REPORT NUMBER: R&D-CAL-15-004

VEHICLE TO FRONTAL BARRIER CRASH TEST IN SUPPORT OF NHTSA'S FRONTAL RESEARCH PROGRAM

2015 Ford F-150 Super Crew

56.3 KPH RIGID BARRIER FRONTAL

TEST DATE: 8/19/2015

NHTSA No: R20150228

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FINAL REPORT SUBMITTED:

March 29, 2016

PREPARED FOR:

U. S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Vehicle safety Research
1200 New Jersey Ave, SE
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Edward J. Dutton, Test Engineer Director
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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-15-004	**2. *Government Accession No.***	**3. *Recipient's Catalog No.***
4. *Title and Subtitle* Report for Frontal Research Program Testing of a 2015 Ford F-150 Super Crew pickup truck NHTSA No.: R20150228		**5. *Report Date*** 3/29/2016 **6. *Performing Organization Code*** CAL
7. *Author(s)* Vanessa Hansen, Test Engineer Edward Dutton, Operations Manager		**8. *Performing Organization Report No.*** CAL-DOT-2015-004
9. *Performing Organization Name and Address* Calspan Corporation 4455 Genesee Street Buffalo, New York 14225		**10. *Work Unit No.*** **11. *Contract or Grant No.*** DTNH22-14-D-00359 TO-0003
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, 3/29/2016 **14. *Sponsoring Agency Code*** NVS-321
15. *Supplementary Notes*		

16. *Abstract*

A test was conducted in accordance with Contract DTNH22-14-D-00359 Task Order 0002. The test consisted of a 2015 Ford F-150 Super Crew pickup truck traveling at a target speed of 56.3 kph into a stationary flat frontal barrier wall. 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 August 18, 2015. The vehicle's impact velocity was 56.15 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 592 mm. The test vehicle's performance was as follows:

Measurement Description	Units	Driver	Front Passenger	Rear Passenger
Head Injury Criteria (HIC_{15})	N/A		489.78	
Brain Injury Criterion (BrIC)	N/A	0.58	0.49	
Abdomen Deflection	mm	-55.30		
Resultant Acetabulum Force	N	960.94		
Maximum Chest Compression	mm	39.27	-22.16	-51.61
Neck Injury Criteria (Nij)	N/A	0.26	0.47	1.33
Neck Tension	N	1233.76	937.64	1832.79
Neck Compression	N	-299.88	-353.91	-1205.43
Tibia Index	N/A	0.40	0.70	
Left Femur Force	N	-2874.87	-405.64	-145.57
Right Femur Force	N	-2972.56	-448.47	-112.61

17. *Key Words* THOR ATD HIII 5th Female RibEye 56.3 kph Frontal Barrier Impact Test	**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

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DISCLAIMER

The contents of this report relate only to the specific product evaluated under the specific test conditions, as defined within this report. The findings and conclusions are those of the author(s) and not necessarily those of Calspan Corporation. For the purposes of this report, Calspan Corporation provided test services only and was not involved with the consulting, design or manufacture of any product. Calspan Corporation does not endorse products or manufacturers. Further, Calspan Corporation (to include: any of its affiliates, parent companies or subsidiaries) assumes no liability associated with the contents of this report or the use of this report.

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SECTION 1
PURPOSE OF TEST

Test Vehicle:	2015 Ford F-150 Super Crew pickup truck	NHTSA No.:	R20150228
Test Program:	56.3 KPH Research Frontal Rigid Barrier Test	Test Date:	8/18/2015

This 56.3 kph (35 mph) test vehicle into a rigid barrier is part of the Frontal Rigid Barrier Test a outlined in Contract No. DTNH22-14-D-00359 Task Order 0002. The purpose of this test is to obtain vehicle crashworthiness and occupant restraint system performance data for research purposes.

This test was conducted in accordance with the instructions set forth for a vehicle to rigid barrier impact, outlined in Contract No. DTNH22-14-D-00359 Task Order 0002. 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 Contract No. DTNH22-14-D-00359 Task Order 0002.

SECTION 2
SUMMARY OF TEST

Test Vehicle:	2015 Ford F-150 Super Crew pickup truck	NHTSA No.:	R20150228
Test Program:	56.3 KPH Research Frontal Rigid Barrier Test	Test Date:	8/18/2015

A rigid fixed barrier was impacted by a 2015 Ford F-150 Super Crew pickup truck at a velocity of 56.15 km/h. The test was performed at Calspan Corporation's Transportation Test Operations facility in Buffalo, New York on August 18, 2015. Pre- and post-test photographs of the vehicle and dummies to document the test can be found in Appendix A. One real-time camera and 16 high-speed cameras were used to document the frontal barrier impact event. Camera locations and other pertinent camera information can be found in Data Sheet 6 of this report.

One 50% adult male THOR-M anthropomorphic test device (ATD) (Serial No. DL9207), was placed in the driver seating position, and one Part 572O 5th percentile female ATD with RibEye (Serial No. 324), was placed in the right-front passenger seating position at mid-track according to dummy placement instructions specified in the frontal NCAP laboratory test procedure. One Part 572O 5th percentile female ATD with RibEye (Serial No. 019) was also placed in the rear seating position (P3) and positioned according to dummy placement instructions specified in the Side MDB NCAP Laboratory Test Procedure.

Seat belt load cells were also on the driver's and passengers' shoulder and lap belts to measure the dummy's torso and pelvic section loading. In addition to seat belt load cells, belt movement sensors were utilized on both the driver and front passengers' seat belts to measure displacement. The driver (position 1) ATD (Serial No. DL9207), right-front passenger (position 2) ATD (Serial No. 324), and the rear passenger ATD (Serial No. 019) were calibrated previous to this test. Certification details, along with instrumentation calibration data, can be found in Appendix C of this report.

Two hundred and sixty seven (267) channels of data from the ATD's and test vehicle were collected using Kayser – Threde and DTS data acquisition systems. Appendix B contains dummy and vehicle response data plots.

There was 100% total windshield retention and 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 592 mm at C3 to the right of the vehicle's centerline. Full vehicle measurements are presented in Section 3 of this report.

Test Vehicle:	2015 Ford F-150 Super Crew pickup truck	NHTSA No.:	R20150228
Test Program:	56.3 KPH Research Frontal Rigid Barrier Test	Test Date:	8/18/2015

All four vehicle doors remained closed and latched during the test. All doors remained operational after the impact event.

Structure observations include the following:

- Hood bent inwards exposing part of the engine compartment

The driver ATD's visible contact points were:

- Head contacted the frontal airbag, and headrest
- Torso contacted the frontal airbag
- Knees contacted the knee bolster

The right front passenger ATD's visible contact points were:

- Head contacted the frontal airbag and headrest
- Torso contacted the frontal airbag

The rear passenger ATD's visible contact points were:

- Head contacted the headrest

SECTION 2 (CONTINUED)
CRASH VEHICLE SUMMARY

Test Vehicle:	2015 Ford F-150 Super Crew pickup truck	NHTSA No.:	R20150228
Test Program:	56.3 KPH Research Frontal Rigid Barrier Test	Test Date:	8/18/2015

Primary Impact Data

Measured Parameter	Units	Value
Test Vehicle Velocity at Impact	kph	56.15
Vehicle Test Weight	kg	2474
Vehicle Maximum Static Crush	mm	592
Number of Data Channels		267
Number of Real-Time Cameras		1
Number of High-Speed Cameras		16

GENERAL COMMENTS:

1. P1 (Driver) serial number – DL9207
2. P2 (Passenger) serial number – 324
3. P3 (Rear Passenger) serial number – 019

Data Anamolies:

- Driver Head CG Y Acceleration, Questionable spikes throughout B-8
- Driver Right Tibia Y Acceleration, Questionable data throughout B-32
- Rear Passenger Head X Acceleration, Questionable data after 19.2ms B-55
- Engine Top X Acceleration, Questionable data from 19ms B-72
- Vehicle CG Z Angular Rate, Questionable data from 82.2ms to 164ms B-72
- Front Passenger RibEye Right Rib 06 Displacement Data Anomaly due to Chest Pot or abdominal insert Interference B-45

PRELIMINARY INJURY SUMMARY: Driver

Test Vehicle: 2015 Ford F-150 - R20150228 NHTSA No.: R20150228
Test Program: NHTSA R&D Frontal Rigid Barrier Test Date: 8/18/2015

Driver: THOR Serial No. DL9207 Injury Summary

Location	Description	Unit	Source	Max	Min
Head	15 ms HIC		Compute	204.58(1)	
	Brain Injury Criteria		Compute	0.58	
	Head Rotational Velocity X	Deg/s	60	424.38	-306.45
	Head Rotational Velocity Y	Deg/s	60	1176.18	-1641.05
	Head Rotational Velocity Z	Deg/s	60	651.55	-447.64
Neck	Upper Neck Z-axis Force	N	1000	1233.76	-299.88
	Upper Neck Y-axis Moment	N-m	Thortest	35.99	-18.47
Chest	Upper Left Resultant Chest Deflection	mm	Thortest	21.49	
	Upper Right Resultant Chest Deflection	mm	Thortest	39.27	
	Lower Left Resultant Chest Deflection	mm	Thortest	9.95	
	Lower Right Resultant Chest Deflection	mm	Thortest	28.45	
Abdomen	Lower Left X-axis Deflection	mm	Thortest	0.69(2)	-53.22(2)
	Lower Right X-axis Deflection	mm	Thortest	0.35	-55.30
Acetabulum	Left Acetabulum Resultant Force	N	Compute	794.37	1.69
	Right Acetabulum Resultant Force	N	Compute	960.94	0.86
Femur	Left Femur Force, FZ	N	600	192.01	-2874.87
	Right Femur Force, FZ	N	600	191.48	-2972.56
Tibia	Left Upper Tibia, FZ	N	600	142.62	-1231.29
	Left Upper Tibia Index		Compute	0.31	
	Right Upper Tibia, FZ	N	600	102.16	-2184.71
	Right Upper Tibia Index		Compute	0.36	
	Left Lower Tibia, FZ	N	600	150.06	-1794.35
	Left Lower Tibia Index		Compute	0.30	
	Right Lower Tibia, FZ	N	600	113.90	-2440.79
	Right Lower Tibia Index		Compute	0.40	
Ankle	Left Ankle Rotation, RX	Deg	180	1.63	-14.26
	Left Ankle Rotation, RY	Deg	180	-3.62	-12.80
	Left Ankle Dorsiflexion Moment, MY	Nm	Compute	16.27	-32.00
	Left Ankle In/Eversion Moment, MX	Nm	Compute	28.19	-13.04
	Right Ankle Rotation, RX	Deg	180	5.34	-3.07
	Right Ankle Rotation, RY	Deg	180	6.64	-9.10
	Right Ankle Dorsiflexion Moment, MY	Nm	Compute	16.81	-32.49
	Right Ankle In/Eversion Moment, MX	Nm	Compute	502.15	-639.92

Anomalies:

(1) Head CG Y Acceleration – Questionable spikes throughout
(2) Questionable Data: Bad Cal

PRELIMINARY INJURY SUMMARY: Right Front Passenger

Test Vehicle: 2015 Ford F-150 - R20150228 NHTSA No.: R20150228
Test Program: NHTSA R&D Frontal Rigid Barrier Test Date: 8/18/2015

Right Front Passenger: HF Serial No. 324 Injury Summary

Location	Description	Unit	Source	Max	Min
Head	15 ms HIC		Compute	489.78	
	Brain Injury Criteria (BrIC)		Compute	0.49	
Neck	Upper Neck Force Z	N	1000	937.64	-353.91
	Upper Neck Moment Y	Nm	600	19.62	-20.20
	NIJ		Compute	0.47	
Chest	Chest Potentiometer Deflection	mm	600		-20.68
	Left Ribeye 01 X-Axis Deflection	mm	600	0.14	-22.16
	Left Ribeye 02 X-Axis Deflection	mm	600	0.20	-20.72
	Left Ribeye 03 X-Axis Deflection	mm	600	0.25	-19.76
	Left Ribeye 04 X-Axis Deflection	mm	600	0.91	-18.44
	Left Ribeye 05 X-Axis Deflection	mm	600	1.12	-17.43
	Left Ribeye 06 X-Axis Deflection	mm	600	1.36	-15.64
	Right Ribeye 01 X-Axis Deflection	mm	600	0.83	-16.24
	Right Ribeye 02 X-Axis Deflection	mm	600	0.23	-13.65
	Right Ribeye 03 X-Axis Deflection	mm	600	0.20	-12.43
	Right Ribeye 04 X-Axis Deflection	mm	600	0.28	-10.72
	Right Ribeye 05 X-Axis Deflection	mm	600	0.23	-9.75
	Right Ribeye 06 X-Axis Deflection	mm	600	1.82(3)	-6.79(3)
	Overall Ribeye X-Axis Deflection	mm	600	1.82(3)	-22.16
	Chest Resultant Acceleration	g	Compute	47.89	
	Chest Resultant Acceleration, 3 ms clip	g	Compute	45.97	
Pelvis	Pelvis Resultant Acceleration	g	Compute	53.10	
Femur	Left Femur Force, FZ	N	600	2146.36	-405.64
	Right Femur Force, FZ	N	600	2101.23	-448.47
Tibia	Left Upper Tibia, FZ	N	600	1449.97	-290.84
	Left Upper Tibia Index		Compute	0.31	
	Right Upper Tibia, FZ	N	600	1399.91	-117.48
	Right Upper Tibia Index		Compute	0.41	
	Left Lower Tibia, FZ	N	600	1150.91	-1155.85
	Left Lower Tibia Index		Compute	0.32	
	Right Lower Tibia, FZ	N	600	970.86	-188.16
	Right Lower Tibia Index		Compute	0.70	

Anomalies

(3) Interference by Chest Pot or Abdominal Insert

PRELIMINARY INJURY SUMMARY: Right Rear Passenger

Test Vehicle: 2015 Ford F-150 - R20150228 NHTSA No.: R20150228
Test Program: NHTSA R&D Frontal Rigid Barrier Test Date: 8/18/2015

Right Rear Passenger: HF Serial No. 019 Injury Summary

Location	Description	Unit	Source	Max	Min
Head	15 ms HIC		Compute	1995969.20(4)	
Neck	Upper Neck Force Z	N	1000	1832.79	-1205.43
	Upper Neck Moment Y	Nm	600	30.31	-75.06
	NIJ		Compute	1.33	
Chest	Chest Potentiometer Deflection	mm	600		-51.61
	Left Ribeye 01 X-Axis Deflection	mm	600	-	-
	Left Ribeye 02 X-Axis Deflection	mm	600	-	-
	Left Ribeye 03 X-Axis Deflection	mm	600	-	-
	Left Ribeye 04 X-Axis Deflection	mm	600	-	-
	Left Ribeye 05 X-Axis Deflection	mm	600	-	-
	Left Ribeye 06 X-Axis Deflection	mm	600	-	-
	Right Ribeye 01 X-Axis Deflection	mm	600	-	-
	Right Ribeye 02 X-Axis Deflection	mm	600	-	-
	Right Ribeye 03 X-Axis Deflection	mm	600	-	-
	Right Ribeye 04 X-Axis Deflection	mm	600	-	-
	Right Ribeye 05 X-Axis Deflection	mm	600	-	-
	Right Ribeye 06 X-Axis Deflection	mm	600	-	-
	Overall Ribeye X-Axis Deflection	mm	600	-	-
	Chest Resultant Acceleration	g	Compute	53.25	
	Chest Resultant Acceleration, 3 ms clip	g	Compute	52.79	
Pelvis	Pelvis Resultant Acceleration	g	Compute	63.77	
	Left ASIS Force X	N	600	52.05	-3780.78
	Right ASIS Force X	N	600	16.73	-2610.18
Femur	Left Femur Force Z	N	600	4446.91	-145.57
	Right Femur Force Z	N	600	4527.27	-112.61

Anomalies

(4) Head CG X Acceleration - Questionable data after 19.2ms

SECTION 3
DATA SHEETS

Test Vehicle:	2015 Ford F-150 Super Crew pickup truck	NHTSA No.:	R20150228
Test Program:	56.3 KPH Research Frontal Rigid Barrier Test	Test Date:	8/18/2015

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DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle:	2015 Ford F-150 Super Crew pickup truck	NHTSA No.:	R20150228
Test Program:	56.3 KPH Research Frontal Rigid Barrier Test	Test Date:	8/18/2015

VEHICLE INFORMATION

NHTSA No.	R20150228
Model Year	2015
Make	Ford
Model	F-150 Super Crew
Body Style	Crew Cab / Pick Up
VIN	1FTEW1CG4FKD64891
Body Color	White
Odometer Reading (km/mi)	11.2 km / 7 mi
Engine Displacement. (L)	3.5
Type/No. Cylinders	V6
Engine Placement	Inline
Transmission Type	Automatic
Transmission Speeds	6-Speed
Overdrive	Yes
Final Drive	Rear Wheel Drive
Roof Rack	No
Sunroof/T-Top	No
Running Boards	Yes
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	Ford Motor Co.
Date of Manufacture	06/15

GVWR (kg)	3084
GAWR Front (kg)	1429
GAWR Rear (kg)	1724

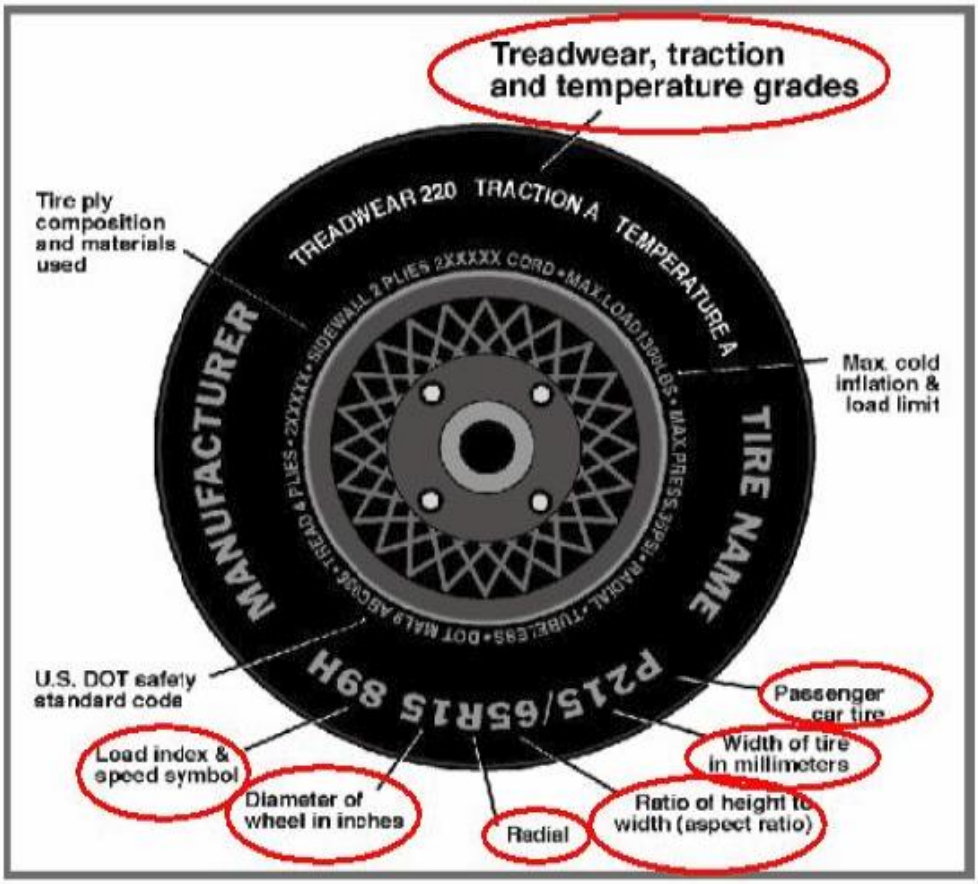
VEHICLE SEATING AND WEIGHT CAPACITY

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Split Bench	Split Bench	-	
Number of Occupants	3	3	-	6
Capacity Wt. (VCW) (kg)				920
Cargo Wt. (RCLW) (kg)				136

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

Test Vehicle:	2015 Ford F-150 Super Crew pickup truck	NHTSA No.:	R20150228
Test Program:	56.3 KPH Research Frontal Rigid Barrier Test	Test Date:	8/18/2015

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



Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	250	250
Recommended Tire Size	P245/70R17	P245/70R17
Tire Size on Vehicle	P245/70R17	P245/70R17
Tire Manufacturer	Michelin	Michelin
Tire Model	LTX M/S^2	LTX M/S^2
Treadwear	720	720
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	2 Polyester, 1 Polyamide, 2 Steel	2 Polyester, 1 Polyamide, 2 Steel
Load Index/Speed Symbol	110T	110T
Tire Material	Rubber	Rubber
DOT Safety Code Right	M3X600AX2115	M3X600AX2115
DOT Safety Code Left	M3X600AX2115	M3X600AX2115

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

Test Vehicle: 2015 Ford F-150 Super Crew pickup truck
Test Program: 56.3 KPH Research Frontal Rigid Barrier Test
NHTSA No.: R20150228
Test Date: 8/18/2015

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	615	455		678	555	
Right	kg	615	449		681	560	
Ratio	%	58%	42%		55%	45%	
Totals	kg	1230	904	2134	1359	1115	2474

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	2134
Weight of 1 THOR & 2 HIII 5th Females	kg	211
Rated Cargo/Luggage Weight (RCLW)	kg	136
Calculated Vehicle Target Weight (TVTW)	kg	2481

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	914	912	989	989	1563
As Tested	mm	896	896	953	957	1663
Post Test	mm	881	866	1037	978	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	3690
Total Vehicle Length at Left Side	mm	5838
Total Vehicle Length at Centerline	mm	5883
Total Vehicle Length at Right Side	mm	5836
Weight of Ballast in Cargo Area	kg	0
Weight of Vehicle Components Removed	kg	0
Amount of Stoddard Solvent in Fuel Tank	L	84.5

LIST OF COMPONENTS REMOVED TO MEET TEST WEIGHT:

None.

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

Test Vehicle: 2015 Ford F-150 Super Crew pickup truck NHTSA No.: R20150228
Test Program: 56.3 KPH Research Frontal Rigid Barrier Test Test Date: 8/18/2015

TARGET VEHICLE STRUCTURAL MEASUREMENT

	Elements		Pre-Test
1	Total Length	mm	5883
2	Total Width	mm	2028
3*	Bumper Top Height	mm	682
4*	Bumper Bottom Height	mm	467
5*	Longitudinal Member Top Height	mm	657
6	Distance Between Longitudinal Members	mm	964
7	Longitudinal Member Width	mm	95
8*	Engine Top Height	mm	1137
9*	Engine Bottom Height	mm	347
10	Engine and Gearbox Width	mm	581
11	Front Bumper-Engine Distance	mm	842
12*	Front Shock Absorber Fixing Height	mm	888
13*	Bonnet Leading Edge Height	mm	1179
14	Front Shock Absorber Fixing Width	mm	978
15	Front Bumper – Front Axle Distance	mm	954
16	Front Axle – A Pillar Distance	mm	579
17	A-Pillar – B-Pillar Distance	mm	1290
18	B-Pillar – Rear Axle Distance	mm	1817
19	B-Pillar – C-Pillar Distance	mm	1035
20*	Roof Sill Bottom Height	mm	1810
21*	Roof Sill Top Height	mm	1846
22*	Floor Sill Bottom Height	mm	601
23*	Floor Sill Top Height	mm	591

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

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

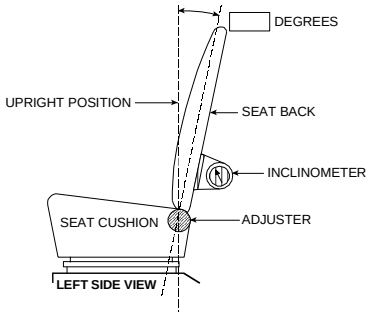
Test Vehicle: 2015 Ford F-150 Super Crew pickup truck NHTSA No.: R20150228
Test Program: 56.3 KPH Research Frontal Rigid Barrier Test Test Date: 8/18/2015

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 according to the Nominal Design Riding position listed in FORM 1. Rear Passenger seatback is a fixed angle.



FRONT SEAT ASSEMBLY

	Deg.
Driver Seat Back Angle	2.7
Passenger Seat Back Angle	3.5
Rear Passenger Seat Back Angle	6.5

SEAT FORE/AFT POSITIONS

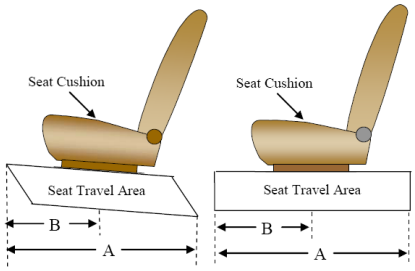
Describe the method used of determining seat fore/aft positions. The driver's seat was positioned at its lowest position at mid angle and at the mid-point of fore/aft travel. The front passenger's seat was positioned at the mid-point of fore/aft travel at Mid angle and mid height.

	Total Fore/Aft Travel	Placed in Position #
Driver Seat	38 (0 – 37)	19
Passenger Seat	38 (0 – 37)	19
Rear Passenger Seat	FIXED	FIXED

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	1
Passenger Seat	4	0
Rear Passenger Seat	FIXED	FIXED



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

Test Vehicle: 2015 Ford F-150 Super Crew pickup truck
NHTSA No.: R20150228
Test Program: 56.3 KPH Research Frontal Rigid Barrier Test
Test Date: 8/18/2015

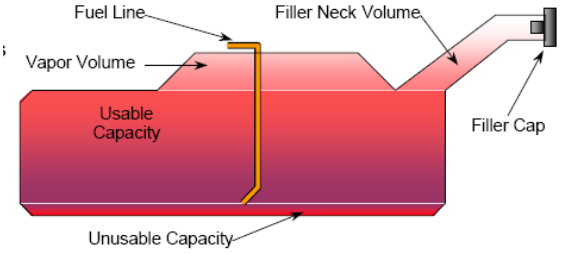
FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank"	90.8
Usable Capacity of "Optional Tank"	136.3
93% of Usable Capacity	84.5
Actual Amount of Solvent Used	84.5
1/3 of Usable Capacity	30.2

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.

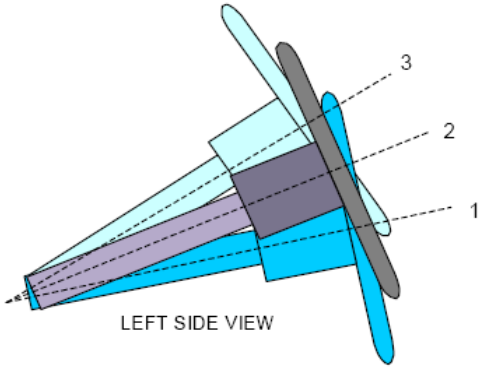


VEHICLE FUEL TANK ASSEMBLY

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)



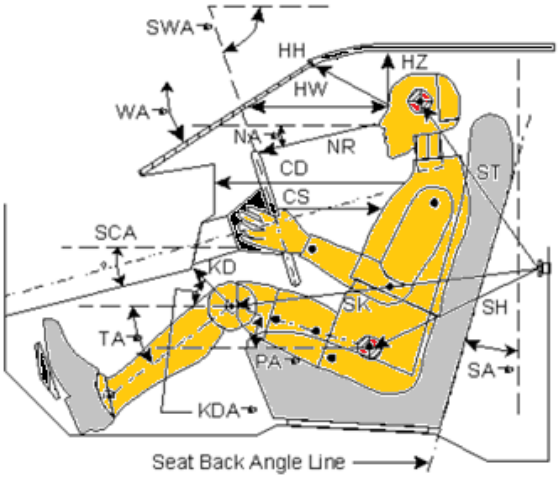
STEERING COLUMN ASSEMBLY

STEERING COLUMN POSITIONS

	Tilt (degrees)	Fore/Aft Position (mm)
Lowermost position No. 1	22.4	
Geometric center position No. 2	20.7	
Uppermost position No. 3	18.9	
Telescoping Steering Wheel Travel		40
Test Position	20.7	20

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

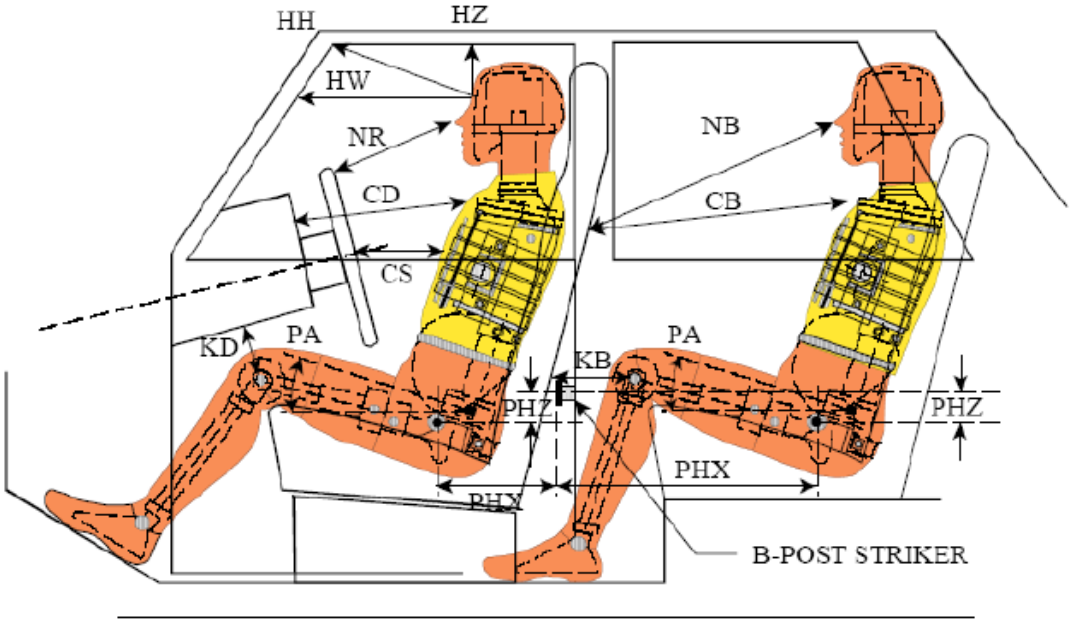
Test Vehicle: 2015 Ford F-150 Super Crew pickup truck
Test Program: 56.3 KPH Research Frontal Rigid Barrier Test
NHTSA No.: R20150228
Test Date: 8/18/2015



Code	Measurement Description	Driver (Serial # THOR DL9207)		Front Passenger (Serial # 324)	
		Length (mm)	Angle(°)	Length (mm)	Angle (°)
WAº	Windshield Angle		-33		
SWAº	Steering Wheel Angle		21.2		
SCAº	Steering Column Angle		68.8		
SAº	Seat Back Angle (on headrest post)		3.1		3.5
HZ	Head to Roof (Z)	238	90	333	90
HH	Head to Header	535	16.4	526	29.2
HW	Head to Windshield	795	0	873	0
NR	Nose to Rim	515	17.1	630	19.8
CD	Chest to Dash	653		576	
CS	Chest to Steering Hub	408	1.6		
RA	Rim to Abdomen	203	0.3		
KDL	Left Knee to Dash	136	20.2	205	24.8
KDR	Right Knee to Dash	125	4.2	214	21.7
PAº	Pelvic Angle		34.1		20.3
TAº	Tibia Angle		47.5		43.7
SK	Striker to Knee	723	3.3	656	1.0
ST	Striker to Head	620	-80.2	536	-72.4
SH	Striker to H-Point	323	-6.2	321	9.0
HAX°	Head Angle (X)		0.3		
HAY°	Head Angle (Y)		-2.9		
TAX°	T6 Angle (X)		0.7		
TAY°	T6 Angle (Y)		23.3		
TAX°	T1 (X)		0.1		
TAY°	T1 (Y)		1.0		
TAX°	T12 (X)		0.8		
TAY°	T12 (Y)		32.0		
	Pelvis (X)		0.7		
	Pelvis (Y)		34.1		

DATA SHEET NO. 3 (CONTINUED)
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2015 Ford F-150 Super Crew pickup truck
NHTSA No.: R20150228
Test Program: 56.3 KPH Research Frontal Rigid Barrier Test
Test Date: 8/18/2015



NOTE: 2-DOOR VEHICLE SHOWN. REAR DUMMY PHX & PHZ MEASUREMENTS FOR A 4-DOOR VEHICLE WOULD USE THE C-POST STRIKER AS A REFERENCE POINT

LEFT SIDE VIEW

Code	Measurement Description	Rear Passenger (Serial # 019)	
		Length (mm)	Angle (°)
SA°	Seat Back Angle (on headrest post)		6.5
HZ	Head to Roof (Z)	345	
NR	Nose to Seatback	705	
CB	Chest to Seatback	716	
KDL	Left Knee to Seatback	428	12.6
KDR	Right Knee Seatback	424	13.2
PAX°	Pelvic Tilt Angle (X-axis)		0
PAY°	Pelvic Tilt Angle (Y-axis)		19.3
PHX	Hip Point to Striker (X-Axis)	230	
PHZ	Hip Point to Striker (Z-Axis)	26	

DATA SHEET NO.3 (CONTINUED)
DUMMY CMM MEASUREMENTS

Test Vehicle:	2015 Ford F-150 Super Crew pickup truck	NHTSA No.:	R20150228
Test Program:	56.3 KPH Research Frontal Rigid Barrier Test	Test Date:	8/18/2015

MEASUREMENT LOCATIONS

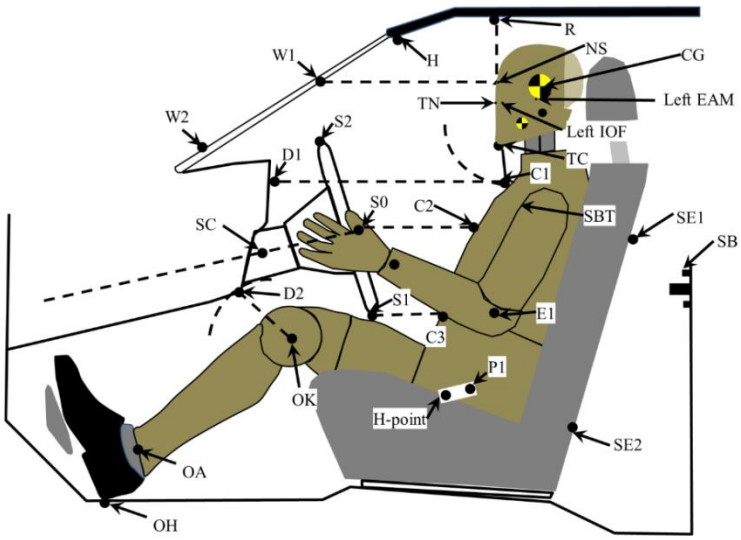


DIAGRAM #1

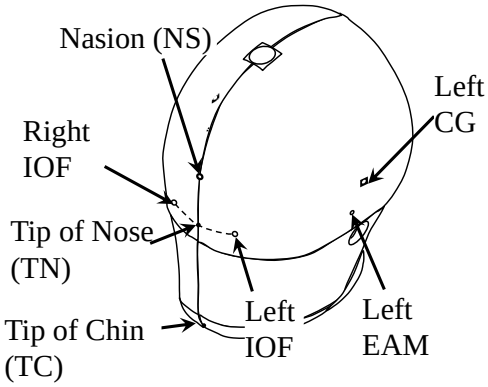


DIAGRAM #2

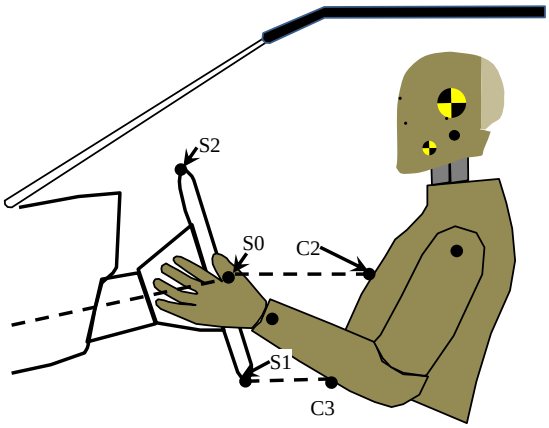


DIAGRAM #3

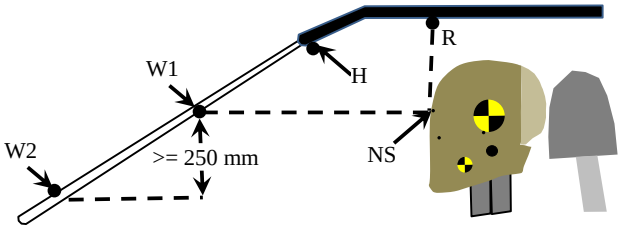


DIAGRAM #4

DATA SHEET NO.3 (CONTINUED)
DUMMY CMM MEASUREMENTS

Test Vehicle: 2015 Ford F-150 Super Crew pickup truck NHTSA No.: R20150228
Test Program: 56.3 KPH Research Frontal Rigid Barrier Test Test Date: 8/18/2015

DRIVER MEASUREMENT PONITS

Description	Units	Driver		
		X	Y	Z
Tip of Striker	mm	3145	-897	-471
Top of Head Restraint	mm	3087	-453	-1153
Outboard Head Restraint Post	mm	3073	-541	-944
Head CG	mm	3251	-529	-1082
Nasion	mm	3345	-451	-1090
Tip of Nose	mm	3344	-454	-1052
Tip of Chin	mm	3338	-454	-951
LEAM	mm	3258	-524	-1054
LIOF	mm	3342	-484	-1052
RIOF	mm	3342	-420	-1052
Outboard Elbow	mm	3482	-672	-659
H-Point	mm	3466	-652	-436
Center of H-Point Tool	mm	3391	-696	-464
Left Knee	mm	3867	-678	-512
Right Knee	mm	3878	-380	-518
Left Ankle	mm	4153	-700	-209
Right Heel	mm	4167	-313	-74
Left Heel	mm	4151	-680	-70
W1 – Upper Windshield	mm	4137	-452	-1089
W2 – Lower Windshield	mm	4290	-453	-990
Header	mm	3855	-452	-1252
Head to Roof	mm	3344	-453	-1331
C1- Upper Chest	mm	3377	-453	-816
C2 – Mid Chest	mm	3387	-452	-799
C3 – Lower Chest	mm	3501	-454	-614
S2 – Top Steering Wheel Rim	mm	3842	-452	-966
S1 – Lower Steering Wheel Rim	mm	3704	-452	-617
SC – Steering Column	mm	4020	-573	-673
D1 – Dash Point	mm	3791	-453	-819
D2 – Knee Bolster	mm	3991	-683	-559
SE1 – Seatback Point	mm	3041	-453	-815
SE2 – Seatback Point	mm	3186	-452	-339
Left Front Outboard Seat Anchor Bolt	mm	3702	-628	-116
Left Rear Outboard Seat Anchor Bolt	mm	3208	-667	-114

Reference point:

+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.3 (CONTINUED)
DUMMY CMM MEASUREMENTS

Test Vehicle: 2015 Ford F-150 Super Crew pickup truck NHTSA No.: R20150228
Test Program: 56.3 KPH Research Frontal Rigid Barrier Test Test Date: 8/18/2015

FRONT PASSENGER MEASUREMENT POINTS

Description	Units	Front Passenger		
		X	Y	Z
Tip of Striker	mm	3136	895	-468
Top of Head Restraint	mm	3126	466	-1134
Outboard Head Restraint Post	mm	3068	546	-943
Head CG	mm	3298	532	-979
Bridge of Nose	mm	3391	466	-988
Tip of Nose	mm	3412	467	-958
Tip of Chin	mm	3399	466	-885
Outboard Shoulder Bolt	mm	3281	620	-747
Outboard Elbow	mm	3382	680	-549
H-Point	mm	3453	730	-418
Center of H-Point Tool	mm	3365	742	-448
Left Knee	mm	3798	414	-474
Right Knee	mm	3792	582	-479
Left Ankle	mm	4009	380	-192
Right Ankle	mm	3999	553	-196
Left Heel	mm	3955	370	-111
Right Heel	mm	3949	542	-114
W1 – Upper Windshield	mm	4289	467	-986
W2 – Lower Windshield	mm	4439	468	-886
Header	mm	3846	466	-1253
Head up to Roof	mm	3389	465	-1323
C1 - Upper Chest	mm	3403	465	-752
D1 - Dash Point	mm	4000	466	-753
D2 - Dash Bolster	mm	3983	415	-559
SE1 - Seat Back Point	mm	3040	466	-820
SE2 - Seat Back Point	mm	3175	467	-343
Right Front Outboard Seat Anchor Bolt	mm	3696	635	-115
Right Rear Outboard Seat Anchor Bolt	mm	3204	668	-114

Reference point:
+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.3 (CONTINUED)
DUMMY CMM MEASUREMENTS

Test Vehicle: 2015 Ford F-150 Super Crew pickup truck NHTSA No.: R20150228
Test Program: 56.3 KPH Research Frontal Rigid Barrier Test Test Date: 8/18/2015

Description	Units	Rear Passenger		
		X	Y	Z
Tip of Striker	mm	2150	896	-473
Top of Head Restraint	mm	2025	460	-1111
Outboard Head Restraint Post	mm	2012	523	-904
Head CG	mm	2223	530	-1007
Bridge of Nose	mm	2309	459	-1015
Tip of Nose	mm	2332	459	-984
Tip of Chin	mm	2315	460	-907
Outboard Shoulder Bolt	mm	2215	617	-772
Outboard Elbow	mm	2277	695	-565
H-Point	mm	2380	667	-447
Center of H-Point Tool	mm	2295	681	-480
Left Knee	mm	2707	413	-497
Right Knee	mm	2713	569	-501
Left Ankle	mm	2871	385	-189
Right Ankle	mm	2872	551	-191
Left Heel	mm	2801	361	-120
Right Heel	mm	2804	529	-124
Head up to Roof	mm	2310	460	-1359
C1 - Upper Chest	mm	2324	460	-777
D1 - Dash Point	mm	3048	460	-778
D2 - Dash Bolster	mm	3129	412	-585
SE1 - Seat Back Point	mm			
SE2 - Seat Back Point	mm			

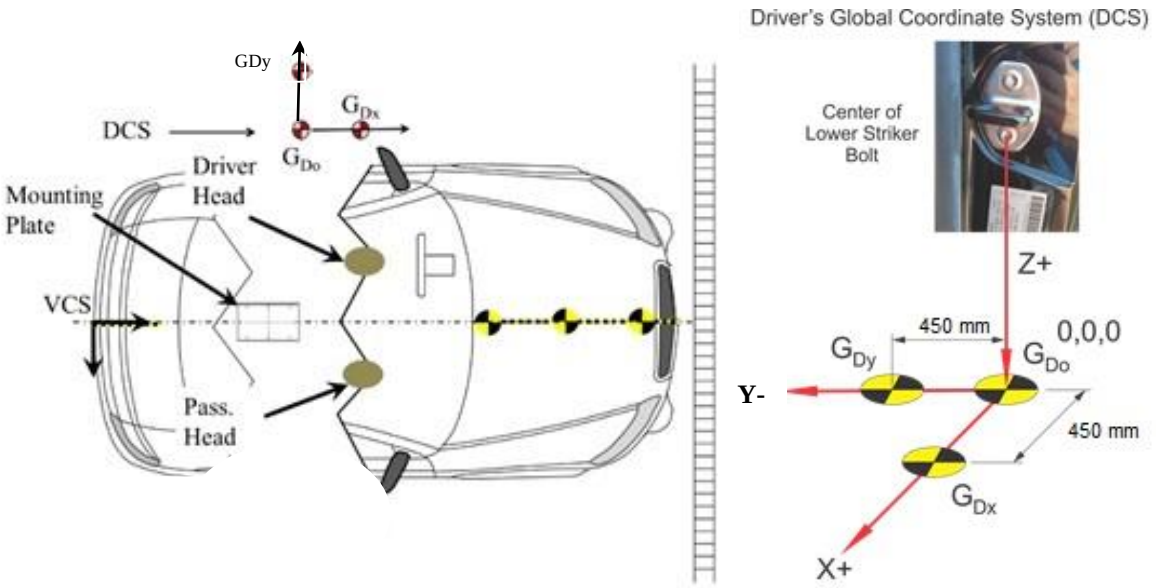
Reference point:

+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.3 (CONTINUED)
DUMMY CMM MEASUREMENTS

Test Vehicle:	2015 Ford F-150 Super Crew pickup truck	NHTSA No.:	R20150228
Test Program:	56.3 KPH Research Frontal Rigid Barrier Test	Test Date:	8/18/2015

DRIVER GLOBAL COORDINATE SYSTEM



Driver ATD Measurement Points

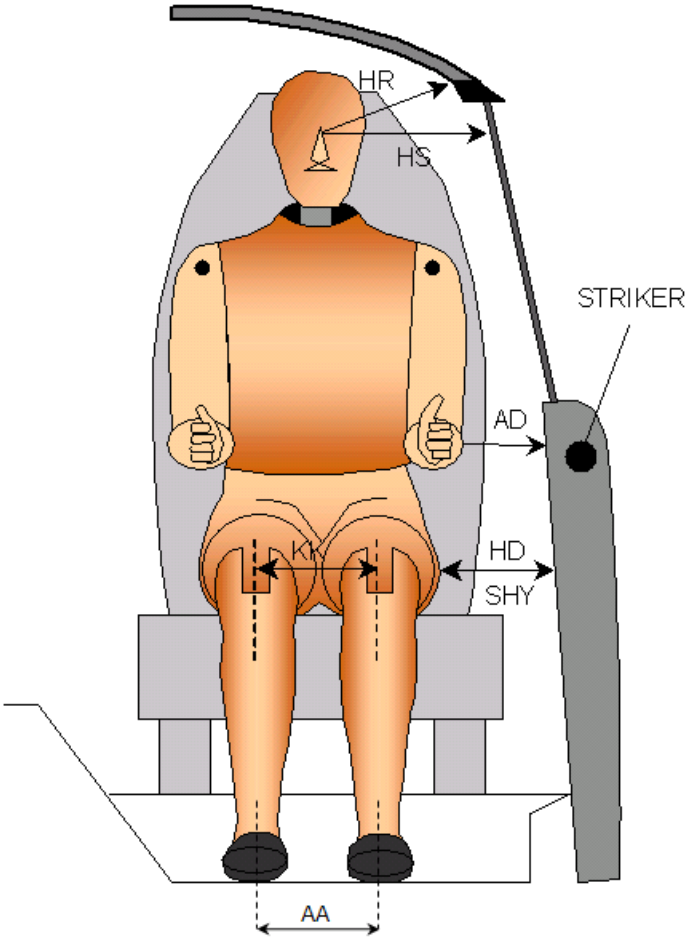
Measurement Points	Units	Measurements (mm)		
		X	Y	Z
Head CG	mm	140	368	-1564
Nasion	mm	234	446	-1572
Tip of Nose	mm	232	443	-1534
Tip of Chin	mm	227	443	-1434
LEAM	mm	147	373	-1536
LIOF	mm	230	413	-1534
RIOF	mm	231	478	-1534

Reference point:

+X – From GD_0 to the front of the vehicle
+Y – From GD_0 to the right side of the vehicle
+Z – From GD_0 into the ground

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

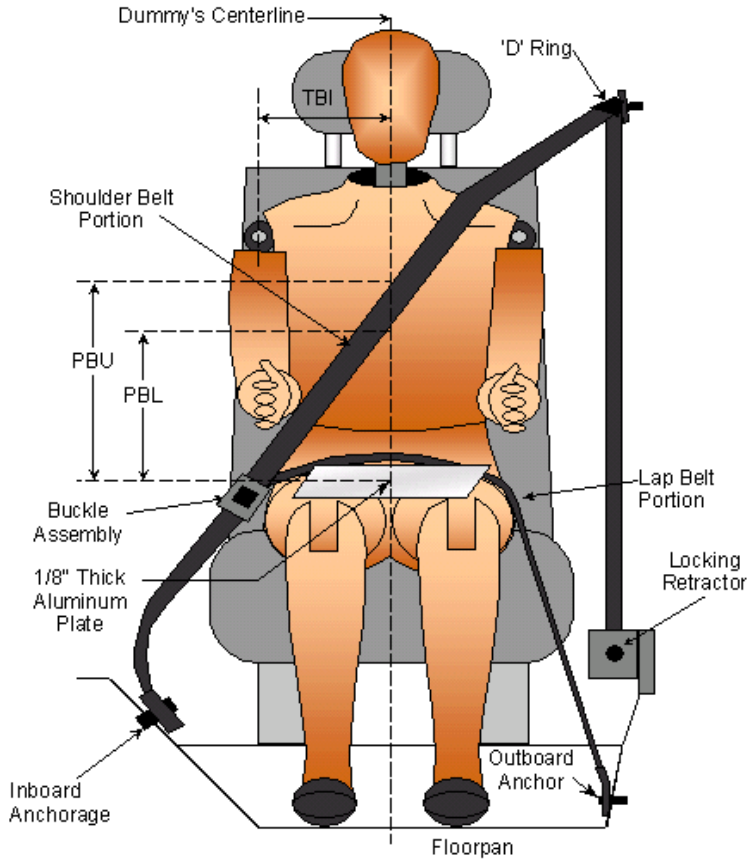
Test Vehicle:	2015 Ford F-150 Super Crew pickup truck	NHTSA No.:	R20150228
Test Program:	56.3 KPH Research Frontal Rigid Barrier Test	Test Date:	8/18/2015



Code	Description	Units	Driver	Front Passenger	Rear Passenger
AD	Arm to Door	mm	163	95	88
HD	H-Point to Door	mm	146	182	205
HR	Head to Side Header	mm	224	288	293
HS	Head to Side Window	mm	364	384	388
KK	Knee to Knee	mm	351	165	163
SHY	Striker to H-Point (Y Direction)	mm	250	285	285
AA	Ankle to Ankle	mm	359	178	161

DATA SHEET NO. 5
SEAT BELT POSITIONING DATA

Test Vehicle:	2015 Ford F-150 Super Crew pickup truck	NHTSA No.:	R20150228
Test Program:	56.3 KPH Research Frontal Rigid Barrier Test	Test Date:	8/18/2015



SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger	Rear Pass.
PBU — Top surface of reference to belt upper edge	mm	375	295	280
PBL — Top surface of reference to belt lower edge	mm	300	225	205

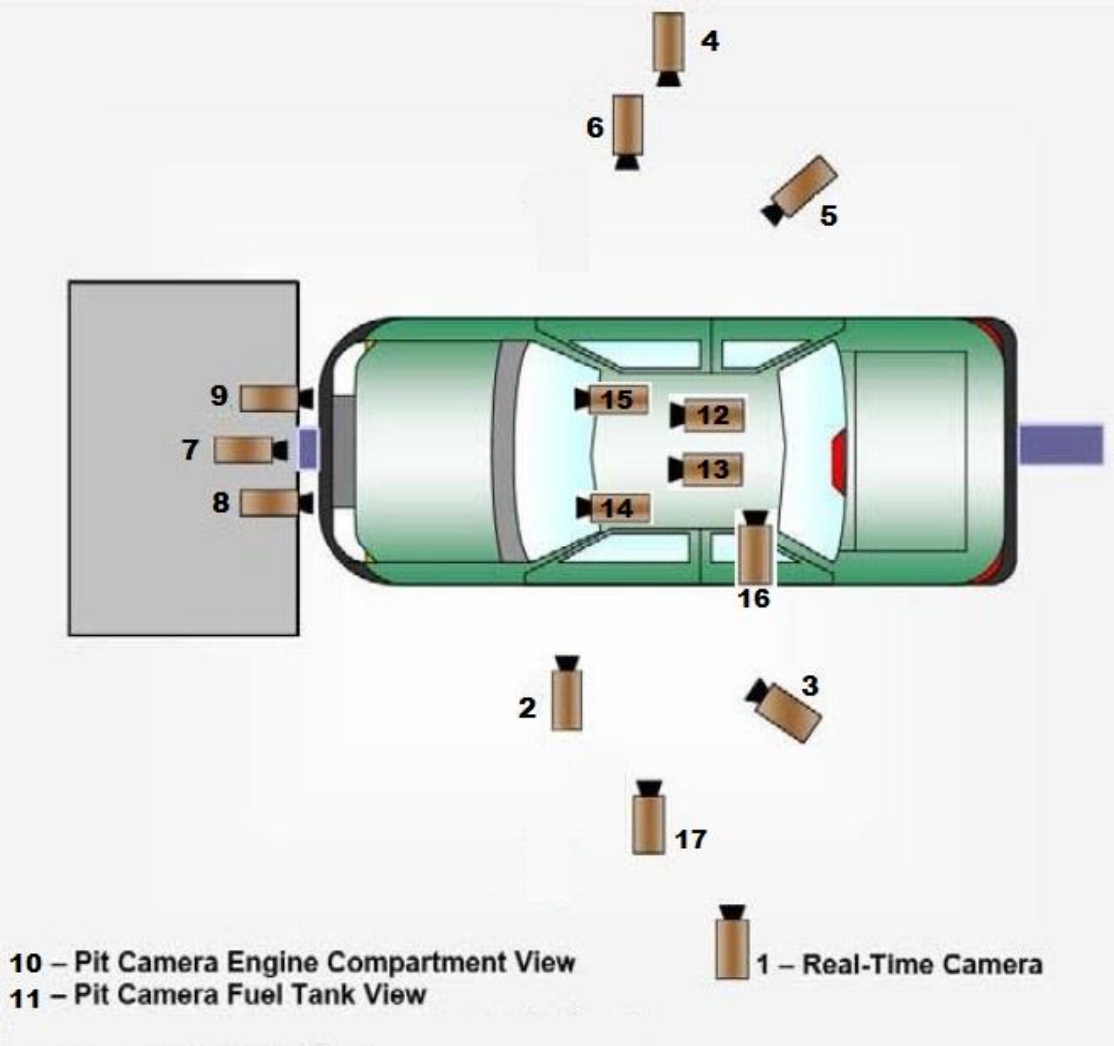
BELT LENGTH DATA

Measurement Description	Units	Driver	Passenger	Rear Pass.
Shoulder belt length as measured on ATD	mm	848	838	837
Lap Belt Length as measured on ATD	mm	775	675	705
Remainder of belt on reel	mm	887	997	1158
Total belt length for continuous webbing systems	mm	2510	2510	2700

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

Test Vehicle:	2015 Ford F-150 Super Crew pickup truck	NHTSA No.:	R20150228
Test Program:	56.3 KPH Research Frontal Rigid Barrier Test	Test Date:	8/18/2015

HORIZONTAL LOCATION



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

Test Vehicle: 2015 Ford F-150 Super Crew pickup truck NHTSA No.: R20150228
Test Program: 56.3 KPH Research Frontal Rigid Barrier Test Test Date: 8/18/2015

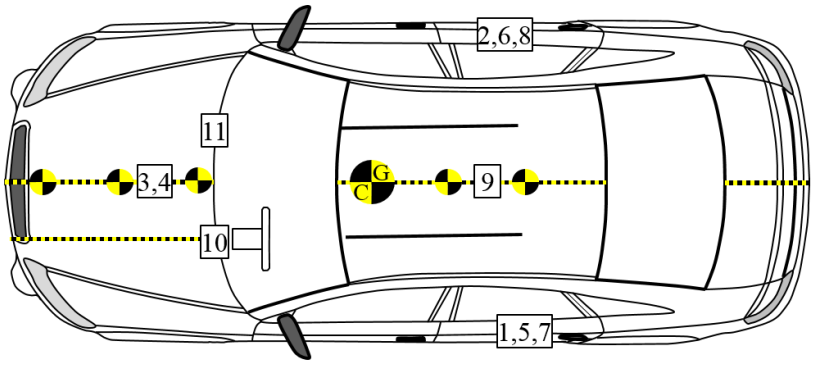
CAMERA LOCATIONS

No.	Camera View	Location (mm)			Lens (mm)	Speed (fps)
		X	Y	Z		
1	Real-Time Left Side	--	--	--	Zoom	60
2	Left Front Half	-986	-10124	-1597	50	1000
3	Left Angle	-2537	-2987	-2278	28	1000
4	Right Overall	-2090	9991	-1156	24	1000
5	Right Angle	-2664	2929	-2182	28	1000
6	Right Front Half	-1294	7215	-1195	28	1000
7	Windshield	100	0	-3525	20	1000
8	Driver Windshield	-450	-606	-1989	12.5	1000
9	Passenger Windshield	-450	606	-1989	12.5	1000
10	Pit Front	-890	0	1530	13	1000
11	Pit Rear	-2851	0	1521	13	1000
12	Onboard Driver Airbag	-2936	-168	-1685	12.5	1000
13	Onboard Passenger Airbag	-2936	168	-1685	12.5	1000
14	Onboard Driver Toepan	-1940	-419	-609	6.5	1000
15	Onboard Front Passenger Toepan	-1940	419	-609	6.5	1000
16	Onboard Rear Passenger Side View	-3336	-687	-1147	12.5	1000
17	Left Overall	-2908	-10588	-1630	24	1000

Reference Point:
+X – forward of impact plane
+Y – right of monorail center
+Z – into ground

DATA SHEET NO. 7
VEHICLE INSTRUMENTATION DATA

Test Vehicle: 2015 Ford F-150 Super Crew pickup truck
Test Program: 56.3 KPH Research Frontal Rigid Barrier Test
NHTSA No.: R20150228
Test Date: 8/18/2015



VEHICLE INSTRUMENTATION PRE-TEST LOCATIONS

No.	Instrumentation Location	Axes	Units	Measurements (mm)		
				X	Y	Z
1	Left Rear Seat Cross Member	X,Z	mm	2343	-550	-148
2	Right Rear Seat Cross Member	X,Z	mm	2337	538	-143
3	Top of Engine	X	mm	4918	-2	-563
4	Bottom of Engine	X	mm	5244	-68	194
5	Left Sill	X,Y	mm	2893	834	-50
6	Right Sill	X,Y	mm	2929	-837	-54
7	Left Rear Seat Cross Member Redundant	X,Z	mm	2903	-837	-55
8	Right Rear Seat Cross Member Redundant	X,Z	mm	2915	835	-54
9	Linear Acceleration and Angular Rate Sensors	X	mm	3040	7	-133
		Y	mm	3027	19	-131
		Z	mm	3029	8	-136
10	Driver Toe Pan	X,Y,	mm	4511	-480	-275
11	Front Passenger Toe Pan	X,Y,	mm	4404	524	-179

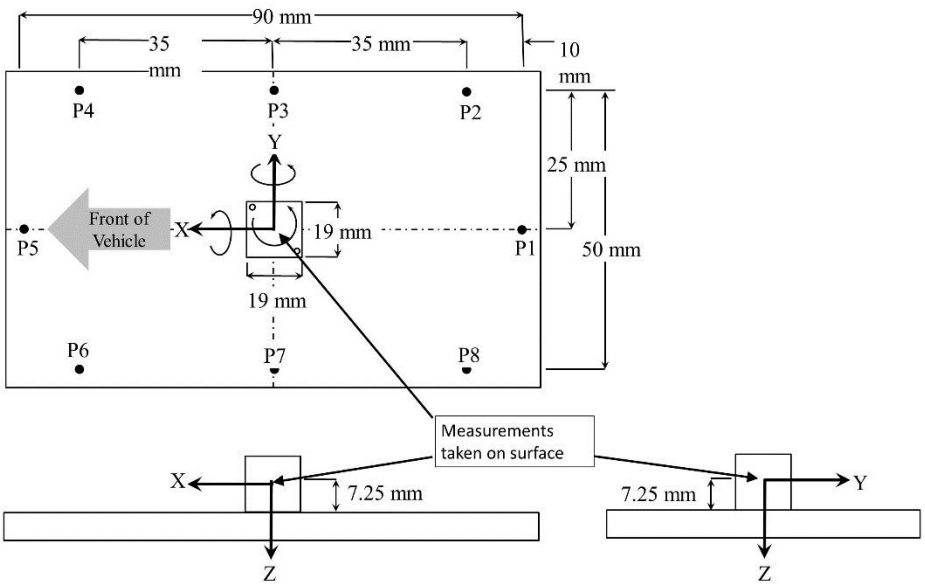
Reference point: Origin at rear centerline of vehicle. Vertical coordinate point for origin determined with contact of vehicle structure by 10 mm deep block moved downward along front edge of a level. The level is positioned perpendicular to ground and in contact with rear centerline of vehicle.

+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:	2015 Ford F-150 Super Crew pickup truck	NHTSA No.:	R20150228
Test Program:	56.3 KPH Research Frontal Rigid Barrier Test	Test Date:	8/18/2015

ANGULAR RATE SENSOR

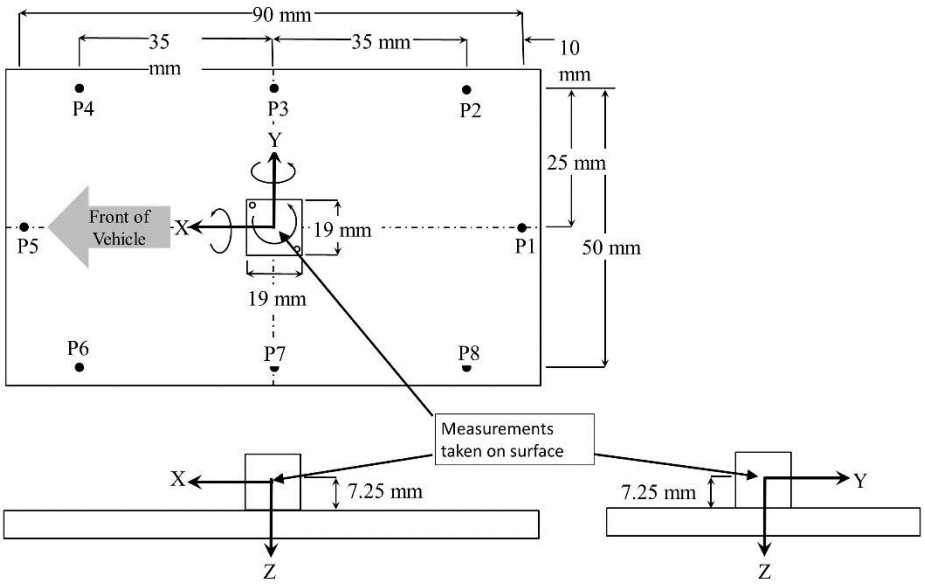


VEHICLE COORDINATE SYSTEM					
No.	**Accelerometer Location**	**Units**	**Measurements (mm)**		
			X	**Y**	**Z**
ACC-1	Accelerometer CG – X Direction	mm	3040	7	-133
ACC-2	Accelerometer CG – Y Direction	mm	3027	19	-131
ACC-3	Accelerometer CG – Z Direction	mm	3029	8	-136
M1	Mounting Bolt 1	mm	3022	0	-136
M2	Mounting Bolt 2	mm	3037	15	-136
P1	Plate Point 1	mm	2984	8	-121
P2	Plate Point 2	mm	2995	32	-122
P3	Plate Point 3	mm	3029	33	-121
P4	Plate Point 4	mm	3064	33	-121
P5	Plate Point 5	mm	3074	8	-121
P6	Plate Point 6	mm	3065	-17	-121
P7	Plate Point 7	mm	3030	-17	-121
P8	Plate Point 8	mm	2994	-17	-121

DATA SHEET NO. 7 (CONTINUED)
VEHICLE INSTRUMENTATION DATA

Test Vehicle: 2015 Ford F-150 Super Crew pickup truck
Test Program: 56.3 KPH Research Frontal Rigid Barrier Test
NHTSA No.: R20150228
Test Date: 8/18/2015

ANGULAR RATE SENSOR



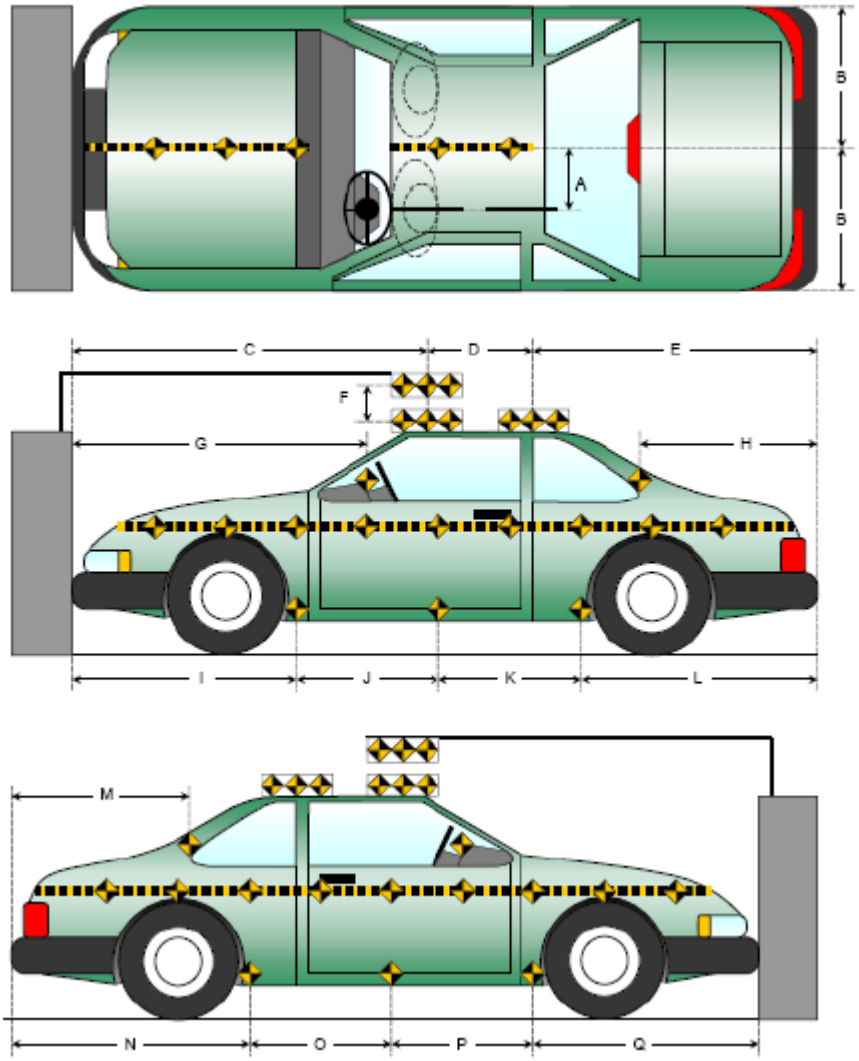
DRIVER GLOBAL COORDINATE SYSTEM					
No.	Accelerometer Location	Units	Measurements (mm)		
			X	Y	Z
ACC-1	Accelerometer CG – X Direction	mm	-71	904	-615
ACC-2	Accelerometer CG – Y Direction	mm	-85	916	-613
ACC-3	Accelerometer CG – Z Direction	mm	-82	905	-618
M1	Mounting Bolt 1	mm	-90	897	-618
M2	Mounting Bolt 2	mm	-74	912	-618
P1	Plate Point 1	mm	-127	905	-603
P2	Plate Point 2	mm	-117	930	-604
P3	Plate Point 3	mm	-82	930	-604
P4	Plate Point 4	mm	-47	930	-604
P5	Plate Point 5	mm	-37	905	-603
P6	Plate Point 6	mm	-47	880	-603
P7	Plate Point 7	mm	-82	880	-603
P8	Plate Point 8	mm	-117	880	-603

DATA SHEET NO. 8
PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2015 Chevrolet Malibu
Test Program: 56.3 KPH Research Frontal Rigid Barrier Test
NHTSA No.: R20150228
Test Date: 8/18/2015

Item	Value
A	454
B	1014
C	3086
D	610
E	2174
F	125
G	1916
H	2011
I	1504
J	1265
K	1318
L	1782
M	2002
N	1771
O	1318
P	1271
Q	1509

All units in millimeters



DATA SHEET NO. 9
TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2015 Ford F-150 Super Crew pickup truck NHTSA No.: R20150228
Test Program: 56.3 KPH Research Frontal Rigid Barrier Test Test Date: 8/18/2015

INSTRUMENTATION

Instrumentation	Number of Channels Collected
Driver Dummy Accelerometers	108
Passenger Dummy Accelerometers	74
Rear Passenger Dummy Accelerometers	46
Vehicle Structure Accelerometers	39
Total	267

CAMERA COVERAGE

Type of Camera	Number Used in this Test
High-Speed Vehicle Onboard	5
High-Speed Off-board	11
Real-Time Panning	1
Total	17

DATA SHEET NO. 10
POST TEST OBSERVATIONS

Test Vehicle: 2015 Ford F-150 Super Crew pickup truck NHTSA No.: R20150228
Test Program: 56.3 KPH Research Frontal Rigid Barrier Test Test Date: 8/18/2015

TEST DUMMY INFORMATION AND CONTACT LOCATIONS

Description	Driver	Right Front Passenger	Rear Passenger
Dummy Type/Serial No.	DL9207	324	019
Lower Leg Type	LX		
Lower Leg Serial No.	LX0045/LX0046		
Head Contact	Frontal Airbag & Headrest	Frontal Airbag & Headrest	Headrest
Upper Torso Contact	Frontal Airbag	Frontal Airbag	None
Lower Torso Contact	None	None	None
Left Knee Contact	Knee Bolster	None	None
Right Knee Contact	Knee Bolster	None	None

DOOR OPENING AND SEAT TRACK INFORMATION

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

POST TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	Remained in good condition
Windshield Damage	Minor Cracks
Window Damage	Windows slid up in track but did not break
Other Notable Effects	None

VEHICLE REBOUND FROM BARRIER

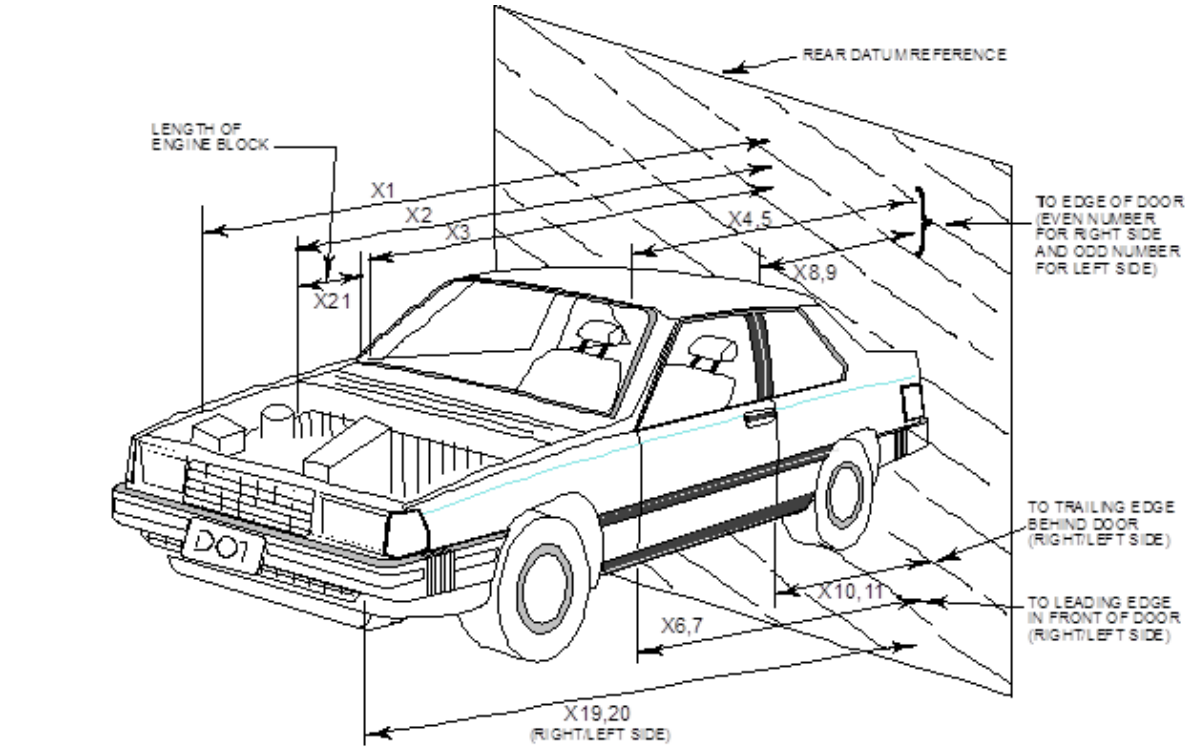
Measured Parameter	Units	Value
Left Side	mm	372
Center	mm	380
Right Side	mm	372
Average	mm	375

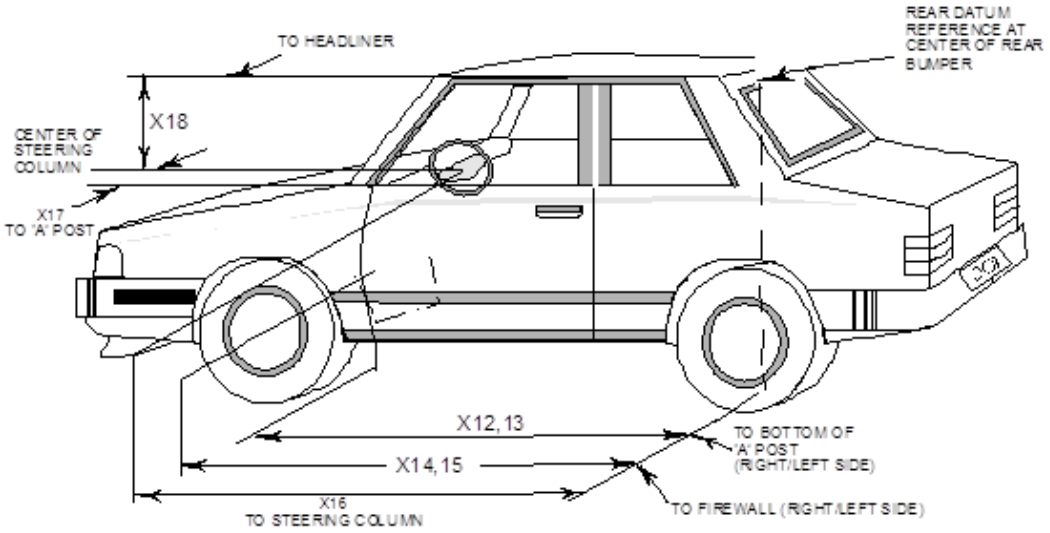
SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Driver (Occupant 1)		Right Front Passenger (Occupant 2)		Rear Passenger (Occupant 3)	
	Installed	Deployed	Installed	Deployed	Installed	Deployed
Front Airbag	Yes	Yes	Yes	Yes	No	N/A
Curtain Airbag	Yes	No	Yes	No	Yes	No
Torso Airbag	Yes	No	Yes	No	No	N/A
Knee Airbag	No	N/A	No	N/A	No	N/A
Seat Belt Pretensioner	Yes	Yes	Yes	Yes	No	N/A
Seat Belt Load Limiter	Yes	Yes	Yes	Yes	No	N/A
Other						

DATA SHEET NO. 11
VEHICLE PROFILE MEASUREMENTS

Test Vehicle:	2015 Ford F-150 Super Crew pickup truck	NHTSA No.:	R20150228
Test Program:	56.3 KPH Research Frontal Rigid Barrier Test	Test Date:	8/18/2015





DATA SHEET NO. 11 (CONTINUED)
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2015 Ford F-150 Super Crew pickup truck NHTSA No.: R20150228
Test Program: 56.3 KPH Research Frontal Rigid Barrier Test Test Date: 8/18/2015

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	mm	5883	5296	-587
2	Rear Surface of Vehicle (RSOV) to Front of Engine	mm	5040	4978	-63
3	RSOV to Firewall	mm	4735	4731	-4
4	RSOV to Upper Leading Edge of Right Door	mm	4289	4277	-13
5	RSOV to Upper Leading Edge of Left Door	mm	4296	4282	-14
6	RSOV to Lower Leading Edge of Right Door	mm	4253	4251	-2
7	RSOV to Lower Leading Edge of Left Door	mm	4259	4257	-1
8	RSOV to Upper Trailing Edge of Right Door	mm	3057	3048	-9
9	RSOV to Upper Trailing Edge of Left Door	mm	3066	3055	-11
10	RSOV to Lower Trailing Edge of Right Door	mm	3053	3051	-2
11	RSOV to Lower Trailing Edge of Left Door	mm	3059	3058	-1
12	RSOV to Bottom of “A” Post of Right Side	mm	4341	4326	-14
13	RSOV to Bottom of “A” Post of Left Side	mm	4350	4329	-20
14	RSOV to Firewall, Right Side	mm	4715	4709	-6
15	RSOV to Firewall, Left Side	mm	4721	4712	-9
16	RSOV to Steering Column	mm	3795	3836	41
17	Center of Steering Column to “A” Post	mm	291	292	1
18	Center of Steering Column to Headliner	mm	444	452	9
19	RSOV to Right Side of Front Bumper	mm	5834	5306	-527
20	RSOV to Left Side of Front Bumper	mm	5842	5318	-525
21	Length of Engine Block	mm	432	432	0
RD	RSOV to Right Side of Dash Panel	mm	3971	3971	0
CD	RSOV to Center of Dash Panel	mm	3948	3945	-3
LD	RSOV to Left Side of Dash Panel	mm	3978	3970	-8

UR* = Unrecoverable Data Point

DATA SHEET NO. 12
ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle:	2015 Ford F-150 Super Crew pickup truck	NHTSA No.:	R20150228
Test Program:	56.3 KPH Research Frontal Rigid Barrier Test	Test Date:	8/18/2015

VEHICLE INFORMATION

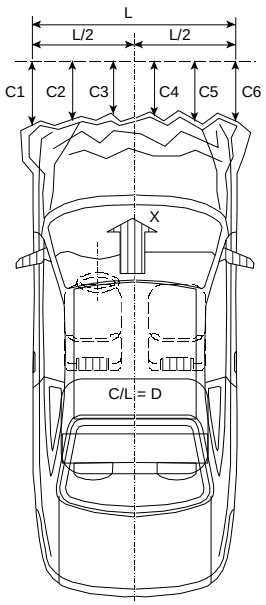
VIN:	1FTEW1CG4FKD64891	Wheelbase (mm):	3,690
Vehicle Size Category:	Passenger	Test Weight (kg):	2,474

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):	56.15
Velocity Change (kph):	56.15

CRUSH PROFILE

Collision Deformation Classification:	12FDEW3
Midpoint of Damage:	C3
Damage Region Length (mm):	1501
Impact Mode:	Frontal Barrier



Crush Measurements: Bumper Cover

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	5672	5219	-453
C2	Crush zone 2 at left side	mm	5820	5281	-539
C3	Crush zone 3 at left side	mm	5865	5273	-592
C4	Crush zone 4 at right side	mm	5864	5273	-591
C5	Crush zone 5 at right side	mm	5816	5280	-536
C6	Crush zone 6 at right side	mm	5666	5222	-444
L	C1 to C6	mm	1501	1543	42
	Logitudinal horizontal distance from the tip of the front bumper to the base of the windshield	mm	1,288	706	-582

DATA SHEET NO. 13
VEHICLE INTRUSION MEASUREMENTS

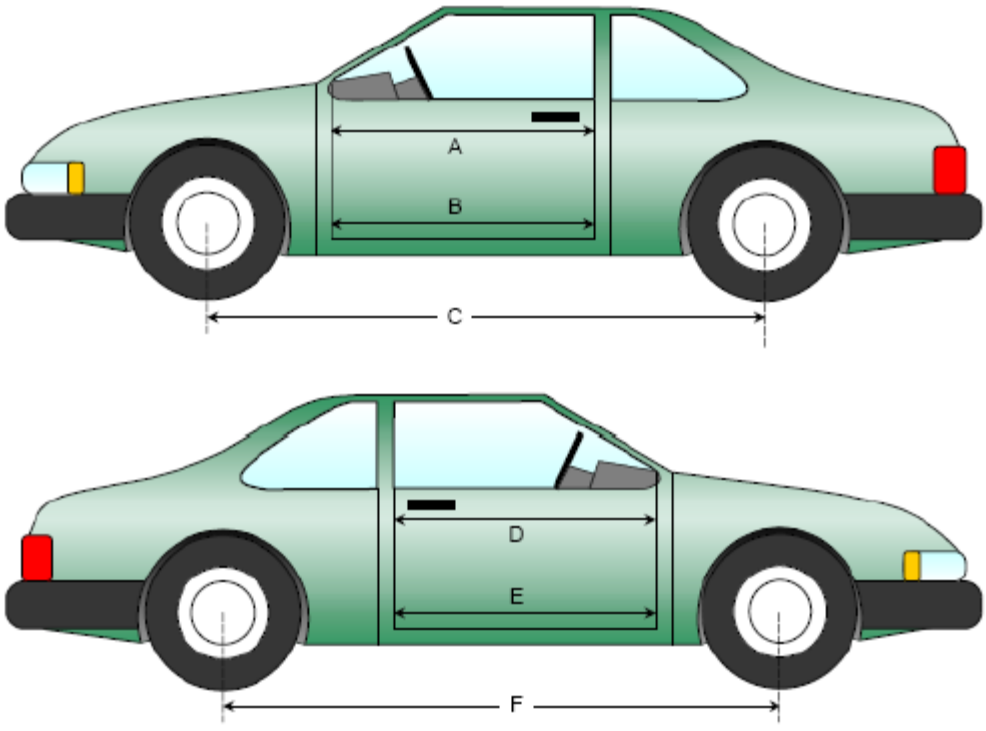
Test Vehicle:	2015 Ford F-150 Super Crew pickup truck	NHTSA No.:	R20150228
Test Program:	56.3 KPH Research Frontal Rigid Barrier Test	Test Date:	8/18/2015

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	1100	1100	0
B	Left Side Lower	mm	928	928	0
D	Right Side Upper	mm	1098	1098	0
E	Right Side Lower	mm	947	948	1

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	3690	3549	-141
F	Right Side Wheelbase	mm	3690	3560	-130



Left & Right Side Views

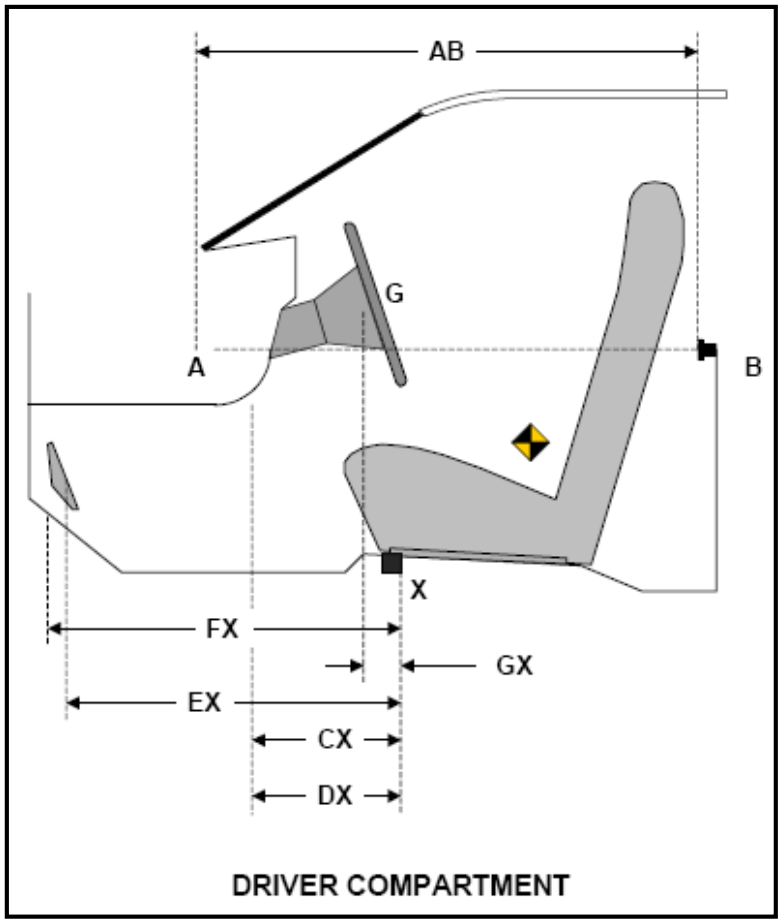
DATA SHEET NO.13 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2015 Ford F-150 Super Crew pickup truck
Test Program: 56.3 KPH Research Frontal Rigid Barrier Test
NHTSA No.: R20150228
Test Date: 8/18/2015

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	846	846	0
CX	Left Knee Bolster to X	mm	317	317	0
DX	Right Knee Bolster to X	mm	306	305	-1
EX	Brake Pedal to X	mm	552	557	5
FX	Foot Rest to X	mm	592	678	86
GX	Center of Steering Column Wheel Hub to X	mm	80	126	46

X = Front of Seat Track (Stationary)



DATA SHEET NO. 14
SUMMARY OF FMVSS 212, 219 (PARTIAL), AND 301 DATA

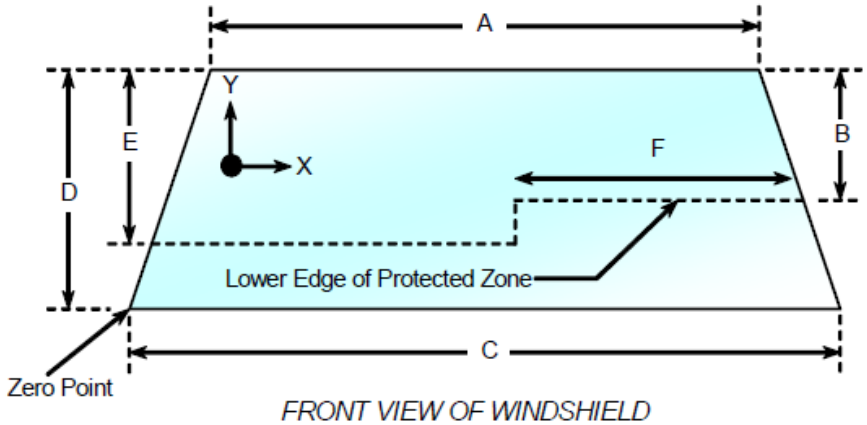
Test Vehicle:	2015 Ford F-150 Super Crew pickup truck	NHTSA No.:	R20150228
Test Program:	56.3 KPH Research Frontal Rigid Barrier Test	Test Date:	8/18/2015

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: 21ºC

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% Retention
Left Side	2392.5	2392.5	100%
Right Side	2392.5	2392.5	100%
Total	4785	4785	100%



FRONT VIEW OF WINDSHIELD

Item	Units	Value
A	mm	1475
B	mm	490
C	mm	1760
D	mm	775
E	mm	535
F	mm	530

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. 14 (CONTINUED)
SUMMARY OF FMVSS 212, 219 (PARTIAL), AND 301 DATA

Test Vehicle:	2015 Ford F-150 Super Crew pickup truck	NHTSA No.:	R20150228
Test Program:	56.3 KPH Research Frontal Rigid Barrier Test	Test Date:	8/18/2015

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

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

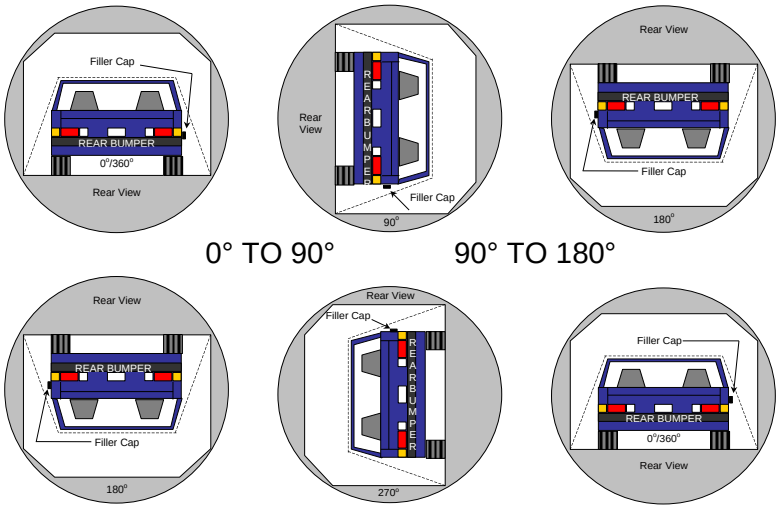
Test Time: 2:04 PM

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. 15
FMVSS 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2015 Ford F-150 Super Crew pickup truck
Test Program: 56.3 KPH Research Frontal Rigid Barrier Test
NHTSA No.: R20150228
Test Date: 8/18/2015



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°	68	300	368
90° to 180°	65	300	365
180° to 270°	62	300	362
270° to 360°	68	300	368

FMVSS 301 SPILLAGE TABLE

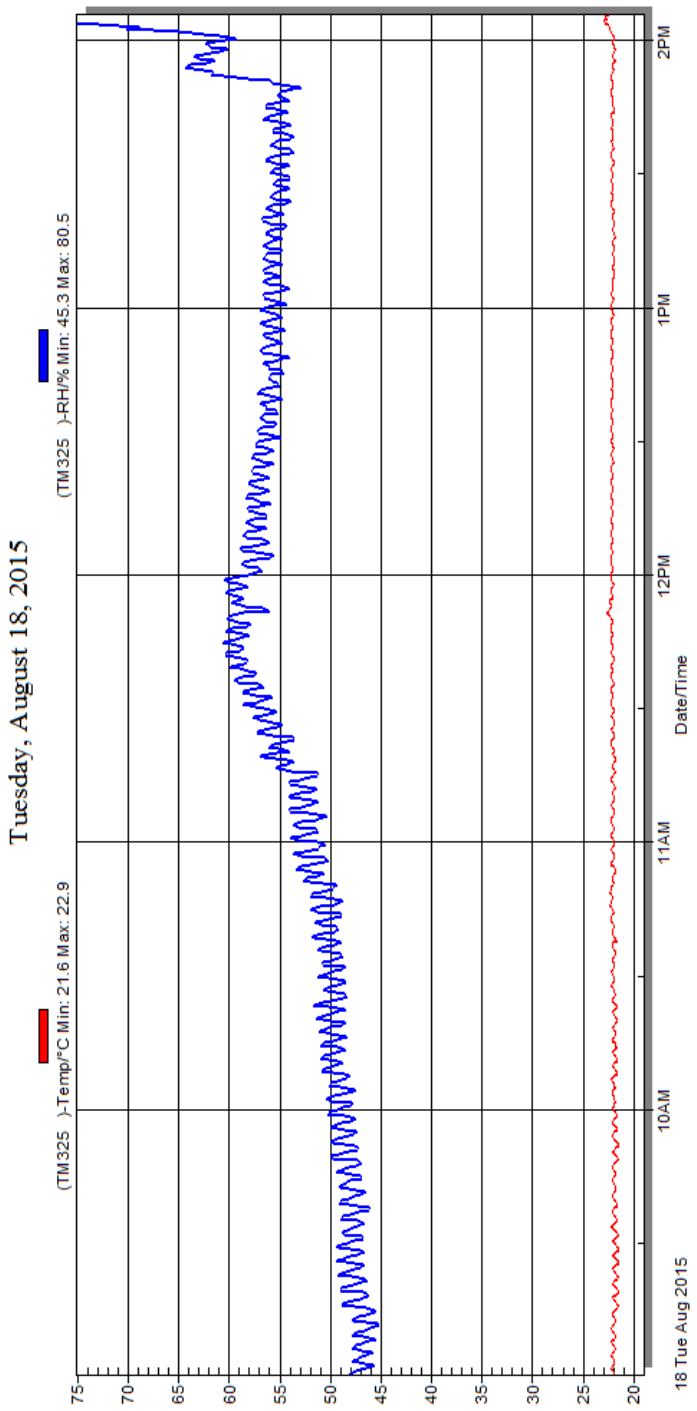
Test Phase	First 5 Minutes	Sixth Minute	Seventh Minute	Eighth Minute
0° to 90°	0	0	0	
90° to 180°	0	0	0	
180° to 270°	0	0	0	
270° to 360°	0	0	0	

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. 16
DUMMY/VEHICLE TEMPERATURE STABILIZATION

Test Vehicle:	2015 Ford F-150 Super Crew pickup truck	NHTSA No.:	R20150228
Test Program:	56.3 KPH Research Frontal Rigid Barrier Test	Test Date:	8/18/2015



Temperature Stabilization Chart/Data

APPENDIX A

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11	Pre-Test Right View of Test Vehicle	A-10
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95	Post-Test Rear Passenger Dummy Face	A-52
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Figure A-1: Load Cell Location



Figure A-2: Rigid Barrier Frontal Wall



Figure A-3: Manufacturer's Label

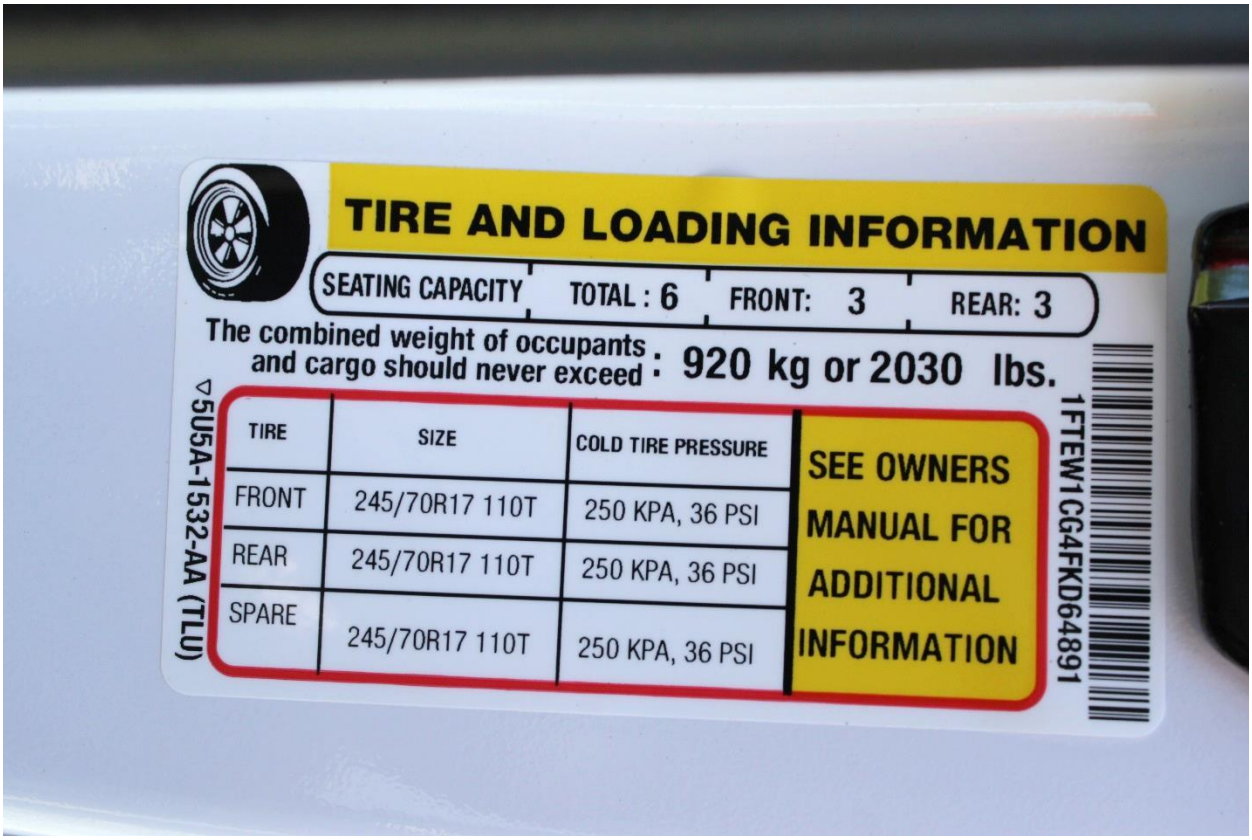


Figure A-4: Tire Placard



Figure A-5: 2015 Ford F-150 Frontal As Delivered



Figure A-6: Left Rear 3-4 View, As Received



Figure A-7: Pre-Test Front View of Test Vehicle



Figure A-8: Post-Test Front View of Test Vehicle



Figure A-9: Pre-Test Left View of Test Vehicle



Figure A-10: Post-Test Left View of Test Vehicle



Figure A-11: Pre-Test Right View of Test Vehicle



Figure A-12: Post-Test Right View of Test Vehicle



Figure A-13: Pre-Test Right Front 3-4 View



Figure A-14: Post-Test Right Front 3-4 View



Figure A-15: Pre-Test Left Rear 3-4 View



Figure A-16: Post-Test Left Rear 3-4 View

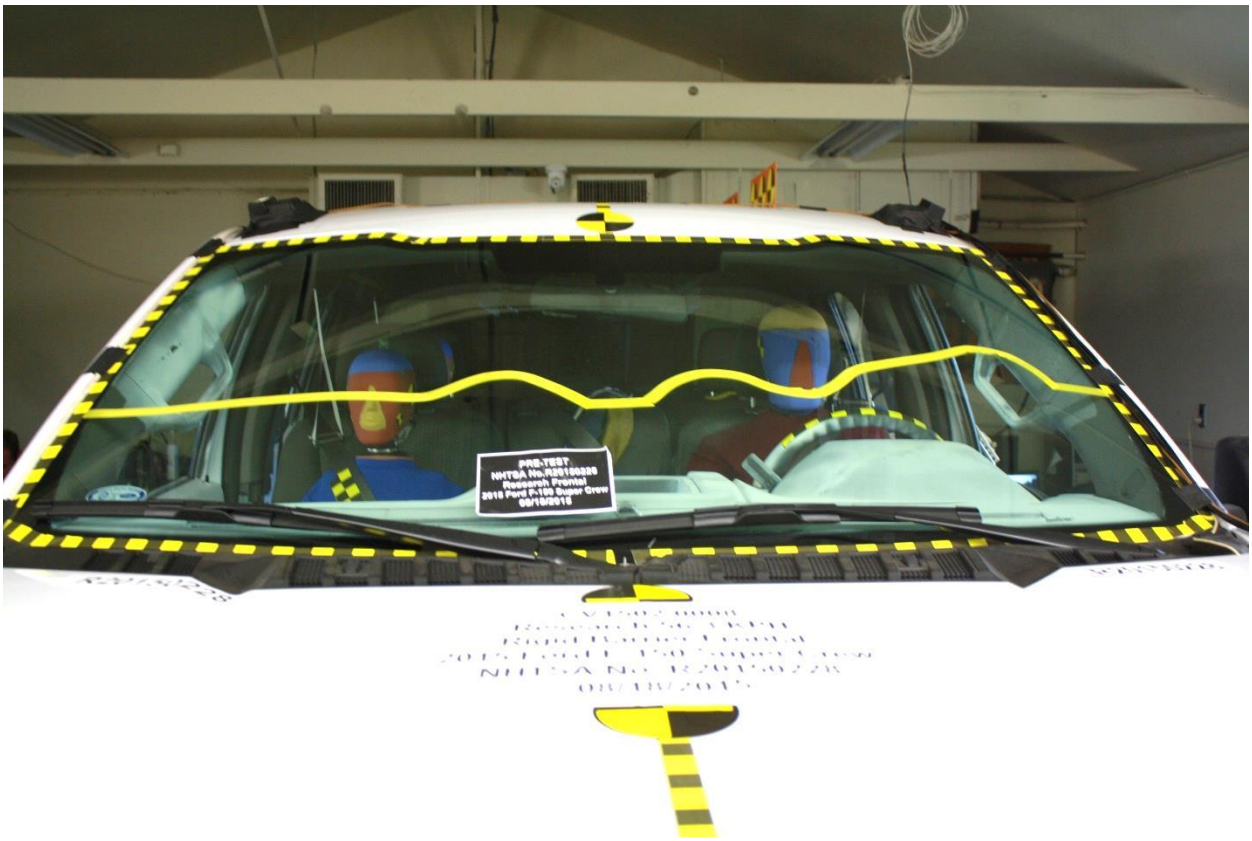


Figure A-17: Pre-Test Windshield View



Figure A-18: Post-Test Windshield View



Figure A-19: Pre-Test Engine Compartment View

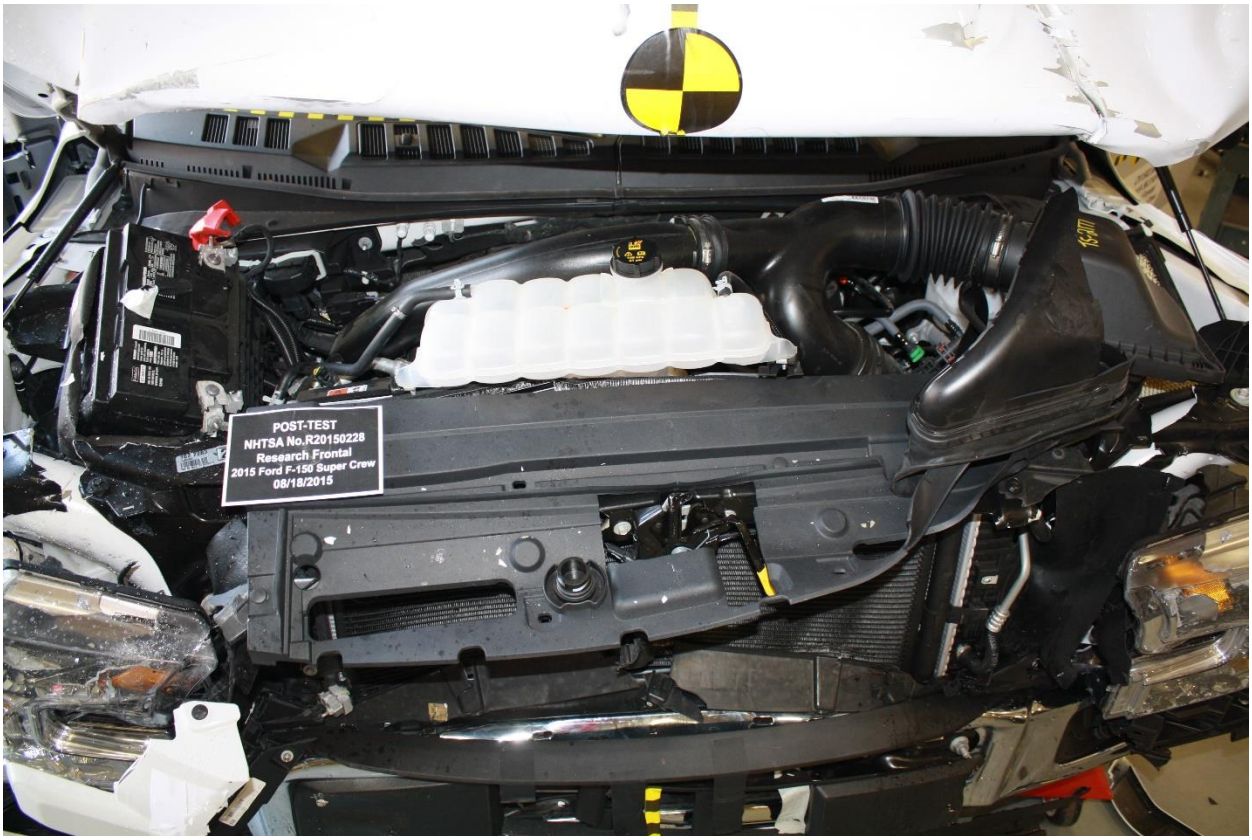


Figure A-20: Post-Test Engine Compartment View



Figure A-21: Pre-Test Fuel Filler Cap View



Figure A-22: Post-Test Fuel Filler Cap View

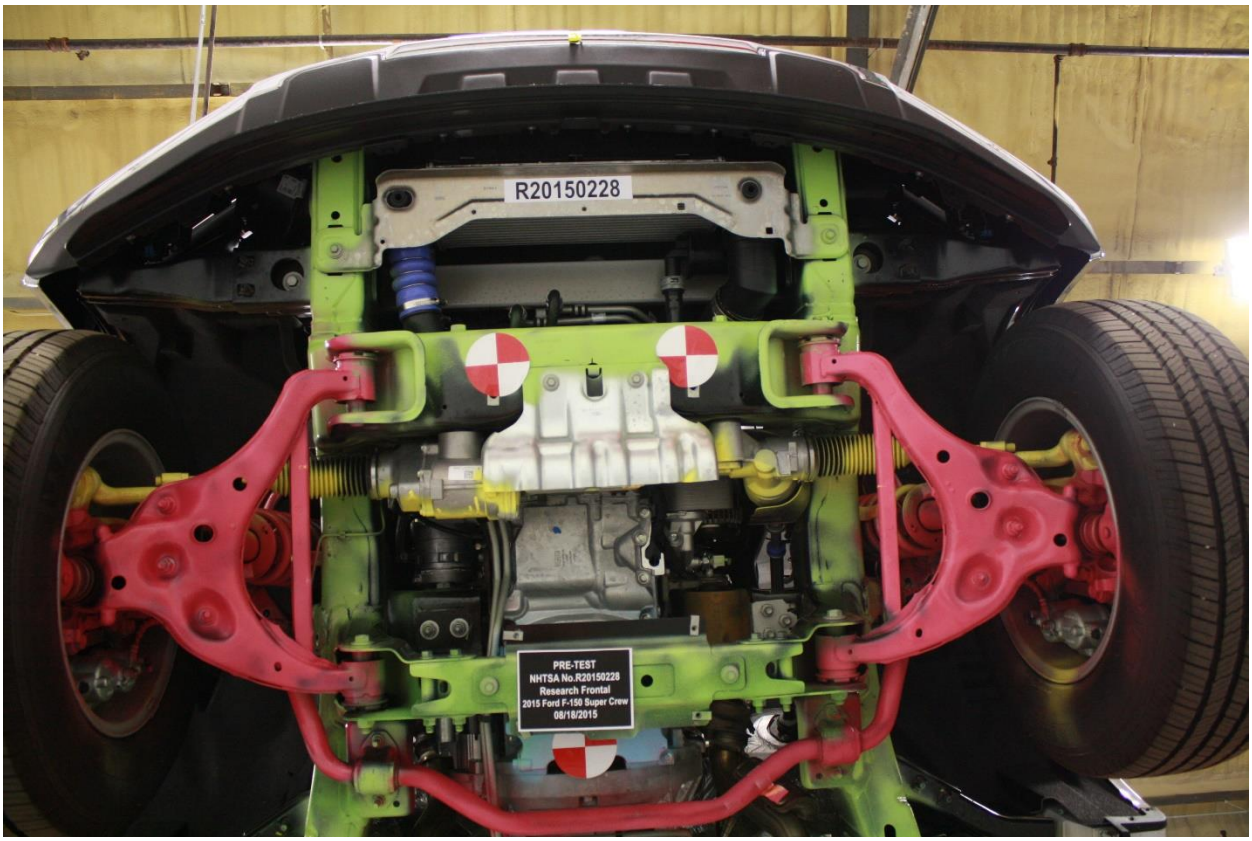


Figure A-23: Pre-Test Front Underbody View



Figure A-24: Post-Test Front Underbody View

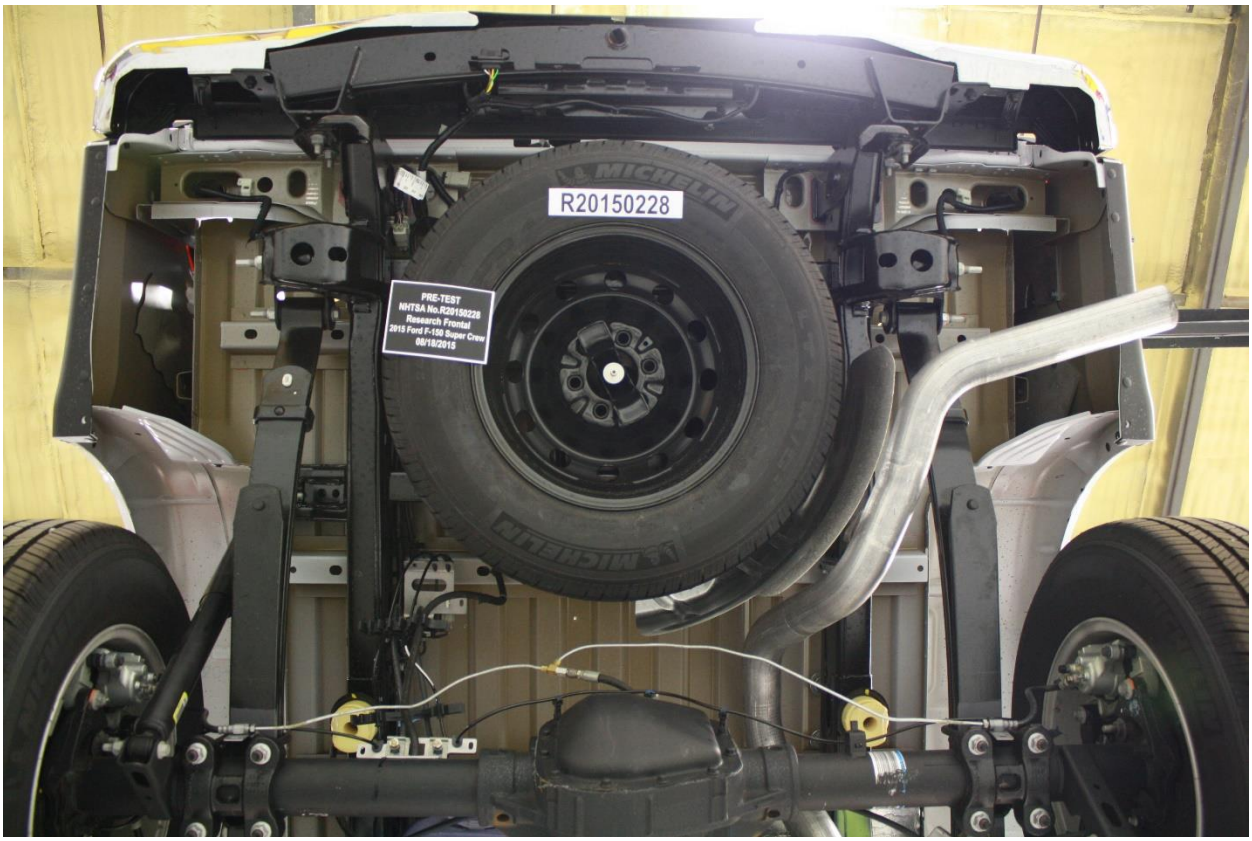


Figure A-25: Pre-Test Rear Underbody View

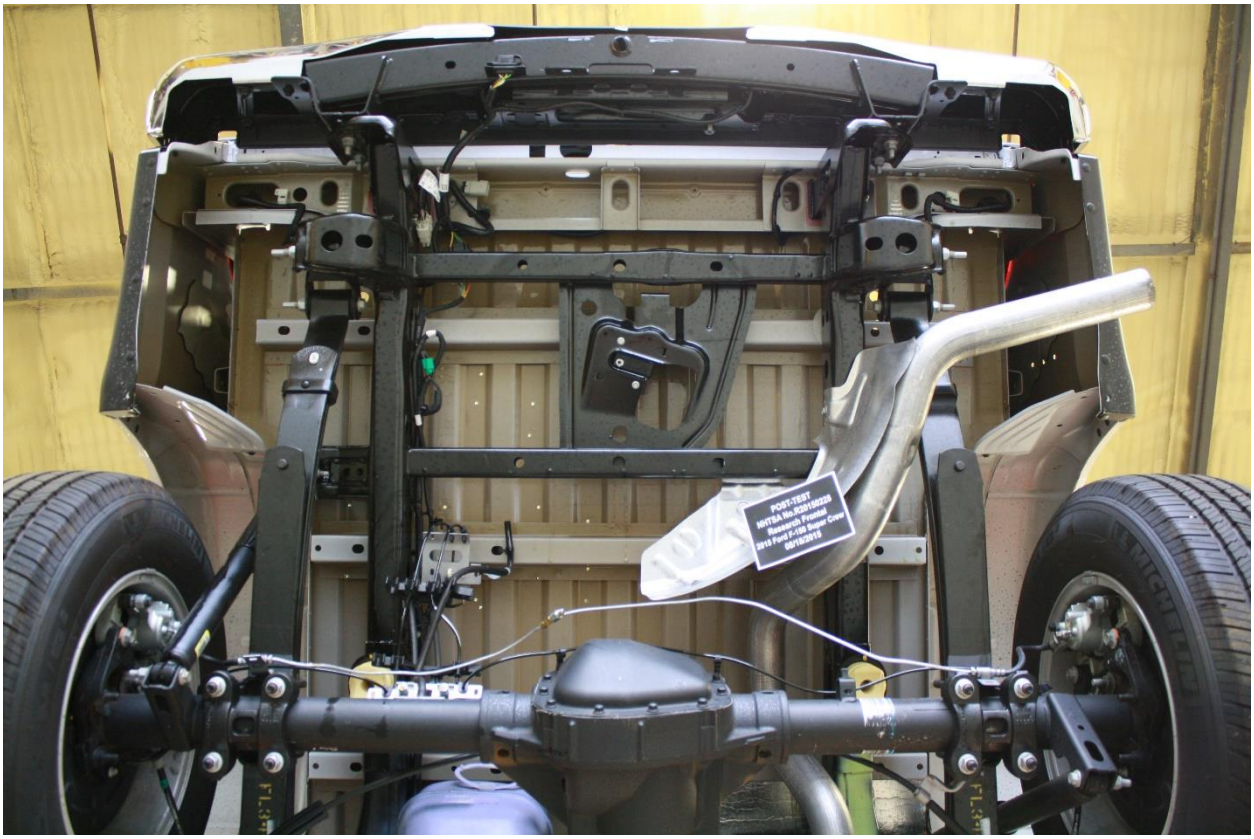


Figure A-26: Post-Test Rear Underbody View



Figure A-27: Pre-Test Dummy Cable Routing



Figure A-28: Post-Test Dummy Cable Routing

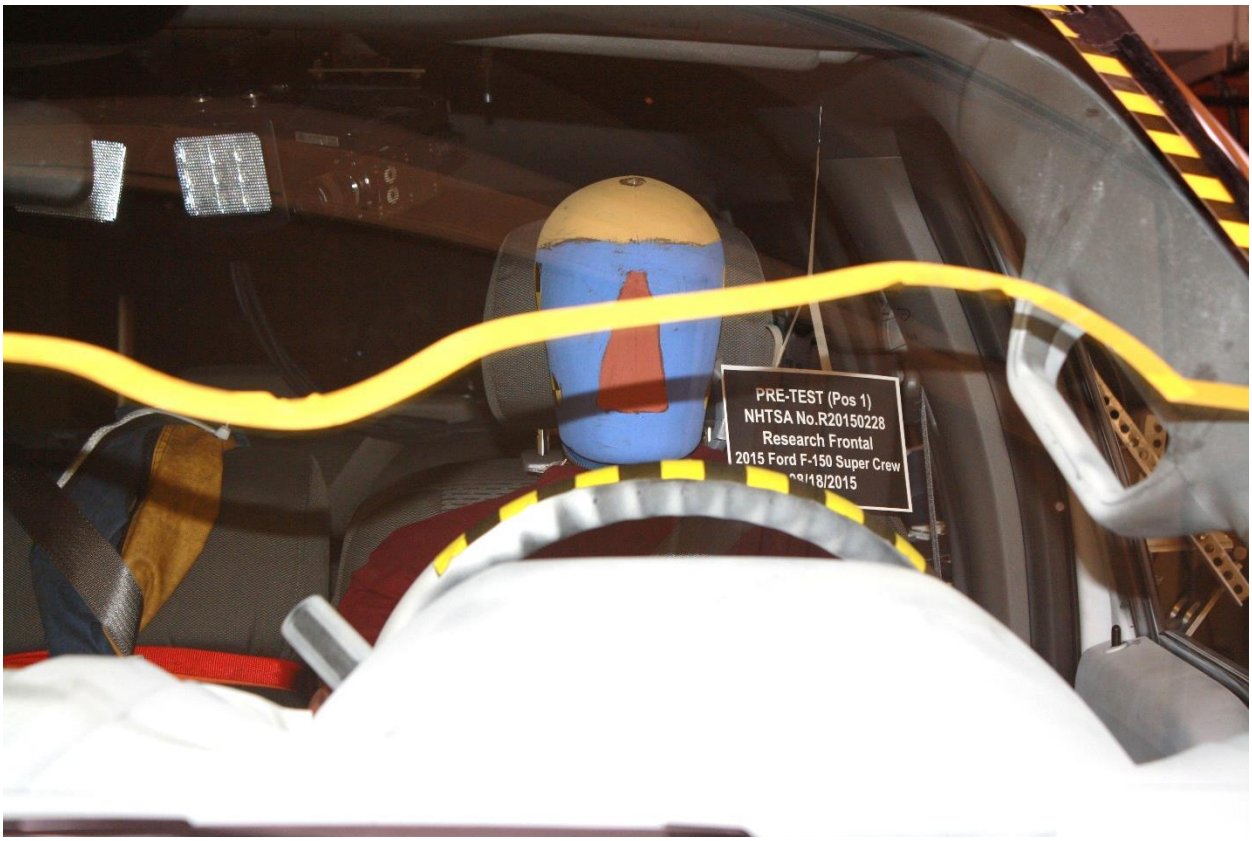


Figure A-29: Pre-Test Driver Dummy Front View

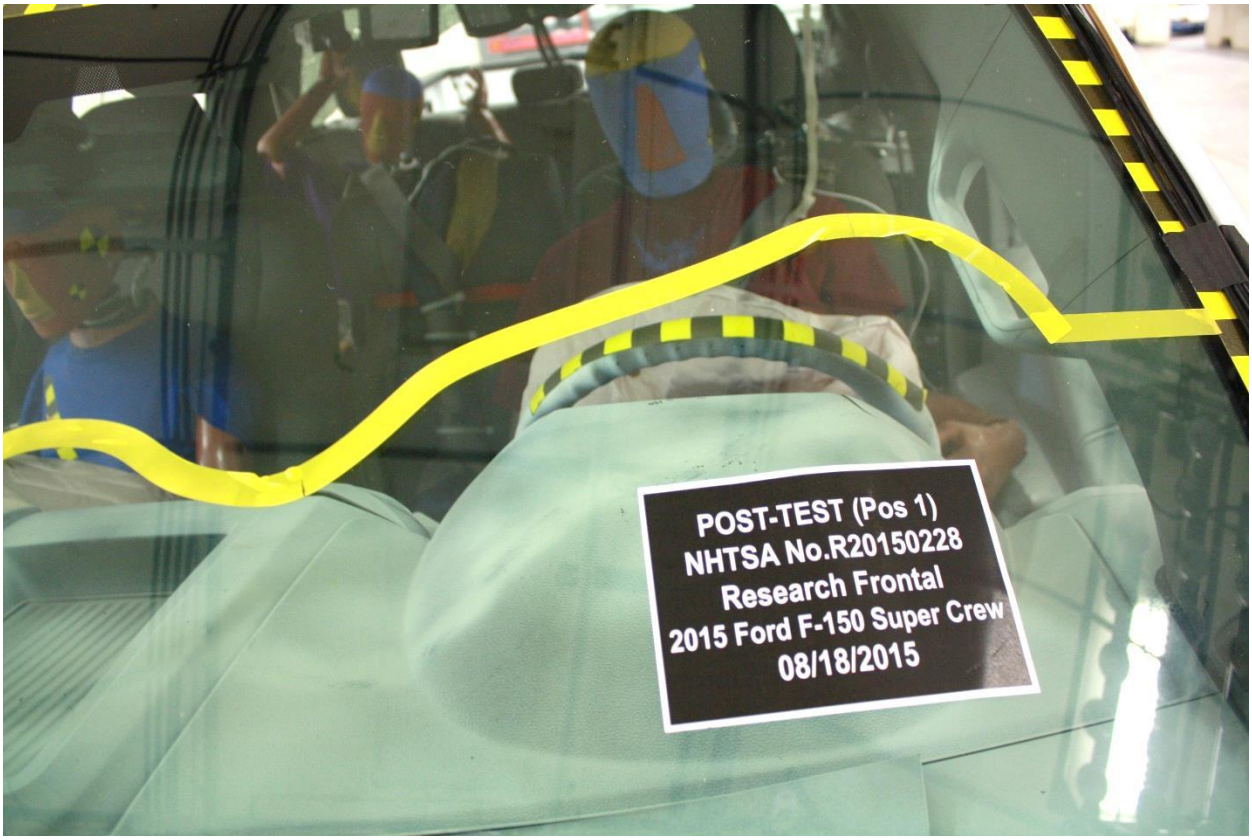


Figure A-30: Post-Test Driver Dummy Front View



Figure A-31: Pre-Test Driver Dummy Window View



Figure A-32: Post-Test Driver Dummy Window View



Figure A-33: Pre-Test Driver Dummy and Vehicle Interior View



Figure A-34: Post-Test Driver Dummy and Vehicle Interior View

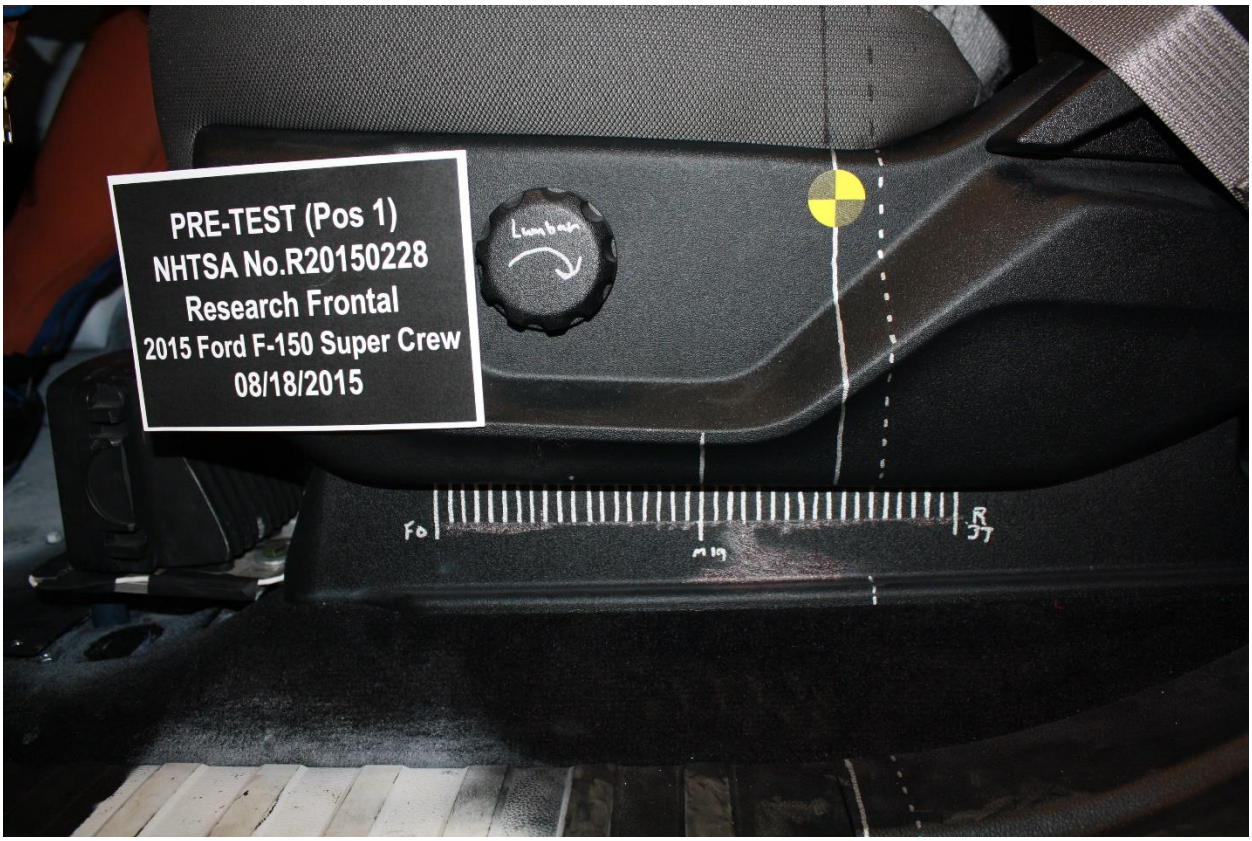


Figure A-35: Pre-Test Driver's Seat Fore-Aft Markings

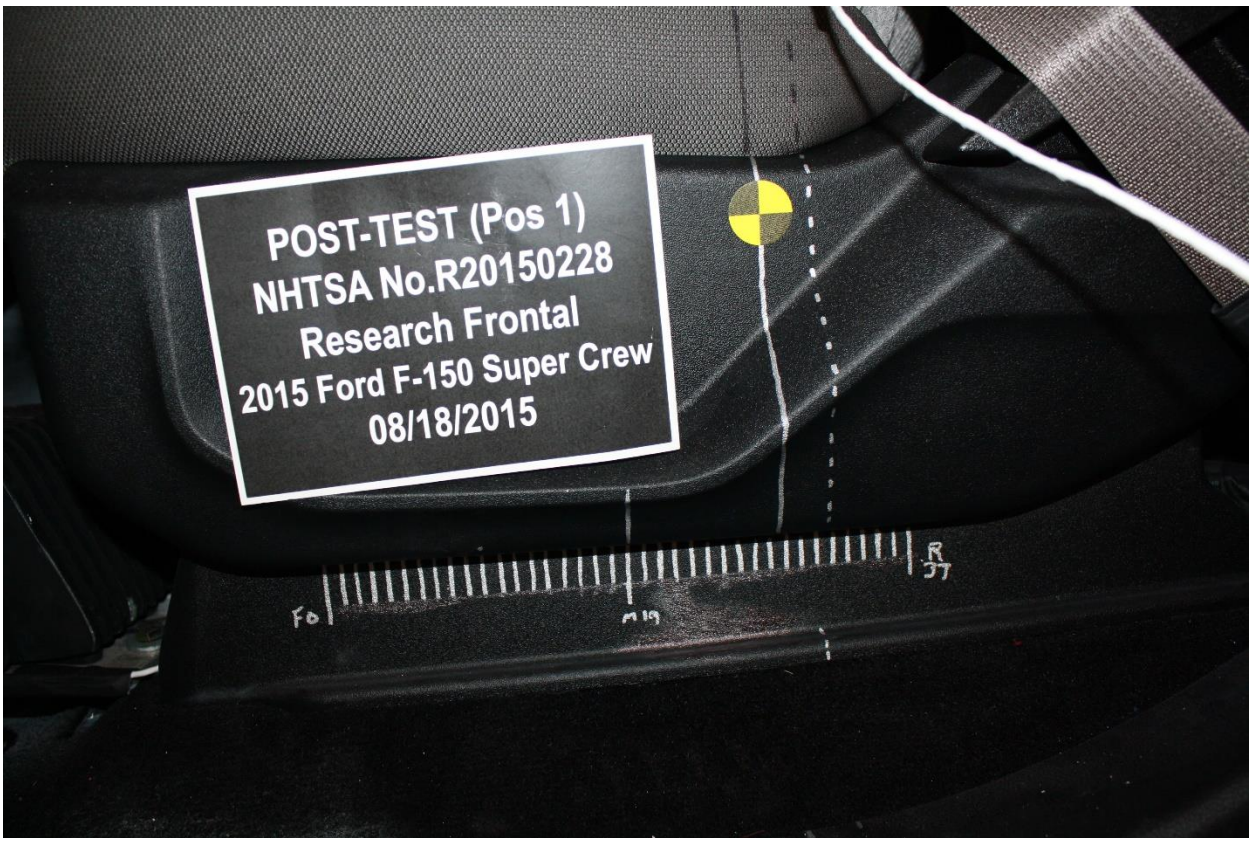


Figure A-36: Post-Test Driver's Seat Fore-Aft Markings

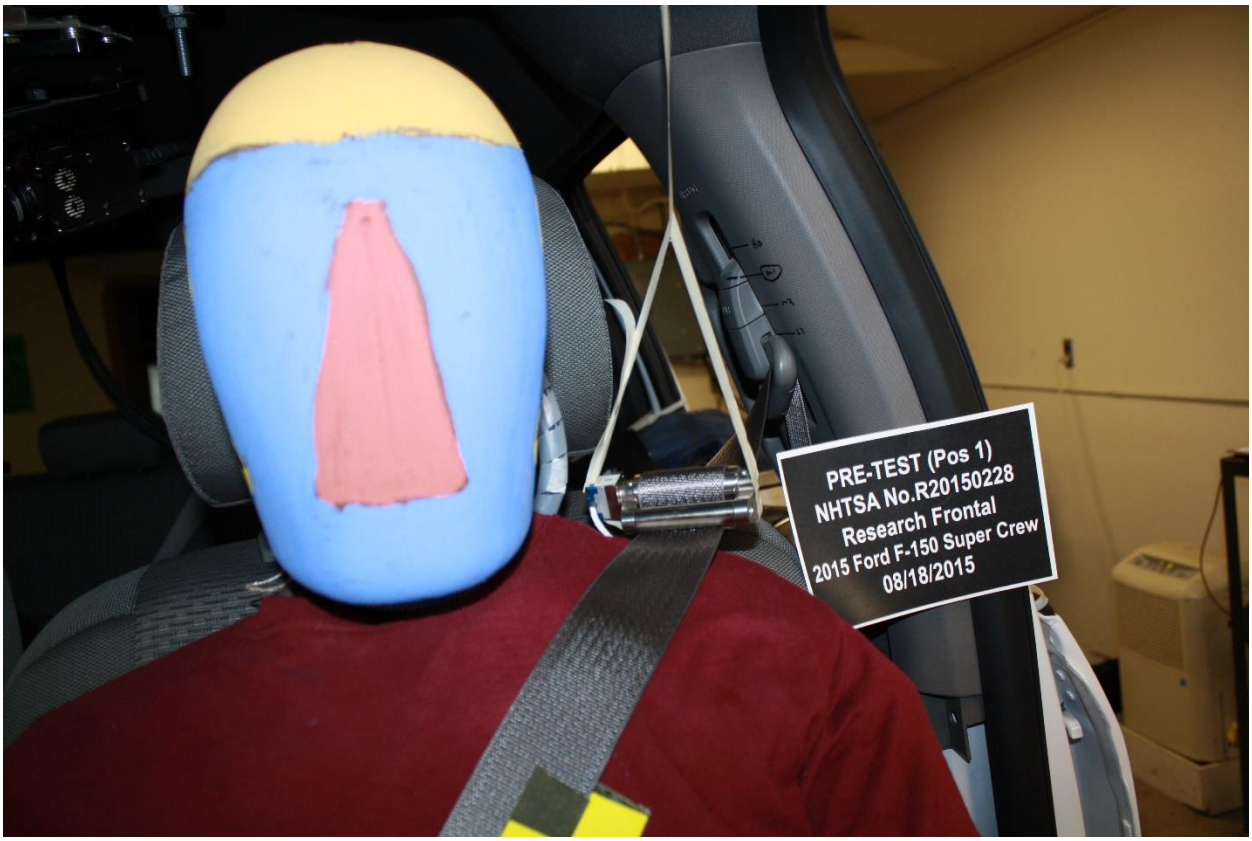


Figure A-37: Pre-Test View of Belt Anchorage for Driver Dummy



Figure A-38: Post-Test View of Belt Anchorage for Driver Dummy



Figure A-39: Pre-Test Driver Dummy Feet



Figure A-40: Post-Test Driver Dummy Feet

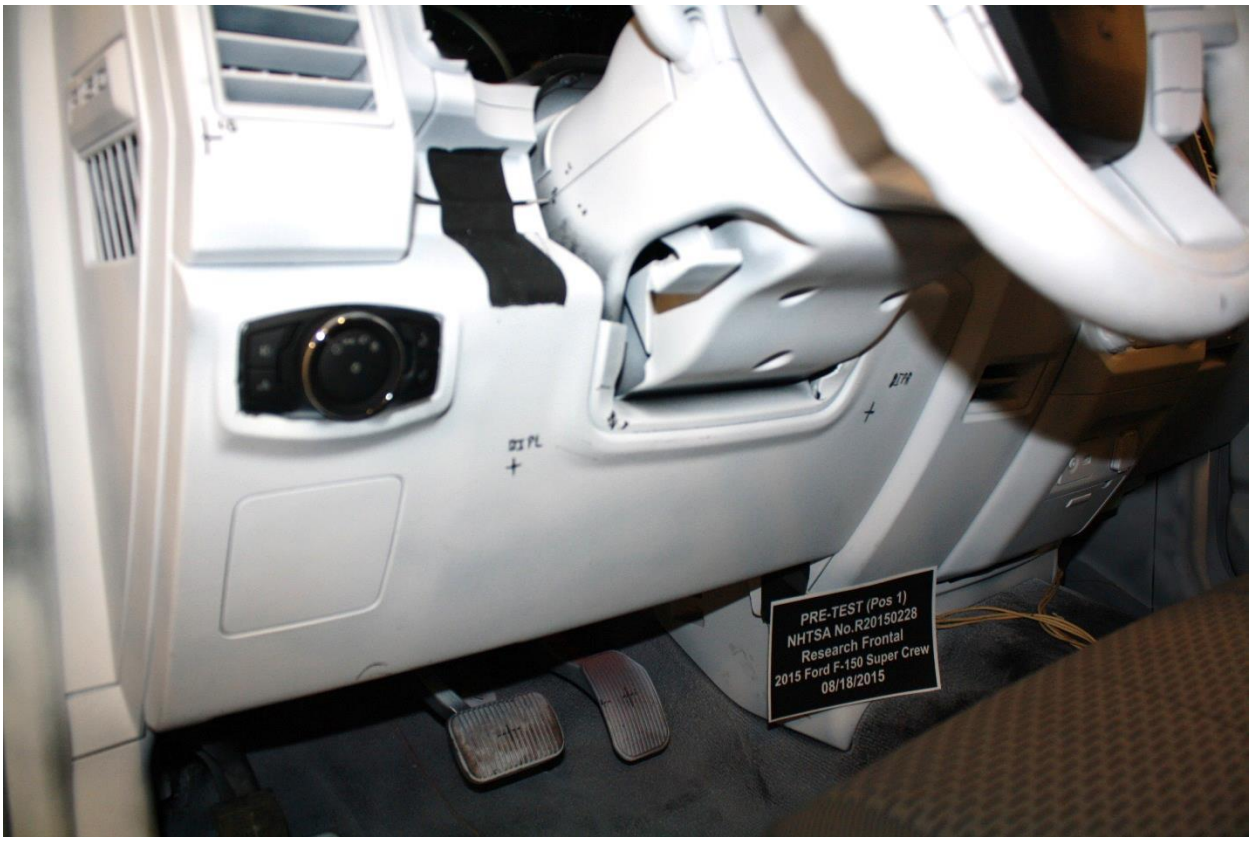


Figure A-41: Pre-Test Driver's Side Knee Bolster



Figure A-42: Post-Test Driver's Side Knee Bolster



Figure A-43: Pre-Test Driver's Side Floorpan



Figure A-44: Post-Test Driver's Side Floorpan



Figure A-45: Post-Test Driver Dummy Face



Figure A-46: Post-Test Driver Dummy Contact With Airbag

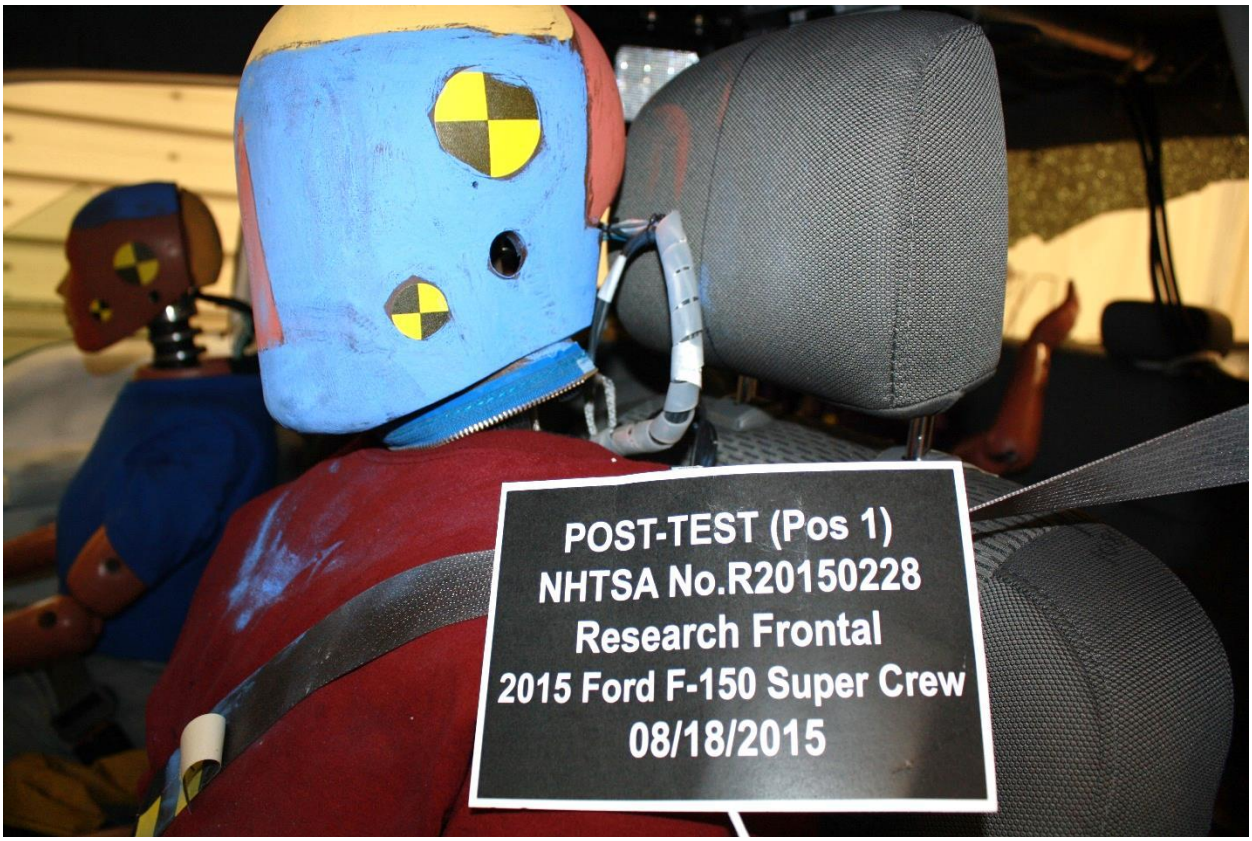


Figure A-47: Post-Test Driver Dummy Contact With Headrest



Figure A-48: Pre-Test View of the Steering Wheel



Figure A-49: Post-Test View of the Steering Wheel

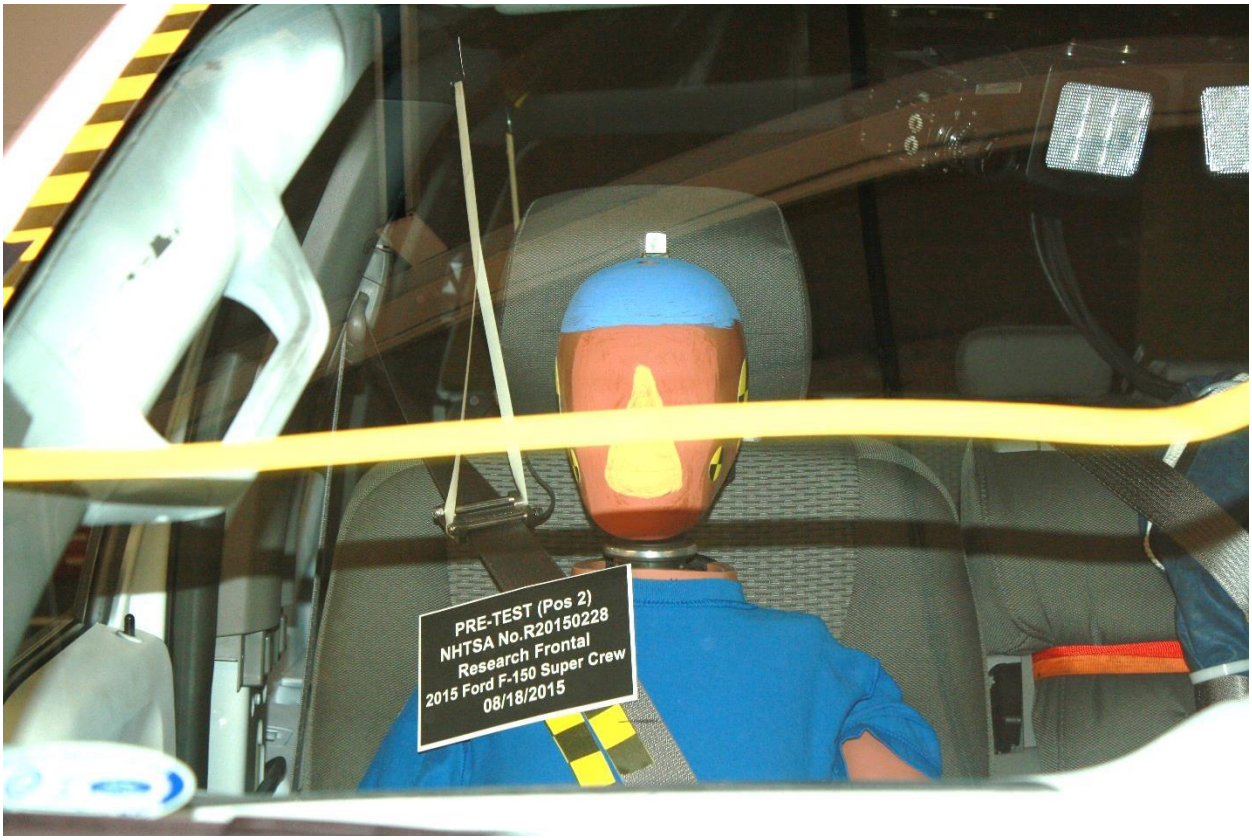


Figure A-50: Pre-Test Passenger Dummy Front View



Figure A-51: Post-Test Passenger Dummy Front View



Figure A-52: Pre-Test Passenger Dummy Window View



Figure A-53: Post-Test Passenger Dummy Window View



Figure A-54: Pre-Test Passenger Dummy and Vehicle Interior View



Figure A-55: Post-Test Passenger Dummy and Vehicle Interior View



Figure A-56: Pre-Test Passenger's Seat Fore-Aft Markings



Figure A-57: Post-Test Passenger's Seat Fore-Aft Markings

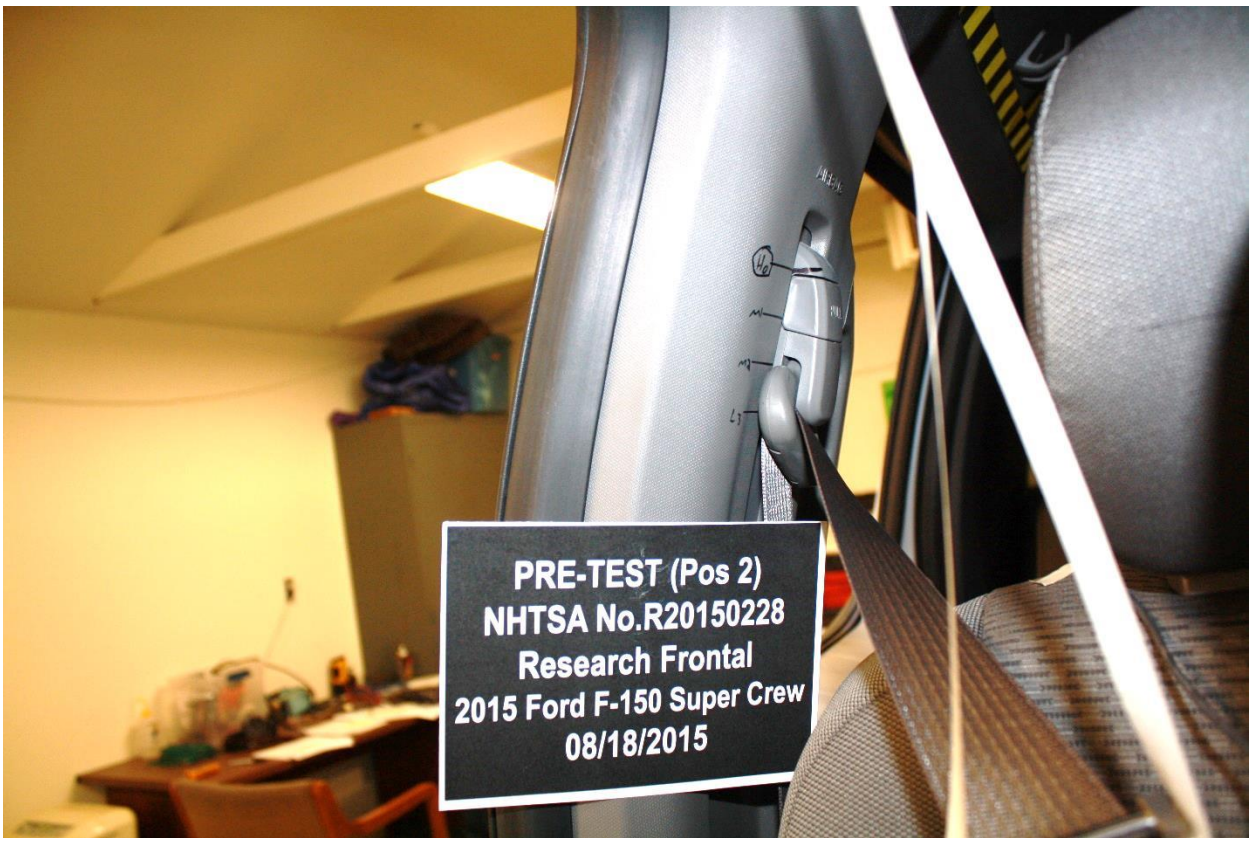


Figure A-58: Pre-Test View of Belt Anchorage for Passenger Dummy



Figure A-59: Post-Test View of Belt Anchorage for Passenger Dummy



Figure A-60: Pre-Test Passenger Dummy Feet



Figure A-61: Post-Test Passenger Dummy Feet



Figure A-62: Pre-Test Passenger's Side Knee Bolster



Figure A-63: Post-Test Passenger's Side Knee Bolster



Figure A-64: Pre-Test Passenger's Side Floorpan

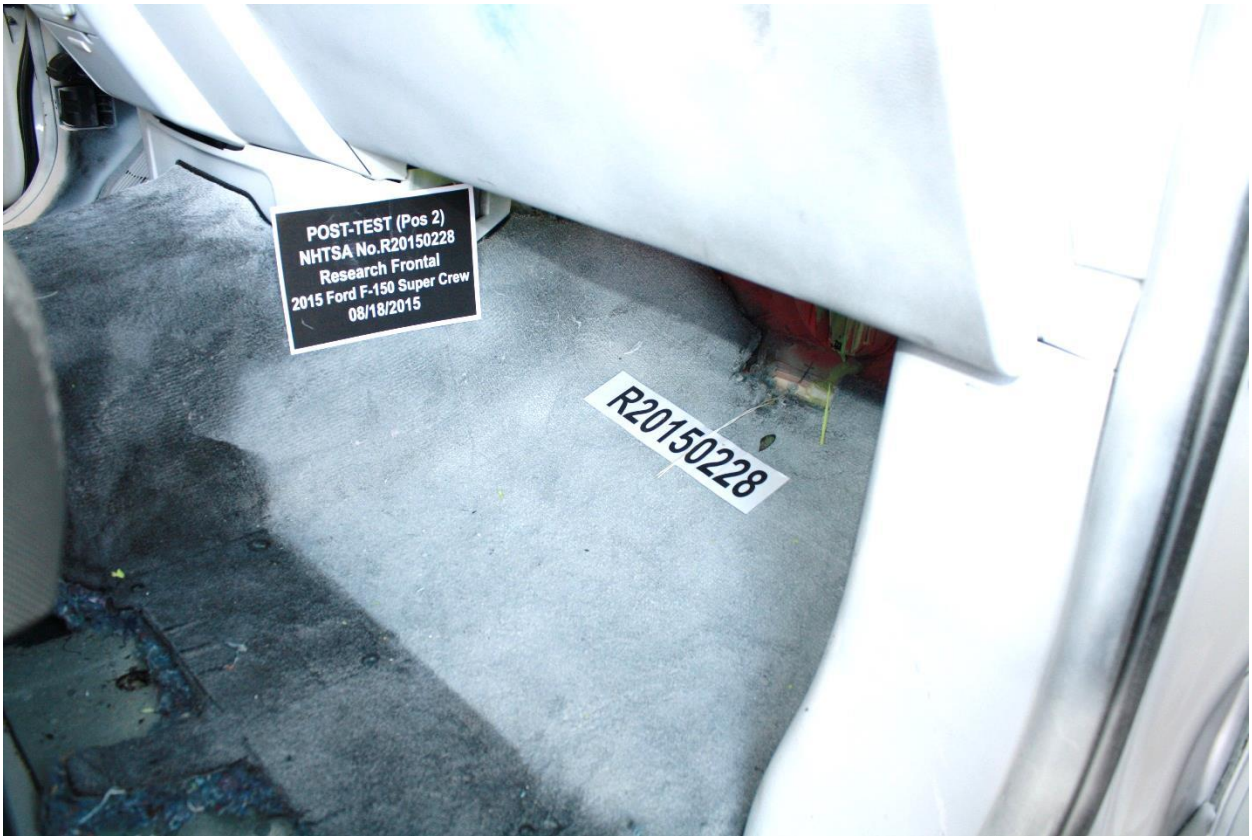


Figure A-65: Post-Test Passenger's Side Floorpan

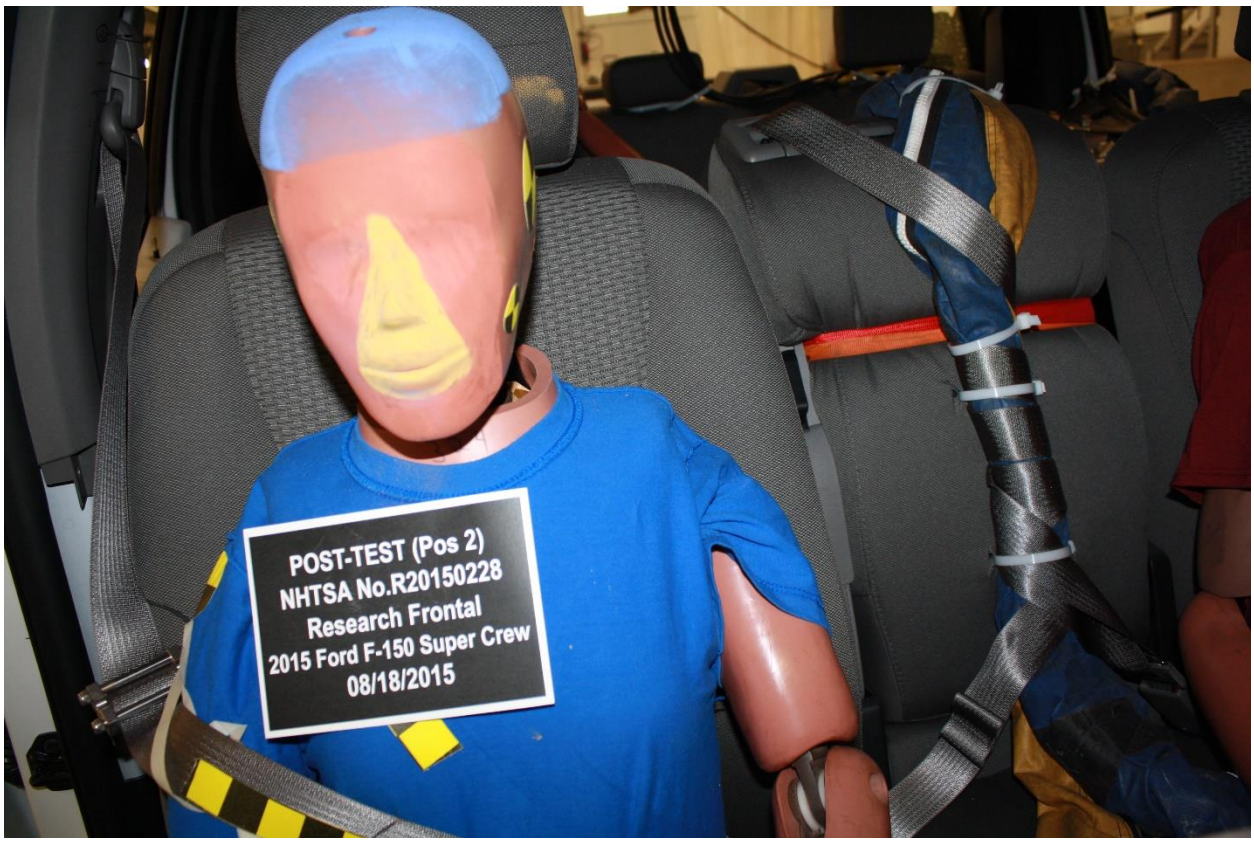


Figure A-66: Post-Test Passenger Dummy Face



Figure A-67: Post-Test Passenger Dummy Contact With Airbag



Figure A-68: Post-Test Passenger Dummy Contact With Headrest

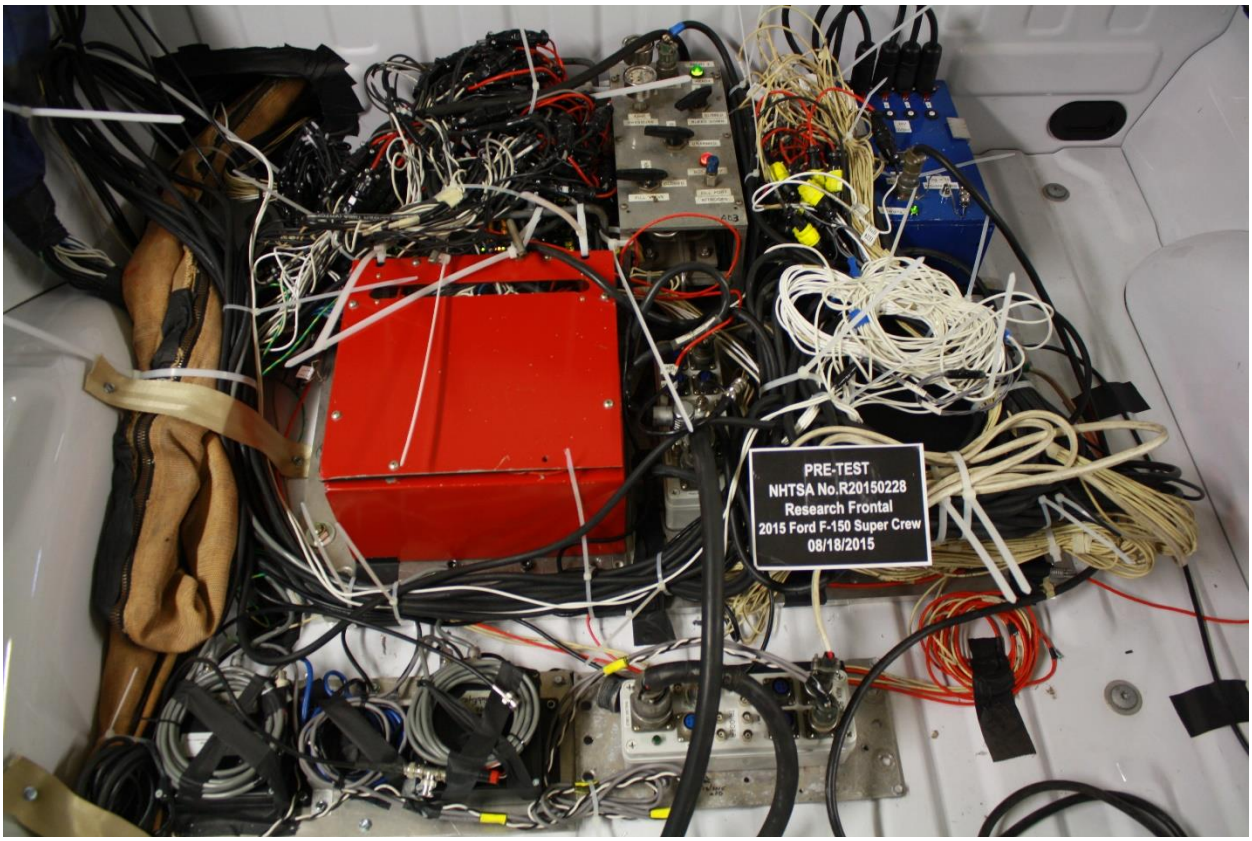


Figure A-69: Photograph of Ballast Installed in Vehicle

Photo Not Applicable

Figure A-70: Post-Test Stoddard Solvent Spillage Location View, If Required



Figure A-71: Post-Test Speed Trap Read-Out



Figure A-72: Vehicle at 0º on Static Rollover Device



Figure A-73: Vehicle at 90º on Static Rollover Device



Figure A-74: Vehicle at 180º on Static Rollover Device



Figure A-75: Vehicle at 270º on Static Rollover Device



Figure A-76: Vehicle at 360º on Static Rollover Device

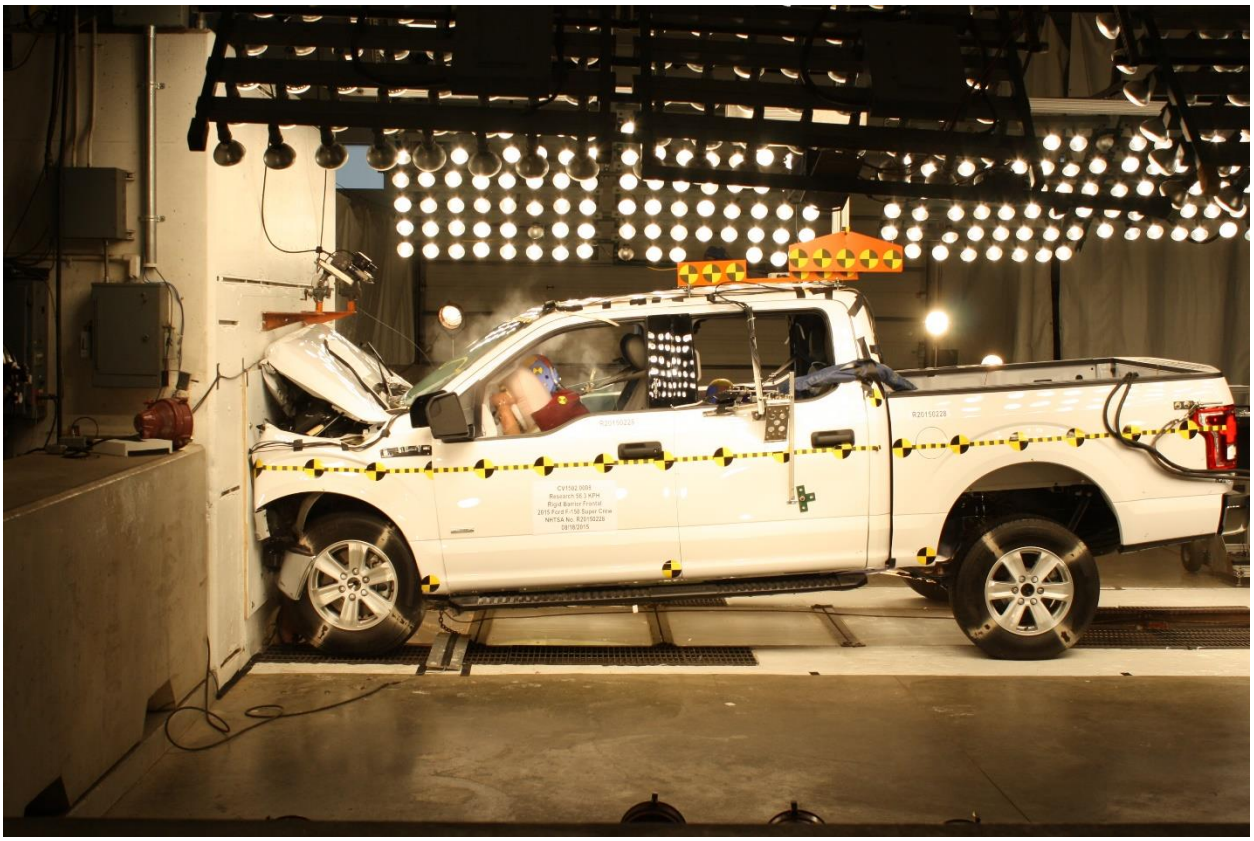


Figure A-77: 2015 Ford F-150 Frontal Impact Event

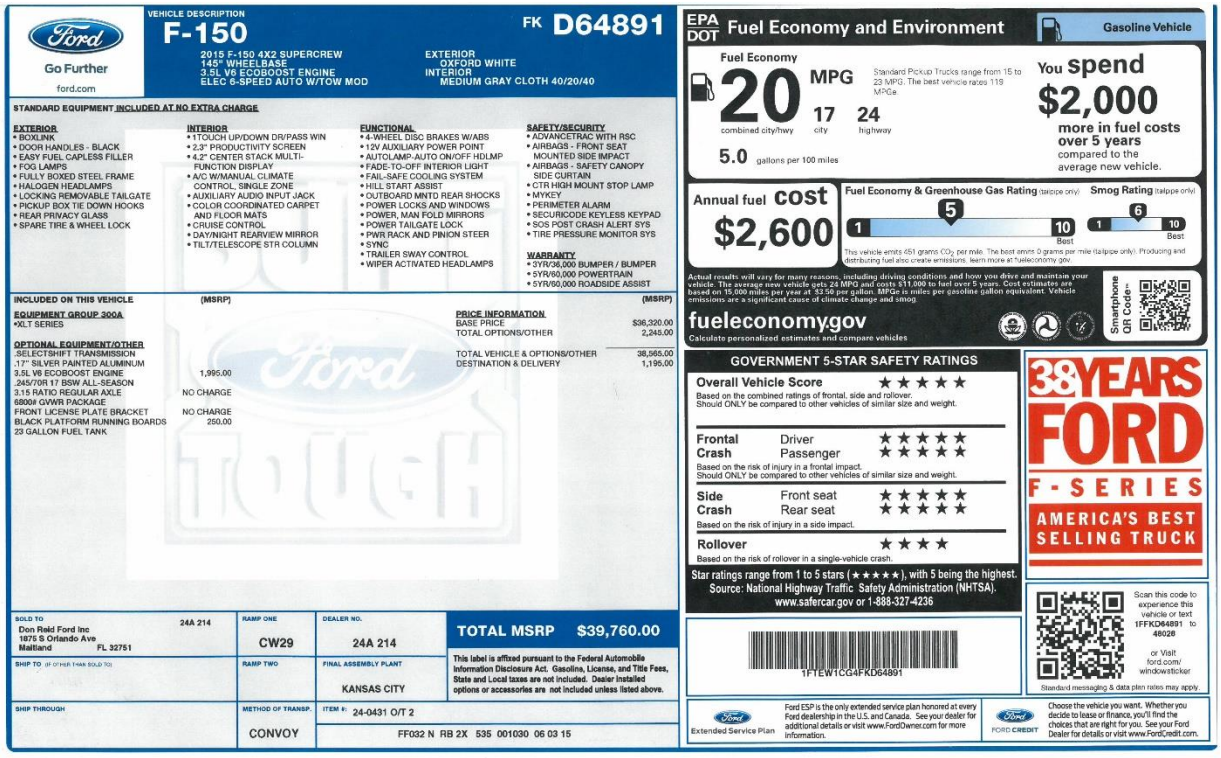


Figure A-78: Monroney Label Photograph



Figure A-79: Pre-Test Rear Passenger Dummy Front view



Figure A-80: Post-Test Rear Passenger Dummy Front view



Figure A-81: Pre-Test Rear Passenger Dummy Window View



Figure A-82: Post-Test Rear Passenger Dummy Window View



Figure A-83: Pre-Test Rear Passenger Dummy and Vehicle Interior View



Figure A-84: Post-Test Rear Passenger Dummy and Vehicle Interior View

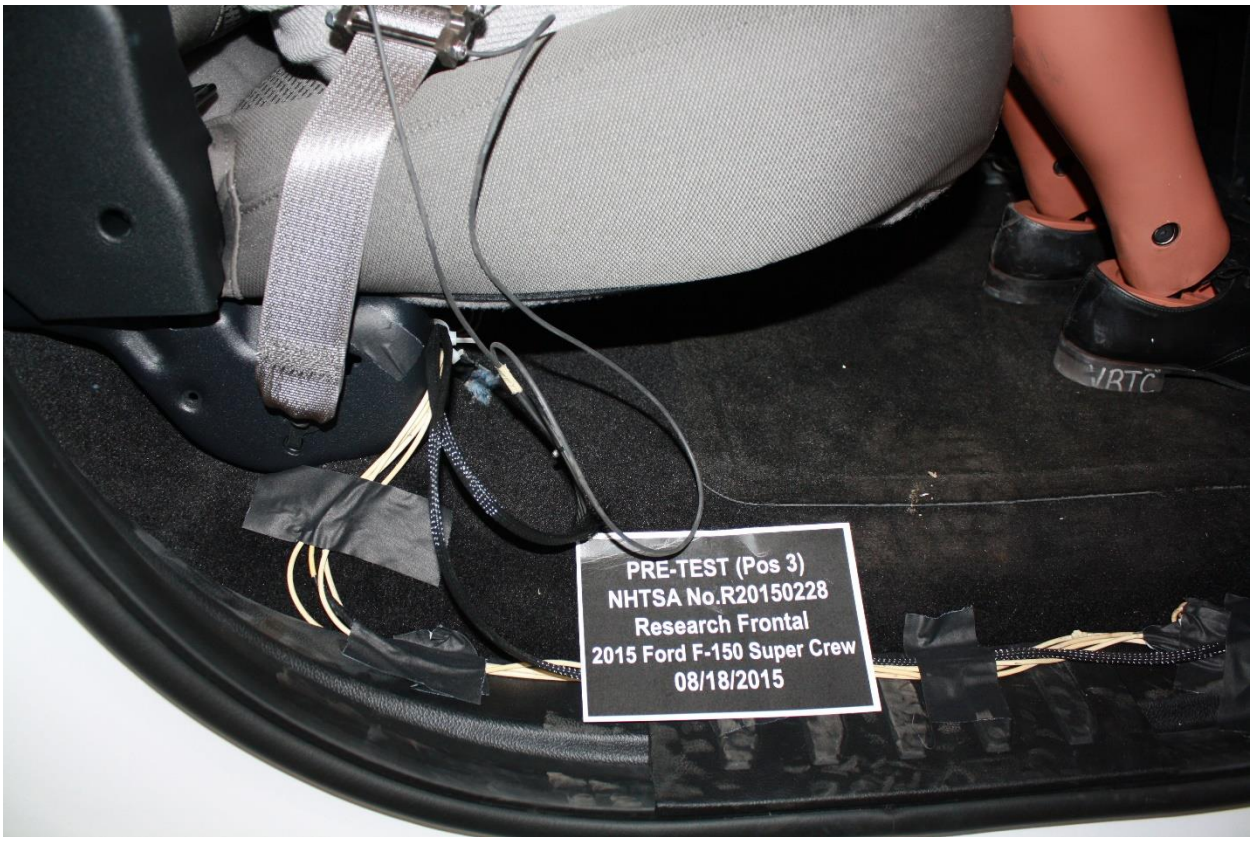


Figure A-85: Pre-Test Rear Passenger Seat Fore-Aft Markings



Figure A-86: Post-Test Rear Passenger Seat Fore-Aft Markings

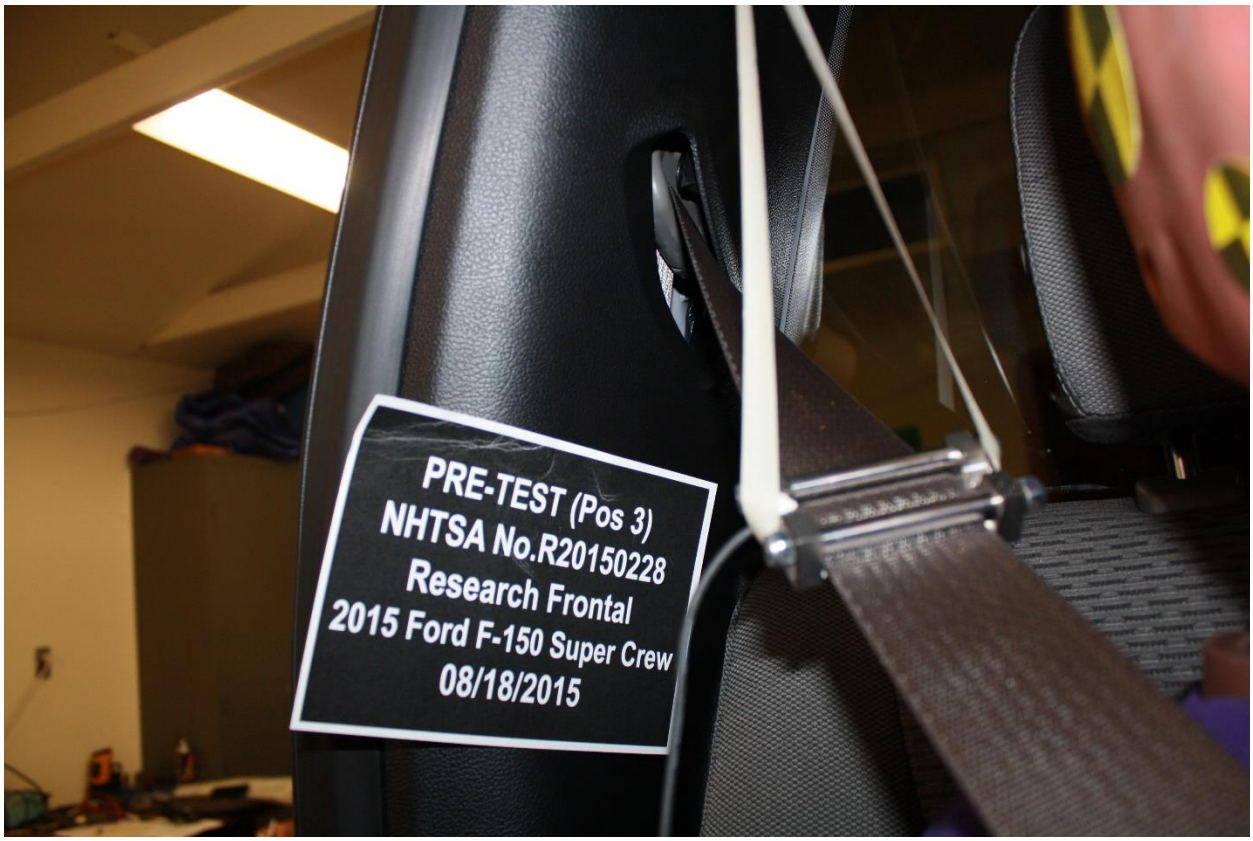


Figure A-87: Pre-Test View of Belt Anchorage for Rear Passenger Dummy

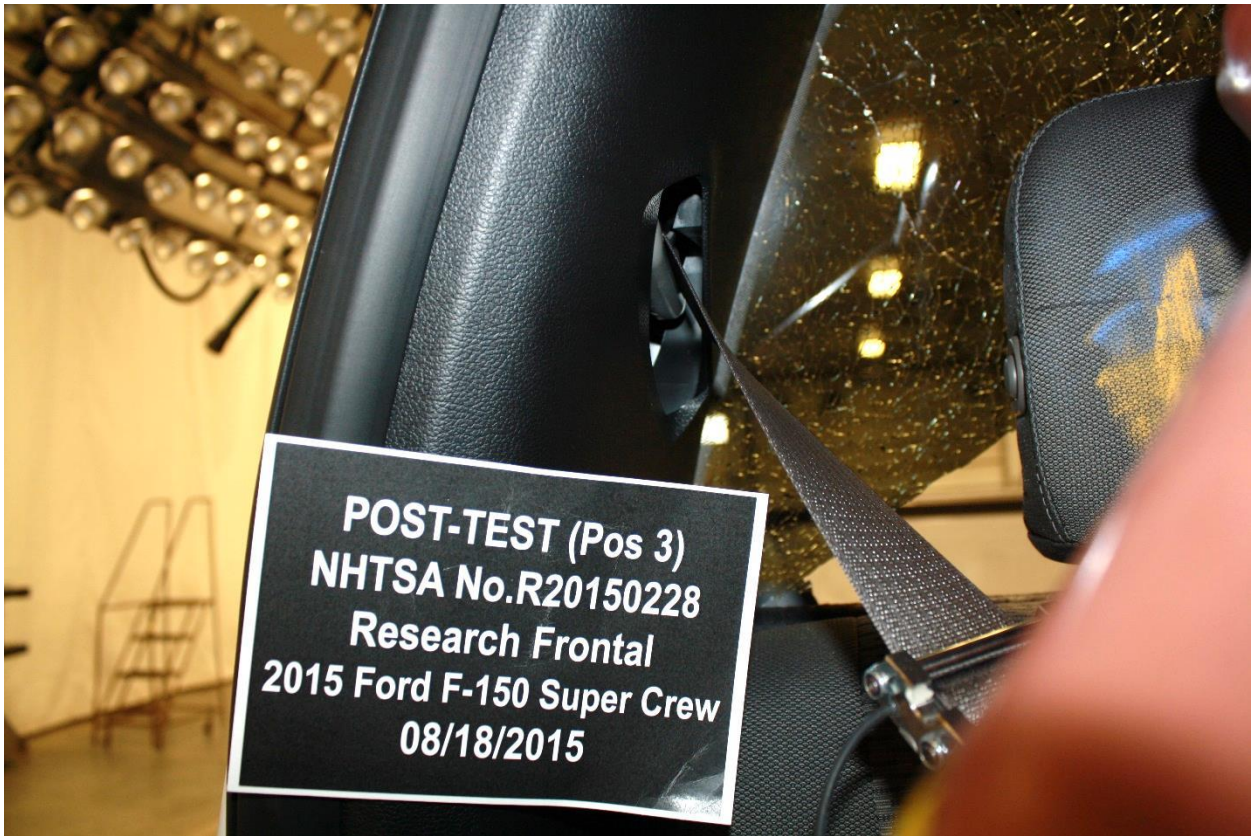


Figure A-88: Post-Test View of Belt Anchorage for Rear Passenger Dummy

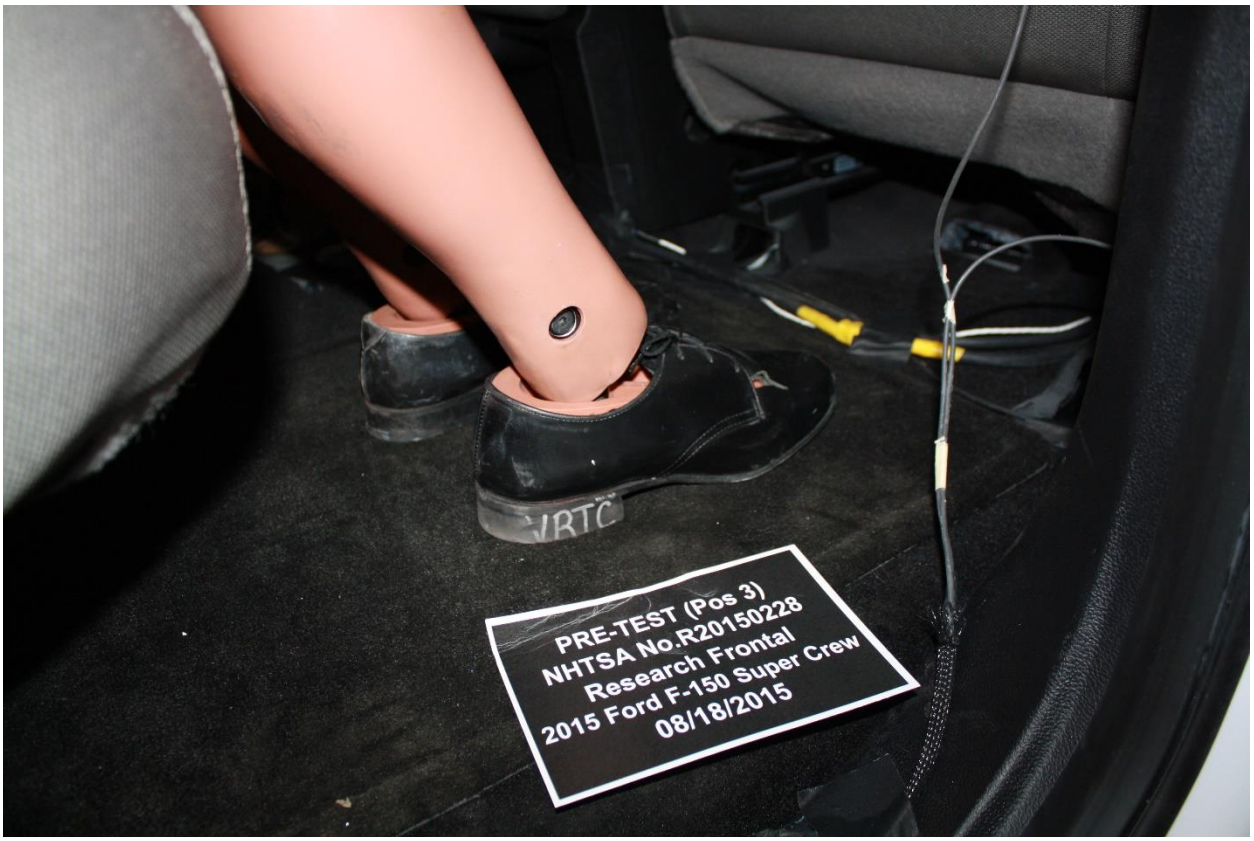


Figure A-89: Pre-Test Rear Passenger Dummy Feet



Figure A-90: Post-Test Rear Passenger Dummy Feet



Figure A-91: Pre-Test Rear Passenger Dummy Knee and Seatback View



Figure A-92: Post-Test Rear Passenger Dummy Knee Contact with Seatback



Figure A-93: Pre-Test Rear Passenger's Side Floorpan



Figure A-94: Post-Test Rear Passenger's Side Floorpan

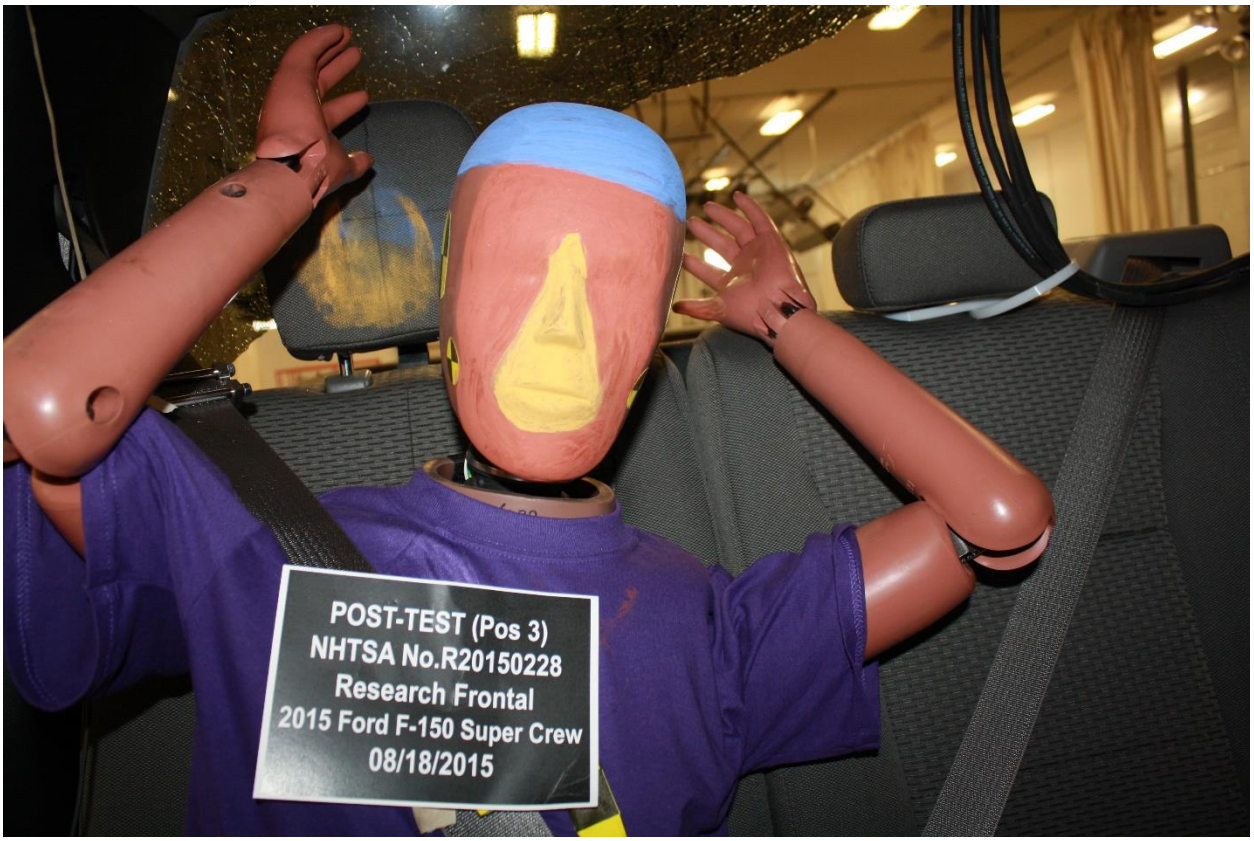


Figure A-95: Post-Test Rear Passenger Dummy Face

Photo Not Applicable

Figure A-96: Post-Test Rear Passenger Dummy Contact with Airbag



Figure A-97: Post-Test Rear Passenger dummy Contact with Headrest

APPENDIX B
VEHICLE & DUMMY RESPONSE DATA TRACES

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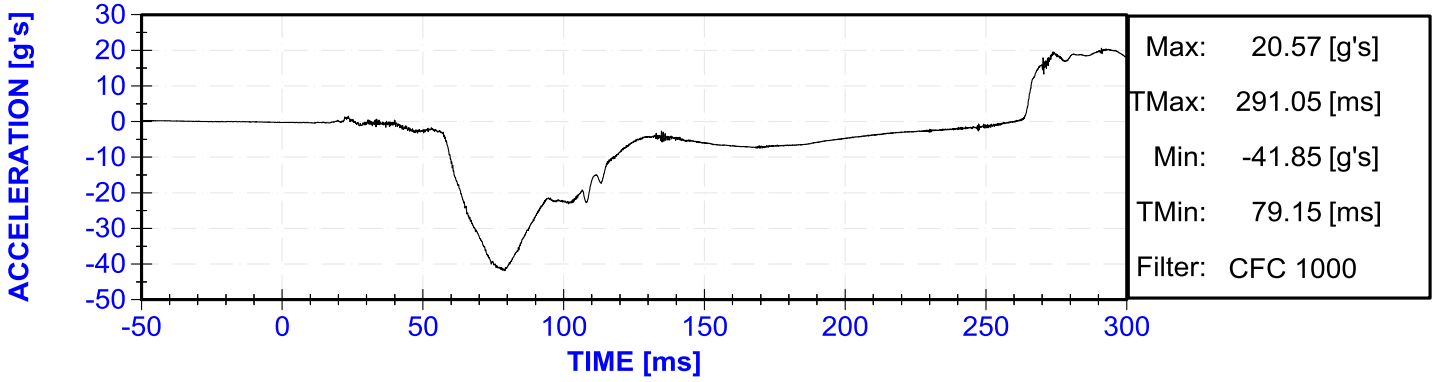
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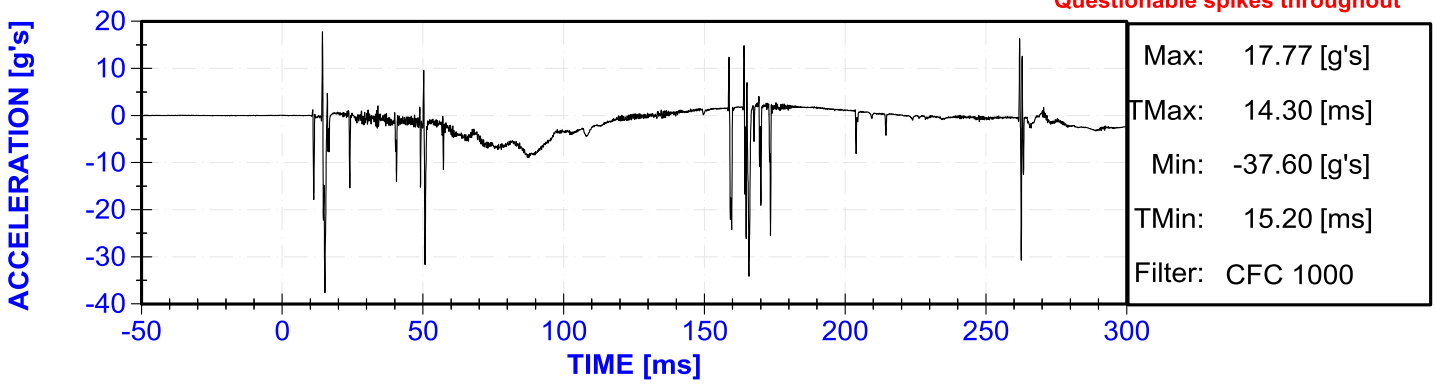
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V1P1 Head CG X Acceleration

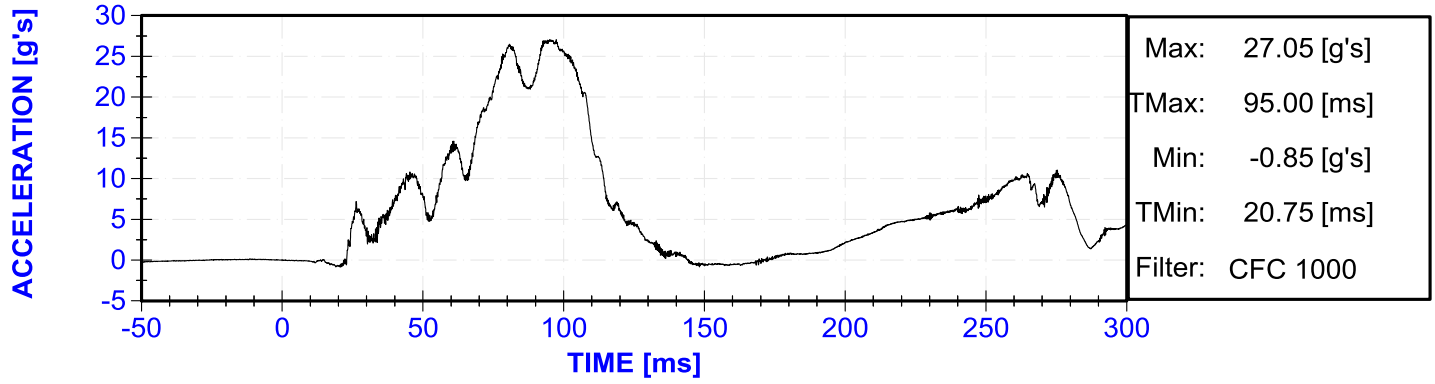


V1P1 Head CG Y Acceleration

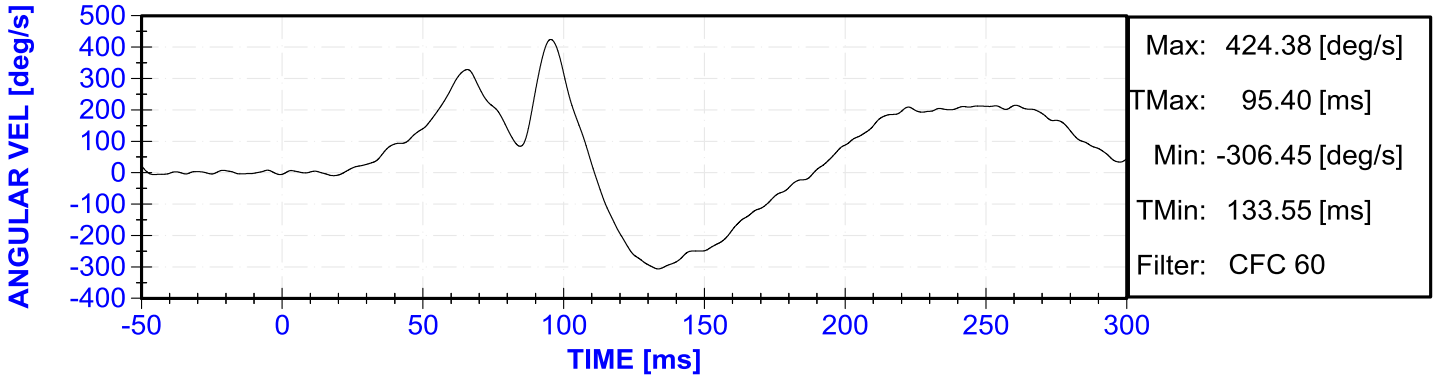
Questionable spikes throughout

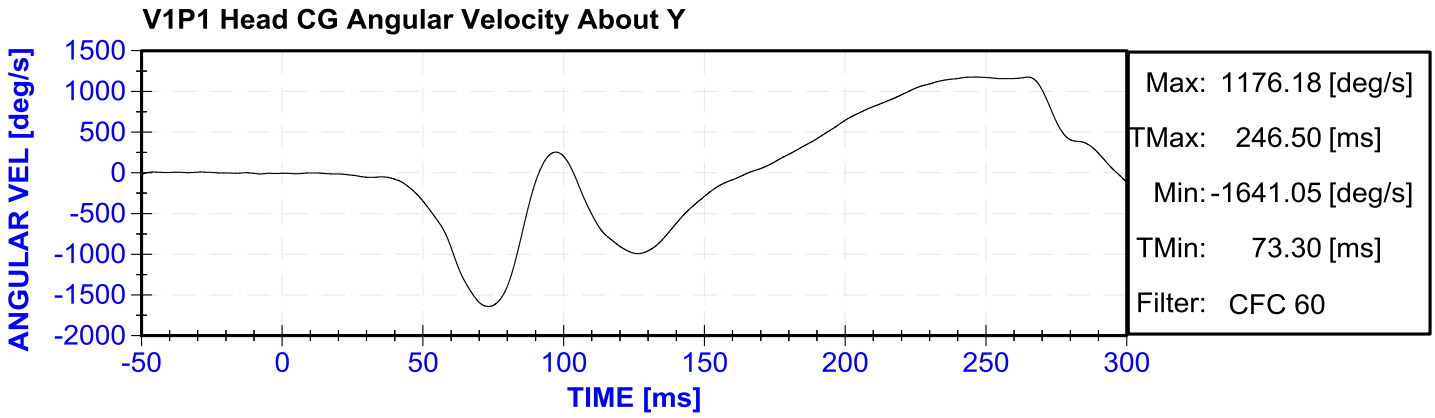


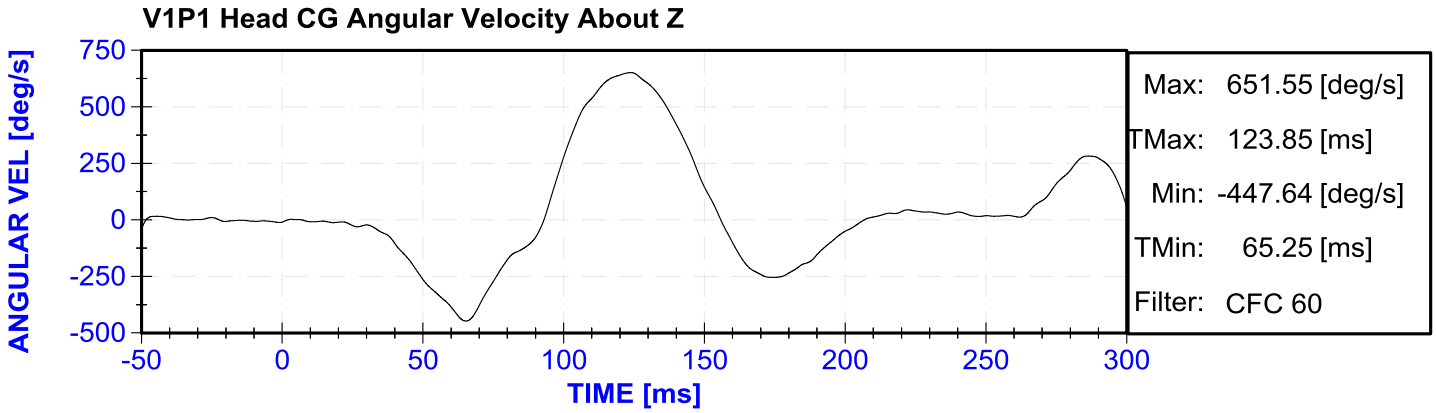
V1P1 Head CG Z Acceleration

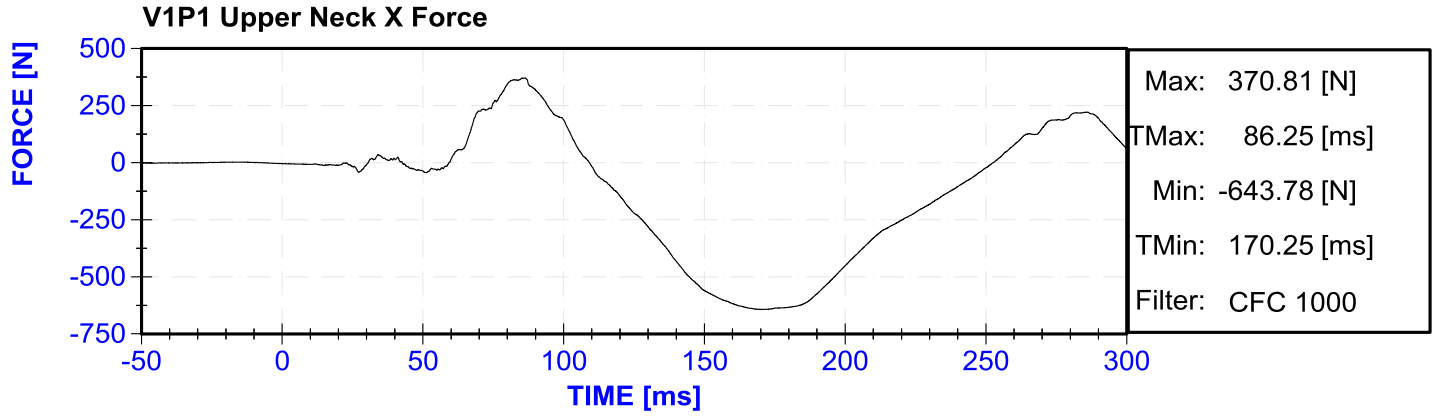


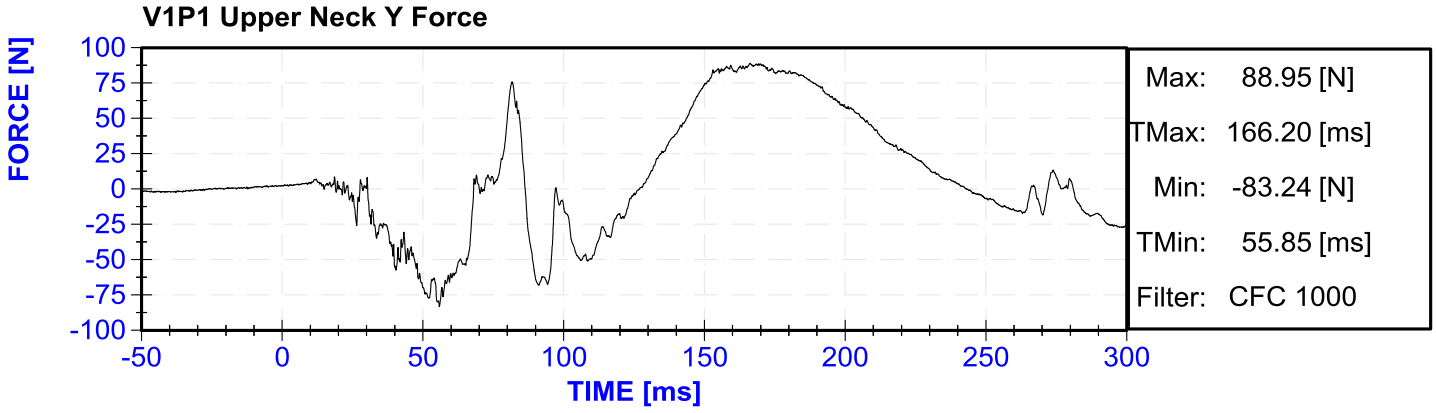
V1P1 Head CG Angular Velocity About X

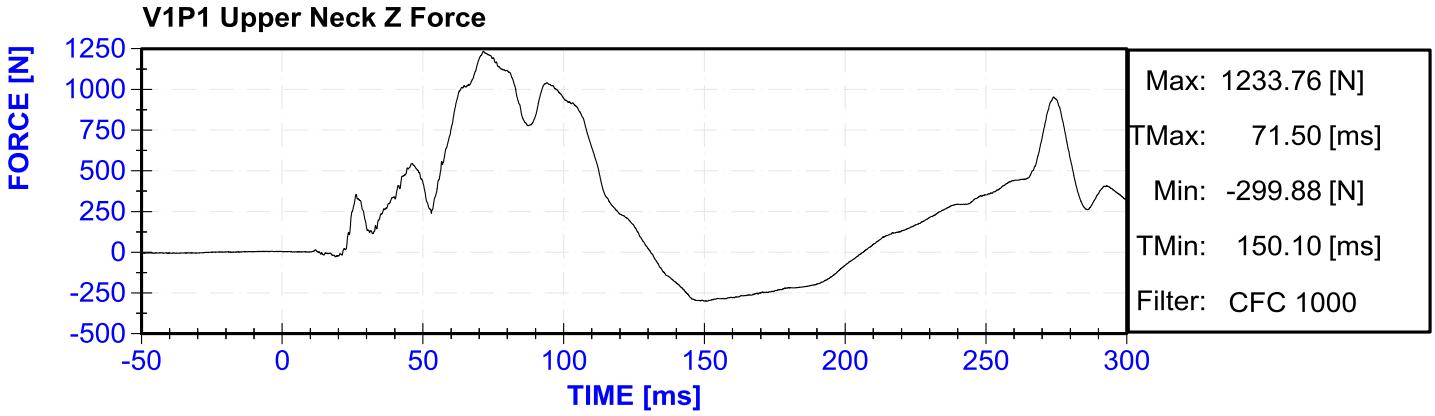


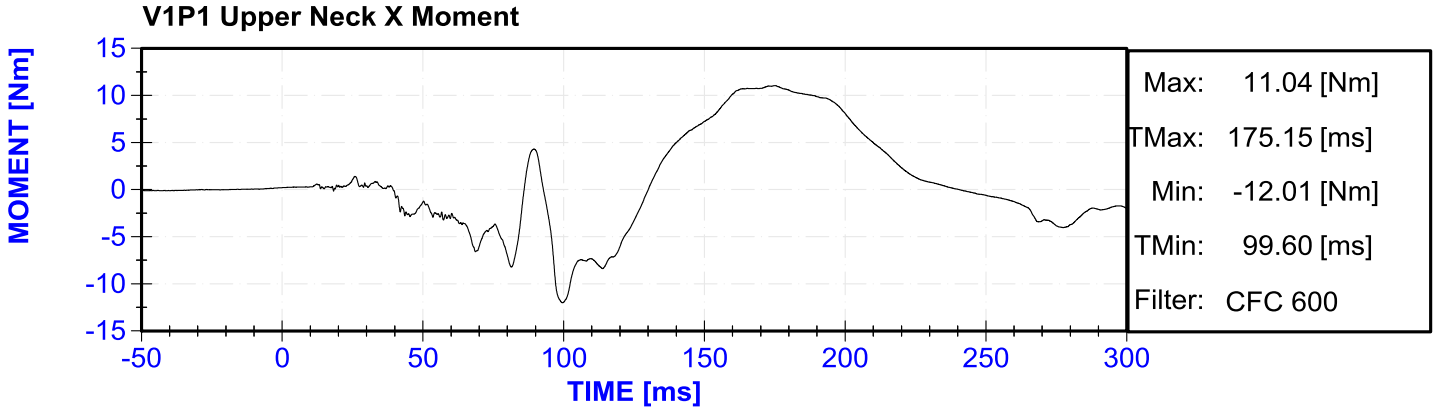

V1P1 Head CG Angular Velocity About Y
ANGULAR VEL [deg/s]
1500
1000
500
0
-500
-1000
-1500
-2000
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 1176.18 [deg/s]
TMax: 246.50 [ms]
Min: -1641.05 [deg/s]
TMin: 73.30 [ms]
Filter: CFC 60

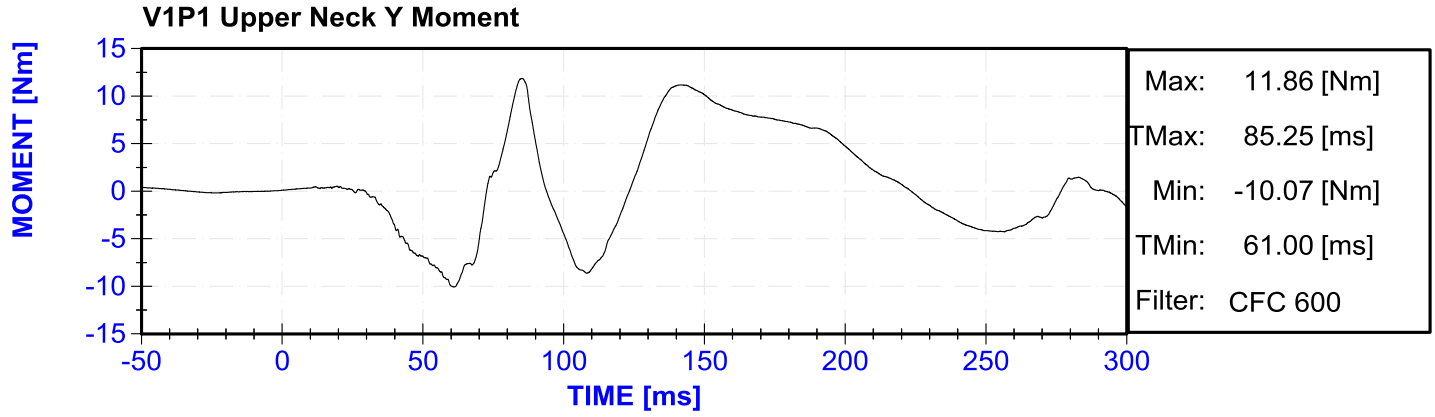

V1P1 Head CG Angular Velocity About Z
ANGULAR VEL [deg/s]
750
500
250
0
-250
-500
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 651.55 [deg/s]
TMax: 123.85 [ms]
Min: -447.64 [deg/s]
TMin: 65.25 [ms]
Filter: CFC 60

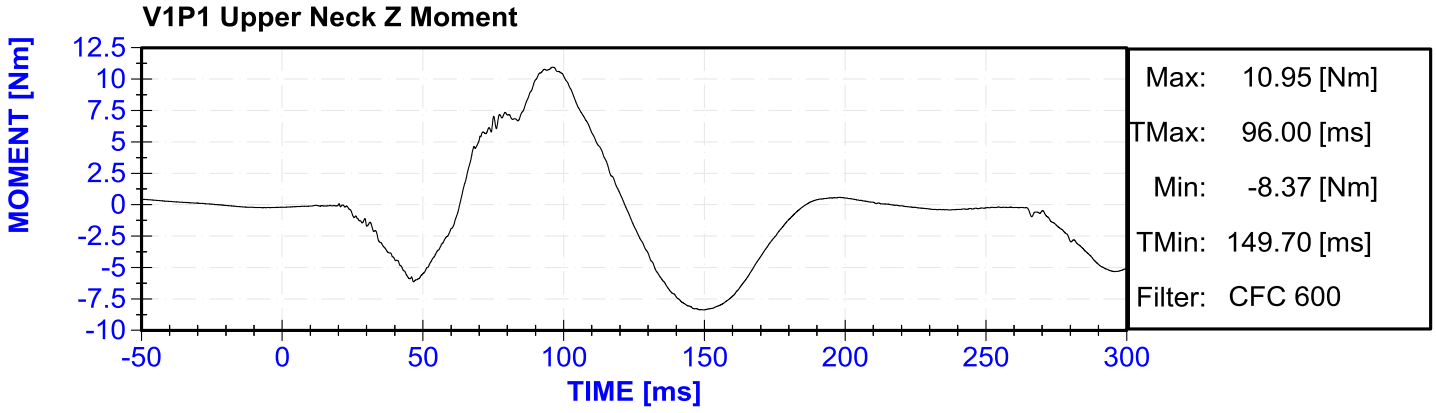

V1P1 Upper Neck X Force
FORCE [N]
500
250
0
-250
-500
-750
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 370.81 [N]
TMax: 86.25 [ms]
Min: -643.78 [N]
TMin: 170.25 [ms]
Filter: CFC 1000

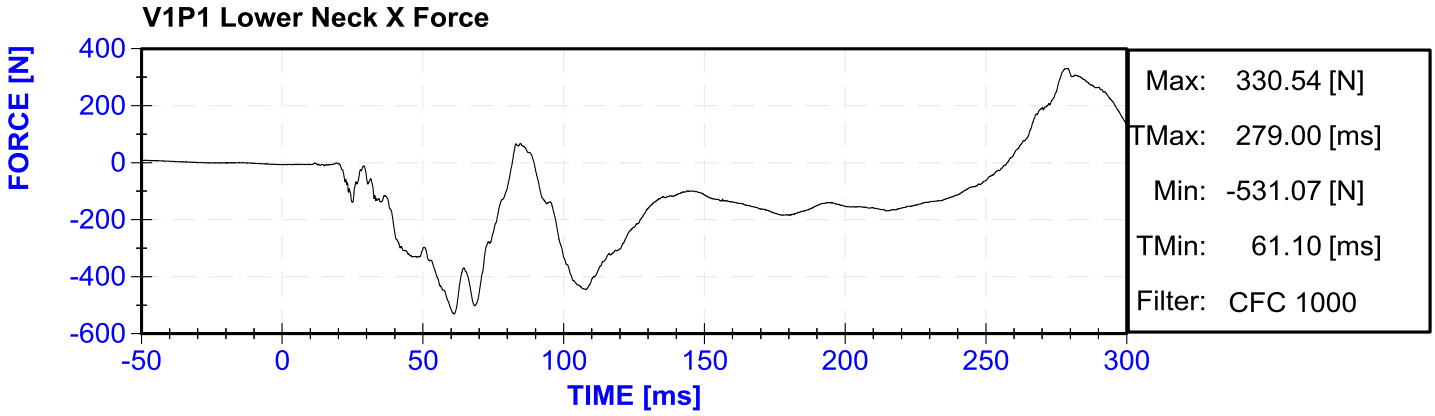

V1P1 Upper Neck Y Force
FORCE [N]
100
75
50
25
0
-25
-50
-75
-100
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 88.95 [N]
TMax: 166.20 [ms]
Min: -83.24 [N]
TMin: 55.85 [ms]
Filter: CFC 1000

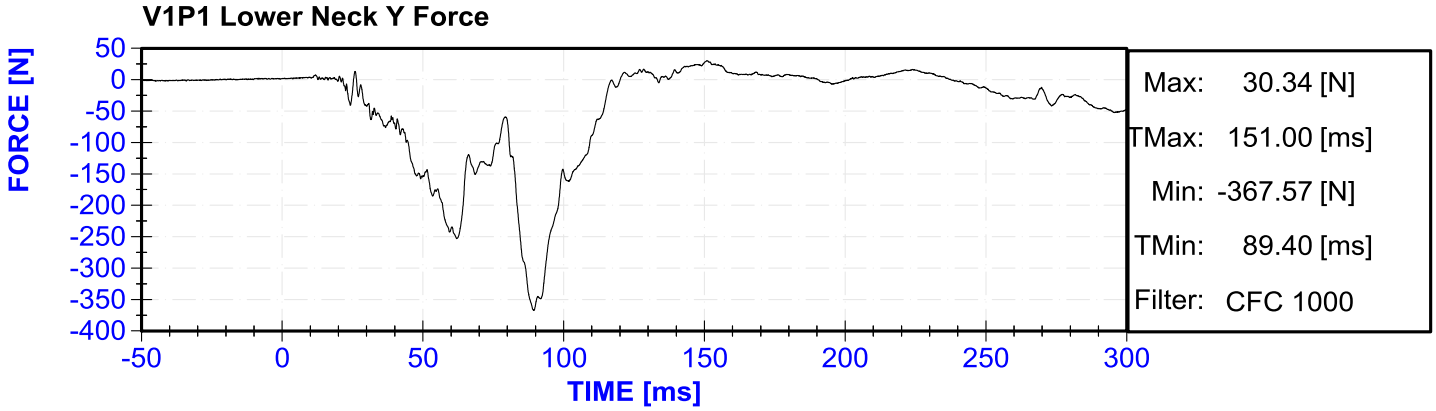

V1P1 Upper Neck Z Force
FORCE [N]
1250
1000
750
500
250
0
-250
-500
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 1233.76 [N]
TMax: 71.50 [ms]
Min: -299.88 [N]
TMin: 150.10 [ms]
Filter: CFC 1000

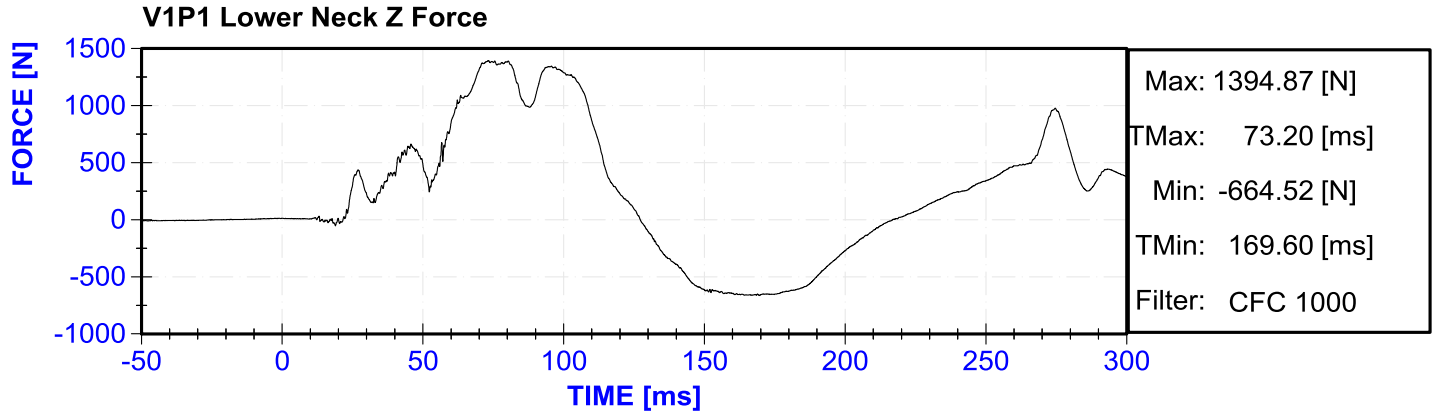

V1P1 Upper Neck X Moment
MOMENT [Nm]
15
10
5
0
-5
-10
-15
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 11.04 [Nm]
TMax: 175.15 [ms]
Min: -12.01 [Nm]
TMin: 99.60 [ms]
Filter: CFC 600

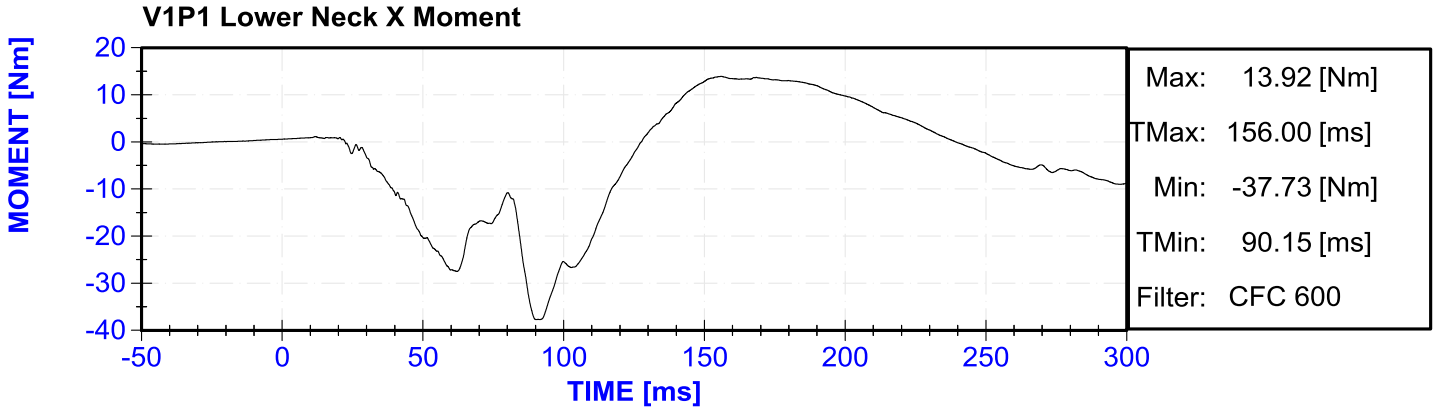

V1P1 Upper Neck Y Moment
MOMENT [Nm]
15
10
5
0
-5
-10
-15
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 11.86 [Nm]
TMax: 85.25 [ms]
Min: -10.07 [Nm]
TMin: 61.00 [ms]
Filter: CFC 600

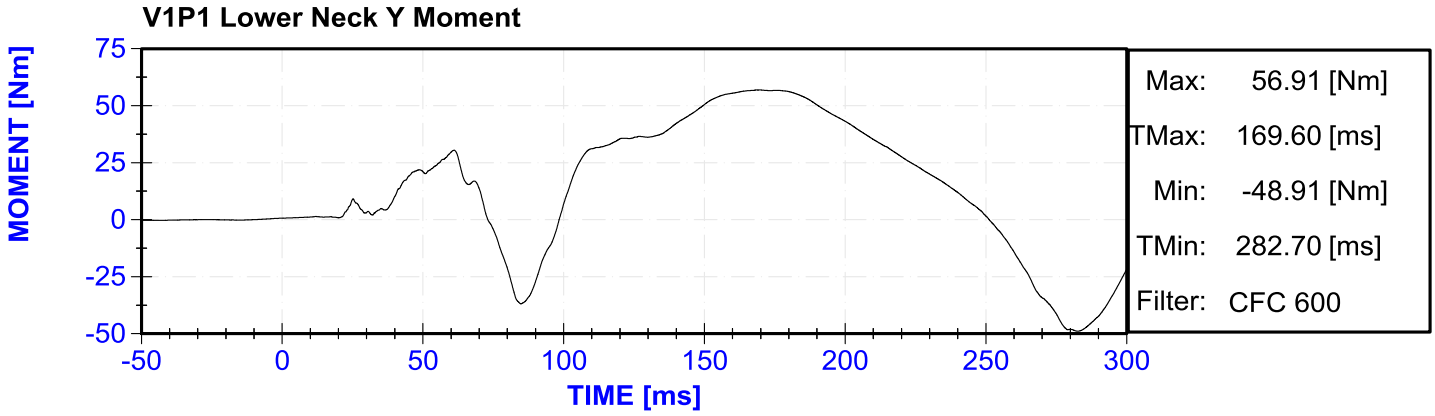

V1P1 Upper Neck Z Moment
MOMENT [Nm]
12.5
10
7.5
5
2.5
0
-2.5
-5
-7.5
-10
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 10.95 [Nm]
TMax: 96.00 [ms]
Min: -8.37 [Nm]
TMin: 149.70 [ms]
Filter: CFC 600

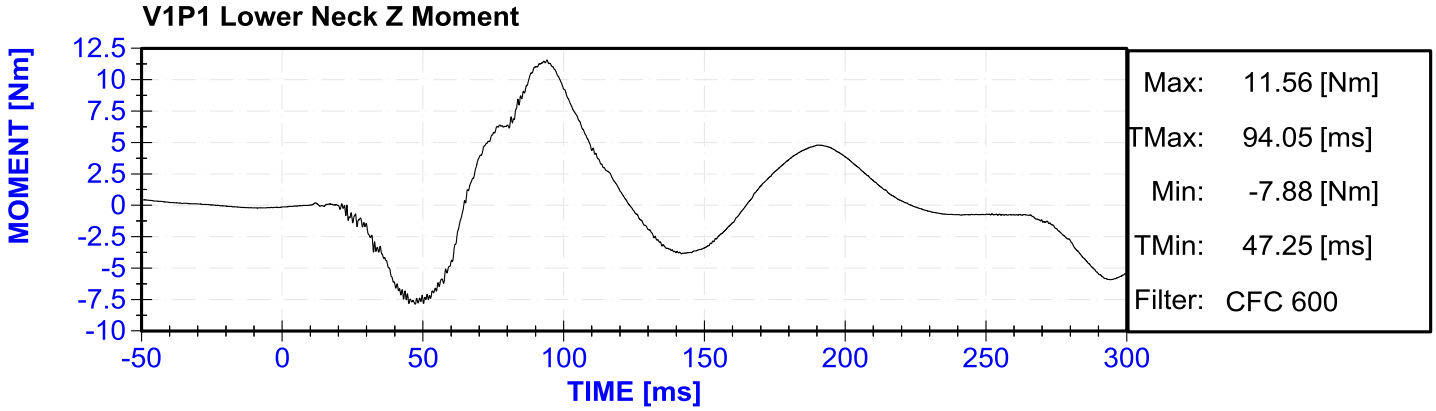

V1P1 Lower Neck X Force
FORCE [N]
400
200
0
-200
-400
-600
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 330.54 [N]
TMax: 279.00 [ms]
Min: -531.07 [N]
TMin: 61.10 [ms]
Filter: CFC 1000

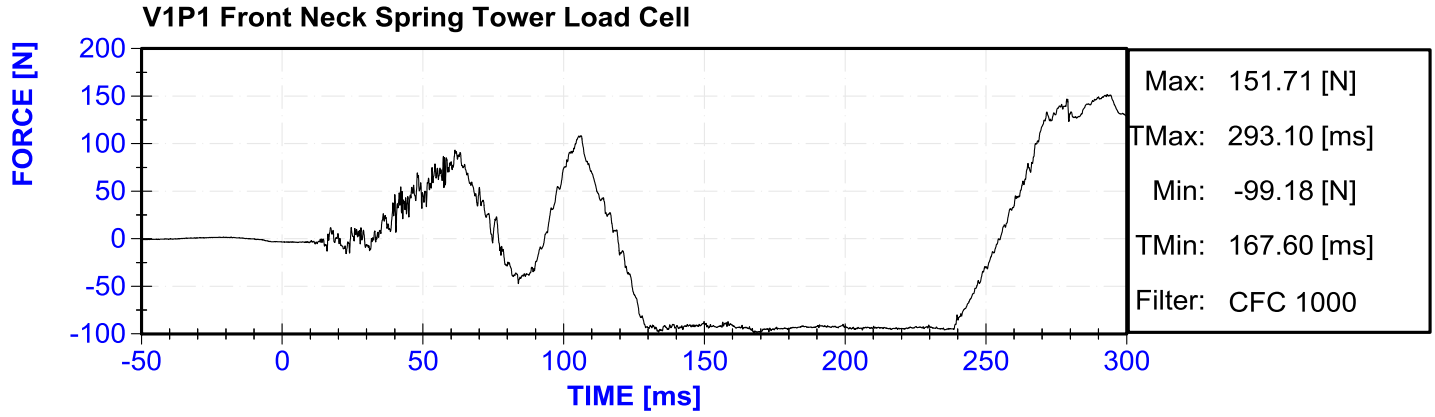

V1P1 Lower Neck Y Force
FORCE [N]
50
0
-50
-100
-150
-200
-250
-300
-350
-400
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 30.34 [N]
TMax: 151.00 [ms]
Min: -367.57 [N]
TMin: 89.40 [ms]
Filter: CFC 1000

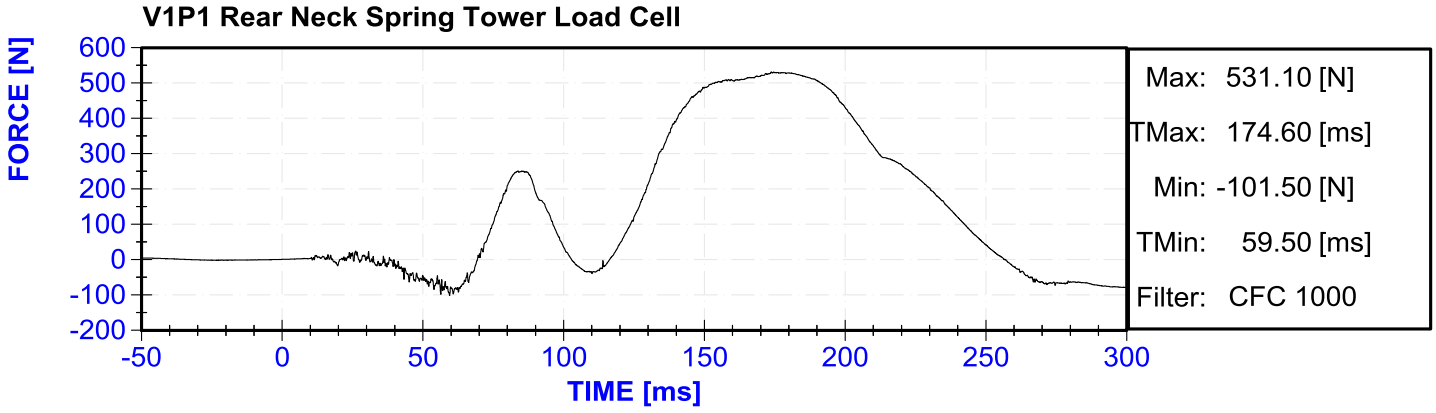

V1P1 Lower Neck Z Force
FORCE [N]
1500
1000
500
0
-500
-1000
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 1394.87 [N]
TMax: 73.20 [ms]
Min: -664.52 [N]
TMin: 169.60 [ms]
Filter: CFC 1000


V1P1 Lower Neck X Moment
MOMENT [Nm]
20
10
0
-10
-20
-30
-40
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 13.92 [Nm]
TMax: 156.00 [ms]
Min: -37.73 [Nm]
TMin: 90.15 [ms]
Filter: CFC 600

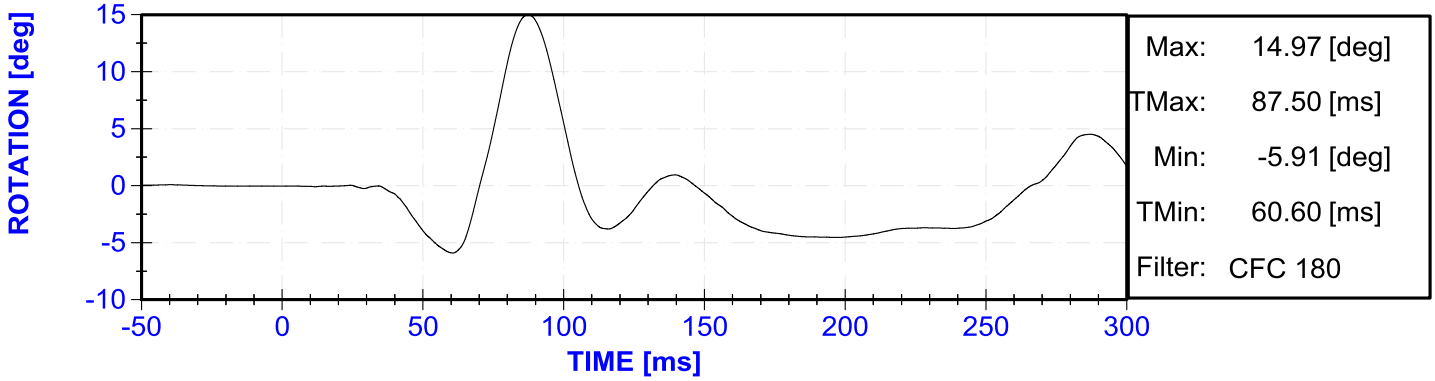

V1P1 Lower Neck Y Moment
MOMENT [Nm]
75
50
25
0
-25
-50
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 56.91 [Nm]
TMax: 169.60 [ms]
Min: -48.91 [Nm]
TMin: 282.70 [ms]
Filter: CFC 600


V1P1 Lower Neck Z Moment
MOMENT [Nm]
12.5
10
7.5
5
2.5
0
-2.5
-5
-7.5
-10
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 11.56 [Nm]
TMax: 94.05 [ms]
Min: -7.88 [Nm]
TMin: 47.25 [ms]
Filter: CFC 600

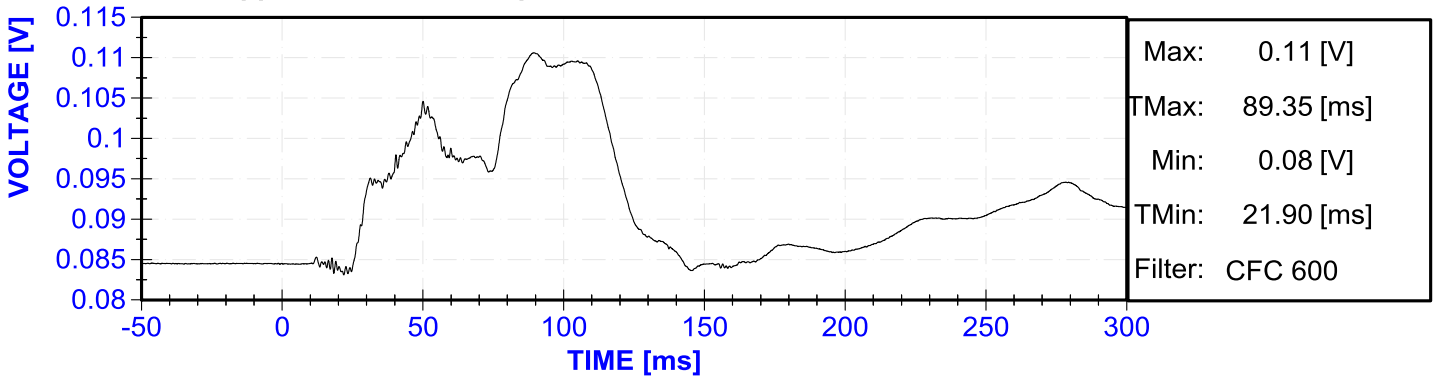

V1P1 Front Neck Spring Tower Load Cell
FORCE [N]
200
150
100
50
0
-50
-100
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 151.71 [N]
TMax: 293.10 [ms]
Min: -99.18 [N]
TMin: 167.60 [ms]
Filter: CFC 1000


V1P1 Rear Neck Spring Tower Load Cell
FORCE [N]
600
500
400
300
200
100
0
-100
-200
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 531.10 [N]
TMax: 174.60 [ms]
Min: -101.50 [N]
TMin: 59.50 [ms]
Filter: CFC 1000

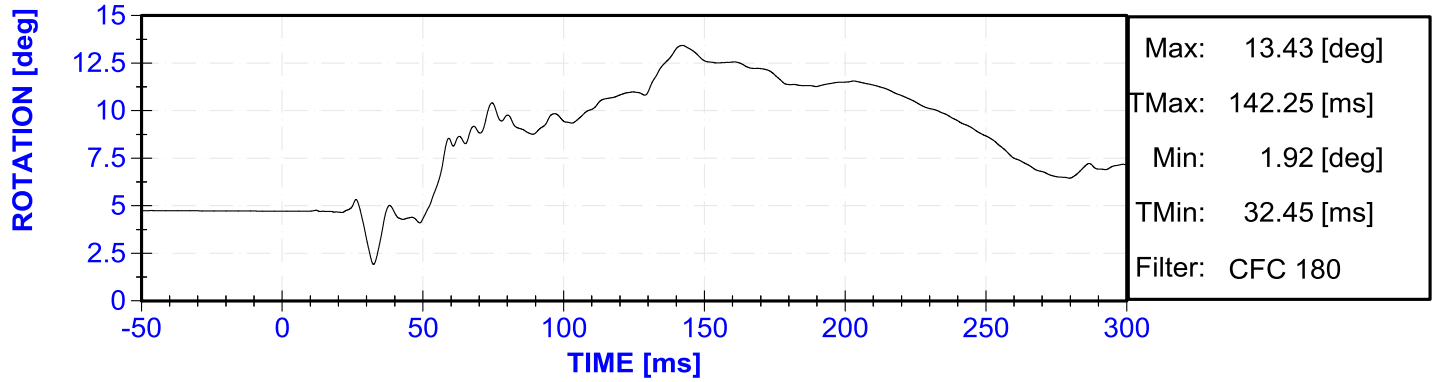
V1P1 Occipital Condyle Rotation Potentiometer



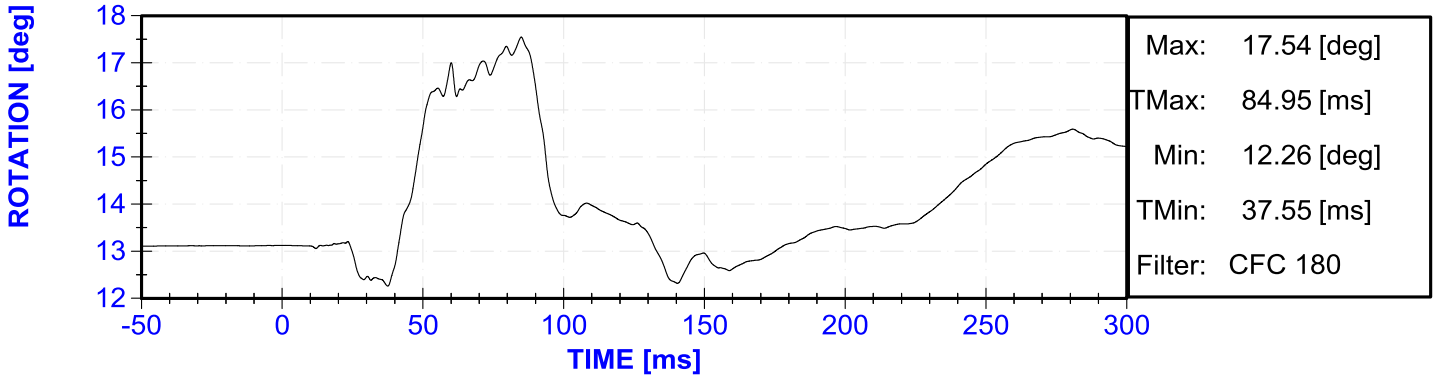
V1P1 Upper Left DGIR X Displacement

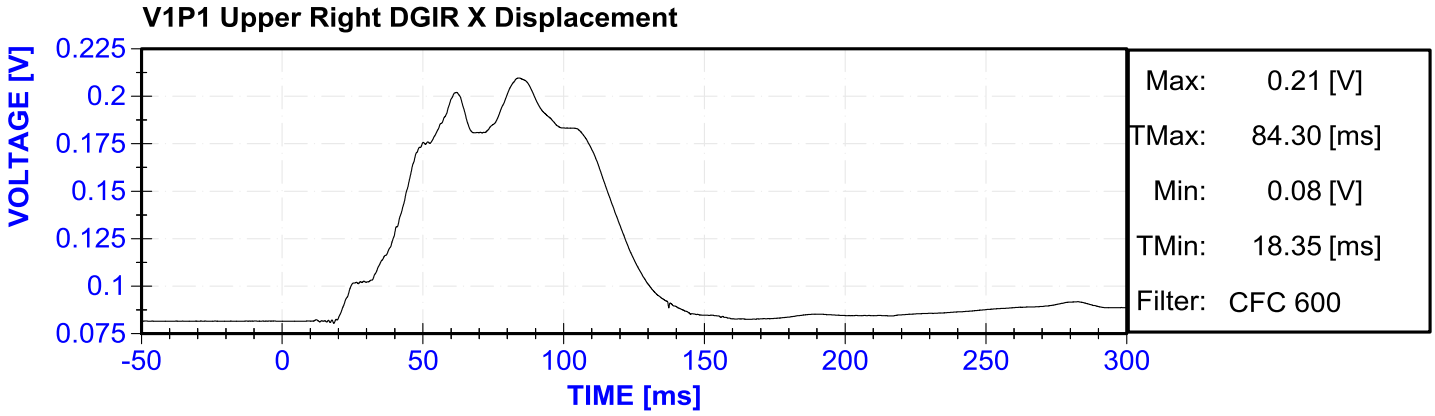


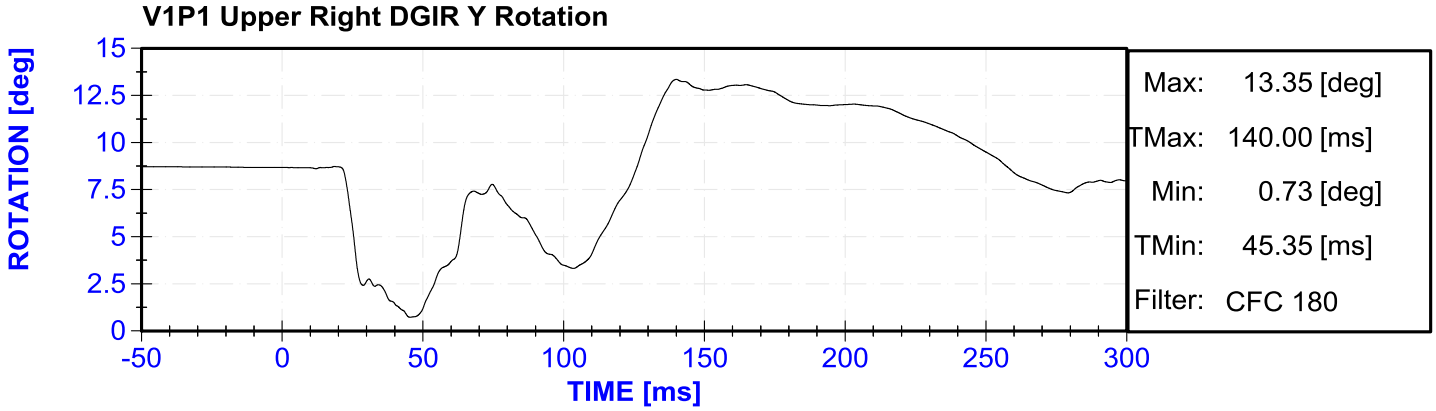
V1P1 Upper Left DGIR Y Rotation

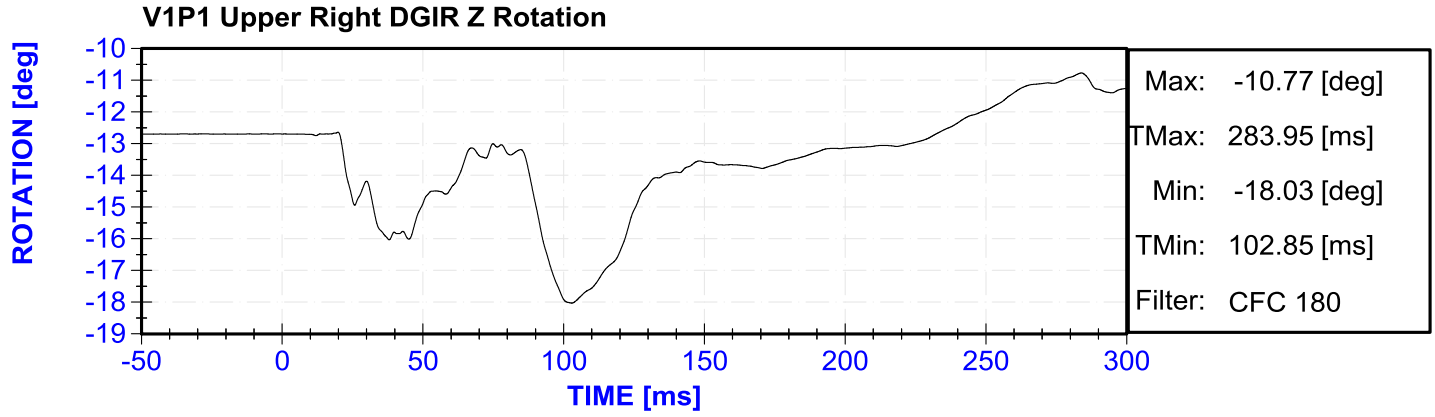


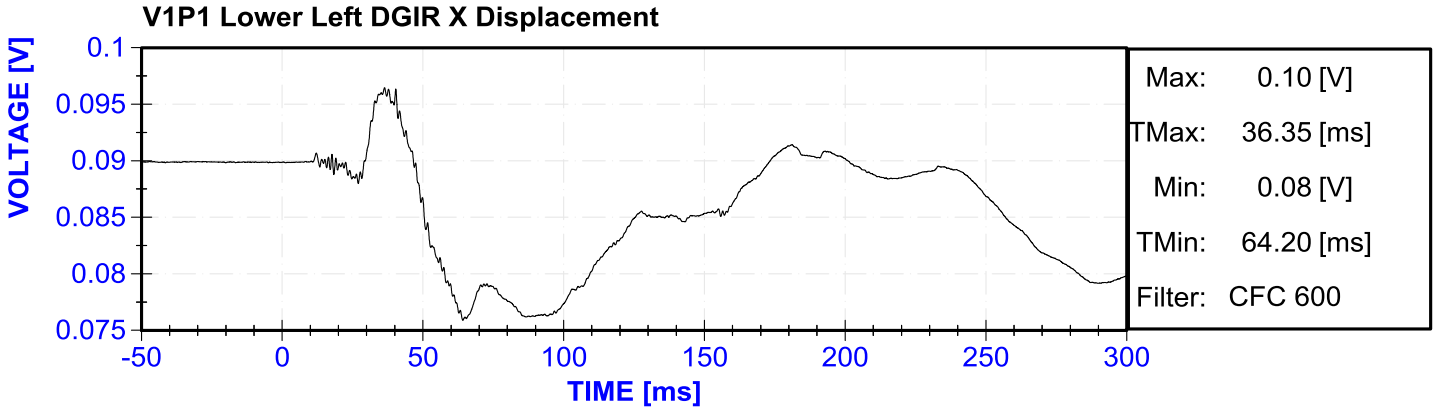
V1P1 Upper Left DGIR Z Rotation

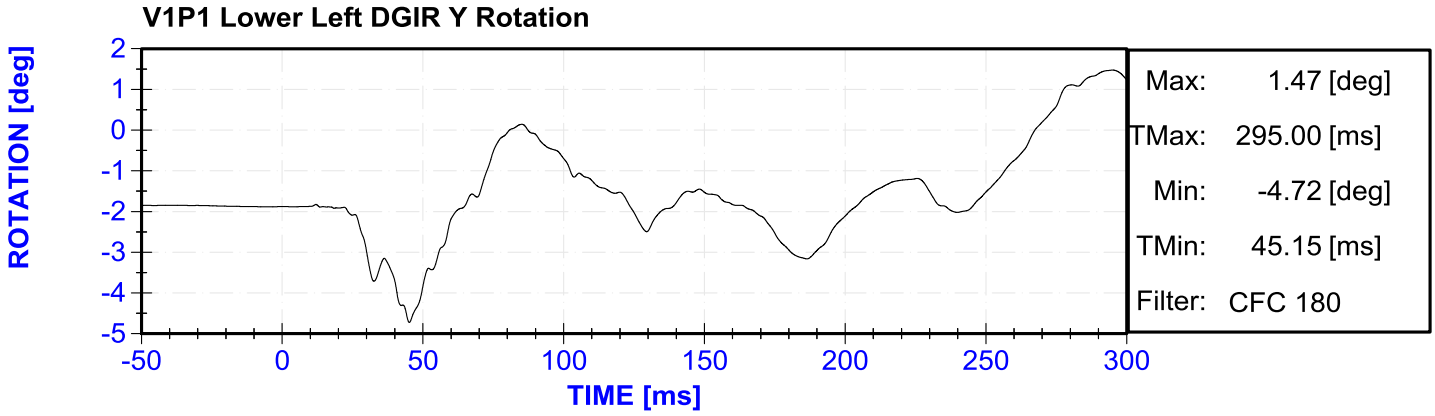


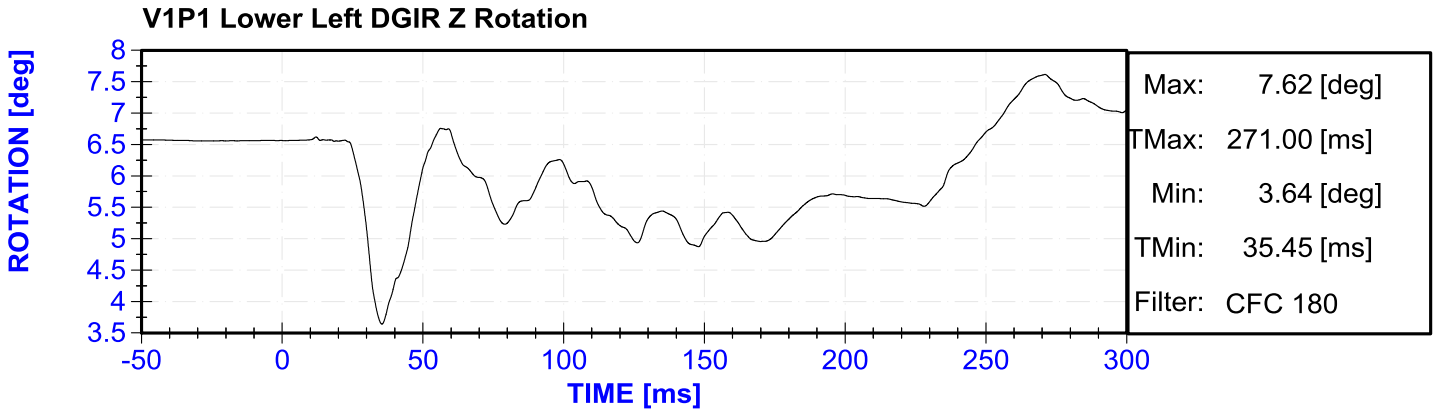

V1P1 Upper Right DGIR X Displacement
VOLTAGE [V]
0.225
0.2
0.175
0.15
0.125
0.1
0.075
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 0.21 [V]
TMax: 84.30 [ms]
Min: 0.08 [V]
TMin: 18.35 [ms]
Filter: CFC 600

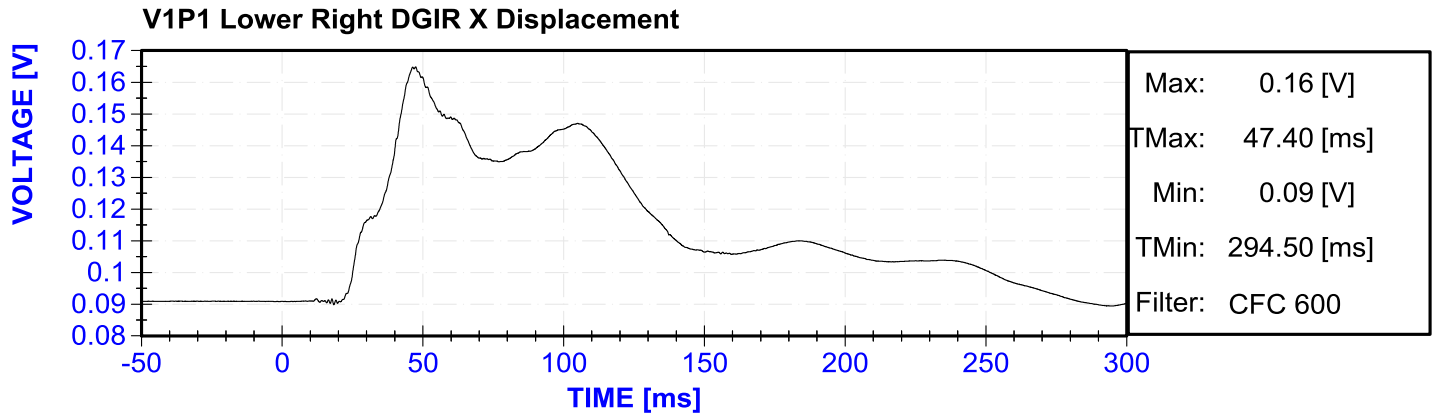

V1P1 Upper Right DGIR Y Rotation
ROTATION [deg]
15
12.5
10
7.5
5
2.5
0
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 13.35 [deg]
TMax: 140.00 [ms]
Min: 0.73 [deg]
TMin: 45.35 [ms]
Filter: CFC 180

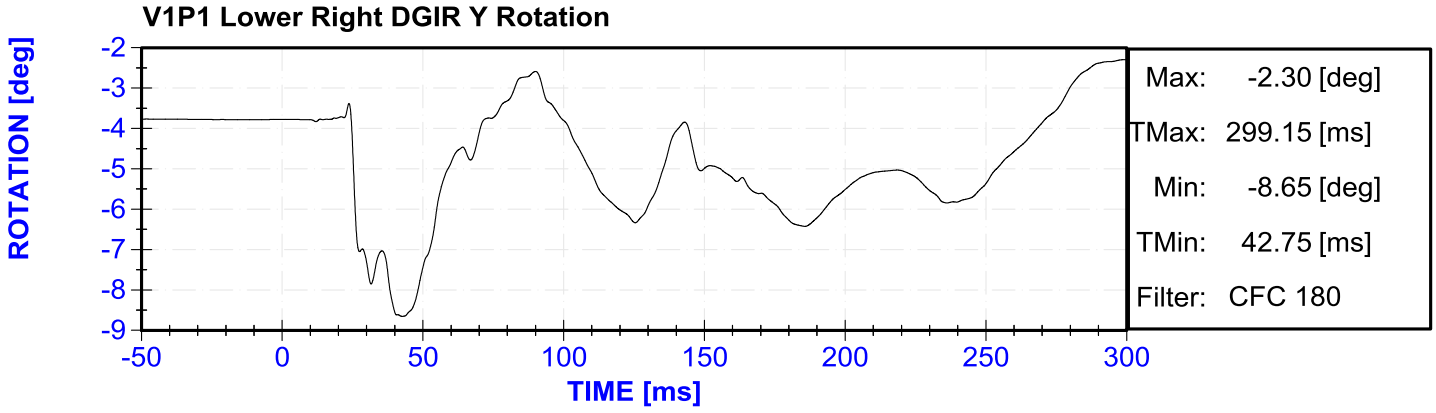

V1P1 Upper Right DGIR Z Rotation
ROTATION [deg]
-10
-11
-12
-13
-14
-15
-16
-17
-18
-19
-50
0
50
100
150
200
250
300
TIME [ms]
Max: -10.77 [deg]
TMax: 283.95 [ms]
Min: -18.03 [deg]
TMin: 102.85 [ms]
Filter: CFC 180

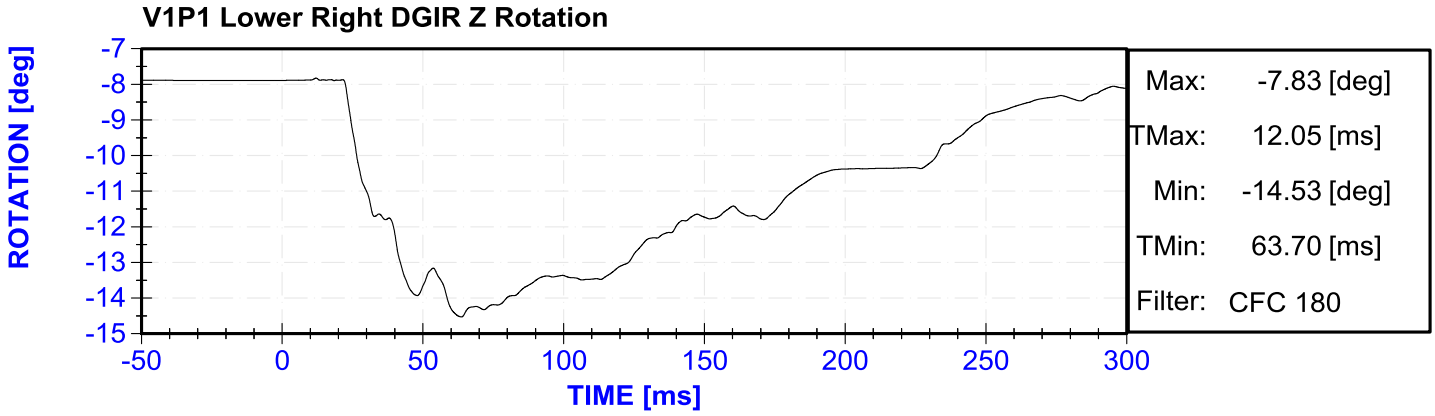

V1P1 Lower Left DGIR X Displacement
VOLTAGE [V]
0.1
0.095
0.09
0.085
0.08
0.075
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 0.10 [V]
TMax: 36.35 [ms]
Min: 0.08 [V]
TMin: 64.20 [ms]
Filter: CFC 600

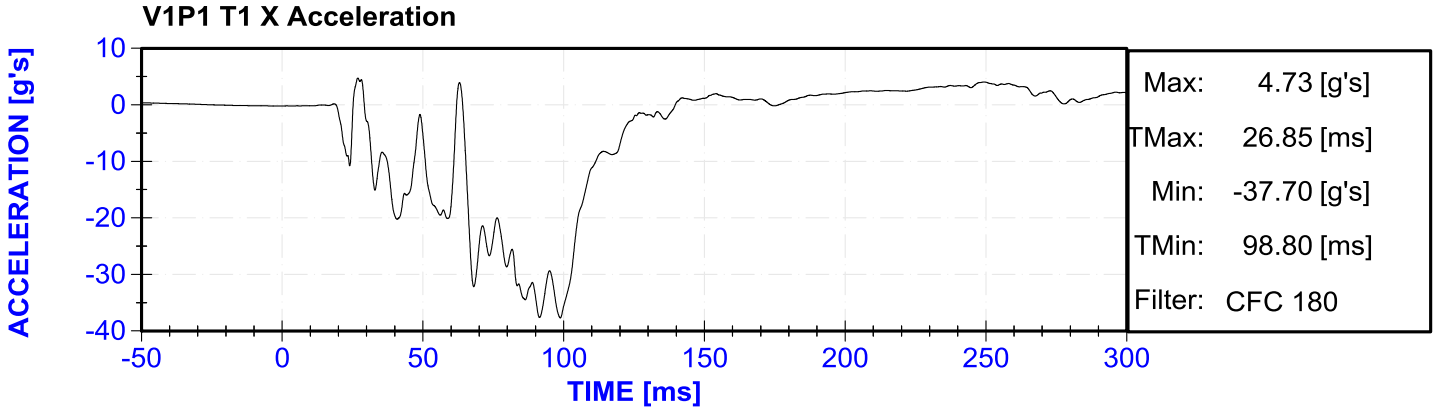

V1P1 Lower Left DGIR Y Rotation
ROTATION [deg]
TIME [ms]
Max: 1.47 [deg]
TMax: 295.00 [ms]
Min: -4.72 [deg]
TMin: 45.15 [ms]
Filter: CFC 180

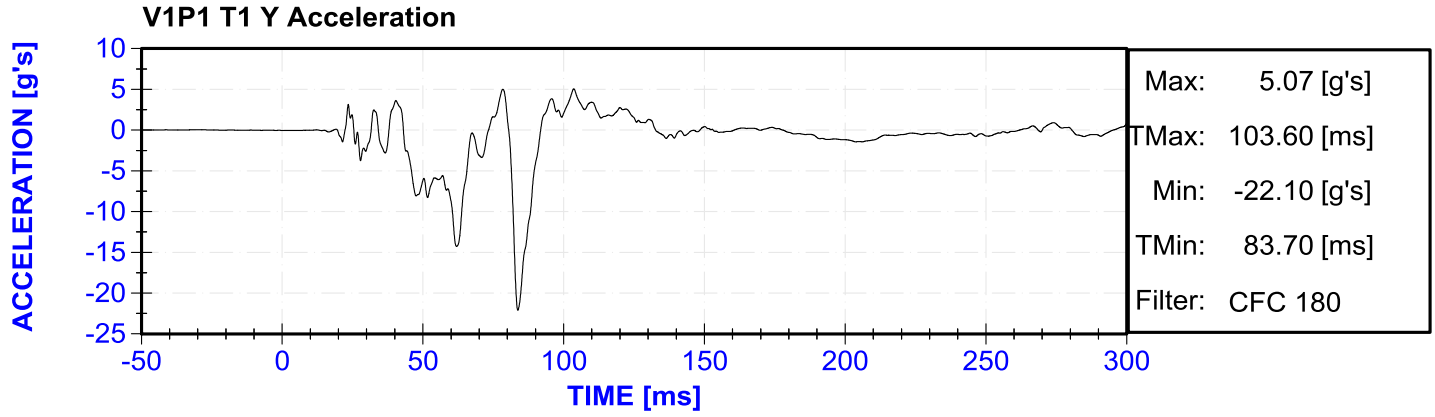

V1P1 Lower Left DGIR Z Rotation
ROTATION [deg]
TIME [ms]
Max: 7.62 [deg]
TMax: 271.00 [ms]
Min: 3.64 [deg]
TMin: 35.45 [ms]
Filter: CFC 180

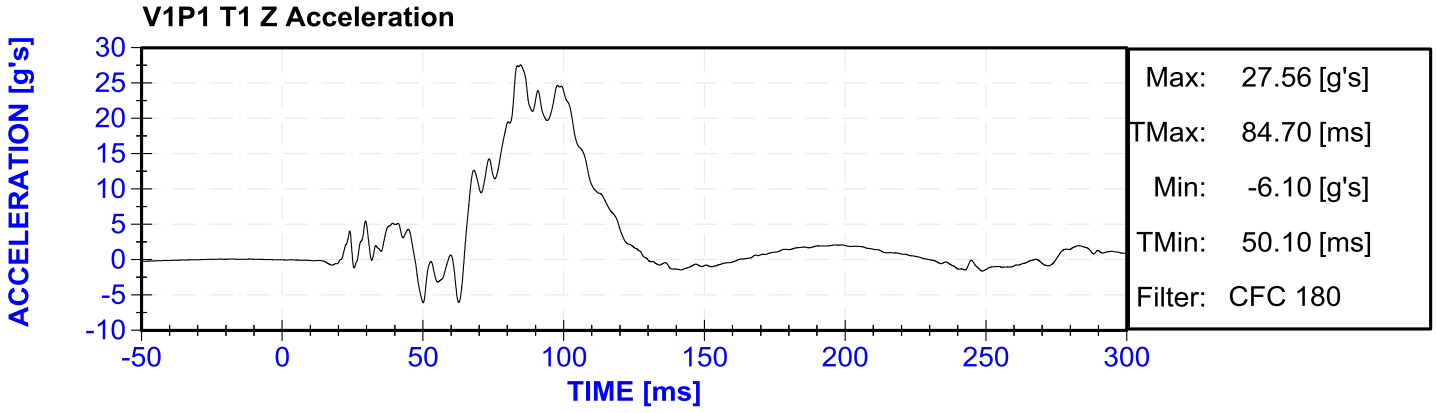

V1P1 Lower Right DGIR X Displacement
VOLTAGE [V]
TIME [ms]
Max: 0.16 [V]
TMax: 47.40 [ms]
Min: 0.09 [V]
TMin: 294.50 [ms]
Filter: CFC 600

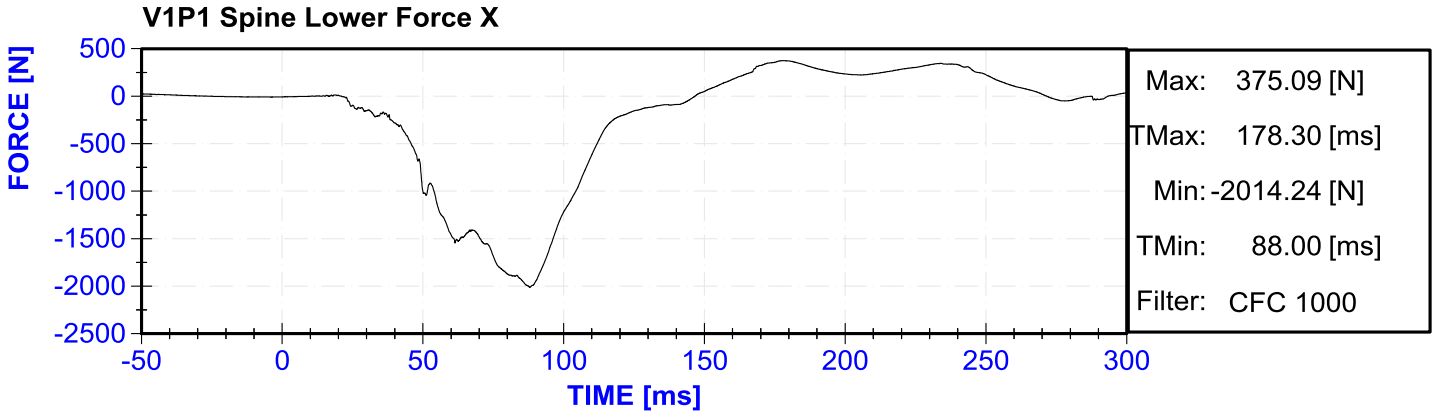

V1P1 Lower Right DGIR Y Rotation
ROTATION [deg]
TIME [ms]
Max: -2.30 [deg]
TMax: 299.15 [ms]
Min: -8.65 [deg]
TMin: 42.75 [ms]
Filter: CFC 180

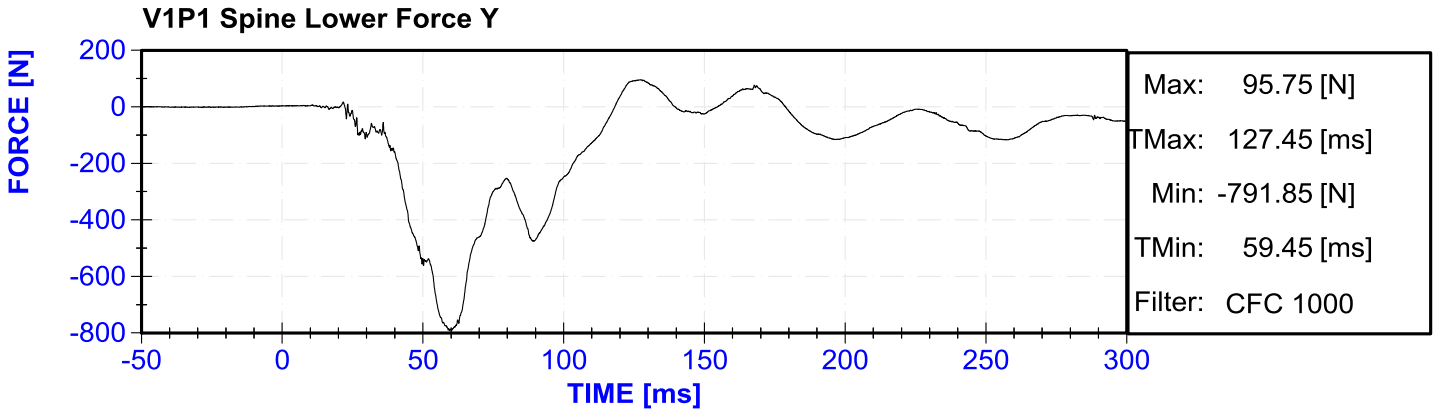

V1P1 Lower Right DGIR Z Rotation
ROTATION [deg]
-7
-8
-9
-10
-11
-12
-13
-14
-15
-50
0
50
100
150
200
250
300
TIME [ms]
Max: -7.83 [deg]
TMax: 12.05 [ms]
Min: -14.53 [deg]
TMin: 63.70 [ms]
Filter: CFC 180

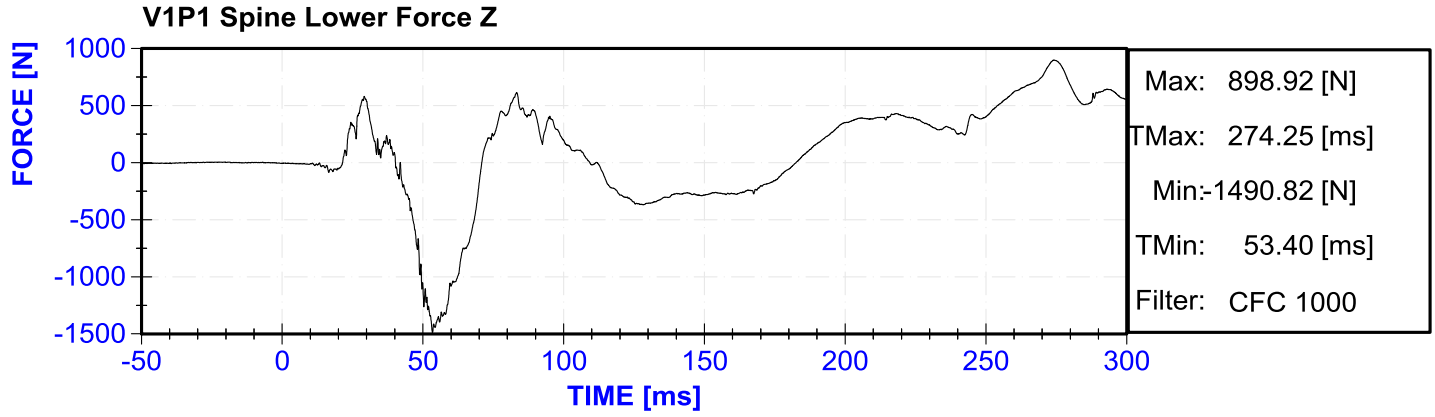

V1P1 T1 X Acceleration
ACCELERATION [g's]
10
0
-10
-20
-30
-40
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 4.73 [g's]
TMax: 26.85 [ms]
Min: -37.70 [g's]
TMin: 98.80 [ms]
Filter: CFC 180

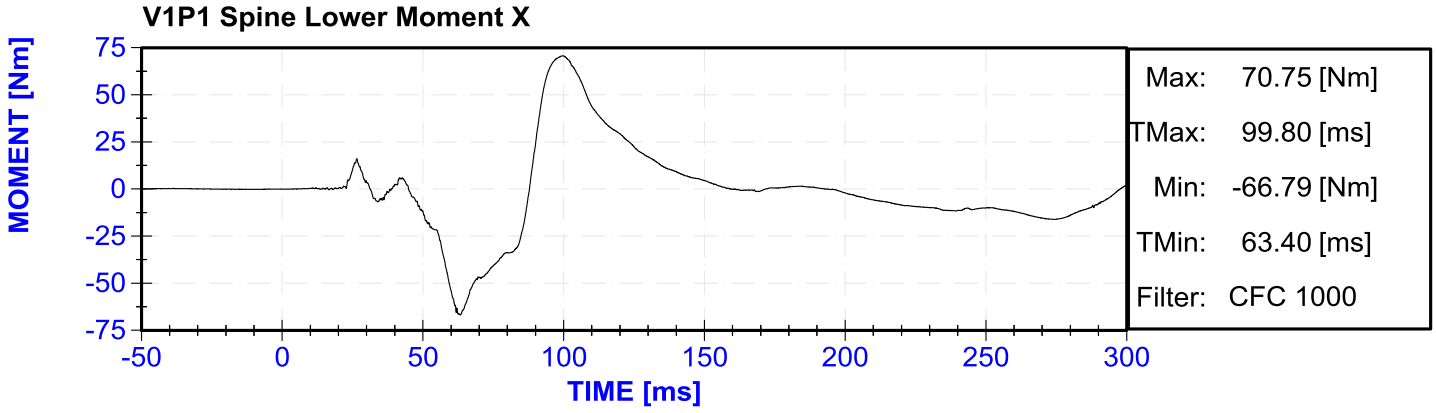

V1P1 T1 Y Acceleration
ACCELERATION [g's]
10
5
0
-5
-10
-15
-20
-25
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 5.07 [g's]
TMax: 103.60 [ms]
Min: -22.10 [g's]
TMin: 83.70 [ms]
Filter: CFC 180


V1P1 T1 Z Acceleration
ACCELERATION [g's]
30
25
20
15
10
5
0
-5
-10
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 27.56 [g's]
TMax: 84.70 [ms]
Min: -6.10 [g's]
TMin: 50.10 [ms]
Filter: CFC 180

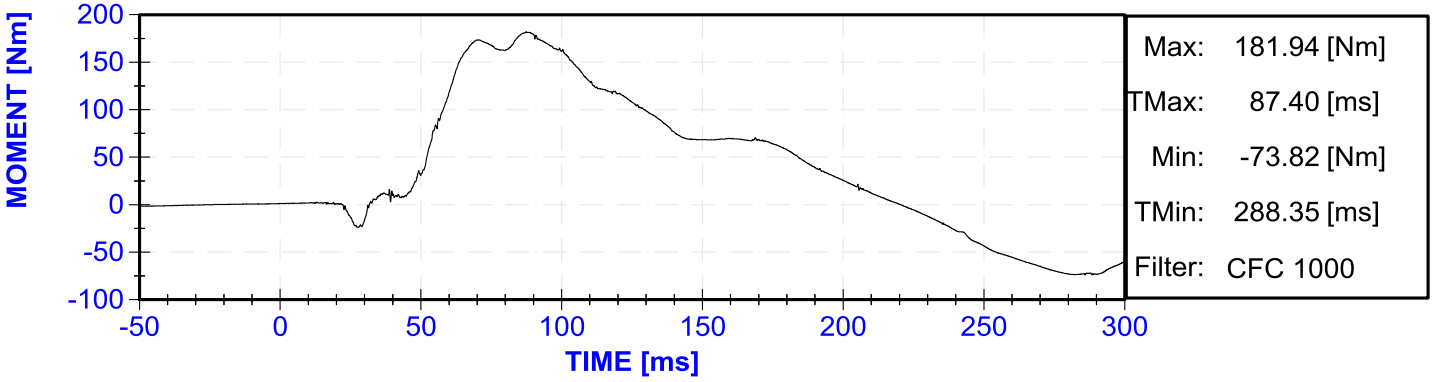

V1P1 Spine Lower Force X
FORCE [N]
500
0
-500
-1000
-1500
-2000
-2500
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 375.09 [N]
TMax: 178.30 [ms]
Min: -2014.24 [N]
TMin: 88.00 [ms]
Filter: CFC 1000


V1P1 Spine Lower Force Y
FORCE [N]
200
0
-200
-400
-600
-800
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 95.75 [N]
TMax: 127.45 [ms]
Min: -791.85 [N]
TMin: 59.45 [ms]
Filter: CFC 1000

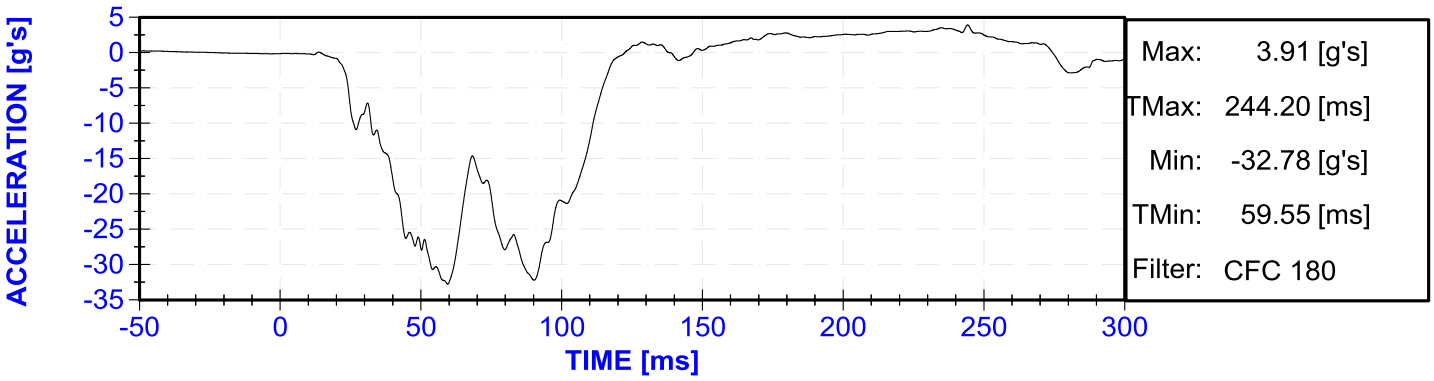

V1P1 Spine Lower Force Z
FORCE [N]
1000
500
0
-500
-1000
-1500
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 898.92 [N]
TMax: 274.25 [ms]
Min: -1490.82 [N]
TMin: 53.40 [ms]
Filter: CFC 1000


V1P1 Spine Lower Moment X
MOMENT [Nm]
75
50
25
0
-25
-50
-75
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 70.75 [Nm]
TMax: 99.80 [ms]
Min: -66.79 [Nm]
TMin: 63.40 [ms]
Filter: CFC 1000

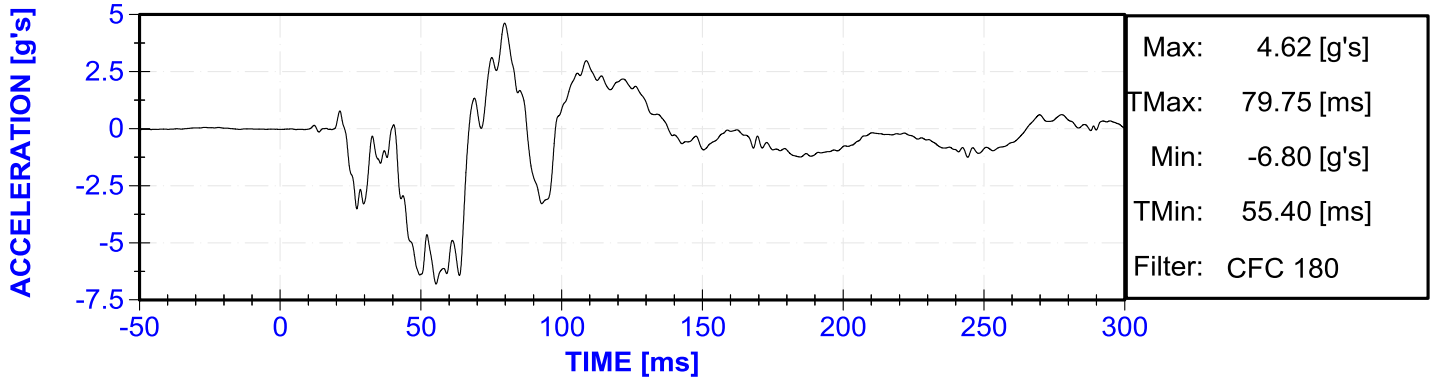
V1P1 Spine Lower Moment Y



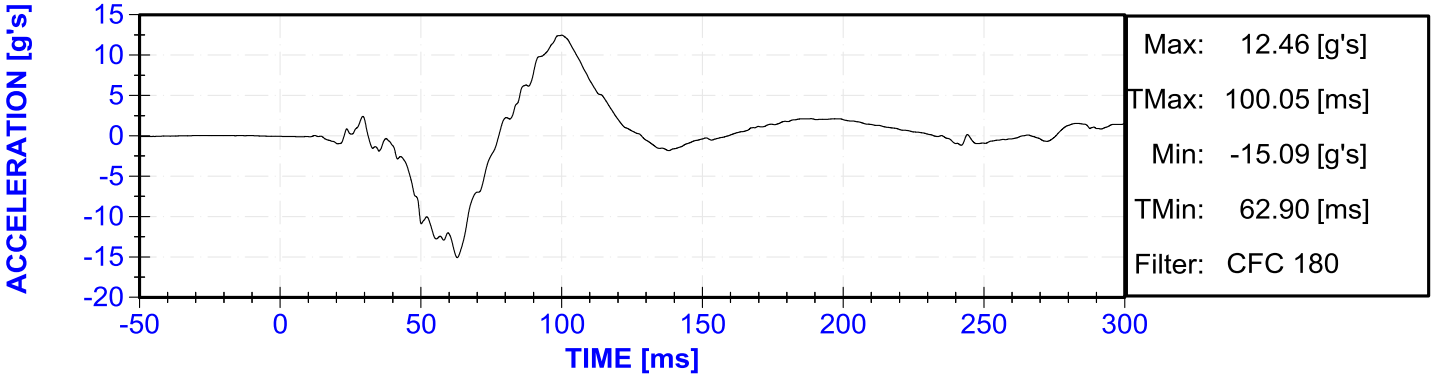
V1P1 T6 X Acceleration



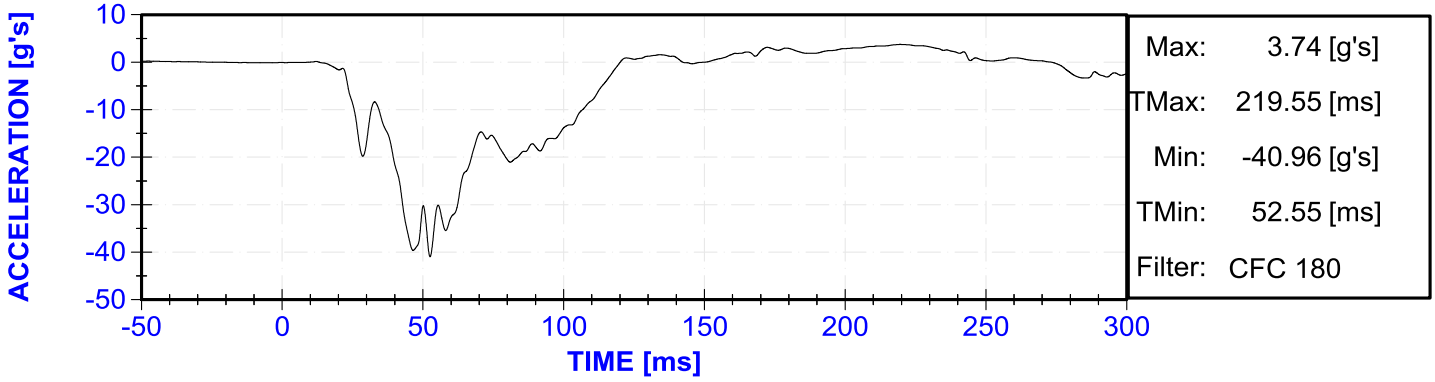
V1P1 T6 Y Acceleration



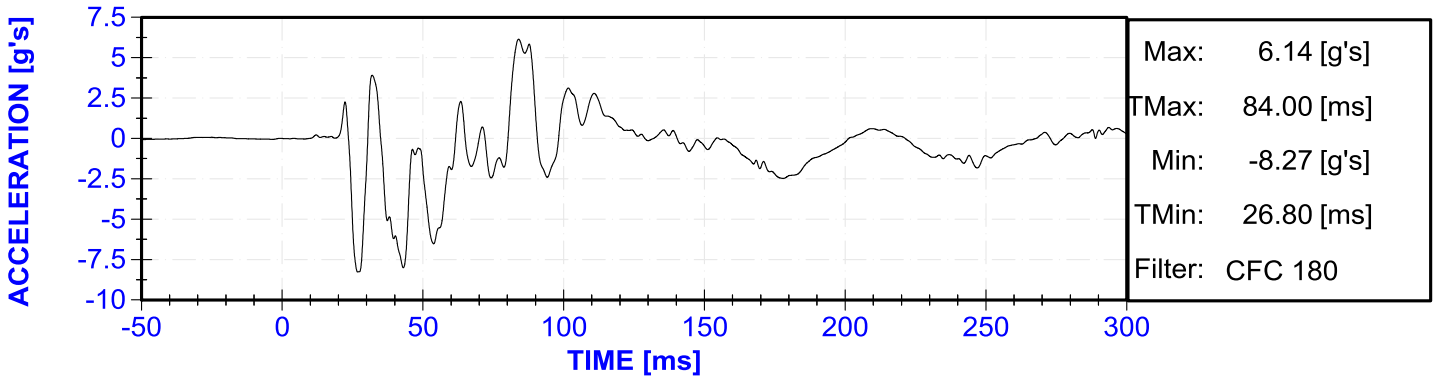
V1P1 T6 Z Acceleration



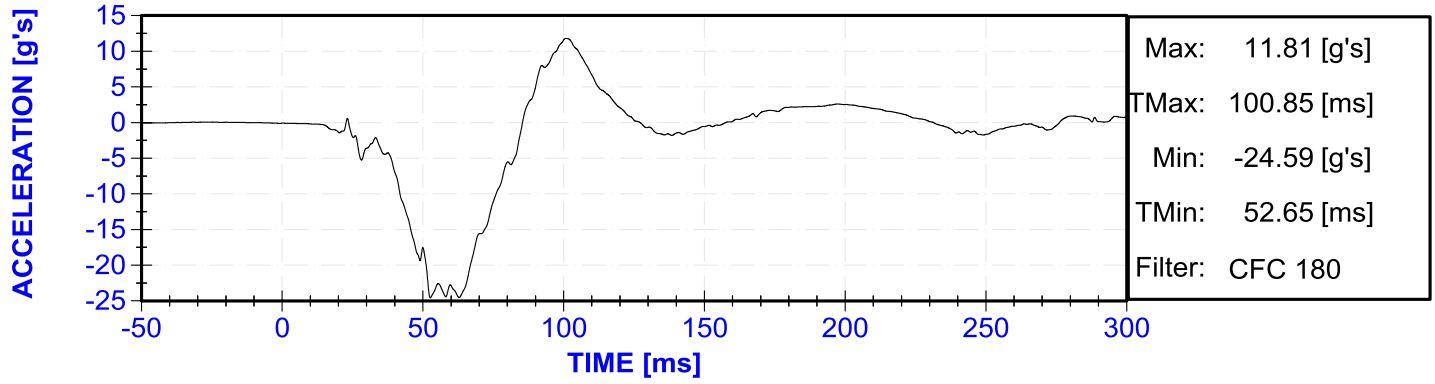
V1P1 T12 X Acceleration



V1P1 T12 Y Acceleration

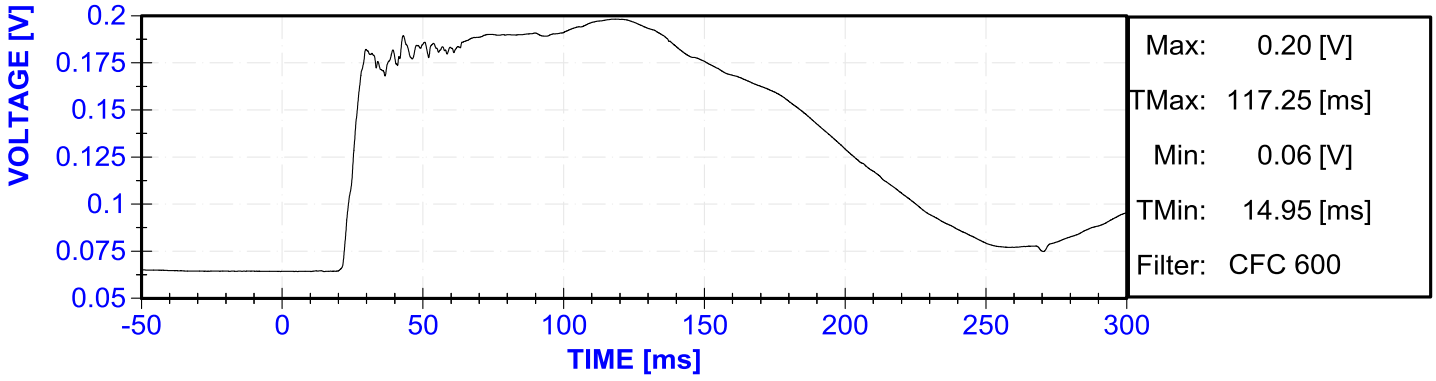


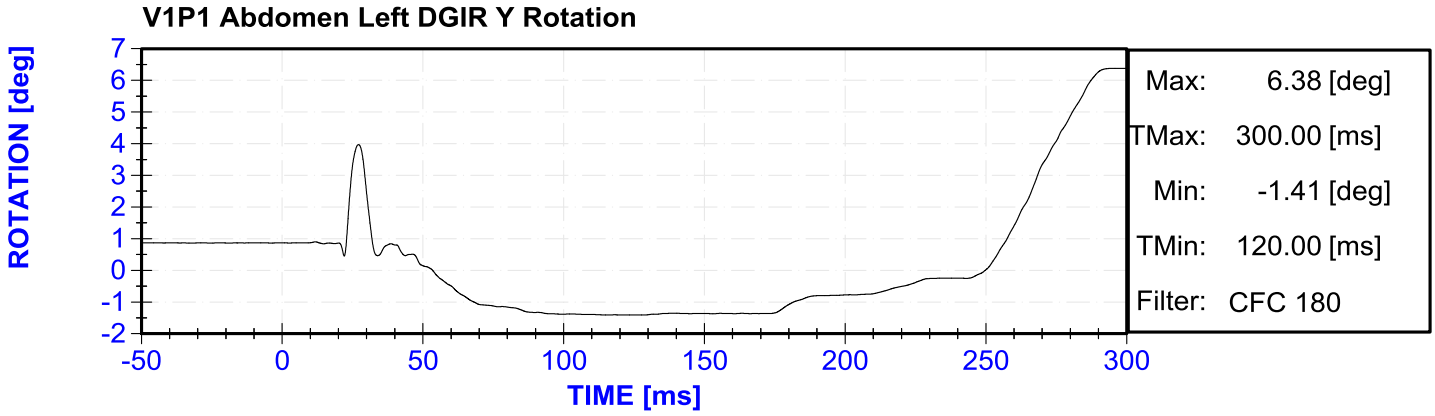
V1P1 T12 Z Acceleration

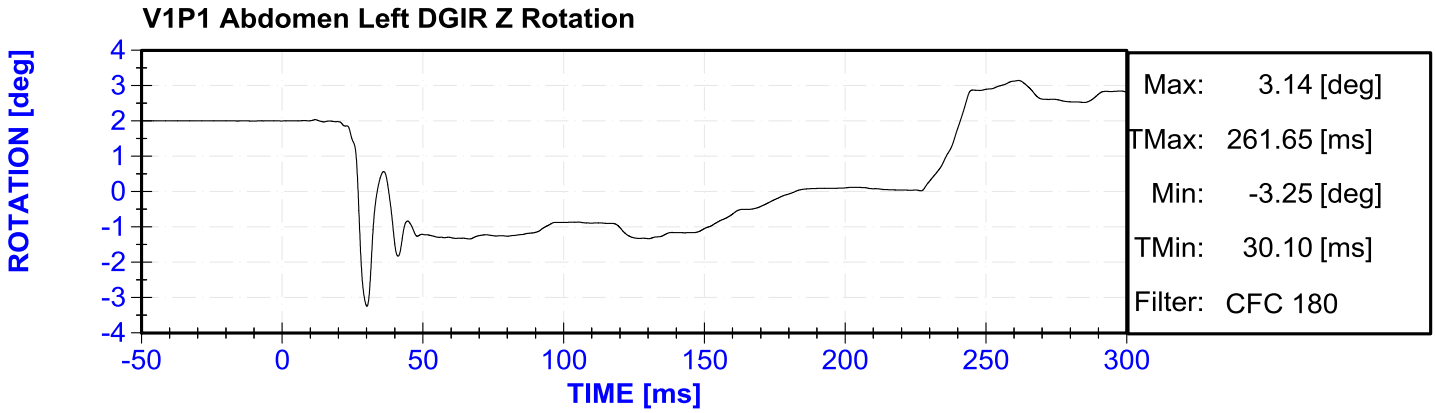


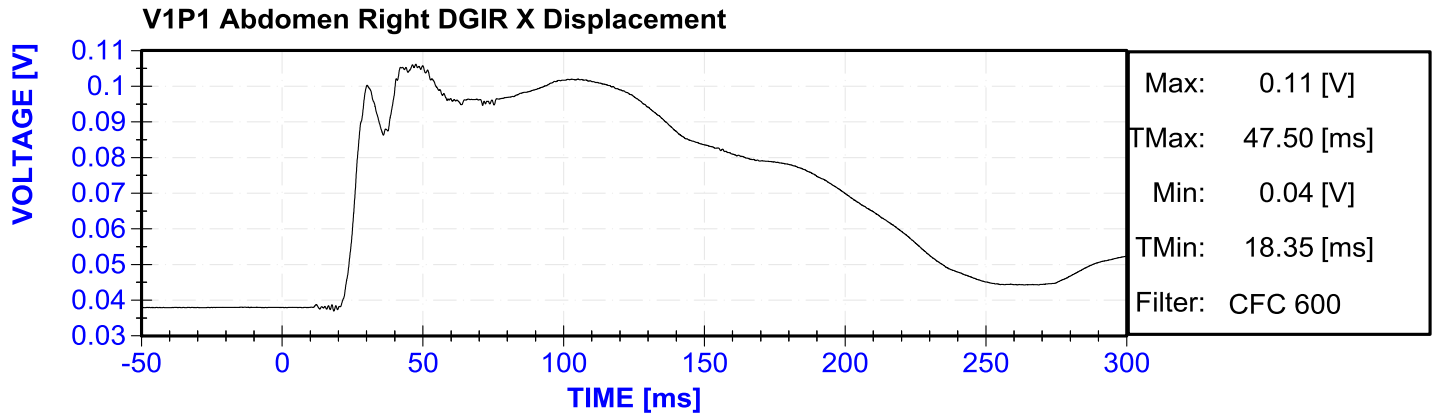
V1P1 Abdomen Left DGIR X Displacement

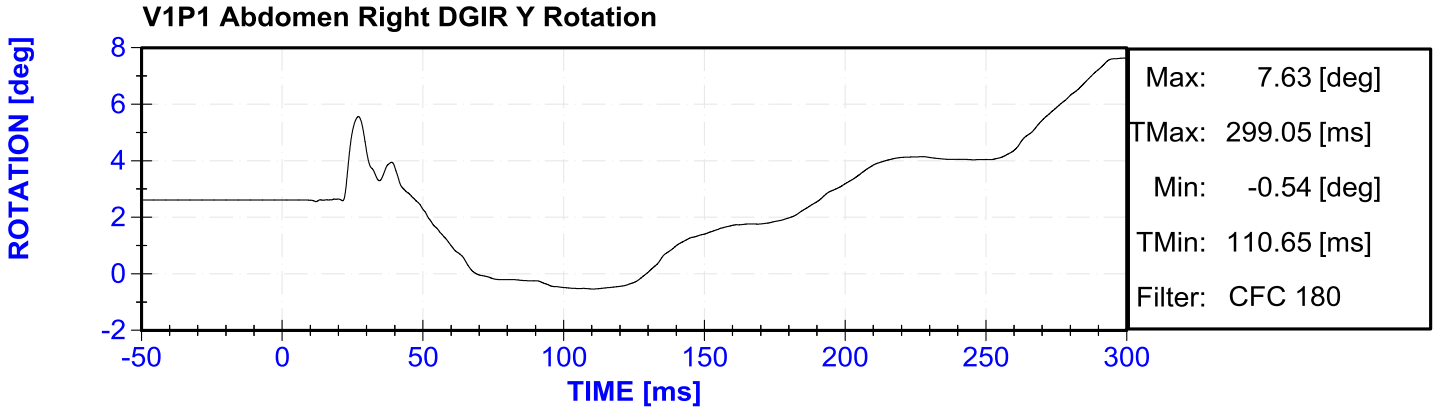
Questionable Data: Bad Calibration



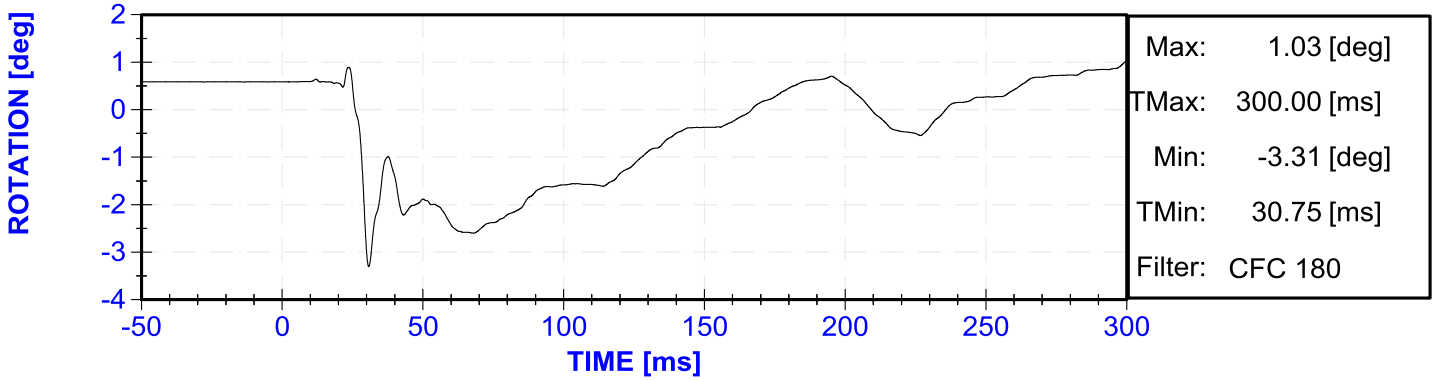

V1P1 Abdomen Left DGIR Y Rotation
ROTATION [deg]
TIME [ms]
Max: 6.38 [deg]
TMax: 300.00 [ms]
Min: -1.41 [deg]
TMin: 120.00 [ms]
Filter: CFC 180


V1P1 Abdomen Left DGIR Z Rotation
ROTATION [deg]
TIME [ms]
Max: 3.14 [deg]
TMax: 261.65 [ms]
Min: -3.25 [deg]
TMin: 30.10 [ms]
Filter: CFC 180

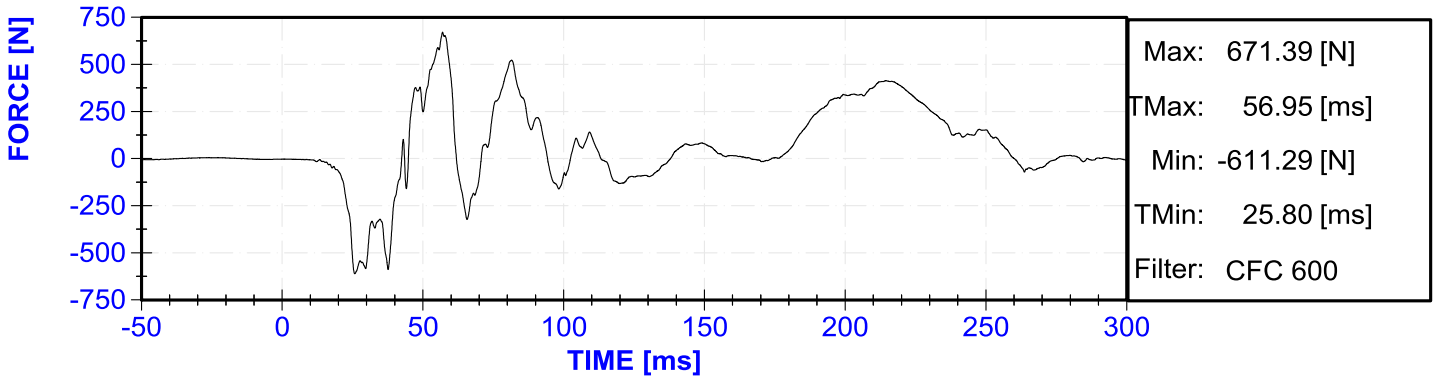

V1P1 Abdomen Right DGIR X Displacement
VOLTAGE [V]
TIME [ms]
Max: 0.11 [V]
TMax: 47.50 [ms]
Min: 0.04 [V]
TMin: 18.35 [ms]
Filter: CFC 600


V1P1 Abdomen Right DGIR Y Rotation
ROTATION [deg]
TIME [ms]
Max: 7.63 [deg]
TMax: 299.05 [ms]
Min: -0.54 [deg]
TMin: 110.65 [ms]
Filter: CFC 180

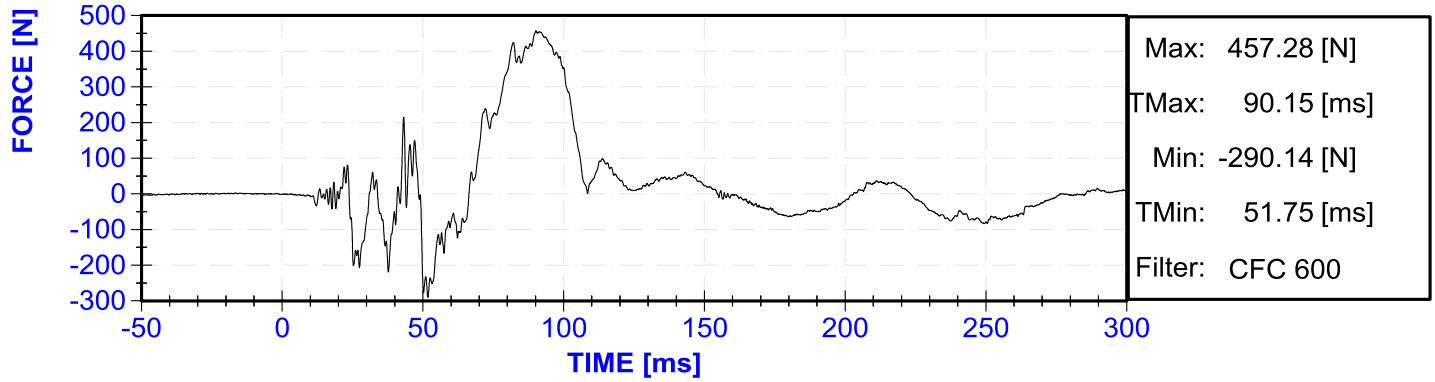
V1P1 Abdomen Right DGIR Z Rotation



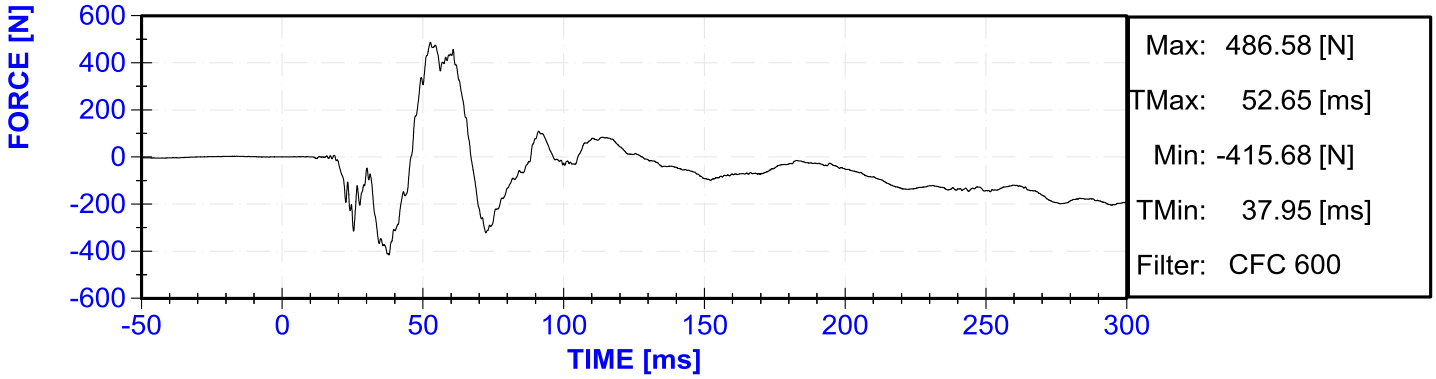
V1P1 Pelvis Acetabulum Left X Force

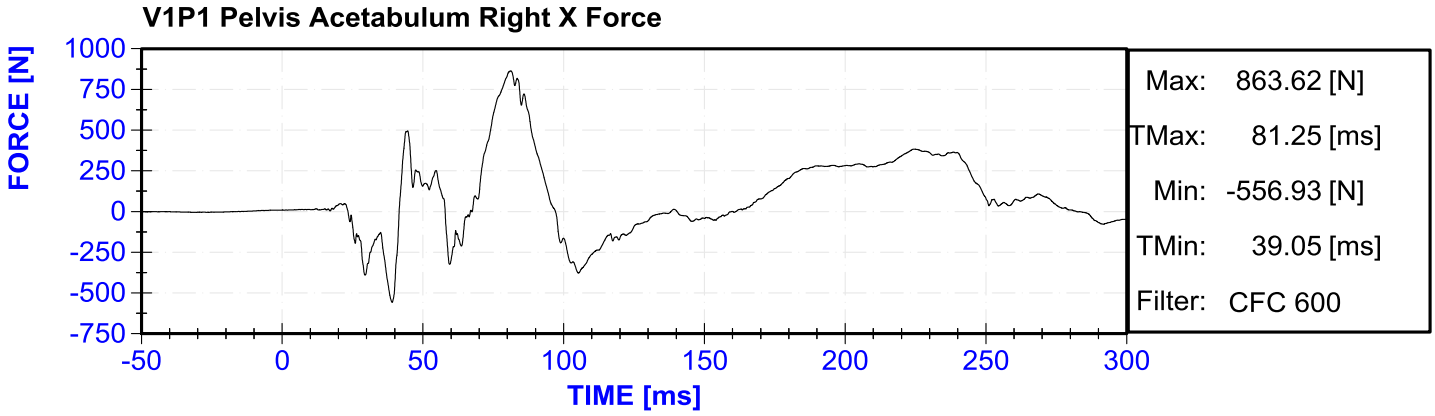


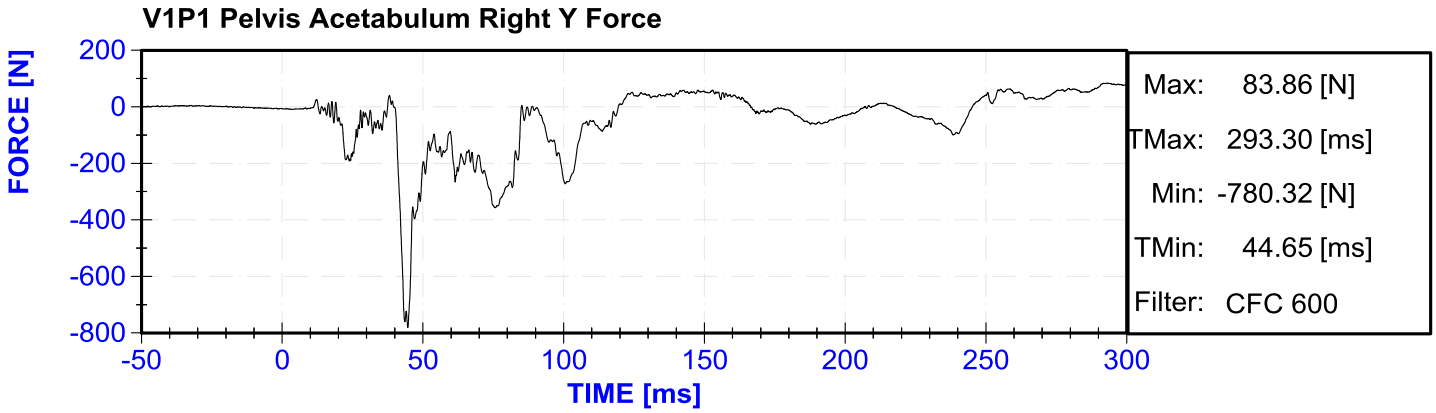
V1P1 Pelvis Acetabulum Left Y Force

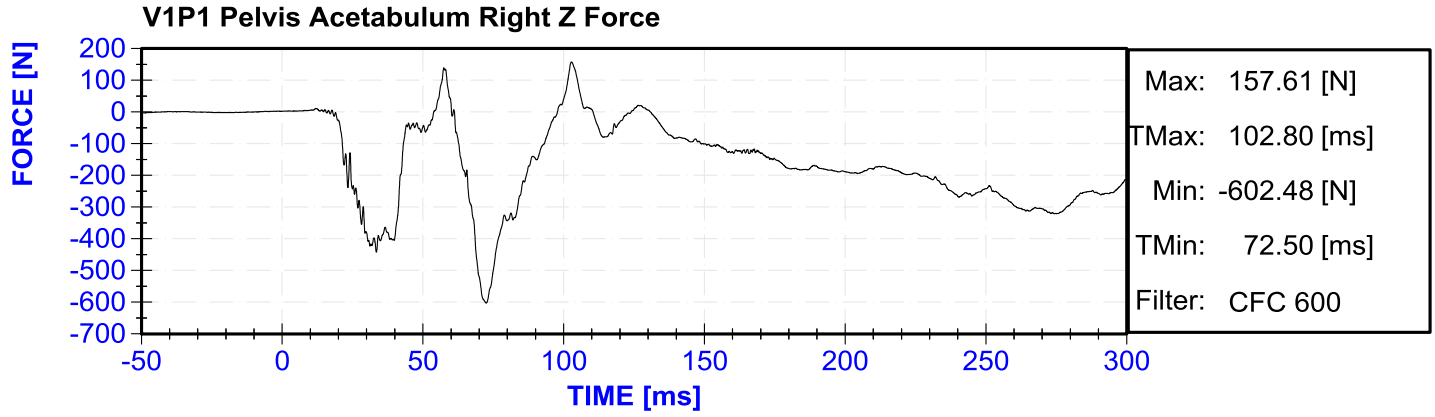


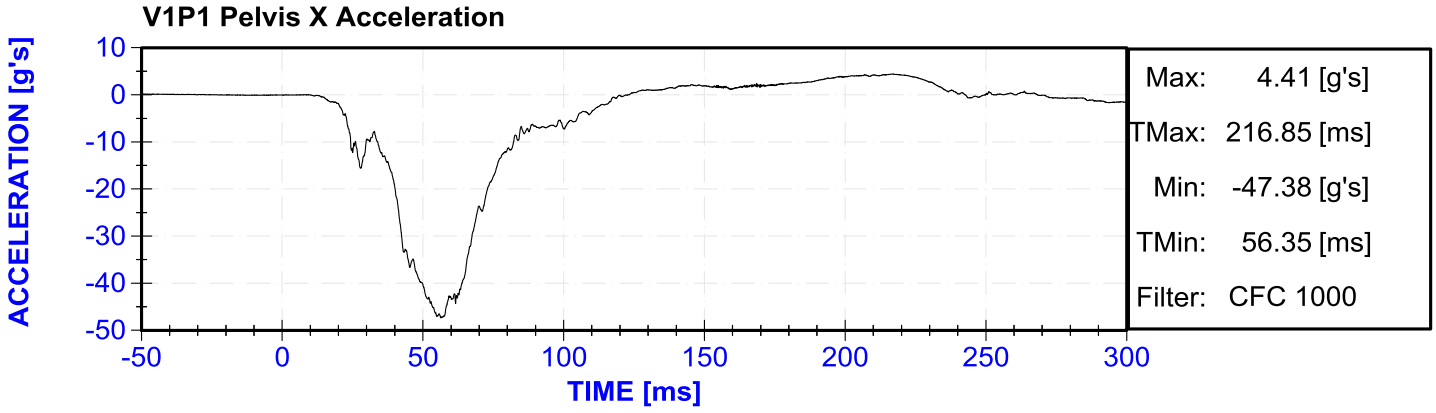
V1P1 Pelvis Acetabulum Left Z Force

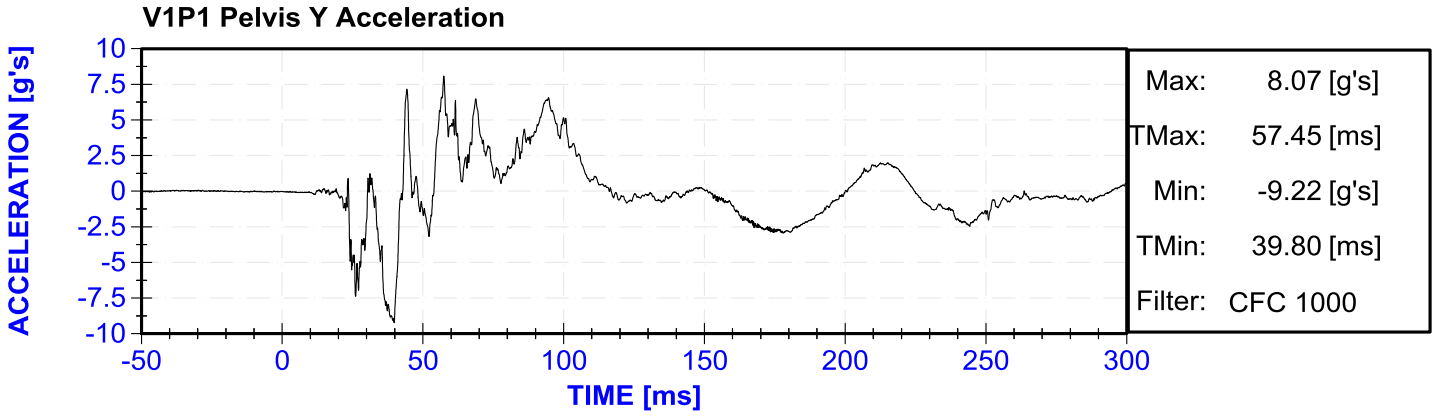


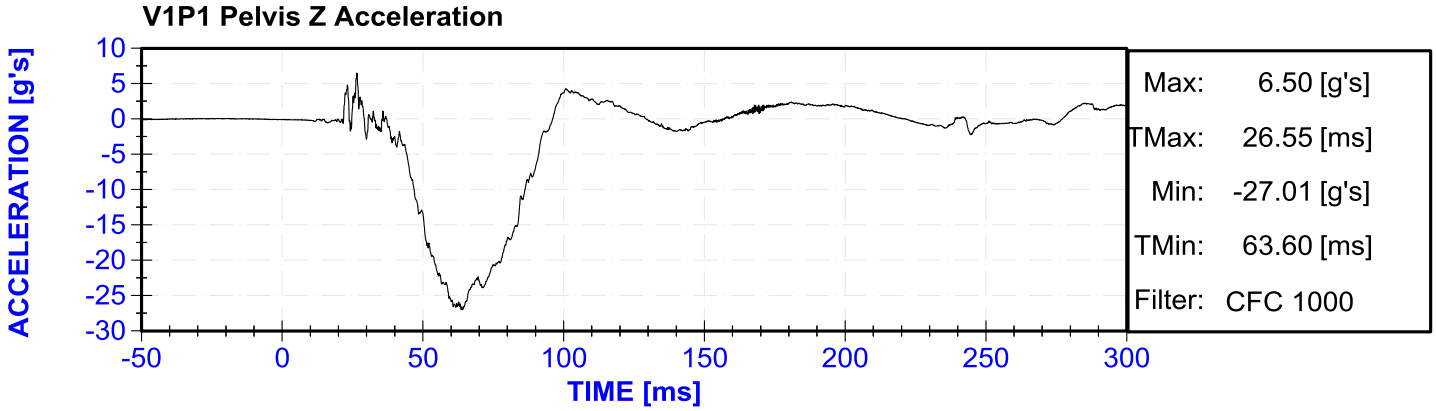

V1P1 Pelvis Acetabulum Right X Force
FORCE [N]
1000
750
500
250
0
-250
-500
-750
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 863.62 [N]
TMax: 81.25 [ms]
Min: -556.93 [N]
TMin: 39.05 [ms]
Filter: CFC 600

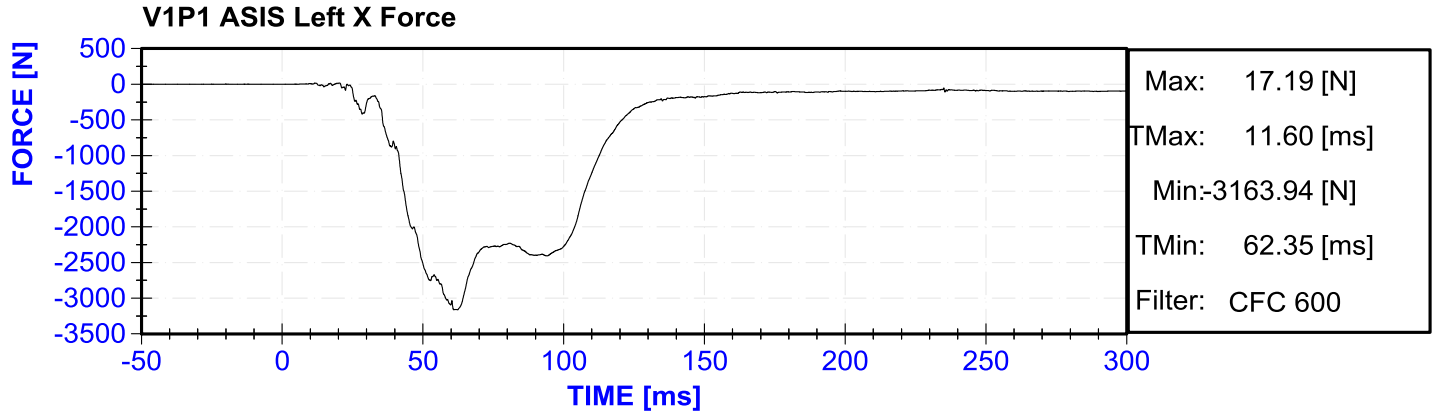

V1P1 Pelvis Acetabulum Right Y Force
FORCE [N]
200
0
-200
-400
-600
-800
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 83.86 [N]
TMax: 293.30 [ms]
Min: -780.32 [N]
TMin: 44.65 [ms]
Filter: CFC 600

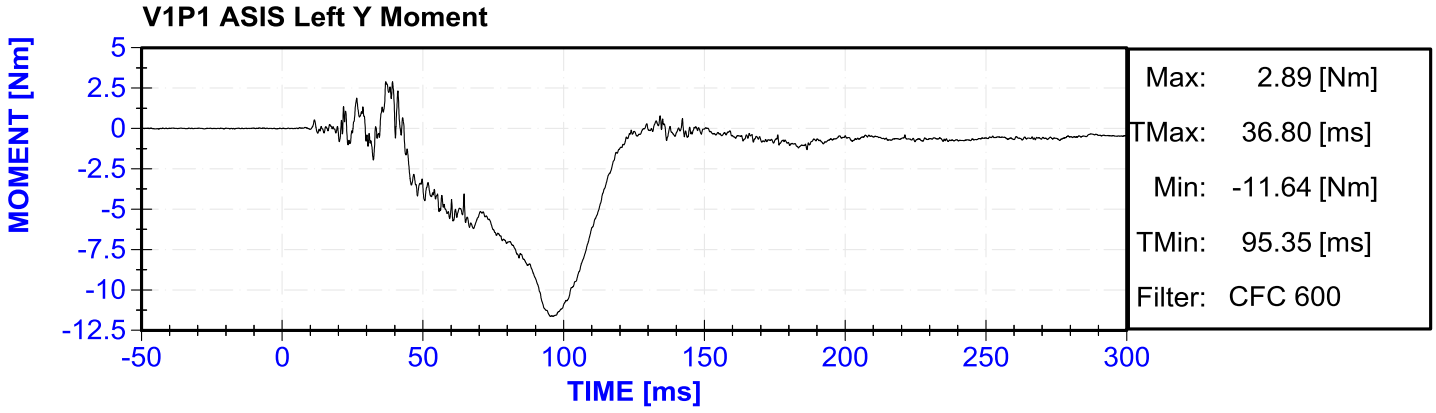

V1P1 Pelvis Acetabulum Right Z Force
FORCE [N]
200
100
0
-100
-200
-300
-400
-500
-600
-700
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 157.61 [N]
TMax: 102.80 [ms]
Min: -602.48 [N]
TMin: 72.50 [ms]
Filter: CFC 600


V1P1 Pelvis X Acceleration
ACCELERATION [g's]
10
0
-10
-20
-30
-40
-50
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 4.41 [g's]
TMax: 216.85 [ms]
Min: -47.38 [g's]
TMin: 56.35 [ms]
Filter: CFC 1000

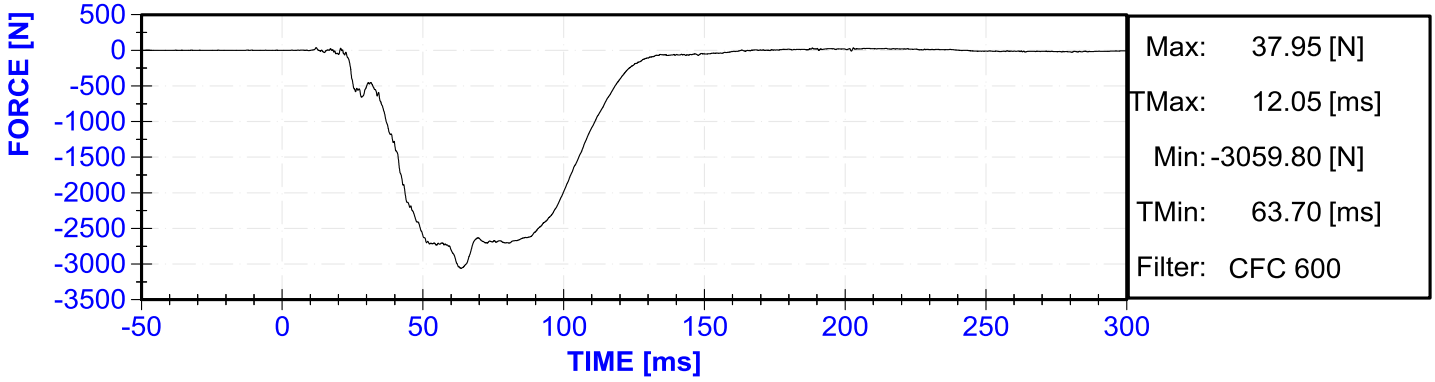

V1P1 Pelvis Y Acceleration
ACCELERATION [g's]
10
7.5
5
2.5
0
-2.5
-5
-7.5
-10
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 8.07 [g's]
TMax: 57.45 [ms]
Min: -9.22 [g's]
TMin: 39.80 [ms]
Filter: CFC 1000


V1P1 Pelvis Z Acceleration
ACCELERATION [g's]
10
5
0
-5
-10
-15
-20
-25
-30
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 6.50 [g's]
TMax: 26.55 [ms]
Min: -27.01 [g's]
TMin: 63.60 [ms]
Filter: CFC 1000

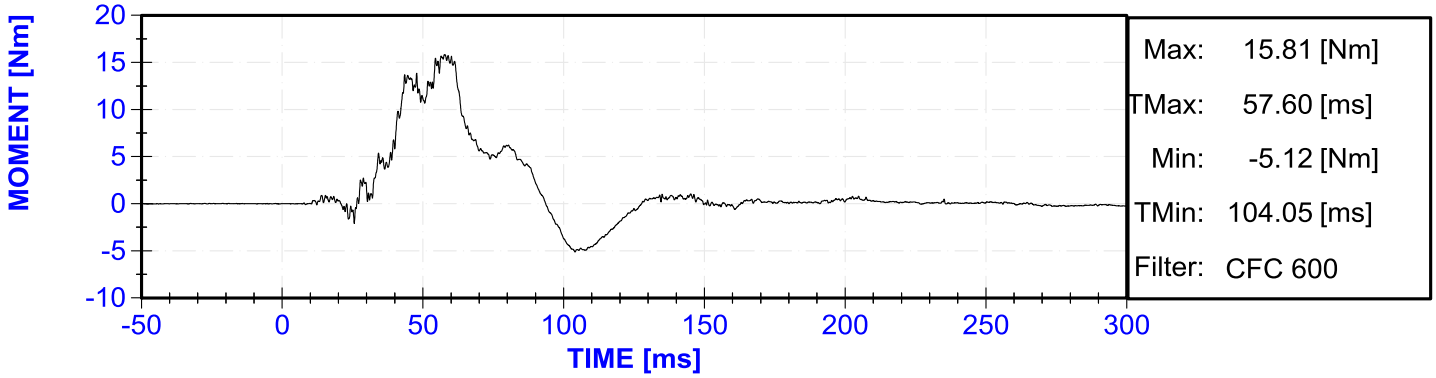

V1P1 ASIS Left X Force
FORCE [N]
500
0
-500
-1000
-1500
-2000
-2500
-3000
-3500
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 17.19 [N]
TMax: 11.60 [ms]
Min:-3163.94 [N]
TMin: 62.35 [ms]
Filter: CFC 600


V1P1 ASIS Left Y Moment
MOMENT [Nm]
5
2.5
0
-2.5
-5
-7.5
-10
-12.5
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 2.89 [Nm]
TMax: 36.80 [ms]
Min: -11.64 [Nm]
TMin: 95.35 [ms]
Filter: CFC 600

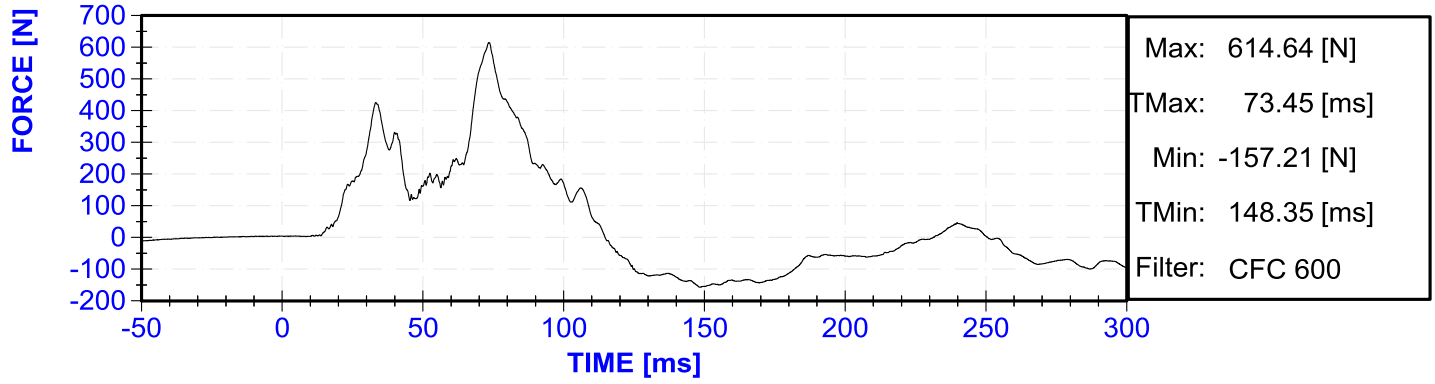
V1P1 ASIS Right X Force



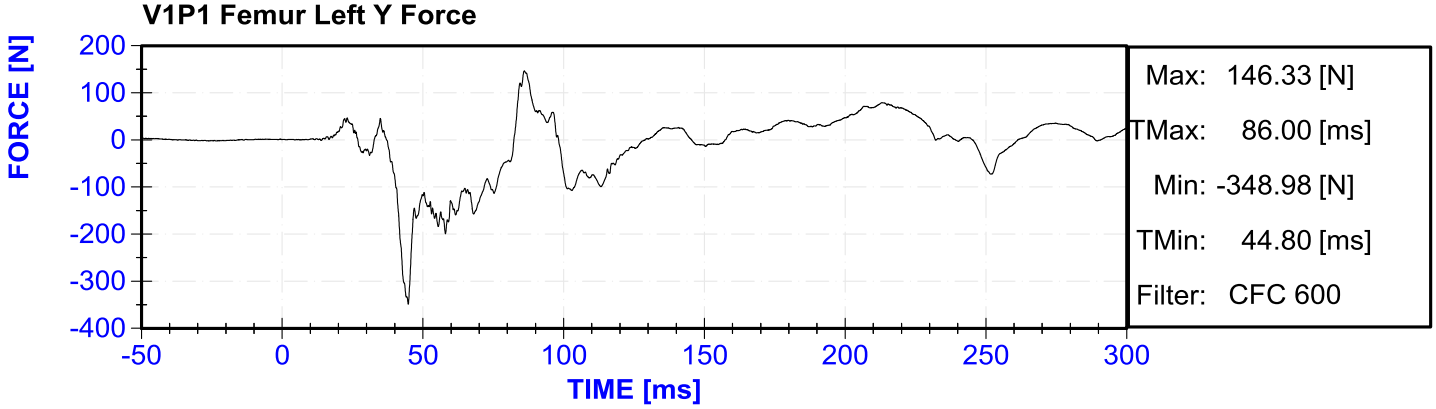
V1P1 ASIS Right Y Moment

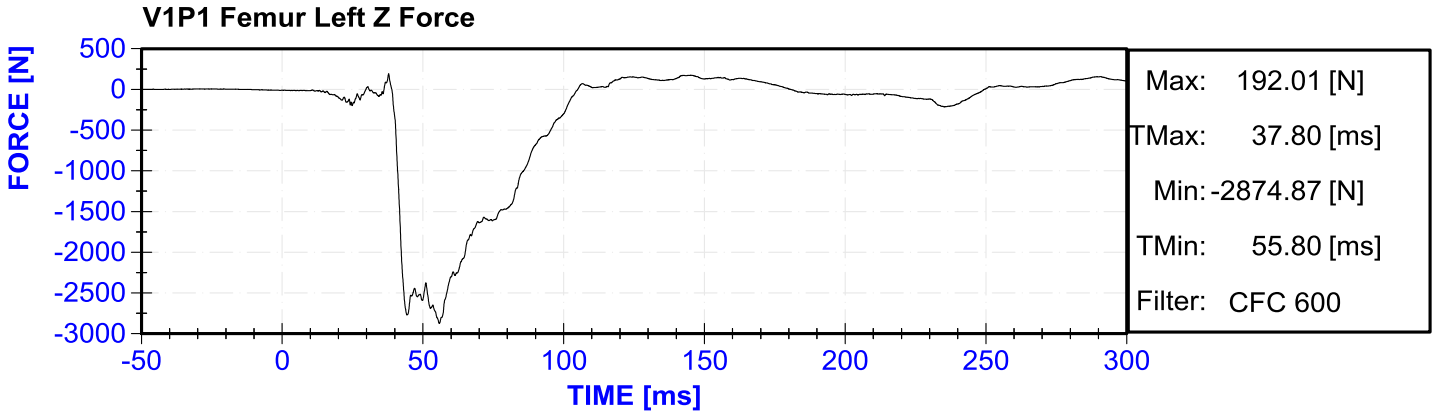


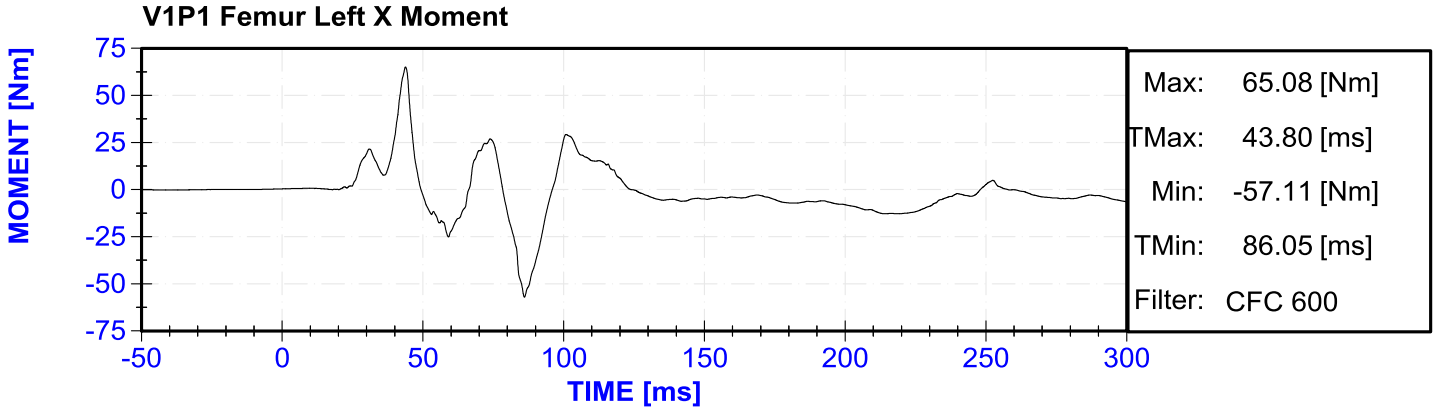
V1P1 Femur Left X Force

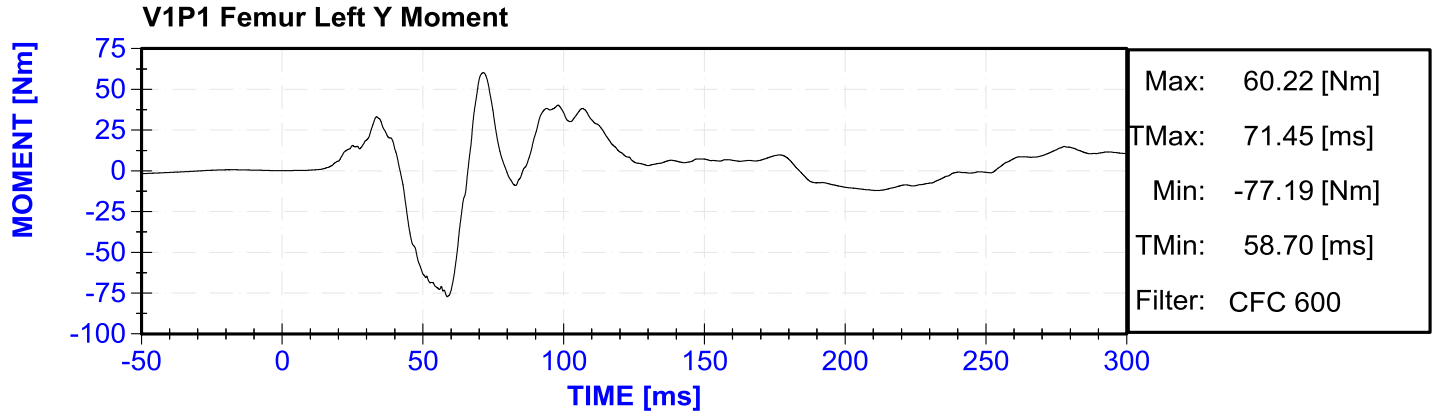


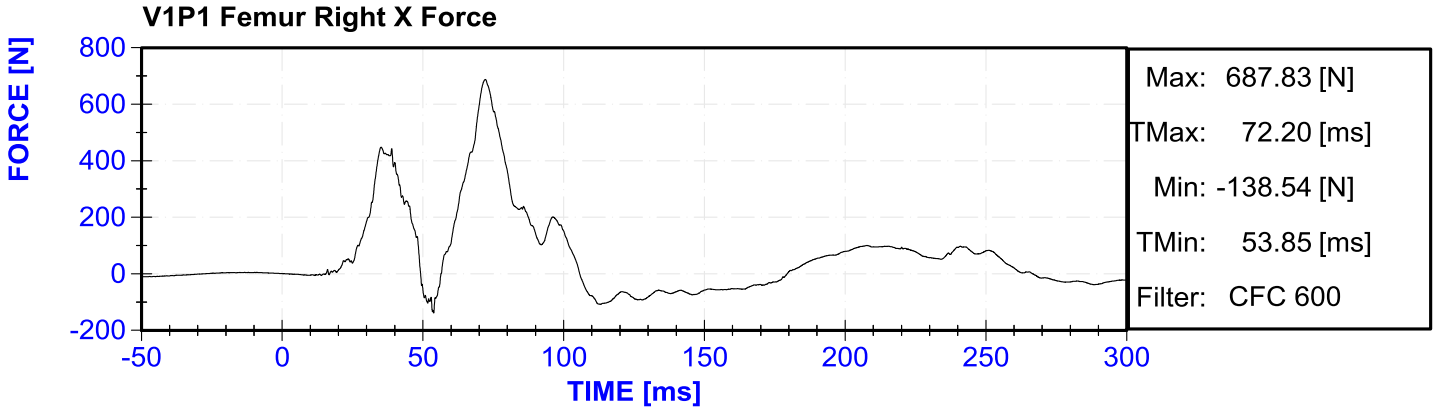
V1P1 Femur Left Y Force



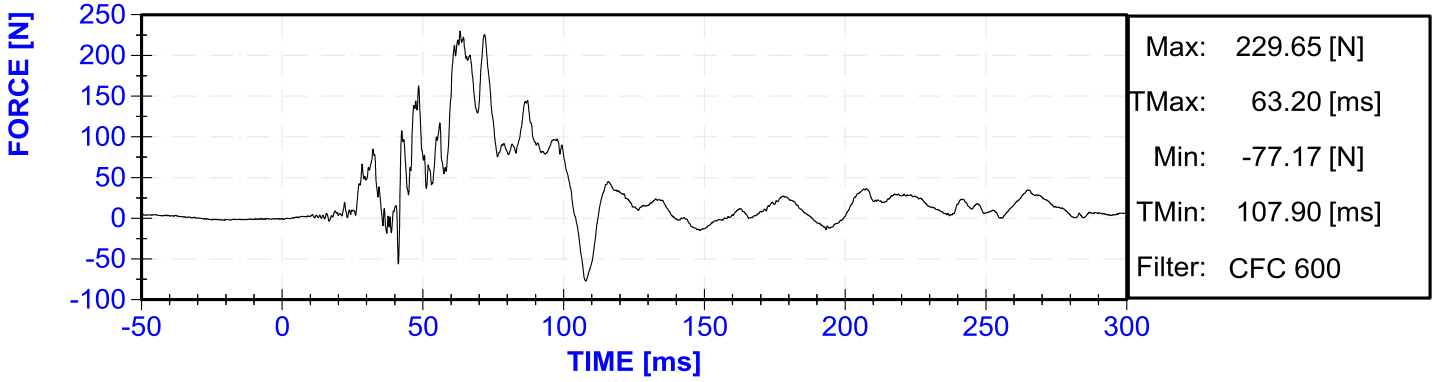

V1P1 Femur Left Z Force
FORCE [N]
500
0
-500
-1000
-1500
-2000
-2500
-3000
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 192.01 [N]
TMax: 37.80 [ms]
Min: -2874.87 [N]
TMin: 55.80 [ms]
Filter: CFC 600


V1P1 Femur Left X Moment
MOMENT [Nm]
75
50
25
0
-25
-50
-75
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 65.08 [Nm]
TMax: 43.80 [ms]
Min: -57.11 [Nm]
TMin: 86.05 [ms]
Filter: CFC 600

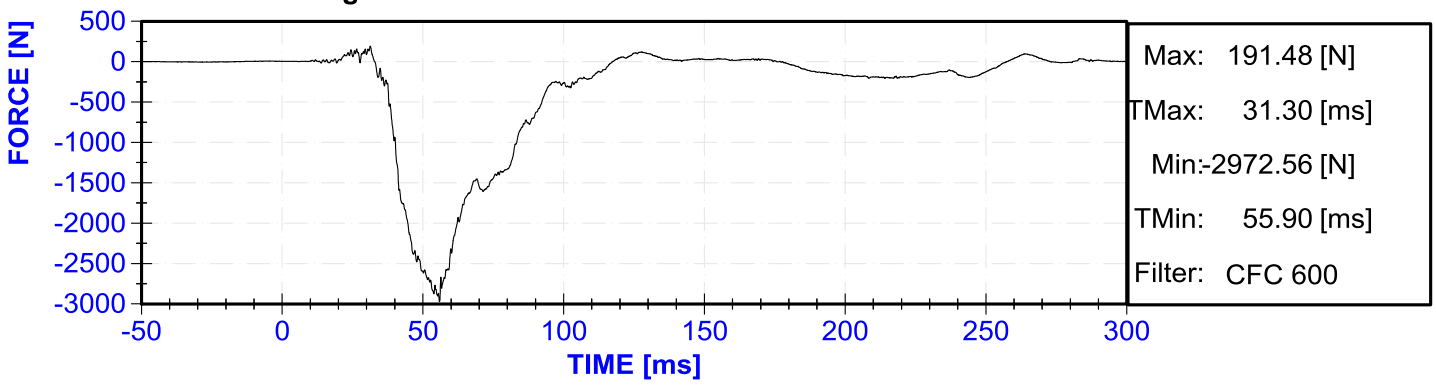

V1P1 Femur Left Y Moment
MOMENT [Nm]
75
50
25
0
-25
-50
-75
-100
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 60.22 [Nm]
TMax: 71.45 [ms]
Min: -77.19 [Nm]
TMin: 58.70 [ms]
Filter: CFC 600


V1P1 Femur Right X Force
FORCE [N]
800
600
400
200
0
-200
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 687.83 [N]
TMax: 72.20 [ms]
Min: -138.54 [N]
TMin: 53.85 [ms]
Filter: CFC 600

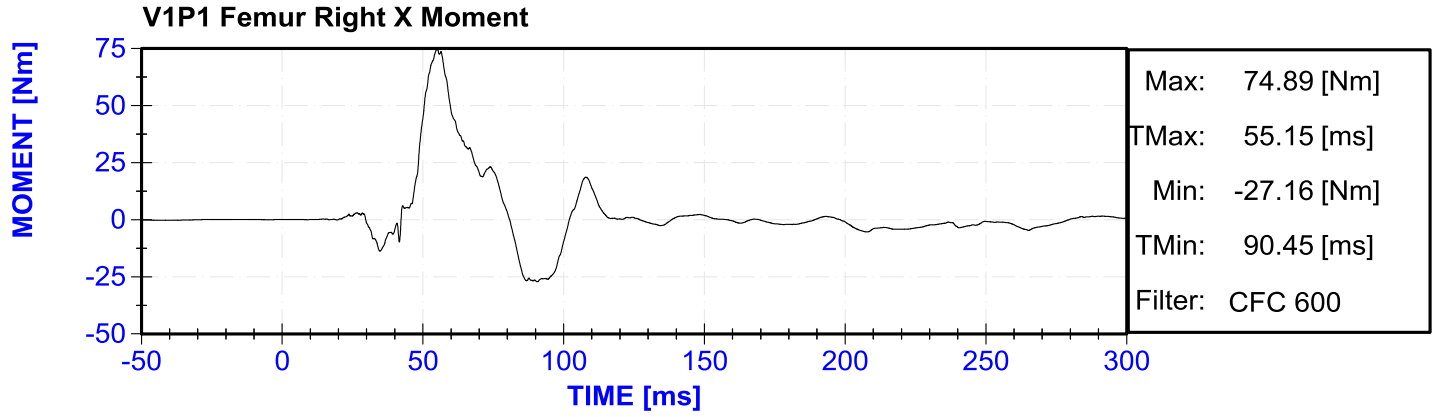
V1P1 Femur Right Y Force



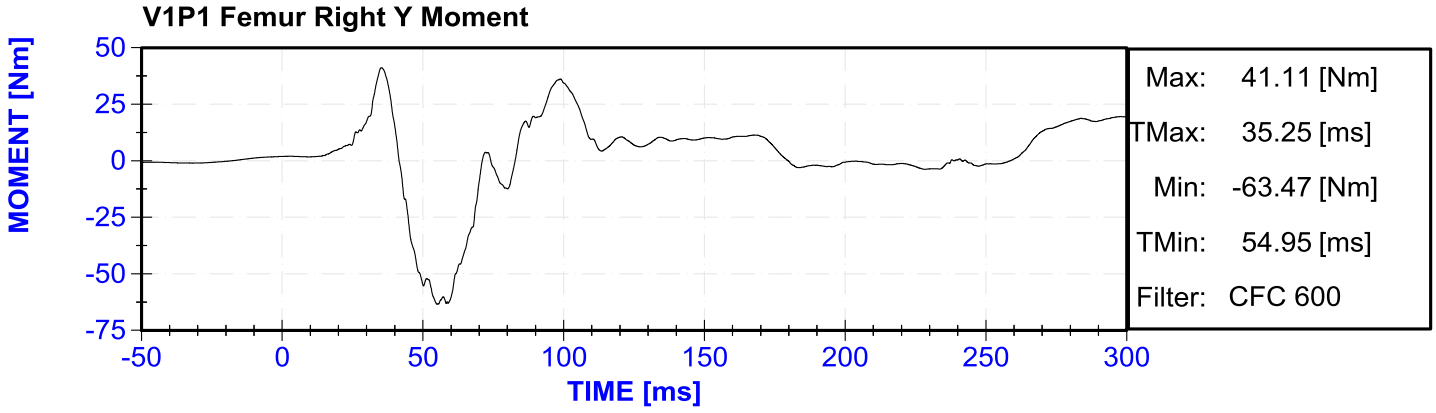
V1P1 Femur Right Z Force

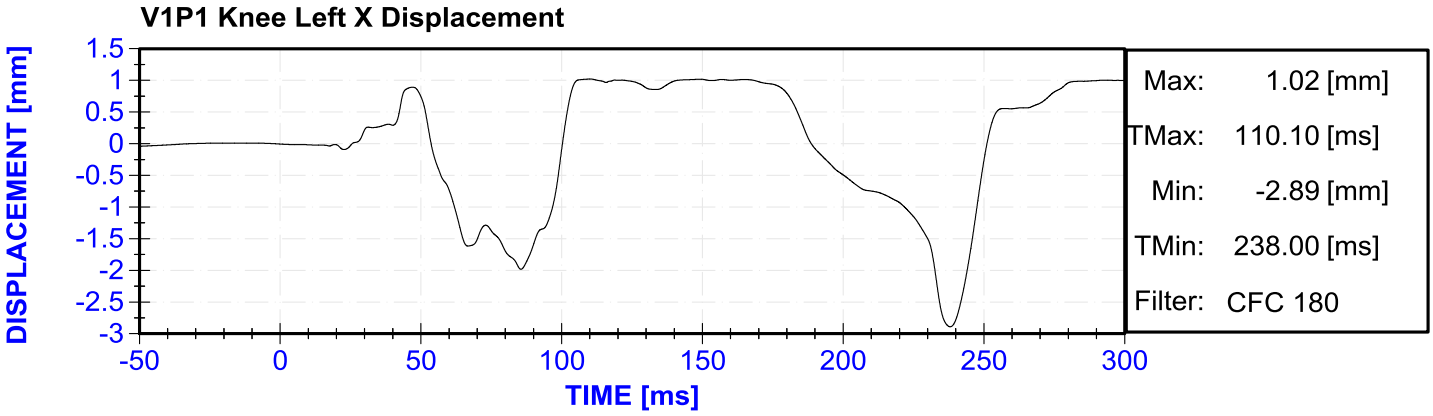


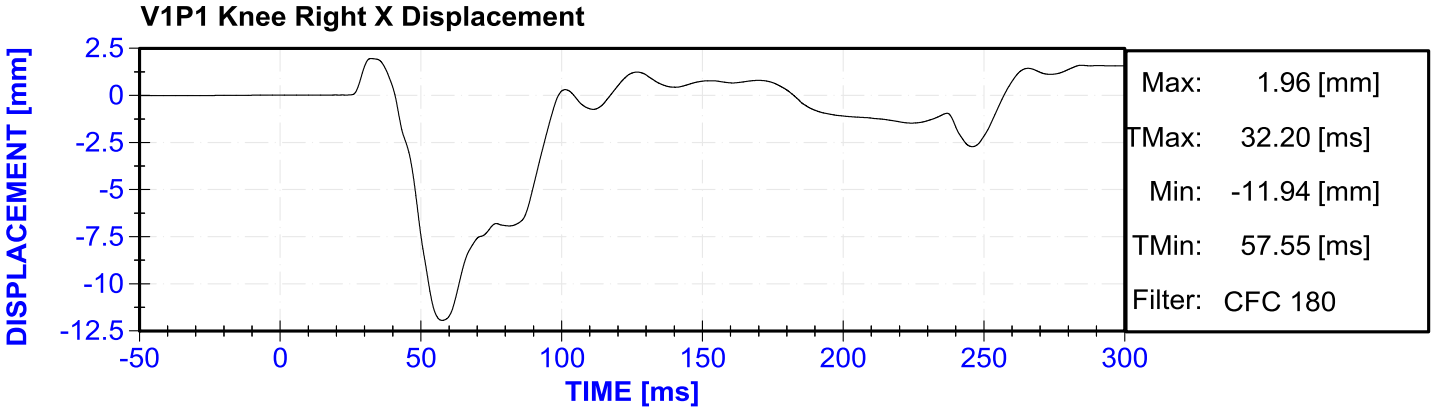
V1P1 Femur Right X Moment

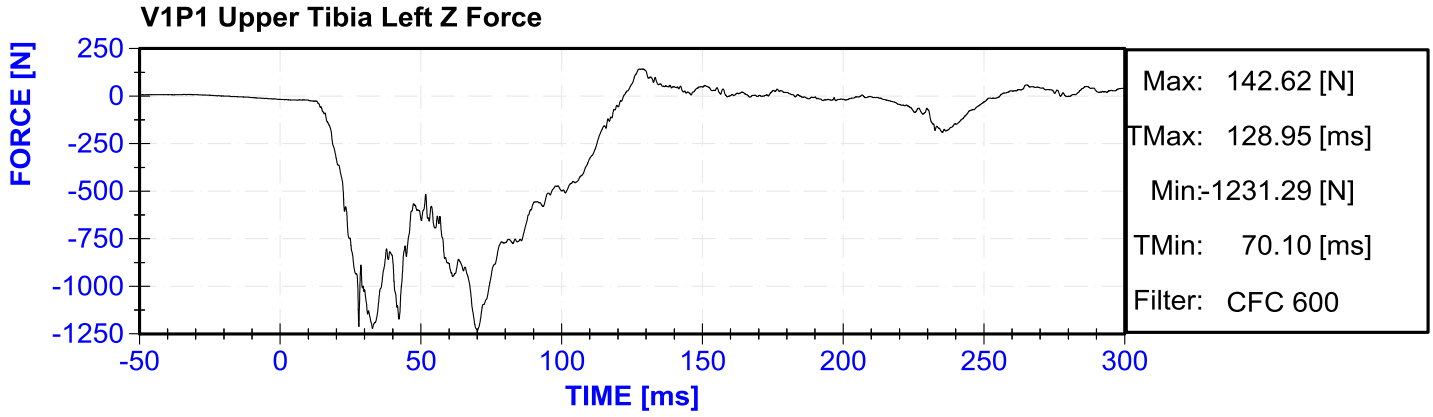


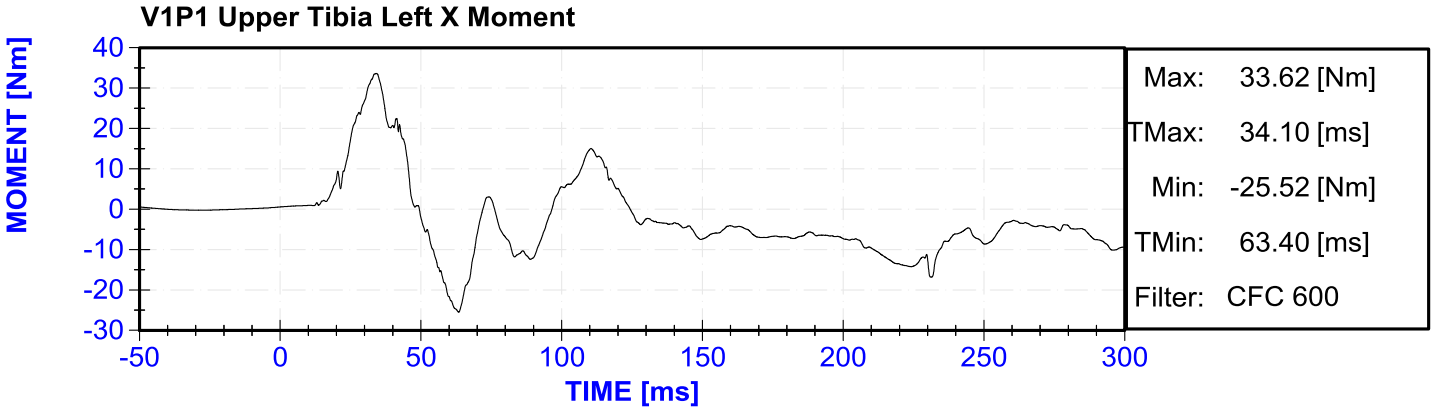
V1P1 Femur Right Y Moment



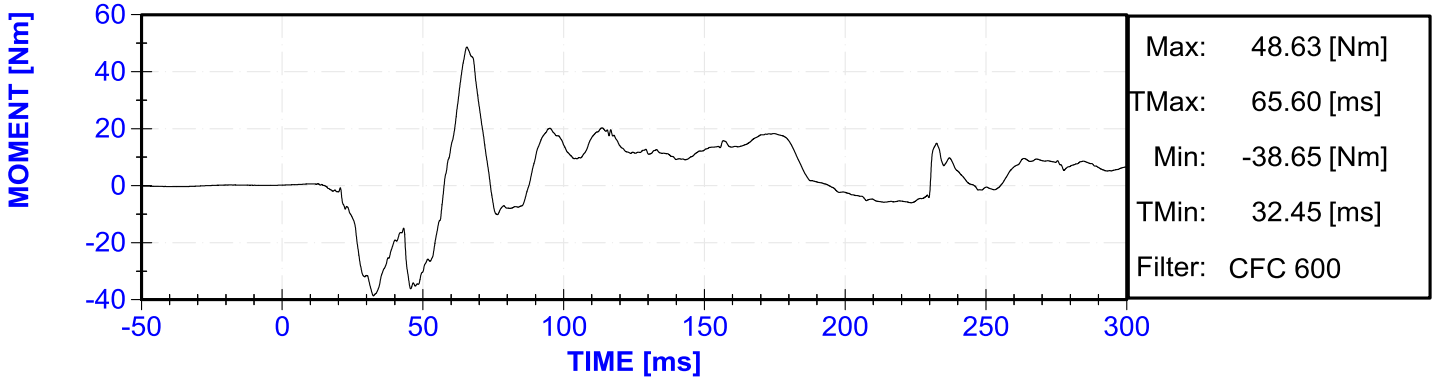

V1P1 Knee Left X Displacement
DISPLACEMENT [mm]
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 1.02 [mm]
TMax: 110.10 [ms]
Min: -2.89 [mm]
TMin: 238.00 [ms]
Filter: CFC 180


V1P1 Knee Right X Displacement
DISPLACEMENT [mm]
2.5
0
-2.5
-5
-7.5
-10
-12.5
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 1.96 [mm]
TMax: 32.20 [ms]
Min: -11.94 [mm]
TMin: 57.55 [ms]
Filter: CFC 180

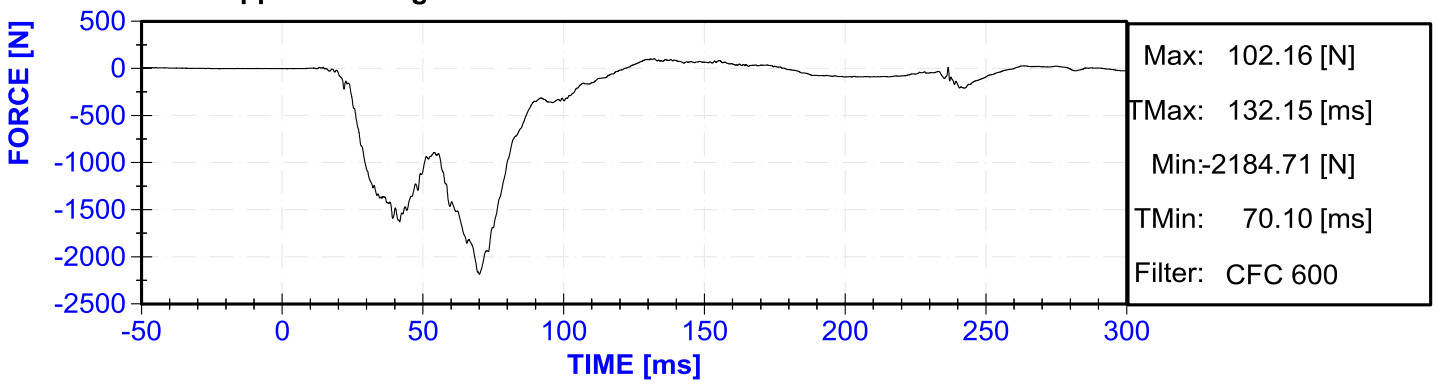

V1P1 Upper Tibia Left Z Force
FORCE [N]
250
0
-250
-500
-750
-1000
-1250
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 142.62 [N]
TMax: 128.95 [ms]
Min:-1231.29 [N]
TMin: 70.10 [ms]
Filter: CFC 600


V1P1 Upper Tibia Left X Moment
MOMENT [Nm]
40
30
20
10
0
-10
-20
-30
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 33.62 [Nm]
TMax: 34.10 [ms]
Min: -25.52 [Nm]
TMin: 63.40 [ms]
Filter: CFC 600

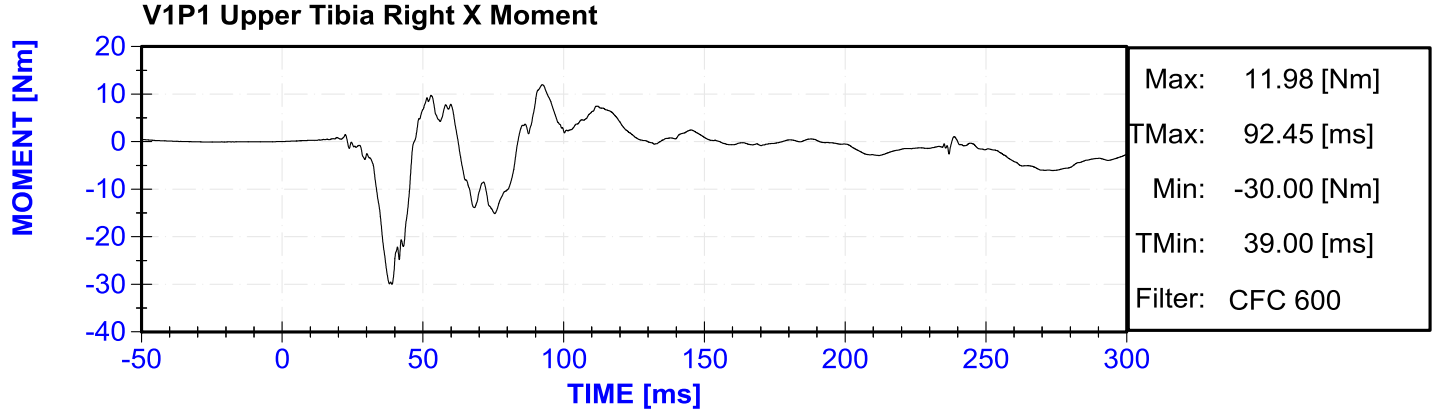
V1P1 Upper Tibia Left Y Moment



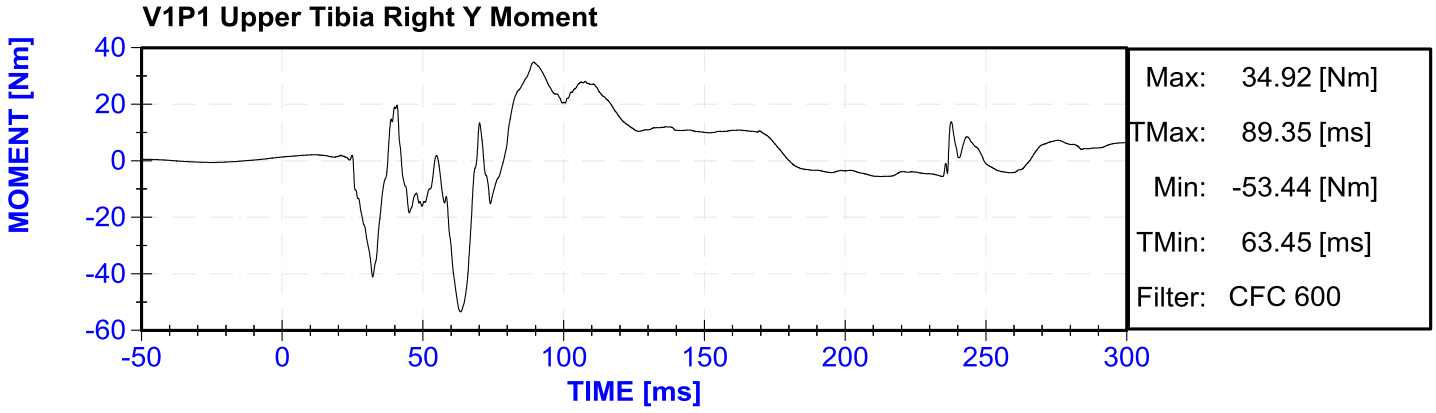
V1P1 Upper Tibia Right Z Force

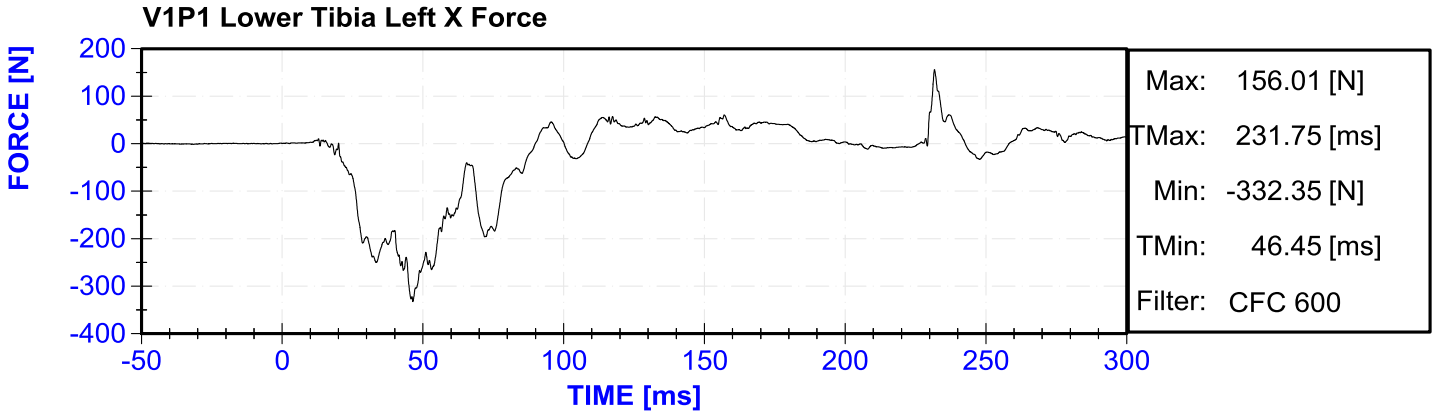


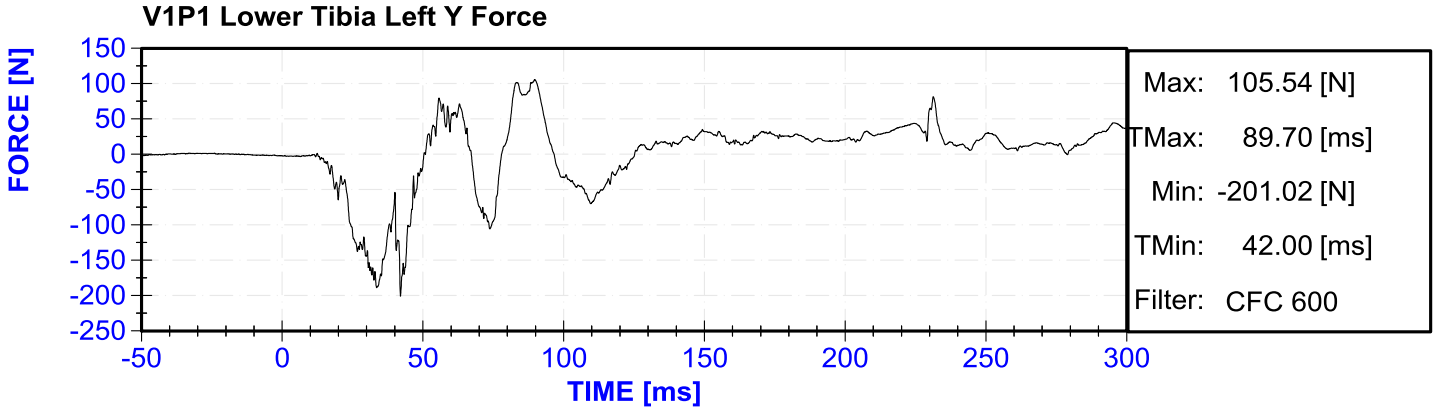
V1P1 Upper Tibia Right X Moment

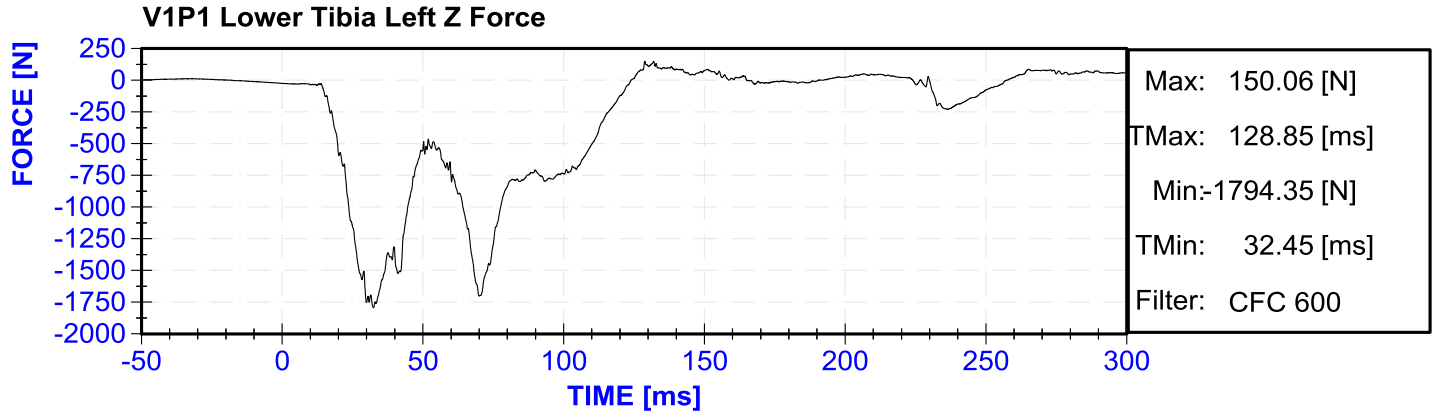


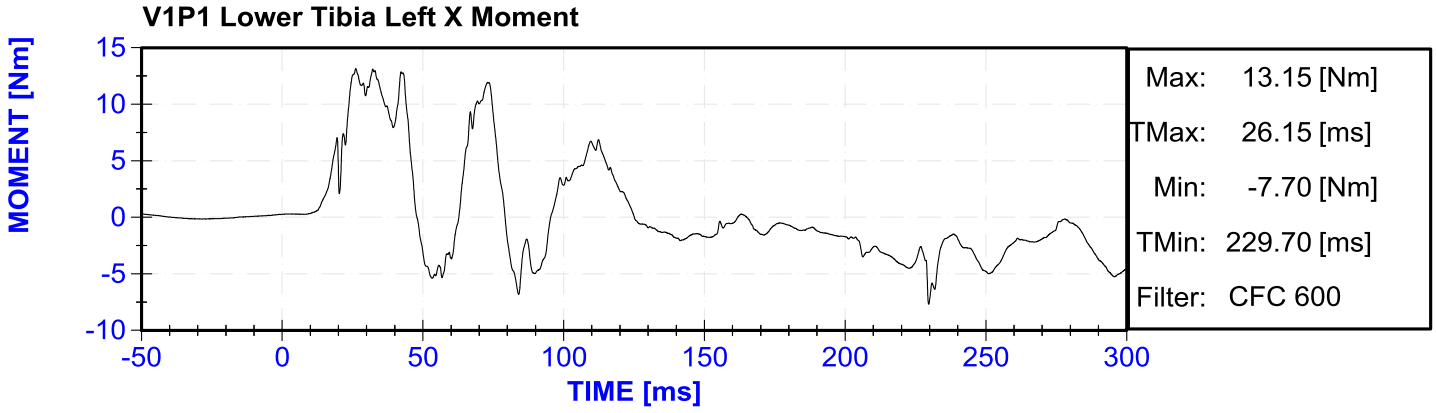
V1P1 Upper Tibia Right Y Moment



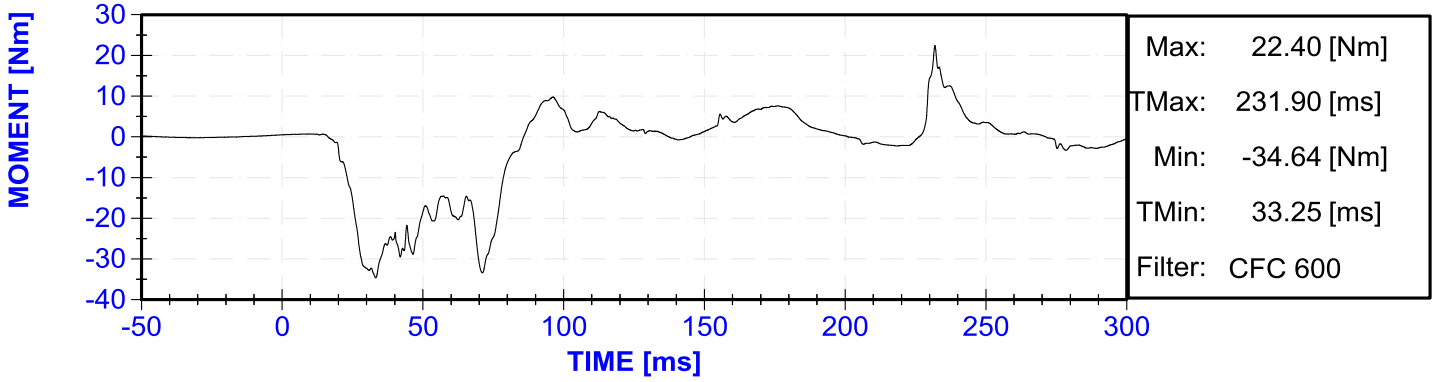

V1P1 Lower Tibia Left X Force
FORCE [N]
200
100
0
-100
-200
-300
-400
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 156.01 [N]
TMax: 231.75 [ms]
Min: -332.35 [N]
TMin: 46.45 [ms]
Filter: CFC 600


V1P1 Lower Tibia Left Y Force
FORCE [N]
150
100
50
0
-50
-100
-150
-200
-250
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 105.54 [N]
TMax: 89.70 [ms]
Min: -201.02 [N]
TMin: 42.00 [ms]
Filter: CFC 600

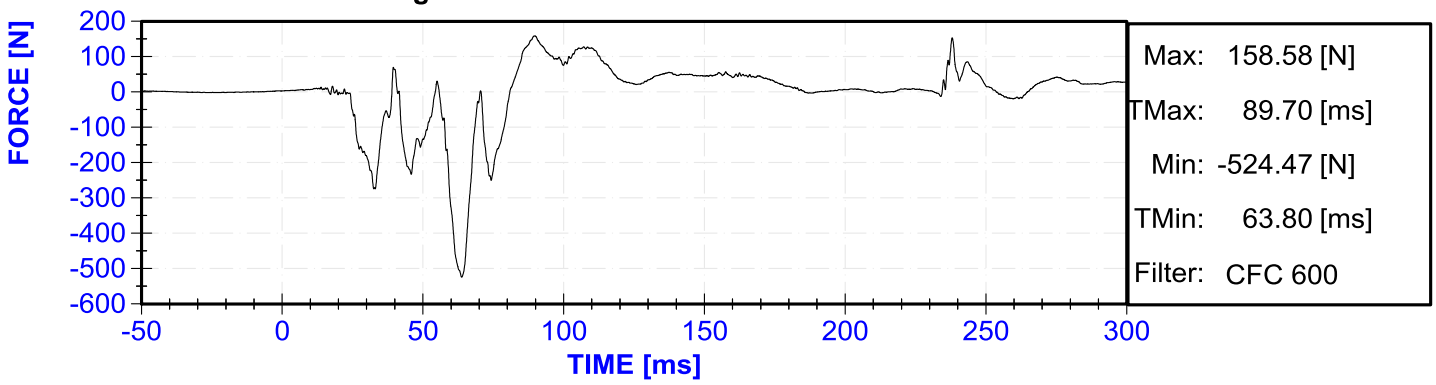

V1P1 Lower Tibia Left Z Force
FORCE [N]
250
0
-250
-500
-750
-1000
-1250
-1500
-1750
-2000
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 150.06 [N]
TMax: 128.85 [ms]
Min:-1794.35 [N]
TMin: 32.45 [ms]
Filter: CFC 600


V1P1 Lower Tibia Left X Moment
MOMENT [Nm]
15
10
5
0
-5
-10
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 13.15 [Nm]
TMax: 26.15 [ms]
Min: -7.70 [Nm]
TMin: 229.70 [ms]
Filter: CFC 600

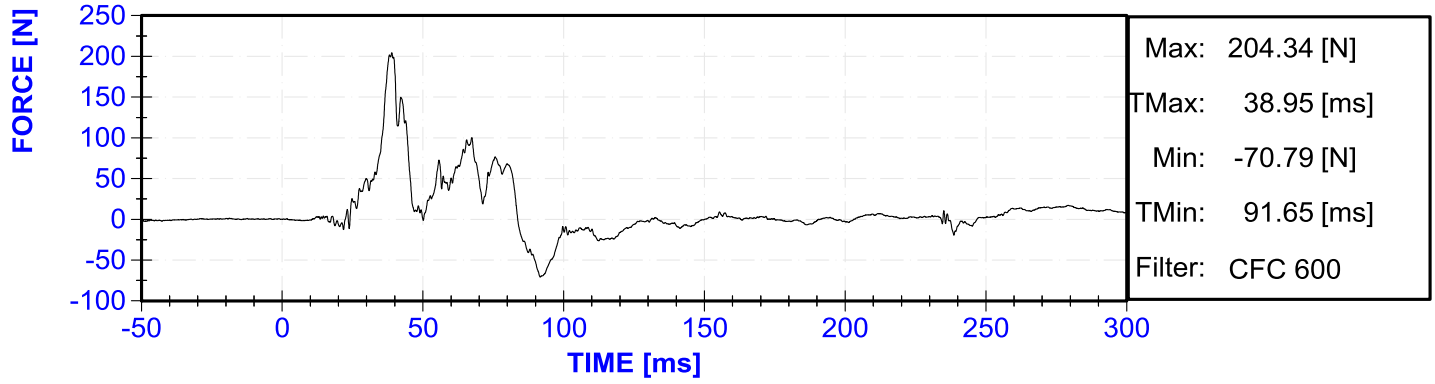
V1P1 Lower Tibia Left Y Moment



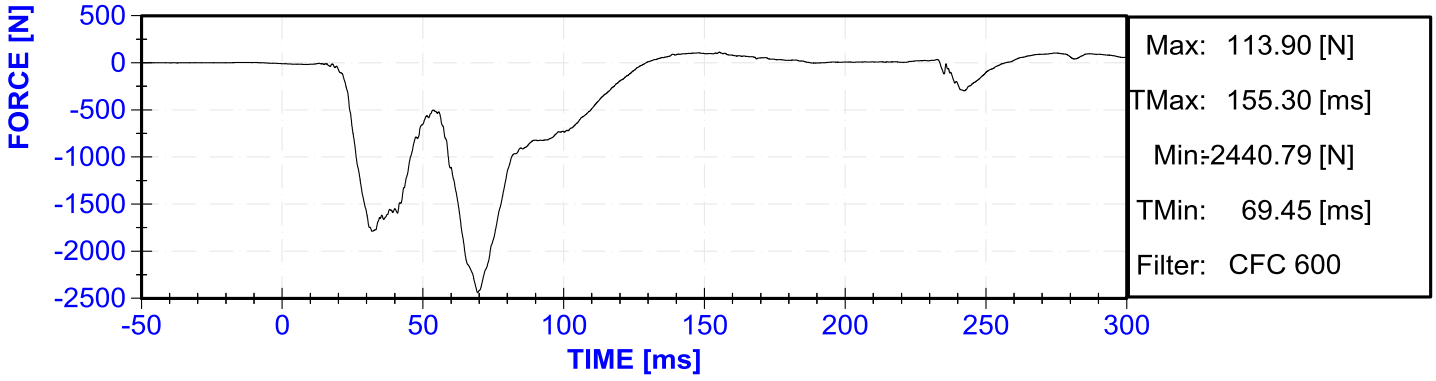
V1P1 Lower Tibia Right X Force

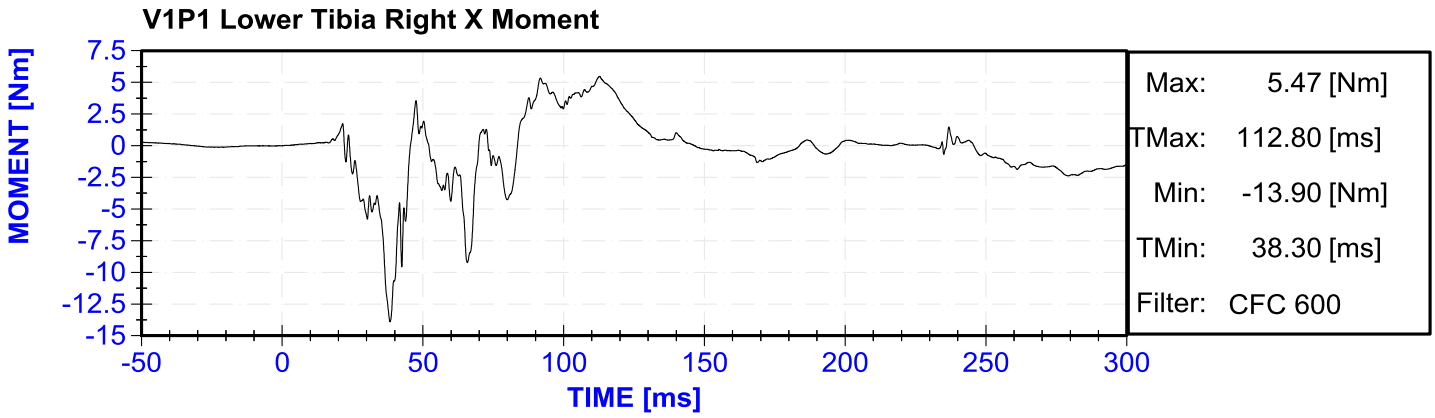


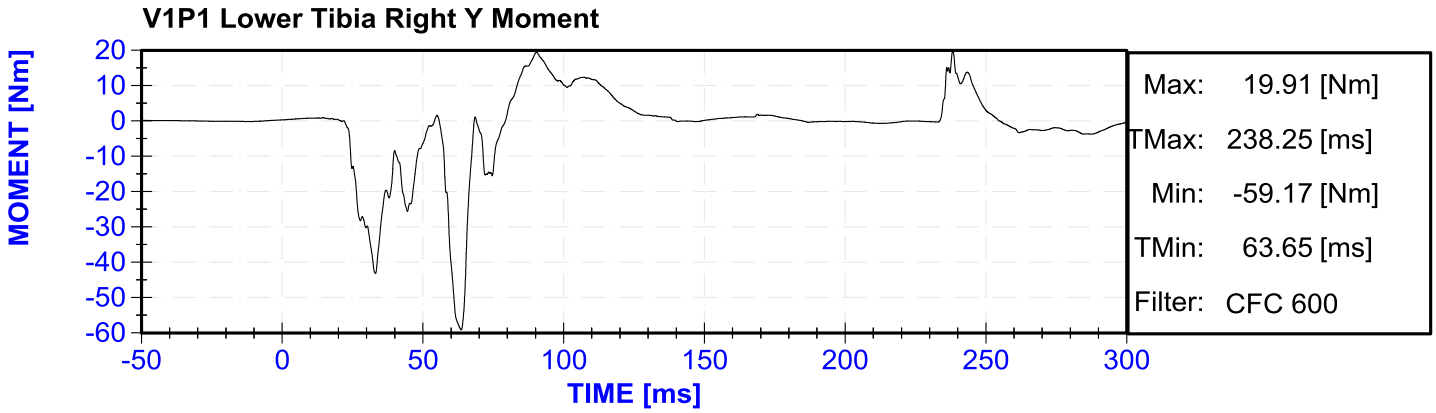
V1P1 Lower Tibia Right Y Force

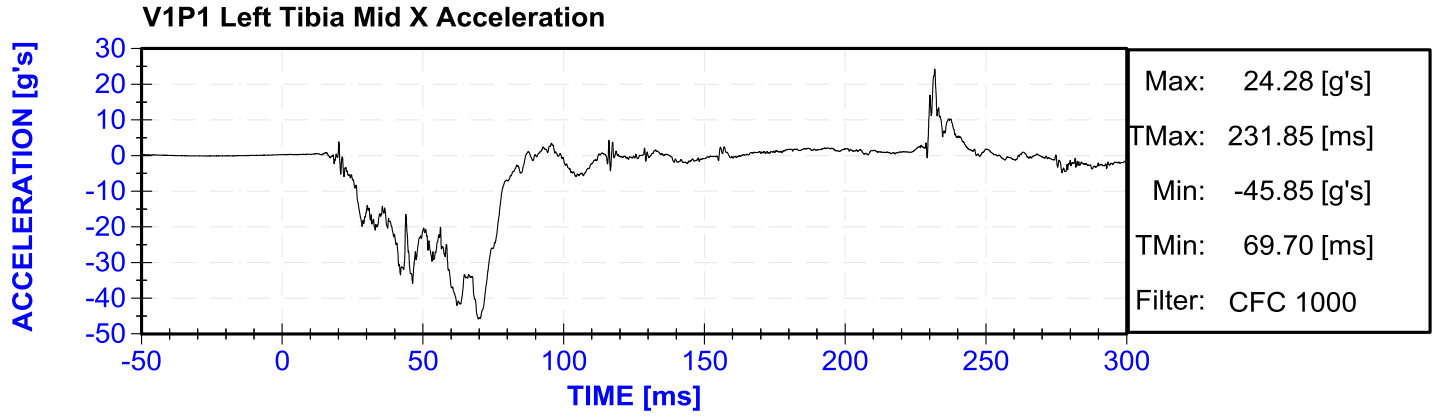


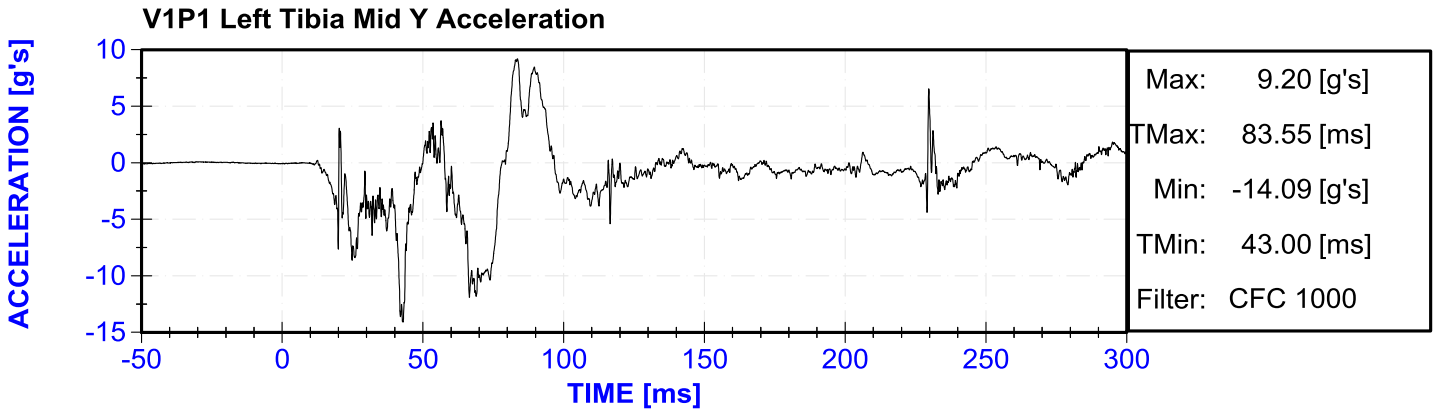
V1P1 Lower Tibia Right Z Force



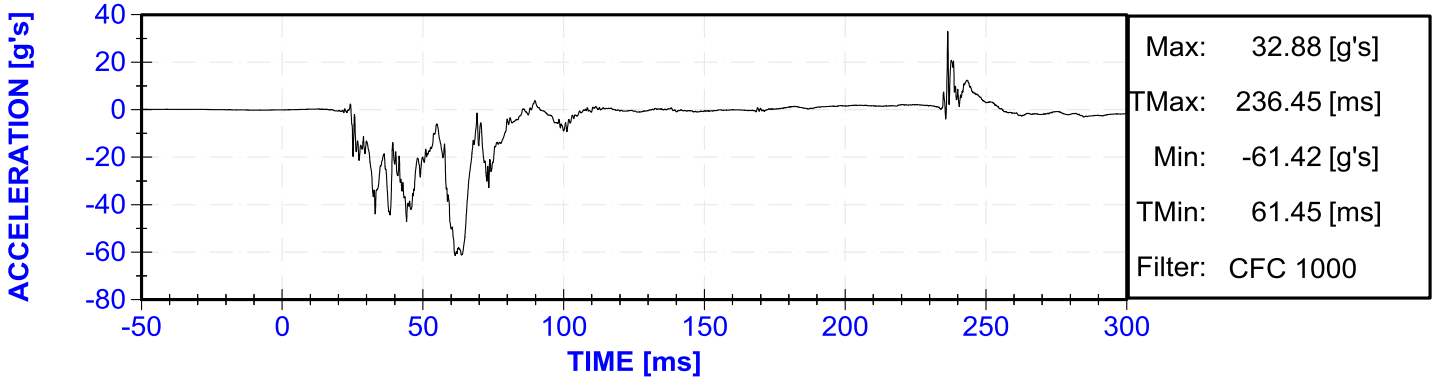

V1P1 Lower Tibia Right X Moment
MOMENT [Nm]
7.5
5
2.5
0
-2.5
-5
-7.5
-10
-12.5
-15
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 5.47 [Nm]
TMax: 112.80 [ms]
Min: -13.90 [Nm]
TMin: 38.30 [ms]
Filter: CFC 600


V1P1 Lower Tibia Right Y Moment
MOMENT [Nm]
20
10
0
-10
-20
-30
-40
-50
-60
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 19.91 [Nm]
TMax: 238.25 [ms]
Min: -59.17 [Nm]
TMin: 63.65 [ms]
Filter: CFC 600


V1P1 Left Tibia Mid X Acceleration
ACCELERATION [g's]
30
20
10
0
-10
-20
-30
-40
-50
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 24.28 [g's]
TMax: 231.85 [ms]
Min: -45.85 [g's]
TMin: 69.70 [ms]
Filter: CFC 1000

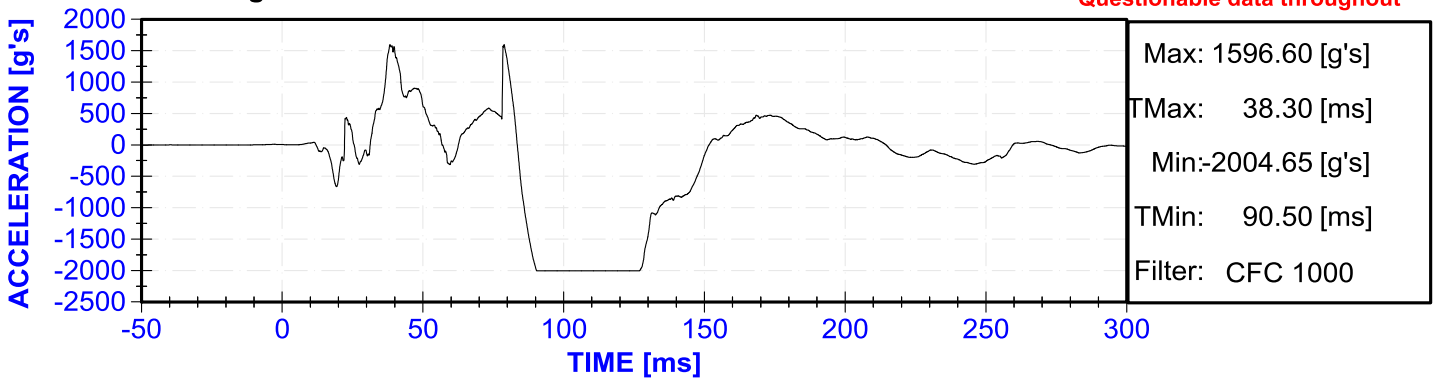

V1P1 Left Tibia Mid Y Acceleration
ACCELERATION [g's]
10
5
0
-5
-10
-15
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 9.20 [g's]
TMax: 83.55 [ms]
Min: -14.09 [g's]
TMin: 43.00 [ms]
Filter: CFC 1000

V1P1 Right Tibia Mid X Acceleration

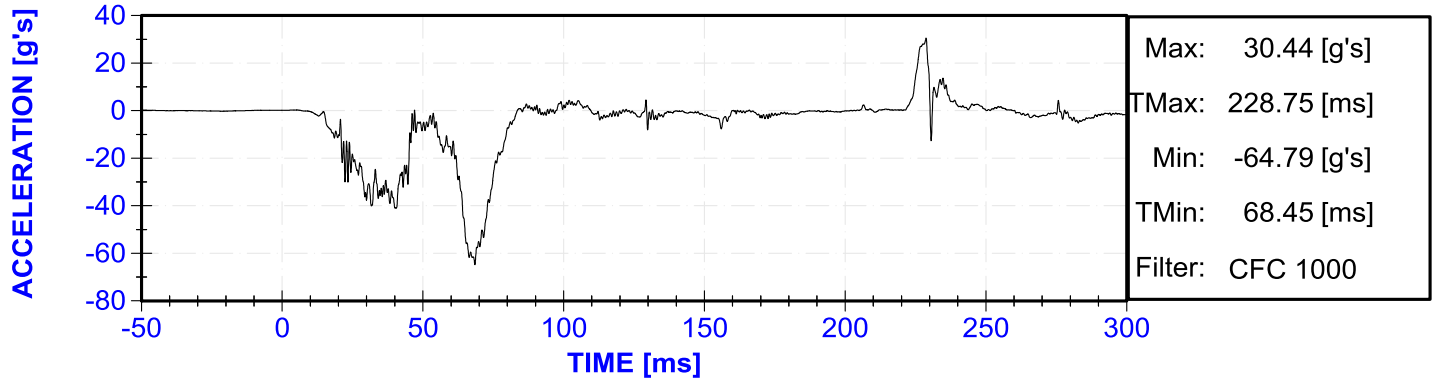


V1P1 Right Tibia Mid Y Acceleration

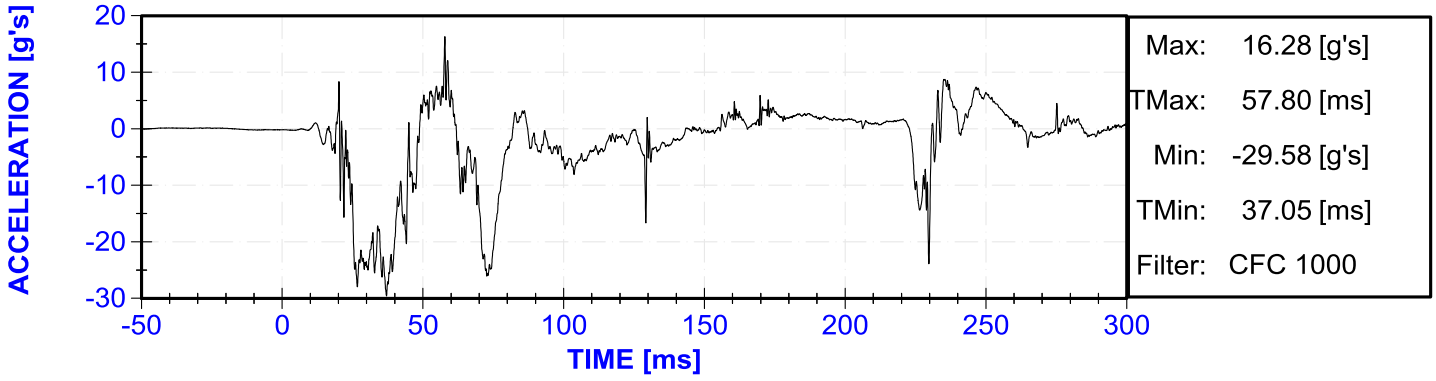
Questionable data throughout

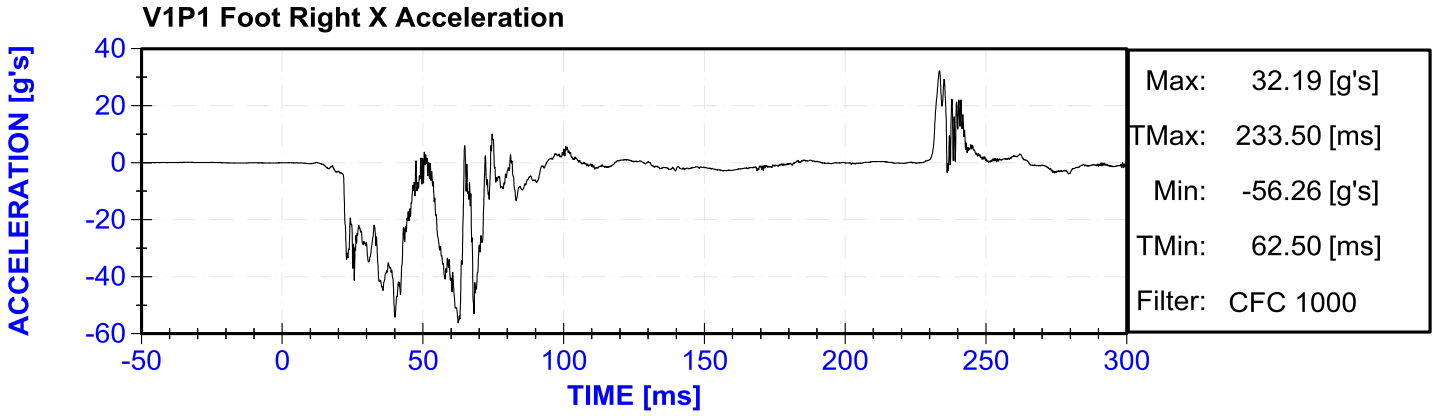


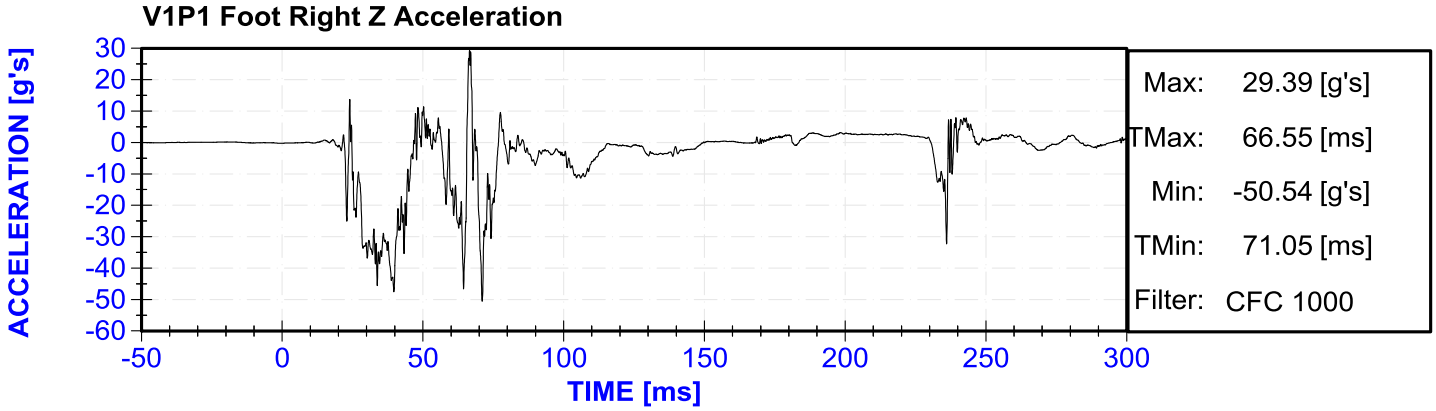
V1P1 Foot Left X Acceleration

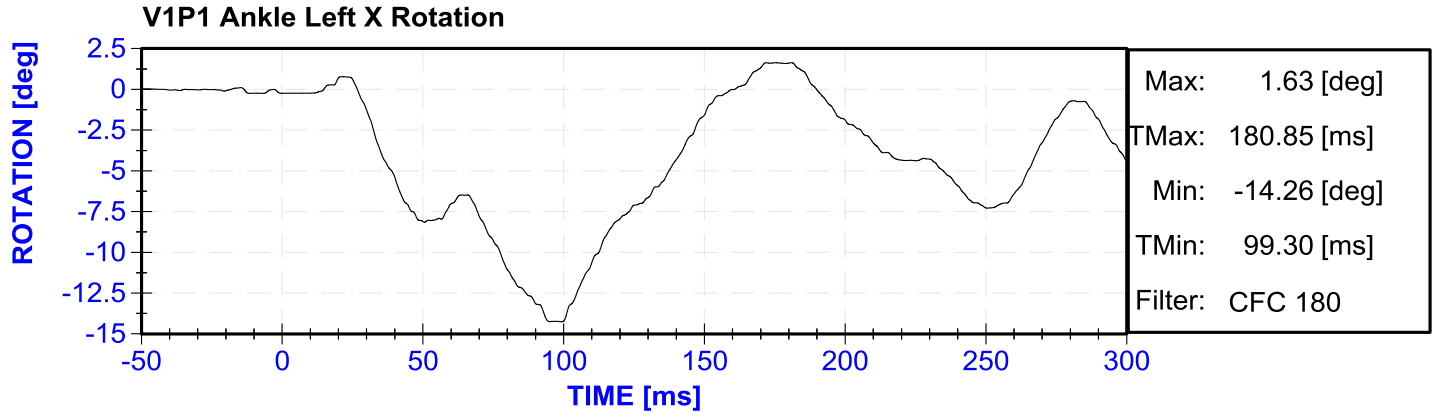


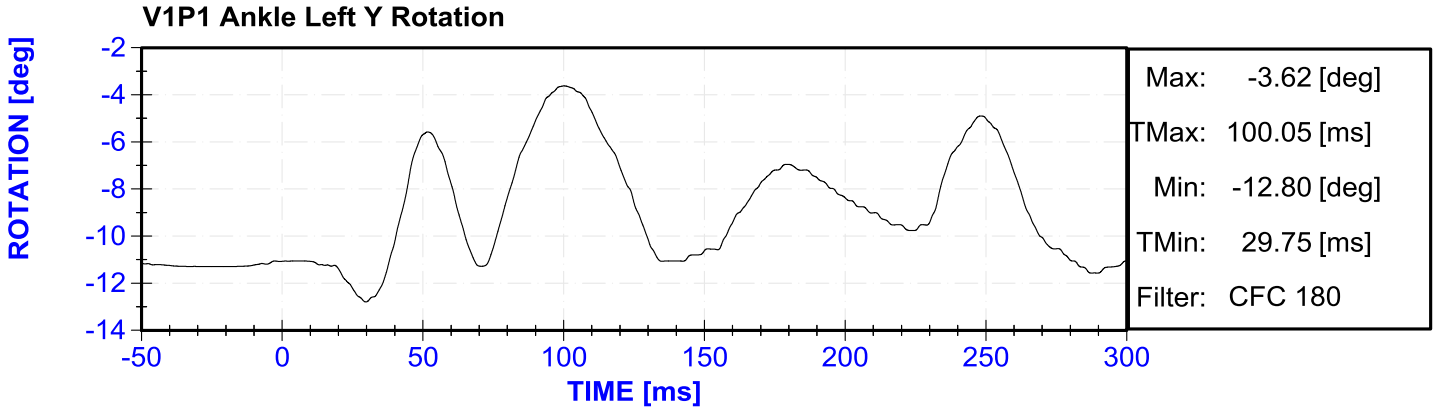
V1P1 Foot Left Z Acceleration

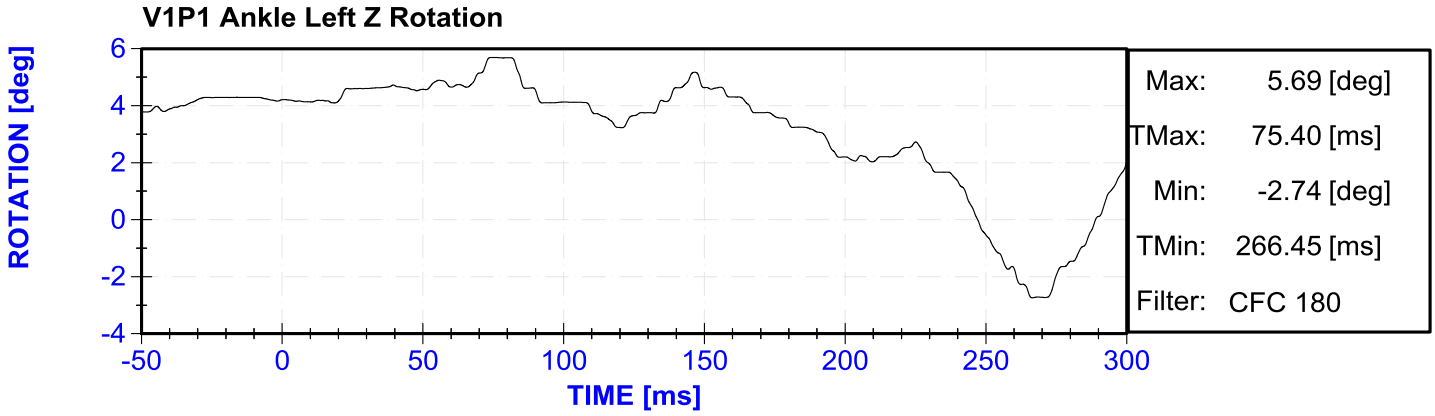


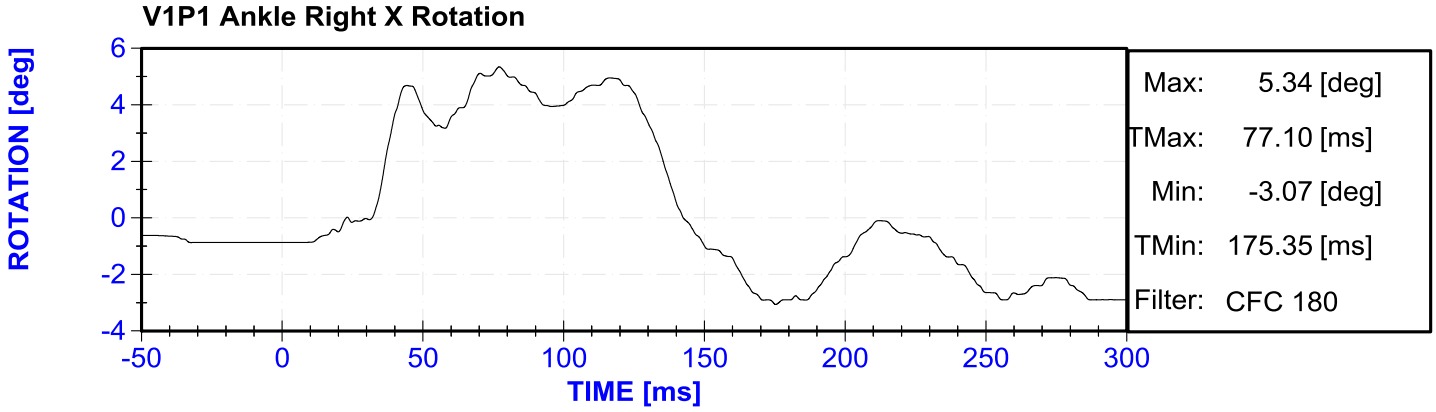

V1P1 Foot Right X Acceleration
ACCELERATION [g's]
TIME [ms]
Max: 32.19 [g's]
TMax: 233.50 [ms]
Min: -56.26 [g's]
TMin: 62.50 [ms]
Filter: CFC 1000

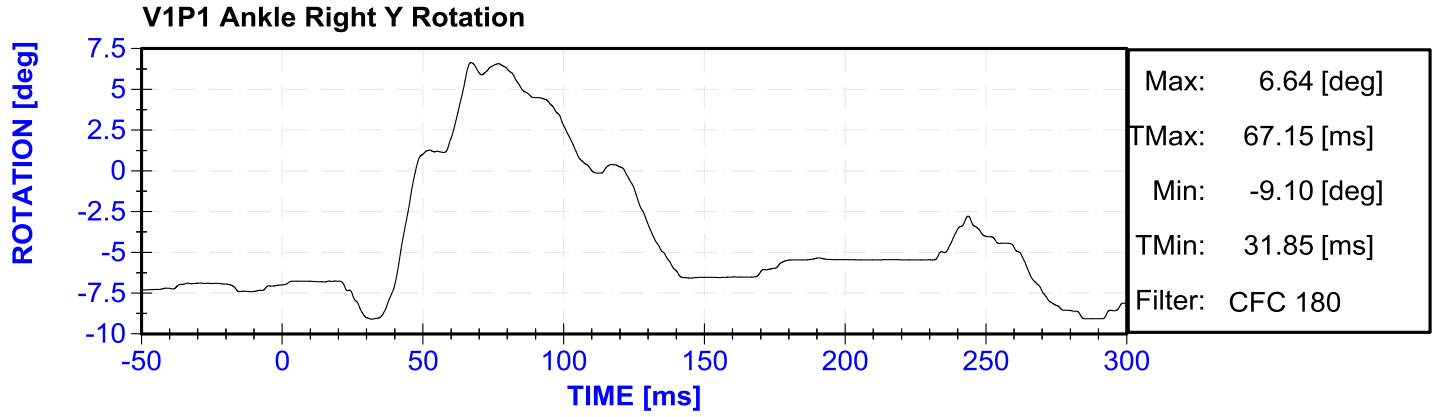

V1P1 Foot Right Z Acceleration
ACCELERATION [g's]
TIME [ms]
Max: 29.39 [g's]
TMax: 66.55 [ms]
Min: -50.54 [g's]
TMin: 71.05 [ms]
Filter: CFC 1000

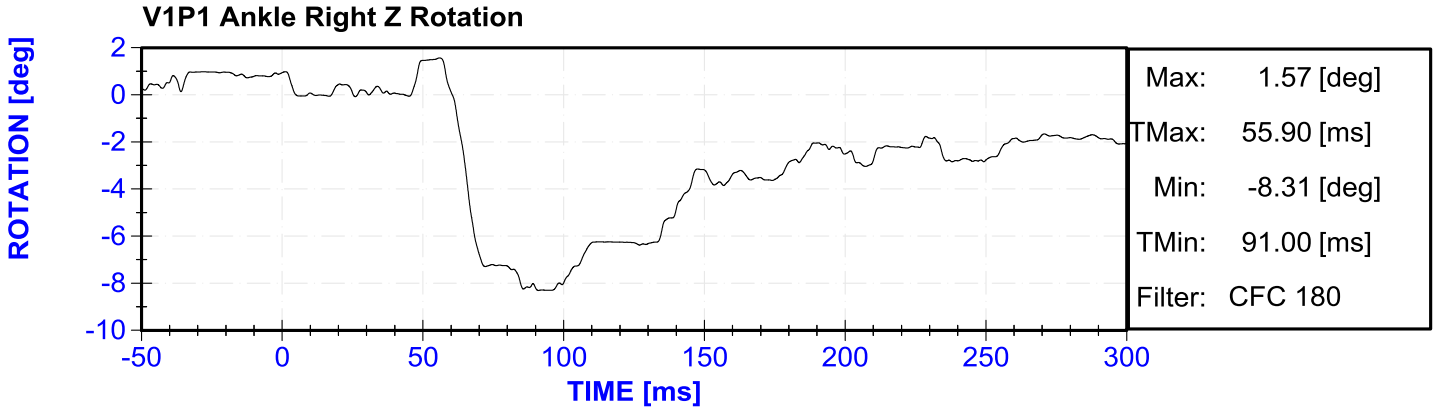

V1P1 Ankle Left X Rotation
ROTATION [deg]
TIME [ms]
Max: 1.63 [deg]
TMax: 180.85 [ms]
Min: -14.26 [deg]
TMin: 99.30 [ms]
Filter: CFC 180

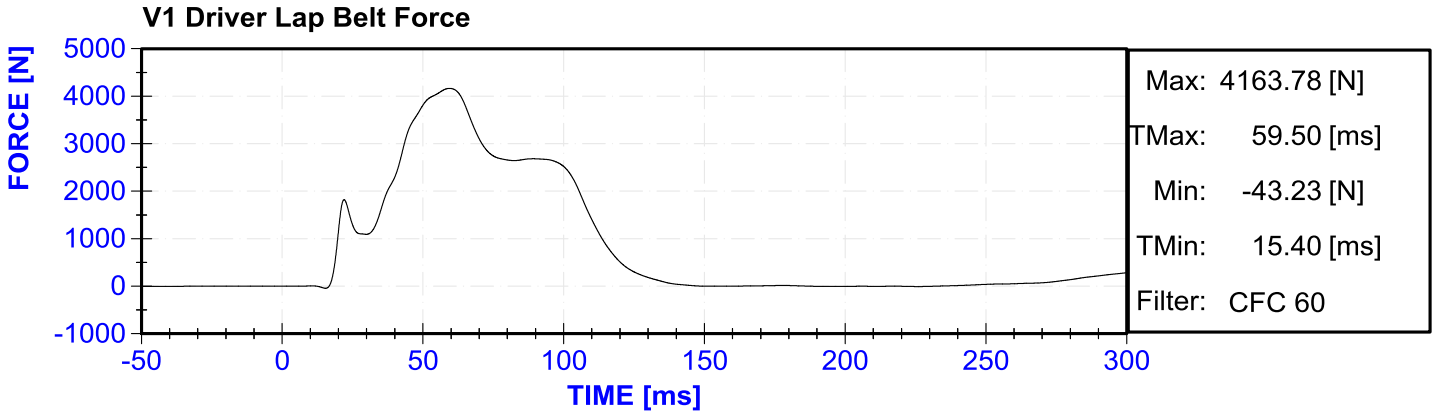

V1P1 Ankle Left Y Rotation
ROTATION [deg]
TIME [ms]
Max: -3.62 [deg]
TMax: 100.05 [ms]
Min: -12.80 [deg]
TMin: 29.75 [ms]
Filter: CFC 180

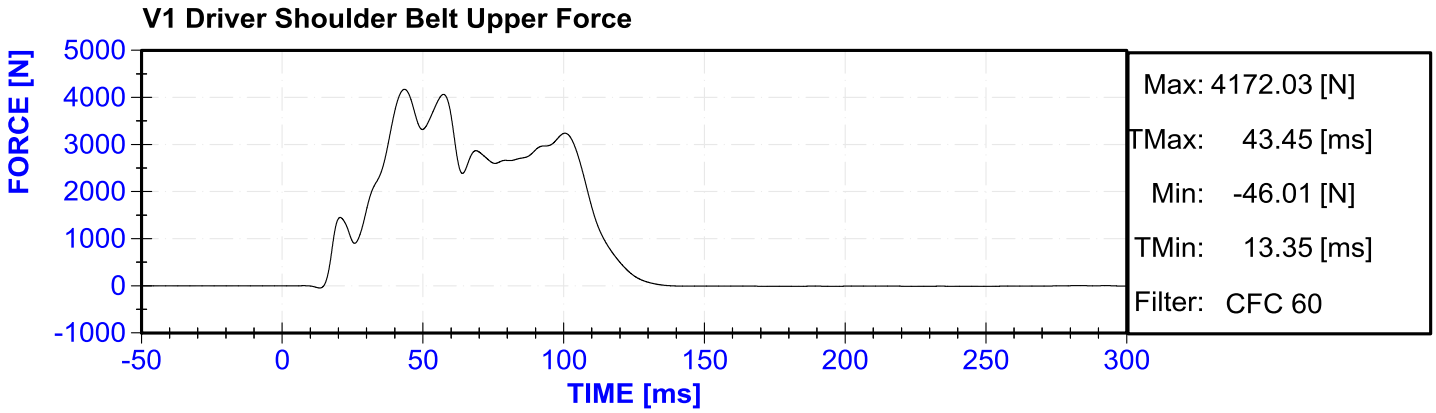

V1P1 Ankle Left Z Rotation
ROTATION [deg]
6
4
2
0
-2
-4
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 5.69 [deg]
TMax: 75.40 [ms]
Min: -2.74 [deg]
TMin: 266.45 [ms]
Filter: CFC 180

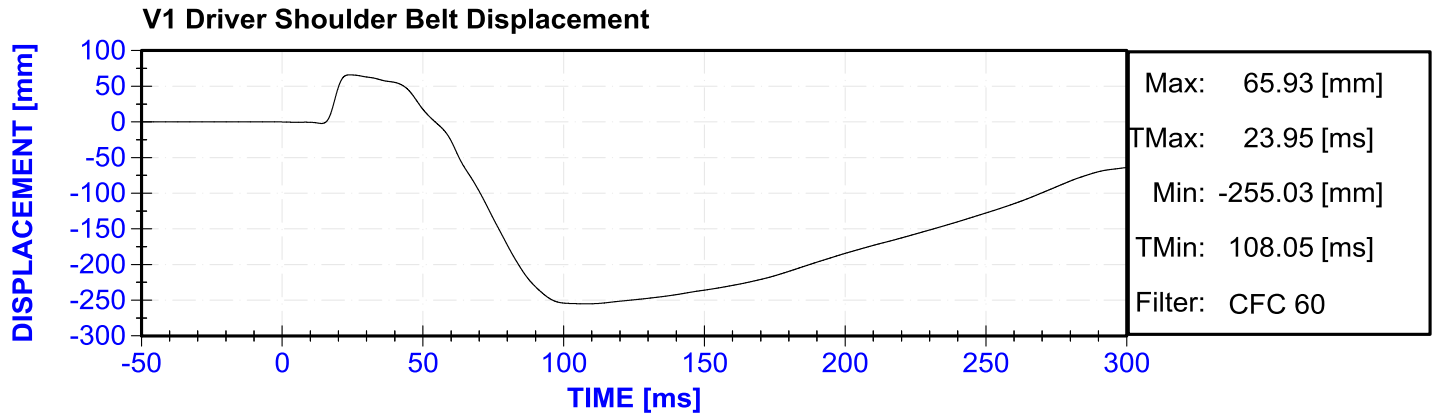

V1P1 Ankle Right X Rotation
ROTATION [deg]
6
4
2
0
-2
-4
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 5.34 [deg]
TMax: 77.10 [ms]
Min: -3.07 [deg]
TMin: 175.35 [ms]
Filter: CFC 180

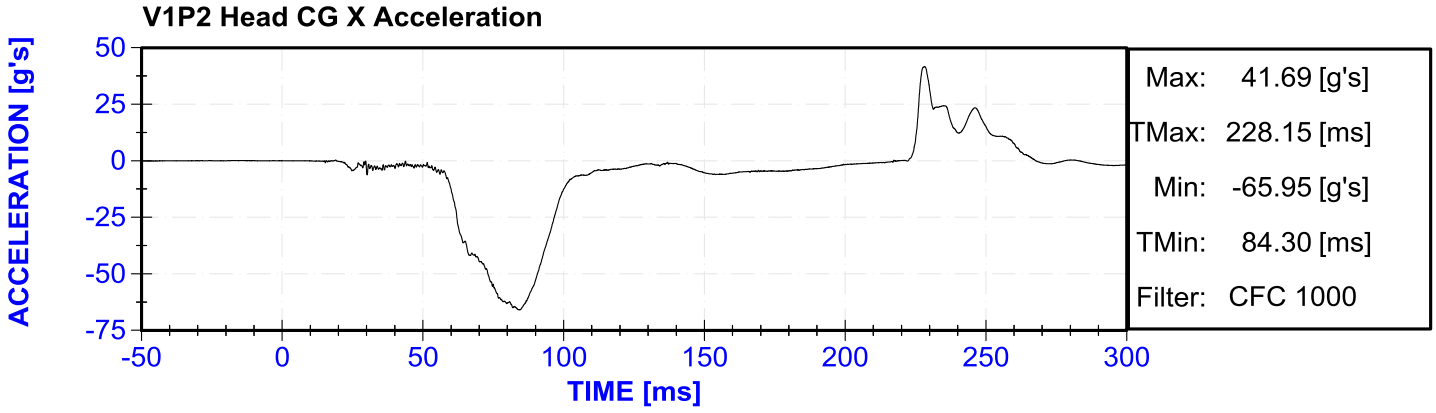

V1P1 Ankle Right Y Rotation
ROTATION [deg]
7.5
5
2.5
0
-2.5
-5
-7.5
-10
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 6.64 [deg]
TMax: 67.15 [ms]
Min: -9.10 [deg]
TMin: 31.85 [ms]
Filter: CFC 180

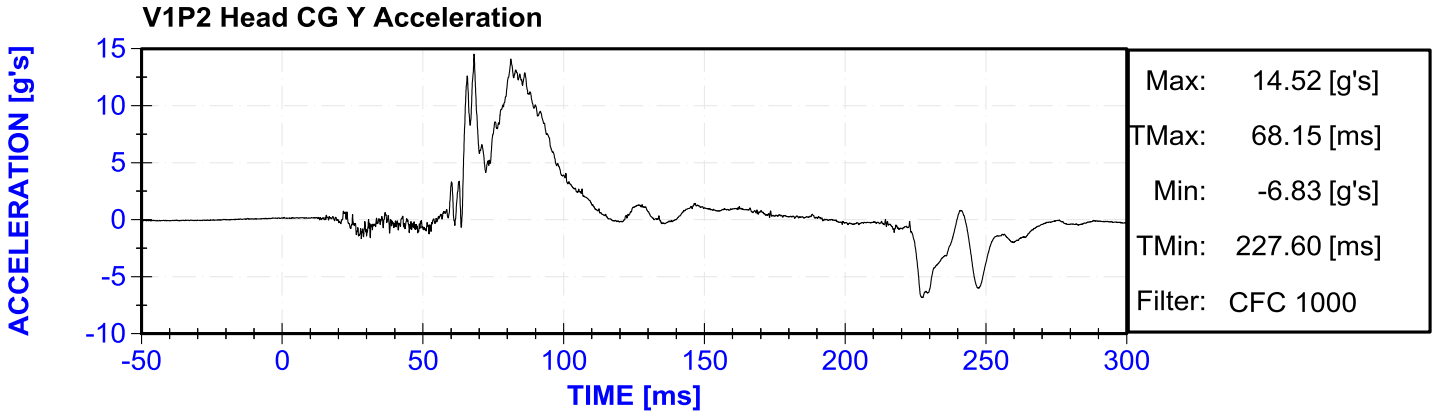

V1P1 Ankle Right Z Rotation
ROTATION [deg]
2
0
-2
-4
-6
-8
-10
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 1.57 [deg]
TMax: 55.90 [ms]
Min: -8.31 [deg]
TMin: 91.00 [ms]
Filter: CFC 180

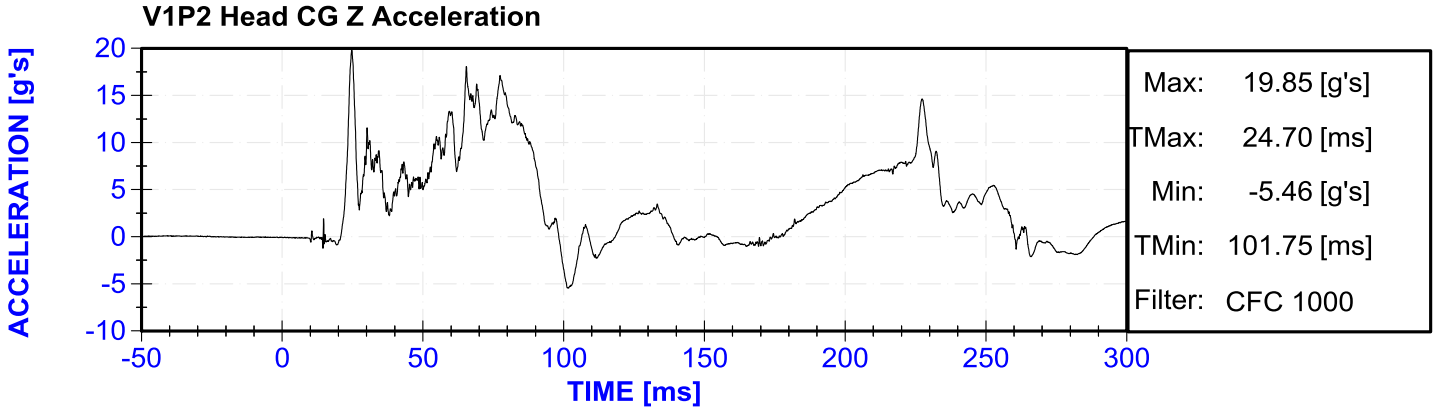

V1 Driver Lap Belt Force
FORCE [N]
5000
4000
3000
2000
1000
0
-1000
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 4163.78 [N]
TMax: 59.50 [ms]
Min: -43.23 [N]
TMin: 15.40 [ms]
Filter: CFC 60

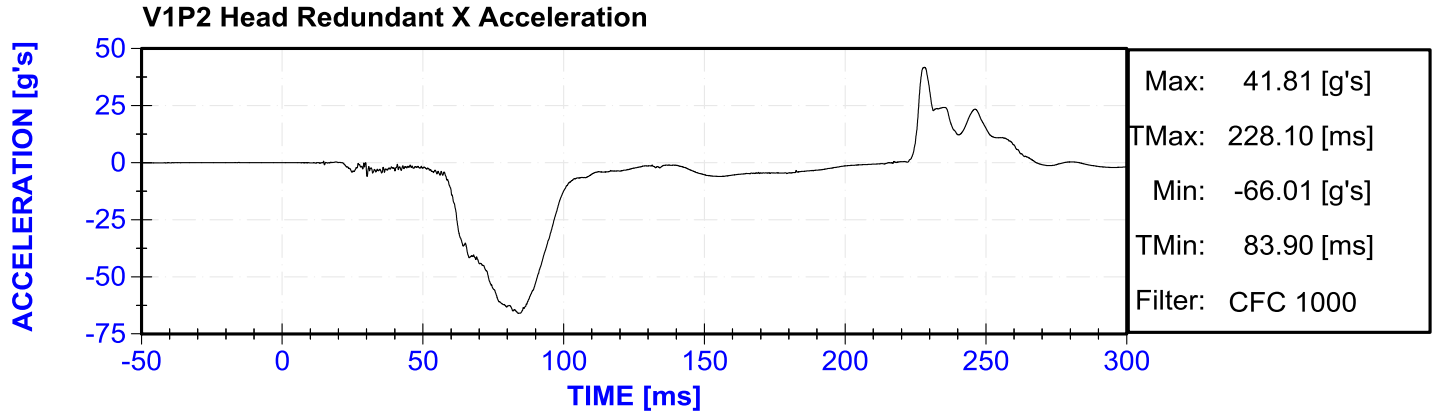

V1 Driver Shoulder Belt Upper Force
FORCE [N]
5000
4000
3000
2000
1000
0
-1000
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 4172.03 [N]
TMax: 43.45 [ms]
Min: -46.01 [N]
TMin: 13.35 [ms]
Filter: CFC 60

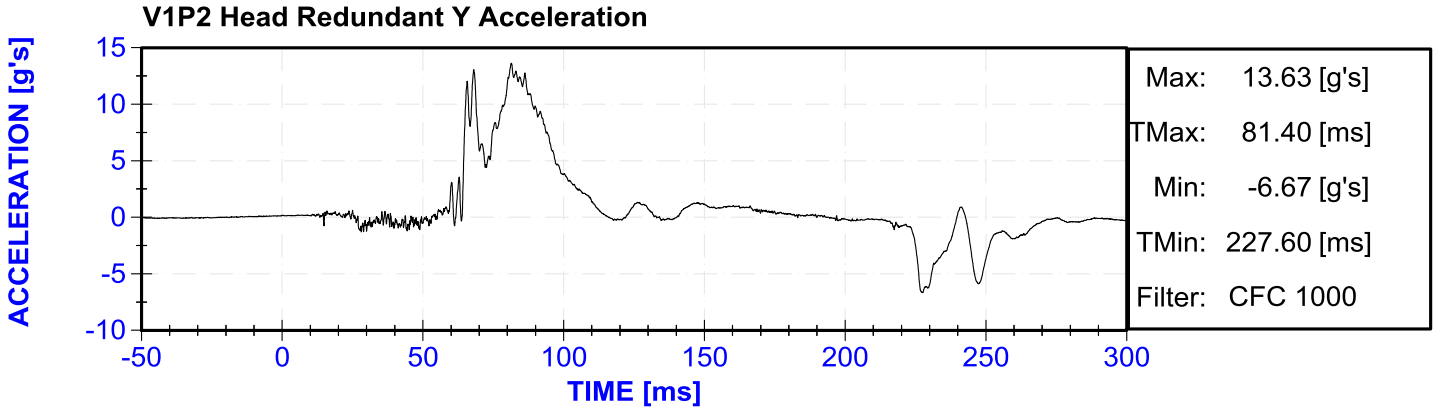

V1 Driver Shoulder Belt Displacement
DISPLACEMENT [mm]
100
50
0
-50
-100
-150
-200
-250
-300
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 65.93 [mm]
TMax: 23.95 [ms]
Min: -255.03 [mm]
TMin: 108.05 [ms]
Filter: CFC 60

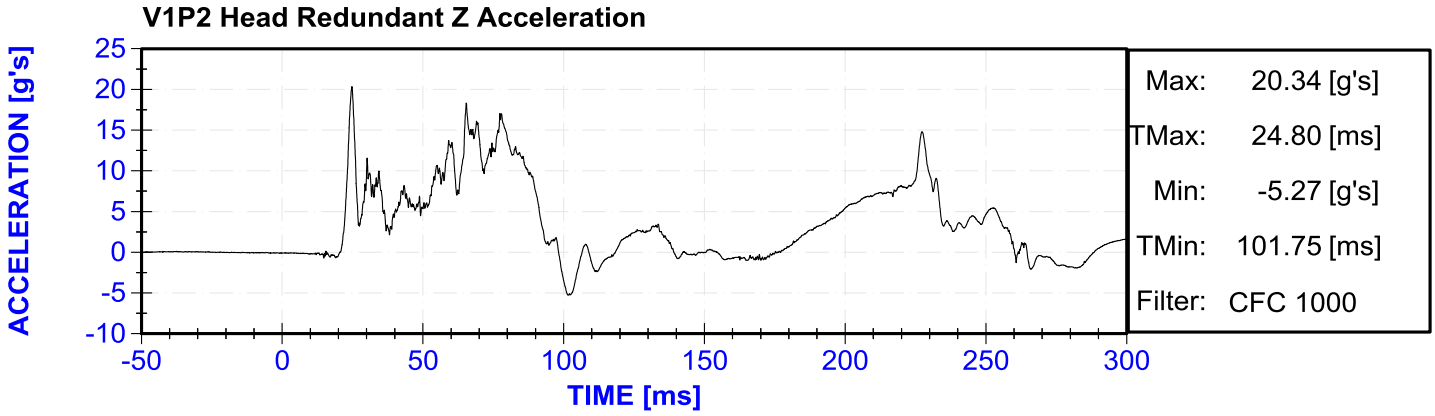

V1P2 Head CG X Acceleration
ACCELERATION [g's]
50
25
0
-25
-50
-75
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 41.69 [g's]
TMax: 228.15 [ms]
Min: -65.95 [g's]
TMin: 84.30 [ms]
Filter: CFC 1000

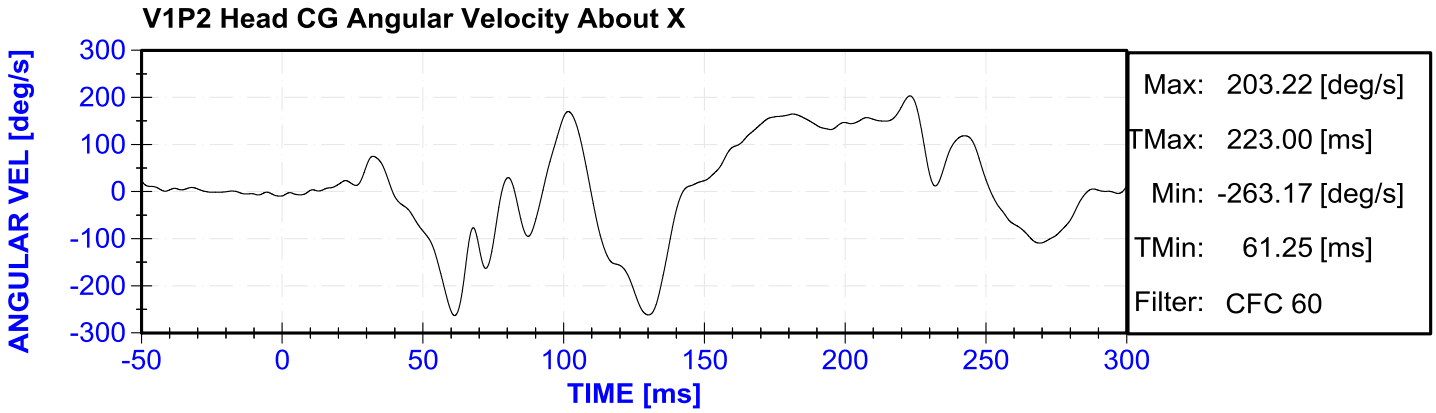

V1P2 Head CG Y Acceleration
ACCELERATION [g's]
TIME [ms]
Max: 14.52 [g's]
TMax: 68.15 [ms]
Min: -6.83 [g's]
TMin: 227.60 [ms]
Filter: CFC 1000

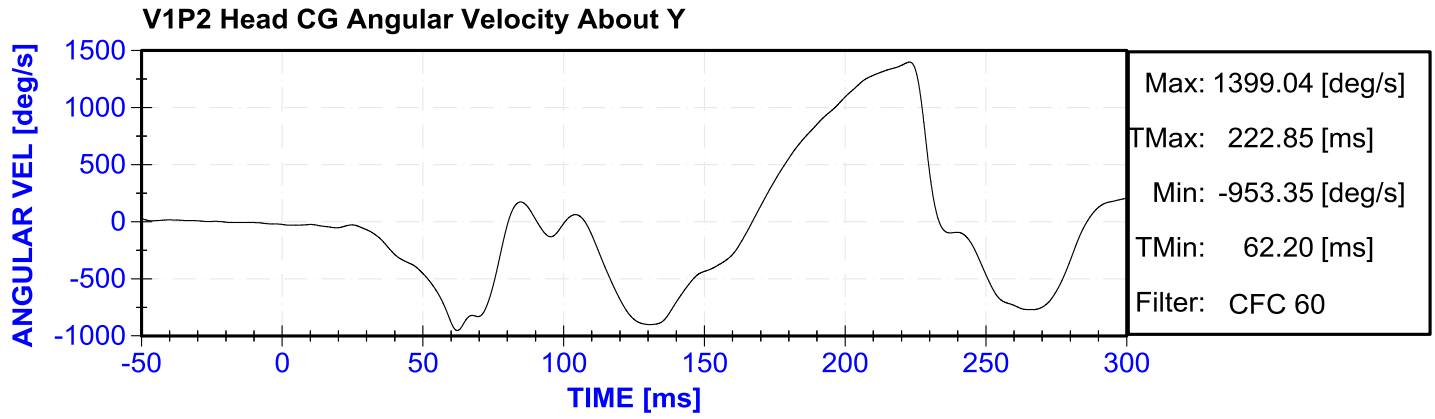

V1P2 Head CG Z Acceleration
ACCELERATION [g's]
TIME [ms]
Max: 19.85 [g's]
TMax: 24.70 [ms]
Min: -5.46 [g's]
TMin: 101.75 [ms]
Filter: CFC 1000

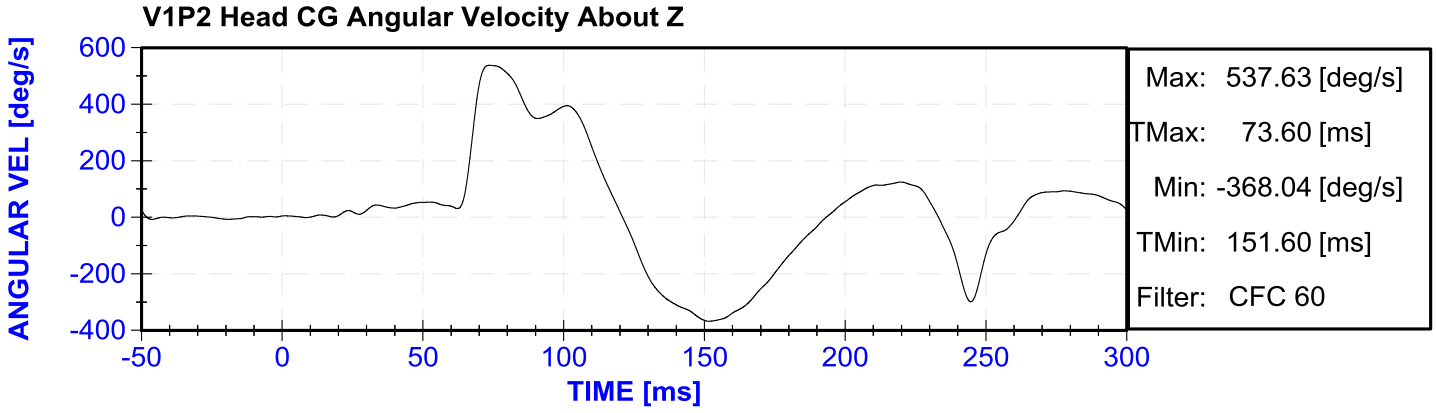

V1P2 Head Redundant X Acceleration
ACCELERATION [g's]
TIME [ms]
Max: 41.81 [g's]
TMax: 228.10 [ms]
Min: -66.01 [g's]
TMin: 83.90 [ms]
Filter: CFC 1000

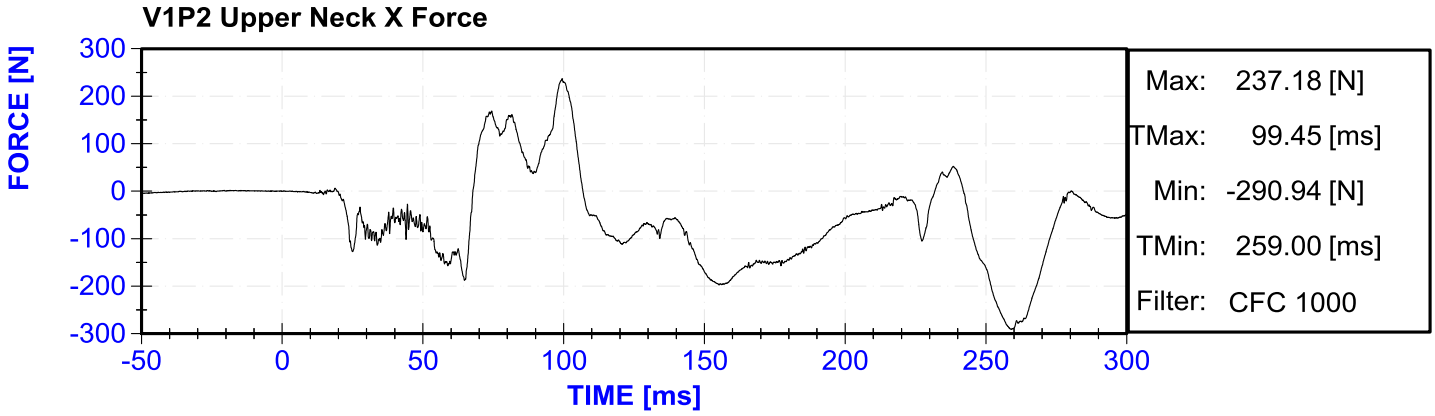

V1P2 Head Redundant Y Acceleration
ACCELERATION [g's]
TIME [ms]
Max: 13.63 [g's]
TMax: 81.40 [ms]
Min: -6.67 [g's]
TMin: 227.60 [ms]
Filter: CFC 1000

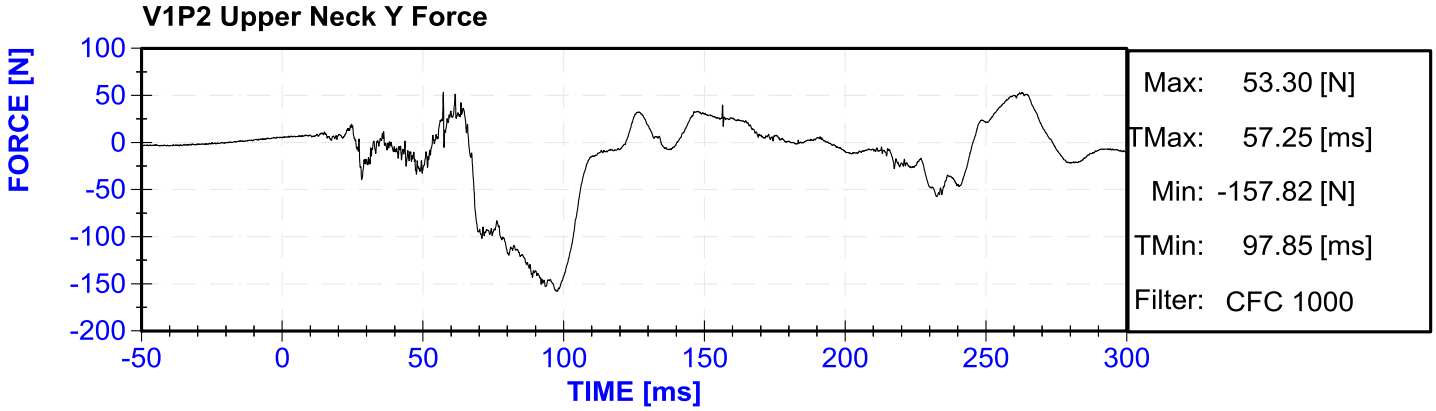

V1P2 Head Redundant Z Acceleration
ACCELERATION [g's]
25
20
15
10
5
0
-5
-10
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 20.34 [g's]
TMax: 24.80 [ms]
Min: -5.27 [g's]
TMin: 101.75 [ms]
Filter: CFC 1000

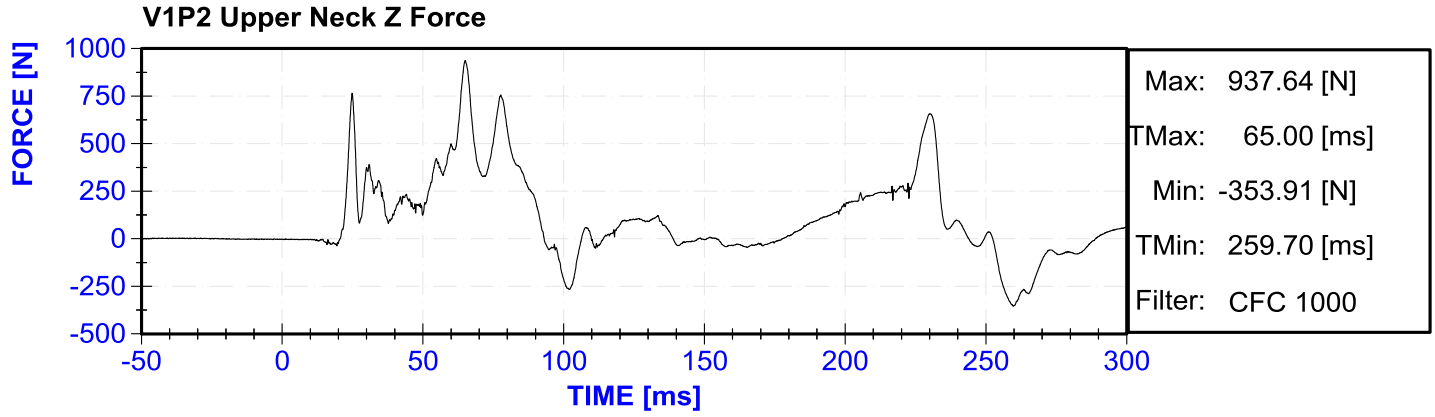

V1P2 Head CG Angular Velocity About X
ANGULAR VEL [deg/s]
300
200
100
0
-100
-200
-300
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 203.22 [deg/s]
TMax: 223.00 [ms]
Min: -263.17 [deg/s]
TMin: 61.25 [ms]
Filter: CFC 60

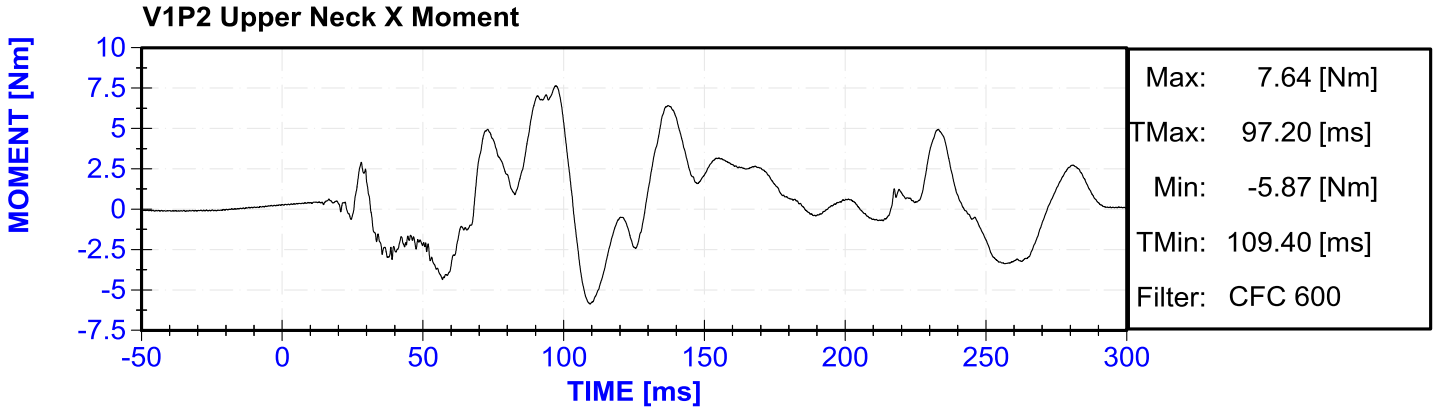

V1P2 Head CG Angular Velocity About Y
ANGULAR VEL [deg/s]
1500
1000
500
0
-500
-1000
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 1399.04 [deg/s]
TMax: 222.85 [ms]
Min: -953.35 [deg/s]
TMin: 62.20 [ms]
Filter: CFC 60

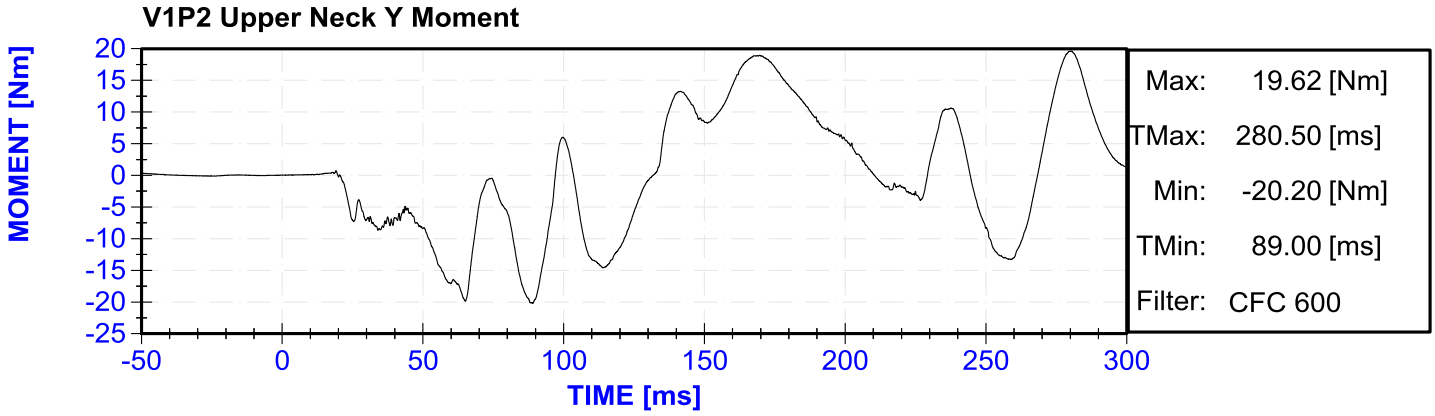

V1P2 Head CG Angular Velocity About Z
ANGULAR VEL [deg/s]
600
400
200
0
-200
-400
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 537.63 [deg/s]
TMax: 73.60 [ms]
Min: -368.04 [deg/s]
TMin: 151.60 [ms]
Filter: CFC 60

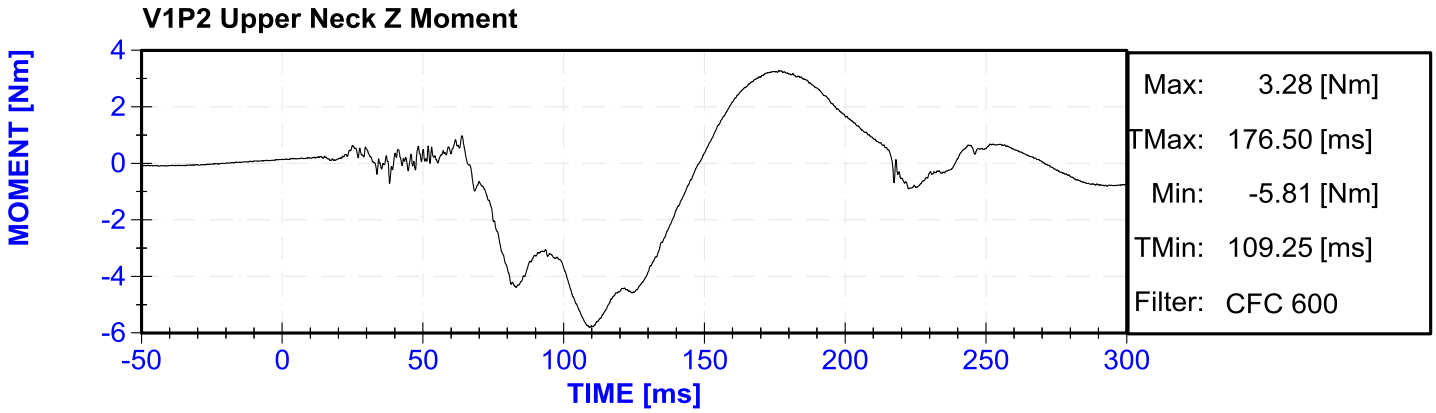

V1P2 Upper Neck X Force
FORCE [N]
300
200
100
0
-100
-200
-300
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 237.18 [N]
TMax: 99.45 [ms]
Min: -290.94 [N]
TMin: 259.00 [ms]
Filter: CFC 1000

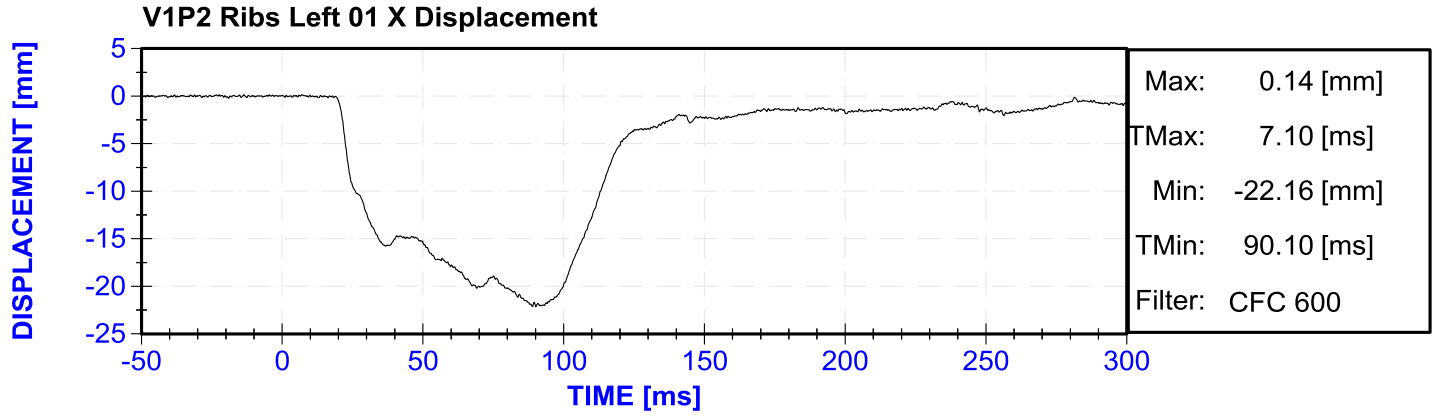

V1P2 Upper Neck Y Force
FORCE [N]
100
50
0
-50
-100
-150
-200
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 53.30 [N]
TMax: 57.25 [ms]
Min: -157.82 [N]
TMin: 97.85 [ms]
Filter: CFC 1000

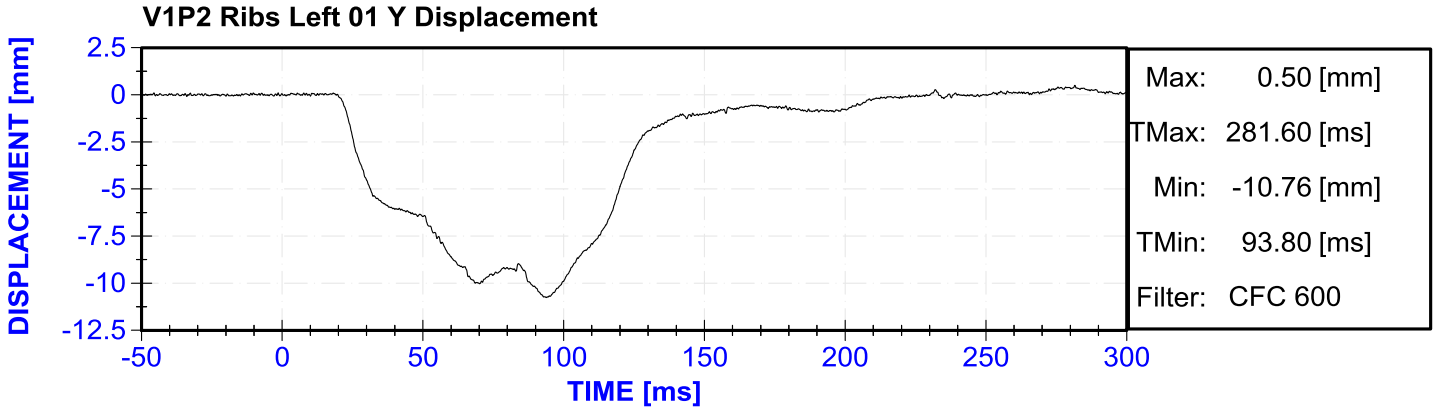

V1P2 Upper Neck Z Force
FORCE [N]
1000
750
500
250
0
-250
-500
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 937.64 [N]
TMax: 65.00 [ms]
Min: -353.91 [N]
TMin: 259.70 [ms]
Filter: CFC 1000

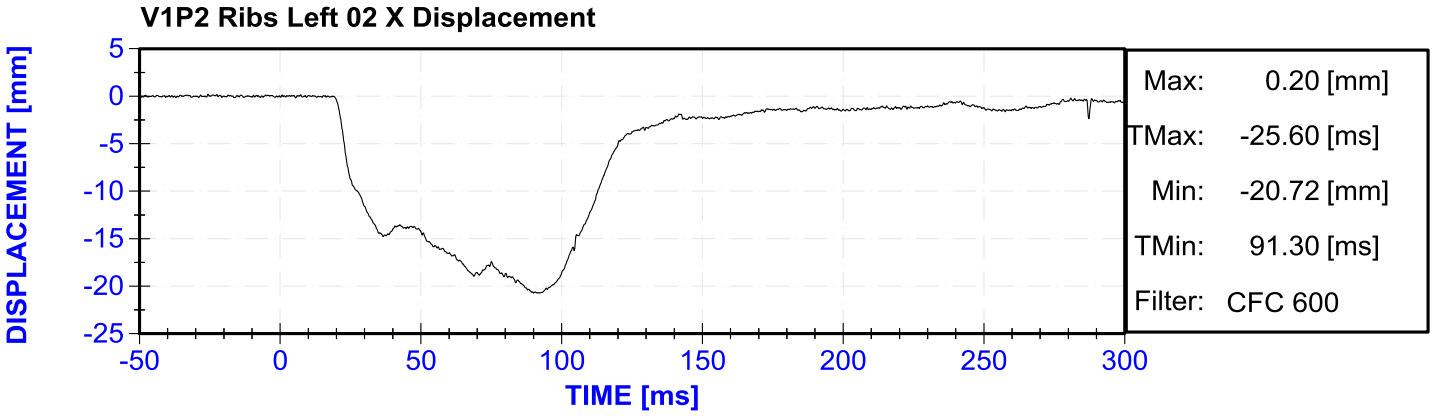

V1P2 Upper Neck X Moment
MOMENT [Nm]
10
7.5
5
2.5
0
-2.5
-5
-7.5
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 7.64 [Nm]
TMax: 97.20 [ms]
Min: -5.87 [Nm]
TMin: 109.40 [ms]
Filter: CFC 600

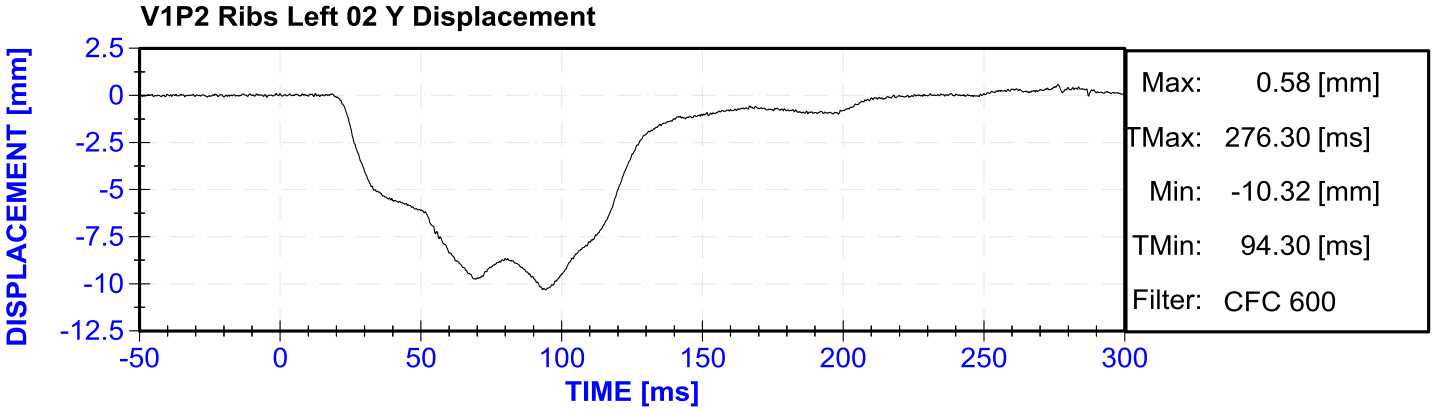

V1P2 Upper Neck Y Moment
MOMENT [Nm]
TIME [ms]
Max: 19.62 [Nm]
TMax: 280.50 [ms]
Min: -20.20 [Nm]
TMin: 89.00 [ms]
Filter: CFC 600

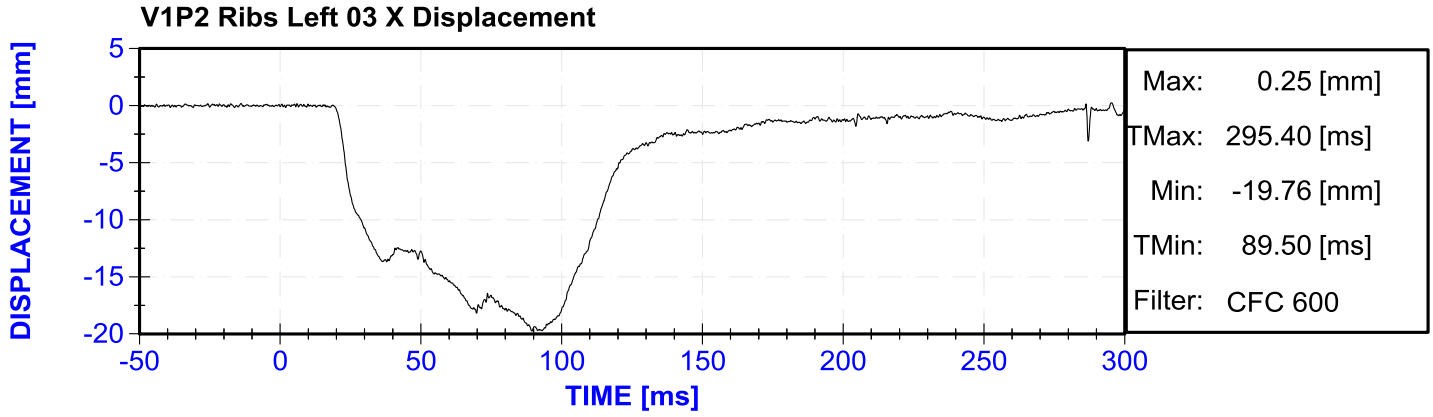

V1P2 Upper Neck Z Moment
MOMENT [Nm]
TIME [ms]
Max: 3.28 [Nm]
TMax: 176.50 [ms]
Min: -5.81 [Nm]
TMin: 109.25 [ms]
Filter: CFC 600

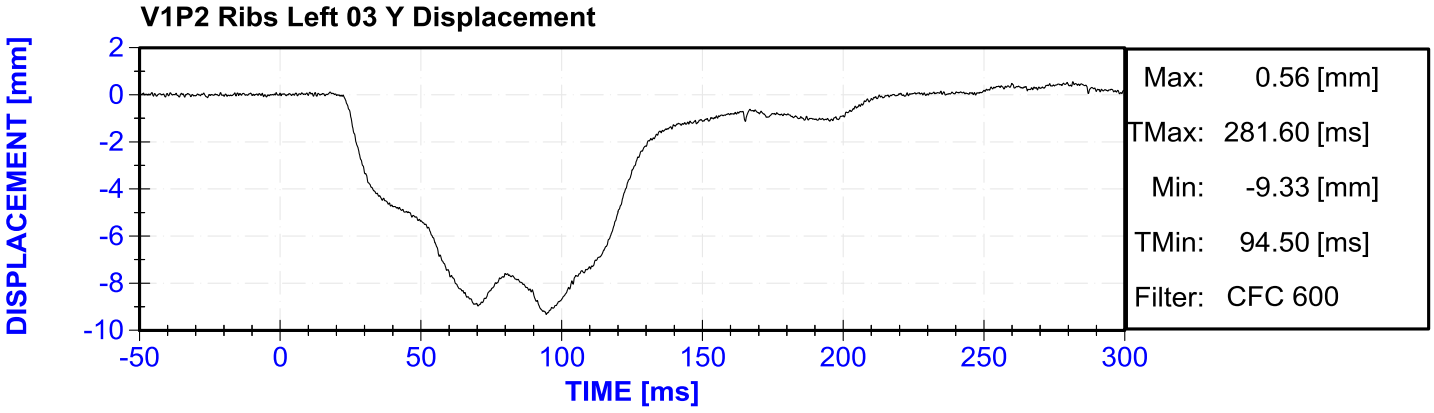

V1P2 Ribs Left 01 X Displacement
DISPLACEMENT [mm]
TIME [ms]
Max: 0.14 [mm]
TMax: 7.10 [ms]
Min: -22.16 [mm]
TMin: 90.10 [ms]
Filter: CFC 600

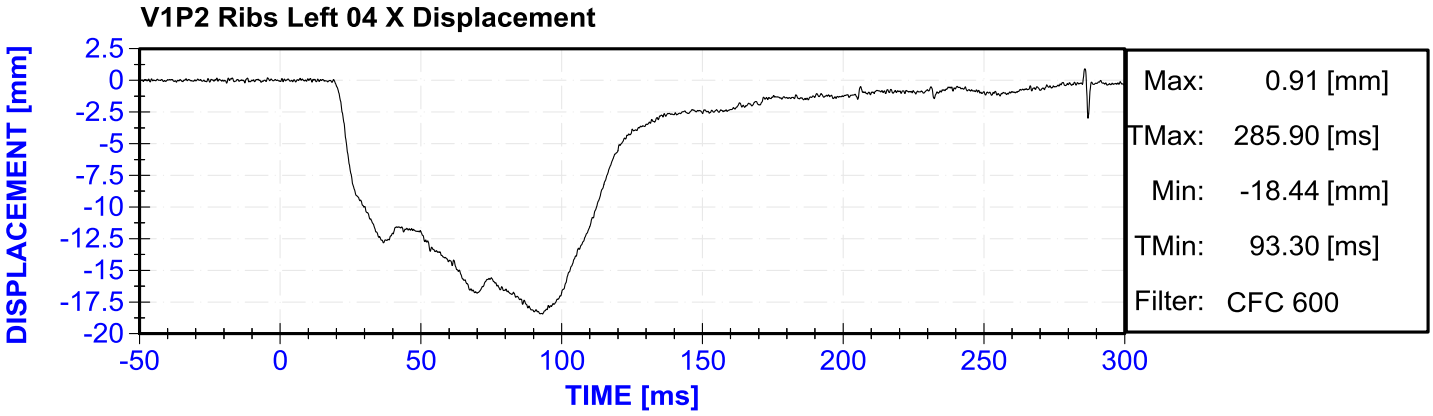

V1P2 Ribs Left 01 Y Displacement
DISPLACEMENT [mm]
TIME [ms]
Max: 0.50 [mm]
TMax: 281.60 [ms]
Min: -10.76 [mm]
TMin: 93.80 [ms]
Filter: CFC 600

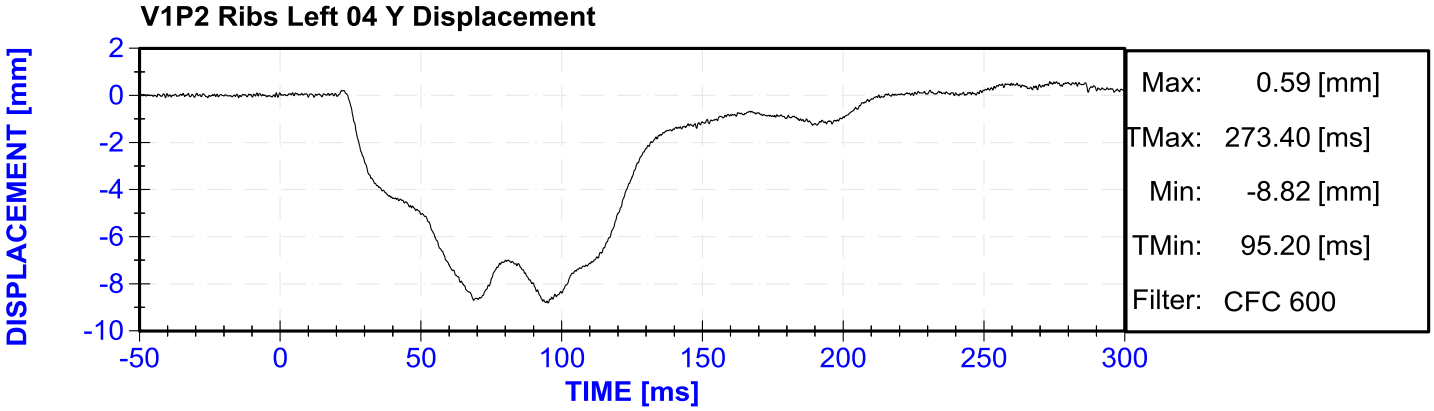

V1P2 Ribs Left 02 X Displacement
DISPLACEMENT [mm]
5
0
-5
-10
-15
-20
-25
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 0.20 [mm]
TMax: -25.60 [ms]
Min: -20.72 [mm]
TMin: 91.30 [ms]
Filter: CFC 600

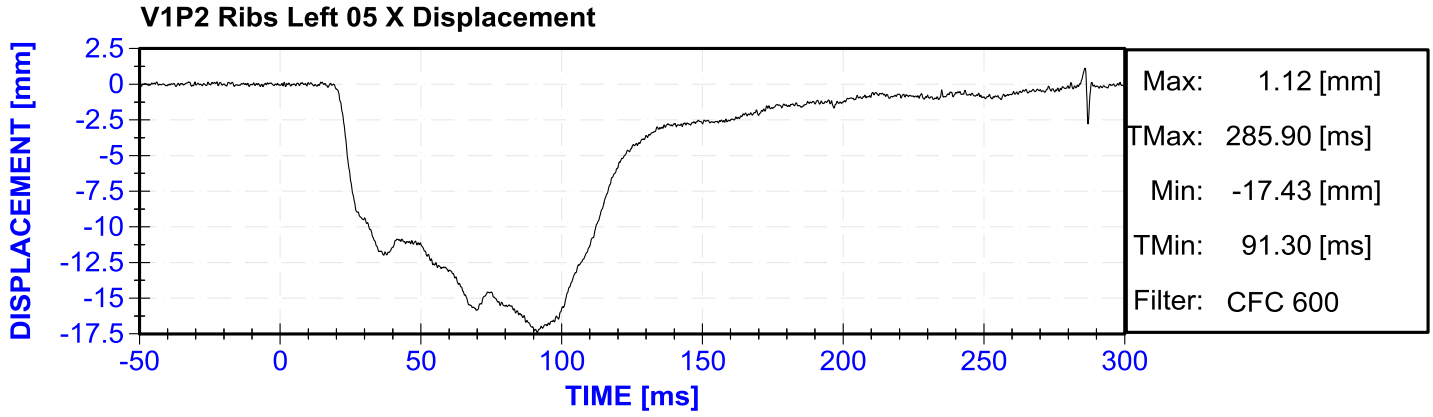

V1P2 Ribs Left 02 Y Displacement
DISPLACEMENT [mm]
2.5
0
-2.5
-5
-7.5
-10
-12.5
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 0.58 [mm]
TMax: 276.30 [ms]
Min: -10.32 [mm]
TMin: 94.30 [ms]
Filter: CFC 600

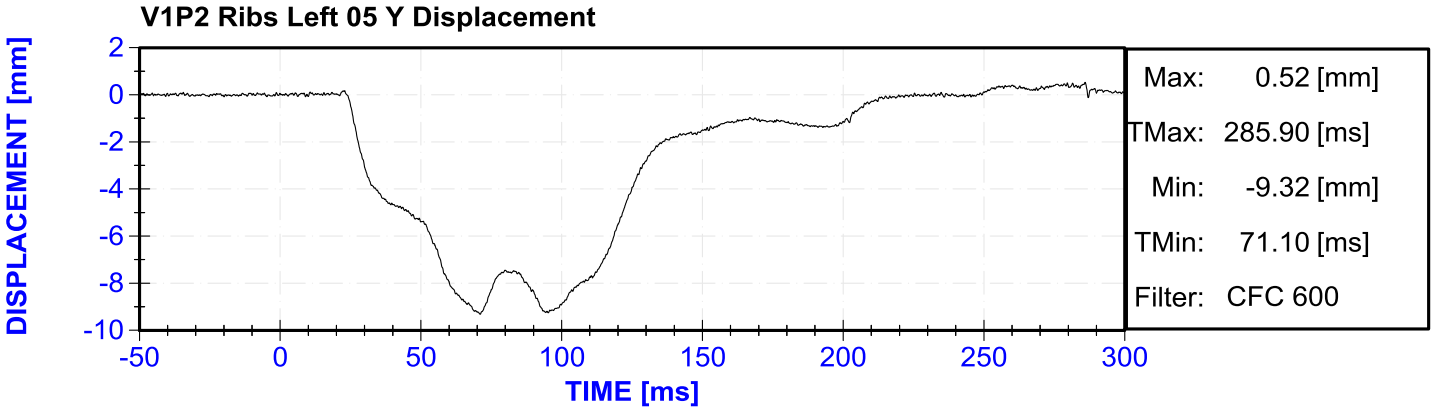

V1P2 Ribs Left 03 X Displacement
DISPLACEMENT [mm]
5
0
-5
-10
-15
-20
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 0.25 [mm]
TMax: 295.40 [ms]
Min: -19.76 [mm]
TMin: 89.50 [ms]
Filter: CFC 600

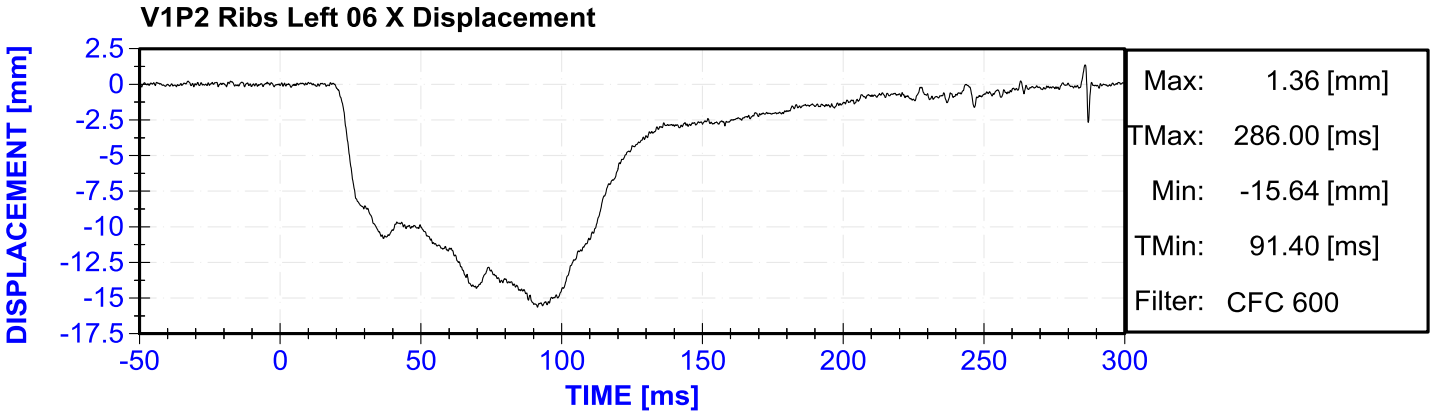

V1P2 Ribs Left 03 Y Displacement
DISPLACEMENT [mm]
2
0
-2
-4
-6
-8
-10
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 0.56 [mm]
TMax: 281.60 [ms]
Min: -9.33 [mm]
TMin: 94.50 [ms]
Filter: CFC 600

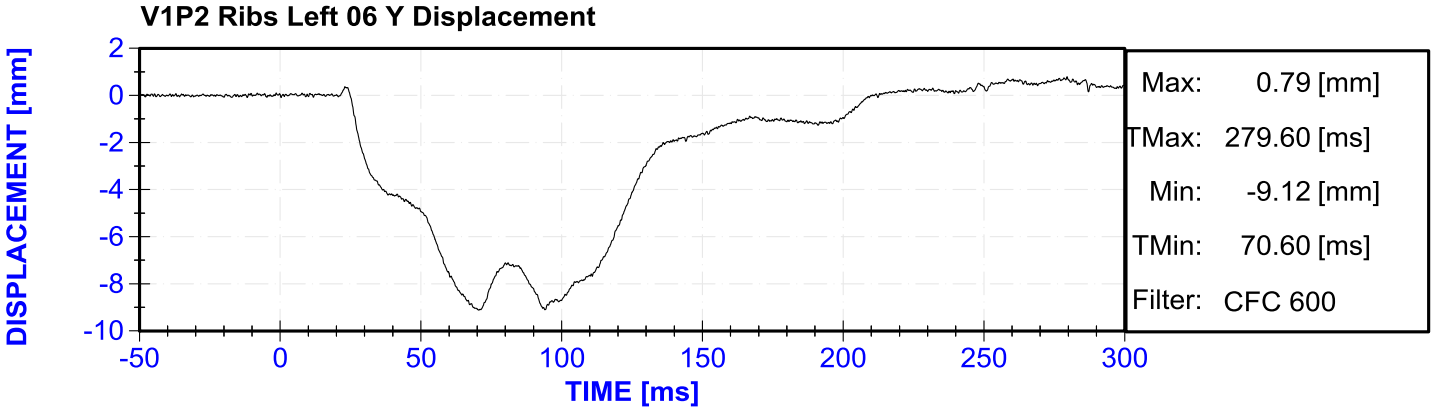

V1P2 Ribs Left 04 X Displacement
DISPLACEMENT [mm]
TIME [ms]
Max: 0.91 [mm]
TMax: 285.90 [ms]
Min: -18.44 [mm]
TMin: 93.30 [ms]
Filter: CFC 600

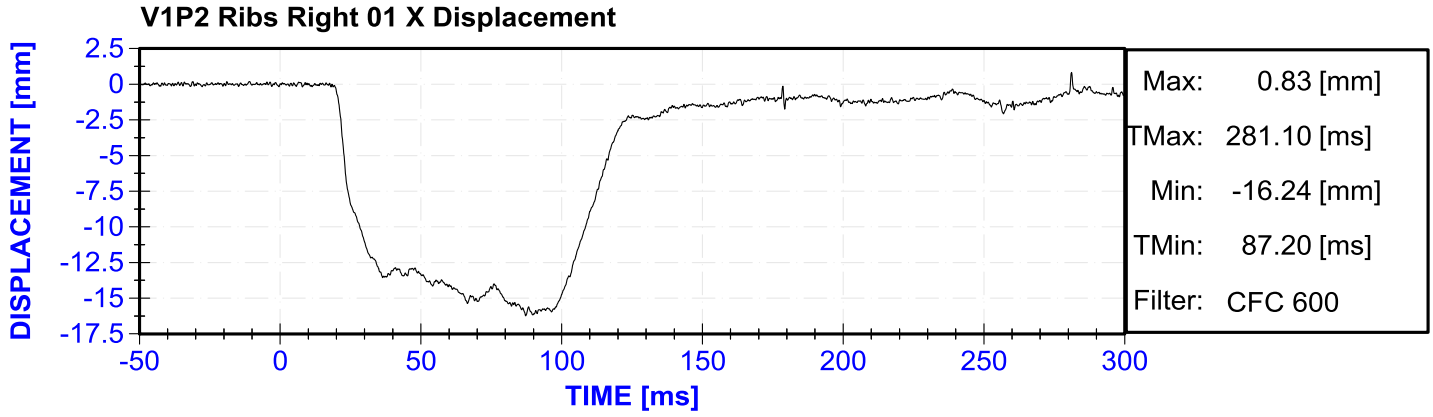

V1P2 Ribs Left 04 Y Displacement
DISPLACEMENT [mm]
TIME [ms]
Max: 0.59 [mm]
TMax: 273.40 [ms]
Min: -8.82 [mm]
TMin: 95.20 [ms]
Filter: CFC 600

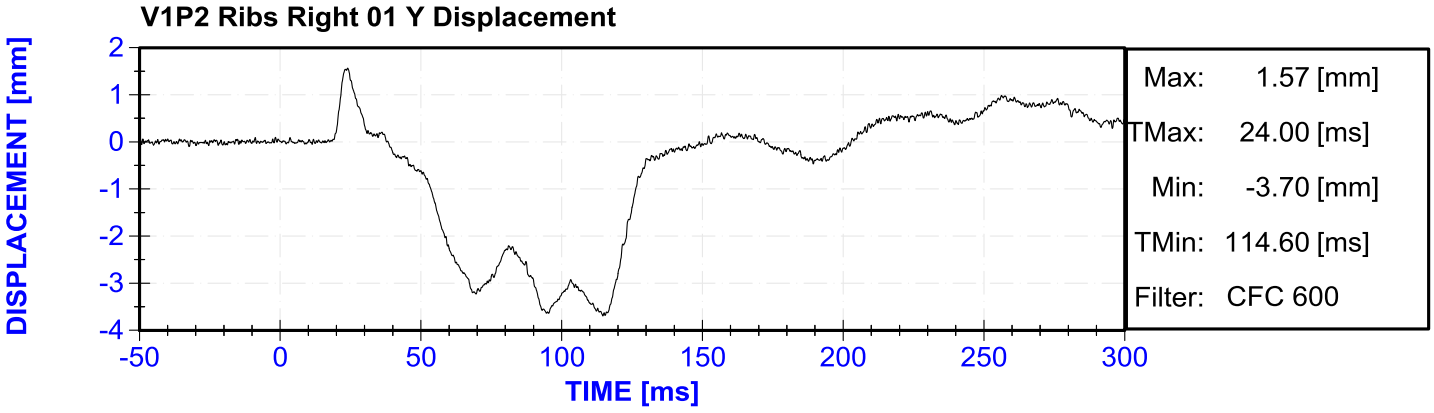

V1P2 Ribs Left 05 X Displacement
DISPLACEMENT [mm]
TIME [ms]
Max: 1.12 [mm]
TMax: 285.90 [ms]
Min: -17.43 [mm]
TMin: 91.30 [ms]
Filter: CFC 600

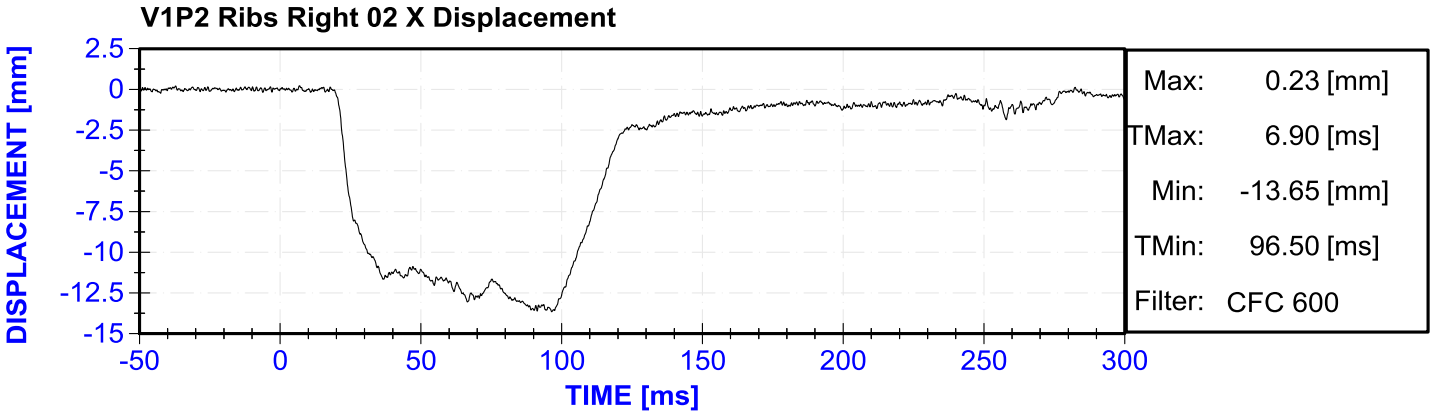

V1P2 Ribs Left 05 Y Displacement
DISPLACEMENT [mm]
TIME [ms]
Max: 0.52 [mm]
TMax: 285.90 [ms]
Min: -9.32 [mm]
TMin: 71.10 [ms]
Filter: CFC 600

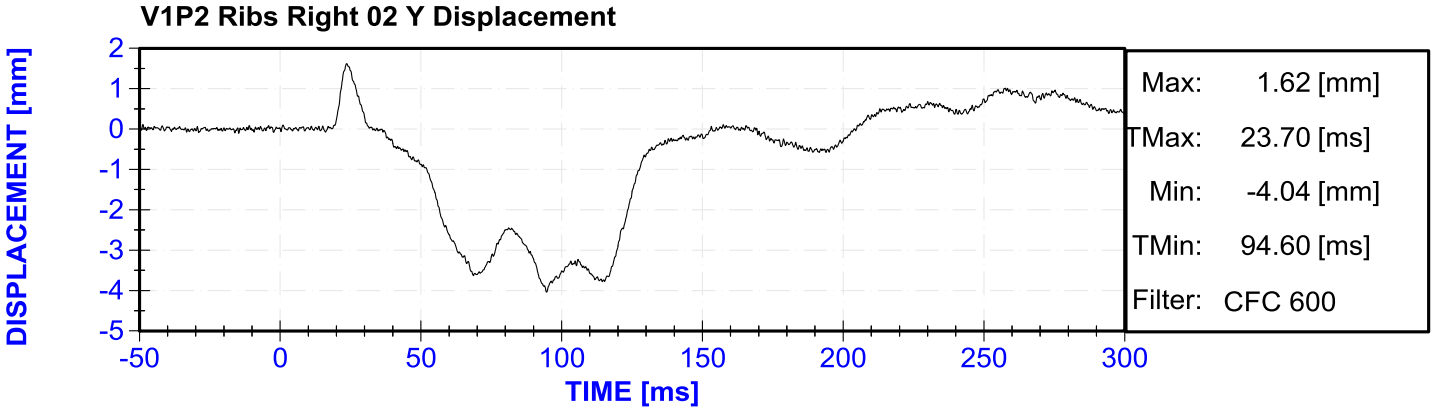

V1P2 Ribs Left 06 X Displacement
DISPLACEMENT [mm]
TIME [ms]
Max: 1.36 [mm]
TMax: 286.00 [ms]
Min: -15.64 [mm]
TMin: 91.40 [ms]
Filter: CFC 600

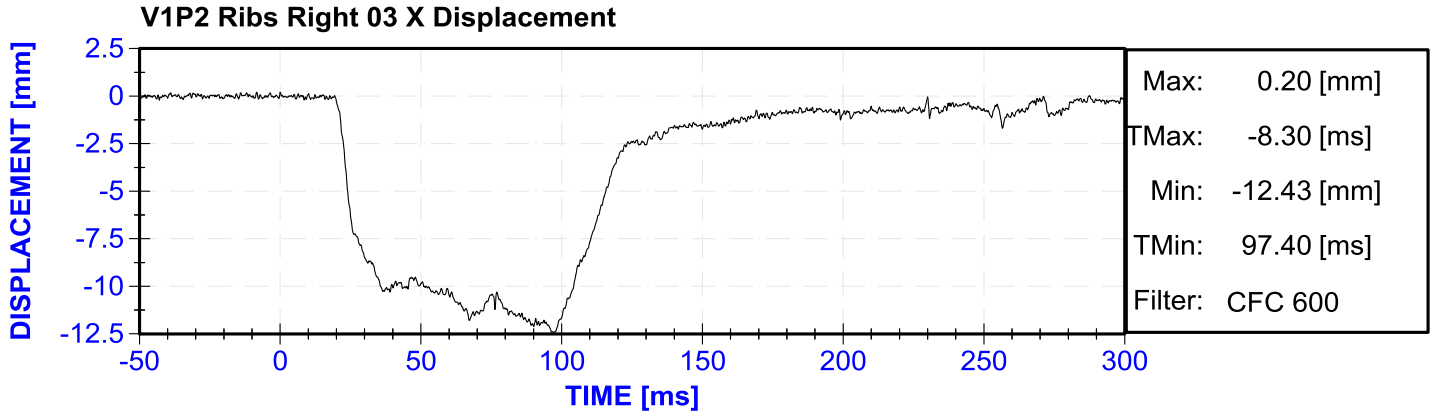

V1P2 Ribs Left 06 Y Displacement
DISPLACEMENT [mm]
TIME [ms]
Max: 0.79 [mm]
TMax: 279.60 [ms]
Min: -9.12 [mm]
TMin: 70.60 [ms]
Filter: CFC 600

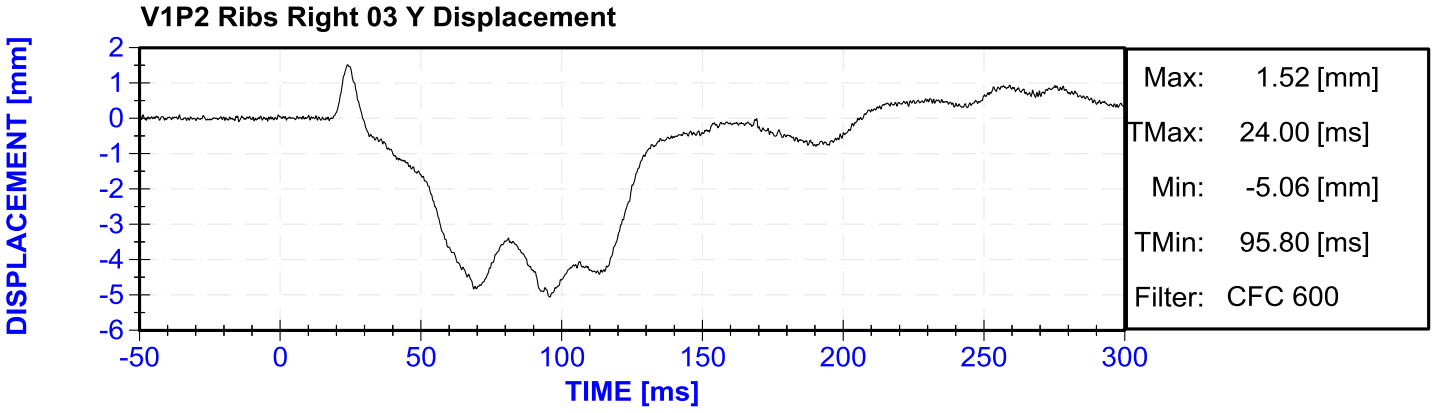

V1P2 Ribs Right 01 X Displacement
DISPLACEMENT [mm]
TIME [ms]
Max: 0.83 [mm]
TMax: 281.10 [ms]
Min: -16.24 [mm]
TMin: 87.20 [ms]
Filter: CFC 600

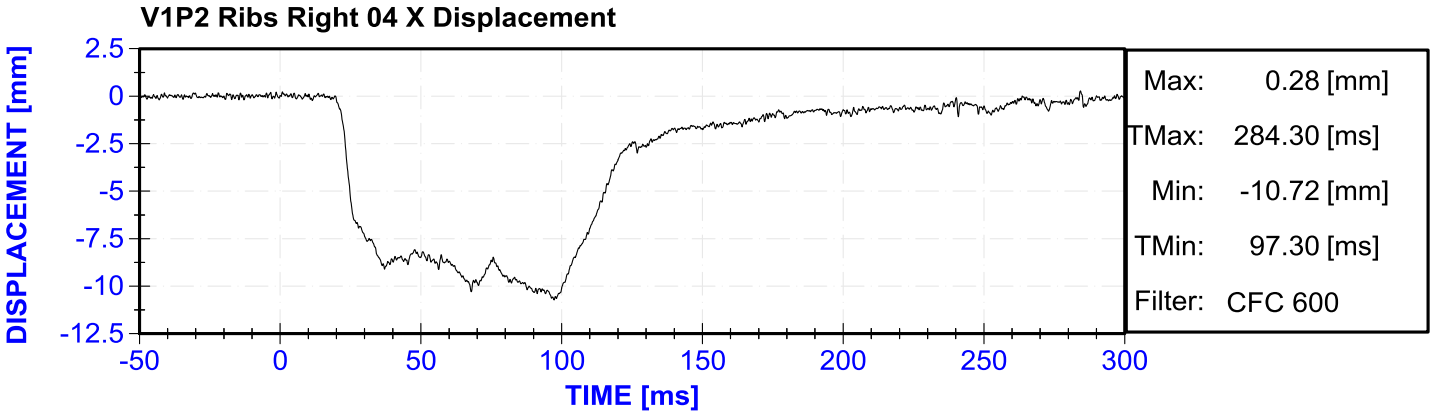

V1P2 Ribs Right 01 Y Displacement
DISPLACEMENT [mm]
TIME [ms]
Max: 1.57 [mm]
TMax: 24.00 [ms]
Min: -3.70 [mm]
TMin: 114.60 [ms]
Filter: CFC 600

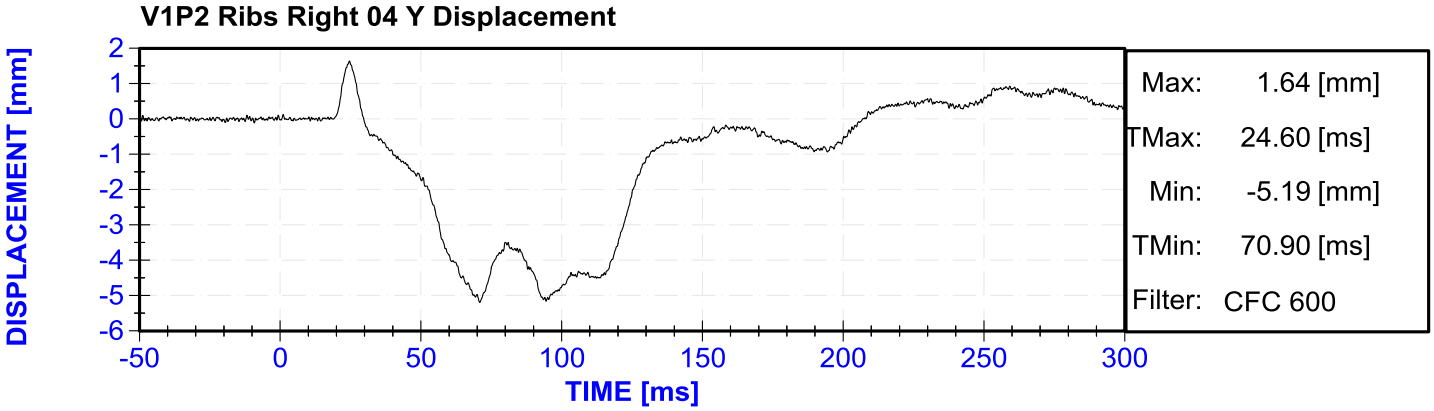

V1P2 Ribs Right 02 X Displacement
DISPLACEMENT [mm]
TIME [ms]
Max: 0.23 [mm]
TMax: 6.90 [ms]
Min: -13.65 [mm]
TMin: 96.50 [ms]
Filter: CFC 600

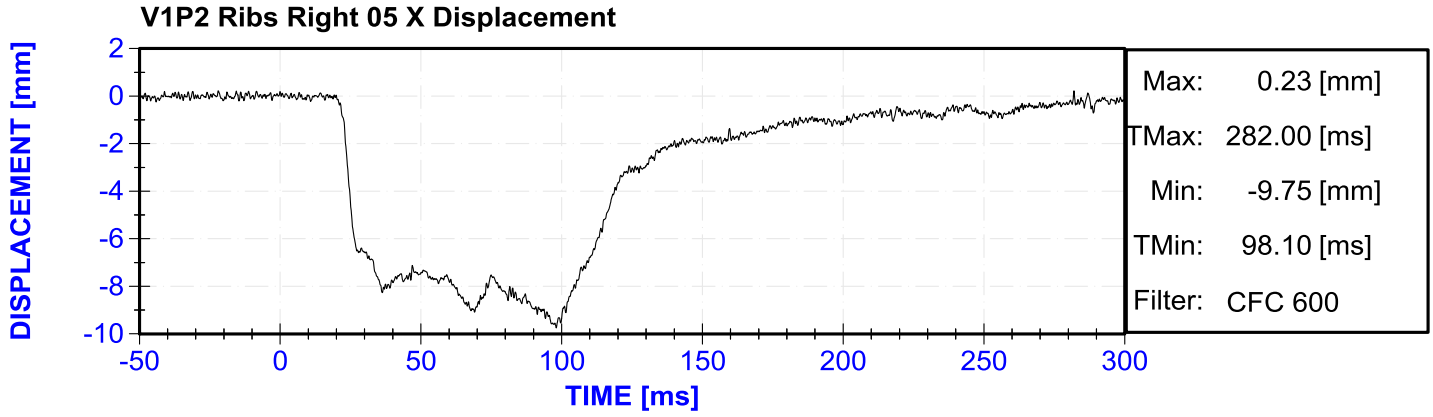

V1P2 Ribs Right 02 Y Displacement
DISPLACEMENT [mm]
TIME [ms]
Max: 1.62 [mm]
TMax: 23.70 [ms]
Min: -4.04 [mm]
TMin: 94.60 [ms]
Filter: CFC 600

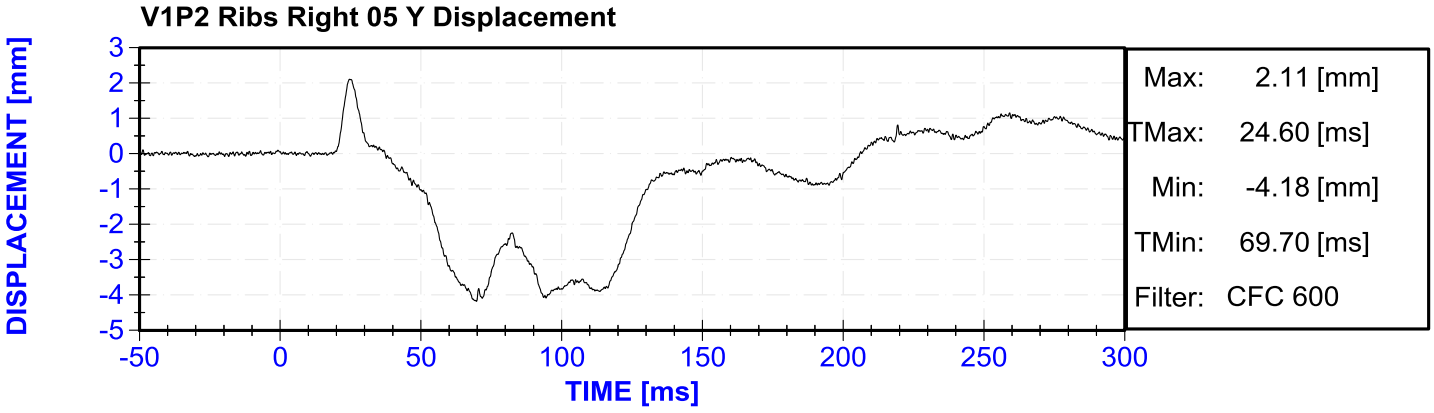

V1P2 Ribs Right 03 X Displacement
DISPLACEMENT [mm]
TIME [ms]
Max: 0.20 [mm]
TMax: -8.30 [ms]
Min: -12.43 [mm]
TMin: 97.40 [ms]
Filter: CFC 600


V1P2 Ribs Right 03 Y Displacement
DISPLACEMENT [mm]
TIME [ms]
Max: 1.52 [mm]
TMax: 24.00 [ms]
Min: -5.06 [mm]
TMin: 95.80 [ms]
Filter: CFC 600


V1P2 Ribs Right 04 X Displacement
DISPLACEMENT [mm]
2.5
0
-2.5
-5
-7.5
-10
-12.5
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 0.28 [mm]
TMax: 284.30 [ms]
Min: -10.72 [mm]
TMin: 97.30 [ms]
Filter: CFC 600

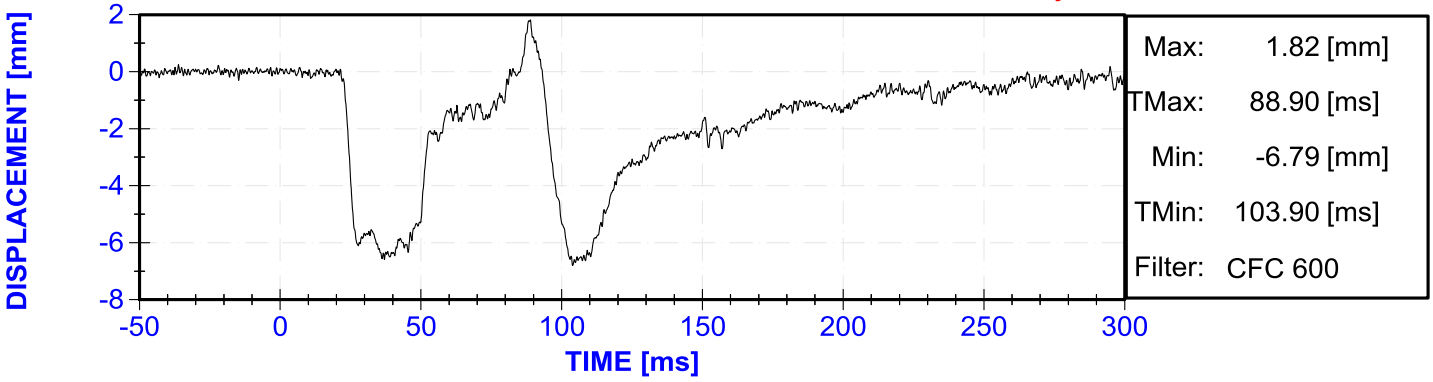

V1P2 Ribs Right 04 Y Displacement
DISPLACEMENT [mm]
2
1
0
-1
-2
-3
-4
-5
-6
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 1.64 [mm]
TMax: 24.60 [ms]
Min: -5.19 [mm]
TMin: 70.90 [ms]
Filter: CFC 600


V1P2 Ribs Right 05 X Displacement
DISPLACEMENT [mm]
2
0
-2
-4
-6
-8
-10
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 0.23 [mm]
TMax: 282.00 [ms]
Min: -9.75 [mm]
TMin: 98.10 [ms]
Filter: CFC 600

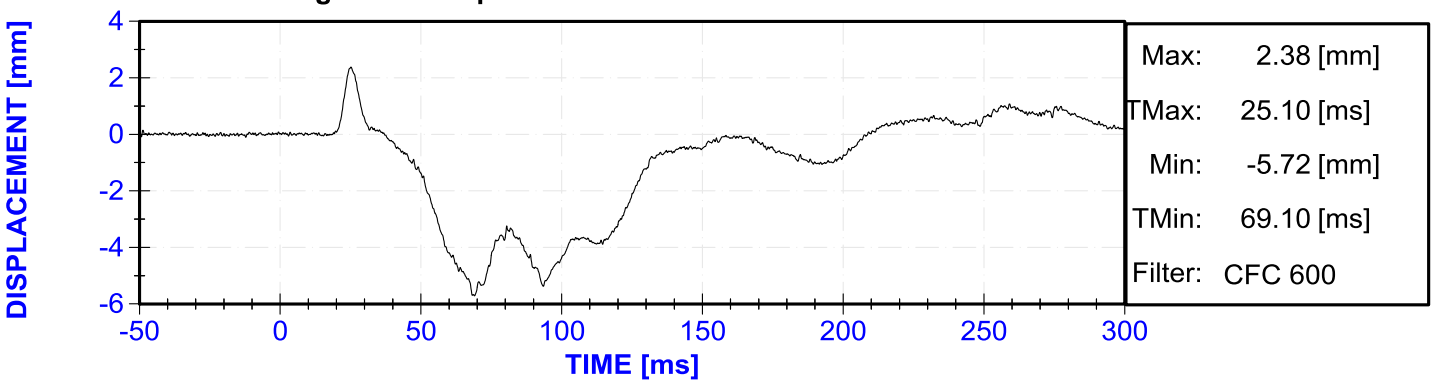

V1P2 Ribs Right 05 Y Displacement
DISPLACEMENT [mm]
3
2
1
0
-1
-2
-3
-4
-5
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 2.11 [mm]
TMax: 24.60 [ms]
Min: -4.18 [mm]
TMin: 69.70 [ms]
Filter: CFC 600

V1P2 Ribs Right 06 X Displacement

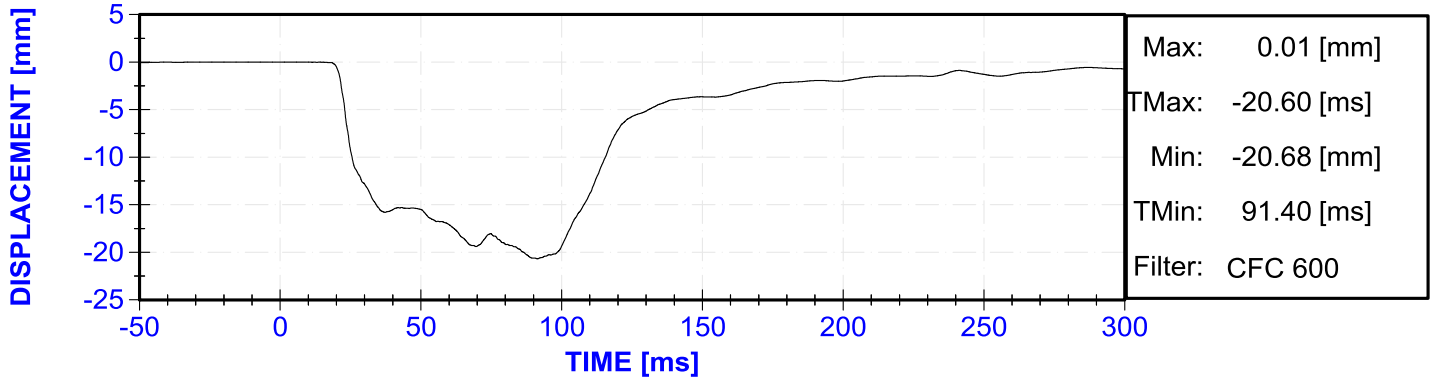
Interference by Chest Pot or Abdominal Insert



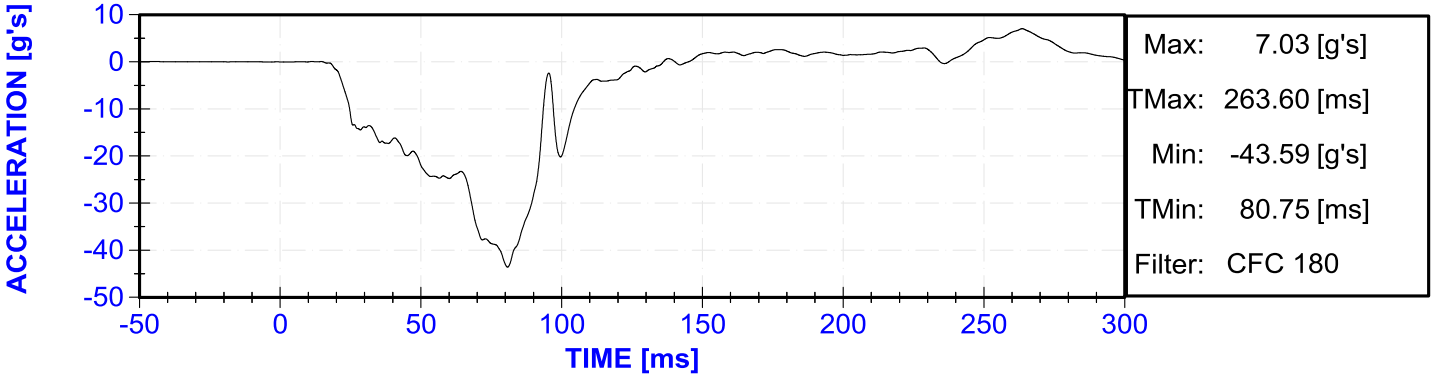
V1P2 Ribs Right 06 Y Displacement

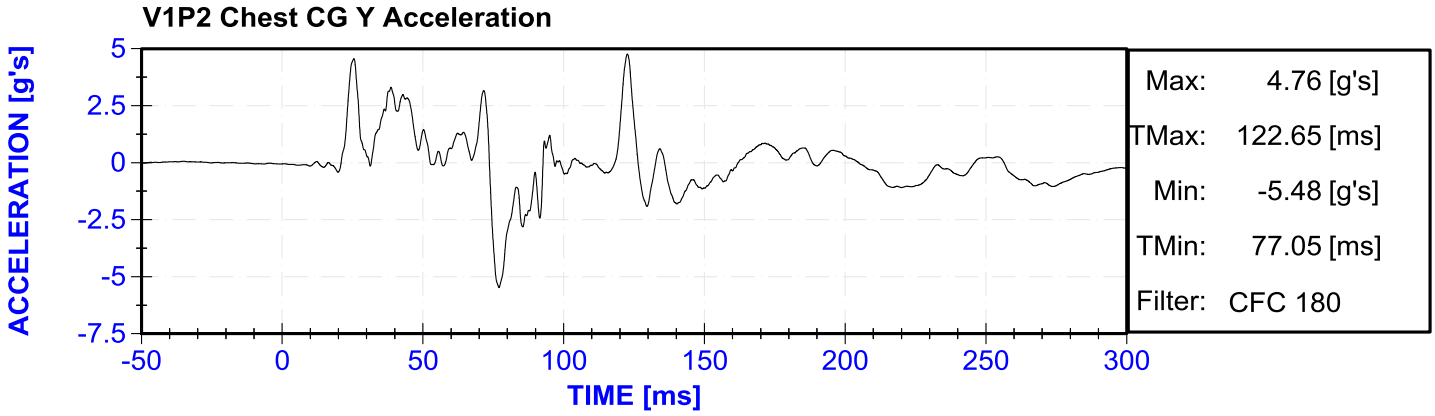


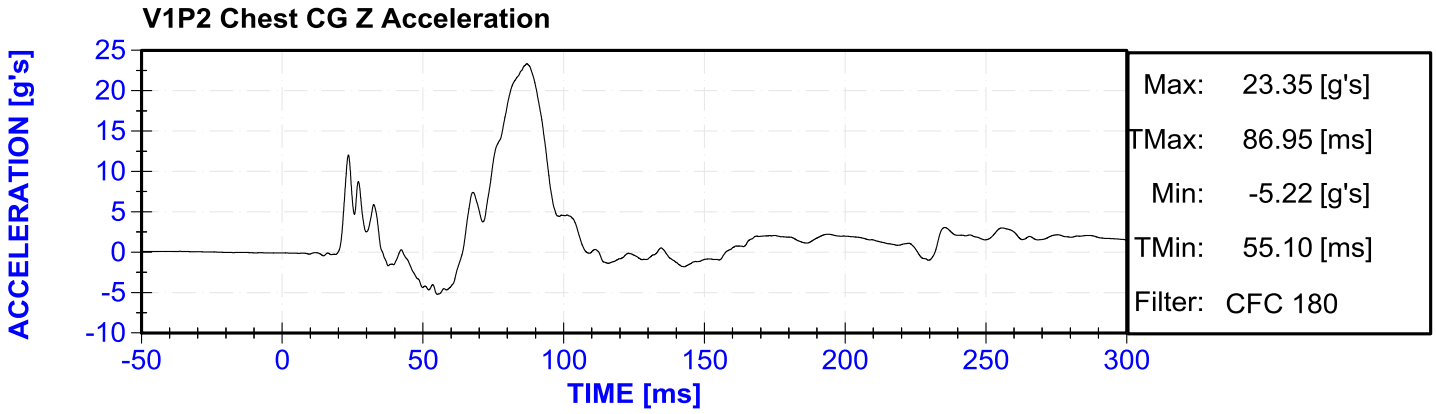
V1P2 Chest X Displacement

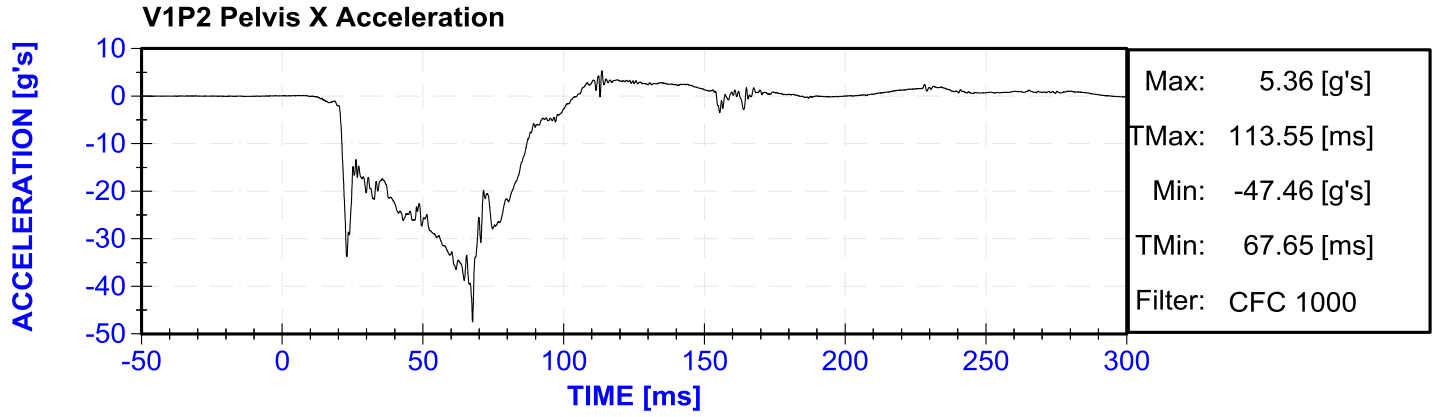


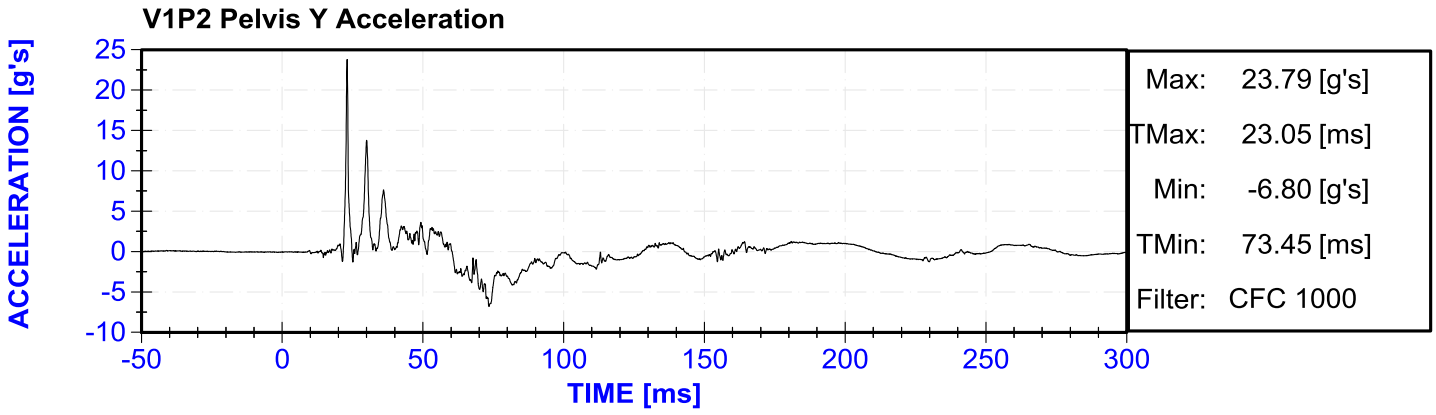
V1P2 Chest CG X Acceleration



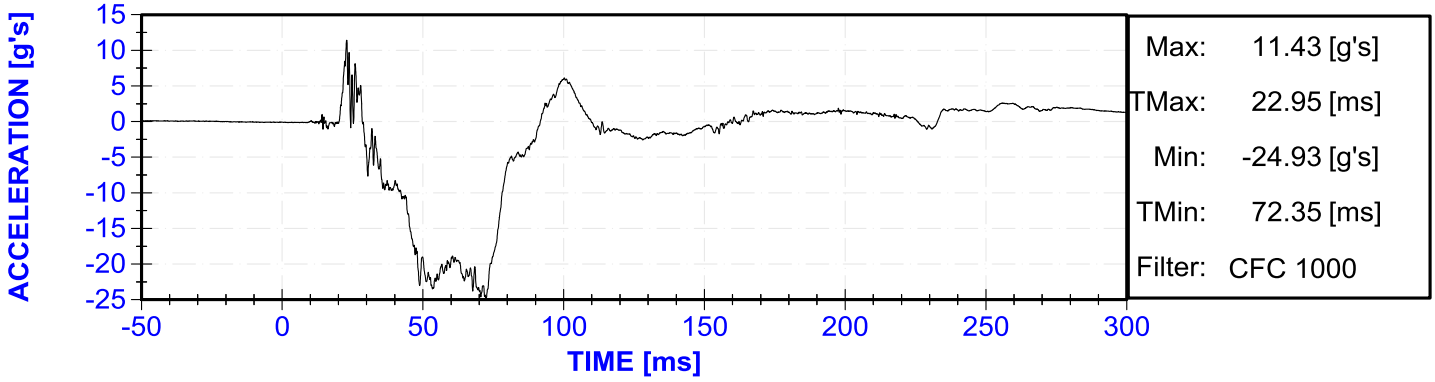

V1P2 Chest CG Y Acceleration
ACCELERATION [g's]
TIME [ms]
Max: 4.76 [g's]
TMax: 122.65 [ms]
Min: -5.48 [g's]
TMin: 77.05 [ms]
Filter: CFC 180


V1P2 Chest CG Z Acceleration
ACCELERATION [g's]
TIME [ms]
Max: 23.35 [g's]
TMax: 86.95 [ms]
Min: -5.22 [g's]
TMin: 55.10 [ms]
Filter: CFC 180

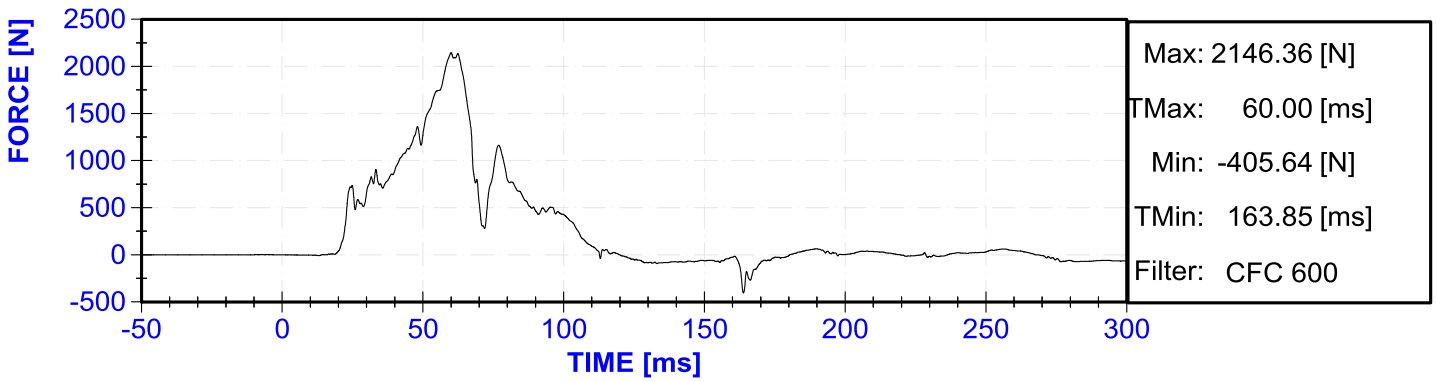

V1P2 Pelvis X Acceleration
ACCELERATION [g's]
TIME [ms]
Max: 5.36 [g's]
TMax: 113.55 [ms]
Min: -47.46 [g's]
TMin: 67.65 [ms]
Filter: CFC 1000


V1P2 Pelvis Y Acceleration
ACCELERATION [g's]
TIME [ms]
Max: 23.79 [g's]
TMax: 23.05 [ms]
Min: -6.80 [g's]
TMin: 73.45 [ms]
Filter: CFC 1000

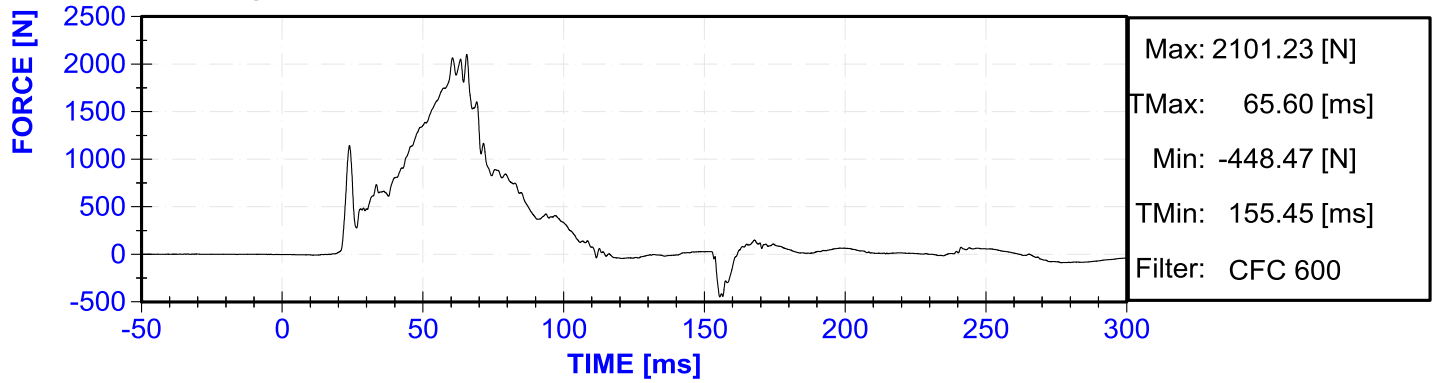
V1P2 Pelvis Z Acceleration



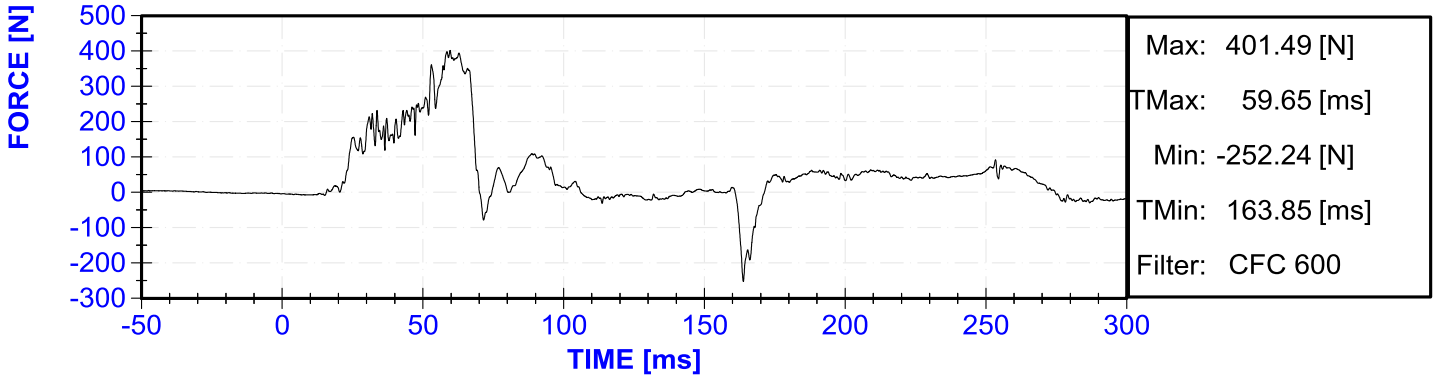
V1P2 Left Femur Z Force



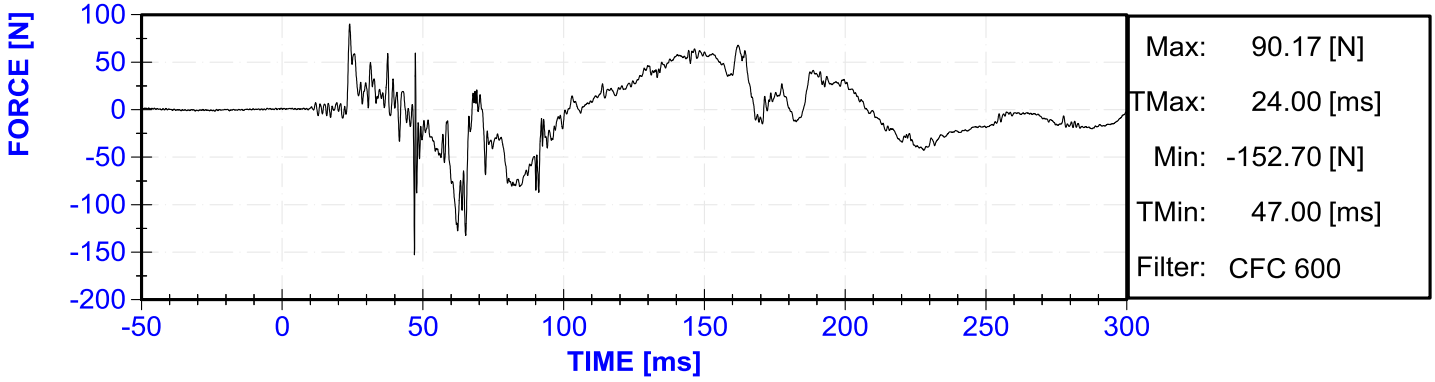
V1P2 Right Femur Z Force



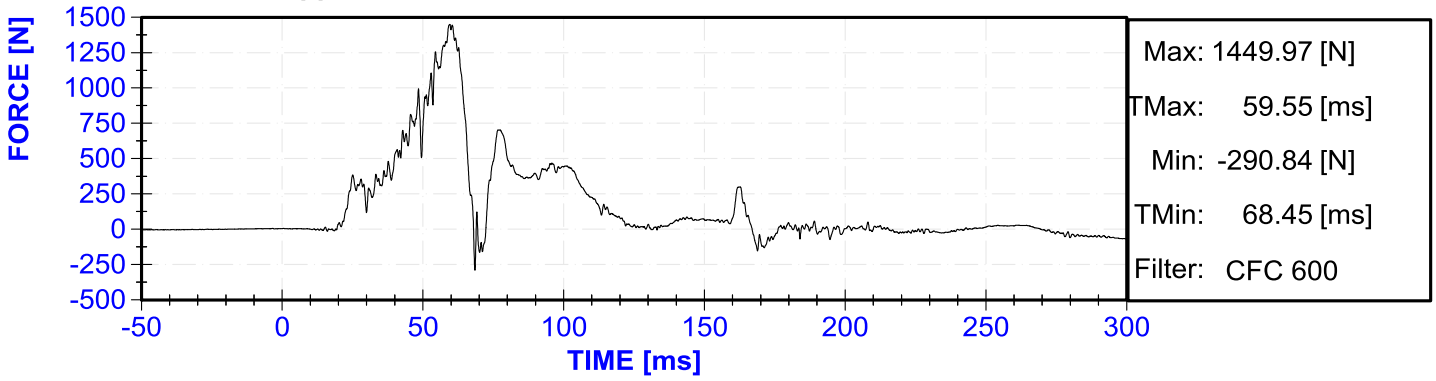
V1P2 Left Upper Tibia X Force



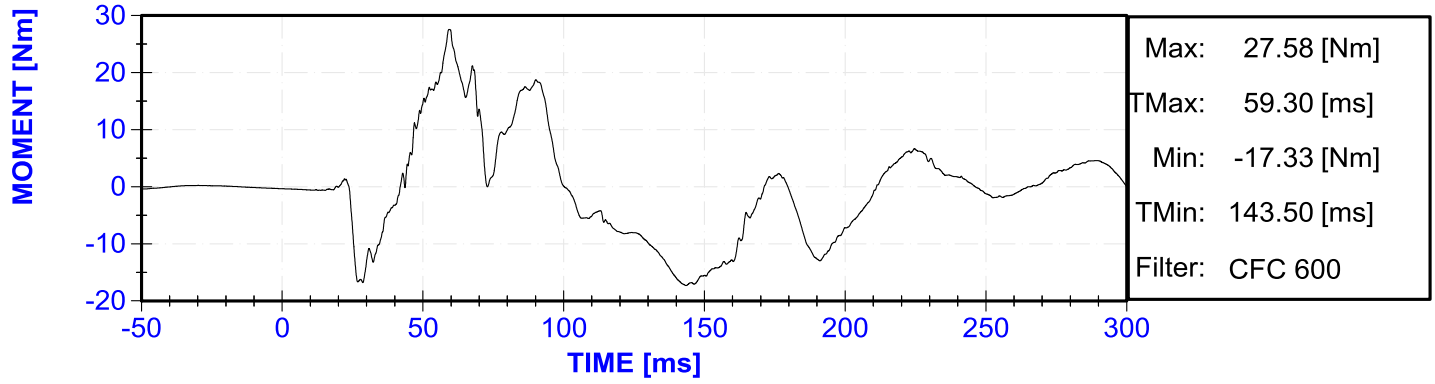
V1P2 Left Upper Tibia Y Force



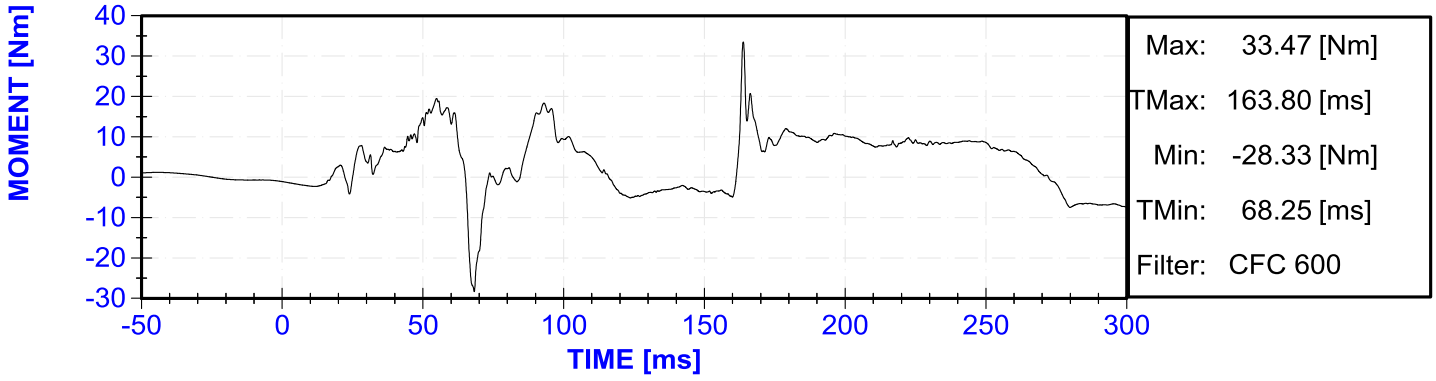
V1P2 Left Upper Tibia Z Force

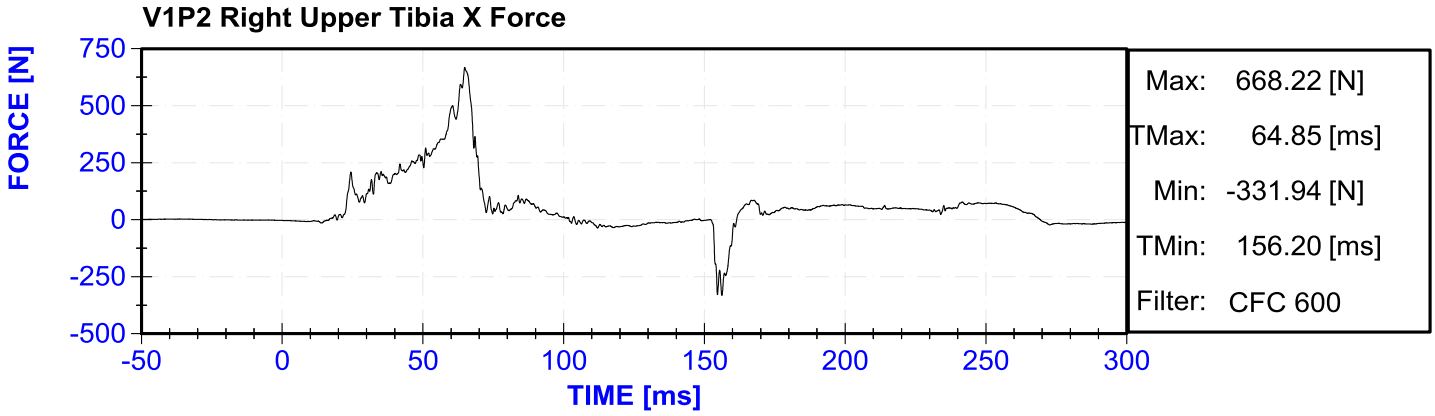


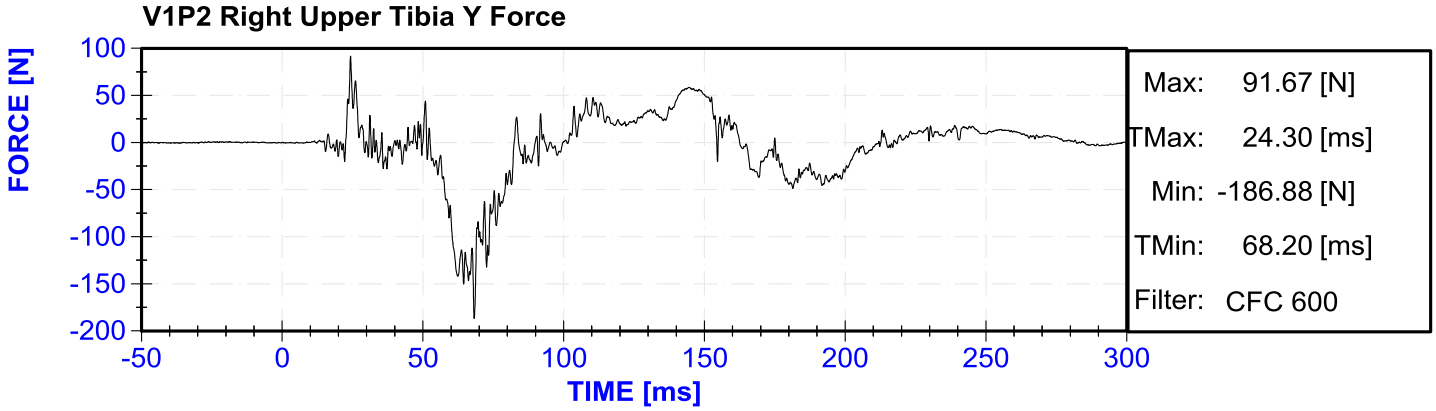
V1P2 Left Upper Tibia X Moment

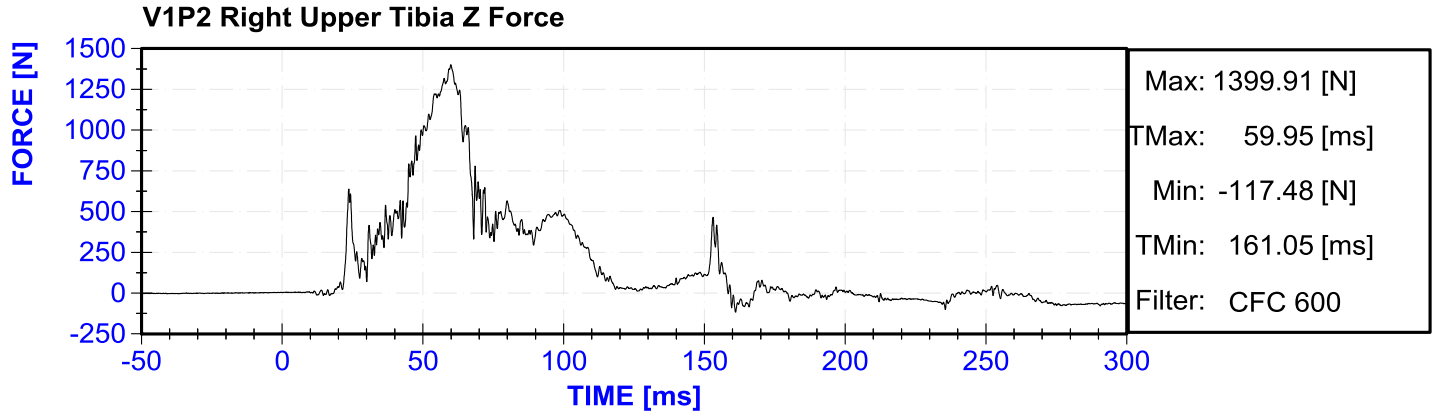


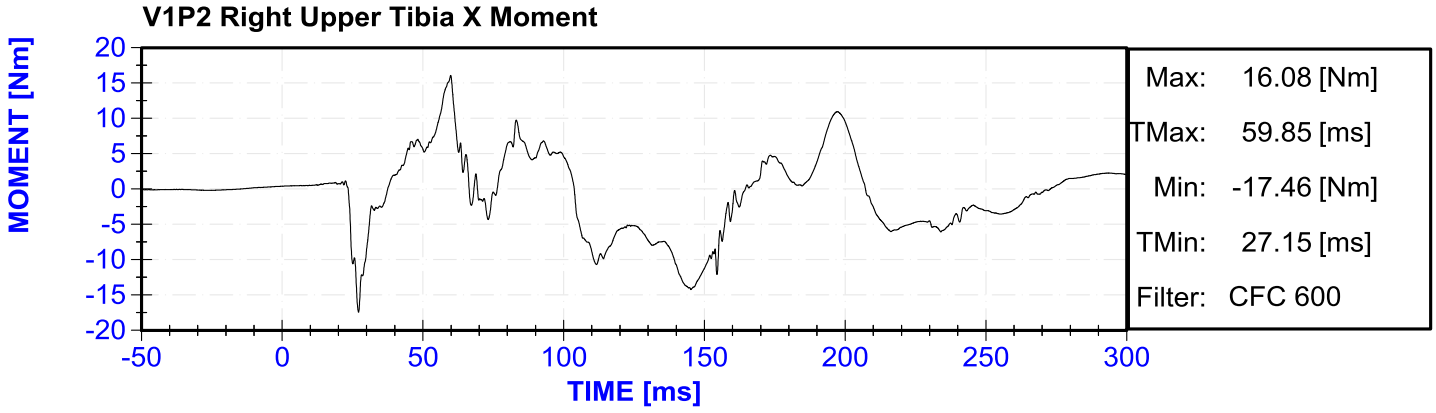
V1P2 Left Upper Tibia Y Moment



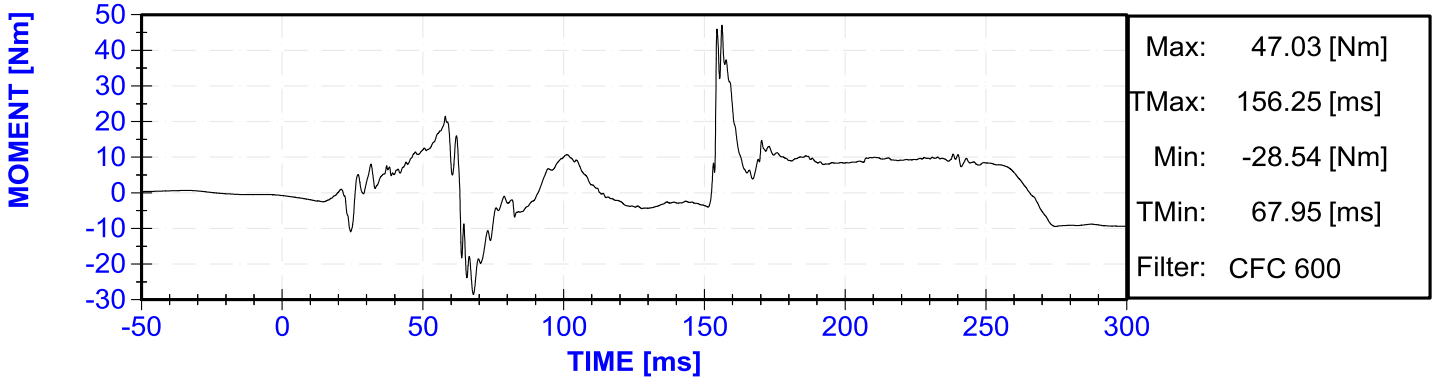

V1P2 Right Upper Tibia X Force
FORCE [N]
750
500
250
0
-250
-500
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 668.22 [N]
TMax: 64.85 [ms]
Min: -331.94 [N]
TMin: 156.20 [ms]
Filter: CFC 600


V1P2 Right Upper Tibia Y Force
FORCE [N]
100
50
0
-50
-100
-150
-200
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 91.67 [N]
TMax: 24.30 [ms]
Min: -186.88 [N]
TMin: 68.20 [ms]
Filter: CFC 600

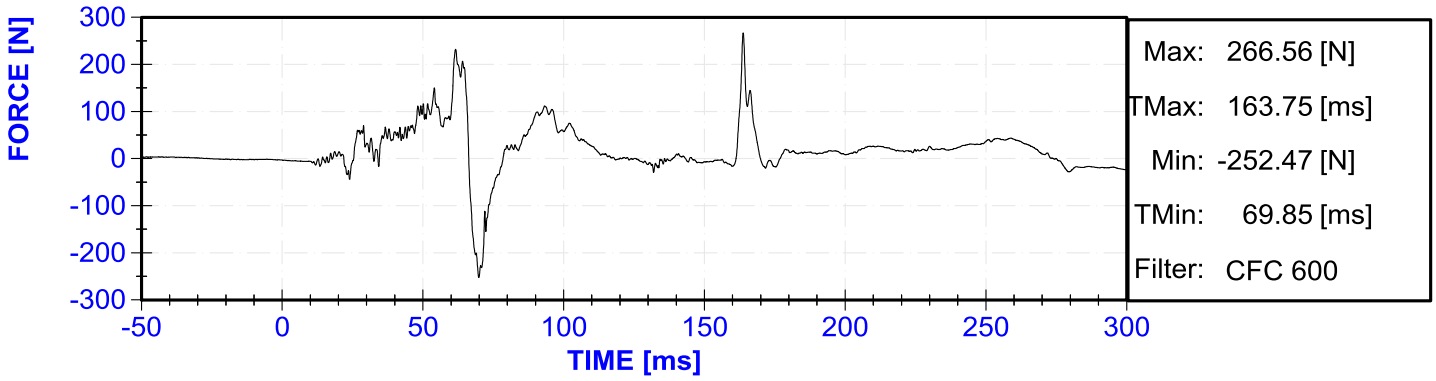

V1P2 Right Upper Tibia Z Force
FORCE [N]
1500
1250
1000
750
500
250
0
-250
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 1399.91 [N]
TMax: 59.95 [ms]
Min: -117.48 [N]
TMin: 161.05 [ms]
Filter: CFC 600


V1P2 Right Upper Tibia X Moment
MOMENT [Nm]
20
15
10
5
0
-5
-10
-15
-20
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 16.08 [Nm]
TMax: 59.85 [ms]
Min: -17.46 [Nm]
TMin: 27.15 [ms]
Filter: CFC 600

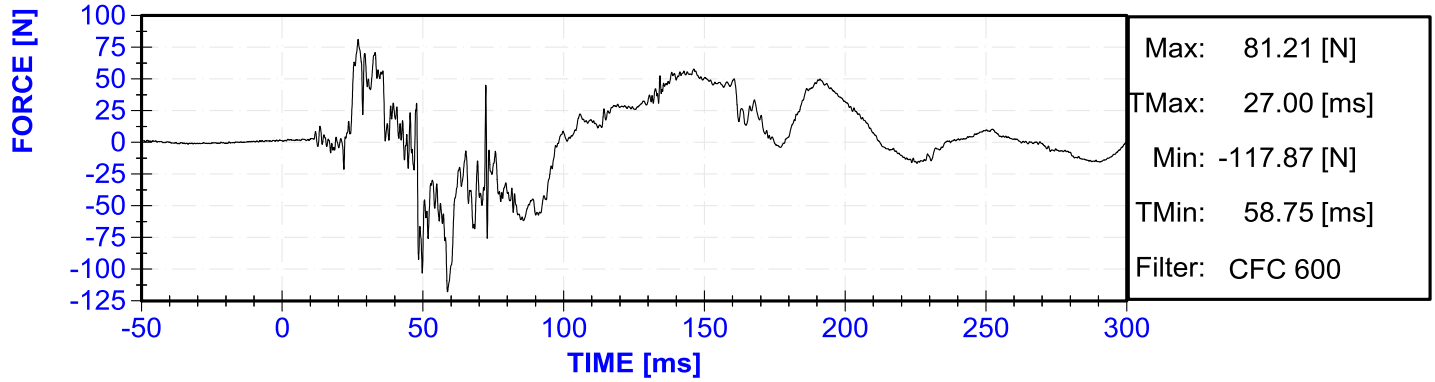
V1P2 Right Upper Tibia Y Moment



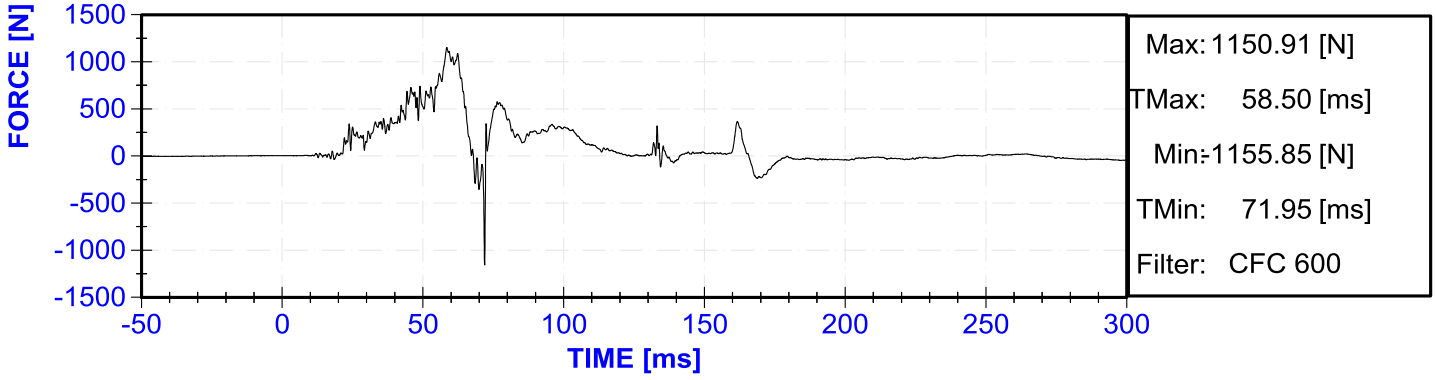
V1P2 Left Lower Tibia X Force

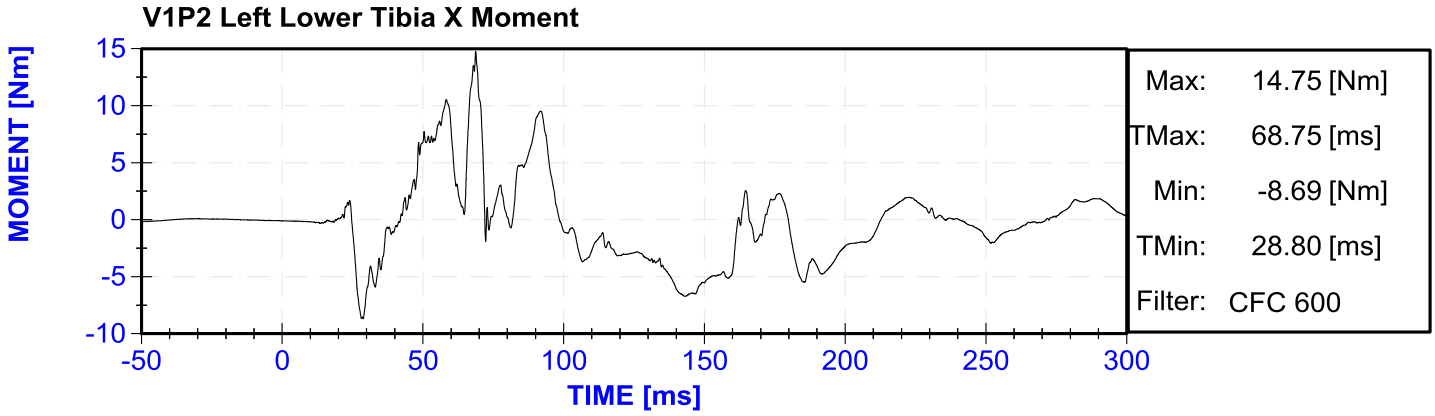


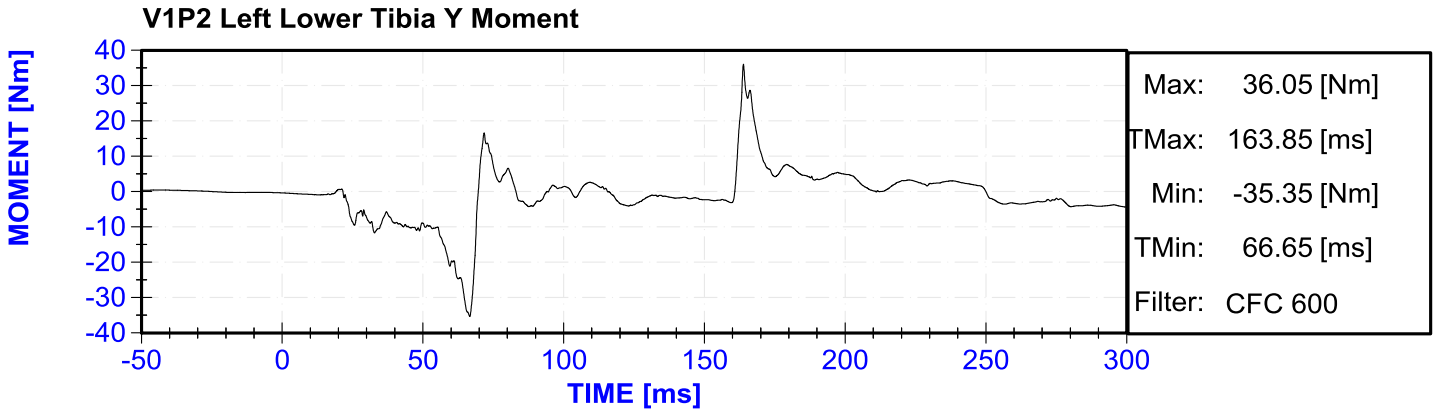
V1P2 Left Lower Tibia Y Force

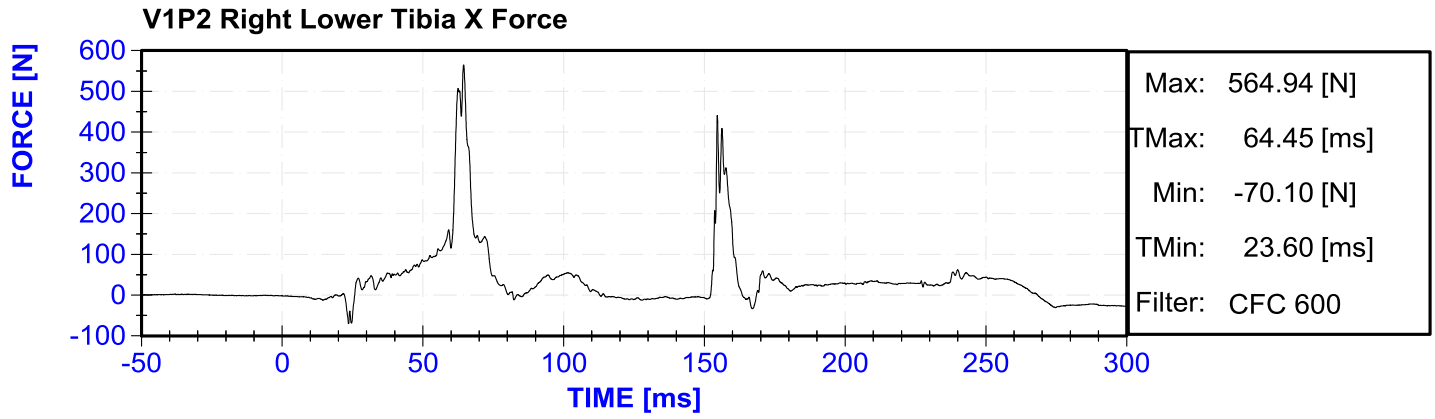


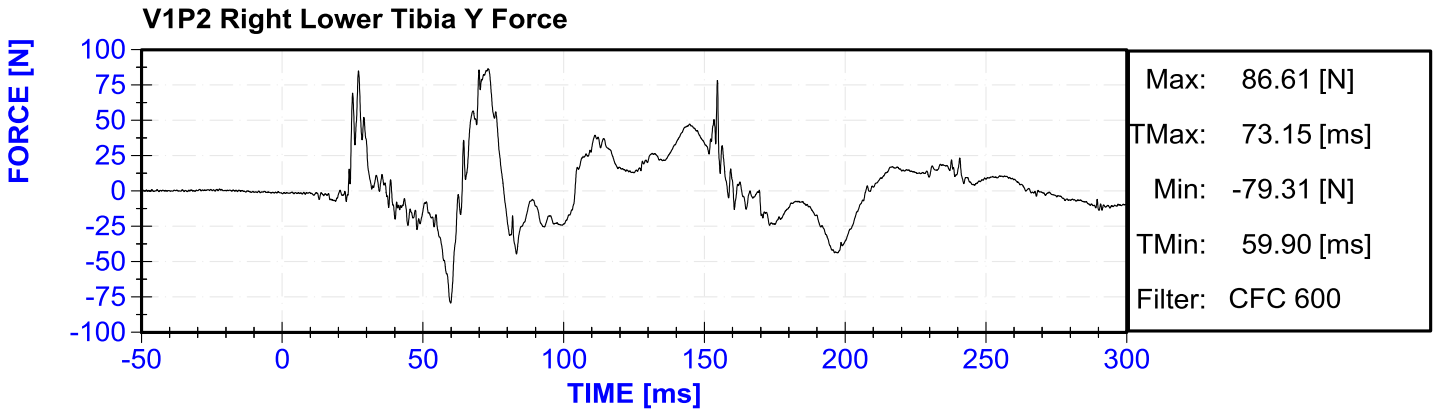
V1P2 Left Lower Tibia Z Force

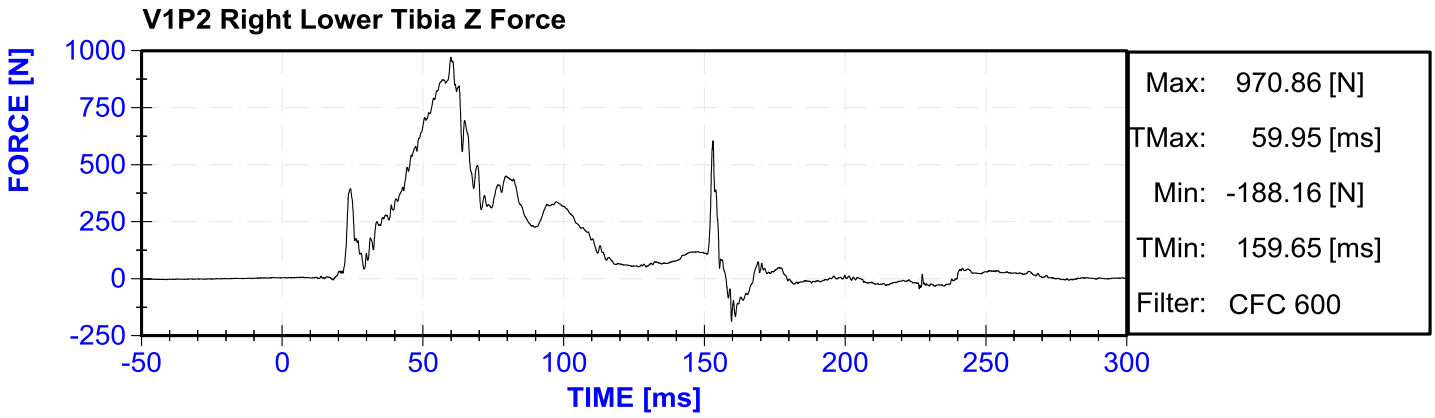


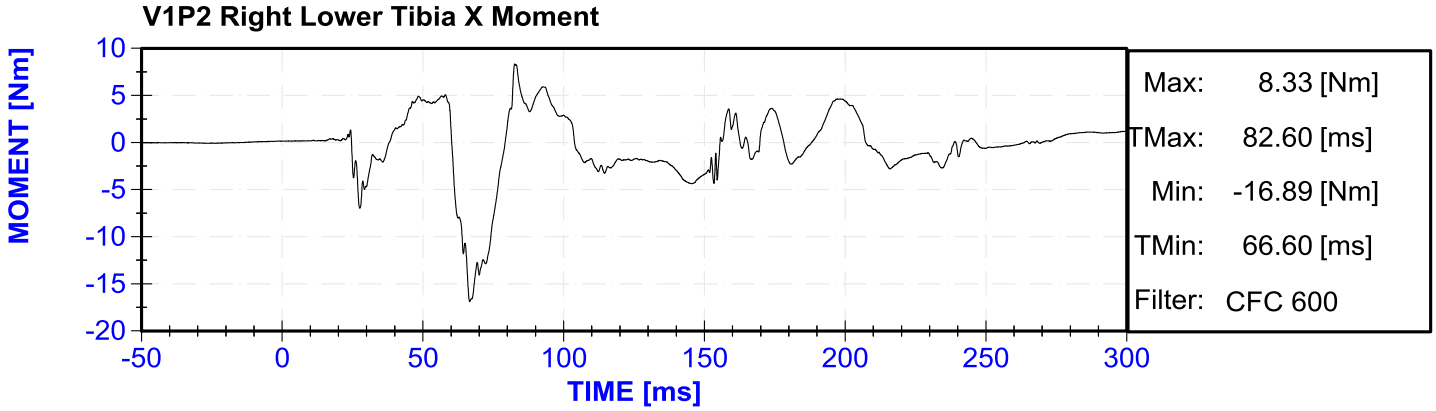

V1P2 Left Lower Tibia X Moment
MOMENT [Nm]
15
10
5
0
-5
-10
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 14.75 [Nm]
TMax: 68.75 [ms]
Min: -8.69 [Nm]
TMin: 28.80 [ms]
Filter: CFC 600

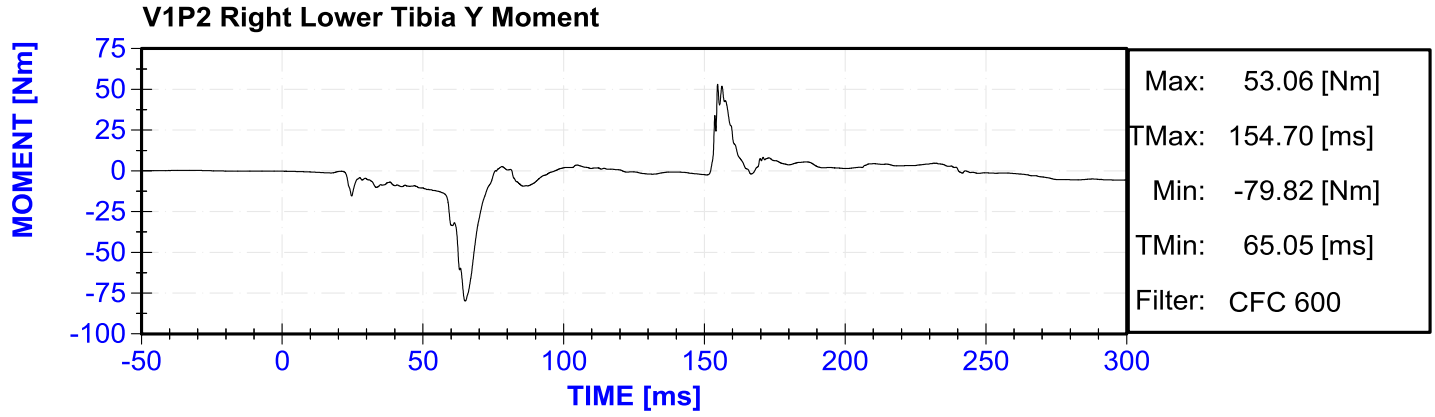

V1P2 Left Lower Tibia Y Moment
MOMENT [Nm]
40
30
20
10
0
-10
-20
-30
-40
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 36.05 [Nm]
TMax: 163.85 [ms]
Min: -35.35 [Nm]
TMin: 66.65 [ms]
Filter: CFC 600

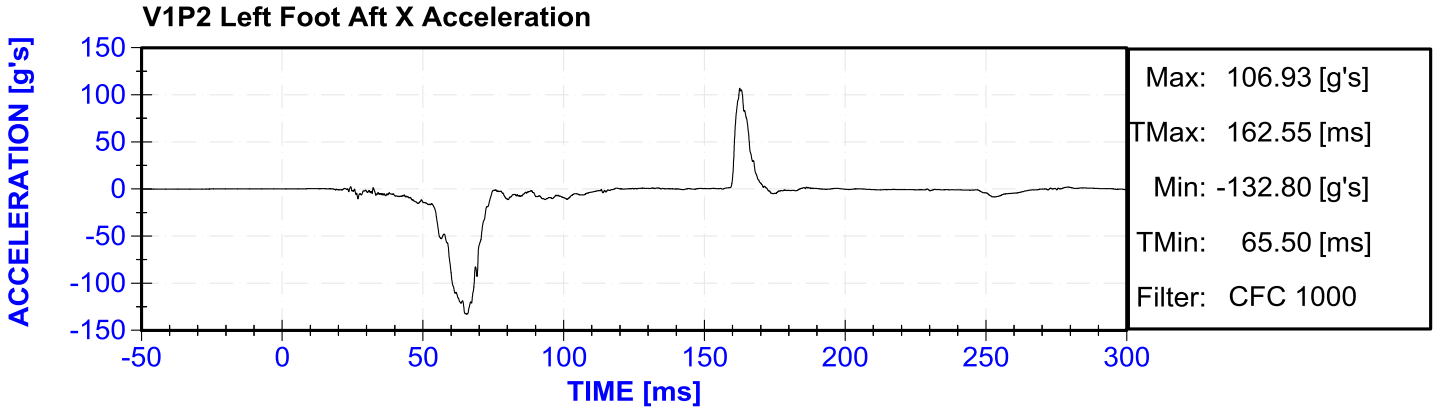

V1P2 Right Lower Tibia X Force
FORCE [N]
600
500
400
300
200
100
0
-100
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 564.94 [N]
TMax: 64.45 [ms]
Min: -70.10 [N]
TMin: 23.60 [ms]
Filter: CFC 600

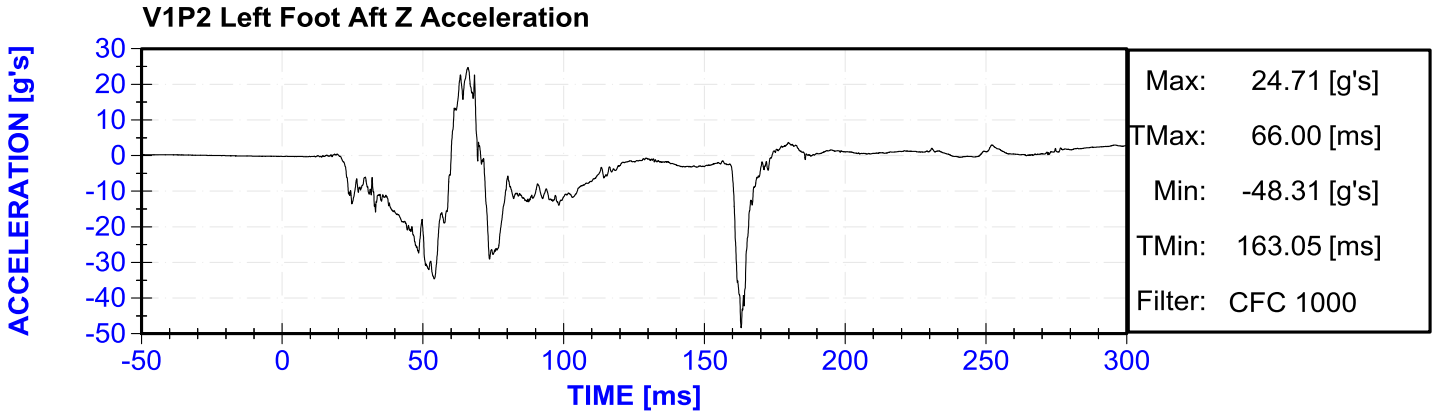

V1P2 Right Lower Tibia Y Force
FORCE [N]
100
75
50
25
0
-25
-50
-75
-100
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 86.61 [N]
TMax: 73.15 [ms]
Min: -79.31 [N]
TMin: 59.90 [ms]
Filter: CFC 600

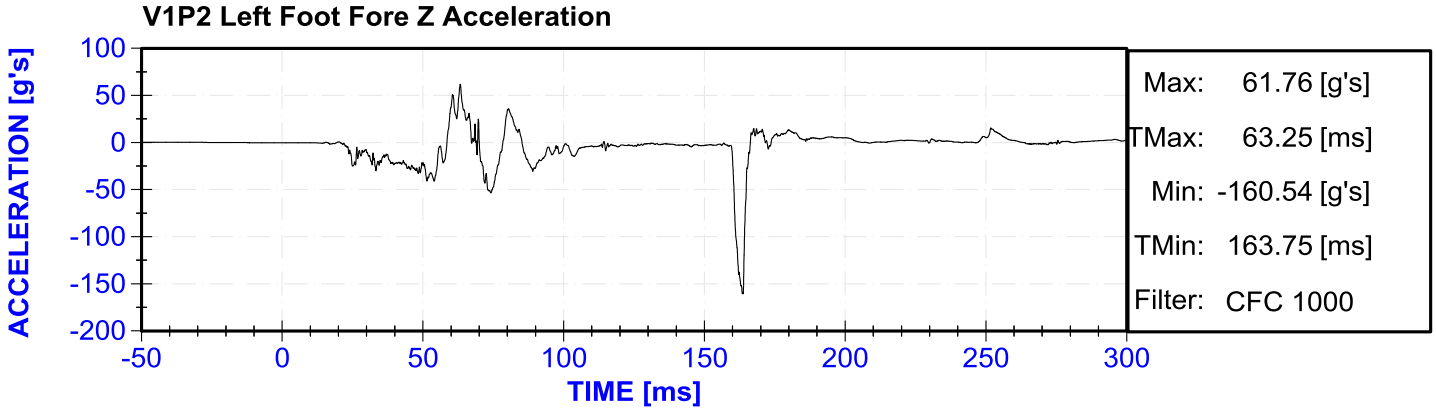

V1P2 Right Lower Tibia Z Force
FORCE [N]
1000
750
500
250
0
-250
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 970.86 [N]
TMax: 59.95 [ms]
Min: -188.16 [N]
TMin: 159.65 [ms]
Filter: CFC 600

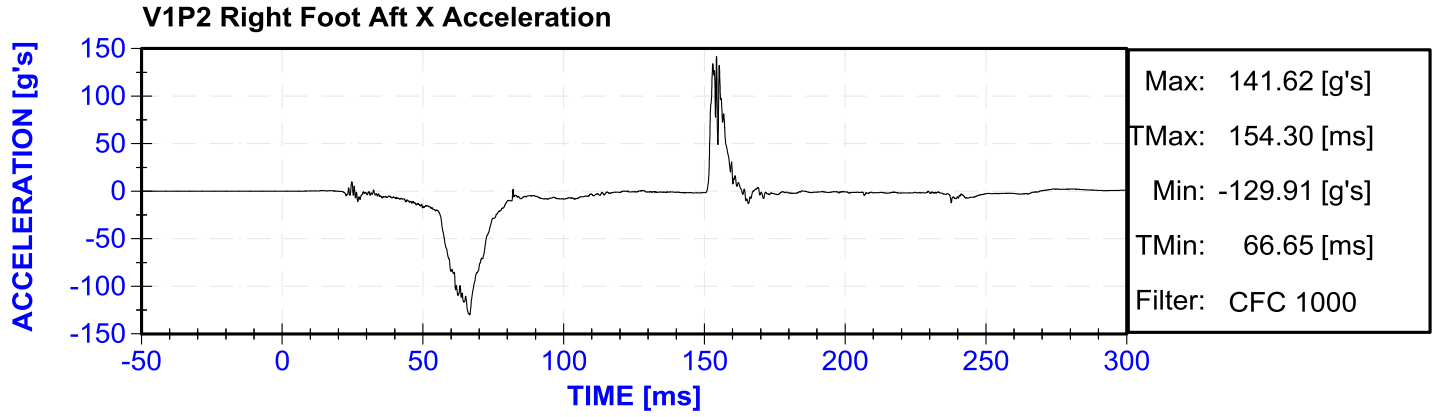

V1P2 Right Lower Tibia X Moment
MOMENT [Nm]
10
5
0
-5
-10
-15
-20
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 8.33 [Nm]
TMax: 82.60 [ms]
Min: -16.89 [Nm]
TMin: 66.60 [ms]
Filter: CFC 600

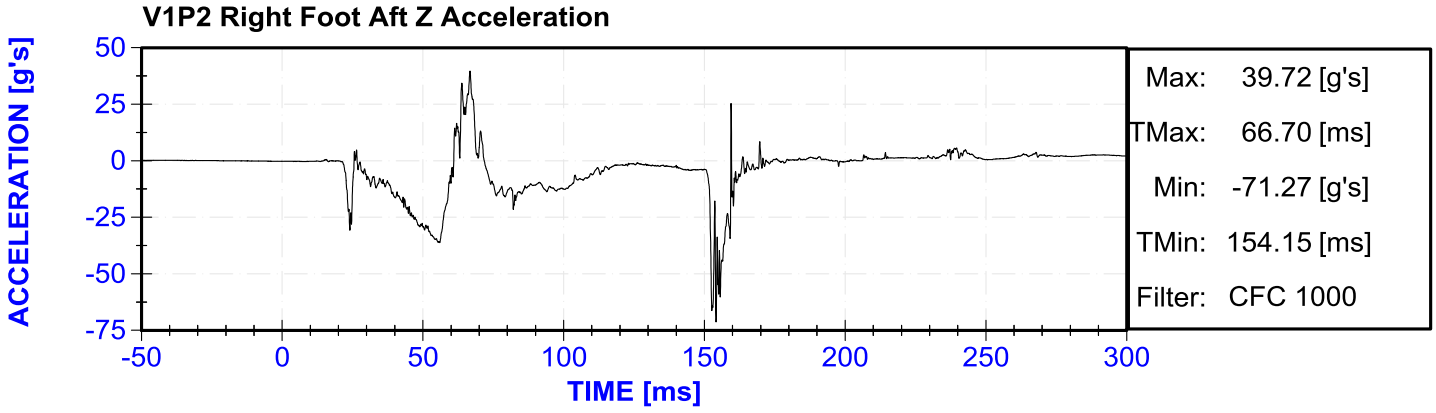

V1P2 Right Lower Tibia Y Moment
MOMENT [Nm]
75
50
25
0
-25
-50
-75
-100
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 53.06 [Nm]
TMax: 154.70 [ms]
Min: -79.82 [Nm]
TMin: 65.05 [ms]
Filter: CFC 600


V1P2 Left Foot Aft X Acceleration
ACCELERATION [g's]
150
100
50
0
-50
-100
-150
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 106.93 [g's]
TMax: 162.55 [ms]
Min: -132.80 [g's]
TMin: 65.50 [ms]
Filter: CFC 1000

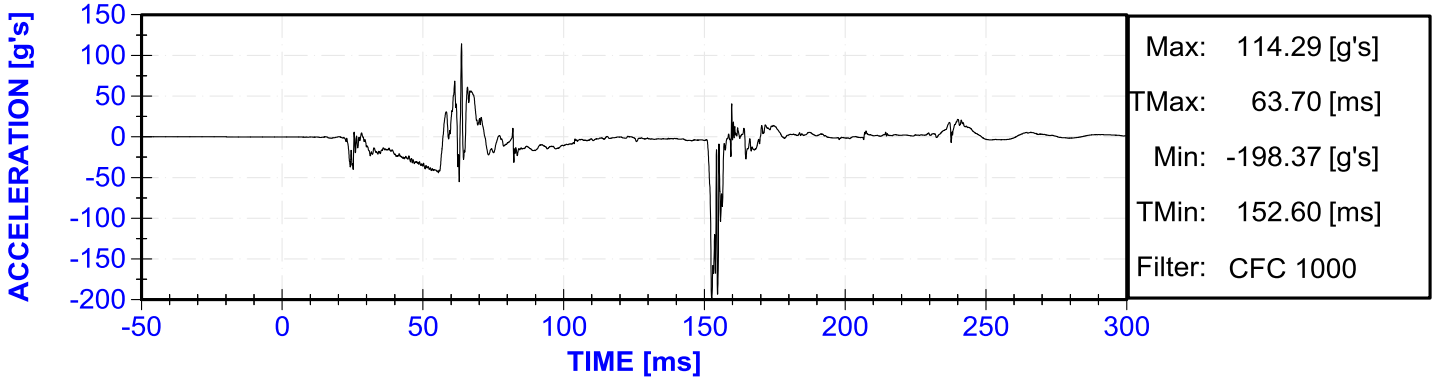

V1P2 Left Foot Aft Z Acceleration
ACCELERATION [g's]
TIME [ms]
Max: 24.71 [g's]
TMax: 66.00 [ms]
Min: -48.31 [g's]
TMin: 163.05 [ms]
Filter: CFC 1000


V1P2 Left Foot Fore Z Acceleration
ACCELERATION [g's]
TIME [ms]
Max: 61.76 [g's]
TMax: 63.25 [ms]
Min: -160.54 [g's]
TMin: 163.75 [ms]
Filter: CFC 1000

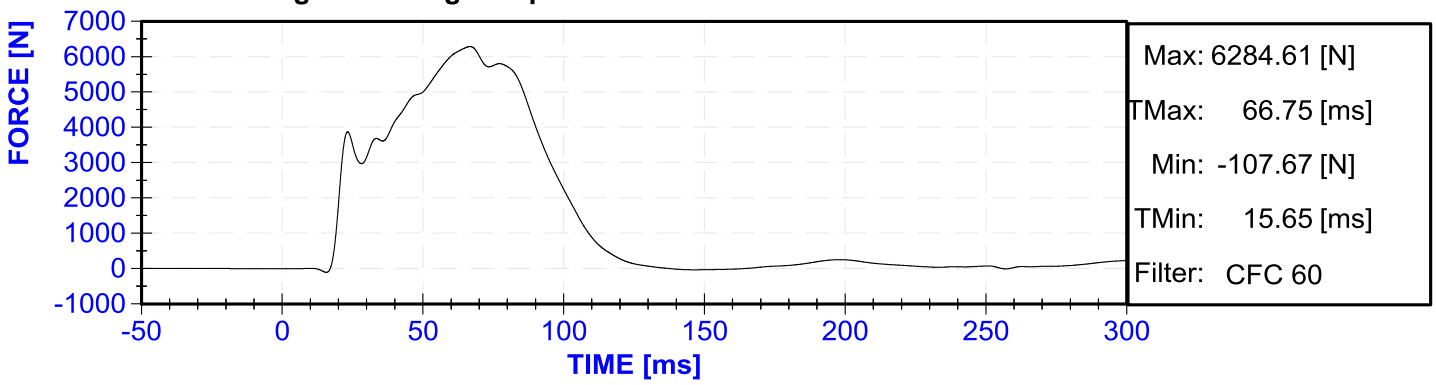

V1P2 Right Foot Aft X Acceleration
ACCELERATION [g's]
TIME [ms]
Max: 141.62 [g's]
TMax: 154.30 [ms]
Min: -129.91 [g's]
TMin: 66.65 [ms]
Filter: CFC 1000


V1P2 Right Foot Aft Z Acceleration
ACCELERATION [g's]
TIME [ms]
Max: 39.72 [g's]
TMax: 66.70 [ms]
Min: -71.27 [g's]
TMin: 154.15 [ms]
Filter: CFC 1000

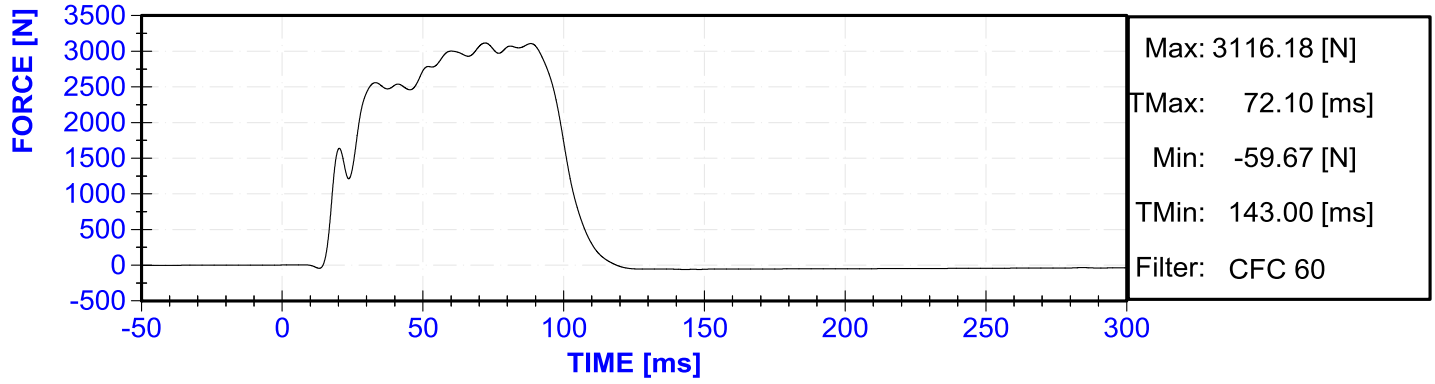
V1P2 Right Foot Fore Z Acceleration



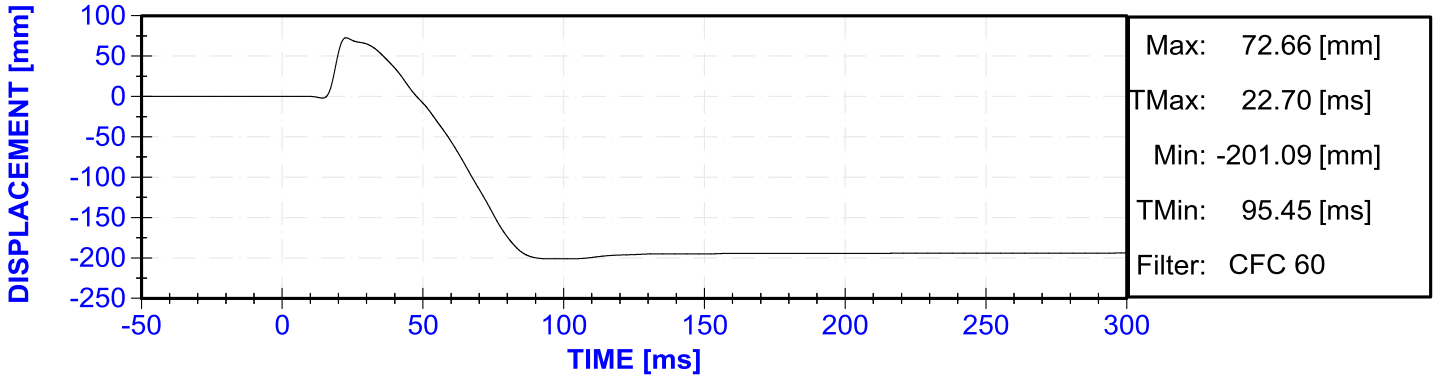
V1 Front Right Passenger Lap Belt Force



V1 Front Right Passenger Shoulder Belt Upper Force

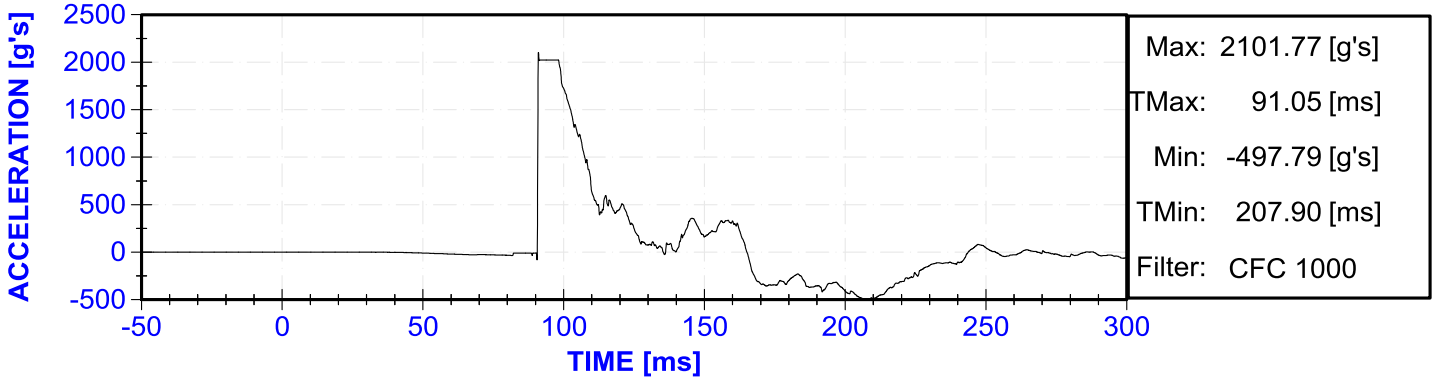


V1 Front Right Passenger Shoulder Belt Displacement

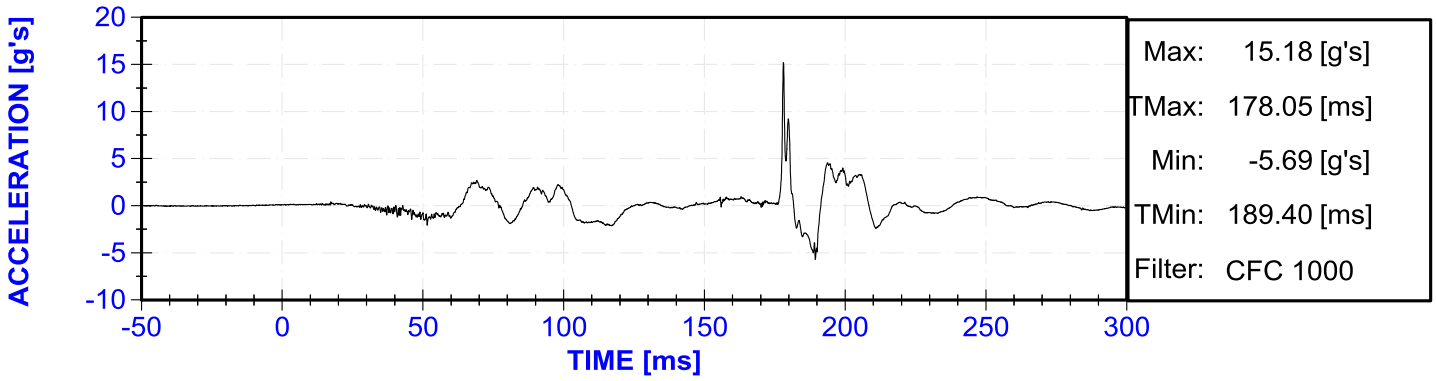


V1P3 Head CG X Acceleration

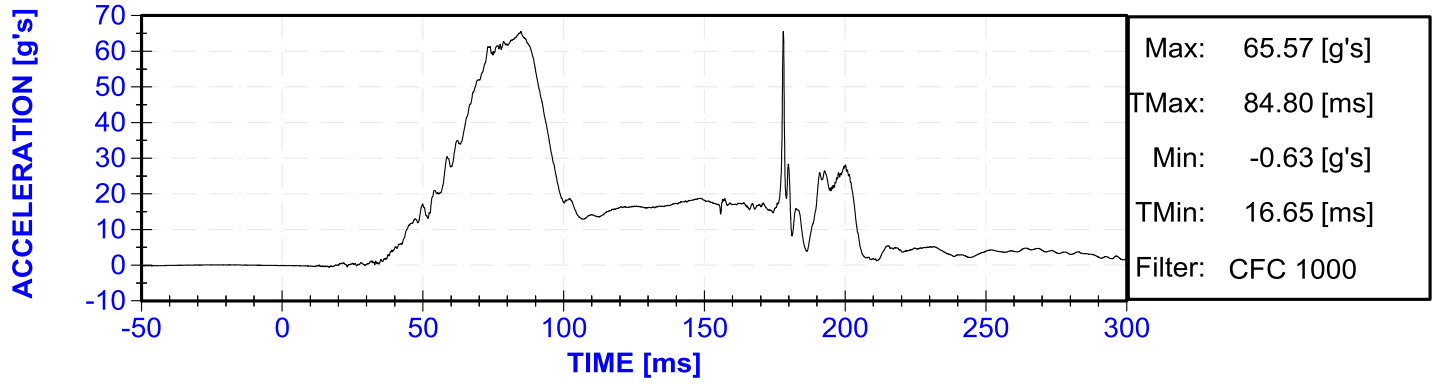
Questionable data after 19.2ms



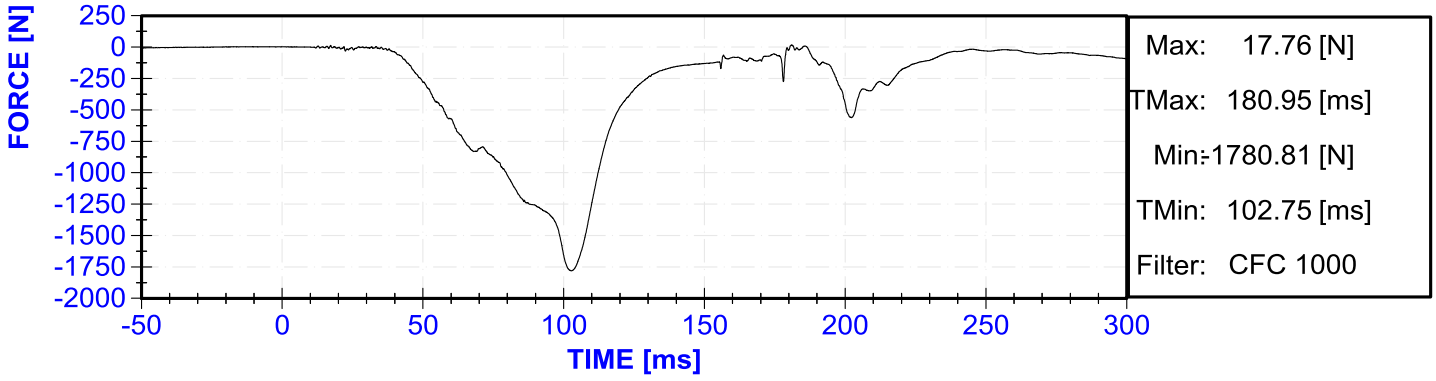
V1P3 Head CG Y Acceleration

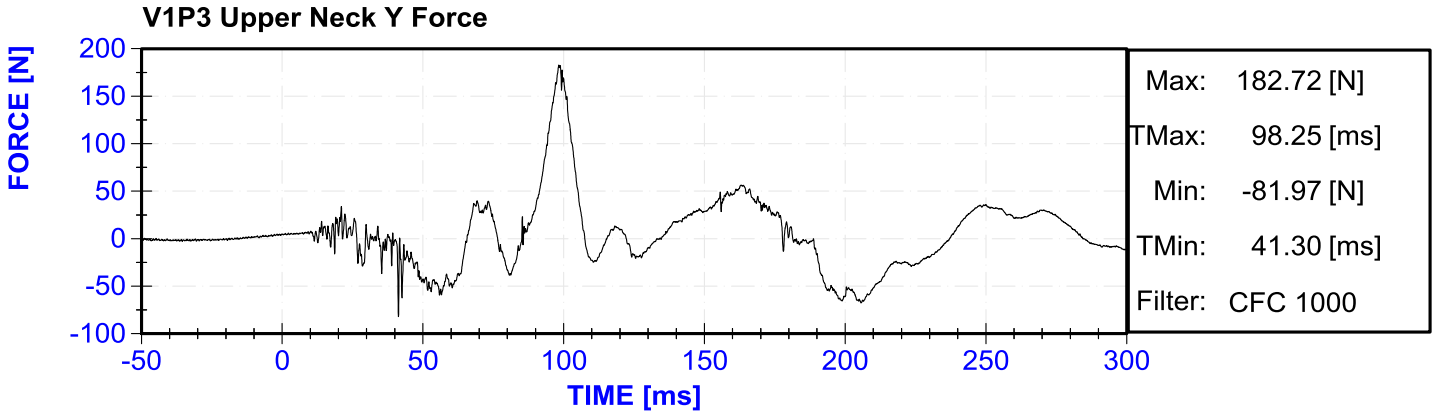


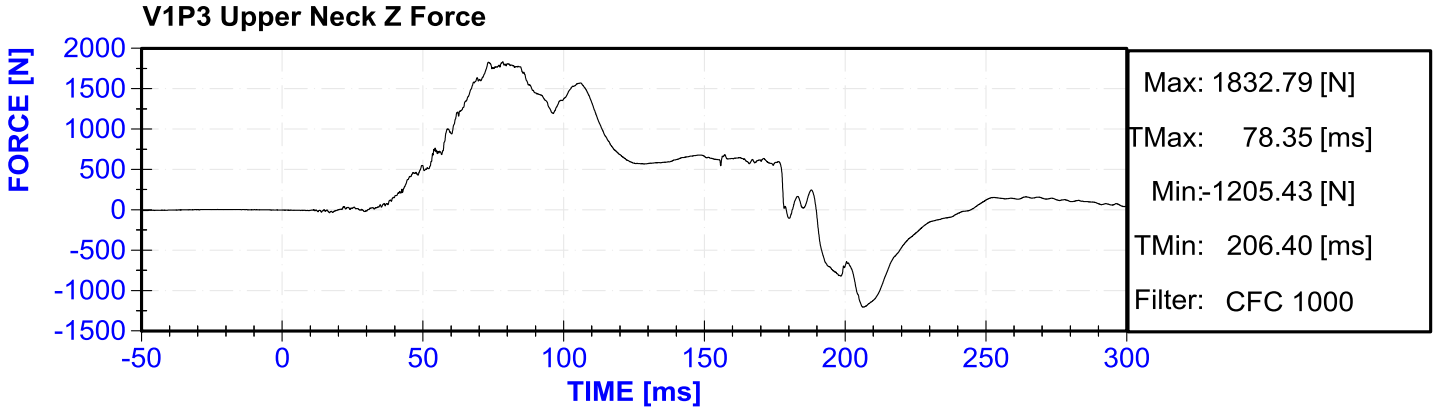
V1P3 Head CG Z Acceleration

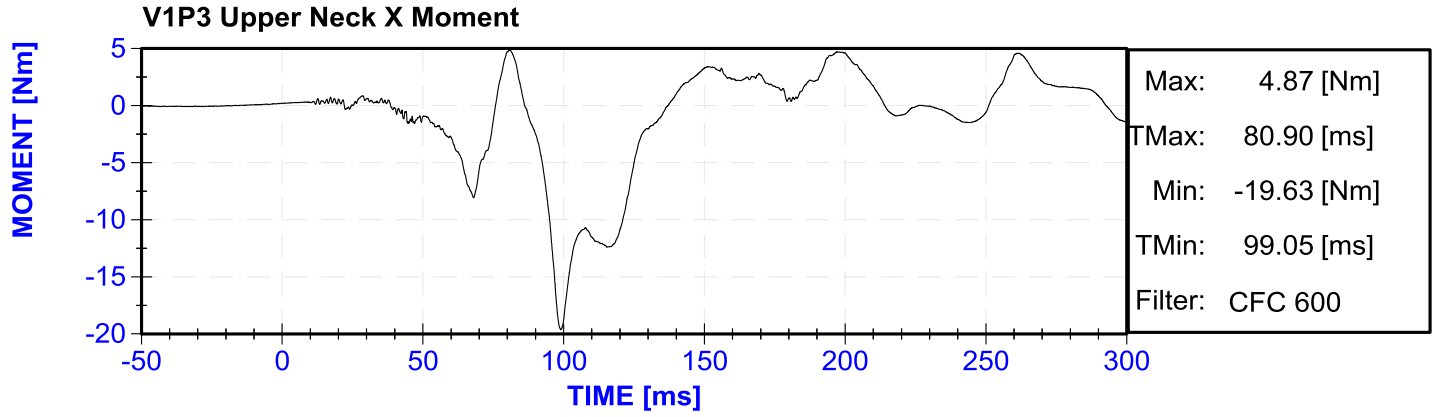


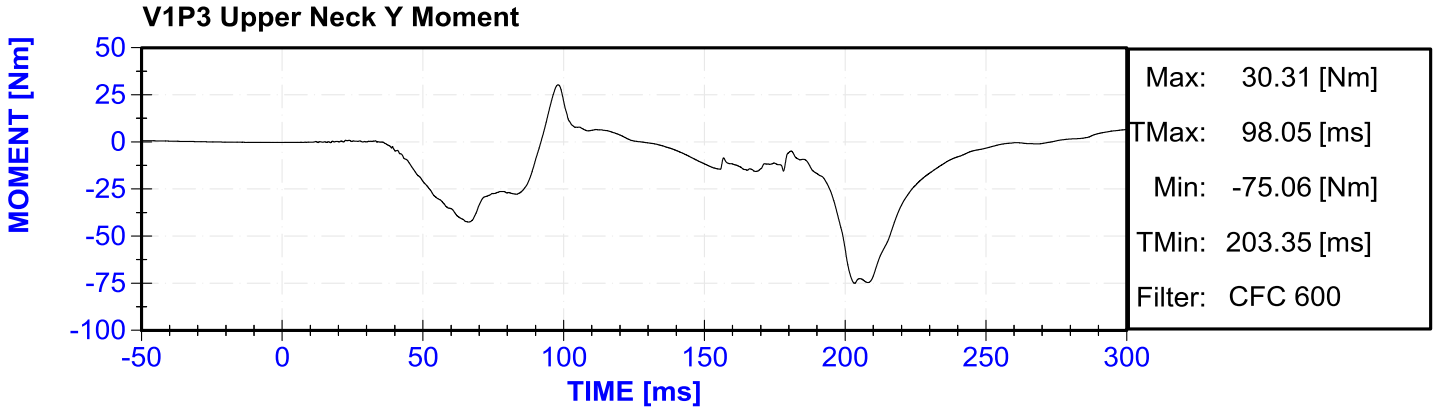
V1P3 Upper Neck X Force



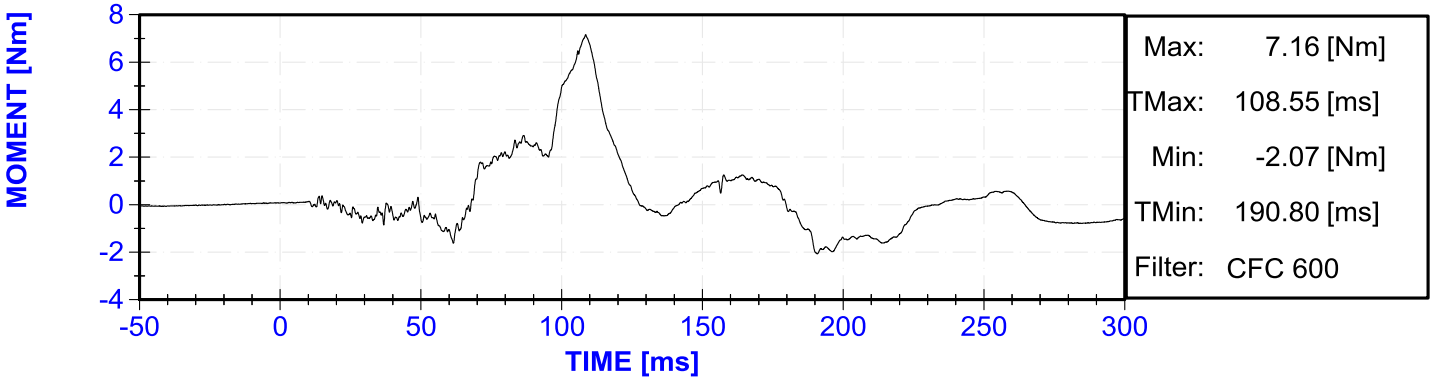

V1P3 Upper Neck Y Force
FORCE [N]
200
150
100
50
0
-50
-100
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 182.72 [N]
TMax: 98.25 [ms]
Min: -81.97 [N]
TMin: 41.30 [ms]
Filter: CFC 1000


V1P3 Upper Neck Z Force
FORCE [N]
2000
1500
1000
500
0
-500
-1000
-1500
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 1832.79 [N]
TMax: 78.35 [ms]
Min:-1205.43 [N]
TMin: 206.40 [ms]
Filter: CFC 1000


V1P3 Upper Neck X Moment
MOMENT [Nm]
5
0
-5
-10
-15
-20
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 4.87 [Nm]
TMax: 80.90 [ms]
Min: -19.63 [Nm]
TMin: 99.05 [ms]
Filter: CFC 600

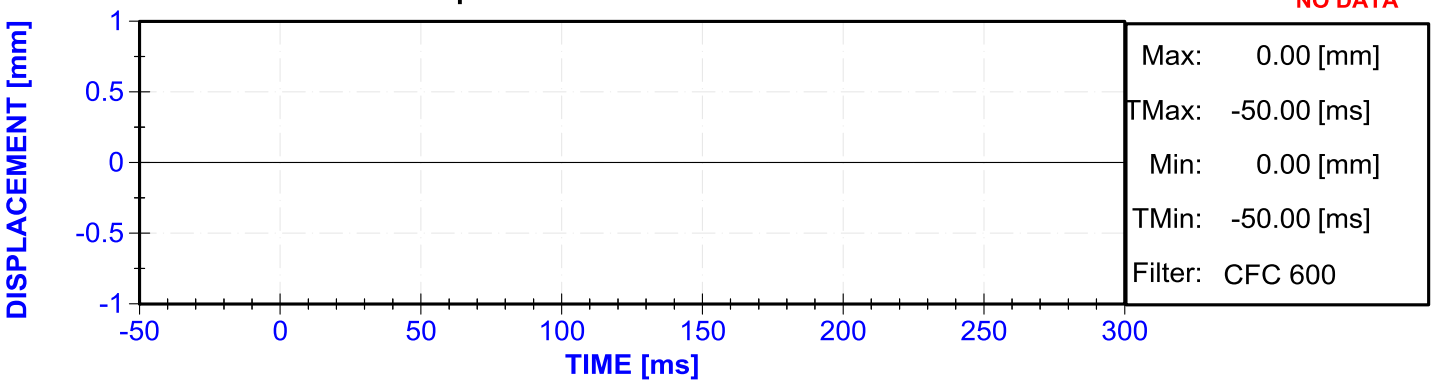

V1P3 Upper Neck Y Moment
MOMENT [Nm]
50
25
0
-25
-50
-75
-100
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 30.31 [Nm]
TMax: 98.05 [ms]
Min: -75.06 [Nm]
TMin: 203.35 [ms]
Filter: CFC 600

V1P3 Upper Neck Z Moment



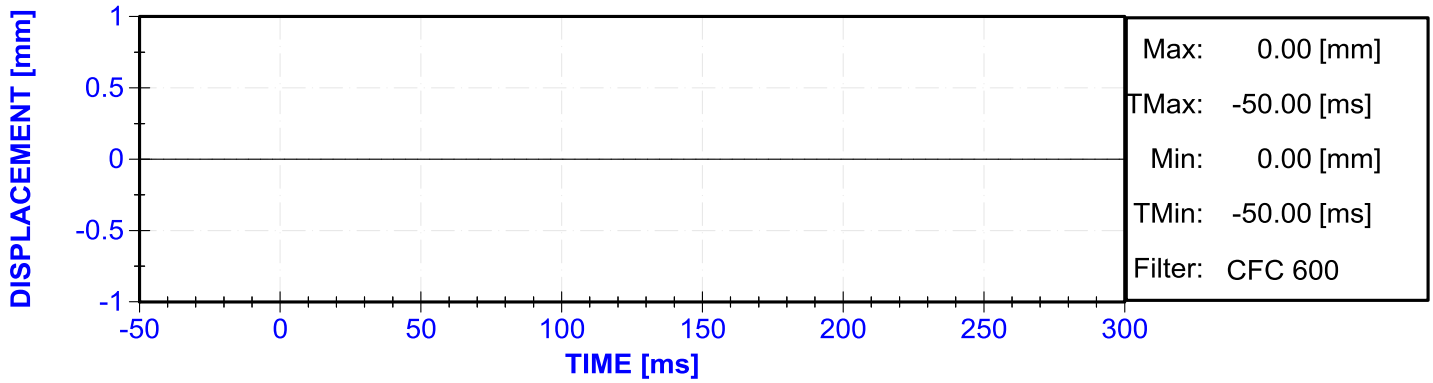
V1P3 Ribs Left 01 X Displacement

NO DATA



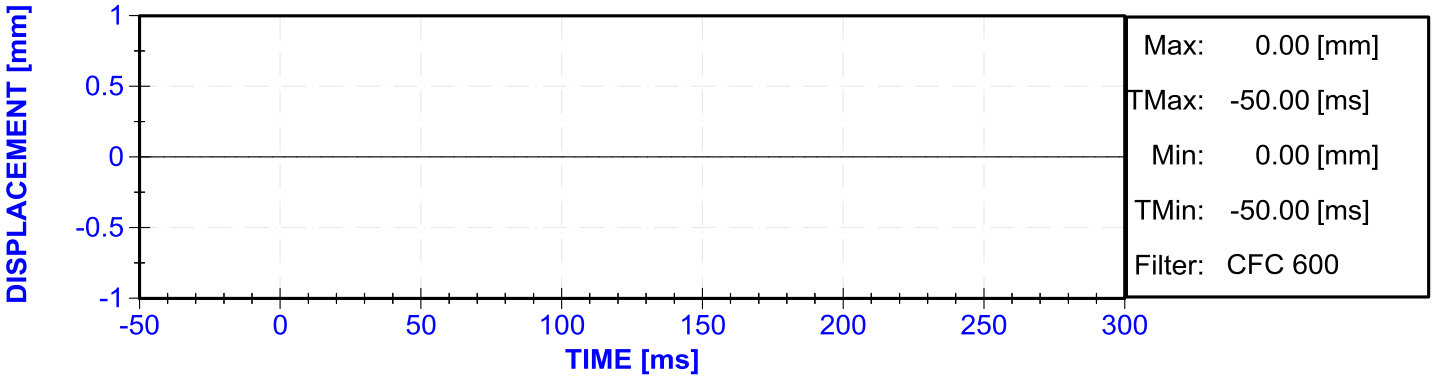
V1P3 Ribs Left 01 Y Displacement

NO DATA



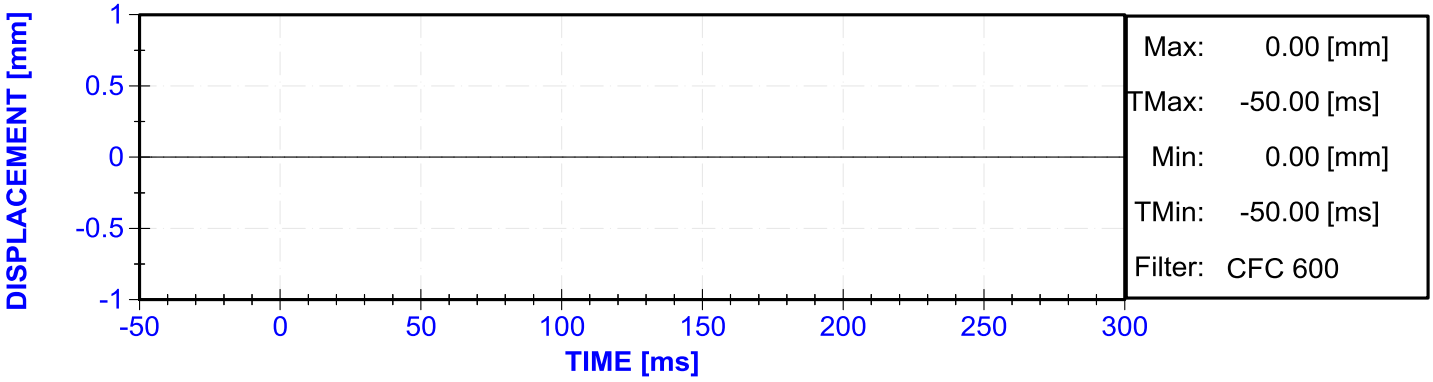
V1P3 Ribs Left 02 X Displacement

NO DATA



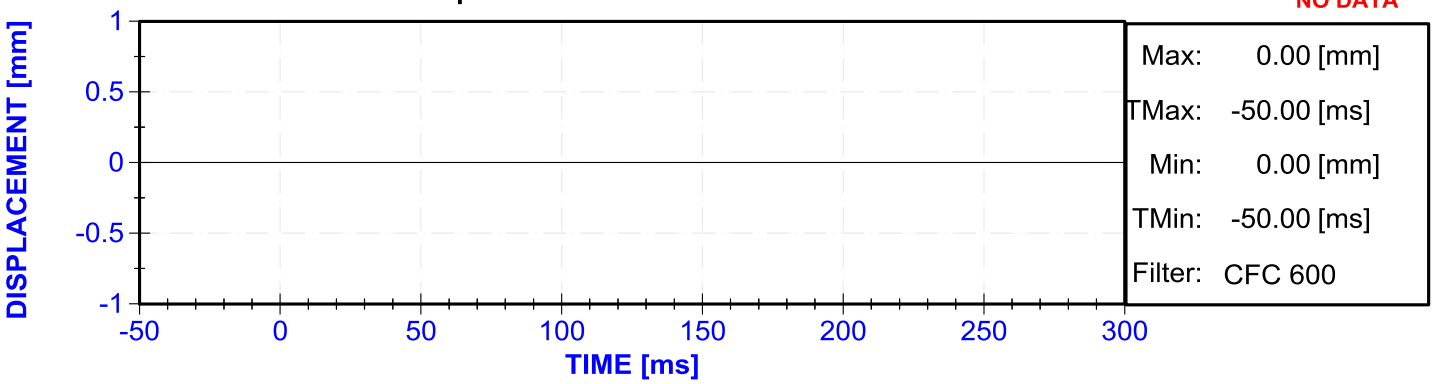
V1P3 Ribs Left 02 Y Displacement

NO DATA



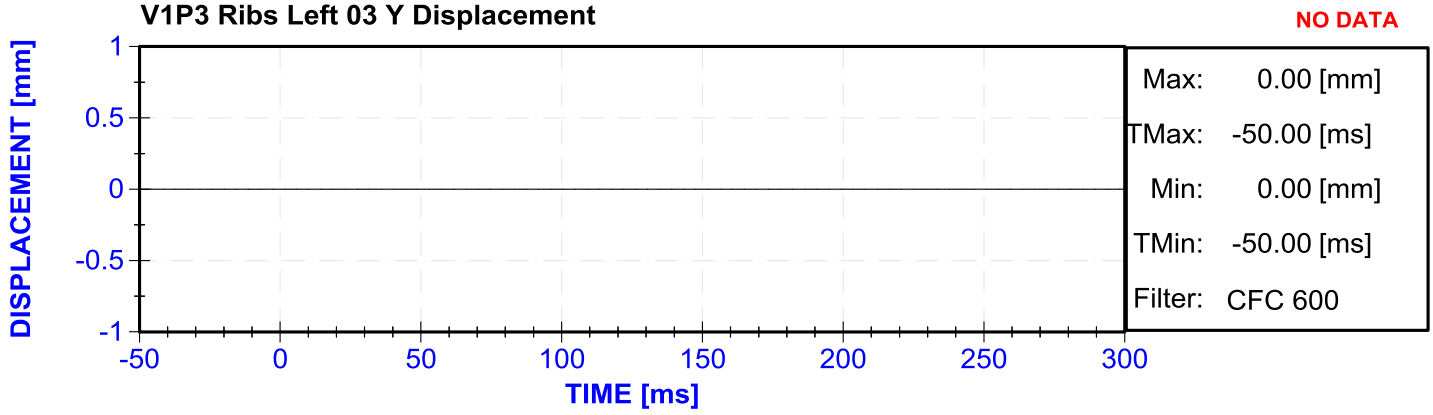
V1P3 Ribs Left 03 X Displacement

NO DATA



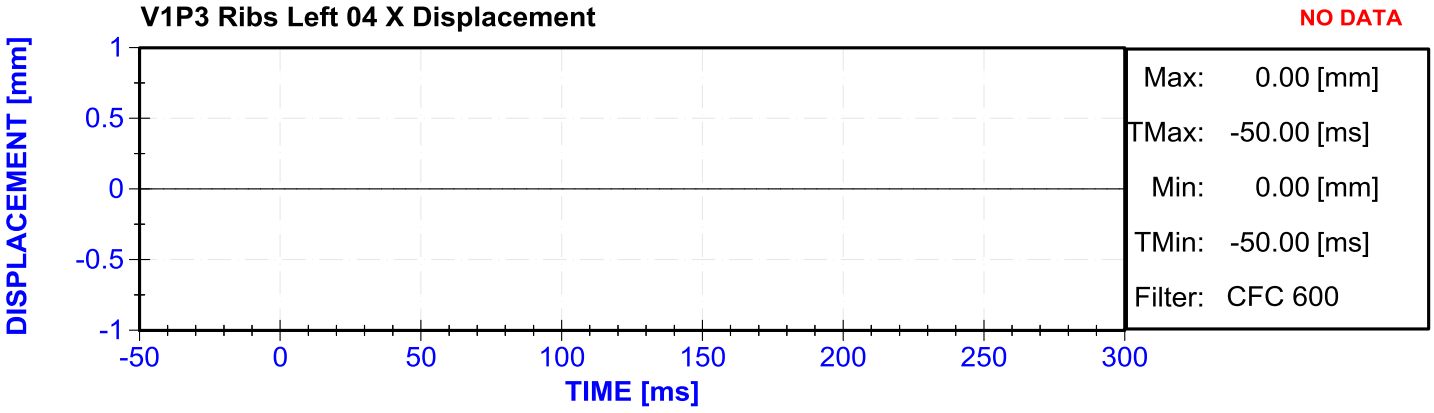
V1P3 Ribs Left 03 Y Displacement

NO DATA



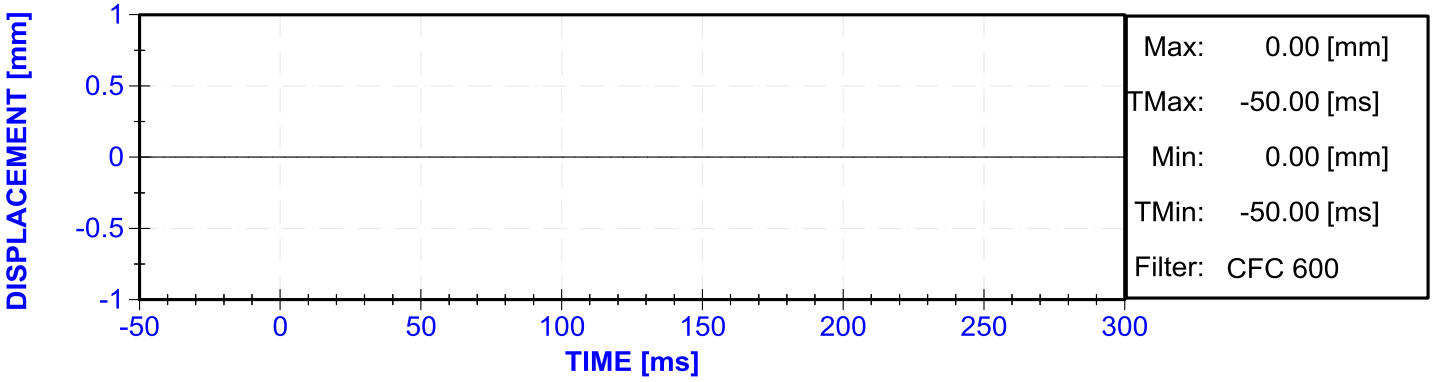
V1P3 Ribs Left 04 X Displacement

NO DATA



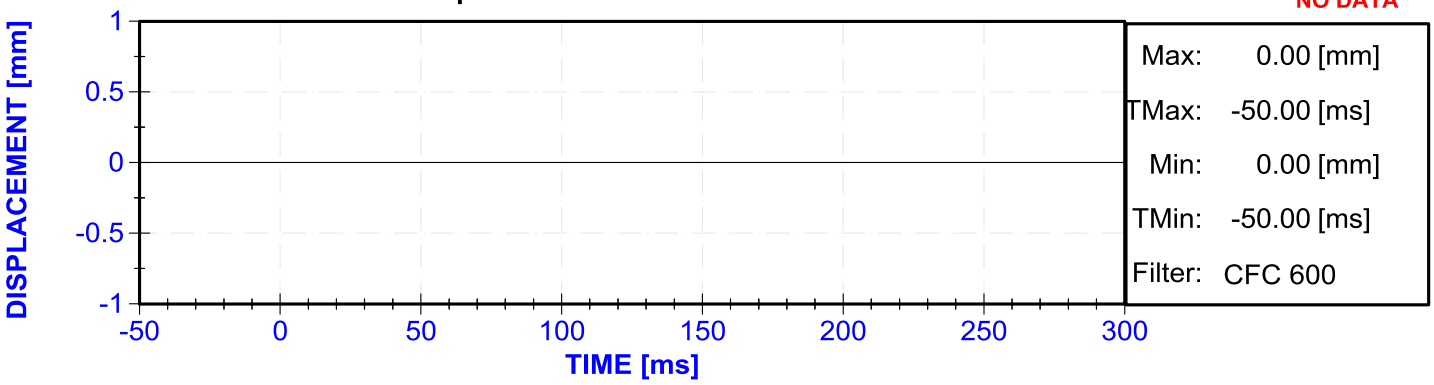
V1P3 Ribs Left 04 Y Displacement

NO DATA



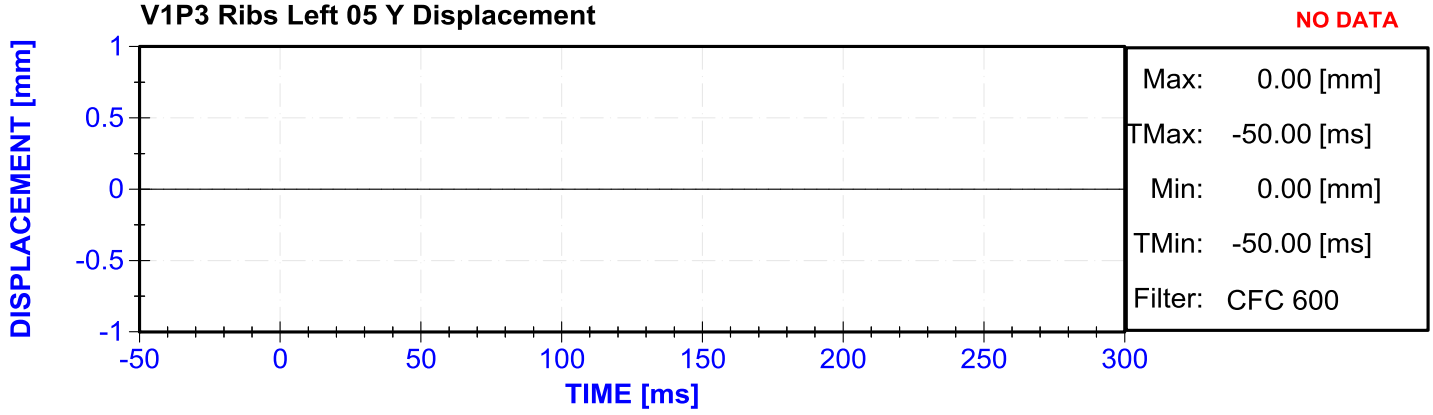
V1P3 Ribs Left 05 X Displacement

NO DATA



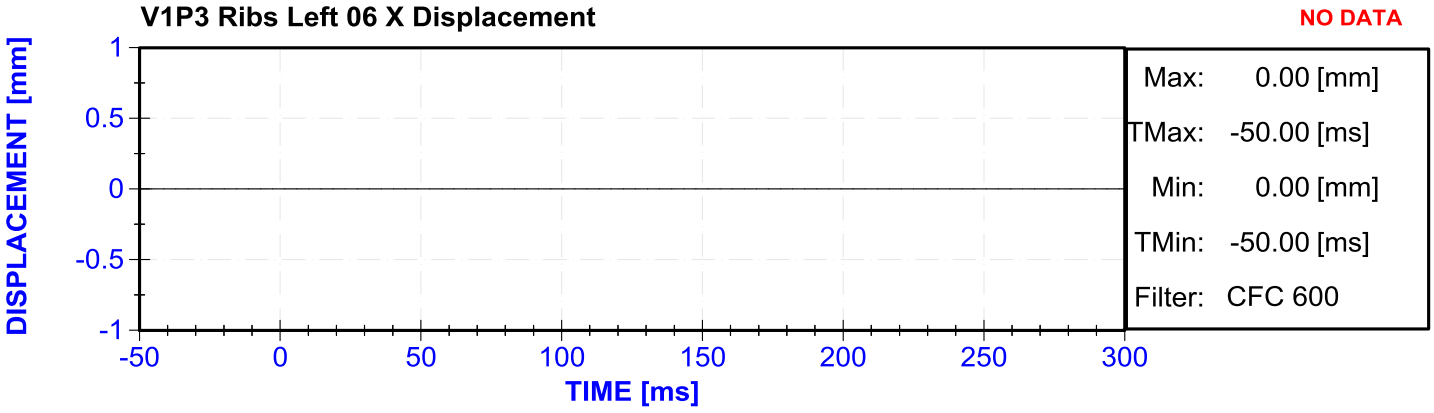
V1P3 Ribs Left 05 Y Displacement

NO DATA



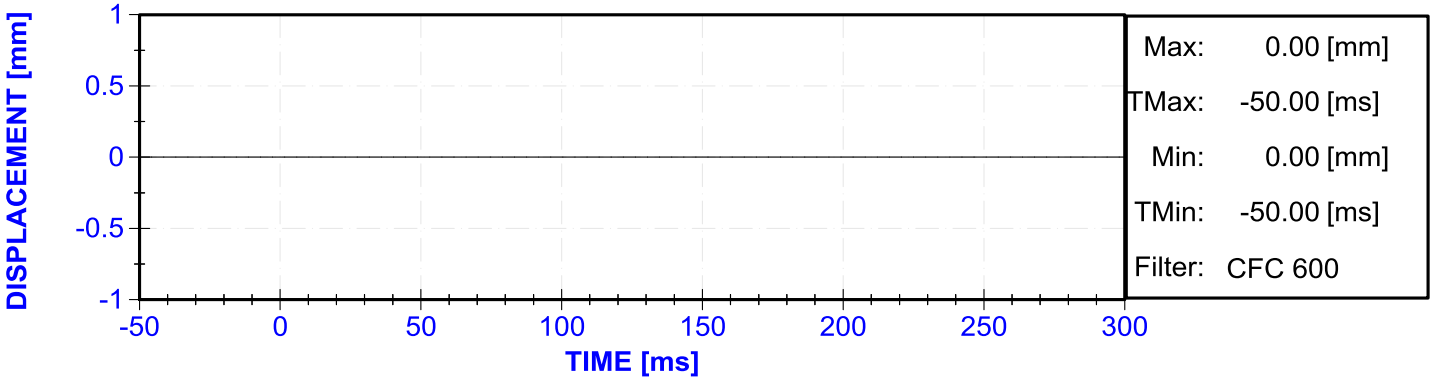
V1P3 Ribs Left 06 X Displacement

NO DATA



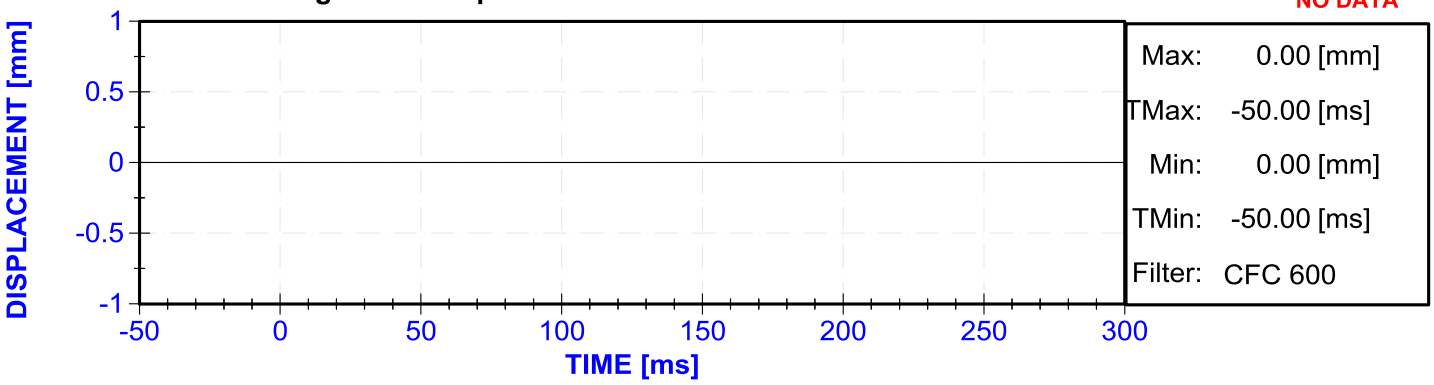
V1P3 Ribs Left 06 Y Displacement

NO DATA



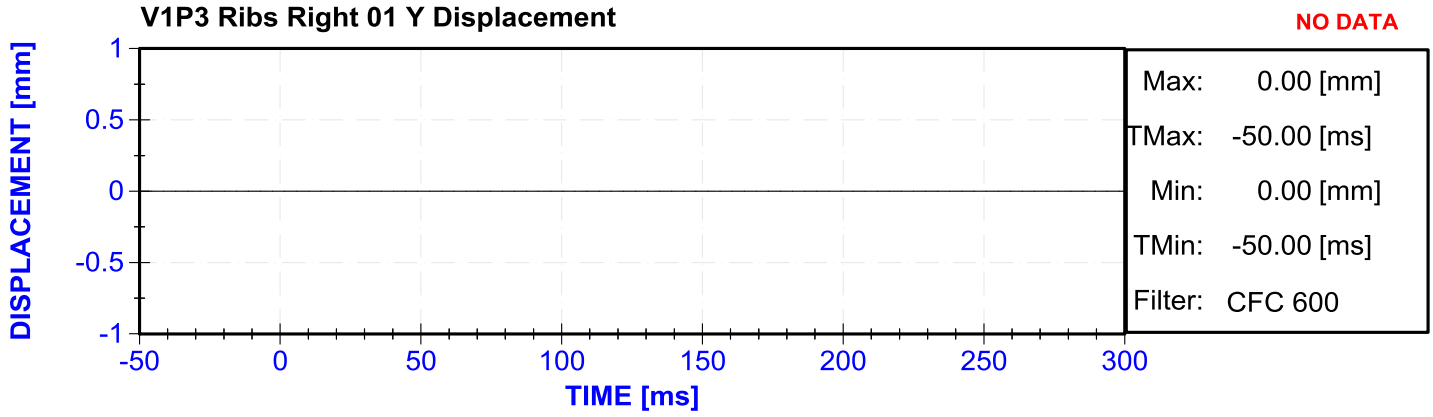
V1P3 Ribs Right 01 X Displacement

NO DATA



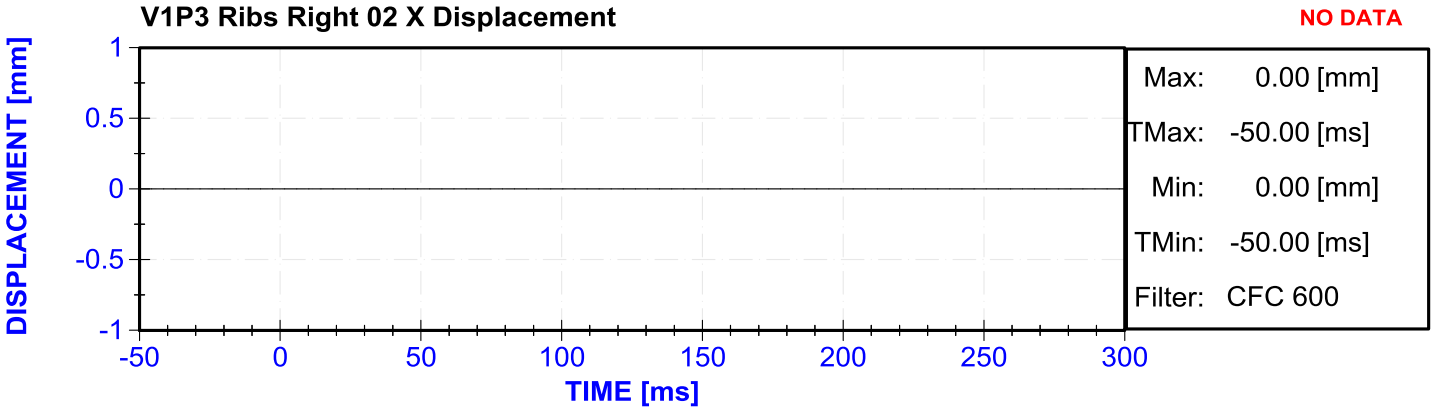
V1P3 Ribs Right 01 Y Displacement

NO DATA



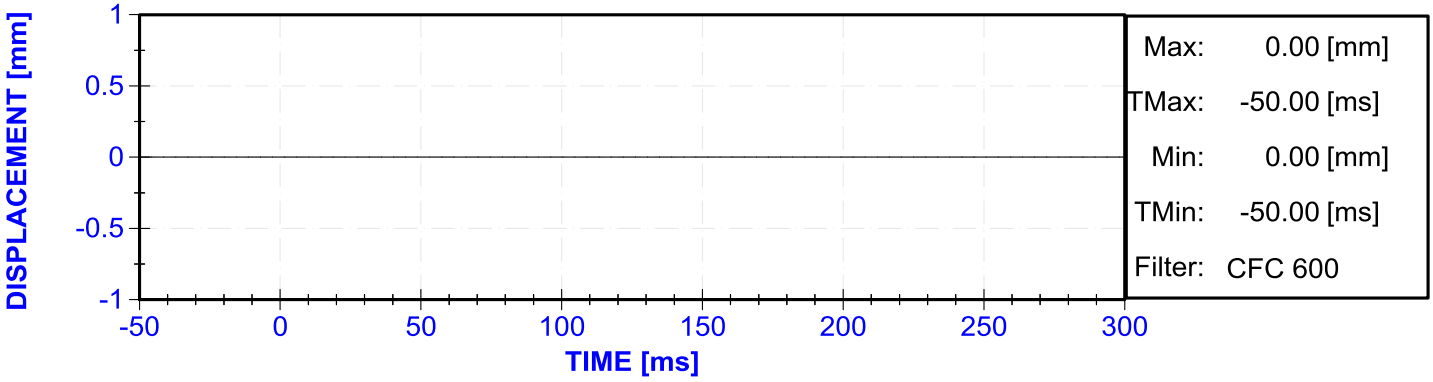
V1P3 Ribs Right 02 X Displacement

NO DATA



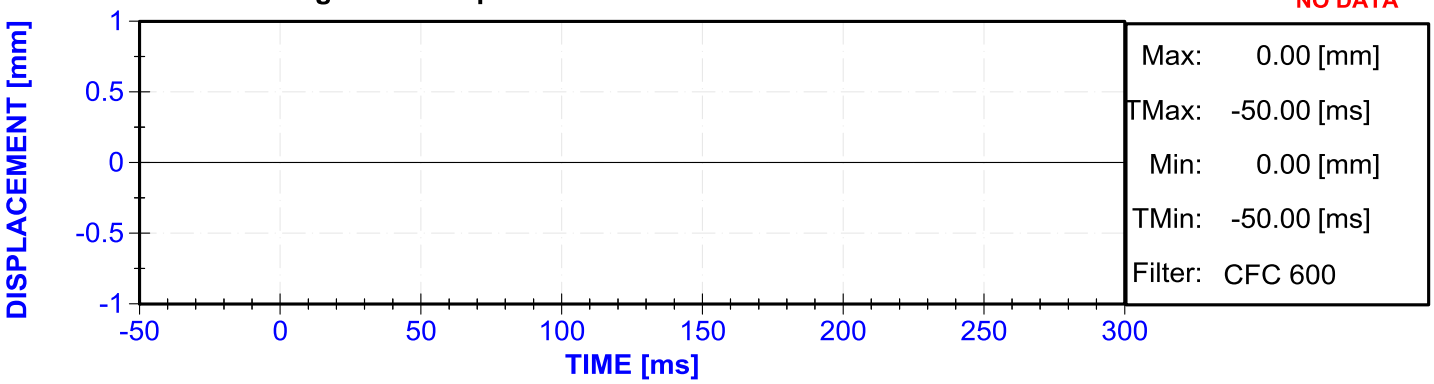
V1P3 Ribs Right 02 Y Displacement

NO DATA



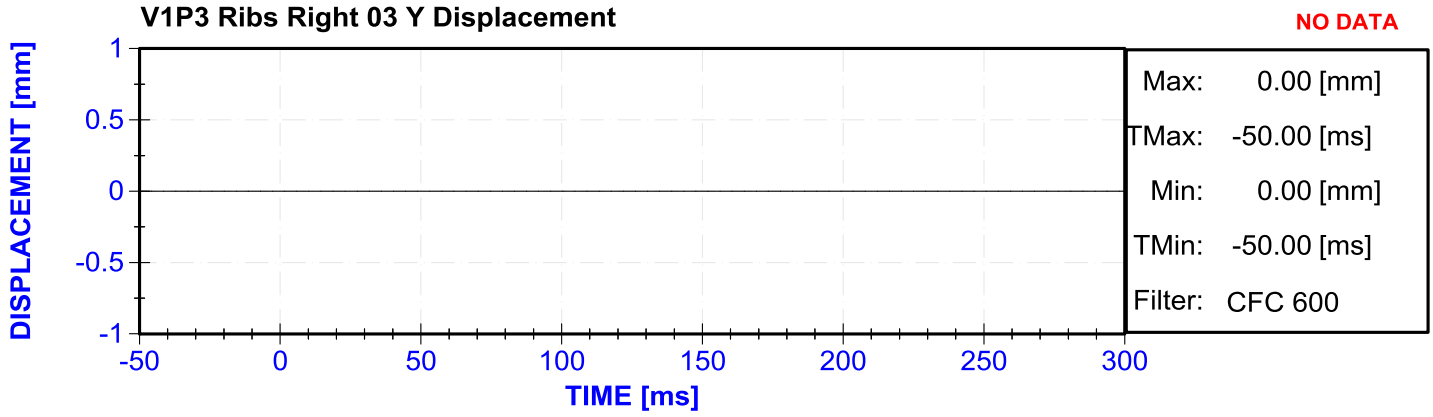
V1P3 Ribs Right 03 X Displacement

NO DATA



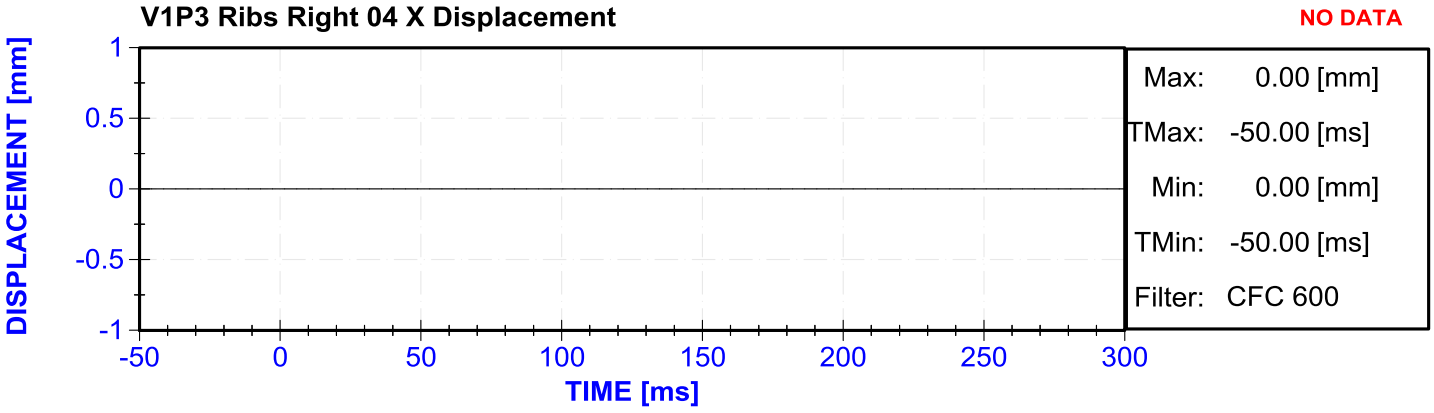
V1P3 Ribs Right 03 Y Displacement

NO DATA



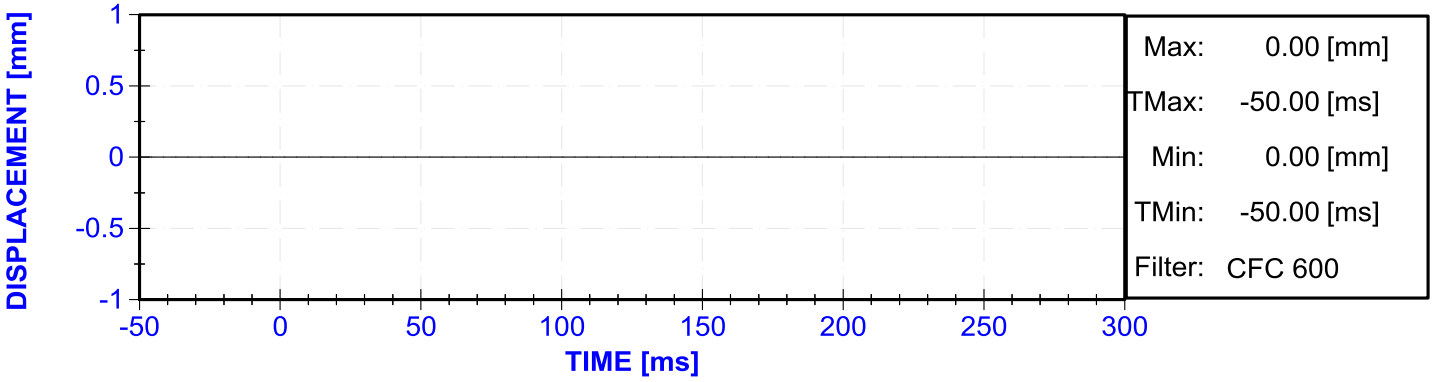
V1P3 Ribs Right 04 X Displacement

NO DATA



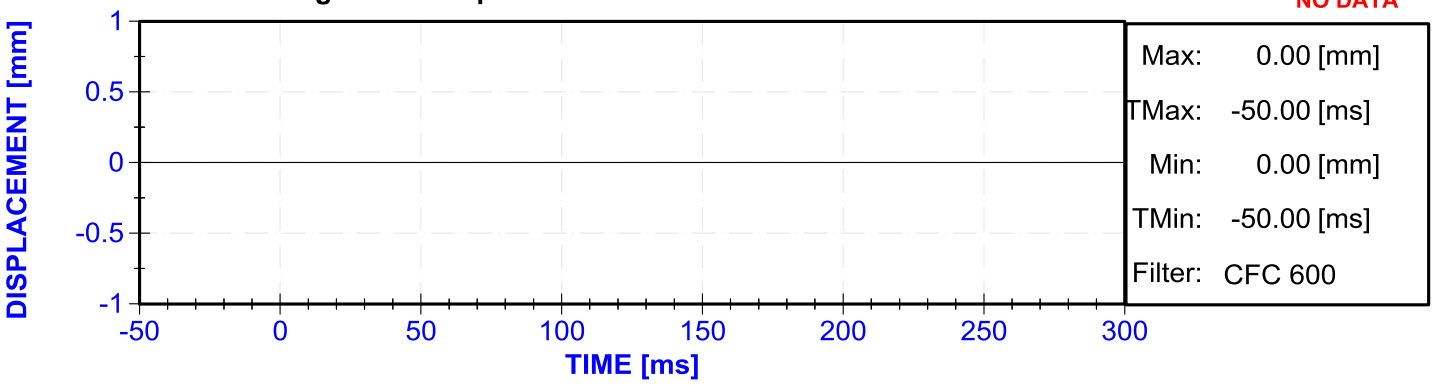
V1P3 Ribs Right 04 Y Displacement

NO DATA



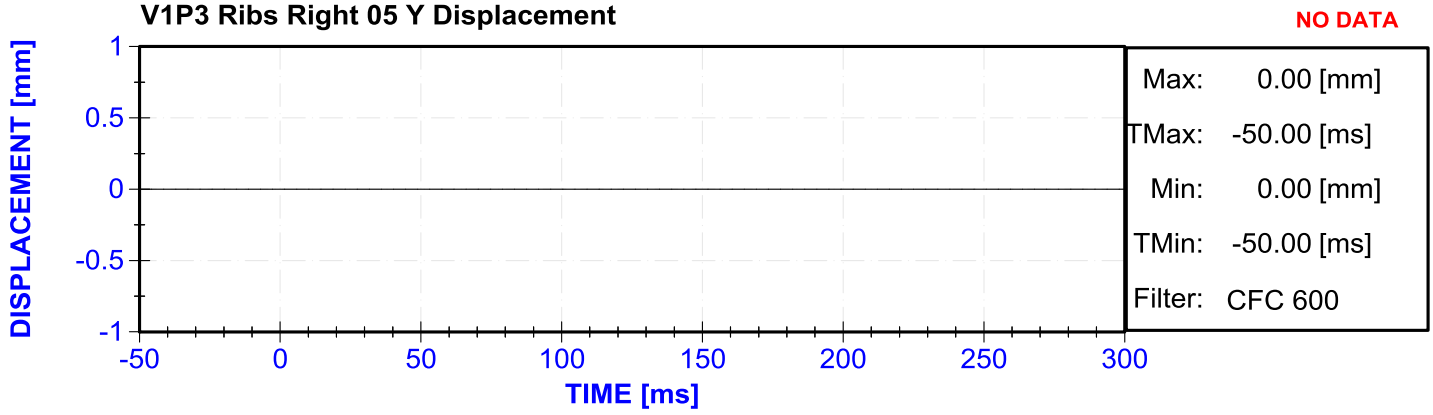
V1P3 Ribs Right 05 X Displacement

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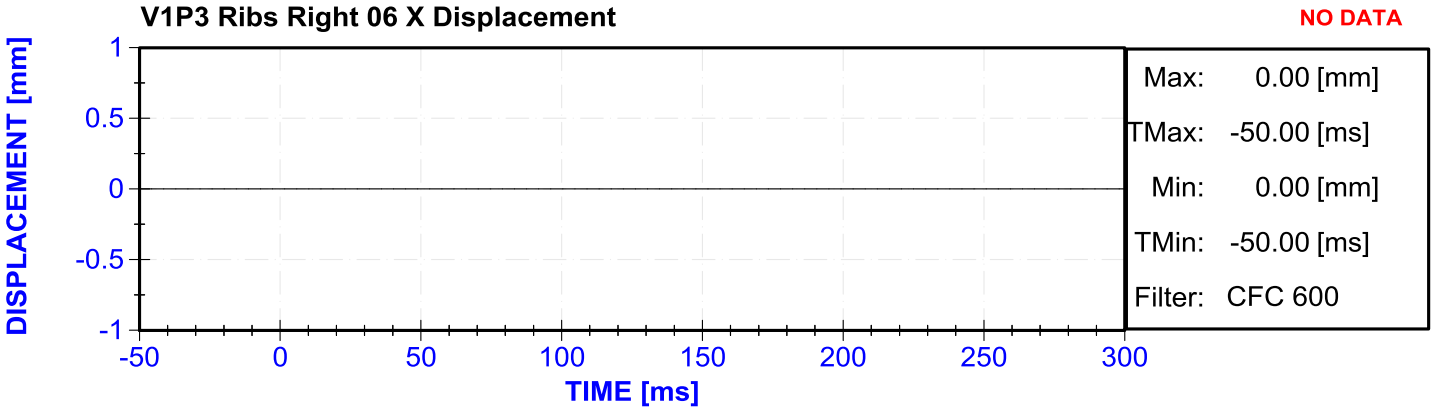
V1P3 Ribs Right 05 Y Displacement

NO DATA



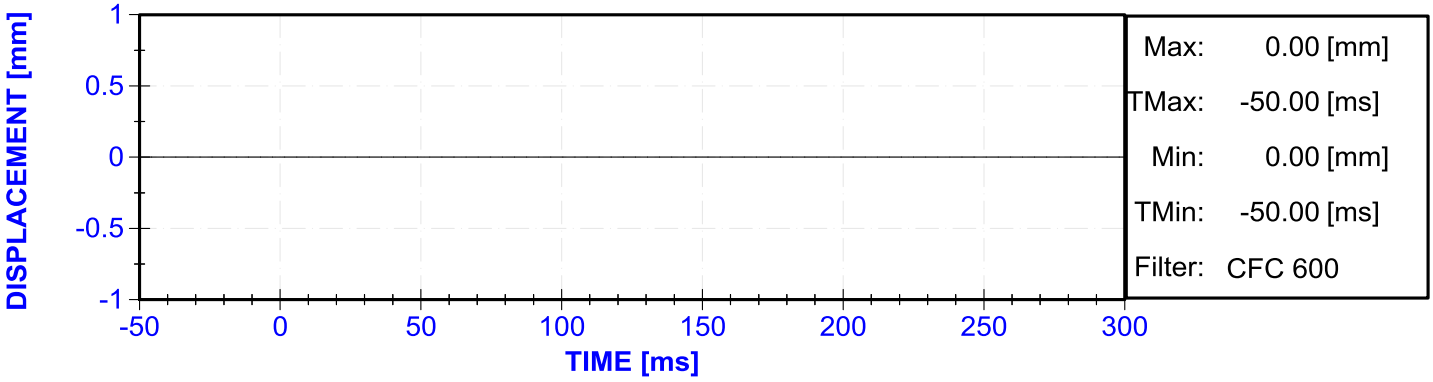
V1P3 Ribs Right 06 X Displacement

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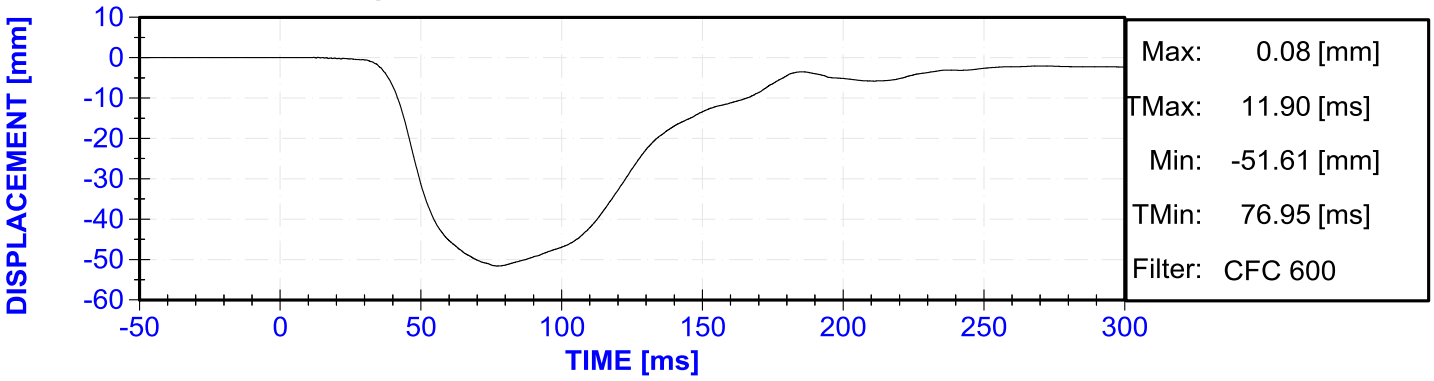


V1P3 Ribs Right 06 Y Displacement

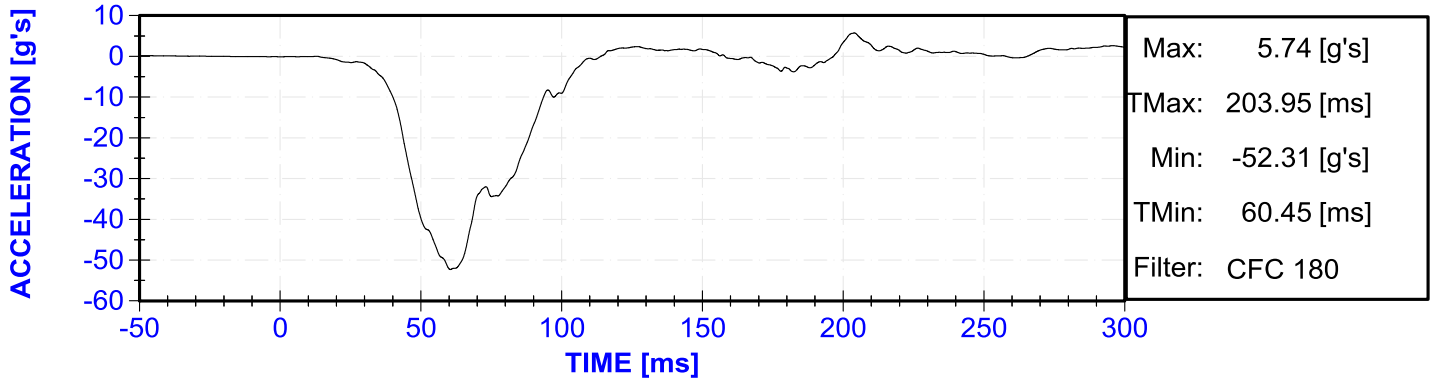
NO DATA



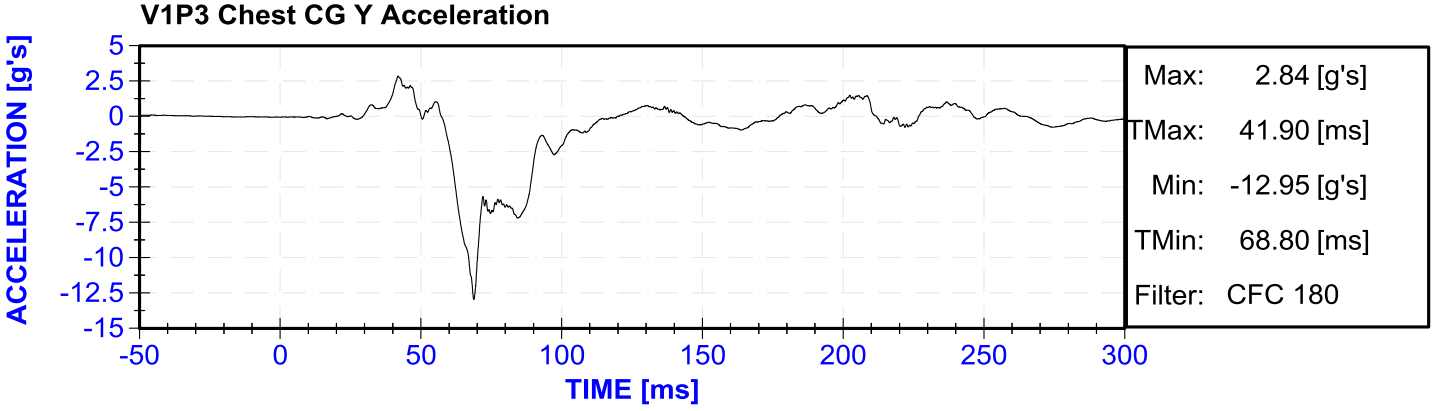
V1P3 Chest X Displacement

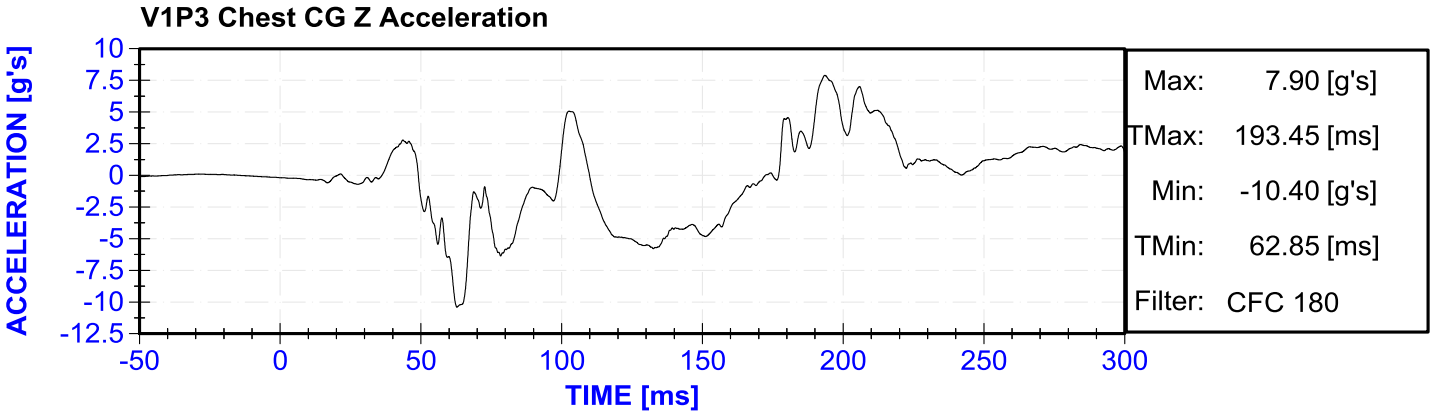


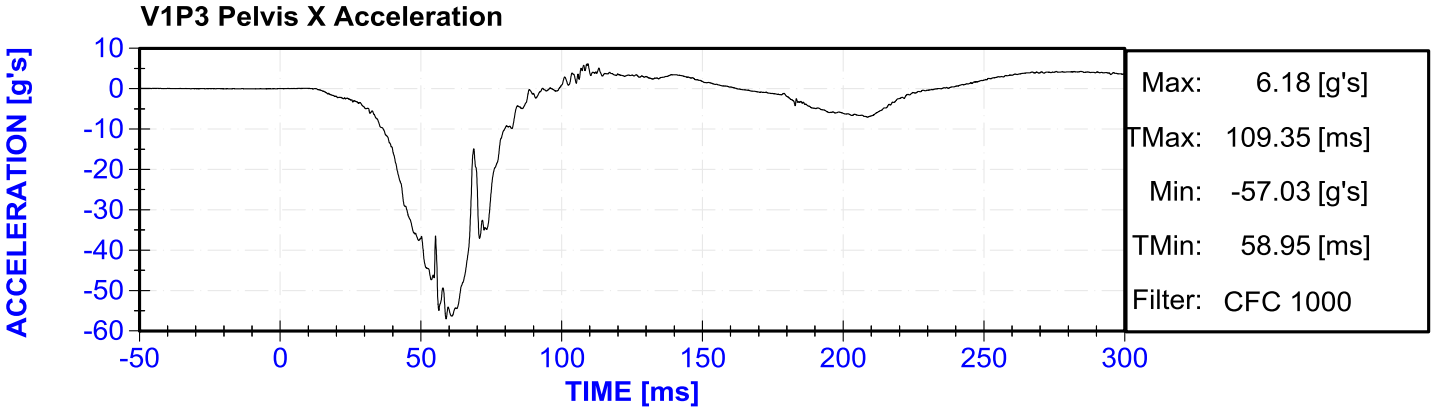
V1P3 Chest CG X Acceleration

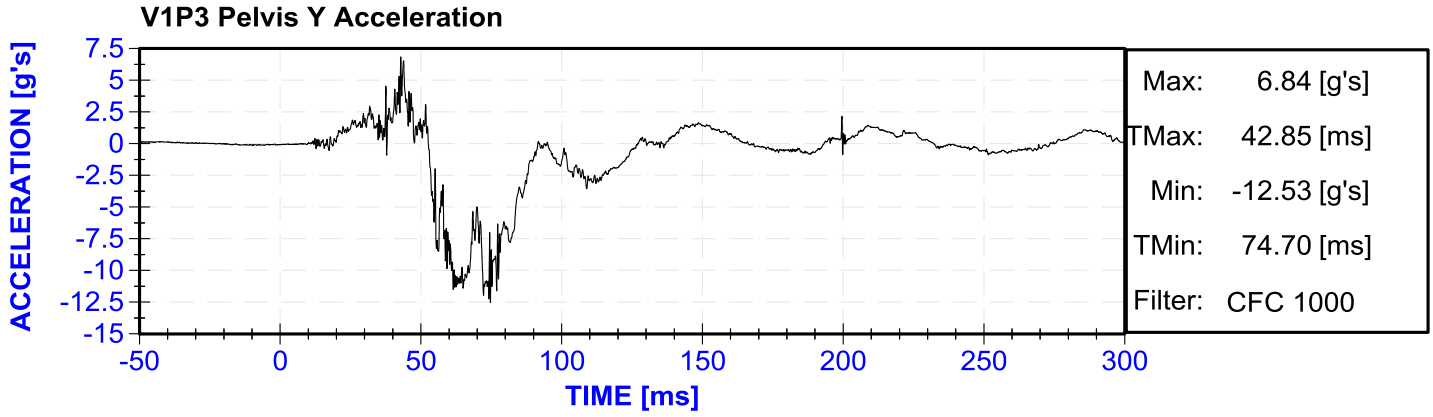


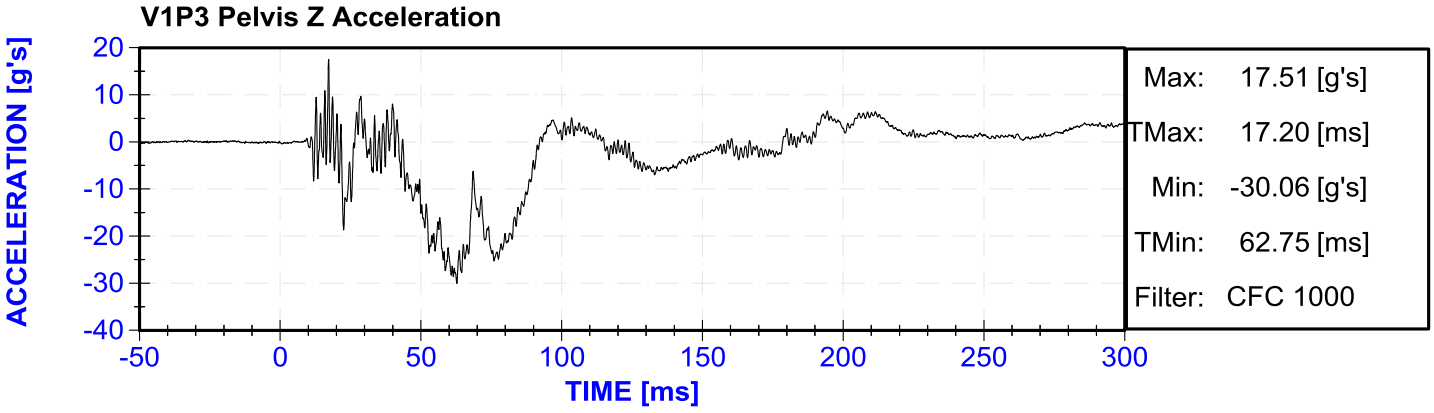
V1P3 Chest CG Y Acceleration

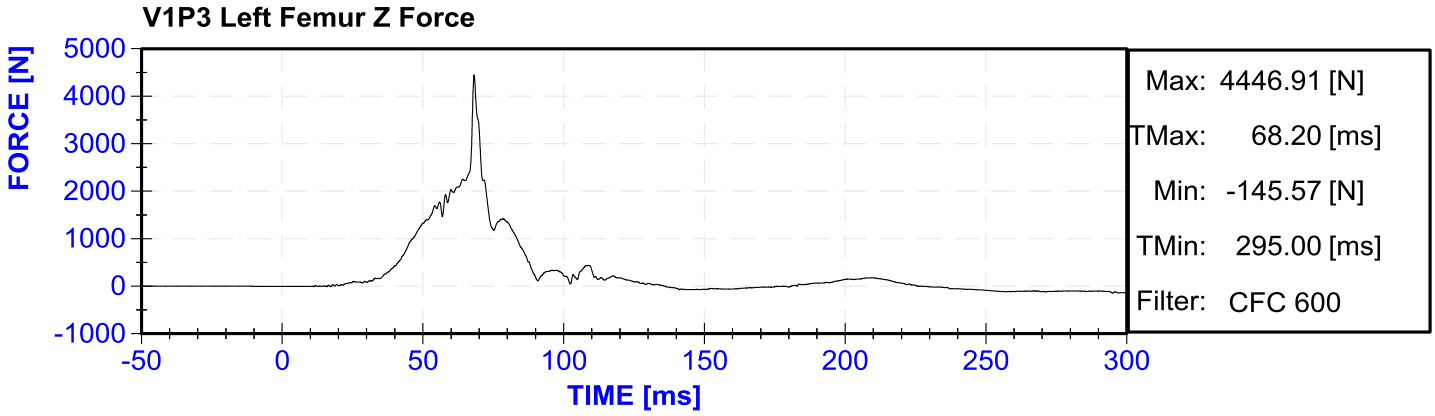


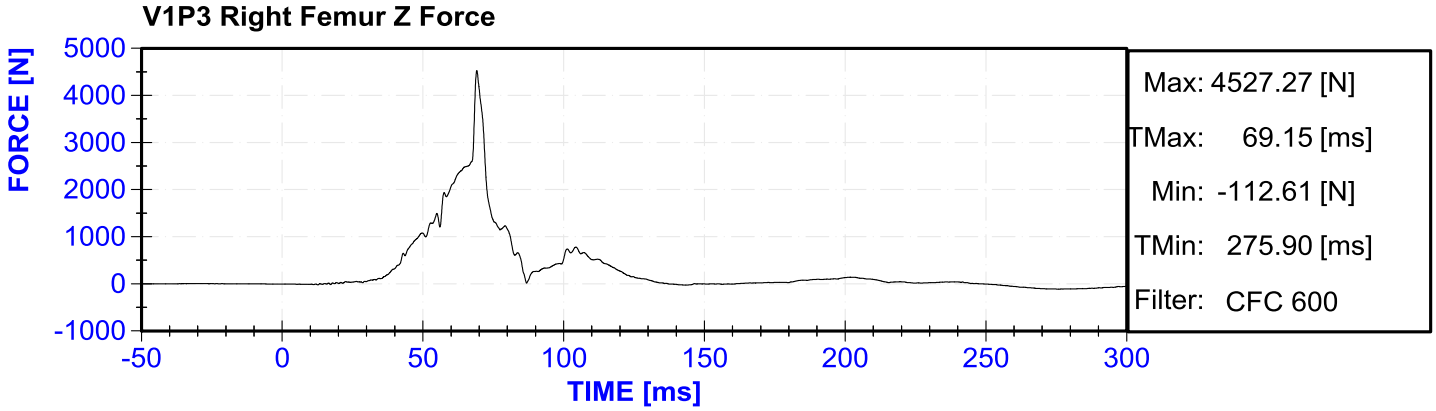

V1P3 Chest CG Z Acceleration
ACCELERATION [g's]
TIME [ms]
Max: 7.90 [g's]
TMax: 193.45 [ms]
Min: -10.40 [g's]
TMin: 62.85 [ms]
Filter: CFC 180

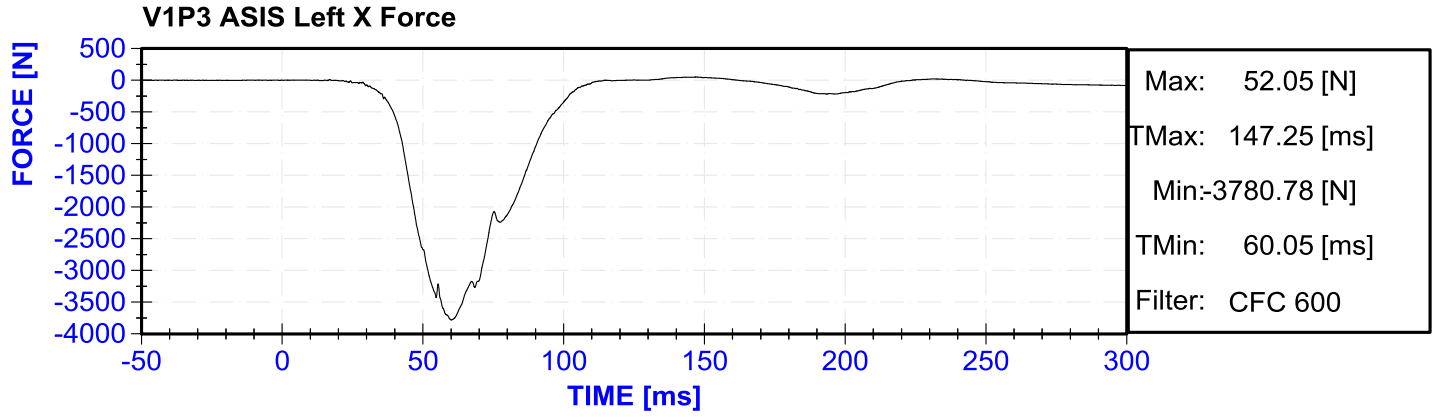

V1P3 Pelvis X Acceleration
ACCELERATION [g's]
TIME [ms]
Max: 6.18 [g's]
TMax: 109.35 [ms]
Min: -57.03 [g's]
TMin: 58.95 [ms]
Filter: CFC 1000

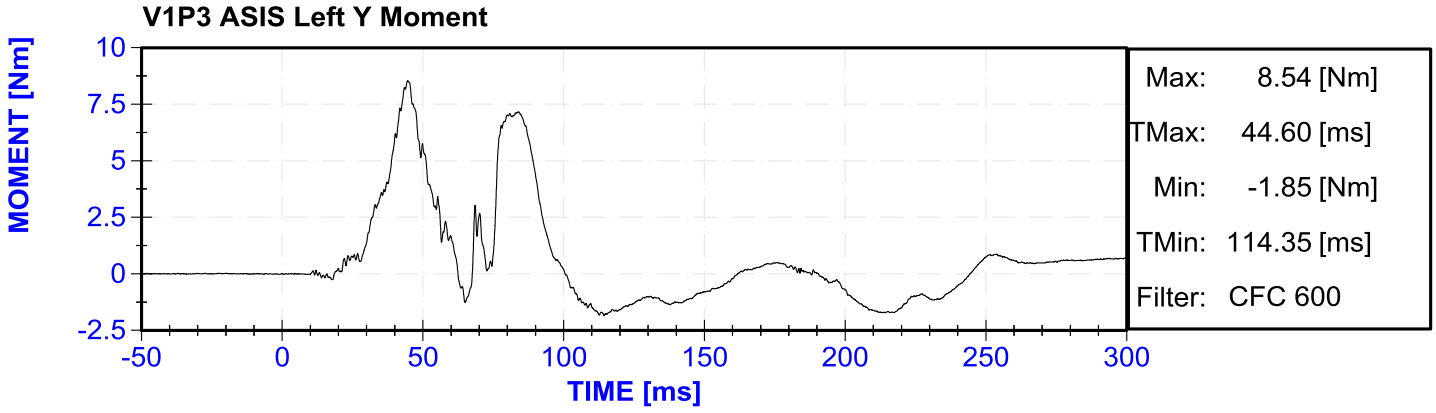

V1P3 Pelvis Y Acceleration
ACCELERATION [g's]
TIME [ms]
Max: 6.84 [g's]
TMax: 42.85 [ms]
Min: -12.53 [g's]
TMin: 74.70 [ms]
Filter: CFC 1000

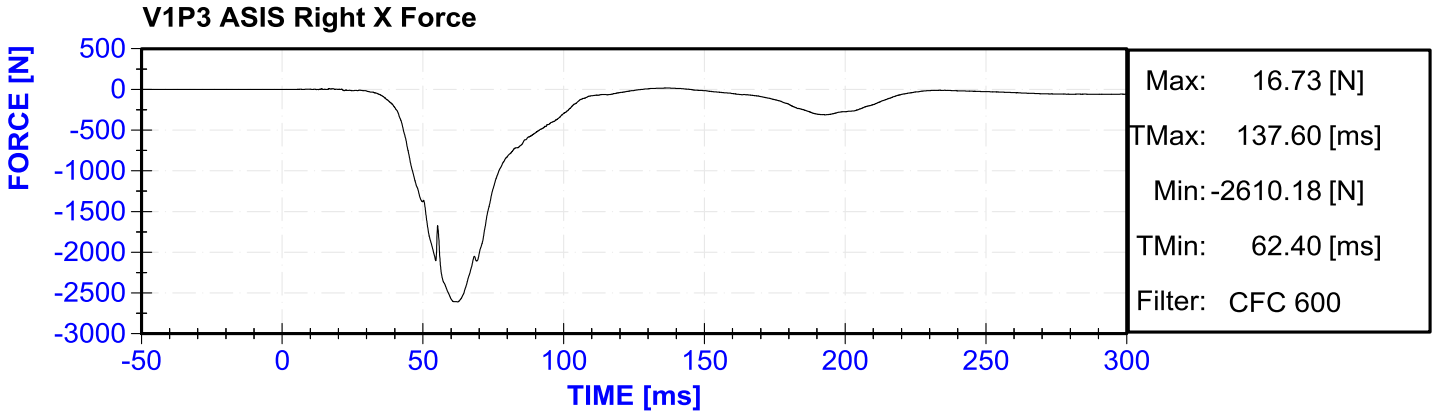

V1P3 Pelvis Z Acceleration
ACCELERATION [g's]
TIME [ms]
Max: 17.51 [g's]
TMax: 17.20 [ms]
Min: -30.06 [g's]
TMin: 62.75 [ms]
Filter: CFC 1000

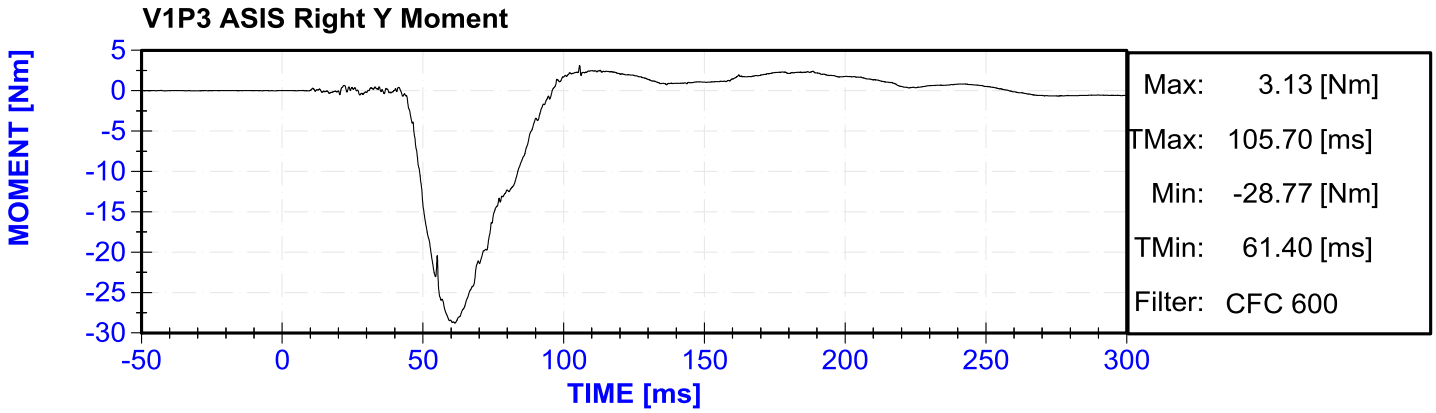

V1P3 Left Femur Z Force
FORCE [N]
5000
4000
3000
2000
1000
0
-1000
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 4446.91 [N]
TMax: 68.20 [ms]
Min: -145.57 [N]
TMin: 295.00 [ms]
Filter: CFC 600

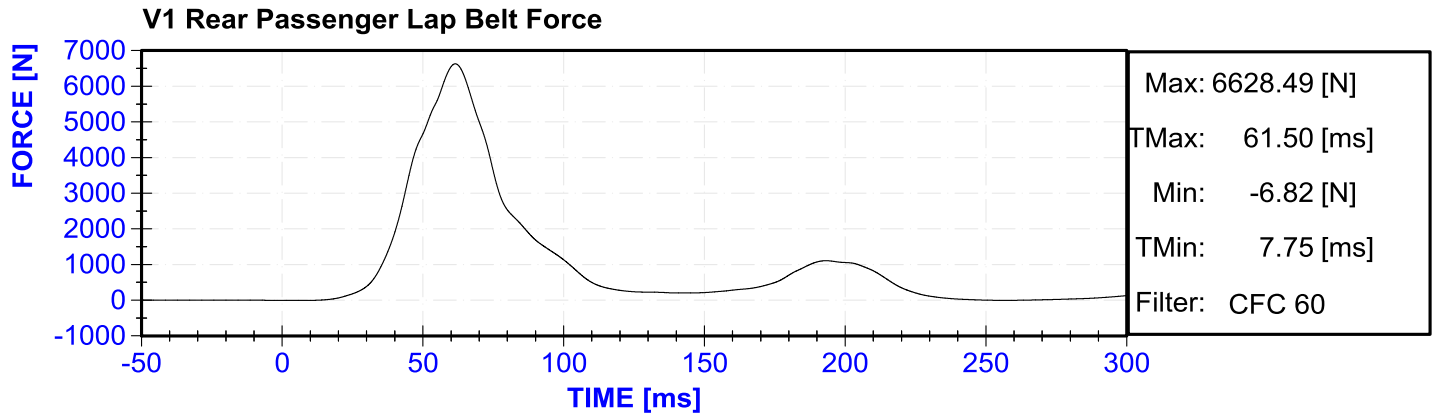

V1P3 Right Femur Z Force
FORCE [N]
5000
4000
3000
2000
1000
0
-1000
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 4527.27 [N]
TMax: 69.15 [ms]
Min: -112.61 [N]
TMin: 275.90 [ms]
Filter: CFC 600

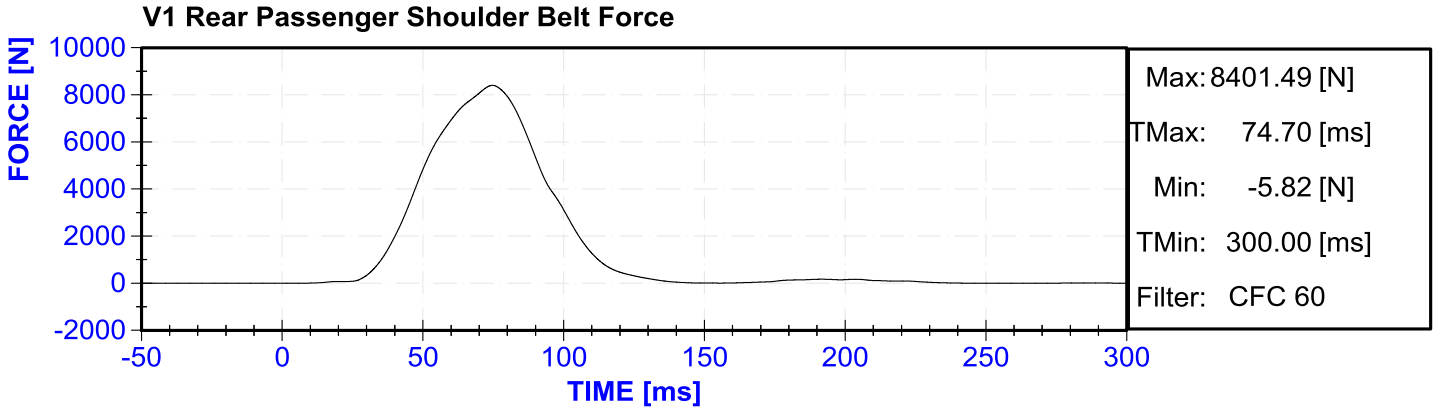

V1P3 ASIS Left X Force
FORCE [N]
500
0
-500
-1000
-1500
-2000
-2500
-3000
-3500
-4000
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 52.05 [N]
TMax: 147.25 [ms]
Min:-3780.78 [N]
TMin: 60.05 [ms]
Filter: CFC 600

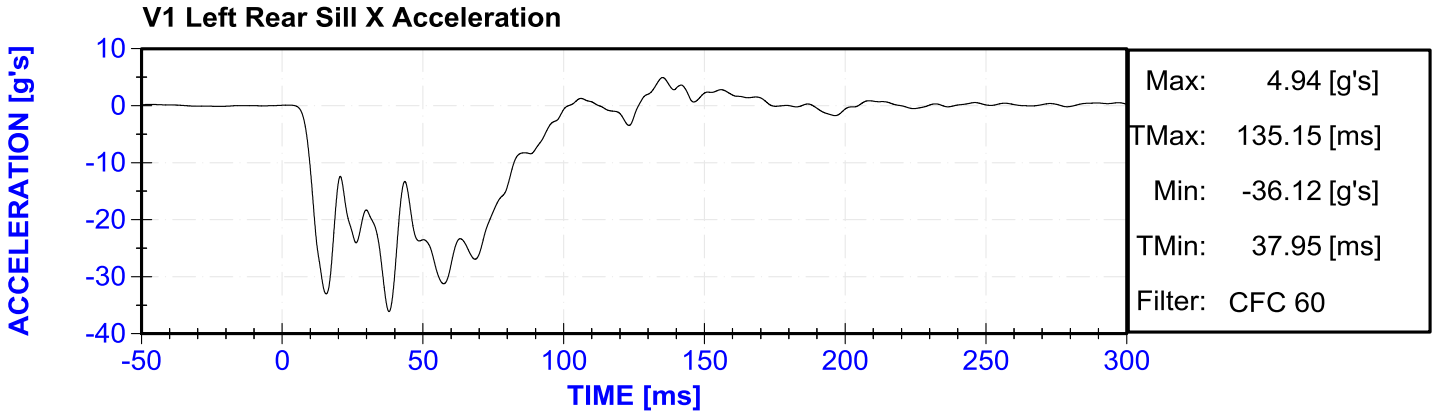

V1P3 ASIS Left Y Moment
MOMENT [Nm]
10
7.5
5
2.5
0
-2.5
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 8.54 [Nm]
TMax: 44.60 [ms]
Min: -1.85 [Nm]
TMin: 114.35 [ms]
Filter: CFC 600

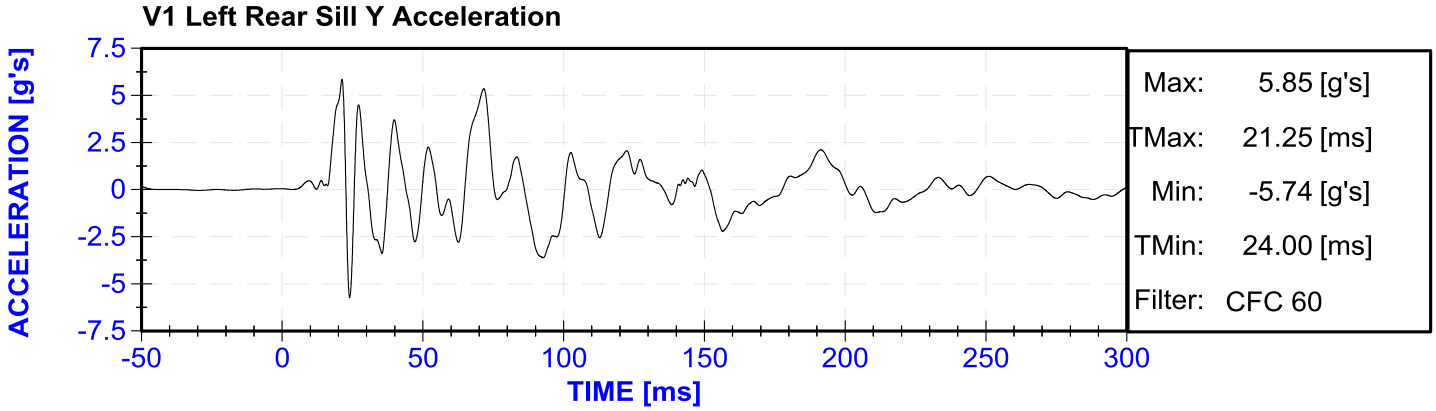

V1P3 ASIS Right X Force
FORCE [N]
500
0
-500
-1000
-1500
-2000
-2500
-3000
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 16.73 [N]
TMax: 137.60 [ms]
Min: -2610.18 [N]
TMin: 62.40 [ms]
Filter: CFC 600

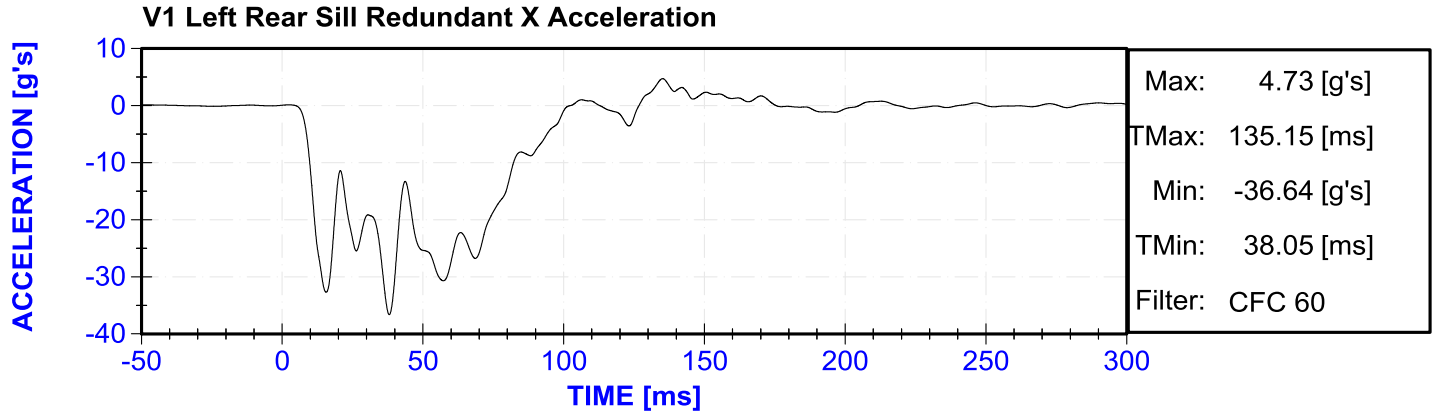

V1P3 ASIS Right Y Moment
MOMENT [Nm]
5
0
-5
-10
-15
-20
-25
-30
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 3.13 [Nm]
TMax: 105.70 [ms]
Min: -28.77 [Nm]
TMin: 61.40 [ms]
Filter: CFC 600

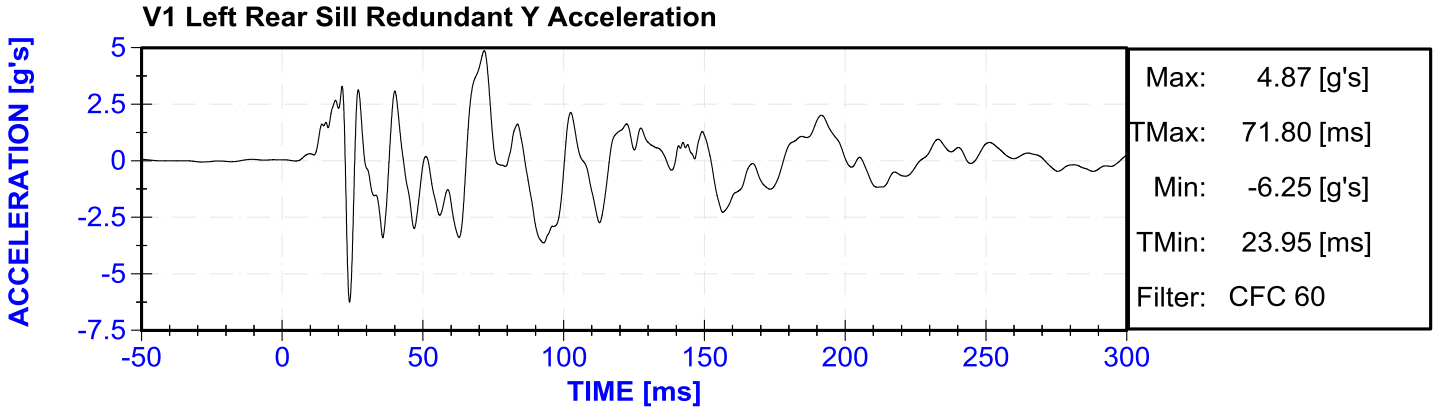

V1 Rear Passenger Lap Belt Force
FORCE [N]
7000
6000
5000
4000
3000
2000
1000
0
-1000
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 6628.49 [N]
TMax: 61.50 [ms]
Min: -6.82 [N]
TMin: 7.75 [ms]
Filter: CFC 60


V1 Rear Passenger Shoulder Belt Force
FORCE [N]
10000
8000
6000
4000
2000
0
-2000
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 8401.49 [N]
TMax: 74.70 [ms]
Min: -5.82 [N]
TMin: 300.00 [ms]
Filter: CFC 60

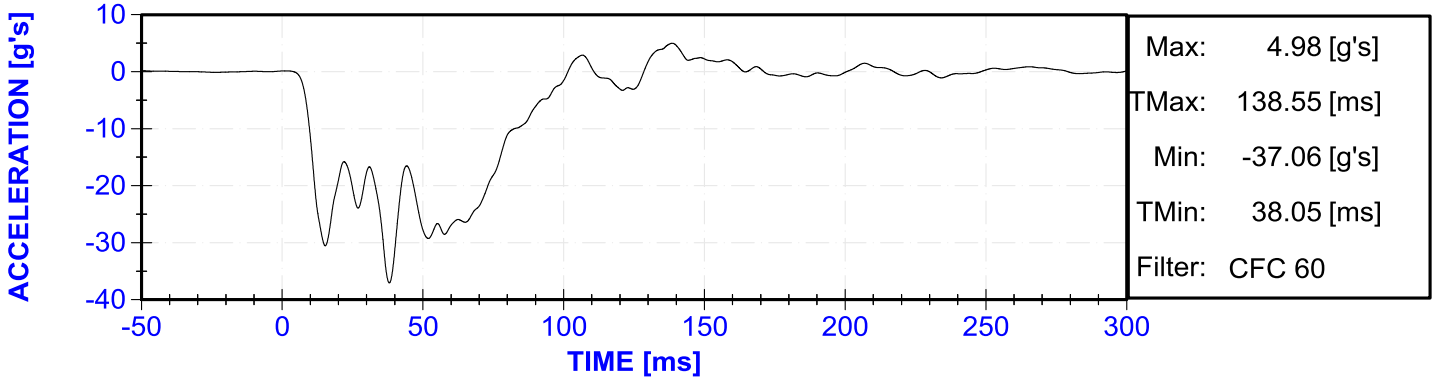

V1 Left Rear Sill X Acceleration
ACCELERATION [g's]
10
0
-10
-20
-30
-40
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 4.94 [g's]
TMax: 135.15 [ms]
Min: -36.12 [g's]
TMin: 37.95 [ms]
Filter: CFC 60


V1 Left Rear Sill Y Acceleration
ACCELERATION [g's]
7.5
5
2.5
0
-2.5
-5
-7.5
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 5.85 [g's]
TMax: 21.25 [ms]
Min: -5.74 [g's]
TMin: 24.00 [ms]
Filter: CFC 60

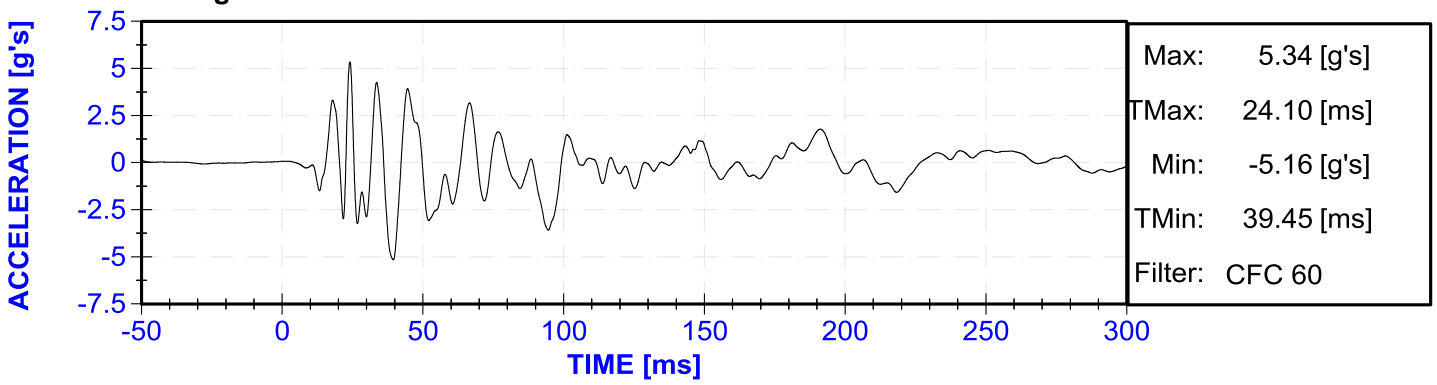

V1 Left Rear Sill Redundant X Acceleration
ACCELERATION [g's]
10
0
-10
-20
-30
-40
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 4.73 [g's]
TMax: 135.15 [ms]
Min: -36.64 [g's]
TMin: 38.05 [ms]
Filter: CFC 60


V1 Left Rear Sill Redundant Y Acceleration
ACCELERATION [g's]
5
2.5
0
-2.5
-5
-7.5
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 4.87 [g's]
TMax: 71.80 [ms]
Min: -6.25 [g's]
TMin: 23.95 [ms]
Filter: CFC 60

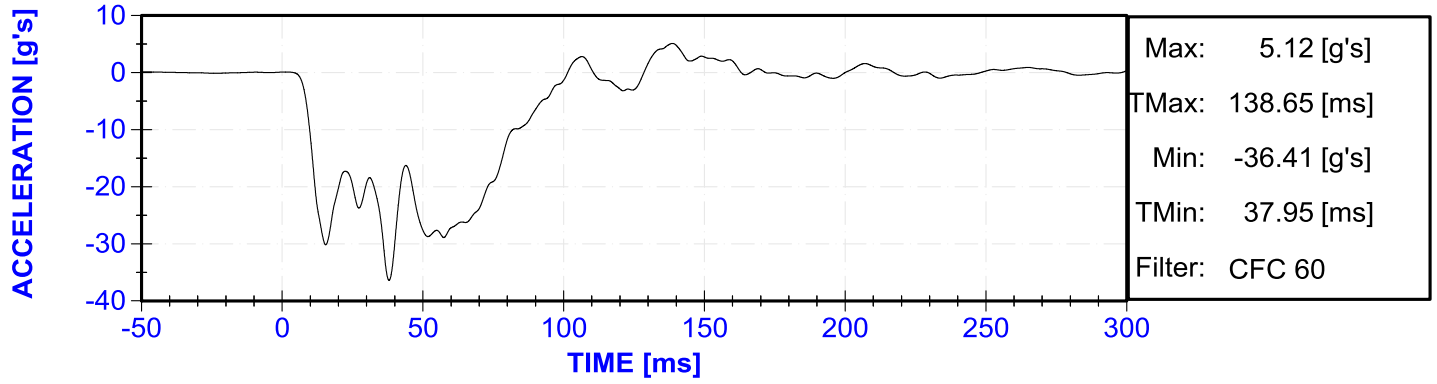
V1 Right Rear Sill X Acceleration



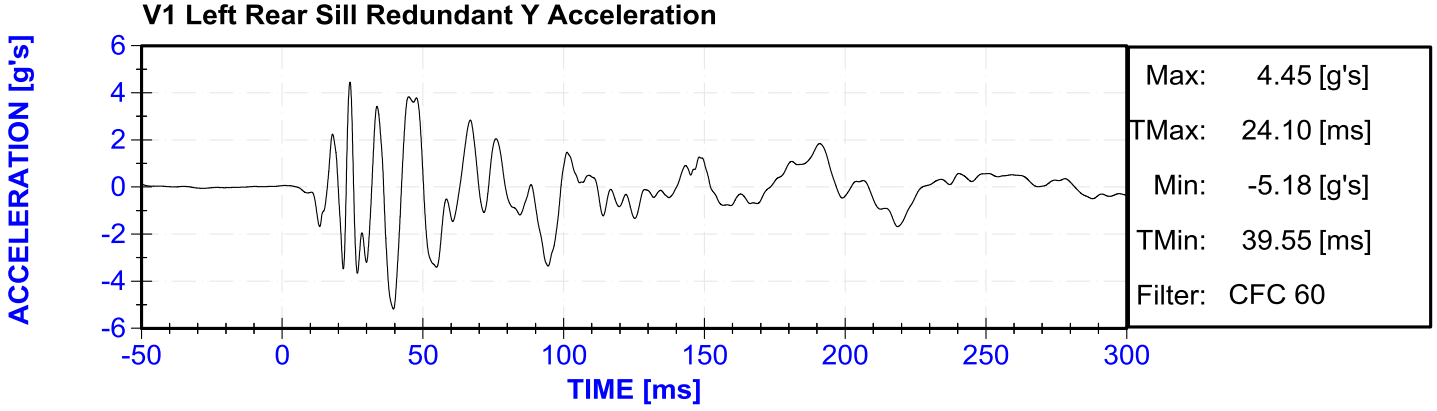
V1 Right Rear Sill Y Acceleration



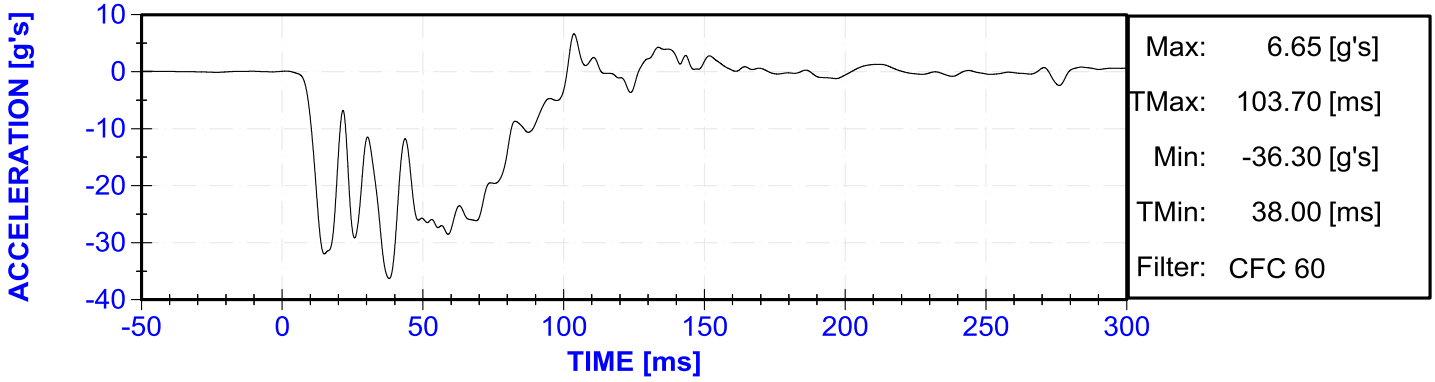
V1 Left Rear Sill Redundant X Acceleration



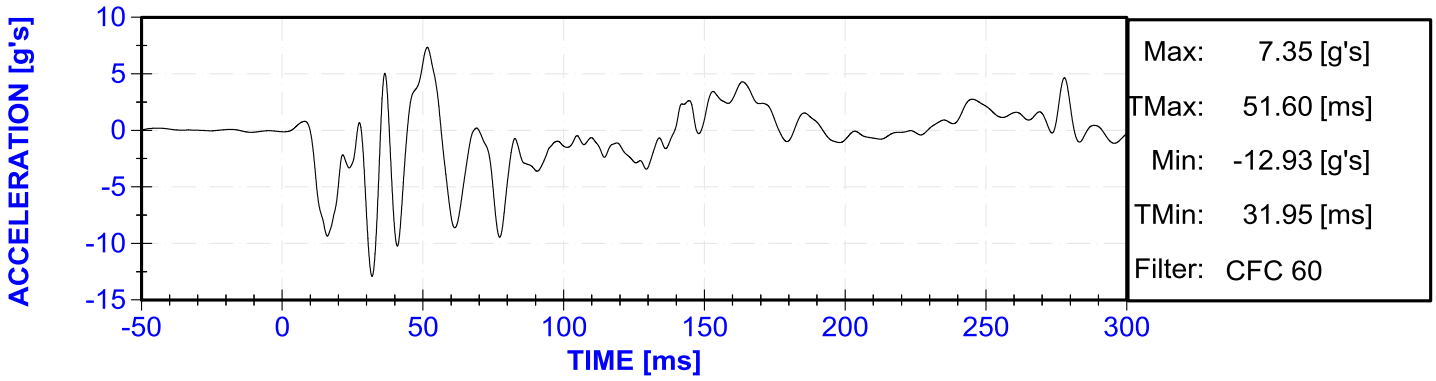
V1 Left Rear Sill Redundant Y Acceleration



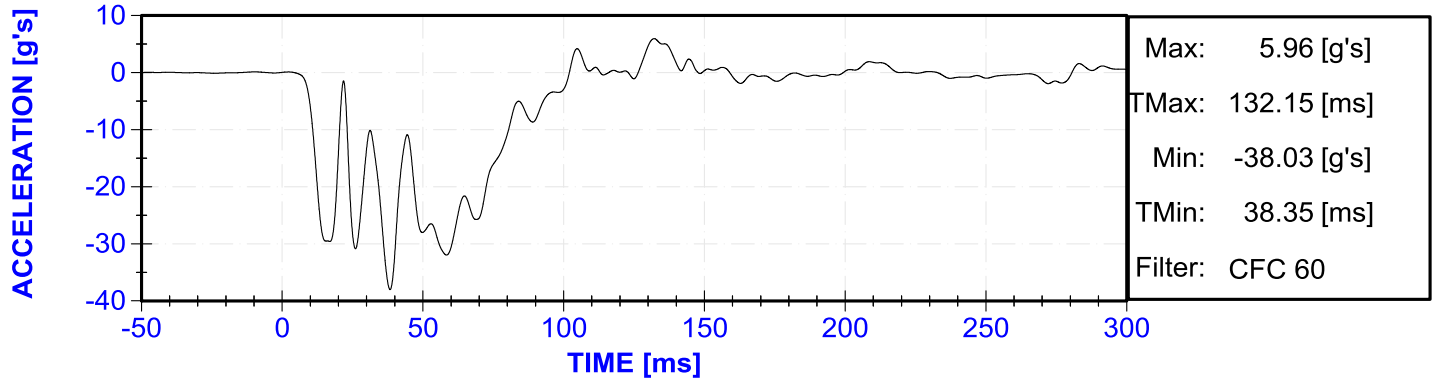
V1 Left Front Outer Seat Track Mid X Acceleration



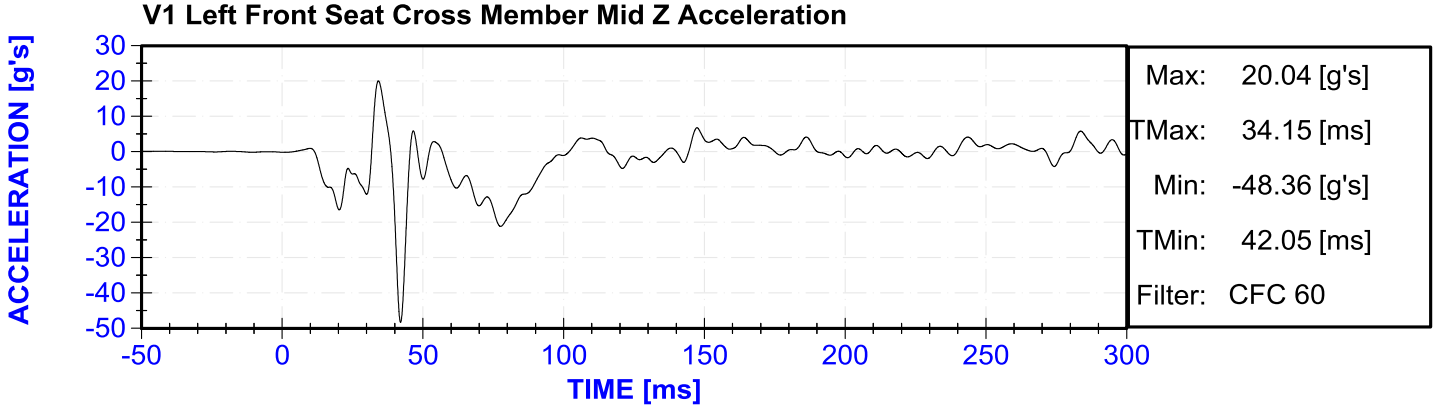
V1 Left Front Outer Seat Track Mid Z Acceleration



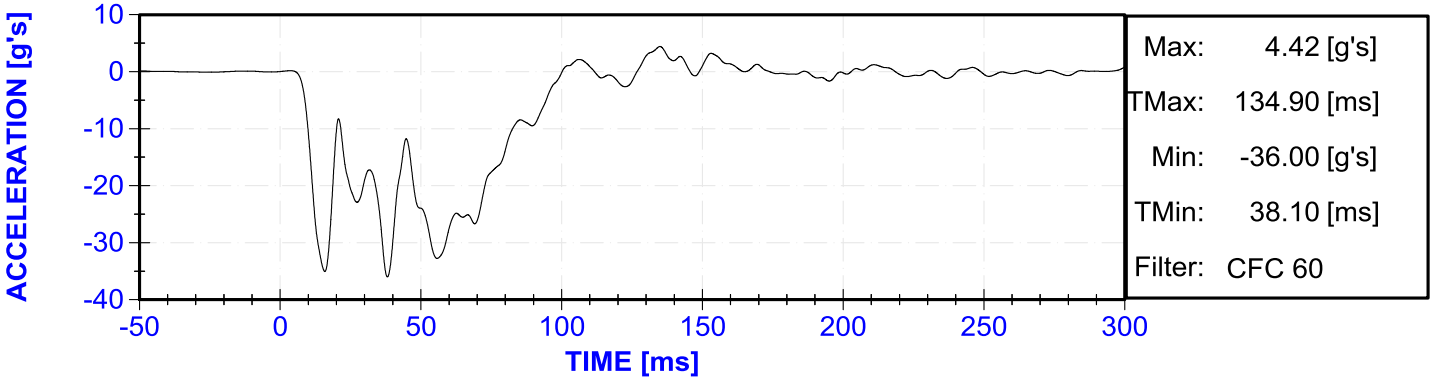
V1 Left Front Seat Cross Member Mid X Acceleration



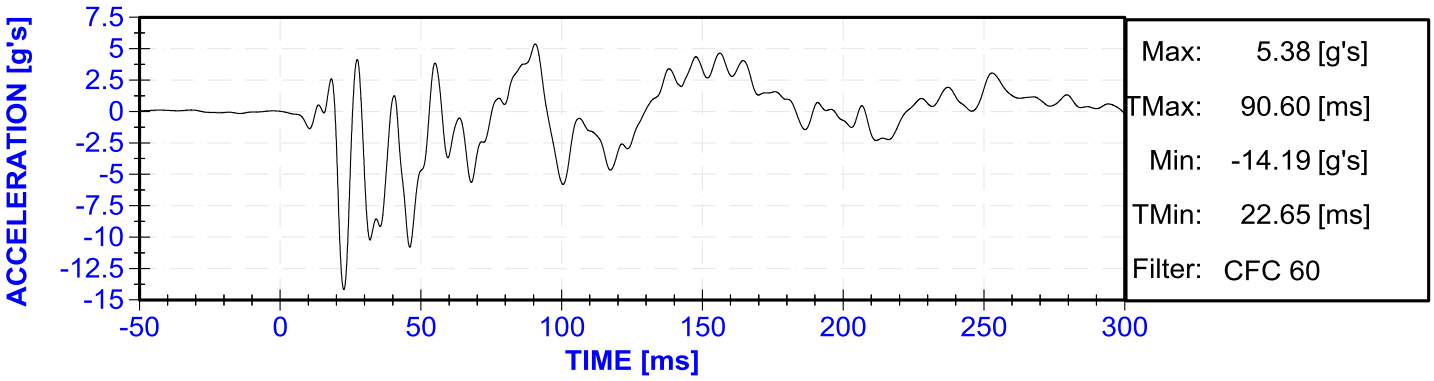
V1 Left Front Seat Cross Member Mid Z Acceleration



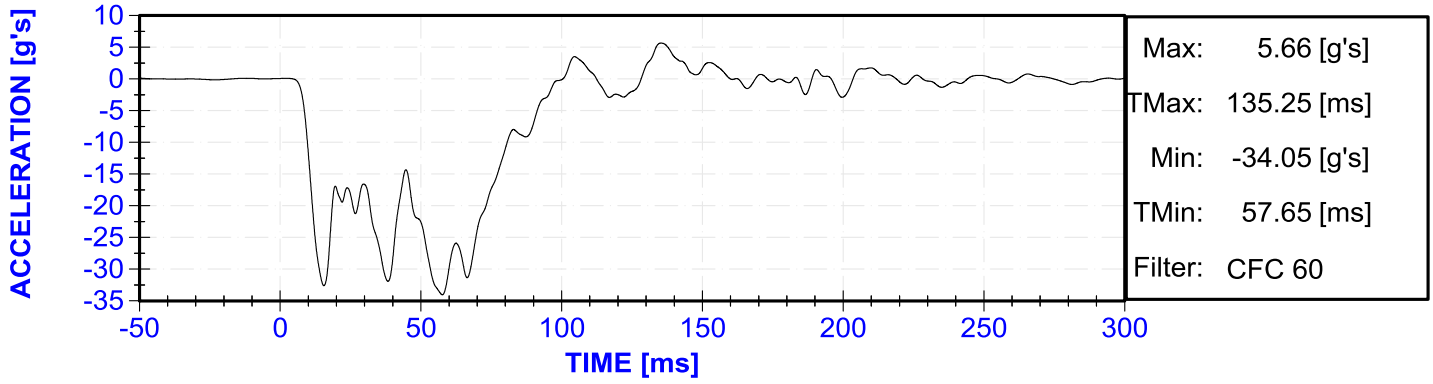
V1 Left Rear Seat Cross Member X Acceleration



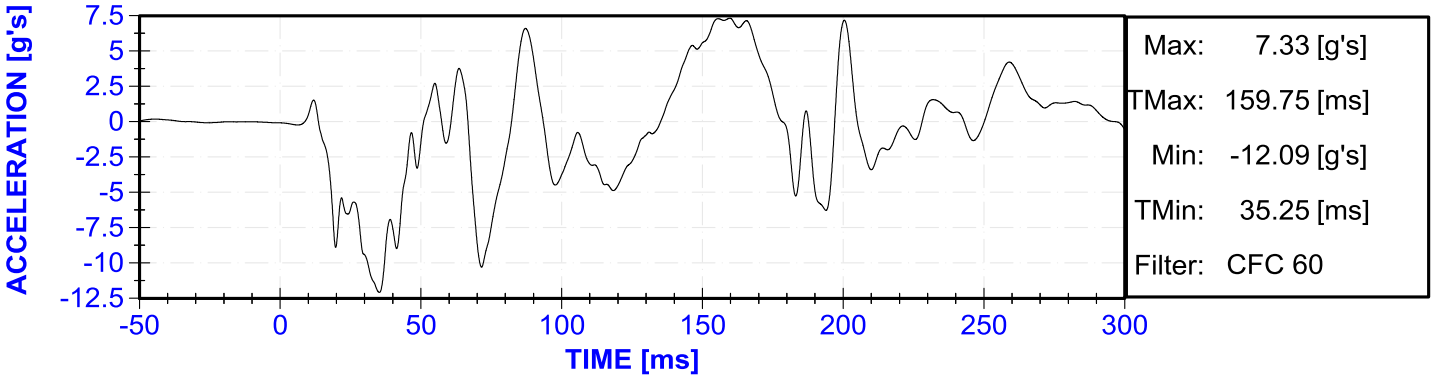
V1 Left Rear Seat Cross Member Z Acceleration

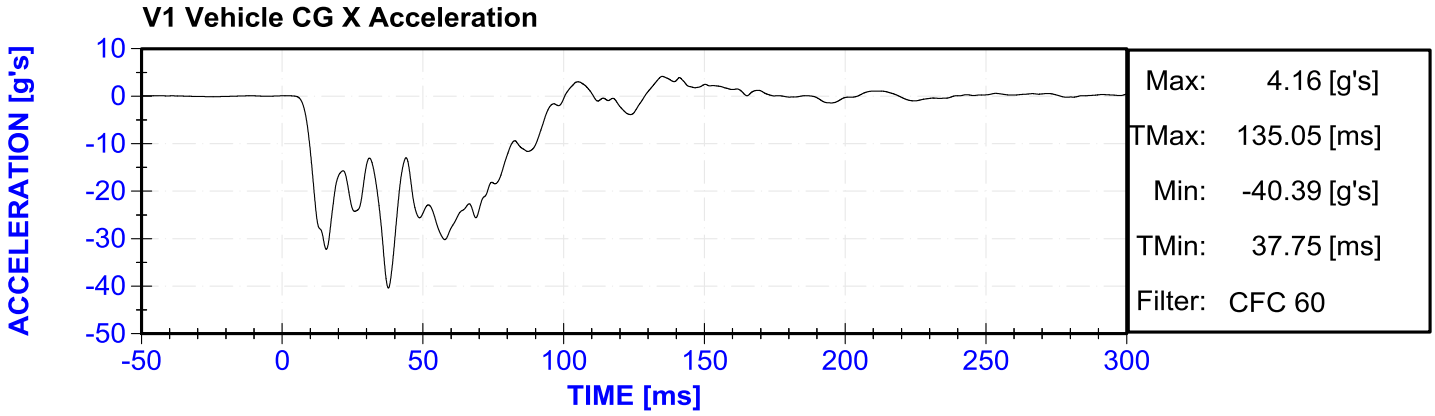


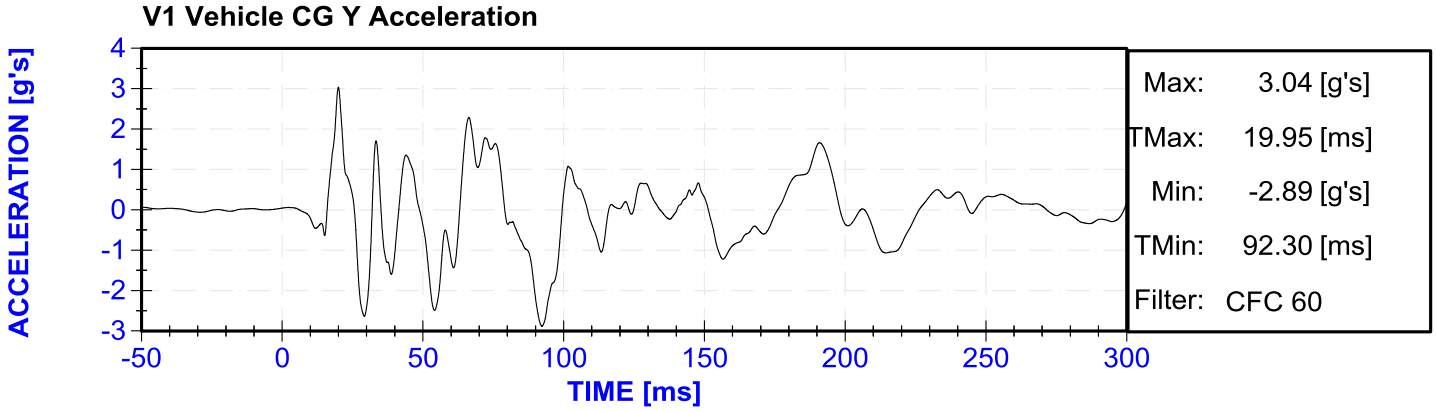
V1 Right Rear Seat Cross Member X Acceleration

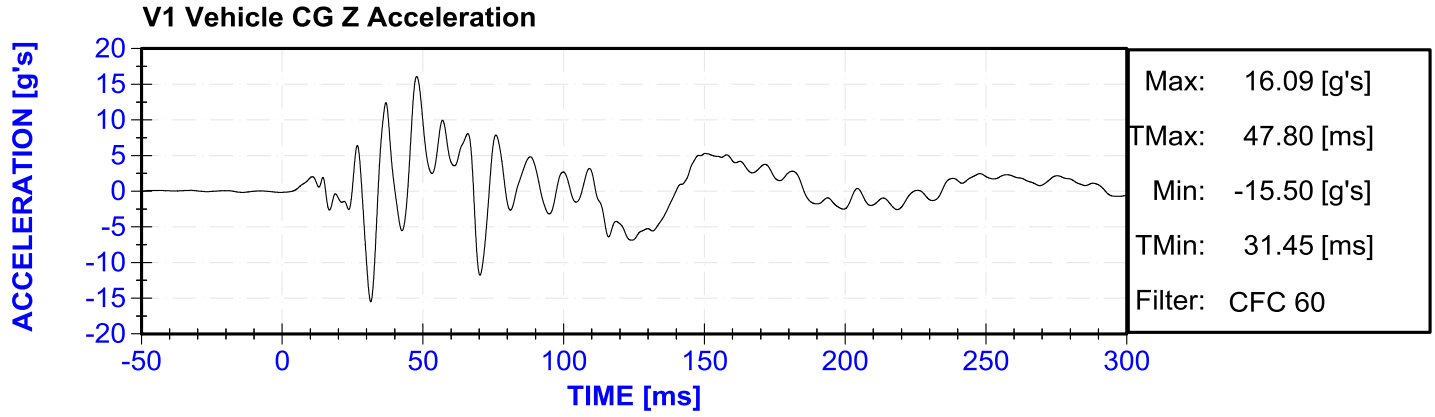


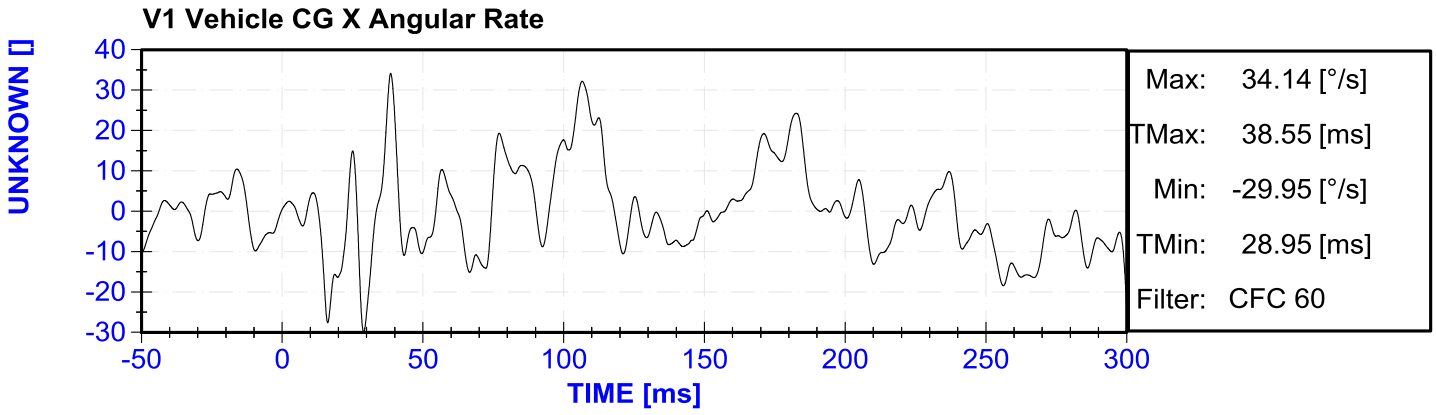
V1 Right Rear Seat Cross Member Z Acceleration



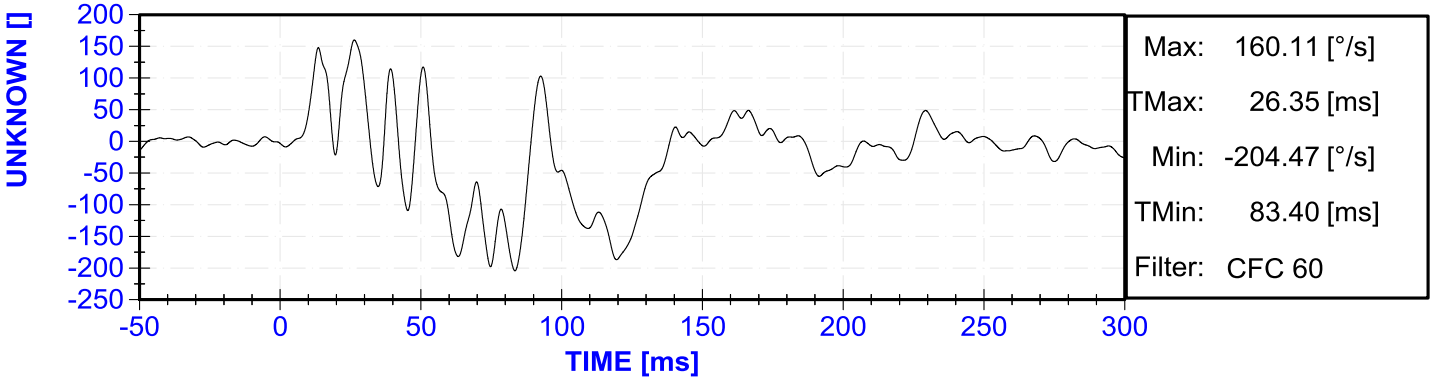

V1 Vehicle CG X Acceleration
ACCELERATION [g's]
10
0
-10
-20
-30
-40
-50
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 4.16 [g's]
TMax: 135.05 [ms]
Min: -40.39 [g's]
TMin: 37.75 [ms]
Filter: CFC 60


V1 Vehicle CG Y Acceleration
ACCELERATION [g's]
4
3
2
1
0
-1
-2
-3
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 3.04 [g's]
TMax: 19.95 [ms]
Min: -2.89 [g's]
TMin: 92.30 [ms]
Filter: CFC 60


V1 Vehicle CG Z Acceleration
ACCELERATION [g's]
20
15
10
5
0
-5
-10
-15
-20
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 16.09 [g's]
TMax: 47.80 [ms]
Min: -15.50 [g's]
TMin: 31.45 [ms]
Filter: CFC 60

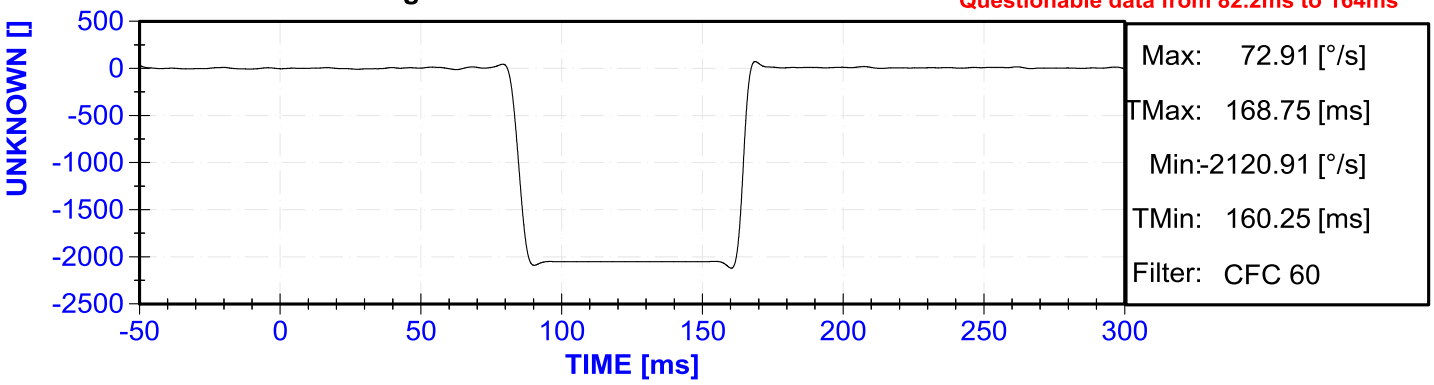

V1 Vehicle CG X Angular Rate
UNKNOWN []
40
30
20
10
0
-10
-20
-30
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 34.14 [°/s]
TMax: 38.55 [ms]
Min: -29.95 [°/s]
TMin: 28.95 [ms]
Filter: CFC 60

V1 Vehicle CG Y Angular Rate



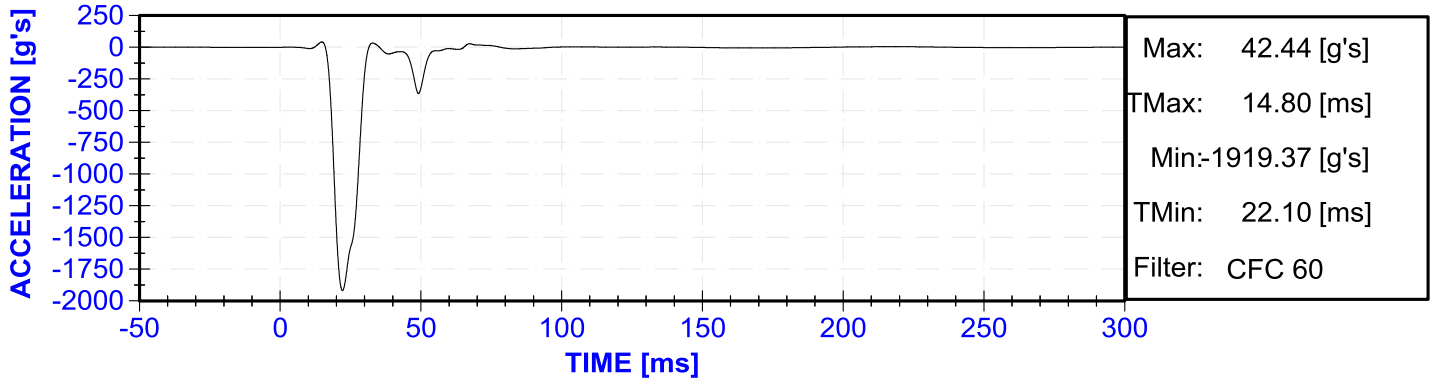
V1 Vehicle CG Z Angular Rate

Questionable data from 82.2ms to 164ms

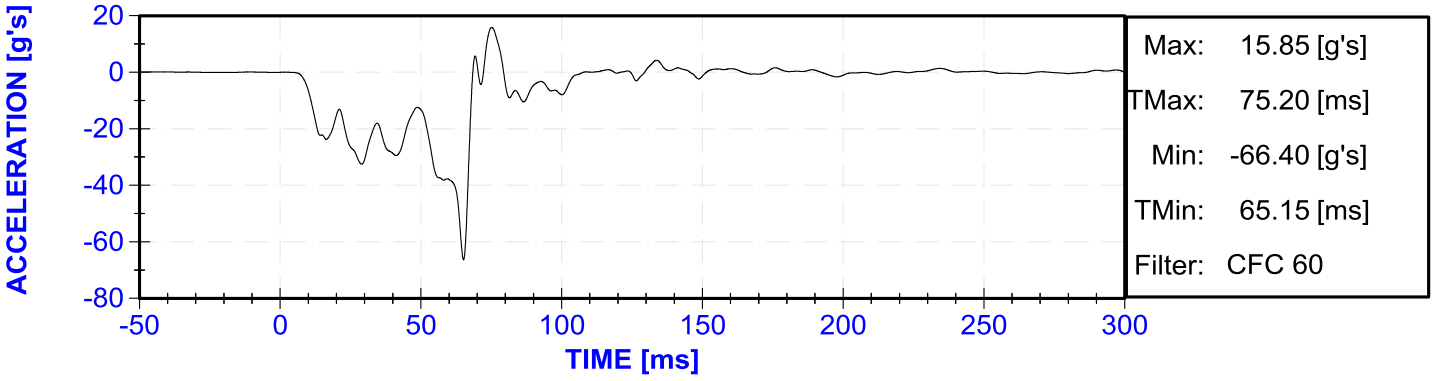


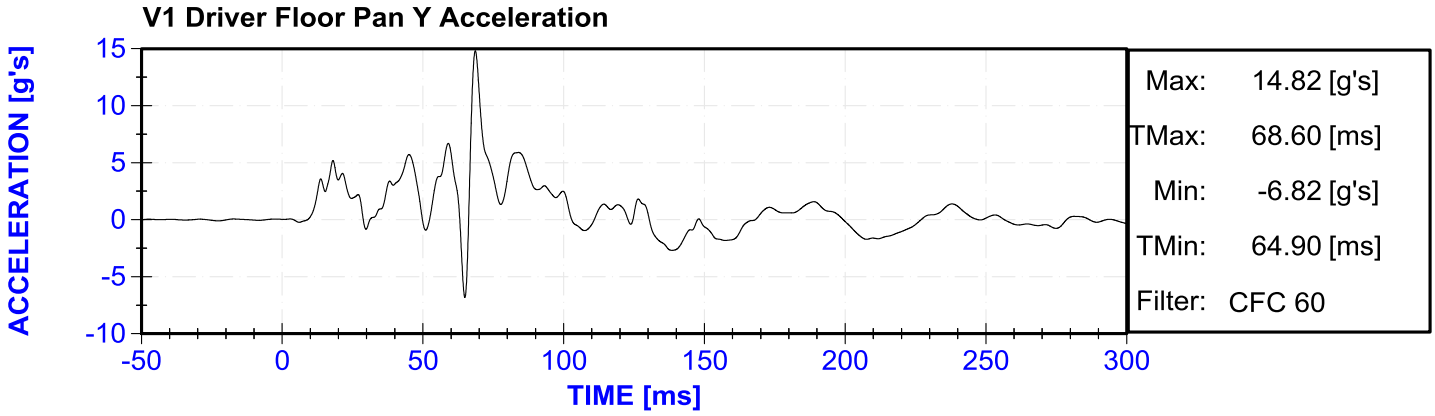
V1 Engine Top X Acceleration

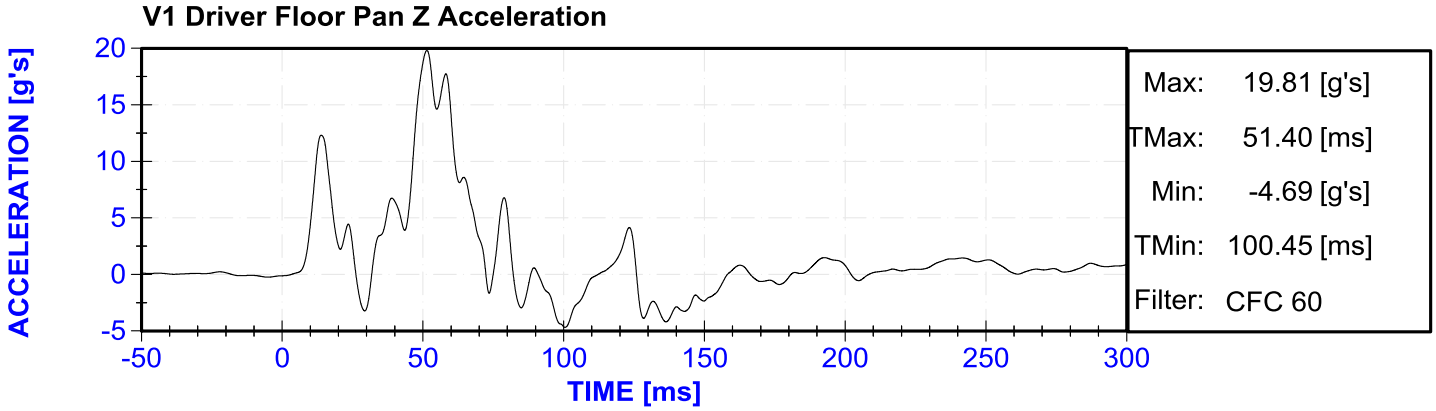
Questionable data from 19ms

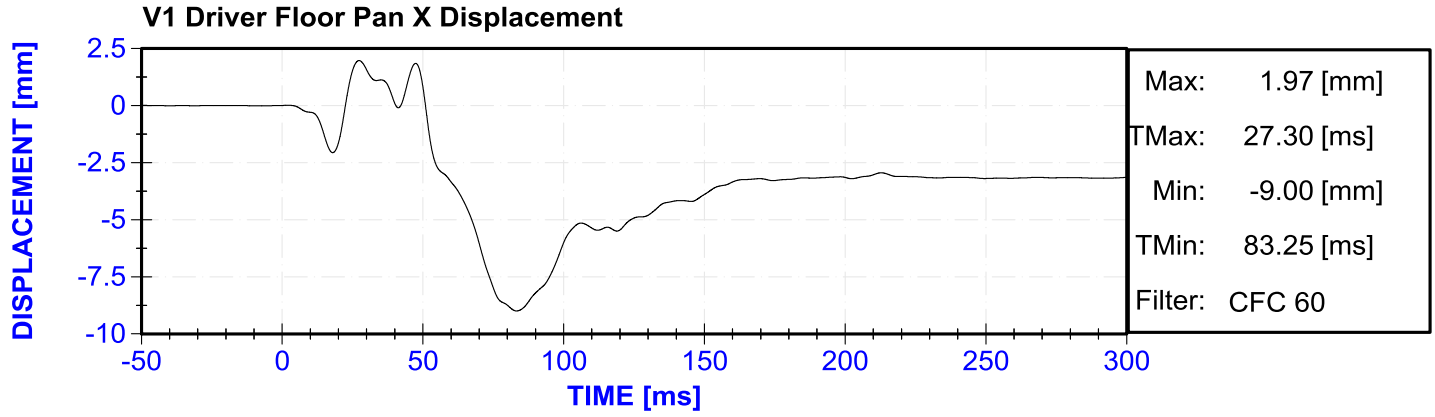


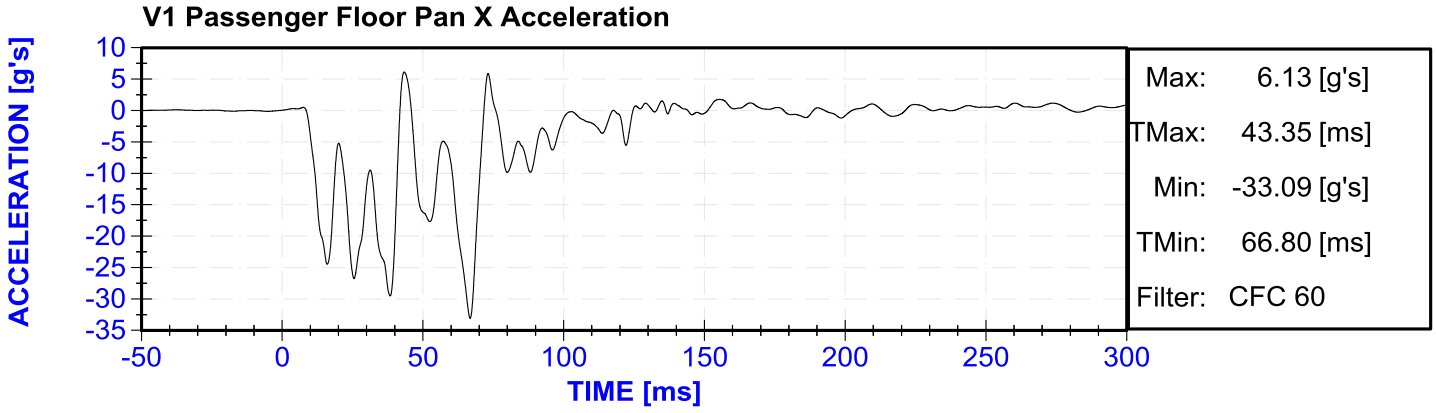
V1 Driver Floor Pan X Acceleration

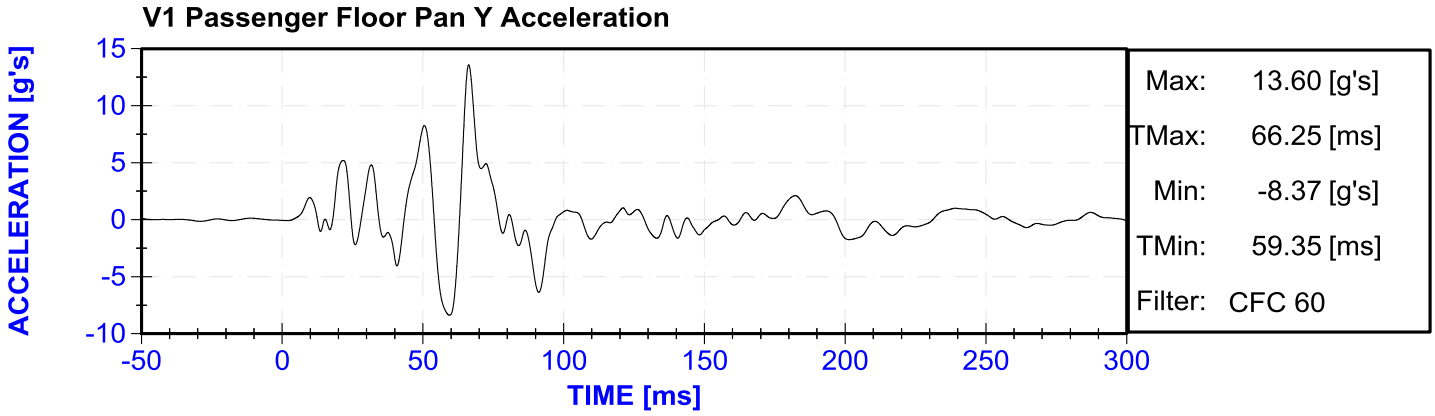


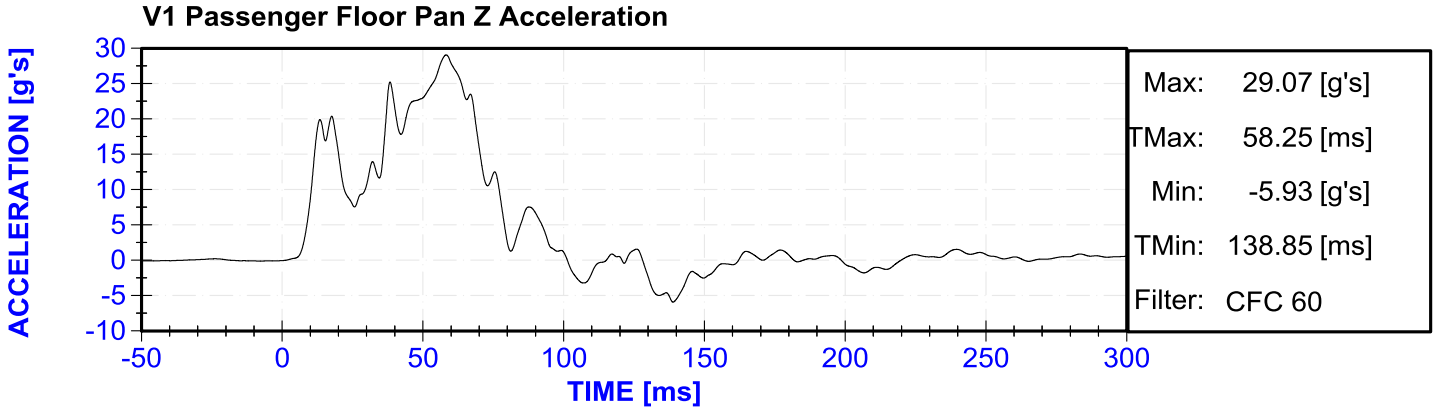

V1 Driver Floor Pan Y Acceleration
ACCELERATION [g's]
15
10
5
0
-5
-10
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 14.82 [g's]
TMax: 68.60 [ms]
Min: -6.82 [g's]
TMin: 64.90 [ms]
Filter: CFC 60

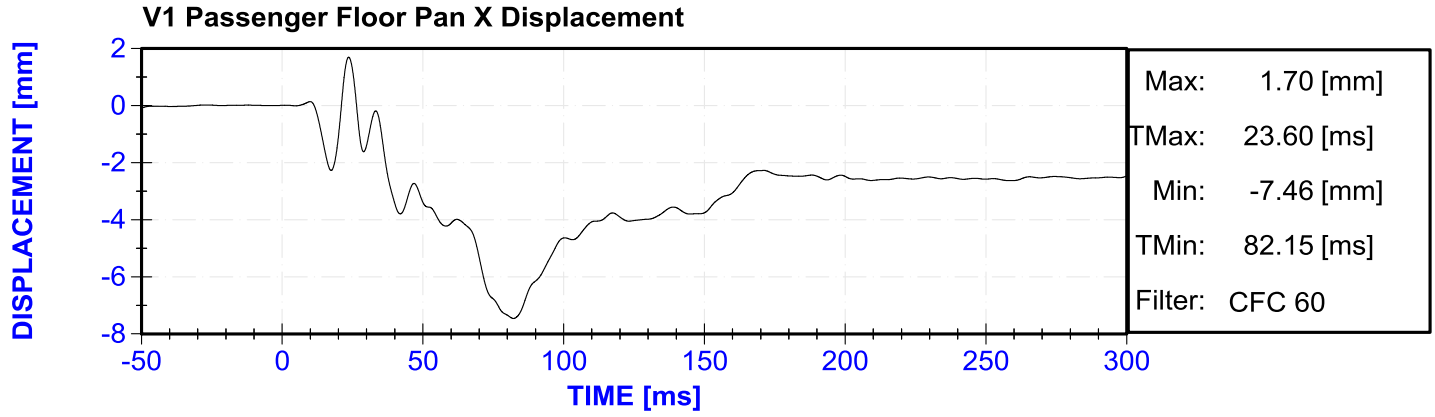

V1 Driver Floor Pan Z Acceleration
ACCELERATION [g's]
20
15
10
5
0
-5
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 19.81 [g's]
TMax: 51.40 [ms]
Min: -4.69 [g's]
TMin: 100.45 [ms]
Filter: CFC 60

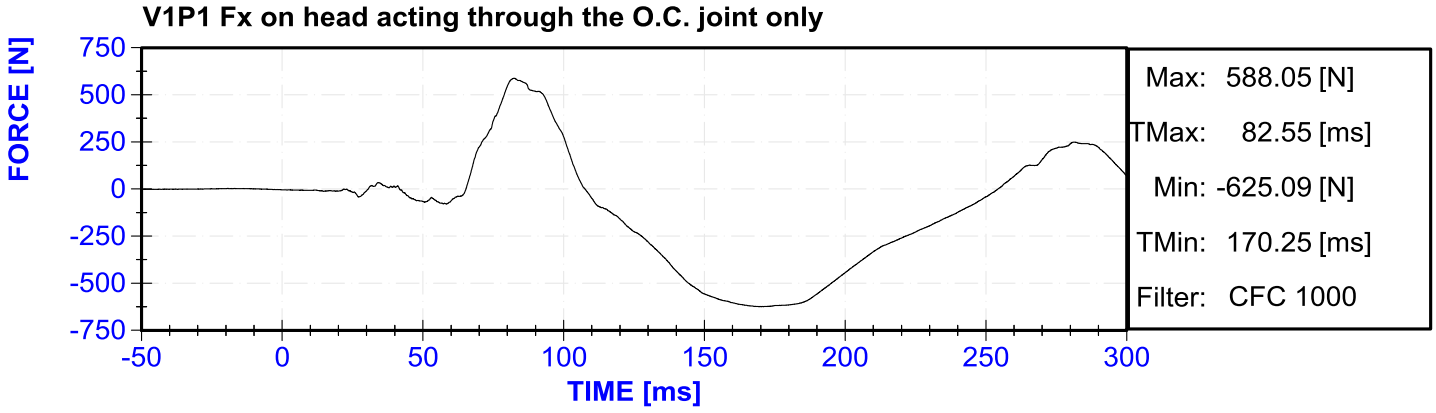

V1 Driver Floor Pan X Displacement
DISPLACEMENT [mm]
2.5
0
-2.5
-5
-7.5
-10
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 1.97 [mm]
TMax: 27.30 [ms]
Min: -9.00 [mm]
TMin: 83.25 [ms]
Filter: CFC 60


V1 Passenger Floor Pan X Acceleration
ACCELERATION [g's]
10
5
0
-5
-10
-15
-20
-25
-30
-35
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 6.13 [g's]
TMax: 43.35 [ms]
Min: -33.09 [g's]
TMin: 66.80 [ms]
Filter: CFC 60

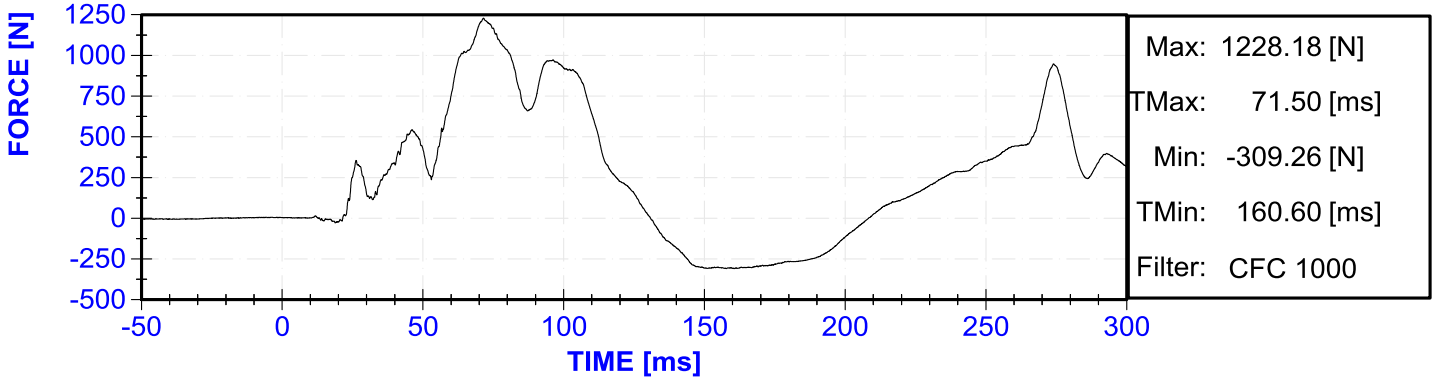

V1 Passenger Floor Pan Y Acceleration
ACCELERATION [g's]
15
10
5
0
-5
-10
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 13.60 [g's]
TMax: 66.25 [ms]
Min: -8.37 [g's]
TMin: 59.35 [ms]
Filter: CFC 60


V1 Passenger Floor Pan Z Acceleration
ACCELERATION [g's]
30
25
20
15
10
5
0
-5
-10
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 29.07 [g's]
TMax: 58.25 [ms]
Min: -5.93 [g's]
TMin: 138.85 [ms]
Filter: CFC 60

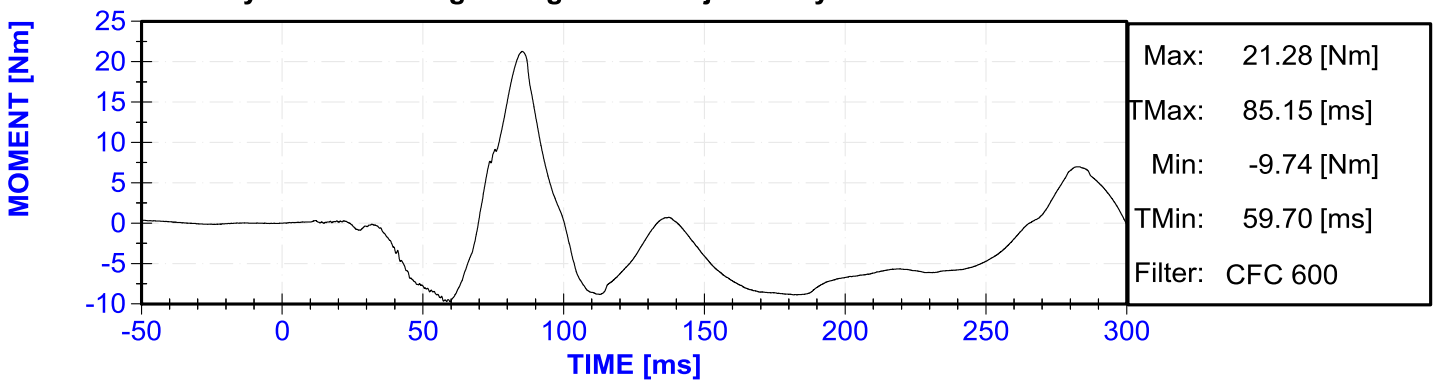

V1 Passenger Floor Pan X Displacement
DISPLACEMENT [mm]
2
0
-2
-4
-6
-8
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 1.70 [mm]
TMax: 23.60 [ms]
Min: -7.46 [mm]
TMin: 82.15 [ms]
Filter: CFC 60


V1P1 Fx on head acting through the O.C. joint only
FORCE [N]
750
500
250
0
-250
-500
-750
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 588.05 [N]
TMax: 82.55 [ms]
Min: -625.09 [N]
TMin: 170.25 [ms]
Filter: CFC 1000

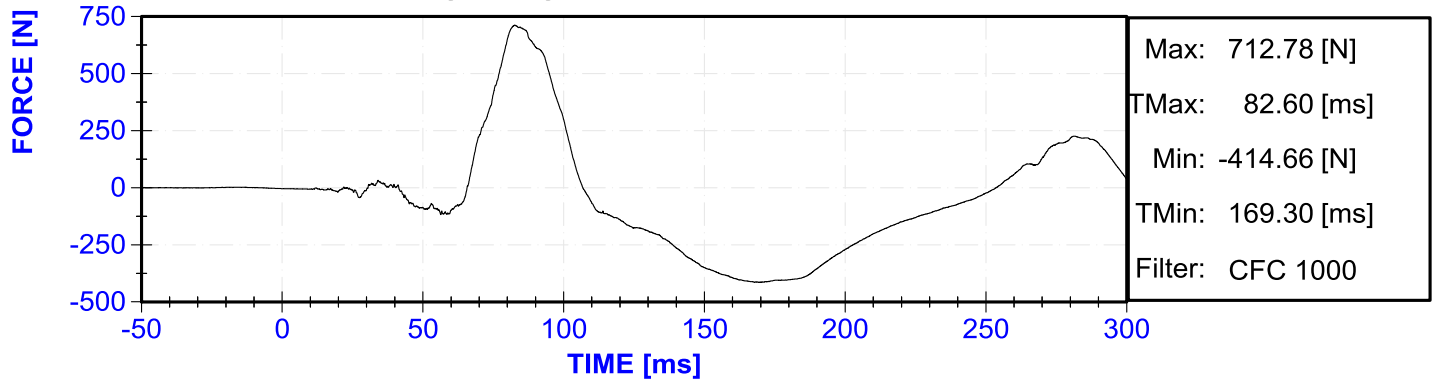
V1P1 Fz on head acting through the O.C. joint only



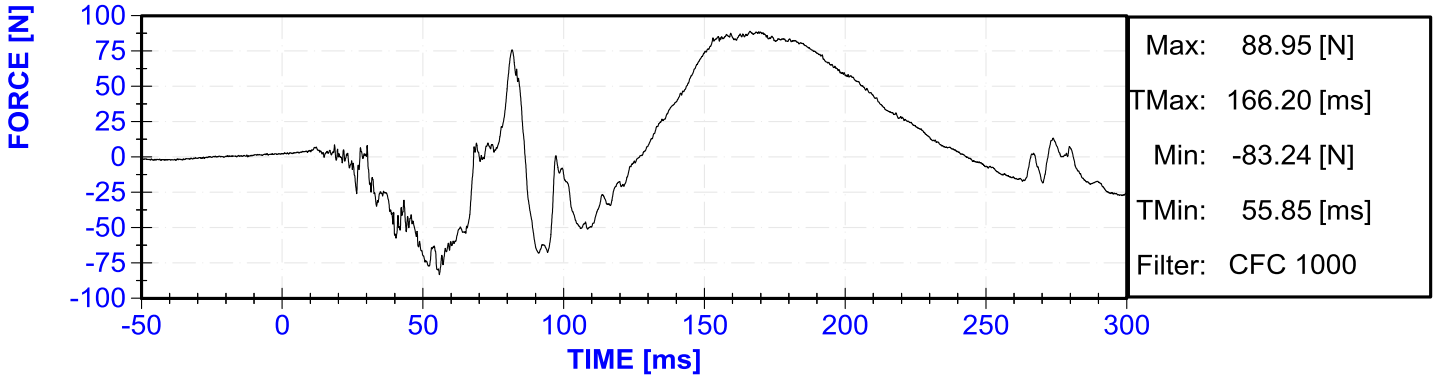
V1P1 My on head acting through the O.C. joint only



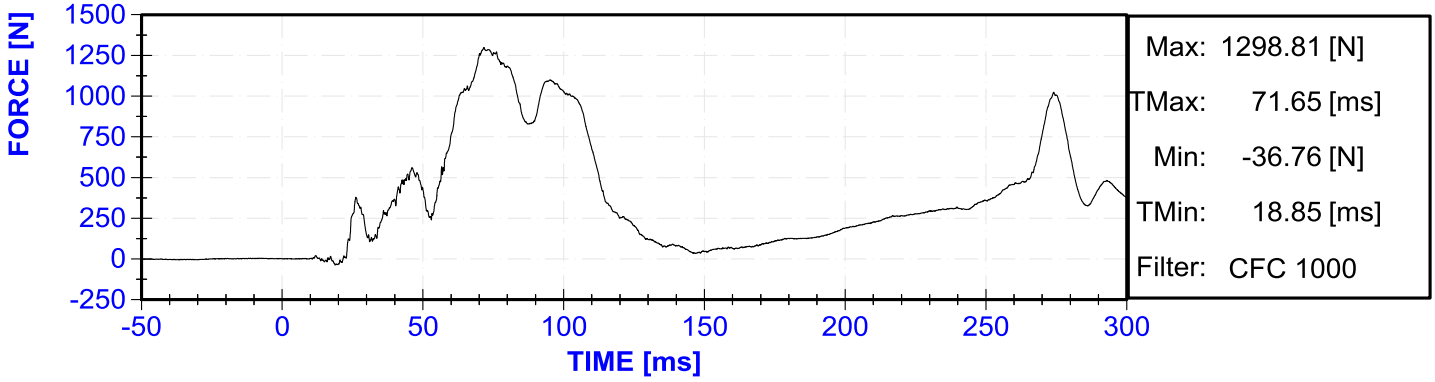
V1P1 Fx on head acting through the total neck section



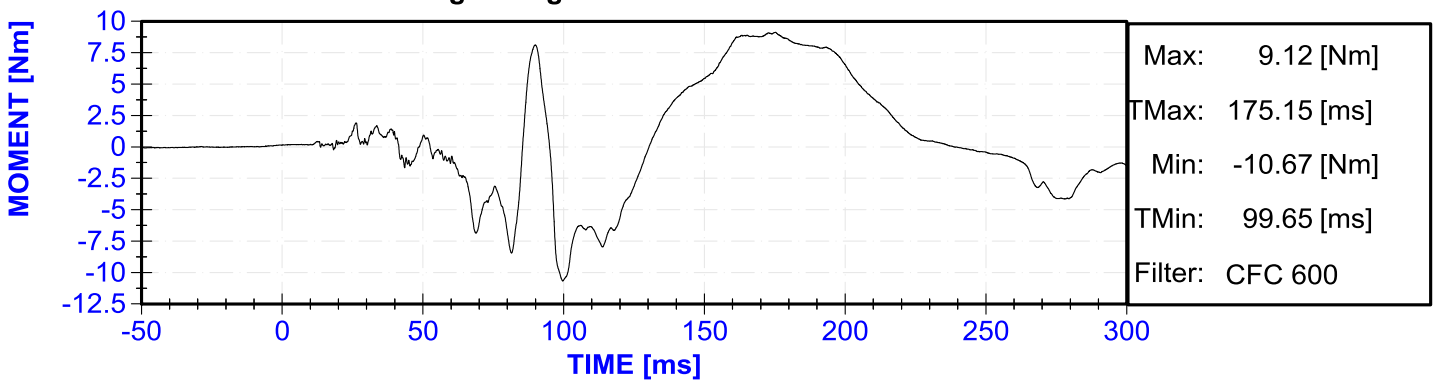
V1P1 Fy on head acting through the total neck section



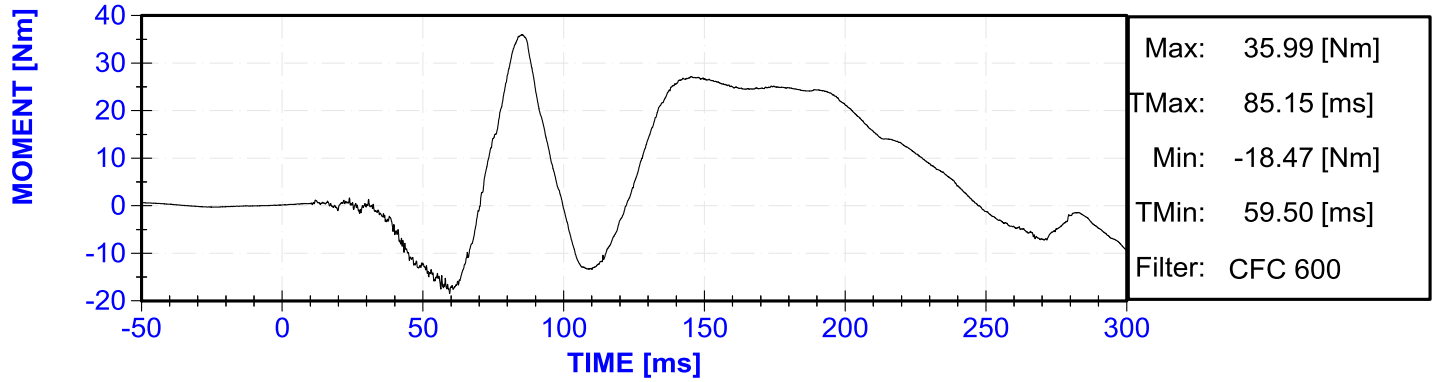
V1P1 Fz on head acting through the total neck section



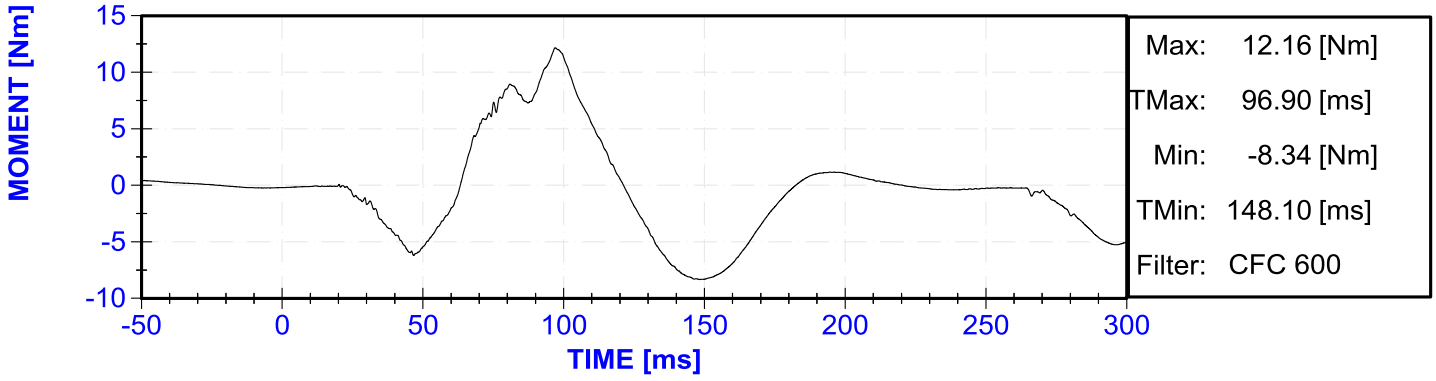
V1P1 Mx on head acting through the total neck section



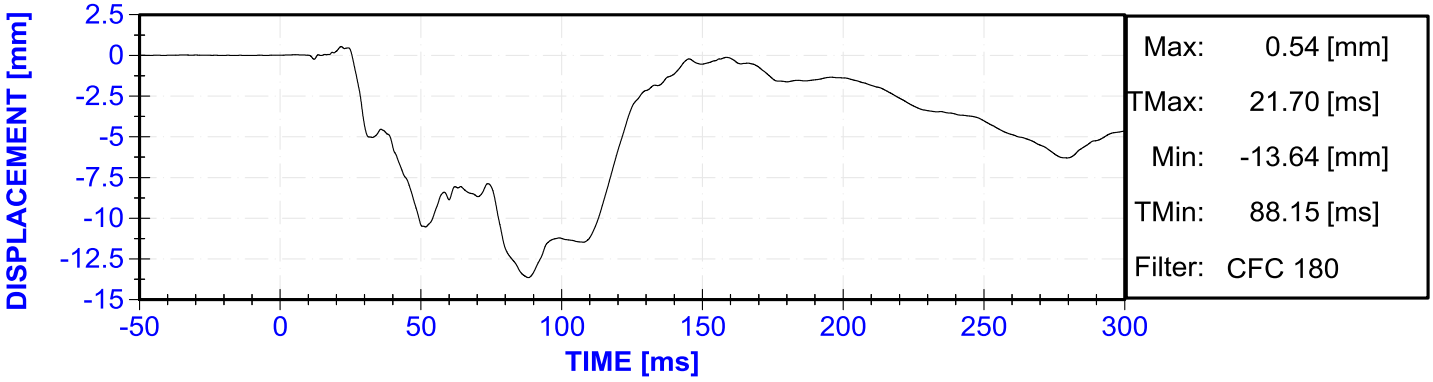
V1P1 My on head acting through the total neck section



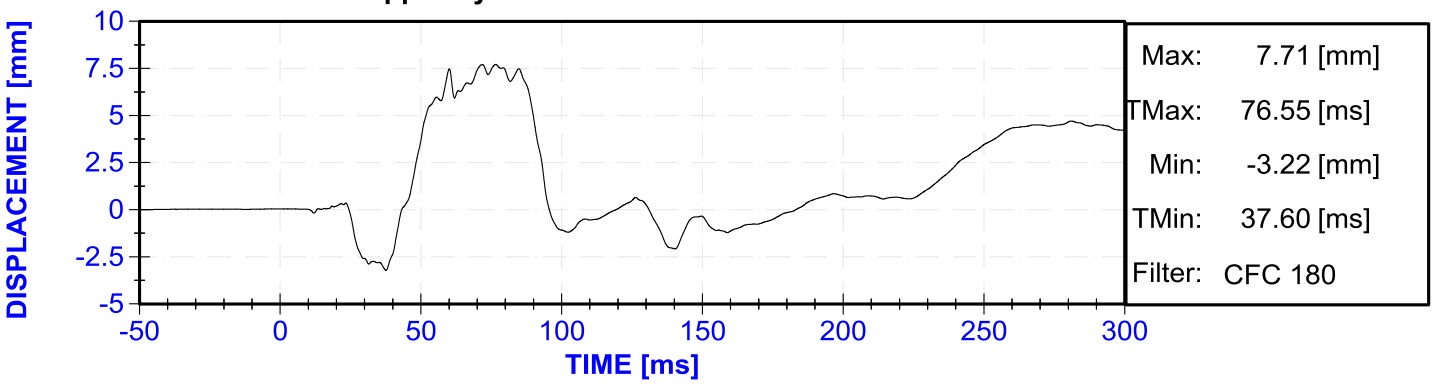
V1P1 Mz on head acting through the total neck section



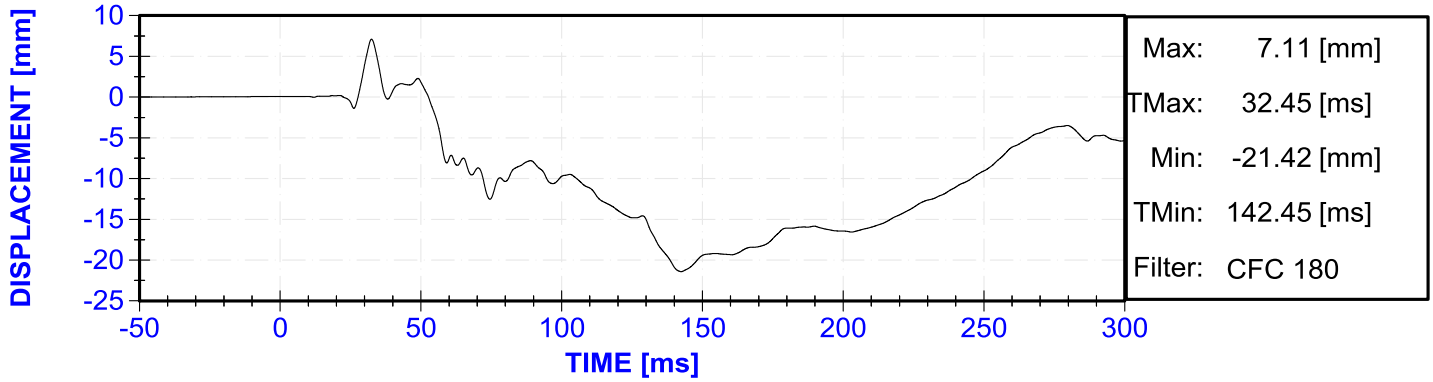
V1P1 Chest Left Upper Dx



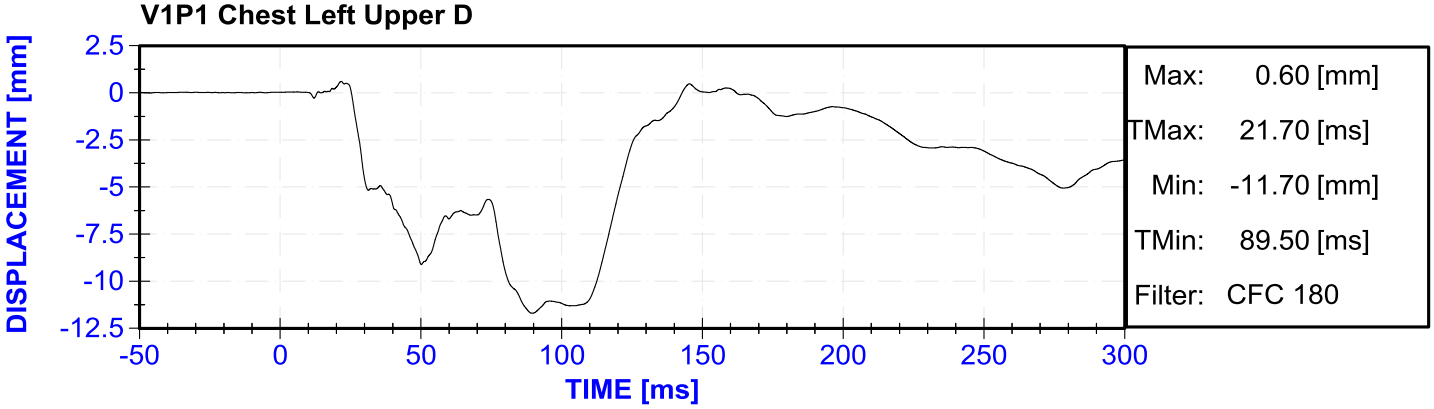
V1P1 Chest Left Upper Dy

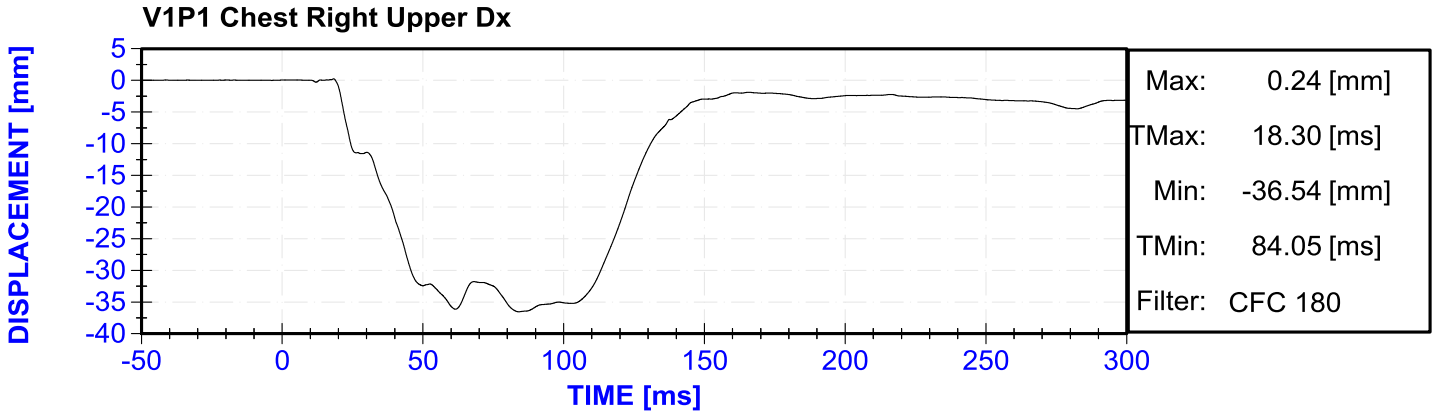


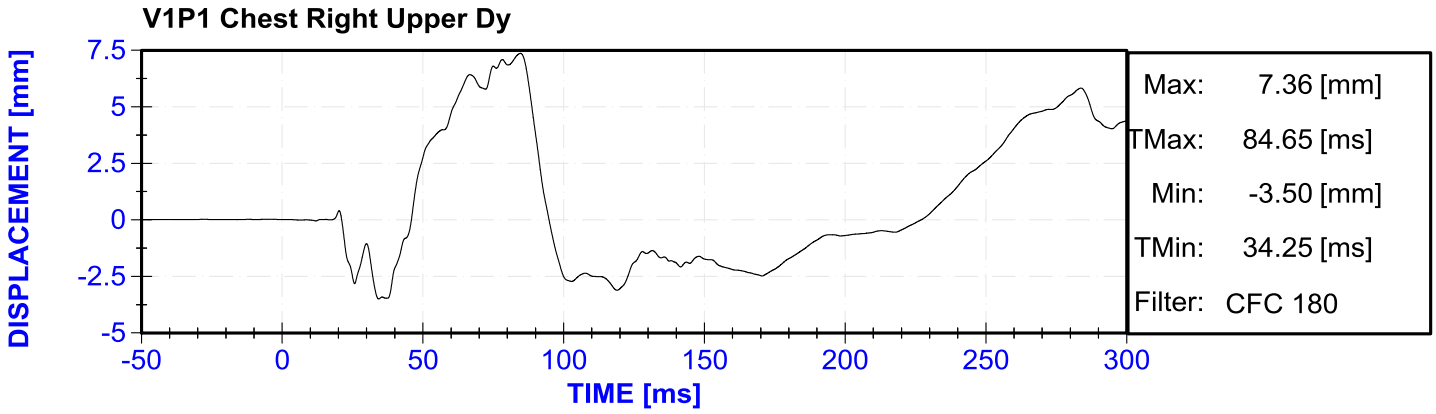
V1P1 Chest Left Upper Dz

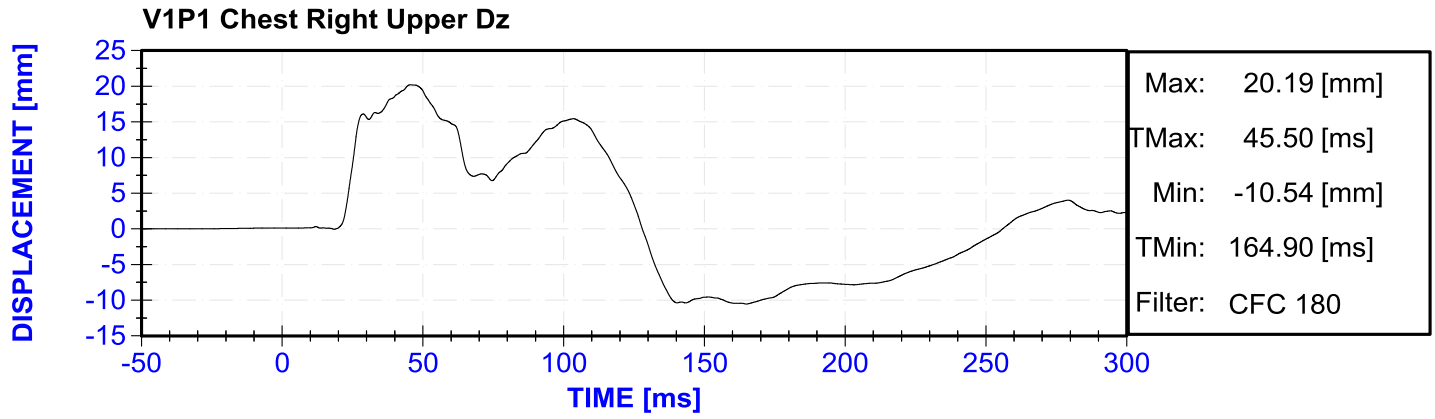


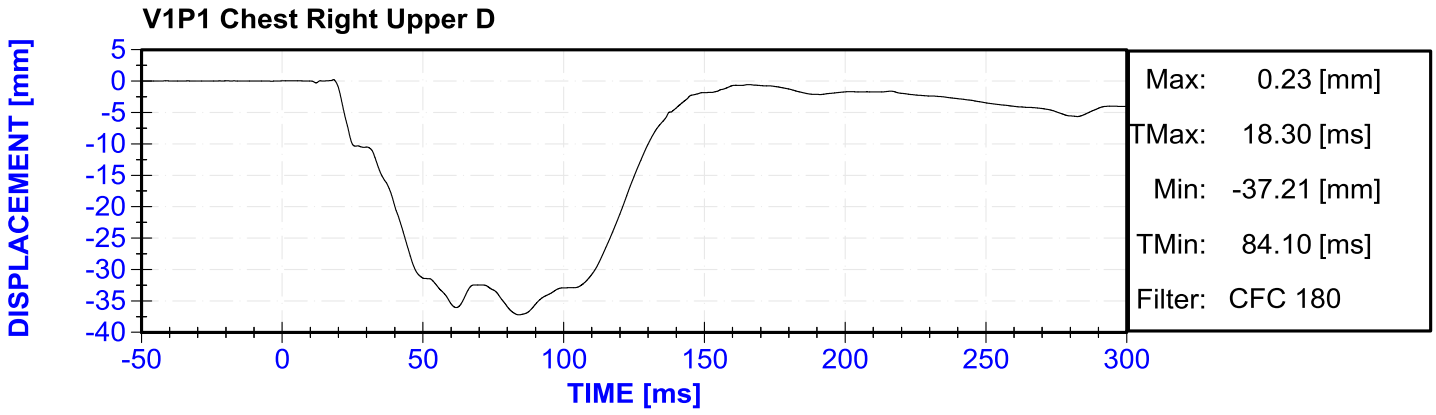
V1P1 Chest Left Upper D

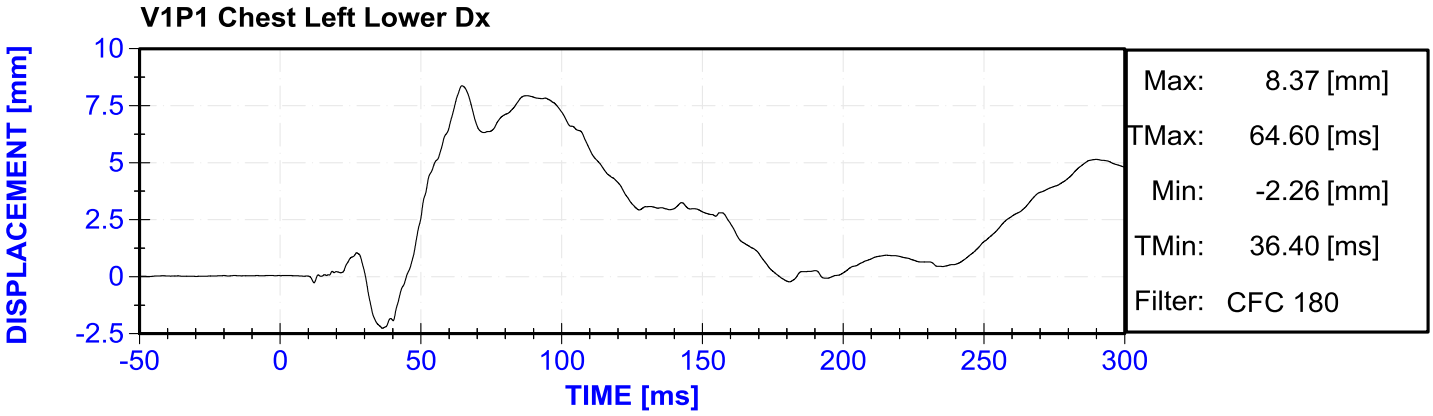


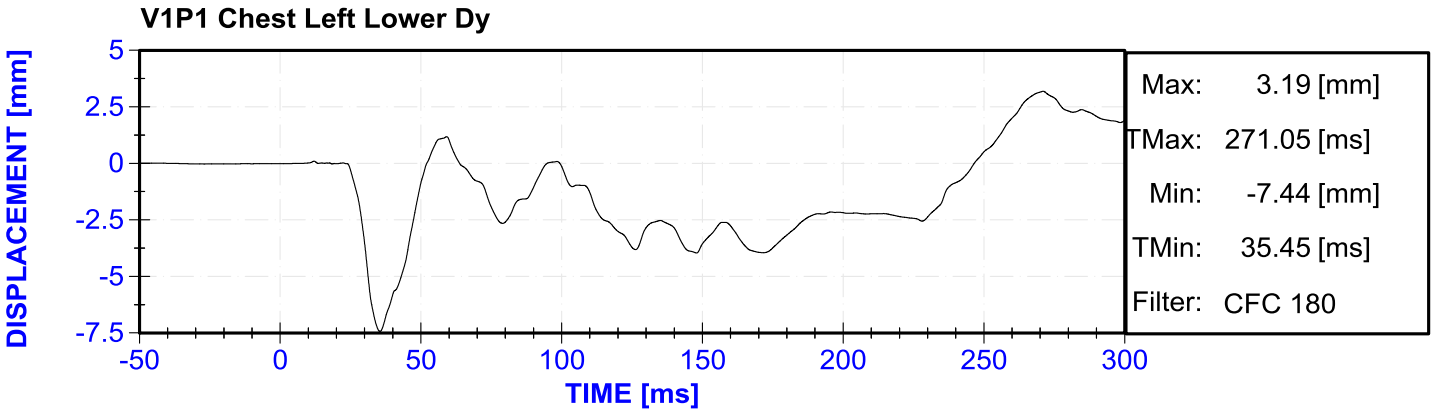

V1P1 Chest Right Upper Dx
DISPLACEMENT [mm]
TIME [ms]
Max: 0.24 [mm]
TMax: 18.30 [ms]
Min: -36.54 [mm]
TMin: 84.05 [ms]
Filter: CFC 180

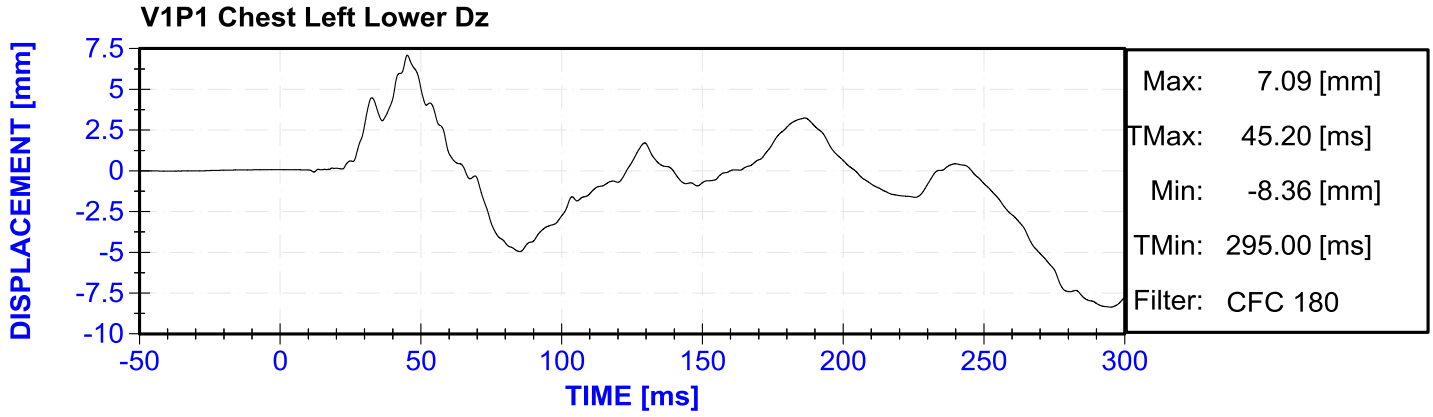

V1P1 Chest Right Upper Dy
DISPLACEMENT [mm]
TIME [ms]
Max: 7.36 [mm]
TMax: 84.65 [ms]
Min: -3.50 [mm]
TMin: 34.25 [ms]
Filter: CFC 180

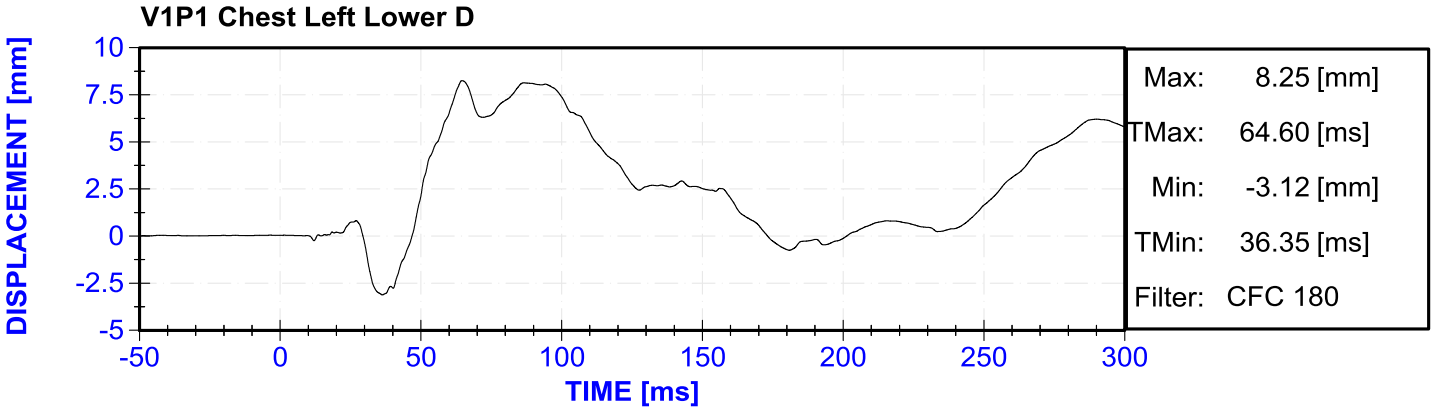

V1P1 Chest Right Upper Dz
DISPLACEMENT [mm]
TIME [ms]
Max: 20.19 [mm]
TMax: 45.50 [ms]
Min: -10.54 [mm]
TMin: 164.90 [ms]
Filter: CFC 180

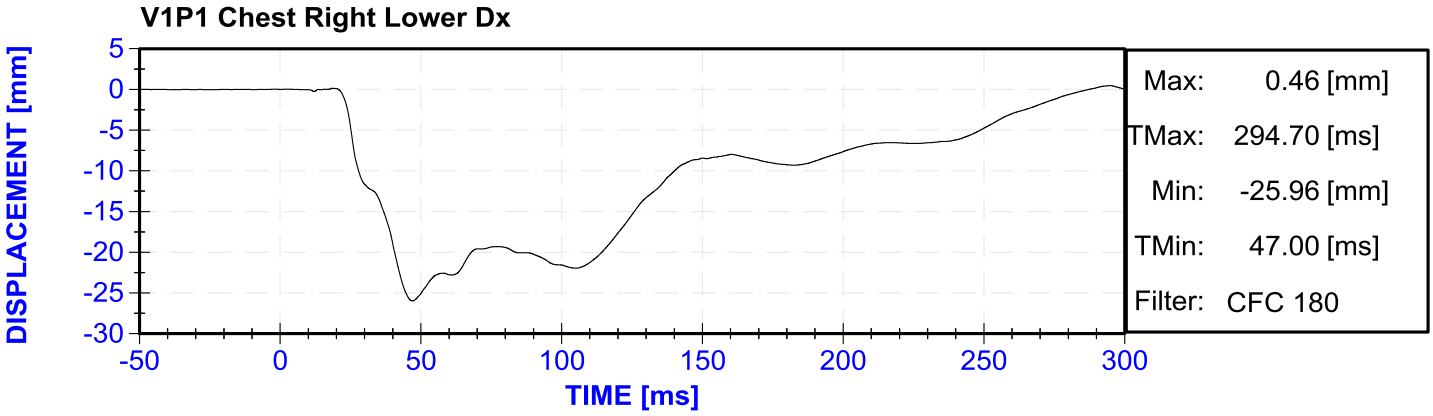

V1P1 Chest Right Upper D
DISPLACEMENT [mm]
TIME [ms]
Max: 0.23 [mm]
TMax: 18.30 [ms]
Min: -37.21 [mm]
TMin: 84.10 [ms]
Filter: CFC 180

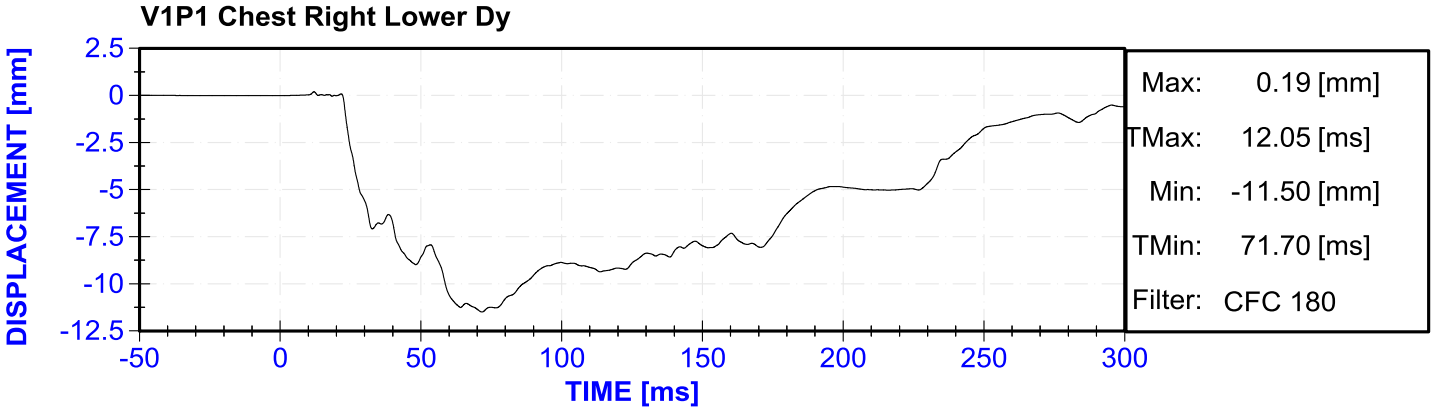

V1P1 Chest Left Lower Dx
DISPLACEMENT [mm]
TIME [ms]
Max: 8.37 [mm]
TMax: 64.60 [ms]
Min: -2.26 [mm]
TMin: 36.40 [ms]
Filter: CFC 180

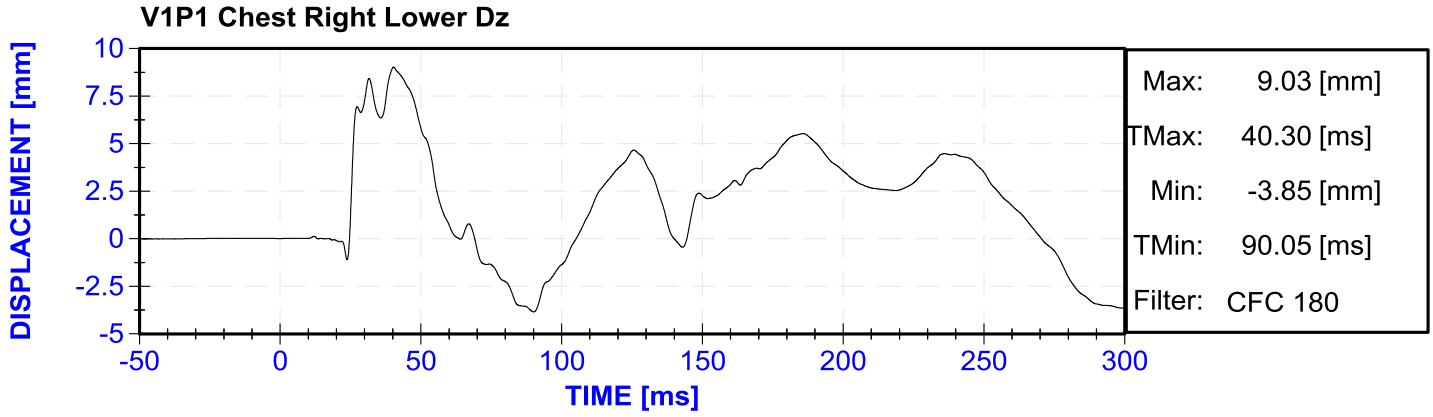

V1P1 Chest Left Lower Dy
DISPLACEMENT [mm]
TIME [ms]
Max: 3.19 [mm]
TMax: 271.05 [ms]
Min: -7.44 [mm]
TMin: 35.45 [ms]
Filter: CFC 180

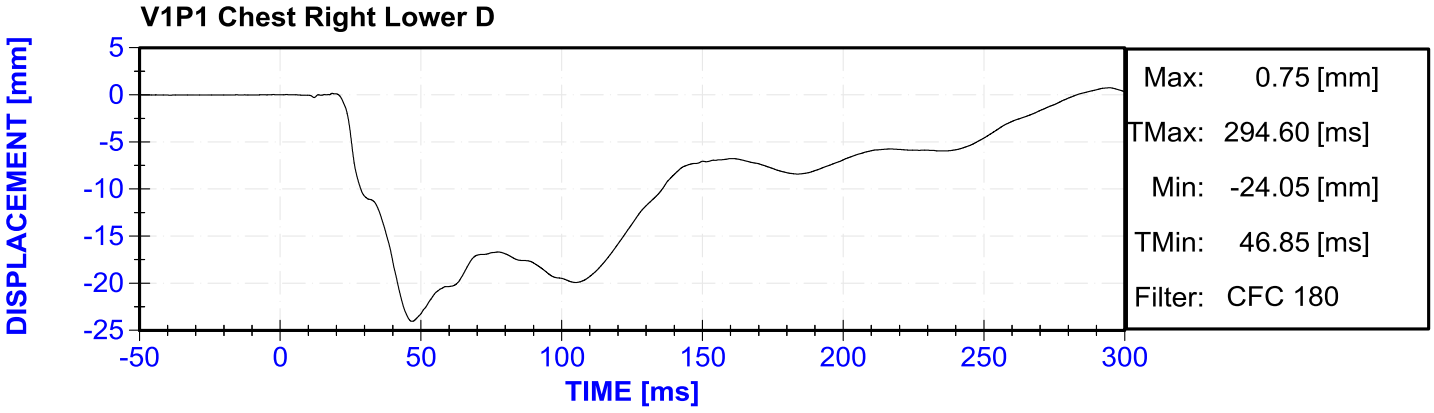

V1P1 Chest Left Lower Dz
DISPLACEMENT [mm]
TIME [ms]
Max: 7.09 [mm]
TMax: 45.20 [ms]
Min: -8.36 [mm]
TMin: 295.00 [ms]
Filter: CFC 180


V1P1 Chest Left Lower D
DISPLACEMENT [mm]
TIME [ms]
Max: 8.25 [mm]
TMax: 64.60 [ms]
Min: -3.12 [mm]
TMin: 36.35 [ms]
Filter: CFC 180


V1P1 Chest Right Lower Dx
DISPLACEMENT [mm]
TIME [ms]
Max: 0.46 [mm]
TMax: 294.70 [ms]
Min: -25.96 [mm]
TMin: 47.00 [ms]
Filter: CFC 180

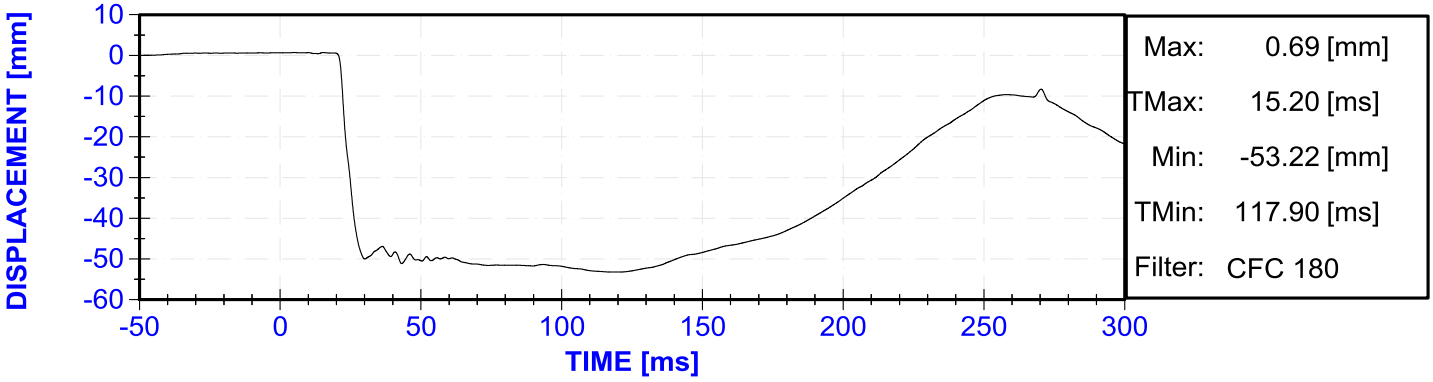

V1P1 Chest Right Lower Dy
DISPLACEMENT [mm]
TIME [ms]
Max: 0.19 [mm]
TMax: 12.05 [ms]
Min: -11.50 [mm]
TMin: 71.70 [ms]
Filter: CFC 180


V1P1 Chest Right Lower Dz
DISPLACEMENT [mm]
TIME [ms]
Max: 9.03 [mm]
TMax: 40.30 [ms]
Min: -3.85 [mm]
TMin: 90.05 [ms]
Filter: CFC 180


V1P1 Chest Right Lower D
DISPLACEMENT [mm]
TIME [ms]
Max: 0.75 [mm]
TMax: 294.60 [ms]
Min: -24.05 [mm]
TMin: 46.85 [ms]
Filter: CFC 180

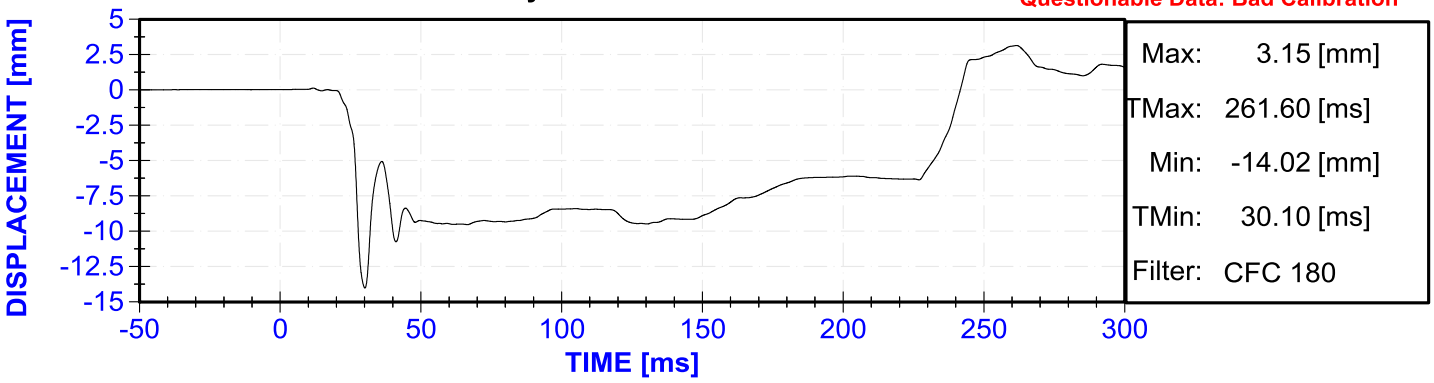
V1P1 Abdomen Left Lower Dx

Questionable Data: Bad Calibration



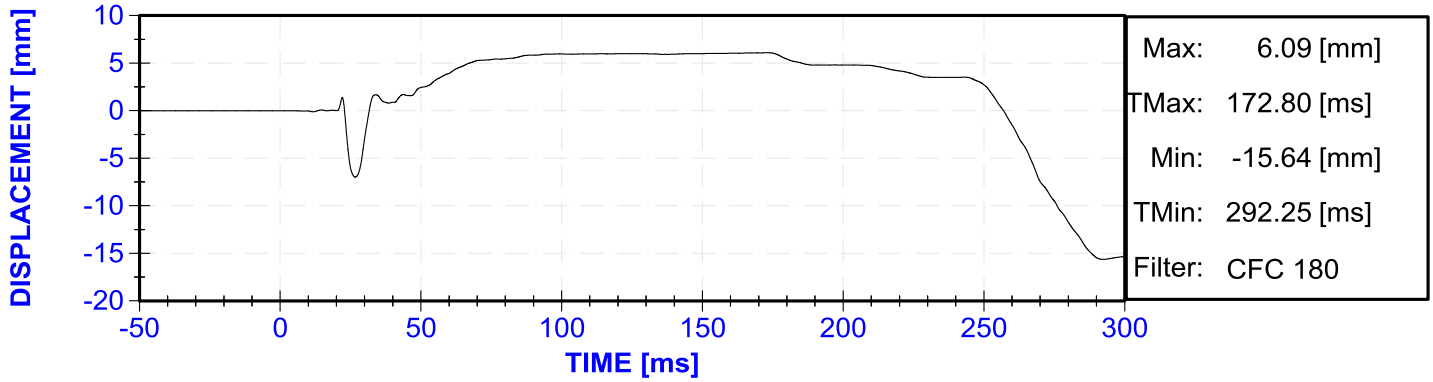
V1P1 Abdomen Left Lower Dy

Questionable Data: Bad Calibration



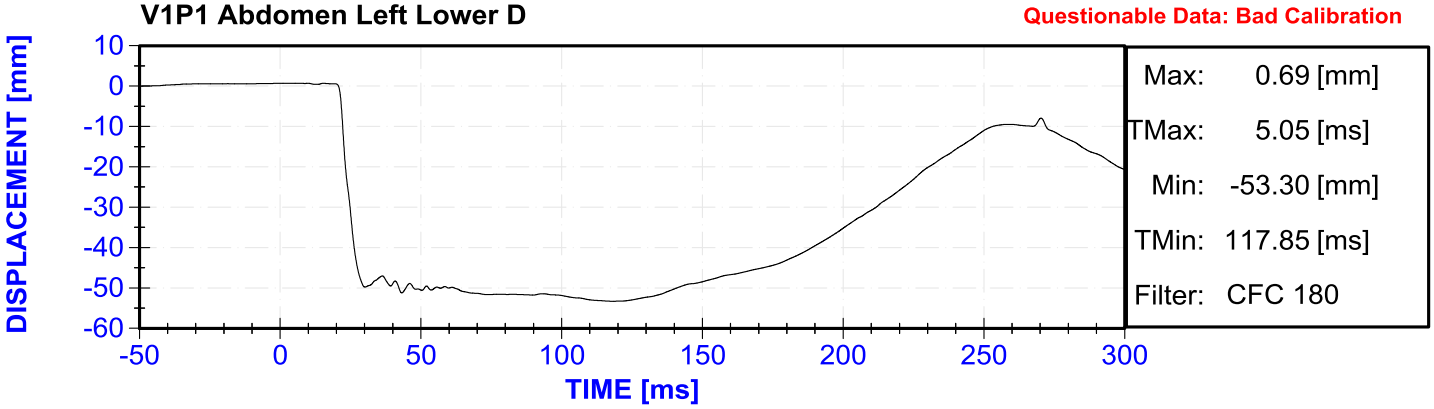
V1P1 Abdomen Left Lower Dz

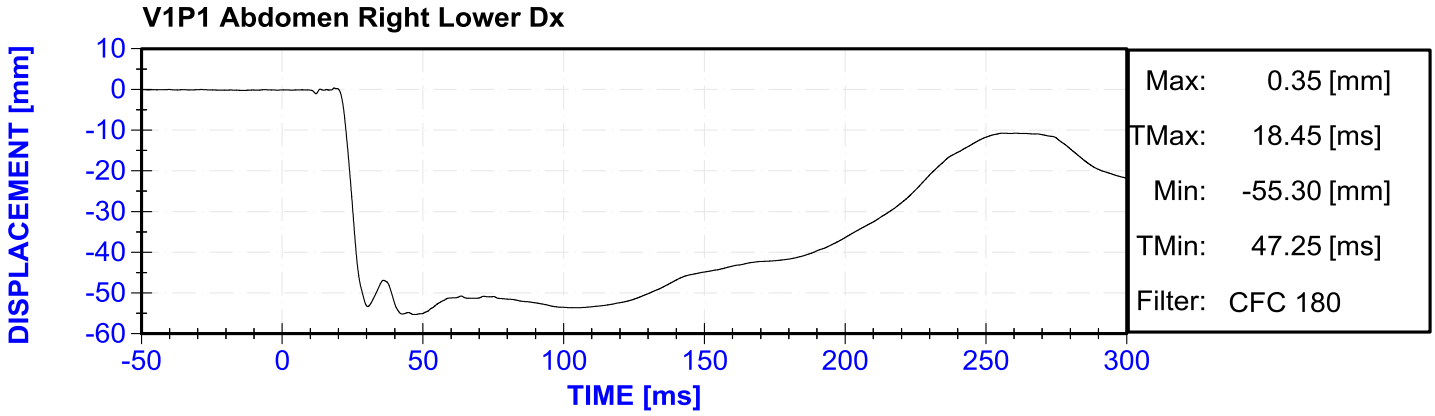
Questionable Data: Bad Calibration

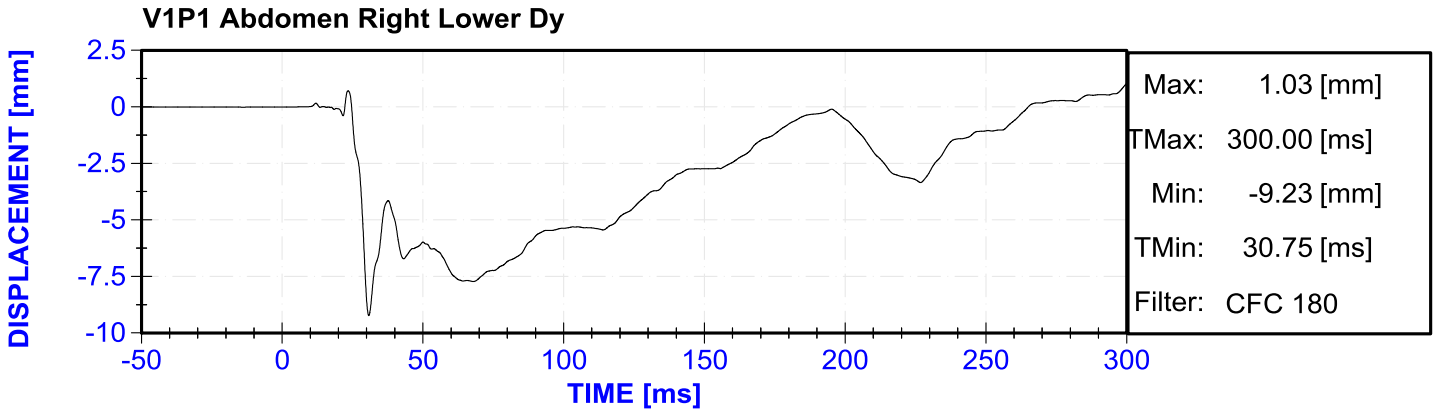


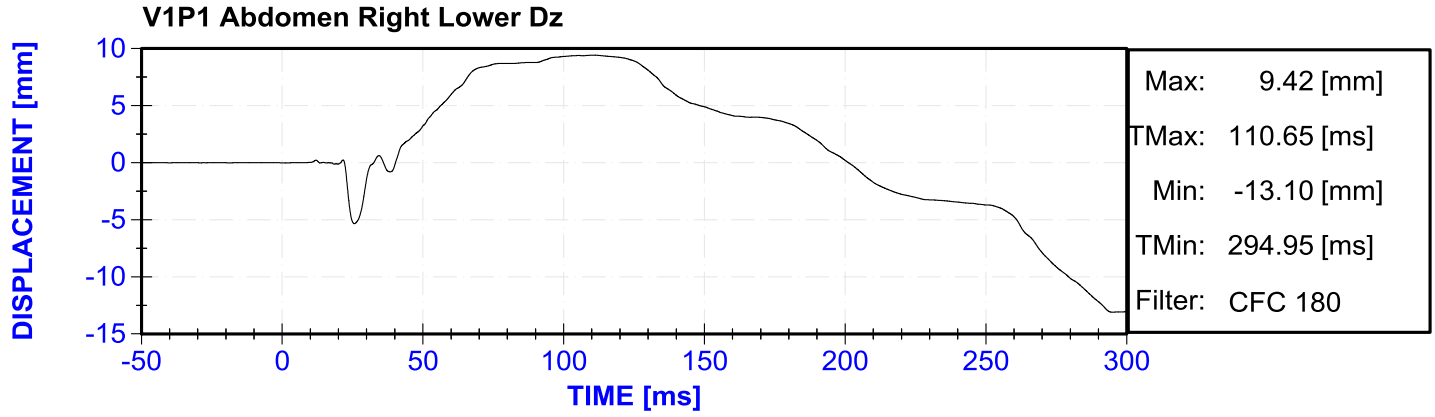
V1P1 Abdomen Left Lower D

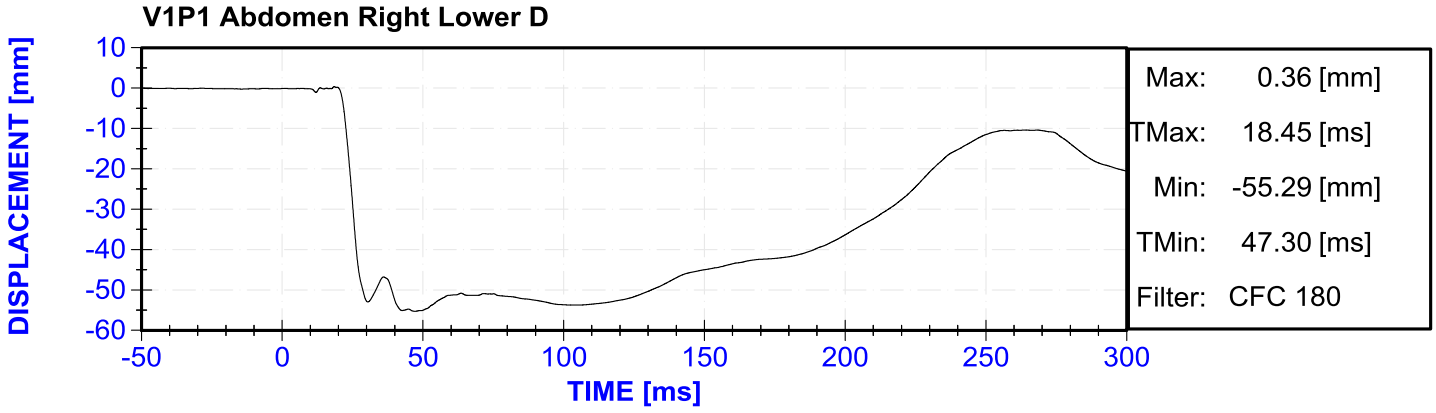
Questionable Data: Bad Calibration




V1P1 Abdomen Right Lower Dx
DISPLACEMENT [mm]
TIME [ms]
Max: 0.35 [mm]
TMax: 18.45 [ms]
Min: -55.30 [mm]
TMin: 47.25 [ms]
Filter: CFC 180


V1P1 Abdomen Right Lower Dy
DISPLACEMENT [mm]
TIME [ms]
Max: 1.03 [mm]
TMax: 300.00 [ms]
Min: -9.23 [mm]
TMin: 30.75 [ms]
Filter: CFC 180


V1P1 Abdomen Right Lower Dz
DISPLACEMENT [mm]
TIME [ms]
Max: 9.42 [mm]
TMax: 110.65 [ms]
Min: -13.10 [mm]
TMin: 294.95 [ms]
Filter: CFC 180


V1P1 Abdomen Right Lower D
DISPLACEMENT [mm]
TIME [ms]
Max: 0.36 [mm]
TMax: 18.45 [ms]
Min: -55.29 [mm]
TMin: 47.30 [ms]
Filter: CFC 180

APPENDIX C

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

Table C-1: Dummy Information

TYPE	SERIAL NUMBER
THOR-M 50TH Male	DL9207
5th Female	324
5th Female	019

Table C-2: THOR IR-TRACC Initial Set-Up Information

THOR – M S/N: DL9207		
IR-TRACC Location	**IR-TRACC Exponent**	**IR-TRACC Slope**
Upper Left Thorax Dx	-0.43199	36.9703
Upper Right Thorax Dx	-0.48860	29.8982
Lower Left Thorax Dx	-0.45268	35.3389
Lower Right Thorax Dx	-0.43502	37.4827
Left Abdomen Dx	-0.34061	66.5336
Right Abdomen Dx	-0.50000	26.8025

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

THOR – M S/N: DL9207					
Sensor	**Manufacturer**	**Serial Number**	**Range**	**Sensitivity**	**Sensitivity Units**
Head CG Ax	Endevco	P82183	2000	0.017690000	mV/V/g
Head CG Ay	Endevco	P81384	2000	0.017600000	mV/V/g
Head CG Az	Endevco	P81797	2000	0.019350000	mV/V/g
Head Wx	DTS	ARS4740	18000	0.091430000	mV/deg/sec
Head Wy	DTS	ARS4737	18000	0.095640000	mV/deg/sec
Head Wz	DTS	ARS4073	18000	0.093760000	mV/deg/sec
Skull Spring Front Fz	Humanetics	DO9740	4448.2	0.000512814	mV/V/N
Skull Spring Rear Fz	Humanetics	DO9741	4448.2	0.000508183	mV/V/N
Condyle Pot Ry	Humanetics	DK5911	180	3.021000000	mV/V/deg
Upper Neck Fx	Humanetics	DP3956	8896.4	0.000224158	mV/V/N
Upper Neck Fy	Humanetics	DP3956	8896.4	0.000227755	mV/V/N
Upper Neck Fz	Humanetics	DP3956	13344.7	0.000085255	mV/V/N
Upper Neck Mx	Humanetics	DP3956	282.5	0.005819469	mV/V/Nm
Upper Neck My	Humanetics	DP3956	282.5	0.005983009	mV/V/Nm
Upper Neck Mz	Humanetics	DP3956	282.5	0.009425133	mV/V/Nm
Lower Neck Fx	Humanetics	DP4780	13344.7	0.000173709	mV/V/N
Lower Neck Fy	Humanetics	DP4780	13344.7	0.000174489	mV/V/N
Lower Neck Fz	Humanetics	DP4780	13344.7	0.000070575	mV/V/N

THOR – M (Continued) S/N: DL9207					
Sensor	**Manufacturer**	**Serial Number**	**Range**	**Sensitivity**	**Sensitivity Units**
Lower Neck Mx	Humanetics	DP4780	451.9	0.004108210	mV/V/Nm
Lower Neck My	Humanetics	DP4780	451.9	0.004146714	mV/V/Nm
Lower Neck Mz	Humanetics	DP4780	226	0.006740265	mV/V/Nm
T1 Ax	Endevco	P79630	2000	0.020870000	mV/V/g
T1 Ay	Endevco	P78880	2000	0.019820000	mV/V/g
T1 Az	Endevco	P82758	2000	0.018610000	mV/V/g
Upper Left Thorax Dx	Humanetics	DS6355			
Upper Left Thorax Ry	Humanetics	DI2382	180	2.978800000	mV/V/deg
Upper Left Thorax Rz	Humanetics	DI2383	180	3.007300000	mV/V/deg
Upper Right Thorax Dx	Humanetics	DJ2613			
Upper Right Thorax Ry	Humanetics	DI7753	180	3.035900000	mV/V/deg
Upper Right Thorax Rz	Humanetics	DI7752	180	3.052400000	mV/V/deg
Lower Left Thorax Dx	Humanetics	DS6353			
Lower Left Thorax Ry	Humanetics	DM4781	180	3.001400000	mV/V/deg
Lower Left Thorax Rz	Humanetics	DS4092	180	3.072500000	mV/V/deg
Lower Right Thorax Dx	Humanetics	DS6354			
Lower Right Thorax Ry	Humanetics	DM4776	180	3.004900000	mV/V/deg
Lower Right Thorax Rz	Humanetics	DM4777	180	2.994700000	mV/V/deg
T6 Ax	Endevco	P49229	2000	0.018010000	mV/V/g
T6 Ay	Endevco	P49215	2000	0.016950000	mV/V/g
T6 Az	Endevco	P52122	2000	0.017050000	mV/V/g
Thoracic Spine Fx	Humanetics	DP2984	13344.7	0.000146365	mV/V/N
Thoracic Spine Fy	Humanetics	DP2984	13344.7	0.000147107	mV/V/N
Thoracic Spine Fz	Humanetics	DP2984	17792.9	0.000060193	mV/V/N
Thoracic Spine Mx	Humanetics	DP2984	677.9	0.002146039	mV/V/Nm
Thoracic Spine My	Humanetics	DP2984	903.9	0.001914371	mV/V/Nm
T12 Ax	Endevco	P74936	2000	0.017350000	mV/V/g
T12 Ay	Endevco	P74937	2000	0.017230000	mV/V/g
T12 Az	Endevco	P52005	2000	0.019870000	mV/V/g
Abdomen Left Dx	Humanetics	DQ2303			
Abdomen Left Ry	Humanetics	DS8363	150	3.024100000	mV/V/deg
Abdomen Left Rz	Humanetics	DS8361	150	3.047400000	mV/V/deg
Abdomen Right Dx	Humanetics	DM2641			
Abdomen Right Ry	Humanetics	DS4094	150	3.012300000	mV/V/deg
Abdomen Right Rz	Humanetics	DS4121	150	3.021800000	mV/V/deg
Acetabulum Right Fx	Humanetics	DP3835	22241.1	0.000118506	mV/V/N
Acetabulum Right Fy	Humanetics	DP3835	13344.7	0.000059342	mV/V/N
Acetabulum Right Fz	Humanetics	DP3835	13344.7	0.000161173	mV/V/N
Acetabulum Left Fx	Humanetics	DP4639	22241.1	0.000121280	mV/V/N
Acetabulum Left Fy	Humanetics	DP4639	13344.7	0.000059432	mV/V/N
Acetabulum Left Fz	Humanetics	DP4639	13344.7	0.000165871	mV/V/N
Pelvis Ax	Endevco	P83434	2000	0.017540000	mV/V/g
Pelvis Ay	Endevco	P82752	2000	0.018310000	mV/V/g

THOR – M (Continued) S/N: DL9207					
Sensor	**Manufacturer**	**Serial Number**	**Range**	**Sensitivity**	**Sensitivity Units**
Pelvis Az	Endevco	P80296	2000	0.019410000	mV/V/g
ASIS Right Fx	Humanetics	DP5091	13000	0.000065215	mV/V/N
ASIS Right My	Humanetics	DP5091	325	0.003697538	mV/V/Nm
ASIS Left Fx	Humanetics	DP5092	13000	0.000067323	mV/V/N
ASIS Left My	Humanetics	DP5092	325	0.003688923	mV/V/Nm
Femur Left Fx	Denton	DM4975	15000	0.000143700	mV/V/N
Femur Left Fy	Denton	DM4975	15000	0.000143600	mV/V/N
Femur Left Fz	Denton	DM4975	15000	0.000072700	mV/V/N
Femur Left Mx	Denton	DM4975	350	0.006601400	mV/V/Nm
Femur Left My	Denton	DM4975	350	0.006642000	mV/V/Nm
Femur Left Mz	Denton	DM4975	300	0.008961300	mV/V/Nm
Femur Right Fx	Denton	DM4976	15000	0.000142600	mV/V/N
Femur Right Fy	Denton	DM4976	15000	0.000142900	mV/V/N
Femur Right Fz	Denton	DM4976	15000	0.000072200	mV/V/N
Femur Right Mx	Denton	DM4976	350	0.006505700	mV/V/Nm
Femur Right My	Denton	DM4976	350	0.006488900	mV/V/Nm
Femur Right Mz	Denton	DM4976	300	0.008811600	mV/V/Nm
Upper Tibia Fx	Denton	97	11120	0.00017270	mv/v/N
Upper Tibia Fz	Denton	97	11120	0.00009330	mv/v/N
Upper Tibia Mx	Denton	97	395	0.00733320	mv/v/Nm
Upper Tibia My	Denton	97	395	0.00739800	mv/v/Nm
Lower Tibia Fx	Denton	121	11100	0.00017510	mv/v/N
Lower Tibia Fy	Denton	121	11100	0.00017180	mv/v/N
Lower Tibia Fz	Denton	121	11100	0.00009580	mv/v/N
Lower Tibia Mx	Denton	121	395	0.00739650	mv/v/Nm
Lower Tibia My	Denton	121	395	0.00744720	mv/v/Nm
Ankle Rx	Contelec	0523	180	3.17860	mv/v/deg
Ankle Ry	Contelec	0524	180	3.19060	mv/v/deg
Ankle Rz	Contelec	0525	180	3.18790	mv/v/deg
Knee Dx	Space Age	C2102639B	33	24.09410	mv/v/mm
Leg Ax	Endevco	P77996	2000	0.01803	mv/v/g
Leg Ay	Endevco	P64094	2000	0.02214	mv/v/g
Foot Ax	Endevco	P80271	2000	0.02100	mv/v/g
Foot Ay	Endevco	P74950	2000	0.01782	mv/v/g
Foot Az	Endevco	P51684	2000	0.01953	mv/v/g
Achilles Fz	Denton	136	4448	0.000257800	mv/V/N
Upper Tibia Fx	Denton	75	11120	0.00017350	mv/v/N
Upper Tibia Fz	Denton	75	11120	0.00009520	mv/v/N
Upper Tibia Mx	Denton	75	395	0.00749000	mv/v/Nm
Upper Tibia My	Denton	75	395	0.00747580	mv/v/Nm
Lower Tibia Fx	Denton	166	11100	0.00017560	mv/v/N

THOR – M (Continued) S/N: DL9207					
Sensor	**Manufacturer**	**Serial Number**	**Range**	**Sensitivity**	**Sensitivity Units**
Lower Tibia Fy	Denton	166	11100	0.00017130	mv/v/N
Lower Tibia Fz	Denton	166	11100	0.00009950	mv/v/N
Lower Tibia Mx	Denton	166	395	0.00742480	mv/v/Nm
Lower Tibia My	Denton	166	395	0.00737260	mv/v/Nm
Ankle Rx	Contelec	0528	180	3.20220	mv/v/deg
Ankle Ry	Contelec	0526	180	3.15530	mv/v/deg
Ankle Rz	Contelec	0527-1	180	3.16060	mv/v/deg
Knee Dx	Space Age	021033	30	23.25080	mv/v/mm
Leg Ax	Endevco	P82744	2000	0.01827	mv/v/g
Leg Ay	Endevco	P82322	2000	0.01726	mv/v/g
Foot Ax	Endevco	P74976	2000	0.01784	mv/v/g
Foot Ay	Endevco	P83340	2000	0.02038	mv/v/g
Foot Az	Endevco	P83339	2000	0.01990	mv/v/g
Achilles Fz	Denton	129	4448	0.000278100	mv/V/N

Table C- 4: 5th Female Dummy Initial Set-Up Information

5th Female S/N: 324					
Sensor	**Manufacturer**	**Serial Number**	**Range**	**Sensitivity**	**Sensitivity Units**
Head CG Ax	Endevco	P58729	2000	0.018150000	mV/V/g
Head CG Ax	Endevco	P74955	2000	0.018560000	mV/V/g
Head CG Ax	Endevco	P74778	2000	0.017380000	mV/V/g
Head CG RAx	Endevco	P74972	2000	0.017520000	mV/V/g
Head CG RAy	Endevco	P82756	2000	0.017520000	mV/V/g
Head CG RAz	Endevco	P74773	2000	0.018130000	mV/V/g
Head Wx	DTS	ARS5931	18000	0.093230000	mV/V/sec
Head Wy	DTS	ARS4714	18000	0.094490000	mV/V/sec
Head Wz	DTS	ARS6635	18000	0.098430000	mV/V/sec
Upper Neck Fx	Denton	2193	8896.4	0.000189700	mV/V/N
Upper Neck Fy	Denton	2193	8896.4	0.000184400	mV/V/N
Upper Neck Fz	Denton	2193	13344.6	0.000098300	mV/V/N
Upper Neck Mx	Denton	2193	282.5	0.005692000	mV/V/Nm
Upper Neck My	Denton	2193	282.5	0.005724200	mV/V/Nm
Upper Neck Mz	Denton	2193	282.5	0.008138800	mV/V/Nm
Chest Ax	Endevco	P52012	2000	0.017510000	mV/V/g
Chest Ay	Endevco	P80910	2000	0.018350000	mV/V/g
Chest Az	Endevco	P74774	2000	0.017030000	mV/V/g
Chest Dx	Servo	CST324	54	1.752400000	mVV/deg

5th Female (Continued) S/N: 324					
Sensor	**Manufacturer**	**Serial Number**	**Range**	**Sensitivity**	**Sensitivity Units**
Pelvis Ax	Endevco	P80335	2000	0.016810000	mV/V/g
Pelvis Ay	Endevco	P78730	2000	0.017530000	mV/V/g
Pelvis Az	Endevco	P52128	2000	0.016890000	mV/V/g
Femur Right Fz	Denton	1714	13340	0.000108200	mV/V/N
Femur Left Fz	Denton	1702	13340	0.000109400	mV/V/N
Upper Tibia Right Fx	Denton	372	11120.55	0.000171412	mV/V/N
Upper Tibia Right Fy	Denton	372	11120.55	0.000170342	mV/V/N
Upper Tibia Right Fz	Denton	372	11120.55	0.000092630	mV/V/N
Upper Tibia Right Mx	Denton	372	395.4467	0.007423756	mV/V/Nm
Upper Tibia Right My	Denton	372	395.4467	0.007387342	mV/V/Nm
Lower Tibia Right Fx	Denton	405	11120.55	0.000174398	mV/V/N
Lower Tibia Right Fy	Denton	405	11120.55	0.000178211	mV/V/N
Lower Tibia Right Fz	Denton	405	11120.55	0.000093925	mV/V/N
Lower Tibia Right Mx	Denton	405	395.4467	0.007600771	mV/V/Nm
Lower Tibia Right My	Denton	405	395.4467	0.007638450	mV/V/Nm
Upper Tibia Left Fx	Denton	484	11120.55	0.000172159	mV/V/N
Upper Tibia Left Fy	Denton	484	11120.55	0.000170585	mV/V/N
Upper Tibia Left Fz	Denton	484	11120.55	0.000098853	mV/V/N
Upper Tibia Left Mx	Denton	484	395.4467	0.007399480	mV/V/Nm
Upper Tibia Left My	Denton	484	395.4467	0.007426791	mV/V/Nm
Lower Tibia Left Fx	Denton	397	11120.55	0.000174299	mV/V/N
Lower Tibia Left Fy	Denton	397	11120.55	0.000178453	mV/V/N
Lower Tibia Left Fz	Denton	397	11120.55	0.000095040	mV/V/N
Lower Tibia Left Mx	Denton	397	395.4467	0.007559047	mV/V/Nm
Lower Tibia Left My	Denton	397	395.4467	0.007546908	mV/V/Nm
Right Toe Az	Endevco	P82746	2000	0.017850000	mV/V/g
Right Foot Ax	Endevco	P64098	2000	0.023010000	mV/V/g
Right Foot Az	Endevco	P52046	2000	0.019130000	mV/V/g
Left Toe Az	Endevco	P52045	2000	0.020320000	mV/V/g
Left Foot Ax	Endevco	P52055	2000	0.018800000	mV/V/g
Left Foot Az	Endevco	P79408	2000	0.017150000	mV/V/g
RibEye Rib Deflection System	Boxboro	108	N/A	N/A	N/A

Table C- 4: 5th Female Dummy Initial Set-Up Information

5th Female S/N: 019					
Sensor	**Manufacturer**	**Serial Number**	**Range**	**Sensitivity**	**Sensitivity Units**
Head CG Ax	Endevco	P78168	2000	0.017840000	mV/V/g
Head CG Ay	Endevco	P82323	2000	0.018100000	mV/V/g
Head CG Az	Endevco	P58727	2000	0.017660000	mV/V/g
Upper Neck Fx	Denton	2184	8896.4	0.000186800	mV/V/N
Upper Neck Fy	Denton	2184	8896.4	0.000182300	mV/V/N
Upper Neck Fz	Denton	2184	13344.6	0.000098100	mV/V/N
Upper Neck Mx	Denton	2184	282.5	0.005686400	mV/V/Nm
Upper Neck My	Denton	2184	282.5	0.005715100	mV/V/Nm
Upper Neck Mz	Denton	2184	282.5	0.008202000	mV/V/Nm
Chest Ax	Endevco	P83431	2000	0.017910000	mV/V/g
Chest Ay	Endevco	P84365	2000	0.019440000	mV/V/g
Chest Az	Endevco	P84472	2000	0.019240000	mV/V/g
Chest Ds	Servo	FEM019	54	1.831500000	mV/V/deg
Pelvis Ax	Endevco	P84579	2000	0.017590000	mV/V/g
Pelvis Ay	Endevco	P51698	2000	0.022320000	mV/V/g
Pelvis Az	Endevco	P64084	2000	0.023570000	mV/V/g
ASIS Left Fx	Denton	79	8896.4	0.000185400	mV/V/N
ASIS Left My	Denton	79	225.9	0.005273300	mV/V/Nm
ASIS Right Fx	Denton	76	8896.4	0.000185200	mV/V/N
ASIS Right My	Denton	76	225.9	0.005243000	mV/V/Nm
Left Femur Fz	Denton	1394	13340	0.000108800	mV/V/N
Right Femur Fz	Denton	1395	13340	0.000108300	mV/V/N
RibEye Rib Deflection System	Boxboro	107	N/A	N/A	N/A

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 DL9207

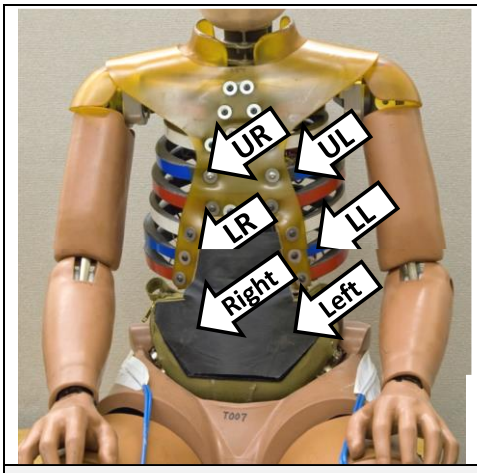


Figure 1. Manipulation to determine thoracic and abdominal IR-TRACC polarity.

Channel	Motion
DX	Push inward
RY	Push upward
RZ	Push rightward

Upper Right Thorax				Upper Left Thorax			
Channel	**Initial Value**	**Expected Polarity**	**Recorded Polarity**	**Channel**	**Initial Value**	**Expected Polarity**	**Recorded Polarity**
DX (V)	0.08241	+	+	DX (V)	0.08511	+	+
RY (Deg)	7.03304	+	+	RY (Deg)	3.59406	+	+
RZ (Deg)	-12.423	+	+	RZ (Deg)	13.5504	+	+
Lower Right Thorax				**Lower Left Thorax**			
Channel	**Initial Value**	**Expected Polarity**	**Recorded Polarity**	**Channel**	**Initial Value**	**Expected Polarity**	**Recorded Polarity**
DX (V)	0.09267	+	+	DX (V)	0.09412	+	+
RY (Deg)	-3.8281	+	+	RY (Deg)	-2.5555	+	+
RZ (Deg)	-7.9202	+	+	RZ (Deg)	7.39997	+	+
Abdomen Right				**Abdomen Left**			
Channel	**Initial Value**	**Expected Polarity**	**Recorded Polarity**	**Channel**	**Initial Value**	**Expected Polarity**	**Recorded Polarity**
DX (V)	0.04006	+	+	DX (V)	0.06807	+	+
RY (Deg)	2.38104	+	+	RY (Deg)	-0.3082	+	+
RZ (Deg)	-0.2716	+	+	RZ (Deg)	2.00407	+	+

THOR Inspection Checklist

Date: **8/14/2015**		
NHTSA Representative: **Timothy Keon**		
Inspection Reporter**: Matt Goehle**		
Inspection type (check one): ☒ Pre-Test ☐ Post-Test		
Dummy S/N: **DL9207**	Legs S/N: **LX0045/LX0046**	
Dummy Description: **THOR-M 50th Male**		
Date of last Certification: **Certification performed from 7/2014 through 4/2015**		
Tests conducted: Since last inspection: **R20150228 – 2015 Highlander** Since last certification: **S0309 (at UVA)** **S0310 (at UVA)** **S0311 (at UVA)** **S0312 (at UVA)**	LX Leg certification performed **R20150186 - 2015 Malibu** **R20150187 - 2015 Malibu** **R20150228 – 2015 Highlander**	

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

- **11FOOTRILXTHANYP,Ankle Right Y Rotation, Questionable Data from 50ms to 100 ms, SN:DS-0526**

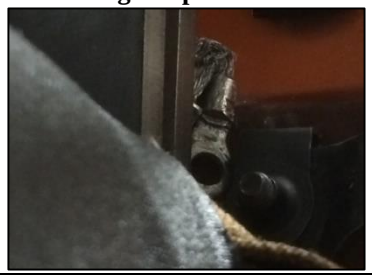
Wires at potentiometer are not insulated, and movement of the ankle causes shorts. This may have occurred during the test. We will heat shrink as necessary to insulate the 3 wires, and secure the cables with gaffer's tape tightly to the leg to prevent a repeat

Physical evidence of damage:
None New

Anecdotal evidence of damage:
None

Equipment delivered to Borrower:	*Continued*
THOR DL9207 ATD	**2 LX Leg Assemblies**
26 Accelerometers	**2 Upper Tibia LC**
3 Angular Rate Sensors	**2 Lower Tibia LC**
2 Skull Spring LC	**6 Ank1e Potentiometers**
1 Condyle Pot	**2 Knee Sliders**
1 Upper Neck LC	**1 Neck Skin**
6 IRTraccs	**1 Neck Foam**
12 Rotational Pots	**1 Tiltview Interface Cable**
1 Spine LC	**4 Tilt Sensors**
2 Acetabulum LC	**1 H-Point Tool**
2 ASIS LC	**1 Tool Box**
2 Femur LC	**1 Laptop**

Note: New Damage is Noted in Red

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
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 de-bonding between neck pucks and plates
Y / N	No evidence of de-bonding 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	
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 de-bonding, tearing, or permanent compression of posterior soft stops
OTHER	
SPINE	
Y / N	No evidence of de-bonding between thoracic spine flex joint and metal plates
Y / N	No evidence of de-bonding between lumbar spine flex joint and metal plates
Y / N	Lumbar spine pitch change joint mechanism mating teeth are engaged
OTHER	
THORAX	
Y / N	No evidence of contact at top, bottom, or interior faces of rib damping material
Y / N	No evidence of de-bonding between rib damping material and ribs
Y / N	IRTRACCs securely attached to anterior ribs
Y / N	IRTRACCs 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	**Grounding strap disconnected from thorax damper to rib. We will reattach.** 

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 **Multiple tears and broken stiches in lower abdomen bag. The upper and lower abdomen bags appear to be from THOR SN007** 
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	**Left femur flesh is separating from zipper. We placed gaffer's tape across zipper to prevent further damage.** 

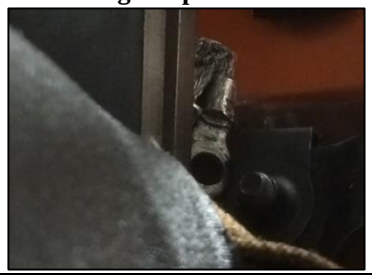
LOWER EXTREMITY (LX)	
Y / N	Rotational potentiometers in ankle securely attached
Y / N	Achilles tendon provides resistance to dorsiflexion
Y / N	No evidence of de-bonding, tearing, or permanent compression of ankle soft stops
Y / N	No cuts, tears, or scuffing of leg flesh **Left lower leg flesh is torn near zipper. We placed gaffer's tape around the flesh to prevent further damage.** 
OTHER	
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: **8/18/2015**		
NHTSA Representative: **Timothy Keon**		
Inspection Reporter**: Matt Goehle**		
Inspection type (check one): ☐ Pre-Test ☒ Post-Test		
Dummy S/N: **DL9207**	Legs S/N: **LX0045/LX0046**	
Dummy Description: **THOR-M 50th Male**		
Date of last Certification: **Certification performed from 7/2014 through 4/2015**		
Tests conducted: Since last inspection: **R20150228 - 2015 F-150** Since last certification: **S0309 (at UVA)**	**S0310 (at UVA)** **S0311 (at UVA)** **S0312 (at UVA)** LX Leg certification performed **R20150186 - 2015 Malibu**	**R20150187 - 2015 Malibu** **R20155144 – 2015 Highlander** LX Leg certification performed **R20150228 - 2015 F-150**
Known errors in data channels (no data, clipping, unexpected drops): **- 11HEADCG00THACYP,Head CG Y Acceleration, Questionable spikes throughout, SN:AC-P81384 -** Spikes occur while shaking the amphenol connection. Pins are spread on the female connection. -We retightened the pins, retested, and it no longer shows spikes. **- 11TIBIRILXTHACYP,Right Tibia Y Acceleration, Questionable data throughout, SN:AC-P82322 -** Input and output circuits are open. Cable break found where the cable is run near the Iliac load cell. - We spliced the cable together, retested, and secured to the outside of pelvis flesh with more gaffers tape to reduce the chance of the wire snagging on something again.		
Physical evidence of damage: **None New**		
Anecdotal evidence of damage: **None**		

Equipment delivered to Borrower:	*Continued*
THOR DL9207 ATD	**2 LX Leg Assemblies**
26 Accelerometers	**2 Upper Tibia LC**
3 Angular Rate Sensors	**2 Lower Tibia LC**
2 Skull Spring LC	**6 Ank1e Potentiometers**
1 Condyle Pot	**2 Knee Sliders**
1 Upper Neck LC	**1 Neck Skin**
6 IRTraccs	**1 Neck Foam**
12 Rotational Pots	**1 Tiltview Interface Cable**
1 Spine LC	**4 Tilt Sensors**
2 Acetabulum LC	**1 H-Point Tool**
2 ASIS LC	**1 Tool Box**
2 Femur LC	**1 Laptop**

Note: New Damage is Noted in Red

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
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 de-bonding between neck pucks and plates
Y / N	No evidence of de-bonding 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	
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 de-bonding, tearing, or permanent compression of posterior soft stops
OTHER	
SPINE	
Y / N	No evidence of de-bonding between thoracic spine flex joint and metal plates
Y / N	No evidence of de-bonding between lumbar spine flex joint and metal plates
Y / N	Lumbar spine pitch change joint mechanism mating teeth are engaged
OTHER	
THORAX	
Y / N	No evidence of contact at top, bottom, or interior faces of rib damping material
Y / N	No evidence of de-bonding between rib damping material and ribs
Y / N	IRTRACCs securely attached to anterior ribs
Y / N	IRTRACCs 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	**Grounding strap disconnected from thorax damper to rib. We will reattach.** 

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 **Multiple tears and broken stiches in lower abdomen bag. The upper and lower abdomen bags appear to be from THOR SN007** 
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	**Left femur flesh is separating from zipper. We placed gaffer's tape across zipper to prevent further damage.** 

LOWER EXTREMITY (LX)	
Y / N	Rotational potentiometers in ankle securely attached
Y / N	Achilles tendon provides resistance to dorsiflexion
Y / N	No evidence of de-bonding, tearing, or permanent compression of ankle soft stops
Y / N	No cuts, tears, or scuffing of leg flesh **Left lower leg flesh is torn near zipper. We placed gaffer's tape around the flesh to prevent further damage.** 
OTHER	
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	

ATD 324: Pre-Test Inspection

Calspan

FM-ATD-DC5F-031-R00

Damage Checklist
Hybrid III – 5th Female

Dummy Serial Number 324

Technician [signature]

Test Date 8/17/15

✓ Pre-test calibration
Post-test calibration

✓ 1) Clean dummy and disassemble as necessary to check for damage.
✓ 2) Complete the following table and throughout the certification process, note any physical or anecdotal damage on this form.

Dummy Item	Inspect for	Comments	Damaged	OK
Outer skin	Gashes, rips, cracks			✓
Head	Ballast secure			✓
	General appearance	Sm Tear (R) Neck / Rough / Abrasion on nose		✓
Neck	Broken or cracked rubber			✓
	Upper neck bracket firmly attached to the lower neck bracket			✓
	Looseness at the condyle joint			✓
	Nodding blocks cracked or out of position			✓
Spine	Broken or cracks in rubber.			✓
Ribs	Broken or bent ribs			✓
	Broken or bent rib supports			✓
	Damping material separated or cracked			✓
	Rubber bumpers in place			✓
Chest Potentiometer	Bent shaft			✓
	Slider arm riding in track			✓
Transducer leads	Torn cables			✓
Accelerometer Mountings	Head mounting secure			✓
	Chest mounting secure			✓
Knees	Skin condition			✓
	Insert (do not remove)			✓
	Casting			✓
Limbs	Normal movement and adjustment			✓
Knee Sliders	Wires intact			✓
	Rubber returned to "at rest" position			N/A
Pelvis	Broken			✓
Other	RubEye			✓

(Discuss any damage with the lab supervisor and if replacement parts are required, complete the "Parts Requested from NHTSA" Section of the Certification Workbook, and forward this form to Calspan's Contracts Department.)

[signature]
Signature

8/17/15
Date

Page 1 of 1

Calspan

FM-ATD-DC5F-031-R00

Damage Checklist
Hybrid III – 5th Female

Dummy Serial Number 324

Technician M. Hartung

Test Date 8/18/15

__ Pre-test calibration
__ Post-test calibration

1) Clean dummy and disassemble as necessary to check for damage.
2) Complete the following table and throughout the certification process, note any physical or anecdotal damage on this form.

Dummy Item	Inspect for	Comments	Damaged	OK
Outer skin	Gashes, rips, cracks			✓
Head	Ballast secure			✓
	General appearance Sm tear rear (R)	Abrasion on nose		✓
Neck	Broken or cracked rubber			✓
	Upper neck bracket firmly attached to the lower neck bracket			✓
	Looseness at the condyle joint			✓
	Nodding blocks cracked or out of position			✓
Spine	Broken or cracks in rubber.			✓
Ribs	Broken or bent ribs			✓
	Broken or bent rib supports			✓
	Damping material separated or cracked			✓
	Rubber bumpers in place			✓
Chest Potentiometer	Bent shaft			✓
	Slider arm riding in track			✓
Transducer leads	Torn cables			✓
Accelerometer Mountings	Head mounting secure			✓
	Chest mounting secure			✓
Knees	Skin condition			✓
	Insert (do not remove)			✓
	Casting			✓
Limbs	Normal movement and adjustment			✓
Knee Sliders	Wires intact			✓
	Rubber returned to "at rest" position			✓
Pelvis	Broken			✓
Other				

(Discuss any damage with the lab supervisor and if replacement parts are required, complete the "Parts Requested from NHTSA" Section of the Certification Workbook, and forward this form to Calspan's Contracts Department.)

Signature

8/18/15
Date

ATD 019: Pre-Test Inspection

Calspan

FM-ATD-DC5F-031-R00

Damage Checklist
Hybrid III – 5th Female

Dummy Serial Number 819

Technician W. Hartung

Test Date 8/17/15

__Pre-test calibration
__Post-test calibration

__1) Clean dummy and disassemble as necessary to check for damage.
__2) Complete the following table and throughout the certification process, note any physical or anecdotal damage on this form.

Dummy Item	Inspect for	Comments	Damaged	OK
Outer skin	Gashes, rips, cracks			
Head	Ballast secure			
	General appearance			
Neck	Broken or cracked rubber			
	Upper neck bracket firmly attached to the lower neck bracket			
	Looseness at the condyle joint			
	Nodding blocks cracked or out of position			
Spine	Broken or cracks in rubber.			
Ribs	Broken or bent ribs			
	Broken or bent rib supports			
	Damping material separated or cracked			
	Rubber bumpers in place			
Chest Potentiometer	Bent shaft			
	Slider arm riding in track			
Transducer leads	Torn cables			
Accelerometer Mountings	Head mounting secure			
	Chest mounting secure			
Knees	Skin condition			
	Insert (do not remove)			
	Casting			
Limbs	Normal movement and adjustment			
Knee Sliders	Wires intact			
	Rubber returned to "at rest" position			WA
Pelvis	Broken			
Other	R b Eye			

(Discuss any damage with the lab supervisor and if replacement parts are required, complete the "Parts Requested from NHTSA" Section of the Certification Workbook, and forward this form to Calspan's Contracts Department.)

Signature

8/17/15
Date

Page 1 of 1

ATD 019: Post-Test Inspection

Calspan

FM-ATD-DC5F-031-R00

Damage Checklist
Hybrid III – 5th Female

Dummy Serial Number 019

Technician M. Harting Test Date 8/18/15

✓ Pre-test calibration
Post-test calibration

✓ 1) Clean dummy and disassemble as necessary to check for damage.
✓ 2) Complete the following table and throughout the certification process, note any physical or anecdotal damage on this form.

Dummy Item	Inspect for	Comments	Damaged	OK
Outer skin	Gashes, rips, cracks			✓
Head	Ballast secure			✓
	General appearance			✓
Neck	Broken or cracked rubber			✓
	Upper neck bracket firmly attached to the lower neck bracket			✓
	Looseness at the condyle joint			✓
	Nodding blocks cracked or out of position			✓
Spine	Broken or cracks in rubber.			✓
Ribs	Broken or bent ribs			✓
	Broken or bent rib supports			✓
	Damping material separated or cracked			✓
	Rubber bumpers in place			✓
Chest Potentiometer	Bent shaft			✓
	Slider arm riding in track			✓
Transducer leads	Torn cables	Torso Head x 2 Insulation ✓		✓
Accelerometer Mountings	Head mounting secure			✓
	Chest mounting secure			✓
Knees	Skin condition			✓
	Insert (do not remove)			✓
	Casting			✓
Limbs	Normal movement and adjustment			✓
Knee Sliders	Wires intact			✓
	Rubber returned to "at rest" position			N/A
Pelvis	Broken			✓
Other	Rib Eye	Not Functioning		

(Discuss any damage with the lab supervisor and if replacement parts are required, complete the "Parts Requested from NHTSA" Section of the Certification Workbook, and forward this form to Calspan's Contracts Department.)

Signature

8/18/15
Date

Page 1 of 1

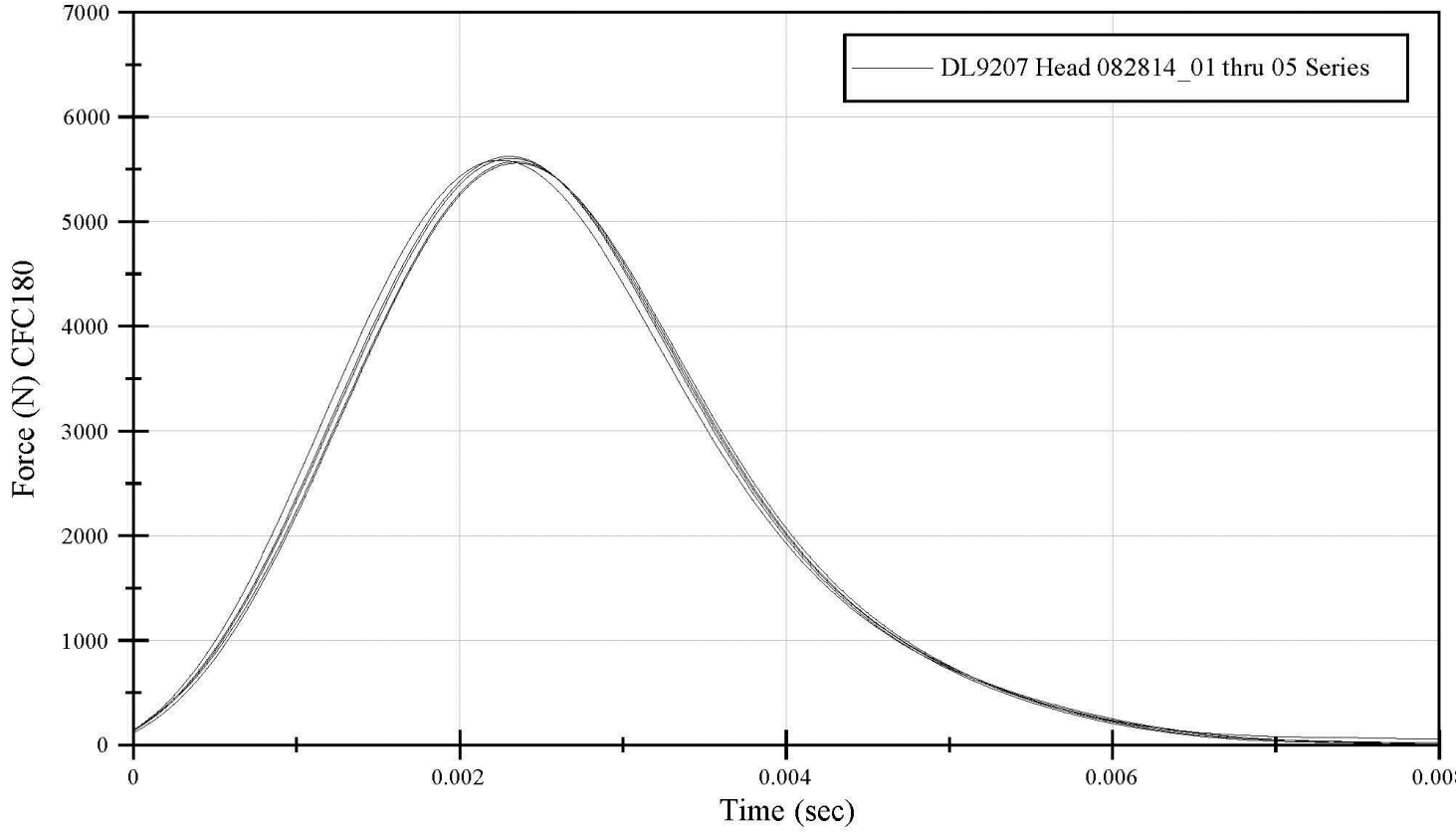
Test Data/Sensor Repair Notes

DUMMY CALIBRATIONS

50% ADULT MALE THOR DL9207 DUMMY CALIBRATIONS

Test Temperature: 71 degrees
Relative Humidity: 50%
Test Velocity: 2 m/s

THOR Head Impact Qualification
Probe Force
Serial Number: DL9207

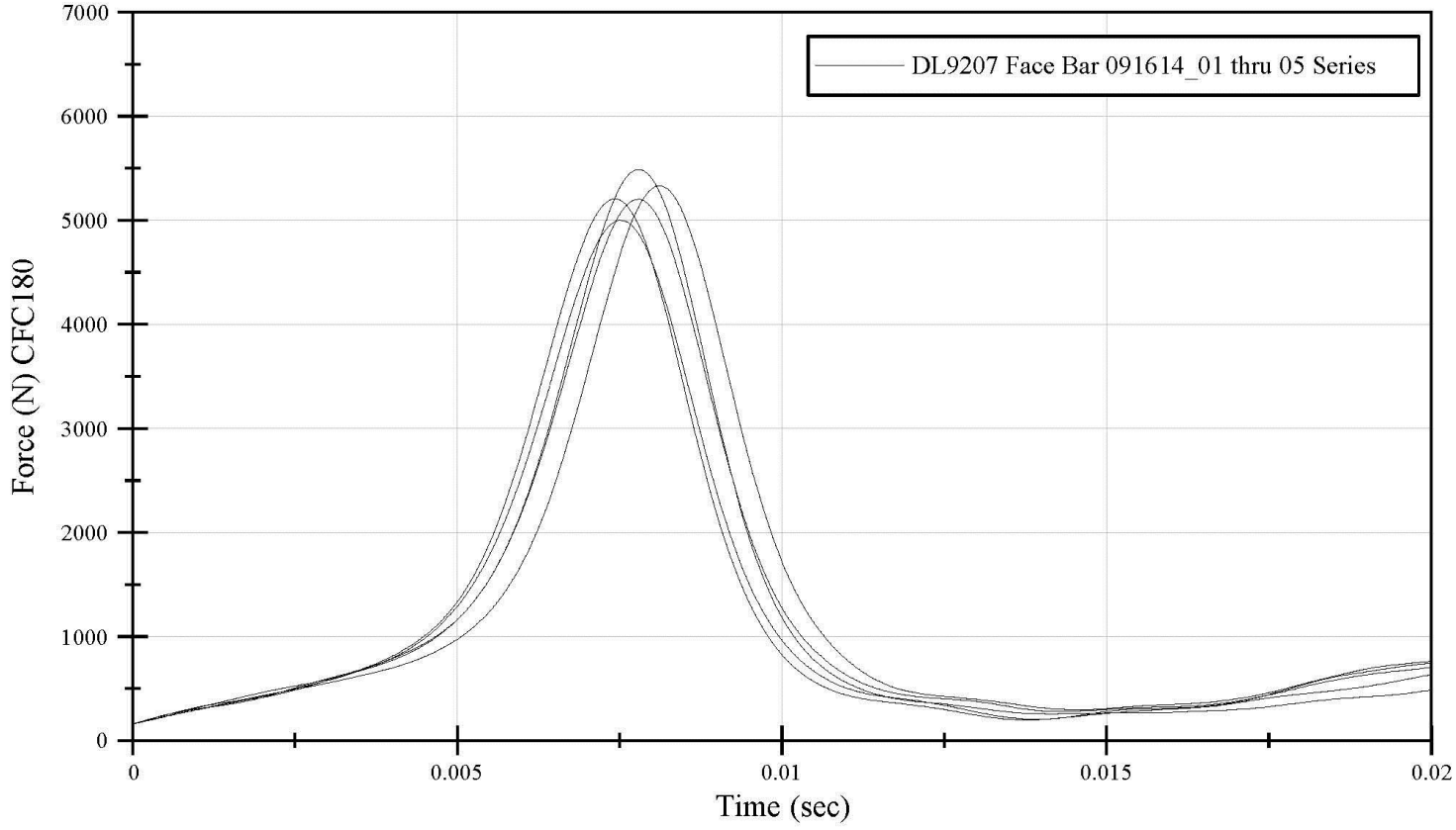


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08/28/2014 14:08:19.0000

Software Version:

Test Temperature: 71 degrees
Relative Humidity: 44%
Test Velocity: 3.60 m/s

THOR Face-Bar Qualification
Probe Force
Serial Number: DL9207

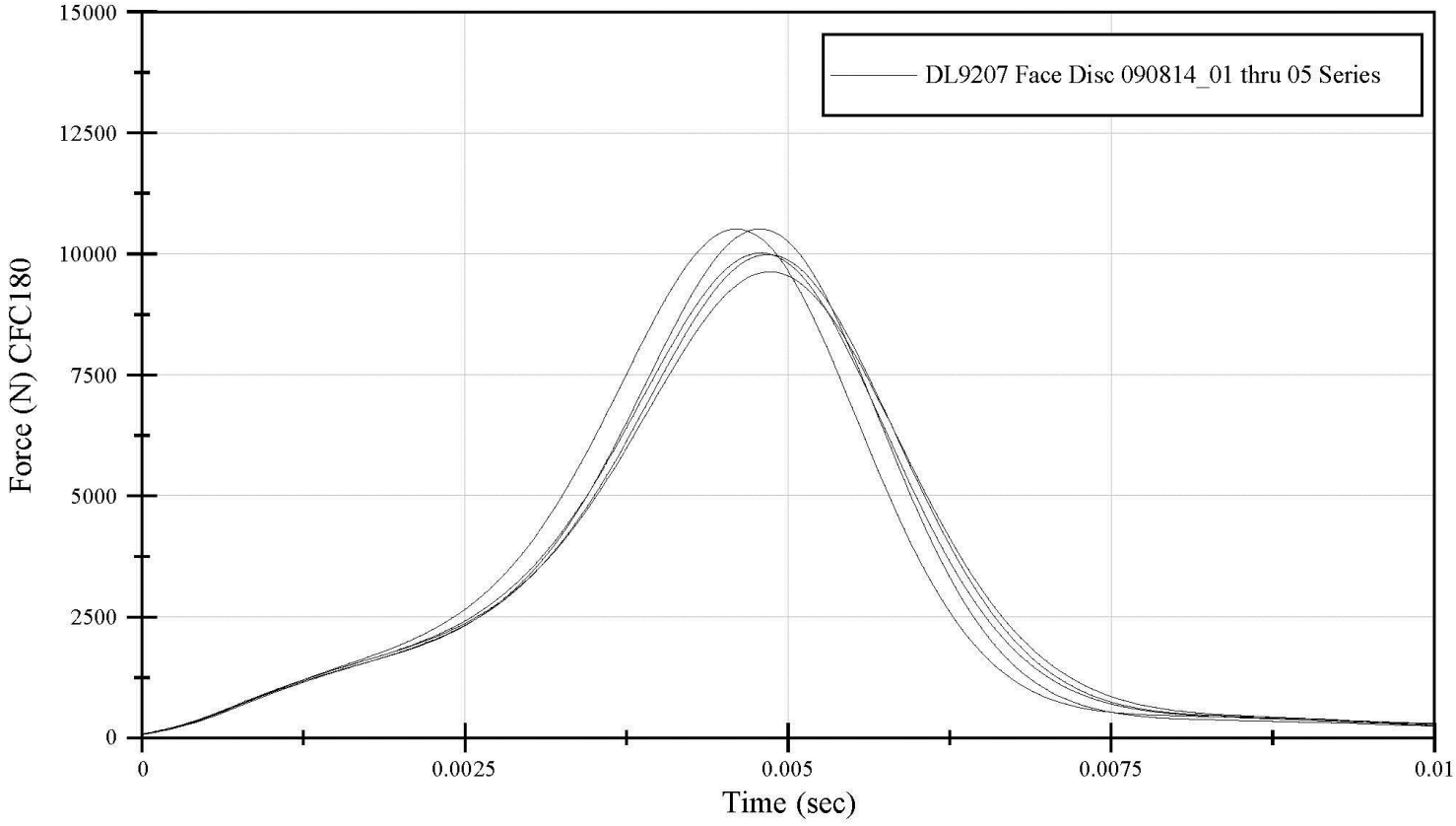


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Software Version:

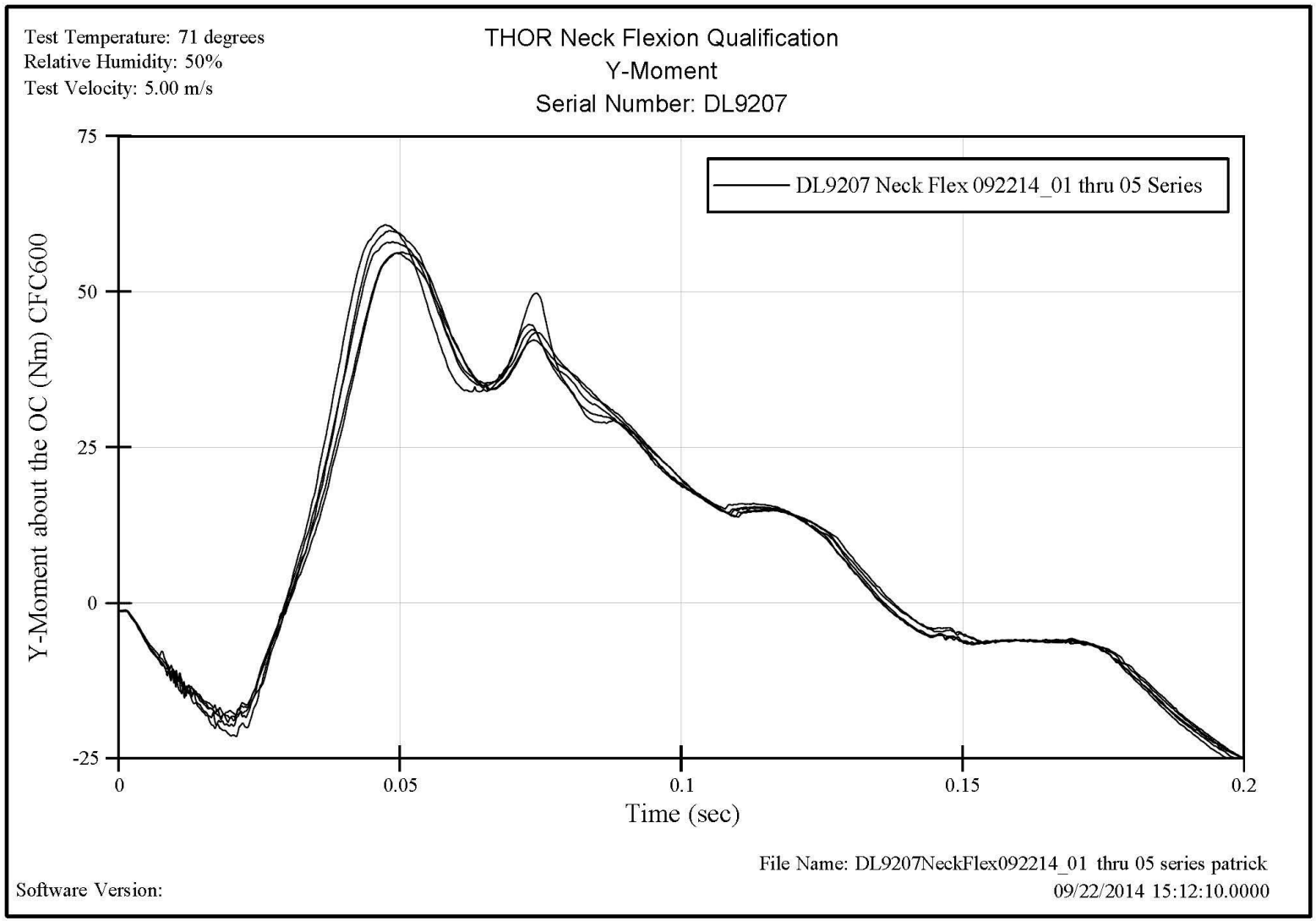
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Relative Humidity: 50%
Test Velocity: 6.68 m/s

THOR Face-Disk Qualification
Probe Force
Serial Number: DL9207



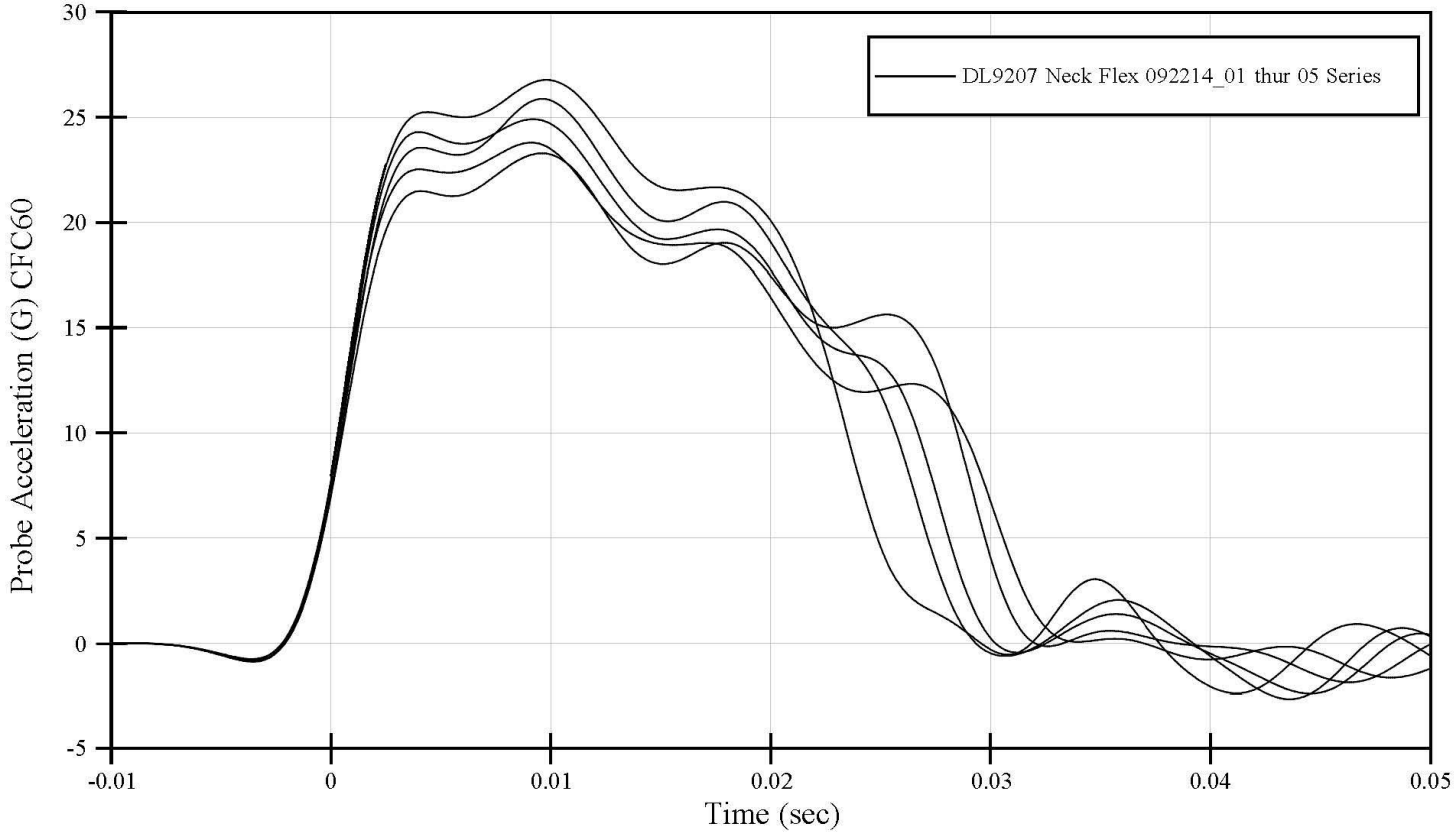
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09/08/2014 14:44:59.0000

Software Version:


Test Temperature: 71 degrees
Relative Humidity: 50%
Test Velocity: 5.00 m/s
THOR Neck Flexion Qualification
Y-Moment
Serial Number: DL9207
DL9207 Neck Flex 092214_01 thru 05 Series
Y-Moment about the OC (Nm) CFC600
75
50
25
0
-25
0
0.05
0.1
0.15
0.2
Time (sec)
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Software Version:

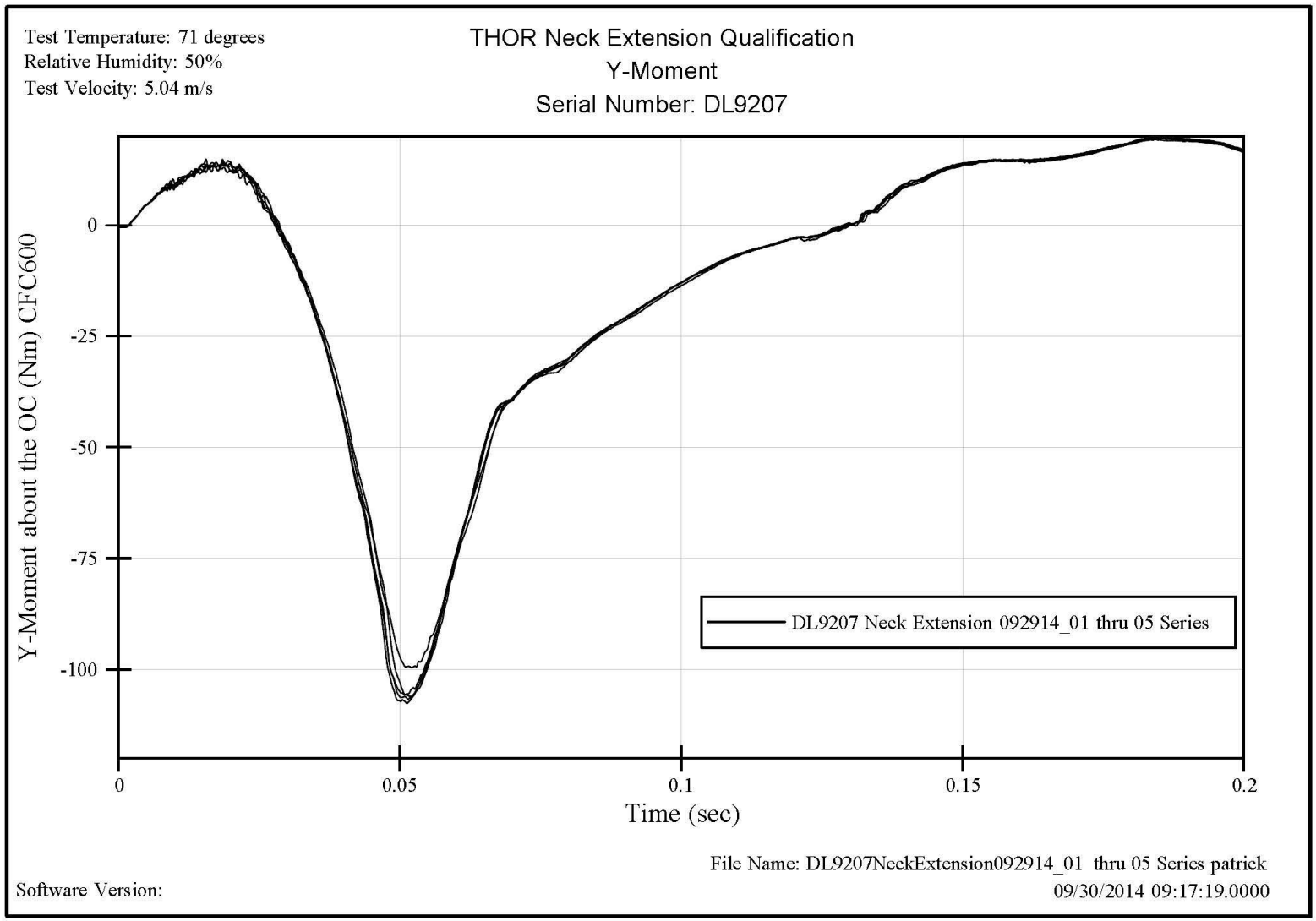
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Relative Humidity: 50%
Test Velocity: 5.00 m/s

THOR Neck Flexion Qualification
Probe Acceleration
Serial Number: DL9207



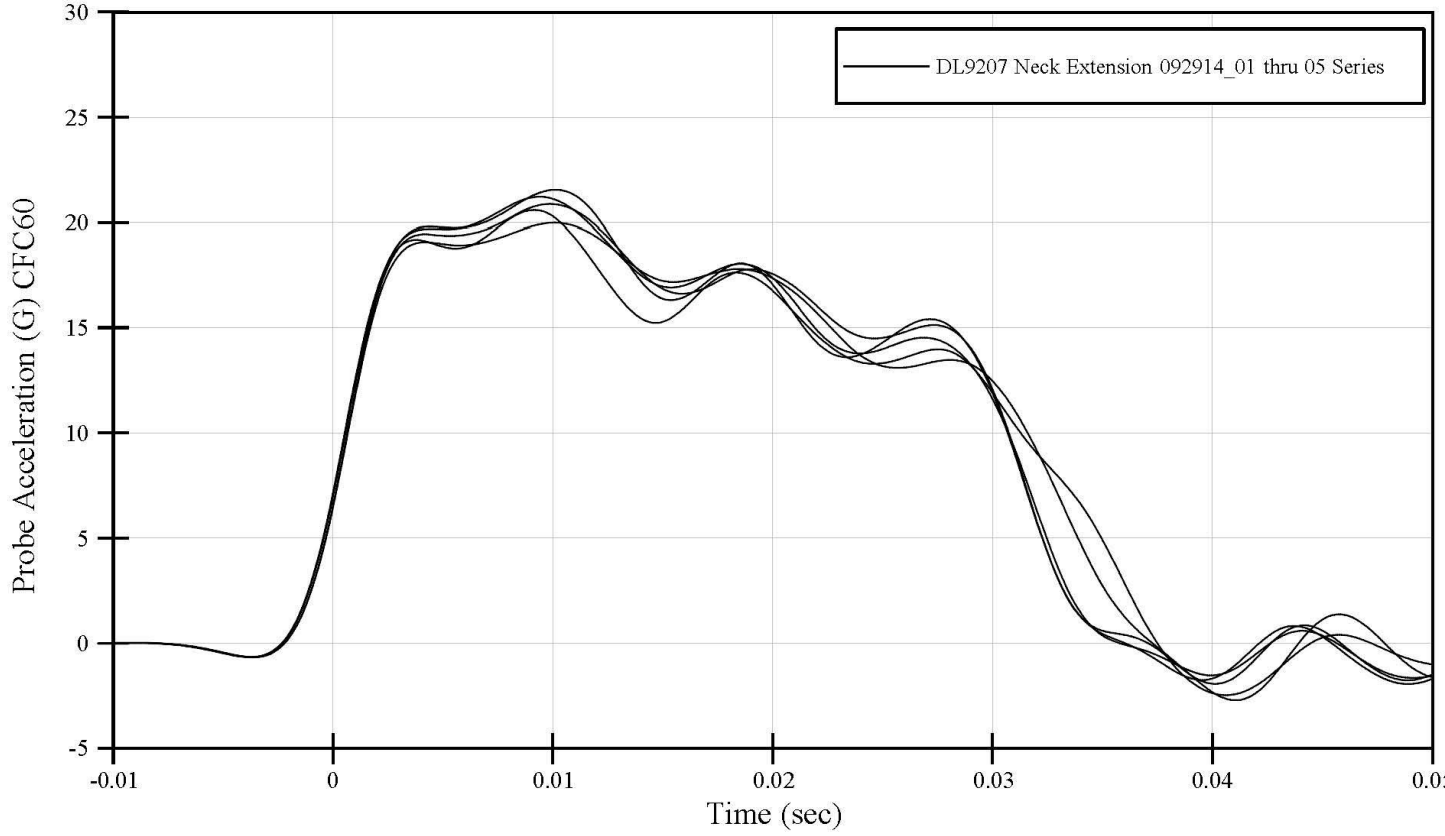
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Software Version:


Test Temperature: 71 degrees
Relative Humidity: 50%
Test Velocity: 5.04 m/s
THOR Neck Extension Qualification
Y-Moment
Serial Number: DL9207
Y-Moment about the OC (Nm) CFC600
0
-25
-50
-75
-100
0
0.05
0.1
0.15
0.2
Time (sec)
DL9207 Neck Extension 092914_01 thru 05 Series
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09/30/2014 09:17:19.0000
Software Version:

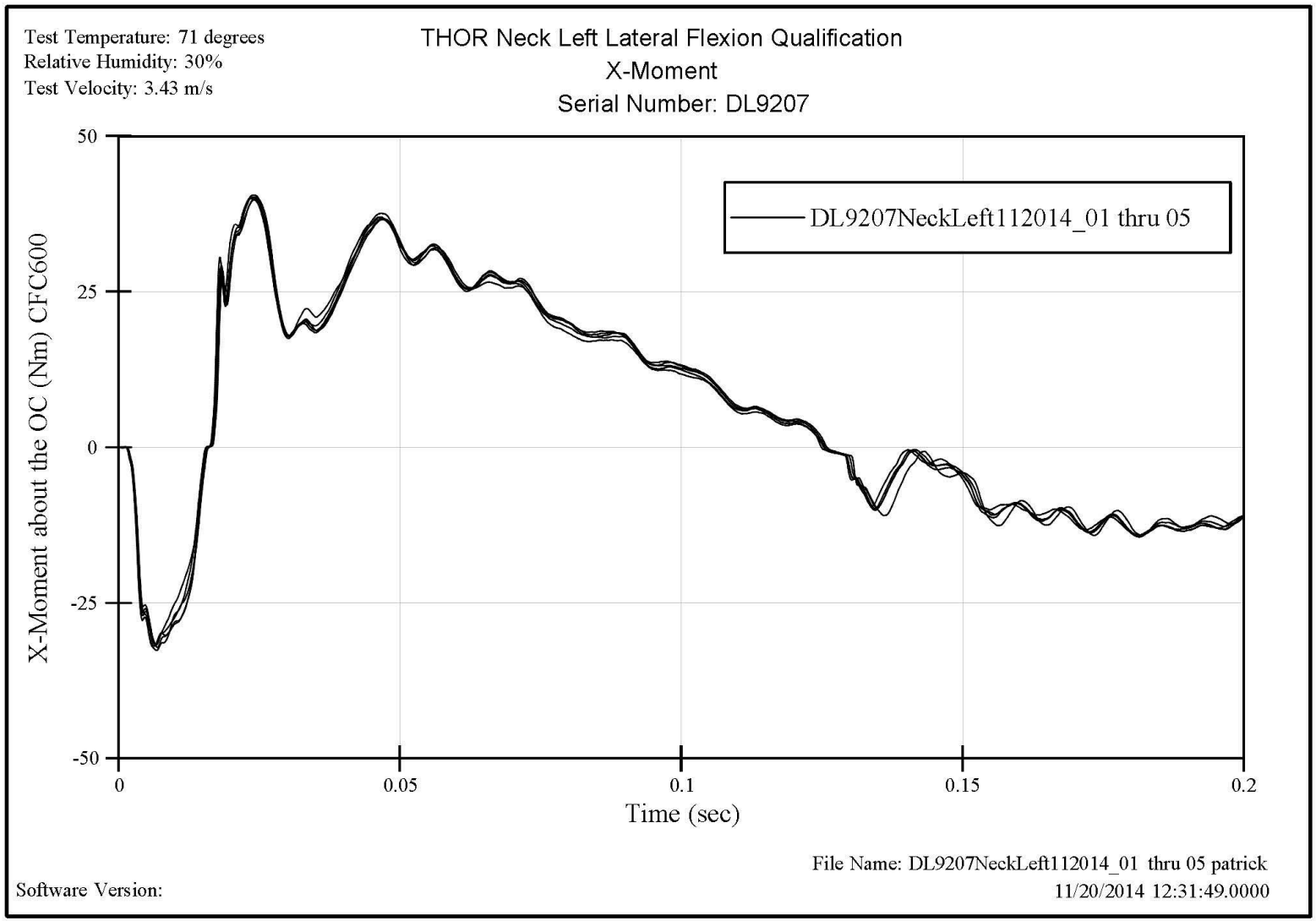
Test Temperature: 71 degrees
Relative Humidity: 50%
Test Velocity: 5.04 m/s

THOR Neck Extension Qualification
Probe Acceleration
Serial Number: DL9207



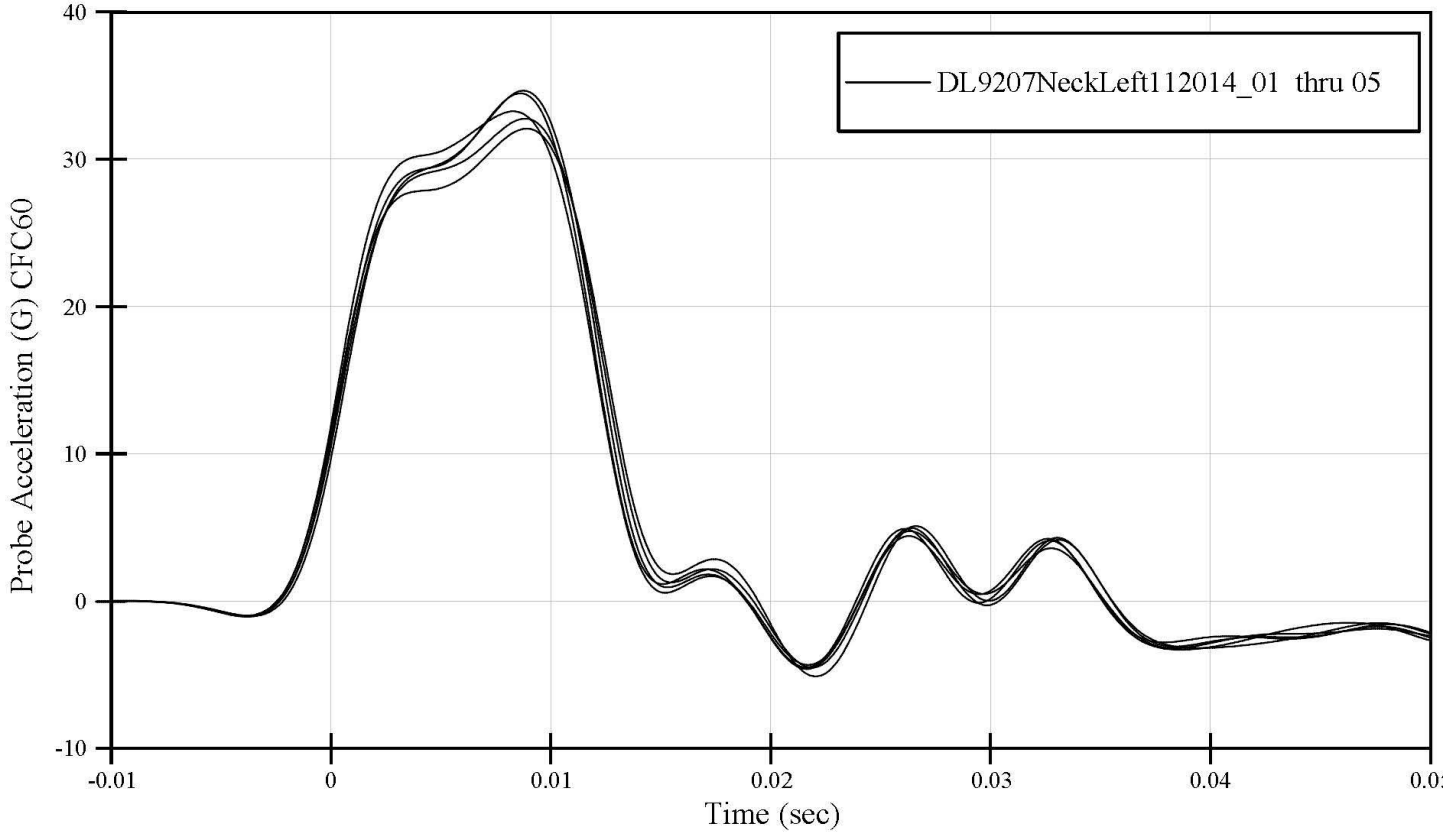
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09/30/2014 09:17:19.0000

Software Version:


Test Temperature: 71 degrees
Relative Humidity: 30%
Test Velocity: 3.43 m/s
THOR Neck Left Lateral Flexion Qualification
X-Moment
Serial Number: DL9207
DL9207NeckLeft112014_01 thru 05
X-Moment about the OC (Nm) CFC600
50
25
0
-25
-50
0
0.05
0.1
0.15
0.2
Time (sec)
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Software Version:

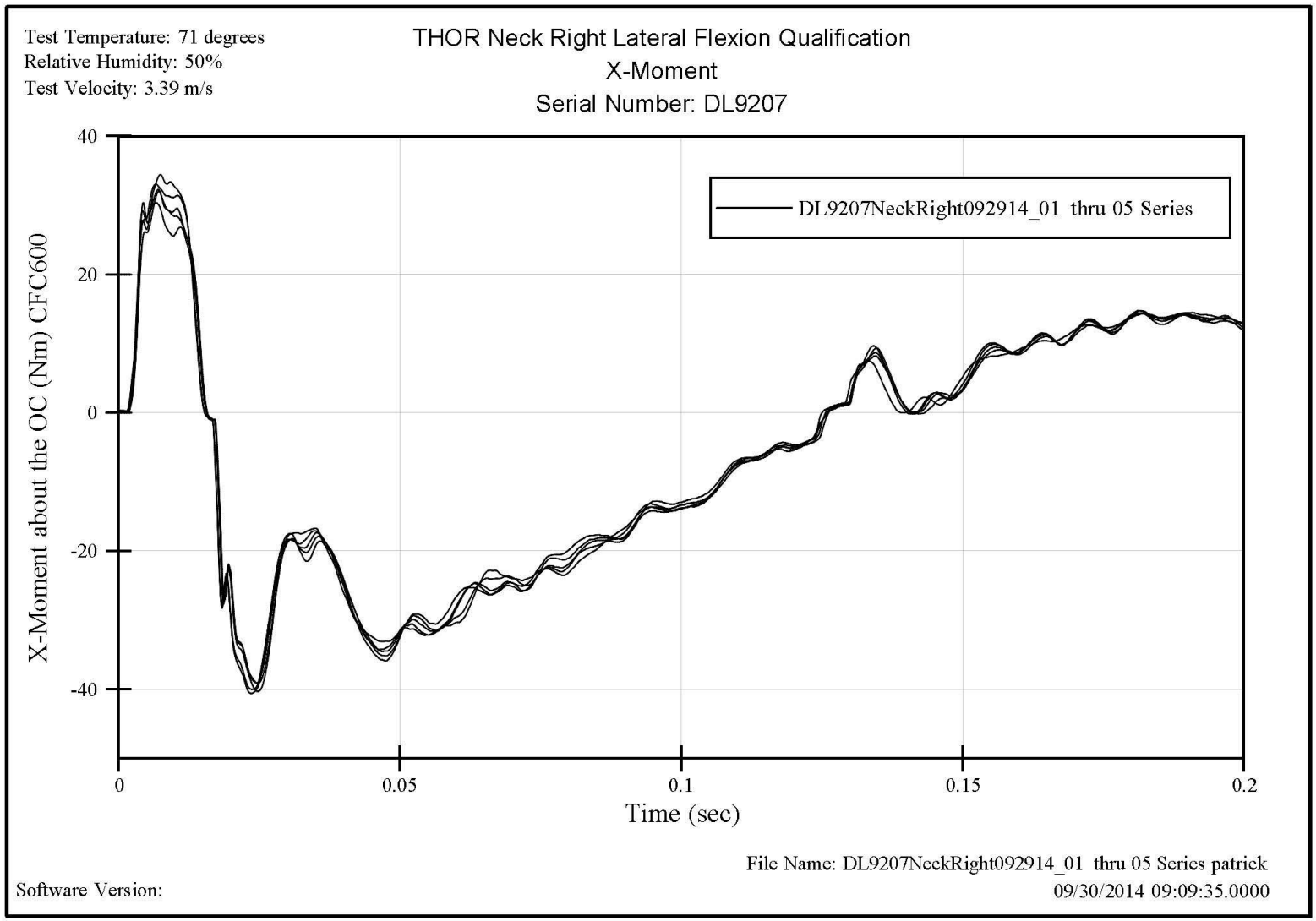
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Relative Humidity: 30%
Test Velocity: 3.43 m/s

THOR Neck Left Lateral Flexion Qualification
Probe Acceleration
Serial Number: DL9207



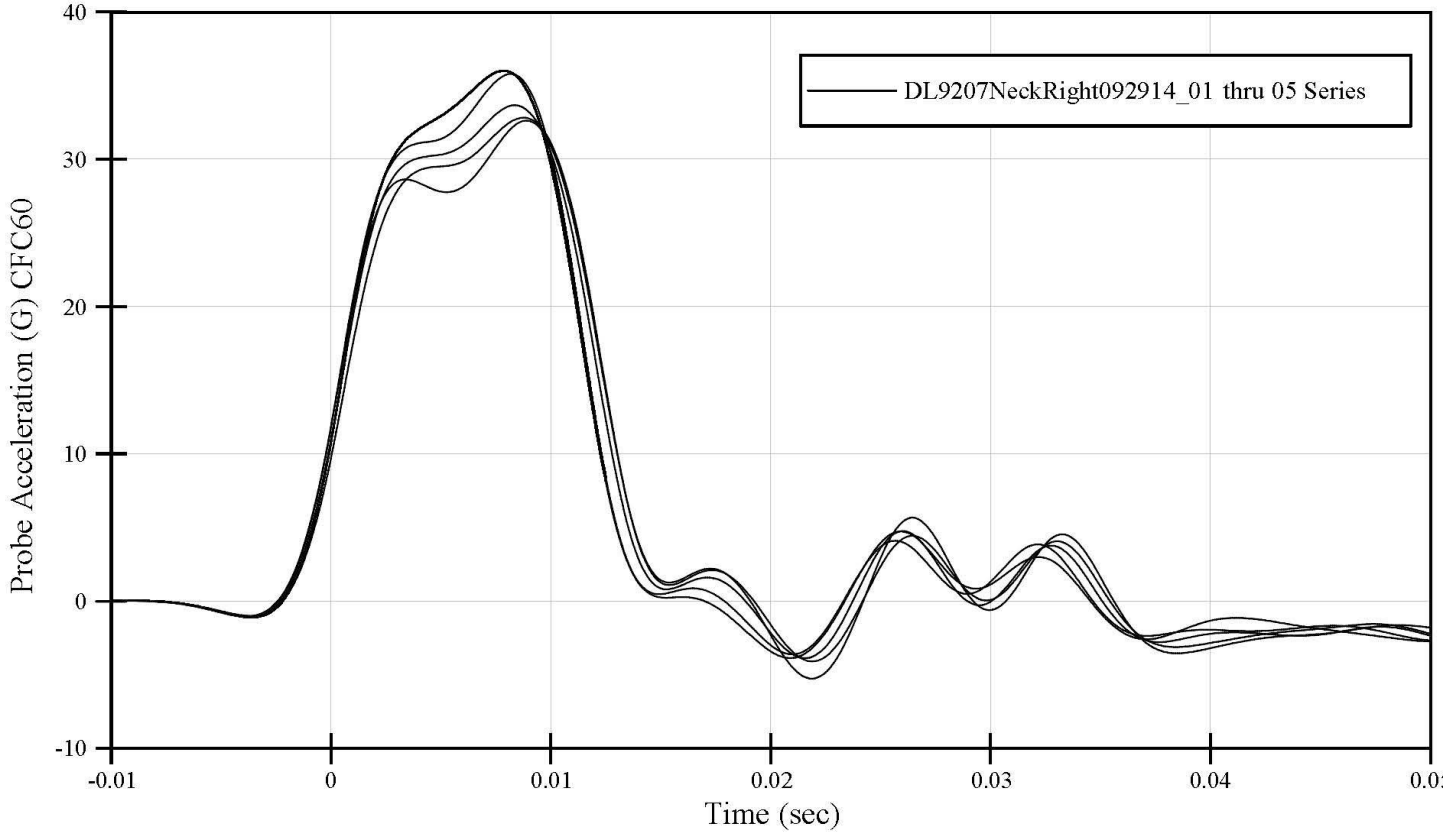
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11/20/2014 12:31:49.0000

Software Version:


Test Temperature: 71 degrees
Relative Humidity: 50%
Test Velocity: 3.39 m/s
THOR Neck Right Lateral Flexion Qualification
X-Moment
Serial Number: DL9207
DL9207NeckRight092914_01 thru 05 Series
X-Moment about the OC (Nm) CFC600
40
20
0
-20
-40
0
0.05
0.1
0.15
0.2
Time (sec)
File Name: DL9207NeckRight092914_01 thru 05 Series patrick
09/30/2014 09:09:35.0000
Software Version:

Test Temperature: 71 degrees
Relative Humidity: 50%
Test Velocity: 3.39 m/s

THOR Neck Right Lateral Flexion Qualification
Probe Acceleration
Serial Number: DL9207

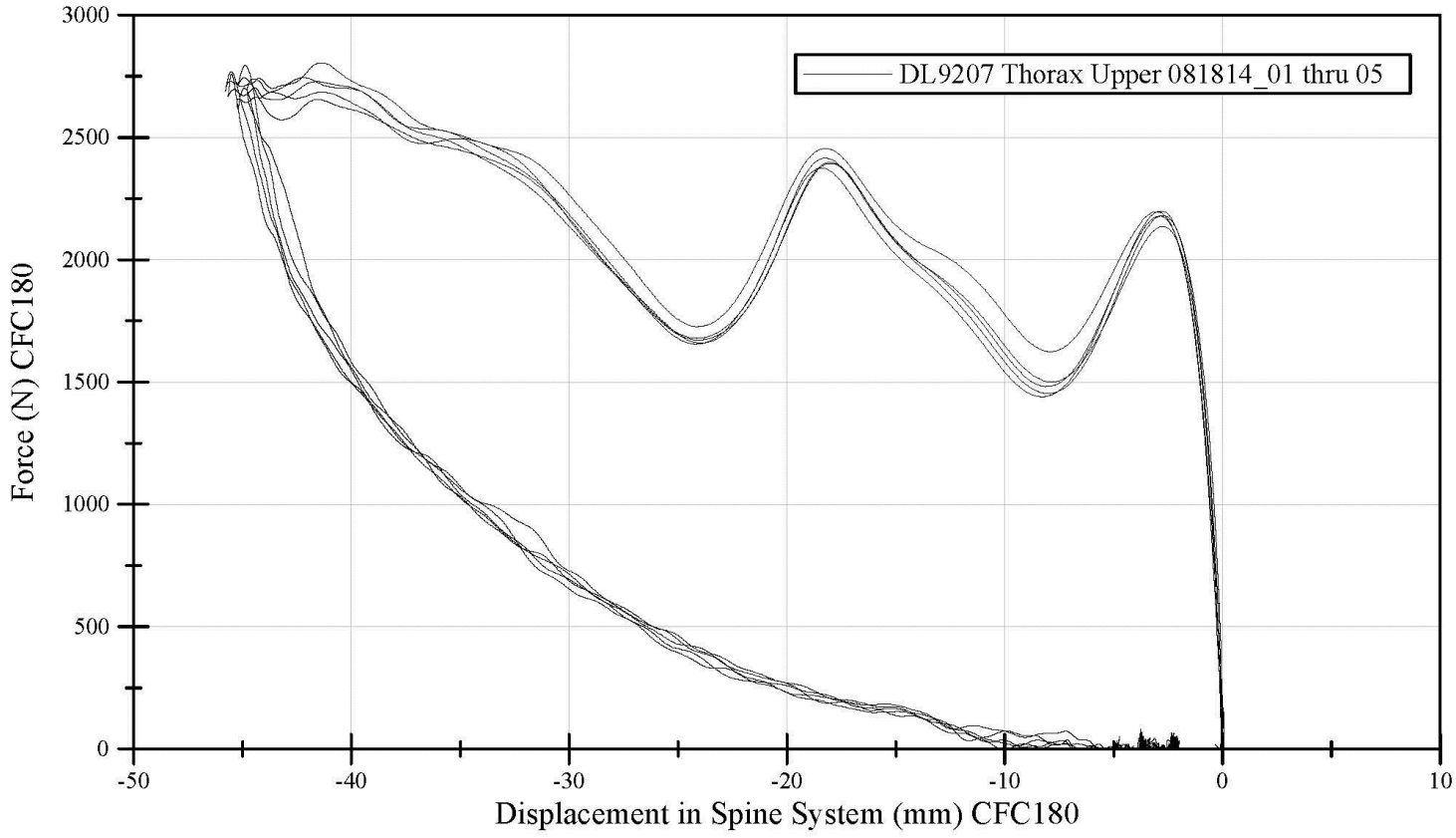


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09/30/2014 09:09:35.0000

Software Version:

Test Temperature: 71 degrees
Relative Humidity: 50%
Test Velocity: 4.34 m/s

THOR Upper Thorax Qualification
Serial Number: DL9207

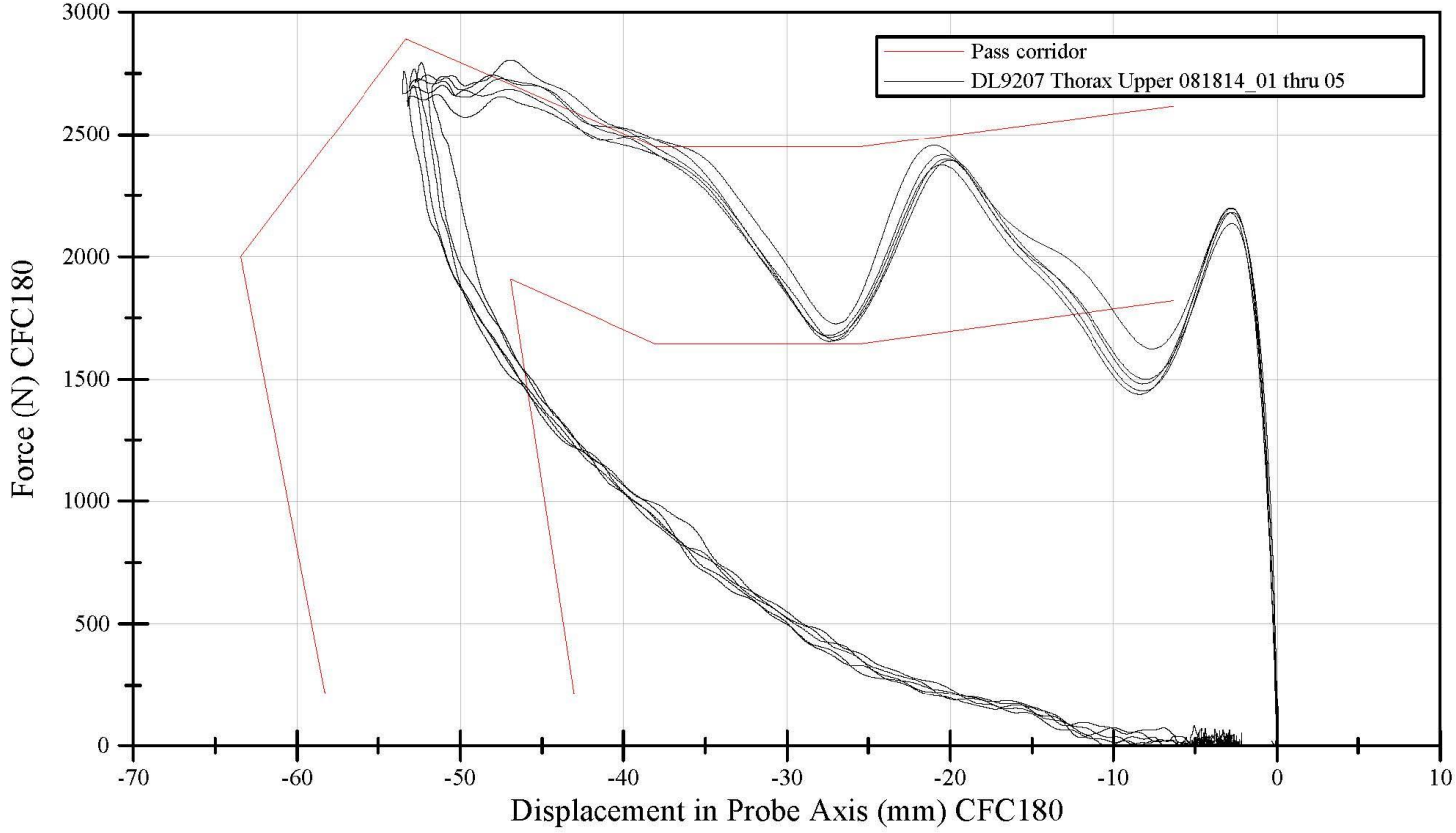


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08/21/2014 10:13:55.0000

Software Version: 2.5

Test Temperature: 71 degrees
Relative Humidity: 50%
Test Velocity: 4.34 m/s

THOR Upper Thorax Qualification
Thorax Response With Kroell Corridor
Serial Number: DL9207

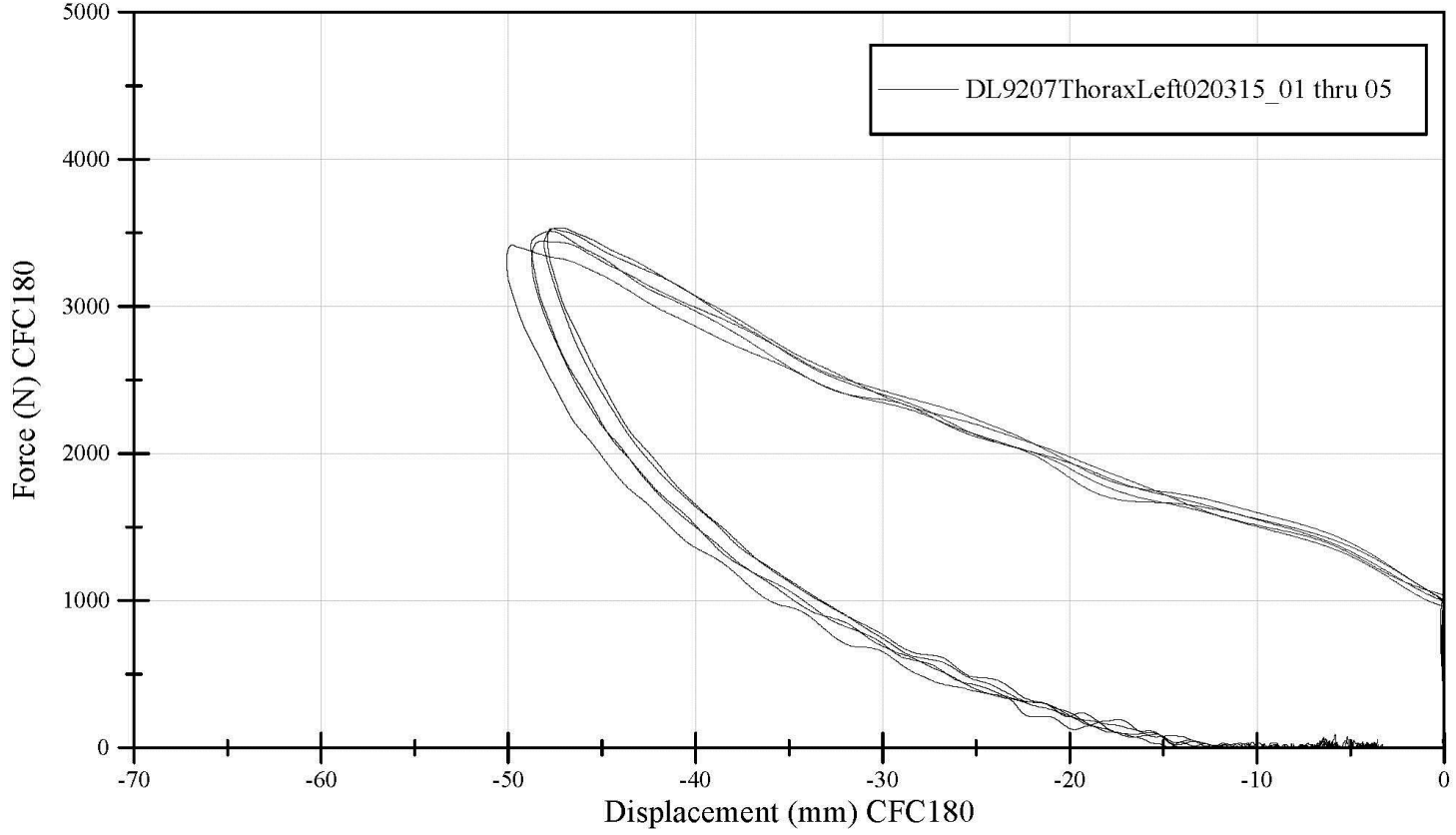


File Name: DL9207ThoraxUpper081814_01_DIAdemHeader_BINARYpatrick.tdms
08/21/2014 10:13:55.0000

Software Version: 2.5

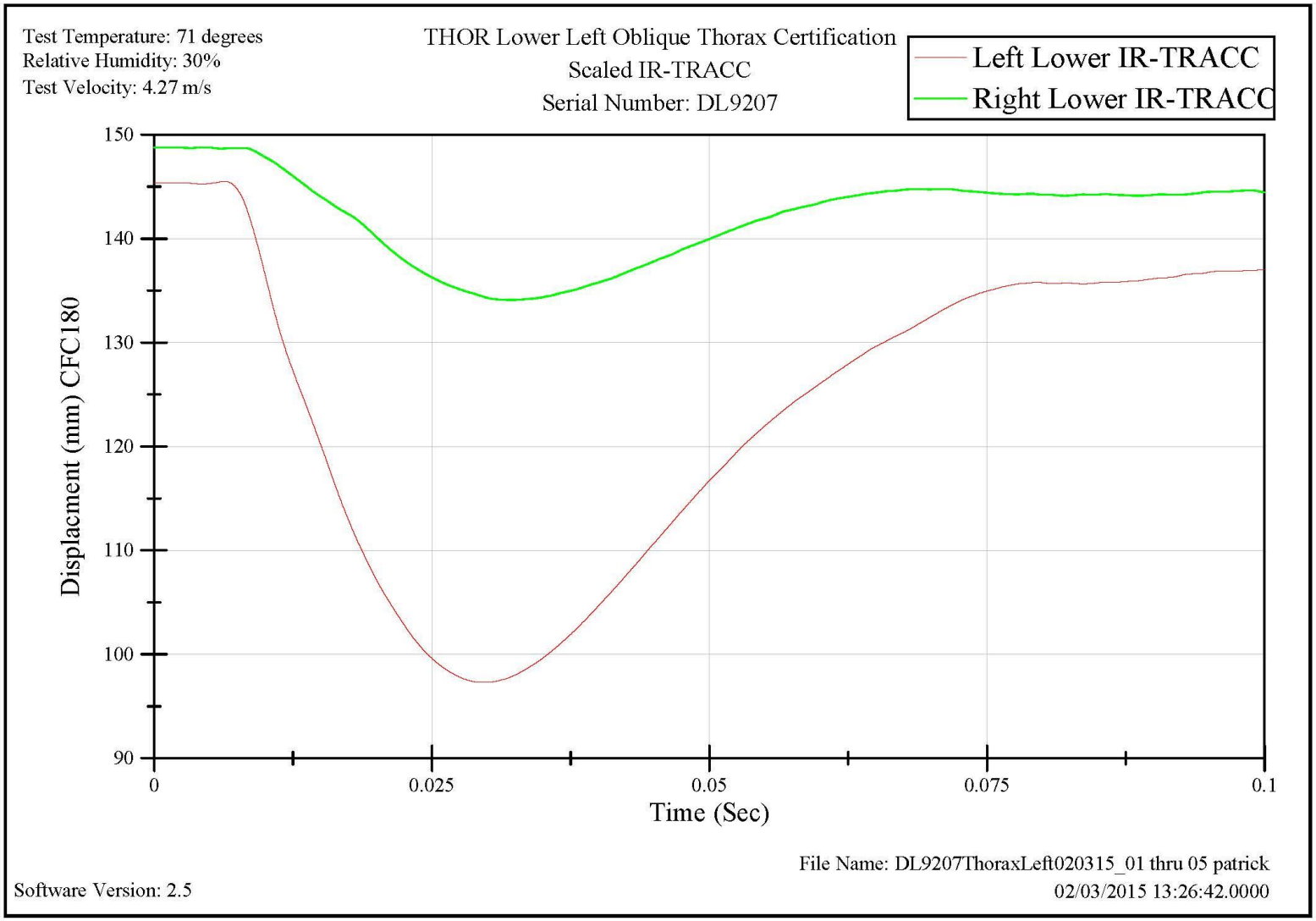
Test Temperature: 71 degrees
Relative Humidity: 30%
Test Velocity: 4.27 m/s

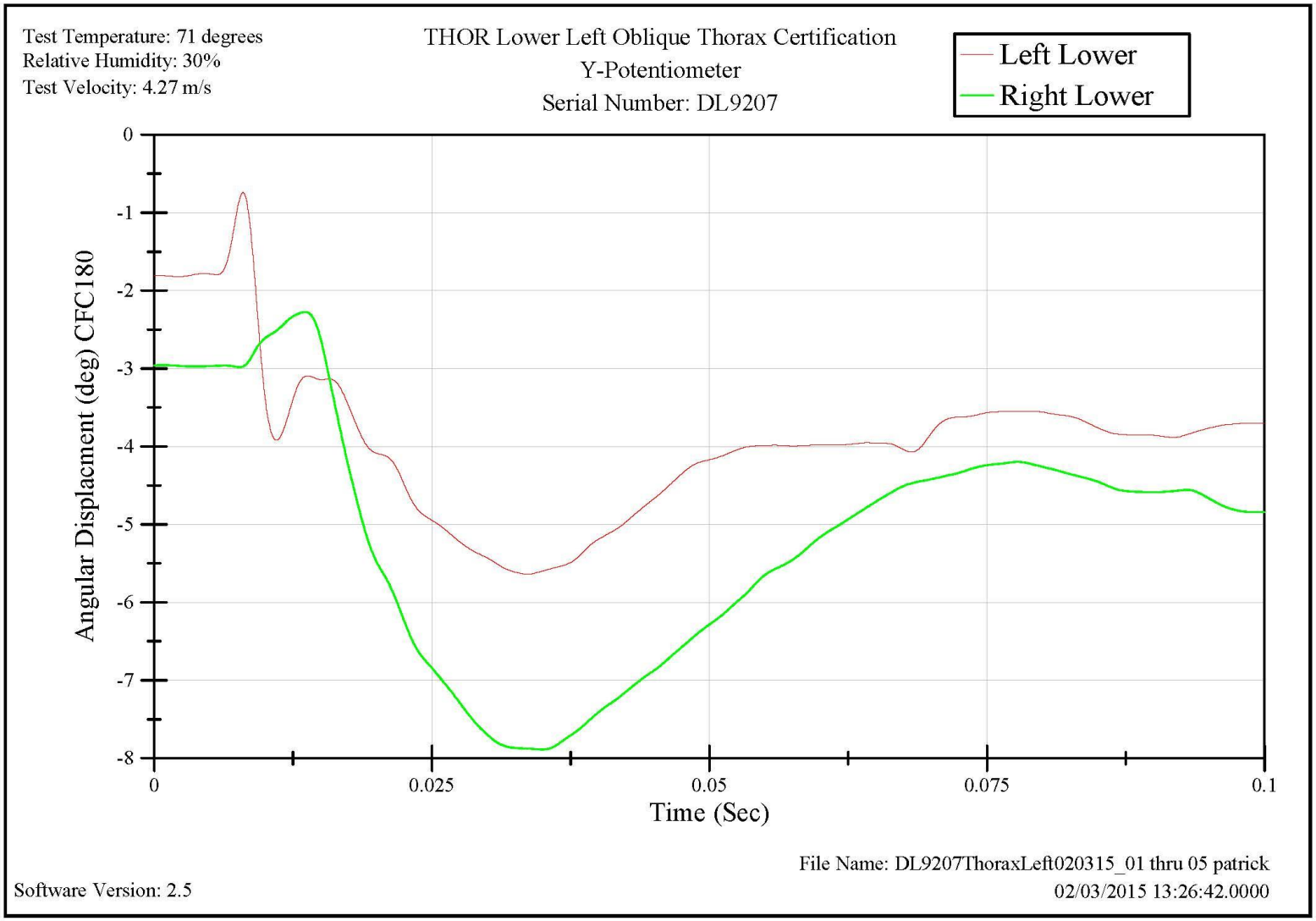
THOR Lower Left Thorax Qualification
Thorax Displacement vs. Probe Force
Serial Number: DL9207

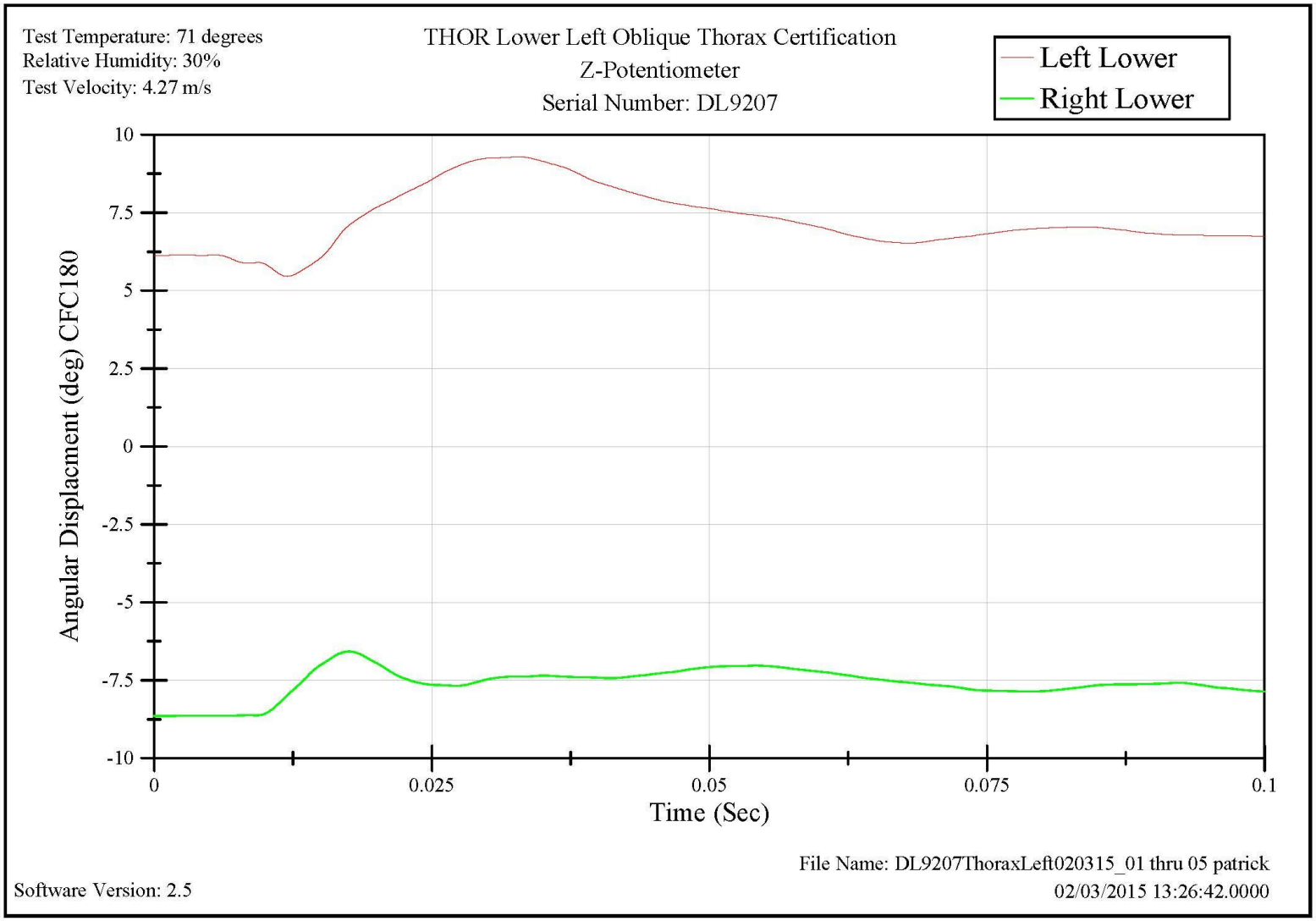


File Name: DL9207ThoraxLeft020315_01 thru 05 patrick
02/03/2015 13:26:42.0000

Software Version: 2.5

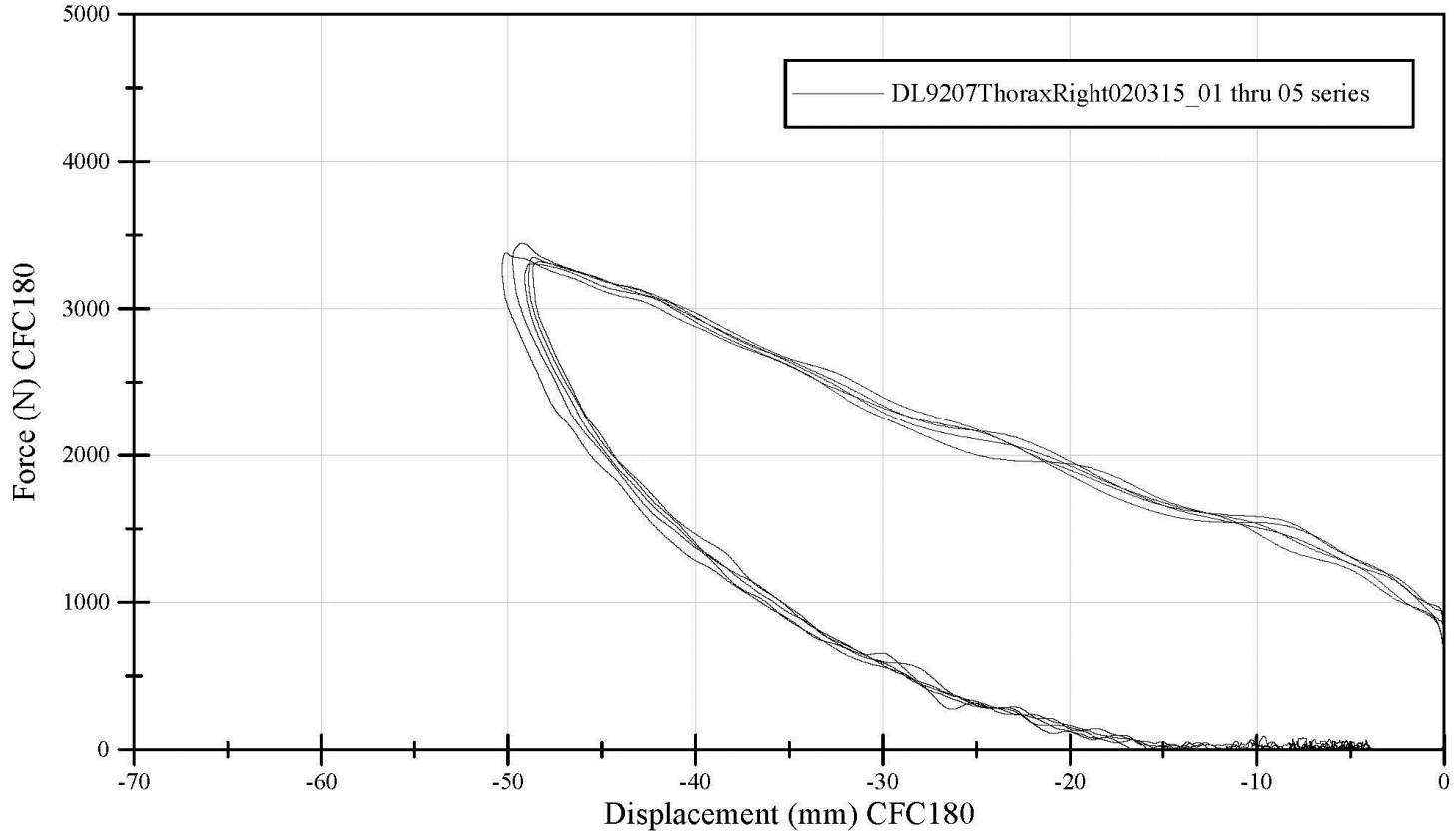

Test Temperature: 71 degrees
Relative Humidity: 30%
Test Velocity: 4.27 m/s
THOR Lower Left Oblique Thorax Certification
Scaled IR-TRACC
Serial Number: DL9207
Left Lower IR-TRACC
Right Lower IR-TRACC
Displacment (mm) CFC180
150
140
130
120
110
100
90
0
0.025
0.05
0.075
0.1
Time (Sec)
File Name: DL9207ThoraxLeft020315_01 thru 05 patrick
02/03/2015 13:26:42.0000
Software Version: 2.5


Test Temperature: 71 degrees
Relative Humidity: 30%
Test Velocity: 4.27 m/s
THOR Lower Left Oblique Thorax Certification
Y-Potentiometer
Serial Number: DL9207
Left Lower
Right Lower
Angular Displacment (deg) CFC180
0
-1
-2
-3
-4
-5
-6
-7
-8
0
0.025
0.05
0.075
0.1
Time (Sec)
File Name: DL9207ThoraxLeft020315_01 thru 05 patrick
02/03/2015 13:26:42.0000
Software Version: 2.5


Test Temperature: 71 degrees
Relative Humidity: 30%
Test Velocity: 4.27 m/s
THOR Lower Left Oblique Thorax Certification
Z-Potentiometer
Serial Number: DL9207
Left Lower
Right Lower
Angular Displacment (deg) CFC180
10
7.5
5
2.5
0
-2.5
-5
-7.5
-10
0
0.025
0.05
0.075
0.1
Time (Sec)
File Name: DL9207ThoraxLeft020315_01 thru 05 patrick
02/03/2015 13:26:42.0000
Software Version: 2.5

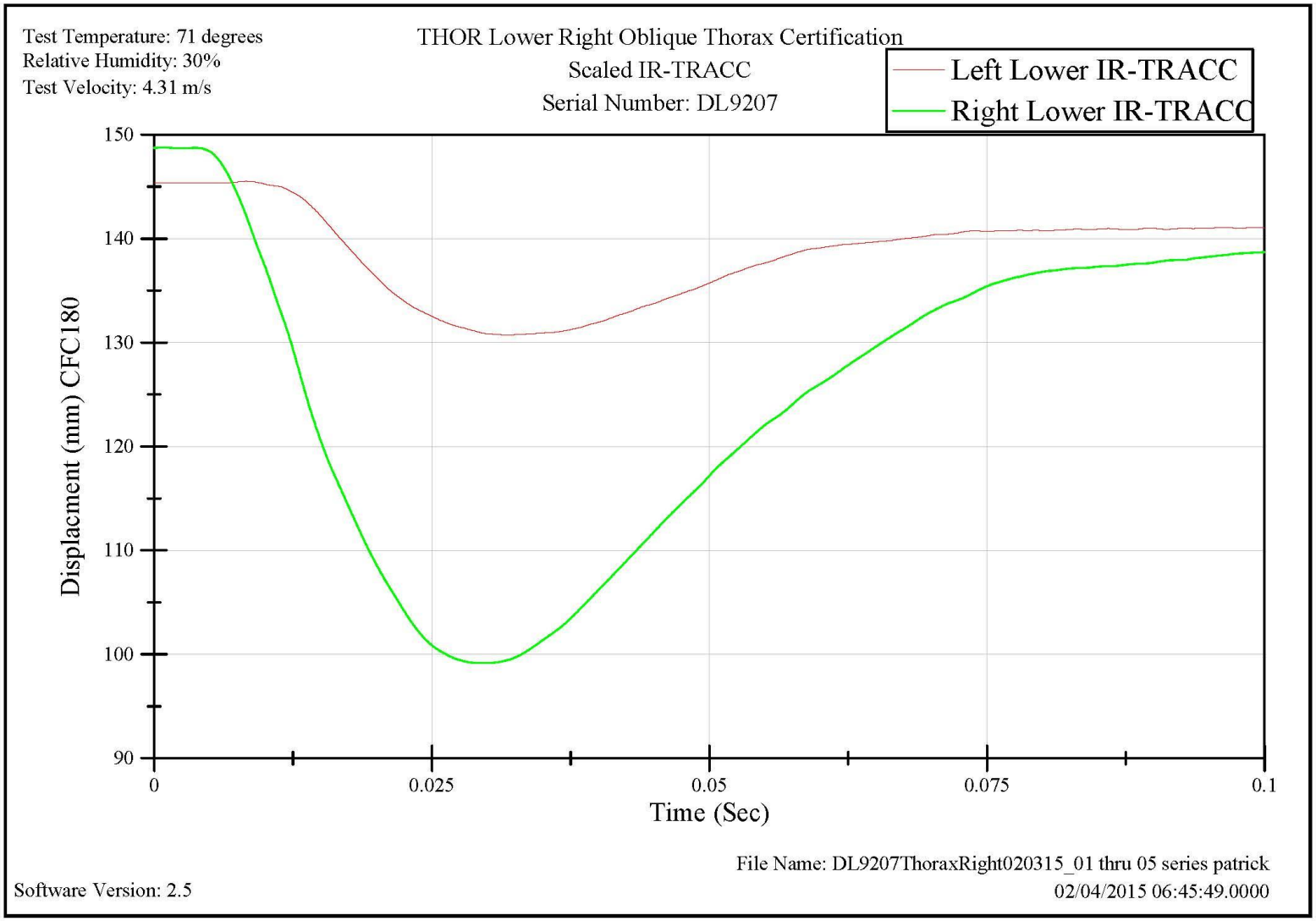
Test Temperature: 71 degrees
Relative Humidity: 30%
Test Velocity: 4.31 m/s

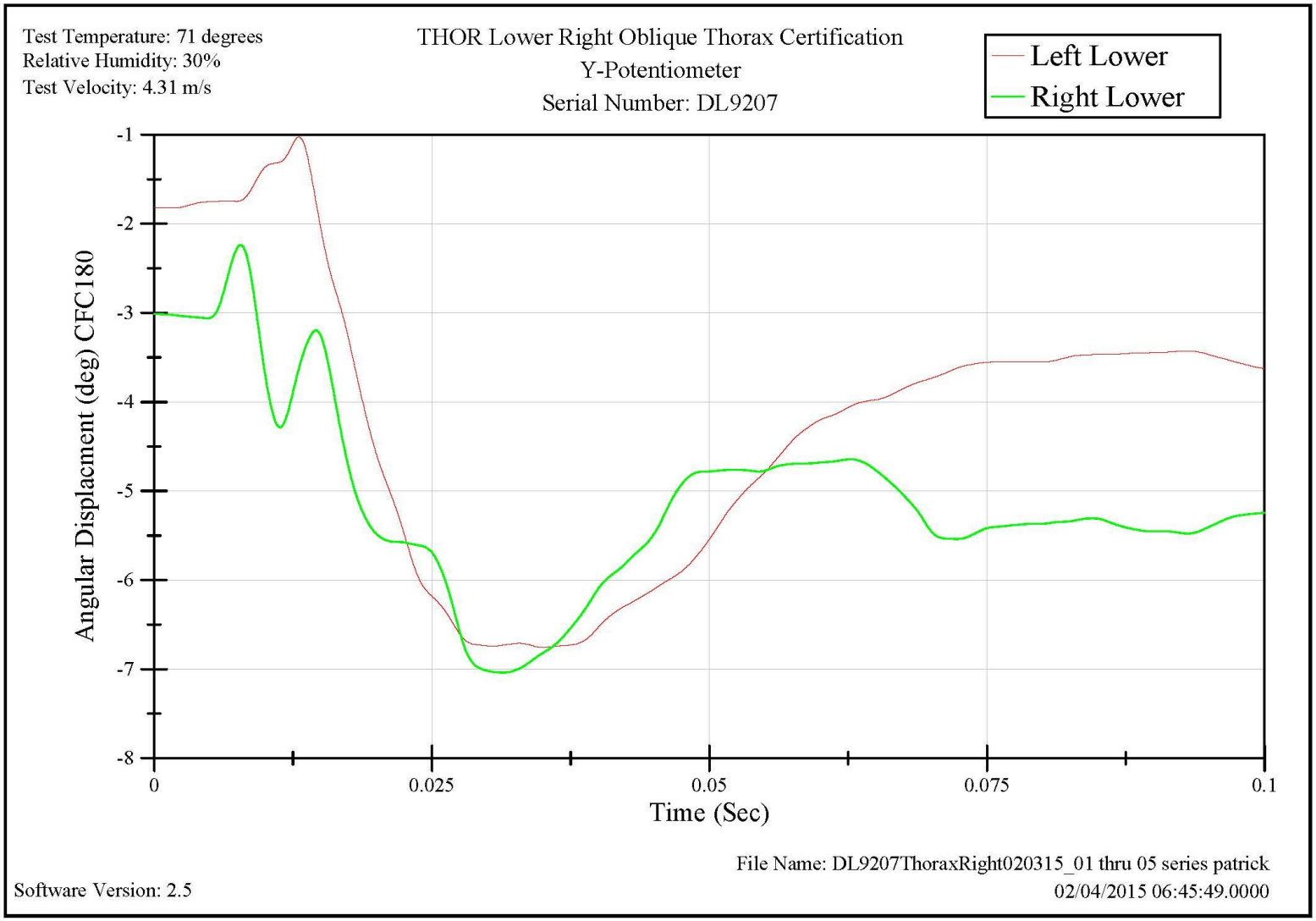
THOR Lower Right Thorax Qualification
Thorax Displacement vs. Probe Force
Serial Number: DL9207

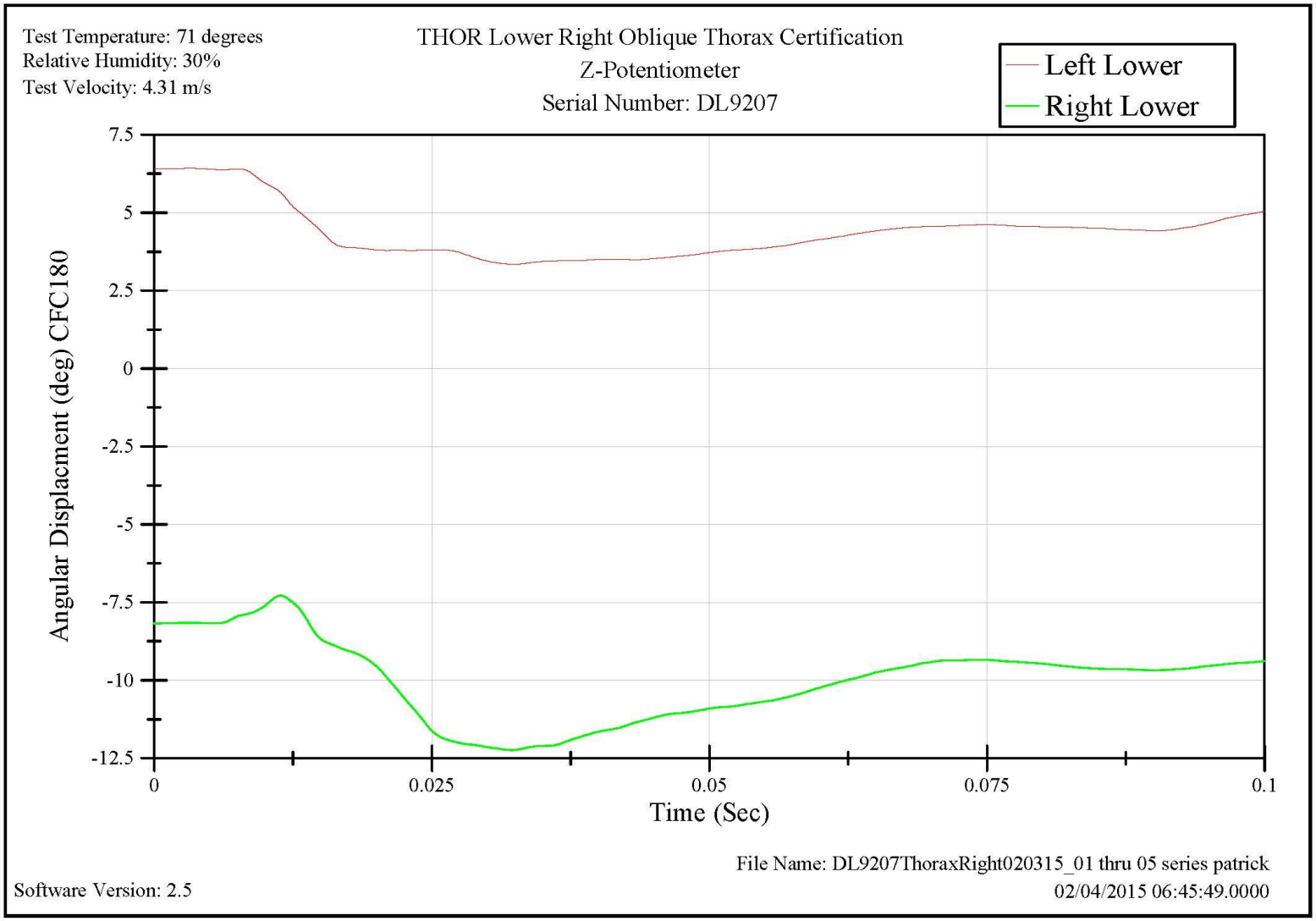


File Name: DL9207ThoraxRight020315_01 thru 05 series patrick
02/04/2015 06:45:49.0000

Software Version: 2.5

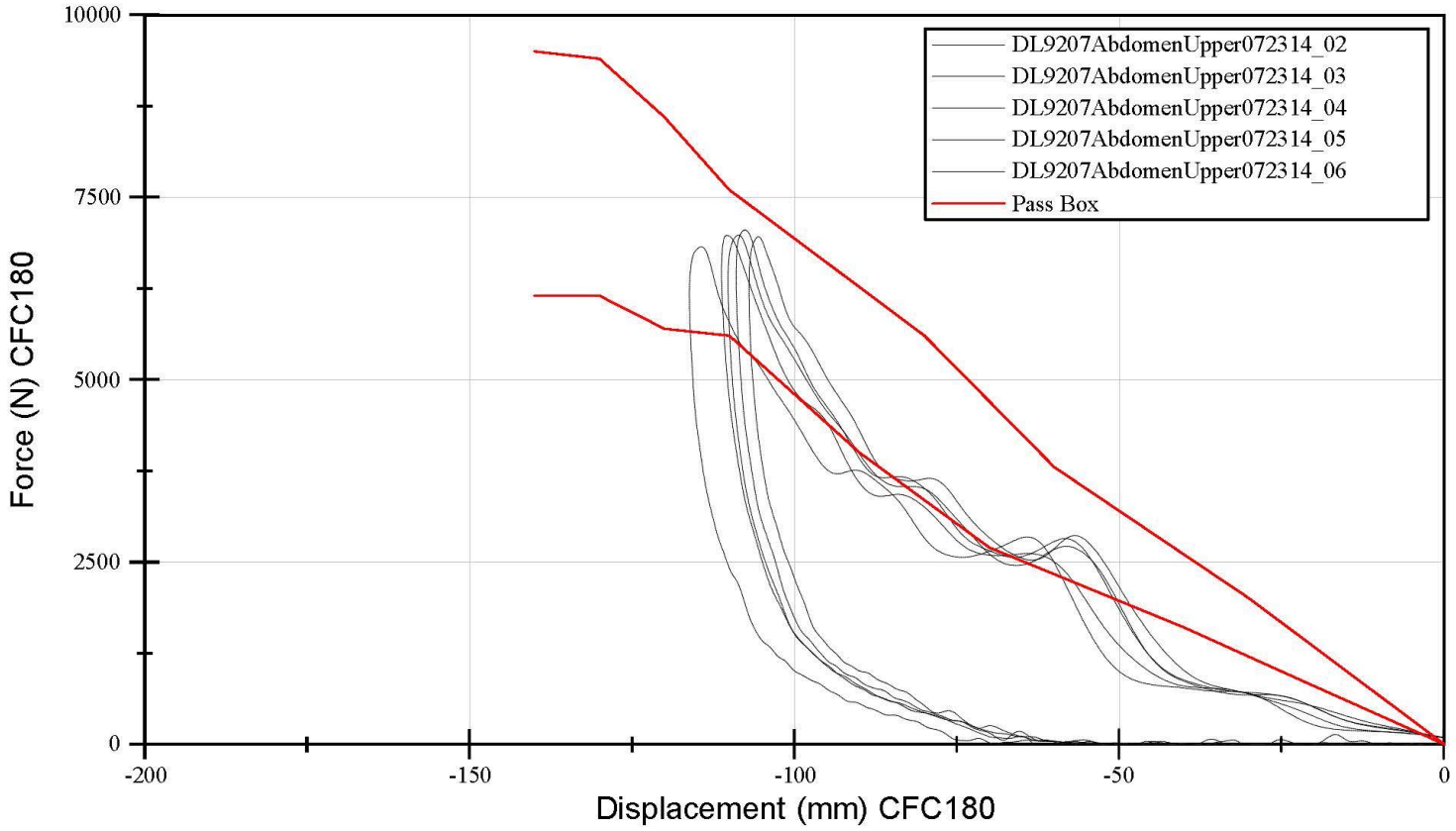

Test Temperature: 71 degrees
Relative Humidity: 30%
Test Velocity: 4.31 m/s
THOR Lower Right Oblique Thorax Certification
Scaled IR-TRACC
Serial Number: DL9207
Left Lower IR-TRACC
Right Lower IR-TRACC
Displacment (mm) CFC180
150
140
130
120
110
100
90
0
0.025
0.05
0.075
0.1
Time (Sec)
File Name: DL9207ThoraxRight020315_01 thru 05 series patrick
02/04/2015 06:45:49.0000
Software Version: 2.5


Test Temperature: 71 degrees
Relative Humidity: 30%
Test Velocity: 4.31 m/s
THOR Lower Right Oblique Thorax Certification
Y-Potentiometer
Serial Number: DL9207
Left Lower
Right Lower
Angular Displacment (deg) CFC180
-1
-2
-3
-4
-5
-6
-7
-8
0
0.025
0.05
0.075
0.1
Time (Sec)
File Name: DL9207ThoraxRight020315_01 thru 05 series patrick
02/04/2015 06:45:49.0000
Software Version: 2.5


Test Temperature: 71 degrees
Relative Humidity: 30%
Test Velocity: 4.31 m/s
THOR Lower Right Oblique Thorax Certification
Z-Potentiometer
Serial Number: DL9207
Left Lower
Right Lower
Angular Displacment (deg) CFC180
7.5
5
2.5
0
-2.5
-5
-7.5
-10
-12.5
0
0.025
0.05
0.075
0.1
Time (Sec)
File Name: DL9207ThoraxRight020315_01 thru 05 series patrick
02/04/2015 06:45:49.0000
Software Version: 2.5

Test Temperature: 71 degrees
Relative Humidity: 50%
Test Velocity: 6.68 m/s

THOR Upper Abdomen Qualification
Abdomen Displacement vs. Probe Force
Serial Number: DL9207

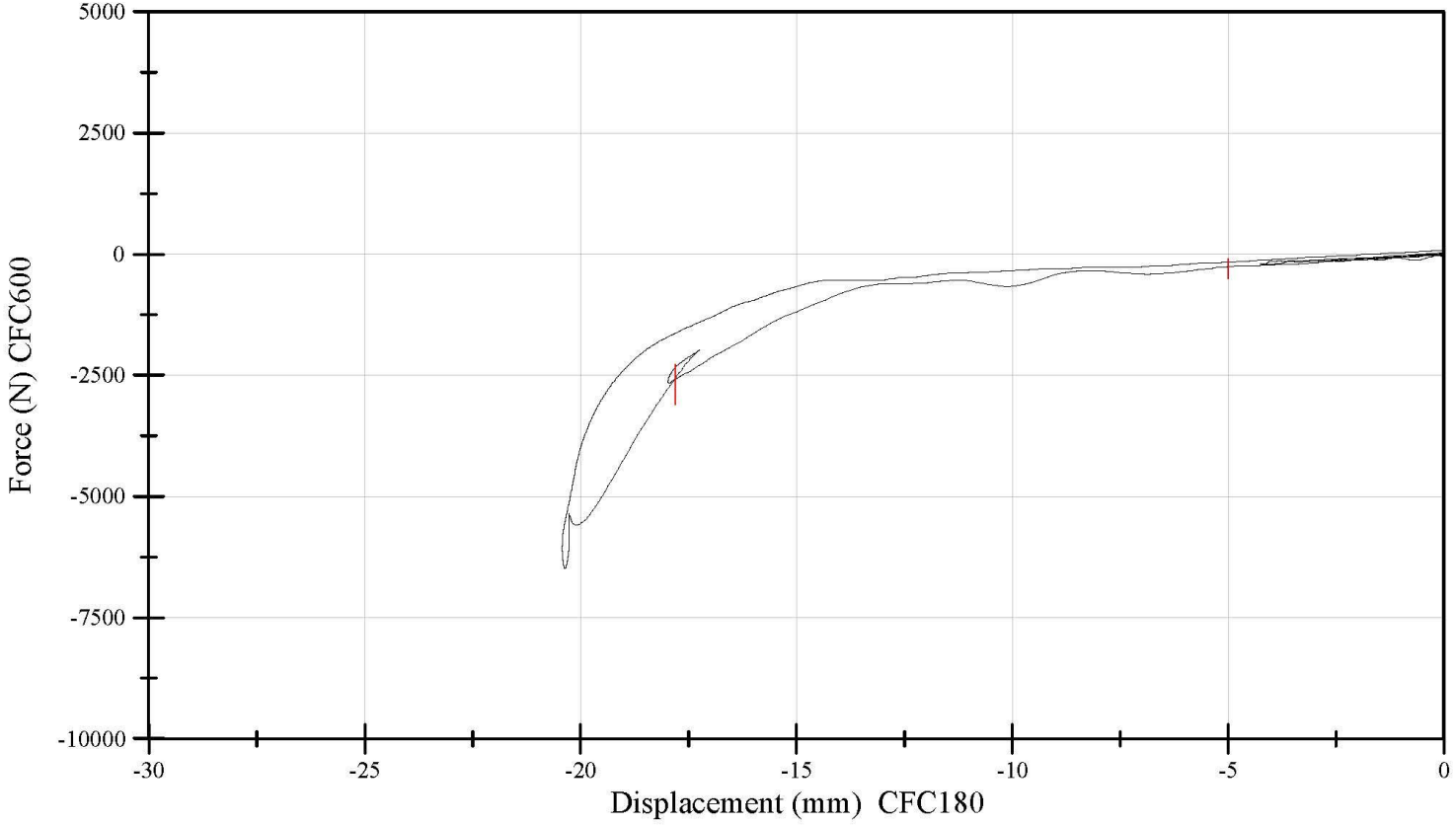


File Name: DL9207AbdomenUpper072314_all_DIAdemHeader_BINARYpatrick
07/23/2014 11:21:18.0000

Software Version:

Test Temperature: 70.7 degrees
Relative Humidity: 45%
Test Velocity: 2.78 m/s

THOR Right Knee Certification
Femur Force vs. Knee Displacement
Serial Number: 021033

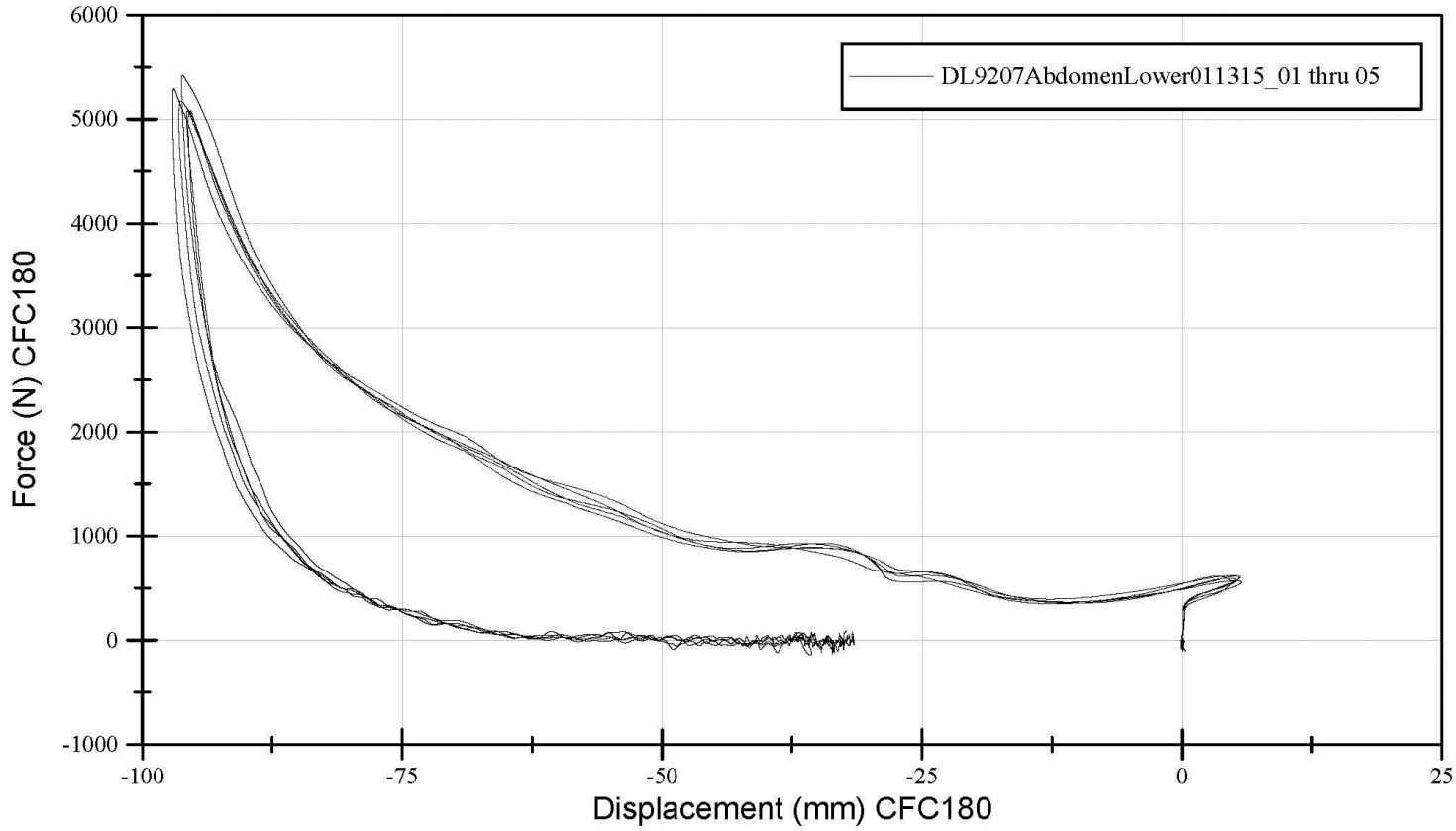


File Name: 012033 Knee1150407-03processed.dat
04/07/2015 09:51:56.0000

Software Version: 2.4

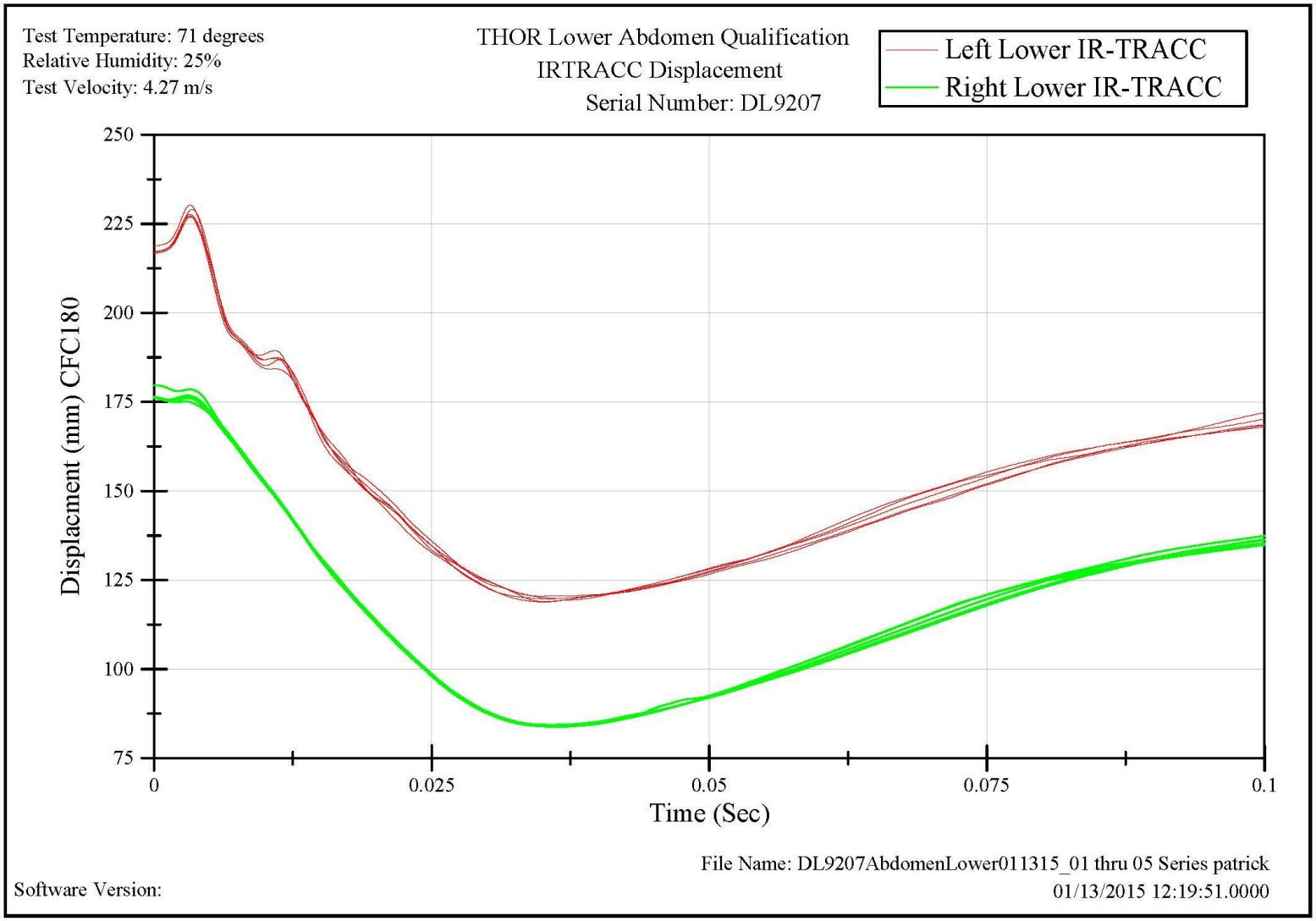
Test Temperature: 71 degrees
Relative Humidity: 25%
Test Velocity: 4.27 m/s

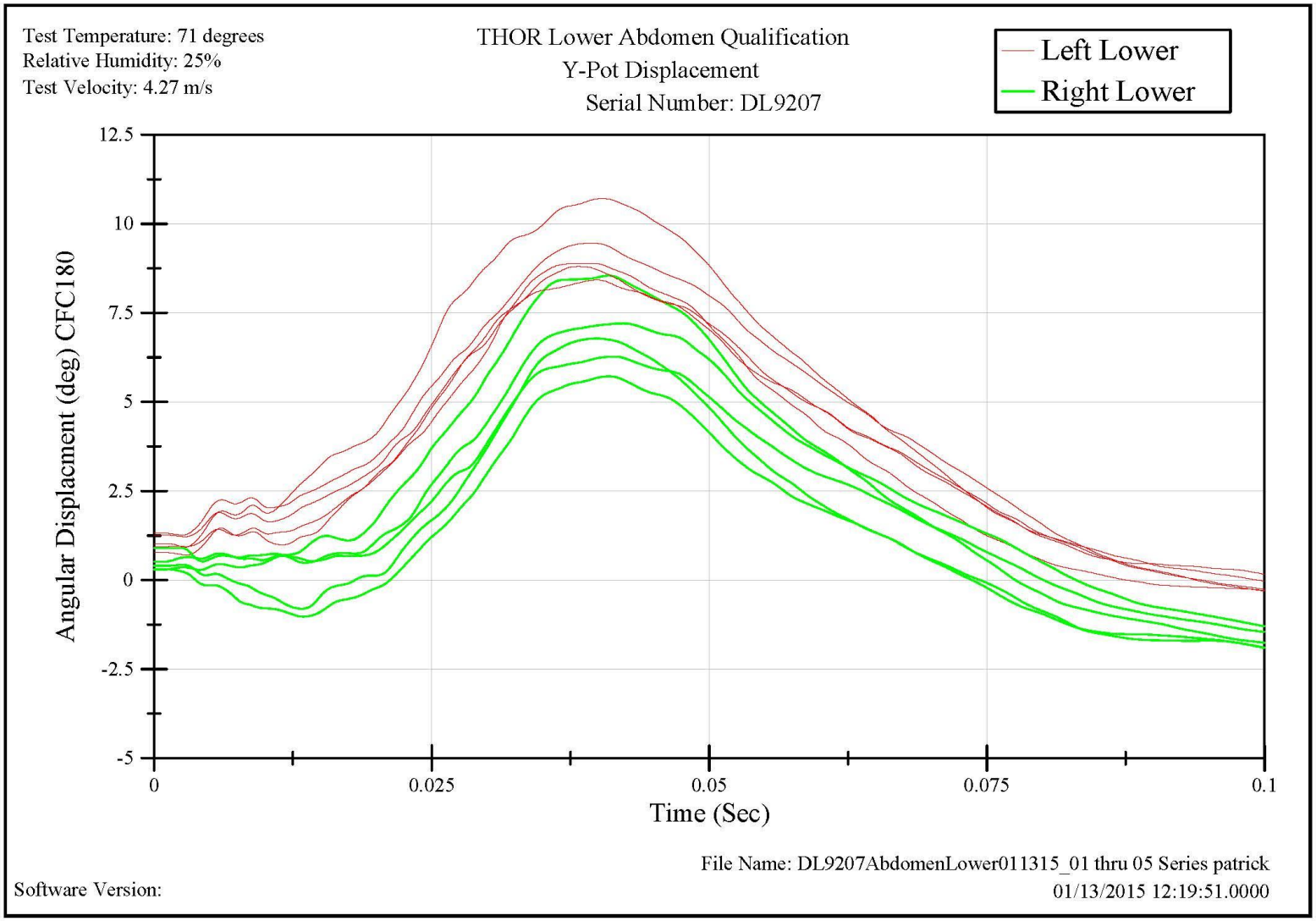
THOR Lower Abdomen Qualification
Abdomen Displacement vs. Probe Force
Serial Number: DL9207

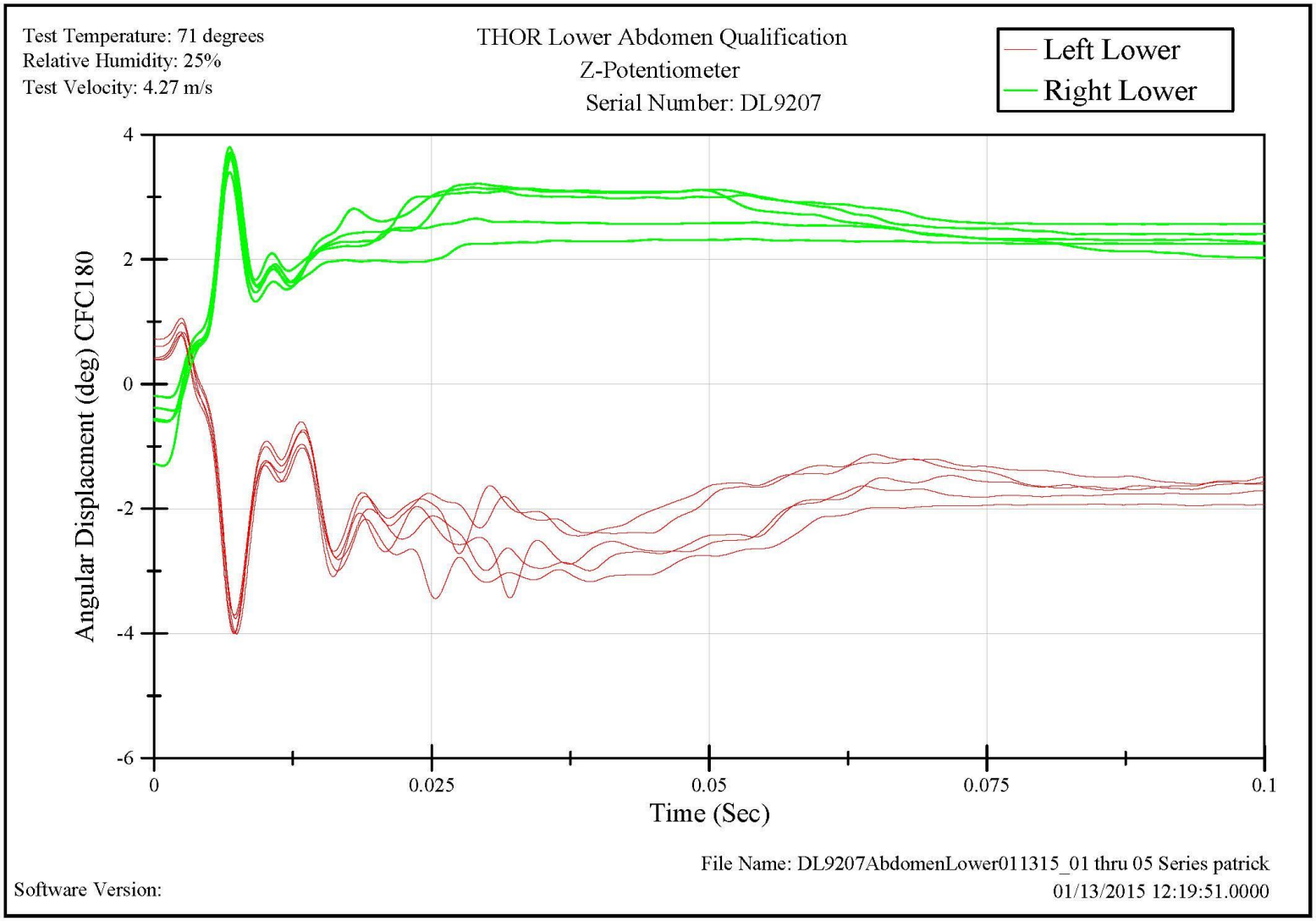


File Name: DL9207AbdomenLower011315_01 thru 05 Series patrick
01/13/2015 12:19:51.0000

Software Version:

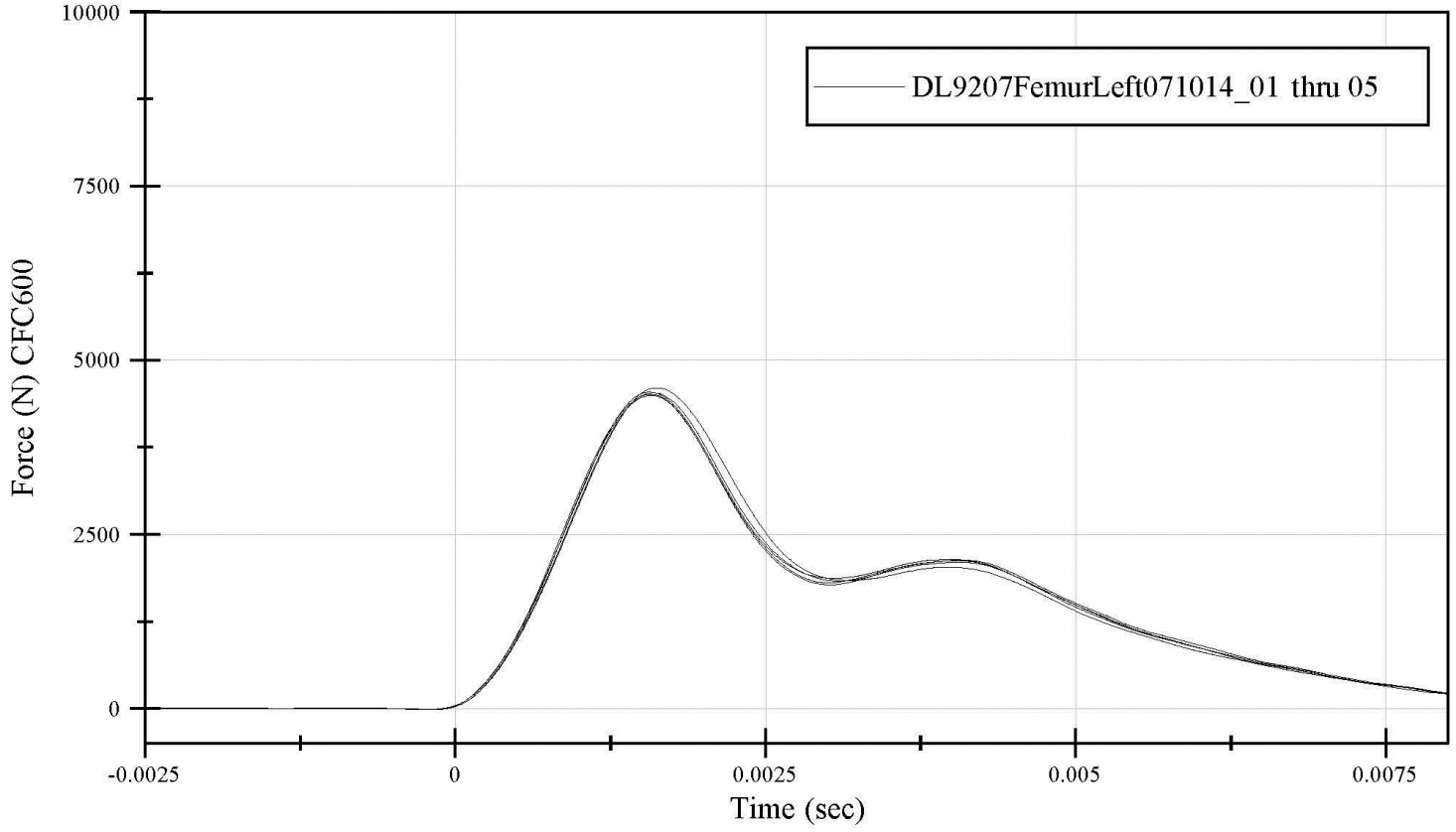

Test Temperature: 71 degrees
Relative Humidity: 25%
Test Velocity: 4.27 m/s
THOR Lower Abdomen Qualification
IRTRACC Displacement
Serial Number: DL9207
Left Lower IR-TRACC
Right Lower IR-TRACC
Displacment (mm) CFC180
250
225
200
175
150
125
100
75
0
0.025
0.05
0.075
0.1
Time (Sec)
File Name: DL9207AbdomenLower011315_01 thru 05 Series patrick
01/13/2015 12:19:51.0000
Software Version:


Test Temperature: 71 degrees
Relative Humidity: 25%
Test Velocity: 4.27 m/s
THOR Lower Abdomen Qualification
Y-Pot Displacement
Serial Number: DL9207
Left Lower
Right Lower
Angular Displacment (deg) CFC180
12.5
10
7.5
5
2.5
0
-2.5
-5
0
0.025
0.05
0.075
0.1
Time (Sec)
File Name: DL9207AbdomenLower011315_01 thru 05 Series patrick
01/13/2015 12:19:51.0000
Software Version:


Test Temperature: 71 degrees
Relative Humidity: 25%
Test Velocity: 4.27 m/s
THOR Lower Abdomen Qualification
Z-Potentiometer
Serial Number: DL9207
Left Lower
Right Lower
Angular Displacment (deg) CFC180
4
2
0
-2
-4
-6
0
0.025
0.05
0.075
0.1
Time (Sec)
File Name: DL9207AbdomenLower011315_01 thru 05 Series patrick
01/13/2015 12:19:51.0000
Software Version:

Test Temperature: 71 degrees
Relative Humidity: 49%
Test Velocity: 2.58 m/s

THOR Left Femur Qualification
Probe Force
Serial Number: DL9207

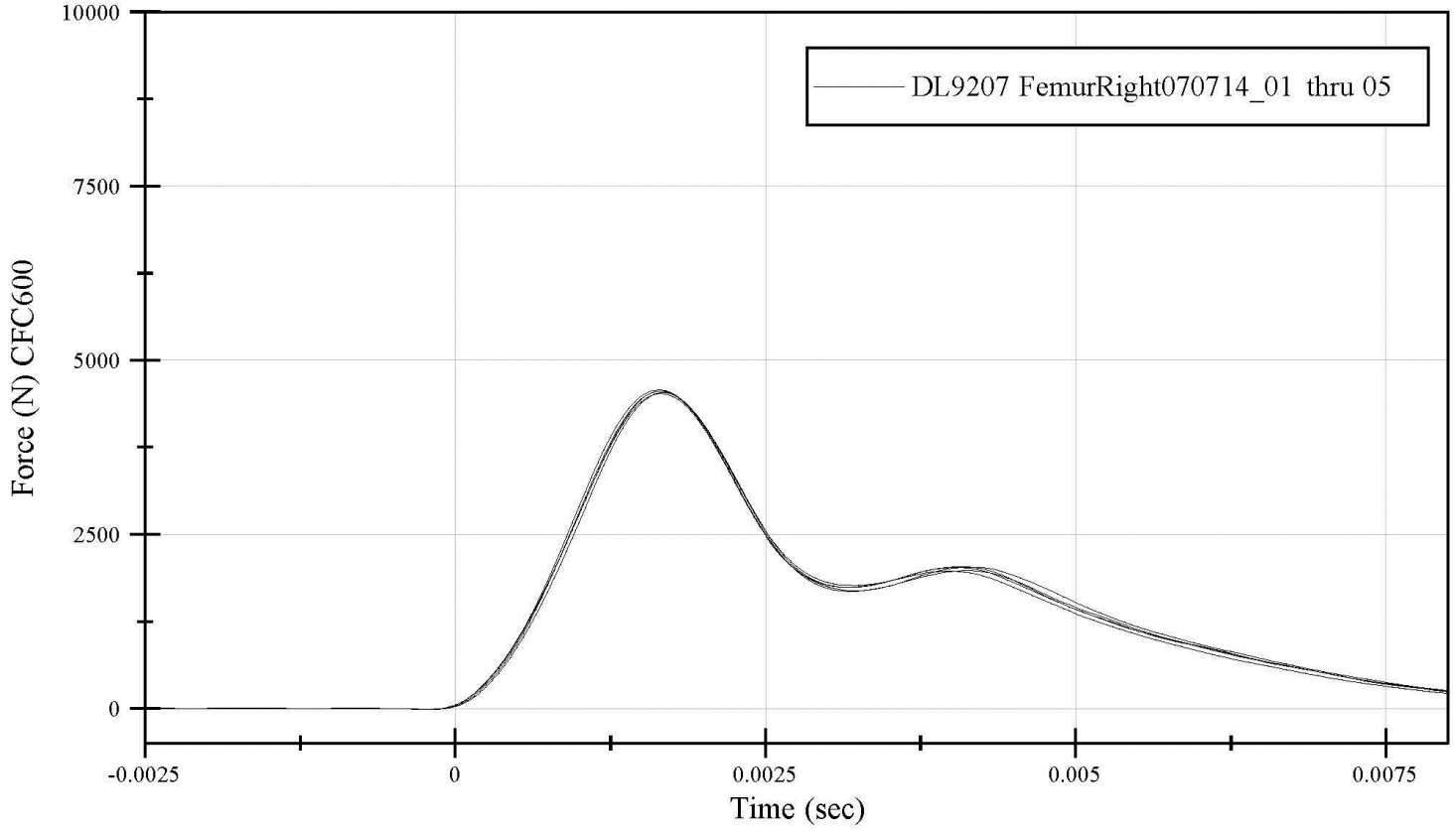


File Name: DL9207 Femur Left 070814_01 thru 05 Series
07/09/2014 09:10:57.0000

Software Version:

Test Temperature: 71 degrees
Relative Humidity: 49%
Test Velocity: 2.58 m/s

THOR Right Femur Qualification
Probe Force
Serial Number: DL9207

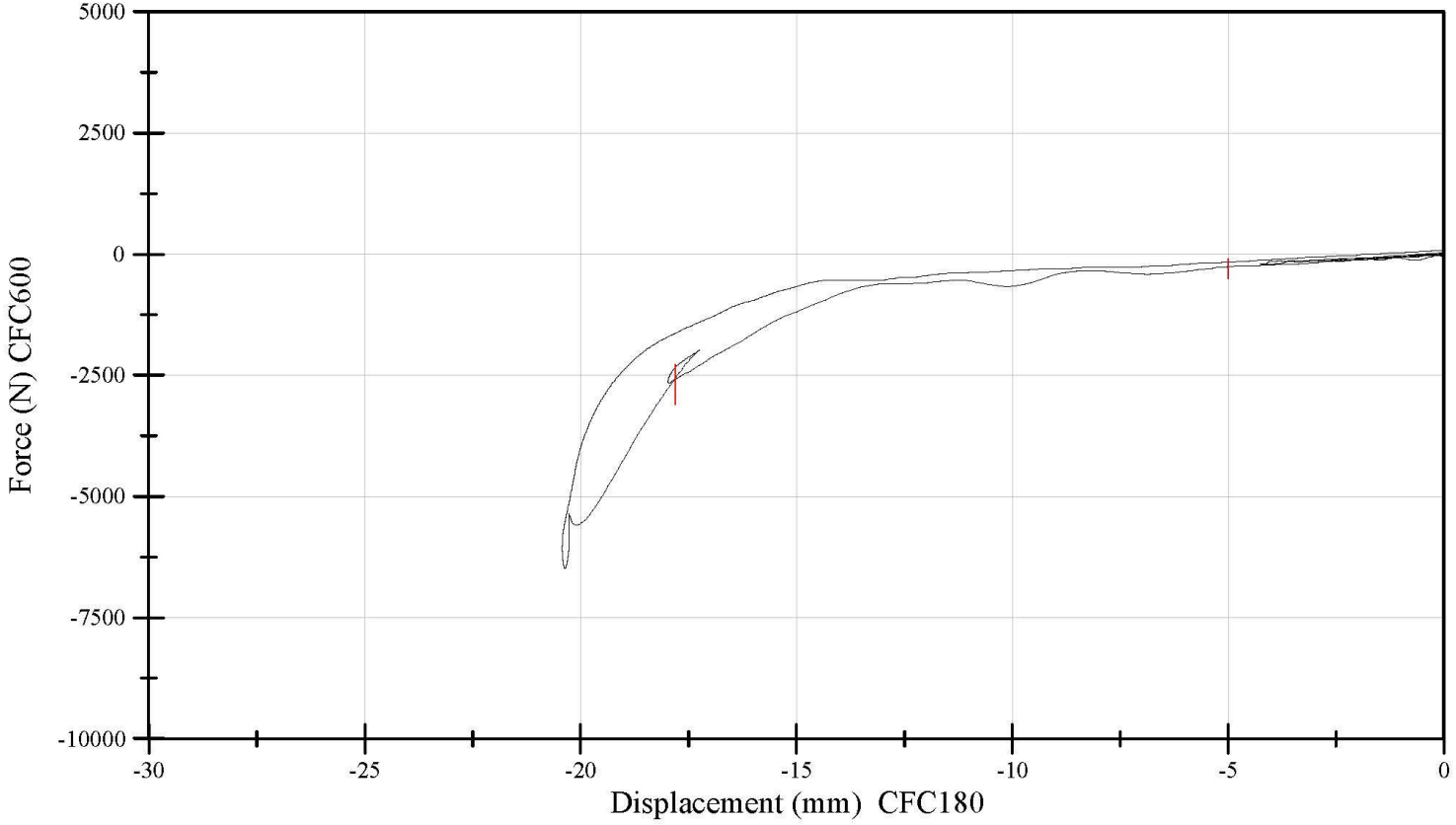


File Name: DL9207 Femur Right 070714_01 thru 05 Series
07/09/2014 09:12:34.0000

Software Version:

Test Temperature: 70.7 degrees
Relative Humidity: 45%
Test Velocity: 2.78 m/s

THOR Right Knee Certification
Femur Force vs. Knee Displacement
Serial Number: 021033



File Name: 012033 Knee1150407-03processed.dat
04/07/2015 09:51:56.0000

Software Version: 2.4

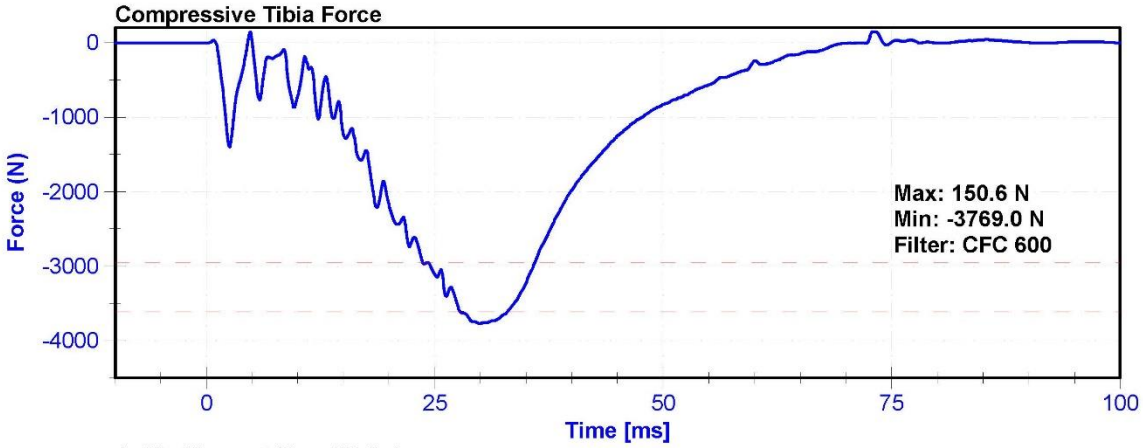
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

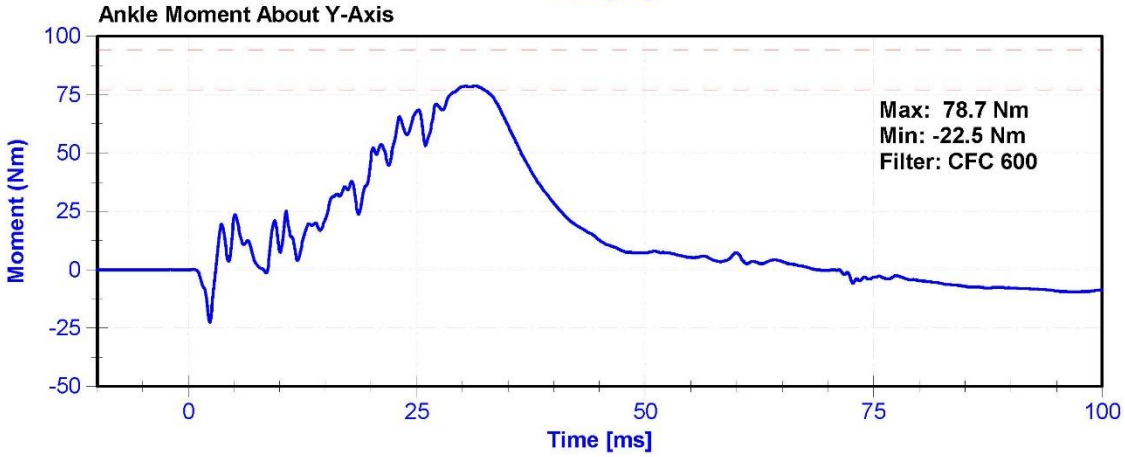
Results

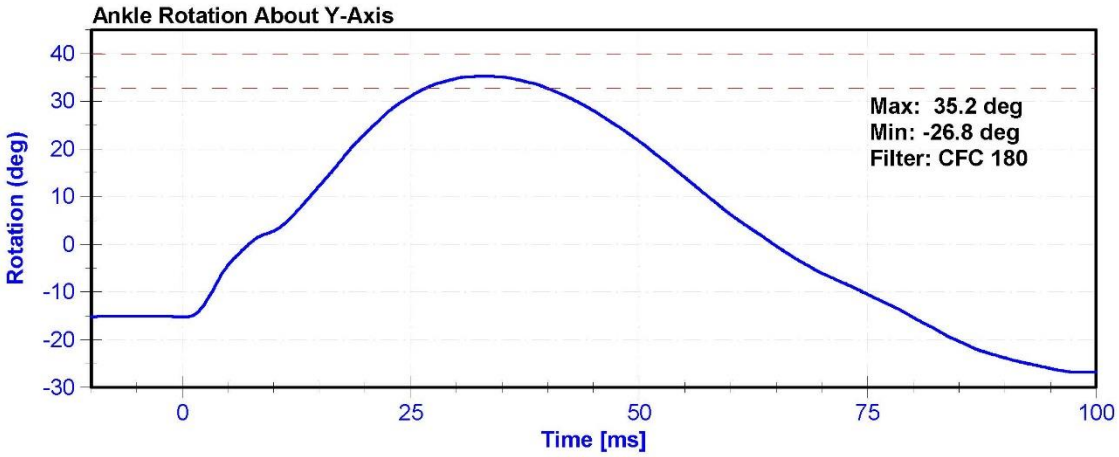
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.4	Pass
Humidity	10	70	%	64.4	Pass
Velocity	4.9	5.1	m/s	4.916	Pass
Lower Tibia Compressive Force	-3,613	-2,956	N	-3769.0	Fail
Peak Moment about Y-Axis	77.1	94.2	Nm	78.73	Pass
Peak Rotation about Y-Axis	32.7	39.9	deg	35.23	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-C15018	7/15/2015	7/14/2016
Lower Tibia Load Cell	Denton 4929J	LC-121 Fz	2/10/2015	2/10/2016
Ankle Y Potentiometer	Contelec PD210-4B	DS-0524	2/18/2015	2/18/2016


Compressive Tibia Force
Force (N)
0
-1000
-2000
-3000
-4000
Max: 150.6 N
Min: -3769.0 N
Filter: CFC 600
0
25
50
75
100
Time [ms]


Ankle Moment About Y-Axis
Moment (Nm)
100
75
50
25
0
-25
-50
Max: 78.7 Nm
Min: -22.5 Nm
Filter: CFC 600
0
25
50
75
100
Time [ms]


Ankle Rotation About Y-Axis
Rotation (deg)
40
30
20
10
0
-10
-20
-30
Max: 35.2 deg
Min: -26.8 deg
Filter: CFC 180
0
25
50
75
100
Time [ms]

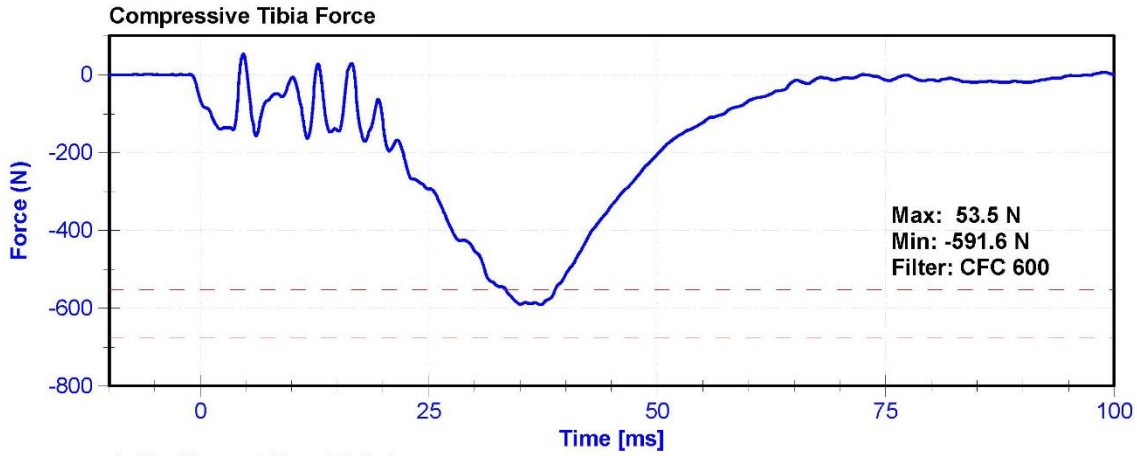
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

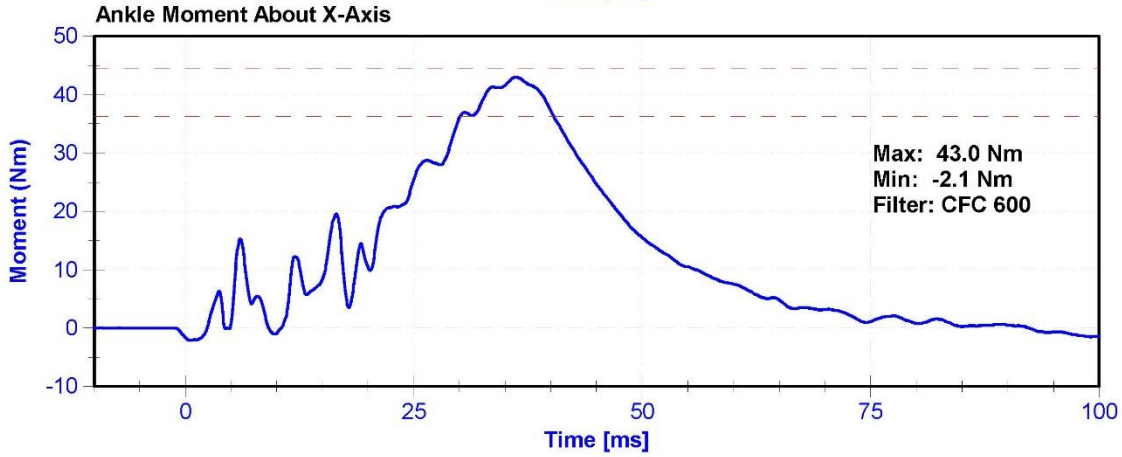
Results

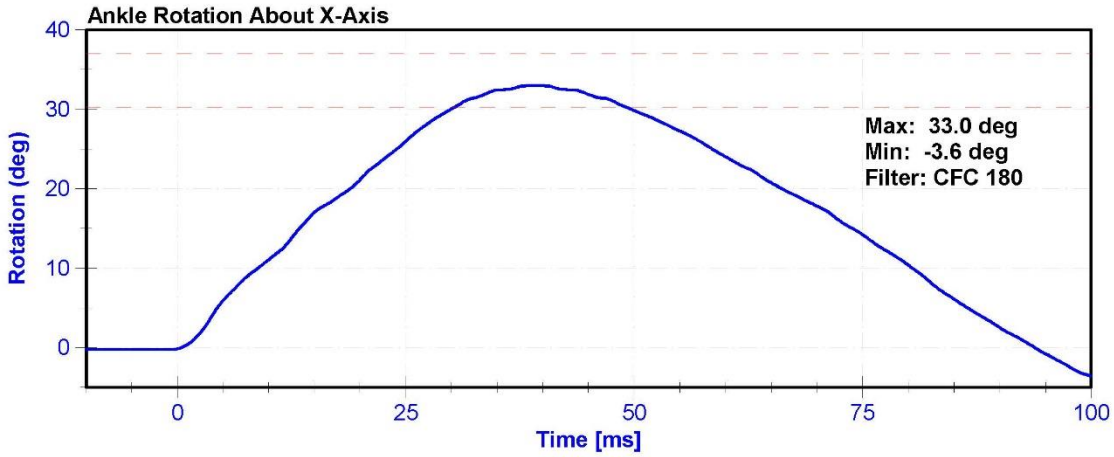
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.1	Pass
Humidity	10	70	%	58.4	Pass
Velocity	1.9	2.1	m/s	2.016	Pass
Lower Tibia Compressive Force	-675	-552	N	-591.6	Pass
Peak Moment about X-Axis	36.3	44.4	Nm	42.99	Pass
Peak Rotation about X-Axis	30.3	37.0	deg	32.97	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-C15018	7/15/2015	7/14/2016
Lower Tibia Load Cell	Denton 4929J	LC-121 Fz	2/10/2015	2/10/2016
Ankle Y Potentiometer	Contelec PD210-4B	DS-0525	2/18/2015	2/18/2016


Compressive Tibia Force
Force (N)
0
-200
-400
-600
-800
0
25
50
75
100
Time [ms]
Max: 53.5 N
Min: -591.6 N
Filter: CFC 600


Ankle Moment About X-Axis
Moment (Nm)
50
40
30
20
10
0
-10
0
25
50
75
100
Time [ms]
Max: 43.0 Nm
Min: -2.1 Nm
Filter: CFC 600


Ankle Rotation About X-Axis
Rotation (deg)
40
30
20
10
0
0
25
50
75
100
Time [ms]
Max: 33.0 deg
Min: -3.6 deg
Filter: CFC 180

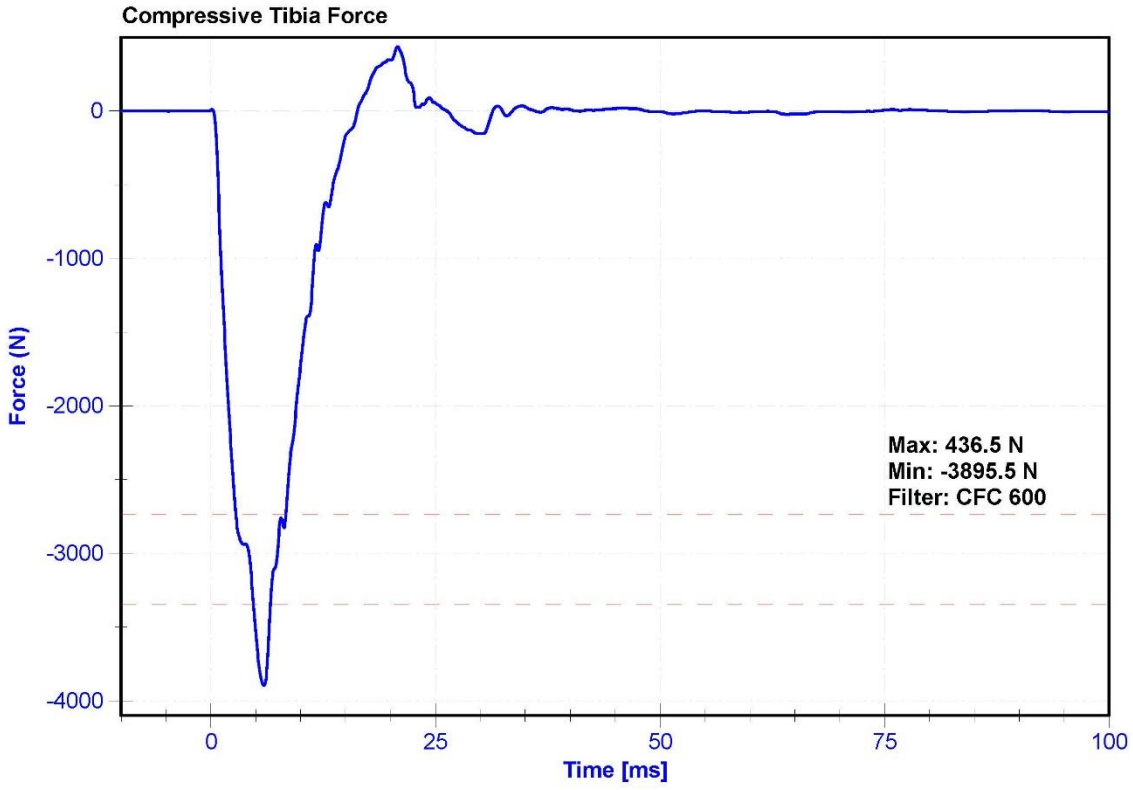
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.3	Pass
Humidity	10	70	%	65.3	Pass
Velocity	3.9	4.1	m/s	3.908	Pass
Lower Tibia Compressive Force	2,738	3,346	N	-3895.5	Fail

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-C15018	7/15/2015	7/14/2016
Lower Tibia Load Cell	Denton 4929J	LC-121 Fz	2/10/2015	2/10/2016



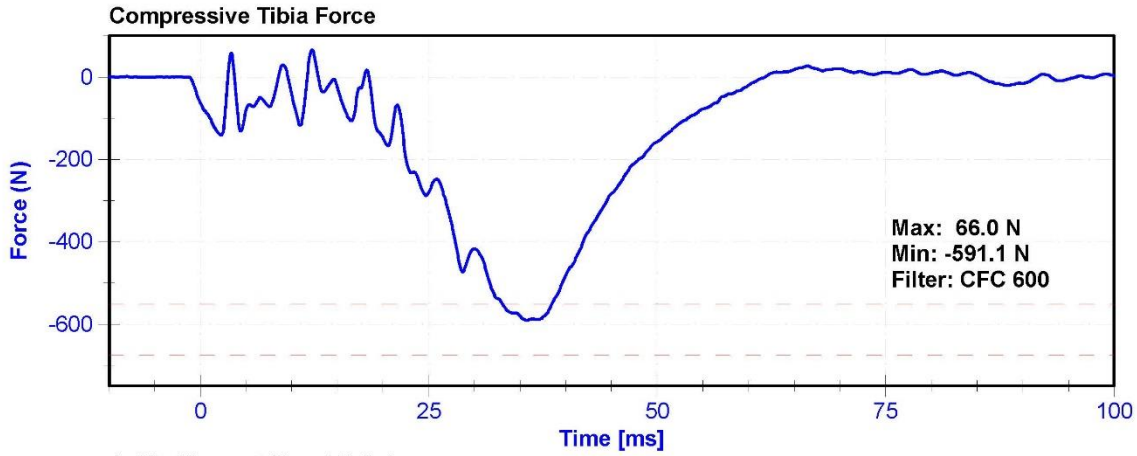
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

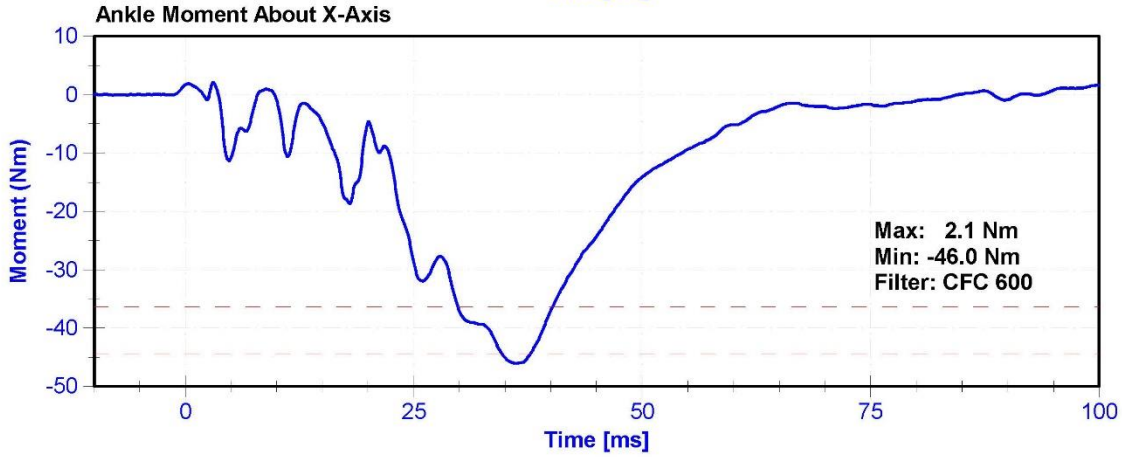
Results

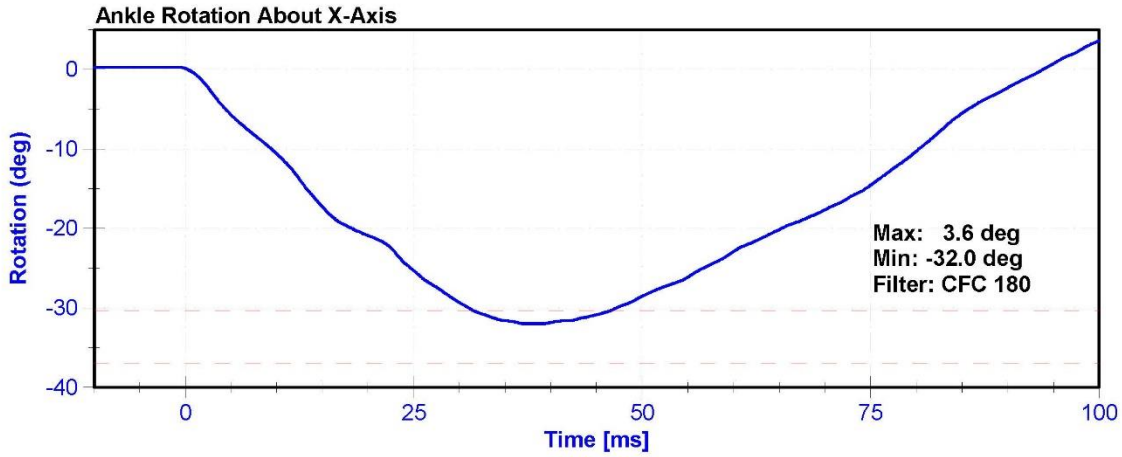
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.3	Pass
Humidity	10	70	%	58.3	Pass
Velocity	1.9	2.1	m/s	1.939	Pass
Lower Tibia Compressive Force	-675	-552	N	-591.1	Pass
Peak Moment about X-Axis	-44.4	-36.3	Nm	-46.02	Fail
Peak Rotation about X-Axis	-37.0	-30.3	deg	-32.01	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-C15018	7/15/2015	7/14/2016
Lower Tibia Load Cell	Denton 4929J	LC-121 Fz	2/10/2015	2/10/2016
Ankle Y Potentiometer	Contelec PD210-4B	DS-0525	2/18/2015	2/18/2016


Compressive Tibia Force
Force (N)
0
-200
-400
-600
0
25
50
75
100
Time [ms]
Max: 66.0 N
Min: -591.1 N
Filter: CFC 600


Ankle Moment About X-Axis
Moment (Nm)
10
0
-10
-20
-30
-40
-50
0
25
50
75
100
Time [ms]
Max: 2.1 Nm
Min: -46.0 Nm
Filter: CFC 600


Ankle Rotation About X-Axis
Rotation (deg)
0
-10
-20
-30
-40
0
25
50
75
100
Time [ms]
Max: 3.6 deg
Min: -32.0 deg
Filter: CFC 180

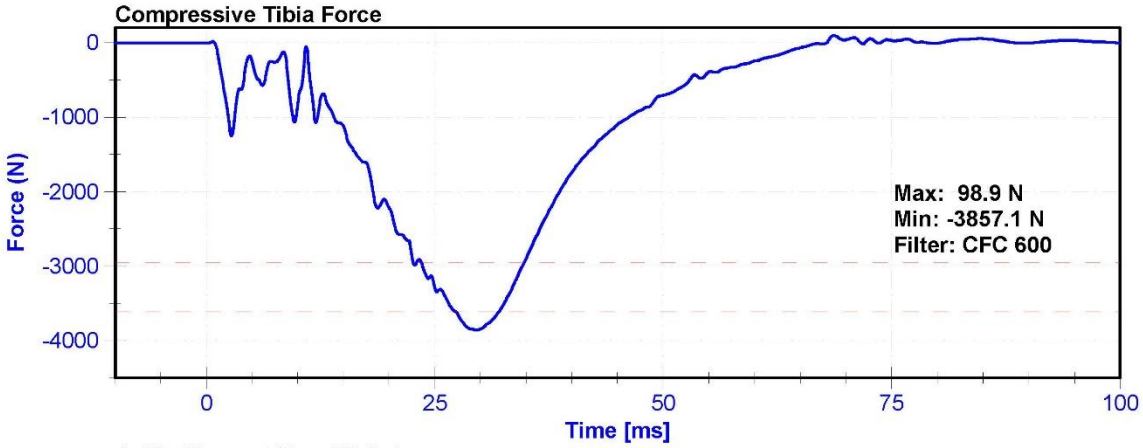
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

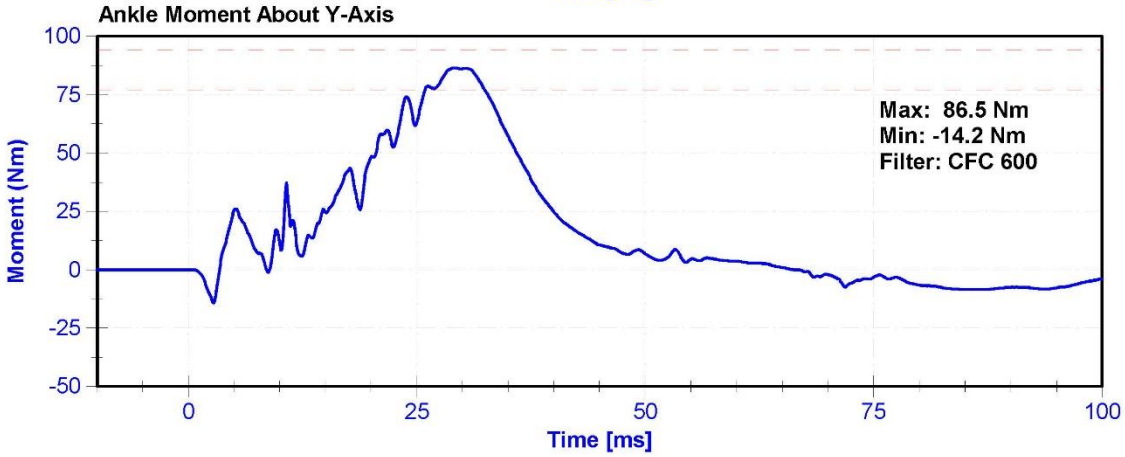
Results

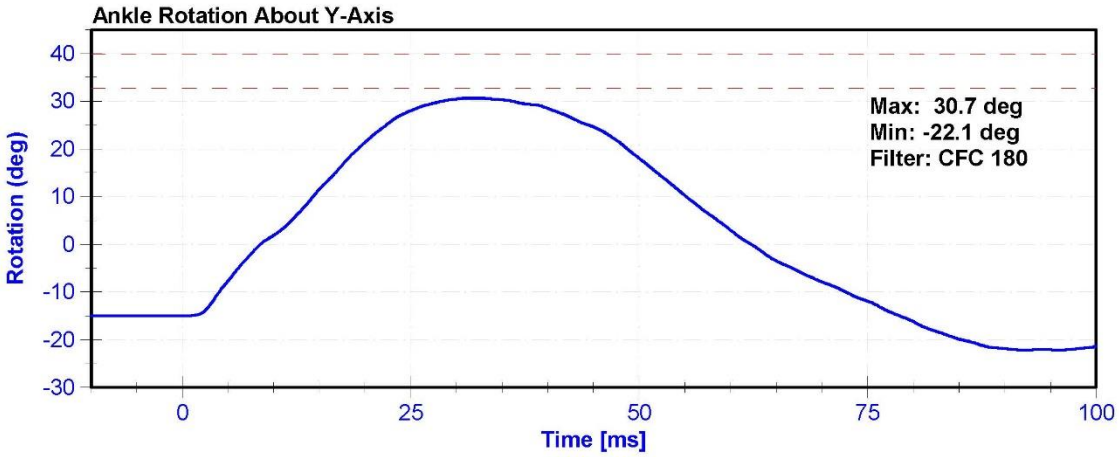
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.1	Pass
Humidity	10	70	%	53.9	Pass
Velocity	4.9	5.1	m/s	4.916	Pass
Lower Tibia Compressive Force	-3,613	-2,956	N	-3857.1	Fail
Peak Moment about Y-Axis	77.1	94.2	Nm	86.48	Pass
Peak Rotation about Y-Axis	32.7	39.9	deg	30.69	Fail

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-C15018	7/15/2015	7/14/2016
Lower Tibia Load Cell	Denton 4929J	LC-166 Fz	2/9/2015	2/9/2016
Ankle Y Potentiometer	Contelec PD210-4B	DS-0526	2/19/2015	2/19/2016


Compressive Tibia Force
Force (N)
0
-1000
-2000
-3000
-4000
0
25
50
75
100
Time [ms]
Max: 98.9 N
Min: -3857.1 N
Filter: CFC 600


Ankle Moment About Y-Axis
Moment (Nm)
100
75
50
25
0
-25
-50
0
25
50
75
100
Time [ms]
Max: 86.5 Nm
Min: -14.2 Nm
Filter: CFC 600


Ankle Rotation About Y-Axis
Rotation (deg)
40
30
20
10
0
-10
-20
-30
0
25
50
75
100
Time [ms]
Max: 30.7 deg
Min: -22.1 deg
Filter: CFC 180

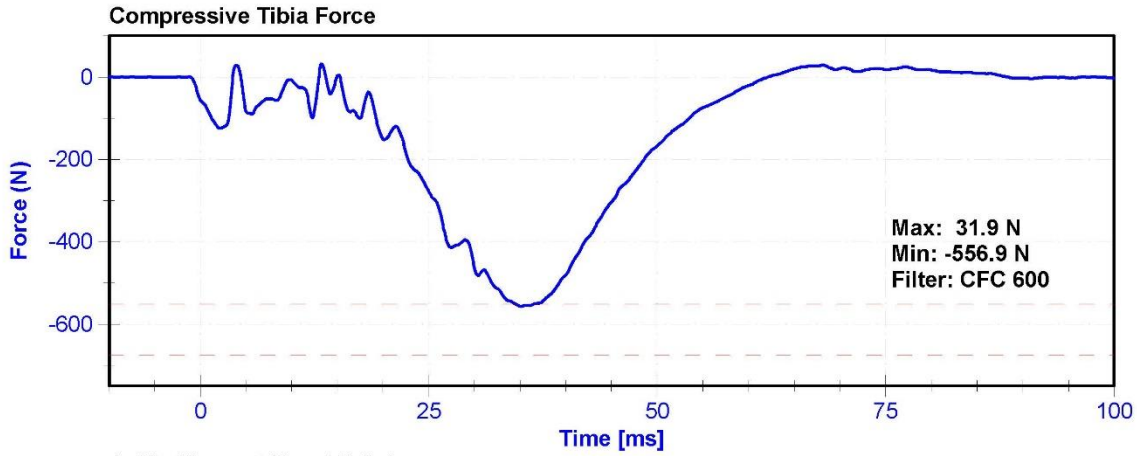
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

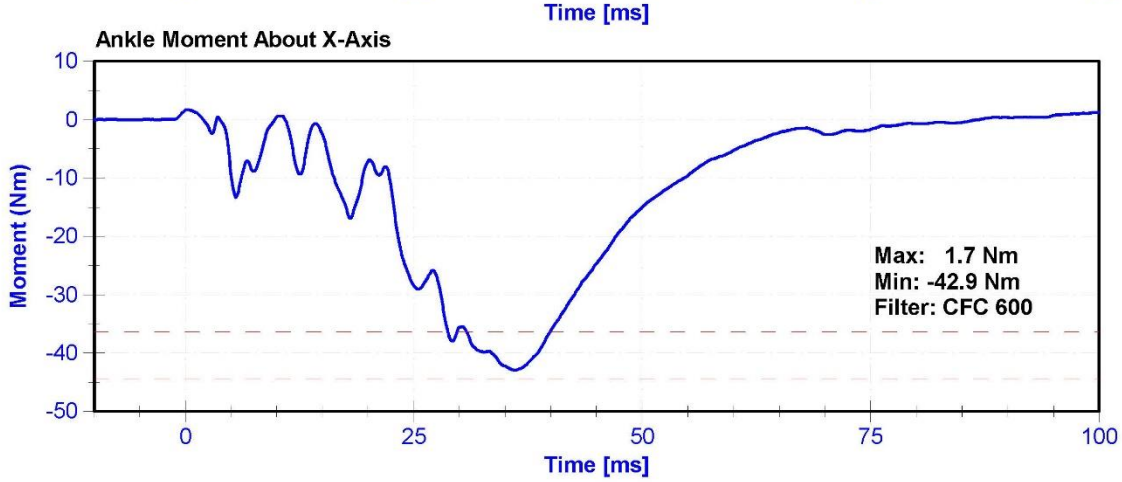
Results

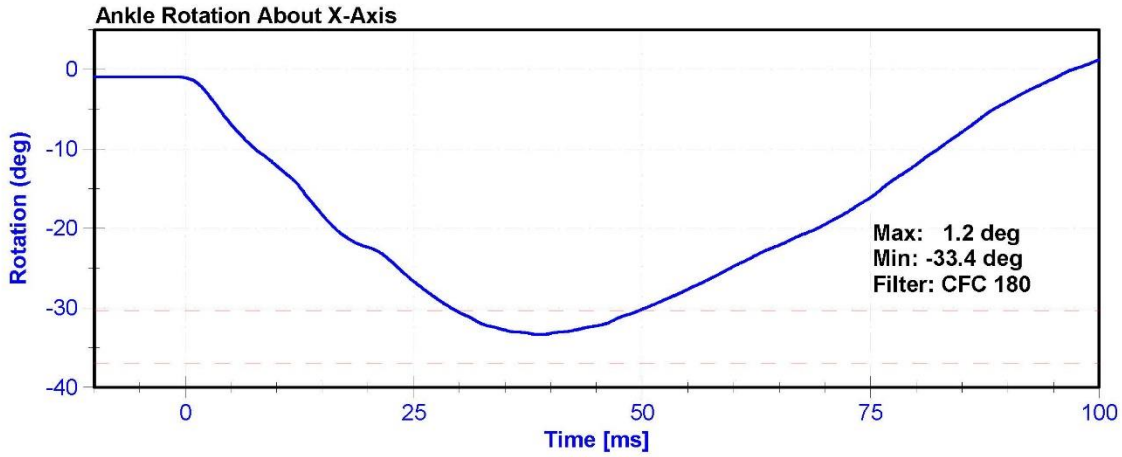
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.3	Pass
Humidity	10	70	%	60.4	Pass
Velocity	1.9	2.1	m/s	1.934	Pass
Lower Tibia Compressive Force	-675	-552	N	-556.9	Pass
Peak Moment about X-Axis	-44.4	-36.3	Nm	-42.92	Pass
Peak Rotation about X-Axis	-37.0	-30.3	deg	-33.36	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-C15018	7/15/2015	7/14/2016
Lower Tibia Load Cell	Denton 4929J	LC-166 Fz	2/9/2015	2/9/2016
Ankle Y Potentiometer	Contelec PD210-4B	DS-0528	2/19/2015	2/19/2016


Compressive Tibia Force
Force (N)
0
-200
-400
-600
0
25
50
75
100
Time [ms]
Max: 31.9 N
Min: -556.9 N
Filter: CFC 600


Ankle Moment About X-Axis
Moment (Nm)
10
0
-10
-20
-30
-40
-50
0
25
50
75
100
Time [ms]
Max: 1.7 Nm
Min: -42.9 Nm
Filter: CFC 600


Ankle Rotation About X-Axis
Rotation (deg)
0
-10
-20
-30
-40
0
25
50
75
100
Time [ms]
Max: 1.2 deg
Min: -33.4 deg
Filter: CFC 180

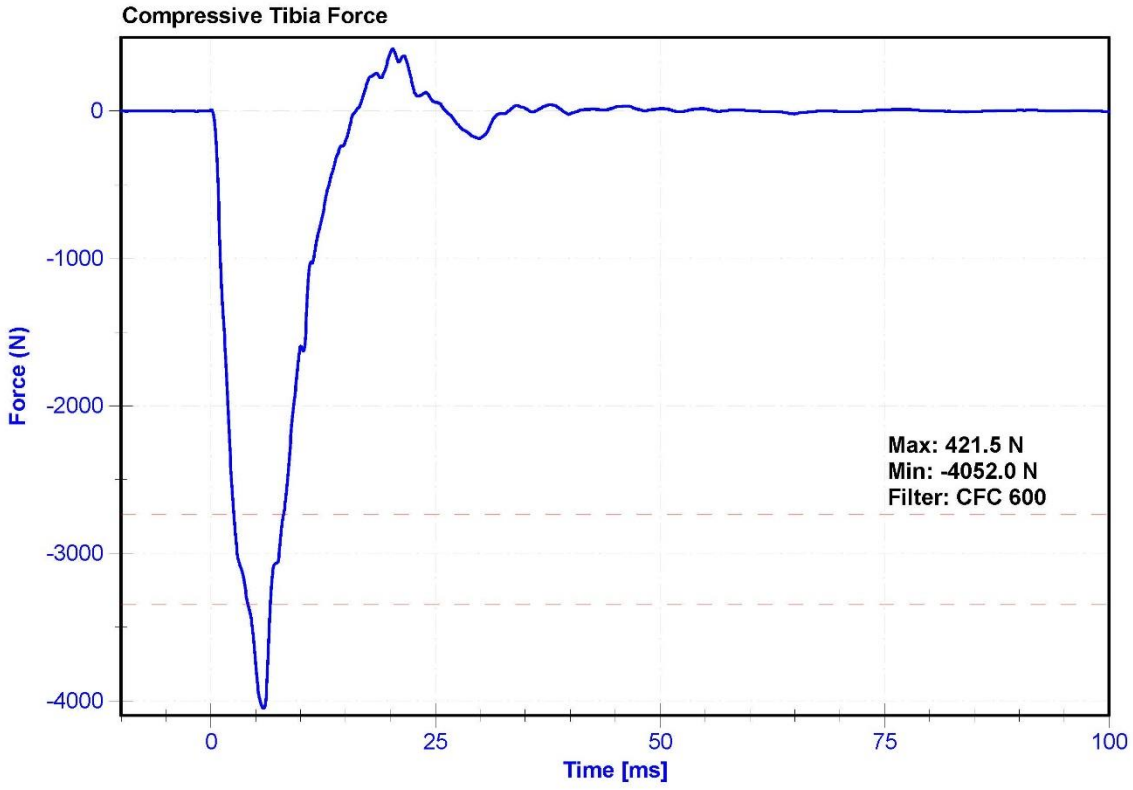
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.1	Pass
Humidity	10	70	%	55.2	Pass
Velocity	3.9	4.1	m/s	3.948	Pass
Lower Tibia Compressive Force	2,738	3,346	N	-4052.0	Fail

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-C15018	7/15/2015	7/14/2016
Lower Tibia Load Cell	Denton 4929J	LC-166 Fz	2/9/2015	2/9/2016



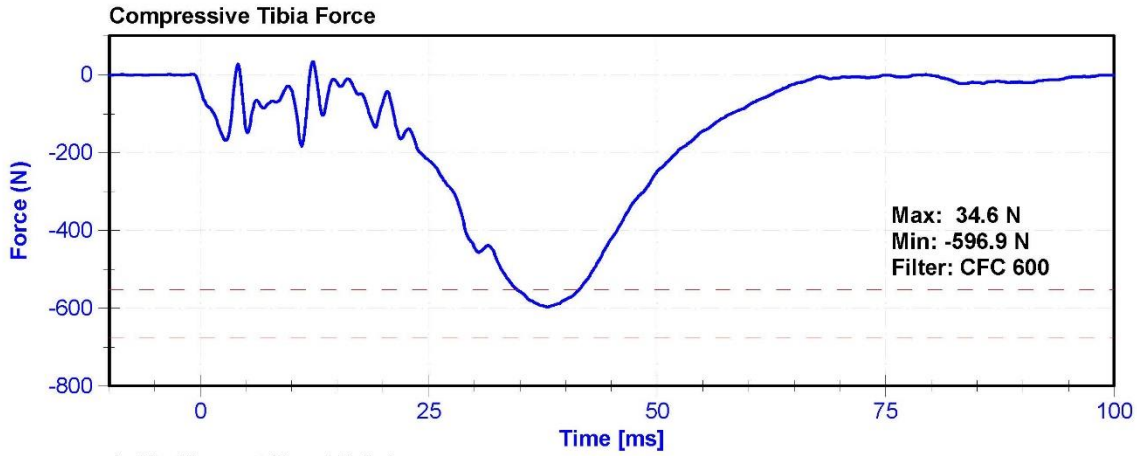
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

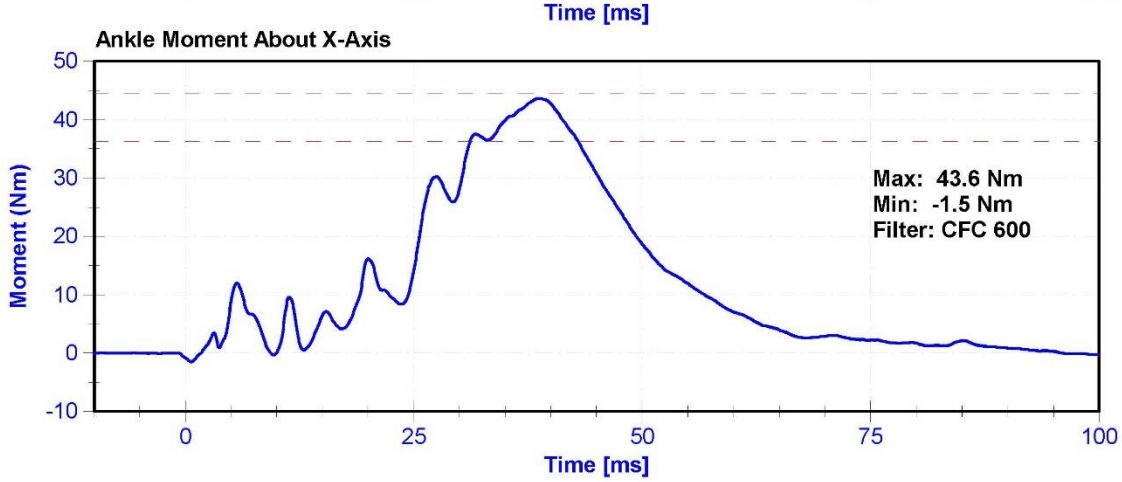
Results

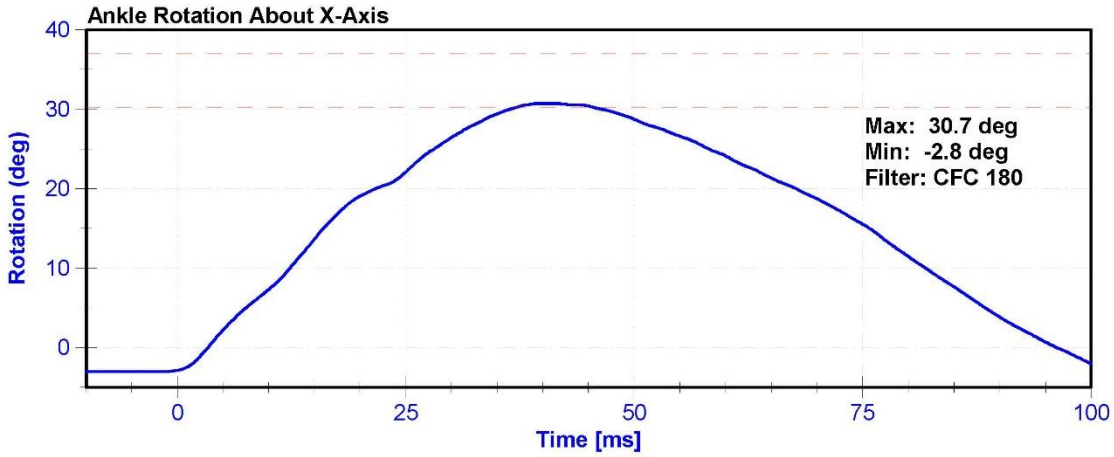
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.1	Pass
Humidity	10	70	%	58.2	Pass
Velocity	1.9	2.1	m/s	1.934	Pass
Lower Tibia Compressive Force	-675	-552	N	-596.9	Pass
Peak Moment about X-Axis	36.3	44.4	Nm	43.63	Pass
Peak Rotation about X-Axis	30.3	37.0	deg	30.72	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-C15018	7/15/2015	7/14/2016
Lower Tibia Load Cell	Denton 4929J	LC-166 Fz	2/9/2015	2/9/2016
Ankle Y Potentiometer	Contelec PD210-4B	DS-0528	2/19/2015	2/19/2016


Compressive Tibia Force
Force (N)
0
-200
-400
-600
-800
0
25
50
75
100
Time [ms]
Max: 34.6 N
Min: -596.9 N
Filter: CFC 600


Ankle Moment About X-Axis
Moment (Nm)
50
40
30
20
10
0
-10
0
25
50
75
100
Time [ms]
Max: 43.6 Nm
Min: -1.5 Nm
Filter: CFC 600

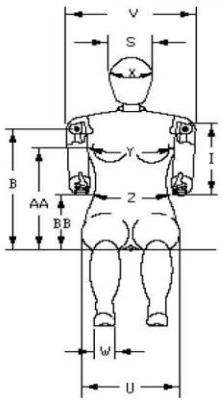

Ankle Rotation About X-Axis
Rotation (deg)
40
30
20
10
0
0
25
50
75
100
Time [ms]
Max: 30.7 deg
Min: -2.8 deg
Filter: CFC 180

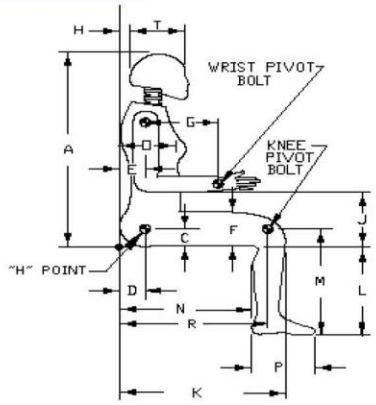
Hybrid III 5th Female 019 DUMMY CALIBRATIONS

External Measurements - Hybrid 3 - 5th Female

Technician: M. Geesey Date: 8/14/2015

Dummy Serial Number: 19





Symbol	Description	Specification (mm)		Result (mm)	Pass/Fail
A	Sitting Height	775	800	776	Pass
B	Shoulder Pivot Height	432	457	445	Pass
C	H-Point Height	81	86	83	Pass
D	H-Point from Backline	145	150	146	Pass
E	Shoulder Pivot from Backline	69	84	76	Pass
F	Thigh Clearance	119	135	130	Pass
G	Back of Elbow to Wrist Pivot	244	259	248	Pass
H	Head Back to Backline	43	48	45	Pass
I	Shoulder to Elbow Length	277	297	281	Pass
J	Elbow Rest Height	183	203	186	Pass
K	Buttock to Knee Length	521	546	535	Pass
L	Popliteal Height	356	376	360	Pass
M	Knee Pivot Height	394	419	401	Pass
N	Buttock Popliteal Length	414	439	429	Pass
O	Chest Depth without Jacket	175	191	182	Pass
P	Foot Length (right)	219	234	225	Pass
R	Buttock To Knee Pivot Length	457	483	478	Pass
S	Head Breadth	137	437	141	Pass
T	Head Depth	178	188	182	Pass
U	Hip Breadth	300	315	308	Pass
V	Shoulder Breadth	351	366	358	Pass
W	Foot Breadth	79	94	85	Pass
X	Head Circumference	528	549	533	Pass
Y	Chest Circumference with Jacket	851	881	869	Pass
Z	Waist Circumference	460	790	771	Pass
AA	Reference Location (Chest Circumference)	333	358	340	Pass
BB	Reference Location (Waist Circumference)	160	170	165	Pass

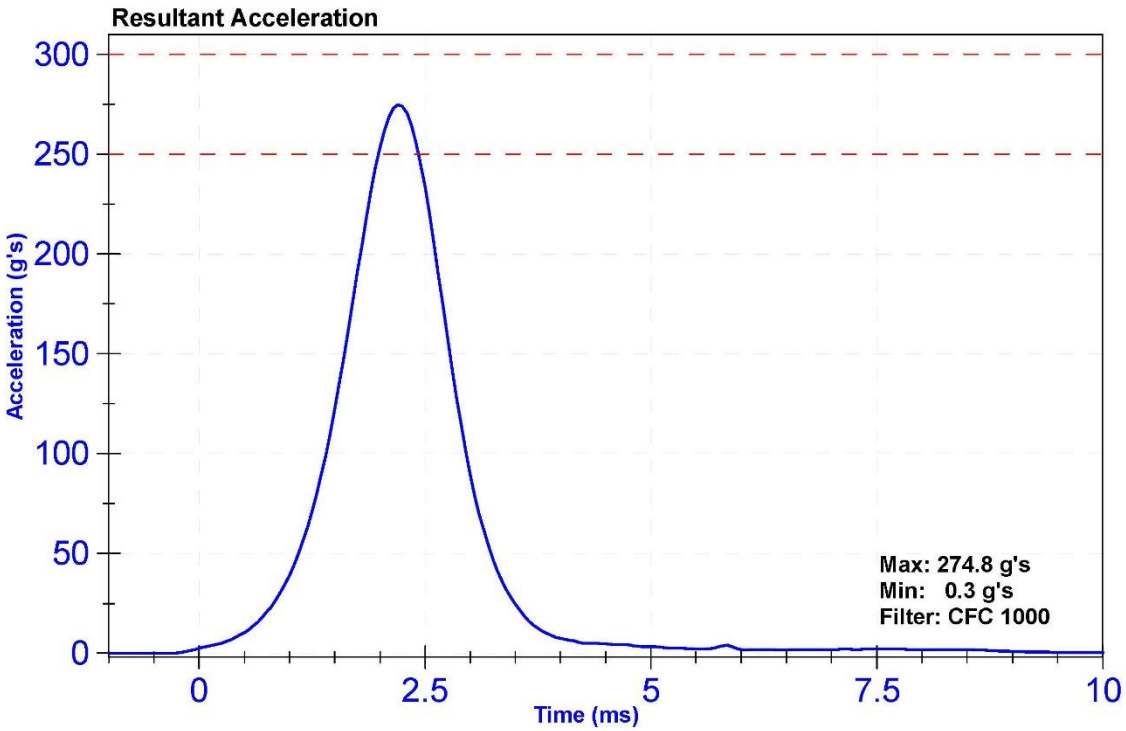
ATD Manufacturer	ASTC	Test Technician	M.Hartung
ATD Serial Number	019	Laboratory Supervisor	M.Goehle

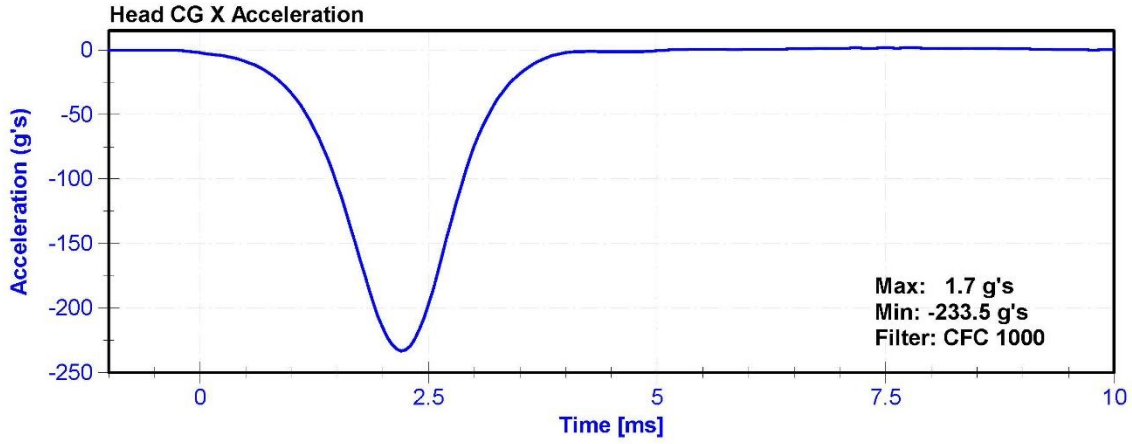
Results

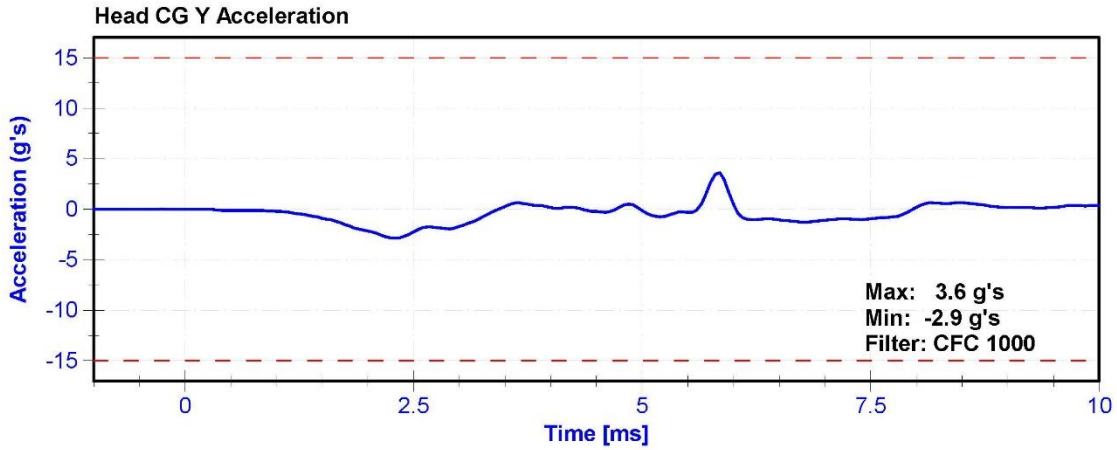
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	20.9	Pass
Humidity	10	70	%	66.5	Pass
Resultant Acceleration	250	300	g's	274.8	Pass
Oscillation	0	10	%	1.8	Pass
Lateral Acceleration	-15	15	g's	3.6	Pass

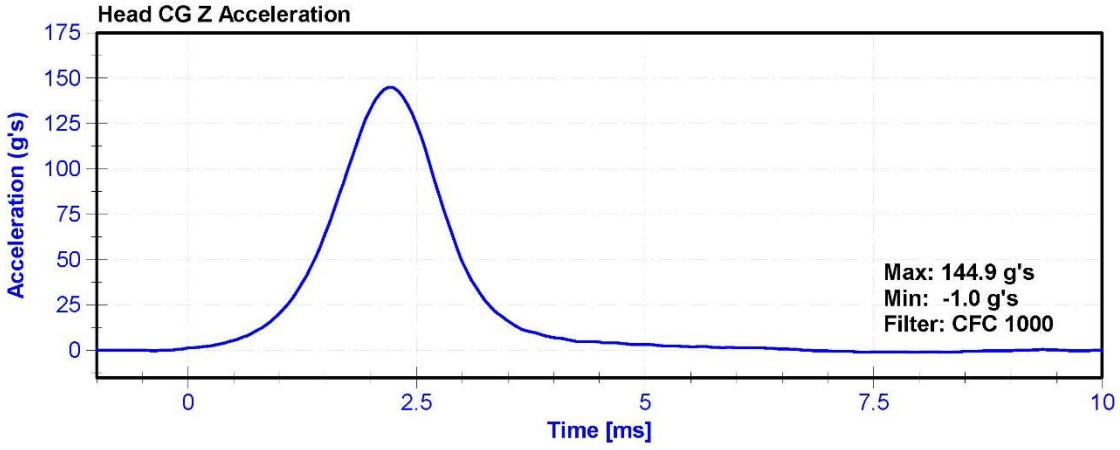
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
X Accelerometer	Endevco 7264	AC-P78168	6/26/2015	6/25/2016
Y Accelerometer	Endevco 7264	AC-P82323	6/26/2015	6/25/2016
Z Accelerometer	Endevco 7264	AC-P58727	6/26/2015	6/25/2016




Head CG X Acceleration
Acceleration (g's)
0
-50
-100
-150
-200
-250
0
2.5
5
7.5
10
Time [ms]
Max: 1.7 g's
Min: -233.5 g's
Filter: CFC 1000


Head CG Y Acceleration
Acceleration (g's)
15
10
5
0
-5
-10
-15
0
2.5
5
7.5
10
Time [ms]
Max: 3.6 g's
Min: -2.9 g's
Filter: CFC 1000


Head CG Z Acceleration
Acceleration (g's)
175
150
125
100
75
50
25
0
0
2.5
5
7.5
10
Time [ms]
Max: 144.9 g's
Min: -1.0 g's
Filter: CFC 1000

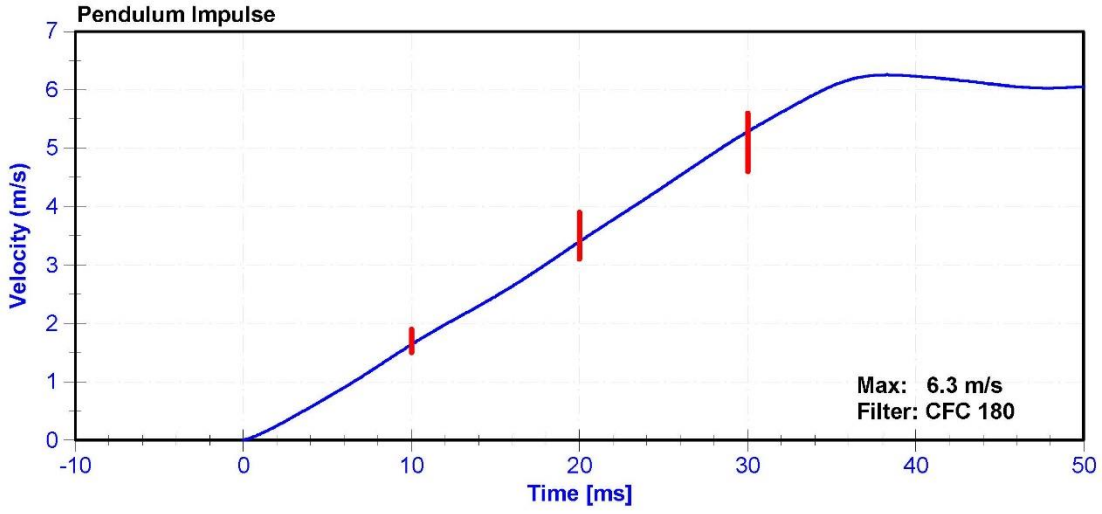
ATD Manufacturer	ASTC	Test Technician	M.Hartung
ATD Serial Number	019	Laboratory Supervisor	M.Goehle

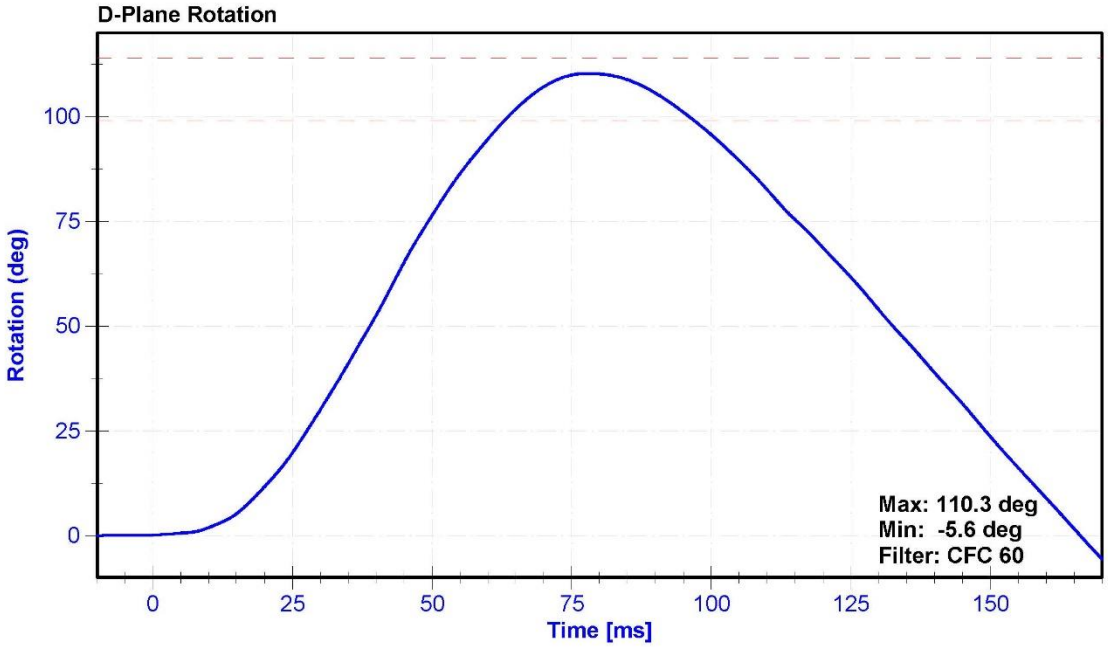
Results

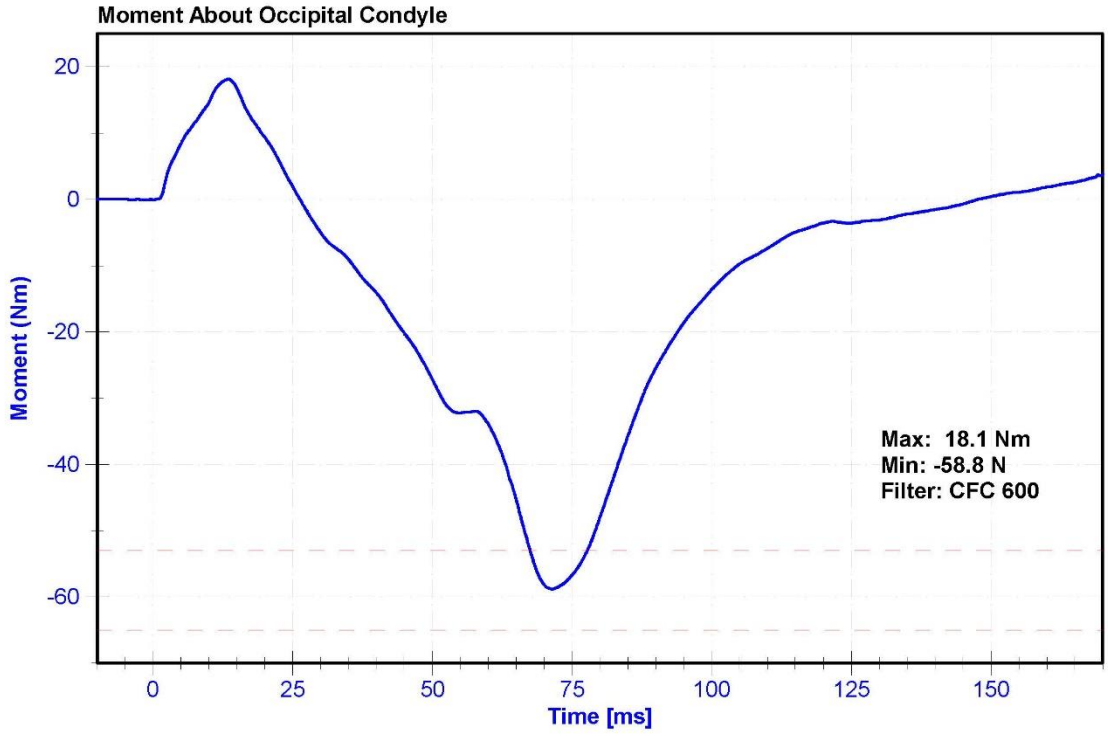
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.8	Pass
Humidity	10	70	%	61.2	Pass
Velocity	5.95	6.19	m/s	6.025	Pass
Pendulum Impulse at 10ms	1.5	1.9	m/s	1.64	Pass
Pendulum Impulse at 20ms	3.1	3.9	m/s	3.40	Pass
Pendulum Impulse at 30ms	4.6	5.6	m/s	5.28	Pass
D Plane Rotation	99	114	deg	110.3	Pass
Moment During Rotation Interval	-65	-53	Nm	-58.8	Pass
Moment Decay to -10Nm	94	114	ms	104.6	Pass

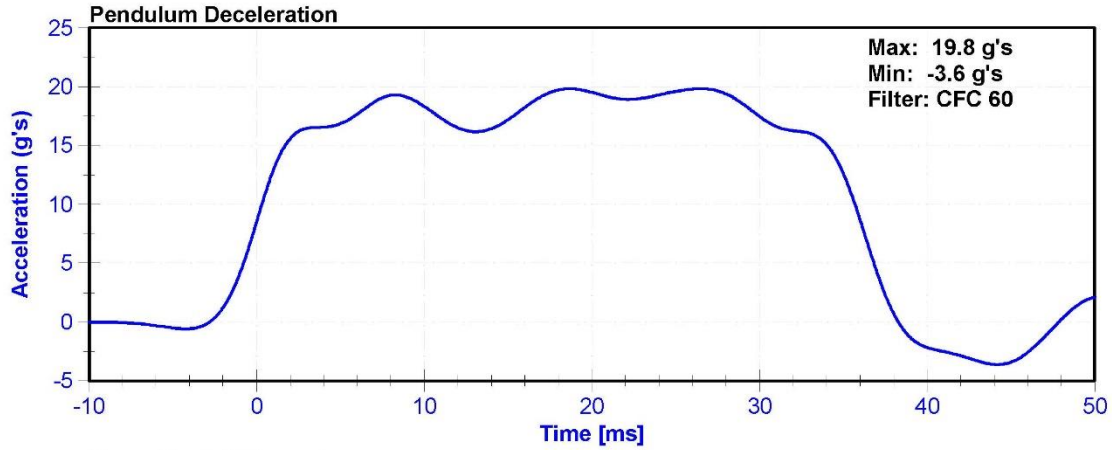
Transducer Calibrations

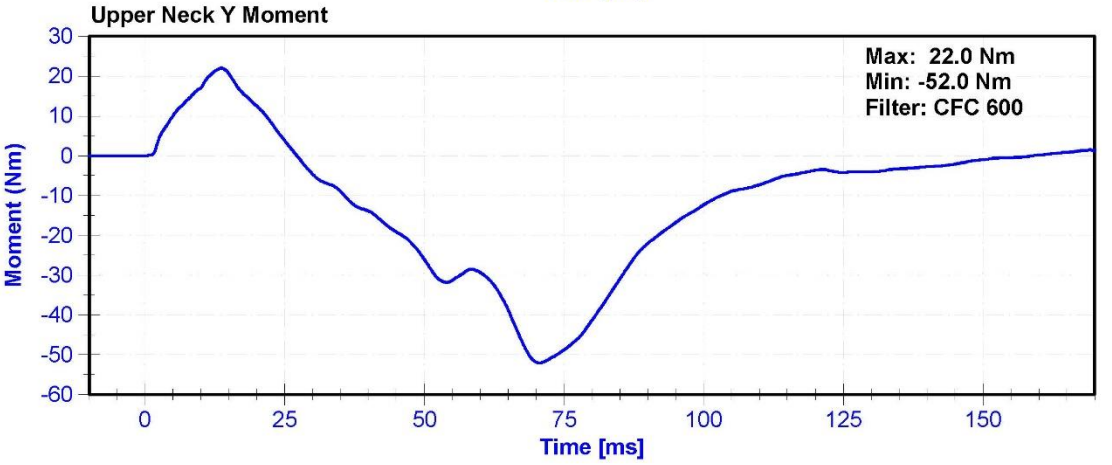
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5F3	5/7/2015	11/7/2015
Pendulum Potentiometer	SP22G	DS-PendPot	3/3/2015	3/2/2016
Condyle Potentiometer	SP22G	DS-CondPot	3/3/2015	3/2/2016
Upper Neck Load Cell	Denton 1716ATF	LC-2184 Fx	6/29/2015	6/28/2016

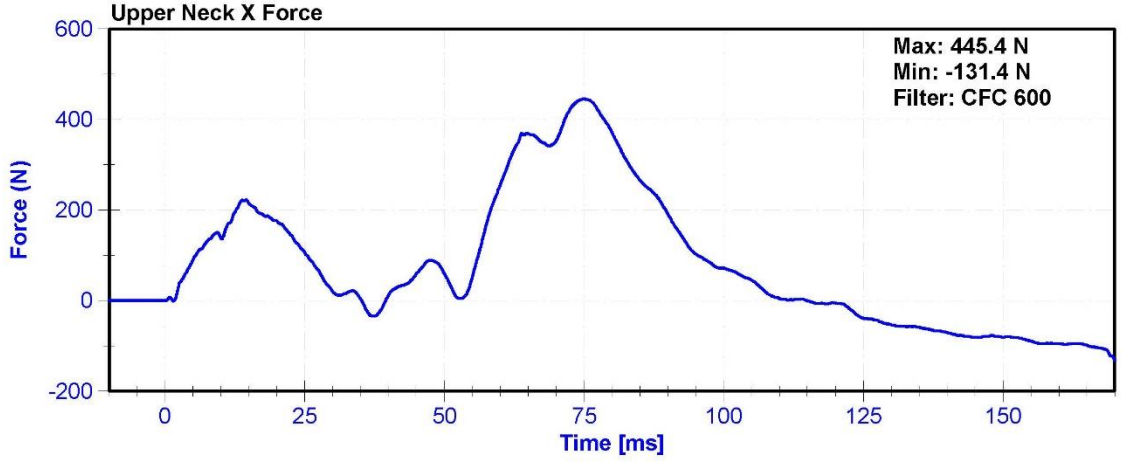



D-Plane Rotation
Rotation (deg)
100
75
50
25
0
0
25
50
75
100
125
150
Time [ms]
Max: 110.3 deg
Min: -5.6 deg
Filter: CFC 60


Moment About Occipital Condyle
Moment (Nm)
20
0
-20
-40
-60
0
25
50
75
100
125
150
Time [ms]
Max: 18.1 Nm
Min: -58.8 N
Filter: CFC 600


Pendulum Deceleration
Max: 19.8 g's
Min: -3.6 g's
Filter: CFC 60
Acceleration (g's)
25
20
15
10
5
0
-5
-10
0
10
20
30
40
50
Time [ms]


Upper Neck Y Moment
Max: 22.0 Nm
Min: -52.0 Nm
Filter: CFC 600
Moment (Nm)
30
20
10
0
-10
-20
-30
-40
-50
-60
0
25
50
75
100
125
150
Time [ms]


Upper Neck X Force
Max: 445.4 N
Min: -131.4 N
Filter: CFC 600
Force (N)
600
400
200
0
-200
0
25
50
75
100
125
150
Time [ms]

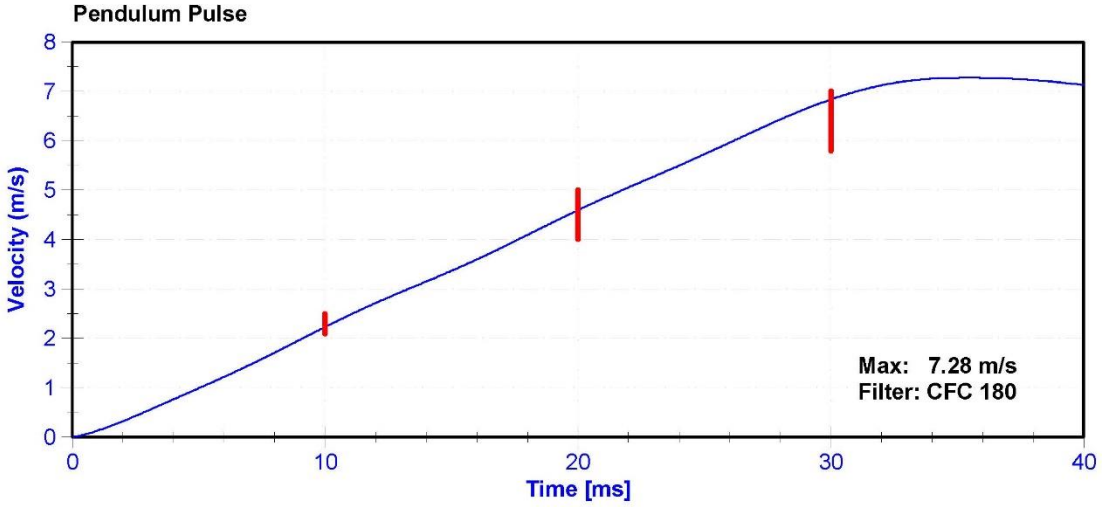
ATD Manufacturer	ASTC	Test Technician	M.Hartung
ATD Serial Number	019	Laboratory Supervisor	M.Goehle

Results

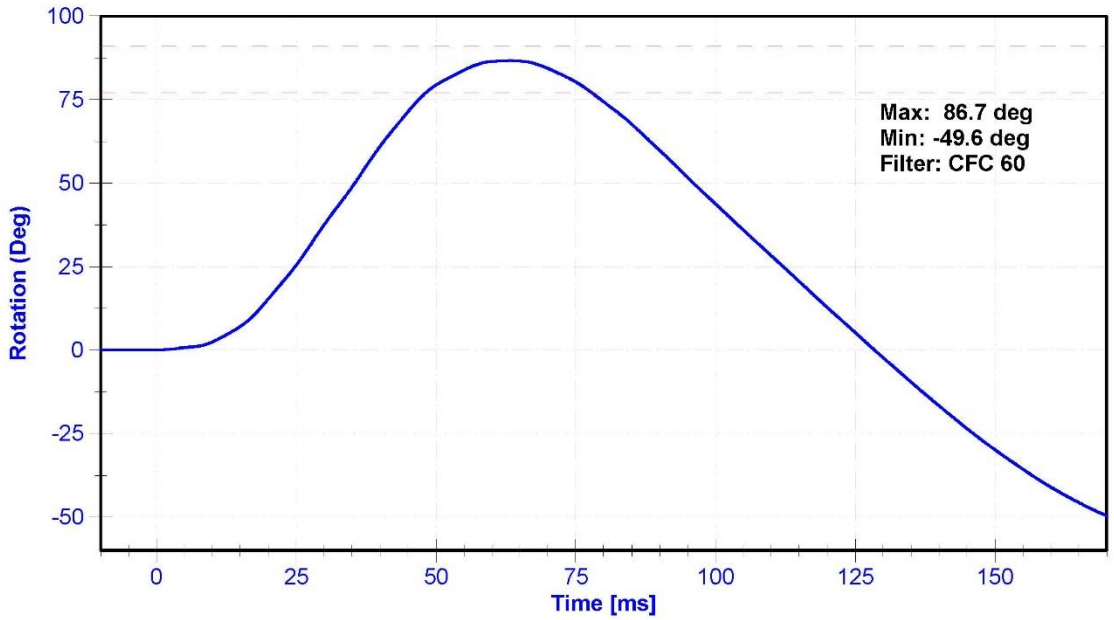
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21	Pass
Humidity	10	70	%	61.1	Pass
Velocity	6.89	7.13	m/s	7.037	Pass
Pendulum Impulse at 10ms	2.1	2.5	m/s	2.23	Pass
Pendulum Impulse at 20ms	4.0	5.0	m/s	4.60	Pass
Pendulum Impulse at 30ms	5.8	7.0	m/s	6.84	Pass
Max D Plane Rotation	77	91	deg	86.7	Pass
Max Moment During Rotation Interval	69	83	Nm	69.9	Pass
Moment Decay to 10.0 Nm	80	100	ms	89.3	Pass

Transducer Calibrations

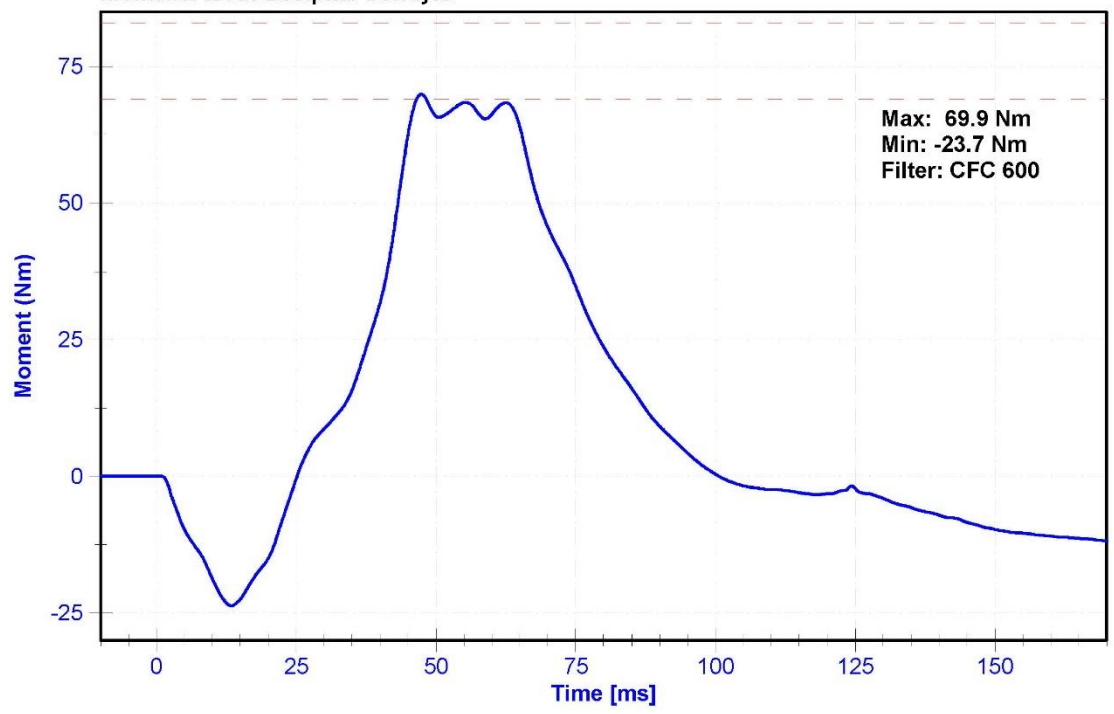
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5F3	5/7/2015	11/7/2015
Pendulum Potentiometer	SP22G	DS-PendPot	3/3/2015	3/2/2016
Condyle Potentiometer	SP22G	DS-CondPot	3/3/2015	3/2/2016
Upper Neck Load Cell	Denton 1716ATF	LC-2184 Fx	6/29/2015	6/28/2016

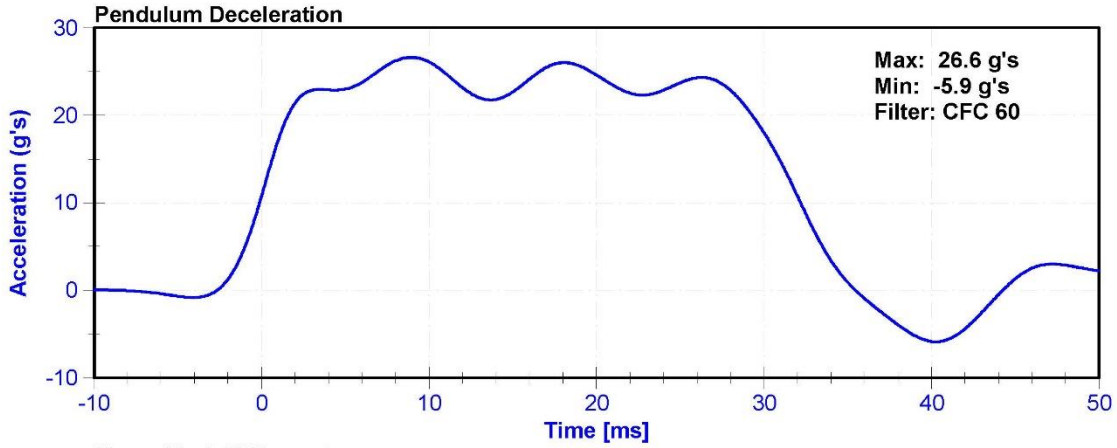


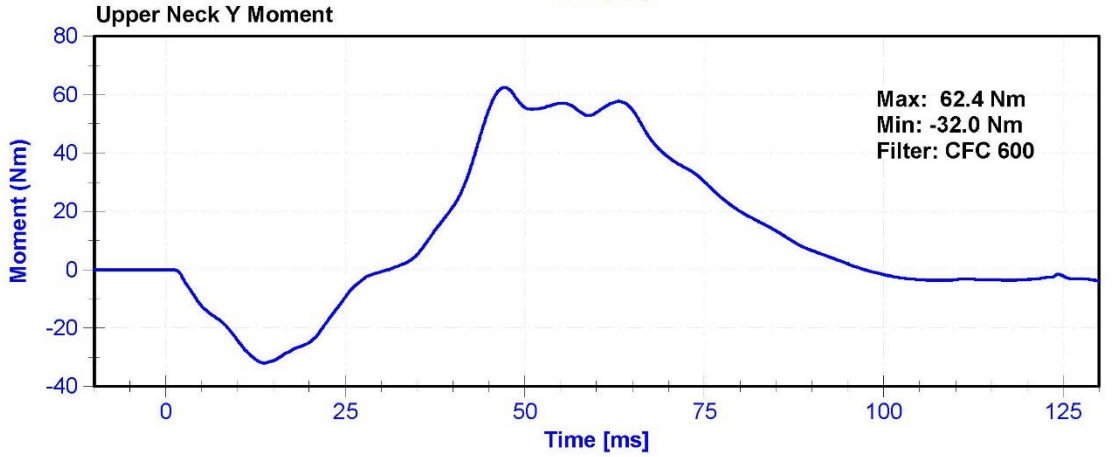
D-Plane Rotation

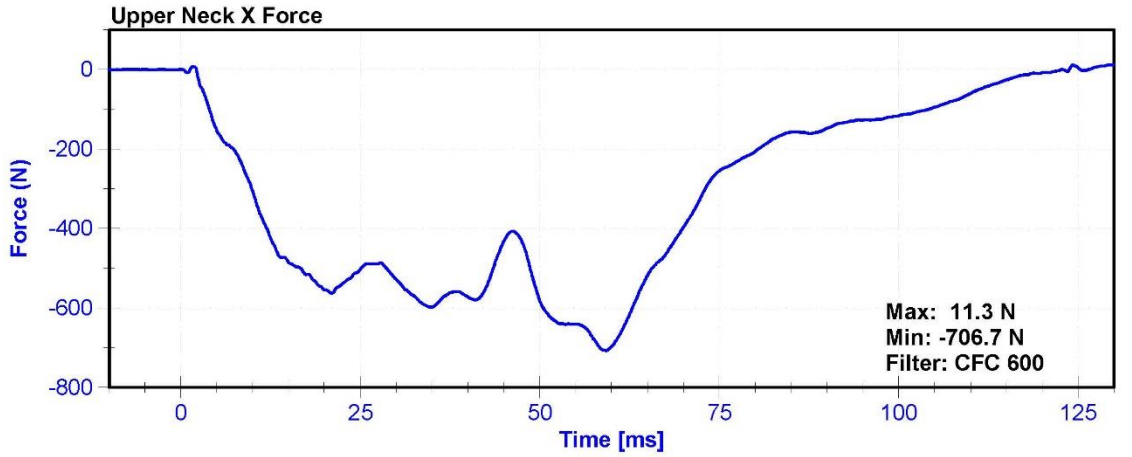


Moment About Occipital Condyle




Pendulum Deceleration
Max: 26.6 g's
Min: -5.9 g's
Filter: CFC 60
Acceleration (g's)
30
20
10
0
-10
-10
0
10
20
30
40
50
Time [ms]


Upper Neck Y Moment
Max: 62.4 Nm
Min: -32.0 Nm
Filter: CFC 600
Moment (Nm)
80
60
40
20
0
-20
-40
0
25
50
75
100
125
Time [ms]


Upper Neck X Force
Max: 11.3 N
Min: -706.7 N
Filter: CFC 600
Force (N)
0
-200
-400
-600
-800
0
25
50
75
100
125
Time [ms]

ATD Manufacturer	ASTC	Test Technician	M.Hartung
ATD Serial Number	019	Laboratory Supervisor	M.Goehle

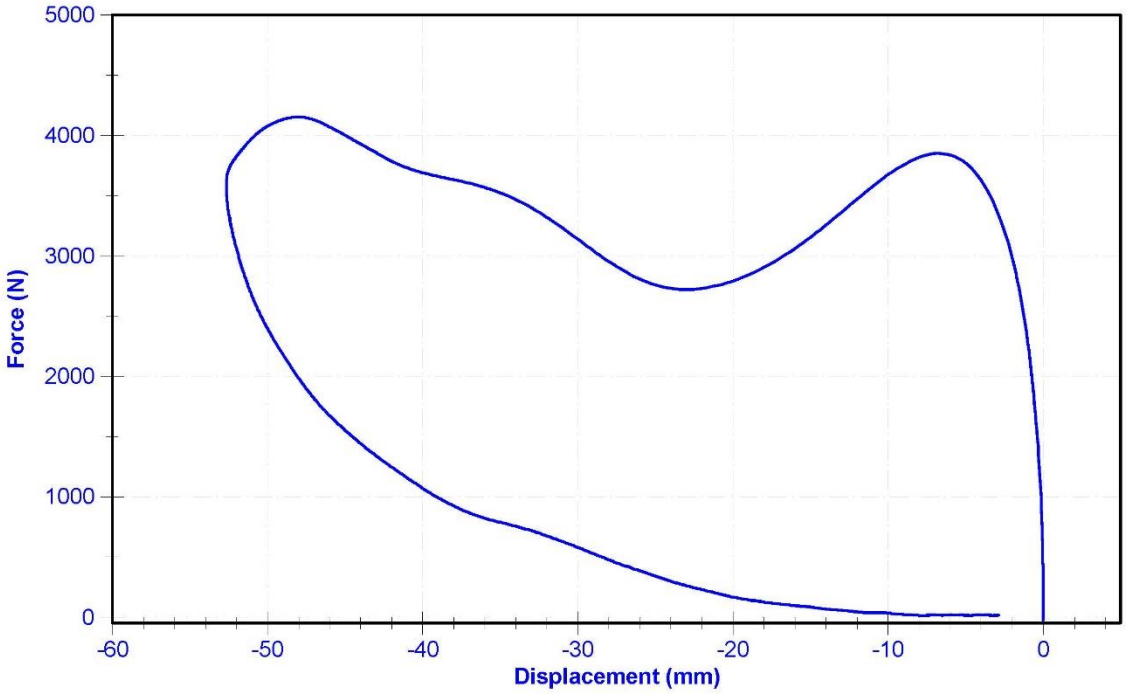
Results

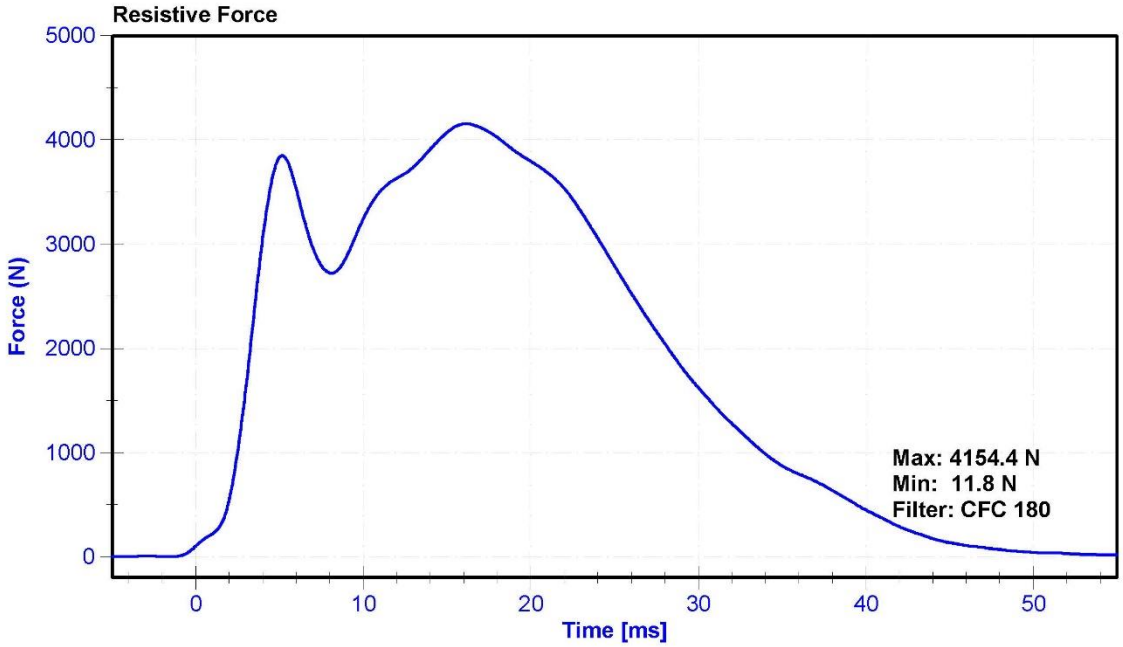
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.6	Pass
Humidity	10	70	%	65.9	Pass
Velocity	6.59	6.83	m/s	6.684	Pass
Chest Deflection	-58	-50	mm	-52.7	Pass
Maximum Resistive Force (50 to 58mm)	3,900	4,400	N	4081.9	Pass
Maximum Resistive Force (18 to 50mm)	0	4,600	N	4154.4	Pass
Hysteresis	69	85	%	79.8	Pass

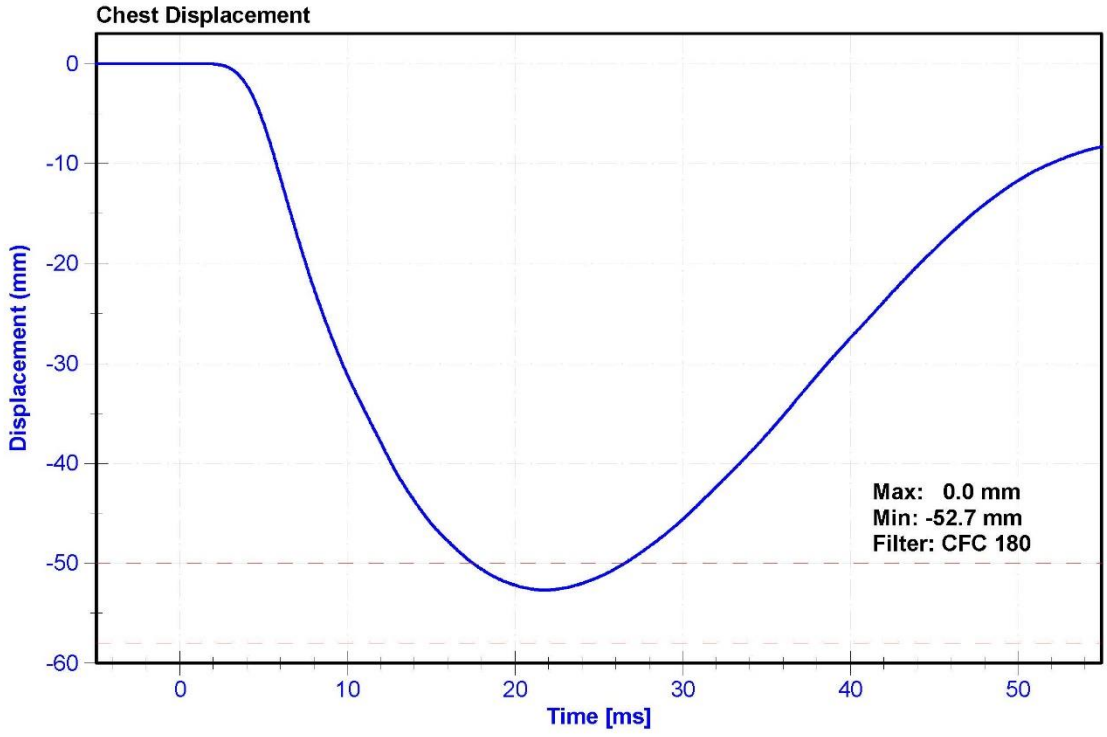
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-C14972	8/13/2015	2/11/2016
Chest Potentiometer	Servo 14CB1	DS-FEM019	7/1/2015	6/30/2016

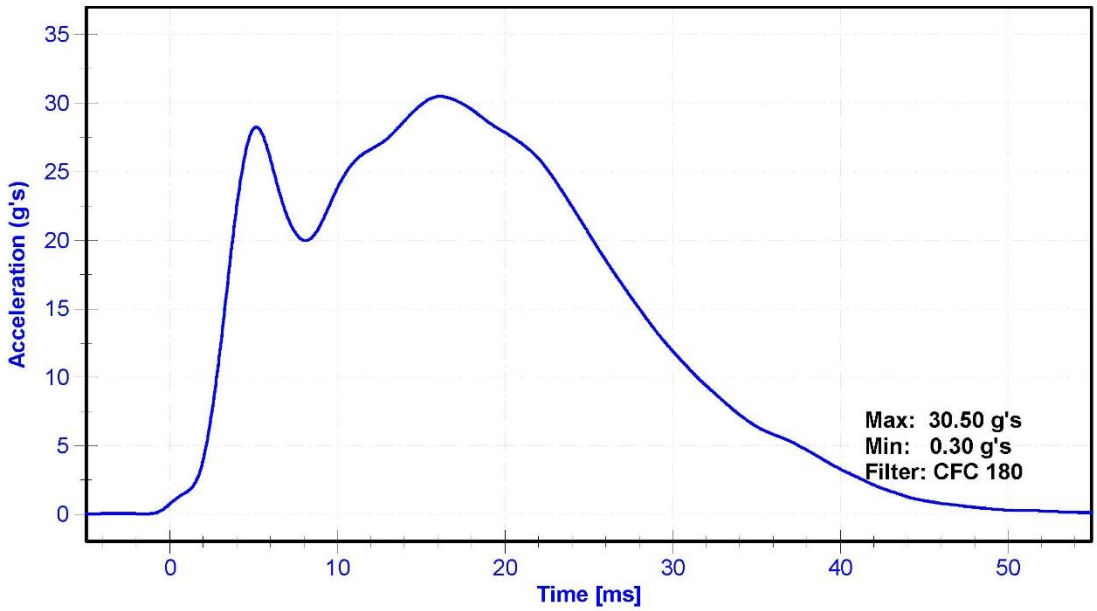
Force vs. Displacement



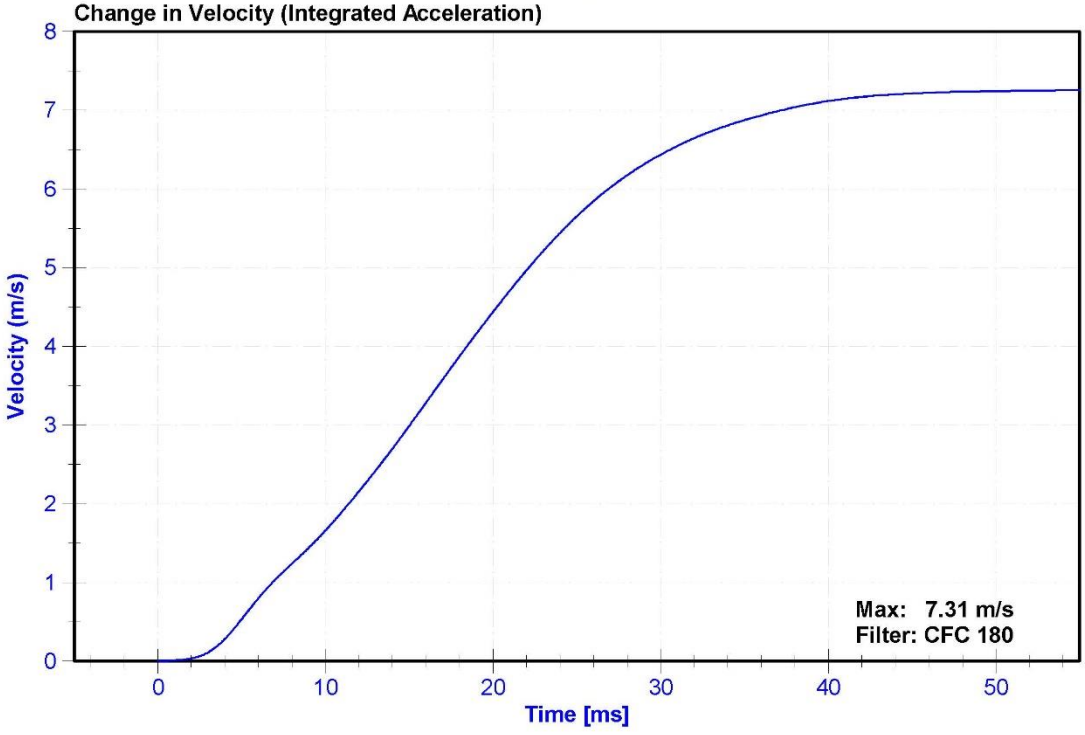

Resistive Force
5000
4000
3000
2000
1000
0
Force (N)
0
10
20
30
40
50
Time [ms]
Max: 4154.4 N
Min: 11.8 N
Filter: CFC 180


Chest Displacement
0
-10
-20
-30
-40
-50
-60
Displacement (mm)
0
10
20
30
40
50
Time [ms]
Max: 0.0 mm
Min: -52.7 mm
Filter: CFC 180

Probe Acceleration



Change in Velocity (Integrated Acceleration)



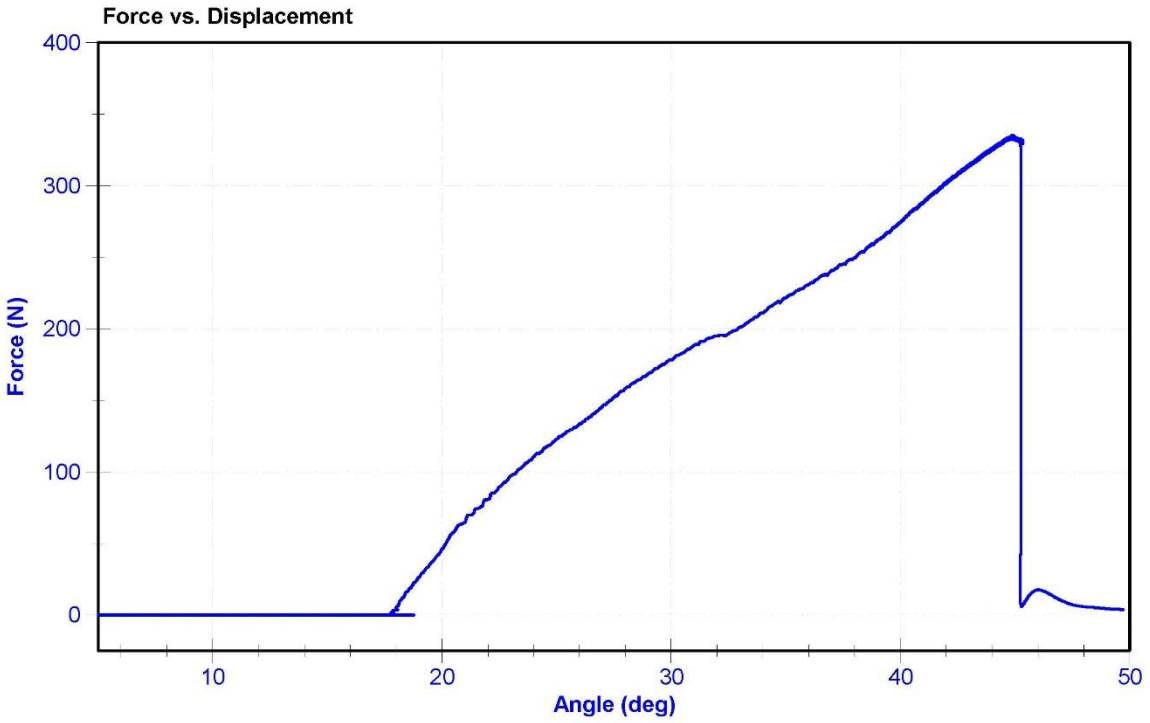
ATD Manufacturer	ASTC	Test Technician	M.Hartung
ATD Serial Number	019	Laboratory Supervisor	M.Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.6	25.6	°C	21.5	Pass
Humidity	10	70	%	68.6	Pass
Initial Angle	0	20	deg	17.3	Pass
Force at 45 Degrees	320	390	N	332.6	Pass
Return Angle Relative to Initial	0	8	deg	3.5	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Potentiometer	Rieker N4C-1	DS-13051548	8/14/2015	8/13/2016
Load Cell	Interface SML-200	LC-493319	8/13/2015	8/12/2016



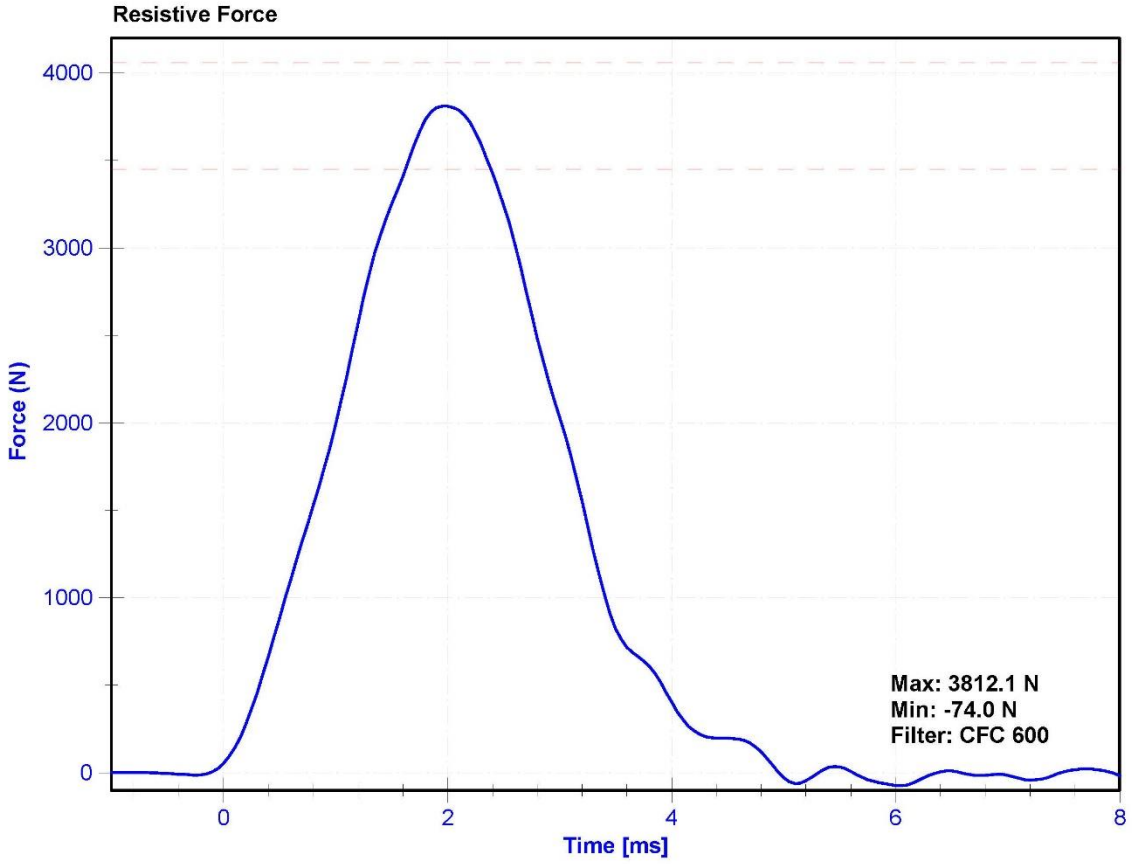
ATD Manufacturer	ASTC	Test Technician	M.Hartung
ATD Serial Number	019	Laboratory Supervisor	M.Goehle

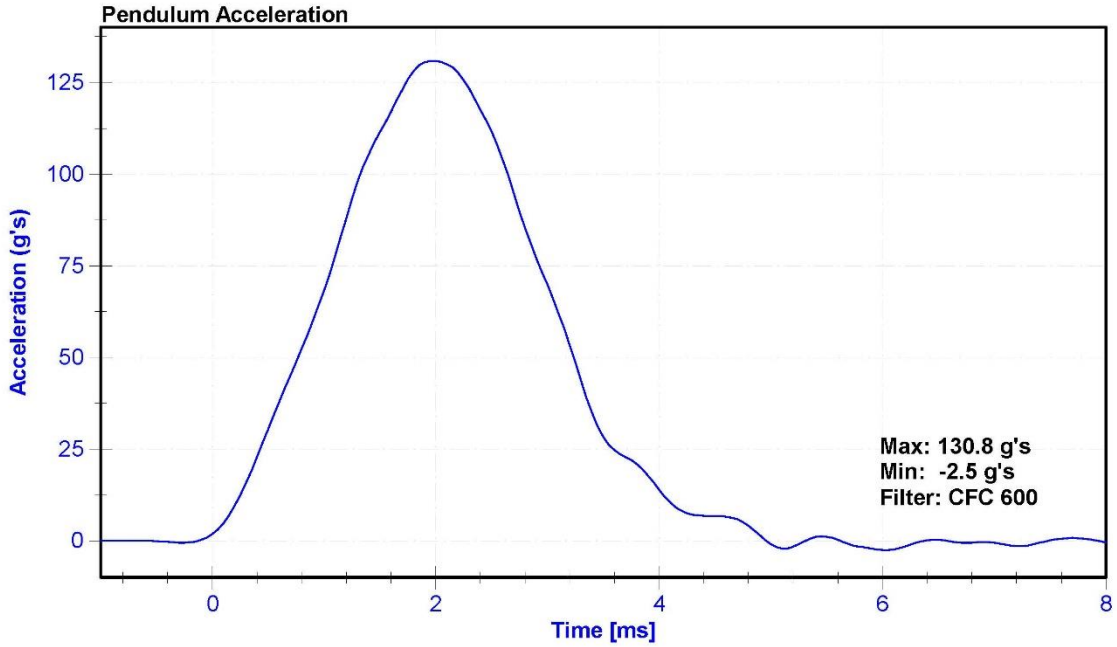
Results

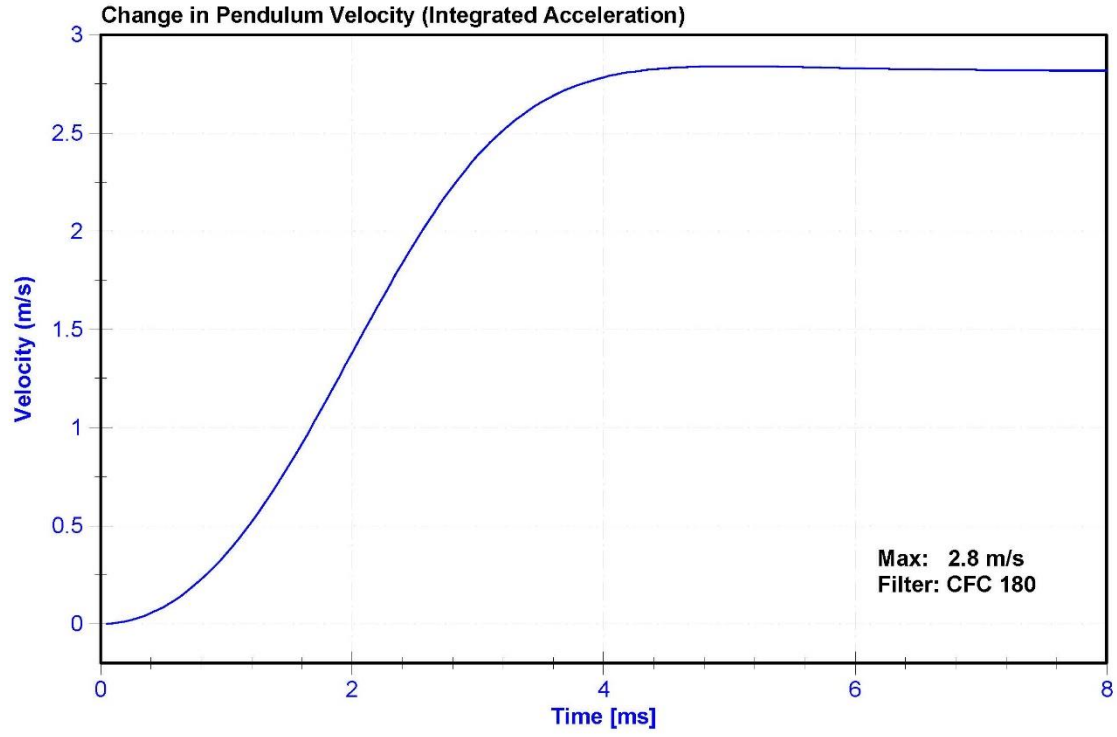
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	21	Pass
Humidity	10	70	%	69	Pass
Velocity	2.07	2.13	m/s	2.083	Pass
Resistive Force	3,450	4,060	N	3812.1	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-C14972	8/13/2015	2/11/2016




Pendulum Acceleration
Acceleration (g's)
125
100
75
50
25
0
0
2
4
6
8
Time [ms]
Max: 130.8 g's
Min: -2.5 g's
Filter: CFC 600


Change in Pendulum Velocity (Integrated Acceleration)
Velocity (m/s)
3
2.5
2
1.5
1
0.5
0
0
2
4
6
8
Time [ms]
Max: 2.8 m/s
Filter: CFC 180

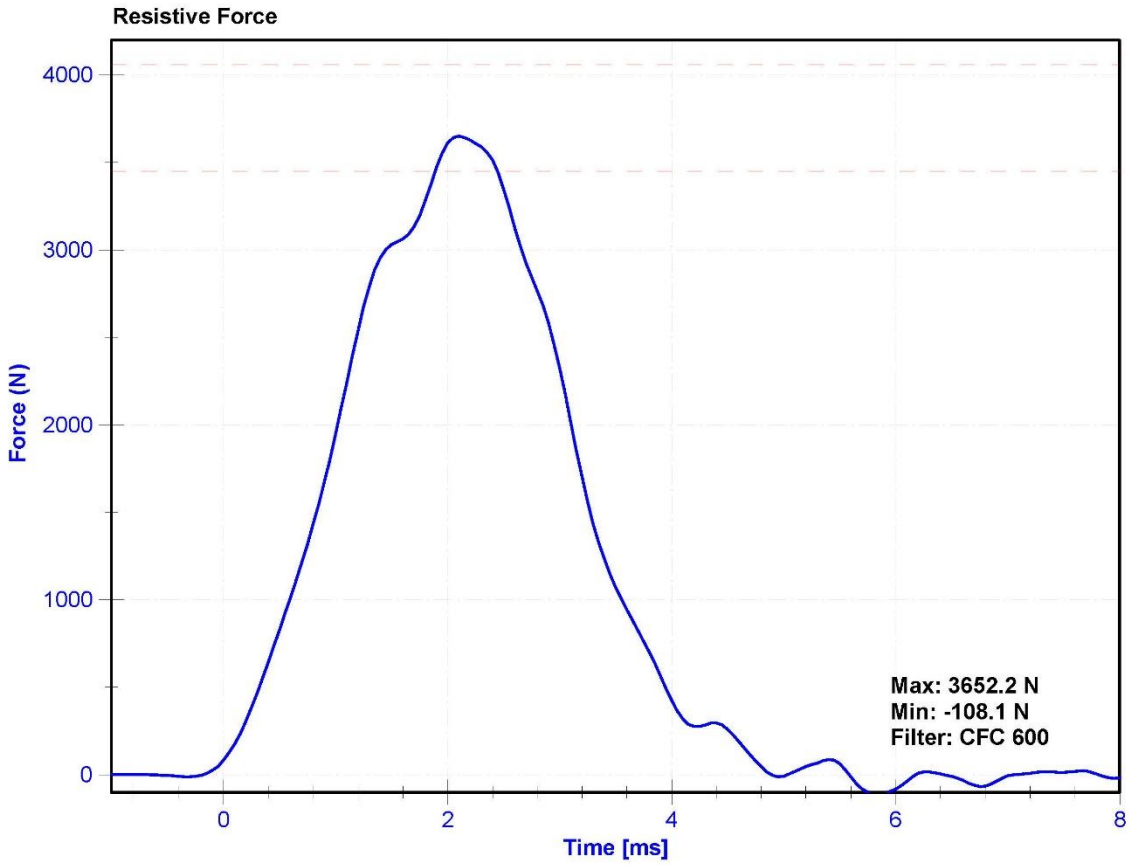
ATD Manufacturer	ASTC	Test Technician	M.Hartung
ATD Serial Number	019	Laboratory Supervisor	M.Goehle

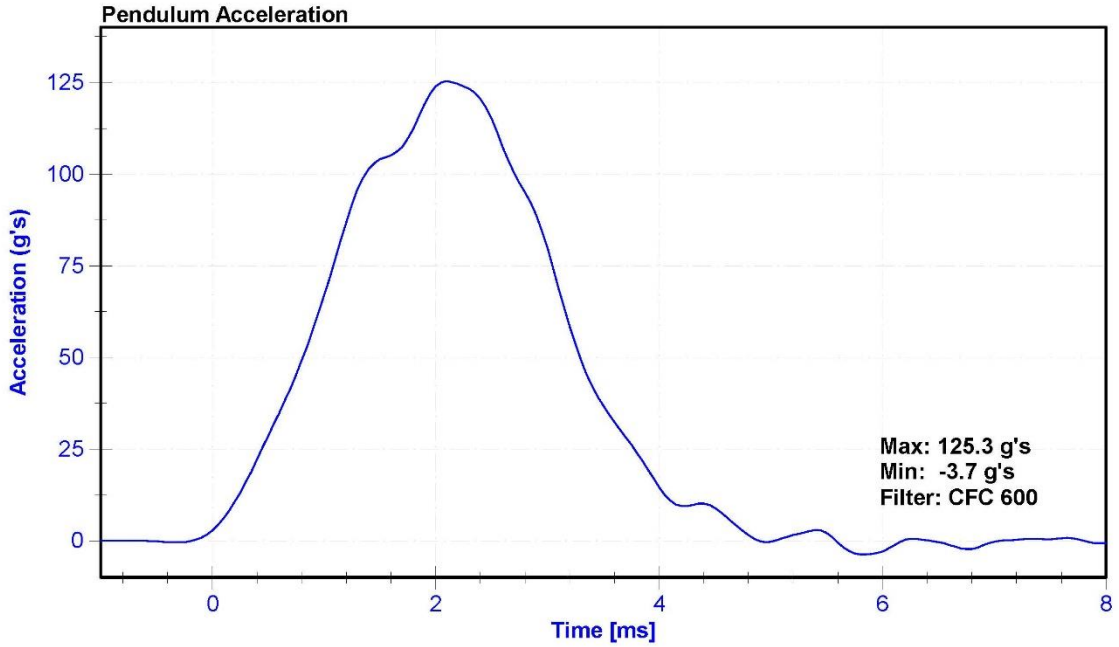
Results

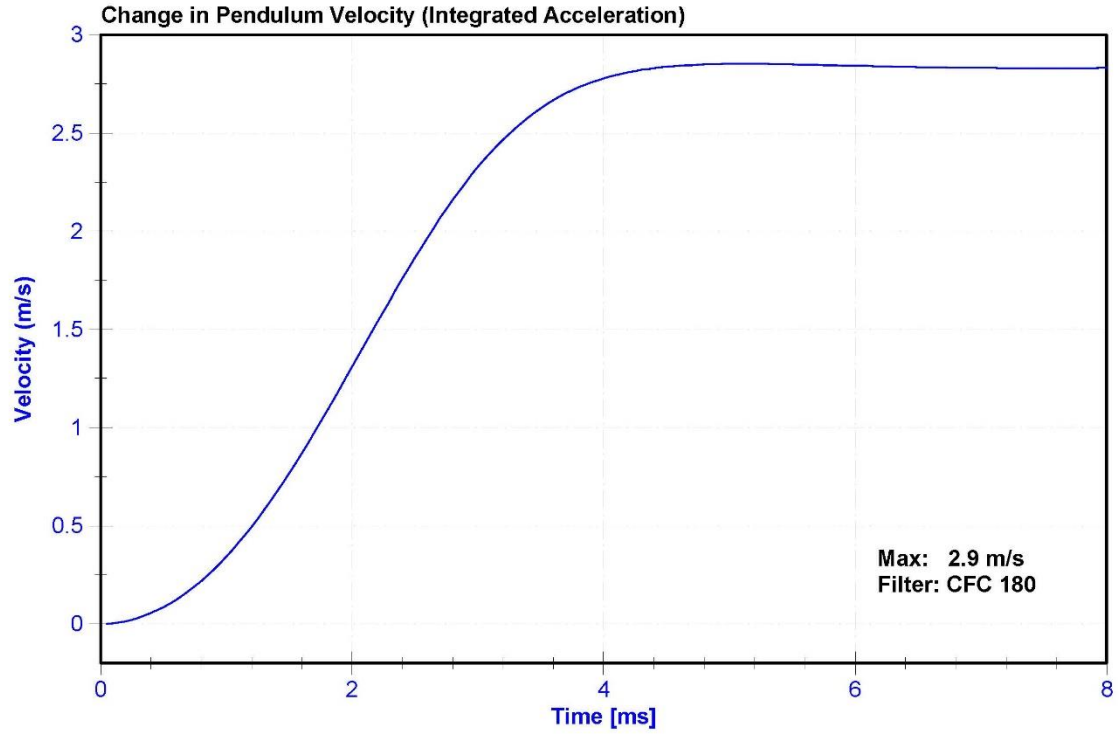
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	20.5	Pass
Humidity	10	70	%	63.4	Pass
Velocity	2.07	2.13	m/s	2.081	Pass
Resistive Force	3,450	4,060	N	3652.2	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-C14972	8/13/2015	2/11/2016



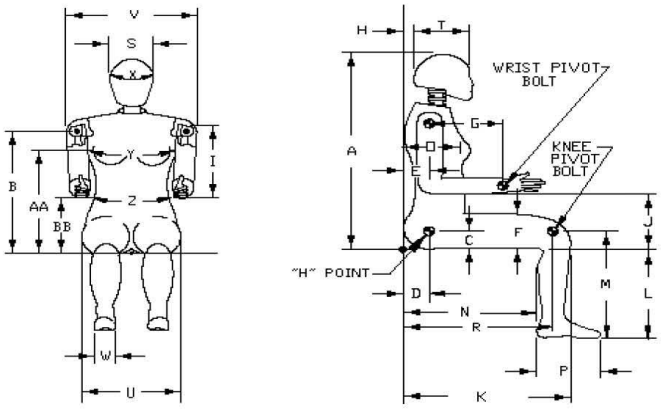

Pendulum Acceleration
Acceleration (g's)
125
100
75
50
25
0
0
2
4
6
8
Time [ms]
Max: 125.3 g's
Min: -3.7 g's
Filter: CFC 600


Change in Pendulum Velocity (Integrated Acceleration)
Velocity (m/s)
3
2.5
2
1.5
1
0.5
0
0
2
4
6
8
Time [ms]
Max: 2.9 m/s
Filter: CFC 180

External Measurements - Hybrid 3 - 5th Female

Technician: M.Hartung Date: 8/17/2015

Dummy Serial Number: 324



Symbol	Description	Specification (mm)		Result (mm)	Pass/Fail
A	Sitting Height	775	800	780	Pass
B	Shoulder Pivot Height	432	457	442	Pass
C	H-Point Height	81	86	85	Pass
D	H-Point from Backline	145	150	146	Pass
E	Shoulder Pivot from Backline	69	84	79	Pass
F	Thigh Clearance	119	135	128	Pass
G	Back of Elbow to Wrist Pivot	244	259	250	Pass
H	Head Back to Backline	43	48	46	Pass
I	Shoulder to Elbow Length	277	297	282	Pass
J	Elbow Rest Height	183	203	195	Pass
K	Buttock to Knee Length	521	546	535	Pass
L	Popliteal Height	356	376	368	Pass
M	Knee Pivot Height	394	419	409	Pass
N	Buttock Popliteal Length	414	439	433	Pass
O	Chest Depth without Jacket	175	191	183	Pass
P	Foot Length (right)	219	234	223	Pass
R	Buttock To Knee Pivot Length	457	483	471	Pass
S	Head Breadth	137	437	140	Pass
T	Head Depth	178	188	181	Pass
U	Hip Breadth	300	315	306	Pass
V	Shoulder Breadth	351	366	356	Pass
W	Foot Breadth	79	94	84	Pass
X	Head Circumference	528	549	539	Pass
Y	Chest Circumference with Jacket	851	881	865	Pass
Z	Waist Circumference	460	790	772	Pass
AA	Reference Location (Chest Circumference)	333	358	346	Pass
BB	Reference Location (Waist Circumference)	160	170	165	Pass

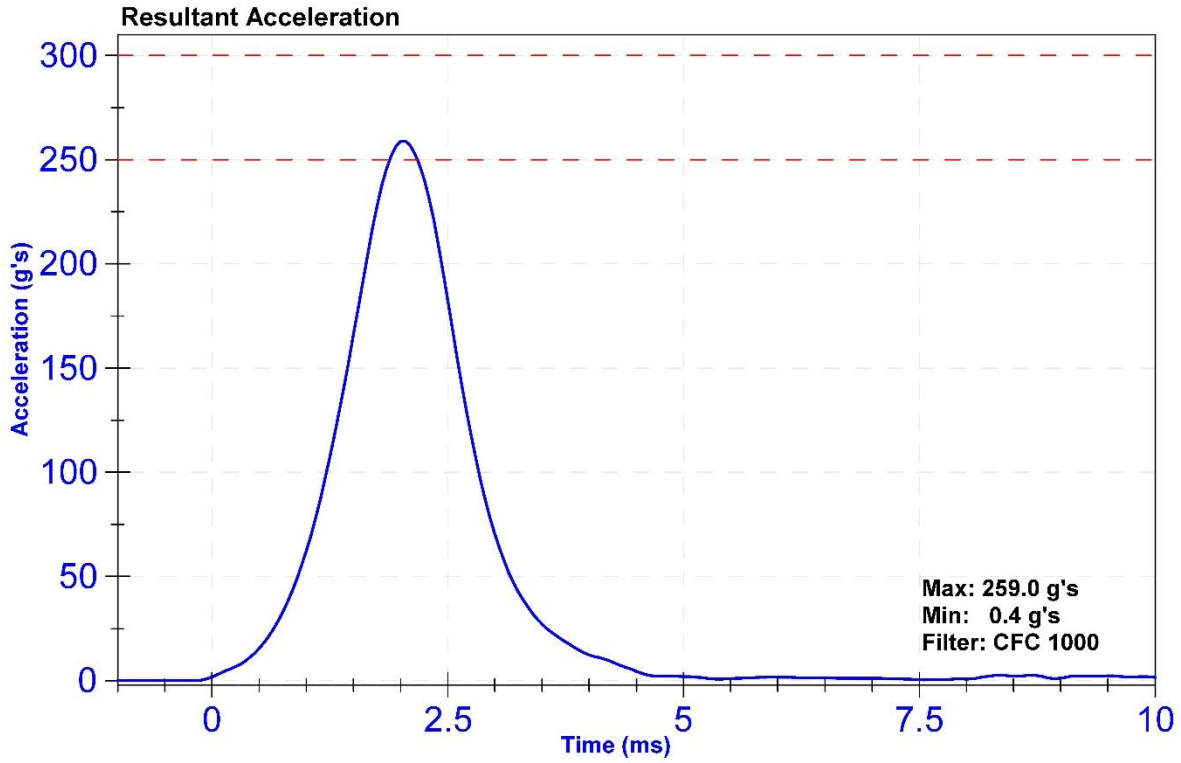
ATD Manufacturer	FTSS	Test Technician	M.Hartung
ATD Serial Number	324	Laboratory Supervisor	M.Goehle

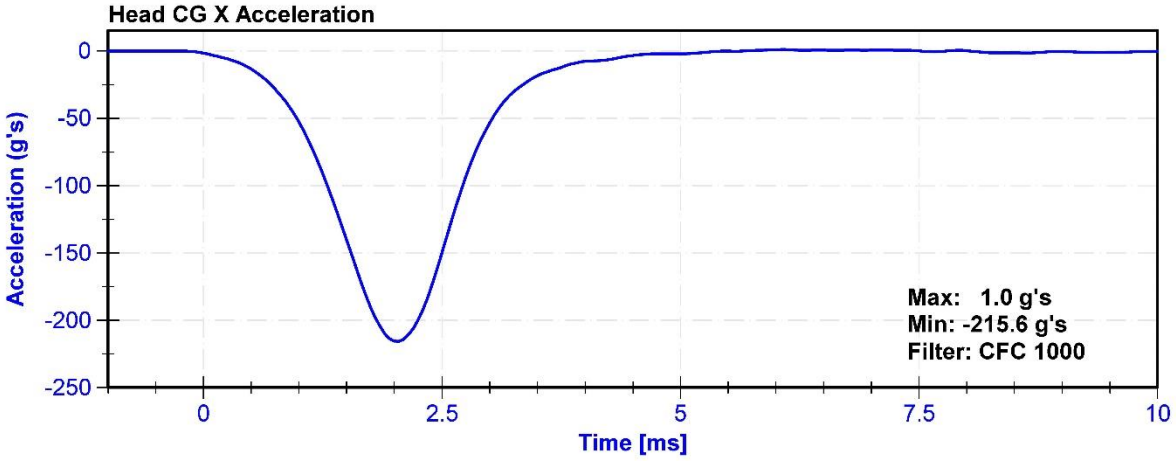
Results

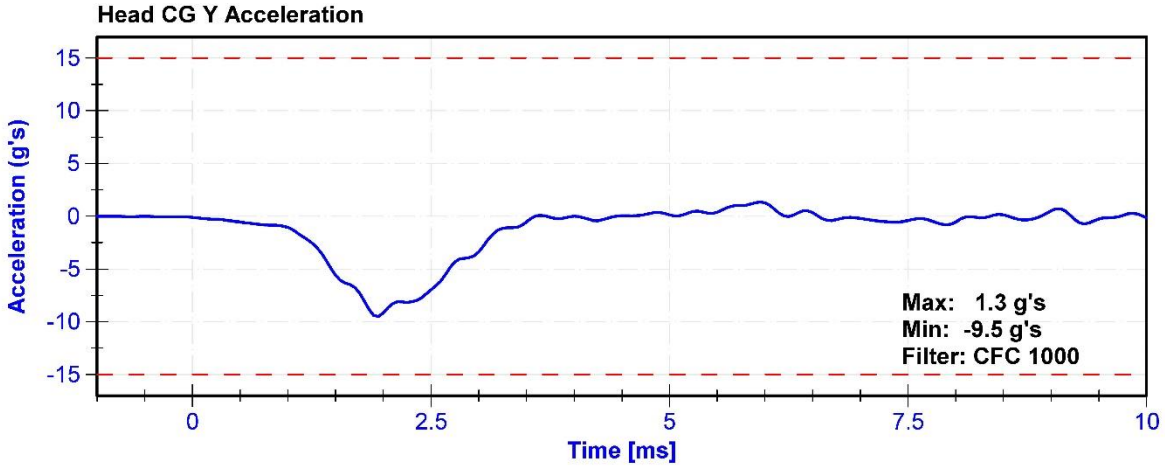
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	20.9	Pass
Humidity	10	70	%	61.8	Pass
Resultant Acceleration	250	300	g's	259.0	Pass
Oscillation	0	10	%	1.0	Pass
Lateral Acceleration	-15	15	g's	-9.5	Pass

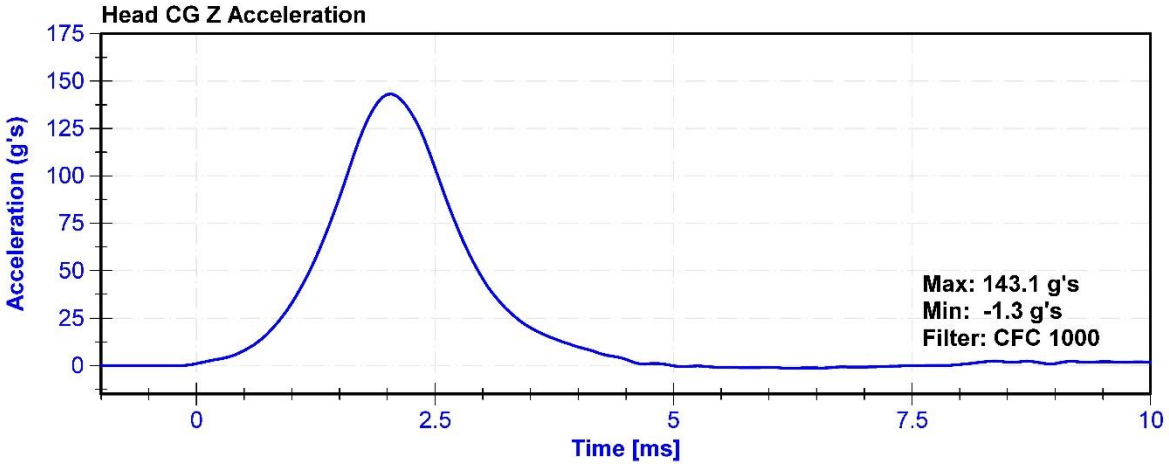
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
X Accelerometer	Endevco 7264	AC-P58729	6/26/2015	6/25/2016
Y Accelerometer	Endevco 7264	AC-P74955	6/26/2015	6/25/2016
Z Accelerometer	Endevco 7264	AC-P74778	6/26/2015	6/25/2016




Head CG X Acceleration
Acceleration (g's)
0
-50
-100
-150
-200
-250
0
2.5
5
7.5
10
Time [ms]
Max: 1.0 g's
Min: -215.6 g's
Filter: CFC 1000


Head CG Y Acceleration
Acceleration (g's)
15
10
5
0
-5
-10
-15
0
2.5
5
7.5
10
Time [ms]
Max: 1.3 g's
Min: -9.5 g's
Filter: CFC 1000


Head CG Z Acceleration
Acceleration (g's)
175
150
125
100
75
50
25
0
0
2.5
5
7.5
10
Time [ms]
Max: 143.1 g's
Min: -1.3 g's
Filter: CFC 1000

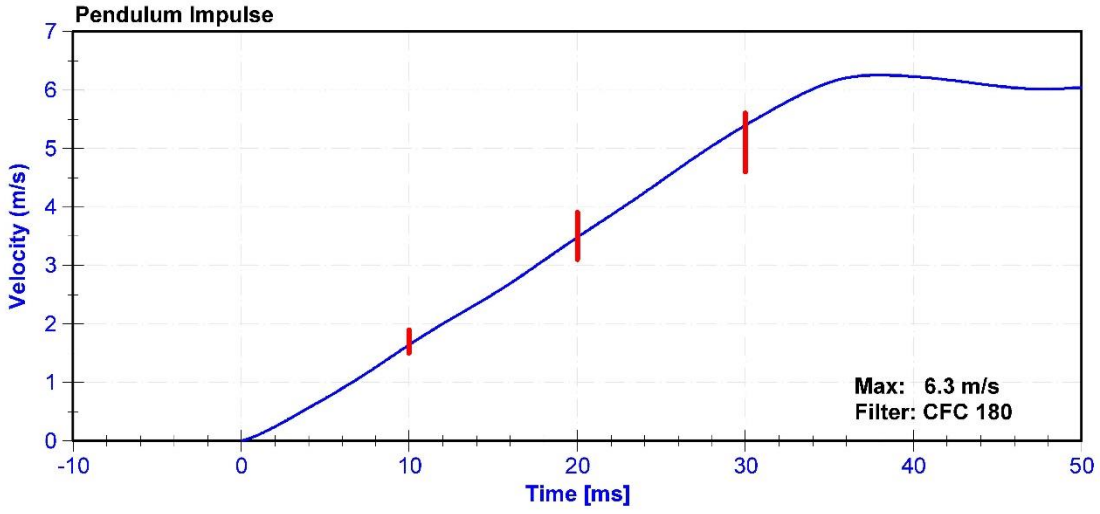
ATD Manufacturer	FTSS	Test Technician	M.Hartung
ATD Serial Number	324	Laboratory Supervisor	M.Goehle

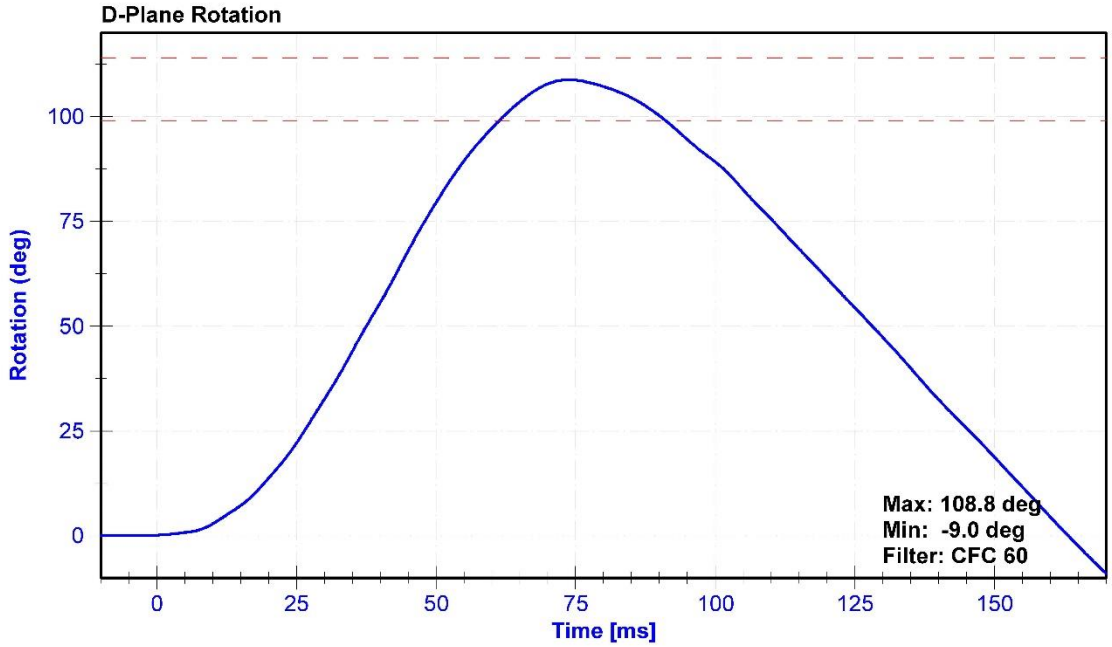
Results

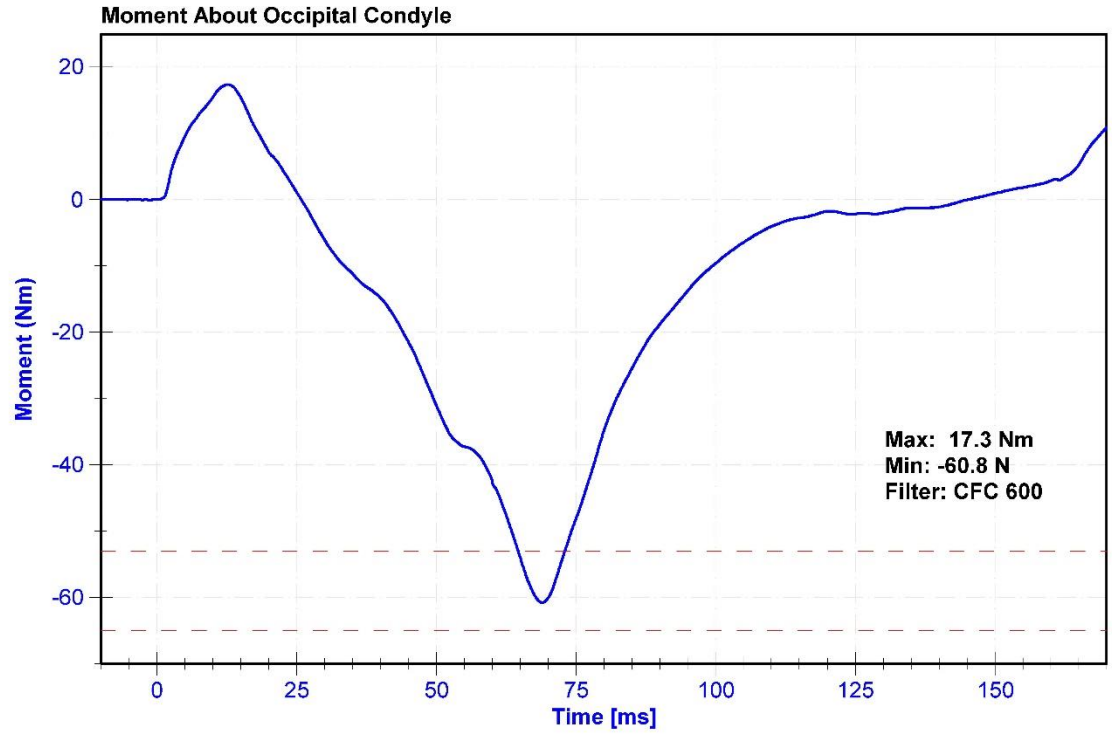
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	^{0}C	20.8	Pass
Humidity	10	70	%	62.0	Pass
Velocity	5.95	6.19	m/s	6.025	Pass
Pendulum Impulse at 10ms	1.5	1.9	m/s	1.64	Pass
Pendulum Impulse at 20ms	3.1	3.9	m/s	3.48	Pass
Pendulum Impulse at 30ms	4.6	5.6	m/s	5.40	Pass
D Plane Rotation	99	114	deg	108.8	Pass
Moment During Rotation Interval	-65	-53	Nm	-60.8	Pass
Moment Decay to -10Nm	94	114	ms	99.4	Pass

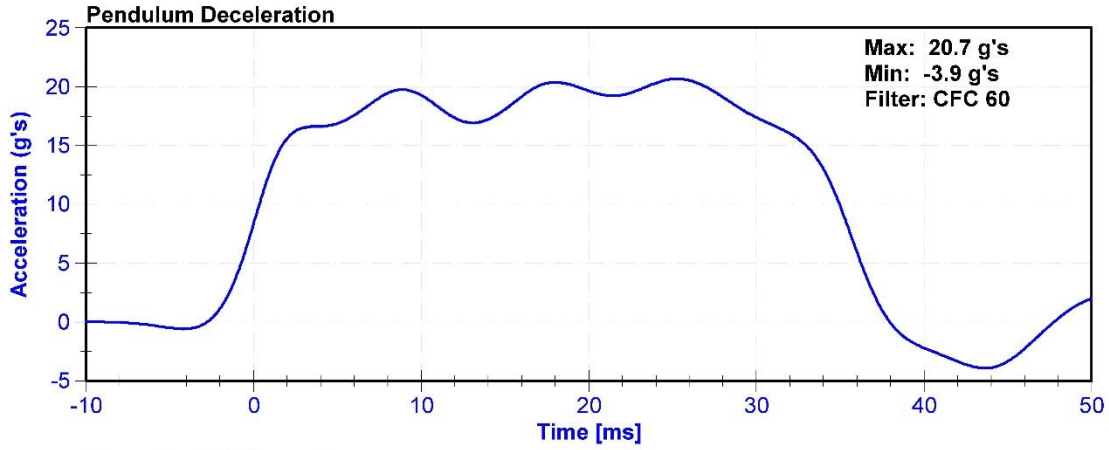
Transducer Calibrations

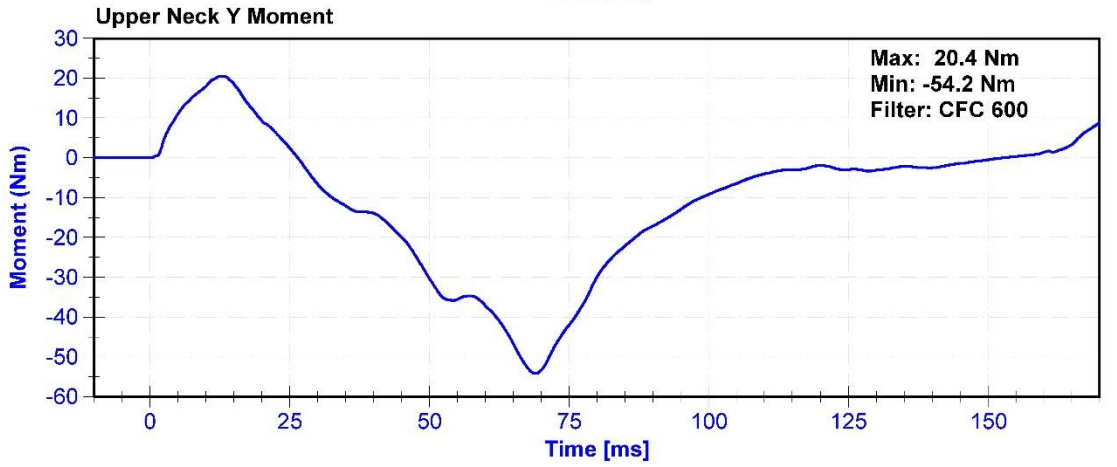
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5F3	5/7/2015	11/7/2015
Pendulum Potentiometer	SP22G	DS-PendPot	3/3/2015	3/2/2016
Condyle Potentiometer	SP22G	DS-CondPot	3/3/2015	3/2/2016
Upper Neck Load Cell	Denton 1716	LC-2193 Fx	11/25/2014	11/25/2015

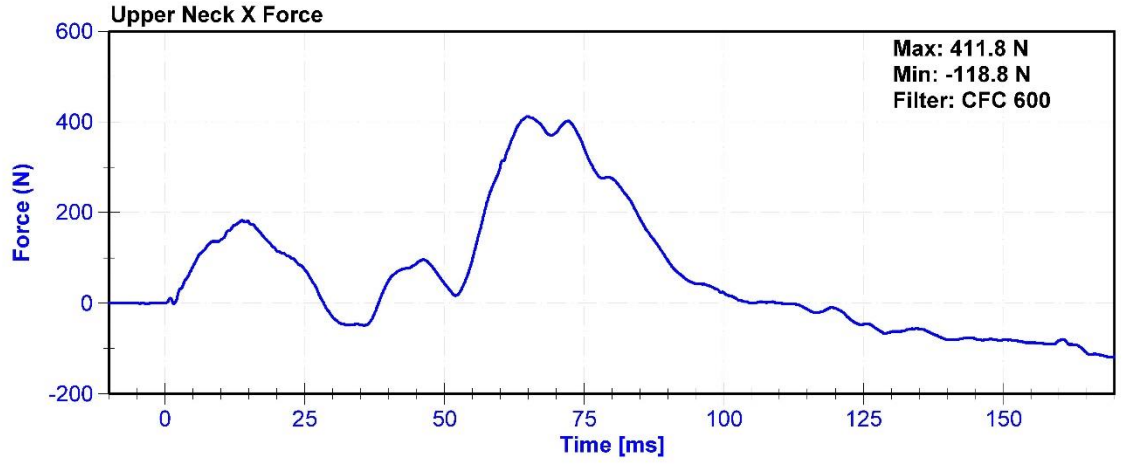



D-Plane Rotation
Rotation (deg)
100
75
50
25
0
0
25
50
75
100
125
150
Time [ms]
Max: 108.8 deg
Min: -9.0 deg
Filter: CFC 60


Moment About Occipital Condyle
Moment (Nm)
20
0
-20
-40
-60
0
25
50
75
100
125
150
Time [ms]
Max: 17.3 Nm
Min: -60.8 N
Filter: CFC 600


Pendulum Deceleration
Max: 20.7 g's
Min: -3.9 g's
Filter: CFC 60
Acceleration (g's)
25
20
15
10
5
0
-5
-10
0
10
20
30
40
50
Time [ms]


Upper Neck Y Moment
Max: 20.4 Nm
Min: -54.2 Nm
Filter: CFC 600
Moment (Nm)
30
20
10
0
-10
-20
-30
-40
-50
-60
0
25
50
75
100
125
150
Time [ms]


Upper Neck X Force
Max: 411.8 N
Min: -118.8 N
Filter: CFC 600
Force (N)
600
400
200
0
-200
0
25
50
75
100
125
150
Time [ms]

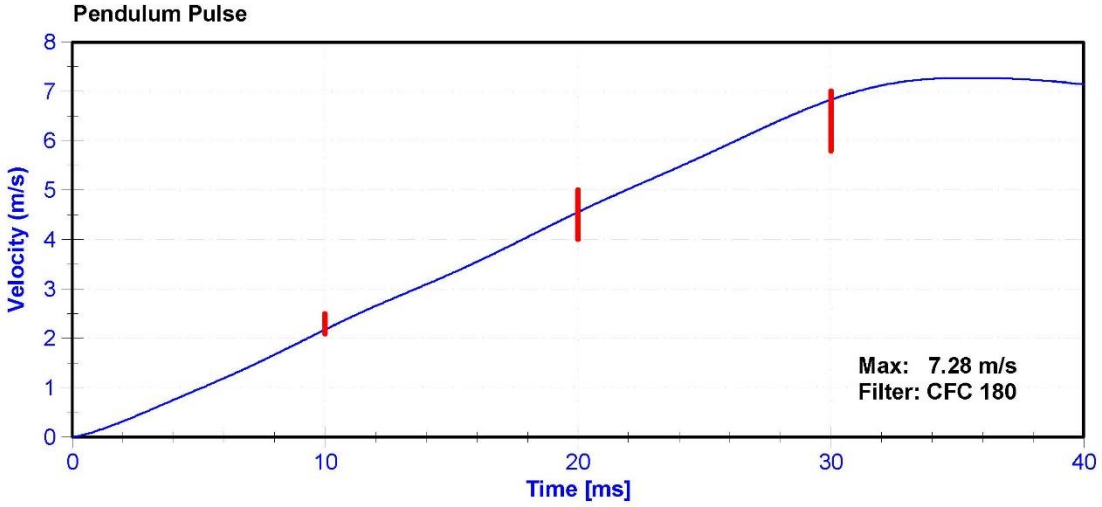
ATD Manufacturer	FTSS	Test Technician	M.Hartung
ATD Serial Number	324	Laboratory Supervisor	M.Goehle

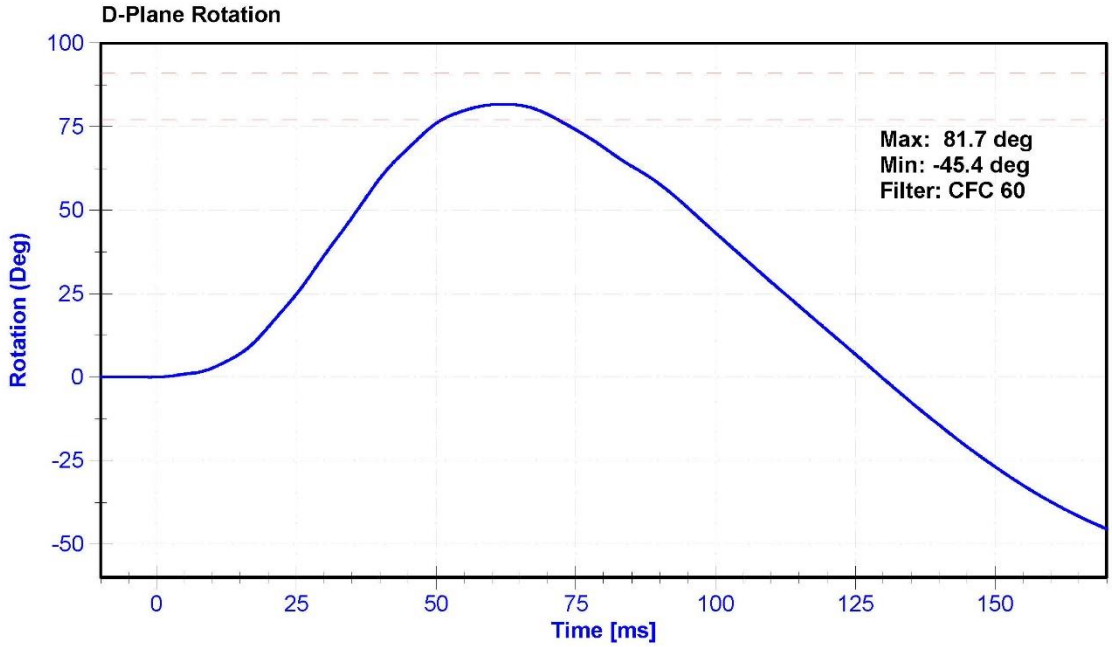
Results

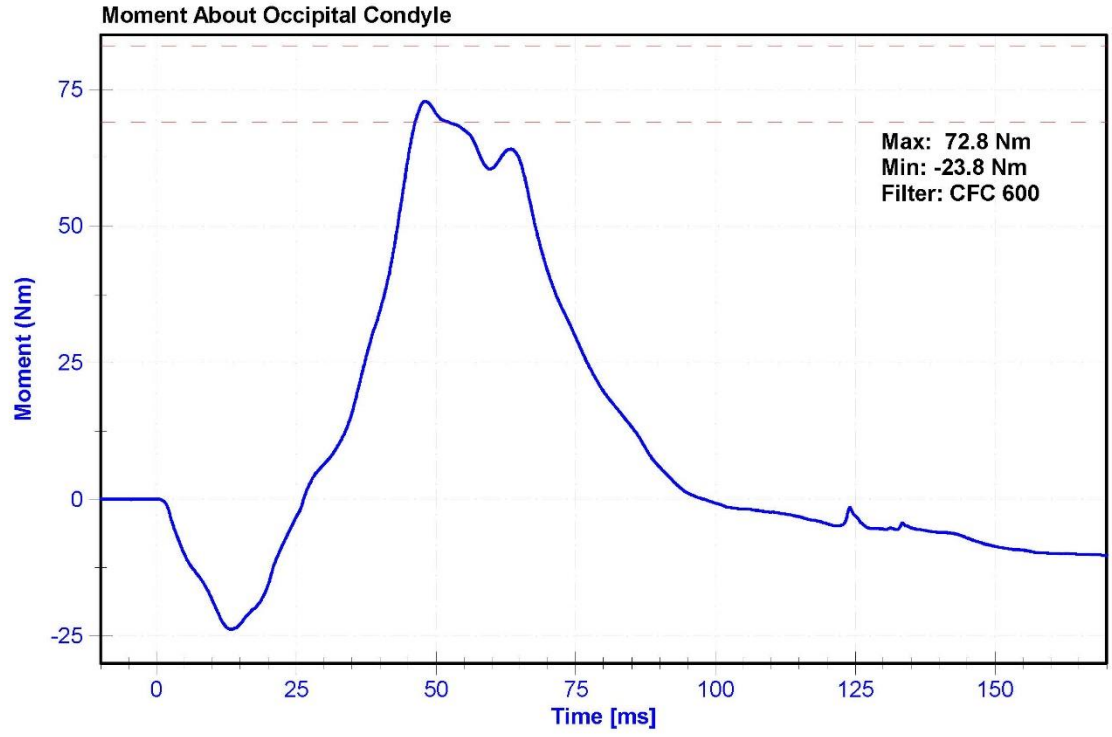
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.8	Pass
Humidity	10	70	%	49.2	Pass
Velocity	6.89	7.13	m/s	6.979	Pass
Pendulum Impulse at 10ms	2.1	2.5	m/s	2.18	Pass
Pendulum Impulse at 20ms	4.0	5.0	m/s	4.56	Pass
Pendulum Impulse at 30ms	5.8	7.0	m/s	6.83	Pass
Max D Plane Rotation	77	91	deg	81.7	Pass
Max Moment During Rotation Interval	69	83	Nm	72.8	Pass
Moment Decay to 10.0 Nm	80	100	ms	87.1	Pass

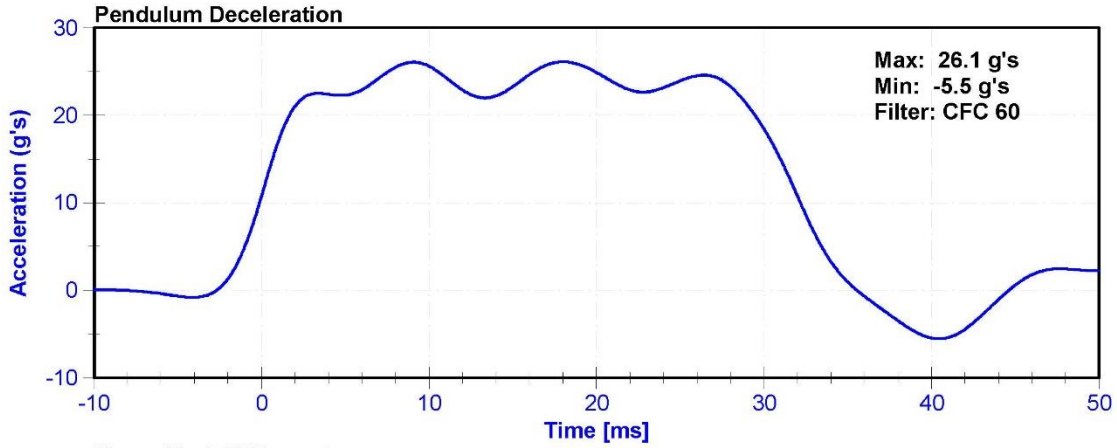
Transducer Calibrations

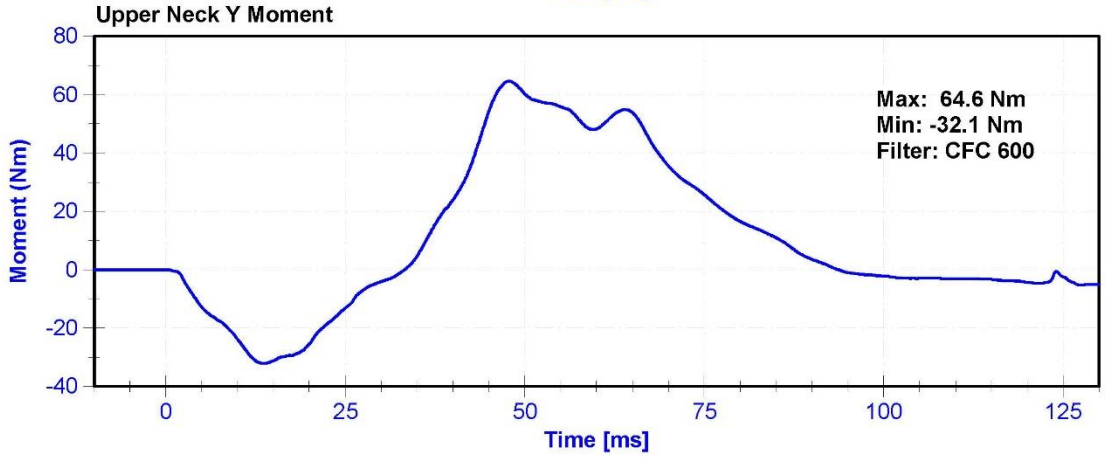
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5F3	5/7/2015	11/7/2015
Pendulum Potentiometer	SP22G	DS-PendPot	3/3/2015	3/2/2016
Condyle Potentiometer	SP22G	DS-CondPot	3/3/2015	3/2/2016
Upper Neck Load Cell	Denton 1716	LC-2193 Fx	11/25/2014	11/25/2015

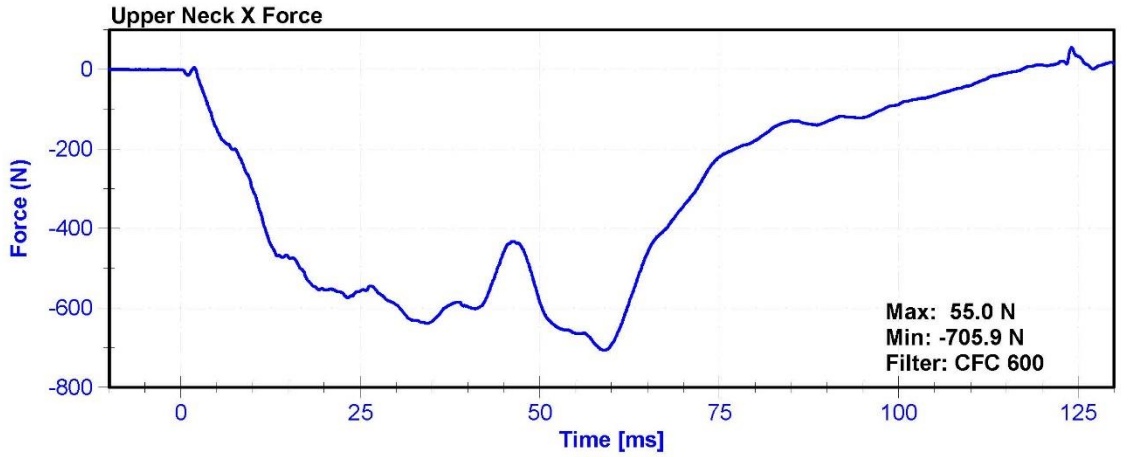



D-Plane Rotation
Rotation (Deg)
100
75
50
25
0
-25
-50
0
25
50
75
100
125
150
Time [ms]
Max: 81.7 deg
Min: -45.4 deg
Filter: CFC 60


Moment About Occipital Condyle
Moment (Nm)
75
50
25
0
-25
0
25
50
75
100
125
150
Time [ms]
Max: 72.8 Nm
Min: -23.8 Nm
Filter: CFC 600


Pendulum Deceleration
Max: 26.1 g's
Min: -5.5 g's
Filter: CFC 60
Acceleration (g's)
30
20
10
0
-10
-10
0
10
20
30
40
50
Time [ms]


Upper Neck Y Moment
Max: 64.6 Nm
Min: -32.1 Nm
Filter: CFC 600
Moment (Nm)
80
60
40
20
0
-20
-40
0
25
50
75
100
125
Time [ms]


Upper Neck X Force
Max: 55.0 N
Min: -705.9 N
Filter: CFC 600
Force (N)
0
-200
-400
-600
-800
0
25
50
75
100
125
Time [ms]

ATD Manufacturer	FTSS	Test Technician	M.Hartung
ATD Serial Number	324	Laboratory Supervisor	M.Goehle

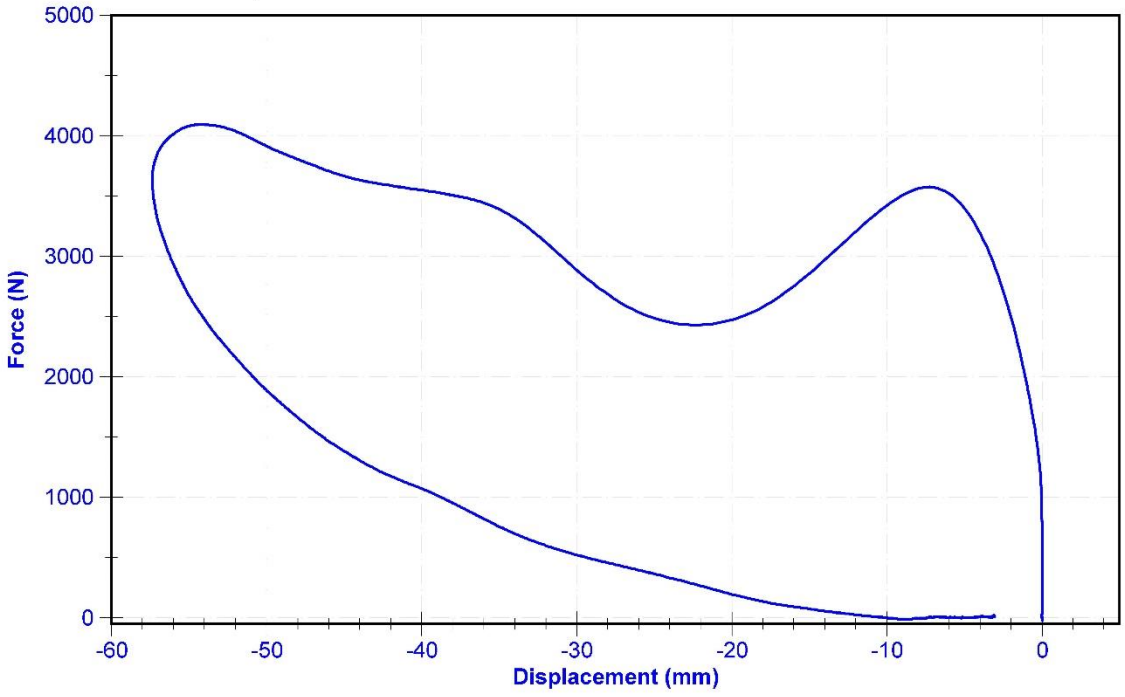
Results

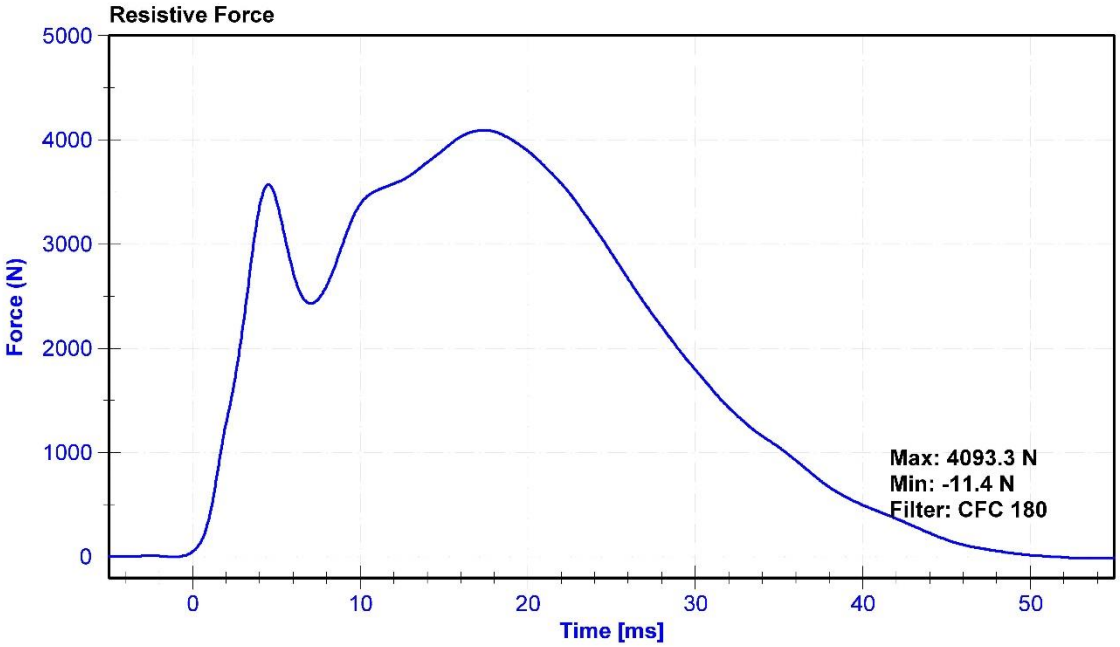
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.8	Pass
Humidity	10	70	%	57.5	Pass
Velocity	6.59	6.83	m/s	6.612	Pass
Chest Deflection	-58	-50	mm	-57.4	Pass
Maximum Resistive Force (50 to 58mm)	3,900	4,400	N	4093.3	Pass
Maximum Resistive Force (18 to 50mm)	0	4,600	N	3909.2	Pass
Hysteresis	69	85	%	75.8	Pass

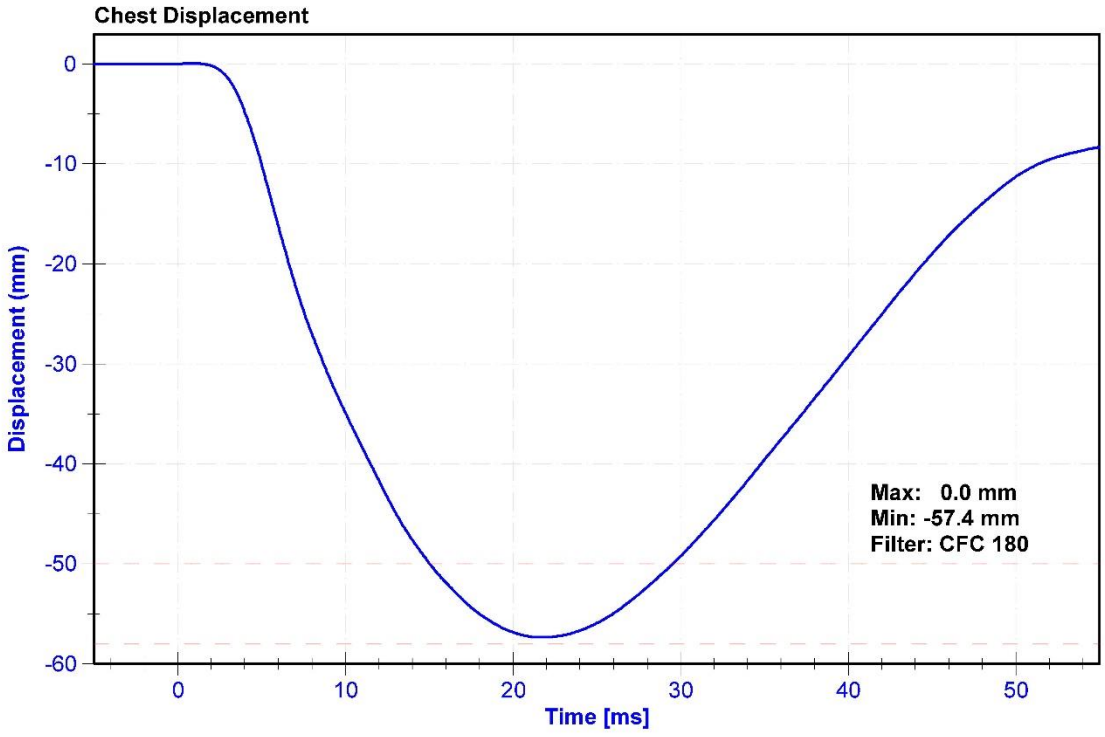
Transducer Calibrations

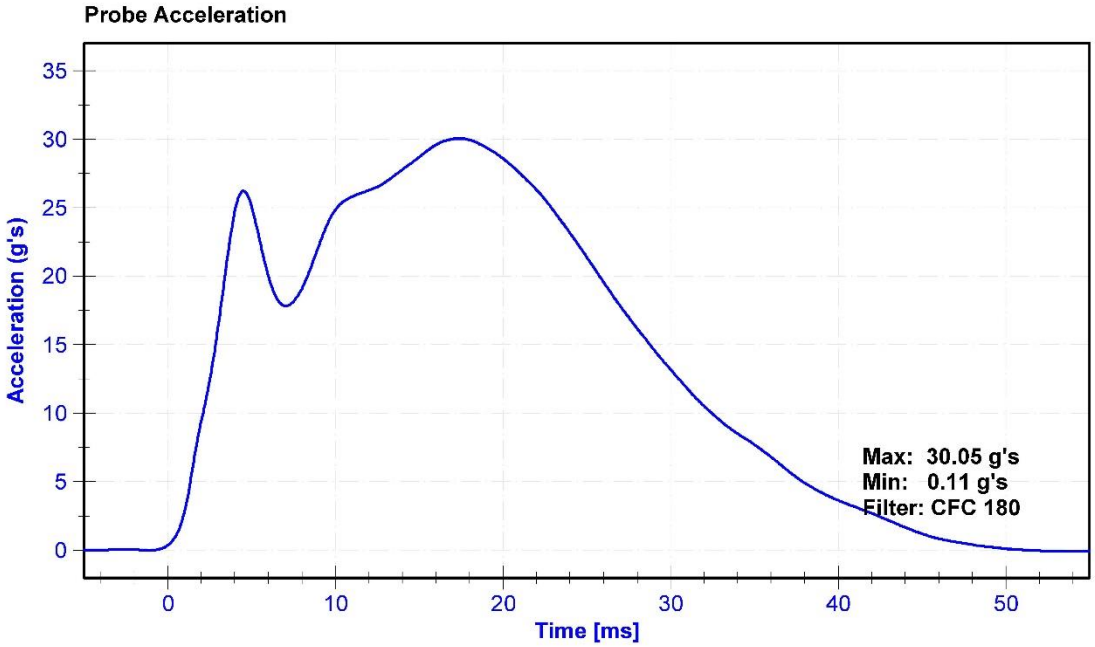
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-C14972	8/13/2015	2/11/2016
Chest Potentiometer	Servo 14CB1	DS-CST324	6/30/2015	6/29/2016

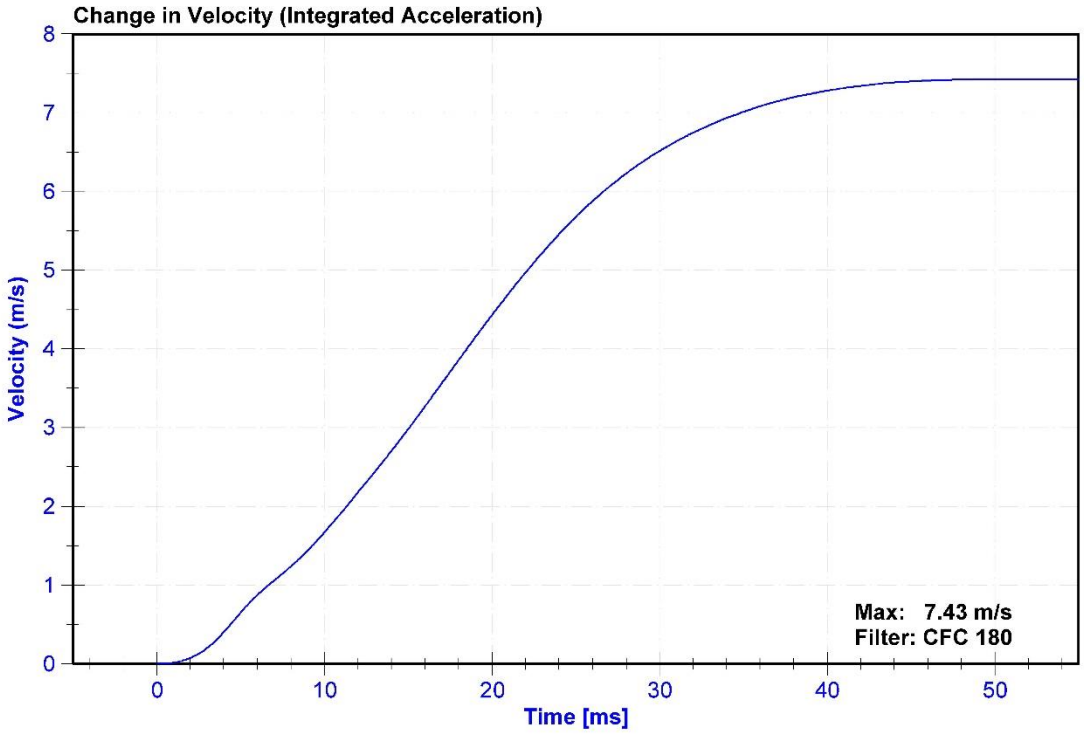
Force vs. Displacement




Resistive Force
Force (N)
5000
4000
3000
2000
1000
0
0
10
20
30
40
50
Time [ms]
Max: 4093.3 N
Min: -11.4 N
Filter: CFC 180


Chest Displacement
Displacement (mm)
0
-10
-20
-30
-40
-50
-60
0
10
20
30
40
50
Time [ms]
Max: 0.0 mm
Min: -57.4 mm
Filter: CFC 180


Probe Acceleration
Acceleration (g's)
35
30
25
20
15
10
5
0
0
10
20
30
40
50
Time [ms]
Max: 30.05 g's
Min: 0.11 g's
Filter: CFC 180


Change in Velocity (Integrated Acceleration)
Velocity (m/s)
8
7
6
5
4
3
2
1
0
0
10
20
30
40
50
Time [ms]
Max: 7.43 m/s
Filter: CFC 180

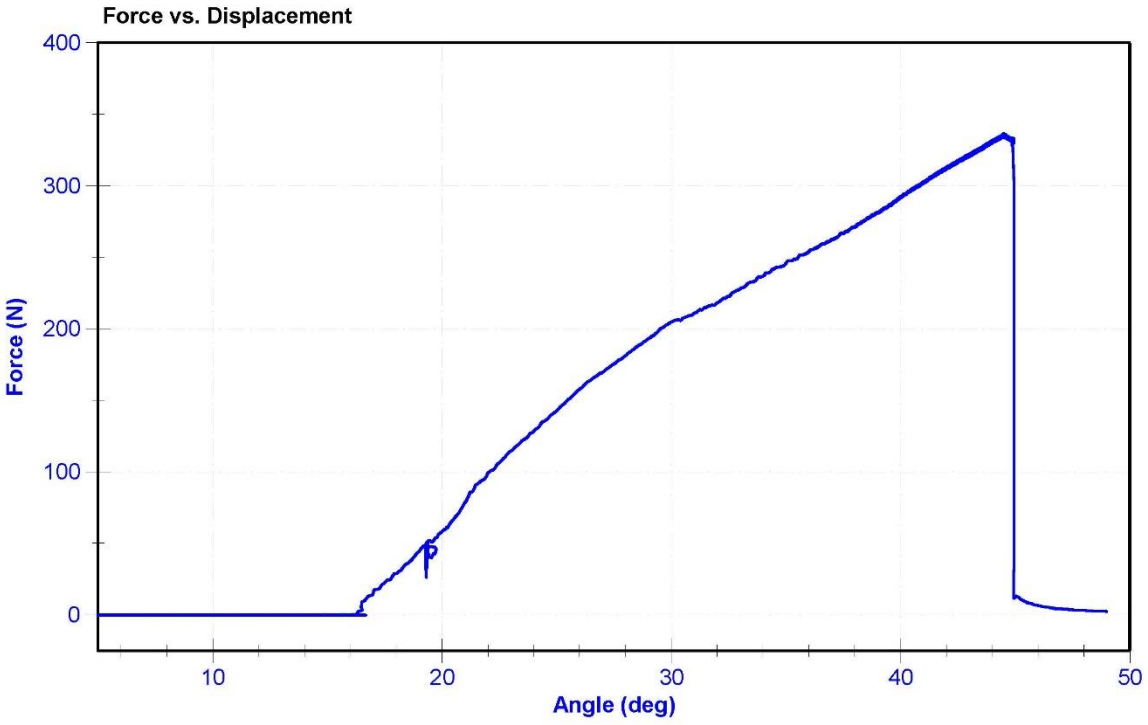
ATD Manufacturer	FTSS	Test Technician	M.Hartung
ATD Serial Number	324	Laboratory Supervisor	M.Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.6	25.6	°C	21.3	Pass
Humidity	10	70	%	69.2	Pass
Initial Angle	0	20	deg	15.6	Pass
Force at 45 Degrees	320	390	N	336.4	Pass
Return Angle Relative to Initial	0	8	deg	4.3	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Potentiometer	Rieker N4C-1	DS-13051548	8/14/2015	8/13/2016
Load Cell	Interface SML-200	LC-493319	8/13/2015	8/12/2016



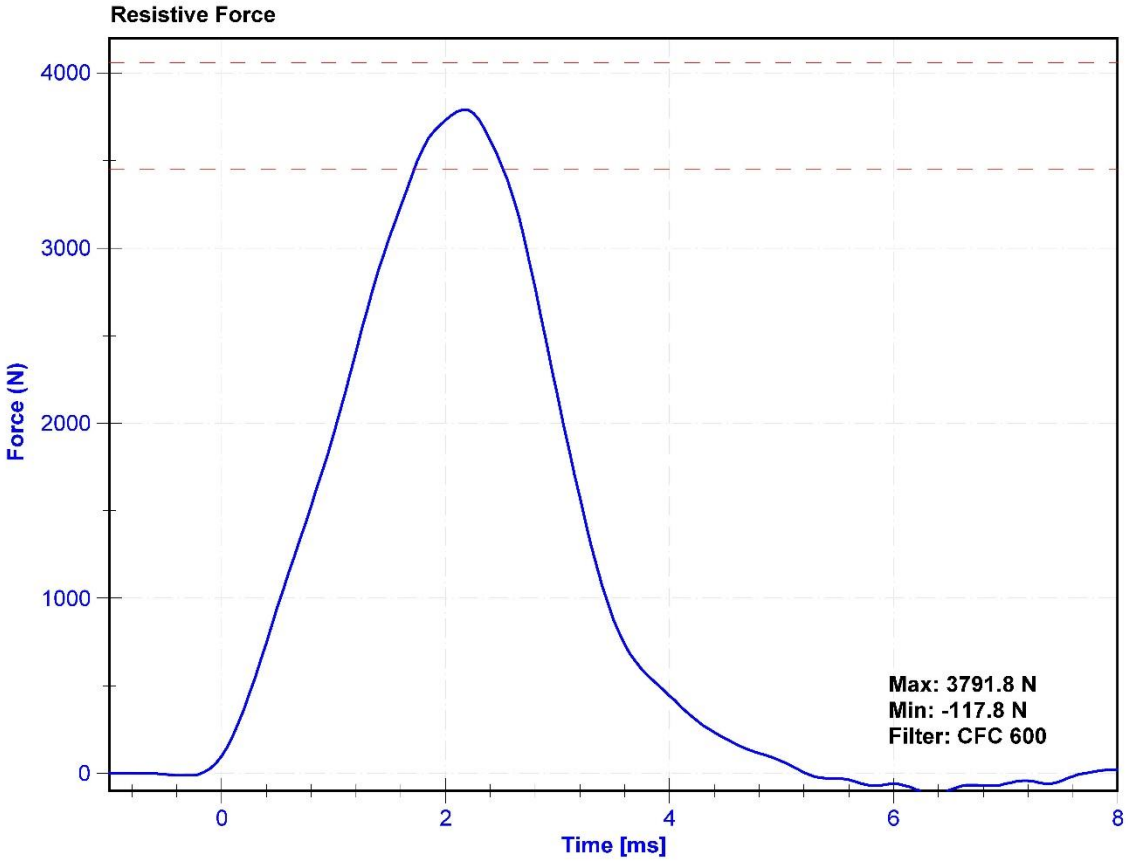
ATD Manufacturer	FTSS	Test Technician	M.Hartung
ATD Serial Number	324	Laboratory Supervisor	M.Goehle

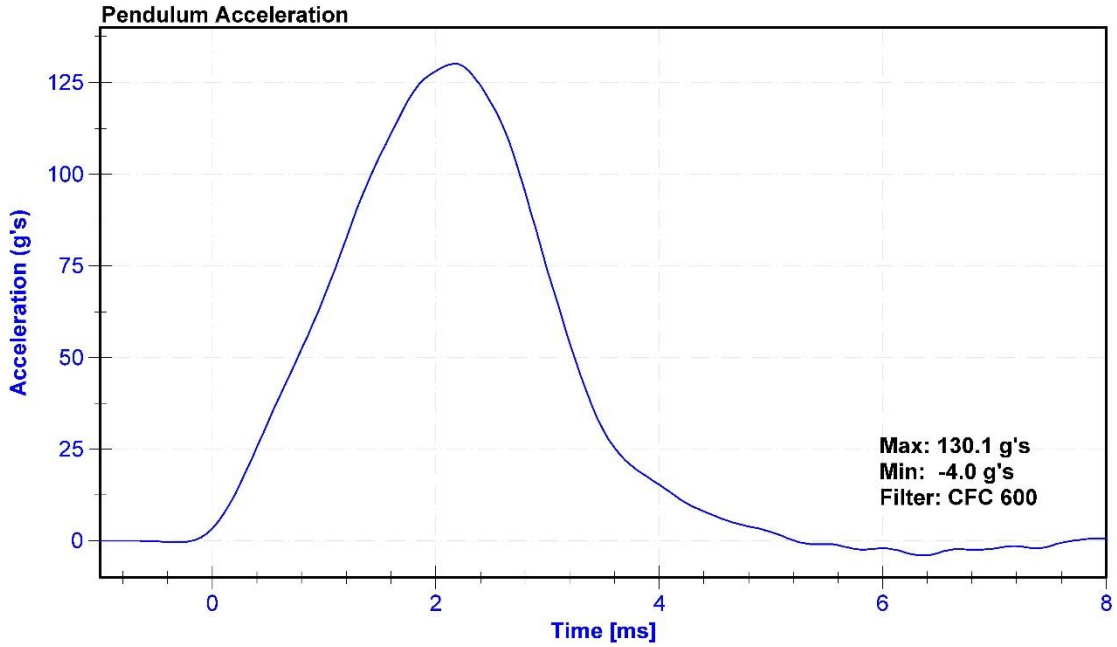
Results

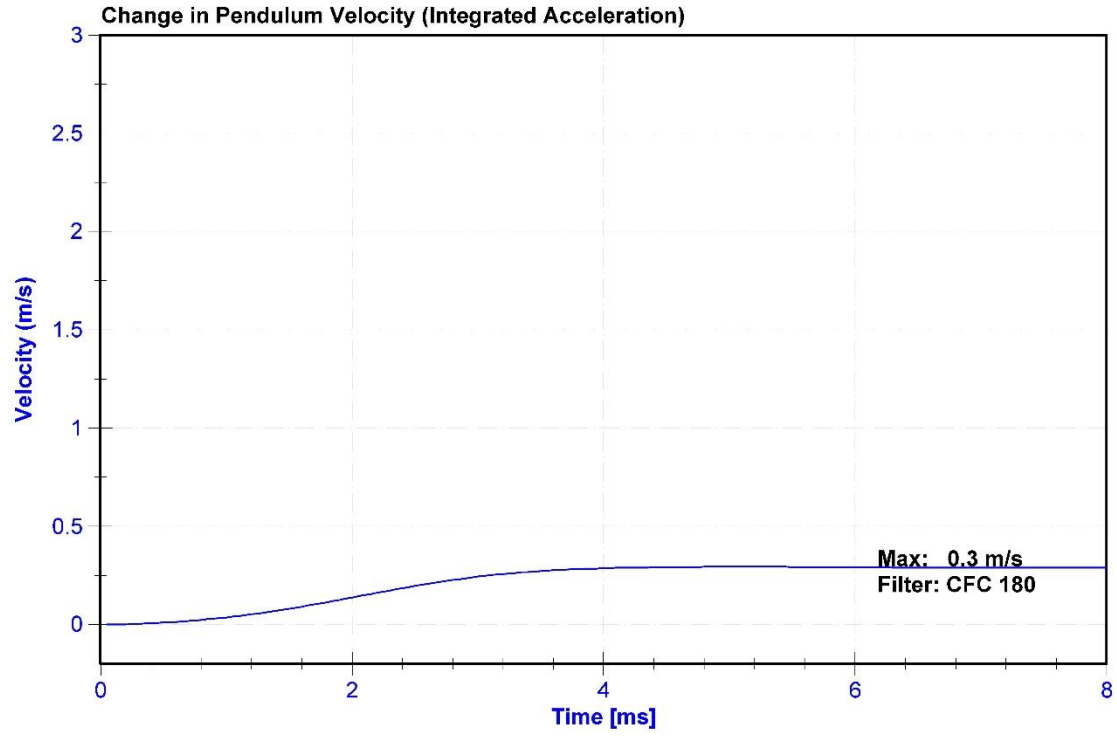
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	20.6	Pass
Humidity	10	70	%	68.3	Pass
Velocity	2.07	2.13	m/s	2.128	Pass
Resistive Force	3,450	4,060	N	3791.8	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-C14972	8/13/2015	2/11/2016




Pendulum Acceleration
Acceleration (g's)
125
100
75
50
25
0
0
2
4
6
8
Time [ms]
Max: 130.1 g's
Min: -4.0 g's
Filter: CFC 600


Change in Pendulum Velocity (Integrated Acceleration)
Velocity (m/s)
3
2.5
2
1.5
1
0.5
0
0
2
4
6
8
Time [ms]
Max: 0.3 m/s
Filter: CFC 180

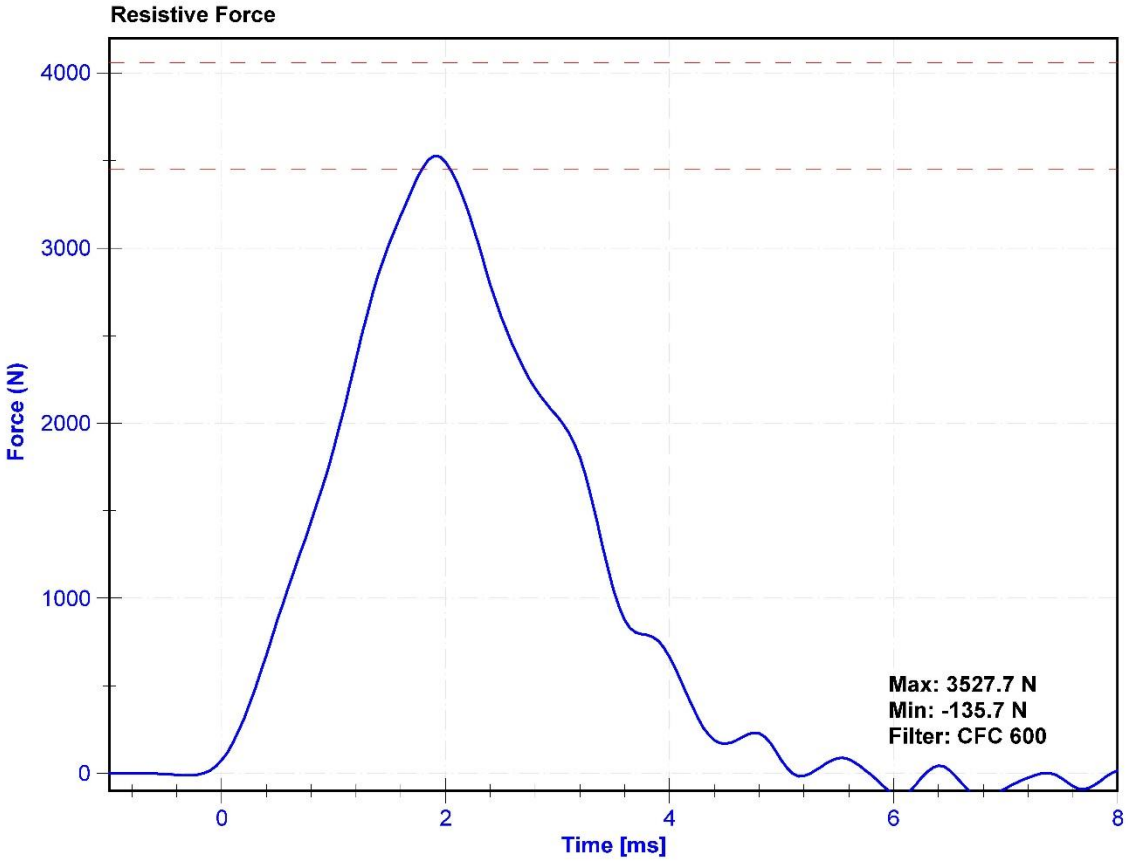
ATD Manufacturer	FTSS	Test Technician	M.Hartung
ATD Serial Number	324	Laboratory Supervisor	M.Goehle

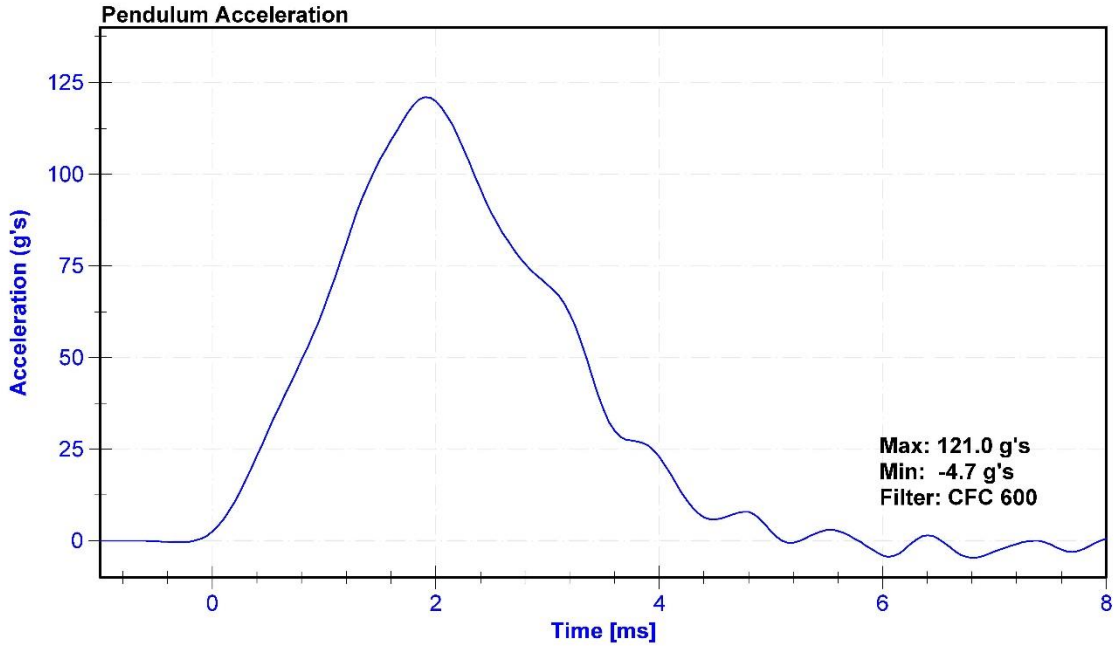
Results

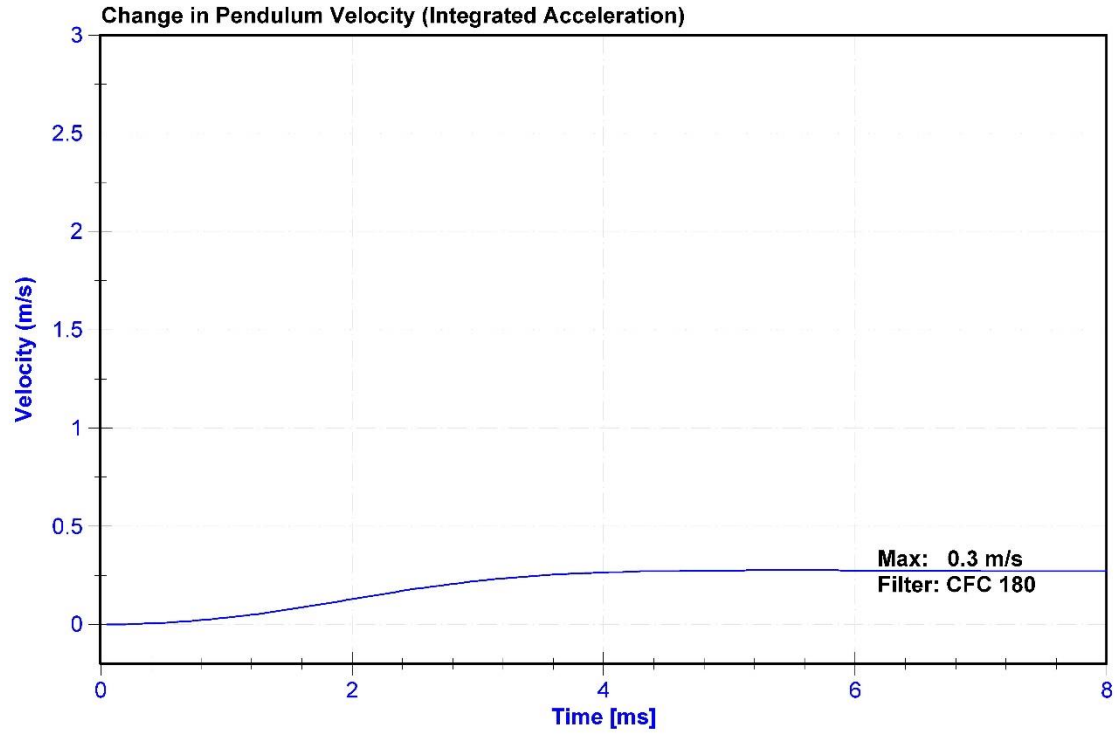
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	20.7	Pass
Humidity	10	70	%	62.7	Pass
Velocity	2.07	2.13	m/s	2.082	Pass
Resistive Force	3,450	4,060	N	3527.7	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-C14972	8/13/2015	2/11/2016




Pendulum Acceleration
Acceleration (g's)
125
100
75
50
25
0
0
2
4
6
8
Time [ms]
Max: 121.0 g's
Min: -4.7 g's
Filter: CFC 600


Change in Pendulum Velocity (Integrated Acceleration)
Velocity (m/s)
3
2.5
2
1.5
1
0.5
0
0
2
4
6
8
Time [ms]
Max: 0.3 m/s
Filter: CFC 180