REPORT NUMBER: R&D-CAL-12-007

MOVING BARRIER TO VEHICLE CRASH TEST IN SUPPORT OF NHTSA'S FRONTAL OBLIQUE OFFSET PROGRAM RESEARCH MOVING DEFORMABLE BARRIER INTO LEFT FRONT OF A

2012 HONDA CR-V

90.1KPH, 15 DEGREE ANGLE, 35% OVERLAP

TEST DATE: 12/21/2012

NHTSA No: RC5369

CALSPAN CORPORATION
TRANSPORTATION TEST OPERATIONS
P.O. BOX 400
BUFFALO, NEW YORK 14225

FINAL REPORT SUBMITTED:

March 4, 2015

PREPARED FOR:

U. S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Vehicle safety Research
1200 New Jersey Ave, SE
Room W46-446
Washington, DC 20590

This publication is distributed by the U.S. Department of Transportation, National Highway Traffic Safety Administration, in the interest of information exchange. The opinions, findings and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof. If trade or manufacturers' names or products are mentioned it is only because they are considered essential to the object of the publication and should not be construed as an endorsement. The United States Government does not endorse products or manufacturers.

Prepared by:  Date: March 4, 2015

Vanessa Walsh, Project Engineer

Approved by:  Date: March 4, 2015

Edward J. Dutton, Test Engineer Director
Transportation Test Operations

FINAL REPORT ACCEPTANCE BY VEHICLE SAFETY RESEARCH, OFFICE OF STRUCTURAL AND RESTRAINTS RESEARCH DIVISION
:

_____

Date: _____

_____

TOM, Vehicle Crash Testing
NHTSA, Office of Structures and Restraints Research

Date: _____

TECHNICAL REPORT STANDARD TITLE PAGE

1. *Report No.* R&D-CAL-12-007	***2. Government Accession No.***	***3. Recipient's Catalog No.***
4. Title and Subtitle Report for Frontal Oblique Offset Program Testing of a 2012 Honda CR-V five door hatchback NHTSA No.: RC5369		***5. Report Date*** 3/4/2015 ***6. Performing Organization Code*** CAL
7. Author(s) Vanessa Walsh, Project Engineer Anthony Martino, Software Engineer		***8. Performing Organization Report No.*** CAL-DOT-2012-007
9. Performing Organization Name and Address Calspan Corporation 4455 Genesee Street Buffalo, New York 14225		***10. Work Unit No.*** ***11. Contract or Grant No.*** DTNH22-10-D-00155
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Office of Vehicle Safety Research 1200 New Jersey Ave SE, Room W46-446 Washington, DC 20590		***13. Type of Report and Period Covered*** Final Report, 3/4/2015 ***14. Sponsoring Agency Code*** NVS-321
15. Supplementary Notes		

16. Abstract

A test was conducted in accordance with Task Order 0001 of Contract DTNH22-10-D-00155. The Test consisted of a Research Moving Deformable Barrier (RMDB) traveling at a target speed of 90.12 kph into a stationary 2012 Honda CR-V. The struck vehicle was positioned 15 degrees relative to the moving barrier and impacted 35% of the left side of the vehicle. The test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), 301, and foot well intrusion performance. The test was conducted at the Calspan Corporation's Transportation Test Operation's facility in Buffalo, New York on December 21, 2012. The RMDB impact velocity was 89.66 kph and the ambient temperature at the test vehicle at the time of impact was 21°C. The target vehicle post-test maximum crush was 332 mm. The test vehicle's performance was as follows:

Measurement Description	Units	Driver ATD		Pass. ATD	
		Threshold	Result	Threshold	Result
Head Injury Criteria (HIC_{15})	N/A	700	206.54	700	899.16
Maximum Chest Compression	mm	63	-42.30	63	-33.90
Neck Injury Criteria (Nij)	N/A	1	0.33	1	0.42
Neck Tension	N	4,170	1695.54	4,170	2193.73
Neck Compression	N	4,000	-92.73	4,000	-345.36
Left Femur Force	N	10,008	-7535.90	10,008	-4353.83
Right Femur Force	N	10,008	-5048.24	10,008	-4826.22

17. Key Words THOR ATD Oblique Offset	***18. Distribution Statement*** Copies of this report are available from: National Highway Traffic Safety Administration Technical Reference Division 1200 New Jersey Ave, SE Washington, DC 20590		
19. Security Classif. (of this report) UNCLASSIFIED	***20. Security Classif. (of this page)*** UNCLASSIFIED	***21. No. of Pages*** 413	***22. Price***

Form DOT F1700.7 (8-69)

TABLE OF CONTENTS

Test Vehicle: 2012 Honda CR-V Five Door Hatchback NHTSA No.: RC5369
Test Program: R&D 90.1kph, 15° angle, 35% offset Test Date: 12/21/2012

Section		Page No.
1	Purpose of Test	1-1
2	Summary of Test	2-1
	Crash Vehicle Summary	2-3
	Injury Summary: Driver THOR Male	2-4
	Injury Summary: Driver THOR Male Legs	2-6
	Injury Summary: Front Passenger THOR Male	2-7
	Injury Summary: Front Passenger THOR Male Legs	2-9
3	Data Sheets	3-1

Data Sheet No.		Page No.
1	General Test and Vehicle Parameter Data	3-2
2	Seat Adjustment, Fuel System, and Steering Wheel	3-6
3	Dummy Longitudinal Clearance Dimensions	3-8
4	Dummy Lateral Clearance Dimensions	3-10
5	Seat Belt Positioning Data	3-11
6	High-Speed Camera Locations and Data	3-12
7	Vehicle Instrumentation Data	3-15
8	Photographic Reference Target Locations	3-17
9	Test Vehicle Summary of Results	3-24
10	Post-Test Observations	3-25
11	Vehicle Profile Measurements	3-26
12	Accident Investigation Division Data	3-28
13	Vehicle Intrusion Measurements	3-29
14	RMDB Crush Measurements	3-46
15	Summary of FMVSS 212, 219 (Partial), and 301 Data	
	Windshield Periphery Measurements	3-47
	Fuel System Integrity Post Impact Data	3-48
16	FMVSS 301 Static Rollover Results	3-49
17	Dummy / Vehicle Temperature Stabilization	3-50

Appendix		Page No.
A	Photographs	A-1
B	Vehicle & Dummy Response Data Traces	B-1
C	Part 572 E/O Dummy Calibration and Performance Verification Data Sheets	C-1
D	CMM Measurement Procedures	D-1

SECTION 1
PURPOSE OF TEST

Test Vehicle:	2012 Honda CR-V Five Door Hatchback	NHTSA No.:	RC5369
Test Program:	R&D 90.1kph, 15° angle, 35% offset	Test Date:	12/21/2012

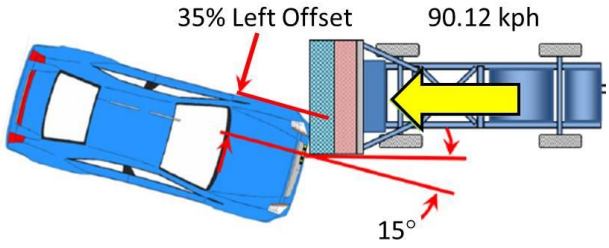
This 90.12 kph (56 mph) Research Moving Deformable Barrier (RMDB) into a vehicle test is part of the Frontal Offset Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-10-D-00155. The purpose of this test is to obtain vehicle crashworthiness and occupant restraint system performance data for consumer information purposes.

This test was conducted in accordance with the instructions set forth by NHTSA in which the vehicle was placed at a 15° angle, 35% offset relative to the RMDB as outlined in Task Order (TO-1) DTNH22-10-D00155. Data was obtained indicant of Federal Motor Vehicle Safety Standard FMVSS 208-Occupant Crash Protection, FMVSS 212 – Windshield Mounting, FMVSS 219 (partial) – Windshield Zone Intrusion, and FMVSS 301 – Fuel System Integrity, in addition to the requirements of TO-1 of DTNH22-10-D-00155.

SECTION 2
SUMMARY OF TEST

Test Vehicle:	2012 Honda CR-V Five Door Hatchback	NHTSA No.:	RC5369
Test Program:	R&D 90.1kph, 15° angle, 35% offset	Test Date:	12/21/2012

A 2012 Honda CR-V Five Door Hatchback was impacted on the left front corner by a Research Moving Deformable Barrier (RMDB). This test vehicle was stationary and positioned at a target angle of 15˚ and at a target offset of 35% to the forward line of motion of the RMDB. The RMDB was towed down the test track in a full forward direction, without any crabbing, and at the targeted impact velocity of 90.12 kph (56.0 mph) into the test vehicle. The test vehicle's mass was 1,757.0 kg (3,873.5 lbs), and the RMDB's mass was 2490.7 kg (5491 lbs). The test was conducted by Calspan Corporation on December 21, 2012.



The test was documented by one (1) real time and fourteen (14) high-speed video cameras. Camera locations and other pertinent data are located in Data Sheet No. 6 of this report. Pre and post – test photographs of the test vehicle, RMDB, and test setup were taken using a digital still camera. Photographic documentation of the test is presented in Appendix A of this report.

One 50% adult male THOR-NT with MOD KIT (TK) Anthropomorphic Test Device (ATD) (Serial No. 007) was seated in the left, front (P1 -Driver's) seating position and one 50% adult male THOR-NT with MOD KIT (TK) ATD (Serial No. 016) was seated in the right front passenger seating position (P2). The THOR TK driver and passenger were positioned according to instructions specified in laboratory test procedures FMVSS 208-14, "Occupant Crash Protection", TP208-14, July 27, 2006.

The driver was restrained with a 3 – point seat belt, a front airbag, a curtain airbag, and a torso airbag. The passenger was restrained with a 3 – point seat belt, and a front airbag. The passenger's curtain and torso airbags were disabled.

Test Vehicle: 2012 Honda CR-V Five Door Hatchback NHTSA No.: RC5369
Test Program: R&D 90.1kph, 15° angle, 35% offset Test Date: 12/21/2012

Two hundred and thirty (230) channels of data from the two ATD's, test vehicle and RMDB were collected using Kayser – Threde and DTS data acquisition systems. Appendix B contains dummy data plots, as well as vehicle and RMDB response data plots.

There was 92.1% total windshield retention, with 82.4% and 100% retention on the left and right sides, respectively. There appeared to be no intrusion into the protected zone of the windshield during any portion of the impact event. The maximum static crush of the vehicle was 332 mm at C1 to the left of the vehicle's centerline. The maximum crush of the structural bumper beam was 529 mm at B1, to the left of the vehicle's centerline. Additional information pertaining to static crush measurements can be found on Data Sheet No.12 of this report.

All four vehicle doors remained closed and latched during the test. The left front door was deformed as a result of the impact causing it to be non-operational. The remaining doors all remained operational after the test.

Structure observations include the following:

- Driver's side A-Pillar buckled rearward. Resulting in separation between the top of the door and roof sill. (See Photo No.061 in Appendix A)
- Windshield cracked throughout, however there was no penetration observed in the protected zone.
- The hood of the vehicle remained latched during the event, however bent upwards exposing part of the engine compartment.

The driver ATD's visible contact points were:

- Head Contact: Front and Curtain Airbag
- Torso Contact: Front Airbag, Curtain Airbag, and Torso Airbag
- Knee Contact: Knee Bolster

The passenger ATD's visible contact points were:

- Head Contact: Front Airbag & Center Dash Panel
- Torso Contact: Front Airbag & Center Dash Panel
- Knee Contact: Glove Box

CRASH VEHICLE SUMMARY

Test Vehicle: 2012 Honda CR-V Five Door Hatchback
Test Program: R&D 90.1kph, 15° angle, 35% offset
NHTSA No.: RC5369
Test Date: 12/21/2012

Primary Impact Data

Measured Parameter	Units	Value
RMDB Velocity at Impact	kph	89.66
RMDB Test Weight	kg	2490.7
RMDB Maximum Static Crush	mm	241.6
Vehicle Test Weight	kg	1757
Actual Vehicle Angle	degrees	15
Vehicle Maximum Static Crush	mm	332
Vertical Offset from Target Point (+ down / - up)*	mm	0
Lateral Offset from Target Point (+ left / - right)*	mm	0
Number of Data Channels		230
Number of Real-Time Cameras		1
Number of High-Speed Cameras		14

*Offsets are in relation to the vehicle coordinate system.

Dummy Contacts

	Driver	Picture Ref.	Passenger	Picture Ref.
Dummy Type	50% Male, Thor 007		50% Male, Thor 016	
Head Contact	Front and Curtain Airbag	A49-A51	Front Airbag, Center Dash Panel & Side Head Liner	A70-A72
Upper Torso Contact	Front and Curtain & Torso Airbag	NA	Front Airbag & Center Dash Panel	NA
Lower Torso Contact	None	NA	None	NA
Left Knee Contact	Knee Bolster	A28	Glove Box	A52
Right Knee Contact	Knee Bolster	A28	Glove Box	A52

Data Anomalies:

- V2P1 HDCG AX — Spike at 52ms
- V2P1 NKCF FZ — Noise throughout data
- V2P1 NKCR FZ — Noisy between 50 & 95ms
- V2P1 PVCG AY — Spike at 58ms
- V2P1 FOTL AZ — Spikes at 43 & 47ms
- V2P1 FOTR AZ — Spikes at 37, 41 & 101ms
- V2P2 HDCG AY — Spike at 110ms
- V2P2 HDCG AZ — Spike at 110ms
- V2P2 NKCR FZ — Noisy between 43 & 95ms
- V2P2 FOTL AZ — Channel Failed
- V2P2 ANKL RX — Questionable Data
- V2P2 ANKL RY — Questionable Data
- V2P2 ANKR RX — Questionable Data
- V2P2 ANKR RY — Questionable Data

SECTION 2 (CONTINUED)
PRELIMINARY INJURY SUMMARY: Driver

Test Vehicle: Research 2012 Honda CR-V - Five Door Hatchback NHTSA No.: RC5369
Test Program: Research and Development Left Oblique Offset Test Date: 12/21/2012

Driver: Thor Serial No. 007 Injury Summary

	Nomenclature	Units	Source	Max	Min
Head	Head CG X	g	1000	7.22	-49.62
	Head CG Y	g	1000	15.30	-3.98
	Head CG Z	g	1000	21.85	-9.80
	Head Resultant	g	Compute	53.39	
	36 ms HIC		Compute	288.91	
	15 ms HIC		Compute	206.54	
	Head Resultant CG Acceleration, 3 ms Clip	g	Compute	49.09	
	Head Rotational Velocity X	deg/s	60	791.36	-1752.02
	Head Rotational Velocity Y	deg/s	60	223.83	-1035.81
	Head Rotational Velocity Z	deg/s	60	1964.89	-672.92
	Head Rotational Velocity Resultant	deg/s	Compute	2443.27	
	Brain Injury Criteria		Compute	0.98	
Neck	UNLC Transferred to OC, Neck System, FX	N	1000	329.92	-158.95
	UNLC Neck System Tension, FZ	N	1000	1695.54	
	UNLC Neck System Compression, FZ	N	1000		-92.73
	UNLC Transferred to OC, Neck System Flexion, MY	N-m	Thortest	2.02(1,2)	
	UNLC Transferred to OC, Neck System Extension, MY	N-m	Thortest		-8.09(1,2)
	NIJ		Compute	0.34	
	On head acting through total neck section, FX	N	Thortest	374.21	-269.03
	On head acting through total neck section, FY	N	Thortest	461.19	-93.91
	On head acting through total neck section, FZ	N	Thortest	1881.66	-74.06
	On head acting through total neck section, MX	N-m	Thortest	41.10	-40.61
	On head acting through total neck section, MY	N-m	Thortest	7.68	-15.64
	On head acting through total neck section, MZ	N-m	Thortest	7.99	-18.05
	On head acting through O.C. joint only, FX	N	Thortest	359.37(1,2)	-252.74(1,2)
	On head acting through O.C. joint only, FZ	N	Thortest	1711.13(1,2)	-95.26(1,2)
	On head acting through O.C. joint only, MY	N-m	Thortest	2.02(1,2)	-8.09(1,2)
Chest	Upper Left IR-TRACC X - deflection	mm	Thortest	3.98	-9.21
	Upper Left IR-TRACC Y - deflection	mm	Thortest	2.54	-10.82
	Upper Left IR-TRACC Z - deflection	mm	Thortest	13.86	-12.11
	Upper Left IR-TRACC D - deflection	mm	Thortest	4.20	-8.03
	Upper Right IR-TRACC X - deflection	mm	Thortest	0.08	-31.54
	Upper Right IR-TRACC Y - deflection	mm	Thortest	3.28	-11.37
	Upper Right IR-TRACC Z - deflection	mm	Thortest	22.26	-5.13
	Upper Right IR-TRACC D - deflection	mm	Thortest	0.08	-26.35
	Lower Left IR-TRACC X - deflection	mm	Thortest	10.29	-3.94
	Lower Left IR-TRACC Y - deflection	mm	Thortest	7.07	-14.61

SECTION 2 (CONTINUED)
PRELIMINARY INJURY SUMMARY: Driver

Test Vehicle: Research 2012 Honda CR-V - Five Door Hatchback NHTSA No.: RC5369
Test Program: Research and Development Left Oblique Offset Test Date: 12/21/2012

Driver: Thor Serial No. 007 Injury Summary

	Nomenclature	Units	Source	Max	Min
Chest (Con't)	Lower Left IR-TRACC Z - deflection	mm	Thortest	13.29	-3.06
	Lower Left IR-TRACC D - deflection	mm	Thortest	8.72	-5.27
	Lower Right IR-TRACC X - deflection	mm	Thortest	0.36	-44.62
	Lower Right IR-TRACC Y - deflection	mm	Thortest	3.54	-19.04
	Lower Right IR-TRACC Z - deflection	mm	Thortest	3.74	-18.37
	Lower Right IR-TRACC D - deflection	mm	Thortest	0.36	-42.30
	Chest CG Acceleration, 3 ms clip	g	Compute	44.63	
Abdomen	Lower Left IR-TRACC X - deflection	mm	Thortest	0.68	-66.12
	Lower Left IR-TRACC Y - deflection	mm	Thortest	4.69	-6.97
	Lower Left IR-TRACC Z - deflection	mm	Thortest	19.44	-0.85
	Lower Left IR-TRACC D - deflection	mm	Thortest	0.68	-66.21
	Left Viscous Criterion Based on X - deflection		Compute	1.78	
	Lower Right IR-TRACC X - deflection	mm	Thortest	0.87	-60.60
	Lower Right IR-TRACC Y - deflection	mm	Thortest	7.45	-2.44
	Lower Right IR-TRACC Z - deflection	mm	Thortest	28.76	-0.92
	Lower Right IR-TRACC D - deflection	mm	Thortest	0.93	-65.39
	Right Viscous Criterion Based on X - deflection		Compute	1.98	
Spine	Upper Spine (T1) AX	g	180	6.40	-61.32
	Upper Spine (T1) AY	g	180	26.64	-4.29
	Upper Spine (T1) AZ	g	180	28.58	-5.97
	Upper Spine (T1) Resultant	g	Compute	61.83	
	Middle Spine (T6) AX	g	180	5.81	-44.42
	Middle Spine (T6) AY	g	180	20.24	-4.15
	Middle Spine (T6) AZ	g	180	9.16	-16.21
	Middle Spine (T6) Resultant	g	Compute	45.42	
Pelvis	Pelvis CG Resultant Acceleration	g	Compute	72.12(3)	
Acetabulum	Left FX force	N	600	601.22	-3666.68
	Left FY force	N	600	617.94	-1080.46
	Left FZ force	N	600	2020.90	-2299.05
	Left Acetabulum Resultant	N	Compute	4131.84	
	Right FX force	N	600	853.81	-1219.58
	Right FY force	N	600	176.94	-2411.71
	Right FZ force	N	600	848.14	-386.54
	Right Acetabulum Resultant	N	Compute	2684.21	

Anomalies

(1) Front neck Fz questionable noise throughout
(2) Rear neck Fz questionable noise from 50 to 95 ms
(3) Pelvis Ay questionable spike at 58 ms

SECTION 2 (CONTINUED)
PRELIMINARY INJURY SUMMARY: Driver Legs

Test Vehicle: Research 2012 Honda CR-V - Five Door Hatchback NHTSA No.: RC5369
Test Program: Research and Development Left Oblique Offset Test Date: 12/21/2012

Driver: Thor Serial No. 007 Injury Summary

	Nomenclature	Units	Source	Max	Min
Knee	Left Knee Displacement, DX	mm	180	1.74	-10.89
	Right Knee Displacement, DX	mm	180	2.33	-7.09
Femur	Left Femur Force, FZ	N	600	270.89	-7535.90
	Left Femur Moment, MX	N-m	600	16.84	-158.70
	Left Femur Moment, MY	N-m	600	34.89	-91.79
	Left Femur Res (MX / MY only, not MZ)	N-m	Compute	176.15	
	Right Femur Force, FZ	N	600	418.31	-5048.24
	Right Femur Moment, MX	N-m	600	16.01	-236.35
	Right Femur Moment, MY	N-m	600	73.73	-12.97
	Right Femur Res (MX / MX only, not MZ)	N-m	Compute	238.37	
Tibia	Left Upper Tibia, FZ	N	600	425.08	-826.04
	Left Upper Tibia, MY	N-m	600	101.62	-74.30
	Left Upper Tibia, Index		Compute	0.45	
	Right Upper Tibia, FZ	N	600	235.85	-2573.75
	Right Upper Tibia, MY	N-m	600	27.11	-95.57
	Right Upper Tibia, Index		Compute	1.21	
	Left Lower Tibia, FZ	N	600	165.63	-1541.23
	Left Lower Tibia, MY	N-m	600	94.06	-46.13
	Left Lower Tibia, Index		Compute	0.50	
	Right Lower Tibia, FZ	N	600	1.62	-4538.85
	Right Lower Tibia, MY	N-m	600	13.25	-94.61
	Right Lower Tibia, Index		Compute	1.41	
Ankle	Left Ankle Rotation, RX	Deg	180	23.78	-13.05
	Left Ankle Rotation, RY	Deg	180	22.66	-16.96
	Right Ankle Rotation, RX	Deg	180	20.22	-40.70
	Right Ankle Rotation, RY	Deg	180	24.63	-9.06

Anomalies
None

SECTION 2 (CONTINUED)
PRELIMINARY INJURY SUMMARY: Right Front Passenger

Test Vehicle: Research 2012 Honda CR-V - Five Door Hatchback NHTSA No.: RC5369
Test Program: Research and Development Left Oblique Offset Test Date: 12/21/2012

Right Front Passenger: Thor Serial No. 016 Injury Summary

	Nomenclature	Units	Source	Max	Min
Head	Head CG X	g	1000	28.62	-24.66
	Head CG Y	g	1000	131.52	-2.11
	Head CG Z	g	1000	58.06	-0.48
	Head Resultant	g	Compute	136.41	
	36 ms HIC		Compute	899.15	
	15 ms HIC		Compute	899.15	
	Head Resultant CG Acceleration, 3 ms Clip	g	Compute	100.25	
	Head Rotational Velocity X	deg/s	60	719.06	-2398.03
	Head Rotational Velocity Y	deg/s	60	500.34	-1526.50
	Head Rotational Velocity Z	deg/s	60	3068.61	-1428.20
	Head Rotational Velocity Resultant	deg/s	Compute	3927.67	
	Brain Injury Criteria		Compute	1.48	
Neck	UNLC Transferred to OC, Neck System, FX	N	1000	442.47	-121.14
	UNLC Neck System Tension, FZ	N	1000	2193.73	
	UNLC Neck System Compression, FZ	N	1000		-345.36
	UNLC Transferred to OC, Neck System Flexion, MY	N-m	Thortest	9.83(4)	
	UNLC Transferred to OC, Neck System Extension, MY	N-m	Thortest		-4.08(4)
	NIJ		Compute	0.44	
	On head acting through total neck section, FX	N	Thortest	753.83	-132.28
	On head acting through total neck section, FY	N	Thortest	548.34	-195.95
	On head acting through total neck section, FZ	N	Thortest	2301.92	-210.84
	On head acting through total neck section, MX	N-m	Thortest	41.93	-44.31
	On head acting through total neck section, MY	N-m	Thortest	12.39	-8.58
	On head acting through total neck section, MZ	N-m	Thortest	14.79	-33.71
	On head acting through O.C. joint only, FX	N	Thortest	658.17(4)	-122.18(4)
	On head acting through O.C. joint only, FZ	N	Thortest	2134.42(4)	-344.09(4)
	On head acting through O.C. joint only, MY	N-m	Thortest	9.83(4)	-4.08(4)
Chest	Upper Left IR-TRACC X - deflection	mm	Thortest	0.15	-33.53
	Upper Left IR-TRACC Y - deflection	mm	Thortest	9.73	-11.95
	Upper Left IR-TRACC Z - deflection	mm	Thortest	8.55	-20.42
	Upper Left IR-TRACC D - deflection	mm	Thortest	0.16	-33.90
	Upper Right IR-TRACC X - deflection	mm	Thortest	2.12	-19.17
	Upper Right IR-TRACC Y - deflection	mm	Thortest	6.74	-8.30
	Upper Right IR-TRACC Z - deflection	mm	Thortest	9.67	-6.84
	Upper Right IR-TRACC D - deflection	mm	Thortest	1.34	-17.77
	Lower Left IR-TRACC X - deflection	mm	Thortest	0.23	-30.16
	Lower Left IR-TRACC Y - deflection	mm	Thortest	10.12	-0.54

SECTION 2 (CONTINUED)
PRELIMINARY INJURY SUMMARY: Right Front Passenger

Test Vehicle: Research 2012 Honda CR-V - Five Door Hatchback NHTSA No.: RC5369
Test Program: Research and Development Left Oblique Offset Test Date: 12/21/2012

Right Front Passenger: Thor Serial No. 016 Injury Summary

	Nomenclature	Units	Source	Max	Min
Chest (Con't)	Lower Left IR-TRACC Z - deflection	mm	Thortest	11.56	-7.44
	Lower Left IR-TRACC D - deflection	mm	Thortest	0.70	-27.80
	Lower Right IR-TRACC X - deflection	mm	Thortest	15.95	-7.98
	Lower Right IR-TRACC Y - deflection	mm	Thortest	8.31	-11.42
	Lower Right IR-TRACC Z - deflection	mm	Thortest	6.02	-9.03
	Lower Right IR-TRACC D - deflection	mm	Thortest	14.79	-6.09
	Chest CG Acceleration, 3 ms clip	g	Compute	28.90	
Abdomen	Lower Left IR-TRACC X - deflection	mm	Thortest	0.46	-64.38
	Lower Left IR-TRACC Y - deflection	mm	Thortest	7.87	-2.06
	Lower Left IR-TRACC Z - deflection	mm	Thortest	10.59	-13.92
	Lower Left IR-TRACC D - deflection	mm	Thortest	0.46	-63.71
	Left Viscous Criterion Based on X - deflection		Compute	0.97	
	Lower Right IR-TRACC X - deflection	mm	Thortest	0.14	-49.91
	Lower Right IR-TRACC Y - deflection	mm	Thortest	17.49	-0.67
	Lower Right IR-TRACC Z - deflection	mm	Thortest	10.80	-8.15
	Lower Right IR-TRACC D - deflection	mm	Thortest	0.14	-49.64
	Right Viscous Criterion Based on X - deflection		Compute	0.73	
Spine	Upper Spine (T1) AX	g	180	2.70	-36.61
	Upper Spine (T1) AY	g	180	56.17	-7.08
	Upper Spine (T1) AZ	g	180	27.81	-1.64
	Upper Spine (T1) Resultant	g	Compute	60.20	
	Middle Spine (T6) AX	g	180	2.91	-26.82
	Middle Spine (T6) AY	g	180	21.27	-3.09
	Middle Spine (T6) AZ	g	180	12.27	-6.81
	Middle Spine (T6) Resultant	g	Compute	29.85	
Pelvis	Pelvis CG Resultant Acceleration	g	Compute	49.65	
Acetabulum	Left FX force	N	600	2000.43	-1482.21
	Left FY force	N	600	1491.12	-211.96
	Left FZ force	N	600	344.62	-1249.10
	Left Acetabulum Resultant	N	Compute	2414.49	
	Right FX force	N	600	2700.67	-1132.48
	Right FY force	N	600	1060.30	-444.39
	Right FZ force	N	600	2437.20	-1075.79
	Right Acetabulum Resultant	N	Compute	2724.52	

Anomalies

(4) Rear neck Fz questionable noise from 43 to 95 ms

SECTION 2 (CONTINUED)
PRELIMINARY INJURY SUMMARY: Right Front Passenger Legs

Test Vehicle: Research 2012 Honda CR-V - Five Door Hatchback NHTSA No.: RC5369
Test Program: Research and Development Left Oblique Offset Test Date: 12/21/2012

Right Front Passenger: Thor Serial No. 016 Injury Summary

	Nomenclature	Units	Source	Max	Min
Knee	Left Knee Displacement, DX	mm	180	1.22	-4.08
	Right Knee Displacement, DX	mm	180	1.47	-1.33
Femur	Left Femur Force, FZ	N	600	204.23	-4353.83
	Left Femur Moment, MX	N-m	600	60.10	-142.09
	Left Femur Moment, MY	N-m	600	138.49	-18.42
	Left Femur Res (MX / MY only, not MZ)	N-m	Compute	154.85	
	Right Femur Force, FZ	N	600	297.96	-4826.22
	Right Femur Moment, MX	N-m	600	32.69	-233.48
	Right Femur Moment, MY	N-m	600	176.88	-49.80
	Right Femur Res (MX / MX only, not MZ)	N-m	Compute	238.24	
Tibia	Left Upper Tibia, FZ	N	600	21.16	-1776.68
	Left Upper Tibia, MY	N-m	600	39.36	-24.04
	Left Upper Tibia, Index		Compute	0.59	
	Right Upper Tibia, FZ	N	600	116.11	-2462.12
	Right Upper Tibia, MY	N-m	600	40.93	-92.73
	Right Upper Tibia, Index		Compute	0.72	
	Left Lower Tibia, FZ	N	600	63.71	-2018.06
	Left Lower Tibia, MY	N-m	600	22.73	-22.72
	Left Lower Tibia, Index		Compute	0.24	
	Right Lower Tibia, FZ	N	600	197.11	-2971.47
	Right Lower Tibia, MY	N-m	600	28.14	-48.80
	Right Lower Tibia, Index		Compute	0.53	
Ankle	Left Ankle Rotation, RX	Deg	180	29.08(5)	-93.91(5)
	Left Ankle Rotation, RY	Deg	180	4.18(6)	-94.09(6)
	Right Ankle Rotation, RX	Deg	180	11.52	-32.89
	Right Ankle Rotation, RY	Deg	180	17.85	-19.70

Anomalies

(5) Channel failed
(6) Channel failed

SECTION 3
DATA SHEETS

Test Vehicle: 2012 Honda CR-V Five Door Hatchback
Test Program: R&D 90.1kph, 15° angle, 35% offset
NHTSA No.: RC5369
Test Date: 12/21/2012

Data Sheet No.		Page No.
1	General Test and Vehicle Parameter Data	3-2
2	Seat Adjustment, Fuel System, and Steering Wheel	3-6
3	Dummy Longitudinal Clearance Dimensions	3-8
4	Dummy Lateral Clearance Dimensions	3-10
5	Seat Belt Positioning Data	3-11
6	High-Speed Camera Locations and Data	3-12
7	Vehicle Instrumentation Data	3-15
8	Photographic Reference Target Locations	3-17
9	Test Vehicle Summary of Results	3-24
10	Post-Test Observations	3-25
11	Vehicle Profile Measurements	3-26
12	Accident Investigation Division Data	3-28
13	Vehicle Intrusion Measurements	3-29
14	RMDB Crush Measurements	3-46
15	Summary of FMVSS 212, 219 (Partial), and 301 Data	
	Windshield Periphery Measurements	3-47
	Fuel System Integrity Post Impact Data	3-48
16	FMVSS 301 Static Rollover Results	3-49
17	Dummy / Vehicle Temperature Stabilization	3-50

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2012 Honda CR-V Five Door Hatchback
Test Program: R&D 90.1kph, 15° angle, 35% offset

NHTSA No.: RC5369
Test Date: 12/21/2012

VEHICLE INFORMATION

NHTSA No.	RC5369
Model Year	2012
Make	Honda
Model	CR-V
Body Style	Five Door Hatchback
VIN	5J6RM3H32CL047815
Body Color	Brown
Odometer Reading (km/mi)	121 / 75
Engine Displacement. (L)	2.4
Type/No. Cylinders	I4
Engine Placement	Transverse
Transmission Type	Automatic
Transmission Speeds	5-Speed
Overdrive	Yes
Final Drive	Front Wheel Drive
Roof Rack	No
Sunroof/T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	No
Anti-Lock Brakes (ABS)	Yes
All-Wheel Drive (AWD)	No
Traction Control System (TCS)	Yes

VEHICLE OPTIONS

Auto-Leveling System	No
Automatic Door Locks (ADL)	Yes
Power Window Auto-Reverse	No
Other Optional Feature	--
Driver Front Airbag	Yes
Driver Curtain Airbag	Yes
Driver Head/Torso Airbag	No
Driver Torso Airbag	Yes
Driver Torso/Pelvis Airbag	No
Driver Pelvis Airbag	No
Driver Knee Airbag	No
Pass. Front Airbag	Yes
Pass. Curtain Airbag	Yes
Pass. Head/Torso Airbag	No
Pass. Torso Airbag	Yes
Pass. Torso/Pelvis Airbag	No
Pass. Pelvis Airbag	No
Pass. Knee Airbag	No
Driver Seat Belt Pretensioner	Yes
Pass. Seat Belt Pretensioner	Yes
Driver Load Limiter	Yes
Pass. Load Limiter	Yes
Other Safety Restraint	--

Does owner's manual provide instructions to turn off automatic door locks? Yes

DATA FROM CERTIFICATION LABEL

Manufactured By	Honda of America MFG INC
Date of Manufacture	08/12

GVWR (kg)	1965
GAWR Front (kg)	1010
GAWR Rear (kg)	975

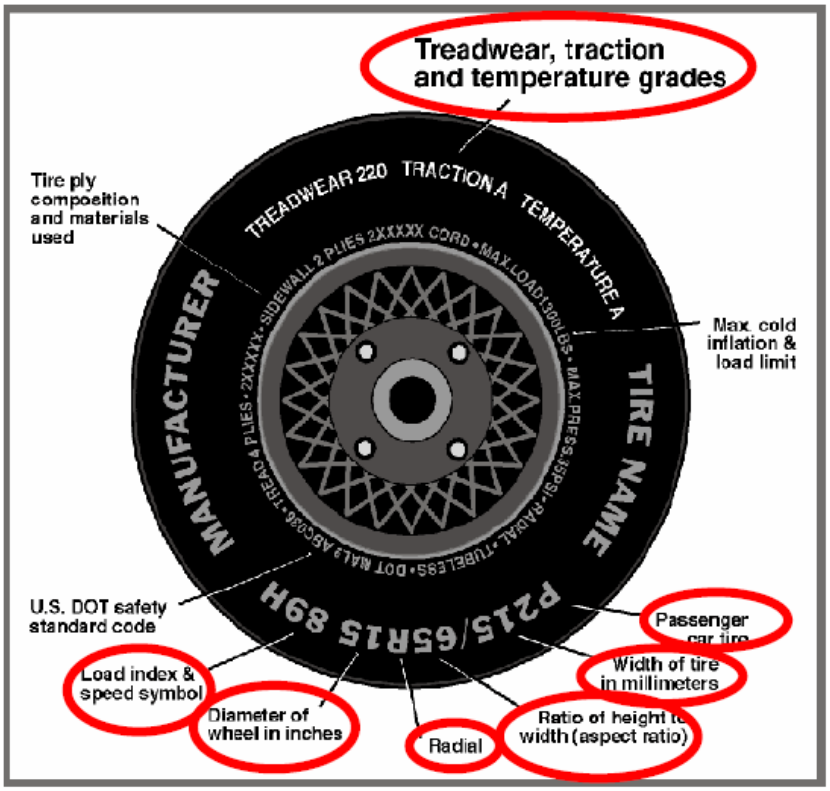
VEHICLE SEATING AND WEIGHT CAPACITY

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench	--	
Number of Occupants	2	3	--	5
Capacity Wt. (VCW) (kg)				385.00
Cargo Wt. (RCLW) (kg)				44.80

DATA SHEET NO. 1 (CONTINUED)
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle:	2012 Honda CR-V Five Door Hatchback	NHTSA No.:	RC5369
Test Program:	R&D 90.1kph, 15° angle, 35% offset	Test Date:	12/21/2012

Collect items circled in red, tire manufacturer, and tire name.



Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	220	220
Recommended Tire Size	P215/70R16	P215/70R16
Tire Size on Vehicle	P215/70R16	P215/70R16
Tire Manufacturer	Continental	Continental
Tire Model	Cross Contact	Cross Contact
Treadwear	680	680
Traction	A	A
Temperature Grades	B	B
Tire Plies Sidewall	1 Polyester	1 Polyester
Tire Plies Body	1 Polyester, 2 Steel, 1 Polyamide	1 Polyester, 2 Steel, 1 Polyamide
Load Index/Speed Symbol	100S	100S
Tire Material	Rubber	Rubber
DOT Safety Code Right	A3093WM3312	A3093WM3312
DOT Safety Code Left	A3093WM3312	A3093WM3312

DATA SHEET NO. 1 (CONTINUED)
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2012 Honda CR-V Five Door Hatchback
Test Program: R&D 90.1kph, 15° angle, 35% offset

NHTSA No.: RC5369
Test Date: 12/21/2012

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	440.5	315		480	417	
Right	kg	428	299.5		463	397	
Ratio	%	58.6%	41.4%		53.7%	46.3%	
Totals	kg	868.5	614.5	1,483.0	943.0	814.0	1757

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1,483.00
Weight of 2 P572E ATDs	kg	190.51
Rated Cargo/Luggage Weight (RCLW)	kg	44.80
Calculated Vehicle Target Weight (TVTW)	kg	1,709.31

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	795	802	798	805	1087
As Tested	mm	783	790	759	769	1215
Post Test	mm	845	791	704	803	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	2623
Total Vehicle Length at Left Side	mm	4413
Total Vehicle Length at Centerline	mm	4528
Total Vehicle Length at Right Side	mm	4413
Weight of Ballast in Cargo Area	kg	0
Weight of Vehicle Components Removed	kg	23
Amount of Stoddard Solvent in Fuel Tank	L	53.7

LIST OF COMPONENTS REMOVED TO MEET TEST WEIGHT:

Trunk carpeting, spare tire, and jack.

DATA SHEET NO.1 (CONTINUED)
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2012 Honda CR-V Five Door Hatchback
Test Program: R&D 90.1kph, 15° angle, 35% offset
NHTSA No.: RC5369
Test Date: 12/21/2012

TARGET VEHICLE STRUCTURAL MEASUREMENT

	Elements		Pre-Test
1	Total Length	mm	4528
2	Total Width	mm	1821
3	Bumper Top Height	mm	573
4	Bumper Bottom Height	mm	469
5	Longitudinal Member Top Height	mm	561
6	Distance Between Longitudinal Members	mm	1061
7	Longitudinal Member Width	mm	64
8	Engine Top Height	mm	874
9	Engine Bottom Height	mm	188
10	Engine and Gearbox Width	mm	560
11	Front Bumper-Engine Distance	mm	433
12	Front Shock Absorber Fixing Height	mm	983
13	Bonnet Leading Edge Height	mm	883
14	Front Shock Absorber Fixing Width	mm	1140
15	Front Bumper – Front Axle Distance	mm	902
16	Front Axle – A Pillar Distance	mm	494
17	A-Pillar – B-Pillar Distance	mm	1105
18	B-Pillar – Rear Axle Distance	mm	1026
19	B-Pillar – C-Pillar Distance	mm	953
20	Roof Sill Bottom Height	mm	1491
21	Roof Sill Top Height	mm	1601
22	Floor Sill Bottom Height	mm	384
23	Floor Sill Top Height	mm	463

*Note: Height measurements are in reference to the ground.

DATA SHEET NO. 2
SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL

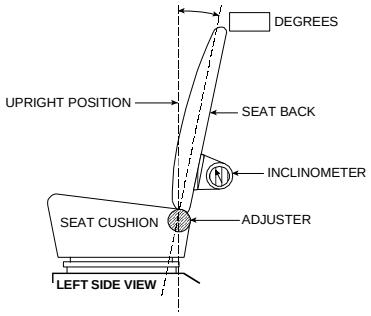
Test Vehicle: 2012 Honda CR-V Five Door Hatchback
Test Program: R&D 90.1kph, 15° angle, 35% offset
NHTSA No.: RC5369
Test Date: 12/21/2012

NORMAL DESIGN RIDING POSITION

For adjustable driver and passenger seat backs. Please describe how to position the inclinometer to measure the seat back angle. Include description of the location of the adjustment latch detent, if applicable.

Driver seat: The driver seat back was positioned according to the Nominal Design Riding position listed in FORM 1

Passenger Seat: The passenger seat back was positioned to allow for a zero head angle of the passenger dummy



FRONT SEAT ASSEMBLY

	Deg.
Driver Seat Back Angle	9.4
Passenger Seat Back Angle	9.5

SEAT FORE/AFT POSITIONS

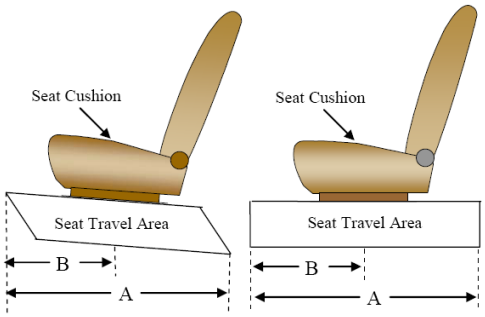
Describe the method used of determining seat fore/aft positions.
The driver's seat was positioned at the mid-point of fore/aft travel.
The passenger's seat was positioned at the most forward position of fore/aft travel.

	Total Fore/Aft Travel	Placed in Position #
Driver Seat	25	11
Passenger Seat	25	12

SEAT BELT UPPER ANCHORAGES

Describe the method of positioning seat belt upper anchorages. Belt anchorages were moved along the full range of motion, and marked on the B-Pillar to their respective possible positions. Photographic evidence can be found in Appendix A of this report. Zero is defined as the upper-most position.

	Total # of Positions	Placed in Position #
Driver Seat	4	0-uppermost
Passenger Seat	4	0-uppermost



DATA SHEET NO. 2 (CONTINUED)
SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

Test Vehicle: 2012 Honda CR-V Five Door Hatchback
NHTSA No.: RC5369
Test Program: R&D 90.1kph, 15° angle, 35% offset
Test Date: 12/21/2012

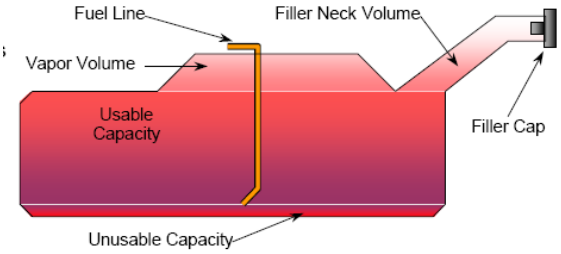
FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank"	57.9
Usable Capacity of "Optional Tank"	
93% of Usable Capacity	53.8
Actual Amount of Solvent Used	53.7
1/3 of Usable Capacity	19.1

FUEL PUMP

Describe the fuel system - what type of fuel pump, details about how it operates, etc.

Fuel evacuated according to the specifications provided by the manufacturer in Form 1. Electric fuel pump operates when the ignition is in the 'on' position and the engine is running. The fuel filler neck is located above the left rear wheel.

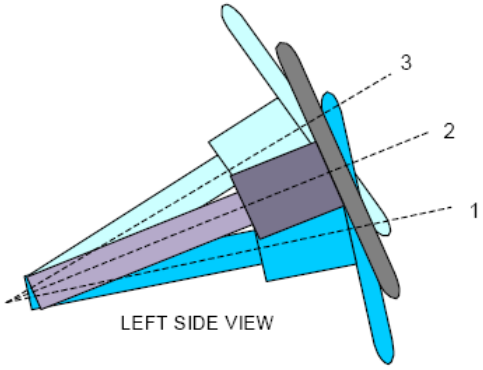


VEHICLE FUEL TANK ASSEMBLY

STEERING COLUMN ADJUSTMENT

Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes when moved through its full range of motion. Describe how this measurement was taken.

The steering wheel was adjusted to the midpoint of tilt angle range and the midpoint of the telescoping travel (if applicable)



STEERING COLUMN ASSEMBLY

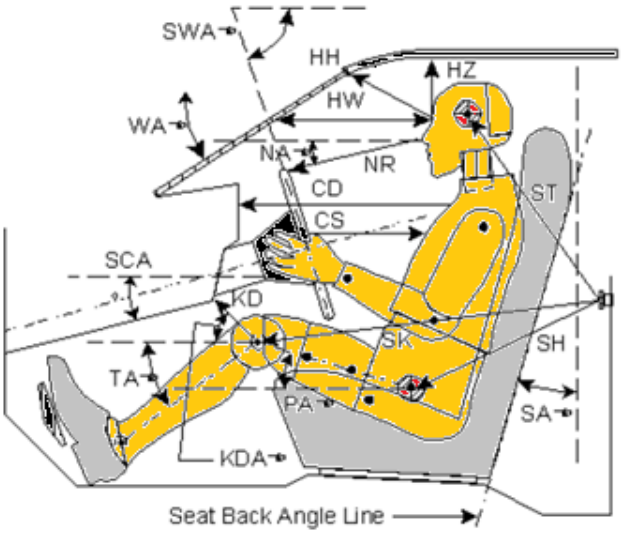
STEERING COLUMN POSITIONS

	Tilt (degrees)	Fore/Aft Position (mm)
Lowermost position No. 1	26.9	
Geometric center position No. 2	29.2	
Uppermost position No. 3	31.7	
Telescoping Steering Wheel Travel		44
Test Position	29.2	22

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2012 Honda CR-V Five Door Hatchback
Test Program: R&D 90.1kph, 15° angle, 35% offset

NHTSA No.: RC5369
Test Date: 12/21/2012



Code	Measurement Description	Driver (Serial # Thor 007)		Passenger (Serial # Thor 016)	
		Length (mm)	Angle(°)	Length (mm)	Angle (°)
WAº	Windshield Angle		28.6		
SWAº	Steering Wheel Angle		28.5		
SCAº	Steering Column Angle		61.5		
SAº	Seat Back Angle (on headrest post)		9.4		9.5
HZ	Head to Roof (Z)	215	90.0	205	90.0
HH	Head to Header	458	15.2	450	14.2
HW	Head to Windshield	682	0.0	681	0.0
NR	Nose to Rim	518	-13.5	703	33.6
CD	Chest to Dash	640		582	
CS	Chest to Steering Hub	380	-4.2		
RA	Rim to Abdomen	190	5.0		
KDL	Left Knee to Dash	121	29.2	98	30.7
KDR	Right Knee to Dash	93	27.2	112	27.2
PAº	Pelvic Angle		-23.7		23.4
TAº	Tibia Angle		-43.0		-44.8
SK	Striker to Knee	635	-7.4	652	-7.0
ST	Striker to Head	44	84.8	49	84.3
SH	Striker to H-Point	239	-41.7	237	-37.0
HAX°	Head Angle (X)		-0.2		0.3
HAY°	Head Angle (Y)		-0.2		0.3
NAX°	Neck Angle (X)		5.0		
NAY°	Neck Angle (Y)		-0.4		
TAX°	T6 Angle (X)		20.5		2.5
TAY°	T6 Angle (Y)		-0.6		0.6
LAX°	Lumbar Angle (X)		23.7		-1.3
LAY°	Lumbar Angle (Y)		0.3		17.7

DATA SHEET NO.3 (CONTINUED)
DUMMY CMM MEASUREMENTS

Test Vehicle: 2012 Honda CR-V Five Door Hatchback NHTSA No.: RC5369
Test Program: R&D 90.1kph, 15° angle, 35% offset Test Date: 12/21/2012

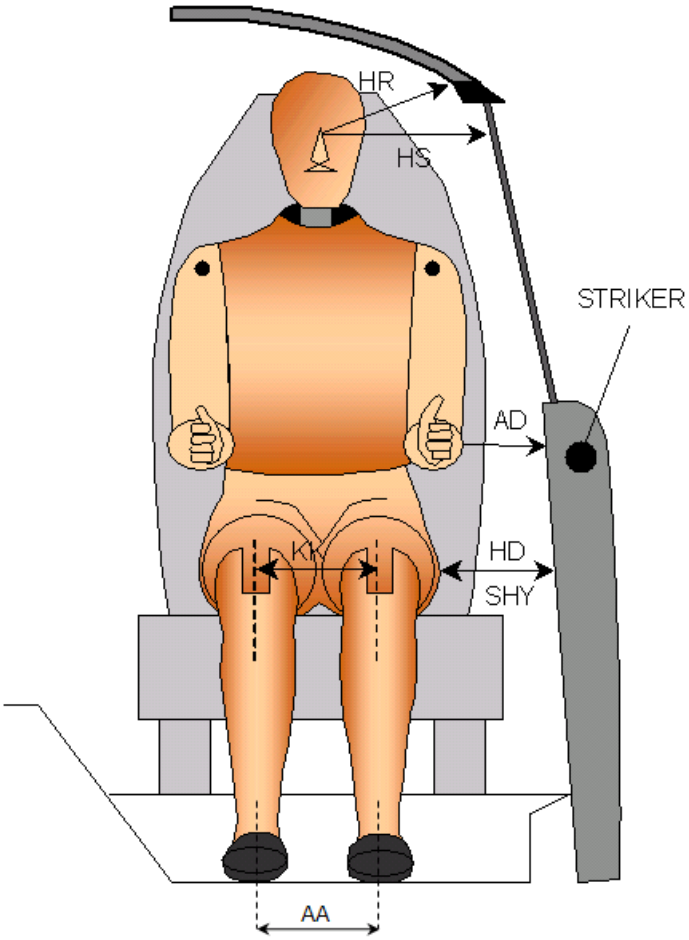
Description	Units	Driver			Passenger		
		X	Y	Z	X	Y	Z
Striker	mm	1478	-792	686	1479	790	685
Head CG	mm	1557	-452	219	1562	452	205
Bridge of Nose	mm	1652	-372	225	1656	375	207
Tip of Nose	mm	1652	-372	262	1655	373	247
Shoulder Bolt	mm	1617	-564	461	1611	564	472
Tip of Chin	mm	1651	-374	342	1651	372	331
H-Point	mm	1751	-574	915	1750	577	878
Left Knee	mm	2147	-579	784	2163	319	779
Right Knee	mm	2153	-318	804	2165	545	779
Left Ankle	mm	2449	-575	1073	2462	319	1071
Right Ankle	mm	2469	-279	1087	2462	528	1073
Left Heel	mm	2464	-561	1210	2432	282	1208
Right Heel	mm	2489	-235	1211	2441	484	1213
Outboard Seat Anchor Bolt	mm	1926	-592	1193	1929	596	1191
Outboard Head Restraint Post	mm	1378	-453	431	1365	457	413
Top of Head Restraint	mm	1441	-373	141	1419	376	124
Center of Steering Wheel	mm	2076	-380	519			

Reference point: 50mm above the center of the rear windshield (See appendix D for procedure to create coordinate system).

+X – From the rear of the vehicle to the front of the vehicle
+Y – From the left side of the vehicle to the right side of the vehicle
+Z – From the top of the vehicle to the bottom of the vehicle

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

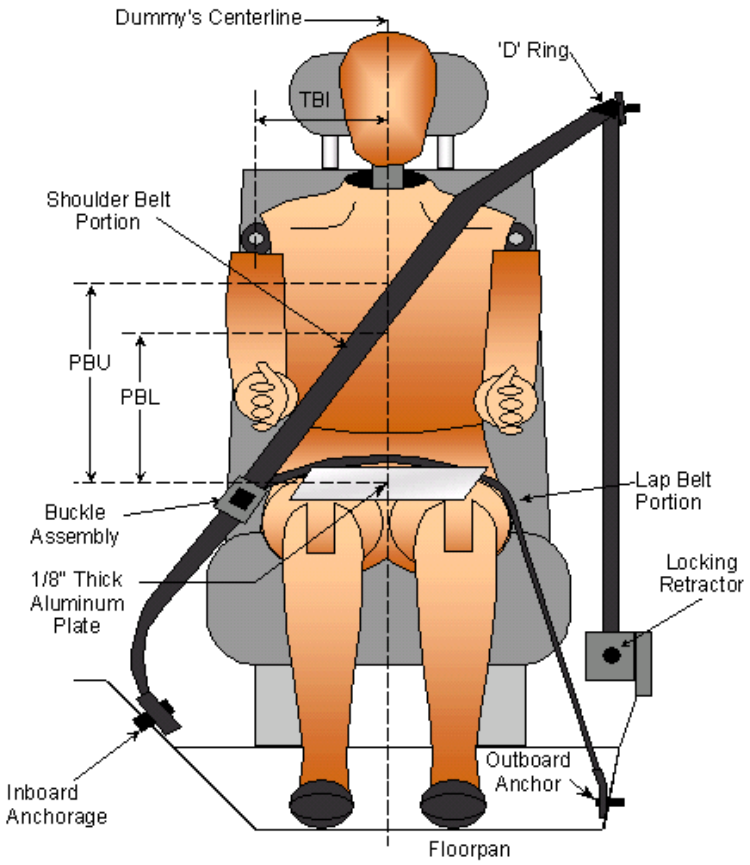
Test Vehicle: 2012 Honda CR-V Five Door Hatchback
Test Program: R&D 90.1kph, 15° angle, 35% offset
NHTSA No.: RC5369
Test Date: 12/21/2012



Code	Description	Units	Driver	Passenger
AD	Arm to Door	mm	127	120
HD	H-Point to Door	mm	127	123
HR	Head to Side Header	mm	223	221
HS	Head to Side Window	mm	360	355
KK	Knee to Knee	mm	295	270
SHY	Striker to H-Point (Y Direction)	mm	205	205
AA	Ankle to Ankle	mm	300	205

DATA SHEET NO. 5
SEAT BELT POSITIONING DATA

Test Vehicle:	2012 Honda CR-V Five Door Hatchback	NHTSA No.:	RC5369
Test Program:	R&D 90.1kph, 15° angle, 35% offset	Test Date:	12/21/2012



SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU — Top surface of reference to belt upper edge	mm	385	385
PBL — Top surface of reference to belt lower edge	mm	305	305

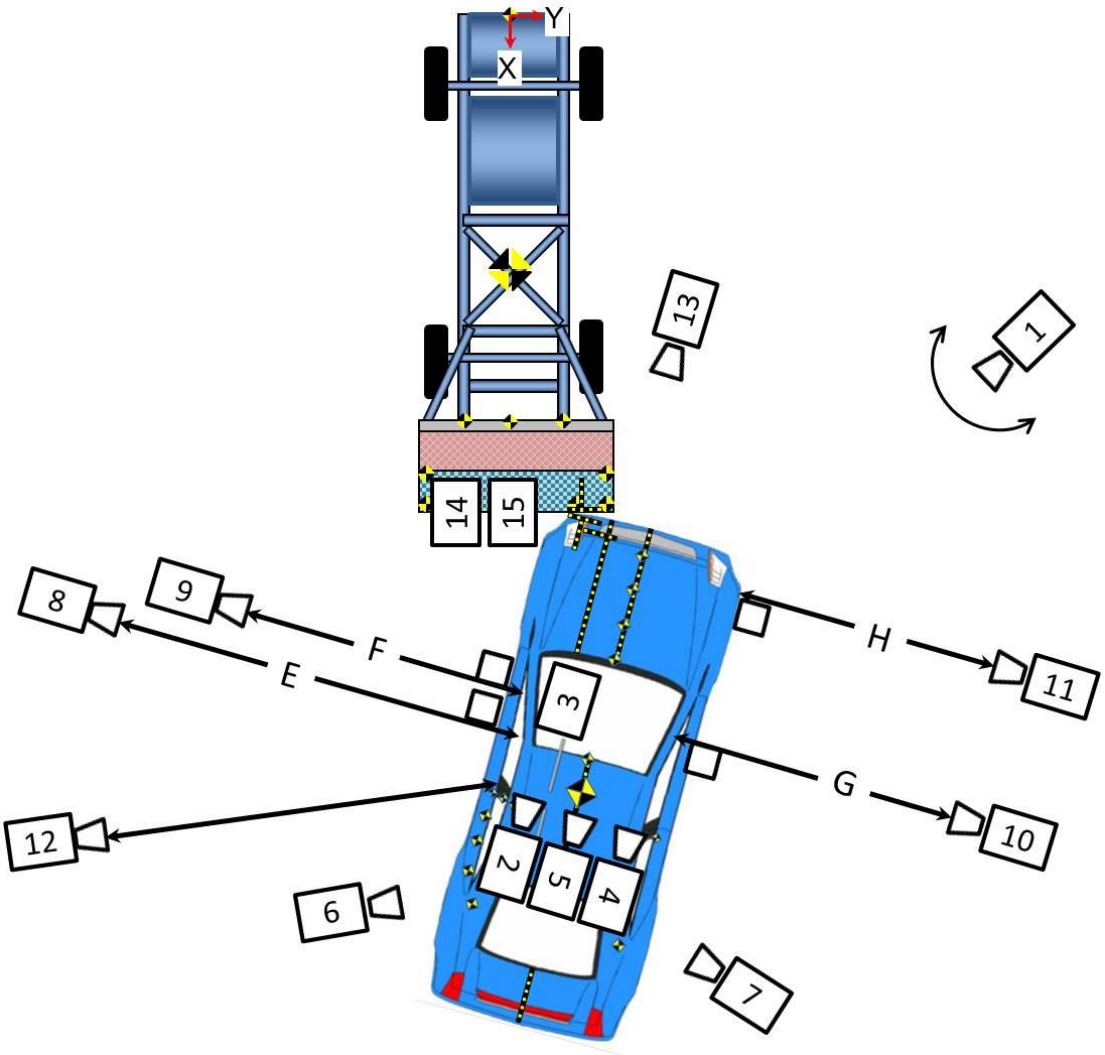
BELT LENGTH DATA

Measurement Description	Units	Driver	Passenger
Shoulder belt length as measured on ATD	mm	880	890
Lap Belt Length as measured on ATD	mm	675	665
Remainder of belt on reel	mm	745	745
Total belt length for continuous webbing systems	mm	2,300	2,300

DATA SHEET NO. 6
HIGH-SPEED CAMERA LOCATIONS AND DATA

Test Vehicle:	2012 Honda CR-V Five Door Hatchback	NHTSA No.:	RC5369
Test Program:	R&D 90.1kph, 15° angle, 35% offset	Test Date:	12/21/2012

HORIZONTAL LOCATION

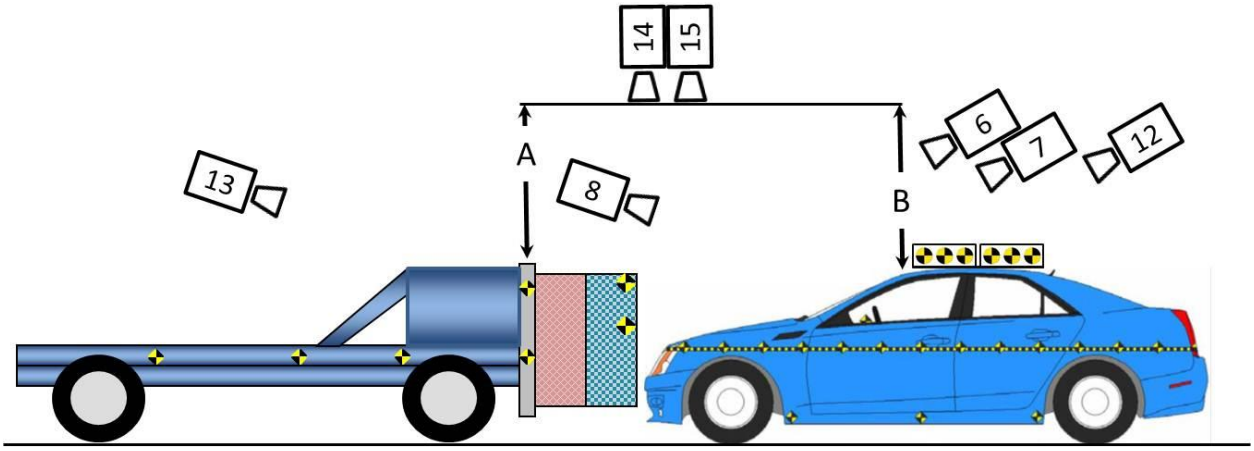


E	mm	8557
F	mm	8684
G	mm	6653
H	mm	9732

DATA SHEET NO. 6 (CONTINUED)
HIGH-SPEED CAMERA LOCATIONS AND DATA

Test Vehicle:	2012 Honda CR-V Five Door Hatchback	NHTSA No.:	RC5369
Test Program:	R&D 90.1kph, 15° angle, 35% offset	Test Date:	12/21/2012

VERTICAL LOCATION



A	mm	3508
B	mm	3716

DATA SHEET NO. 6 (CONTINUED)
HIGH-SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2012 Honda CR-V Five Door Hatchback NHTSA No.: RC5369
Test Program: R&D 90.1kph, 15° angle, 35% offset Test Date: 12/21/2012

CAMERA LOCATIONS

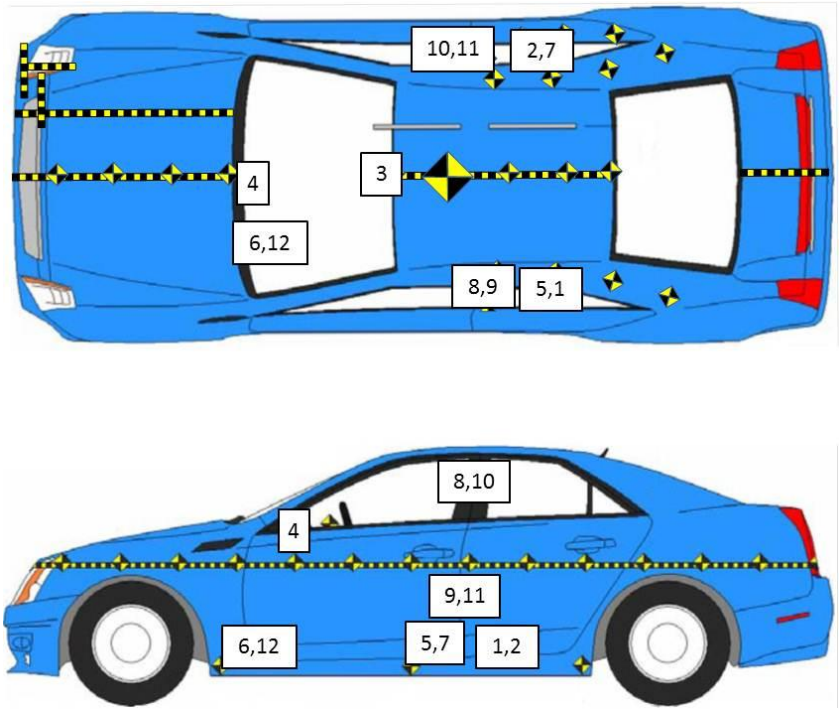
No.	Camera View	Location (mm)			Lens (mm)	Speed (fps)
		X	Y	Z		
1	Real-Time Left Side	--	--	--	Zoom	30
2	Onboard Passenger Movement	8136	-674	1342	12.5	500
3	Onboard Driver Lower Leg	6401	-571	352	6.5	500
4	Onboard Driver Movement	8064	-404	1441	12.5	500
5	Onboard Centerline	7682	100	1332	12.5	500
6	Driver Interaction	7694	3967	3380	24	1000
7	Passenger Interaction	12253	-10770	2269	50	1000
8	Target Vehicle Left Side Perpendicular (High)	4859	9654	3409	24-70	1000
9	Target Vehicle Driver Motion	5813	6524	954	24	1000
10	Target Vehicle Passenger Motion	9516	-10183	1759	50	1000
11	Target Vehicle Right Side	8555	-10140	1959	24	1000
12	Target Vehicle Left Side (High)	10246	8506	3124	28-70	1000
13	RMDB/Target Vehicle Interaction	3792	1611	2012	13	1000
14	Close-up Impact Point	4840	-1080	4719	28	1000
15	Overall Impact	6269	-585	5317	14	1000

Reference Point: Center most rearward point of the RMDB when in contact with the target vehicle:

+X – From back of RMDB to front of RMDB
+Y – Right of monorail center
+Z – Up from ground

DATA SHEET NO. 7
VEHICLE INSTRUMENTATION DATA

Test Vehicle: 2012 Honda CR-V Five Door Hatchback
Test Program: R&D 90.1kph, 15° angle, 35% offset
NHTSA No.: RC5369
Test Date: 12/21/2012



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Accelerometer Location	Axes	Units	Measurements (mm)		
				X	Y	Z
1	Left Rear Sill	X,Y	mm	1256	-640	1198
2	Right Rear Sill	X,Y	mm	1263	647	1179
3	Vehicle CG	X,Y,Z	mm	1762	-5	1141
4	Instrument Panel	X	mm	2201	-1	665
5	Driver Seat Track	X,Y,Z	mm	1577	-524	1209
6	Behind Brake Pedal	X,Y,Z	mm	2764	-417	968
7	Passenger Seat Track	X,Y,Z	mm	1578	525	1208

Reference point: 50mm above the center of the rear windshield (See appendix D for procedure to create coordinate system).

+X – From the rear of the vehicle to the front of the vehicle
+Y – From the left side of the vehicle to the right side of the vehicle
+Z – From the top of the vehicle to the bottom of the vehicle

DATA SHEET NO. 7 (CONTINUED)
VEHICLE INSTRUMENTATION DATA

Test Vehicle: 2012 Honda CR-V Five Door Hatchback
Test Program: R&D 90.1kph, 15° angle, 35% offset
NHTSA No.: RC5369
Test Date: 12/21/2012

VEHICLE INSTRUMENTATION DATA

Loc.	Description	Axes	Units	Positive Direction		Negative Direction	
				Max	Time (ms)	Max	Time (ms)
1	Left Rear Sill	X	g	2.22	124.75	-50.58	42.65
		Y	g	14.47	72.90	-8.73	37.55
2	Right Rear Sill	X	g	3.27	118.00	-35.94	39.00
		Y	g	6.02	75.55	-9.15	42.50
3	Vehicle CG	X	g	5.33	118.75	-60.63	43.50
		Y	g	56.23	59.50	-14.50	55.50
		Z	g	33.61	56.05	-39.75	51.70
4	Instrument Panel	X	g	56.35	70.70	-61.53	46.35
5	Driver Seat Track	X	g	2.61	118.25	-51.79	42.30
		Y	g	26.38	39.50	-2.49	7.80
		Z	g	15.04	36.50	-15.40	72.40
6	Behind Brake Pedal	X	g	28.72	64.25	-144.98	36.05
		Y	g	23.20	30.85	-30.35	46.25
		Z	g	46.64	34.45	-18.16	46.05
7	Passenger Seat Track	X	g	2.79	126.55	-55.32	41.30
		Y	g	22.78	40.25	-13.88	46.65
		Z	g	23.29	47.05	-29.42	50.25
8	Driver Shoulder Belt		N	3,623.92	70.30	-38.68	163.20
9	Driver Lap Belt		N	3,249.29	55.45	-0.75	-1.45
10	Passenger Shoulder Belt		N	3,279.51	74.65	-6.82	158.00
11	Passenger Lap Belt		N	4,118.02	67.25	-0.49	-48.85
12	Driver Floor Pan String Pot		mm	70.59	69.30	-0.03	-11.55

TIME TO FIRE RESTRAINT TIMING

Loc.	Description	Axes	Units	Time to Fire (ms)
1	Driver Air Bag Squib 1	*	V	12.4
2	Driver Air Bag Squib 2	*	V	53.7
3	Driver Curtain Airbag	*	V	37.2
4	Driver Torso Airbag	*	V	37.2
5	Driver Knee Airbag	*	V	N/A
6	Driver Pretensioner	*	V	11.8
7	Passenger Air Bag Squib 1	*	V	23.3
8	Passenger Air Bag Squib 2	*	V	41.8
9	Passenger Curtain Airbag	*	V	Disabled
10	Passenger Torso Airbag	*	V	Disabled
11	Passenger Knee Airbag	*	V	N/A
12	Passenger Pretensioner	*	V	11.8

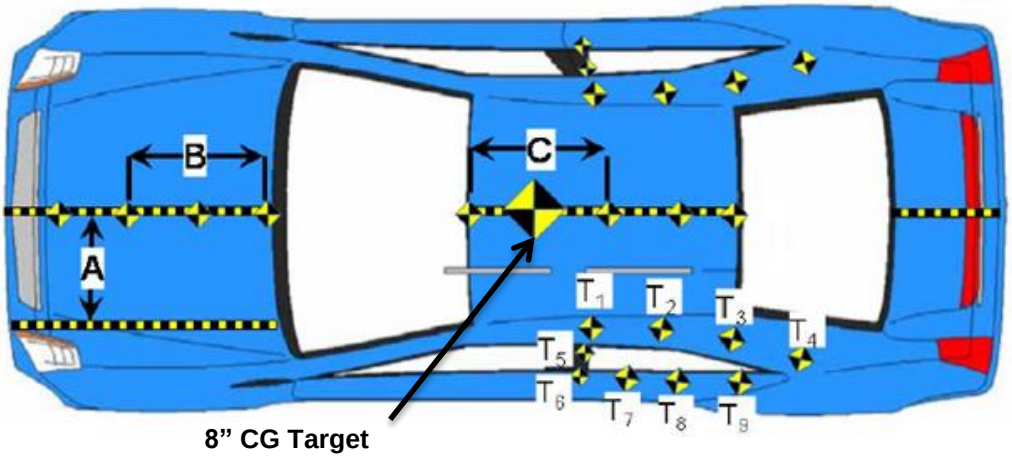
* The measurement indicates the time the voltage changed

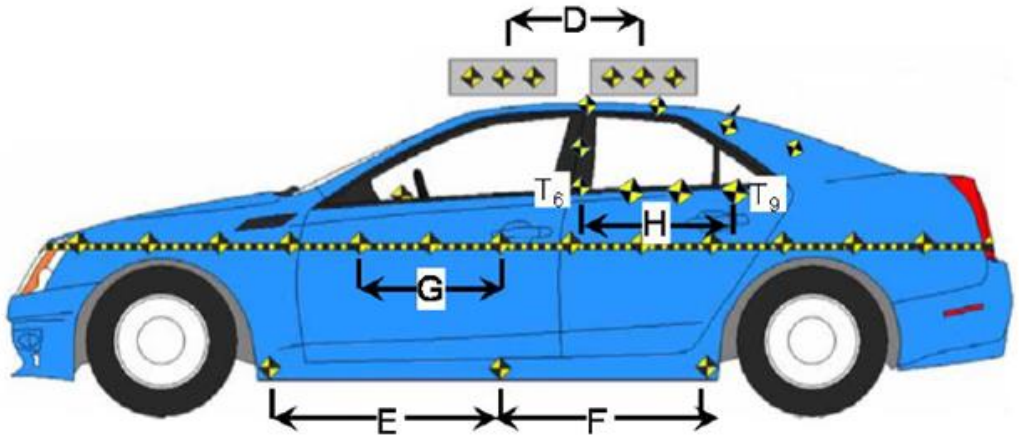
DATA SHEET NO. 8
PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

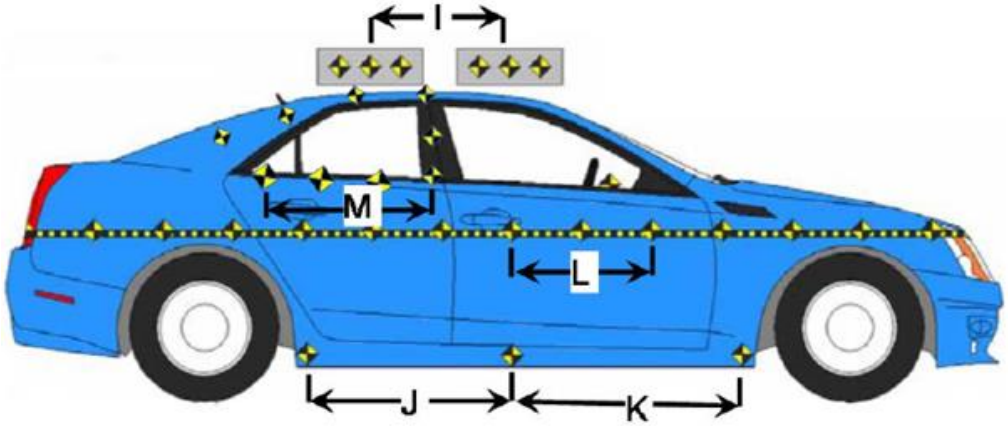
Test Vehicle:	2012 Honda CR-V Five Door Hatchback	NHTSA No.:	RC5369
Test Program:	R&D 90.1kph, 15° angle, 35% offset	Test Date:	12/21/2012

Item	Units	Value
A	mm	274
B	mm	1220
C	mm	1220
D	mm	612
E	mm	806
F	mm	806
G	mm	1220
H	mm	925
I	mm	612
J	mm	806
K	mm	804
L	mm	1220
M	mm	925

Note: All 6" targets on the centerline of the hood and roof are 610mm apart

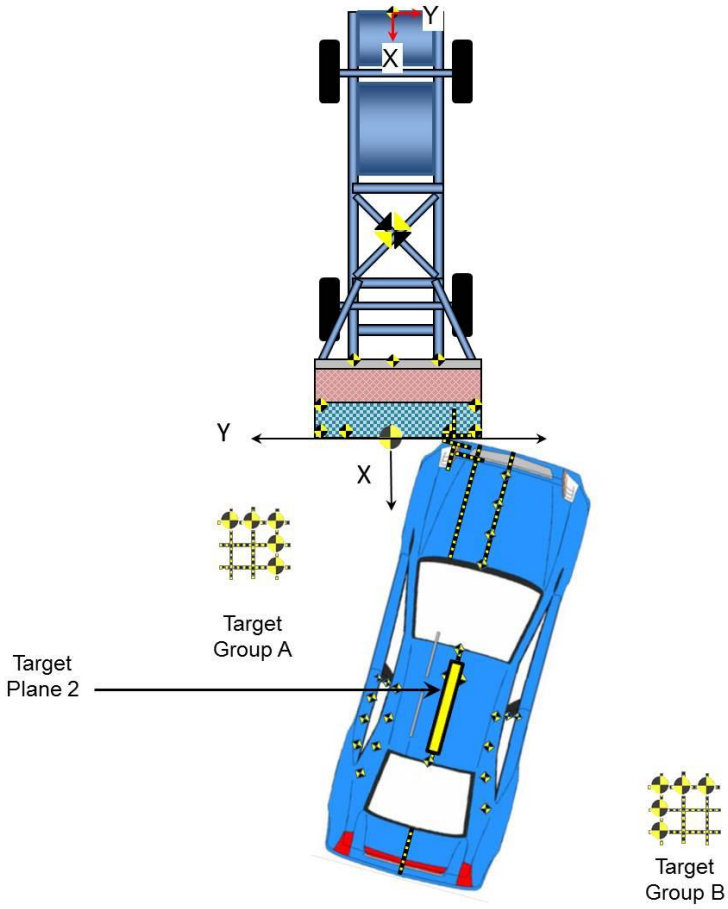




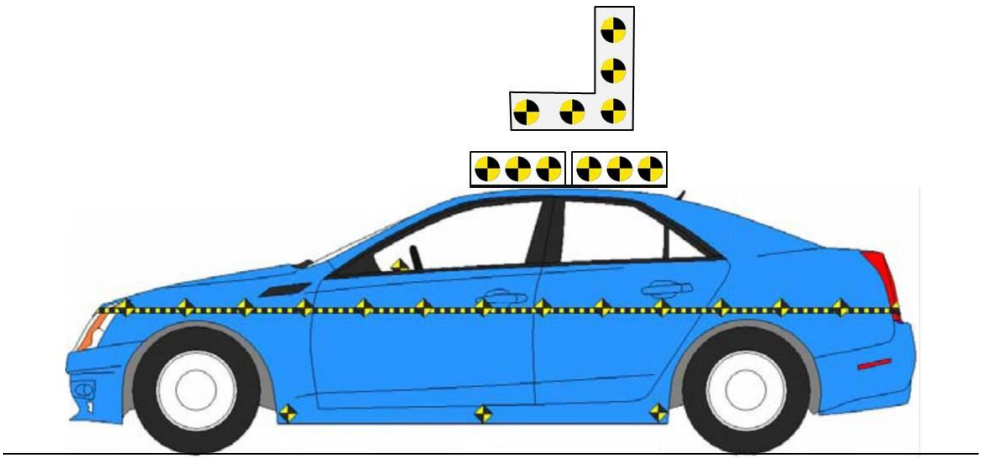


DATA SHEET NO. 8 (CONTINUED)
PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle:	2012 Honda CR-V Five Door Hatchback	NHTSA No.:	RC5369
Test Program:	R&D 90.1kph, 15° angle, 35% offset	Test Date:	12/21/2012



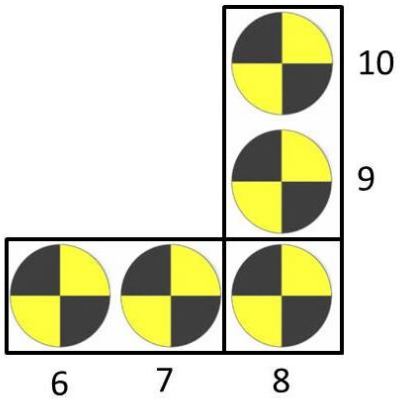
Target Plane 2



DATA SHEET NO. 8 (CONTINUED)
PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2012 Honda CR-V Five Door Hatchback
Test Program: R&D 90.1kph, 15° angle, 35% offset

NHTSA No.: RC5369
Test Date: 12/21/2012



Vertical Target
Plane 2
(Over Roof)

Target	Units	X	Y	Z
1	mm			
2	mm			
3	mm			
4	mm			
5	mm			
6*	mm	1689	-410	-366
7*	mm	1384	-410	-376
8*	mm	1078	-407	-388
9*	mm	1086	-433	-692
10*	mm	1101	-463	-996
11	mm			
12	mm			
13	mm			
14	mm			
15	mm			

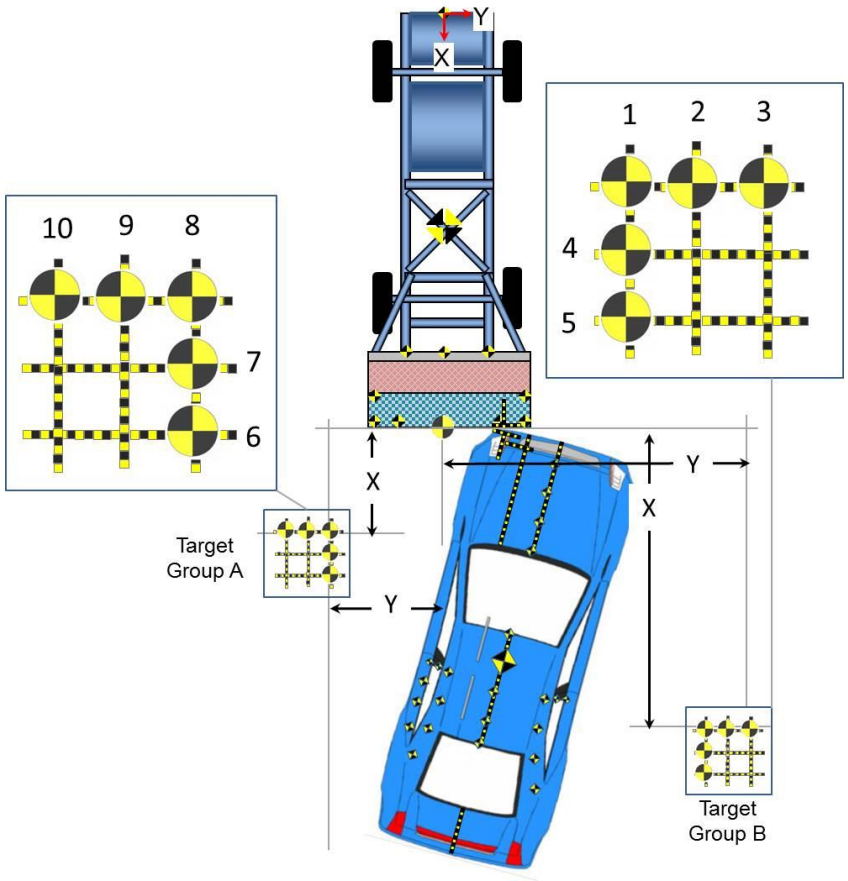
*NOTE:

- Targets 6-10 are in reference to the vehicle coordinate system
- Vertical Target Plane 1&3 were removed for this test per James Saunders

DATA SHEET NO. 8 (CONTINUED)
PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2012 Honda CR-V Five Door Hatchback
Test Program: R&D 90.1kph, 15° angle, 35% offset

NHTSA No.: RC5369
Test Date: 12/21/2012

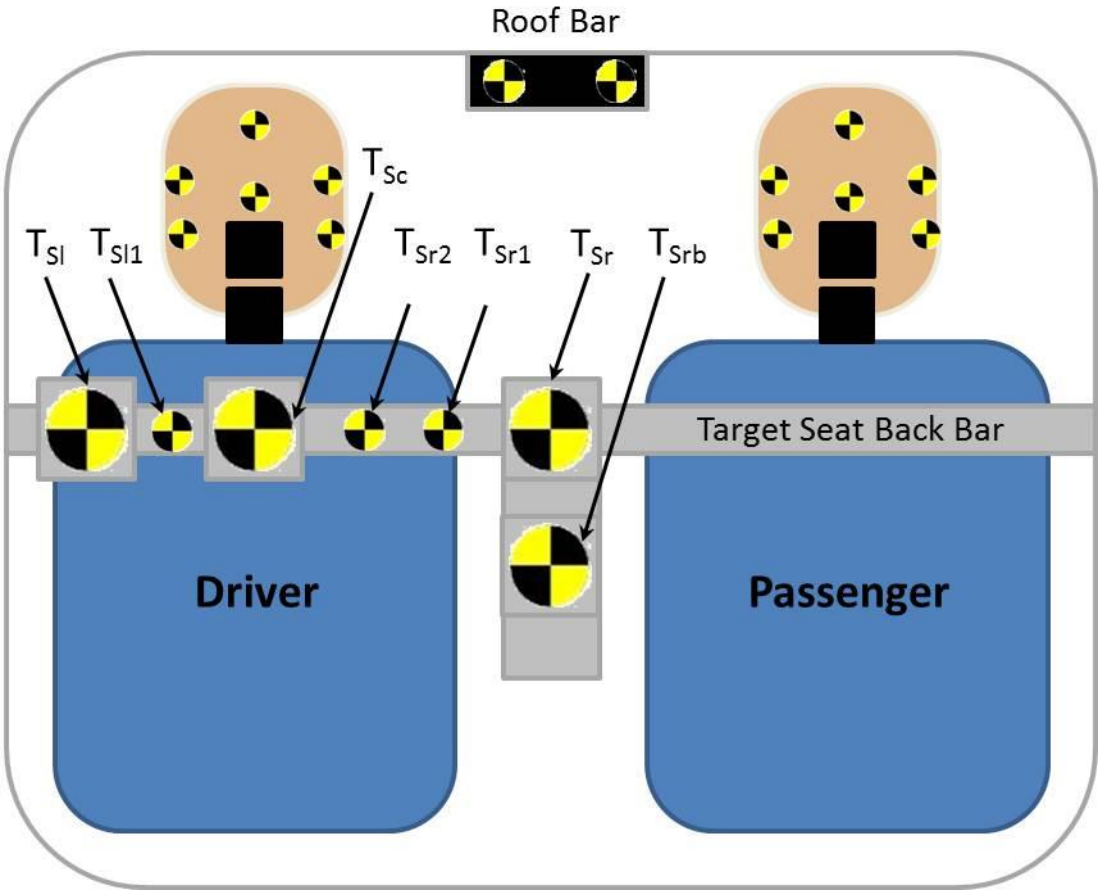


Target	Units	X	Y
1	mm	3198	1820
2	mm	3198	2122
3	mm	3198	2425
4	mm	3500	1820
5	mm	3803	1820
6	mm	1678	615
7	mm	1382	615
8	mm	1068	615
9	mm	1068	923
10	mm	1068	1916

Note: Target Locations are in reference to the front center of RMDB

DATA SHEET NO. 8 (CONTINUED)
PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle:	2012 Honda CR-V Five Door Hatchback	NHTSA No.:	RC5369
Test Program:	R&D 90.1kph, 15° angle, 35% offset	Test Date:	12/21/2012

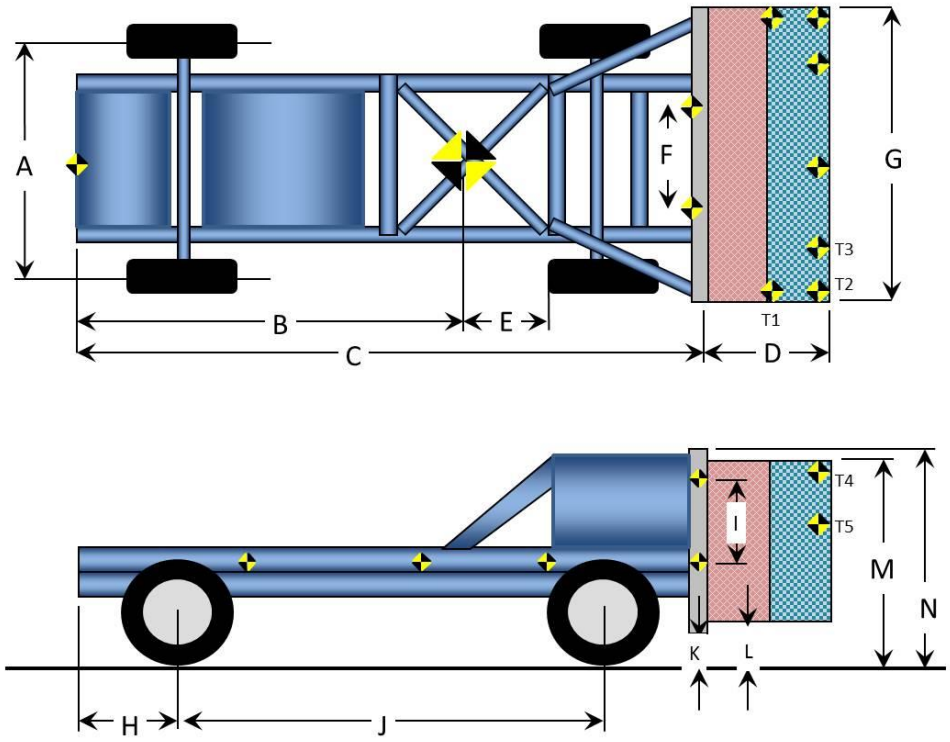


Point	Pre-Test		
	X	Y	Z
TSrb	1216	-11	668
TSr	1208	-7	517
TSr1	1219	-145	547
TSr2	1218	-263	543
TSc	1208	-374	514
TSl1	1217	-506	543
TSl	1207	-623	512
Roof Bar Driver	2087	-66	144
Roof Bar Passenger	2087	56	143

Note: Target locations are in reference to the vehicle coordinate system.
+X – From the rear of the vehicle to the front of the vehicle
+Y – From the left side of the vehicle to the right side of the vehicle
+Z – From the top of the vehicle to the bottom of the vehicle

DATA SHEET NO. 8 (CONTINUED)
RMDB PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle:	2012 Honda CR-V Five Door Hatchback	NHTSA No.:	RC5369
Test Program:	R&D 90.1kph, 15° angle, 35% offset	Test Date:	12/21/2012



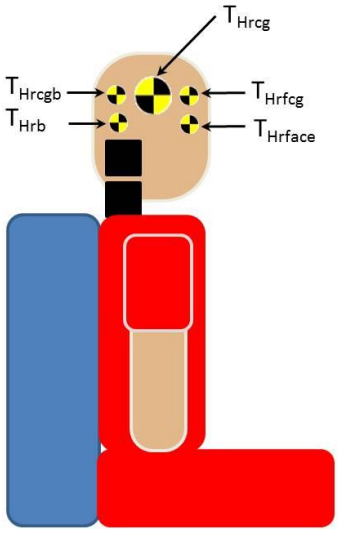
Item	Units	Value	Item	Units	Value
A	mm	1930	H	mm	800
B	mm	2451	I	mm	500
C	mm	3995	J	mm	2555
D	mm	605	K	mm	77
E	mm	904	L	mm	71
F	mm	1123	M	mm	1024
G	mm	2205	N	mm	1177

	Units	Front Axle	Rear Axle	Total
Left	kg	802.0	453.6	1255.6
Right	kg	807.4	427.7	1235.1
Ratio	%	65	35	100
Total	kg	1609.4	881.3	2490.7
CG Aft of Front Axle	mm			904

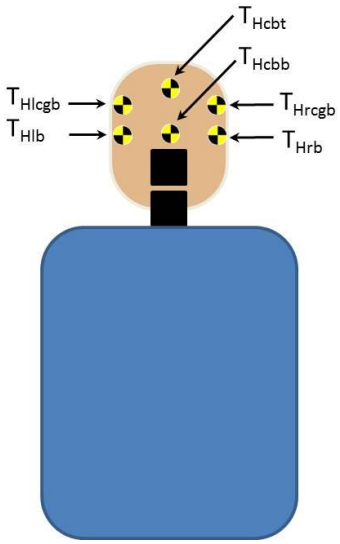
DATA SHEET NO. 8 (CONTINUED)
DUMMY PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle:	2012 Honda CR-V Five Door Hatchback	NHTSA No.:	RC5369
Test Program:	R&D 90.1kph, 15° angle, 35% offset	Test Date:	12/21/2012

Side View



Rear View



Driver Dummy Head Targets (THOR007)

Measurement	Units	Value
Distance between T_{Hrcg} & T_{Hrfcg}	mm	50
Distance between T_{Hrcg} & T_{Hrcgb}	mm	40
Distance between T_{Hrcgb} & T_{Hrb}	mm	70
Distance between T_{Hrfcg} & T_{Hrface}	mm	70
Distance between T_{Hlcg} & T_{Hlfcg}	mm	50
Distance between T_{Hlcg} & T_{Hlcgb}	mm	40
Distance between T_{Hlcgb} & T_{Hlb}	mm	70
Distance between T_{Hlfcg} & T_{Hlface}	mm	70
Distance between T_{Hcbt} & T_{Hcbb}	mm	67

Passenger Dummy Head Targets (THOR016)

Measurement	Units	Value
Distance between T_{Hrcg} & T_{Hrfcg}	mm	50
Distance between T_{Hrcg} & T_{Hrcgb}	mm	40
Distance between T_{Hrcgb} & T_{Hrb}	mm	70
Distance between T_{Hrfcg} & T_{Hrface}	mm	70
Distance between T_{Hlcg} & T_{Hlfcg}	mm	50
Distance between T_{Hlcg} & T_{Hlcgb}	mm	40
Distance between T_{Hlcgb} & T_{Hlb}	mm	70
Distance between T_{Hlfcg} & T_{Hlface}	mm	70
Distance between T_{Hcbt} & T_{Hcbb}	mm	67

DATA SHEET NO. 9
TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2012 Honda CR-V Five Door Hatchback
Test Program: R&D 90.1kph, 15° angle, 35% offset
NHTSA No.: RC5369
Test Date: 12/21/2012

INSTRUMENTATION

Instrumentation	Number of Channels Collected
Driver Dummy Accelerometers	93
Passenger Dummy Accelerometers	93
Vehicle Structure Accelerometers	38
RMDB Cart Accelerometers	6
Total	230

CAMERA COVERAGE

Type of Camera	Number Used in this Test
High-Speed Vehicle Onboard	4
High-Speed Off-board	10
Real-Time Panning	1
Total	15

DATA SHEET NO. 10 - POST TEST OBSERVATIONS

Test Vehicle: 2012 Honda CR-V Five Door Hatchback
Test Program: R&D 90.1kph, 15° angle, 35% offset
NHTSA No.: RC5369
Test Date: 12/21/2012

TEST DUMMY INFORMATION AND CONTACT LOCATIONS

Description	Driver	Right Front Passenger
Dummy Type/Serial No.	THOR 007	THOR 016
Lower Leg Type	THOR LOWER LEG LX	THOR LOWER LEG LX
Lower Leg Serial No.	LX036 / LX037	LX018 / LX019
Head Contact	Front, Curtain Airbag	Front Airbag, Center Dash Panel & Side Head Liner
Upper Torso Contact	Front, Curtain & Torso Airbag	Front Airbag & Center Dash Panel
Lower Torso Contact	None	None
Left Knee Contact	Knee Bolster	Glove Box
Right Knee Contact	Knee Bolster	Glove Box

DOOR OPENING AND SEAT TRACK INFORMATION

Description	Driver	Right Front Passenger
Locked/Unlocked Doors	Unlocked	Unlocked
Front Door Opening	Closed & Jammed Shut	Closed & Operational
Rear Door Opening	Closed & Operational	Closed & Operational
Seat Track Shift (mm)	0	0
Seat Back Failure	No	No
Glazing Damage	None	None

POST TEST STRUCTURAL OBSERVATIONS

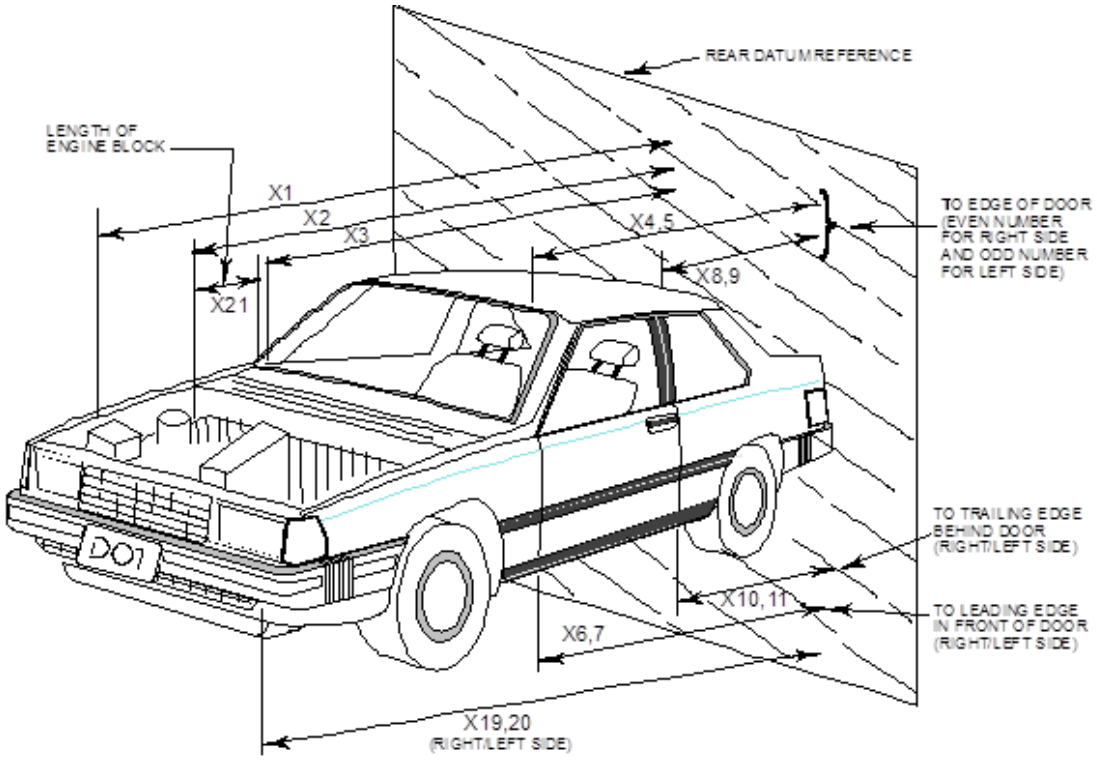
Critical Areas of Performance	Observations and Conclusions	Photo Taken (Y/N)
Pillar Performance	Driver's A-Pillar buckled	Y
Windshield Damage	Cracks throughout with some tears in the non-protected zone	Y
Window Damage	None	Y
Other Notable Effects	Bumper Beam was seared from the vehicle	Y

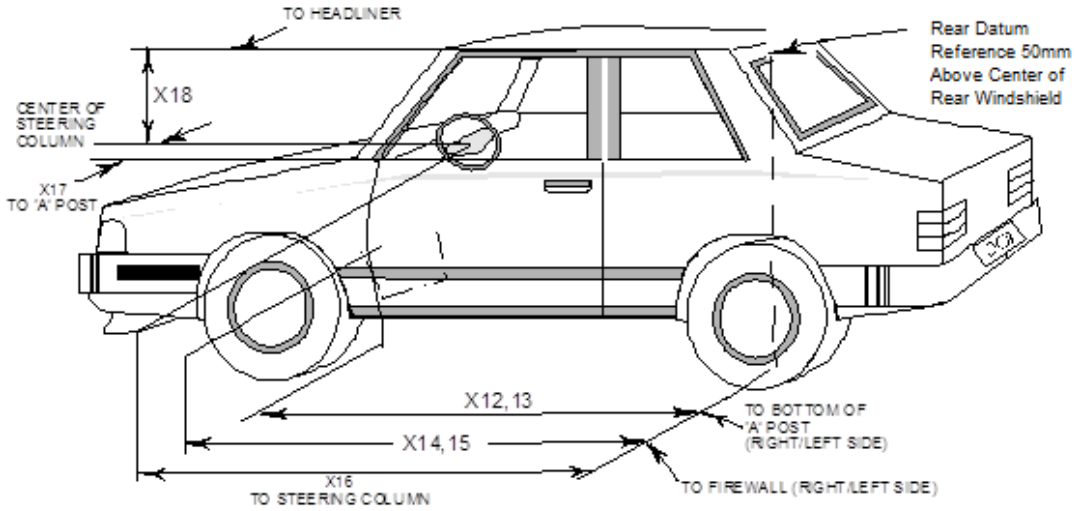
SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Driver (Occupant 1)		Right Front Passenger (Occupant 2)	
	Installed	Deployed	Installed	Deployed
Front Airbag	Yes	Yes	Yes	Yes
Curtain Airbag	Yes	Yes	Yes	No
Torso Airbag	Yes	Yes	Yes	No
Knee Airbag	No	NA	No	NA
Seat Belt Pretensioner	Yes	Yes	Yes	Yes
Seat Belt Load Limiter	Yes	Yes	Yes	Yes
Other				

DATA SHEET NO. 11
VEHICLE PROFILE MEASUREMENTS

Test Vehicle:	2012 Honda CR-V Five Door Hatchback	NHTSA No.:	RC5369
Test Program:	R&D 90.1kph, 15° angle, 35% offset	Test Date:	12/21/2012





DATA SHEET NO. 11 (CONTINUED)
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2012 Honda CR-V Five Door Hatchback
Test Program: R&D 90.1kph, 15° angle, 35% offset
NHTSA No.: RC5369
Test Date: 12/21/2012

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	mm	3919	3783	136
2	Rear Surface of Vehicle (RSOV) to Front of Engine	mm	3486	3325	161
3	RSOV to Firewall	mm	3011	2879	132
4	RSOV to Upper Leading Edge of Right Door	mm	2518	2522	-4
5	RSOV to Upper Leading Edge of Left Door	mm	2519	2510	9
6	RSOV to Lower Leading Edge of Right Door	mm	2493	2501	-8
7	RSOV to Lower Leading Edge of Left Door	mm	2496	2483	13
8	RSOV to Upper Trailing Edge of Right Door	mm	1421	1424	-3
9	RSOV to Upper Trailing Edge of Left Door	mm	1422	1414	8
10	RSOV to Lower Trailing Edge of Right Door	mm	1456	1462	-6
11	RSOV to Lower Trailing Edge of Left Door	mm	1457	1450	7
12	RSOV to Bottom of “A” Post of Right Side	mm	2630	2632	-2
13	RSOV to Bottom of “A” Post of Left Side	mm	2648	2644	4
14	RSOV to Firewall, Right Side	mm	3068	3072	-4
15	RSOV to Firewall, Left Side	mm	3063	2873	190
16	RSOV to Steering Column	mm	2076	2052	24
17	Center of Steering Column to “A” Post	mm	300	245	55
18	Center of Steering Column to Headliner	mm	413	384	29
19	RSOV to Right Side of Front Bumper	mm	3852	3890	-38
20	RSOV to Left Side of Front Bumper	mm	3851	3544	307
21	Length of Engine Block	mm	440	441	-1
RD	RSOV to Right Side of Dash Panel	mm	2257	2252	5
CD	RSOV to Center of Dash Panel	mm	2222	2174	48
LD	RSOV to Left Side of Dash Panel	mm	2256	2180	76

DATA SHEET NO. 12
ACCIDENT INVESTIGATION DIVISION DATA

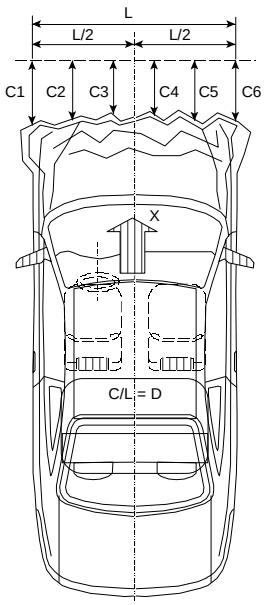
Test Vehicle:	2012 Honda CR-V Five Door Hatchback	NHTSA No.:	RC5369
Test Program:	R&D 90.1kph, 15° angle, 35% offset	Test Date:	12/21/2012

VEHICLE INFORMATION

VIN:	5J6RM3H32CL047815	Wheelbase (mm):	2623
Vehicle Size Category:	Five Door Hatchback	Test Weight (kg):	1757.0

ACCELEROMETER DATA

Accelerometer Locations:	As Described in Data Sheet No. 7
Cal. Procedure/Interval:	Calspan Procedure / 6 month
Integration Algorithm:	Trapezoidal
Linearity:	> 99%
Impact Velocity (kph):	89.66
Velocity Change (kph):	89.66



CRUSH PROFILE

Collision Deformation Classification:	11FYEW5
Midpoint of Damage:	C2
Damage Region Length (mm):	1165
Impact Mode:	Frontal 15˚ Angle, 35% Left Offset

Crush Measurements: Bumper Cover

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	3803	3471	332
C2	Crush zone 2 at left side	mm	3892	3626	266
C3	Crush zone 3 at left side	mm	3913	3732	181
C4	Crush zone 4 at right side	mm	3914	3823	91
C5	Crush zone 5 at right side	mm	3893	3893	0
C6	Crush zone 6 at right side	mm	3803	3865	-62
L	C1 to C6	mm	1165	1088	78

Crush Measurements: Bumper Cover Removed

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
B1	Bumper Beam 1 at left side	mm	3819	3290	-529
B2	Bumper Beam 2 at left side	mm	3842	3361	-481
B3	Bumper Beam 3 at left side	mm	3856	3439	-417
B4	Bumper Beam 4 at left side	mm	3863	3512	-351
B5	Bumper Beam 5 at right side	mm	3865	3582	-283
B6	Bumper Beam 6 at right side	mm	3863	3647	-216
B7	Bumper Beam 7 at right side	mm	3855	3708	-147
B8	Bumper Beam 8 at right side	mm	3841	3763	-78
B9	Bumper Beam 9 at right side	mm	3817	3808	-9
L	B1 to B9	mm	960	801	159

DATA SHEET NO. 13
VEHICLE INTRUSION MEASUREMENTS

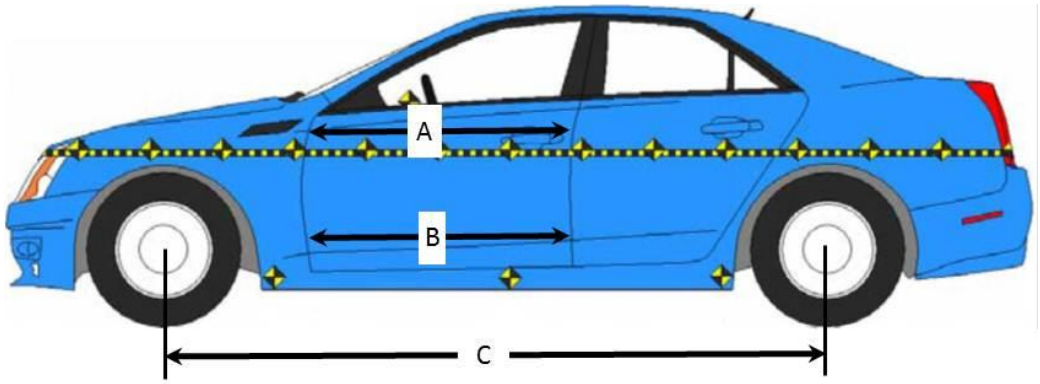
Test Vehicle: 2012 Honda CR-V Five Door Hatchback
Test Program: R&D 90.1kph, 15° angle, 35% offset
NHTSA No.: RC5369
Test Date: 12/21/2012

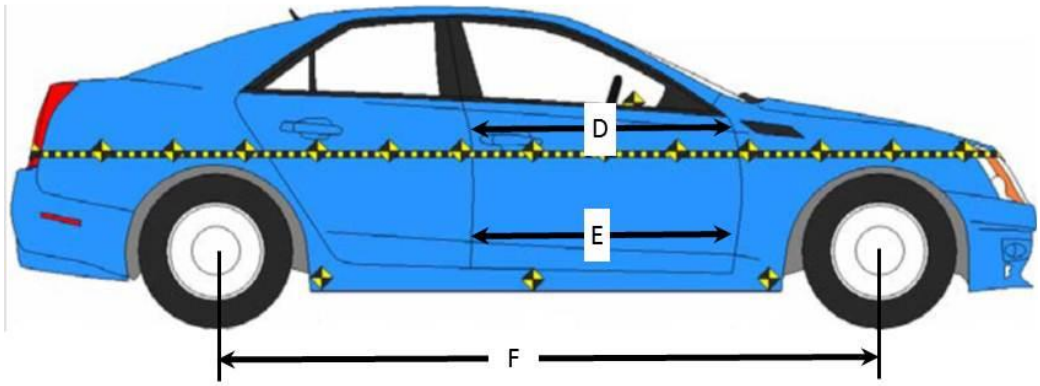
DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	1007	990	-17
B	Left Side Lower	mm	875	857	-17
D	Right Side Upper	mm	1007	1004	-3
E	Right Side Lower	mm	863	861	-2

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2623	2396	-227
F	Right Side Wheelbase	mm	2623	2581	-42





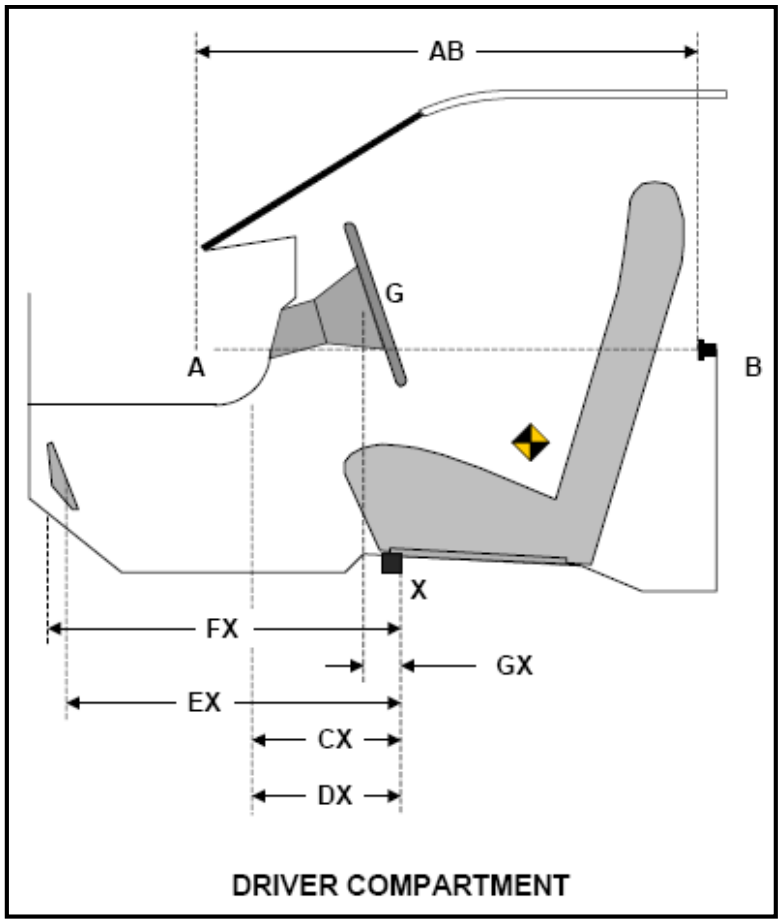
DATA SHEET NO.13 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2012 Honda CR-V Five Door Hatchback
Test Program: R&D 90.1kph, 15° angle, 35% offset
NHTSA No.: RC5369
Test Date: 12/21/2012

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	835	831	-4
CX	Left Knee Bolster to X	mm	333	303	-30
DX	Right Knee Bolster to X	mm	309	278	-31
EX	Brake Pedal to X	mm	600	412	-188
FX	Foot Rest to X	mm	621	617	-4
GX	Center of Steering Column Wheel Hub to X	mm	151	133	-18

X = Front of Seat Track (Stationary)



DATA SHEET NO.13 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2012 Honda CR-V Five Door Hatchback
Test Program: R&D 90.1kph, 15° angle, 35% offset
NHTSA No.: RC5369
Test Date: 12/21/2012

DRIVER SIDE DOOR SILL INTRUSIONS



Reference point: 50mm above the center of the rear windshield (See appendix D for procedure to create coordinate system).

+X – From the rear of the vehicle to the front of the vehicle
+Y – From the left side of the vehicle to the right side of the vehicle
+Z – From the top of the vehicle to the bottom of the vehicle

Point	Pre-Test			Post-Test			Difference		
	X	Y	Z	X	Y	Z	X	Y	Z
1	2453	-751	1046	2436	-684	1035	-17	67	-11
2	2465	-753	972	2444	-692	962	-21	61	-10
3	2469	-753	897	2448	-698	887	-21	55	-10
4	2480	-759	597	2466	-725	588	-14	34	-9
5	2473	-754	520	2461	-726	511	-12	28	-9
6	2454	-739	447	2445	-717	437	-9	22	-10
7	2326	-742	1162	2320	-674	1161	-6	68	-1
8	2177	-742	1166	2172	-686	1164	-5	56	-2
9	2027	-743	1164	2023	-696	1162	-4	47	-2
10	2382	-744	1139	2375	-674	1133	-7	70	-6
11	2425	-746	1097	2415	-675	1088	-10	71	-9
12	2472	-754	796	2452	-706	787	-20	48	-9
13	2478	-757	698	2460	-717	690	-18	40	-8
14	2424	-744	353	2420	-727	343	-4	17	-10
15	2347	-729	305	2344	-716	289	-3	13	-16
16	2269	-716	259	2269	-707	241	0	9	-18

DATA SHEET NO.13 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2012 Honda CR-V Five Door Hatchback NHTSA No.: RC5369
Test Program: R&D 90.1kph, 15° angle, 35% offset Test Date: 12/21/2012

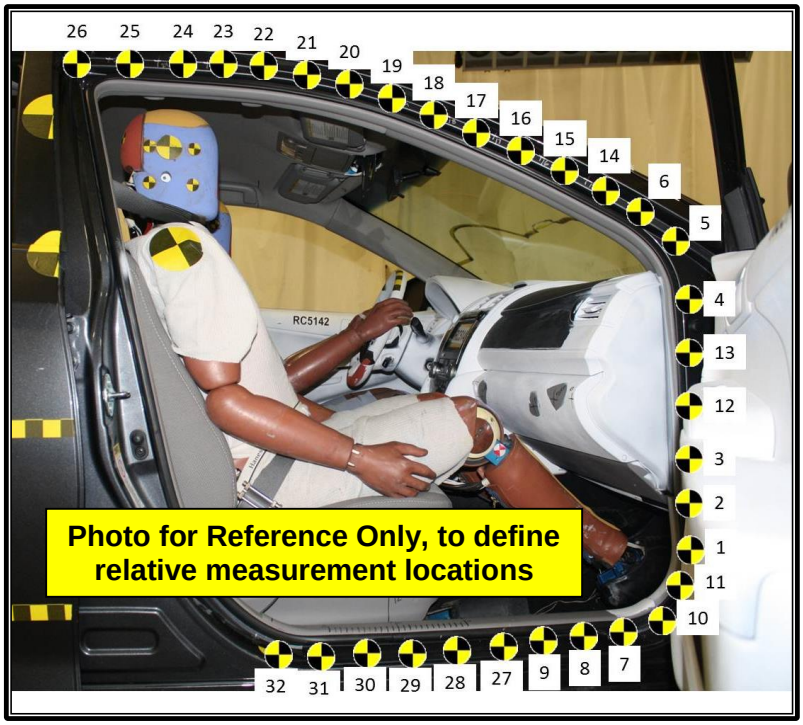
Point	Pre-Test			Post-Test			Difference		
	X	Y	Z	X	Y	Z	X	Y	Z
17	2189	-701	217	2190	-696	195	1	5	-22
18	2108	-687	178	2111	-682	152	3	5	-26
19	2025	-673	143	2026	-669	119	1	4	-24
20	1941	-661	114	1942	-657	94	1	4	-20
21	1852	-651	92	1852	-647	74	0	4	-18
22	1763	-643	74	1762	-639	61	-1	4	-13
23	1674	-637	61	1673	-634	51	-1	3	-10
24	1585	-633	53	1583	-630	46	-2	3	-7
25	1492	-629	47	1491	-627	43	-1	2	-4
26	1400	-627	42	1399	-625	43	-1	2	1
27	1959	-741	1166	1954	-701	1164	-5	40	-2
28	1891	-742	1163	1888	-707	1162	-3	35	-1
29	1823	-742	1166	1820	-709	1166	-3	33	0
30	1754	-744	1163	1751	-715	1165	-3	29	2
31	1691	-746	1135	1689	-719	1136	-2	27	1
32	1647	-747	1083	1645	-724	1083	-2	23	0

Note: See Appendix D for detailed procedure on how to measure the required door sill intrusions.

DATA SHEET NO.13 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2012 Honda CR-V Five Door Hatchback
NHTSA No.: RC5369
Test Program: R&D 90.1kph, 15° angle, 35% offset
Test Date: 12/21/2012

PASSENGER SIDE DOOR SILL INTRUSIONS



Reference point: 50mm above the center of the rear windshield (See appendix D for procedure to create coordinate system).

+X – From the rear of the vehicle to the front of the vehicle
+Y – From the left side of the vehicle to the right side of the vehicle
+Z – From the top of the vehicle to the bottom of the vehicle

Point	Pre-Test			Post-Test			Difference		
	X	Y	Z	X	Y	Z	X	Y	Z
1	2452	753	1044	2446	810	1044	-6	57	0
2	2466	756	971	2460	810	971	-6	54	0
3	2469	754	893	2463	806	893	-6	52	0
4	2481	760	596	2473	798	595	-8	38	-1
5	2474	755	519	2466	790	518	-8	35	-1
6	2455	740	445	2447	771	445	-8	31	0
7	2329	747	1159	2324	802	1159	-5	55	0
8	2178	746	1163	2172	794	1164	-6	48	1
9	2028	746	1161	2023	786	1161	-5	40	0
10	2385	747	1134	2379	803	1134	-6	56	0
11	2429	749	1090	2423	806	1088	-6	57	-2
12	2472	755	797	2465	802	796	-7	47	-1
13	2478	757	697	2471	801	696	-7	44	-1
14	2434	746	355	2427	773	355	-7	27	0
15	2357	731	307	2350	752	307	-7	21	0
16	2277	716	260	2271	732	261	-6	16	1

DATA SHEET NO.13 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

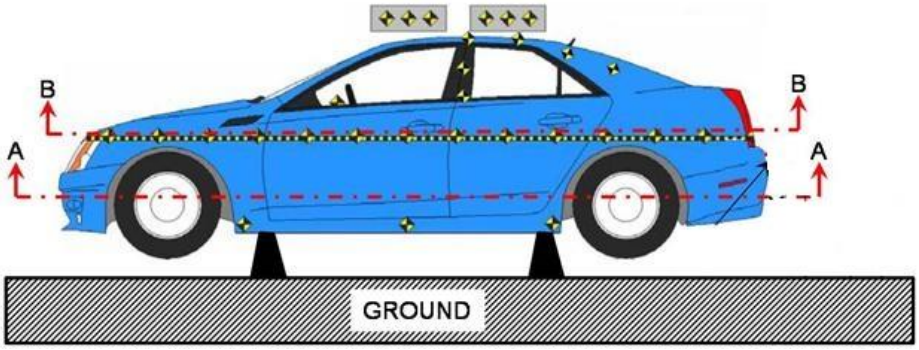
Test Vehicle: 2012 Honda CR-V Five Door Hatchback NHTSA No.: RC5369
Test Program: R&D 90.1kph, 15° angle, 35% offset Test Date: 12/21/2012

Point	Pre-Test			Post-Test			Difference		
	X	Y	Z	X	Y	Z	X	Y	Z
17	2197	701	216	2192	713	217	-5	12	1
18	2115	686	176	2111	692	178	-4	6	2
19	2030	671	140	2028	671	141	-2	0	1
20	1944	659	110	1941	658	112	-3	-1	2
21	1854	648	87	1851	648	90	-3	0	3
22	1762	640	70	1760	640	72	-2	0	2
23	1670	633	58	1668	634	61	-2	1	3
24	1580	629	50	1577	629	52	-3	0	2
25	1487	626	43	1485	626	45	-2	0	2
26	1394	622	46	1392	623	48	-2	1	2
27	1961	747	1164	1956	783	1165	-5	36	1
28	1891	746	1160	1886	778	1161	-5	32	1
29	1821	745	1163	1816	775	1164	-5	30	1
30	1751	748	1159	1746	774	1159	-5	26	0
31	1691	749	1130	1686	771	1130	-5	22	0
32	1646	750	1076	1641	770	1077	-5	20	1

Note: See Appendix D for detailed procedure on how to measure the required door sill intrusions.

DATA SHEET NO.13 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2012 Honda CR-V Five Door Hatchback
Test Program: R&D 90.1kph, 15° angle, 35% offset
NHTSA No.: RC5369
Test Date: 12/21/2012



Reference point: 50mm above the center of the rear windshield (See appendix D for procedure to create coordinate system).

+X – From the rear of the vehicle to the front of the vehicle
+Y – From the left side of the vehicle to the right side of the vehicle
+Z – From the top of the vehicle to the bottom of the vehicle

VEHICLE EXTERIOR CRUSH PROFILE
SECTION A-A

Point	Pre-Test			Point	Post-Test		
	X	Y	Z		X	Y	Z
1	3435	-892	1077	1	3042	-422	1076
2	3497	-877	1076	2	3139	-443	1077
3	3557	-858	1076	3	3249	-372	1076
4	3615	-829	1076	4	3283	-299	1077
5	3662	-786	1078	5	3355	-275	1076
6	3723	-687	1077	6	3447	-114	1077
7	3786	-595	1076	7	3517	1	1077
8	3840	-498	1077	8	3598	150	1077
9	3880	-407	1075	9	3659	275	1076
10	3906	-295	1077	10	3690	335	1076
11	3916	-137	1077	11	3586	630	1076
12	3919	-17	1076	12	3309	1038	1076
13	3918	90	1077	13	3235	1120	1076
14	3914	208	1076	14	3063	1031	1076
15	3903	327	1076	15	2860	903	1077
16	3879	420	1077	16	2601	964	1076
17	3835	514	1076	17	2469	959	1077
18	3765	630	1077	18	2286	957	1076
19	3667	784	1075	19	2079	952	1077
20	3605	842	1076	20	1878	946	1077
21	3504	881	1076	21	1731	942	1077
22	3428	898	1076	22	1583	936	1076
23	2583	903	1078	23	1472	933	1077
24	2432	901	1076	24	1281	926	1076
25	2253	900	1077	25	1089	923	1077

DATA SHEET NO.13 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2012 Honda CR-V Five Door Hatchback
NHTSA No.: RC5369
Test Program: R&D 90.1kph, 15° angle, 35% offset
Test Date: 12/21/2012

VEHICLE EXTERIOR CRUSH PROFILE
SECTION A-A (Continued)

Point	Pre-Test			Point	Post-Test		
	X	Y	Z		X	Y	Z
26	2098	902	1077	26	925	919	1077
27	1930	905	1075	27	830	919	1077
28	1740	907	1076	28	-16	867	1077
29	1575	909	1076	29	925	919	1077
30	1466	910	1076	30	-16	867	1077
31	1400	911	1077	31	-128	835	1077
32	1266	912	1077	32	-238	808	1077
33	1137	911	1077	33	-376	774	1077
34	1014	909	1075	34	-461	722	1076
35	919	907	1076	35	-528	599	1077
36	820	906	1077	36	-564	477	1076
37	-35	895	1076	37	-589	326	1077
38	-122	874	1076	38	-601	187	1077
39	-224	848	1076	39	-606	38	1077
40	-320	816	1076	40	-604	-123	1076
41	-397	785	1076	41	-593	-291	1076
42	-464	736	1075	42	-568	-458	1076
43	-511	659	1076	43	-527	-612	1077
44	-550	544	1077	44	-476	-717	1077
45	-579	400	1077	45	-387	-785	1076
46	-596	255	1077	46	-240	-836	1077
47	-604	103	1077	47	-127	-864	1077
48	-606	-14	1078	48	-21	-887	1077
49	-602	-160	1077	49	833	-900	1076
50	-593	-278	1077	50	962	-900	1076
51	-567	-458	1078	51	1109	-901	1077
52	-544	-559	1076	52	1262	-899	1077
53	-510	-654	1077	53	1399	-896	1076
54	-469	-723	1078	54	1443	-895	1076
55	-399	-777	1077	55	1575	-896	1076
56	-308	-812	1077	56	1745	-888	1077
57	-191	-846	1077	57	1921	-879	1077
58	-91	-871	1077	58	2158	-866	1076
59	-20	-887	1078	59	2374	-857	1077
60	825	-904	1076	60	2499	-852	1076
61	966	-906	1076	61	2658	-794	1077
62	1133	-909	1077	62	2811	-749	1076
63	1317	-910	1077				
64	1445	-909	1077				
65	1585	-909	1076				
66	1751	-907	1077				

DATA SHEET NO.13 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

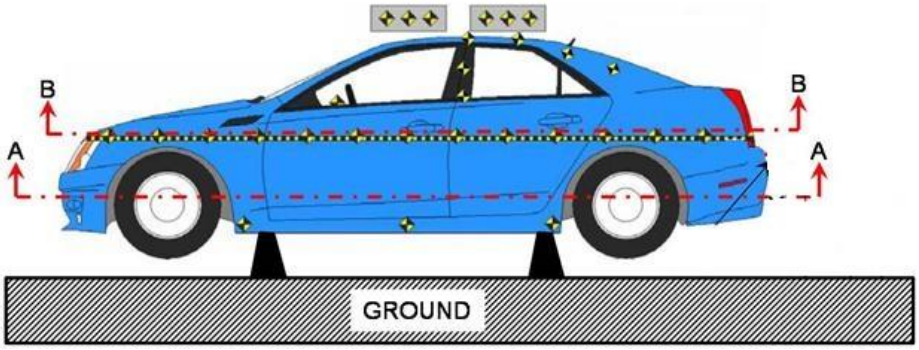
Test Vehicle: 2012 Honda CR-V Five Door Hatchback NHTSA No.: RC5369
Test Program: R&D 90.1kph, 15° angle, 35% offset Test Date: 12/21/2012

VEHICLE EXTERIOR CRUSH PROFILE
SECTION A-A (Continued)

Point	Pre-Test		
	X	Y	Z
67	1878	-905	1077
68	2012	-903	1077
69	2164	-900	1077
70	2300	-899	1077
71	2421	-899	1076
72	2531	-898	1076
73	2593	-902	1076
74	3435	-892	1077

DATA SHEET NO.13 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2012 Honda CR-V Five Door Hatchback
Test Program: R&D 90.1kph, 15° angle, 35% offset
NHTSA No.: RC5369
Test Date: 12/21/2012



Reference point: 50mm above the center of the rear windshield (See appendix D for procedure to create coordinate system).

+X – From the rear of the vehicle to the front of the vehicle
+Y – From the left side of the vehicle to the right side of the vehicle
+Z – From the top of the vehicle to the bottom of the vehicle

VEHICLE EXTERIOR CRUSH PROFILE
SECTION B-B

Point	Pre-Test			Point	Post-Test		
	X	Y	Z		X	Y	Z
1	2840	-900	695	1	2894	-527	695
2	2941	-901	695	2	2918	-399	696
3	3042	-900	695	3	3056	-240	696
4	3147	-893	697	4	3177	-113	695
5	3251	-874	697	5	3315	-61	696
6	3351	-845	696	6	3434	129	695
7	3448	-807	694	7	3577	319	696
8	3541	-718	694	8	3560	410	696
9	3608	-616	695	9	3337	900	698
10	3665	-510	696	10	3130	931	695
11	3713	-396	696	11	2888	944	695
12	3743	-291	694	12	2714	946	696
13	3767	-165	694	13	2567	944	695
14	3781	-10	696	14	2509	941	696
15	3777	100	697	15	2368	933	696
16	3761	222	695	16	2222	928	696
17	3736	333	696	17	2038	922	695
18	3689	459	696	18	1834	918	695
19	3606	623	695	19	1706	914	696
20	3526	741	695	20	1466	906	696
21	3428	823	698	21	1328	904	695
22	3327	860	696	22	1174	904	695
23	3159	895	695	23	947	905	695
24	3001	904	695	24	712	909	696
25	2886	905	696	25	500	915	695

DATA SHEET NO.13 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2012 Honda CR-V Five Door Hatchback
NHTSA No.: RC5369
Test Program: R&D 90.1kph, 15° angle, 35% offset
Test Date: 12/21/2012

VEHICLE EXTERIOR CRUSH PROFILE
SECTION B-B (Continued)

Point	Pre-Test			Point	Post-Test		
	X	Y	Z		X	Y	Z
26	2787	901	695	26	342	914	696
27	2756	900	696	27	174	907	695
28	2599	891	696	28	83	893	695
29	2414	886	696	29	-43	855	696
30	2213	885	696	30	-199	809	697
31	1977	886	695	31	-305	778	695
32	1774	887	695	32	-401	689	696
33	1562	889	696	33	-449	583	695
34	1428	889	697	34	-493	395	696
35	1235	889	696	35	-503	234	696
36	1086	890	695	36	-507	28	695
37	934	892	696	37	-506	-161	696
38	752	895	696	38	-507	-289	696
39	554	904	696	39	-479	-474	695
40	388	904	695	40	-436	-615	695
41	162	892	694	41	-378	-726	696
42	0	867	695	42	-270	-801	695
43	-50	860	693	43	-14	-865	696
44	-139	840	692	44	228	-900	695
45	-226	817	692	45	382	-904	696
46	-288	797	693	46	461	-904	695
47	-346	762	695	47	506	-908	695
48	-404	694	696	48	619	-903	696
49	-446	603	697	49	765	-895	696
50	-481	484	697	50	934	-888	695
51	-504	356	696	51	1127	-884	695
52	-508	246	698	52	1337	-880	696
53	-511	97	696	53	1428	-879	695
54	-511	-47	695	54	1532	-880	696
55	-507	-231	696	55	1666	-875	696
56	-507	-327	696	56	1897	-867	696
57	-488	-442	696	57	2141	-859	696
58	-458	-561	696	58	2340	-855	695
59	-424	-652	695	59	2517	-853	695
60	-379	-723	694	60	2588	-870	696
61	-324	-774	696	61	2618	-919	695
62	-214	-815	696	62	2726	-771	686
63	-97	-845	696	63	2764	-701	696
64	28	-870	696	64	2835	-581	695
65	144	-888	695				
66	261	-898	696				
67	366	-901	696				

DATA SHEET NO.13 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2012 Honda CR-V Five Door Hatchback NHTSA No.: RC5369
Test Program: R&D 90.1kph, 15° angle, 35% offset Test Date: 12/21/2012

VEHICLE EXTERIOR CRUSH PROFILE
SECTION B-B (Continued)

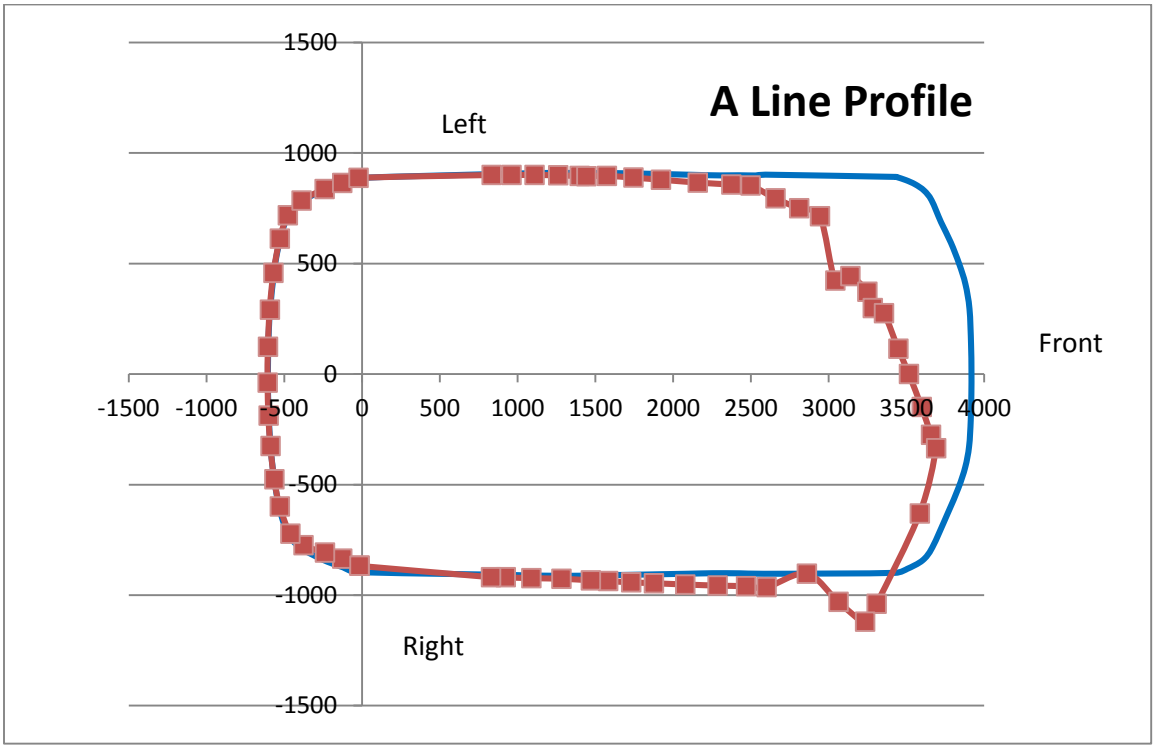
Point	Pre-Test		
	X	Y	Z
68	459	-901	696
69	497	-904	696
70	615	-900	695
71	763	-894	695
72	941	-891	696
73	1113	-890	696
74	1303	-889	696
75	1425	-890	695
76	1594	-889	695
77	1739	-889	696
78	1855	-888	696
79	2038	-886	696
80	2194	-886	696
81	2374	-886	696
82	2534	-888	695
83	2643	-891	696
84	2746	-897	696
85	2801	-900	695

DATA SHEET NO.13 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

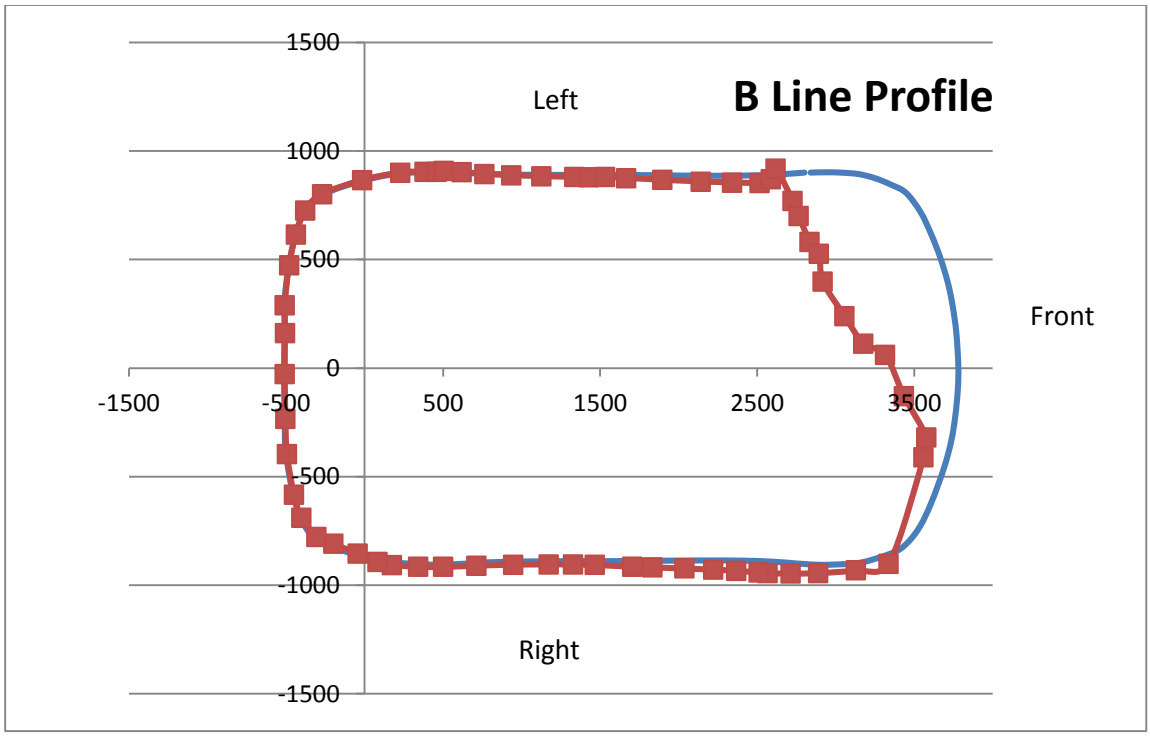
Test Vehicle: 2012 Honda CR-V Five Door Hatchback
Test Program: R&D 90.1kph, 15° angle, 35% offset

NHTSA No.: RC5369
Test Date: 12/21/2012

VEHICLE EXTERIOR CRUSH PROFILE
SECTION A-A



SECTION B-B



DATA SHEET NO.13 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2012 Honda CR-V Five Door Hatchback
Test Program: R&D 90.1kph, 15° angle, 35% offset

NHTSA No.: RC5369
Test Date: 12/21/2012



STRUCTURAL BUMPER BEAM POINTS

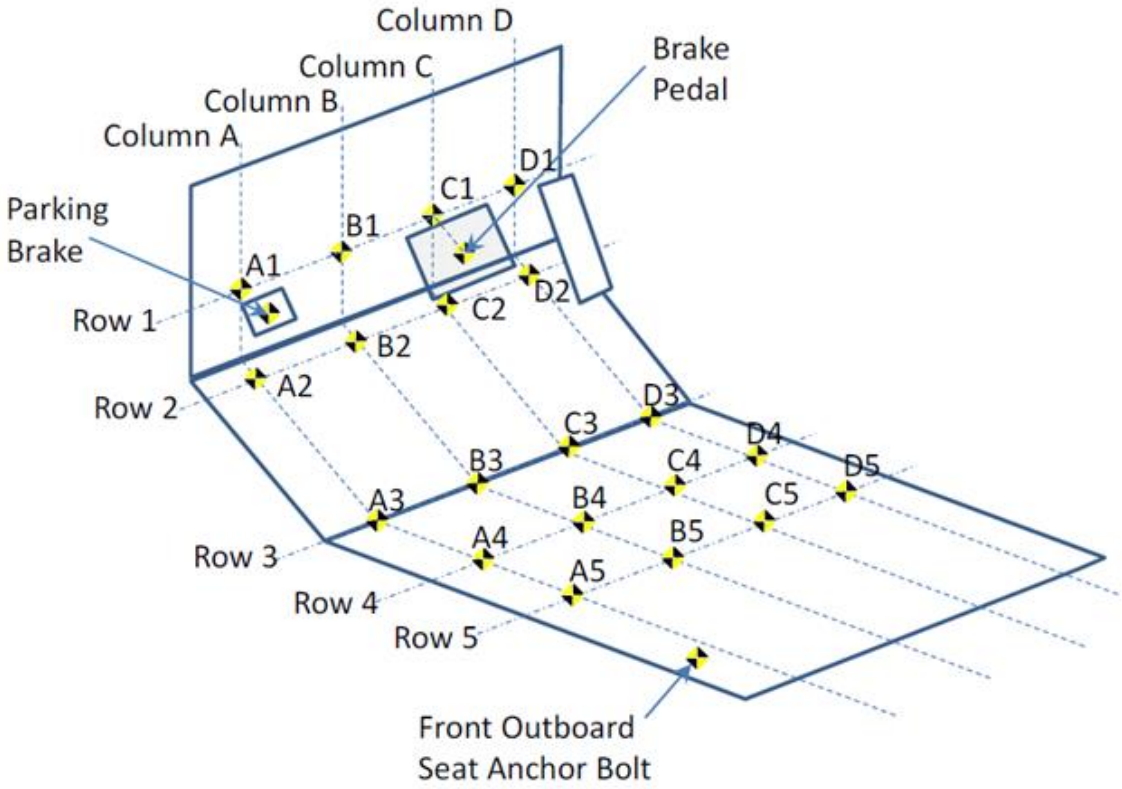
	Point	Pre-Test (mm)			Post-Test (mm)			Difference (mm)		
		X	Y	Z	X	Y	Z	X	Y	Z
Redundant Structural Bumper Beam	B10	3814	-477	1048	3282	-398	983	-532	79	-65
	B11	3837	-359	1048	3354	-307	976	-483	52	-72
	B12	3851	-240	1049	3433	-216	969	-418	24	-80
	B13	3857	-119	1048	3505	-119	962	-352	0	-86
	B14	3860	3	1049	3575	-20	956	-285	-23	-93
	B15	3857	125	1048	3640	82	949	-217	-43	-99
	B16	3850	246	1049	3702	187	942	-148	-59	-107
	B17	3835	366	1048	3756	295	936	-79	-71	-112
	B18	3811	481	1049	3800	404	930	-11	-77	-119
Center Structural Bumper Beam	B1	3819	-478	1077	3290	-399	1011	-529	79	-66
	B2	3842	-360	1077	3361	-311	1004	-481	49	-73
	B3	3856	-240	1076	3439	-219	996	-417	21	-80
	B4	3863	-118	1076	3512	-121	990	-351	-3	-86
	B5	3865	3	1076	3582	-22	983	-283	-25	-93
	B6	3863	125	1076	3647	80	976	-216	-45	-100
	B7	3855	247	1076	3708	185	970	-147	-62	-106
	B8	3841	367	1076	3763	293	963	-78	-74	-113
	B9	3817	482	1078	3808	402	959	-9	-80	-119
Upper Radiator Support	1	3555	-427	709	2972	-138	588	-583	289	-121
	2	3591	-320	704	3060	-105	594	-531	215	-110
	3	3580	-212	698	3132	-30	569	-448	182	-129
	4	3574	-104	695	3205	46	547	-369	150	-148
	5	3566	3	694	3273	132	554	-293	129	-140
	6	3575	111	695	3349	209	563	-226	98	-132
	7	3579	216	698	3419	288	578	-160	72	-120
	8	3592	321	705	3495	362	595	-97	41	-110
	9	3556	428	709	3517	467	608	-39	39	-101

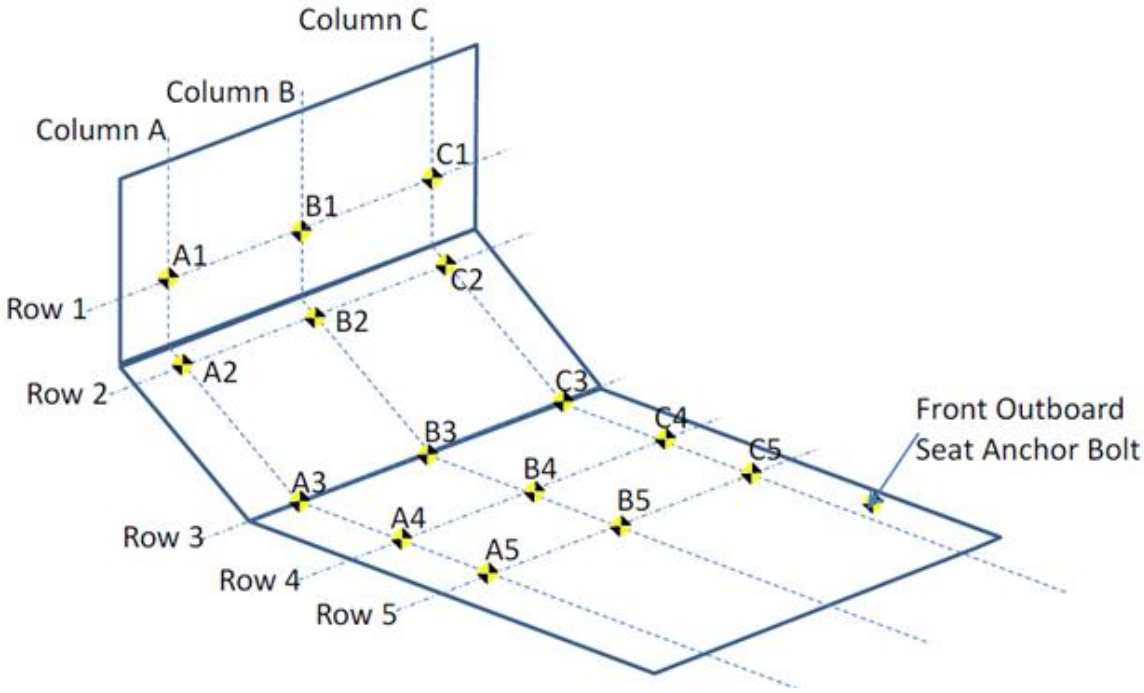
Reference point: 50mm above the center of the rear windshield (See appendix D for procedure to create coordinate system).

+X – From the rear of the vehicle to the front of the vehicle
+Y – From the left side of the vehicle to the right side of the vehicle
+Z – From the top of the vehicle to the bottom of the vehicle

DATA SHEET NO.13 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle:	2012 Honda CR-V Five Door Hatchback	NHTSA No.:	RC5369
Test Program:	R&D 90.1kph, 15° angle, 35% offset	Test Date:	12/21/2012





Note: See Appendix D for toe pan measuring procedure

DATA SHEET NO.13 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2012 Honda CR-V Five Door Hatchback
NHTSA No.: RC5369
Test Program: R&D 90.1kph, 15° angle, 35% offset
Test Date: 12/21/2012

DRIVER FLOOR PAN MEASUREMENTS

Intrusion Location	Pre-Test (mm)			Post-Test (mm)			Difference (mm)		
	X	Y	Z	X	Y	Z	X	Y	Z
A1	2654	-600	1047	2566	-501	1024	-88	99	-23
B1	2732	-501	1047	2603	-386	1010	-129	115	-36
C1	2754	-353	1046	2653	-261	1001	-101	92	-45
D1	2750	-189	1045	2664	-105	1001	-86	84	-44
A2	2628	-604	1116	2569	-513	1096	-59	91	-20
B2	2693	-503	1117	2613	-401	1087	-80	102	-30
C2	2704	-354	1117	2633	-270	1078	-71	84	-39
D2	2642	-202	1117	2567	-121	1099	-75	82	-17
A3	2532	-602	1225	2514	-522	1230	-19	80	5
B3	2534	-501	1220	2507	-420	1219	-26	81	-1
C3	2534	-350	1219	2495	-272	1218	-40	79	-1
D3	2533	-203	1233	2492	-129	1220	-40	74	-14
A4	2485	-601	1228	2469	-524	1233	-16	77	5
B4	2486	-503	1231	2459	-427	1239	-27	76	7
C4	2482	-349	1229	2445	-279	1233	-37	70	4
D4	2484	-204	1250	2446	-131	1247	-38	73	-3
A5	2435	-601	1224	2419	-527	1228	-16	73	5
B5	2434	-499	1227	2409	-430	1236	-25	70	9
C5	2433	-350	1224	2400	-272	1228	-33	78	4
D5	2435	-200	1250	2400	-132	1253	-35	68	3
Brake Pedal	2526	-351	1045	2332	-345	991	-194	5	-54
Driver IP Left	2259	-532	738	2223	-505	692	-36	27	-46
Driver IP Right	2235	-231	736	2198	-190	715	-37	40	-22
DOLP	2259	-630	745	2227	-606	712	-32	25	-33
Steering Column	2076	-380	519	2052	-385	470	-24	-5	-49
Front Outboard Bolt	1926	-592	1193	1920	-560	1202	-6	32	9

Reference point: 50mm above the center of the rear windshield (See appendix D for procedure to create coordinate system).

+X – From the rear of the vehicle to the front of the vehicle
+Y – From the left side of the vehicle to the right side of the vehicle
+Z – From the top of the vehicle to the bottom of the vehicle

DATA SHEET NO.13 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2012 Honda CR-V Five Door Hatchback
Test Program: R&D 90.1kph, 15° angle, 35% offset
NHTSA No.: RC5369
Test Date: 12/21/2012

PASSENGER FLOOR PAN MEASUREMENTS

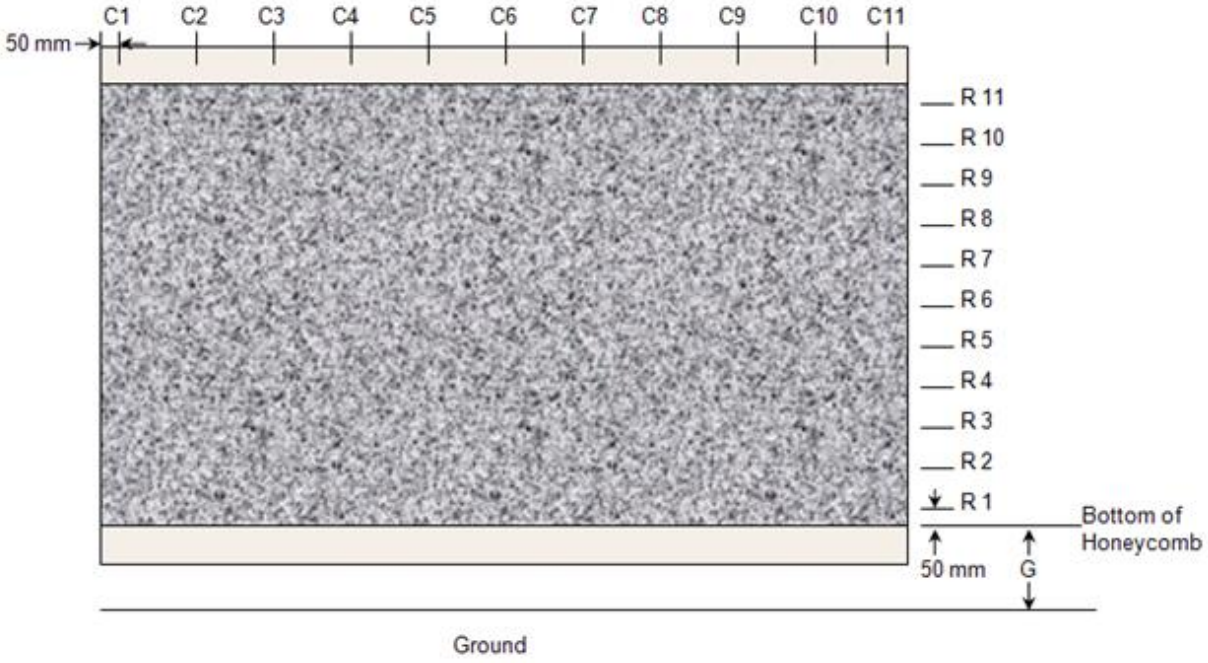
Intrusion Location	Pre-Test (mm)			Post-Test (mm)			Difference (mm)		
	X	Y	Z	X	Y	Z	X	Y	Z
A1	2754	228	1046	2719	290	1048	-36	62	2
B1	2753	378	1048	2733	438	1050	-21	60	3
C1	2709	527	1045	2698	591	1045	-11	64	0
A2	2705	228	1116	2678	294	1120	-27	66	5
B2	2700	377	1116	2689	442	1123	-11	65	8
C2	2673	529	1115	2661	593	1116	-12	64	1
A3	2535	227	1219	2526	299	1241	-9	72	22
B3	2536	378	1218	2528	446	1230	-7	68	12
C3	2537	529	1218	2529	596	1227	-8	68	9
A4	2486	227	1225	2479	303	1256	-8	77	31
B4	2486	380	1222	2478	448	1235	-8	68	12
C4	2483	529	1228	2476	597	1237	-7	68	9
A5	2436	228	1223	2428	310	1254	-8	82	31
B5	2435	378	1223	2428	448	1237	-7	69	14
C5	2434	527	1227	2430	597	1235	-4	71	8
Pass IP Left	2250	229	753	2254	268	741	3	39	-12
Pass IP Right	2284	529	752	2287	567	751	3	38	-1
PORP	2279	629	744	2281	667	747	2	38	4
Front Outboard Bolt	1929	596	1191	1925	628	1196	-4	32	5

Reference point: 50mm above the center of the rear windshield (See appendix D for procedure to create coordinate system).

+X – From the rear of the vehicle to the front of the vehicle
+Y – From the left side of the vehicle to the right side of the vehicle
+Z – From the top of the vehicle to the bottom of the vehicle

DATA SHEET NO.14
RMDB CRUSH MEASUREMENTS

Test Vehicle: 2012 Honda CR-V Five Door Hatchback
Test Program: R&D 90.1kph, 15° angle, 35% offset
NHTSA No.: RC5369
Test Date: 12/21/2012



		C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11
		50 mm	260 mm	470 mm	680 mm	890 mm	1100 mm	1310 mm	1520 mm	1730 mm	1940 mm	2150 mm
R11	**910mm**	-2.3	0.2	0.8	1.0	2.0	2.6	4.1	4.5	14.1	6.5	40.4
R10	**824mm**	-2.7	-2.0	-1.8	-1.3	-0.2	0.3	1.9	10.4	24.1	13.8	67.5
R9	**738mm**	-2.8	-2.5	-2.3	-1.6	-0.8	0.1	5.6	5.0	25.4	20.2	98.9
R8	**652mm**	-2.9	-2.8	-2.6	-1.7	-1.1	-0.2	0.7	1.3	20.6	45.1	129.7
R7	**566mm**	-3.2	-2.9	-2.6	-1.9	-0.9	0.0	0.8	3.8	20.5	83.9	162.0
R6	**480mm**	-3.5	-3.2	-2.9	-2.1	-0.9	-0.2	4.1	44.8	62.2	164.9	206.7
R5	**384mm**	-3.7	-3.6	-3.0	-1.7	-0.8	-0.1	18.3	87.4	52.6	188.5	240.8
R4	**308mm**	-4.0	-3.6	-3.0	-1.8	-0.8	0.2	49.7	121.0	34.6	176.3	237.3
R3	**222mm**	-4.4	-3.7	-2.9	-1.8	-1.0	0.1	71.1	162.1	42.2	207.3	236.2
R2	**136mm**	-4.8	-4.0	-2.7	-1.4	-0.7	0.6	86.5	183.3	51.1	218.0	241.6
R1	**50mm**	-4.6	-3.7	-2.2	-0.9	*	*	92.3	199.6	62.8	151.4	195.0

*Barrier was cut to accommodate the rail, therefore these points were un-measureable.

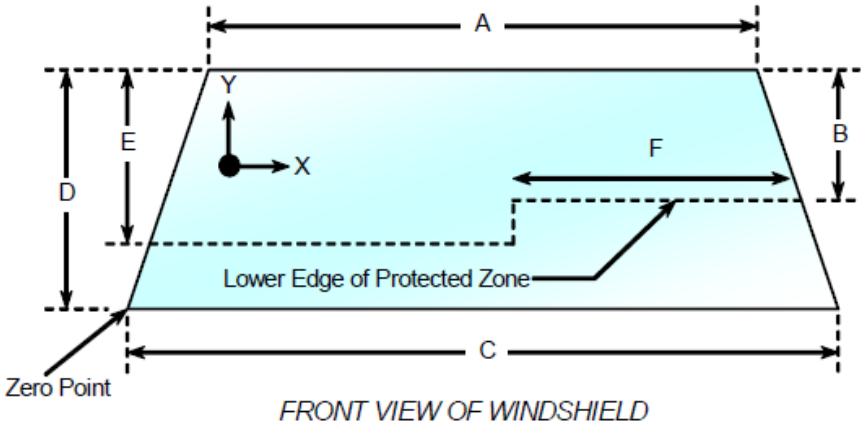
DATA SHEET NO. 15
SUMMARY OF FMVSS 212, 219 (PARTIAL), AND 301 DATA

Test Vehicle: 2012 Honda CR-V Five Door Hatchback
Test Program: R&D 90.1kph, 15° angle, 35% offset
NHTSA No.: RC5369
Test Date: 12/21/2012

Please provide windshield mounting details. A 0.8 mm trim surrounds the top and side of windshield while a plastic shroud is on the bottom.
The standard requires that the post-test retention measurement be a minimum of 75% of the pre-test total periphery measurement for vehicles not equipped with occupant passive restraints and 50% for each side of the windshield for vehicles which are equipped with occupant passive restraints.
Temperature of windshield molding during test: 21°C

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% Retention
Left Side	2209.5	1820	82.4%
Right Side	2209.5	2210	100%
Total	4419	4030	91.2%



FRONT VIEW OF WINDSHIELD

Item	Units	Value
A	mm	1225
B	mm	504
C	mm	1548
D	mm	823
E	mm	585
F	mm	305

AREAS OF PROTECTED ZONE FAILURES

A. Provide coordinates of the area that the protected zone was penetrated more than .25 inches by a vehicle component other than one that is normally in contact with the windshield.

- No Penetration

X	Y

B. Provide coordinates of the area beneath the protected zone that the inner surface of the windshield was penetrated by a vehicle component.

- No Penetration

X	Y

DATA SHEET NO. 15 (CONTINUED)
SUMMARY OF FMVSS 212, 219 (PARTIAL), AND 301 DATA

Test Vehicle: 2012 Honda CR-V Five Door Hatchback NHTSA No.: RC5369
Test Program: R&D 90.1kph, 15° angle, 35% offset Test Date: 12/21/2012

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Ambient Temperature of Test Vehicle at Time of Impact: 21° C

Test Time: 9:57 AM

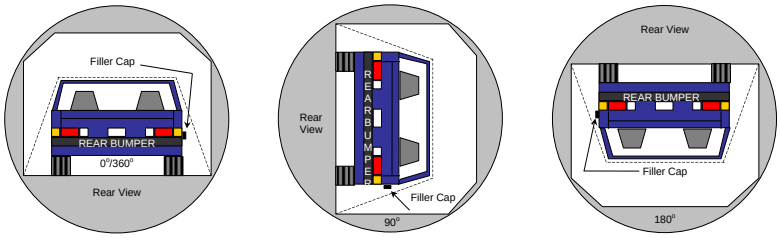
Stoddard Solvent Spillage Measurements

A.	From impact until vehicle motion ceases: (Maximum allowable = 1 oz.)	0	oz
B.	For the 5-minute period after motion ceases: (Maximum allowable = 5 oz.	0	oz
C.	For the following 25 minutes: (Maximum allowable = 1 oz./minute	0	oz
D.	Spillage	0	oz

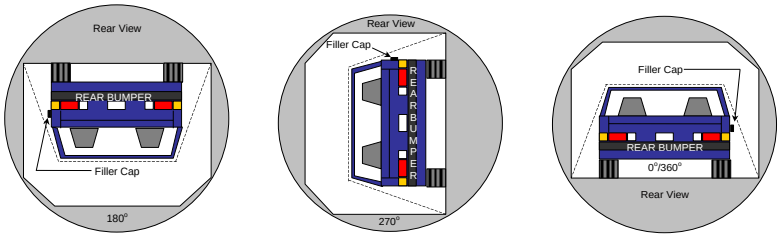
DATA SHEET NO. 16
FMVSS 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2012 Honda CR-V Five Door Hatchback
Test Program: R&D 90.1kph, 15° angle, 35% offset

NHTSA No.: RC5369
Test Date: 12/21/2012



0° TO 90° 90° TO 180°



180° TO 270° 270° TO 360°

1. The specified fixture rollover rate for each 90° of rotation is 60 to 180 seconds.

2. The position hold time at each position is 300 seconds (minimum).

3. Details of Stoddard Solvent spillage: None

SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	72	300	372
90° to 180°	67	300	367
180° to 270°	62	300	362
270° to 360°	68	300	368

FMVSS 301 SPILLAGE TABLE

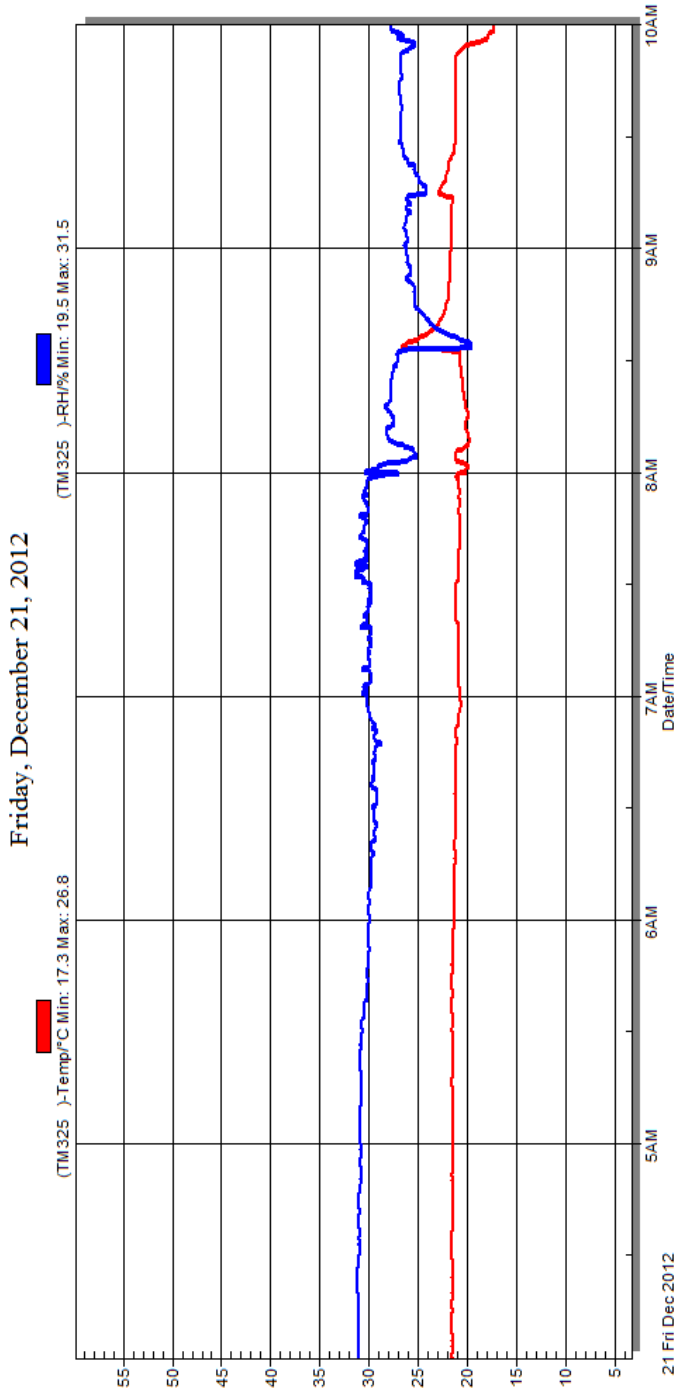
Test Phase	First 5 Minutes	Sixth Minute	Seventh Minute	Eighth Minute
0° to 90°	0	0	0	
90° to 180°	0	0	0	
180° to 270°	0	0	0	
270° to 360°	0	0	0	

SOLVENT SPILLAGE LOCATION TABLE

Test Phase	Spillage Location
0° to 90°	None
90° to 180°	None
180° to 270°	None
270° to 360°	None

DATA SHEET NO. 17
DUMMY/VEHICLE TEMPERATURE STABILIZATION

Test Vehicle:	2012 Honda CR-V Five Door Hatchback	NHTSA No.:	RC5369
Test Program:	R&D 90.1kph, 15° angle, 35% offset	Test Date:	12/21/2012



Temperature Stabilization Chart/Data
Note: Temperature spike caused by light check

APPENDIX A

PHOTOGRAPHS

TABLE OF PHOTOGRAPHS		
No.	Description	Page
1	As Delivered Right Front 3-4 View of Test Vehicle	A-9
2	As Delivered Left Rear 3-4 View of Test Vehicle	A-9
3	Test Vehicle Certification Label	A-10
4	Test Vehicle Tire Placard	A-10
5	Pre-Test Front View of Test Vehicle	A-11
6	Post-Test Front View of Test Vehicle	A-11
7	Pre-Test Left Front 3-4 View of Test Vehicle	A-12
8	Post-Test Left Front 3-4 View of Test Vehicle	A-12
9	Pre-Test Left Side View of Test Vehicle	A-13
10	Post-Test Left Side View of Test Vehicle	A-13
11	Pre-Test Left Rear 3-4 View of Test Vehicle	A-14
12	Post-Test Left Rear 3-4 View of Test Vehicle	A-14
13	Pre-Test Rear View of Test Vehicle	A-15
14	Post-Test Rear View of Test Vehicle	A-15
15	Pre-Test Right Rear 3-4 View of Test Vehicle	A-16
16	Post-Test Right Rear 3-4 View of Test Vehicle	A-16
17	Pre-Test Right Side View of Test Vehicle	A-17
18	Post-Test Right Side View of Test Vehicle	A-17
19	Pre-Test Right Front 3-4 View of Test Vehicle	A-18
20	Post-Test Right Front 3-4 View of Test Vehicle	A-18
21	Monroney Label Photograph	A-19
22	Pre-Test Overhead View of RMDB against target vehicle at ideal Impact Point	A-19
23	Pre-Test Left Side View of RMDB against target vehicle at ideal Impact Point	A-20
24	Pre-Test Right Side View of RMDB against target vehicle at ideal Impact Point	A-20
25	Pre-Test Close-up View of Impact Point	A-21
26	Post-Test Close-up View of Impact Point	A-21
27	Post-Test Vehicle Overhead View	A-22
28	Pre-Test Close-up View of Driver Door Latch	A-23
29	Post-Test Close-up View of Driver Door Latch	A-23
30	Pre-Test Close-up View of Passenger Door Latch	A-24

TABLE OF PHOTOGRAPHS (Continued)		
No.	Description	Page
31	Post-Test Close-up View of Passenger Door Latch	A-24
32	Pre-Test Windshield View	A-25
33	Post-Test Windshield View	A-25
34	Pre-Test View of Driver Inner Door Panel	A-26
35	Post-Test View of Driver Inner Door Panel	A-26
36	Pre-Test View of Passenger Inner Door Panel	A-27
37	Post-Test View of Passenger Inner Door Panel	A-27
38	Pre-Test Overall View of Driver Knee Bolsters	A-28
39	Post-Test Overall View of Driver Knee Bolsters	A-28
40	Pre-Test Left Side View of Driver Knee Bolsters	A-29
41	Post-Test Left Side View of Driver Knee Bolsters	A-29
42	Pre-Test Right Side View of Driver Knee Bolsters	A-30
43	Post-Test Right Side View of Driver Knee Bolsters	A-30
44	Pre-Test View of Driver Floor pan at Left sill level, w/carpet	A-31
45	Post-Test View of Driver Floor pan at Left sill level, w/carpet	A-31
46	Pre-Test View of Driver Floor pan at Mid seat level, w/carpet	A-32
47	Post-Test view of Driver Floor pan at Mid seat level, w/carpet	A-32
48	Pre-Test View of Driver Floor pan at Left sill level, w/o carpet	A-33
49	Post-Test View of Driver Floor pan at Left sill level, w/o carpet	A-33
50	Pre-Test View of Driver Floor pan at Mid seat level, w/o carpet	A-34
51	Post-Test view of Driver Floor pan at Mid seat level, w/o carpet	A-34
52	Pre-Test Driver Front Windshield View	A-35
53	Post-Test Driver Front Windshield View	A-35
54	Pre-Test Left Side View of Driver and Interior	A-36
55	Post-Test Left Side View of Driver and Interior	A-36
56	Pre-Test Left Side Driver Window View	A-37
57	Post-Test Left Side Driver Window View	A-37
58	Pre-Test Right Side View of Driver and Interior	A-38
59	Post-Test Right Side View of Driver and Interior	A-38
60	Pre-Test View of Driver Door Clearance	A-39

TABLE OF PHOTOGRAPHS (Continued)		
No.	Description	Page
61	Post-Test View of Driver Door Clearance	A-39
62	Pre-Test View of Parking Brake	A-40
63	Pre-Test Driver Seat Fore Aft Markings	A-41
64	Post-Test Driver Seat Fore Aft Markings	A-41
65	Pre-Test Driver Seat Back Markings	A-42
66	Pre-Test Overhead View of Driver Thighs on Seat	A-42
67	Pre-Test Driver Adjustable D-ring	A-43
68	Post-Test Driver Adjustable D-ring	A-43
69	Pre-Test Driver Feet	A-44
70	Post-Test Driver Feet	A-44
71	Pre-Test View of Driver Right Knee and Bolster	A-45
72	Post-Test View of Driver Right Knee and Bolster	A-45
73	Pre-Test View of Driver Left Knee and Bolster	A-46
74	Post-Test View of Driver Left Knee and Bolster	A-46
75	Pre-Test View of Driver Abdomen	A-47
76	Post-Test View of Driver Abdomen	A-47
77	Pre-Test Left Side View of Steering Wheel set position	A-48
78	Post-Test Left Side View of Steering Wheel set position	A-48
79	Post-Test View of Driver Head Contact with Airbag – Front	A-49
80	Post-Test View of Driver Head Contact with Airbag – Curtain	A-49
81	Post-Test View of Driver Head Contact with Vehicle Interior – A	A-50
81a	Post-Test View of Driver Head Contact with Vehicle Interior – B	A-50
81b	Post-Test View of Driver Head Contact with Vehicle Interior – C	A-51
82	Pre-Test Overall View of Passenger Knee Bolsters	A-52
83	Post-Test Overall View of Passenger Knee Bolsters	A-52
84	Pre-Test Left Side View of Passenger Knee Bolsters	A-53
85	Post-Test Left Side View of Passenger Knee Bolsters	A-53
86	Pre-Test Right Side View of Passenger Knee Bolsters	A-54
87	Post-Test Right Side View of Passenger Knee Bolsters	A-54
88	Pre-Test View of Passenger Floor pan at Left sill level, w/carpet	A-55

TABLE OF PHOTOGRAPHS (Continued)		
No.	Description	Page
89	Post-Test View of Passenger Floor pan at Left sill level, w/carpet	A-55
90	Pre-Test View of Passenger Floor pan at Mid seat level, w/carpet	A-56
91	Post-Test view of Passenger Floor pan at Mid seat level, w/carpet	A-56
92	Pre-Test View of Passenger Floor pan at Left sill level, w/o carpet	A-57
93	Post-Test View of Passenger Floor pan at Left sill level, w/o carpet	A-57
94	Pre-Test View of Passenger Floor pan at Mid seat level, w/o carpet	A-58
95	Post-Test view of Passenger Floor pan at Mid seat level, w/o carpet	A-58
96	Pre-Test Passenger Front Close-up View, Windshield	A-59
97	Post-Test Passenger Front Close-up View, Windshield	A-59
98	Pre-Test Left Side Passenger and Interior View	A-60
99	Post-Test Left Side Passenger and Interior View	A-60
100	Pre-Test Right Side Passenger Window View	A-61
101	Post-Test Right Side Passenger Window View	A-61
102	Pre-Test Right Side Passenger and Interior View	A-62
103	Post-Test Right Side Passenger and Interior View	A-62
104	Pre-Test View of Passenger Door Clearance	A-63
105	Post-Test View of Passenger Door Clearance	A-63
106	Pre-Test Passenger Seat Fore-Aft Markings	A-64
107	Post-Test Passenger Seat Fore-Aft Markings	A-64
108	Pre-Test Passenger Seat Back Markings	A-65
109	Pre-Test Overhead View of Passenger Thighs on seat	A-65
110	Pre-Test Passenger Adjustable D-ring	A-66
111	Post-Test Passenger Adjustable D-ring	A-66
112	Pre-Test View of Passenger Feet	A-67
113	Post-Test View of Passenger Feet	A-67
114	Pre-Test View of Passenger Right Knee and Bolster	A-68
115	Post-Test View of Passenger Right Knee and Bolster	A-68
116	Pre-Test View of Passenger Left Knee and Bolster	A-69
117	Post-Test View of Passenger Left Knee and Bolster	A-69
118	Pre-Test View of Passenger Abdomen	A-70

TABLE OF PHOTOGRAPHS (Continued)		
No.	Description	Page
119	Post-Test View of Passenger Abdomen	A-70
120	Post-Test View of Passenger Head contact with Airbag – Front	A-71
120a	Post-Test View of Passenger Head contact with Airbag – Curtain	A-71
121	Post-Test View of Passenger Head contact with Interior – A	A-72
121a	Post-Test View of Passenger Head contact with Interior – B	A-72
121b	Post-Test View of Passenger Head contact with Interior – C	A-73
122	Post-Test Passenger Contact With Glovebox	A-73
123	Pre-Test Ballast Locations	A-74
124	Post-Test Speed Trap Readout	A-74
125	Pre-Test View of Fuel Filler Cap	A-75
126	Post-Test View of Fuel Filler Cap	A-75
127	Pre-Test Engine Compartment View	A-76
128	Post-Test Engine Compartment View	A-76
129	Pre-Test View of Front Underbody (perpendicular to vehicle)	A-77
130	Post-Test View of Front Underbody (perpendicular to vehicle)	A-77
131	Pre-Test View of Mid Underbody (perpendicular to vehicle)	A-78
132	Post-Test View of Mid Underbody (perpendicular to vehicle)	A-78
133	Pre-Test View of Rear Underbody (perpendicular to vehicle)	A-79
134	Post-Test View of Rear Underbody (perpendicular to vehicle)	A-79
135	Pre-Test View of Steering rack and or sway bar	A-80
136	Post-Test View of Steering rack and or sway bar	A-80
137	Pre-Test Bumper to Rail Attachments and Crush Initiators	A-81
138	Post-Test Bumper to Rail Attachments and Crush Initiators	A-82
139	Post-Test View of Front Sub-Frame Deformation	A-82
140	Pre-Test Frame Rail with tire removed	A-83
141	Post-Test Frame Rail with tire removed	A-83
142	Pre-Test View of Front Driver Wheel Well with tire removed	A-84
143	Post-Test ¾ View of Front Driver Wheel Well w/ tire removed	A-84
144	Post-Test Side View of Front Driver Wheel Well w/ tire removed	A-85
145	Post-Test Right Side 3/4 Rear View of the Front Driver Wheel Well w/ tire removed	A-85

TABLE OF PHOTOGRAPHS (Continued)		
No.	Description	Page
146	Post-Test Looking Down at the Front Driver Shotgun	A-86
147	Post-Test Right Side ¾ View of Front Driver Shotgun	A-86
148	Post-Test Front Driver Close up View of Suspension w/ tire removed	A-87
149	Post-Test ¾ View of Front Passenger Wheel Well w/ tire removed	A-87
150	Post-Test Side View of Front Passenger Wheel Well w/ tire removed	A-88
151	Post-Test Right Side 3/4 Rear View of the Front Passenger Wheel Well w/ tire removed	A-88
152	Post-Test Looking Down at the Front Passenger Shotgun	A-89
153	Post-Test Right Side ¾ View of Front Passenger Shotgun	A-89
154	Post-Test Front Passenger Close up View of Suspension w/ tire removed	A-90
155	Post-Test View of Door Sill with door open-Struck Side	A-90
156	Post-Test View of Deformation of A pillar-Struck Side	A-91
157	Post-Test View of Deformation of B pillar-Struck Side	A-91
158	Post-Test View of Deformation of C pillar-Struck Side	A-92
159	Post-Test View of Wheel and/or Tire Deformation-Struck Side	A-92
160	Post-Test View of Deformation of Rocker or Post-Struck Side	A-93
161	Post-Test View of Windshield Separation	A-93
162	Pre-Test Left Side View of RMDB	A-94
163	Post-Test Left Side View of RMDB	A-94
164	Pre-Test Right Side View of RMDB	A-95
165	Post-Test Right Side View of RMDB	A-95
166	Pre-Test Top View of RMDB	A-96
167	Post-Test Top View of RMDB	A-96
168	Pre-Test Front View of RMDB	A-97
169	Post-Test Front View of RMDB	A-97
170	Pre-Test RMDB & Vehicle, Right Side	A-98
171	Post-Test RMDB & Vehicle, Right Side	A-98
172	Pre-Test RMDB & Vehicle, Left Side	A-99
173	Post-Test RMDB & Vehicle, Left Side	A-99
174	Pre-Test RMDB & Vehicle, Top View	A-100
175	Post-Test RMDB & Vehicle, Top View	A-100

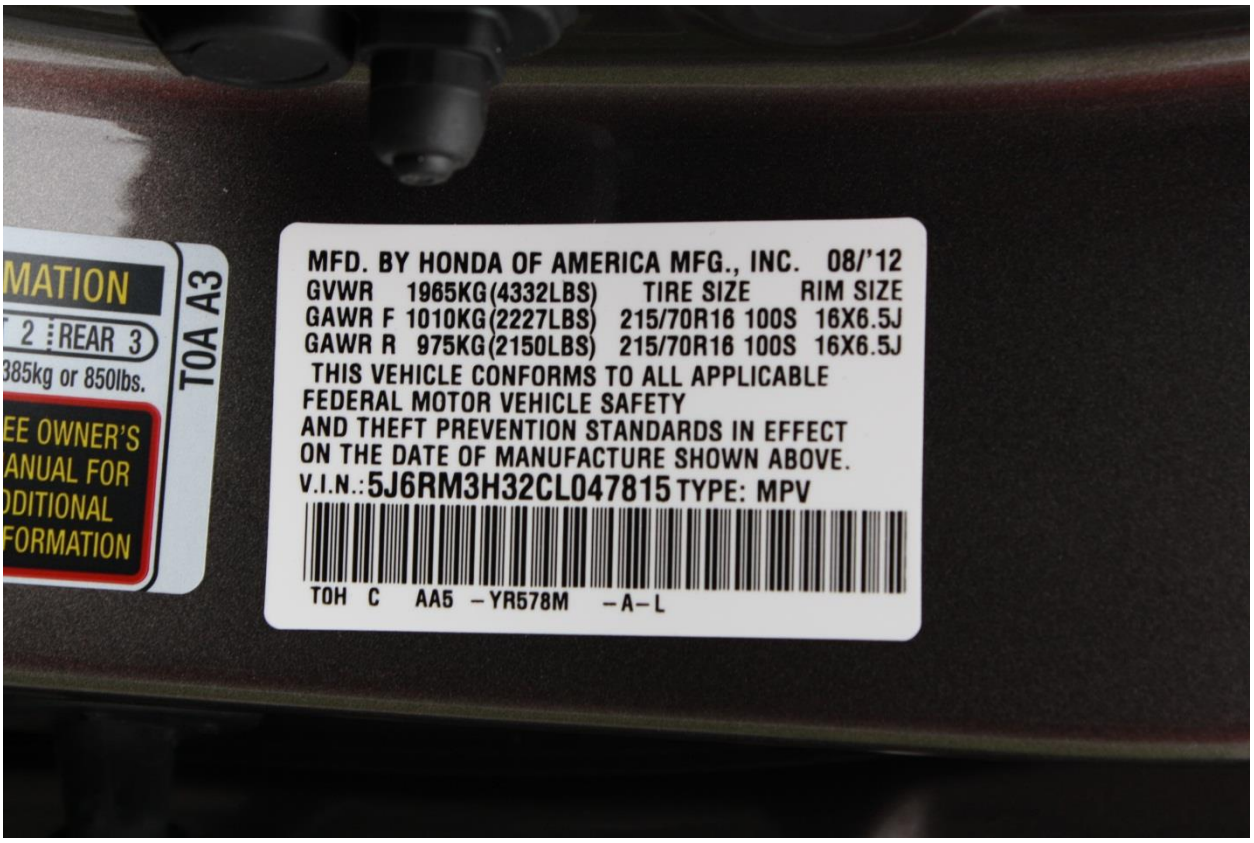
TABLE OF PHOTOGRAPHS (Continued)		
No.	Description	Page
176	Pre-Test RMDB & Vehicle, Rear View	A-101
177	Post-Test RMDB & Vehicle, Rear View	A-101
178	Pre-Test RMDB & Vehicle, Front View	A-102
179	Post-Test RMDB & Vehicle, Front View	A-102
180	Vehicle at 0 Degrees on Static Rollover Device	A-103
181	Vehicle at 90 Degrees on Static Rollover Device	A-103
182	Vehicle at 180 Degrees on Static Rollover Device	A-104
183	Vehicle at 270 Degrees on Static Rollover Device	A-104
184	Vehicle at 360 Degrees on Static Rollover Device	A-105
185	Impact Photo	A-105



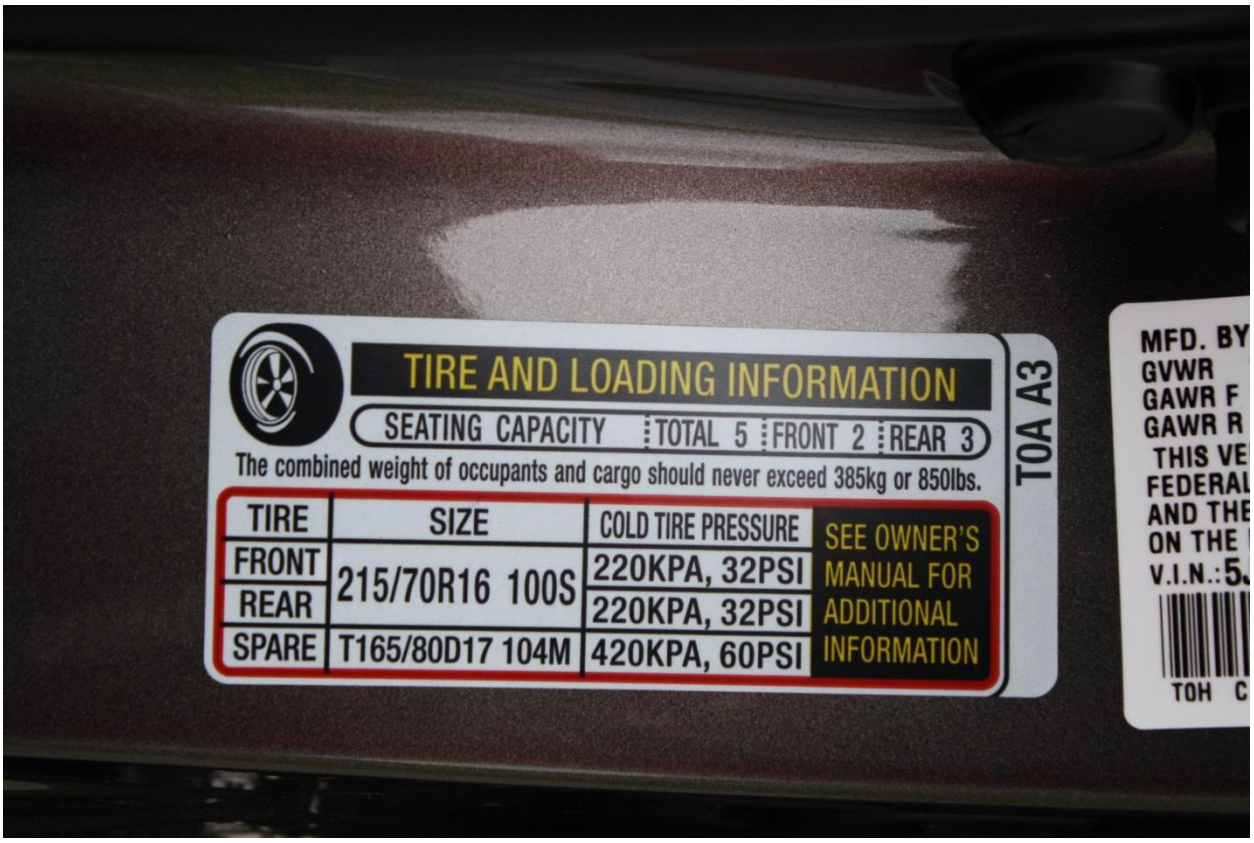
No. 001 As Delivered Right Front 3-4 View of Test Vehicle



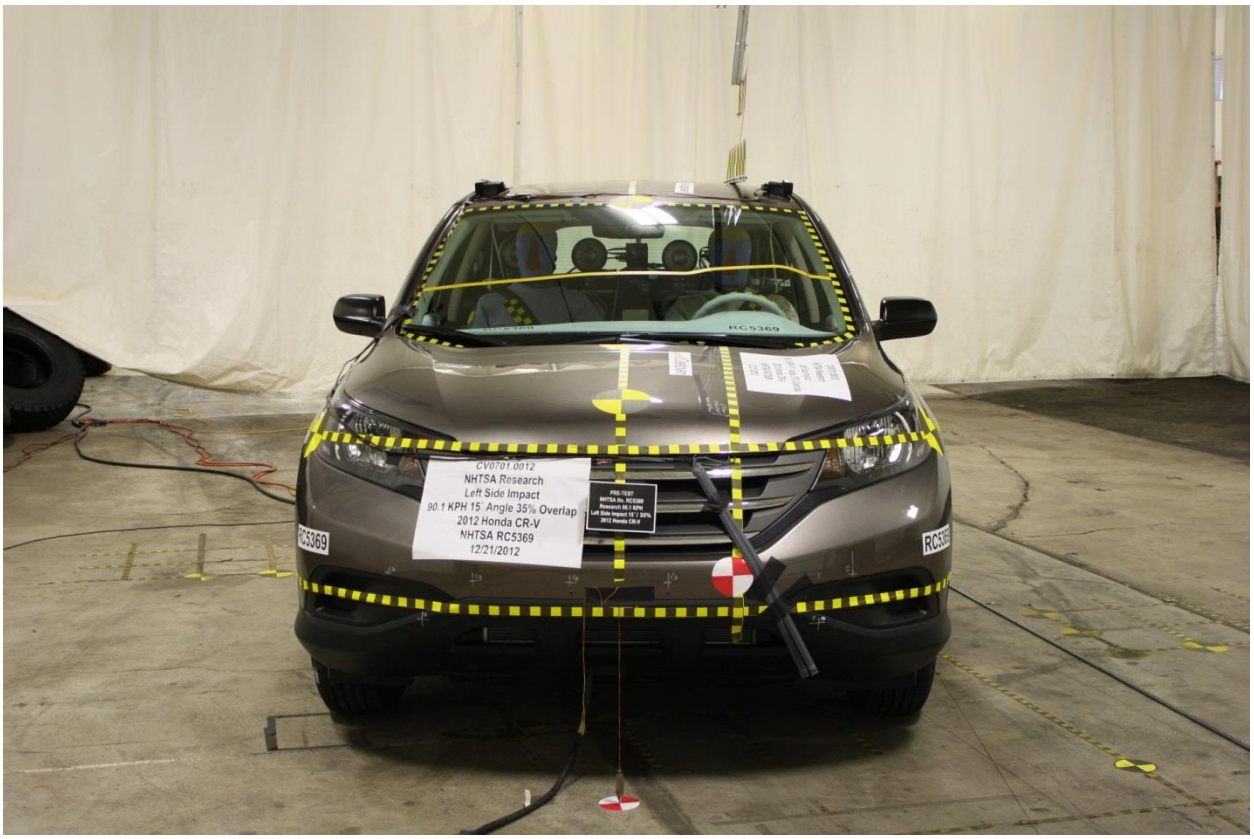
No. 002 As Delivered Left Rear 3-4 View of Test Vehicle



No. 003 Test Vehicle Certification Label



No. 004 Test Vehicle Tire Placard



No. 005 Pre-Test Front View of Test Vehicle



No. 006 Post-Test Front View of Test Vehicle



No. 007 Pre-Test Left Front 3-4 View of Test Vehicle



No. 008 Post-Test Left Front 3-4 View of Test Vehicle



No. 009 Pre-Test Left Side View of Test Vehicle



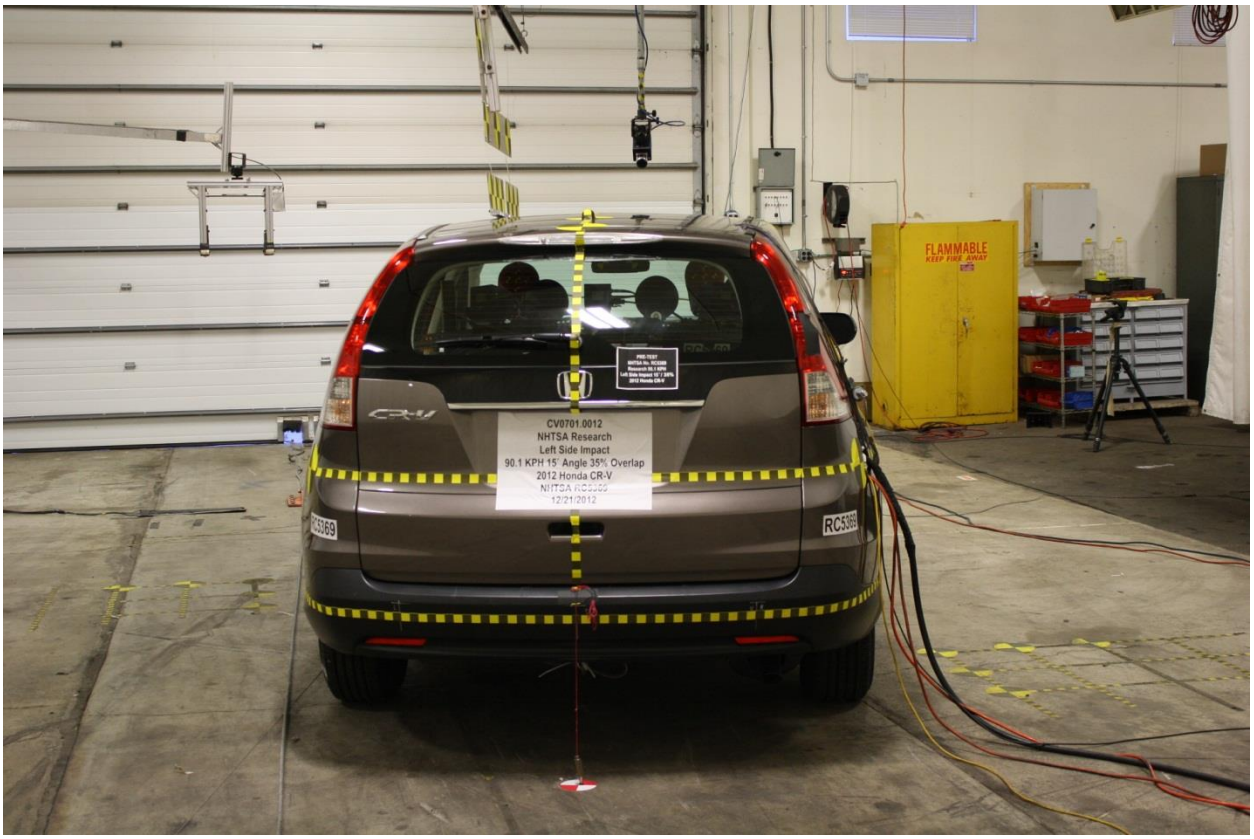
No. 010 Post-Test Left Side View of Test Vehicle



No. 011 Pre-Test Left Rear 3-4 View of Test Vehicle



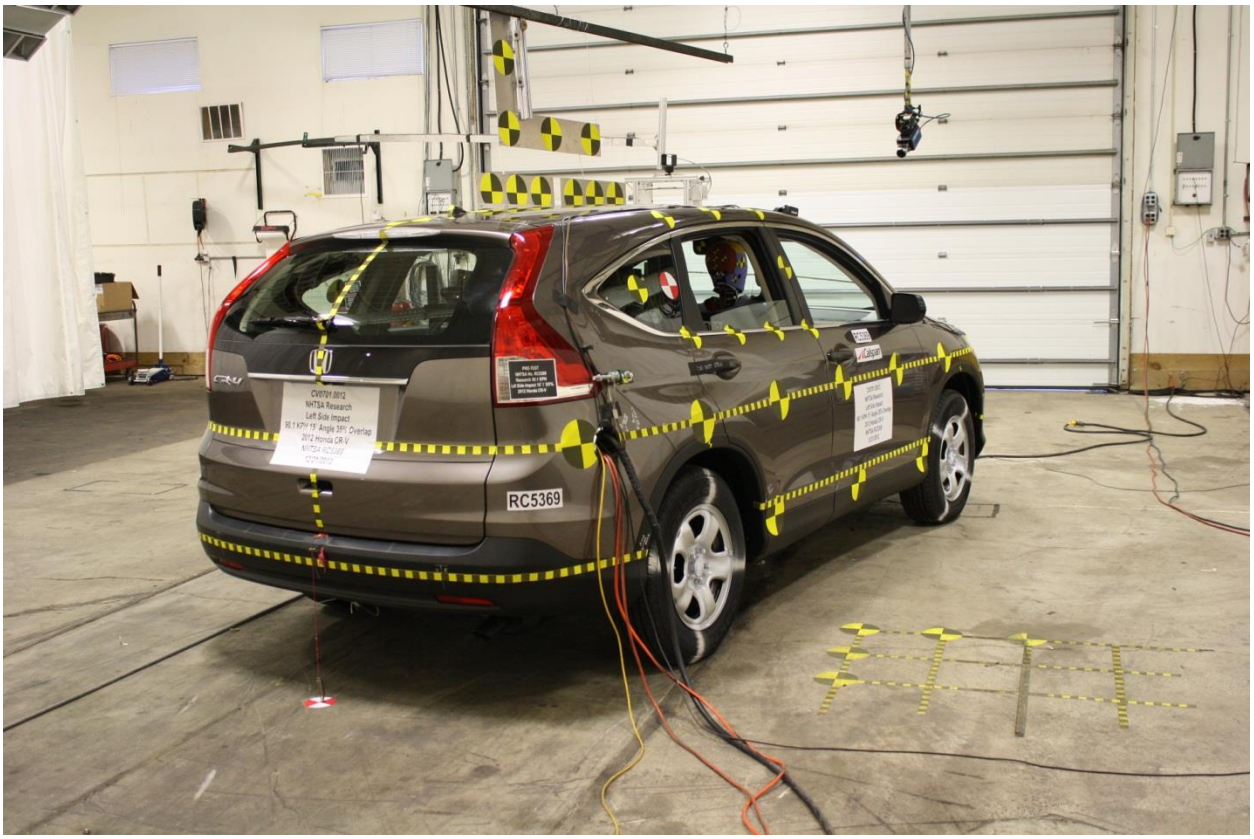
No. 012 Post-Test Left Rear 3-4 View of Test Vehicle



No. 013 Pre-Test Rear View of Test Vehicle



No. 014 Post-Test Rear View of Test Vehicle



No. 015 Pre-Test Right Rear 3-4 View of Test Vehicle



No. 016 Post-Test Right Rear 3-4 View of Test Vehicle



No. 017 Pre-Test Right Side View of Test Vehicle



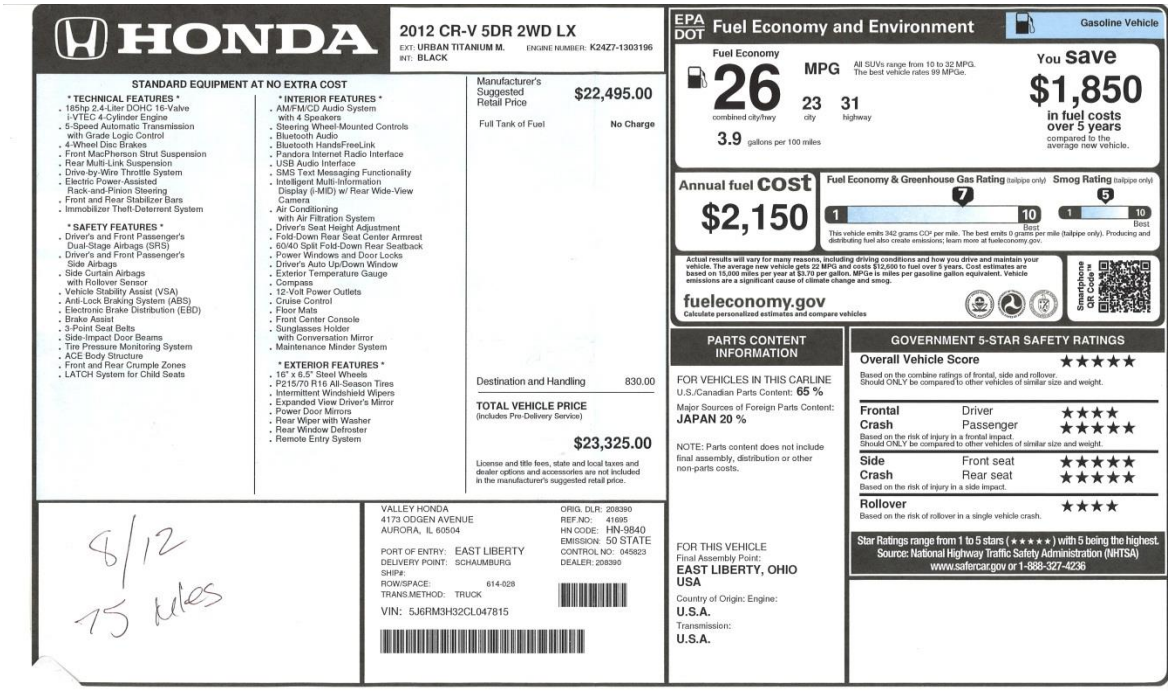
No. 018 Post-Test Right Side View of Test Vehicle



No. 019 Pre-Test Right Front 3-4 View of Test Vehicle



No. 020 Post-Test Right Front 3-4 View of Test Vehicle



HONDA

2012 CR-V 5DR 2WD LX

EXT: URBAN TITANIUM M. ENGINE NUMBER: K24Z7-1303196
INT: BLACK

STANDARD EQUIPMENT AT NO EXTRA COST

* TECHNICAL FEATURES *
- 185hp 2.4-Liter DOHC 16-Valve i-VTEC 4-Cylinder Engine
- 5-Speed Automatic Transmission with Grade Logic Control
- 4-Wheel Disc Brakes
- Front MacPherson Strut Suspension
- Rear Multi-Link Suspension
- Drive-by-Wire Throttle System
- Electric Power-Assisted Rack-and-Pinion Steering
- Front and Rear Stabilizer Bars
- Immobilizer Theft-Deterrent System

* SAFETY FEATURES *
- Driver's and Front Passenger's Dual-Stage Airbags (SRS)
- Driver's and Front Passenger's Side Airbags
- Side Curtain Airbags with Rollover Sensor
- Vehicle Stability Assist (VSA)
- Anti-Lock Braking System (ABS)
- Electronic Brake Distribution (EBD)
- Brake Assist
- 3-Point Seat Belts
- Side-Impact Door Beams
- Tire Pressure Monitoring System
- ACE Body Structure
- Front and Rear Crumple Zones
- LATCH System for Child Seats

* INTERIOR FEATURES *
- AM/FM/CD Audio System with 4 Speakers
- Steering Wheel-Mounted Controls
- Bluetooth Audio
- Bluetooth HandsFreeLink
- Pandora Internet Radio Interface
- USB Audio Interface
- SMS Text Messaging Functionality
- Intelligent Multi-Information Display (i-MID) w/ Rear Wide-View Camera
- Air Conditioning with Air Filtration System
- Driver's Seat Height Adjustment
- Fold-Down Rear Seat Center Armrest
- 60/40 Split Fold-Down Rear Seatback
- Power Windows and Door Locks
- Driver's Auto Up/Down Window
- Exterior Temperature Gauge
- Compass
- 12-Volt Power Outlets
- Cruise Control
- Floor Mats
- Front Center Console
- Sunglasses Holder with Conversation Mirror
- Maintenance Minder System

* EXTERIOR FEATURES *
- 16" x 6.5" Steel Wheels
- P215/70 R16 All-Season Tires
- Intermittent Windshield Wipers
- Expanded View Driver's Mirror
- Power Door Mirrors
- Rear Wiper with Washer
- Rear Window Defroster
- Remote Entry System

Manufacturer's Suggested Retail Price $22,495.00

Full Tank of Fuel No Charge

Destination and Handling 830.00

TOTAL VEHICLE PRICE (Includes Pre-Delivery Service)

$23,325.00

License and title fees, state and local taxes and dealer options and accessories are not included in the manufacturer's suggested retail price.

8/12
15 miles

VALLEY HONDA
4173 ODGEN AVENUE
AURORA, IL 60504

ORIG. DLR: 208390
REF.NO: 41695
HN CODE: HN-9840
EMISSION: 50 STATE
CONTROL NO: 045823
DEALER: 208390

PORT OF ENTRY: EAST LIBERTY
DELIVERY POINT: SCHAUMBURG
SHIP#:
ROW/SPACE: 614-028
TRANS.METHOD: TRUCK

VIN: 5J6RM3H32CL047815

EPA DOT Fuel Economy and Environment

Gasoline Vehicle

Fuel Economy
26 MPG
combined city/hwy
23 city
31 highway
3.9 gallons per 100 miles

All SUVs range from 10 to 32 MPG. The best vehicle rates 99 MPGe.

You save $1,850 in fuel costs over 5 years compared to the average new vehicle.

Annual fuel cost $2,150

Fuel Economy & Greenhouse Gas Rating (tailpipe only) 7
1 10 Best

Smog Rating (tailpipe only) 5
1 10 Best

This vehicle emits 342 grams CO2 per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also create emissions; learn more at fueleconomy.gov.

Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 22 MPG and costs $12,650 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at $3.70 per gallon. MPGe is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.

fueleconomy.gov
Calculate personalized estimates and compare vehicles

Smartphone QR Code

PARTS CONTENT INFORMATION

FOR VEHICLES IN THIS CARLINE
U.S./Canadian Parts Content: 65 %
Major Sources of Foreign Parts Content:
JAPAN 20 %

NOTE: Parts content does not include final assembly, distribution or other non-parts costs.

FOR THIS VEHICLE
Final Assembly Point:
EAST LIBERTY, OHIO USA
Country of Origin: Engine:
U.S.A.
Transmission:
U.S.A.

GOVERNMENT 5-STAR SAFETY RATINGS

Overall Vehicle Score ★★★★★
Based on the combine ratings of frontal, side and rollover. Should ONLY be compared to other vehicles of similar size and weight.

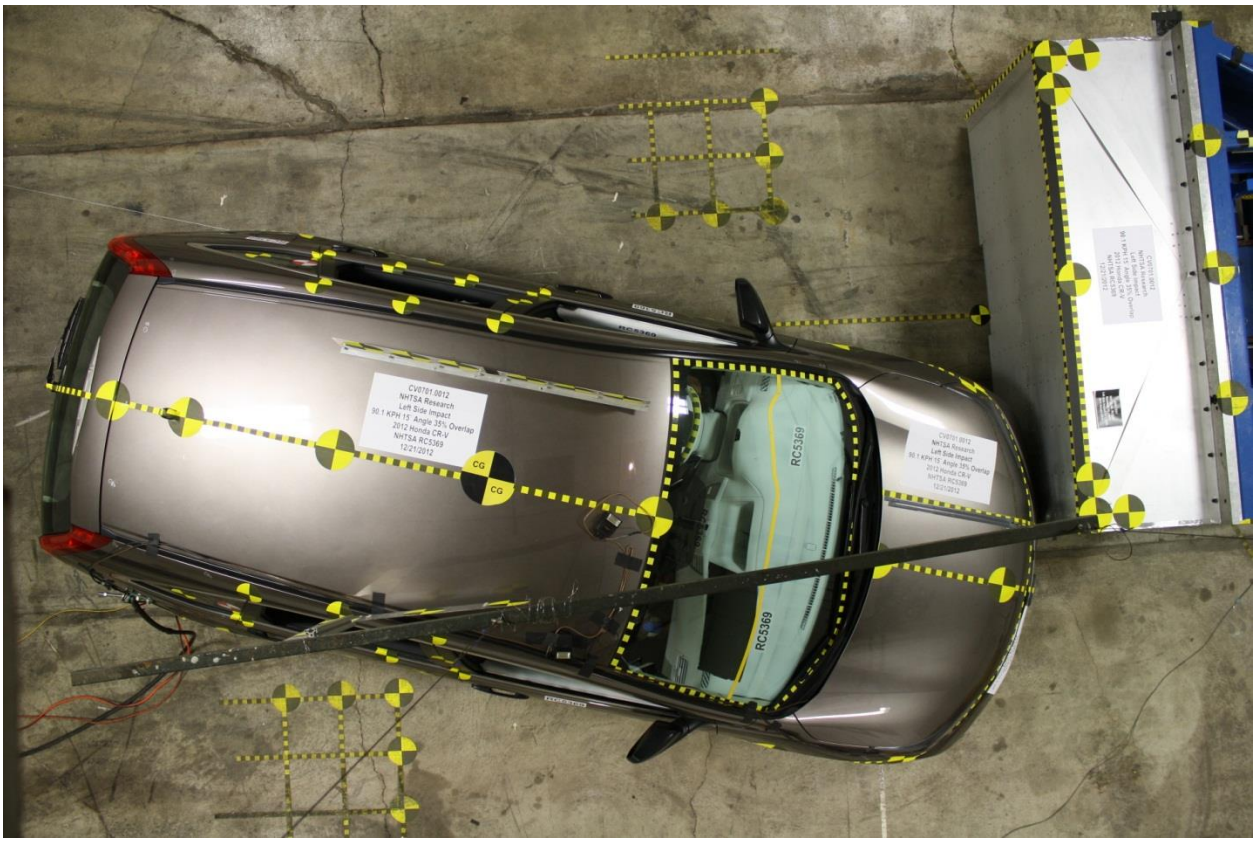
Frontal Crash — Driver ★★★★ — Passenger ★★★★★
Based on the risk of injury in a frontal impact. Should ONLY be compared to other vehicles of similar size and weight.

Side Crash — Front seat ★★★★★ — Rear seat ★★★★★
Based on the risk of injury in a side impact.

Rollover ★★★★
Based on the risk of rollover in a single vehicle crash.

Star Ratings range from 1 to 5 stars (★★★★★) with 5 being the highest. Source: National Highway Traffic Safety Administration (NHTSA) www.safercar.gov or 1-888-327-4236

No. 021 Monroney Label Photograph



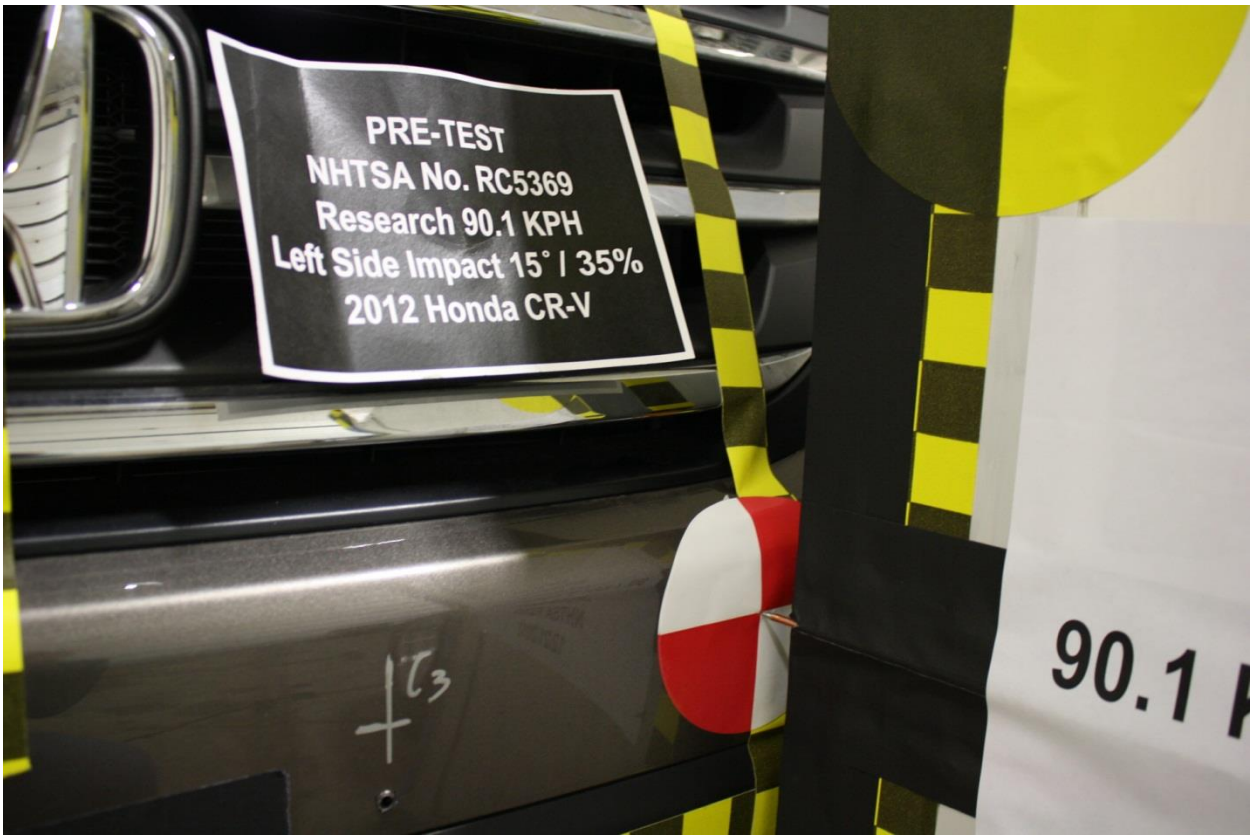
No. 022 Pre-Test Overhead View of RMDB against target vehicle at ideal Impact Point



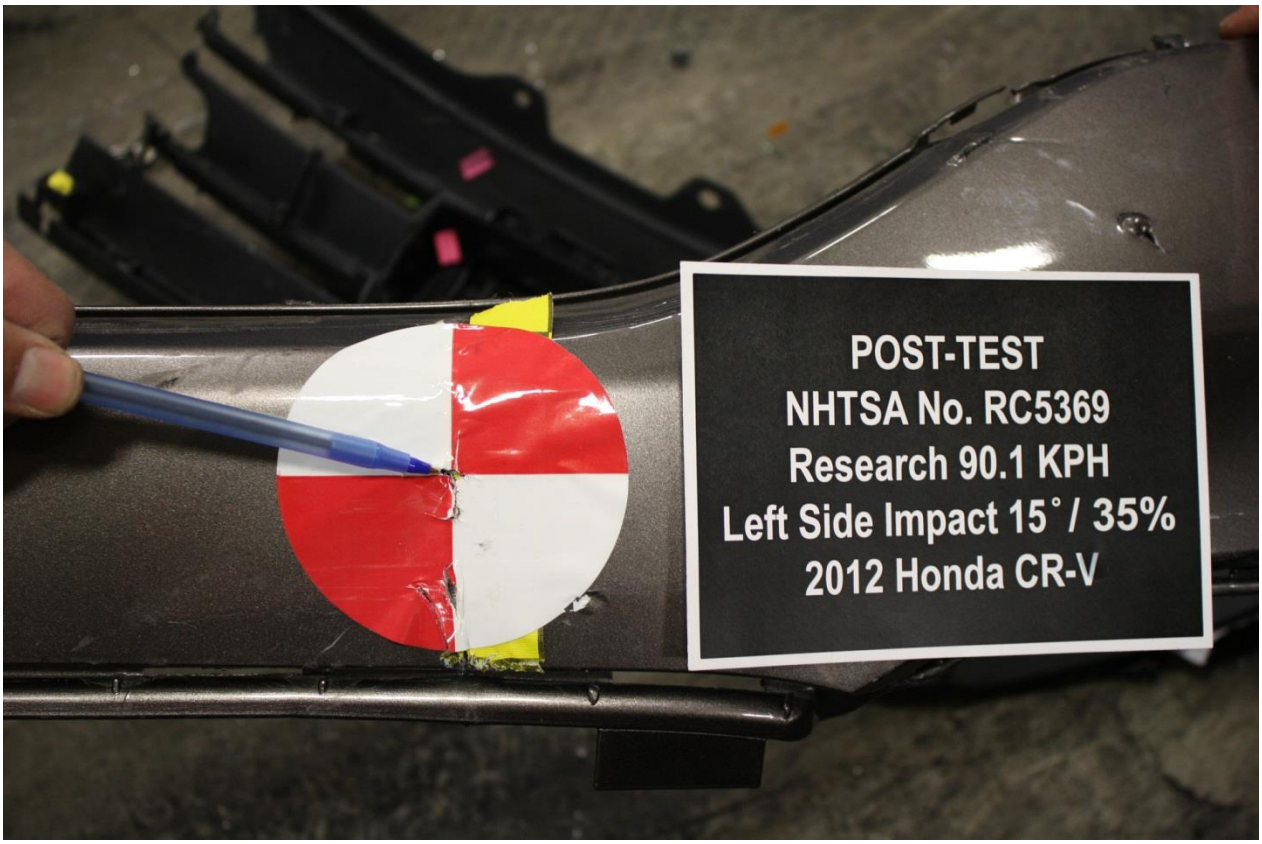
No. 023 Pre-Test Left Side View of RMDB against target vehicle at ideal Impact Point



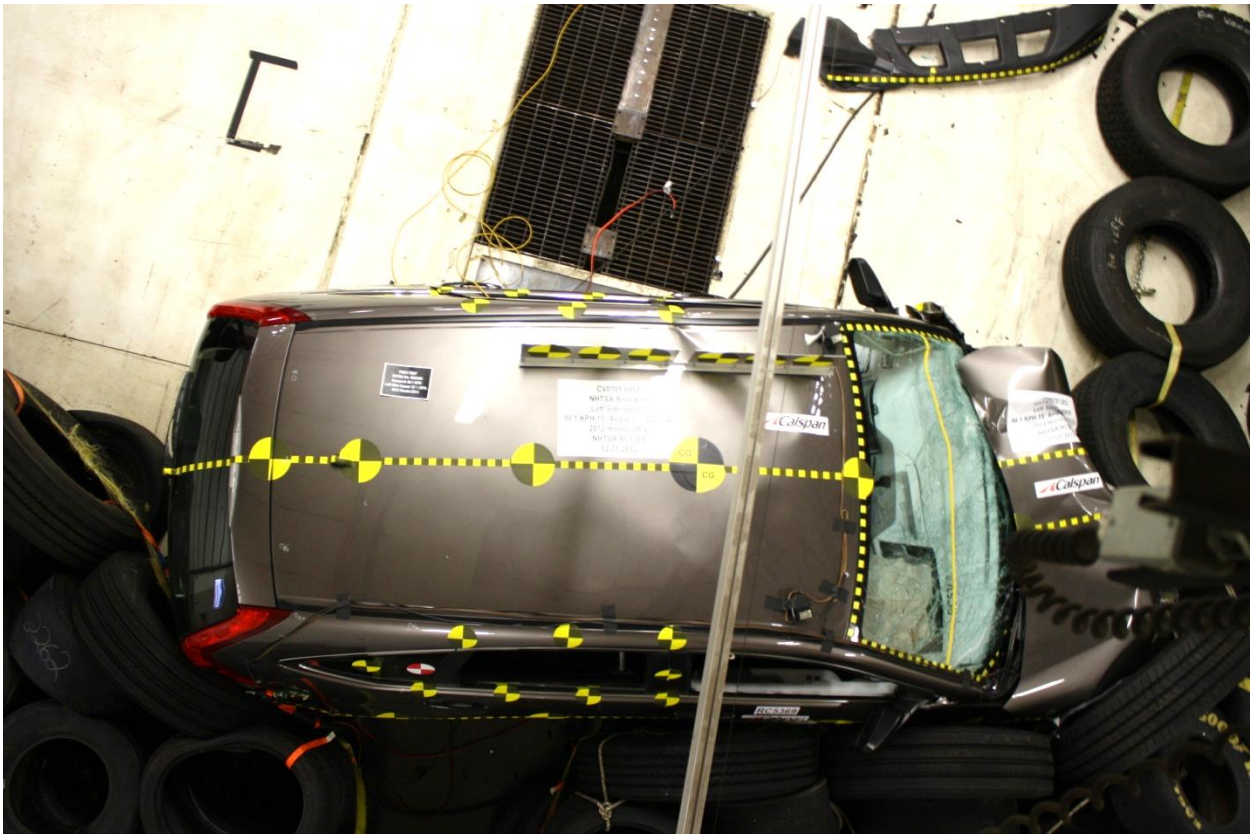
No. 024 Pre-Test Right Side View of RMDB against target vehicle at ideal Impact Point



No. 025 Pre-Test Close-up View of Impact Point



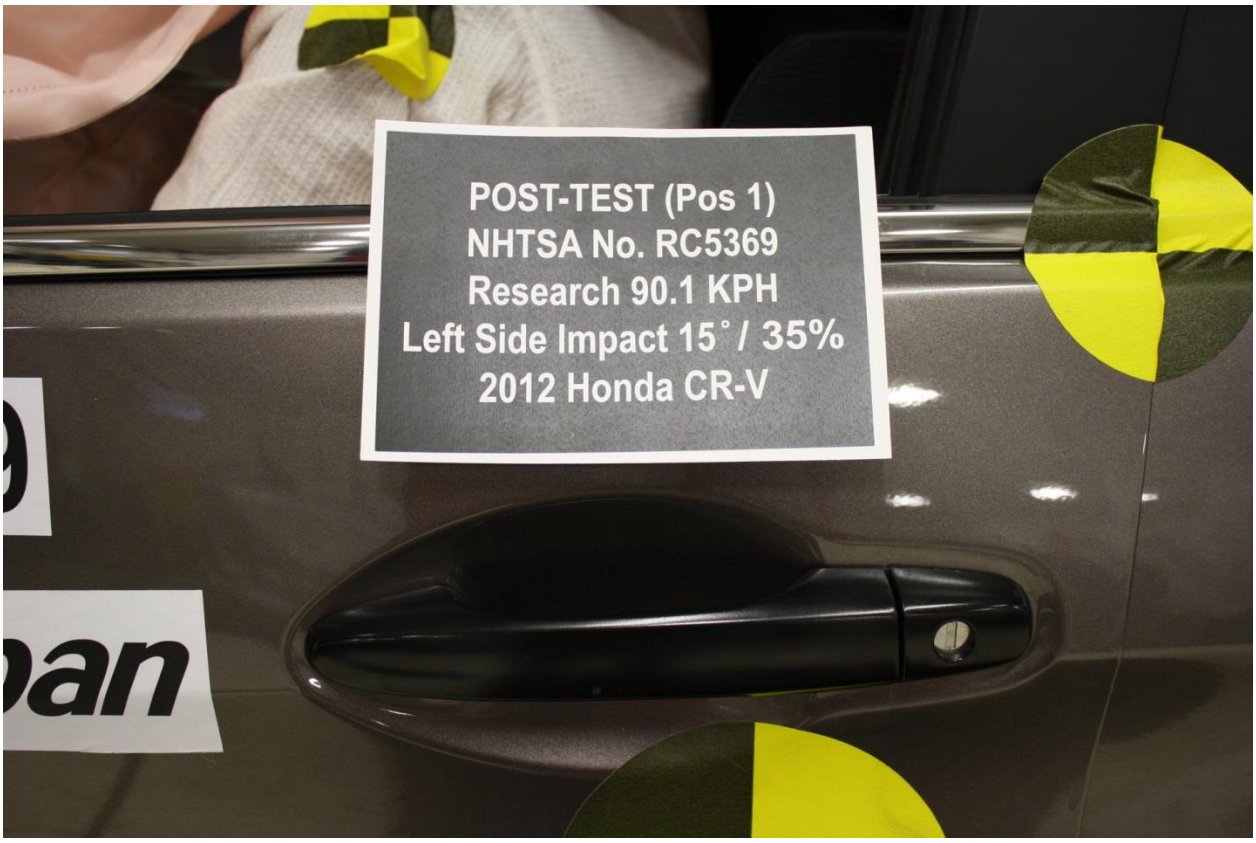
No. 026 Post-Test Close-up View of Impact Point



No. 027 Post-Test Vehicle Overhead View



No. 028 Pre-Test Close-up View of Driver Door Latch



No. 029 Post-Test Close-up View of Driver Door Latch



No. 030 Pre-Test Close-up View of Passenger Door Latch



No. 031 Post-Test Close-up View of Passenger Door Latch



No. 032 Pre-Test Windshield View



No. 033 Post-Test Windshield View



No. 034 Pre-Test View of Driver Inner Door Panel



No. 035 Post-Test View of Driver Inner Door Panel



No. 036 Pre-Test View of Passenger Inner Door Panel



No. 037 Post-Test View of Passenger Inner Door Panel



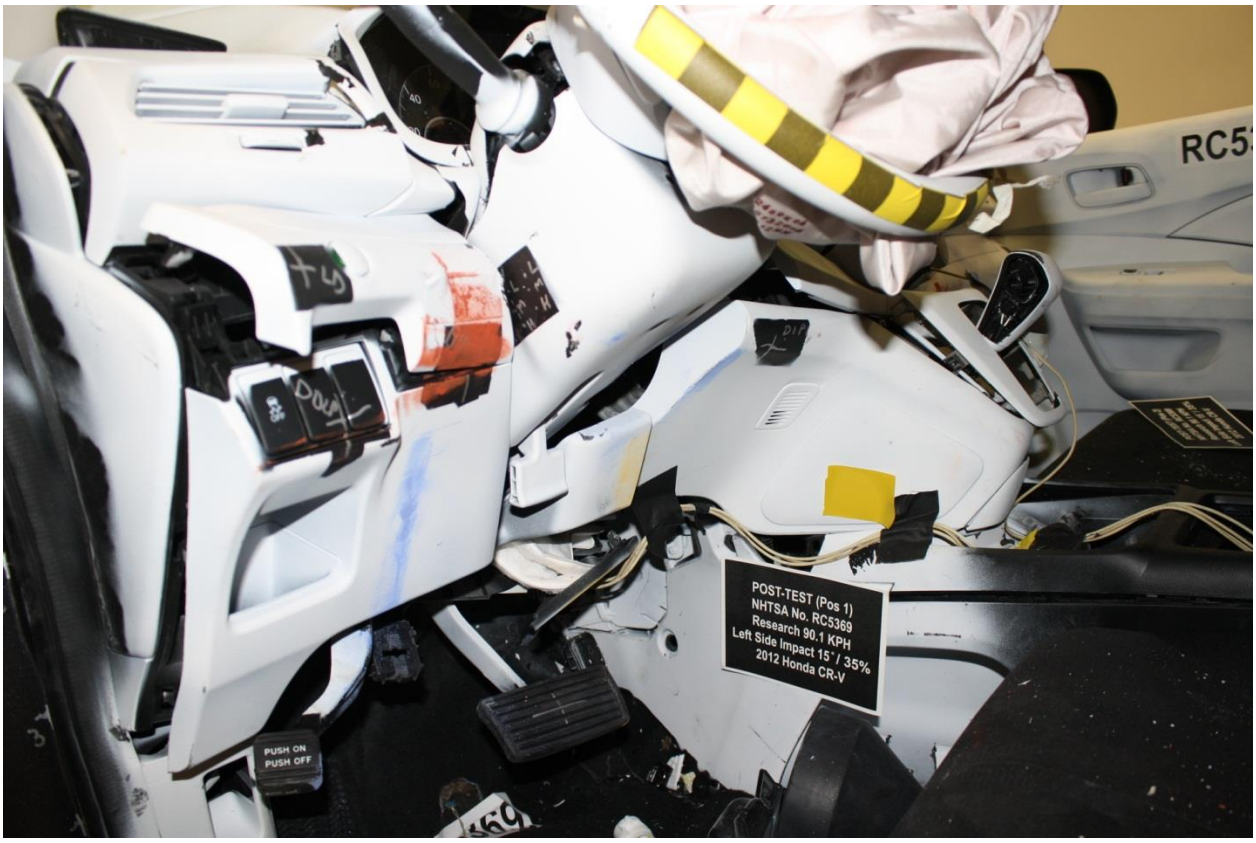
No. 038 Pre-Test Overall View of Driver Knee Bolsters



No. 039 Post-Test Overall View of Driver Knee Bolsters



No. 040 Pre-Test Left Side View of Driver Knee Bolsters



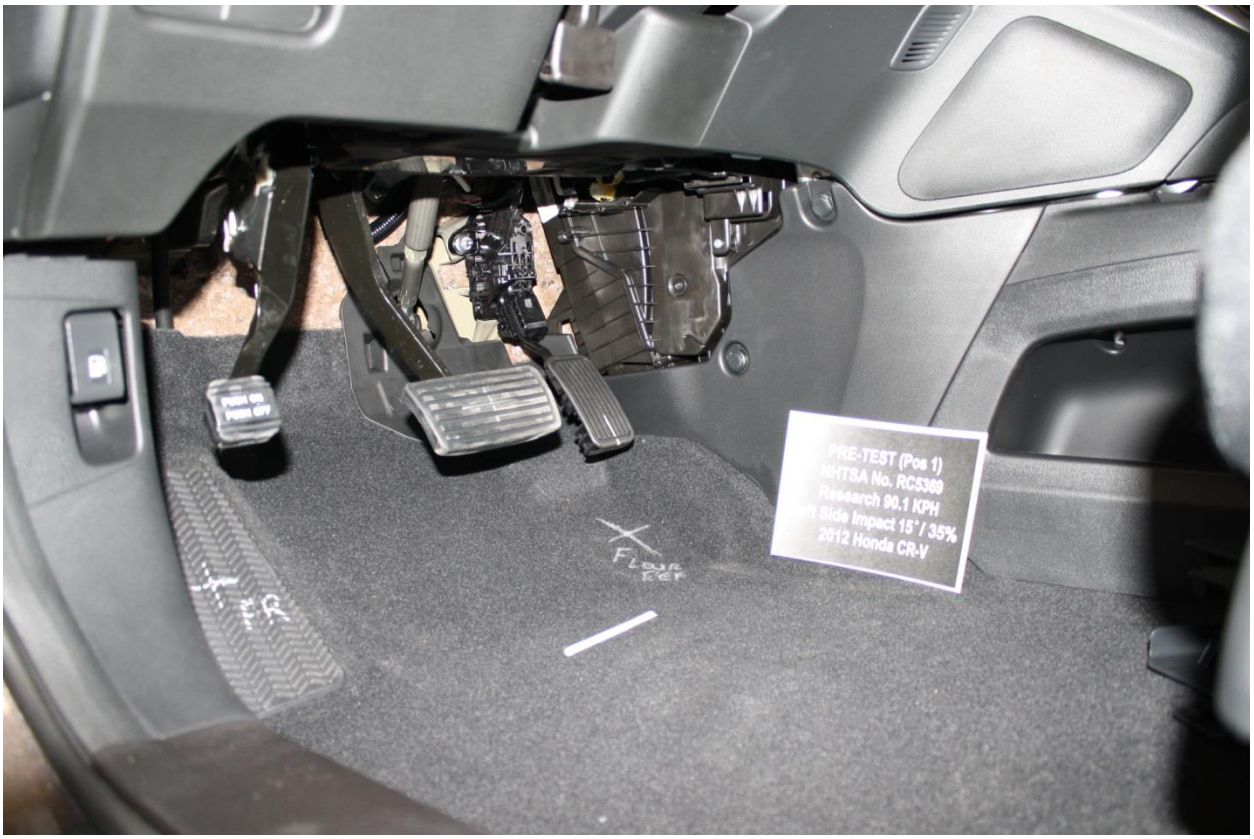
No. 041 Post-Test Left Side View of Driver Knee Bolsters



No. 042 Pre-Test Right Side View of Driver Knee Bolsters



No. 043 Post-Test Right Side View of Driver Knee Bolsters



No. 044 Pre-Test View of Driver Floor pan at Left sill level, w/carpet



No. 045 Post-Test View of Driver Floor pan at Left sill level, w/carpet



No. 046 Pre-Test View of Driver Floor pan at Mid seat level, w/carpet



No. 047 Post-Test view of Driver Floor pan at Mid seat level, w/carpet



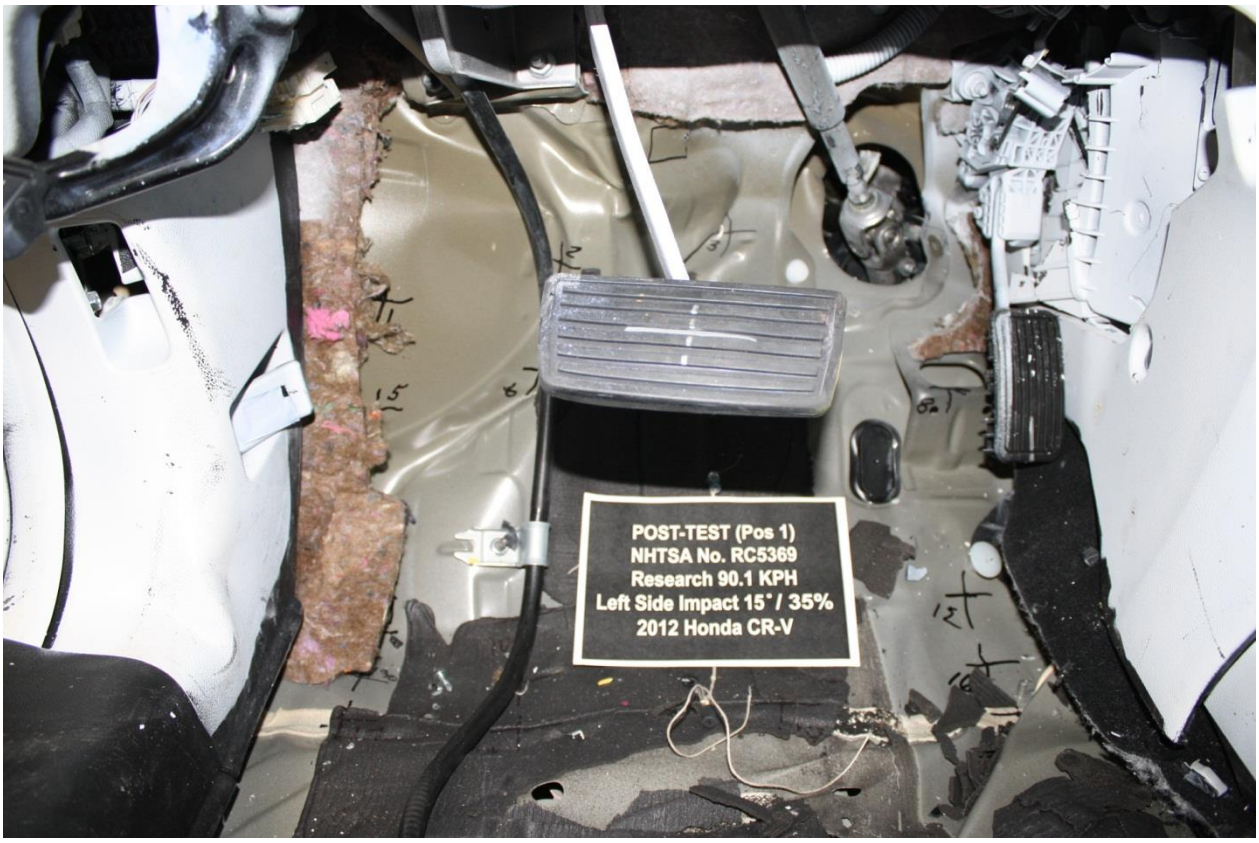
No. 048 Pre-Test View of Driver Floor pan at Left sill level, w/o carpet



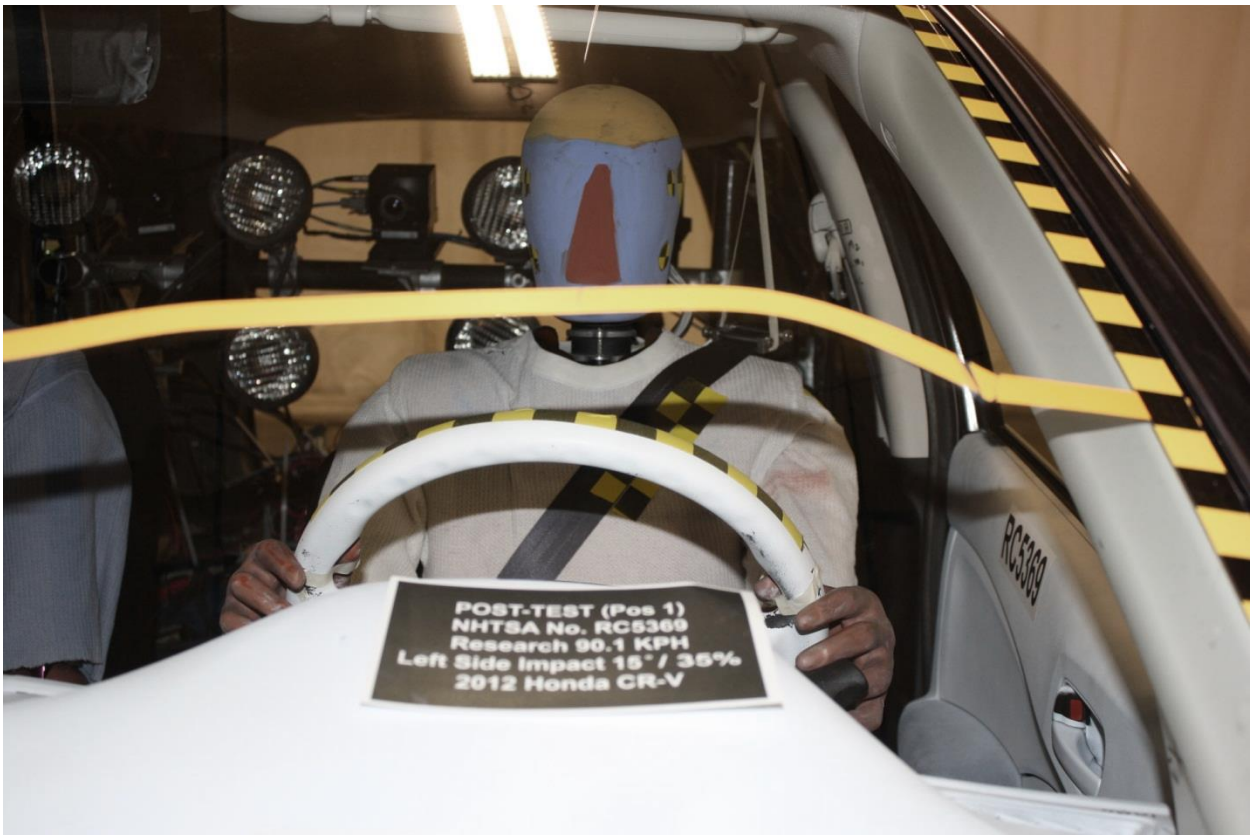
No. 049 Post-Test View of Driver Floor pan at Left sill level, w/o carpet



No. 050 Pre-Test View of Driver Floor pan at Mid seat level, w/o carpet



No. 051 Post-Test view of Driver Floor pan at Mid seat level, w/o carpet



No. 052 Pre-Test Driver Front Windshield View



No. 053 Post-Test Driver Front Windshield View



No. 054 Pre-Test Left Side View of Driver and Interior



No. 055 Post-Test Left Side View of Driver and Interior



No. 056 Pre-Test Left Side Driver Window View



No. 057 Post-Test Left Side Driver Window View



No. 058 Pre-Test Right Side View of Driver and Interior



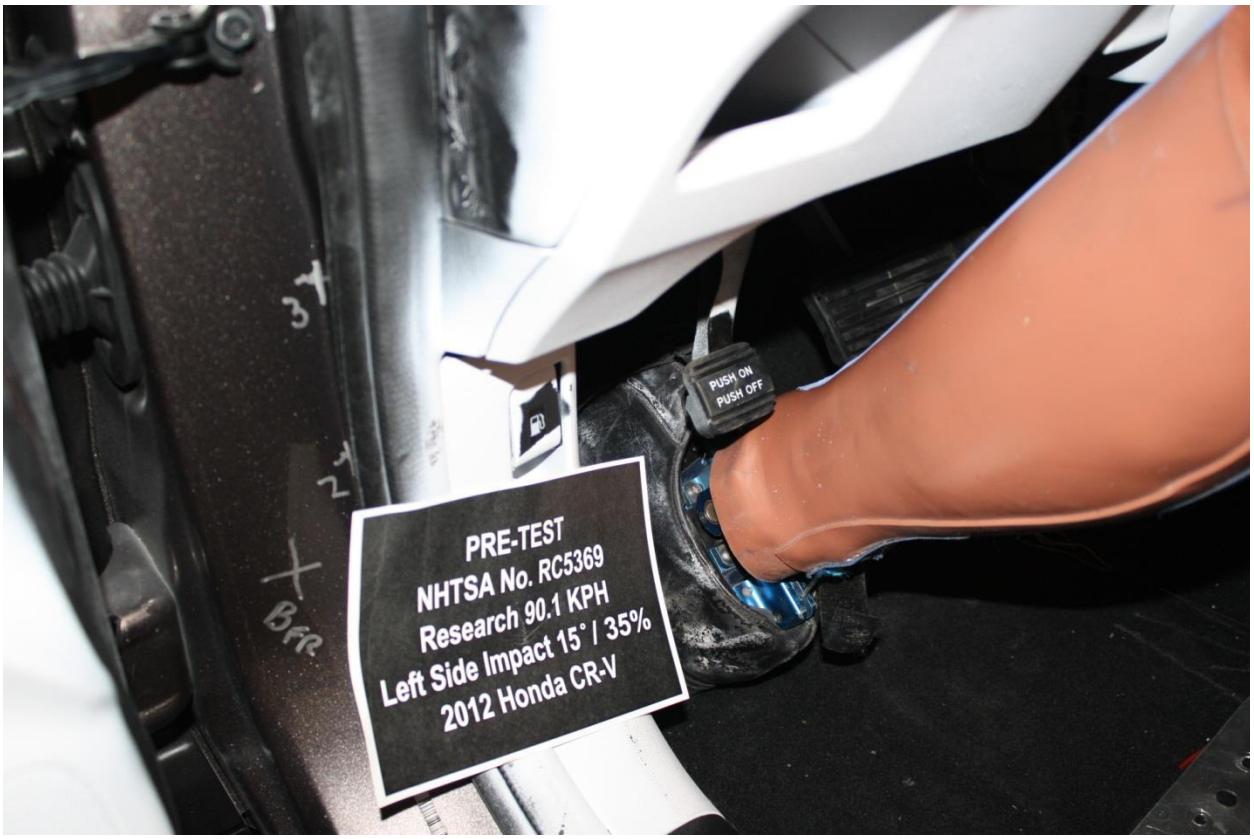
No. 059 Post-Test Right Side View of Driver and Interior



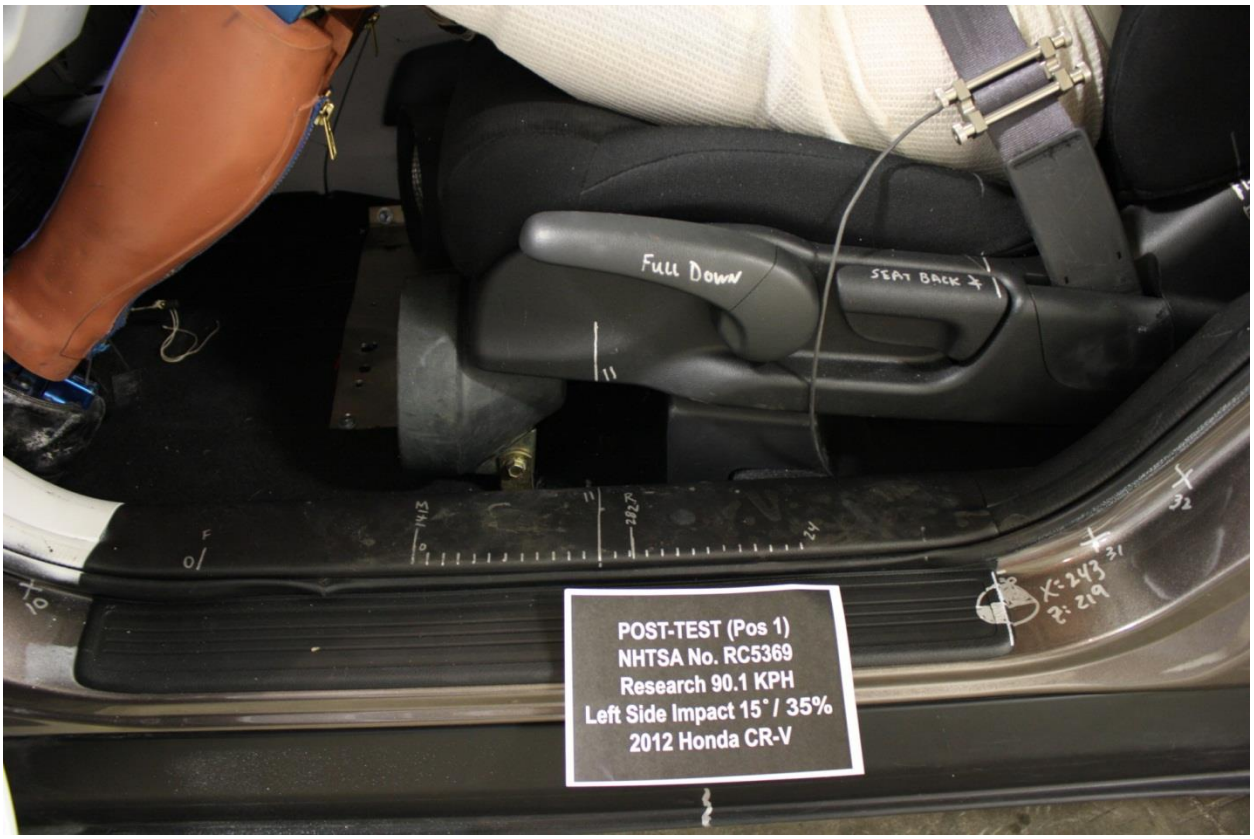
No. 060 Pre-Test View of Driver Door Clearance



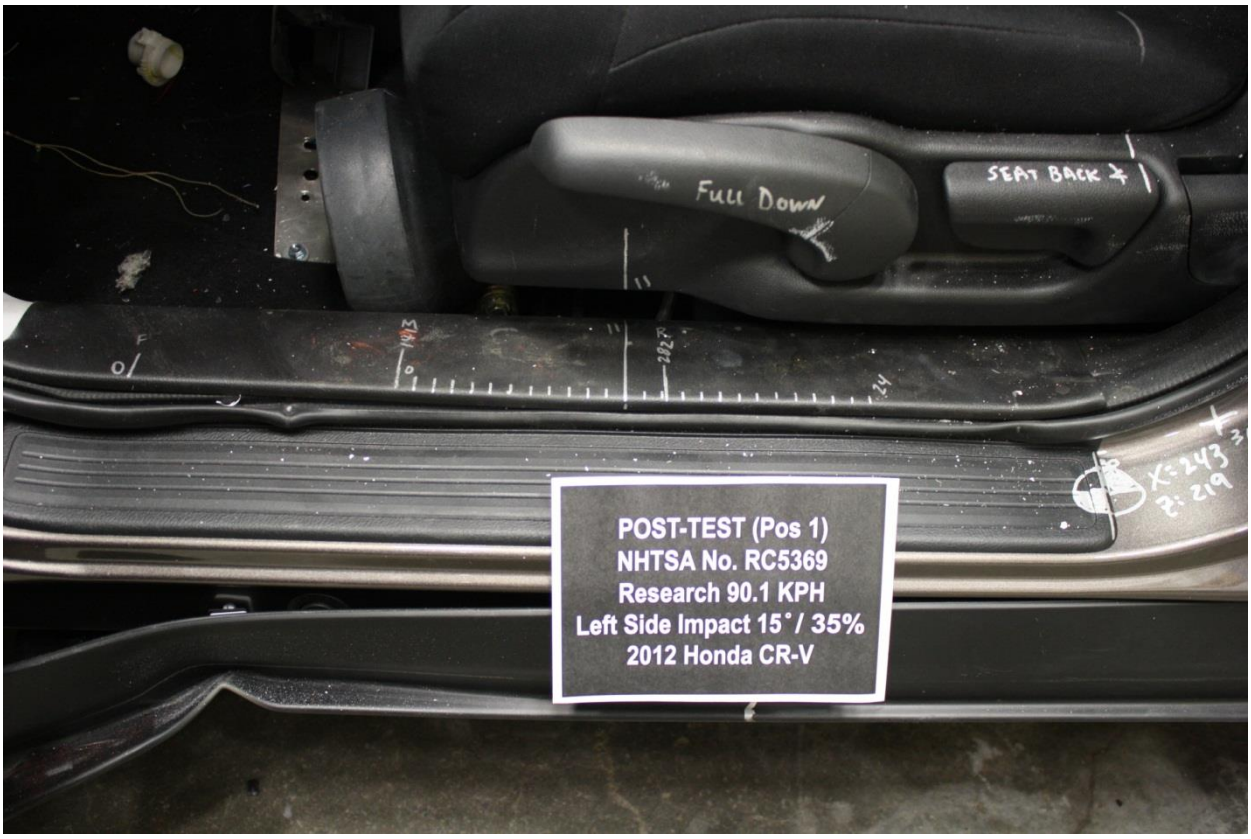
No. 061 Post-Test View of Driver Door Clearance



No. 062 Pre-Test View of Parking Brake



No. 063 Pre-Test Driver Seat Fore Aft Markings



No. 064 Post-Test Driver Seat Fore Aft Markings



No. 065 Pre-Test Driver Seat Back Markings



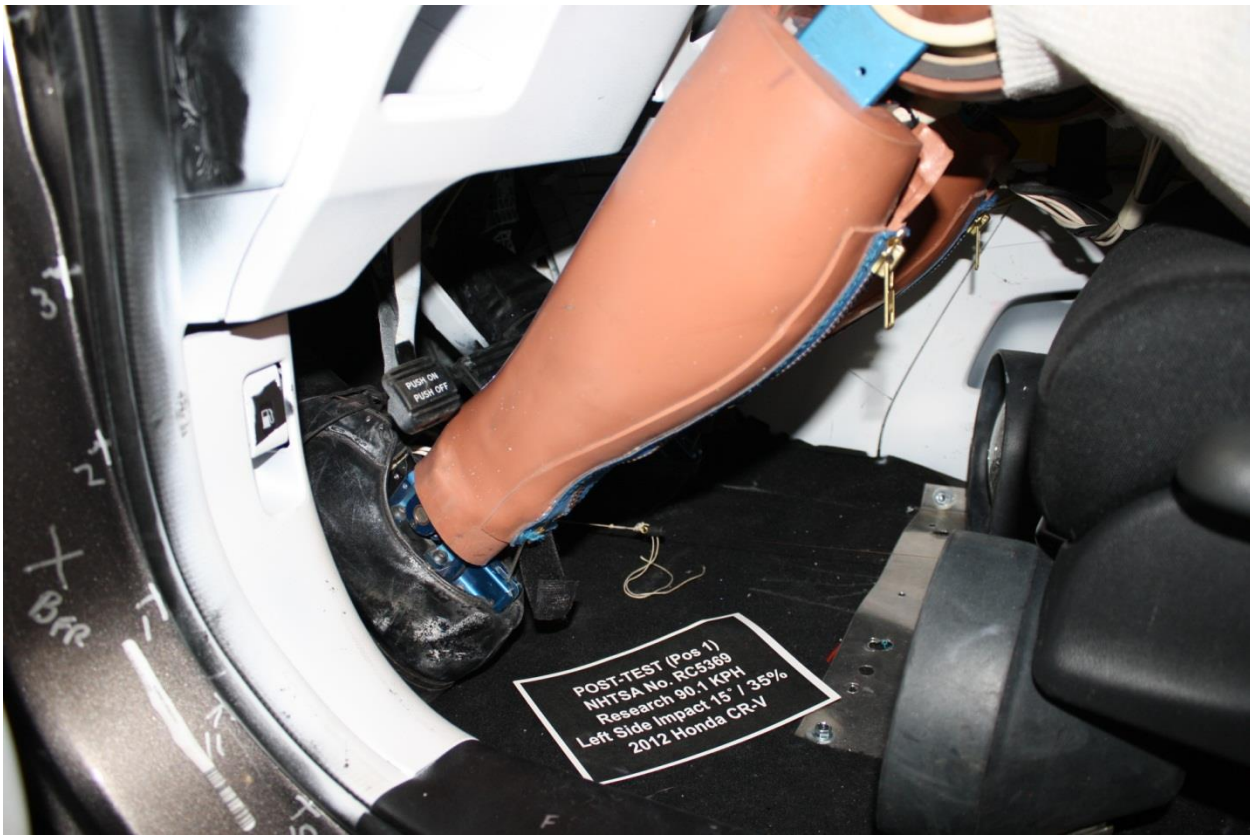
No. 066 Pre-Test Overhead View of Driver Thighs on Seat



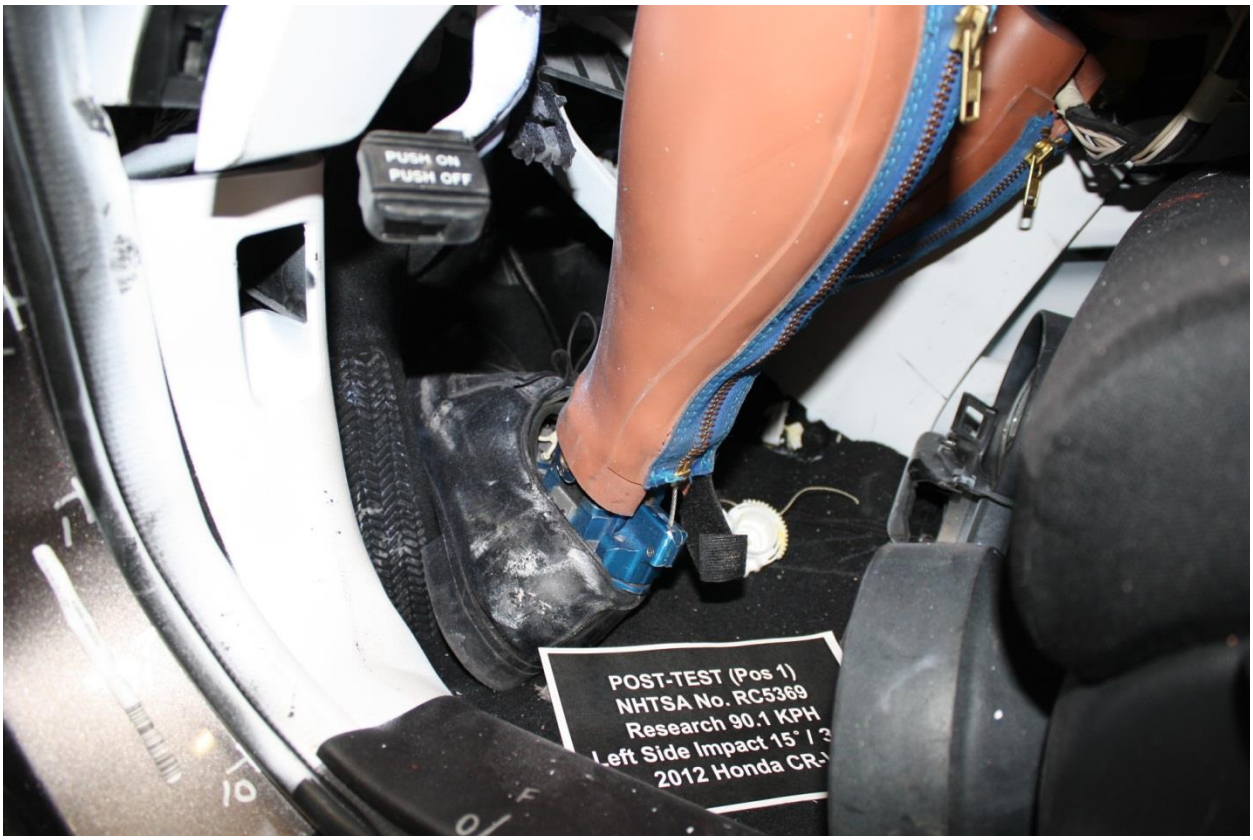
No. 067 Pre-Test Driver Adjustable D-Ring



No. 068 Post-Test Driver Adjustable D-Ring



No. 069 Pre-Test Driver Feet



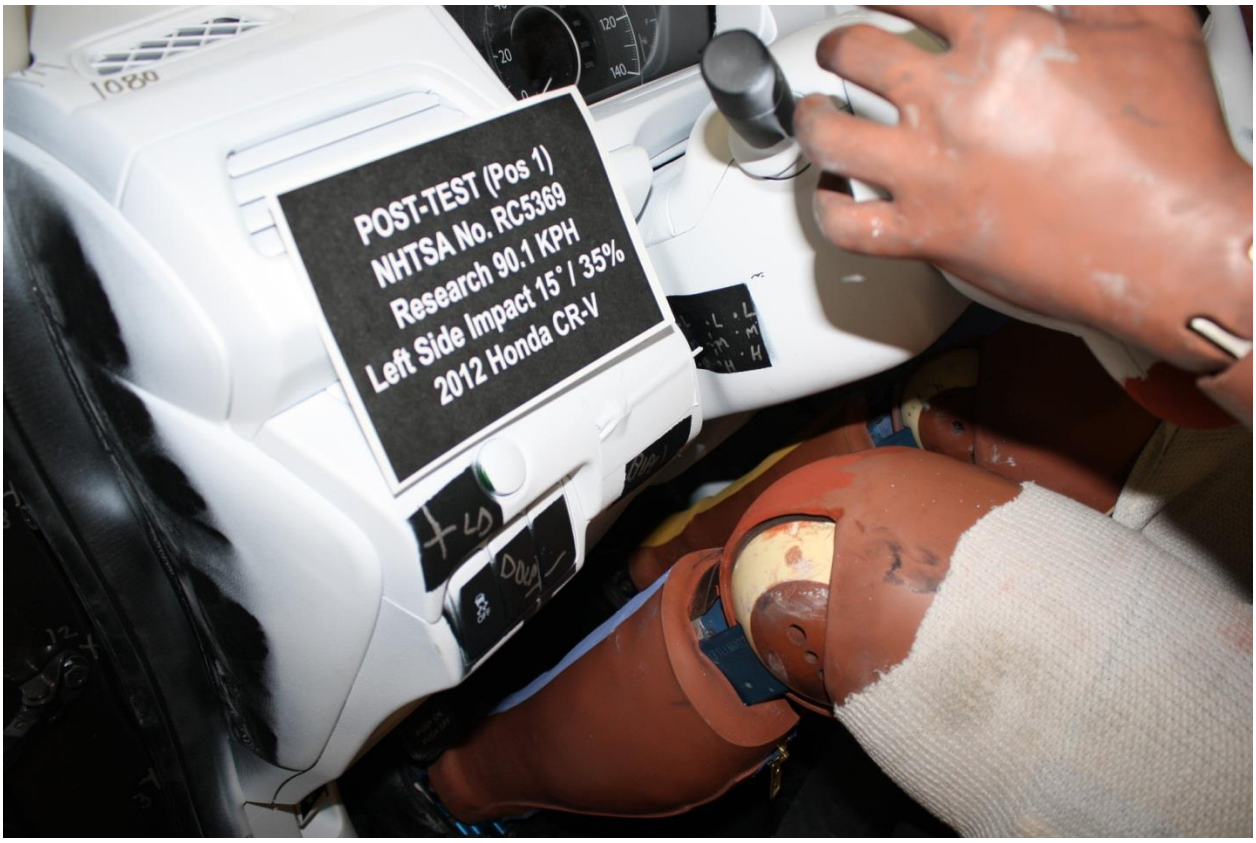
No. 070 Post-Test Driver Feet



No. 071 Pre-Test View of Driver Right Knee and Bolster

Photo Not Available

No. 072 Post-Test View of Driver Right Knee and Bolster



No. 073 Pre-Test View of Driver Left Knee and Bolster



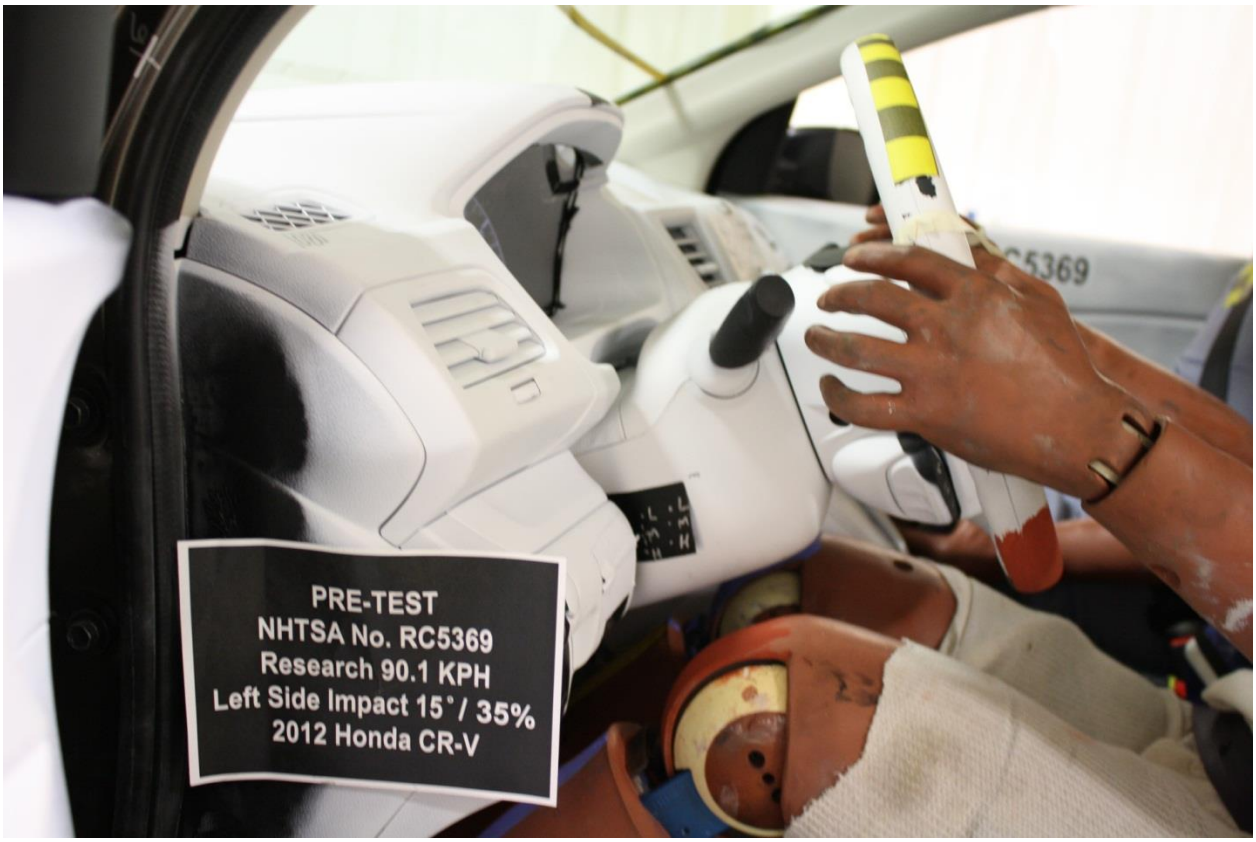
No. 074 Post-Test View of Driver Left Knee and Bolster



No. 075 Pre-Test View of Driver Abdomen



No. 076 Post-Test View of Driver Abdomen



No. 077 Pre-Test Left Side View of Steering Wheel set position



No. 078 Post-Test Left Side View of Steering Wheel set position



No. 079 Post-Test View of Driver Head Contact with Front Airbag



No. 080 Post-Test View of Driver Head Contact with Curtain Airbag

No. 081 Post-Test View of Driver Head Contact with Vehicle Interior – A

No. 081a Post-Test View of Driver Head Contact with Vehicle Interior - B

Photo Not Applicable

No. 081b Post-Test View of Driver Head Contact with Vehicle Interior - C



No. 082 Pre-Test Overall View of Passenger Knee Bolsters



No. 083 Post-Test Overall View of Passenger Knee Bolsters



No. 084 Pre-Test Left Side View of Passenger Knee Bolsters



No. 085 Post-Test Left Side View of Passenger Knee Bolsters



No. 086 Pre-Test Right Side View of Passenger Knee Bolsters



No. 087 Post-Test Right Side View of Passenger Knee Bolsters



No. 088 Pre-Test View of Passenger Floor pan at Left sill level, w/carpet



No. 089 Post-Test View of Passenger Floor pan at Left sill level, w/carpet



No. 090 Pre-Test View of Passenger Floor pan at Mid seat level, w/carpet



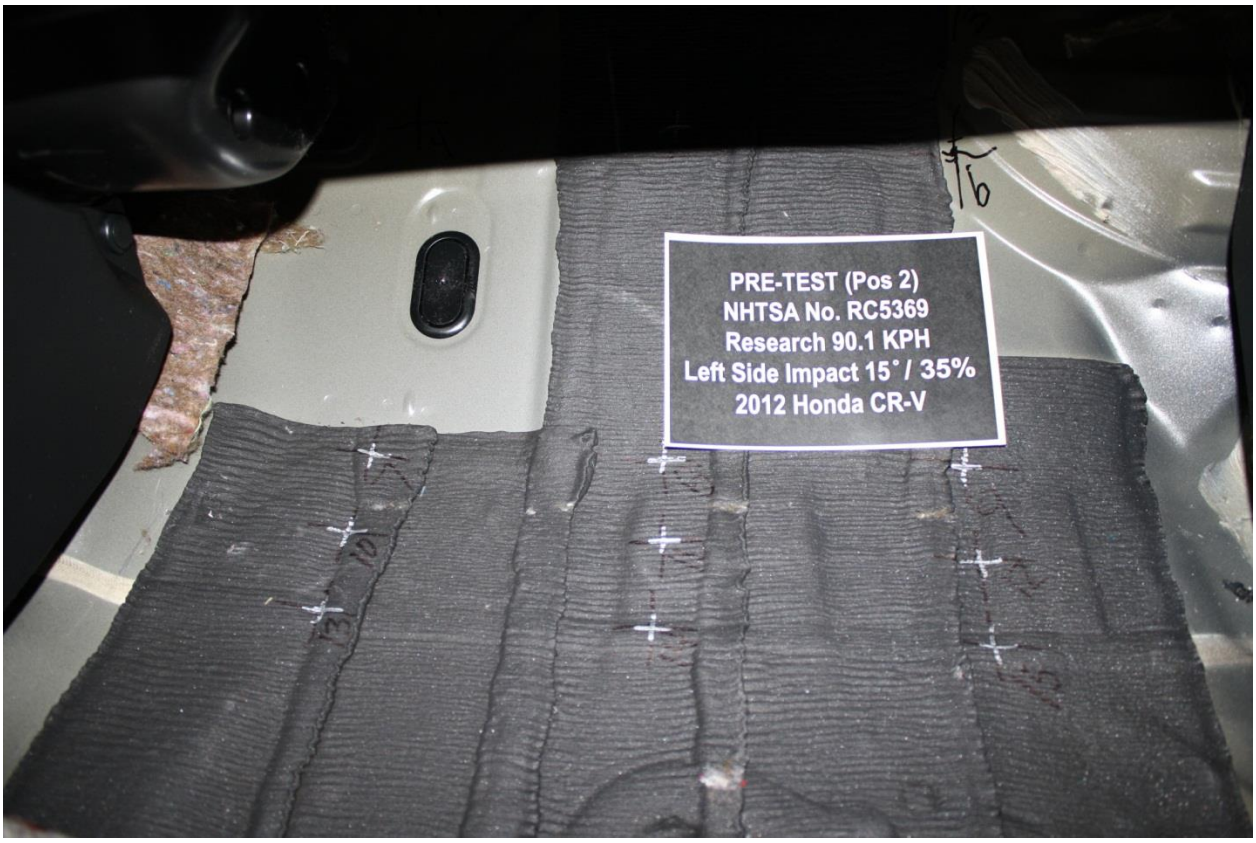
No. 091 Post-Test view of Passenger Floor pan at Mid seat level, w/carpet



No. 092 Pre-Test View of Passenger Floor pan at Left sill level, w/o carpet



No. 093 Post-Test View of Passenger Floor pan at Left sill level, w/o carpet



No. 094 Pre-Test View of Passenger Floor pan at Mid seat level, without carpet



No. 095 Post-Test view of Passenger Floor pan at Mid seat level, wo carpet



No. 096 Pre-Test Passenger Front Close-up View, Windshield



No. 097 Post-Test Passenger Front Close-up View, Windshield



No. 098 Pre-Test Left Side Passenger and Interior View



No. 099 Post-Test Left Side Passenger and Interior View



No. 100 Pre-Test Right Side Passenger Window View



No. 101 Post-Test Right Side Passenger Window View



No. 102 Pre-Test Right Side Passenger and Interior View



No. 103 Post-Test Right Side Passenger and Interior View



No. 104 Pre-Test View of Passenger Door Clearance



No. 105 Post-Test View of Passenger Door Clearance



No. 106 Pre-Test Passenger Seat Fore-Aft Markings



No. 107 Post-Test Passenger Seat Fore-Aft Markings



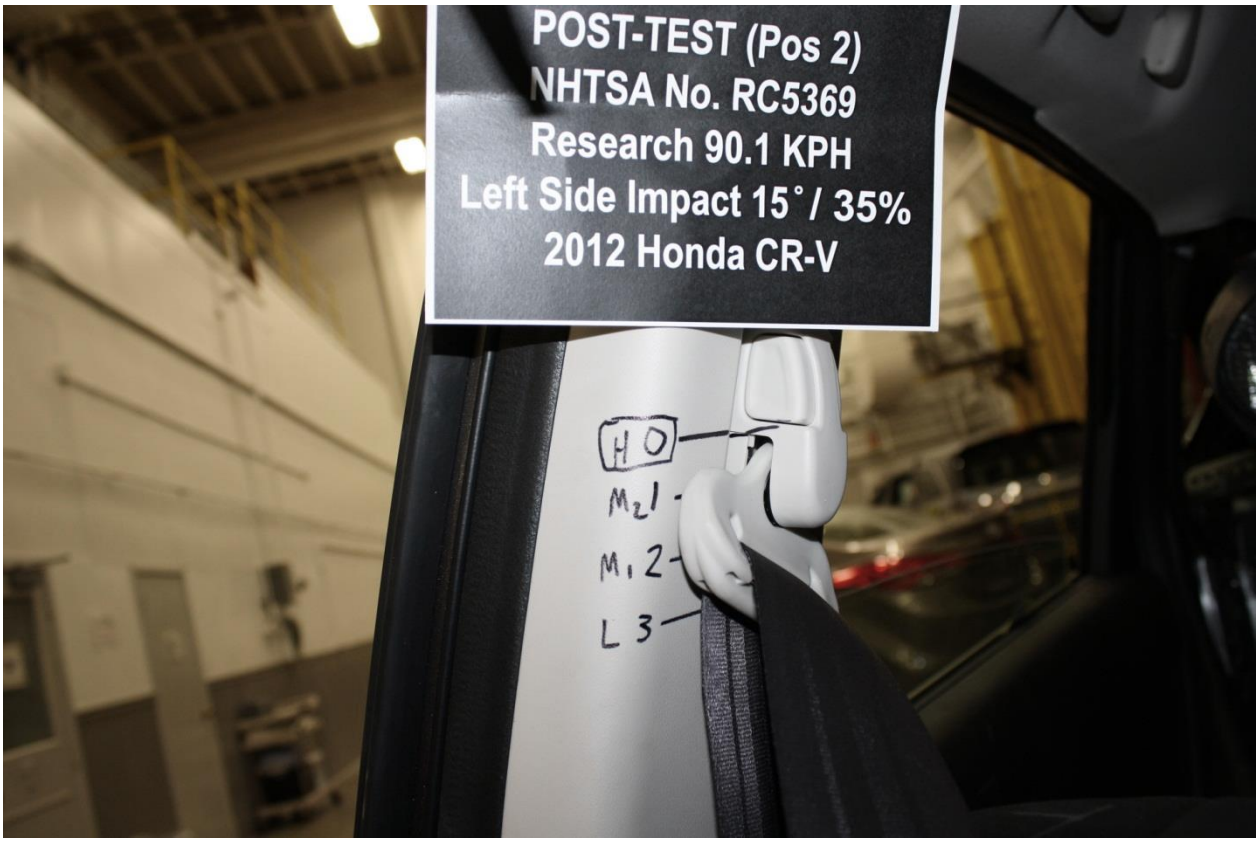
No. 108 Pre-Test Passenger Seat Back Markings



No. 109 Pre-Test Overhead View of Passenger Thighs on seat



No. 110 Pre-Test Passenger Adjustable D-ring



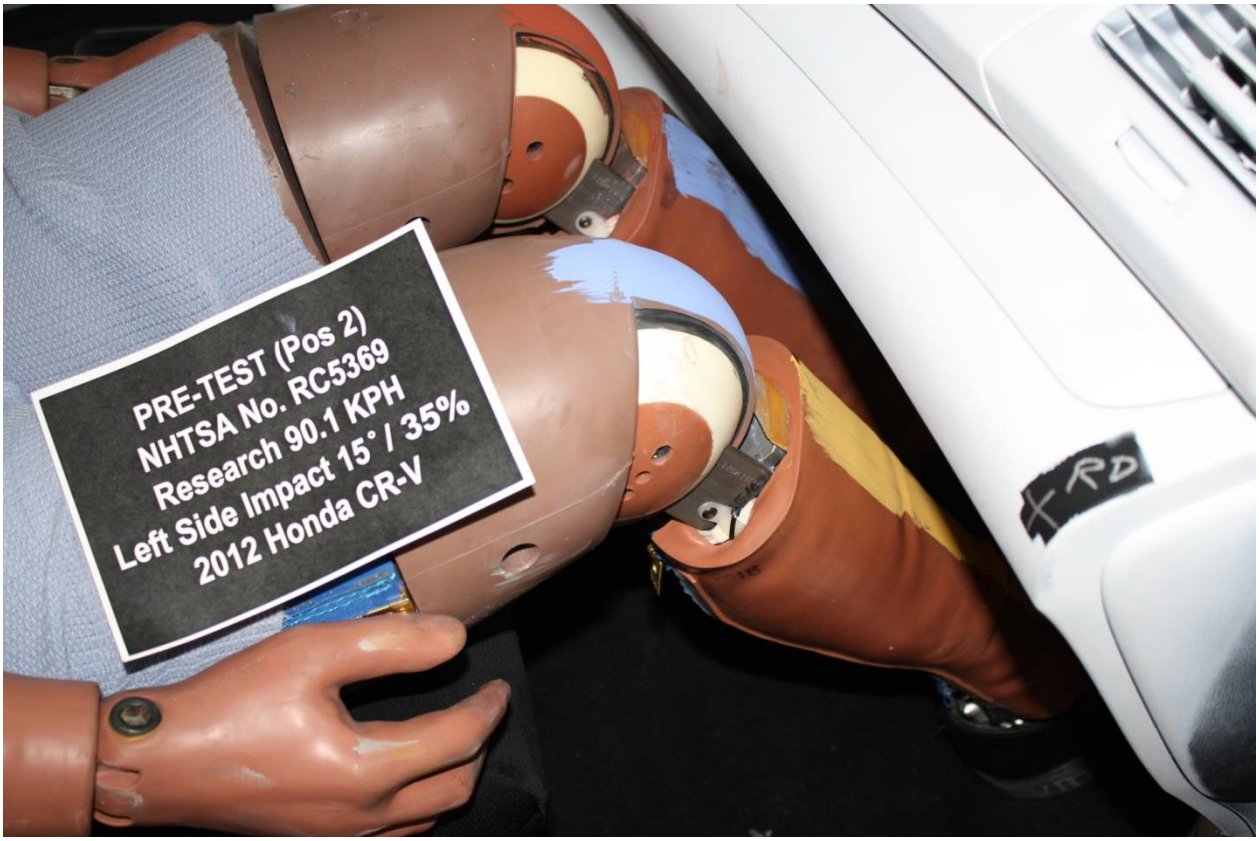
No. 111 Post-Test Passenger Adjustable D-ring



No. 112 Pre-Test View of Passenger Feet



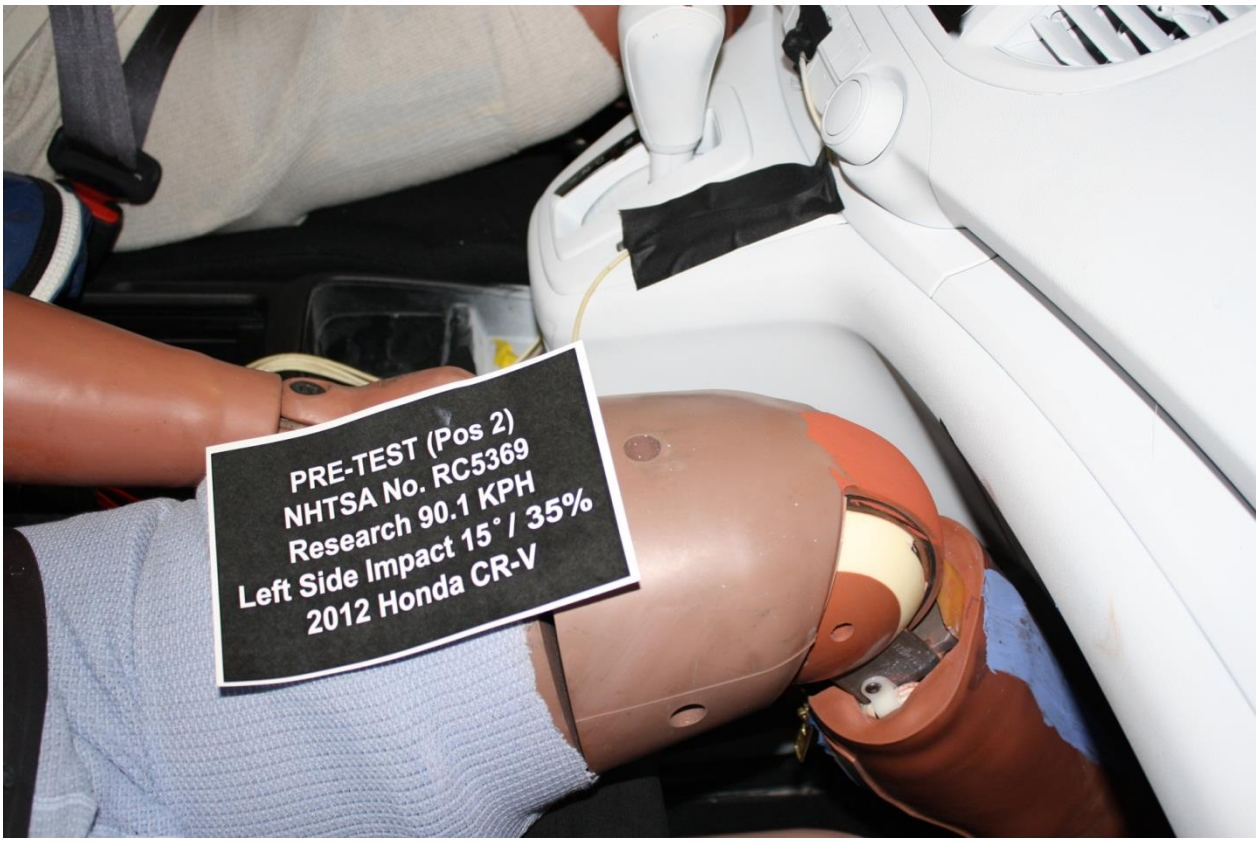
No. 113 Post-Test View of Passenger Feet



No. 114 Pre-Test View of Passenger Right Knee and Bolster



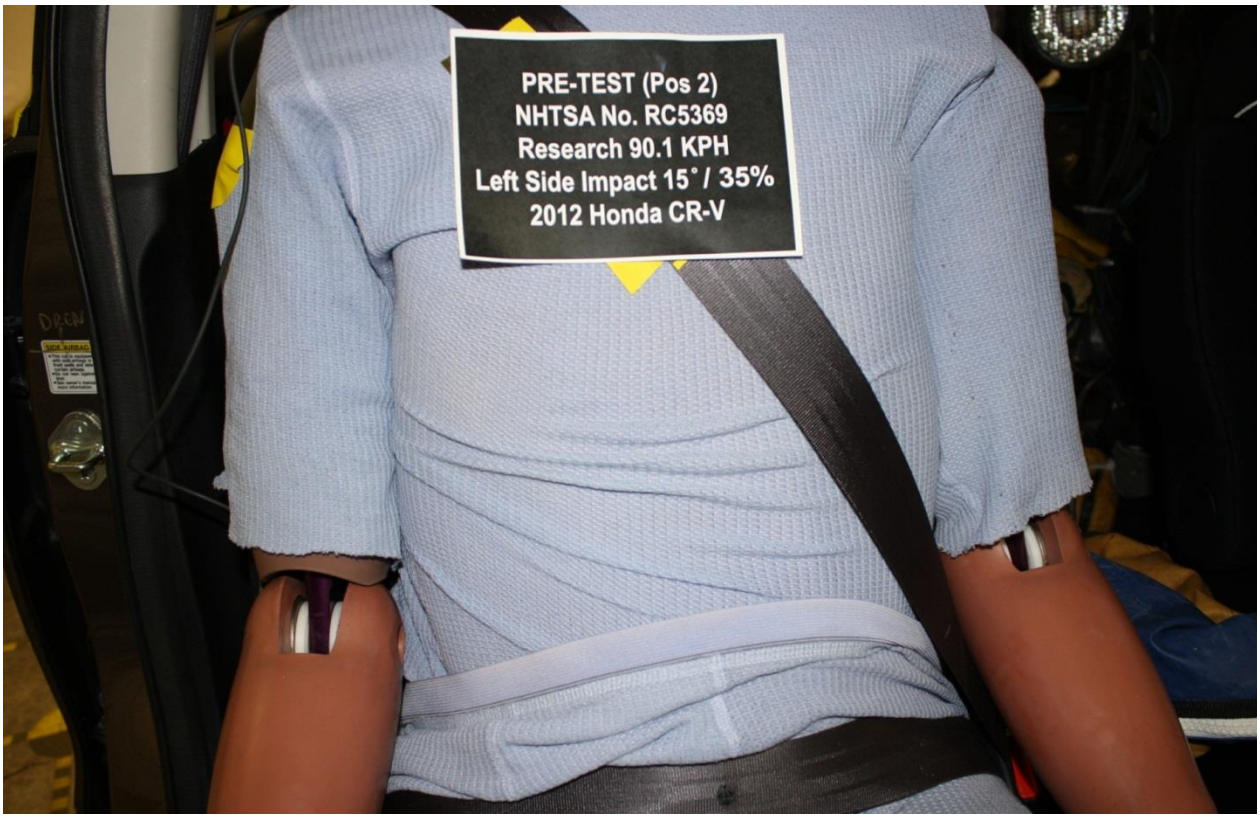
No. 115 Post-Test View of Passenger Right Knee and Bolster



No. 116 Pre-Test View of Passenger Left Knee and Bolster



No. 117 Post-Test View of Passenger Left Knee and Bolster



No. 118 Pre-Test View of Passenger Abdomen



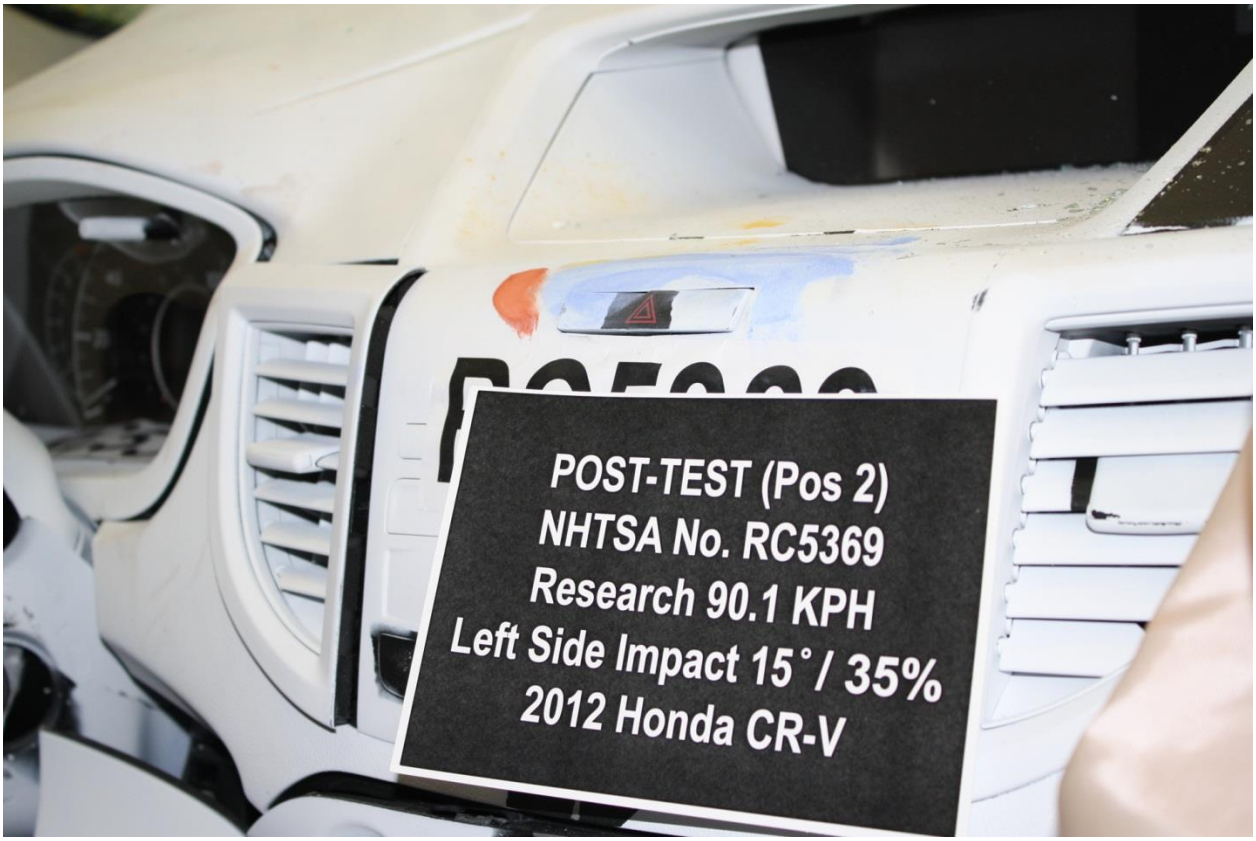
No. 119 Post-Test View of Passenger Abdomen



No. 120 Post-Test View of Passenger Head contact with Airbag – Front

Photo Not Applicable

No. 120a Post-Test View of Passenger Head contact with Airbag - Curtain



No. 121 Post-Test View of Passenger Head contact with Interior



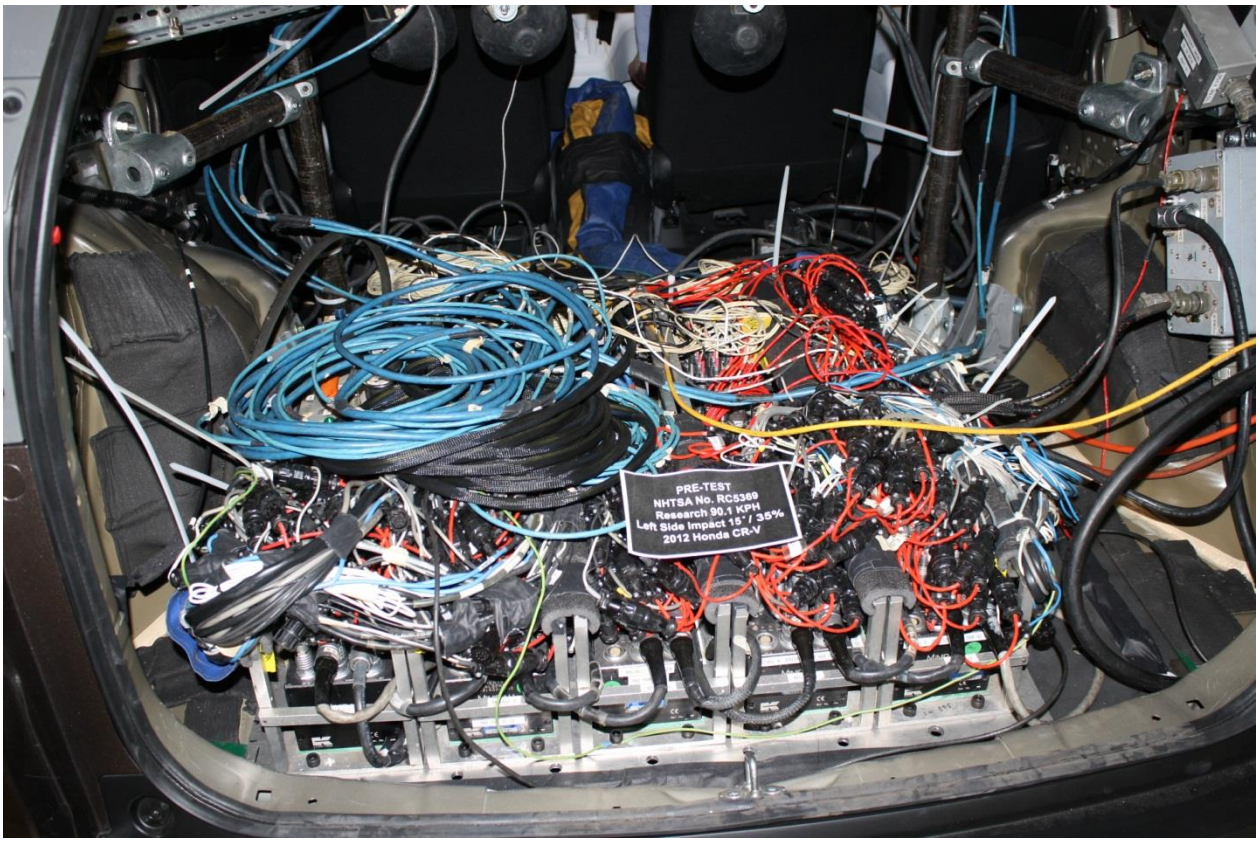
No. 121a Post-Test View of Passenger Head contact with Interior

Photo Not Applicable

No. 121b Post-Test View of Passenger Head contact with Interior



No. 122 Post-Test Passenger Contact With Glovebox



No. 123 Pre-Test Ballast Locations



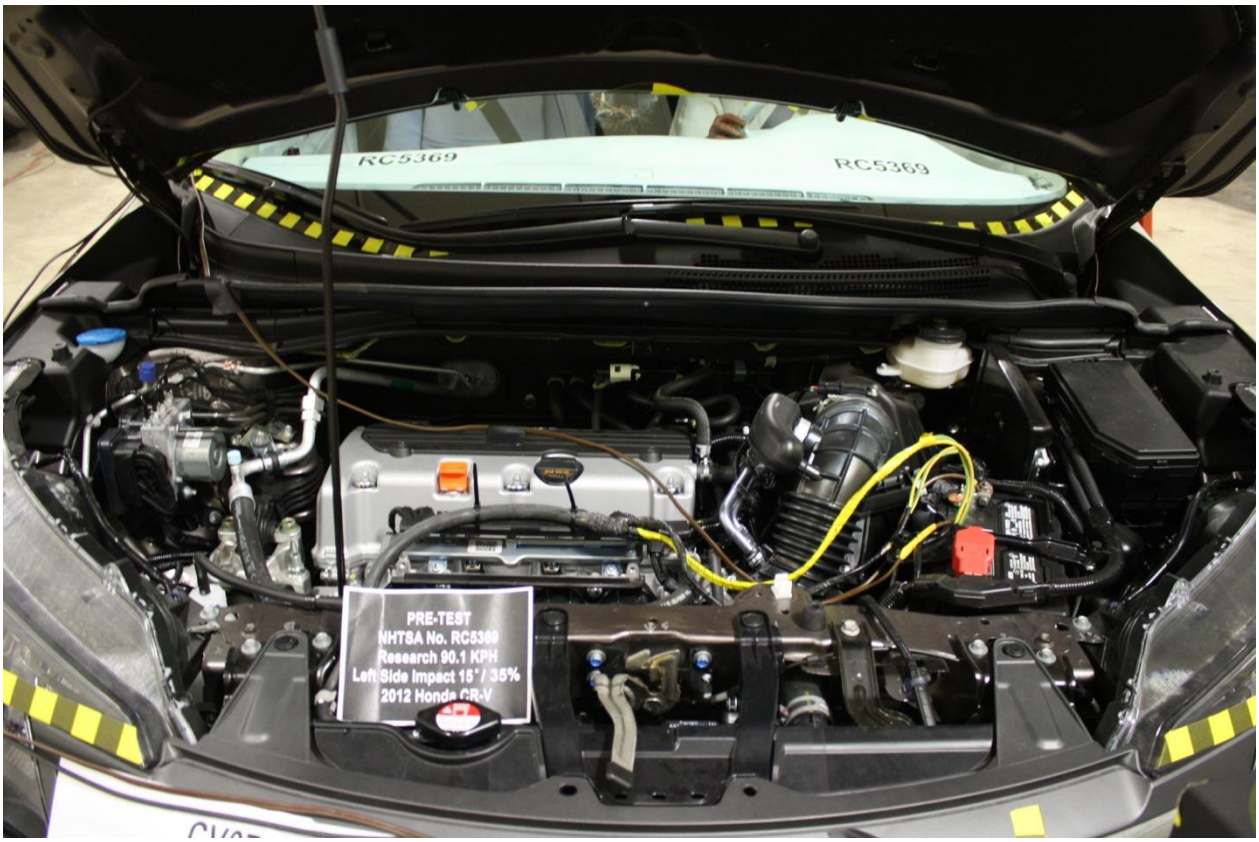
No. 124 Post-Test Speed Trap Readout



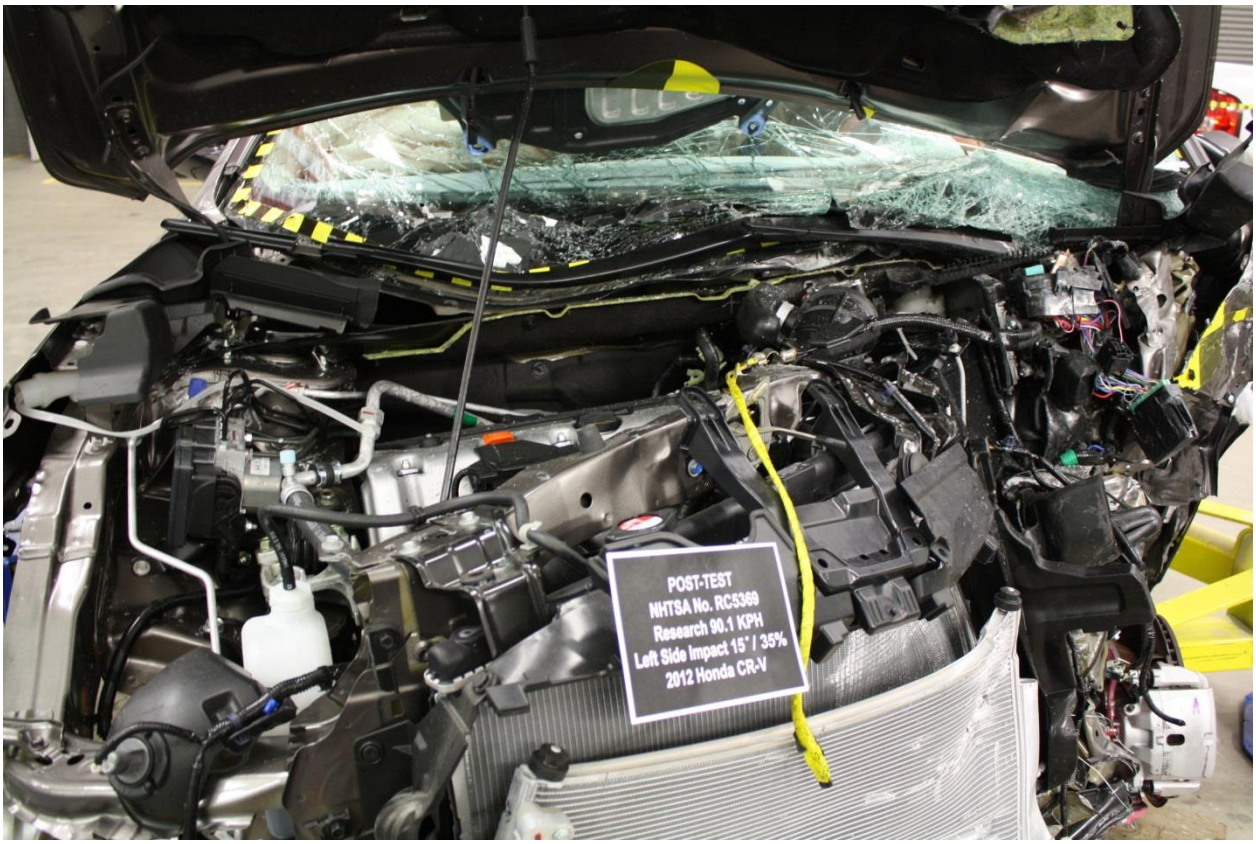
No. 125 Pre-Test View of Fuel Filler Cap



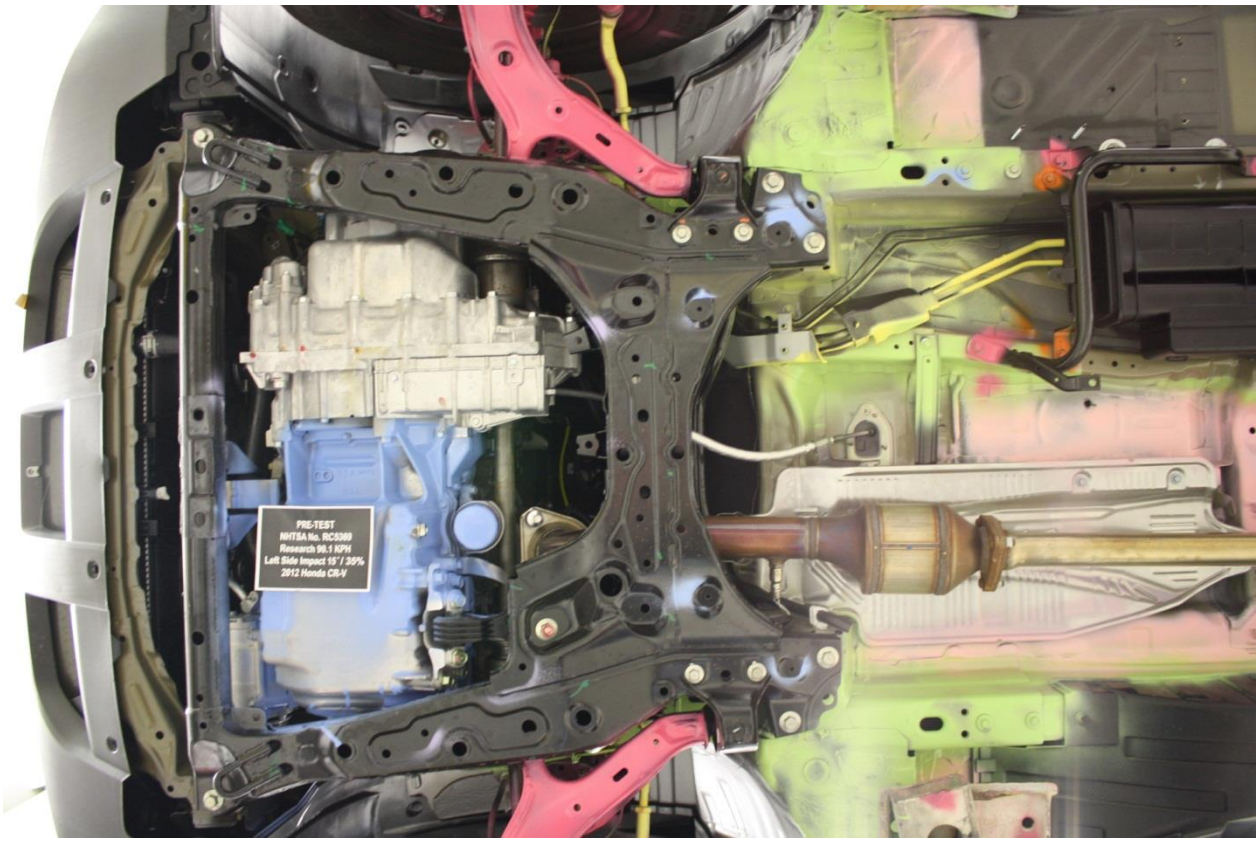
No. 126 Post-Test View of Fuel Filler Cap



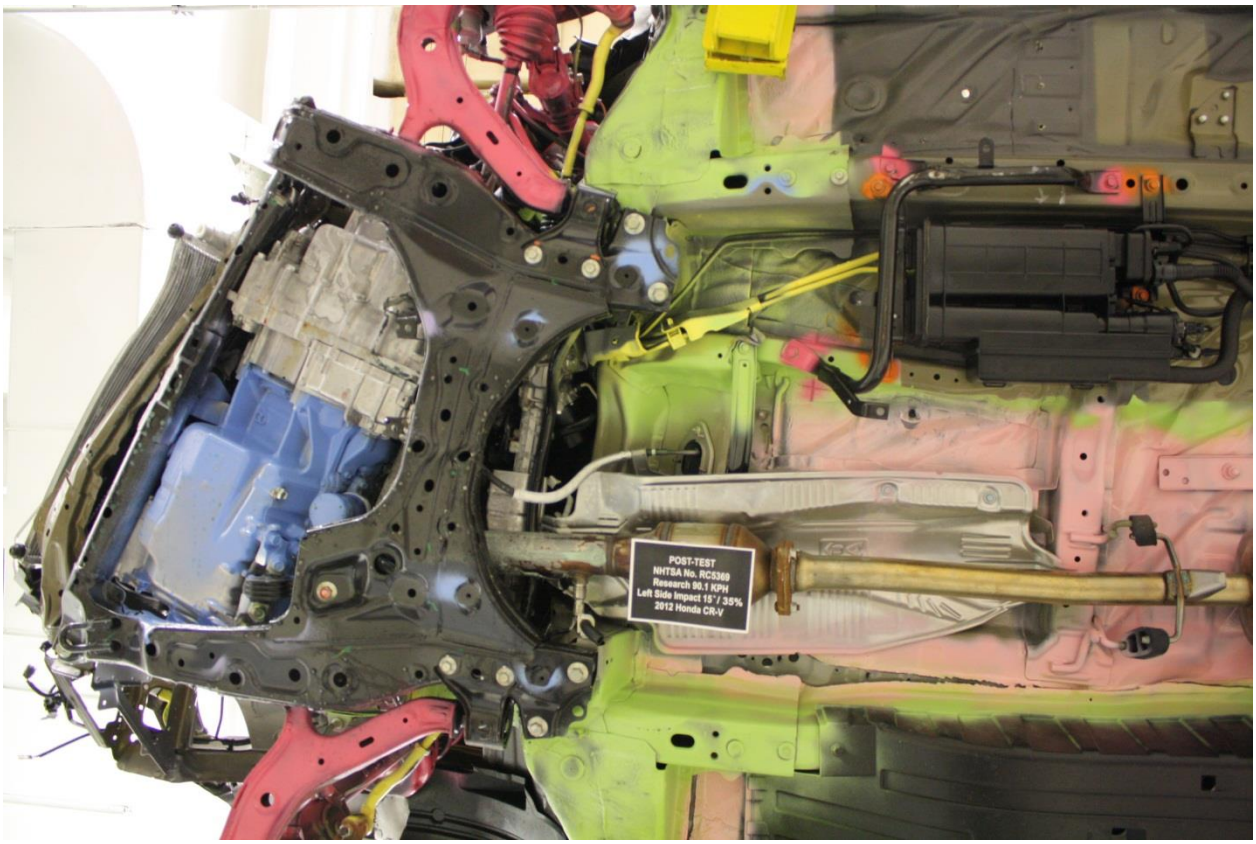
No. 127 Pre-Test Engine Compartment View



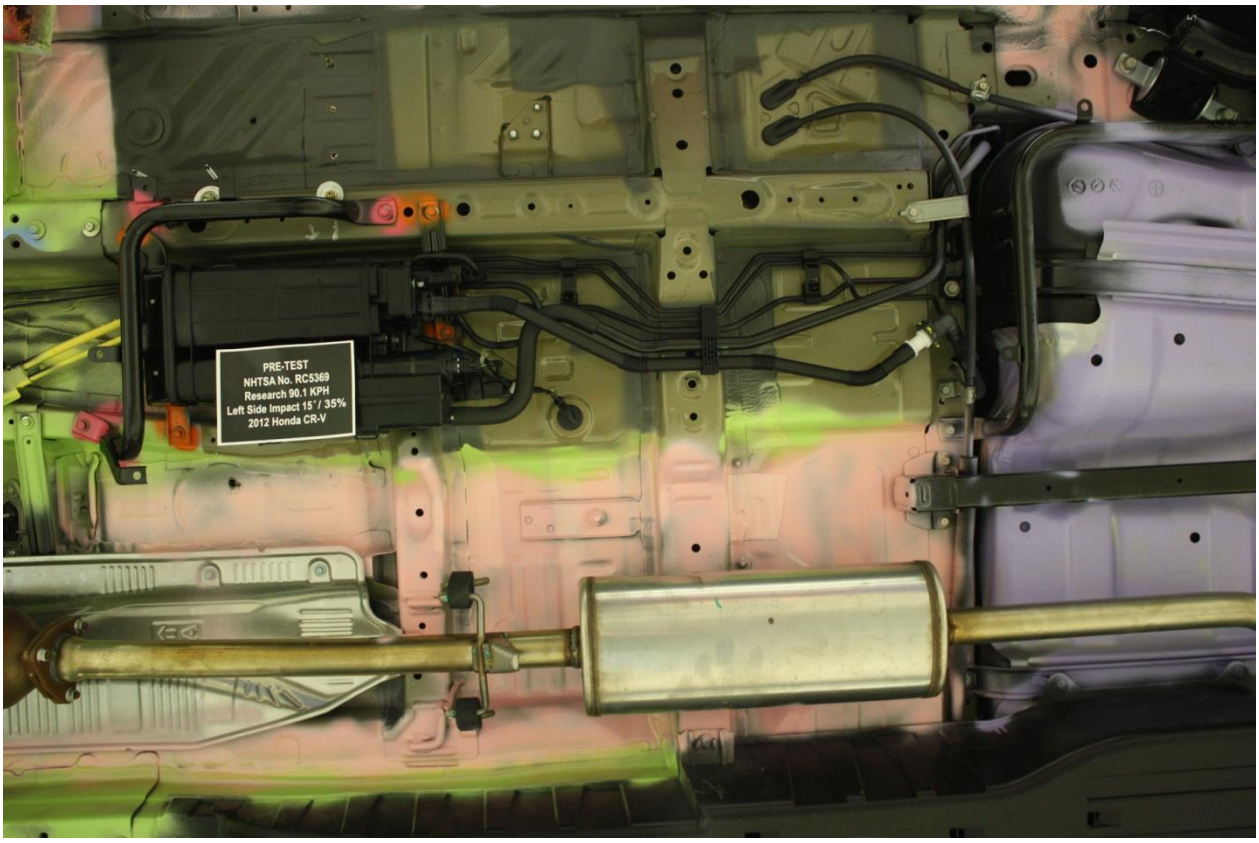
No. 128 Post-Test Engine Compartment View



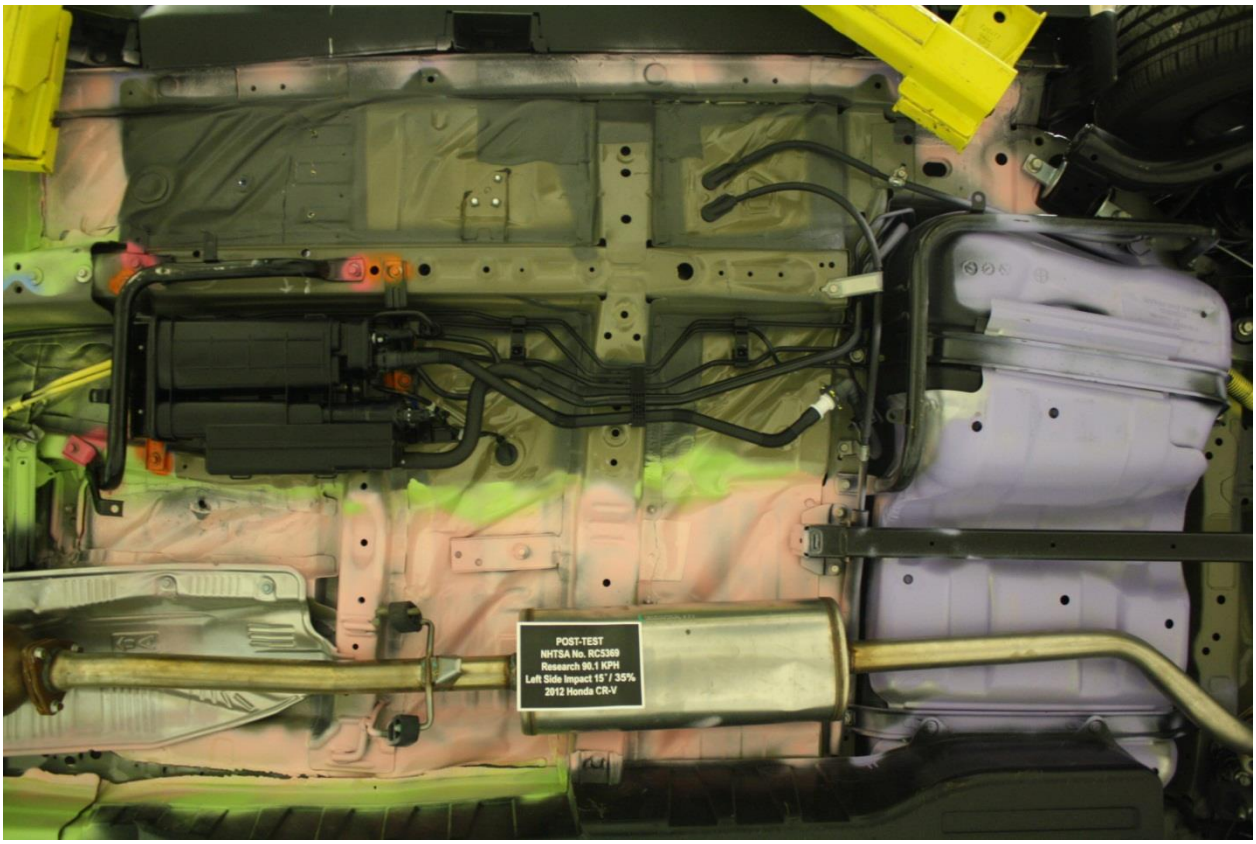
No. 129 Pre-Test View of Front Underbody (perpendicular to vehicle)



No. 130 Post-Test View of Front Underbody (perpendicular to vehicle)



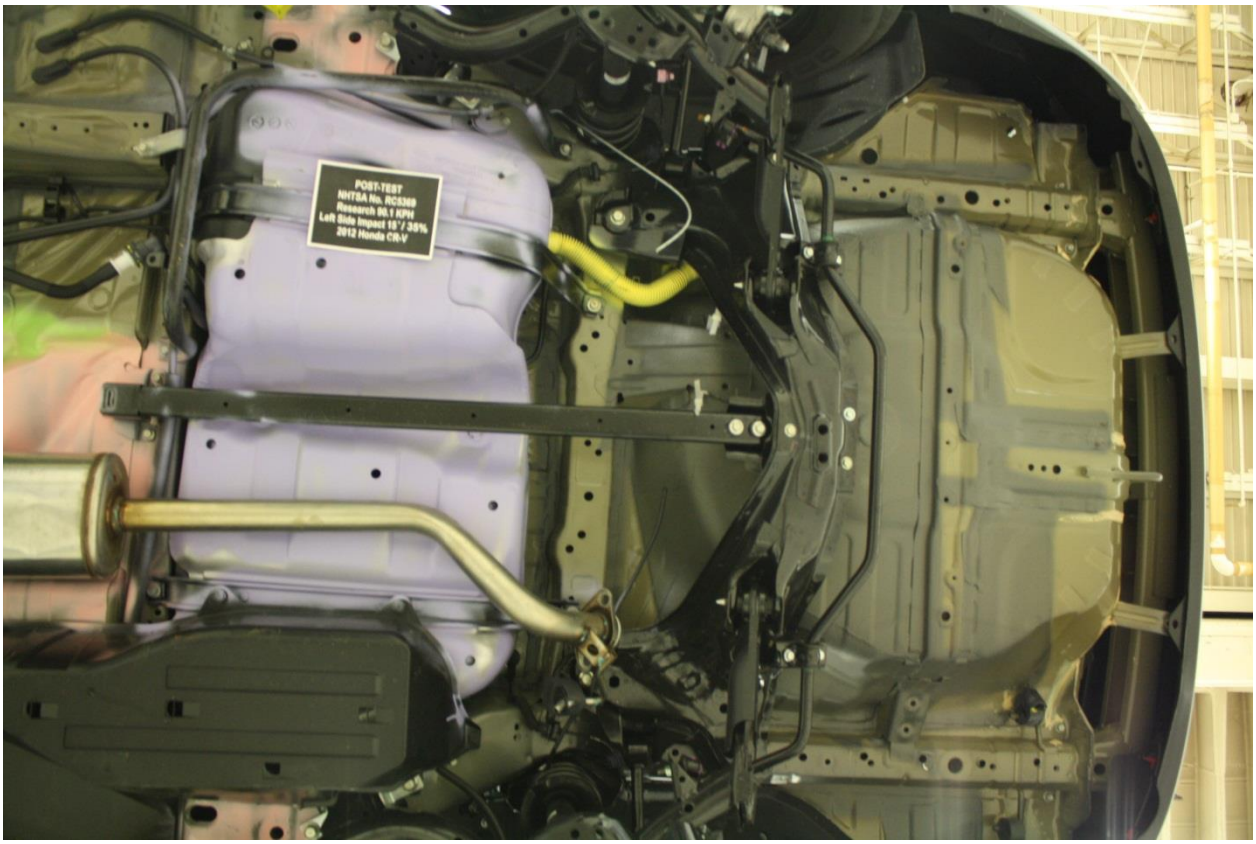
No. 131 Pre-Test View of Mid Underbody (perpendicular to vehicle)



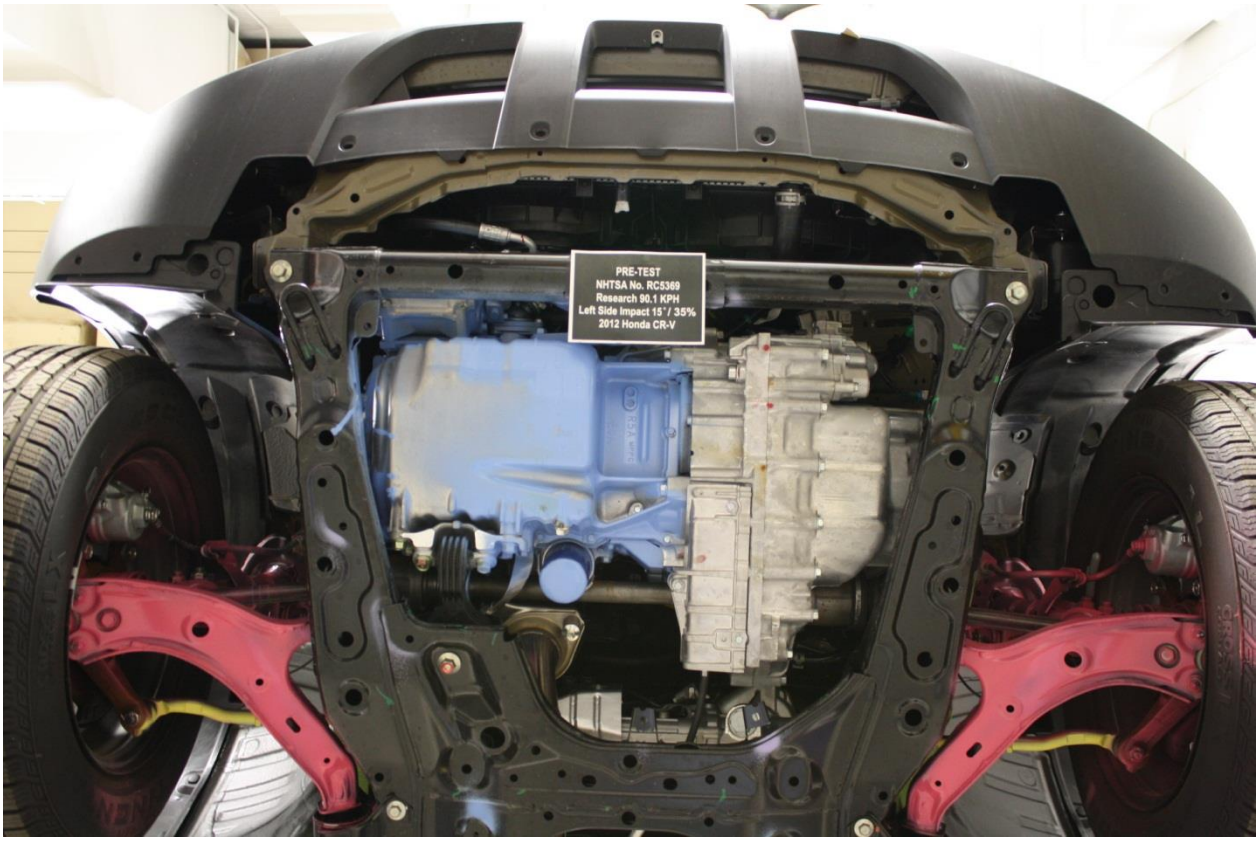
No. 132 Post-Test View of Mid Underbody (perpendicular to vehicle)



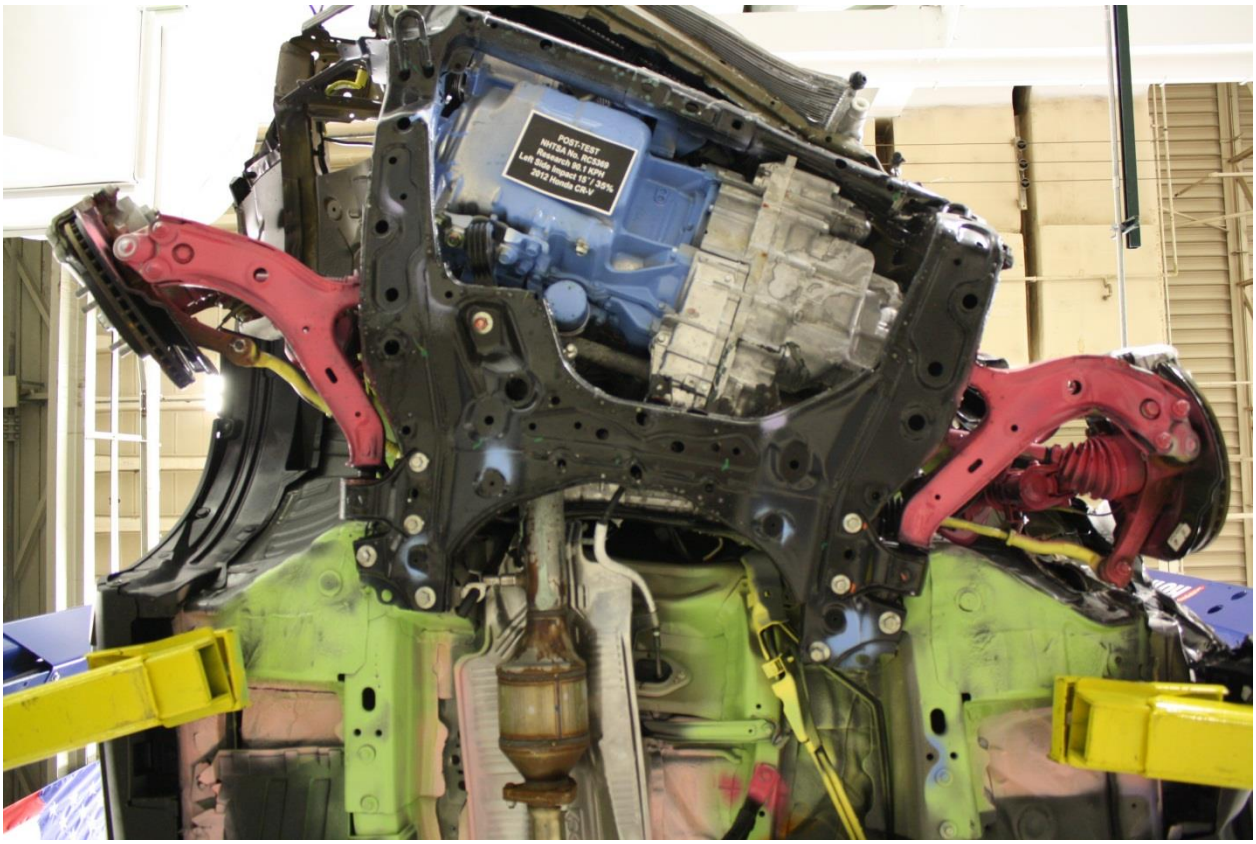
No. 133 Pre-Test View of Rear Underbody (perpendicular to vehicle)



No. 134 Post-Test View of Rear Underbody (perpendicular to vehicle)



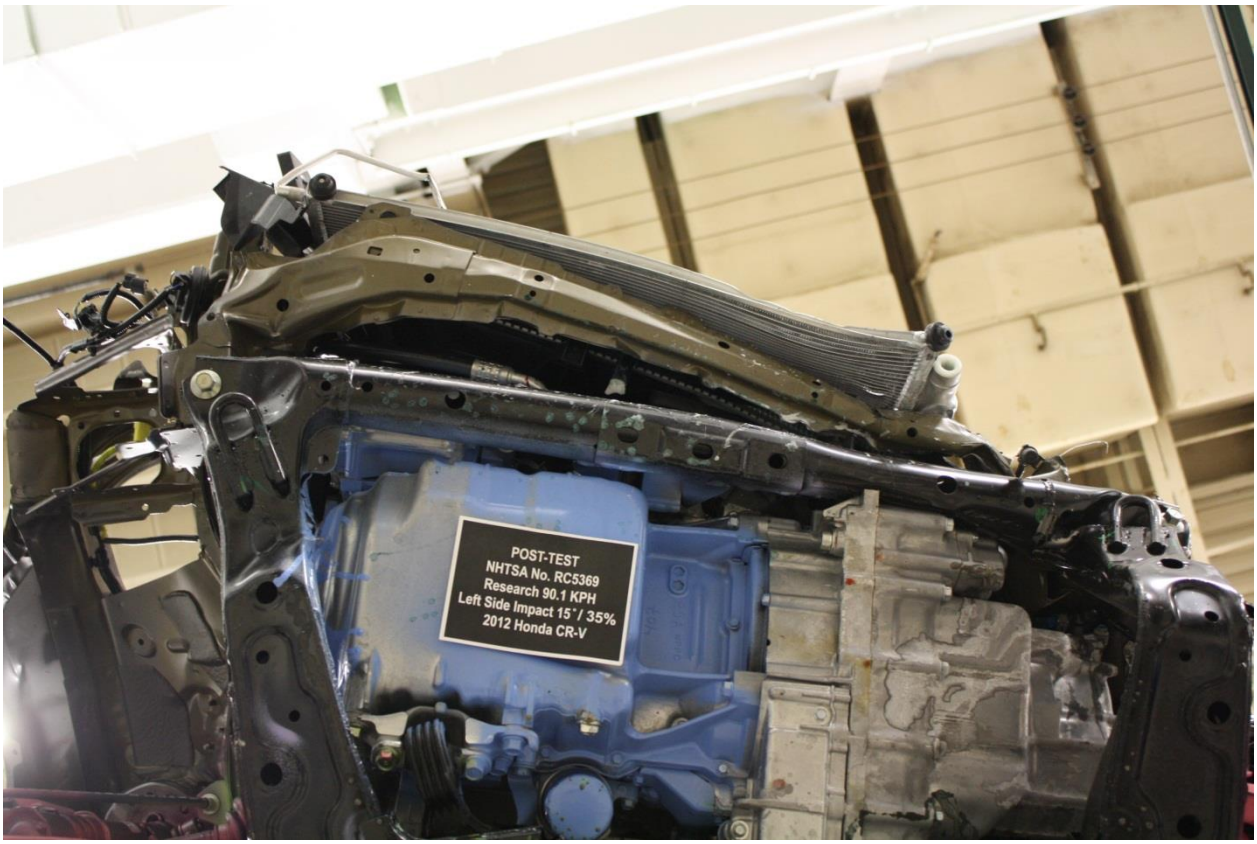
No. 135 Pre-Test View of Steering rack and or sway bar



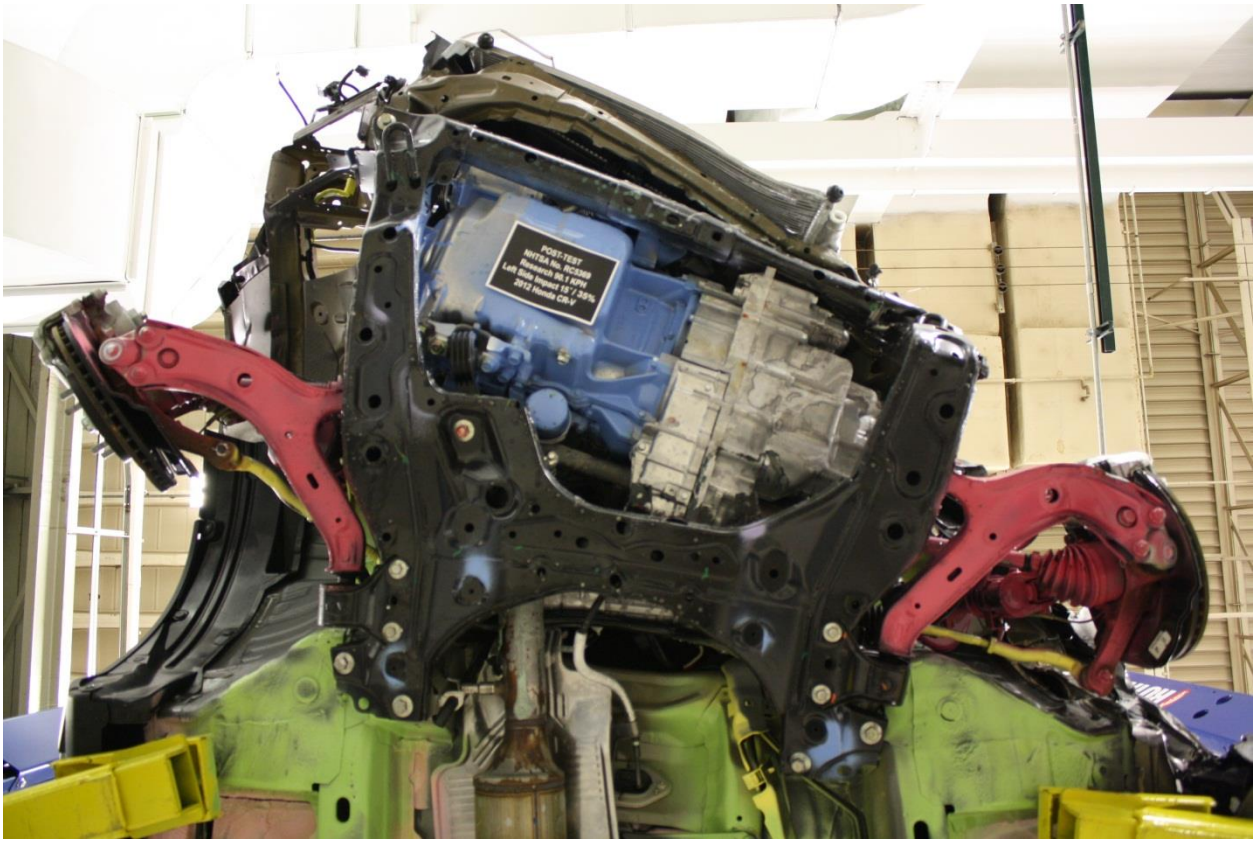
No. 136 Post-Test View of Steering rack and or sway bar



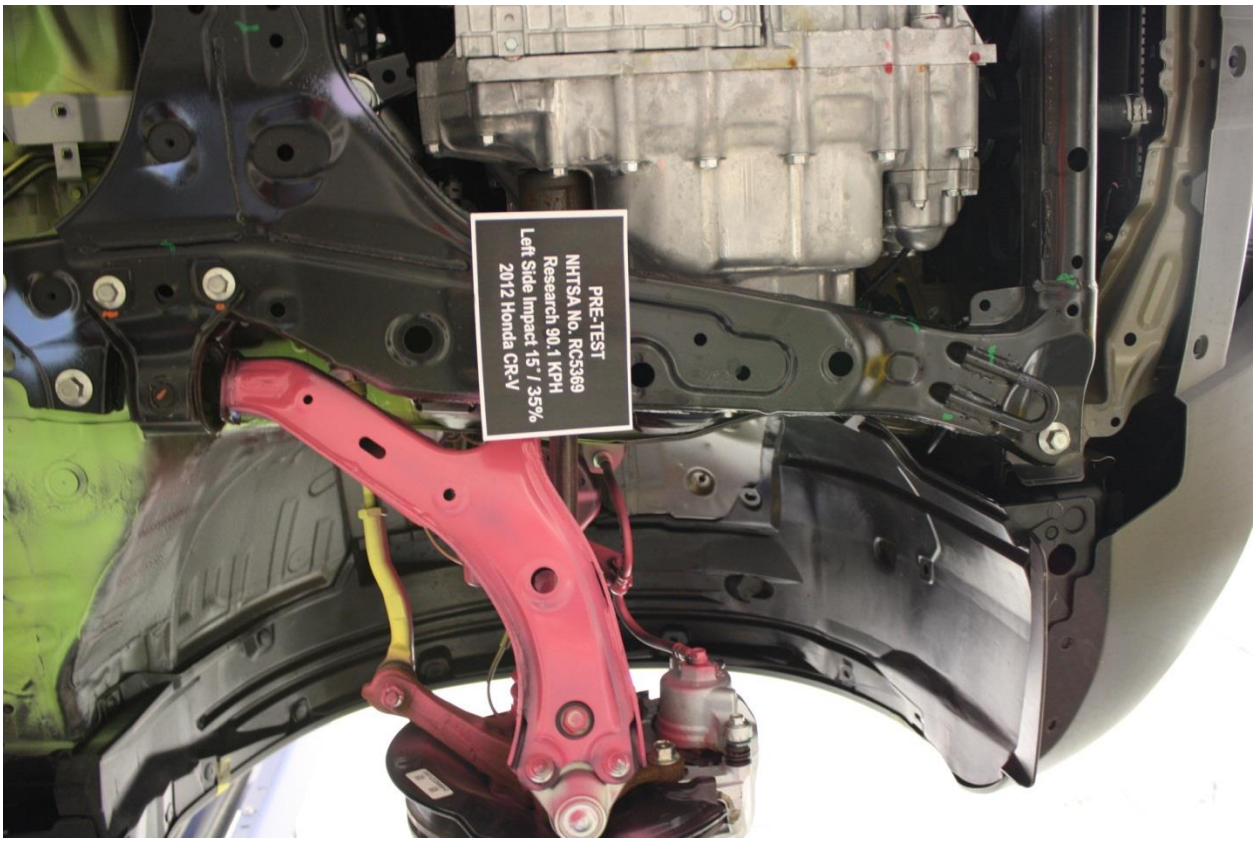
No. 137 Pre-Test Bumper to Rail Attachments and Crush Initiators



No. 138 Post-Test Bumper to Rail Attachments and Crush Initiators



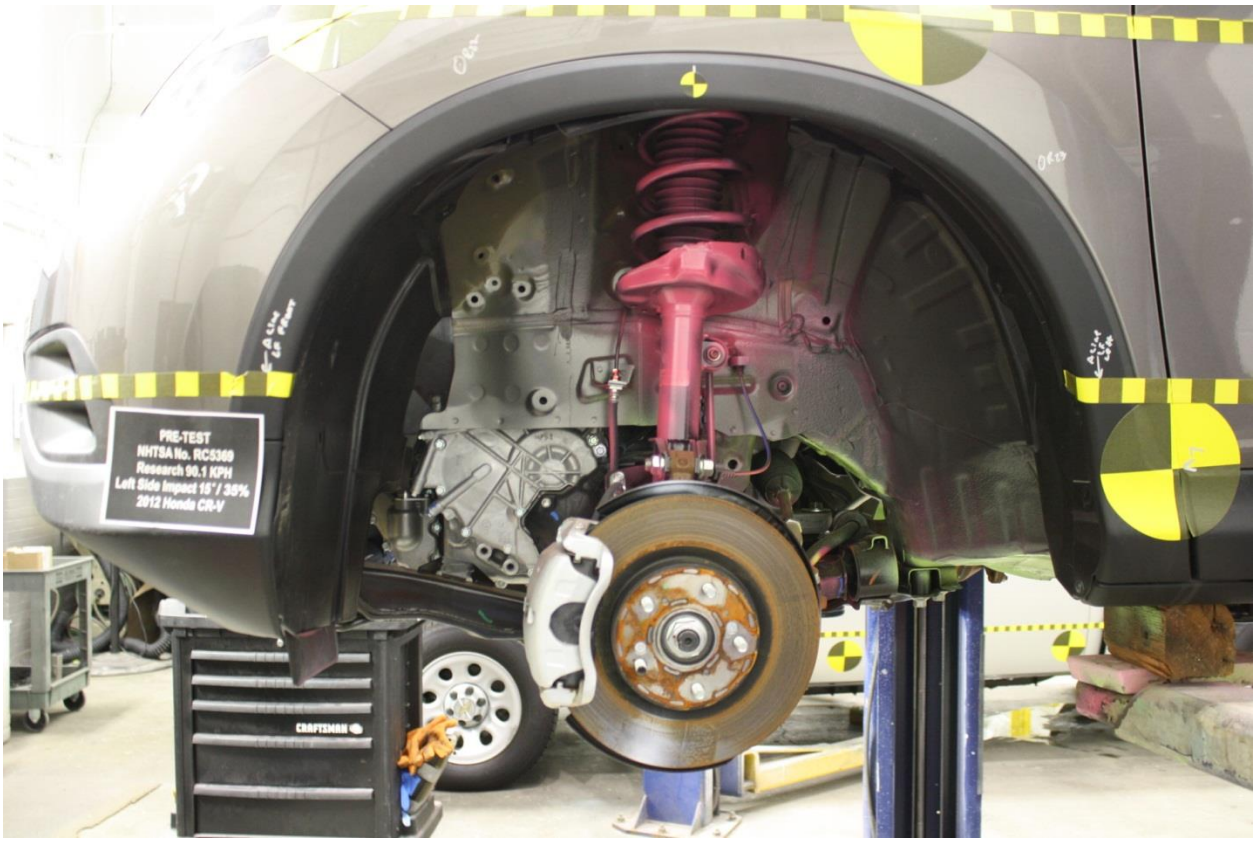
No. 139 Post-Test View of Front Sub-Frame Deformation



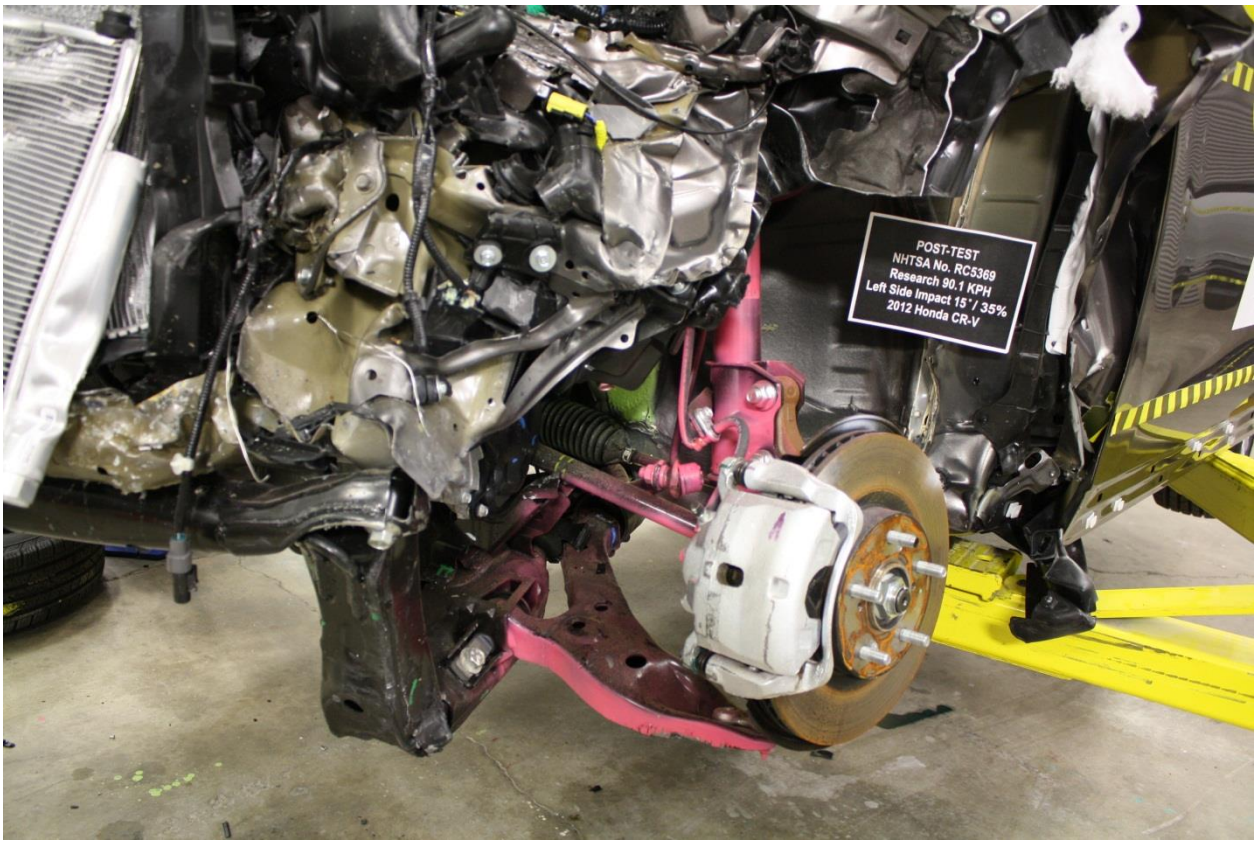
No. 140 Pre-Test Frame Rail with tire removed



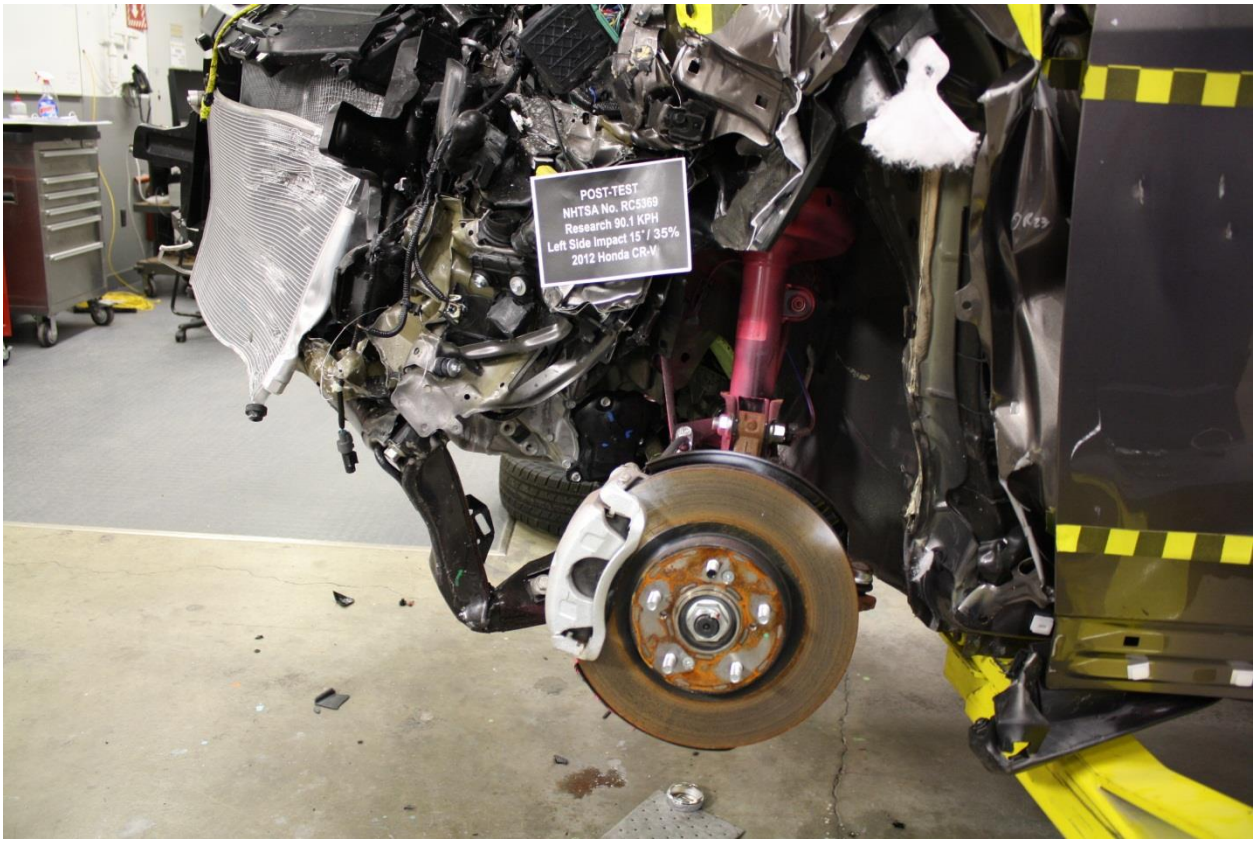
No. 141 Post-Test Frame Rail with tire removed



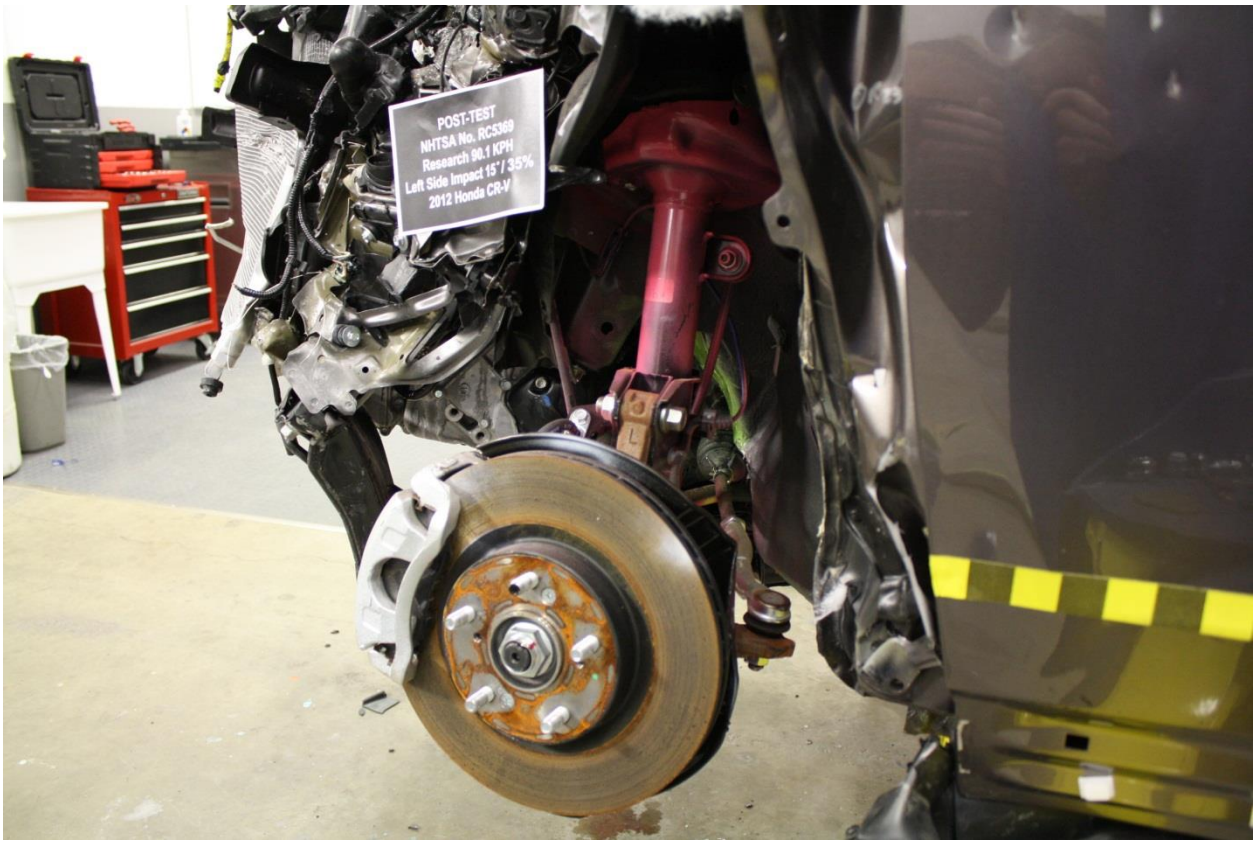
No. 142 Pre-Test View of Front Driver Wheel Well w/ Tire Removed



No. 143 Post-Test ¾ View of Front Driver Wheel Well w/ Tire Removed



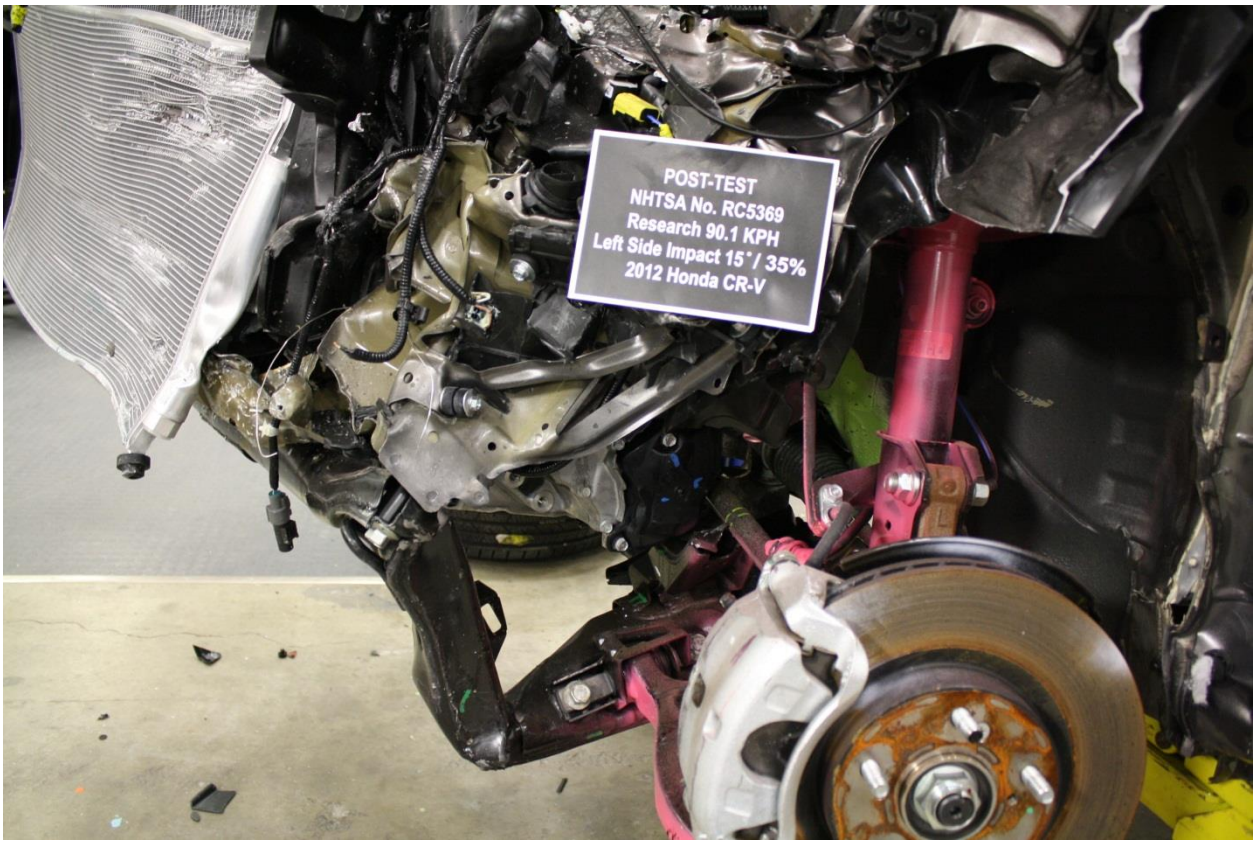
No. 144 Post-Test Side View of Front Driver Wheel Well w/ Tire Removed



No. 145 Post-Test Right Side 3/4 Rear View of the Front Driver Wheel Well w/ Tire Removed



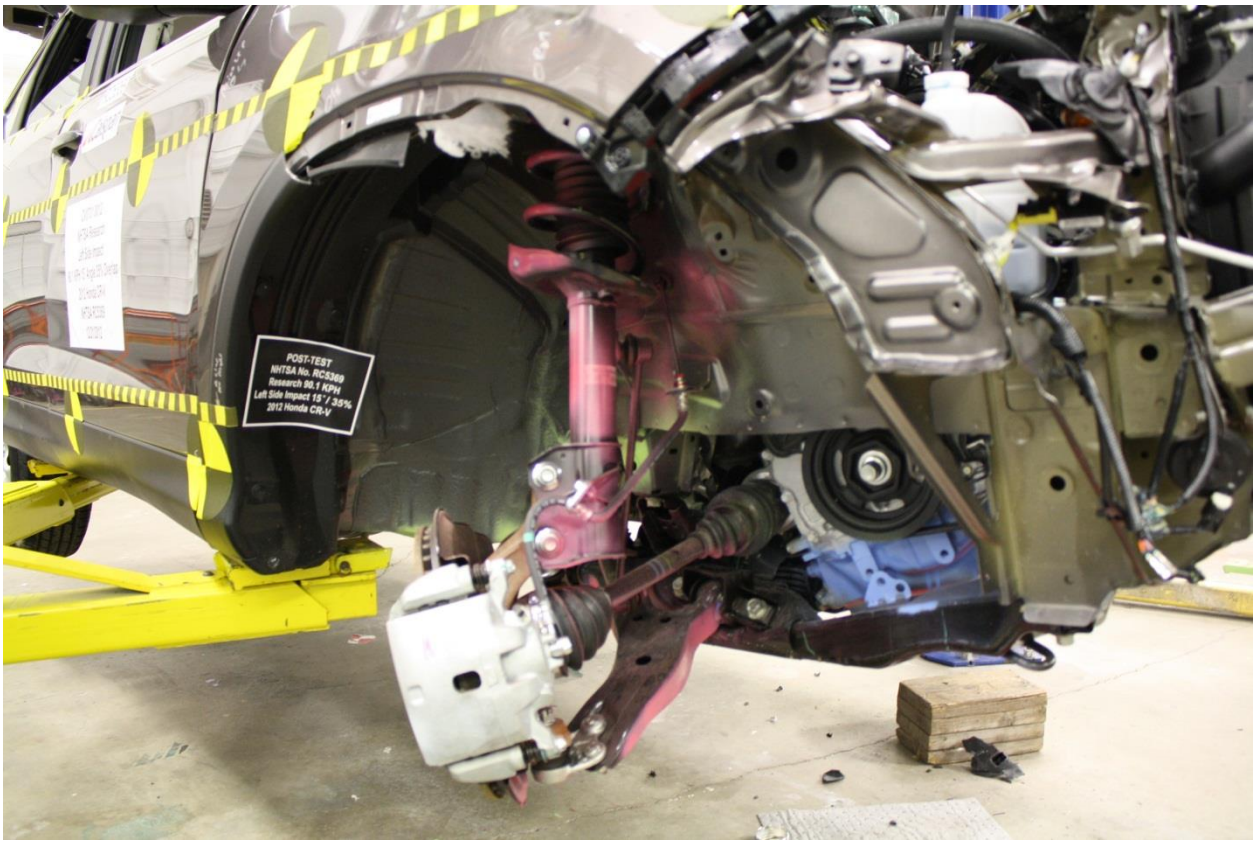
No. 146 Post-Test Looking Down at the Front Driver Shotgun



No. 147 Post-Test Right Side ¾ View of Front Driver Shotgun



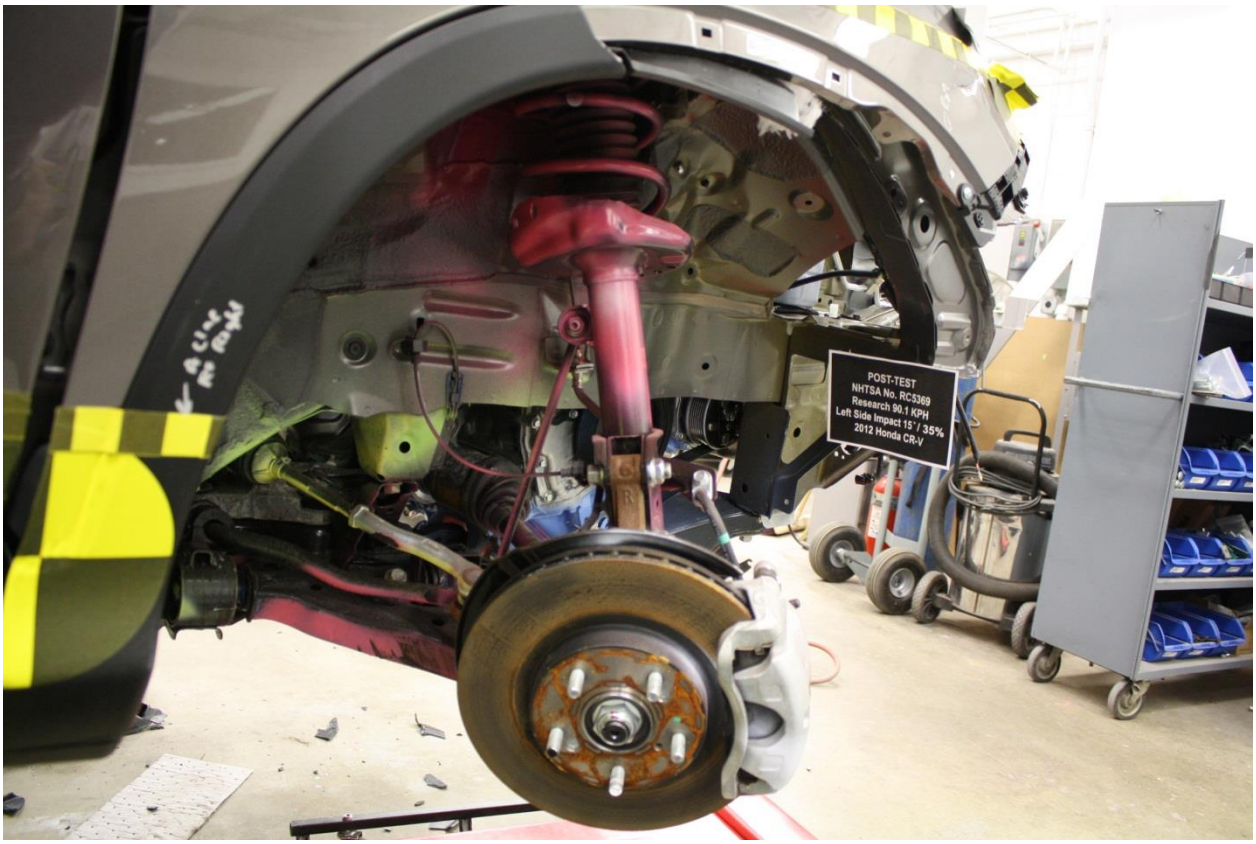
No. 148 Post-Test Front Driver Close up View of Suspension w/ Tire Removed



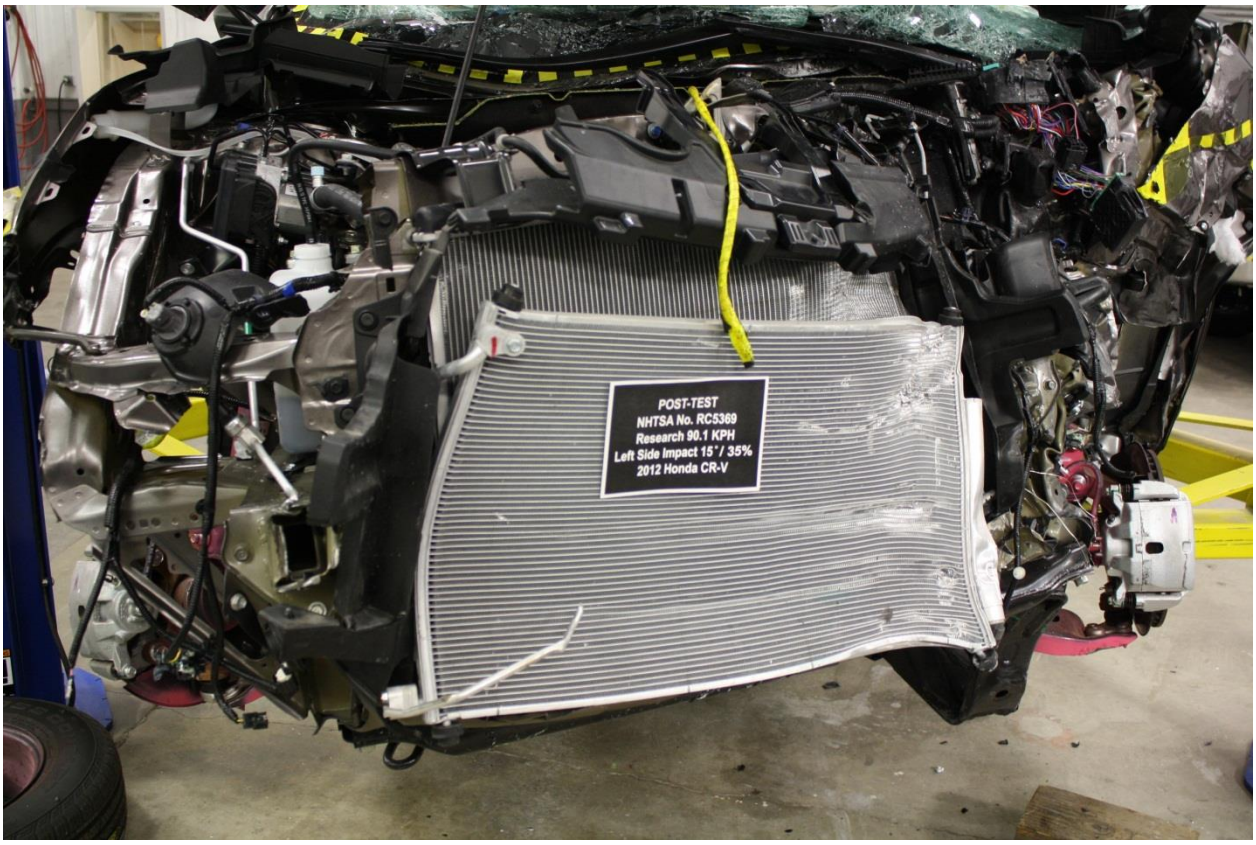
No. 149 Post-Test ¾ View of Front Passenger Wheel Well w/ Tire Removed



No. 150 Post-Test Side View of Front Passenger Wheel Well w/ Tire Removed



No. 151 Post-Test Right Side 3/4 Rear View of the Front Passenger Wheel Well w/ Tire Removed



No. 152 Post-Test Looking Down at the Front Passenger Shotgun



No. 153 Post-Test Right Side ¾ View of Front Passenger Shotgun



No. 154 Post-Test Front Passenger Close up View of Suspension w/ Tire Removed



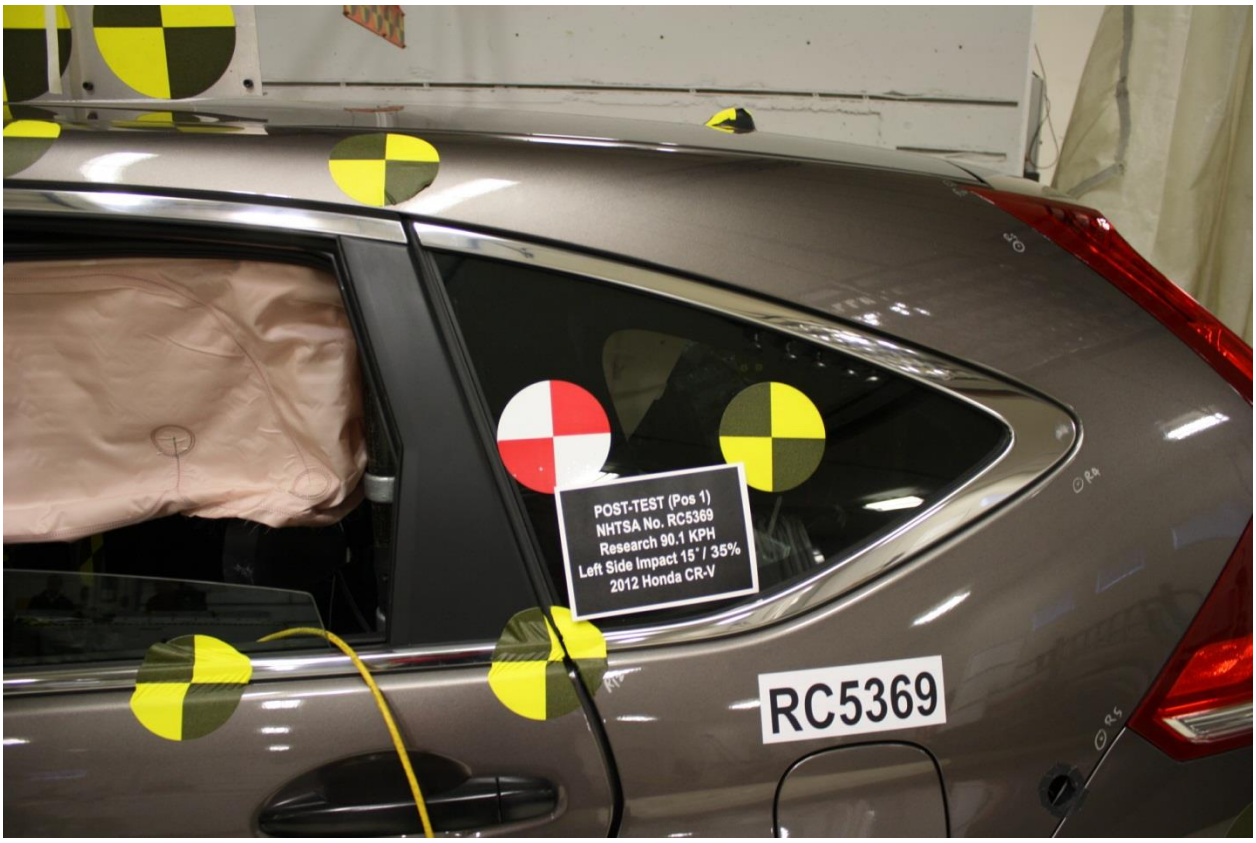
No. 155 Post-Test View of Door Sill with Door Open- Struck Side



No. 156 Post-Test View of Deformation of A pillar-Struck Side



No. 157 Post-Test View of Deformation of B pillar-Struck Side



No. 158 Post-Test View of Deformation of C pillar-Struck Side



No. 159 Post-Test View of Wheel and/or Tire Deformation-Struck Side



No. 160 Post-Test View of Deformation of Rocker or Post-Struck Side



No. 161 Post-Test View of Windshield Separation



No. 162 Pre-Test Left Side View of RMDB



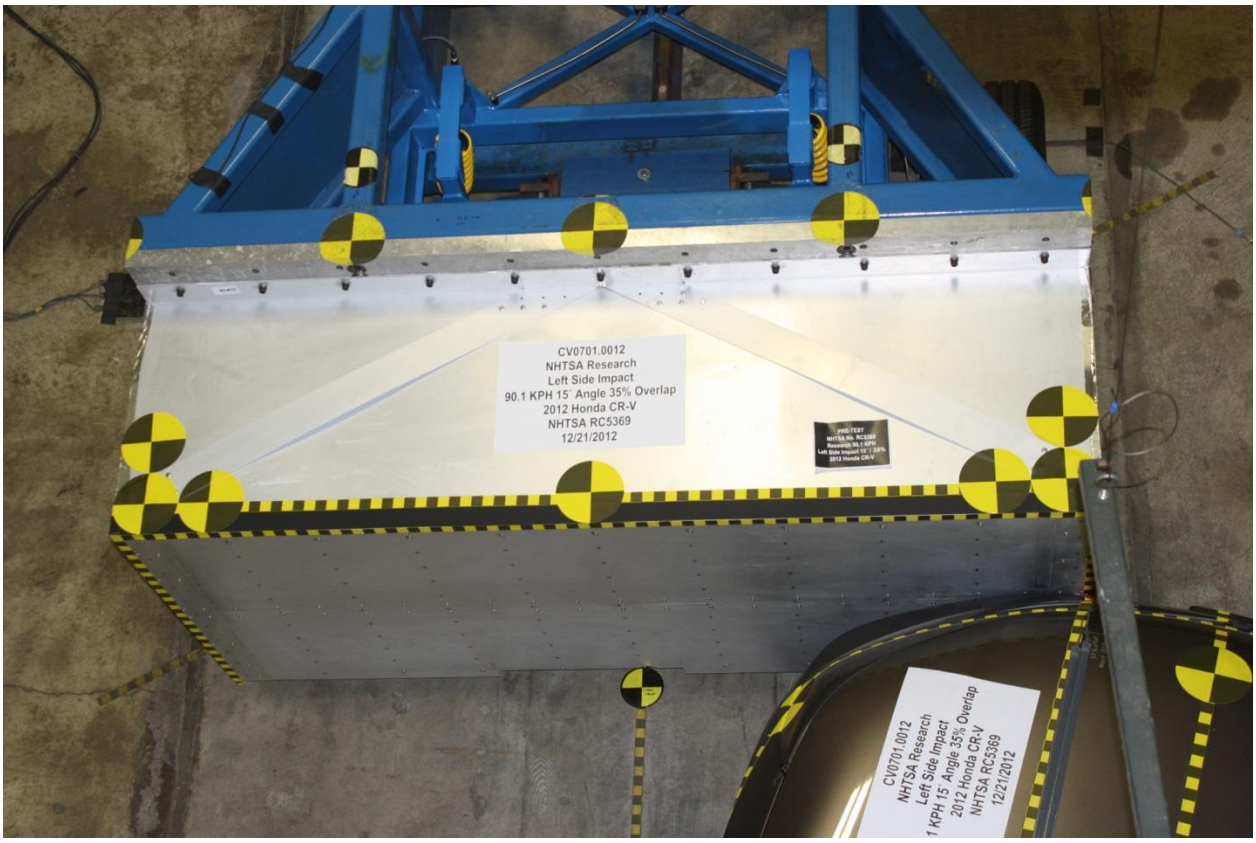
No. 163 Post-Test Left Side View of RMDB



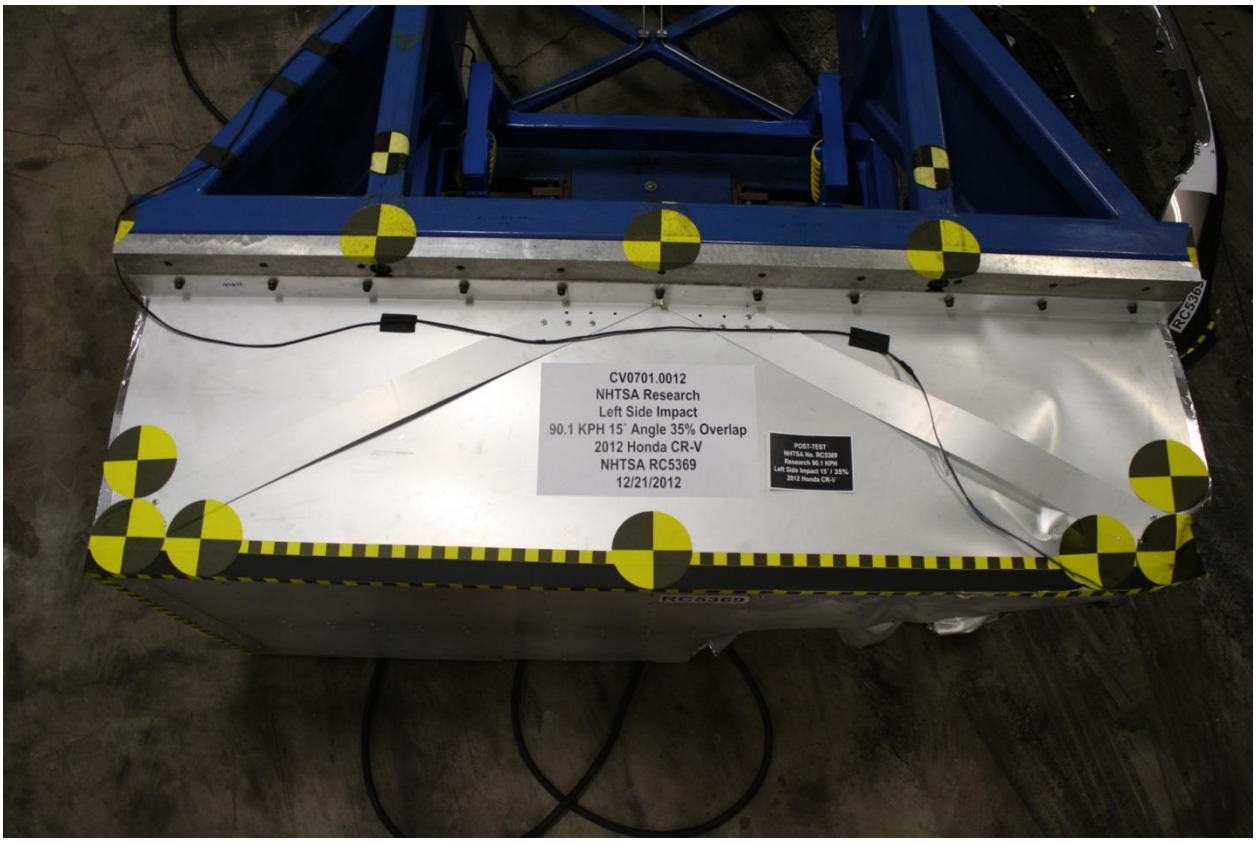
No. 164 Pre-Test Right Side View of RMDB



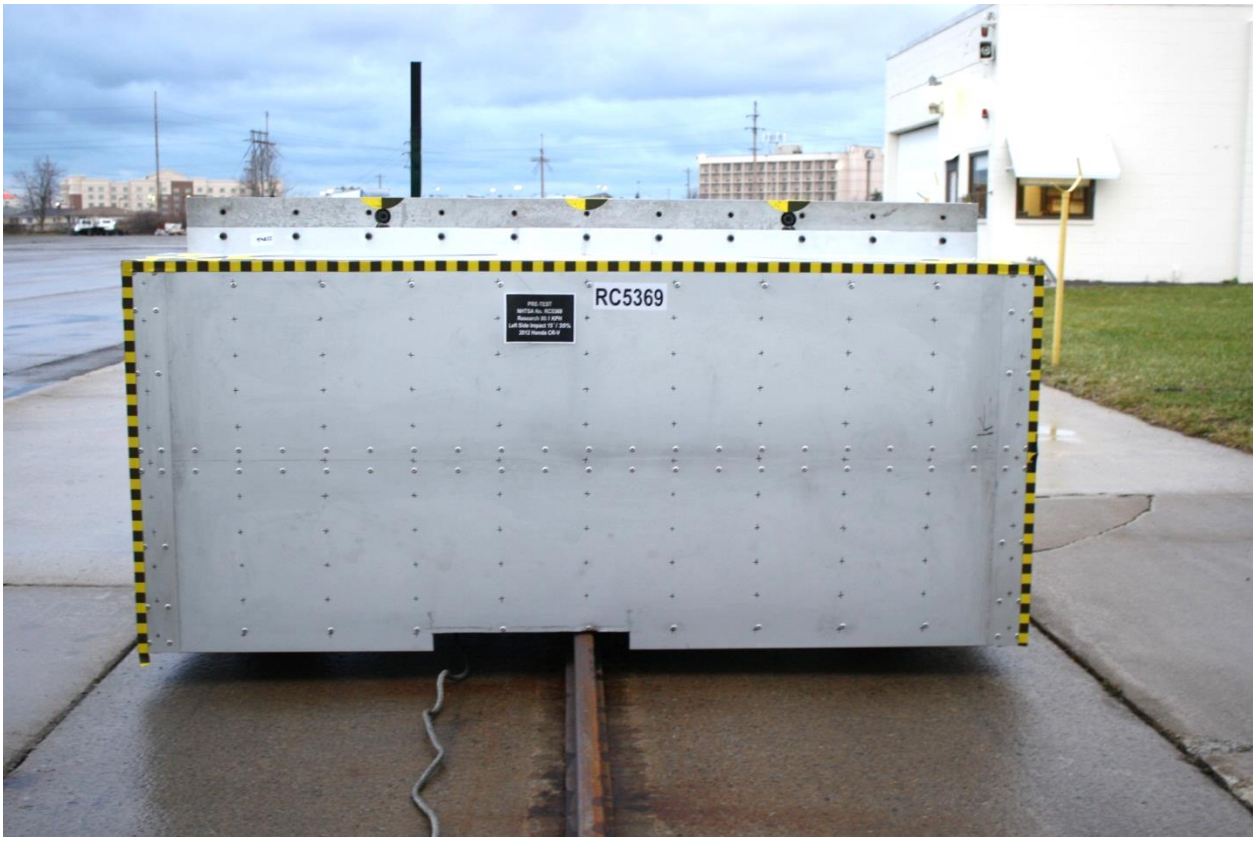
No. 165 Post-Test Right Side View of RMDB



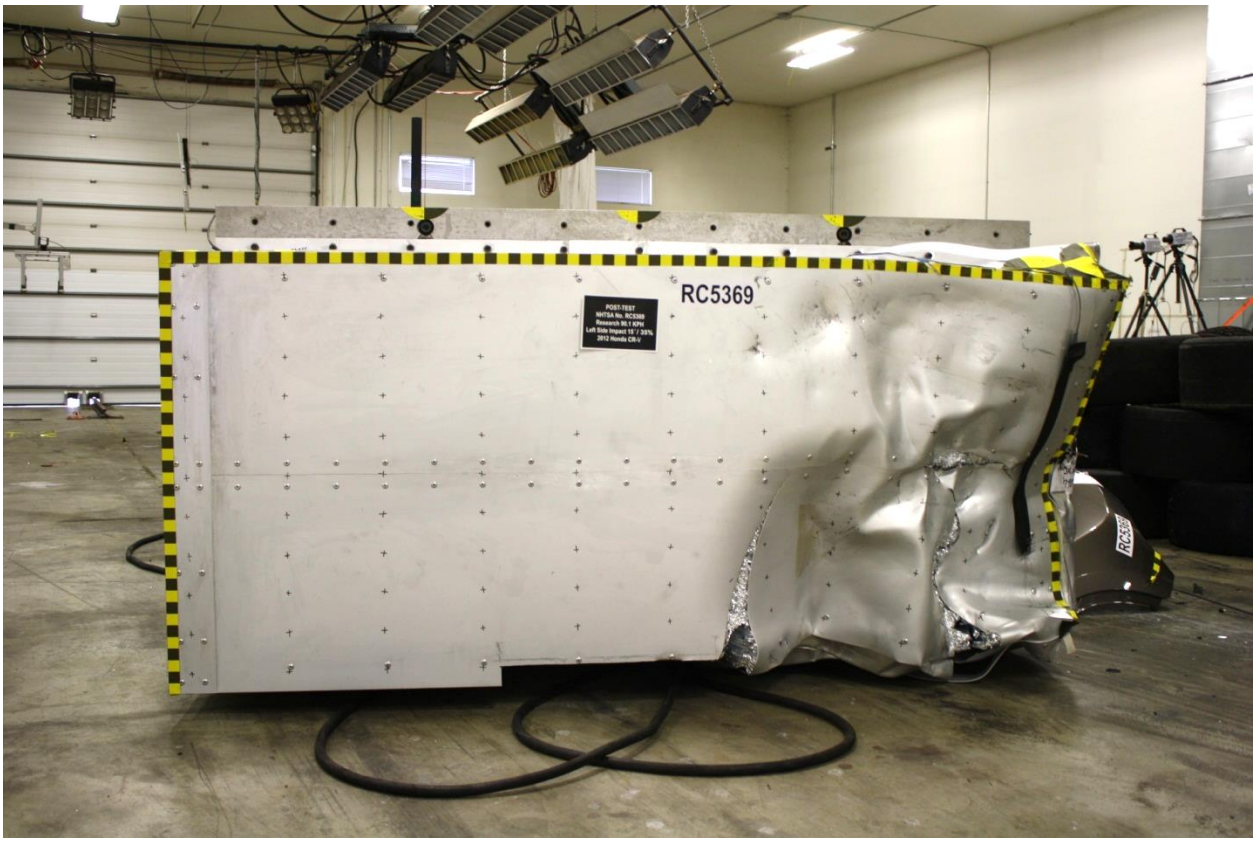
No. 166 Pre-Test Top View of RMDB



No. 167 Post-Test Top View of RMDB



No. 168 Pre-Test Front View of RMDB



No. 169 Post-Test Front View of RMDB



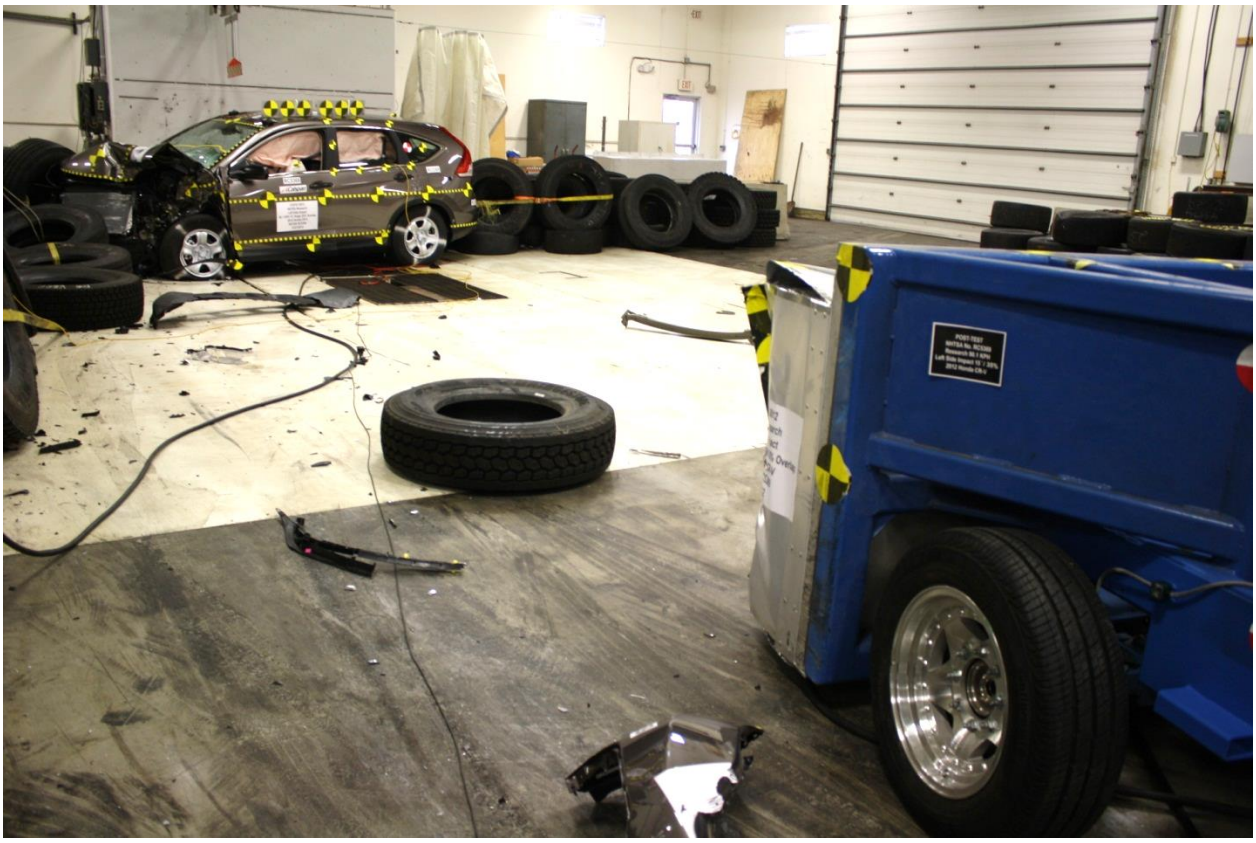
No. 170 Pre-Test RMDB & Vehicle, Right Side



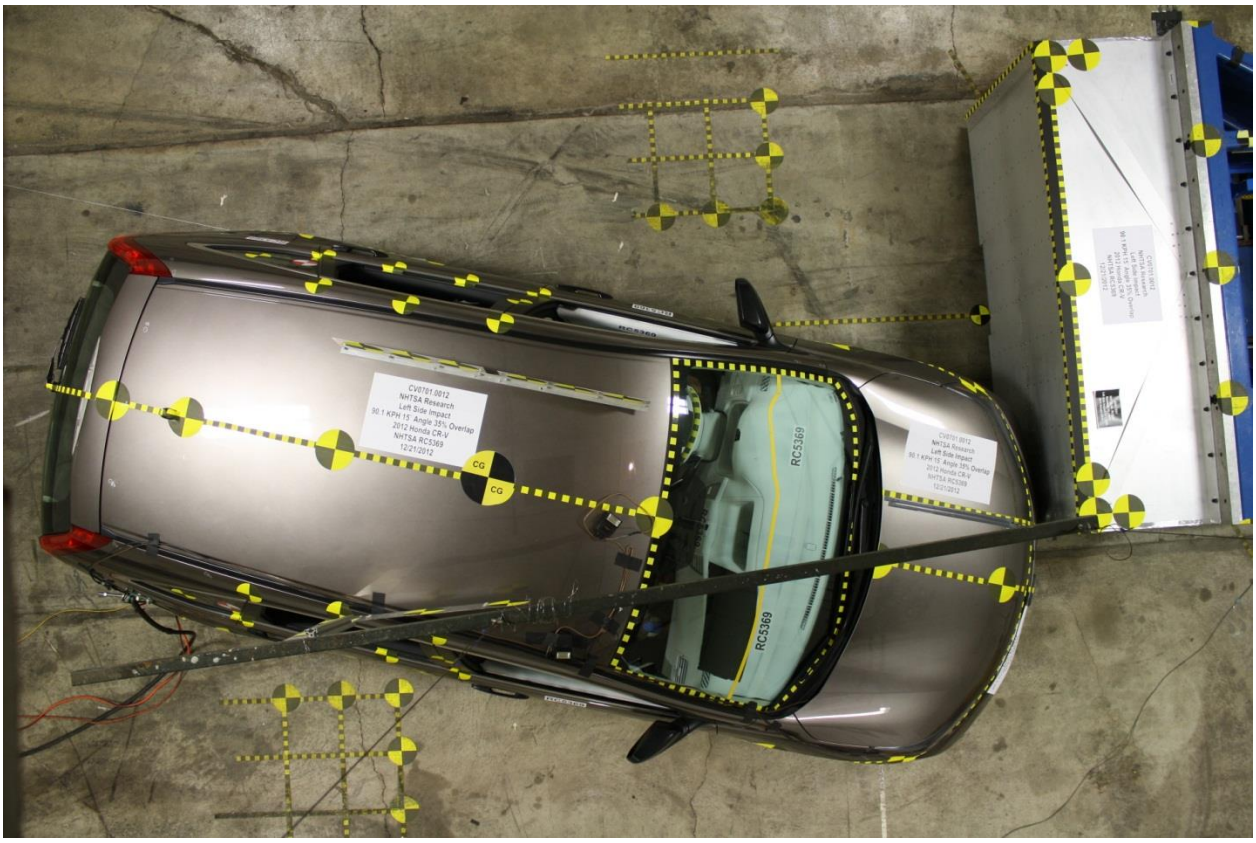
No. 171 Post-Test RMDB & Vehicle, Right Side



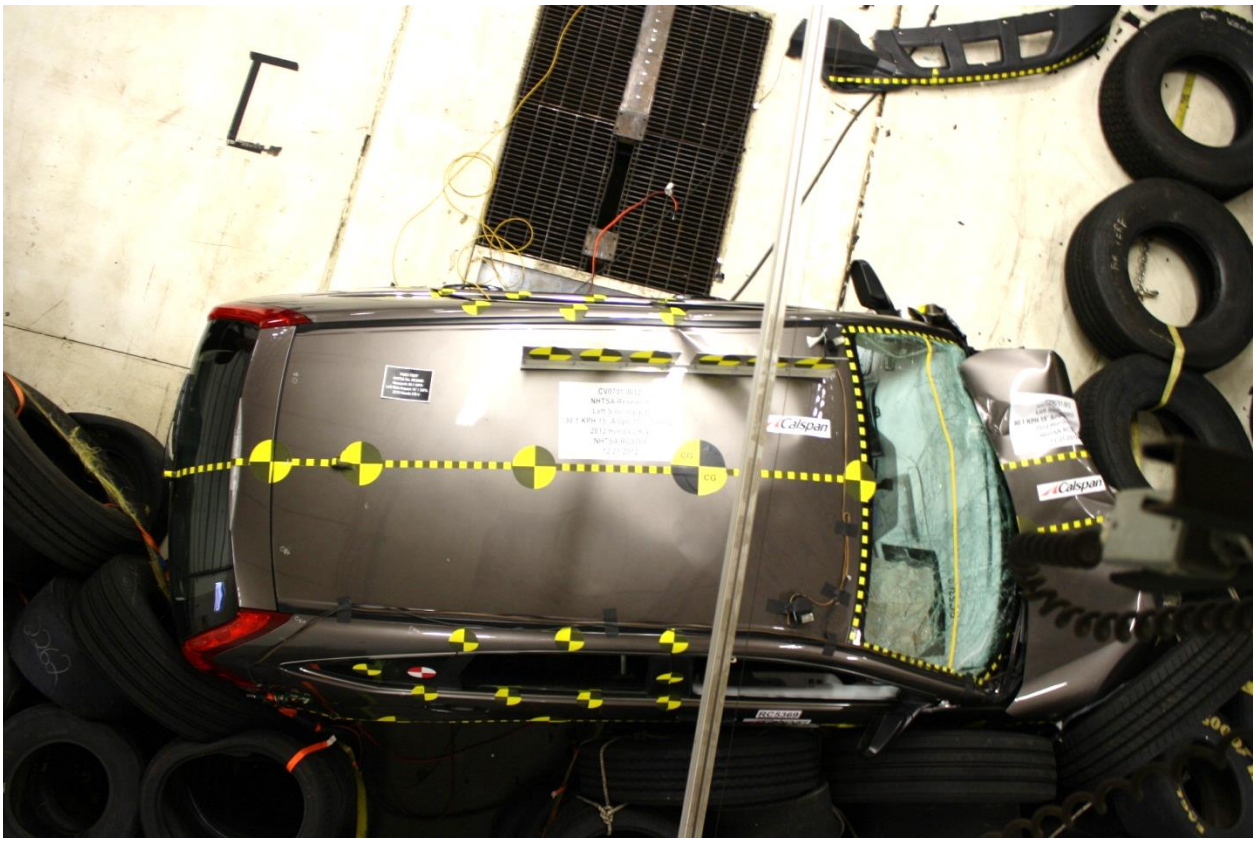
No. 172 Pre-Test RMDB & Vehicle, Left Side



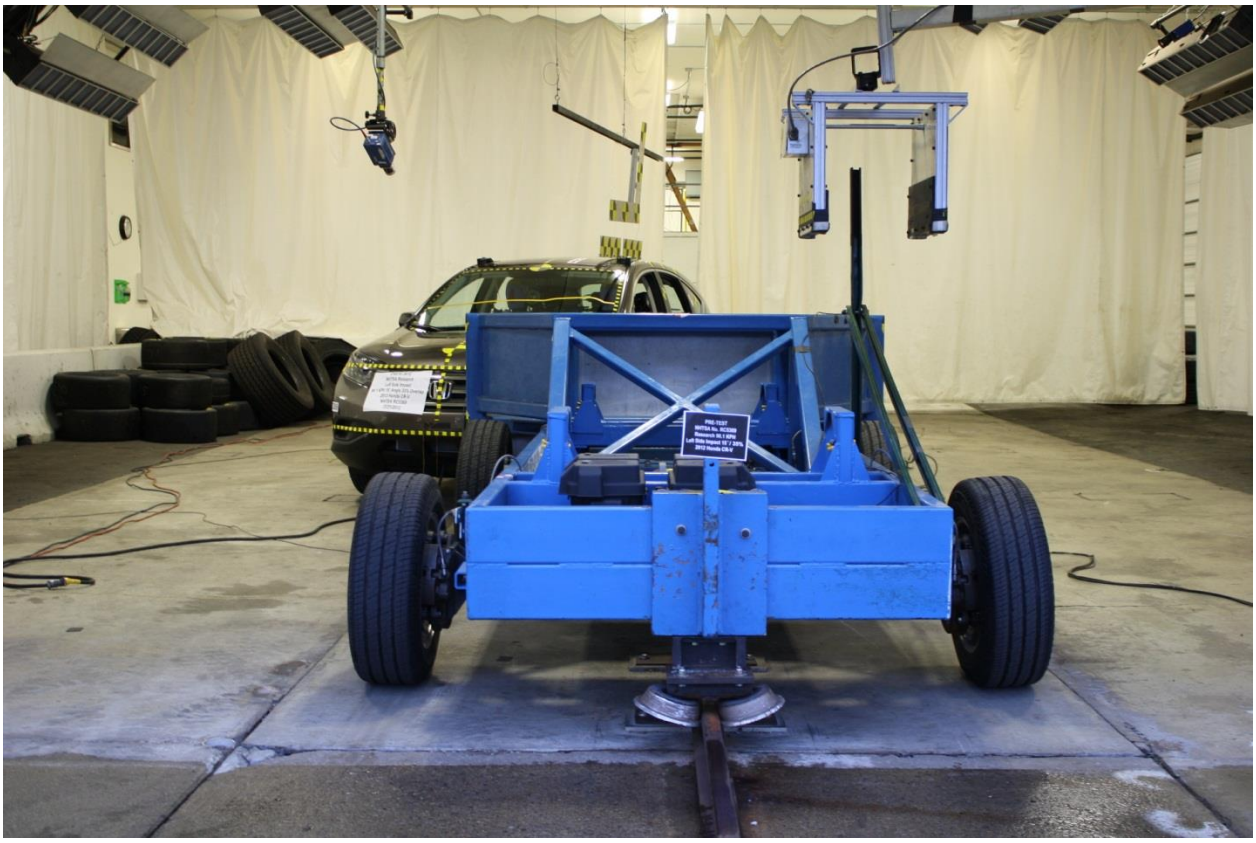
No. 173 Post-Test RMDB & Vehicle, Left Side



No. 174 Pre-Test RMDB & Vehicle, Top View



No. 175 Post-Test RMDB & Vehicle, Top View



No. 176 Pre-Test RMDB & Vehicle, Rear View



No. 177 Post-Test RMDB & Vehicle, Rear View



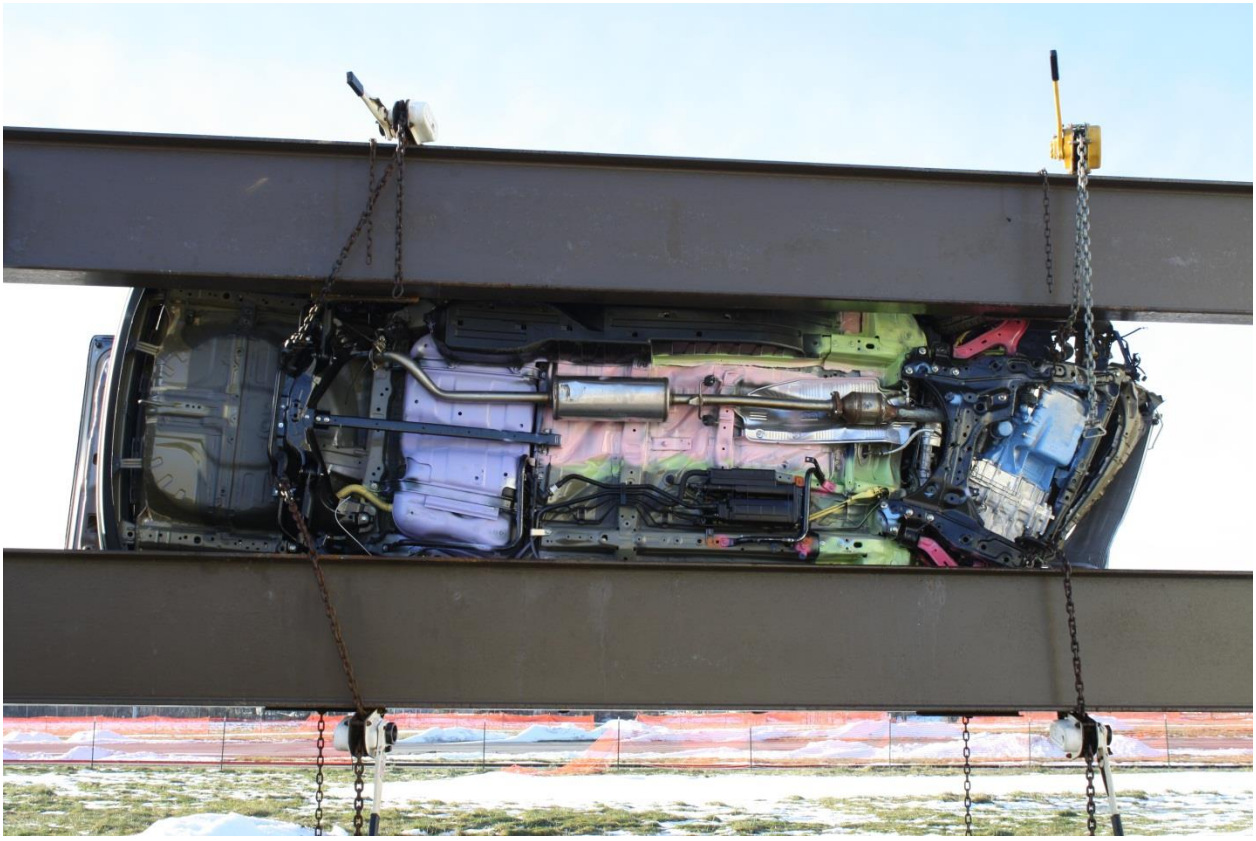
No. 178 Pre-Test RMDB & Vehicle, Front View

Photo Not Available

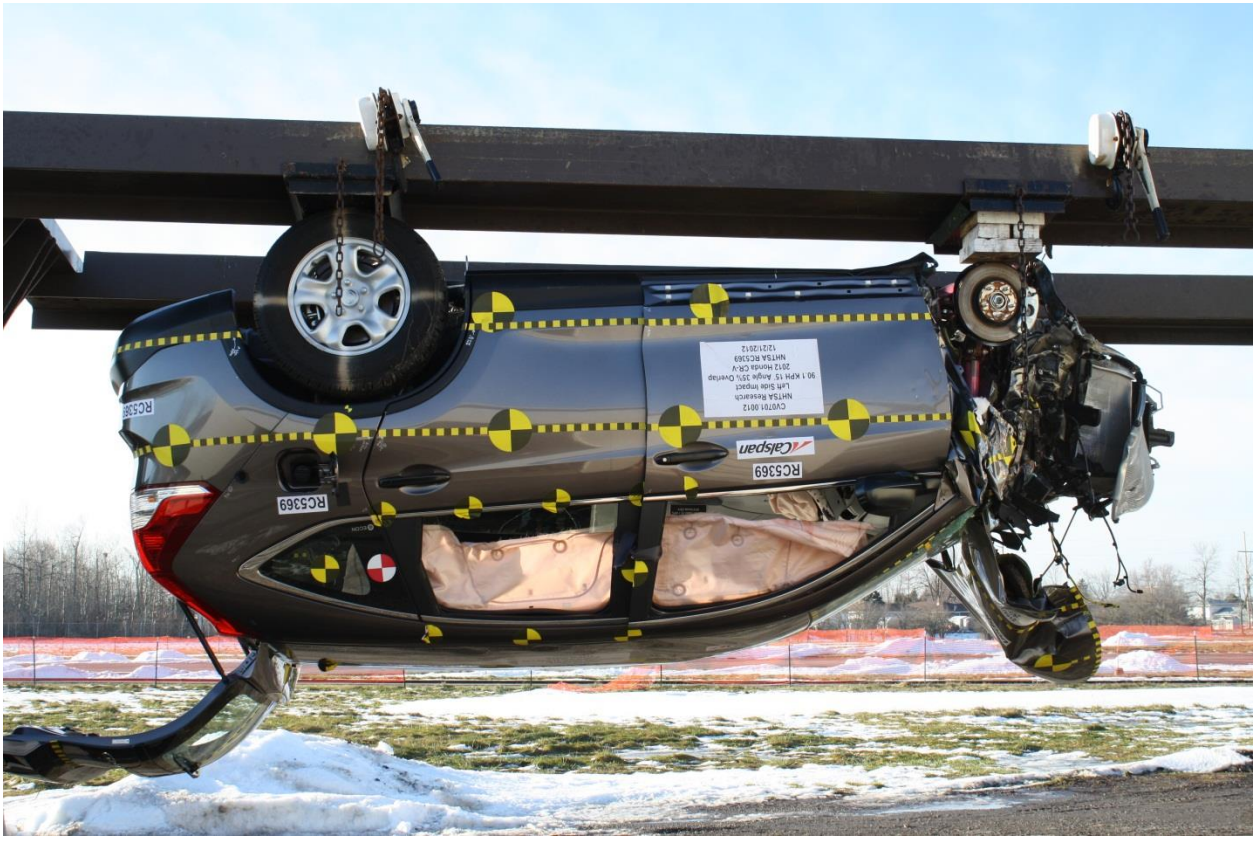
No. 179 Post-Test RMDB & Vehicle, Front View



No. 180 Vehicle at 0 Degrees on Static Rollover Device



No. 181 Vehicle at 90 Degrees on Static Rollover Device



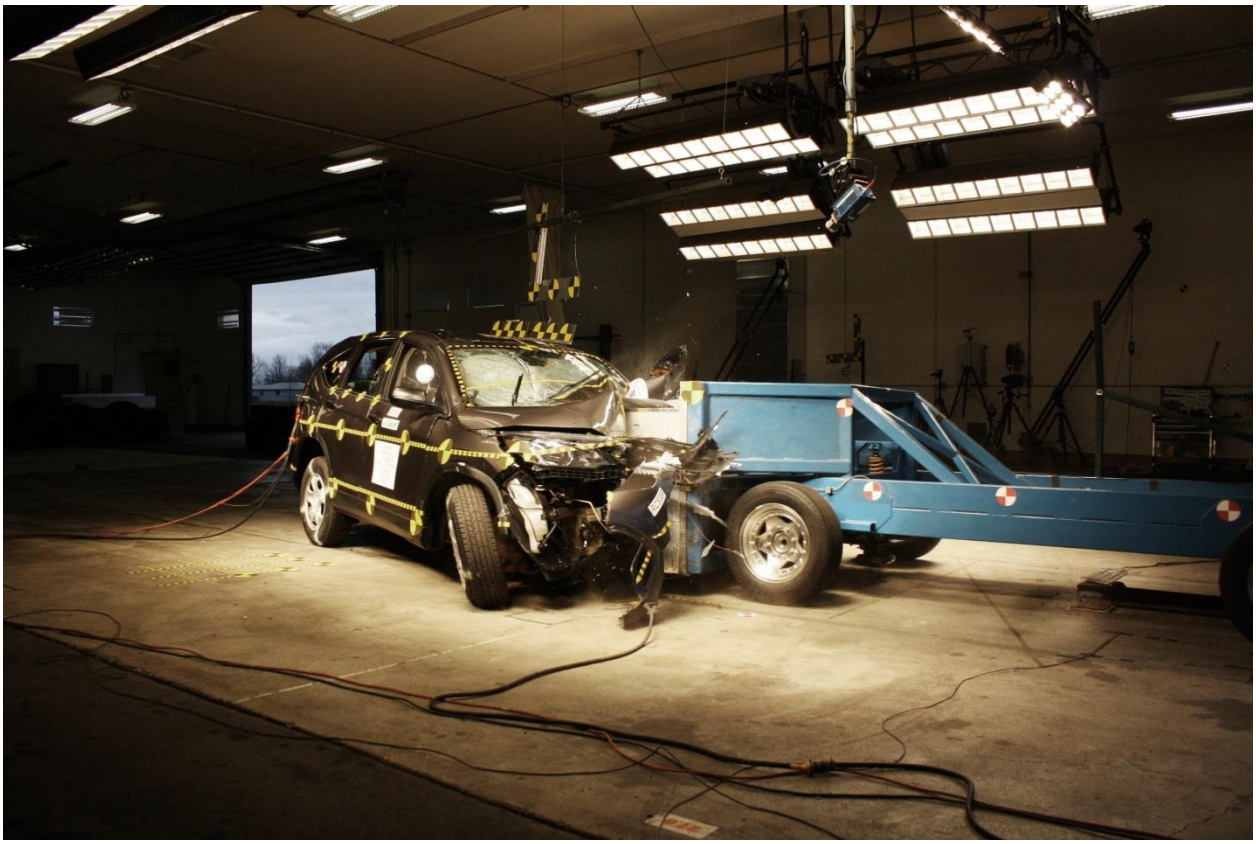
No. 182 Vehicle at 180 Degrees on Static Rollover Device



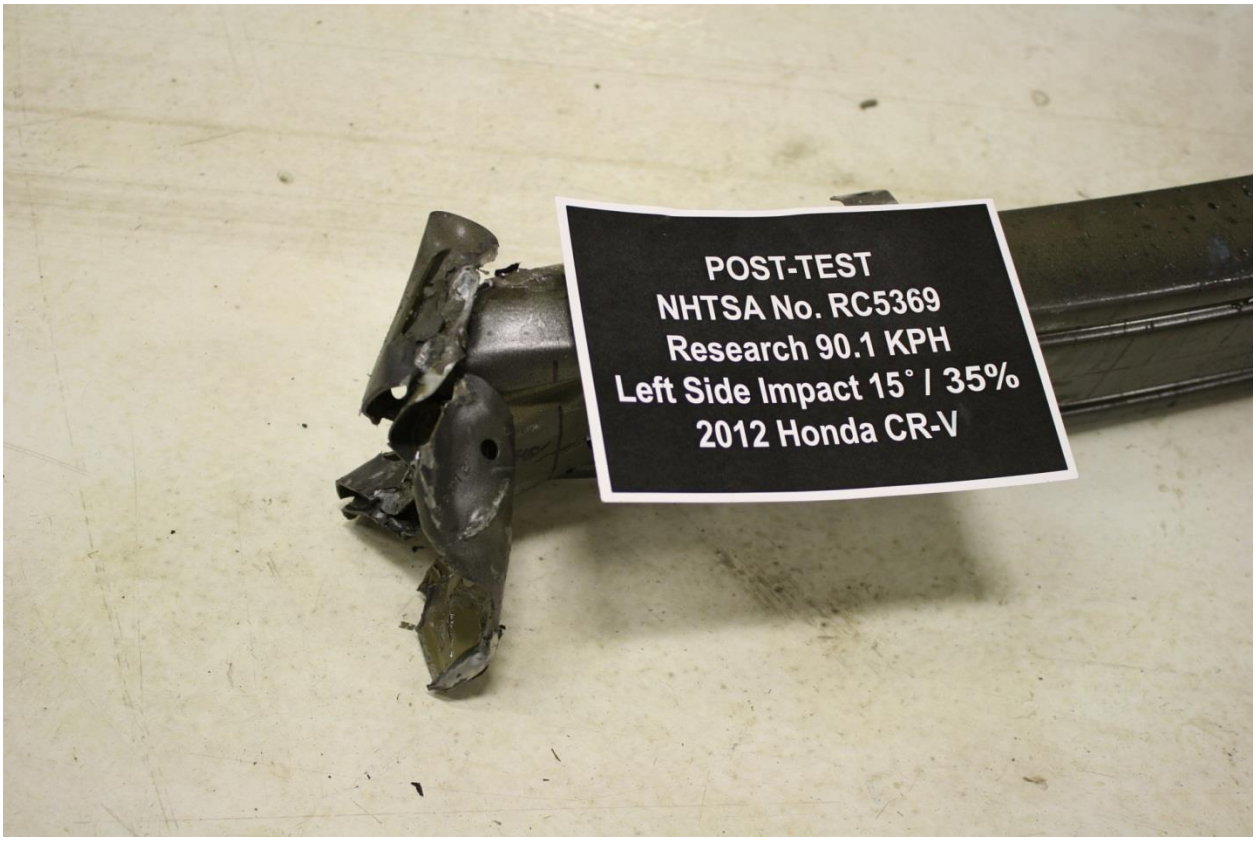
No. 183 Vehicle at 270 Degrees on Static Rollover Device



No. 184 Vehicle at 360 Degrees on Static Rollover Device



No. 185 Impact Photo



No. 186 Additional Bumper Beam Photo



No. 187 Additional Bumper Beam Photo



No. 188 Additional Bumper Beam Photo



No. 189 Additional Bumper Beam Photo

APPENDIX B
VEHICLE & DUMMY RESPONSE DATA TRACES

Table of Data Plots

No.	Description	Page
Plot 1	V2P1 HEAD CG X	B-8
Plot 2	V2P1 HEAD CG Y	B-8
Plot 3	V2P1 HEAD CG Z	B-8
Plot 4	V2P1 HEAD CG WX	B-8
Plot 5	V2P1 HEAD CG WY	B-9
Plot 6	V2P1 HEAD CG WZ	B-9
Plot 7	V2P1 NECK UPPER FX	B-9
Plot 8	V2P1 NECK UPPER FY	B-9
Plot 9	V2P1 NECK UPPER FZ	B-10
Plot 10	V2P1 NECK UPPER MX	B-10
Plot 11	V2P1 NECK UPPER MY	B-10
Plot 12	V2P1 NECK UPPER MZ	B-10
Plot 13	V2P1 NECK LOWER FX	B-11
Plot 14	V2P1 NECK LOWER FY	B-11
Plot 15	V2P1 NECK LOWER FZ	B-11
Plot 16	V2P1 NECK LOWER MX	B-11
Plot 17	V2P1 NECK LOWER MY	B-12
Plot 18	V2P1 NECK LOWER MZ	B-12
Plot 19	V2P1 NECK SPRING LOAD CELL - FRONT	B-12
Plot 20	V2P1 NECK SPRING LOAD CELL - REAR & 95MS	B-12
Plot 21	V2P1 OC ANGLE RY	B-13
Plot 22	V2P1 T1 ACCEL AX	B-13
Plot 23	V2P1 T1 ACCEL AY	B-13
Plot 24	V2P1 T1 ACCEL AZ	B-13
Plot 25	V2P1 T6 ACCEL AX	B-14
Plot 26	V2P1 T6 ACCEL AY	B-14
Plot 27	V2P1 T6 ACCEL AZ	B-14
Plot 28	V2P1 UL CHEST IRTRACC D	B-14
Plot 29	V2P1 UL CHEST RY	B-15
Plot 30	V2P1 UL CHEST RZ	B-15
Plot 31	V2P1 UR CHEST IRTRACC D	B-15
Plot 32	V2P1 UR CHEST RY	B-15
Plot 33	V2P1 UR CHEST RZ	B-16
Plot 34	V2P1 LL CHEST IRTRACC D	B-16
Plot 35	V2P1 LL CHEST RY	B-16
Plot 36	V2P1 LL CHEST RZ	B-16
Plot 37	V2P1 LR CHEST IRTRACC D	B-17
Plot 38	V2P1 LR CHEST RY	B-17
Plot 39	V2P1 LR CHEST RZ	B-17
Plot 40	V2P1 ABDOMEN LEFT IRTRACC D	B-17
Plot 41	V2P1 ABDOMEN LEFT RY	B-18
Plot 42	V2P1 ABDOMEN LEFT RZ	B-18
Plot 43	V2P1 ABDOMEN RIGHT IRTRACC D	B-18
Plot 44	V2P1 ABDOMEN RIGHT RY	B-18
Plot 45	V2P1 ABDOMEN RIGHT RZ	B-19
Plot 46	V2P1 SPINE LOWER FX	B-19
Plot 47	V2P1 SPINE LOWER FY	B-19
Plot 48	V2P1 SPINE LOWER FZ	B-19
Plot 49	V2P1 SPINE LOWER MX	B-20
Plot 50	V2P1 SPINE LOWER MY	B-20
Plot 51	V2P1 PELVIS CG AX	B-20
Plot 52	V2P1 PELVIS CG AY	B-20
Plot 53	V2P1 PELVIS CG AZ	B-21
Plot 54	V2P1 PELVIS ACETABULUM LEFT FX	B-21
Plot 55	V2P1 PELVIS ACETABULUM LEFT FY	B-21
Plot 56	V2P1 PELVIS ACETABULUM LEFT FZ	B-21

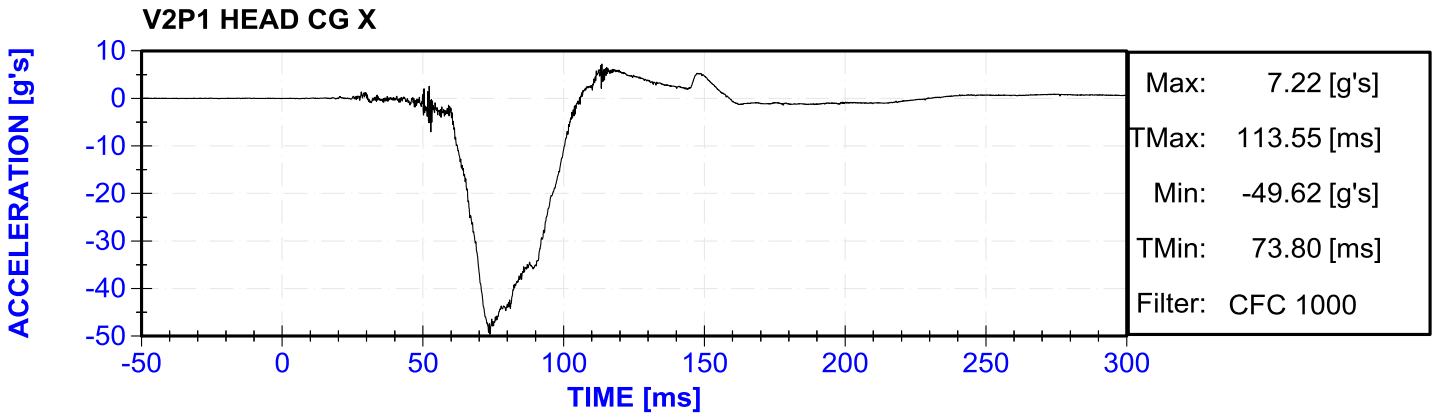
Plot 57	V2P1 PELVIS ACETABULUM RIGHT FX	B-22
Plot 58	V2P1 PELVIS ACETABULUM RIGHT FY	B-22
Plot 59	V2P1 PELVIS ACETABULUM RIGHT FZ	B-22
Plot 60	V2P1 LEFT ASIS FX	B-22
Plot 61	V2P1 RIGHT ASIS FX	B-23
Plot 62	V2P1 LEFT FEMUR FX	B-23
Plot 63	V2P1 LEFT FEMUR FY	B-23
Plot 64	V2P1 LEFT FEMUR FZ	B-23
Plot 65	V2P1 LEFT FEMUR MX	B-24
Plot 66	V2P1 LEFT FEMUR MY	B-24
Plot 67	V2P1 LEFT FEMUR MZ	B-24
Plot 68	V2P1 RIGHT FEMUR FX	B-24
Plot 69	V2P1 RIGHT FEMUR FY	B-25
Plot 70	V2P1 RIGHT FEMUR FZ	B-25
Plot 71	V2P1 RIGHT FEMUR MX	B-25
Plot 72	V2P1 RIGHT FEMUR MY	B-25
Plot 73	V2P1 RIGHT FEMUR MZ	B-26
Plot 74	V2P1 KNEE LEFT DX	B-26
Plot 75	V2P1 TIBIA LEFT UPPER FZ	B-26
Plot 76	V2P1 TIBIA LEFT UPPER MX	B-26
Plot 77	V2P1 TIBIA LEFT UPPER MY	B-27
Plot 78	V2P1 TIBIA LEFT LOWER FZ	B-27
Plot 79	V2P1 TIBIA LEFT LOWER MX	B-27
Plot 80	V2P1 TIBIA LEFT LOWER MY	B-27
Plot 81	V2P1 ANKLE LEFT POT RX	B-28
Plot 82	V2P1 ANKLE LEFT POT RY	B-28
Plot 83	V2P1 FOOT LEFT AZ & 47MS	B-28
Plot 84	V2P1 KNEE RIGHT DX	B-28
Plot 85	V2P1 TIBIA RIGHT UPPER FZ	B-29
Plot 86	V2P1 TIBIA RIGHT UPPER MX	B-29
Plot 87	V2P1 TIBIA RIGHT UPPER MY	B-29
Plot 88	V2P1 TIBIA RIGHT LOWER FZ	B-29
Plot 89	V2P1 TIBIA RIGHT LOWER MX	B-30
Plot 90	V2P1 TIBIA RIGHT LOWER MY	B-30
Plot 91	V2P1 ANKLE RIGHT POT RX	B-30
Plot 92	V2P1 ANKLE RIGHT POT RY	B-30
Plot 93	V2P1 FOOT RIGHT AZ , 41 & 101MS	B-31
Plot 94	V2 P1 DRIVER LAP BELT	B-31
Plot 95	V2 P1 DRIVER SHOULDER BELT	B-31
Plot 96	V2P2 HEAD CG X	B-31
Plot 97	V2P2 HEAD CG Y	B-32
Plot 98	V2P2 HEAD CG Z	B-32
Plot 99	V2P2 HEAD CG WX	B-32
Plot 100	V2P2 HEAD CG WY	B-32
Plot 101	V2P2 HEAD CG WZ	B-33
Plot 102	V2P2 NECK UPPER FX	B-33
Plot 103	V2P2 NECK UPPER FY	B-33
Plot 104	V2P2 NECK UPPER FZ	B-33
Plot 105	V2P2 NECK UPPER MX	B-34
Plot 106	V2P2 NECK UPPER MY	B-34
Plot 107	V2P2 NECK UPPER MZ	B-34
Plot 108	V2P2 NECK LOWER FX	B-34
Plot 109	V2P2 NECK LOWER FY	B-35
Plot 110	V2P2 NECK LOWER FZ	B-35
Plot 111	V2P2 NECK LOWER MX	B-35
Plot 112	V2P2 NECK LOWER MY	B-35
Plot 113	V2P2 NECK LOWER MZ	B-36
Plot 114	V2P2 NECK SPRING LOAD CELL - FRONT	B-36

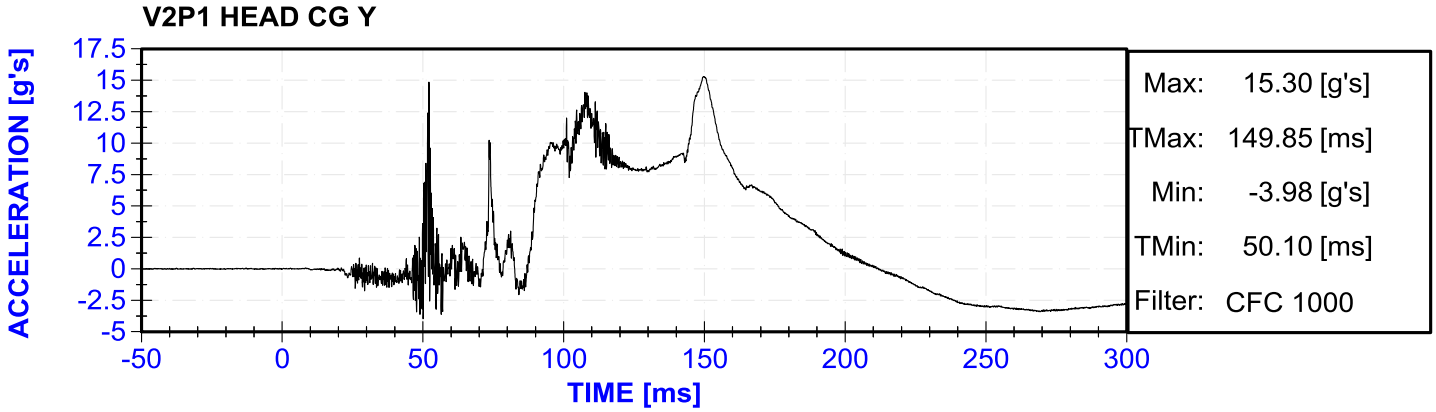
Plot 115	V2P2 NECK SPRING LOAD CELL - REAR & 95MS	B-36
Plot 116	V2P2 OC ANGLE RY	B-36
Plot 117	V2P2 T1 ACCEL AX	B-37
Plot 118	V2P2 T1 ACCEL AY	B-37
Plot 119	V2P2 T1 ACCEL AZ	B-37
Plot 120	V2P2 T6 ACCEL AX	B-37
Plot 121	V2P2 T6 ACCEL AY	B-38
Plot 122	V2P2 T6 ACCEL AZ	B-38
Plot 123	V2P2 UL CHEST IRTRACC D	B-38
Plot 124	V2P2 UL CHEST RY	B-38
Plot 125	V2P2 UL CHEST RZ	B-39
Plot 126	V2P2 UR CHEST IRTRACC D	B-39
Plot 127	V2P2 UR CHEST RY	B-39
Plot 128	V2P2 UR CHEST RZ	B-39
Plot 129	V2P2 LL CHEST IRTRACC D	B-40
Plot 130	V2P2 LL CHEST RY	B-40
Plot 131	V2P2 LL CHEST RZ	B-40
Plot 132	V2P2 LR CHEST IRTRACC D	B-40
Plot 133	V2P2 LR CHEST RY	B-41
Plot 134	V2P2 LR CHEST RZ	B-41
Plot 135	V2P2 ABDOMEN LEFT IRTRACC D	B-41
Plot 136	V2P2 ABDOMEN LEFT RY	B-41
Plot 137	V2P2 ABDOMEN LEFT RZ	B-42
Plot 138	V2P2 ABDOMEN RIGHT IRTRACC D	B-42
Plot 139	V2P2 ABDOMEN RIGHT RY	B-42
Plot 140	V2P2 ABDOMEN RIGHT RZ	B-42
Plot 141	V2P2 SPINE LOWER FX	B-43
Plot 142	V2P2 SPINE LOWER FY	B-43
Plot 143	V2P2 SPINE LOWER FZ	B-43
Plot 144	V2P2 SPINE LOWER MX	B-43
Plot 145	V2P2 SPINE LOWER MY	B-44
Plot 146	V2P2 PELVIS CG AX	B-44
Plot 147	V2P2 PELVIS CG AY	B-44
Plot 148	V2P2 PELVIS CG AZ	B-44
Plot 149	V2P2 PELVIS ACETABULUM LEFT FX	B-45
Plot 150	V2P2 PELVIS ACETABULUM LEFT FY	B-45
Plot 151	V2P2 PELVIS ACETABULUM LEFT FZ	B-45
Plot 152	V2P2 PELVIS ACETABULUM RIGHT FX	B-45
Plot 153	V2P2 PELVIS ACETABULUM RIGHT FY	B-46
Plot 154	V2P2 PELVIS ACETABULUM RIGHT FZ	B-46
Plot 155	V2P2 LEFT ASIS FX	B-46
Plot 156	V2P2 RIGHT ASIS FX	B-46
Plot 157	V2P2 LEFT FEMUR FX	B-47
Plot 158	V2P2 LEFT FEMUR FY	B-47
Plot 159	V2P2 LEFT FEMUR FZ	B-47
Plot 160	V2P2 LEFT FEMUR MX	B-47
Plot 161	V2P2 LEFT FEMUR MY	B-48
Plot 162	V2P2 LEFT FEMUR MZ	B-48
Plot 163	V2P2 RIGHT FEMUR FX	B-48
Plot 164	V2P2 RIGHT FEMUR FY	B-48
Plot 165	V2P2 RIGHT FEMUR FZ	B-49
Plot 166	V2P2 RIGHT FEMUR MX	B-49
Plot 167	V2P2 RIGHT FEMUR MY	B-49
Plot 168	V2P2 RIGHT FEMUR MZ	B-49
Plot 169	V2P2 KNEE LEFT DX	B-50
Plot 170	V2P2 TIBIA LEFT UPPER FZ	B-50
Plot 171	V2P2 TIBIA LEFT UPPER MX	B-50
Plot 172	V2P2 TIBIA LEFT UPPER MY	B-50

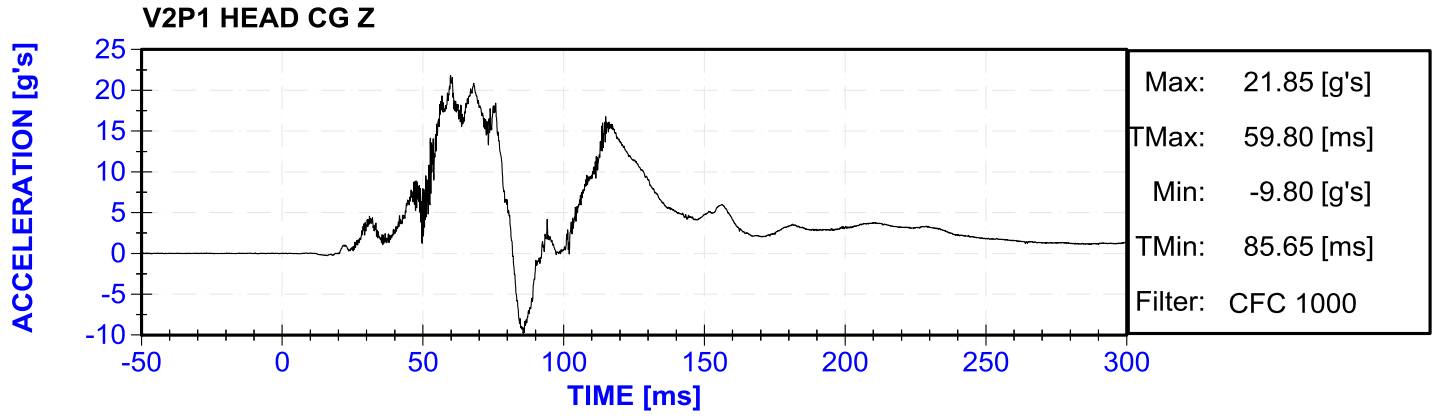
Plot 173	V2P2 TIBIA LEFT LOWER FZ	B-51
Plot 174	V2P2 TIBIA LEFT LOWER MX	B-51
Plot 175	V2P2 TIBIA LEFT LOWER MY	B-51
Plot 176	V2P2 ANKLE LEFT POT RX	B-51
Plot 177	V2P2 ANKLE LEFT POT RY	B-52
Plot 178	V2P2 FOOT LEFT AZ	B-52
Plot 179	V2P2 KNEE RIGHT DX	B-52
Plot 180	V2P2 TIBIA RIGHT UPPER FZ	B-52
Plot 181	V2P2 TIBIA RIGHT UPPER MX	B-53
Plot 182	V2P2 TIBIA RIGHT UPPER MY	B-53
Plot 183	V2P2 TIBIA RIGHT LOWER FZ	B-53
Plot 184	V2P2 TIBIA RIGHT LOWER MX	B-53
Plot 185	V2P2 TIBIA RIGHT LOWER MY	B-54
Plot 186	V2P2 ANKLE RIGHT POT RX	B-54
Plot 187	V2P2 ANKLE RIGHT POT RY	B-54
Plot 188	V2P2 FOOT RIGHT AZ	B-54
Plot 189	V2 P2 PASSENGER LAP BELT	B-55
Plot 190	V2 P2 PASSENGER SHOULDER BELT	B-55
Plot 191	V2 LEFT REAR SILL X	B-55
Plot 192	V2 LEFT REAR SILL Y	B-55
Plot 193	V2 LEFT REAR SILL RX	B-56
Plot 194	V2 LEFT REAR SILL RY	B-56
Plot 195	V2 RIGHT REAR SILL X	B-56
Plot 196	V2 RIGHT REAR SILL Y	B-56
Plot 197	V2 VEHICLE CG X	B-57
Plot 198	V2 VEHICLE CG Y	B-57
Plot 199	V2 VEHICLE CG Z	B-57
Plot 200	V2 VEHICLE CG RX	B-57
Plot 201	V2 VEHICLE CG RY	B-58
Plot 202	V2 VEHICLE CG RZ	B-58
Plot 203	V2 INSTRUMENT PANEL X	B-58
Plot 204	V2 DRIVER SEAT TRACK X	B-58
Plot 205	V2 DRIVER SEAT TRACK Y	B-59
Plot 206	V2 DRIVER SEAT TRACK Z	B-59
Plot 207	V2 PASSENGER SEAT TRACK X	B-59
Plot 208	V2 PASSENGER SEAT TRACK Y	B-59
Plot 209	V2 PASSENGER SEAT TRACK Z	B-60
Plot 210	V2 DRIVER FLOOR PAN X	B-60
Plot 211	V2 DRIVER FLOOR PAN Y	B-60
Plot 212	V2 DRIVER FLOOR PAN Z	B-60
Plot 213	V2 DRIVER FLOOR PAN STRING POT	B-61
Plot 214	V2 DRIVER SW AIRBAG STAGE 1	B-61
Plot 215	V2 DRIVER SW AIRBAG STAGE 2	B-61
Plot 216	V2 DRIVER HEAD CURTAIN	B-61
Plot 217	V2 DRIVER SEAT HEAD/TORSO/PELVIS	B-62
Plot 218	V2 DRIVER KNEE	B-62
Plot 219	V2 DRIVER TORSO BELT PRETENSIONER	B-62
Plot 220	V2 PASSENGER FRT AIRBAG STAGE 1	B-62
Plot 221	V2 PASSENGER FRT AIRBAG STAGE 2	B-63
Plot 222	V2 PASSENGER HEAD CURTAIN	B-63
Plot 223	V2 PASSENGER KNEE	B-63
Plot 224	V2 PASSENGER HEAD/TORSO/PELVIS	B-63
Plot 225	V2 PASSENGER TORSO BELT PRETENSIONER	B-64
Plot 226	V1 CG AX	B-64
Plot 227	V1 CG AY	B-64
Plot 228	V1 CG AZ	B-64
Plot 229	V1 REAR C/L AX	B-65
Plot 230	V1 REAR C/L AY	B-65

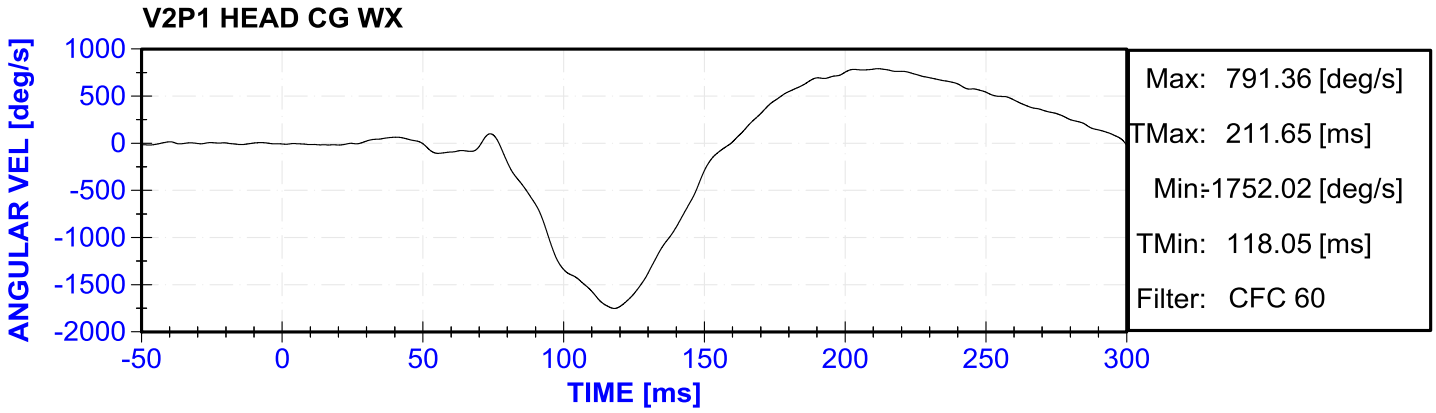
Plot 231	V1 REAR C/L AZ	B-65
Plot 232	V2P1 NECK OCCIPITAL CONDYLE FORCE X [THORTEST]	B-65
Plot 233	V2P1 NECK OCCIPITAL CONDYLE FORCE Z [THORTEST]	B-66
Plot 234	V2P1 NECK OCCIPITAL CONDYLE MY [THORTEST]	B-66
Plot 235	V2P1 NECK UPPER FORCE X [THORTEST]	B-66
Plot 236	V2P1 NECK UPPER FORCE Y [THORTEST]	B-66
Plot 237	V2P1 NECK UPPER FORCE Z [THORTEST]	B-67
Plot 238	V2P1 NECK UPPER MOMENT X [THORTEST]	B-67
Plot 239	V2P1 NECK UPPER MOMENT Y [THORTEST]	B-67
Plot 240	V2P1 NECK UPPER MOMENT Z [THORTEST]	B-67
Plot 241	V2P1 CHEST UPPER LEFT X [CFC_180]	B-68
Plot 242	V2P1 CHEST UPPER LEFT Y [CFC_180]	B-68
Plot 243	V2P1 CHEST UPPER LEFT Z [CFC_180]	B-68
Plot 244	V2P1 CHEST UPPER LEFT D [CFC_180]	B-68
Plot 245	V2P1 CHEST UPPER RIGHT X [CFC_180]	B-69
Plot 246	V2P1 CHEST UPPER RIGHT Y [CFC_180]	B-69
Plot 247	V2P1 CHEST UPPER RIGHT Z [CFC_180]	B-69
Plot 248	V2P1 CHEST UPPER RIGHT D [CFC_180]	B-69
Plot 249	V2P1 CHEST LOWER LEFT X [CFC_180]	B-70
Plot 250	V2P1 CHEST LOWER LEFT Y [CFC_180]	B-70
Plot 251	V2P1 CHEST LOWER LEFT Z [CFC_180]	B-70
Plot 252	V2P1 CHEST LOWER LEFT D [CFC_180]	B-70
Plot 253	V2P1 CHEST LOWER RIGHT X [CFC_180]	B-71
Plot 254	V2P1 CHEST LOWER RIGHT Y [CFC_180]	B-71
Plot 255	V2P1 CHEST LOWER RIGHT Z [CFC_180]	B-71
Plot 256	V2P1 CHEST LOWER RIGHT D [CFC_180]	B-71
Plot 257	V2P1 ABDOMEN LEFT LOWER X [CFC_180]	B-72
Plot 258	V2P1 ABDOMEN LEFT LOWER Y [CFC_180]	B-72
Plot 259	V2P1 ABDOMEN LEFT LOWER Z [CFC_180]	B-72
Plot 260	V2P1 ABDOMEN LEFT LOWER D [CFC_180]	B-72
Plot 261	V2P1 ABDOMEN RIGHT LOWER X [CFC_180]	B-73
Plot 262	V2P1 ABDOMEN RIGHT LOWER Y [CFC_180]	B-73
Plot 263	V2P1 ABDOMEN RIGHT LOWER Z [CFC_180]	B-73
Plot 264	V2P1 ABDOMEN RIGHT LOWER D [CFC_180]	B-73
Plot 265	V2P2 NECK OCCIPITAL CONDYLE FORCE X [THORTEST]	B-74
Plot 266	V2P2 NECK OCCIPITAL CONDYLE FORCE Z [THORTEST]	B-74
Plot 267	V2P2 NECK OCCIPITAL CONDYLE MY [THORTEST]	B-74
Plot 268	V2P2 NECK UPPER FORCE X [THORTEST]	B-74
Plot 269	V2P2 NECK UPPER FORCE Y [THORTEST]	B-75
Plot 270	V2P2 NECK UPPER FORCE Z [THORTEST]	B-75
Plot 271	V2P2 NECK UPPER MOMENT X [THORTEST]	B-75
Plot 272	V2P2 NECK UPPER MOMENT Y [THORTEST]	B-75
Plot 273	V2P2 NECK UPPER MOMENT Z [THORTEST]	B-76
Plot 274	V2P2 CHEST UPPER LEFT X [CFC_180]	B-76
Plot 275	V2P2 CHEST UPPER LEFT Y [CFC_180]	B-76
Plot 276	V2P2 CHEST UPPER LEFT Z [CFC_180]	B-76
Plot 277	V2P2 CHEST UPPER LEFT D [CFC_180]	B-77
Plot 278	V2P2 CHEST UPPER RIGHT X [CFC_180]	B-77
Plot 279	V2P2 CHEST UPPER RIGHT Y [CFC_180]	B-77
Plot 280	V2P2 CHEST UPPER RIGHT Z [CFC_180]	B-77
Plot 281	V2P2 CHEST UPPER RIGHT D [CFC_180]	B-78
Plot 282	V2P2 CHEST LOWER LEFT X [CFC_180]	B-78
Plot 283	V2P2 CHEST LOWER LEFT Y [CFC_180]	B-78
Plot 284	V2P2 CHEST LOWER LEFT Z [CFC_180]	B-78
Plot 285	V2P2 CHEST LOWER LEFT D [CFC_180]	B-79
Plot 286	V2P2 CHEST LOWER RIGHT X [CFC_180]	B-79
Plot 287	V2P2 CHEST LOWER RIGHT Y [CFC_180]	B-79
Plot 288	V2P2 CHEST LOWER RIGHT Z [CFC_180]	B-79

Plot 289	V2P2 CHEST LOWER RIGHT D [CFC_180]	B-80
Plot 290	V2P2 ABDOMEN LEFT LOWER X [CFC_180]	B-80
Plot 291	V2P2 ABDOMEN LEFT LOWER Y [CFC_180]	B-80
Plot 292	V2P2 ABDOMEN LEFT LOWER Z [CFC_180]	B-80
Plot 293	V2P2 ABDOMEN LEFT LOWER D [CFC_180]	B-81
Plot 294	V2P2 ABDOMEN RIGHT LOWER X [CFC_180]	B-81
Plot 295	V2P2 ABDOMEN RIGHT LOWER Y [CFC_180]	B-81
Plot 296	V2P2 ABDOMEN RIGHT LOWER Z [CFC_180]	B-81
Plot 297	V2P2 ABDOMEN RIGHT LOWER D [CFC_180]	B-82

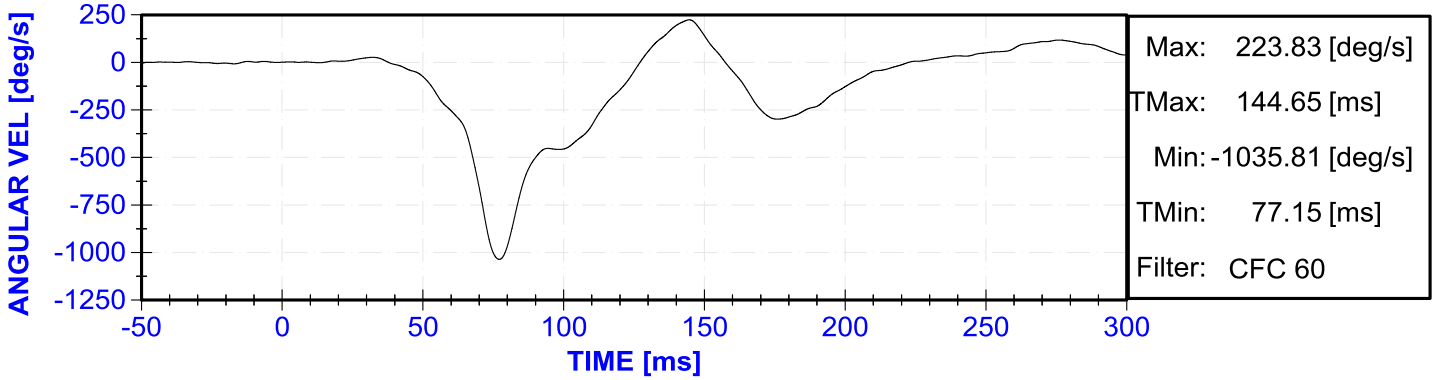

V2P1 HEAD CG X
ACCELERATION [g's]
10
0
-10
-20
-30
-40
-50
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 7.22 [g's]
TMax: 113.55 [ms]
Min: -49.62 [g's]
TMin: 73.80 [ms]
Filter: CFC 1000


V2P1 HEAD CG Y
ACCELERATION [g's]
17.5
15
12.5
10
7.5
5
2.5
0
-2.5
-5
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 15.30 [g's]
TMax: 149.85 [ms]
Min: -3.98 [g's]
TMin: 50.10 [ms]
Filter: CFC 1000

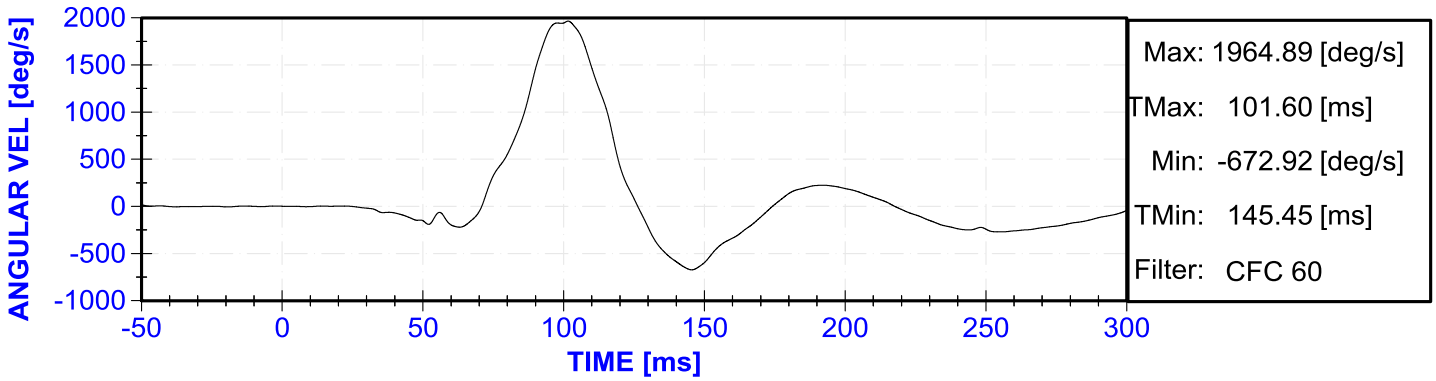

V2P1 HEAD CG Z
ACCELERATION [g's]
25
20
15
10
5
0
-5
-10
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 21.85 [g's]
TMax: 59.80 [ms]
Min: -9.80 [g's]
TMin: 85.65 [ms]
Filter: CFC 1000


V2P1 HEAD CG WX
ANGULAR VEL [deg/s]
1000
500
0
-500
-1000
-1500
-2000
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 791.36 [deg/s]
TMax: 211.65 [ms]
Min: -1752.02 [deg/s]
TMin: 118.05 [ms]
Filter: CFC 60

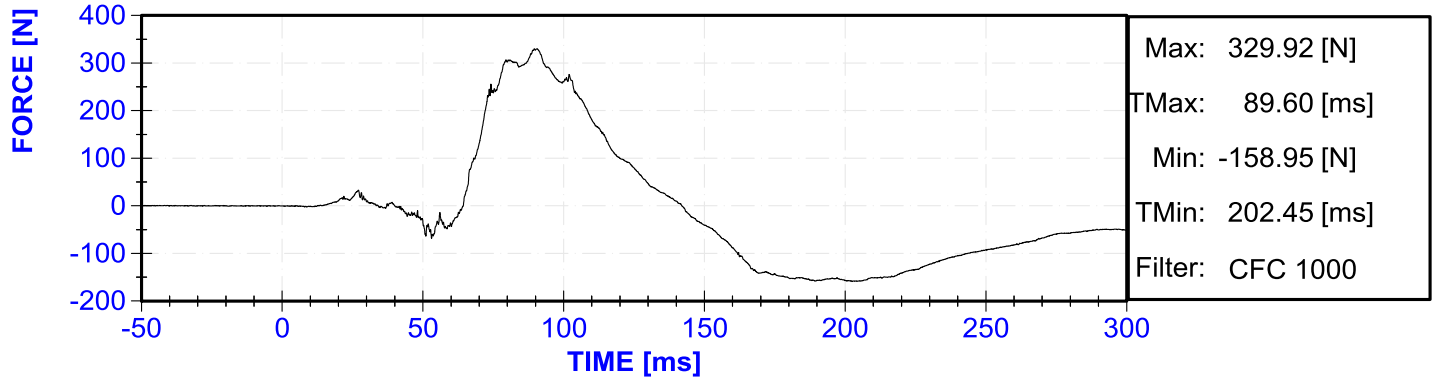
V2P1 HEAD CG WY



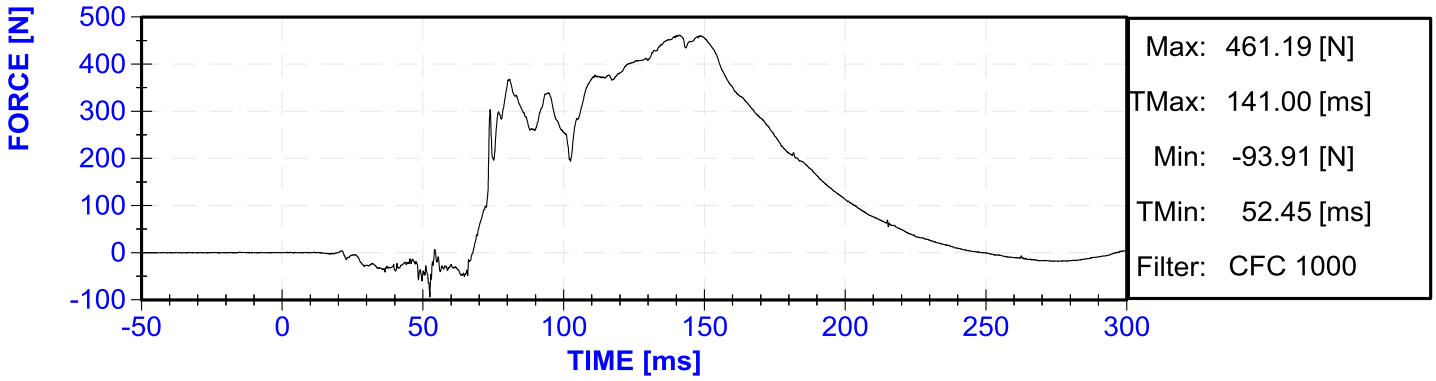
V2P1 HEAD CG WZ



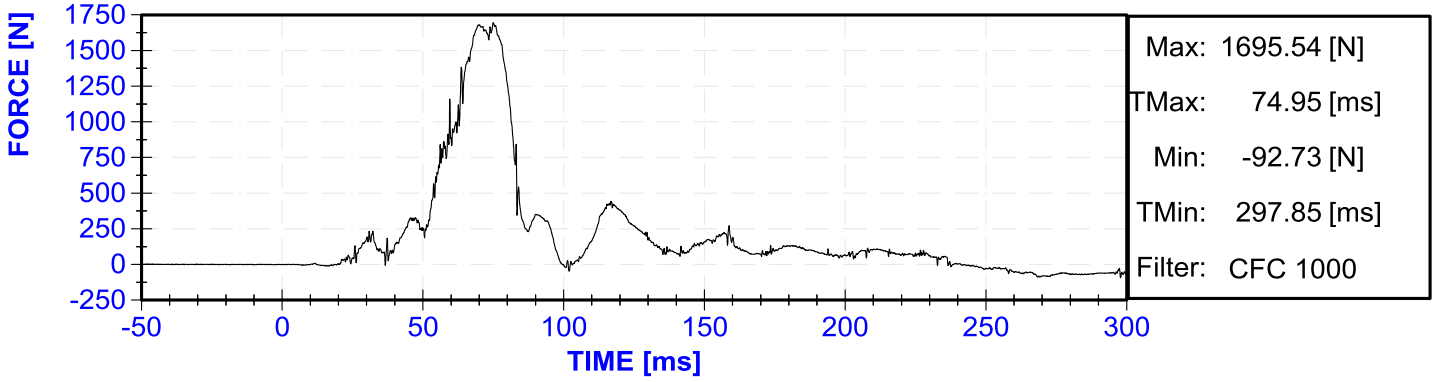
V2P1 NECK UPPER FX



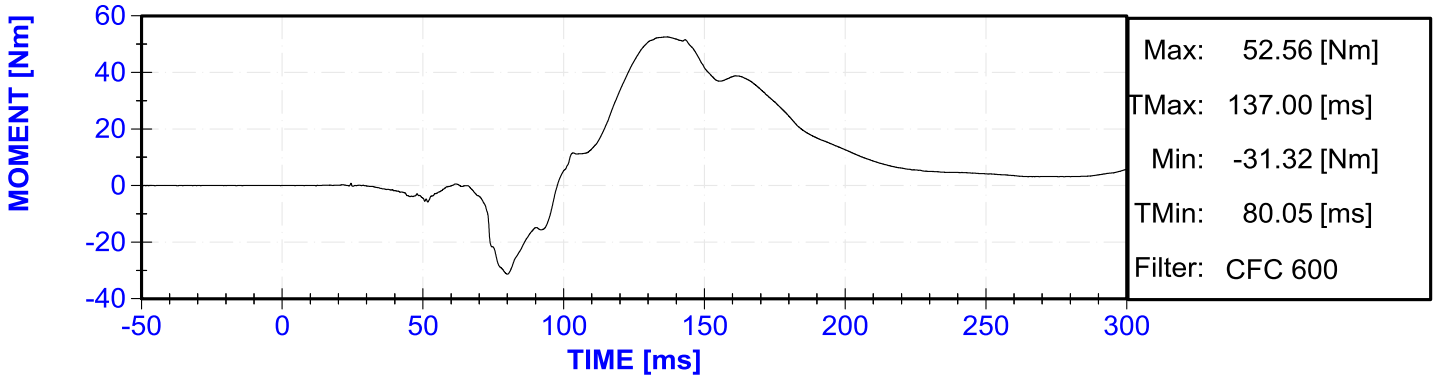
V2P1 NECK UPPER FY



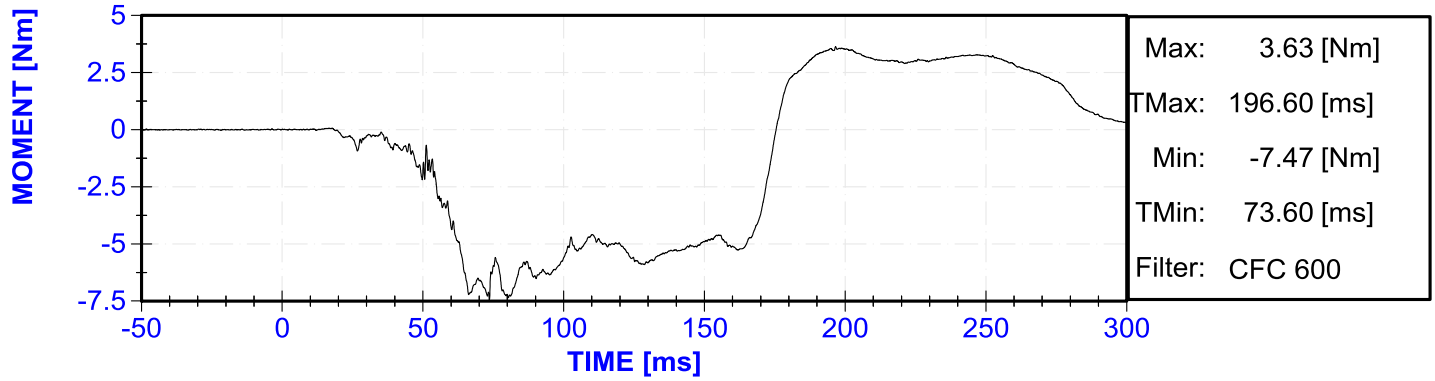
V2P1 NECK UPPER FZ



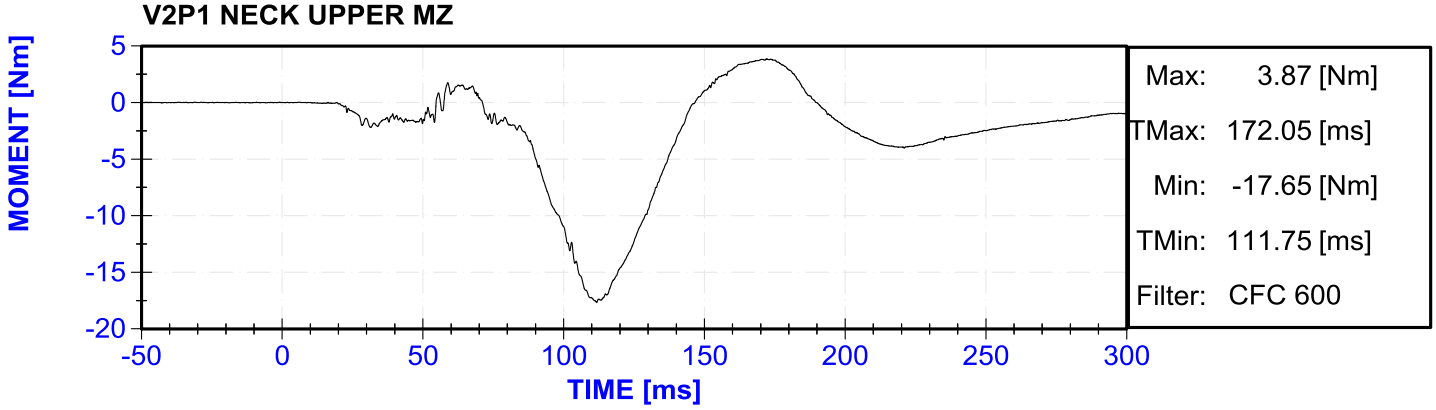
V2P1 NECK UPPER MX



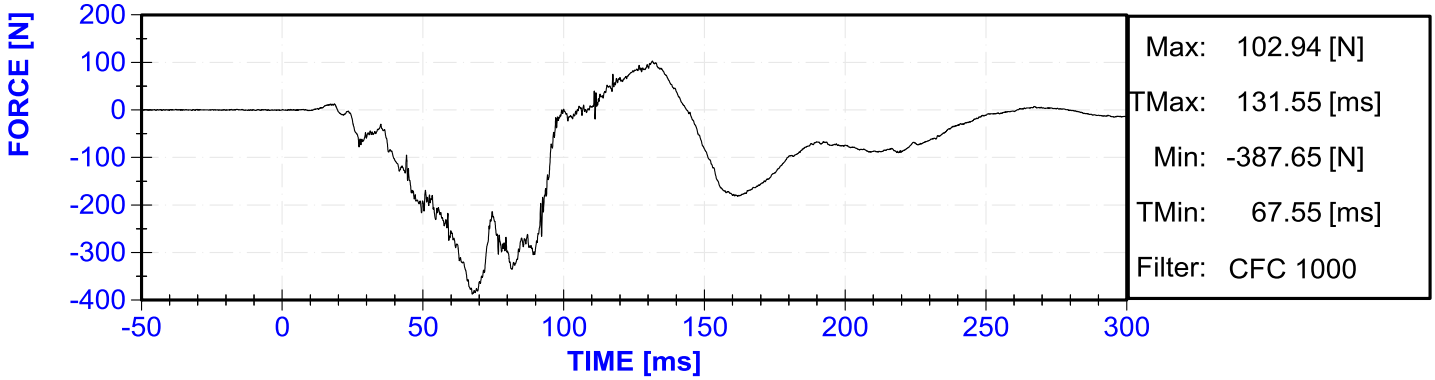
V2P1 NECK UPPER MY



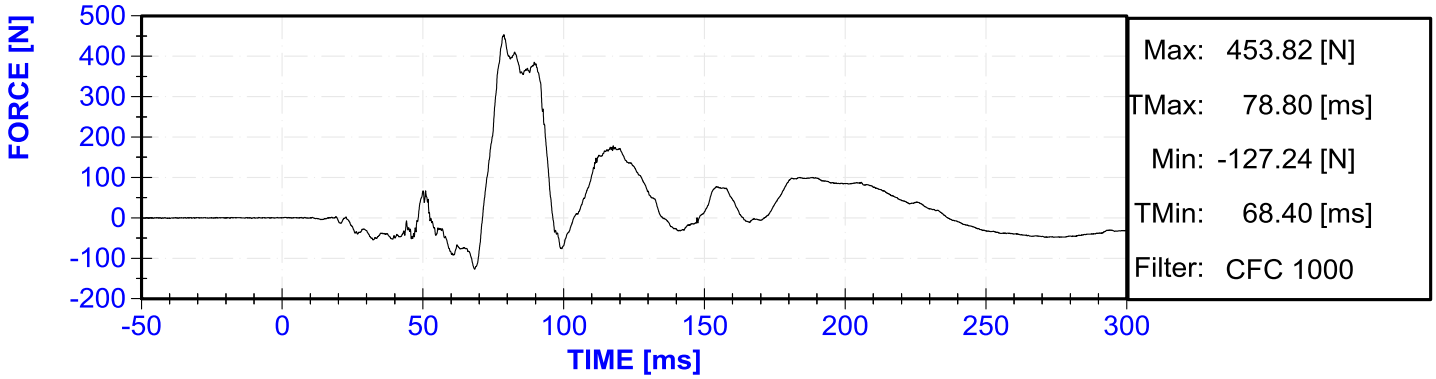
V2P1 NECK UPPER MZ



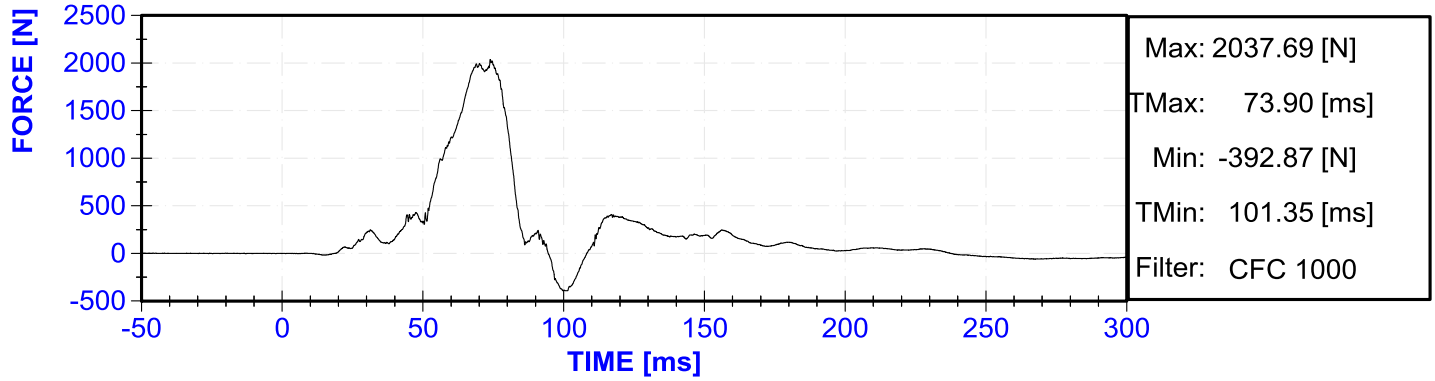
V2P1 NECK LOWER FX



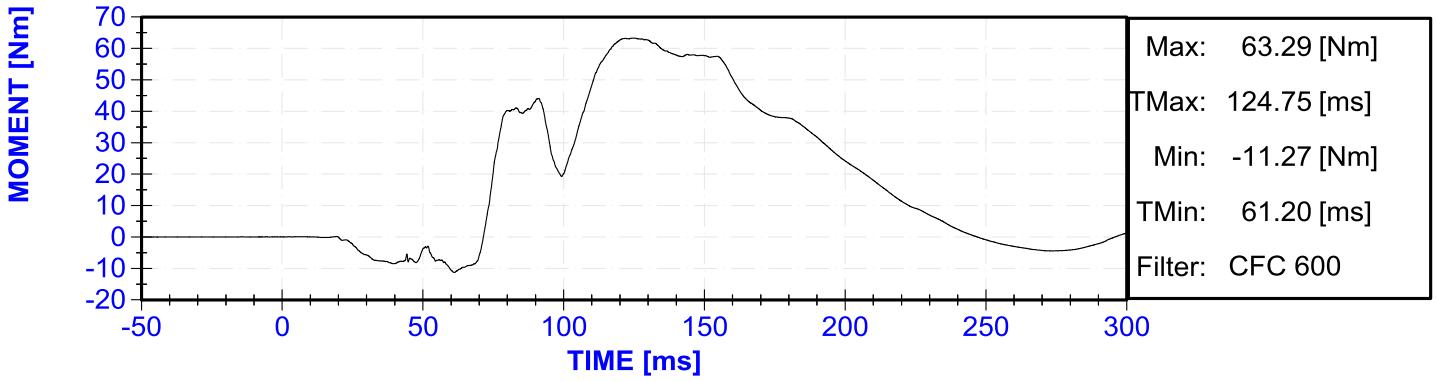
V2P1 NECK LOWER FY



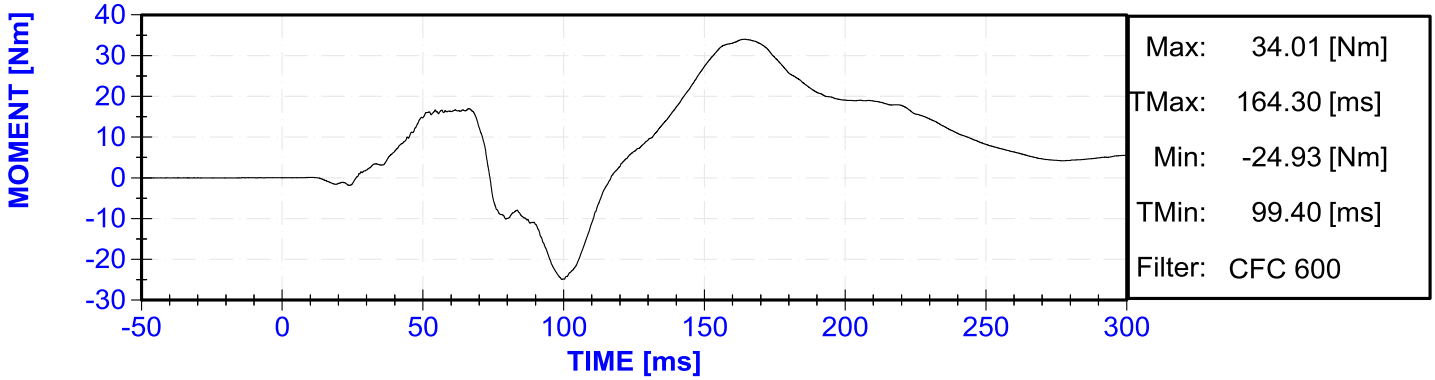
V2P1 NECK LOWER FZ



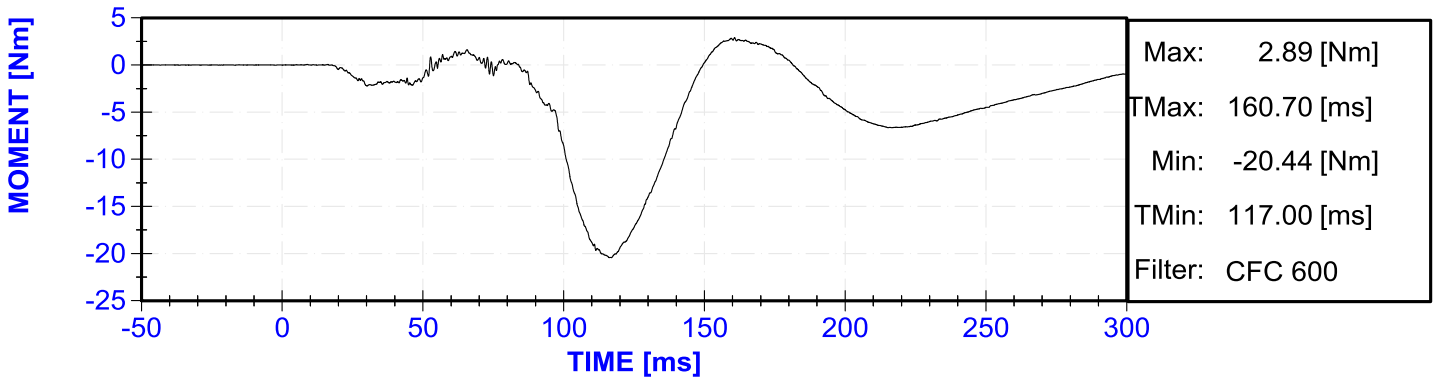
V2P1 NECK LOWER MX



V2P1 NECK LOWER MY

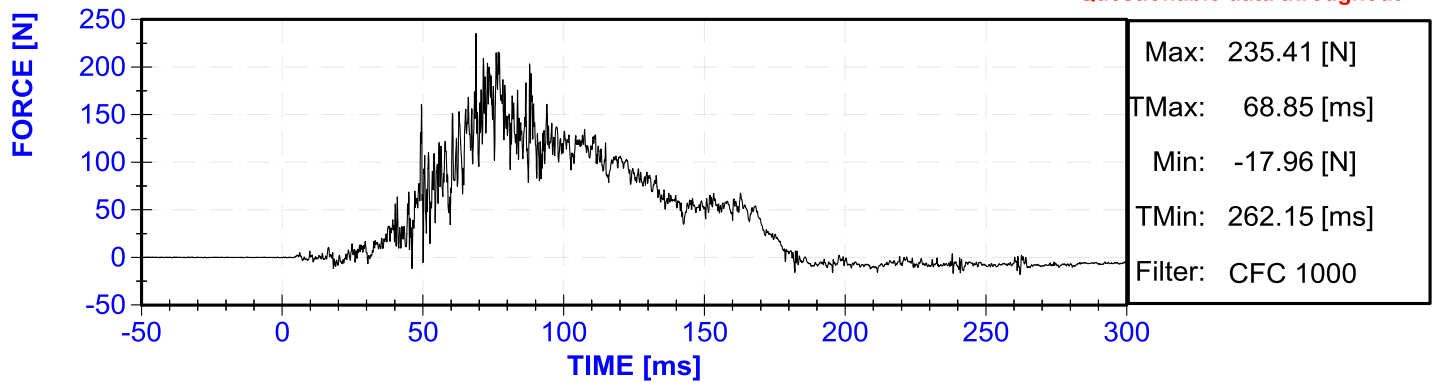


V2P1 NECK LOWER MZ



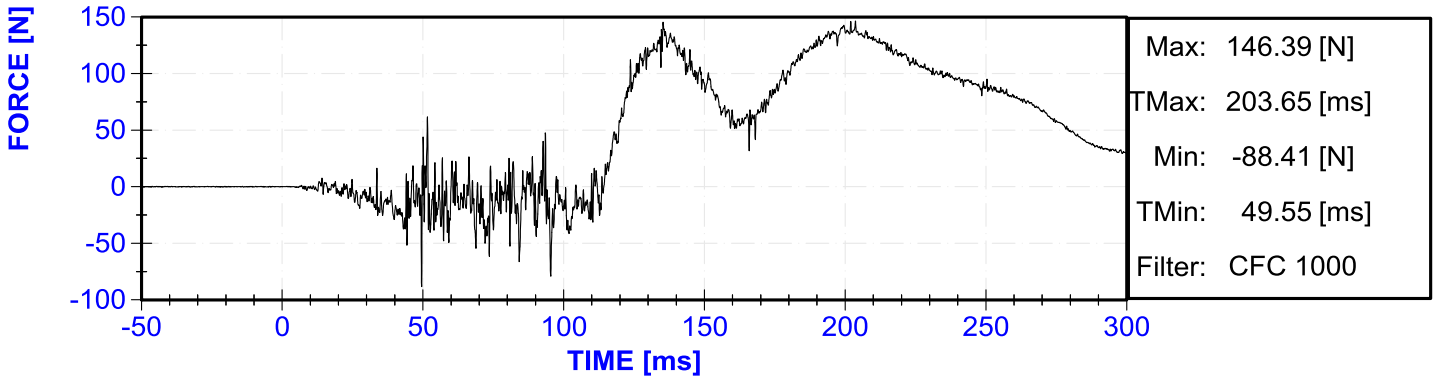
V2P1 NECK SPRING LOAD CELL - FRONT

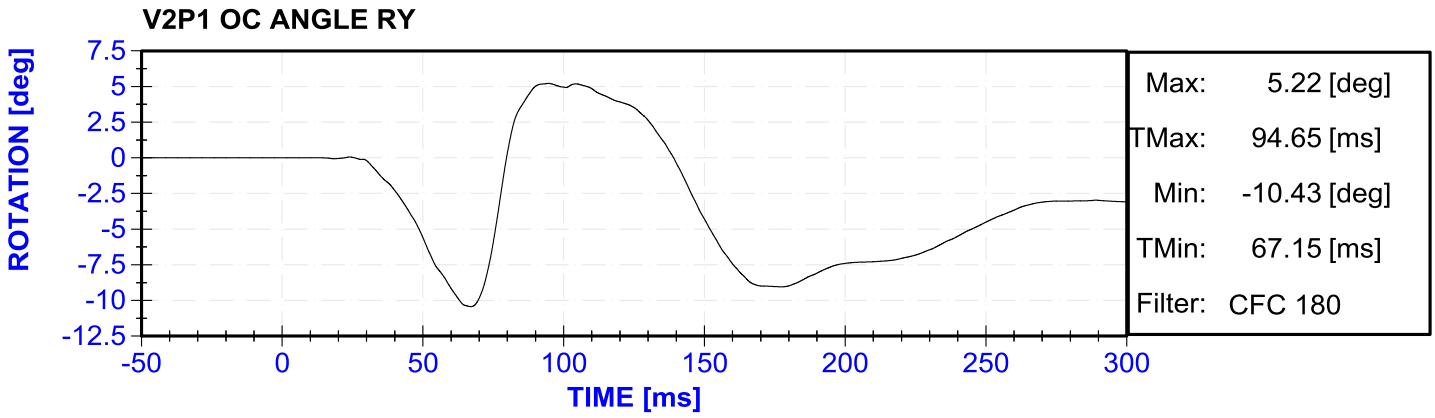
Questionable data throughout

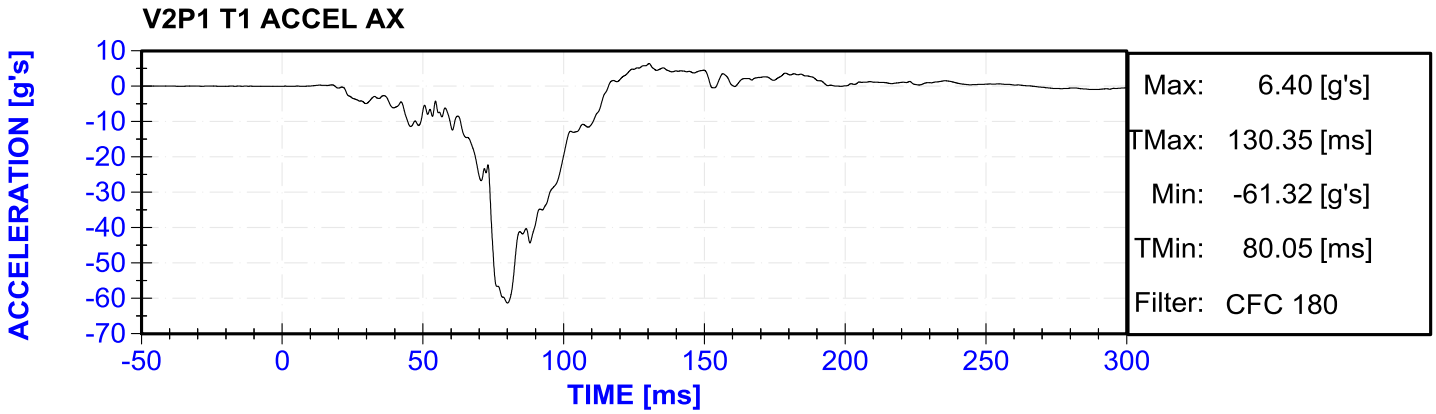


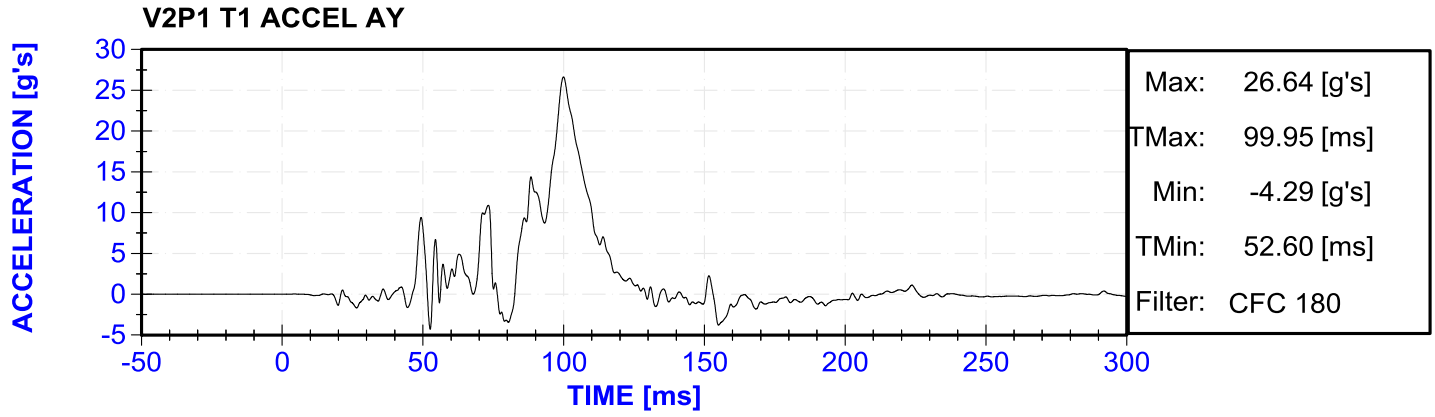
V2P1 NECK SPRING LOAD CELL - REAR & 95MS

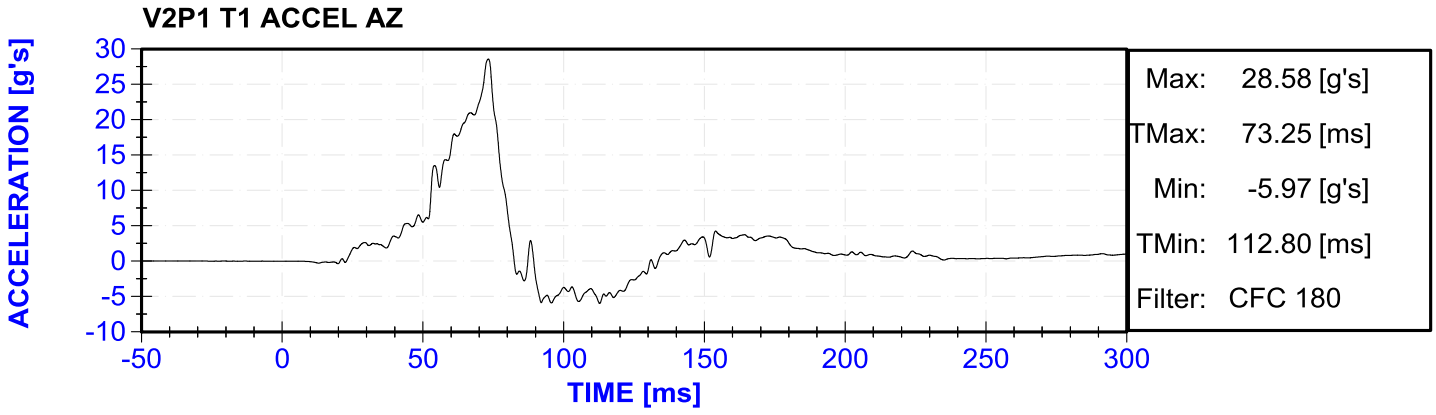
Questionable data from 50 to 95 ms



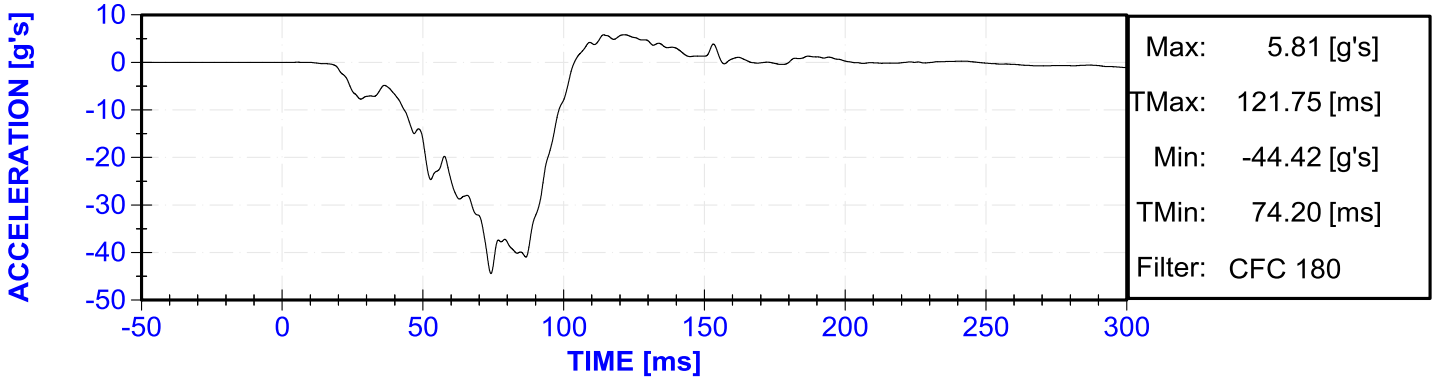

V2P1 OC ANGLE RY
ROTATION [deg]
7.5
5
2.5
0
-2.5
-5
-7.5
-10
-12.5
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 5.22 [deg]
TMax: 94.65 [ms]
Min: -10.43 [deg]
TMin: 67.15 [ms]
Filter: CFC 180


V2P1 T1 ACCEL AX
ACCELERATION [g's]
10
0
-10
-20
-30
-40
-50
-60
-70
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 6.40 [g's]
TMax: 130.35 [ms]
Min: -61.32 [g's]
TMin: 80.05 [ms]
Filter: CFC 180

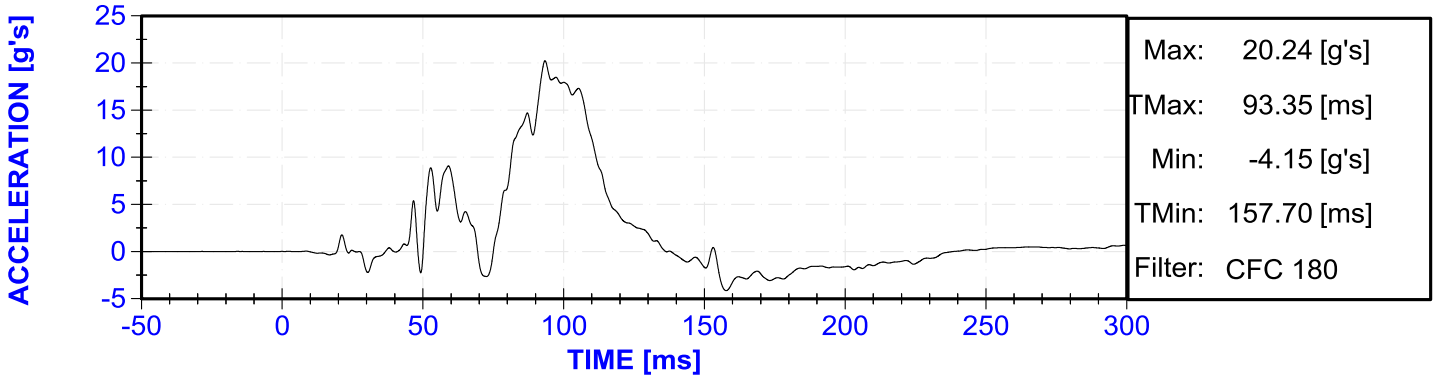

V2P1 T1 ACCEL AY
ACCELERATION [g's]
30
25
20
15
10
5
0
-5
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 26.64 [g's]
TMax: 99.95 [ms]
Min: -4.29 [g's]
TMin: 52.60 [ms]
Filter: CFC 180


V2P1 T1 ACCEL AZ
ACCELERATION [g's]
30
25
20
15
10
5
0
-5
-10
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 28.58 [g's]
TMax: 73.25 [ms]
Min: -5.97 [g's]
TMin: 112.80 [ms]
Filter: CFC 180

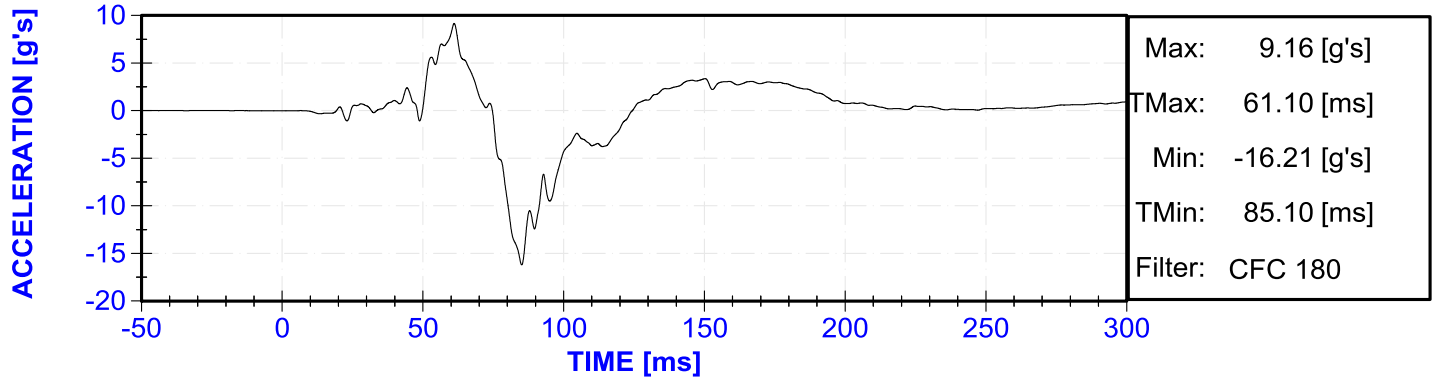
V2P1 T6 ACCEL AX



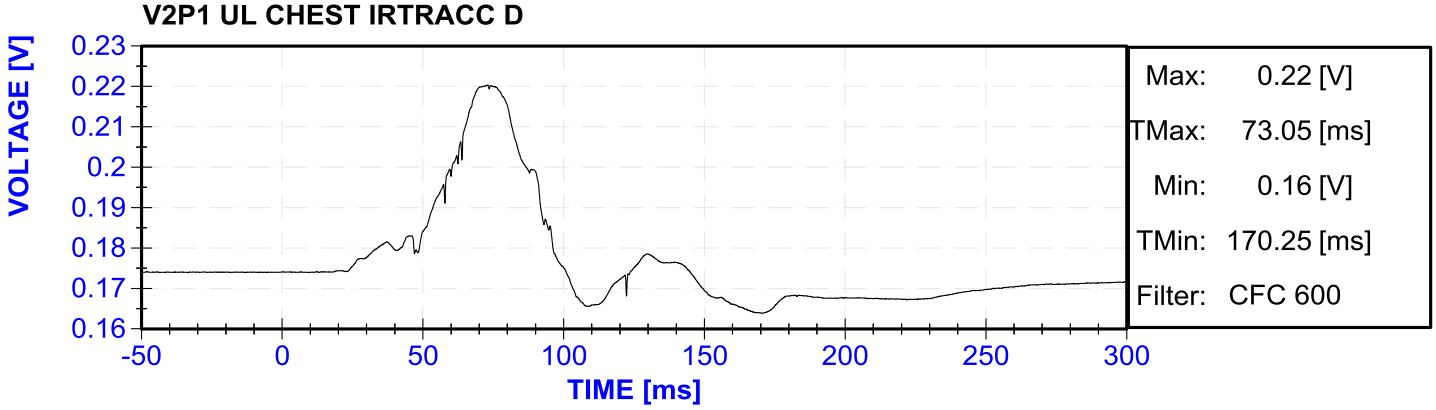
V2P1 T6 ACCEL AY

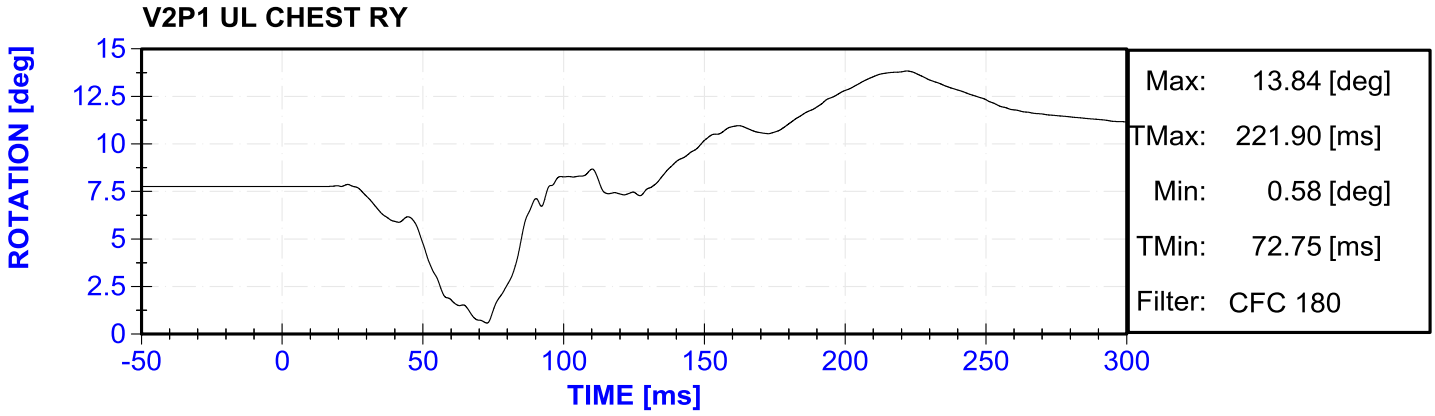


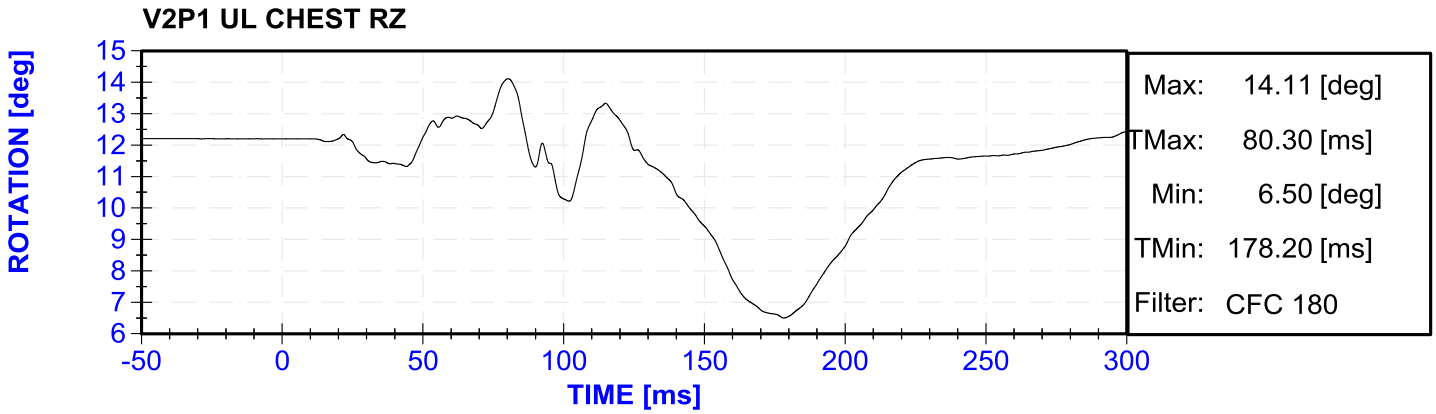
V2P1 T6 ACCEL AZ

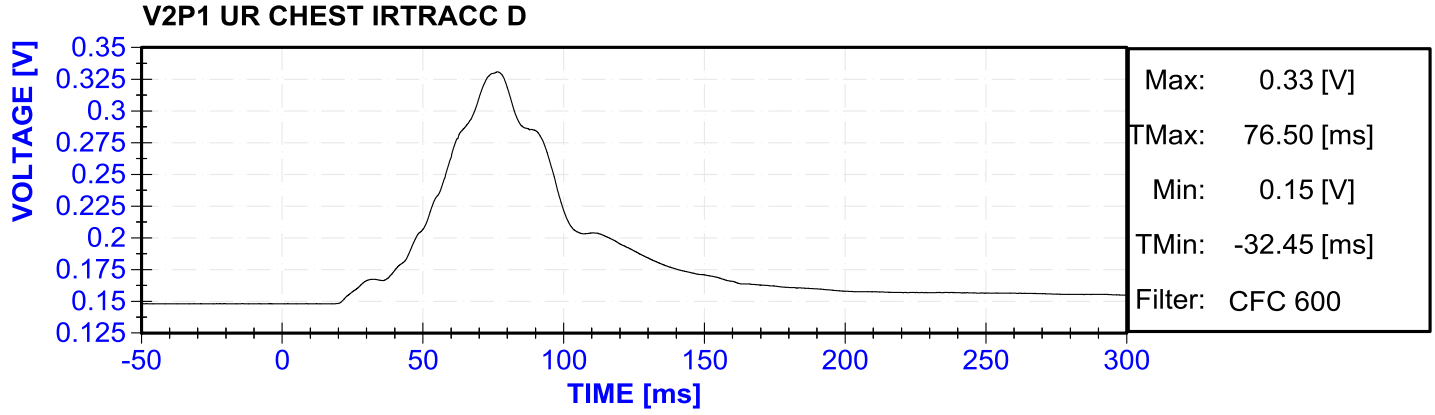


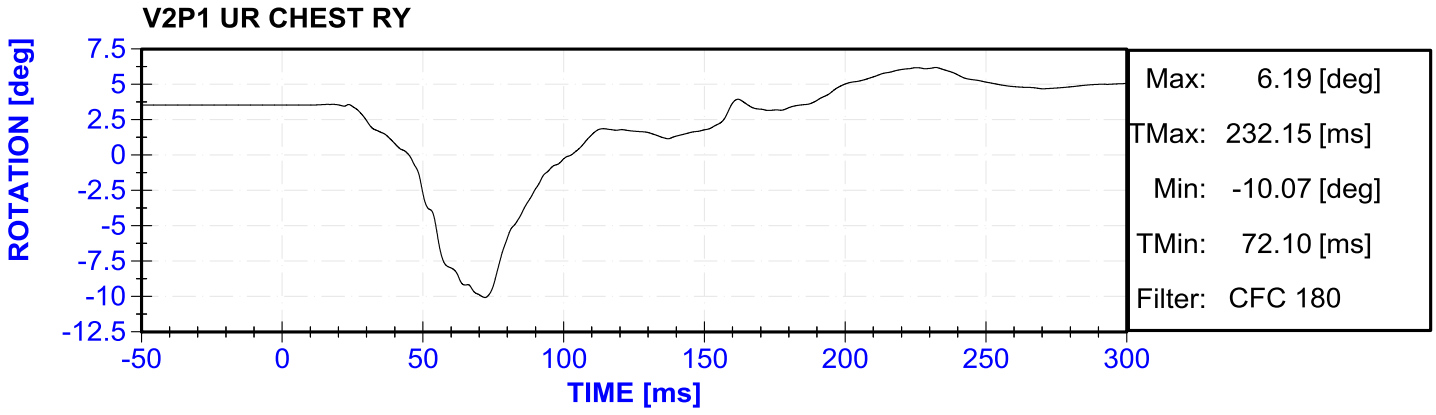
V2P1 UL CHEST IRTRACC D



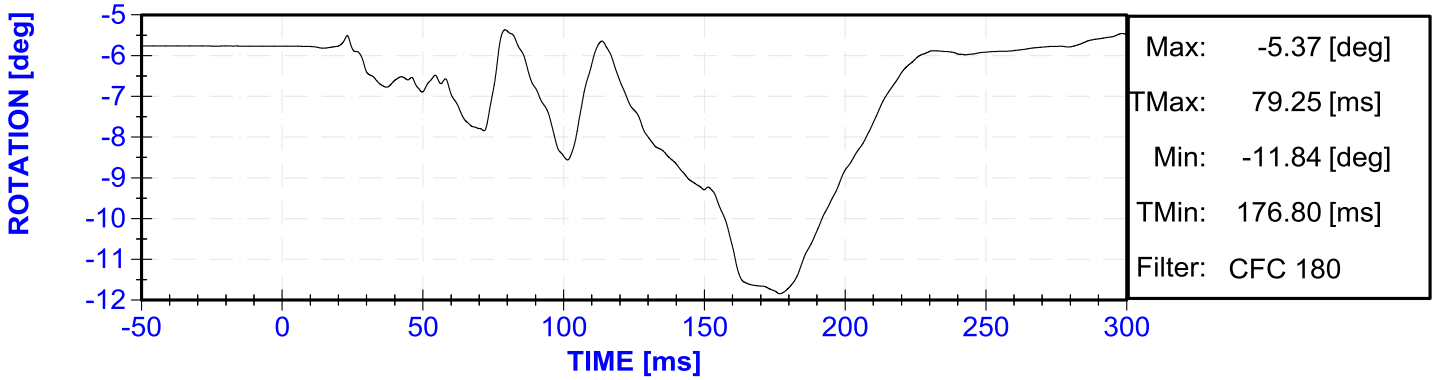

V2P1 UL CHEST RY
ROTATION [deg]
15
12.5
10
7.5
5
2.5
0
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 13.84 [deg]
TMax: 221.90 [ms]
Min: 0.58 [deg]
TMin: 72.75 [ms]
Filter: CFC 180


V2P1 UL CHEST RZ
ROTATION [deg]
15
14
13
12
11
10
9
8
7
6
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 14.11 [deg]
TMax: 80.30 [ms]
Min: 6.50 [deg]
TMin: 178.20 [ms]
Filter: CFC 180

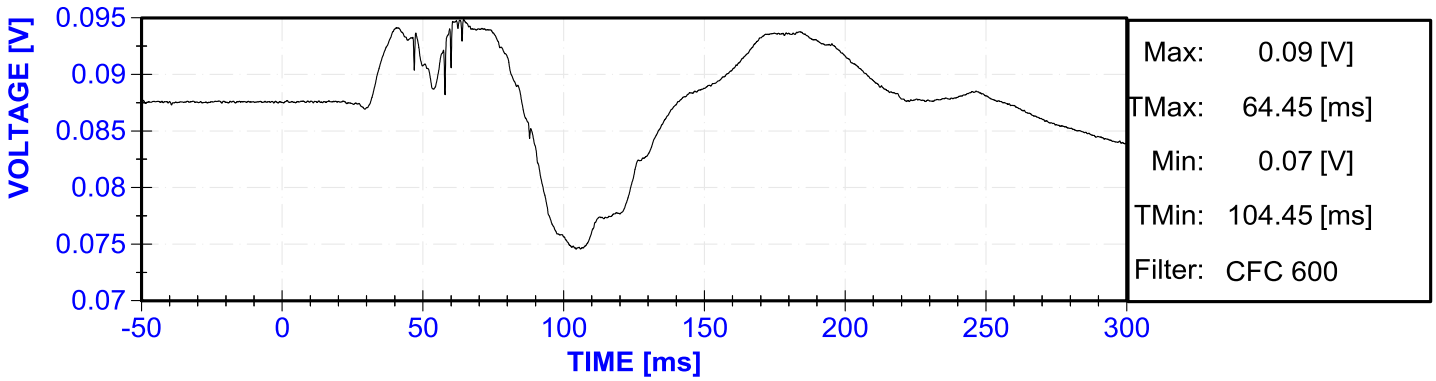

V2P1 UR CHEST IRTRACC D
VOLTAGE [V]
0.35
0.325
0.3
0.275
0.25
0.225
0.2
0.175
0.15
0.125
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 0.33 [V]
TMax: 76.50 [ms]
Min: 0.15 [V]
TMin: -32.45 [ms]
Filter: CFC 600


V2P1 UR CHEST RY
ROTATION [deg]
7.5
5
2.5
0
-2.5
-5
-7.5
-10
-12.5
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 6.19 [deg]
TMax: 232.15 [ms]
Min: -10.07 [deg]
TMin: 72.10 [ms]
Filter: CFC 180

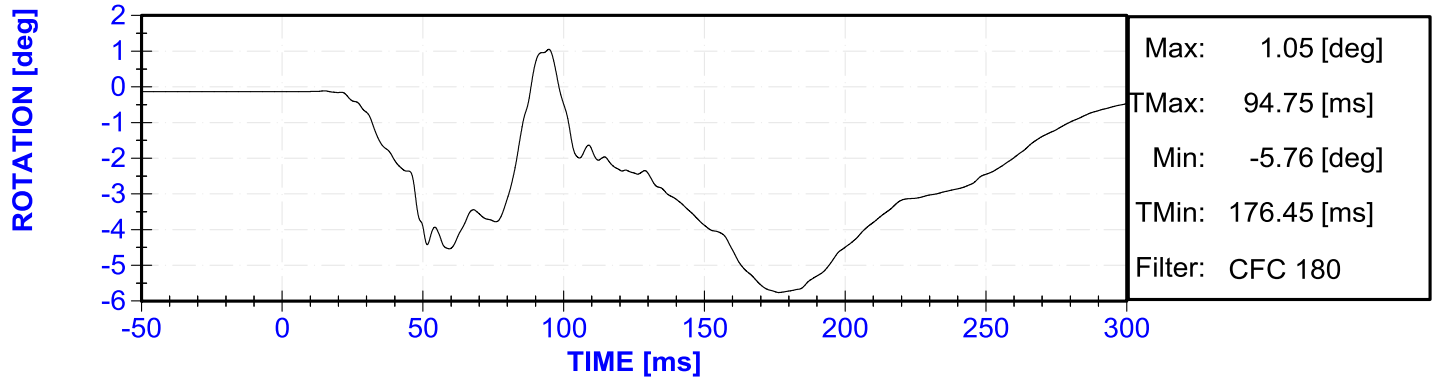
V2P1 UR CHEST RZ



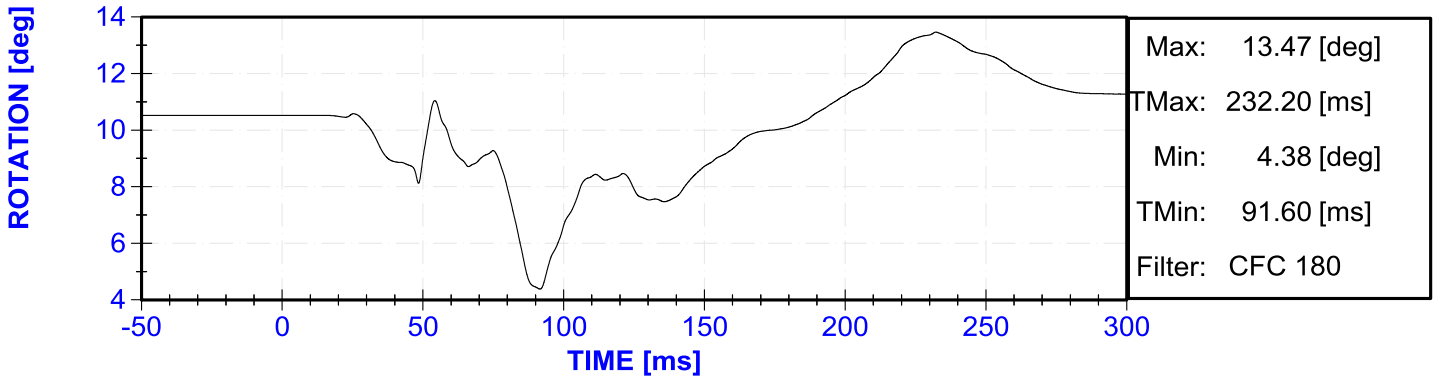
V2P1 LL CHEST IRTRACC D



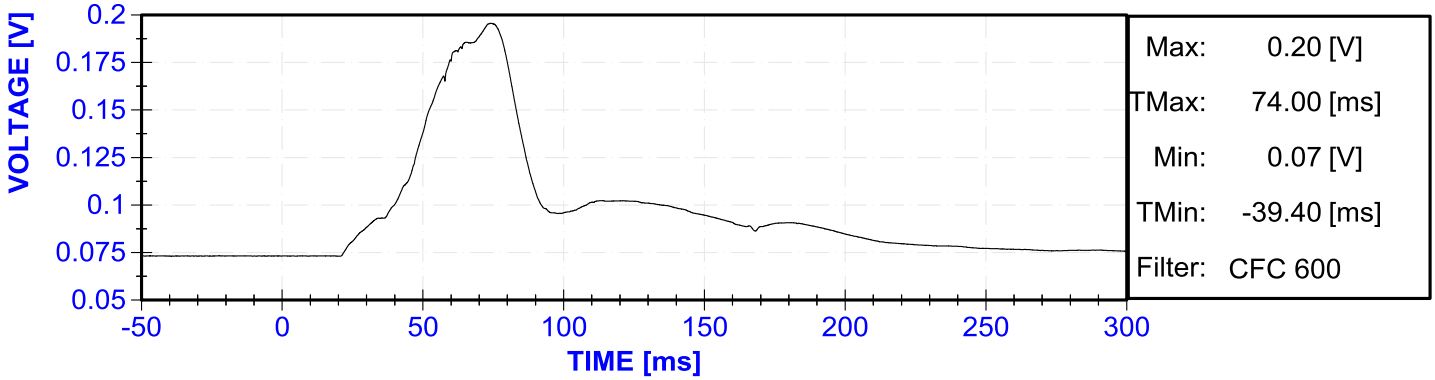
V2P1 LL CHEST RY



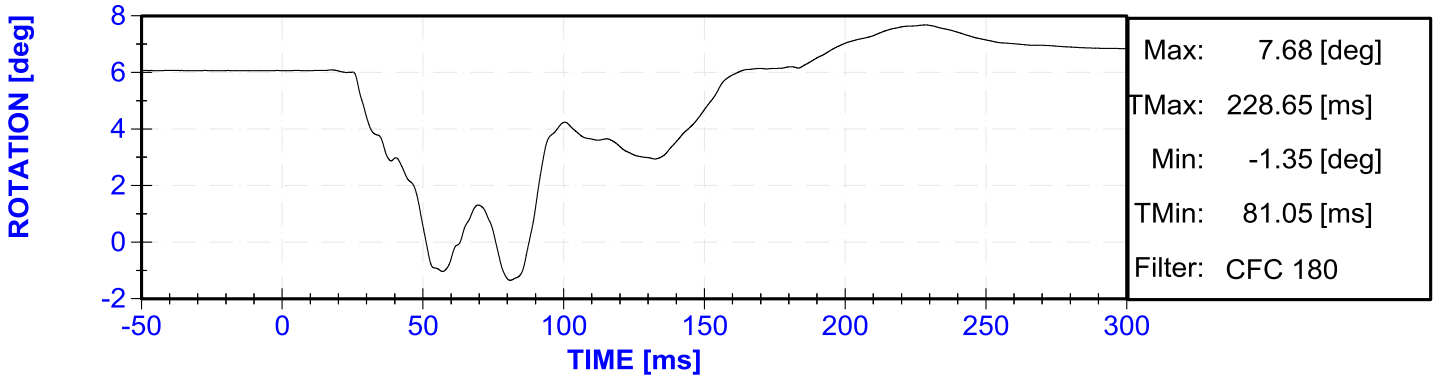
V2P1 LL CHEST RZ



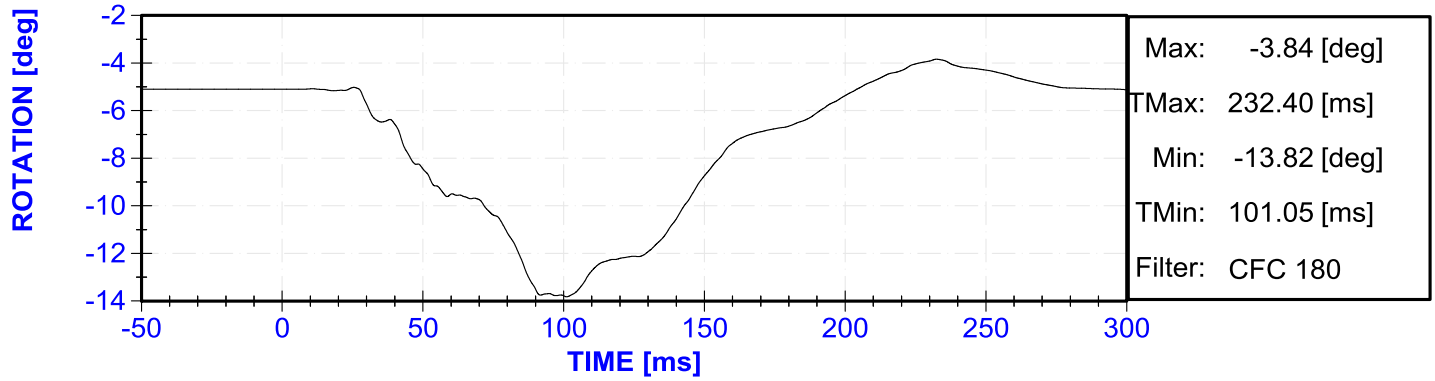
V2P1 LR CHEST IRTRACC D



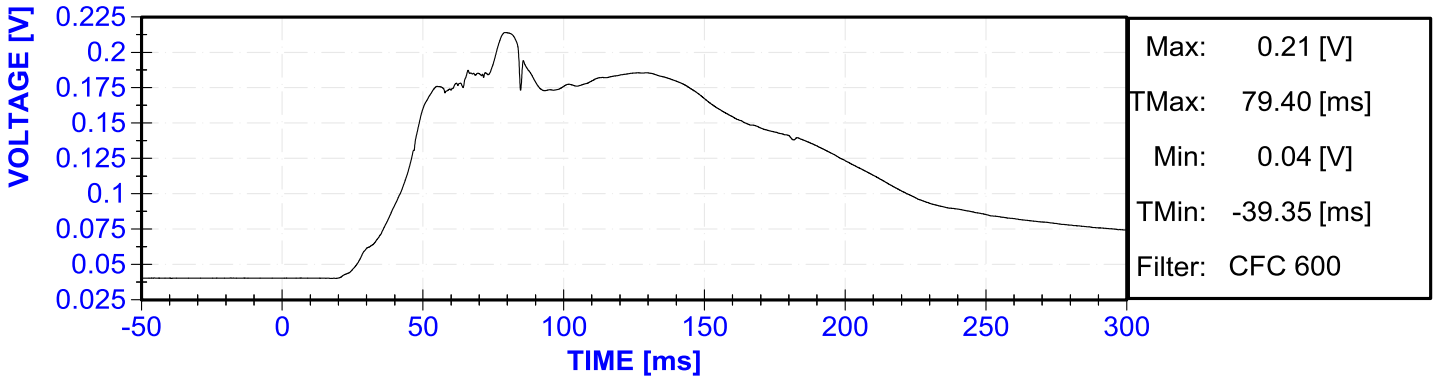
V2P1 LR CHEST RY

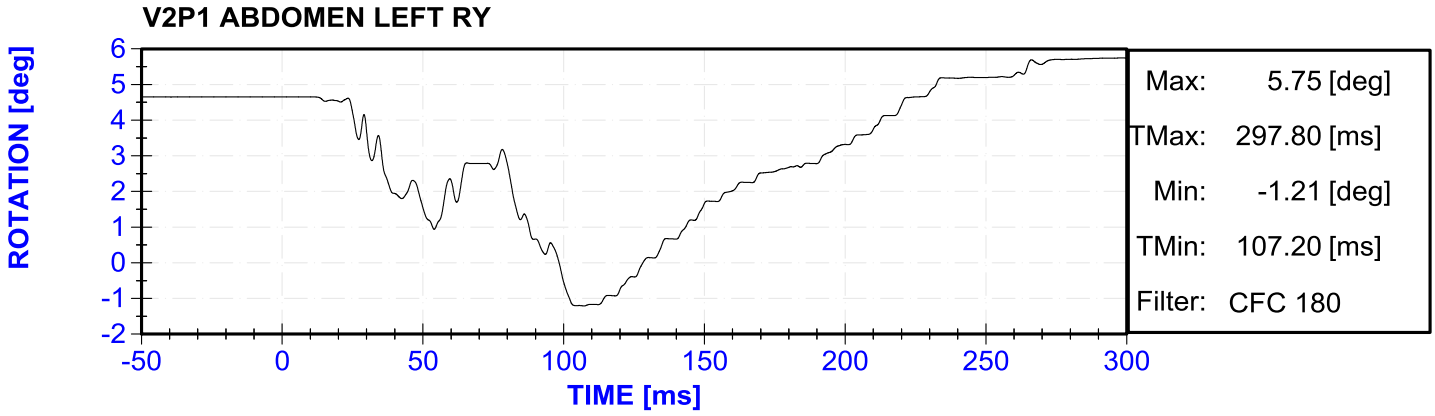


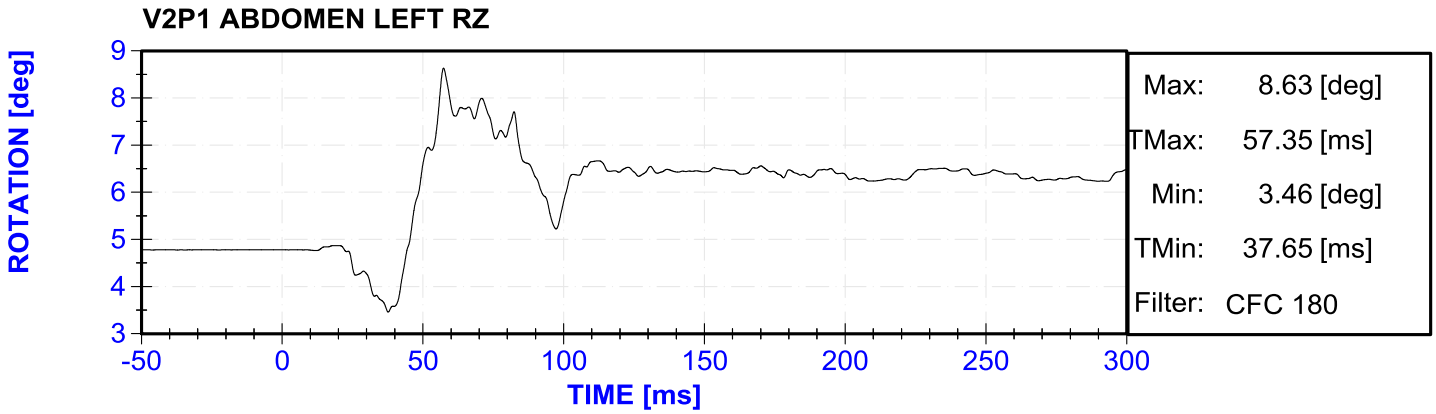
V2P1 LR CHEST RZ

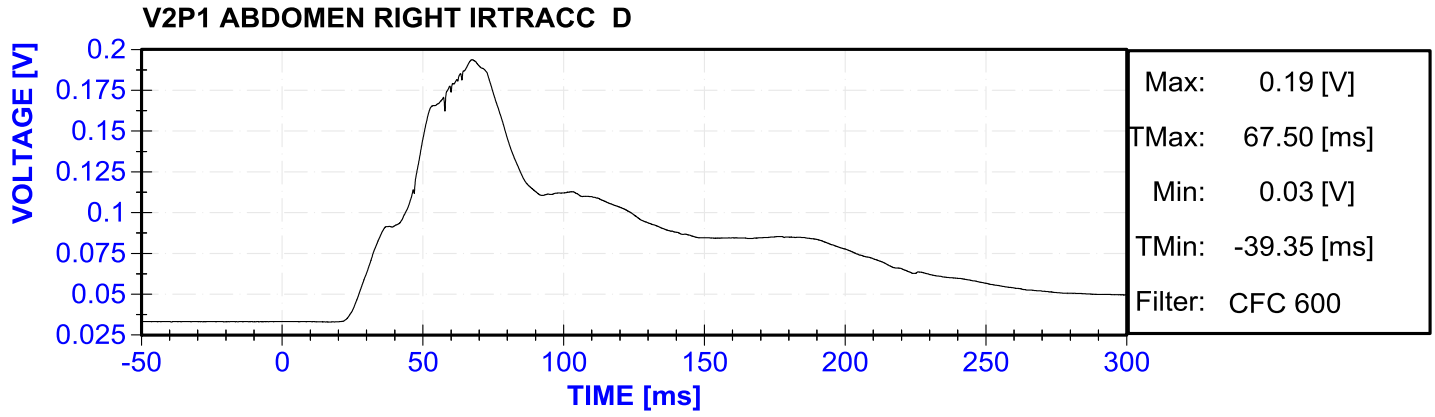


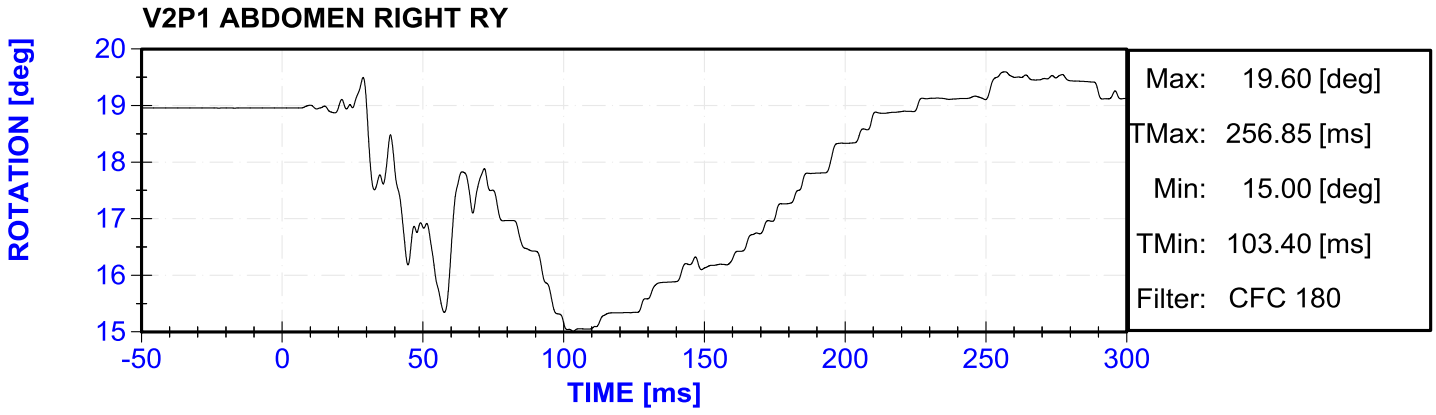
V2P1 ABDOMEN LEFT IRTRACC D



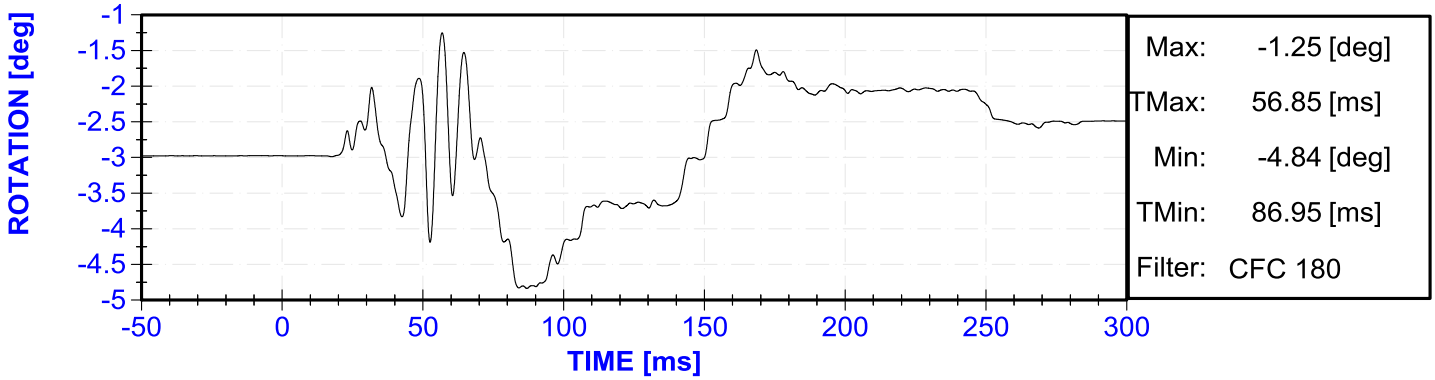

V2P1 ABDOMEN LEFT RY
ROTATION [deg]
TIME [ms]
Max: 5.75 [deg]
TMax: 297.80 [ms]
Min: -1.21 [deg]
TMin: 107.20 [ms]
Filter: CFC 180


V2P1 ABDOMEN LEFT RZ
ROTATION [deg]
TIME [ms]
Max: 8.63 [deg]
TMax: 57.35 [ms]
Min: 3.46 [deg]
TMin: 37.65 [ms]
Filter: CFC 180

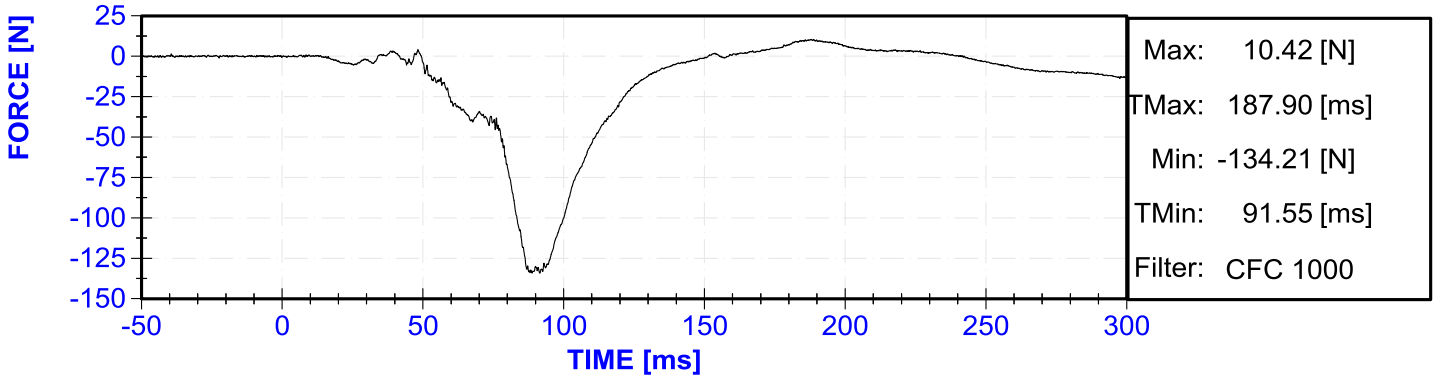

V2P1 ABDOMEN RIGHT IRTRACC D
VOLTAGE [V]
TIME [ms]
Max: 0.19 [V]
TMax: 67.50 [ms]
Min: 0.03 [V]
TMin: -39.35 [ms]
Filter: CFC 600


V2P1 ABDOMEN RIGHT RY
ROTATION [deg]
TIME [ms]
Max: 19.60 [deg]
TMax: 256.85 [ms]
Min: 15.00 [deg]
TMin: 103.40 [ms]
Filter: CFC 180

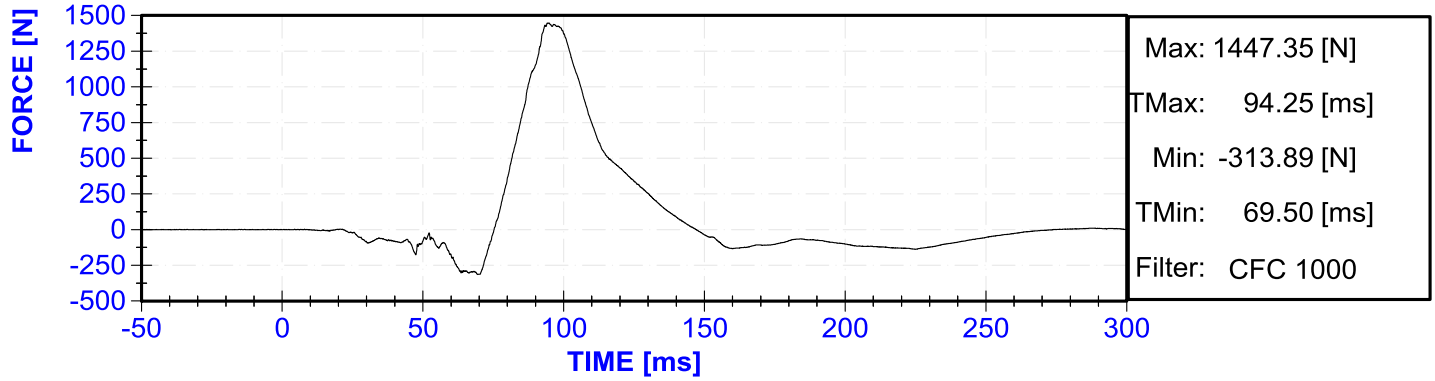
V2P1 ABDOMEN RIGHT RZ



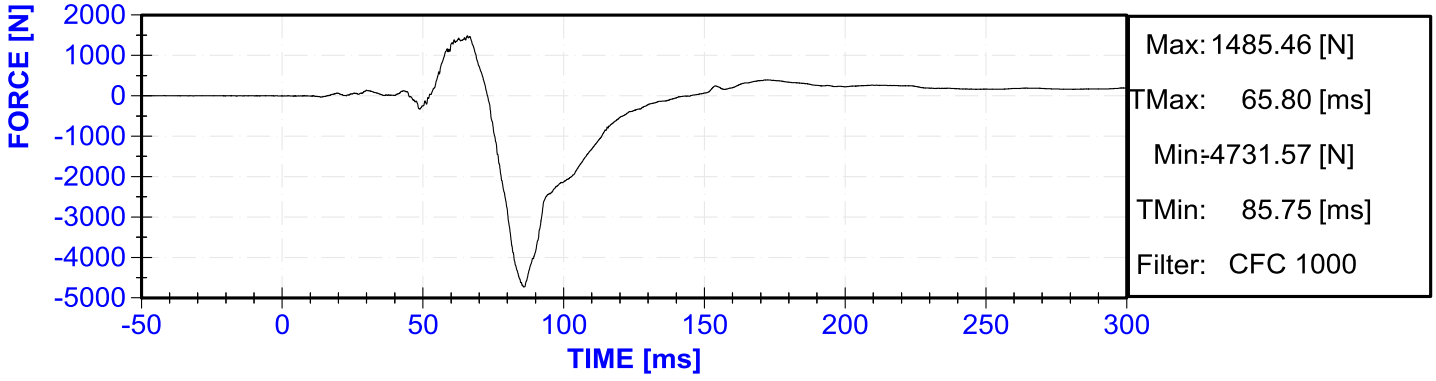
V2P1 SPINE LOWER FX



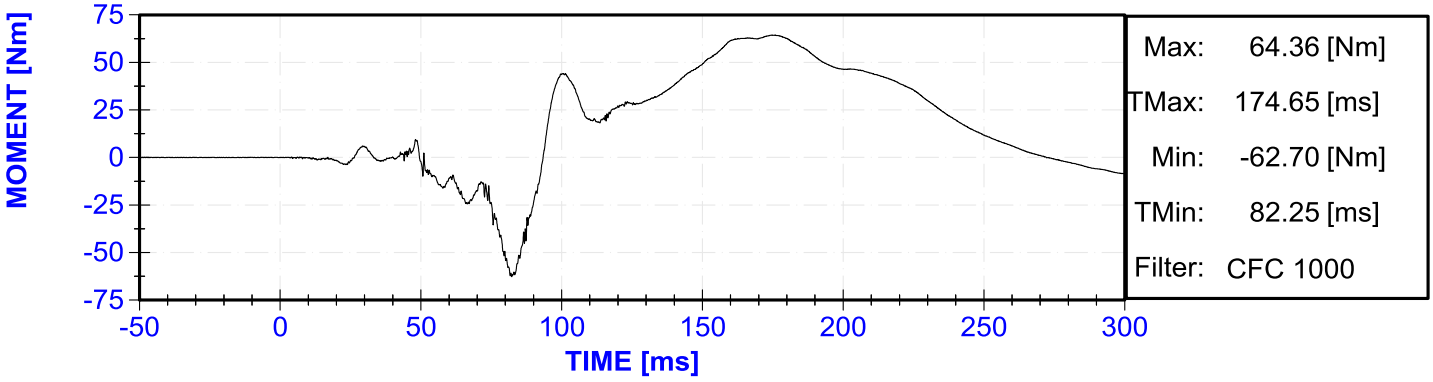
V2P1 SPINE LOWER FY



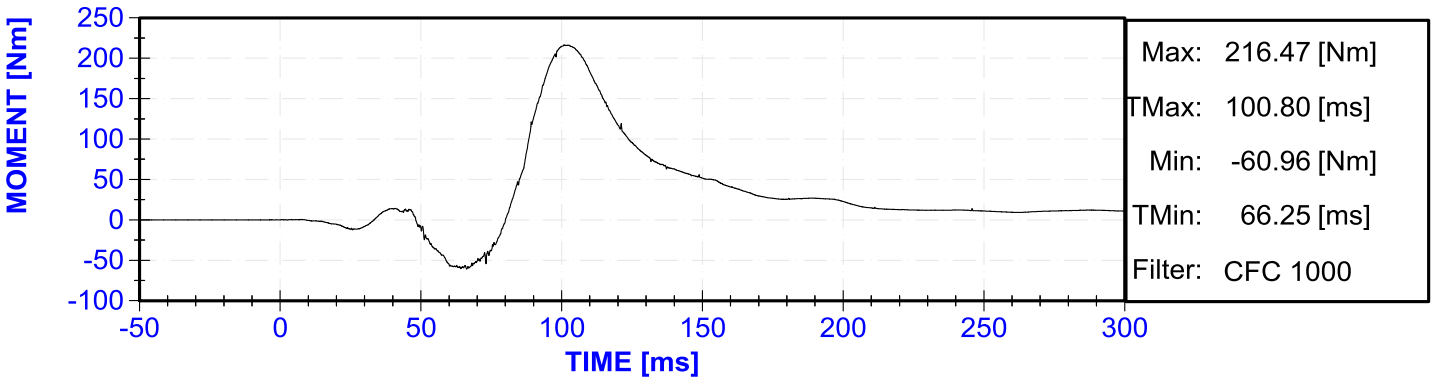
V2P1 SPINE LOWER FZ



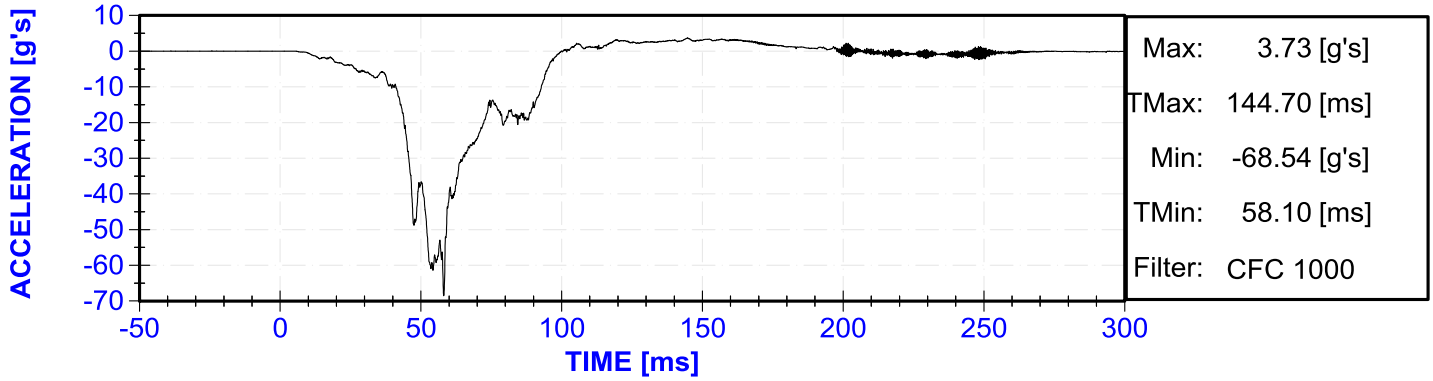
V2P1 SPINE LOWER MX



V2P1 SPINE LOWER MY

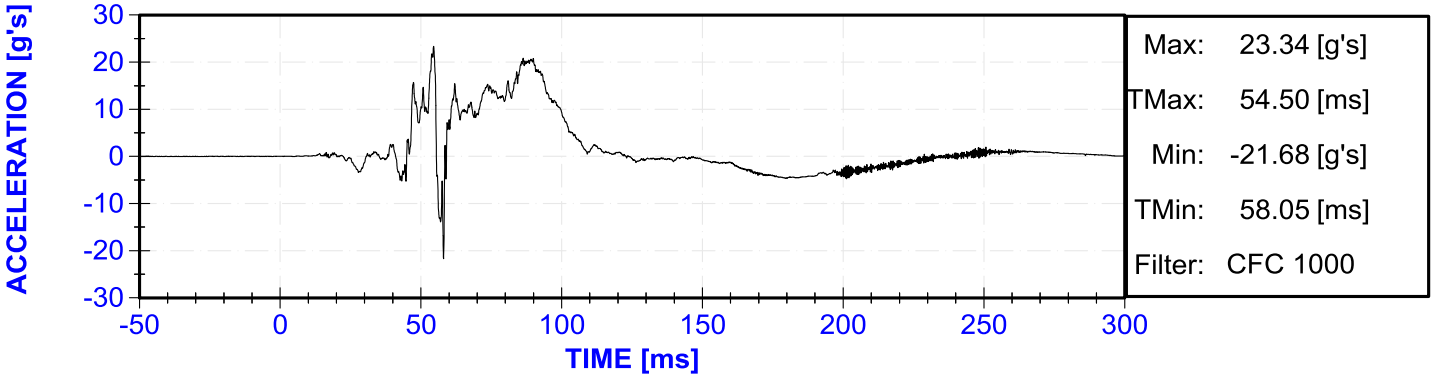


V2P1 PELVIS CG AX

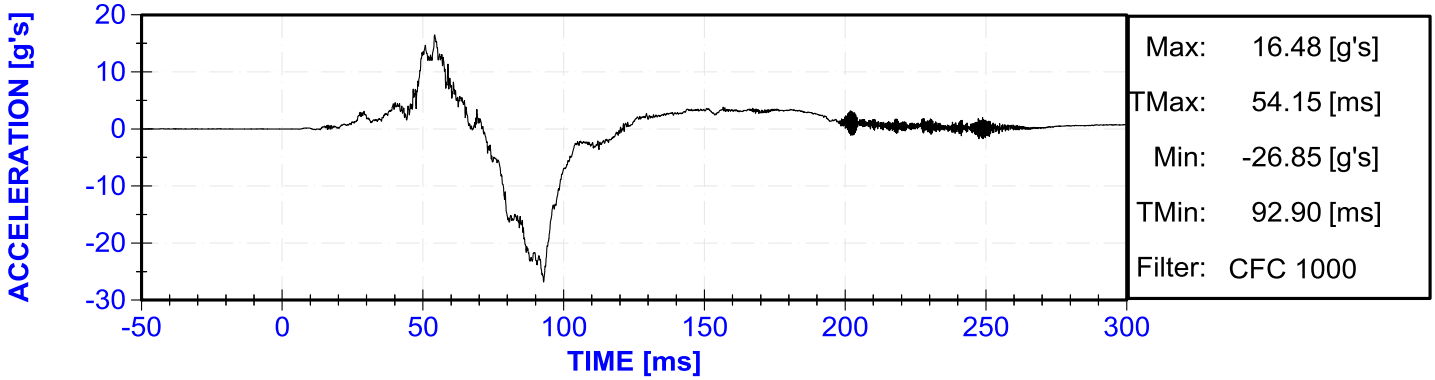


V2P1 PELVIS CG AY

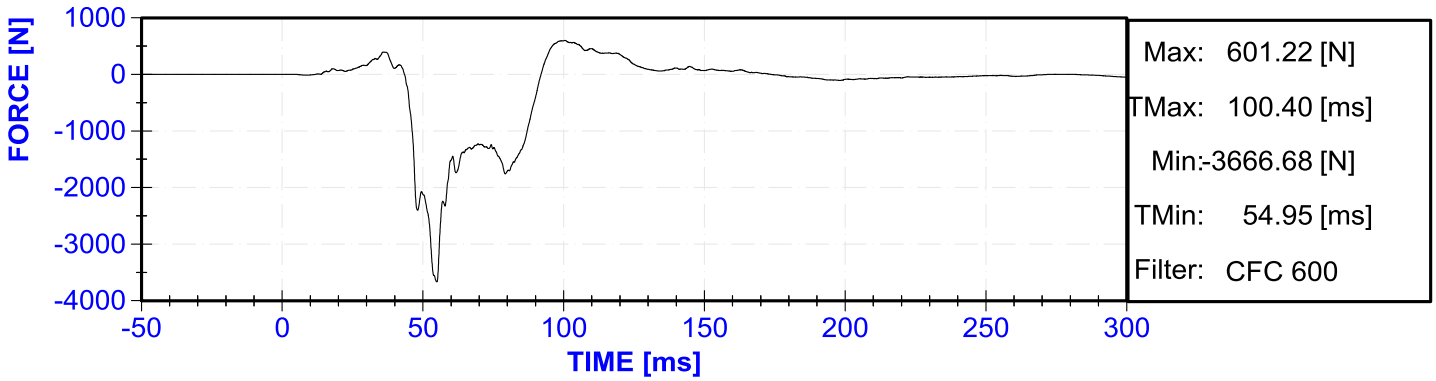
Questionable spike at 58 ms



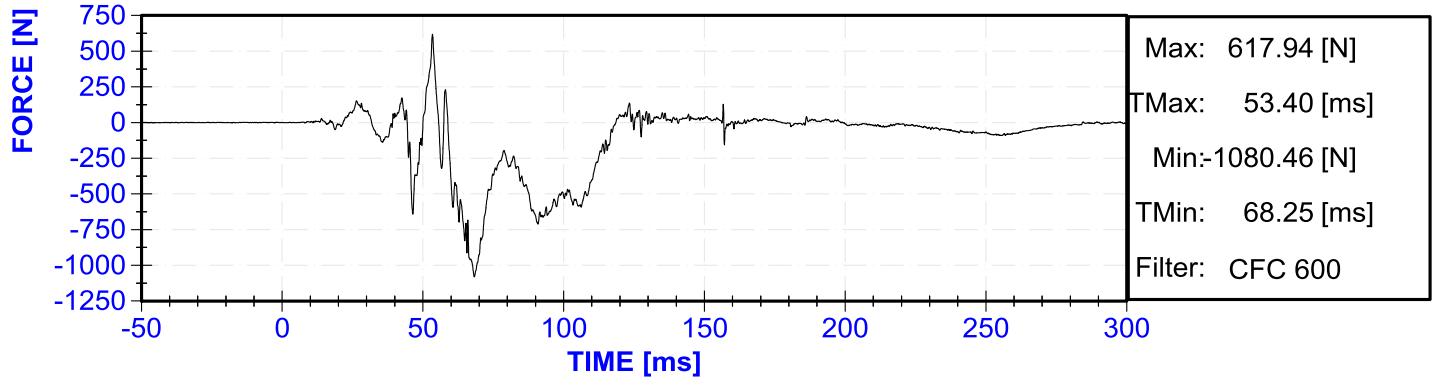
V2P1 PELVIS CG AZ



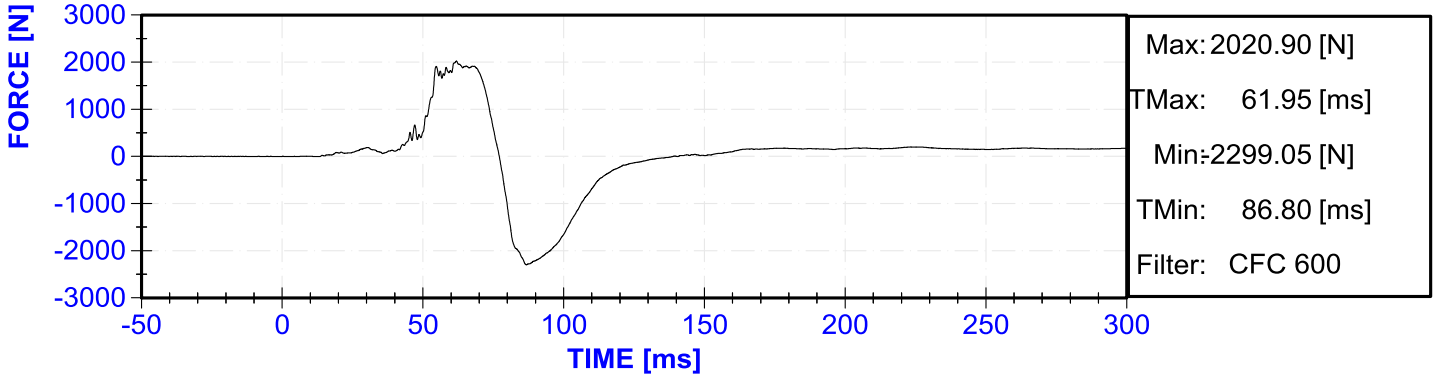
V2P1 PELVIS ACETABULUM LEFT FX



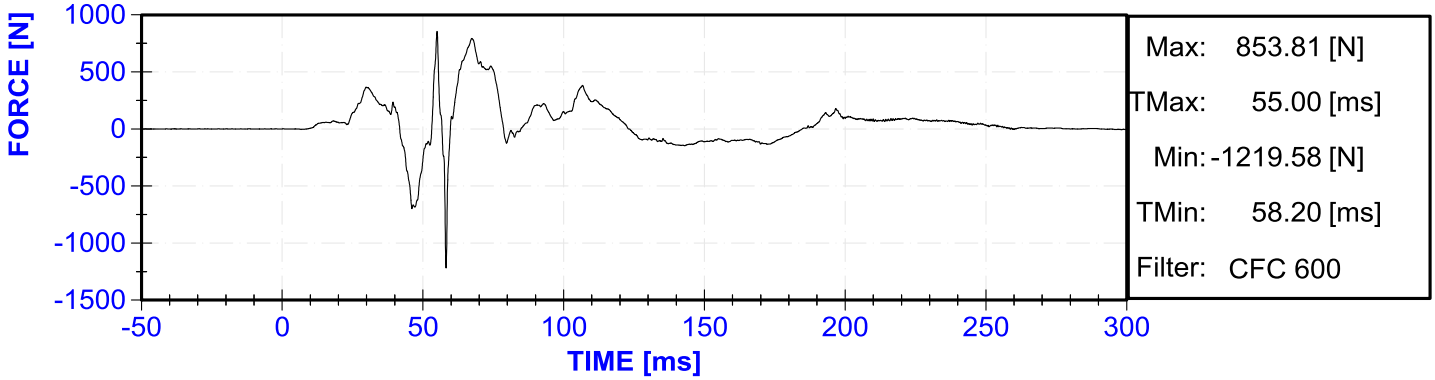
V2P1 PELVIS ACETABULUM LEFT FY



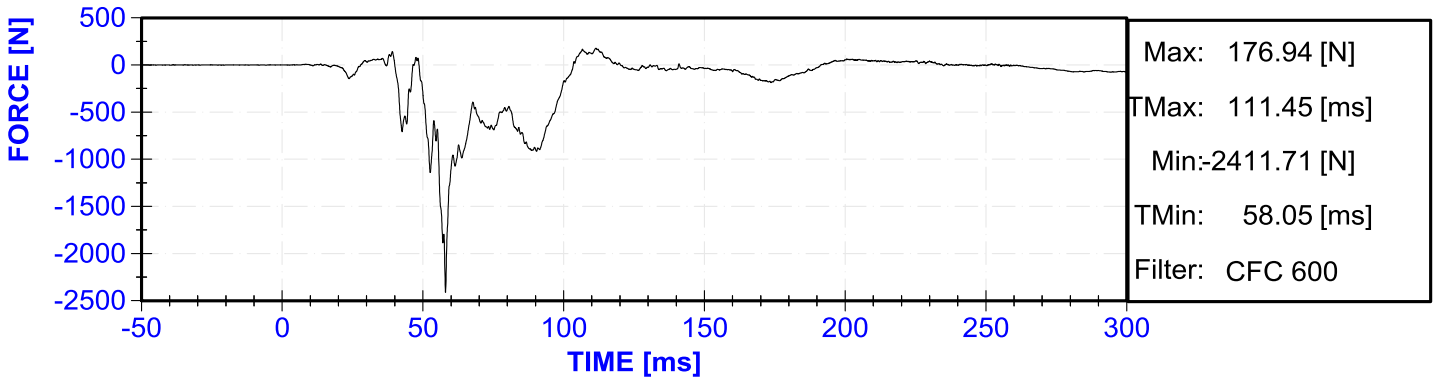
V2P1 PELVIS ACETABULUM LEFT FZ



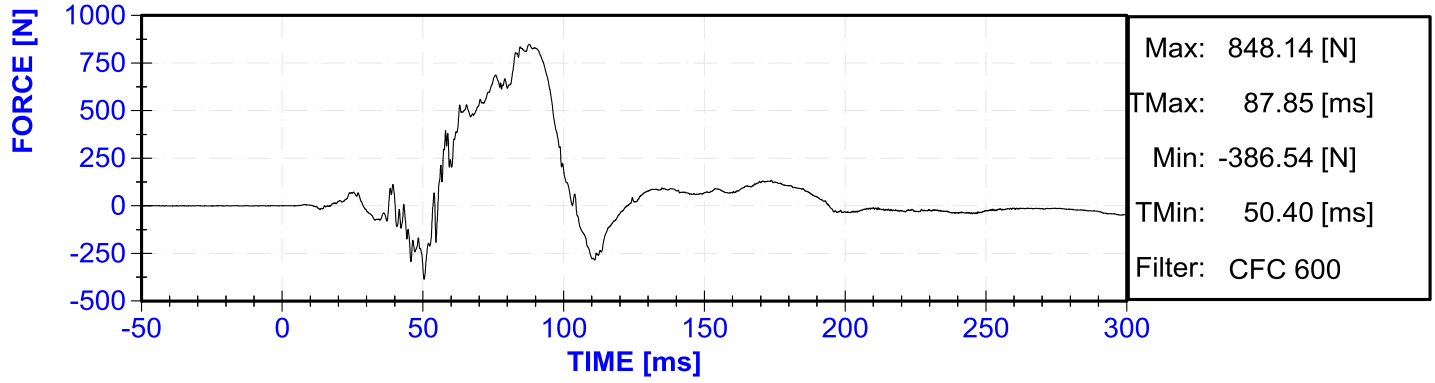
V2P1 PELVIS ACETABULUM RIGHT FX



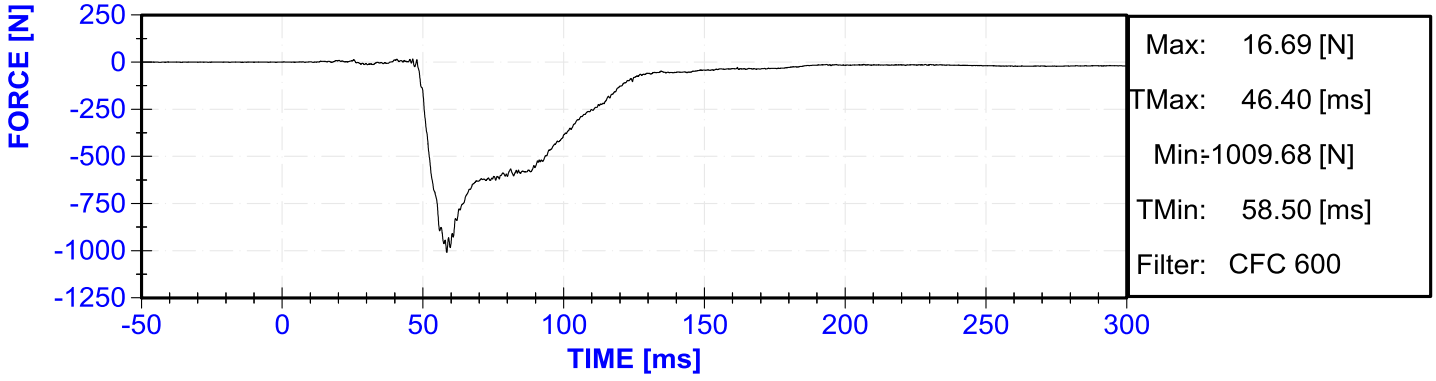
V2P1 PELVIS ACETABULUM RIGHT FY



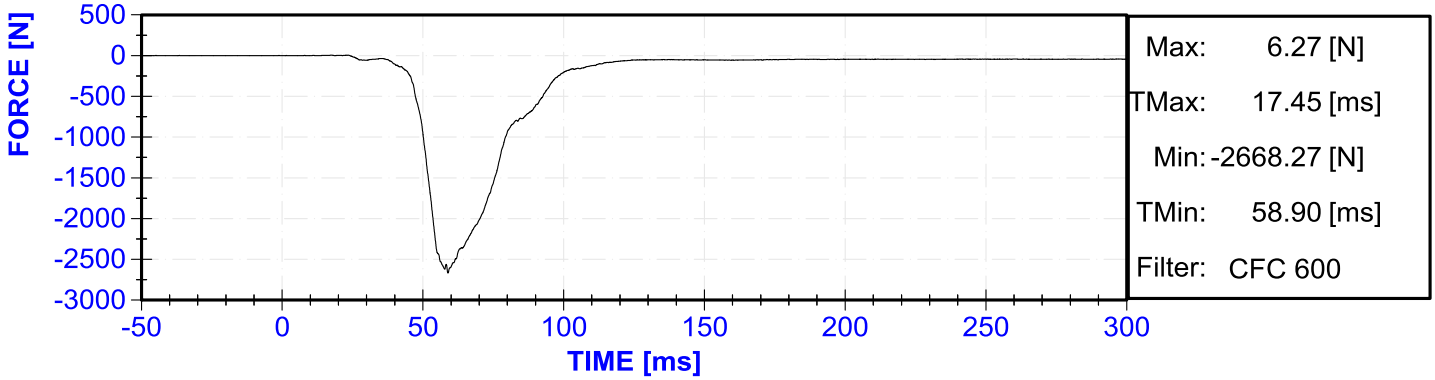
V2P1 PELVIS ACETABULUM RIGHT FZ



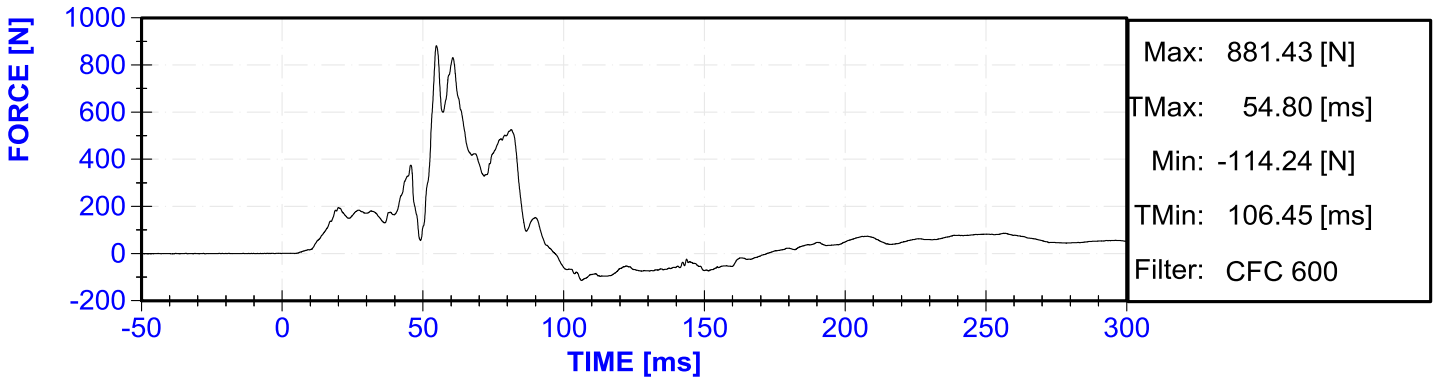
V2P1 LEFT ASIS FX



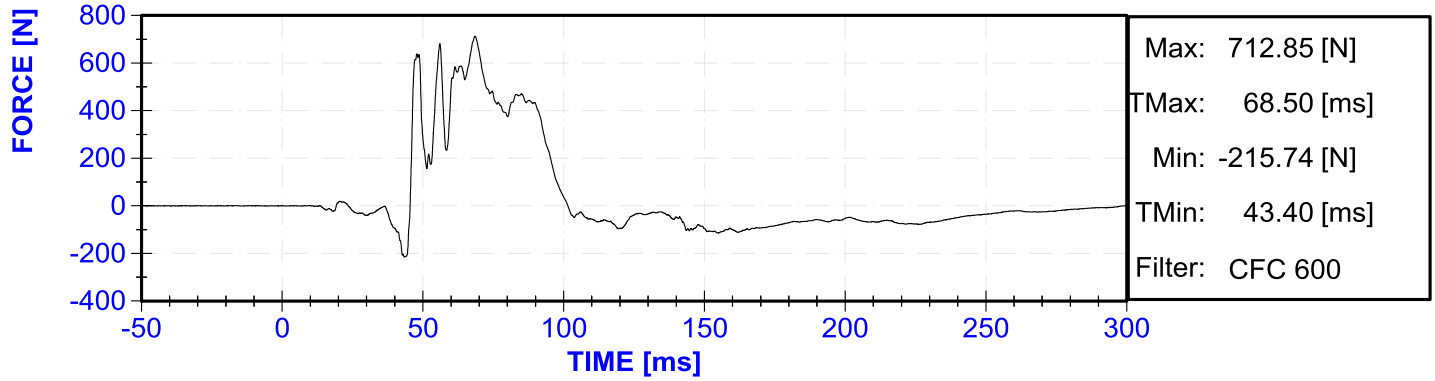
V2P1 RIGHT ASIS FX



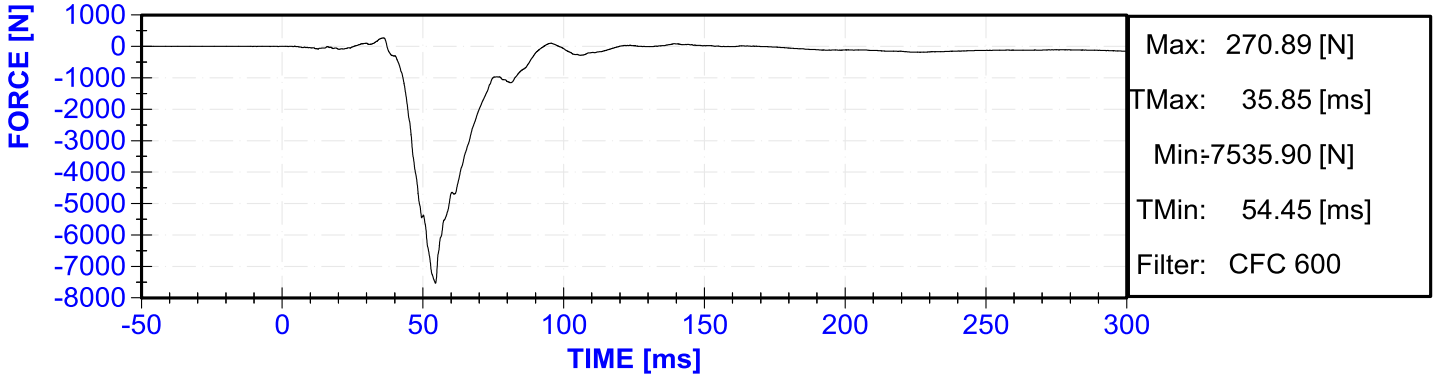
V2P1 LEFT FEMUR FX

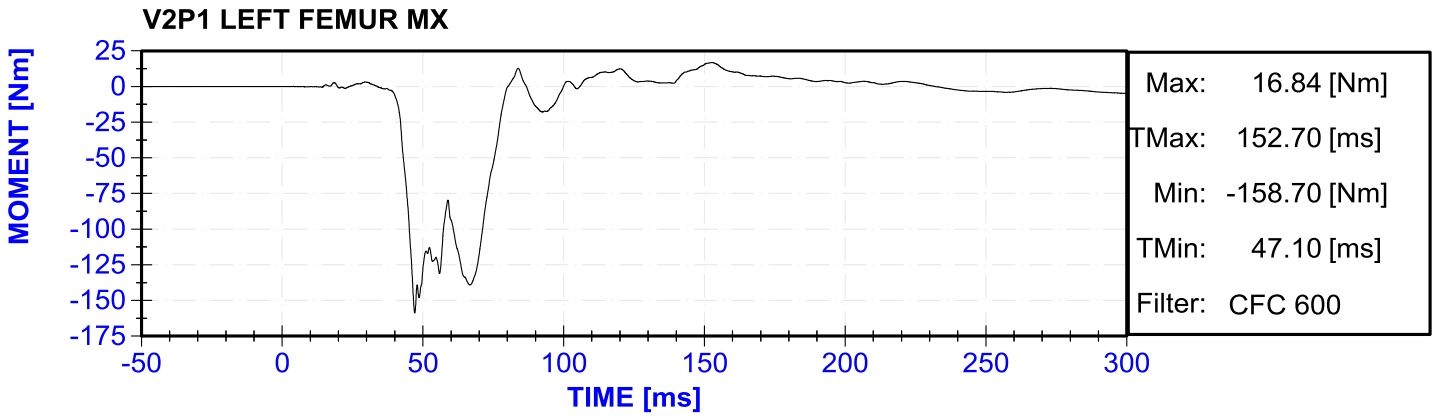


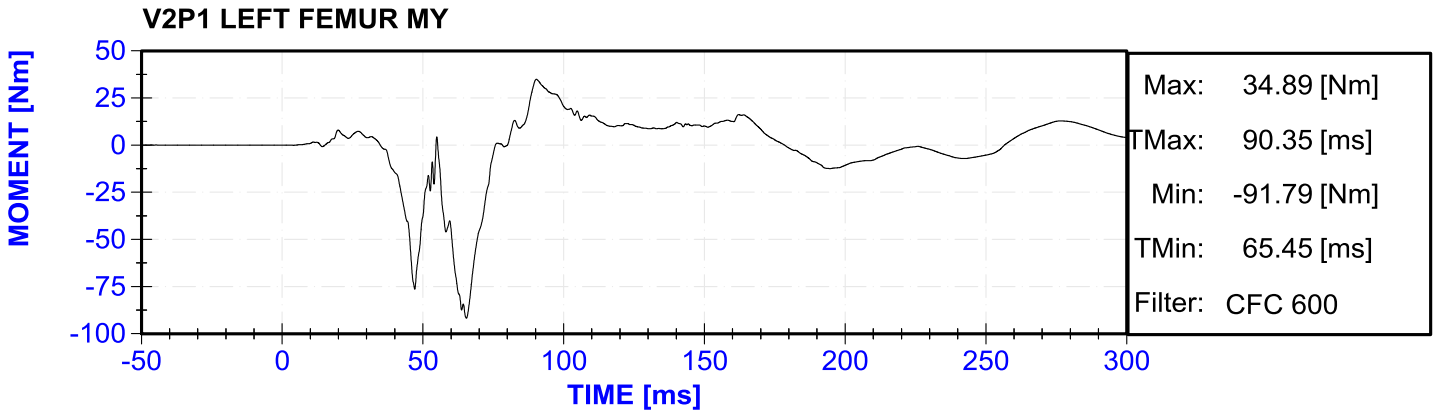
V2P1 LEFT FEMUR FY

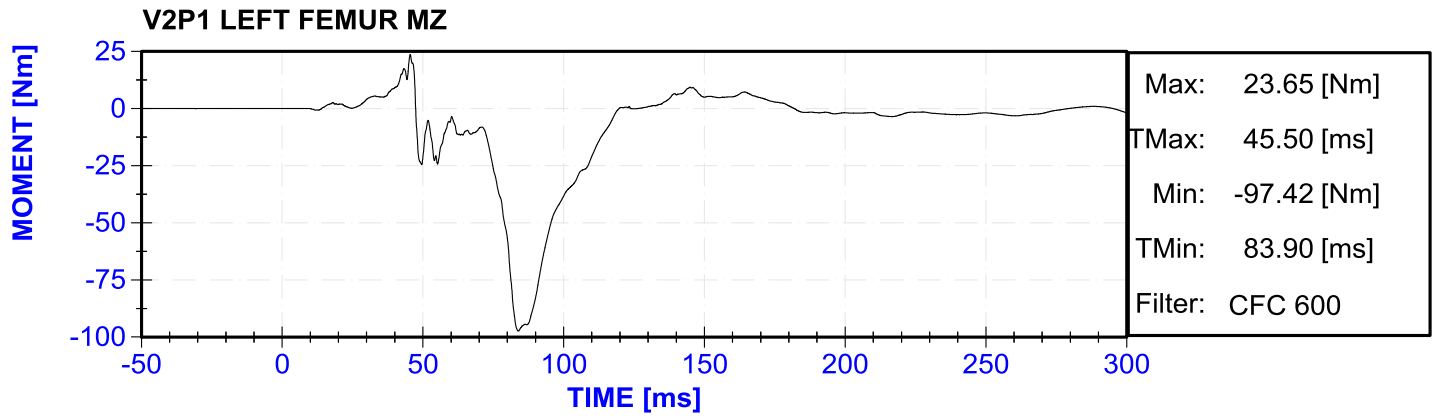


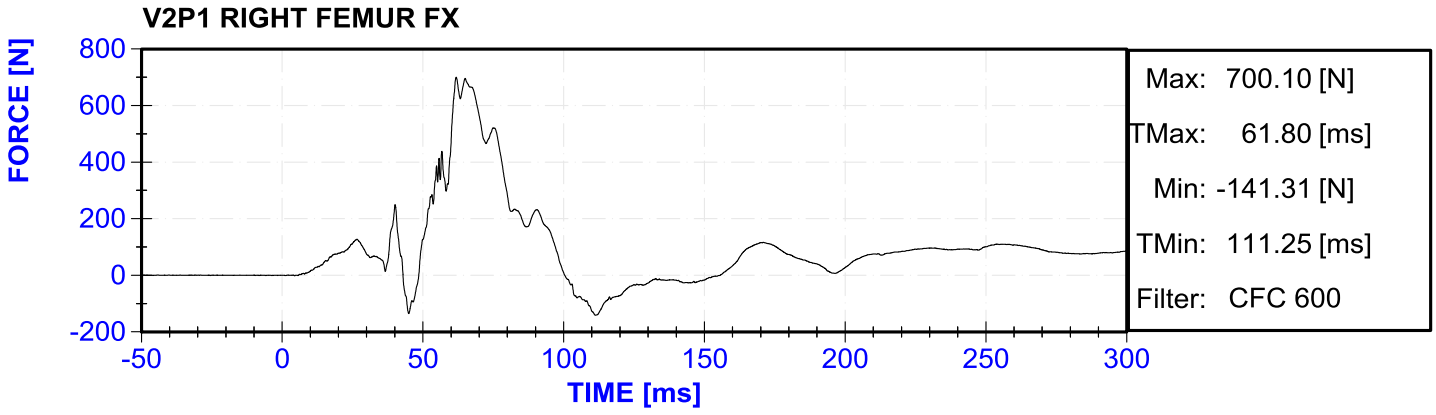
V2P1 LEFT FEMUR FZ



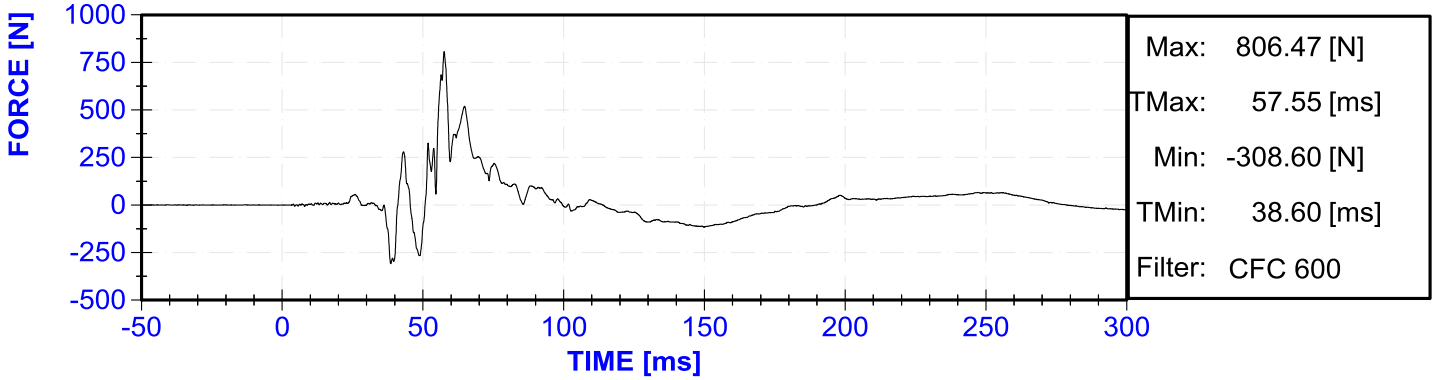

V2P1 LEFT FEMUR MX
MOMENT [Nm]
25
0
-25
-50
-75
-100
-125
-150
-175
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 16.84 [Nm]
TMax: 152.70 [ms]
Min: -158.70 [Nm]
TMin: 47.10 [ms]
Filter: CFC 600


V2P1 LEFT FEMUR MY
MOMENT [Nm]
50
25
0
-25
-50
-75
-100
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 34.89 [Nm]
TMax: 90.35 [ms]
Min: -91.79 [Nm]
TMin: 65.45 [ms]
Filter: CFC 600

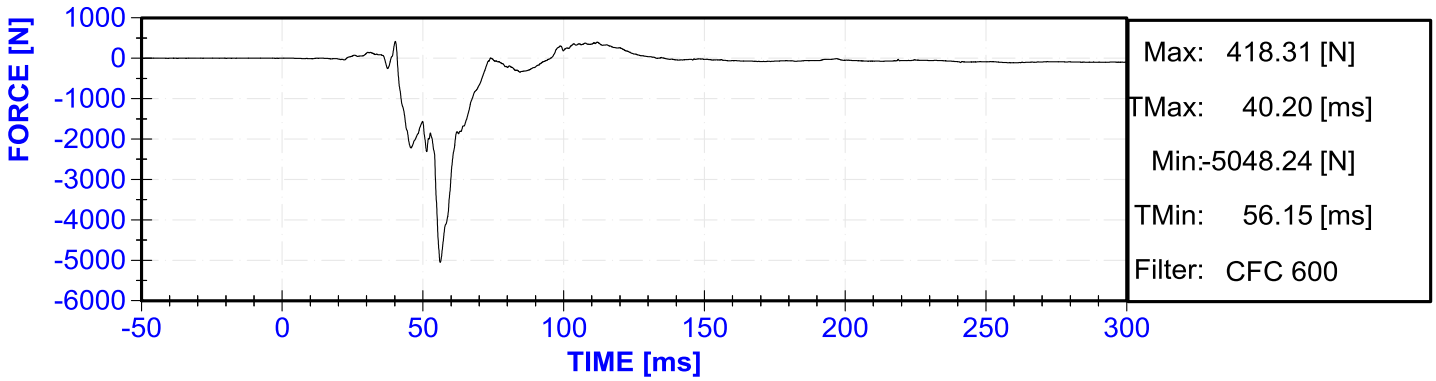

V2P1 LEFT FEMUR MZ
MOMENT [Nm]
25
0
-25
-50
-75
-100
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 23.65 [Nm]
TMax: 45.50 [ms]
Min: -97.42 [Nm]
TMin: 83.90 [ms]
Filter: CFC 600


V2P1 RIGHT FEMUR FX
FORCE [N]
800
600
400
200
0
-200
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 700.10 [N]
TMax: 61.80 [ms]
Min: -141.31 [N]
TMin: 111.25 [ms]
Filter: CFC 600

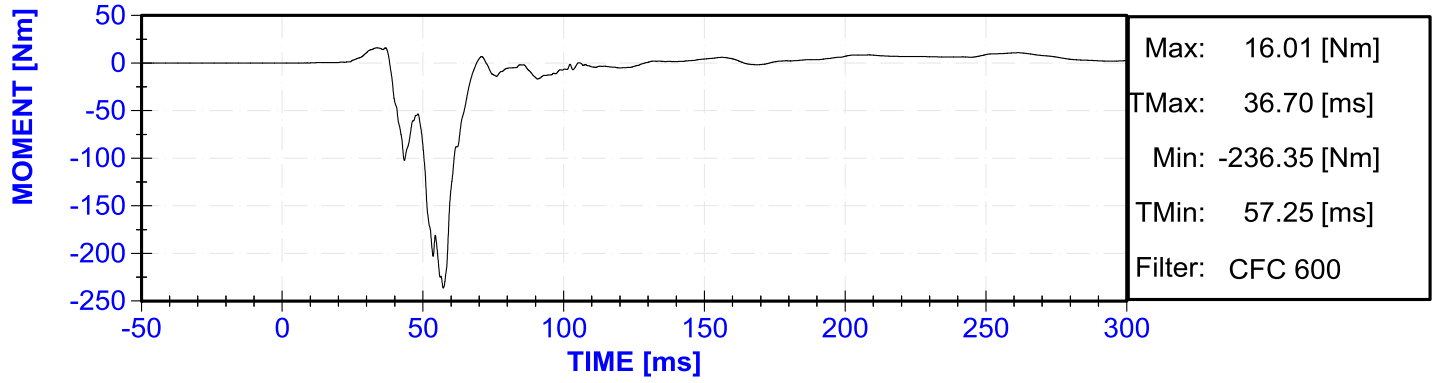
V2P1 RIGHT FEMUR FY



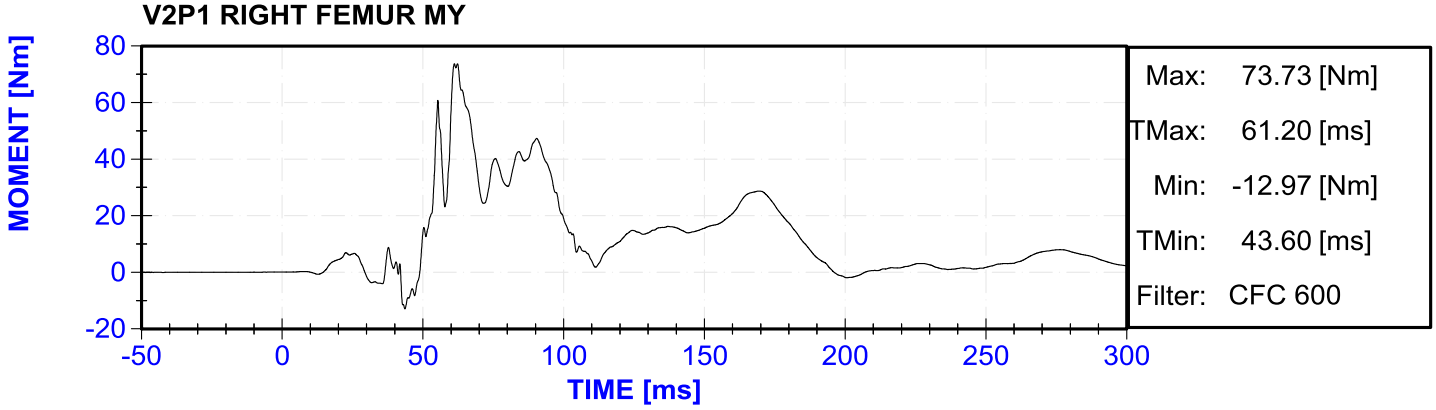
V2P1 RIGHT FEMUR FZ



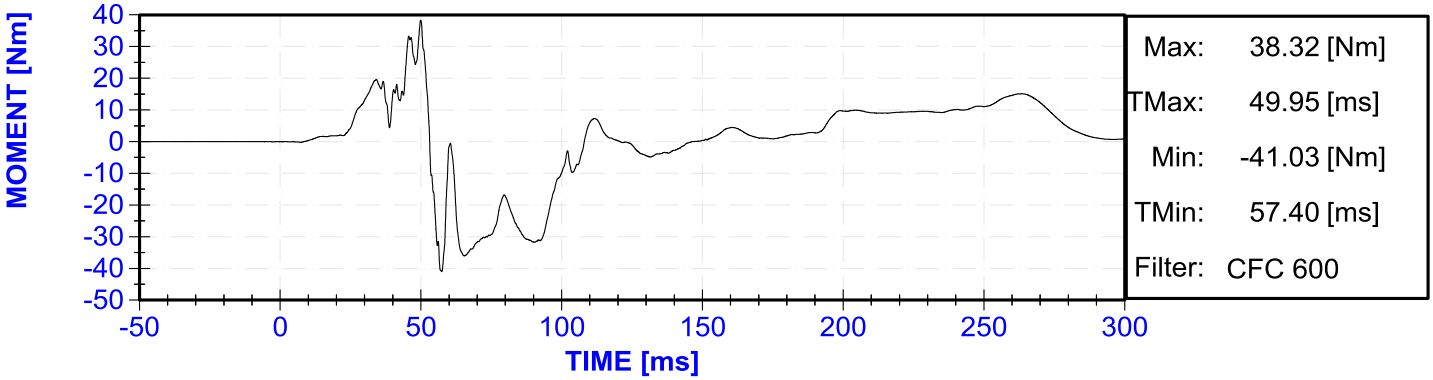
V2P1 RIGHT FEMUR MX



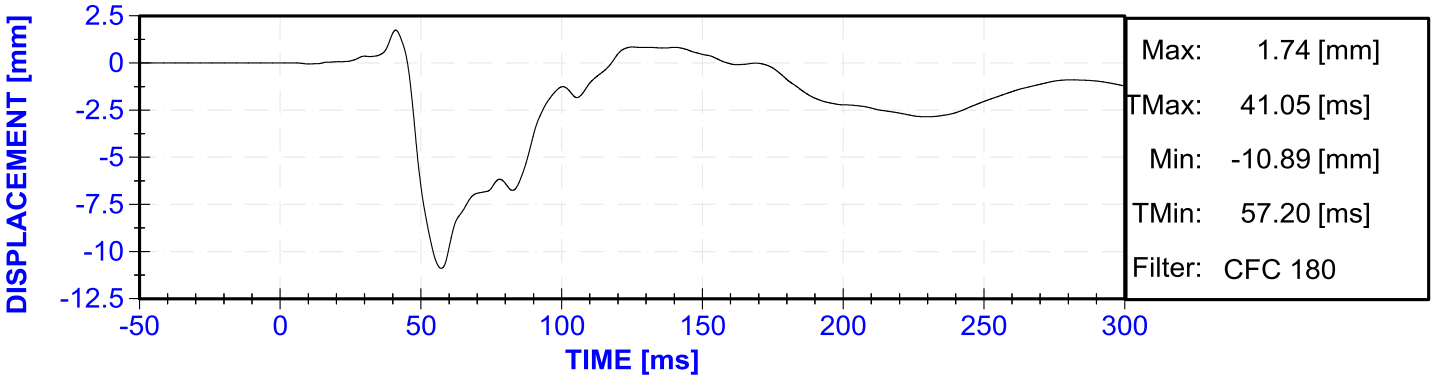
V2P1 RIGHT FEMUR MY



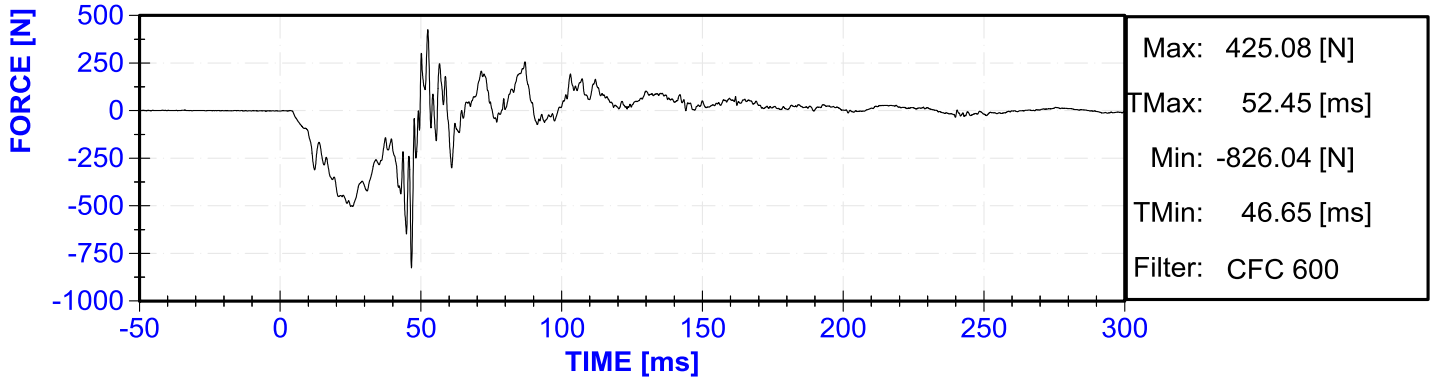
V2P1 RIGHT FEMUR MZ



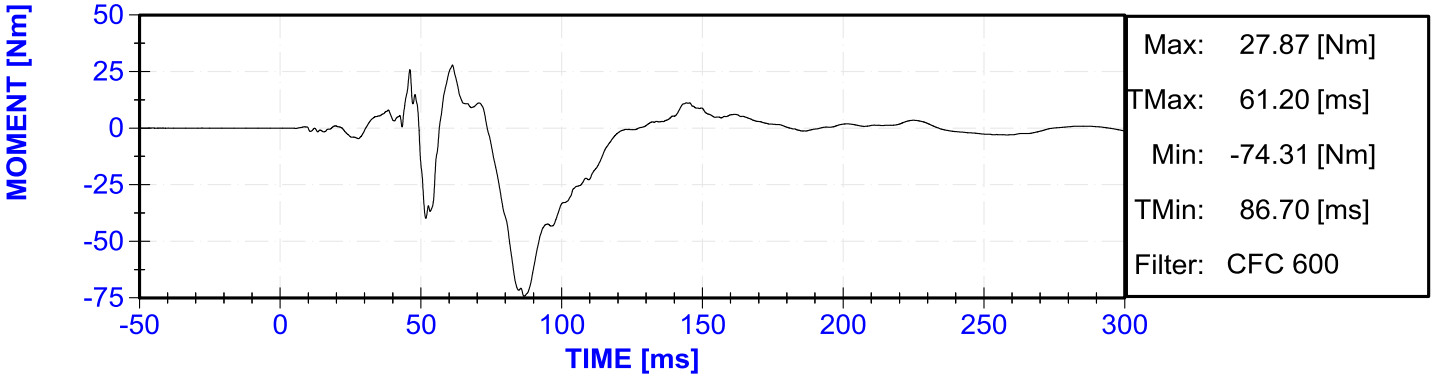
V2P1 KNEE LEFT DX



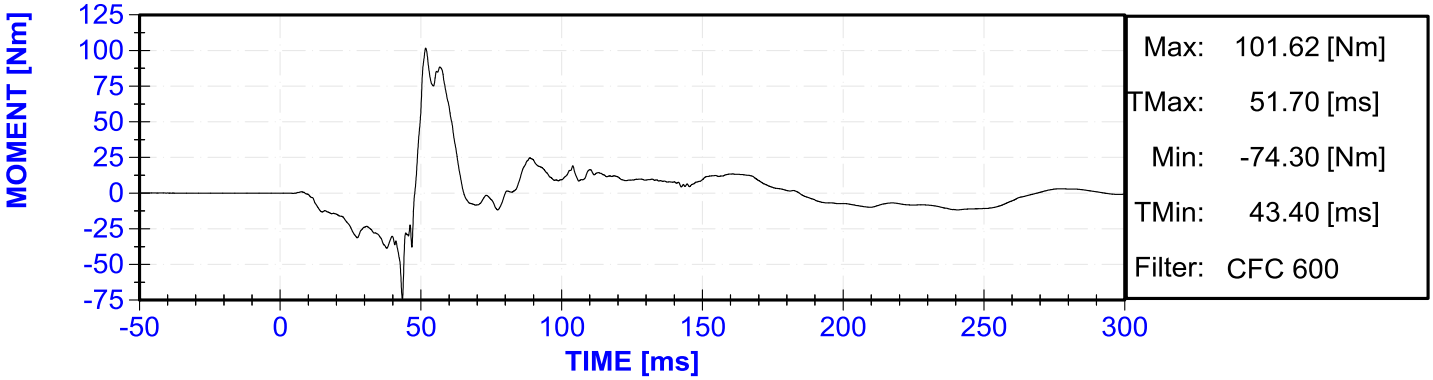
V2P1 TIBIA LEFT UPPER FZ



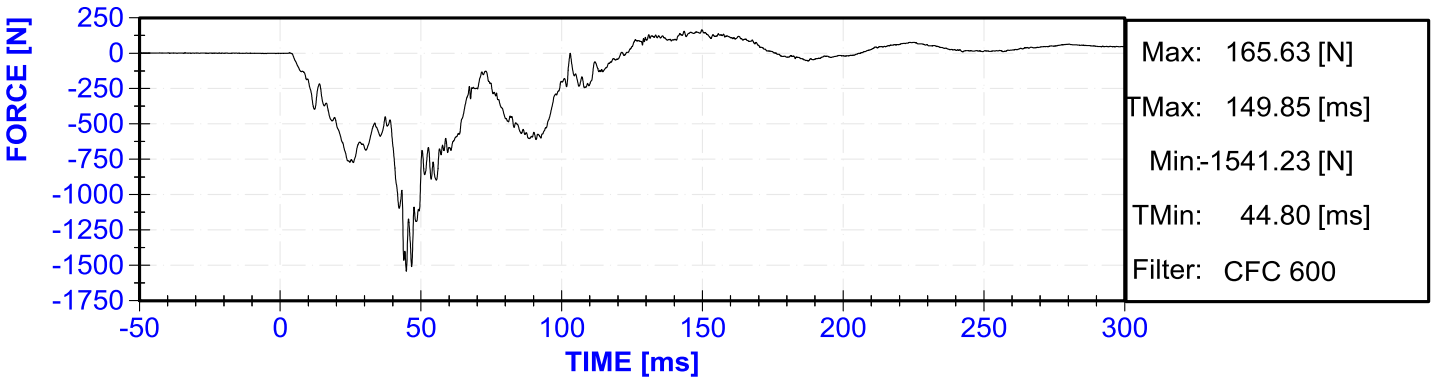
V2P1 TIBIA LEFT UPPER MX



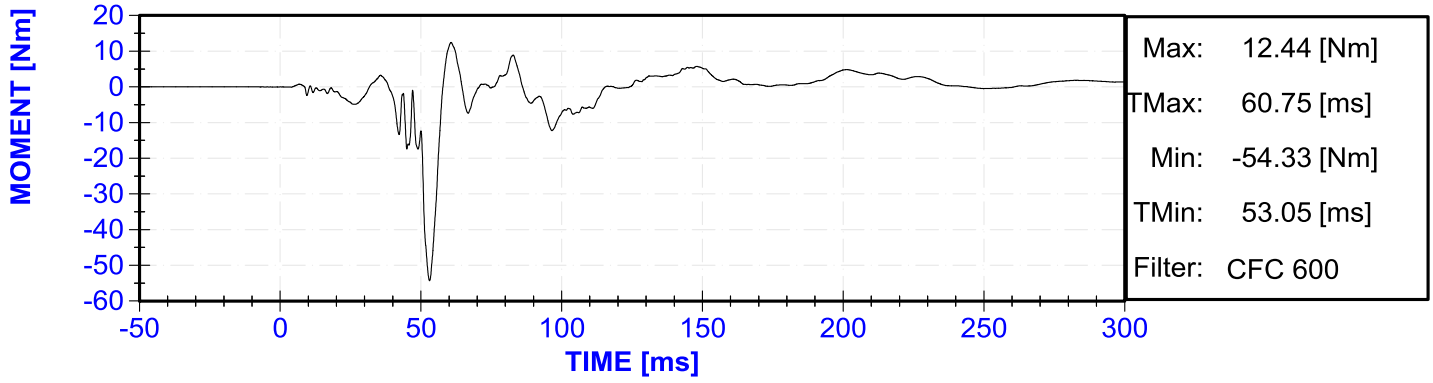
V2P1 TIBIA LEFT UPPER MY



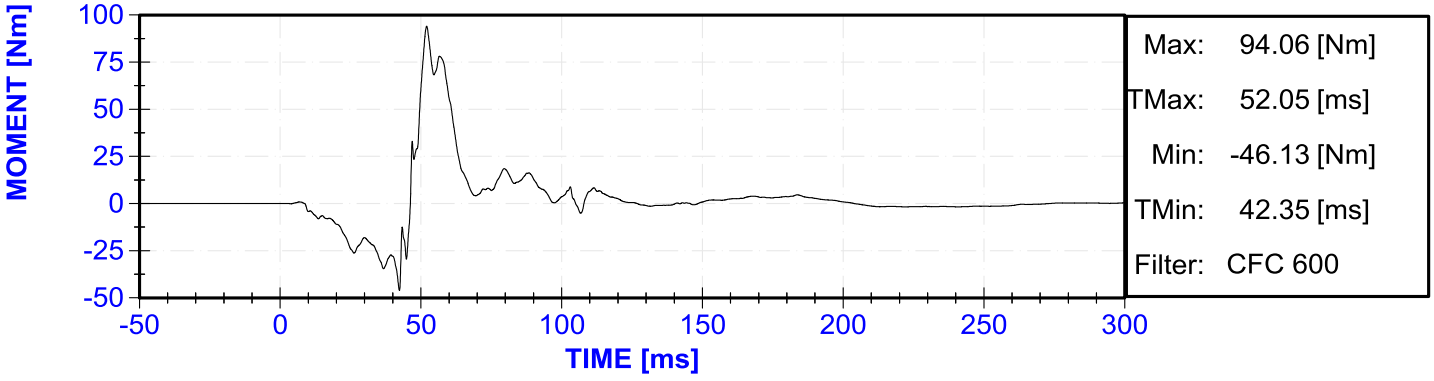
V2P1 TIBIA LEFT LOWER FZ



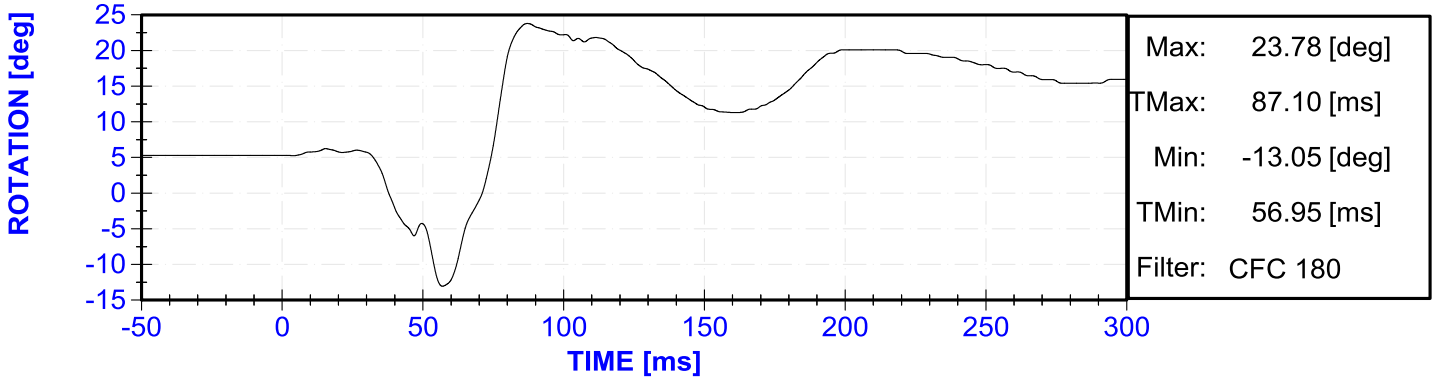
V2P1 TIBIA LEFT LOWER MX



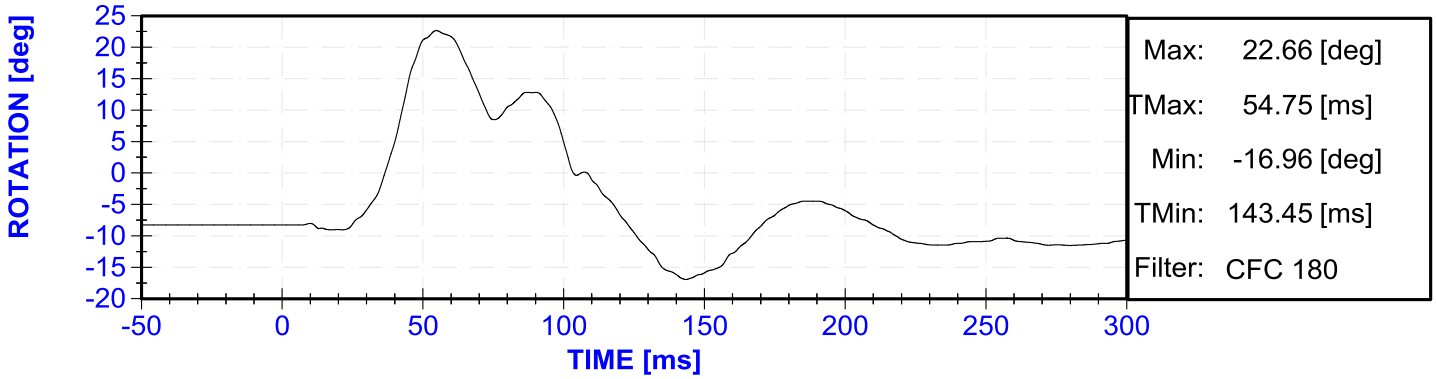
V2P1 TIBIA LEFT LOWER MY



V2P1 ANKLE LEFT POT RX

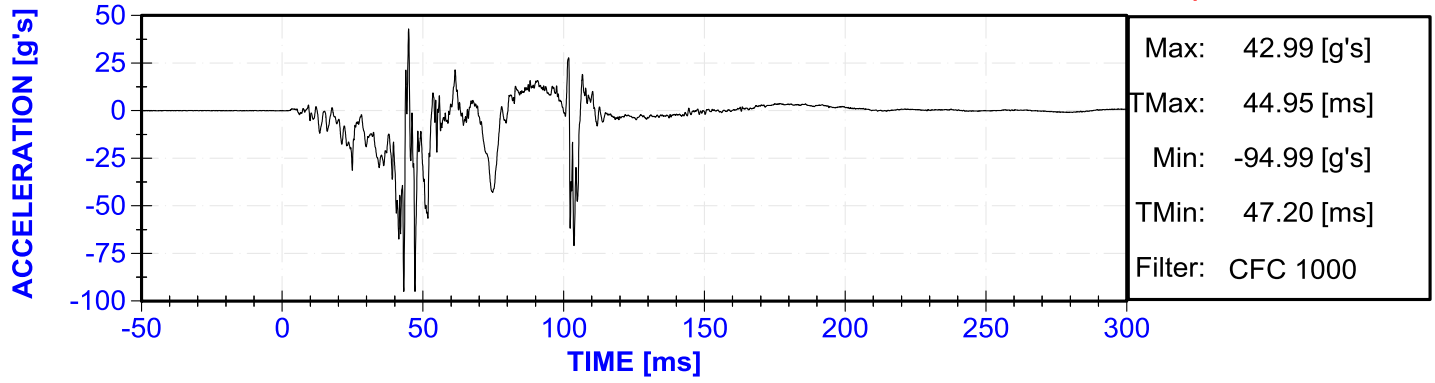


V2P1 ANKLE LEFT POT RY

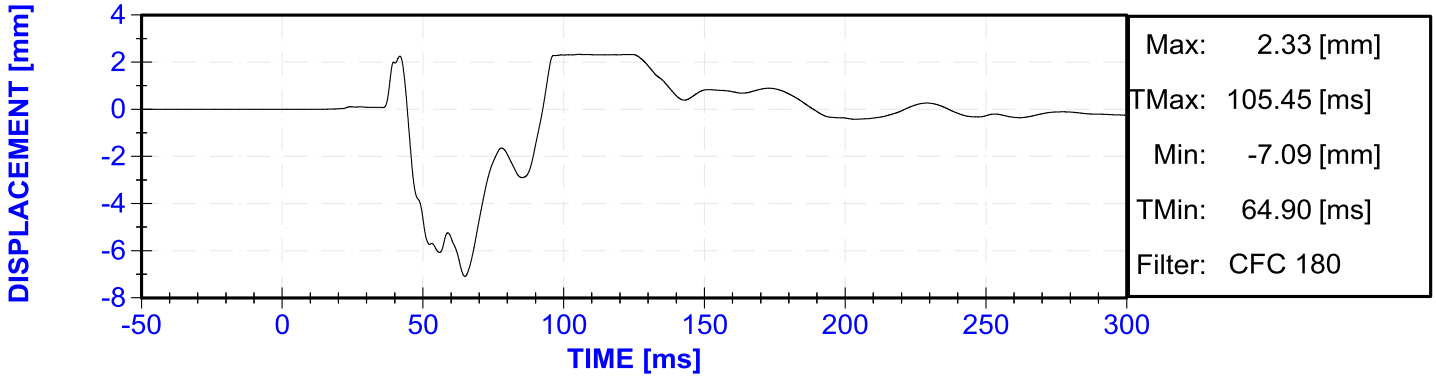


V2P1 FOOT LEFT AZ & 47MS

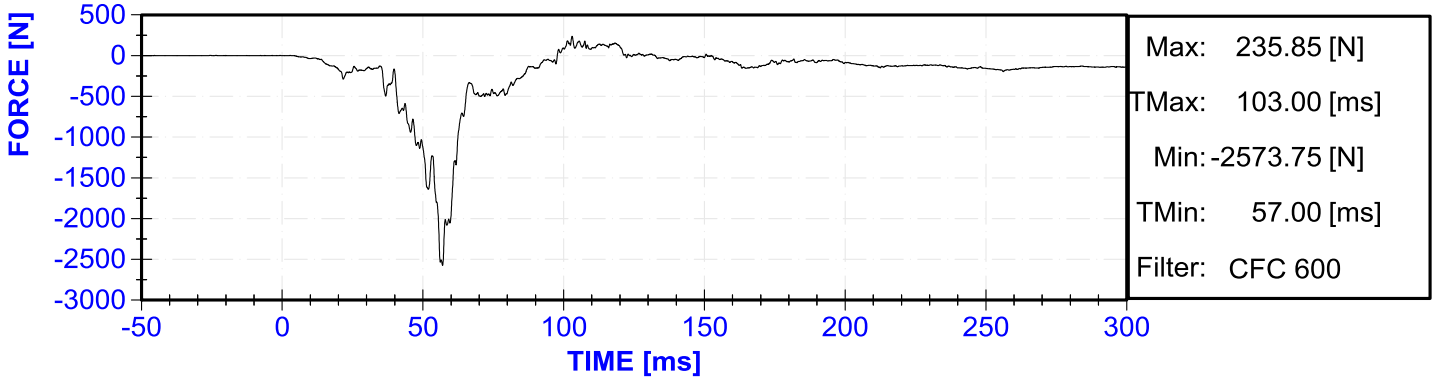
Questionable spikes at 43 & 47 ms



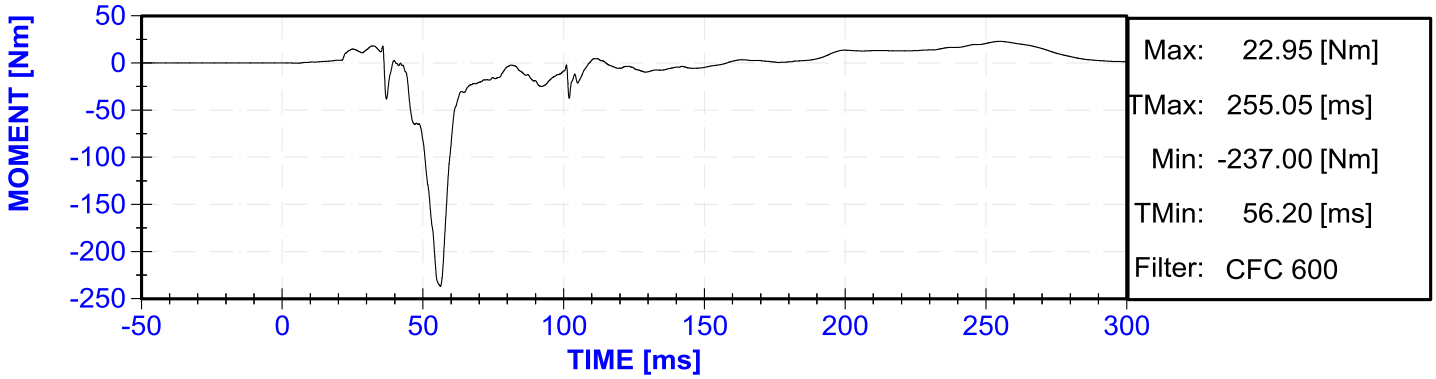
V2P1 KNEE RIGHT DX



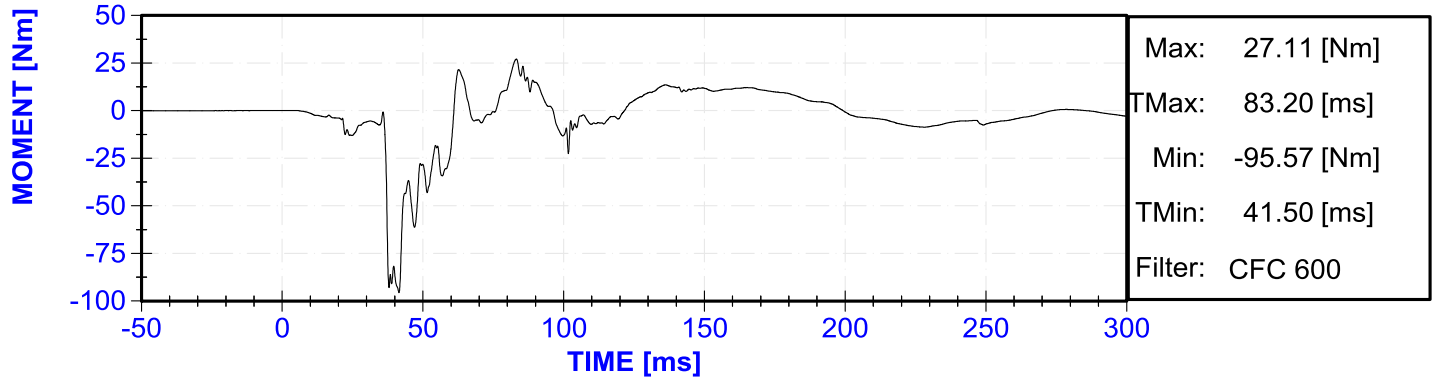
V2P1 TIBIA RIGHT UPPER FZ



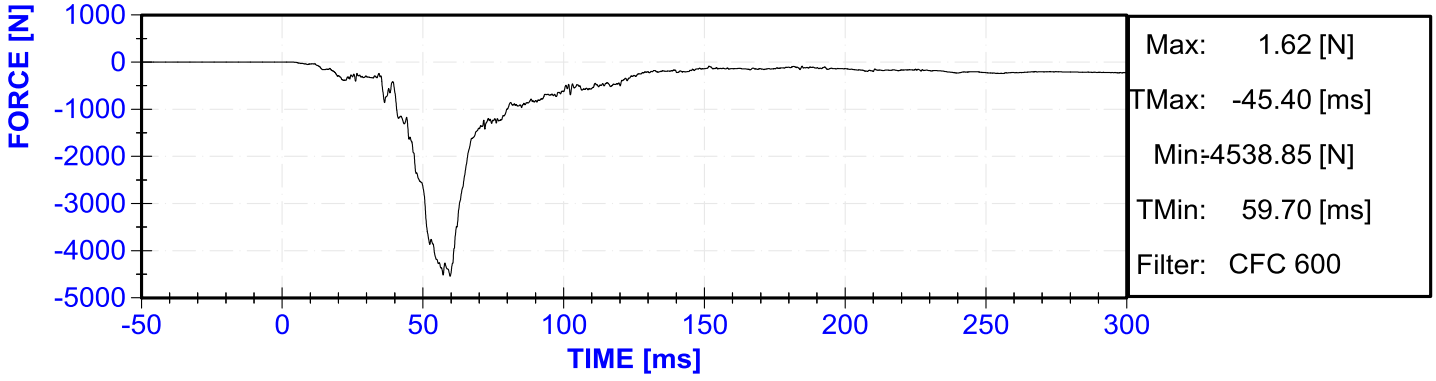
V2P1 TIBIA RIGHT UPPER MX



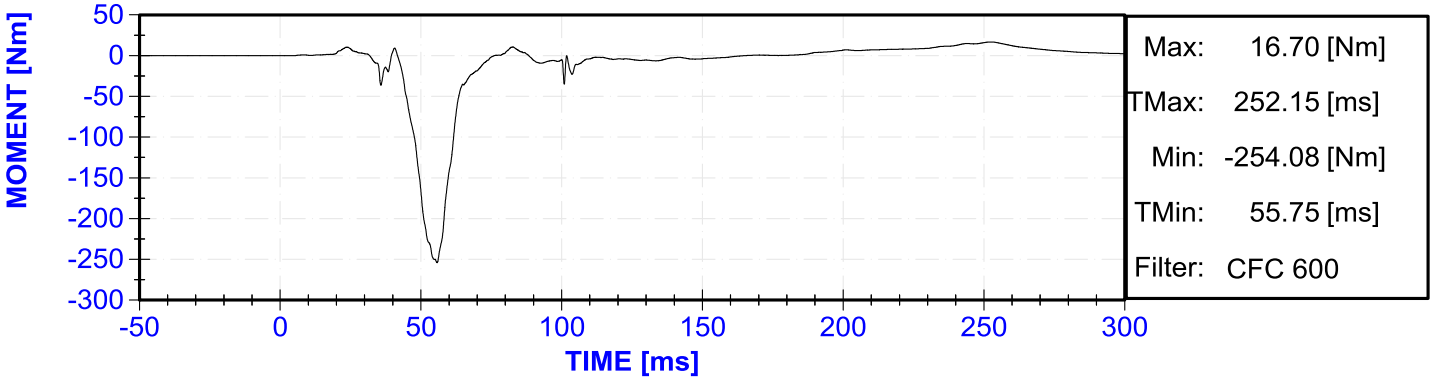
V2P1 TIBIA RIGHT UPPER MY



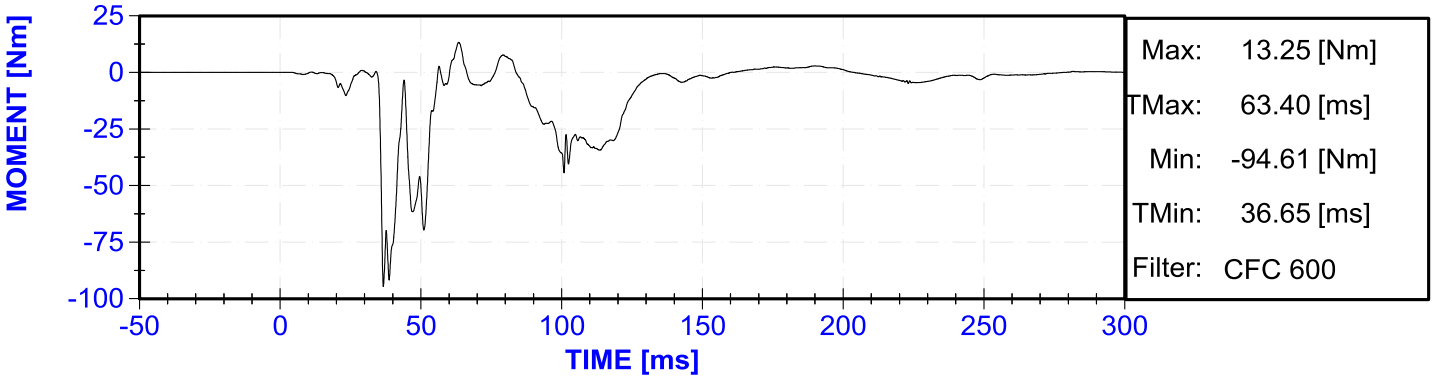
V2P1 TIBIA RIGHT LOWER FZ



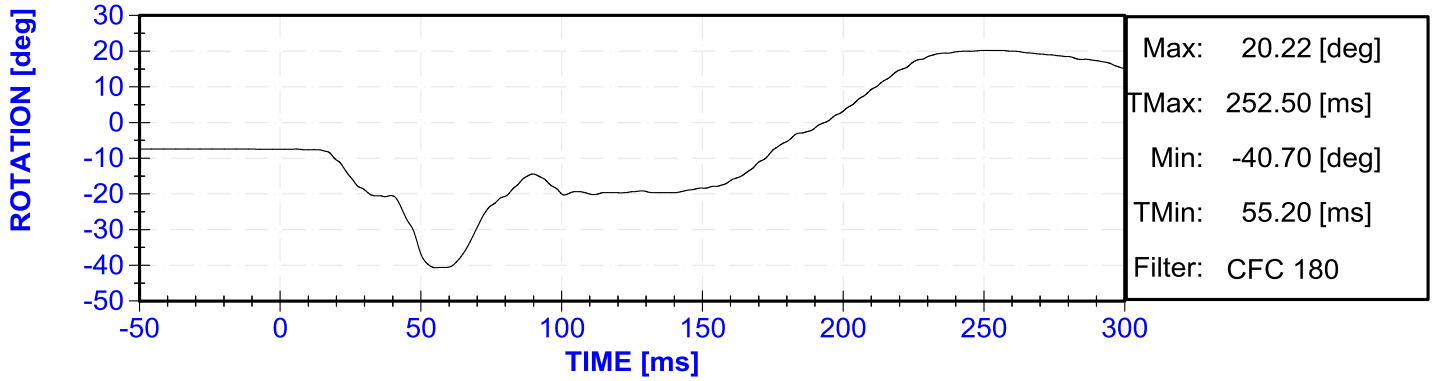
V2P1 TIBIA RIGHT LOWER MX



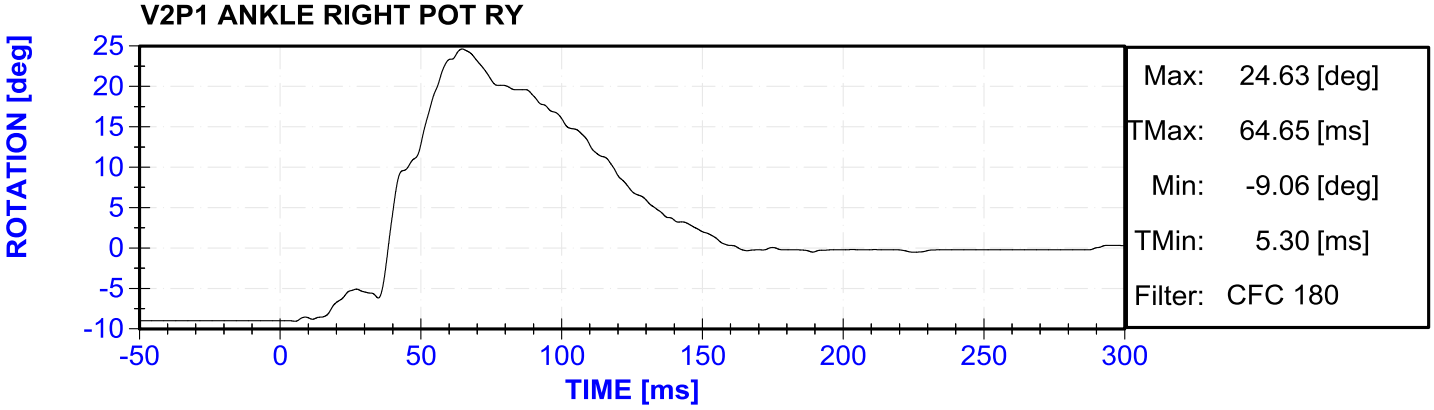
V2P1 TIBIA RIGHT LOWER MY



V2P1 ANKLE RIGHT POT RX

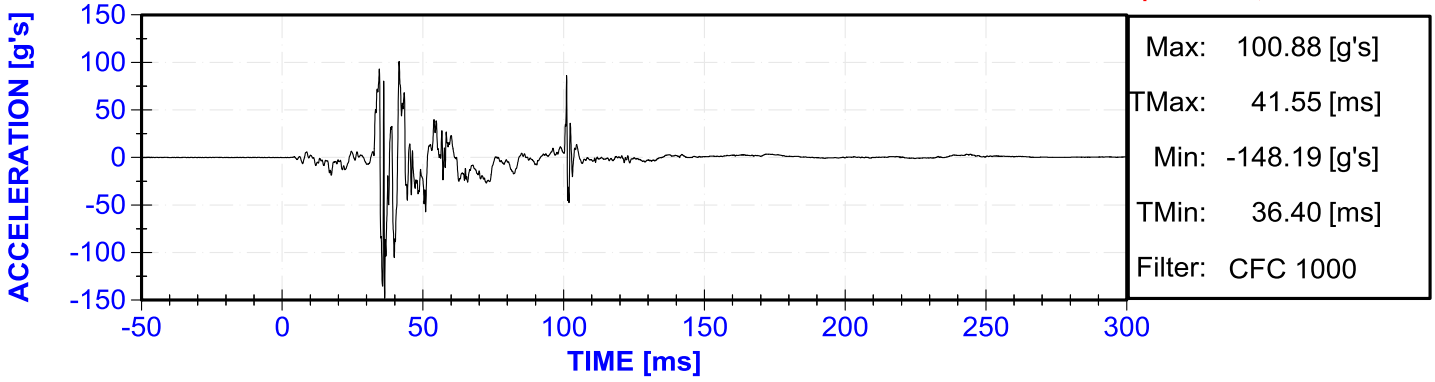


V2P1 ANKLE RIGHT POT RY

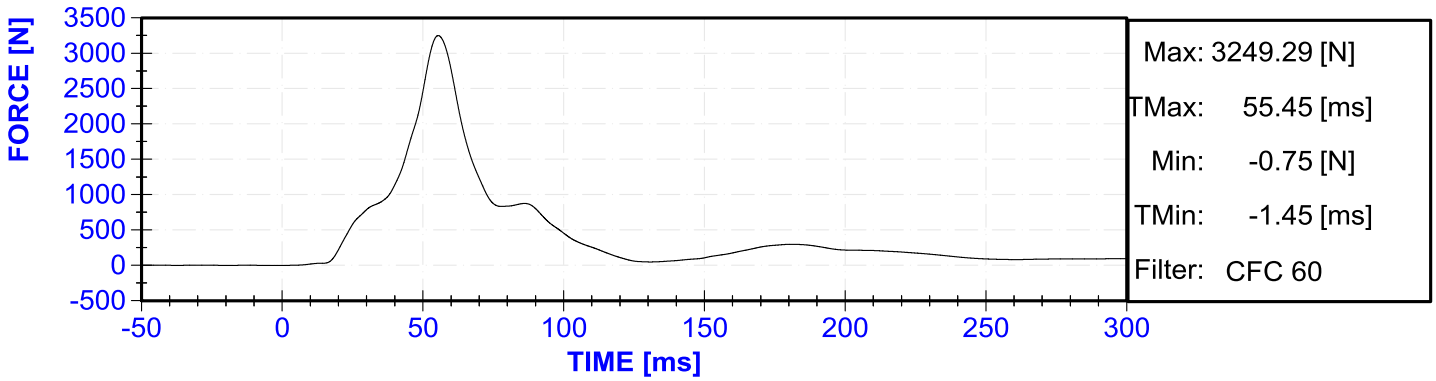


V2P1 FOOT RIGHT AZ , 41 & 101MS

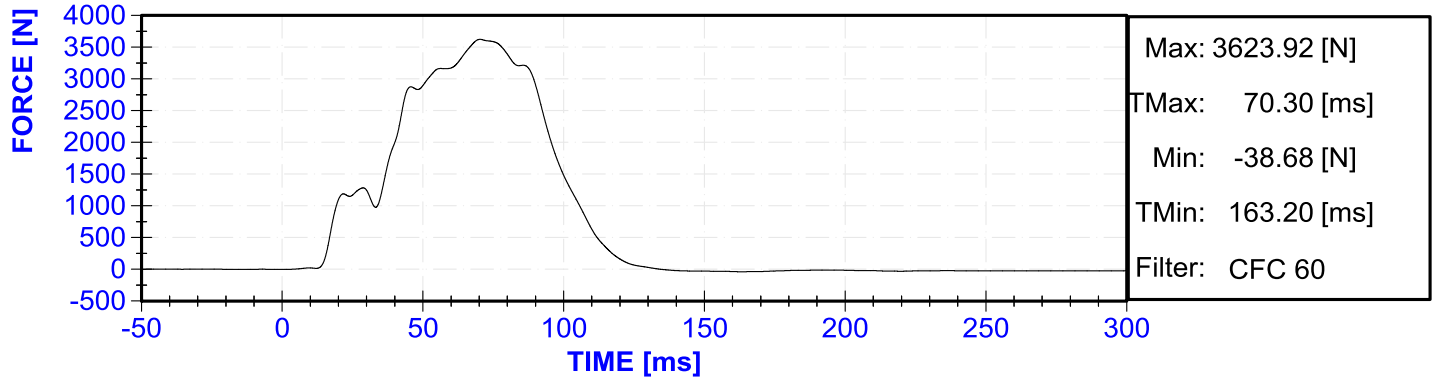
Questionable spikes at 37, 41 & 101 ms



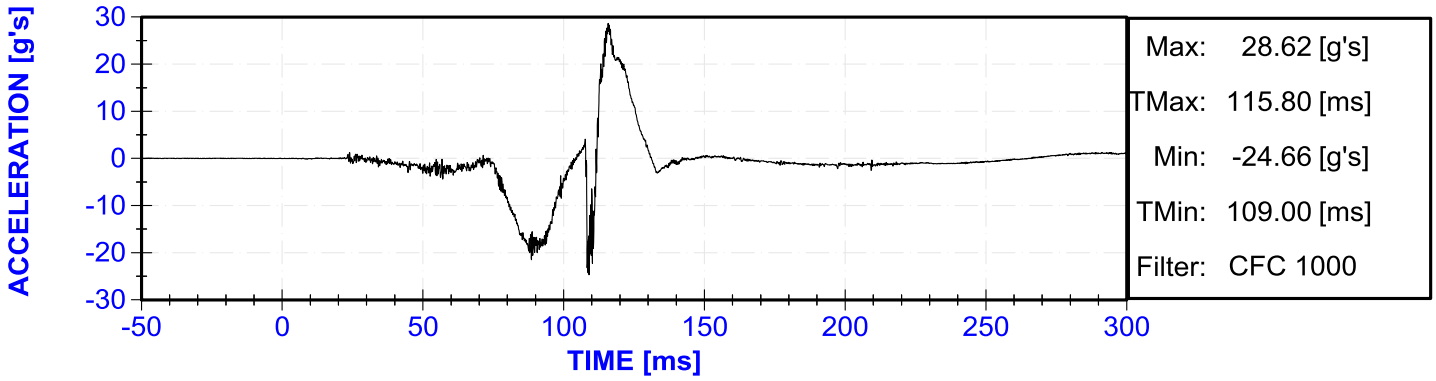
V2 P1 DRIVER LAP BELT



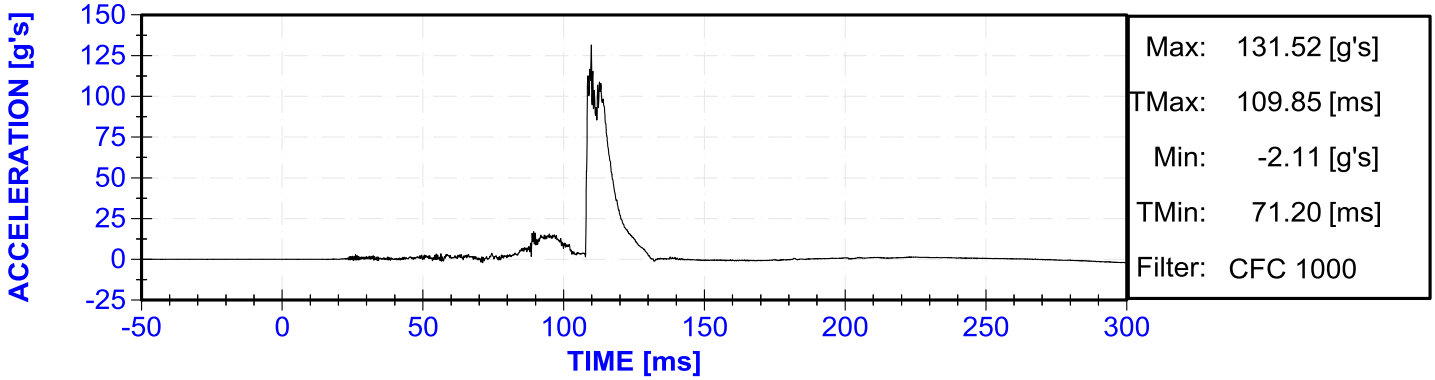
V2 P1 DRIVER SHOULDER BELT



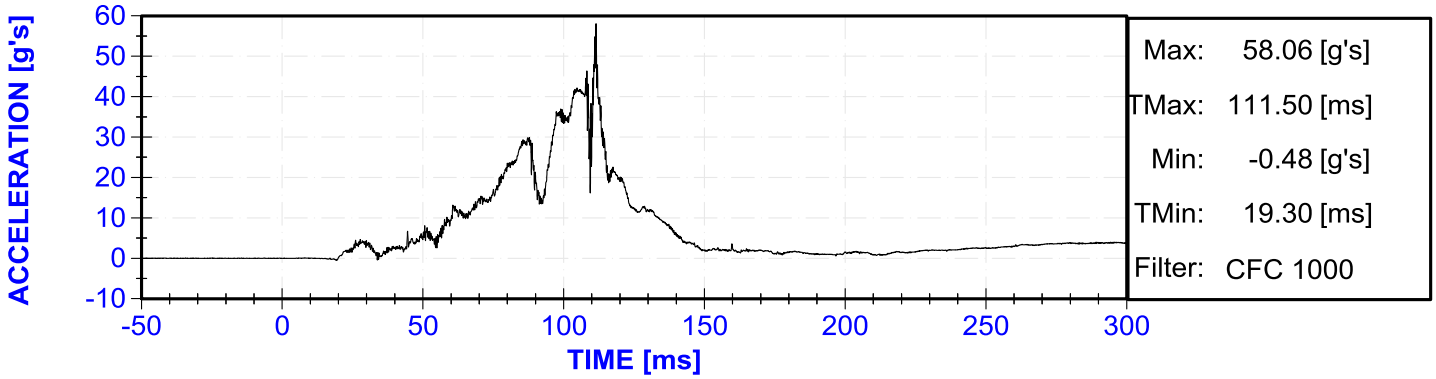
V2P2 HEAD CG X



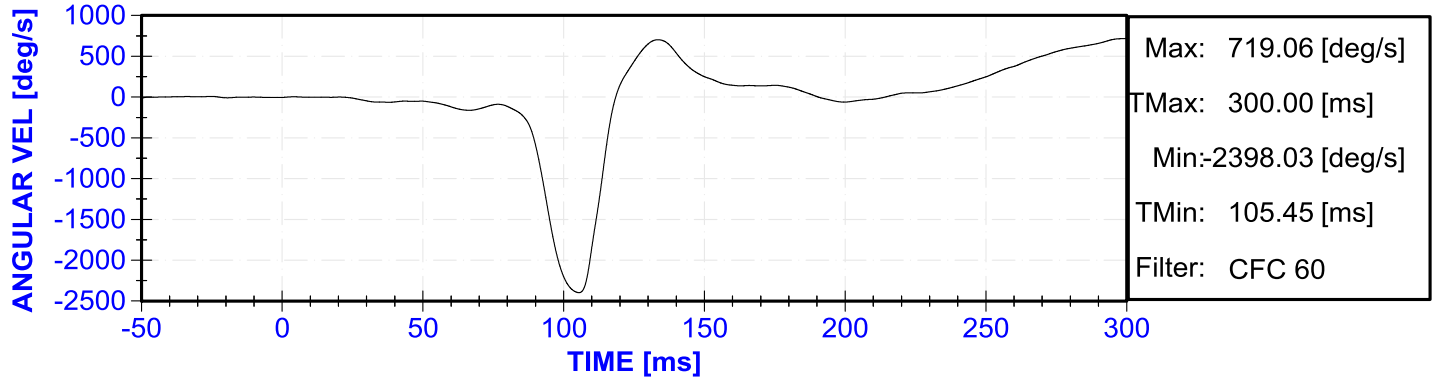
V2P2 HEAD CG Y



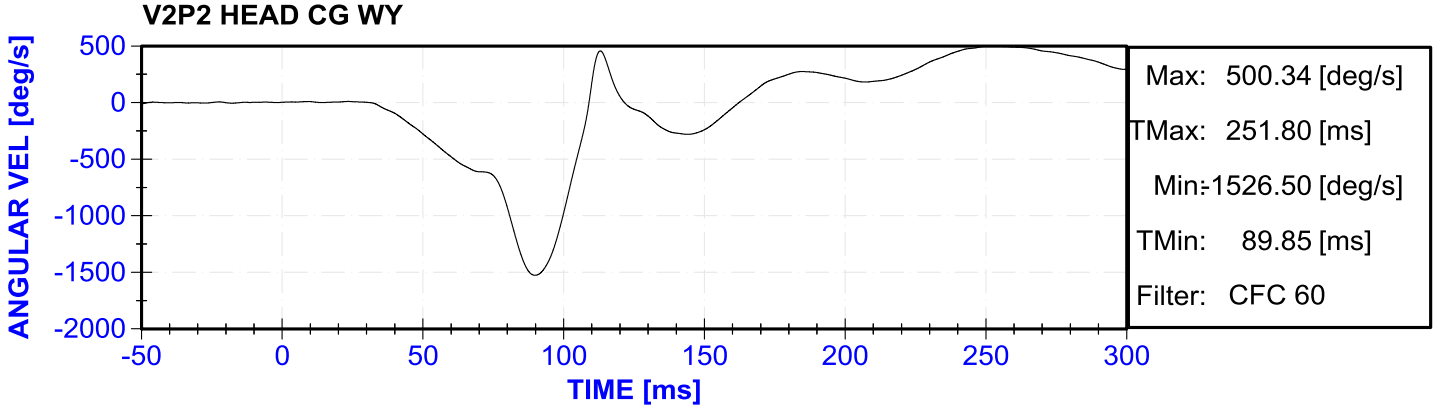
V2P2 HEAD CG Z



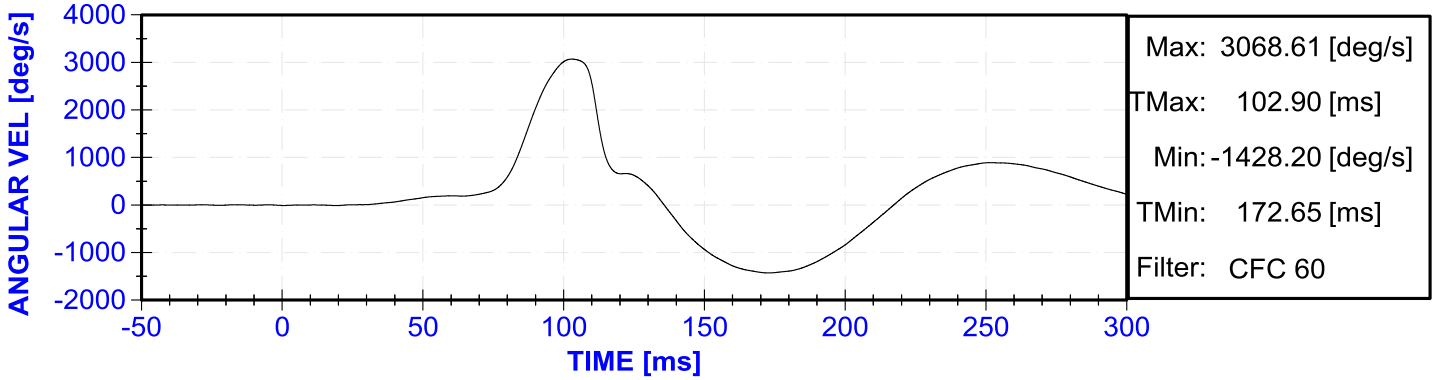
V2P2 HEAD CG WX



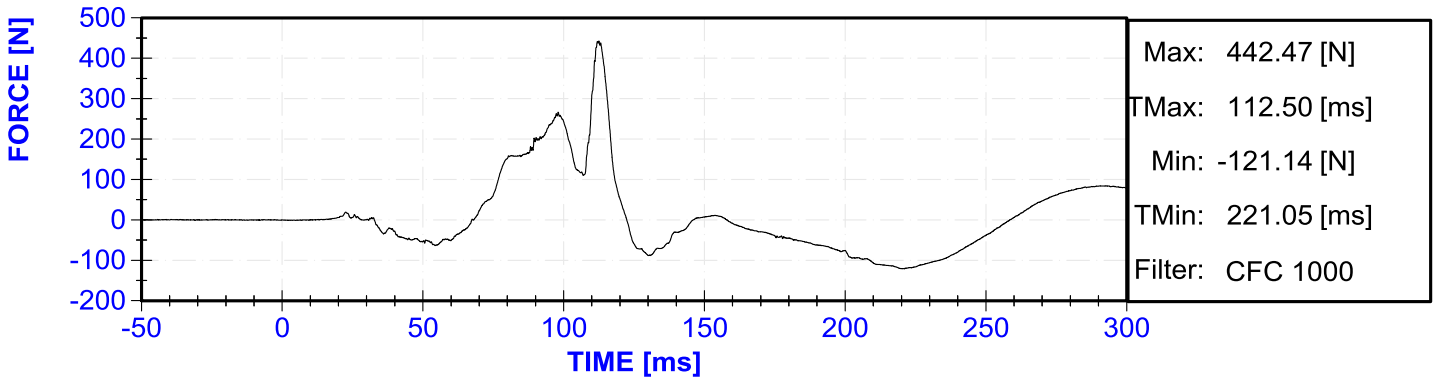
V2P2 HEAD CG WY



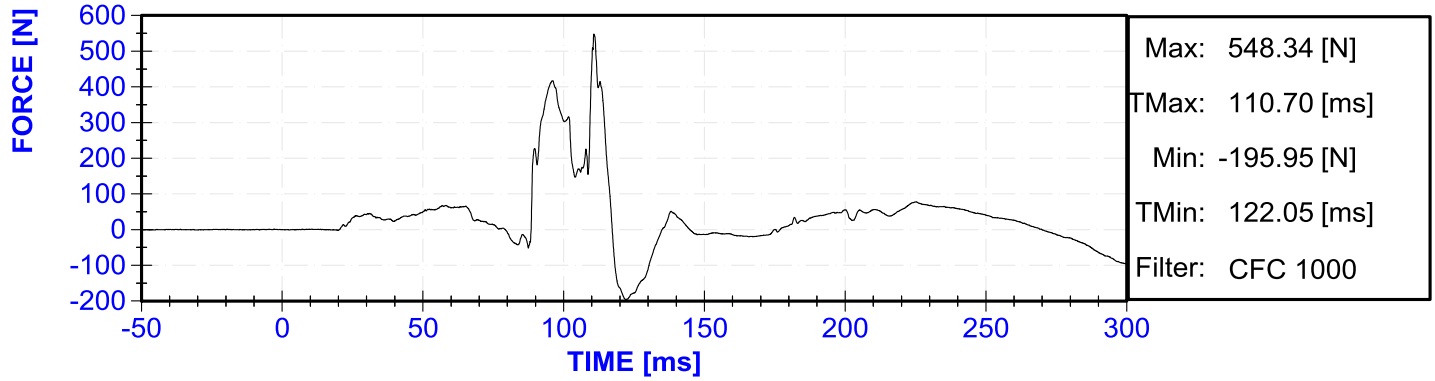
V2P2 HEAD CG WZ



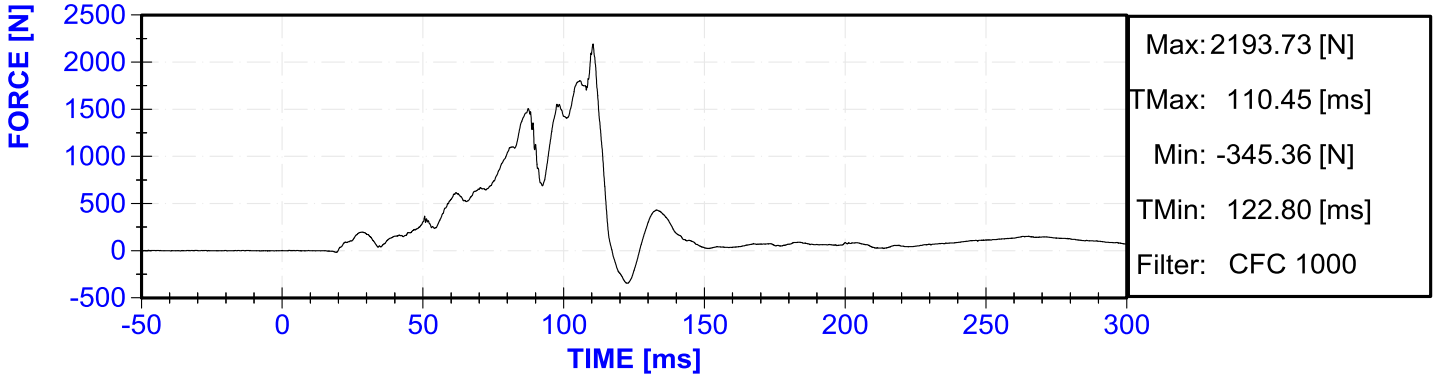
V2P2 NECK UPPER FX

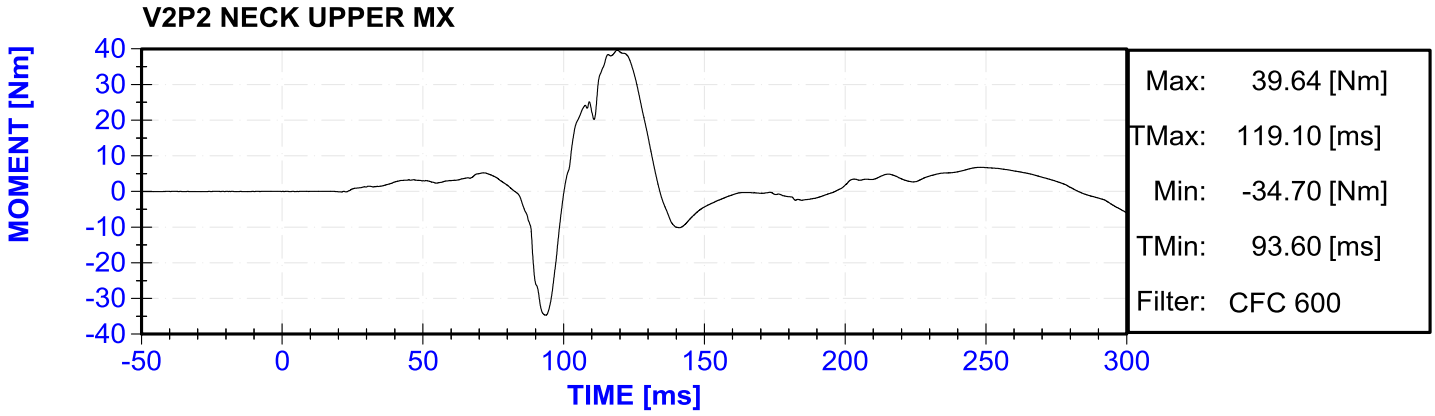


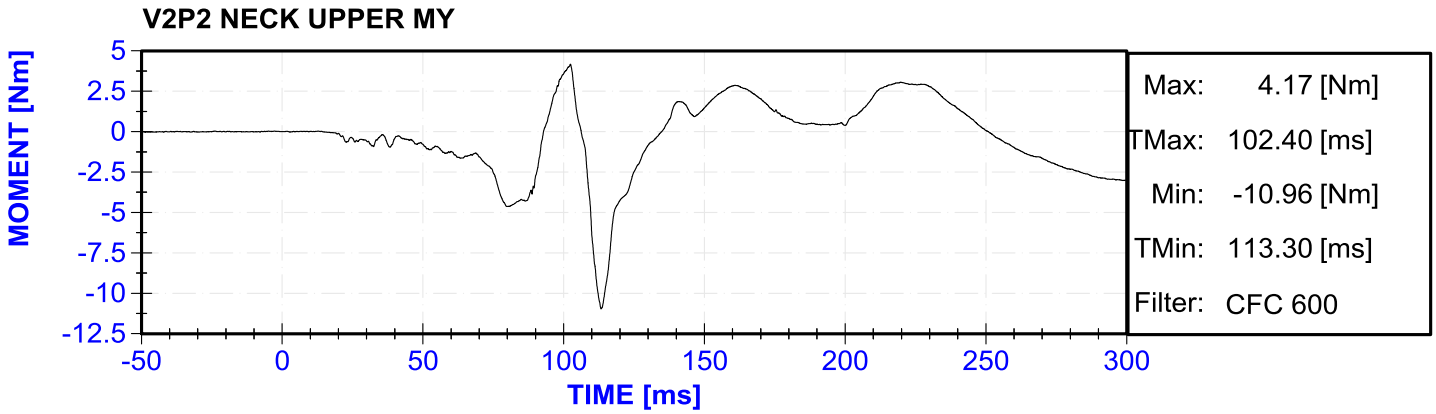
V2P2 NECK UPPER FY

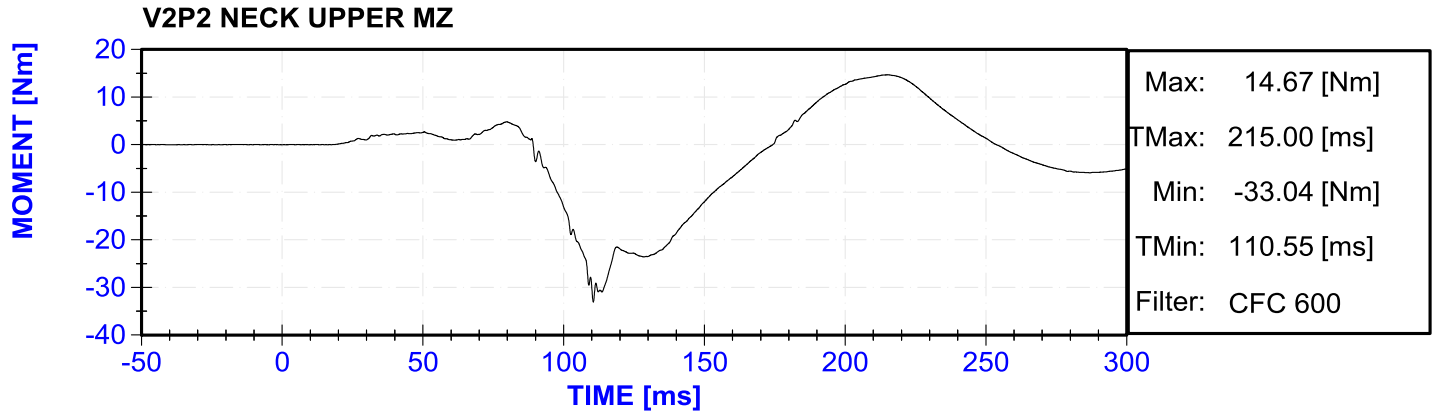


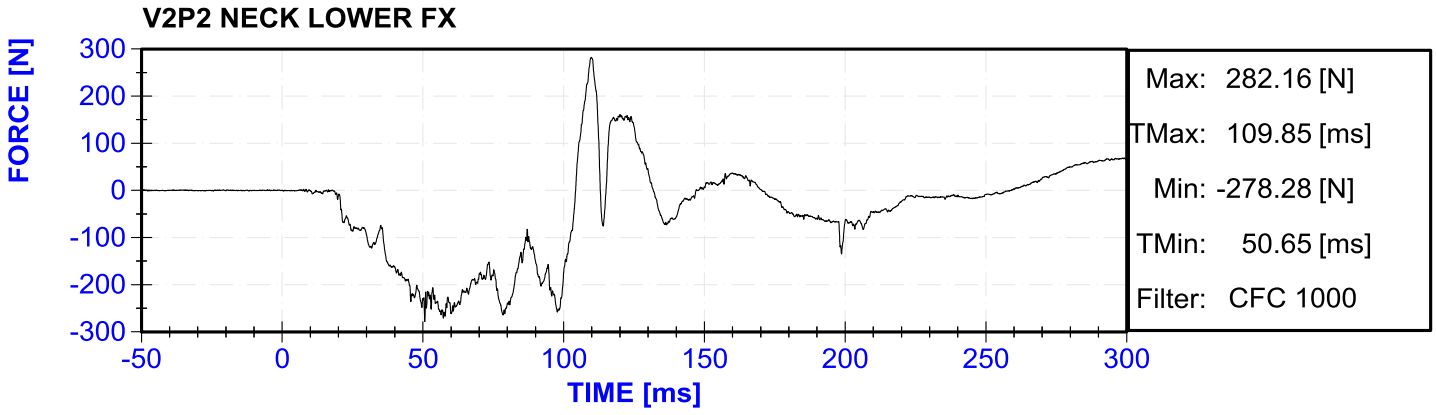
V2P2 NECK UPPER FZ



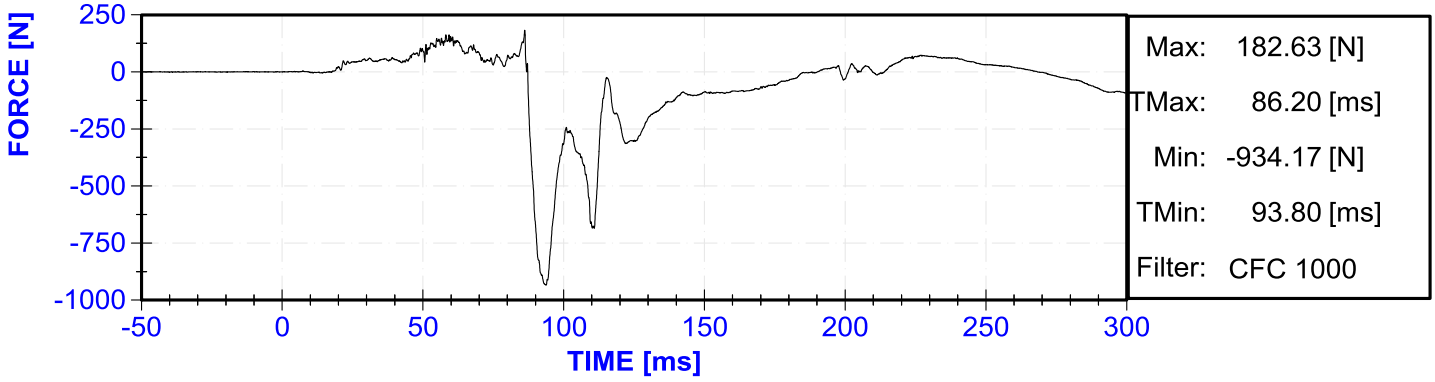

V2P2 NECK UPPER MX
MOMENT [Nm]
TIME [ms]
Max: 39.64 [Nm]
TMax: 119.10 [ms]
Min: -34.70 [Nm]
TMin: 93.60 [ms]
Filter: CFC 600


V2P2 NECK UPPER MY
MOMENT [Nm]
TIME [ms]
Max: 4.17 [Nm]
TMax: 102.40 [ms]
Min: -10.96 [Nm]
TMin: 113.30 [ms]
Filter: CFC 600

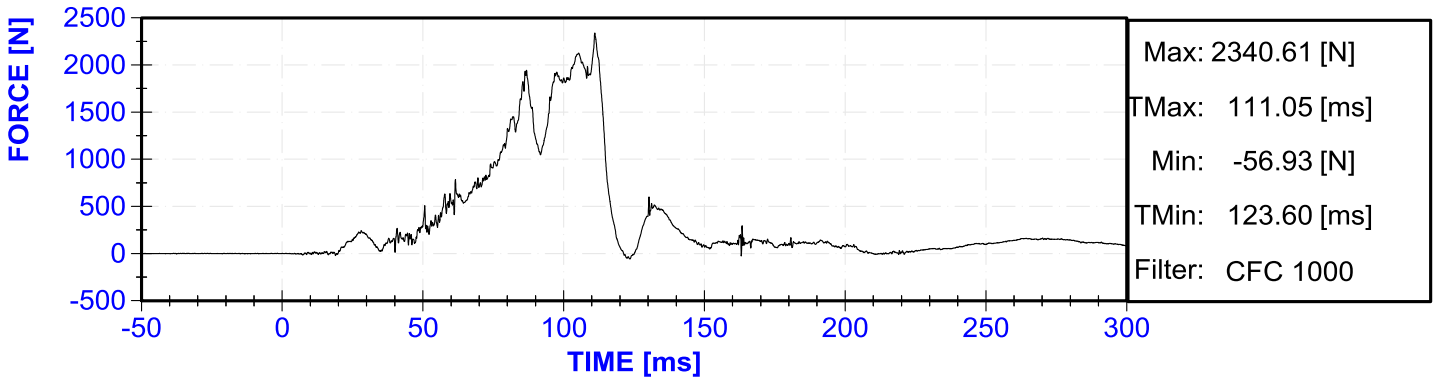

V2P2 NECK UPPER MZ
MOMENT [Nm]
TIME [ms]
Max: 14.67 [Nm]
TMax: 215.00 [ms]
Min: -33.04 [Nm]
TMin: 110.55 [ms]
Filter: CFC 600


V2P2 NECK LOWER FX
FORCE [N]
TIME [ms]
Max: 282.16 [N]
TMax: 109.85 [ms]
Min: -278.28 [N]
TMin: 50.65 [ms]
Filter: CFC 1000

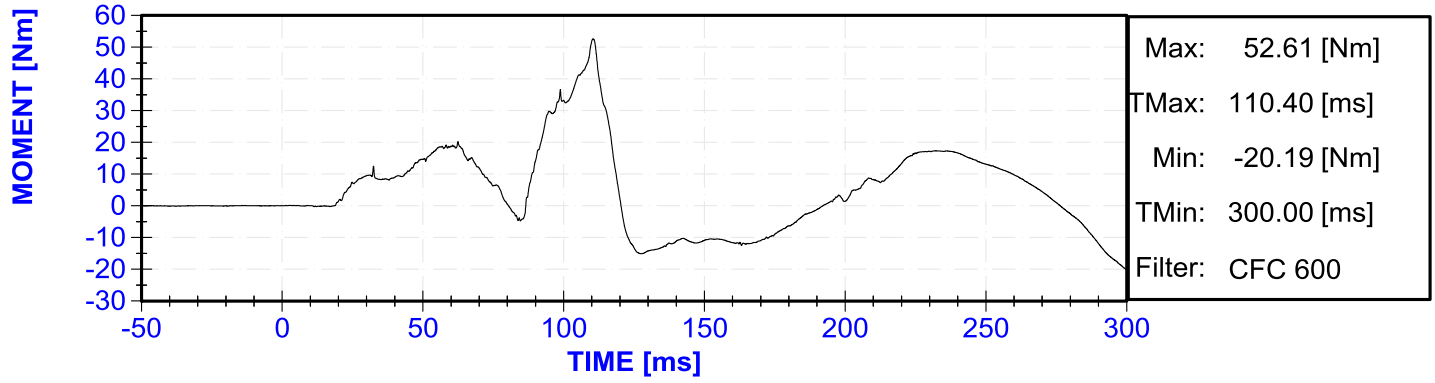
V2P2 NECK LOWER FY



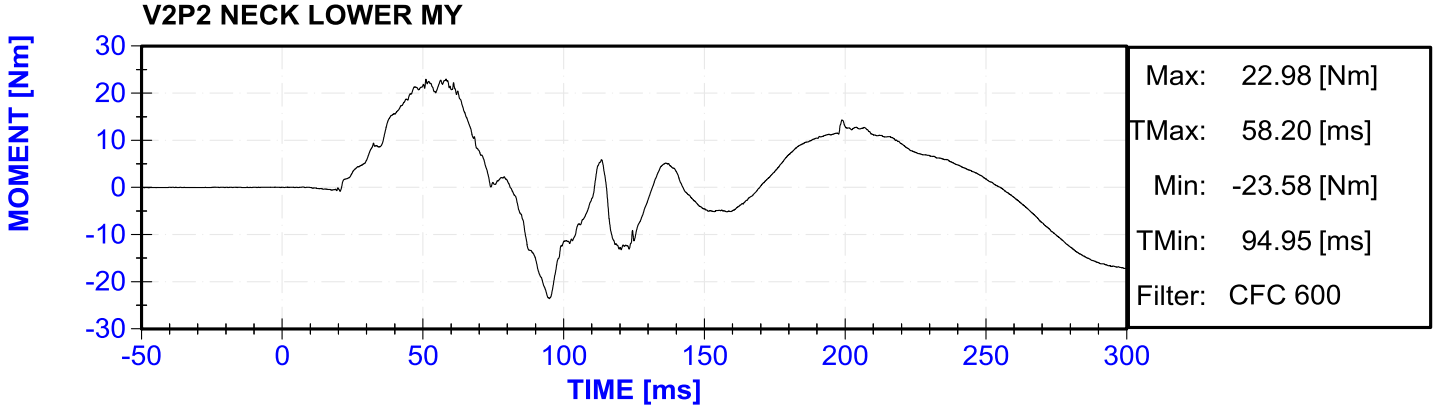
V2P2 NECK LOWER FZ



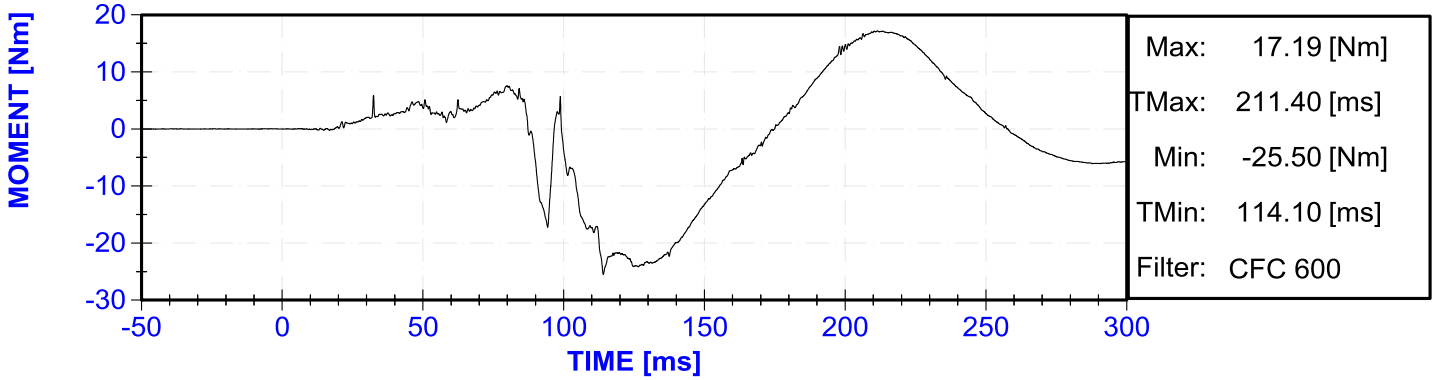
V2P2 NECK LOWER MX



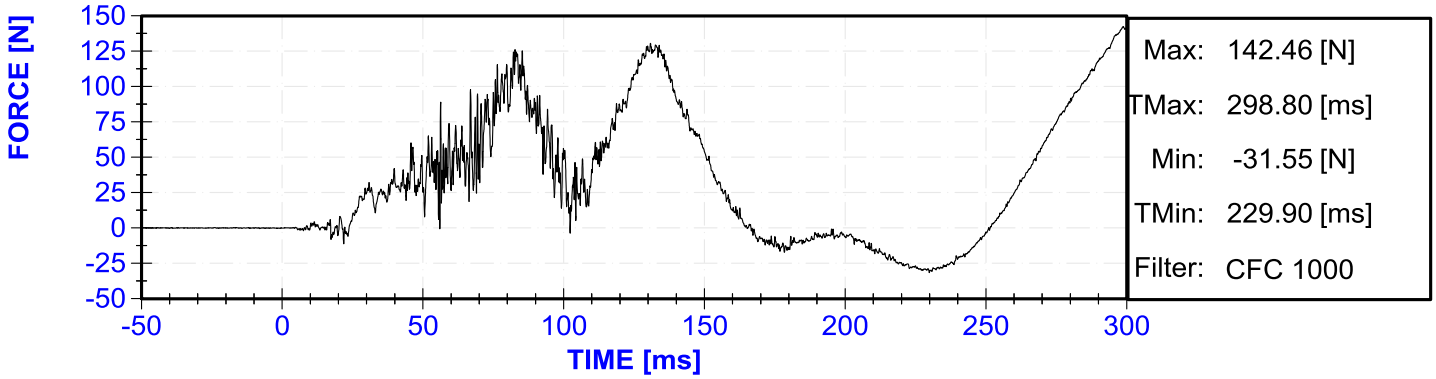
V2P2 NECK LOWER MY



V2P2 NECK LOWER MZ

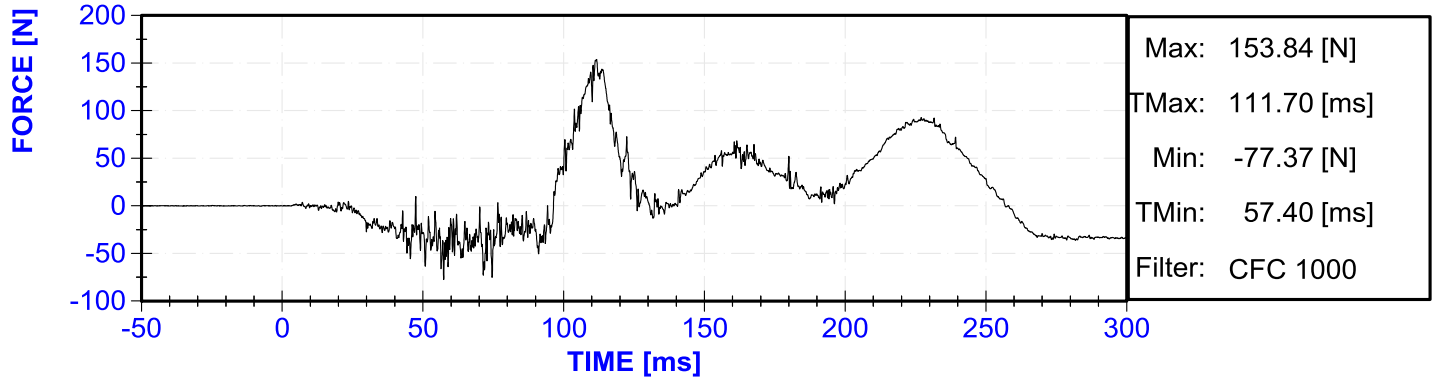


V2P2 NECK SPRING LOAD CELL - FRONT

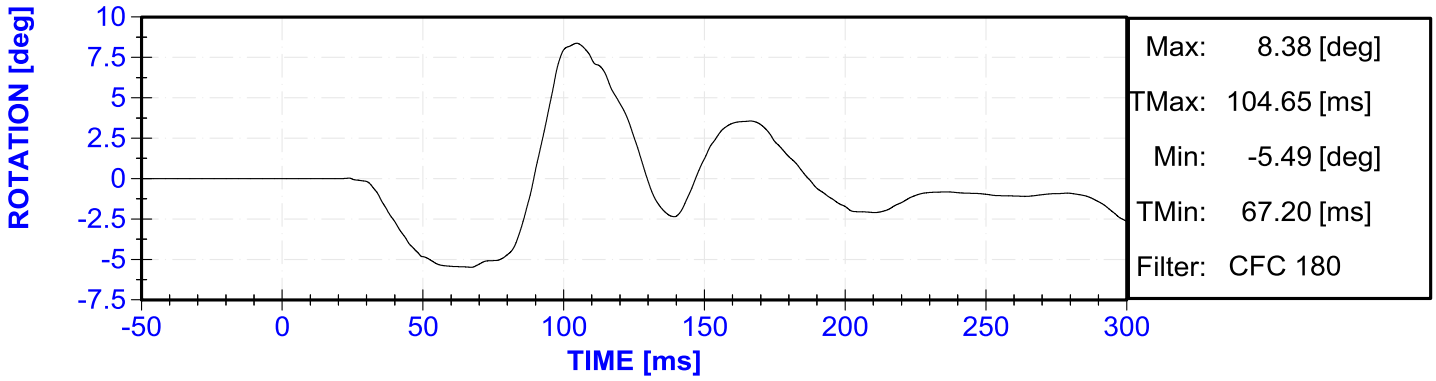


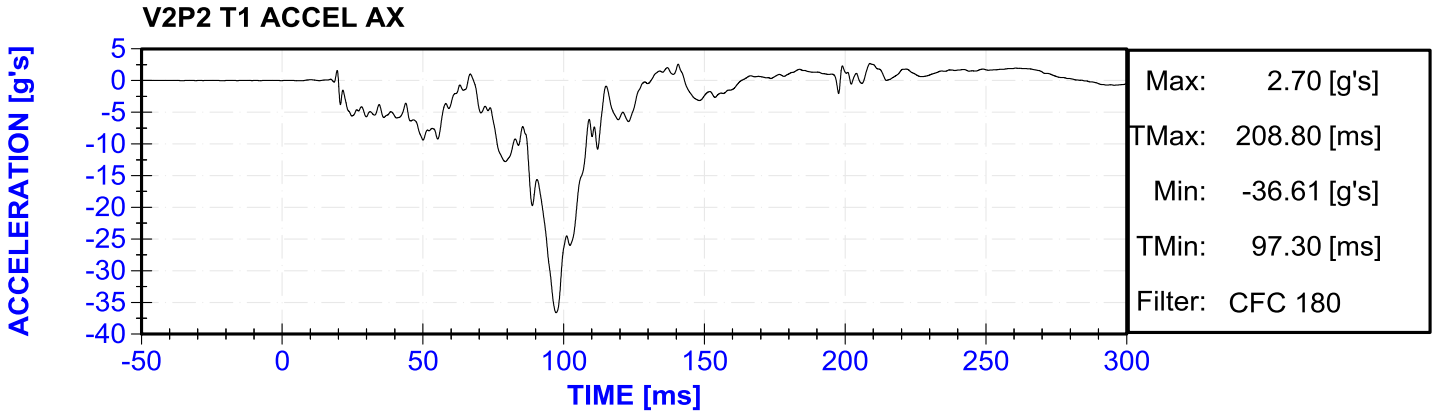
V2P2 NECK SPRING LOAD CELL - REAR & 95MS

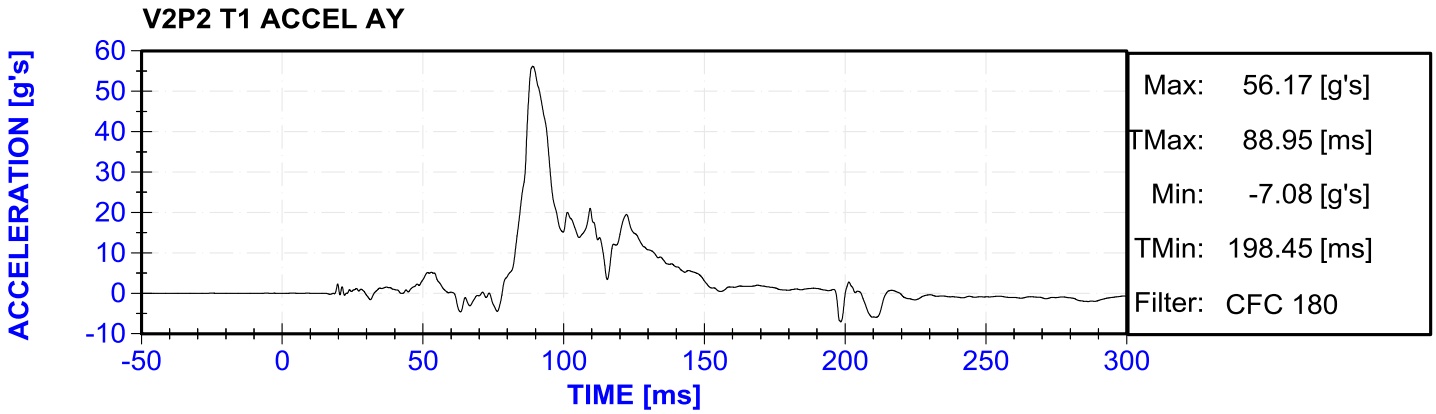
Questionable data from 43 to 95 ms

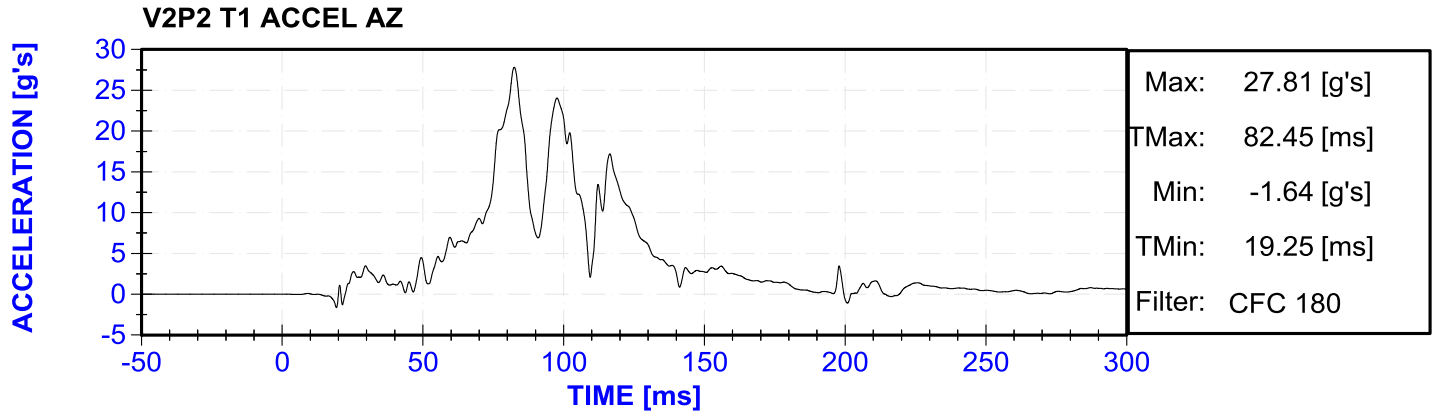


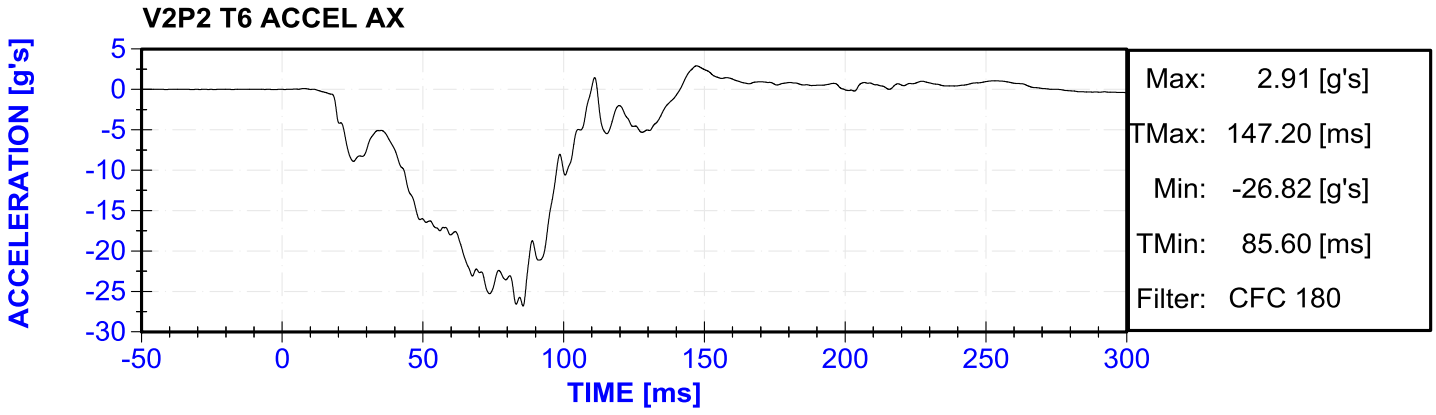
V2P2 OC ANGLE RY



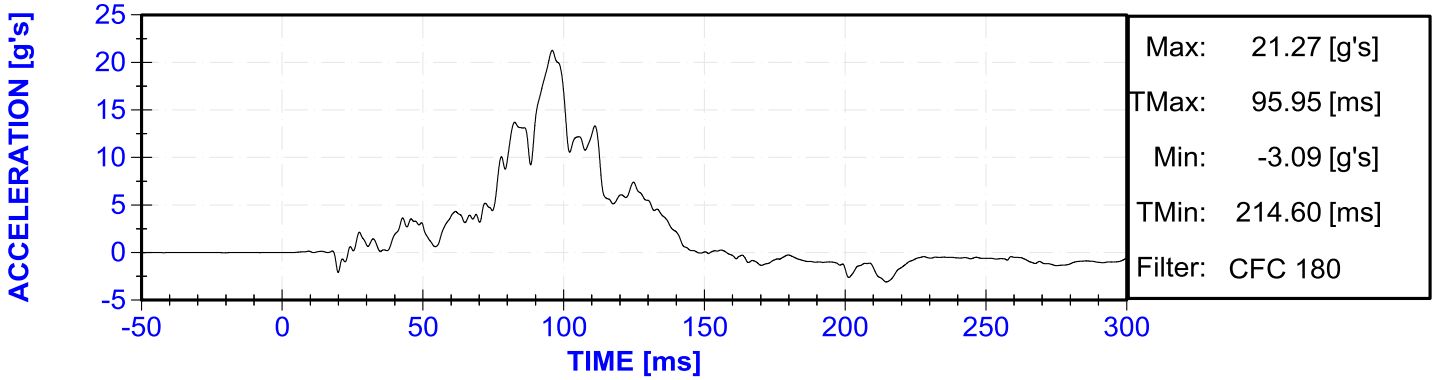

V2P2 T1 ACCEL AX
ACCELERATION [g's]
TIME [ms]
Max: 2.70 [g's]
TMax: 208.80 [ms]
Min: -36.61 [g's]
TMin: 97.30 [ms]
Filter: CFC 180


V2P2 T1 ACCEL AY
ACCELERATION [g's]
TIME [ms]
Max: 56.17 [g's]
TMax: 88.95 [ms]
Min: -7.08 [g's]
TMin: 198.45 [ms]
Filter: CFC 180

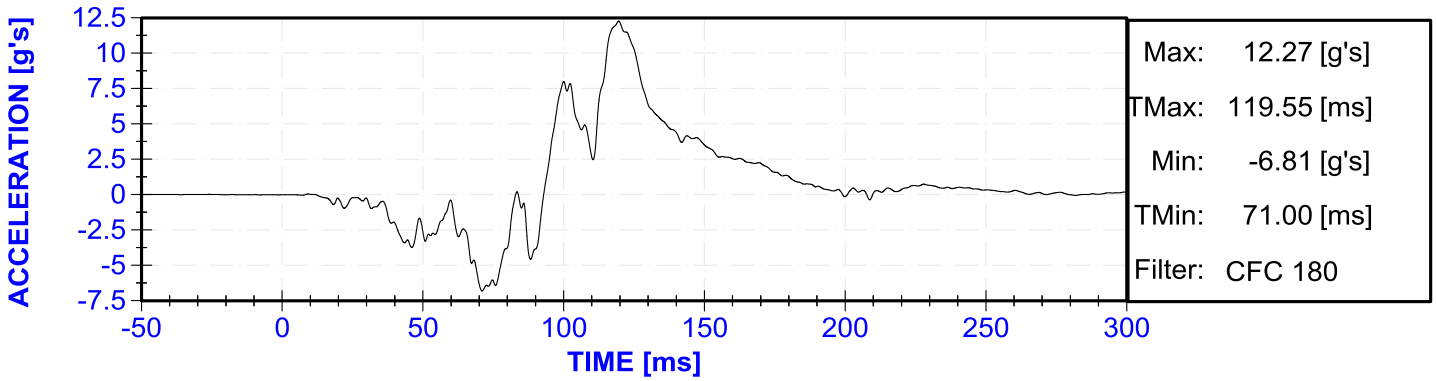

V2P2 T1 ACCEL AZ
ACCELERATION [g's]
TIME [ms]
Max: 27.81 [g's]
TMax: 82.45 [ms]
Min: -1.64 [g's]
TMin: 19.25 [ms]
Filter: CFC 180


V2P2 T6 ACCEL AX
ACCELERATION [g's]
TIME [ms]
Max: 2.91 [g's]
TMax: 147.20 [ms]
Min: -26.82 [g's]
TMin: 85.60 [ms]
Filter: CFC 180

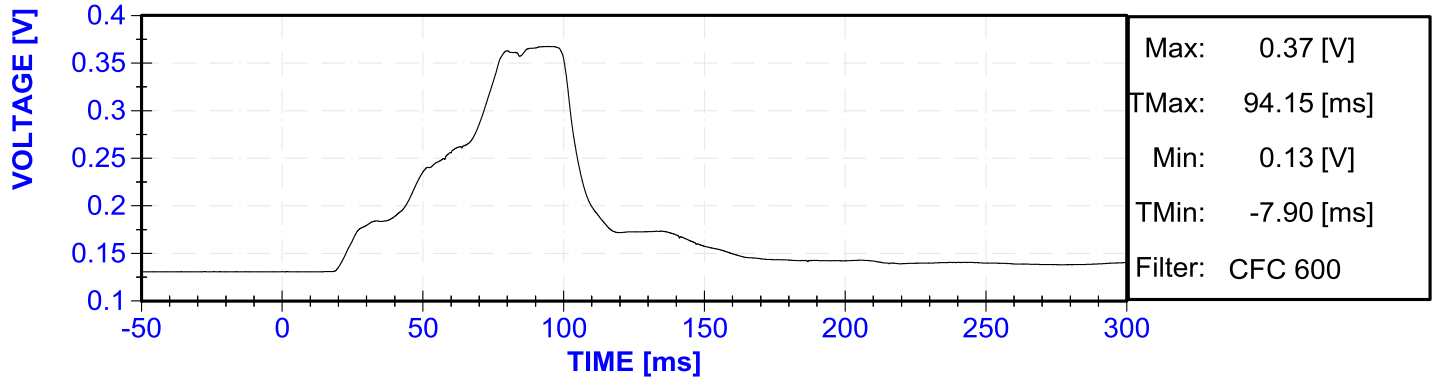
V2P2 T6 ACCEL AY



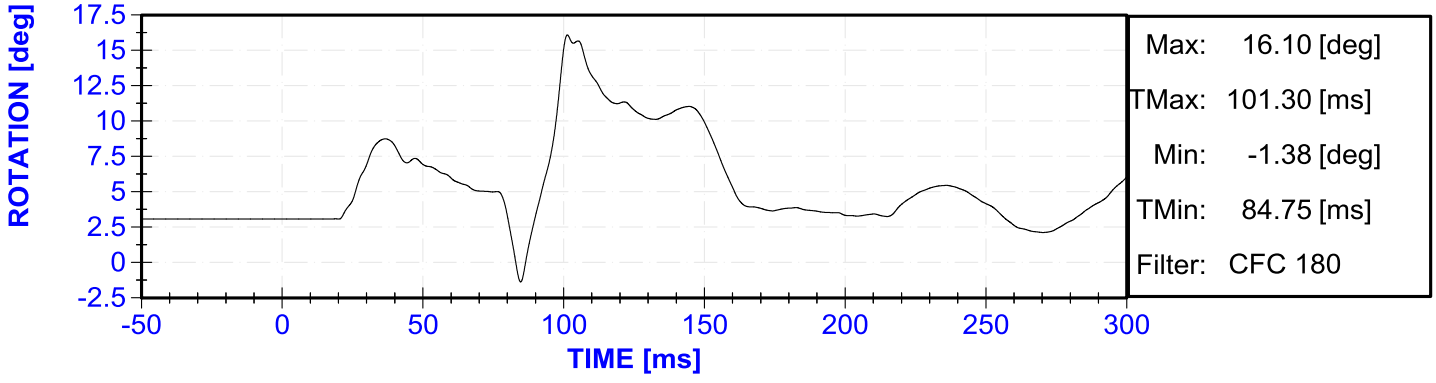
V2P2 T6 ACCEL AZ

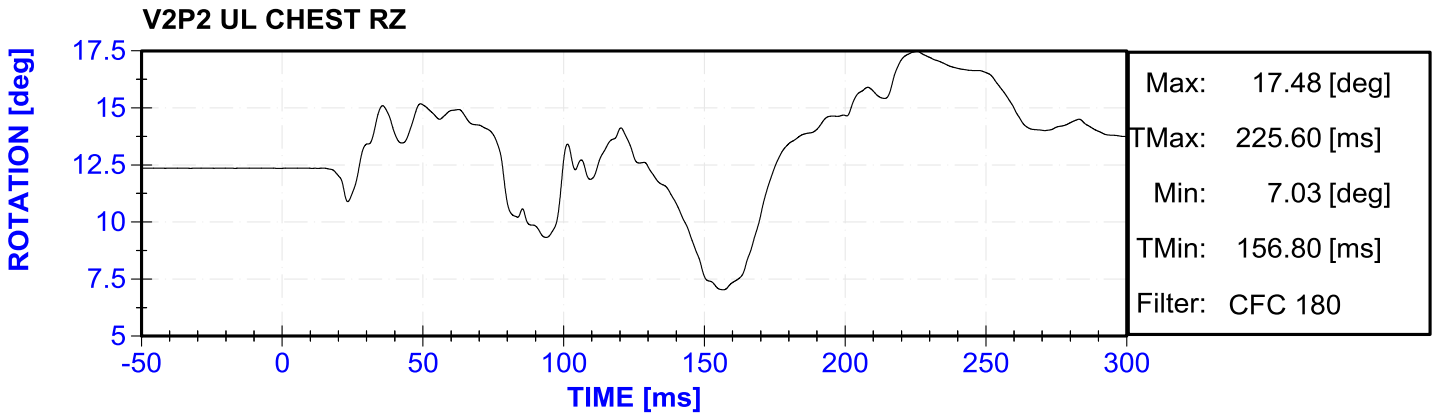


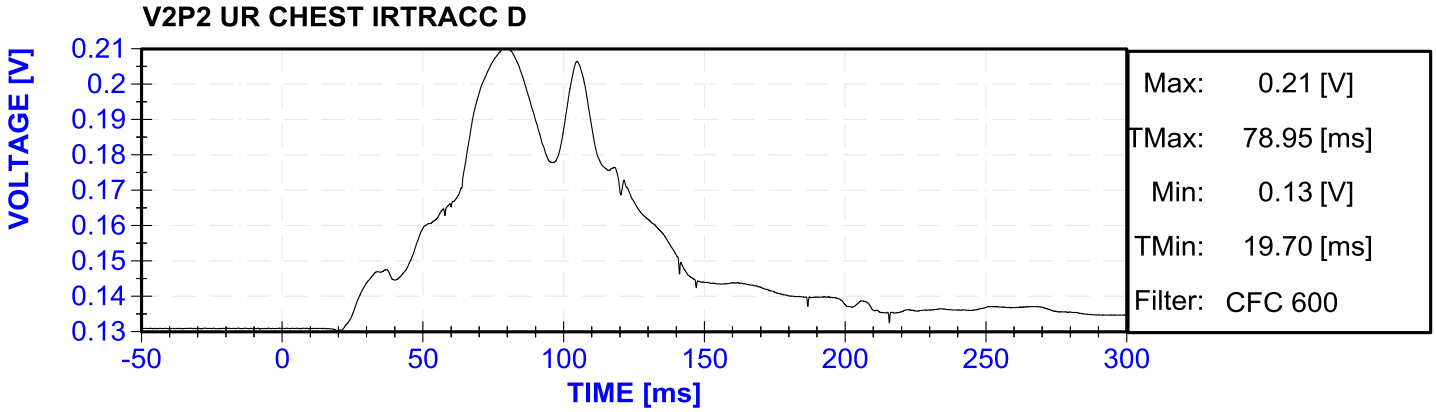
V2P2 UL CHEST IRTRACC D

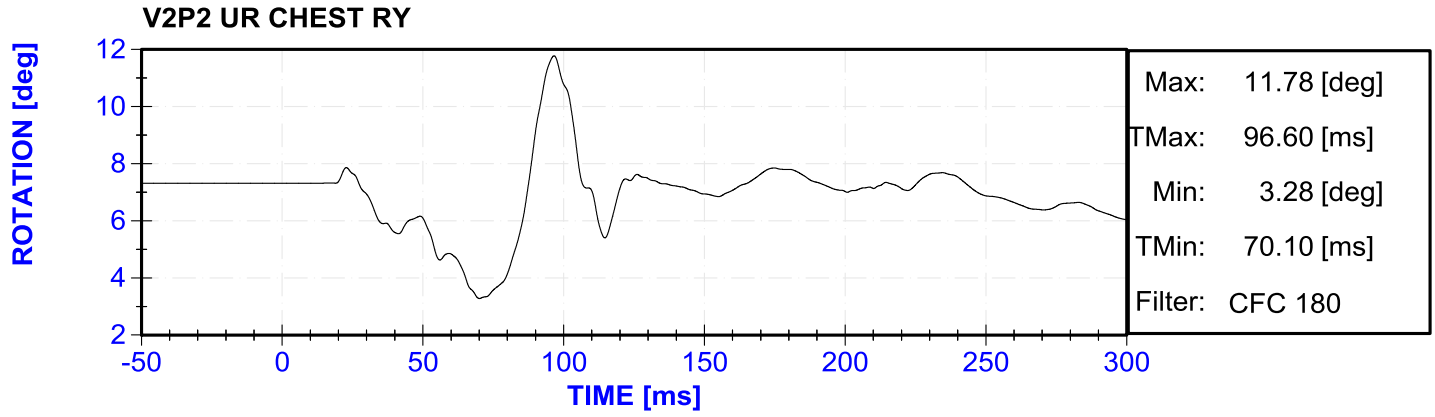


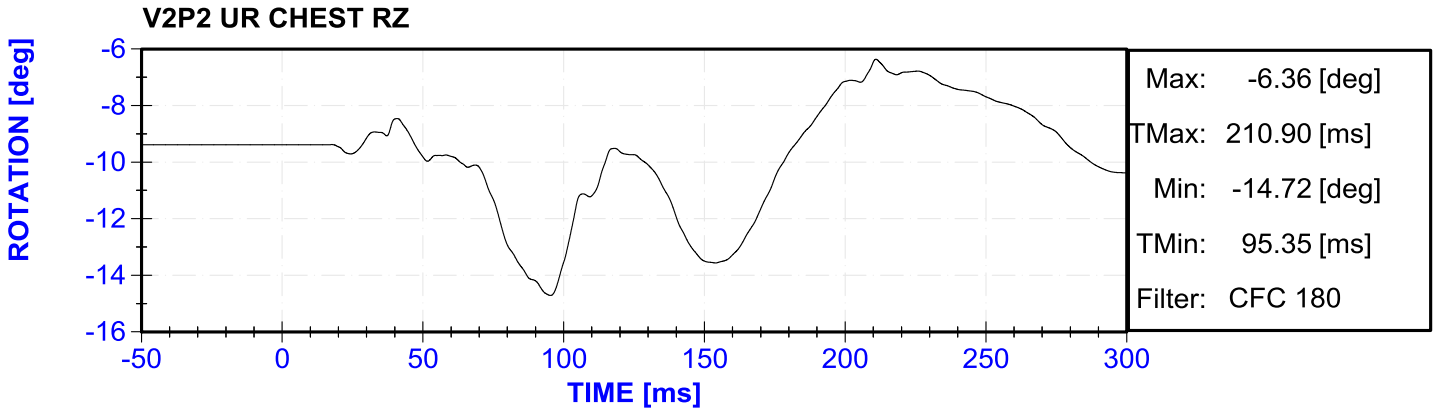
V2P2 UL CHEST RY



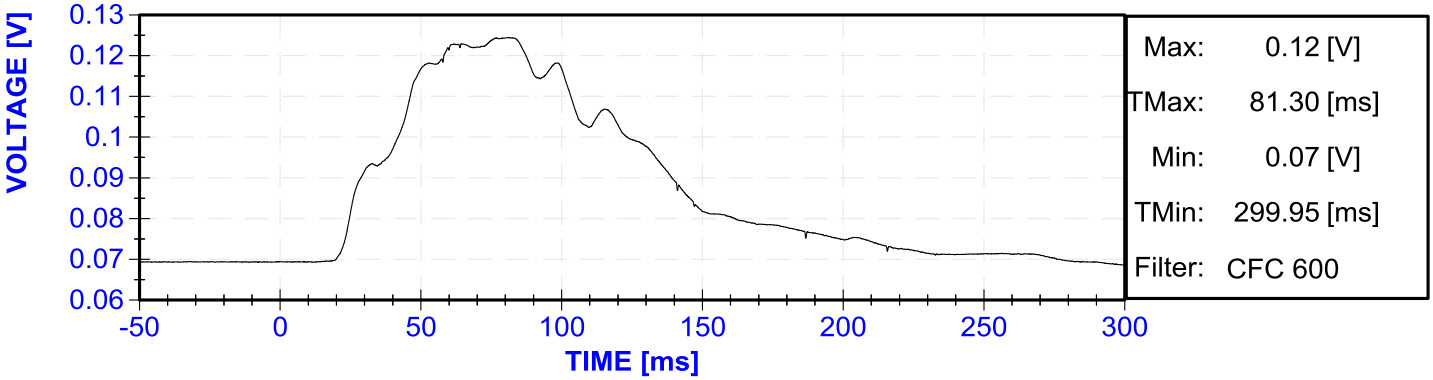

V2P2 UL CHEST RZ
ROTATION [deg]
17.5
15
12.5
10
7.5
5
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 17.48 [deg]
TMax: 225.60 [ms]
Min: 7.03 [deg]
TMin: 156.80 [ms]
Filter: CFC 180


V2P2 UR CHEST IRTRACC D
VOLTAGE [V]
0.21
0.2
0.19
0.18
0.17
0.16
0.15
0.14
0.13
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 0.21 [V]
TMax: 78.95 [ms]
Min: 0.13 [V]
TMin: 19.70 [ms]
Filter: CFC 600

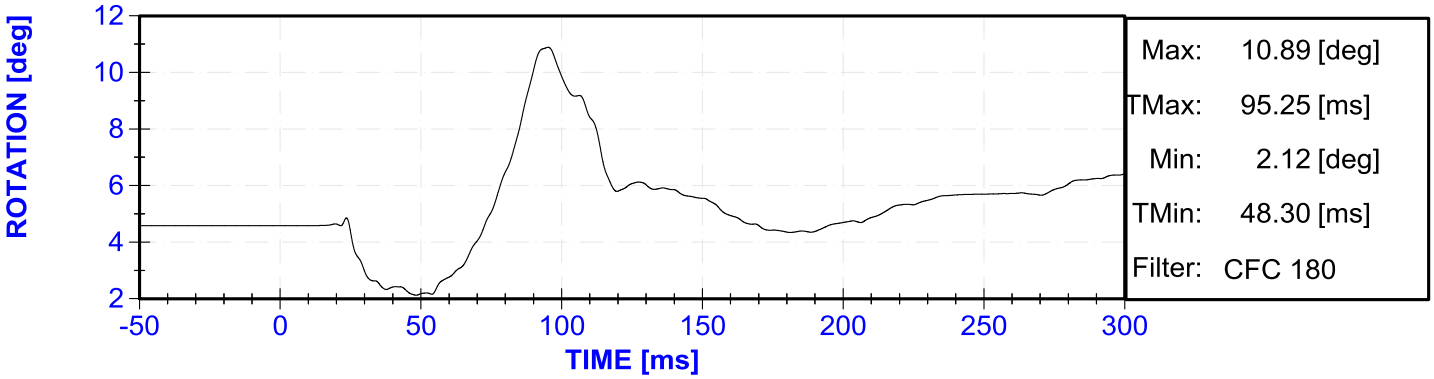

V2P2 UR CHEST RY
ROTATION [deg]
12
10
8
6
4
2
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 11.78 [deg]
TMax: 96.60 [ms]
Min: 3.28 [deg]
TMin: 70.10 [ms]
Filter: CFC 180


V2P2 UR CHEST RZ
ROTATION [deg]
-6
-8
-10
-12
-14
-16
-50
0
50
100
150
200
250
300
TIME [ms]
Max: -6.36 [deg]
TMax: 210.90 [ms]
Min: -14.72 [deg]
TMin: 95.35 [ms]
Filter: CFC 180

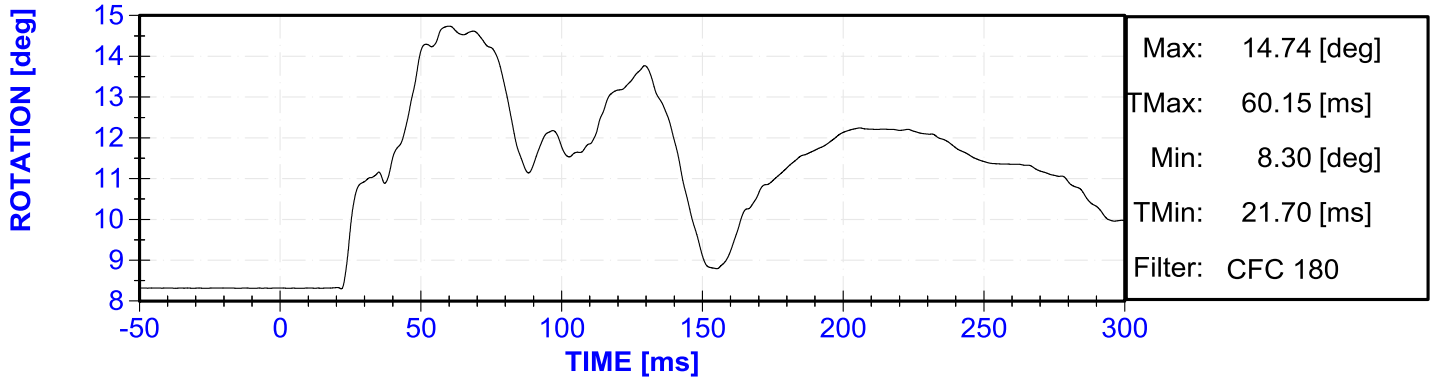
V2P2 LL CHEST IRTRACC D



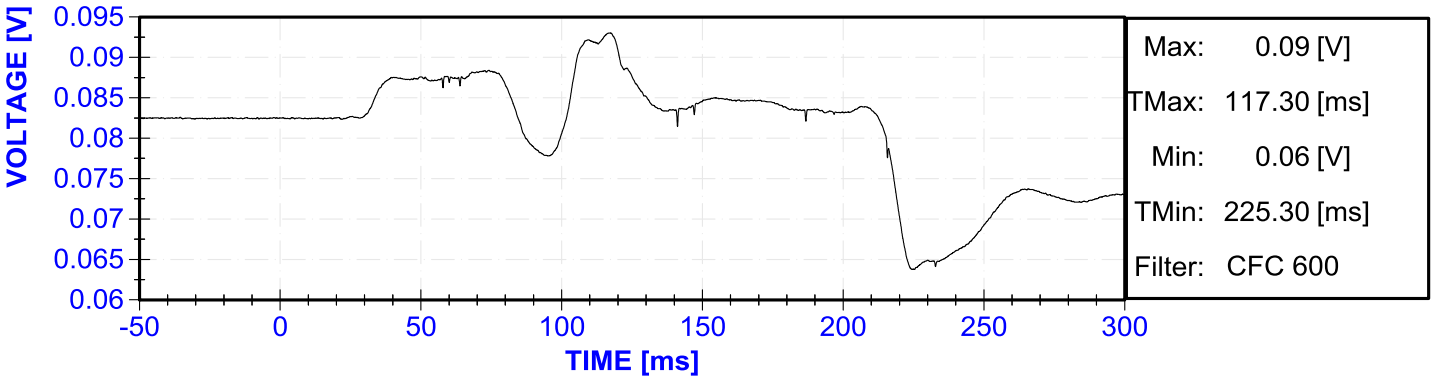
V2P2 LL CHEST RY



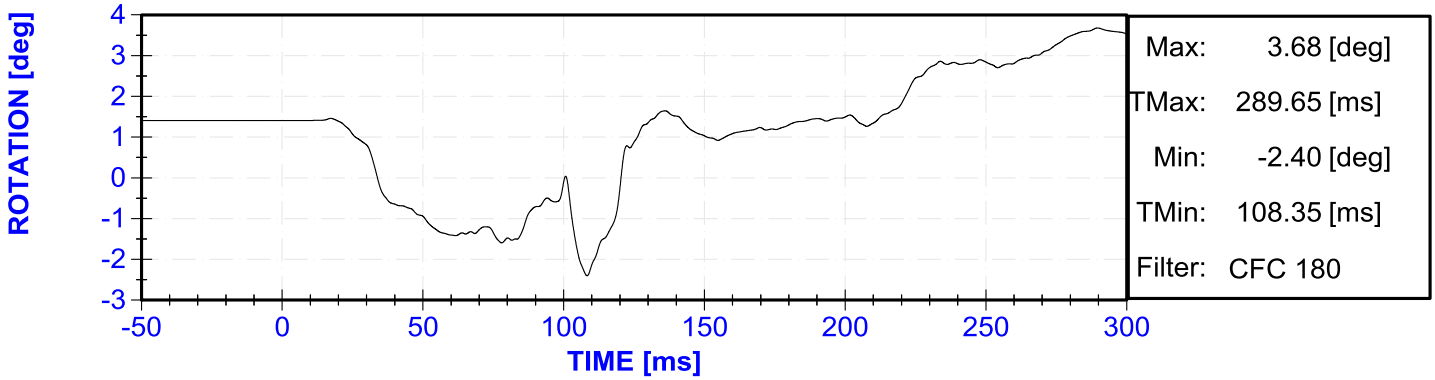
V2P2 LL CHEST RZ



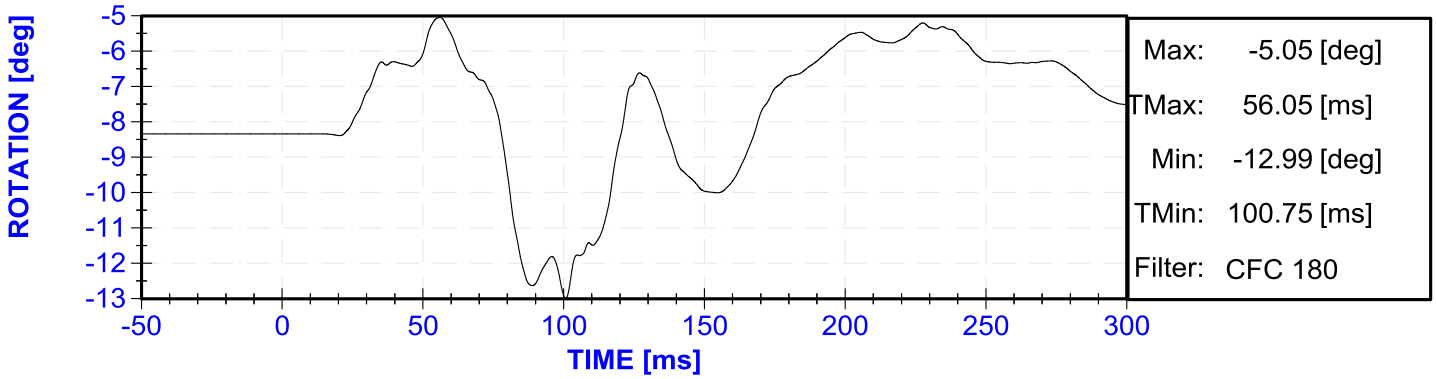
V2P2 LR CHEST IRTRACC D



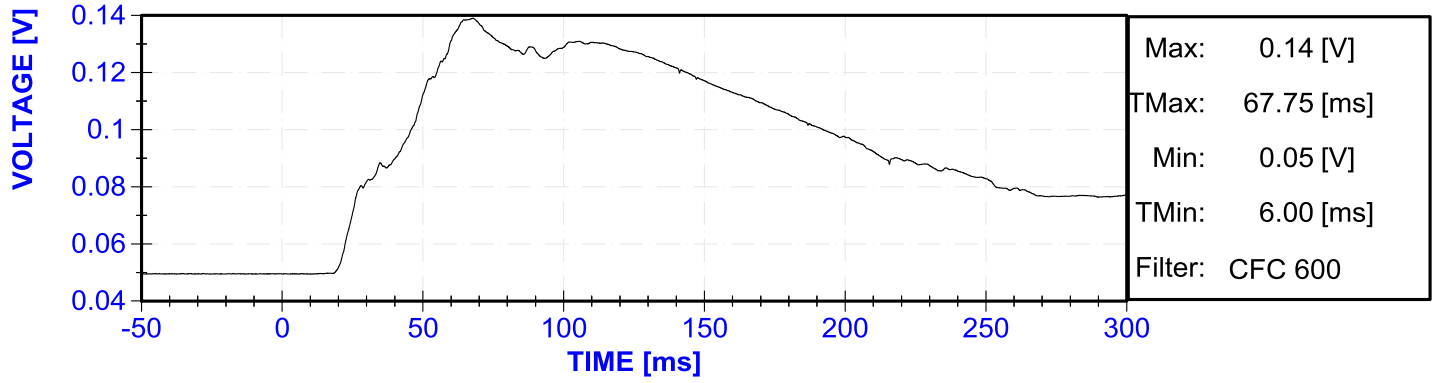
V2P2 LR CHEST RY



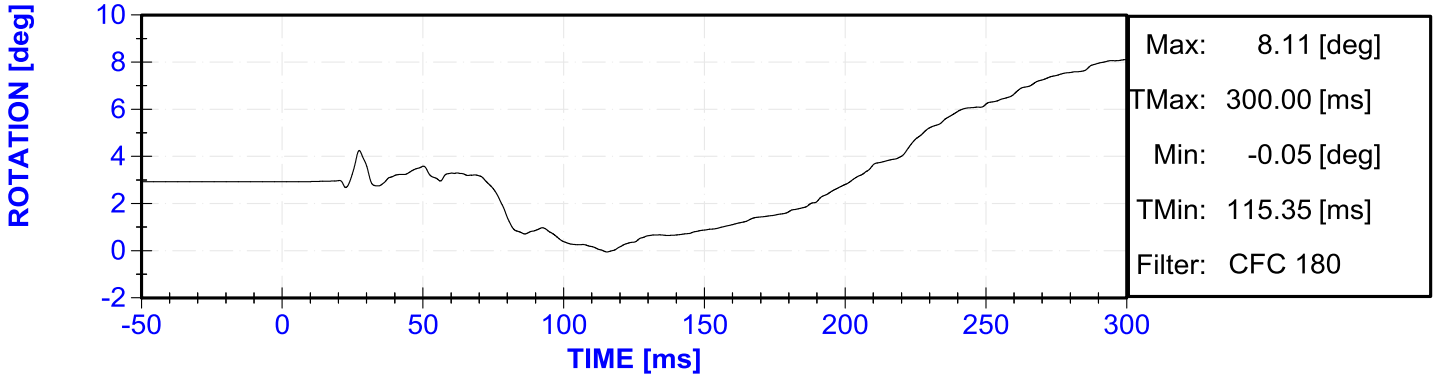
V2P2 LR CHEST RZ



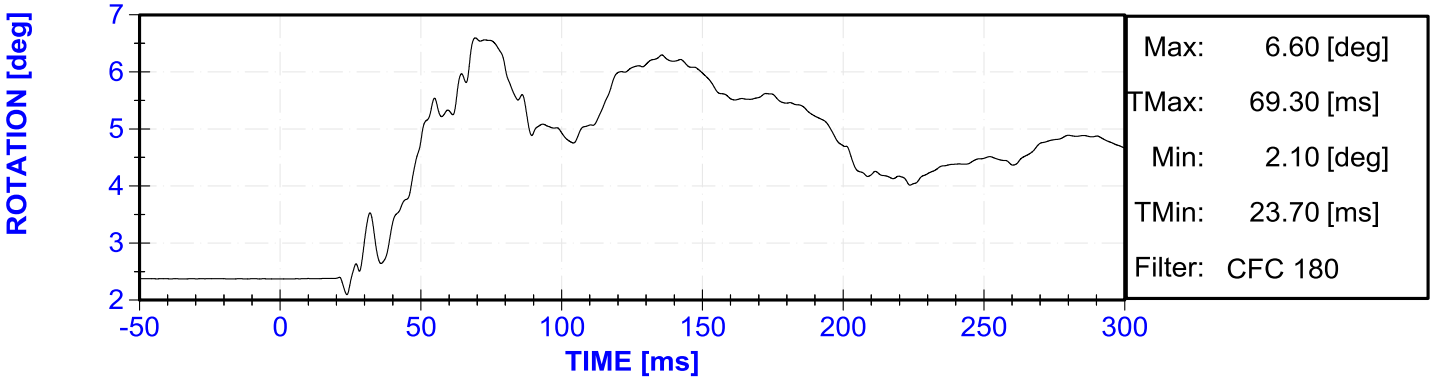
V2P2 ABDOMEN LEFT IRTRACC D



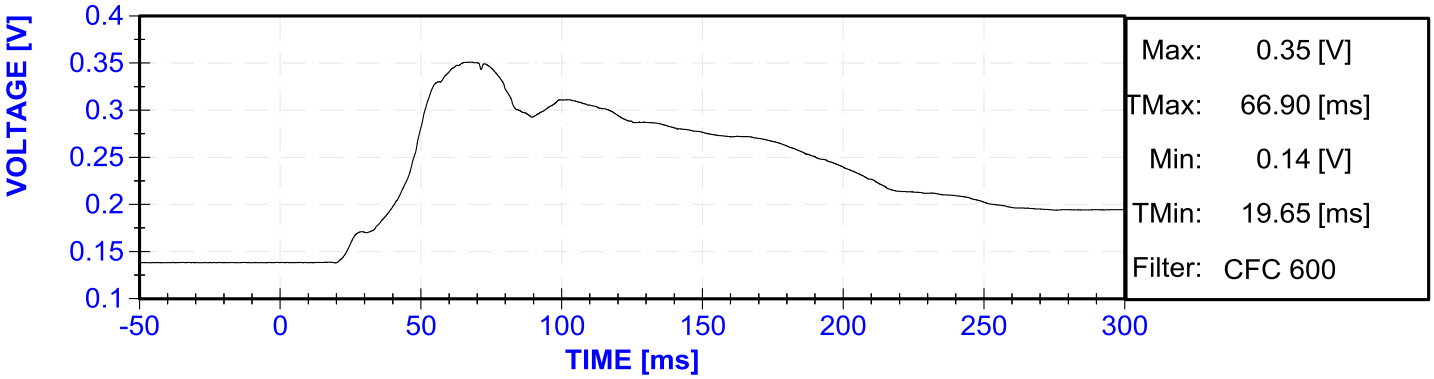
V2P2 ABDOMEN LEFT RY



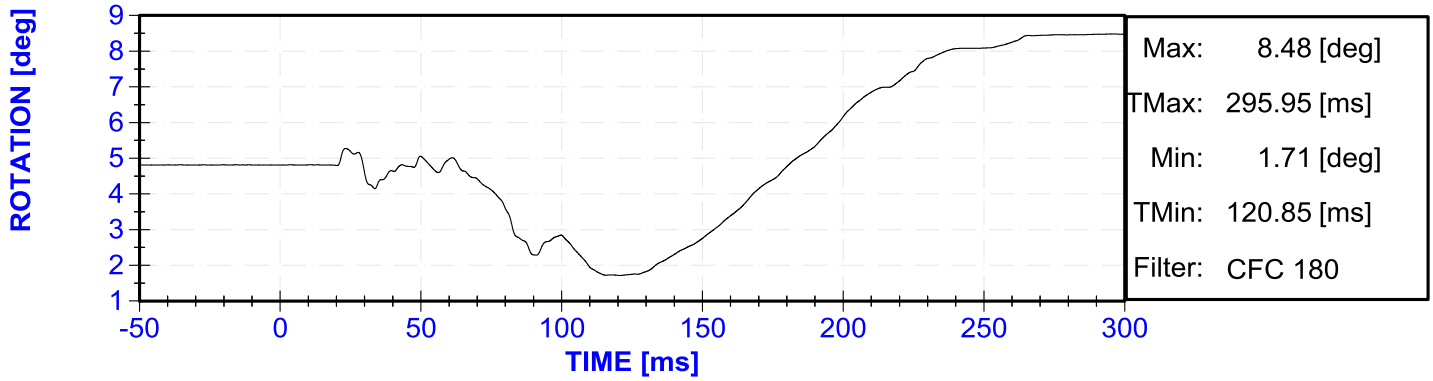
V2P2 ABDOMEN LEFT RZ



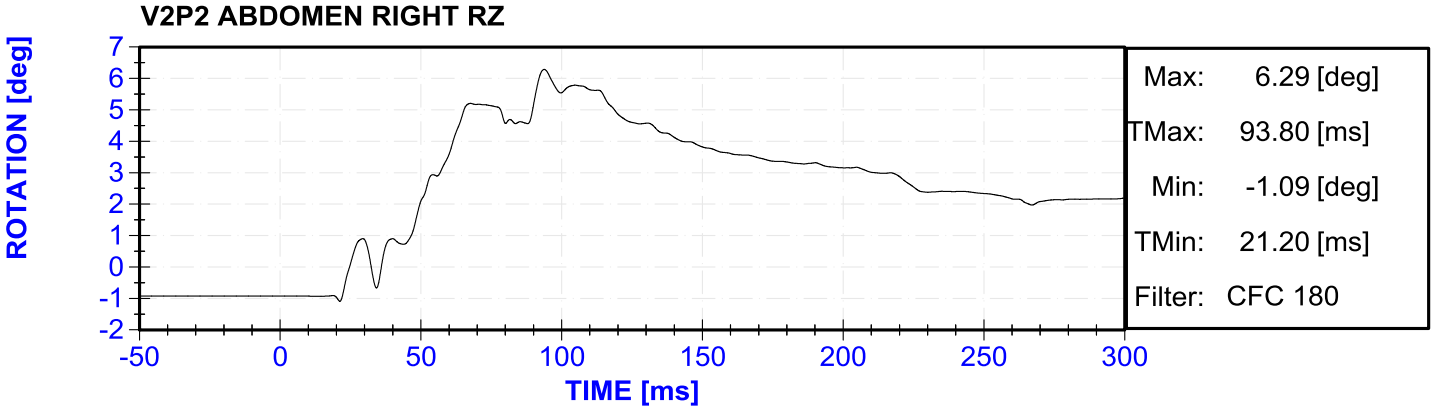
V2P2 ABDOMEN RIGHT IRTRACC D



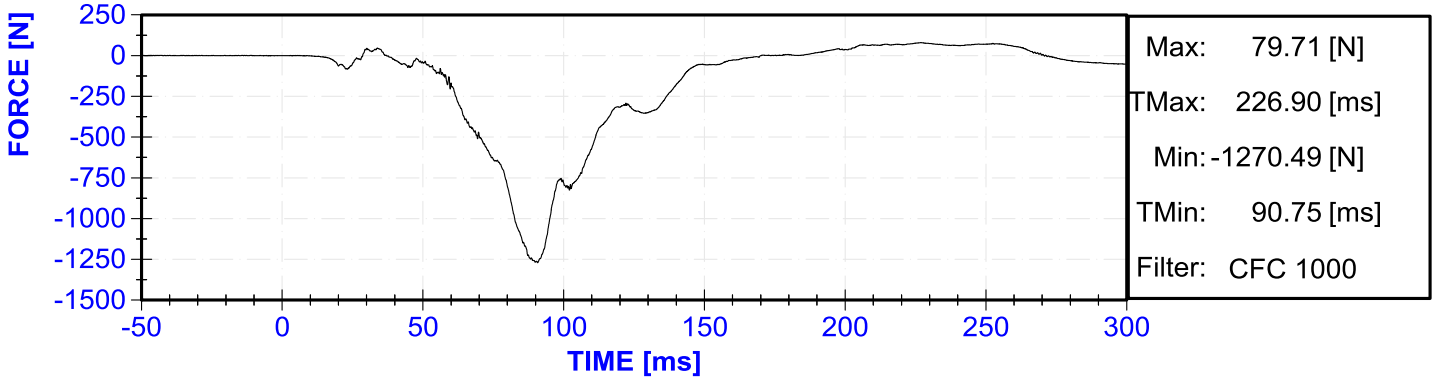
V2P2 ABDOMEN RIGHT RY



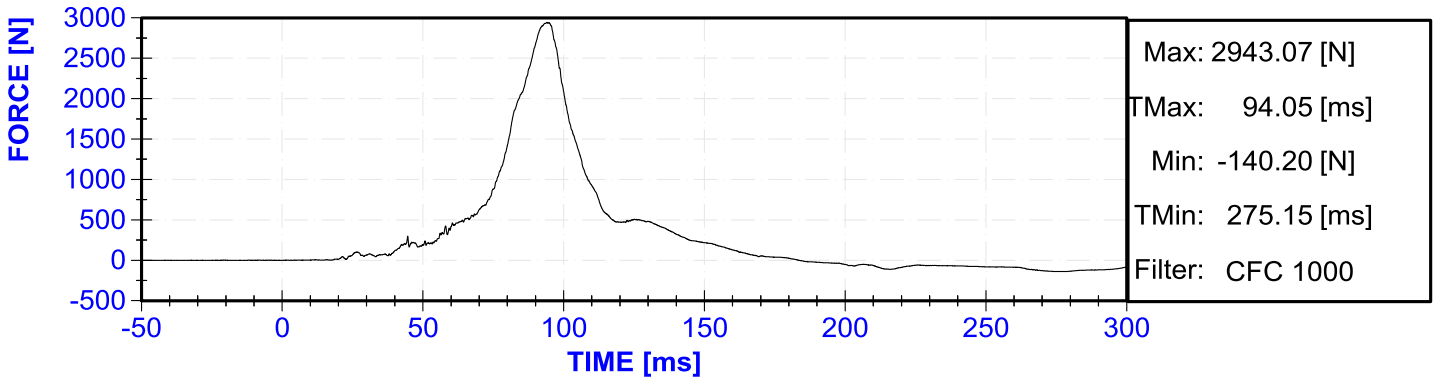
V2P2 ABDOMEN RIGHT RZ



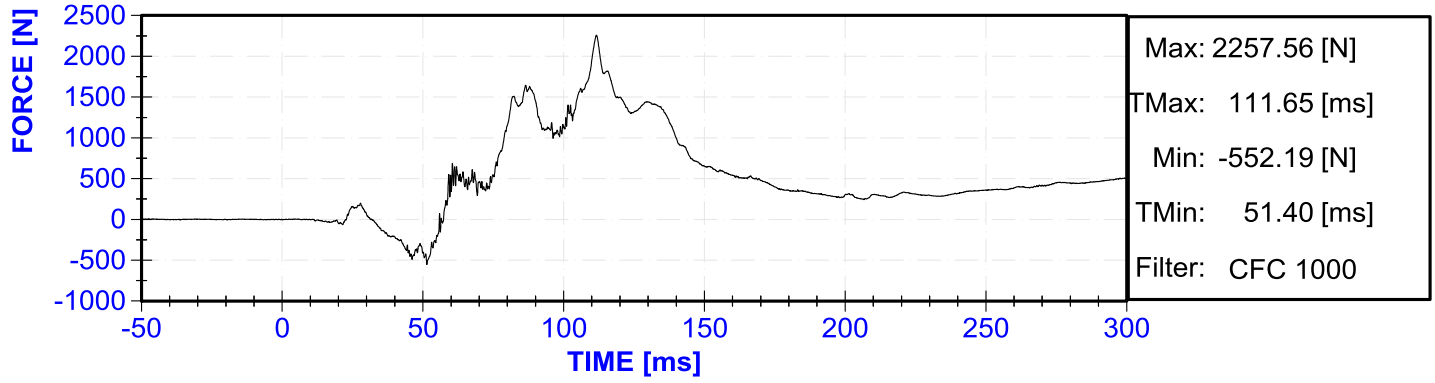
V2P2 SPINE LOWER FX



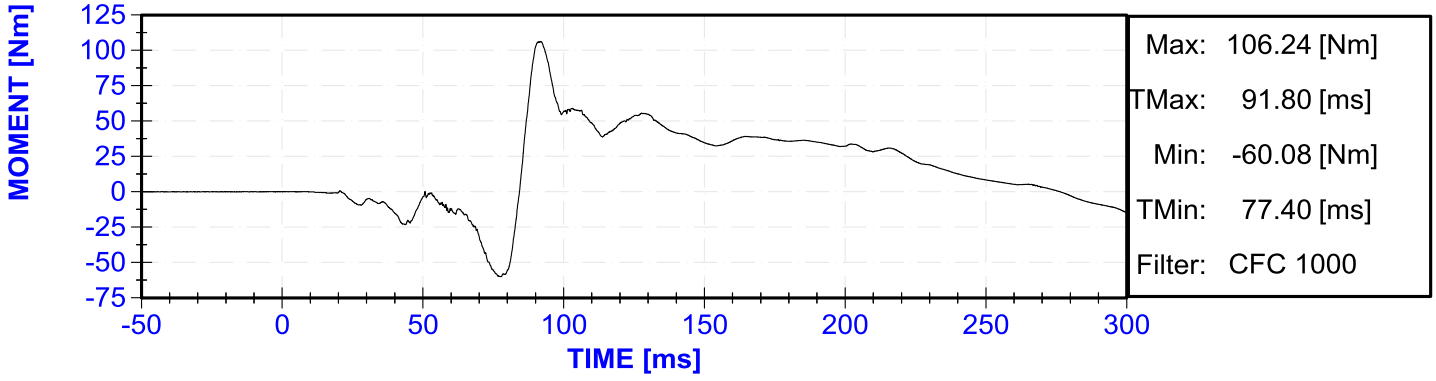
V2P2 SPINE LOWER FY



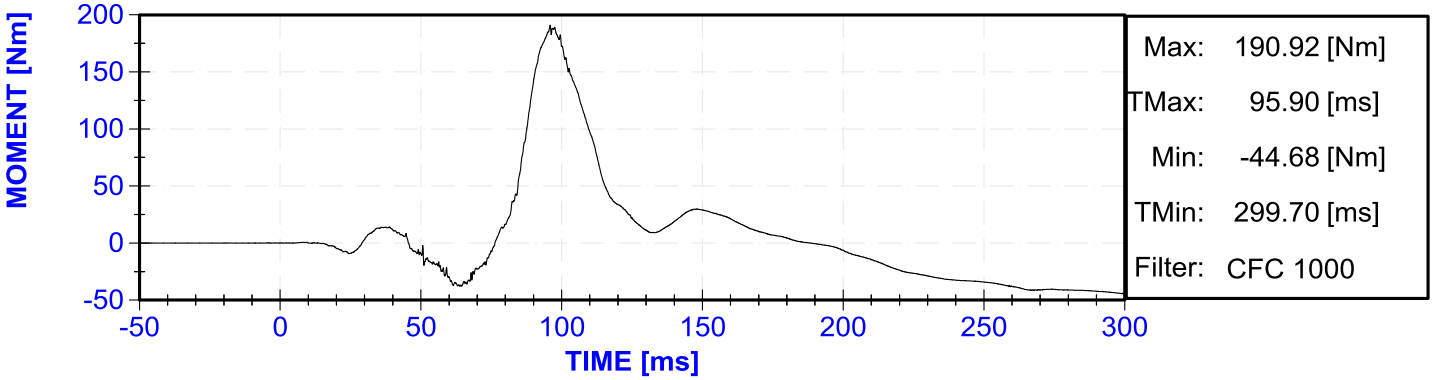
V2P2 SPINE LOWER FZ



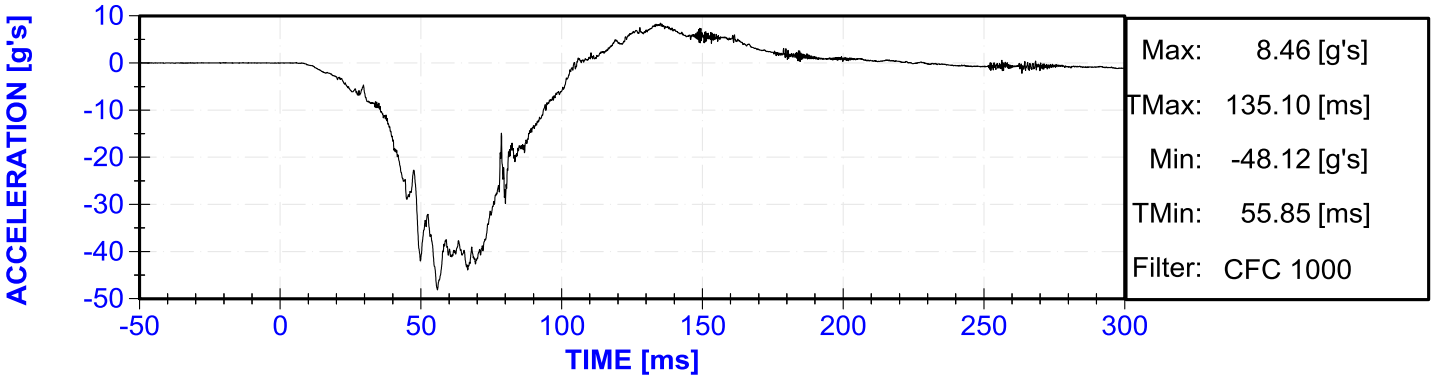
V2P2 SPINE LOWER MX



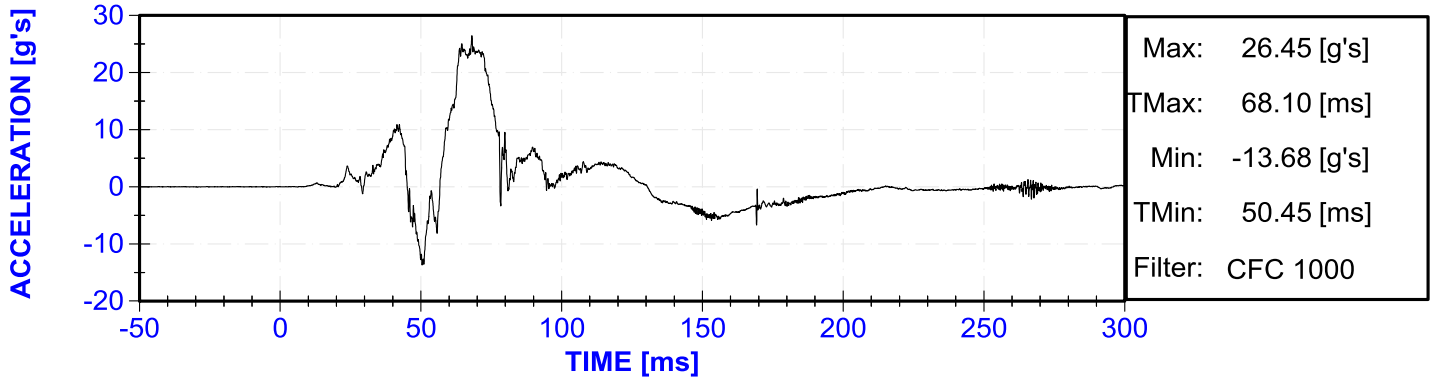
V2P2 SPINE LOWER MY



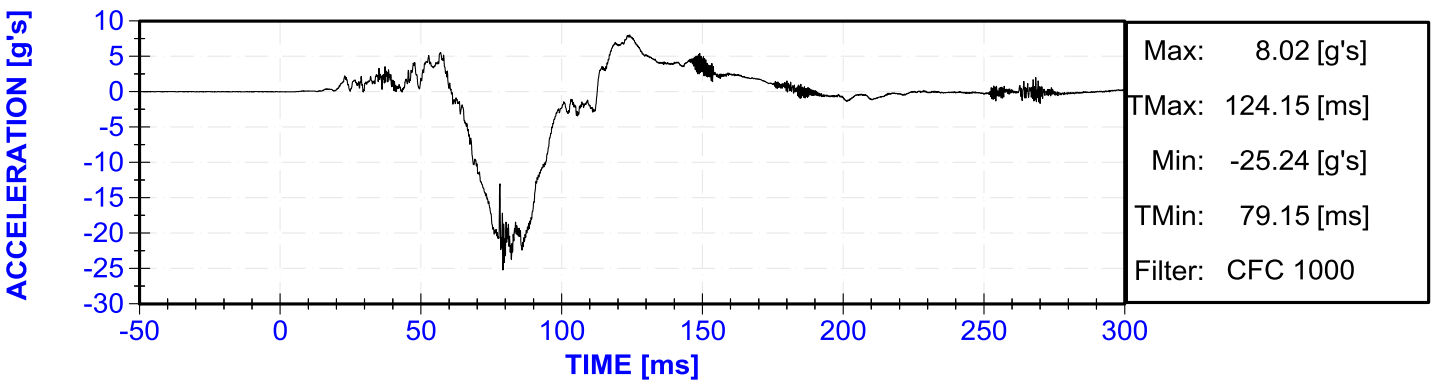
V2P2 PELVIS CG AX



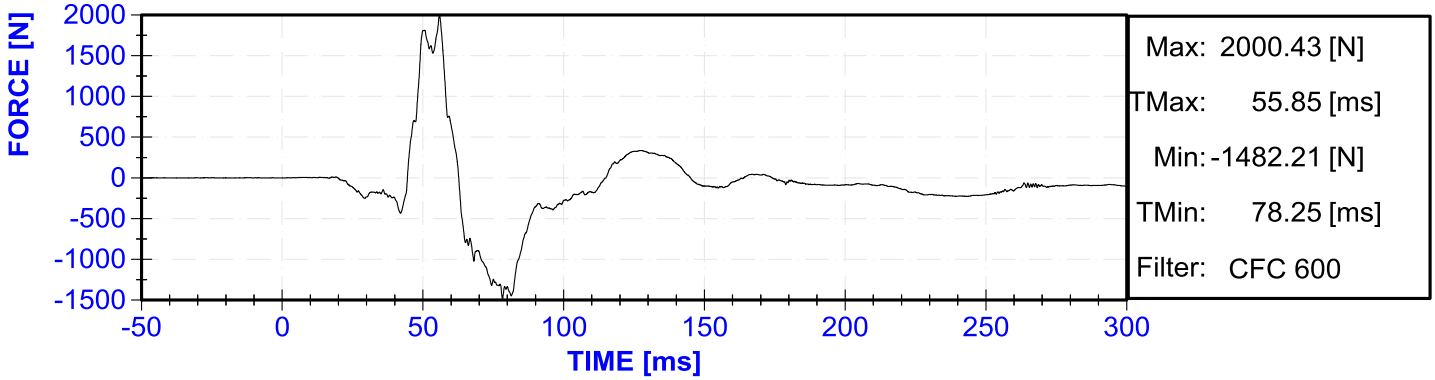
V2P2 PELVIS CG AY



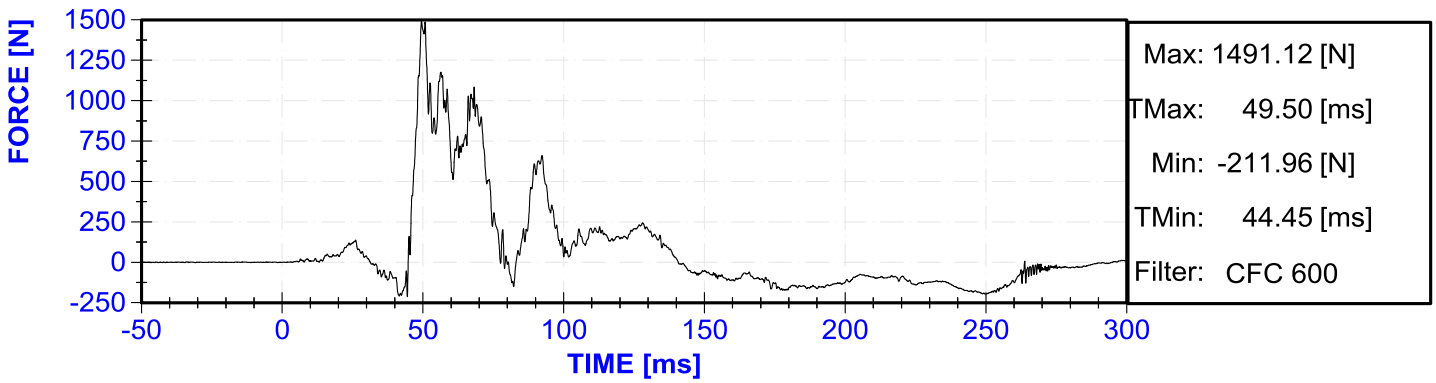
V2P2 PELVIS CG AZ



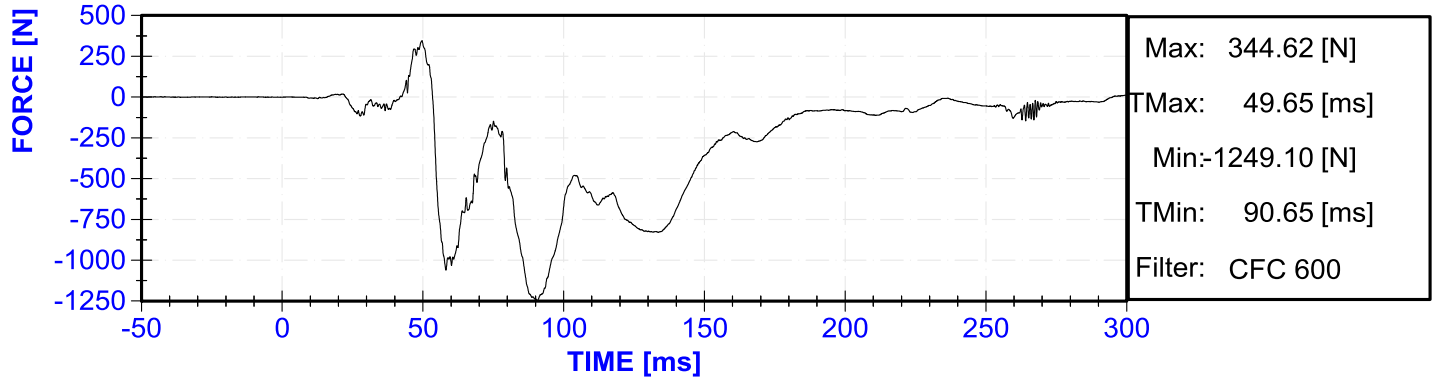
V2P2 PELVIS ACETABULUM LEFT FX



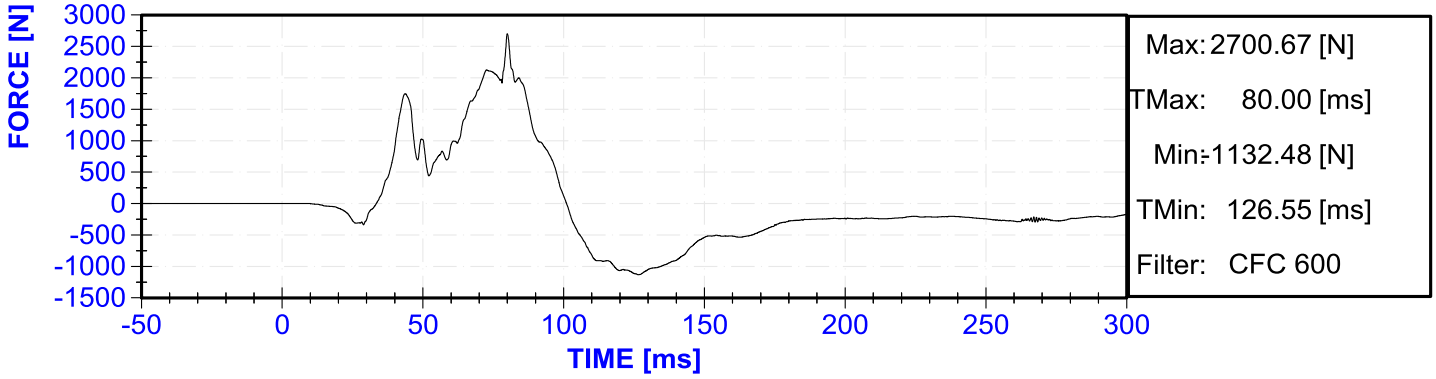
V2P2 PELVIS ACETABULUM LEFT FY



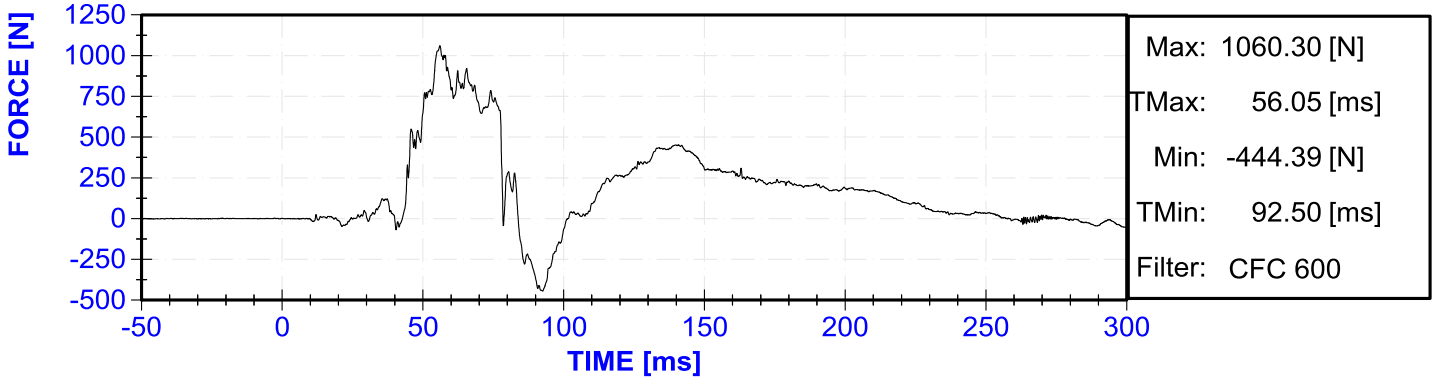
V2P2 PELVIS ACETABULUM LEFT FZ



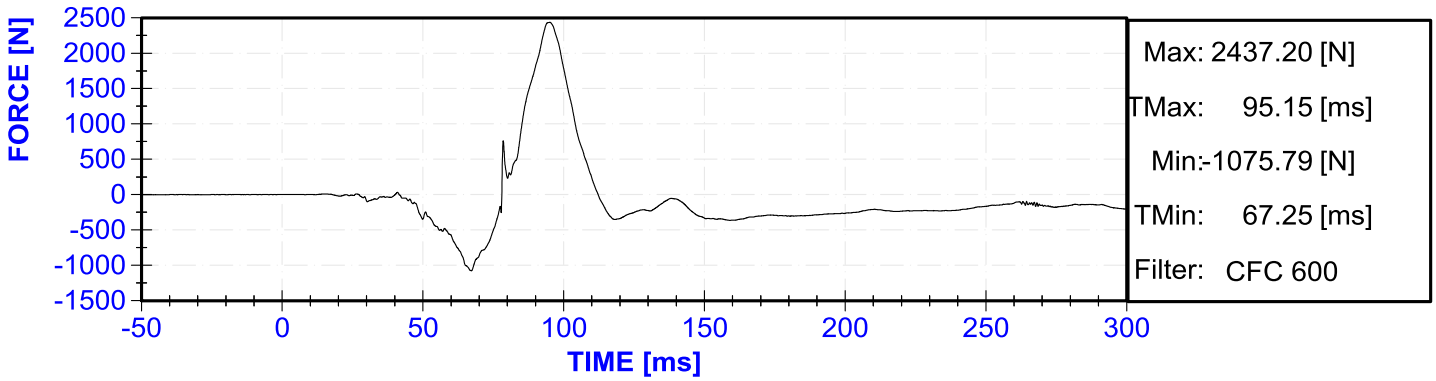
V2P2 PELVIS ACETABULUM RIGHT FX



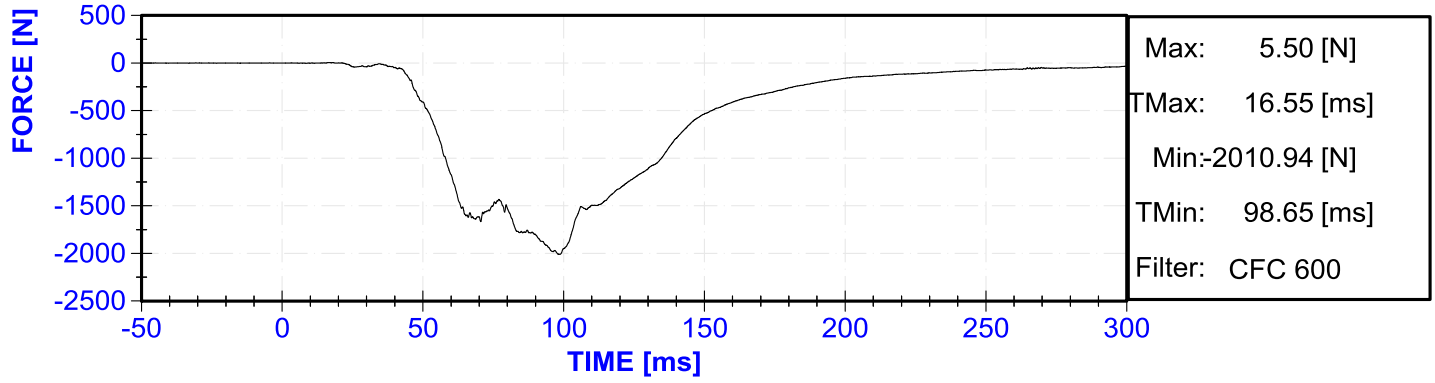
V2P2 PELVIS ACETABULUM RIGHT FY



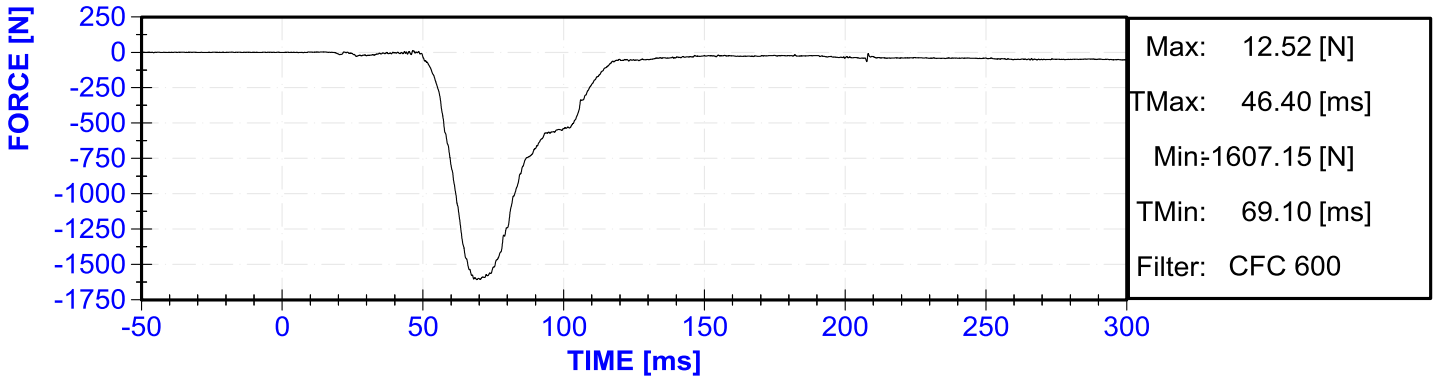
V2P2 PELVIS ACETABULUM RIGHT FZ



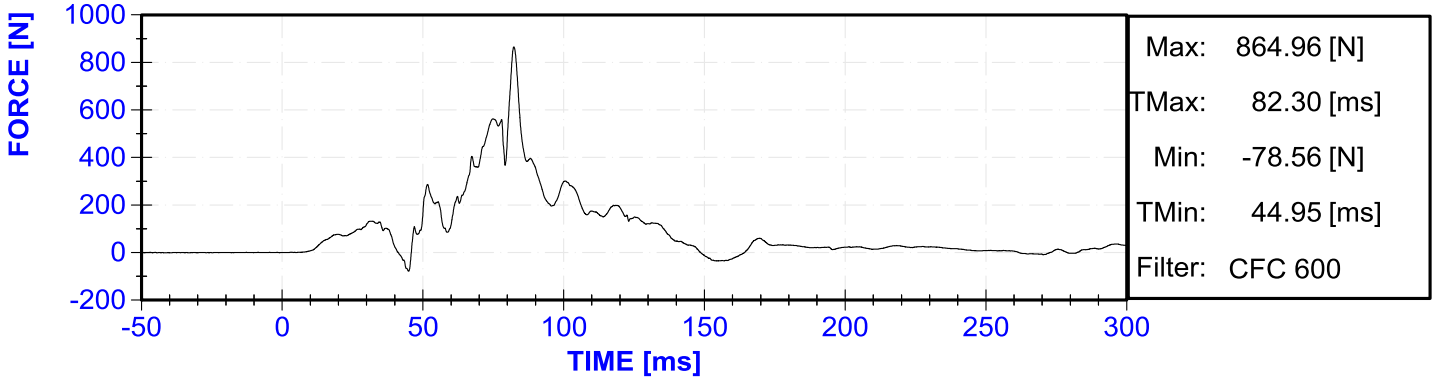
V2P2 LEFT ASIS FX



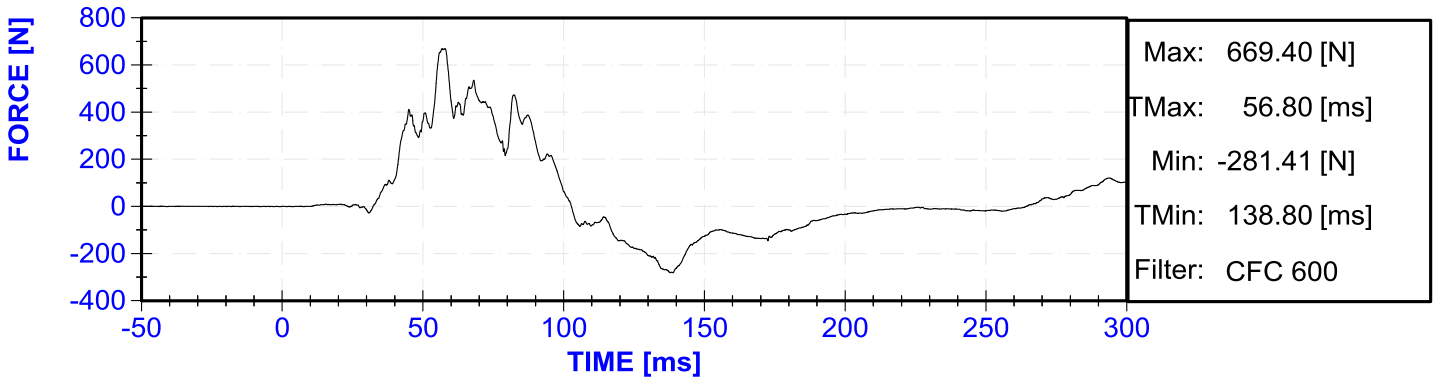
V2P2 RIGHT ASIS FX



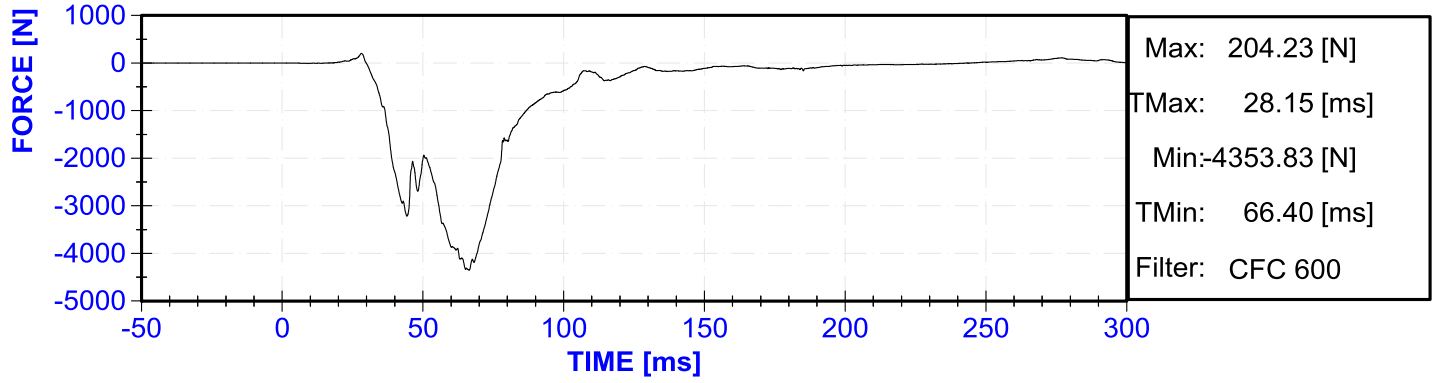
V2P2 LEFT FEMUR FX



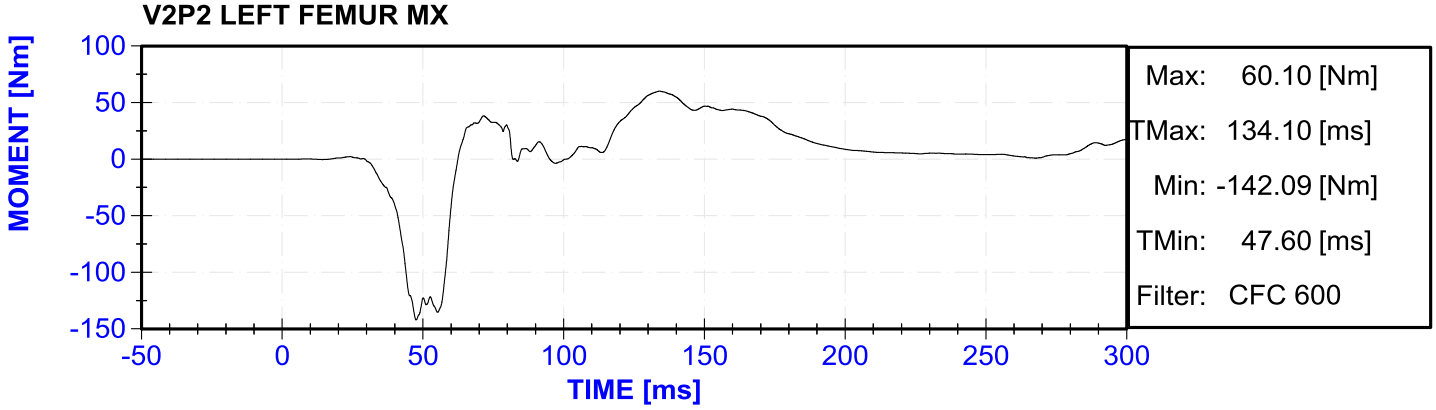
V2P2 LEFT FEMUR FY



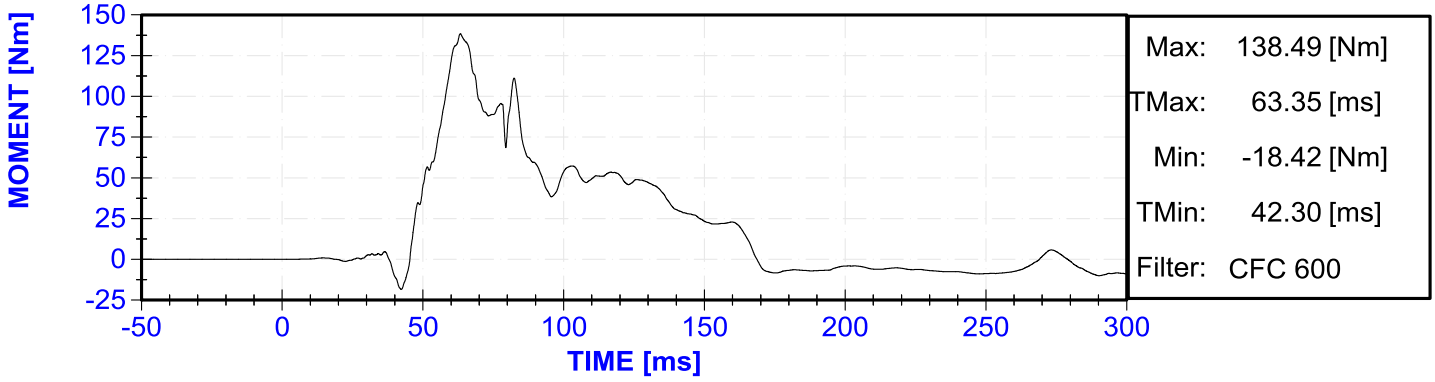
V2P2 LEFT FEMUR FZ



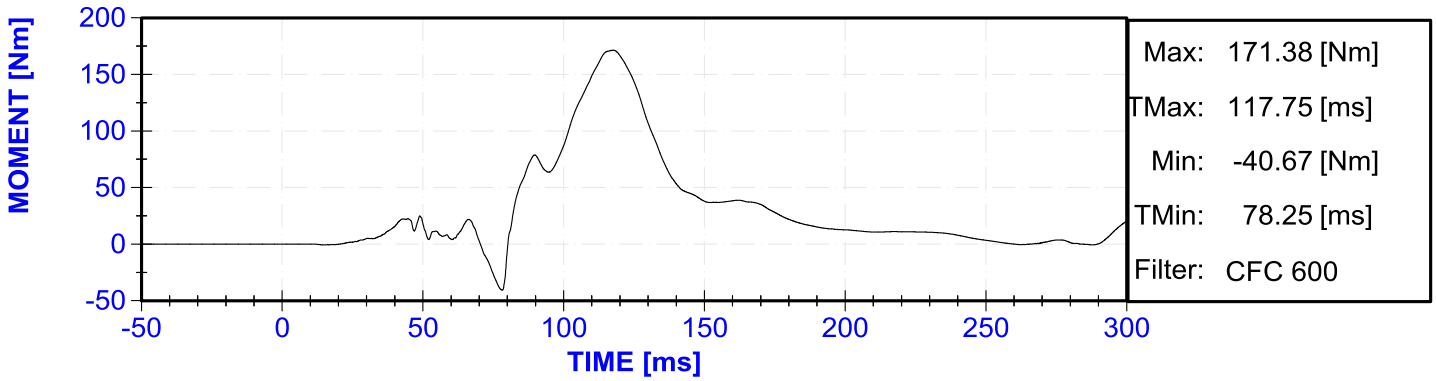
V2P2 LEFT FEMUR MX



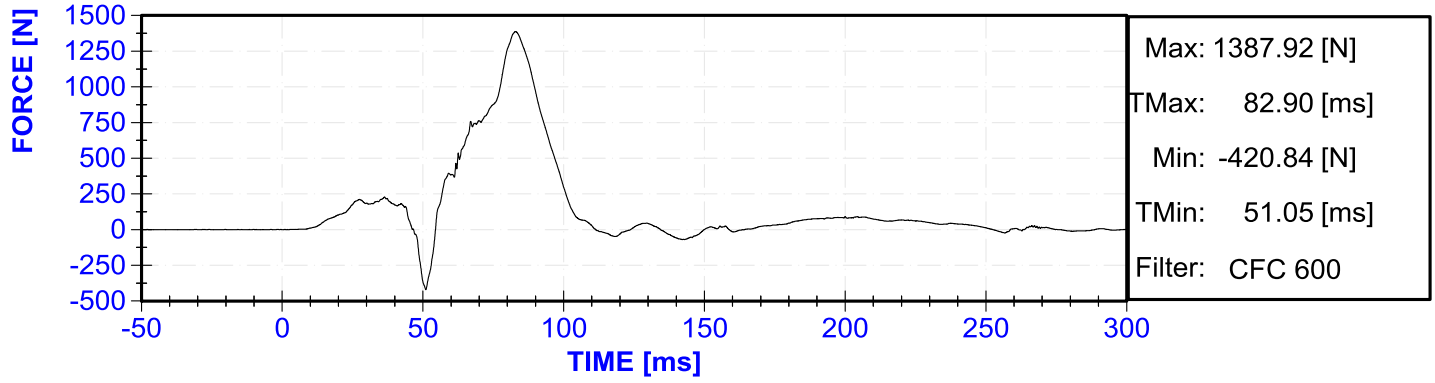
V2P2 LEFT FEMUR MY



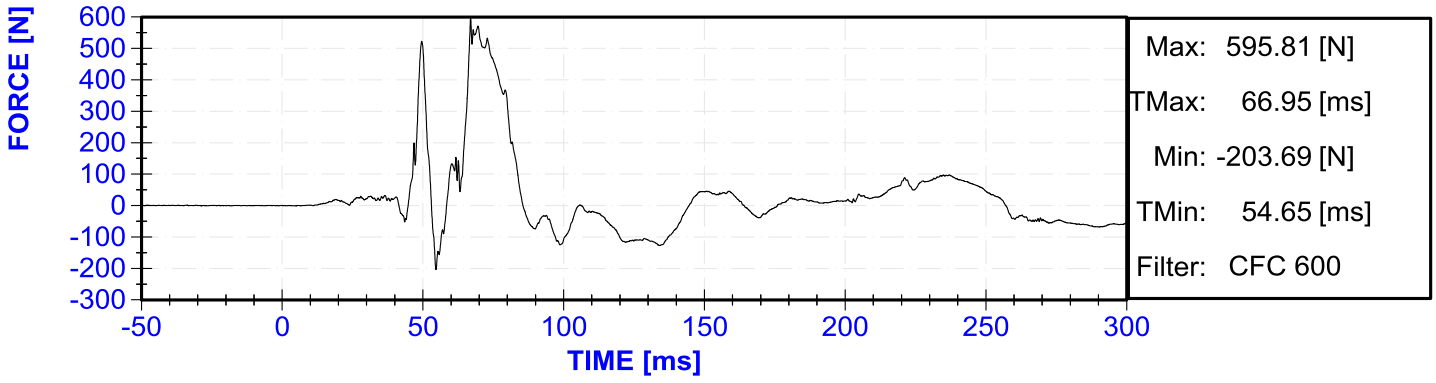
V2P2 LEFT FEMUR MZ



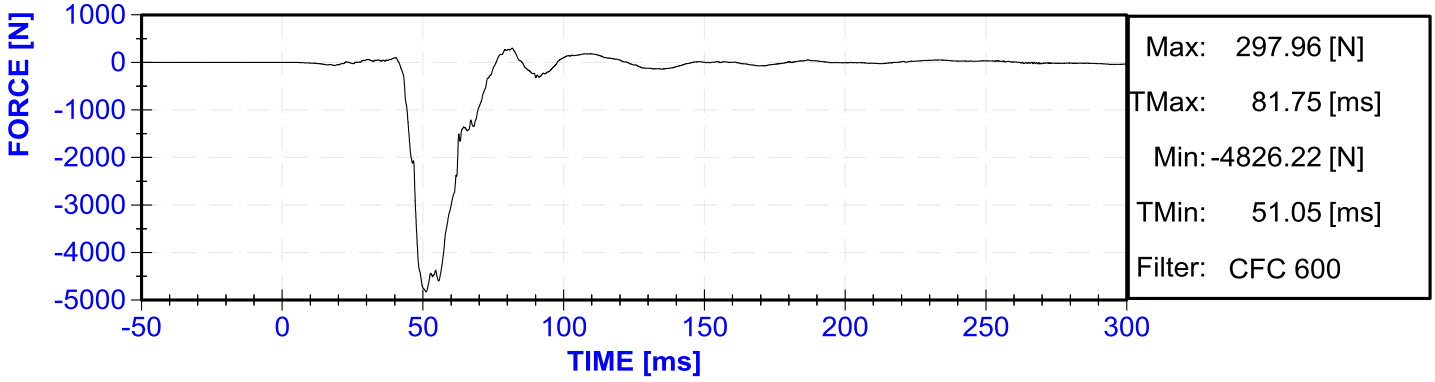
V2P2 RIGHT FEMUR FX



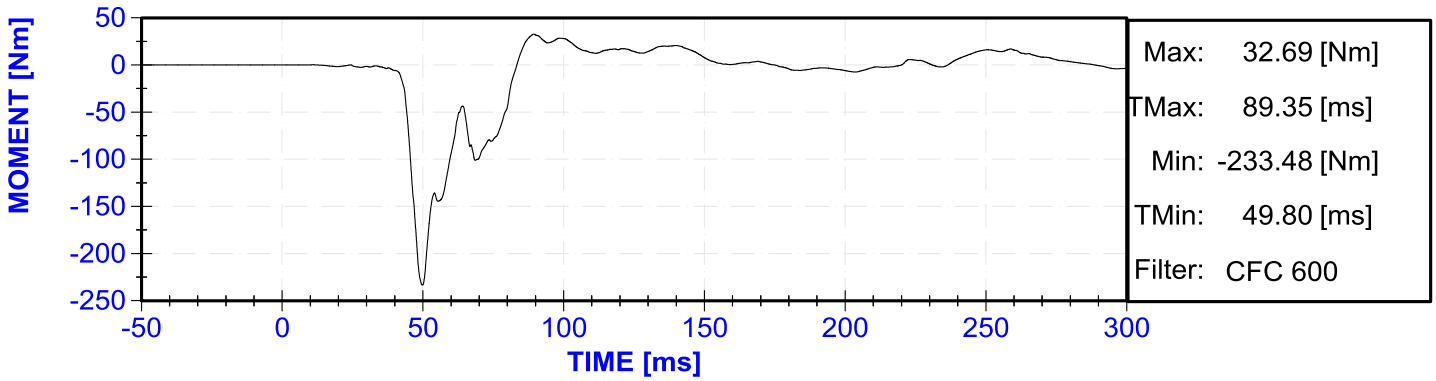
V2P2 RIGHT FEMUR FY



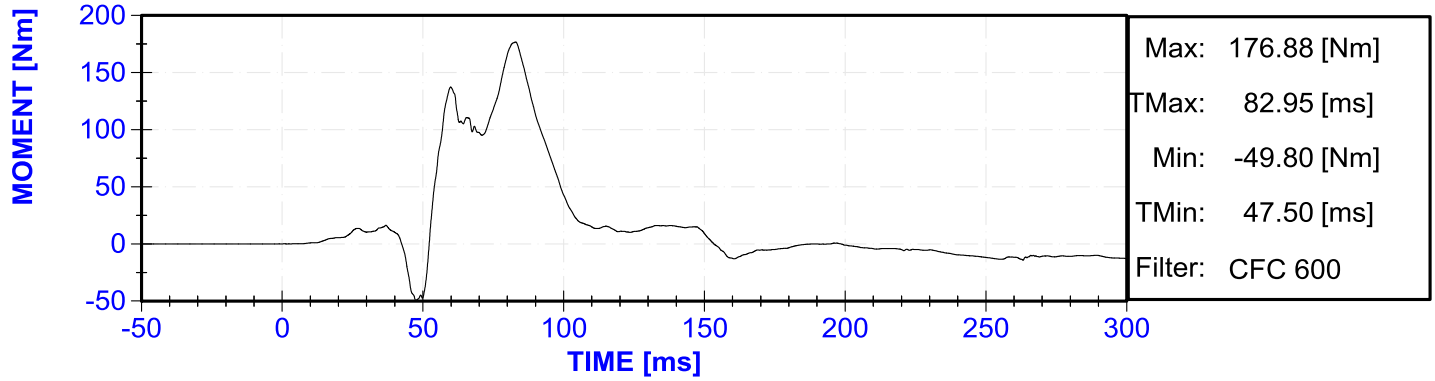
V2P2 RIGHT FEMUR FZ



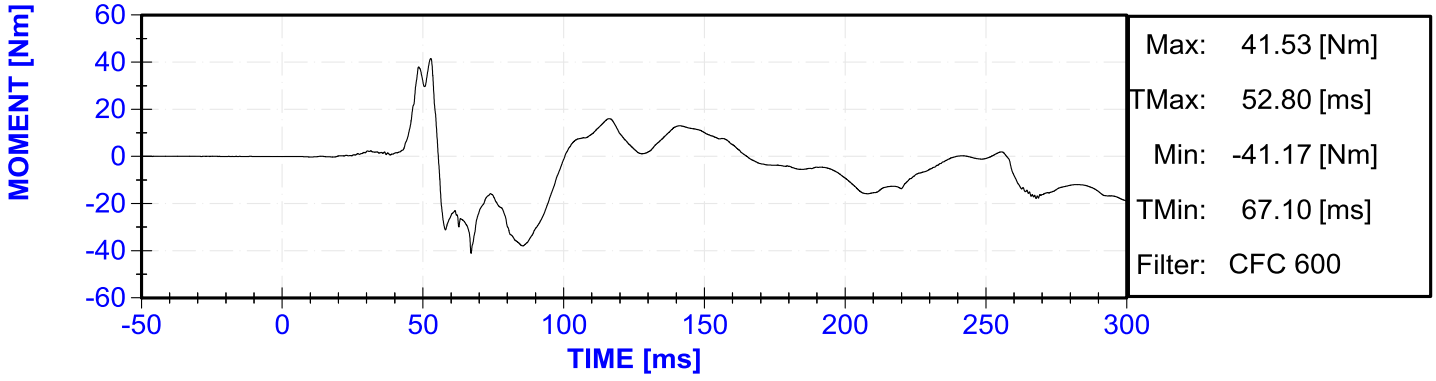
V2P2 RIGHT FEMUR MX



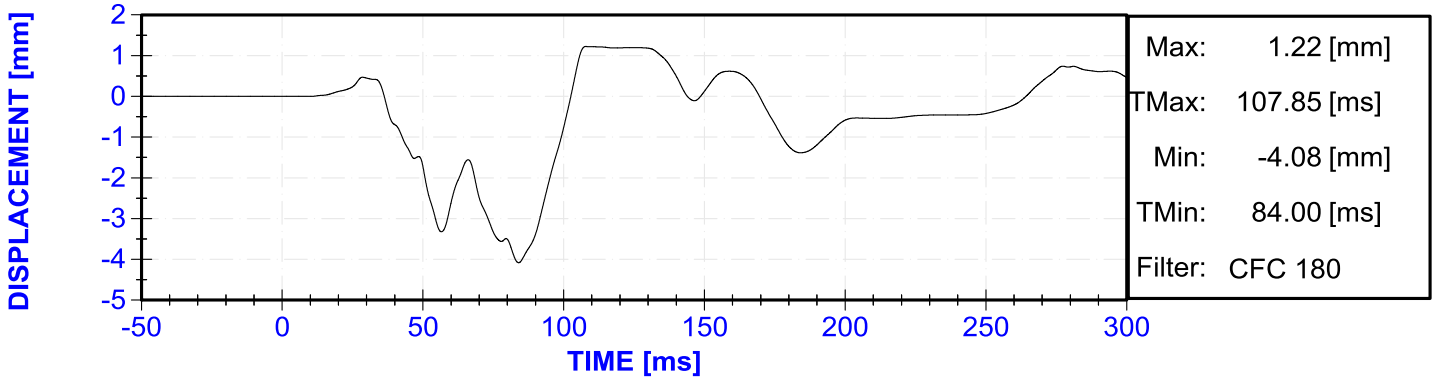
V2P2 RIGHT FEMUR MY



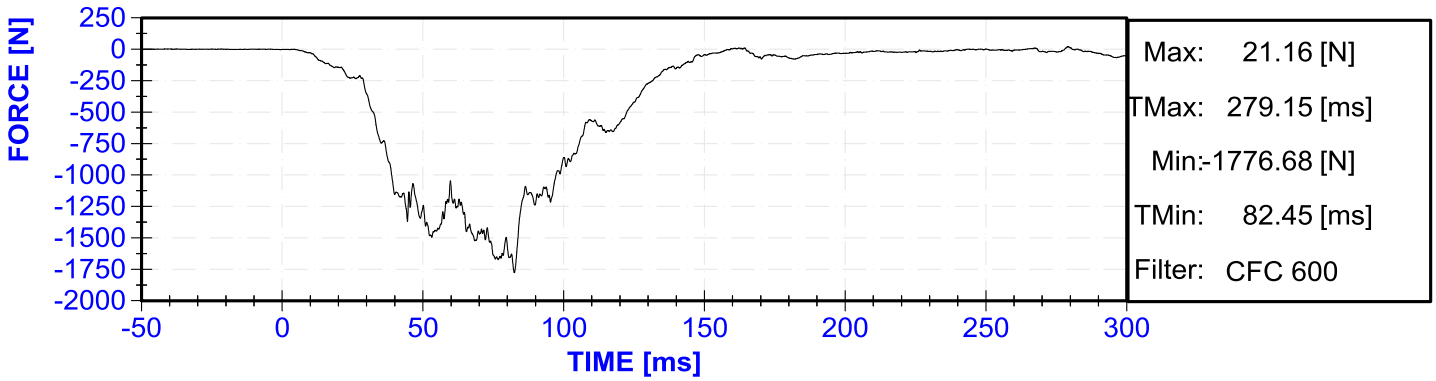
V2P2 RIGHT FEMUR MZ



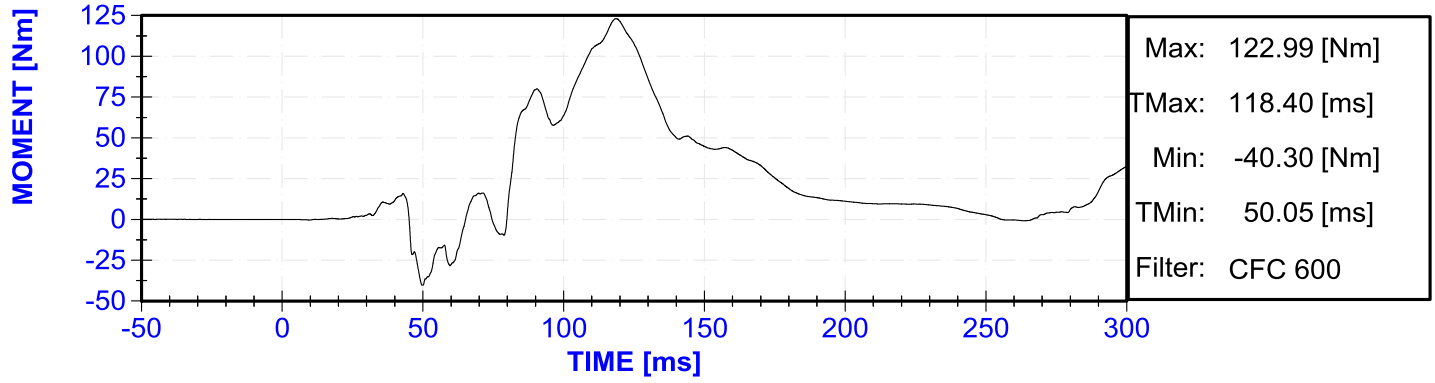
V2P2 KNEE LEFT DX



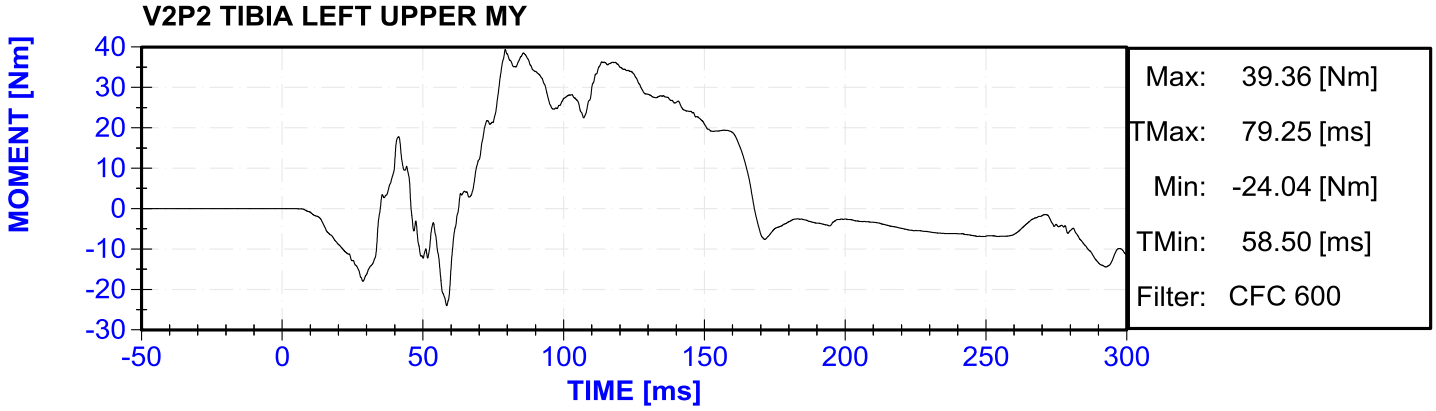
V2P2 TIBIA LEFT UPPER FZ



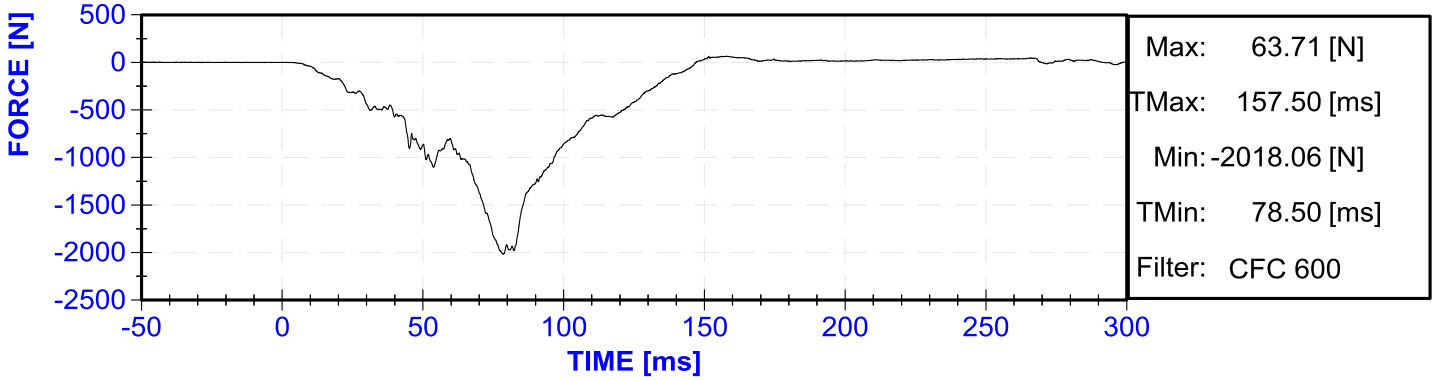
V2P2 TIBIA LEFT UPPER MX



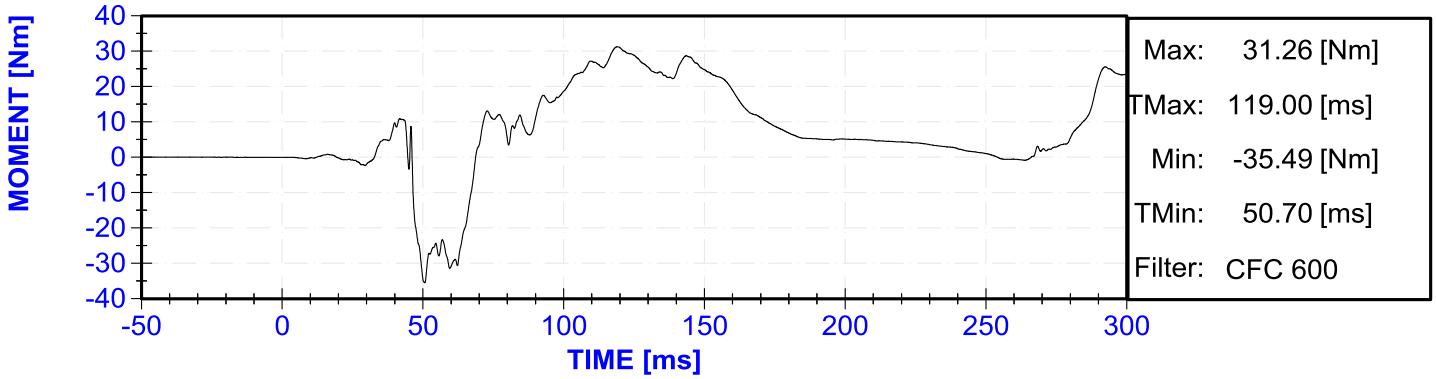
V2P2 TIBIA LEFT UPPER MY



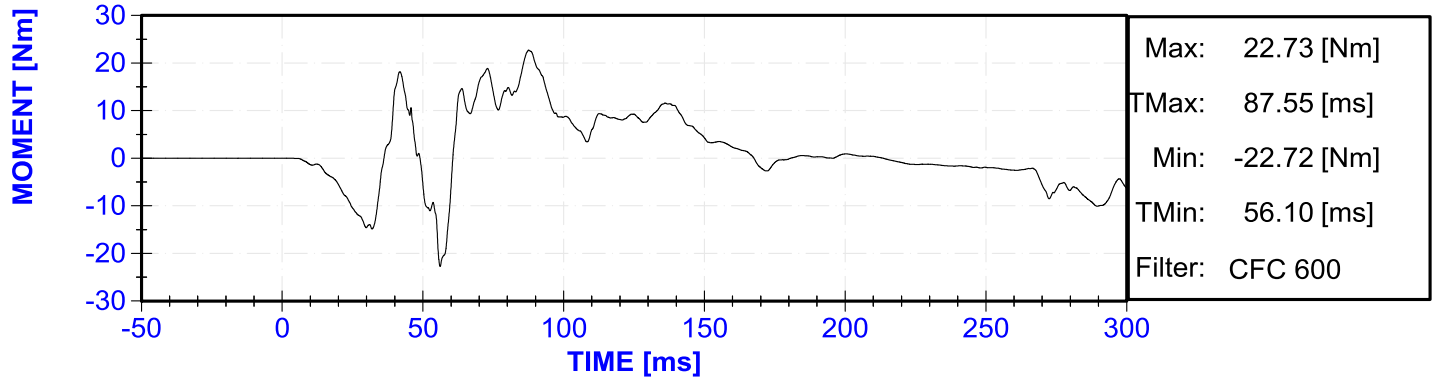
V2P2 TIBIA LEFT LOWER FZ



V2P2 TIBIA LEFT LOWER MX

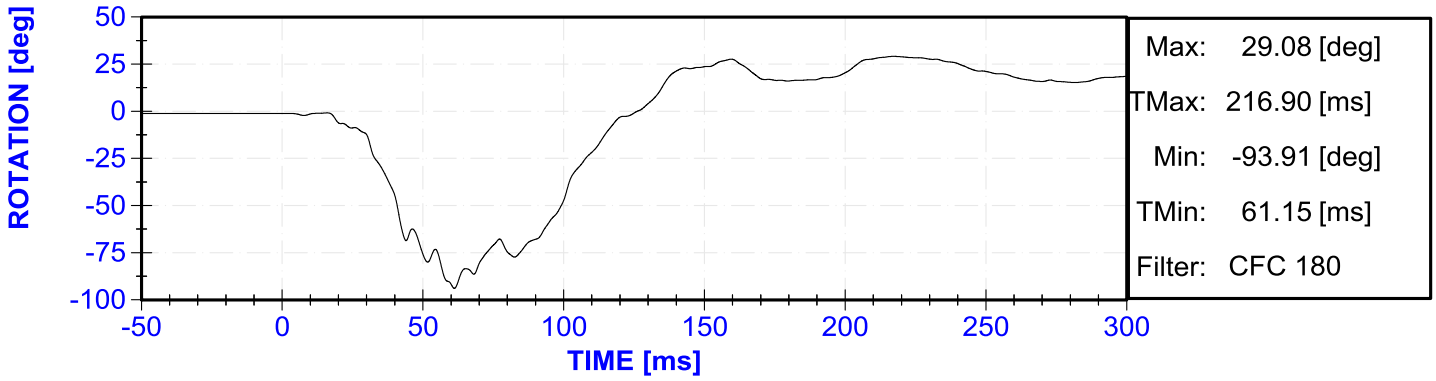


V2P2 TIBIA LEFT LOWER MY



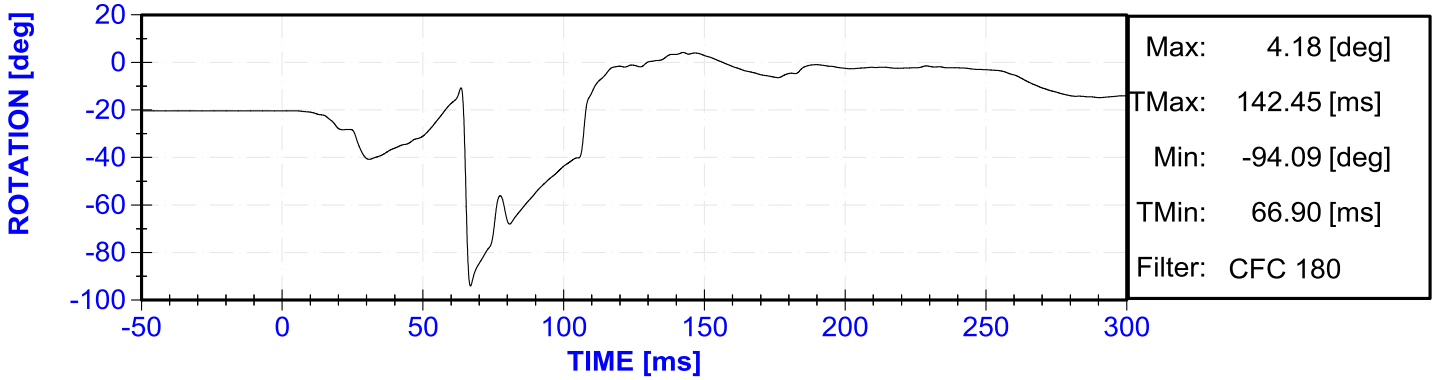
V2P2 ANKLE LEFT POT RX

Channel failed



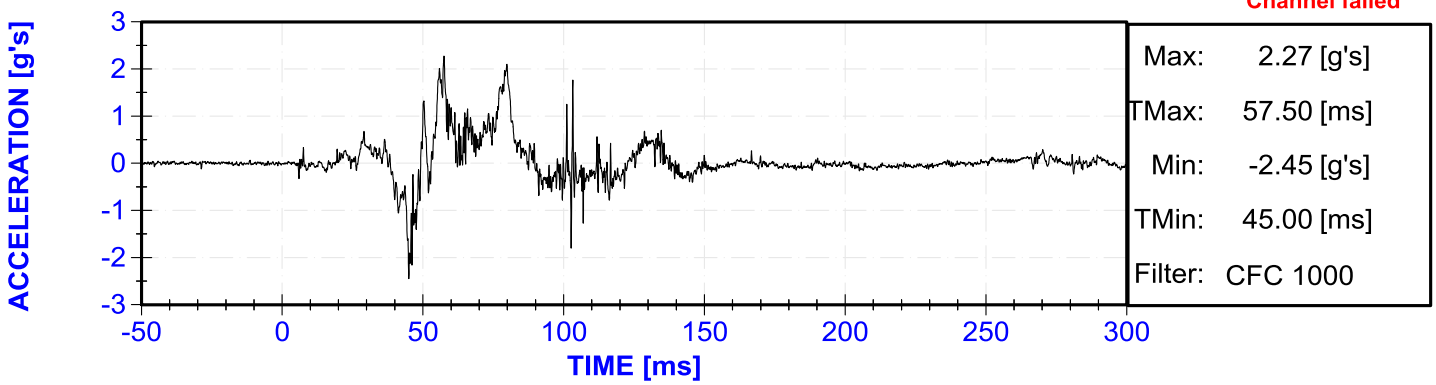
V2P2 ANKLE LEFT POT RY

Channel failed

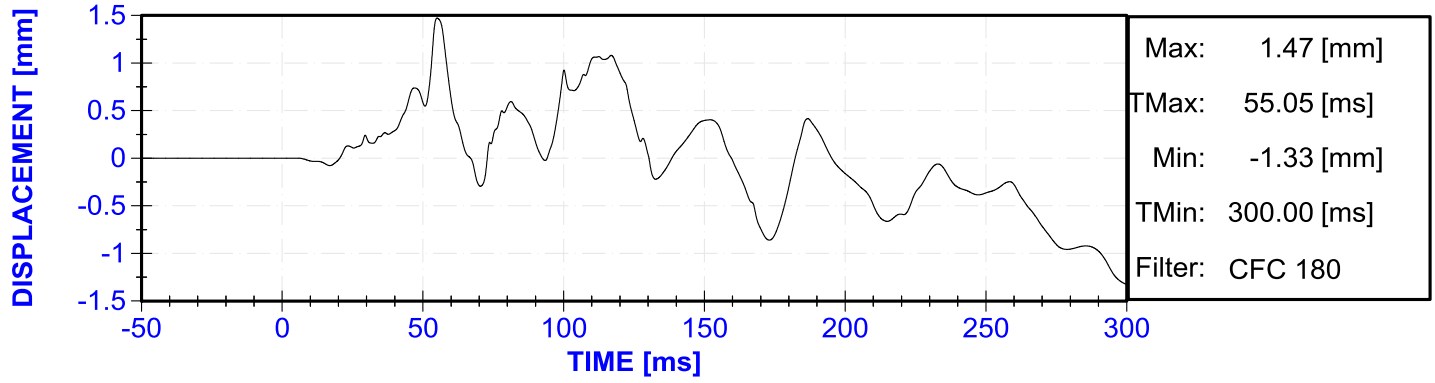


V2P2 FOOT LEFT AZ

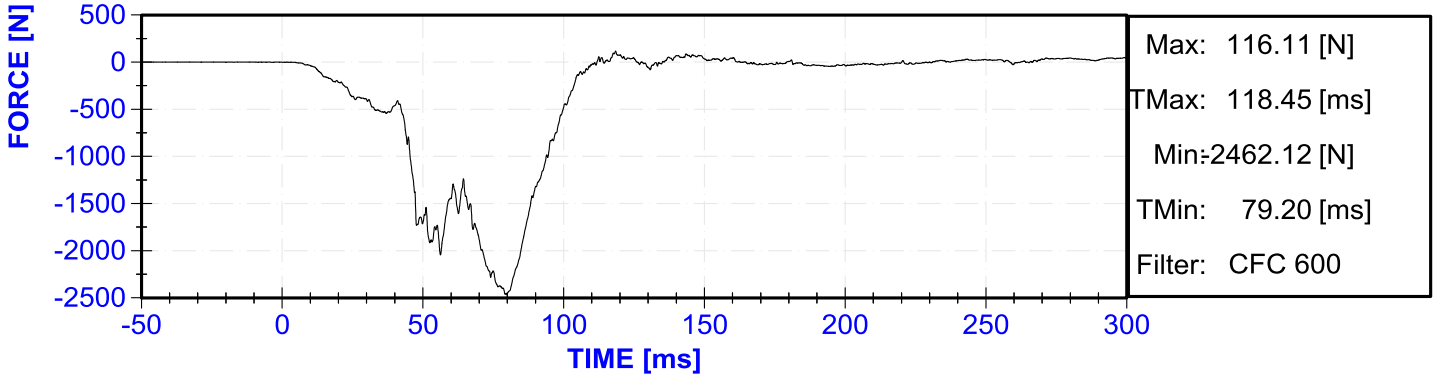
Channel failed



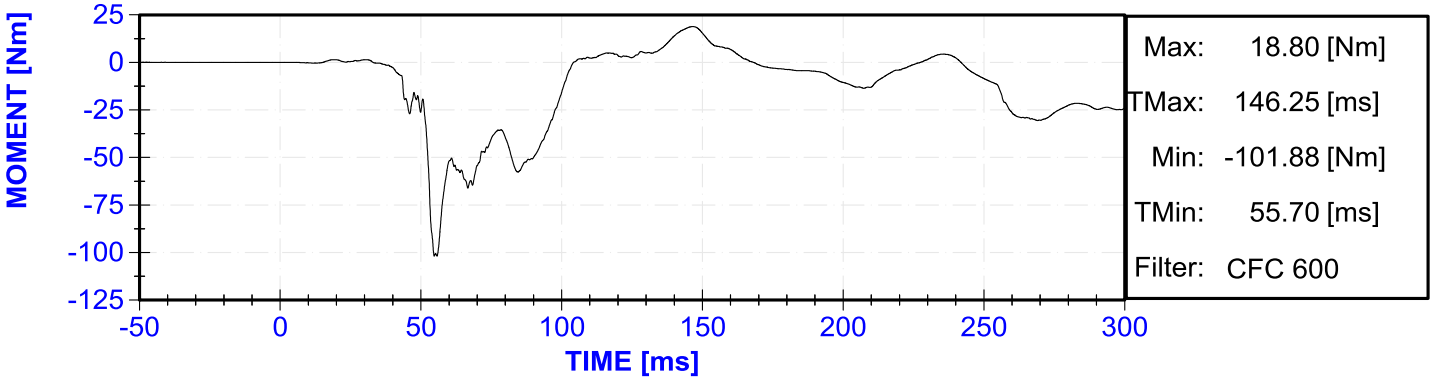
V2P2 KNEE RIGHT DX



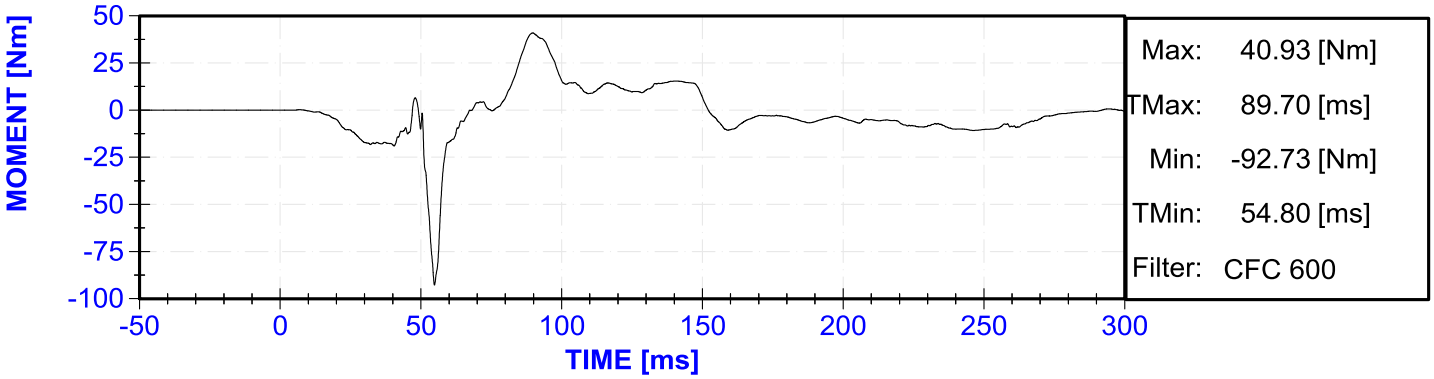
V2P2 TIBIA RIGHT UPPER FZ



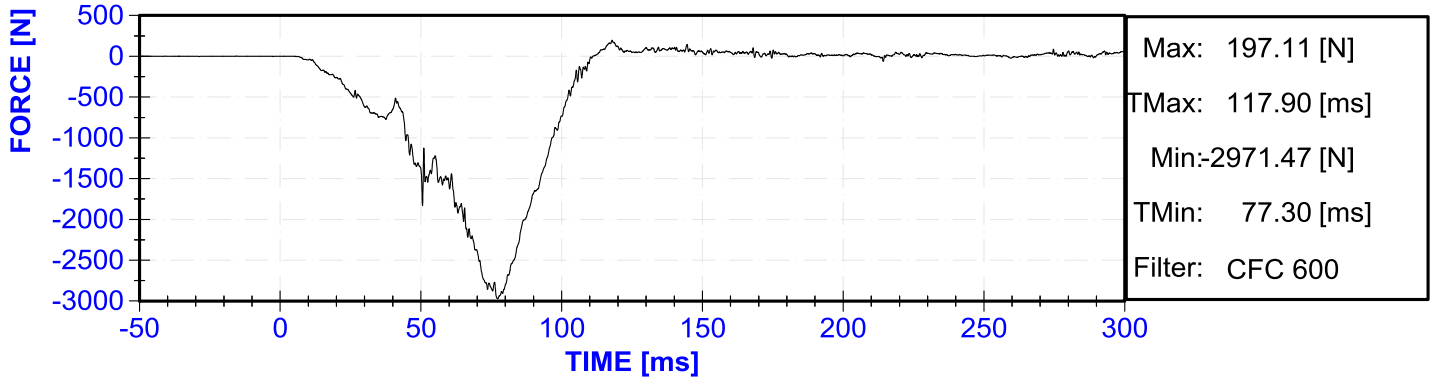
V2P2 TIBIA RIGHT UPPER MX



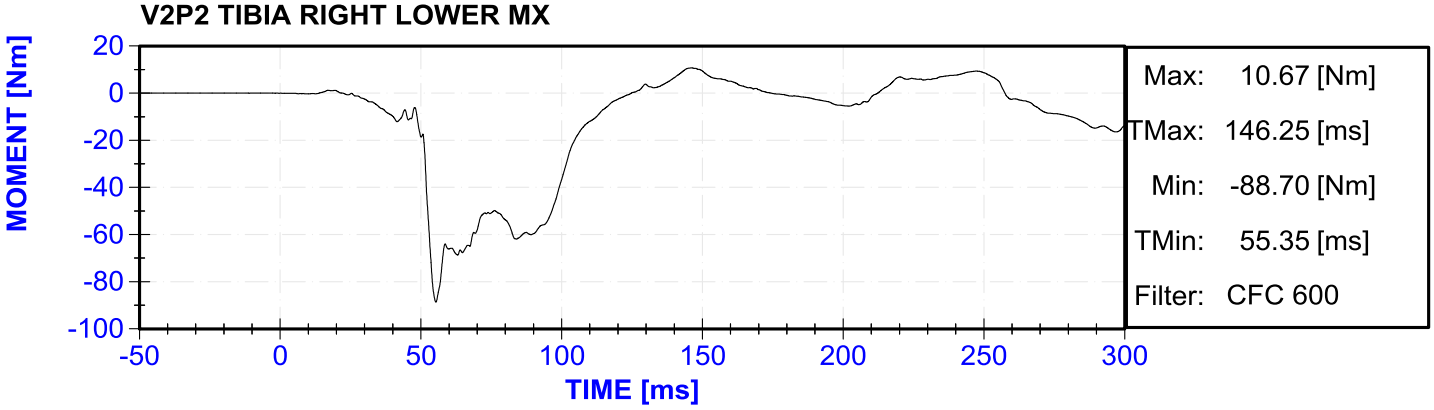
V2P2 TIBIA RIGHT UPPER MY



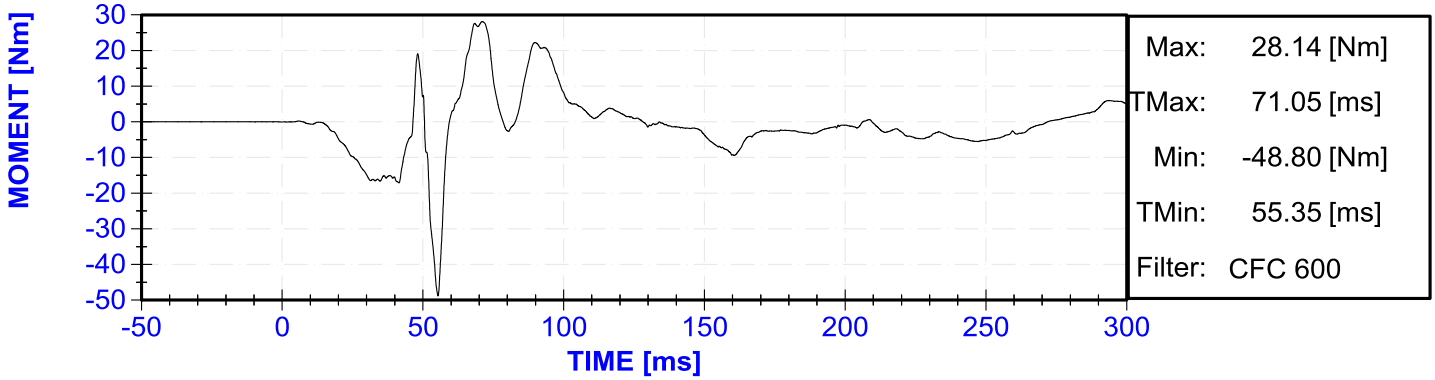
V2P2 TIBIA RIGHT LOWER FZ



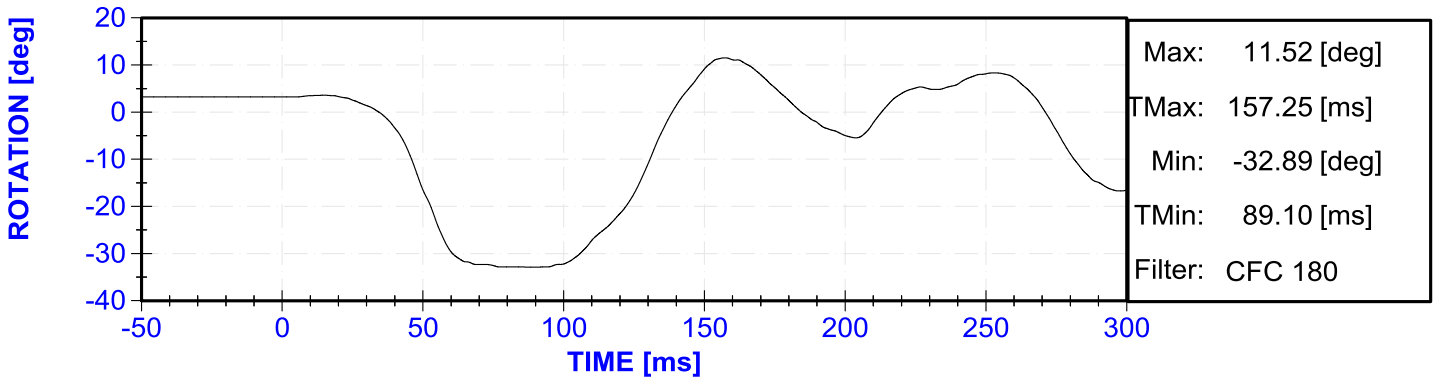
V2P2 TIBIA RIGHT LOWER MX



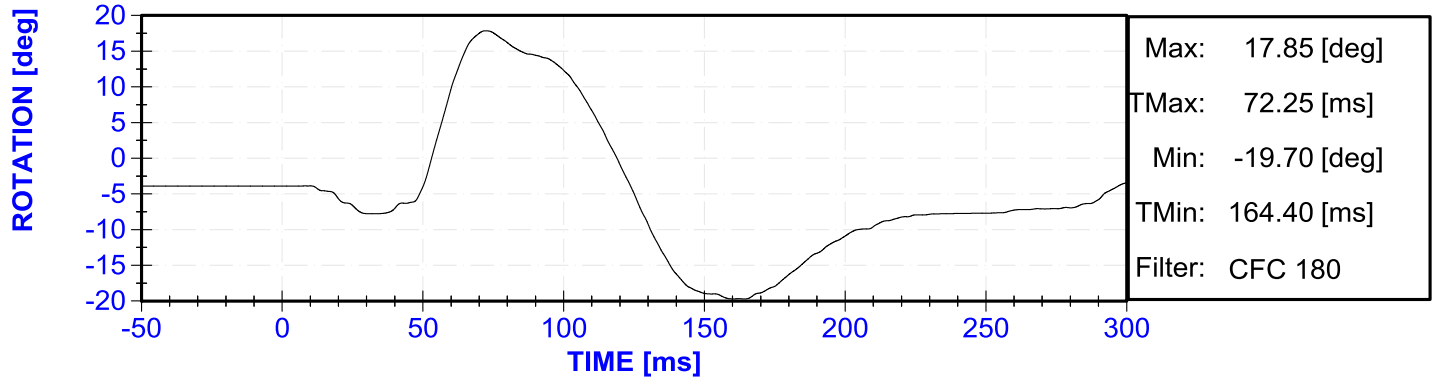
V2P2 TIBIA RIGHT LOWER MY



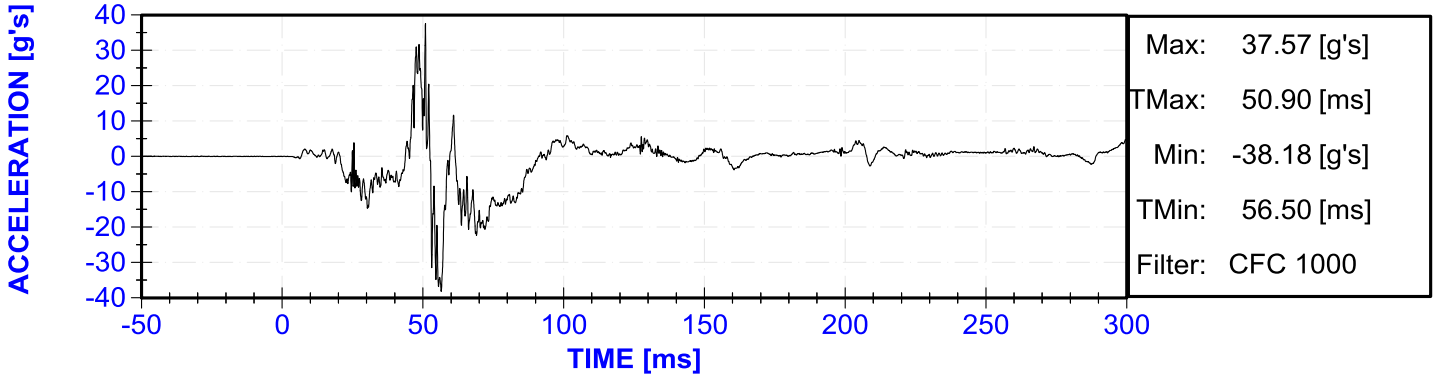
V2P2 ANKLE RIGHT POT RX



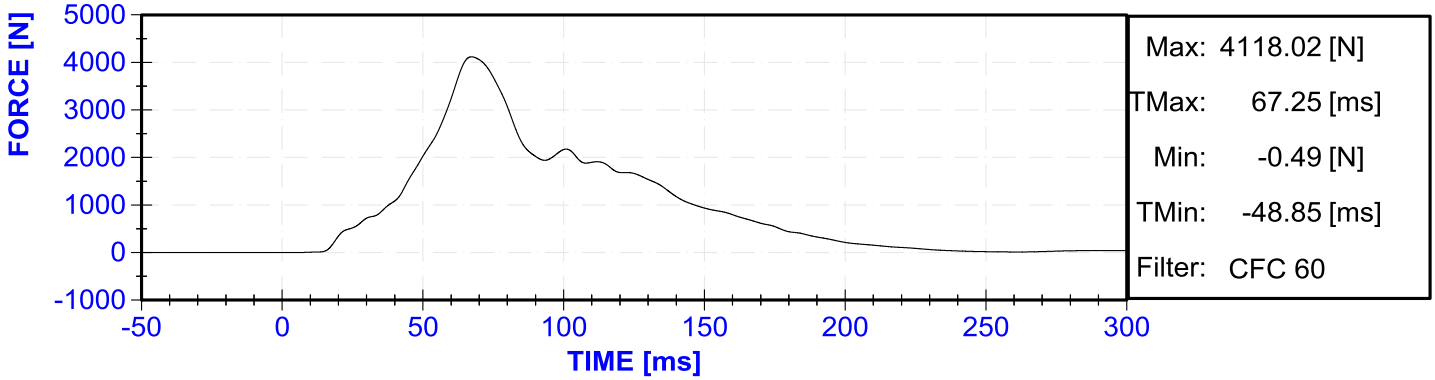
V2P2 ANKLE RIGHT POT RY



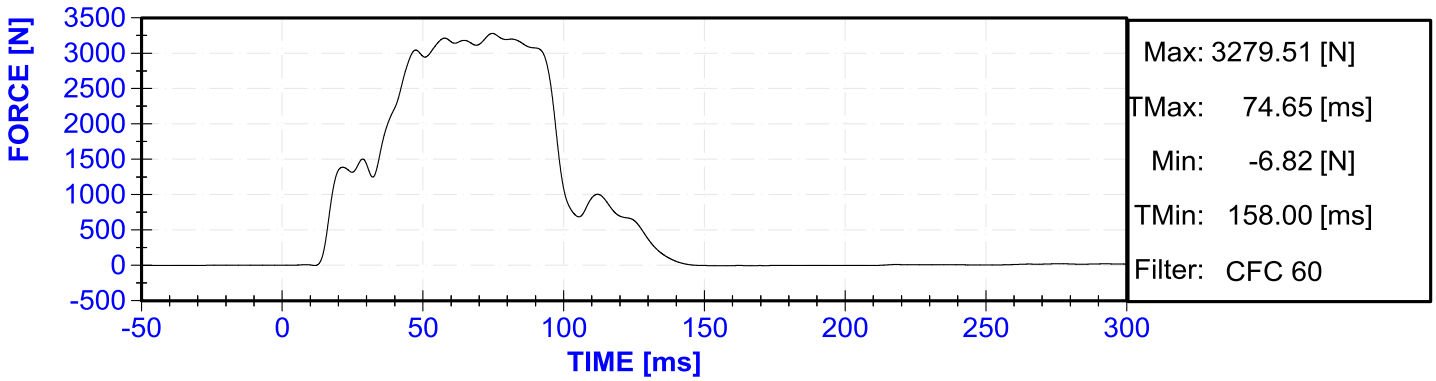
V2P2 FOOT RIGHT AZ



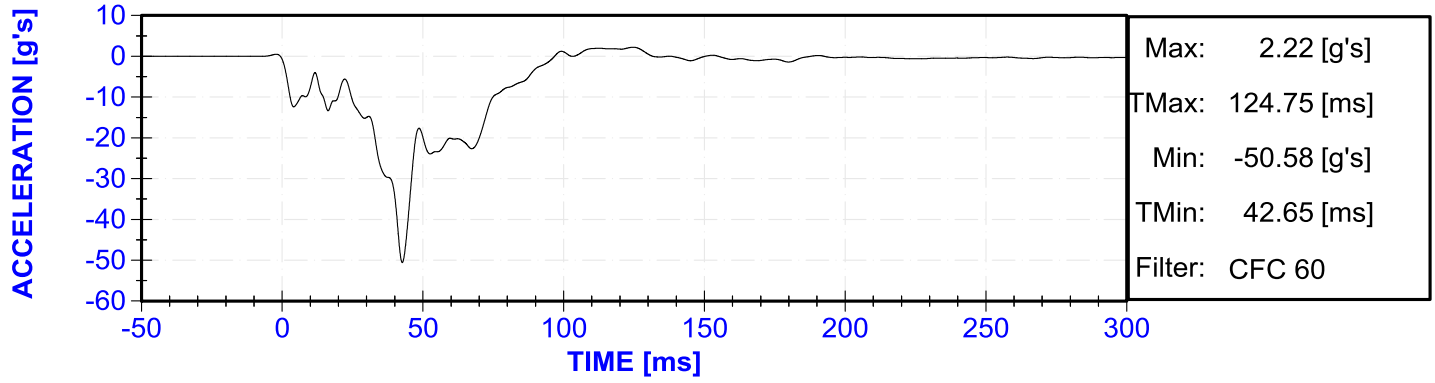
V2 P2 PASSENGER LAP BELT



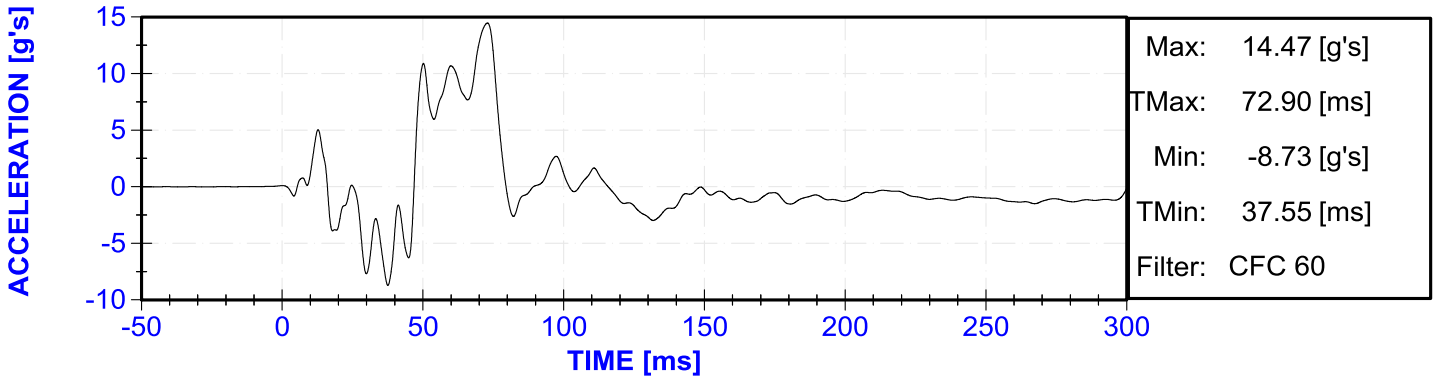
V2 P2 PASSENGER SHOULDER BELT



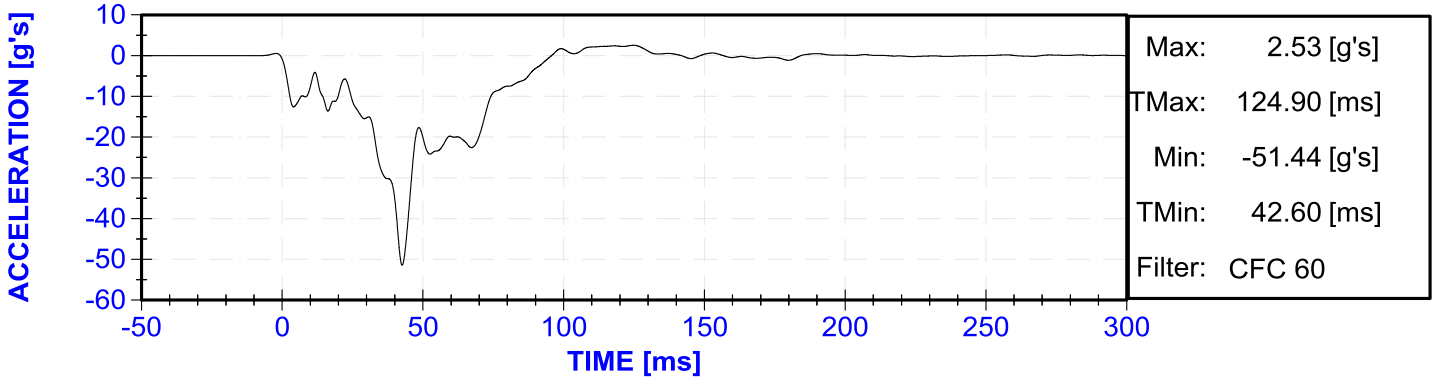
V2 LEFT REAR SILL X



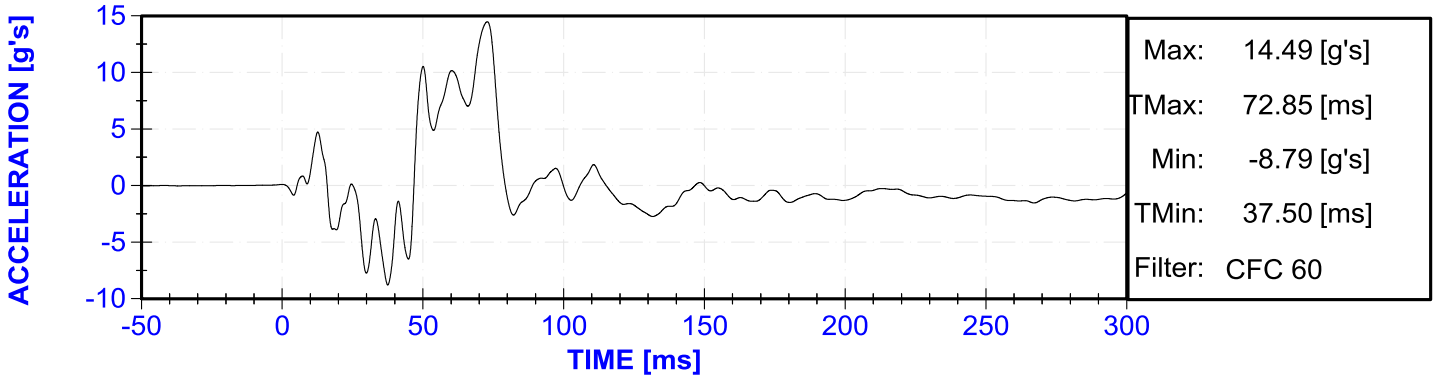
V2 LEFT REAR SILL Y



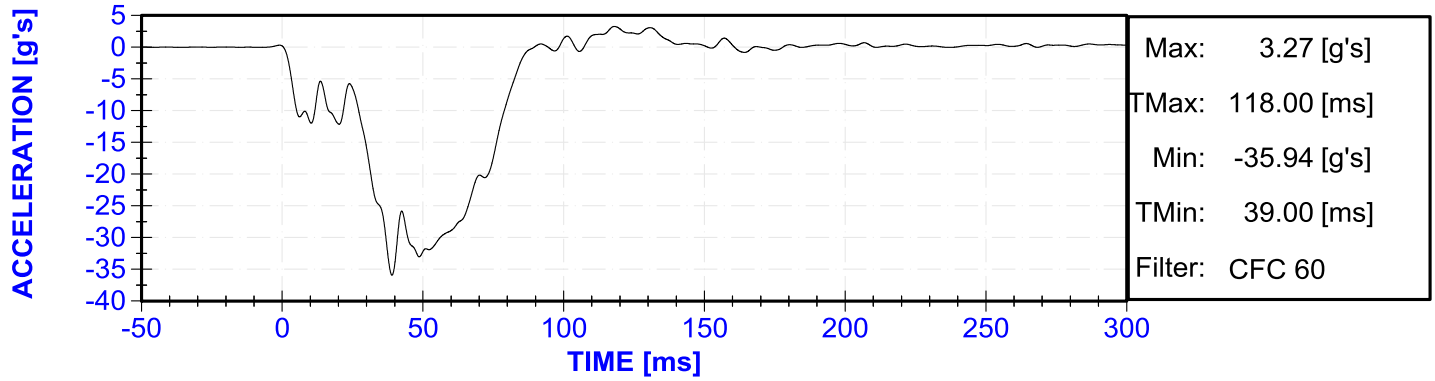
V2 LEFT REAR SILL RX



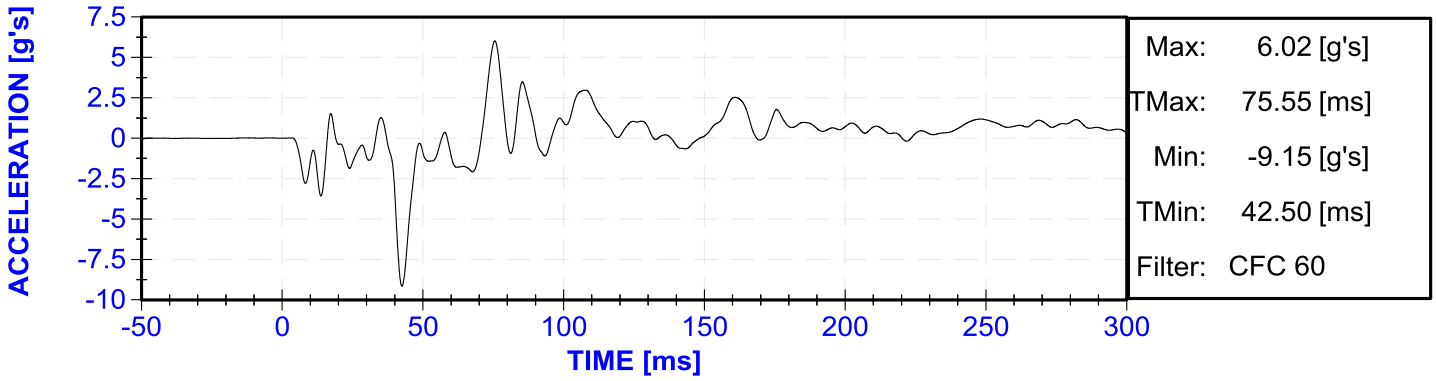
V2 LEFT REAR SILL RY



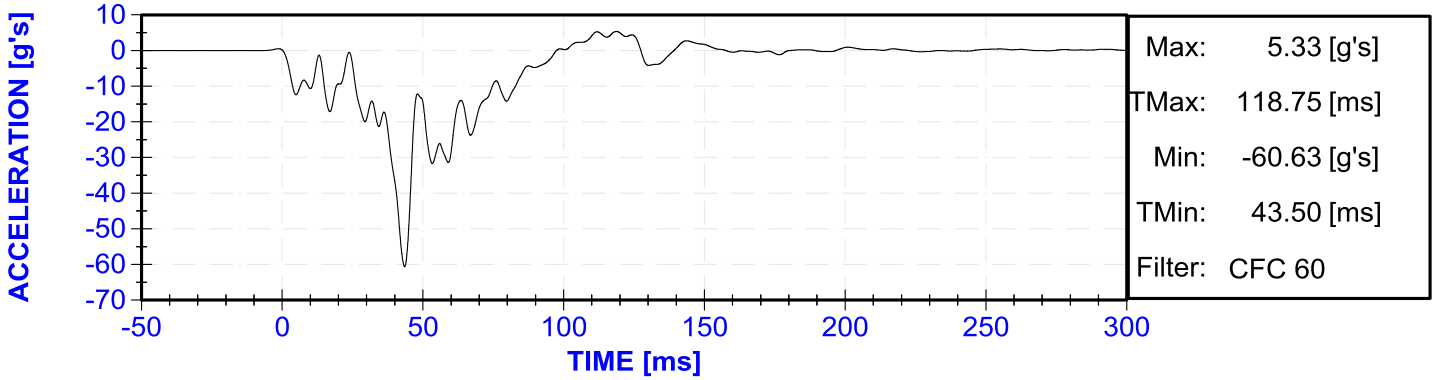
V2 RIGHT REAR SILL X



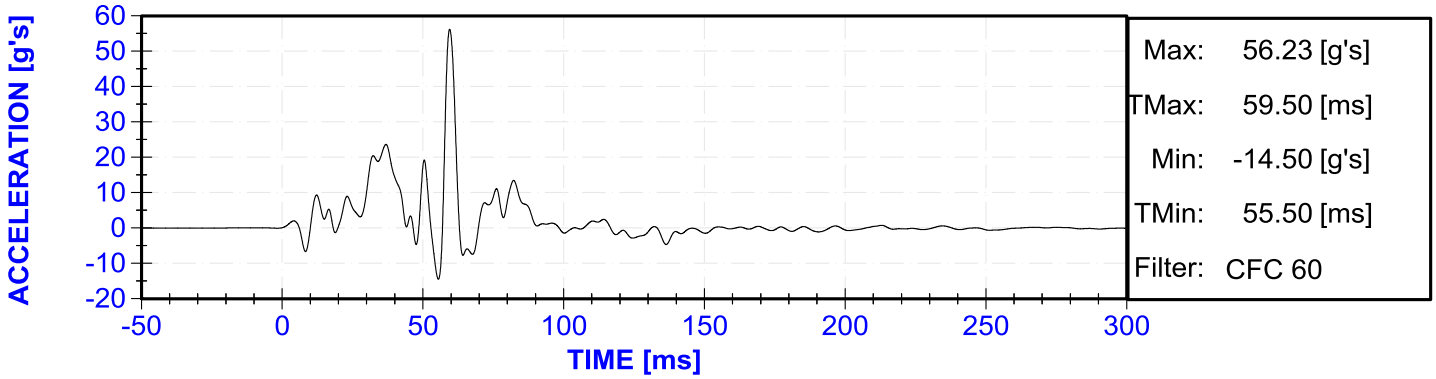
V2 RIGHT REAR SILL Y



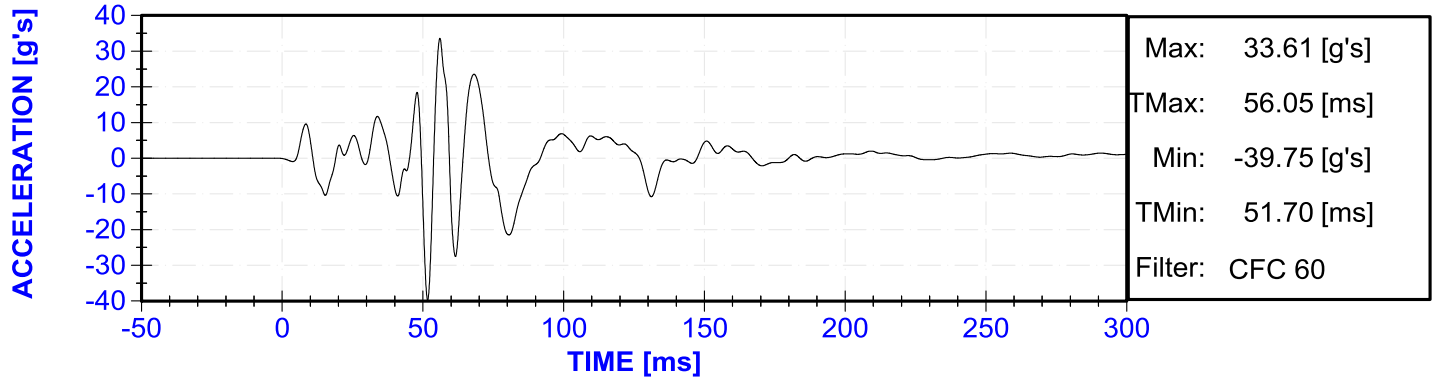
V2 VEHICLE CG X



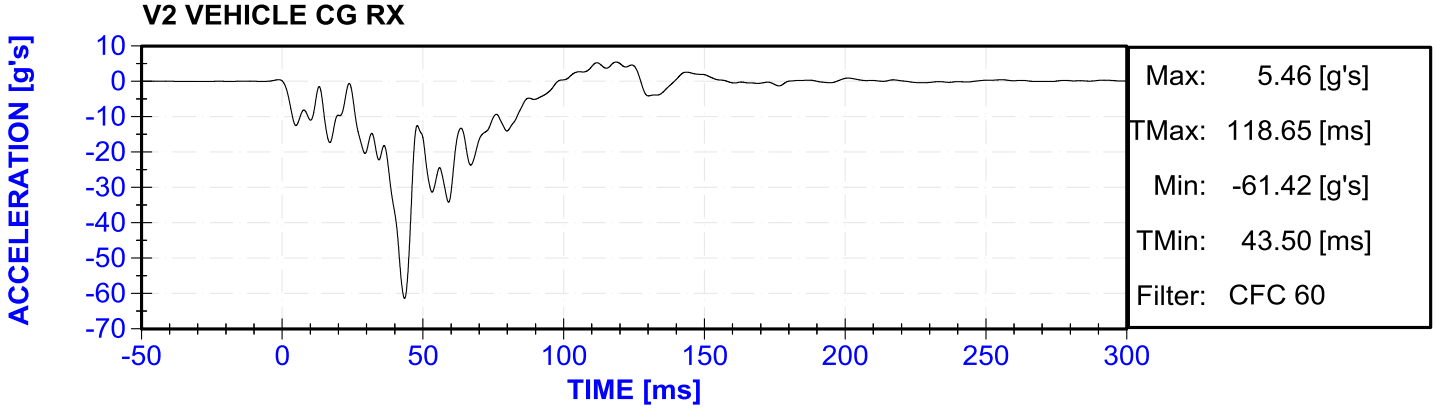
V2 VEHICLE CG Y



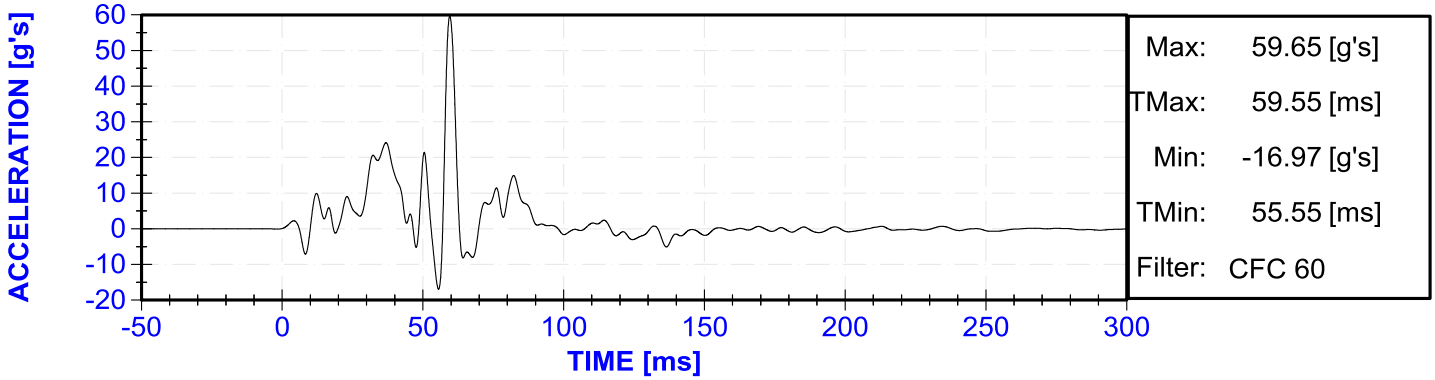
V2 VEHICLE CG Z



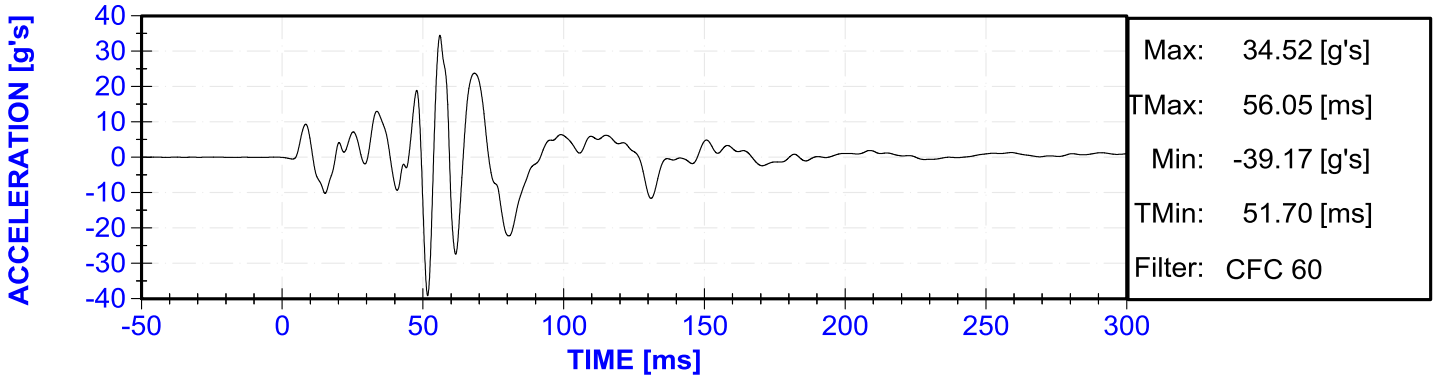
V2 VEHICLE CG RX



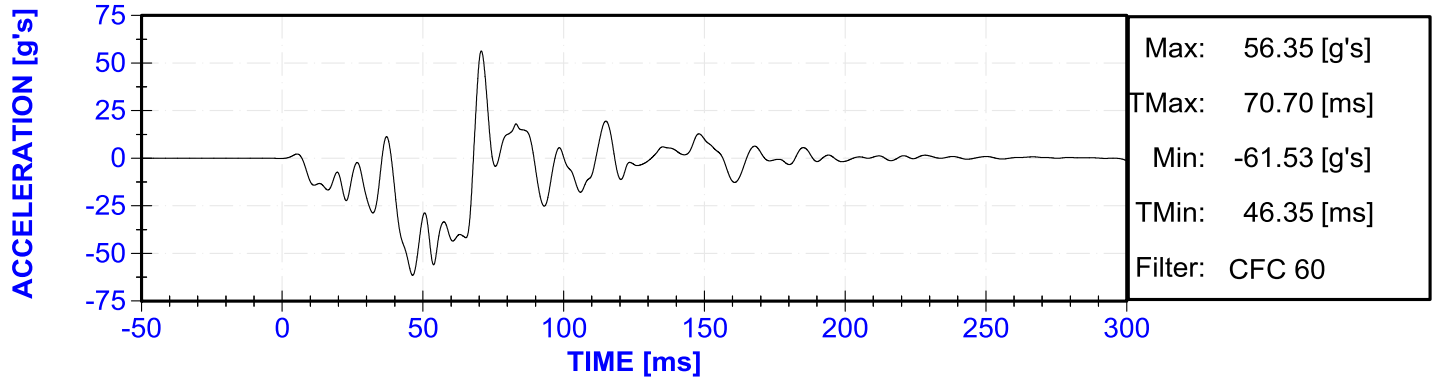
V2 VEHICLE CG RY



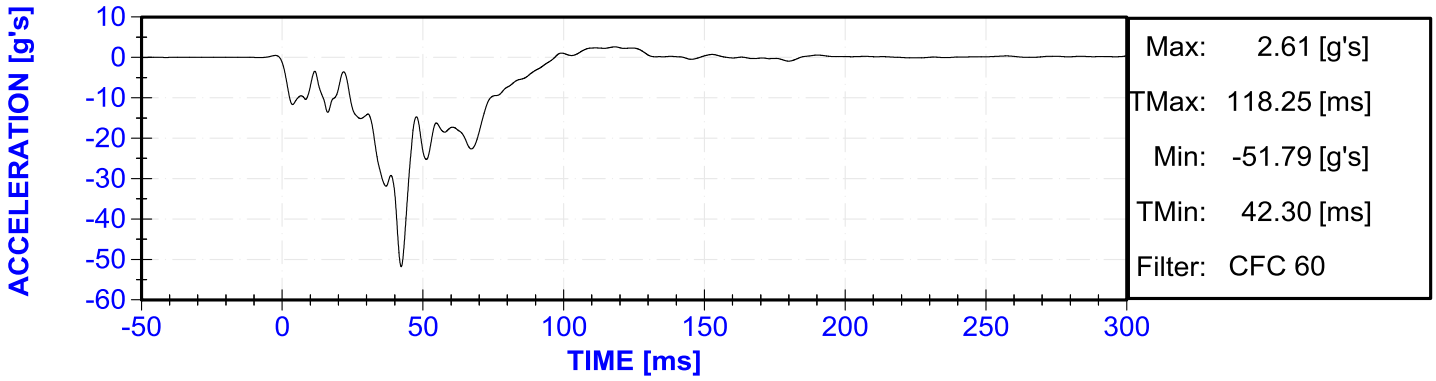
V2 VEHICLE CG RZ



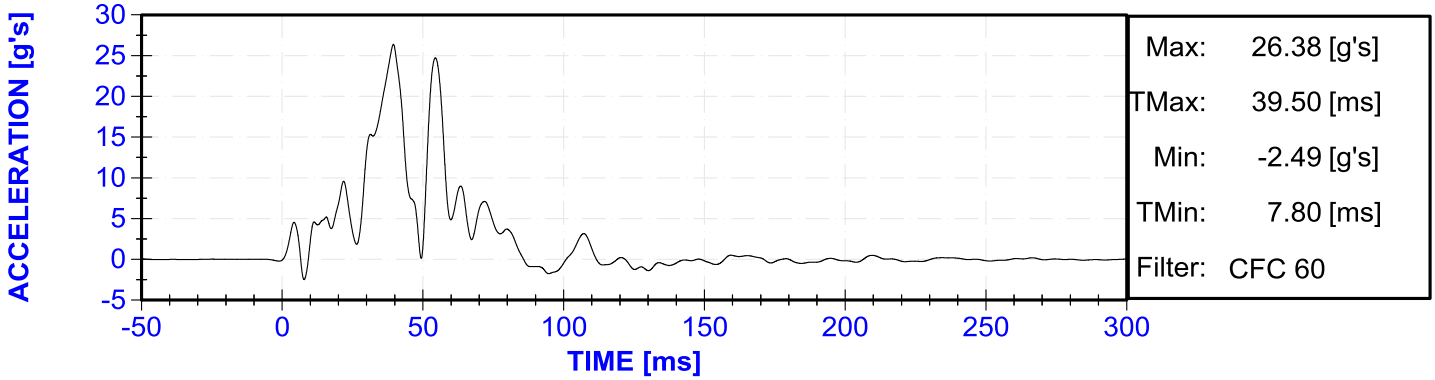
V2 INSTRUMENT PANEL X



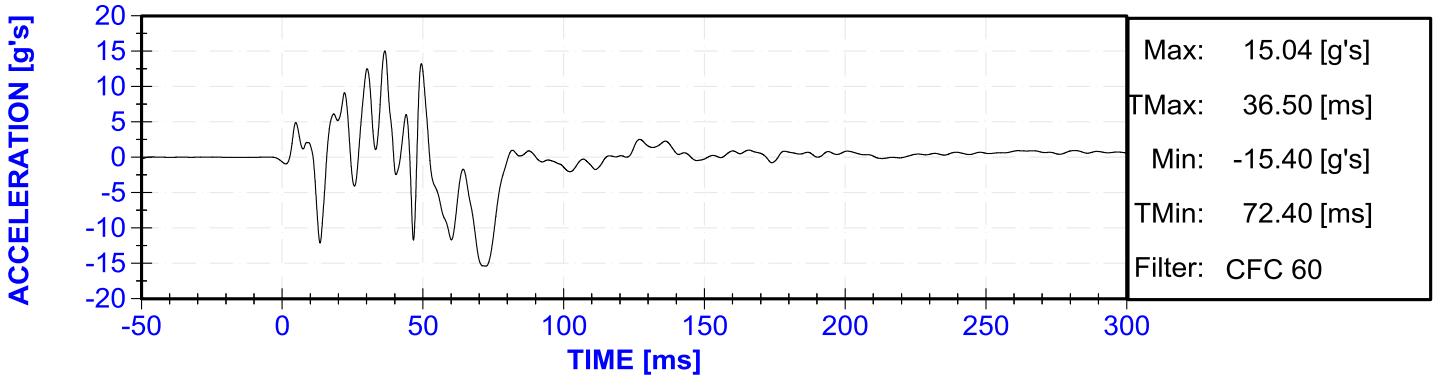
V2 DRIVER SEAT TRACK X



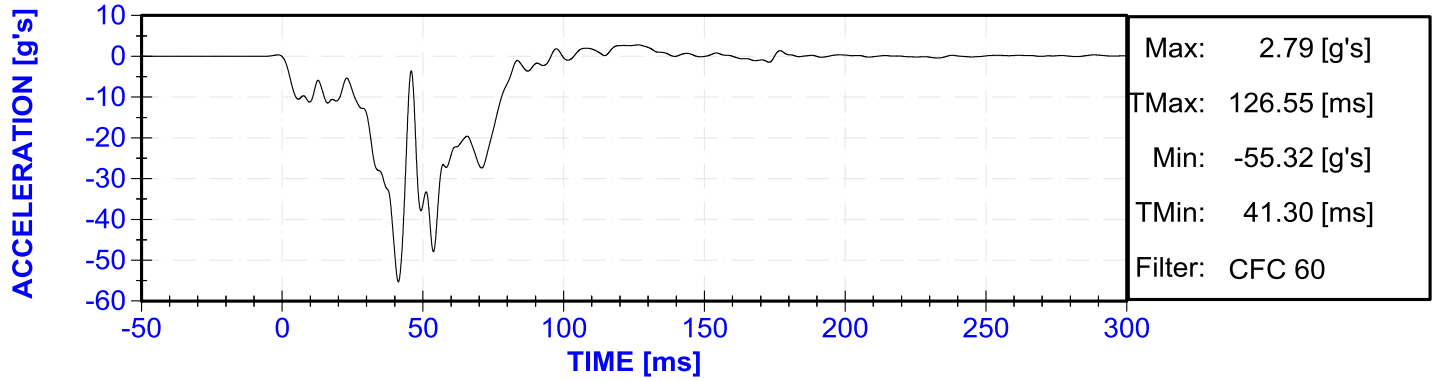
V2 DRIVER SEAT TRACK Y



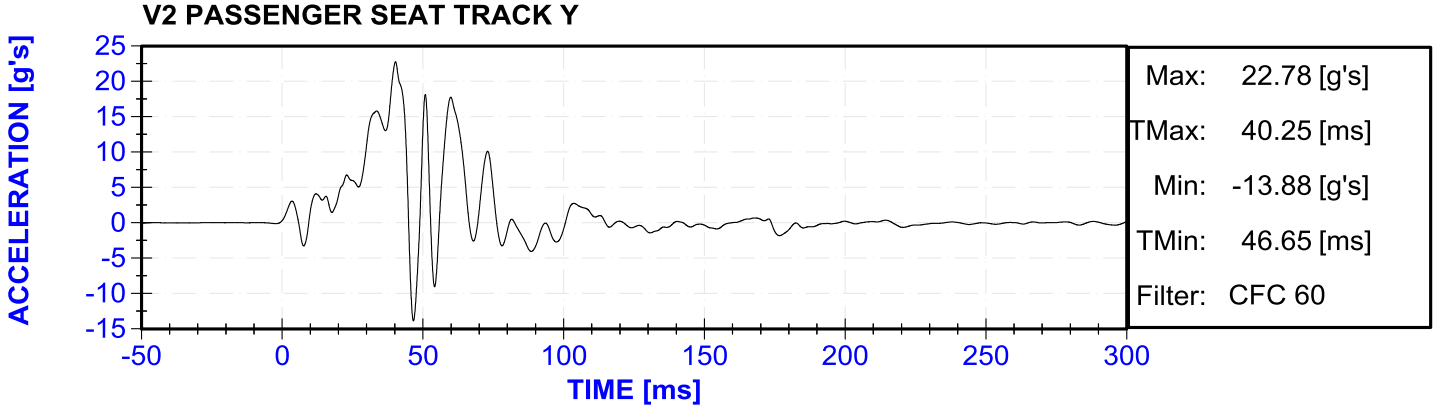
V2 DRIVER SEAT TRACK Z



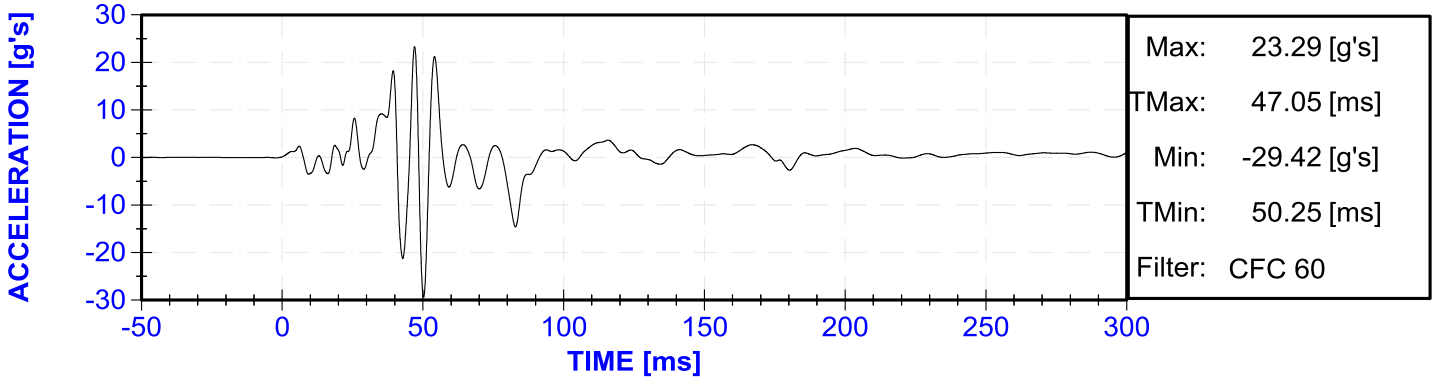
V2 PASSENGER SEAT TRACK X



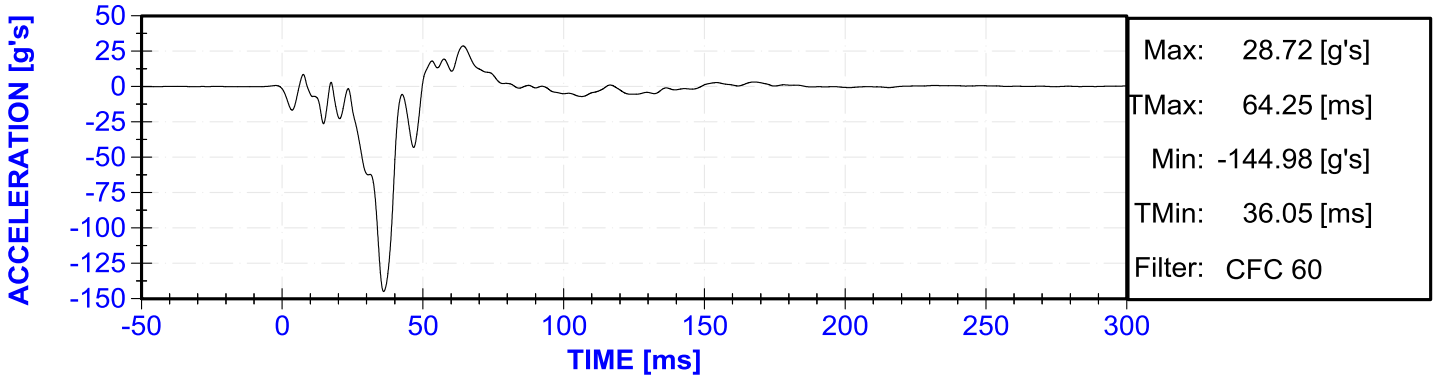
V2 PASSENGER SEAT TRACK Y



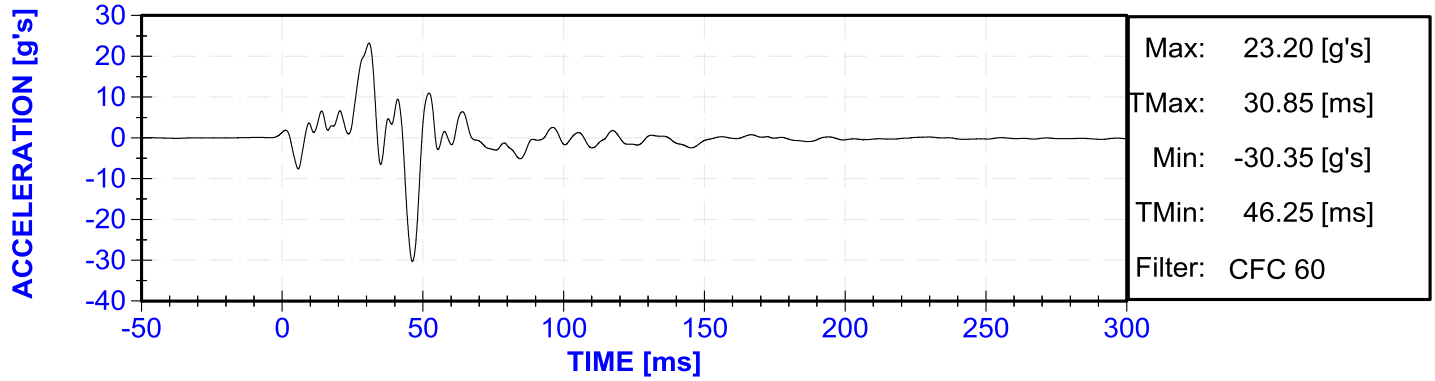
V2 PASSENGER SEAT TRACK Z



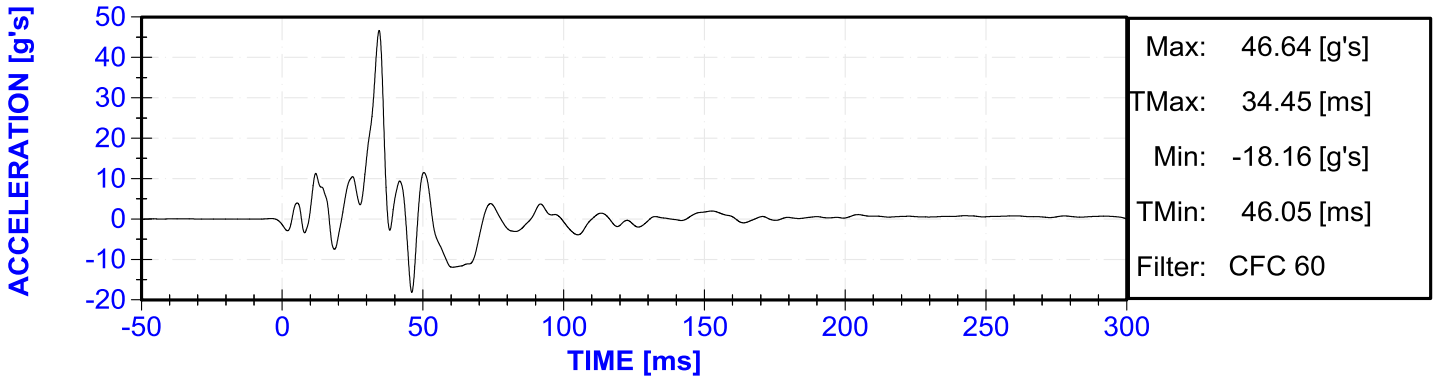
V2 DRIVER FLOOR PAN X



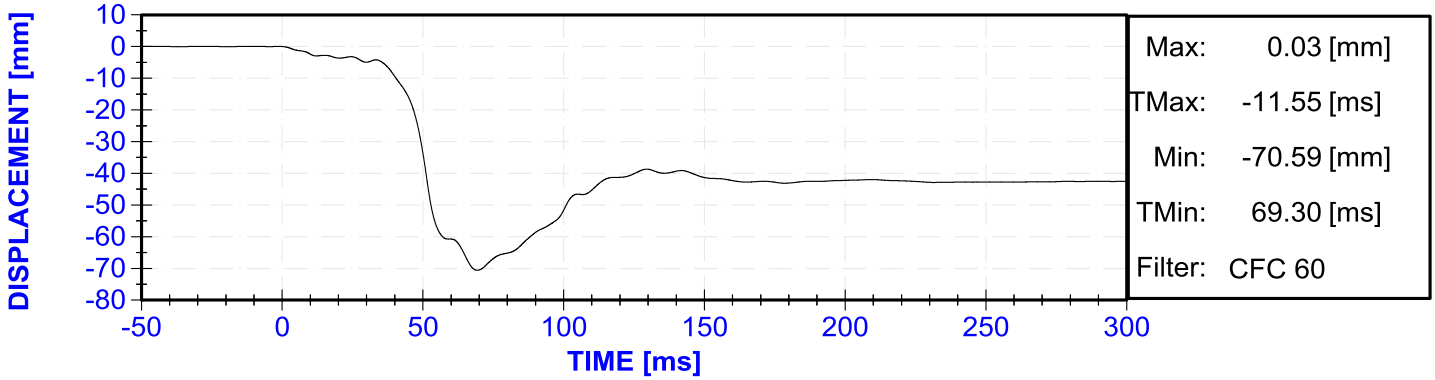
V2 DRIVER FLOOR PAN Y



V2 DRIVER FLOOR PAN Z

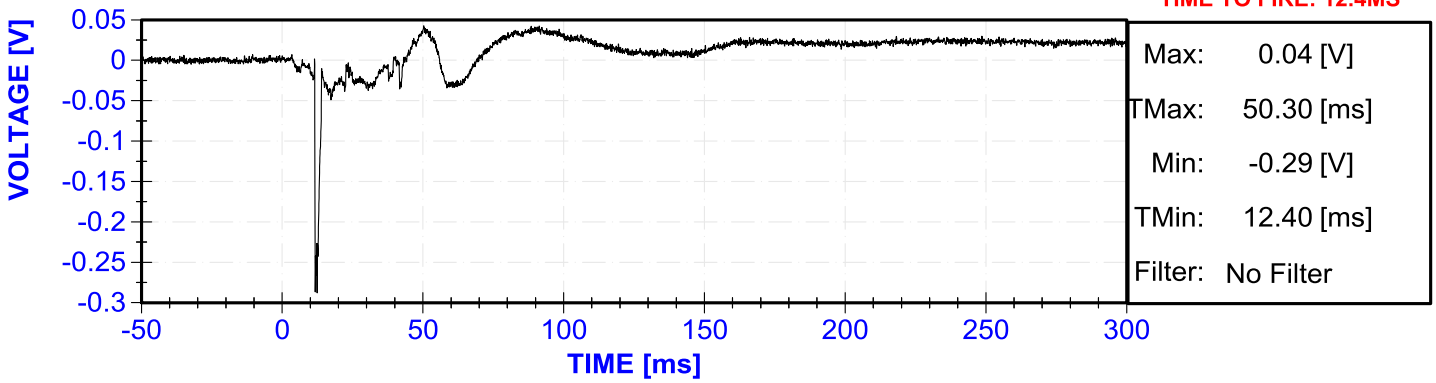


V2 DRIVER FLOOR PAN STRING POT



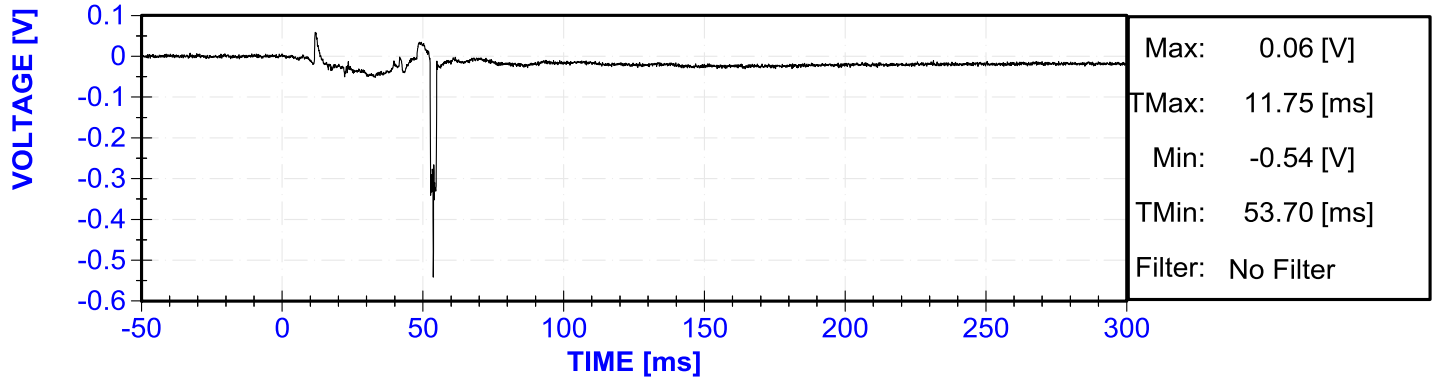
V2 DRIVER SW AIRBAG STAGE 1

TIME TO FIRE: 12.4MS



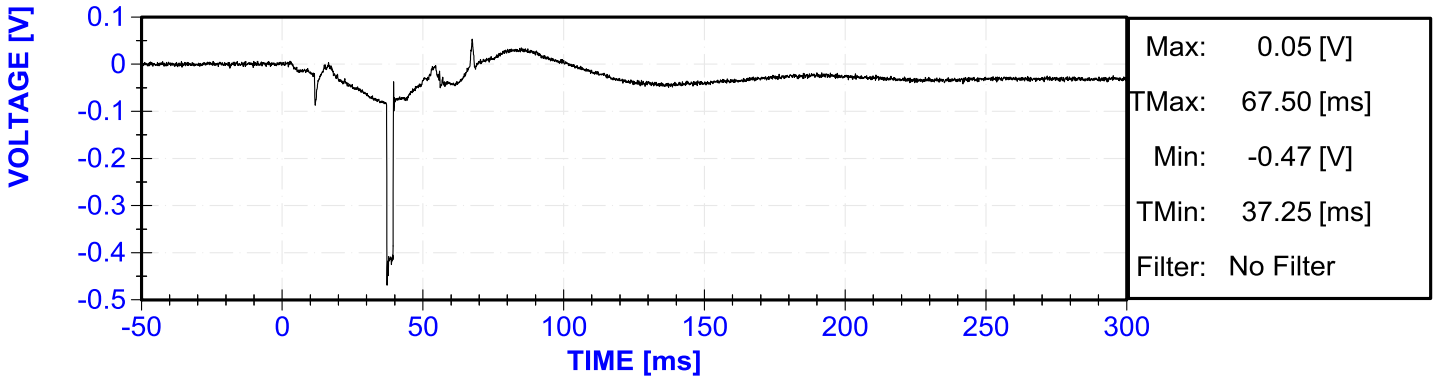
V2 DRIVER SW AIRBAG STAGE 2

TIME TO FIRE: 53.7MS



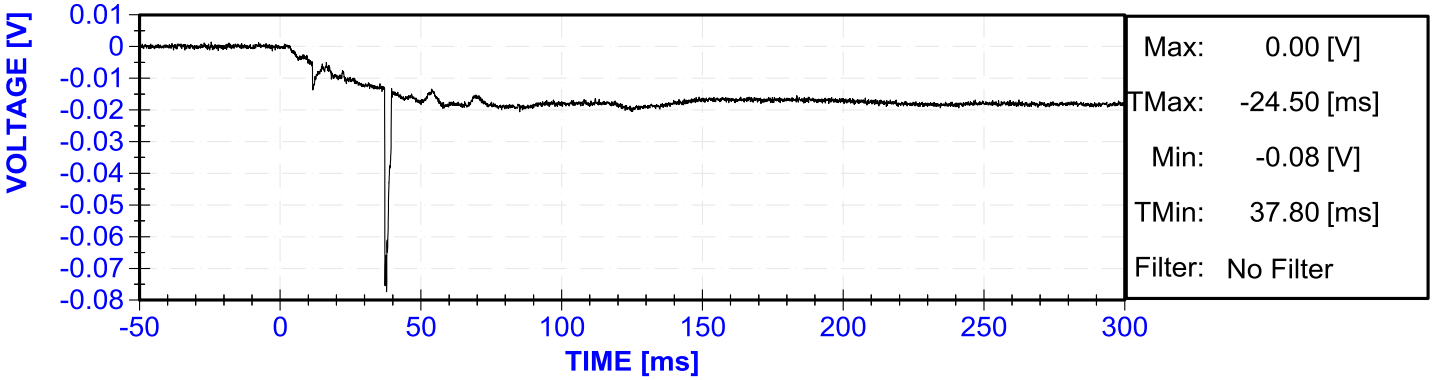
V2 DRIVER HEAD CURTAIN

TIME TO FIRE: 37.2MS



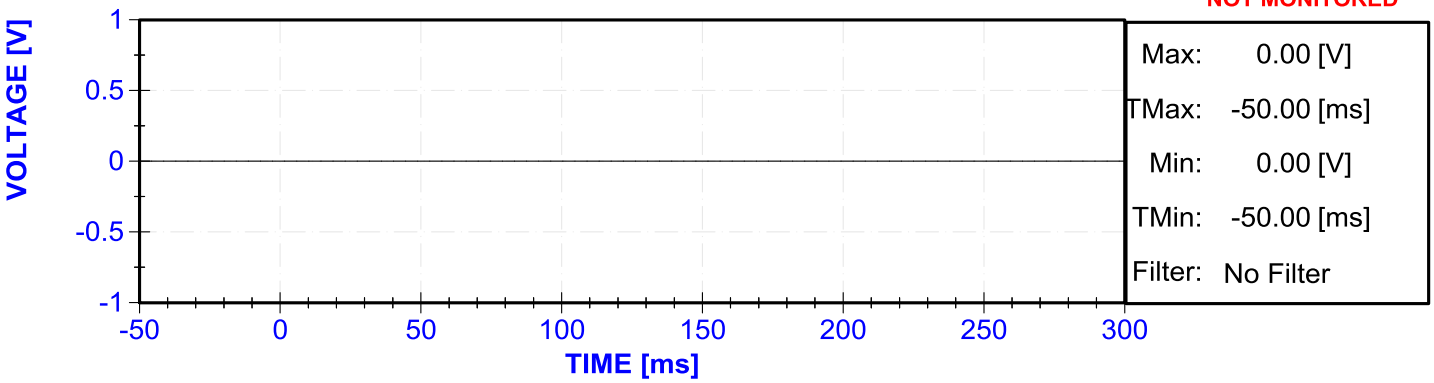
V2 DRIVER SEAT HEAD/TORSO/PELVIS

TIME TO FIRE: 37.2MS



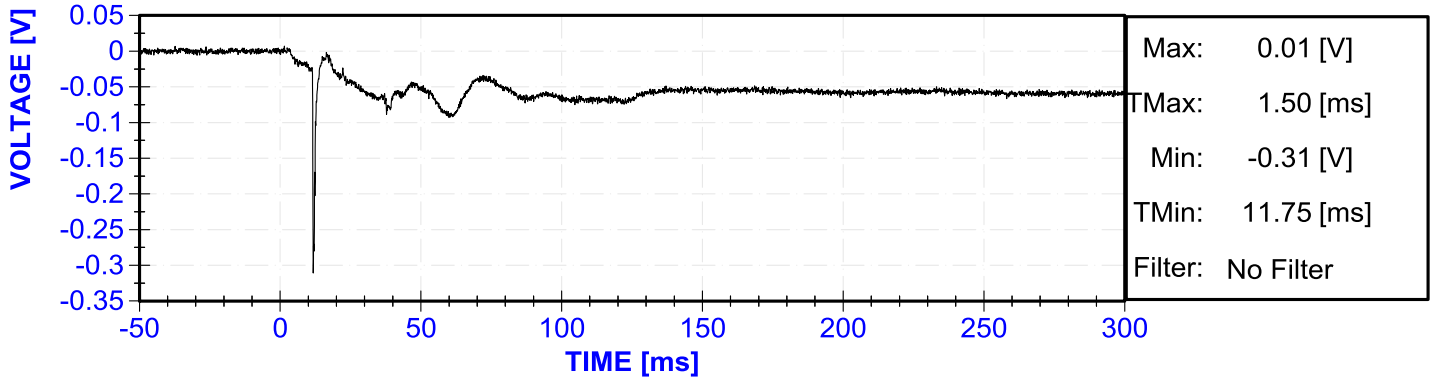
V2 DRIVER KNEE

NOT MONITORED



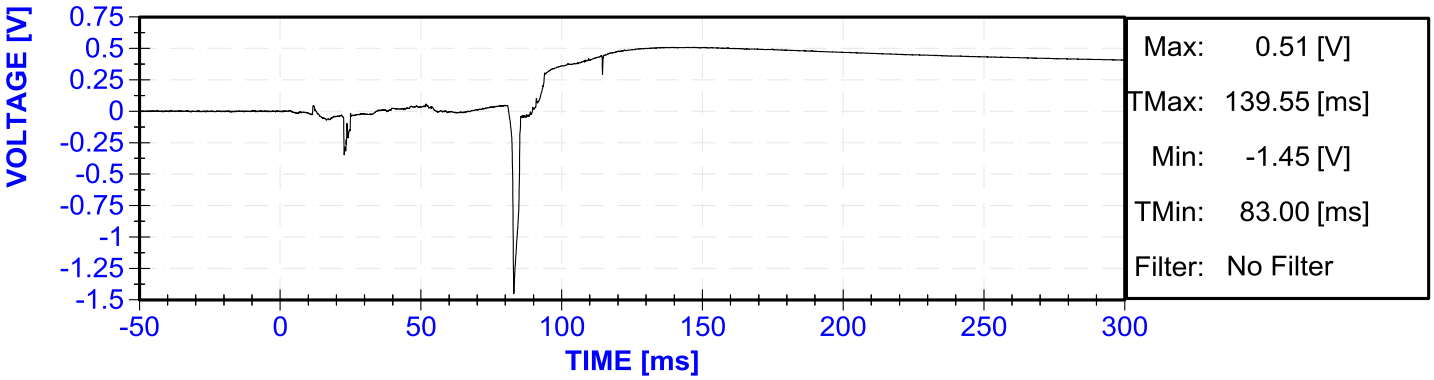
V2 DRIVER TORSO BELT PRETENSIONER

TIME TO FIRE: 11.8MS



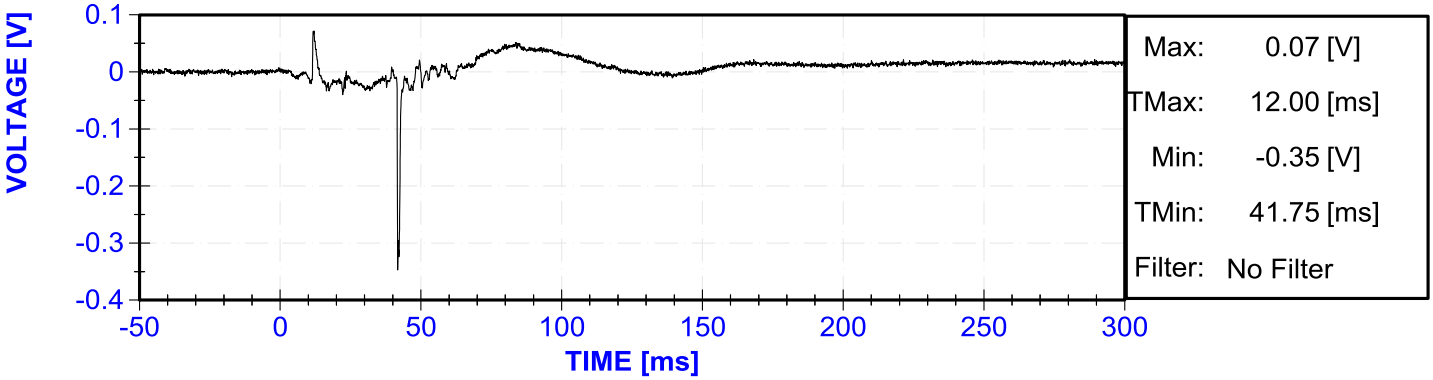
V2 PASSENGER FRT AIRBAG STAGE 1

TIME TO FIRE: 23.3MS



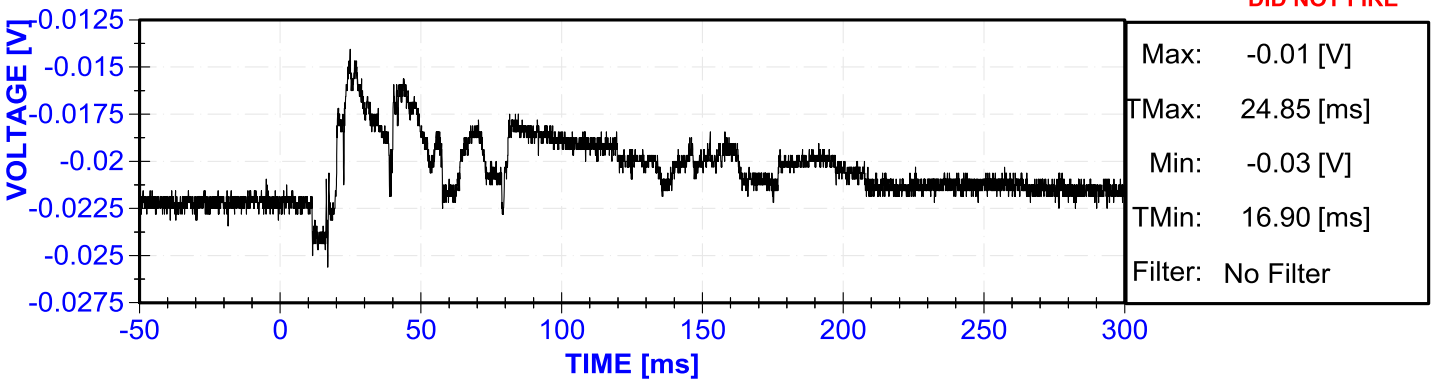
V2 PASSENGER FRT AIRBAG STAGE 2

TIME TO FIRE: 41.8MS



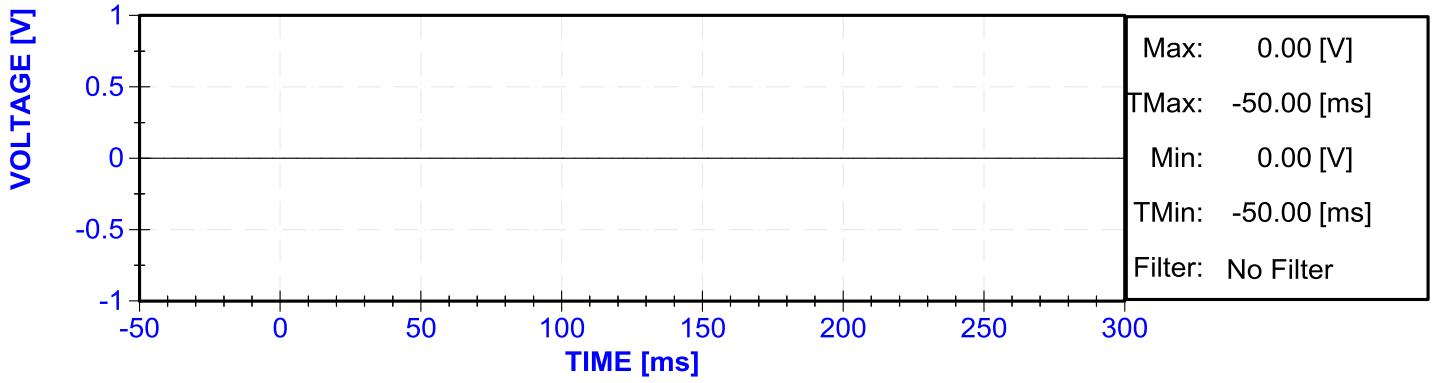
V2 PASSENGER HEAD CURTAIN

DID NOT FIRE



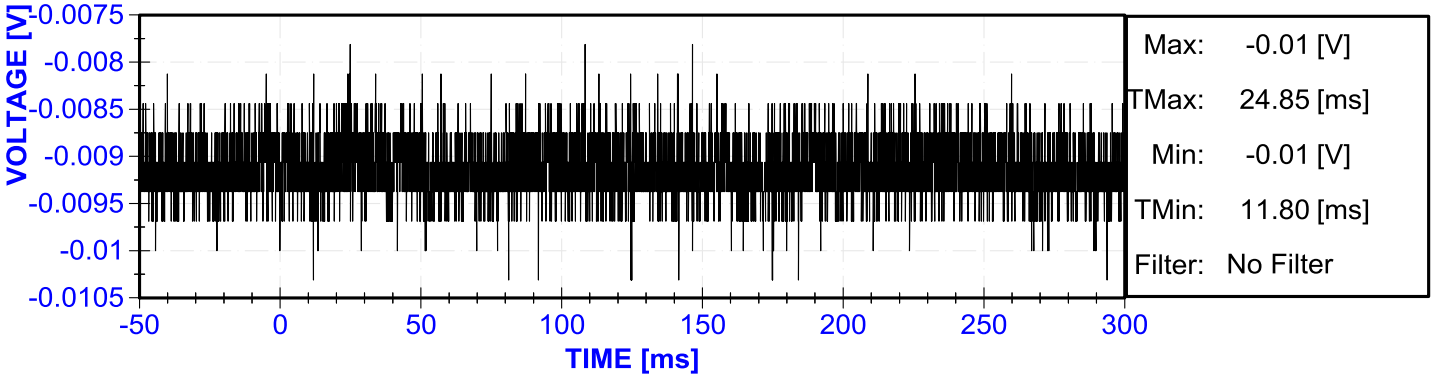
V2 PASSENGER KNEE

NOT MONITORED



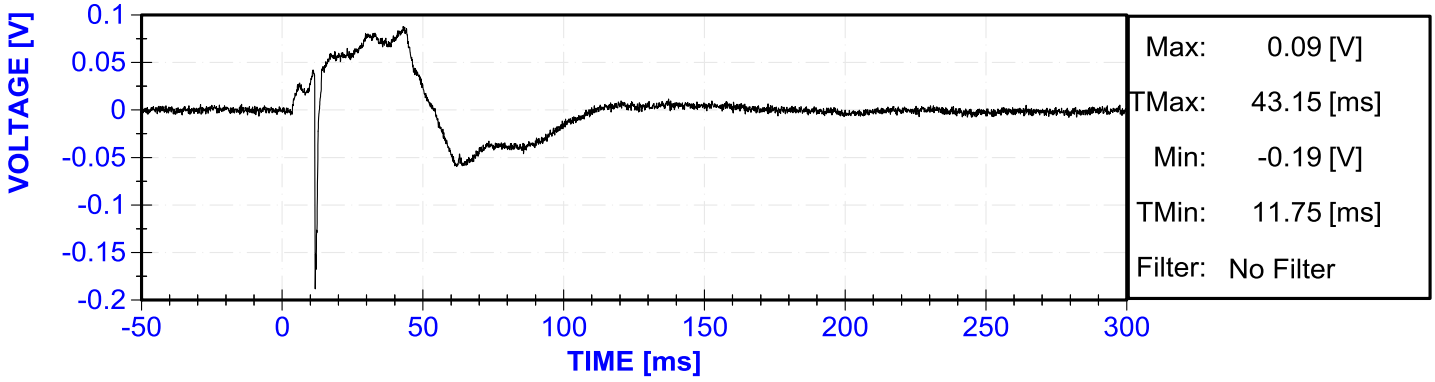
V2 PASSENGER HEAD/TORSO/PELVIS

Did not fire

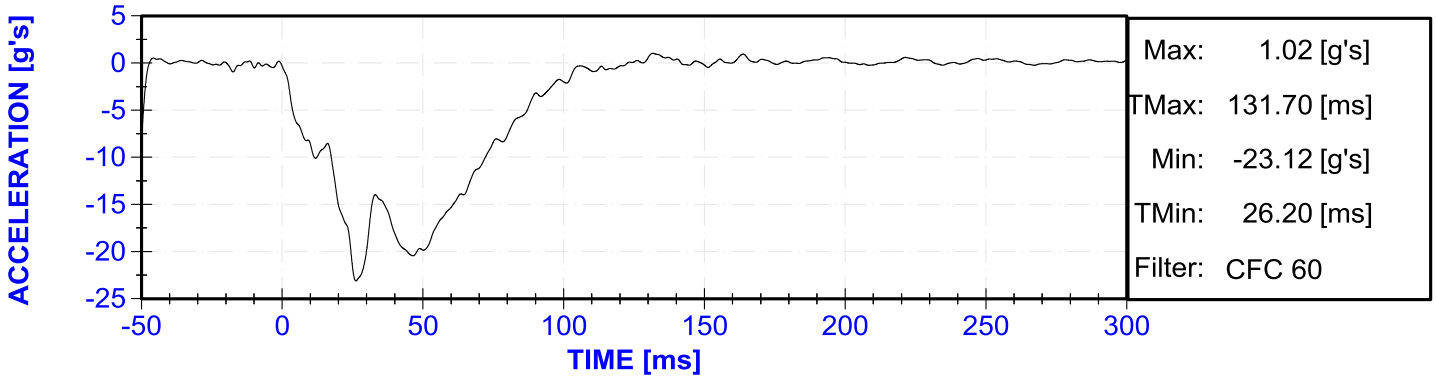


V2 PASSENGER TORSO BELT PRETENSIONER

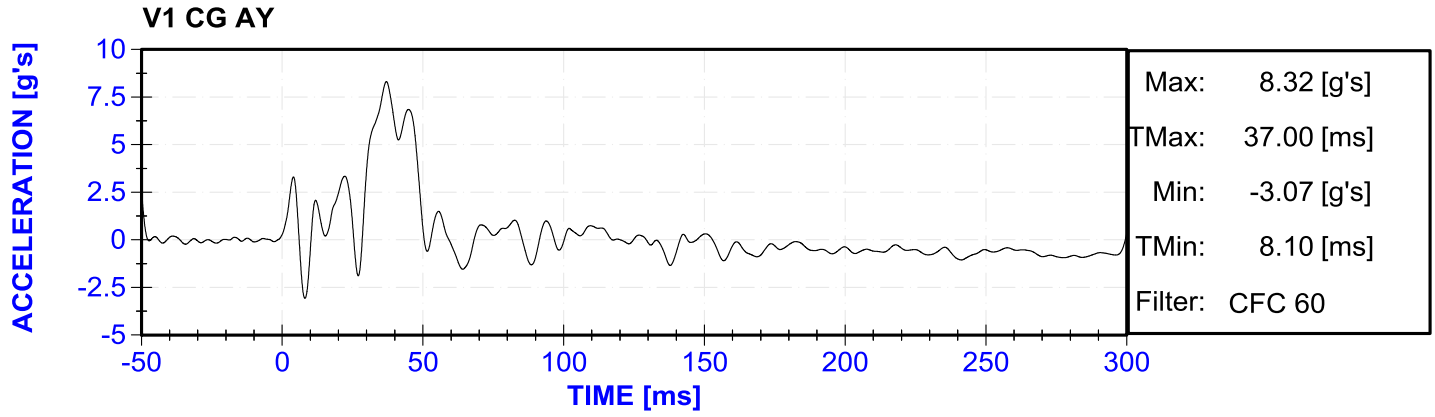
TIME TO FIRE: 11.8MS



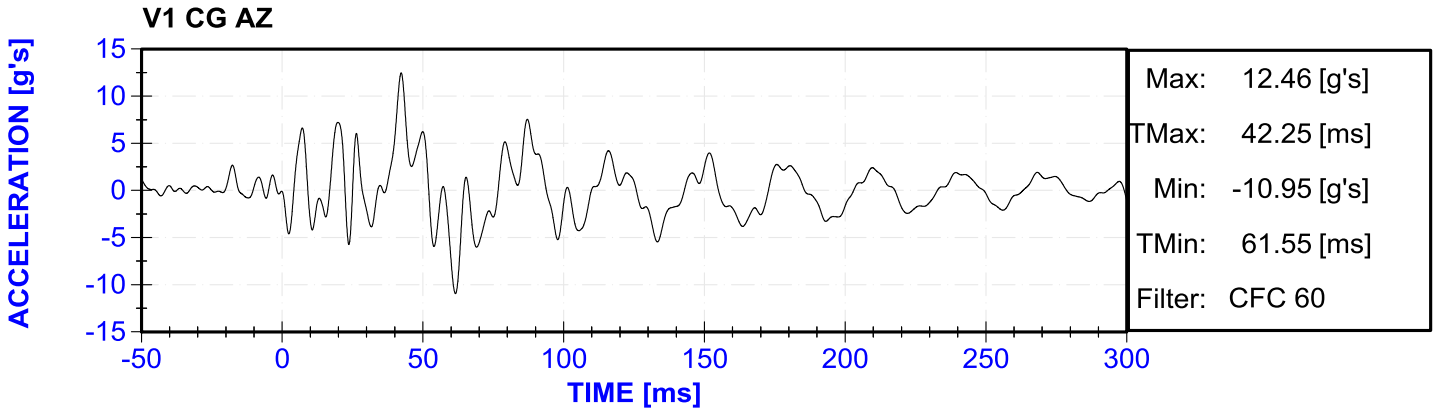
V1 CG AX



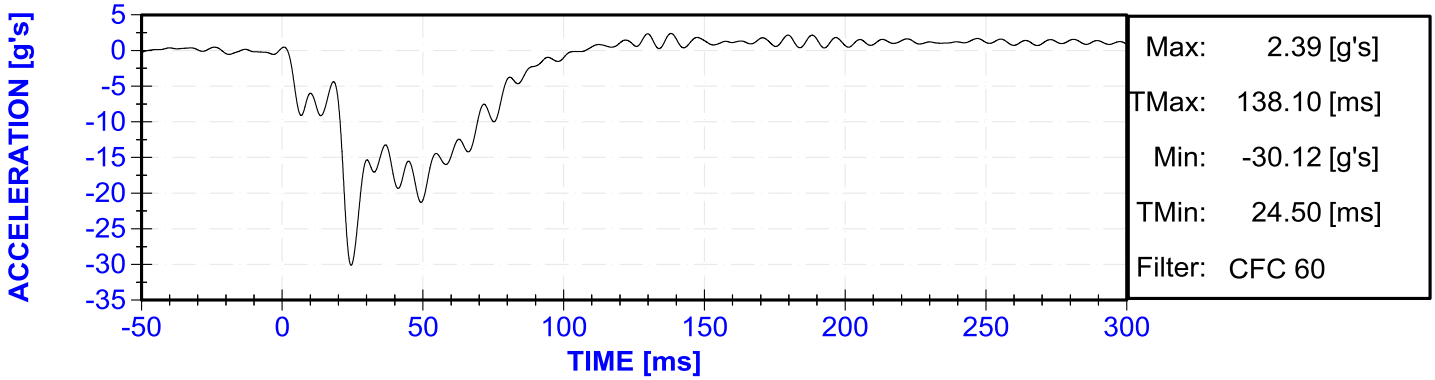
V1 CG AY



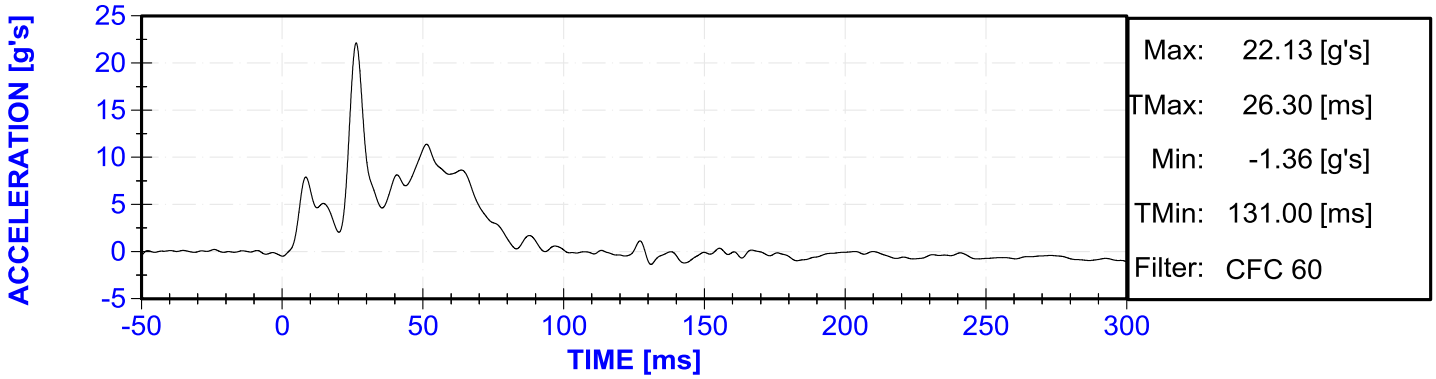
V1 CG AZ



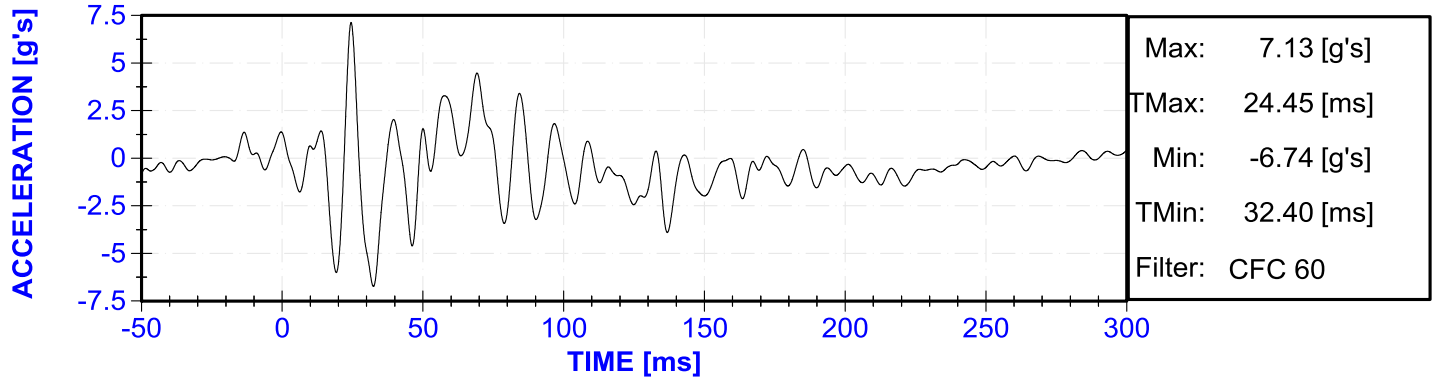
V1 REAR C/L AX



V1 REAR C/L AY

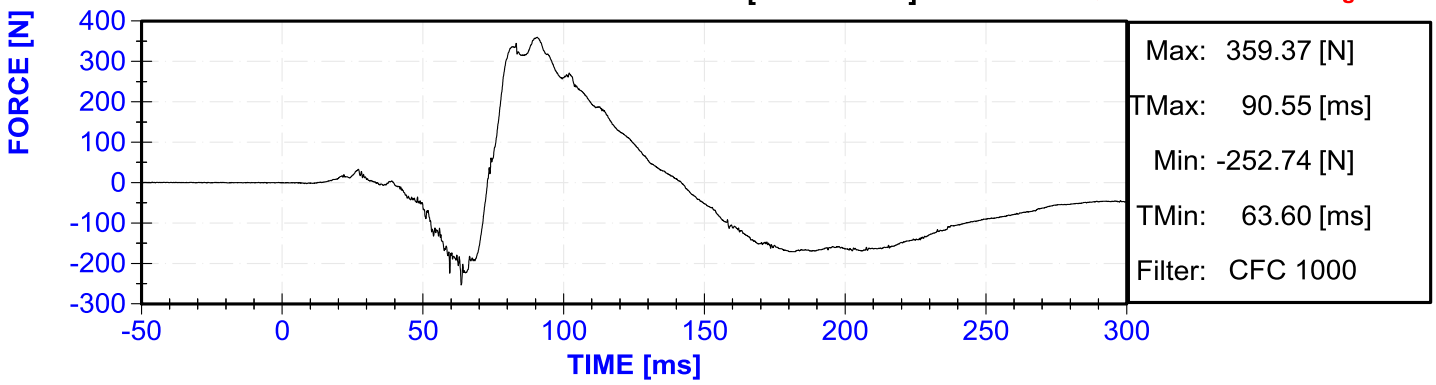


V1 REAR C/L AZ



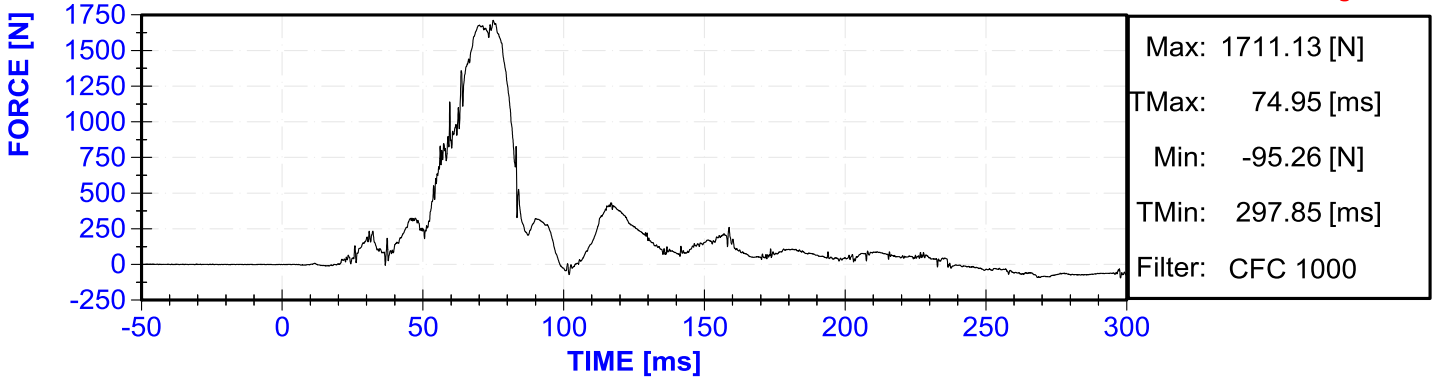
V2P1 NECK OCCIPITAL CONDYLE FORCE X [THORTEST]

Questionable data throughout



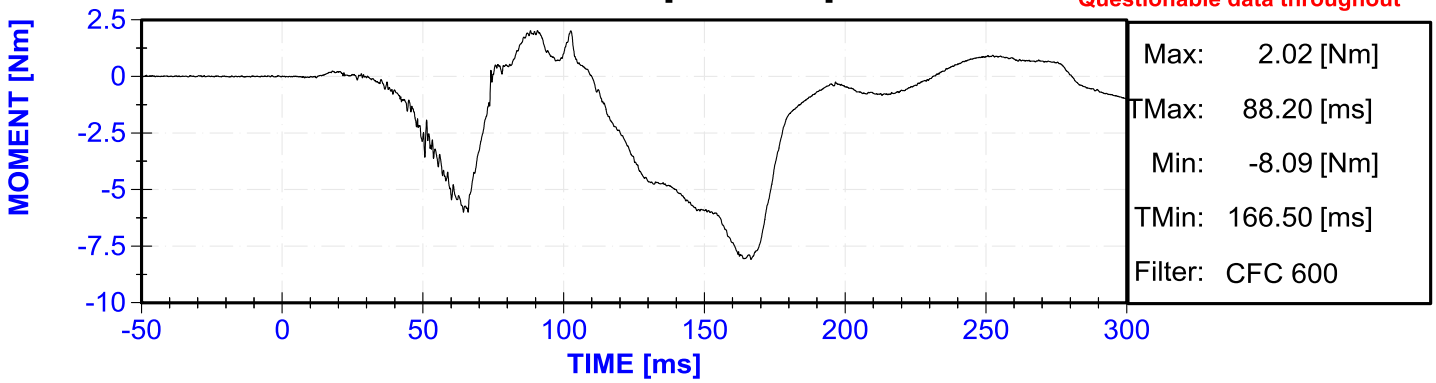
V2P1 NECK OCCIPITAL CONDYLE FORCE Z [THORTEST]

Questionable data throughout

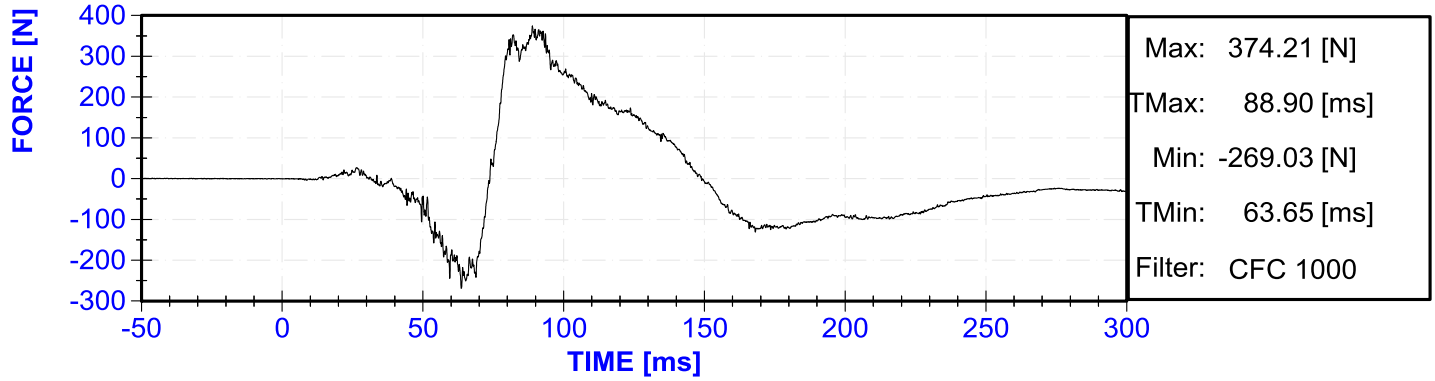


V2P1 NECK OCCIPITAL CONDYLE MY [THORTEST]

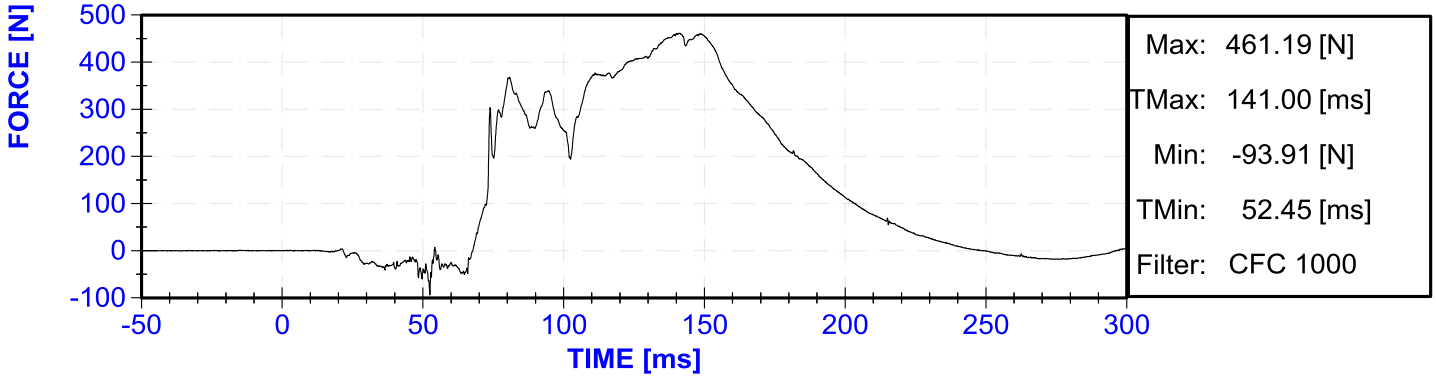
Questionable data throughout



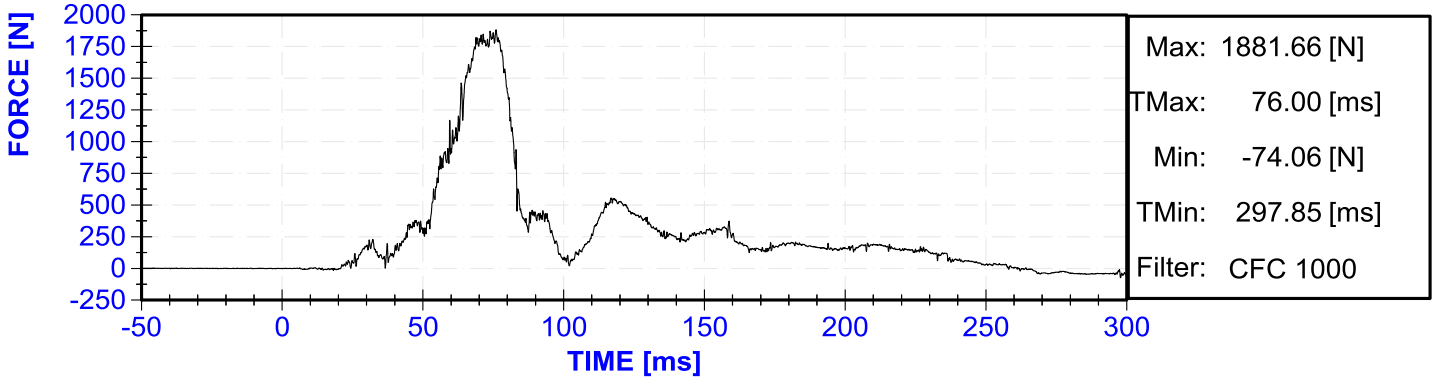
V2P1 NECK UPPER FORCE X [THORTEST]



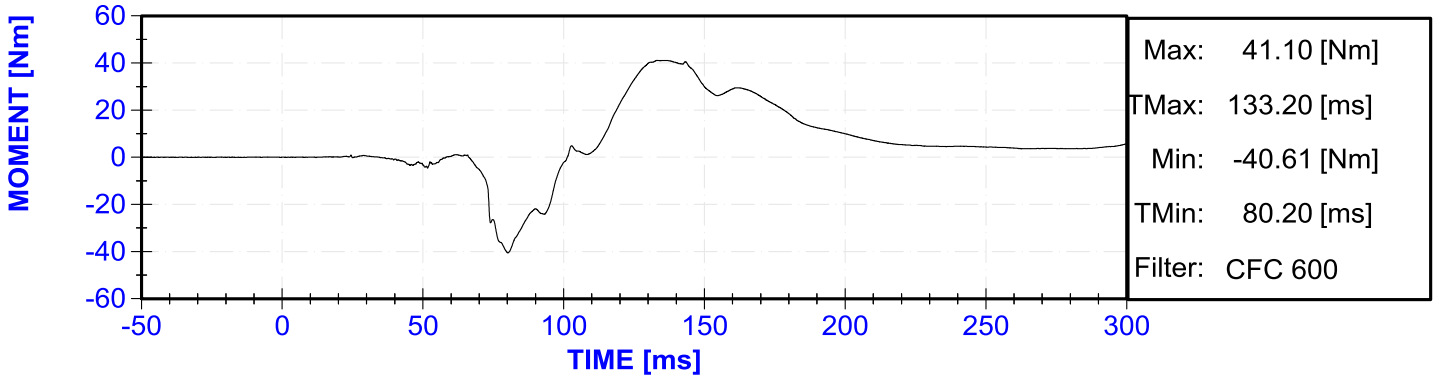
V2P1 NECK UPPER FORCE Y [THORTEST]



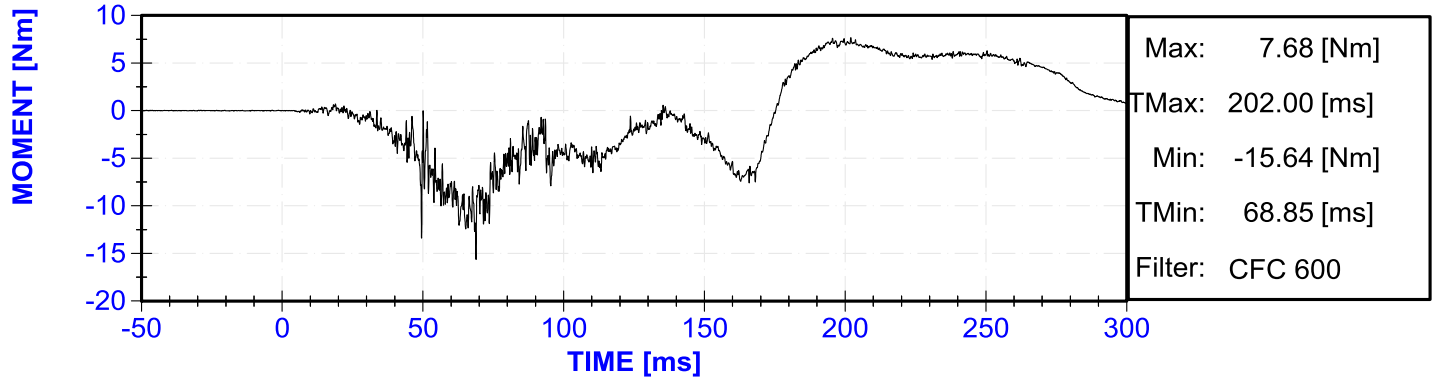
V2P1 NECK UPPER FORCE Z [THORTEST]



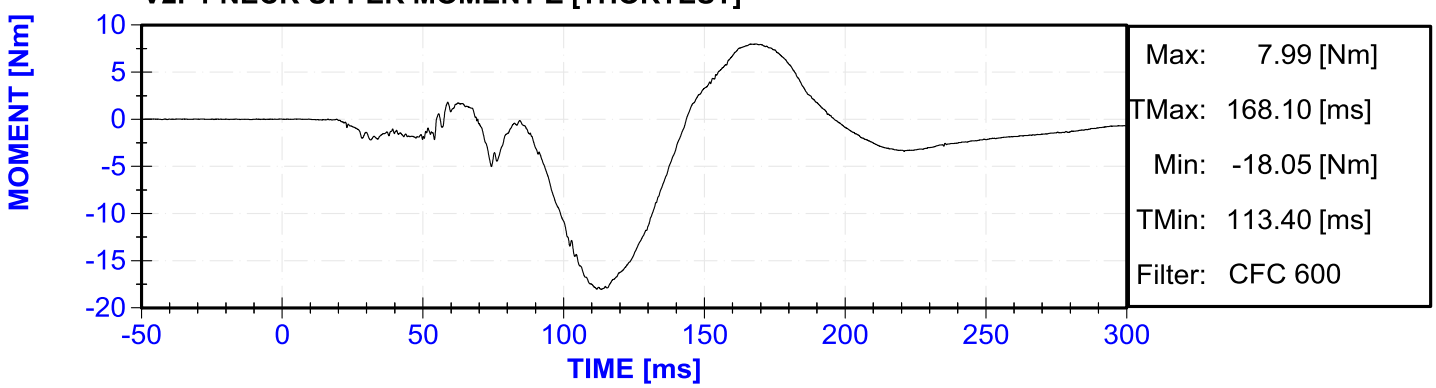
V2P1 NECK UPPER MOMENT X [THORTEST]



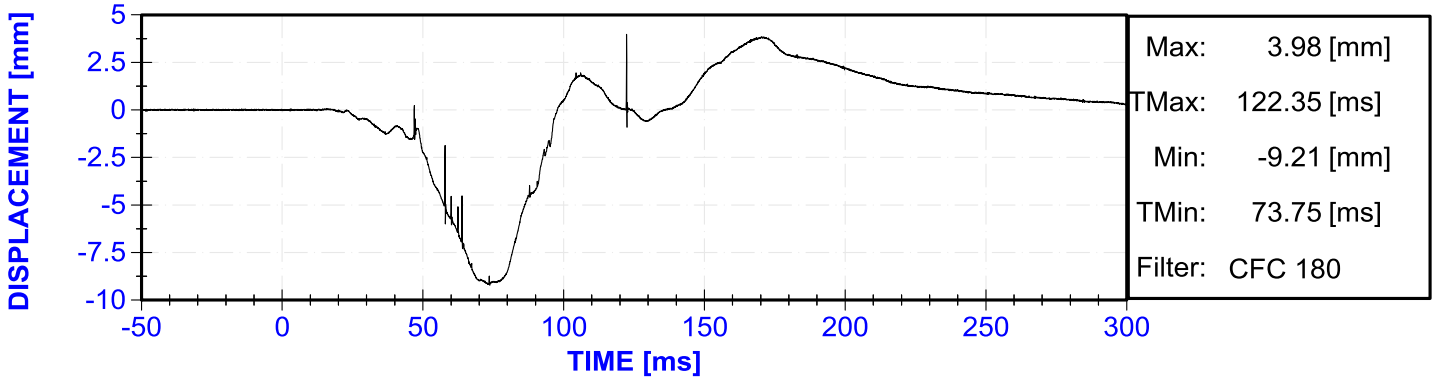
V2P1 NECK UPPER MOMENT Y [THORTEST]



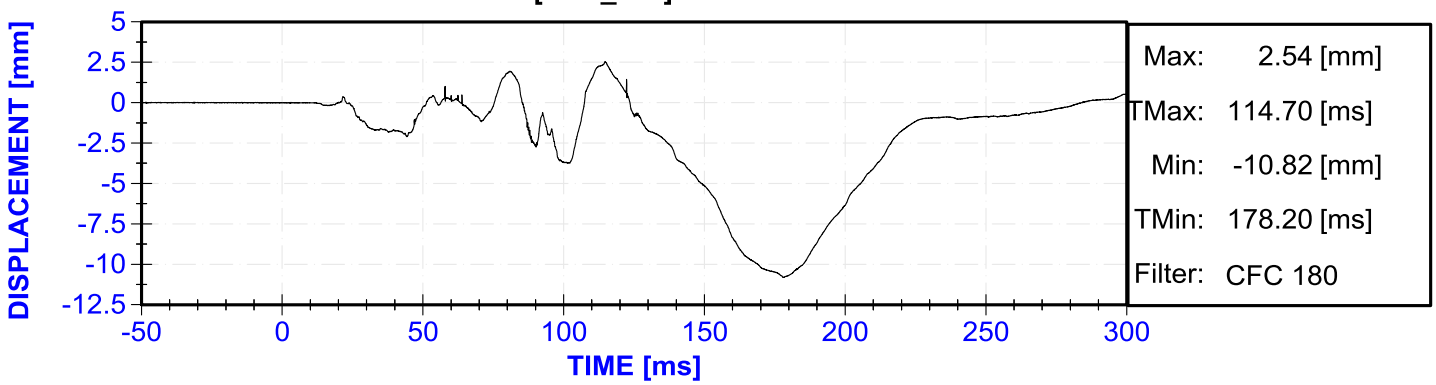
V2P1 NECK UPPER MOMENT Z [THORTEST]



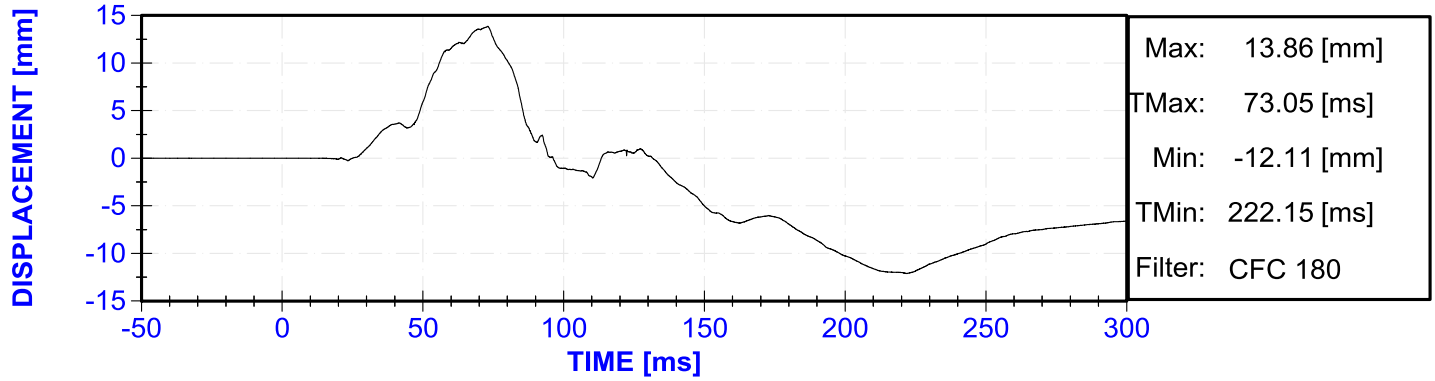
V2P1 CHEST UPPER LEFT X [CFC_180]



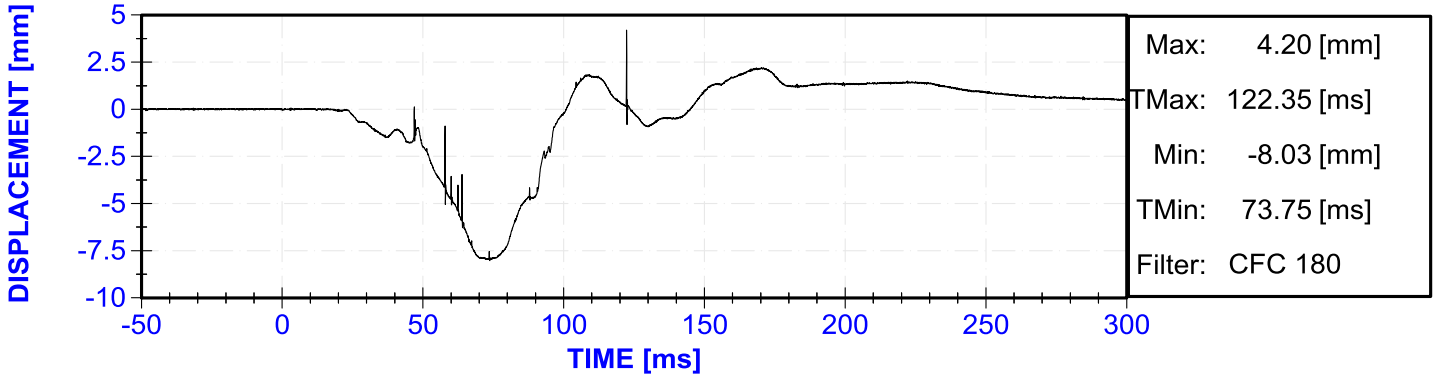
V2P1 CHEST UPPER LEFT Y [CFC_180]



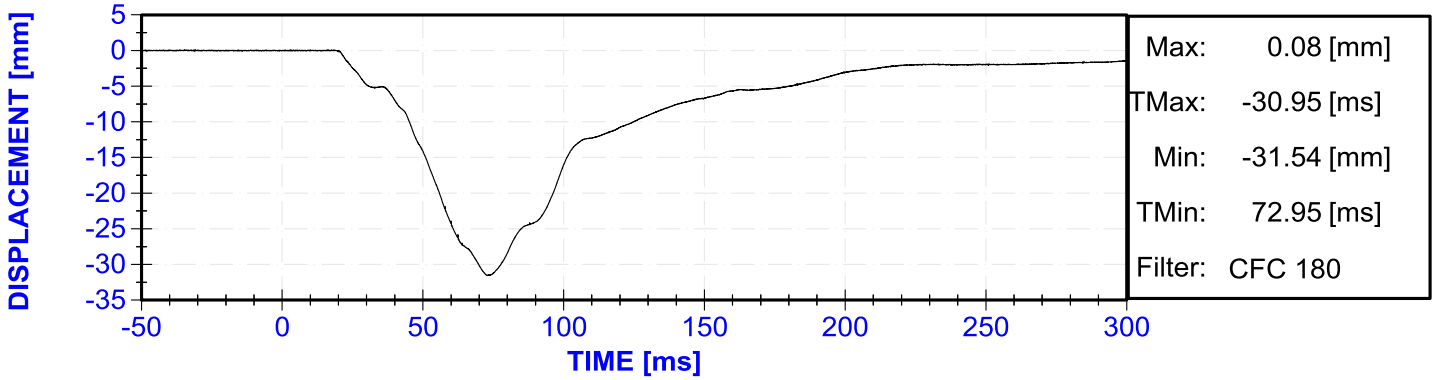
V2P1 CHEST UPPER LEFT Z [CFC_180]



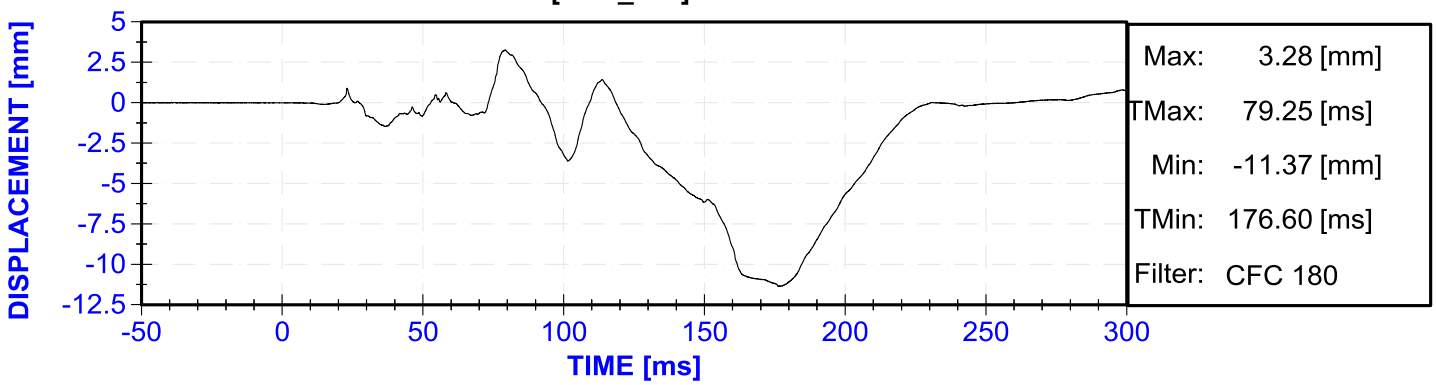
V2P1 CHEST UPPER LEFT D [CFC_180]



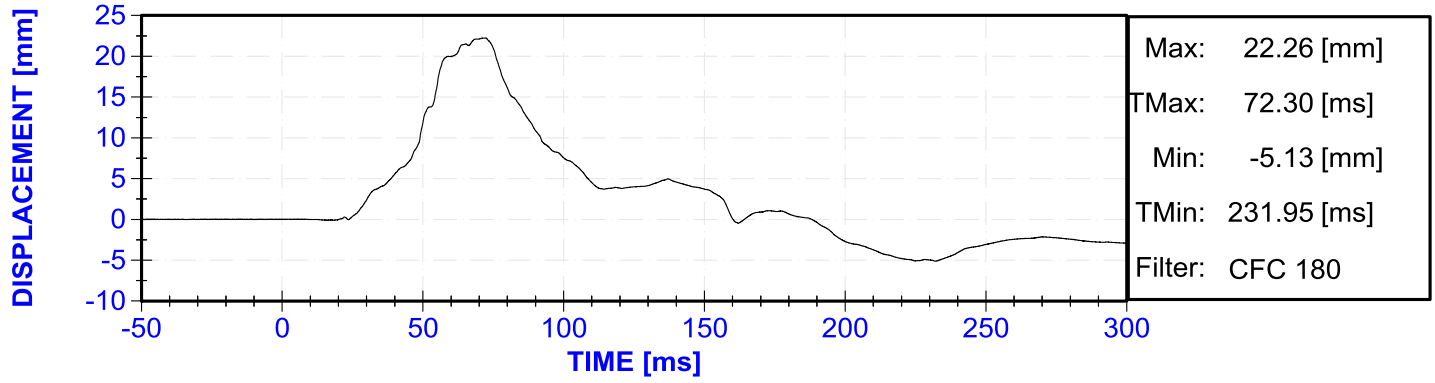
V2P1 CHEST UPPER RIGHT X [CFC_180]



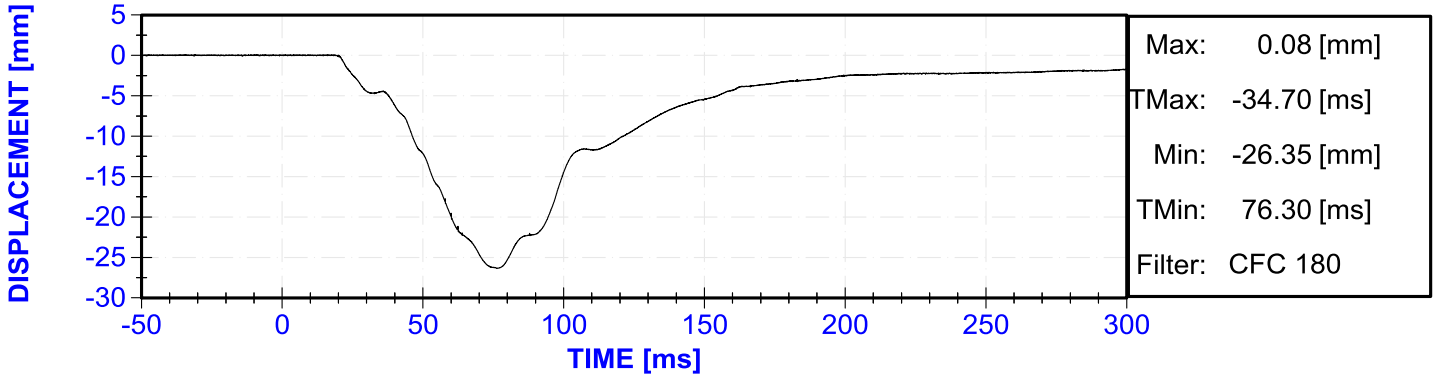
V2P1 CHEST UPPER RIGHT Y [CFC_180]



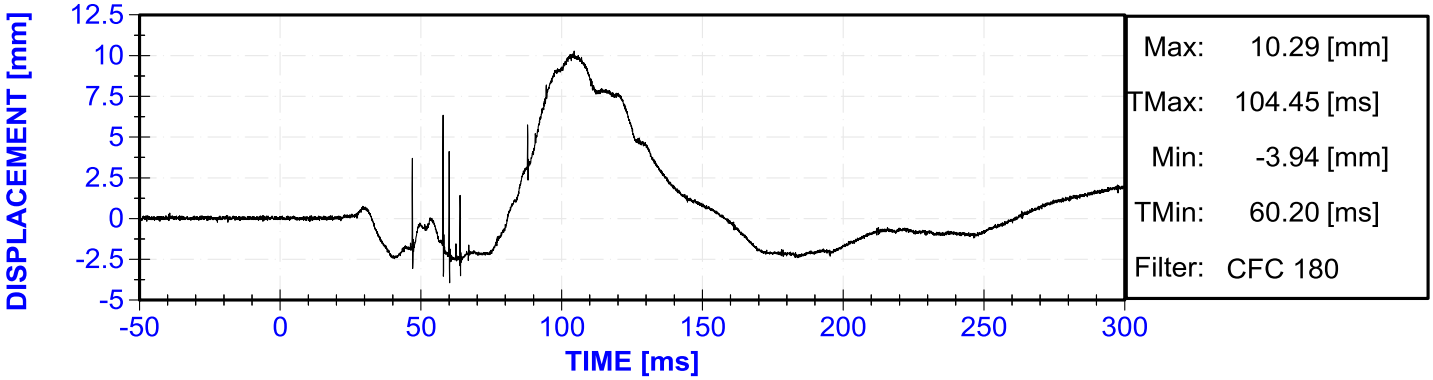
V2P1 CHEST UPPER RIGHT Z [CFC_180]



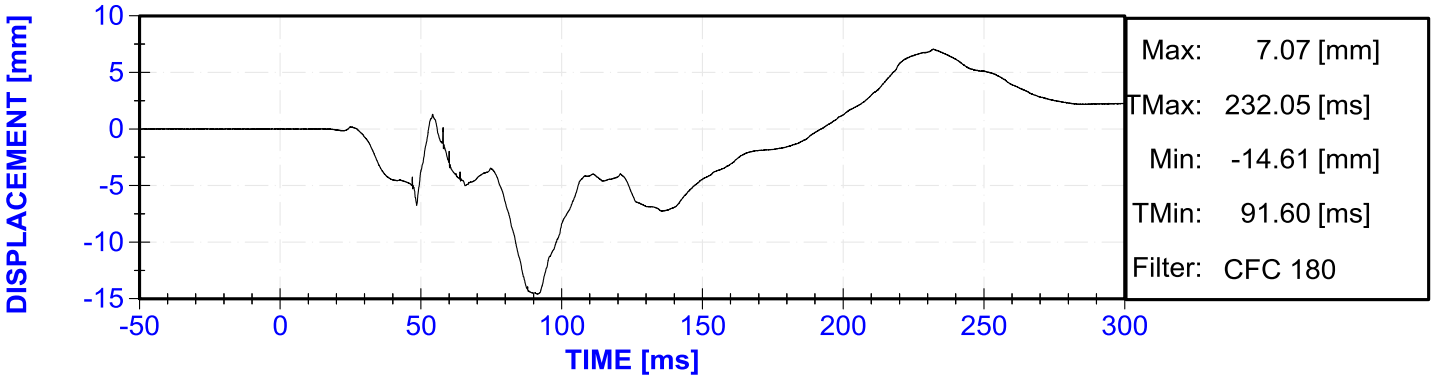
V2P1 CHEST UPPER RIGHT D [CFC_180]



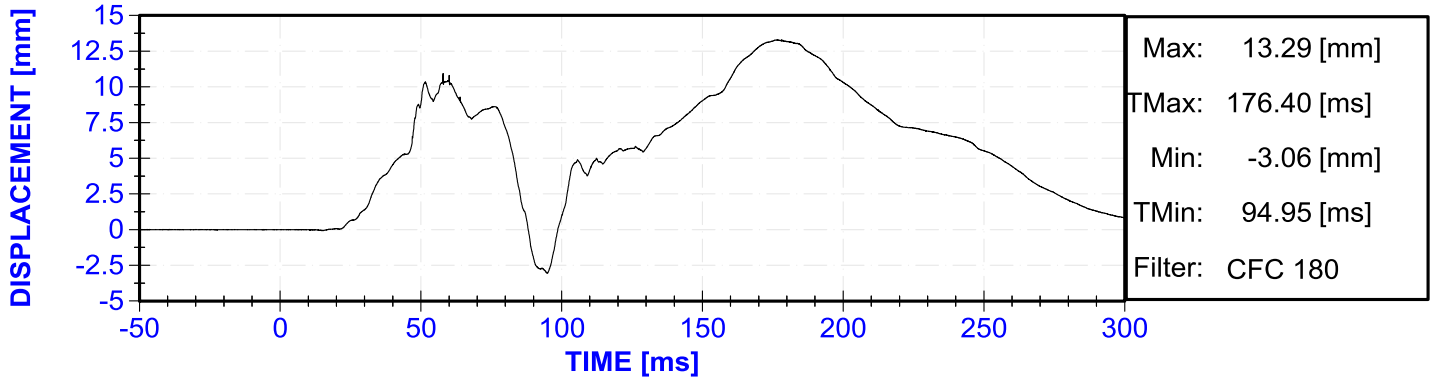
V2P1 CHEST LOWER LEFT X [CFC_180]



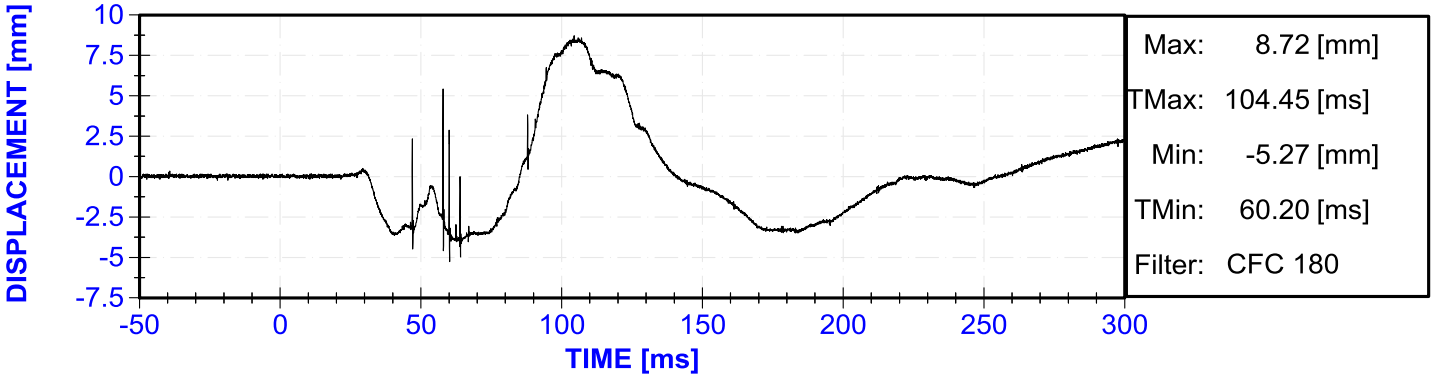
V2P1 CHEST LOWER LEFT Y [CFC_180]



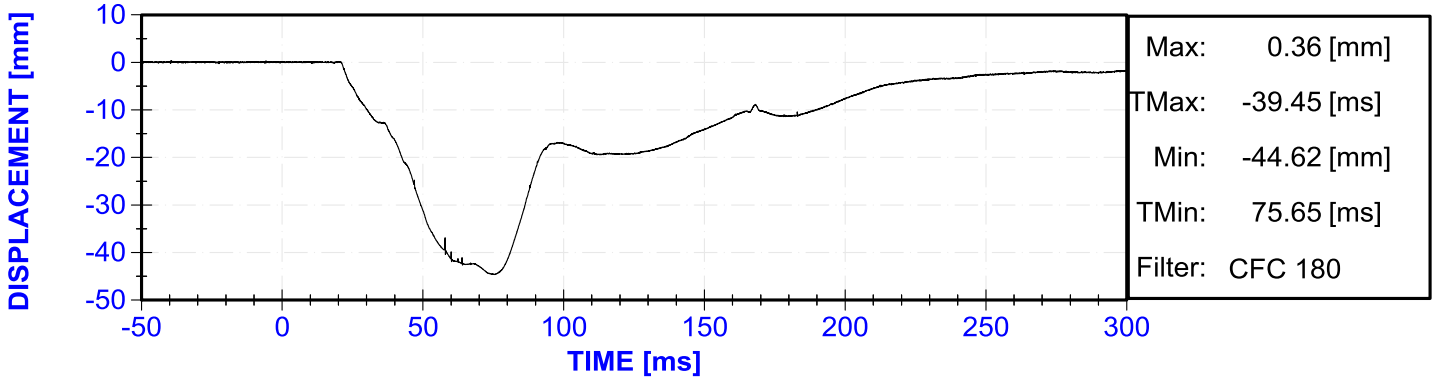
V2P1 CHEST LOWER LEFT Z [CFC_180]



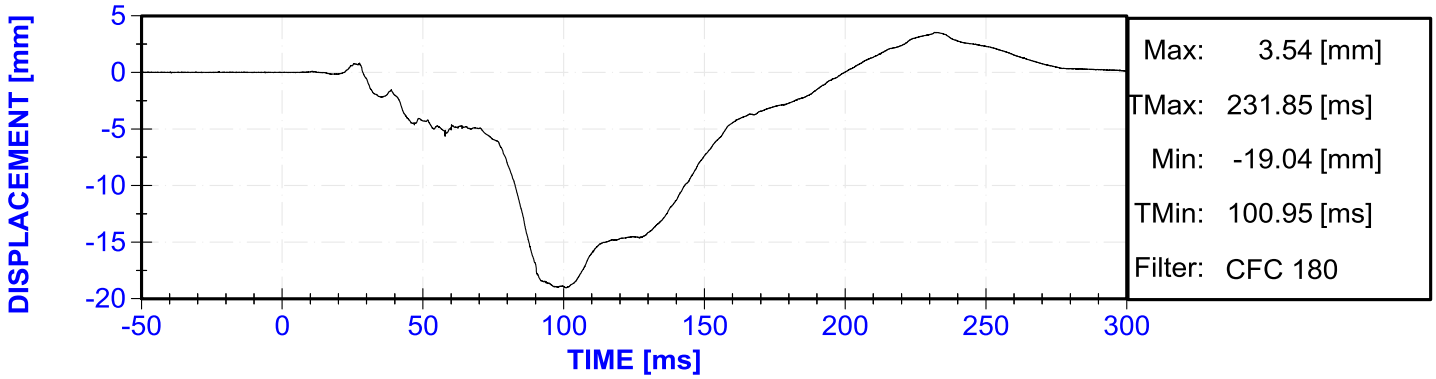
V2P1 CHEST LOWER LEFT D [CFC_180]



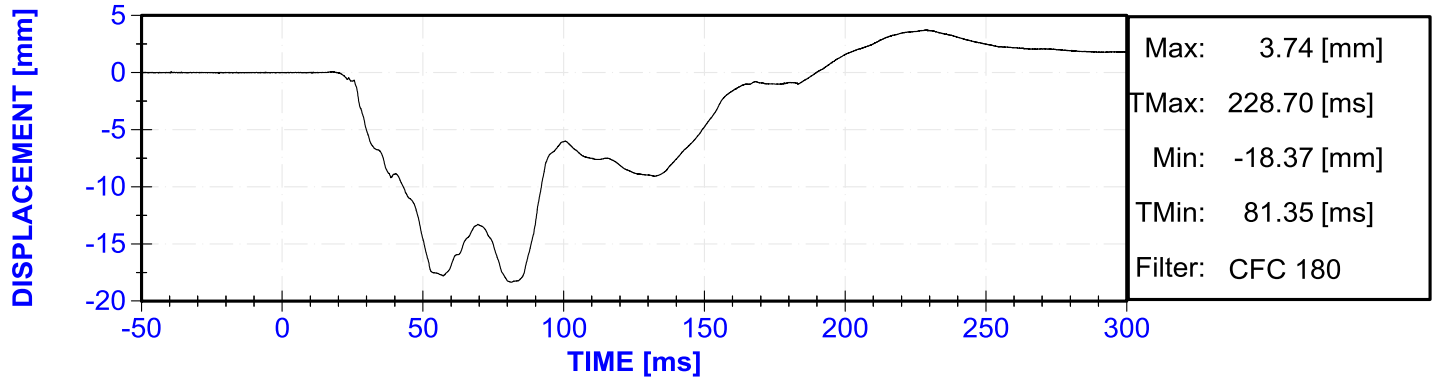
V2P1 CHEST LOWER RIGHT X [CFC_180]



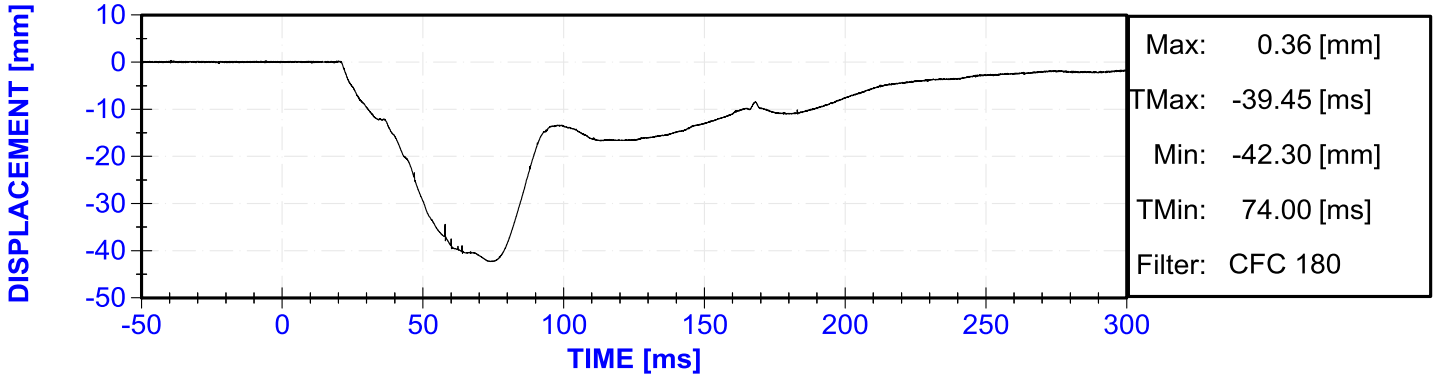
V2P1 CHEST LOWER RIGHT Y [CFC_180]



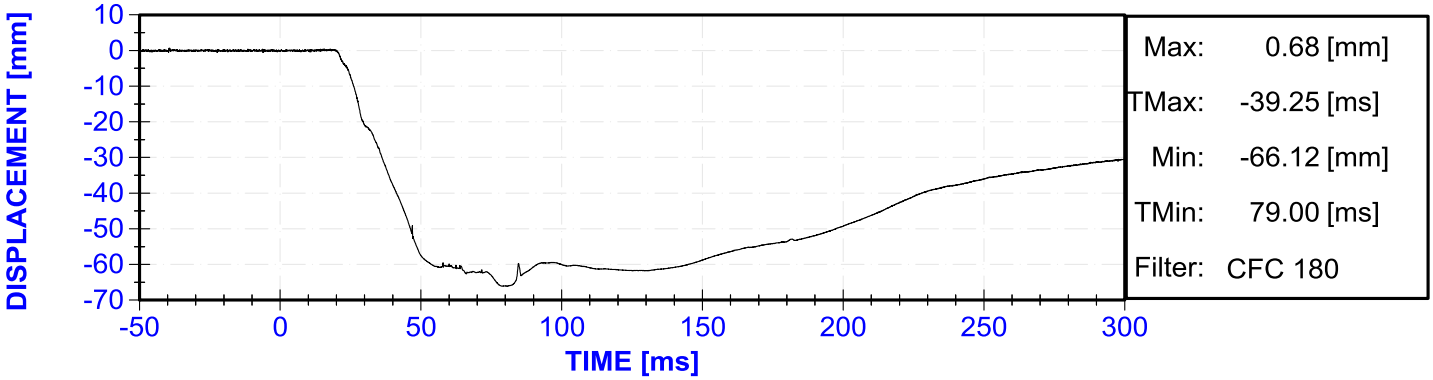
V2P1 CHEST LOWER RIGHT Z [CFC_180]



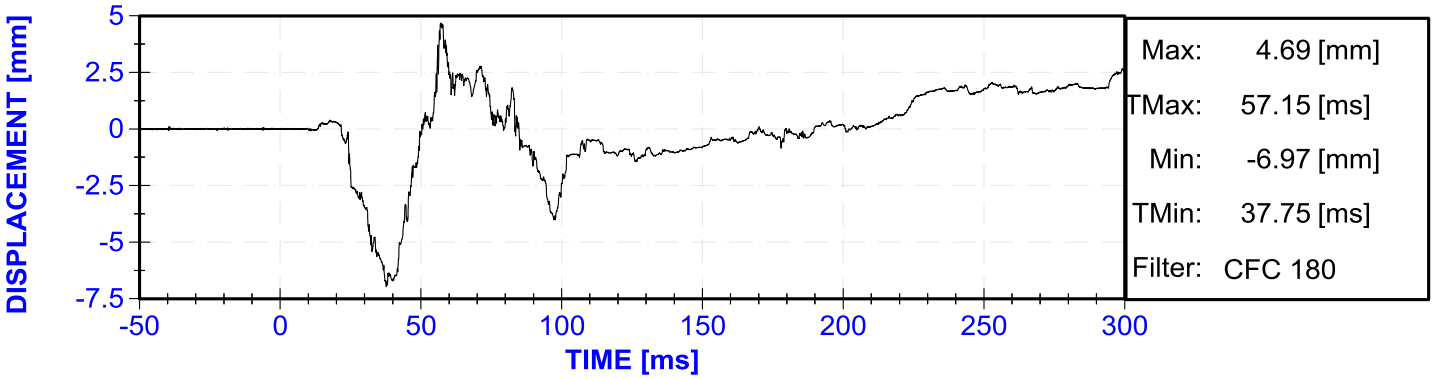
V2P1 CHEST LOWER RIGHT D [CFC_180]



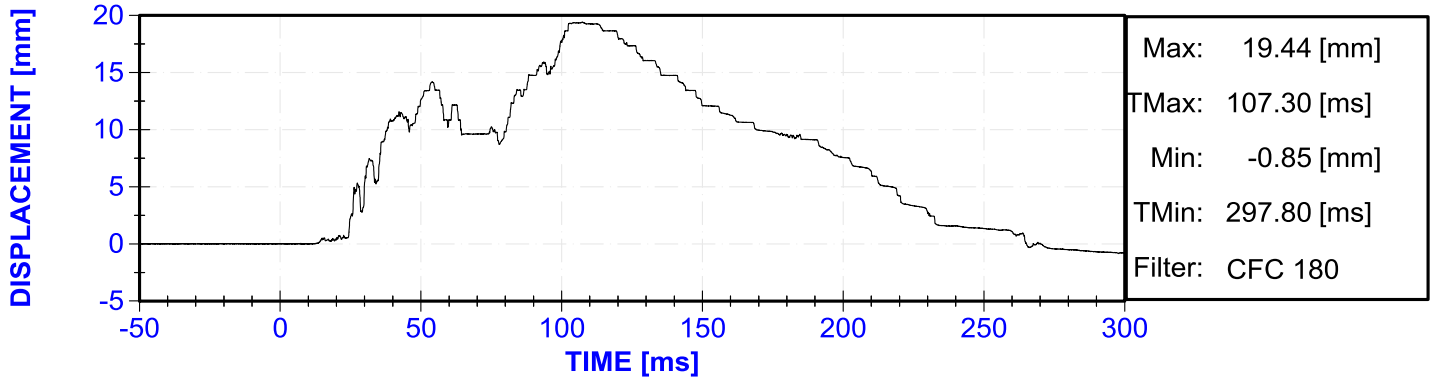
V2P1 ABDOMEN LEFT LOWER X [CFC_180]



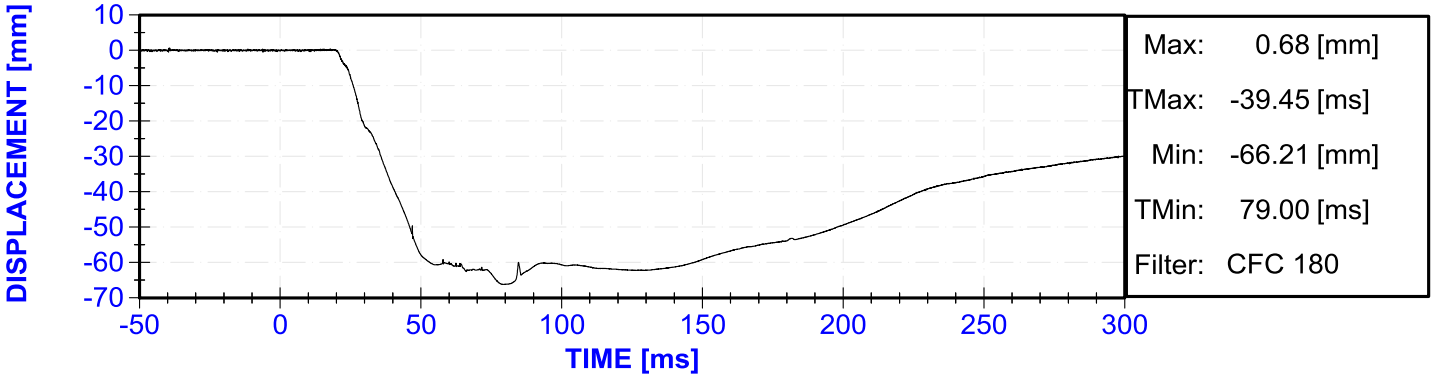
V2P1 ABDOMEN LEFT LOWER Y [CFC_180]



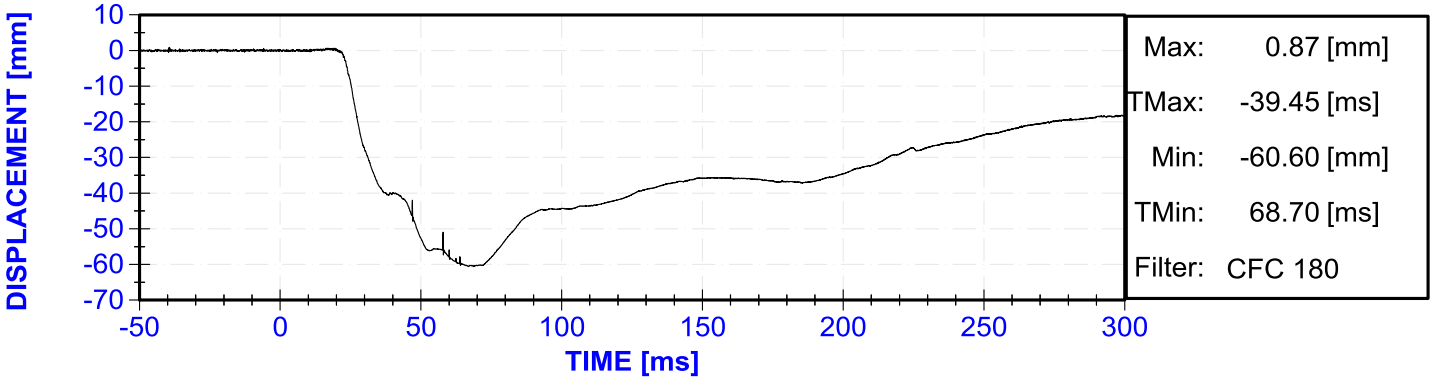
V2P1 ABDOMEN LEFT LOWER Z [CFC_180]



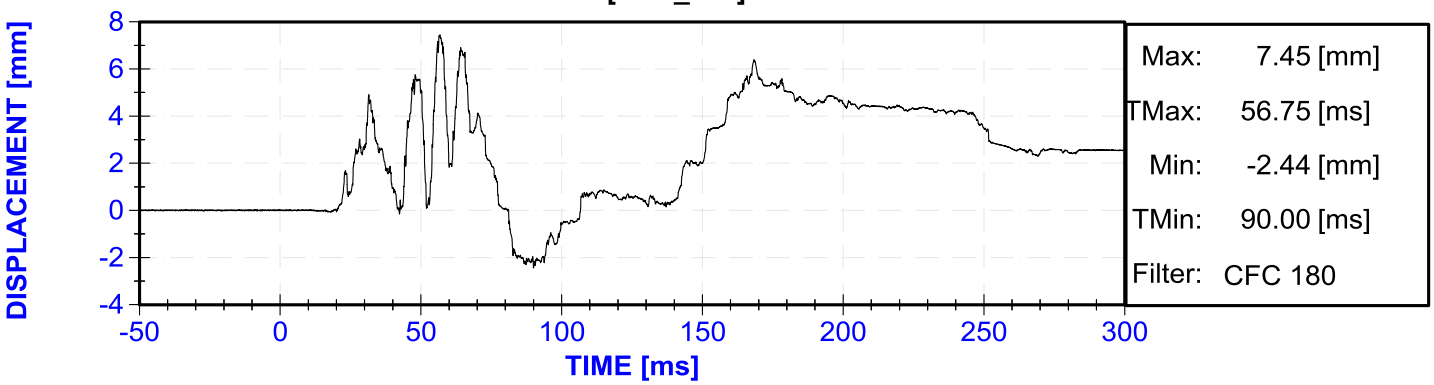
V2P1 ABDOMEN LEFT LOWER D [CFC_180]



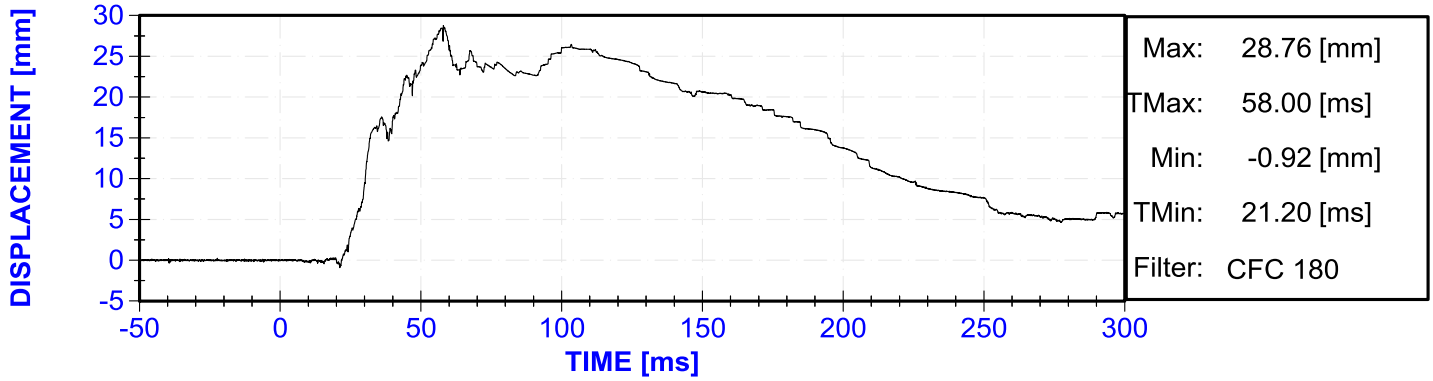
V2P1 ABDOMEN RIGHT LOWER X [CFC_180]



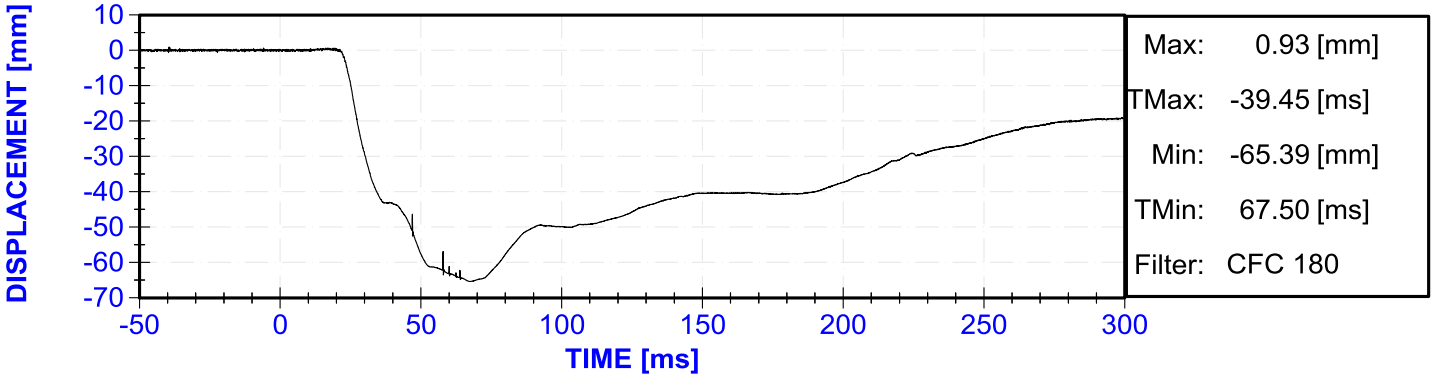
V2P1 ABDOMEN RIGHT LOWER Y [CFC_180]



V2P1 ABDOMEN RIGHT LOWER Z [CFC_180]

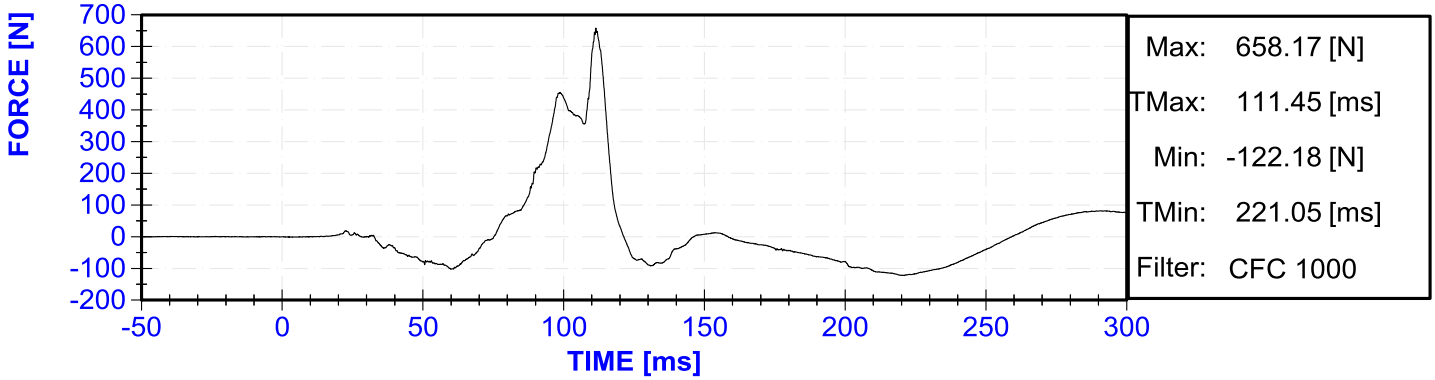


V2P1 ABDOMEN RIGHT LOWER D [CFC_180]



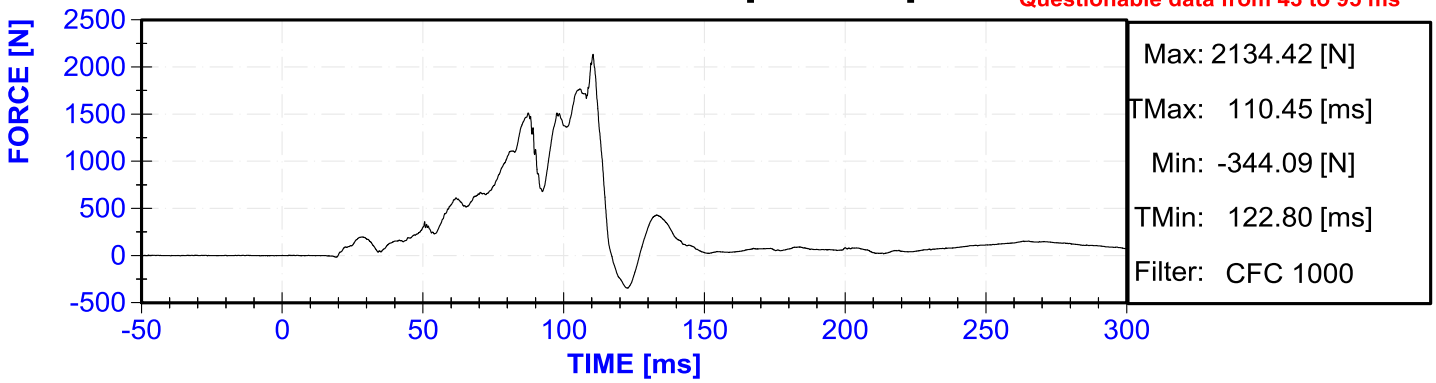
V2P2 NECK OCCIPITAL CONDYLE FORCE X [THORTEST]

Questionable data from 43 to 95 ms



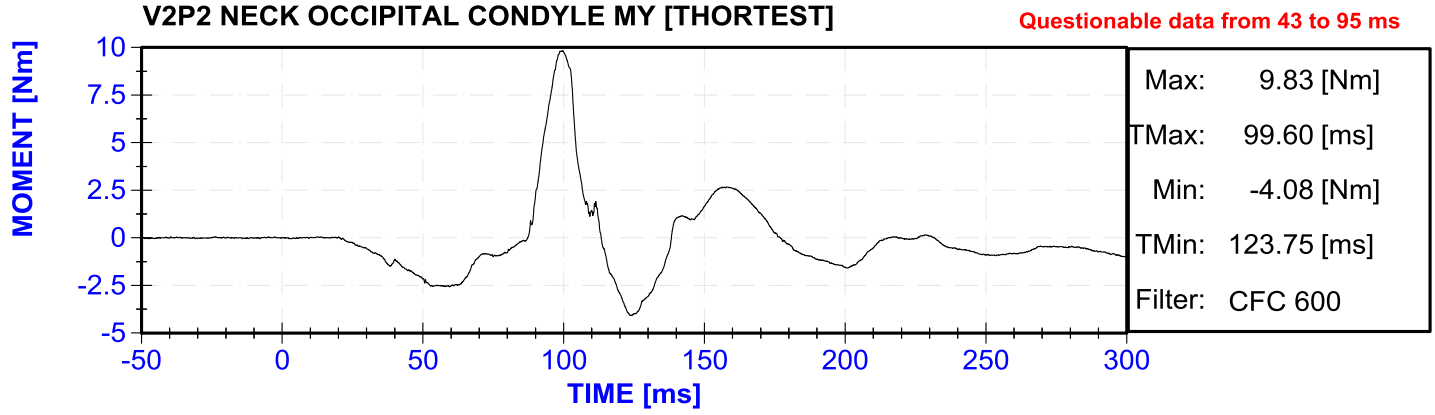
V2P2 NECK OCCIPITAL CONDYLE FORCE Z [THORTEST]

Questionable data from 43 to 95 ms

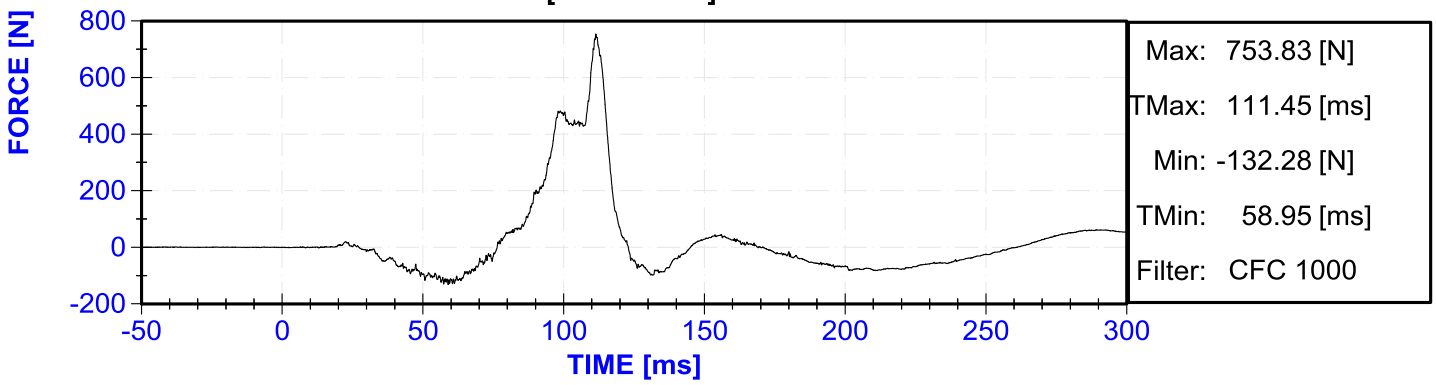


V2P2 NECK OCCIPITAL CONDYLE MY [THORTEST]

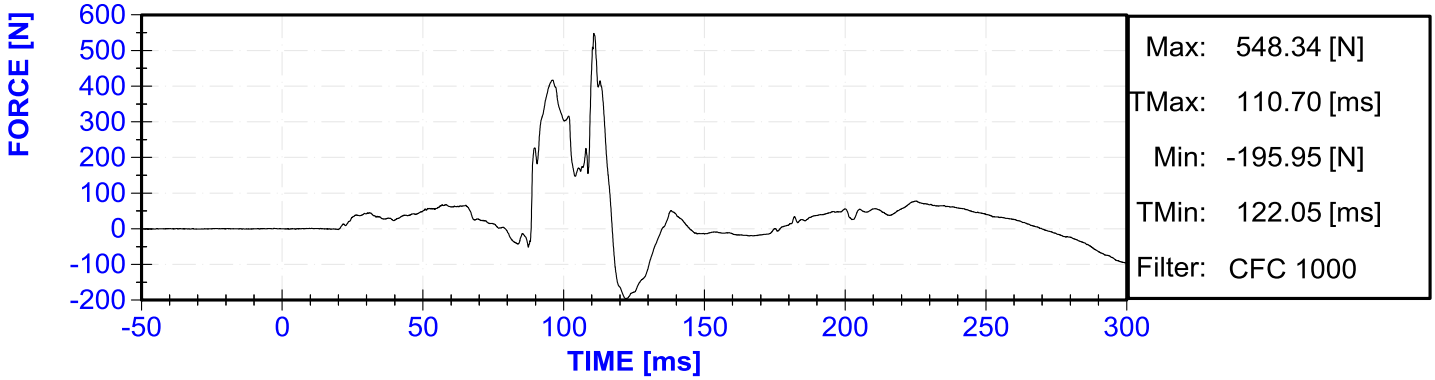
Questionable data from 43 to 95 ms



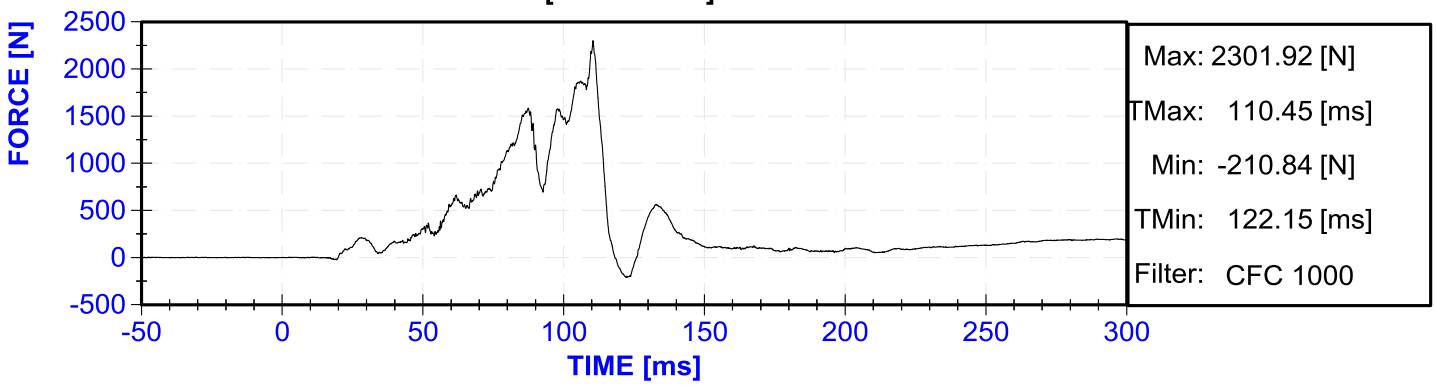
V2P2 NECK UPPER FORCE X [THORTEST]



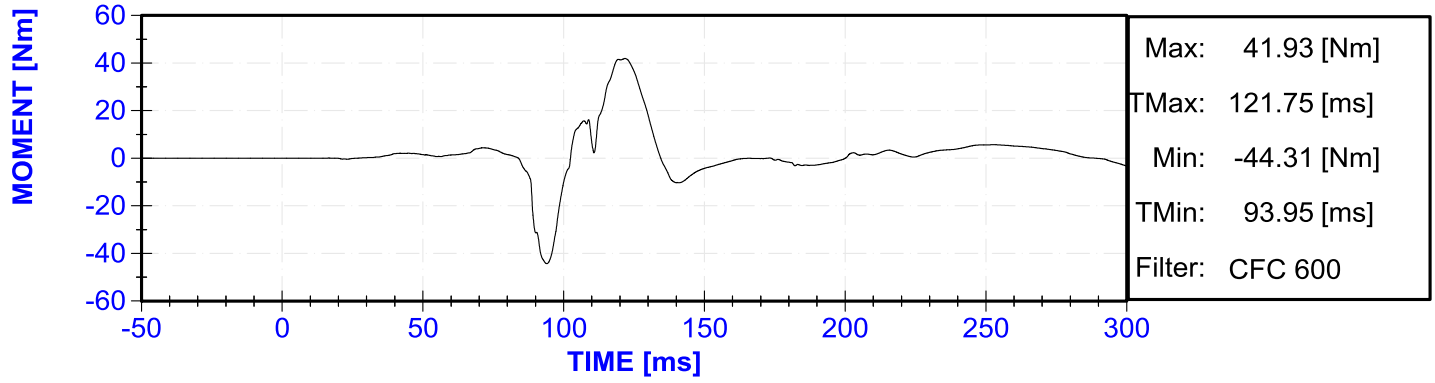
V2P2 NECK UPPER FORCE Y [THORTEST]



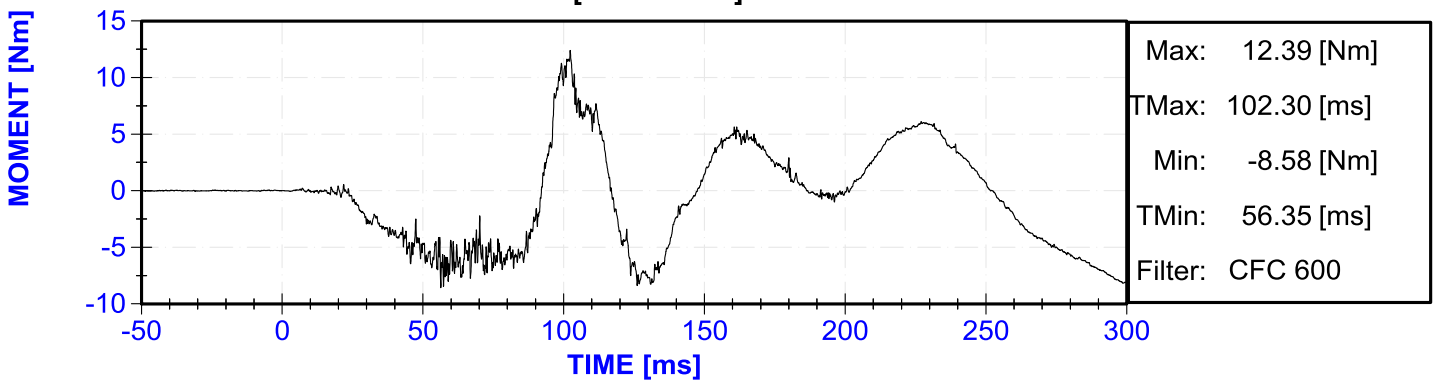
V2P2 NECK UPPER FORCE Z [THORTEST]



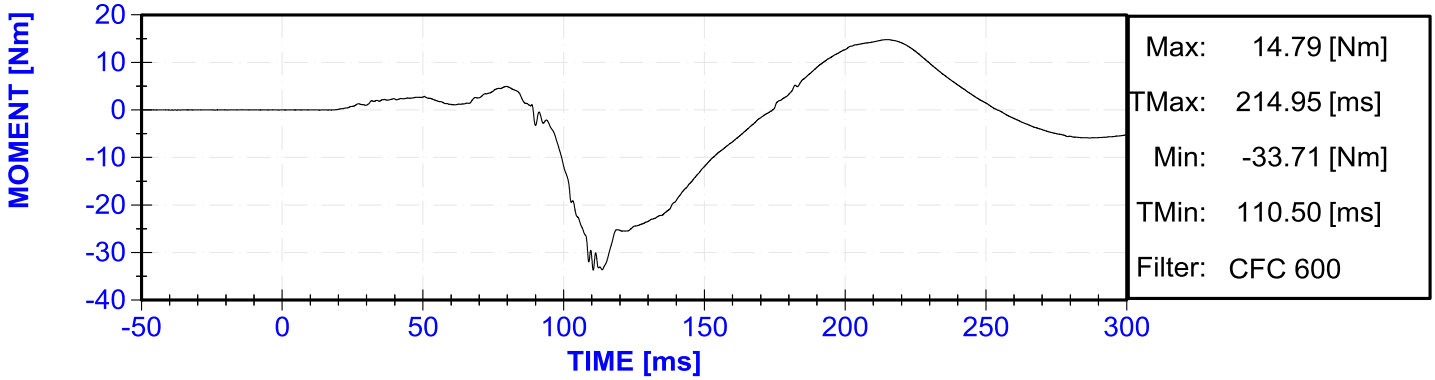
V2P2 NECK UPPER MOMENT X [THORTEST]



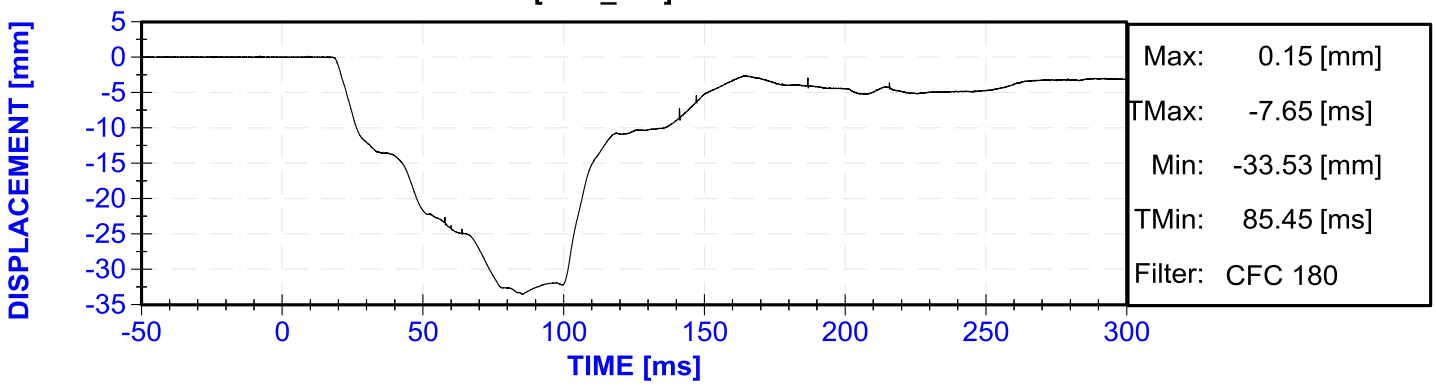
V2P2 NECK UPPER MOMENT Y [THORTEST]



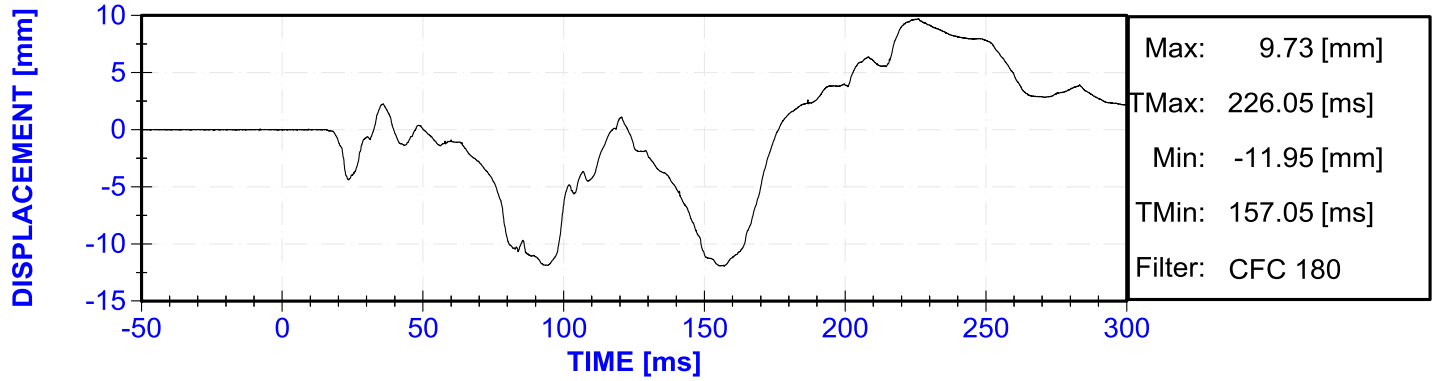
V2P2 NECK UPPER MOMENT Z [THORTEST]



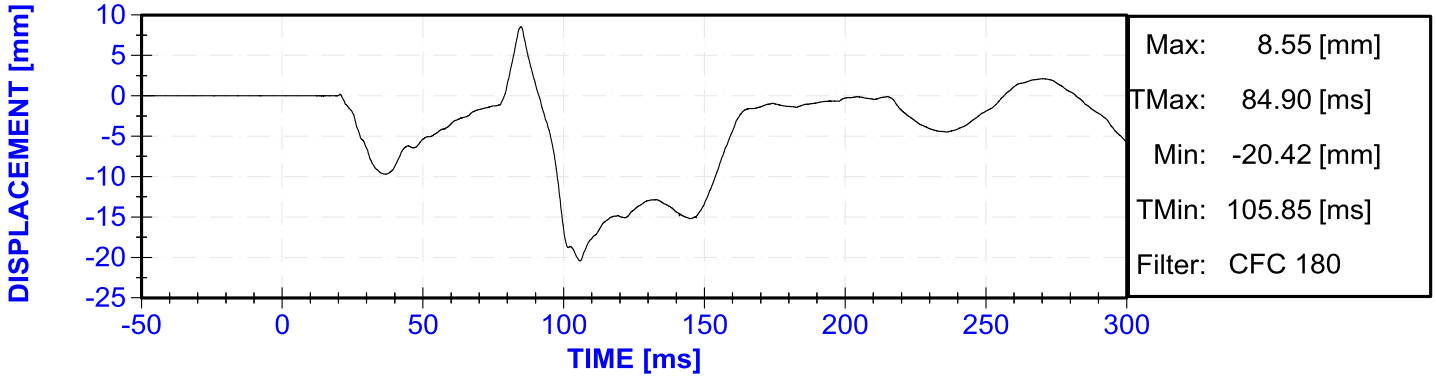
V2P2 CHEST UPPER LEFT X [CFC_180]



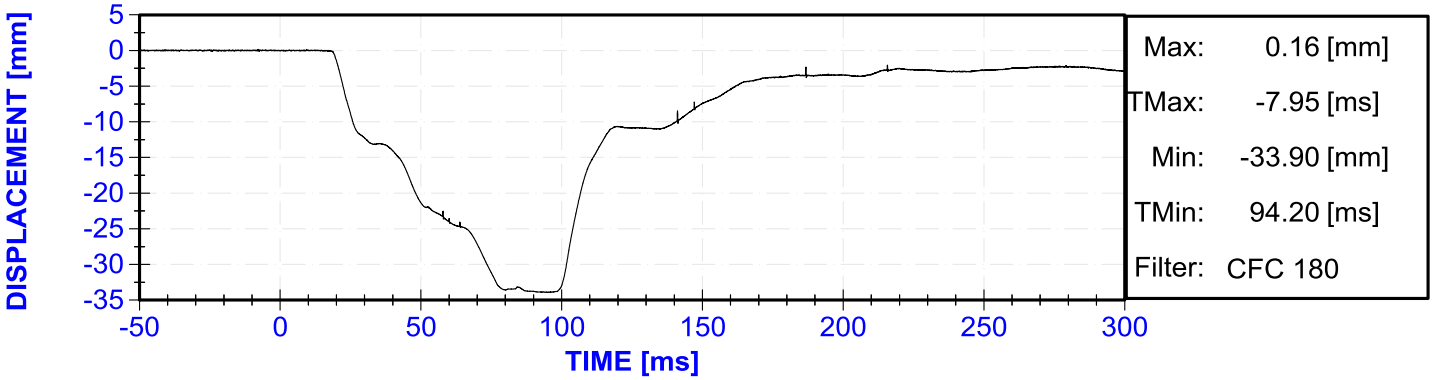
V2P2 CHEST UPPER LEFT Y [CFC_180]



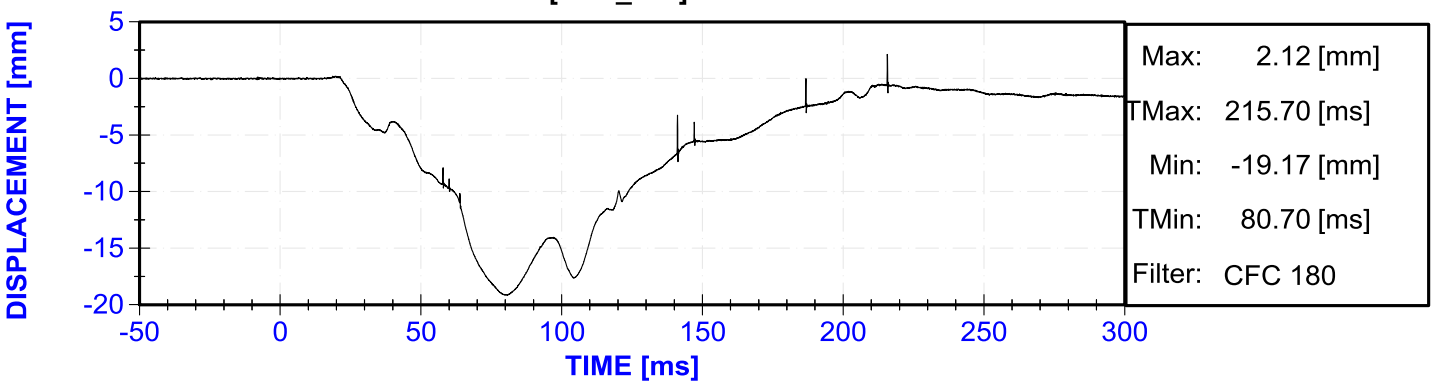
V2P2 CHEST UPPER LEFT Z [CFC_180]



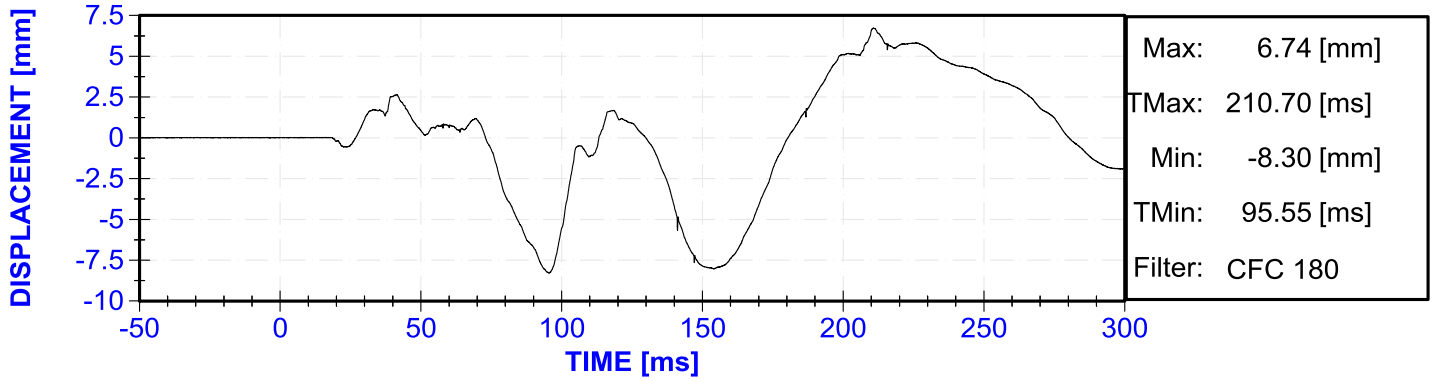
V2P2 CHEST UPPER LEFT D [CFC_180]



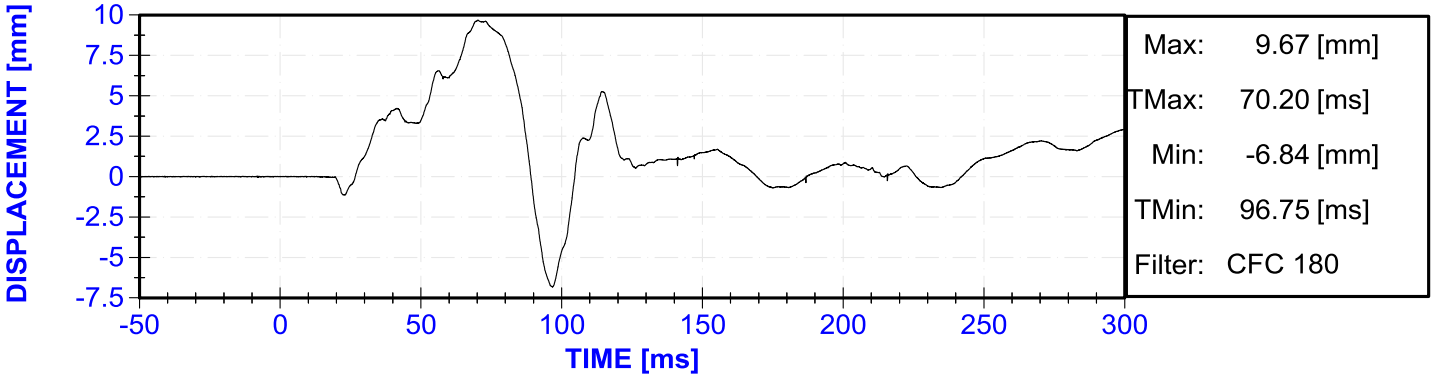
V2P2 CHEST UPPER RIGHT X [CFC_180]



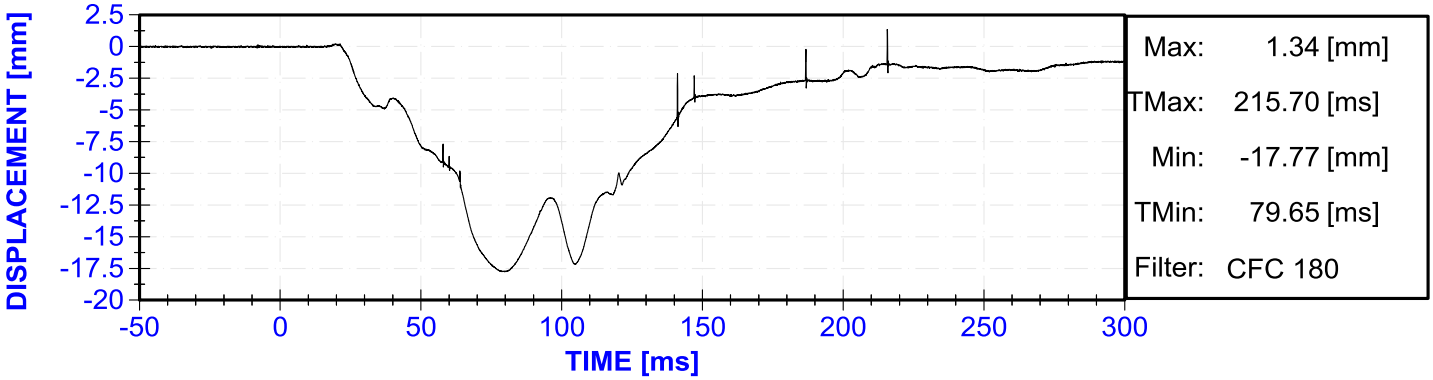
V2P2 CHEST UPPER RIGHT Y [CFC_180]



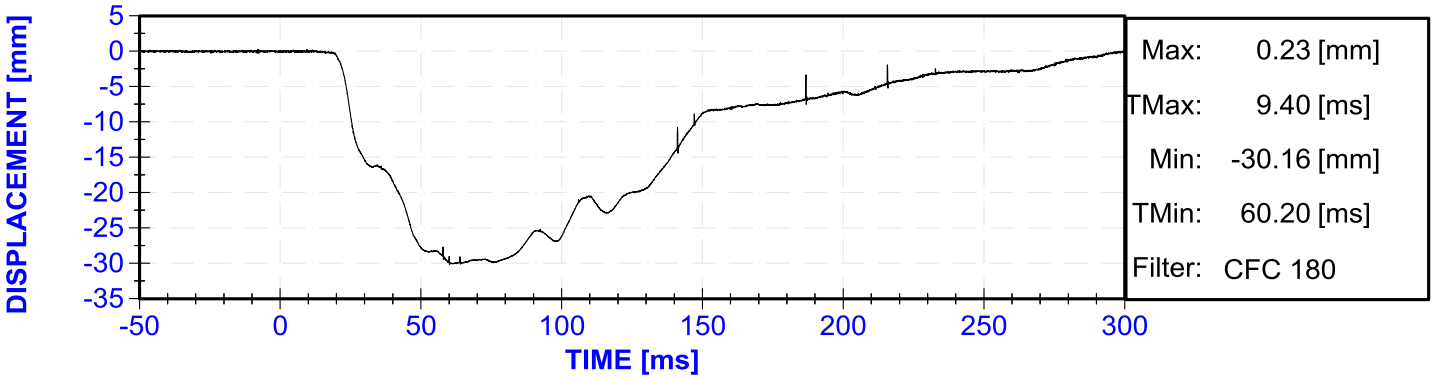
V2P2 CHEST UPPER RIGHT Z [CFC_180]



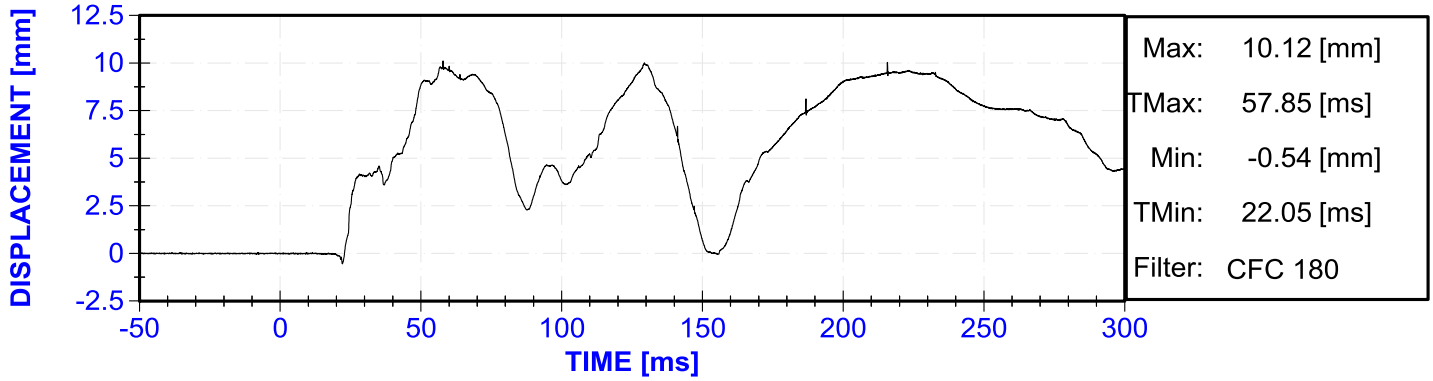
V2P2 CHEST UPPER RIGHT D [CFC_180]



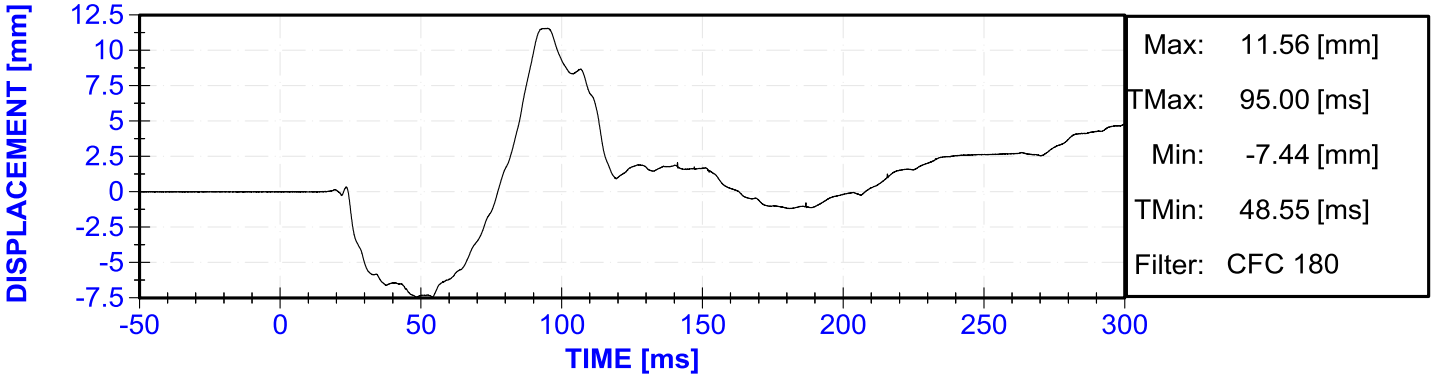
V2P2 CHEST LOWER LEFT X [CFC_180]



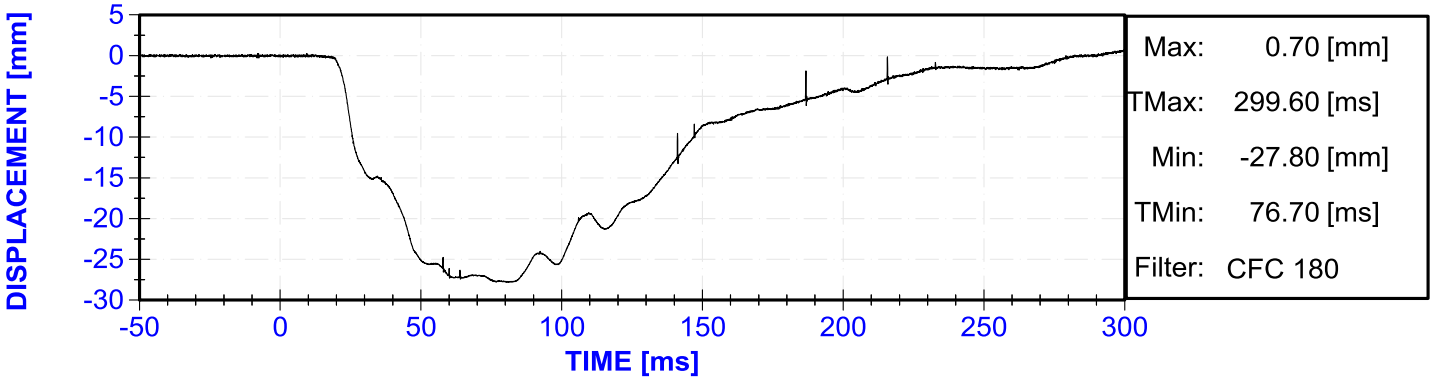
V2P2 CHEST LOWER LEFT Y [CFC_180]



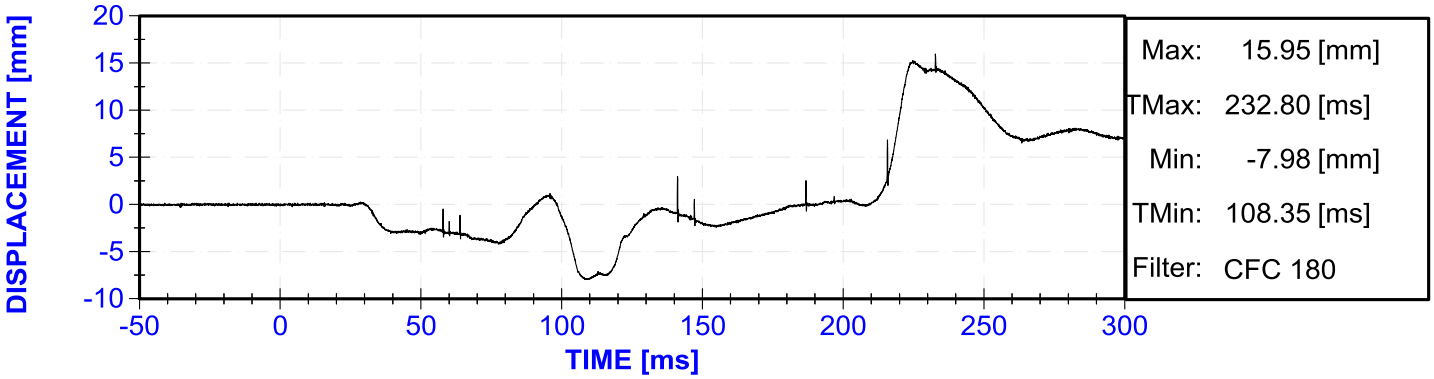
V2P2 CHEST LOWER LEFT Z [CFC_180]



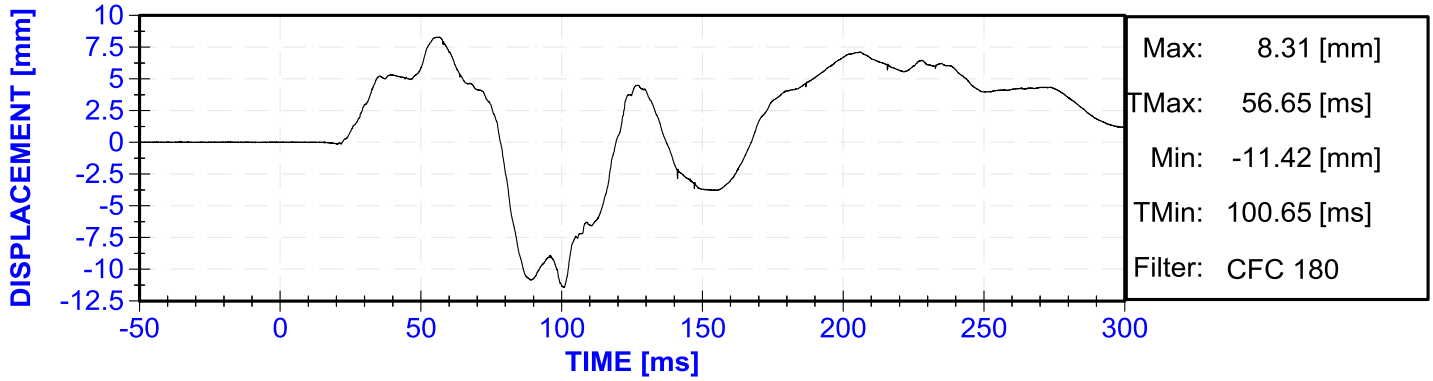
V2P2 CHEST LOWER LEFT D [CFC_180]



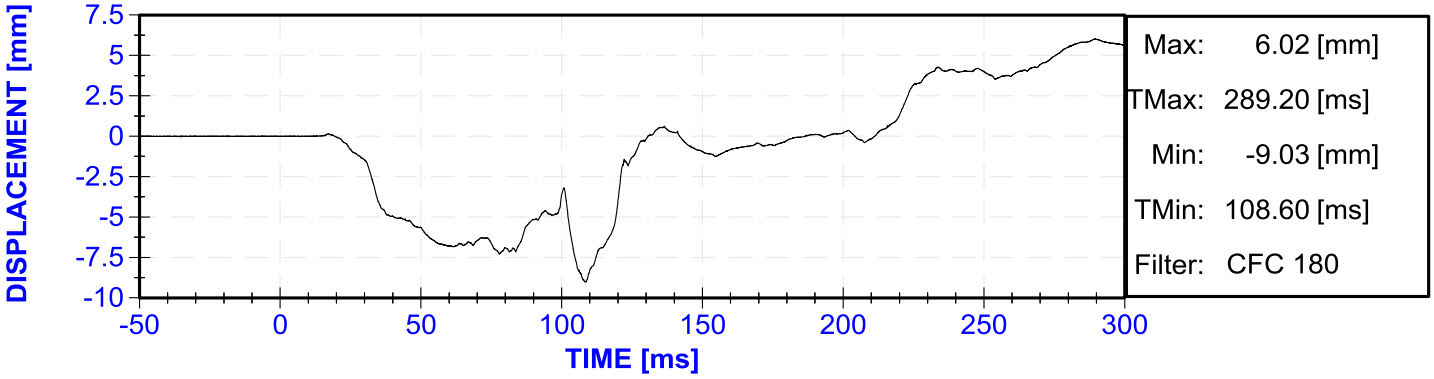
V2P2 CHEST LOWER RIGHT X [CFC_180]



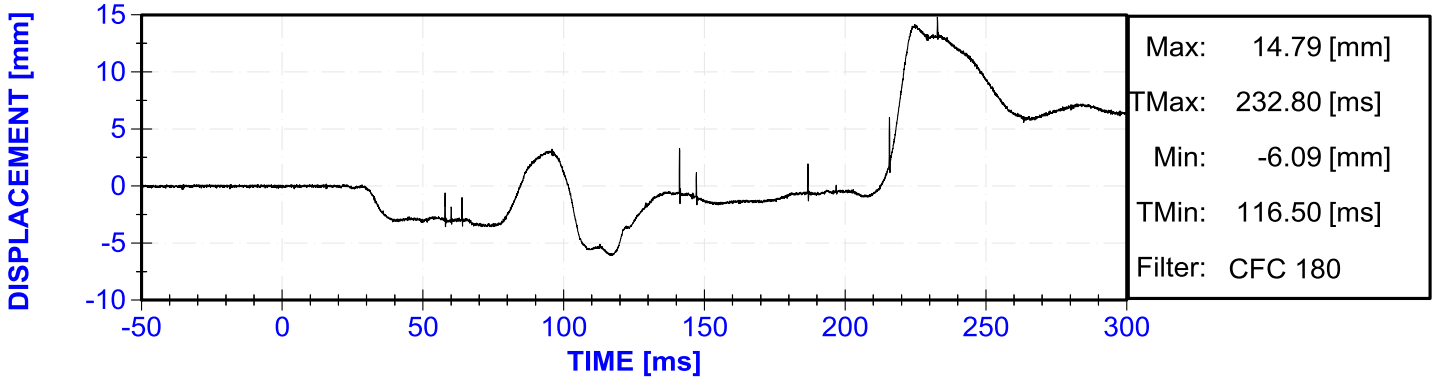
V2P2 CHEST LOWER RIGHT Y [CFC_180]



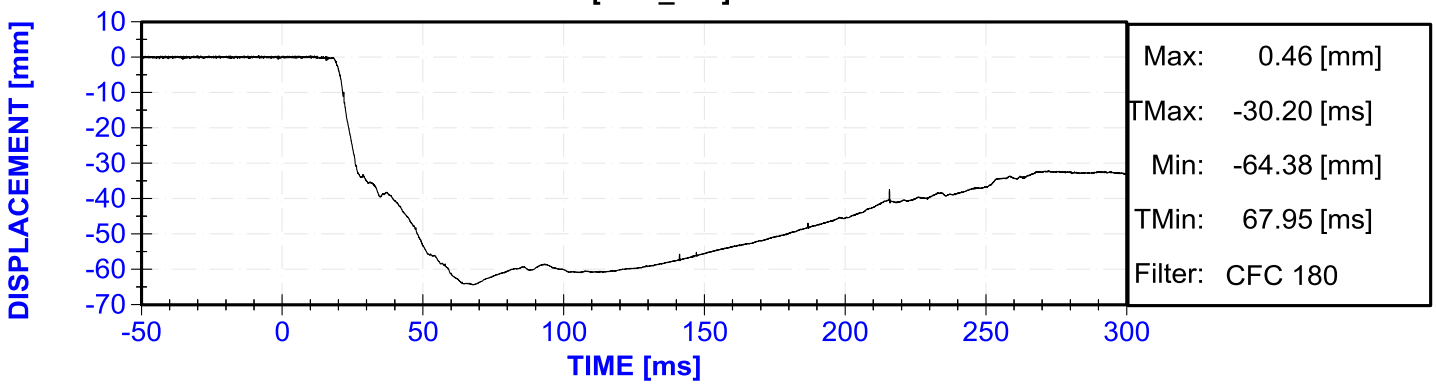
V2P2 CHEST LOWER RIGHT Z [CFC_180]



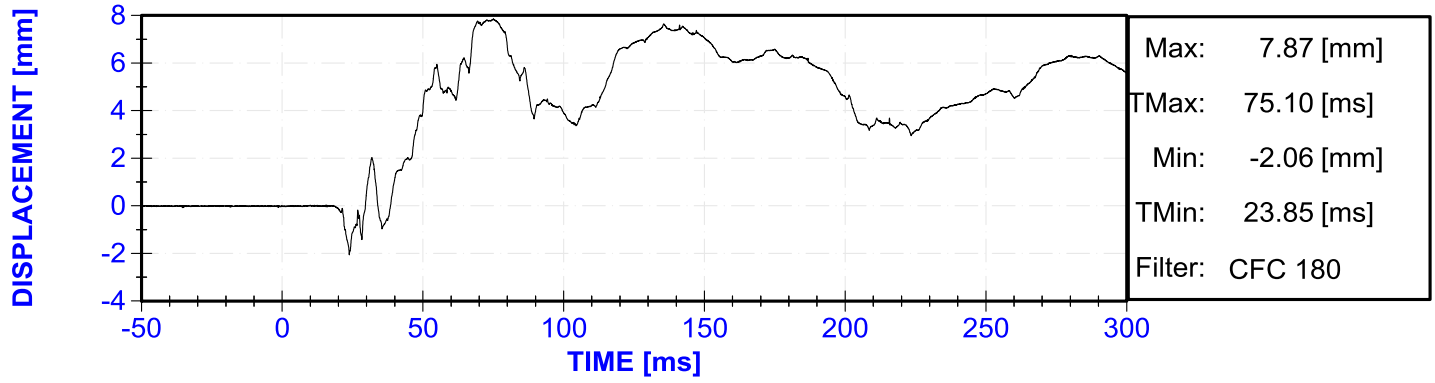
V2P2 CHEST LOWER RIGHT D [CFC_180]



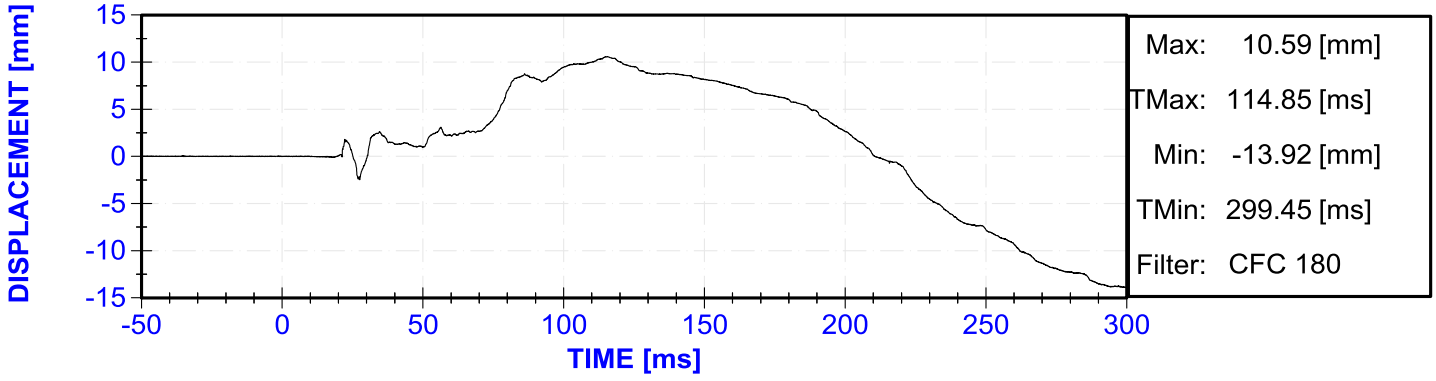
V2P2 ABDOMEN LEFT LOWER X [CFC_180]



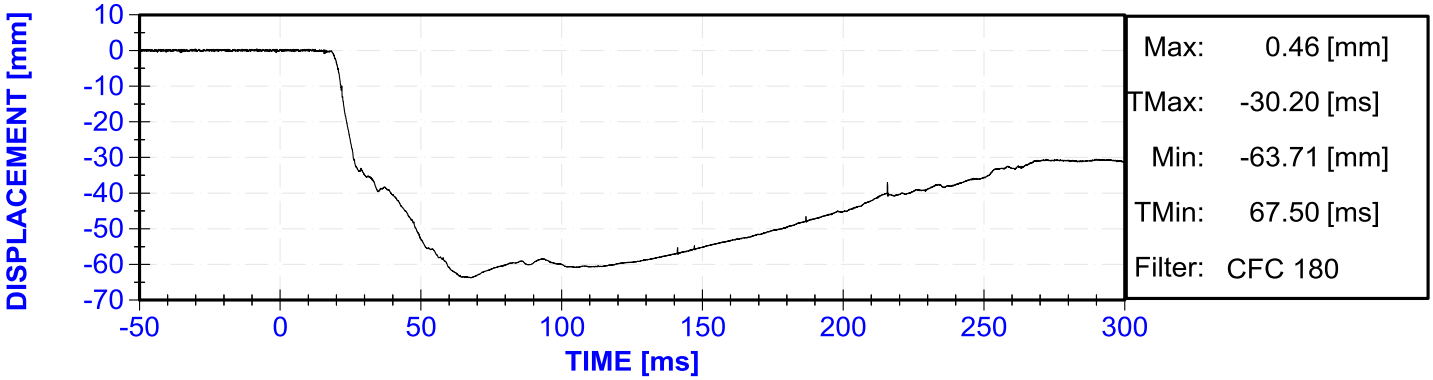
V2P2 ABDOMEN LEFT LOWER Y [CFC_180]



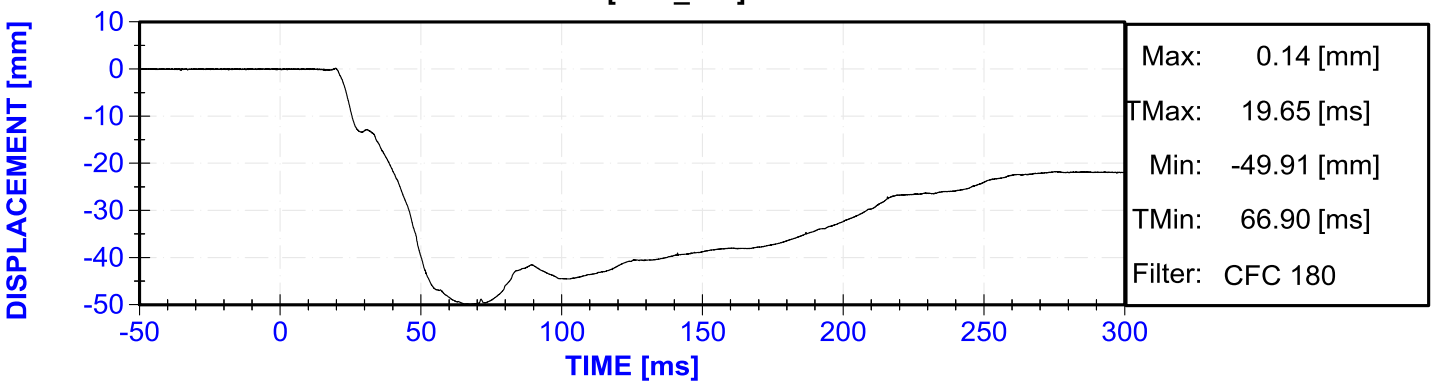
V2P2 ABDOMEN LEFT LOWER Z [CFC_180]



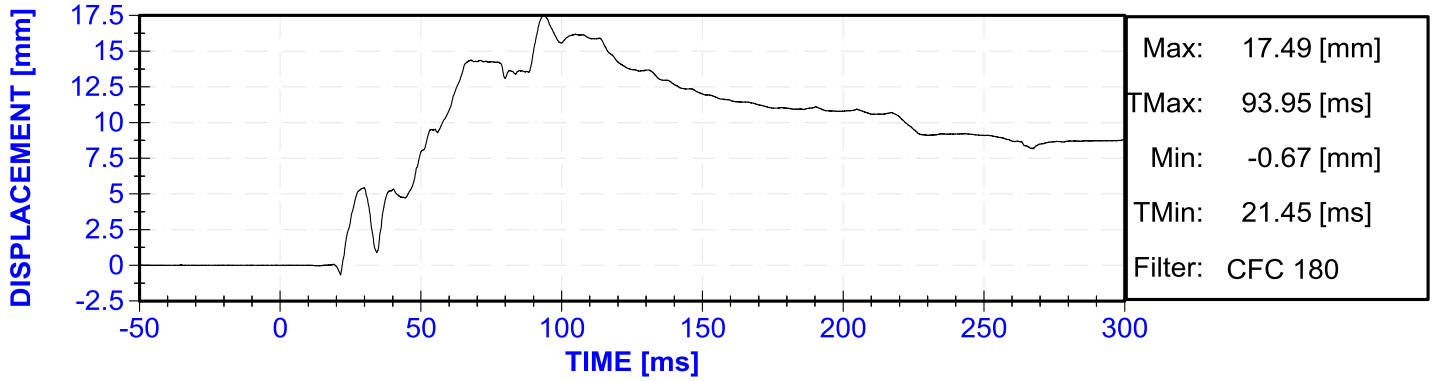
V2P2 ABDOMEN LEFT LOWER D [CFC_180]



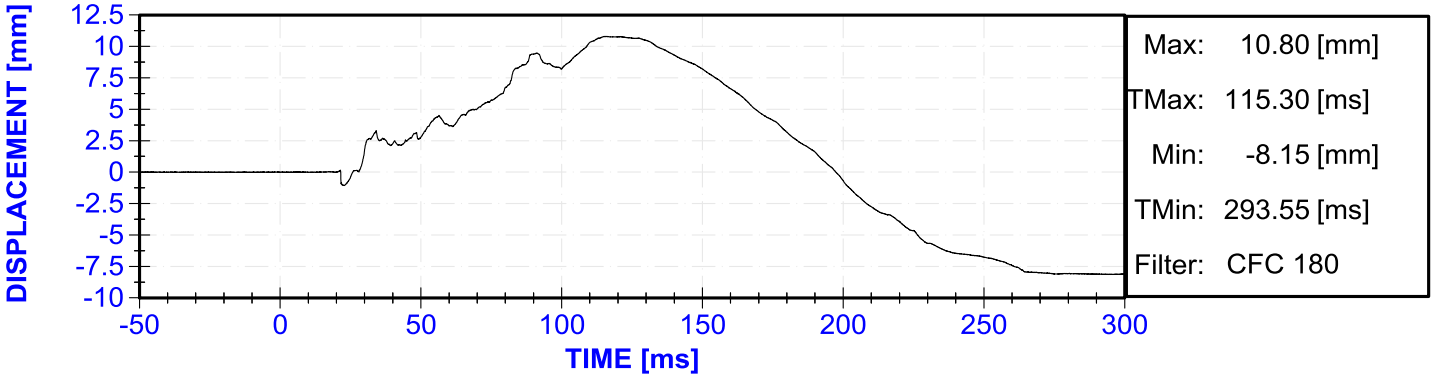
V2P2 ABDOMEN RIGHT LOWER X [CFC_180]

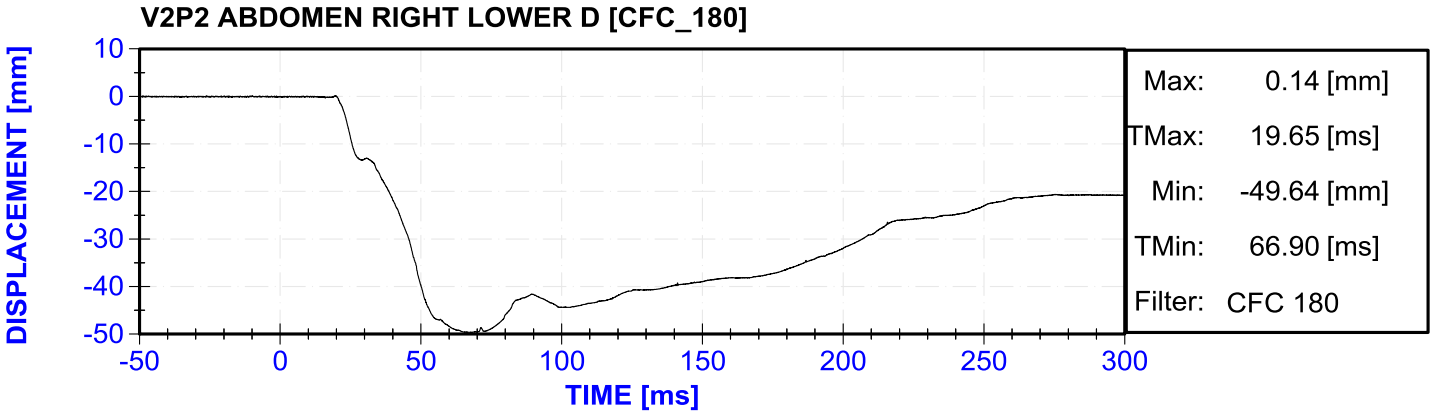


V2P2 ABDOMEN RIGHT LOWER Y [CFC_180]



V2P2 ABDOMEN RIGHT LOWER Z [CFC_180]




V2P2 ABDOMEN RIGHT LOWER D [CFC_180]
DISPLACEMENT [mm]
10
0
-10
-20
-30
-40
-50
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 0.14 [mm]
TMax: 19.65 [ms]
Min: -49.64 [mm]
TMin: 66.90 [ms]
Filter: CFC 180

APPENDIX C

PART 572 E/O DUMMY CALIBRATION AND PERFORMANCE VERIFICATION DATA SHEETS

Table C-1: Dummy Information

TYPE	DESCRIPTION	SERIAL NUMBER
THOR TK	50^{TH} Male	007
THOR TK	50^{TH} Male	016

Table C-2: Ankle Offset Files

THOR – TK S/N: 007					
LFTX	**LFTY**	**LFTZ**	**RFTX**	**RFTY**	**RFTZ**
Left Ankle X Rotation	Left Ankle Y Rotation	Left Ankle Z Rotation	Right Ankle X Rotation	Right Ankle Y Rotation	Right Ankle Z Rotation
-0.83479	-16.049		0.0405	-11.961	
THOR – TK S/N: 016					
LFTX	**LFTY**	**LFTZ**	**RFTX**	**RFTY**	**RFTZ**
Left Ankle X Rotation	Left Ankle Y Rotation	Left Ankle Z Rotation	Right Ankle X Rotation	Right Ankle Y Rotation	Right Ankle Z Rotation
-0.9575	-14.97		-6.842	13.223	

Table C- 3: THOR Dummies Initial Set-Up Information

THOR – TK S/N: 0007								
Sensor	**Manufacturer/ Serial #**	**Capacity**	**Units (E)**	**Units (M)**	**Range**	**CFC**	**Sensitivity (mv/V/EU)**	**Initial Offset (EU)**
HEAD CG X	MFG: ENDEVCO S/N: P74967	2000	g	g	-1000	1000	0.0185	0
HEAD CG Y	MFG: ENDEVCO S/N: P71875	2000	g	g	-1000	1000	0.0176	0
HEAD CG Z	MFG: ENDEVCO S/N: P74784	2000	g	g	-1000	1000	0.01999	0
HDCG Wx	MFG: DTS S/N: ARS4643	36000	deg/s	deg/s	-18000	1000	0.0921	0
HDCG Wy	MFG: DTS S/N: ARS4651	36000	deg/s	deg/s	-18000	1000	0.09301	0
HDCG Wz	MFG: DTS S/N: ARS4650	36000	deg/s	deg/s	-18000	1000	0.09444	0
NEKU Fx	MFG: Denton S/N: 94	18000	lbf	N	-9000	1000	-0.00022811	0
NEKU Fy	MFG: Denton S/N: 94	18000	lbf	N	-9000	1000	0.00022894	0
NEKU Fz	MFG: Denton S/N: 94	26000	lbf	N	-13000	1000	-0.00008764	0
NEKU Mx	MFG: Denton S/N: 94	1200	in-lbf	N-m	-600	600	-0.00591849	0
NEKU My	MFG: Denton S/N: 94	1200	in-lbf	N-m	-600	600	0.00598399	0
NEKU Mz	MFG: Denton S/N: 94	1200	in-lbf	N-m	-600	600	0.00965262	0
NEKL Fx	MFG: DENTON S/N: 88	26000	lbf	N	-13000	1000	0.00017038	0
NEKL Fy	MFG: DENTON S/N: 88	26000	lbf	N	-13000	1000	0.0001704	0
NEKL Fz	MFG: DENTON S/N: 88	26000	lbf	N	-13000	1000	-0.00007065	0
NEKL Mx	MFG: DENTON S/N: 88	1200	in-lbf	N-m	-600	600	-0.0040085	0
NEKL My	MFG: DENTON S/N: 88	1200	in-lbf	N-m	-600	600	0.00400231	0
NEKL Mz	MFG: DENTON S/N: 88	1200	in-lbf	N-m	-600	600	0.0067779	0
NKCF Fz	MFG: DENTON S/N: 93	90000	lbf	N	-45000	1000	0.00086877	0

THOR – TK (Continued) S/N: 0007								
Sensor	**Manufacturer/ Serial #**	**Capacity**	**Units (E)**	**Units (M)**	**Range**	**CFC**	**Sensitivity (mv/V/EU)**	**Initial Offset (EU)**
NKCR Fz	MFG: DENTON S/N: 132	90000	lbf	N	-45000	1000	0.00071044	0
HDOT RDy	MFG: Sfernice S/N: 0942	340	deg	deg	-170	180	3.038	0
SPNU Ax	MFG: ENDEVCO S/N: P74970	1000	g	g	-500	180	0.02212	0
SPNU Ay	MFG: ENDEVCO S/N: P74979	1000	g	g	-500	180	0.01907	0
SPNU Az	MFG: ENDEVCO S/N: P75158	1000	g	g	-500	180	0.01723	0
SPNM Ax	MFG: ENDEVCO S/N: P75155	1000	g	g	-500	180	0.01993	0
SPNM Ay	MFG: ENDEVCO S/N: P75150	1000	g	g	-500	180	0.01954	0
SPNM Az	MFG: ENDEVCO S/N: P75153	1000	g	g	-500	180	0.02378	0
CHLU Dx	MFG: FTSS S/N: AC3556	3.3	V	mm	3.3	600	1000	
CHLU Ry	MFG: Sfernice S/N: AC6043	150	deg	deg	-75	180	3.0419	8.364
CHLU Rz	MFG: Sfernice S/N: AC6041	150	deg	deg	-75	180	3.0642	12.383
CHRU Dx	MFG: FTSS S/N: AC2288	3.3	V	mm	3.3	600	1000	
CHRU Ry	MFG: Sfernice S/N: AC6045	150	deg	deg	-75	180	3.0685	4.271
CHRU Rz	MFG: Sfernice S/N: AC6044	150	deg	deg	-75	180	3.0637	-7.104
CHLL Dx	MFG: FTSS S/N: AC3555	3.3	V	mm	3.3	600	1000	
CHLL Ry	MFG: Sfernice S/N: AC6158	150	deg	deg	-75	180	3.0696	-2.058
CHLL Rz	MFG: Sfernice S/N: AC6159	150	deg	deg	-75	180	3.0682	12.064
CHRL Dx	MFG: FTSS S/N: AC2287	3.3	V	mm	3.3	600	1000	
CHRL Ry	MFG: Sfernice S/N: AC6042	150	deg	deg	-75	180	2.6324	4.158
CHRL Rz	MFG: Sfernice S/N: AC6040	150	deg	deg	-75	180	3.0327	-3.550
ABDL Dx	MFG: Denton S/N: 173	3.3	V	mm	3.3	600	12.97679	
ABDL Ry	MFG: Contelec S/N: DS-558	150	deg	deg	-75	180	3.0172	1.067
ABDL Rz	MFG: Contelec S/N: DS-556	150	deg	deg	-75	180	3.0149	4.797
ABDR Dx	MFG: Denton S/N: 172	3.3	V	mm	3.3	600	13.03657	
ABDR Ry	MFG: Contelec S/N: DS-523	150	deg	deg	-75	180	3.0277	16.200
ABDR Rz	MFG: Contelec S/N: DS-557	150	deg	deg	-75	180	3.0114	-4.094
SPNL Fx	MFG: Denton S/N: 122	26000	lbf	N	-13000	1000	-0.0001395	0
SPNL Fy	MFG: Denton S/N: 122	26000	lbf	N	-13000	1000	0.00014053	0
SPNL Fz	MFG: Denton S/N: 122	36000	lbf	N	-18000	1000	-0.0000533	0
SPNL Mx	MFG: Denton S/N: 122	1400	in-lbf	N-m	-700	1000	-0.00209586	0
SPNL My	MFG: Denton S/N: 122	1400	in-lbf	N-m	-700	1000	0.00184981	0
PVCG Ax	MFG: ENDEVCO S/N: P74965	1000	g	g	-500	1000	0.0202	0
PVCG Ay	MFG: ENDEVCO S/N: P74976	1000	g	g	-500	1000	0.01703	0
PVCG Az	MFG: ENDEVCO S/N: P49439	1000	g	g	-500	1000	0.01961	0
PVAL Fx	MFG: DENTON S/N: 75	44000	lbf	N	-22000	600	0.00012174	0
PVAL Fy	MFG: DENTON S/N: 75	27000	lbf	N	-13500	600	-0.00005981	0
PVAL Fz	MFG: DENTON S/N: 75	27000	lbf	N	-13500	600	0.00016528	0
PVAR Fx	MFG: DENTON S/N: 75	44000	lbf	N	-22000	600	0.00012302	0
PVAR Fy	MFG: DENTON S/N: 75	26000	lbf	N	-13000	600	-0.00006078	0
PVAR Fz	MFG: DENTON S/N: 75	26000	lbf	N	-13000	600	-0.0001662	0
PILL Fx	MFG: Denton S/N: 75	26000	lbf	N	-13000	600	-0.00006743	0
PILR Fx	MFG: Denton S/N: 76	26000	lbf	N	-13000	600	-0.00006867	0
FMRL Fx	MFG: Humanetics S/N: DJ1040Fx	30000	N	N	-15000	600	0.0001436	0
FMRL Fy	MFG: Humanetics S/N: DJ1040Fy	30000	N	N	-15000	600	0.0001441	0
FMRL Fz	MFG: Humanetics S/N: DJ1040Fz	40000	N	N	-20000	600	-0.0000728	0
FMRL Mx	MFG: Humanetics S/N: DJ1040Mx	700	N-m	N-m	-350	600	0.0064454	0

THOR – TK (Continued) S/N: 0007								
Sensor	**Manufacturer/ Serial #**	**Capacity**	**Units (E)**	**Units (M)**	**Range**	**CFC**	**Sensitivity (mv/V/EU)**	**Initial Offset (EU)**
FMRL My	MFG: Humanetics S/N: DJ1040My	700	N-m	N-m	-350	600	0.0064621	0
FMRL Mz	MFG: Humanetics S/N: DJ1040Mz	600	N-m	N-m	-300	600	0.009063	0
KNEL Dx	MFG: Space Age Controls S/N: 025670	80	mm	mm	-40	180	23.8618	0
TBLU Fz	MFG: DENTON S/N: 110Fz	50000	N	N	-25000	600	-0.0000908	0
TBLU Mx	MFG: DENTON S/N: 110Mx	800	N-m	N-m	-400	600	0.0072731	0
TBLU My	MFG: DENTON S/N: 110My	800	N-m	N-m	-400	600	0.0072771	0
TBLL Fz	MFG: Denton S/N: 120Fz	50000	N	N	-25000	600	-0.00009686	0
TBLL Mx	MFG: Denton S/N: 120Mx	800	N-m	N-m	-400	600	0.00750986	0
TBLL My	MFG: Denton S/N: 120My	800	N-m	N-m	-400	600	0.0075842	0
ANKL Rx	MFG: Contelec S/N: ANKLX-0371	200	deg	deg	-100	180	2.995	-0.83479
ANKL Ry	MFG: Contelec S/N: ANKLY-0367	200	deg	deg	-100	180	3.014	-16.049
FOTL Az	MFG: ENDEVCO S/N: P51711	3000	g	g	-1500	1000	0.01972	0
FMRR Fx	MFG: Humanetics S/N: DJ1045Fx	30000	N	N	-15000	600	0.0001461	0
FMRR Fy	MFG: Humanetics S/N: DJ1045Fy	30000	N	N	-15000	600	0.0001465	0
FMRR Fz	MFG: Humanetics S/N: DJ1045Fz	40000	N	N	-20000	600	-0.0000756	0
FMRR Mx	MFG: Humanetics S/N: DJ1045Mx	700	N-m	N-m	-350	600	0.0065482	0
FMRR My	MFG: Humanetics S/N: DJ1045My	700	N-m	N-m	-350	600	0.006518	0
FMRR Mz	MFG: Humanetics S/N: DJ1045Mz	600	N-m	N-m	-300	600	0.0097325	0
KNER Dx	MFG: Space Age Controls S/N: 019588	80	mm	mm	-40	180	23.9349	0
TBRU Fz	MFG: DENTON S/N: 107Fz	50000	N	N	-25000	600	-0.0000955	0
TBRU Mx	MFG: DENTON S/N: 107Mx	800	N-m	N-m	-400	600	0.0074272	0
TBRU My	MFG: DENTON S/N: 107My	800	N-m	N-m	-400	600	0.007333	0
TBRL Fz	MFG: Denton S/N: 75Fz	50000	N	N	-25000	600	-0.00009964	0
TBRL Mx	MFG: Denton S/N: 75Mx	800	N-m	N-m	-400	600	0.00736028	0
TBRL My	MFG: Denton S/N: 75My	800	N-m	N-m	-400	600	0.00736294	0
ANKR Rx	MFG: Contelec S/N: ANKRX-0368	200	deg	deg	-100	180	3.017	0.0405
ANKR Ry	MFG: Contelec S/N: ANKRY-0369	200	deg	deg	-100	180	3.009	-11.961
FOTR Az	MFG: ENDEVCO S/N: P64128	3000	g	g	-1500	1000	0.02344	0

THOR – TK S/N: 016								
Sensor	**Manufacturer/ Serial #**	**Capacity**	**Units (E)**	**Units (M)**	**Range**	**CFC**	**Sensitivity (mv/V/EU)**	**Initial Offset (EU)**
HEAD CG X	MFG: ENDEVCO S/N: P49194	2000	g	g	-1000	1000	0.0177	0
HEAD CG Y	MFG: ENDEVCO S/N: P52086	2000	g	g	-1000	1000	0.02065	0
HEAD CG Z	MFG: ENDEVCO S/N: P52043	2000	g	g	-1000	1000	0.01721	0
HDCG Wx	MFG: DTS S/N: ARS4727	36000	deg/s	deg/s	-18000	1000	0.09262	0
HDCG Wy	MFG: DTS S/N: ARS4712	36000	deg/s	deg/s	-18000	1000	0.09378	0
HDCG Wz	MFG: DTS S/N: ARS4714	36000	deg/s	deg/s	-18000	1000	0.09563	0
NEKU Fx	MFG: DENTON S/N: 77	18000	lbf	N	-9000	1000	0.0002406	0
NEKU Fy	MFG: DENTON S/N: 77	18000	lbf	N	-9000	1000	0.00024081	0
NEKU Fz	MFG: DENTON S/N: 77	26000	lbf	N	-13000	1000	-0.00008546	0
NEKU Mx	MFG: DENTON S/N: 77	1200	in-lbf	N-m	-600	600	0.00584857	0
NEKU My	MFG: DENTON S/N: 77	1200	in-lbf	N-m	-600	600	0.00609285	0

THOR – TK (Continued) S/N: 016								
Sensor	**Manufacturer/ Serial #**	**Capacity**	**Units (E)**	**Units (M)**	**Range**	**CFC**	**Sensitivity (mv/V/EU)**	**Initial Offset (EU)**
NEKU Mz	MFG: DENTON S/N: 77	1200	in-lbf	N-m	-600	600	0.00980132	0
NEKL Fx	MFG: DENTON S/N: 80	26000	lbf	N	-13000	1000	-0.00017312	0
NEKL Fy	MFG: DENTON S/N: 80	26000	lbf	N	-13000	1000	0.00017328	0
NEKL Fz	MFG: DENTON S/N: 80	26000	lbf	N	-13000	1000	-0.00006903	0
NEKL Mx	MFG: DENTON S/N: 80	1200	in-lbf	N-m	-600	600	-0.00417667	0
NEKL My	MFG: DENTON S/N: 80	1200	in-lbf	N-m	-600	600	0.00421295	0
NEKL Mz	MFG: DENTON S/N: 80	1200	in-lbf	N-m	-600	600	0.00690093	0
NKCF Fz	MFG: DENTON S/N: 80	90000	lbf	N	-45000	1000	0.00052317	0
NKCR Fz	MFG: DENTON S/N: 75	90000	lbf	N	-45000	1000	0.0004801	0
HDOT RDy	MFG: Sfernice S/N: DI7189	340	deg	deg	-170	180	3.038	0
SPNU Ax	MFG: ENDEVCO S/N: P64099	1000	g	g	-500	180	0.01844	0
SPNU Ay	MFG: ENDEVCO S/N: P58838	1000	g	g	-500	180	0.01739	0
SPNU Az	MFG: ENDEVCO S/N: P58834	1000	g	g	-500	180	0.0188	0
SPNM Ax	MFG: ENDEVCO S/N: P64002	1000	g	g	-500	180	0.01799	0
SPNM Ay	MFG: ENDEVCO S/N: P58735	1000	g	g	-500	180	0.01841	0
SPNM Az	MFG: ENDEVCO S/N: P64111	1000	g	g	-500	180	0.01674	0
CHLU Dx	MFG: FTSS S/N: DI4715	3.3	V	mm	3.3	600	1000	
CHLU Ry	MFG: Denton S/N: DI2382	150	deg	deg	-75	180	3.0087	8.434
CHLU Rz	MFG: Denton S/N: DI2383	150	deg	deg	-75	180	3.0074	11.913
CHRU Dx	MFG: FTSS S/N: DI4716	3.3	V	mm	3.3	600	1000	
CHRU Ry	MFG: Denton S/N: DI2381	150	deg	deg	-75	180	3.0077	7.451
CHRU Rz	MFG: Denton S/N: DI2380	150	deg	deg	-75	180	3.0199	-9.781
CHLL Dx	MFG: FTSS S/N: DI4718	3.3	V	mm	3.3	600	1000	
CHLL Ry	MFG: Denton S/N: DI2386	150	deg	deg	-75	180	3.0211	3.758
CHLL Rz	MFG: Denton S/N: DI6129	150	deg	deg	-75	180	3.01218	7.021
CHRL Dx	MFG: FTSS S/N: DI4717	3.3	V	mm	3.3	600	1000	
CHRL Ry	MFG: Denton S/N: DI2385	150	deg	deg	-75	180	3.016	.5991
CHRL Rz	MFG: Denton S/N: DI2384	150	deg	deg	-75	180	3.0217	-8.613
ABDL Dx	MFG: Denton S/N: 183T	3.3	V	mm	3.3	600	1000	
ABDL Ry	MFG: Denton S/N: 219	150	deg	deg	-75	180	3.218	4.171
ABDL Rz	MFG: Denton S/N: 218	150	deg	deg	-75	180	3.165	1.789
ABDR Dx	MFG: Denton S/N: 184	3.3	V	mm	3.3	600	1000	
ABDR Ry	MFG: Denton S/N: 220	150	deg	deg	-75	180	3.182	5.652
ABDR Rz	MFG: Denton S/N: 221	150	deg	deg	-75	180	3.168	-1.162
SPNL Fx	MFG: Denton S/N: 123	26000	lbf	N	-13000	1000	0.00139138	0
SPNL Fy	MFG: Denton S/N: 123	26000	lbf	N	-13000	1000	0.00013943	0
SPNL Fz	MFG: Denton S/N: 123	36000	lbf	N	-18000	1000	-0.00005291	0
SPNL Mx	MFG: Denton S/N: 123	1400	in-lbf	N-m	-700	1000	-0.00209586	0
SPNL My	MFG: Denton S/N: 123	1400	in-lbf	N-m	-700	1000	0.00182945	0
PVCG Ax	MFG: ENDEVCO S/N: P64087	1000	g	g	-500	1000	0.01834	0
PVCG Ay	MFG: ENDEVCO S/N: P50065	1000	g	g	-500	1000	0.01785	0
PVCG Az	MFG: ENDEVCO S/N: P64123	1000	g	g	-500	1000	0.01914	0
PVAL Fx	MFG: DENTON S/N: 77	44000	lbf	N	-22000	600	-0.00011976	0
PVAL Fy	MFG: DENTON S/N: 77	27000	lbf	N	-13500	600	-0.00005959	0
PVAL Fz	MFG: DENTON S/N: 77	27000	lbf	N	-13500	600	-0.00016344	0

THOR – TK (Continued) S/N: 016								
Sensor	**Manufacturer/ Serial #**	**Capacity**	**Units (E)**	**Units (M)**	**Range**	**CFC**	**Sensitivity (mv/V/EU)**	**Initial Offset (EU)**
PVAR Fx	MFG: DENTON S/N: 84	44000	lbf	N	-22000	600	0.00012055	0
PVAR Fy	MFG: DENTON S/N: 84	26000	lbf	N	-13000	600	-0.00006006	0
PVAR Fz	MFG: DENTON S/N: 84	26000	lbf	N	-13000	600	0.00016272	0
PILL Fx	MFG: Denton S/N: DI4774	26000	lbf	N	-13000	1000	-0.00012118	0
PILR Fx	MFG: Denton S/N: DI4775	26000	lbf	N	-13000	1000	-0.00012068	0
FMRL Fx	MFG: Denton S/N: DH9717	30000	N	N	-15000	600	0.0001446	0
FMRL Fy	MFG: Denton S/N: DH9717	30000	N	N	-15000	600	0.0001458	0
FMRL Fz	MFG: Denton S/N: DH9717	40000	N	N	-20000	600	-0.0000724	0
FMRL Mx	MFG: Denton S/N: DH9717	700	N-m	N-m	-350	600	0.0065482	0
FMRL My	MFG: Denton S/N: DH9717	700	N-m	N-m	-350	600	0.0065257	0
FMRL Mz	MFG: Denton S/N: DH9717	600	N-m	N-m	-300	600	0.0091723	0
KNEL Dx	MFG: Space Age Controls S/N: D2103665B	80	mm	mm	-40	180	22.147	0
TBLU Fz	MFG: Denton S/N: 89	50000	N	N	-25000	600	-0.0000921	0
TBLU Mx	MFG: Denton S/N: 89	800	N-m	N-m	-400	600	0.0073598	0
TBLU My	MFG: Denton S/N: 89	800	N-m	N-m	-400	600	0.0073288	0
TBLL Fz	MFG: Denton S/N: 142	50000	N	N	-25000	600	-0.0000948	0
TBLL Mx	MFG: Denton S/N: 142	800	N-m	N-m	-400	600	0.0073026	0
TBLL My	MFG: Denton S/N: 142	800	N-m	N-m	-400	600	0.0073735	0
ANKL Rx	MFG: Contelec S/N: LX0019	200	deg	deg	-100	180	3.04982	-0.9575
ANKL Ry	MFG: Contelec S/N: LX0019	200	deg	deg	-100	180	2.96419	-14.97
FOTL Az	MFG: ENDEVCO S/N: P52001	3000	g	g	-1500	1000	0.0191	0
FMRR Fx	MFG: Denton S/N: DH9722	30000	N	N	-15000	600	0.0001474	0
FMRR Fy	MFG: Denton S/N: DH9722	30000	N	N	-15000	600	0.0001474	0
FMRR Fz	MFG: Denton S/N: DH9722	40000	N	N	-20000	600	-0.0000737	0
FMRR Mx	MFG: Denton S/N: DH9722	700	N-m	N-m	-350	600	0.0065614	0
FMRR My	MFG: Denton S/N: DH9722	700	N-m	N-m	-350	600	0.0065759	0
FMRR Mz	MFG: Denton S/N: DH9722	600	N-m	N-m	-300	600	0.0089348	0
KNER Dx	MFG: Space Age Controls S/N: D2103657B	80	mm	mm	-40	180	23.135	0
TBRU Fz	MFG: Denton S/N: 95	50000	N	N	-25000	600	-0.0000918	0
TBRU Mx	MFG: Denton S/N: 95	800	N-m	N-m	-400	600	0.0073681	0
TBRU My	MFG: Denton S/N: 95	800	N-m	N-m	-400	600	0.0072947	0
TBRL Fz	MFG: Denton S/N: 164	50000	N	N	-25000	600	-0.0000956	0
TBRL Mx	MFG: Denton S/N: 164	800	N-m	N-m	-400	600	0.0075105	0
TBRL My	MFG: Denton S/N: 164	800	N-m	N-m	-400	600	0.0073588	0
ANKR Rx	MFG: Contelec S/N: LX0018	200	deg	deg	-100	180	3.13066	-6.842
ANKR Ry	MFG: Contelec S/N: LX0018	200	deg	deg	-100	180	2.95682	13.223
FOTR Az	MFG: ENDEVCO S/N: P64102	3000	g	g	-1500	1000	0.01986	0

Table C-4: THOR Dummy Initial Set-Up Information (IR-TRACC)

THOR – TK S/N: 007			
Sensor	**IR-TRACC Exponent**	**IR-TRACC Slope**	**IR-TRACC Intercept**
CHLU Dx	-0.4675	-34.009493	120.7103
CHRU Dx	-0.4675	-34.871682	125.2528
CHLL Dx	-0.4675	-34.916600	123.9557
CHRL Dx	-0.4675	-34.121632	121.9603
ABDL Dx	-0.43568	31.6159	3.688
ABDR Dx	-0.40940	31.7099	3.774
THOR – TK S/N: 016			
Sensor	**IR-TRACC Exponent**	**IR-TRACC Slope**	**IR-TRACC Intercept**
CHLU Dx	-0.48024	33.0284	3.680
CHRU Dx	-0.4675	-34.919035	121.2325
CHLL Dx	-0.4672	33.6317	3.612
CHRL Dx	-0.48206	32.0908	3.791
ABDL Dx	-0.47743	38.9774	3.894
ABDR Dx	-0.48020	53.1720	2.874

Table 5 - THOR IR-TRACC Polarity

In order to reduce the risk of damage to instrumentation, it is recommended that the 3D IR-TRACC units are not disconnected from the rib cage to conduct the polarity test. An alternate procedure for checking the IR-TRACC polarity is described below.

1. Using the data acquisition system control software, open a live view of each channel. If possible, view the DX, RY, and RZ components of a given quadrant simultaneously.
2. Record the initial reading of each channel
3. Perform the following motions on each of the four rib attachment locations and two abdomen attachment locations (specified by the hexagonal bolt attaching the blue ribs).
    a. DX: Push inward (front-to-back). The IR-TRACC tube voltage should increase.
    b. RY: Push downward (head-to-pelvis). The Y-axis potentiometer reading should decrease.
    c. RZ: Push rightward (left-to-right). The Z-axis potentiometer should increase.
4. Record the final reading of each channel
5. If the “Measured” value (increase or decrease) does not match the “Expected” value, the polarity of the channel must be inverted.

THOR 007

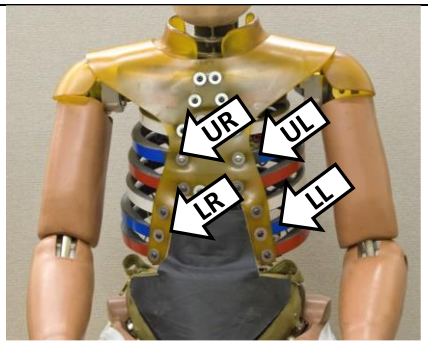
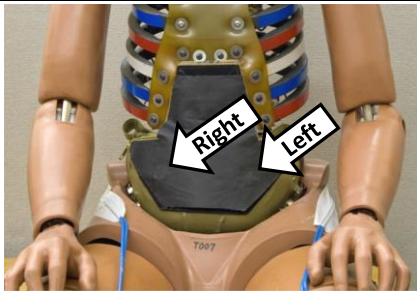


Figure 1. Manipulation to determine thoracic IR-TRACC polarity.

UR				UL			
Channel	**Initial**	**Final**	**Measured** **Expected**	**Channel**	**Initial**	**Final**	**Measured** **Expected**
DX (V)	.1501	.1760	Increase **Increase**	DX (V)	.1759	.2025	Increase **Increase**
RY (Deg)	4.271	-.331	Increase **Decrease**	RY (Deg)	8.364	5.141	Decrease **Decrease**
RZ (Deg)	-7.104	-5.851	Decrease **Increase**	RZ (Deg)	12.383	13.858	Decrease **Increase**
LR				**LL**			
Channel	**Initial**	**Final**	**Measured** **Expected**	**Channel**	**Initial**	**Final**	**Measured** **Expected**
DX (V)	.0781	.1042	Increase **Increase**	DX (V)	.0921	.1323	Increase **Increase**
RY (Deg)	4.158	.9250	Increase **Decrease**	RY (Deg)	-2.058	-4.612	Decrease **Decrease**
RZ (Deg)	-3.550	-1.357	Decrease **Increase**	RZ (Deg)	12.064	17.925	Increase **Increase**



Abdomen Left				Abdomen Right			
Channel	**Initial**	**Final**	**Measured** **Expected**	**Channel**	**Initial**	**Final**	**Measured** **Expected**
DX (V)	.0431	.1373	Increase **Increase**	DX (V)	.0329	.9302	Increase **Increase**
RY (Deg)	1.067	-3.028	Decrease **Decrease**	RY (Deg)	16.200	8.392	Increase **Decrease**
RZ (Deg)	4.797	10.073	Increase **Increase**	RZ (Deg)	-4.094	.4204	Decrease **Increase**

THOR 0016

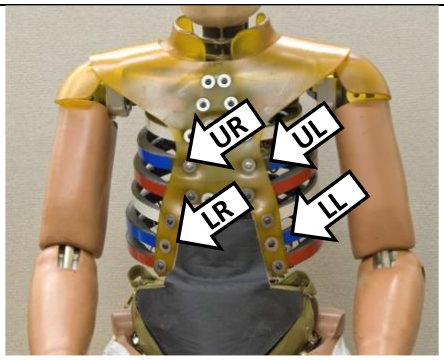
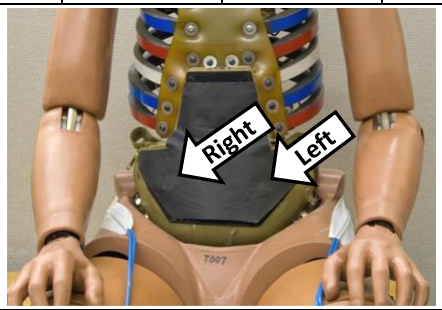


Figure 2. Manipulation to determine thoracic IR-TRACC polarity.

UR				UL			
Channel	**Initial**	**Final**	**Measured** / **Expected**	**Channel**	**Initial**	**Final**	**Measured** / **Expected**
DX (V)	.1312	.2071	Increase / **Increase**	DX (V)	.1357	.2316	Increase / **Increase**
RY (Deg)	7.451	2.791	Increase / **Decrease**	RY (Deg)	8.434	1.591	Decrease / **Decrease**
RZ (Deg)	-9.781	-6.440	Decrease / **Increase**	RZ (Deg)	11.913	16.909	Decrease / **Increase**
LR				**LL**			
Channel	**Initial**	**Final**	**Measured** / **Expected**	**Channel**	**Initial**	**Final**	**Measured** / **Expected**
DX (V)	.0856	.1421	Increase / **Increase**	DX (V)	.0753	.1350	Increase / **Increase**
RY (Deg)	.5991	-3.319	Increase / **Decrease**	RY (Deg)	3.758	-1.598	Decrease / **Decrease**
RZ (Deg)	-8.613	-1.556	Decrease / **Increase**	RZ (Deg)	7.021	15.472	Increase / **Increase**



Abdomen Left				Abdomen Right			
Channel	**Initial**	**Final**	**Measured** / **Expected**	**Channel**	**Initial**	**Final**	**Measured** / **Expected**
DX (V)	.0512	.1152	Increase / **Increase**	DX (V)	.1361	.2685	Increase / **Increase**
RY (Deg)	4.171	-2.343	Decrease / **Decrease**	RY (Deg)	5.652	-.500	Increase / **Decrease**
RZ (Deg)	1.789	10.213	Increase / **Increase**	RZ (Deg)	-1.162	2.668	Decrease / **Increase**

THOR Inspection Checklist

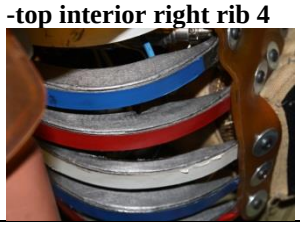
Date: **12/17/2012**
NHTSA Representative: **James Saunders**
Witness(es):
Inspection type (check one): ☒ PRE ☐ POST
Dummy S/N: **007**
Dummy Description: **Thor NT 50th Male**
Date of last Certification or Inspection: **12/13/2012**
Tests conducted since last full certification or inspection: Since last inspection: **RC5369 Left side CR-V** Since last certification: **RD5227 Right side Versa** **RC5142 Right side Camry** **RD5226 Left side Versa** **RD4200 Left side Elantra** **RC5141 Left side Camry** **RC5369 Left side CR-V**
Known errors in data channels (no data, clipping, unexpected drops): V2P1 ABDL RY - Questionable between 102-131ms V2P1 FOTL AZ - Spikes at 40 & 57ms V2P1 FOTR AZ - Spikes at 48& 67ms
Physical evidence of damage:
Anecdotal evidence of damage:
Equipment delivered to Borrower:

HEAD	
Y / N	Rear head cap mounts securely to head
Y / N	Head skin fits securely over skull **-slightly small, does not fit 100% in rear**
Y / N	Head skin shows no sign of tears or damage **-nicks/cuts** 
Y / N	Interior components of skull cavity (ballast, accelerometer mount, accelerometers) securely attached
Y / N	Head securely mounted to OC joint
OTHER	

NECK	
Y / N	Neck cables slide freely through holes in neck plates
Y / N	Neck cables show no sign of fraying, broken strands, or kinking
Y / N	No evidence of debonding between neck pucks and plates If N – indicate which interface (where plate/puck 1 attach to upper neck load cell): **-debonding above pucks 4, 5** 
Y / N	No evidence of debonding or permanent compression in neck soft stop assemblies
Y / N	Neck securely attached to upper neck load cell
Y / N	Neck securely attached to lower neck load cell
Y / N	Neck pitch change joint mechanism mating teeth are engaged
OTHER	

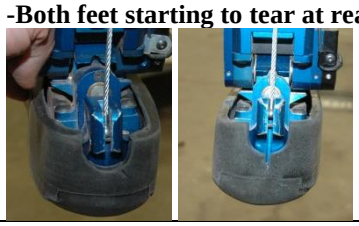
SPINE	
Y / N	No evidence of debonding between thoracic spine flex joint and metal plates **-tears in left/right sides?** 
Y / N	No evidence of debonding between lumbar spine flex joint and metal plates
Y / N	Lumbar spine pitch change joint mechanism mating teeth are engaged
OTHER	

SHOULDER	
Y / N	Urethane shoulder pads show no evidence of contact
Y / N	Clavicles securely attached to sternum and shoulder
Y / N	No evidence of debonding, tearing, or permanent compression of posterior soft stops **-left stop slightly debonded** 
OTHER	

THORAX	
Y / N	No evidence of contact at top, bottom, or interior faces of rib damping material **-top interior left ribs 2, 5** **-top interior right rib 4** 
Y / N	No evidence of debonding between rib damping material and ribs
Y / N	CRUX anterior arms securely attached to anterior ribs
Y / N	CRUX posterior arms securely attached to double gimbals, spine
Y / N	Urethane bib is securely attached to ribs with no sign of tearing or washer penetration
Y / N	Ribs securely attached to posterior spine
Y / N	Rib stiffeners show no evidence of bending (no gaps between ribs and stiffeners)

OTHER	**-Right arm has a gouge near elbow** 
ABDOMEN	
Y / N	No evidence of tearing, cuts, or broken stitches in upper abdomen bag and zipper **-holes in left, right sides near zipper**  
Y / N	Upper abdomen insert securely attached to spine
Y / N	Upper abdomen insert shows no evidence of permanent set
Y / N	No evidence of tearing, cuts, or broken stitches in lower abdomen bag and zipper
Y / N	Lower abdomen insert securely attached to spine
Y / N	Lower abdomen insert shows no evidence of permanent set
OTHER	
PELVIS	
Y / N	Pelvis flesh fits securely over pelvis bones
Y / N	H-point tool fits securely into hole on both sides of pelvis
OTHER	**-holes in pelvis flesh near ASIS anterior surfaces**  

FEMUR	
Y / N	Acetabular load cells firmly attached
Y / N	Femur load cells firmly attached
Y / N	No evidence of deformation of knee slider bump stop
Y / N	No cuts, tears, or scuffing of knee flesh **-cuts/tears/hole in both knee flesh covers** 
OTHER	

LOWER EXTREMITY (LX)	
Y / N	Rotational potentiometers in ankle securely attached
Y / N	Achilles tendon provides resistance to dorsiflexion
Y / N	No evidence of debonding, tearing, or permanent compression of ankle soft stops
OTHER	**-Both feet starting to tear at rear** 

JACKET	
Y / N	Rib stiffeners show no sign of permanent deformation
Y / N	No evidence of tears or holes in jacket fabric, Velcro, or zippers
OTHER	

THOR Inspection Checklist

Date: **12/21/2012**

NHTSA Representative: **James Saunders**

Witness(es):

Inspection type (check one): ☐ PRE ☒ POST

Dummy S/N: **007**

Dummy Description: **Thor NT 50th Male**

Date of last Certification or Inspection: **12/13/2012**

Tests conducted since last full certification or inspection:
Since last inspection:
RC5369 Left side CR-V
Since last certification:
RD5227 Right side Versa
RC5142 Right side Camry
RD5226 Left side Versa
RD4200 Left side Elantra
RC5141 Left side Camry
RC5369 Left side CR-V

Known errors in data channels (no data, clipping, unexpected drops):

HDCG AX had a spike at 52ms – loose connector wiring
NKCF FZ had noise throughout the data – mechanical noise
NKCR FZ was noisy between 50 & 95ms – mechanical noise
PVCG AY had a spike at 58ms – loose connector wiring
FOTL Az Spikes at 43 & 47ms
FOTR AZ Spikes at 37, 41 & 101ms

Physical evidence of damage:

Anecdotal evidence of damage:

Equipment delivered to Borrower:

HEAD	
Y / N	Rear head cap mounts securely to head
Y / N	Head skin fits securely over skull **-slightly small, does not fit 100% in rear**
Y / N	Head skin shows no sign of tears or damage **-nicks/cuts** 
Y / N	Interior components of skull cavity (ballast, accelerometer mount, accelerometers) securely attached
Y / N	Head securely mounted to OC joint
OTHER	

NECK	
Y / N	Neck cables slide freely through holes in neck plates
Y / N	Neck cables show no sign of fraying, broken strands, or kinking
Y / N	No evidence of debonding between neck pucks and plates If N – indicate which interface (where plate/puck 1 attach to upper neck load cell): **-debonding above pucks 4, 5** 
Y / N	No evidence of debonding or permanent compression in neck soft stop assemblies
Y / N	Neck securely attached to upper neck load cell
Y / N	Neck securely attached to lower neck load cell
Y / N	Neck pitch change joint mechanism mating teeth are engaged
OTHER	

SPINE	
Y / N	No evidence of debonding between thoracic spine flex joint and metal plates **-tears in left/right sides?** 
Y / N	No evidence of debonding between lumbar spine flex joint and metal plates
Y / N	Lumbar spine pitch change joint mechanism mating teeth are engaged
OTHER	

SHOULDER	
Y / N	Urethane shoulder pads show no evidence of contact
Y / N	Clavicles securely attached to sternum and shoulder
Y / N	No evidence of debonding, tearing, or permanent compression of posterior soft stops **-left stop slightly debonded** 
OTHER	

THORAX	
Y / N	No evidence of contact at top, bottom, or interior faces of rib damping material **-top interior left ribs 2, 5** **-top interior right rib 4** 
Y / N	No evidence of debonding between rib damping material and ribs
Y / N	CRUX anterior arms securely attached to anterior ribs
Y / N	CRUX posterior arms securely attached to double gimbals, spine
Y / N	Urethane bib is securely attached to ribs with no sign of tearing or washer penetration
Y / N	Ribs securely attached to posterior spine
Y / N	Rib stiffeners show no evidence of bending (no gaps between ribs and stiffeners)

OTHER	**-Right arm has a gouge near elbow** 
ABDOMEN	
Y / N	No evidence of tearing, cuts, or broken stitches in upper abdomen bag and zipper **-holes in left, right sides near zipper**  
Y / N	Upper abdomen insert securely attached to spine
Y / N	Upper abdomen insert shows no evidence of permanent set
Y / N	No evidence of tearing, cuts, or broken stitches in lower abdomen bag and zipper
Y / N	Lower abdomen insert securely attached to spine
Y / N	Lower abdomen insert shows no evidence of permanent set
OTHER	
PELVIS	
Y / N	Pelvis flesh fits securely over pelvis bones
Y / N	H-point tool fits securely into hole on both sides of pelvis
OTHER	**-holes in pelvis flesh near ASIS anterior surfaces**  

FEMUR	
Y / N	Acetabular load cells firmly attached
Y / N	Femur load cells firmly attached
Y / N	No evidence of deformation of knee slider bump stop
Y / N	No cuts, tears, or scuffing of knee flesh **-cuts/tears/hole in both knee flesh covers** 
OTHER	

LOWER EXTREMITY (LX)	
Y / N	Rotational potentiometers in ankle securely attached
Y / N	Achilles tendon provides resistance to dorsiflexion
Y / N	No evidence of debonding, tearing, or permanent compression of ankle soft stops
OTHER	**-Both feet starting to tear at rear** 

JACKET	
Y / N	Rib stiffeners show no sign of permanent deformation
Y / N	No evidence of tears or holes in jacket fabric, Velcro, or zippers
OTHER	

THOR Inspection Checklist

Date: **12/17/2012**

NHTSA Representative: **James Saunders**

Witness(es):

Inspection type (check one): ☒ PRE ☐ POST

Dummy S/N: **0016**

Dummy Description: **Thor NT 50th Male**

Date of last Certification or Inspection: **12/13/2012**

Tests conducted since last full certification or inspection:
Since last inspection:
RC5369 Left side CR-V
Since last certification:
RD5227 Right side Versa
RC5142 Right side Camry
RD5226 Left side Versa
RD4200 Left side Elantra
RC5141 Left side Camry
RC5369 Left side CR-V

Known errors in data channels (no data, clipping, unexpected drops):

V2P2 PVCG AX - Noise spikes at 79 & 116ms - OK
V2P2 PVAR FX - Questionable between 109 &125ms - Nothing observable
V2P2 PVAR FY - Noise spikes at 109 &125ms - Nothing observable
V2P2 FMRL FX - Noise spikes on data - loose connector - repaired
V2P2 FMRL FY - Noise spikes on data - loose connector - repaired
V2P2 FOTL AZ - Channel Failed - Known Dead channel
V2P2 TBRL MY - Questionable between 53 & 63ms - OK

Physical evidence of damage:

Anecdotal evidence of damage:

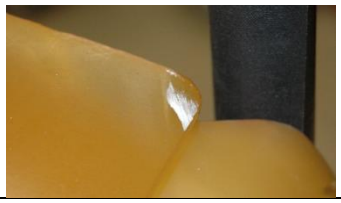
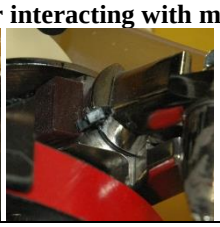
Equipment delivered to Borrower:

Thor 16 ATD

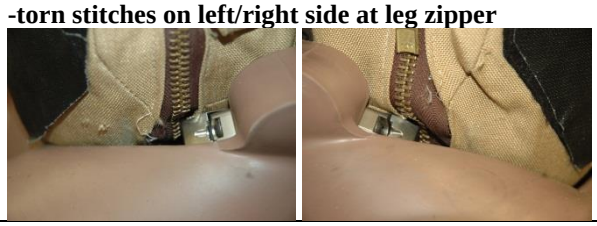
HEAD	
Y / N	Rear head cap mounts securely to head
Y / N	Head skin fits securely over skull
Y / N	Head skin shows no sign of tears or damage **-Small scrapes on right side of head** 
Y / N	Interior components of skull cavity (ballast, accelerometer mount, accelerometers) securely attached
Y / N	Head securely mounted to OC joint
OTHER	

NECK	
Y / N	Neck cables slide freely through holes in neck plates
Y / N	Neck cables show no sign of fraying, broken strands, or kinking
Y / N	No evidence of debonding between neck pucks and plates If N – indicate which interface (where plate/puck 1 attach to upper neck load cell): **-cracks in neck rubber, 2-3, 3-4** **-Lower rear neck stop is missing** 
Y / N	No evidence of debonding or permanent compression in neck soft stop assemblies
Y / N	Neck securely attached to upper neck load cell
Y / N	Neck securely attached to lower neck load cell
Y / N	Neck pitch change joint mechanism mating teeth are engaged
OTHER	

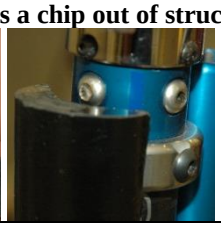
SPINE	
Y / N	No evidence of debonding between thoracic spine flex joint and metal plates
Y / N	No evidence of debonding between lumbar spine flex joint and metal plates
Y / N	Lumbar spine pitch change joint mechanism mating teeth are engaged
OTHER	

SHOULDER	
Y / N	Urethane shoulder pads show no evidence of contact **-small white mark on left shoulder** 
Y / N	Clavicles securely attached to sternum and shoulder
Y / N	No evidence of debonding, tearing, or permanent compression of posterior soft stops
OTHER	**-Stops on shoulder interacting with mechanism that rotates on the y-axis are breaking.**  

THORAX	
Y / N	No evidence of contact at top, bottom, or interior faces of rib damping material **-slight contact top right of rib #2 under arm** 
Y / N	No evidence of debonding between rib damping material and ribs **-right front of rib #5** 
Y / N	CRUX anterior arms securely attached to anterior ribs
Y / N	CRUX posterior arms securely attached to double gimbals, spine

Y / N	Urethane bib is securely attached to ribs with no sign of tearing or washer penetration
Y / N	Ribs securely attached to posterior spine
Y / N	Rib stiffeners show no evidence of bending (no gaps between ribs and stiffeners)
OTHER	- **Left lower IR-Tracc sticks during compression**
ABDOMEN	
Y / N	No evidence of tearing, cuts, or broken stitches in upper abdomen bag and zipper
Y / N	Upper abdomen insert securely attached to spine
Y / N	Upper abdomen insert shows no evidence of permanent set
Y / N	No evidence of tearing, cuts, or broken stitches in lower abdomen bag and zipper **-torn stitches on left/right side at leg zipper** 
Y / N	Lower abdomen insert securely attached to spine
Y / N	Lower abdomen insert shows no evidence of permanent set
OTHER	

PELVIS	
Y / N	Pelvis flesh fits securely over pelvis bones
Y / N	H-point tool fits securely into hole on both sides of pelvis
OTHER	

FEMUR	
Y / N	Acetabular load cells firmly attached
Y / N	Femur load cells firmly attached
Y / N	No evidence of deformation of knee slider bump stop
Y / N	No cuts, tears, or scuffing of knee flesh
OTHER	
LOWER EXTREMITY (LX)	
Y / N	Rotational potentiometers in ankle securely attached
Y / N	Achilles tendon provides resistance to dorsiflexion
Y / N	No evidence of debonding, tearing, or permanent compression of ankle soft stops **-ankle roll stops cracked** 
OTHER	**-Right leg skin is tearing** **-Right leg has a chip out of structural ring**  

JACKET	
Y / N	Rib stiffeners show no sign of permanent deformation
Y / N	No evidence of tears or holes in jacket fabric, Velcro, or zippers
OTHER	

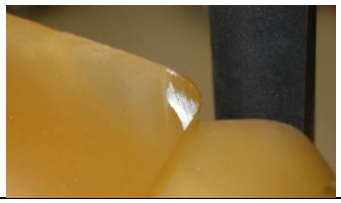
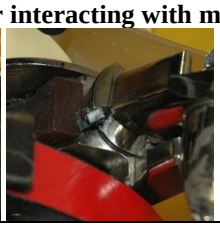
THOR Inspection Checklist

Date: **12/21/2012**
NHTSA Representative: **James Saunders**
Witness(es):
Inspection type (check one): ☐ PRE ☒ POST
Dummy S/N: **0016**
Dummy Description: **Thor NT 50th Male**
Date of last Certification or Inspection: **12/13/2012**
Tests conducted since last full certification or inspection: Since last inspection: **RC5369 Left side CR-V** Since last certification: **RD5227 Right side Versa** **RC5142 Right side Camry** **RD5226 Left side Versa** **RD4200 Left side Elantra** **RC5141 Left side Camry** **RC5369 Left side CR-V**
Known errors in data channels (no data, clipping, unexpected drops): HDCG AY Spike at 110ms HDCG AZ Spike at 110ms NKCR FZ Noisy between 43 & 95ms FOTL AZ Channel Failed ANKL RX Questionable Data ANKL RY Questionable Data ANKR RX Questionable Data ANKR RY Questionable Data
Physical evidence of damage:
Anecdotal evidence of damage:
Equipment delivered to Borrower: **Thor 16 ATD**

HEAD	
Y / N	Rear head cap mounts securely to head
Y / N	Head skin fits securely over skull
Y / N	Head skin shows no sign of tears or damage **-Small scrapes on right side of head** 
Y / N	Interior components of skull cavity (ballast, accelerometer mount, accelerometers) securely attached
Y / N	Head securely mounted to OC joint
OTHER	

NECK	
Y / N	Neck cables slide freely through holes in neck plates
Y / N	Neck cables show no sign of fraying, broken strands, or kinking
Y / N	No evidence of debonding between neck pucks and plates If N – indicate which interface (where plate/puck 1 attach to upper neck load cell): **-cracks in neck rubber, 2-3, 3-4** **-Lower rear neck stop is missing** 
Y / N	No evidence of debonding or permanent compression in neck soft stop assemblies
Y / N	Neck securely attached to upper neck load cell
Y / N	Neck securely attached to lower neck load cell
Y / N	Neck pitch change joint mechanism mating teeth are engaged
OTHER	

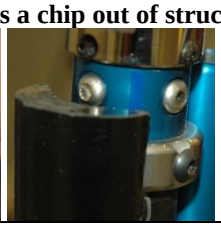
SPINE	
Y / N	No evidence of debonding between thoracic spine flex joint and metal plates
Y / N	No evidence of debonding between lumbar spine flex joint and metal plates
Y / N	Lumbar spine pitch change joint mechanism mating teeth are engaged
OTHER	

SHOULDER	
Y / N	Urethane shoulder pads show no evidence of contact **-small white mark on left shoulder** 
Y / N	Clavicles securely attached to sternum and shoulder
Y / N	No evidence of debonding, tearing, or permanent compression of posterior soft stops
OTHER	**-Stops on shoulder interacting with mechanism that rotates on the y-axis are breaking.**  

THORAX	
Y / N	No evidence of contact at top, bottom, or interior faces of rib damping material **-slight contact top right of rib #2 under arm** 
Y / N	No evidence of debonding between rib damping material and ribs **-right front of rib #5** 
Y / N	CRUX anterior arms securely attached to anterior ribs
Y / N	CRUX posterior arms securely attached to double gimbals, spine

Y / N	Urethane bib is securely attached to ribs with no sign of tearing or washer penetration
Y / N	Ribs securely attached to posterior spine
Y / N	Rib stiffeners show no evidence of bending (no gaps between ribs and stiffeners)
OTHER	- **Left lower IR-Tracc sticks during compression**
ABDOMEN	
Y / N	No evidence of tearing, cuts, or broken stitches in upper abdomen bag and zipper
Y / N	Upper abdomen insert securely attached to spine
Y / N	Upper abdomen insert shows no evidence of permanent set
Y / N	No evidence of tearing, cuts, or broken stitches in lower abdomen bag and zipper **-torn stitches on left/right side at leg zipper**  
Y / N	Lower abdomen insert securely attached to spine
Y / N	Lower abdomen insert shows no evidence of permanent set
OTHER	

PELVIS	
Y / N	Pelvis flesh fits securely over pelvis bones
Y / N	H-point tool fits securely into hole on both sides of pelvis
OTHER	

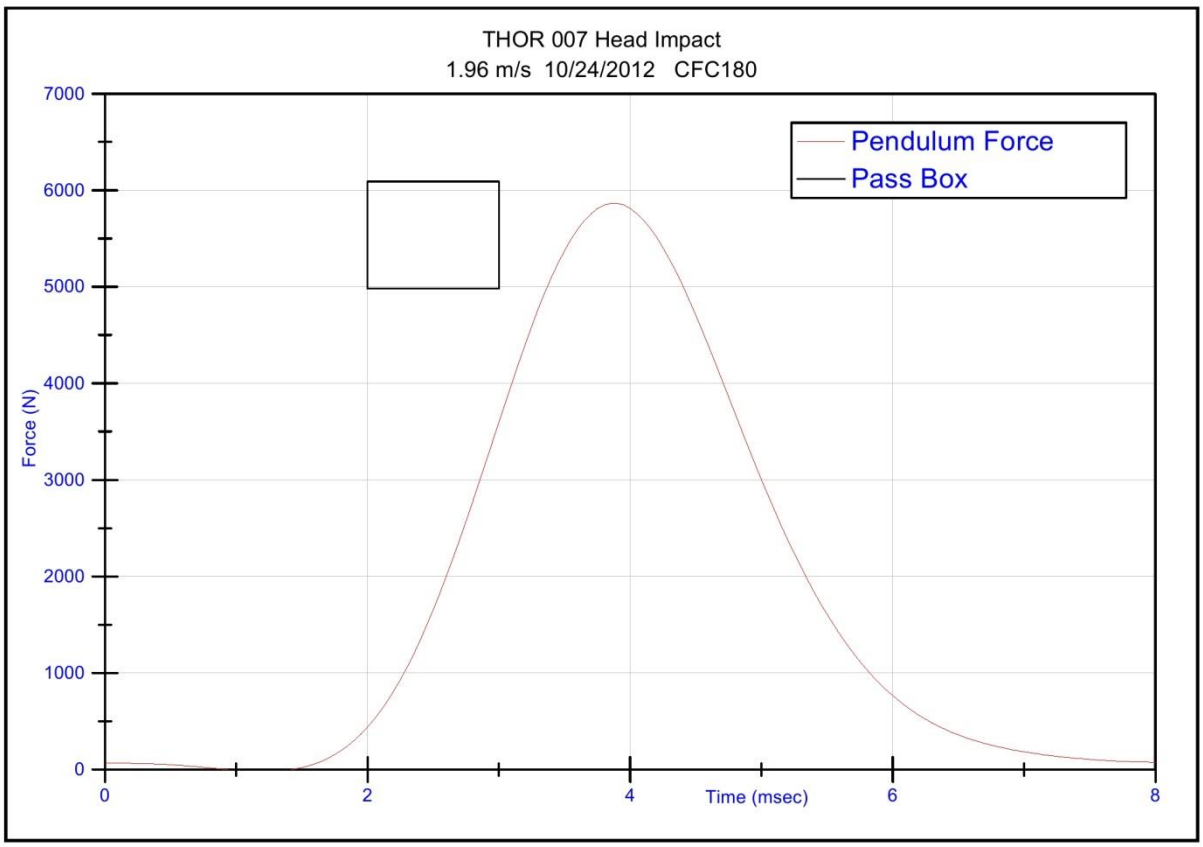
FEMUR	
Y / N	Acetabular load cells firmly attached
Y / N	Femur load cells firmly attached
Y / N	No evidence of deformation of knee slider bump stop
Y / N	No cuts, tears, or scuffing of knee flesh
OTHER	
LOWER EXTREMITY (LX)	
Y / N	Rotational potentiometers in ankle securely attached
Y / N	Achilles tendon provides resistance to dorsiflexion
Y / N	No evidence of debonding, tearing, or permanent compression of ankle soft stops **-ankle roll stops cracked** 
OTHER	**-Right leg skin is tearing** **-Right leg has a chip out of structural ring**  

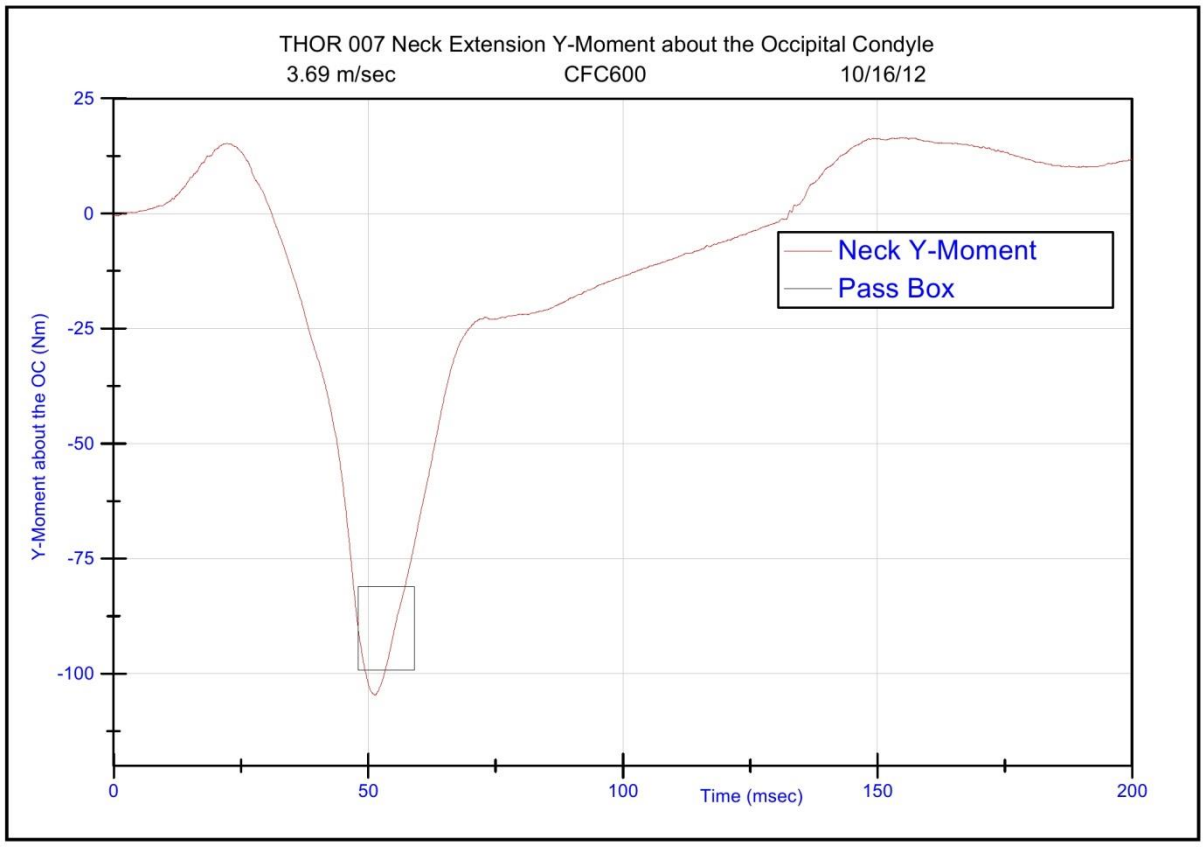
JACKET	
Y / N	Rib stiffeners show no sign of permanent deformation
Y / N	No evidence of tears or holes in jacket fabric, Velcro, or zippers
OTHER	

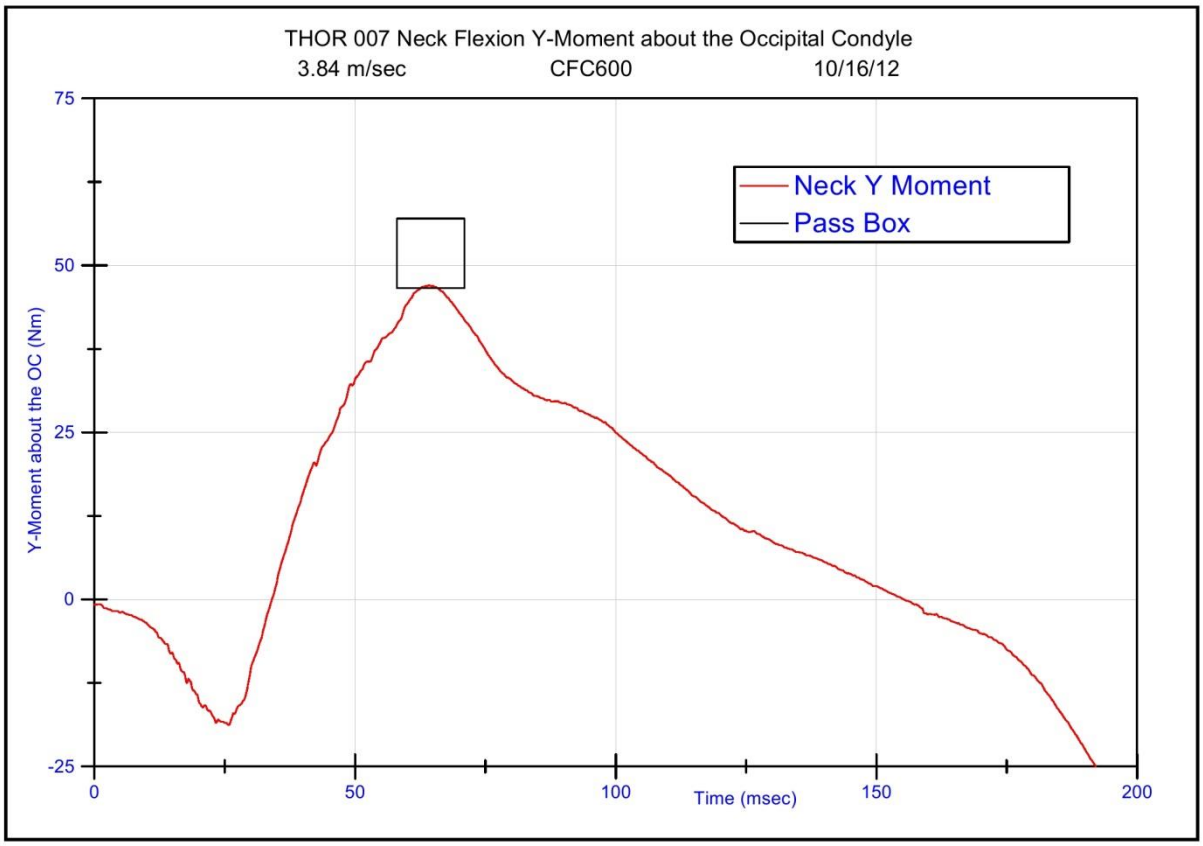
Test Data/Sensor Repair Notes

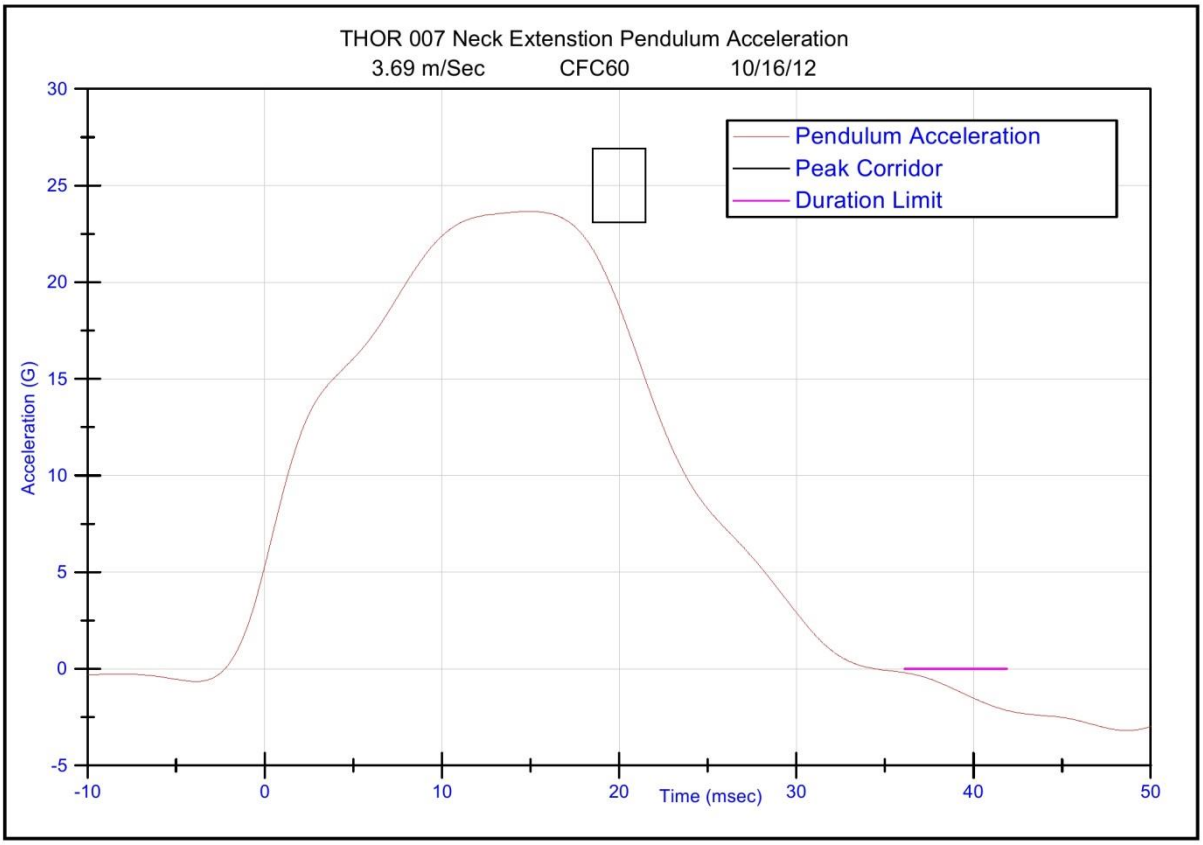
DUMMY CALIBRATIONS

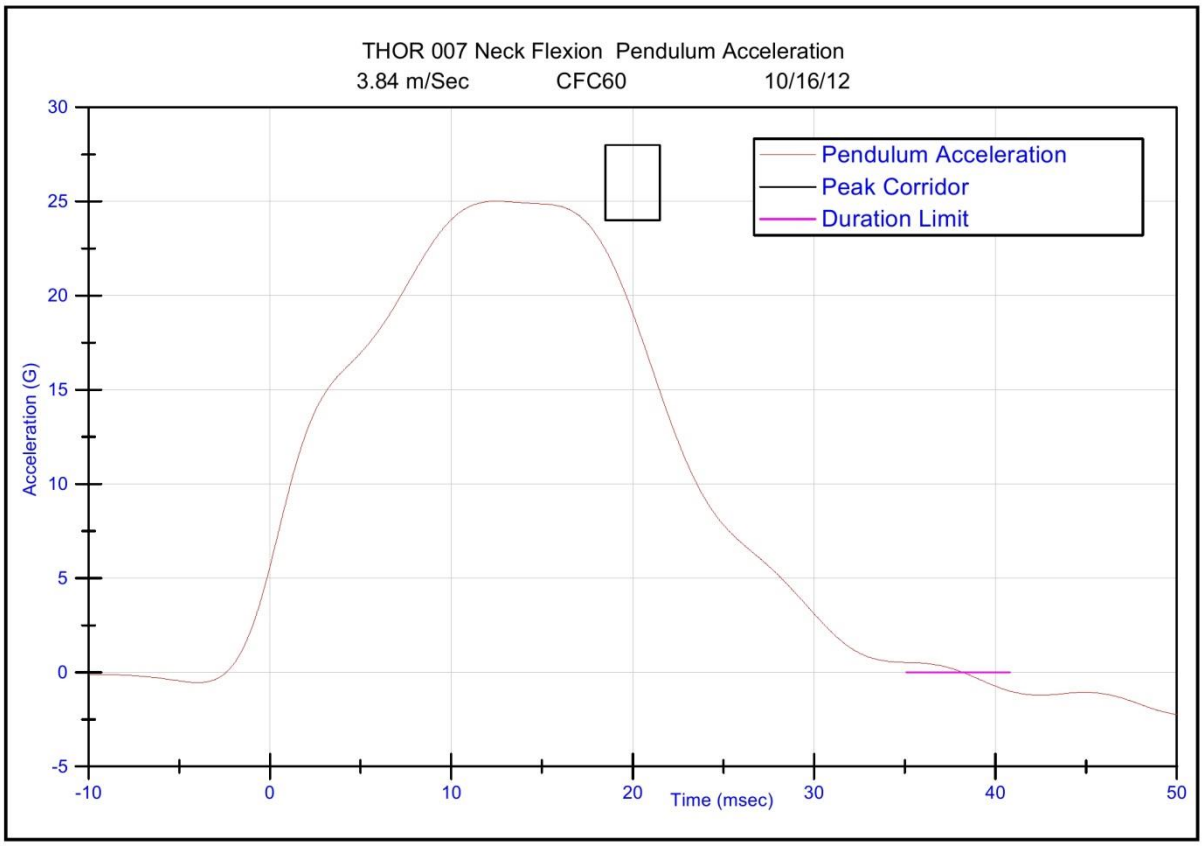
50% ADULT MALE THOR007 DUMMY CALIBRATIONS

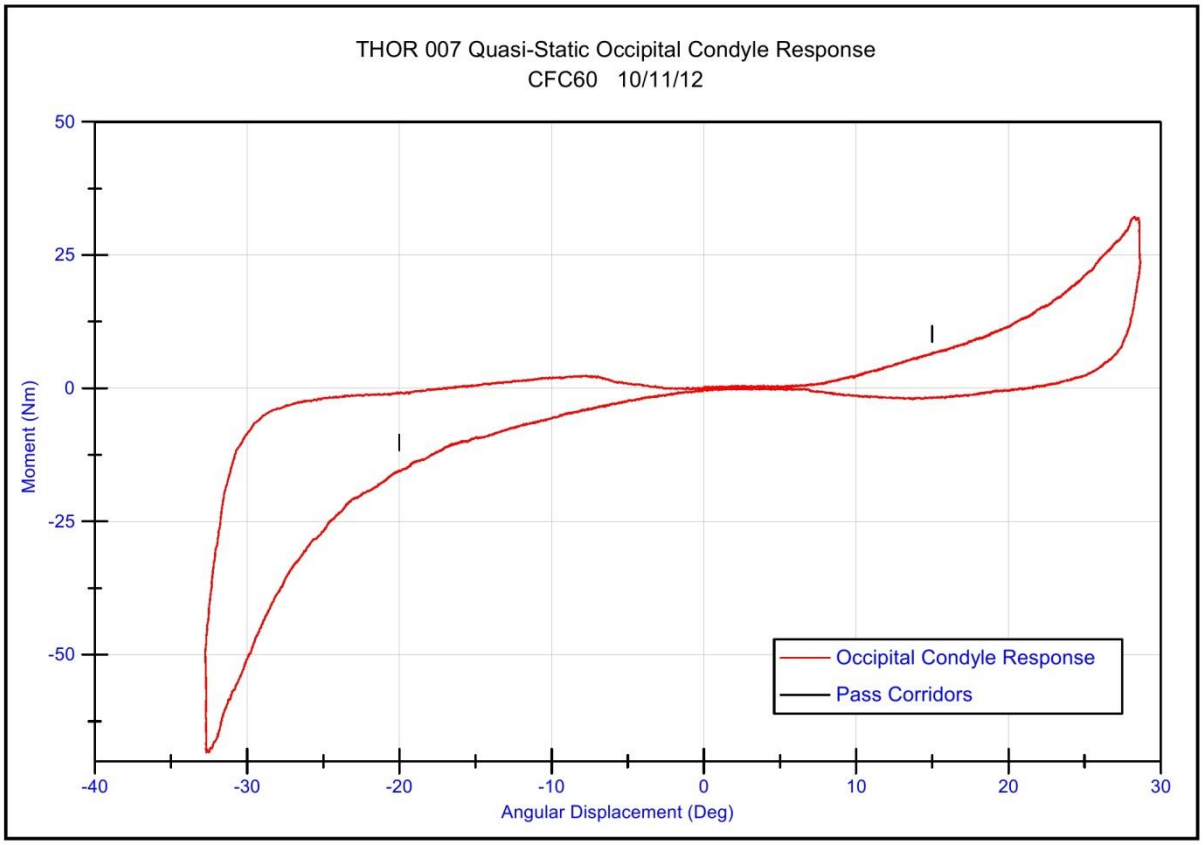

THOR 007 Head Impact
1.96 m/s 10/24/2012 CFC180
Pendulum Force
Pass Box
Force (N)
7000
6000
5000
4000
3000
2000
1000
0
0
2
4
6
8
Time (msec)

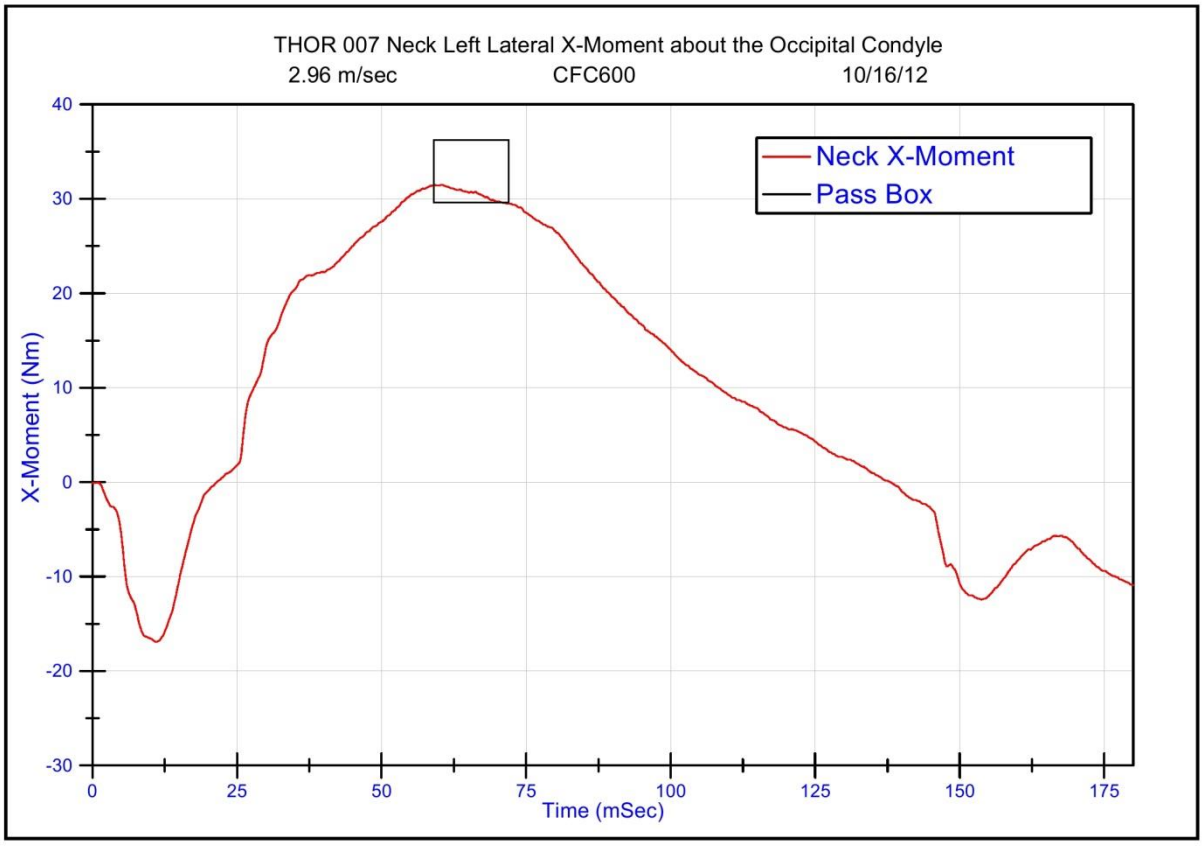

THOR 007 Neck Extension Y-Moment about the Occipital Condyle
3.69 m/sec CFC600 10/16/12
Neck Y-Moment
Pass Box
Y-Moment about the OC (Nm)
25
0
-25
-50
-75
-100
0
50
100
150
200
Time (msec)

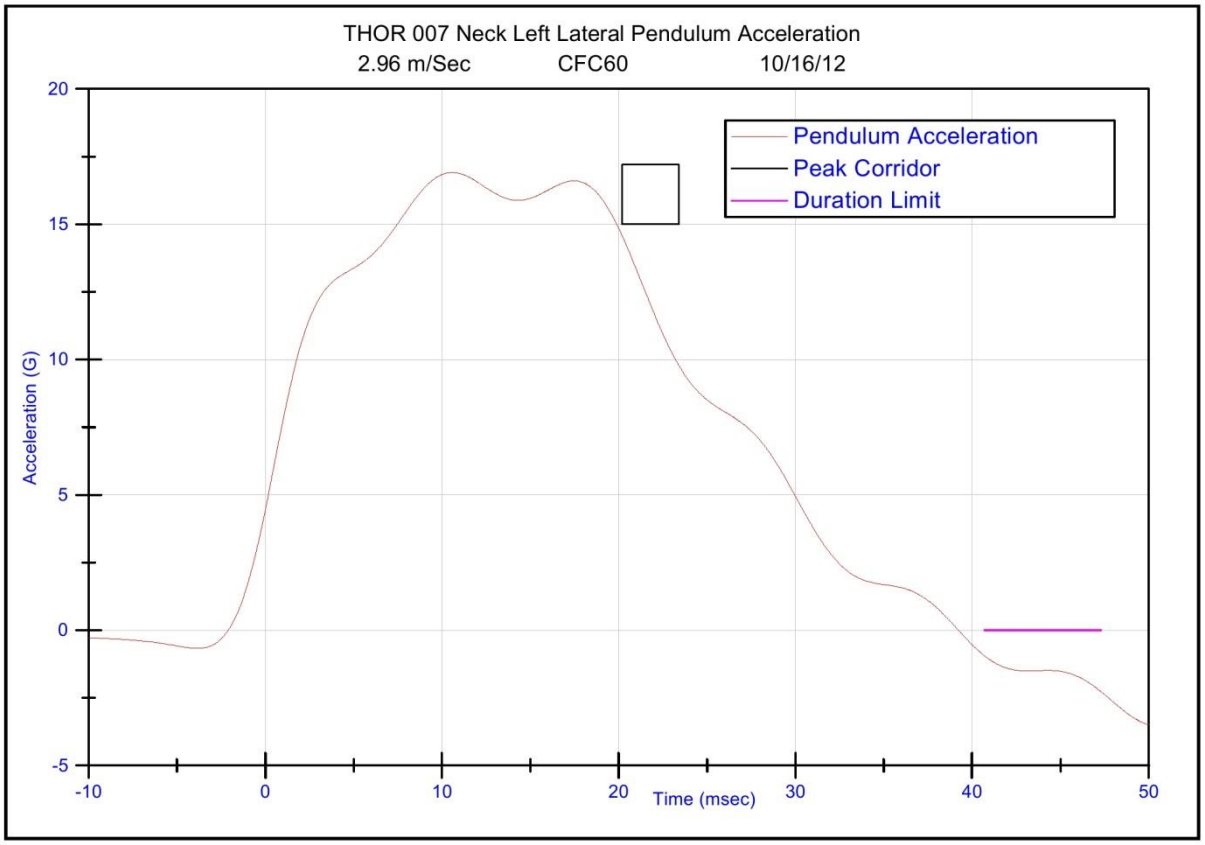

THOR 007 Neck Flexion Y-Moment about the Occipital Condyle
3.84 m/sec
CFC600
10/16/12
Neck Y Moment
Pass Box
Y-Moment about the OC (Nm)
Time (msec)
75
50
25
0
-25
0
50
100
150
200

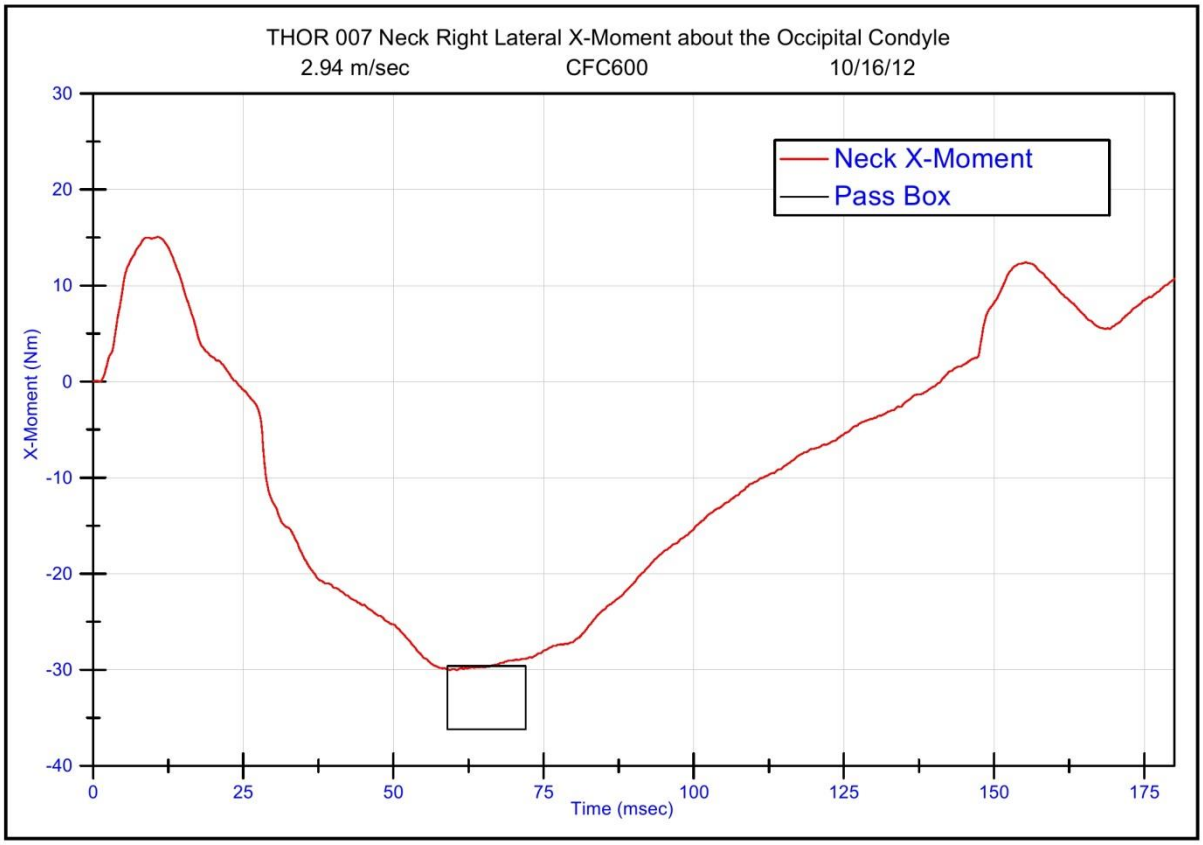

THOR 007 Neck Extenstion Pendulum Acceleration
3.69 m/Sec
CFC60
10/16/12
Pendulum Acceleration
Peak Corridor
Duration Limit
Acceleration (G)
Time (msec)
30
25
20
15
10
5
0
-5
-10
0
10
20
30
40
50

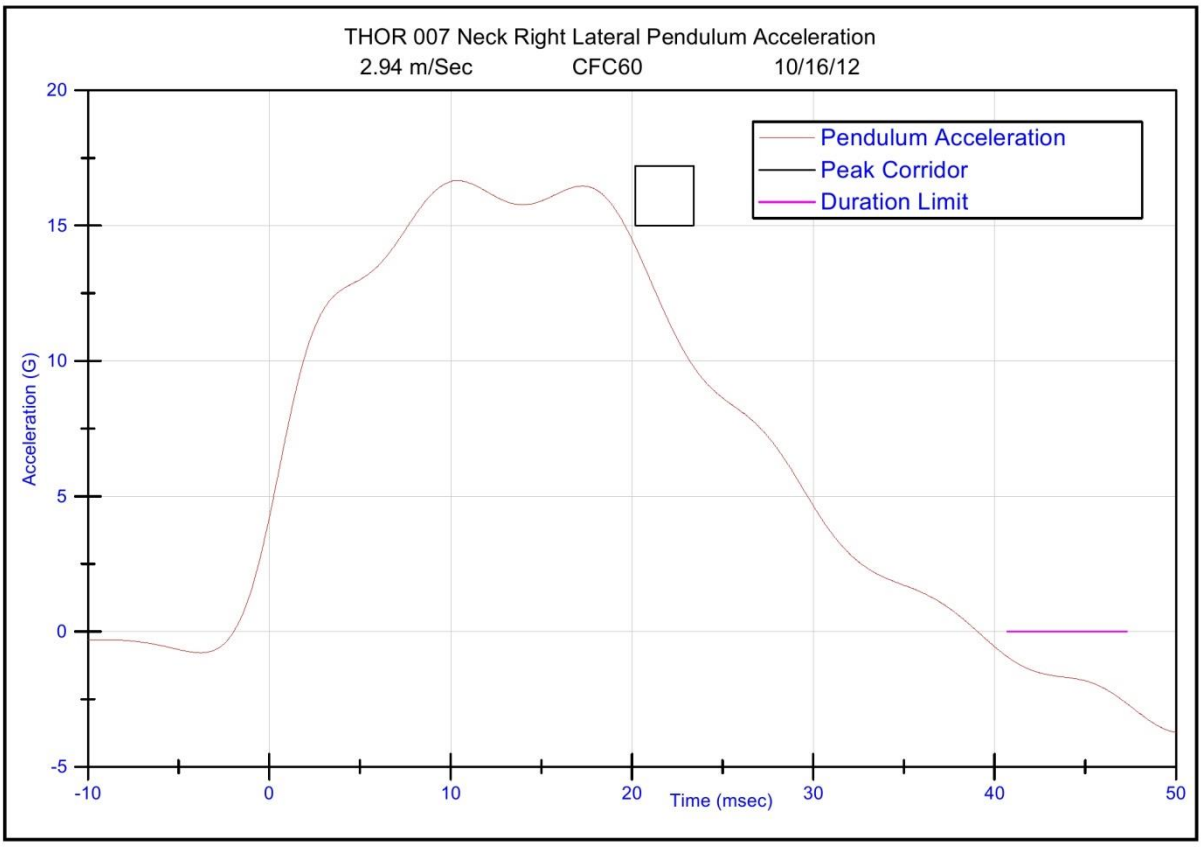

THOR 007 Neck Flexion Pendulum Acceleration
3.84 m/Sec CFC60 10/16/12
Pendulum Acceleration
Peak Corridor
Duration Limit
Acceleration (G)
Time (msec)
30
25
20
15
10
5
0
-5
-10
0
10
20
30
40
50

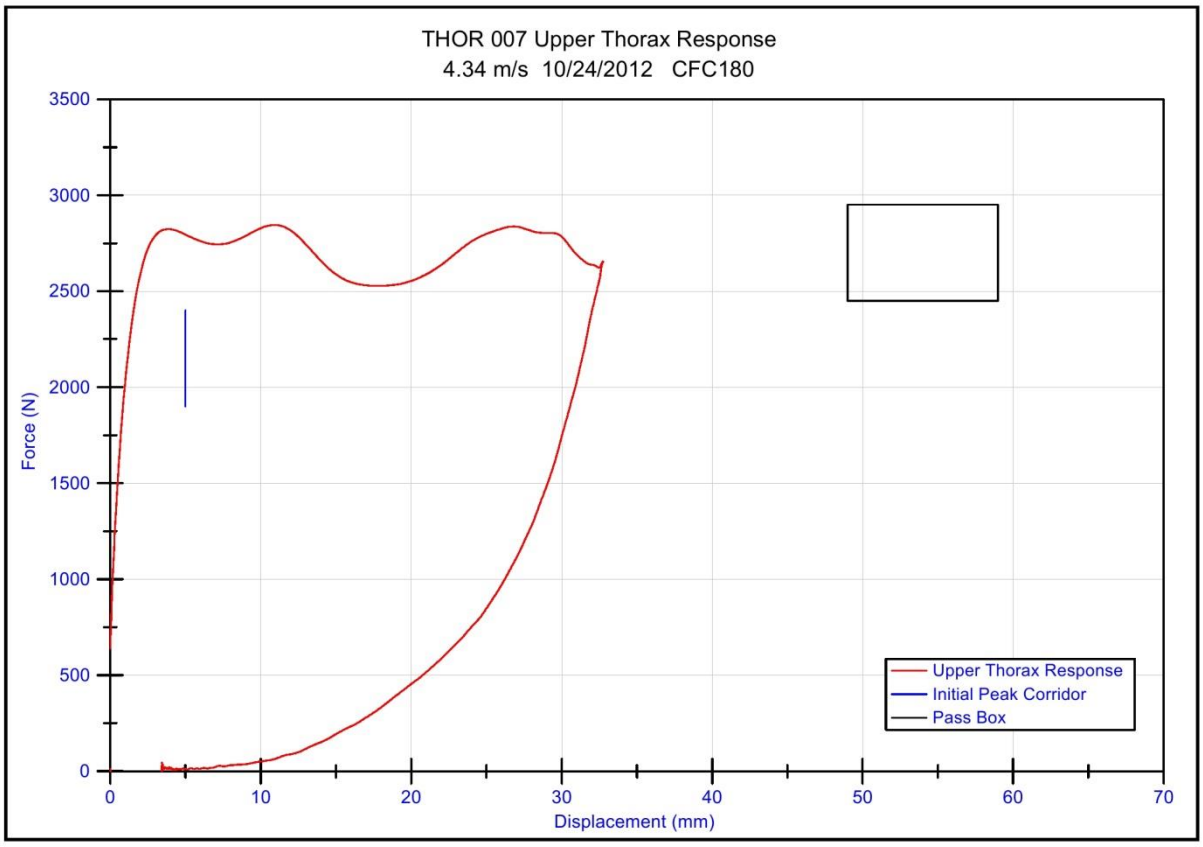

THOR 007 Quasi-Static Occipital Condyle Response
CFC60 10/11/12
Occipital Condyle Response
Pass Corridors
Moment (Nm)
Angular Displacement (Deg)
50
25
0
-25
-50
-40
-30
-20
-10
0
10
20
30

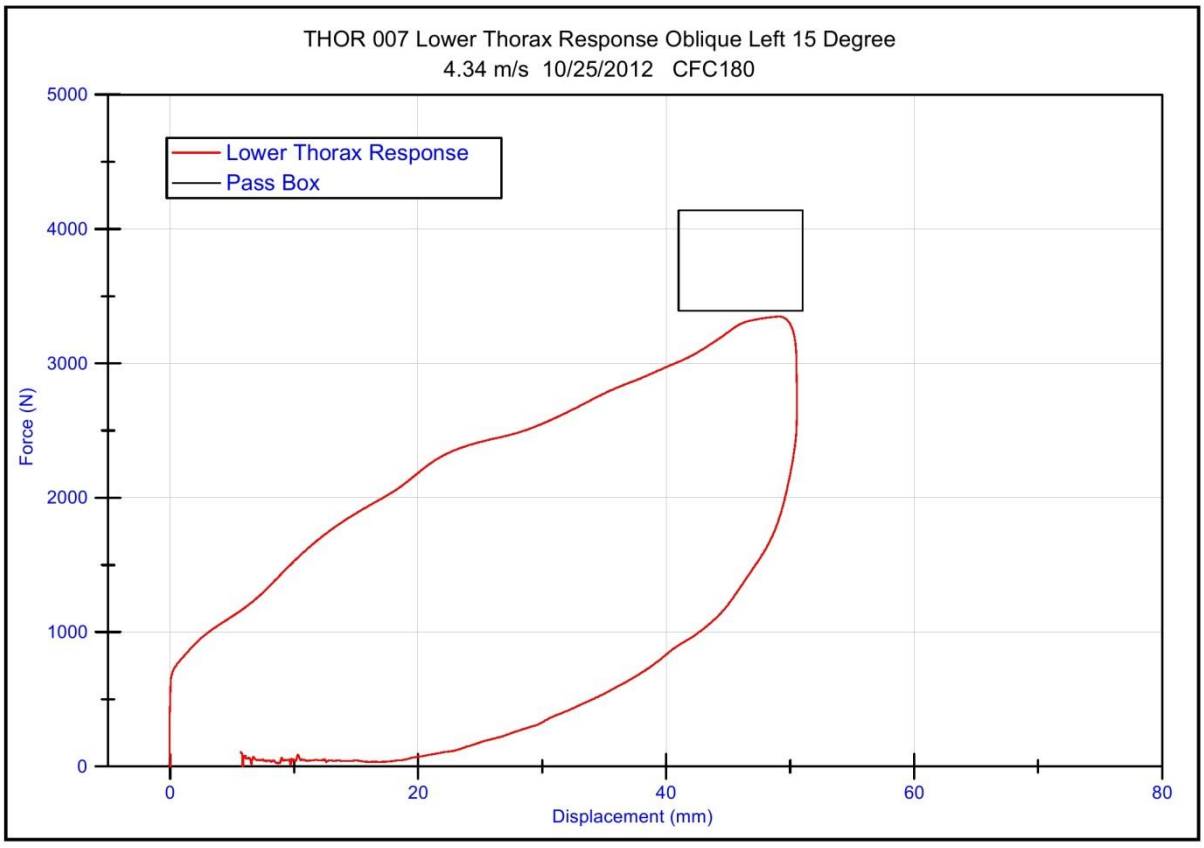

THOR 007 Neck Left Lateral X-Moment about the Occipital Condyle
2.96 m/sec
CFC600
10/16/12
Neck X-Moment
Pass Box
X-Moment (Nm)
Time (mSec)
40
30
20
10
0
-10
-20
-30
0
25
50
75
100
125
150
175

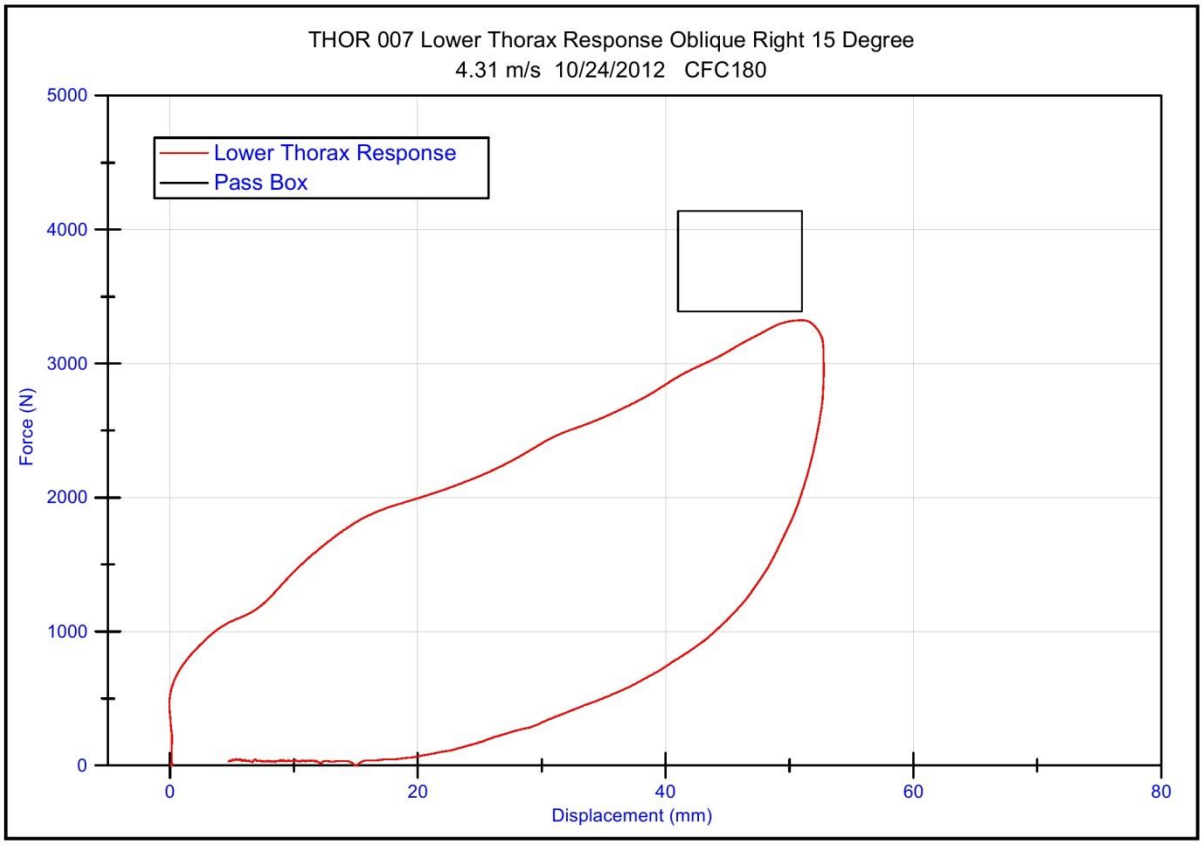

THOR 007 Neck Left Lateral Pendulum Acceleration
2.96 m/Sec
CFC60
10/16/12
Pendulum Acceleration
Peak Corridor
Duration Limit
Acceleration (G)
Time (msec)
20
15
10
5
0
-5
-10
0
10
20
30
40
50

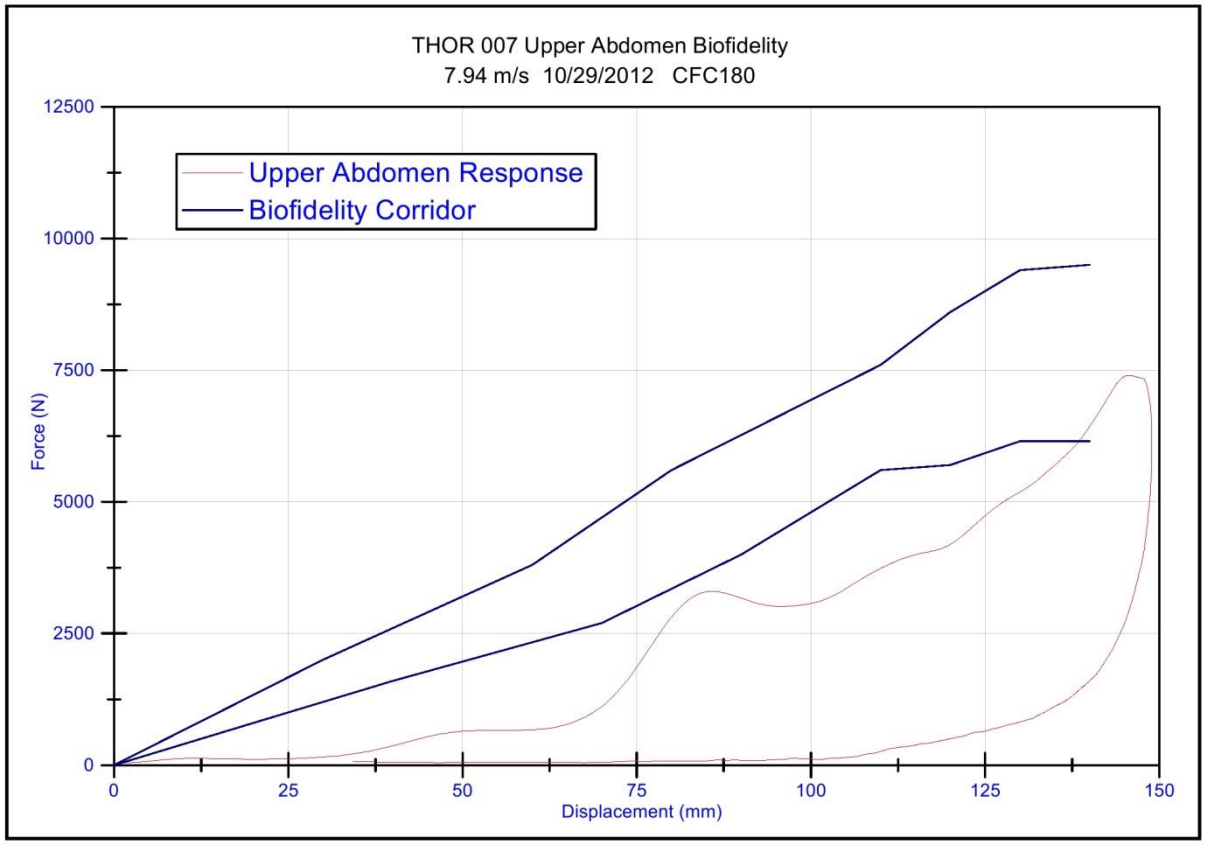

THOR 007 Neck Right Lateral X-Moment about the Occipital Condyle
2.94 m/sec
CFC600
10/16/12
Neck X-Moment
Pass Box
X-Moment (Nm)
Time (msec)
30
20
10
0
-10
-20
-30
-40
0
25
50
75
100
125
150
175

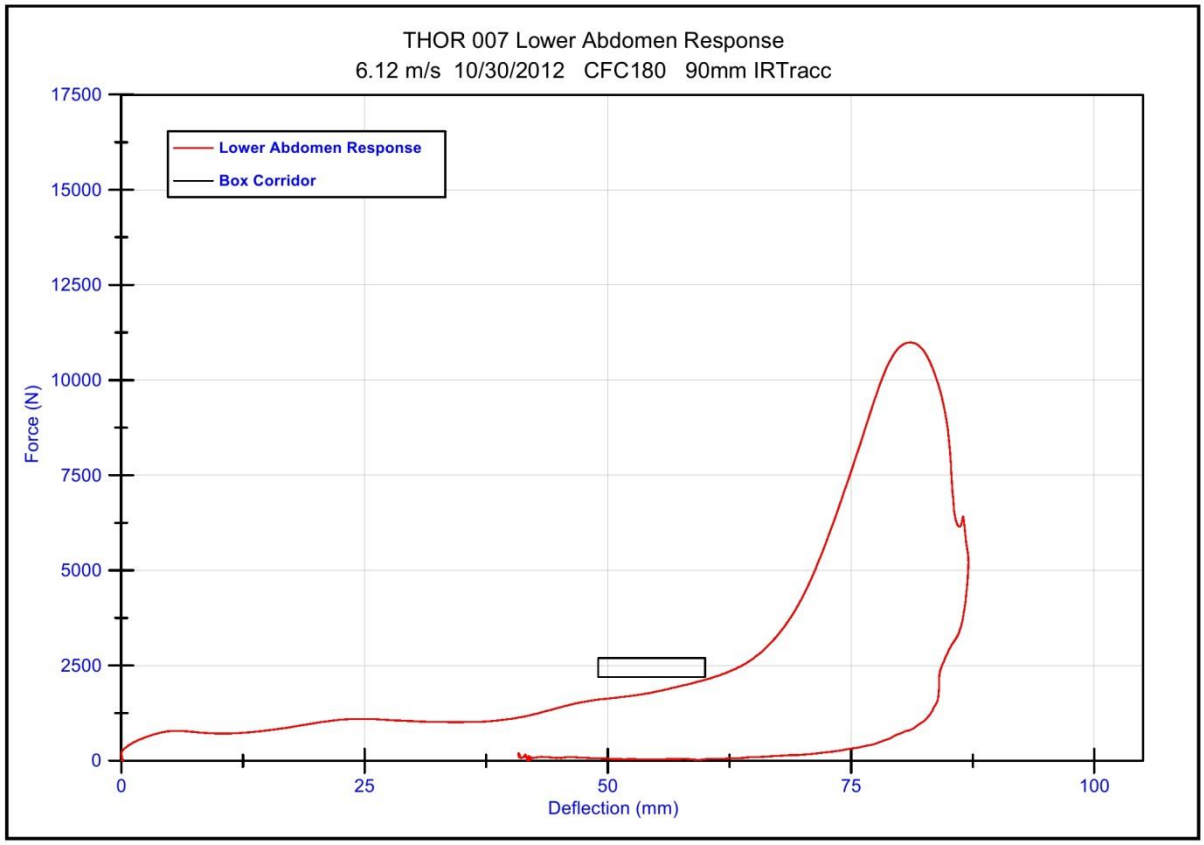

THOR 007 Neck Right Lateral Pendulum Acceleration
2.94 m/Sec
CFC60
10/16/12
Pendulum Acceleration
Peak Corridor
Duration Limit
Acceleration (G)
Time (msec)
20
15
10
5
0
-5
-10
0
10
20
30
40
50

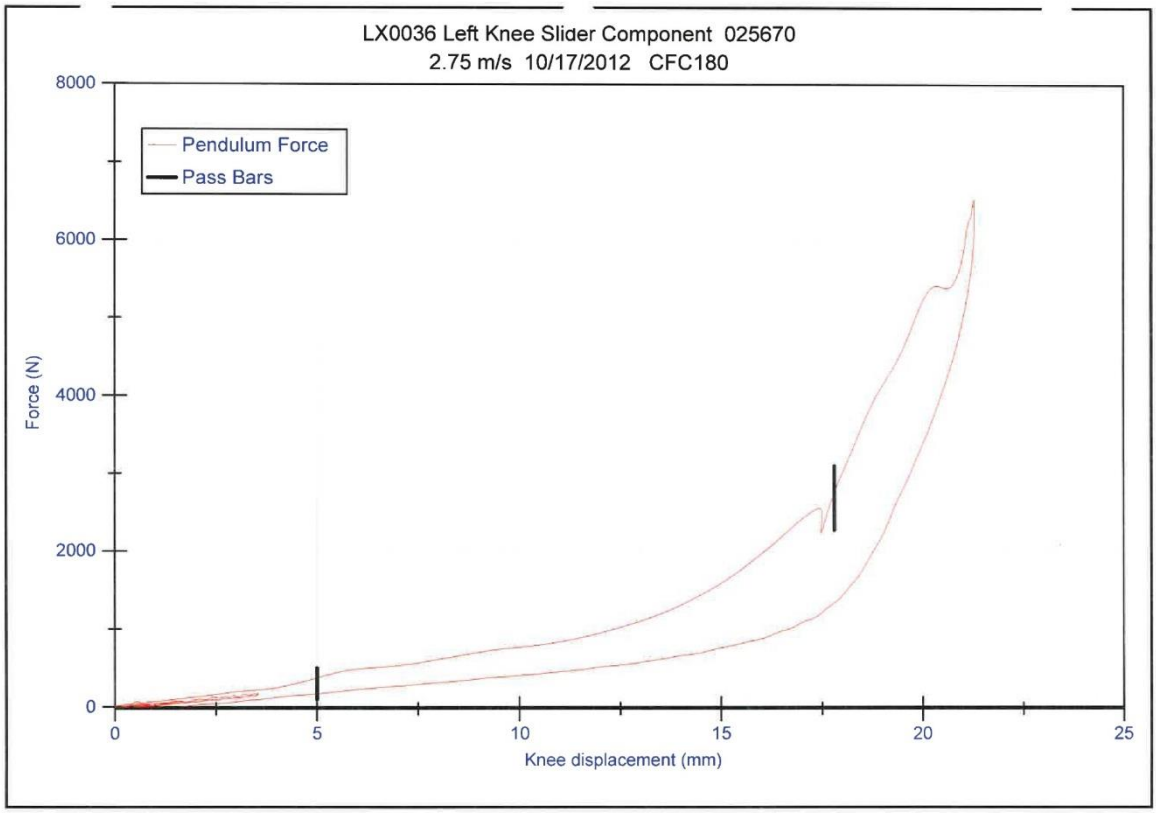

THOR 007 Upper Thorax Response
4.34 m/s 10/24/2012 CFC180
Force (N)
Displacement (mm)
Upper Thorax Response
Initial Peak Corridor
Pass Box

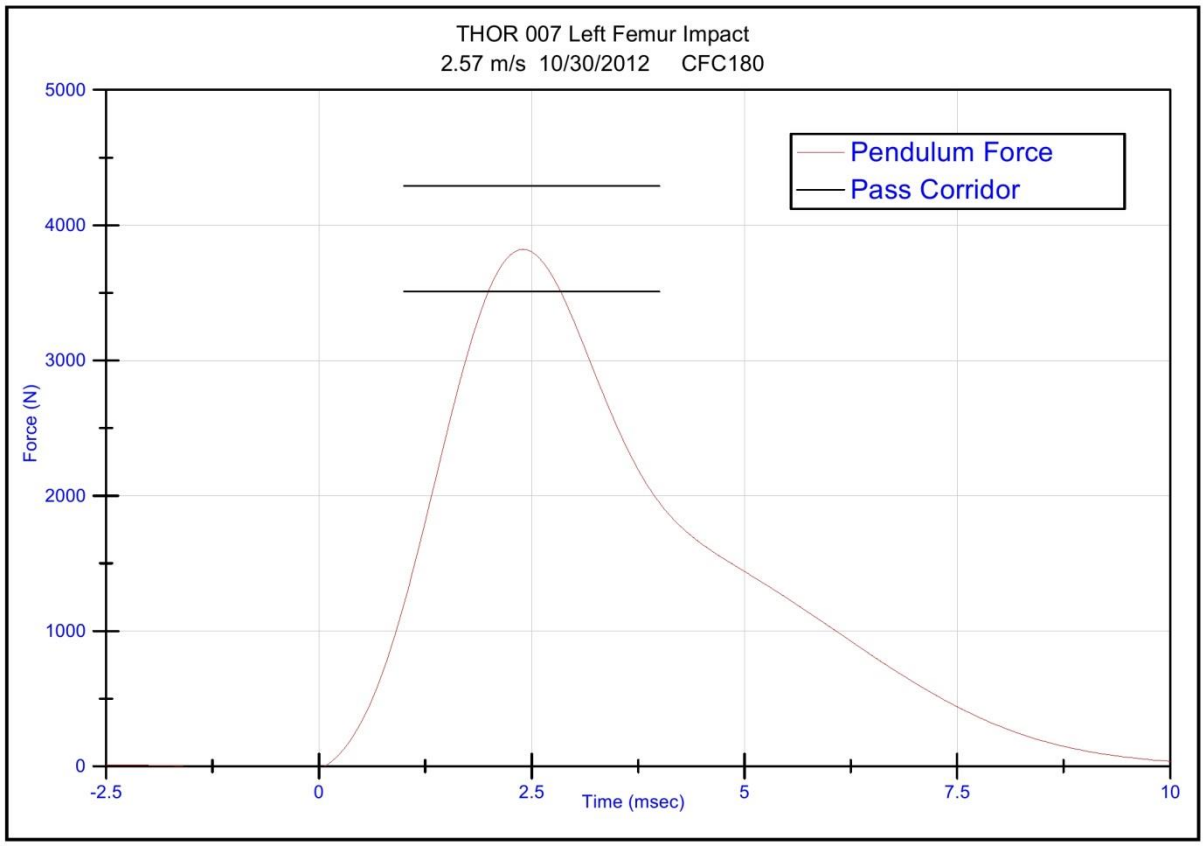

THOR 007 Lower Thorax Response Oblique Left 15 Degree
4.34 m/s 10/25/2012 CFC180
Force (N)
Displacement (mm)
Lower Thorax Response
Pass Box

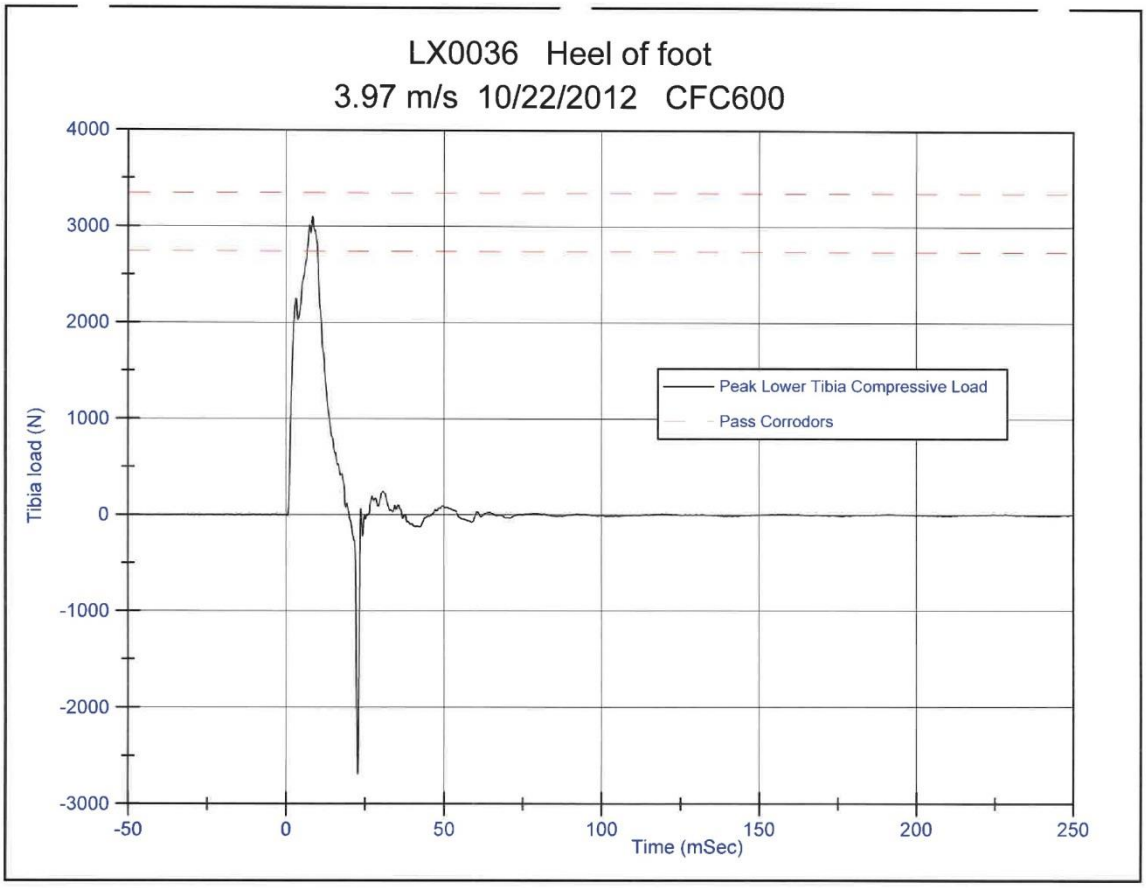

THOR 007 Lower Thorax Response Oblique Right 15 Degree
4.31 m/s 10/24/2012 CFC180
Lower Thorax Response
Pass Box
Force (N)
Displacement (mm)
5000
4000
3000
2000
1000
0
0
20
40
60
80

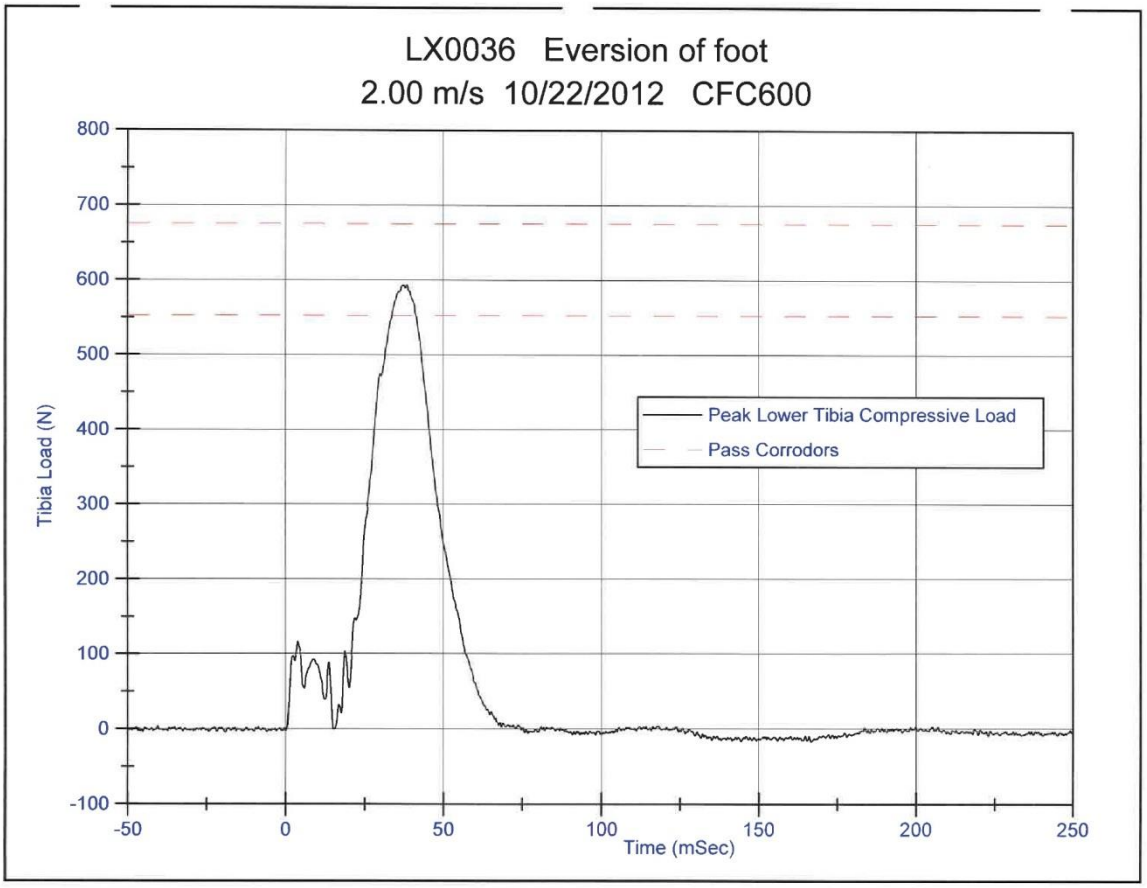

THOR 007 Upper Abdomen Biofidelity
7.94 m/s 10/29/2012 CFC180
Upper Abdomen Response
Biofidelity Corridor
Force (N)
Displacement (mm)
12500
10000
7500
5000
2500
0
0
25
50
75
100
125
150

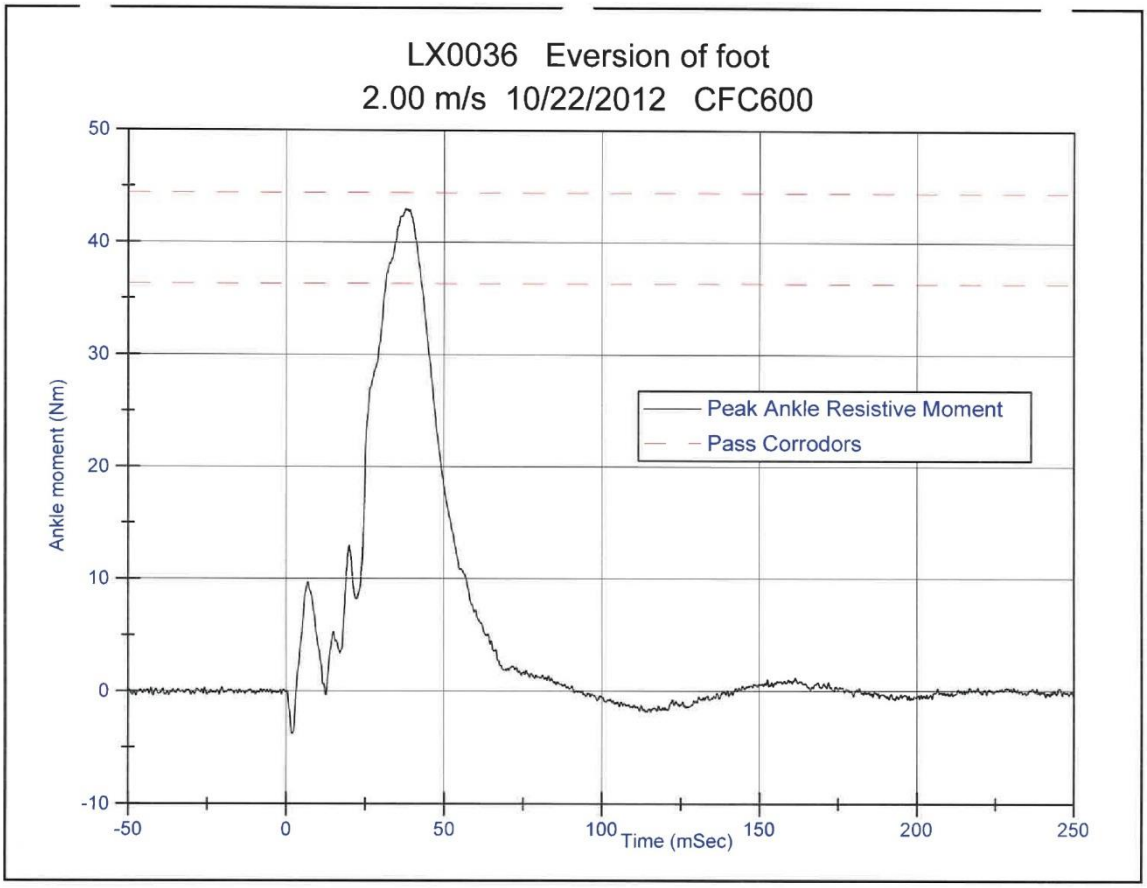

THOR 007 Lower Abdomen Response
6.12 m/s 10/30/2012 CFC180 90mm IRTracc
Lower Abdomen Response
Box Corridor
Force (N)
17500
15000
12500
10000
7500
5000
2500
0
0
25
50
75
100
Deflection (mm)

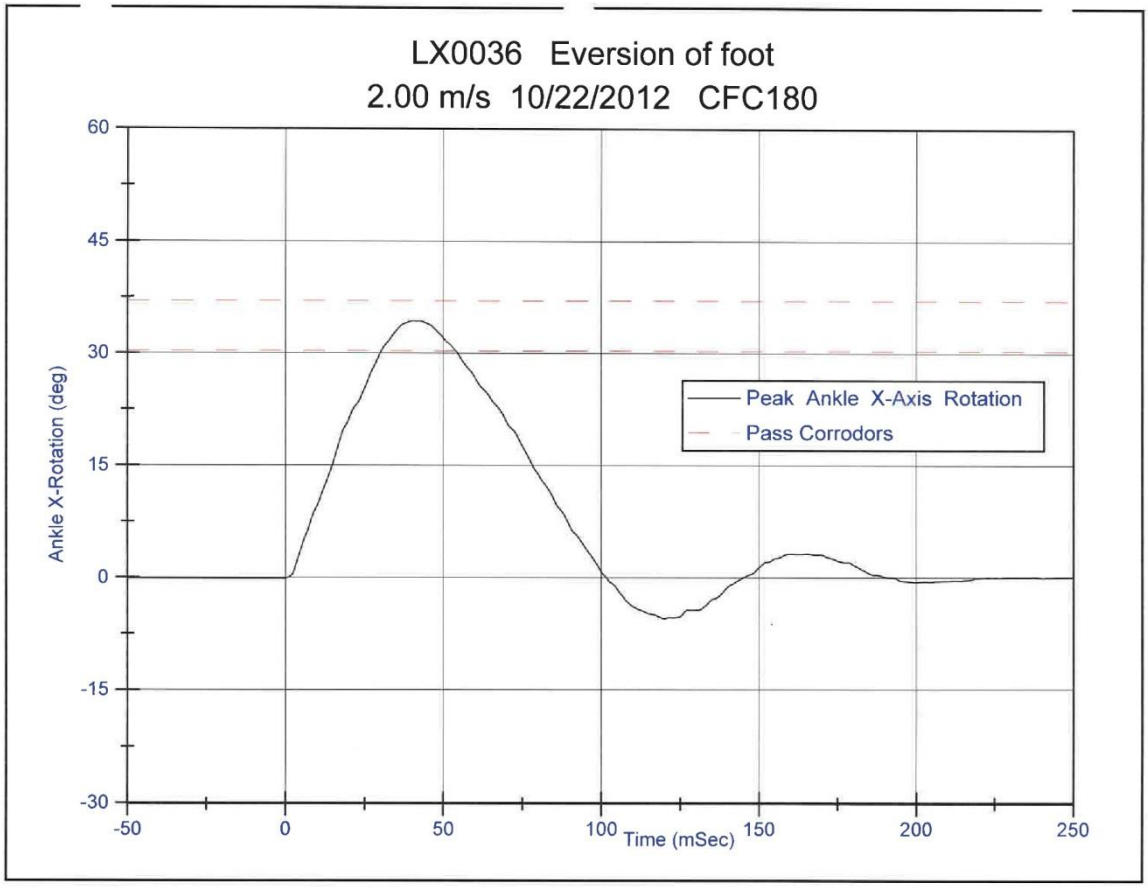

LX0036 Left Knee Slider Component 025670
2.75 m/s 10/17/2012 CFC180
Pendulum Force
Pass Bars
Force (N)
8000
6000
4000
2000
0
0
5
10
15
20
25
Knee displacement (mm)

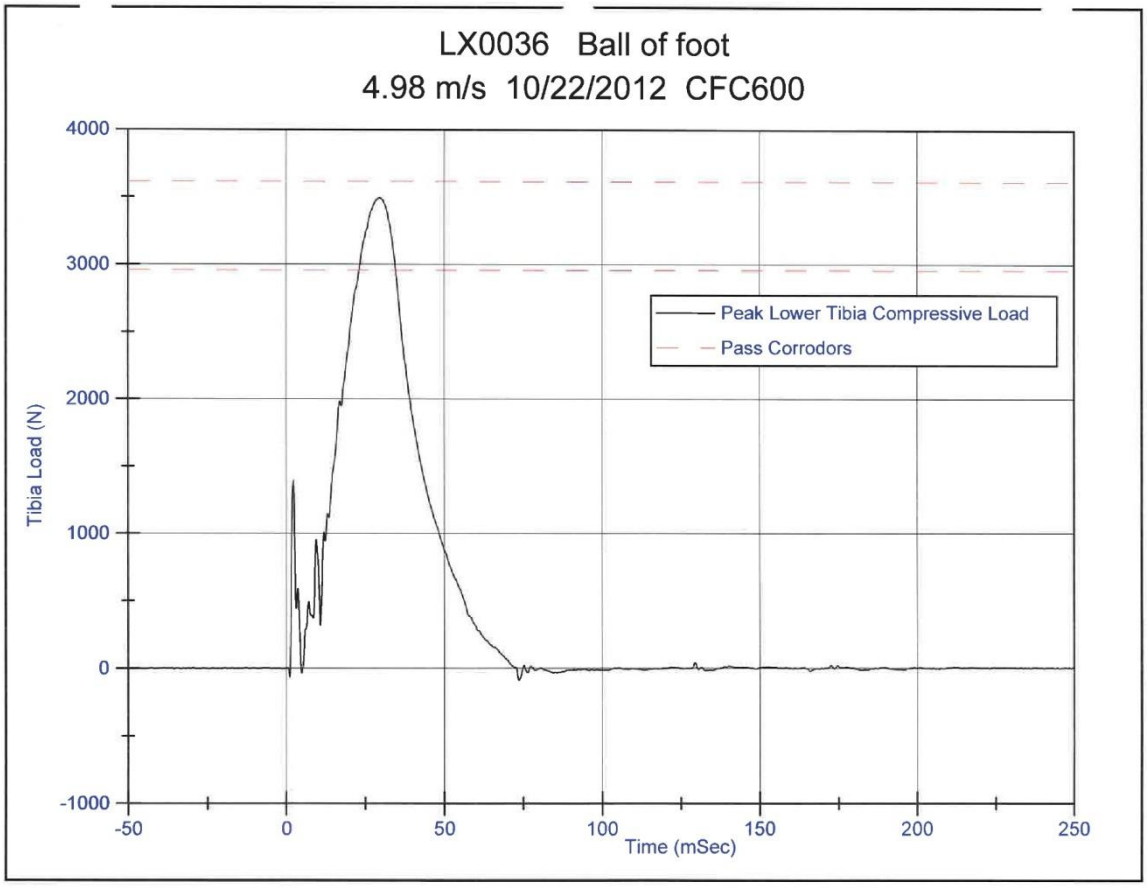

THOR 007 Left Femur Impact
2.57 m/s 10/30/2012 CFC180
Pendulum Force
Pass Corridor
Force (N)
5000
4000
3000
2000
1000
0
-2.5
0
2.5
5
7.5
10
Time (msec)

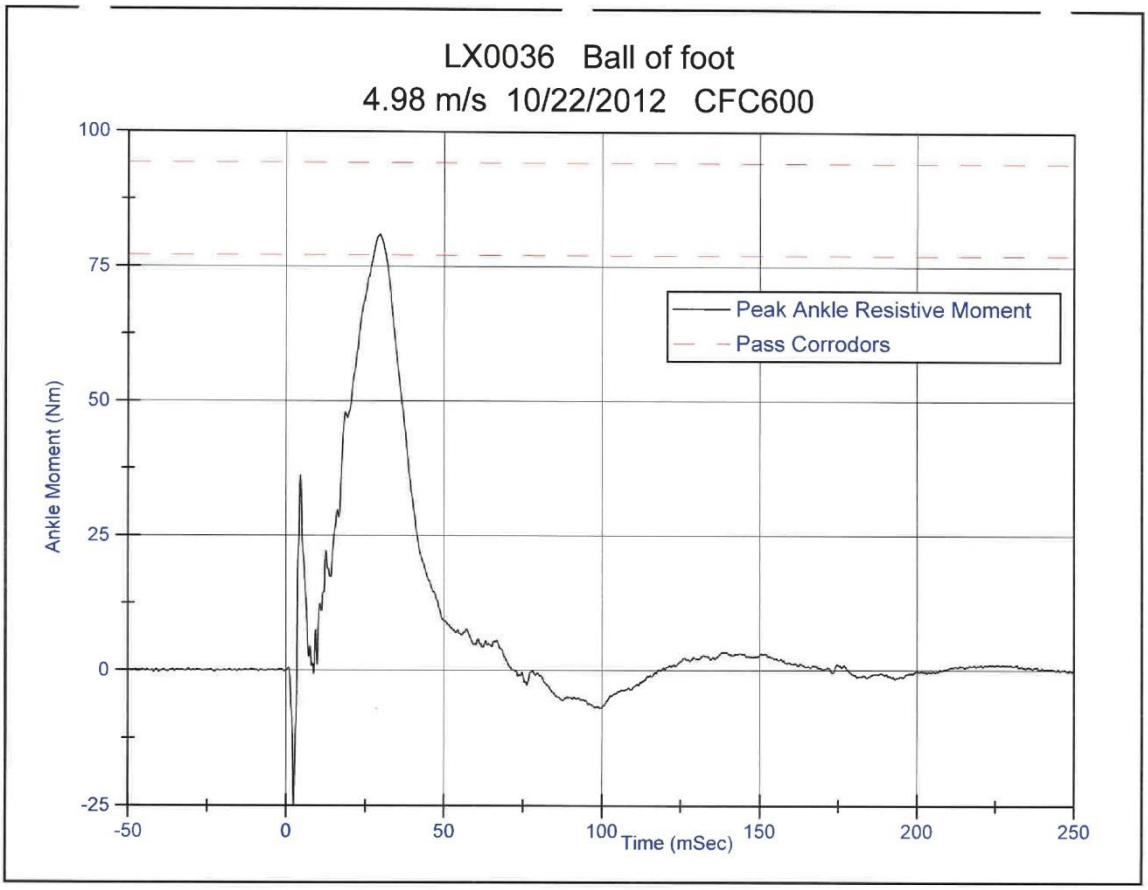

LX0036 Heel of foot
3.97 m/s 10/22/2012 CFC600
Tibia load (N)
Time (mSec)
Peak Lower Tibia Compressive Load
Pass Corrodors
4000
3000
2000
1000
0
-1000
-2000
-3000
-50
0
50
100
150
200
250

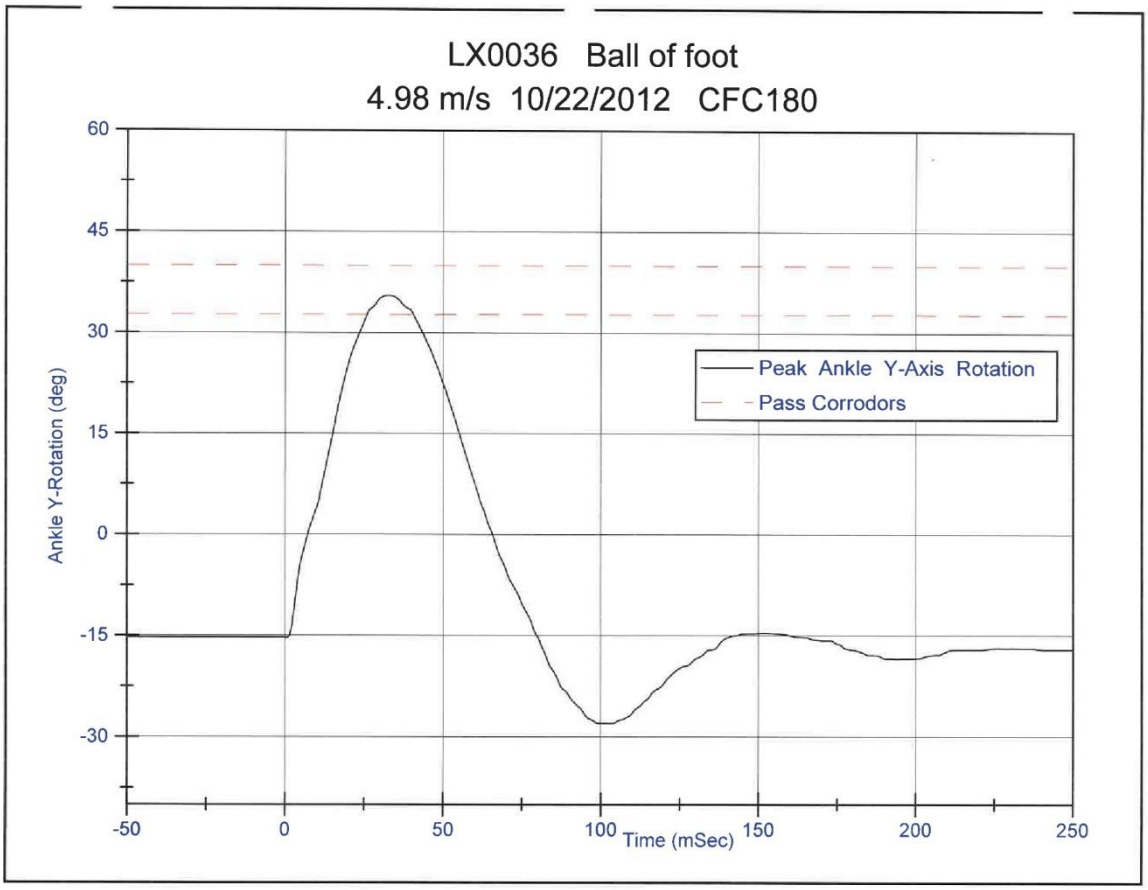

LX0036 Eversion of foot
2.00 m/s 10/22/2012 CFC600
Tibia Load (N)
Time (mSec)
Peak Lower Tibia Compressive Load
Pass Corrodors
800
700
600
500
400
300
200
100
0
-100
-50
0
50
100
150
200
250

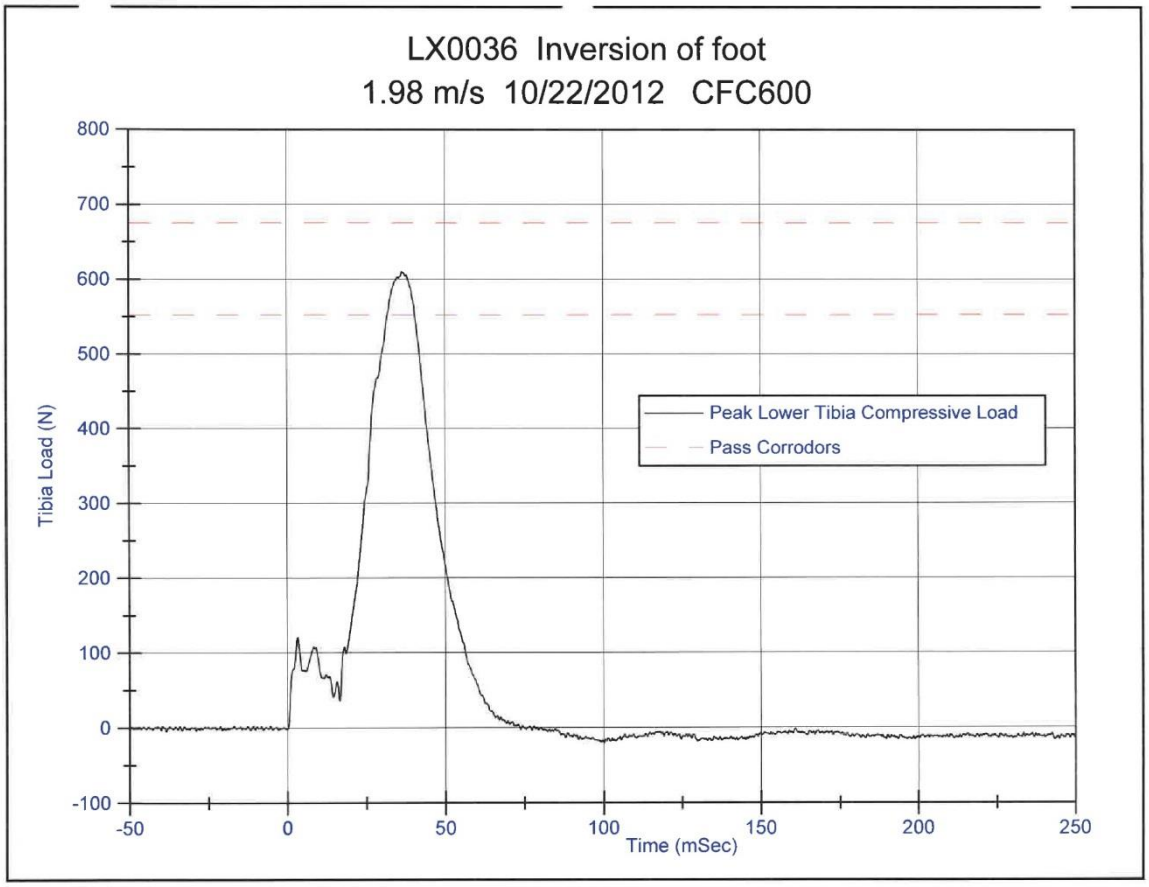

LX0036 Eversion of foot
2.00 m/s 10/22/2012 CFC600
Ankle moment (Nm)
50
40
30
20
10
0
-10
-50
0
50
100
150
200
250
Time (mSec)
Peak Ankle Resistive Moment
Pass Corrodors

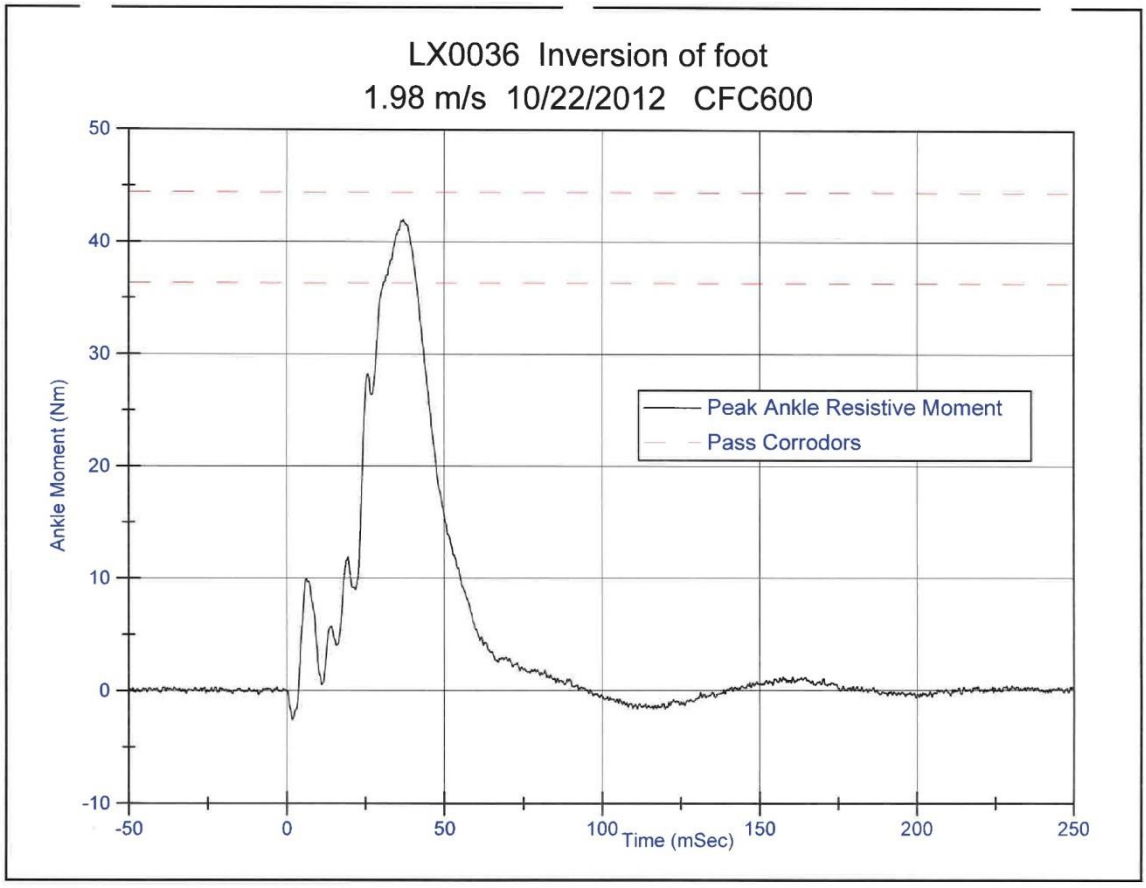

LX0036 Eversion of foot
2.00 m/s 10/22/2012 CFC180
Ankle X-Rotation (deg)
60
45
30
15
0
-15
-30
-50
0
50
100
150
200
250
Time (mSec)
Peak Ankle X-Axis Rotation
Pass Corrodors

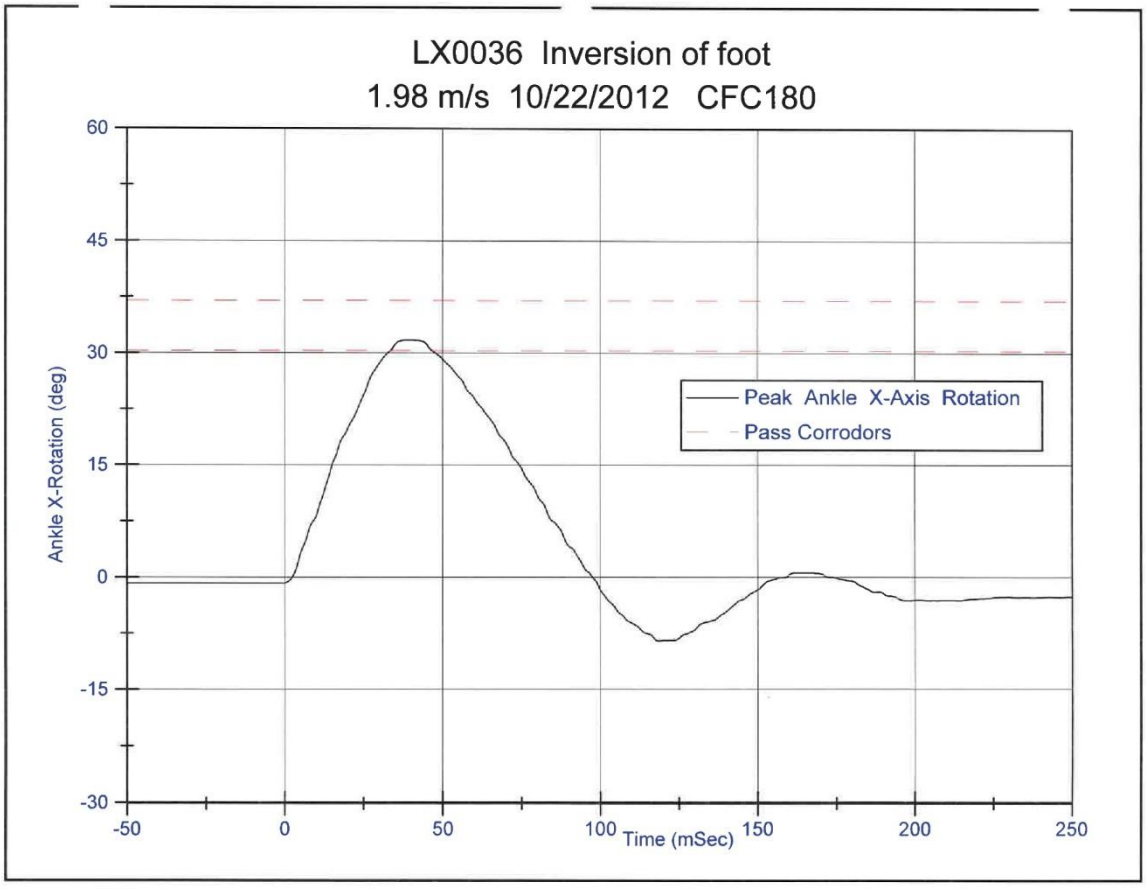

LX0036 Ball of foot
4.98 m/s 10/22/2012 CFC600
Tibia Load (N)
4000
3000
2000
1000
0
-1000
-50
0
50
100
150
200
250
Time (mSec)
Peak Lower Tibia Compressive Load
Pass Corrodors

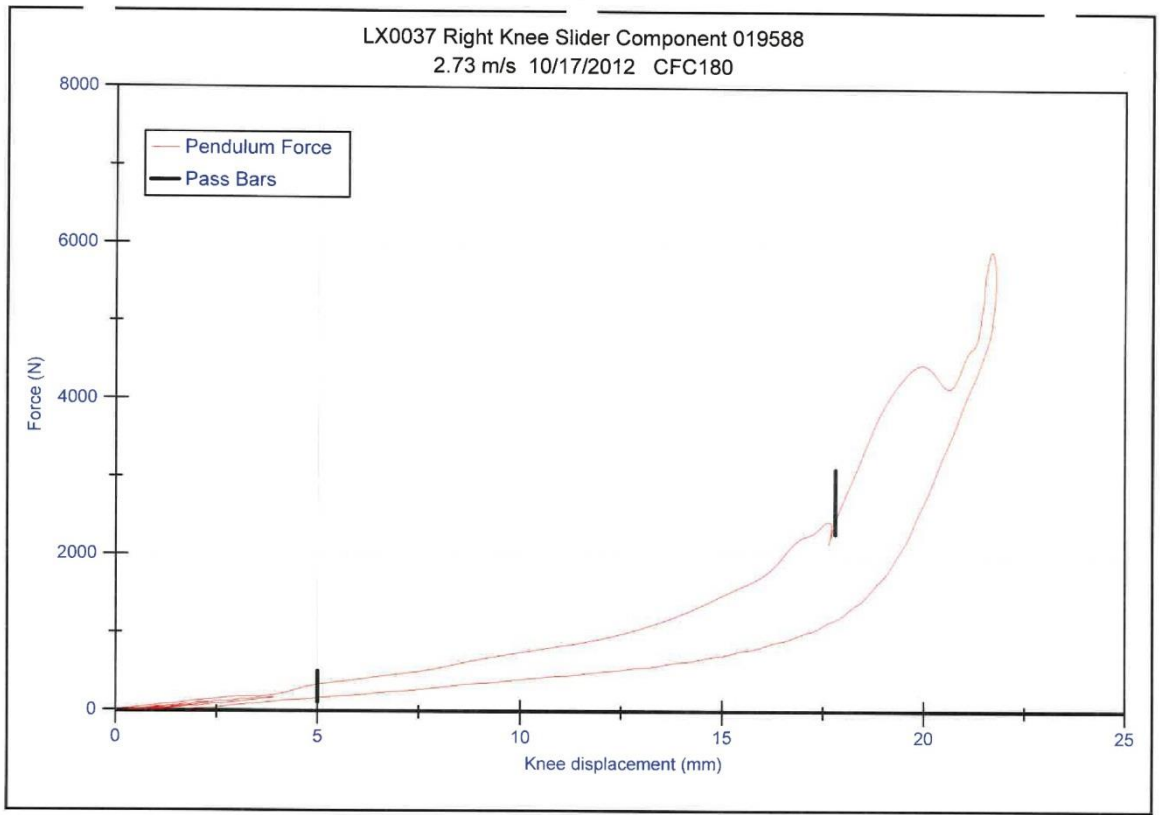

LX0036 Ball of foot
4.98 m/s 10/22/2012 CFC600
Ankle Moment (Nm)
100
75
50
25
0
-25
-50
0
50
100
150
200
250
Time (mSec)
Peak Ankle Resistive Moment
Pass Corrodors

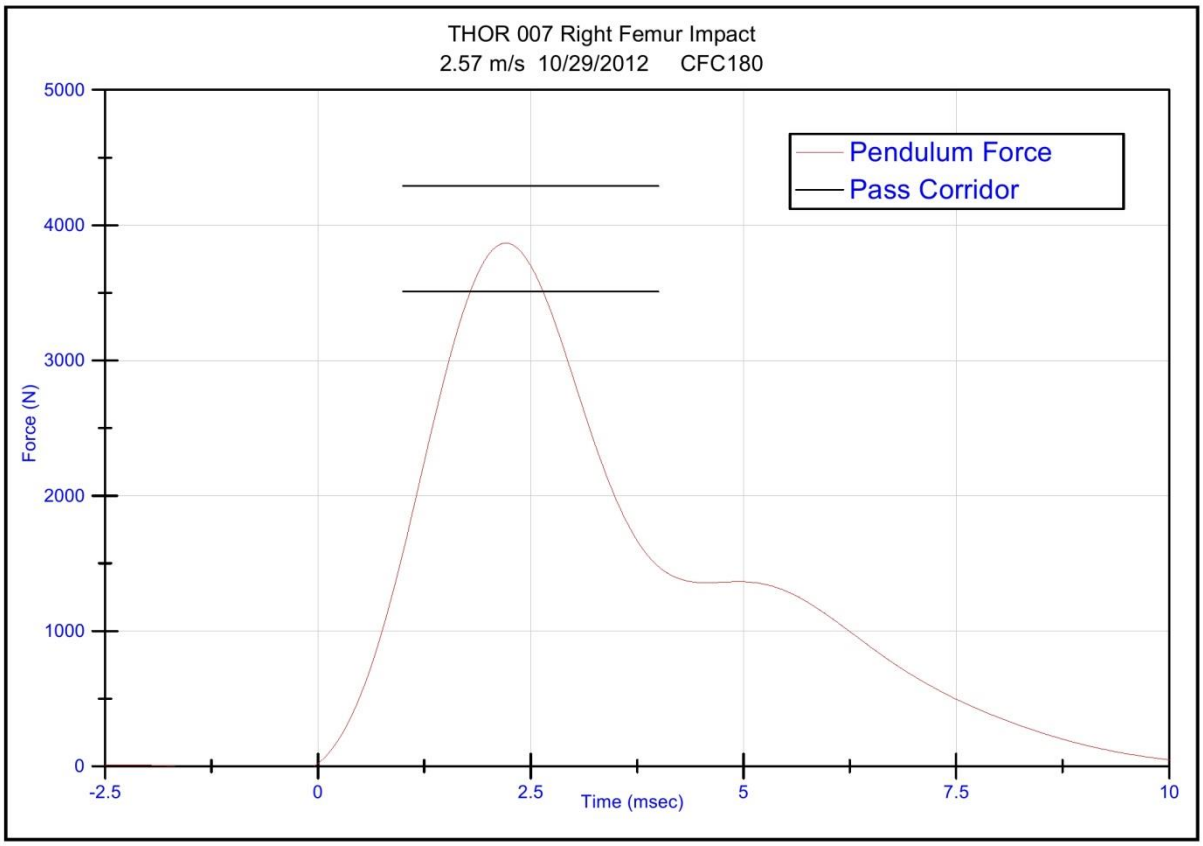

LX0036 Ball of foot
4.98 m/s 10/22/2012 CFC180
Ankle Y-Rotation (deg)
60
45
30
15
0
-15
-30
-50
0
50
100
150
200
250
Time (mSec)
Peak Ankle Y-Axis Rotation
Pass Corrodors

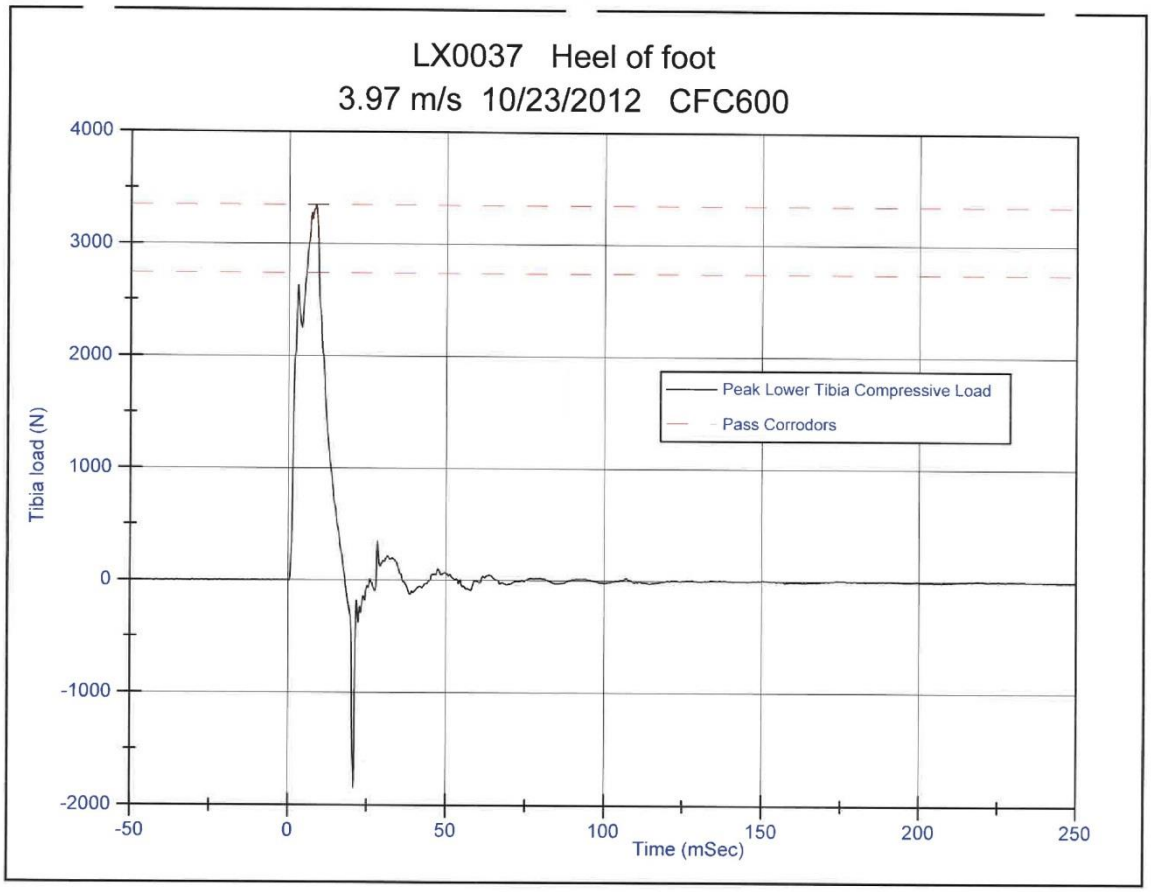

LX0036 Inversion of foot
1.98 m/s 10/22/2012 CFC600
Tibia Load (N)
800
700
600
500
400
300
200
100
0
-100
-50
0
50
100
150
200
250
Time (mSec)
Peak Lower Tibia Compressive Load
Pass Corrodors

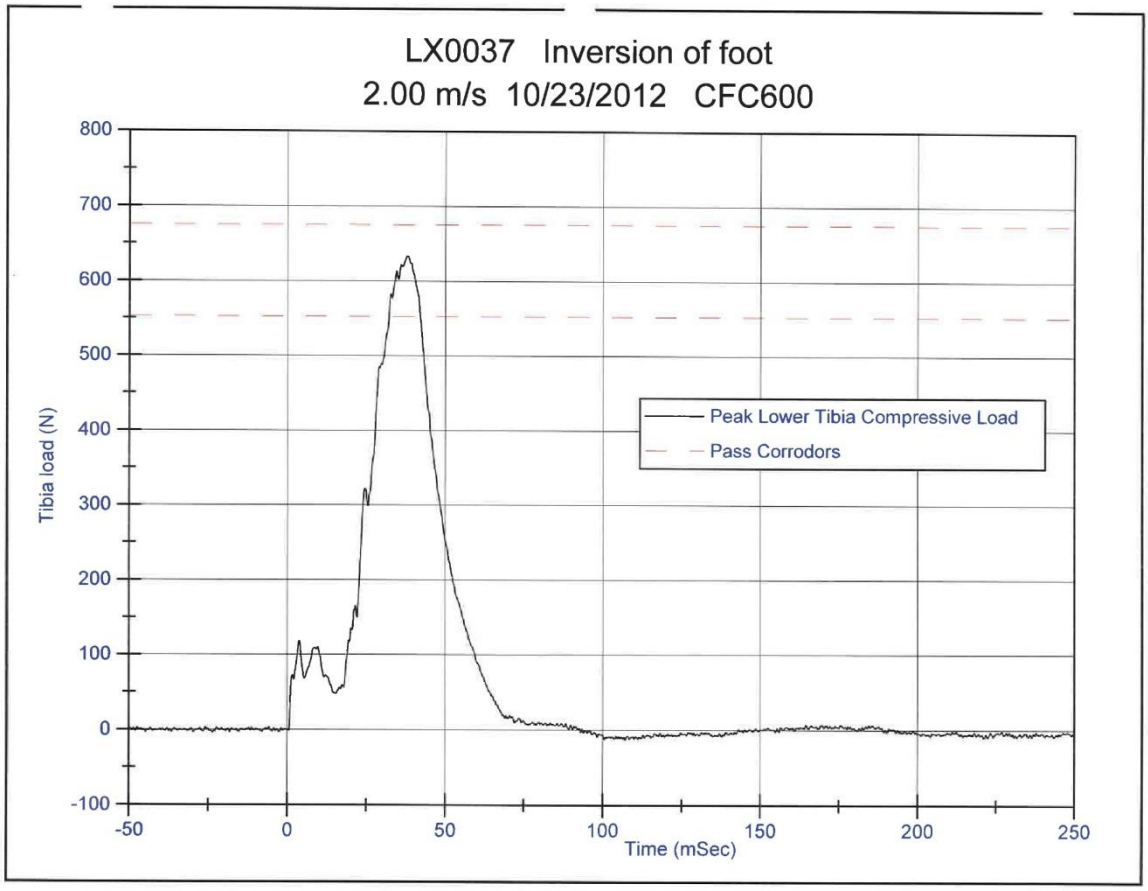

LX0036 Inversion of foot
1.98 m/s 10/22/2012 CFC600
Ankle Moment (Nm)
50
40
30
20
10
0
-10
-50
0
50
100
150
200
250
Time (mSec)
Peak Ankle Resistive Moment
Pass Corrodors

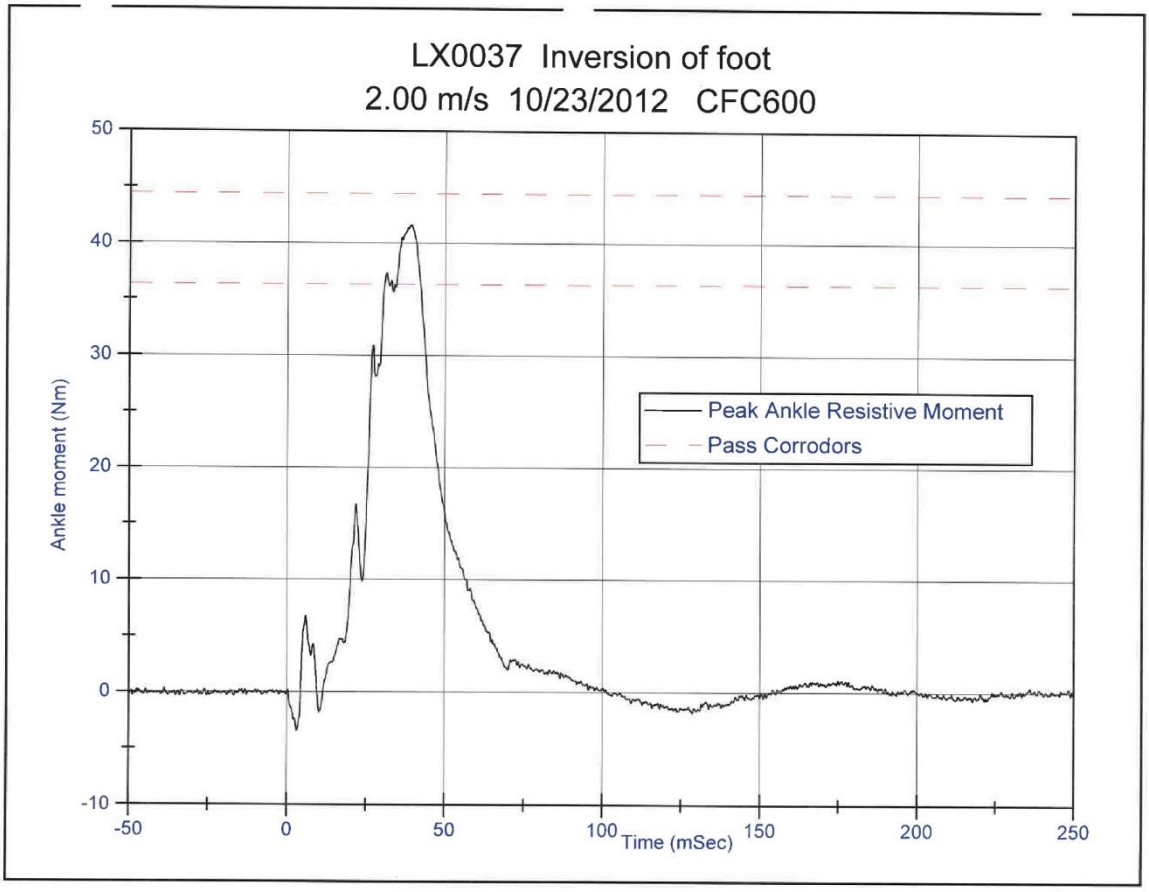

LX0036 Inversion of foot
1.98 m/s 10/22/2012 CFC180
Ankle X-Rotation (deg)
60
45
30
15
0
-15
-30
-50
0
50
100
150
200
250
Time (mSec)
Peak Ankle X-Axis Rotation
Pass Corrodors

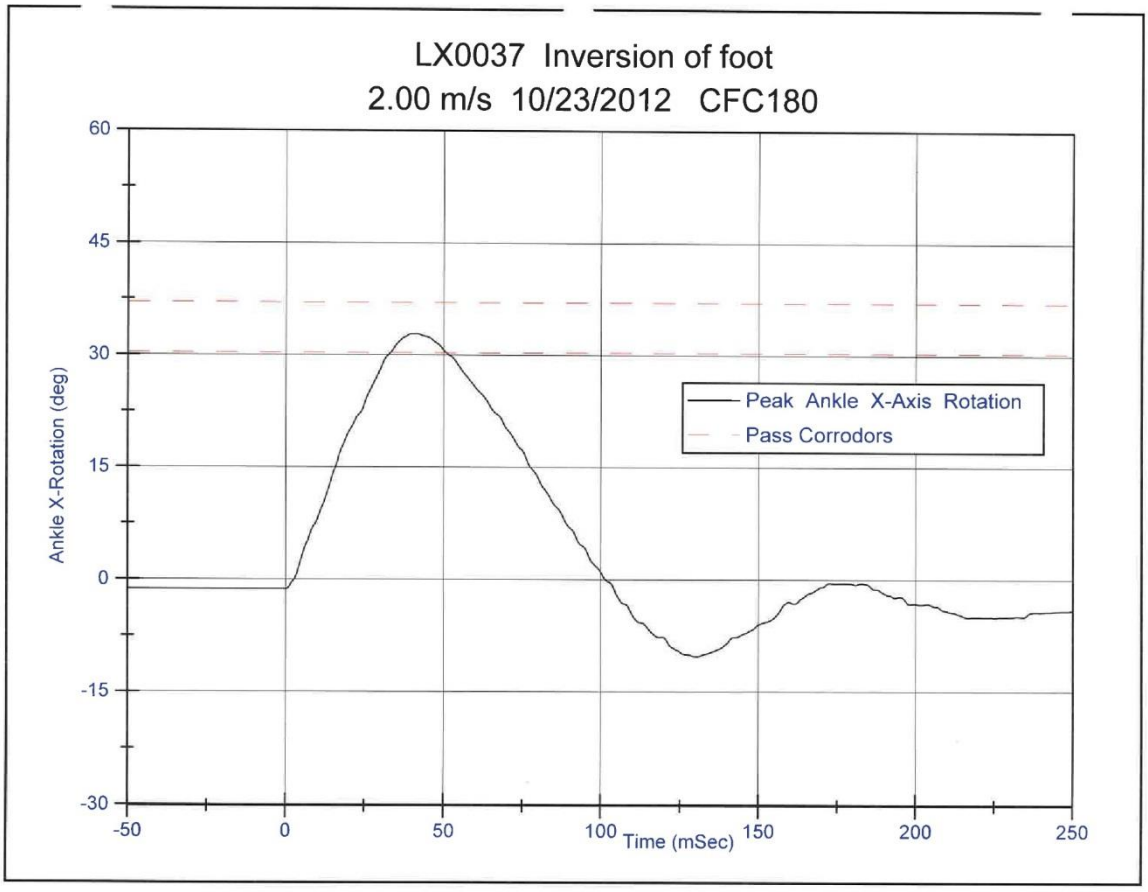

LX0037 Right Knee Slider Component 019588
2.73 m/s 10/17/2012 CFC180
Pendulum Force
Pass Bars
Force (N)
8000
6000
4000
2000
0
0
5
10
15
20
25
Knee displacement (mm)

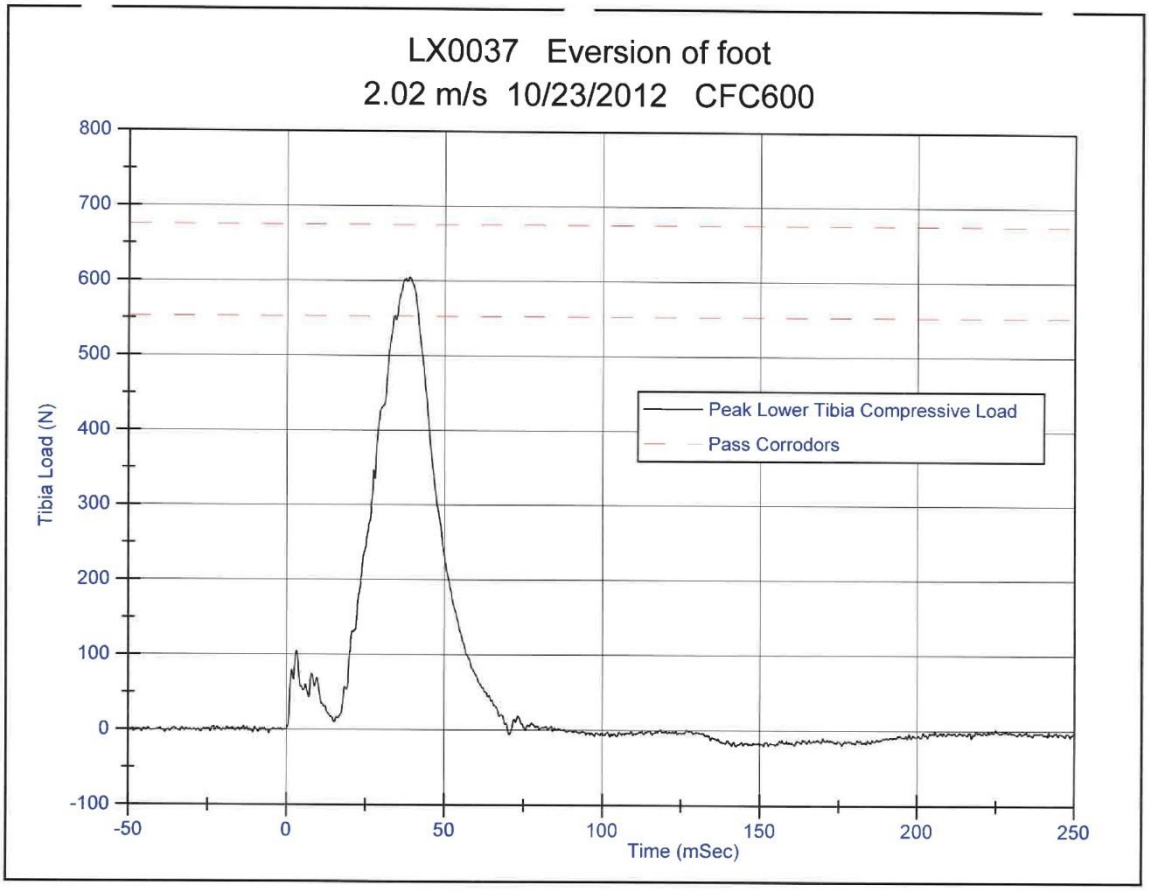

THOR 007 Right Femur Impact
2.57 m/s 10/29/2012 CFC180
Pendulum Force
Pass Corridor
Force (N)
5000
4000
3000
2000
1000
0
-2.5
0
2.5
5
7.5
10
Time (msec)

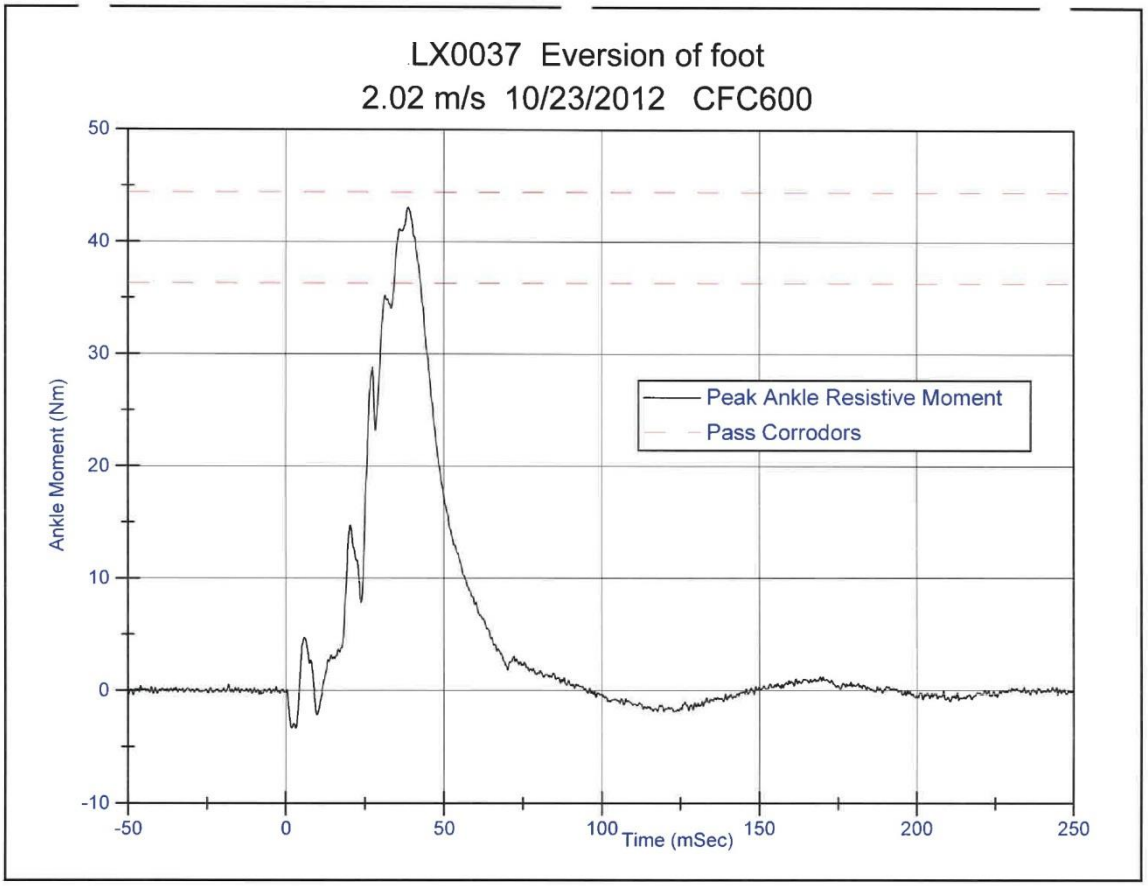

LX0037 Heel of foot
3.97 m/s 10/23/2012 CFC600
Tibia load (N)
4000
3000
2000
1000
0
-1000
-2000
-50
0
50
100
150
200
250
Time (mSec)
Peak Lower Tibia Compressive Load
Pass Corrodors

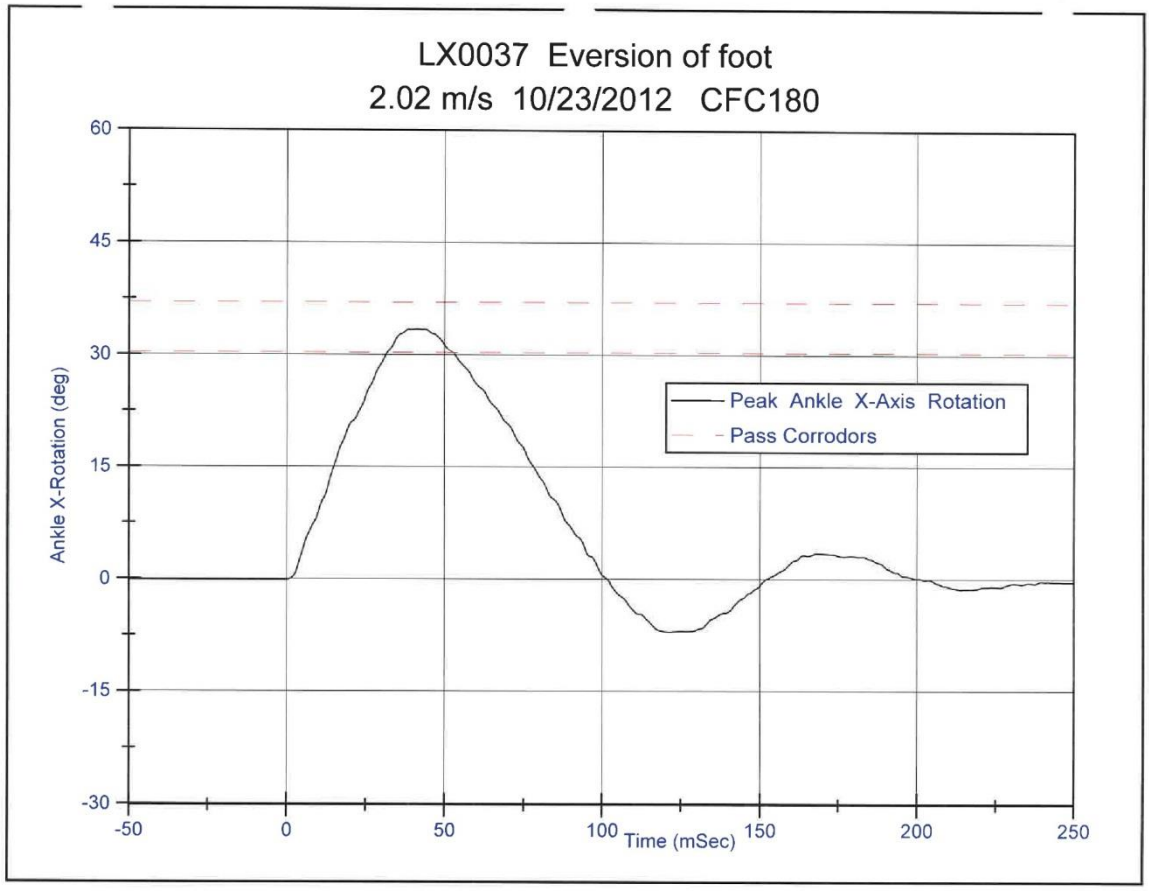

LX0037 Inversion of foot
2.00 m/s 10/23/2012 CFC600
Tibia load (N)
800
700
600
500
400
300
200
100
0
-100
-50
0
50
100
150
200
250
Time (mSec)
Peak Lower Tibia Compressive Load
Pass Corrodors

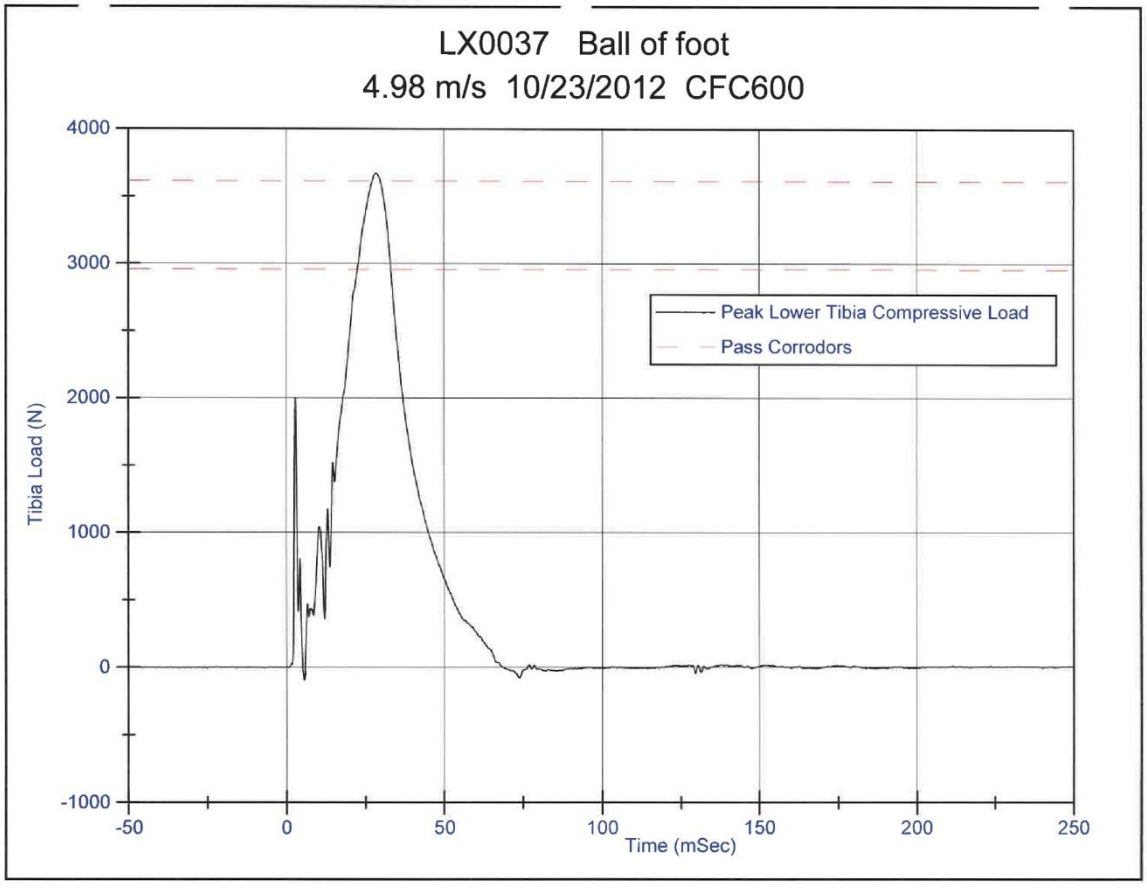

LX0037 Inversion of foot
2.00 m/s 10/23/2012 CFC600
Ankle moment (Nm)
50
40
30
20
10
0
-10
-50
0
50
100
150
200
250
Time (mSec)
Peak Ankle Resistive Moment
Pass Corrodors

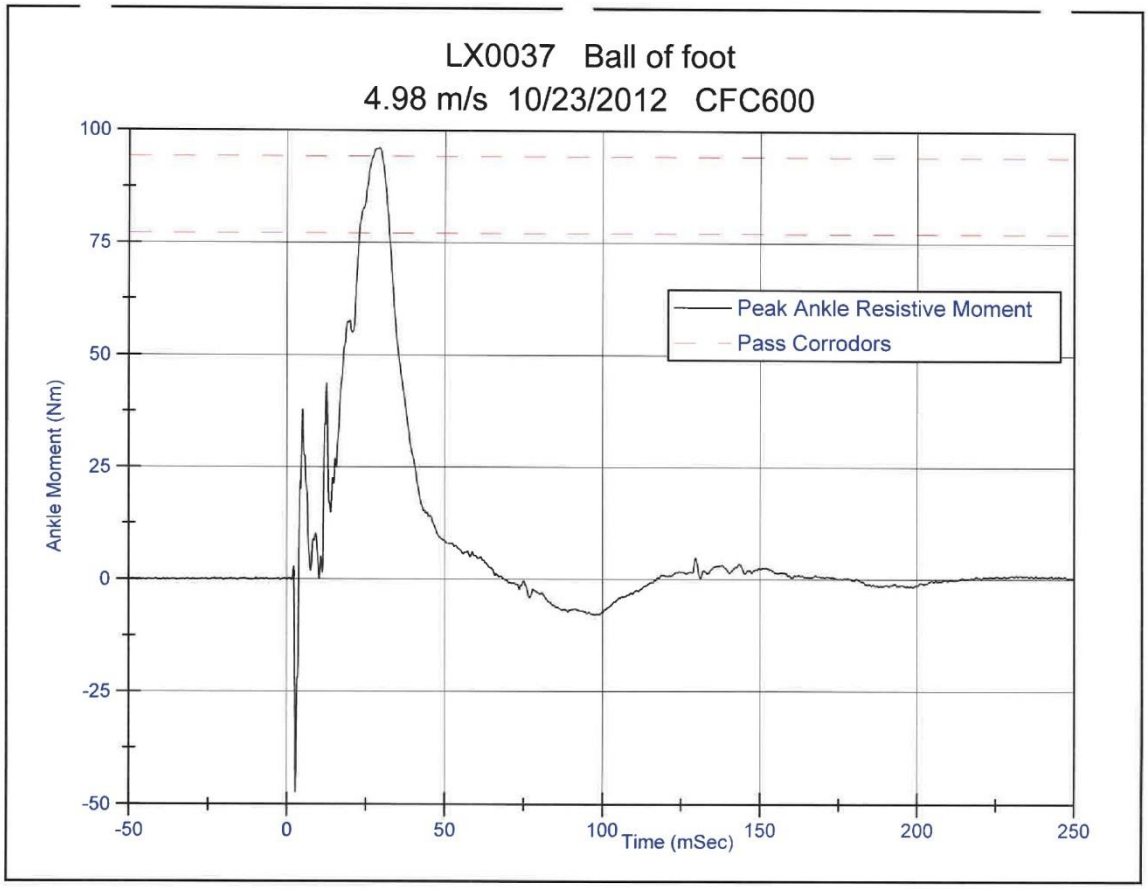

LX0037 Inversion of foot
2.00 m/s 10/23/2012 CFC180
Ankle X-Rotation (deg)
60
45
30
15
0
-15
-30
-50
0
50
100
150
200
250
Time (mSec)
Peak Ankle X-Axis Rotation
Pass Corrodors

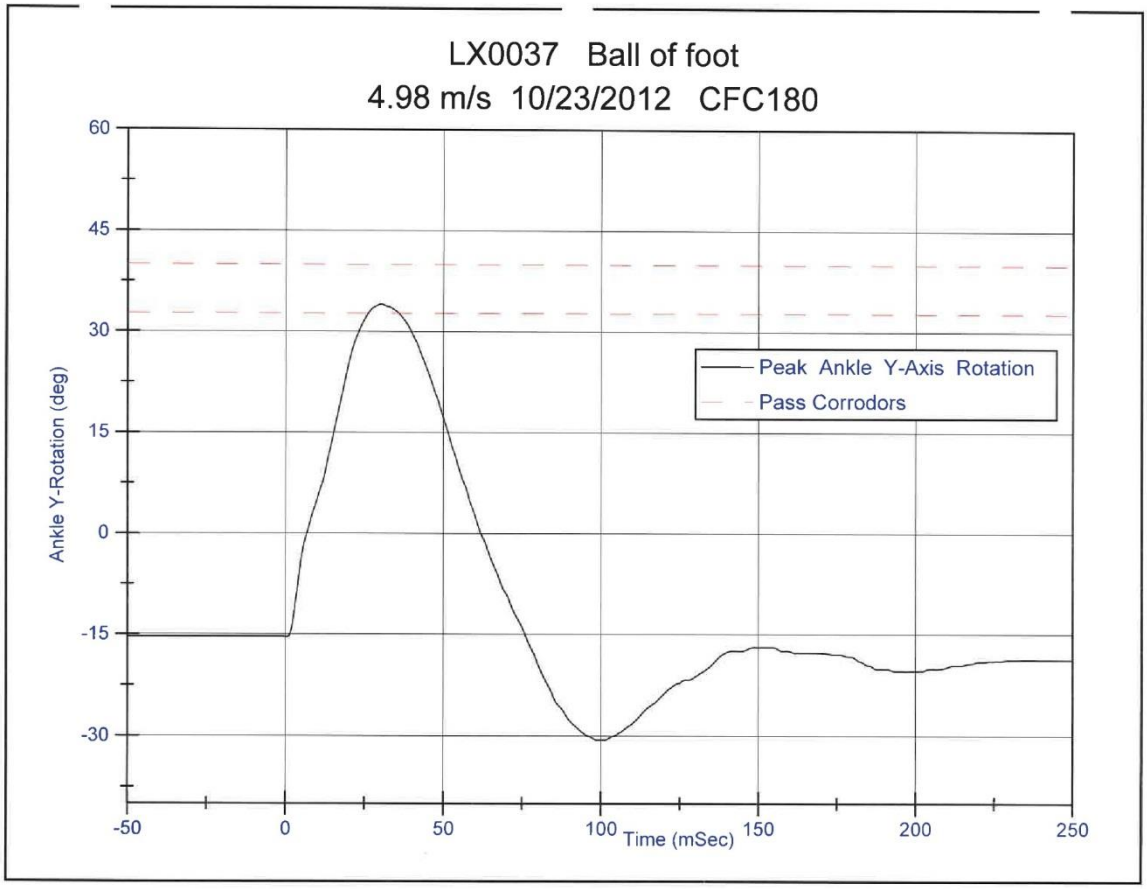

LX0037 Eversion of foot
2.02 m/s 10/23/2012 CFC600
Tibia Load (N)
800
700
600
500
400
300
200
100
0
-100
-50
0
50
100
150
200
250
Time (mSec)
Peak Lower Tibia Compressive Load
Pass Corrodors


LX0037 Eversion of foot
2.02 m/s 10/23/2012 CFC600
Ankle Moment (Nm)
50
40
30
20
10
0
-10
-50
0
50
100
150
200
250
Time (mSec)
Peak Ankle Resistive Moment
Pass Corrodors

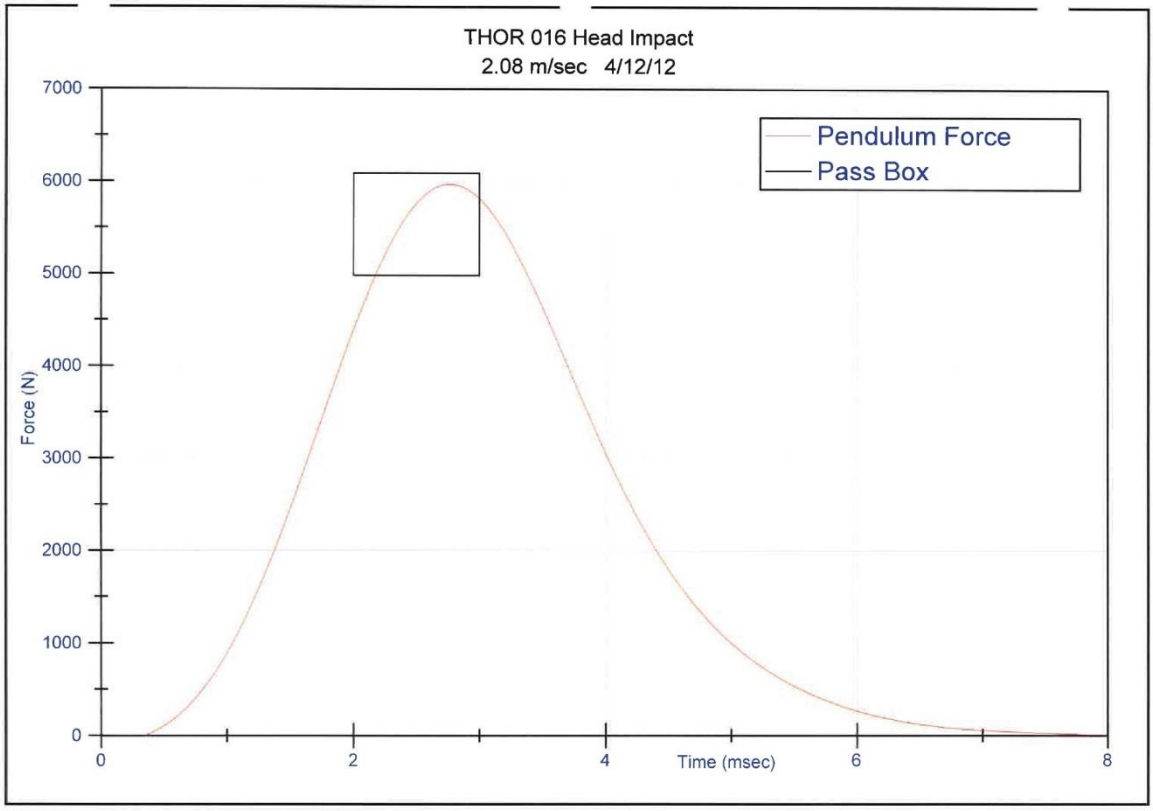

LX0037 Eversion of foot
2.02 m/s 10/23/2012 CFC180
Ankle X-Rotation (deg)
60
45
30
15
0
-15
-30
-50
0
50
100
150
200
250
Time (mSec)
Peak Ankle X-Axis Rotation
Pass Corrodors

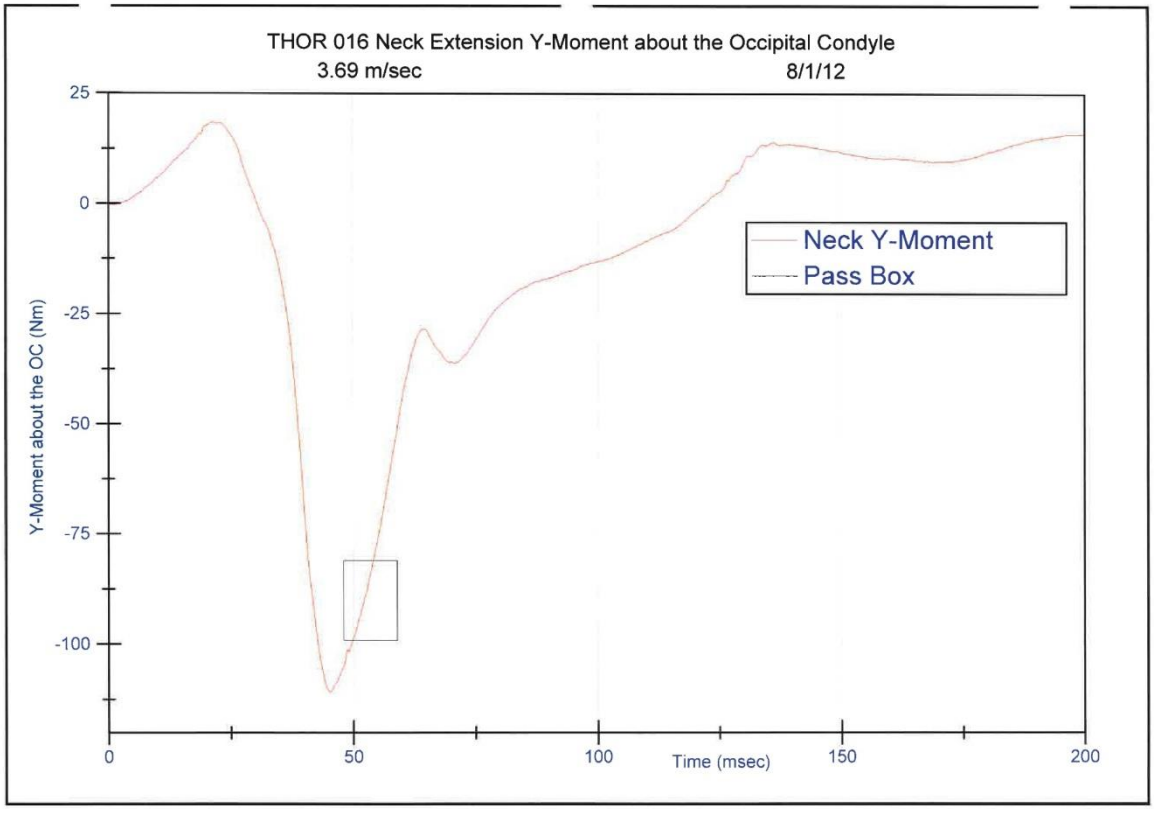

LX0037 Ball of foot
4.98 m/s 10/23/2012 CFC600
Tibia Load (N)
4000
3000
2000
1000
0
-1000
-50
0
50
100
150
200
250
Time (mSec)
Peak Lower Tibia Compressive Load
Pass Corrodors

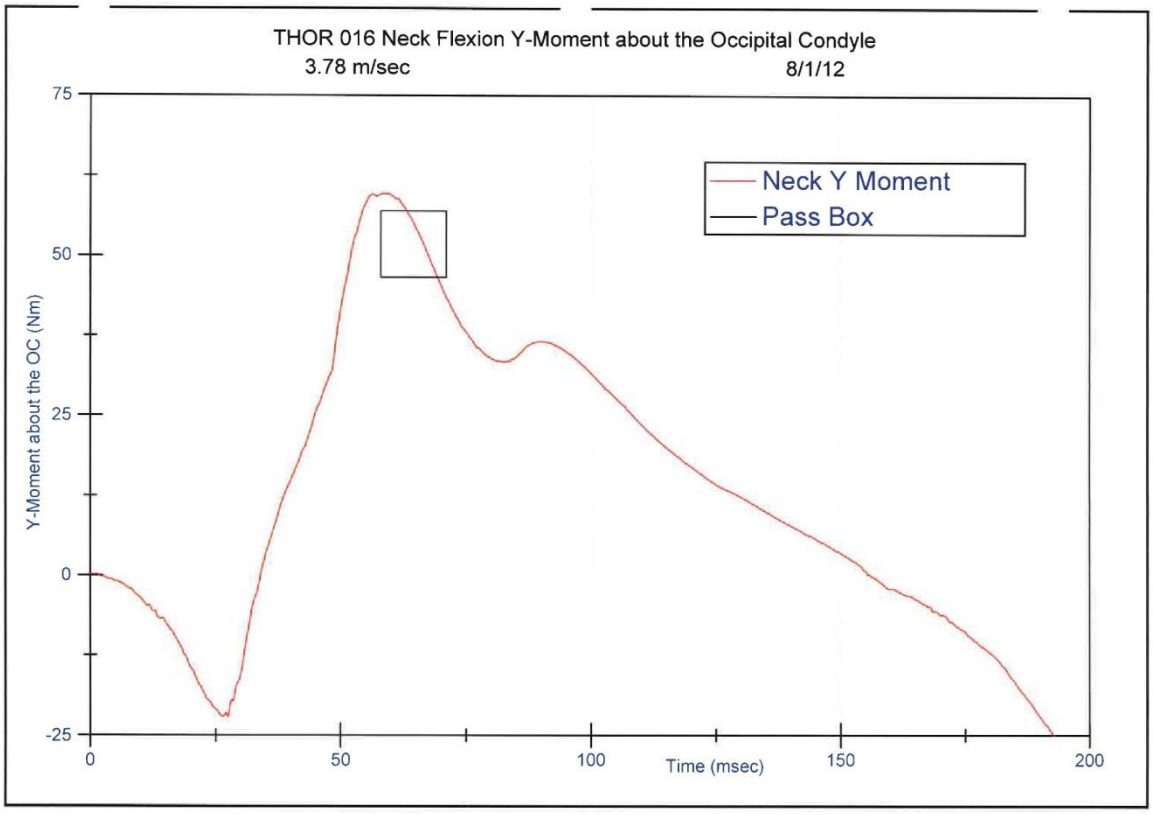

LX0037 Ball of foot
4.98 m/s 10/23/2012 CFC600
Peak Ankle Resistive Moment
Pass Corrodors
Ankle Moment (Nm)
Time (mSec)
100
75
50
25
0
-25
-50
-50
0
50
100
150
200
250

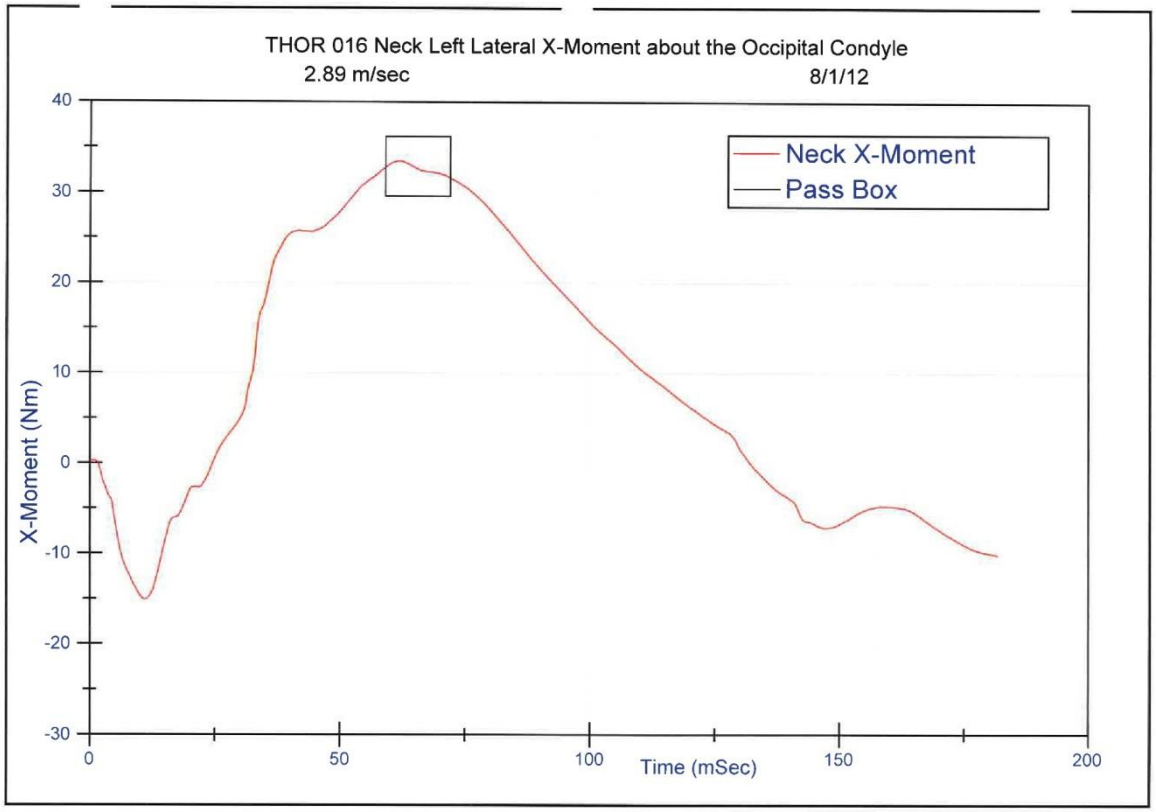

LX0037 Ball of foot
4.98 m/s 10/23/2012 CFC180
Peak Ankle Y-Axis Rotation
Pass Corrodors
Ankle Y-Rotation (deg)
Time (mSec)
60
45
30
15
0
-15
-30
-50
0
50
100
150
200
250

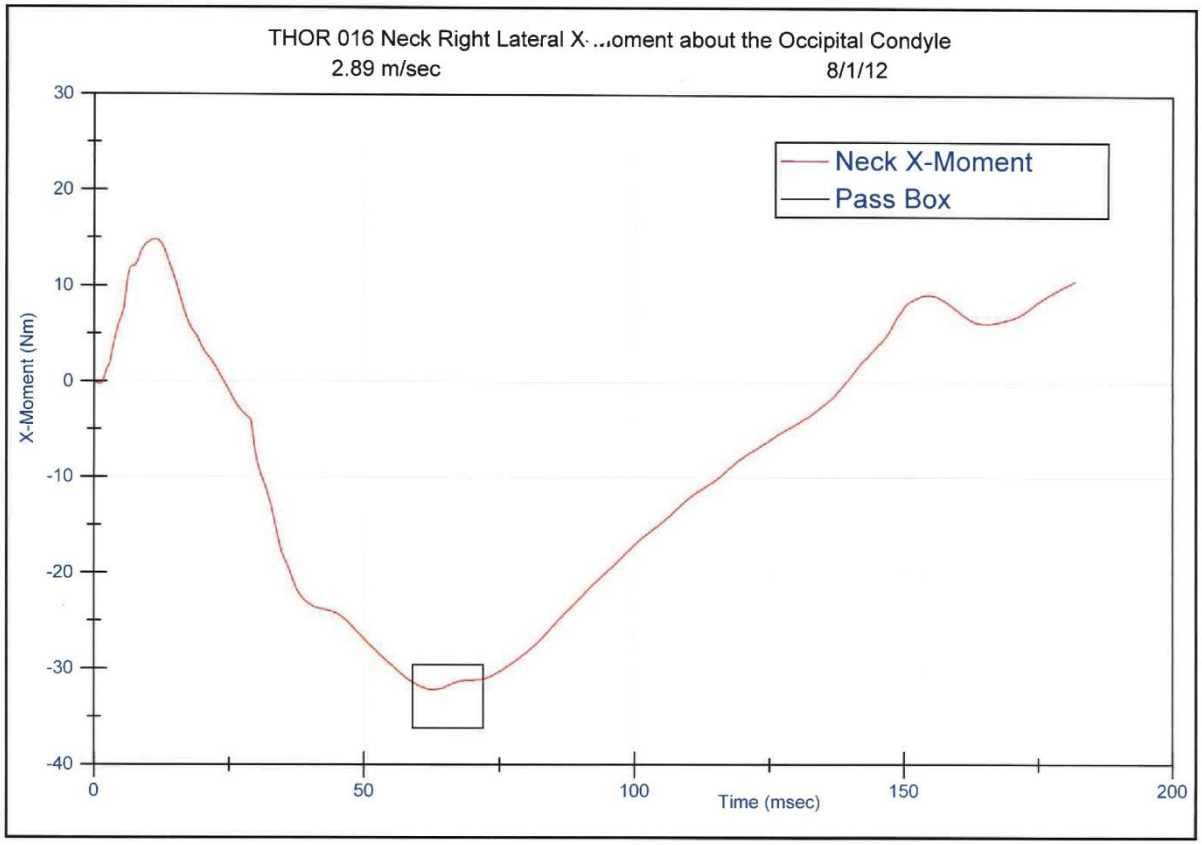
50% ADULT MALE THOR016 DUMMY CALIBRATIONS

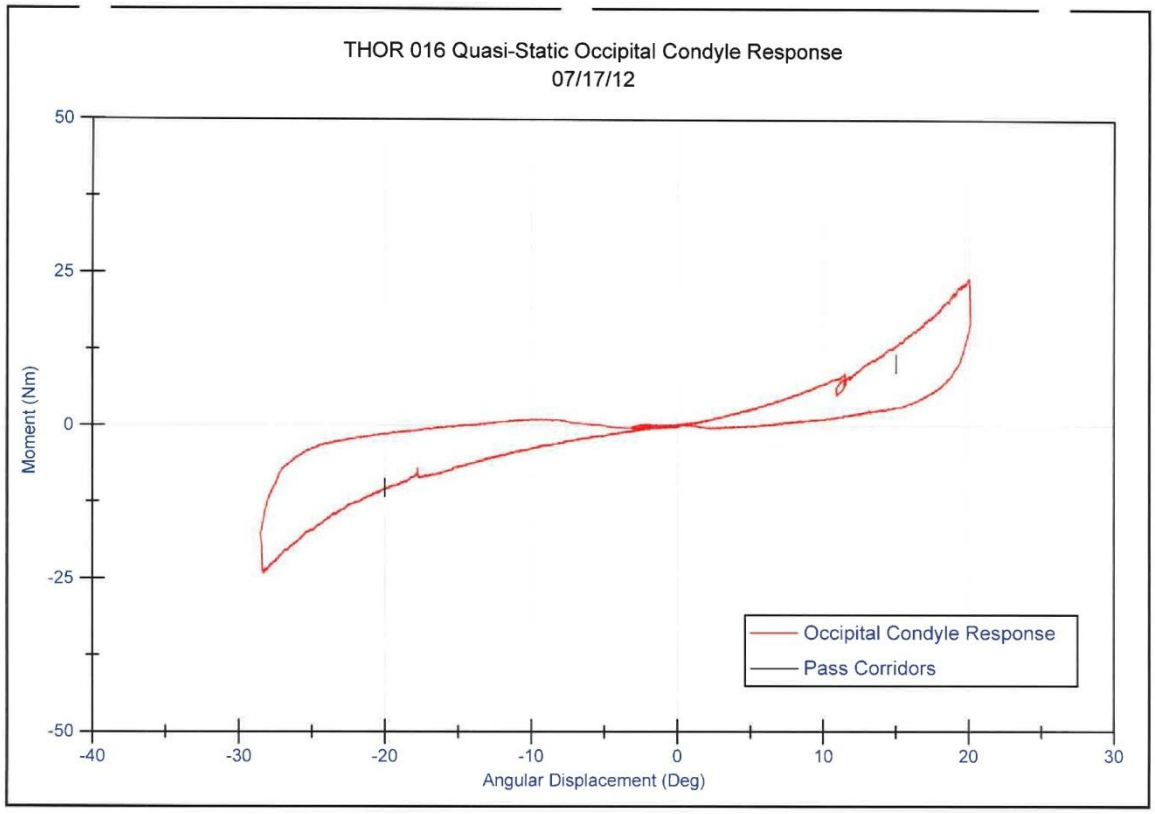

THOR 016 Head Impact
2.08 m/sec 4/12/12
Pendulum Force
Pass Box
Force (N)
7000
6000
5000
4000
3000
2000
1000
0
0
2
4
6
8
Time (msec)

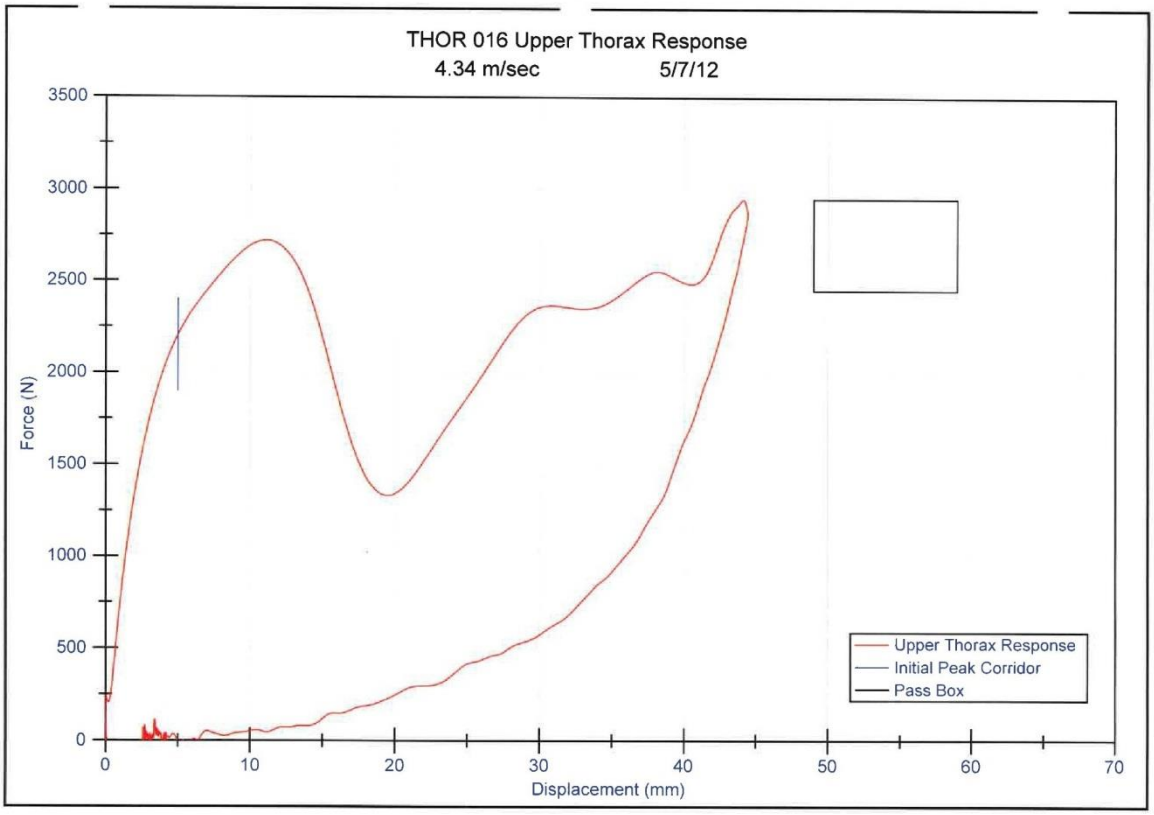

THOR 016 Neck Extension Y-Moment about the Occipital Condyle
3.69 m/sec 8/1/12
Neck Y-Moment
Pass Box
Y-Moment about the OC (Nm)
25
0
-25
-50
-75
-100
0
50
100
150
200
Time (msec)

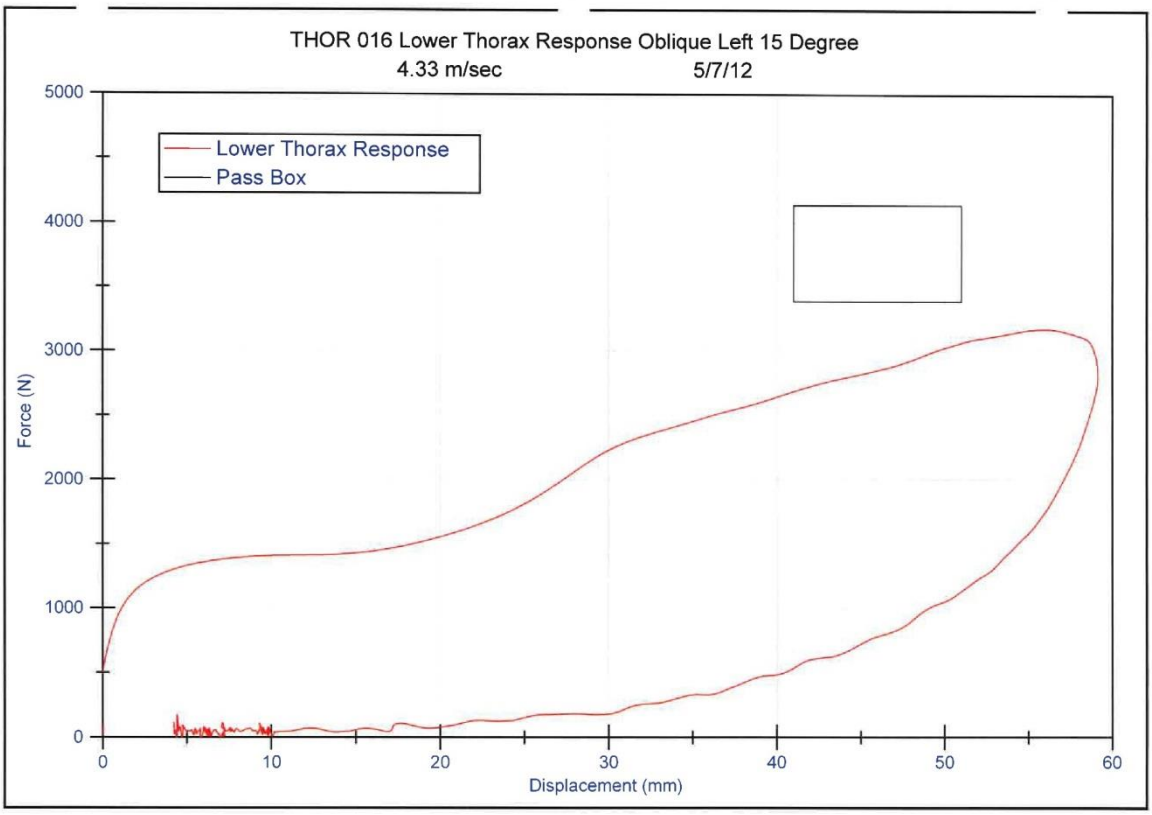

THOR 016 Neck Flexion Y-Moment about the Occipital Condyle
3.78 m/sec
8/1/12
Neck Y Moment
Pass Box
Y-Moment about the OC (Nm)
75
50
25
0
-25
0
50
100
150
200
Time (msec)

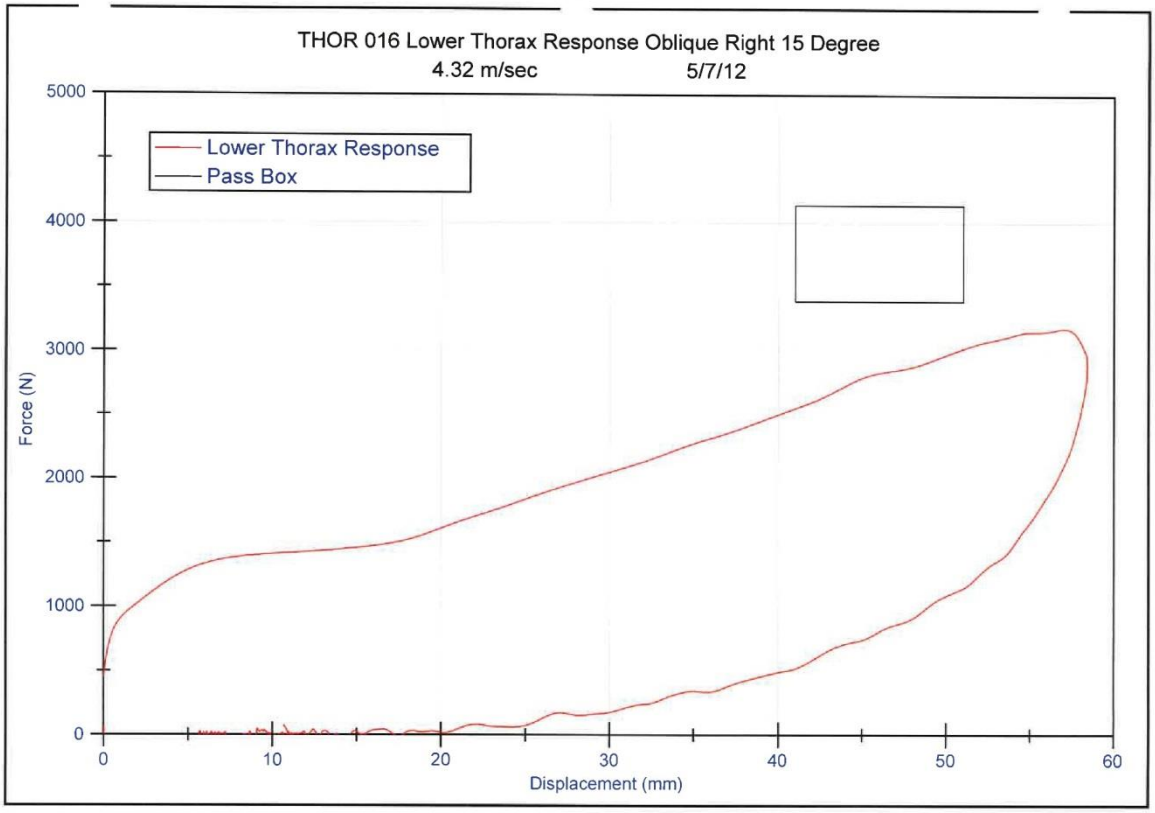

THOR 016 Neck Left Lateral X-Moment about the Occipital Condyle
2.89 m/sec
8/1/12
Neck X-Moment
Pass Box
X-Moment (Nm)
40
30
20
10
0
-10
-20
-30
0
50
100
150
200
Time (mSec)

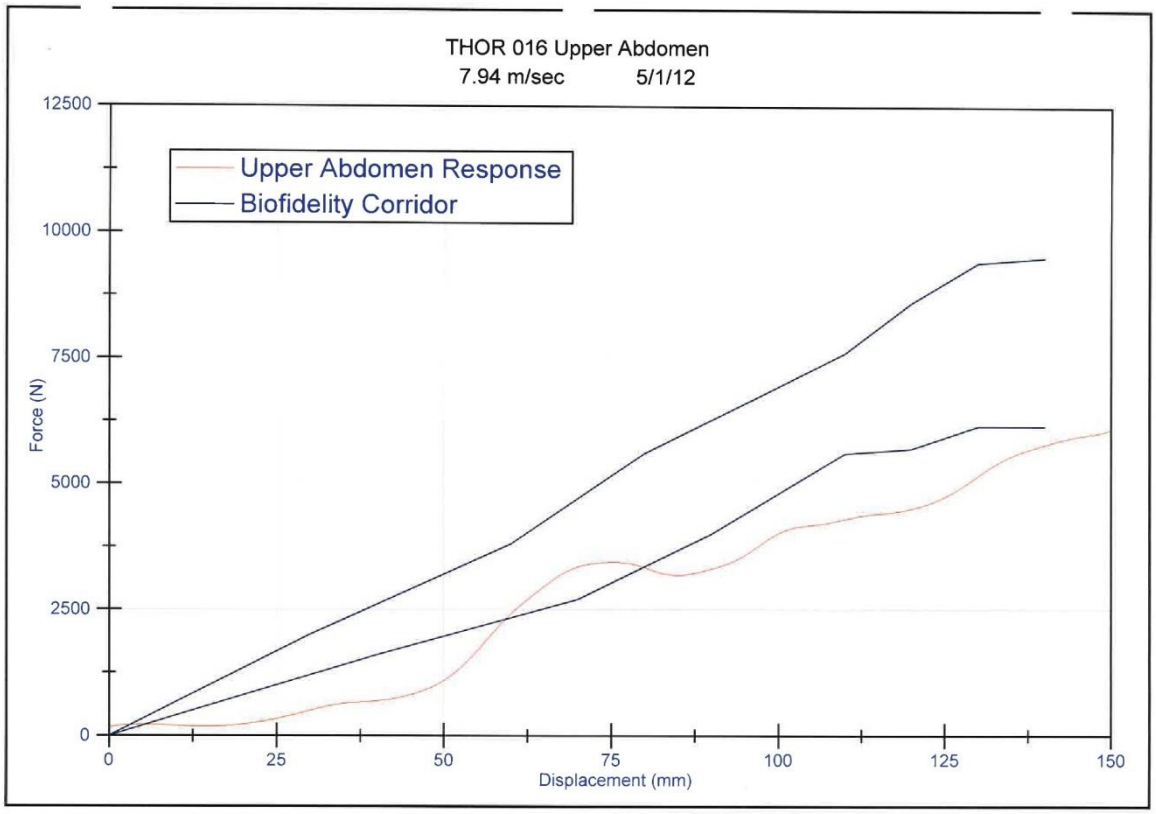

THOR 016 Neck Right Lateral X-...oment about the Occipital Condyle
2.89 m/sec
8/1/12
Neck X-Moment
Pass Box
X-Moment (Nm)
Time (msec)
30
20
10
0
-10
-20
-30
-40
0
50
100
150
200

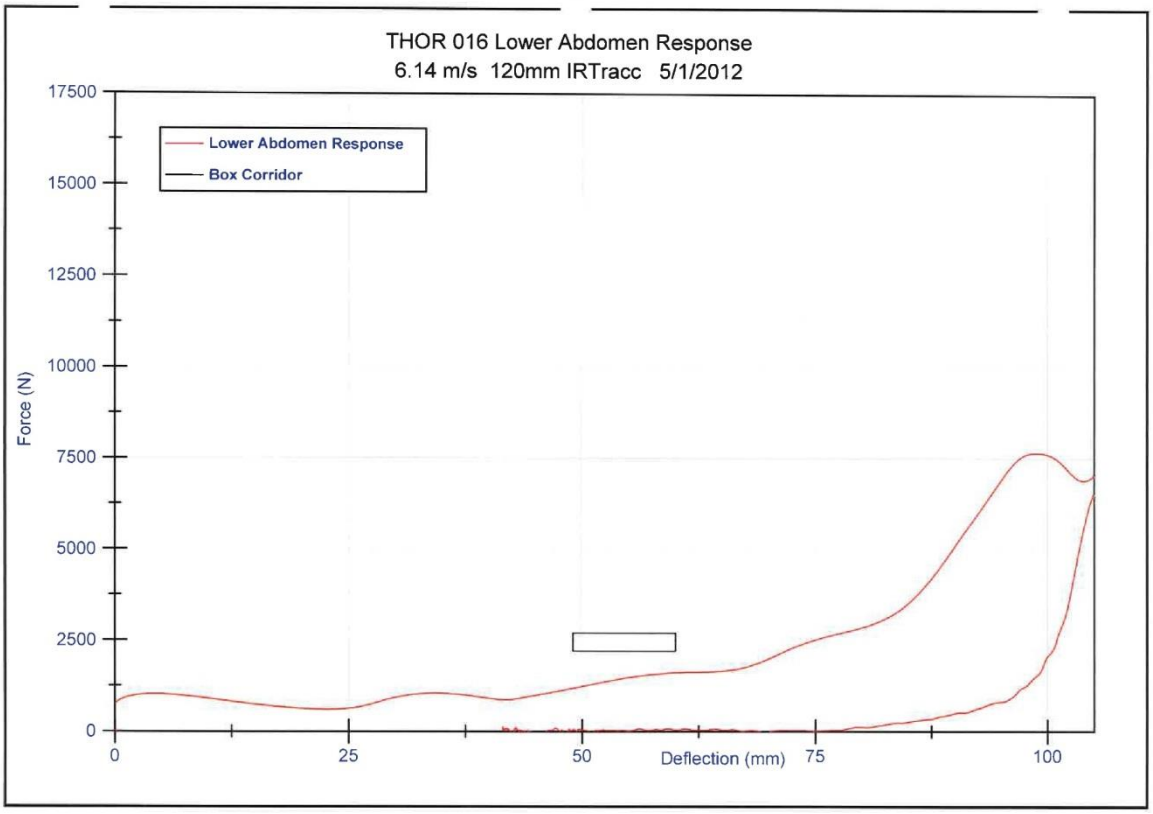

THOR 016 Quasi-Static Occipital Condyle Response
07/17/12
Occipital Condyle Response
Pass Corridors
Moment (Nm)
Angular Displacement (Deg)
50
25
0
-25
-50
-40
-30
-20
-10
0
10
20
30


THOR 016 Upper Thorax Response
4.34 m/sec 5/7/12
Force (N)
Displacement (mm)
Upper Thorax Response
Initial Peak Corridor
Pass Box

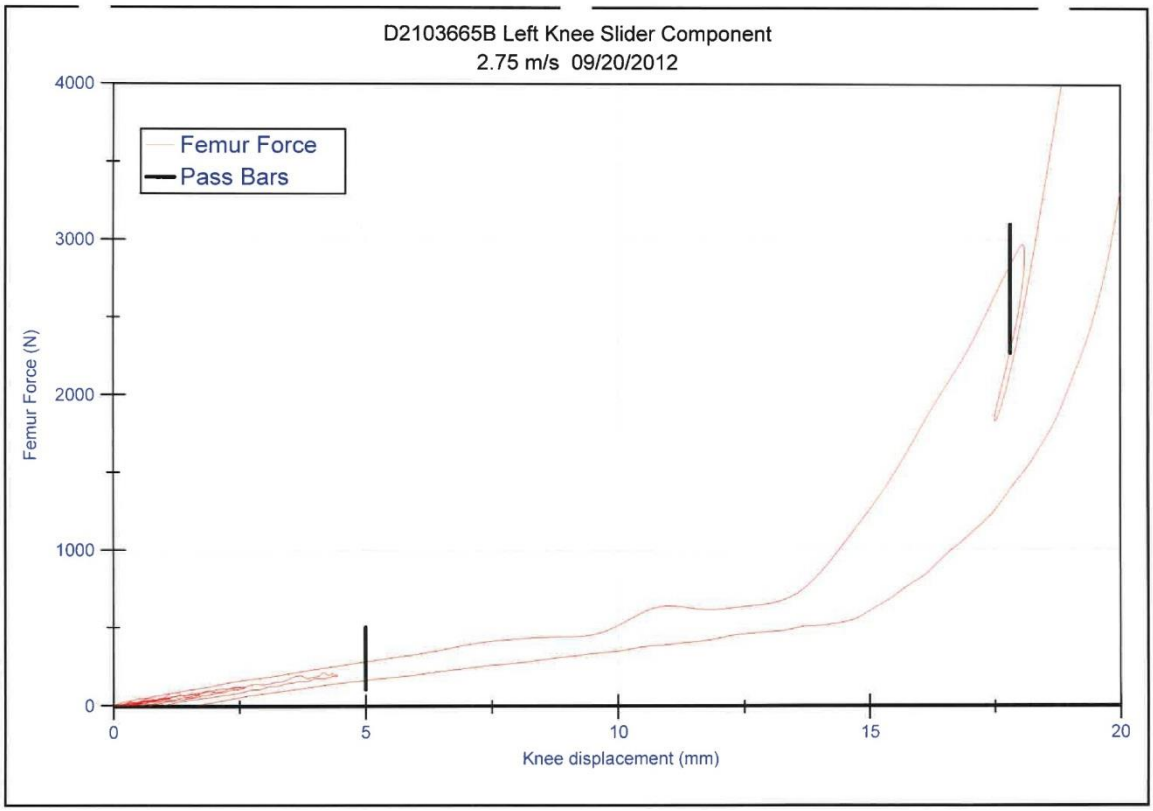

THOR 016 Lower Thorax Response Oblique Left 15 Degree
4.33 m/sec 5/7/12
Force (N)
Displacement (mm)
Lower Thorax Response
Pass Box

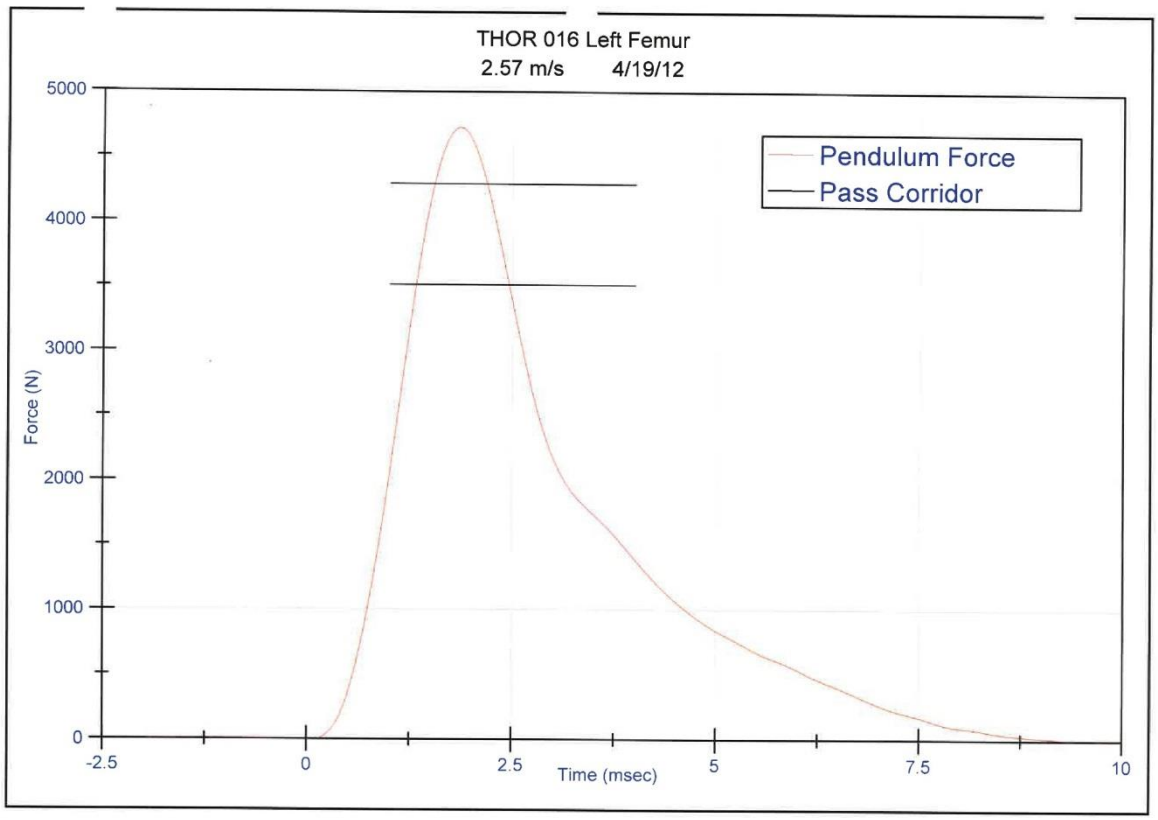

THOR 016 Lower Thorax Response Oblique Right 15 Degree
4.32 m/sec 5/7/12
Lower Thorax Response
Pass Box
Force (N)
Displacement (mm)
0
1000
2000
3000
4000
5000
0
10
20
30
40
50
60

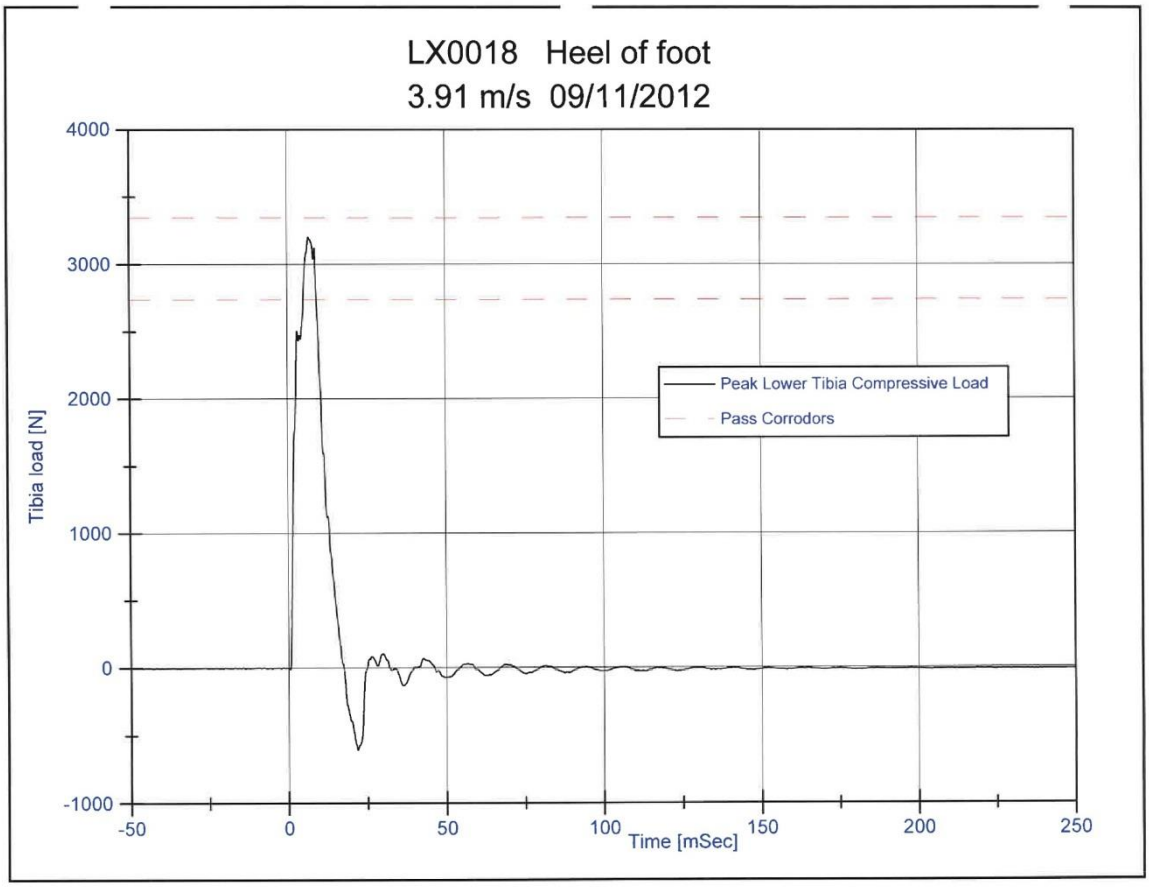

THOR 016 Upper Abdomen
7.94 m/sec 5/1/12
Upper Abdomen Response
Biofidelity Corridor
Force (N)
Displacement (mm)
0
2500
5000
7500
10000
12500
0
25
50
75
100
125
150

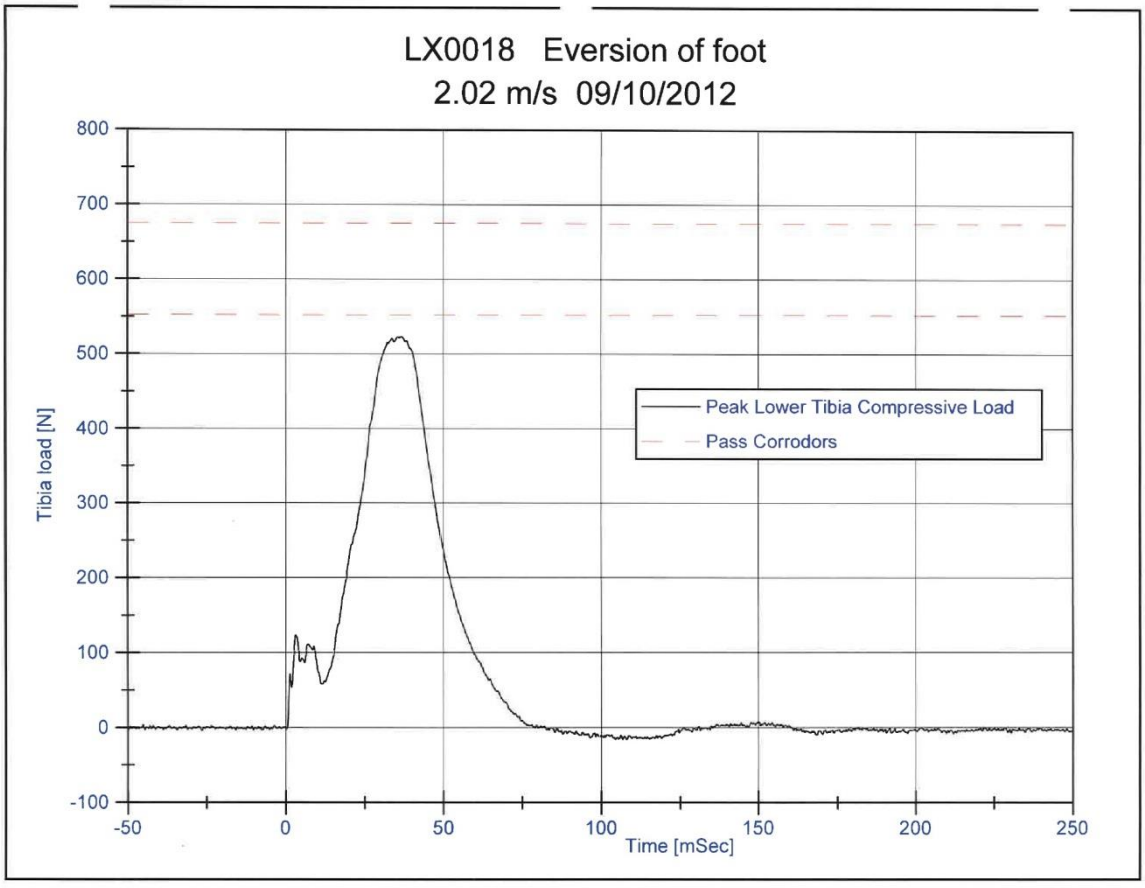

THOR 016 Lower Abdomen Response
6.14 m/s 120mm IRTracc 5/1/2012
Lower Abdomen Response
Box Corridor
Force (N)
17500
15000
12500
10000
7500
5000
2500
0
0
25
50
75
100
Deflection (mm)

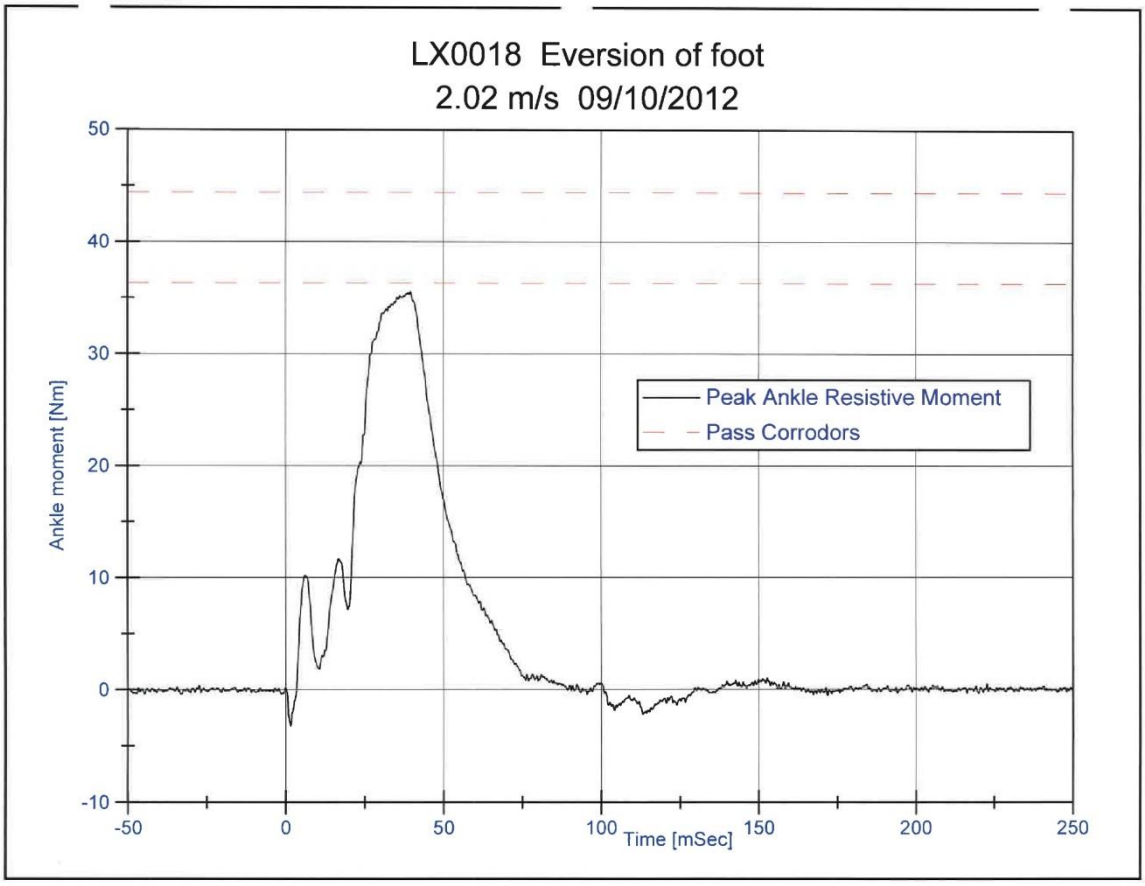
THOR 016 LEG CALIBRATIONS
LX0018 / LX0019

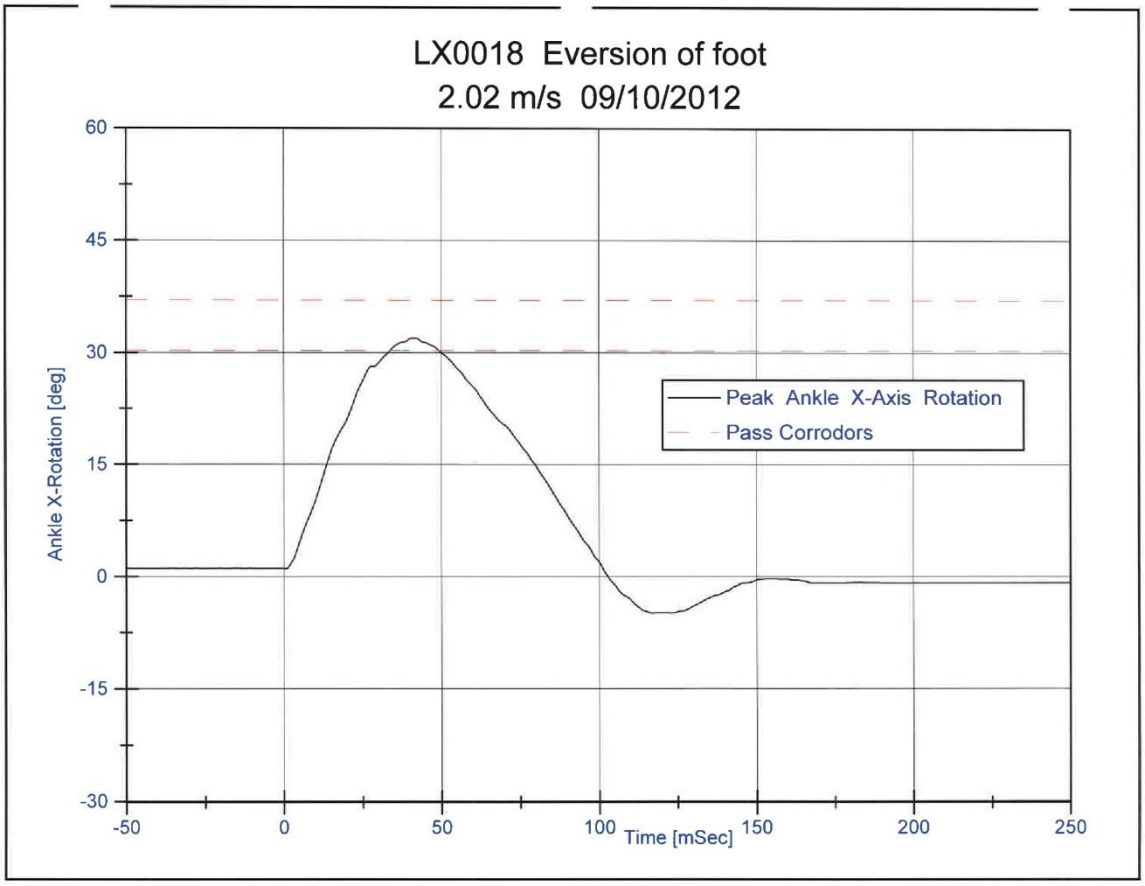

D2103665B Left Knee Slider Component
2.75 m/s 09/20/2012
Femur Force
Pass Bars
Femur Force (N)
Knee displacement (mm)
4000
3000
2000
1000
0
0
5
10
15
20

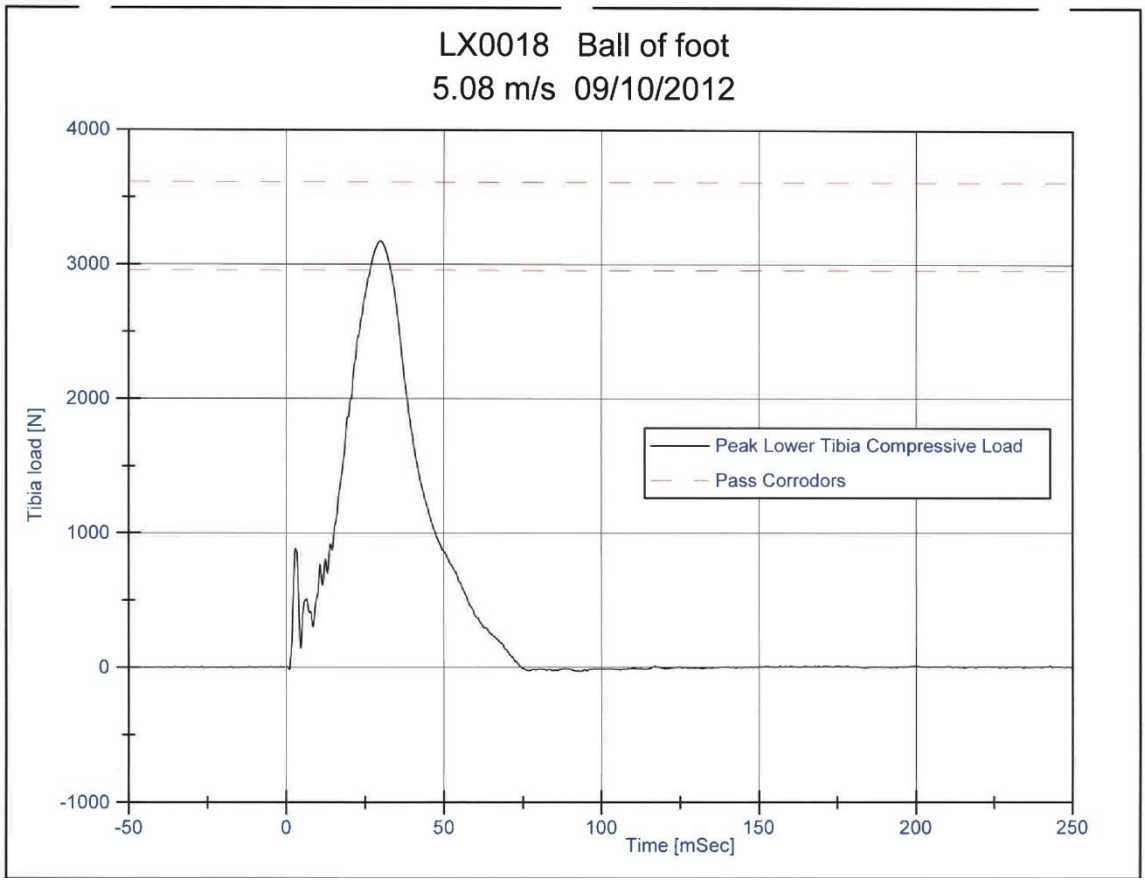

THOR 016 Left Femur
2.57 m/s 4/19/12
Pendulum Force
Pass Corridor
Force (N)
Time (msec)
5000
4000
3000
2000
1000
0
-2.5
0
2.5
5
7.5
10

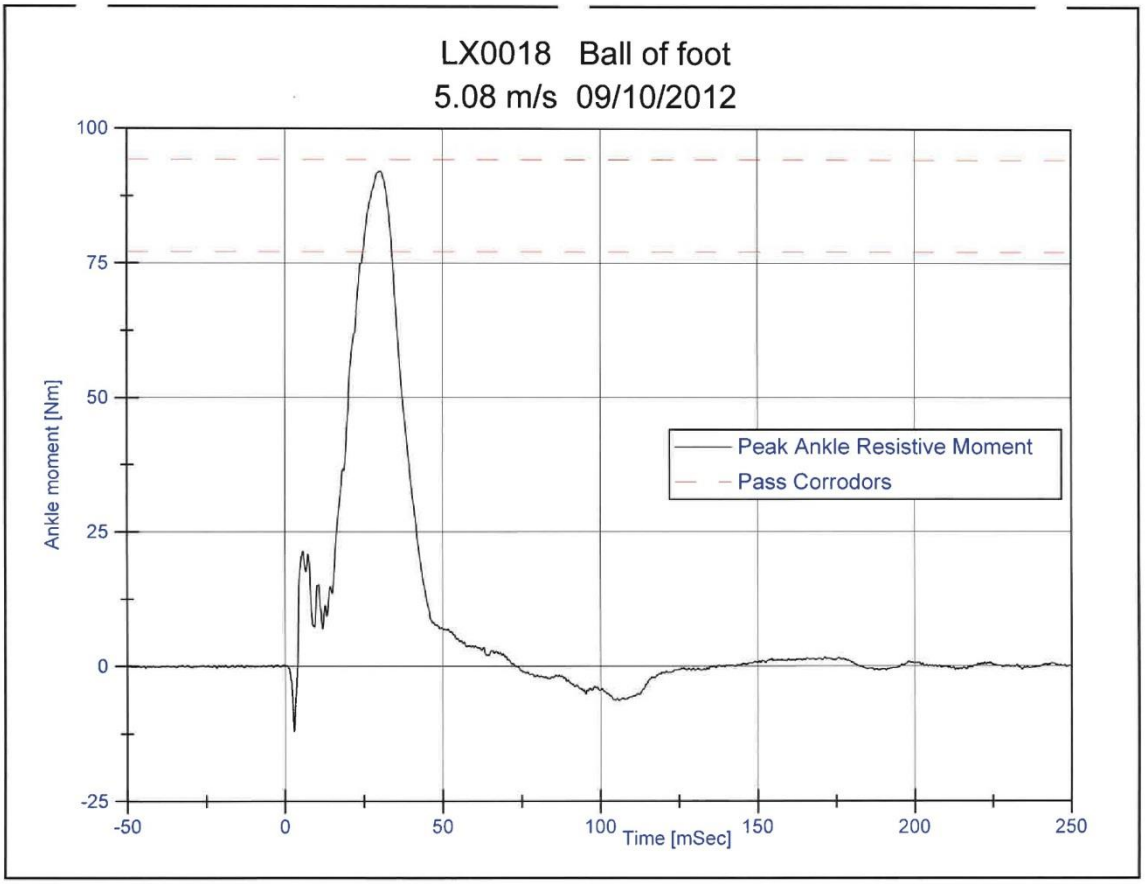

LX0018 Heel of foot
3.91 m/s 09/11/2012
Tibia load [N]
Time [mSec]
Peak Lower Tibia Compressive Load
Pass Corrodors
4000
3000
2000
1000
0
-1000
-50
0
50
100
150
200
250

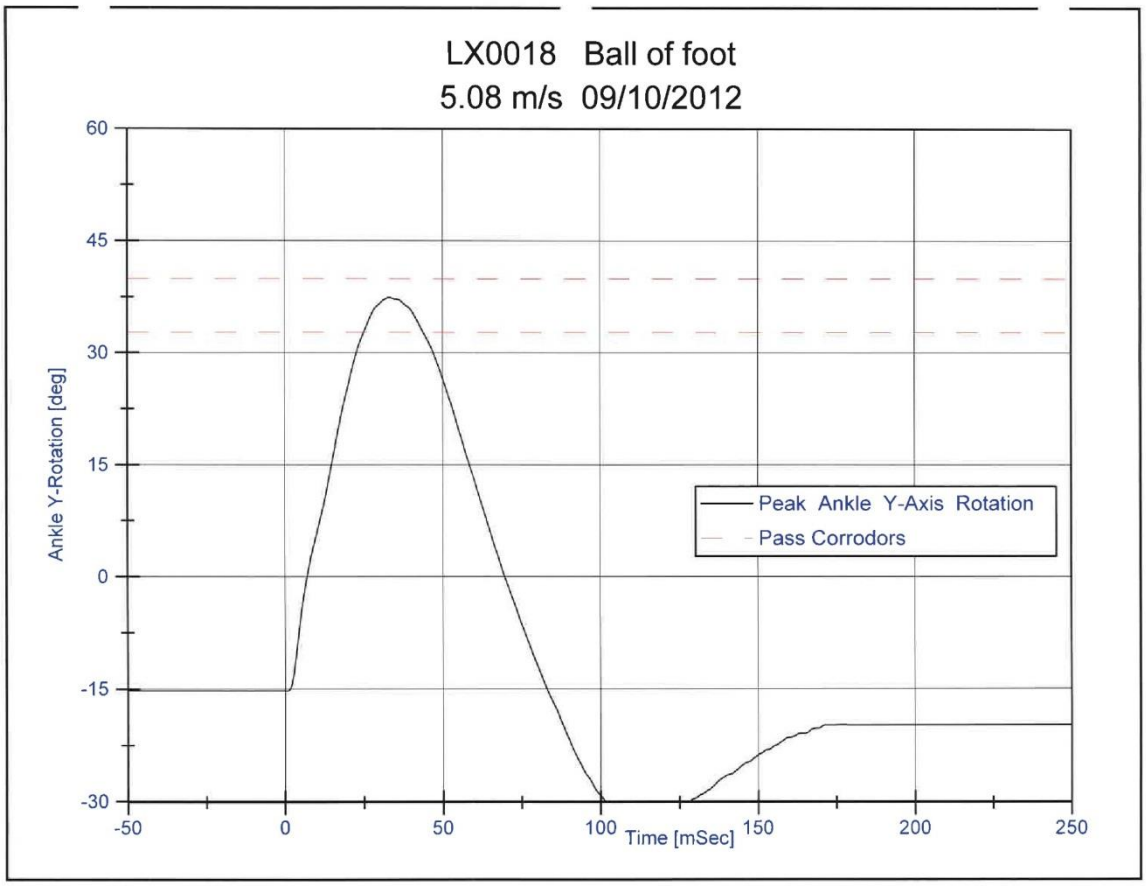

LX0018 Eversion of foot
2.02 m/s 09/10/2012
Tibia load [N]
Time [mSec]
Peak Lower Tibia Compressive Load
Pass Corrodors
800
700
600
500
400
300
200
100
0
-100
-50
0
50
100
150
200
250

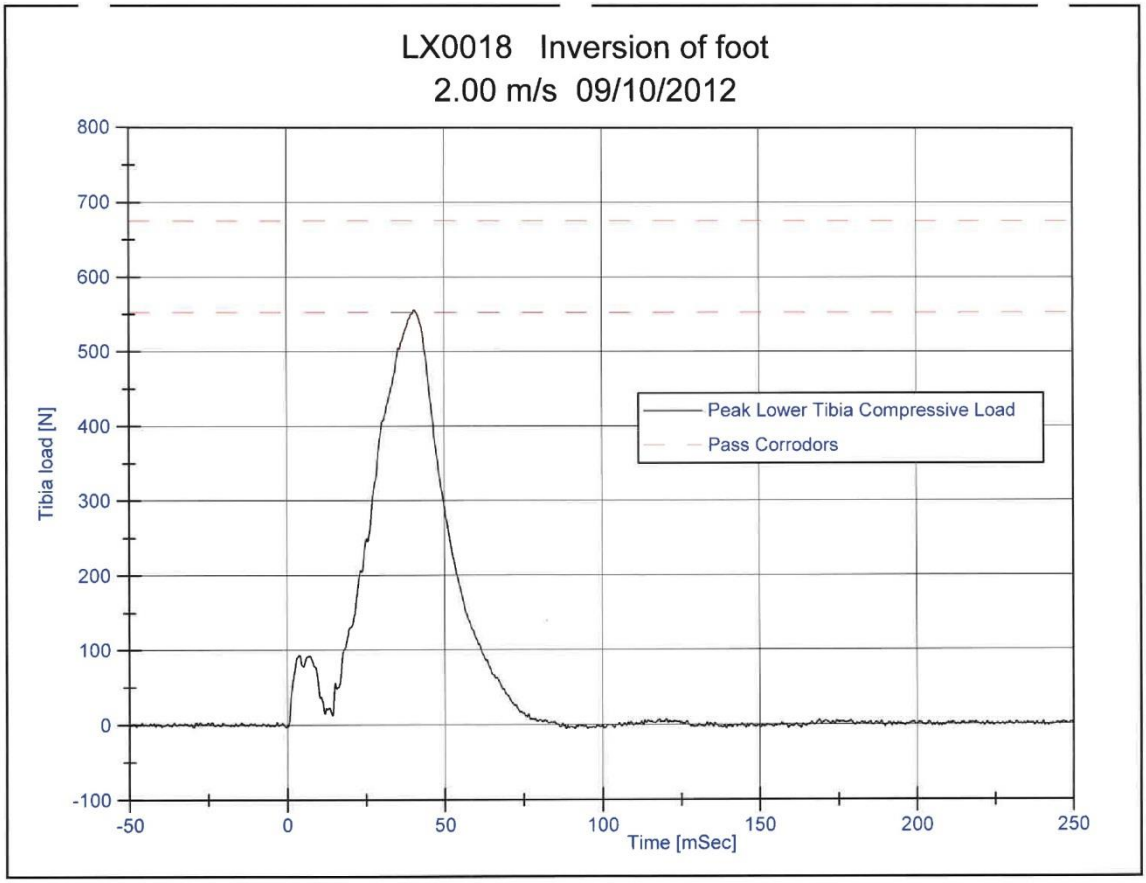

LX0018 Eversion of foot
2.02 m/s 09/10/2012
Ankle moment [Nm]
50
40
30
20
10
0
-10
-50
0
50
100
150
200
250
Time [mSec]
Peak Ankle Resistive Moment
Pass Corrodors

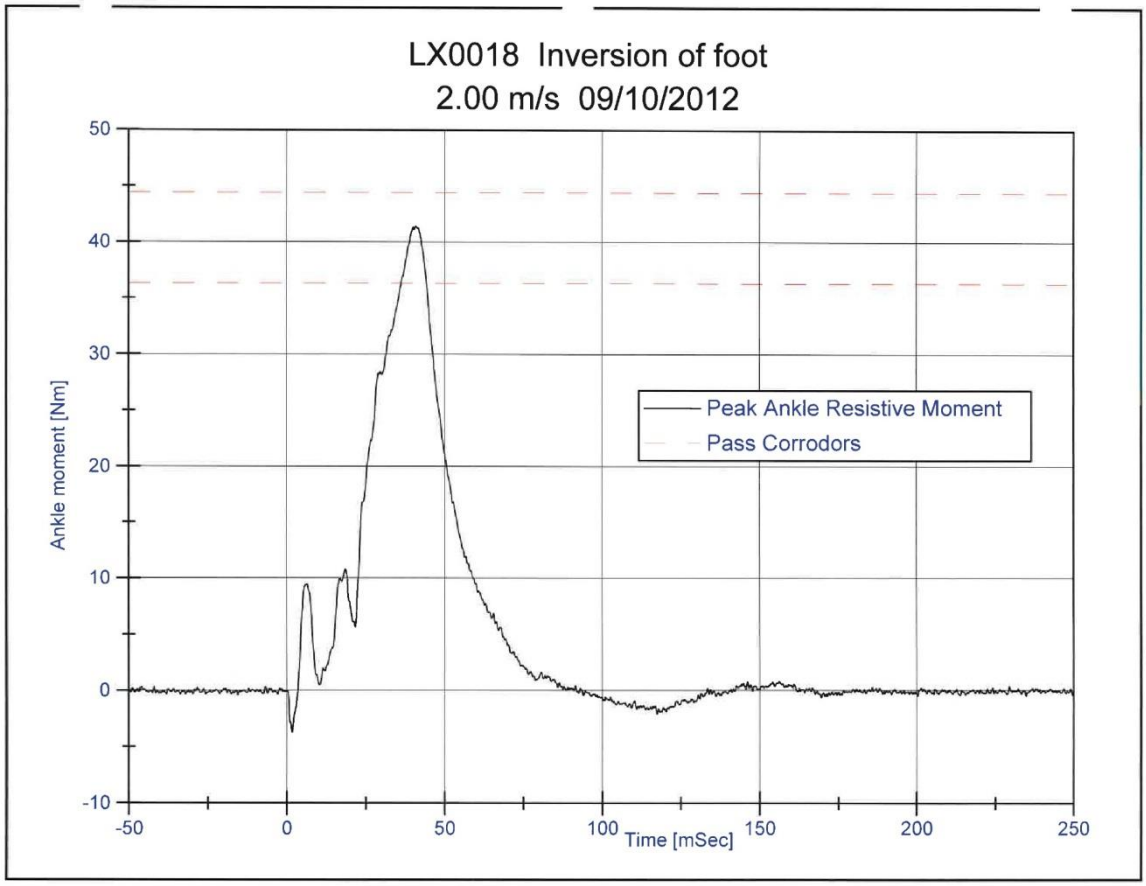

LX0018 Eversion of foot
2.02 m/s 09/10/2012
Ankle X-Rotation [deg]
60
45
30
15
0
-15
-30
-50
0
50
100
150
200
250
Time [mSec]
Peak Ankle X-Axis Rotation
Pass Corrodors

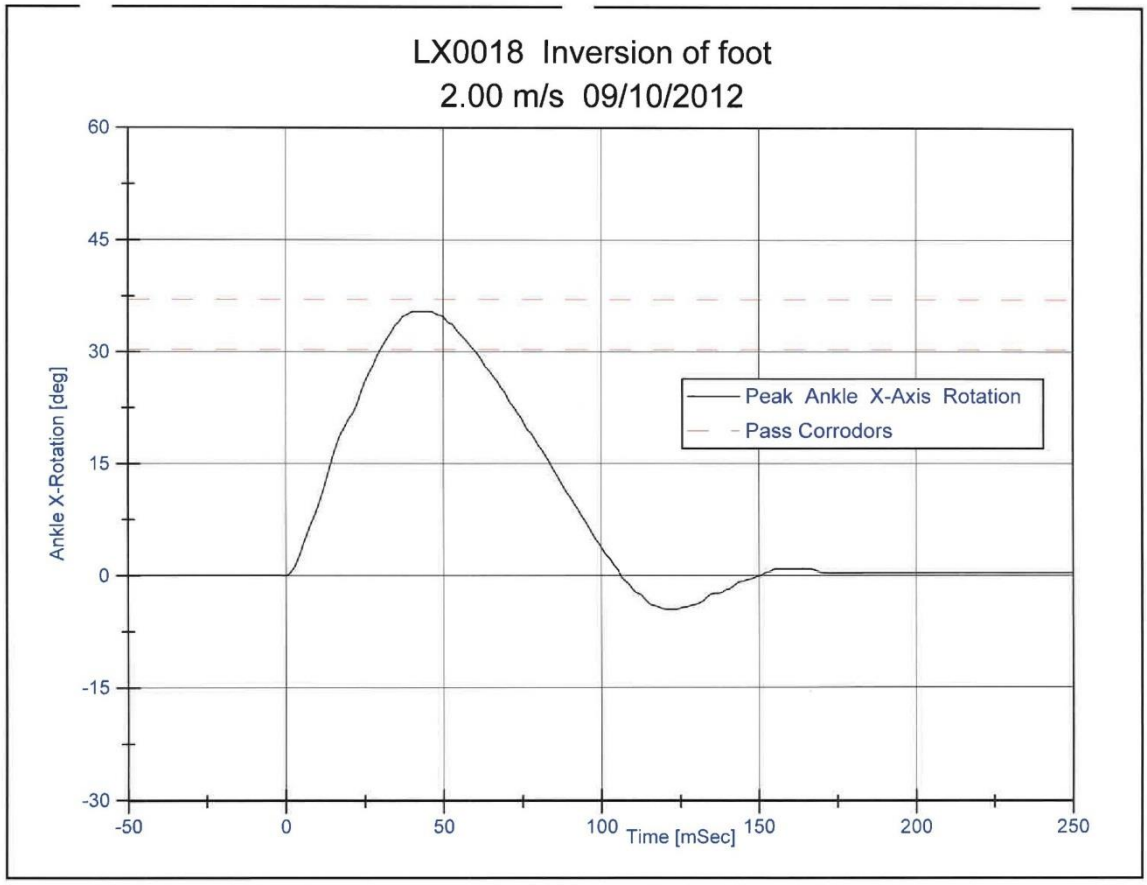

LX0018 Ball of foot
5.08 m/s 09/10/2012
Tibia load [N]
4000
3000
2000
1000
0
-1000
-50
0
50
100
150
200
250
Time [mSec]
Peak Lower Tibia Compressive Load
Pass Corrodors


LX0018 Ball of foot
5.08 m/s 09/10/2012
Ankle moment [Nm]
100
75
50
25
0
-25
-50
0
50
100
150
200
250
Time [mSec]
Peak Ankle Resistive Moment
Pass Corrodors

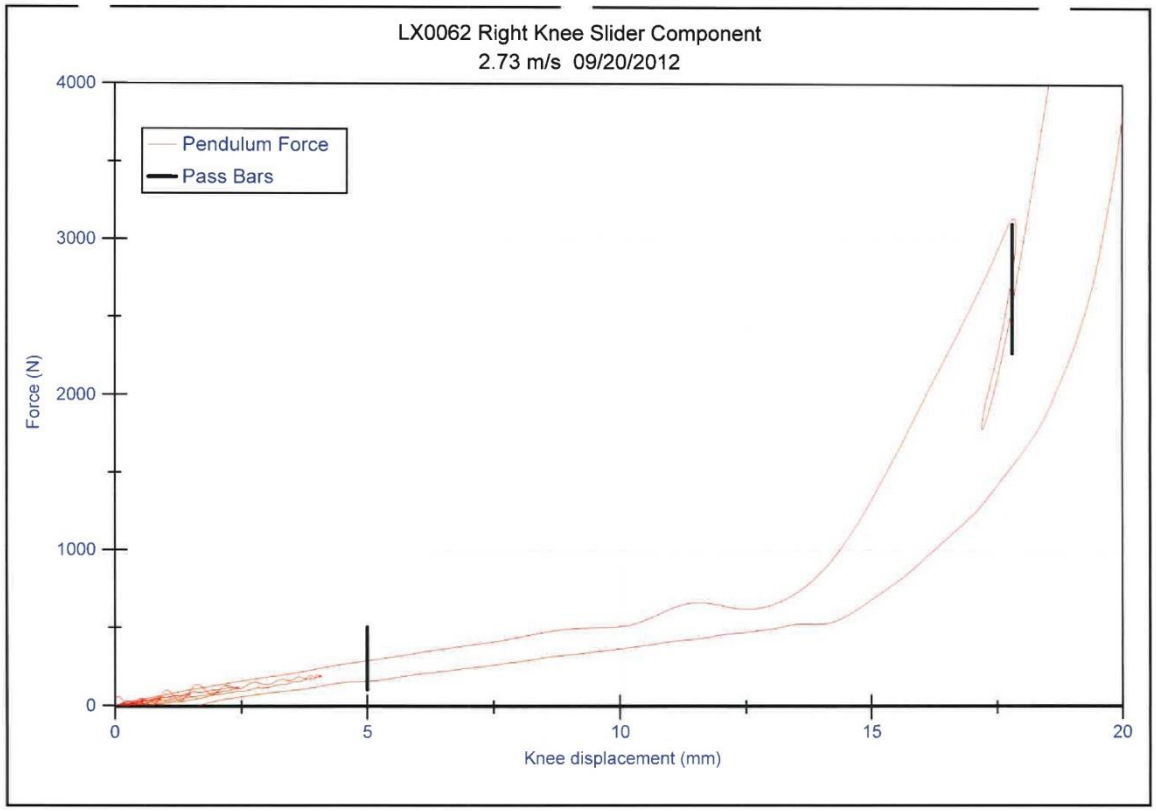

LX0018 Ball of foot
5.08 m/s 09/10/2012
Ankle Y-Rotation [deg]
60
45
30
15
0
-15
-30
-50
0
50
100
150
200
250
Time [mSec]
Peak Ankle Y-Axis Rotation
Pass Corrodors

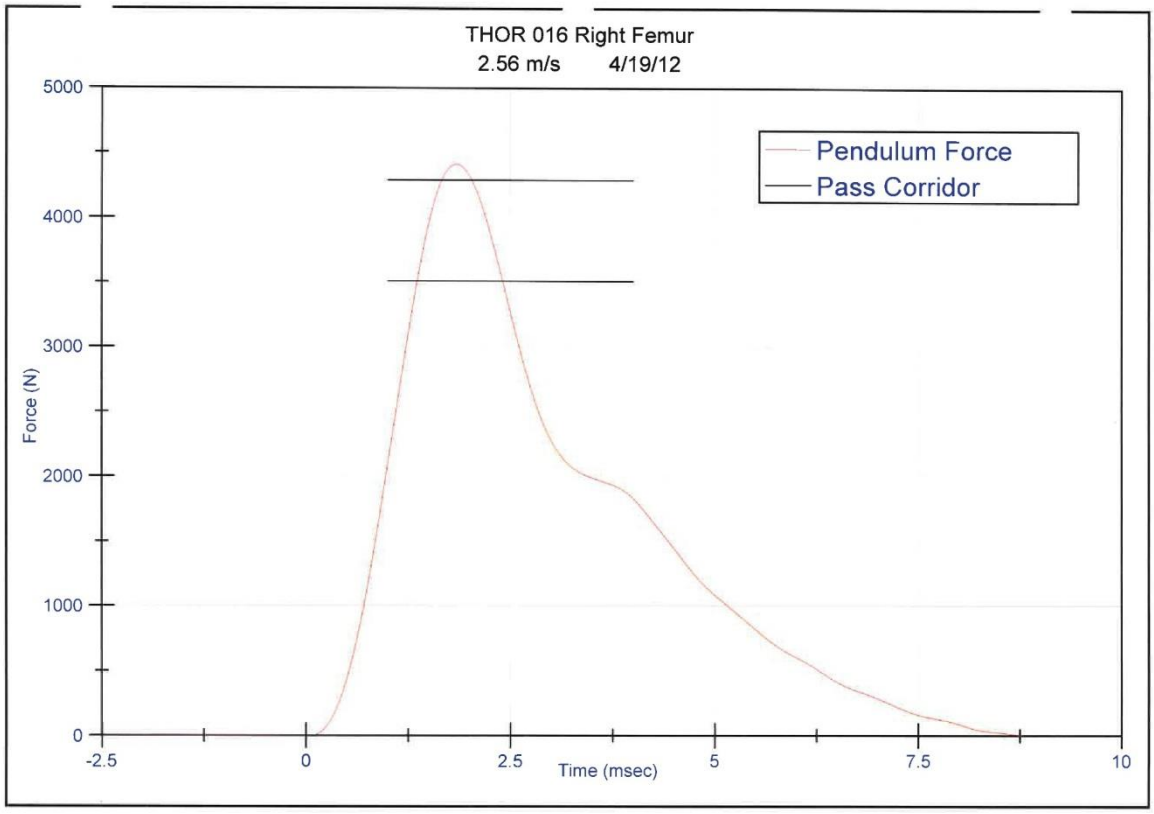

LX0018 Inversion of foot
2.00 m/s 09/10/2012
Tibia load [N]
800
700
600
500
400
300
200
100
0
-100
-50
0
50
100
150
200
250
Time [mSec]
Peak Lower Tibia Compressive Load
Pass Corrodors

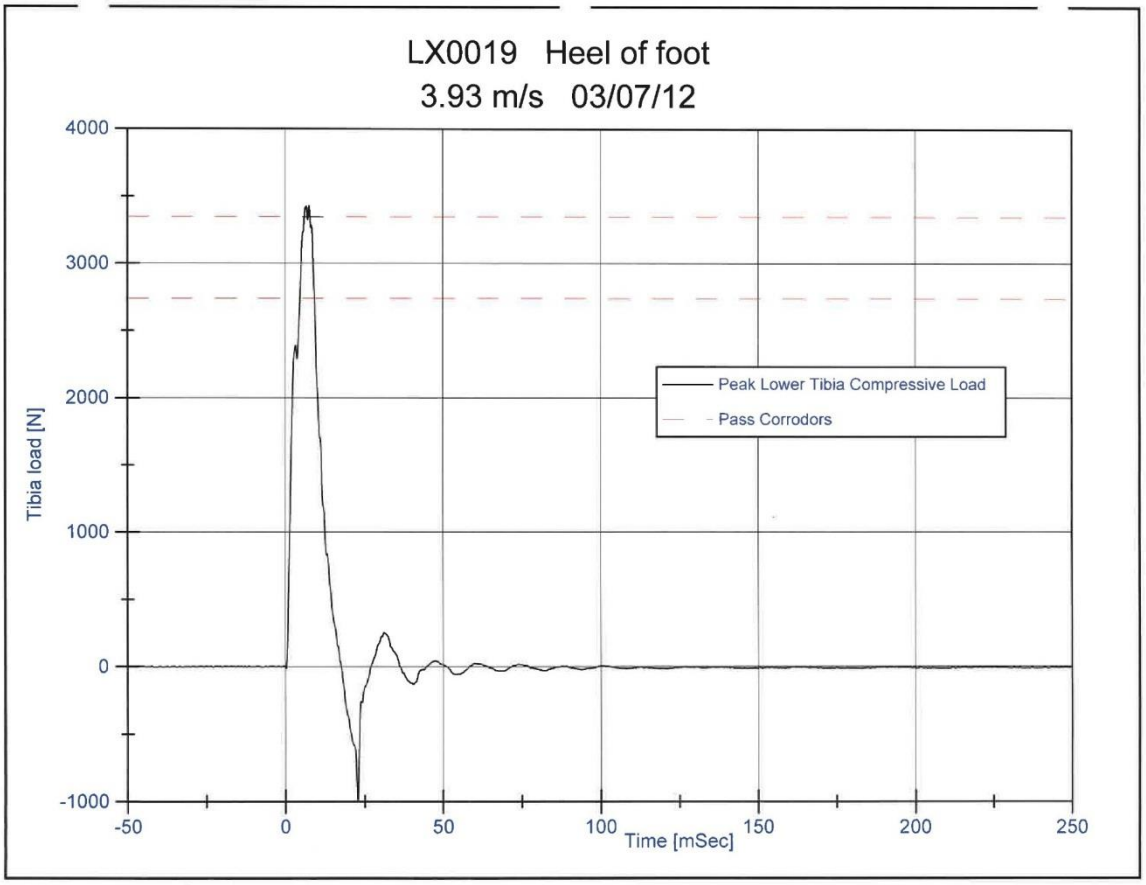

LX0018 Inversion of foot
2.00 m/s 09/10/2012
Ankle moment [Nm]
50
40
30
20
10
0
-10
-50
0
50
100
150
200
250
Time [mSec]
Peak Ankle Resistive Moment
Pass Corrodors

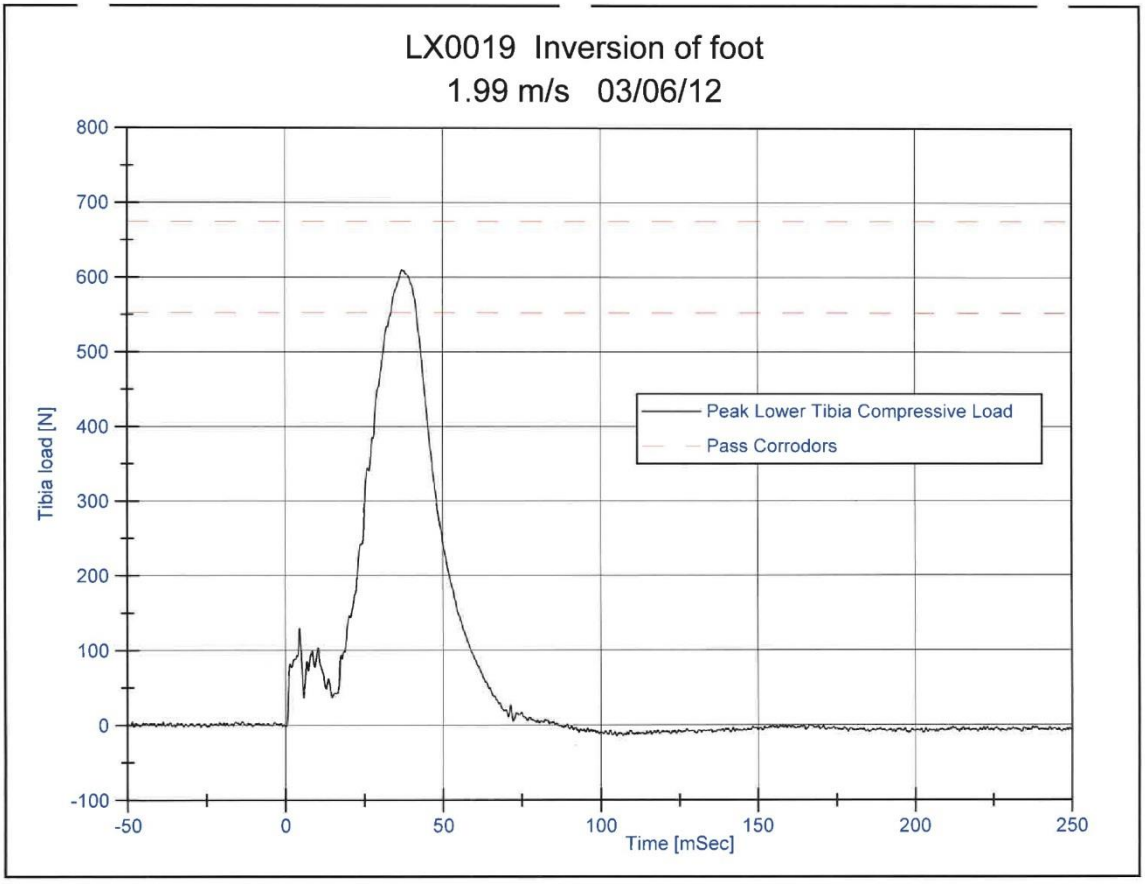

LX0018 Inversion of foot
2.00 m/s 09/10/2012
Ankle X-Rotation [deg]
60
45
30
15
0
-15
-30
-50
0
50
100
150
200
250
Time [mSec]
Peak Ankle X-Axis Rotation
Pass Corrodors

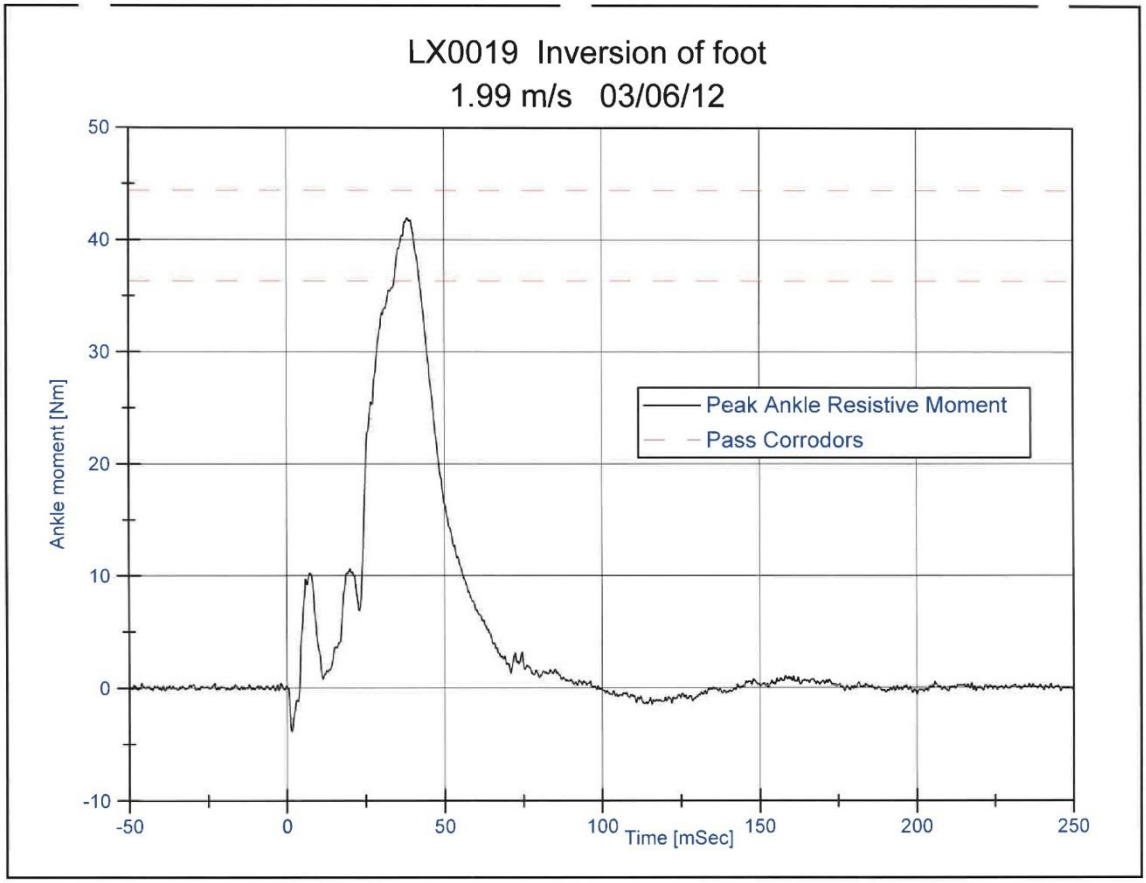
LX0019

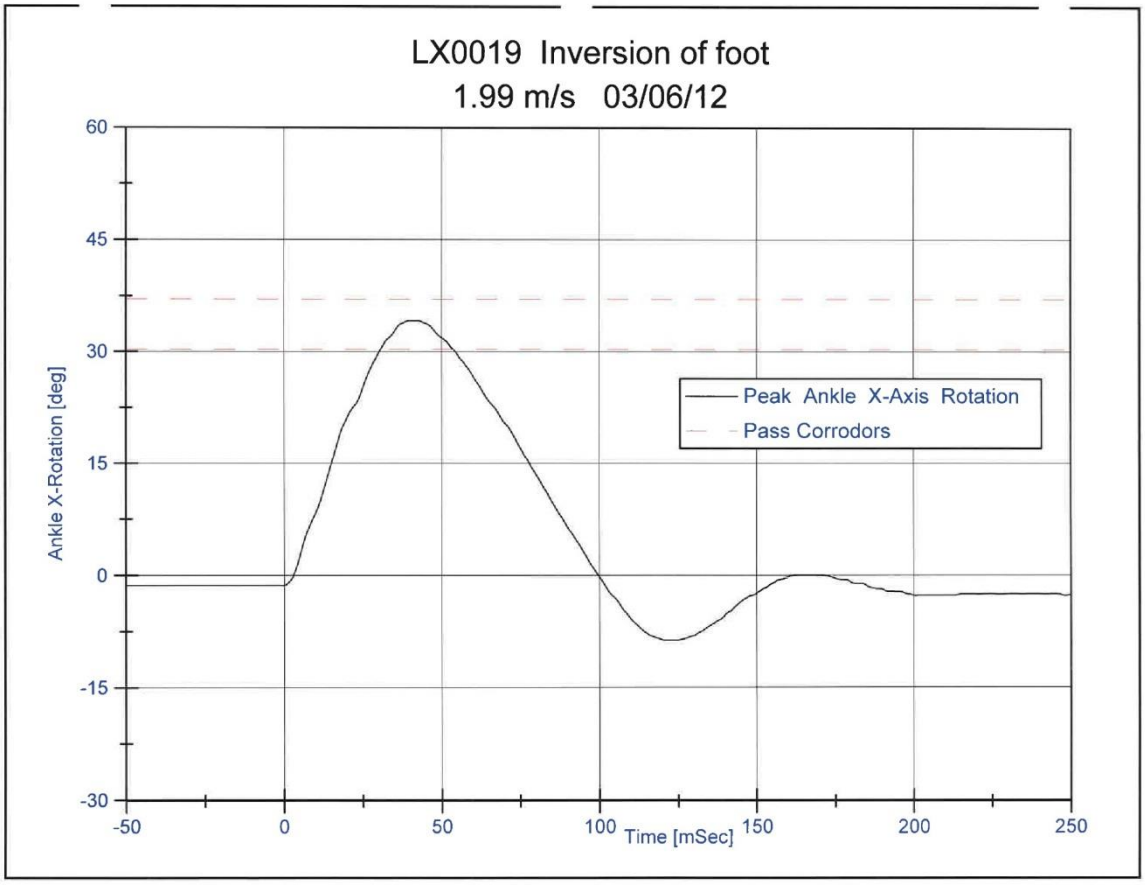

LX0062 Right Knee Slider Component
2.73 m/s 09/20/2012
Pendulum Force
Pass Bars
Force (N)
4000
3000
2000
1000
0
0
5
10
15
20
Knee displacement (mm)

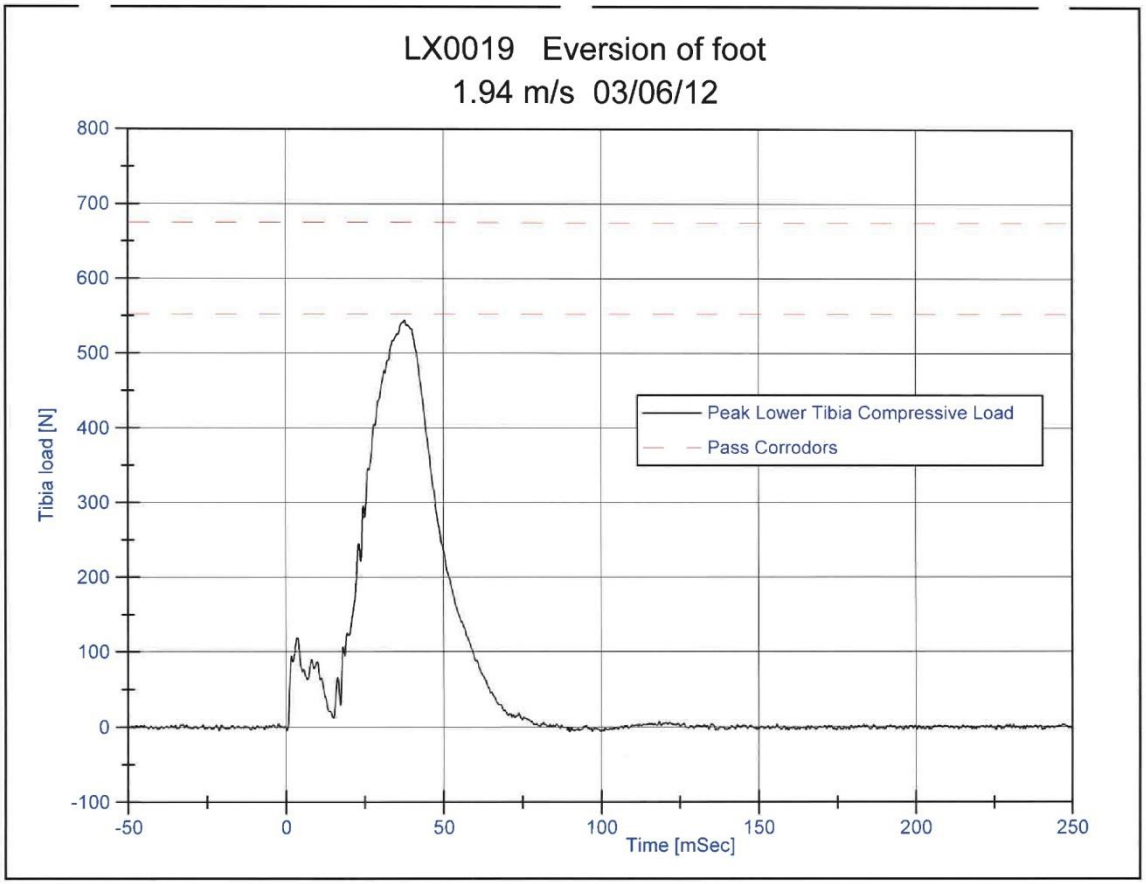

THOR 016 Right Femur
2.56 m/s 4/19/12
Pendulum Force
Pass Corridor
Force (N)
5000
4000
3000
2000
1000
0
-2.5
0
2.5
5
7.5
10
Time (msec)

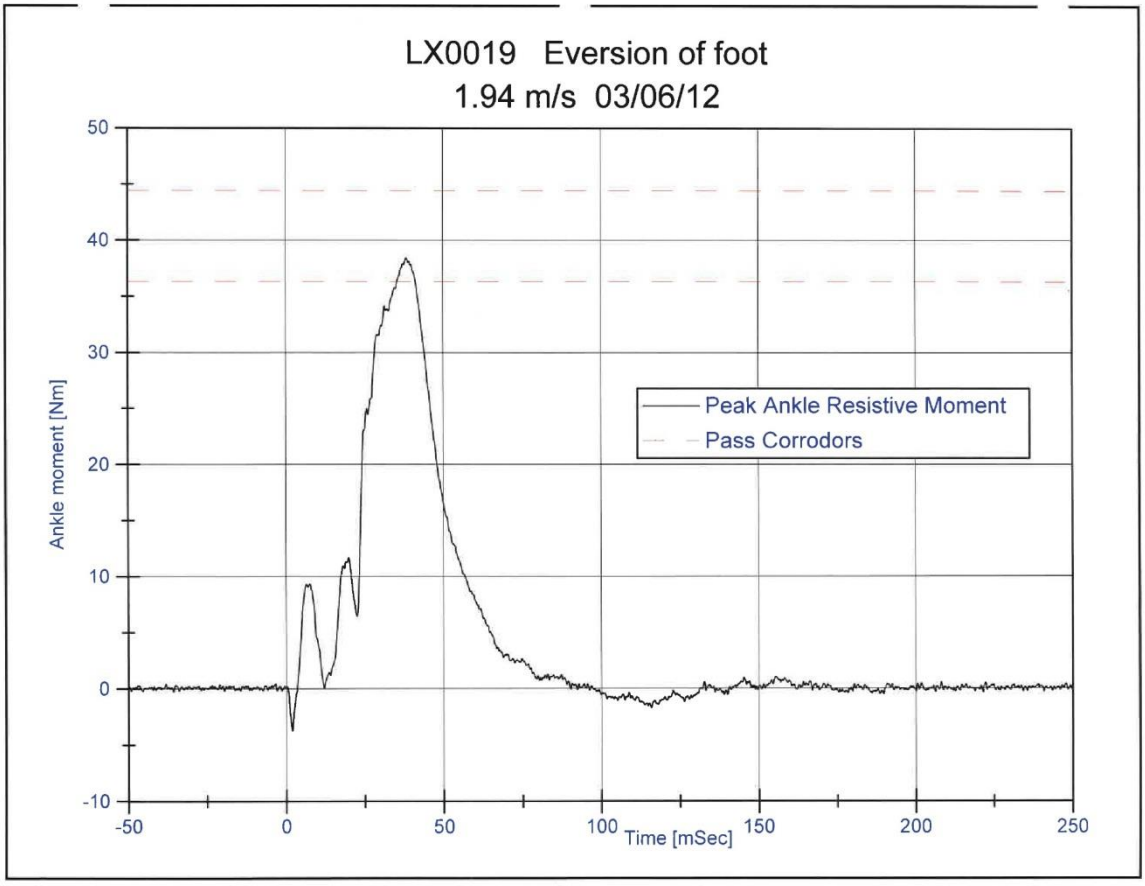

LX0019 Heel of foot
3.93 m/s 03/07/12
Tibia load [N]
Time [mSec]
Peak Lower Tibia Compressive Load
Pass Corrodors
4000
3000
2000
1000
0
-1000
-50
0
50
100
150
200
250

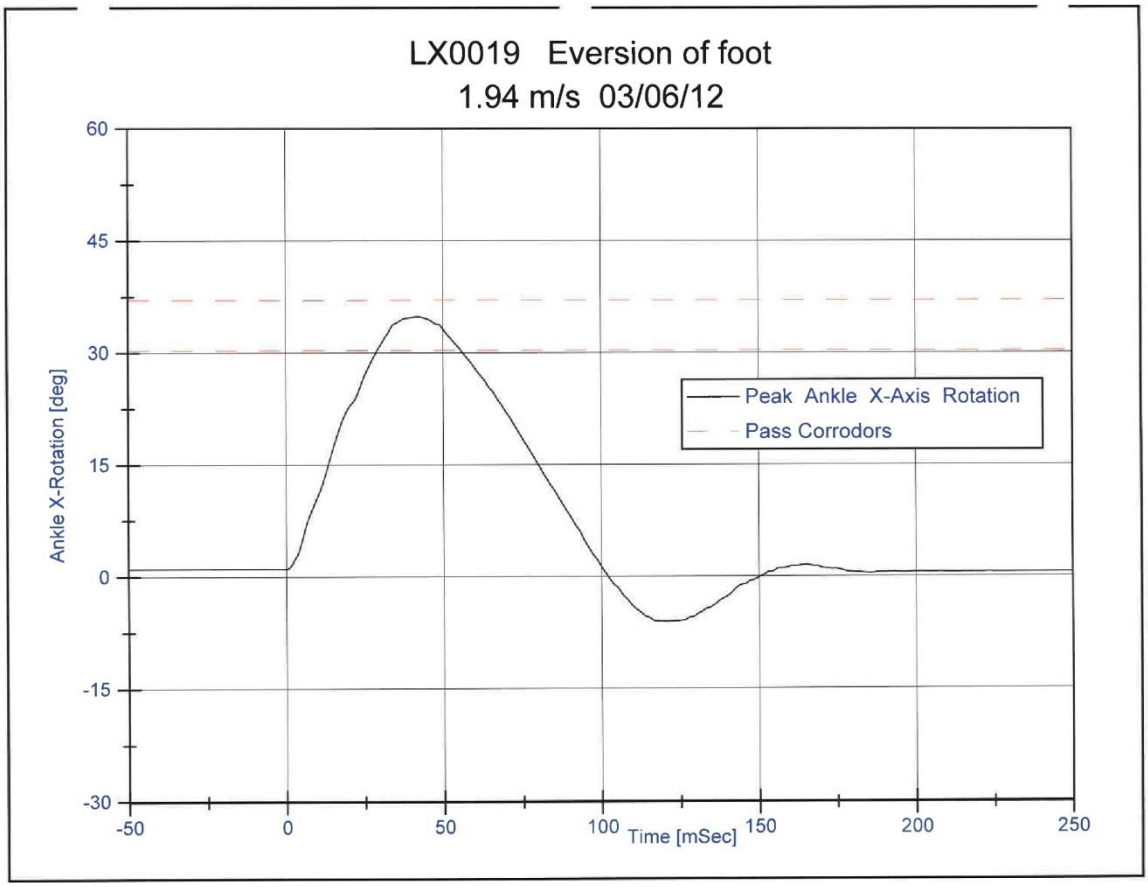

LX0019 Inversion of foot
1.99 m/s 03/06/12
Tibia load [N]
Time [mSec]
Peak Lower Tibia Compressive Load
Pass Corrodors
800
700
600
500
400
300
200
100
0
-100
-50
0
50
100
150
200
250

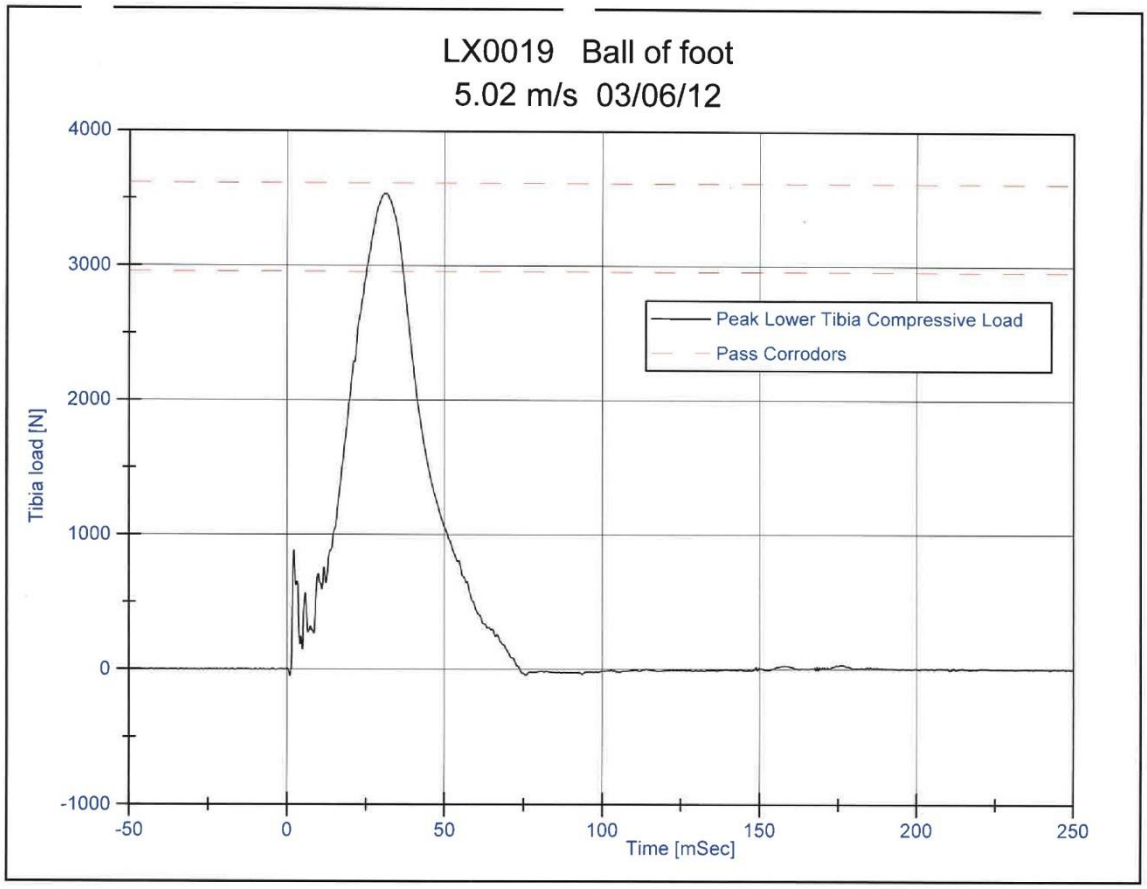

LX0019 Inversion of foot
1.99 m/s 03/06/12
Ankle moment [Nm]
Time [mSec]
Peak Ankle Resistive Moment
Pass Corrodors
50
40
30
20
10
0
-10
-50
0
50
100
150
200
250

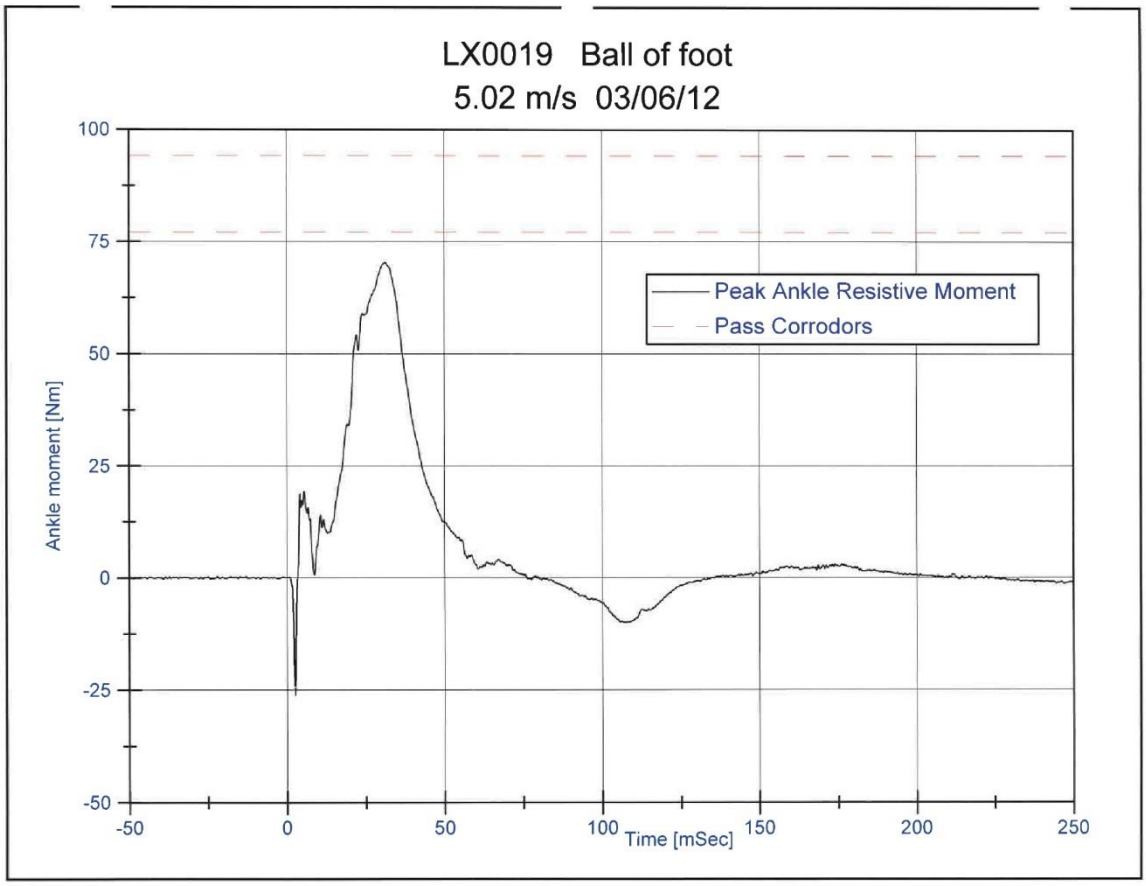

LX0019 Inversion of foot
1.99 m/s 03/06/12
Ankle X-Rotation [deg]
Time [mSec]
Peak Ankle X-Axis Rotation
Pass Corrodors
60
45
30
15
0
-15
-30
-50
0
50
100
150
200
250

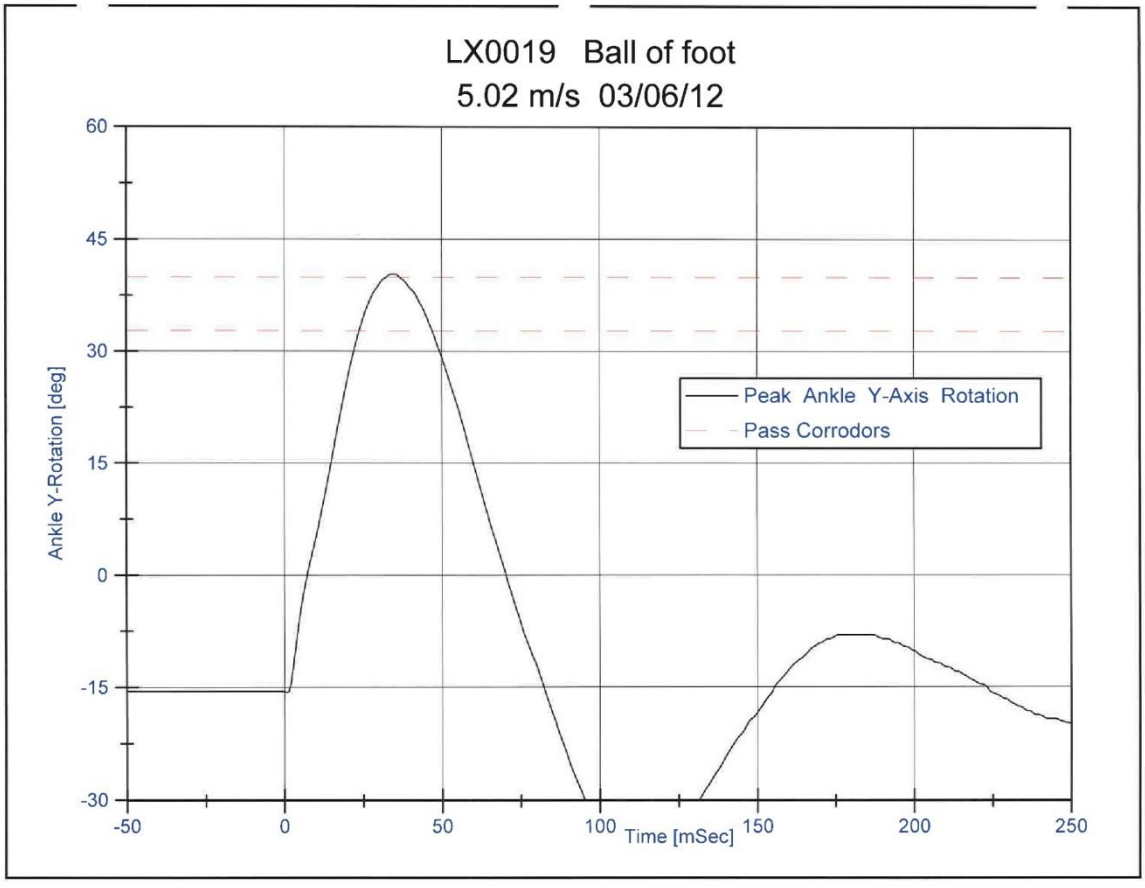

LX0019 Eversion of foot
1.94 m/s 03/06/12
Tibia load [N]
800
700
600
500
400
300
200
100
0
-100
-50
0
50
100
150
200
250
Time [mSec]
Peak Lower Tibia Compressive Load
Pass Corrodors


LX0019 Eversion of foot
1.94 m/s 03/06/12
Ankle moment [Nm]
50
40
30
20
10
0
-10
-50
0
50
100
150
200
250
Time [mSec]
Peak Ankle Resistive Moment
Pass Corrodors


LX0019 Eversion of foot
1.94 m/s 03/06/12
Ankle X-Rotation [deg]
60
45
30
15
0
-15
-30
-50
0
50
100
150
200
250
Time [mSec]
Peak Ankle X-Axis Rotation
Pass Corrodors


LX0019 Ball of foot
5.02 m/s 03/06/12
Tibia load [N]
4000
3000
2000
1000
0
-1000
-50
0
50
100
150
200
250
Time [mSec]
Peak Lower Tibia Compressive Load
Pass Corrodors


LX0019 Ball of foot
5.02 m/s 03/06/12
Peak Ankle Resistive Moment
Pass Corrodors
Ankle moment [Nm]
Time [mSec]
100
75
50
25
0
-25
-50
-50
0
50
100
150
200
250


LX0019 Ball of foot
5.02 m/s 03/06/12
Peak Ankle Y-Axis Rotation
Pass Corrodors
Ankle Y-Rotation [deg]
Time [mSec]
60
45
30
15
0
-15
-30
-50
0
50
100
150
200
250

APPENDIX D:

CMM MEASUREMENT PROCEDURES

Vehicle Coordinate System

The origin point of the VCS is a point 50 mm forward of the rear window glass or hatchback door onto the roof of the vehicle along the vehicle's lateral centerline. The ground is not used as a reference.

The following procedure was used to create the Vehicle Coordinate System (VCS):

1) Place the As Delivered vehicle on a flat surface.
2) Measure the width of the vehicle at the rear of the vehicle to establish a first center point.
3) Measure the width of the vehicle at the front of the vehicle to establish a second center point.
4) Using a vertical laser beam, connect the two points to establish the lateral centerline of the vehicle.
5) Establish a point 50 mm from the edge of the rear window glass or rear hatchback door frame at the intersection of the roof onto the roof to establish the VCS origin point.
6) Construct a line perpendicular to the lateral centerline of the vehicle from VCS origin point towards the C-pillar. Mark a point along this line that is on the C-pillar at the body crease line between the roof and pillar geometry. This will be reference point #2.
7) Construct another perpendicular line in the opposite direction from the lateral centerline of the vehicle that is the same distance from the centerline as reference point #2. This will be reference point #3.
8) The VCS origin point is defined as the following:
   - Positive X is from the VCS origin point to the front of the vehicle
   - Positive Y is from the driver side of the vehicle to the passenger side of the vehicle
   - Positive Z is from the VCS origin point of the vehicle to the bottom of the vehicle

Steering Column Reference Point

The Steering Column Reference point is the x, y, and z location of the geometric center of the steering wheel in the VCS.

Brake Pedal Reference Point

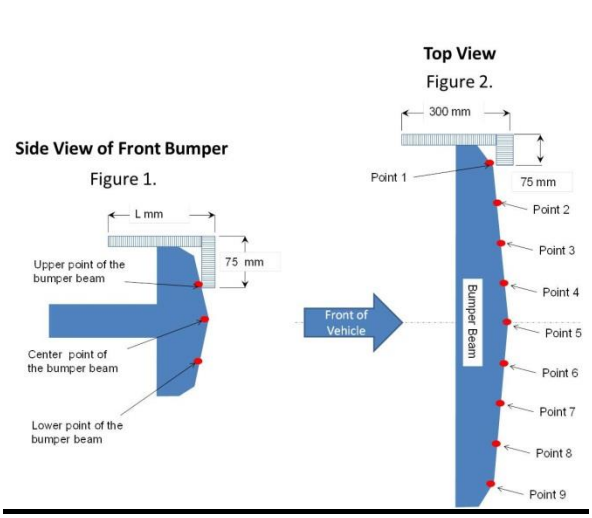
The Brake Pedal Reference Point is the x, y, and z location of the geometric center of the brake pedal pad (top surface) in the VCS.

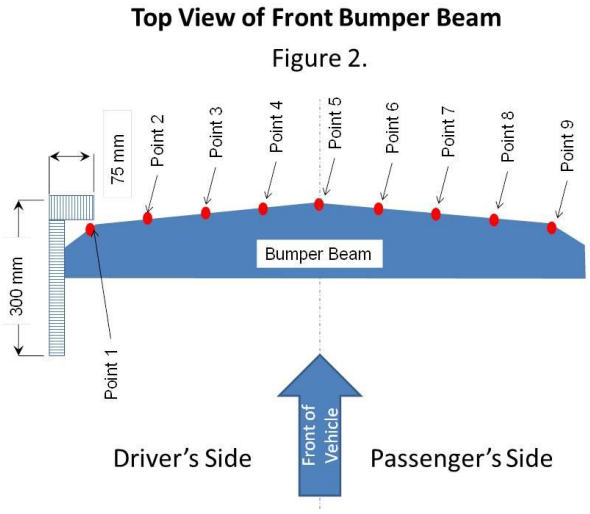
Floor Reference Point

The Floor Reference Point is the x, y, and z location of the floor in the VCS. Use the following procedure to determine the Floor Reference Point:

1. If the vehicle has an accelerator pedal with fore-aft adjustment, adjust the pedal to its forward most position
2. Locate the centerline of the top surface of the bottom of the accelerator pedal (CLAP)
3. Remove floor mats
4. Project a vertical line down from the CLAP point until contact is made to the floor. This point is the Floor Reference Point

Pre and Post Bumper Beam and Radiator Support Measurement





Find the vertical center of the bumper beam using the following procedure (Reference Figure 1).

1) Position a square above the bumper beam at the centerline of the vehicle such that the plan of the square is aligned with the longitudinal axis of the vehicle and the "L mm" part of the square is parallel to the ground.
2) Move the square toward the ground until it contacts the bumper beam.
3) Move the square toward the rear of the vehicle until it contacts the bumper beam. The point where the 75 mm part of the square contacts the bumper beam is the Upper point of the bumper beam.
4) Perform the same procedure for the lower part of the bumper beam. The point where the 75 mm part of the square contacts the bumper beam is the Lower point of the bumper beam.
5) The center point of the bumper beam is half the distance between the Upper and Lower points of the bumper beam.
6) Transpose the lateral center of the bumper beam up onto the top of the upper radiator support.
7) Mark the center of the upper radiator support along its forward leading edge. If the radiator support is not flat this mark is made along the top edge.
8) Mark enough points along this edge to define its profile.

Pre and Post Driver Left Lower Instrument Panel

The left lower instrument panel (knee bolster) lateral coordinates are defined by adding 15 cm from the steering column reference lateral coordinate, respectively. The vertical coordinate is defined as 45 cm above the height of the floor reference point. If the panel or knee bolster loosens or breaks away in the crash, the post-crash measurements are taken by pressing and holding the panel against the underlying structure.
Create a floor vehicle coordinate system on the floor at the location of this measurement.

Pre and Post Driver Right Lower Instrument Panel

The left lower instrument panel (knee bolster) lateral coordinates are defined by subtracting 15 cm from the steering column reference lateral coordinate, respectively. The vertical coordinate is defined as 45 cm above the height of the floor reference point. If the panel or knee bolster loosens or breaks away in the crash, the post-crash measurements are taken by pressing and holding the panel against the underlying structure.

Pre and Post Brake Pedal (Figure 22)

If the brake pedal is constructed so that it dangles loosely after the crash, the brake pedal is pushed straight forward against the toepan/floor pan and held there to take the post-crash measurement. If the pedal drops away entirely, no post-crash measurement is taken.

Pre and Post Driver Toe pan and Floor Board (Figure 22)

DRIVER POINT A1

The vertical coordinate for the A1 measurement location is the vertical of the brake pedal reference. The
lateral coordinate of the A1 is obtained by subtracting 25 cm from the brake pedal reference lateral coordinate.

DRIVER POINT B1

The vertical coordinate for the B1 location is the vertical coordinate of the brake pedal reference. The lateral coordinate of the B1 is obtained by subtracting 15 cm from the brake pedal reference lateral coordinate.

DRIVER POINT C1

The vertical coordinate for the C1 location is the vertical coordinate of the brake pedal reference. The lateral coordinate of the C1 is obtained by subtracting 0 cm from the brake pedal reference lateral coordinate.

DRIVER POINT D1

The vertical coordinate for the D1 location is the vertical coordinate of the brake pedal reference. The lateral coordinate of the D1 is obtained by adding 15 cm from the brake pedal reference lateral coordinate.

DRIVER POINT A2

The vertical coordinate of the A2 measurement location is obtained by adding half the distance between the vertical coordinate of the brake pedal reference and the vertical coordinate of the floor reference. The lateral coordinate of the A2 is obtained by subtracting 25 cm from the brake pedal reference lateral coordinate.

DRIVER POINT B2

The vertical coordinate of the B2 measurement location is obtained by adding half the distance between the vertical coordinate of the brake pedal reference the vertical coordinate of the floor reference. The lateral coordinate of the B2 is obtained by subtracting 15 cm from the brake pedal reference lateral coordinate.

DRIVER POINT C2

The vertical coordinate of the C2 measurement location is obtained by adding half the distance between the vertical coordinate of the brake pedal reference and the vertical coordinate of the floor reference. The lateral coordinate of the C2 is obtained by subtracting 0 cm from the brake pedal reference lateral coordinate.

DRIVER POINT D2

The vertical coordinate of the D2 measurement location is obtained by adding half the distance between the vertical coordinate of the brake pedal reference and the vertical coordinate of the floor reference. The lateral coordinate of the 22 is obtained by adding 15 cm from the brake pedal reference lateral coordinate.

DRIVER POINT A3

The vertical coordinate of the A3 measurement location is obtained by subtracting 1 cm from the floor reference. The lateral coordinate of the A3 is obtained by subtracting 25 cm from the brake pedal reference lateral coordinate.

DRIVER POINT B3

The vertical coordinate of the B3 measurement location is obtained by subtracting 1 cm from the floor reference. The lateral coordinate of the B3 is obtained by subtracting 15 cm from the brake pedal reference lateral coordinate.

DRIVER POINT C3

The vertical coordinate of the C3 measurement location is obtained by subtracting 1 cm from the floor reference. The lateral coordinate of the C3 is obtained by subtracting 0 cm from the brake pedal reference lateral coordinate.

DRIVER POINT D3

The vertical coordinate of the D3 measurement location is obtained by subtracting 1 cm from the floor reference. The lateral coordinate of the D3 is obtained by adding 15 cm from the brake pedal reference lateral coordinate.

DRIVER POINT A4

The longitudinal coordinate of the A4 measurement location is obtained by subtracting 5 cm from the A3 reference. The lateral coordinate of the A4 is obtained by subtracting 25 cm from the brake pedal reference lateral coordinate.

DRIVER POINT B4

The longitudinal coordinate of the B4 measurement location is obtained by subtracting 5 cm from the B3 reference. The lateral coordinate of the B4 is obtained by subtracting 15 cm from the brake pedal reference lateral coordinate.

DRIVER POINT C4

The longitudinal coordinate of the C4 measurement location is obtained by subtracting 5 cm from the C3 reference. The lateral coordinate of the C4 is obtained by subtracting 0 cm from the brake pedal reference lateral coordinate.

DRIVER POINT D4

The longitudinal coordinate of the D4 measurement location is obtained by subtracting 5 cm from the D3 reference. The lateral coordinate of the D4 is obtained by adding 15 cm from the brake pedal reference lateral coordinate.

DRIVER POINT A5

The longitudinal coordinate of the A5 measurement location is obtained by subtracting 5 cm from the A4 reference. The lateral coordinate of the A5 is obtained by subtracting 25 cm from the brake pedal reference lateral coordinate.

DRIVER POINT B5

The longitudinal coordinate of the B5 measurement location is obtained by subtracting 5 cm from the B4 reference. The lateral coordinate of the B5 is obtained by subtracting 15 cm from the brake pedal reference lateral coordinate.

DRIVER POINT C5

The longitudinal coordinate of the C5 measurement location is obtained by subtracting 5 cm from the C4 reference. The lateral coordinate of the C5 is obtained by subtracting 0 cm from the brake pedal reference lateral coordinate.

DRIVER POINT D5

The longitudinal coordinate of the D5 measurement location is obtained by subtracting 5 cm

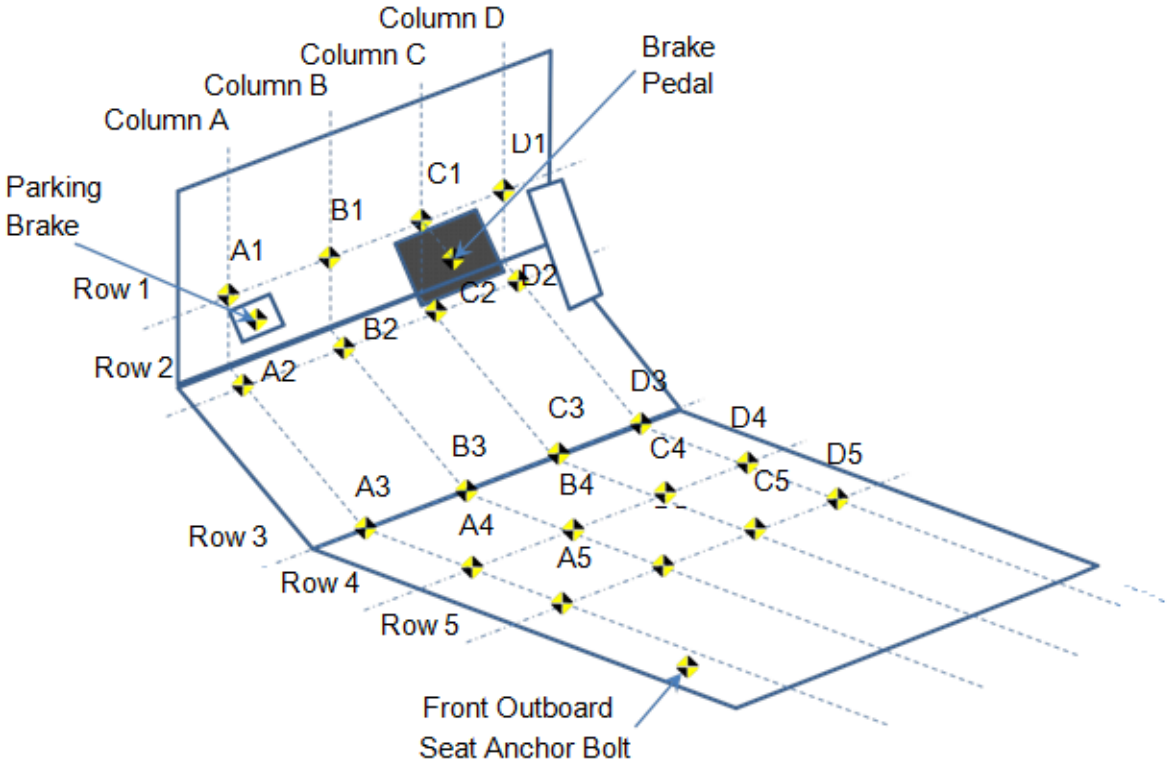
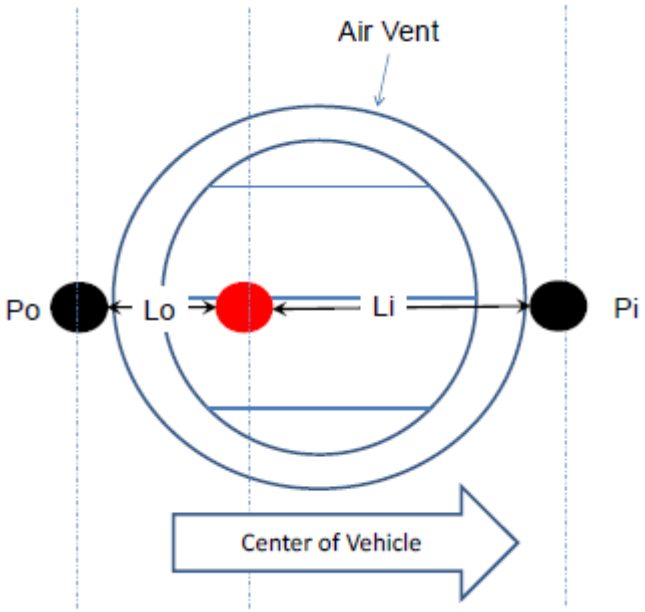


Figure 22: Lower interior intrusion measurements

Driver Upper Dash

The upper dash point is obtained by subtracting 25 cm from the lateral coordinate of the steering column reference lateral coordinate. This defines a line of points on the edge of the upper dash. The upper dash point is located on the rearward most (toward the rear of the vehicle) point on this line. This point must be located at least 30 cm above the brake pedal reference point to ensure a vertical location high enough to represent a location that could be contacted by the driver's upper body or head. If the rearward most point is less than 30 cm above the brake pedal reference point, the upper dash point is located at this 30 cm reference location.

There may be instances when the upper dash point is located on a "soft component" such as an air vent or control knob (Figure 23). To measure a more robust structure, the upper dash point is replaced with two additional points, and the weighted average of their coordinates is used to represent the deformation of a point at the original location (Equation 1). Each new point is determined by moving inboard/outboard to a location that is just off of the soft component.



$$dp = \frac{Li}{Lo + Li}[X_o, Y_o, Z_o] + \frac{Lo}{Lo + Li}[X_o, Y_o, Z_o]$$

Figure 23: Equation for Measuring Soft Component Driver Upper Dash Point

Passenger Left Lower Instrument Panel

The left lower instrument panel (knee bolster) lateral coordinates are defined by adding 15 cm from the center passenger seat reference lateral coordinate, respectively. The vertical coordinate is defined as 45 cm above the height of the floor (without floor mats). If the panel or knee bolster loosens or breaks away in the crash, the post-crash measurements are taken by pressing and holding the panel against the underlying structure.

Create a floor vehicle coordinate system on the floor at the location of this measurement.

Passenger Right Lower Instrument Panel

The left lower instrument panel (knee bolster) lateral coordinates are defined by subtracting 15 cm from the center passenger seat reference lateral coordinate, respectively. The vertical coordinate is defined as 45 cm above the height of the floor (without floor mats). If the panel or knee bolster loosens or breaks away in the crash, the post-crash measurements are taken by pressing and holding the panel against the underlying structure.

Passenger Toe pan and Floor Board (Figure 24)

PASSENGER POINT A1

The vertical coordinate for the A1 measurement location is the vertical coordinate of the brake pedal reference. The lateral coordinate of the A1 is obtained by subtracting 25 cm from the center passenger seat reference lateral coordinate.

PASSENGER POINT B1

The vertical coordinate for the B1 location is the vertical coordinate of the brake pedal reference. The lateral coordinate of the B1 is obtained by subtracting 15 cm from the center passenger seat reference lateral coordinate.

PASSENGER POINT C1

The vertical coordinate for the C1 location is the vertical coordinate of the brake pedal reference. The lateral coordinate of the C1 is obtained by subtracting 0 cm from the center passenger seat reference lateral coordinate..

PASSENGER POINT A2

The vertical coordinate of the A2 measurement location is obtained by adding half the distance between the vertical coordinate of the brake pedal reference and the vertical coordinate of the floor reference. The lateral coordinate of the A2 is obtained by subtracting 25 cm from the center passenger seat reference lateral coordinate.

PASSENGER POINT B2

The vertical coordinate of the B2 measurement location is obtained by adding half the distance between the vertical coordinate of the brake pedal reference the vertical coordinate of the floor reference. The lateral coordinate of the B2 is obtained by subtracting 15 cm from the center passenger seat reference lateral coordinate.

PASSENGER POINT C2

The vertical coordinate of the C2 measurement location is obtained by adding half the distance between the vertical coordinate of the brake pedal reference and the vertical coordinate of the floor reference. The lateral coordinate of the C2 is obtained by subtracting 0 cm from the center passenger seat reference lateral coordinate.

PASSENGER POINT A3

The vertical coordinate of the A3 measurement location is obtained by subtracting 1 cm from the floor reference. The lateral coordinate of the A3 is obtained by subtracting 25 cm from the center passenger seat reference lateral coordinate.

PASSENGER POINT B3

The vertical coordinate of the B3 measurement location is obtained by subtracting 1 cm from the floor reference. The lateral coordinate of the B3 is obtained by subtracting 15 cm from the center passenger seat reference lateral coordinate.

PASSENGER POINT C3

The vertical coordinate of the C3 measurement location is obtained by subtracting 1 cm from the floor reference. The lateral coordinate of the C3 is obtained by subtracting 0 cm from the center passenger seat reference lateral coordinate.

PASSENGER POINT A4

The longitudinal coordinate of the A4 measurement location is obtained by subtracting 5 cm from the A3 reference. The lateral coordinate of the A4 is obtained by subtracting 25 cm from the center passenger seat reference lateral coordinate.

PASSENGER POINT B4

The longitudinal coordinate of the B4 measurement location is obtained by subtracting 5 cm from the B3 reference. The lateral coordinate of the B4 is obtained by subtracting 15 cm from the center passenger seat reference lateral coordinate.

PASSENGER POINT C4

The longitudinal coordinate of the C4 measurement location is obtained by subtracting 5 cm from the C3 reference. The lateral coordinate of the C4 is obtained by subtracting 0 cm from the center passenger seat reference lateral coordinate.

PASSENGER POINT A5

The longitudinal coordinate of the A5 measurement location is obtained by subtracting 5 cm from the A4 reference. The lateral coordinate of the A5 is obtained by subtracting 25 cm from the center passenger seat reference lateral coordinate.

PASSENGER POINT B5

The longitudinal coordinate of the B5 measurement location is obtained by subtracting 5 cm from the B4 reference. The lateral coordinate of the B5 is obtained by subtracting 15 cm from the center passenger seat reference lateral coordinate.

PASSENGER POINT C5

The longitudinal coordinate of the C5 measurement location is obtained by subtracting 5 cm from the C4 reference. The lateral coordinate of the C5 is obtained by adding 15 cm from the center passenger seat
reference lateral coordinate.

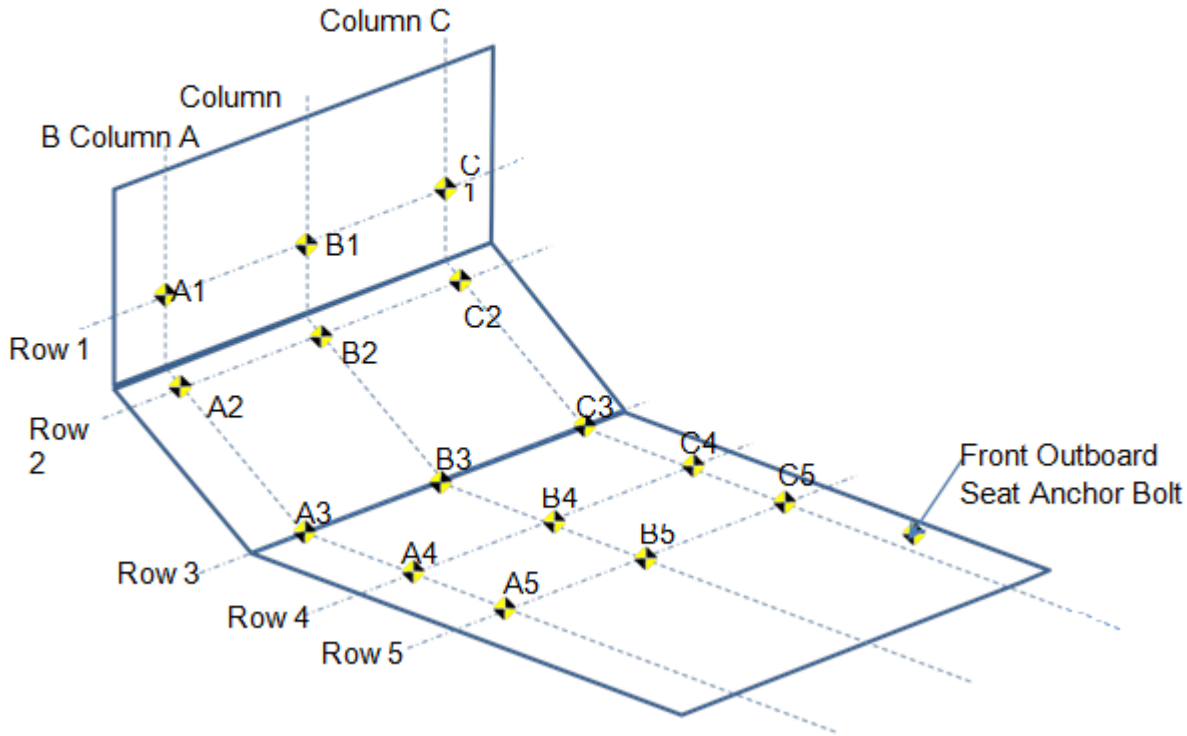


Figure 24: Passenger side lower interior measurements

Passenger Upper Dash

The upper dash point is obtained by adding 25 cm from the lateral coordinate of the center passenger seat reference lateral coordinate. This defines a line of points on the edge of the upper dash. The upper dash point is located on the rearward most (toward the rear of the vehicle) point on this line. This point must be located at least 30 cm above the brake pedal reference point to ensure a vertical location high enough to represent a location that could be contacted by the driver's upper body or head. If the rearward most point is less than 30 cm above the brake pedal reference point, the upper dash point is located at this 30 cm reference location.

There may be instances when the upper dash point is located on a "soft component" such as an air vent or control knob (Figure 23). To measure a more robust structure, the upper dash point is replaced with two additional points, and the weighted average of their coordinates is used to represent the deformation of a point at the original location (Equation 1). Each new point is determined by moving inboard/outboard to a location that is just off of the soft component.

Driver Door Measurements (Figure 25)

Mark the following points on the inner most surface of the door opening, typically on the pinch weld.

1) **Point 1:** The vertical coordinates of this point is obtained by subtracting 0 cm from the brake pedal reference point.
2) **Point 2:** The vertical coordinates of this point is obtained by subtracting 7.5 cm from the

brake pedal reference point.

3) **Point 3:** The vertical coordinates of this point is obtained by subtracting 15 cm from the brake pedal reference point
4) **Point 4:** The vertical coordinates of this point is obtained by subtracting 45 cm from the brake pedal reference point.
5) **Point 5:** The vertical coordinates of this point is obtained by subtracting 52.5 cm from the brake pedal reference point).
6) **Point 6:** The vertical coordinates of this point is obtained by subtracting 60 cm from the brake pedal reference point
7) **Point 7:** The longitudinal coordinates of this point is obtained by subtracting 20 cm from the brake pedal reference point. If the 20 cm point is forward of the actual door frame, this point is located 5 cm rearward of lower hinge pillar point.
8) **Point 8:** The longitudinal coordinates of this point is obtained by subtracting 35 cm from the brake pedal reference point.
9) **Point 9:** The longitudinal coordinates of this point is obtained by subtracting 50 cm from the brake pedal reference point.
10) **Point 10 and 11:** Mark 2 evenly spaced points between points 1 and 7
11) **Point 12 and 13:** Mark 2 evenly spaced points between points 3 and 4
12) **Point 26:** Mark a point at the intersection of the roof rail and the start of the B-pillar
13) **Points 14-25:** Mark 12 evenly spaced points between points 6 and 26
14) **Point 32:** Mark a point at the intersection of the lower sill and the start of the B-pillar
15) **Points 27-31**: Mark 5 evenly spaced points between points 9 and 32



Figure 25: Driver Door Measurements

Passenger Door Measurements

Perform the same procedure as the driver door on the passenger side.

Pre-Test Exterior Profile

1) Expose the front bumper beam.
2) At the lateral center of the bumper beam, measure and mark the center of the front bumper beam (along front face of beam).
3) Using this Z coordinate, mark and measure enough points around the complete circumference of the vehicle to establish cross section A-A.
4) Transpose the lateral center of the bumper beam up onto the top of the upper radiator support.
5) Mark the center of the upper radiator support along its forward leading edge.
6) Using this Z coordinate, mark and measure enough points around the complete circumference of the vehicle to establish cross section B-B.

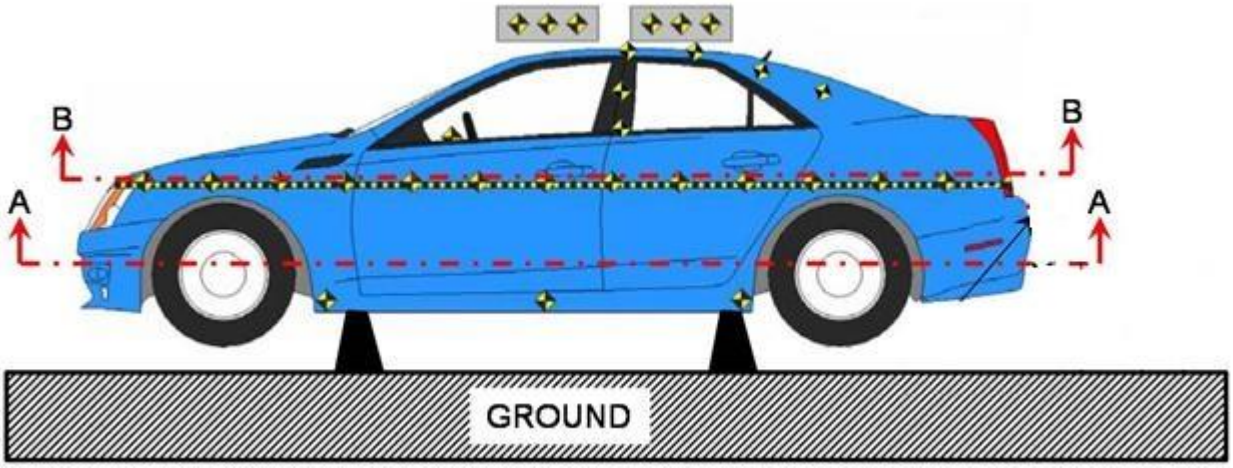


Figure 26: Pre-Test Vehicle Profile

Post-Test Exterior Profile

1) Remove bumper cover
2) Using the vehicle's origin reference point leap into vehicle's coordinate system.
3) Using the pre-test z-value at section A-A which was recorded from VCS origin, take measurements at this z-distance around the circumference of the vehicle.
4) Using the pre-test z-value at section B-B that was recorded from VCS origin, take measurements at this z-distance around the circumference of the vehicle.

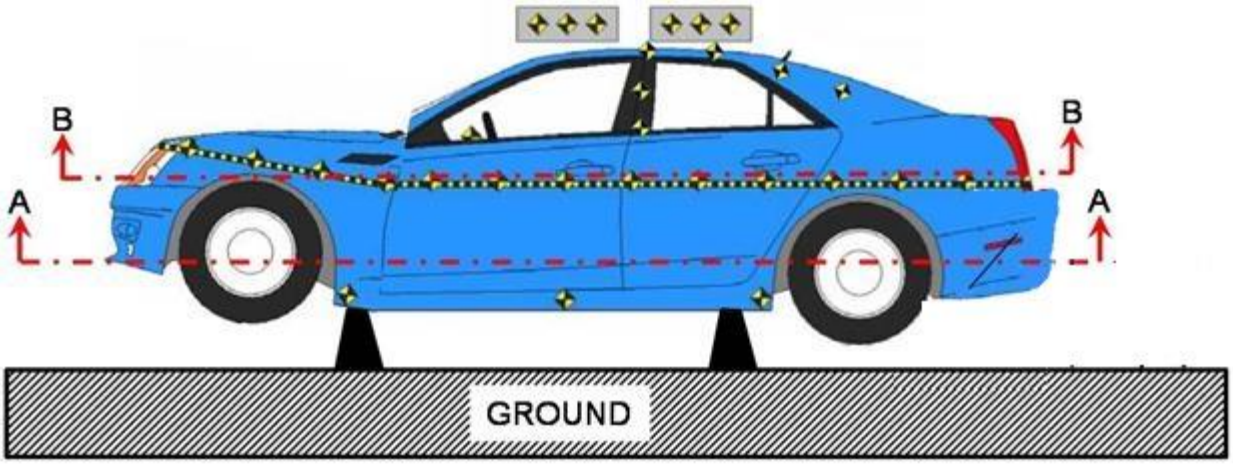


Figure 27: Post-Test Vehicle Profile

Pre and Post Honeycomb Requirements

The contractor shall take pre-and post-crush measurements of the honeycomb while attached to the barrier. These measurements shall be documented in the appropriate datasheet. Also, the contractor shall take pre-and post-test pictures of the left and right side, top, and front view of the honeycomb while attached to the barrier.