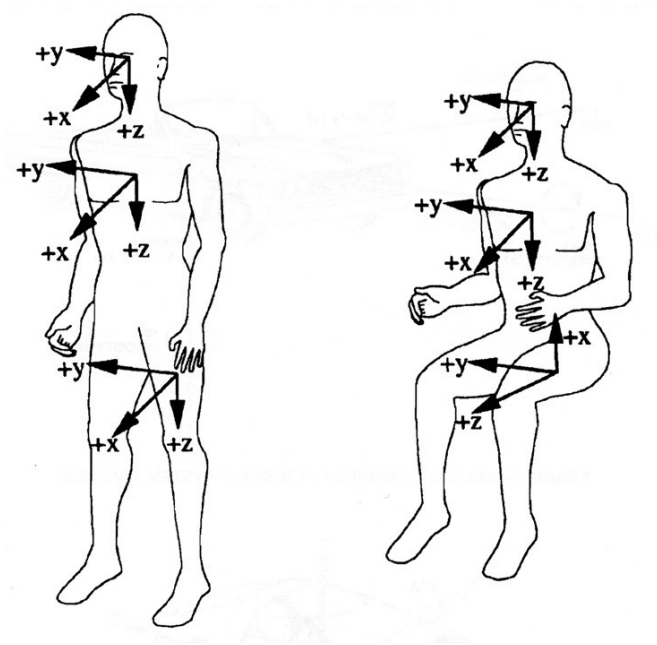
Position: Config 5 - Repaired Belt

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 15:09

J211/1 Sign Conventions



Upper Neck Load Cell:
+FX Head rearward, chest forward
+FY Head leftward, chest rightward
+FZ Head upward, chest downward
+MX Left ear toward left shoulder
+MY Chin toward sternum
+MZ Chin toward left shoulder

Lumbar Load Cell:
+FX Chest rearward, pelvis forward
+FY Chest leftward, pelvis rightward
+FZ Chest upward, pelvis downward
+MX Left shoulder toward left hip
+MY Sternum toward front of legs
+MZ Right shoulder forward, left shoulder rearward

Femur Load Cells:
+FZ Tension

Chest Displacement:
-DX Compression

Rib Dispacement:
-DY Compression

Belt Load Cells:
+FX Tension

Floor Load Cells:
+FX Test article forward
+FY Test article right
+FZ Test article up

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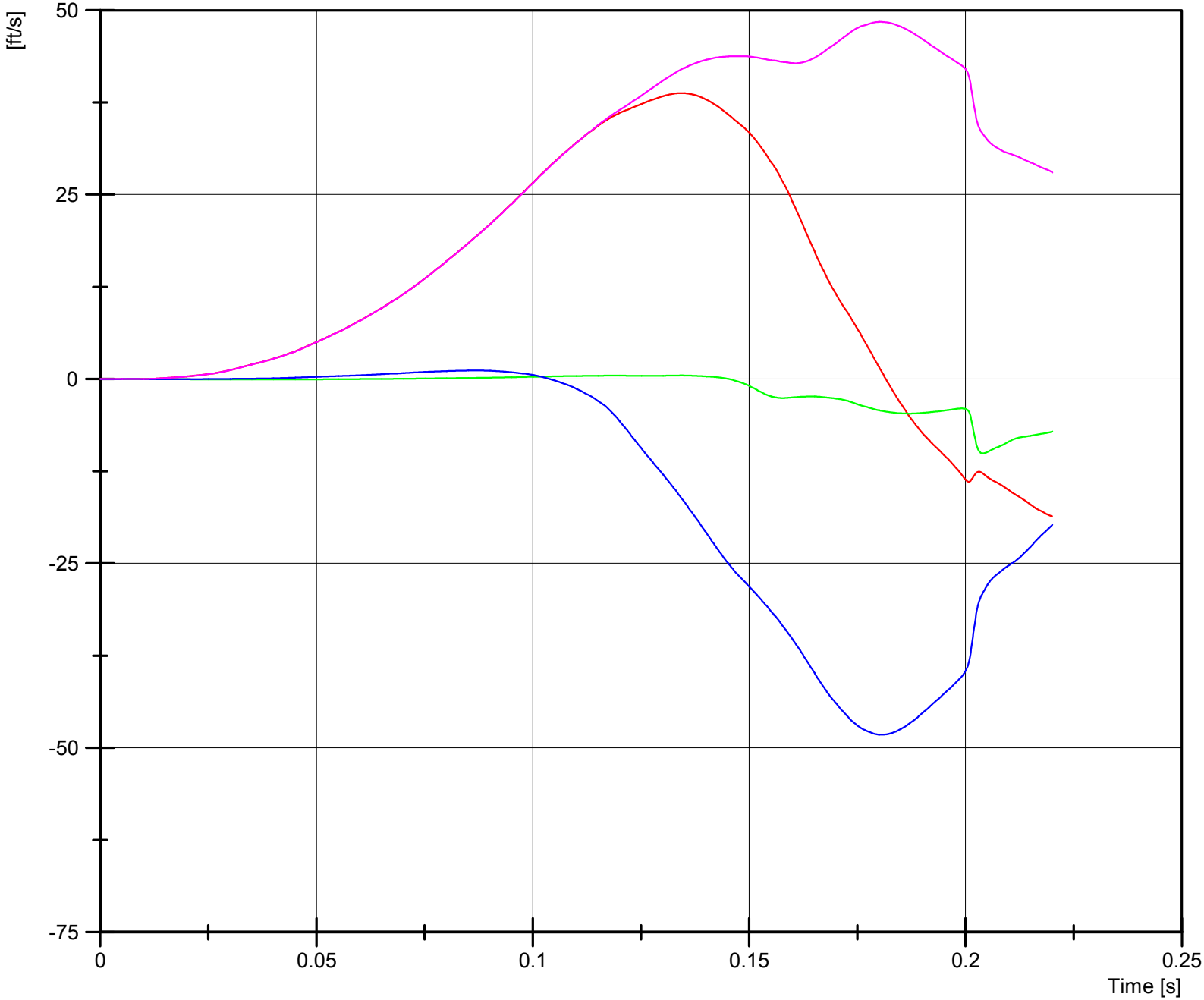

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Customer: FAA

Test: FA14B-08

Dummy: H2 718

Position: Config 5 - Repaired Belt

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Pulse Name:
16g-07b

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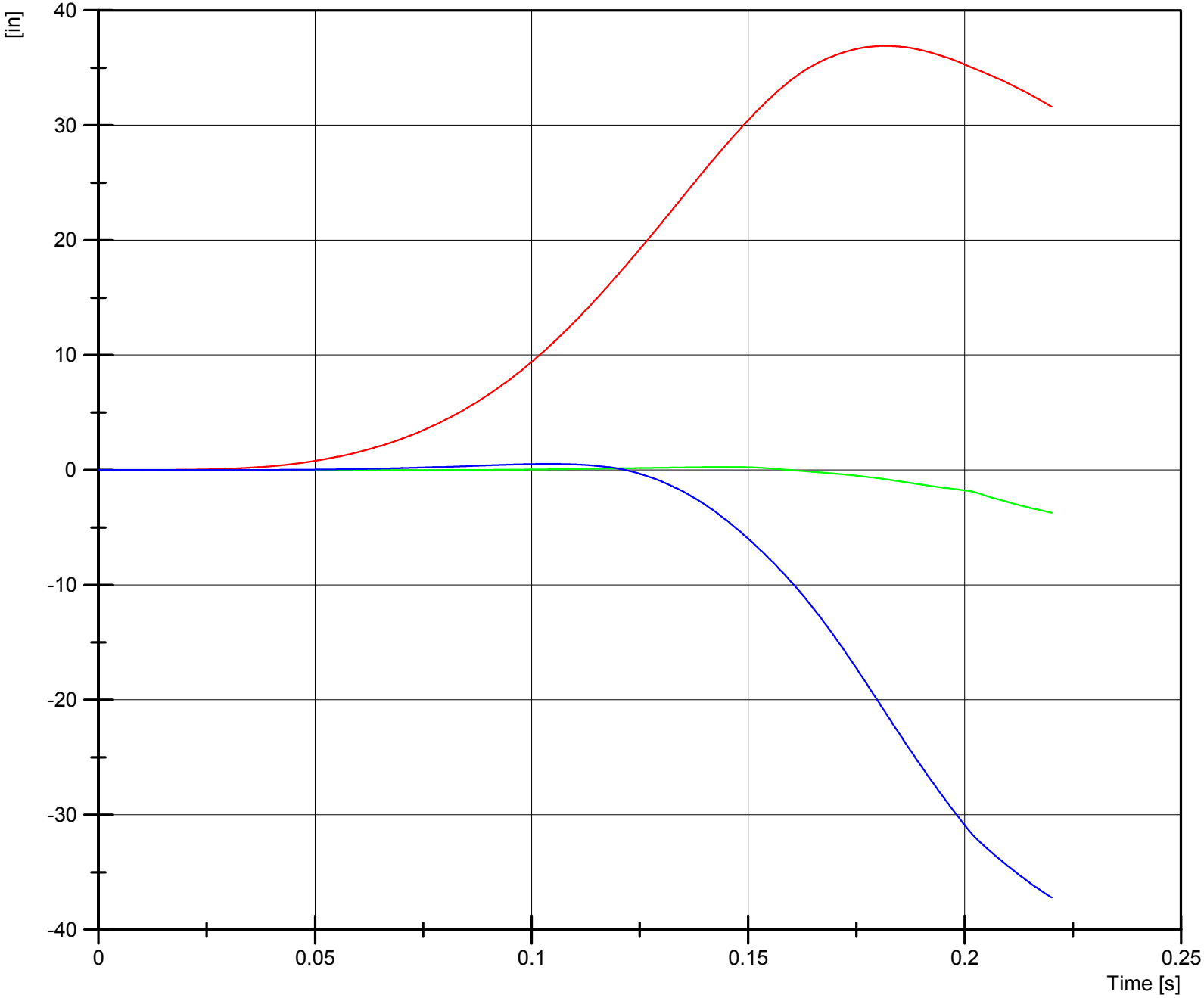
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 15:09

Comments:

Global Head Vx H2 718		Global Head Vy H2 718		Global Head Vz H2 718		Global Head Velocity Resultant H2 718	
Maximum: 38.77 ft/s	Time: 0.1344 sec.	Maximum: 0.483 ft/s	Time: 0.1344 sec.	Maximum: 1.17 ft/s	Time: 0.0868 sec.	Maximum: 48.43 ft/s	Time: 0.1803 sec.
Minimum: -18.59 ft/s	Time: 0.22 sec.	Minimum: -10.07 ft/s	Time: 0.204 sec.	Minimum: -48.22 ft/s	Time: 0.1805 sec.	Minimum: 0 ft/s	Time: 0.0001 sec.



Global Head Dx H2 718 | Global Head Dy H2 718 | Global Head Dz H2 718

Maximum: 36.91 in	Time: 0.1817 sec.	Maximum: 0.25 in	Time: 0.1454 sec.	Maximum: 0.53 in	Time: 0.104 sec.
Minimum: -0.00 in	Time: 0.0063 sec.	Minimum: -3.73 in	Time: 0.2201 sec.	Minimum: -37.20 in	Time: 0.2201 sec.

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Dummy: H2 718

Position: Config 5 - Repaired Belt

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16g-07b

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Total Samples: 81920
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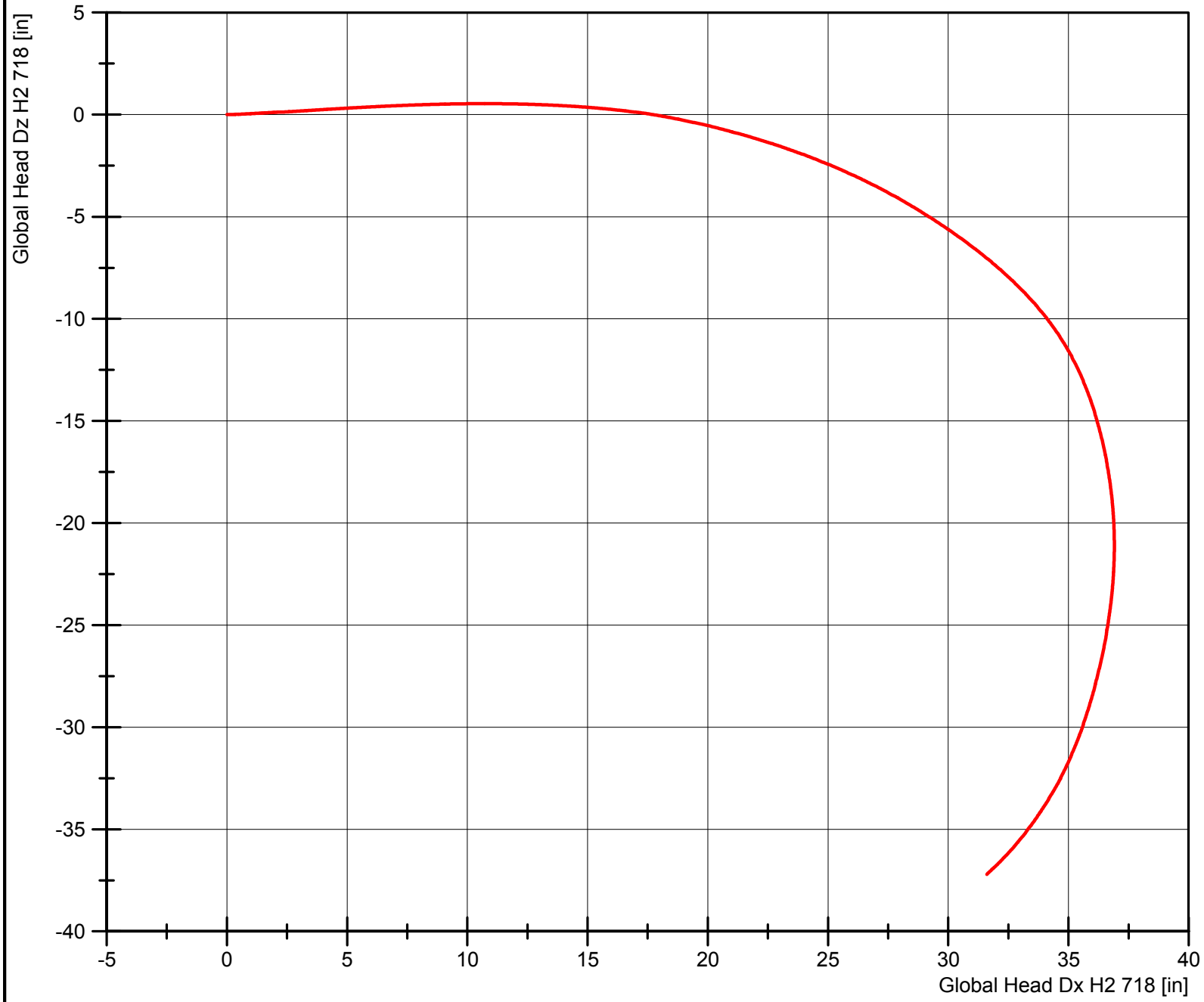
Test Date/Time: 11/22/2013 15:09

Comments:

Displacement values are calculated from Head Accelerations and Angular Velocities.
This method cannot be used to substitute photometric analysis.



Global Head Displacement XZ

X Maximum: 36.91 in **Time: 0.1817 sec.**

Z Value at X Maximum: -21.09 in

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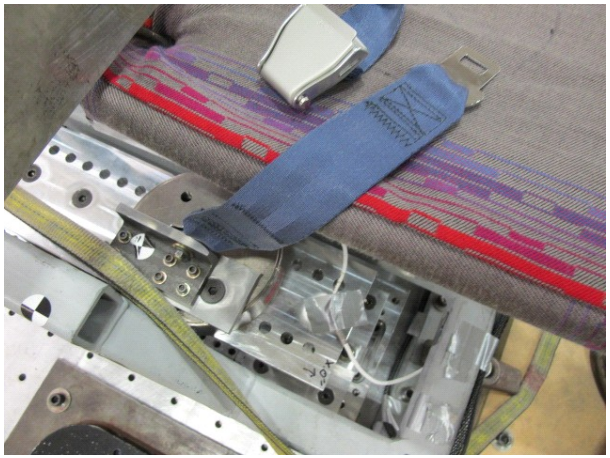
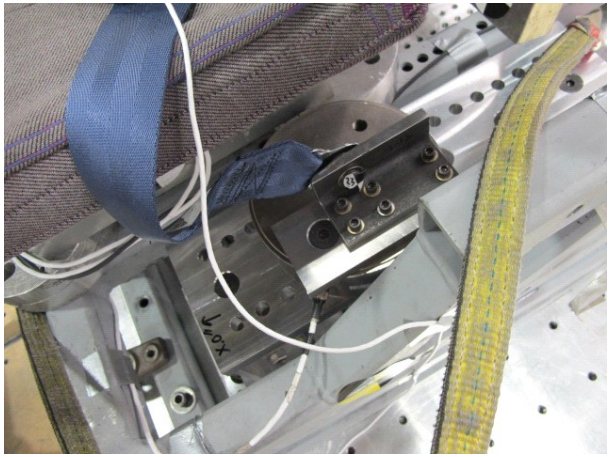
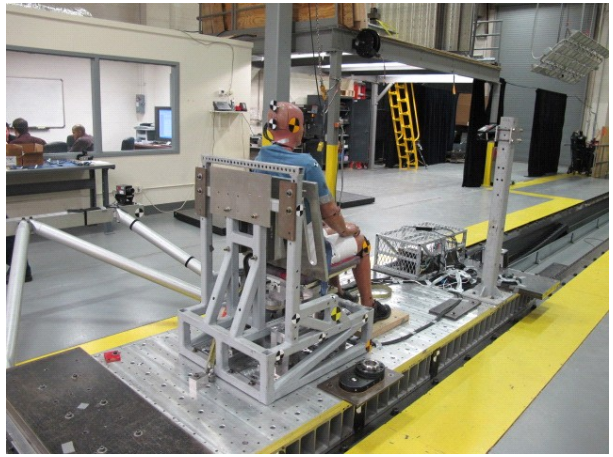
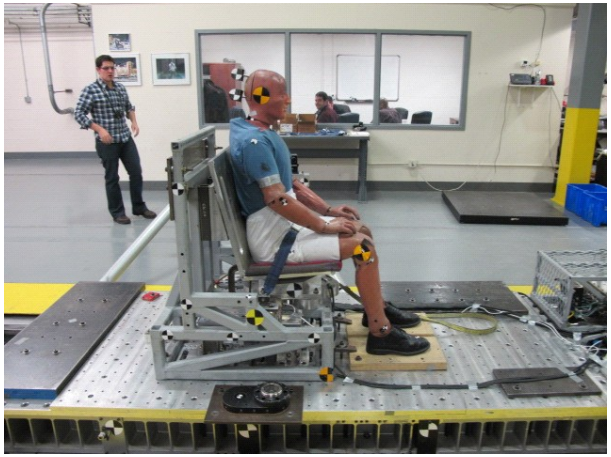
Pre-test Photos









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Position: N/A

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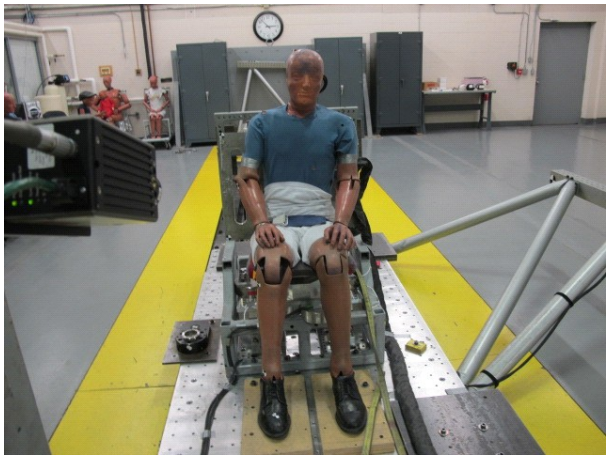
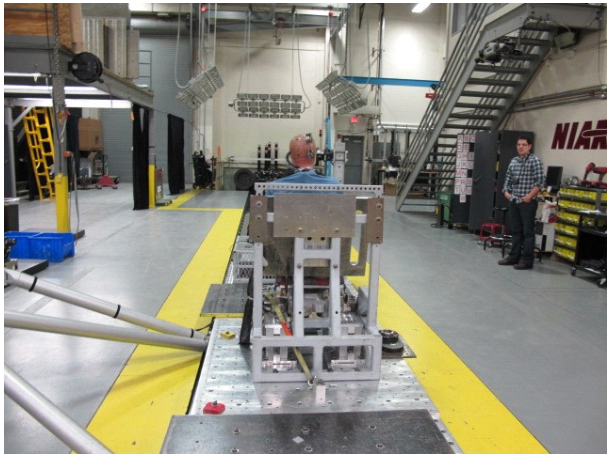
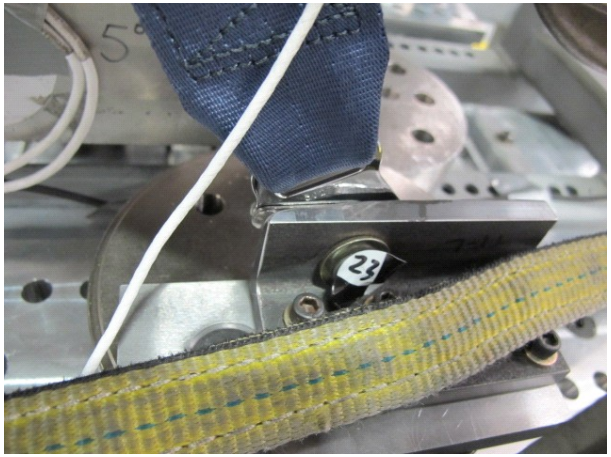
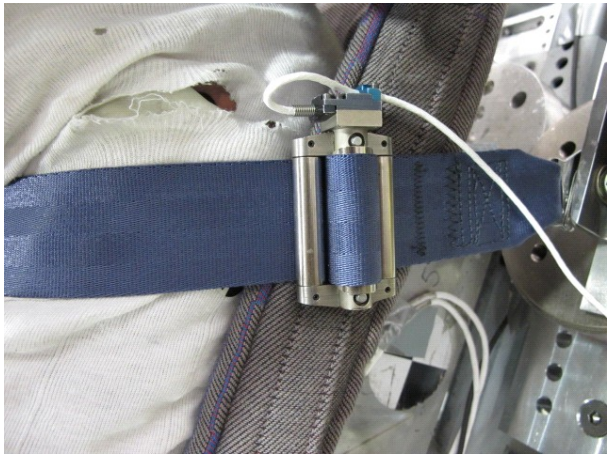
Pre-test Photos









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Doc. No.: CDL-FA14B-08-01

Version: New

Report Date: 03/26/2014

Customer: FAA

Test: FA14B-08

Dummy: N/A

Position: N/A

Test Description:
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Pulse Name:
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Test Date/Time: 11/22/2013 15:09

Comments:

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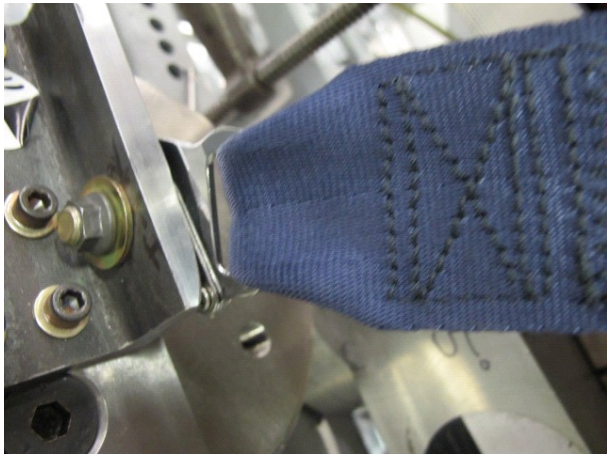

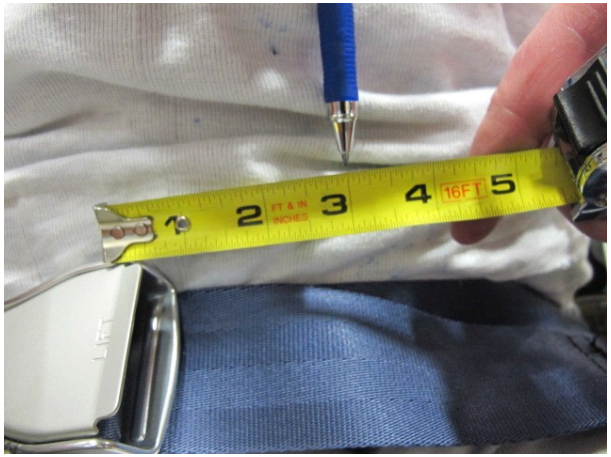

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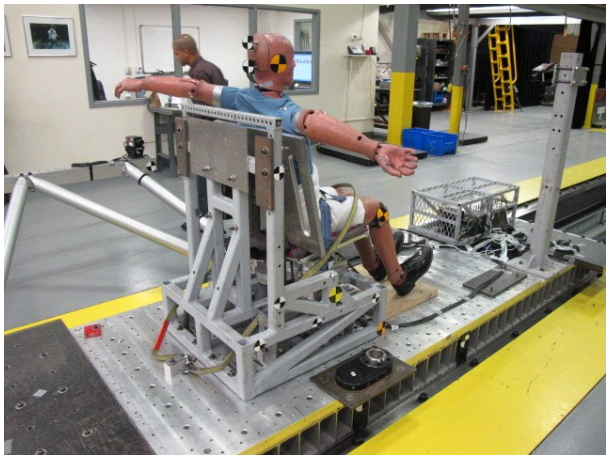

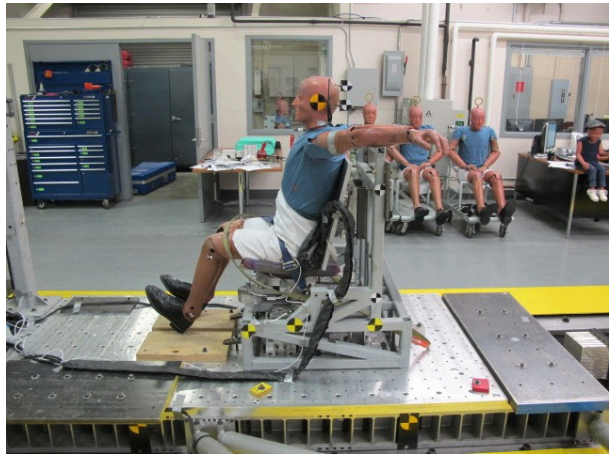

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Doc. No.: CDL-FA14B-08-01

Version: New

Report Date: 03/26/2014

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Test: FA14B-08

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14 CFR 25.562 Test 2

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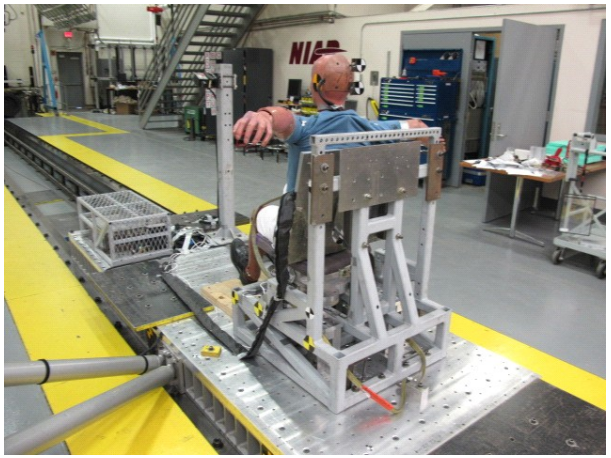

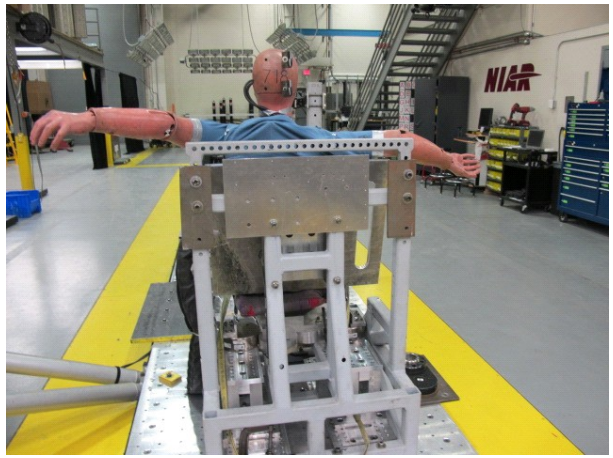

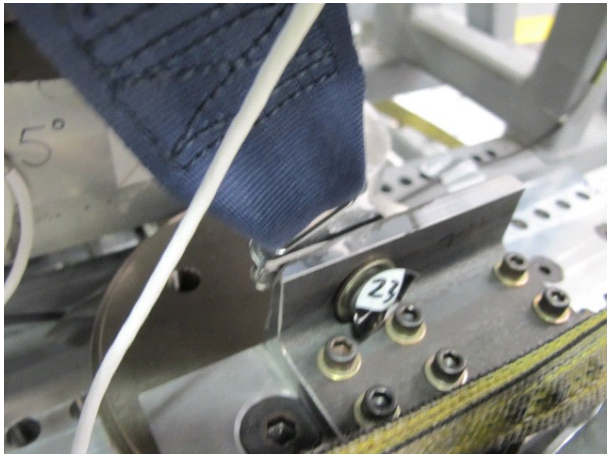

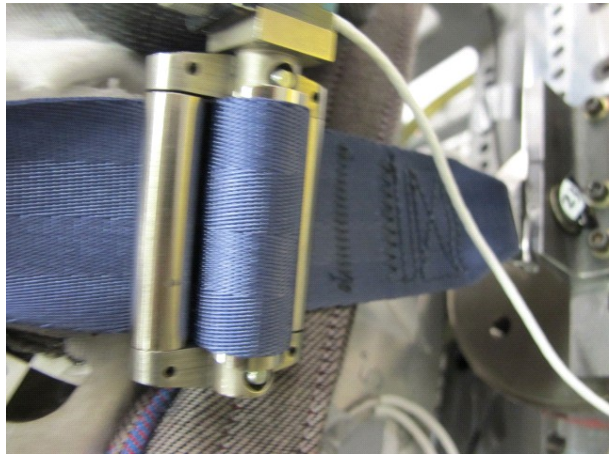

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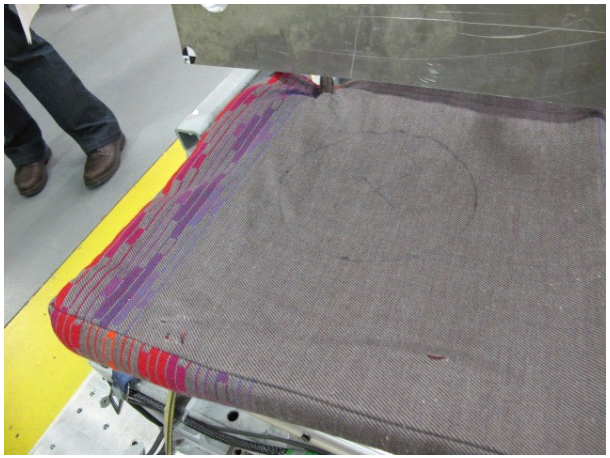

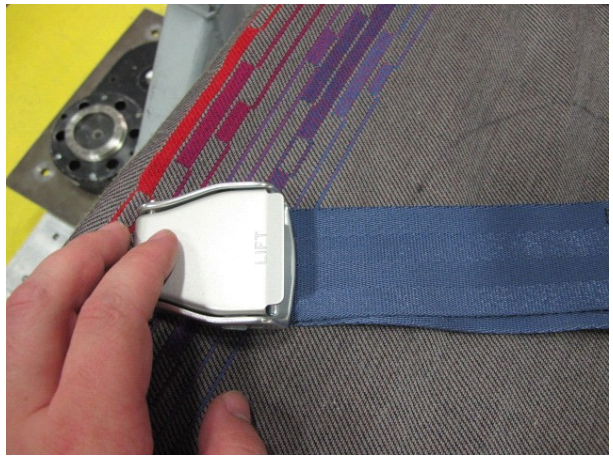

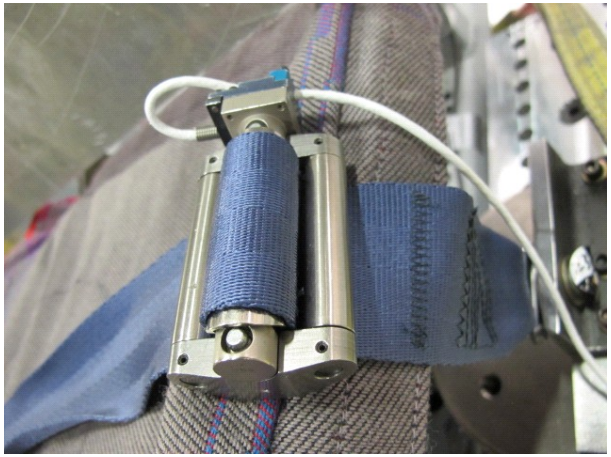

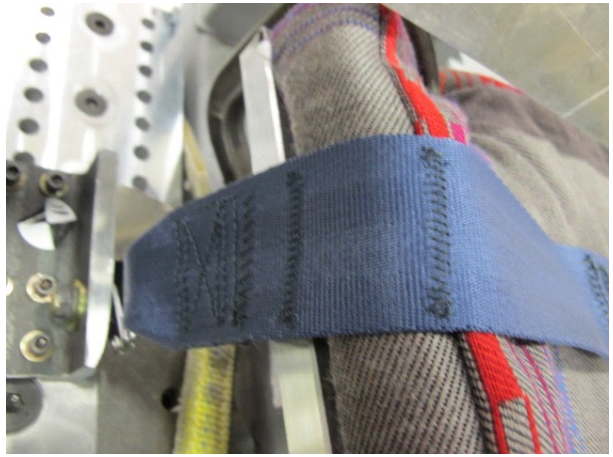

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Customer: FAA

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Dummy: N/A

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CRASH DYNAMICS LABORATORY

Report No. CDL-FA14B-09-01

Requested by:

FAA

Final Test Report
FA14B-09

03/26/2014

Revision	Change	Date	Revised By
New		03/26/2014	Rob Huculak

Prepared and Reviewed by:

Rob Huculak
Laboratory Manager

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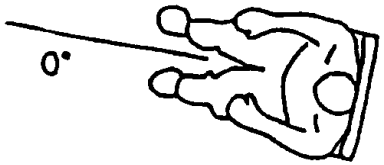
This test report is in accordance with ISO/IEC 17025:2005 requirements and all equipment standards used are traceable to the National Institute of Standards and Technology.
The information in this report relates only to the article under test and cannot be reproduced, except in full, without the written approval of the National Institute for Aviation Research.

Test Summary

The dynamic test (FA14B-09) was performed for FAA in accordance with 14 CFR 25.562 Test 2 on 03/26/2014.

Pulse Parameters	Required	Result	Pass/Fail
Minimum Peak Acceleration (g)	16	16.26	PASS
Minimum Velocity Change (ft/sec)	44	45.84	PASS
Maximum Rise Time (msec)	90	89	PASS
Minimum Velocity Change During Rise Time (ft/sec)	22	23	PASS
2g Offset	--	--	PASS

Test Orientation



ATD: H2 718 **Position: Config 3 - New Belt**

0 deg

Measured Seat Belt Angle	Measured Seat Belt Offset
57.76 deg	-2.00 in

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16g-07b

Rate: 10000
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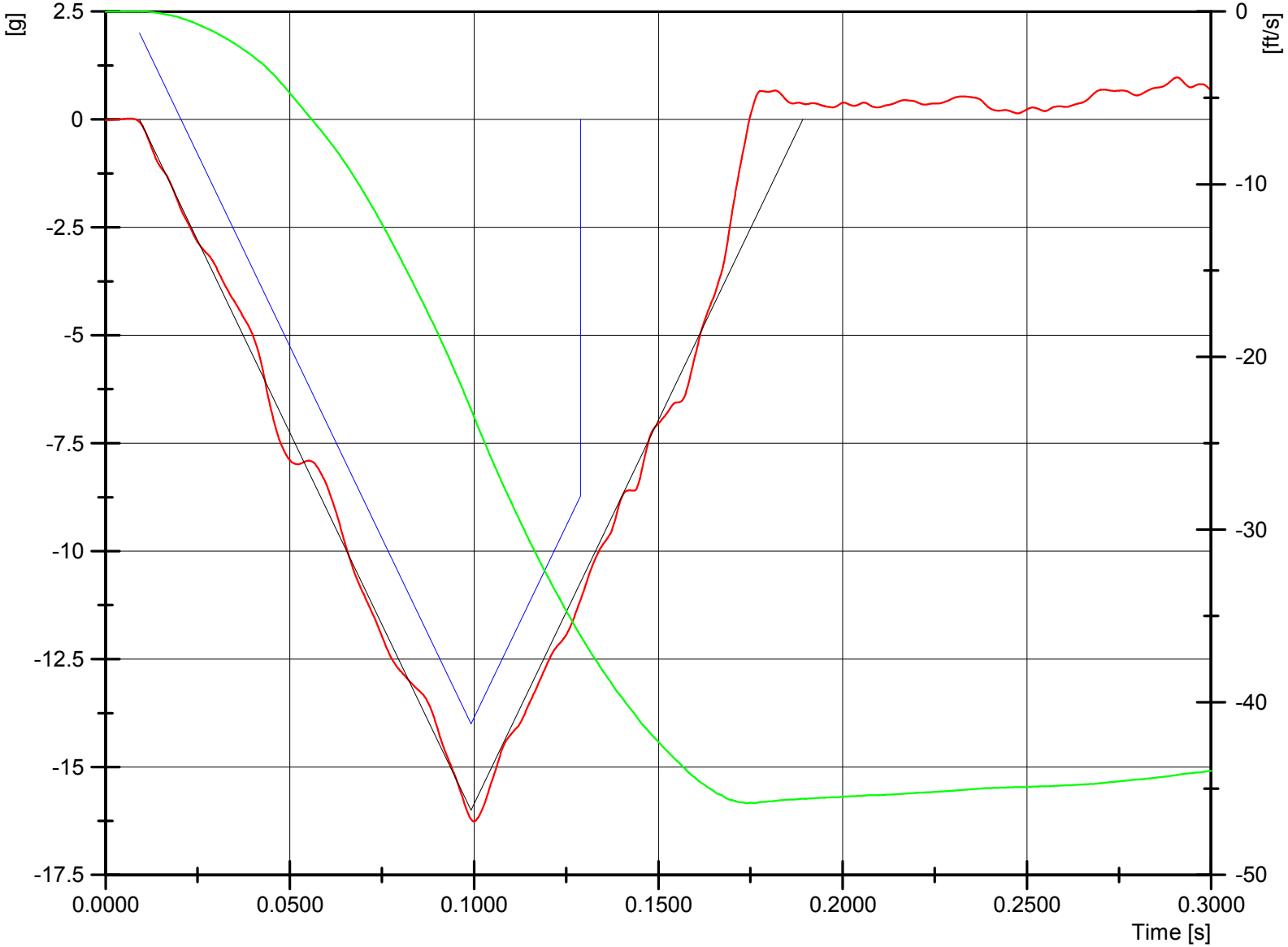
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 16:48

Temperature	Relative Humidity
72.6°F	30.0%



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Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 16:48

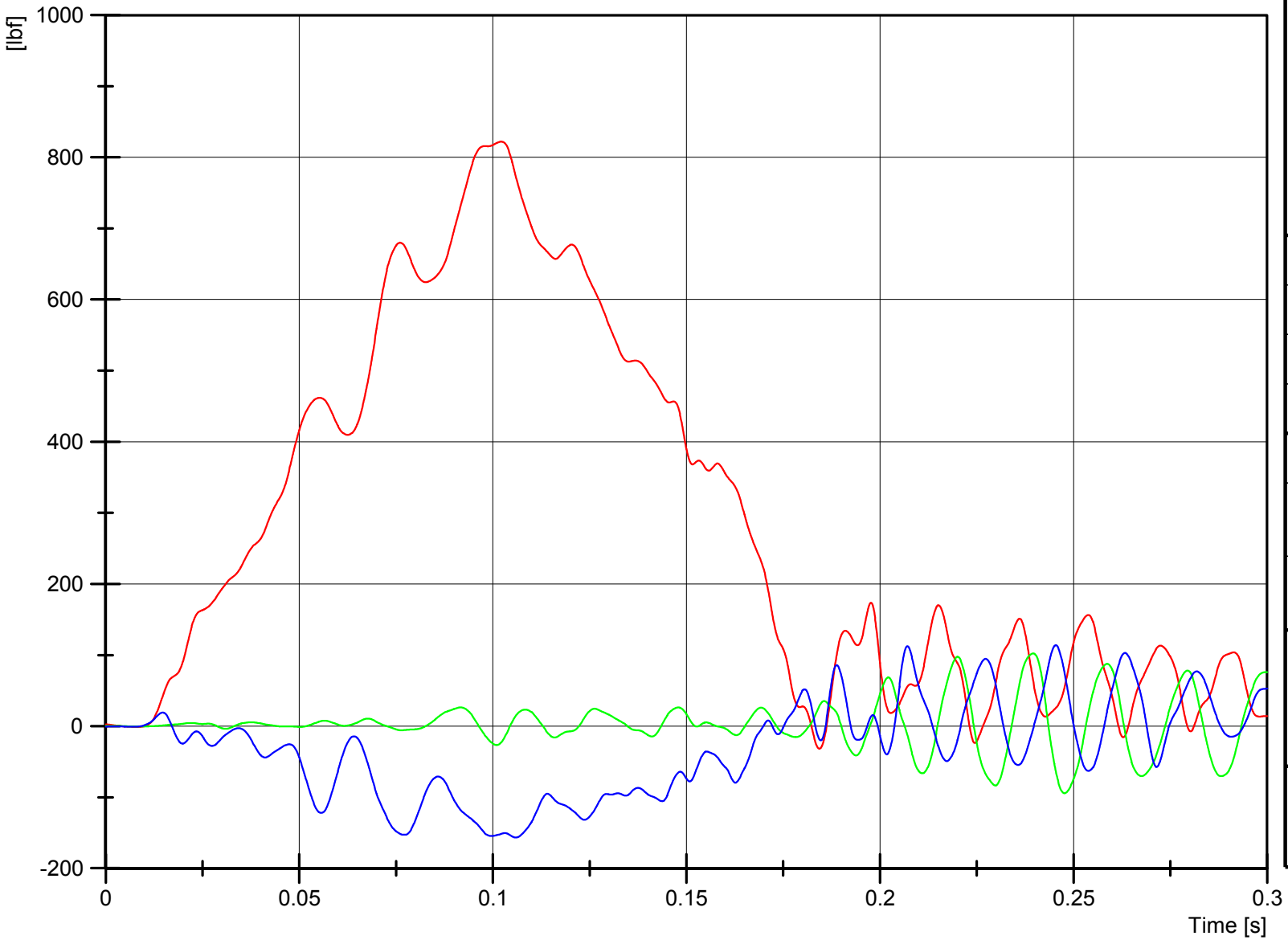
Comments:

Sled Acceleration | Sled Velocity | Ideal Pulse | Upper Limit

Maximum: 0.972 g Time: 0.2907 sec.
Minimum: -16.26 g Time: 0.1 sec.
CFC: 60
Sensor Type: ENDEVCO 7290A-100
S/N: 29924
Sensitivity: 0.01919 V/EU
Cal. Due: 06/11/2014
Full Scale: 100 g
DAS Channel: 50
Ref. No.: 1
Polarity: R

Minimum: -45.84 ft/s Time: 0.1741 sec.

Pulse Requirement		Actual
Minimum Required Peak Acceleration:	16 g	16.26 g
Minimum Overall Velocity Change:	44 ft/s	45.84 ft/s
Maximum Rise Time:	90 msec	89 msec
Minimum Velocity Change Before Greq:	22 ft/s	23 ft/s



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Fax: (316) 978-3175
www.niar.wichita.edu

Doc. No.: CDL-FA14B-09-01

Version: New

Report Date: 03/26/2014

Customer: FAA

Test: FA14B-09

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 16:48

Comments:

Rigid Seat Seat Back Fx

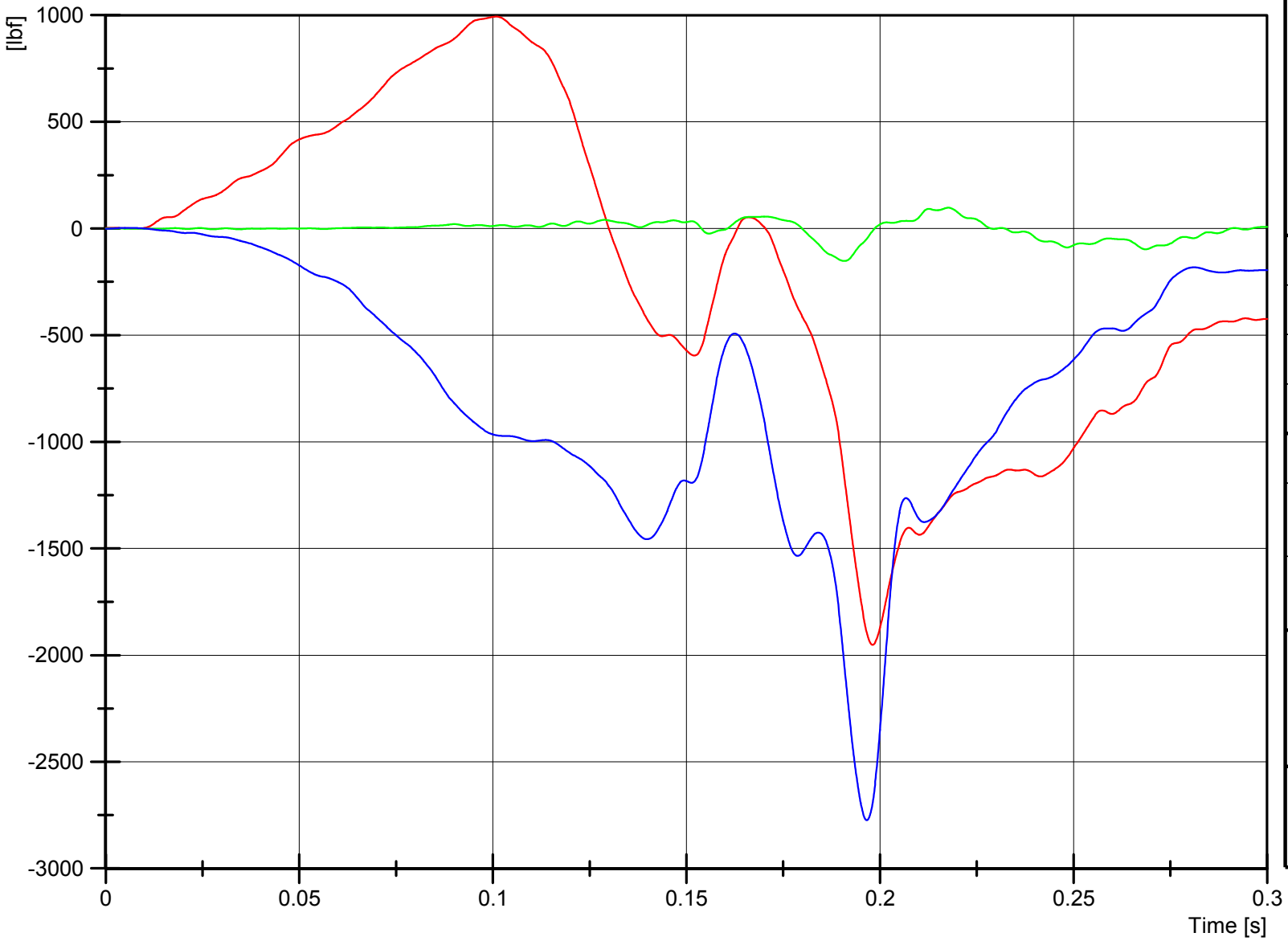
Maximum: 822.23 lbf Time: 0.1024 sec.
Minimum: -31.918 lbf Time: 0.1845 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC084FZ
Sensitivity: 1.176E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 12
Ref. No.: 15
Polarity: N

Rigid Seat Seat Back Fy

Maximum: 102.41 lbf Time: 0.2398 sec.
Minimum: -94.531 lbf Time: 0.2478 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC084FY
Sensitivity: 2.733E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 11
Ref. No.: 14
Polarity: N

Rigid Seat Seat Back Fz

Maximum: 113.74 lbf Time: 0.2456 sec.
Minimum: -156.84 lbf Time: 0.1061 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC084FX
Sensitivity: 2.74E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 10
Ref. No.: 13
Polarity: R



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Doc. No.: CDL-FA14B-09-01

Version: New

Report Date: 03/26/2014

Customer: FAA

Test: FA14B-09

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 16:48

Comments:

Rigid Seat Seat Pan Fx

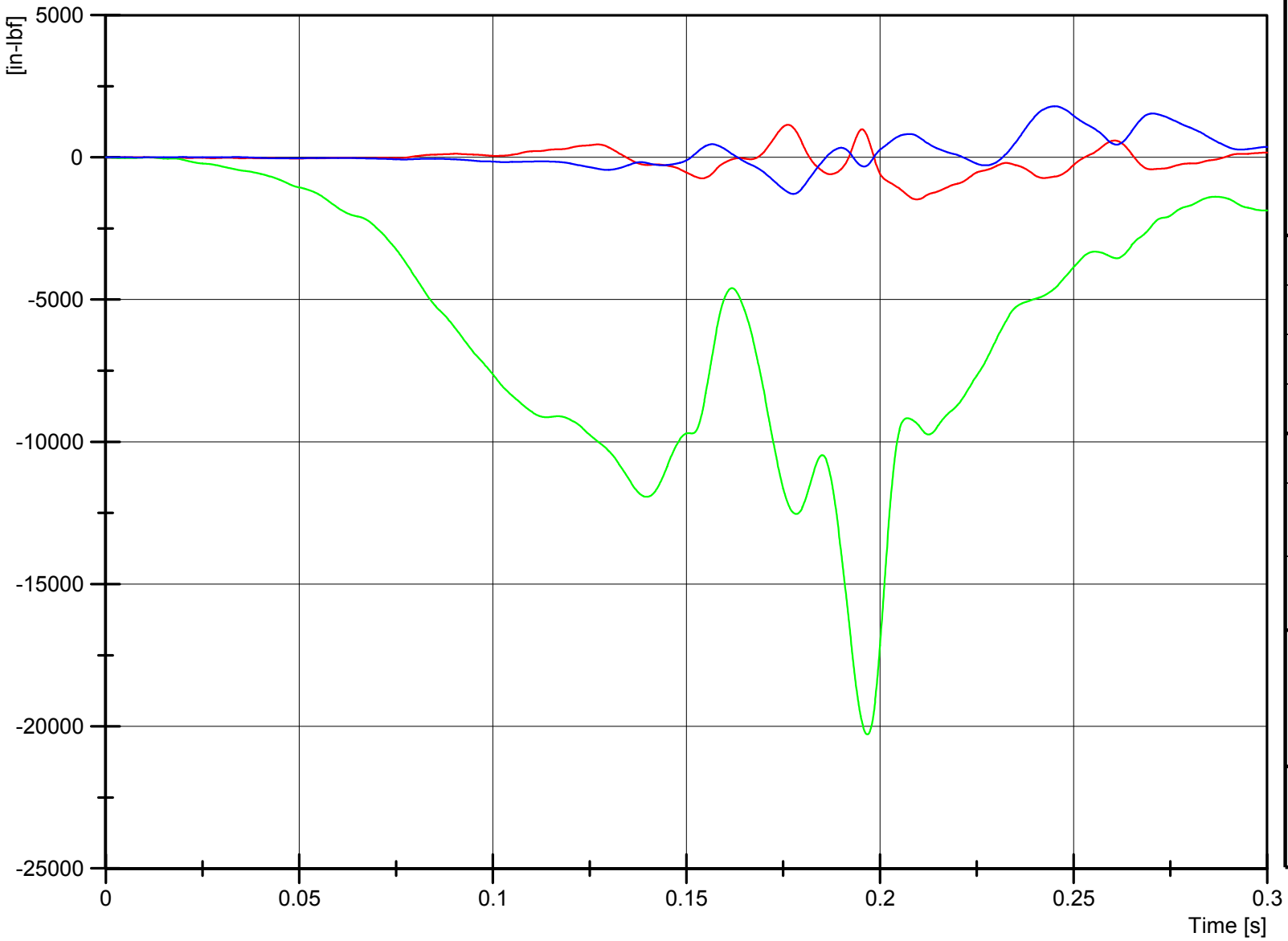
Maximum: 993.35 lbf Time: 0.1011 sec.
Minimum: -1.95E+03 lbf Time: 0.1983 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083FX
Sensitivity: 2.768E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 13
Ref. No.: 10
Polarity: N

Rigid Seat Seat Pan Fy

Maximum: 97.8677 lbf Time: 0.2178 sec.
Minimum: -152.09 lbf Time: 0.191 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083FY
Sensitivity: 2.764E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 14
Ref. No.: 11
Polarity: N

Rigid Seat Seat Pan Fz

Maximum: 3.1497 lbf Time: 0.0059 sec.
Minimum: -2.77E+03 lbf Time: 0.1968 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083FZ
Sensitivity: 1.181E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 15
Ref. No.: 12
Polarity: N



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Doc. No.: CDL-FA14B-09-01

Version: New

Report Date: 03/26/2014

Customer: FAA

Test: FA14B-09

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 16:48

Comments:

Rigid Seat Seat Pan Mx

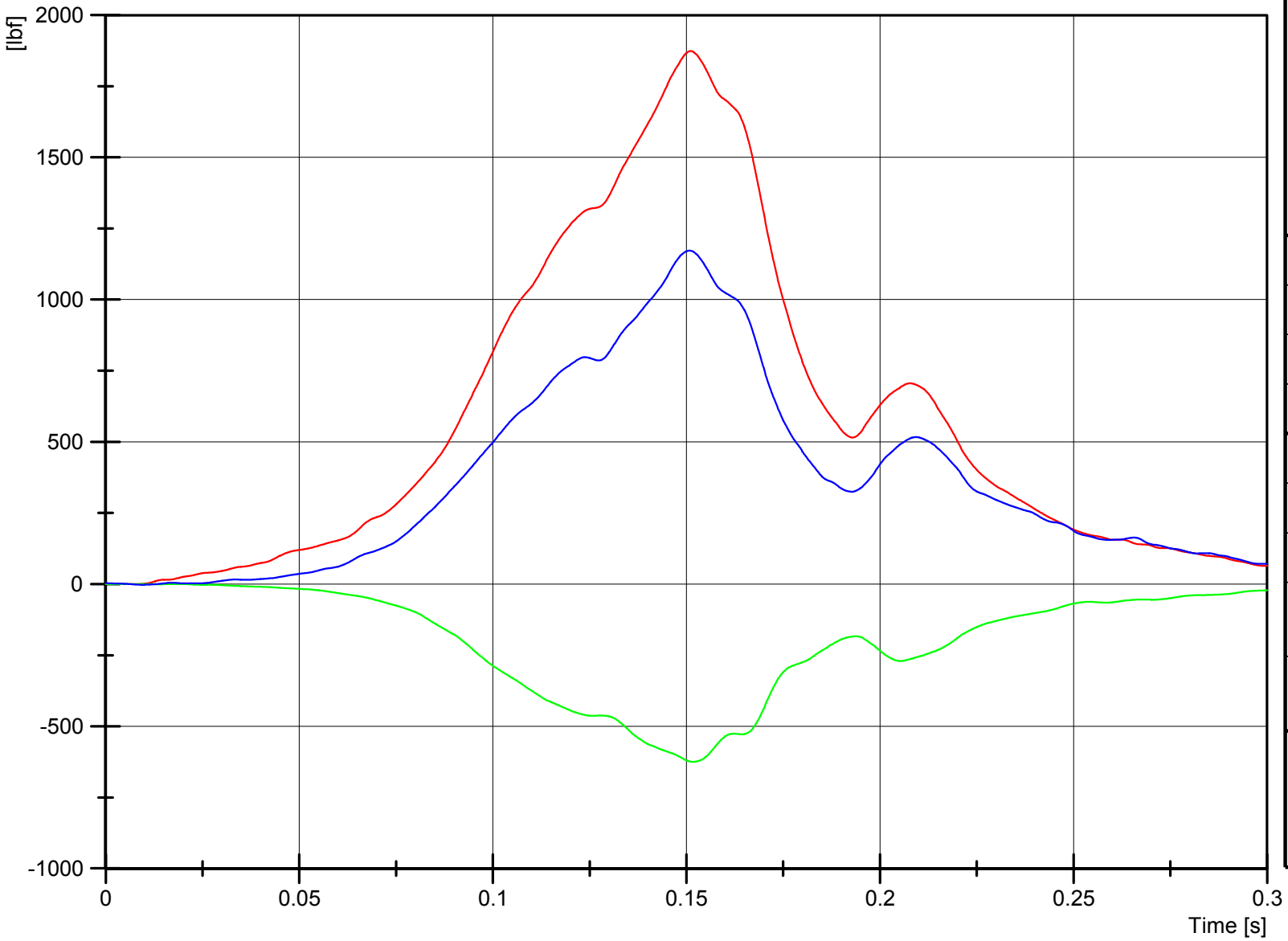
Maximum: 1145.66 in-lbf Time: 0.1764 sec.
Minimum: -1.48E+03 in-lbf Time: 0.2097 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083MX
Sensitivity: 7.03E-08 V/EU
Cal. Due: 02/13/2014
Full Scale: 25000 in-lbf
DAS Channel: 16
Ref. No.: 7
Polarity: N

Rigid Seat Seat Pan My

Maximum: -0.6176 in-lbf Time: 0 sec.
Minimum: -2.03E+04 in-lbf Time: 0.1969 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083MY
Sensitivity: 7.05E-08 V/EU
Cal. Due: 02/13/2014
Full Scale: 25000 in-lbf
DAS Channel: 17
Ref. No.: 8
Polarity: N

Rigid Seat Seat Pan Mz

Maximum: 1800.28 in-lbf Time: 0.2453 sec.
Minimum: -1.28E+03 in-lbf Time: 0.1778 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083MZ
Sensitivity: 9.32E-08 V/EU
Cal. Due: 02/13/2014
Full Scale: 20000 in-lbf
DAS Channel: 18
Ref. No.: 9
Polarity: N



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Doc. No.: CDL-FA14B-09-01

Version: New

Report Date: 03/26/2014

Customer: FAA

Test: FA14B-09

Dummy: H2 718

Position: Config 3 - New Belt

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 16:48

Rigid Seat Right Lap Fx

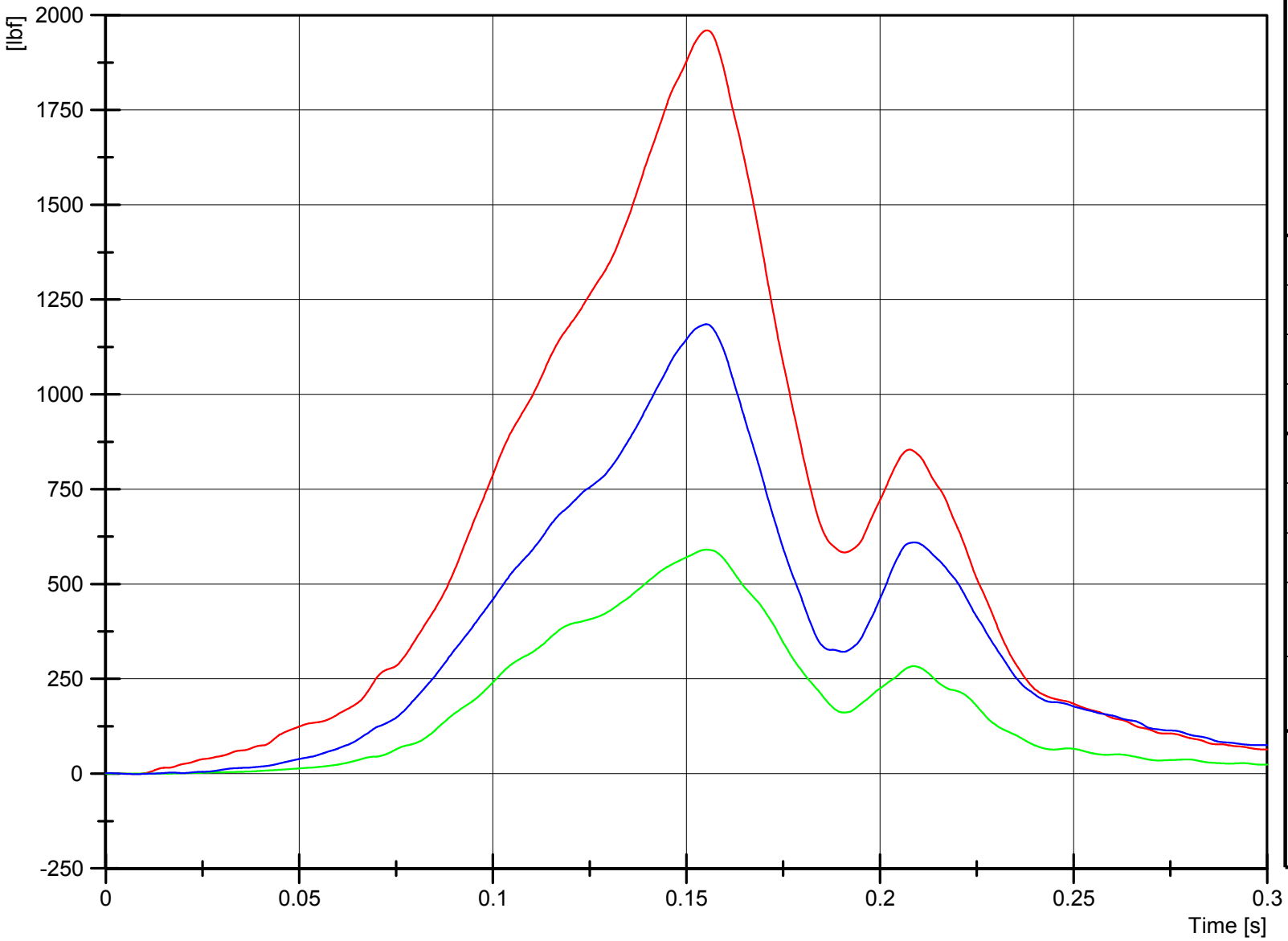
Maximum: 1874.22 lbf Time: 0.1513 sec.
Minimum: -0.574 lbf Time: 0 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC093FX
Sensitivity: 2.587E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 22
Ref. No.: 74
Polarity: N

Rigid Seat Right Lap Fy

Maximum: 0.3032 lbf Time: 0.0186 sec.
Minimum: -624.98 lbf Time: 0.1518 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC093FY
Sensitivity: 2.572E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 23
Ref. No.: 75
Polarity: N

Rigid Seat Right Lap Fz

Maximum: 1172.26 lbf Time: 0.151 sec.
Minimum: -2.4965 lbf Time: 0.0097 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC093FZ
Sensitivity: 1.044E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 24
Ref. No.: 76
Polarity: N



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Doc. No.: CDL-FA14B-09-01

Version: New

Report Date: 03/26/2014

Customer: FAA

Test: FA14B-09

Dummy: H2 718

Position: Config 3 - New Belt

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 16:48

Rigid Seat Left Lap Fx

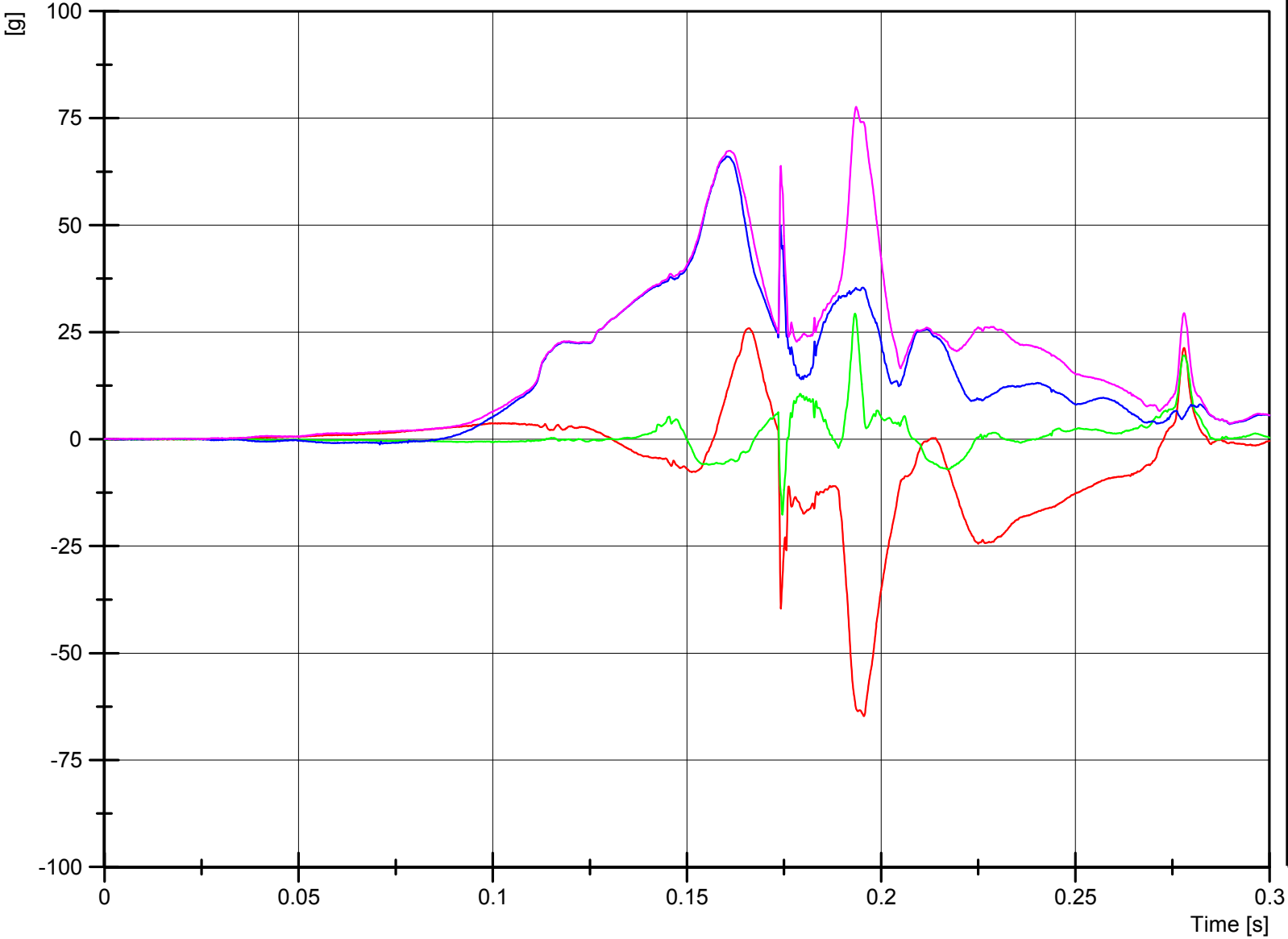
Maximum: 1960.13 lbf Time: 0.1555 sec.
Minimum: -0.5746 lbf Time: 0.0082 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC094FX
Sensitivity: 2.587E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 19
Ref. No.: 77
Polarity: N

Rigid Seat Left Lap Fy

Maximum: 590.45 lbf Time: 0.1554 sec.
Minimum: 0.185 lbf Time: 0.0107 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC094FY
Sensitivity: 2.572E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 20
Ref. No.: 78
Polarity: N

Rigid Seat Left Lap Fz

Maximum: 1184.94 lbf Time: 0.1554 sec.
Minimum: -1.0073 lbf Time: 0.0082 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC094FZ
Sensitivity: 1.044E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 21
Ref. No.: 79
Polarity: N



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Doc. No.: CDL-FA14B-09-01

Version: New

Report Date: 03/26/2014

Customer: FAA

Test: FA14B-09

Dummy: H2 718

Position: Config 3 - New Belt

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 16:48

Head Ax H2 718

Maximum: 25.9331 g Time: 0.1662 sec.
Minimum: -64.72 g Time: 0.1957 sec.
CFC: 1000
Sensor Type: Endevco 7264C
S/N: P47932
Sensitivity: 2.157E-05 V/EU
Cal. Due: 09/25/2014
Full Scale: 2000 g
DAS Channel: 25
Ref. No.: 22
Polarity: R

Head Ay H2 718

Maximum: 29.3399 g Time: 0.1935 sec.
Minimum: -17.66 g Time: 0.1748 sec.
CFC: 1000
Sensor Type: Endevco 7264C
S/N: P48149
Sensitivity: 2.603E-05 V/EU
Cal. Due: 09/25/2014
Full Scale: 2000 g
DAS Channel: 26
Ref. No.: 23
Polarity: R

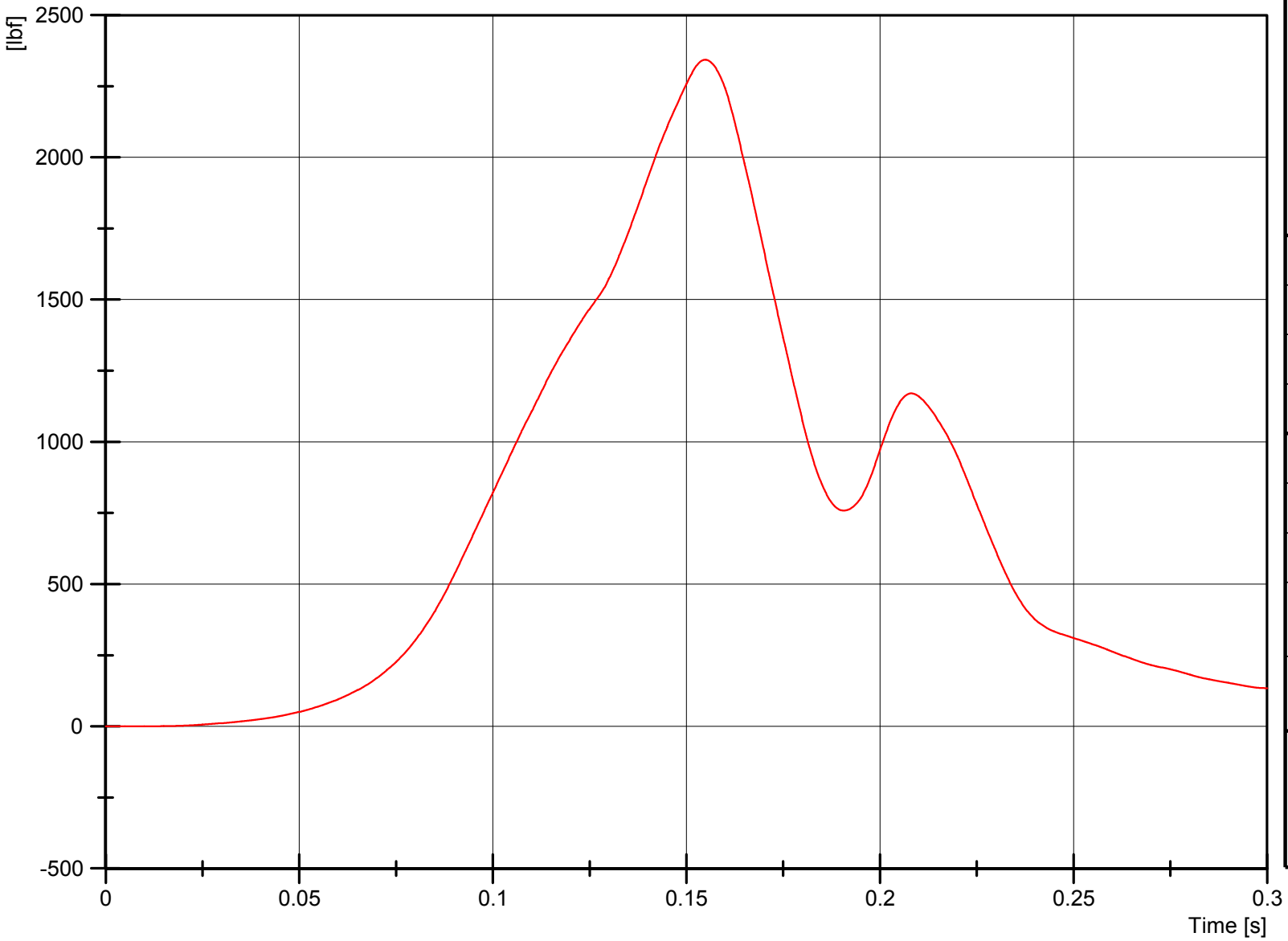
Head Az H2 718

Maximum: 66.0791 g Time: 0.1604 sec.
Minimum: -1.2684 g Time: 0.0711 sec.
CFC: 1000
Sensor Type: Endevco 7264C
S/N: P60367
Sensitivity: 1.782E-05 V/EU
Cal. Due: 09/25/2014
Full Scale: 2000 g
DAS Channel: 27
Ref. No.: 24
Polarity: R

Head Resultant H2 718

Maximum: 77.64 g Time: 0.1936 sec.

HIC: 876.7
T1: 114.8 msec.
T2: 242.4 msec.



Lap Belt Force H2 718

Maximum: 2343.54 lbf Time: 0.155 sec.
Minimum: -0.0661 lbf Time: 0.0115 sec.
CFC: 60
Sensor Type: Denton 3255
S/N: SBLC086
Sensitivity: 6.6006E-07 V/EU
Cal. Due: 05/16/2014
Full Scale: 3000 lbf
DAS Channel: 36
Ref. No.: 17
Polarity: N

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Doc. No.: CDL-FA14B-09-01

Version: New

Report Date: 03/26/2014

Customer: FAA

Test: FA14B-09

Dummy: H2 718

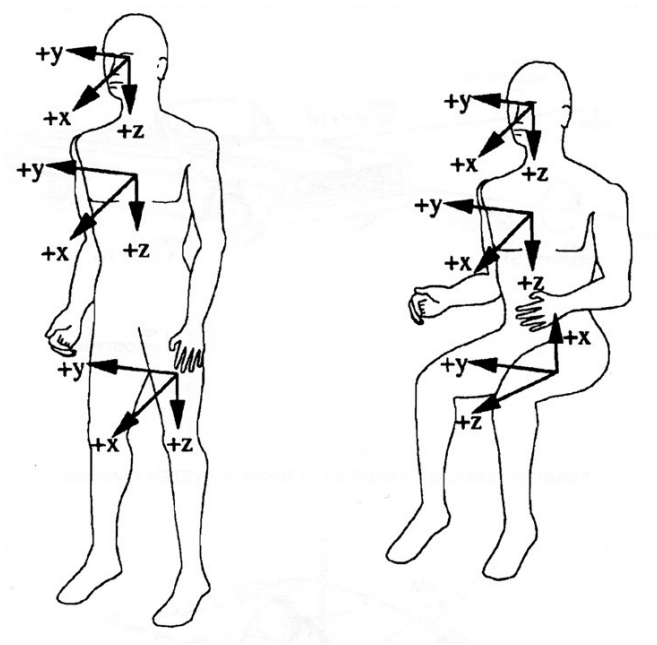
Position: Config 3 - New Belt

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 16:48

J211/1 Sign Conventions



Upper Neck Load Cell:
+FX Head rearward, chest forward
+FY Head leftward, chest rightward
+FZ Head upward, chest downward
+MX Left ear toward left shoulder
+MY Chin toward sternum
+MZ Chin toward left shoulder

Lumbar Load Cell:
+FX Chest rearward, pelvis forward
+FY Chest leftward, pelvis rightward
+FZ Chest upward, pelvis downward
+MX Left shoulder toward left hip
+MY Sternum toward front of legs
+MZ Right shoulder forward, left shoulder rearward

Femur Load Cells:
+FZ Tension

Chest Displacement:
-DX Compression

Rib Dispacement:
-DY Compression

Belt Load Cells:
+FX Tension

Floor Load Cells:
+FX Test article forward
+FY Test article right
+FZ Test article up

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Doc. No.: CDL-FA14B-09-01

Version: New

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Customer: FAA

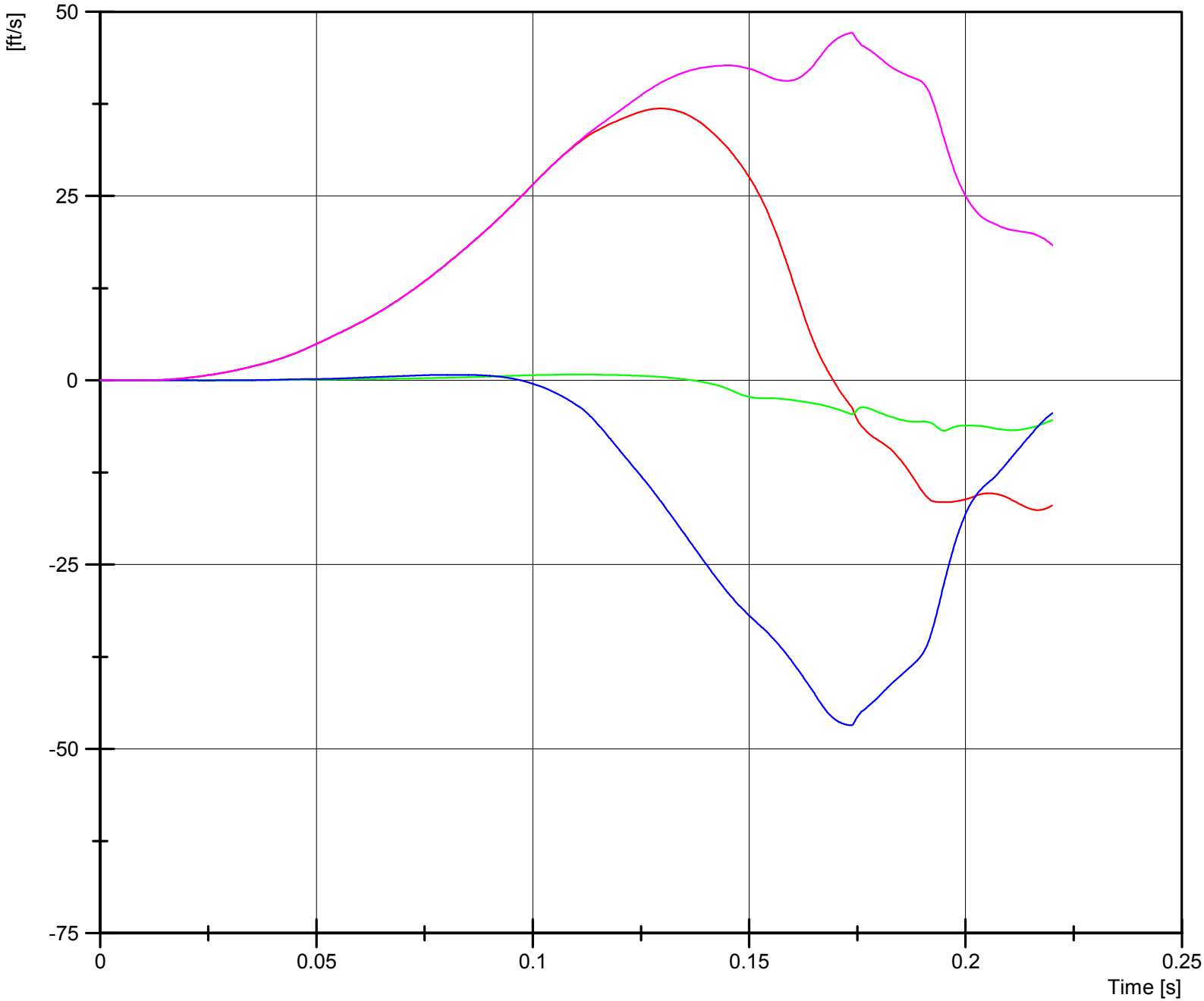
Test: FA14B-09

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 16:48

Comments:



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Doc. No.: CDL-FA14B-09-01

Version: New

Report Date: 03/26/2014

Customer: FAA

Test: FA14B-09

Dummy: H2 718

Position: Config 3 - New Belt

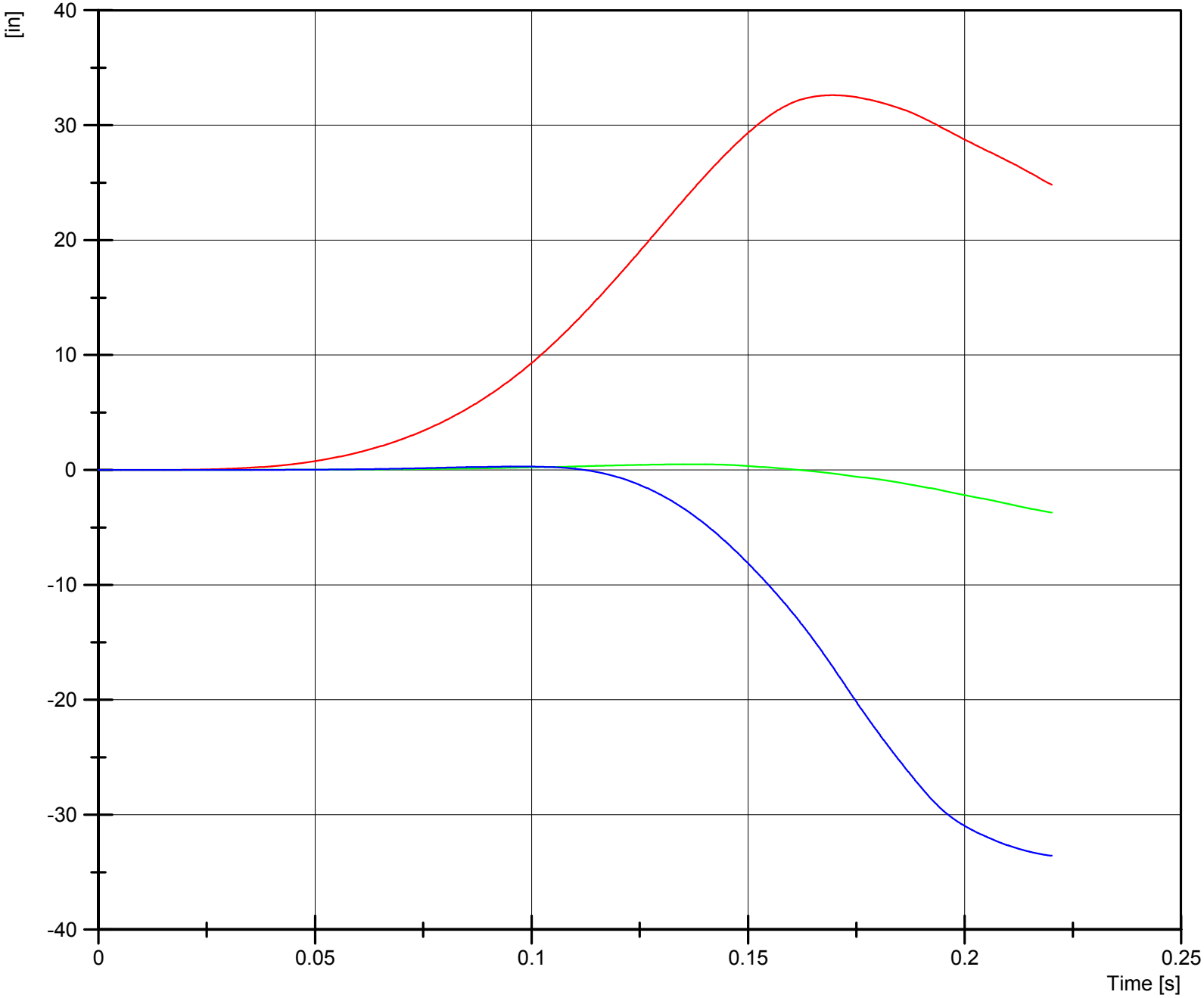
Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 16:48

Comments:

Global Head Vx H2 718		Global Head Vy H2 718		Global Head Vz H2 718		Global Head Velocity Resultant H2 718	
Maximum: 36.89 ft/s	Time: 0.1296 sec.	Maximum: 0.832 ft/s	Time: 0.1119 sec.	Maximum: 0.749 ft/s	Time: 0.0827 sec.	Maximum: 47.14 ft/s	Time: 0.1737 sec.
Minimum: -17.58 ft/s	Time: 0.2167 sec.	Minimum: -6.82 ft/s	Time: 0.1951 sec.	Minimum: -46.79 ft/s	Time: 0.1737 sec.	Minimum: 0 ft/s	Time: 0.0001 sec.



Global Head Dx H2 718 | Global Head Dy H2 718 | Global Head Dz H2 718

Maximum: 32.61 in	Time: 0.1696 sec.	Maximum: 0.50 in	Time: 0.1371 sec.	Maximum: 0.31 in	Time: 0.0973 sec.
Minimum: -0.00 in	Time: 0.0114 sec.	Minimum: -3.71 in	Time: 0.2201 sec.	Minimum: -33.57 in	Time: 0.2201 sec.

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Doc. No.: CDL-FA14B-09-01

Version: New

Report Date: 03/26/2014

Customer: FAA

Test: FA14B-09

Dummy: H2 718

Position: Config 3 - New Belt

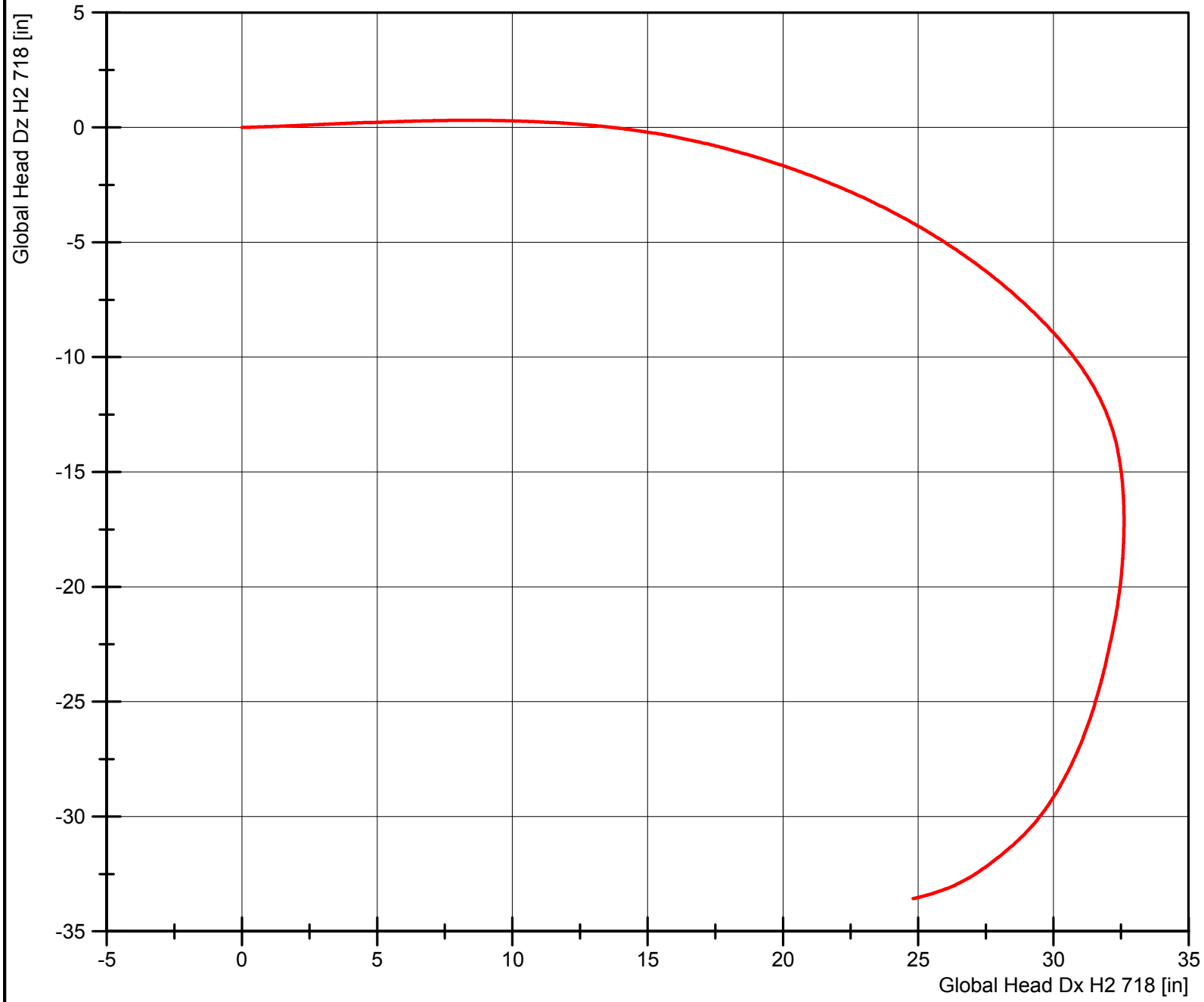
Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 16:48

Comments:

Displacement values are calculated from Head Accelerations and Angular Velocities.
This method cannot be used to substitute photometric analysis.



Global Head Displacement XZ

X Maximum: 32.61 in **Time: 0.1696 sec.**

Z Value at X Maximum: -17.16 in

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Doc. No.: CDL-FA14B-09-01

Version: New

Report Date: 03/26/2014

Customer: FAA

Test: FA14B-09

Dummy: H2 718

Position: Config 3 - New Belt

Test Description:
14 CFR 25.562 Test 2

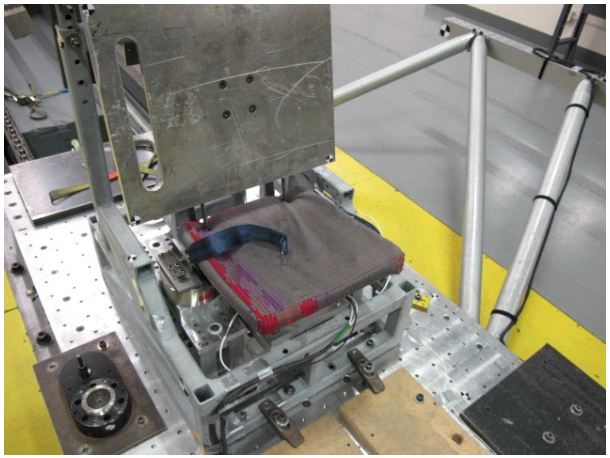
Pulse Name:
16g-07b

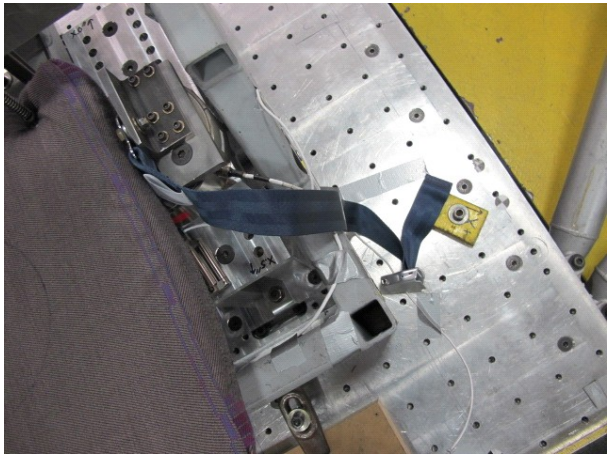
Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 16:48

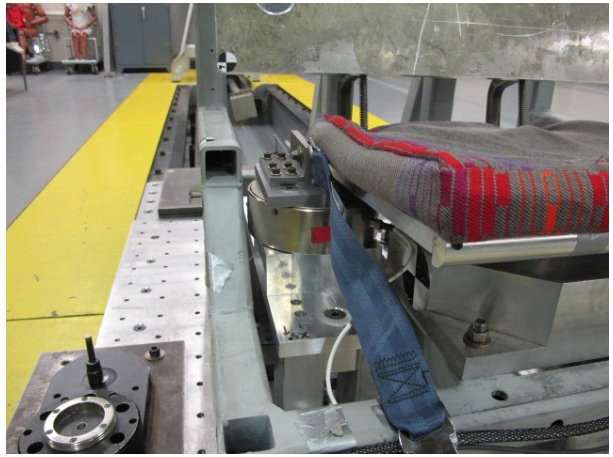
Comments:

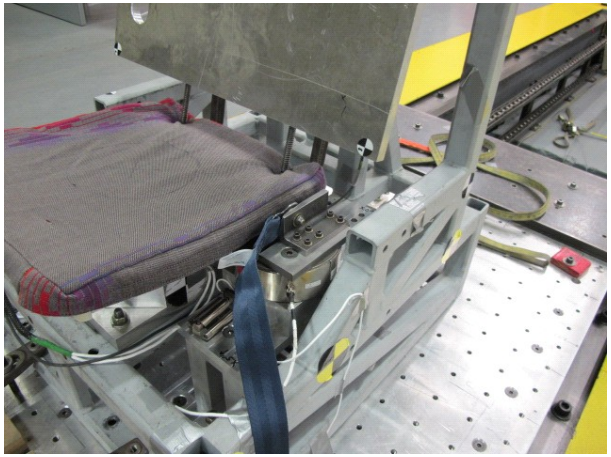
Displacement values are calculated from Head Accelerations and Angular Velocities.
This method cannot be used to substitute photometric analysis.

Pre-test Photos









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Doc. No.: CDL-FA14B-09-01

Version: New

Report Date: 03/26/2014

Customer: FAA

Test: FA14B-09

Dummy: N/A

Position: N/A

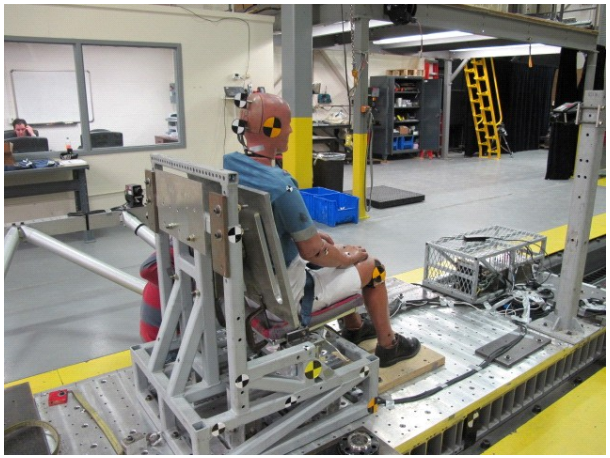
Test Description:
14 CFR 25.562 Test 2

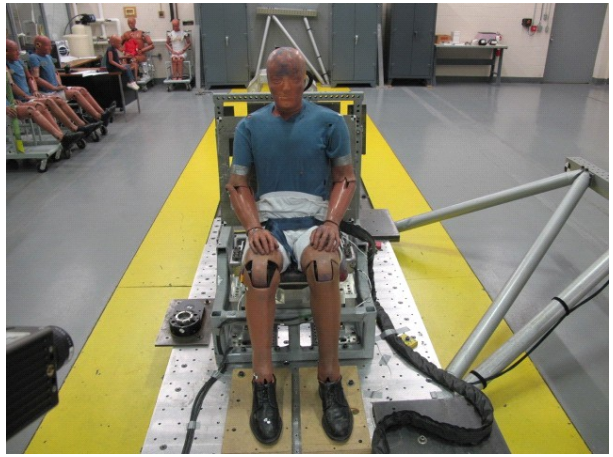
Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 16:48

Comments:

Pre-test Photos





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Doc. No.: CDL-FA14B-09-01

Version: New

Report Date: 03/26/2014

Customer: FAA

Test: FA14B-09

Dummy: N/A

Position: N/A

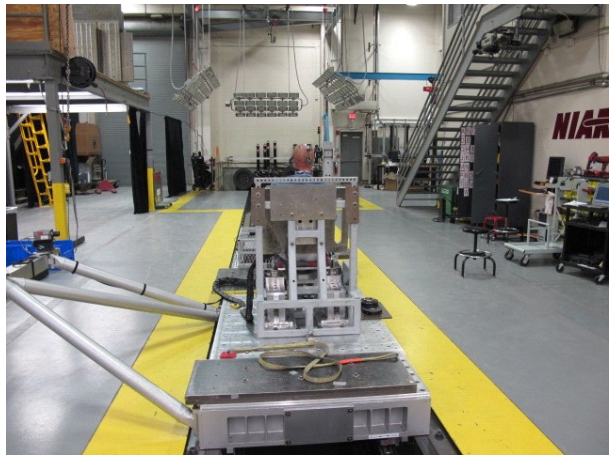
Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 16:48

Comments:

Pre-test Photos



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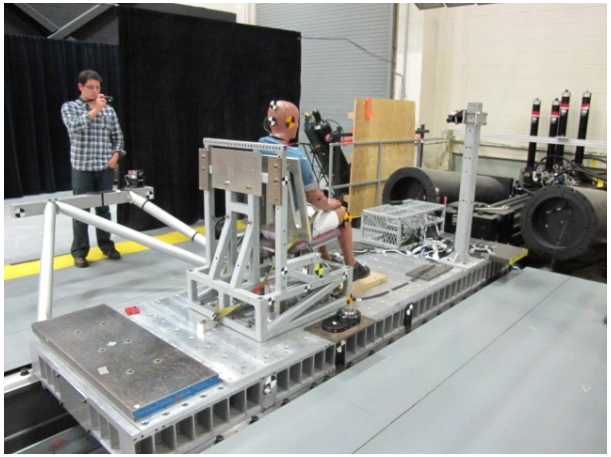
Comments:

Pre-test Photos



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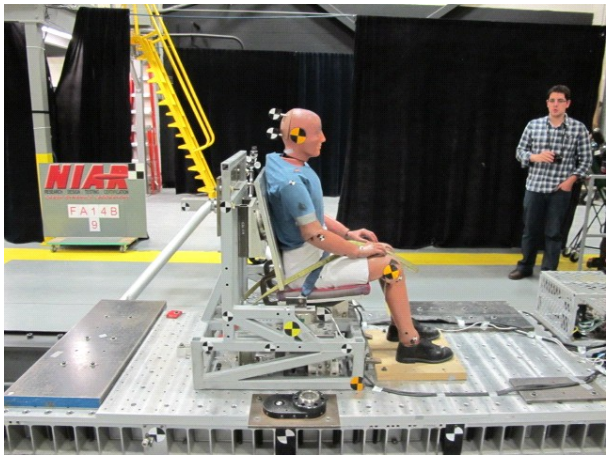

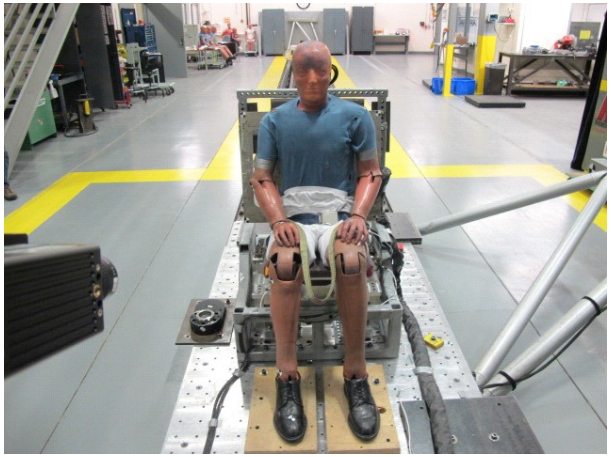

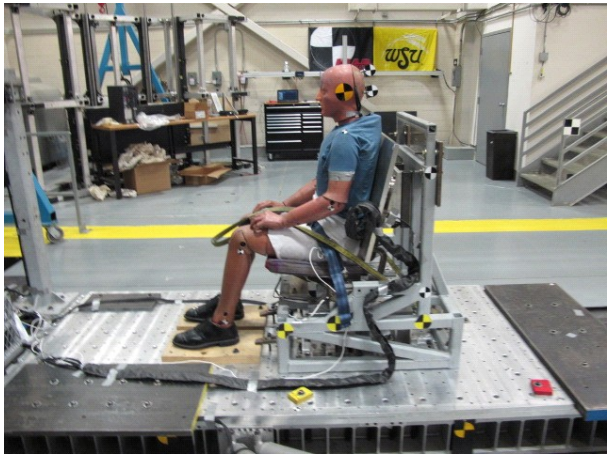

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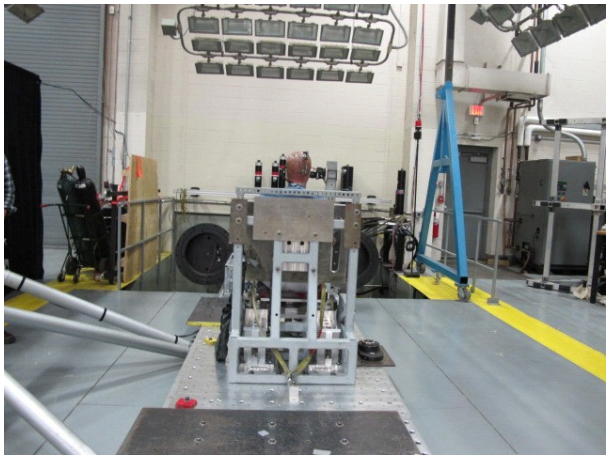

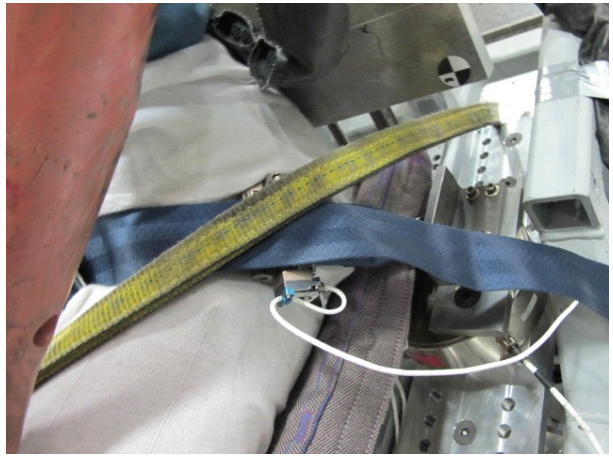

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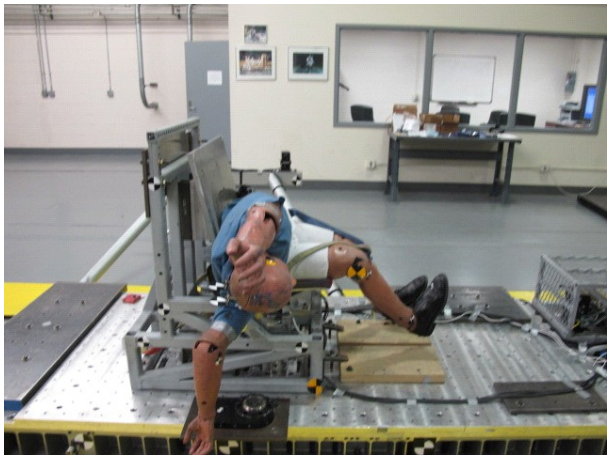
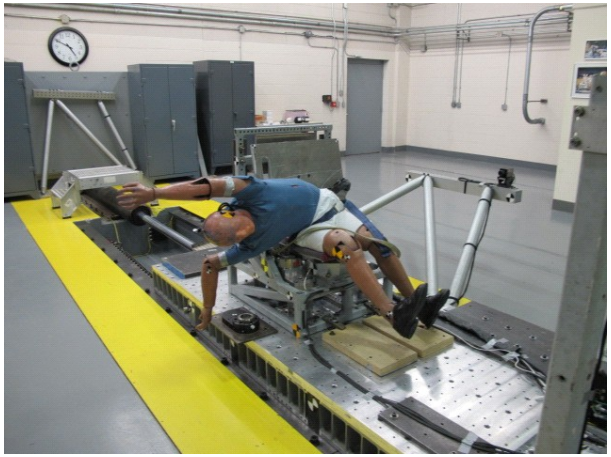
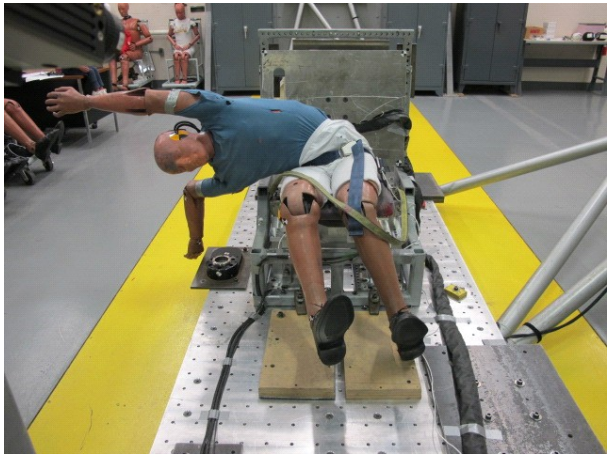
Post-test Photos







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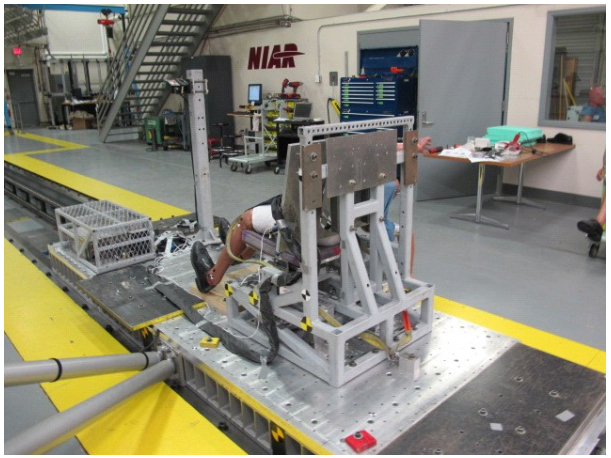

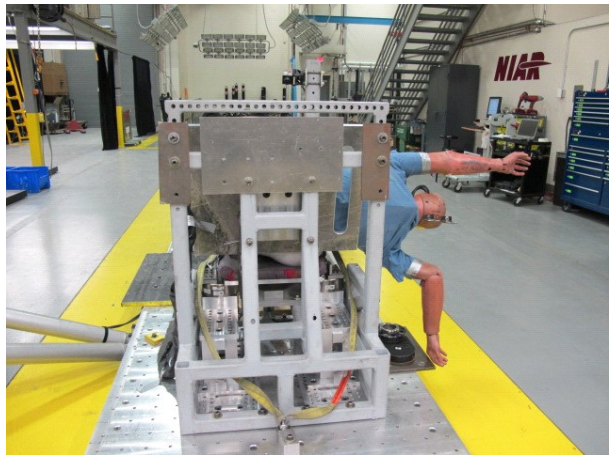

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Test Date/Time: 11/22/2013 16:48

Comments:

CRASH DYNAMICS LABORATORY

Report No. CDL-FA14B-10-01

Requested by:

FAA

Final Test Report
FA14B-10

03/26/2014

Revision	Change	Date	Revised By
New		03/26/2014	Rob Huculak

Prepared and Reviewed by:

Rob Huculak
Laboratory Manager

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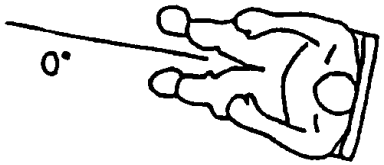
This test report is in accordance with ISO/IEC 17025:2005 requirements and all equipment standards used are traceable to the National Institute of Standards and Technology.
The information in this report relates only to the article under test and cannot be reproduced, except in full, without the written approval of the National Institute for Aviation Research.

Test Summary

The dynamic test (FA14B-10) was performed for FAA in accordance with 14 CFR 25.562 Test 2 on 03/26/2014.

Pulse Parameters	Required	Result	Pass/Fail
Minimum Peak Acceleration (g)	16	16.08	PASS
Minimum Velocity Change (ft/sec)	44	45.62	PASS
Maximum Rise Time (msec)	90	89.5	PASS
Minimum Velocity Change During Rise Time (ft/sec)	22	22.81	PASS
2g Offset	--	--	PASS

Test Orientation



ATD: H2 718 **Position: Config 3 - Repaired Belt**

0 deg

Measured Seat Belt Angle	Measured Seat Belt Offset
57.46 deg	-2.50 in

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Doc. No.: CDL-FA14B-10-01

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Report Date: 03/26/2014

Customer: FAA

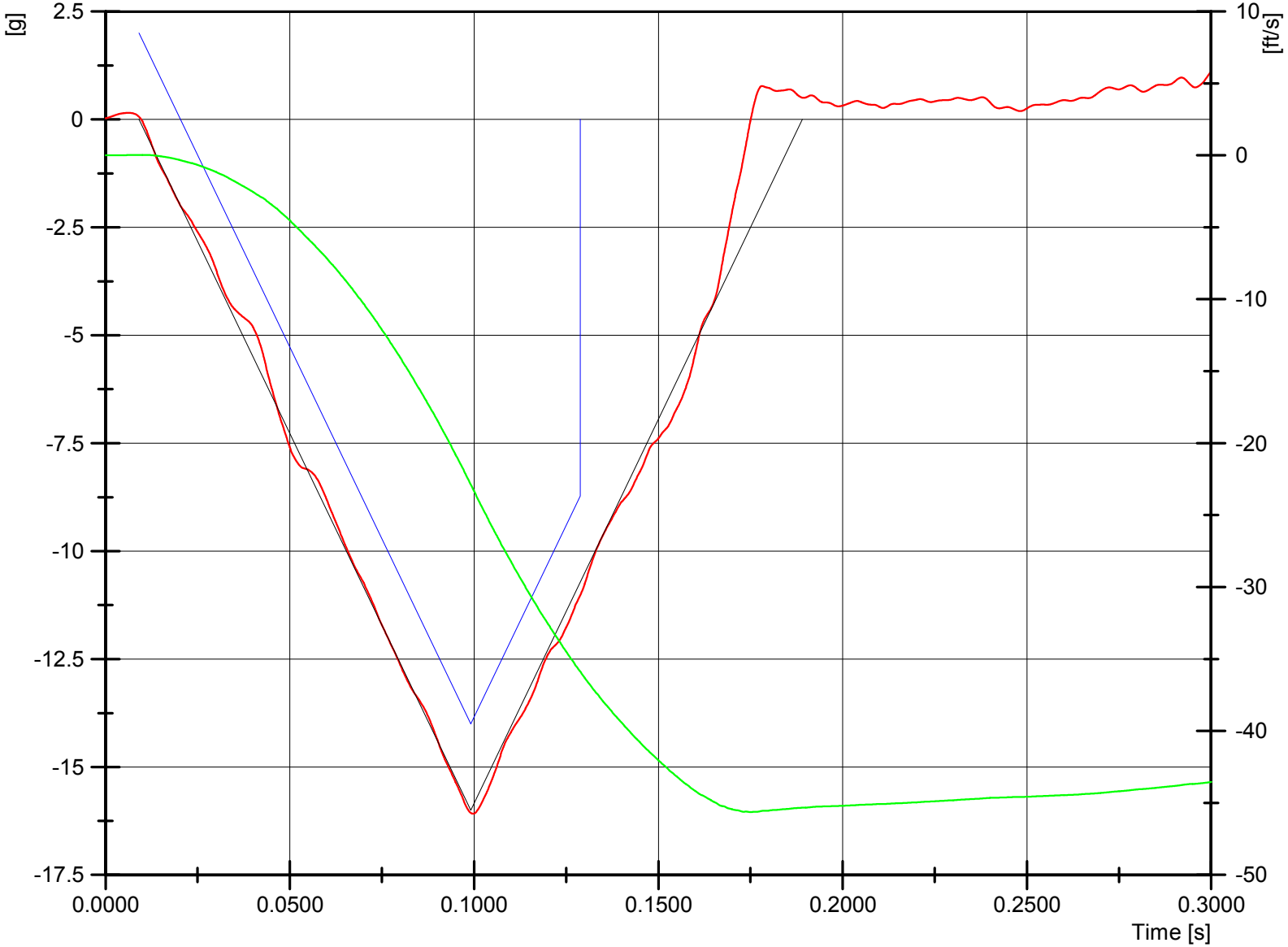
Test: FA14B-10

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 17:36

Temperature	Relative Humidity
72.2°F	29.3%



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Report Date: 03/26/2014

Customer: FAA

Test: FA14B-10

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 17:36

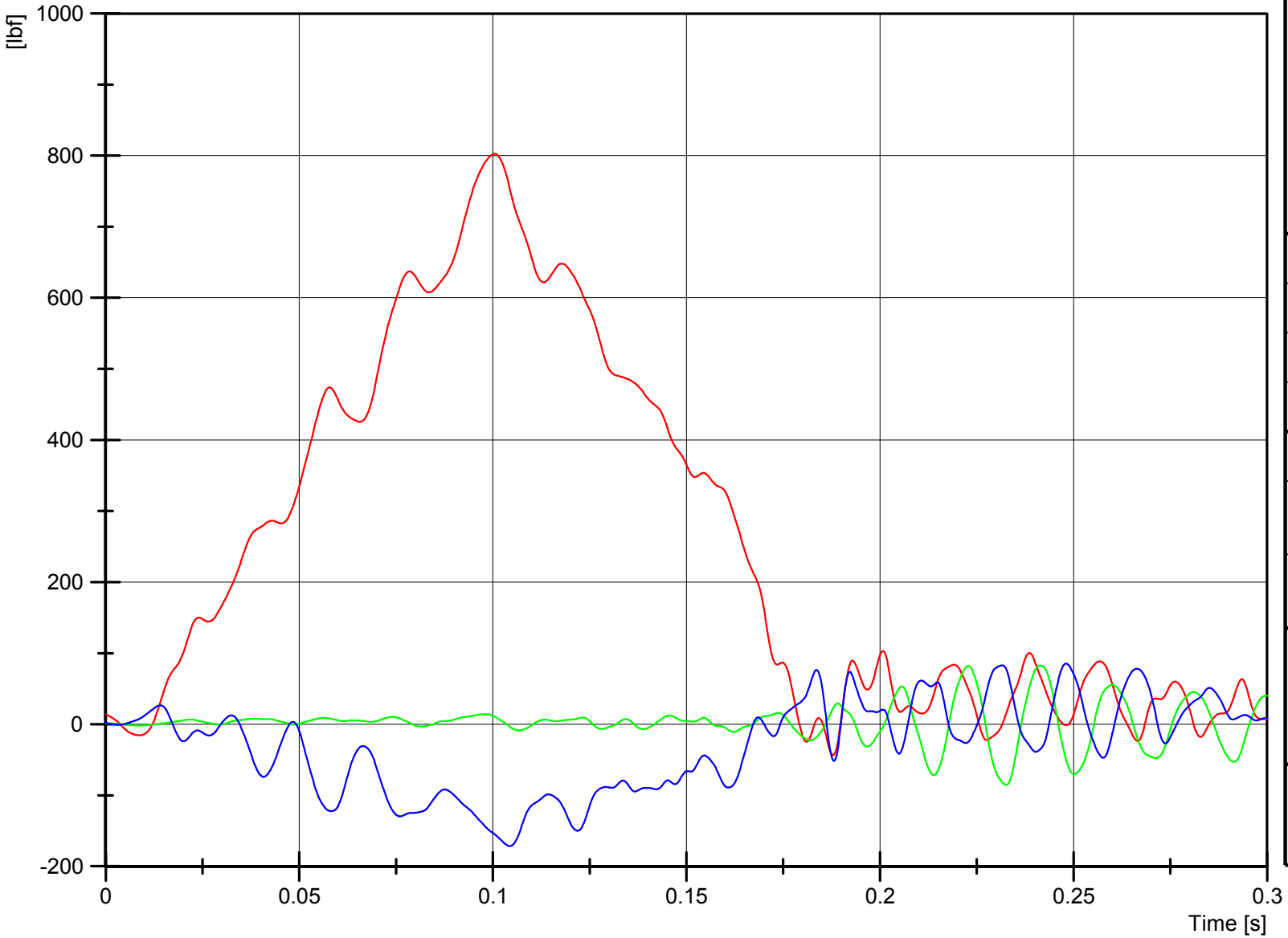
Comments:

Sled Acceleration | Sled Velocity | Ideal Pulse | Upper Limit

Maximum: 1.12 g Time: 0.3 sec.
Minimum: -16.08 g Time: 0.0997 sec.
CFC: 60
Sensor Type: ENDEVCO 7290A-100
S/N: 29924
Sensitivity: 0.01919 V/EU
Cal. Due: 06/11/2014
Full Scale: 100 g
DAS Channel: 50
Ref. No.: 1
Polarity: R

Minimum: -45.62 ft/s Time: 0.1749 sec.

Pulse Requirement		Actual
Minimum Required Peak Acceleration:	16 g	16.08 g
Minimum Overall Velocity Change:	44 ft/s	45.62 ft/s
Maximum Rise Time:	90 msec	89.5 msec
Minimum Velocity Change Before Greq:	22 ft/s	22.81 ft/s



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16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 17:36

Comments:

Rigid Seat Seat Back Fx

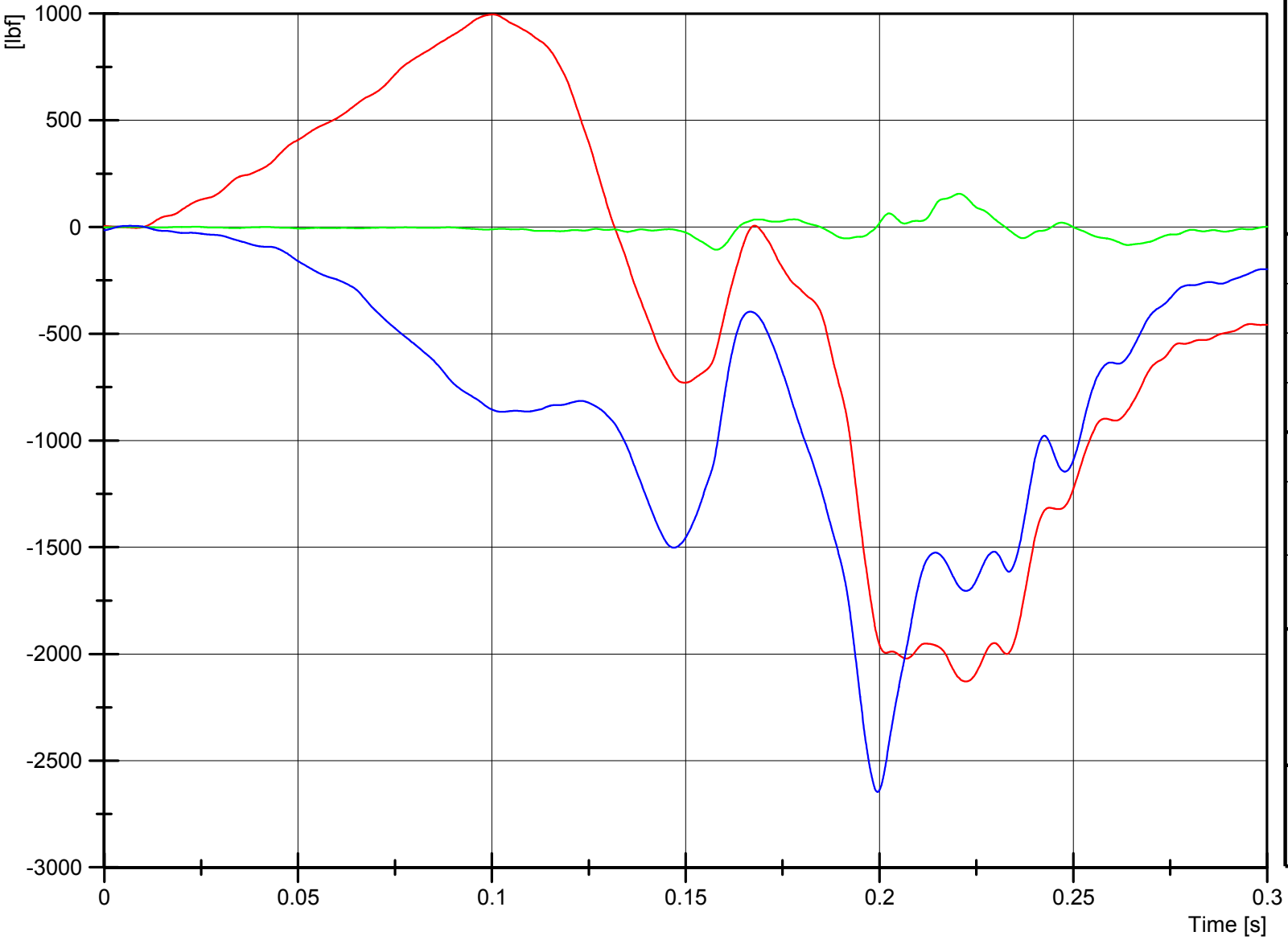
Maximum: 802.63 lbf Time: 0.1007 sec.
Minimum: -43.50 lbf Time: 0.1881 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC084FZ
Sensitivity: 1.176E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 12
Ref. No.: 15
Polarity: N

Rigid Seat Seat Back Fy

Maximum: 82.3962 lbf Time: 0.2416 sec.
Minimum: -85.34 lbf Time: 0.2328 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC084FY
Sensitivity: 2.733E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 11
Ref. No.: 14
Polarity: N

Rigid Seat Seat Back Fz

Maximum: 85.4502 lbf Time: 0.2482 sec.
Minimum: -171.71 lbf Time: 0.1046 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC084FX
Sensitivity: 2.74E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 10
Ref. No.: 13
Polarity: R



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14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
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Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 17:36

Comments:

Rigid Seat Seat Pan Fx

Maximum: 995.86 lbf Time: 0.1004 sec.
Minimum: -2.13E+03 lbf Time: 0.2225 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083FX
Sensitivity: 2.768E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 13
Ref. No.: 10
Polarity: N

Rigid Seat Seat Pan Fy

Maximum: 156.21 lbf Time: 0.2207 sec.
Minimum: -106.23 lbf Time: 0.1581 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083FY
Sensitivity: 2.764E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 14
Ref. No.: 11
Polarity: N

Rigid Seat Seat Pan Fz

Maximum: 5.6062 lbf Time: 0.0069 sec.
Minimum: -2.65E+03 lbf Time: 0.1997 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083FZ
Sensitivity: 1.181E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 15
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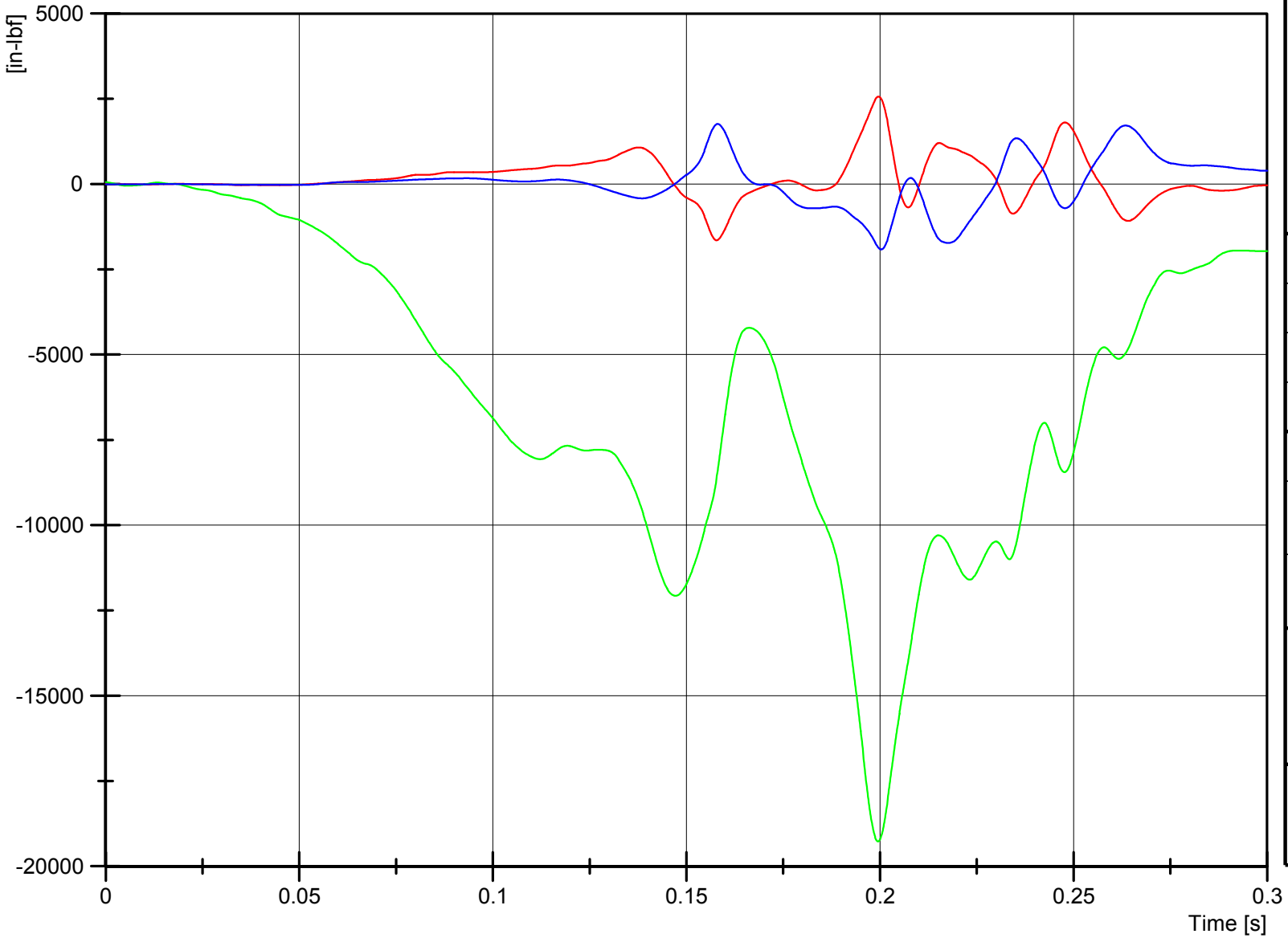
Polarity: N



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Version: New

Report Date: 03/26/2014

Customer: FAA

Test: FA14B-10

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 17:36

Comments:

Rigid Seat Seat Pan Mx

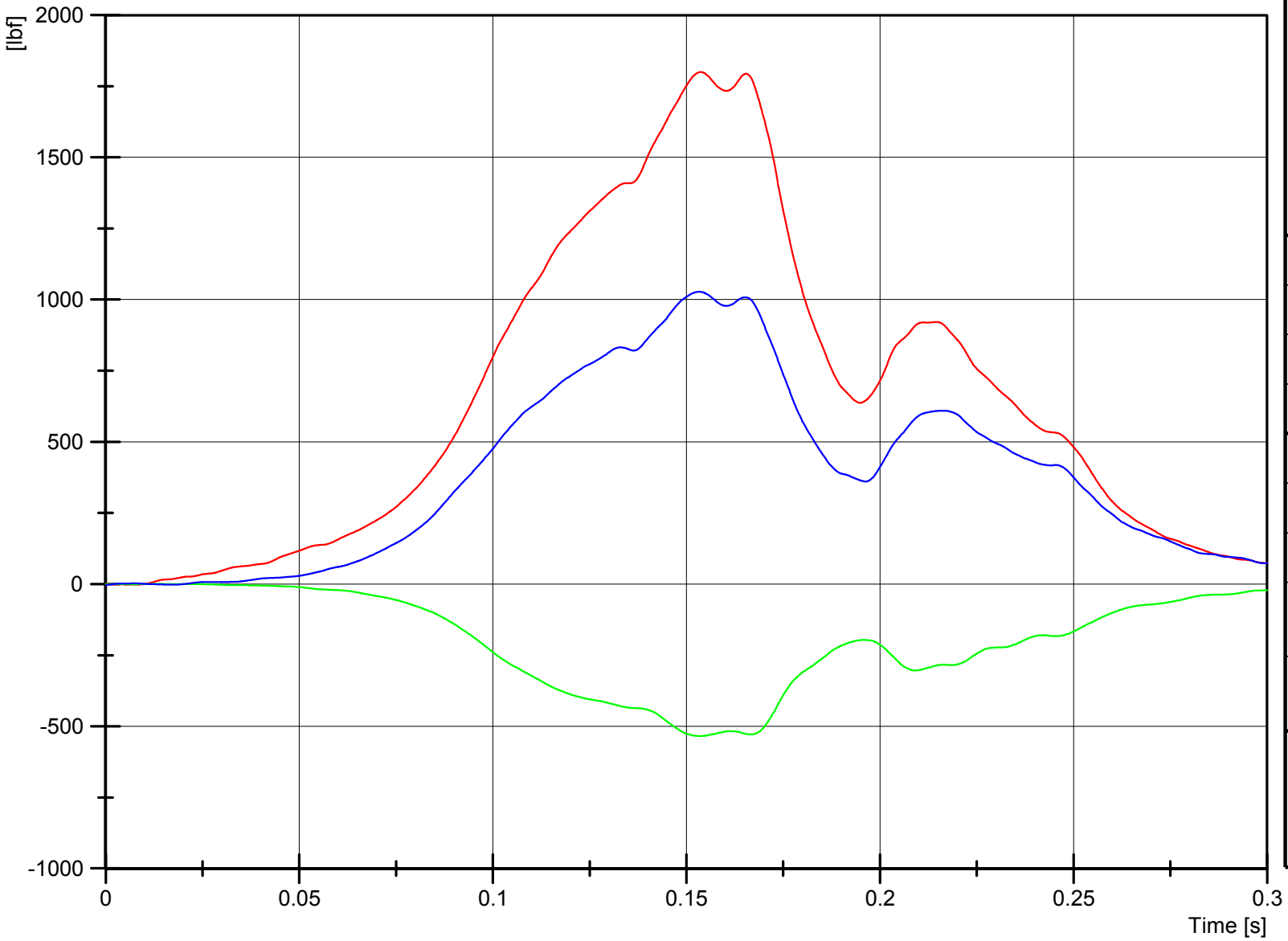
Maximum: 2563.82 in-lbf Time: 0.1998 sec.
Minimum: -1.65E+03 in-lbf Time: 0.158 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083MX
Sensitivity: 7.03E-08 V/EU
Cal. Due: 02/13/2014
Full Scale: 25000 in-lbf
DAS Channel: 16
Ref. No.: 7
Polarity: N

Rigid Seat Seat Pan My

Maximum: 59.5573 in-lbf Time: 0 sec.
Minimum: -1.93E+04 in-lbf Time: 0.1997 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083MY
Sensitivity: 7.05E-08 V/EU
Cal. Due: 02/13/2014
Full Scale: 25000 in-lbf
DAS Channel: 17
Ref. No.: 8
Polarity: N

Rigid Seat Seat Pan Mz

Maximum: 1764.09 in-lbf Time: 0.1583 sec.
Minimum: -1.92E+03 in-lbf Time: 0.2005 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083MZ
Sensitivity: 9.32E-08 V/EU
Cal. Due: 02/13/2014
Full Scale: 20000 in-lbf
DAS Channel: 18
Ref. No.: 9
Polarity: N



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Doc. No.: CDL-FA14B-10-01

Version: New

Report Date: 03/26/2014

Customer: FAA

Test: FA14B-10

Dummy: H2 718

Position: Config 3 - Repaired Belt

Test Description:
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16g-07b

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Test Date/Time: 11/22/2013 17:36

Rigid Seat Right Lap Fx

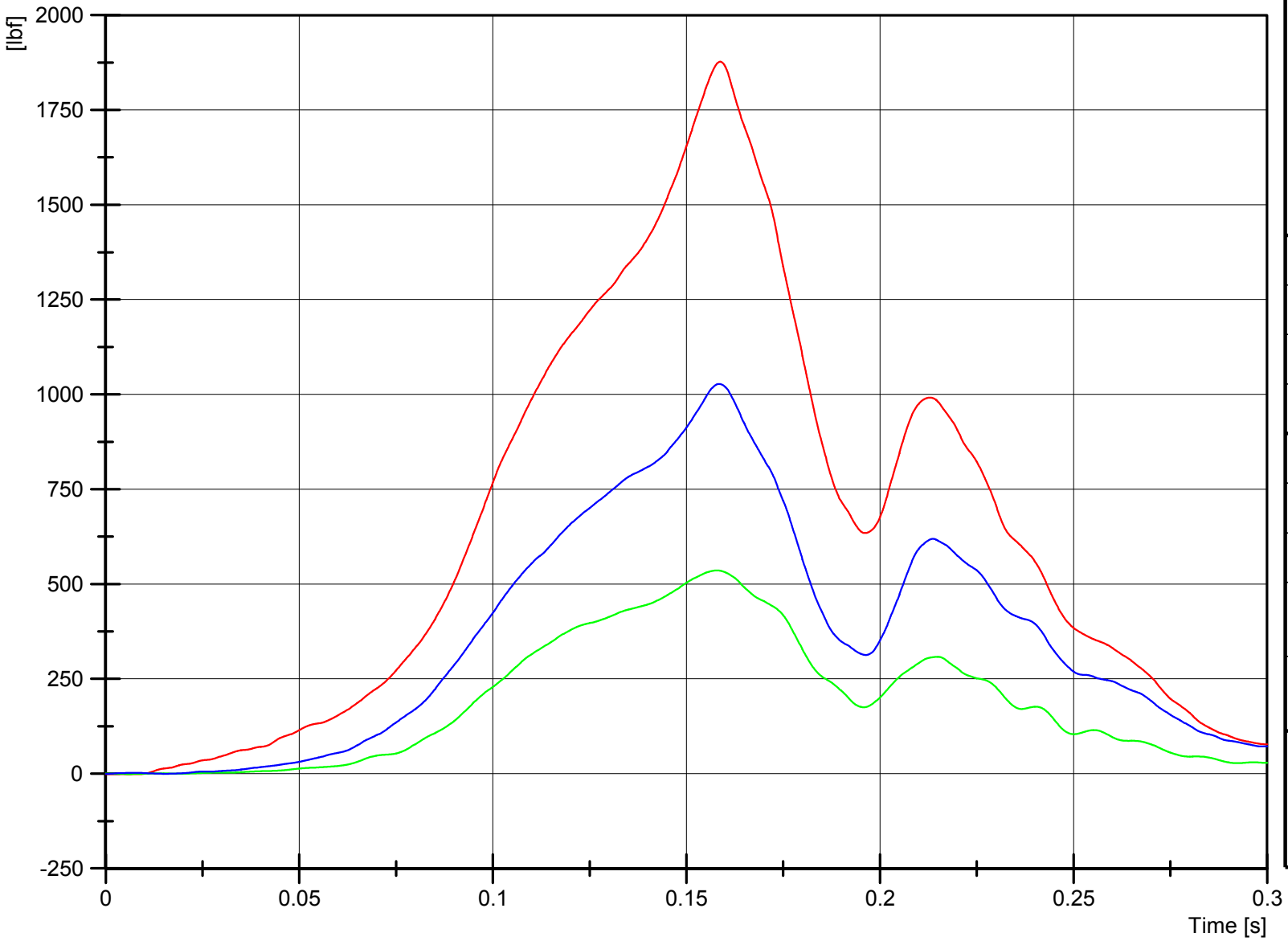
Maximum: 1800.16 lbf Time: 0.1539 sec.
Minimum: -2.0224 lbf Time: 0.008 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC093FX
Sensitivity: 2.587E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 22
Ref. No.: 74
Polarity: N

Rigid Seat Right Lap Fy

Maximum: 0.4286 lbf Time: 0.0132 sec.
Minimum: -534.53 lbf Time: 0.1538 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC093FY
Sensitivity: 2.572E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 23
Ref. No.: 75
Polarity: N

Rigid Seat Right Lap Fz

Maximum: 1027.43 lbf Time: 0.1535 sec.
Minimum: -3.2785 lbf Time: 0 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC093FZ
Sensitivity: 1.044E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 24
Ref. No.: 76
Polarity: N



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Doc. No.: CDL-FA14B-10-01

Version: New

Report Date: 03/26/2014

Customer: FAA

Test: FA14B-10

Dummy: H2 718

Position: Config 3 - Repaired Belt

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 17:36

Rigid Seat Left Lap Fx

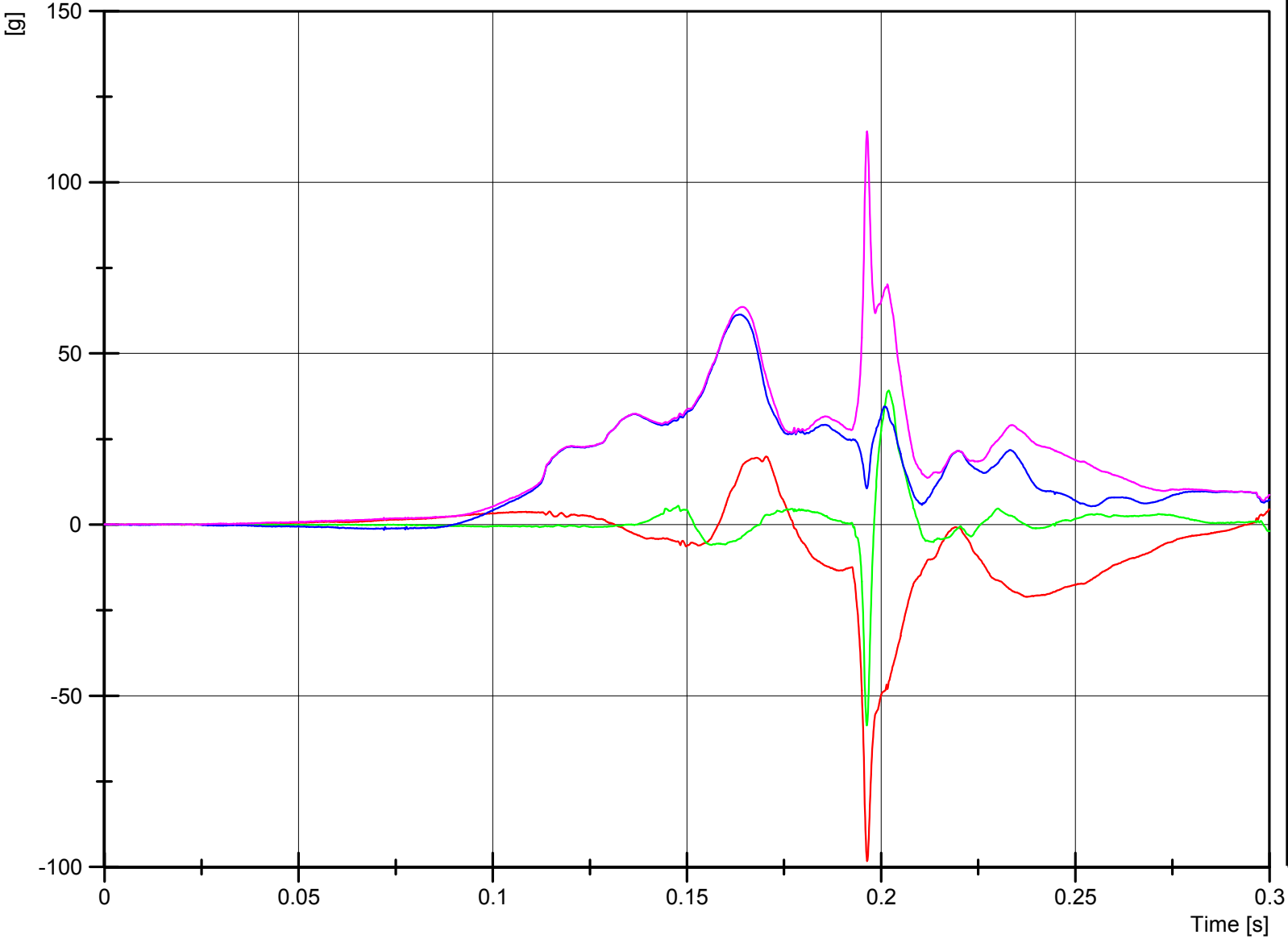
Maximum: 1877.43 lbf Time: 0.1589 sec.
Minimum: -1.5145 lbf Time: 0.0062 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC094FX
Sensitivity: 2.587E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 19
Ref. No.: 77
Polarity: N

Rigid Seat Left Lap Fy

Maximum: 535.86 lbf Time: 0.1581 sec.
Minimum: -0.8753 lbf Time: 0.0063 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC094FY
Sensitivity: 2.572E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 20
Ref. No.: 78
Polarity: N

Rigid Seat Left Lap Fz

Maximum: 1027.67 lbf Time: 0.1586 sec.
Minimum: -0.7636 lbf Time: 0 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC094FZ
Sensitivity: 1.044E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 21
Ref. No.: 79
Polarity: N



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Position: Config 3 - Repaired Belt

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16g-07b

Rate: 10000
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Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/22/2013 17:36

Head Ax H2 718

Maximum: 19.923 g Time: 0.1705 sec.
Minimum: -98.27 g Time: 0.1966 sec.
CFC: 1000
Sensor Type: Endevco 7264C
S/N: P47932
Sensitivity: 2.157E-05 V/EU
Cal. Due: 09/25/2014
Full Scale: 2000 g
DAS Channel: 25
Ref. No.: 22
Polarity: R

Head Ay H2 718

Maximum: 39.2226 g Time: 0.2021 sec.
Minimum: -58.648 g Time: 0.1965 sec.
CFC: 1000
Sensor Type: Endevco 7264C
S/N: P48149
Sensitivity: 2.603E-05 V/EU
Cal. Due: 09/25/2014
Full Scale: 2000 g
DAS Channel: 26
Ref. No.: 23
Polarity: R

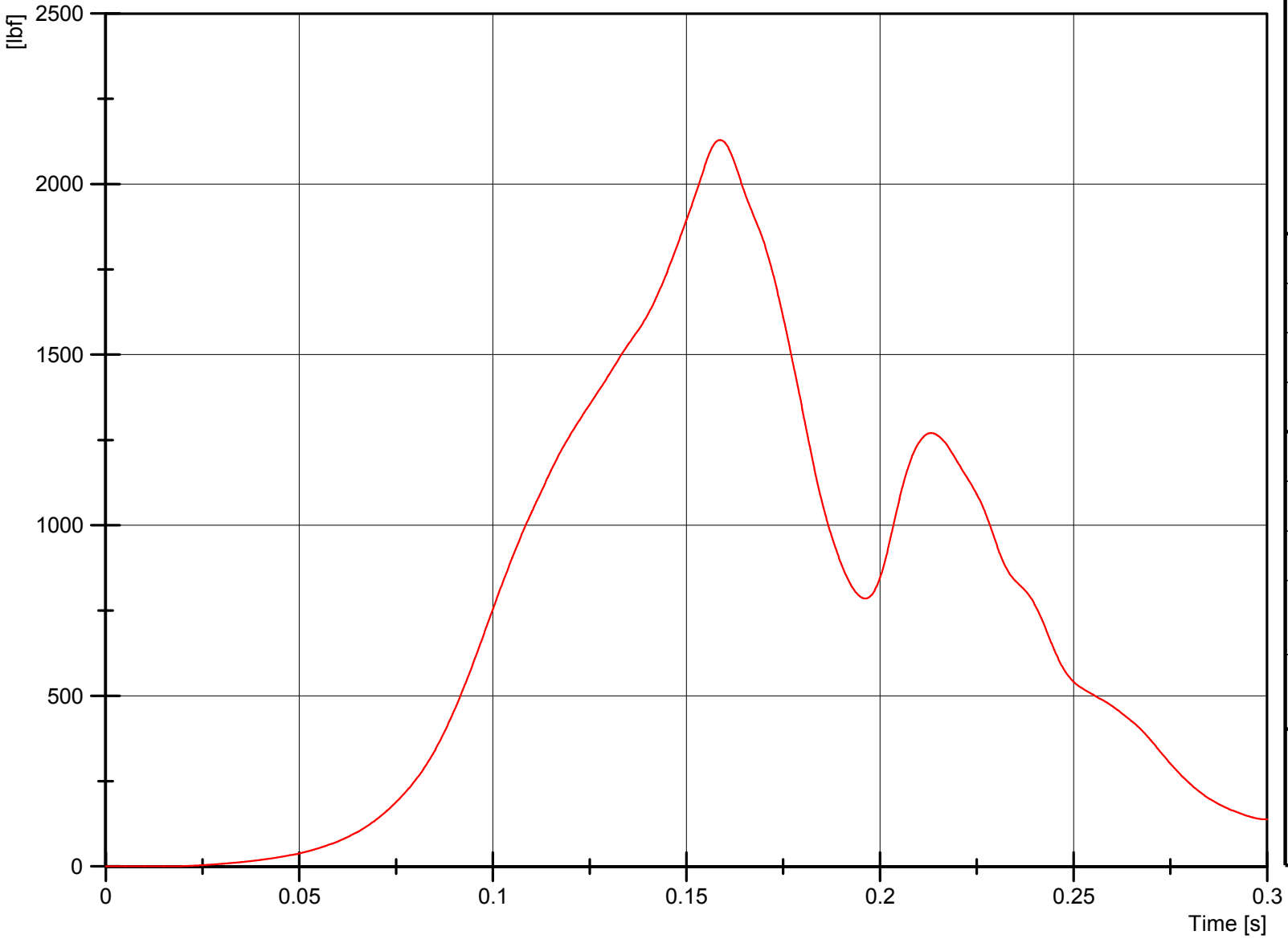
Head Az H2 718

Maximum: 61.3809 g Time: 0.1636 sec.
Minimum: -1.5083 g Time: 0.0722 sec.
CFC: 1000
Sensor Type: Endevco 7264C
S/N: P60367
Sensitivity: 1.782E-05 V/EU
Cal. Due: 09/25/2014
Full Scale: 2000 g
DAS Channel: 27
Ref. No.: 24
Polarity: R

Head Resultant H2 718

Maximum: 114.91 g Time: 0.1964 sec.

HIC: 843.9
T1: 128.8 msec.
T2: 207.5 msec.



Lap Belt Force H2 718

Maximum: 2129.62 lbf Time: 0.1589 sec.
Minimum: 0.0896 lbf Time: 0.0125 sec.
CFC: 60
Sensor Type: Denton 3255
S/N: SBLC086
Sensitivity: 6.6006E-07 V/EU
Cal. Due: 05/16/2014
Full Scale: 3000 lbf
DAS Channel: 36
Ref. No.: 17
Polarity: N

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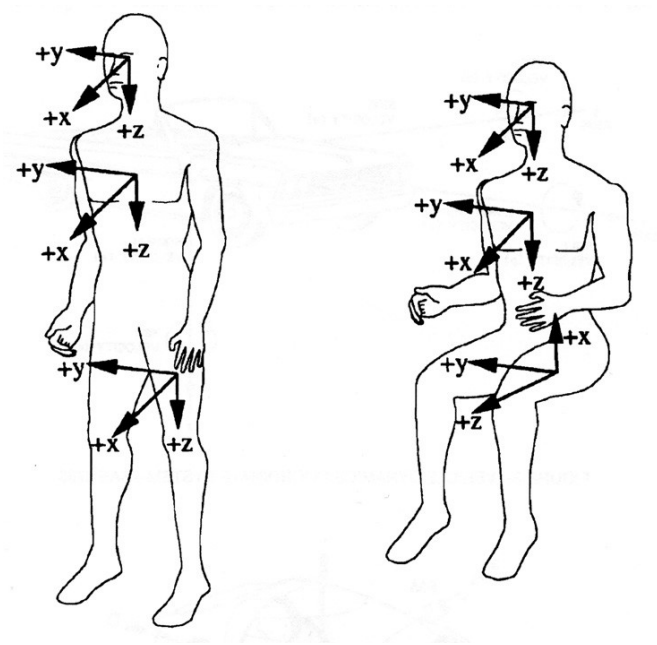
J211/1 Sign Conventions



Upper Neck Load Cell:
+FX Head rearward, chest forward
+FY Head leftward, chest rightward
+FZ Head upward, chest downward
+MX Left ear toward left shoulder
+MY Chin toward sternum
+MZ Chin toward left shoulder

Lumbar Load Cell:
+FX Chest rearward, pelvis forward
+FY Chest leftward, pelvis rightward
+FZ Chest upward, pelvis downward
+MX Left shoulder toward left hip
+MY Sternum toward front of legs
+MZ Right shoulder forward, left shoulder rearward

Femur Load Cells:
+FZ Tension

Chest Displacement:
-DX Compression

Rib Dispacement:
-DY Compression

Belt Load Cells:
+FX Tension

Floor Load Cells:
+FX Test article forward
+FY Test article right
+FZ Test article up

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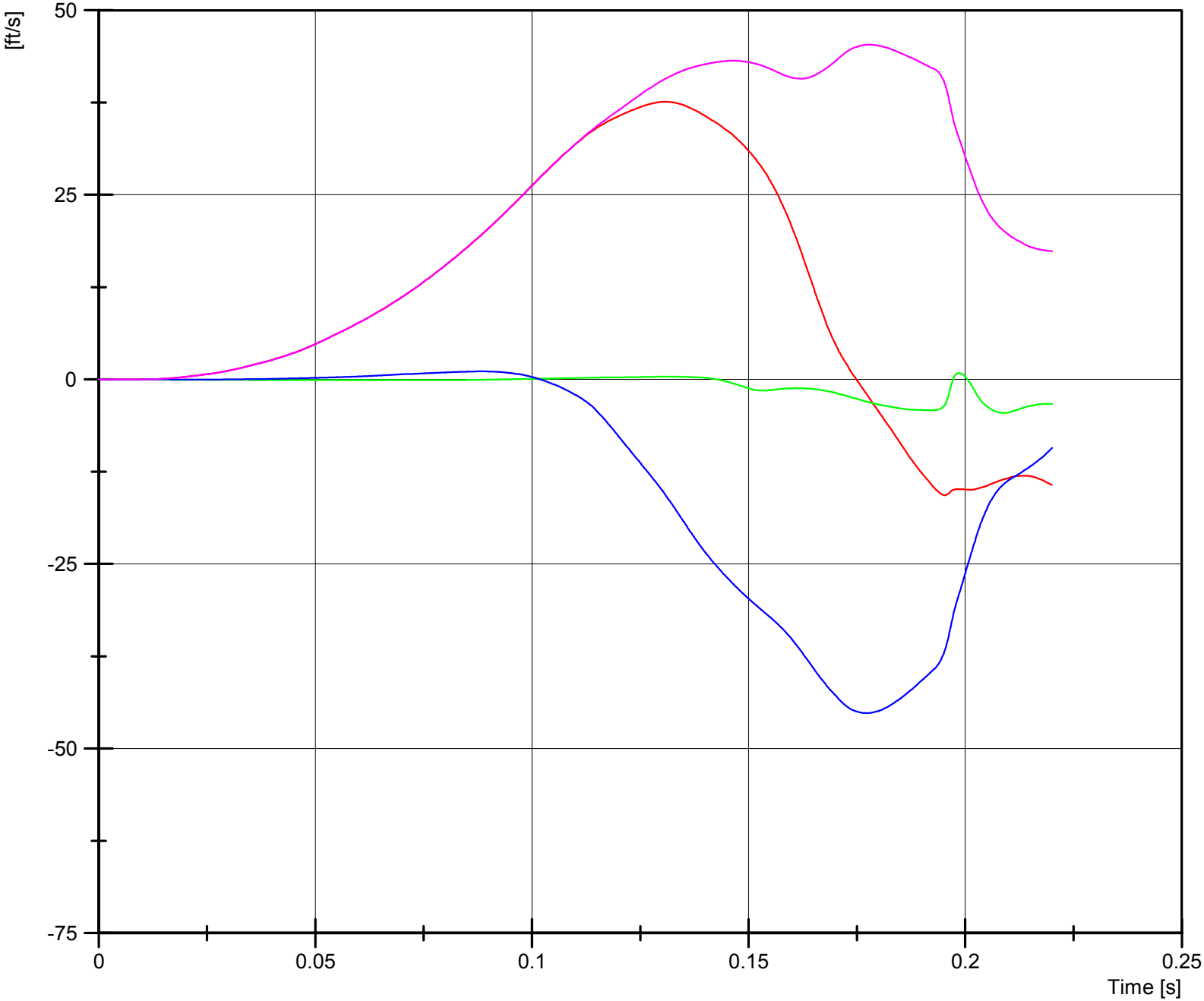

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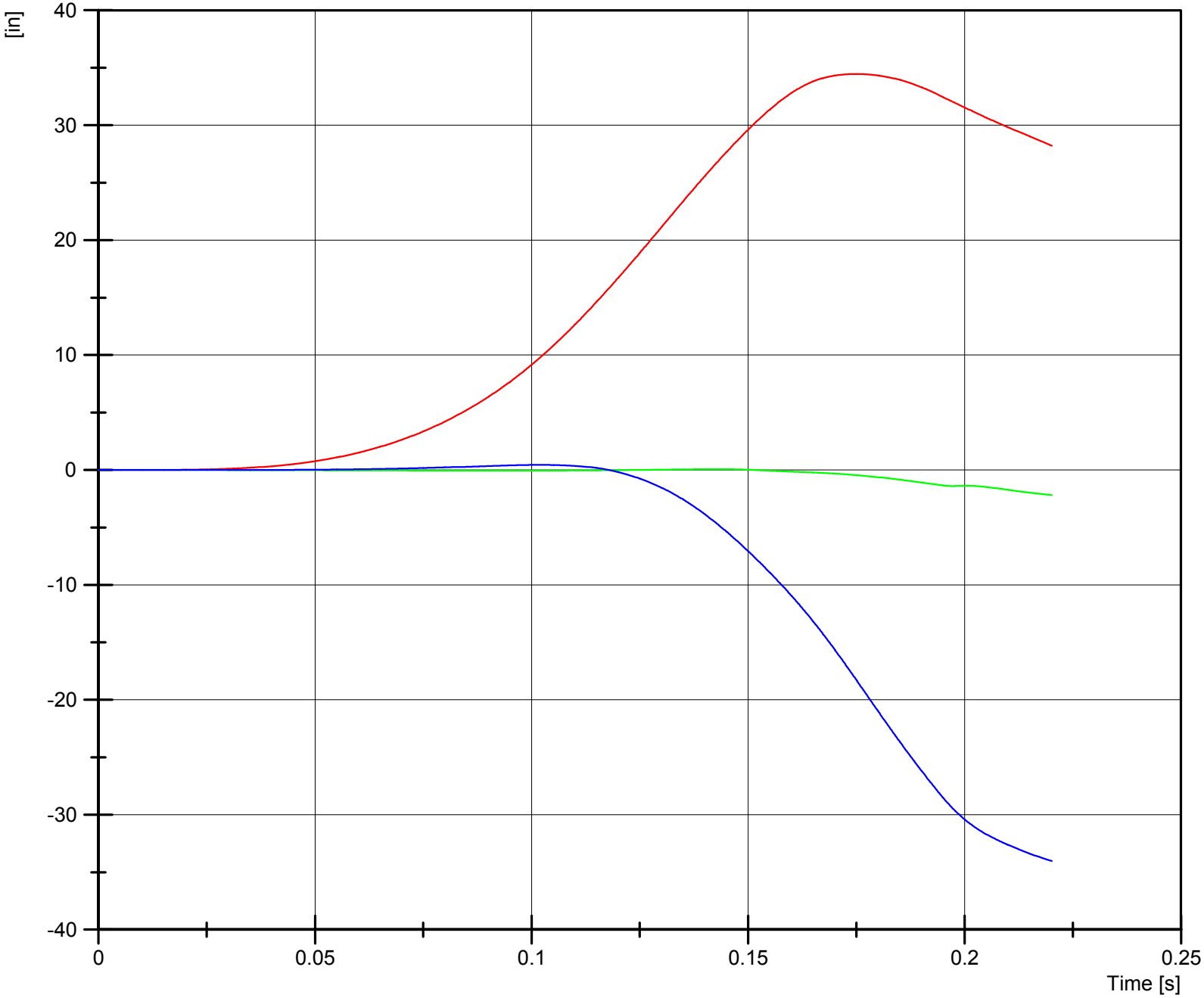
Comments:

Global Head Vx H2 718		Global Head Vy H2 718		Global Head Vz H2 718		Global Head Velocity Resultant H2 718	
Maximum: 37.60 ft/s	Time: 0.1305 sec.	Maximum: 0.873 ft/s	Time: 0.1986 sec.	Maximum: 1.10 ft/s	Time: 0.0885 sec.	Maximum: 45.35 ft/s	Time: 0.1777 sec.
Minimum: -15.68 ft/s	Time: 0.1953 sec.	Minimum: -4.53 ft/s	Time: 0.2089 sec.	Minimum: -45.21 ft/s	Time: 0.1773 sec.	Minimum: 0 ft/s	Time: 0.0001 sec.



Global Head Dx H2 718 | Global Head Dy H2 718 | Global Head Dz H2 718

Global Head Dx H2 718		Global Head Dy H2 718		Global Head Dz H2 718	
Maximum: 34.46 in	Time: 0.175 sec.	Maximum: 0.06 in	Time: 0.1428 sec.	Maximum: 0.45 in	Time: 0.102 sec.
Minimum: -0.00 in	Time: 0.0115 sec.	Minimum: -2.18 in	Time: 0.2201 sec.	Minimum: -34.02 in	Time: 0.2201 sec.

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Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
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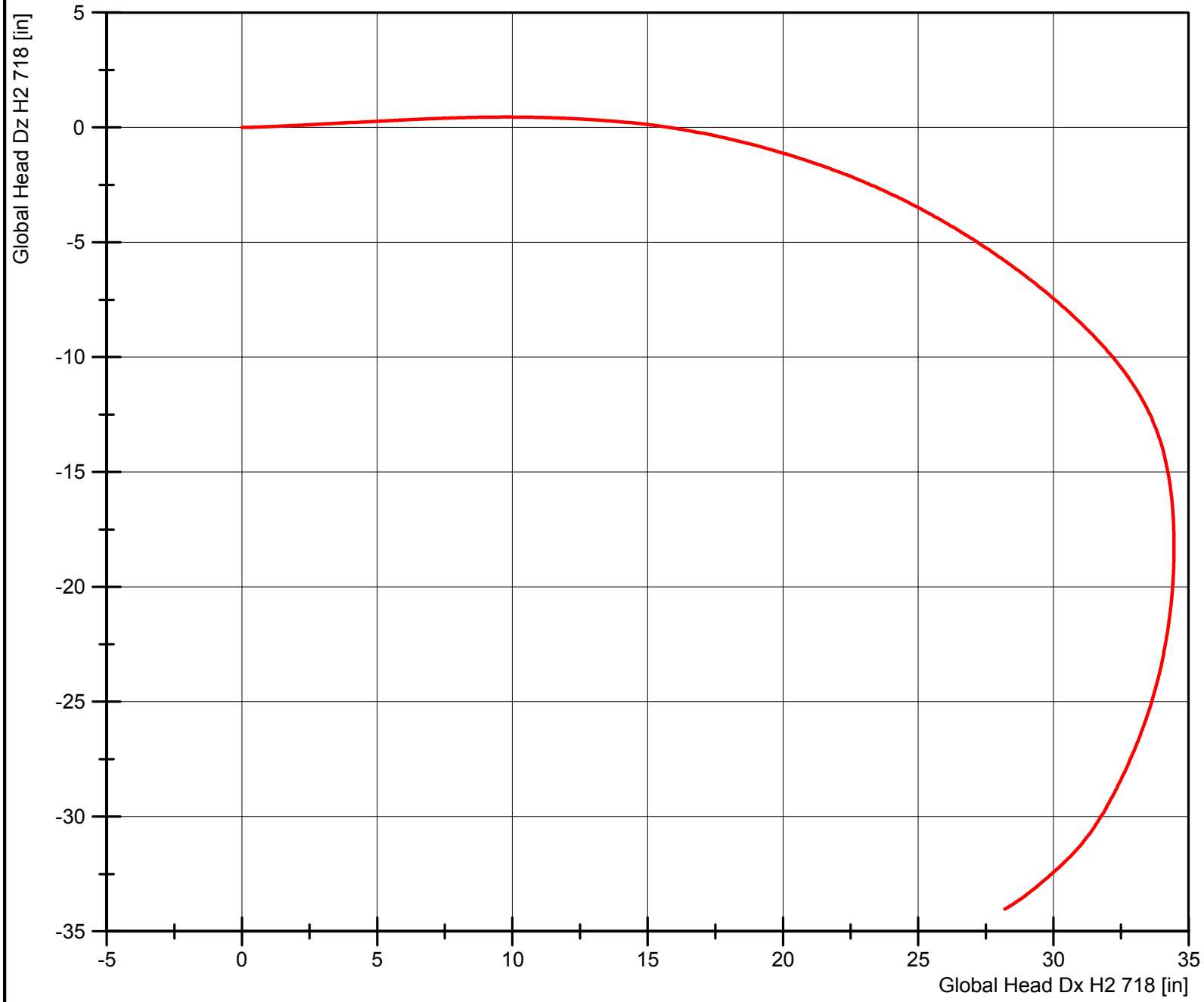
Test Date/Time: 11/22/2013 17:36

Comments:

Displacement values are calculated from Head Accelerations and Angular Velocities.
This method cannot be used to substitute photometric analysis.



Global Head Displacement XZ

X Maximum: 34.46 in **Time: 0.175 sec.**

Z Value at X Maximum: -18.26 in

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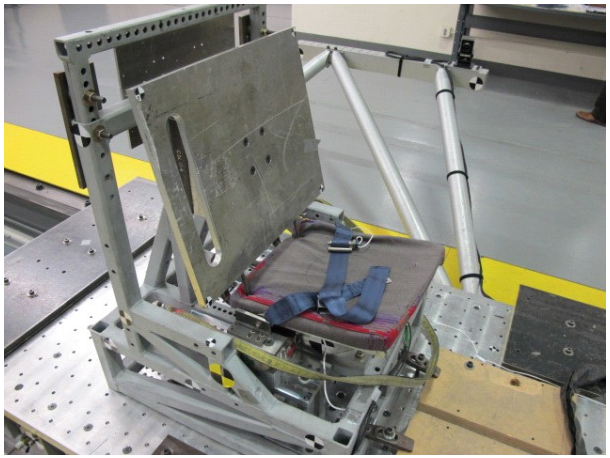
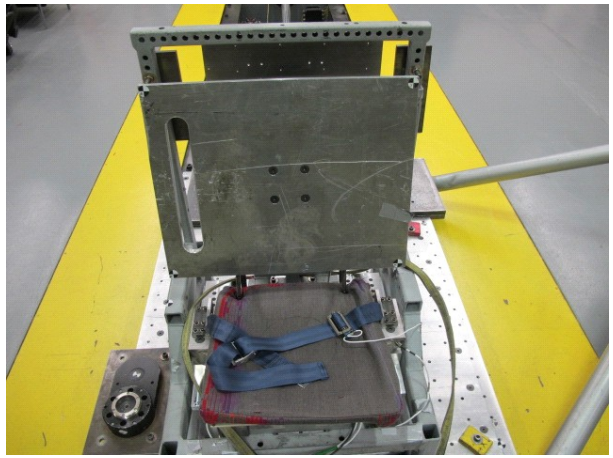
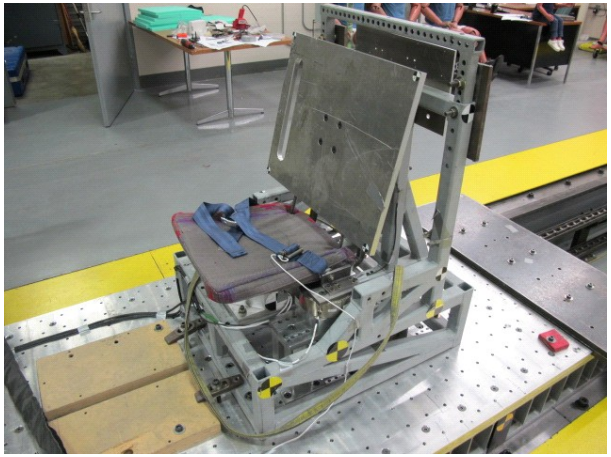
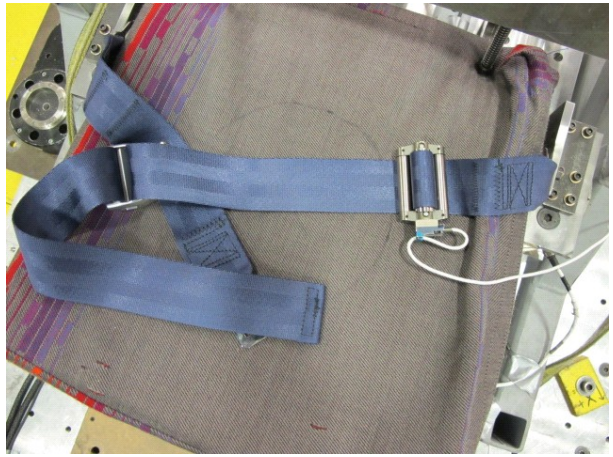
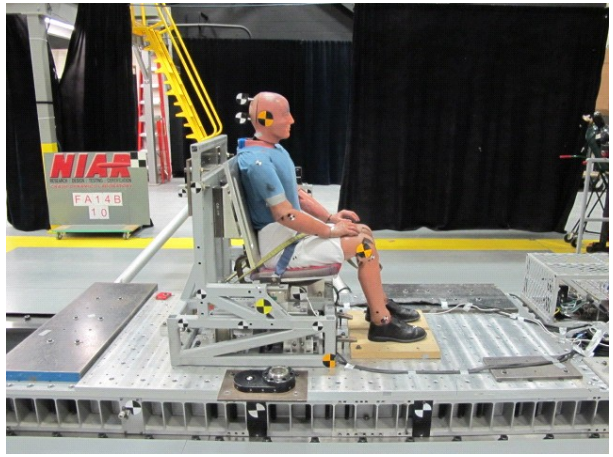
Pre-test Photos











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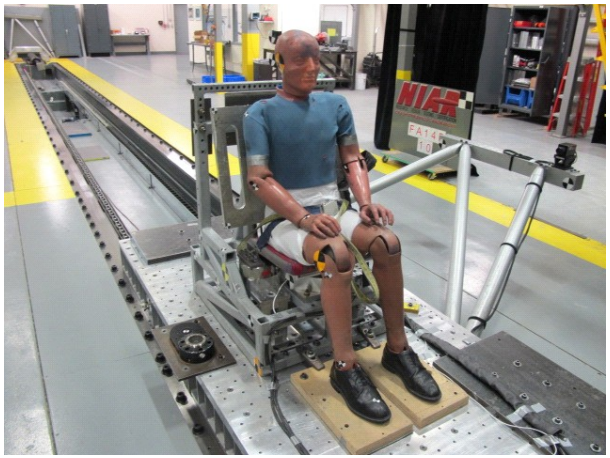

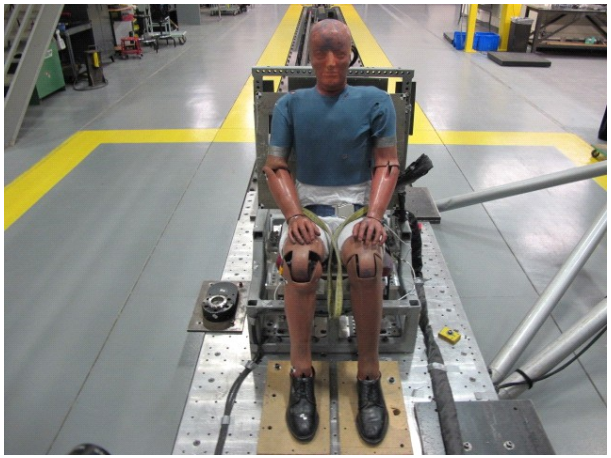

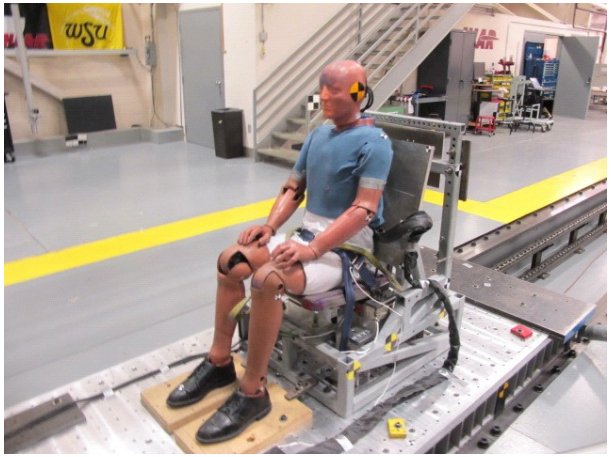

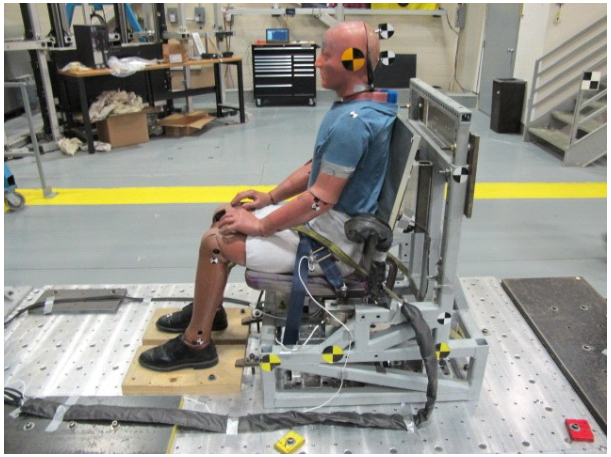

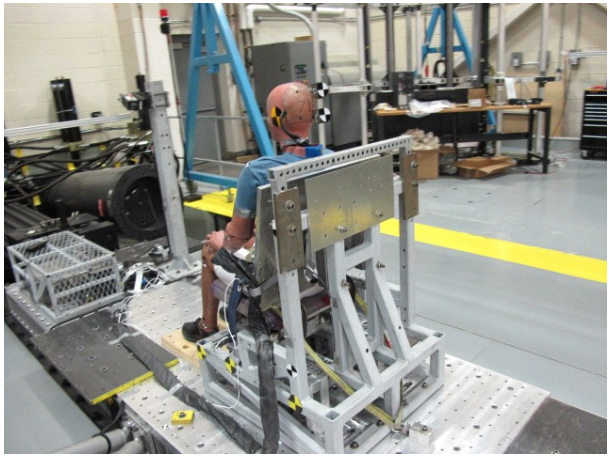

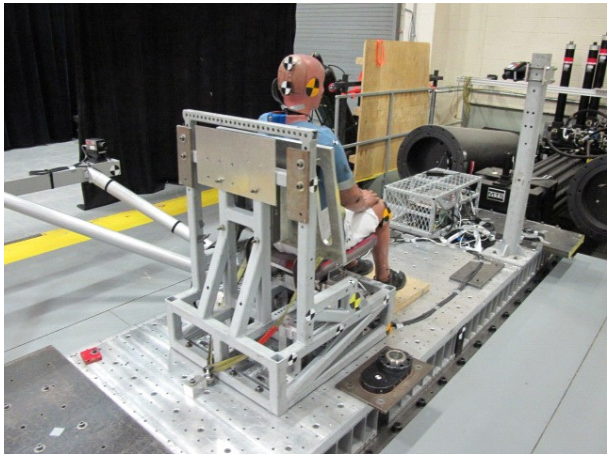

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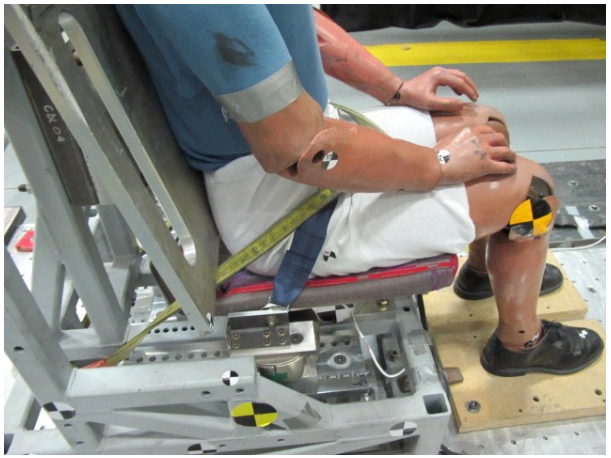

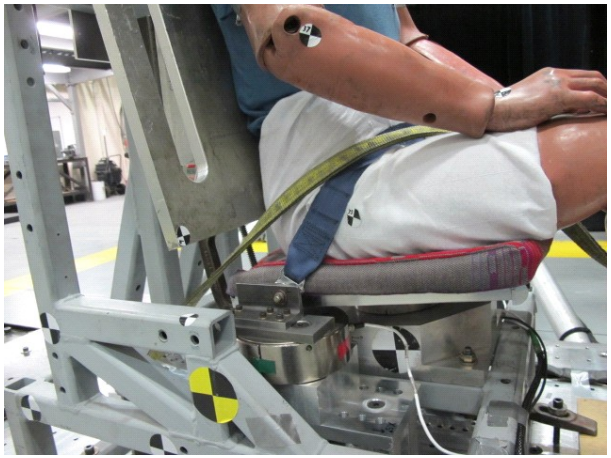

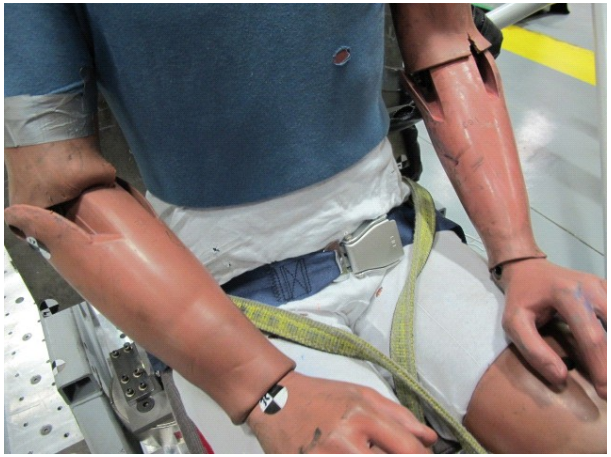

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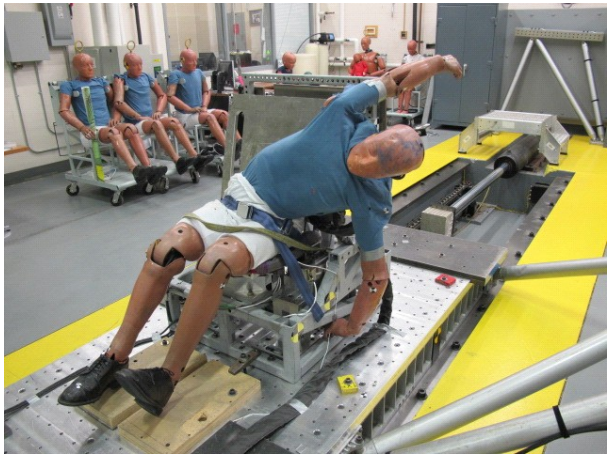

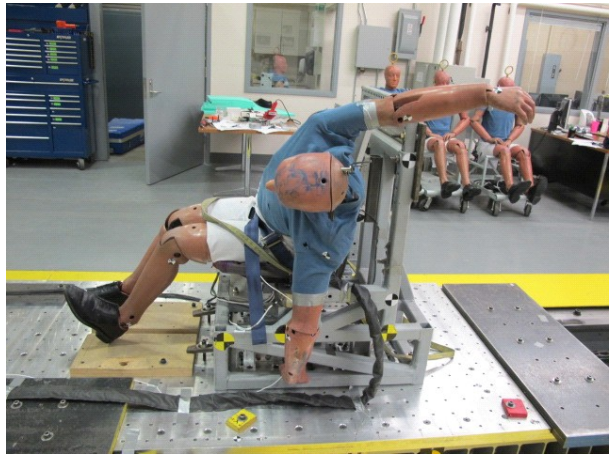

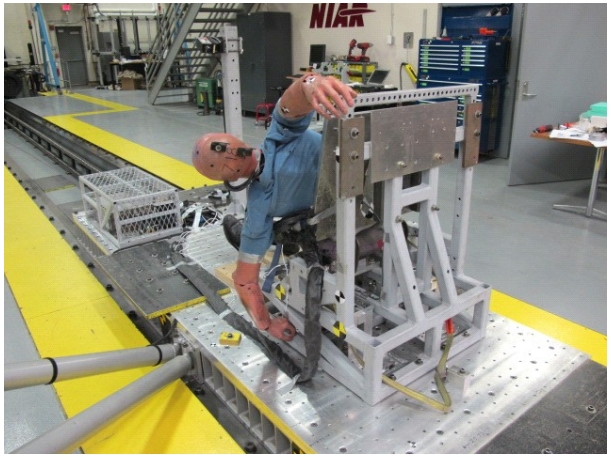

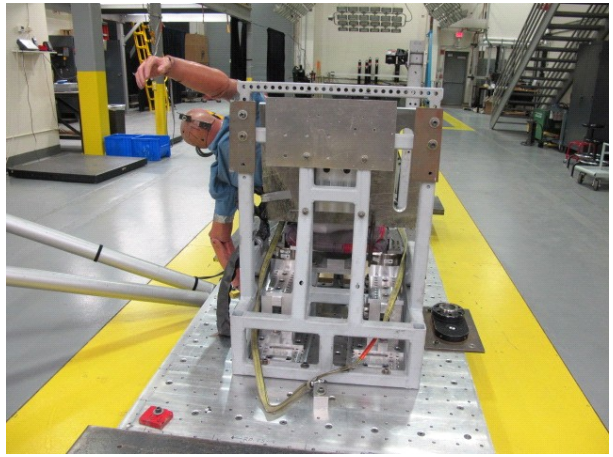

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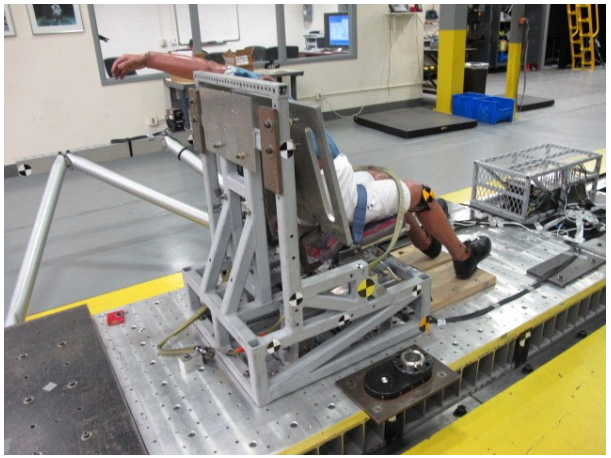

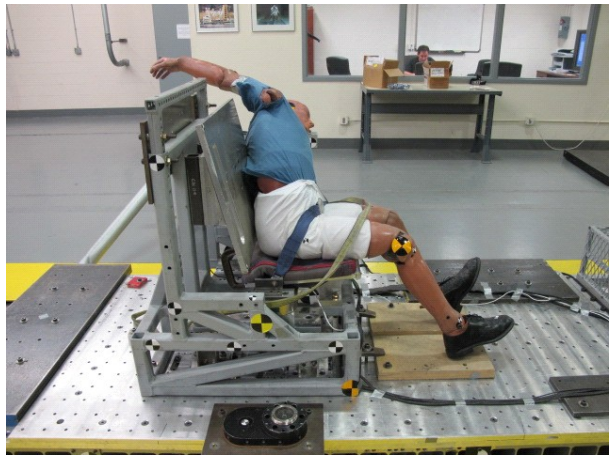

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CRASH DYNAMICS LABORATORY

Report No. CDL-FA14B-11-01

Requested by:

FAA

Final Test Report
FA14B-11

03/26/2014

Revision	Change	Date	Revised By
New		03/26/2014	Rob Huculak

Prepared and Reviewed by:

Rob Huculak
Laboratory Manager

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This test report is in accordance with ISO/IEC 17025:2005 requirements and all equipment standards used are traceable to the National Institute of Standards and Technology.
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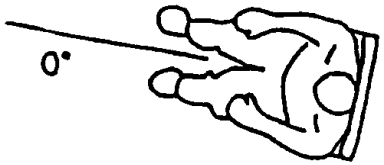
Test Summary

The dynamic test (FA14B-11) was performed for FAA in accordance with 14 CFR 25.562 Test 2 on 03/26/2014.

Pulse Parameters	Required	Result	Pass/Fail
Minimum Peak Acceleration (g)	16	16.2	PASS
Minimum Velocity Change (ft/sec)	44	45.28	PASS
Maximum Rise Time (msec)	90	87.6	PASS
Minimum Velocity Change During Rise Time (ft/sec)	22	23.48	PASS
2g Offset	--	--	PASS

Test Orientation



ATD: H2 718 **Position: Config 1 - New Belt**

0 deg

Measured Seat Belt Angle	Measured Seat Belt Offset
57.44 deg	1.75 in

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Doc. No.: CDL-FA14B-11-01

Version: New

Report Date: 03/26/2014

Customer: FAA

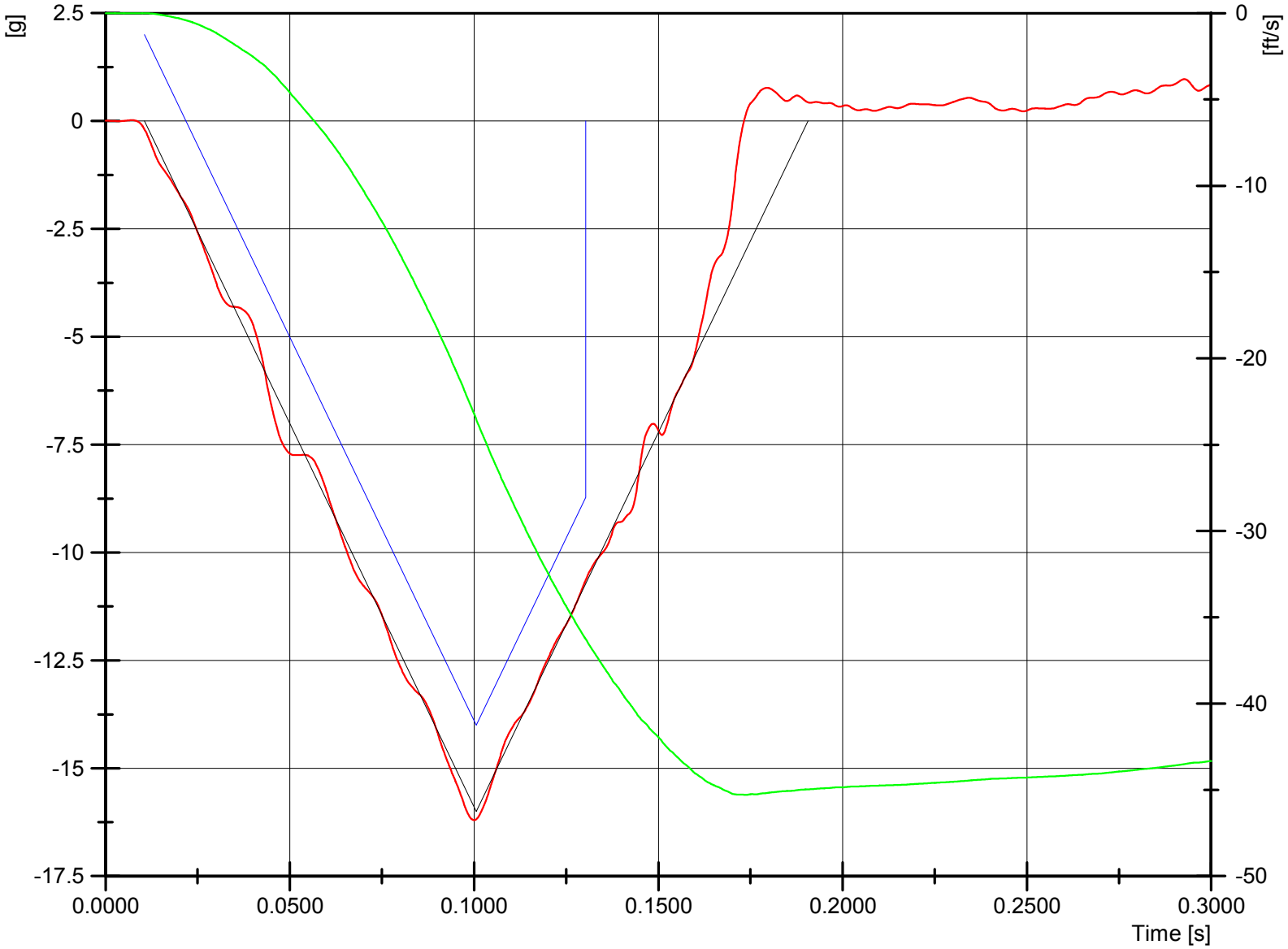
Test: FA14B-11

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/25/2013 10:07

Temperature	Relative Humidity
73.3°F	30.5%



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Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/25/2013 10:07

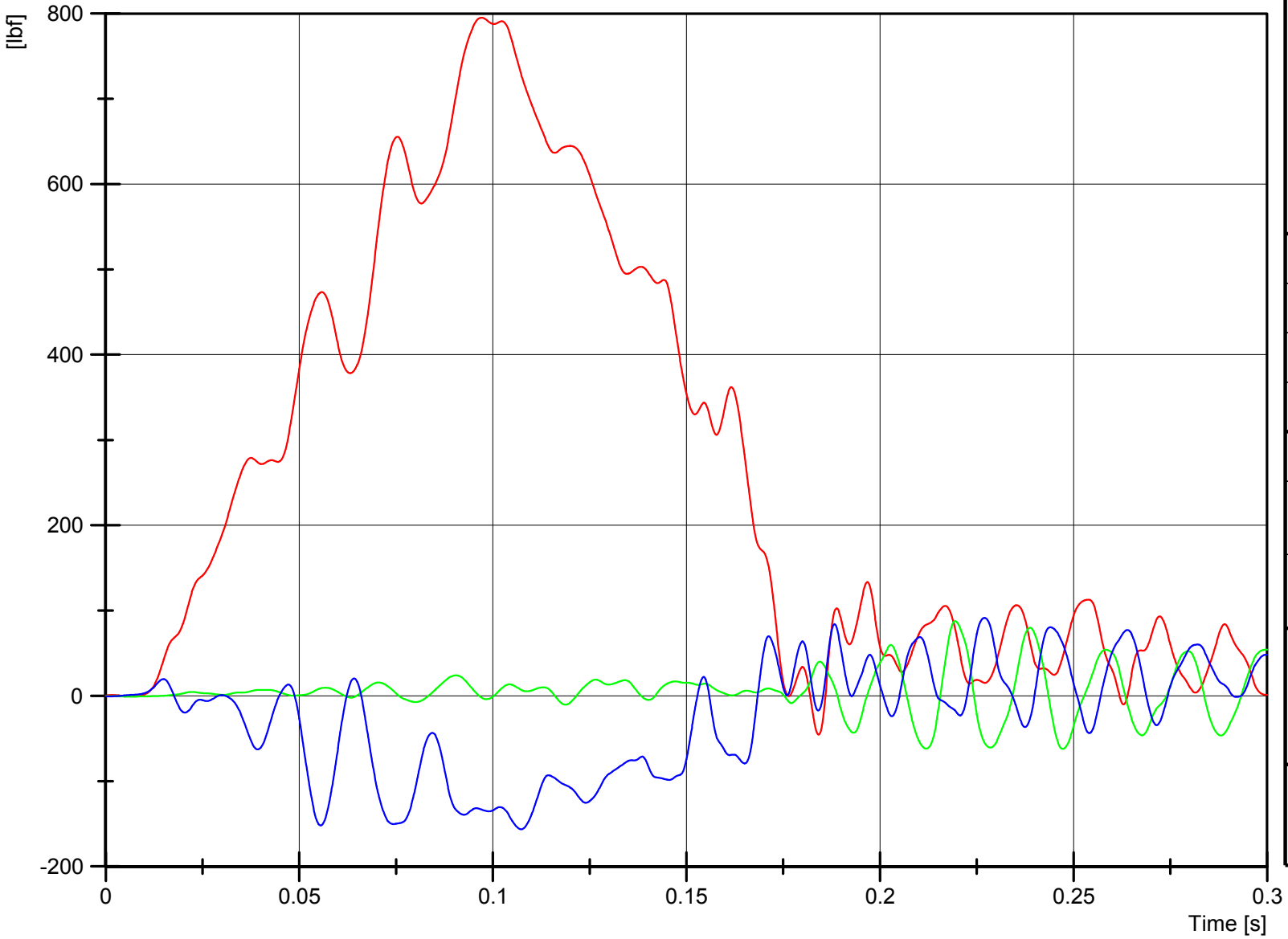
Comments:

Sled Acceleration | Sled Velocity | Ideal Pulse | Upper Limit

Maximum: 0.969 g Time: 0.2927 sec.
Minimum: -16.20 g Time: 0.1 sec.
CFC: 60
Sensor Type: ENDEVCO 7290A-100
S/N: 29924
Sensitivity: 0.01919 V/EU
Cal. Due: 06/11/2014
Full Scale: 100 g
DAS Channel: 50
Ref. No.: 1
Polarity: R

Minimum: -45.28 ft/s Time: 0.1738 sec.

Pulse Requirement		Actual
Minimum Required Peak Acceleration:	16 g	16.2 g
Minimum Overall Velocity Change:	44 ft/s	45.28 ft/s
Maximum Rise Time:	90 msec	87.6 msec
Minimum Velocity Change Before Greq:	22 ft/s	23.48 ft/s



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Customer: FAA

Test: FA14B-11

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/25/2013 10:07

Comments:

Rigid Seat Seat Back Fx

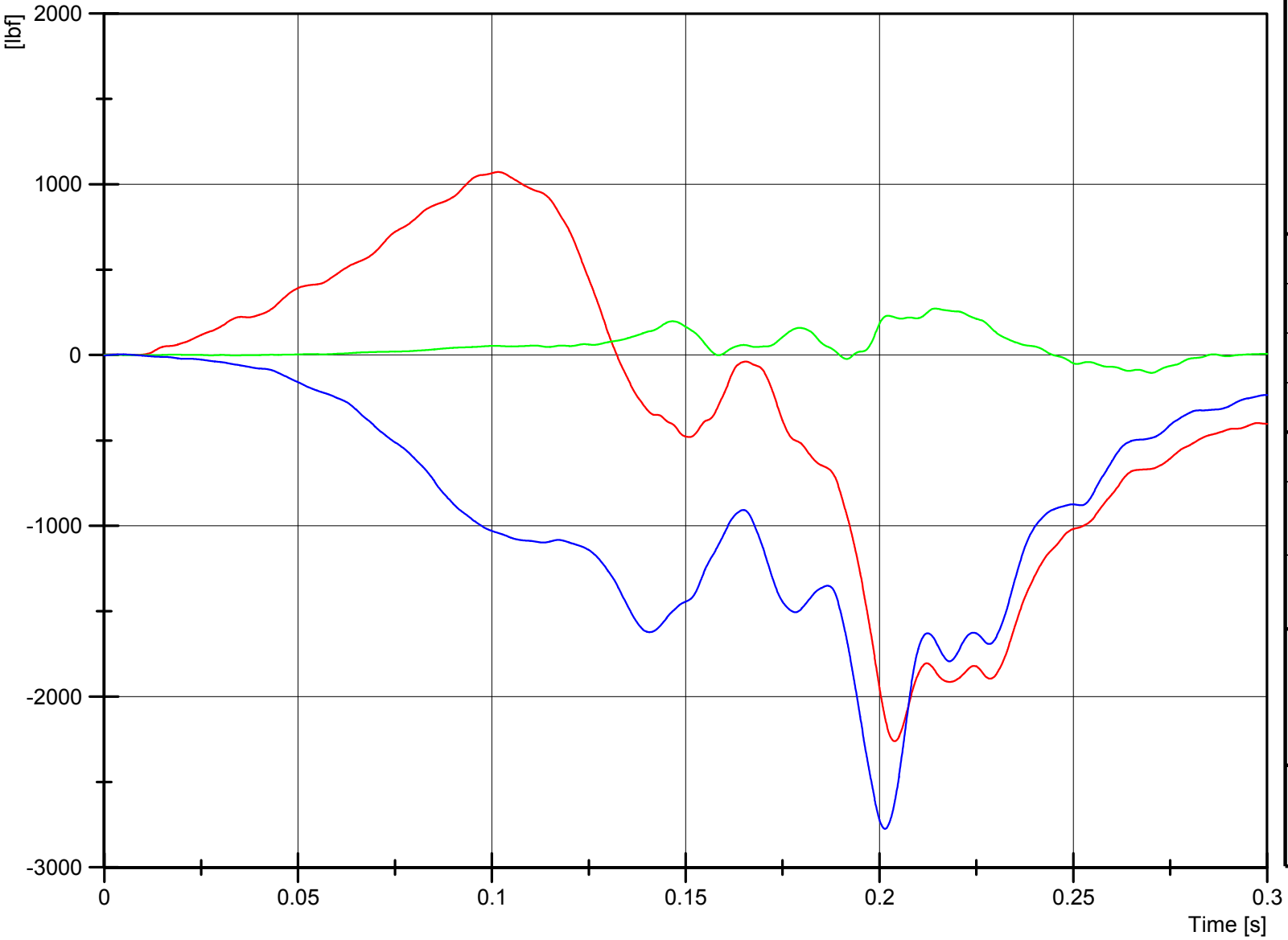
Maximum: 795.25 lbf Time: 0.0973 sec.
Minimum: -45.55 lbf Time: 0.1843 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC084FZ
Sensitivity: 1.176E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 12
Ref. No.: 15
Polarity: N

Rigid Seat Seat Back Fy

Maximum: 87.7461 lbf Time: 0.2196 sec.
Minimum: -62.111 lbf Time: 0.2474 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC084FY
Sensitivity: 2.733E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 11
Ref. No.: 14
Polarity: N

Rigid Seat Seat Back Fz

Maximum: 91.6084 lbf Time: 0.2272 sec.
Minimum: -156.30 lbf Time: 0.1075 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC084FX
Sensitivity: 2.74E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 10
Ref. No.: 13
Polarity: R



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14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/25/2013 10:07

Comments:

Rigid Seat Seat Pan Fx

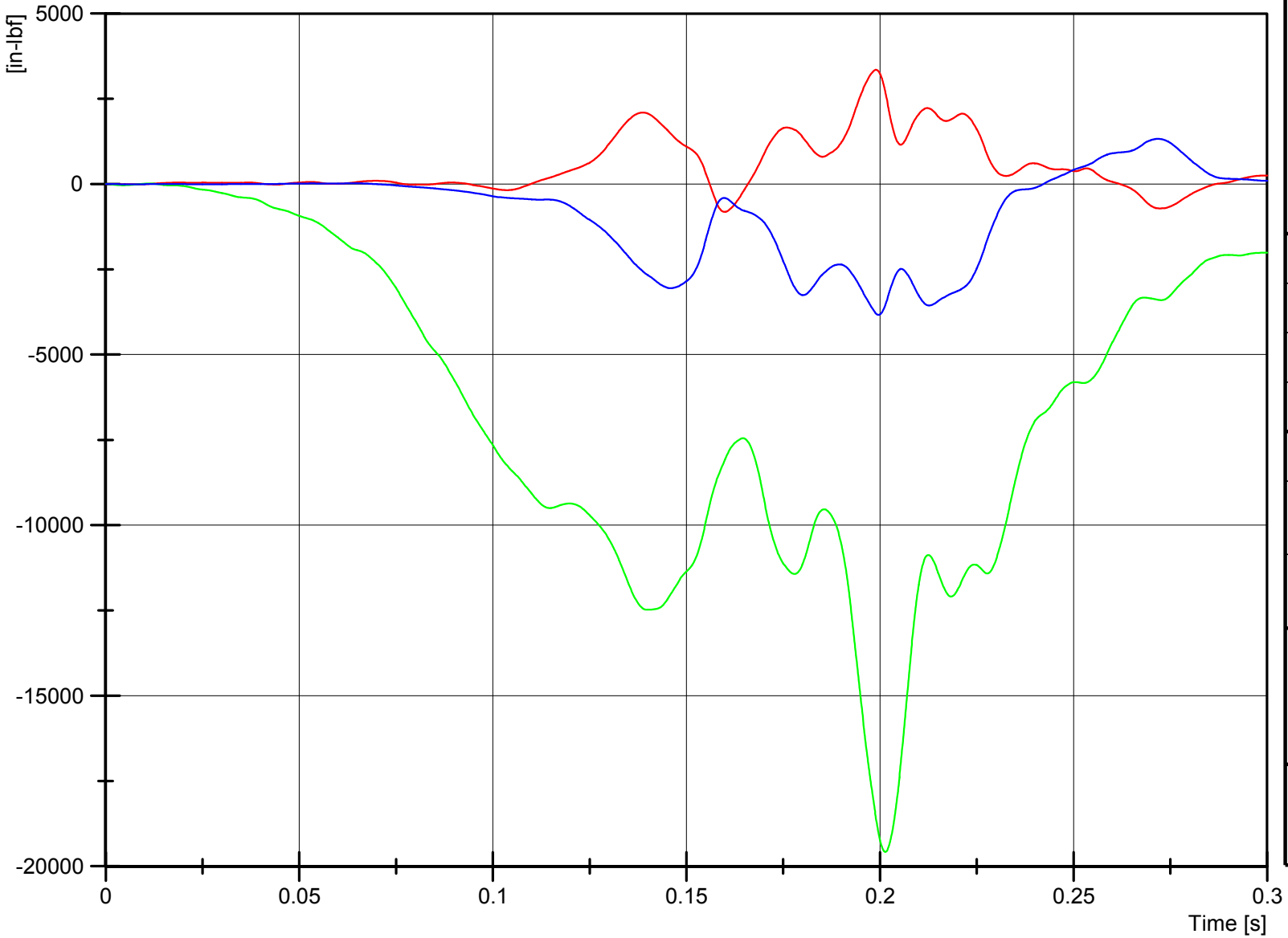
Maximum: 1072.41 lbf Time: 0.1019 sec.
Minimum: -2.26E+03 lbf Time: 0.2041 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083FX
Sensitivity: 2.768E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 13
Ref. No.: 10
Polarity: N

Rigid Seat Seat Pan Fy

Maximum: 273.80 lbf Time: 0.2146 sec.
Minimum: -103.45 lbf Time: 0.2704 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083FY
Sensitivity: 2.764E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 14
Ref. No.: 11
Polarity: N

Rigid Seat Seat Pan Fz

Maximum: 3.5311 lbf Time: 0.0046 sec.
Minimum: -2.77E+03 lbf Time: 0.2016 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083FZ
Sensitivity: 1.181E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 15
Ref. No.: 12
Polarity: N



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Version: New

Report Date: 03/26/2014

Customer: FAA

Test: FA14B-11

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/25/2013 10:07

Comments:

Rigid Seat Seat Pan Mx

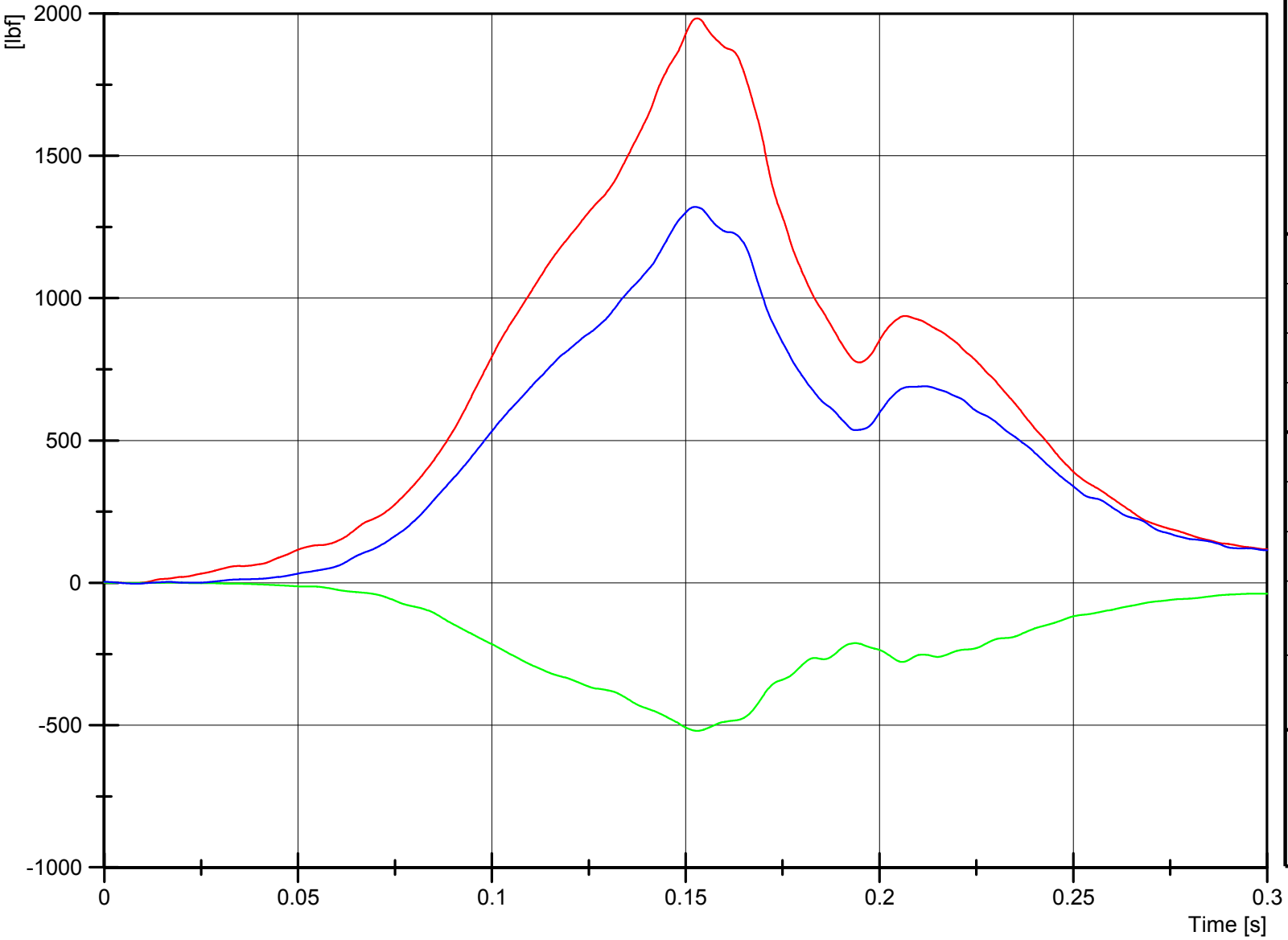
Maximum: 3351.43 in-lbf Time: 0.1992 sec.
Minimum: -816.05 in-lbf Time: 0.1601 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083MX
Sensitivity: 7.03E-08 V/EU
Cal. Due: 02/13/2014
Full Scale: 25000 in-lbf
DAS Channel: 16
Ref. No.: 7
Polarity: N

Rigid Seat Seat Pan My

Maximum: 19.3112 in-lbf Time: 0.0116 sec.
Minimum: -1.96E+04 in-lbf Time: 0.2016 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083MY
Sensitivity: 7.05E-08 V/EU
Cal. Due: 02/13/2014
Full Scale: 25000 in-lbf
DAS Channel: 17
Ref. No.: 8
Polarity: N

Rigid Seat Seat Pan Mz

Maximum: 1328.42 in-lbf Time: 0.272 sec.
Minimum: -3.83E+03 in-lbf Time: 0.1998 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083MZ
Sensitivity: 9.32E-08 V/EU
Cal. Due: 02/13/2014
Full Scale: 20000 in-lbf
DAS Channel: 18
Ref. No.: 9
Polarity: N



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Doc. No.: CDL-FA14B-11-01

Version: New

Report Date: 03/26/2014

Customer: FAA

Test: FA14B-11

Dummy: H2 718

Position: Config 1 - New Belt

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/25/2013 10:07

Rigid Seat Right Lap Fx

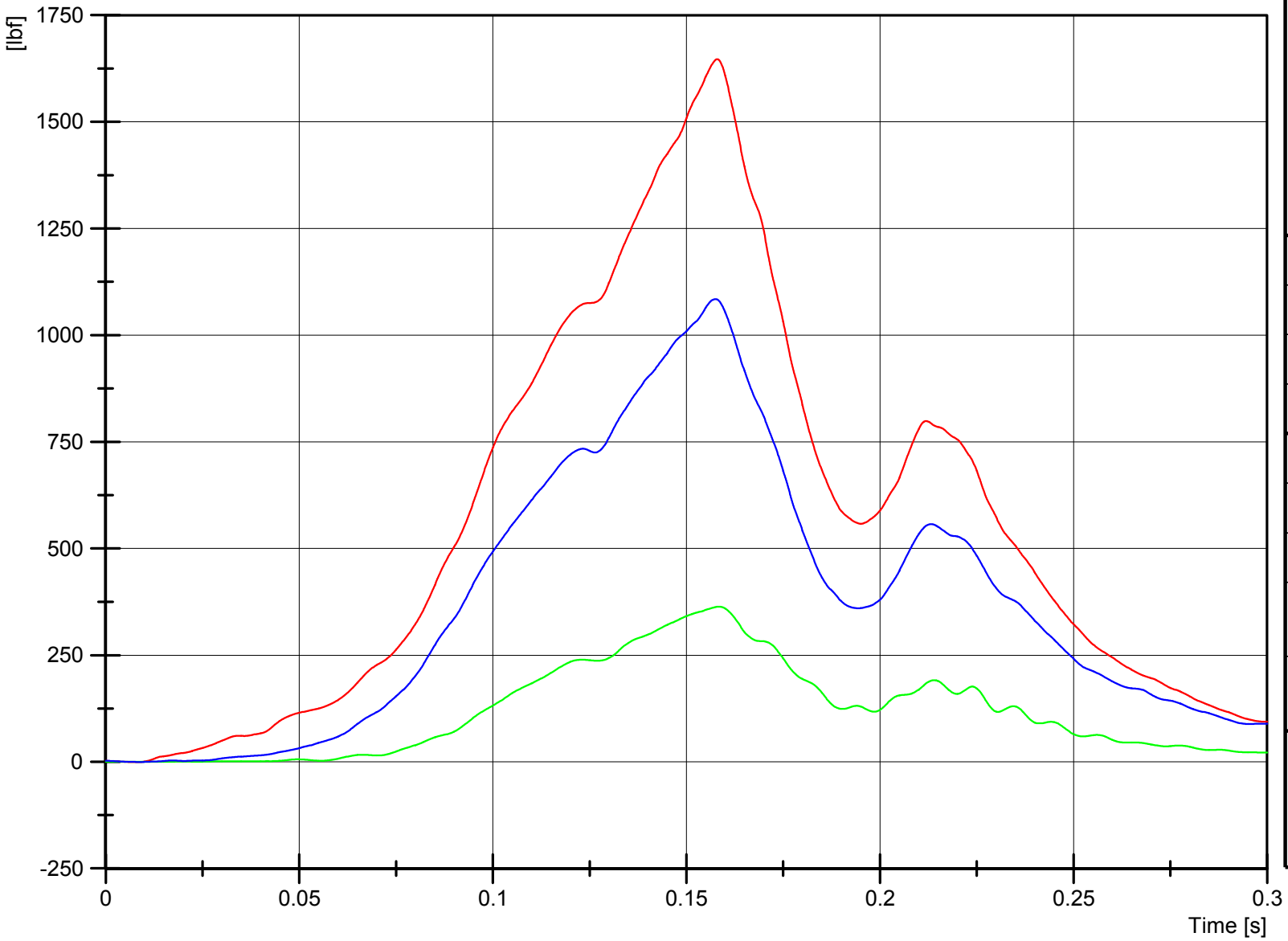
Maximum: 1983.32 lbf Time: 0.1531 sec.
Minimum: 0.0341 lbf Time: 0.0078 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC093FX
Sensitivity: 2.587E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 22
Ref. No.: 74
Polarity: N

Rigid Seat Right Lap Fy

Maximum: 0.6506 lbf Time: 0.0188 sec.
Minimum: -519.83 lbf Time: 0.1531 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC093FY
Sensitivity: 2.572E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 23
Ref. No.: 75
Polarity: N

Rigid Seat Right Lap Fz

Maximum: 1320.91 lbf Time: 0.1526 sec.
Minimum: -2.9594 lbf Time: 0.0085 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC093FZ
Sensitivity: 1.044E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 24
Ref. No.: 76
Polarity: N



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Doc. No.: CDL-FA14B-11-01

Version: New

Report Date: 03/26/2014

Customer: FAA

Test: FA14B-11

Dummy: H2 718

Position: Config 1 - New Belt

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/25/2013 10:07

Rigid Seat Left Lap Fx

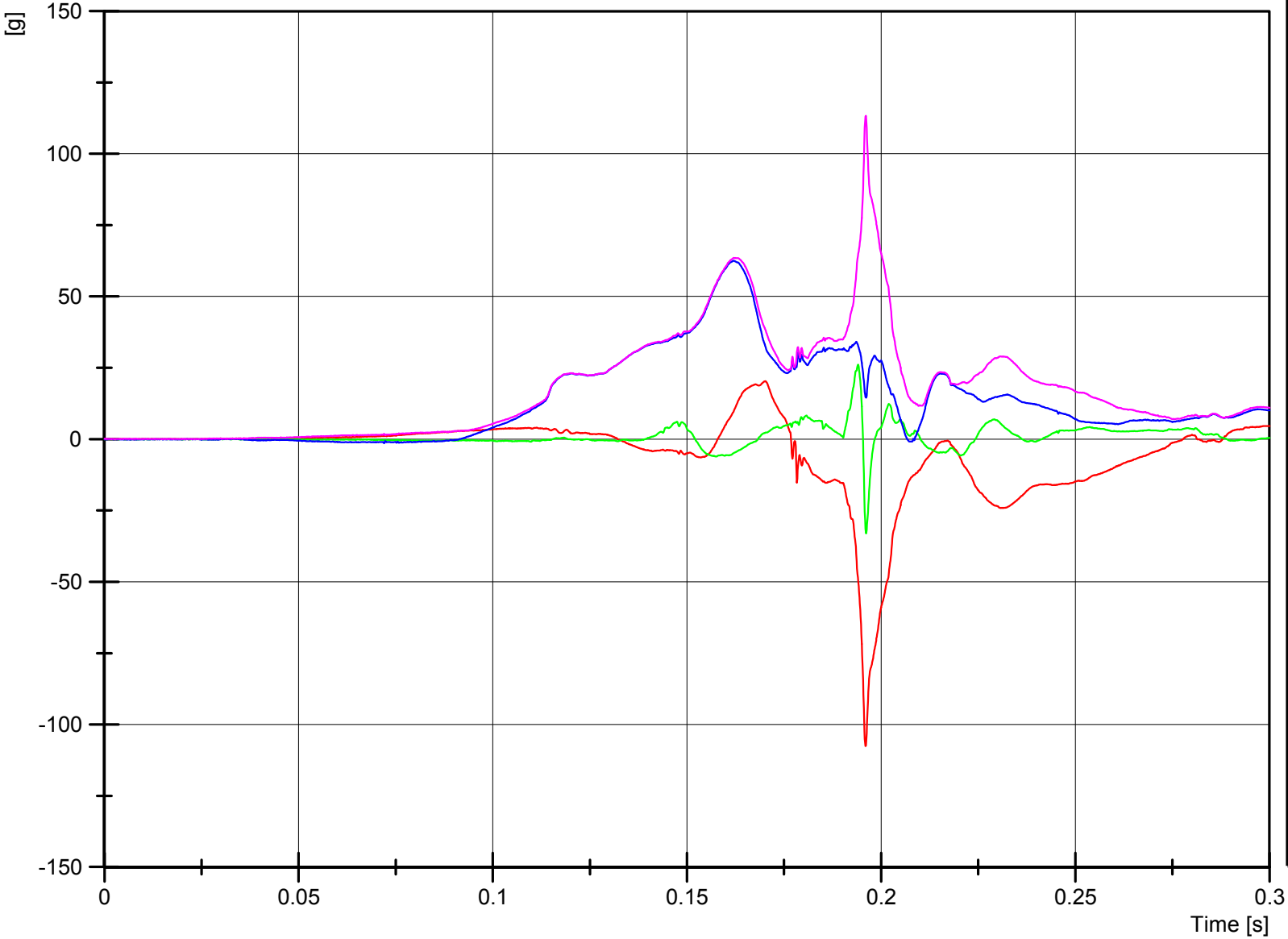
Maximum: 1646.90 lbf Time: 0.1582 sec.
Minimum: -0.6389 lbf Time: 0.0083 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC094FX
Sensitivity: 2.587E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 19
Ref. No.: 77
Polarity: N

Rigid Seat Left Lap Fy

Maximum: 363.75 lbf Time: 0.1586 sec.
Minimum: -0.1461 lbf Time: 0.0041 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC094FY
Sensitivity: 2.572E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 20
Ref. No.: 78
Polarity: N

Rigid Seat Left Lap Fz

Maximum: 1084.35 lbf Time: 0.1577 sec.
Minimum: -0.3701 lbf Time: 0.0091 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC094FZ
Sensitivity: 1.044E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 21
Ref. No.: 79
Polarity: N



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Doc. No.: CDL-FA14B-11-01

Version: New

Report Date: 03/26/2014

Customer: FAA

Test: FA14B-11

Dummy: H2 718

Position: Config 1 - New Belt

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/25/2013 10:07

Head Ax H2 718

Maximum: 20.3549 g Time: 0.1704 sec.
Minimum: -107.66 g Time: 0.1962 sec.
CFC: 1000
Sensor Type: Endevco 7264C
S/N: P47932
Sensitivity: 2.157E-05 V/EU
Cal. Due: 09/25/2014
Full Scale: 2000 g
DAS Channel: 25
Ref. No.: 22
Polarity: R

Head Ay H2 718

Maximum: 26.0924 g Time: 0.1942 sec.
Minimum: -33.06 g Time: 0.1964 sec.
CFC: 1000
Sensor Type: Endevco 7264C
S/N: P48149
Sensitivity: 2.603E-05 V/EU
Cal. Due: 09/25/2014
Full Scale: 2000 g
DAS Channel: 26
Ref. No.: 23
Polarity: R

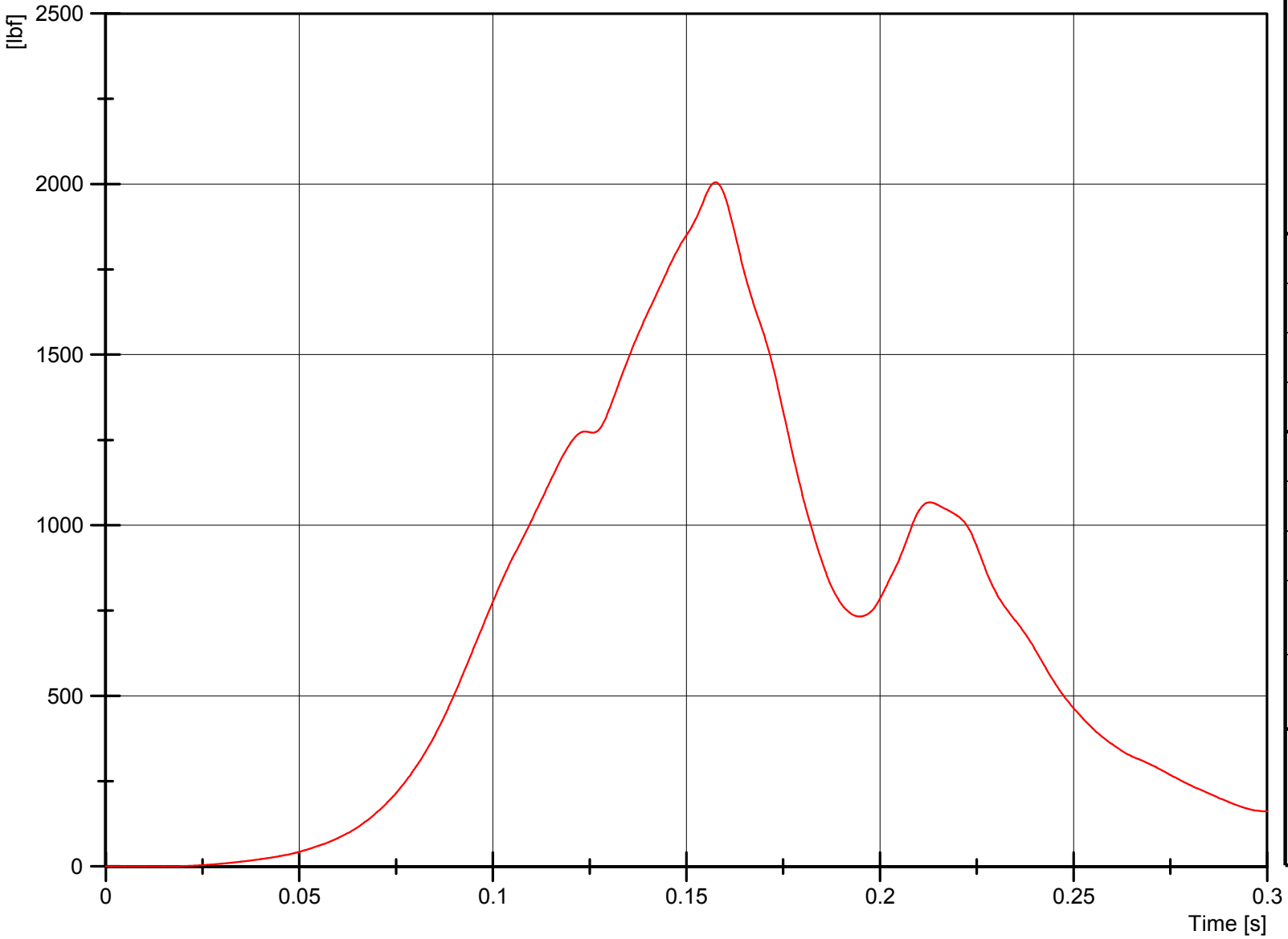
Head Az H2 718

Maximum: 62.5904 g Time: 0.1622 sec.
Minimum: -1.5352 g Time: 0.0722 sec.
CFC: 1000
Sensor Type: Endevco 7264C
S/N: P60367
Sensitivity: 1.782E-05 V/EU
Cal. Due: 09/25/2014
Full Scale: 2000 g
DAS Channel: 27
Ref. No.: 24
Polarity: R

Head Resultant H2 718

Maximum: 113.33 g Time: 0.1961 sec.

HIC: 897.7
T1: 131.9 msec.
T2: 204.8 msec.



Lap Belt Force H2 718

Maximum: 2005.65 lbf Time: 0.1577 sec.
Minimum: 0.1034 lbf Time: 0.0112 sec.
CFC: 60
Sensor Type: Denton 3255
S/N: SBLC086
Sensitivity: 6.6006E-07 V/EU
Cal. Due: 05/16/2014
Full Scale: 3000 lbf
DAS Channel: 36
Ref. No.: 17
Polarity: N

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Customer: FAA

Test: FA14B-11

Dummy: H2 718

Position: Config 1 - New Belt

Test Description:
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Pulse Name:
16g-07b

Rate: 10000
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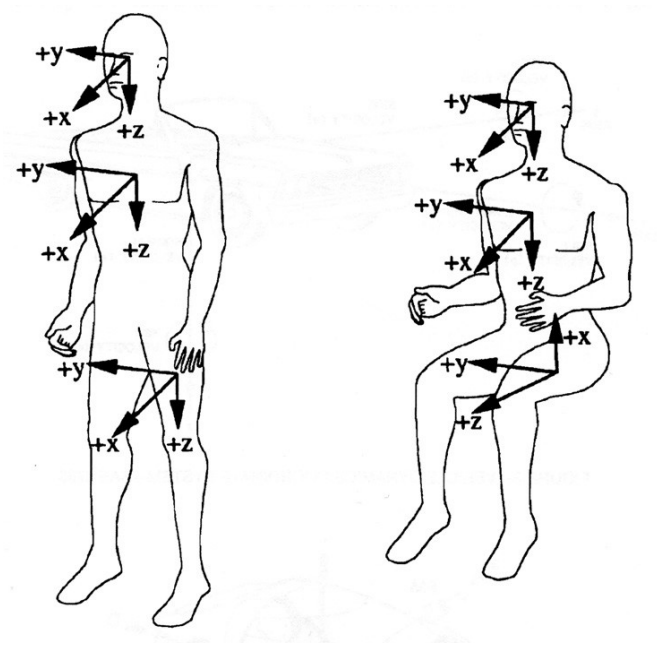
J211/1 Sign Conventions



Upper Neck Load Cell:
+FX Head rearward, chest forward
+FY Head leftward, chest rightward
+FZ Head upward, chest downward
+MX Left ear toward left shoulder
+MY Chin toward sternum
+MZ Chin toward left shoulder

Lumbar Load Cell:
+FX Chest rearward, pelvis forward
+FY Chest leftward, pelvis rightward
+FZ Chest upward, pelvis downward
+MX Left shoulder toward left hip
+MY Sternum toward front of legs
+MZ Right shoulder forward, left shoulder rearward

Femur Load Cells:
+FZ Tension

Chest Displacement:
-DX Compression

Rib Dispacement:
-DY Compression

Belt Load Cells:
+FX Tension

Floor Load Cells:
+FX Test article forward
+FY Test article right
+FZ Test article up

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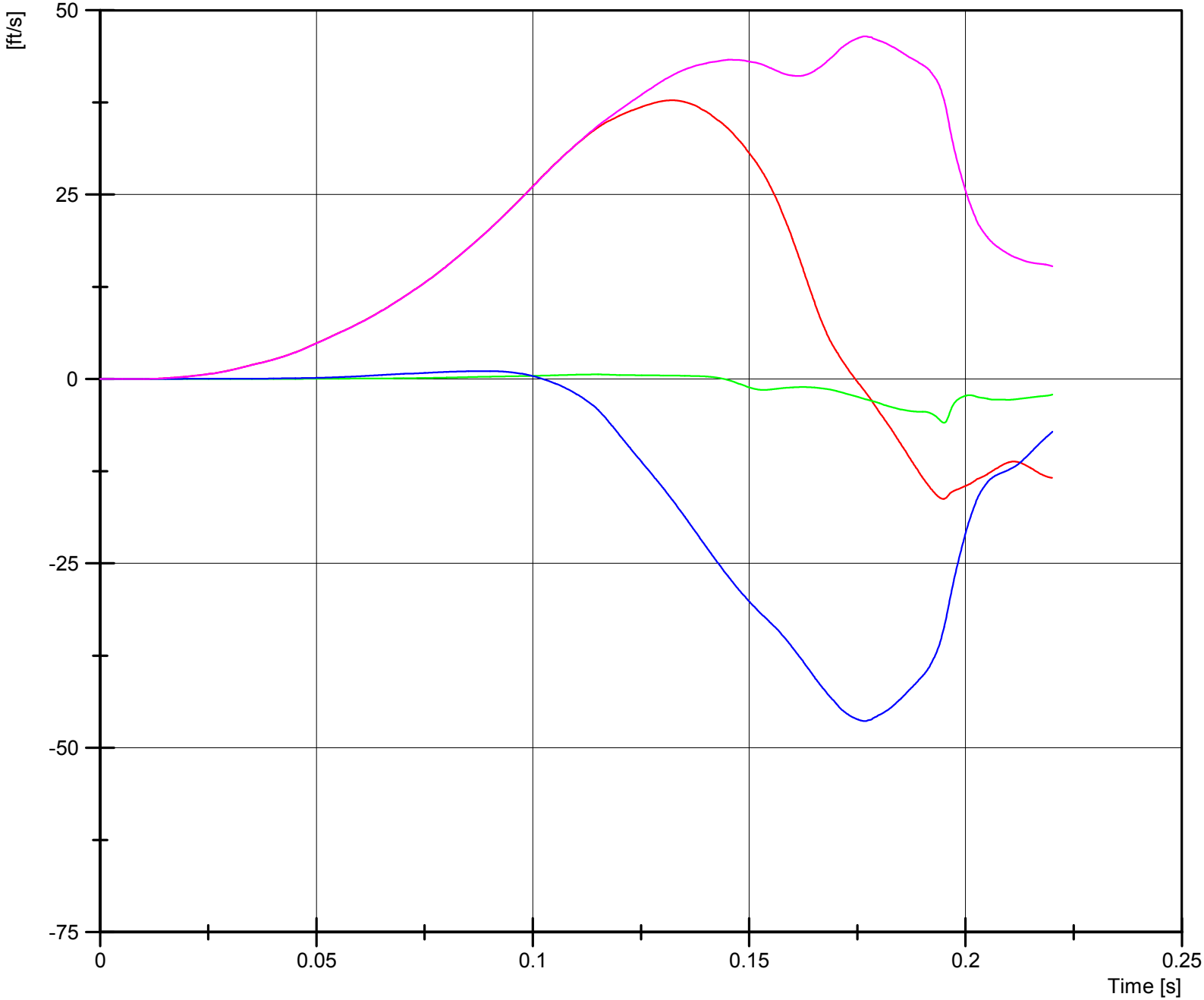
Comments:



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Position: Config 1 - New Belt

Test Description:
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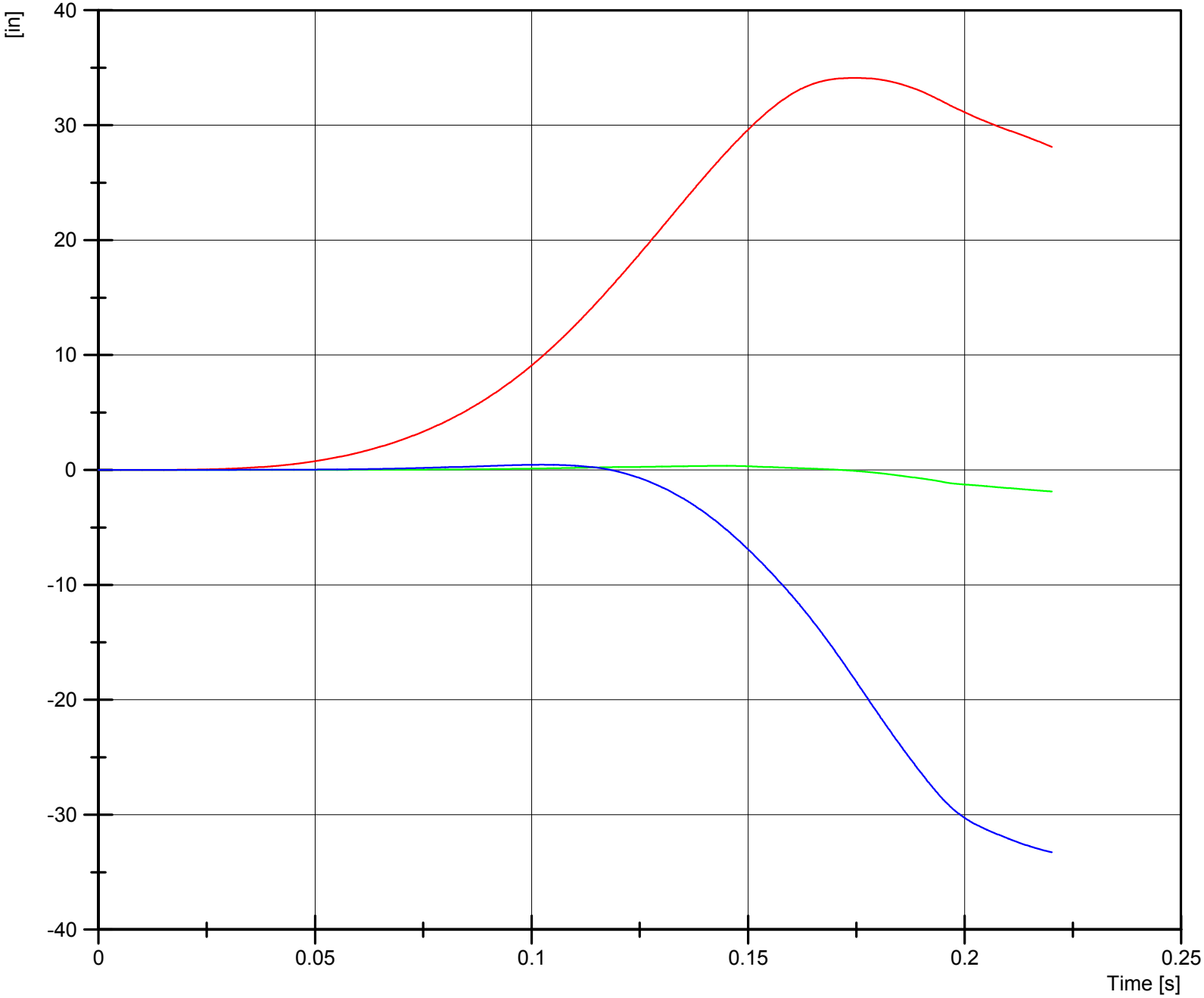
Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/25/2013 10:07

Comments:

Global Head Vx H2 718		Global Head Vy H2 718		Global Head Vz H2 718		Global Head Velocity Resultant H2 718	
Maximum: 37.79 ft/s	Time: 0.1322 sec.	Maximum: 0.616 ft/s	Time: 0.1151 sec.	Maximum: 1.09 ft/s	Time: 0.0889 sec.	Maximum: 46.47 ft/s	Time: 0.1769 sec.
Minimum: -16.24 ft/s	Time: 0.1949 sec.	Minimum: -5.91 ft/s	Time: 0.195 sec.	Minimum: -46.35 ft/s	Time: 0.1769 sec.	Minimum: 0 ft/s	Time: 0.0001 sec.



Global Head Dx H2 718 | Global Head Dy H2 718 | Global Head Dz H2 718

Maximum: 34.12 in	Time: 0.1746 sec.	Maximum: 0.37 in	Time: 0.1443 sec.	Maximum: 0.46 in	Time: 0.1024 sec.
Minimum: 0.00 in	Time: 0.0001 sec.	Minimum: -1.87 in	Time: 0.2201 sec.	Minimum: -33.26 in	Time: 0.2201 sec.

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Version: New

Report Date: 03/26/2014

Customer: FAA

Test: FA14B-11

Dummy: H2 718

Position: Config 1 - New Belt

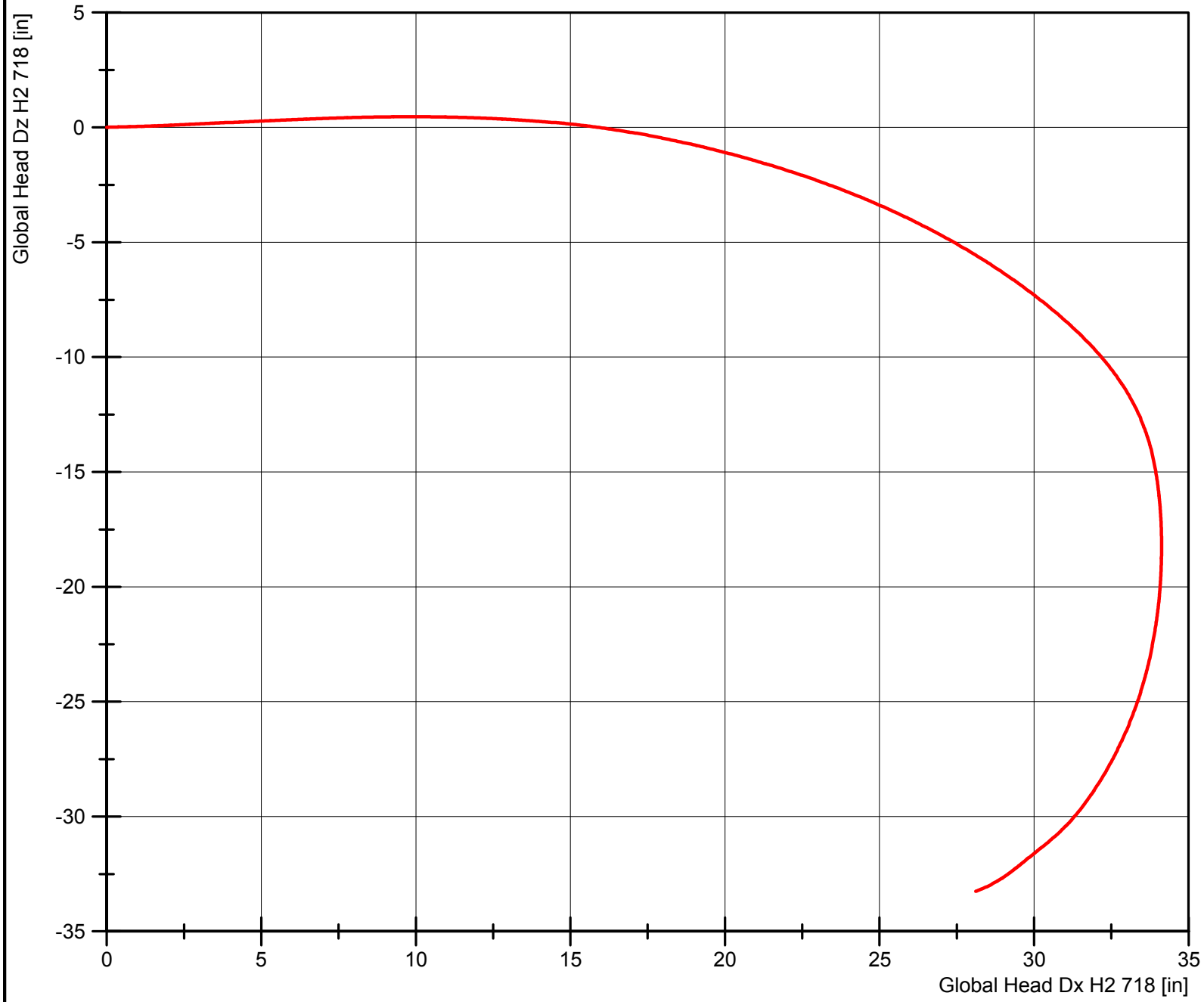
Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/25/2013 10:07

Comments:

Displacement values are calculated from Head Accelerations and Angular Velocities.
This method cannot be used to substitute photometric analysis.



Global Head Displacement XZ

X Maximum: 34.12 in **Time: 0.1746 sec.**

Z Value at X Maximum: -18.20 in

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Version: New

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Customer: FAA

Test: FA14B-11

Dummy: H2 718

Position: Config 1 - New Belt

Test Description:
14 CFR 25.562 Test 2

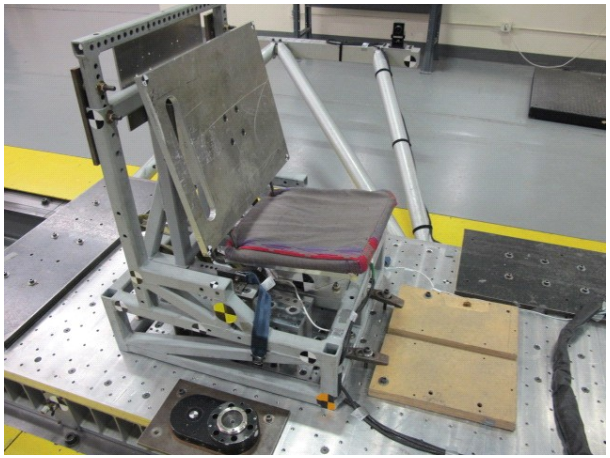
Pulse Name:
16g-07b

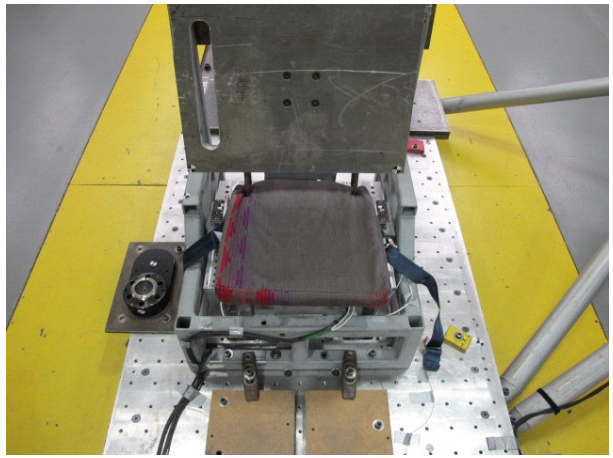
Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/25/2013 10:07

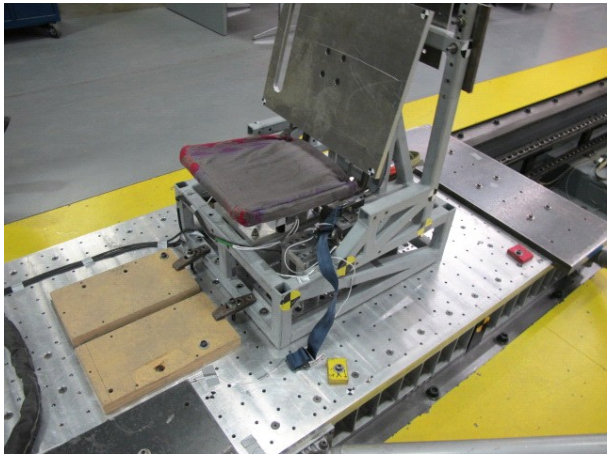
Comments:

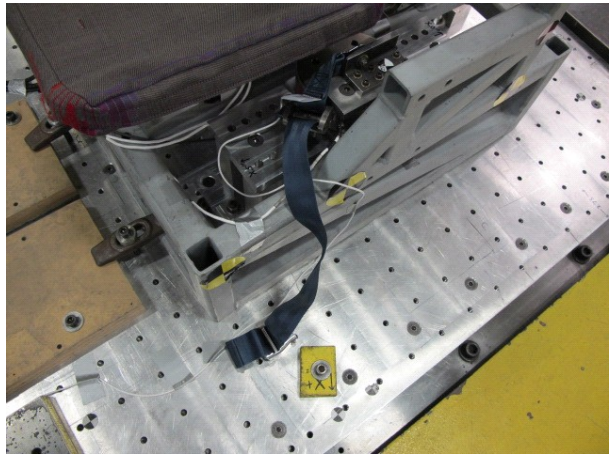
Displacement values are calculated from Head Accelerations and Angular Velocities.
This method cannot be used to substitute photometric analysis.

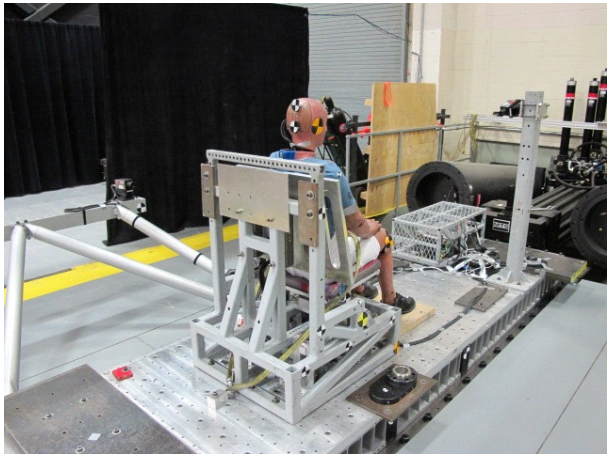
Pre-test Photos

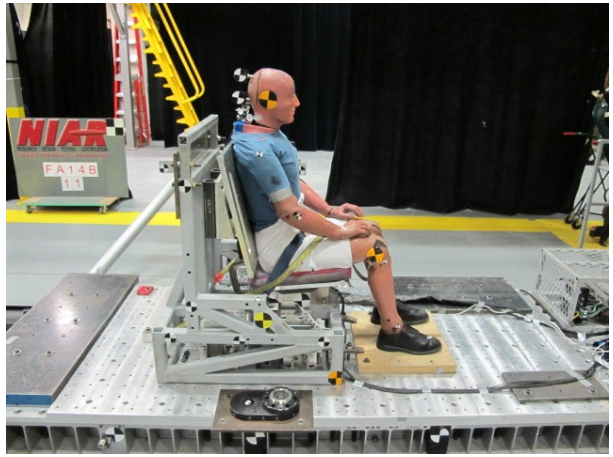












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Doc. No.: CDL-FA14B-11-01

Version: New

Report Date: 03/26/2014

Customer: FAA

Test: FA14B-11

Dummy: N/A

Position: N/A

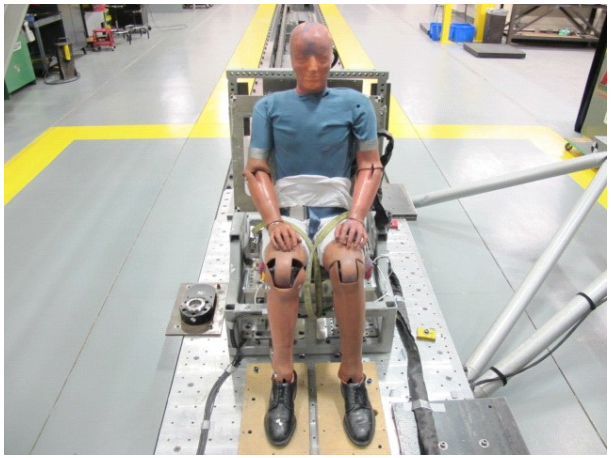
Test Description:
14 CFR 25.562 Test 2

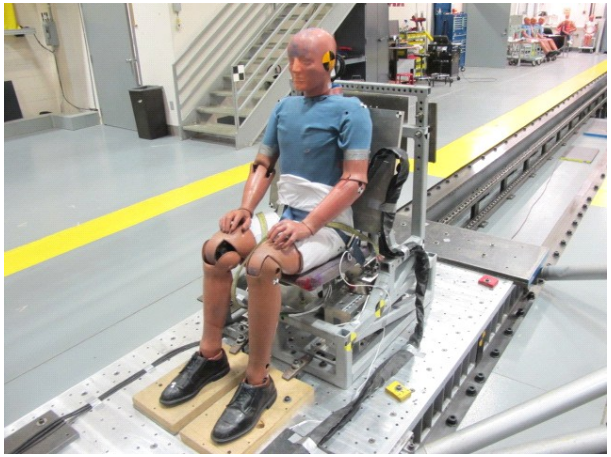
Pulse Name:
16g-07b

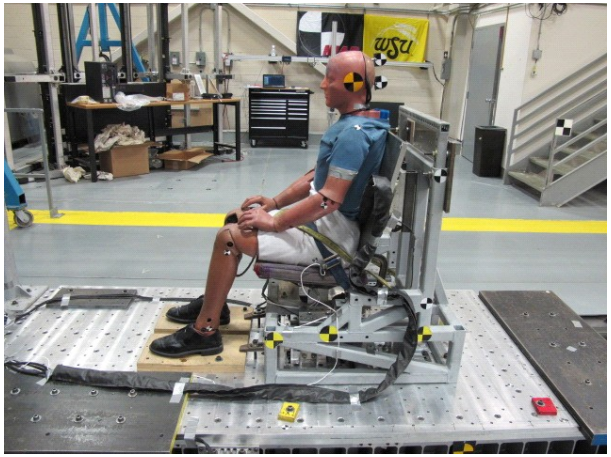
Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/25/2013 10:07

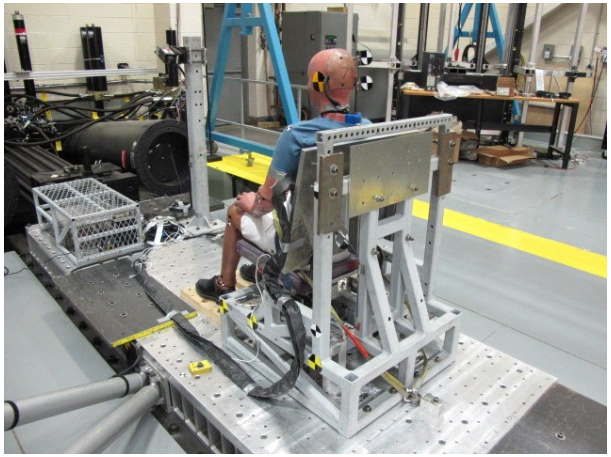
Comments:

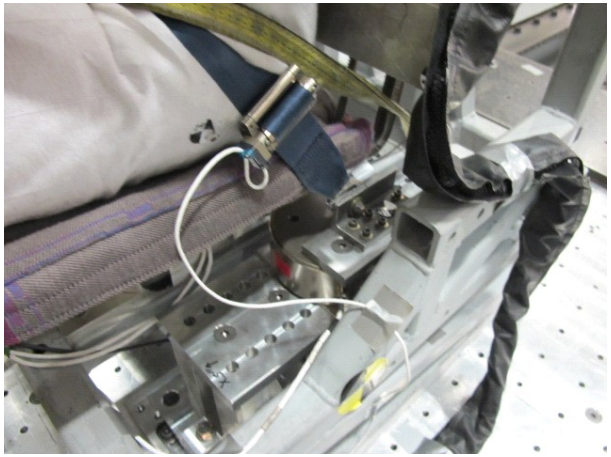
Pre-test Photos











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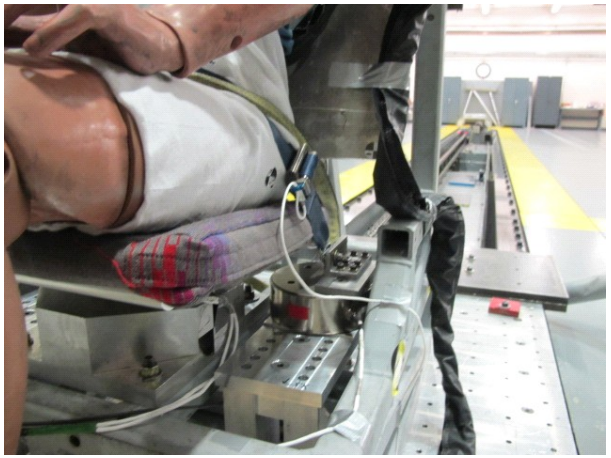

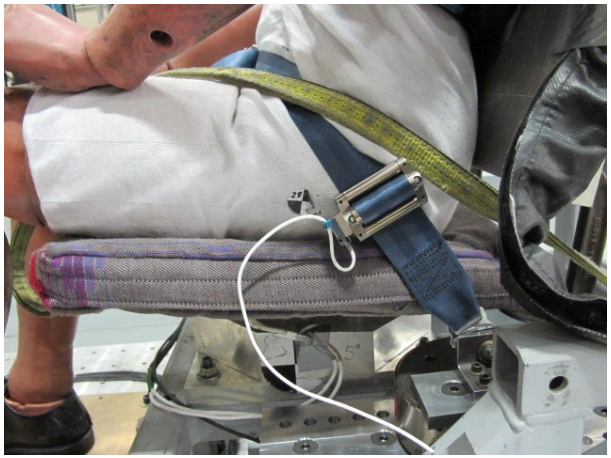

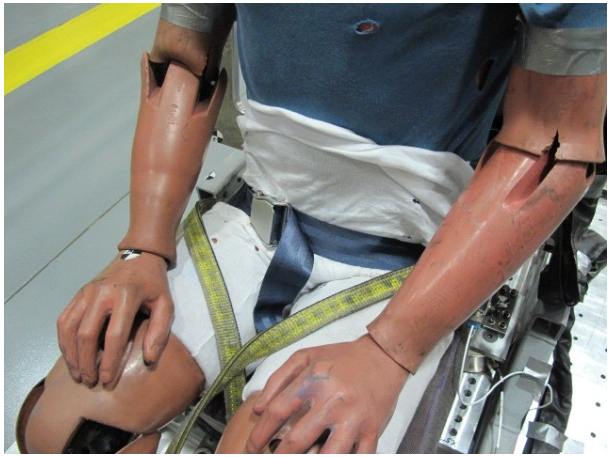

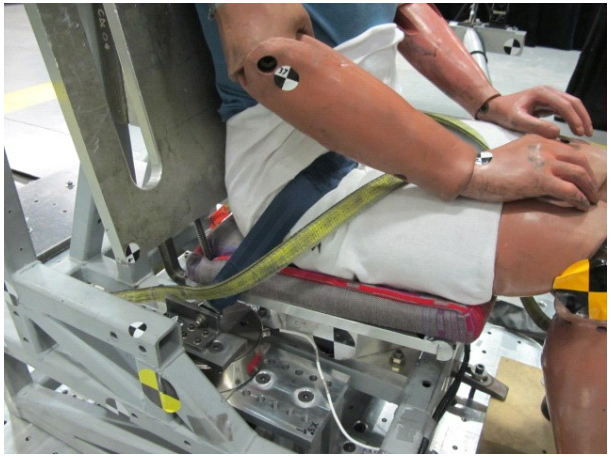

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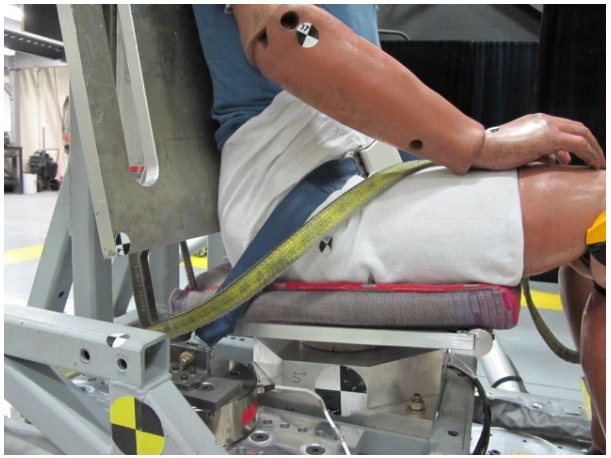

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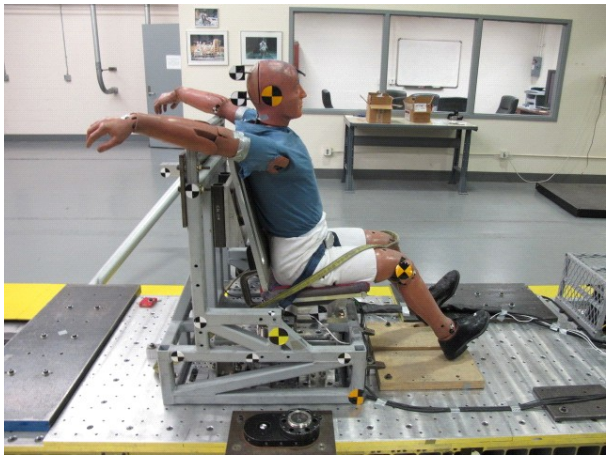

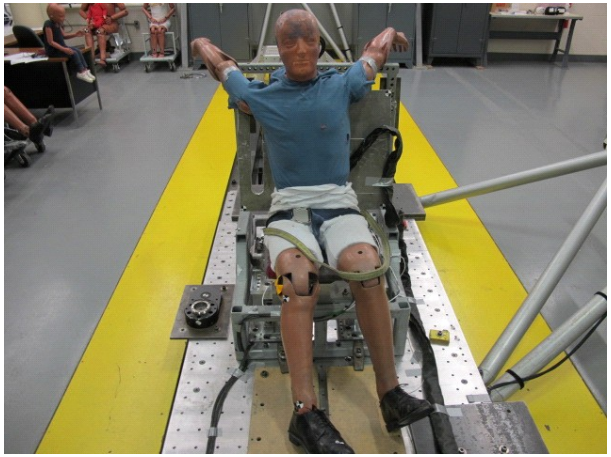

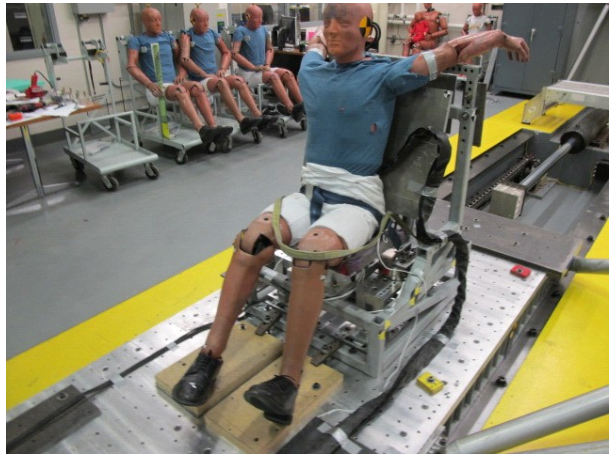

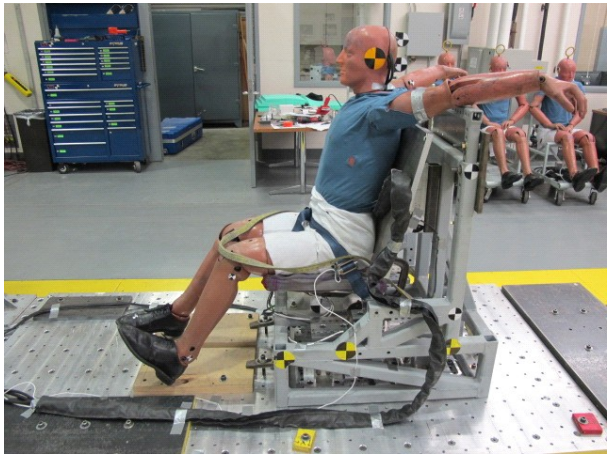

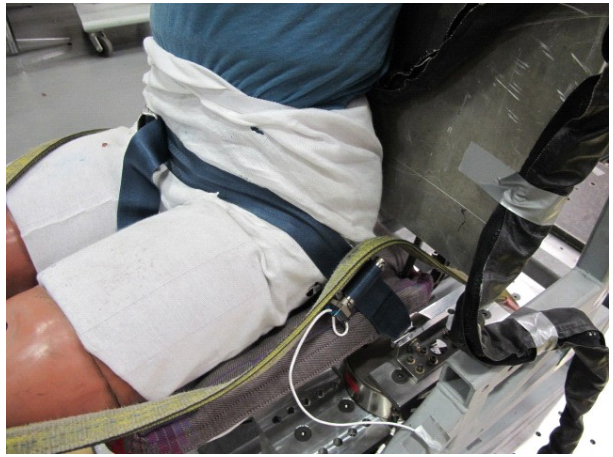

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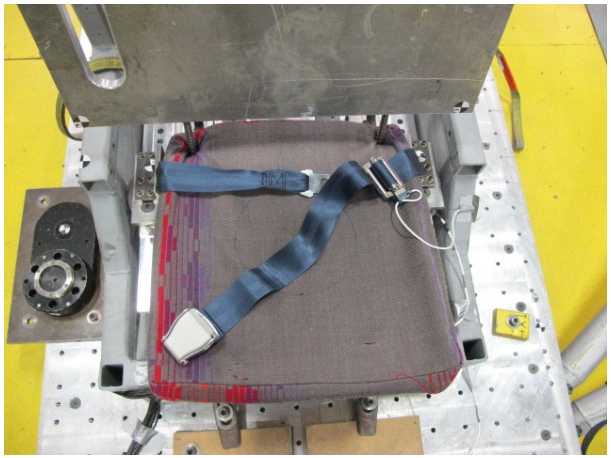

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Test Date/Time: 11/25/2013 10:07

Comments:

CRASH DYNAMICS LABORATORY

Report No. CDL-FA14B-12-01

Requested by:

FAA

Final Test Report
FA14B-12

03/26/2014

Revision	Change	Date	Revised By
New		03/26/2014	Rob Huculak

Prepared and Reviewed by:

Rob Huculak
Laboratory Manager

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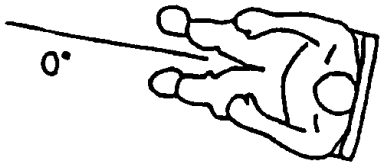
This test report is in accordance with ISO/IEC 17025:2005 requirements and all equipment standards used are traceable to the National Institute of Standards and Technology.
The information in this report relates only to the article under test and cannot be reproduced, except in full, without the written approval of the National Institute for Aviation Research.

Test Summary

The dynamic test (FA14B-12) was performed for FAA in accordance with 14 CFR 25.562 Test 2 on 03/26/2014.

Pulse Parameters	Required	Result	Pass/Fail
Minimum Peak Acceleration (g)	16	16.1	PASS
Minimum Velocity Change (ft/sec)	44	45.52	PASS
Maximum Rise Time (msec)	90	89	PASS
Minimum Velocity Change During Rise Time (ft/sec)	22	23.19	PASS
2g Offset	--	--	PASS

Test Orientation



ATD: H2 718 **Position: Config 1 - Repaired Belt**

Measured Seat Belt Angle	Measured Seat Belt Offset
56.96 deg	1.75 in

0 deg

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Doc. No.: CDL-FA14B-12-01

Version: New

Report Date: 03/26/2014

Customer: FAA

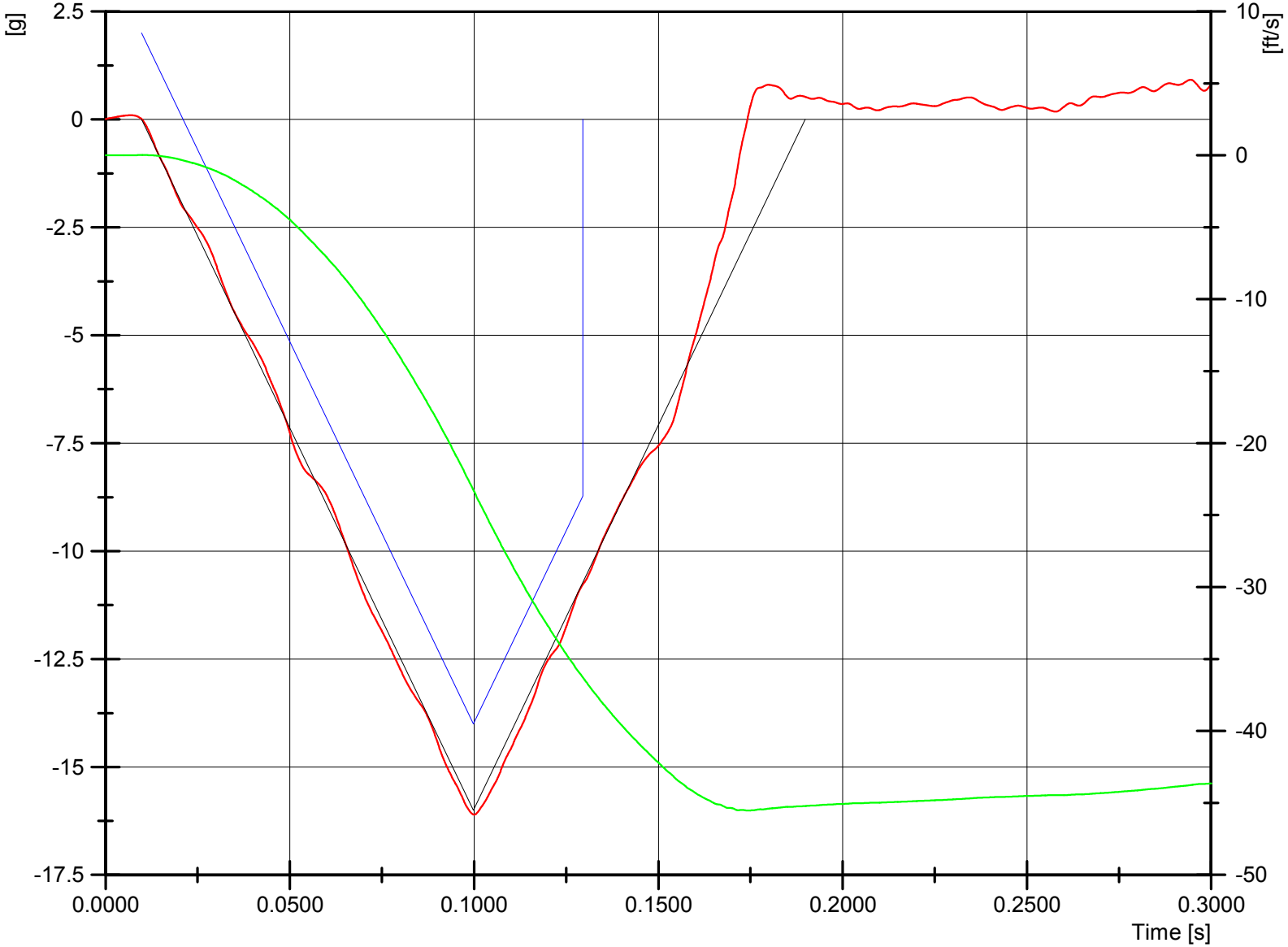
Test: FA14B-12

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/25/2013 11:16

Temperature	Relative Humidity
71.7°F	29.3%



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Customer: FAA

Test: FA14B-12

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/25/2013 11:16

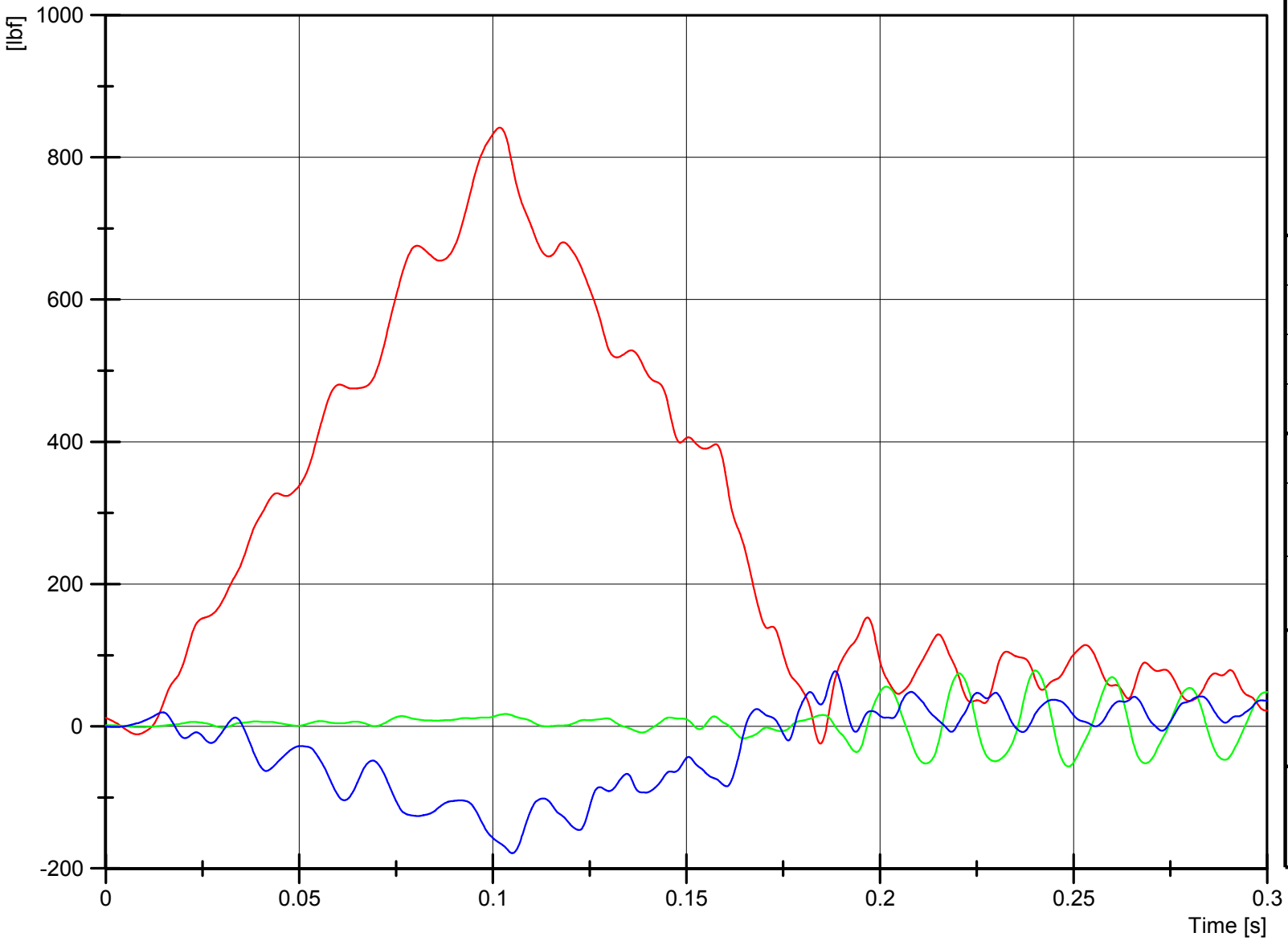
Comments:

Sled Acceleration | Sled Velocity | Ideal Pulse | Upper Limit

Maximum: 0.920 g Time: 0.2944 sec.
Minimum: -16.10 g Time: 0.1 sec.
CFC: 60
Sensor Type: ENDEVCO 7290A-100
S/N: 29924
Sensitivity: 0.01919 V/EU
Cal. Due: 06/11/2014
Full Scale: 100 g
DAS Channel: 50
Ref. No.: 1
Polarity: R

Minimum: -45.52 ft/s Time: 0.1741 sec.

Pulse Requirement		Actual
Minimum Required Peak Acceleration:	16 g	16.1 g
Minimum Overall Velocity Change:	44 ft/s	45.52 ft/s
Maximum Rise Time:	90 msec	89 msec
Minimum Velocity Change Before Greq:	22 ft/s	23.19 ft/s



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14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
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Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/25/2013 11:16

Comments:

Rigid Seat Seat Back Fx

Maximum: 841.88 lbf
Minimum: -24.15 lbf
CFC: 60
Sensor Type: Denton 2513
S/N: STLC084FZ
Sensitivity: 1.176E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 12
Ref. No.: 15
Polarity: N

Time: 0.102 sec.
Time: 0.1848 sec.

Rigid Seat Seat Back Fy

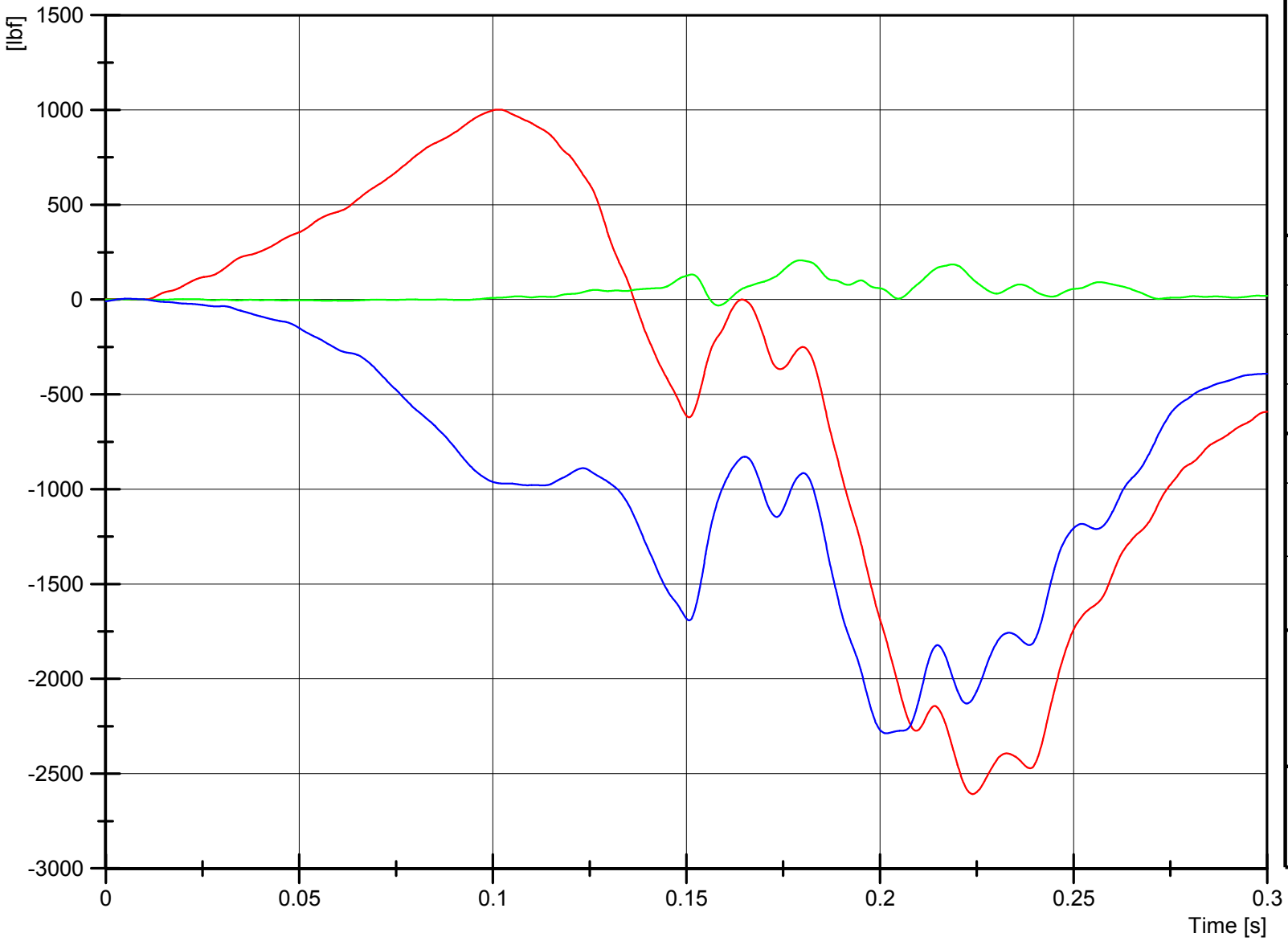
Maximum: 78.2784 lbf
Minimum: -56.35 lbf
CFC: 60
Sensor Type: Denton 2513
S/N: STLC084FY
Sensitivity: 2.733E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 11
Ref. No.: 14
Polarity: N

Time: 0.2403 sec.
Time: 0.2489 sec.

Rigid Seat Seat Back Fz

Maximum: 77.2823 lbf
Minimum: -178.38 lbf
CFC: 60
Sensor Type: Denton 2513
S/N: STLC084FX
Sensitivity: 2.74E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 10
Ref. No.: 13
Polarity: R

Time: 0.1886 sec.
Time: 0.1053 sec.



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16g-07b

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Test Date/Time: 11/25/2013 11:16

Comments:

Rigid Seat Seat Pan Fx

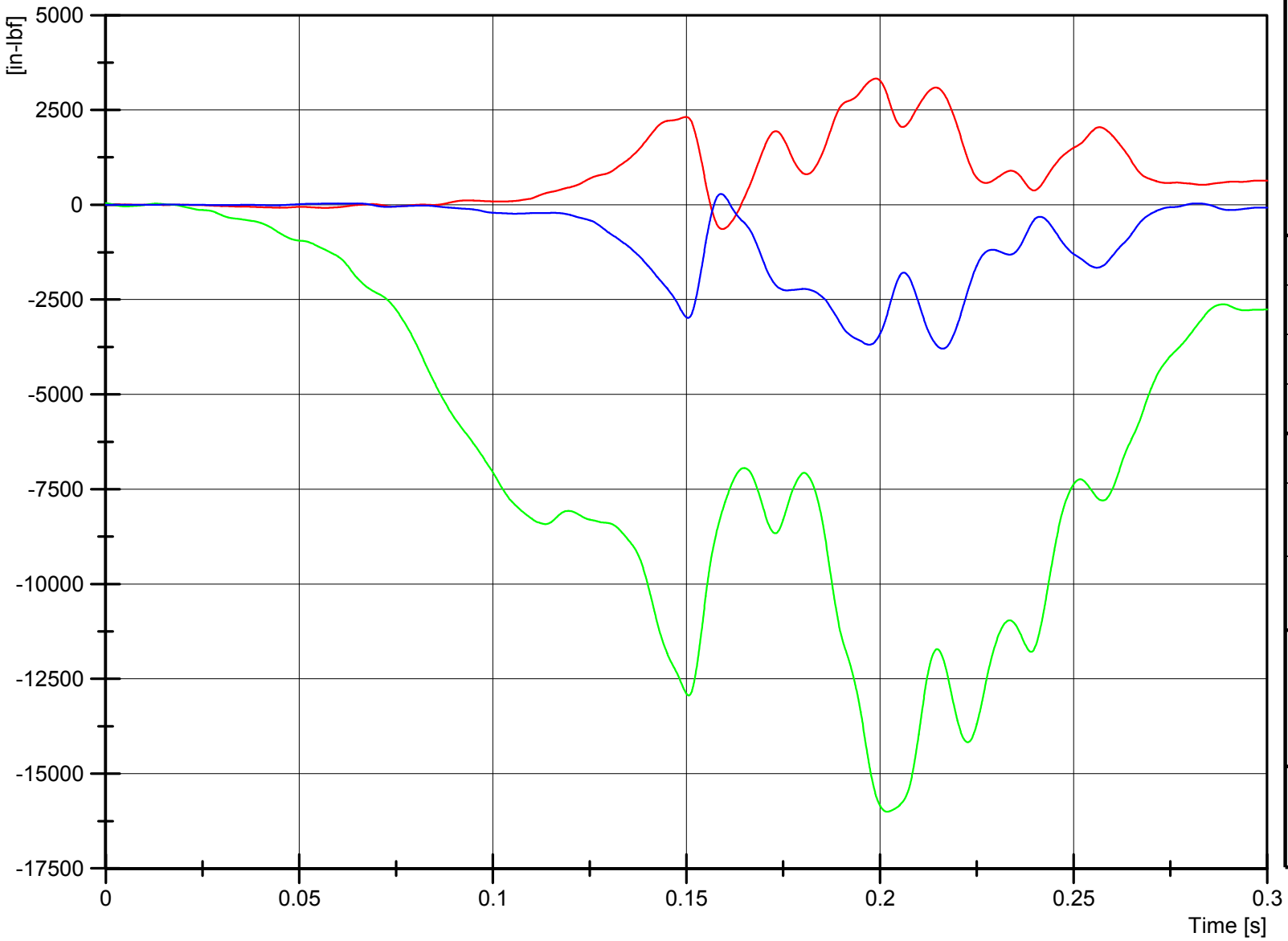
Maximum: 1002.43 lbf Time: 0.1017 sec.
Minimum: -2.61E+03 lbf Time: 0.2241 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083FX
Sensitivity: 2.768E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 13
Ref. No.: 10
Polarity: N

Rigid Seat Seat Pan Fy

Maximum: 207.54 lbf Time: 0.1796 sec.
Minimum: -30.99 lbf Time: 0.1585 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083FY
Sensitivity: 2.764E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 14
Ref. No.: 11
Polarity: N

Rigid Seat Seat Pan Fz

Maximum: 5.2966 lbf Time: 0.0058 sec.
Minimum: -2.29E+03 lbf Time: 0.2018 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083FZ
Sensitivity: 1.181E-07 V/EU
Cal. Due: 02/13/2014
Full Scale: 10000 lbf
DAS Channel: 15
Ref. No.: 12
Polarity: N



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Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/25/2013 11:16

Comments:

Rigid Seat Seat Pan Mx

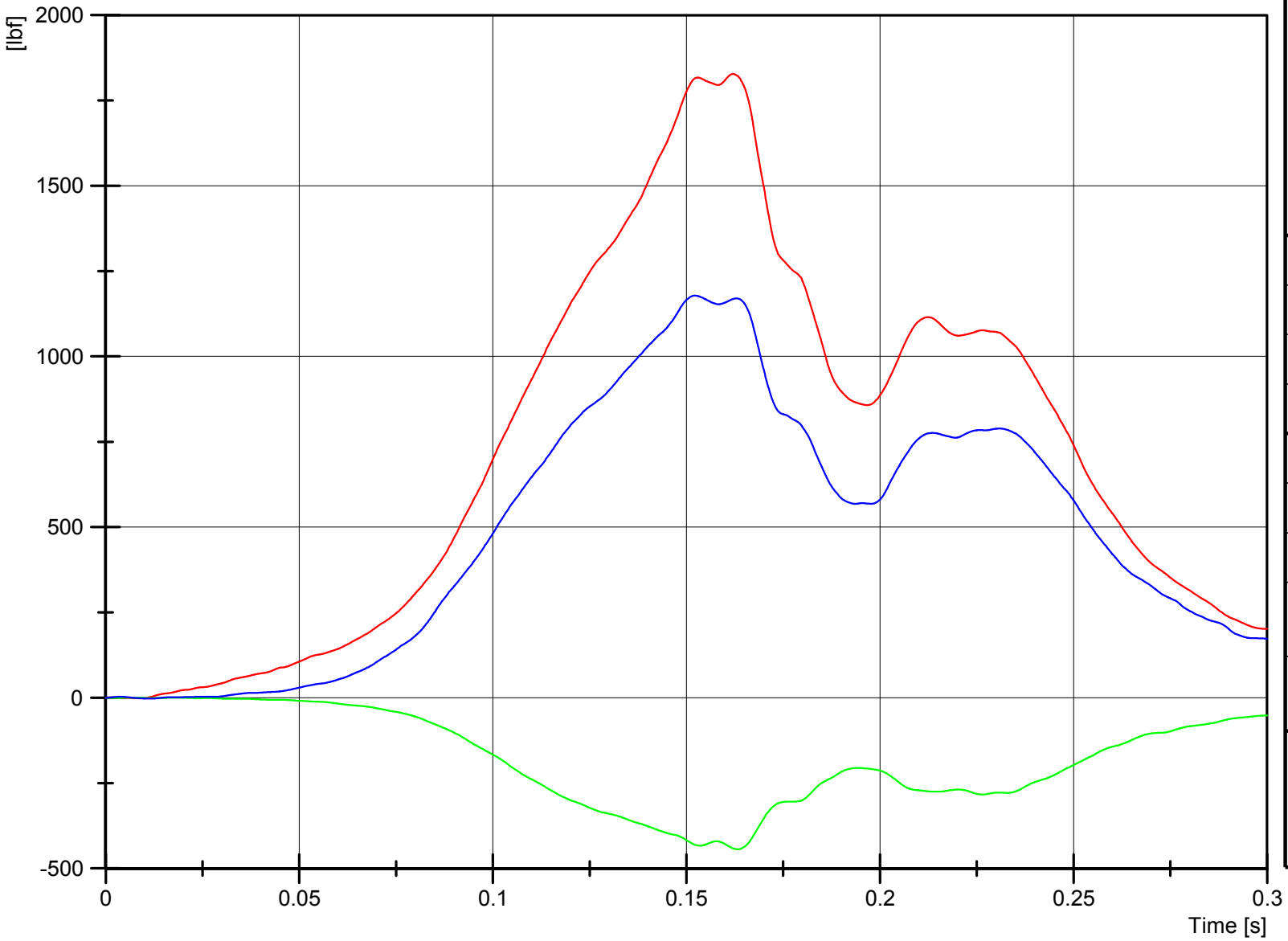
Maximum: 3326.90 in-lbf Time: 0.1991 sec.
Minimum: -639.81 in-lbf Time: 0.1595 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083MX
Sensitivity: 7.03E-08 V/EU
Cal. Due: 02/13/2014
Full Scale: 25000 in-lbf
DAS Channel: 16
Ref. No.: 7
Polarity: N

Rigid Seat Seat Pan My

Maximum: 45.1996 in-lbf Time: 0 sec.
Minimum: -1.60E+04 in-lbf Time: 0.2021 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083MY
Sensitivity: 7.05E-08 V/EU
Cal. Due: 02/13/2014
Full Scale: 25000 in-lbf
DAS Channel: 17
Ref. No.: 8
Polarity: N

Rigid Seat Seat Pan Mz

Maximum: 286.86 in-lbf Time: 0.1591 sec.
Minimum: -3.79E+03 in-lbf Time: 0.2164 sec.
CFC: 60
Sensor Type: Denton 2513
S/N: STLC083MZ
Sensitivity: 9.32E-08 V/EU
Cal. Due: 02/13/2014
Full Scale: 20000 in-lbf
DAS Channel: 18
Ref. No.: 9
Polarity: N



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Test: FA14B-12

Dummy: H2 718

Position: Config 1 - Repaired Belt

Test Description:
14 CFR 25.562 Test 2

Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/25/2013 11:16

Rigid Seat Right Lap Fx

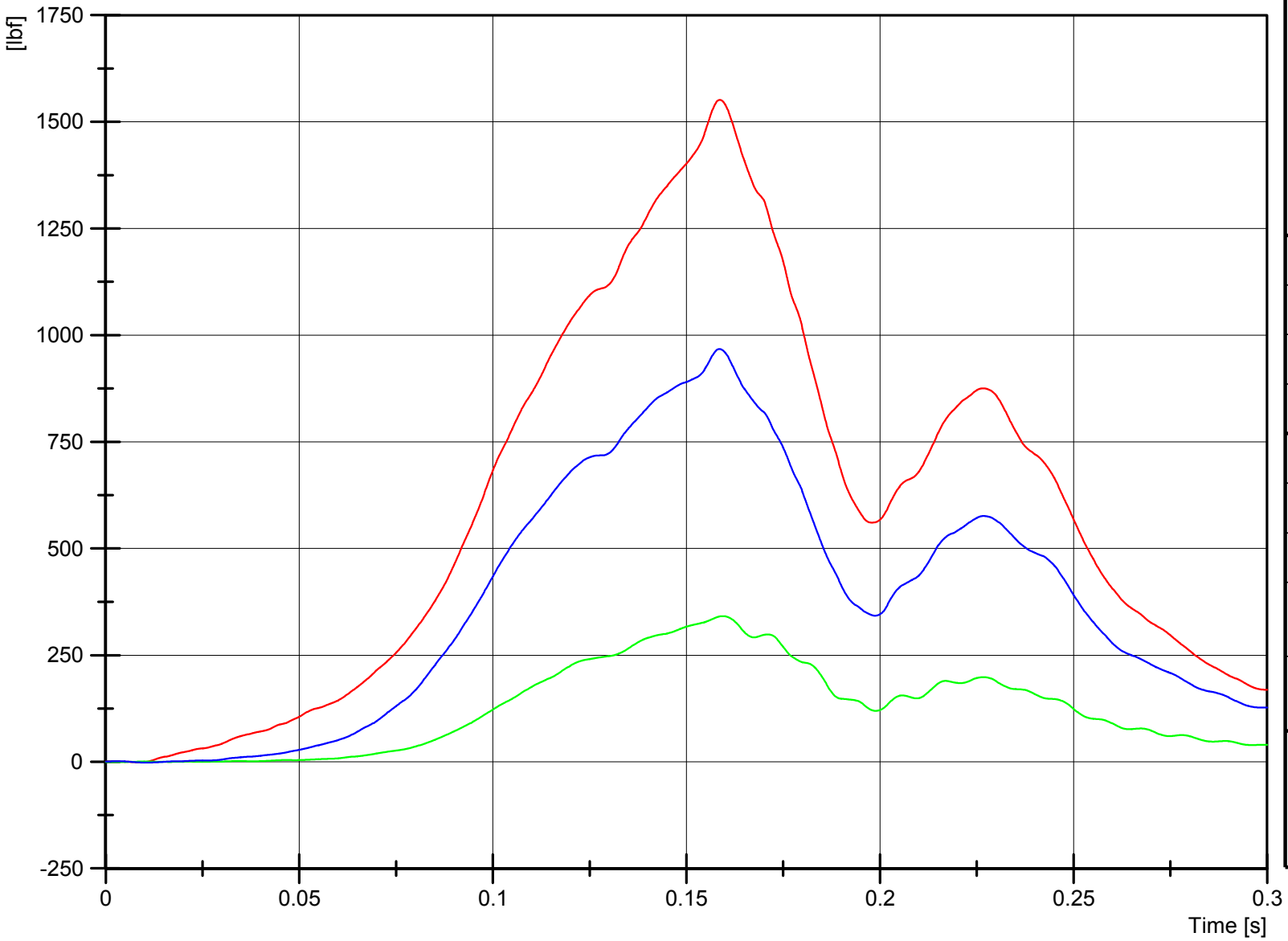
Maximum: 1827.95 lbf Time: 0.1623 sec.
Minimum: -1.2193 lbf Time: 0.0089 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC093FX
Sensitivity: 2.587E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 22
Ref. No.: 74
Polarity: N

Rigid Seat Right Lap Fy

Maximum: 0.6775 lbf Time: 0.019 sec.
Minimum: -443.73 lbf Time: 0.1634 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC093FY
Sensitivity: 2.572E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 23
Ref. No.: 75
Polarity: N

Rigid Seat Right Lap Fz

Maximum: 1178.55 lbf Time: 0.1524 sec.
Minimum: -2.0137 lbf Time: 0.0116 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC093FZ
Sensitivity: 1.044E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 24
Ref. No.: 76
Polarity: N



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Doc. No.: CDL-FA14B-12-01

Version: New

Report Date: 03/26/2014

Customer: FAA

Test: FA14B-12

Dummy: H2 718

Position: Config 1 - Repaired Belt

Test Description:
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Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/25/2013 11:16

Rigid Seat Left Lap Fx

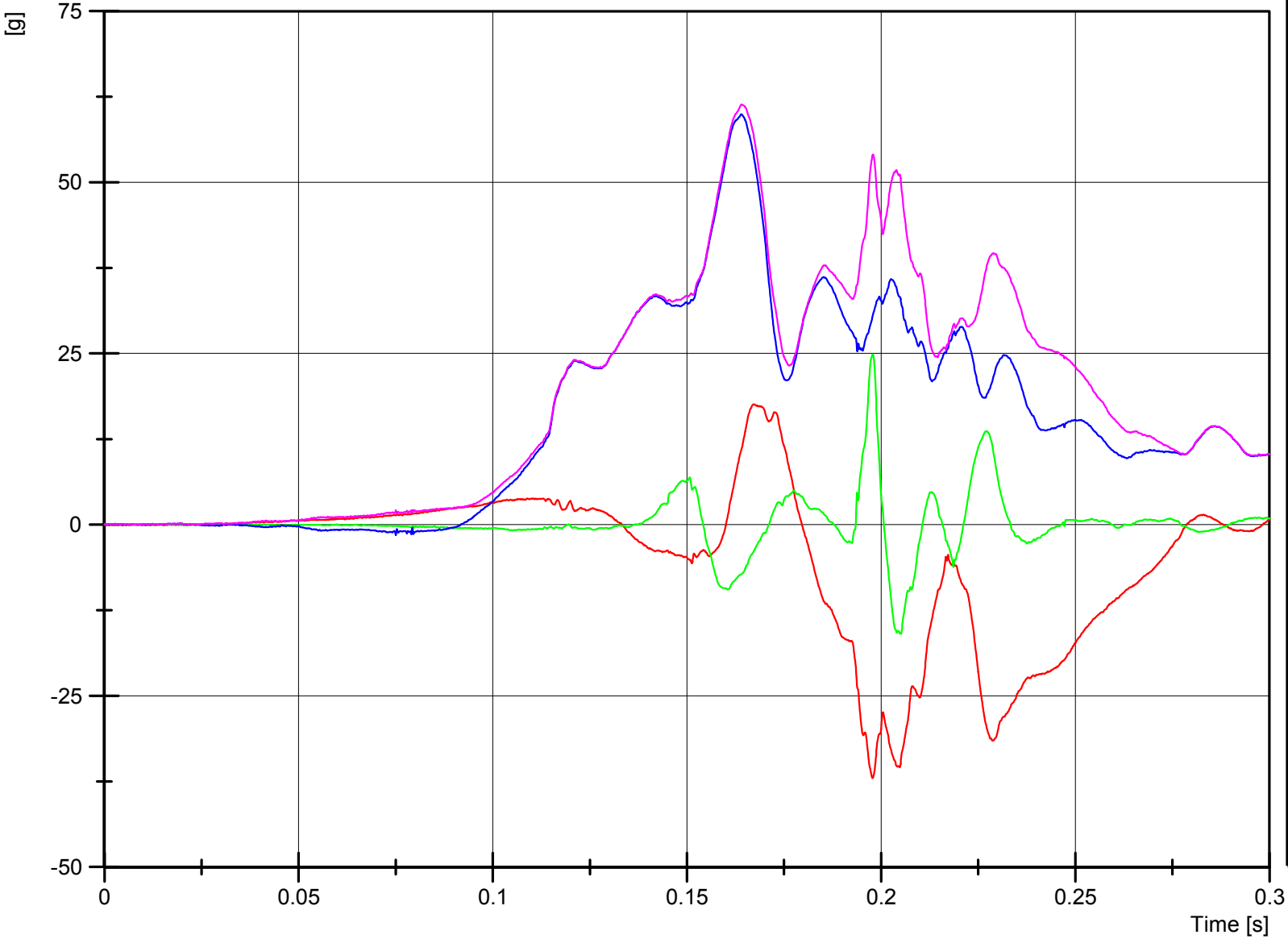
Maximum: 1551.21 lbf Time: 0.1589 sec.
Minimum: -1.0173 lbf Time: 0.0089 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC094FX
Sensitivity: 2.587E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 19
Ref. No.: 77
Polarity: N

Rigid Seat Left Lap Fy

Maximum: 341.38 lbf Time: 0.1595 sec.
Minimum: -0.4562 lbf Time: 0.004 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC094FY
Sensitivity: 2.572E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 20
Ref. No.: 78
Polarity: N

Rigid Seat Left Lap Fz

Maximum: 967.473 lbf Time: 0.1587 sec.
Minimum: -1.6131 lbf Time: 0.0104 sec.
CFC: 60
Sensor Type: Denton 2177A
S/N: STLC094FZ
Sensitivity: 1.044E-07 V/EU
Cal. Due: 05/14/2014
Full Scale: 10000 lbf
DAS Channel: 21
Ref. No.: 79
Polarity: N



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Position: Config 1 - Repaired Belt

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Test Date/Time: 11/25/2013 11:16

Head Ax H2 718

Maximum: 17.6015 g Time: 0.1674 sec.
Minimum: -37.01 g Time: 0.198 sec.
CFC: 1000
Sensor Type: Endevco 7264C
S/N: P47932
Sensitivity: 2.157E-05 V/EU
Cal. Due: 09/25/2014
Full Scale: 2000 g
DAS Channel: 25
Ref. No.: 22
Polarity: R

Head Ay H2 718

Maximum: 24.8749 g Time: 0.198 sec.
Minimum: -15.97 g Time: 0.2053 sec.
CFC: 1000
Sensor Type: Endevco 7264C
S/N: P48149
Sensitivity: 2.603E-05 V/EU
Cal. Due: 09/25/2014
Full Scale: 2000 g
DAS Channel: 26
Ref. No.: 23
Polarity: R

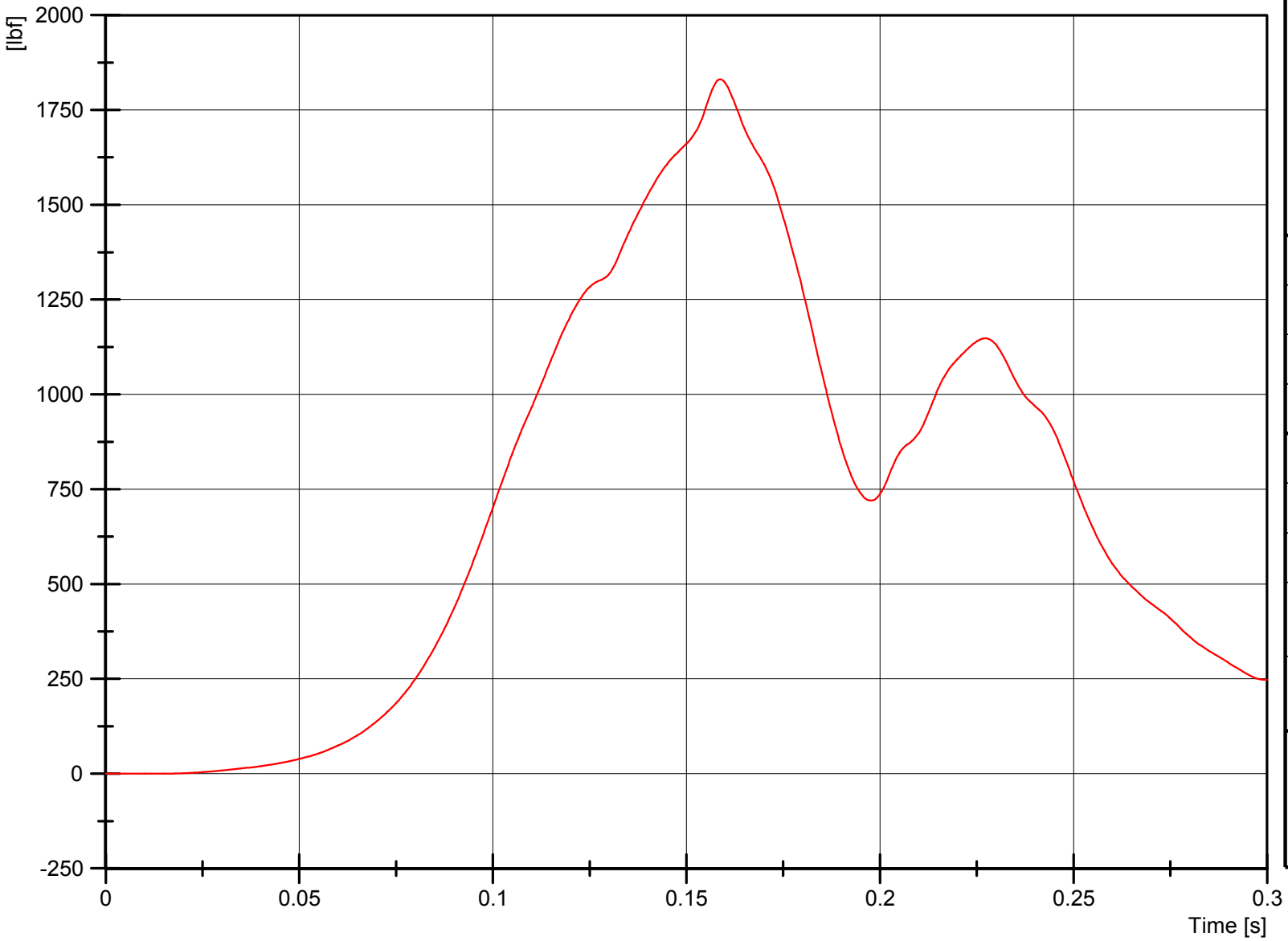
Head Az H2 718

Maximum: 59.9617 g Time: 0.1642 sec.
Minimum: -1.5139 g Time: 0.0752 sec.
CFC: 1000
Sensor Type: Endevco 7264C
S/N: P60367
Sensitivity: 1.782E-05 V/EU
Cal. Due: 09/25/2014
Full Scale: 2000 g
DAS Channel: 27
Ref. No.: 24
Polarity: R

Head Resultant H2 718

Maximum: 61.39 g Time: 0.164 sec.

HIC: 937.6
T1: 117.3 msec.
T2: 253.5 msec.



Lap Belt Force H2 718

Maximum: 1830.76 lbf Time: 0.1589 sec.
Minimum: -0.0246 lbf Time: 0.013 sec.
CFC: 60
Sensor Type: Denton 3255
S/N: SBLC086
Sensitivity: 6.6006E-07 V/EU
Cal. Due: 05/16/2014
Full Scale: 3000 lbf
DAS Channel: 36
Ref. No.: 17
Polarity: N

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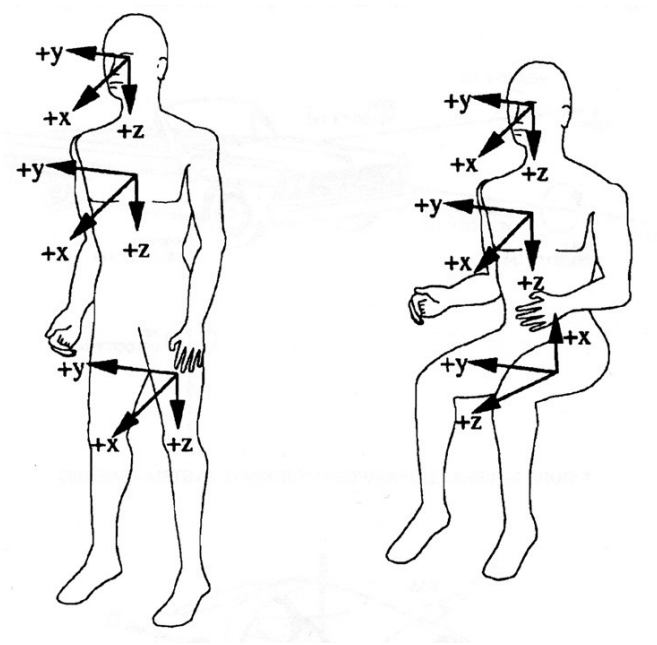
J211/1 Sign Conventions



Upper Neck Load Cell:
+FX Head rearward, chest forward
+FY Head leftward, chest rightward
+FZ Head upward, chest downward
+MX Left ear toward left shoulder
+MY Chin toward sternum
+MZ Chin toward left shoulder

Lumbar Load Cell:
+FX Chest rearward, pelvis forward
+FY Chest leftward, pelvis rightward
+FZ Chest upward, pelvis downward
+MX Left shoulder toward left hip
+MY Sternum toward front of legs
+MZ Right shoulder forward, left shoulder rearward

Femur Load Cells:
+FZ Tension

Chest Displacement:
-DX Compression

Rib Dispacement:
-DY Compression

Belt Load Cells:
+FX Tension

Floor Load Cells:
+FX Test article forward
+FY Test article right
+FZ Test article up

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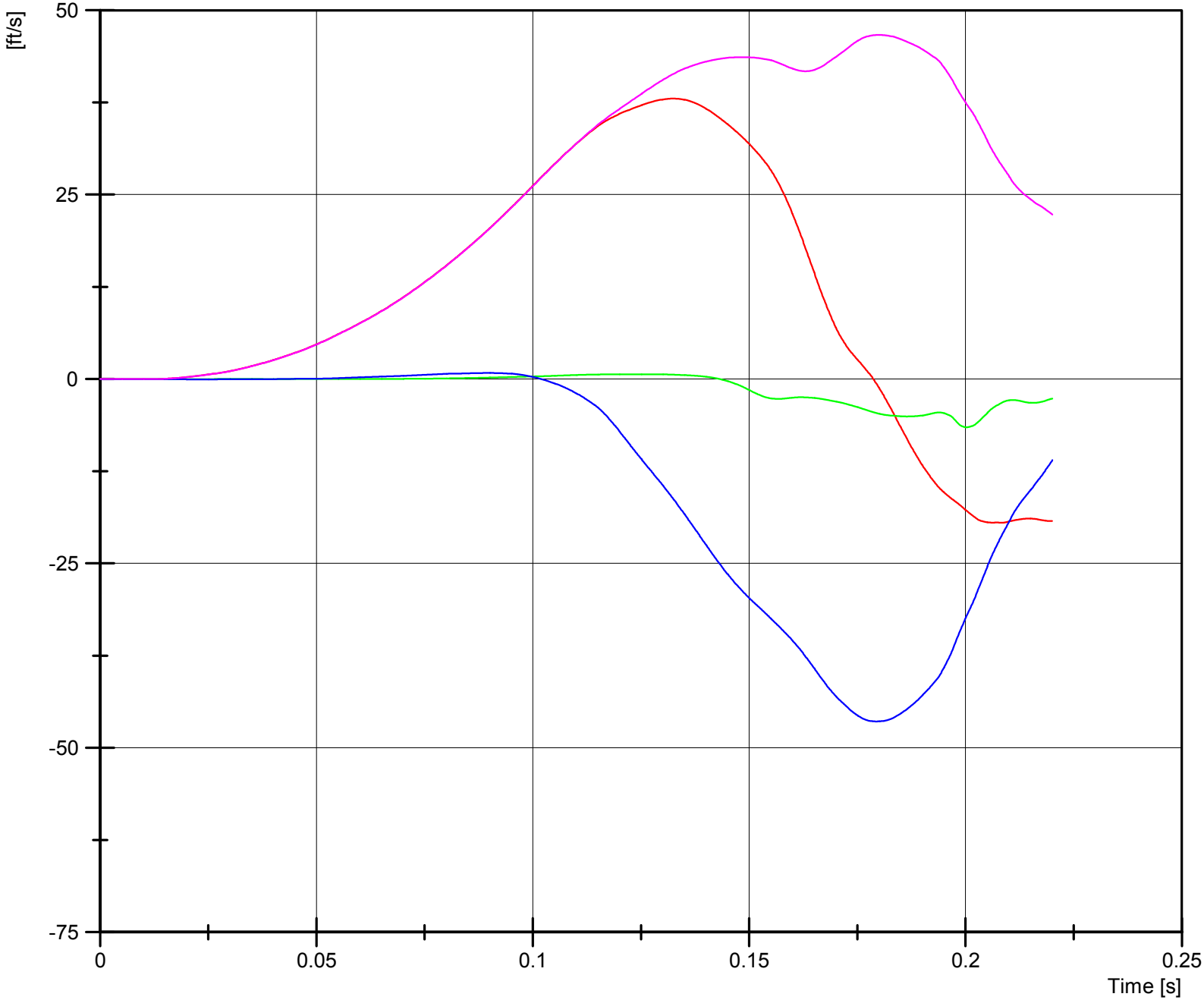

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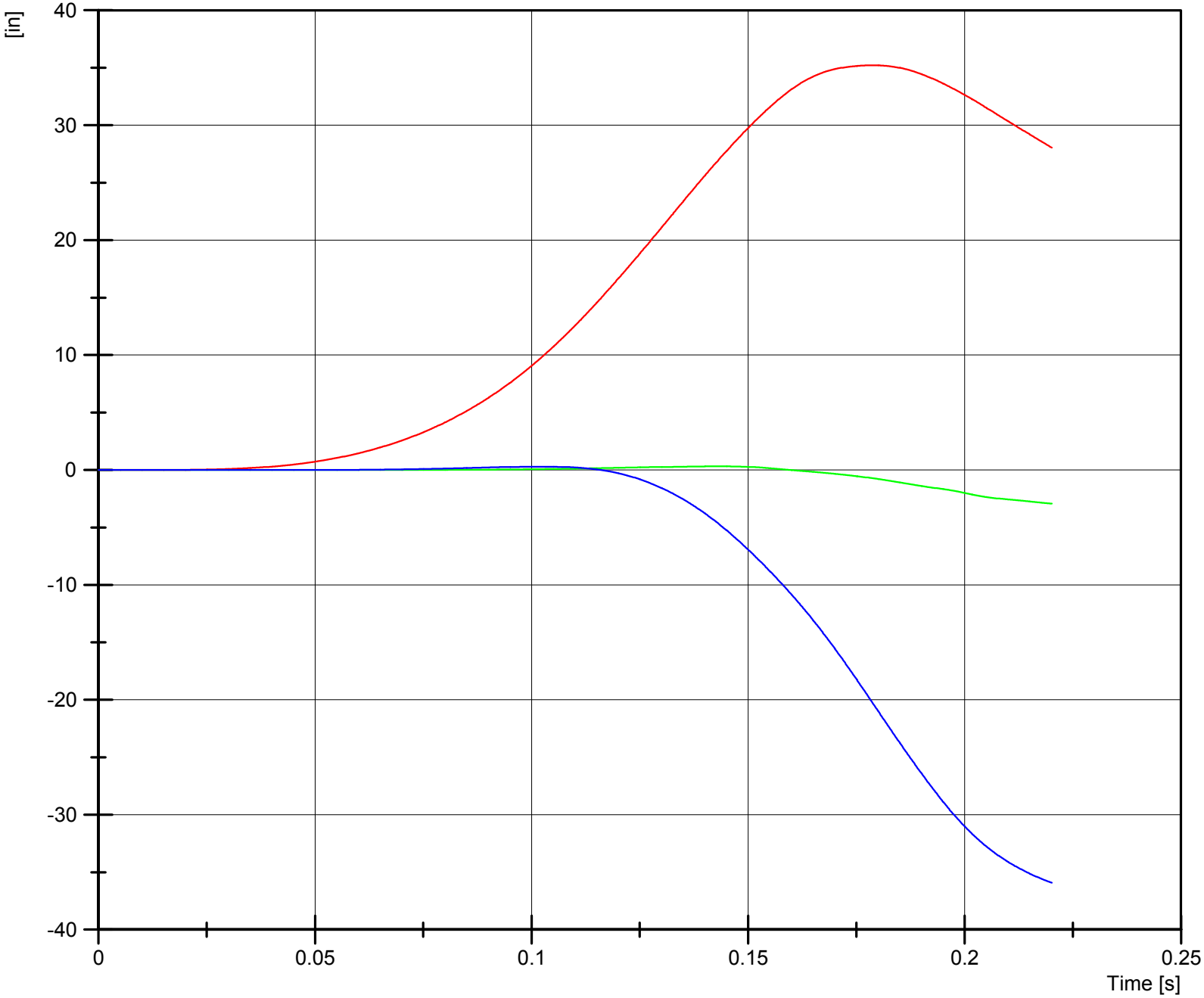
Comments:

Global Head Vx H2 718		Global Head Vy H2 718		Global Head Vz H2 718		Global Head Velocity Resultant H2 718	
Maximum: 38.04 ft/s	Time: 0.1323 sec.	Maximum: 0.633 ft/s	Time: 0.1271 sec.	Maximum: 0.840 ft/s	Time: 0.09 sec.	Maximum: 46.67 ft/s	Time: 0.18 sec.
Minimum: -19.49 ft/s	Time: 0.2083 sec.	Minimum: -6.54 ft/s	Time: 0.2002 sec.	Minimum: -46.43 ft/s	Time: 0.1794 sec.	Minimum: 0 ft/s	Time: 0.0001 sec.



Global Head Dx H2 718 | Global Head Dy H2 718 | Global Head Dz H2 718

Maximum: 35.22 in	Time: 0.1788 sec.	Maximum: 0.33 in	Time: 0.1432 sec.	Maximum: 0.30 in	Time: 0.102 sec.
Minimum: -0.00 in	Time: 0.0135 sec.	Minimum: -2.93 in	Time: 0.2201 sec.	Minimum: -35.91 in	Time: 0.2201 sec.

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Rate: 10000
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Total Samples: 81920
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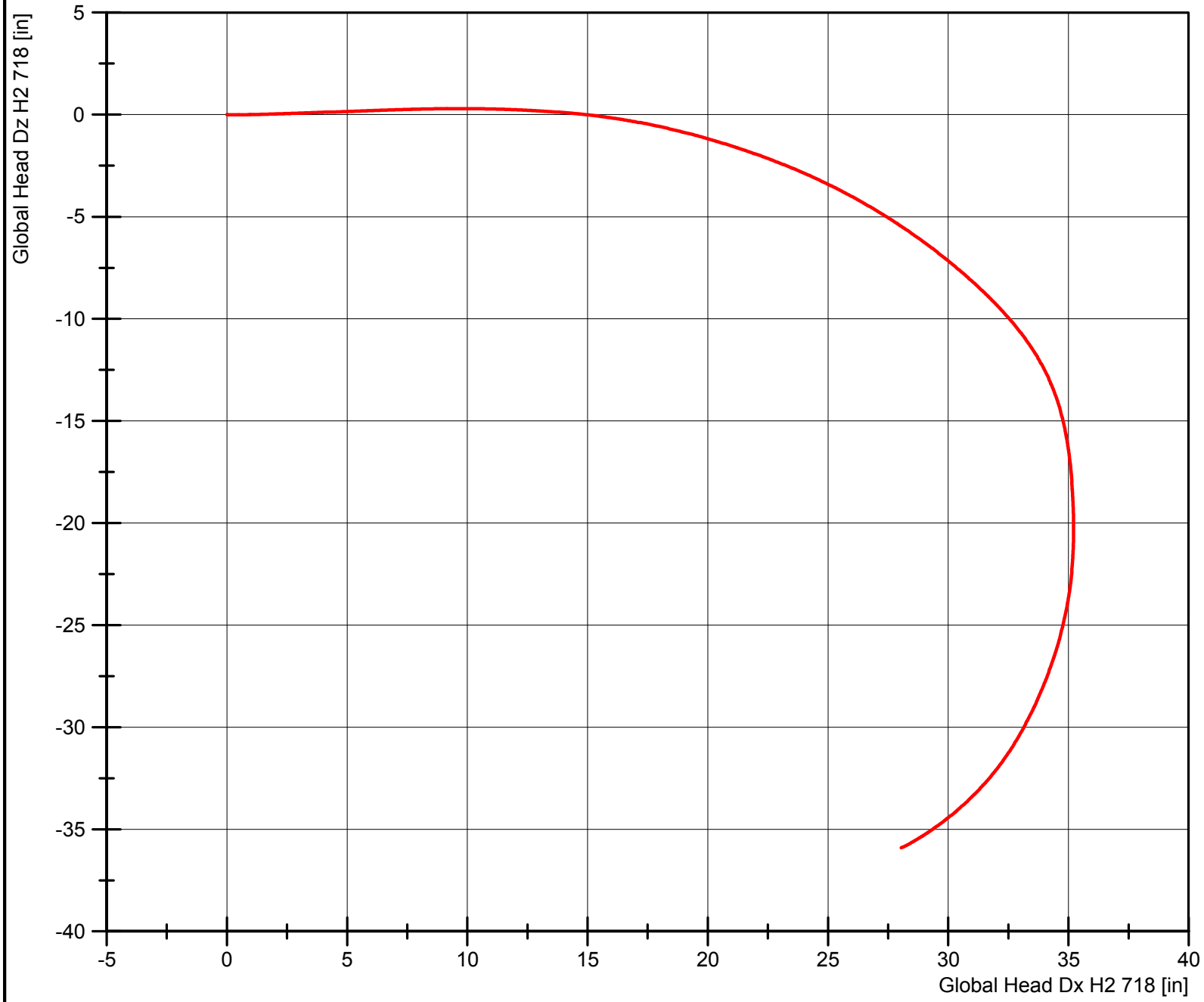
Test Date/Time: 11/25/2013 11:16

Comments:

Displacement values are calculated from Head Accelerations and Angular Velocities.
This method cannot be used to substitute photometric analysis.



Global Head Displacement XZ

X Maximum: 35.22 in **Time: 0.1788 sec.**

Z Value at X Maximum: -20.29 in

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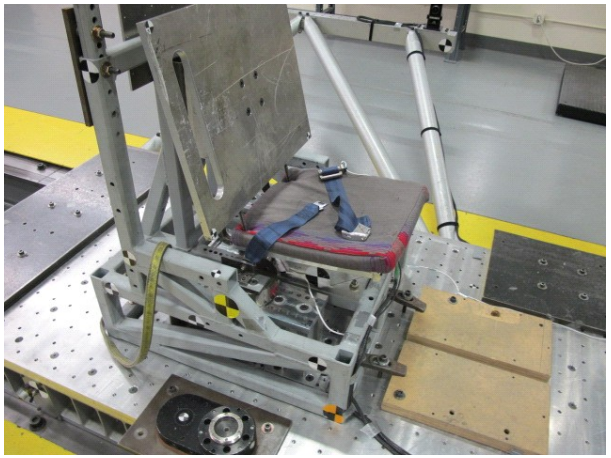
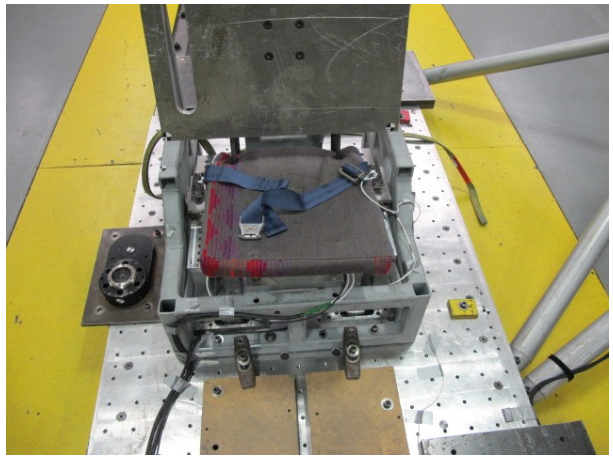
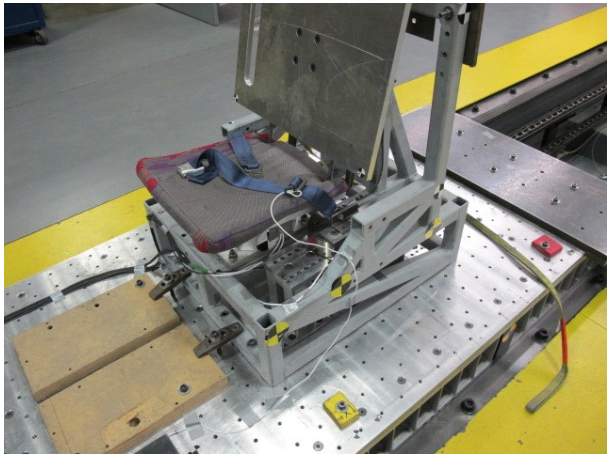
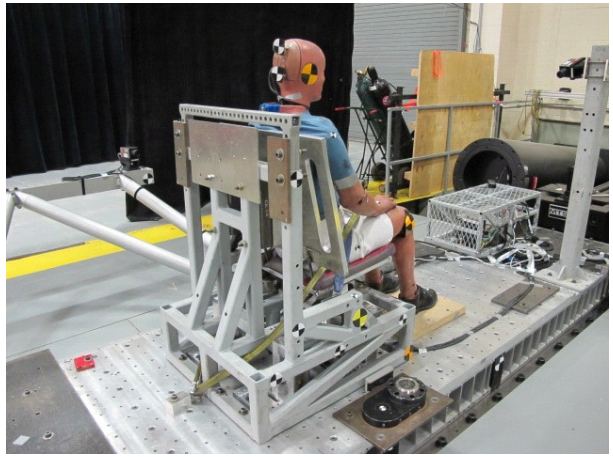
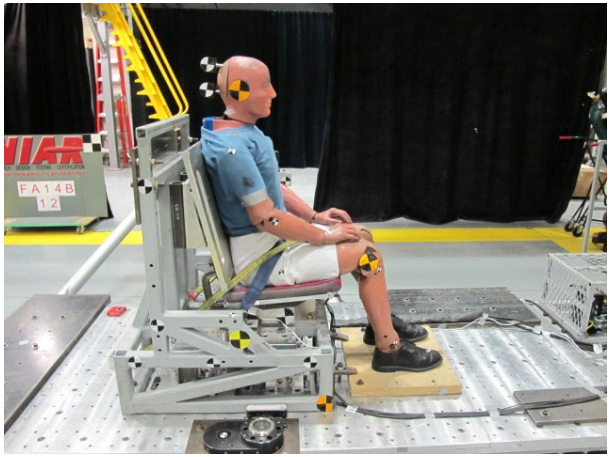
Pre-test Photos











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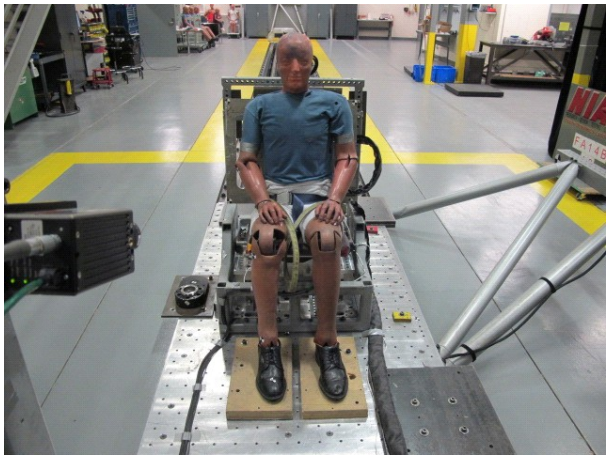

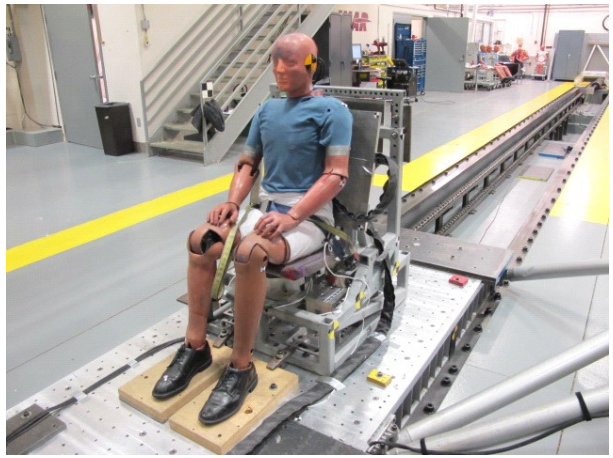

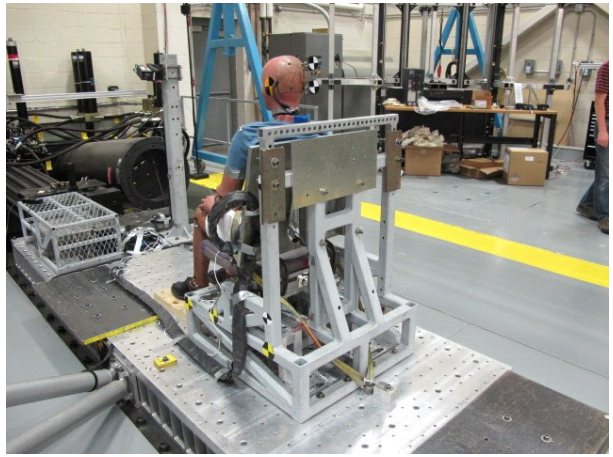

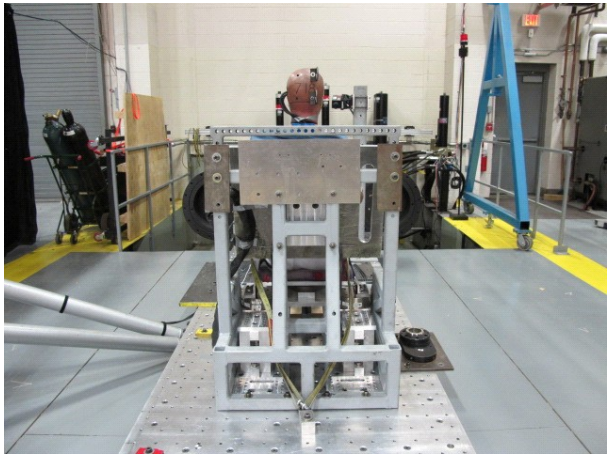

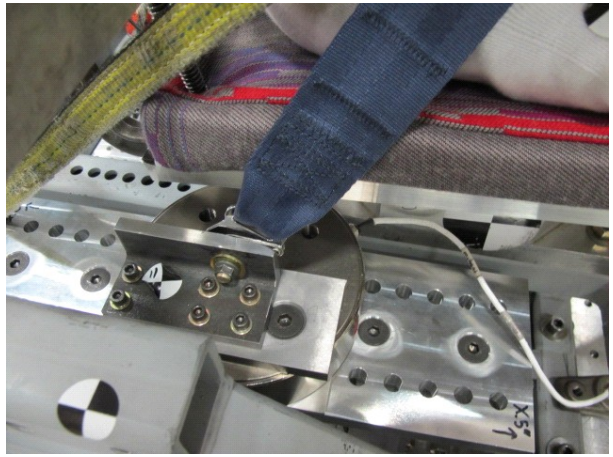

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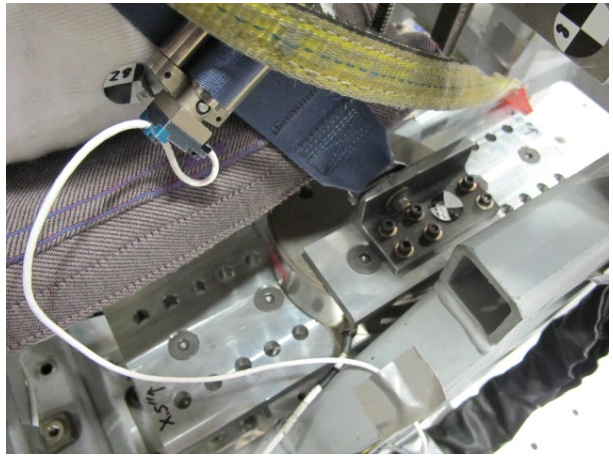

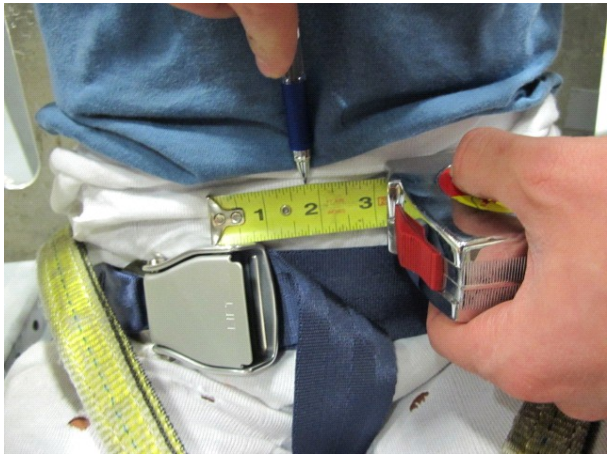

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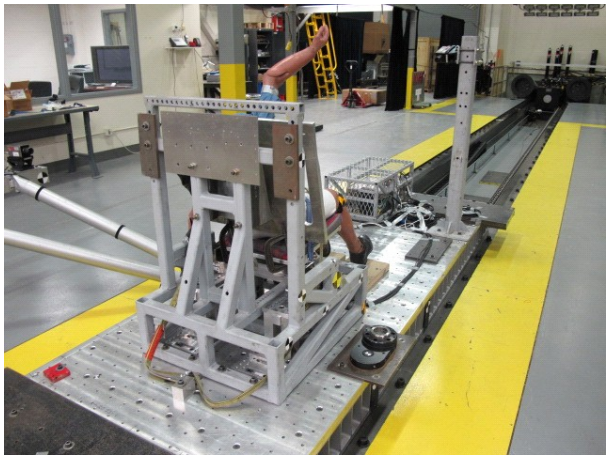

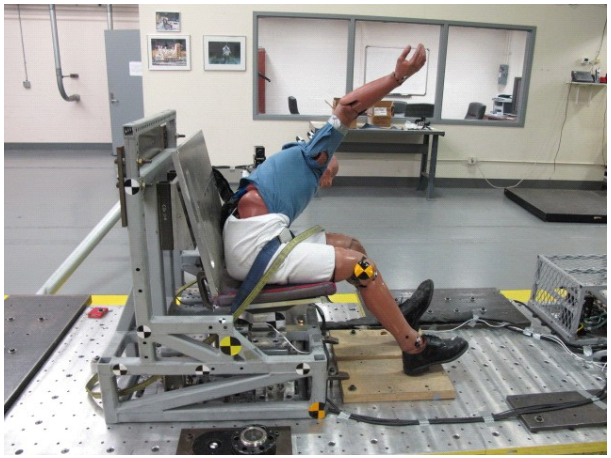

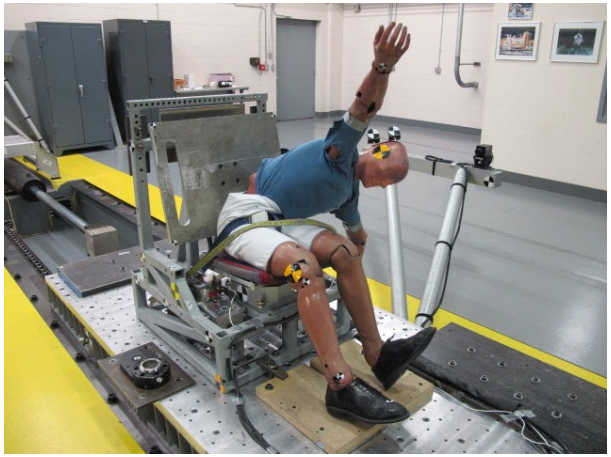

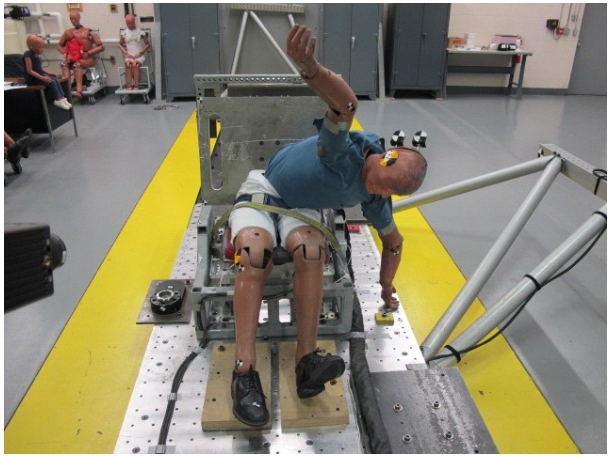

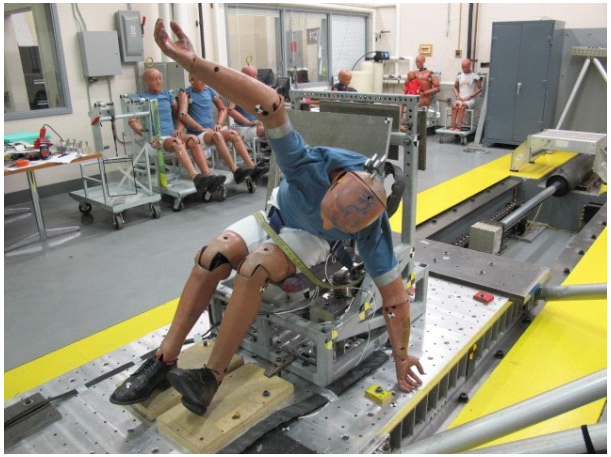

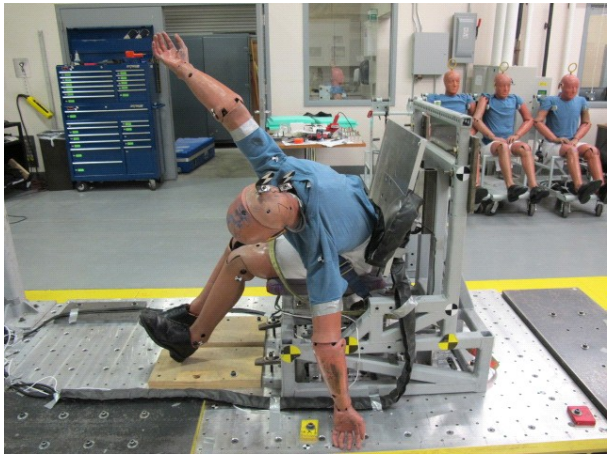

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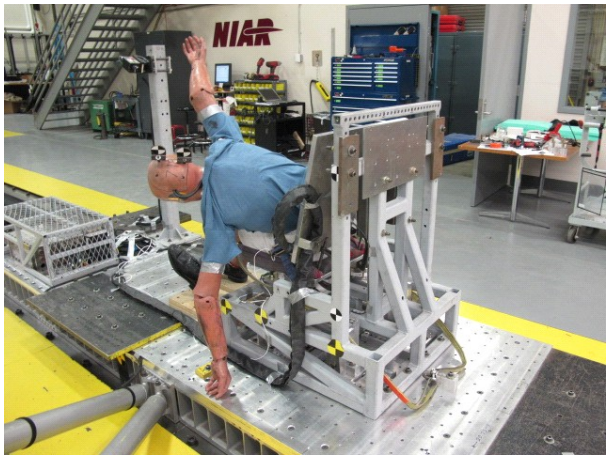
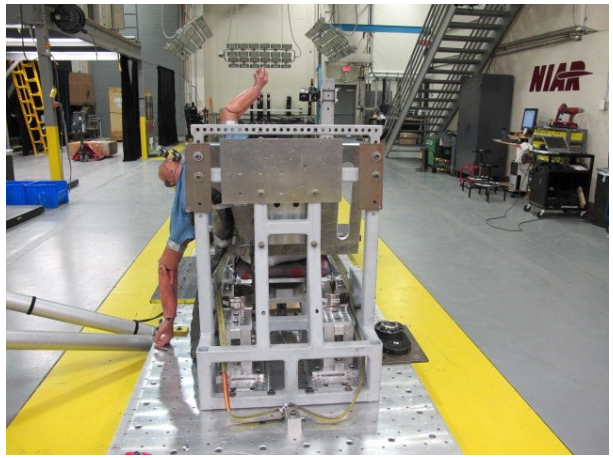
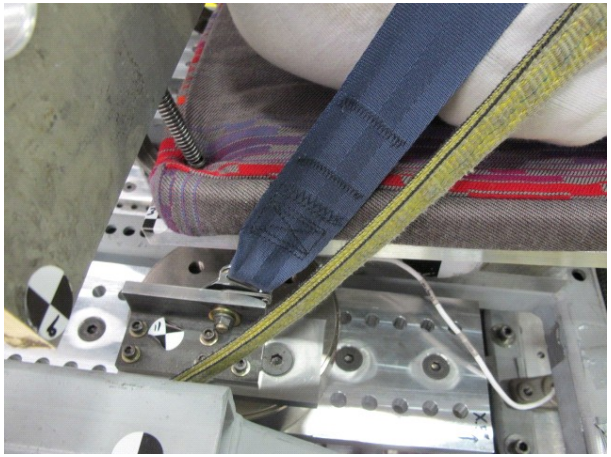
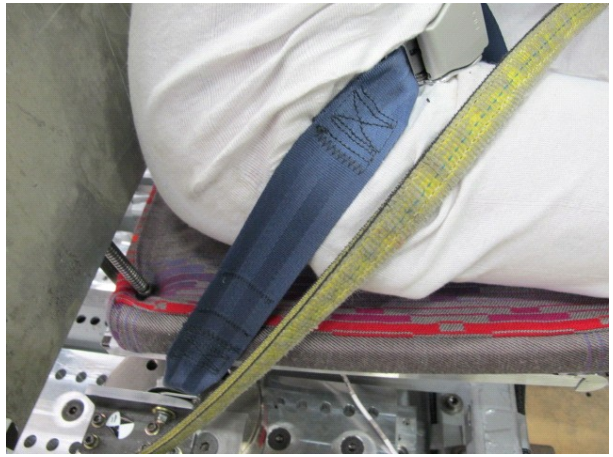
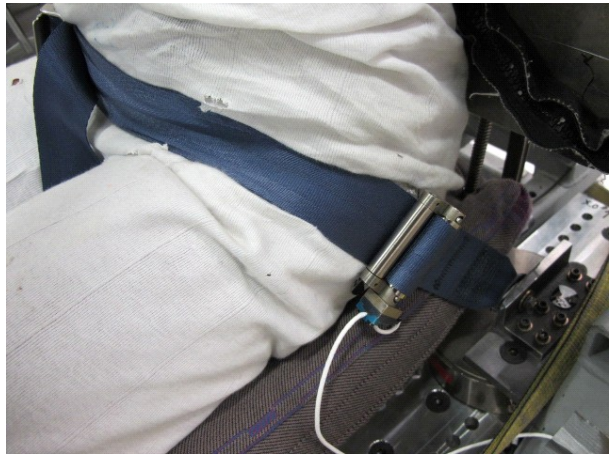










CRASH DYNAMICS LABORATORY

National Institute for Aviation Research
1845 N. Fairmount St.
Wichita, Kansas 67260-0093
Tel: (316) 978-5239
Fax: (316) 978-3175
www.niar.wichita.edu

Doc. No.: CDL-FA14B-12-01

Version: New

Report Date: 03/26/2014

Customer: FAA

Test: FA14B-12

Dummy: N/A

Position: N/A

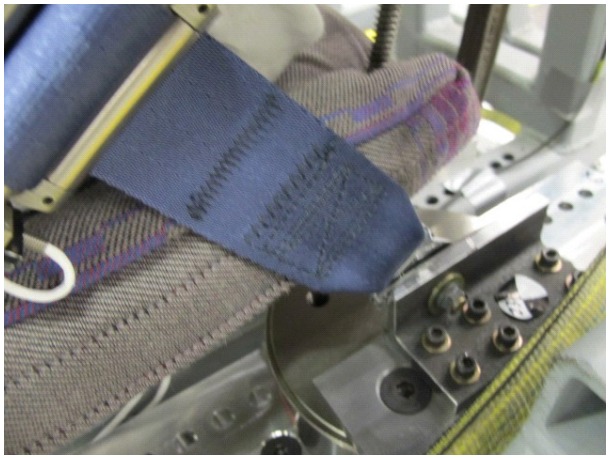
Test Description:
14 CFR 25.562 Test 2

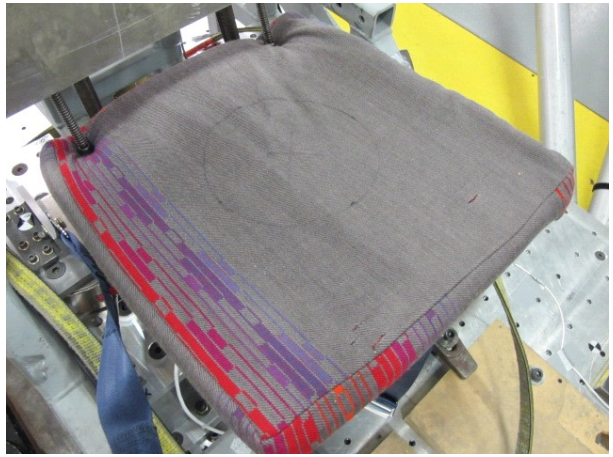
Pulse Name:
16g-07b

Rate: 10000
Pretrigger Samples: 40960
Total Samples: 81920
Rev.: Impax-SD 6.02 Rev A12t
Test Date/Time: 11/25/2013 11:16

Comments:

Post-test Photos





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