CHILD RESTRAINT
SLED TEST
FMVSS 213 Frontal Impact

PJLA
Testing
Accreditation #76654

Report Number: 1067-17-01
Report Date: July 19, 2017

Test Date: July 18, 2017

Test Conducted By:

Calspan Corporation
Transportation Test Operations
4455 Genesee Street
Buffalo, New York 14225
716.632.7500
1.800.CALSPAN

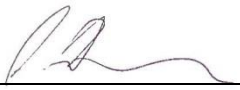
Prepared For:

Braxx Sp. Z o.o
Warzawska 976
05-083 Borzecin maly
Poland

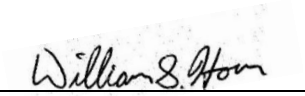
Calspan

DISCLAIMER

The contents of this report relate only to the specific product evaluated under the specific test conditions, as defined within this report. Any changes to the contents of this report (including, but not limited to: modifications, deletions, additions, etc) are expressly prohibited. If such changes occur without the prior knowledge or expressed written consent of Calspan, Calspan will take actions to disclaim the validity of the changes and report same to the appropriate authorities. The findings and conclusions are those of the author(s) and not necessarily those of Calspan Corporation. For the purposes of this report, Calspan Corporation provided test services only and was not involved with the consulting, design or manufacture of any product. Calspan Corporation does not endorse products or manufacturers. Further, Calspan Corporation (to include: any of its affiliates, parent companies or subsidiaries) assumes no liability associated with the contents of this report or the use of this report.

Prepared by:  Date: July 19, 2017

Adam Hardbattle, SLED Engineer

Authorized by:  Date: July 19, 2017

William Horn, SLED Director

TABLE OF CONTENTS

REVISION HISTORY

Revision	Revision Date	Description

SECTION 1
TEST PURPOSE

This report represents the results of a sled test program performed at Calspan's Transportation Test Operations for Braxx Sp. Z o.o during July 18, 2017. All tests were performed on the Transportation Research Group's tandem configuration Hydraulically Controlled, Gas Energized (HYGE) Sled utilizing non-reinforced seat covers on both benches. The standard seats were equipped with certified foam inserts prior to each test program. The foam utilized for each test is documented in this report. Change frequency was based on requirements or every 5 tests. The objective of these tests was to obtain data in accordance with the standards set forth in the Federal Motor Vehicle Safety Standard (FMVSS-213) and/or Transport Canada SOR (CMVSS-213), Child Restraint Systems.

The tests conducted under this program are indicator tests of dynamic restraint performance and are not to be considered tests that assure passage of any government standards. The indicator test data presented in this report is solely advisory and is intended to assist in determining the appropriateness of any future action and is not to be considered a warranty or guarantee of performance for any specific purpose.

SECTION 2
TEST SUMMARY

The following ATDs and Anchor systems were used during this test project. Please refer to the test summary page for additional test details.

ATD			
TYPE	**WEIGHTED**	**SERIAL #**	**RUN #**
10-YO HYB III	N	09	001A
3-YO HYB III	N	852	001B
5% Female HYB	N	503	002A
6-YO HYB III	N	141	002B

The SLED Test Data Summary Table lists the test matrix and correlates the dummy and restraint configurations. Data pertaining to each test can be found in section 3 of this report. Each test is broken into individual bench data tables, data traces, corridor, synopsis, and photographs for a test. The tests are arranged according to their order in the test summary in section 2.

Calspan

Braxx - FRONTAL IMPACT SLED TEST - DATA SUMMARY

Sled Test # Date	FMVSS / CMVSS	Veh. Seat Position	Child Restraint	Harness Position	Crotch Position	Recline Position	Seat Direction / Mode	Restraint System	Tether (Y/N)	ATD	Canadian Head Clip 3ms (g's)	HIC 36ms (g's)	Chest 3ms (g's)	Head Ex (in) Pre SB Angle (deg)	Knee Ex (in) Post SB Angle (deg)	Vertical Head CG Exceeded (Y/N)	Test G's (g's)	Velocity (mph)
BX07-17-001A 07/18/2017	F	P3	Smart Kid Belt	-	-	-	FF	Type 2	N	10-YO HYB III SN 09	87.5	881.1	39.7	15.8	29.6	--	22.8	29.5
Comments: - Lap shield and foam spacer are used. No post-test issues.																		
BX07-17-001B 07/18/2017	F	P6	Smart Kid Belt	-	-	-	FF	Type 2	N	3-YO HYB III SN 852	64.2	751.9	47.4	11.7	18.8	--	22.8	29.5
Comments: - No post-test issues.																		
BX07-17-002A 07/18/2017	F	P1	Smart Kid Belt	-	-	-	FF	Type 2	N	5% Female HYB SN 503	--	--	--	17.8	30.1	--	23.2	29.9
Comments: - No post-test issues.																		
BX07-17-002B 07/18/2017	F	P6	Smart Kid Belt	-	-	-	FF	Type 2	N	6-YO HYB III SN 141	56	558.9	47	13.7	19.3	--	23.2	29.9
Comments: - Lap shield is used. No post-test issues.																		

SECTION 3
TEST DATA

This section contains information reporting on the following Data Sections:

- Bench Data
- Data Traces
- Corridor
- Synopsis
- Photos

SLED TEST RUN: BX07-17-001

Braxx - FRONTAL IMPACT SLED TEST - DATA SUMMARY

Sled Test # Date	FMVSS / CMVSS	Veh. Seat Position	Child Restraint	Harness Position	Crotch Position	Recline Position	Seat Direction / Mode	Restraint System	Tether (Y/N)	ATD	Canadian Head Clip 3ms (g's)	HIC 36ms (g's)	Chest 3ms (g's)	Head Ex (in) Pre SB Angle (deg)	Knee Ex (in) Post SB Angle (deg)	Vertical Head CG Exceeded (Y/N)	Test G's (g's)	Velocity (mph)
BX07-17-001A 07/18/2017	F	P3	Smart Kid Belt	-	-	-	FF	Type 2	N	10-YO HYB III SN 09	87.5	881.1	39.7	15.8	29.6	--	22.8	29.5

Comments: - Lap shield and foam spacer are used. No post-test issues.

Bottom Foam (2"x20" and 4"x20")	C57-2x20	T23-4x20	Back Foam (2"x24" and 4"x24")	H16-2x24	S9-4x24

Test	Compliance Requirement	Test Result	Pass/Fail
Buckle	(S5.4.3.5(e) of CFR 571.213 2015) Buckle did not release during the dynamic test	No Buckle	NA
Structural integrity:	(S5.1.1(a) of CFR 571.213 2015) No Complete Separation	No Structure	NA
	(S5.1.1(a) of CFR 571.213 2015) No Partial Separation with Exposed Edge Radius < 6.4mm (1/4")	No Structure	NA
	(S5.1.1(a) of CFR 571.213 2015) No Partial Separation with Protrusion> 9.5mm (3/8")	No Structure	NA
Adjustment Positioning During Impact:	(S5.1.1(b)(1) and S5.1.1(b)(2)(ii) of CFR 571.213 2015) No Change of Position or Decrease in Existing Openings from change.	No Change	Pass
RF Head Excursion:	(S5.1.3.2 of CFR 571.213 2015) Head CG not beyond the forward-most edge of the restraint system nor shall the head-torso angle be more than 45 degrees rearward	NA	NA
Max. Back Support:	(S5.1.4 of CFR 571.213 2015) Equal to, or less than 70 degrees	NA	NA
Head Support	(S5.2.1.1(c) of CFR 571.213 2015) Head to torso angle difference less than 45 degrees when placed in seat (whiplash)	NA	NA
Chest Acceleration:	(S5.1.2.1(b) of CFR 571.213 2015) The chest acceleration shall not exceed 60g for intervals whose cumulative duration is more than 3 ms.	39.7	Pass
Head Acceleration:	(S5.1.2.1(a) of CFR 571.213 2015) Maximum calculated head injury criterion for a 36ms time interval shall not exceed 1000 (not applicable for tests using 10YO & weighted 6-year-old dummy).	881.1	Pass
Forward Head Excursion	(S5.1.3.1(a)(1) of CFR 571.213 2015) Allow any portion of the head to go more than 32" (813mm) past Z-point - unless tethered, then 28.3" (720mm) past Z-point.	15.8	Pass
Forward Knee Excursion	(S5.1.3.1(a)(2) of CFR 571.213 2015) Allow knee pivot point to go more than 36" (915mm) past Z-point.	29.6	Pass

Calspan

Braxx BX07-17-001
Bench A

Test Date:
7/18/2017

Critical Injury Values

Test Parameter	Limit	Value	Time 1 msec	Time 2 msec	Duration
Head Injury (15 ms)	-	**654.7**	65.1	80.1	15
Head Injury (36 ms)	**1000**	**881.1**	48.5	84.4	36
Head Clip (3 ms)	**80**	**87.5**	73.9	76.9	3.0
Head Max	**80**	**102.9**	0.0	0.0	4.00
Resultant Chest Clip	**60**	**39.7**	43.1	46.1	3.0
Chest Max	**60**	**43.4**	0.0	0.0	0.0

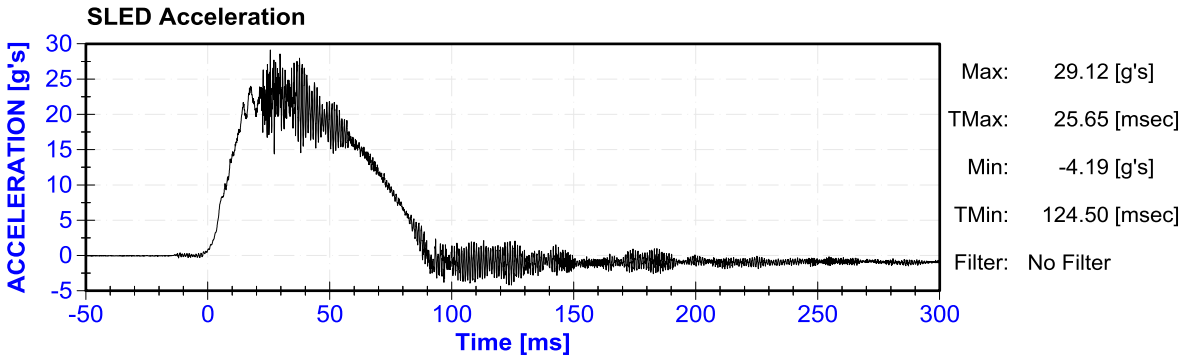
Maximum / Minimum Values

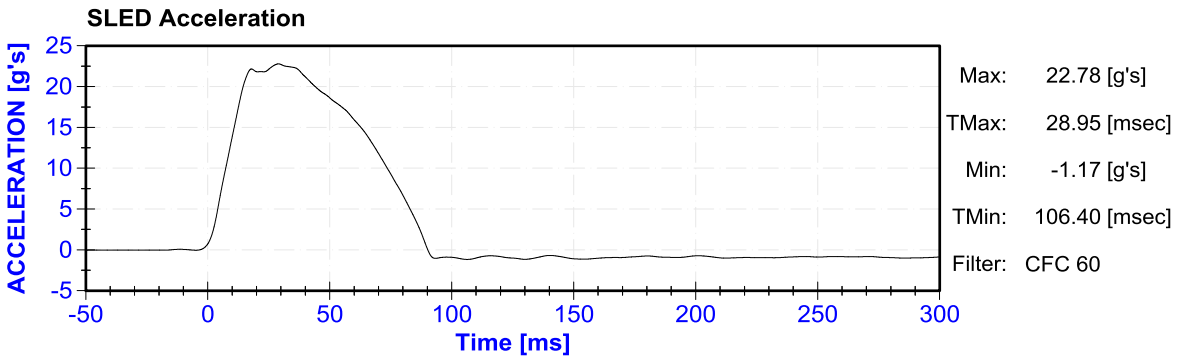
Channel	Unit	Max	Max Time msec	Min	Min Time msec	Filter
SLED Acceleration	g's	22.8	29.0	-1.2	106.4	CFC 60
SLED Acceleration Velocity	mph	29.5	90.2	-0.0	-49.9	CFC 180
SLED Acceleration Displacement	ft	10.6	300.0	-0.0	0.3	CFC 180
A Bench ATD Head X Acceleration	g's	22.1	176.9	-97.7	75.0	CFC 1000
A Bench ATD Head Y Acceleration	g's	6.4	155.9	-16.2	72.7	CFC 1000
A Bench ATD Head Z Acceleration	G's	53.6	66.5	-34.7	72.7	CFC 1000
A Bench ATD Head Resultant Acceleration	g's	102.9	75.3	0.0	0.9	CFC 1000
A Bench ATD Chest X Acceleration	g's	5.4	189.4	-40.1	44.9	CFC 180
A Bench ATD Chest Y Acceleration	G's	12.4	36.0	-16.3	72.6	CFC 180
A Bench ATD Chest Z Acceleration	g's	25.2	74.1	-32.2	61.8	CFC 180
A Bench ATD Chest Resultant Acceleration	g's	43.4	72.3	0.0	2.5	CFC 180

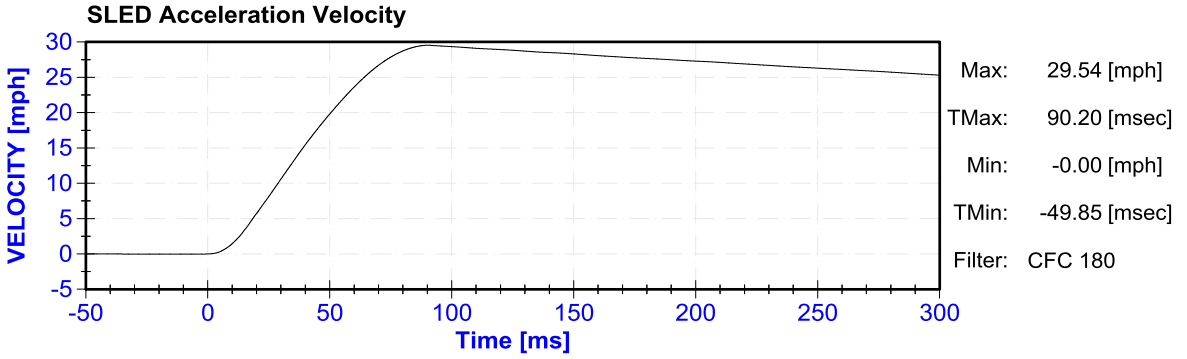
Calspan

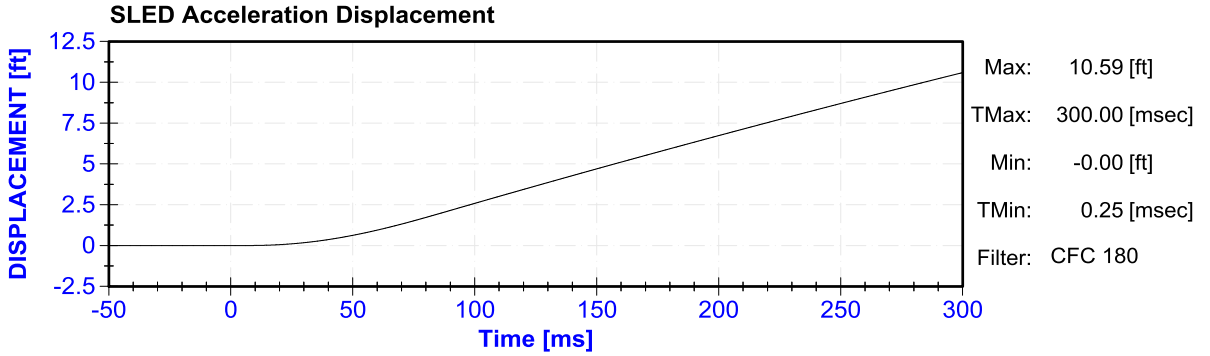
Braxx BX07-17-001

Test Date:
July 18,2017







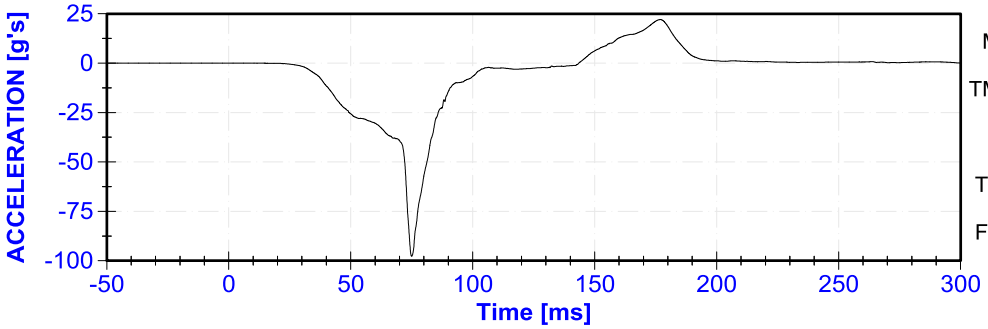


Calspan

Braxx BX07-17-001

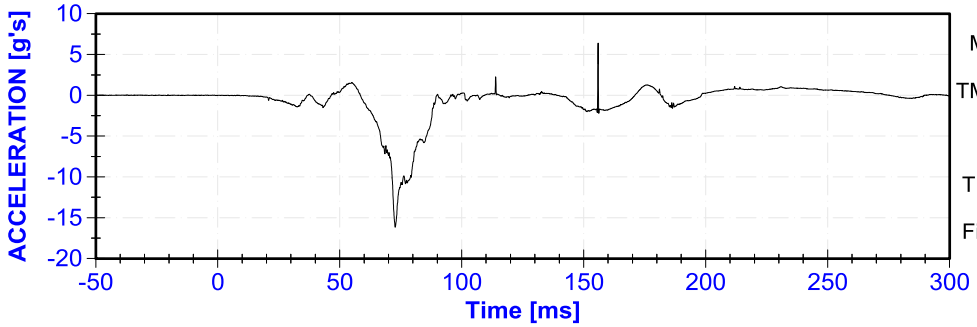
Test Date: July 18,2017

A Bench ATD Head X Acceleration



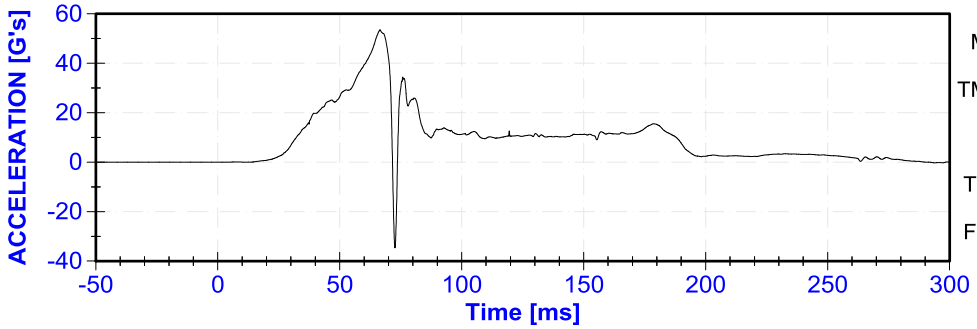
Max: 22.05 [g's]
TMax: 176.90 [msec]
Min: -97.68 [g's]
TMin: 75.00 [msec]
Filter: CFC 1000

A Bench ATD Head Y Acceleration



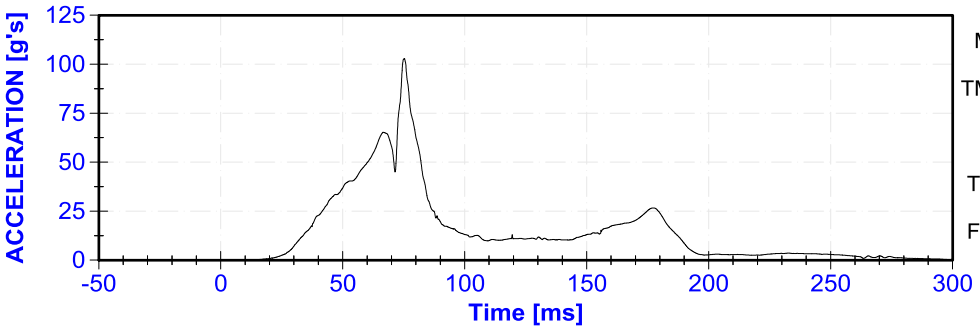
Max: 6.39 [g's]
TMax: 155.90 [msec]
Min: -16.16 [g's]
TMin: 72.70 [msec]
Filter: CFC 1000

A Bench ATD Head Z Acceleration



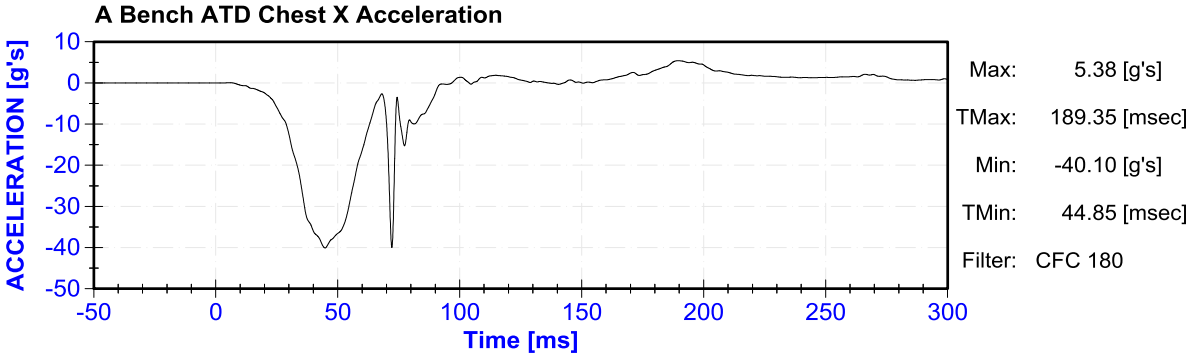
Max: 53.56 [G's]
TMax: 66.45 [msec]
Min: -34.67 [G's]
TMin: 72.65 [msec]
Filter: CFC 1000

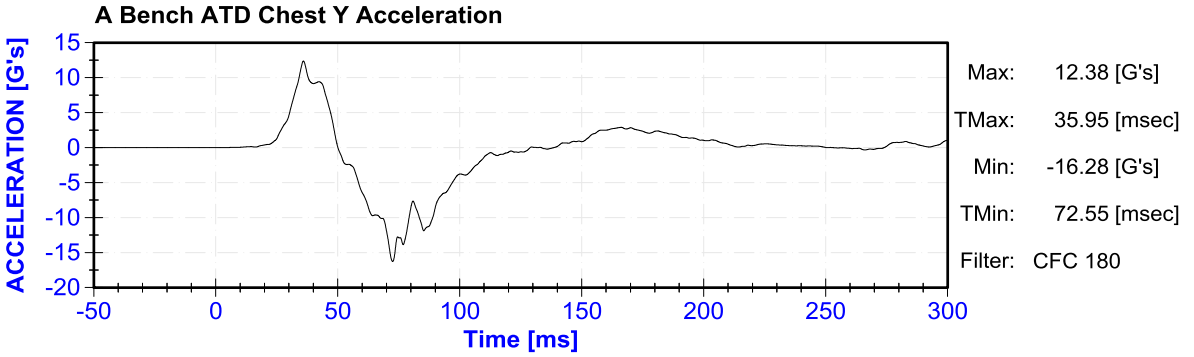
A Bench ATD Head Resultant Acceleration

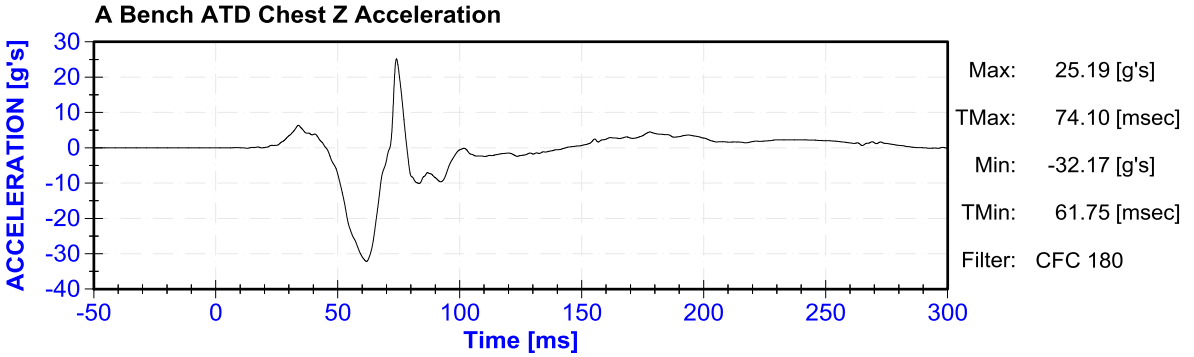


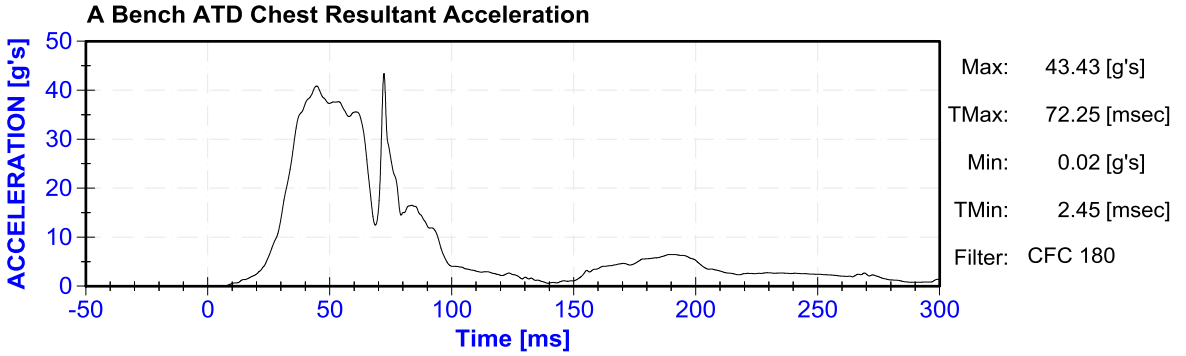
Max: 102.88 [g's]
TMax: 75.30 [msec]
Min: 0.00 [g's]
TMin: 0.85 [msec]
Filter: CFC 1000

Calspan | Braxx BX07-17-001 | Test Date: July 18,2017







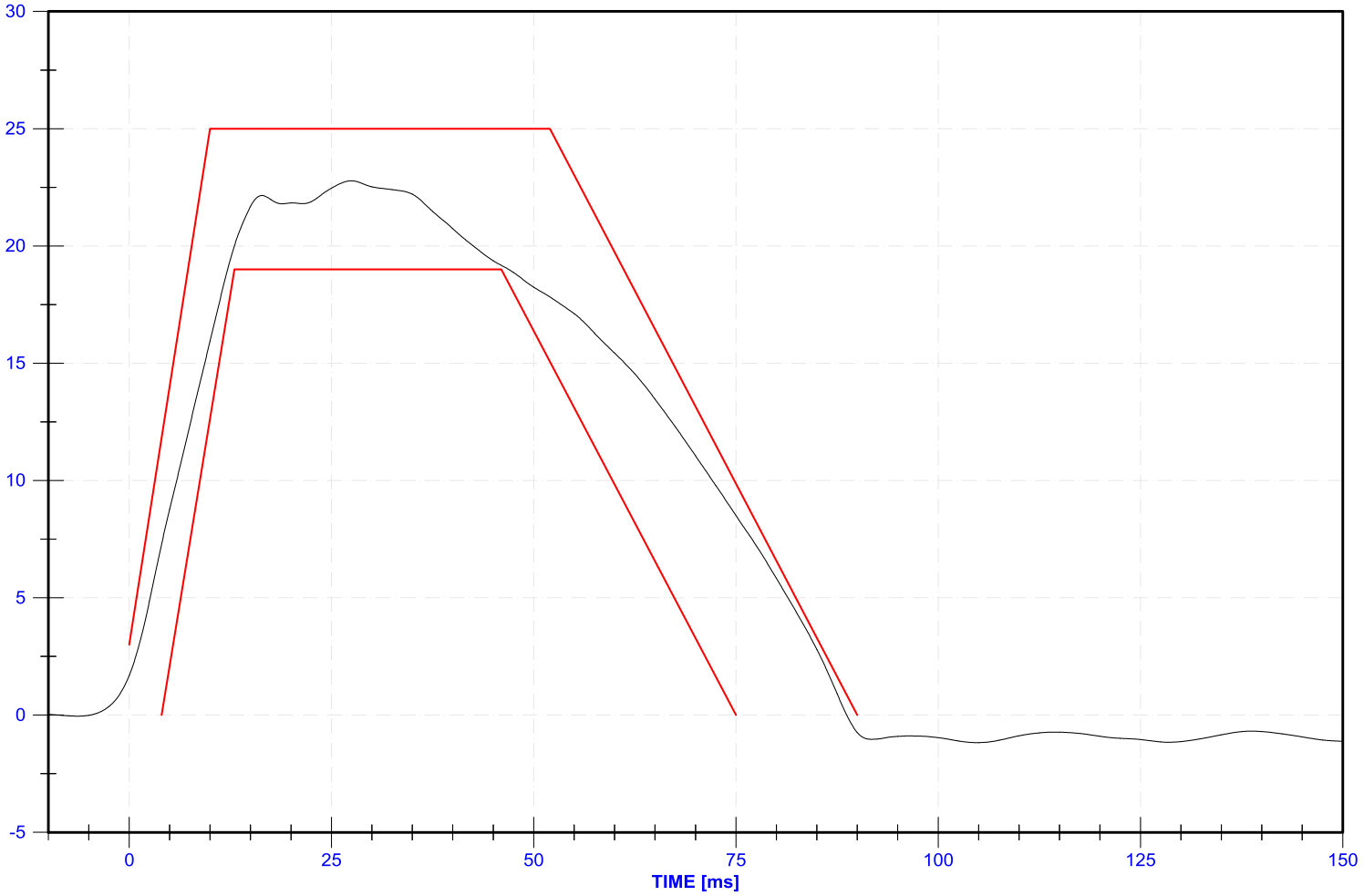


Calspan

Braxx BX07-17-001

Test Date:
July 18,2017

SLED Pulse Corridor



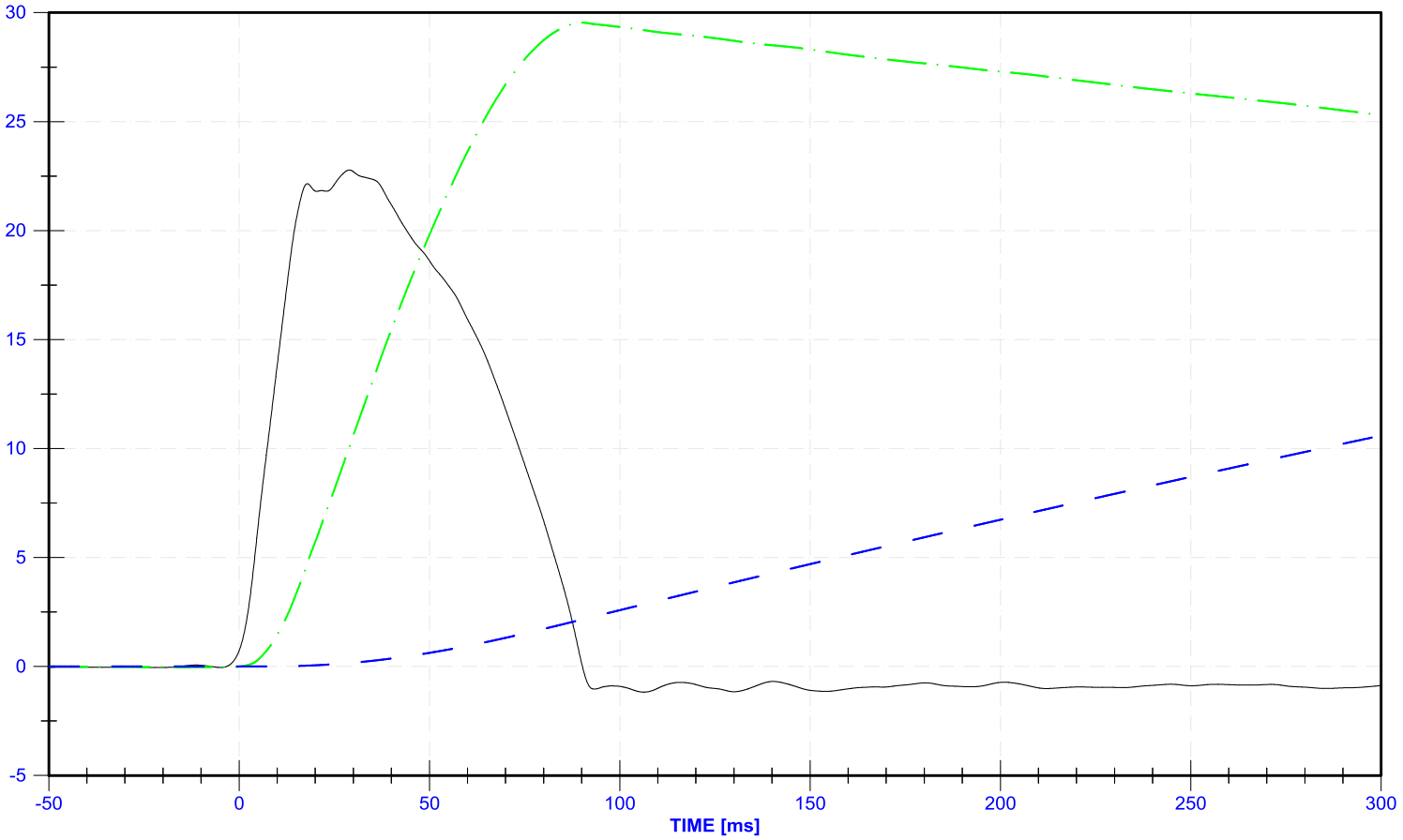
	Maximum	Time (ms)	Filter Class	Legend
SLED Acceleration (g's)	22.77	29.0	CFC 60	S0SLED00OR00ACXD

Calspan

Braxx BX07-17-001

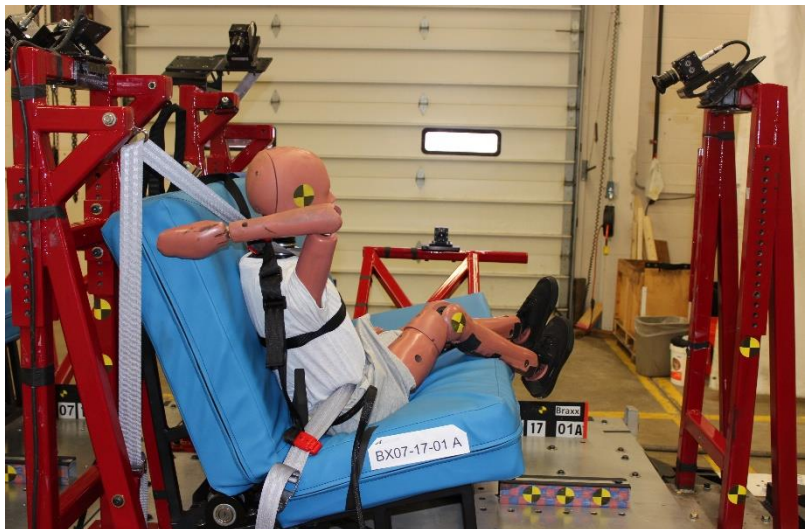
Test Date:
July 18,2017

SLED Pulse



	Maximum	Time (ms)	Filter Class	Legend
SLED Acceleration (g's)	22.77	106.4	CFC 60	S0SLED000000ACXD
SLED Velocity (mph)	29.53	-14.5	CFC 180	S0SLED000000VAXC
SLED Displacement (ft)	10.59	0.3	CFC 180	S0SLED000000DVXC

Pre-Test



Post-Test

Customer: Braxx Report No: 1067-17-01 Test Date: 07/18/2017

SLED TEST RUN: BX07-17-001

Braxx - FRONTAL IMPACT SLED TEST - DATA SUMMARY

Sled Test # Date	FMVSS / CMVSS	Veh. Seat Position	Child Restraint	Harness Position	Crotch Position	Recline Position	Seat Direction / Mode	Restraint System	Tether (Y/N)	ATD	Canadian Head Clip 3ms (g's)	HIC 36ms (g's)	Chest 3ms (g's)	Head Ex (in) Pre SB Angle (deg)	Knee Ex (in) Post SB Angle (deg)	Vertical Head CG Exceeded (Y/N)	Test G's (g's)	Velocity (mph)
BX07-17-001B 07/18/2017	F	P6	Smart Kid Belt	-	-	-	FF	Type 2	N	3-YO HYB III SN 852	64.2	751.9	47.4	11.7	18.8	--	22.8	29.5

Comments: - No post-test issues.

Bottom Foam (2"x20" and 4"x20")	C62-2x20	T18-4x20	Back Foam (2"x24" and 4"x24")	H22-2x24	S5-4x24

Test	Compliance Requirement	Test Result	Pass/Fail
Buckle	(S5.4.3.5(e) of CFR 571.213 2015) Buckle did not release during the dynamic test	No Buckle	NA
Structural integrity:	(S5.1.1(a) of CFR 571.213 2015) No Complete Separation	No Structure	NA
	(S5.1.1(a) of CFR 571.213 2015) No Partial Separation with Exposed Edge Radius < 6.4mm (1/4")	No Structure	NA
	(S5.1.1(a) of CFR 571.213 2015) No Partial Separation with Protrusion> 9.5mm (3/8")	No Structure	NA
Adjustment Positioning During Impact:	(S5.1.1(b)(1) and S5.1.1(b)(2)(ii) of CFR 571.213 2015) No Change of Position or Decrease in Existing Openings from change.	No Change	Pass
RF Head Excursion:	(S5.1.3.2 of CFR 571.213 2015) Head CG not beyond the forward-most edge of the restraint system nor shall the head-torso angle be more than 45 degrees rearward	NA	NA
Max. Back Support:	(S5.1.4 of CFR 571.213 2015) Equal to, or less than 70 degrees	NA	NA
Head Support	(S5.2.1.1(c) of CFR 571.213 2015) Head to torso angle difference less than 45 degrees when placed in seat (whiplash)	NA	NA
Chest Acceleration:	(S5.1.2.1(b) of CFR 571.213 2015) The chest acceleration shall not exceed 60g for intervals whose cumulative duration is more than 3 ms.	47.4	Pass
Head Acceleration:	(S5.1.2.1(a) of CFR 571.213 2015) Maximum calculated head injury criterion for a 36ms time interval shall not exceed 1000 (not applicable for tests using 10YO & weighted 6-year-old dummy).	751.9	Pass
Forward Head Excursion	(S5.1.3.1(a)(1) of CFR 571.213 2015) Allow any portion of the head to go more than 32" (813mm) past Z-point - unless tethered, then 28.3" (720mm) past Z-point.	11.7	Pass
Forward Knee Excursion	(S5.1.3.1(a)(2) of CFR 571.213 2015) Allow knee pivot point to go more than 36" (915mm) past Z-point.	18.8	Pass

Calspan

Braxx BX07-17-001
Bench B

Test Date:
7/18/2017

Critical Injury Values

Test Parameter	Limit	Value	Time 1 msec	Time 2 msec	Duration
Head Injury (15 ms)	**-**	**370.1**	59.2	74.2	15
Head Injury (36 ms)	**1000**	**751.9**	41.6	77.6	36
Head Clip (3 ms)	**80**	**64.2**	69.7	73.0	3.3
Head Max	**80**	**67.7**	0.0	0.0	0.0
Resultant Chest Clip	**60**	**47.4**	41.3	44.3	3.0
Chest Max	**60**	**48.8**	0.0	0.0	0.0

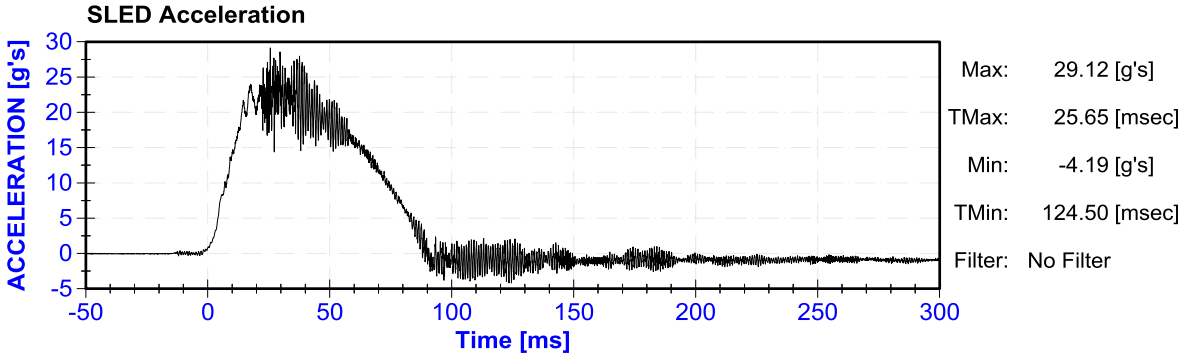
Maximum / Minimum Values

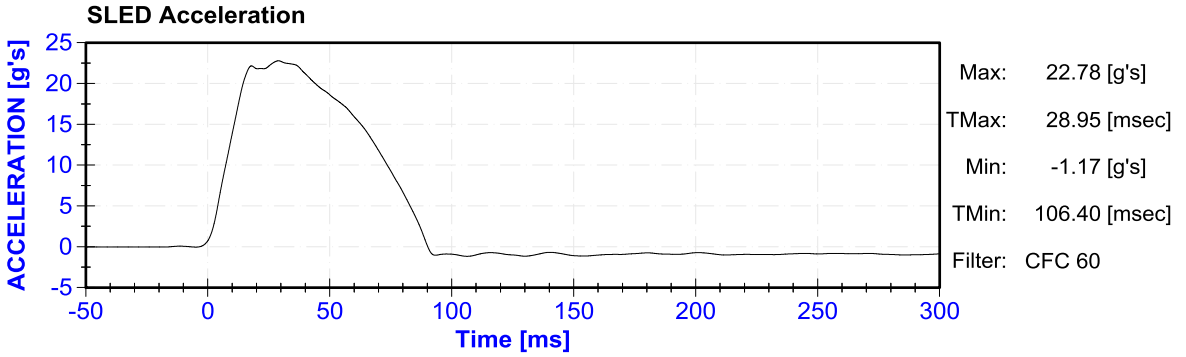
Channel	Unit	Max	Max Time msec	Min	Min Time msec	Filter
SLED Acceleration	g's	22.8	29.0	-1.2	106.4	CFC 60
SLED Acceleration Velocity	mph	29.5	90.2	-0.0	-49.9	CFC 180
SLED Acceleration Displacement	ft	10.6	300.0	-0.0	0.3	CFC 180
B Bench ATD Head X Acceleration	G's	20.9	152.1	-62.5	66.2	CFC 1000
B Bench ATD Head Y Acceleration	G's	13.5	72.7	-3.8	51.4	CFC 1000
B Bench ATD Head Z Acceleration	G's	51.9	53.2	-0.5	295.4	CFC 1000
B Bench ATD Head Resultant Acceleration	g's	67.7	72.3	0.0	0.8	CFC 1000
B Bench ATD Chest X Acceleration	G's	4.1	175.3	-48.0	42.8	CFC 180
B Bench ATD Chest Y Acceleration	G's	6.9	40.8	-8.3	66.5	CFC 180
B Bench ATD Chest Z Acceleration	g's	5.6	173.4	-16.0	74.1	CFC 180
B Bench ATD Chest Resultant Acceleration	g's	48.8	42.8	0.0	-49.9	CFC 180

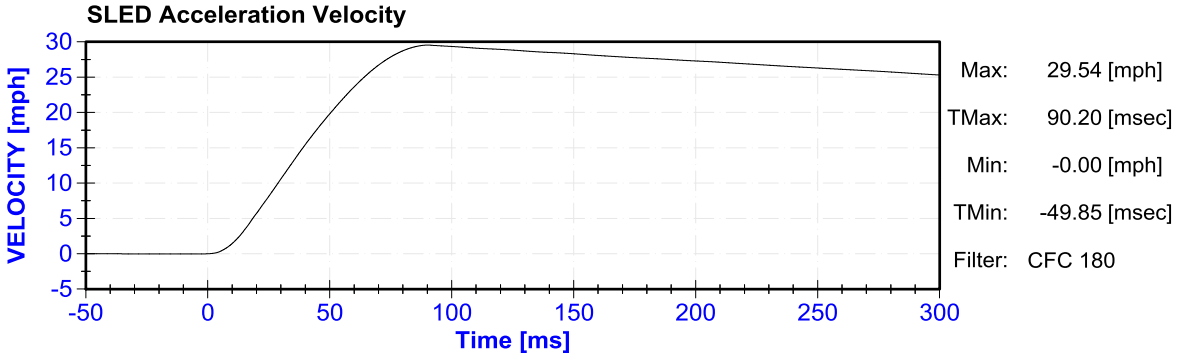
Calspan

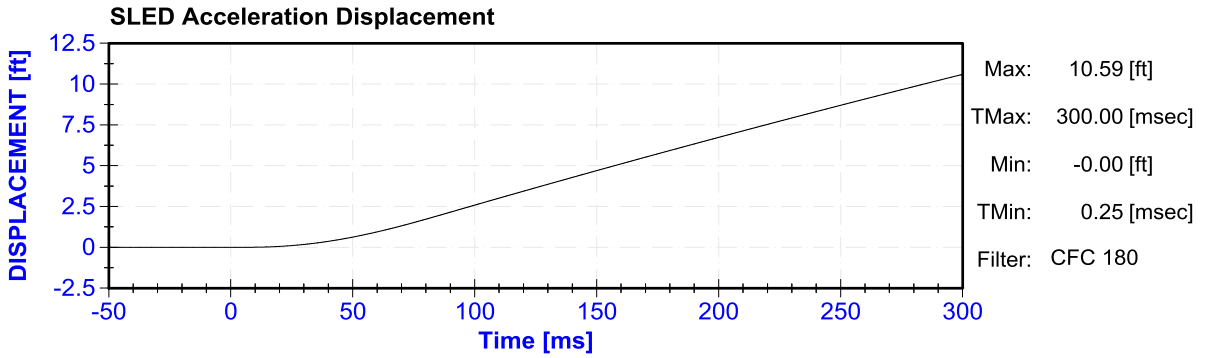
Braxx BX07-17-001

Test Date: July 18,2017







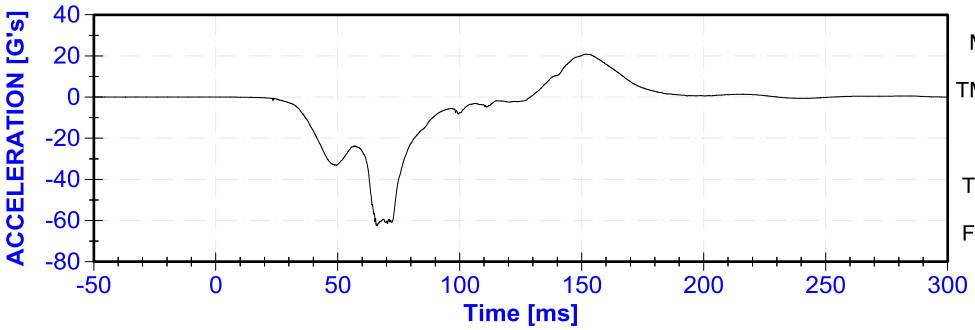


Calspan

Braxx BX07-17-001

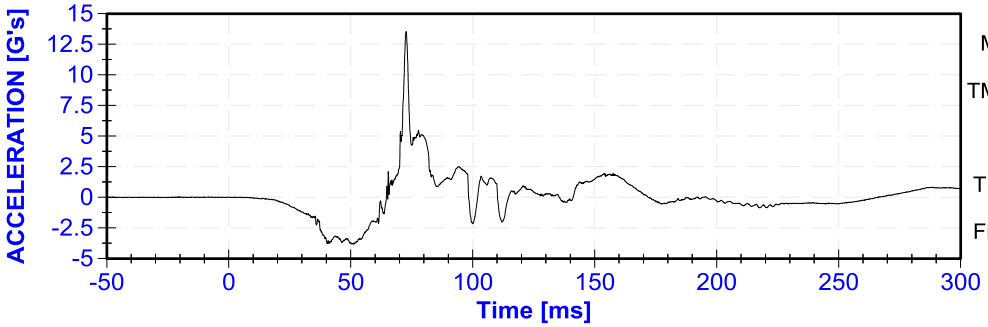
Test Date: July 18,2017

B Bench ATD Head X Acceleration



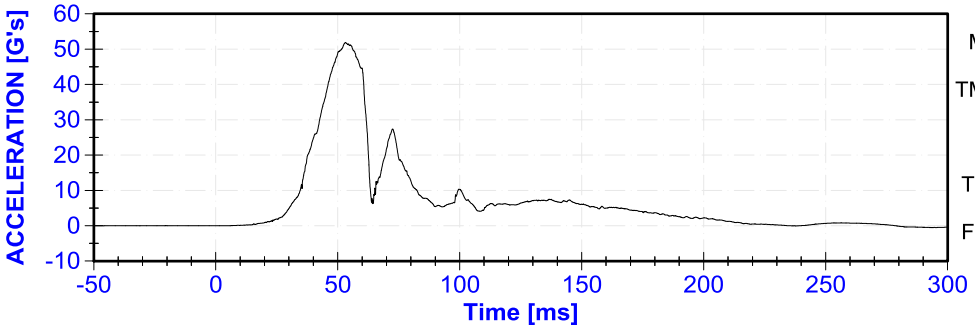
Max: 20.87 [G's]
TMax: 152.05 [msec]
Min: -62.52 [G's]
TMin: 66.20 [msec]
Filter: CFC 1000

B Bench ATD Head Y Acceleration



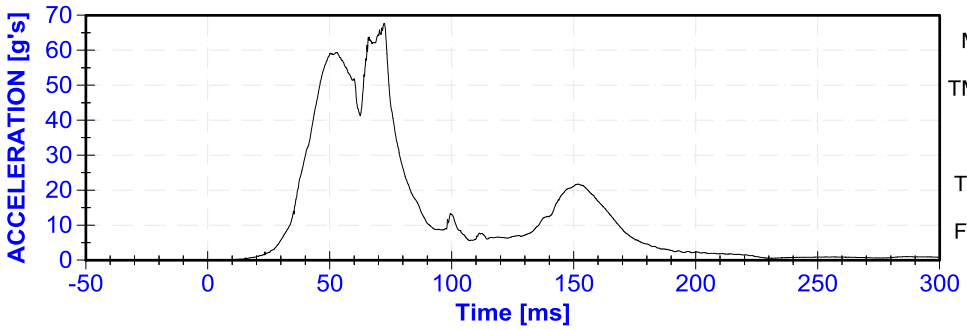
Max: 13.53 [G's]
TMax: 72.70 [msec]
Min: -3.82 [G's]
TMin: 51.40 [msec]
Filter: CFC 1000

B Bench ATD Head Z Acceleration



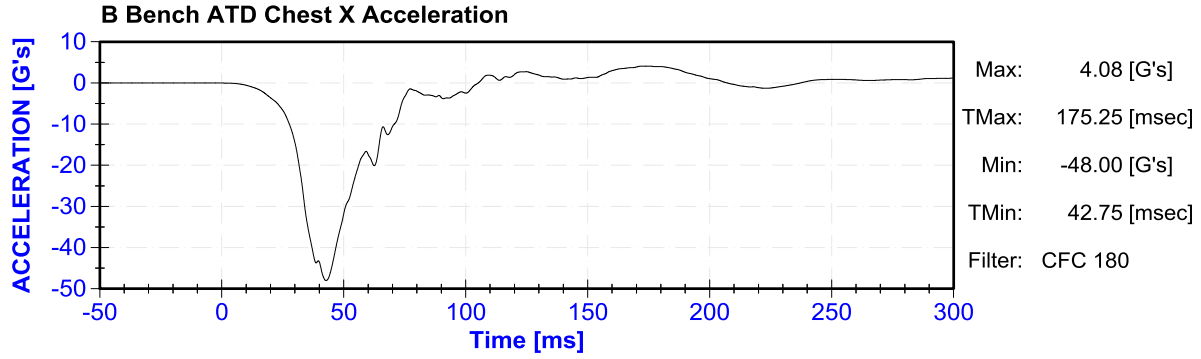
Max: 51.88 [G's]
TMax: 53.15 [msec]
Min: -0.52 [G's]
TMin: 295.40 [msec]
Filter: CFC 1000

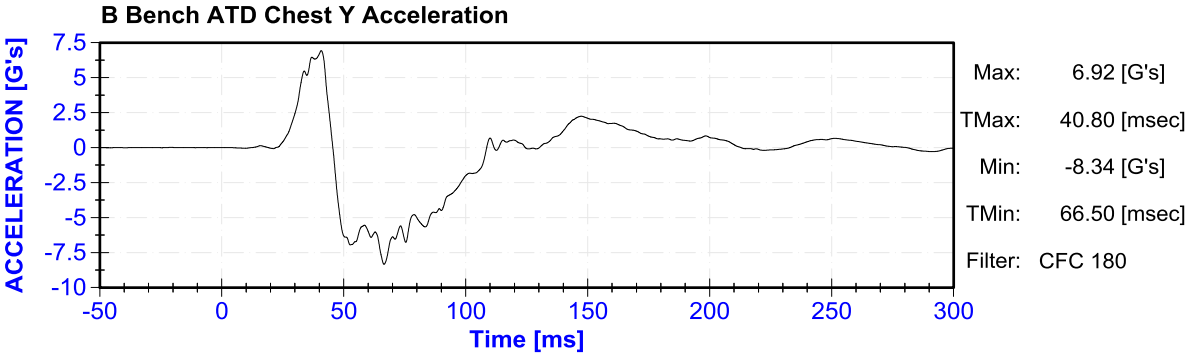
B Bench ATD Head Resultant Acceleration

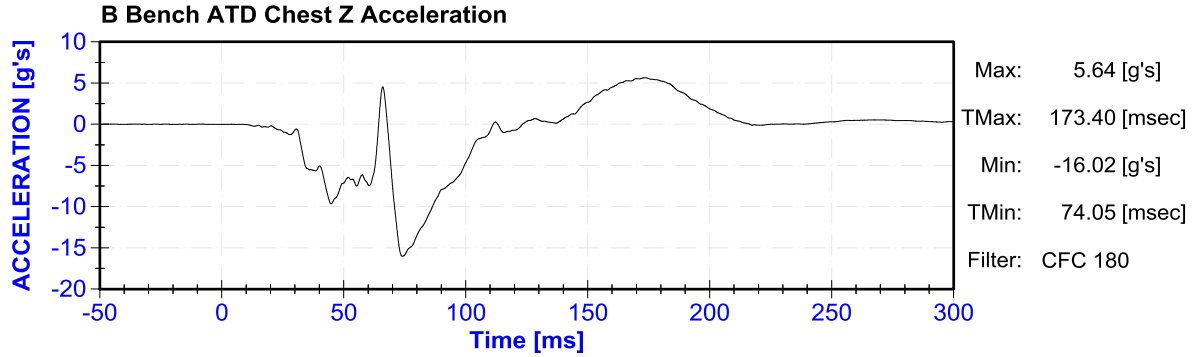


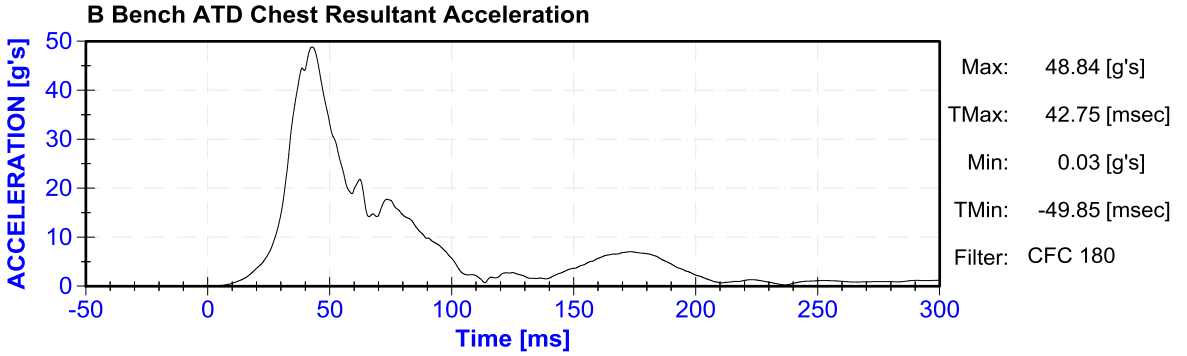
Max: 67.68 [g's]
TMax: 72.30 [msec]
Min: 0.00 [g's]
TMin: 0.75 [msec]
Filter: CFC 1000

Calspan | Braxx BX07-17-001 | Test Date: July 18,2017







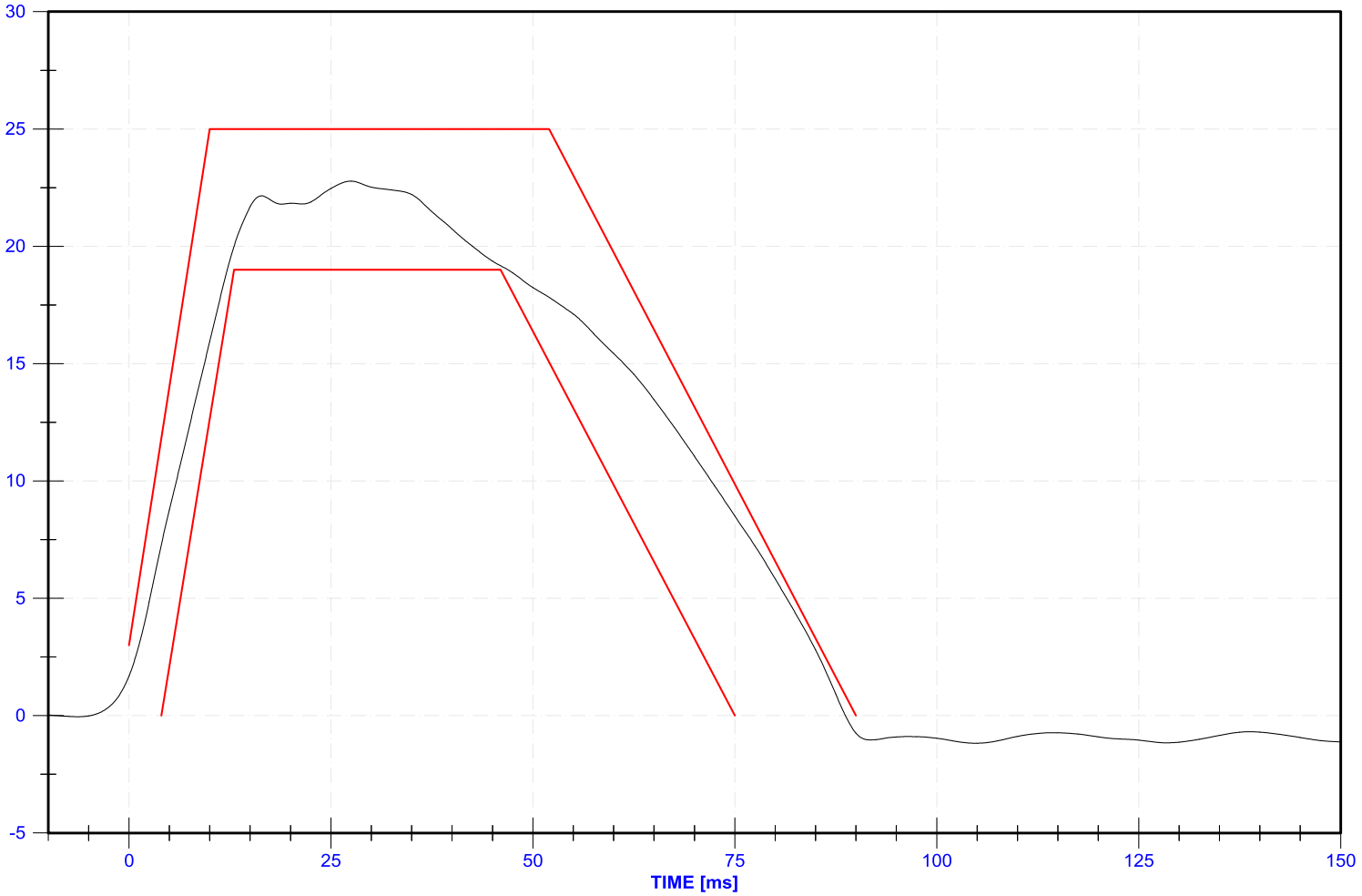


Calspan

Braxx BX07-17-001

Test Date:
July 18,2017

SLED Pulse Corridor



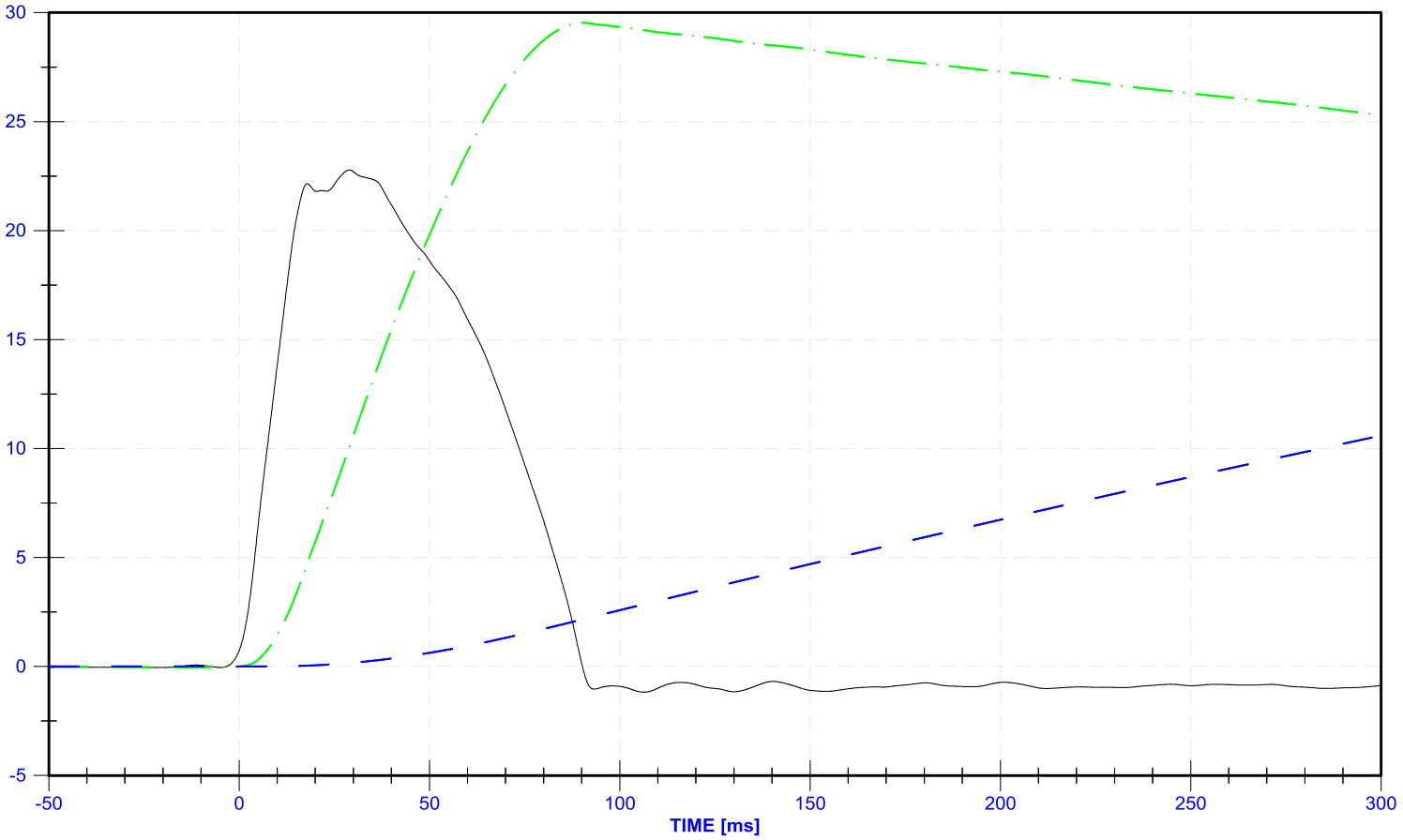
	Maximum	Time (ms)	Filter Class	Legend
SLED Acceleration (g's)	22.77	29.0	CFC 60	S0SLED00OR00ACXD

Calspan

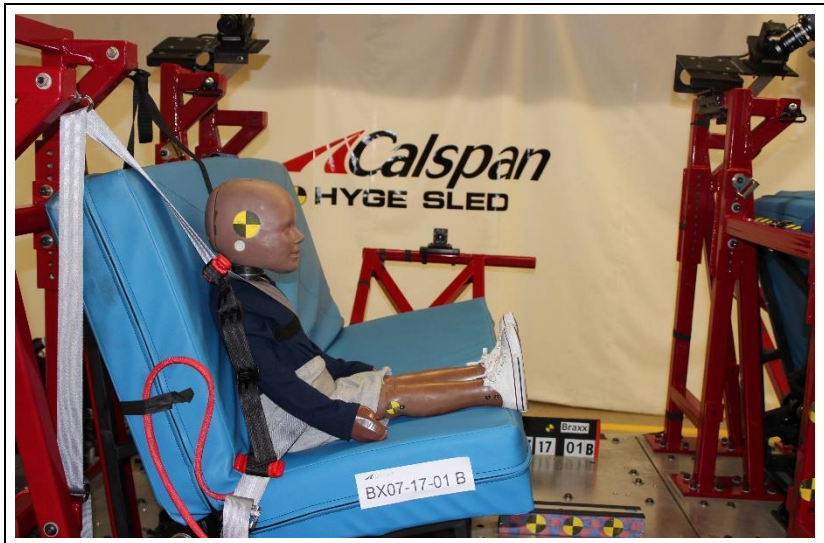
Braxx BX07-17-001

Test Date:
July 18,2017

SLED Pulse



	Maximum	Time (ms)	Filter Class	Legend
SLED Acceleration (g's)	22.77	106.4	CFC 60	S0SLED000000ACXD
SLED Velocity (mph)	29.53	-14.5	CFC 180	S0SLED000000VAXC
SLED Displacement (ft)	10.59	0.3	CFC 180	S0SLED000000DVXC



Pre-Test

Post-Test

SLED TEST RUN: BX07-17-002

Braxx - FRONTAL IMPACT SLED TEST - DATA SUMMARY

Sled Test # Date	FMVSS / CMVSS	Veh. Seat Position	Child Restraint	Harness Position	Crotch Position	Recline Position	Seat Direction / Mode	Restraint System	Tether (Y/N)	ATD	Canadian Head Clip 3ms (g's)	HIC 36ms (g's)	Chest 3ms (g's)	Head Ex (in) Pre SB Angle (deg)	Knee Ex (in) Post SB Angle (deg)	Vertical Head CG Exceeded (Y/N)	Test G's (g's)	Velocity (mph)
BX07-17-002A 07/18/2017	F	P1	Smart Kid Belt	-	-	-	FF	Type 2	N	5% Female HYB SN 503	--	--	--	17.8	30.1	--	23.2	29.9

Comments: - No post-test issues.

Bottom Foam (2"x20" and 4"x20")	-	-	Back Foam (2"x24" and 4"x24")	-	-

Test	Compliance Requirement	Test Result	Pass/Fail
Buckle	(S5.4.3.5(e) of CFR 571.213 2015) Buckle did not release during the dynamic test	No Buckle	NA
Structural integrity:	(S5.1.1(a) of CFR 571.213 2015) No Complete Separation	No Structure	NA
	(S5.1.1(a) of CFR 571.213 2015) No Partial Separation with Exposed Edge Radius < 6.4mm (1/4")	No Structure	NA
	(S5.1.1(a) of CFR 571.213 2015) No Partial Separation with Protrusion> 9.5mm (3/8")	No Structure	NA
Adjustment Positioning During Impact:	(S5.1.1(b)(1) and S5.1.1(b)(2)(ii) of CFR 571.213 2015) No Change of Position or Decrease in Existing Openings from change.	No Change	Pass
RF Head Excursion:	(S5.1.3.2 of CFR 571.213 2015) Head CG not beyond the forward-most edge of the restraint system nor shall the head-torso angle be more than 45 degrees rearward	NA	NA
Max. Back Support:	(S5.1.4 of CFR 571.213 2015) Equal to, or less than 70 degrees	NA	NA
Head Support	(S5.2.1.1(c) of CFR 571.213 2015) Head to torso angle difference less than 45 degrees when placed in seat (whiplash)	NA	NA
Chest Acceleration:	(S5.1.2.1(b) of CFR 571.213 2015) The chest acceleration shall not exceed 60g for intervals whose cumulative duration is more than 3 ms.	NA	NA
Head Acceleration:	(S5.1.2.1(a) of CFR 571.213 2015) Maximum calculated head injury criterion for a 36ms time interval shall not exceed 1000 (not applicable for tests using 10YO & weighted 6-year-old dummy).	NA	NA
Forward Head Excursion	(S5.1.3.1(a)(1) of CFR 571.213 2015) Allow any portion of the head to go more than 32" (813mm) past Z-point - unless tethered, then 28.3" (720mm) past Z-point.	17.8	Pass
Forward Knee Excursion	(S5.1.3.1(a)(2) of CFR 571.213 2015) Allow knee pivot point to go more than 36" (915mm) past Z-point.	30.1	Pass

Calspan

Braxx BX07-17-002
Bench A

Test Date:
7/18/2017

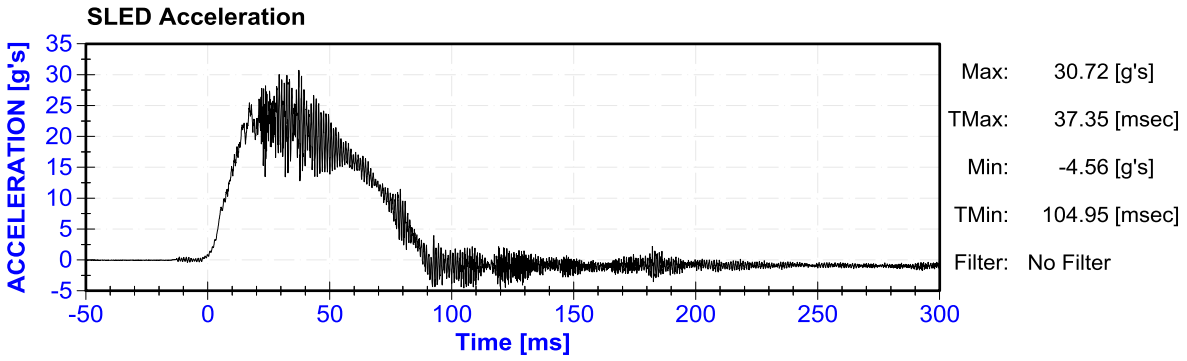
Maximum / Minimum Values

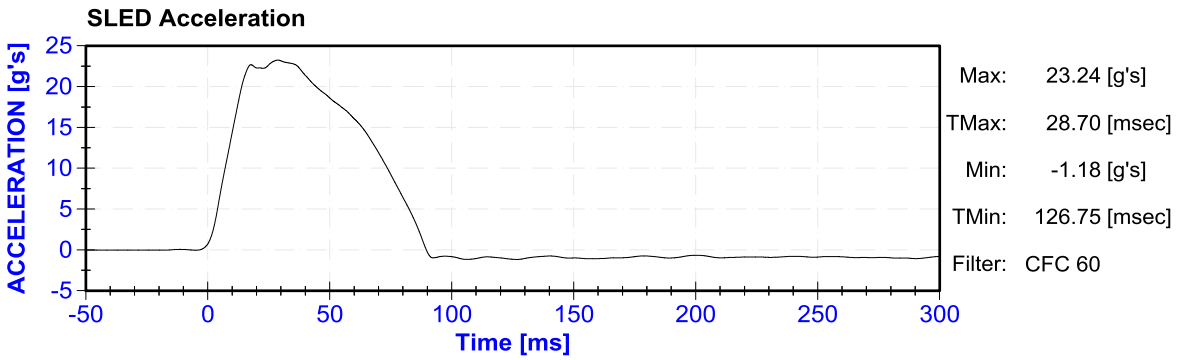
Channel	Unit	Max	Max Time msec	Min	Min Time msec	Filter
SLED Acceleration	g's	23.2	28.7	-1.2	126.8	CFC 60
SLED Acceleration Velocity	mph	29.9	89.7	-0.0	-50.1	CFC 180
SLED Acceleration Displacement	ft	10.7	300.0	-0.0	0.3	CFC 180

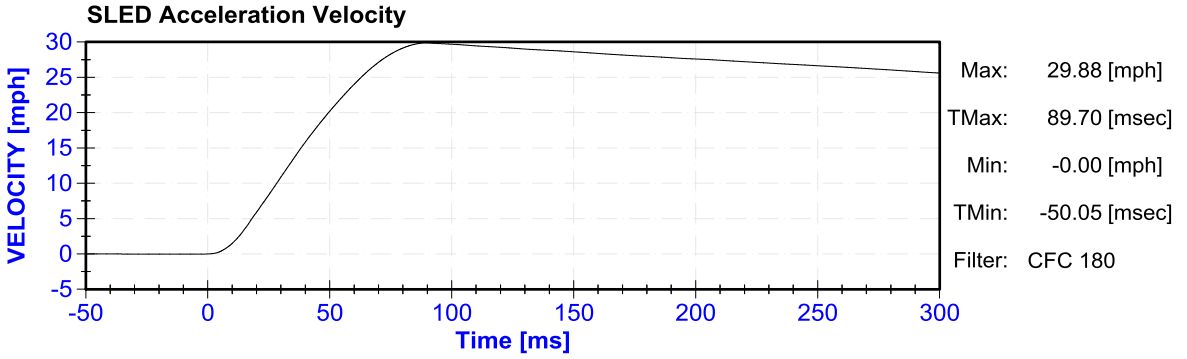
Calspan

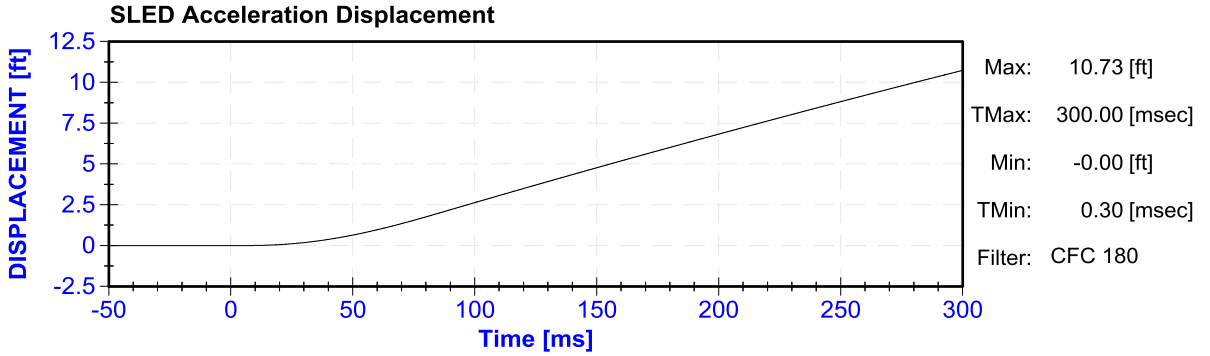
Braxx BX07-17-002

Test Date:
July 18,2017





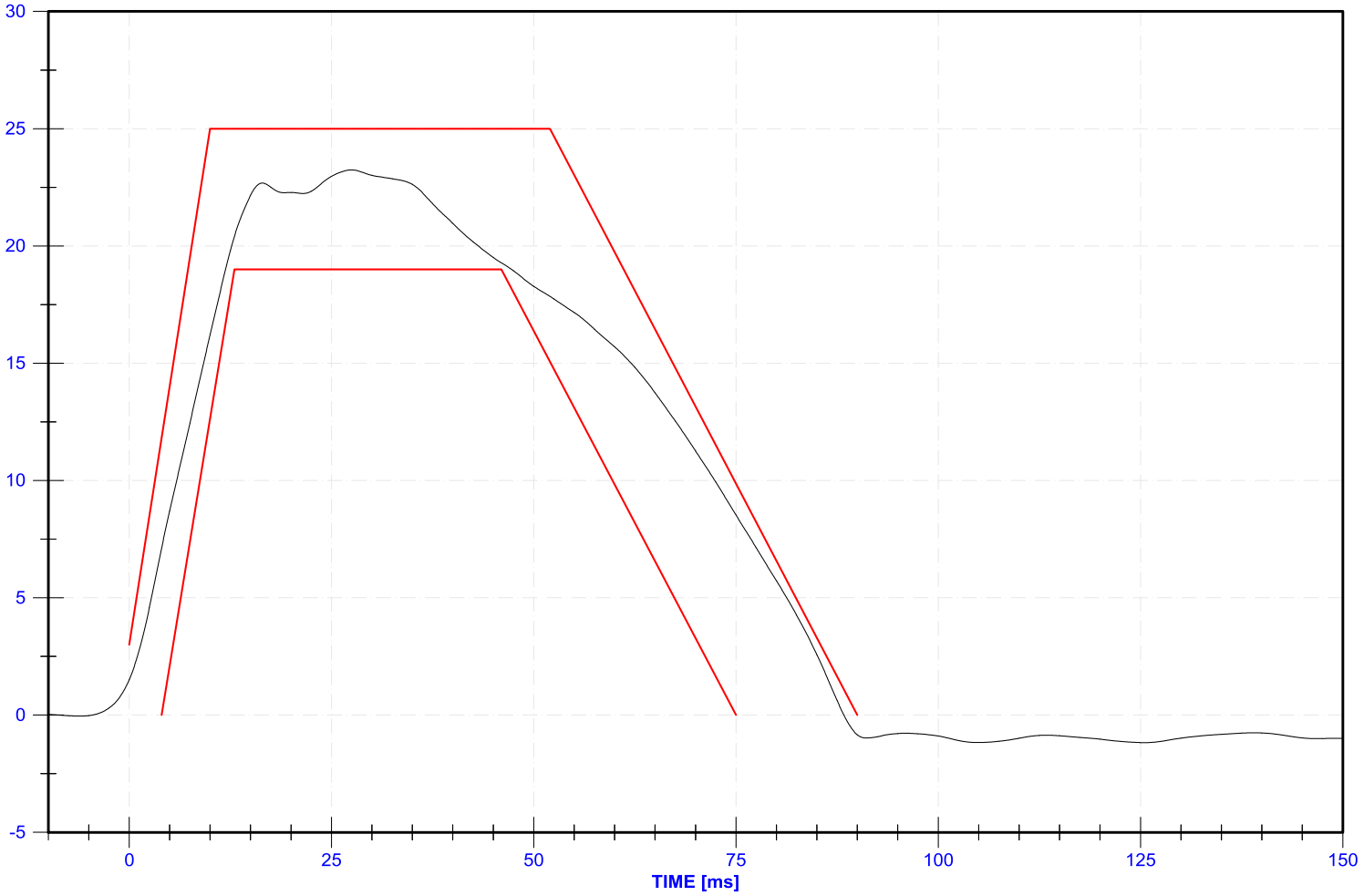




Braxx BX07-17-002

Test Date:
July 18,2017

SLED Pulse Corridor



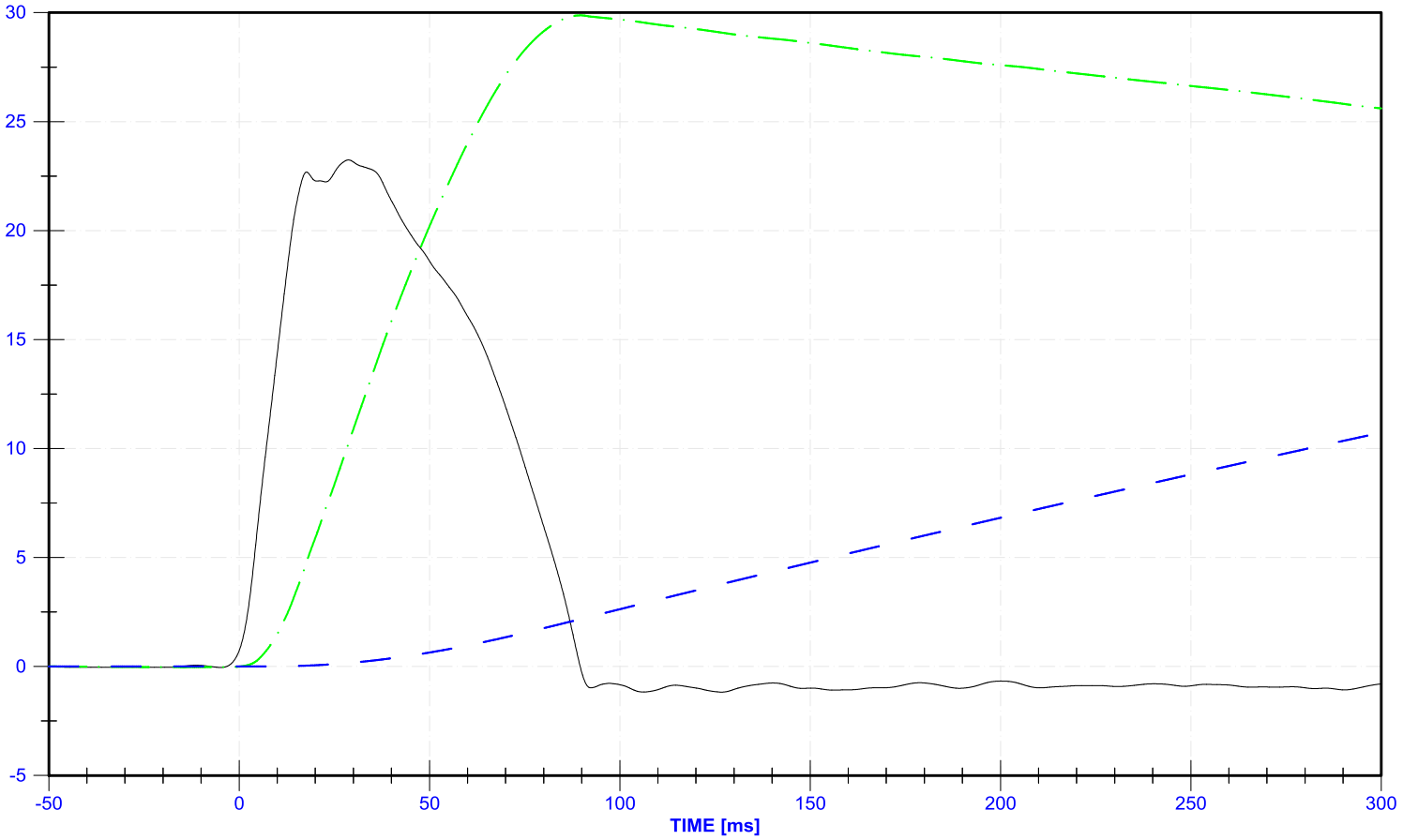
	Maximum	Time (ms)	Filter Class	Legend
SLED Acceleration (g's)	23.24	28.7	CFC 60	S0SLED00OR00ACXD

Calspan

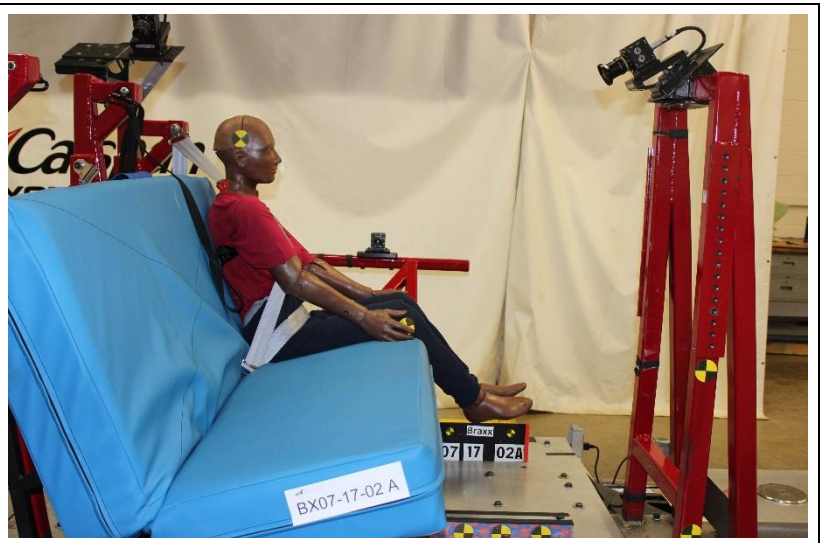
Braxx BX07-17-002

Test Date:
July 18,2017

SLED Pulse



	Maximum	Time (ms)	Filter Class	Legend
SLED Acceleration (g's)	23.24	126.8	CFC 60	S0SLED000000ACXD
SLED Velocity (mph)	29.87	-14.6	CFC 180	S0SLED000000VAXC
SLED Displacement (ft)	10.72	0.3	CFC 180	S0SLED000000DVXC



Pre-Test

Post-Test

SLED TEST RUN: BX07-17-002

Braxx - FRONTAL IMPACT SLED TEST - DATA SUMMARY

Sled Test # Date	FMVSS / CMVSS	Veh. Seat Position	Child Restraint	Harness Position	Crotch Position	Recline Position	Seat Direction / Mode	Restraint System	Tether (Y/N)	ATD	Canadian Head Clip 3ms (g's)	HIC 36ms (g's)	Chest 3ms (g's)	Head Ex (in) Pre SB Angle (deg)	Knee Ex (in) Post SB Angle (deg)	Vertical Head CG Exceeded (Y/N)	Test G's (g's)	Velocity (mph)
BX07-17-002B 07/18/2017	F	P6	Smart Kid Belt	-	-	-	FF	Type 2	N	6-YO HYB III SN 141	56	558.9	47	13.7	19.3	--	23.2	29.9

Comments: - Lap shield is used. No post-test issues.

Bottom Foam (2"x20" and 4"x20")	-	-	Back Foam (2"x24" and 4"x24")	-	-

Test	Compliance Requirement	Test Result	Pass/Fail
Buckle	(S5.4.3.5(e) of CFR 571.213 2015) Buckle did not release during the dynamic test	No Buckle	NA
Structural integrity:	(S5.1.1(a) of CFR 571.213 2015) No Complete Separation	No Structure	NA
	(S5.1.1(a) of CFR 571.213 2015) No Partial Separation with Exposed Edge Radius < 6.4mm (1/4")	No Structure	NA
	(S5.1.1(a) of CFR 571.213 2015) No Partial Separation with Protrusion> 9.5mm (3/8")	No Structure	NA
Adjustment Positioning During Impact:	(S5.1.1(b)(1) and S5.1.1(b)(2)(ii) of CFR 571.213 2015) No Change of Position or Decrease in Existing Openings from change.	No Change	Pass
RF Head Excursion:	(S5.1.3.2 of CFR 571.213 2015) Head CG not beyond the forward-most edge of the restraint system nor shall the head-torso angle be more than 45 degrees rearward	NA	NA
Max. Back Support:	(S5.1.4 of CFR 571.213 2015) Equal to, or less than 70 degrees	NA	NA
Head Support	(S5.2.1.1(c) of CFR 571.213 2015) Head to torso angle difference less than 45 degrees when placed in seat (whiplash)	NA	NA
Chest Acceleration:	(S5.1.2.1(b) of CFR 571.213 2015) The chest acceleration shall not exceed 60g for intervals whose cumulative duration is more than 3 ms.	47	Pass
Head Acceleration:	(S5.1.2.1(a) of CFR 571.213 2015) Maximum calculated head injury criterion for a 36ms time interval shall not exceed 1000 (not applicable for tests using 10YO & weighted 6-year-old dummy).	558.9	Pass
Forward Head Excursion	(S5.1.3.1(a)(1) of CFR 571.213 2015) Allow any portion of the head to go more than 32" (813mm) past Z-point - unless tethered, then 28.3" (720mm) past Z-point.	13.7	Pass
Forward Knee Excursion	(S5.1.3.1(a)(2) of CFR 571.213 2015) Allow knee pivot point to go more than 36" (915mm) past Z-point.	19.3	Pass

Calspan

Braxx BX07-17-002
Bench B

Test Date:
7/18/2017

Critical Injury Values

Test Parameter	Limit	Value	Time 1 msec	Time 2 msec	Duration
Head Injury (15 ms)	**-**	**261.1**	49.6	64.6	15
Head Injury (36 ms)	**1000**	**558.9**	51.1	87.1	36
Head Clip (3 ms)	**80**	**56.0**	82.0	85.0	3.0
Head Max	**80**	**57.3**	0.0	0.0	0.0
Resultant Chest Clip	**60**	**47.0**	40.1	43.1	3.0
Chest Max	**60**	**48.6**	0.0	0.0	0.0

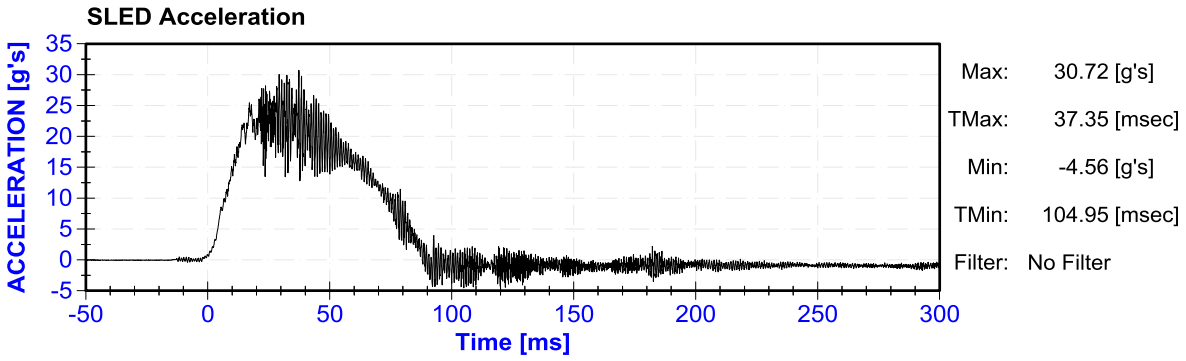
Maximum / Minimum Values

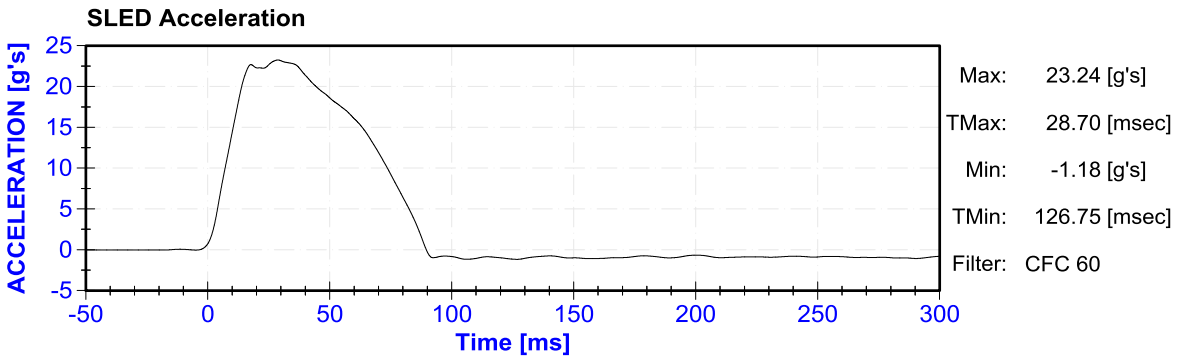
Channel	Unit	Max	Max Time msec	Min	Min Time msec	Filter
SLED Acceleration	g's	23.2	28.7	-1.2	126.8	CFC 60
SLED Acceleration Velocity	mph	29.9	89.7	-0.0	-50.1	CFC 180
SLED Acceleration Displacement	ft	10.7	300.0	-0.0	0.3	CFC 180
B Bench ATD Head X Acceleration	g's	13.0	177.1	-49.1	83.6	CFC 1000
B Bench ATD Head Y Acceleration	g's	2.3	79.7	-2.3	39.1	CFC 1000
B Bench ATD Head Z Acceleration	g's	44.7	56.2	-0.0	0.3	CFC 1000
B Bench ATD Head Resultant Acceleration	g's	57.3	83.6	0.0	0.5	CFC 1000
B Bench ATD Chest X Acceleration	g's	4.4	112.8	-48.0	41.6	CFC 180
B Bench ATD Chest Y Acceleration	g's	8.1	40.1	-7.4	78.8	CFC 180
B Bench ATD Chest Z Acceleration	G's	5.4	191.4	-12.3	66.9	CFC 180
B Bench ATD Chest Resultant Acceleration	g's	48.6	41.5	0.0	-50.1	CFC 180

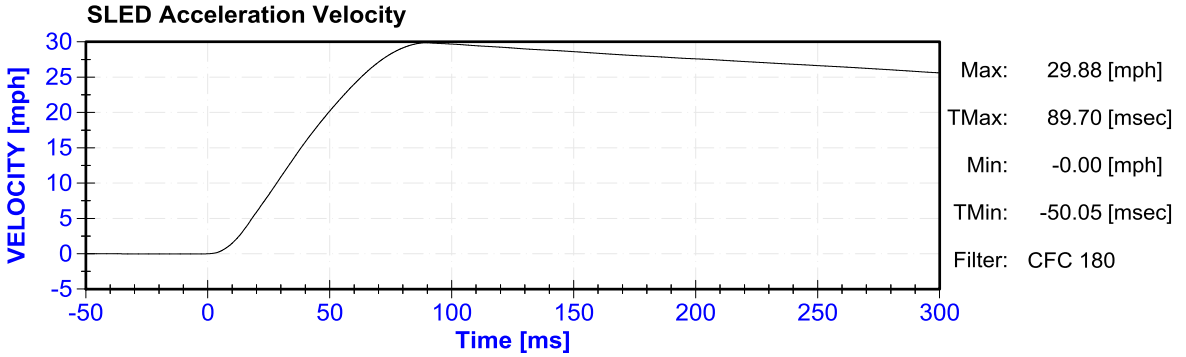
Calspan

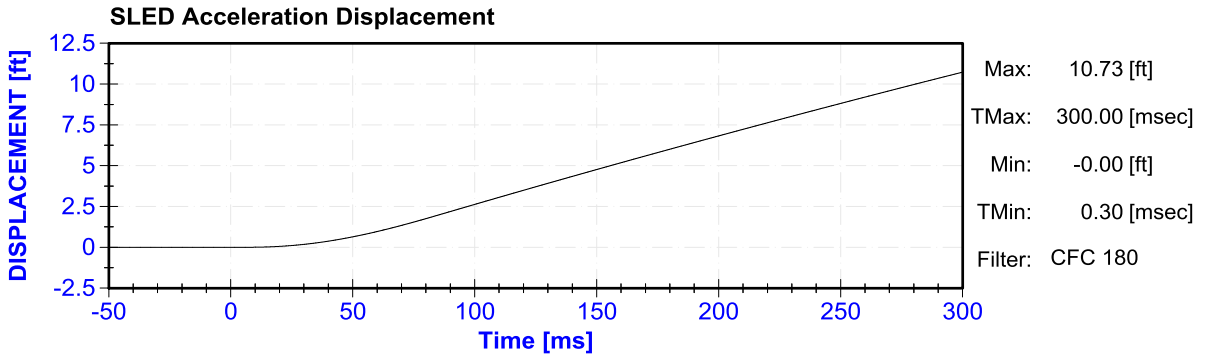
Braxx BX07-17-002

Test Date: July 18,2017







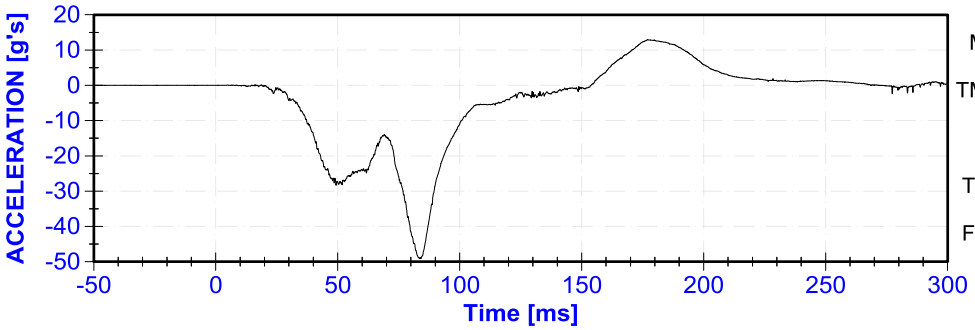


Calspan

Braxx BX07-17-002

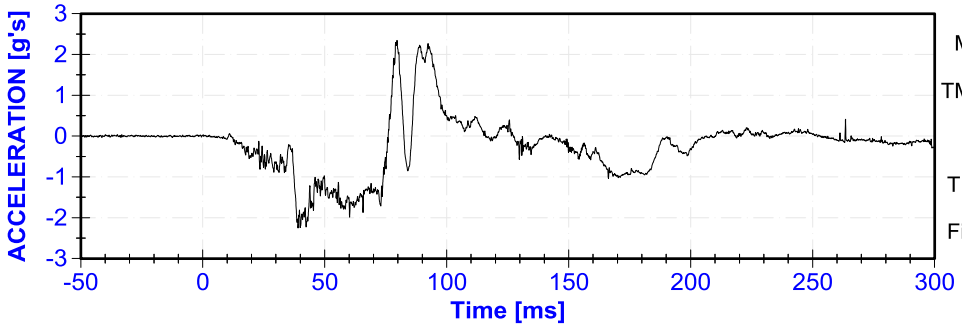
Test Date: July 18,2017

B Bench ATD Head X Acceleration



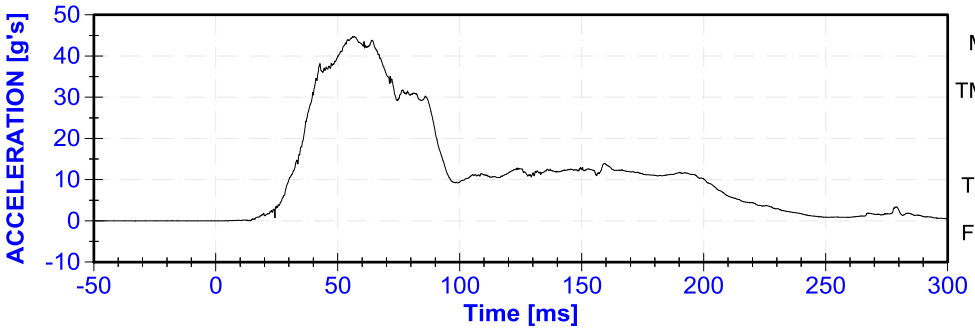
Max: 12.98 [g's]
TMax: 177.05 [msec]
Min: -49.13 [g's]
TMin: 83.60 [msec]
Filter: CFC 1000

B Bench ATD Head Y Acceleration



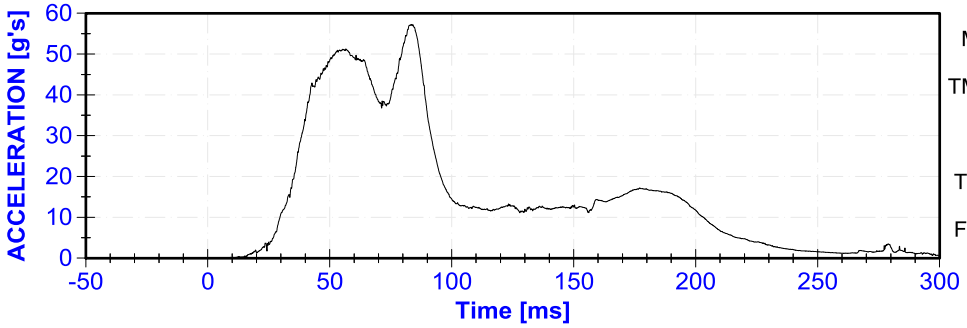
Max: 2.35 [g's]
TMax: 79.65 [msec]
Min: -2.25 [g's]
TMin: 39.05 [msec]
Filter: CFC 1000

B Bench ATD Head Z Acceleration



Max: 44.71 [g's]
TMax: 56.15 [msec]
Min: -0.02 [g's]
TMin: 0.30 [msec]
Filter: CFC 1000

B Bench ATD Head Resultant Acceleration



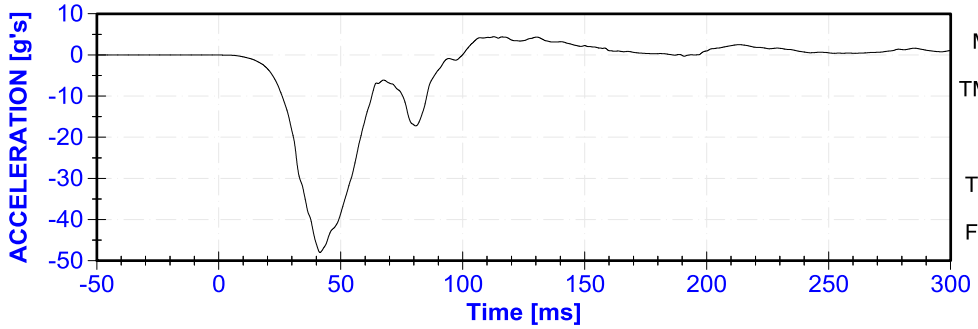
Max: 57.27 [g's]
TMax: 83.60 [msec]
Min: 0.00 [g's]
TMin: 0.50 [msec]
Filter: CFC 1000

Calspan

Braxx BX07-17-002

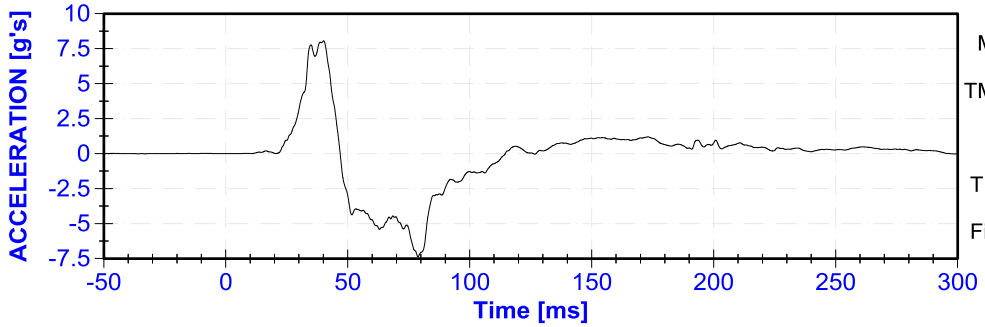
Test Date: July 18,2017

B Bench ATD Chest X Acceleration



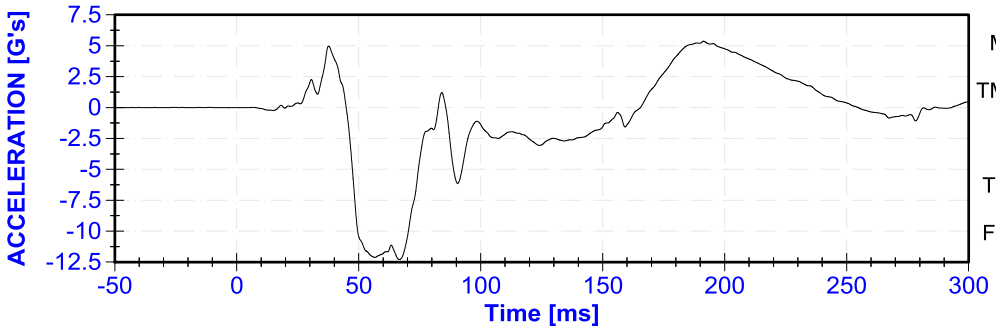
Max: 4.43 [g's]
TMax: 112.75 [msec]
Min: -48.00 [g's]
TMin: 41.55 [msec]
Filter: CFC 180

B Bench ATD Chest Y Acceleration



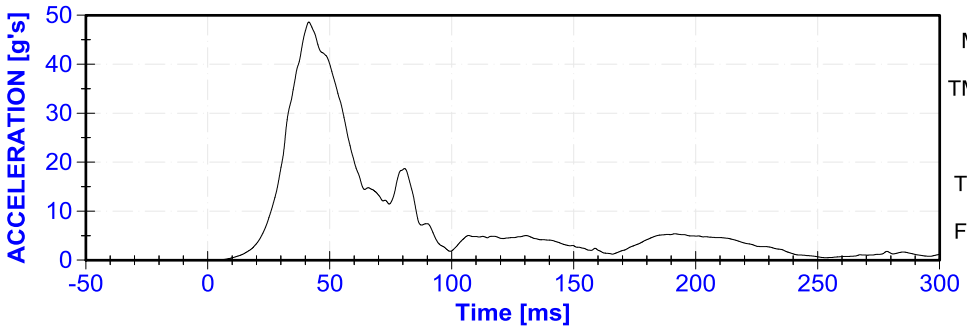
Max: 8.06 [g's]
TMax: 40.10 [msec]
Min: -7.38 [g's]
TMin: 78.80 [msec]
Filter: CFC 180

B Bench ATD Chest Z Acceleration



Max: 5.37 [G's]
TMax: 191.40 [msec]
Min: -12.30 [G's]
TMin: 66.85 [msec]
Filter: CFC 180

B Bench ATD Chest Resultant Acceleration



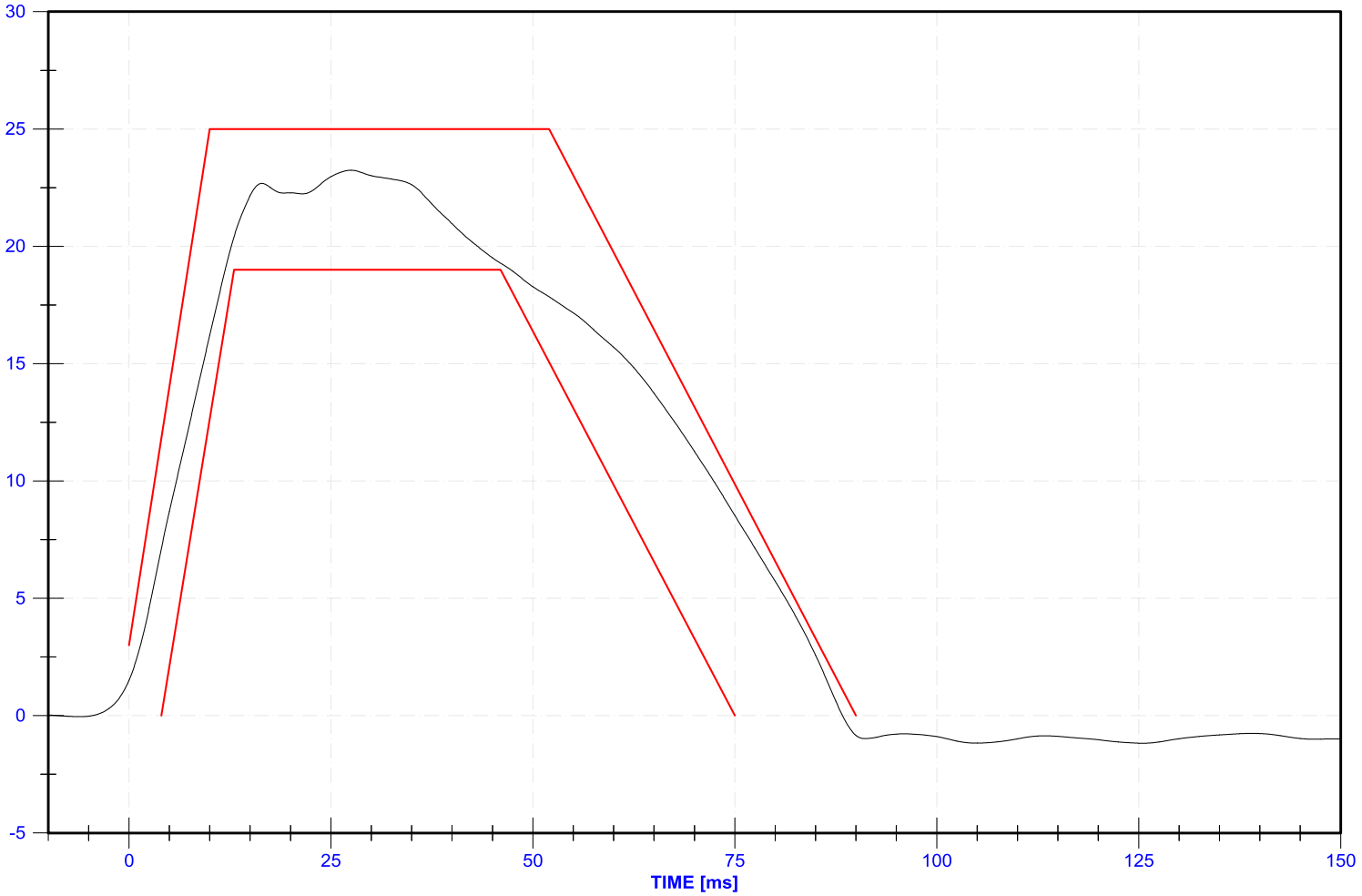
Max: 48.61 [g's]
TMax: 41.45 [msec]
Min: 0.02 [g's]
TMin: -50.05 [msec]
Filter: CFC 180

Calspan

Braxx BX07-17-002

Test Date:
July 18,2017

SLED Pulse Corridor



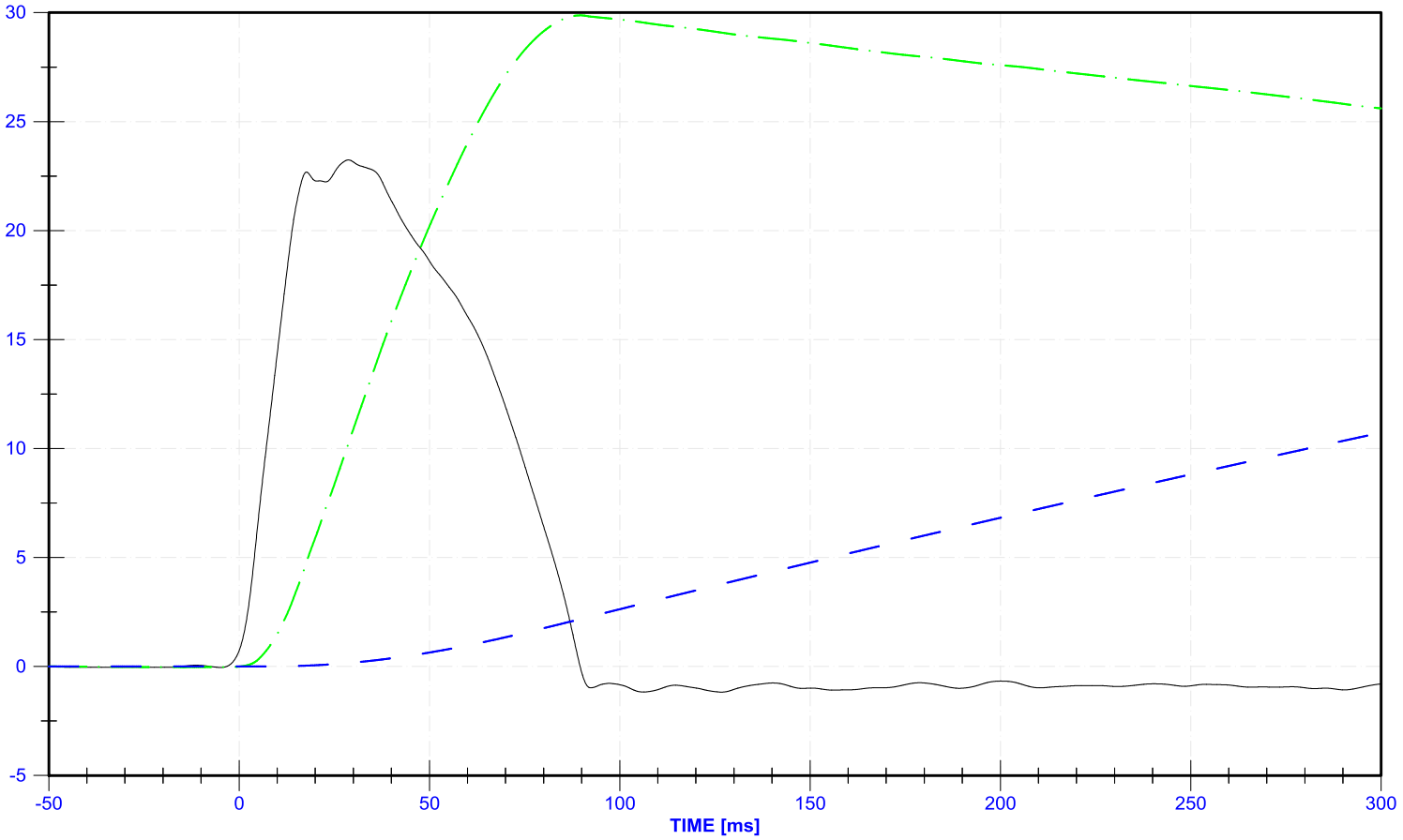
	Maximum	Time (ms)	Filter Class	Legend
SLED Acceleration (g's)	23.24	28.7	CFC 60	S0SLED00OR00ACXD

Calspan

Braxx BX07-17-002

Test Date:
July 18,2017

SLED Pulse



	Maximum	Time (ms)	Filter Class	Legend
SLED Acceleration (g's)	23.24	126.8	CFC 60	S0SLED000000ACXD
SLED Velocity (mph)	29.87	-14.6	CFC 180	S0SLED000000VAXC
SLED Displacement (ft)	10.72	0.3	CFC 180	S0SLED000000DVXC

Customer: Braxx Report No: 1067-17-01 Test Date: 07/18/2017

Pre-Test

Post-Test