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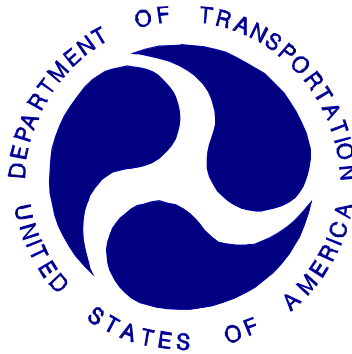
**NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST**

GM DAEWOO AUTO AND TECHNOLOGY COMPANY
2005 SUZUKI VERONA
FOUR-DOOR SEDAN

NHTSA NUMBER: M50503

GENERAL DYNAMICS TEST NUMBER: 8642-NCAP-55

GENERAL DYNAMICS
ADVANCED INFORMATION ENGINEERING SERVICES
TRANSPORTATION SCIENCES CENTER
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January 27, 2005

FINAL REPORT

PREPARED FOR:

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National Highway Traffic Safety Administration
Rulemaking
Office of Crashworthiness Standards
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16. Abstract A frontal load cell barrier test of a 2005 Suzuki Verona Four-Door Sedan was performed at General Dynamics crash test facility in Buffalo, New York, on January 27, 2005. The impact velocity was 55.84 kph and the temperature at the barrier face was 21 °C. The maximum post-test vehicle crush was 531 mm. The test vehicle was equipped with 3-point restraint systems with shoulder belt pretensioners and force limiters, adjustable head restraints, knee bolsters, and airbags at both the driver and right outboard passenger seating positions. With respect to FMVSS 208 "Occupant Crash Protection - Injury Criteria" both the driver and passenger appeared to comply with head, chest, and femur requirements.					
ATD Position	HIC	Clip (g's)	Chest Disp (mm)	Left Femur (N)	Right Femur (N)
Driver (061)	691.5	54.6	-37.7	-4226.5	-7236.7
Passenger (064)	451.8	51.8	-32.3	-2733.9	-1065.8
17. Key Words 56 kph Frontal Barrier Impact test New Car Assessment Program (NCAP)			18. Distribution Statement Copies of this report are available from: NHTSA Technical Reference Division National Highway Traffic Safety Admin. 400 Seventh St., SW, Room 5111 Washington, DC 20590		
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SECTION 1

PURPOSE AND SUMMARY OF TEST

1.1 PURPOSE

This 55.84 kph frontal barrier impact test is part of the Vehicle Barrier Impact Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-01-D-32005. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for an impact speed in excess of the current 48.3 kph requirements.

The 55.84 kph frontal barrier impact test was conducted in accordance with the Office of Crashworthiness Standards Laboratory Indicant Test procedure.

1.2 TEST PROCEDURE

This 55.84 kph frontal barrier impact test was conducted in accordance with the Office of Crashworthiness Standards (OCS) New Car Assessment Program (NCAP) Laboratory Indicant Test Procedure, dated December 1999. Data was obtained indicant of FMVSS 208, "Occupant Crash Protection"; FMVSS 212, "Windshield Retention"; FMVSS 219, "Windshield Zone Intrusion (Partial)"; and FMVSS 301 "Fuel System Integrity" performance. Procedures for receiving, inspection testing and reporting of test results are described in the test procedures and are not repeated in this report.

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 this report.

Two Part 572E, 50th percentile male anthropomorphic test devices (ATDs), were placed in the driver and right-front passenger seating positions according to dummy placement instructions specified in the Laboratory Indicant Test Procedure.

Both ATDs were fully instrumented with nine accelerometer array heads, chest and pelvis triaxial accelerometers, chest displacement potentiometers, upper neck transducers, right/left femur load cells, and lower leg instrumentation. Seat belt load cells were also on the driver's and passenger's lap and shoulder belts to measure dummy torso and pelvic section loading. The driver (position 1) ATD (Serial No. 061) and the right-front passenger (position 2) ATD (Serial No.064) were used in one test (M50102) previous to this test where they did not exceed FMVSS 208 head, chest or femur requirements. Certification details, along with instrumentation calibration data, are found in Appendix C.

The vehicle, occupant, camera and measurement data are presented in Section 2. Appendix A contains the still photograph prints. The 160 channels of data were recorded on an on-board data acquisition system. Appendix B contains the vehicle, load cell barrier and dummy response data traces. Appendix C contains the dummy calibration data and Appendix D contains the transducer calibration dates.

1.3 SUMMARY OF FRONTAL BARRIER IMPACT TEST

A load cell barrier consisting of 36 load cells was impacted by a 2005 Suzuki Verona Four-Door Sedan at a velocity of 55.84 kph. The test was performed at General Dynamics on January 27, 2005. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A.

The occupant data is summarized below.

	HIC	Clip (g)	Chest Disp. (mm)	Left Femur (N)	Right Femur (N)	Belt Spool (mm)	Belt Stretch (mm/50 mm)
Driver ATD	691.5	54.6	-37.7	-4226.5	-7236.7	§	§
Passenger ATD	451.8	51.8	-32.3	-2733.9	-1065.8	§	§

§ - Not used

AUTOMATIC DOOR LOCK SUMMARY

ADL Equipped Test Vehicle:	No
ADL Activation Status:	Not Applicable
Door Lock Condition:	Unlocked

There was 100 percent windshield retention and no intrusion into the protected zone of the windshield during the event. There was no Stoddard solvent leakage after the event or during any phase of the static rollover.

The maximum vehicle static crush was 531 mm and both the driver and passenger side doors remained closed during the impact event and were operable after the impact.

The driver's visible contact points were as follows: The face to the top of the center of the airbag, the back of the head to the left side of the head restraint, the chest to the airbag and the left and right knees to the knee bolster. The passenger's visible contact points were as follows: The face to the center of the airbag, the top of the head to the sunvisor, the chest to the airbag and the left and right knees to the knee bolster.

The 2005 Suzuki Verona Four-Door Sedan did not exceed the requirements of FMVSS 208, FMVSS 212, FMVSS 219, and FMVSS 301. Data pertaining to these standards are presented in the data sheets.

SECTION 2

GENERAL TEST AND VEHICLE PARAMETER DATA

DATA SHEET NO. 1 CRASH TEST SUMMARY

Vehicle NHTSA No.:	M50503	Test Mode:	56.3 kph Frontal Barrier
Test Date:	January 27, 2005	Time:	12:10
		Temperature:	21 °C
Vehicle Make/Model/Body Style:	2005 Suzuki Verona Four-Door Sedan		
Vehicle Test Weight:	1758.0	kg	
Vehicle/Barrier Impact Angle:	0	°	
Impact Velocity:	55.84	kph	
Maximum Static Crush:	531	mm	
Vehicle Rebound:	911	mm	

<u>DUMMIES:</u>	<u>DRIVER</u>	<u>PASSENGER</u>
Type:	572E	572E
Restraint System:	Three point safety belt with shoulder belt pretensioner and force limiter, Airbag, Head Restraint and Knee Bolster	Three point safety belt with shoulder belt pretensioner and force limiter, Airbag, Head Restraint and Knee Bolster

Number of Data Channels:	160	
Number of Cameras:	1	Real Time
	16	High Speed

DOOR OPENING DATA:

	Closed, latched and operable without tools - Left Front
	Closed, latched and operable without tools - Right Front

Front Seat(s) Data:	<u>DRIVER</u>	<u>PASSENGER</u>
Seat Track Failure: (mm of shift)	0	0
Seat Back Failure:	None	None

<u>VISIBLE DUMMY CONTACT POINTS:</u>	<u>DRIVER</u>	<u>PASSENGER</u>
Head:	The face to the top of the center of the airbag, the back of the head to the left side of the head restraint.	The face to the center of the airbag, the top of the head to the sunvisor.
Abdomen:	None	None
Chest:	Airbag	Airbag
Knees:	Knee Bolster	Knee Bolster

DATA SHEET NO. 2 GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 2005 Suzuki Verona Four-Door Sedan

NHTSA No. : M50503 ; VIN: KL5VM56L85B151730 ; Color: Silver

Engine Data: 6 cylinders; - CID; 2.5 Liters; - cc

Placement: - Longitudinal or In-Line; X Transverse or Lateral

Transmission Data: 4 speeds; - Manual; X Automatic; X Overdrive

Final Drive: - Rear Wheel Drive; X Front Wheel Drive; - Four Wheel Drive

Safety Belt Features – Driver X Pretensioner (Shoulder); X Load Limiter; X Adj. Anchorage

Safety Belt Features - Passenger X Pretensioner (Shoulder); X Load Limiter; X Adj. Anchorage

Major Options: - ADLs; X A/C; X Pwr.Strg.; X Pwr. Brakes

X Pwr. Windows; X Pwr. Door Locks; X Tilt Wheel

Date Received: 12-14-2004 ; Odometer Reading 24 km

Selling Dealer: Culligan Suzuki Inc.

& Address: 8129 Main Street Williamsville, NY 14221

DATA FROM TIRE VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured by: GM Daewoo Auto and Technology Company

Date of Manufacture 09/04

GVWR: 1941 kg; GAWR: 1060 kg FRONT; 1020 kg REAR

DATA FROM TIRE PLACARD:

Recommended Tire Size: P205/60R16

* Recommended Cold Tire Pressure: 210 kpa FRONT; 210 kpa REAR

DATA FROM TIRE SIDEWALL:

Size of Tires on Test Vehicle: P205/60R16 91H ; Manufacturer: Kumho

Tire Pressure with Maximum Capacity Vehicle Load: Front: 300 kPa; Rear: 300 kPa

Treadwear: 400 ; Traction: A ; Temperature: A

VEHICLE CAPACITY DATA:

Type of Front Seats: - Bench; X Bucket; - Split Bench

Number of Occupants: 2 Front; 3 Rear; 5 Total

Vehicle Capacity Weight (VCW) = 408.0 kg

No. of Occupants x 68.04 kg = 340.2 kg

Rated Cargo/Luggage Weight (RCLW) = 67.8 kg

*Tire pressure used for test

DATA SHEET NO. 2 GENERAL TEST AND VEHICLE PARAMETER DATA (cont.)

WEIGHT OF TEST VEHICLE AS RECEIVED FROM DEALER (with maximum fluids)= UDW:

Right Front	=	<u>454.0</u>	kg	Right Rear	=	<u>313.0</u>	kg
Left Front	=	<u>463.5</u>	kg	Left Rear	=	<u>313.0</u>	kg
TOTAL FRONT	=	<u>917.5</u>	kg	TOTAL REAR	=	<u>626.0</u>	kg
TOTAL DELIVERED WEIGHT	=	<u>1543.5</u>	kg				
% of Total Front of Vehicle Weight	=	<u>59.4</u>		% of Total Rear Weight	=	<u>40.6</u>	%

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight (UDW)	=	<u>1543.5</u>	kg
Rated Cargo/Luggage Weight (RCLW)	=	<u>67.8</u>	kg
Weight of 2 p.572 Dummies @ 76 each	=	<u>152</u>	kg
TARGET TEST WEIGHT	=	<u>1763.3</u>	kg

WEIGHT OF TEST VEHICLE WITH TWO DUMMIES AND 62.5 KG OF CARGO WEIGHT:

Right Front	=	<u>488.0</u>	kg	Right Rear	=	<u>388.0</u>	kg
Left Front	=	<u>494.0</u>	kg	Left Rear	=	<u>388.0</u>	kg
TOTAL FRONT	=	<u>982.0</u>	kg	TOTAL REAR	=	<u>776.0</u>	kg
TOTAL TEST WEIGHT	=	<u>1758.0</u>	kg				
% of Total Front Weight	=	<u>55.9</u>	%	% of Total Rear Weight	=	<u>44.1</u>	%
Weight of Ballast Secured in Vehicle Trunk Area	=	<u>0</u>	kg				
Vehicle Components Removed for Weight Reduction:				Muffler, rear side glass, side mirrors, 39 L Stoddard			

VEHICLE ATTITUDE (all dimension in millimeters):

AS DELIVERED:	RF	<u>710</u>	LF	<u>710</u>	RR	<u>710</u>	LR	<u>708</u>
FULLY LOADED:	RF	<u>700</u>	LF	<u>695</u>	RR	<u>680</u>	LR	<u>675</u>
AS TESTED:	RF	<u>705</u>	LF	<u>700</u>	RR	<u>690</u>	LR	<u>687</u>
Vehicle's Wheel Base:		<u>2691</u>	mm					
Location of Vehicle's C.G.:		<u>1188</u>	mm rearward of front wheel center.					

FUEL SYSTEM DATA:

Fuel System Capacity From Owner's Manual	=	<u>64.7</u>	liters
Usable Capacity Figure Furnished by COTR	=	<u>64.7</u>	liters
Test Volume Range (92 to 94% of Usable Capacity)	=	<u>59.52</u>	to <u>60.82</u> liters
ACTUAL TEST VOLUME	=	<u>21.6</u>	liters (with entire fuel system filled)
Test Fluid Type:	<u>Stoddard Solution</u>	; Spec. Grav. =	<u>0.764</u>
	Kinematic Viscosity =	<u>0.96</u>	centistokes; Color = <u>Orange</u>
Type of Fuel Pump: Electric-	<u>X</u>	; Mechanical-	<u>-</u>
Does Electric Pump operate with ignition switch "ON" & engine "OFF"		Yes- <u>X</u>	No- <u>-</u>
Details of Fuel System: Fuel tank – centered ahead of the rear axle; Fuel lines – inside right frame stiffener;			
Fuel Filler – Right side rear of the rear axle.			

DATA SHEET NO. 3 POST IMPACT DATA

TYPE OF TEST:

Type of Test: Frontal Barrier Impact Angle: 0°
Test Date: January 27, 2005 Time: 12:10 Temperature: 21 °C
Vehicle NHTSA No.: M50503
Required Impact Velocity Range: 55.5 to 57.1 kph

BARRIER IMPACT VELOCITY: (Speed traps within 5 feet of impact plane.)

Trap No. 1 = 55.84 kph; Trap No. 2 = 55.84 kph
Distance from vehicle to barrier: (1) entering trap = 813 mm
(2) exiting trap = 305 mm

VEHICLE STATIC CRUSH: (mm) (For frontal and rear impacts only.)

Vehicle Length:

Pre-Test	Left = <u>4715</u> ; C/L = <u>4777</u> ; Right = <u>4714</u>
Post-Test	Left = <u>4283</u> ; C/L = <u>4247</u> ; Right = <u>4217</u>
Crush	Left = <u>432</u> ; C/L = <u>530</u> ; Right = <u>497</u>
AVERAGE	= <u>486</u> mm

VEHICLE REBOUND: (From rigid barrier only.)

Distance from front of test vehicle to impact point:

	Left = <u>909</u> ; C/L = <u>917</u> ; Right = <u>907</u>
AVERAGE	= <u>911</u> mm

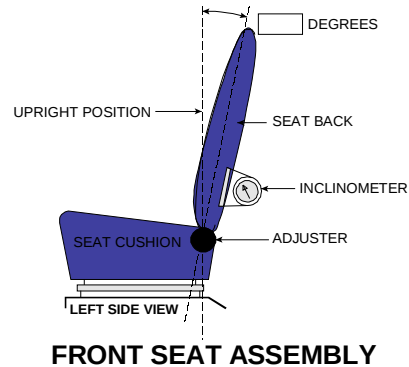
DATA SHEET NO. 4 TEST VEHICLE INFORMATION

VEHICLE IDENTIFICATION:

Model Year : 2005 Vehicle Model: Suzuki Verona Body Style : Four-Door Sedan

1. NOMINAL 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.



Seat back angle for driver's seat: 25°

Measurement instructions: Measured by reclining the seat 26 degrees from its most upright position.

Seat back angle for passenger's seat: 25°

Measurement instructions: The same as the driver's seat.

2. SEAT FORE AND AFT POSITIONING:

Positioning of the driver's seat: Placed in mid-position of 236 mm total travel (118 mm).

Positioning of the passenger's seat: Placed in detent 10 of 0 to 19 detents or at 120 mm of 230 mm total travel.

3. FUEL TANK CAPACITY DATA:

3.1 A. "Usable Capacity" of the standard equipment fuel tank is 64.7 liters

B. "Usable Capacity" of the optional equipment fuel tank is - liters

C. "Usable Capacity" of the vehicle(s) used for certification
testing to requirements of FMVSS 301 = 64.7 liters

3.2 Amount of Stoddard solvent added to vehicle(s) used for certification test(s) = 60.8 liters

3.3 Is vehicle equipped with electric fuel pump? Yes- X ; No- -

If YES, explain the vehicle operating conditions under which the fuel pump will pump fuel.

When the ignition is turned to the 'ON' position for 2.5 seconds or while the engine is running.

DATA SHEET NO. 4 TEST VEHICLE INFORMATION (cont.)

4. STEERING COLUMN ADJUSTMENTS:

Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes when it is moved through its full range of driving positions. If the tested vehicle has any of these adjustments, does your company use any specific procedures to determine the geometric center.

Operational Instructions: Placed in mid-tilt position (23°) or detent 3 of 5 total detents

5. SEAT BELT UPPER ANCHORAGE:

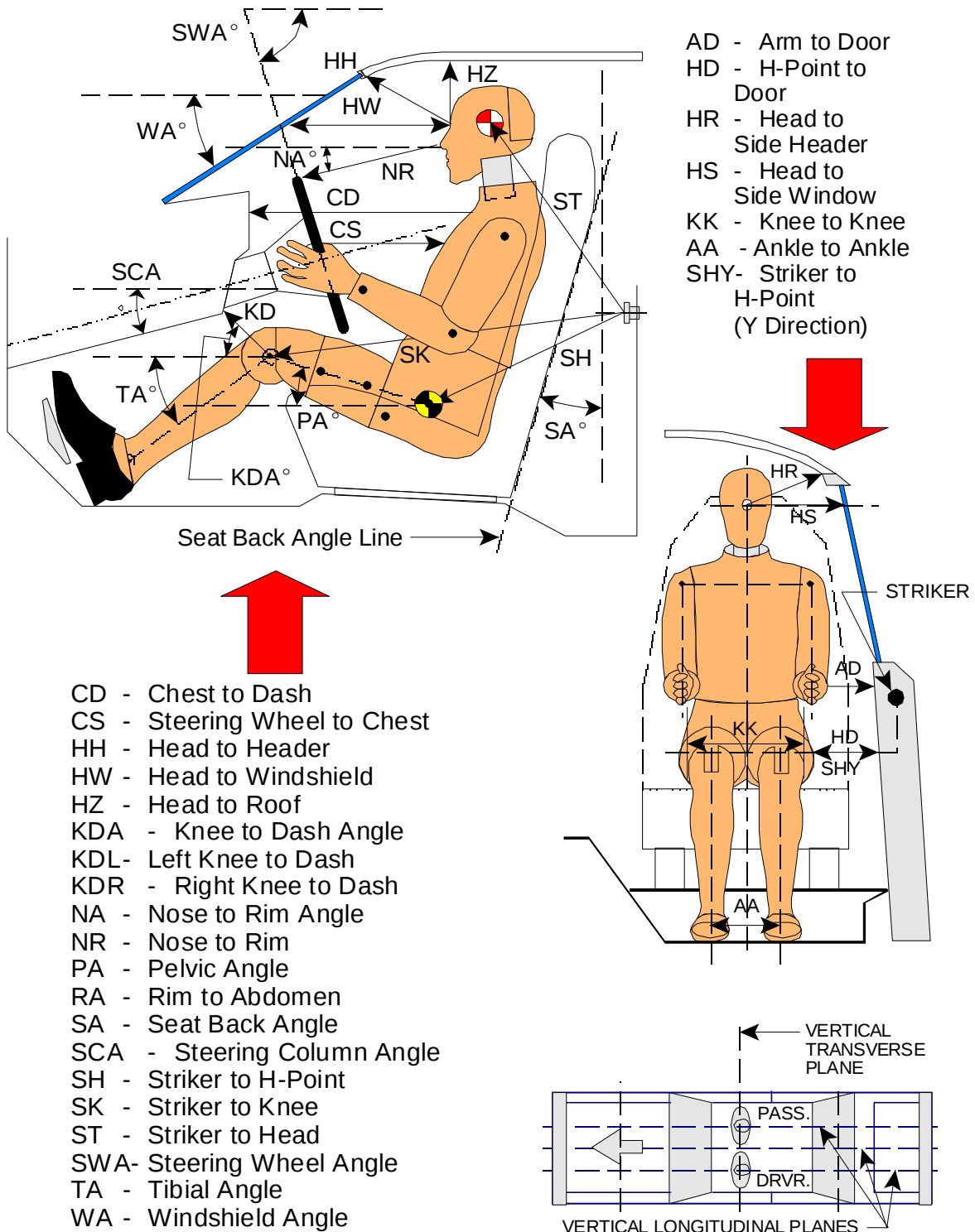
Nominal design riding position: Placed in mid-position (detent 3) of five total positions

6. AUTOMATIC DOOR LOCKS: Is test vehicle equipped with ADLs? - Yes; X No;

Does vehicle owner's manual describe how to deactivate ADLs? - Yes; - No; X N/A

Comments: None

DATA SHEET NO. 5 FRONT SEAT DUMMY POSITIONING MEASUREMENTS IN VEHICLE
DUMMY MEASUREMENT FOR FRONT SEAT PASSENGERS



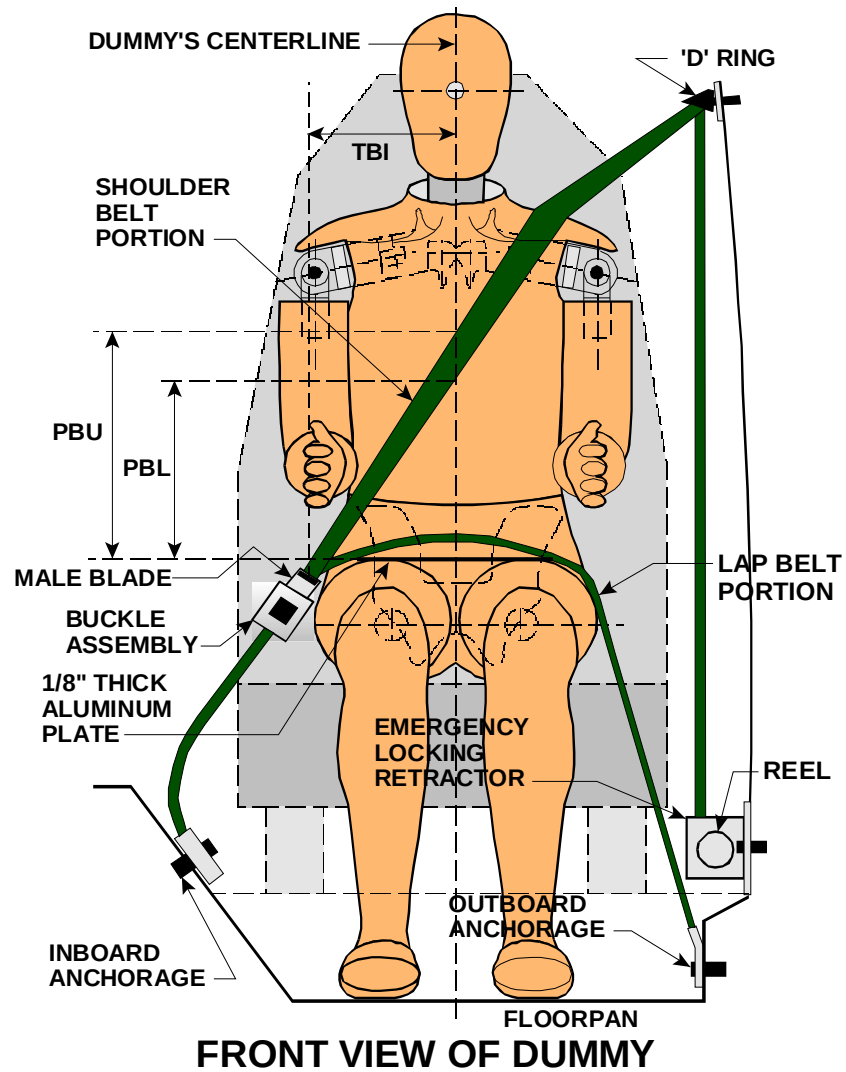
DATA SHEET NO. 5 FRONT SEAT DUMMY POSITIONING MEASUREMENTS IN VEHICLE (cont.)

	DRIVER (Serial #061)			PASS. (Serial #064)		
WA ^o	29.0 deg.			N/A		
SWA ^o	67 deg.			N/A		
SCA ^o	23 deg.			N/A		
SA ^o	25 deg.			25 deg.		
HZ	171			167		
HH	350			339		
HW	623			597		
HR	188			198		
NR	415	Angle	-9 deg.	N/A		
CD	542			626		
CS	332			N/A		
RA	208			N/A		
KDL	147	Angle (KDA)	42 deg.	148		
KDR	144			158	Angle (KDA)	32 deg.
PA ^o	23.8 deg.			24.0 deg.		
TA ^o	41.7 deg.			38.6 deg.		
KK	320			270		
AA	320			250		
ST	500	Angle	10 deg.	498	Angle	7 deg.
SK	599	Angle	95 deg.	597	Angle	97 deg.
SH	275	Angle	132 deg.	260	Angle	136 deg.
SHY	260			260		
HS	296			306		
HD	104			147		
AD	152			115		

Dimensions in millimeters

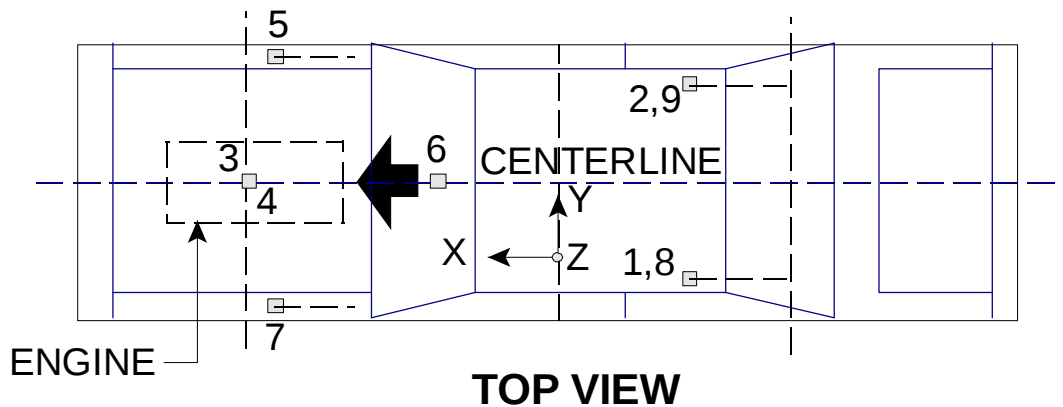
DATA SHEET NO. 6 SEAT BELT POSITIONING DATA

SEAT BELT POSITIONING DATA

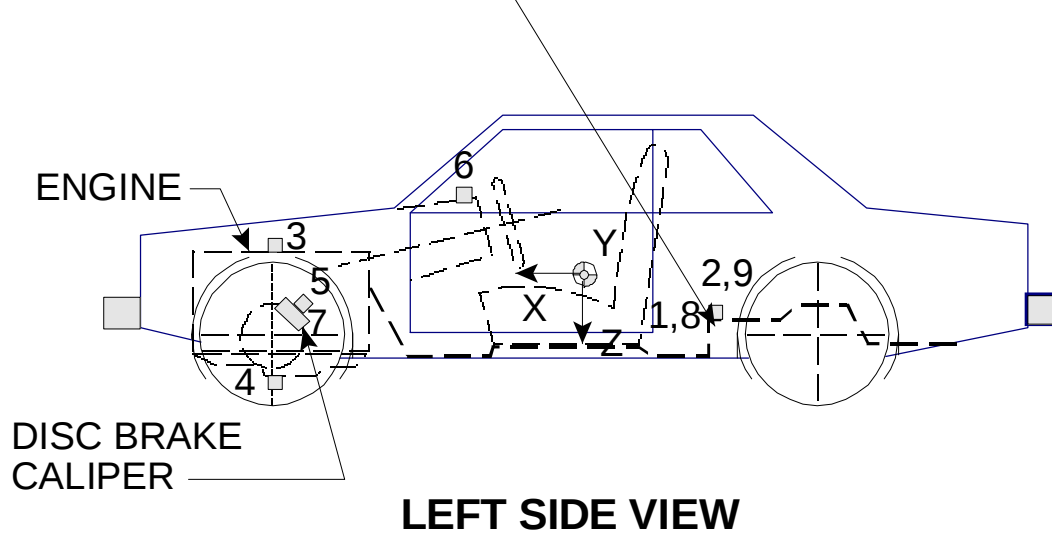


	DRIVER DUMMY (mm)	PASSENGER DUMMY (mm)
PBU -- Top surface of alum. plate to upper edge	345	335
PBL-- Top surface of alum. plate to belt lower edge	265	255
LAP BELT TENSION	10 N	10 N
SHOULDER BELT TENSION	Retractor	Retractor

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY



REAR SEAT CUSHION
ASSY. FRONT ATTACHMENT
BRACKET SUPPORT



Note: Vehicle accelerometer location and data summary shown in DATA SHEET NO. 7

DATA SHEET NO. 7 VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY (cont.)

LOCATION		PRE-TEST LENGTH (mm)		
		X	Y	Z
1	Left Rear Seat Cross Member X	1682	-651	-349
2	Right Rear Seat Cross Member X	1682	651	-349
3	Top of Engine Block	3995	-410	-852
4	Bottom of Engine	3896	62	-256
5	Disc Brake Caliper @ Right Side	3779	657	-328
6	Instrument Panel	2961	0	-828
7	Disc Brake Caliper @Left Side	3778	-660	-326
8	Left Rear Seat Cross Member Z	1682	-651	-349
9	Right Rear Seat Cross Member Z	1682	651	-349

LOCATION NUMBER	DESCRIPTION	MAXIMUM VALUE (g's)			
		Pos.	msec.	Neg.	msec.
1	Left Rear Seat Cross Member X	1.7	101.1	-40.9	36.4
2	Right Rear Seat Cross Member X	2.5	145.6	-34.6	40.3
3	Top of Engine Block	‡	‡	‡	‡
4	Bottom of Engine	5.1	42.7	-100.6	27.8
5	Disc Brake Caliper @ Right Side	36.2	61.2	-107.7	42.8
6	Instrument Panel	40.6	24.9	-75.5	52.5
7	Disc Brake Caliper @Left Side	§	§	§	§
8	Left Rear Seat Cross Member Z	13.8	63.0	-11.8	43.1
9	Right Rear Seat Cross Member Z	6.3	58.0	-7.2	30.2

‡ - Questionable – wire cut at 35 ms.

§ - Data is meaningless

DATA SHEET NO. 8 DUMMY INJURY CRITERIA VALUES

Vehicle Year/Make/Model/Body Style: 2005 Suzuki Verona Four-Door Sedan

NHTSA Test No.: M50503 Test Date: January 27, 2005

		MAXIMUM VALUE							
		Driver				Passenger			
DESCRIPTION	Unit	Pos	msec	Neg	msec	Pos	msec	Neg	msec
Head 9 Array X Arm Y	g	4.1	71.2	-8.6	63.0	2.0	26.3	-10.5	112.9
Head 9 Array X Arm Z	g	32.2	61.2	-6.5	129.2	52.1	76.8	-8.2	125.4
Head 9 Array Y Arm X	g	13.8	196.7	-59.4	79.0	1.7	185.6	-54.8	77.0
Head 9 Array Y Arm Z	g	28.4	76.1	-2.3	128.7	39.1	76.2	-0.7	17.4
Head 9 Array Z Arm X	g	24.4	196.9	-72.4	70.2	4.3	199.5	-44.5	112.2
Head 9 Array Z Arm Y	g	4.1	57.4	-11.6	82.1	8.0	81.1	-15.1	114.0
Head X	g	13.5	196.4	-61.9	79.1	1.7	35.9	-53.0	77.5
Head Y	g	2.3	31.1	-7.9	83.9	6.0	30.3	-11.5	111.5
Head Z	g	27.8	75.6	-3.8	106.8	41.4	77.4	-0.5	17.4
Head Resultant	g	66.8	75.7	0.0	-17.5	66.8	77.2	0.1	7.5
Redundant Head X	g	14.5	196.6	-62.3	78.7	2.7	185.0	-51.1	77.5
Redundant Head Y	g	2.8	53.0	-8.4	84.0	6.1	30.3	-12.1	113.0
Redundant Head Z	g	28.2	75.6	-4.0	106.8	41.4	77.4	-0.5	17.4
Redundant Head Resultant	g	67.4	75.7	0.0	-15.8	65.6	77.6	0.0	7.3
Upper Neck Fx	N	1108.9	69.3	-365.0	116.2	156.2	66.4	-661.5	114.5
Upper Neck Fy	N	123.8	62.9	-134.5	93.0	87.5	199.9	-293.3	122.0
Upper Neck Fz	N	1668.3	70.0	-140.2	107.0	1968.7	77.1	-251.6	113.9
Upper Neck F Resultant	N	1996.2	69.7	0.2	-16.0	2005.2	76.8	2.2	-44.0
Upper Neck Mx	N-m	3.8	146.9	-9.4	106.8	13.4	95.5	-12.2	135.9
Upper Neck My	N-m	97.6	69.0	-19.6	46.1	50.4	125.3	-27.9	76.6
Upper Neck Mz	N-m	5.2	71.3	-4.4	142.4	10.3	93.4	-6.5	147.1
Upper Neck M Resultant	N-m	97.8	69.0	0.0	-16.6	51.7	125.2	0.1	-35.1
Chest X	g	2.1	138.3	-55.8	68.5	0.8	159.7	-54.0	70.2
Chest Y	g	5.1	83.7	-3.3	49.0	2.9	39.4	-10.3	90.1
Chest Z	g	6.3	51.4	-9.3	95.5	18.4	77.8	-13.8	104.7
Chest Resultant	g	55.8	68.5	0.0	-10.8	54.3	70.2	0.1	-9.2

DATA SHEET NO. 8 DUMMY INJURY CRITERIA VALUES (cont.)

Vehicle Year/Make/Model/Body Style: 2005 Suzuki Verona Four-Door Sedan
 NHTSA Test No.: M50503 Test Date: January 27, 2005

		MAXIMUM VALUE							
		Driver				Passenger			
DESCRIPTION	Unit	Pos	msec	Neg	msec	Pos	msec	Neg	msec
Redundant Chest X	g	2.1	144.0	-54.4	68.3	0.9	159.9	-53.3	70.4
Redundant Chest Y	g	5.2	82.8	-3.4	62.0	2.9	39.4	-10.2	90.1
Redundant Chest Z	g	6.2	51.4	-8.9	95.5	18.0	77.9	-13.9	104.7
Redundant Chest Resultant	g	54.4	68.4	0.0	-12.3	53.7	70.4	0.1	-1.0
Chest Displacement	mm	0.0	-35.8	-37.7	72.8	0.0	-10.5	-32.3	79.1
Pelvic X	g	2.9	95.7	-92.1	46.1	5.5	113.1	-62.8	59.5
Pelvic Y	g	13.6	83.7	-11.7	45.5	8.9	47.0	-8.0	73.1
Pelvic Z	g	2.0	31.8	-28.3	64.9	2.0	34.6	-30.6	72.4
Pelvic Resultant	g	92.7	46.1	0.0	-9.1	65.0	57.1	0.0	-1.4
Left Femur	N	543.6	40.7	-4226.5	47.0	911.6	43.0	-2733.9	57.4
Right Femur	N	513.6	35.0	-7236.7	47.2	†	†	-1065.8	52.1
Left Upper Tibia Mx	N-m	24.2	48.0	-18.1	33.3	32.8	75.7	-15.7	56.3
Left Upper Tibia My	N-m	110.0	32.0	-35.7	46.2	99.4	40.5	-66.7	50.4
Left Lower Tibia Fz	N	72.8	139.7	-2998.5	31.6	58.5	161.7	-2992.8	38.3
Left Lower Tibia Mx	N-m	61.2	57.1	-6.8	36.8	13.2	76.0	-7.9	56.0
Left Lower Tibia My	N-m	64.5	68.0	-25.9	32.7	81.6	64.8	-50.6	42.3
Right Upper Tibia Mx	N-m	21.9	76.8	-44.1	58.7	27.3	40.0	-29.5	59.1
Right Upper Tibia My	N-m	144.4	51.5	-15.8	117.6	88.5	40.0	-14.3	77.7
Right Lower Tibia Fz	N	133.1	183.7	-7172.2	48.2	23.8	187.9	-2260.2	80.2
Right Lower Tibia Mx	N-m	62.2	48.7	-8.0	40.3	60.8	58.5	-15.0	39.0
Right Lower Tibia My	N-m	74.4	51.4	-37.6	41.8	104.0	78.2	-41.5	40.4
Left Foot Aft Ax	g	16.1	82.9	-88.0	30.2	41.4	57.3	-123.7	38.6
Left Foot Aft Az	g	18.1	42.9	-62.9	30.6	24.4	60.0	-62.3	41.6
Left Foot Fore Az	g	88.7	43.1	-86.2	33.9	59.5	60.8	-115.8	47.0
Right Foot Aft Ax	g	94.3	56.2	-187.6	46.9	106.6	76.4	-90.9	39.3
Right Foot Aft Az	g	33.8	57.1	-111.0	46.3	16.3	61.9	-50.9	44.6
Right Foot Fore Az	g	135.5	55.9	-229.2	46.4	44.7	57.4	-80.2	48.3
Lap Belt Load	N	7493.6	53.2	-13.2	3.0	7848.6	59.4	-2.4	-45.4
Torso Belt	N	4629.4	70.7	-20.2	143.9	4523.5	77.0	-1.1	167.8

† - Data Spikes Present

DATA SHEET NO. 8 DUMMY INJURY CRITERIA VALUES (cont.)

Vehicle Year/Make/Model/Body Style: 2005 Suzuki Verona Four-Door Sedan

NHTSA Test No.: M50503 Test Date: January 27, 2005

HEAD INJURY CRITERIA (HIC)				
	HIC**	t ₁ (msec)	t ₂ (msec)	Average Acceleration t ₁ to t ₂
Position #1 - Driver	691.5	57.8	91.9	52.8 g
Position #2 - Passenger	451.8	61.8	97.8	43.6 g

** HIC is as defined in FMVSS 208. The maximum time interval from t₁ to t₂ is 36 milliseconds.

CLIP SUMMARY*				
	CLIP (g's)	t ₁ (msec)	t ₂ (msec)	CSI
Position #1 - Driver	54.6	67.0	70.0	557.0
Position #2 - Passenger	51.8	69.0	72.0	481.4

* The maximum chest resultant acceleration is defined as the maximum acceleration which exceeds 0.003 seconds in duration.

DATA SHEET NO. 8 DUMMY INJURY CRITERIA VALUES (cont.)
REDUNDANT DATA

Vehicle Year/Make/Model/Body Style: 2005 Suzuki Verona Four-Door Sedan
NHTSA Test No.: M50503 Test Date: January 27, 2005

HEAD INJURY CRITERIA (HIC) REDUNDANT				
	HIC**	t ₁ (msec)	t ₂ (msec)	Average Acceleration t ₁ to t ₂
Position #1 - Driver	688.3	57.8	92.0	52.6 g
Position #2 - Passenger	419.9	61.4	97.3	42.3 g

** HIC is as defined in FMVSS 208. The maximum time interval from t₁ to t₂ is 36 milliseconds.

CLIP SUMMARY* REDUNDANT				
	CLIP (g's)	t ₁ (msec)	t ₂ (msec)	CSI
Position #1 - Driver	52.9	66.9	69.9	528.3
Position #2 - Passenger	51.1	69.0	72.0	459.3

* The maximum chest resultant acceleration is defined as the maximum acceleration which exceeds 0.003 seconds in duration.

DATA SHEET NO. 9 SEAT BELT PERFORMANCE ASSESSMENT TEST DATA

BELT LENGTH DATA:

Belt length from trim panel exit
to bolt hole anchor point for
continuous webbing systems.

Driver

Passenger

1930

1840

Shoulder belt length as measured
on Part 572 Dummy.

860

840

Lap belt length as measured
on Part 572 Dummy.

910

860

Dimensions in millimeters

DATA SHEET NO.10 SUMMARY OF FMVSS 212 DATA

FMVSS NO. 212 - "WINDSHIELD MOUNTING" DATA

DETAILS OF WINDSHIELD MOUNTING SUCH AS RETENTION METHOD, TRIM TYPE, ETC.:

Windshield is bonded in place and covered with a 15 mm molding.

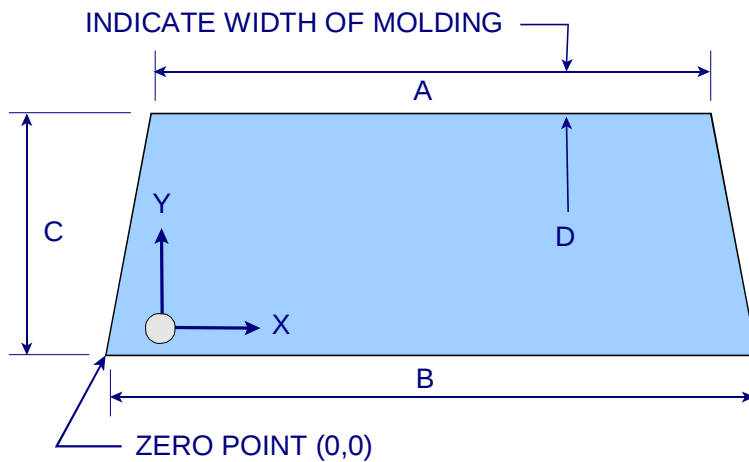
FMVSS 212 REQUIREMENTS:

The Post-Test periphery retention amount must be at least 75% of the Pre-Test periphery measurement for vehicles NOT equipped with automatic restraints, and 50% for each side of the windshield for vehicles equipped with automatic restraint systems for front occupants,

FMVSS 212 TEST DATA

	WINDSHIELD PERIPHERY		% OF RETENTION
	PRE-TEST (mm)	POST-TEST (mm)	
RIGHT SIDE	2110	2110	100.0%
LEFT SIDE	2110	2110	100.0%
TOTAL	4220	4220	100.0%

AREA OF RETENTION FAILURE:



DIMENSIONS (mm)	
A	1210
B	1490
C	760
D	15

FRONT VIEW OF WINDSHIELD

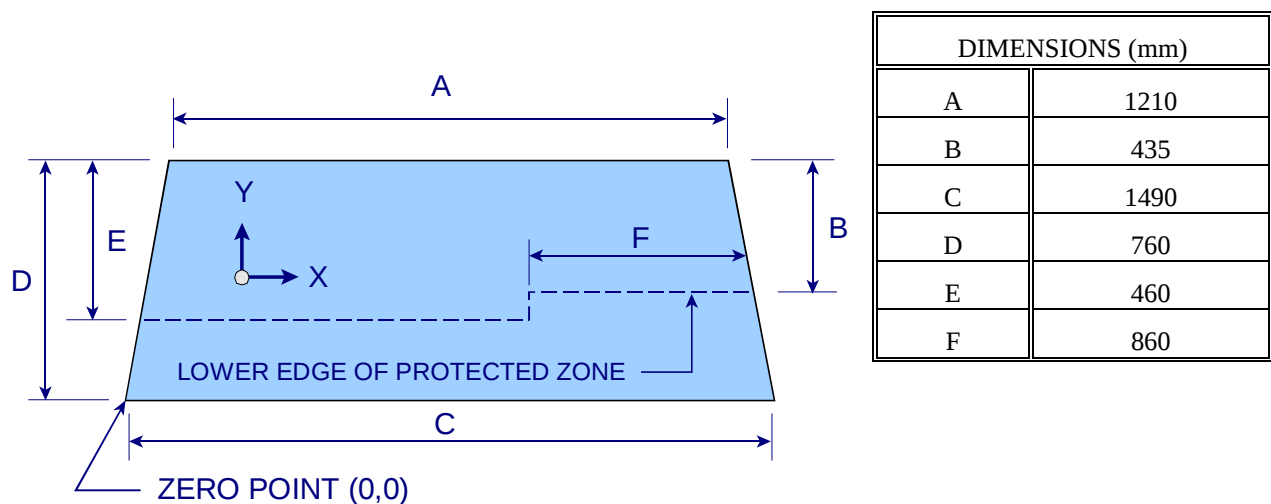
FAILURE DETAILS: None

DATA SHEET NO. 11 FMVSS NO. 219 (PARTIAL) - "WINDSHIELD ZONE INTRUSION" DATA

PROTECTED ZONE LOWER EDGE REQUIREMENT:

The lower edge of the protected zone is determined by placing a 165 mm diameter rigid sphere weighing 6.8 kg in a position such that it simultaneously contacts the inner surface of the windshield and the top surface of the instrument panel including padding. The locus of points is drawn on the inner surface of the windshield contacted by the sphere across the width of the instrument panel. From the outermost contactable points extend the locus line horizontally to the edges of the windshield, then draw a line on the inner surface of the windshield below and 13 mm distant from the locus line. The LOWER EDGE OF THE PROTECTED ZONE is the longitudinal projection of this line onto the outer surface of the windshield.

FMVSS 219 TEST DATA:



FRONT VIEW OF WINDSHIELD

DETAILS OF WINDSHIELD GLASS PENETRATION GREATER THAN 6 mm: None

(Show location of penetration on the above sketch)

COORDINATES		
	X	Y
1.	-	-
2.	-	-
3.	-	-
4.	-	-

NHTSA TEST No.: M50503 TEST DATE: January 27, 2005

VEHICLE MAKE/MODEL: 2005 Suzuki Verona Four-Door Sedan

=====

TEST VEHICLE IMPACT TYPE:	
X	Frontal (56 kph)
	Oblique (48 kph) with _____ deg. barrier face first contacting _____
-	(driver/passenger) side
-	Rear Moving Barrier (48 kph)
-	Lateral Moving Barrier (32 kph)

1. From impact until vehicle motion ceases
2. For 5 minute period after vehicle motion ceases
3. For next 25 minutes

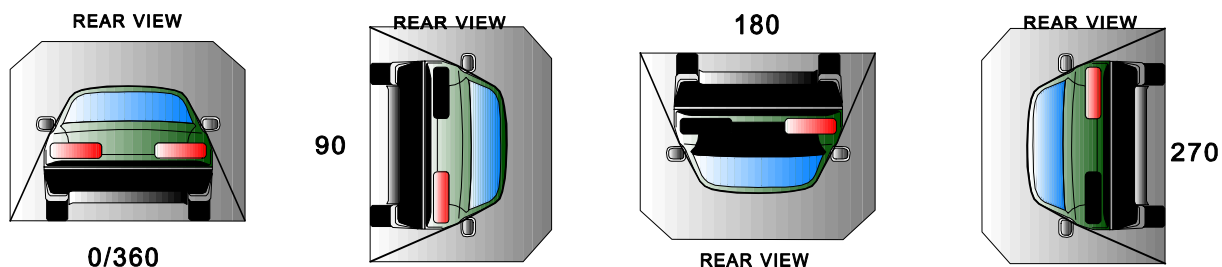
ACTUAL	MAX ALLOWED
0	28 g
0	141 g
0	28 g/min.

8642-NCAP-55

DATA SHEET NO. 13 - ROLLOVER DATA

Vehicle: 2005 Suzuki Verona Four-Door Sedan

NHTSA No.: M50503



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Stage	Rotation Time (spec. 1 -3 min)				FMVSS 301 Hold Time		Total Time				Next Whole Minute Interval	
0° - 90°	1	minutes	09	seconds	5	minutes	6	minutes	9	seconds	7	minutes
90° - 180°	1	minutes	11	seconds	5	minutes	6	minutes	11	seconds	7	minutes
180°-270°	1	minutes	03	seconds	5	minutes	6	minutes	3	seconds	7	minutes
270°-360°	1	minutes	12	seconds	5	minutes	6	minutes	12	seconds	7	minutes

II. FMVSS 301 REQUIREMENTS: (Maximum allowable solvent spillage):

First 5 minutes from onset of rotation	6th min.	7th min.	8th min. (if required)
142 g	28 g	28 g	28 g

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

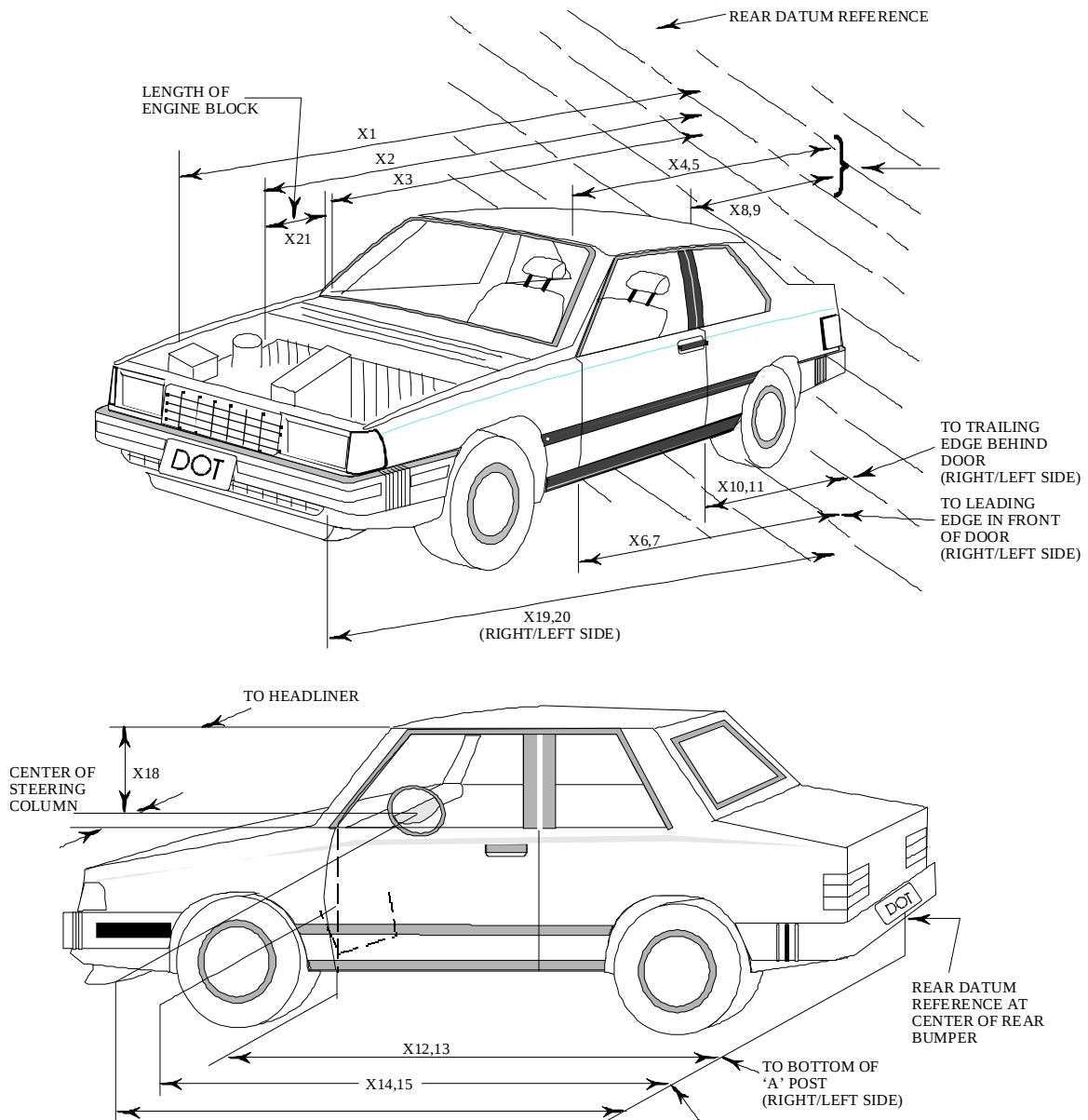
Rollover Stage	First 5 minutes from onset of rotation (g)	6th min. (g)	7th min. (g)	8th min. (if required) (g)
0° - 90°	0	0	0	N/A
90° - 180°	0	0	0	N/A
180°-270°	0	0	0	N/A
270°-360°	0	0	0	N/A

Note: Record spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATION(S):

Rollover Stage	Spillage Location
0° - 90°	None
90° - 180°	None
180°-270°	None
270°-360°	None

DATA SHEET NO. 14 TEST VEHICLE MEASUREMENTS

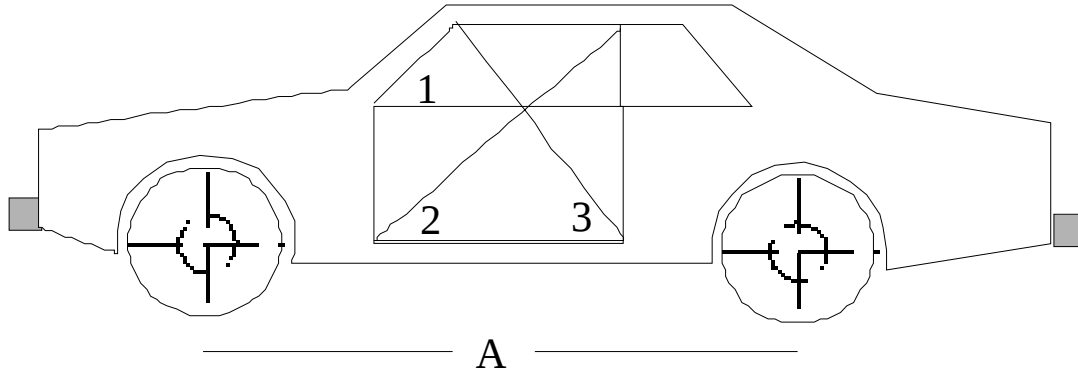


DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)

No.		Pre-Test	Post-Test	Difference
X1	Total Length of Vehicle at Centerline	4777	4247	530
X2	Rear Surface of Vehicle to Front of Engine	4258	4001	257
X3	Rear Surface of Vehicle to Firewall	3633	3541	92
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	3205	3179	26
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	3203	3199	4
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	3224	3217	7
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	3221	3227	-6
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	2173	2147	26
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	2173	2168	5
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	2188	2183	5
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	2187	2192	-5
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	3267	3231	36
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	3264	3260	4
X14	Rear Surface of Vehicle to Firewall, Right Side	3613	3534	79
X15	Rear Surface of Vehicle to Firewall, Left Side	3608	3566	42
X16	Rear Surface of Vehicle to Steering Column	2803	2814	-11
X17	Center of Steering Column to "A" Post	329	328	1
X18	Center of Steering Column to Headliner	406	422	-16
X19	Rear Surface of Vehicle to Right Side of Front Bumper	4714	4217	497
X20	Rear Surface of Vehicle to Left Side of Front Bumper	4715	4283	432
X21	Length of Engine Block	525	525	0
RD	Rear Surface of Vehicle to Right Side of Dash Panel	2971	2940	31
CD	Rear Surface of Vehicle to Center of Dash Panel	3073	3031	42
LD	Rear Surface of Vehicle to Left Side of Dash Panel	2965	2948	17

All Dimensions in mm

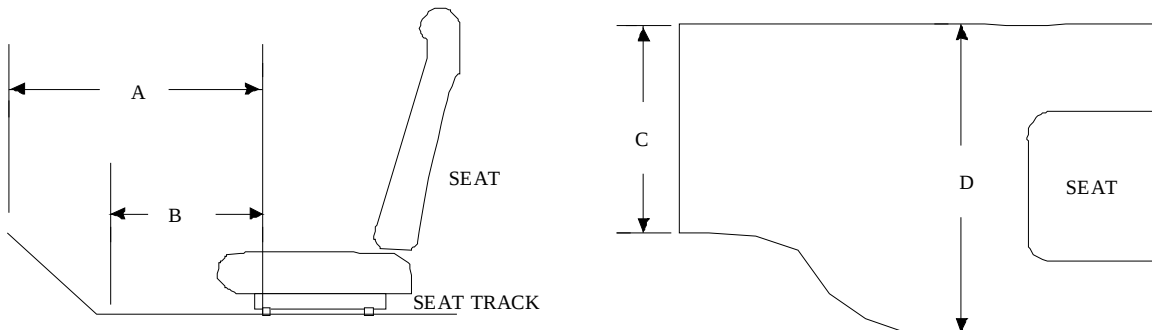
DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)
 VEHICLE INTRUSION MEASUREMENTS
 DOOR OPENING WIDTH



UNITS (mm)	LEFT			RIGHT		
MEASUREMENT	1	2	3	1	2	3
BEFORE TEST	961	1431	951	961	1427	923
AFTER TEST	945	1435	960	938	1430	943
DIFFERENCE	16	-4	-9	23	-3	-20

UNITS (mm)	A = WHEELBASE LEFT	A = WHEELBASE RIGHT
BEFORE TEST	2691	2691
AFTER TEST	2653	2590
DIFFERENCE	38	101

DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)
 VEHICLE INTRUSION MEASUREMENTS
 STATIC FOOTWELL DEFORMATION



DRIVER

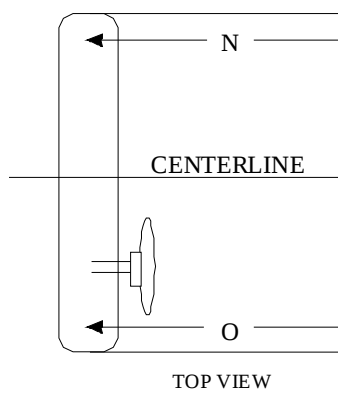
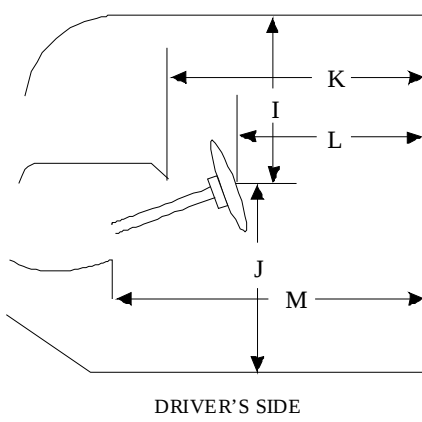
Measurement	Pre-Test	Post-Test	Difference
A	1209	1122	87
B	1006	1000	6
C	506	488	18
D	502	504	-2

PASSENGER

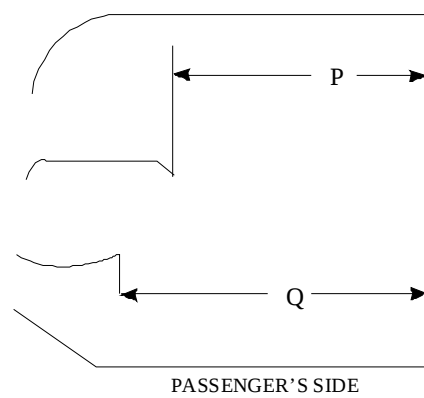
Measurement	Pre-Test	Post-Test	Difference
A	1173	1062	111
B	981	938	43
C	510	476	34
D	498	494	4

Units = mm

DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)
 VEHICLE INTRUSION MEASUREMENTS
 STATIC PASSENGER COMPARTMENT INTRUSION



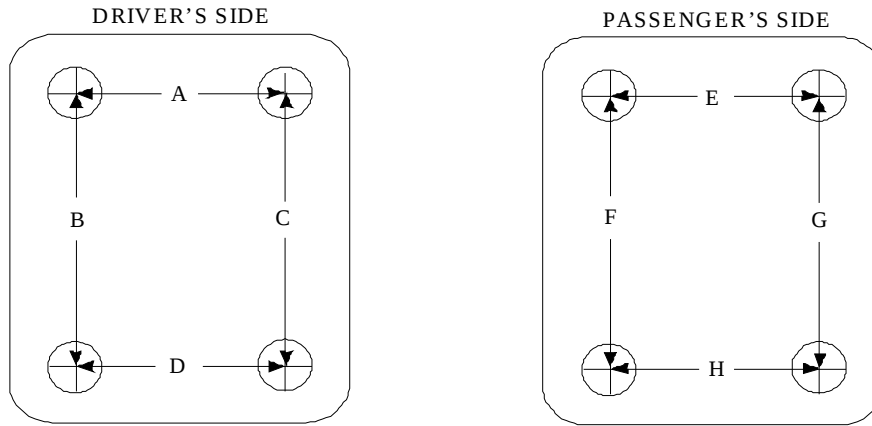
MEASUREMENTS
FROM C-PILLAR
BELT ANCHORAGE



Measurement	Pre-Test	Post-Test	Difference
I	406	422	-16
J	634	648	-14
K	1739	1698	41
L	1533	1541	-8
M	1728	1704	24
N	1704	1670	34
O	1696	1675	21
P = K (PASS.)	1809	1776	33
Q = M (PASS.)	1784	1772	12

Units = mm

DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)
FLOORBOARD DEFORMATION

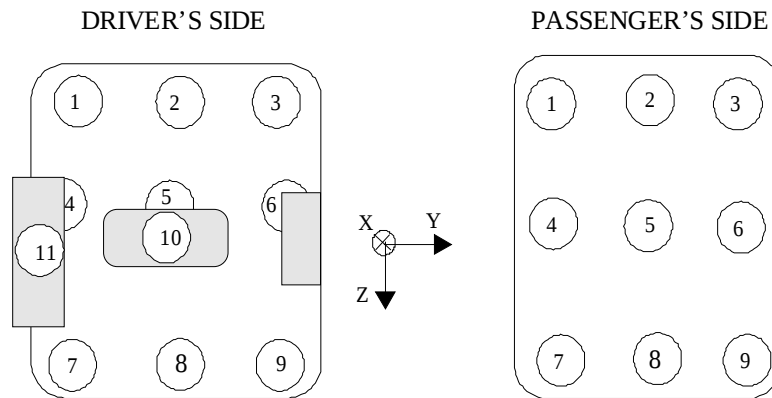


TOP VIEW THROUGH FLOOR PAN

Measurement	Pre-Test	Post-Test	Difference
A	506	488	18
B	377	376	1
C	333	308	24
D	502	504	-1
E	510	476	34
F	324	325	-1
G	324	304	21
H	498	494	5

Units = mm

DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)
TOE-PAN INTRUSION



Driver Side Toe-pan Measurements

Toe-pan Location	X Deformation (mm)			Z Deformation (mm)		
	Pre-Test	Post-Test	Difference	Pre-Test	Post-Test	Difference
1	3473	3392	81	-499	-528	29
2	3494	3406	88	-509	-542	33
3	3484	3402	82	-490	-513	23
4	3410	3368	42	-389	-414	25
5	3410	3362	48	-376	-401	25
6	3405	3355	50	-371	-397	26
7	3289	3292	-3	-291	-275	-16
8	3291	3284	7	-289	-271	-18
9	3274	3269	5	-290	-284	-6
10	3310	3249	61	-470	-483	13
11	3397	3346	51	-477	-479	2

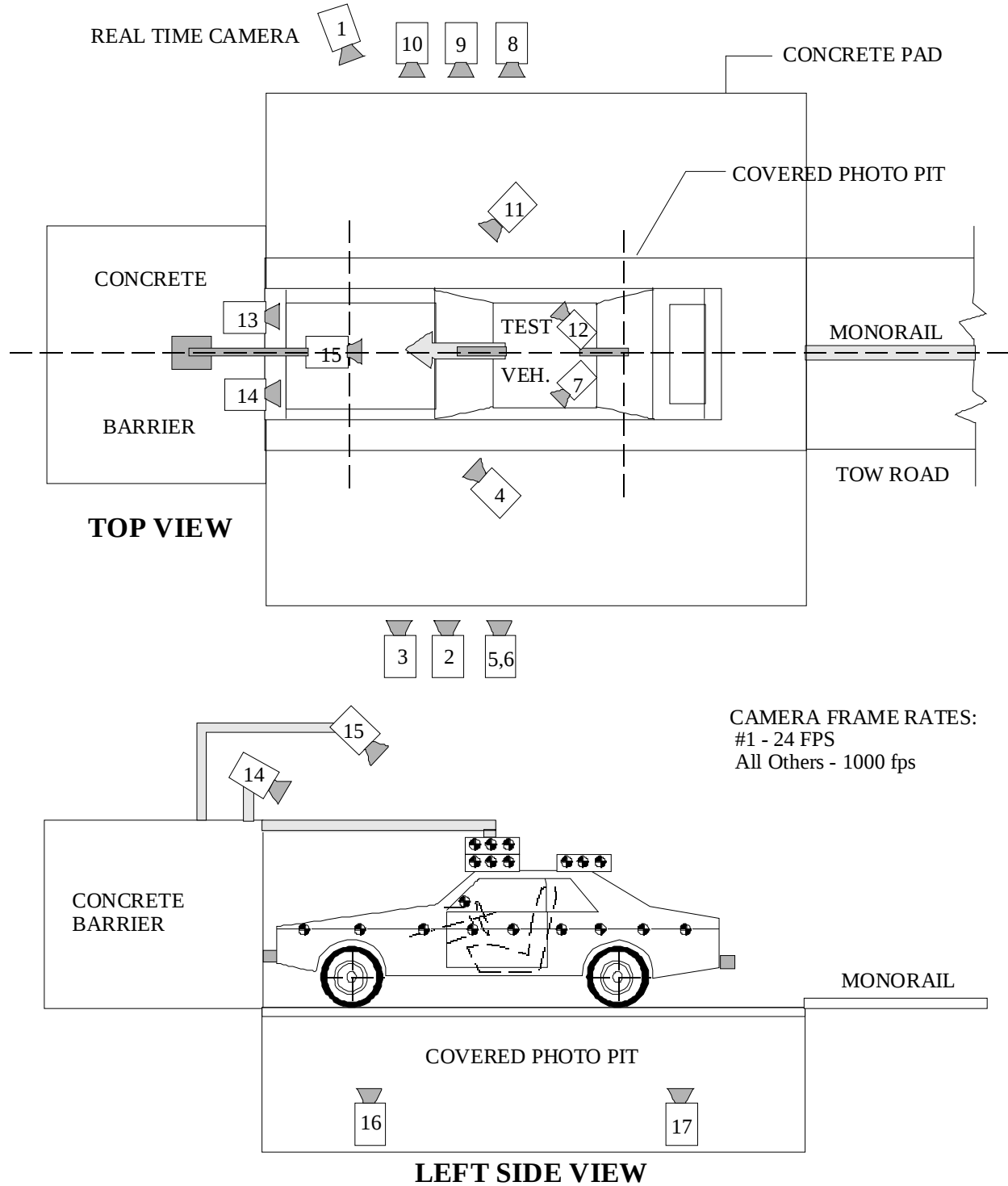
Passenger Side Toe-pan Measurements

Toe-pan Location	X Deformation (mm)			Z Deformation (mm)		
	Pre-Test	Post-Test	Difference	Pre-Test	Post-Test	Difference
1	3464	3346	118	-467	-488	21
2	3457	3346	111	-464	-519	55
3	3449	3349	100	-467	-505	38
4	3370	3294	76	-385	-405	20
5	3360	3286	74	-382	-403	21
6	3350	3293	57	-384	-393	9
7	3270	3234	36	-308	-298	-10
8	3265	3221	44	-305	-295	-10
9	3257	3232	25	-303	-283	-20

Reference: SAE: X = Rear Bumper (Positive: forward); Z = Ground (Positive: down)

DATA SHEET NO.15 HIGH-SPEED CAMERA LOCATIONS

NOTE: Camera information shown in DATA SHEET NO. 15.



DATA SHEET NO.15 HIGH-SPEED CAMERA LOCATIONS (cont.)

NHTSA Test No.: M50503 Vehicle: 2005 Suzuki Verona Four-Door Sedan

CAMERA NO.	VIEW	CAMERA POSITIONS (mm)*			ANGLE (deg)**	FILM PLANE TO HEAD TARGET	LENS (mm)	SPEED (fps)
		X	Y	Z				
1	Real-Time Camera	-	-	-	-	-	-	30
2	Overall Left Side	7155	2103	1032	-4	6822	24	1000
3	Left Side View	9144	517	1070	-2	8811	50	1000
4	Driver and Interior View	7455	2673	2045	-12	-	35	500
5	Steering Column (Bottom)	7620	1723	1077	-4	7287	25	1000
6	Steering Column (Top)	7620	1723	1177	-9	7287	25	1000
7	Left CRS Lateral View	3330	3260	2292	-34	-	28	500
8	Overall Right Side	7084	2189	1108	-3	7374	24	500
9	Right Side View	7928	1045	1146	-2	8218	25	1000
10	Right Passenger View	8333	1885	1325	-2	8623	35	1000
11	Passenger and Interior View	7725	2949	1982	-9	-	35	500
12	Right CRS Lateral View	3280	3280	2355	-35	-	28	500
13	Passenger Front View	620	-92	1987	-36	-	13	500
14	Driver Front View	620	-92	1987	-29	-	13	500
15	Windshield View	0	-530	3374	-49	-	24	500
16	Pit View of Engine	0	615	-3048	90	-	13	500
17	Pit View of Fuel Tank	0	3055	-3048	90	-	13	500

*X = film plane to monorail centerline ** = referenced to horizontal plane

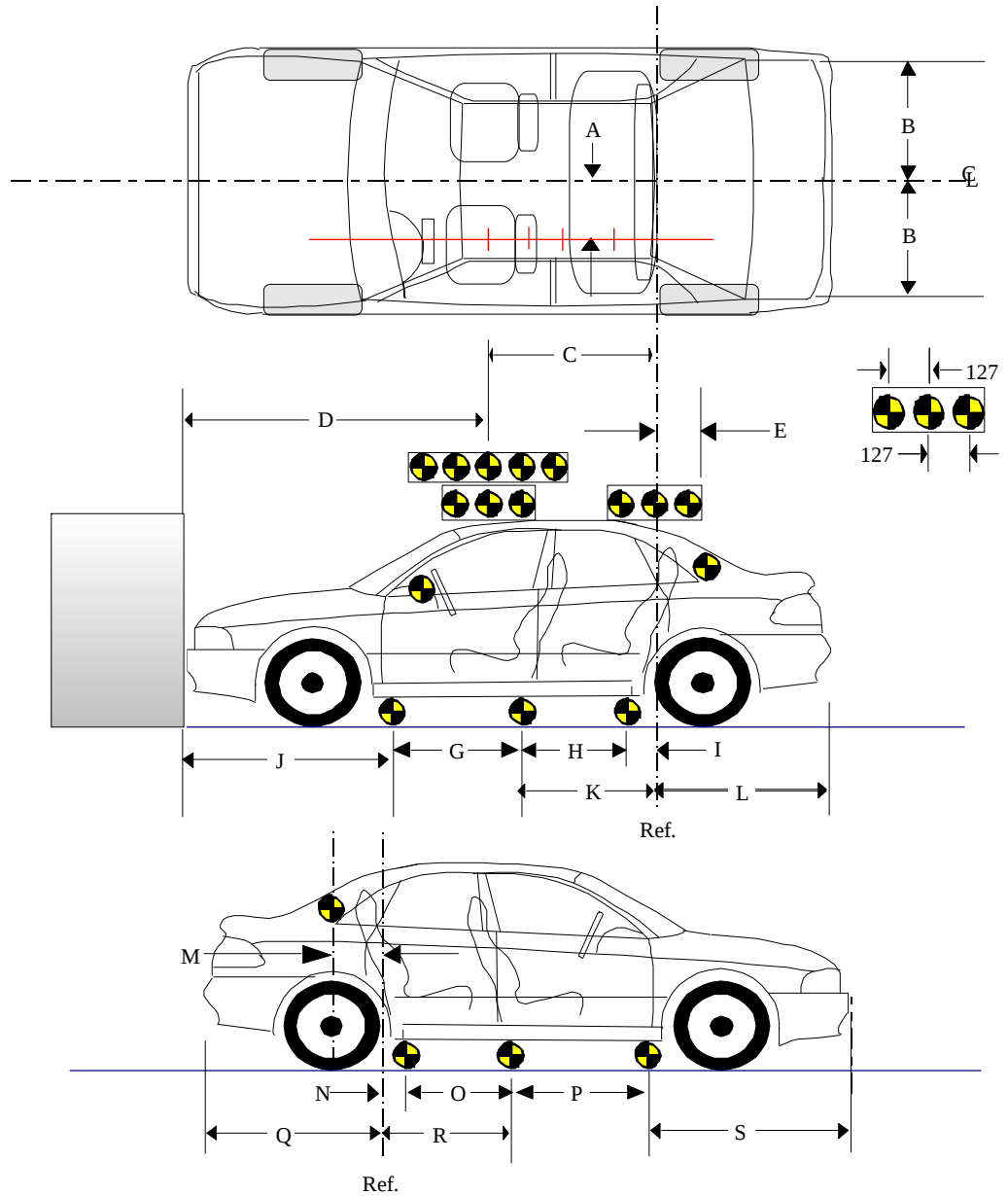
Y = film plane to impact location N.T. indicates No Timing

Z = film plane to ground

DATA SHEET NO. 16 VEHICLE REFERENCE PHOTO TARGET LOCATIONS

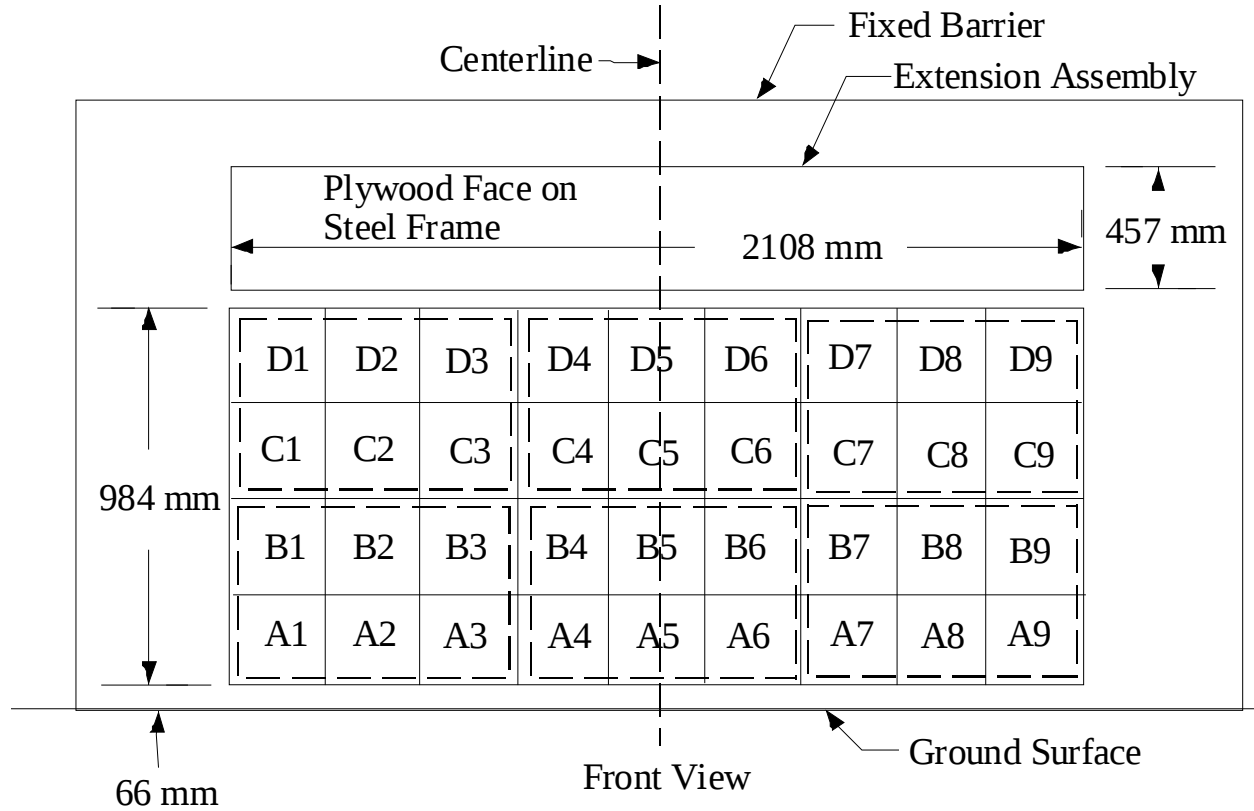
(Dimensions in millimeters)

A	366
B	623
C	1225
D	2114
E	321
F	1709
G	900
H	889
I	101
J	1448
K	990
L	1438
M	321
N	101
O	897
P	896
Q	1438
R	998
S	1445



DATA SHEET NO. 17 LOAD CELL LOCATIONS ON FIXED BARRIER

36 Load Cells
 4 Rows
 9 Columns
 6 Groupings (6 cells/group)



6 GROUPS OF 6 LOAD CELLS EACH

Group 4 C1 thru D3	Group 5 C4 thru D6	Group 6 C7 thru D9
Group 1 A1 thru B3	Group 2 A4 thru B6	Group 3 A7 thru B9

The following data is presented in Appendix B:

- (1)Data from 36 individual load cells
- (2)Total or Sum of 36 individual load cells
- (3)Data from 6 Groupings shown above (6 cells/group)

DATA SHEET NO. 18 POST TEST AIR BAG DATA

NHTSA No.: M50503; Test Date: January 27, 2005; Technician: P. MacDiarmid

Vehicle Model Year/Make/Model: 2005 Suzuki Verona Four-Door Sedan

A. No. of vent holes: 2 -Driver 2 -Passenger

B. Size of vent holes: (mm²) 491 -Driver 1963 -Passenger

C. Total vent area: (mm²) 982 -Driver 3926 -Passenger

D. Deflated air bag length and width dimensions or, if round, diameter. (mm)

Driver: 550 -Height; 450 -Width; 200 -Depth

Passenger: 750 -Height; 450 -Width; 500 -Depth

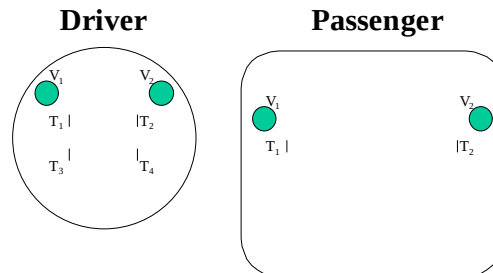
E. Is the air bag tethered?

Driver: X -Yes; - -No; If yes, record length of tether- 200

Passenger: X -Yes; - -No; If yes, record length of tether- 500

Sketch the air bag showing the location of the vent holes, how the bag is tethered, and where the bag is tethered. Also describe how the tethers are attached to the bag and the steering wheel.

(Note: Not to scale; V_n = Vent hole_n, T_n = Tether_n).



F. Record part numbers and manufacturer name of the air bag and gas generator.

Driver: Air bag: 608837F2E114

Generator: N/A

Passenger: Air bag: -

Generator: N/A

DATA SHEET NO. 19 ACCIDENT INVESTIGATION DIVISION DATA

FOR FRONTAL BARRIER IMPACT

Vehicle Make/Model/Body Style: Suzuki Verona Four-Door Sedan

NHTSA Test No.: M50503 VIN: KL5VM56L85B151730

Model Year: 2005 Build Date: 09/04 Test Date: January 27, 2005

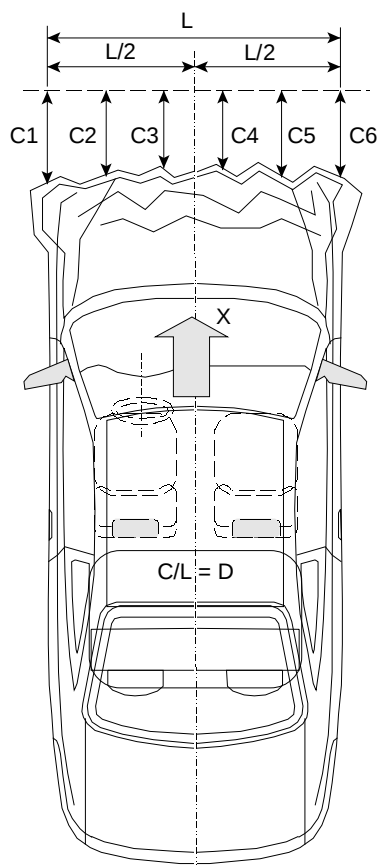
Vehicle Size Category: Midsize Test Weight: 1758.0 kg

Vehicle Wheelbase: 2691 mm; Front Overhang: 964 mm; Overall Width: 1800 mm

Collision Deformation Classification (CDC) Code: 12FDEW3

Crush Depth Dimensions

	PRE (mm)	POST (mm)	DIFF (mm)
C1 =	4646	4274	372
C2 =	4737	4274	463
C3 =	4773	4248	525
C4 =	4772	4241	531
C5 =	4735	4215	520
C6 =	4645	4198	447



Midpoint of Damage: D = Vehicle Centerline (Longitudinal)

Length of Damaged Region: L1= 1325 mm

L2= 662.5 mm

L5= 265 mm

APPENDIX A
PHOTOGRAPHS

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A-30	Pre-Test Driver Head Location	A-33
A-31	Post-Test Driver Head Location	A-34
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A-33	Post-Test Driver Position View	A-36
A-34	Pre-Test Driver And Interior View	A-37
A-35	Post-Test Driver And Interior View	A-38
A-36	Pre-Test Driver Feet View	A-39
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A-38	Pre-Test Driver Knee Bolster View	A-41
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A-40	Pre-Test Driver Floor Pan View	A-43
A-41	Post-Test Driver Floor Pan View	A-44
A-42	Post-Test Driver Head View	A-45
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A-48	Pre-Test Passenger And Interior View	A-51
A-49	Post-Test Passenger And Interior View	A-52
A-50	Pre-Test Passenger Feet View	A-53
A-51	Post-Test Passenger Feet View	A-54
A-52	Pre-Test Passenger Knee Bolster View	A-55
A-53	Post-Test Passenger Knee Bolster View	A-56
A-54	Pre-Test Passenger Floor Pan View	A-57
A-55	Post-Test Passenger Floor Pan View	A-58
A-56	Post-Test Passenger Head View	A-59
A-57	Post-Test Passenger Contact To Airbag	A-60
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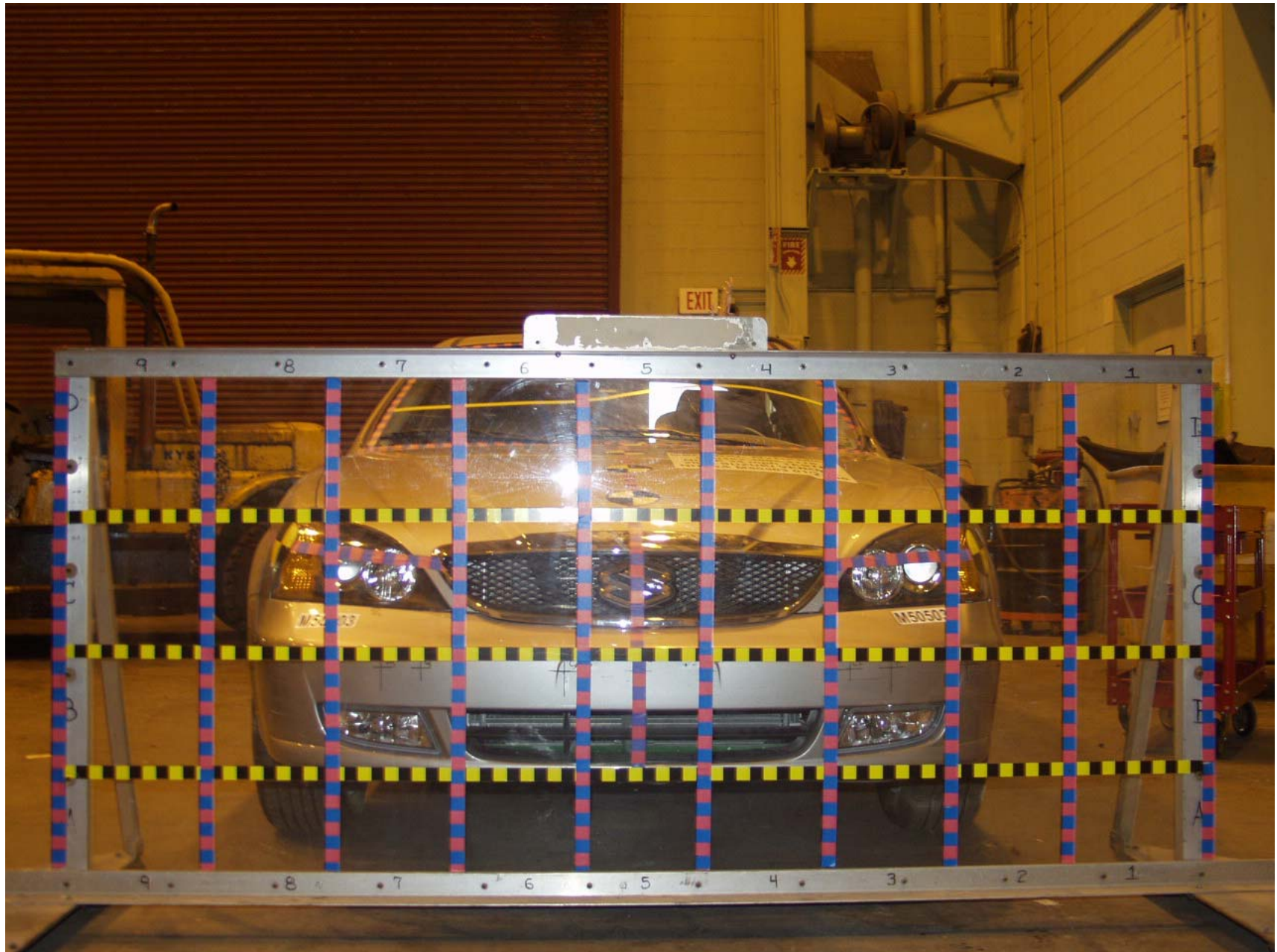


Figure A-1 LOAD CELL LOCATIONS



Figure A-2 VEHICLE CERTIFICATION PLACARD



Figure A-3 VEHICLE TIRE PLACARD



Figure A-4 RIGHT FRONT, AS RECEIVED



Figure A-5 LEFT REAR, AS RECEIVED

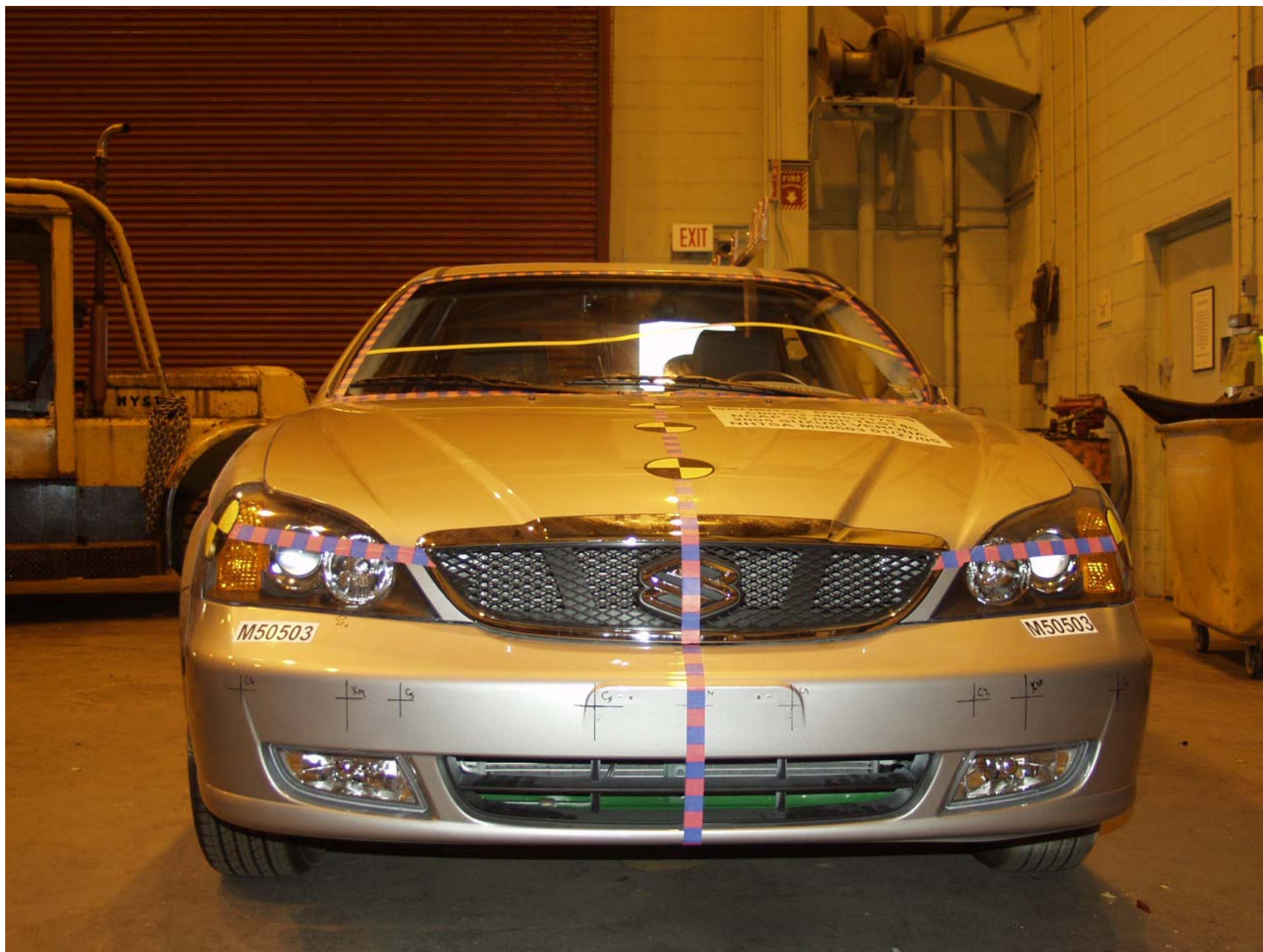


Figure A-6 PRE-TEST FRONT VIEW



Figure A-7 POST-TEST FRONT VIEW



Figure A-8 PRE-TEST LEFT SIDE VIEW



Figure A-9 POST-TEST LEFT SIDE VIEW



Figure A-10 PRE-TEST RIGHT SIDE VIEW



Figure A-11 POST-TEST RIGHT SIDE VIEW



Figure A-12 PRE-TEST RIGHT FRONT THREE-QUARTER VIEW



Figure A-13 POST-TEST RIGHT FRONT THREE-QUARTER VIEW



Figure A-14 PRE-TEST LEFT REAR THREE-QUARTER VIEW



Figure A-15 POST-TEST LEFT REAR THREE-QUARTER VIEW



Figure A-16 LEFT REAR THREE-QUARTER VIEW OF DOORS AFTER IMPACT

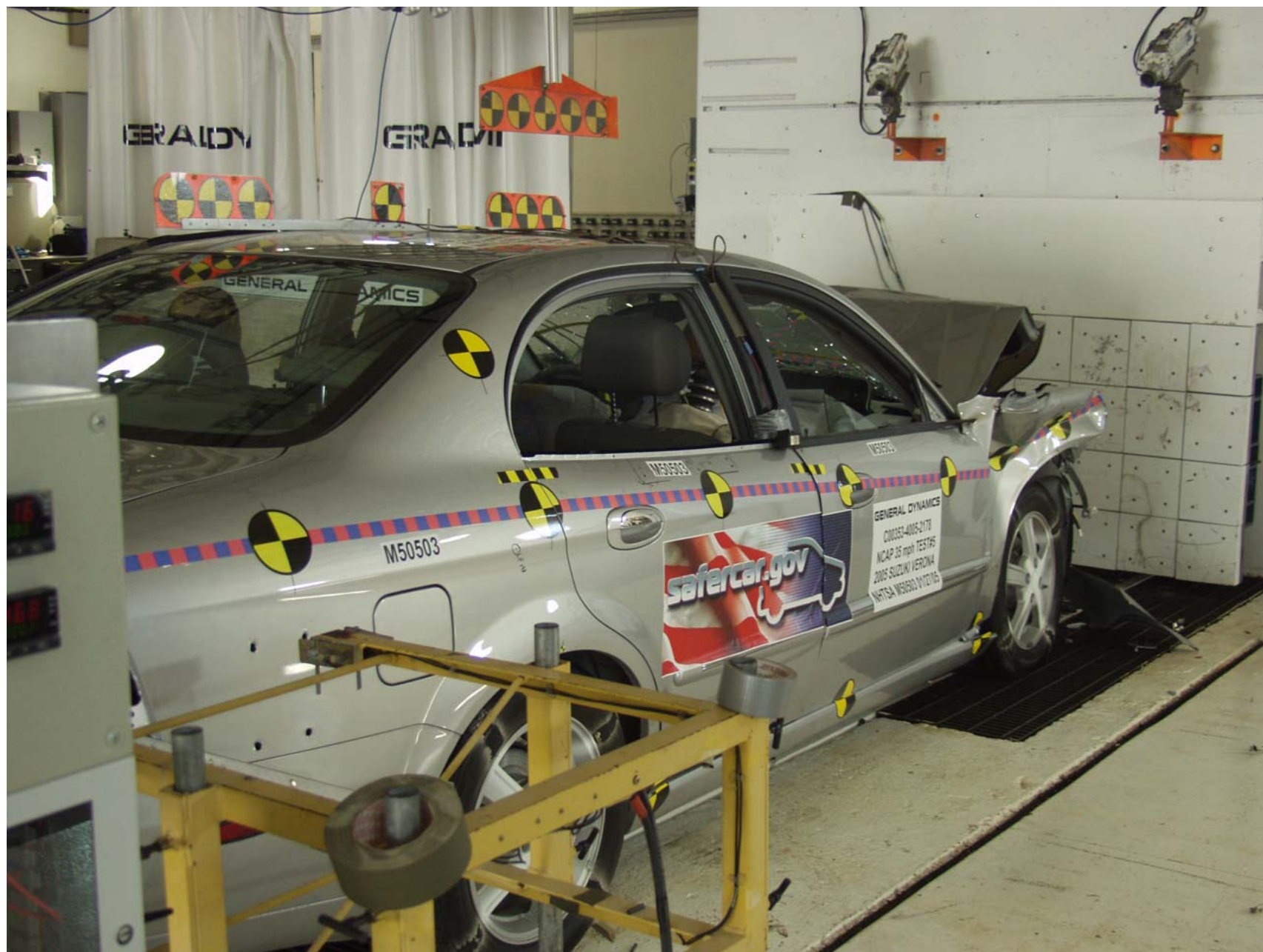


Figure A-17 RIGHT REAR THREE-QUARTER VIEW OF DOORS AFTER IMPACT



Figure A-18 PRE-TEST WINDSHIELD VIEW



Figure A-19 POST-TEST WINDSHIELDVIEW



Figure A-20 PRE-TEST ENGINE COMPARTMENT VIEW



Figure A-21 POST-TEST ENGINE COMPARTMENT VIEW



Figure A-22 PRE-TEST FUEL CAP VIEW



Figure A-23 POST-TEST FUEL CAP VIEW



Figure A-24 PRE-TEST FRONT UNDERBODY VIEW

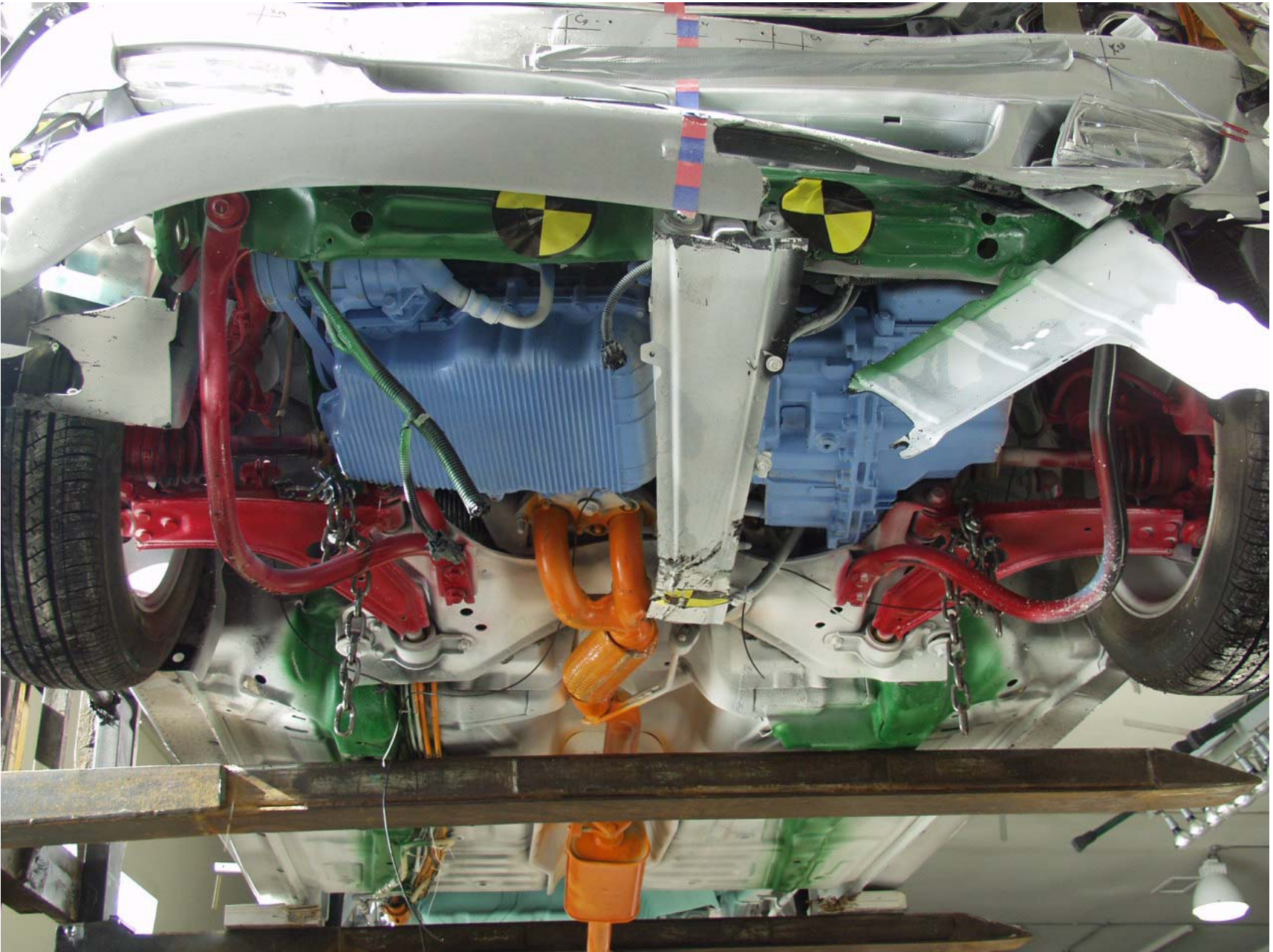


Figure A-25 POST-TEST FRONT UNDERBODY VIEW



Figure A-26 PRE-TEST MID UNDERBODY VIEW

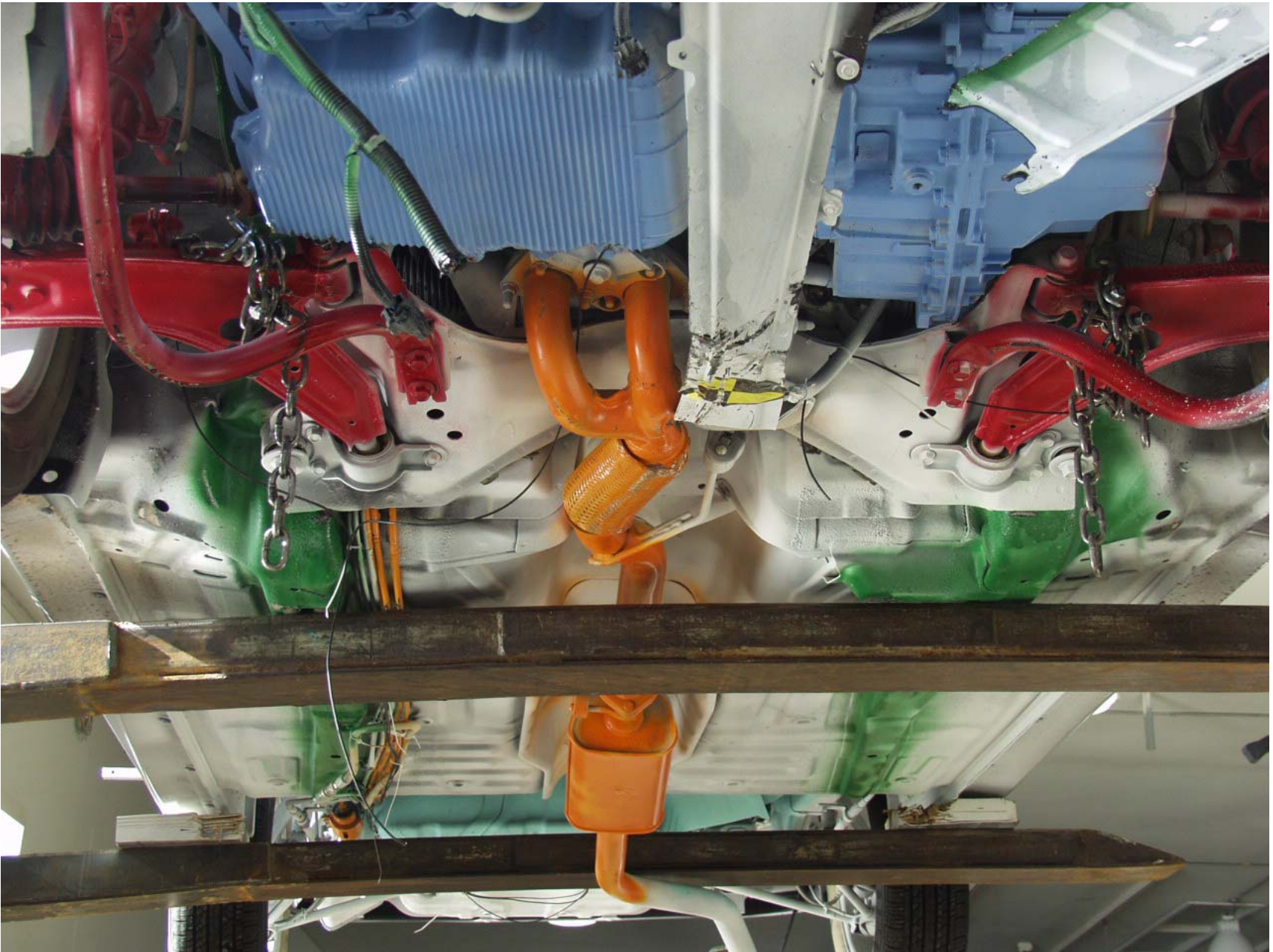


Figure A-27 POST-TEST MID UNDERBODY VIEW



Figure A-28 PRE-TEST REAR UNDERBODY VIEW



Figure A-29 POST-TEST REAR UNDERBODY VIEW



Figure A-30 PRE-TEST DRIVER HEAD LOCATION



Figure A-31 POST-TEST DRIVER HEAD LOCATION



Figure A-32 PRE-TEST DRIVER POSITION VIEW



Figure A-33 POST-TEST DRIVER POSITION VIEW



Figure A-34 PRE-TEST DRIVER AND INTERIOR VIEW



Figure A-35 POST-TEST DRIVER AND INTERIOR VIEW



Figure A-36 PRE-TEST DRIVER FEET VIEW



Figure A-37 POST-TEST DRIVER FEET VIEW



Figure A-38 PRE-TEST DRIVER KNEE BOLSTER VIEW



Figure A-39 POST-TEST DRIVER KNEE BOLSTER VIEW



Figure A-40 PRE-TEST DRIVER FLOOR PAN VIEW



Figure A-41 POST-TEST DRIVER FLOOR PAN VIEW



Figure A-42 POST-TEST DRIVER HEAD VIEW



Figure A-43 POST-TEST DRIVER CONTACT TO AIRBAG



Figure A-44 PRE-TEST PASSENGER HEAD LOCATION



Figure A-45 POST-TEST PASSENGER HEAD LOCATION



Figure A-46 PRE-TEST PASSENGER POSITION VIEW

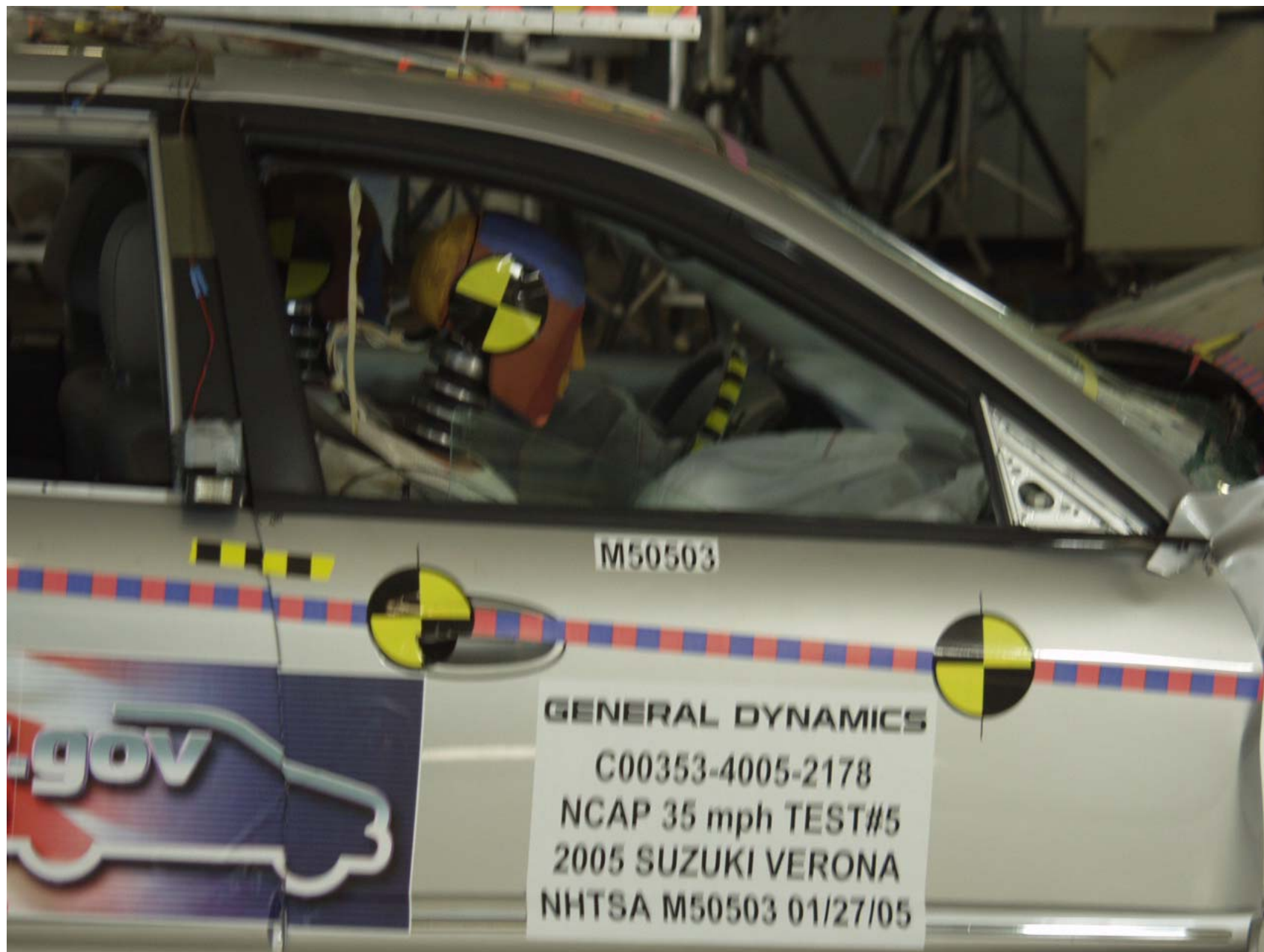


Figure A-47 POST-TEST PASSENGER POSITION VIEW



Figure A-48 PRE-TEST PASSENGER AND INTERIOR VIEW



Figure A-49 POST-TEST PASSENGER AND INTERIOR VIEW



Figure A-50 PRE- TEST PASSENGER FEET VIEW



Figure A-51 POST-TEST PASSENGER FEET VIEW



Figure A-52 PRE-TEST PASSENGER KNEE BOLSTER VIEW



Figure A-53 POST-TEST PASSENGER KNEE BOLSTER VIEW



Figure A-54 PRE-TEST PASSENGER FLOOR PAN VIEW



A-58

8642-NCAP-55

Figure A-55 POST-TEST PASSENGER FLOOR PAN VIEW



Figure A-56 POST-TEST PASSENGER HEAD VIEW



Figure A-57 POST-TEST PASSENGER CONTACT TO AIRBAG



Figure A-58 ROLLOVER VIEW



Figure A-59 IMPACT VIEW

APPENDIX B

DUMMY, VEHICLE AND LOAD CELL BARRIER RESPONSE DATA

**Hybrid III Dummy Sign Conventions
Load Cells and Special Transducers**

Transducer	SAE Sign Convention (positive unless noted)
Upper Neck Load Cell	Fx Head rearward Fy Head left Fz Neck in tension Mx Left ear to left shoulder My Chin to chest (flexion) Mz Chin to left shoulder (look left)
Chest Displacement Potentiometer	Compression is negative
Pelvic Load Cell (Lower Lumbar)	Fx Chest rearward Fy Chest left Fz Spine in tension
Femur Load Cell	Compression is negative
Upper Tibia Load Cell (right and left leg)	Mx Support tibia at ends, load left side center My Support tibia at ends, load front (shin) center
Lower Tibia Load Cell (right and left leg)	Fz Tibia in tension Mx Support tibia at ends, load left side center My Support tibia at ends, load front (shin) center

DATA CHANNEL FILTER CLASS SUMMARY

NHTSA TEST NO.

DATA TYPE	SAE FILTER CLASS (Hz)
Dummy Head Accelerations	1000
Dummy Chest Accelerations	180
Dummy Chest Displacements	600
Dummy Femur Forces	600
Dummy Belt Loads	60
Dummy Belt Displacements	180
Dummy Neck Forces	1000
Dummy Neck Moments	600
Vehicle Accelerations	60
Vehicle Velocity Integrations	180
Vehicle Displacement Integrations	180
Load Cell Barrier Forces	60

Table of Data Plots

PLOT	PLOT NAME[UNITS, CHANNEL FILTER CLASS]	PAGE
1	V1P1 Head 9 Array X Arm Ay [g, CFC_1000]	B-8
2	V1P1 Head 9 Array X Arm Az [g, CFC_1000]	B-8
3	V1P1 Head 9 Array Y Arm Ax [g, CFC_1000]	B-8
4	V1P1 Head 9 Array Y Arm Az [g, CFC_1000]	B-8
5	V1P1 Head 9 Array Z Arm Ax [g, CFC_1000]	B-9
6	V1P1 Head 9 Array Z Arm Ay [g, CFC_1000]	B-9
7	V1P1 Head CG x [g, CFC_1000]	B-10
8	V1P1 Head CG y [g, CFC_1000]	B-10
9	V1P1 Head CG z [g, CFC_1000]	B-10
10	V1P1 Head CG Resultant [g, CFC_1000]	B-10
11	V1P1 Head CG Red x [g, CFC_1000]	B-11
12	V1P1 Head CG Red y [g, CFC_1000]	B-11
13	V1P1 Head CG Red z [g, CFC_1000]	B-11
14	V1P1 Head CG Red Resultant [g, CFC_1000]	B-11
15	V1P1 Upper Neck Fx [N, CFC_1000]	B-12
16	V1P1 Upper Neck Fy [N, CFC_1000]	B-12
17	V1P1 Upper Neck Fz [N, CFC_1000]	B-12
18	V1P1 Upper Neck F Resultant [N, CFC_1000]	B-12
19	V1P1 Upper Neck Mx [N-m, CFC_600]	B-13
20	V1P1 Upper Neck My [N-m, CFC_600]	B-13
21	V1P1 Upper Neck Mz [N-m, CFC_600]	B-13
22	V1P1 Upper Neck M Resultant [N-m, CFC_600]	B-13
23	V1P1 Chest x [g, CFC_180]	B-14
24	V1P1 Chest y [g, CFC_180]	B-14
25	V1P1 Chest z [g, CFC_180]	B-14
26	V1P1 Chest Resultant [g, CFC_180]	B-14
27	V1P1 Chest Red x [g, CFC_180]	B-15
28	V1P1 Chest Red y [g, CFC_180]	B-15
29	V1P1 Chest Red z [g, CFC_180]	B-15
30	V1P1 Chest Red Resultant [g, CFC_180]	B-15
31	V1P1 Chest Compression x [mm, CFC_600]	B-16
32	V1P1 Pelvic x [g, CFC_1000]	B-17
33	V1P1 Pelvic y [g, CFC_1000]	B-17
34	V1P1 Pelvic z [g, CFC_1000]	B-17
35	V1P1 Pelvic Resultant [g, CFC_1000]	B-17
36	V1P1 Left Femur z [N, CFC_600]	B-18
37	V1P1 Right Femur z [N, CFC_600]	B-18
38	V1P1 Left Upper Tibia Mx [N-m, CFC_600]	B-19
39	V1P1 Left Upper Tibia My [N-m, CFC_600]	B-19
40	V1P1 Left Lower Tibia Fz [N, CFC_600]	B-20
41	V1P1 Left Lower Tibia Mx [N-m, CFC_600]	B-20
42	V1P1 Left Lower Tibia My [N-m, CFC_600]	B-20
43	V1P1 Right Upper Tibia Mx [N-m, CFC_600]	B-21
44	V1P1 Right Upper Tibia My [N-m, CFC_600]	B-21
45	V1P1 Right Lower Tibia Fz [N, CFC_600]	B-22
46	V1P1 Right Lower Tibia Mx [N-m, CFC_600]	B-22

Table of Data Plots (Continued)

PLOT	PLOT NAME[UNITS, CHANNEL FILTER CLASS]	PAGE
47	V1P1 Right Lower Tibia My [N-m, CFC_600]	B-22
48	V1P1 Left Foot Aft x [g, CFC_600]	B-23
49	V1P1 Left Foot Aft z [g, CFC_600]	B-23
50	V1P1 Left Foot Fore z [g, CFC_600]	B-23
51	V1P1 Right Foot Aft x [g, CFC_600]	B-24
52	V1P1 Right Foot Aft z [g, CFC_600]	B-24
53	V1P1 Right Foot Fore z [g, CFC_600]	B-24
54	V1 Driver Lap Belt [N, CFC_60]	B-25
55	V1 Driver Torso Belt [N, CFC_60]	B-25
56	V1P2 Head 9 Array X Arm Ay [g, CFC_1000]	B-26
57	V1P2 Head 9 Array X Arm Az [g, CFC_1000]	B-26
58	V1P2 Head 9 Array Y Arm Ax [g, CFC_1000]	B-26
59	V1P2 Head 9 Array Y Arm Az [g, CFC_1000]	B-26
60	V1P2 Head 9 Array Z Arm Ax [g, CFC_1000]	B-27
61	V1P2 Head 9 Array Z Arm Ay [g, CFC_1000]	B-27
62	V1P2 Head CG x [g, CFC_1000]	B-28
63	V1P2 Head CG y [g, CFC_1000]	B-28
64	V1P2 Head CG z [g, CFC_1000]	B-28
65	V1P2 Head CG Resultant [g, CFC_1000]	B-28
66	V1P2 Head CG Red x [g, CFC_1000]	B-29
67	V1P2 Head CG Red y [g, CFC_1000]	B-29
68	V1P2 Head CG Red z [g, CFC_1000]	B-29
69	V1P2 Head CG Red Resultant [g, CFC_1000]	B-29
70	V1P2 Upper Neck Fx [N, CFC_1000]	B-30
71	V1P2 Upper Neck Fy [N, CFC_1000]	B-30
72	V1P2 Upper Neck Fz [N, CFC_1000]	B-30
73	V1P2 Upper Neck F Resultant [N, CFC_1000]	B-30
74	V1P2 Upper Neck Mx [N-m, CFC_600]	B-31
75	V1P2 Upper Neck My [N-m, CFC_600]	B-31
76	V1P2 Upper Neck Mz [N-m, CFC_600]	B-31
77	V1P2 Upper Neck M Resultant [N-m, CFC_600]	B-31
78	V1P2 Chest x [g, CFC_180]	B-32
79	V1P2 Chest y [g, CFC_180]	B-32
80	V1P2 Chest z [g, CFC_180]	B-32
81	V1P2 Chest Resultant [g, CFC_180]	B-32
82	V1P2 Chest Red x [g, CFC_180]	B-33
83	V1P2 Chest Red y [g, CFC_180]	B-33
84	V1P2 Chest Red z [g, CFC_180]	B-33
85	V1P2 Chest Red Resultant [g, CFC_180]	B-33
86	V1P2 Chest Compression x [mm, CFC_600]	B-34
87	V1P2 Pelvic x [g, CFC_1000]	B-35
88	V1P2 Pelvic y [g, CFC_1000]	B-35
89	V1P2 Pelvic z [g, CFC_1000]	B-35
90	V1P2 Pelvic Resultant [g, CFC_1000]	B-35
91	V1P2 Left Femur z [N, CFC_600]	B-36
92	V1P2 Right Femur z [N, CFC_600]	B-36

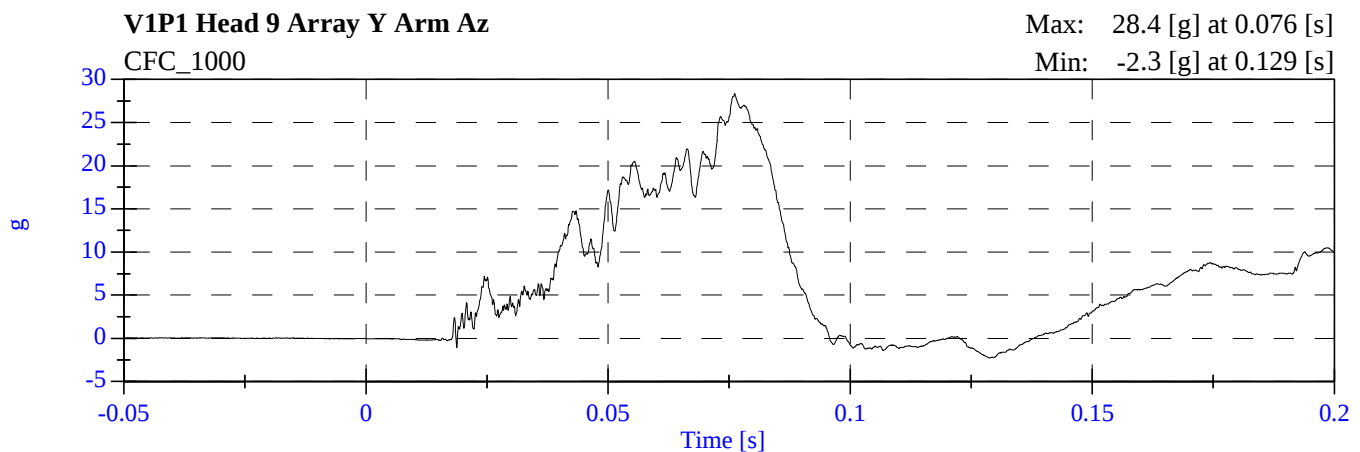
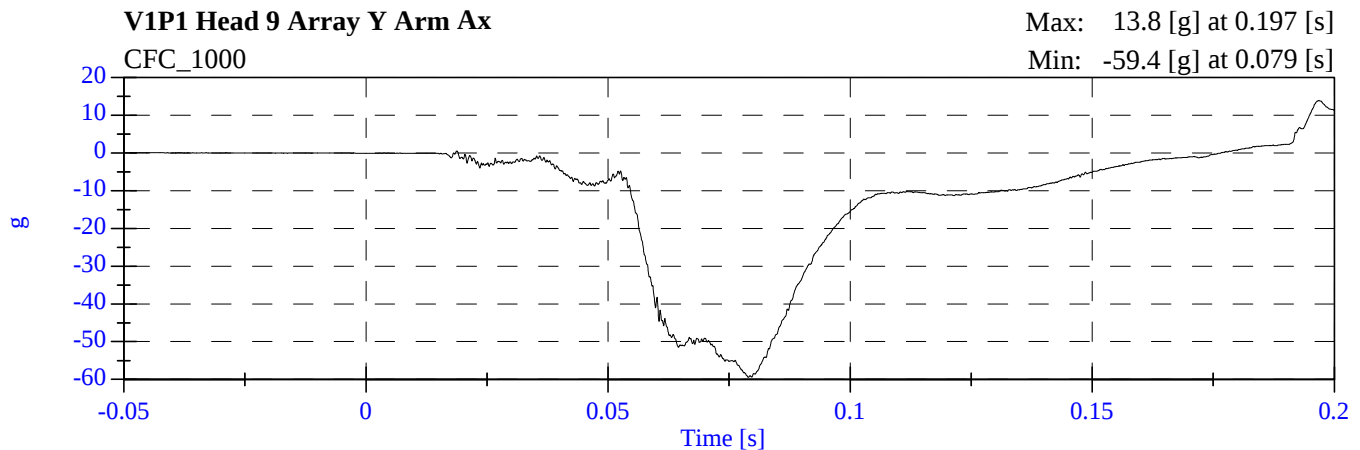
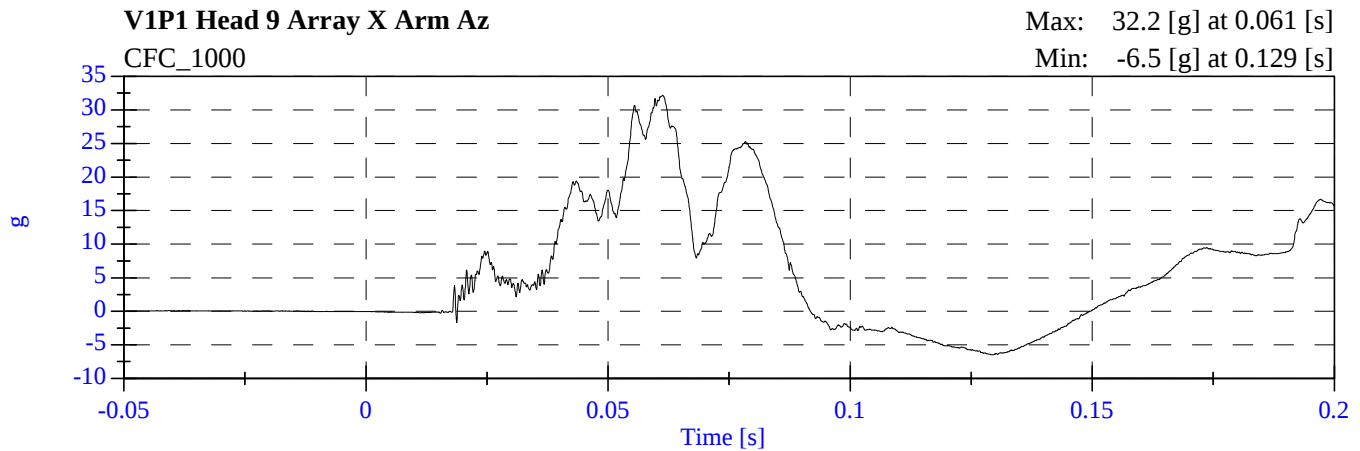
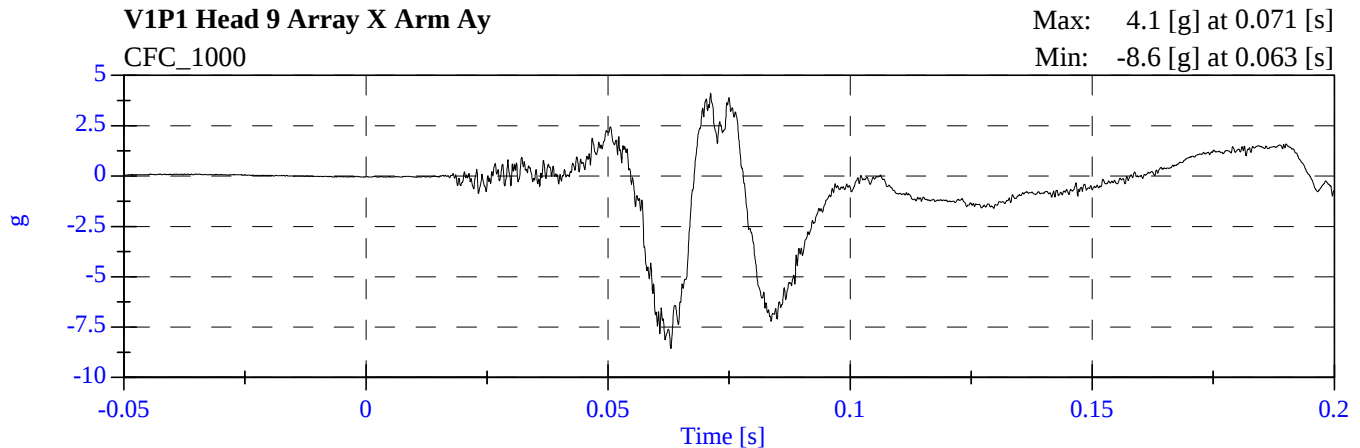
Table of Data Plots (Continued)

PLOT	PLOT NAME[UNITS, CHANNEL FILTER CLASS]	PAGE
93	V1P2 Left Upper Tibia Mx [N-m, CFC_600]	B-37
94	V1P2 Left Upper Tibia My [N-m, CFC_600]	B-37
95	V1P2 Left Lower Tibia Fz [N, CFC_600]	B-38
96	V1P2 Left Lower Tibia Mx [N-m, CFC_600]	B-38
97	V1P2 Left Lower Tibia My [N-m, CFC_600]	B-38
98	V1P2 Right Upper Tibia Mx [N-m, CFC_600]	B-39
99	V1P2 Right Upper Tibia My [N-m, CFC_600]	B-39
100	V1P2 Right Lower Tibia Fz [N, CFC_600]	B-40
101	V1P2 Right Lower Tibia Mx [N-m, CFC_600]	B-40
102	V1P2 Right Lower Tibia My [N-m, CFC_600]	B-40
103	V1P2 Left Foot Aft x [g, CFC_600]	B-41
104	V1P2 Left Foot Aft z [g, CFC_600]	B-41
105	V1P2 Left Foot Fore z [g, CFC_600]	B-41
106	V1P2 Right Foot Aft x [g, CFC_600]	B-42
107	V1P2 Right Foot Aft z [g, CFC_600]	B-42
108	V1P2 Right Foot Fore z [g, CFC_600]	B-42
109	V1 RFP Lap Belt [N, CFC_60]	B-43
110	V1 RFP Torso Belt [N, CFC_60]	B-43
111	V1 Left Rear #1x [g, CFC_60]	B-44
112	V1 Left Rear #1x Velocity [kph, CFC_180]	B-44
113	V1 Left Rear #1x Displacement [mm, CFC_180]	B-44
114	V1 Right Rear #2x [g, CFC_60]	B-45
115	V1 Right Rear #2x Velocity [kph, CFC_180]	B-45
116	V1 Right Rear #2x Displacement [mm, CFC_180]	B-45
117	V1 Engine Top #3x [g, CFC_60]	B-46
118	V1 Engine Top #3x Velocity [kph, CFC_180]	B-46
119	V1 Engine Top #3x Displacement [mm, CFC_180]	B-46
120	V1 Engine Bottom #4x [g, CFC_60]	B-47
121	V1 Engine Bottom #4x Velocity [kph, CFC_180]	B-47
122	V1 Engine Bottom #4x Displacement [mm, CFC_180]	B-47
123	V1 Right Caliper #5x [g, CFC_60]	B-48
124	V1 Right Caliper #5x Velocity [kph, CFC_180]	B-48
125	V1 Right Caliper #5x Displacement [mm, CFC_180]	B-48
126	V1 Instrument Panel #6x [g, CFC_60]	B-49
127	V1 Instrument Panel #6x Velocity [kph, CFC_180]	B-49
128	V1 Instrument Panel #6x Displacement [mm, CFC_180]	B-49
129	V1 Left Caliper #7x [g, CFC_60]	B-50
130	V1 Left Caliper #7x Velocity [kph, CFC_180]	B-50
131	V1 Left Caliper #7x Displacement [mm, CFC_180]	B-50
132	V1 Left Rear #8z [g, CFC_60]	B-51
133	V1 Left Rear #8z Velocity [kph, CFC_180]	B-51
134	V1 Left Rear #8z Displacement [mm, CFC_180]	B-51
135	V1 Right Rear #9z [g, CFC_60]	B-52
136	V1 Right Rear #9z Velocity [kph, CFC_180]	B-52
137	V1 Right Rear #9z Displacement [mm, CFC_180]	B-52
138	Barrier Load Cell A1 Fx [N, CFC_60]	B-53

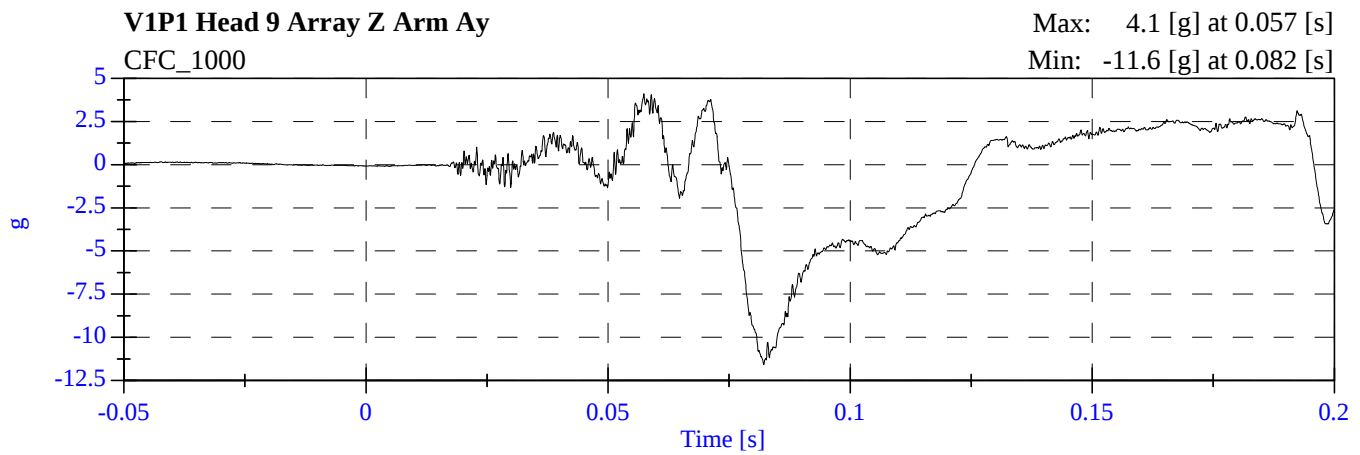
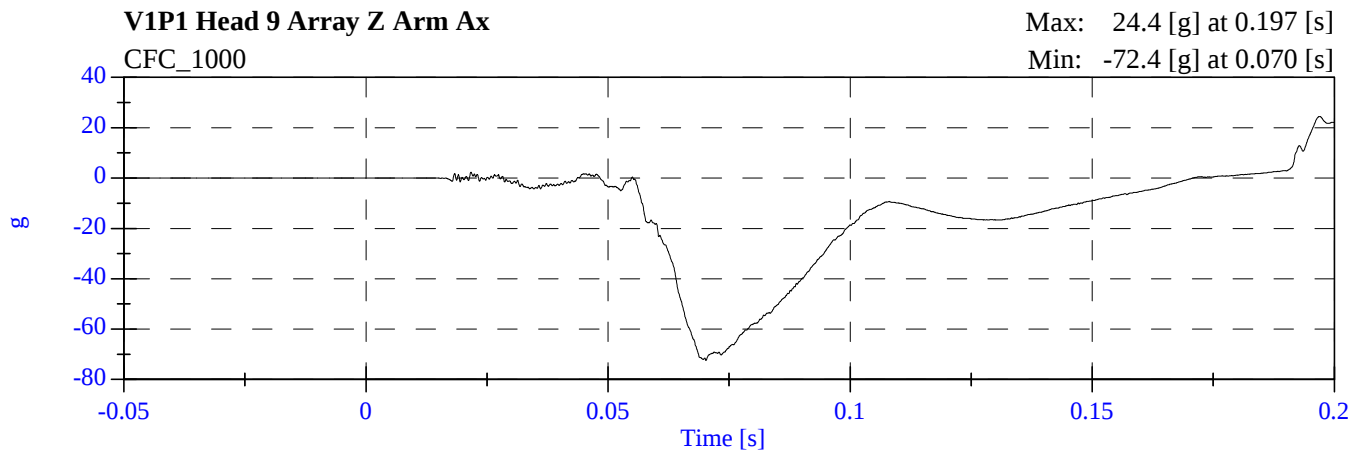
Table of Data Plots (Continued)

PLOT	PLOT NAME[UNITS, CHANNEL FILTER CLASS]	PAGE
139	Barrier Load Cell A2 Fx [N, CFC_60]	B-53
140	Barrier Load Cell A3 Fx [N, CFC_60]	B-53
141	Barrier Load Cell A4 Fx [N, CFC_60]	B-53
142	Barrier Load Cell A5 Fx [N, CFC_60]	B-54
143	Barrier Load Cell A6 Fx [N, CFC_60]	B-54
144	Barrier Load Cell A7 Fx [N, CFC_60]	B-54
145	Barrier Load Cell A8 Fx [N, CFC_60]	B-54
146	Barrier Load Cell A9 Fx [N, CFC_60]	B-55
147	Barrier Load Cell B1 Fx [N, CFC_60]	B-55
148	Barrier Load Cell B2 Fx [N, CFC_60]	B-55
149	Barrier Load Cell B3 Fx [N, CFC_60]	B-55
150	Barrier Load Cell B4 Fx [N, CFC_60]	B-56
151	Barrier Load Cell B5 Fx [N, CFC_60]	B-56
152	Barrier Load Cell B6 Fx [N, CFC_60]	B-56
153	Barrier Load Cell B7 Fx [N, CFC_60]	B-56
154	Barrier Load Cell B8 Fx [N, CFC_60]	B-57
155	Barrier Load Cell B9 Fx [N, CFC_60]	B-57
156	Barrier Load Cell C1 Fx [N, CFC_60]	B-57
157	Barrier Load Cell C2 Fx [N, CFC_60]	B-57
158	Barrier Load Cell C3 Fx [N, CFC_60]	B-58
159	Barrier Load Cell C4 Fx [N, CFC_60]	B-58
160	Barrier Load Cell C5 Fx [N, CFC_60]	B-58
161	Barrier Load Cell C6 Fx [N, CFC_60]	B-58
162	Barrier Load Cell C7 Fx [N, CFC_60]	B-59
163	Barrier Load Cell C8 Fx [N, CFC_60]	B-59
164	Barrier Load Cell C9 Fx [N, CFC_60]	B-59
165	Barrier Load Cell D1 Fx [N, CFC_60]	B-59
166	Barrier Load Cell D2 Fx [N, CFC_60]	B-60
167	Barrier Load Cell D3 Fx [N, CFC_60]	B-60
168	Barrier Load Cell D4 Fx [N, CFC_60]	B-60
169	Barrier Load Cell D5 Fx [N, CFC_60]	B-60
170	Barrier Load Cell D6 Fx [N, CFC_60]	B-61
171	Barrier Load Cell D7 Fx [N, CFC_60]	B-61
172	Barrier Load Cell D8 Fx [N, CFC_60]	B-61
173	Barrier Load Cell D9 Fx [N, CFC_60]	B-61
174	Group 1 Load Cell Sum (A1,A2,A3,B1,B2,B3) [N, CFC_60]	B-62
175	Group 2 Load Cell Sum (A4,A5,A6,B4,B5,B6) [N, CFC_60]	B-62
176	Group 3 Load Cell Sum (A7,A8,A9,B7,B8,B9) [N, CFC_60]	B-62
177	Group 4 Load Cell Sum (C1,C2,C3,D1,D2,D3) [N, CFC_60]	B-62
178	Group 5 Load Cell Sum (C4,C5,C6,D4,D5,D6) [N, CFC_60]	B-63
179	Group 6 Load Cell Sum (C7,C8,C9,D7,D8,D9) [N, CFC_60]	B-63
180	Total Load Cell Sum (All 6 Groups) [N, CFC_60]	B-64

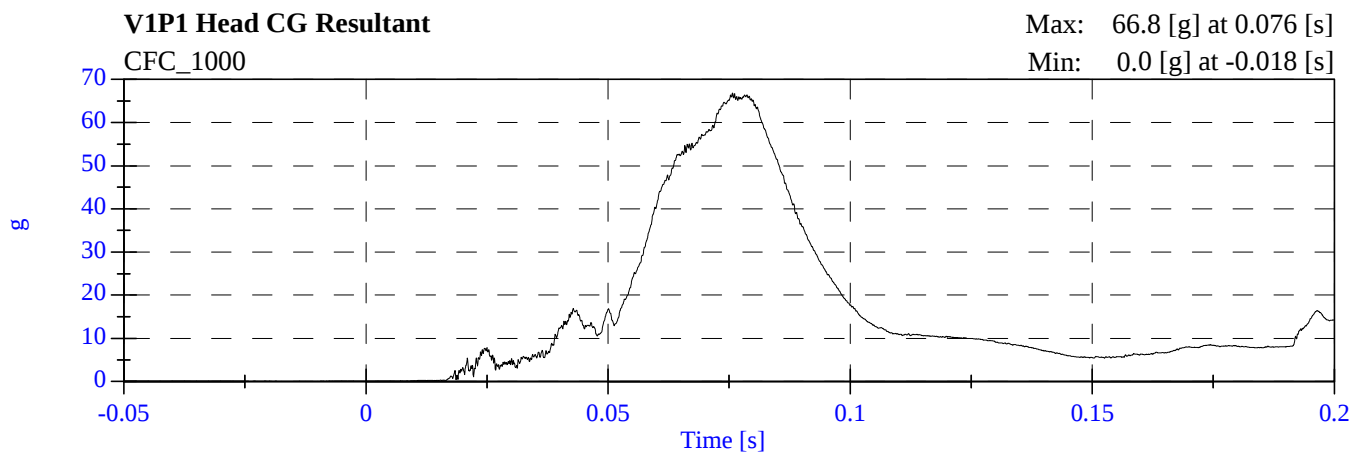
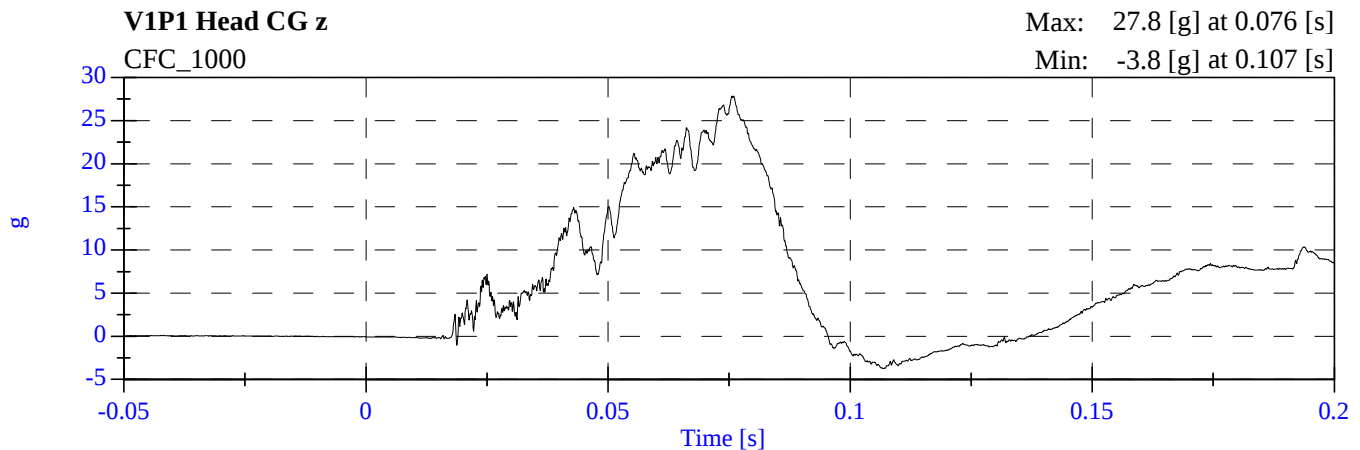
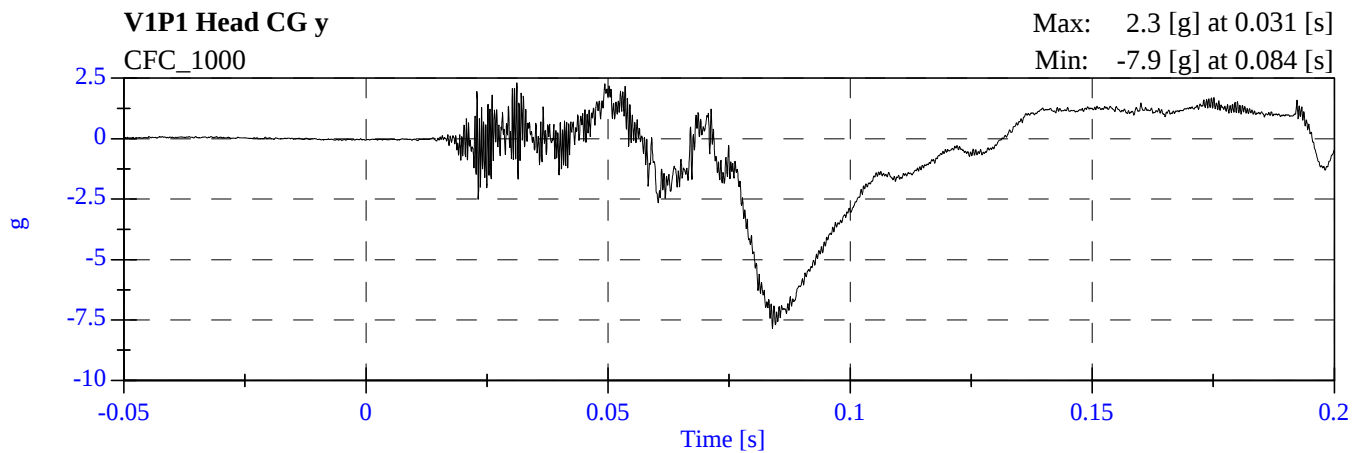
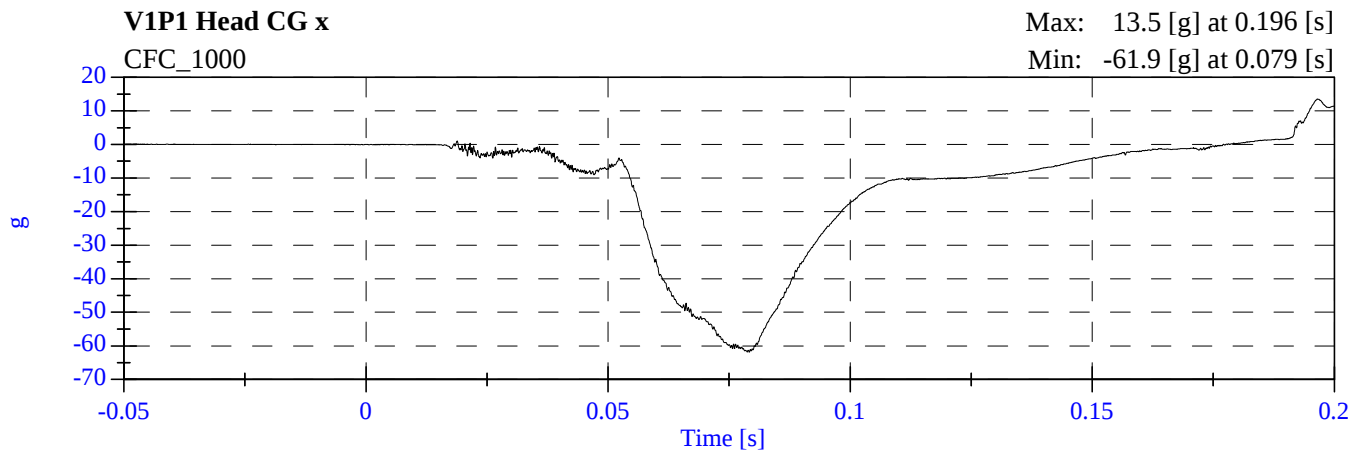
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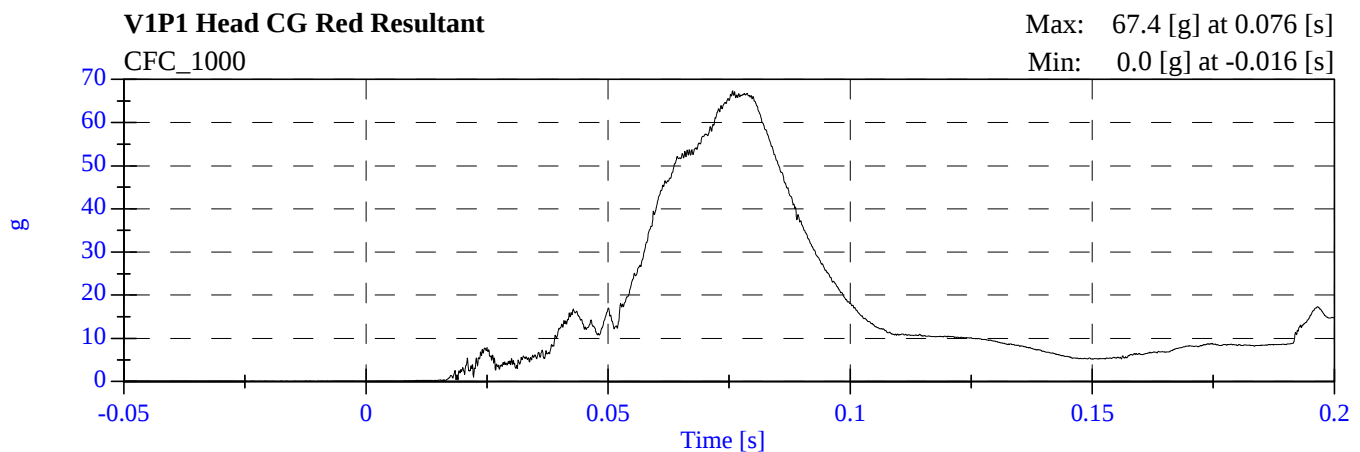
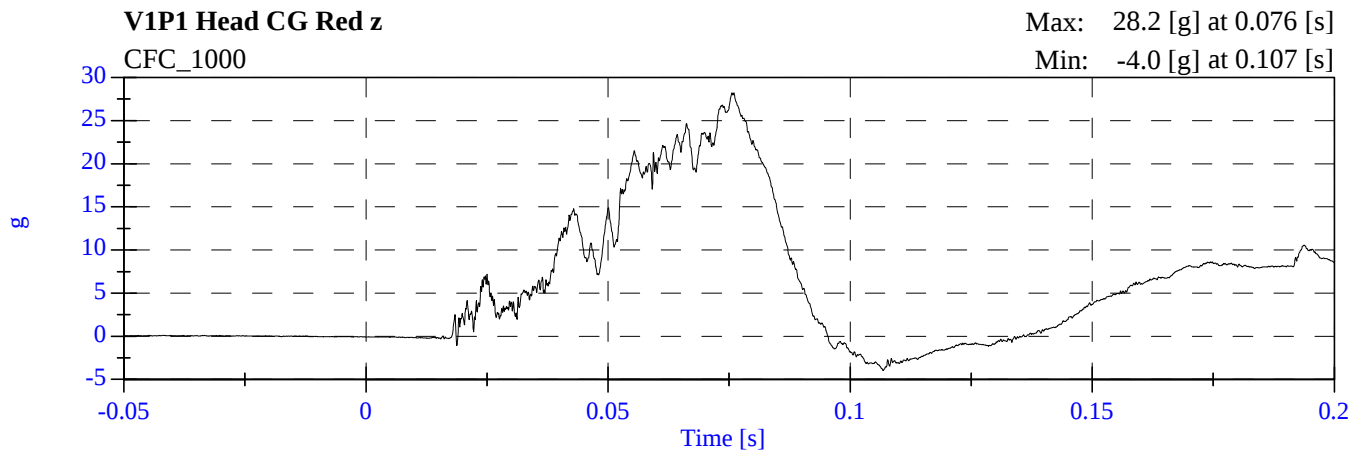
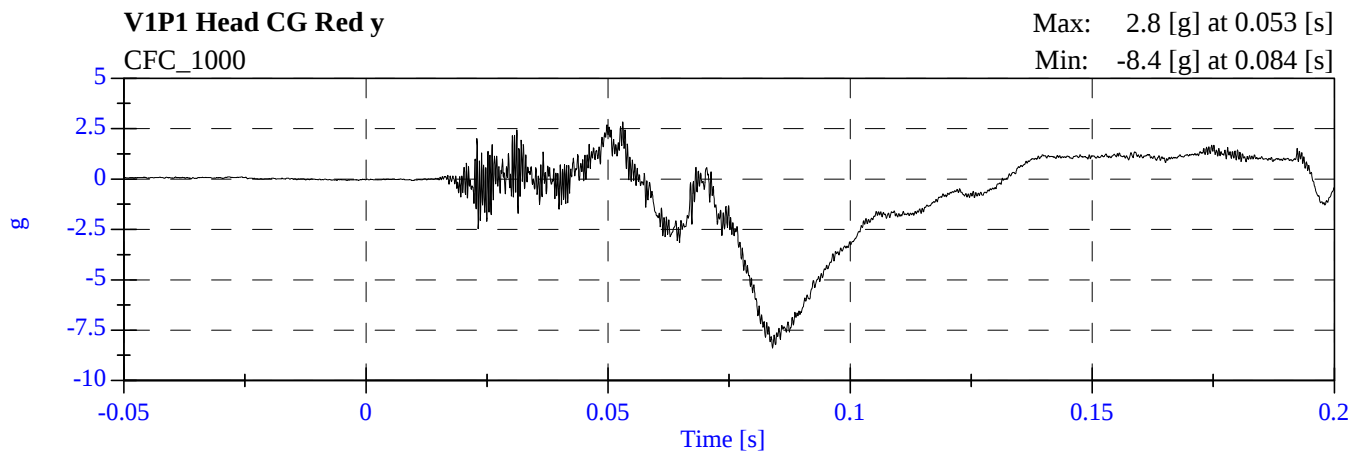
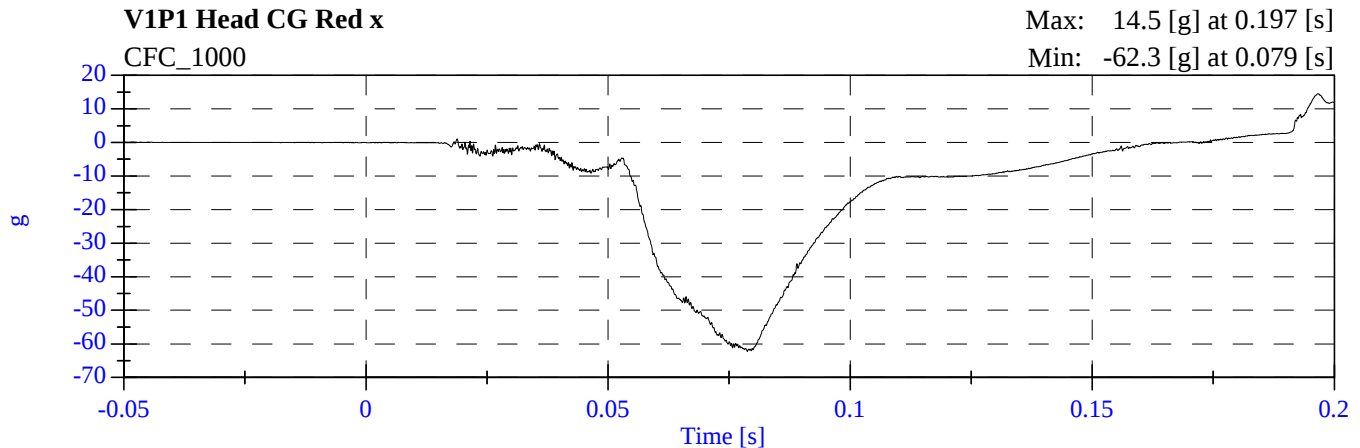
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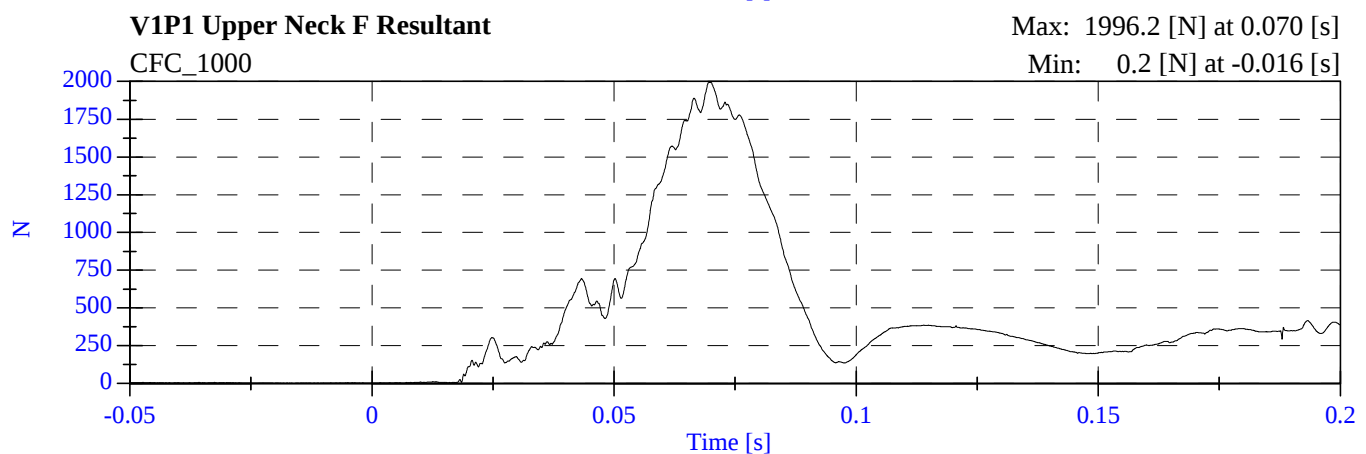
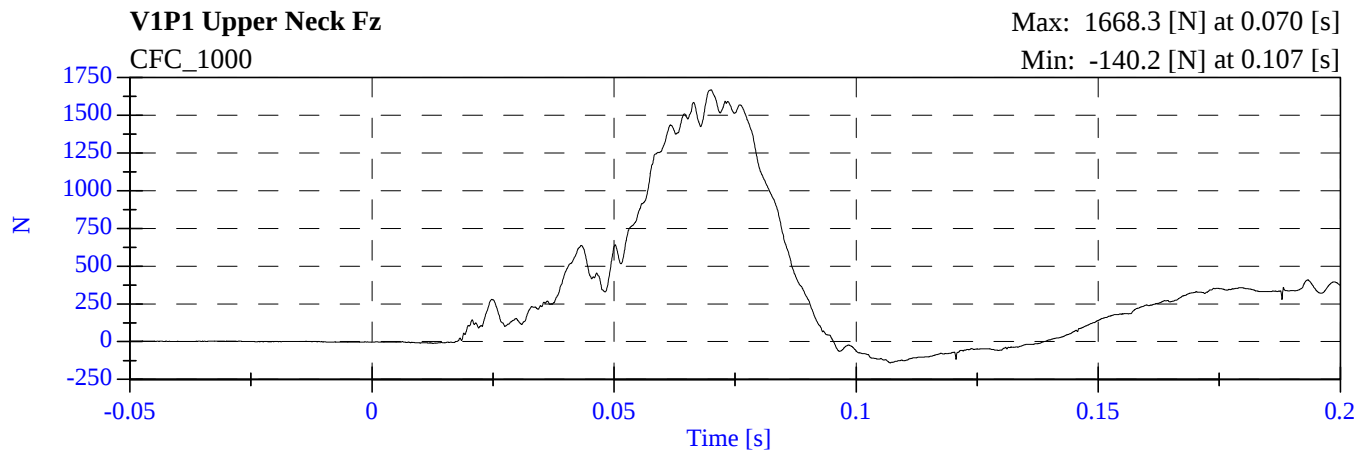
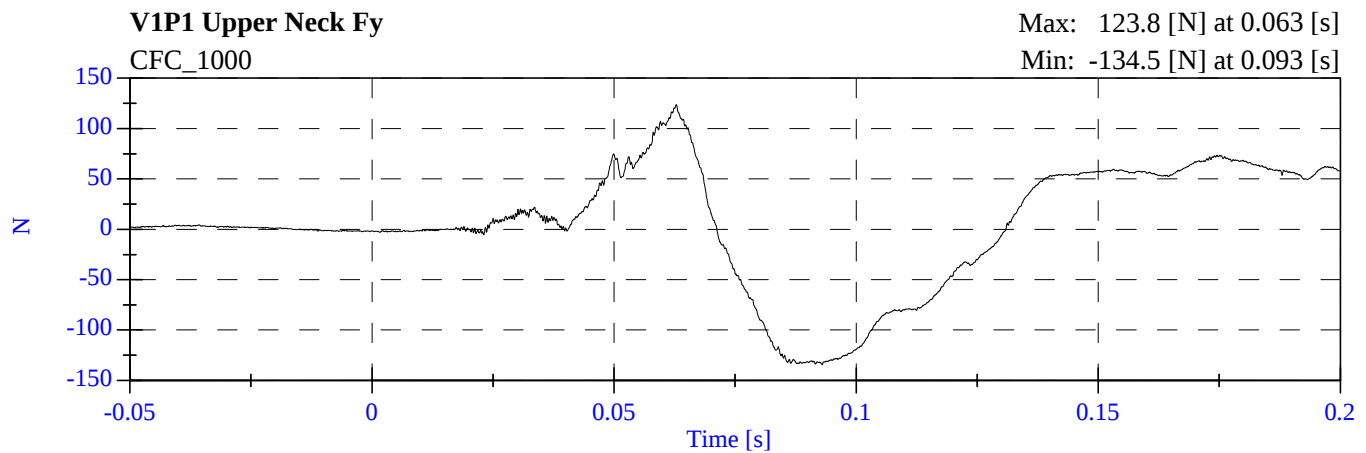
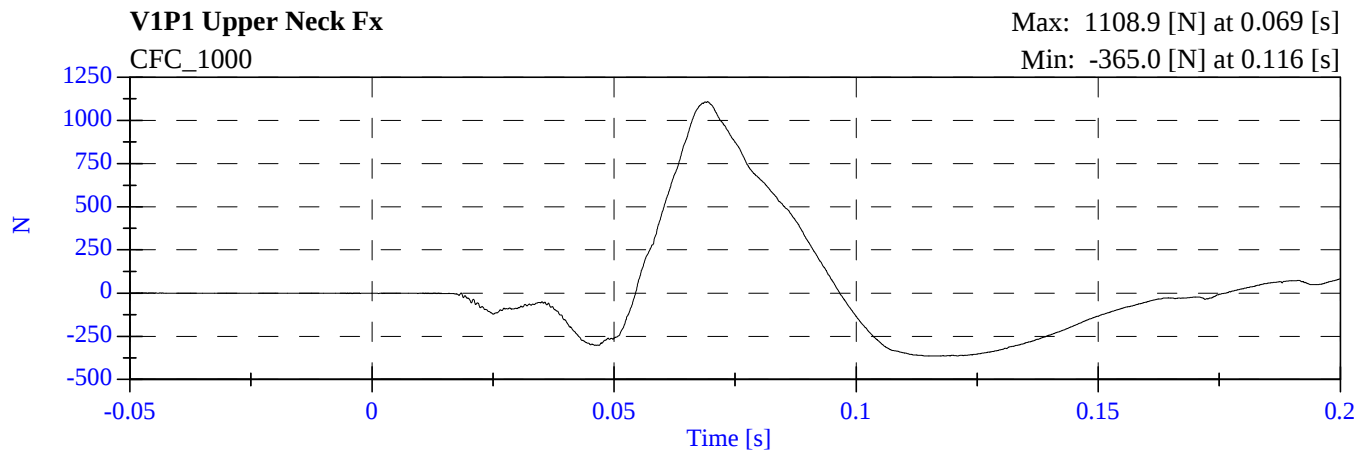
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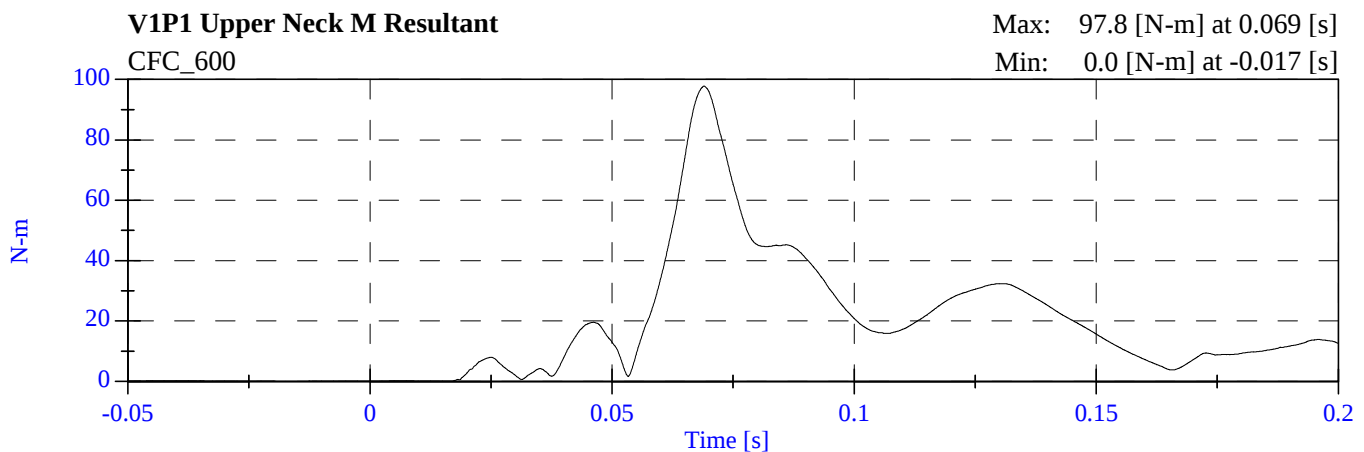
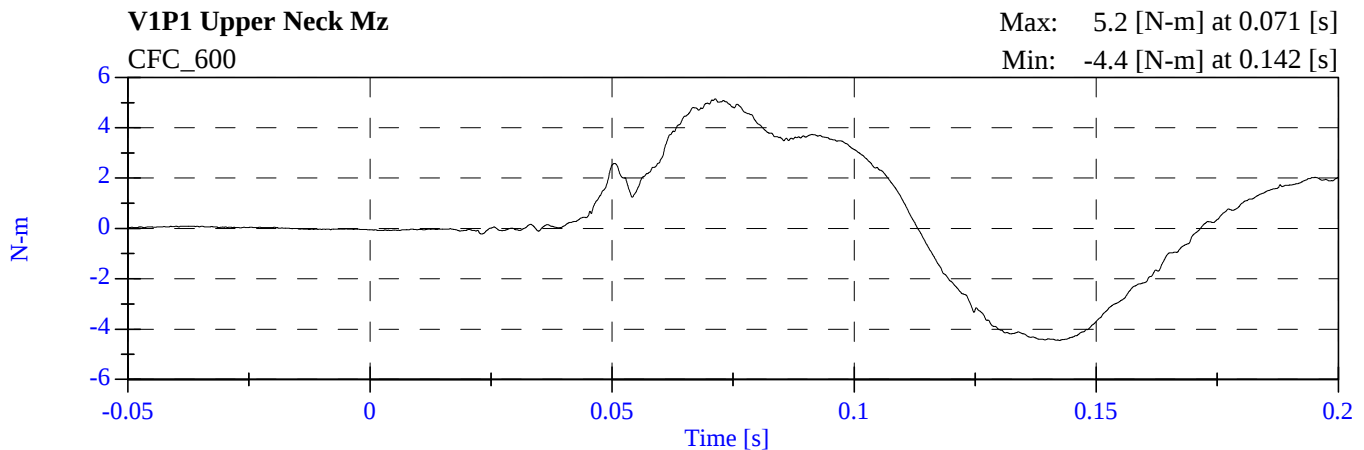
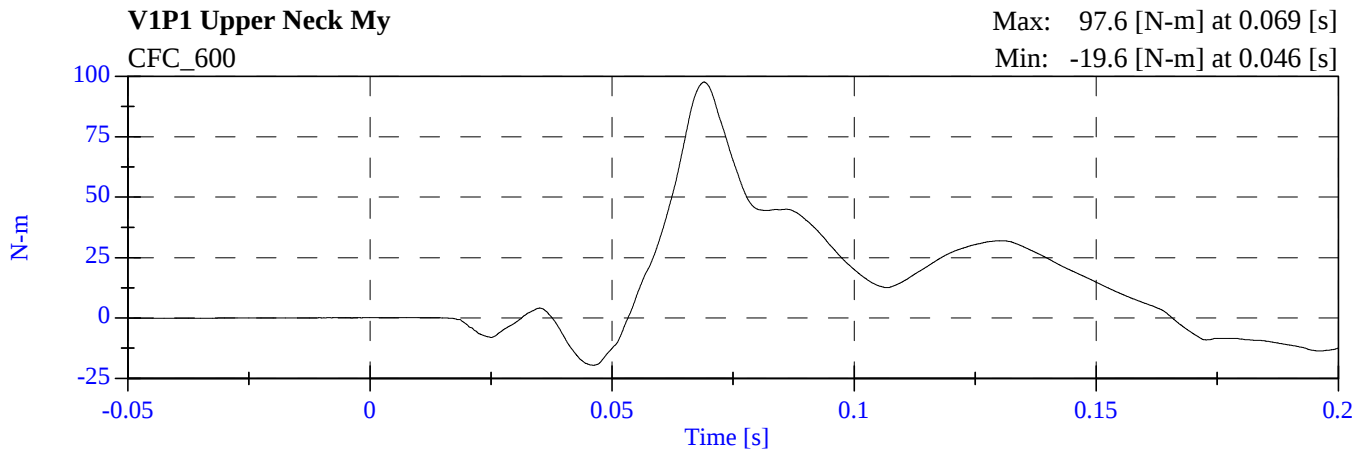
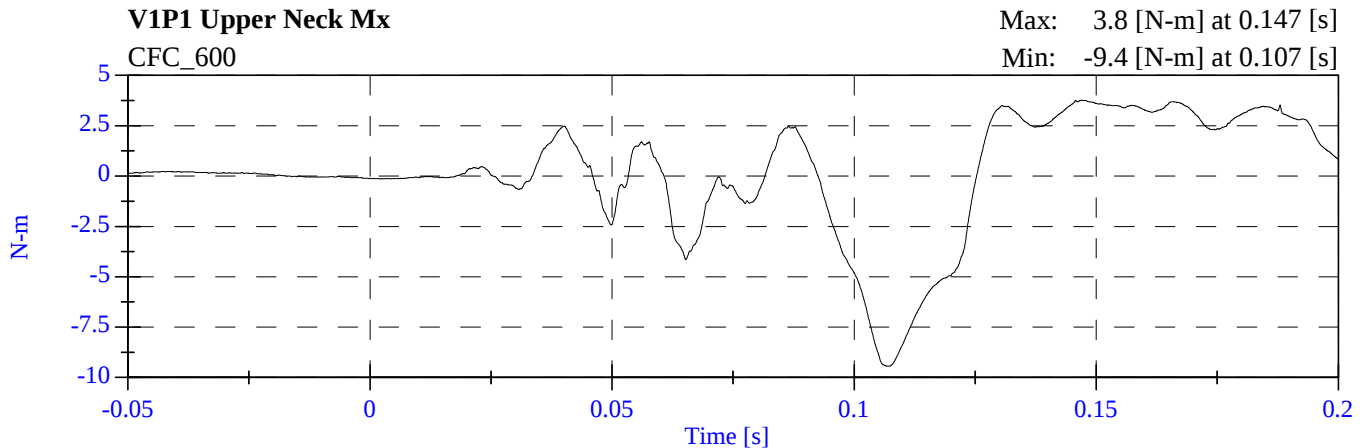
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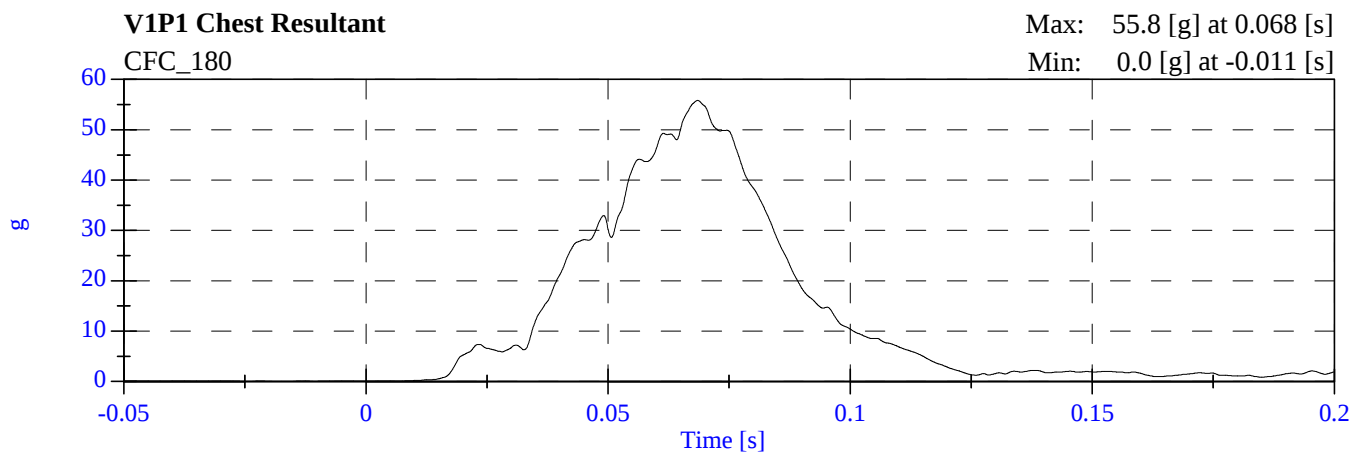
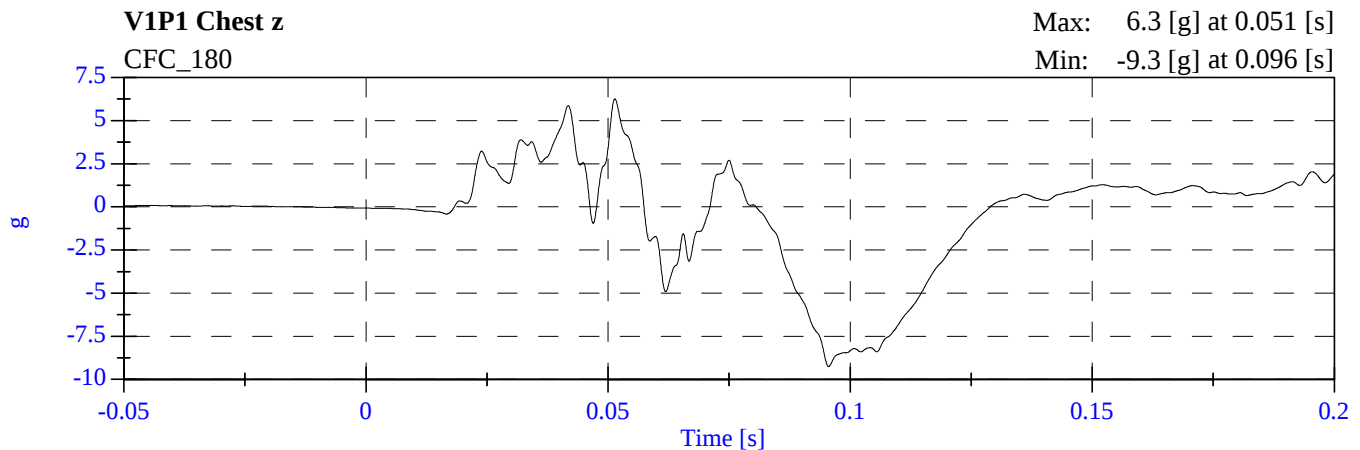
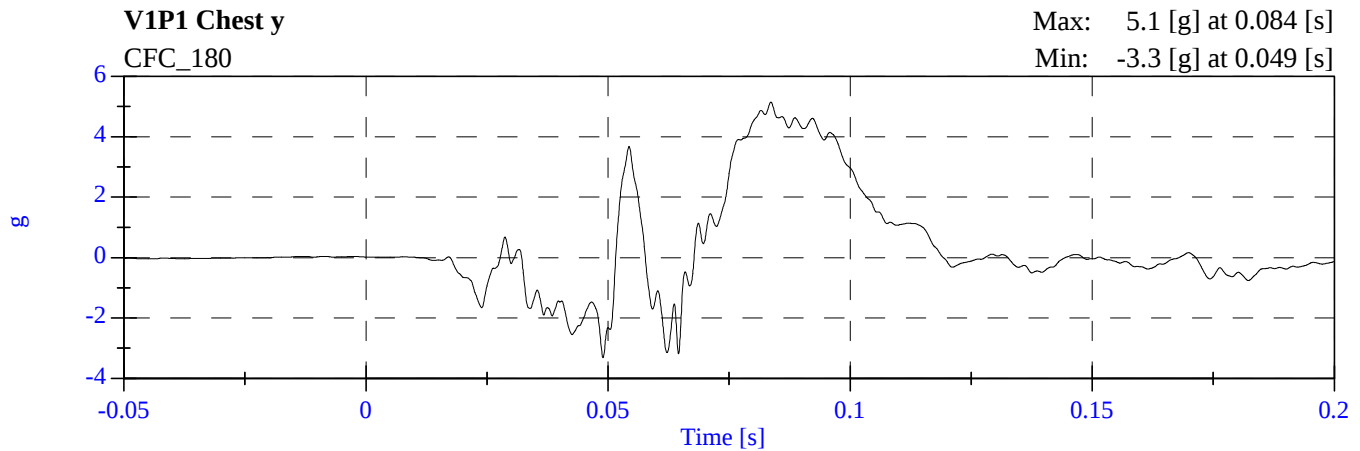
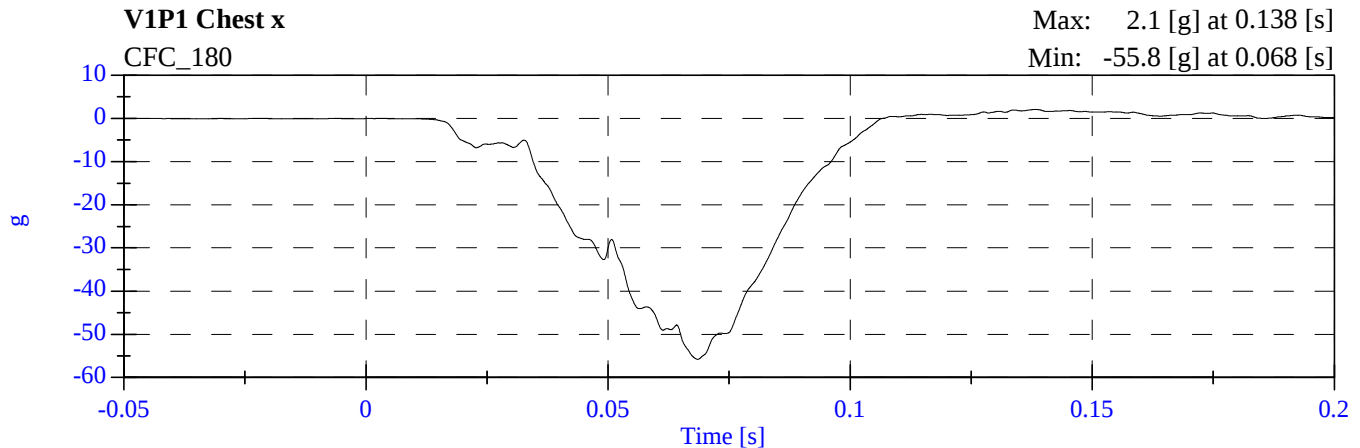
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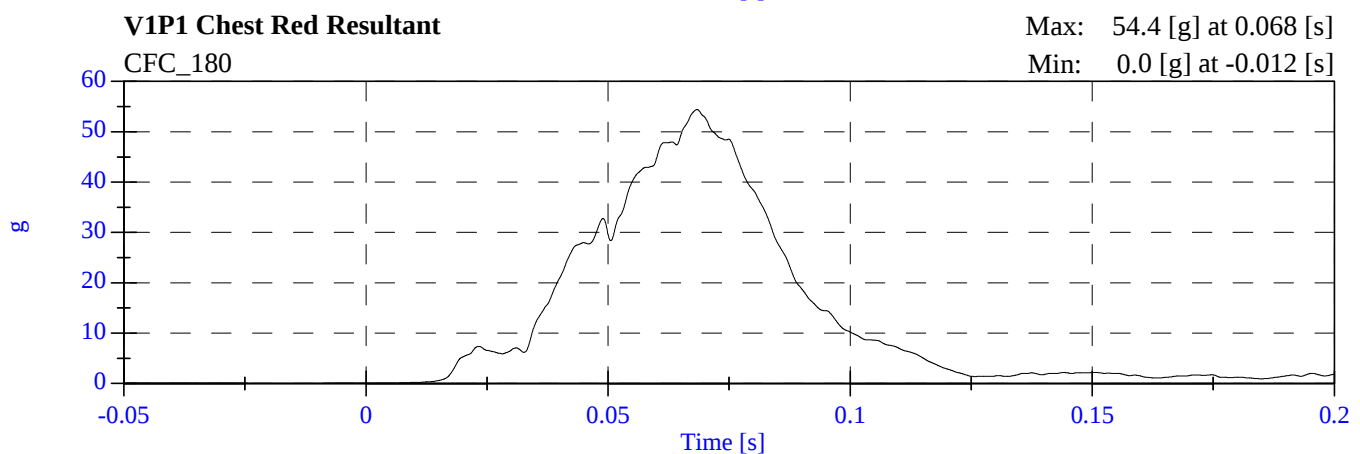
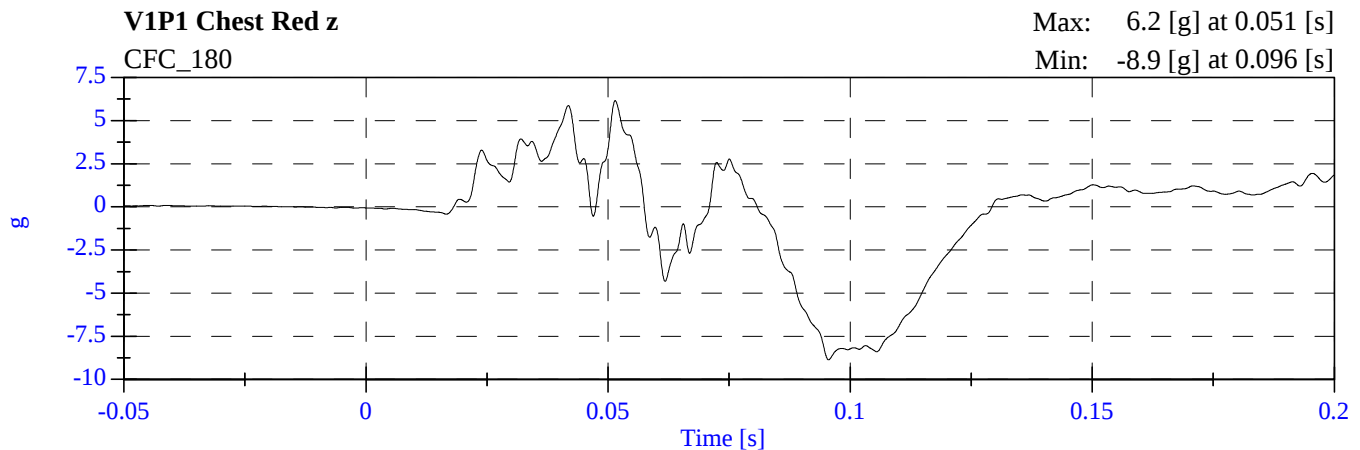
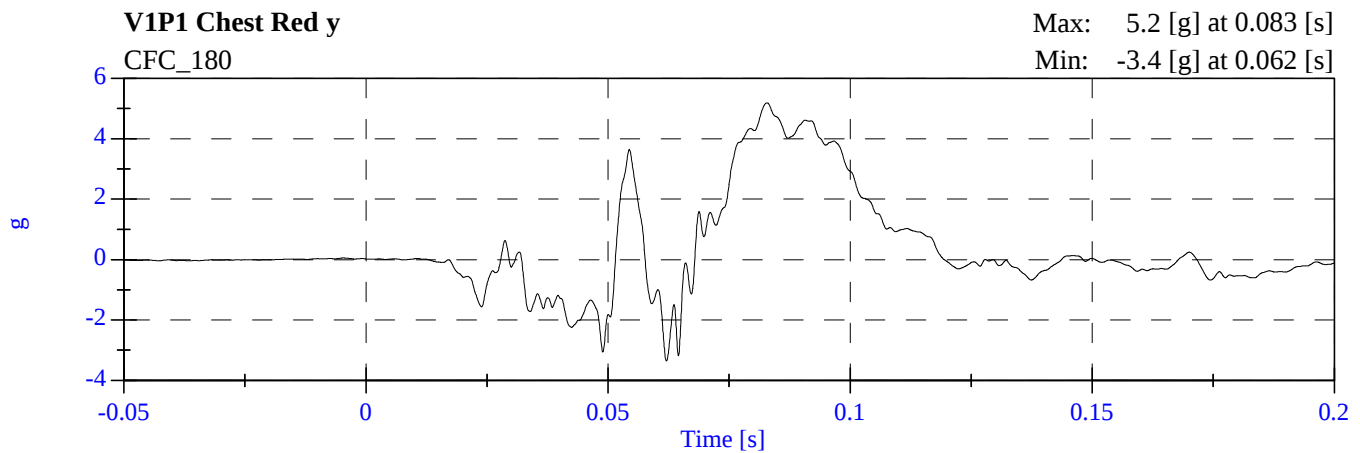
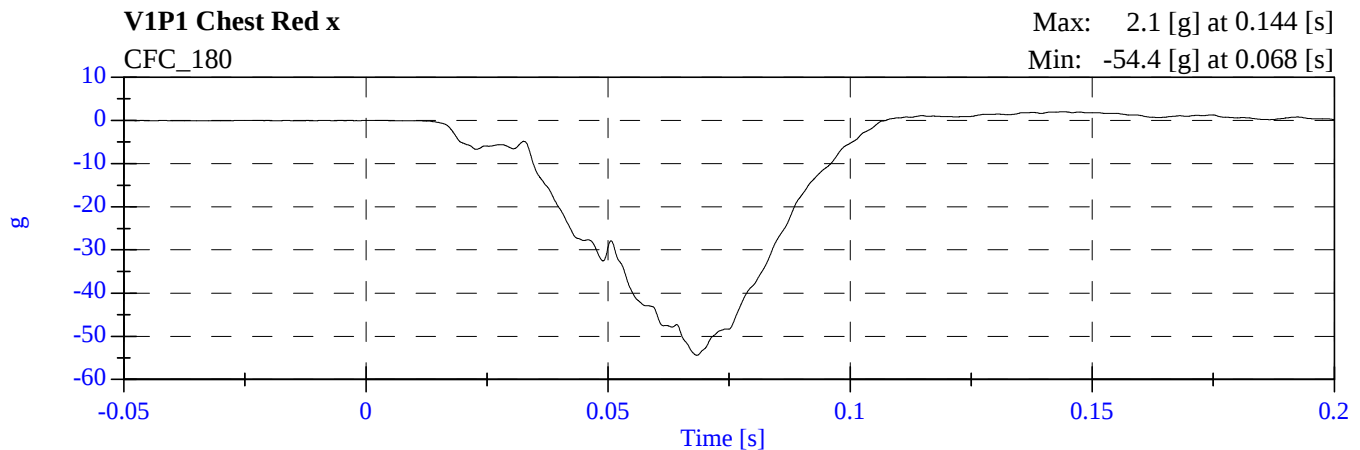
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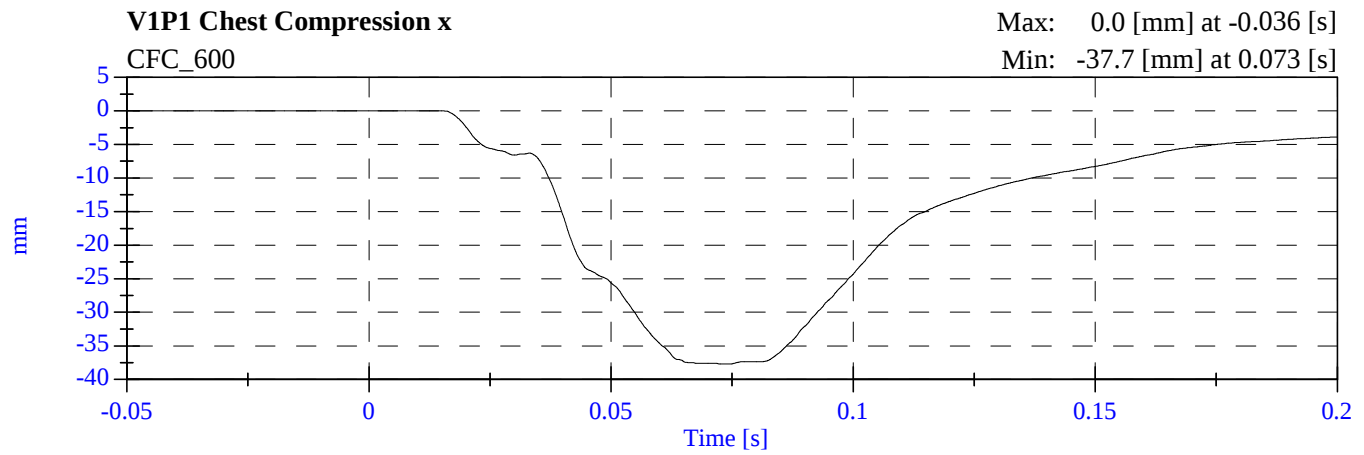
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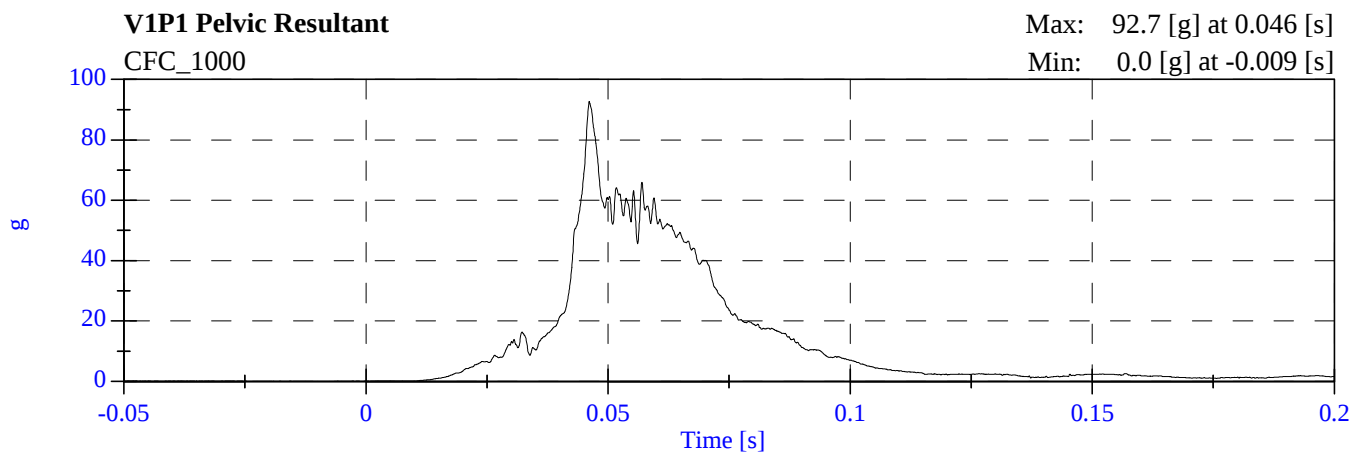
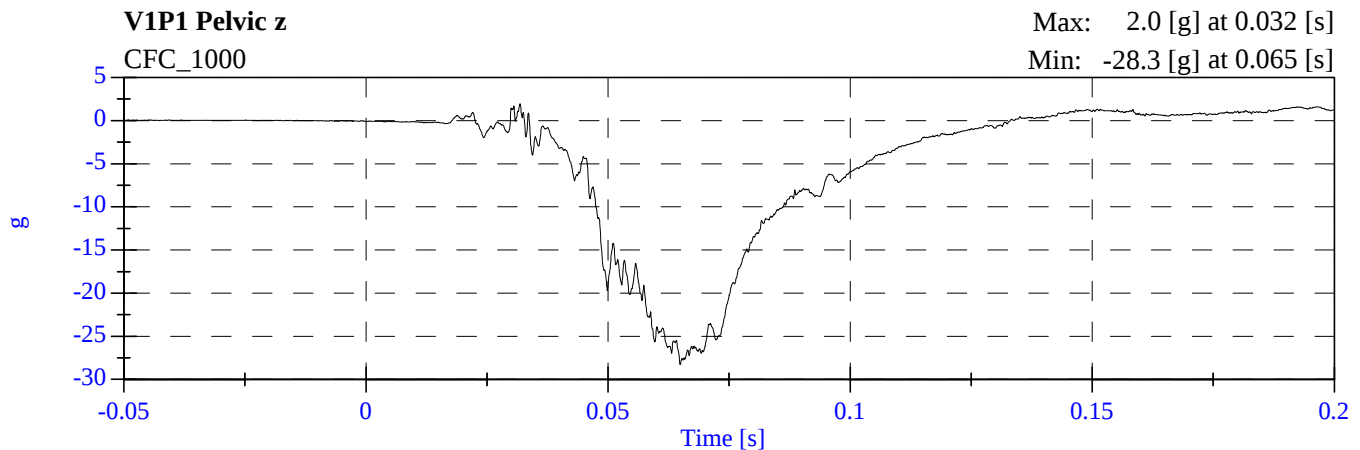
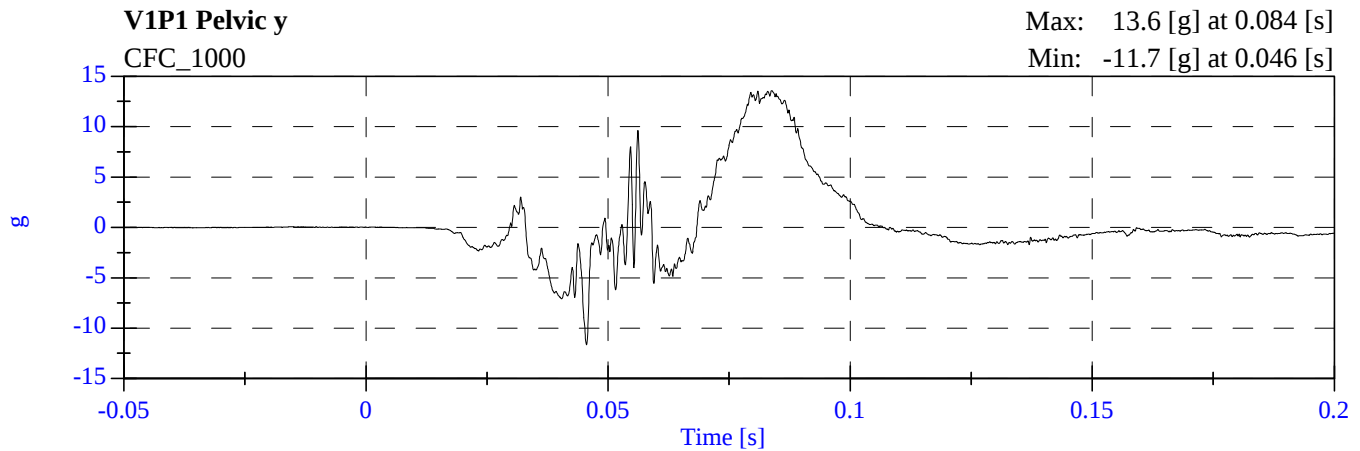
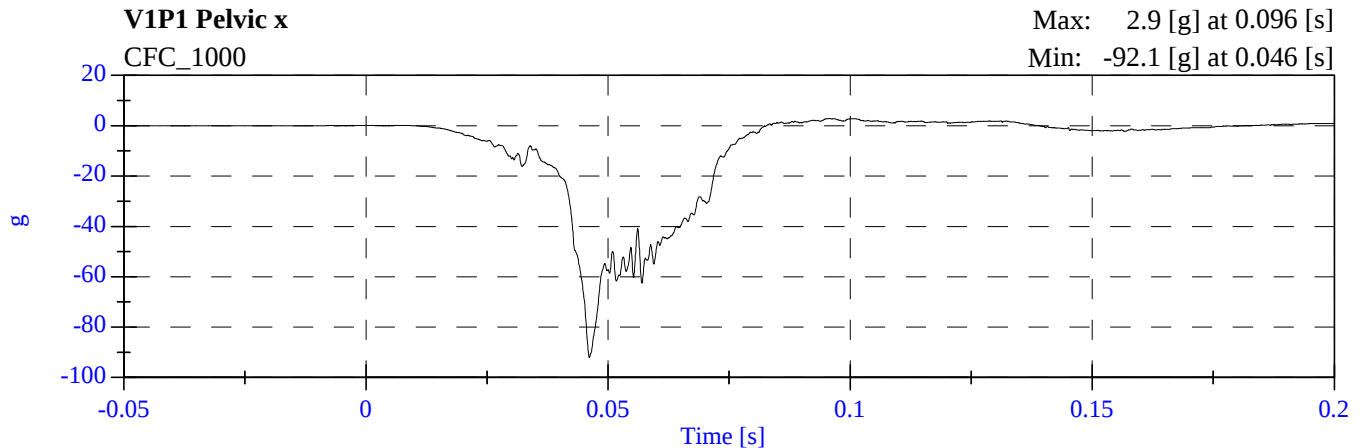
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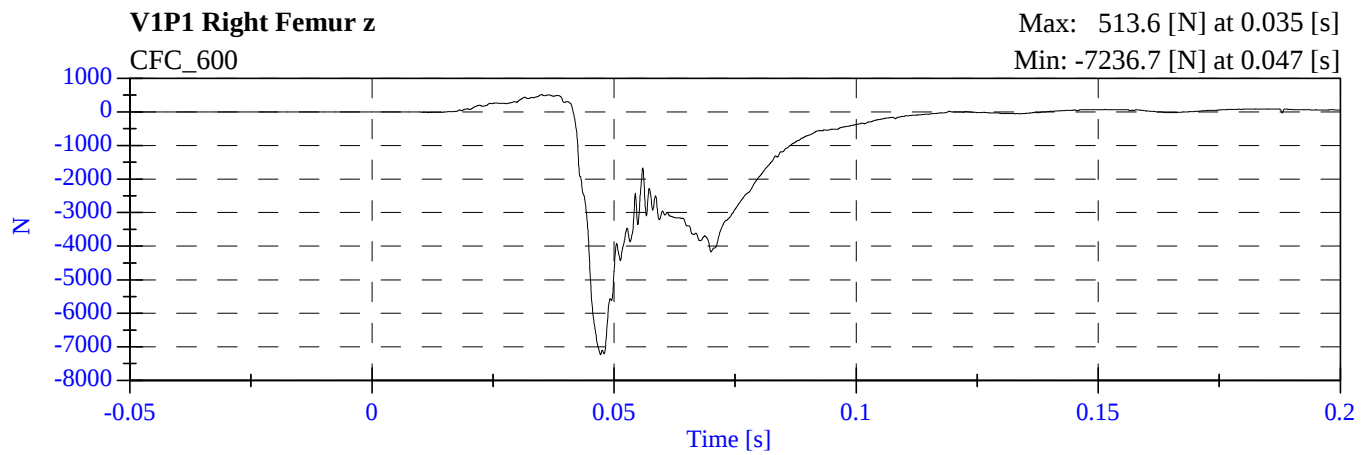
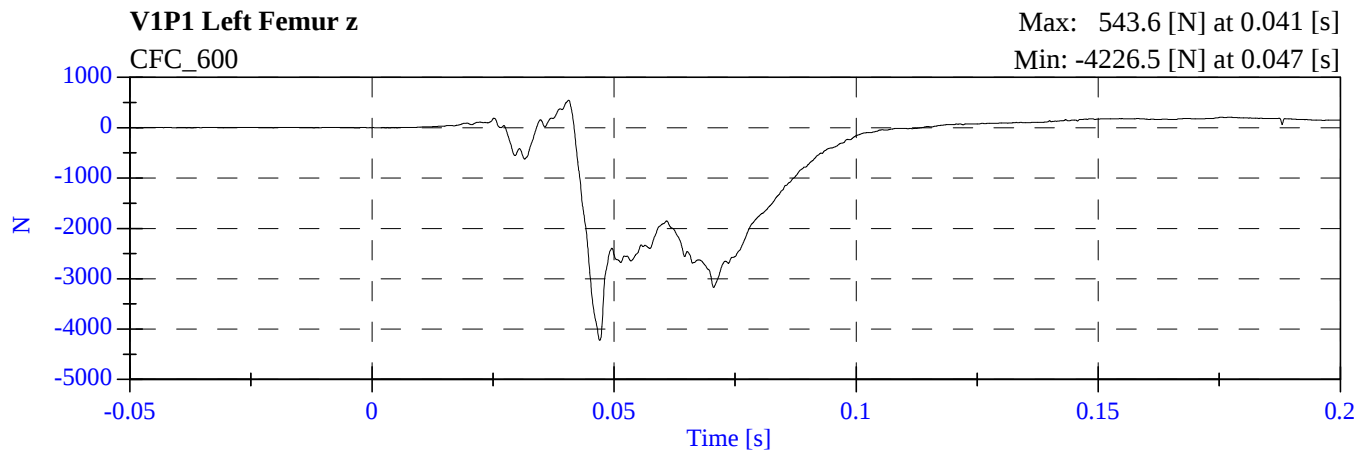
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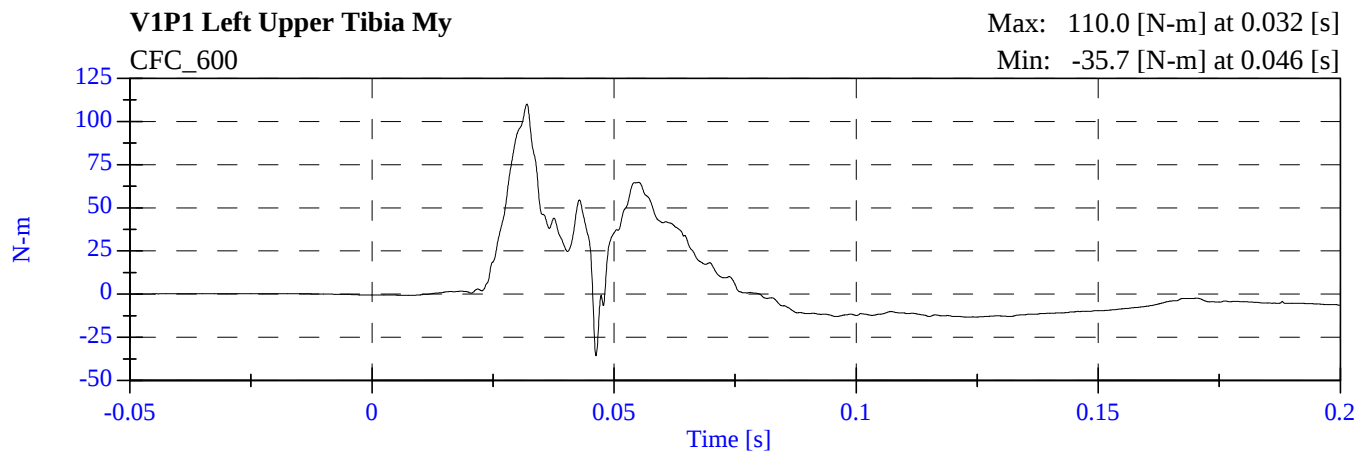
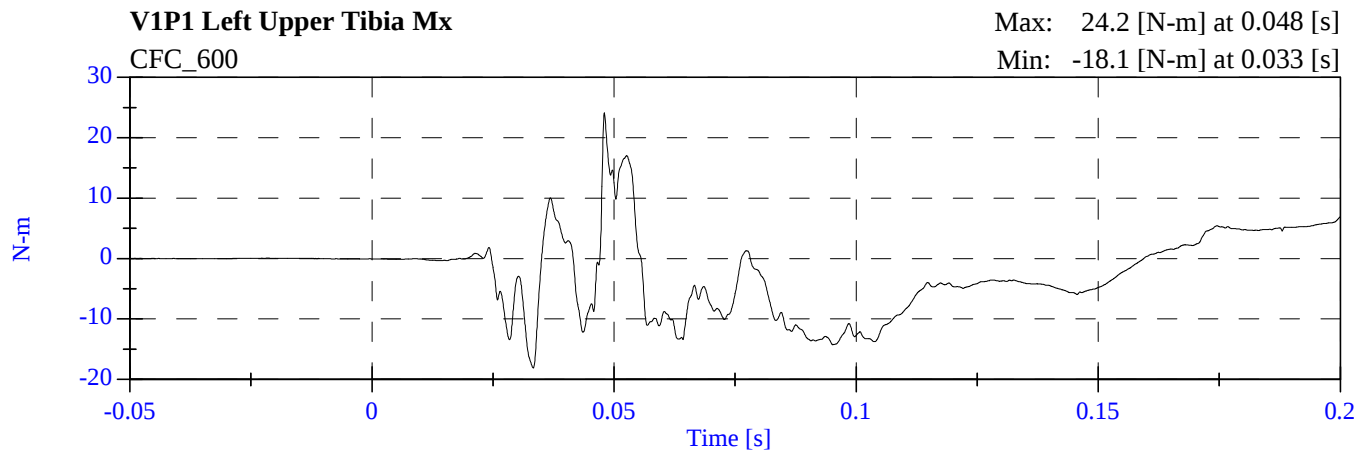
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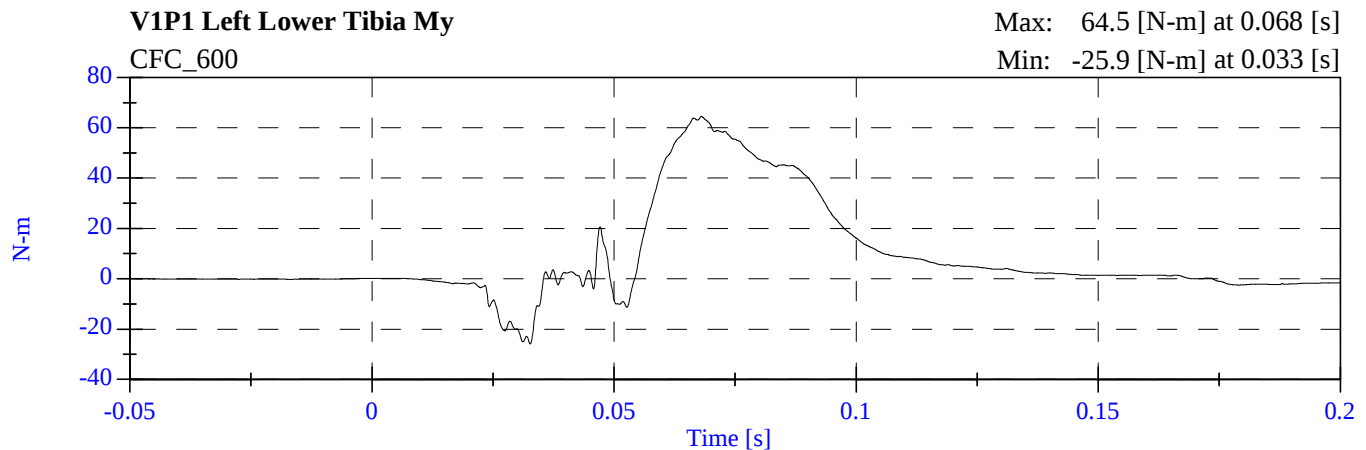
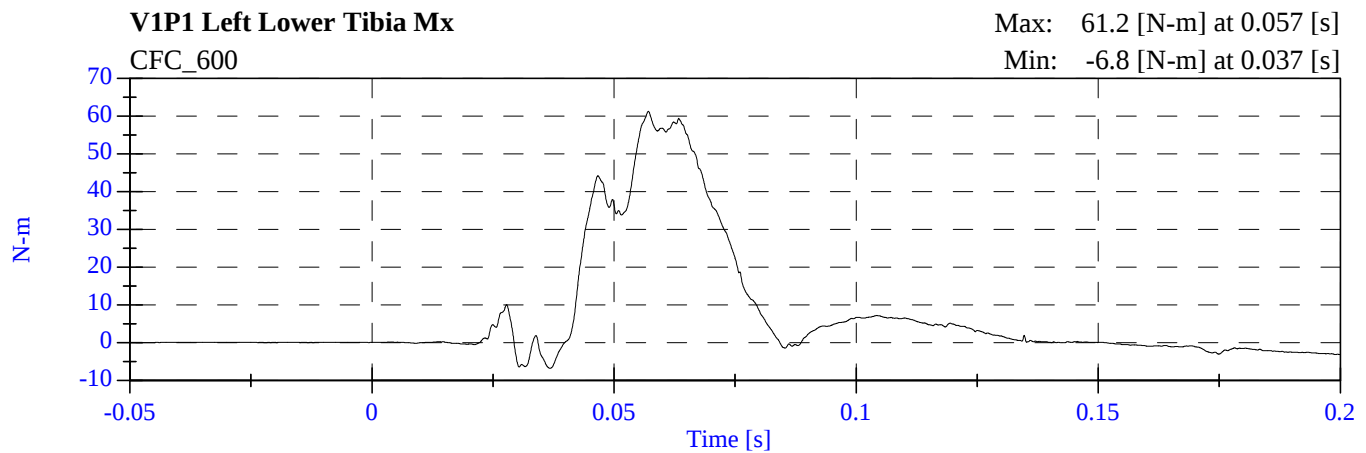
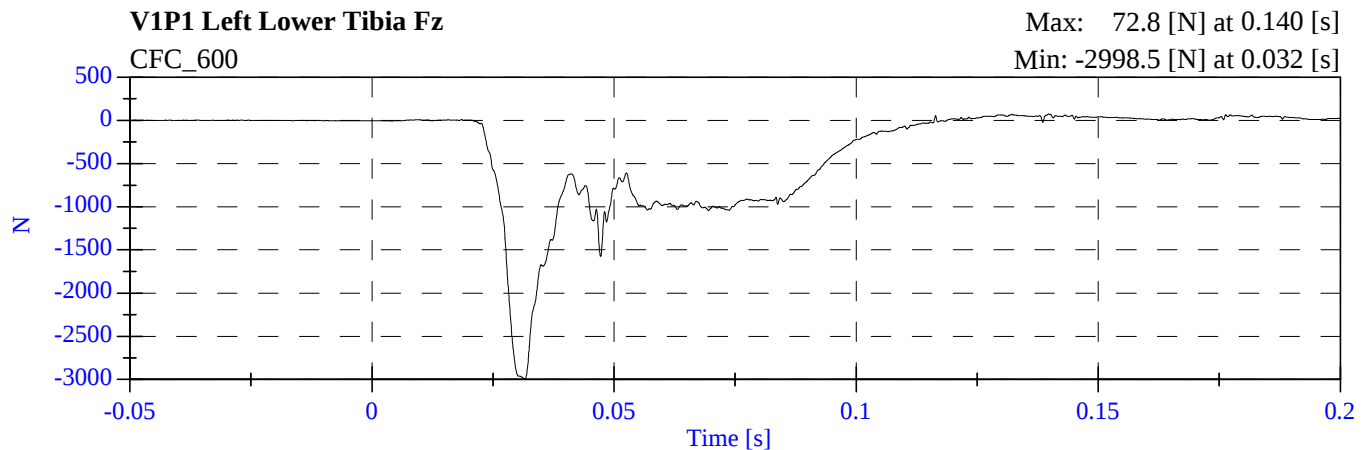
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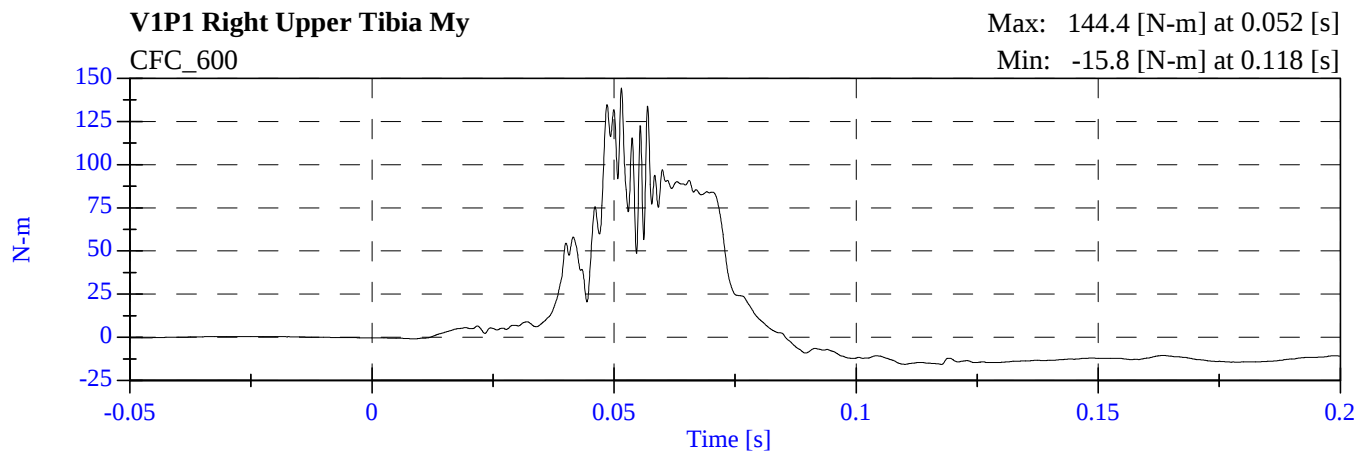
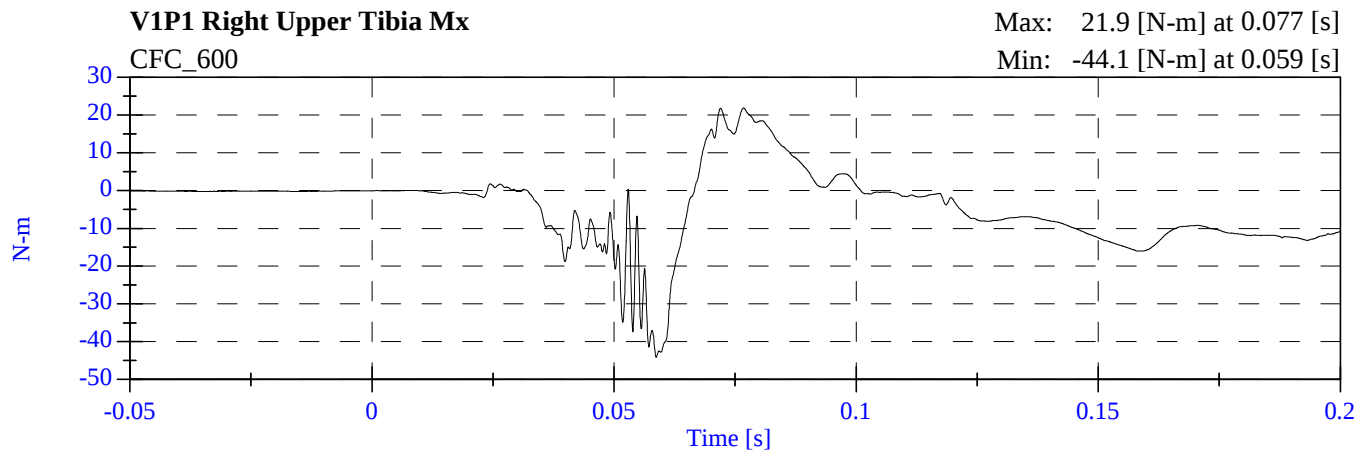
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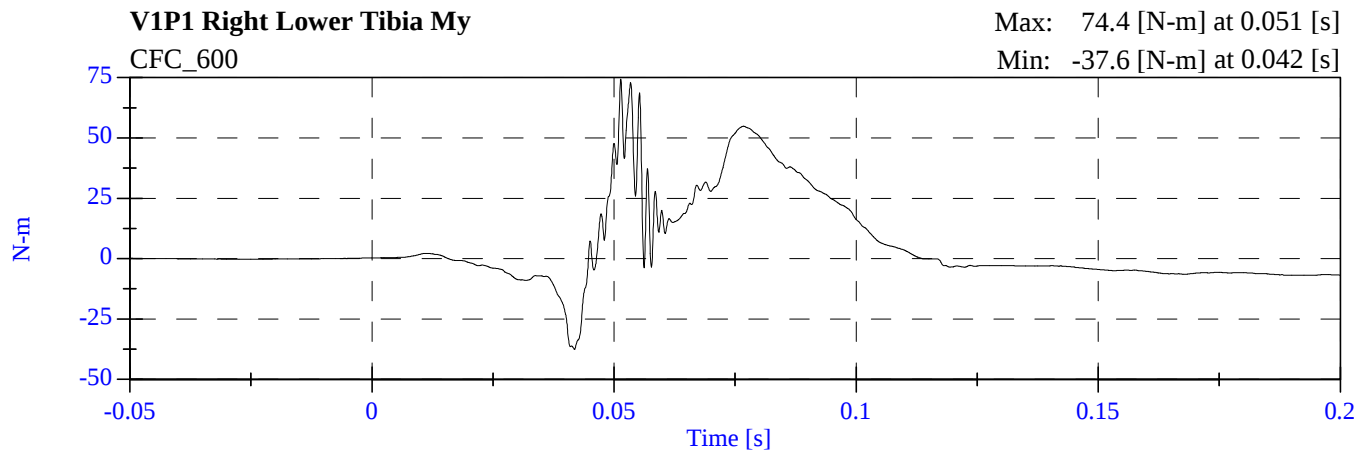
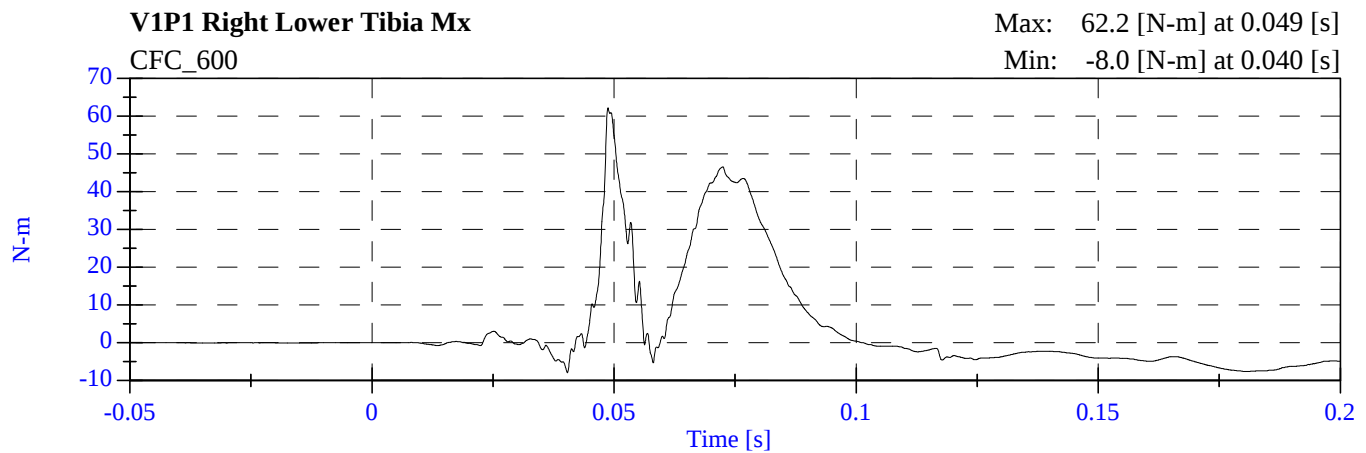
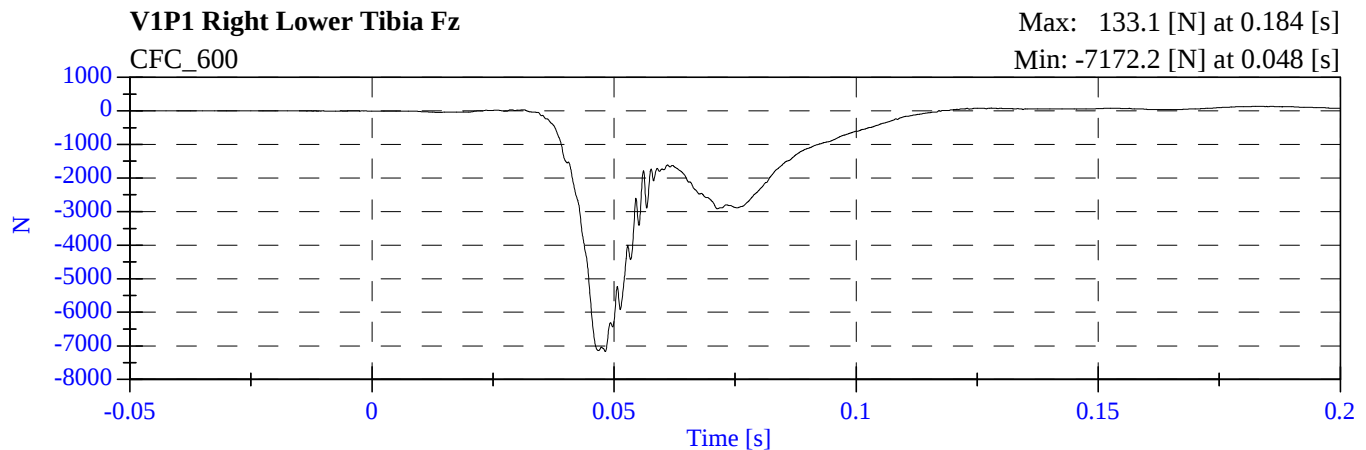
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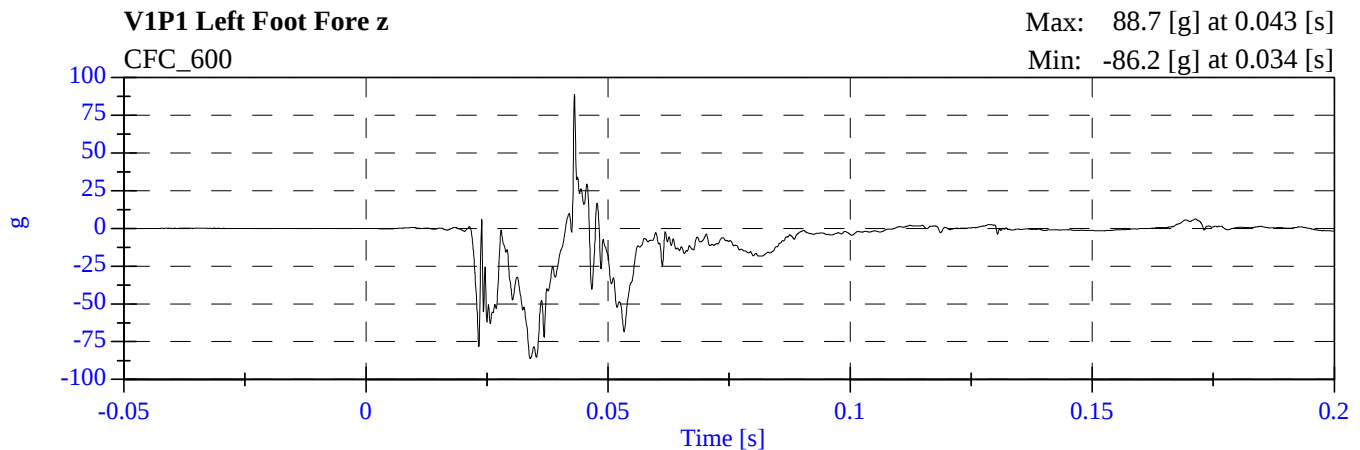
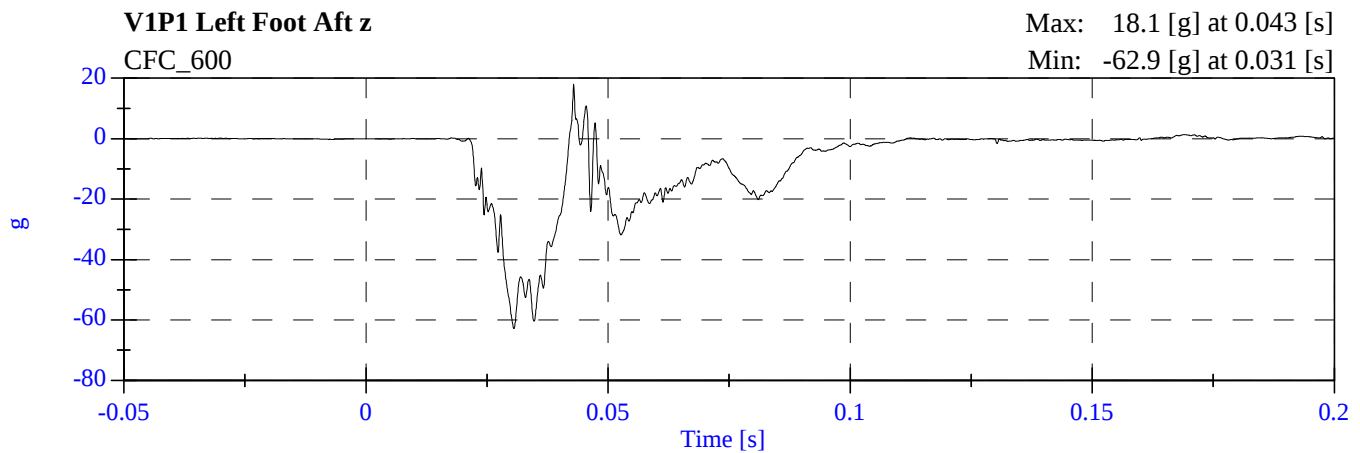
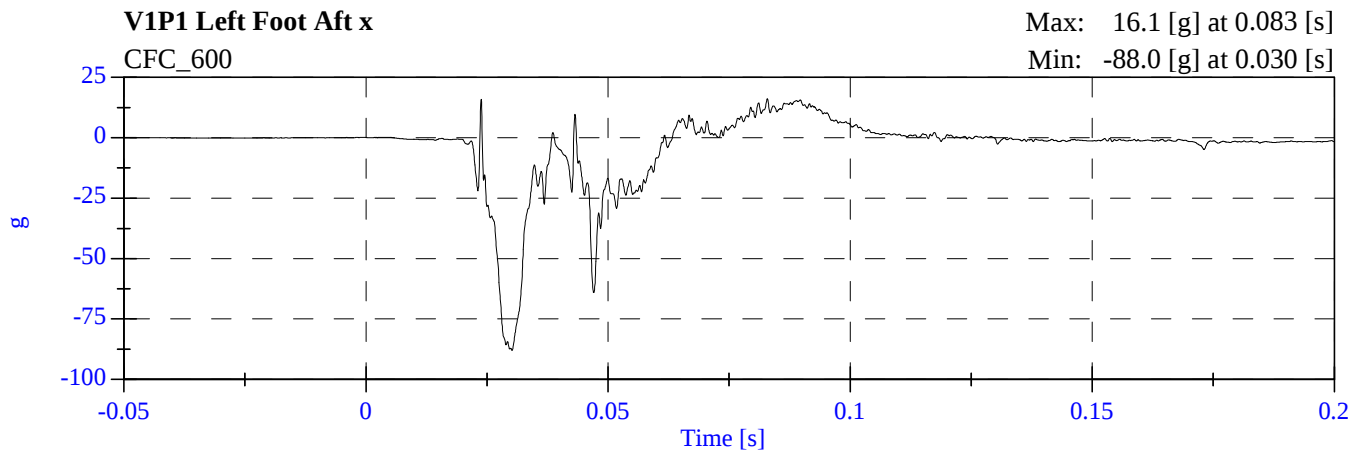
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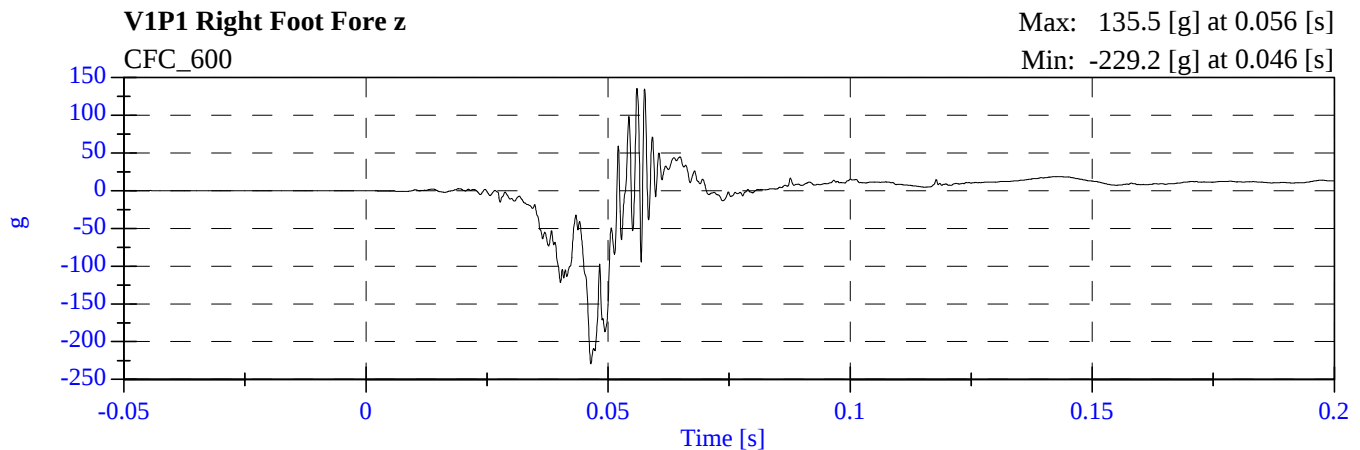
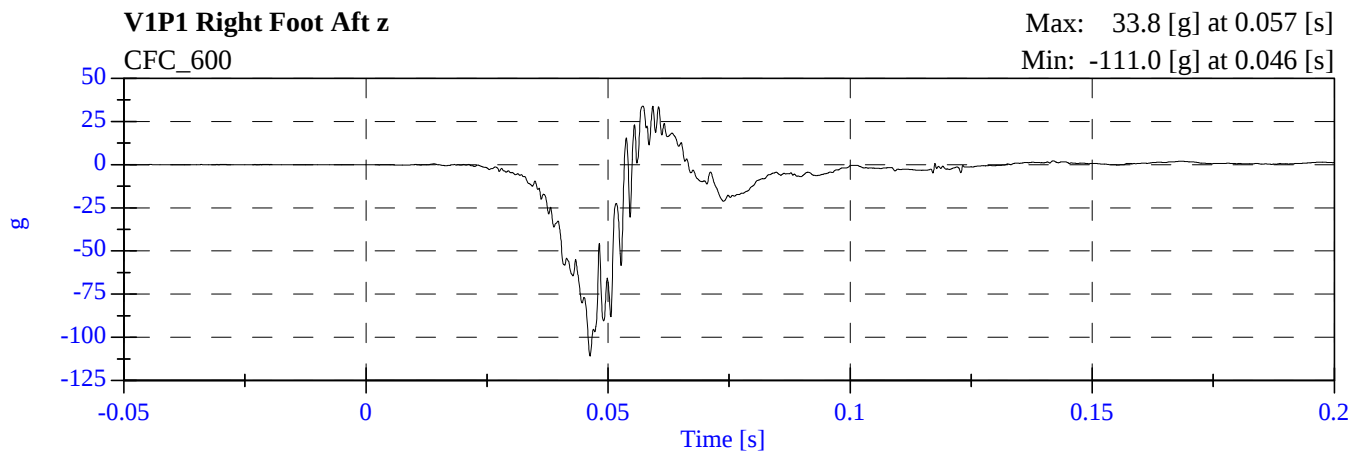
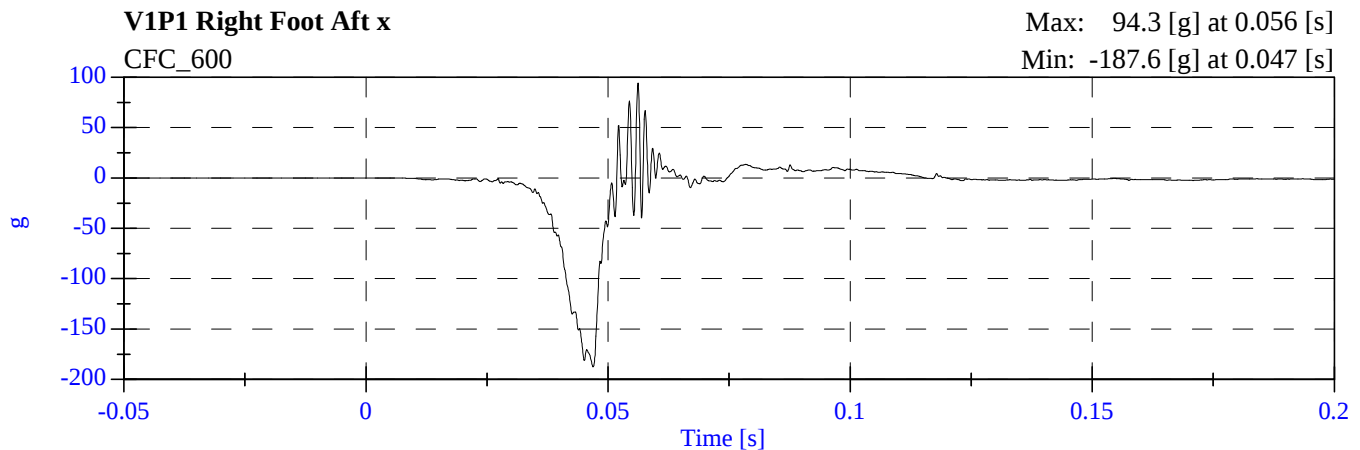
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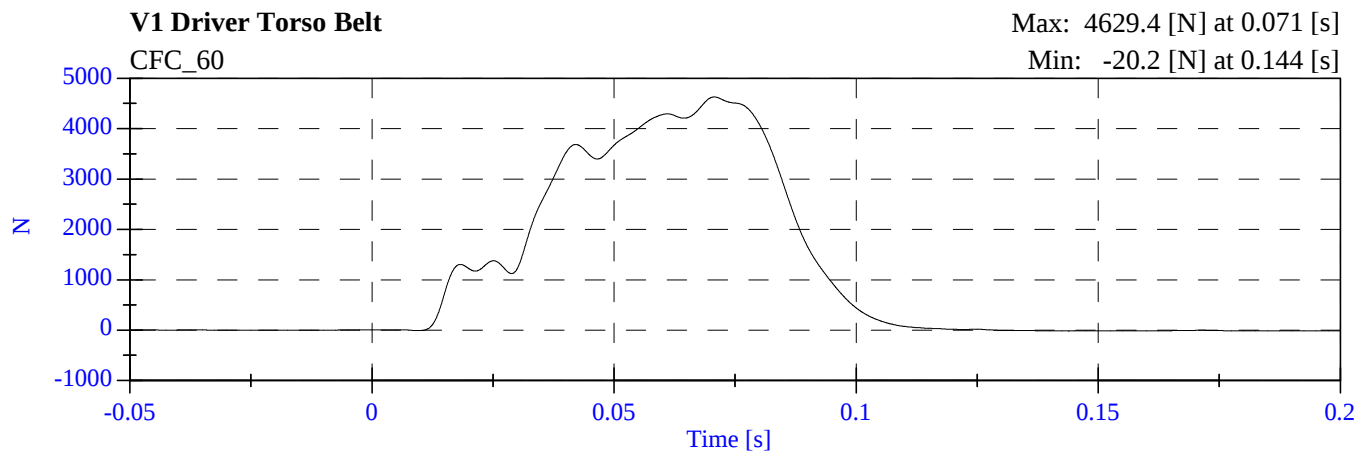
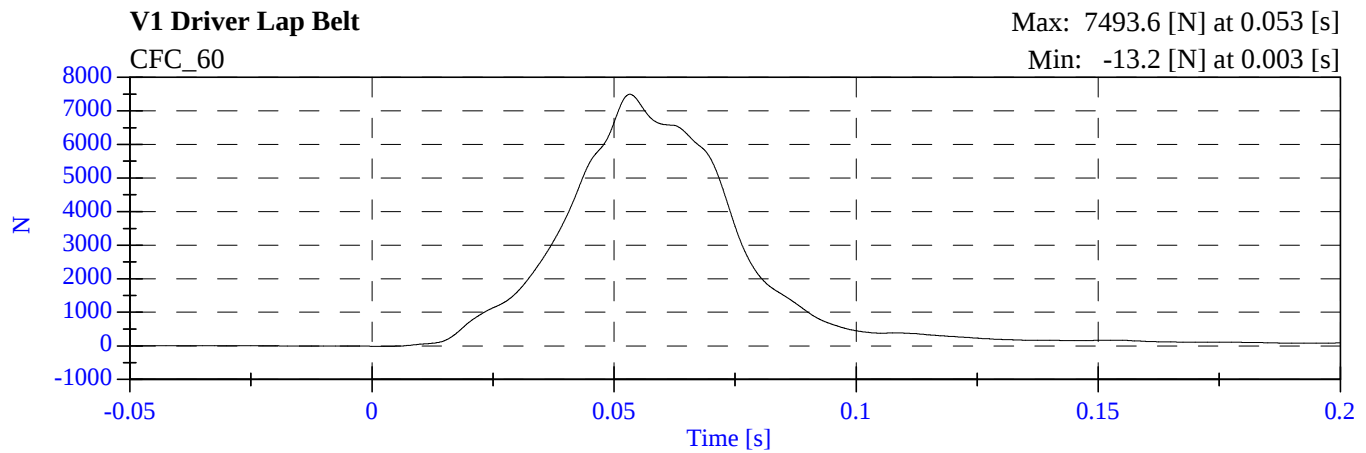
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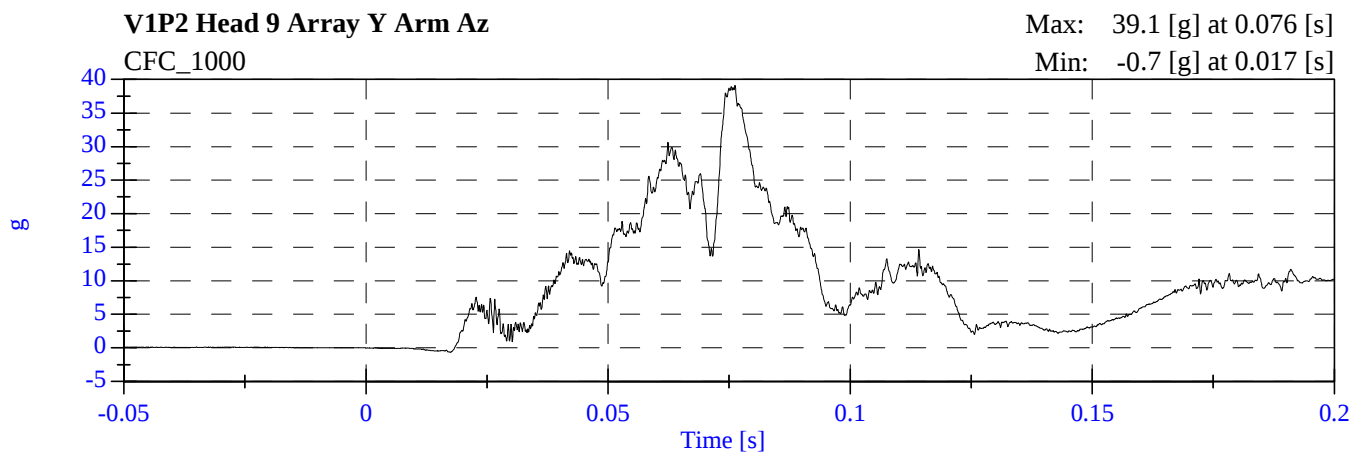
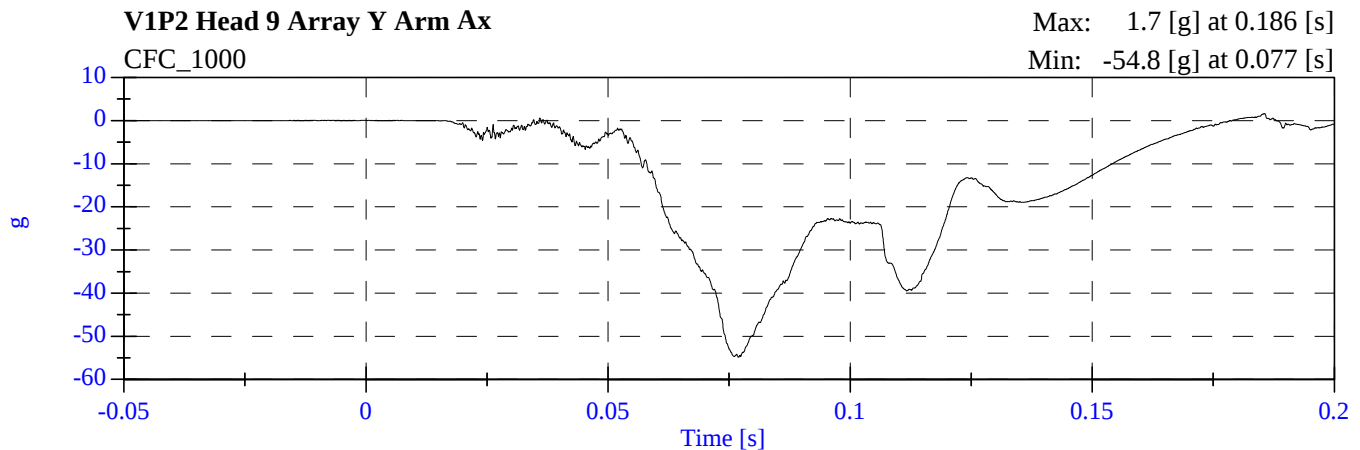
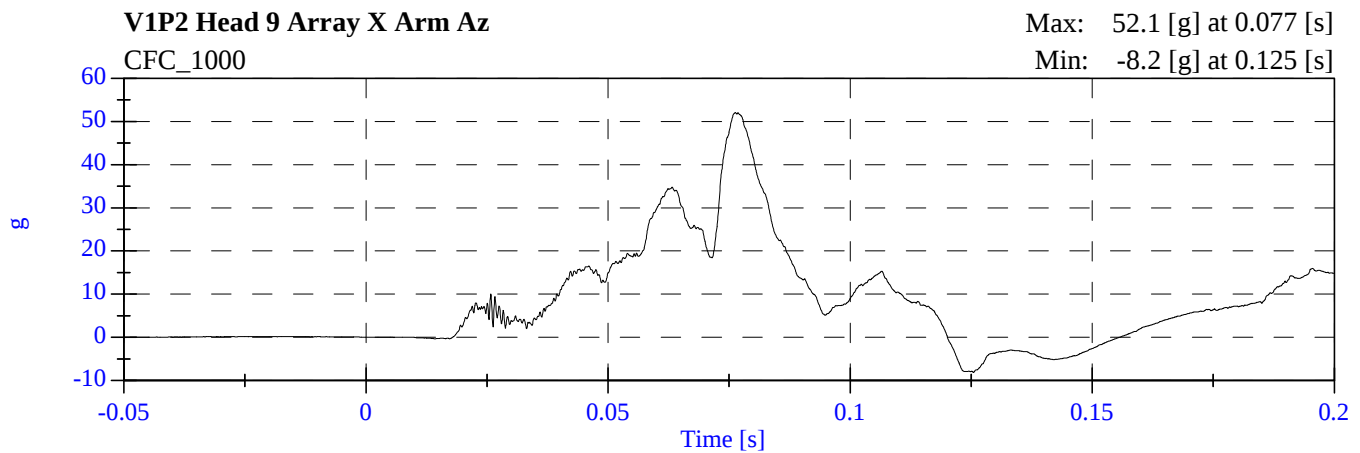
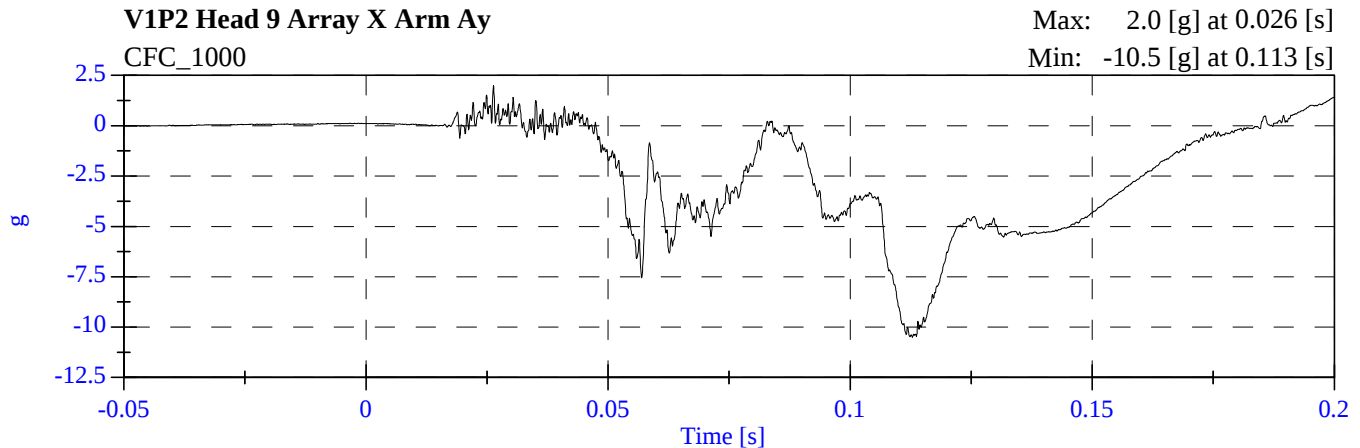
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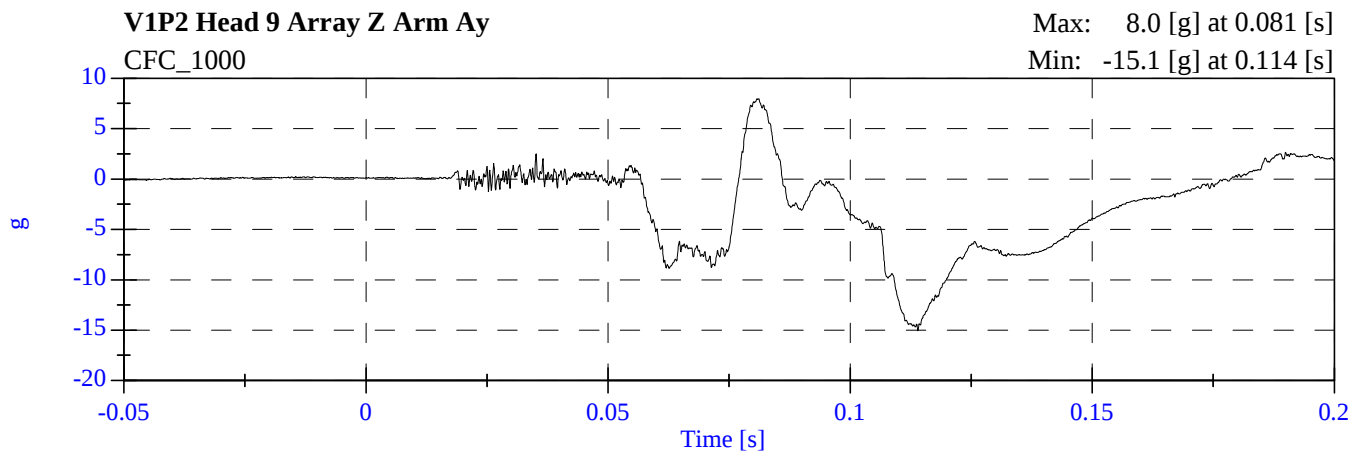
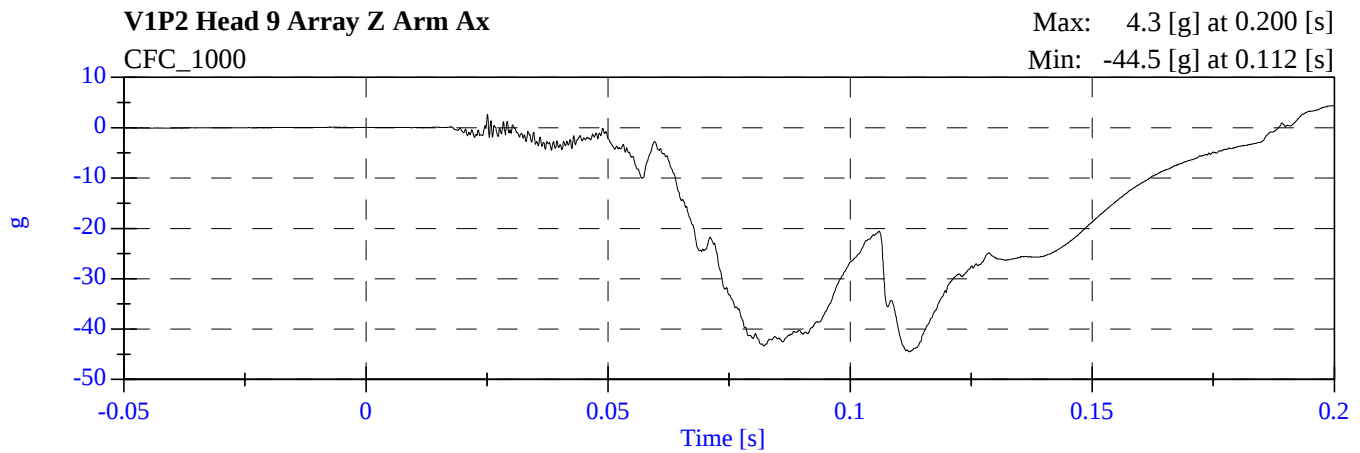
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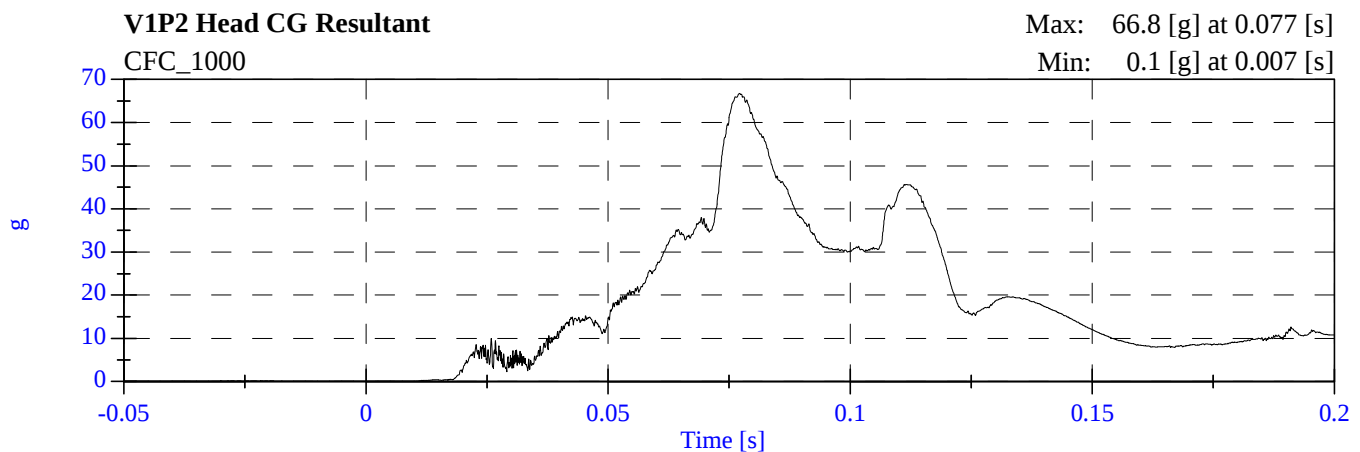
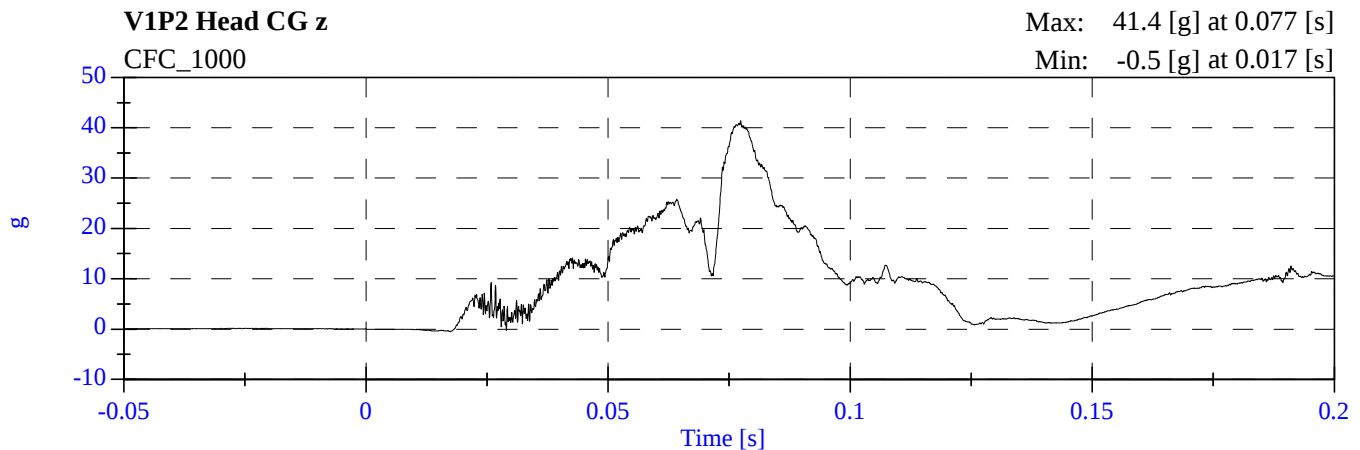
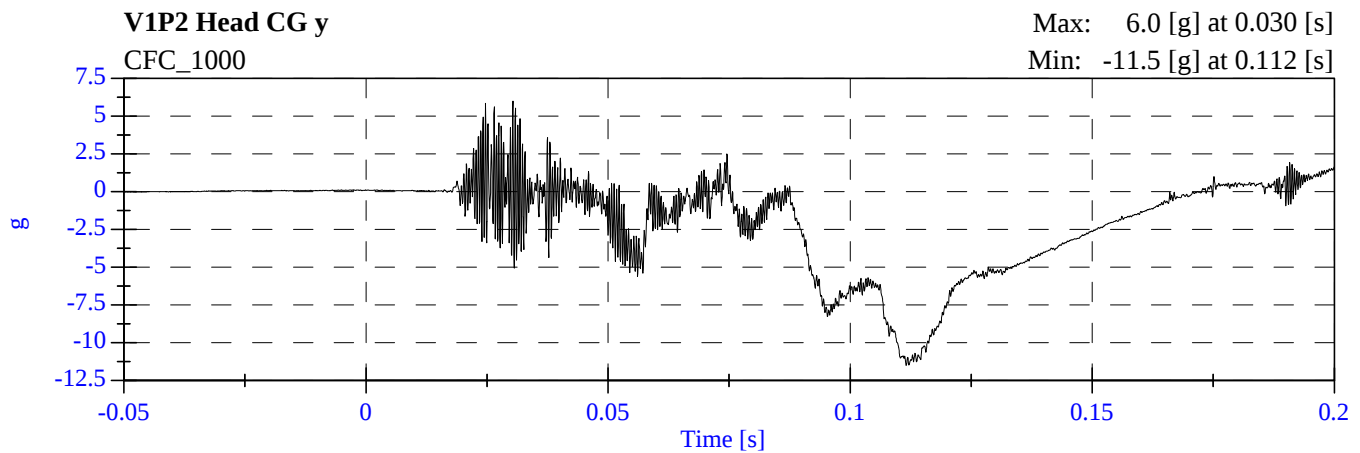
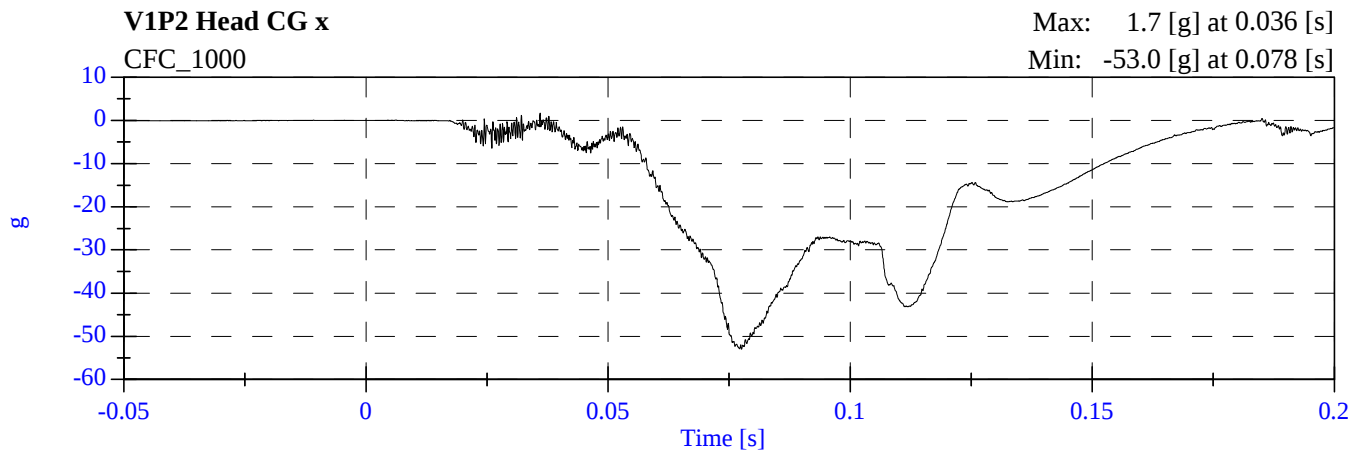
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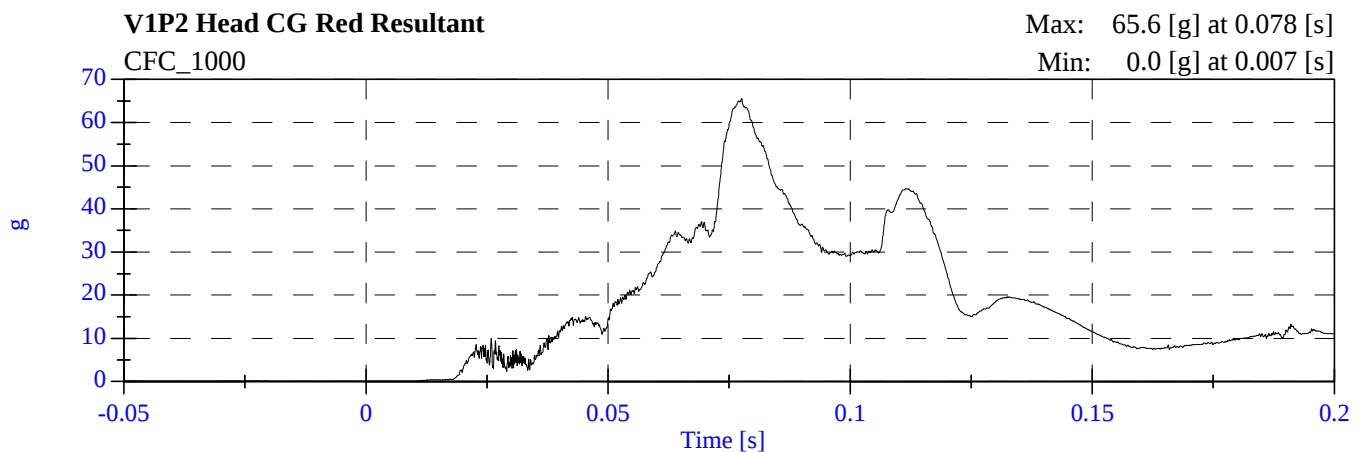
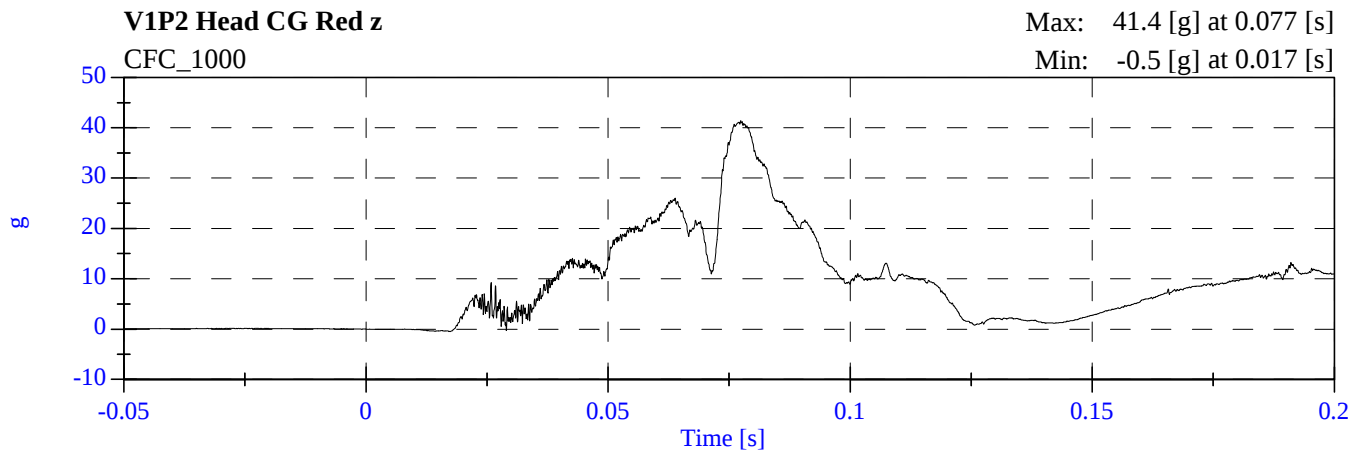
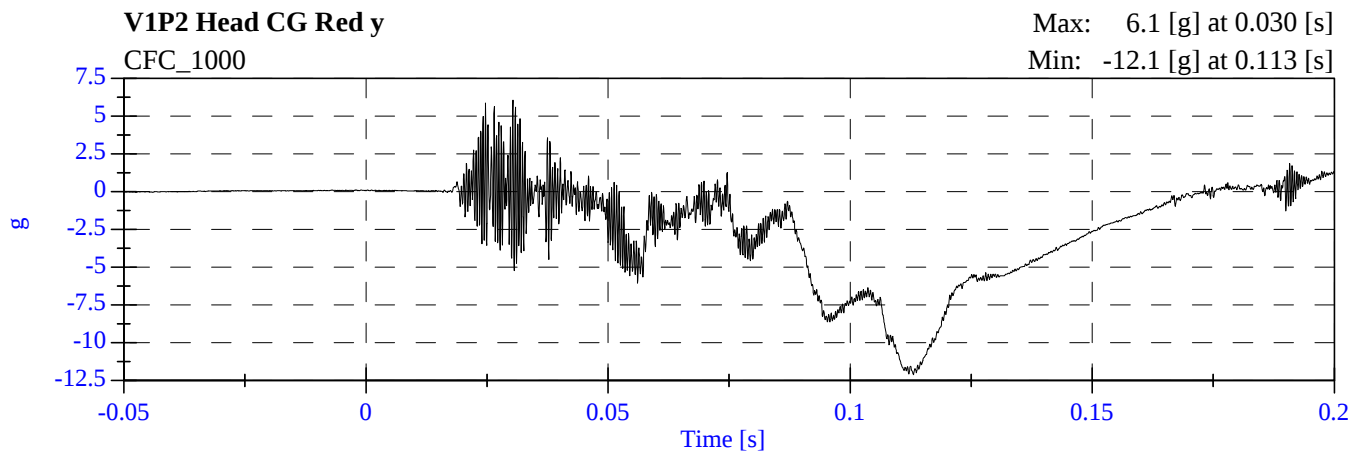
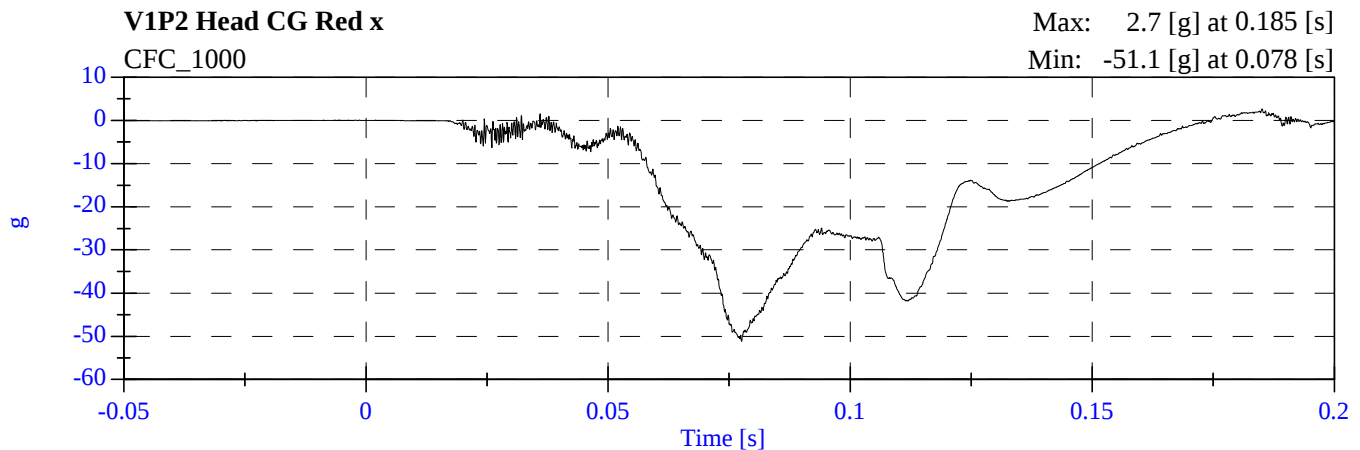
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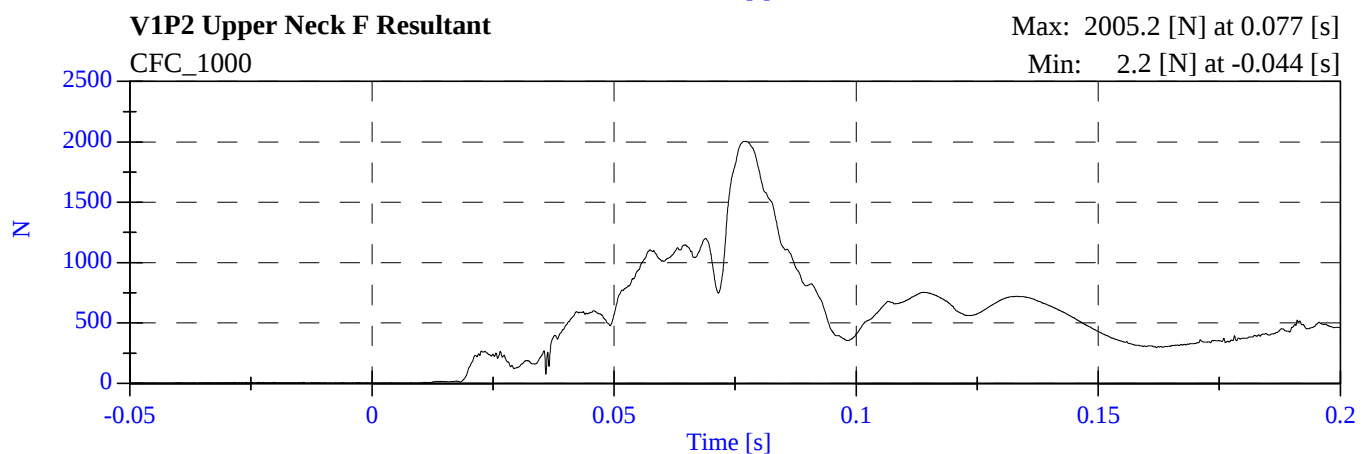
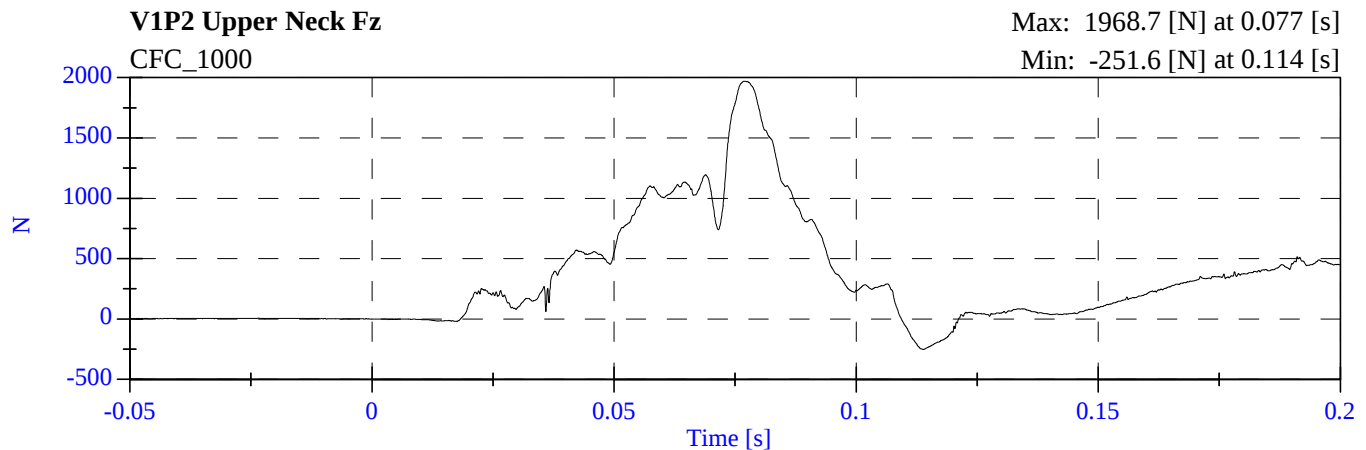
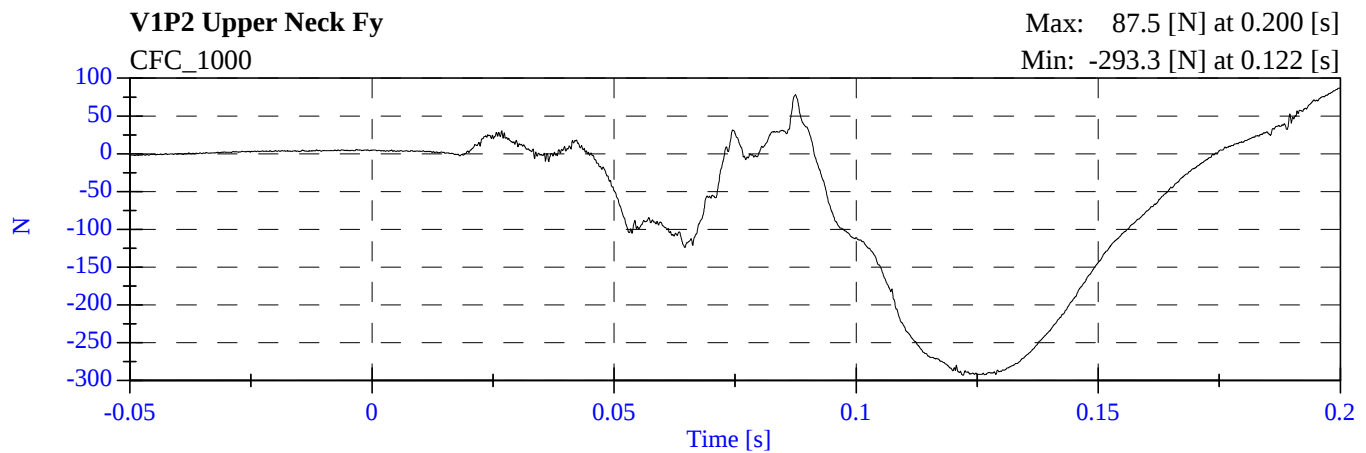
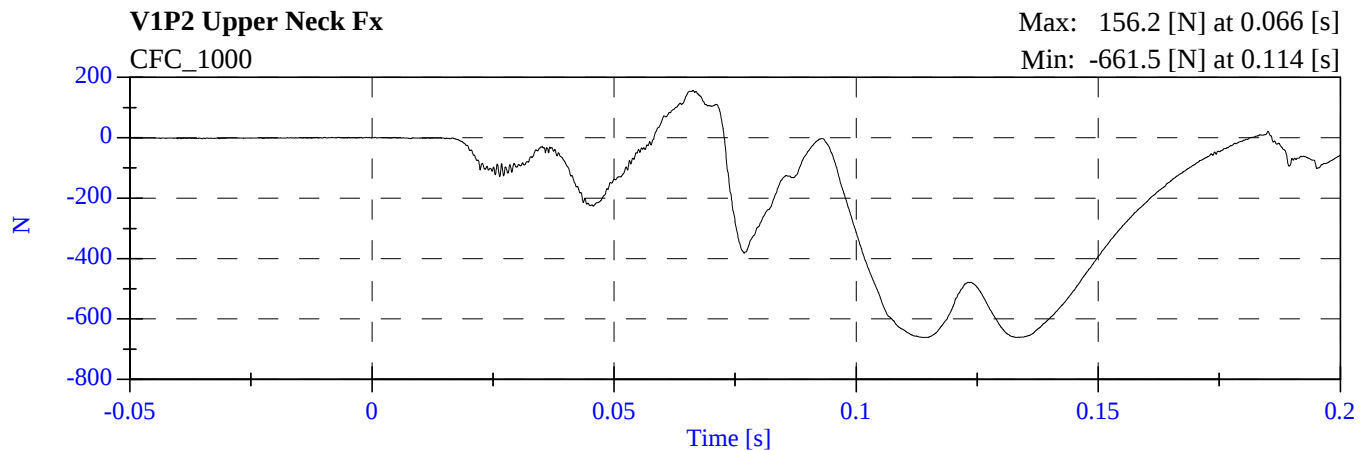
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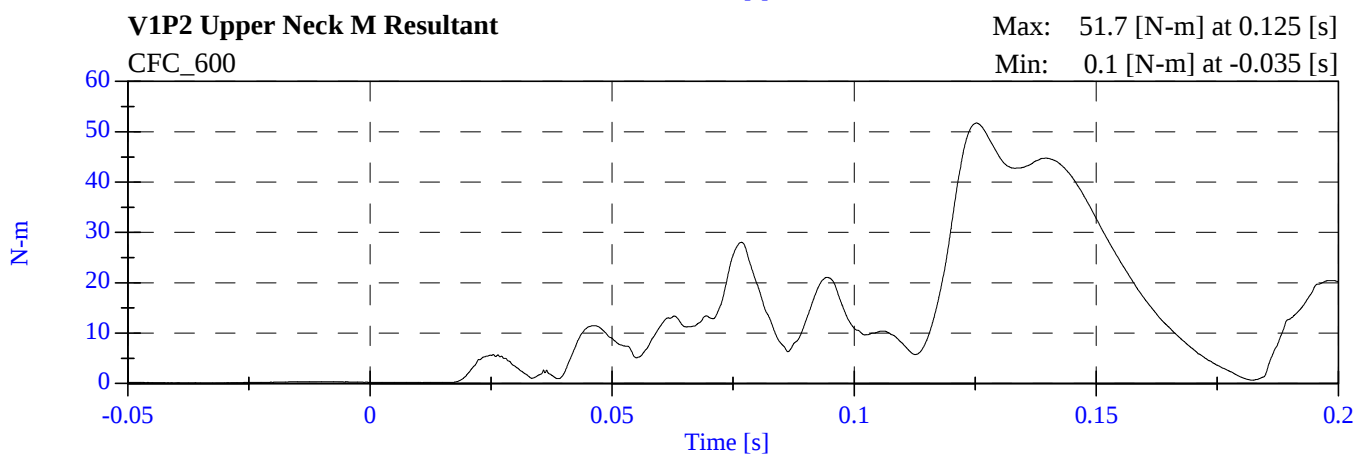
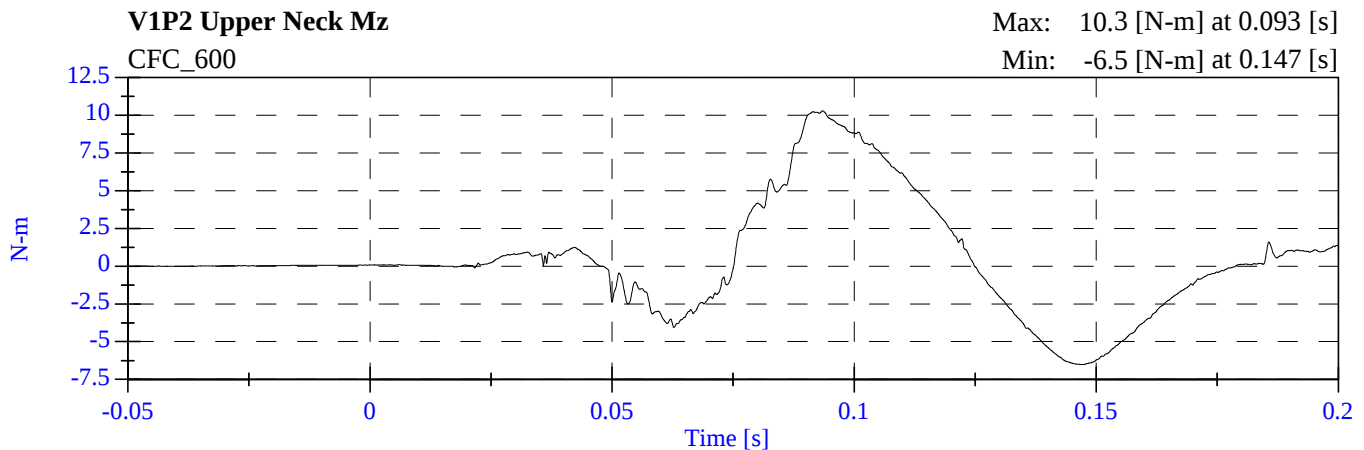
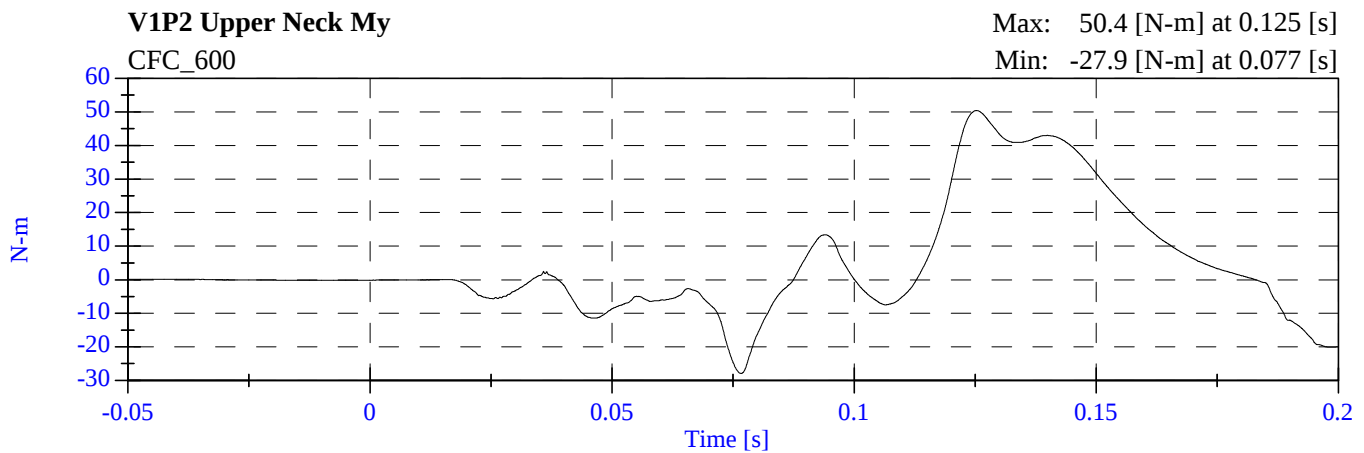
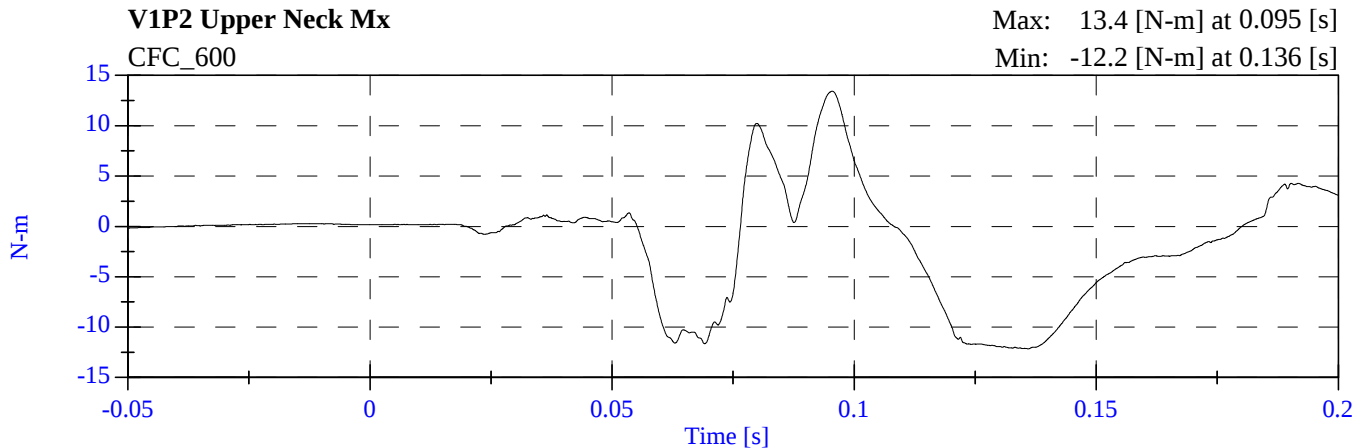
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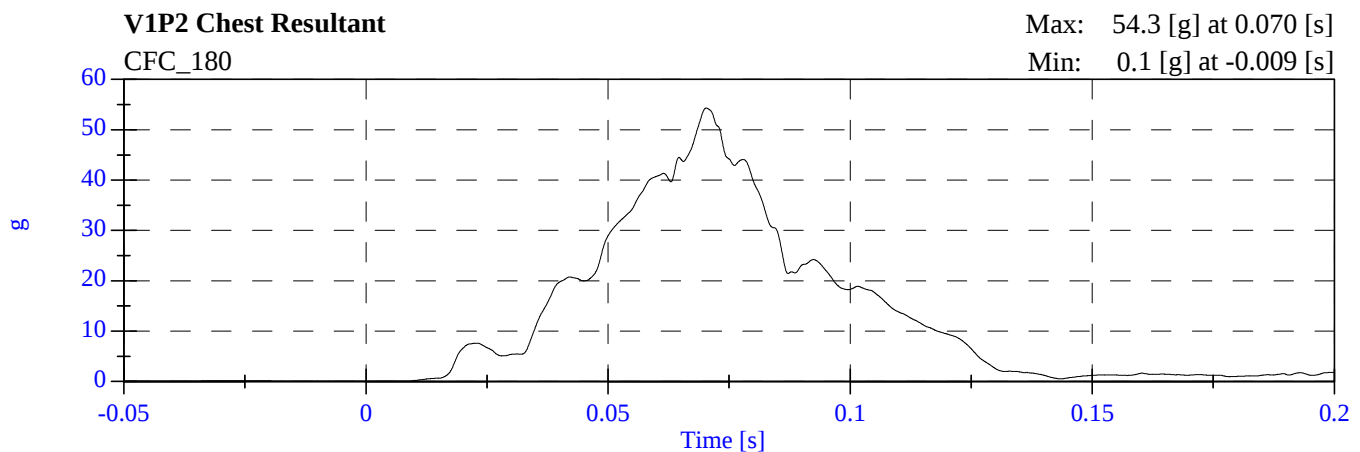
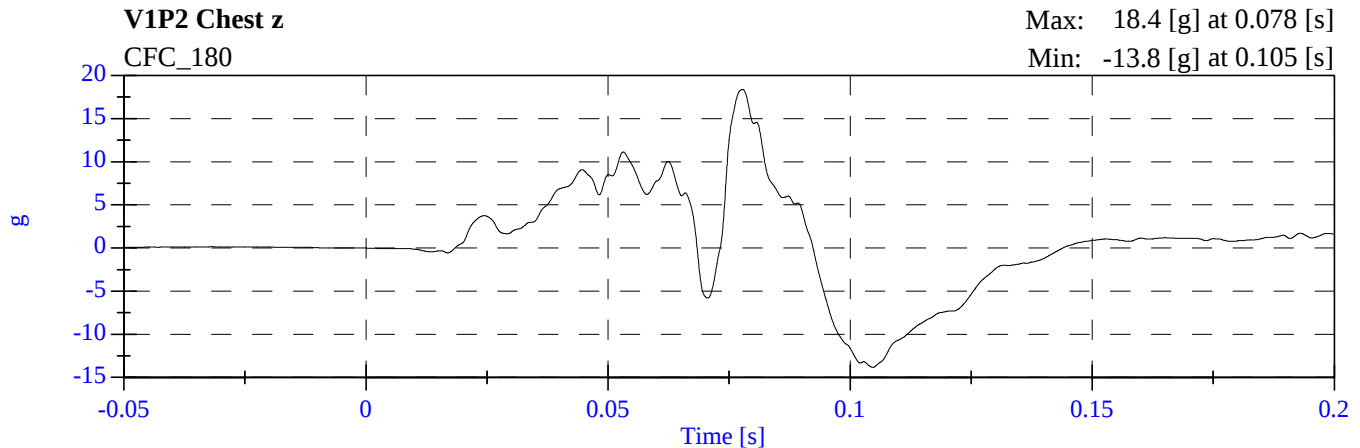
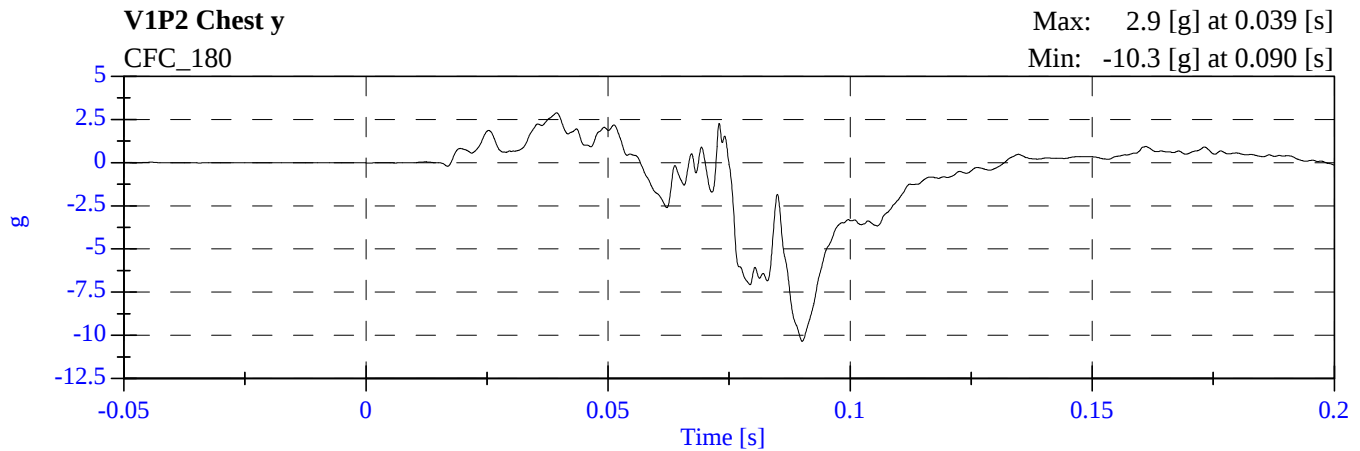
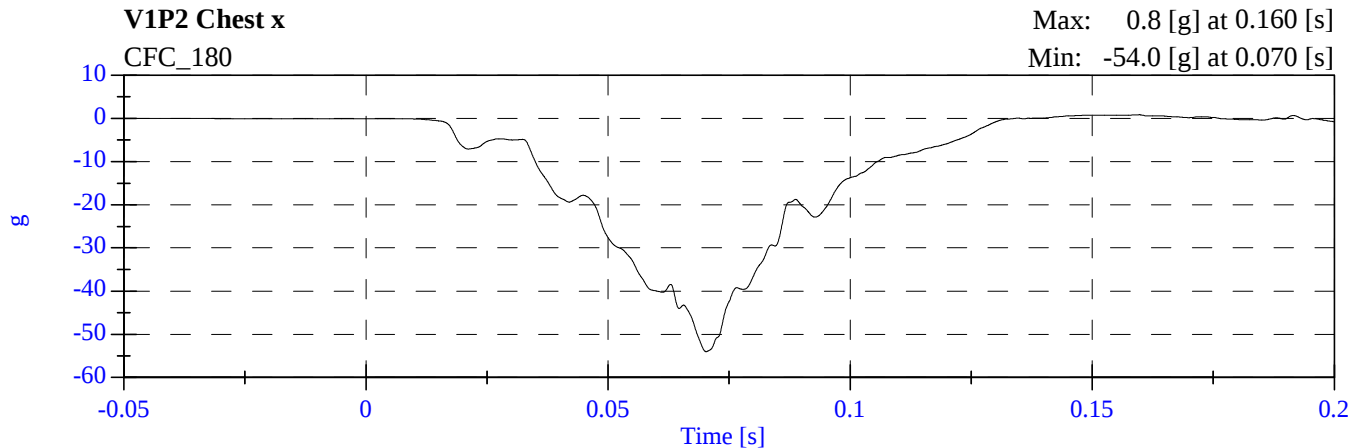
2005 NCAP Test 5 - 2005 Suzuki Verona M50503 - January 27, 2005



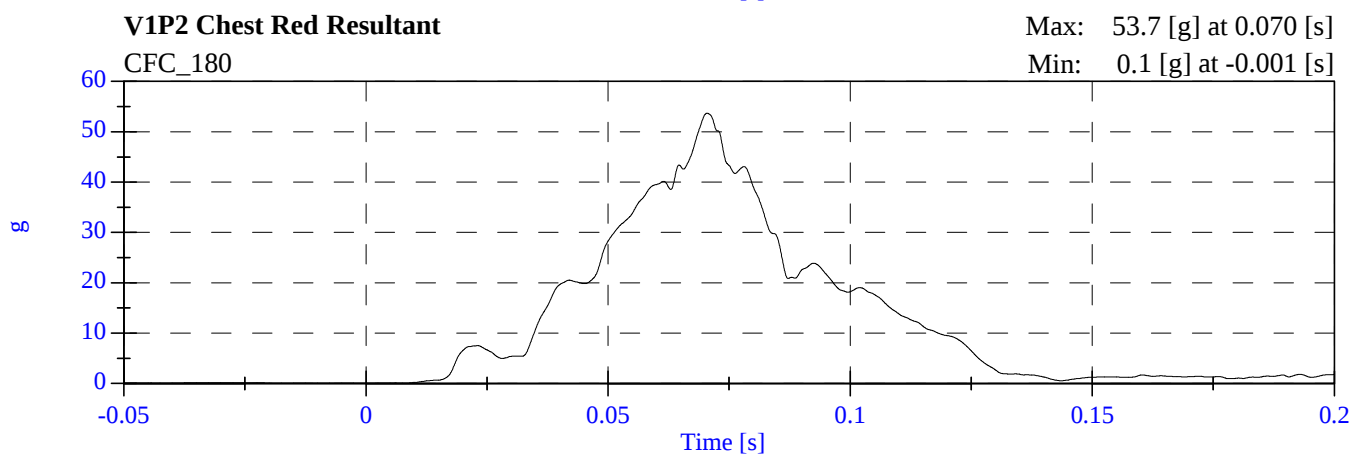
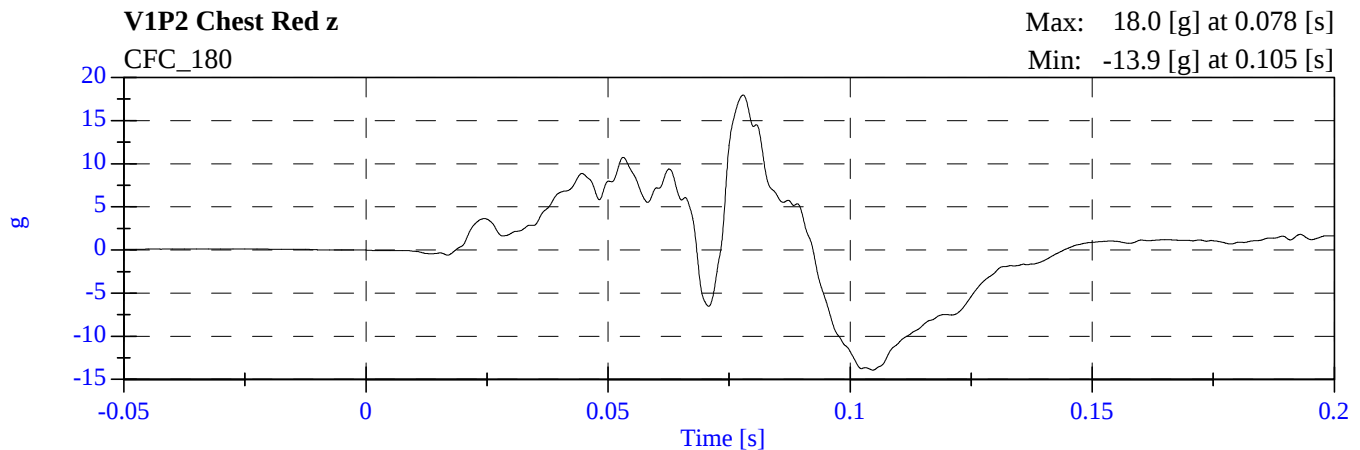
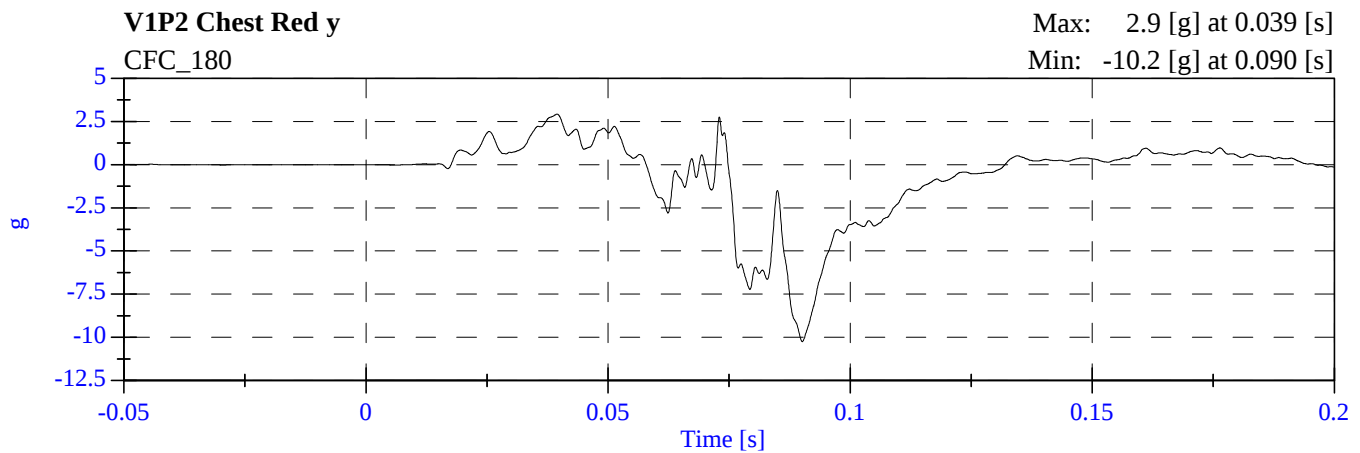
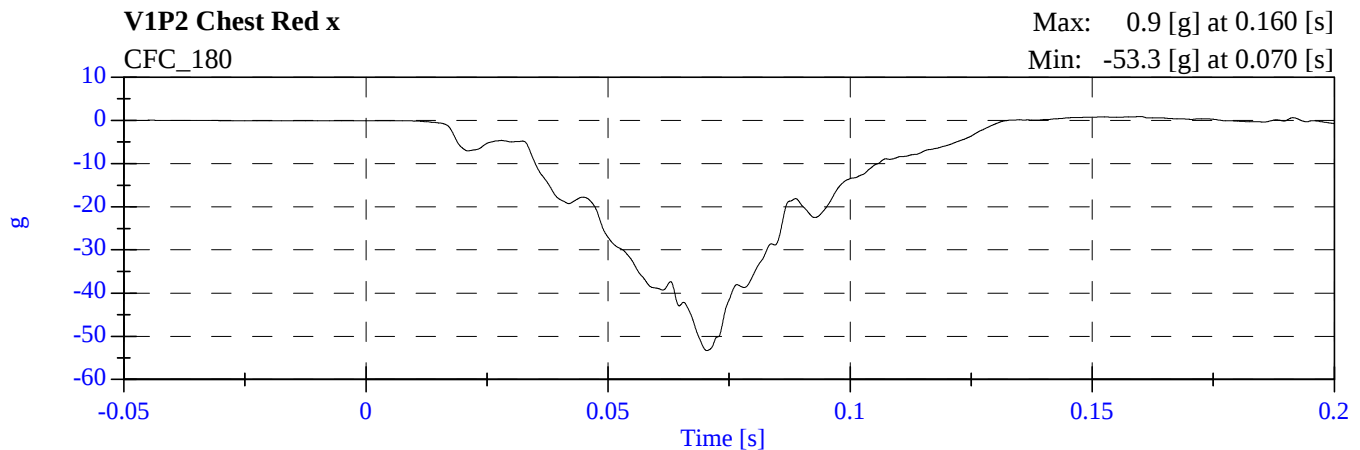
2005 NCAP Test 5 - 2005 Suzuki Verona M50503 - January 27, 2005



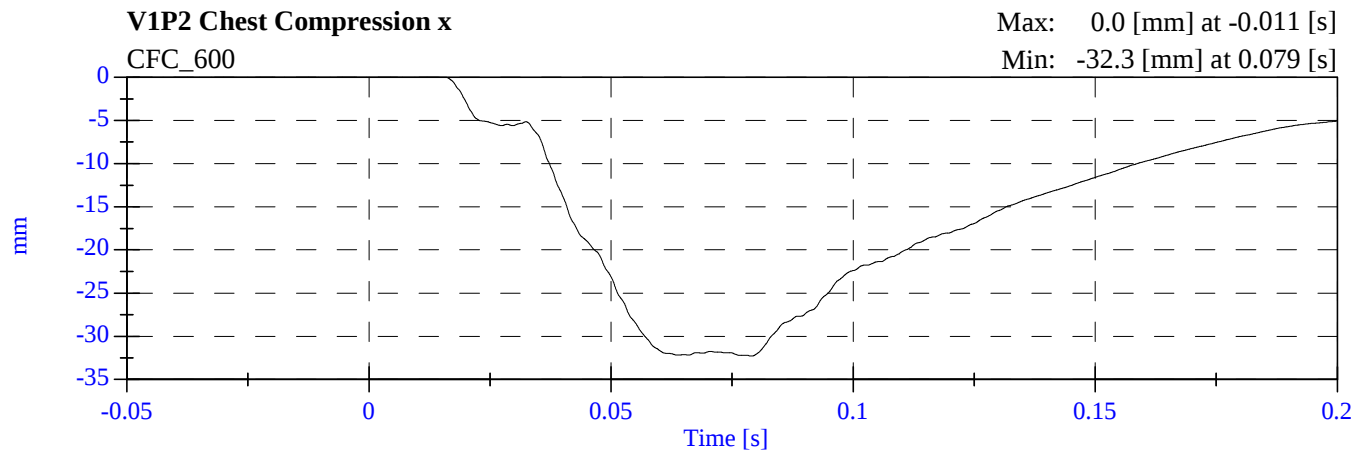
2005 NCAP Test 5 - 2005 Suzuki Verona M50503 - January 27, 2005



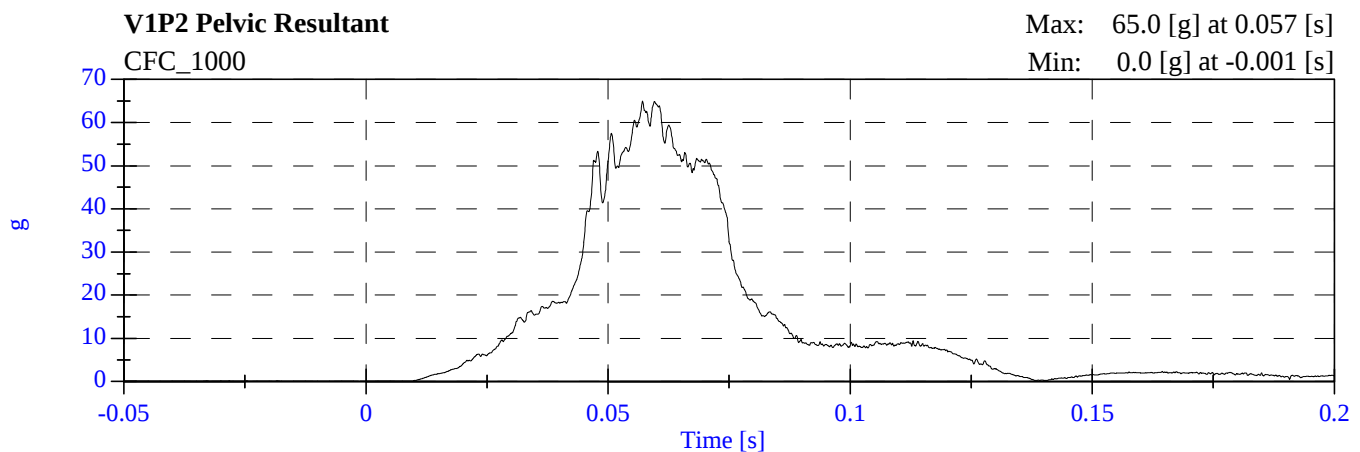
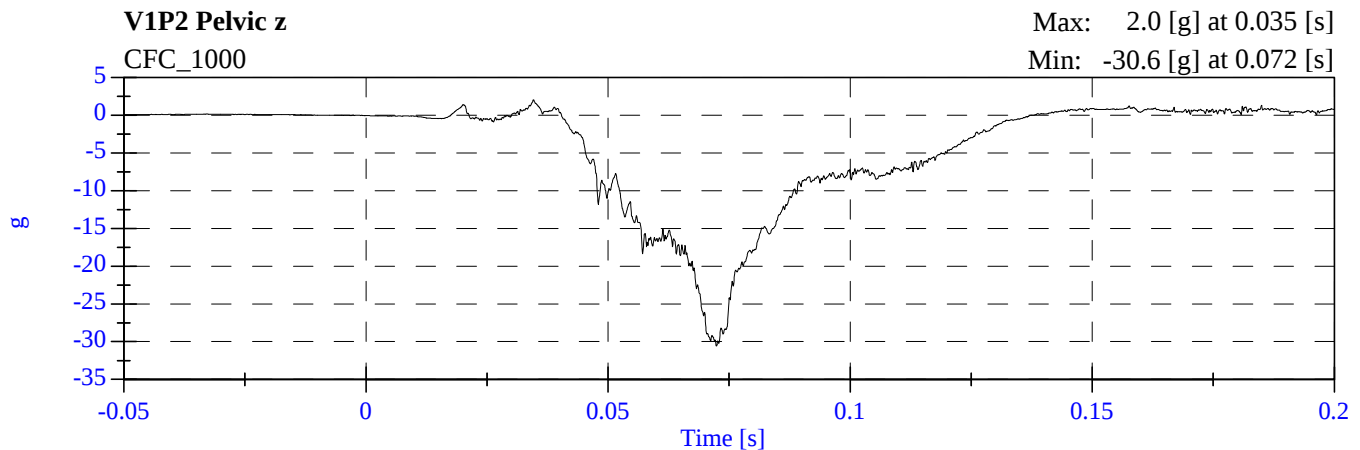
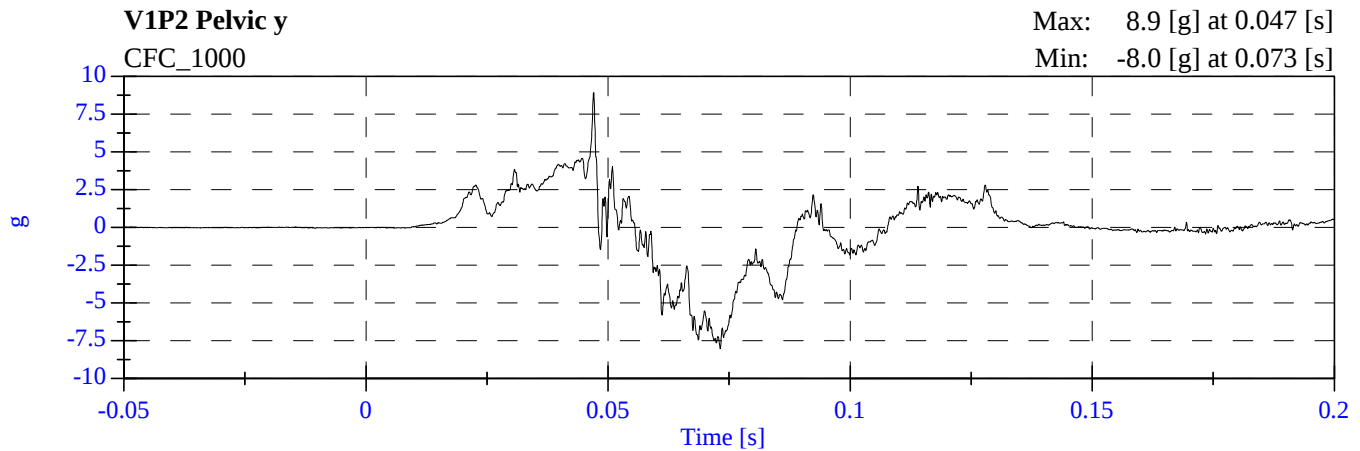
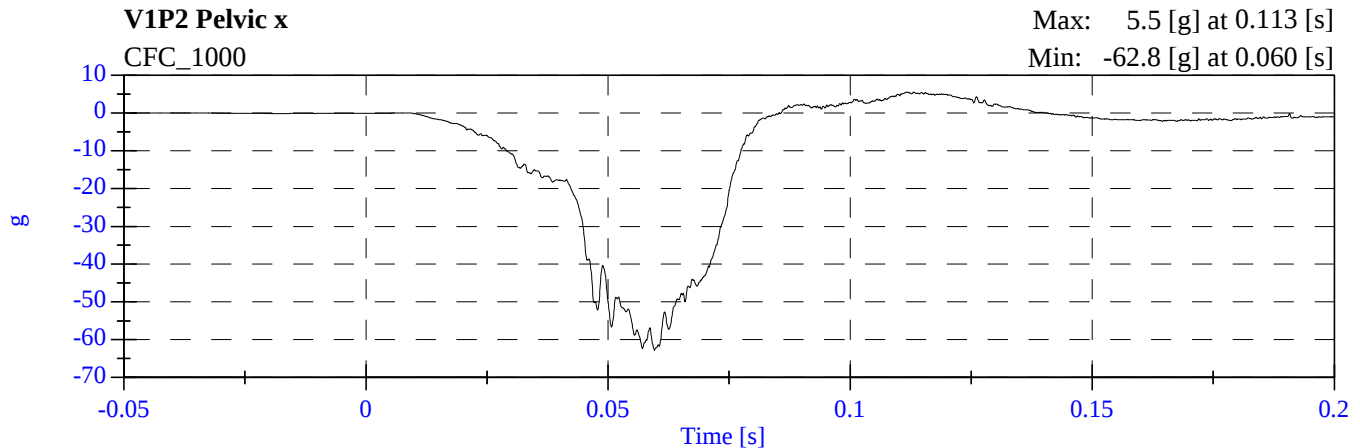
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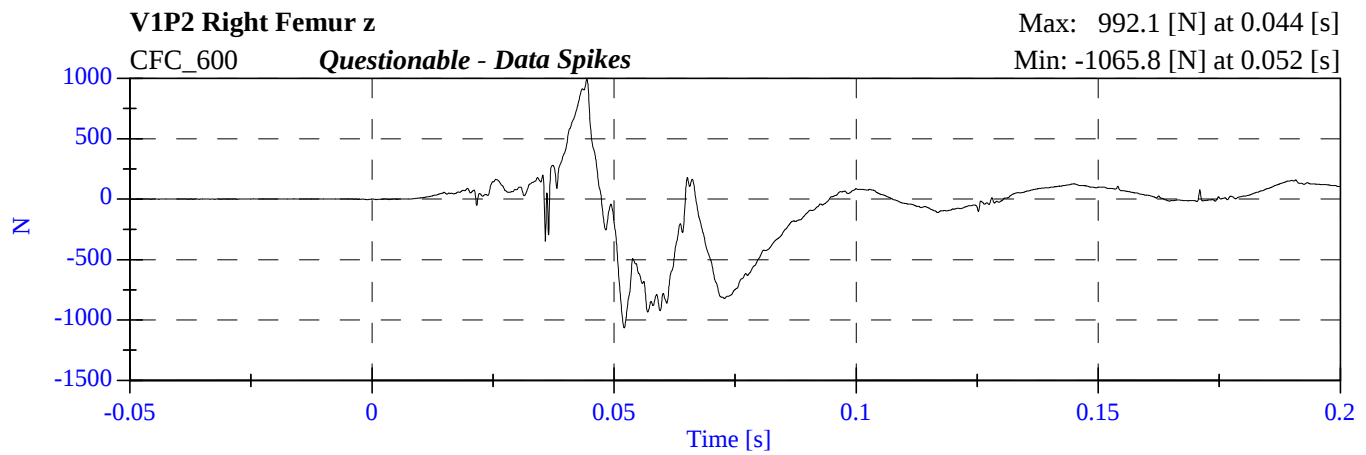
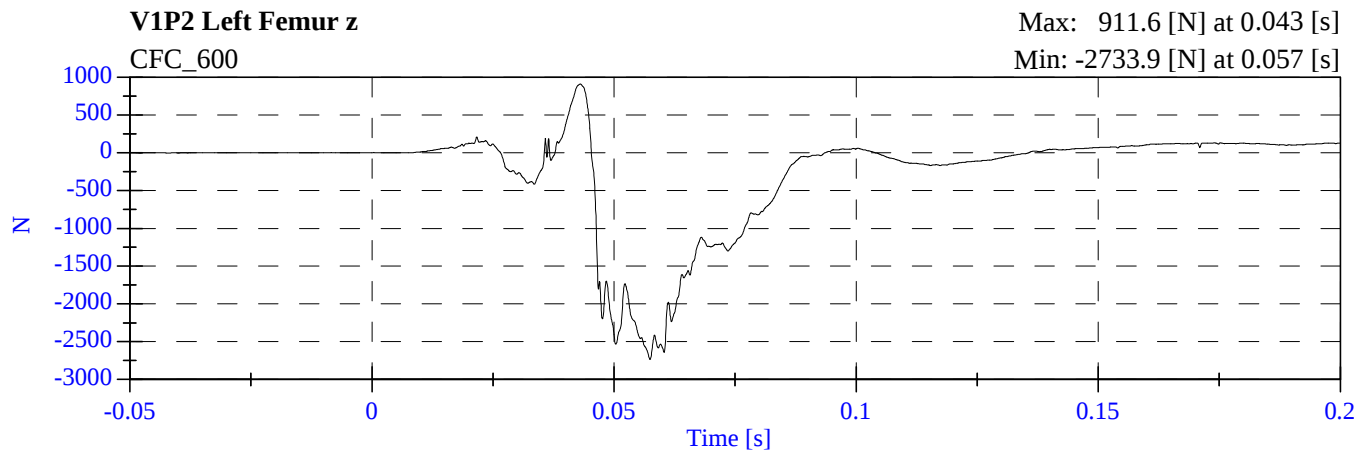
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M50503 - January 27, 2005



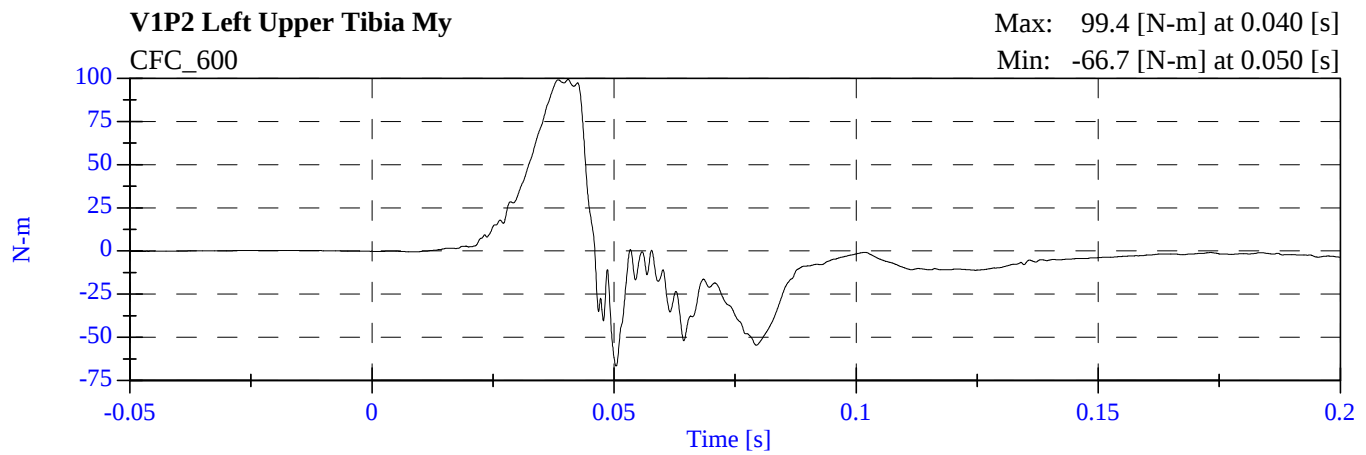
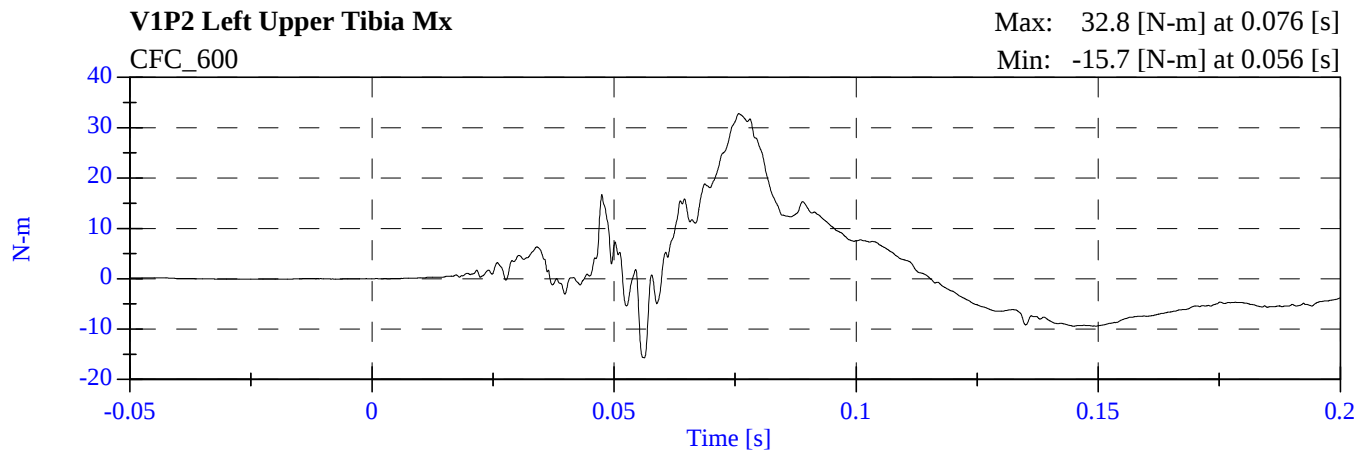
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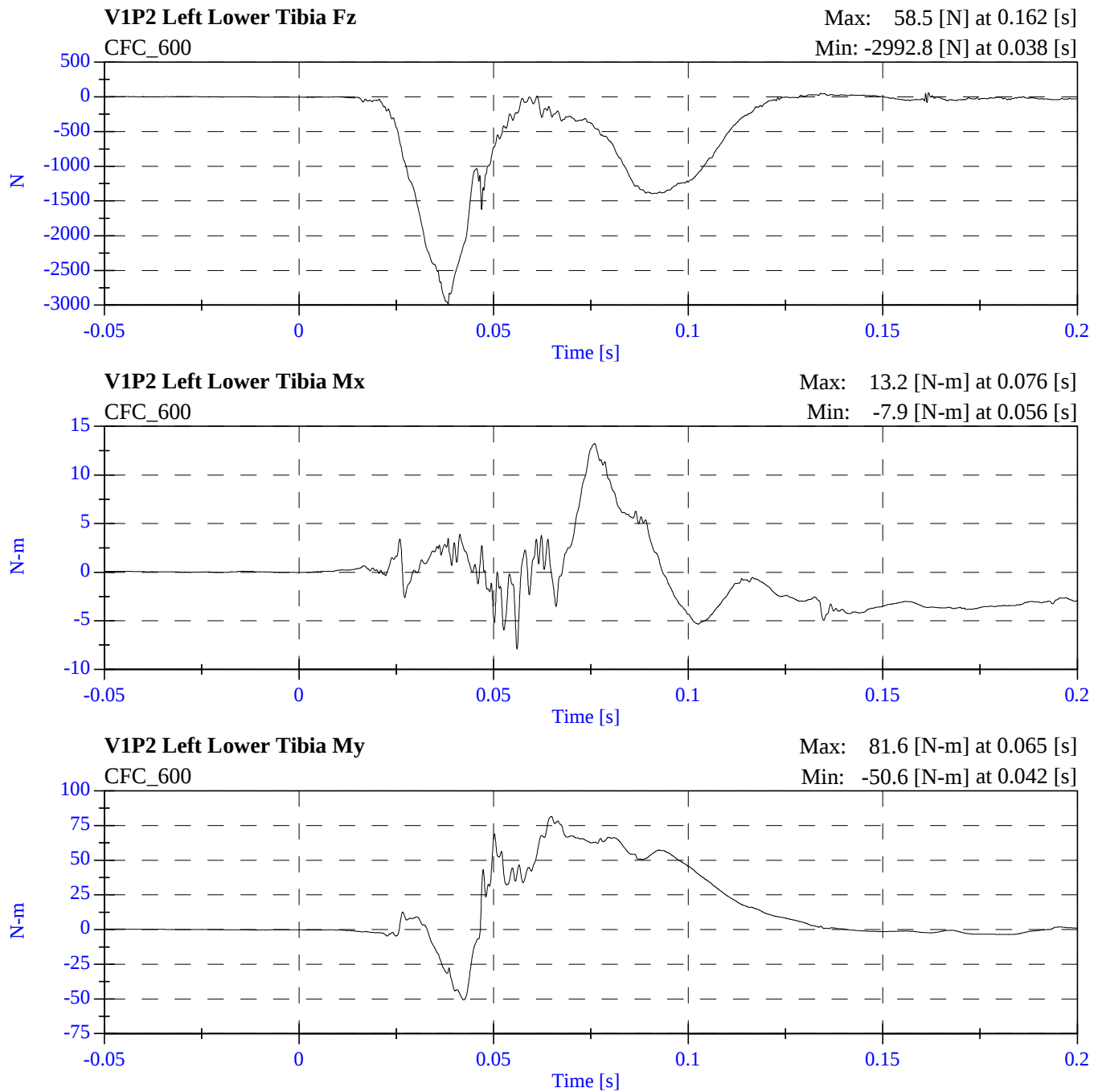
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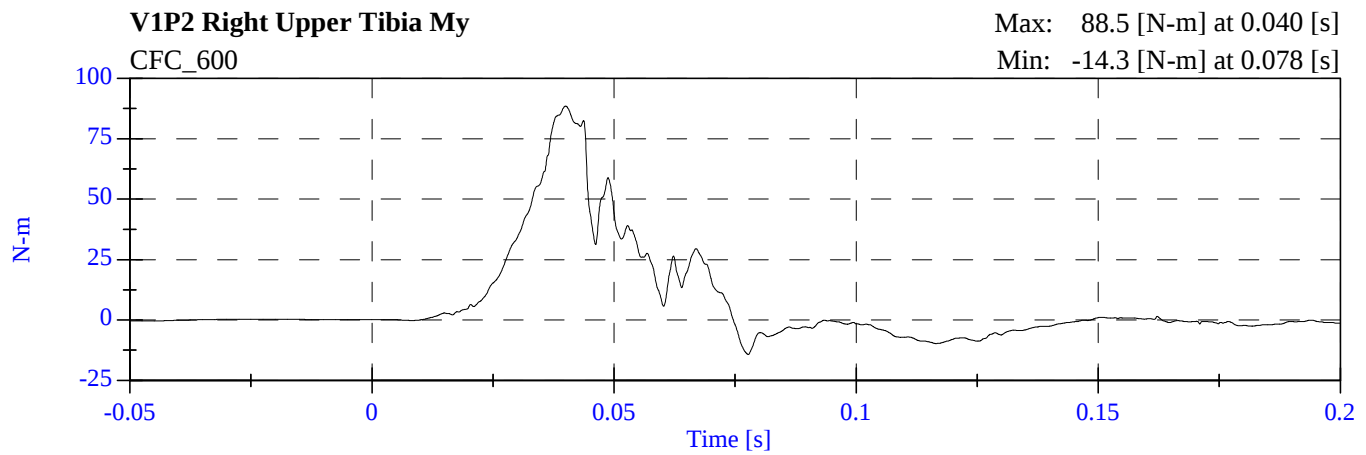
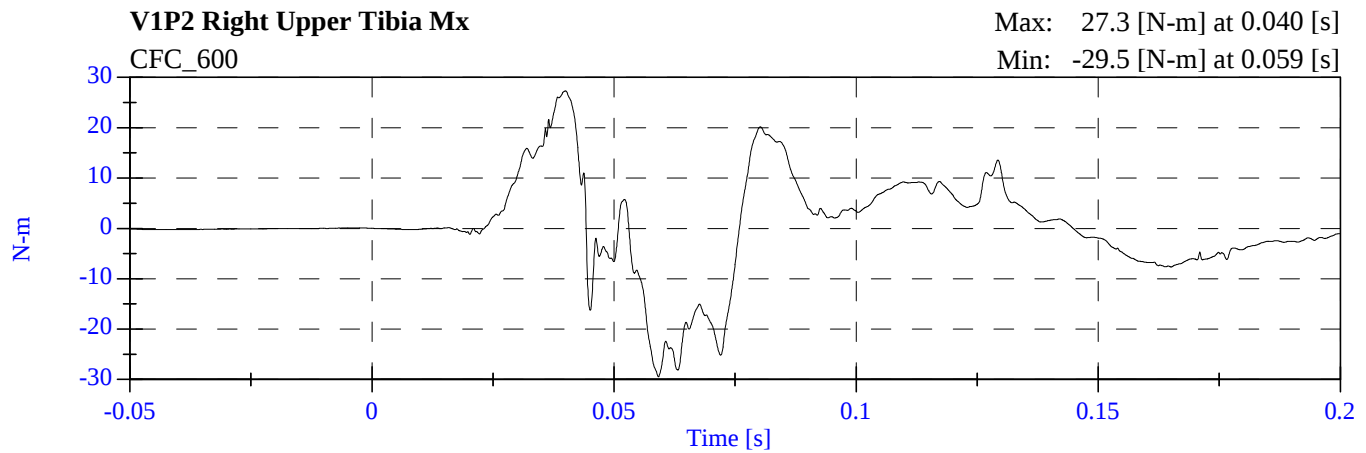
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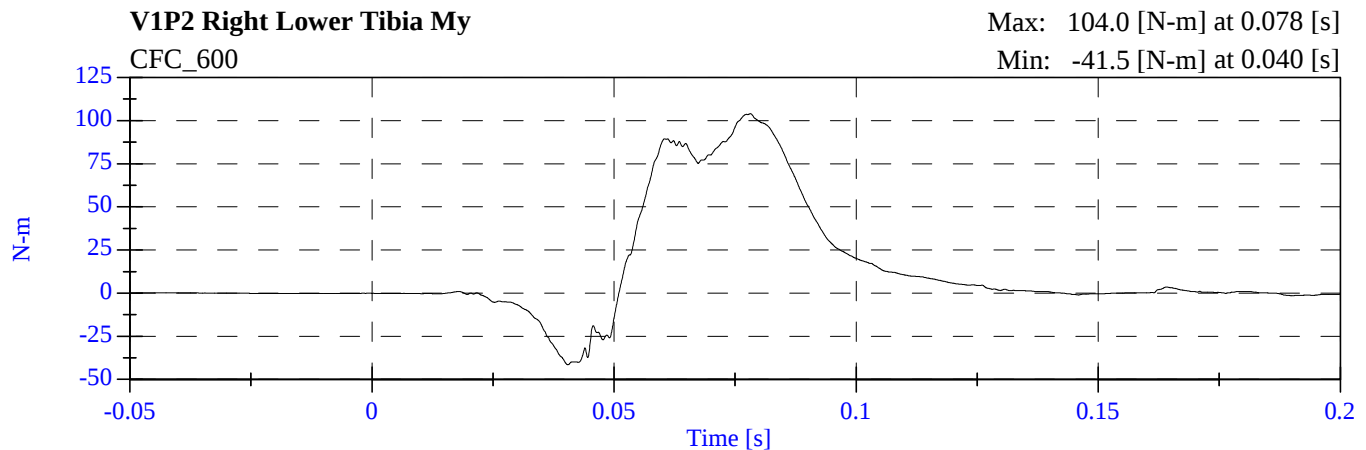
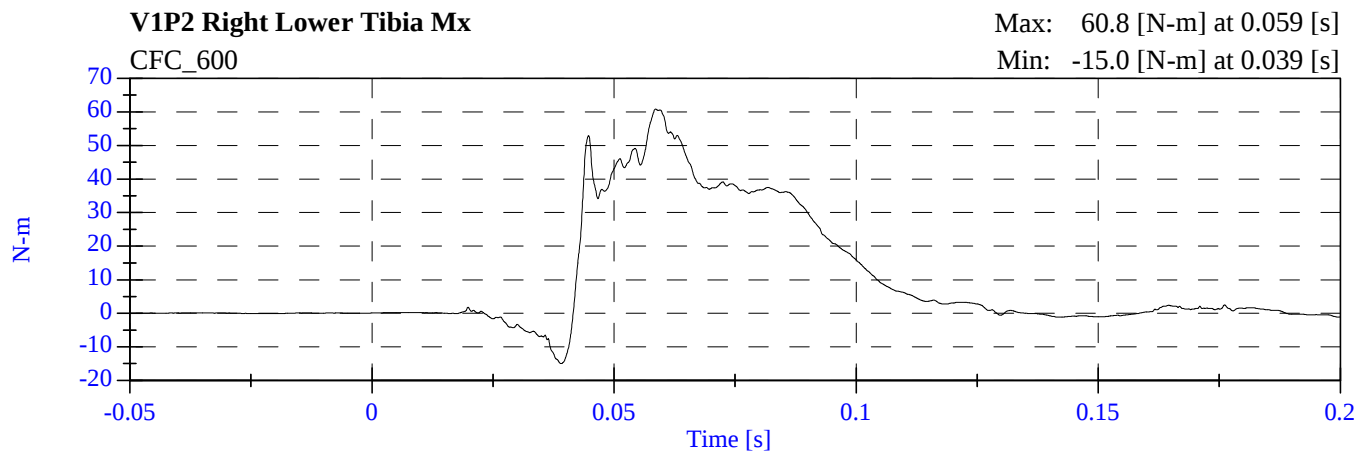
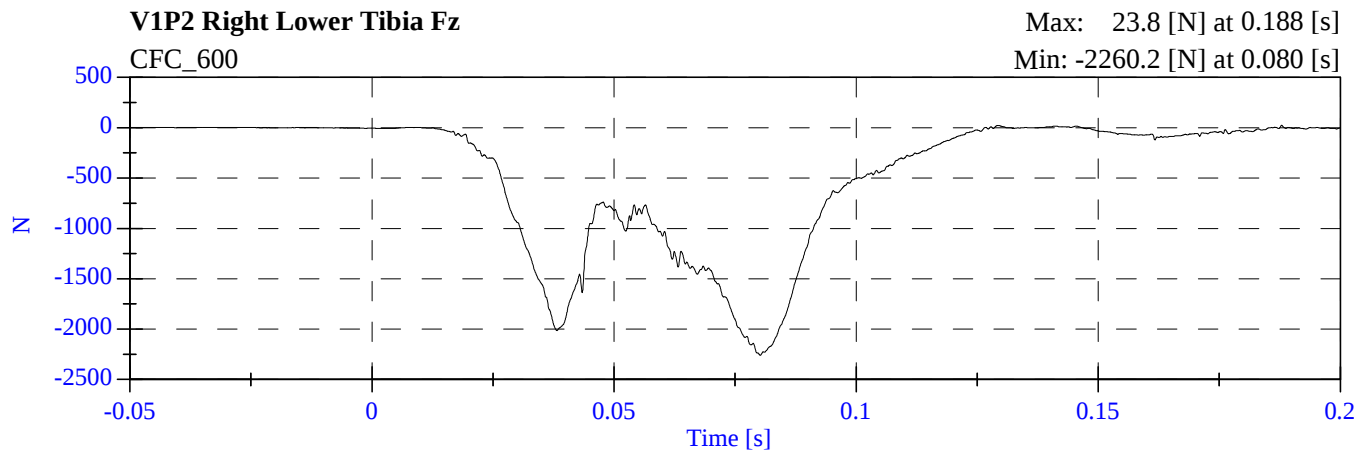
2005 NCAP Test 5 - 2005 Suzuki Verona M50503 - January 27, 2005



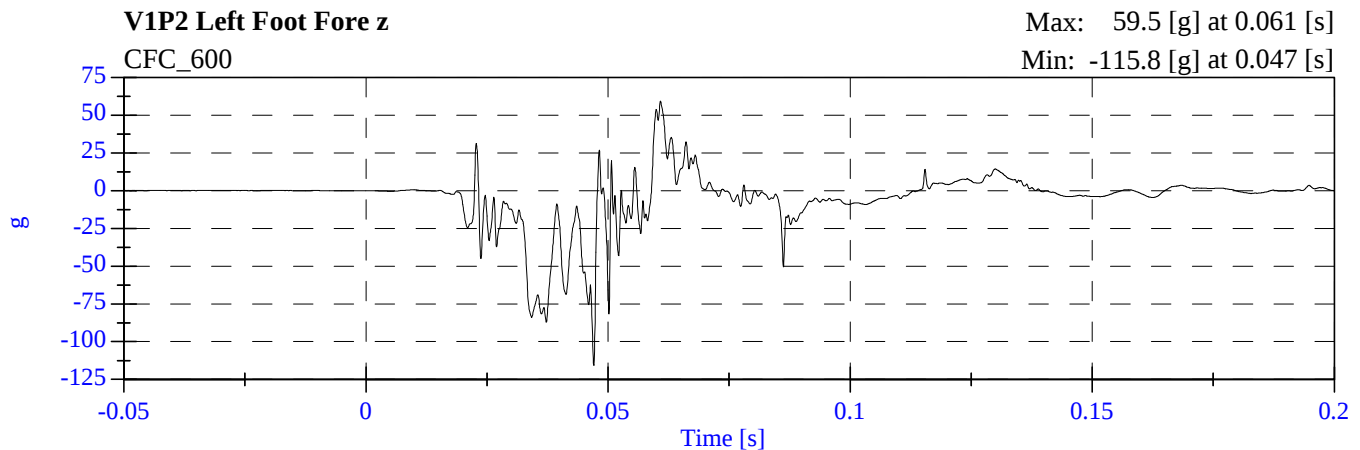
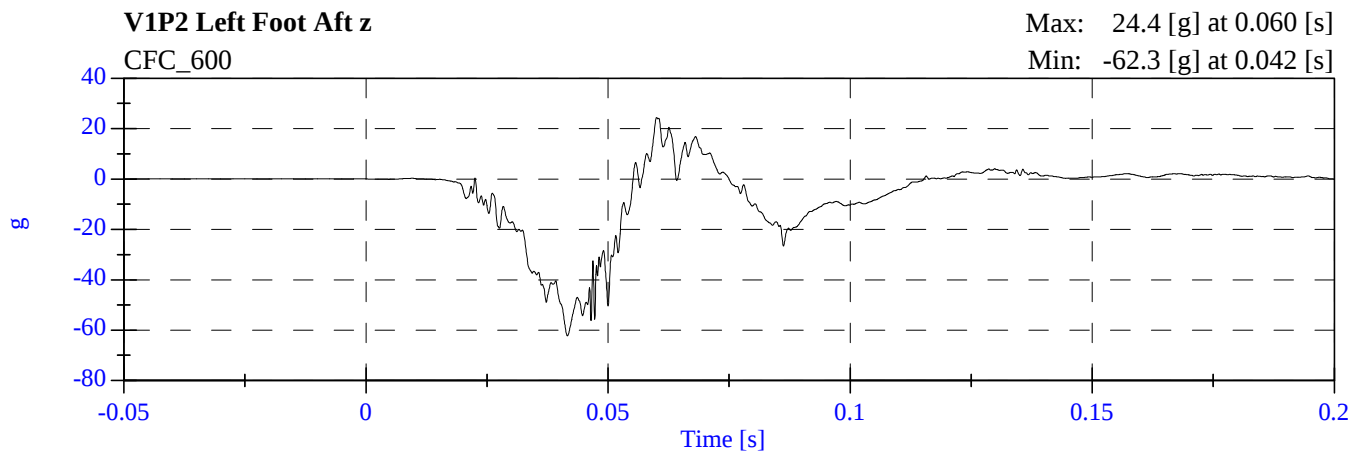
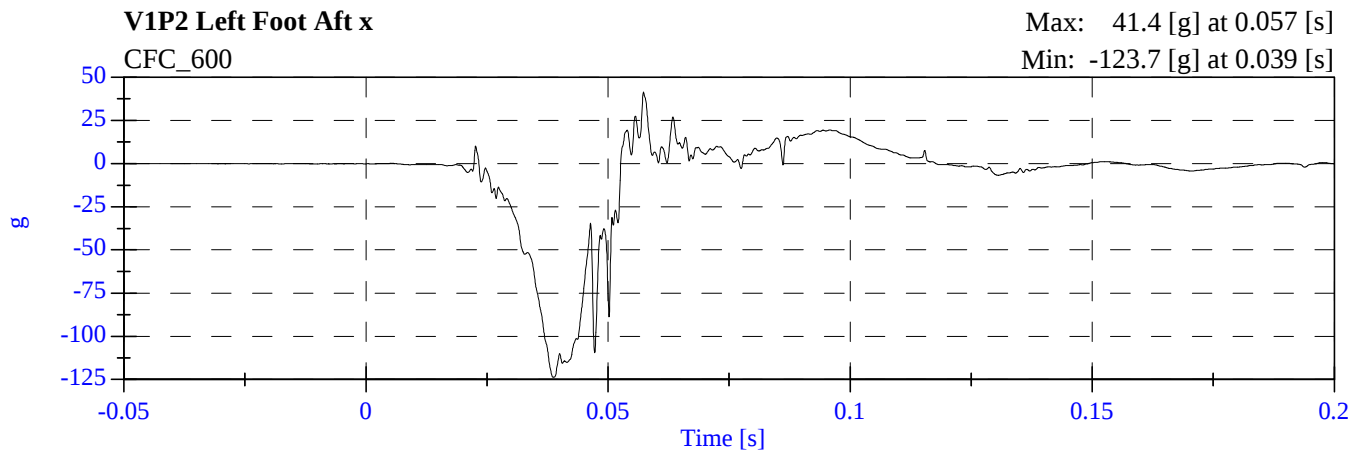
2005 NCAP Test 5 - 2005 Suzuki Verona M50503 - January 27, 2005



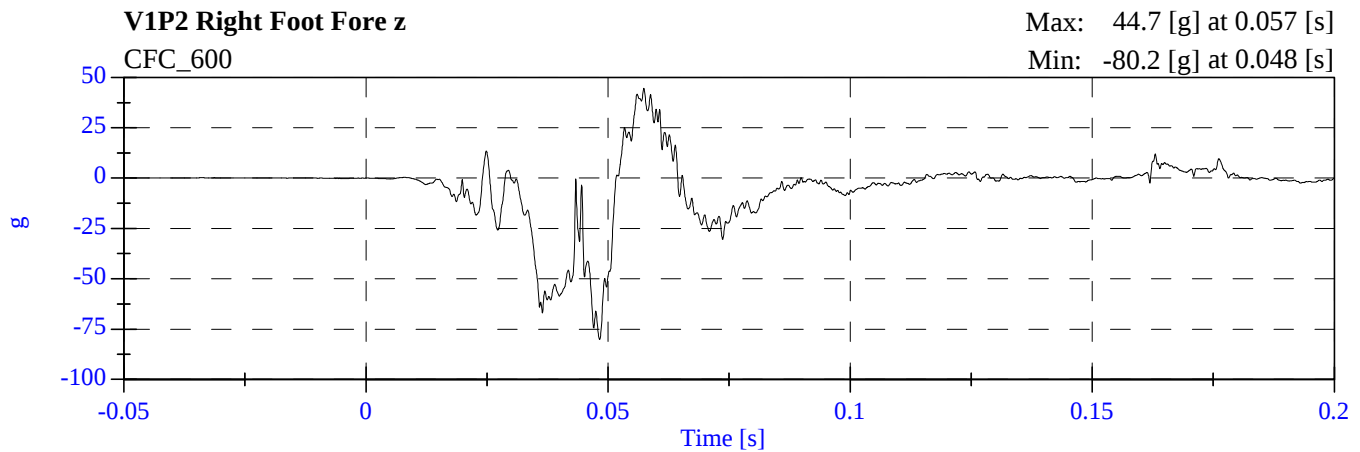
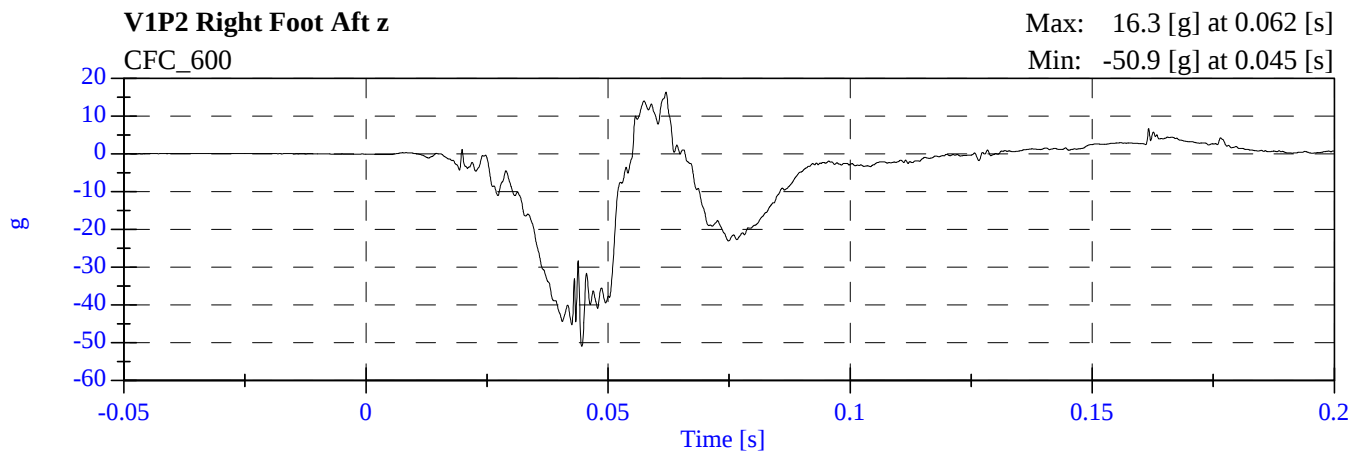
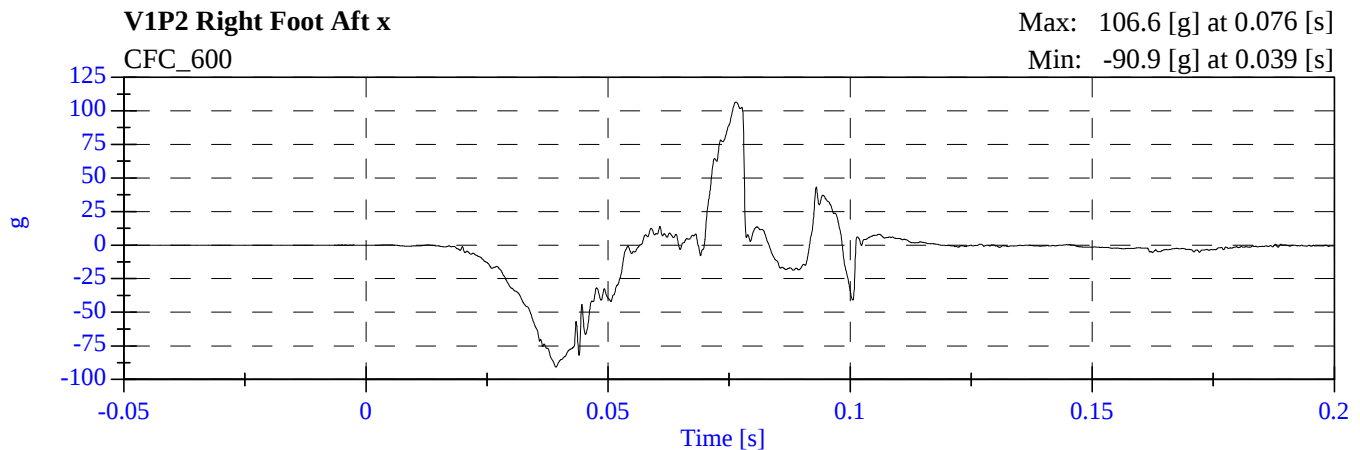
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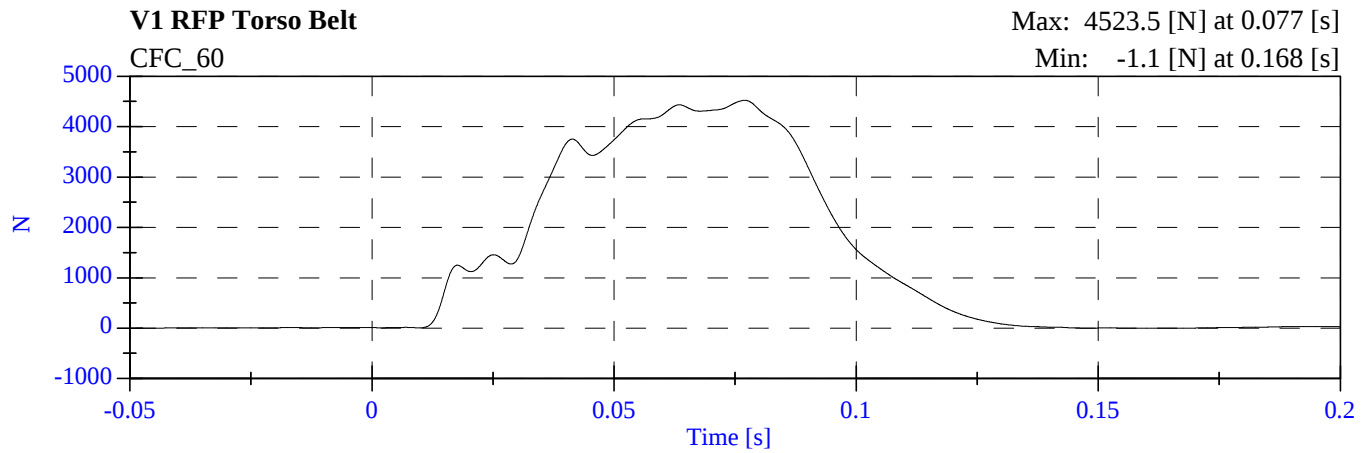
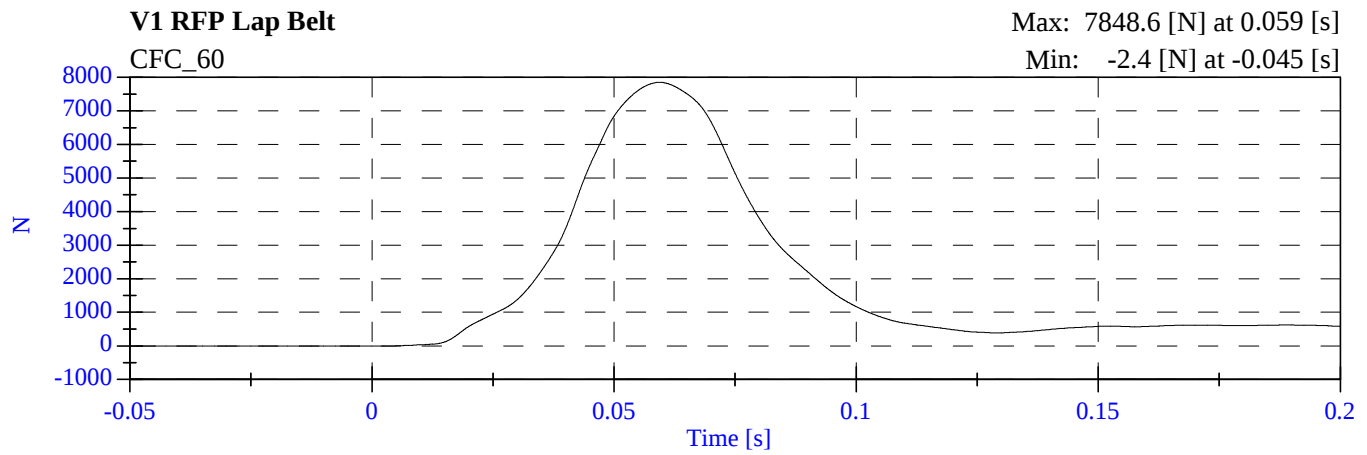
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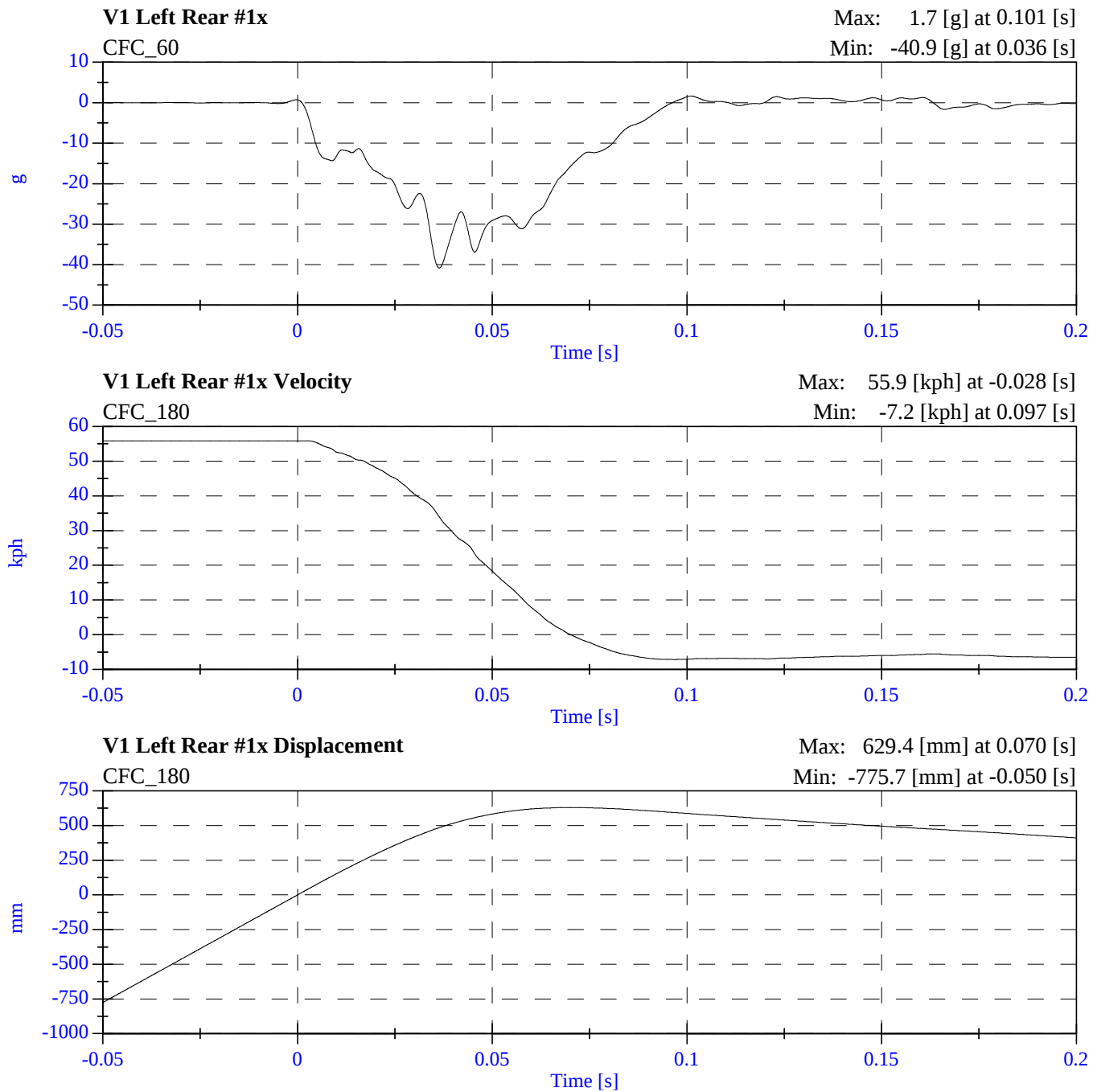
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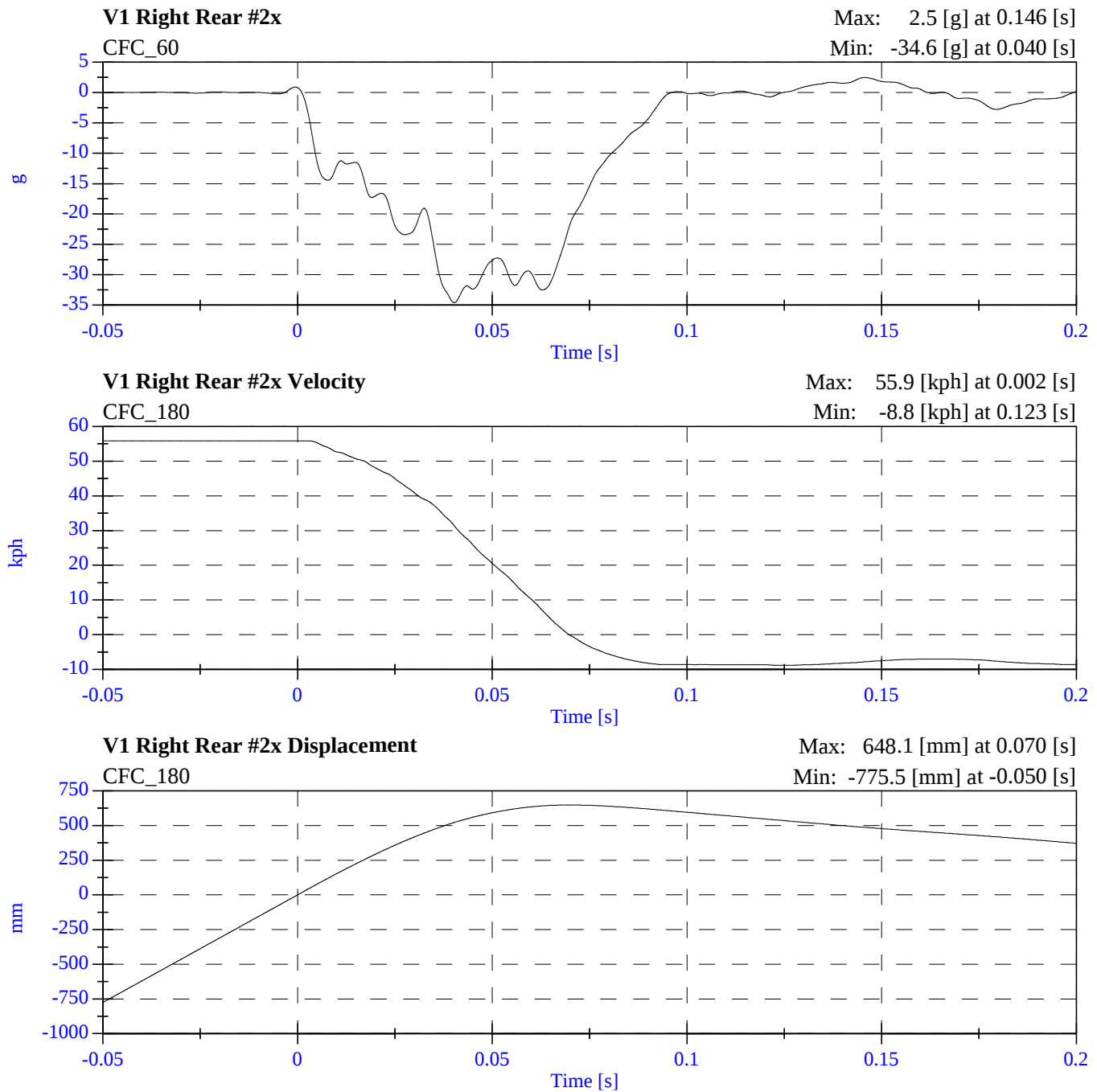
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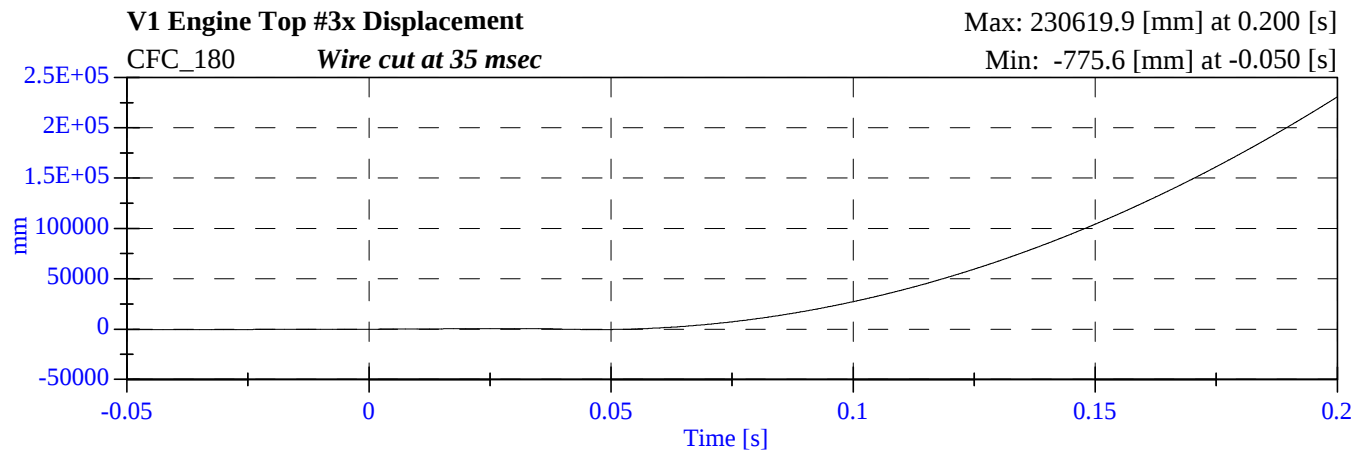
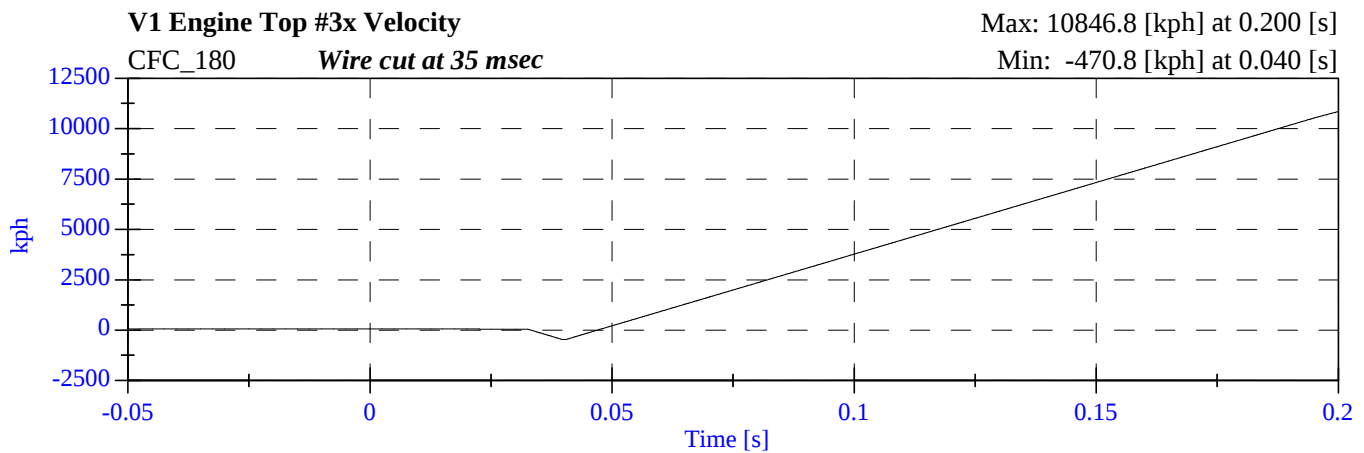
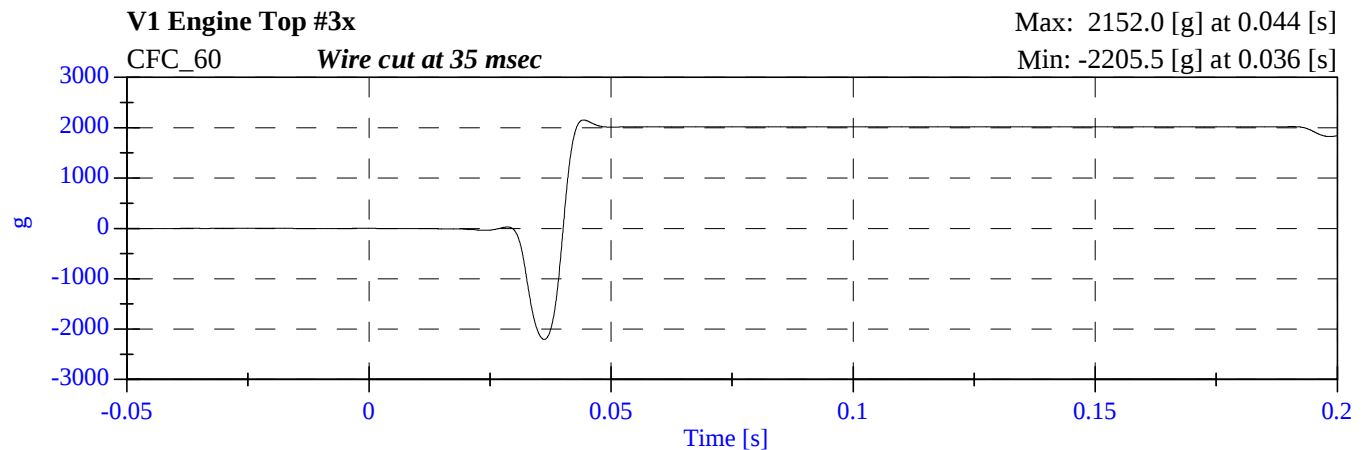
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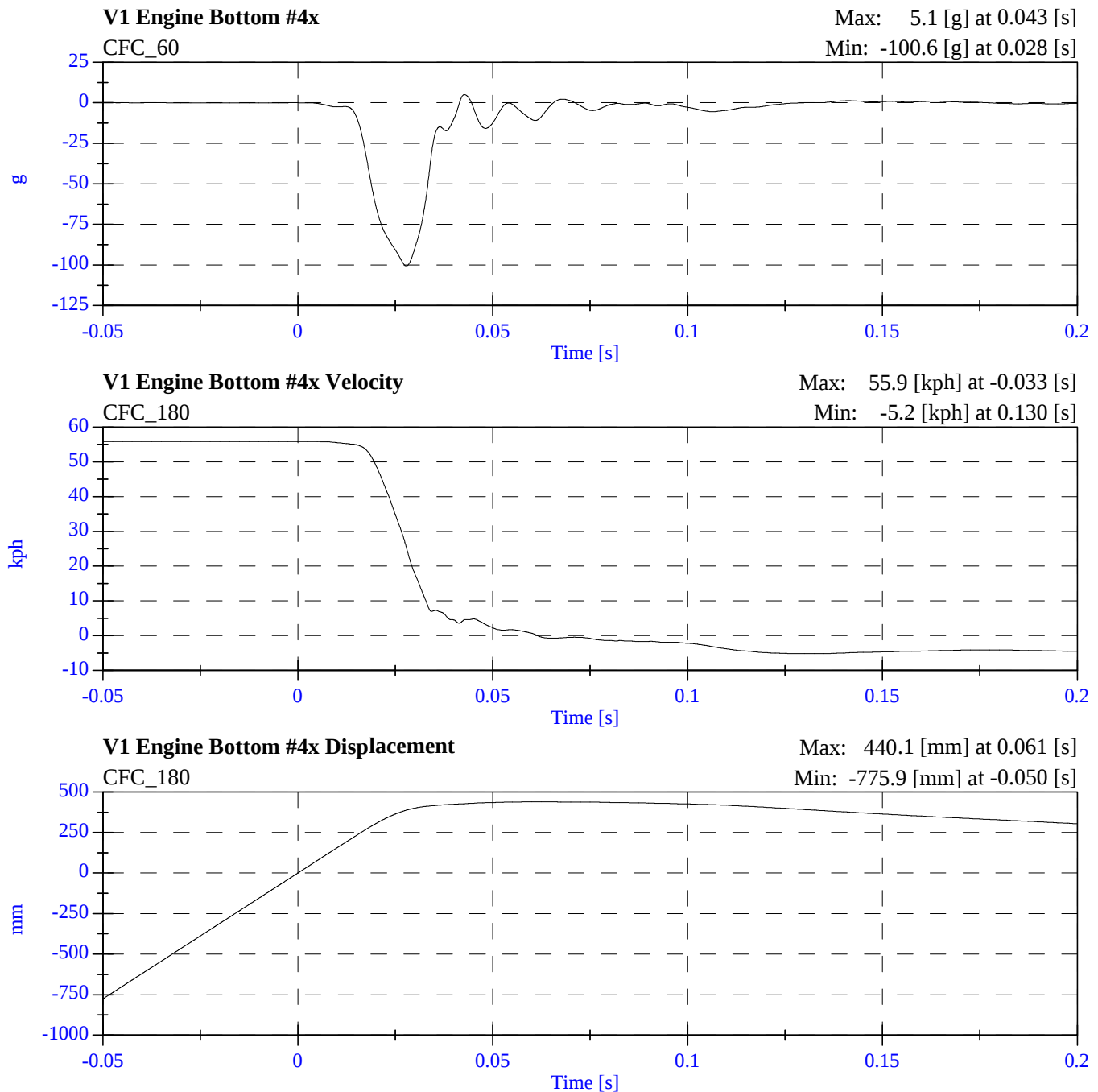
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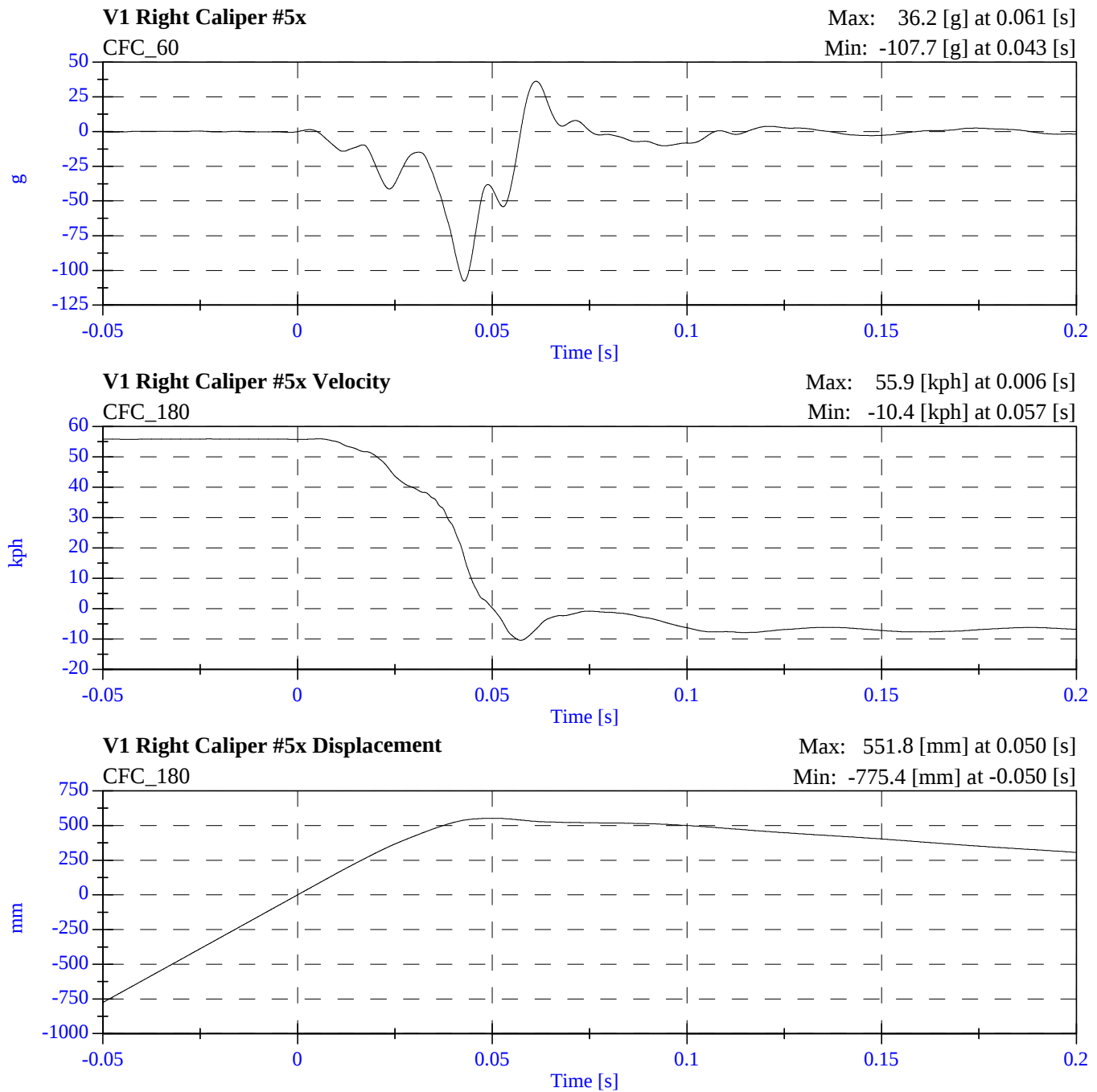
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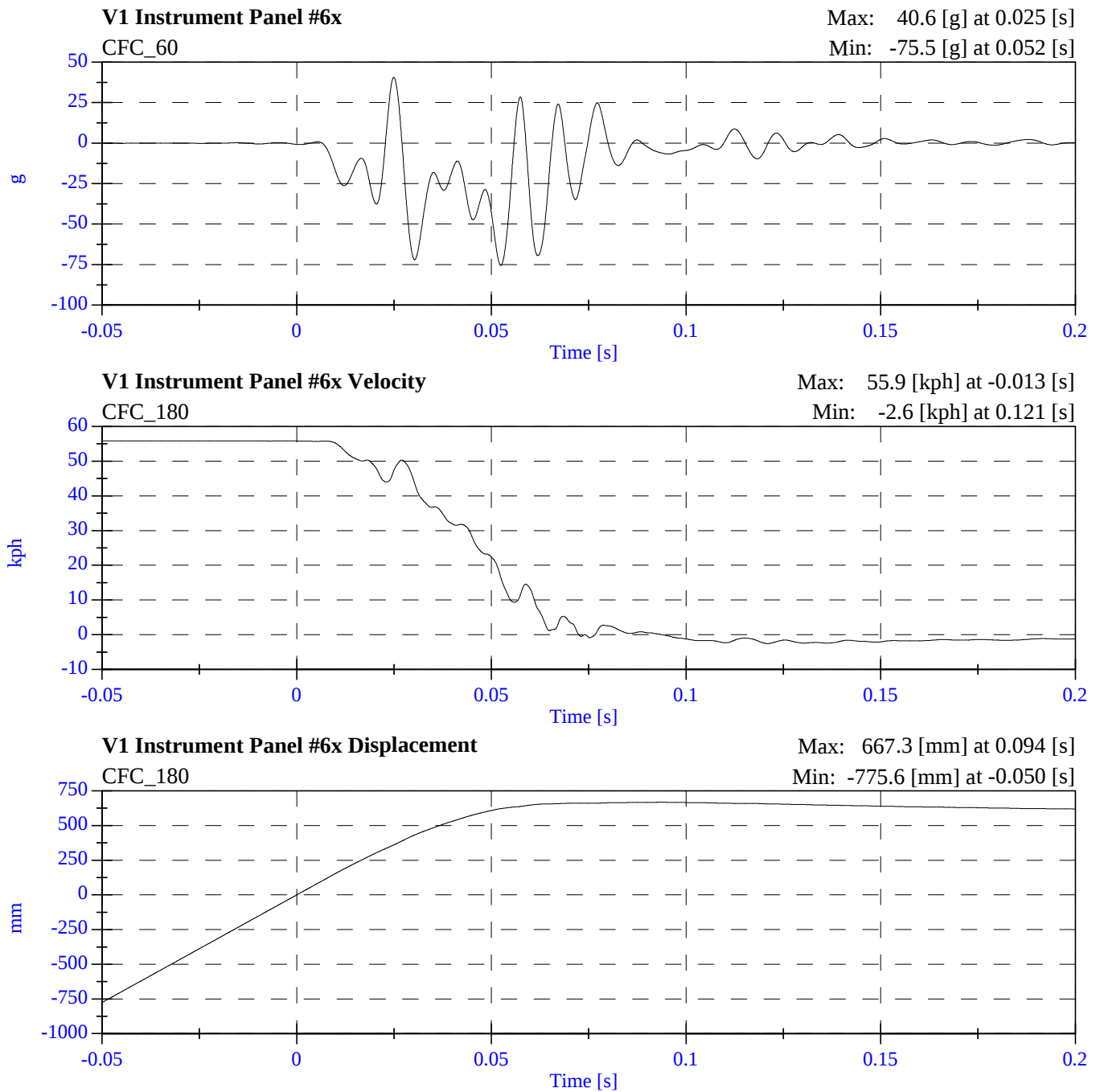
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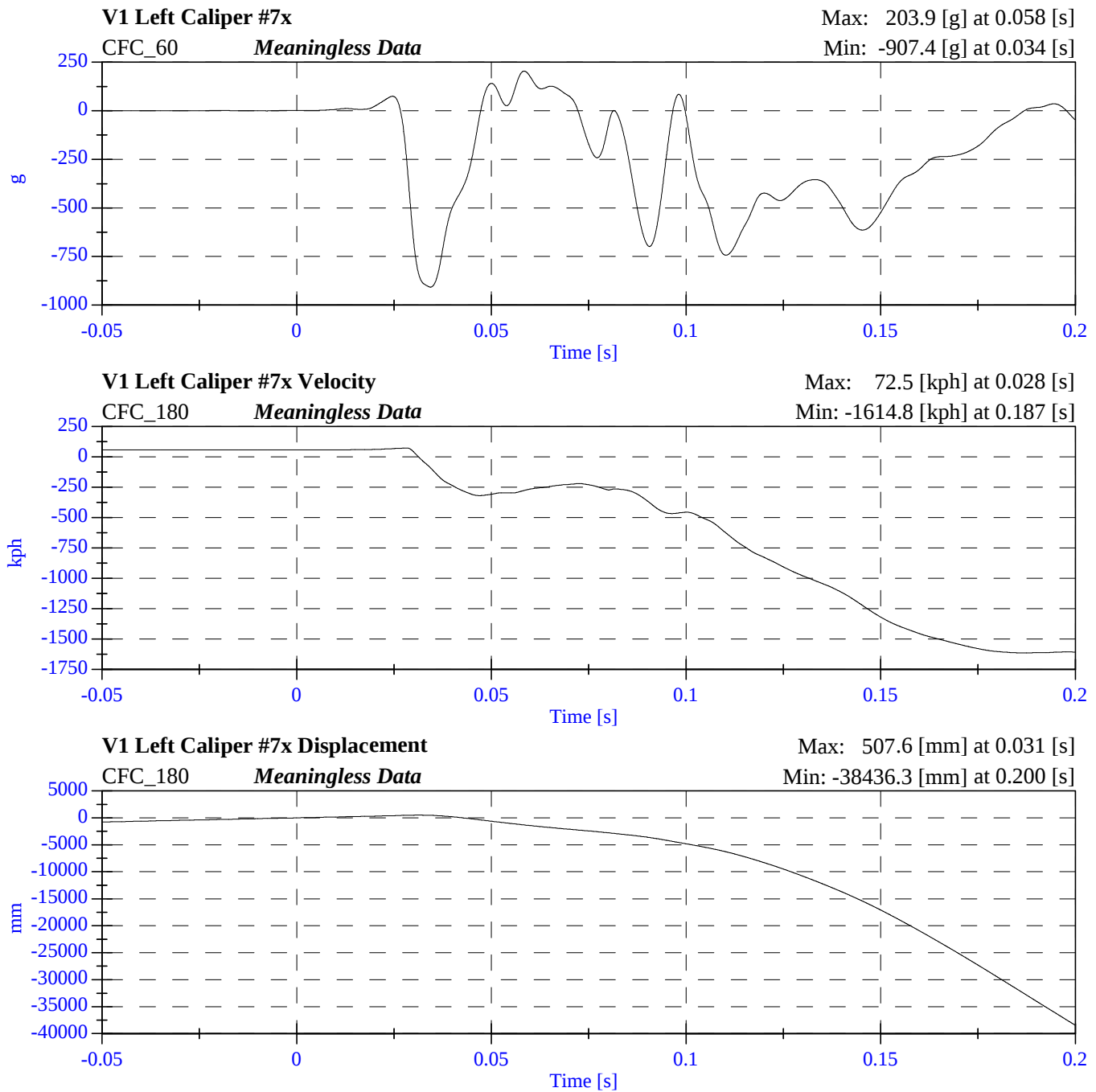
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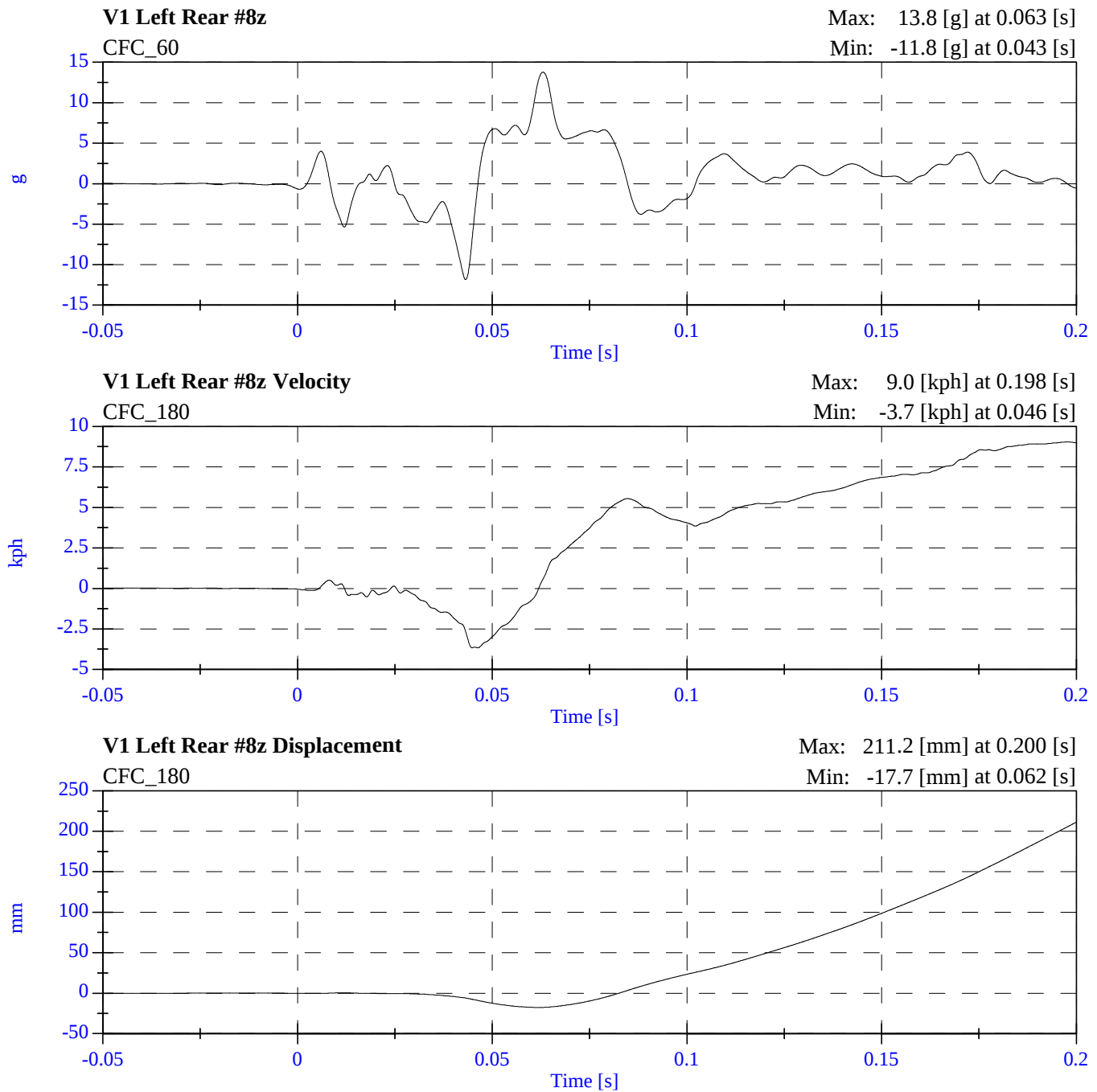
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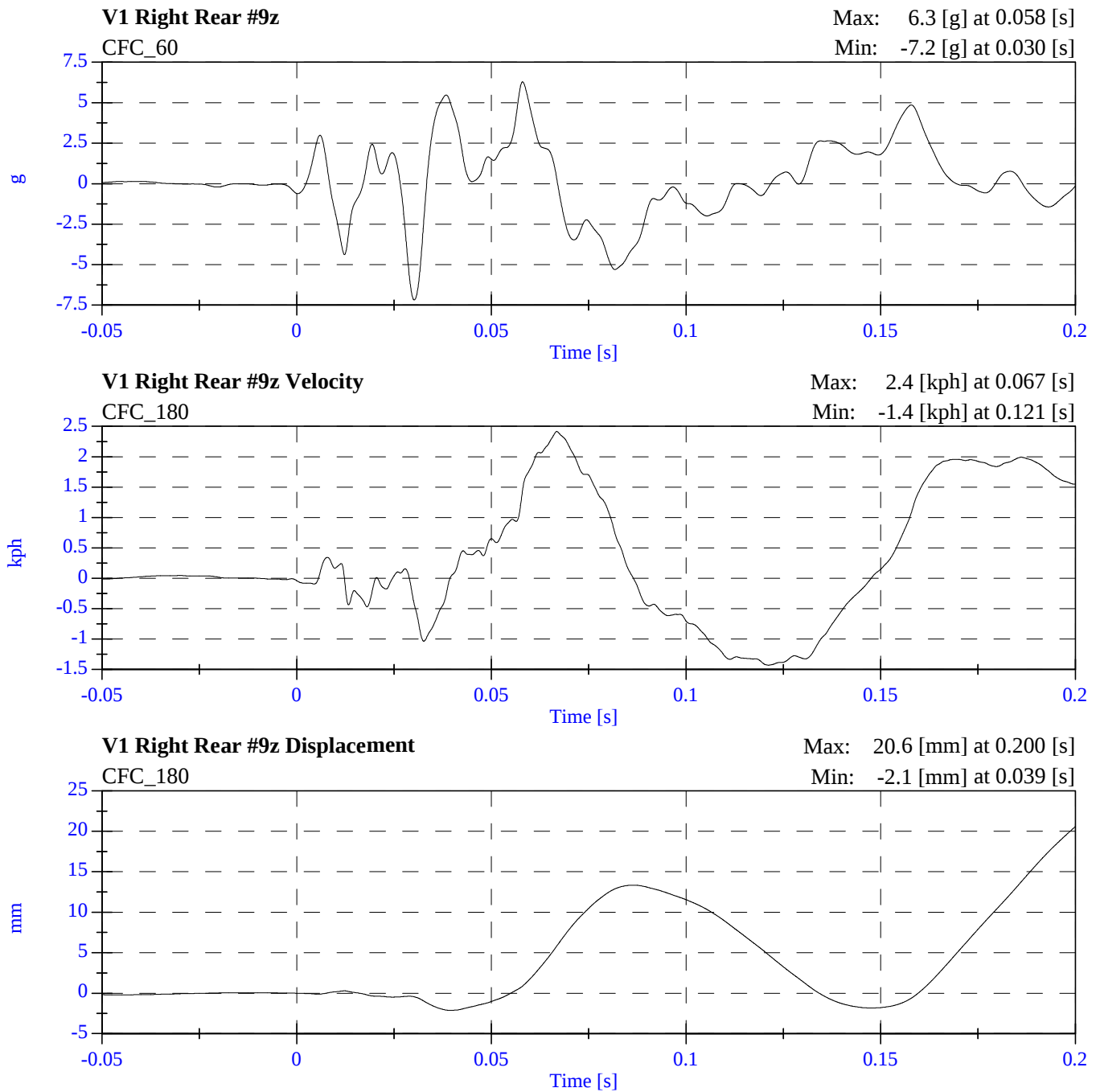
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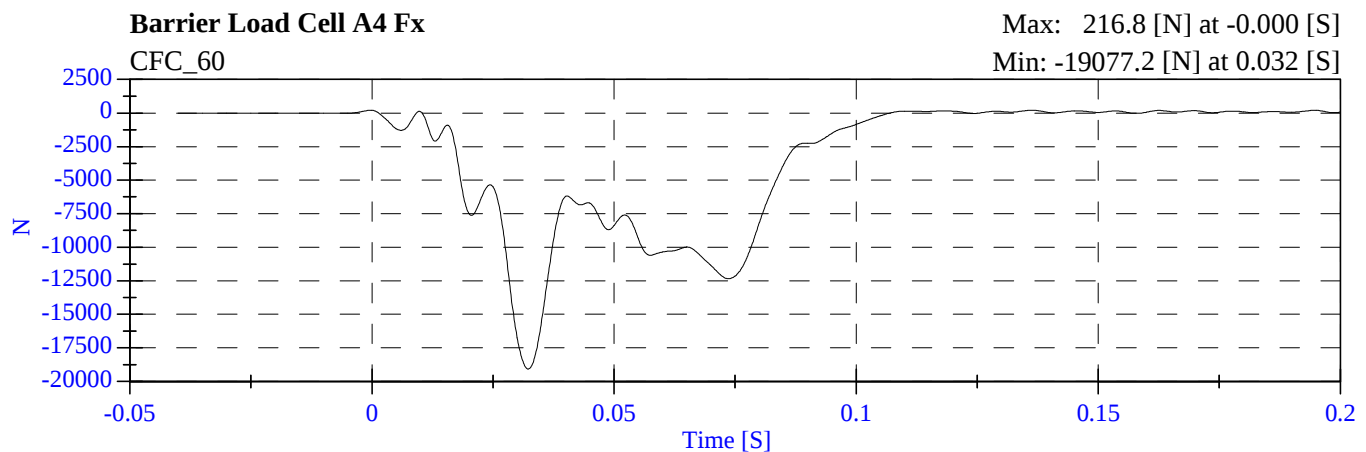
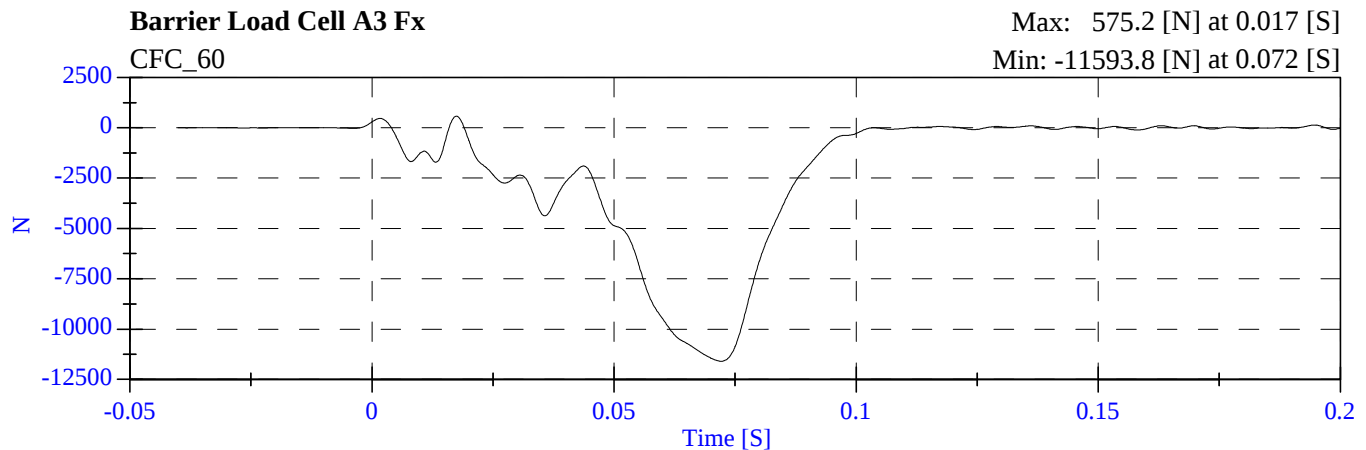
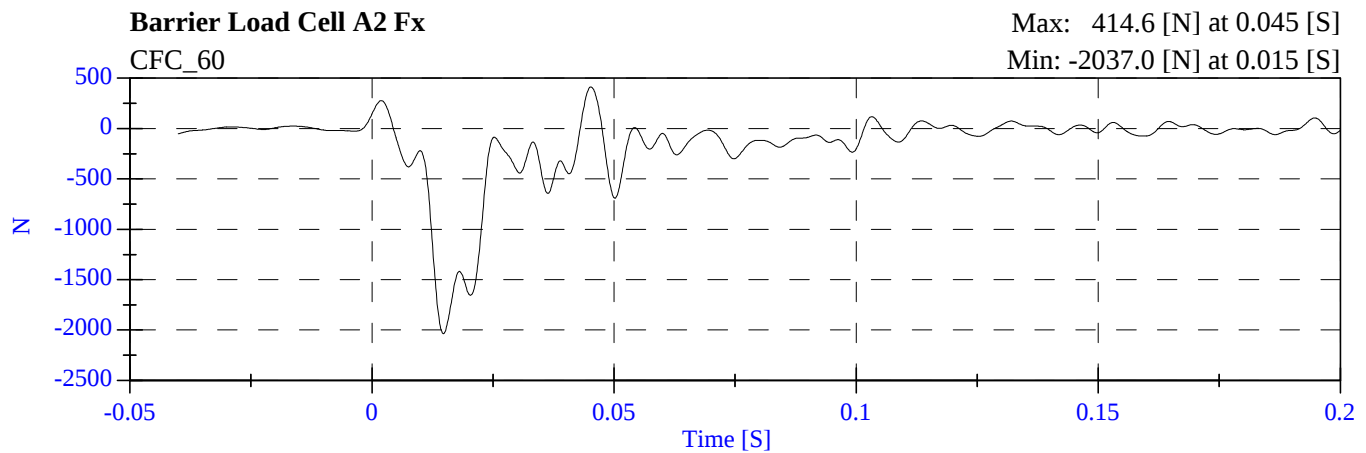
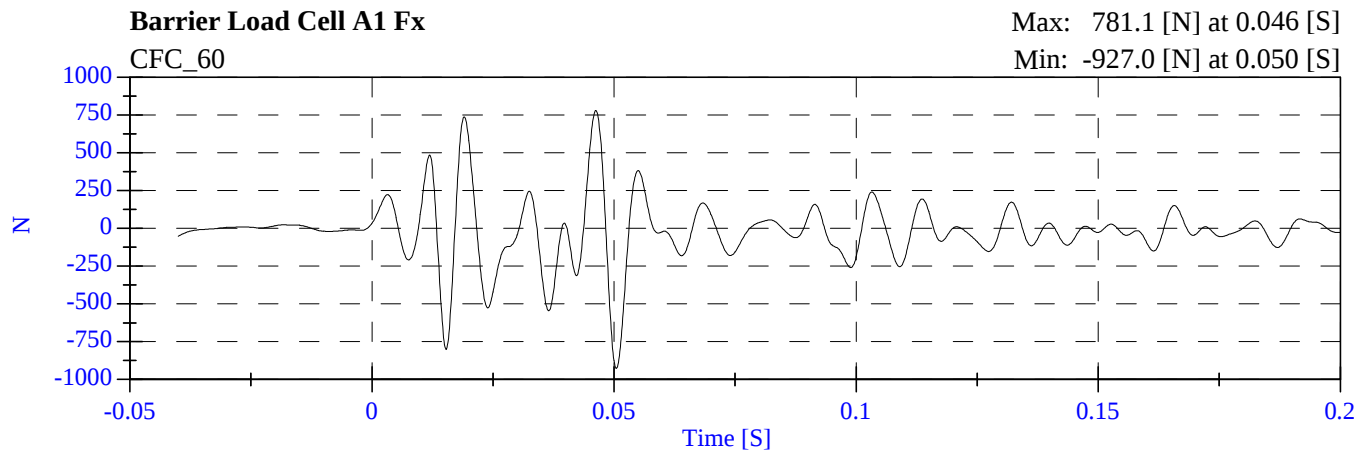
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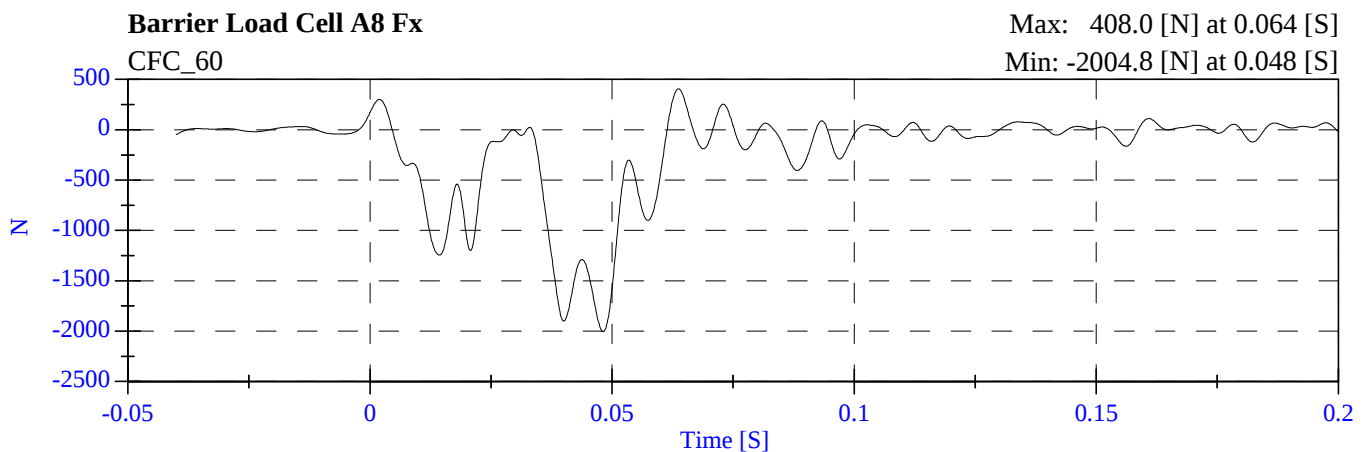
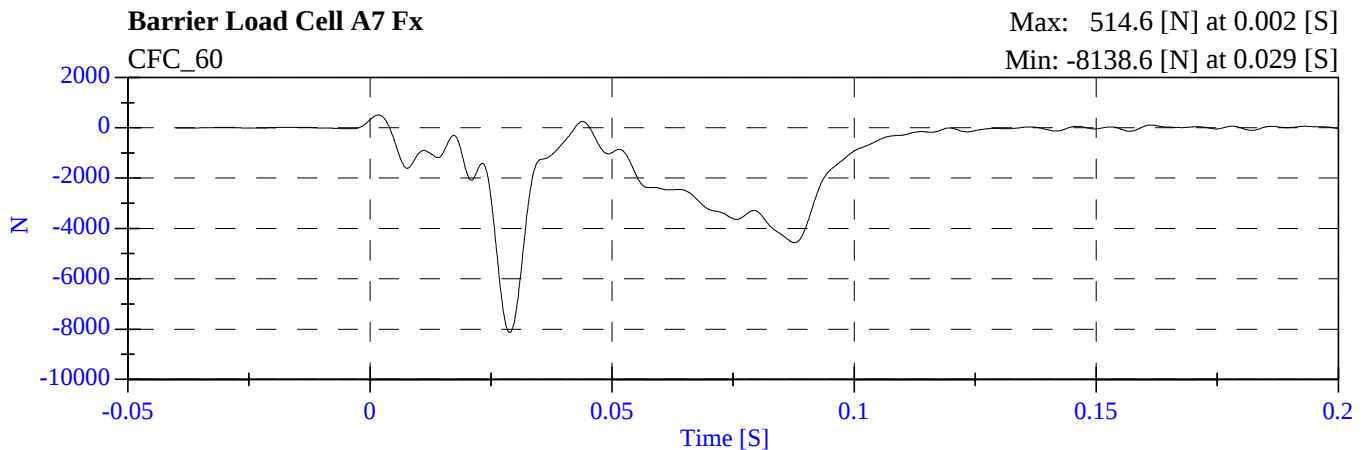
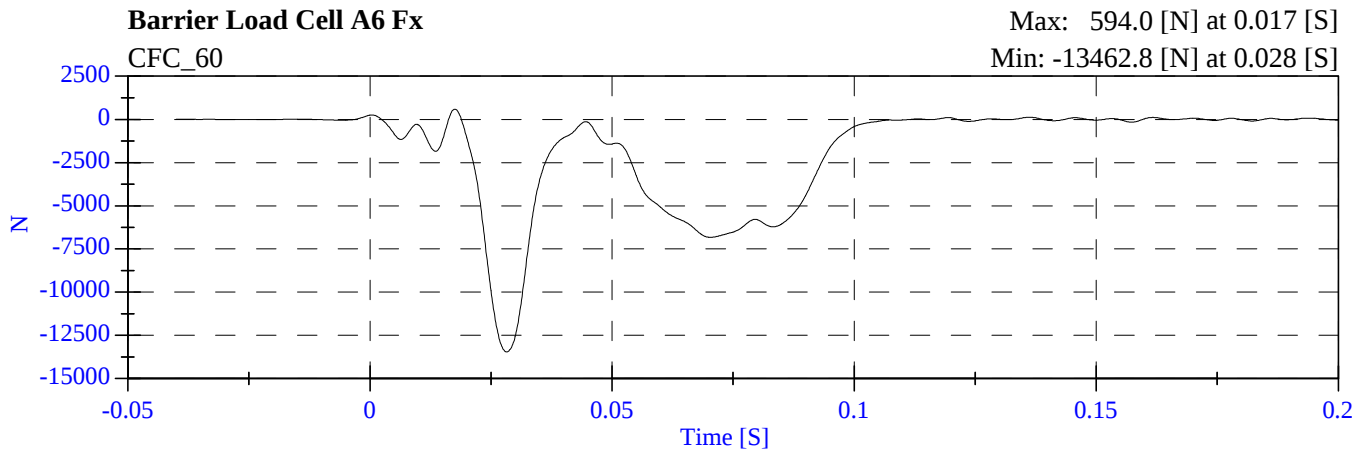
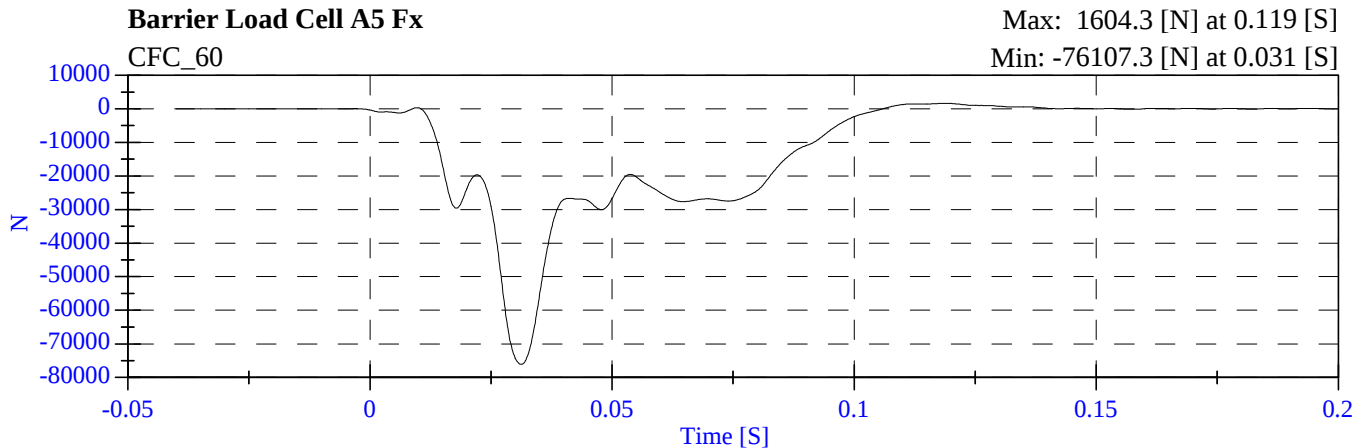
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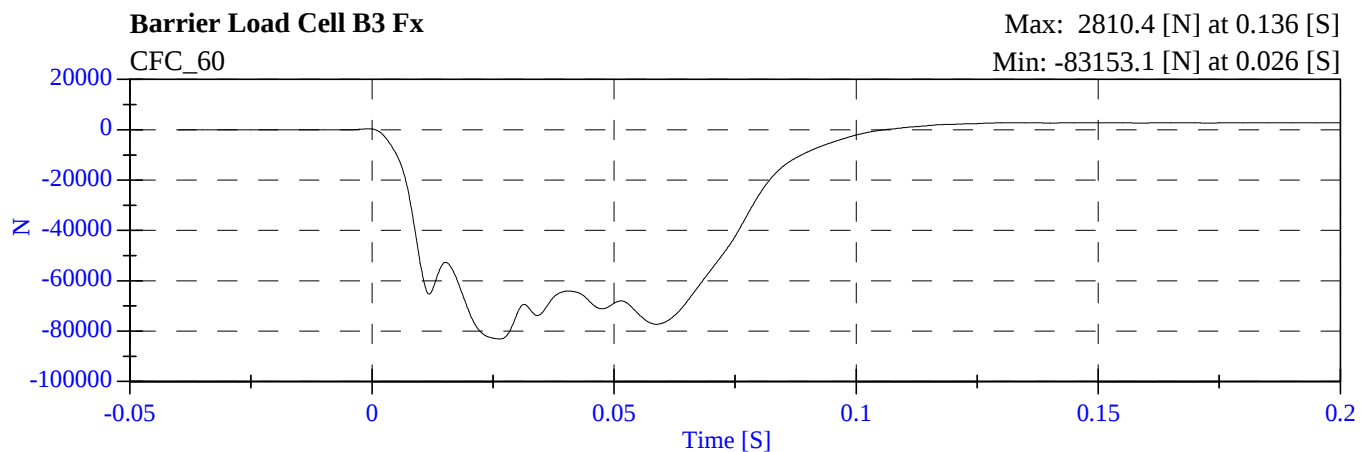
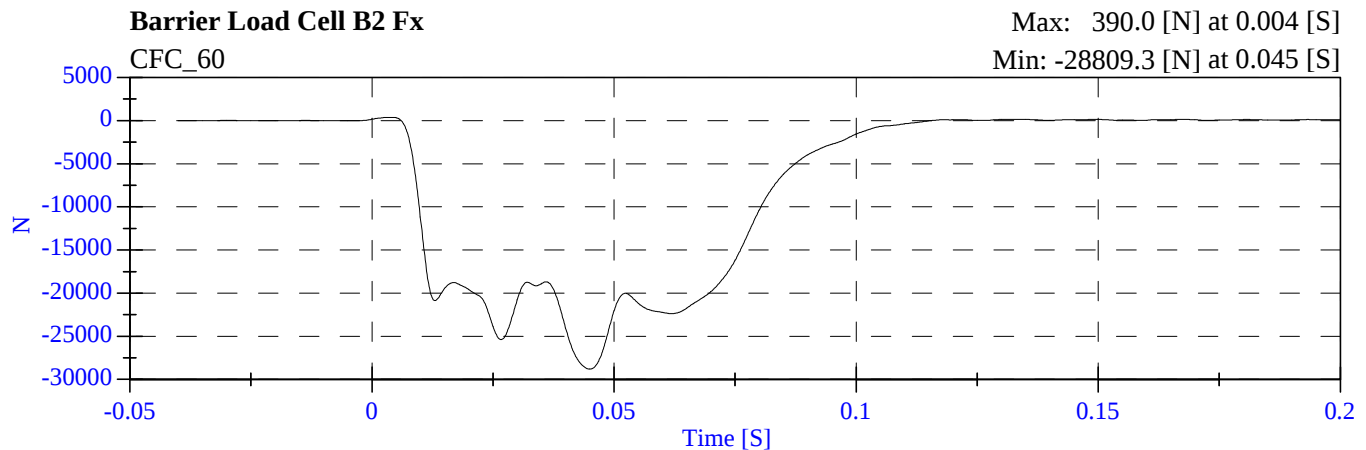
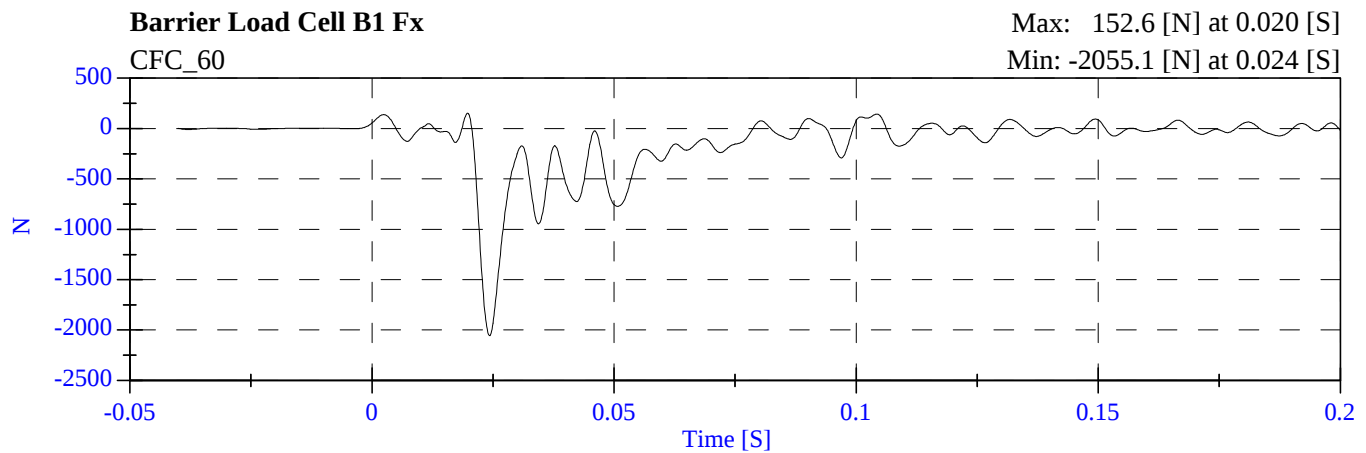
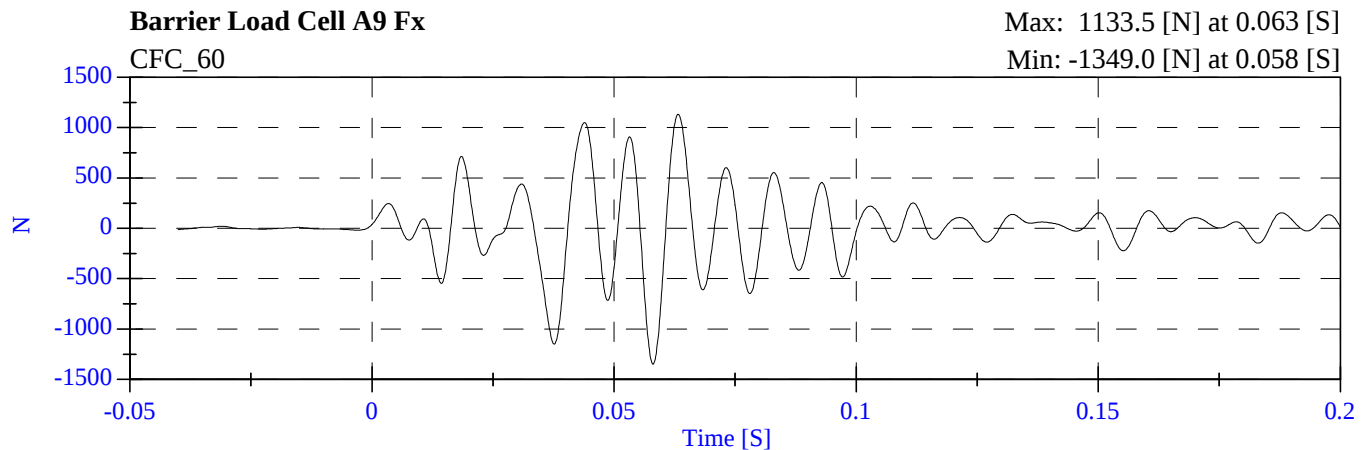
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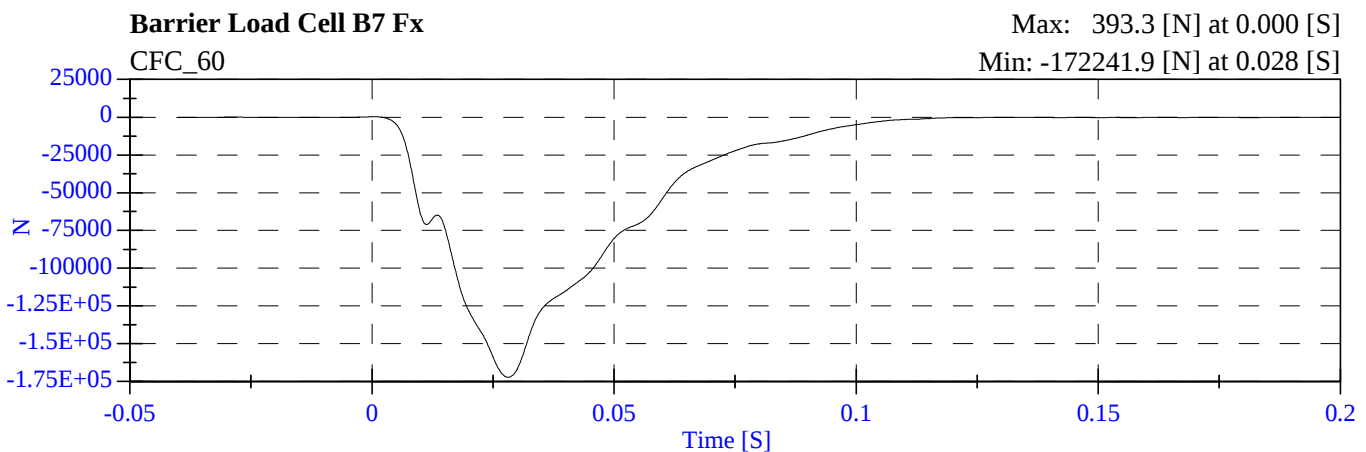
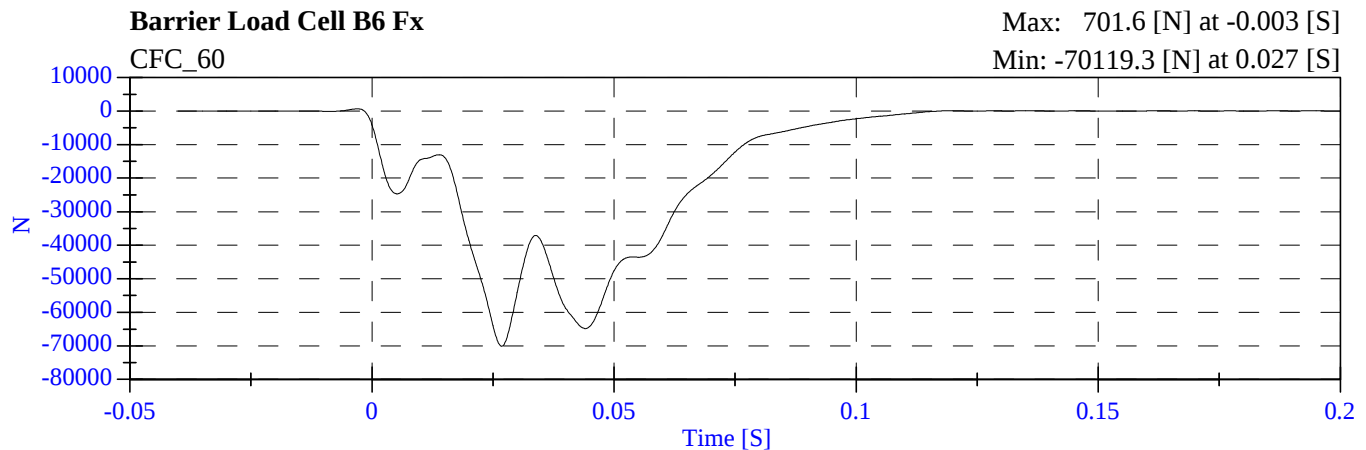
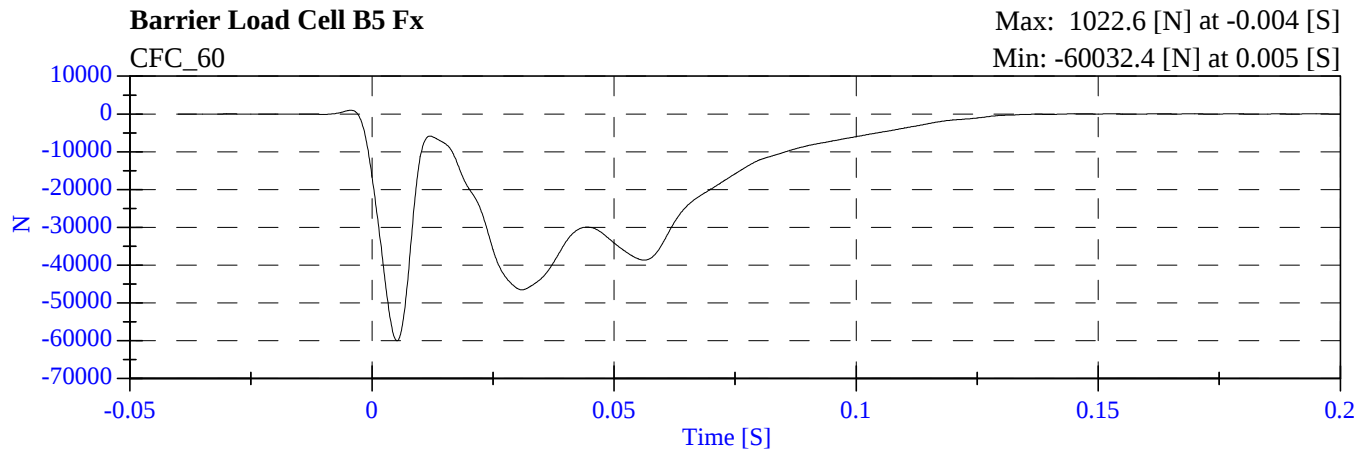
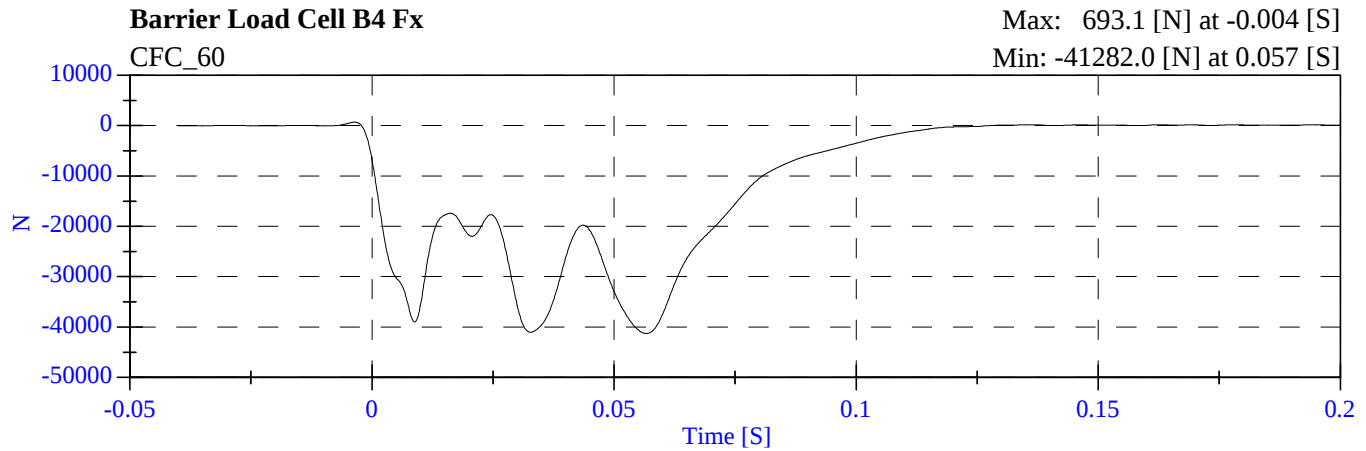
2005 NCAP Test 5 2005 Suzuki Verona M50503 - January 27, 2005



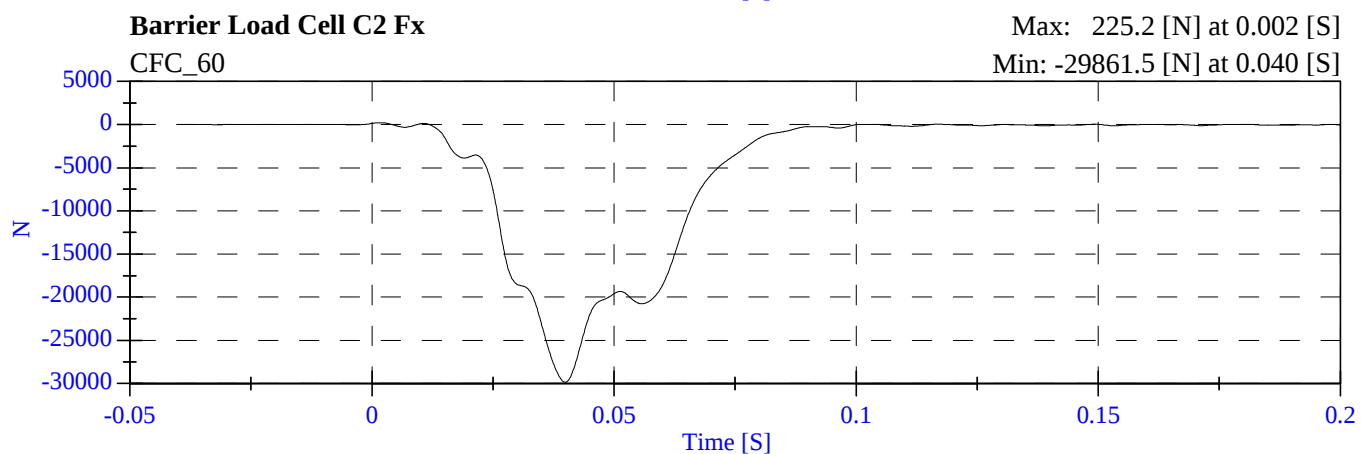
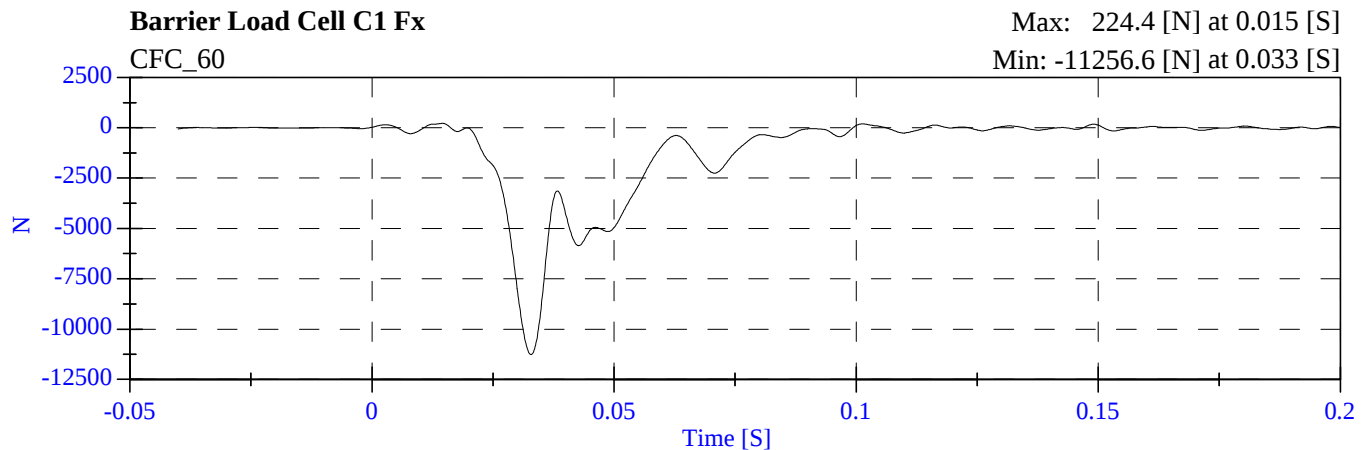
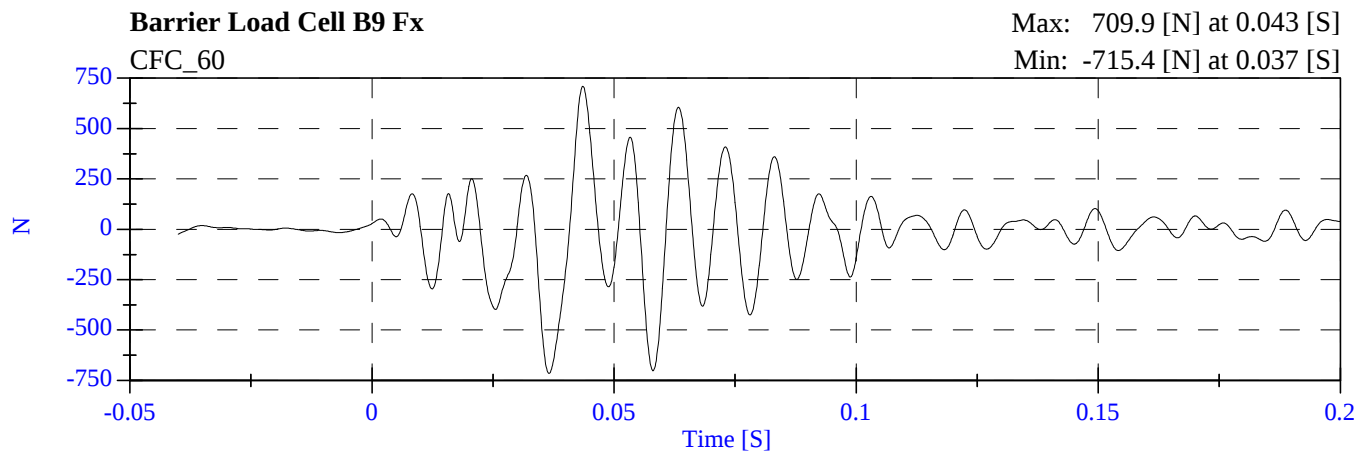
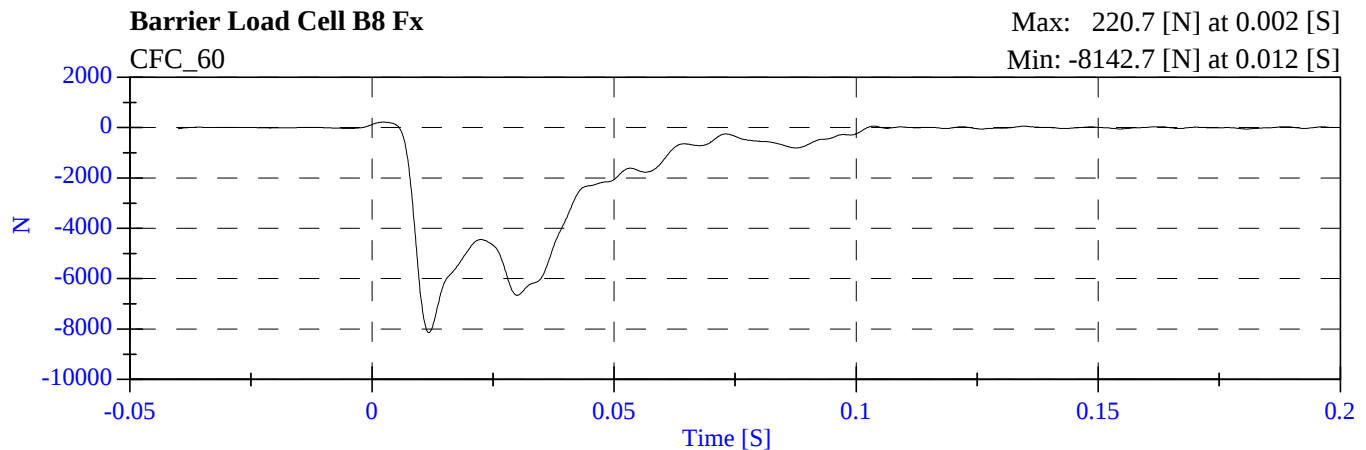
2005 NCAP Test 5 2005 Suzuki Verona M50503 - January 27, 2005



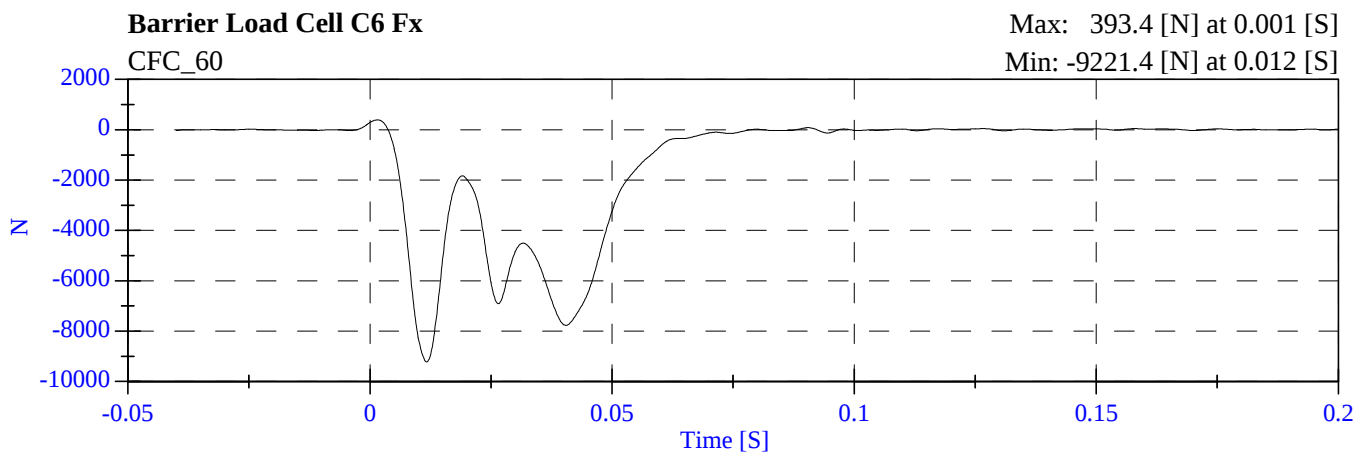
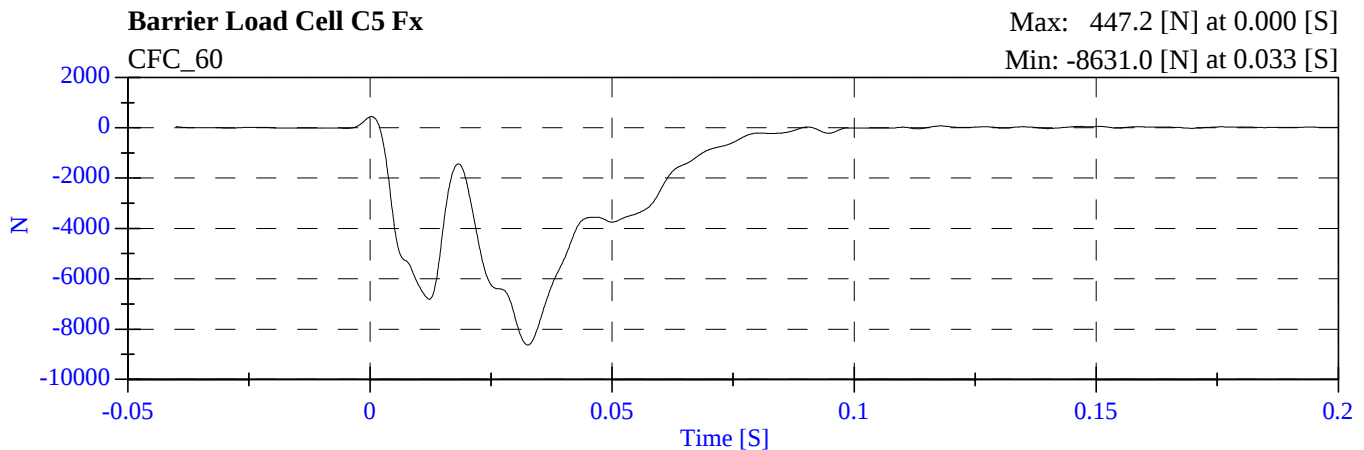
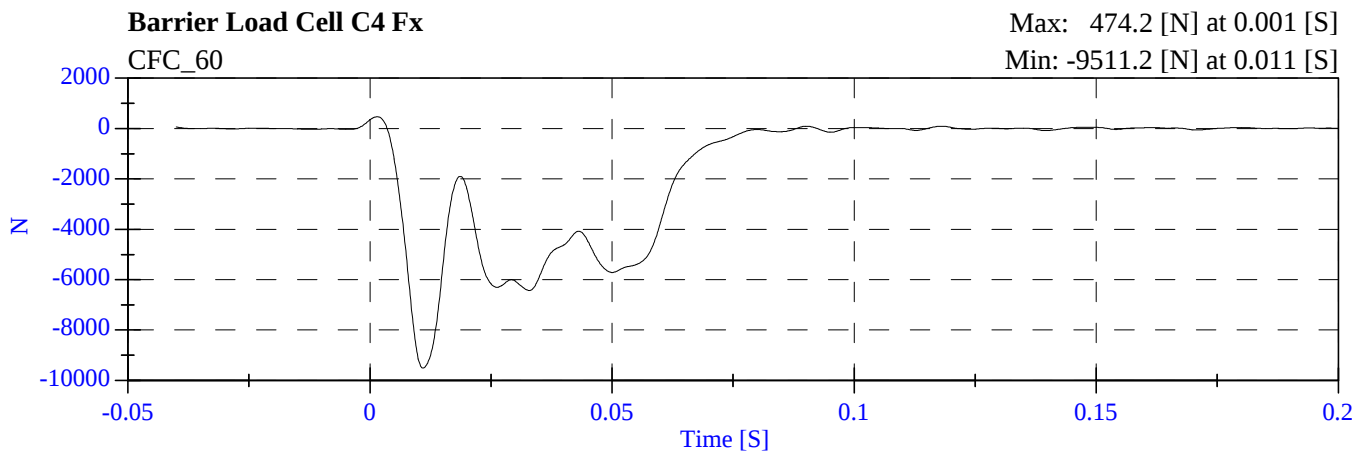
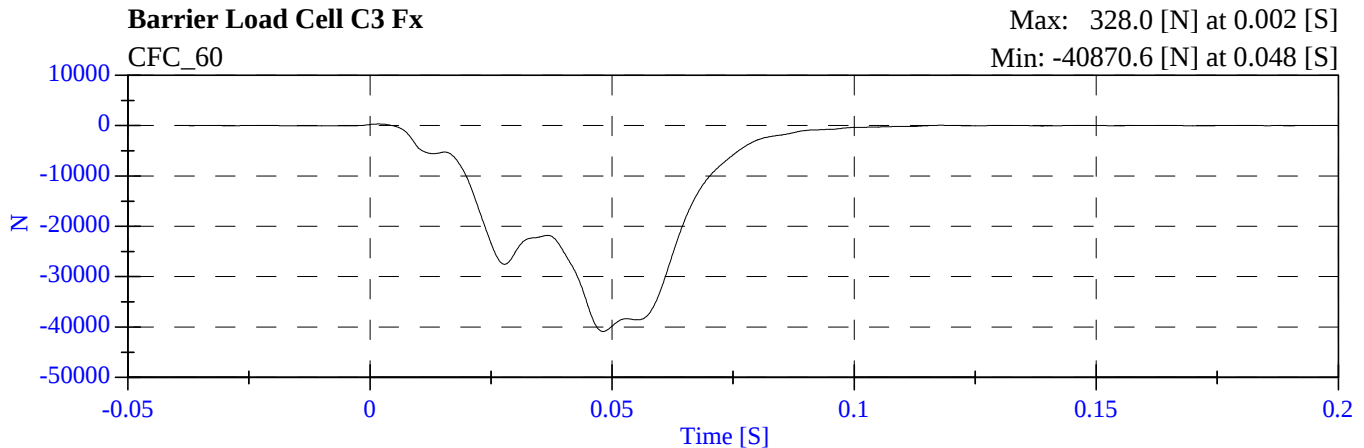
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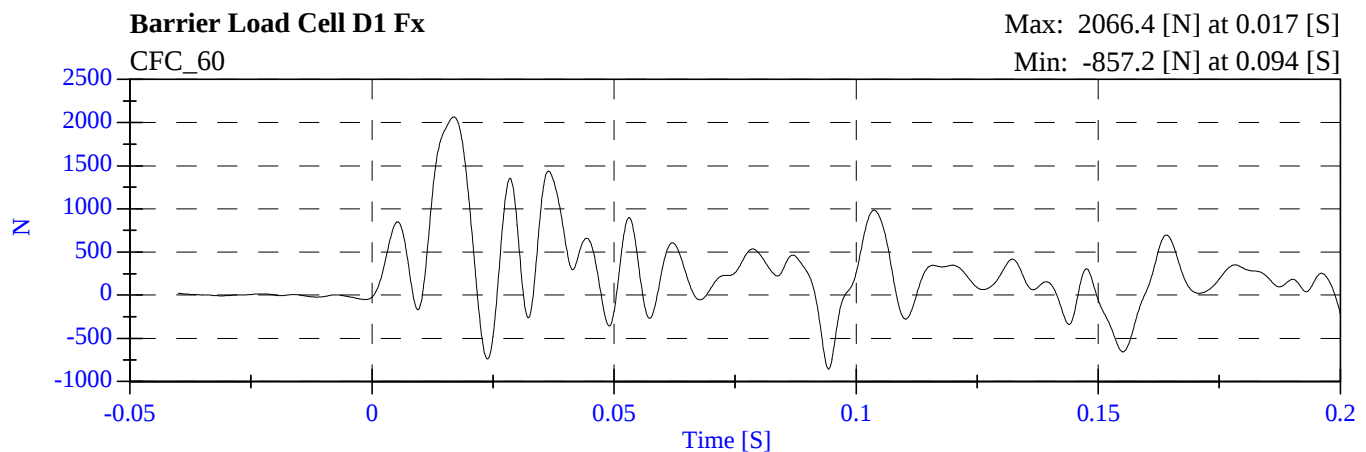
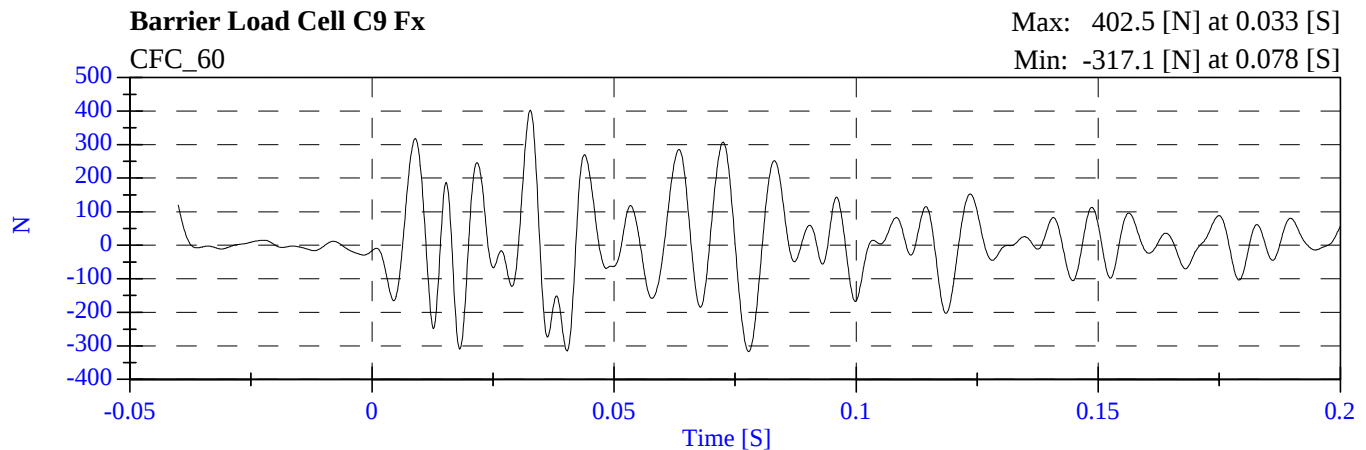
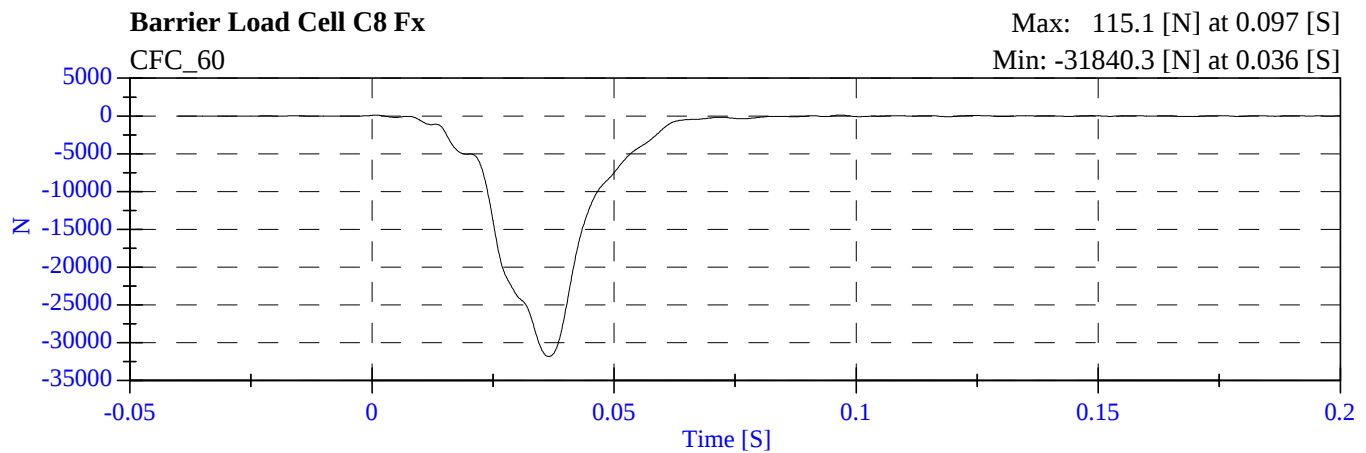
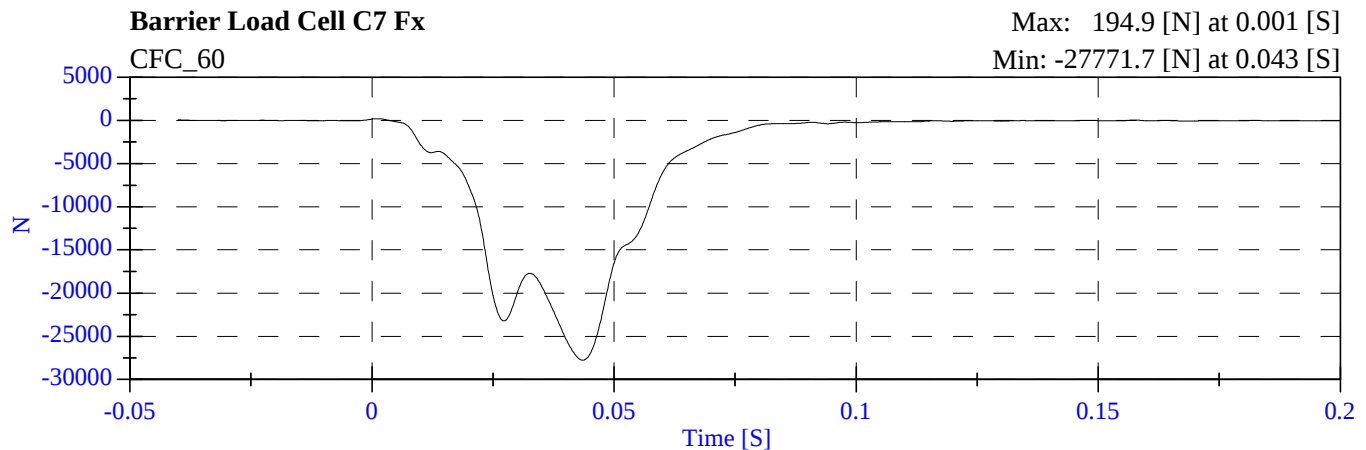
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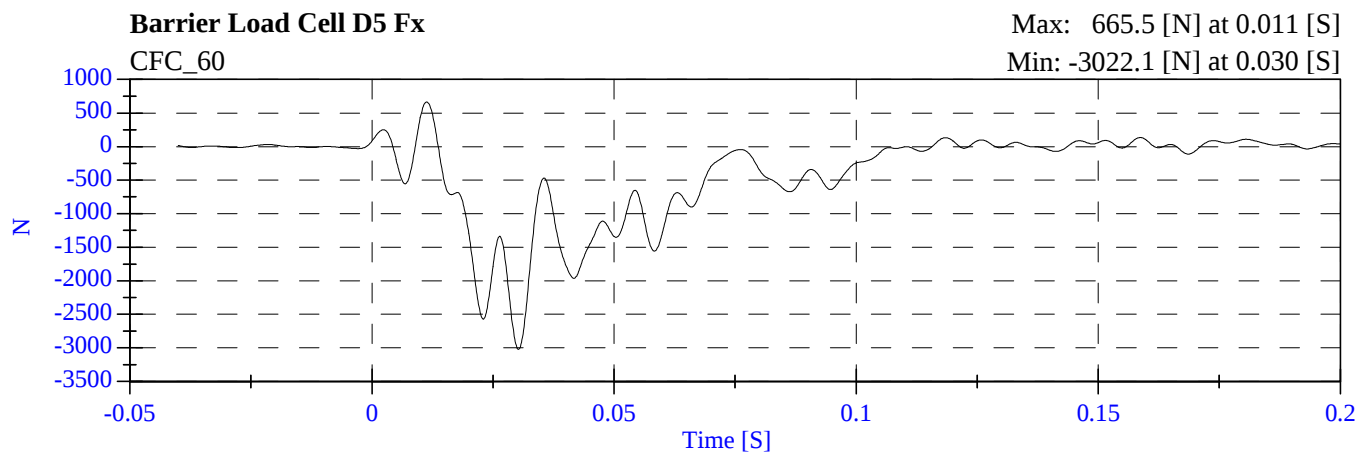
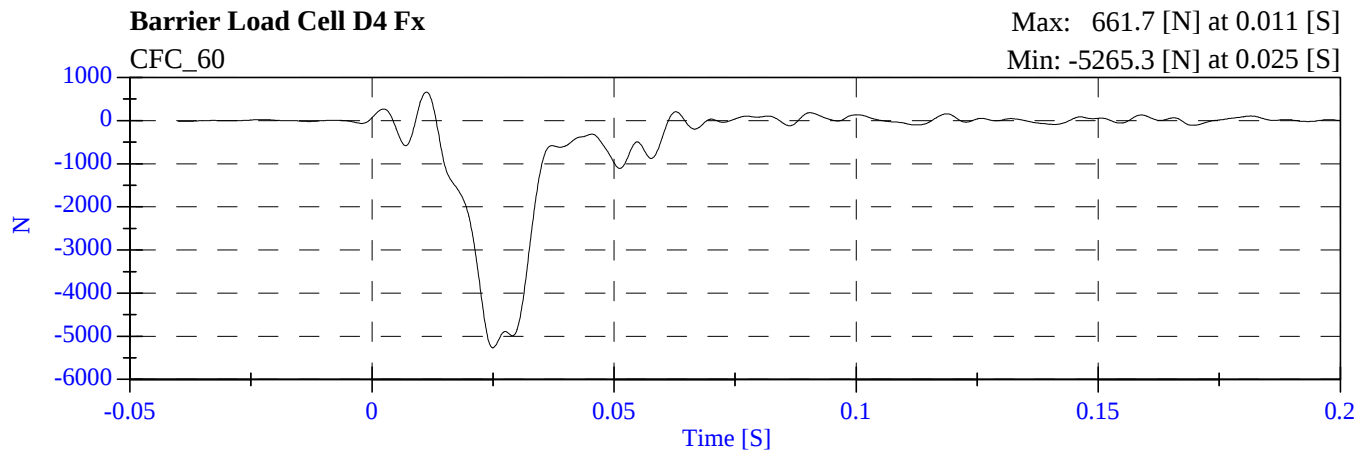
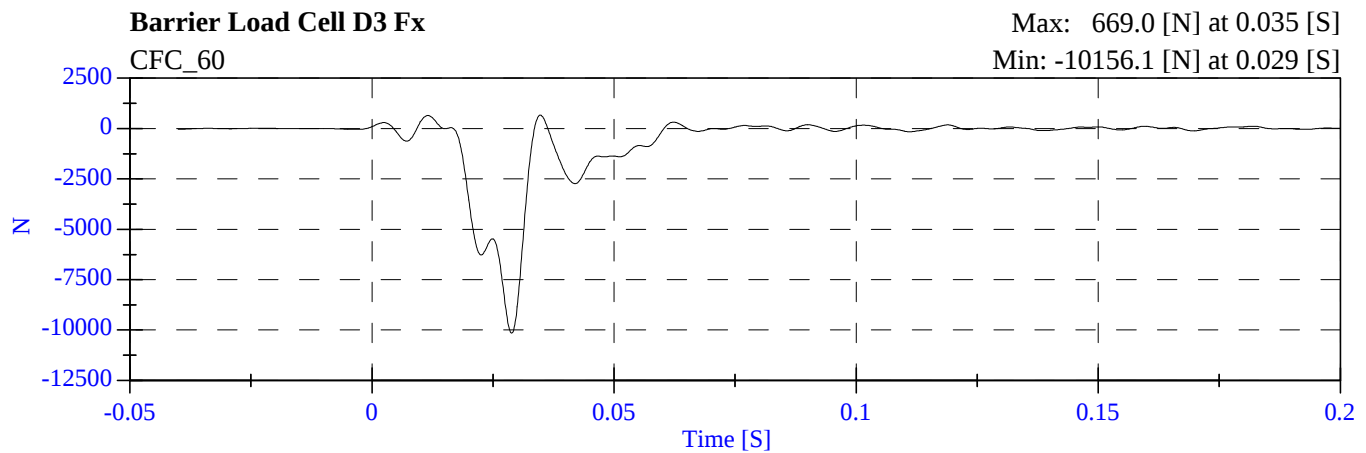
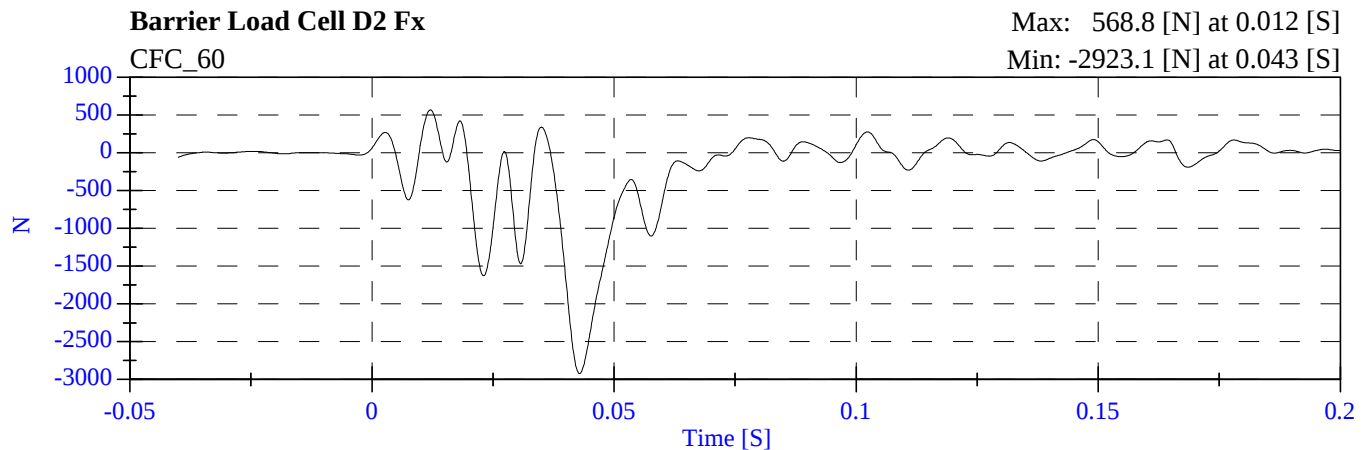
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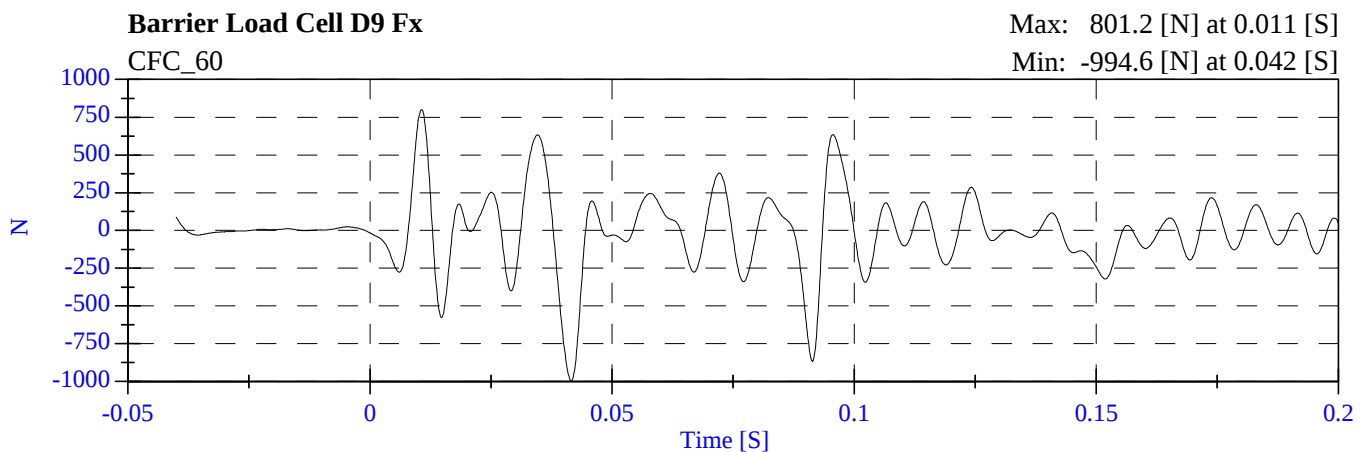
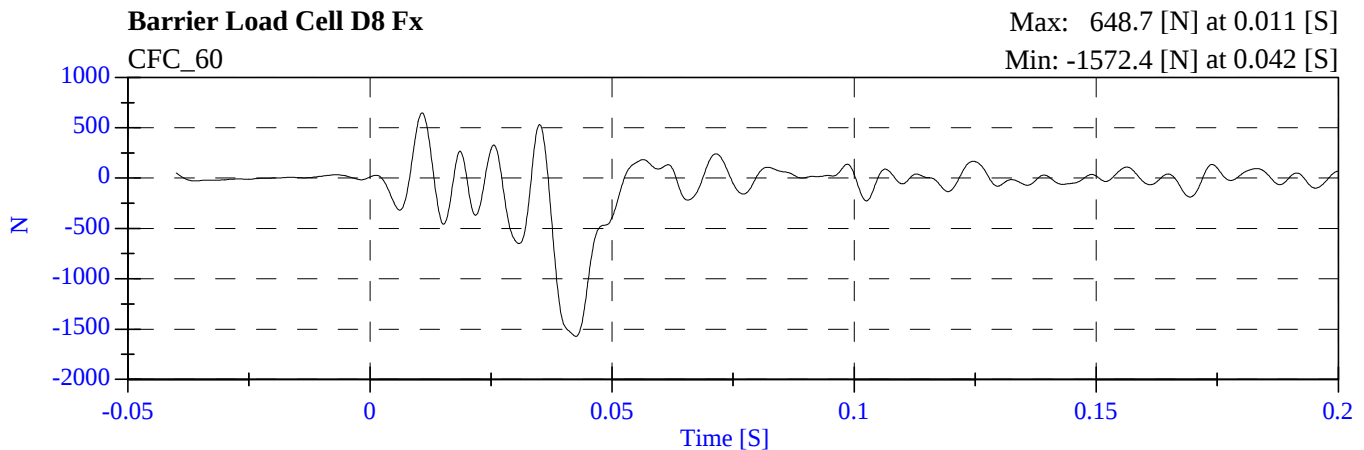
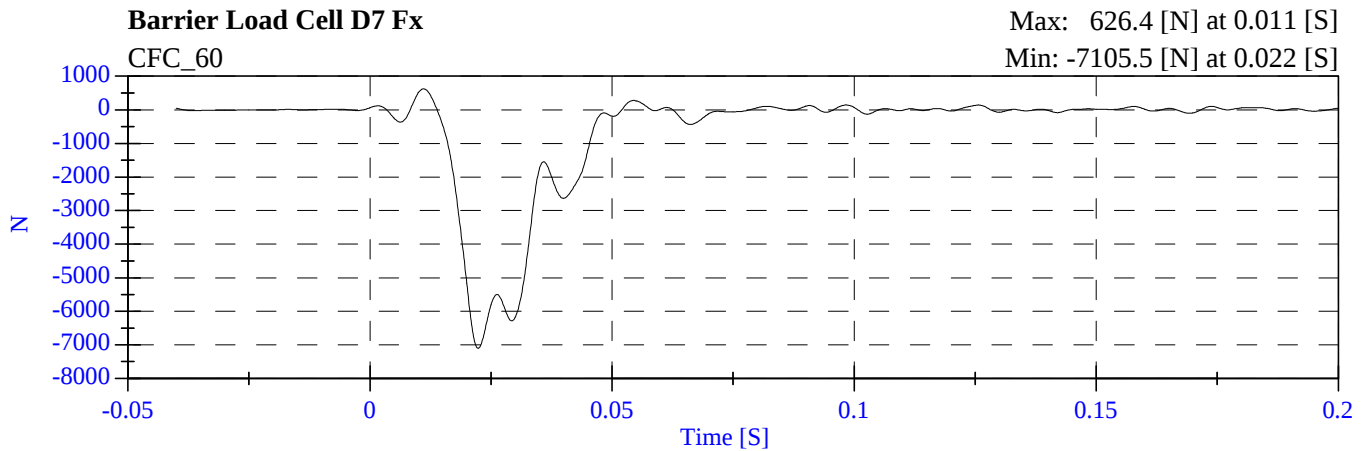
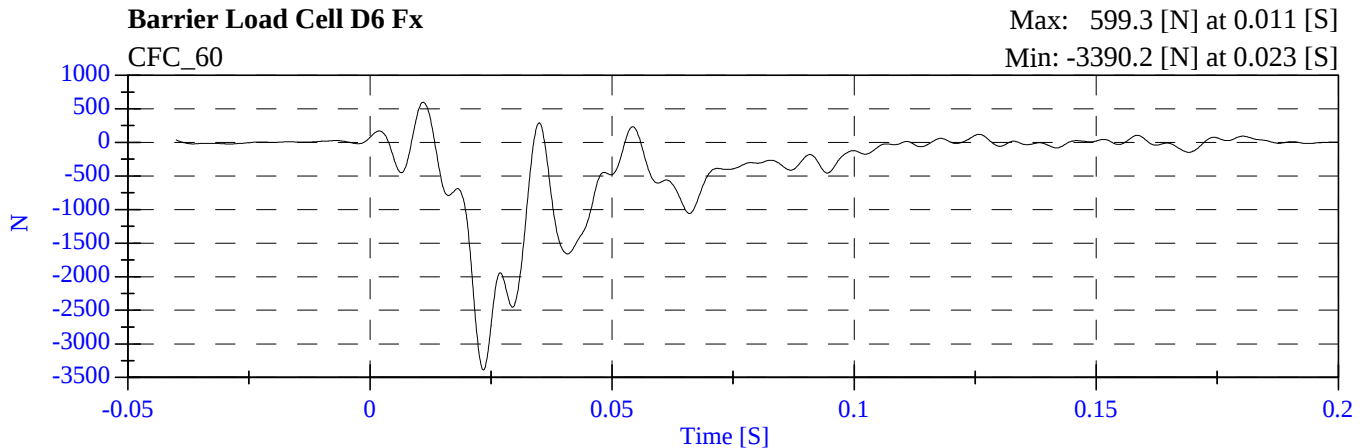
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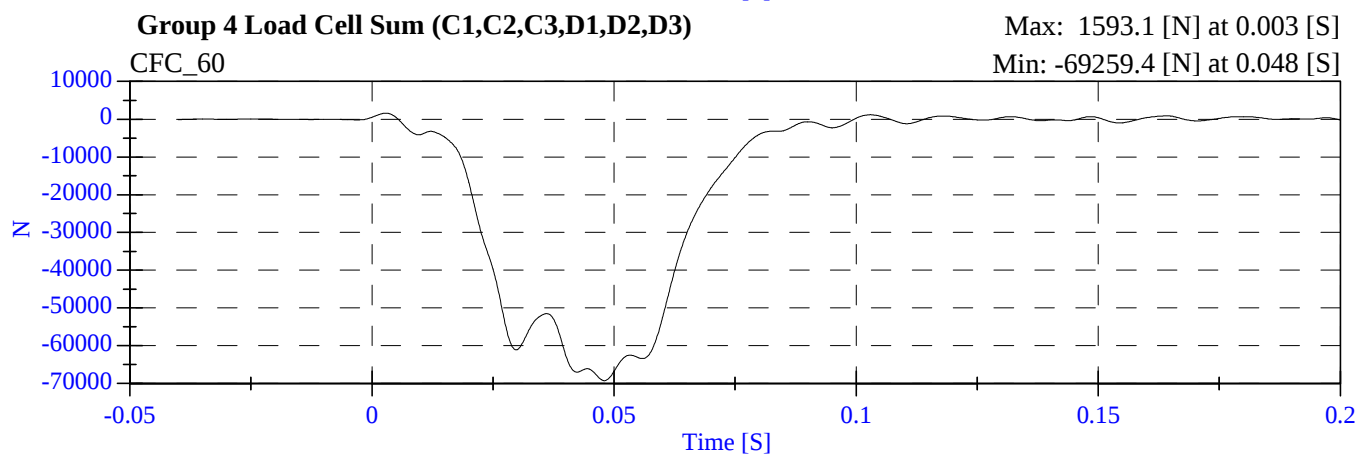
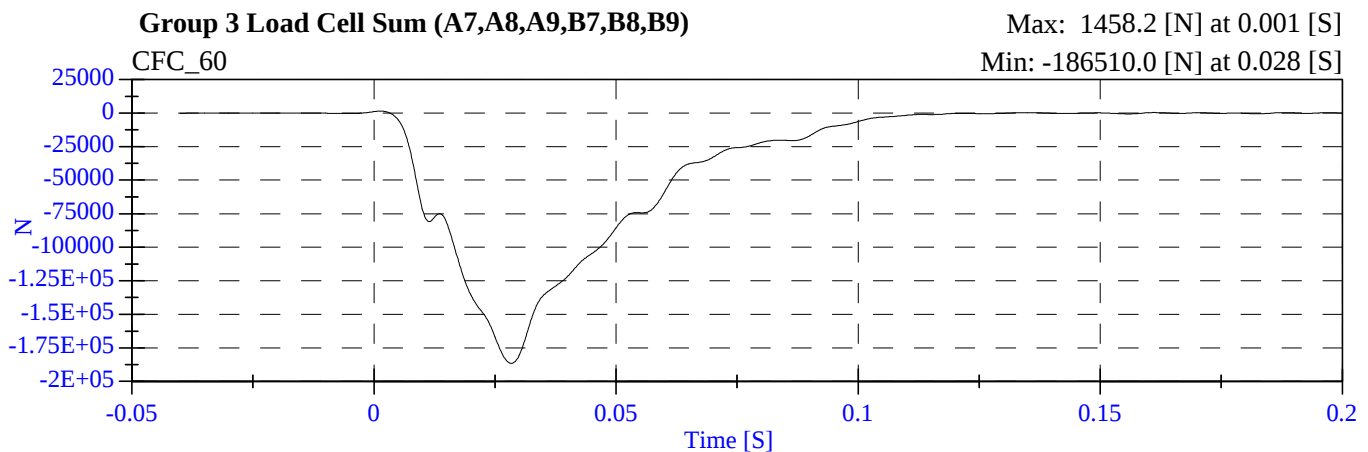
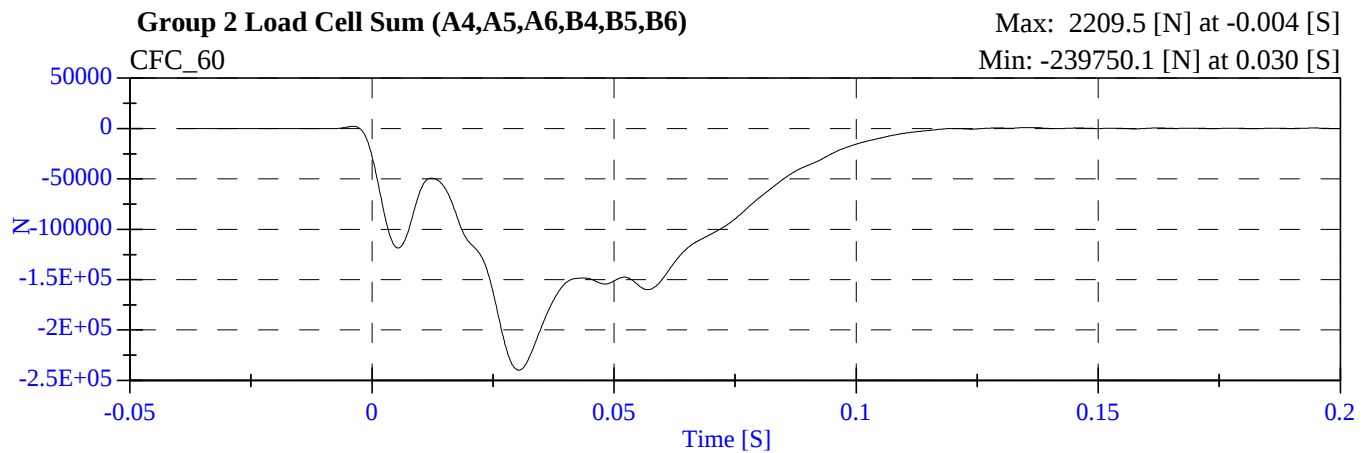
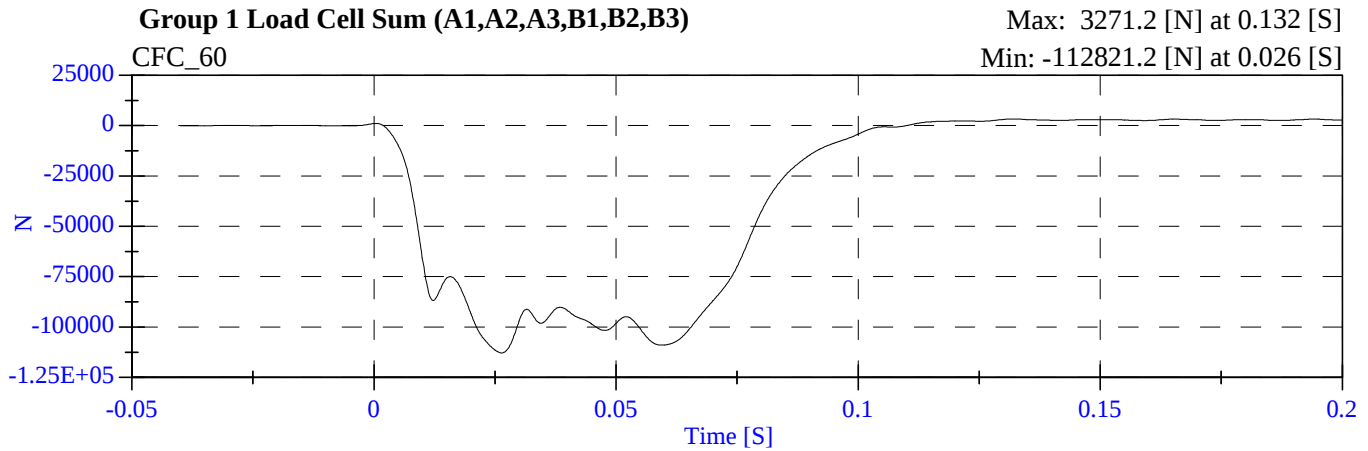
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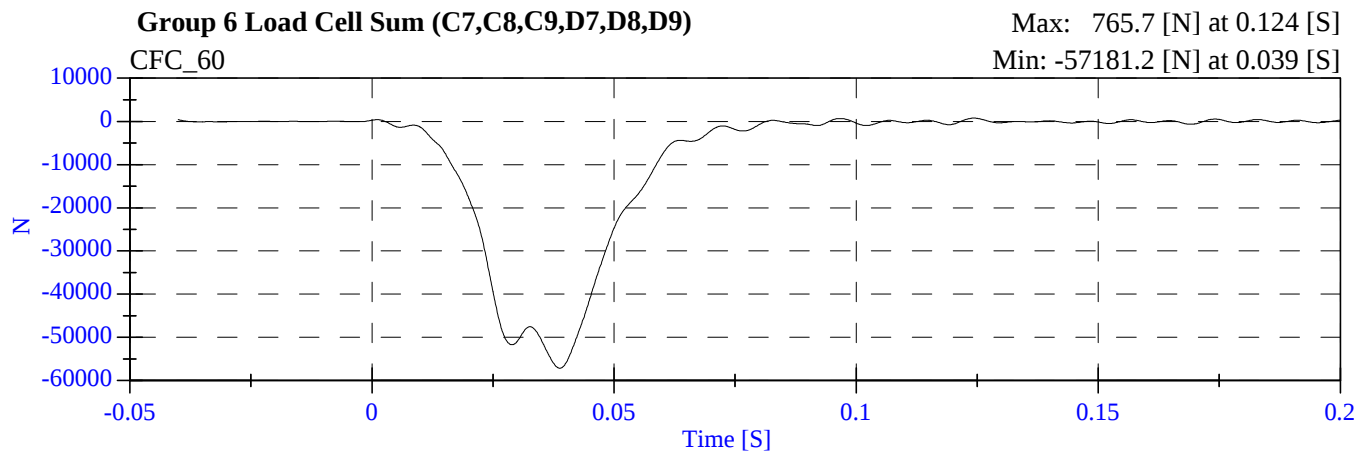
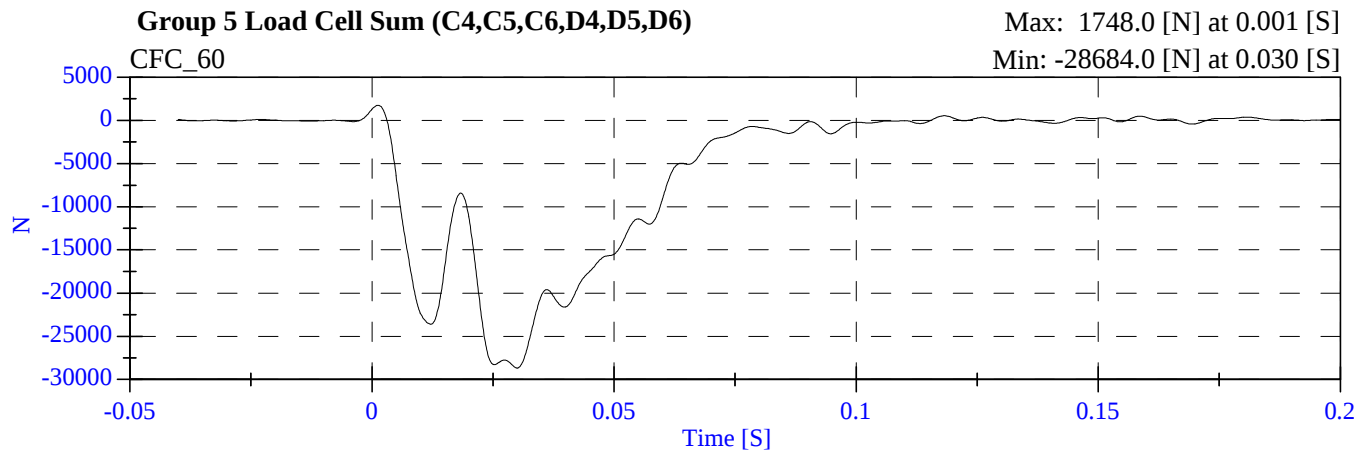
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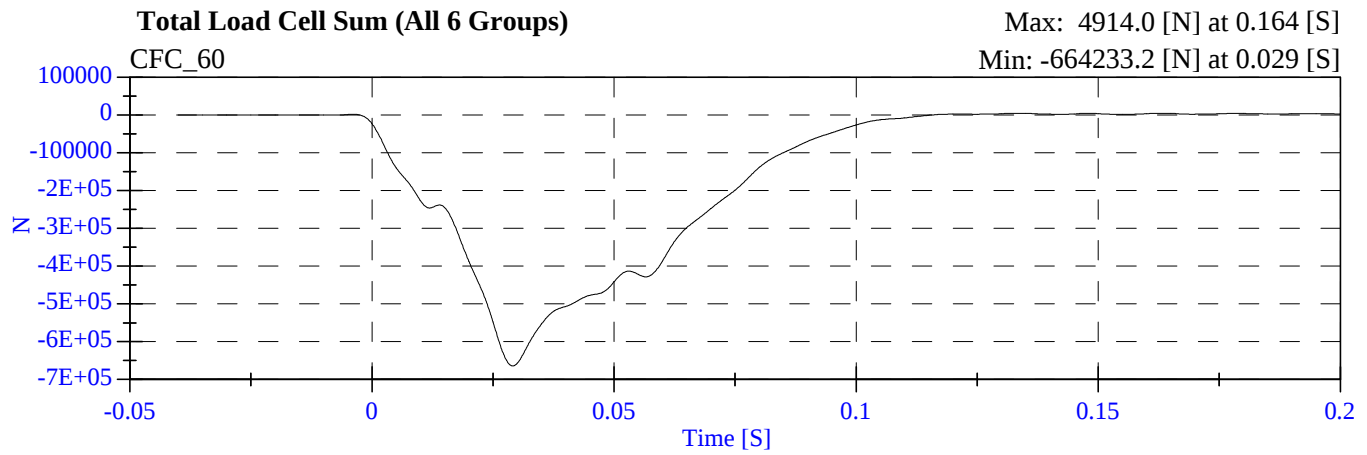
2005 NCAP Test 5 2005 Suzuki Verona M50503 - January 27, 2005



2005 NCAP Test 5 2005 Suzuki Verona M50503 - January 27, 2005



2005 NCAP Test 5 2005 Suzuki Verona M50503 - January 27, 2005



APPENDIX C

PART 572B/E DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA SHEETS

Appendix C contains the results from certification tests performed on the 50th percentile male anthropomorphic test devices utilized for this crash test. The results indicate that the dummies meet all of the performance requirements of the six standard tests as specified in 49 CFR Part 572, Federal Register, Volume 42, No. 25, dated February 7, 1977.

The tests were conducted at the Dummy Certification Test Facility of General Dynamics. A summary of the test results, and Part 572 specifications are included in this Appendix.

Dummy serial numbers and certification dates are:

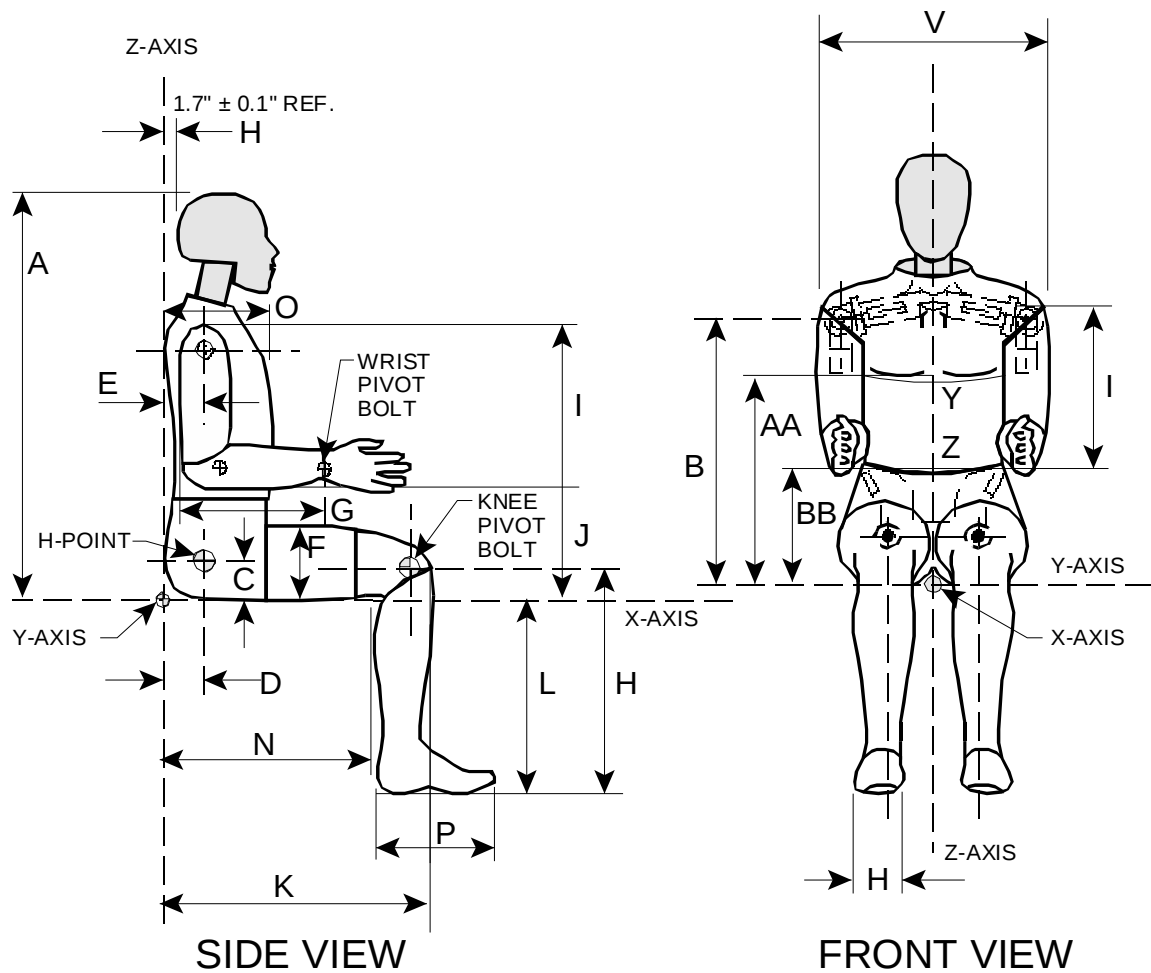
<u>Position No./Location</u>	<u>Serial No.</u>	<u>Completion Date</u>
#1/Driver	061	12/15/2004
#2/Right Front Passenger	064	12/15/2004

Electronic Test Equipment

The complement of signal conditioning, recording and display equipment, in conjunction with dummy certification testing, can be found in New Car Assessment and Standards Inducant Testing Final Report No. 6525-V-1.

DUMMY CONFIGURATION DIMENSIONS

EXTERNAL DIMENSIONS SPECIFICATIONS



NOTE: Figure is referenced to the erect seated position. The curved lumbar does not allow the Hybrid III to be positioned in a perfect erect attitude.
(REF: S572.31(A)(6))

PART 572E
HEAD DROP TEST

Dummy Serial Number 061
Sequential Test Number 1
Date 12/10/2004
Workfile 061H4 12-10-04

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	66-78 Deg F	70.0
Relative Humidity	10% - 70%	40.0
Peak Resultant Acceleration	225-275 G's	241.76
Peak Lateral Acceleration	15 G's Max	10.31
Is Acceleration Curve Unimodal?	YES	YES

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
NECK FLEXION TEST

Dummy Serial Number	061	
Sequential Test Number	1	
Date	12/14/2004	6 Axis Neck Transducer
Workfile	061NF 12-14-04	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		69-72 Deg F	70.0
Relative Humidity		10% - 70%	37.0
Impact Velocity		22.60 - 23.40 Ft/s	23.00
Pendulum Deceleration	10 ms	22.50 - 27.50 G's	22.71
	20 ms	17.60 - 22.60 G's	20.90
	30 ms	12.50 - 18.50 G's	17.66
Max Pendulum G's Above 30 ms		29 G's Max	17.66
Deceleration - Time Curve Decay Time to 5 G's		34 - 42 ms	38.00
D Plane Rotation	Max	64 - 78 Deg	68.28
	Time	57 - 64 ms	58.50
Moment About Occipital Condyle	Max	65 - 80 Ft-Lbs	73.67
	Time	47 - 58 ms	51.30
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 ms	116.10
Positive Moment - Time Curve Decay Time to Zero		97 - 107 ms	98.50

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
NECK EXTENSION TEST

Dummy Serial Number	061	
Sequential Test Number	1	
Date	12/14/2004	6 Axis Neck Transducer
Workfile	061NE6 12-14-04	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		69-72 Deg F	70.00
Relative Humidity		10% - 70%	37.00
Impact Velocity		19.50 - 20.30 Ft/s	19.70
Pendulum Deceleration	10 ms	17.20 - 21.20 G's	18.73
	20 ms	14.00 - 19.00 G's	18.41
	30 ms	11.00 - 16.00 G's	14.49
Max Pendulum G's Above 30 ms		22 G's Max	14.49
Deceleration - Time Curve Decay Time to 5 G's		38 - 46 ms	38.50
D Plane Rotation	Max	81 - 106 Deg	92.68
	Time	72 - 82 ms	74.90
Moment About Occipital Condyle	Max	-59.0 - -39.0 Ft-Lbs	-53.05
	Time	65 - 79 ms	71.10
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 ms	153.60
Positive Moment - Time Curve Decay Time to Zero		120 - 148 ms	136.00

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
THORAX IMPACT TEST

Dummy Serial Number 061
Sequential Test Number 1
Date 12/15/2004
Workfile 061T 12-15-04

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	69-72 Deg F	70.0
Relative Humidity	10% - 70%	33.00
Pendulum Velocity	21.6 - 22.4 Ft/s	22.37
Maximum Deflection	2.50 - 2.86 in	2.50
Maximum Resistive Force	1160 - 1325 Lbs	1257.94
Internal Hysteresis	69 - 85 %	76.44

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
KNEE IMPACT TEST

Dummy Serial Number 061
Sequential Test Number 1
Date 12/15/2004
Workfile 061RF 12-15-04; 061LF 12-15-04

TEST PARAMETER	SPECIFICATION	TEST RESULTS
LEFT KNEE		
Temperature	66 - 78 Deg F	70.0
Relative Humidity	10% - 70%	36.00
Probe Velocity	6.8 - 7.0 Ft/s	7.00
Peak Knee Impact Force	1060 - 1300 Lbs	1214.06
RIGHT KNEE		
Temperature	66 - 78 Deg F	70.0
Relative Humidity	10% - 70%	36.00
Probe Velocity	6.8 - 7.0 Ft/s	7.00
Peak Knee Impact Force	1060 - 1300 Lbs	1261.07

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
EXTERNAL DIMENSIONS

Dummy Serial Number 061
Sequential Test Number 1
Date 12/15/2004

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature			70.00
Relative Humidity			37.00
Location for Chest Circumference	AA	16.9 - 17.1 in	17.0
Location for Waist Circumference	BB	8.9 - 9.1 in	9.0
Chest Circumference (With Jacket)	Y	38.2 - 39.4 in	39.2
Waist Circumference	Z	32.9 - 34.1 in	33.6
Chest Depth	O	8.4 - 9.0 in	8.4
H-Point Height	C	3.3 - 3.5 in	3.4
H-Point from Backline	D	5.3 - 5.5 in	5.4
Skull Cap to Backline	H	1.6 - 1.8 in	1.7
Total Sitting Height	A	34.6 - 35.0 in	34.8
Thigh Clearance	F	5.5 - 6.1 in	6.0
Buttock Knee Length	K	22.8 - 23.8 in	23.6
Buttock Popliteal Length	N	17.8 - 18.8 in	18.4
Popliteal Height	L	16.9 - 17.9 in	17.7
Knee Pivot Height	M	19.1 - 19.7 in	19.4
Foot Length	P	9.9 - 10.5 in	10.1
Foot Breadth	W	3.6 - 4.2 in	3.8
Shoulder Pivot from Backline	E	3.3 - 3.7 in	3.5
Shoulder Breadth	V	16.6 - 17.2 in	16.8
Shoulder Pivot Height	B	19.9 - 20.5 in	20.1
Elbow Rest Height	J	7.5 - 8.3 in	7.8
Shoulder - Elbow Length	I	13.0 - 13.6 in	13.4
Back of Elbow to Wrist Pivot	G	11.4 - 12.0 in	11.6

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
HEAD DROP TEST

Dummy Serial Number 064
Sequential Test Number 1
Date 12/10/2004
Workfile 064 12-10-04

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	66-78 Deg F	70.0
Relative Humidity	10% - 70%	40.00
Peak Resultant Acceleration	225-275 G's	249.35
Peak Lateral Acceleration	15 G's Max	3.78
Is Acceleration Curve Unimodal?	YES	YES

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
NECK FLEXION TEST

Dummy Serial Number	064	
Sequential Test Number	1	
Date	12/14/2004	6 Axis Neck Transducer
Workfile	064NF7 12-14-04	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		69-72 Deg F	70.00
Relative Humidity		10% - 70%	38.00
Impact Velocity		22.60 - 23.40 Ft/s	22.62
Pendulum Deceleration	10 ms	22.50 - 27.50 G's	23.24
	20 ms	17.60 - 22.60 G's	21.84
	30 ms	12.50 - 18.50 G's	18.10
Max Pendulum G's Above 30 ms		29 G's Max	18.10
Deceleration - Time Curve Decay Time to 5 G's		34 - 42 ms	38.90
D Plane Rotation	Max	64 - 78 Deg	67.89
	Time	57 - 64 ms	57.40
Moment About Occipital Condyle	Max	65 - 80 Ft-Lbs	70.95
	Time	47 - 58 ms	48.80
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 ms	113.00
Positive Moment - Time Curve Decay Time to Zero		97 - 107 ms	102.70

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
NECK EXTENSION TEST

Dummy Serial Number	064	
Sequential Test Number	1	
Date	12/14/2004	6 Axis Neck Transducer
Workfile	064NE1 12-14-04	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		69-72 Deg F	70.00
Relative Humidity		10% - 70%	38.00
Impact Velocity		19.50 - 20.30 Ft/s	19.65
Pendulum Deceleration	10 ms	17.20 - 21.20 G's	17.93
	20 ms	14.00 - 19.00 G's	17.15
	30 ms	11.00 - 16.00 G's	14.98
Max Pendulum G's Above 30 ms		22 G's Max	15.49
Deceleration - Time Curve Decay Time to 5 G's		38 - 46 ms	41.70
D Plane Rotation	Max	81 - 106 Deg	88.29
	Time	72 - 82 ms	76.80
Moment About Occipital Condyle	Max	-59.0 - -39.0 Ft-Lbs	-41.21
	Time	65 - 79 ms	74.80
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 ms	156.00
Positive Moment - Time Curve Decay Time to Zero		120 - 148 ms	139.10

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
THORAX IMPACT TEST

Dummy Serial Number 064
Sequential Test Number 1
Date 12/15/2004
Workfile 064T 12-15-04

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	69-72 Deg F	70.0
Relative Humidity	10% - 70%	33.00
Pendulum Velocity	21.6 - 22.4 Ft/s	22.31
Maximum Deflection	2.50 - 2.86 in	2.57
Maximum Resistive Force	1160 - 1325 Lbs	1321.99
Internal Hysteresis	69 - 85 %	74.76

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
KNEE IMPACT TEST

Dummy Serial Number 064
Sequential Test Number 1
Date 12/15/2004
Workfile 064LF 12-15-04; 064RF 12-15-04

TEST PARAMETER	SPECIFICATION	TEST RESULTS
LEFT KNEE		
Temperature	66 - 78 Deg F	70.0
Relative Humidity	10% - 70%	36.00
Probe Velocity	6.8 - 7.0 Ft/s	7.00
Peak Knee Impact Force	1060 - 1300 Lbs	1184.09
RIGHT KNEE		
Temperature	66 - 78 Deg F	70.0
Relative Humidity	10% - 70%	36.00
Probe Velocity	6.8 - 7.0 Ft/s	7.00
Peak Knee Impact Force	1060 - 1300 Lbs	1205.97

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
EXTERNAL DIMENSIONS

Dummy Serial Number 064
Sequential Test Number 1
Date 12/15/2004

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature			70.00
Relative Humidity			37.00
Location for Chest Circumference	AA	16.9 - 17.1 in	17.0
Location for Waist Circumference	BB	8.9 - 9.1 in	9.0
Chest Circumference (With Jacket)	Y	38.2 - 39.4 in	39.2
Waist Circumference	Z	32.9 - 34.1 in	34.0
Chest Depth	O	8.4 - 9.0 in	8.6
H-Point Height	C	3.3 - 3.5 in	3.4
H-Point from Backline	D	5.3 - 5.5 in	5.4
Skull Cap to Backline	H	1.6 - 1.8 in	1.7
Total Sitting Height	A	34.6 - 35.0 in	34.8
Thigh Clearance	F	5.5 - 6.1 in	6.0
Buttock Knee Length	K	22.8 - 23.8 in	23.6
Buttock Popliteal Length	N	17.8 - 18.8 in	18.4
Popliteal Height	L	16.9 - 17.9 in	17.3
Knee Pivot Height	M	19.1 - 19.7 in	19.4
Foot Length	P	9.9 - 10.5 in	10.2
Foot Breadth	W	3.6 - 4.2 in	3.8
Shoulder Pivot from Backline	E	3.3 - 3.7 in	3.6
Shoulder Breadth	V	16.6 - 17.2 in	16.8
Shoulder Pivot Height	B	19.9 - 20.5 in	20.4
Elbow Rest Height	J	7.5 - 8.3 in	8.0
Shoulder - Elbow Length	I	13.0 - 13.6 in	13.4
Back of Elbow to Wrist Pivot	G	11.4 - 12.0 in	11.6

Remarks:

Laboratory Technician:

B. Swiecicki

APPENDIX D

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

INSTRUMENT CALIBRATION FOR DRIVER DUMMY
(Six Month Calibration Minimum)

DRIVER DUMMY (S/N 061)		Manufacturer	Serial #	Calibration	
				Last	Next
Head 9 Array	X Arm Y	ENDEVCO	AC-P32295	19-Jan-05	20-Jul-05
	X Arm Z	ENDEVCO	AC-P32455	19-Jan-05	20-Jul-05
	Y Arm X	ENDEVCO	AC-P32227	19-Jan-05	20-Jul-05
	Y Arm Z	ENDEVCO	AC-P32139	19-Jan-05	20-Jul-05
	Z Arm X	ENDEVCO	AC-P32197	19-Jan-05	20-Jul-05
	Z Arm Y	ENDEVCO	AC-P32464	19-Jan-05	20-Jul-05
Head	X	ENDEVCO	AC-P32276	19-Jan-05	20-Jul-05
	Y	ENDEVCO	AC-P32146	19-Jan-05	20-Jul-05
	Z	ENDEVCO	AC-P32217	19-Jan-05	20-Jul-05
Head	X (R)	ENDEVCO	AC-P32289	19-Jan-05	20-Jul-05
	Y (R)	ENDEVCO	AC-P32225	19-Jan-05	20-Jul-05
	Z (R)	ENDEVCO	AC-P32453	19-Jan-05	20-Jul-05
Neck Load Cell	X	DENTON	LC-1633Fx	05-Aug-04	03-Feb-05
	Y	DENTON	LC-1633Fy	05-Aug-04	03-Feb-05
	Z	DENTON	LC-1633Fz	05-Aug-04	03-Feb-05
Neck Moment	X	DENTON	LC-1633Mx	05-Aug-04	03-Feb-05
	Y	DENTON	LC-1633My	05-Aug-04	03-Feb-05
	Z	DENTON	LC-1633Mz	05-Aug-04	03-Feb-05
Chest	X	ENDEVCO	AC-P16863	19-Jan-05	20-Jul-05
	Y	ENDEVCO	AC-P17283	19-Jan-05	20-Jul-05
	Z	ENDEVCO	AC-P23640	19-Jan-05	20-Jul-05
Chest	X (R)	ENDEVCO	AC-P17235	19-Jan-05	20-Jul-05
	Y (R)	ENDEVCO	AC-P17285	19-Jan-05	20-Jul-05
	Z (R)	ENDEVCO	AC-P14393	19-Jan-05	20-Jul-05
Chest Deflection	X	SERVO	DS-061	11-Nov-04	12-May-05
Pelvic	X	ENDEVCO	AC-P23939	08-Sep-04	09-Mar-05
	Y	ENDEVCO	AC-P23999	08-Sep-04	09-Mar-05
	Z	ENDEVCO	AC-P23993	08-Sep-04	09-Mar-05

INSTRUMENT CALIBRATION FOR DRIVER DUMMY
(Six Month Calibration Minimum)

DRIVER DUMMY (S/N 061)		Manufacturer	Serial #	Calibration	
				Last	Next
Left Femur Load Cell	Fz	GSE	LC-656	05-Nov-04	06-May-05
Right Femur Load Cell	Fz	GSE	LC-657	05-Nov-04	06-May-05
Left Upper Tibia	Mx	DENTON	LC-199Mx	24-Aug-04	22-Feb-05
	My	DENTON	LC-199My	24-Aug-04	22-Feb-05
Left Lower Tibia	Fz	DENTON	LC-128Fz	23-Aug-04	21-Feb-05
	Mx	DENTON	LC-128Mx	23-Aug-04	21-Feb-05
	My	DENTON	LC-128My	23-Aug-04	21-Feb-05
Right Upper Tibia	Mx	DENTON	LC-045Mx	09-Nov-04	10-May-05
	My	DENTON	LC-045My	09-Nov-04	10-May-05
Right Lower Tibia	Fz	DENTON	LC-125Fz	09-Nov-04	10-May-05
	Mx	DENTON	LC-125Mx	09-Nov-04	10-May-05
	My	DENTON	LC-125My	09-Nov-04	10-May-05
Left Foot Rear	X	ENDEVCO	AC-AJ8C0	08-Nov-04	09-May-05
	Z	ENDEVCO	AC-J19868	08-Nov-04	09-May-05
Left Foot Front	Z	ENDEVCO	AC-J34378	08-Nov-04	09-May-05
Right Foot Rear	X	ENTRAN	AC-01G18-F15	08-Nov-04	09-May-05
	Z	ENTRAN	AC-01G18-F14	08-Nov-04	09-May-05
Right Foot Front	Z	ENTRAN	AC-00L13-F04	08-Nov-04	09-May-05
Lap Belt Load Cell		LEBOW	LC-706	01-Nov-04	02-May-05
Shoulder Belt Load Cell		First Technology	LC-156	01-Nov-04	02-May-05

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY
(Six Month Calibration Minimum)

PASSENGER DUMMY (S/N 064)		Manufacturer	Serial #	Calibration	
				Last	Next
Head 9 Array	X Arm Y	ENDEVCO	AC-P17563	24-Jan-05	25-Jul-05
	X Arm Z	ENDEVCO	AC-P32218	24-Jan-05	25-Jul-05
	Y Arm X	ENDEVCO	AC-P14965	24-Jan-05	25-Jul-05
	Y Arm Z	ENDEVCO	AC-P18948	24-Jan-05	25-Jul-05
	Z Arm X	ENDEVCO	AC-P18785	24-Jan-05	25-Jul-05
	Z Arm Y	ENDEVCO	AC-P23926	24-Jan-05	25-Jul-05
Head	X	ENDEVCO	AC-P18524	24-Jan-05	25-Jul-05
	Y	ENDEVCO	AC-P18518	24-Jan-05	25-Jul-05
	Z	ENDEVCO	AC-P18533	24-Jan-05	25-Jul-05
Head	X (R)	ENDEVCO	AC-P18514	24-Jan-05	25-Jul-05
	Y (R)	ENDEVCO	AC-P18688	24-Jan-05	25-Jul-05
	Z (R)	ENDEVCO	AC-P18531	24-Jan-05	25-Jul-05
Neck Load Cell	X	DENTON	LC-1634Fx	05-Aug-04	03-Feb-05
	Y	DENTON	LC-1634Fy	05-Aug-04	03-Feb-05
	Z	DENTON	LC-1634Fz	05-Aug-04	03-Feb-05
Neck Moment	X	DENTON	LC-1634Mx	05-Aug-04	03-Feb-05
	Y	DENTON	LC-1634My	05-Aug-04	03-Feb-05
	Z	DENTON	LC-1634Mz	05-Aug-04	03-Feb-05
Chest	X	ENDEVCO	AC-P17141	24-Jan-05	25-Jul-05
	Y	ENDEVCO	AC-P16832	24-Jan-05	25-Jul-05
	Z	ENDEVCO	AC-P17152	24-Jan-05	25-Jul-05
Chest	X (R)	ENDEVCO	AC-P16286	24-Jan-05	25-Jul-05
	Y (R)	ENDEVCO	AC-P17242	24-Jan-05	25-Jul-05
	Z (R)	ENDEVCO	AC-P16591	24-Jan-05	25-Jul-05
Chest Deflection	X	SERVO	DS-064	11-Nov-04	12-May-05
Pelvic	X	ENDEVCO	AC-P12587	16-Aug-04	14-Feb-05
	Y	ENDEVCO	AC-P17236	16-Aug-04	14-Feb-05
	Z	ENDEVCO	AC-P16597	16-Aug-04	14-Feb-05

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY
(Six Month Calibration Minimum)

PASSENGER DUMMY (S/N 064)		Manufacturer	Serial #	Calibration	
				Last	Next
Left Femur Load Cell	Fz	GSE	LC-653	05-Nov-04	06-May-05
Right Femur Load Cell	Fz	GSE	LC-654	05-Nov-04	06-May-05
Left Upper Tibia	Mx	DENTON	LC-264Mx	23-Aug-04	21-Feb-05
	My	DENTON	LC-264My	23-Aug-04	21-Feb-05
Left Lower Tibia	Fz	DENTON	LC-177Fz	23-Aug-04	21-Feb-05
	Mx	DENTON	LC-177Mx	23-Aug-04	21-Feb-05
	My	DENTON	LC-177My	23-Aug-04	21-Feb-05
Right Upper Tibia	Mx	DENTON	LC-265Mx	10-Aug-04	08-Feb-05
	My	DENTON	LC-265My	10-Aug-04	08-Feb-05
Right Lower Tibia	Fz	DENTON	LC-178Fz	14-Aug-04	12-Feb-05
	Mx	DENTON	LC-178Mx	14-Aug-04	12-Feb-05
	My	DENTON	LC-178My	14-Aug-04	12-Feb-05
Left Foot Rear	X	ENDEVCO	AC-P17912	27-Oct-04	27-Apr-05
	Z	ENTRAN	AC-01G18-F03	08-Nov-04	09-May-05
Left Foot Front	Z	ENTRAN	AC-01G18-F05	08-Nov-04	09-May-05
Right Foot Rear	X	ENDEVCO	AC-J36176	08-Nov-04	09-May-05
	Z	ENDEVCO	AC-J18662	08-Nov-04	09-May-05
Right Foot Front	Z	ENDEVCO	AC-J18059	08-Nov-04	09-May-05
Lap Belt Load Cell		LEBOW	LC-707	01-Nov-04	02-May-05
Shoulder Belt Load Cell		First Technology	LC-170	01-Nov-04	02-May-05

INSTRUMENT CALIBRATION FOR VEHICLE ACCELEROMETERS
(Six Month Calibration Minimum)

	Manufacturer	Serial #	Calibration	
			Last	Next
Left Seat Rear Crossmember X	GS SENSORS	AC-9440-046	14-Dec-04	14-Jun-05
Right Rear Seat Crossmember X	GS SENSORS	AC-9440-032	14-Dec-04	14-Jun-05
Top of Engine	ICS	AC-FGP38	20-Aug-04	18-Feb-05
Bottom of Engine	ICS	AC-FGP32	20-Aug-04	18-Feb-05
Right Disc Brake Caliper	ICS	AC-FGP22	27-Aug-04	25-Feb-05
Instrument Panel	ICS	AC-FGP48	24-Aug-04	22-Feb-05
Left Disc Brake Caliper	ICS	AC-FGP44	24-Aug-04	22-Feb-05
Left Seat Rear Crossmember Z	GS SENSORS	AC-9440-023	14-Dec-04	14-Jun-05
Right Seat Rear Crossmember Z	GS SENSORS	AC-9440-017	14-Dec-04	14-Jun-05

REPORT NUMBER: CAL-05-05

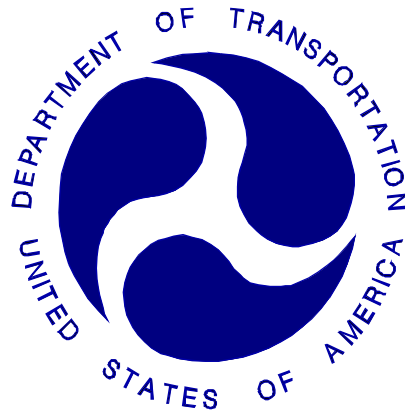
NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST

EVENFLO TITAN V FORWARD FACING CONVERTIBLE WITH LATCH AND TOP TETHER
GRACO TURBOBOOSTER HIGHBACK BOOSTER

NHTSA NUMBER: M50503

GENERAL DYNAMICS REPORT NUMBER: 8642-NCAP-55

GENERAL DYNAMICS
TRANSPORTATION SCIENCES CENTER
P.O. BOX 400
BUFFALO, NEW YORK 14225



January 27, 2005

FINAL REPORT

U. S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Rulemaking
Office of Crashworthiness Standards
Mail Code: NVS-111
400 Seventh Street, SW, Room No. 5313
Washington, DC 20590

This Final Test Report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, under Contract No. DTNH22-01-D-32005. This document is disseminated under the sponsorship of the U.S. Department of Transportation in the interest of information exchange. The United States Government assumes no liability for its contents or use thereof.

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Acceptance Date:

TECHNICAL REPORT STANDARD TITLE PAGE

1. Report No. CAL-05-05		2. Government Accession No.		3. Recipient's Catalog No.	
4. Title and Subtitle Final Report of Evenflo Titan V Forward Facing Convertible with LATCH and Top Tether / Graco TurboBooster NHTSA No.: M50503				5. Report Date January 27, 2005	
				6. Performing Organization Code CAL	
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16. Abstract This CRS test was performed in conjunction with a New Car Assessment Program (NCAP) load cell barrier test. An Evenflo Titan V Forward Facing Convertible CRS was secured in Position 3 (P3) with the LATCH system and top tether. A Graco TurboBooster Highback Booster was placed in Position 4 (P4) with the safety belt in ALR mode. This test was conducted at the General Dynamics Crash Test Facility in Buffalo, New York, on January 27, 2005.					
ATD Position		HIC 15		HIC 36	
P3 (Right Rear) (040)		513.5		737.4	
P4 (Left Rear) (009)		631.3		1023.7	
Clip (3 ms)				48.6	
				57.8	
17. Key Words New Car Assessment Program (NCAP)				18. Distribution Statement	
				<u>Copies of this report are available from:</u> National Highway Traffic Safety Administration Technical Reference Division Room 5111 (NAD-52) 400 Seventh St., S.W. Washington, D.C. 20590 Telephone No. (202) 366-4946 ATTN: Robert Hornicle	
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SECTION 1

PURPOSE AND SUMMARY OF TEST M50503

The purpose of this test was to obtain CRS performance data in a frontal impact NCAP condition. These data constitute part of the general consumer information collected by the New Car Assessment Program (NCAP).

The 55.84 kph NCAP frontal impact test was conducted in accordance with the Office of Crashworthiness Standards (OCS) NCAP Laboratory Test Procedure.

SUMMARY

Both child dummies were instrumented with head, chest, and pelvic triaxial accelerometers. In addition, chest displacement and upper six axial neck force and moment load cell sensors were utilized. Position 3 was equipped with left and right clavicle force transducers, lumbar spine force and moment transducers, left and right lower ASIS force transducers and left and right femur force transducers.

The right rear (Position 3) child dummy (serial no. 040) and left rear (Position 4) child dummy (serial no. 009) were calibrated previous to this test. Child dummy certification information is found in section 5.

The right rear child dummy's HIC (15 ms) was 513.5, the 36 ms HIC was 737.4 and the maximum chest deceleration over 3 ms was 48.6 g's. The left rear child dummy's HIC (15 ms) was 631.3, the 36 ms HIC was 1023.7 and the maximum chest deceleration over 3 ms was 57.8 g's.

SECTION 2
DATA SHEET NO. 1
CRASH TEST SUMMARY

TEST DUMMY INFORMATION:

DESCRIPTION	Position #3 CRS	Position #4 CRS
ATD Type/Serial No.	Hybrid III 3C/040	Hybrid III 10C /009
Restraint System:	Evenflo Titan V Forward Facing Convertible with LATCH and Top Tether	Graco TurboBooster

Number of Data Channels 55
Number of Cameras: 1 Real Time
2 High Speed

POST TEST DOOR OPENING

DESCRIPTION	FRONT	REAR
Left Side Doors	Closed, Latched and Operable without tools	Closed, Latched and Operable without tools
Right Side Doors	Closed, Latched and Operable without tools	Closed, Latched and Operable without tools
Hatch/Other Door	N/A	N/A

POST TEST SEAT DATA

LOCATION	SEAT MOVEMENT (mm)	SEAT BACK FAILURE
P1 (Left Front)	0	None
P2 (Right Front)	0	None
P3 (Right Rear)	0	None
P4 (Left Rear)	0	None

VISIBLE DUMMY CONTACT POINTS

	Position #3 CRS	Position #4 CRS
Head Contact:	The chin to the chest and the back of the head to the child restraint seat back	The chin to the chest and the back of the head to the child restraint seat back
Upper Torso Contact:	The chin to the chest	The chin to the chest; The left hand to the P1 seat back
Lower Torso Contact:	None	None
Left Knee Contact:	No knee contact; The left foot to the inboard half of the P2 seat back	The left foot to the outboard half of the P1 seatback
Right Knee Contact:	No knee contact; The right foot to the outboard half of the P2 seat back	The right foot to the inboard half of the P1 seatback

DATA SHEET NO. 2

CRS PARAMETER DATA

CRS: Evenflo Titan V Forward Facing Convertible with LATCH and Top Tether / Graco TurboBooster

NHTSA No. M50503

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Delivered Weight of Vehicle with Maximum Fluids = 1543.5 kg (A)

AS TESTED WEIGHT OF VEHICLE

(2 P572E + 1 P572P w/ CRS + 1 10 year old w/ CRS +CARGO + EQUIPMENT & INSTRUMENTATION):

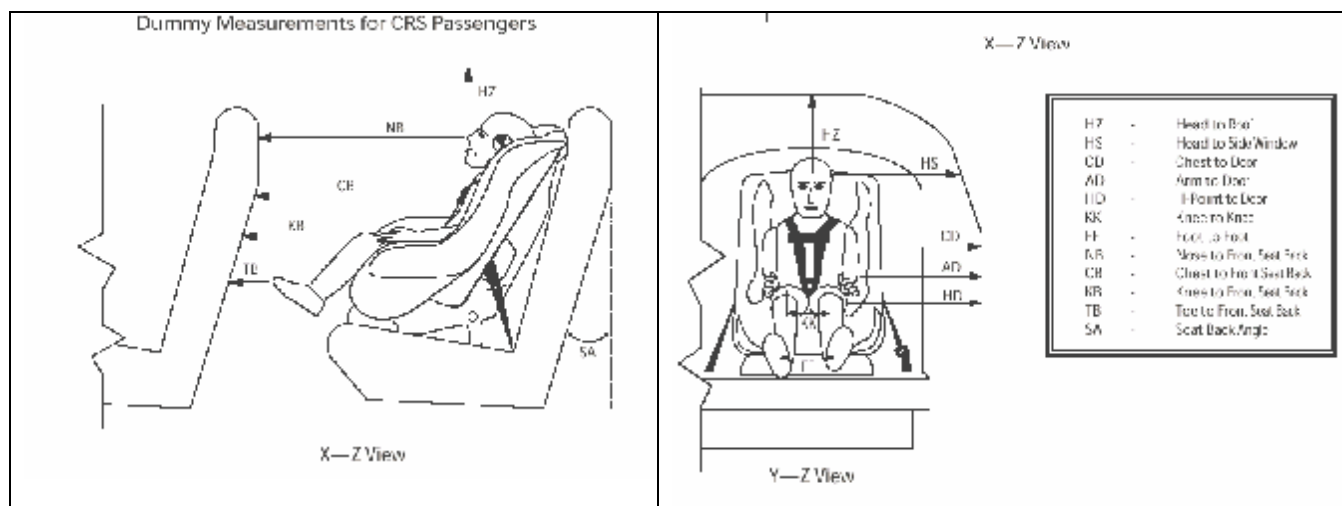
Left Front	=	<u>488.0</u>	kg	Left Rear	=	<u>388</u>	kg
Right Front	=	<u>494.0</u>	kg	Right Rear	=	<u>388</u>	kg
TOTAL FRONT	=	<u>982.0</u>	kg	TOTAL REAR	=	<u>776.0</u>	kg
TOTAL TEST WEIGHT =		<u>1758.0</u>	kg				

DATA SHEET NO. 3

CHILD DUMMY POSITIONING IN VEHICLE

CRS: Evenflo Titan V Forward Facing Convertible with LATCH and Top Tether / Graco TurboBooster

NHTSA No. M50503



Measurement	(mm)	(mm)
	P3 CRS (040)	P4 CRS (009)
SA	28 °	21 °
HS	412	200
CD	372	333
AD	238	179
HD	310	205
HZ	351	186
NB	568	607
CB	539	499
KB	130	130
FF	140	150
KB – LEFT	350	250
KB – RIGHT	350	250
TB – LEFT	55	105
TB – RIGHT	60	105
Top Tether Anchor to CRS		
Angle	-	N/A
Length	390	N/A
X	-	N/A
Y	0	N/A
Z	0	N/A

All dimensions in mm (unless noted)

P3 – Right Rear Passenger (CRS #1)

P4 – Left Rear Passenger (CRS #2)

DATA SHEET 4

CHILD DUMMY INJURY CRITERIA VALUES

CRS: Evenflo Titan V Forward Facing Convertible with LATCH and Top Tether / Graco TurboBooster

NHTSA No. M50503

		MAXIMUM VALUE							
		Position #3				Position #4			
DESCRIPTION	Unit	Pos	msec	Neg	msec	Pos	msec	Neg	msec
Head X	g	39.7	180.9	-28.1	80.8	1.0	187.2	-56.1	105.4
Head Y	g	4.5	71.1	-1.9	183.4	7.0	106.7	-11.9	62.0
Head Z	g	66.2	77.3	-7.5	45.7	71.8	83.8	-3.6	38.6
Head Resultant	g	71.4	77.3	0.0	-49.1	79.1	83.8	0.1	-26.0
Upper Neck Fx	N	63.9	174.8	-509.4	81.7	13.8	20.6	-1478.4	104.2
Upper Neck Fy	N	105.2	69.0	-37.1	180.3	150.9	69.6	-25.7	12.1
Upper Neck Fz	N	2065.3	81.1	-182.2	39.9	2424.2	102.5	-94.1	36.3
Upper Neck F Resultant	N	2127.6	81.1	1.0	-22.1	2799.1	102.6	0.4	-47.9
Upper Neck Mx	N-m	5.8	72.3	-3.5	102.3	19.1	109.1	-3.6	86.1
Upper Neck My	N-m	6.8	145.6	-12.3	199.9	15.5	98.4	-34.1	83.9
Upper Neck Mz	N-m	2.2	160.9	-0.5	110.6	1.7	199.9	-8.4	105.0
Upper Neck M Resultant	N-m	12.4	199.9	0.0	10.9	34.8	83.8	0.1	-39.9
Left Clavicle Fx	N	-	-	-	-	20.9	199.7	-2600.5	80.4
Left Clavicle Fz	N	-	-	-	-	375.9	82.7	-213.1	104.8
Right Clavicle Fx	N	-	-	-	-	135.6	59.4	-495.7	101.5
Right Clavicle Fz	N	-	-	-	-	96.1	67.9	-63.7	64.6
Chest X	g	8.8	162.3	-37.9	72.0	1.5	135.4	-55.4	70.7
Chest Y	g	6.4	70.0	-2.5	166.0	1.9	110.1	-17.3	64.3
Chest Z	g	21.7	85.4	-37.1	59.4	4.4	101.9	-17.3	71.3
Chest Resultant	g	49.6	59.5	0.0	-20.3	59.3	70.7	0.0	-21.6
Chest Displacement	g	0.0	-5.0	-17.5	99.0	0.0	1.9	-35.3	82.1
Lumbar Fx	N	-	-	-	-	2274.7	106.5	-432.1	69.0
Lumbar Fy	N	-	-	-	-	316.9	107.5	-494.4	62.2
Lumbar Fz	N	-	-	-	-	661.0	89.4	-1198.2	57.1
Lumbar F Resultant	N	-	-	-	-	2320.8	106.3	0.8	-26.4
Lumbar Mx	Nm	-	-	-	-	16.5	120.4	-83.2	63.2
Lumbar My	Nm	-	-	-	-	36.0	120.0	-26.6	46.6
Lumbar Mz	Nm	-	-	-	-	12.8	52.5	-8.2	123.4
Lumbar M Resultant	Nm	-	-	-	-	84.3	63.2	0.1	-35.4

DATA SHEET 4

CHILD DUMMY INJURY CRITERIA VALUES (CONTINUED)

CRS: Evenflo Titan V Forward Facing Convertible with LATCH and Top Tether / Graco TurboBooster

NHTSA No. M50503

DESCRIPTION	Unit	MAXIMUM VALUE							
		Position #3				Position #4			
		Pos	msec	Neg	msec	Pos	msec	Neg	msec
Pelvic X	g	14.4	124.4	-43.4	65.3	12.6	120.5	-47.9	73.2
Pelvic Y	g	10.9	70.8	-4.5	127.8	11.5	81.7	-9.0	71.4
Pelvic Z	g	17.0	196.8	-36.5	55.9	3.8	111.9	-43.8	73.3
Pelvic Resultant	g	55.3	65.2	0.0	-18.6	65.1	73.2	0.0	-28.0
Left Lower ASIS Fx	N	-	-	-	-	1.4	15.5	-634.2	73.2
Left Upper ASIS Fx	N	-	-	-	-	125.7	118.1	-786.5	73.7
Right Lower ASIS Fx	N	-	-	-	-	2.3	15.4	-853.5	73.7
Right Upper ASIS Fx	N	-	-	-	-	205.7	104.8	-893.3	72.9
Left Femur Force	N	-	-	-	-	1627.7	61.8	-195.4	119.6
Right Femur Force	N	-	-	-	-	1404.4	58.2	-204.6	120.2
Latch Belt Load	N	4574.6	66.1	-106.0	125.3	-	-	-	-
Tether Belt Load	N	4553.3	70.1	-36.5	166.3	-	-	-	-
Lap Belt Load	N	-	-	-	-	9762.6	61.9	-8.2	3.3
Shoulder Belt Load	N	-	-	-	-	†	†	†	†

† - Channel Opened

DATA SHEET 4

CHILD DUMMY INJURY CRITERIA VALUES (CONTINUED)

CRS: Evenflo Titan V Forward Facing Convertible with LATCH and Top Tether / Graco TurboBooster

NHTSA No. M50503

	HEAD INJURY CRITERIA (HIC)							
	HIC15				HIC36			
	HIC	t ₁ (msec)	t ₂ (msec)	Average Acceleration t ₁ to t ₂	HIC	t ₁ (msec)	t ₂ (msec)	Average Acceleration t ₁ to t ₂
Position #3 - Right	513.5	72.5	87.5	65.1 g	737.4	63.1	99.1	53.0 g
Position #4 - Left	631.3	77.2	92.2	70.7 g	1023.7	72.7	108.7	60.5 g

	CLIP SUMMARY*			
	CLIP (g's)	t ₁ (msec)	t ₂ (msec)	CSI
Position #3 - Right	48.6	57.5	60.5	462.4
Position #4 - Left	57.8	69.5	72.5	574.3

* The maximum chest resultant acceleration is defined as the maximum acceleration which exceeds 0.003 seconds in duration.

	FEMUR SUMMARY			
	Left Femur (N)	t ₁ (msec)	Right Femur (N)	t ₂ (msec)
Position #3 - Right	-	-	-	-
Position #4 - Left	-195.4	119.6	-204.6	120.2

DATA SHEET NO. 5**CRS PERFORMANCE DATA**CRS: Evenflo Titan V Forward Facing Convertible with LATCH and Top Tether / Graco TurboBoosterNHTSA No. M50503

		MAXIMUM VALUE			
DESCRIPTION	Unit	Positive	Time (ms)	Negative	Time (ms)
P3 CRS X	g	17.3	183.0	-54.2	51.5
P3 CRS Y	g	8.3	62.5	-5.8	191.1
P3 CRS Z	g	39.0	193.6	-25.8	184.4
P3 CRS Resultant	g	54.5	51.4	0.0	-41.7

DATA SHEET NO. 5

CRS PERFORMANCE DATA (CONTINUED)

CRS: Evenflo Titan V Forward Facing Convertible with LATCH and Top Tether / Graco TurboBooster

NHTSA No. M50503

POSITION #3 CRS POST-TEST INSPECTION (Serial No. 3671439 P1 – 13OCT04)

LOCATION	DAMAGE	REMARKS
Upper Tether Strap	No	None
Upper Tether Buckle	No	None
Upper Tether Hook	No	None
Vehicle Upper Tether Anchor	No	None
Lower Anchor Strap	No	None
Lower Anchor Buckle	No	None
Lower Anchor Hooks	No	None
Vehicle Lower CRS Anchors	No	None
Five Point Harness Connections	No	None
Cracks on CRS	No	None
Fabric Tears on CRS	No	None
Vehicle Seat Structure	No	None
Vehicle Seat Fabric Tears	No	None
Child Dummy	No	None

POSITION #4 CRS POST-TEST INSPECTION (Serial No. JJ0917041915485 - 091704)

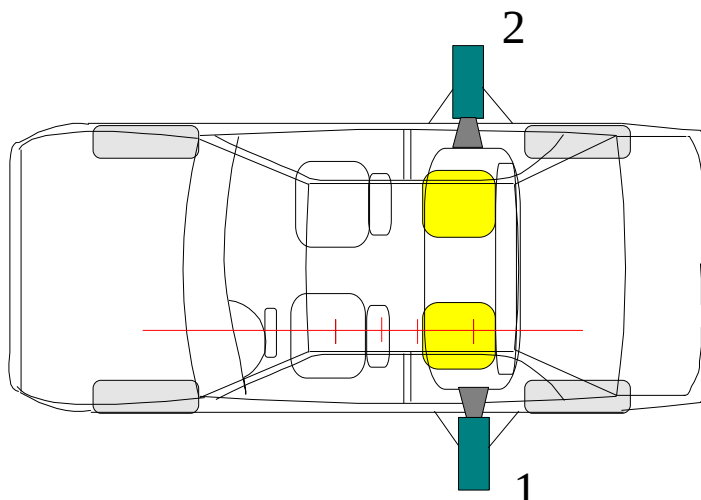
LOCATION	DAMAGE	REMARKS
Upper Tether Strap	NA	NA
Upper Tether Buckle	NA	NA
Upper Tether Hook	NA	NA
Vehicle Upper Tether Anchor	NA	NA
Lower Anchor Strap	NA	NA
Lower Anchor Buckle	NA	NA
Lower Anchor Hooks	NA	NA
Vehicle Lower CRS Anchors	NA	NA
Five Point Harness Connections	NA	NA
Cracks on CRS	No	None
Fabric Tears on CRS	No	None
Vehicle Seat Structure	No	None
Vehicle Seat Fabric Tears	No	None
Child Dummy	No	None

DATA SHEET NO. 6

CRS CAMERA DATA

CRS: Evenflo Titan V Forward Facing Convertible with LATCH and Top Tether / Graco TurboBooster

NHTSA No. M50503



Camera No.	View	Coordinates (millimeters)			Angle (deg.)	Lens (mm)	Film Speed (fps)
		X*	Y*	Z*			
1	Left side CRS lateral view	3330	3260	2292	-34	28	500
2	Right side CRS lateral view	3280	3280	2355	-35	28	500

* Reference (from point of impact); all measurements accurate to within ± 6 mm.

X = + Forward

Y = + To Right

Z = + Down

SECTION 3

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Figure 3-1 CLOSE-UP VIEW OF POSITION 3 CRS LABEL



Figure 3-2 PRE-TEST FRONTAL VIEW OF POSITION 3 CRS



Figure 3-3 POST-TEST FRONTAL VIEW OF POSITION 3 CRS



Figure 3-4 PRE-TEST REAR VIEW OF POSITION 3 CRS



Figure 3-5 POST-TEST REAR VIEW OF POSITION 3 CRS



Figure 3-6 PRE-TEST LEFT SIDE VIEW OF POSITION 3 CRS



Figure 3-7 POST-TEST LEFT SIDE VIEW OF POSITION 3 CRS



Figure 3-8 PRE-TEST RIGHT SIDE VIEW OF POSITION 3 CRS



Figure 3-9 POST-TEST RIGHT SIDE VIEW OF POSITION 3 CRS



Figure 3-10 CLOSE-UP VIEW OF POSITION 4 CRS LABEL



Figure 3-11 PRE-TEST FRONTAL VIEW OF POSITION 4 CRS



Figure 3-12 POST-TEST FRONTAL VIEW OF POSITION 4 CRS



Figure 3-13 PRE-TEST REAR VIEW OF POSITION 4 CRS



Figure 3-14 POST-TEST REAR VIEW OF POSITION 4 CRS



Figure 3-15 PRE-TEST LEFT SIDE VIEW OF POSITION 4 CRS



Figure 3-16 POST-TEST LEFT SIDE VIEW OF POSITION 4 CRS



Figure 3-17 PRE-TEST RIGHT SIDE VIEW OF POSITION 4 CRS



Figure 3-18 POST-TEST RIGHT SIDE VIEW OF POSITION 4 CRS



Figure 3-19 PRE-TEST POSITION 3 LEFT SIDE VIEW



Figure 3-20 POST-TEST POSITION 3 LEFT SIDE VIEW



Figure 3-21 PRE-TEST POSITION 4 LEFT SIDE VIEW



Figure 3-22 POST-TEST POSITION 4 LEFT SIDE VIEW



Figure 3-23 PRE-TEST POSITION 3 RIGHT SIDE VIEW



Figure 3-24 POST-TEST POSITION 3 RIGHT SIDE VIEW



Figure 3-25 PRE-TEST POSITION 4 RIGHT SIDE VIEW



Figure 3-26 POST-TEST POSITION 4 RIGHT SIDE VIEW



Figure 3-27 PRE-TEST POSITION 3 FRONT VIEW



Figure 3-28 POST-TEST POSITION 3 FRONT VIEW



Figure 3-29 PRE-TEST POSITION 4 FRONT VIEW



Figure 3-30 POST-TEST POSITION 4 FRONT VIEW

SECTION 4

CHILD DUMMY RESPONSE AND CRS DATA TRACES

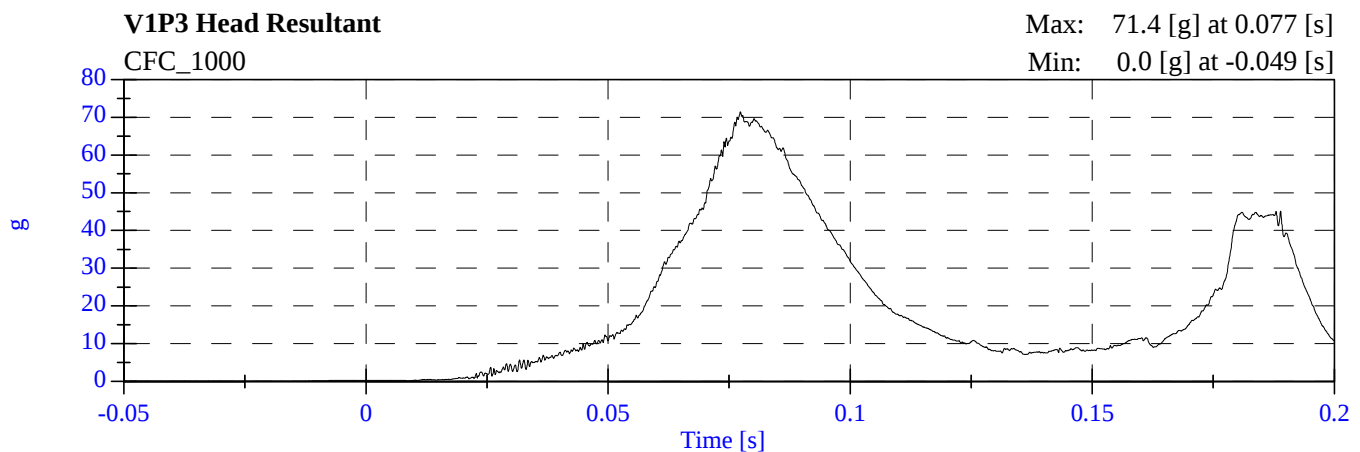
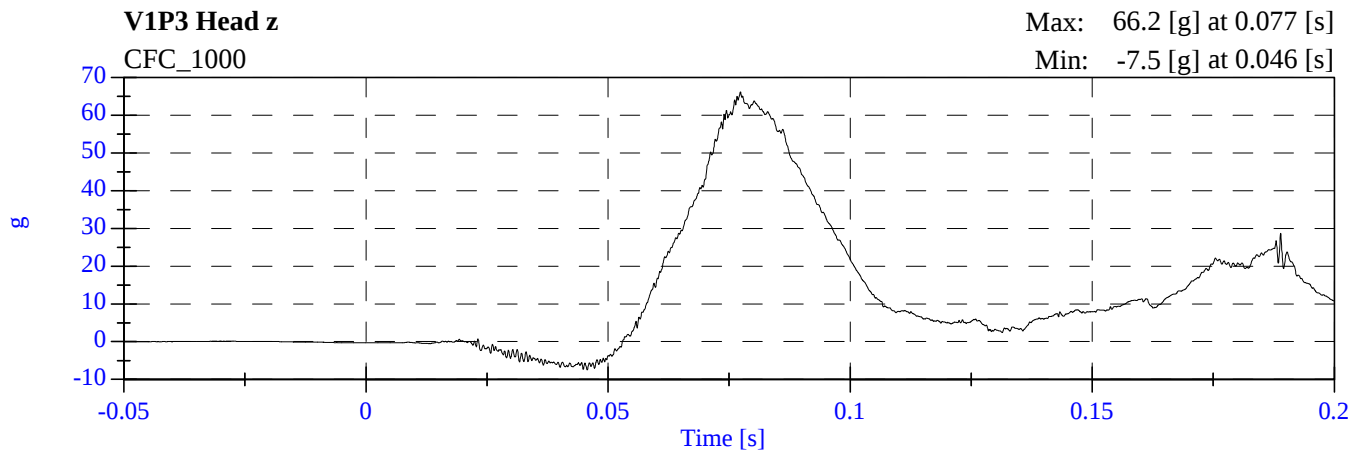
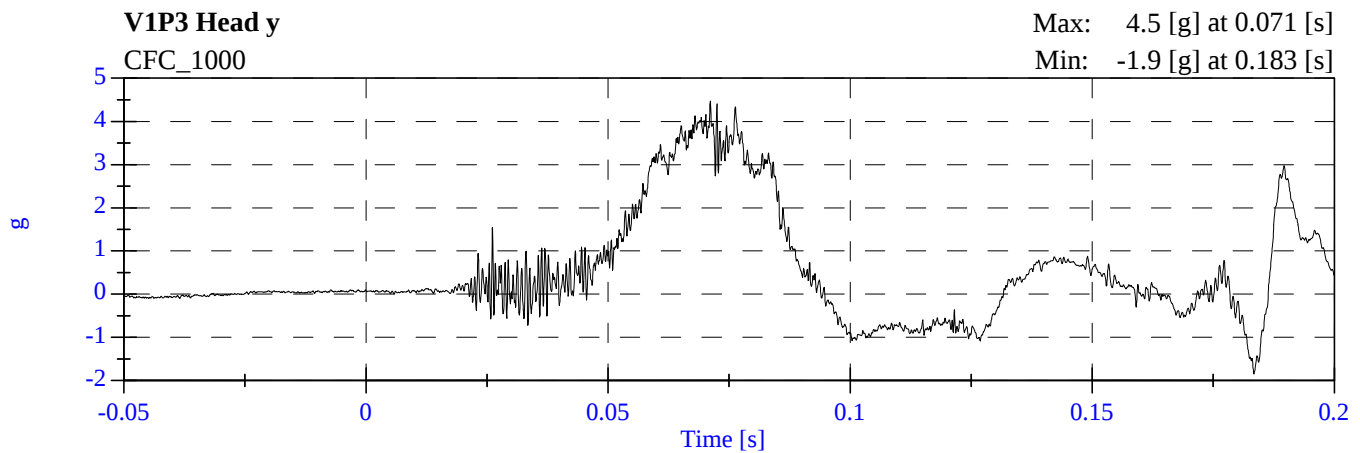
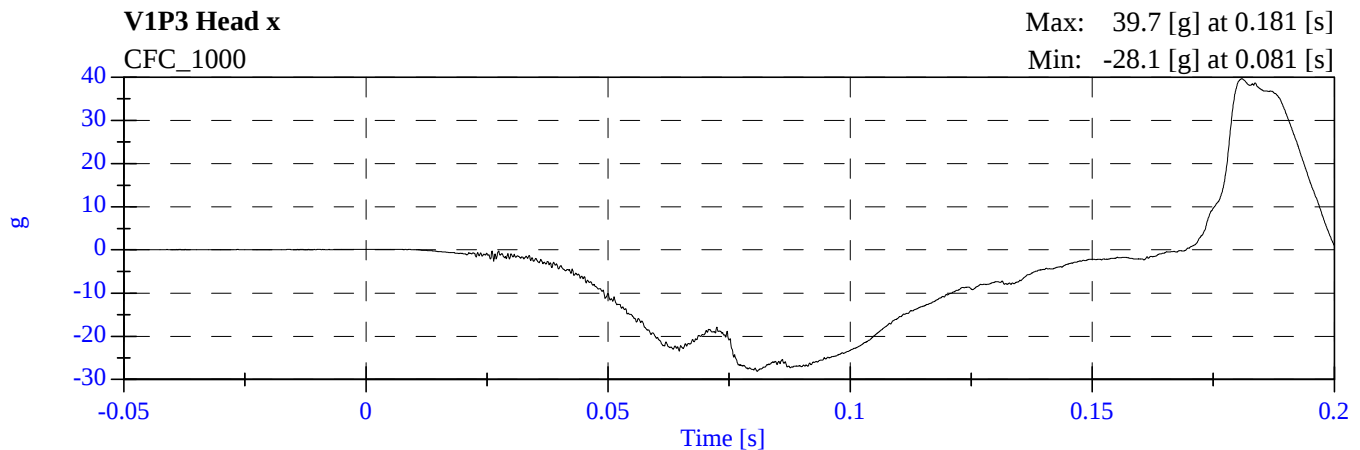
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39	V1P4 Right Clavicle Fz [N, CFC_1000]	4-14
40	V1P4 Chest x [g, CFC_180]	4-15
41	V1P4 Chest y [g, CFC_180]	4-15
42	V1P4 Chest z [g, CFC_180]	4-15
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44	V1P4 Chest Displacement [mm, CFC_600]	4-16
45	V1P4 Lumbar Fx [N, CFC_1000]	4-17
46	V1P4 Lumbar Fy [N, CFC_1000]	4-17
47	V1P4 Lumbar Fz [N, CFC_1000]	4-17
48	V1P4 Lumbar F Resultant [N, CFC_1000]	4-17

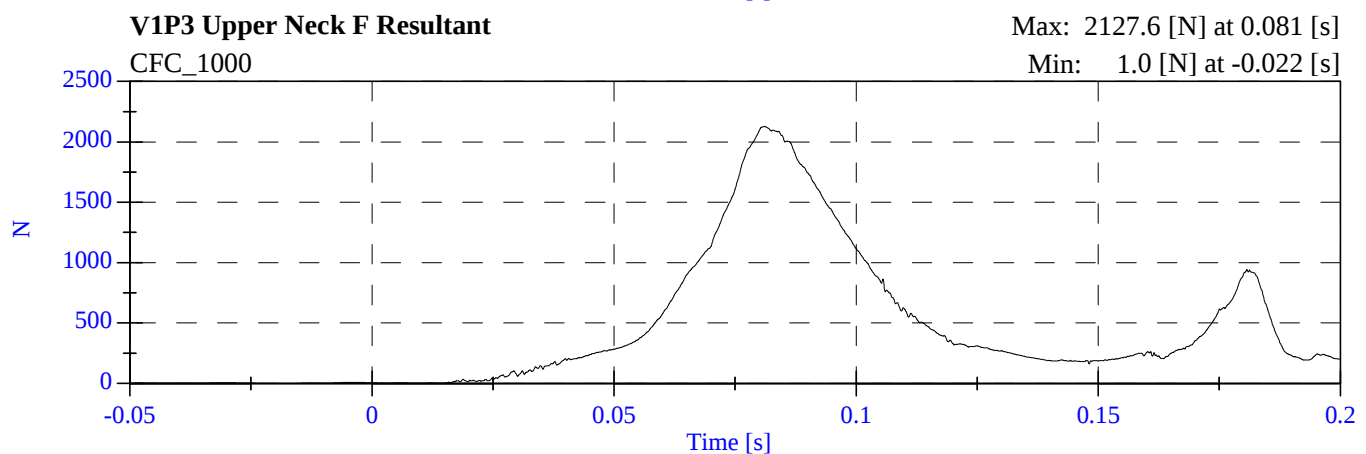
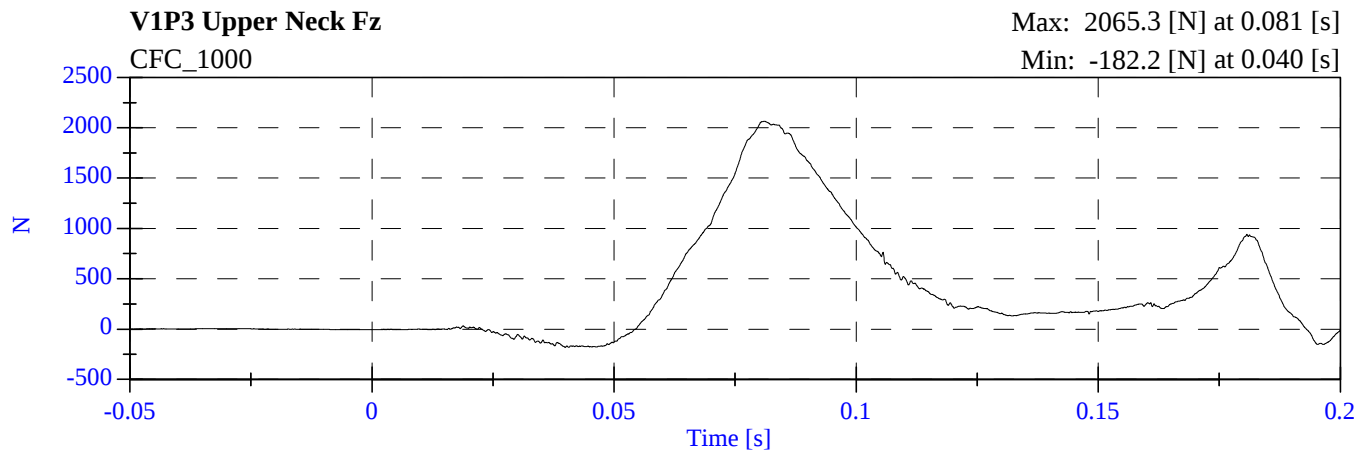
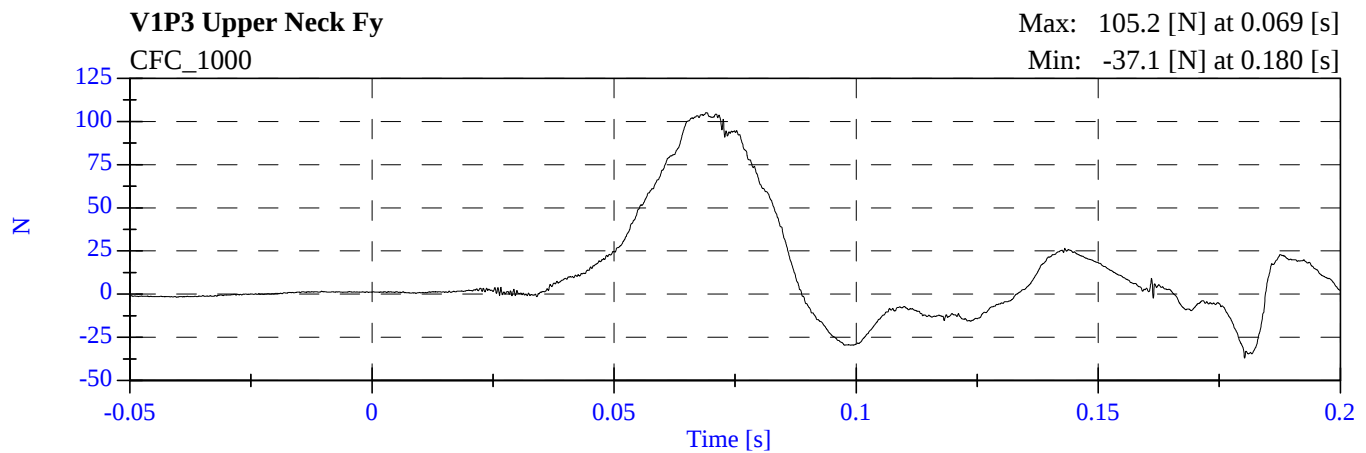
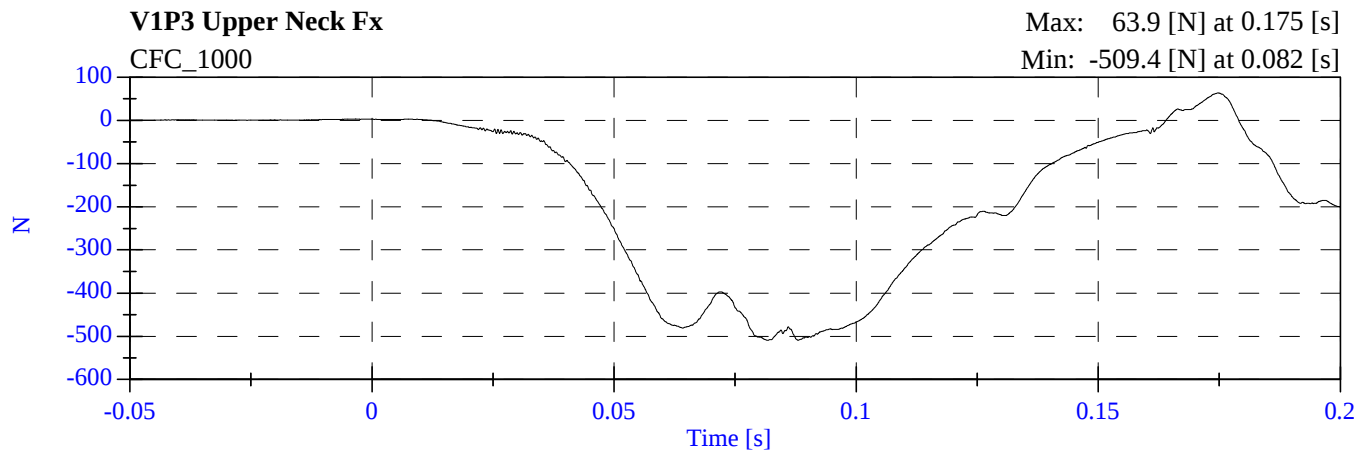
TABLE OF DATA PLOTS (Continued)

PLOT	PLOT NAME[UNITS, CHANNEL FILTER CLASS]	PAGE
49	V1P4 Lumbar Mx [N-m, CFC_1000]	4-18
50	V1P4 Lumbar My [N-m, CFC_1000]	4-18
51	V1P4 Lumbar Mz [N-m, CFC_1000]	4-18
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53	V1P4 Pelvic x [g, CFC_1000]	4-19
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56	V1P4 Pelvic Resultant [g, CFC_1000]	4-19
57	V1P4 Left Lower ASIS Fx [N, CFC_600]	4-20
58	V1P4 Left Upper ASIS Fx [N, CFC_600]	4-20
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60	V1P4 Right Upper ASIS Fx [N, CFC_600]	4-20
61	V1P4 Left Femur [N, CFC_600]	4-21
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63	V1 P4 Lap Belt [N, CFC_60]	4-22
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65	V1 P3 CRS x [g, CFC_60]	4-23
66	V1 P3 CRS y [g, CFC_60]	4-23
67	V1 P3 CRS z [g, CFC_60]	4-23
68	V1 P3 CRS Resultant [g, CFC_60]	4-23
69	V1 P3 CRS x Velocity [kph, CFC_180]	4-24
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71	V1 P3 CRS z Velocity [kph, CFC_180]	4-24
72	V1 P3 CRS x Displacement [mm, CFC_180]	4-25
73	V1 P3 CRS y Displacement [mm, CFC_180]	4-25
74	V1 P3 CRS z Displacement [mm, CFC_180]	4-25

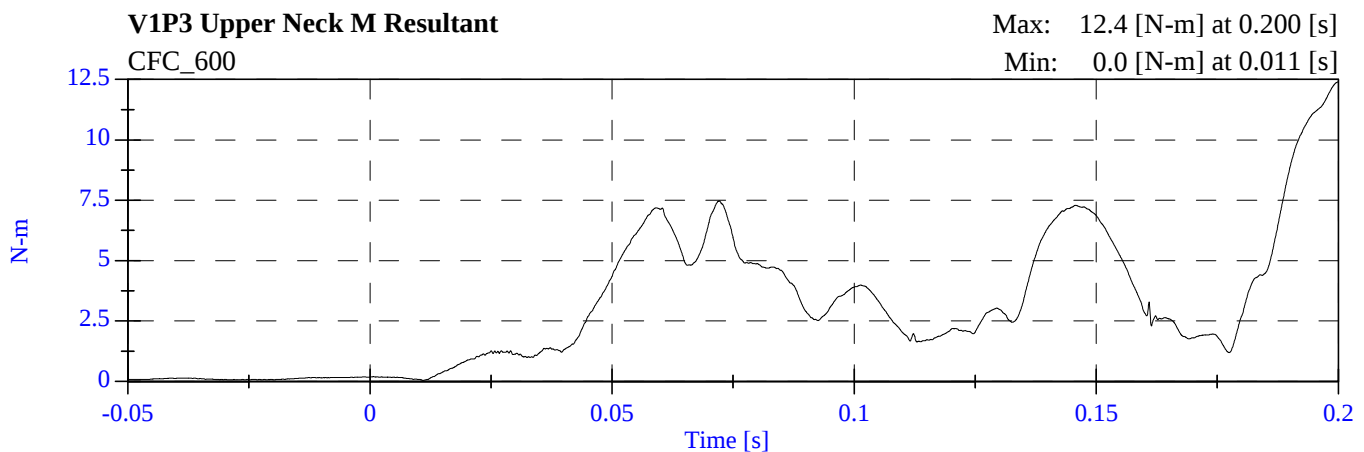
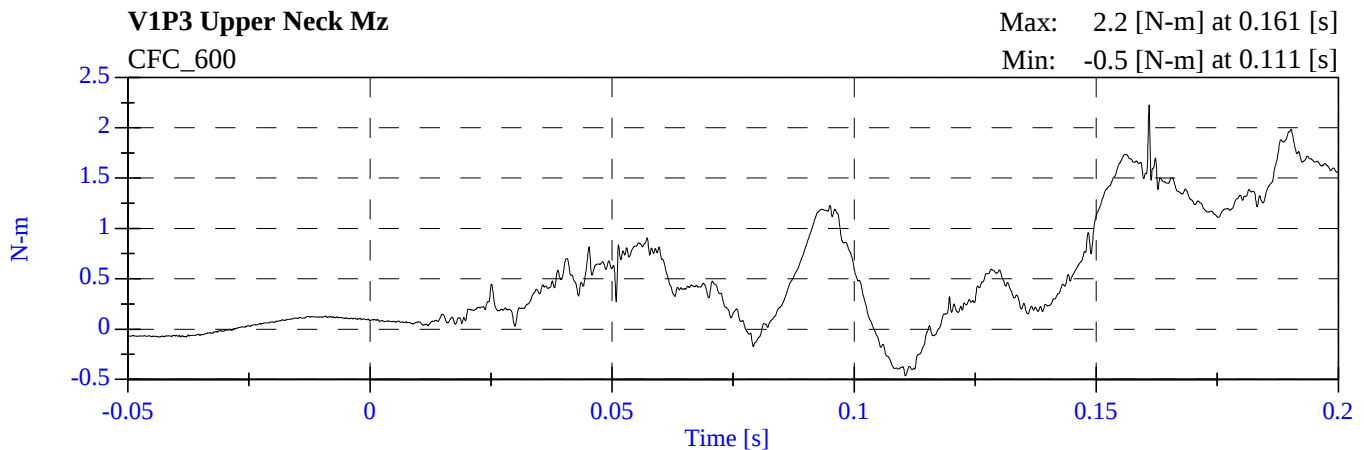
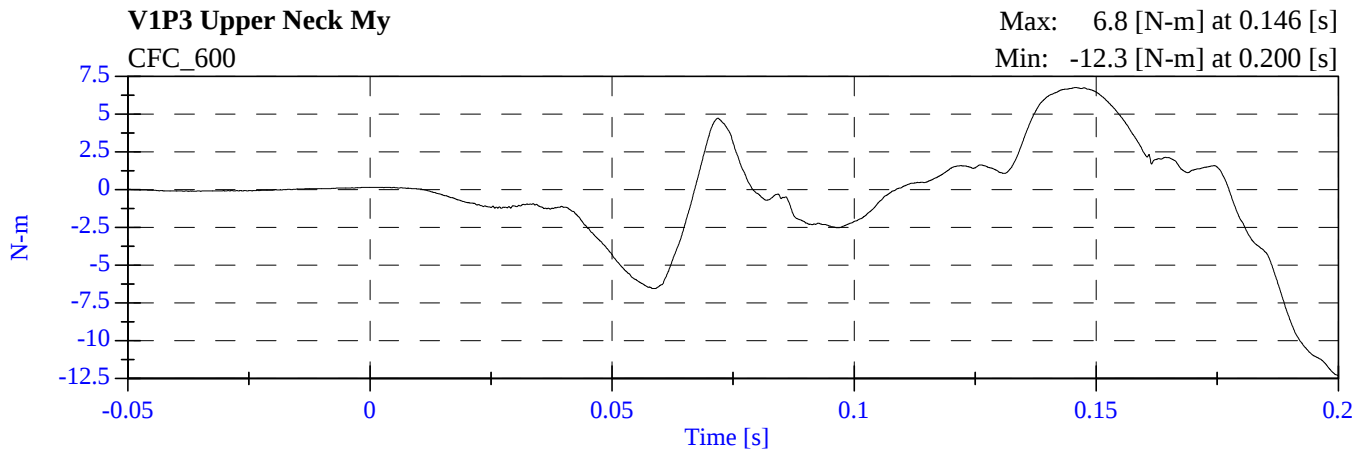
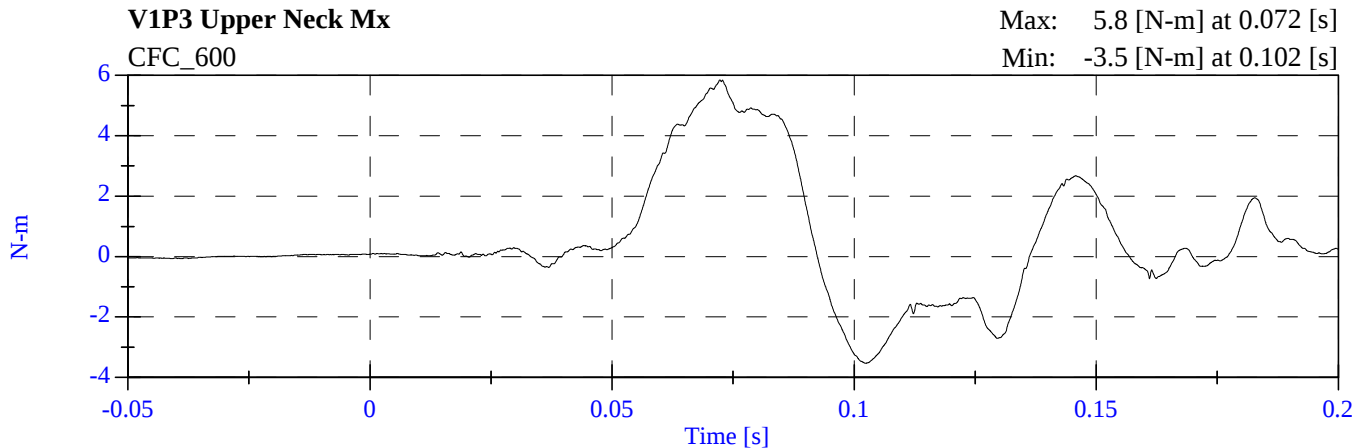
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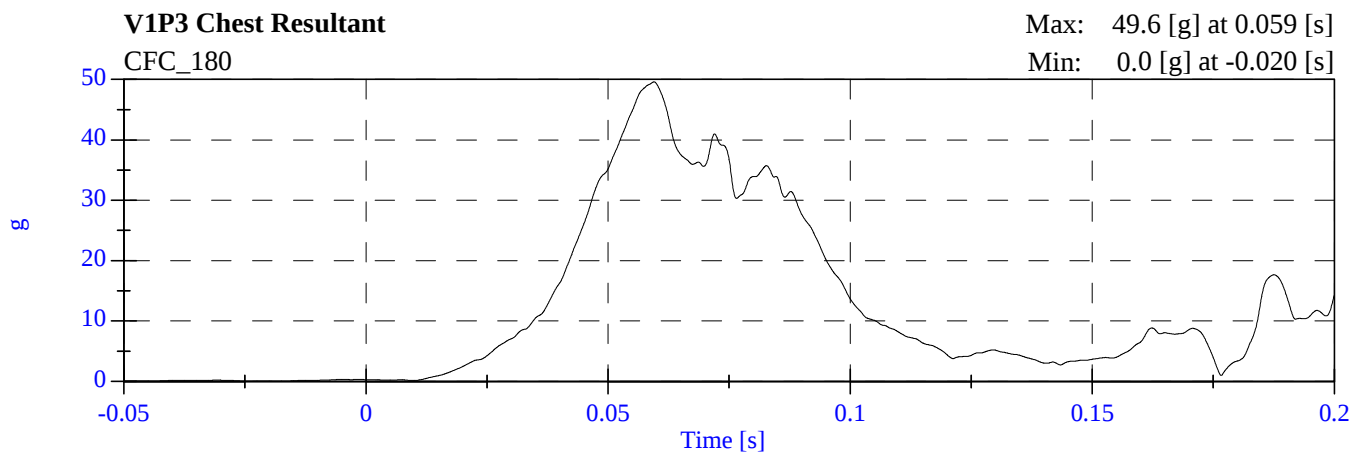
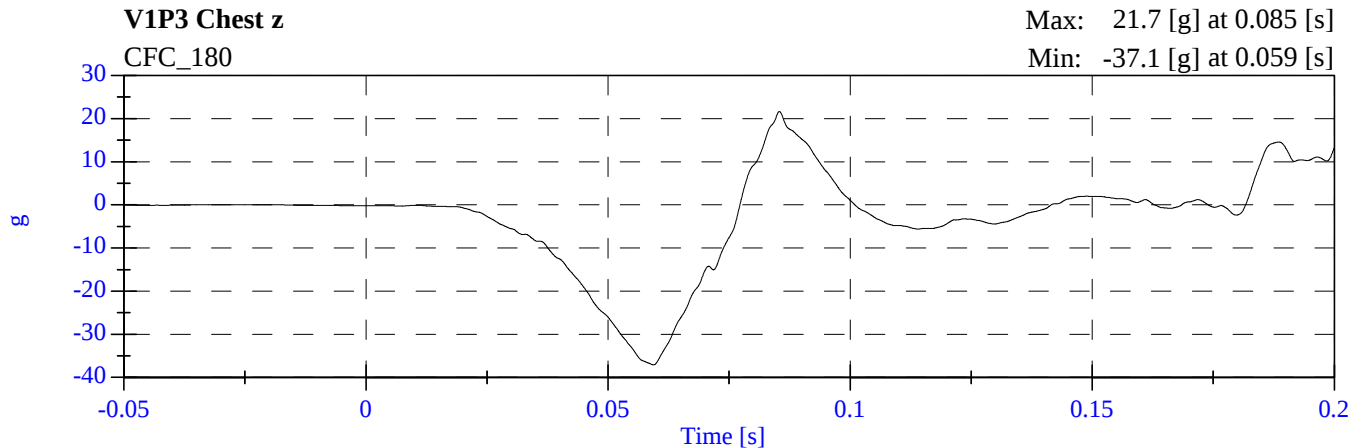
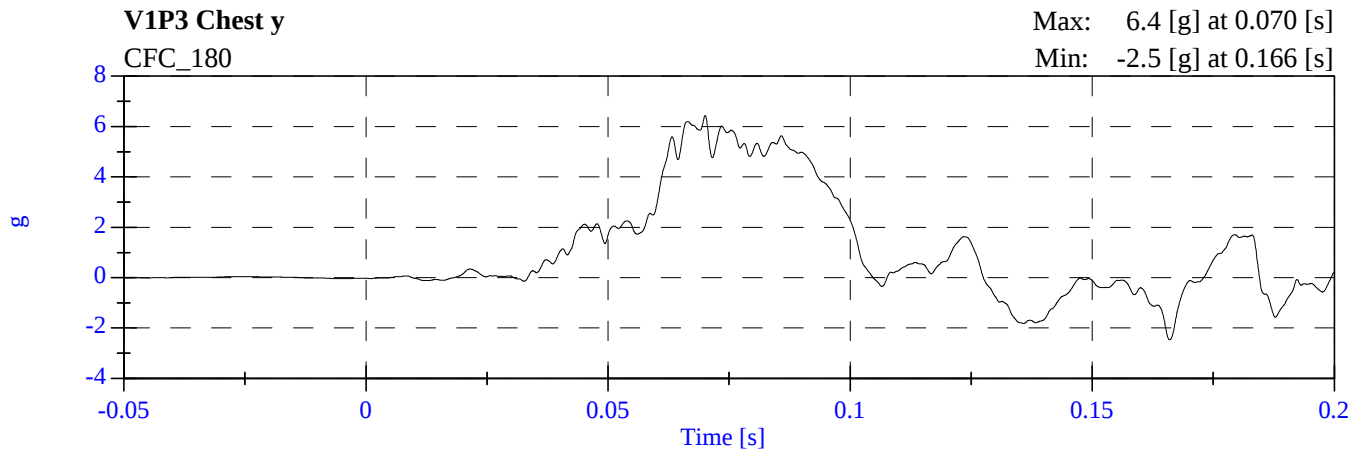
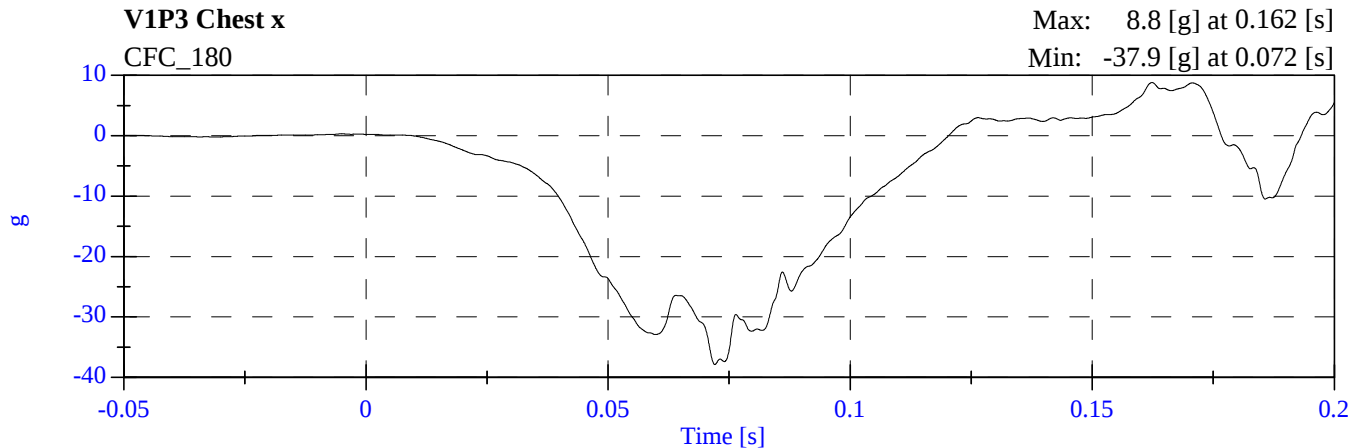
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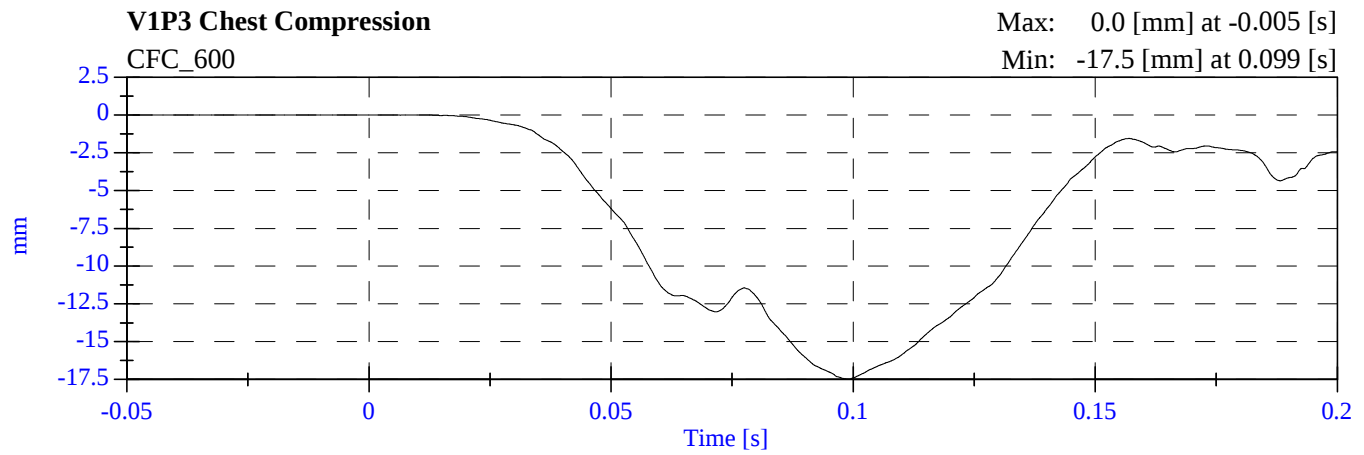
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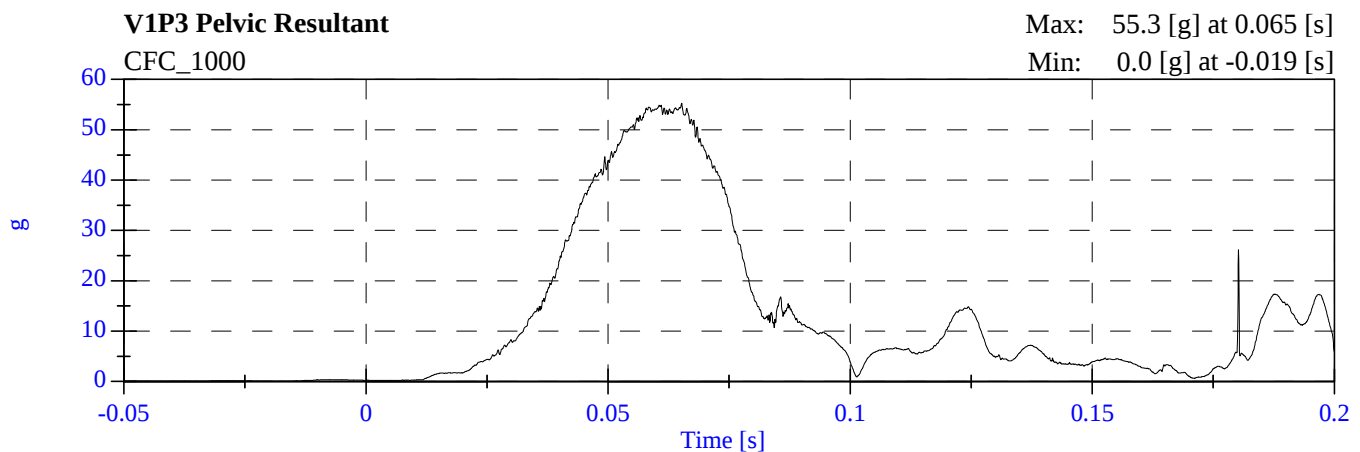
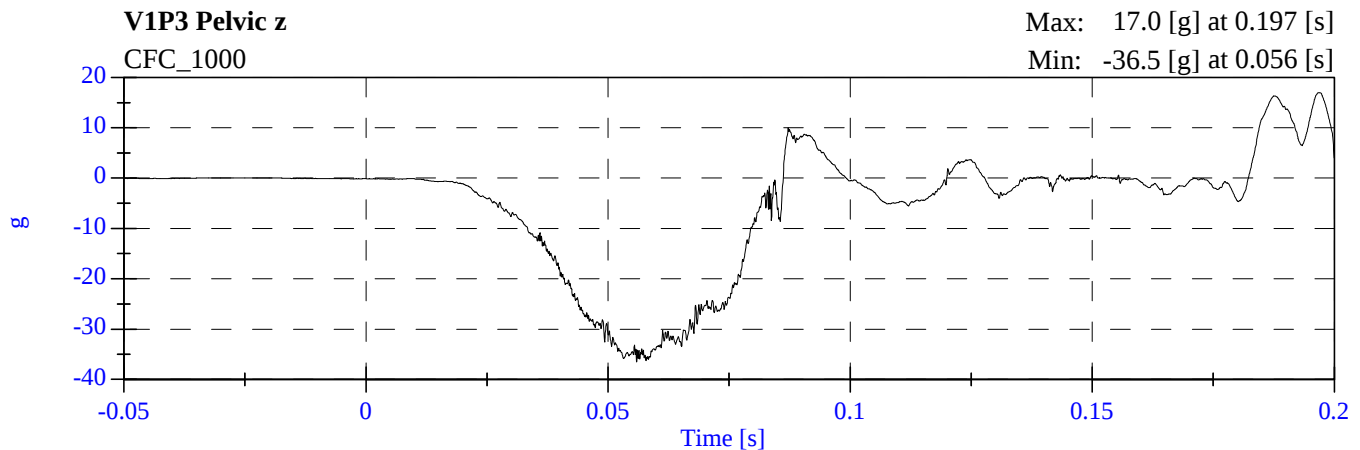
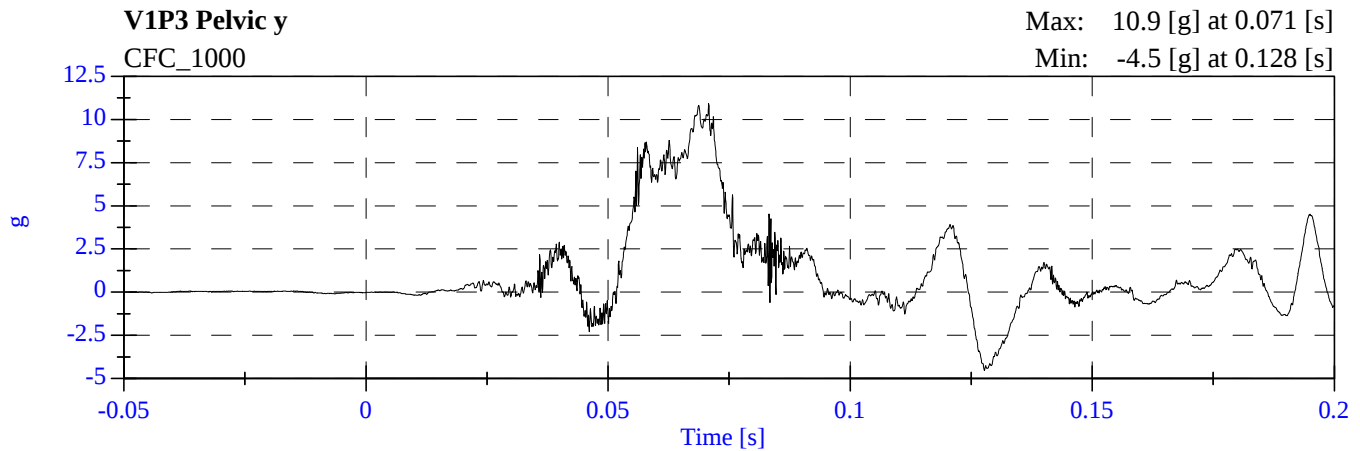
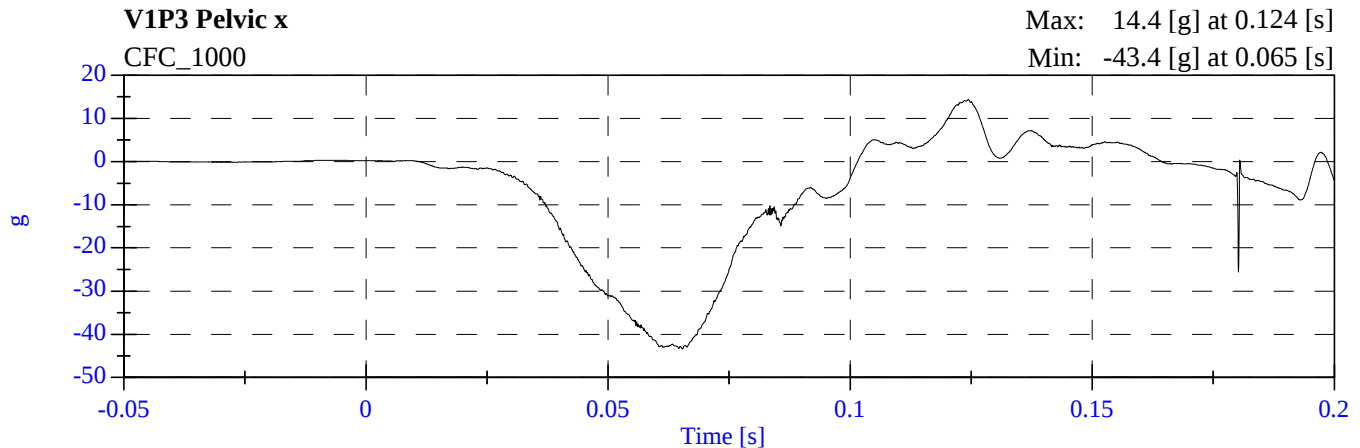
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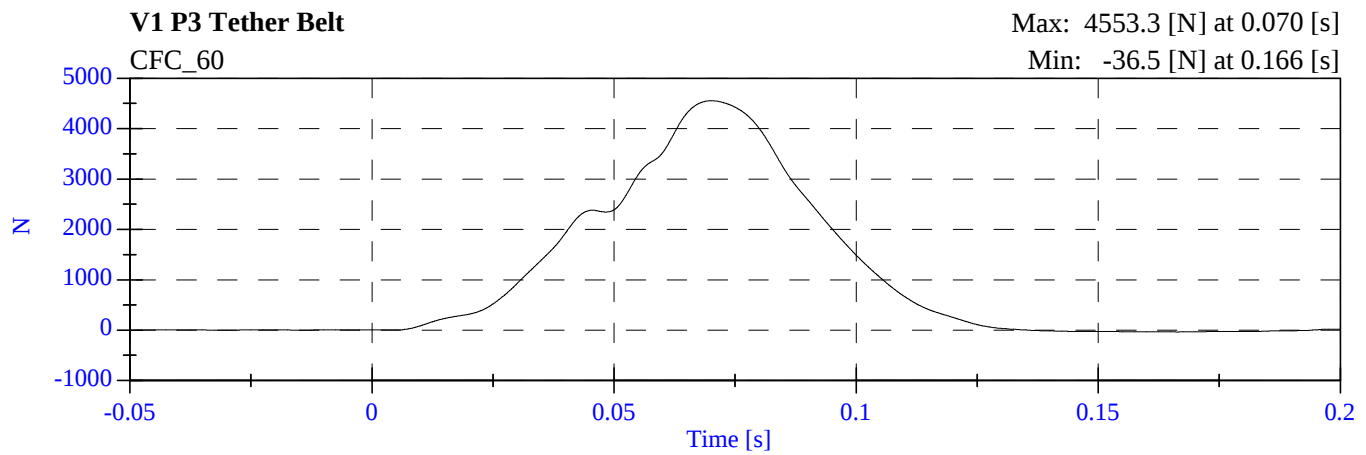
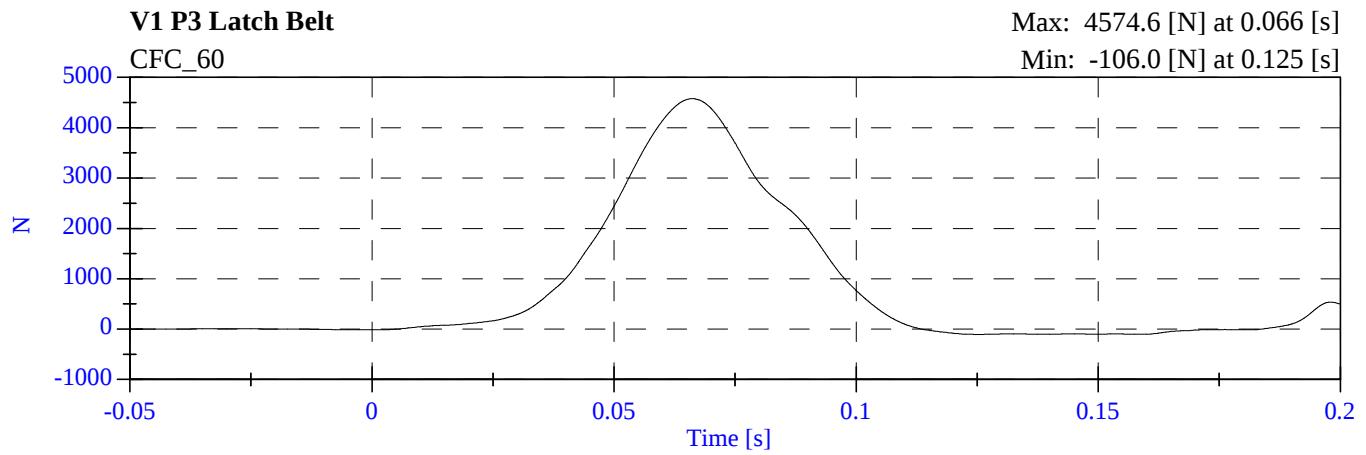
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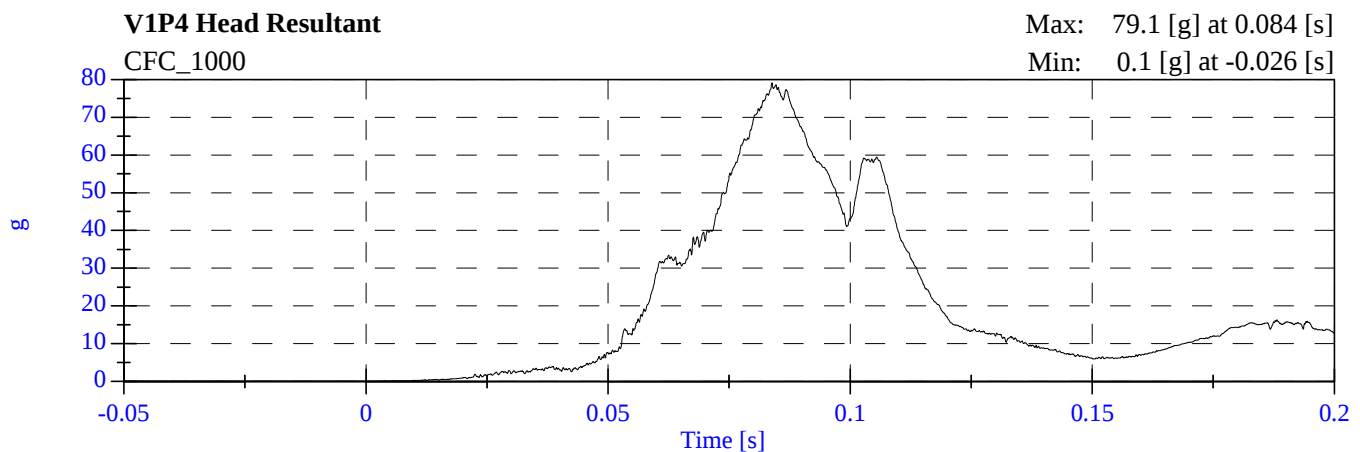
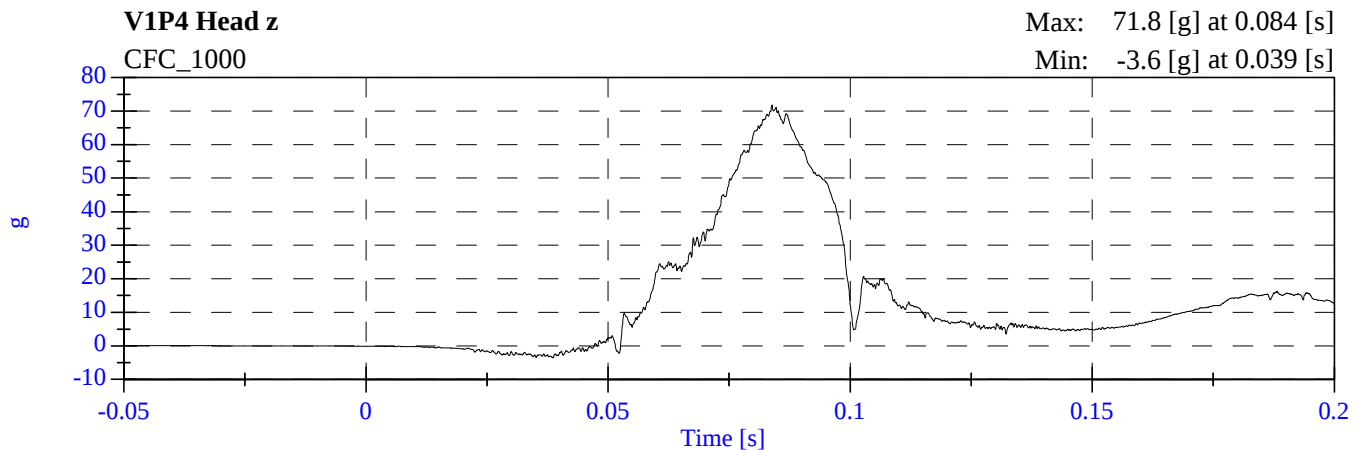
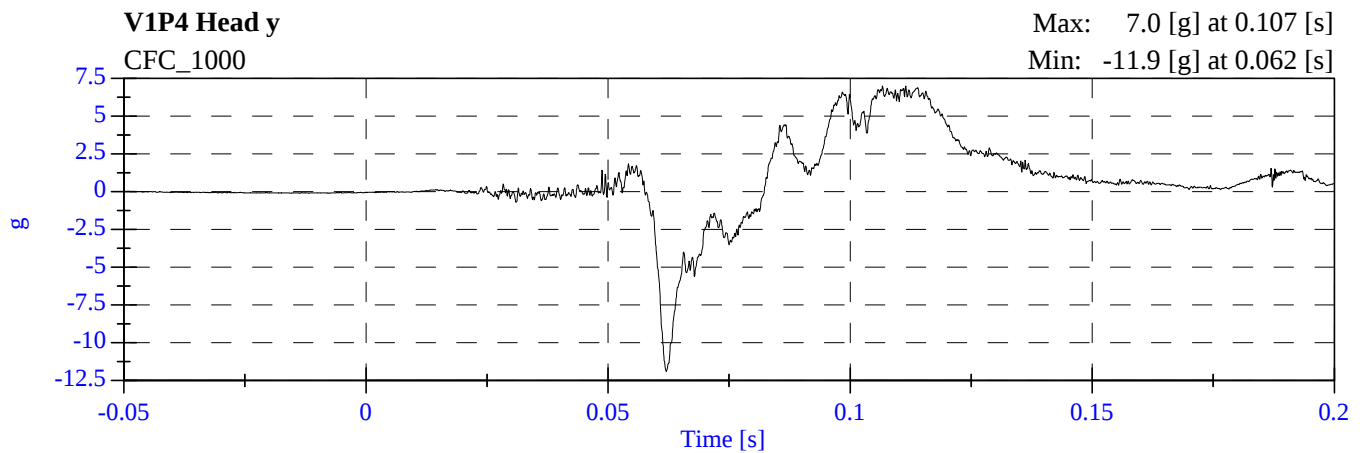
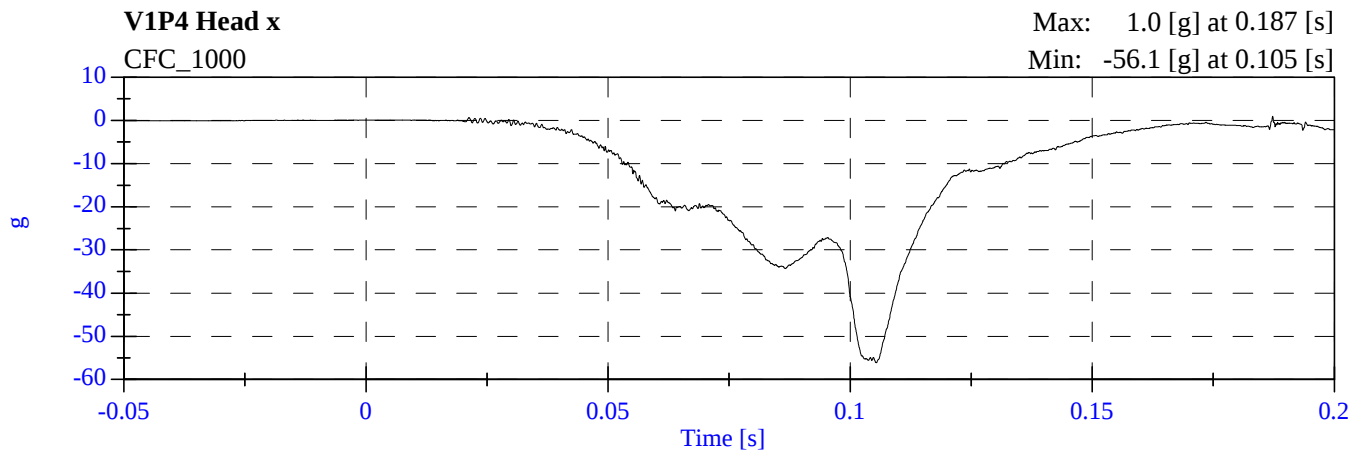
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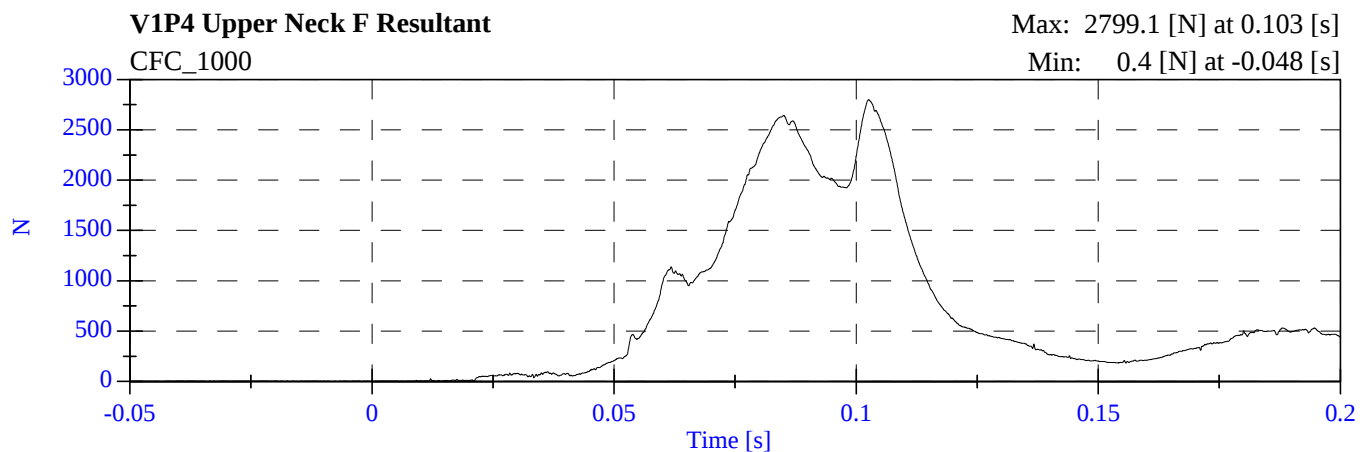
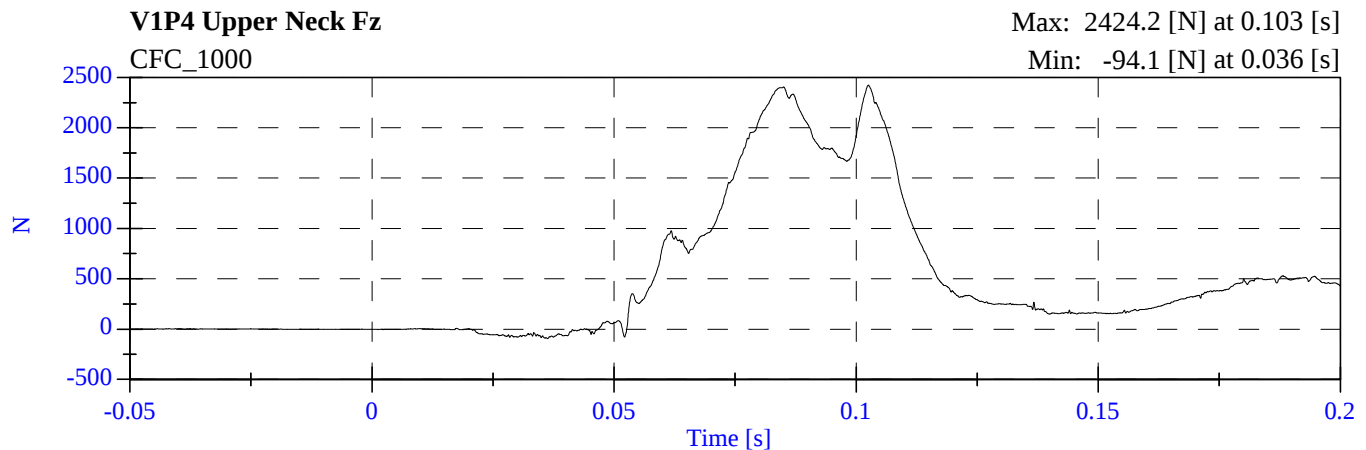
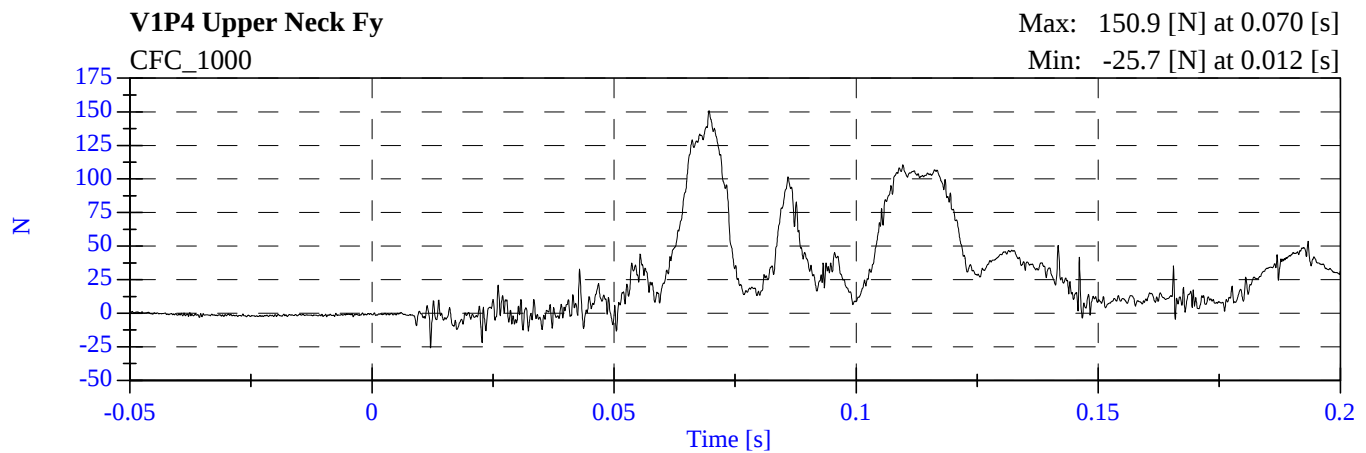
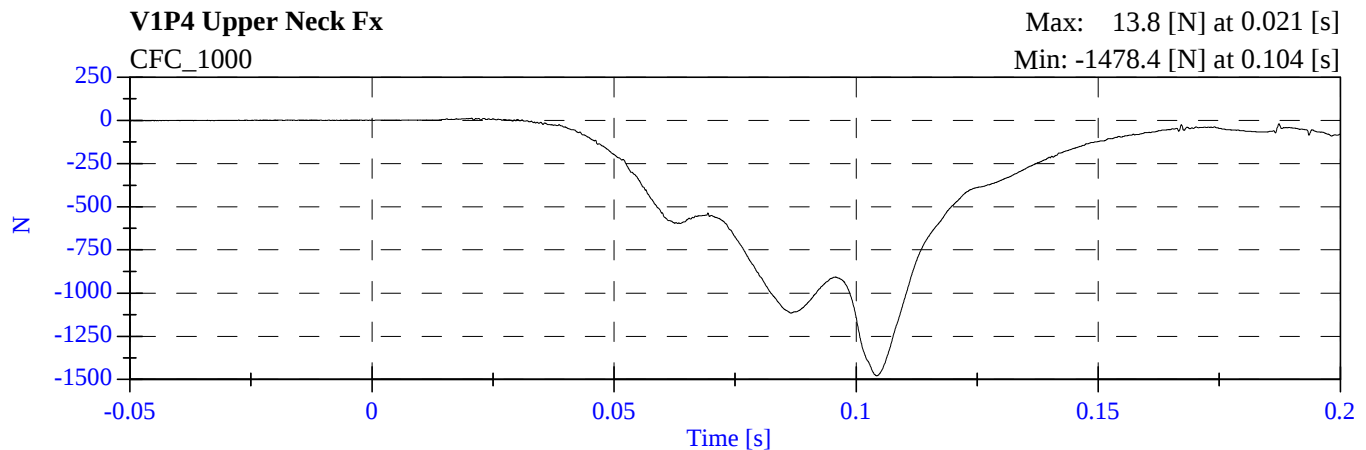
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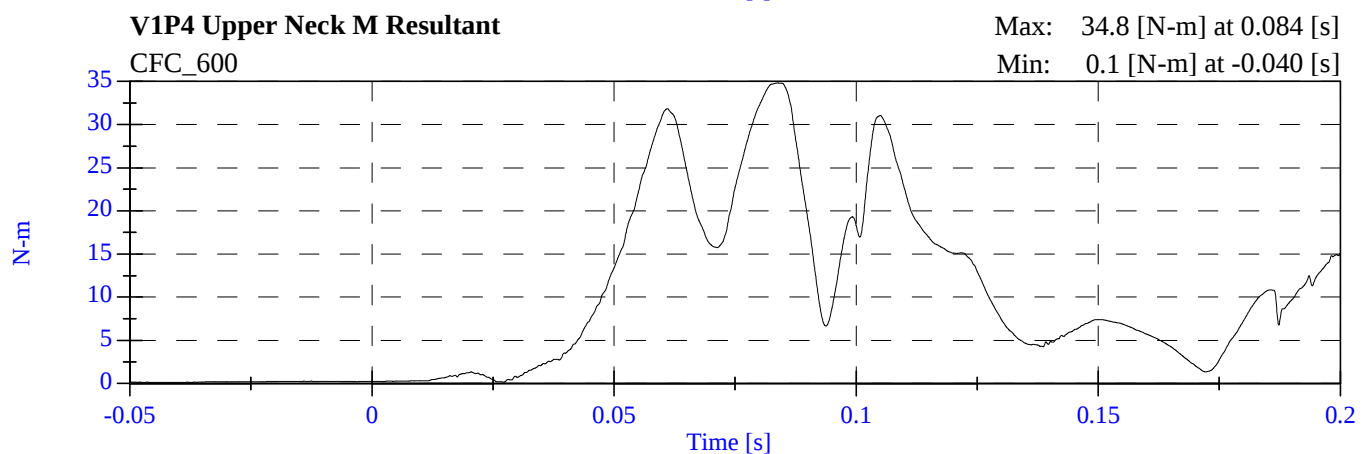
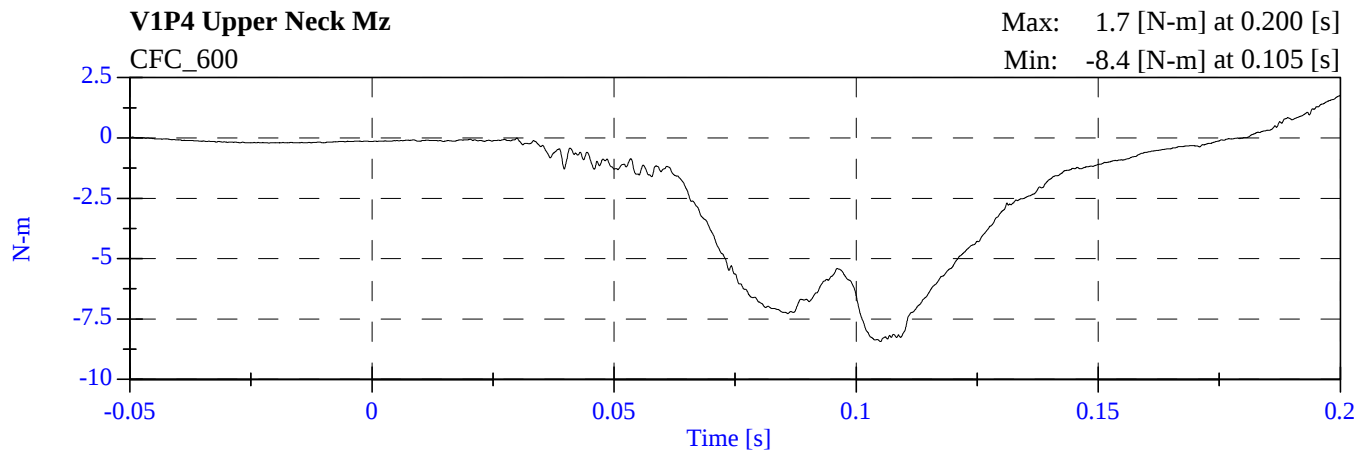
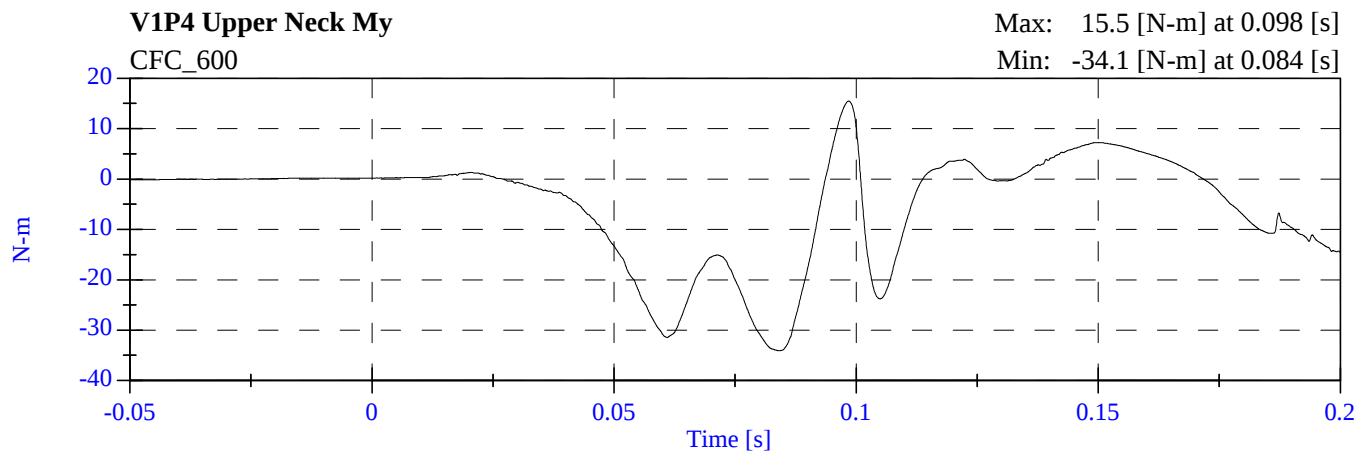
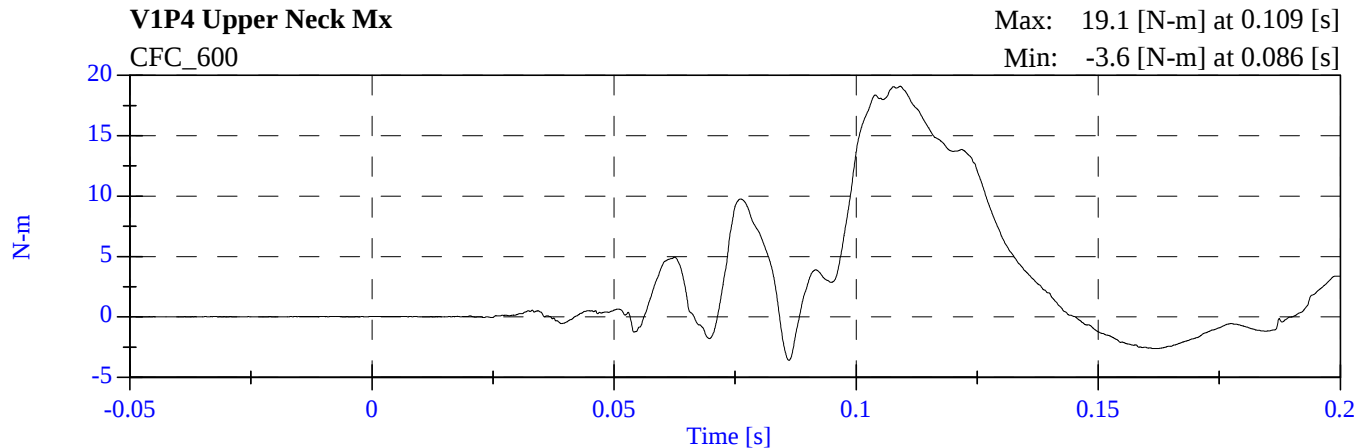
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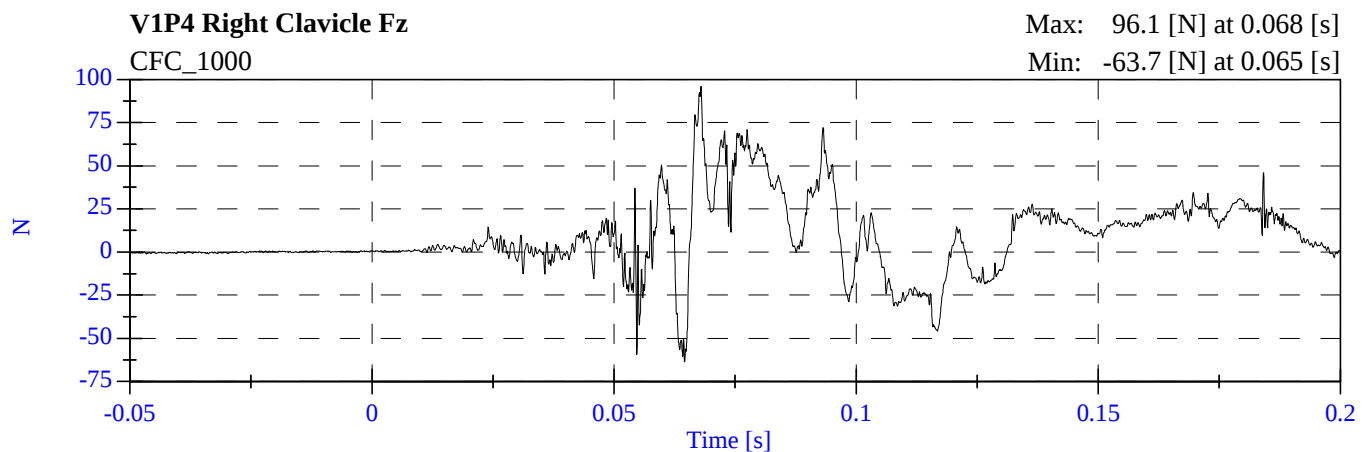
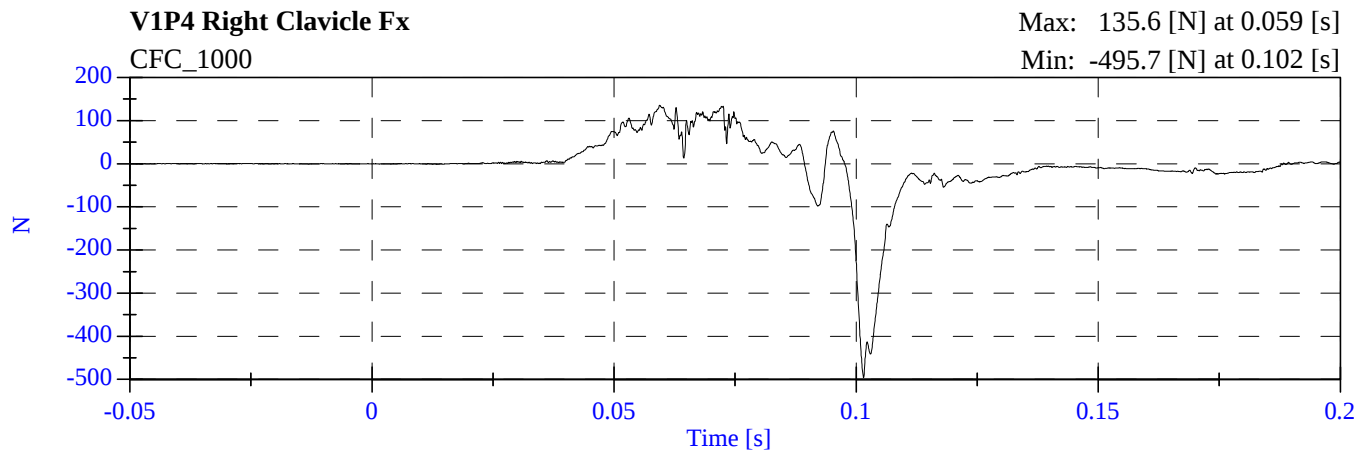
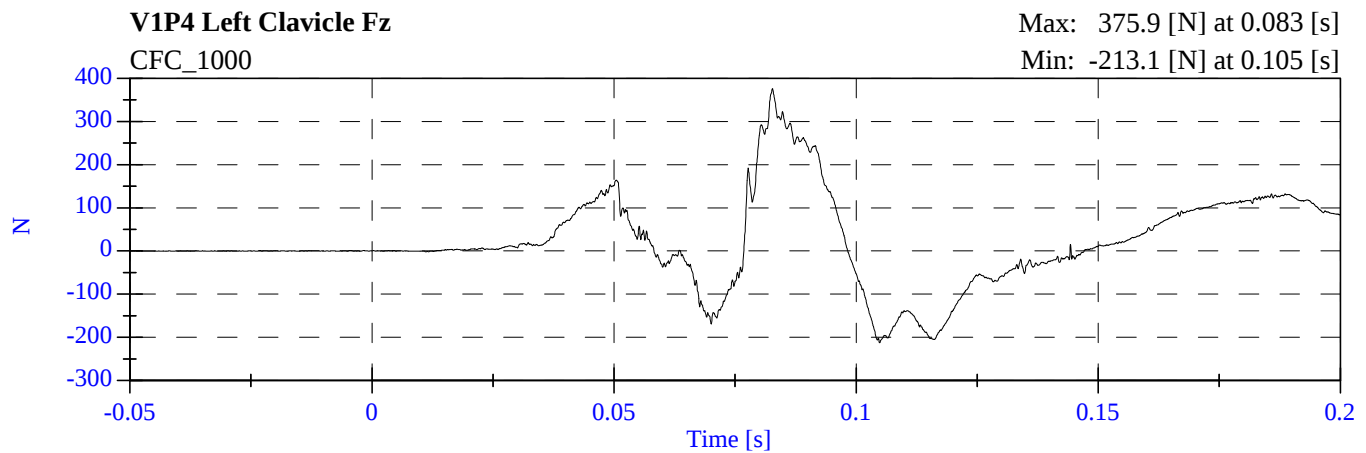
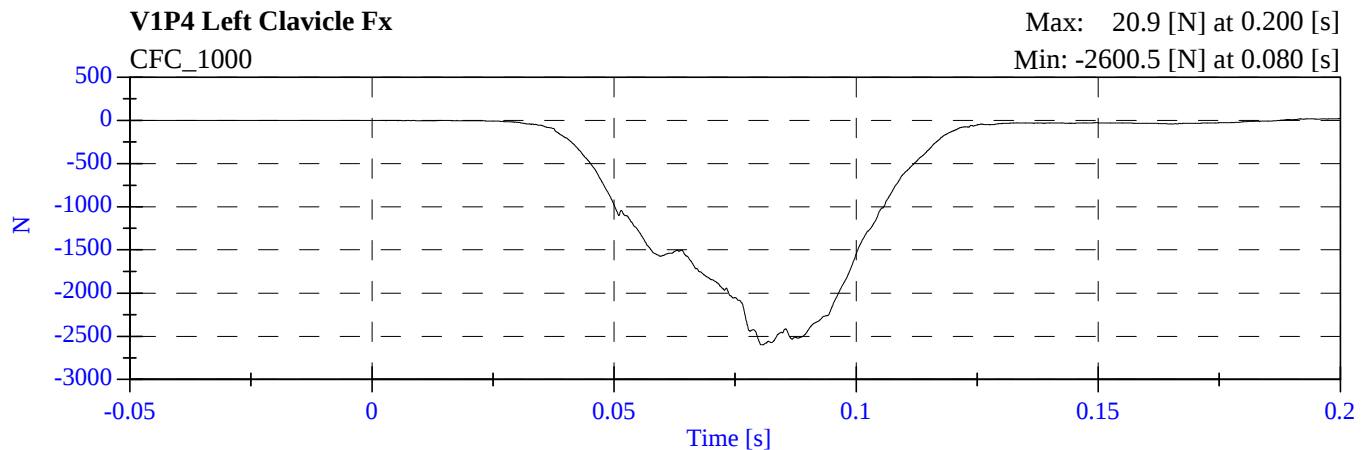
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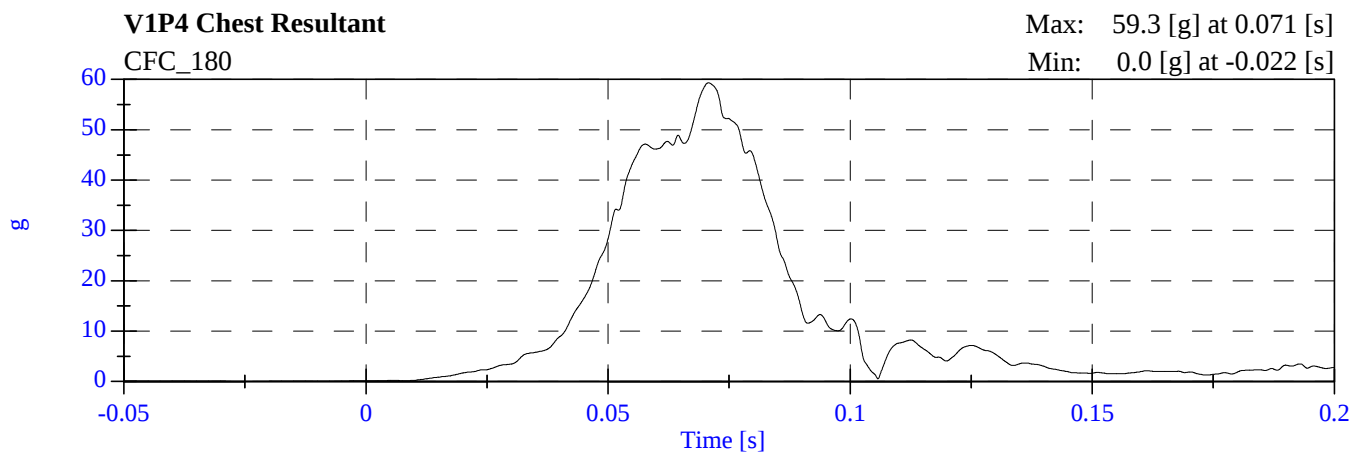
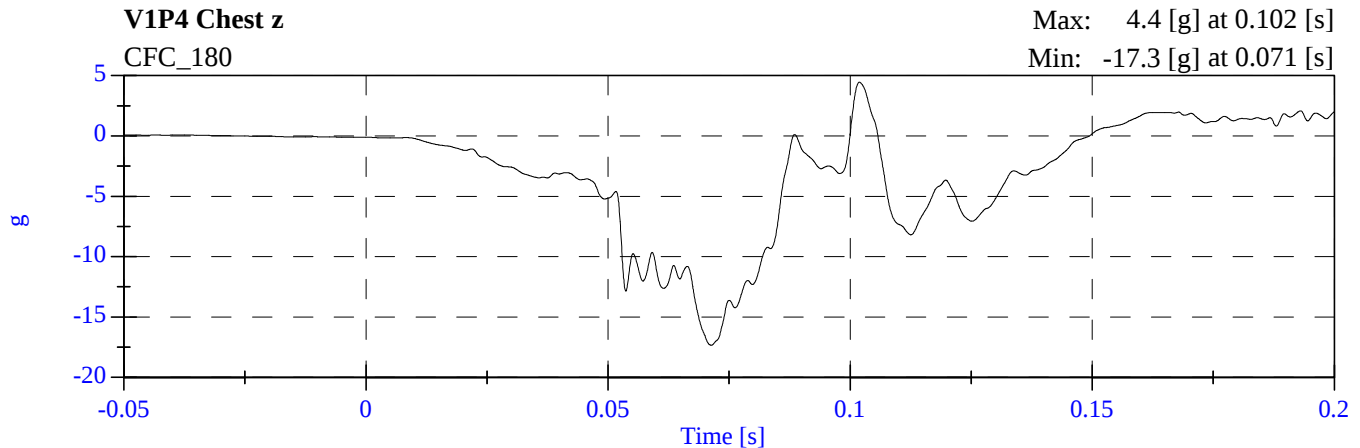
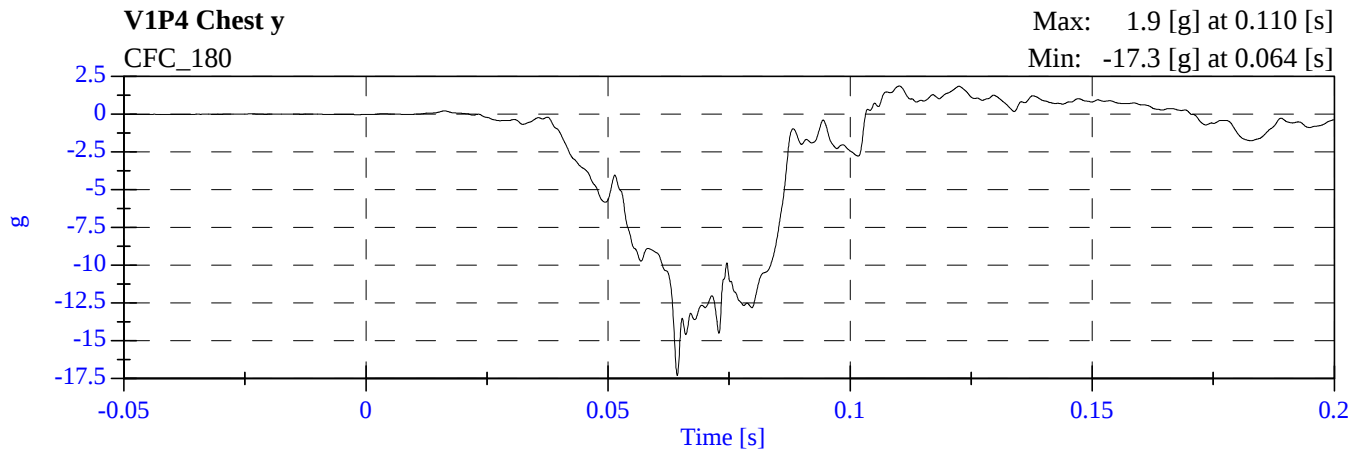
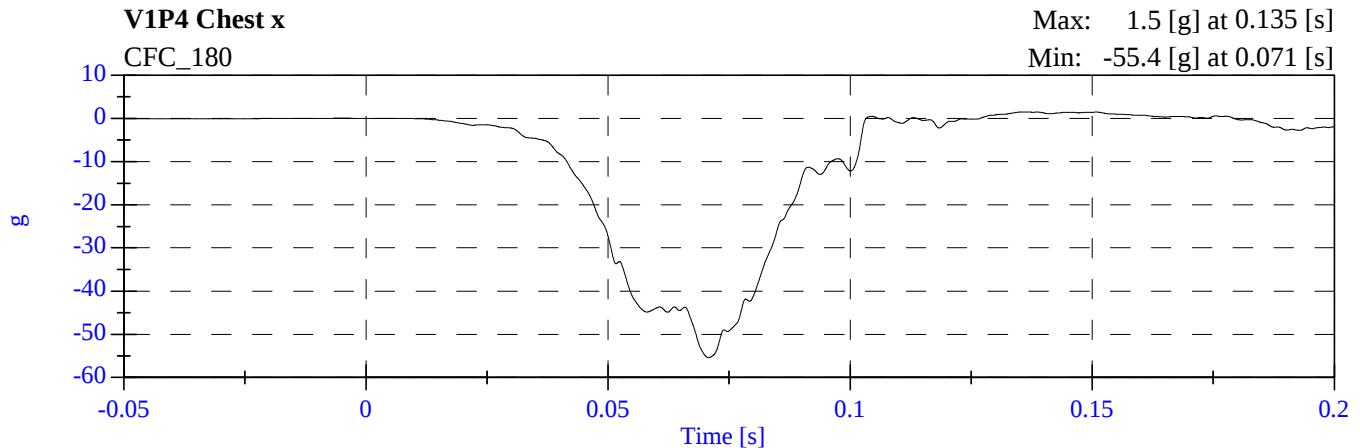
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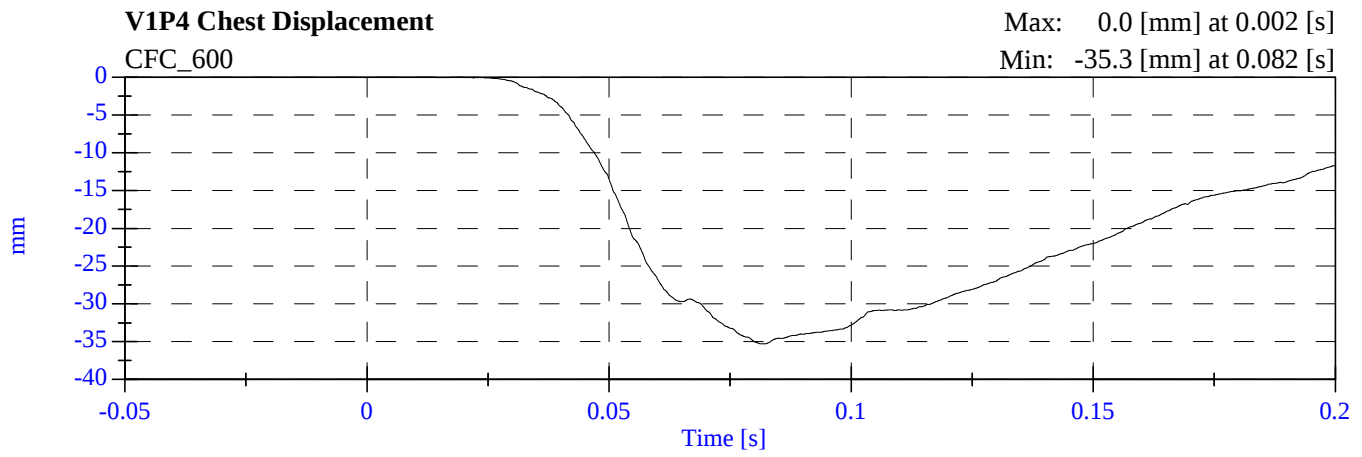
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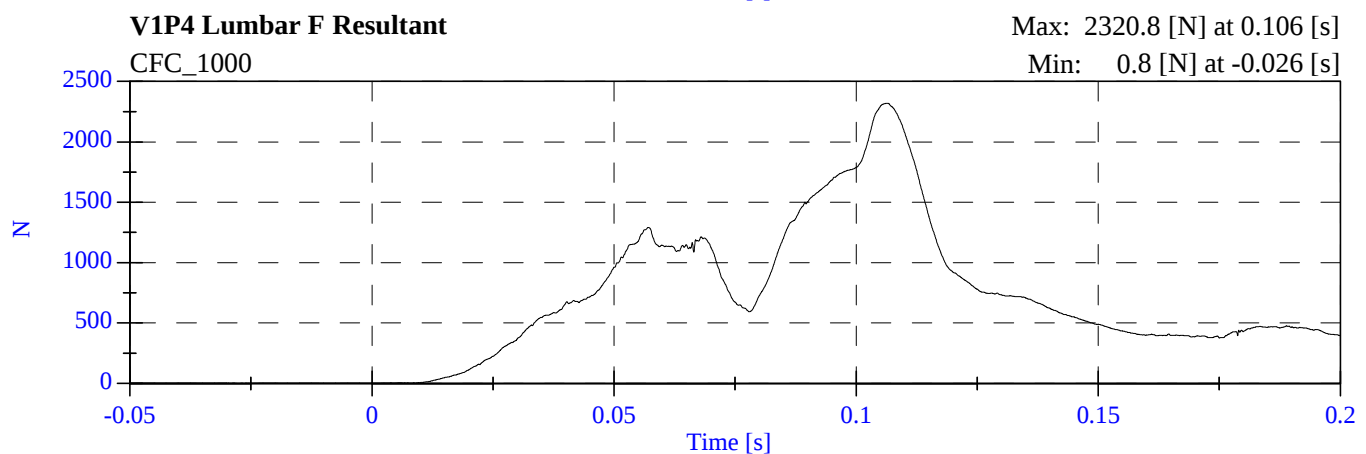
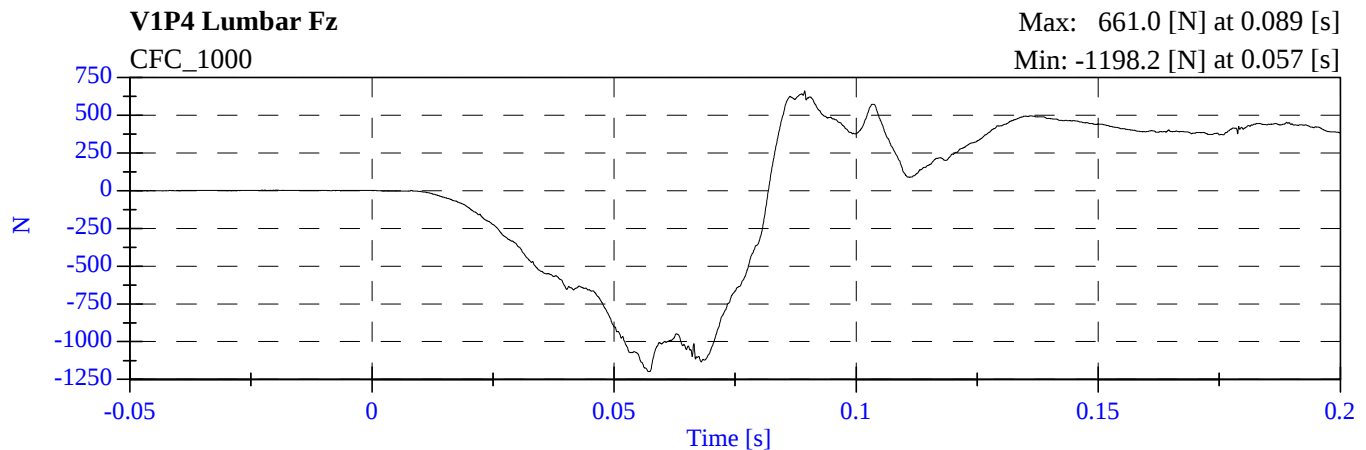
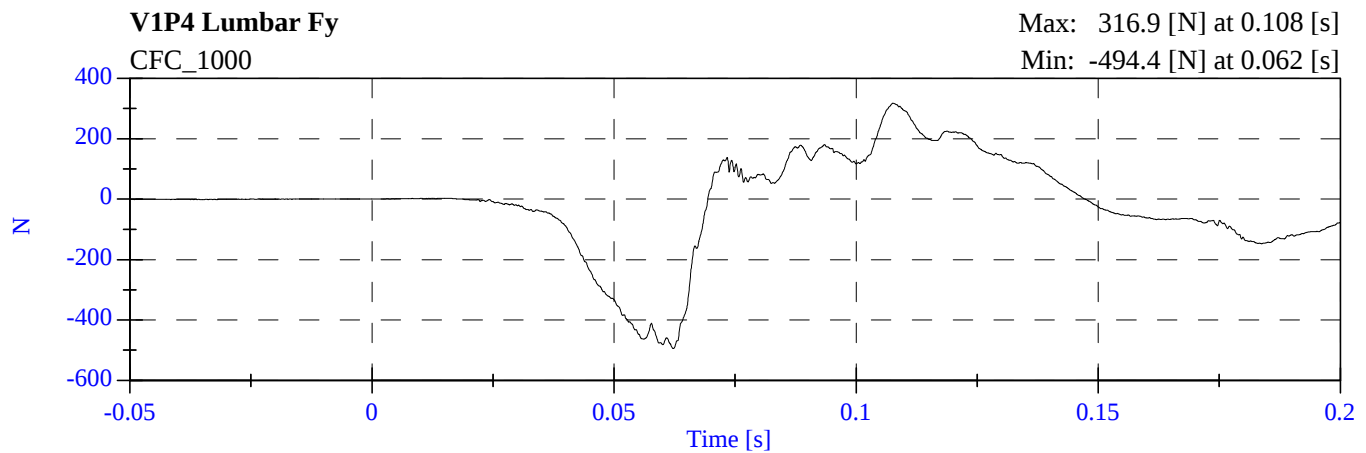
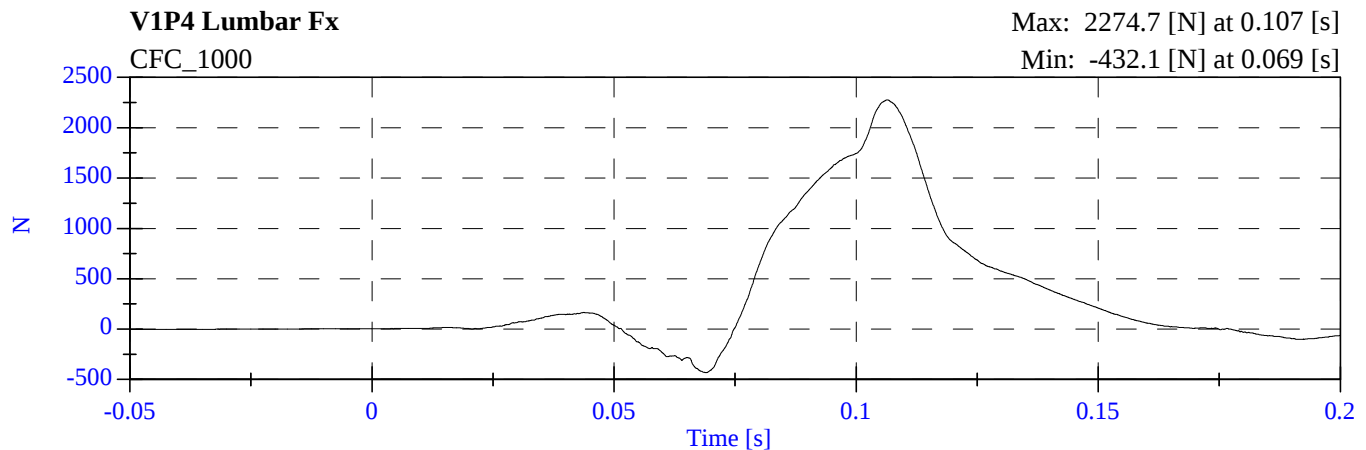
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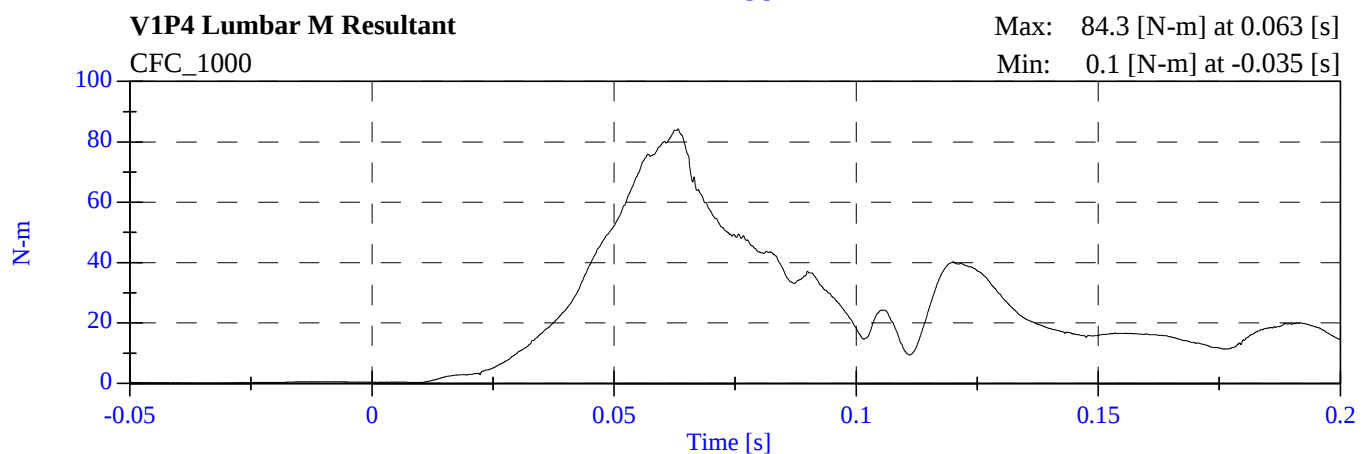
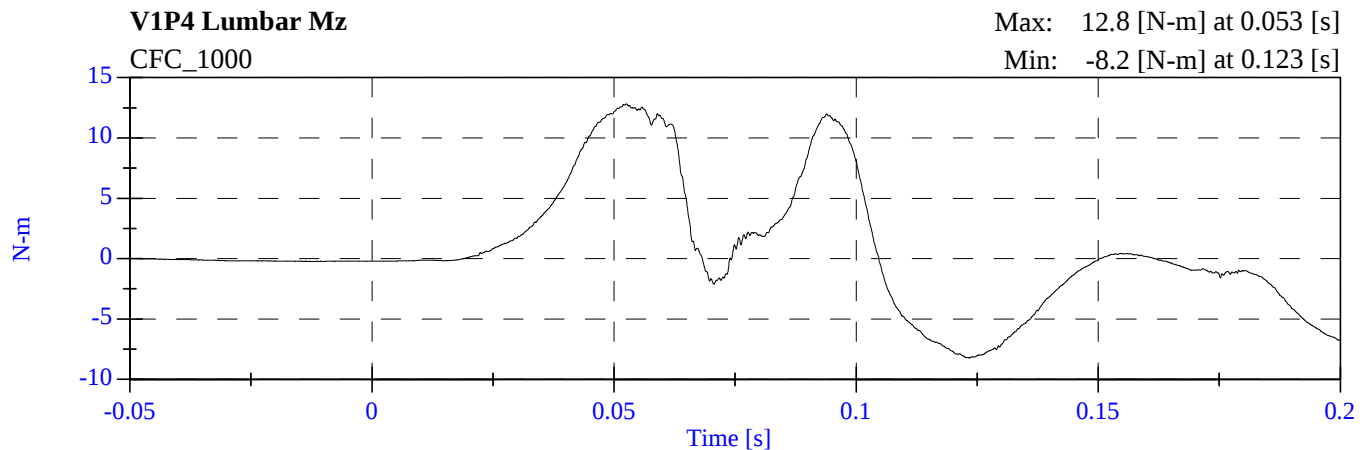
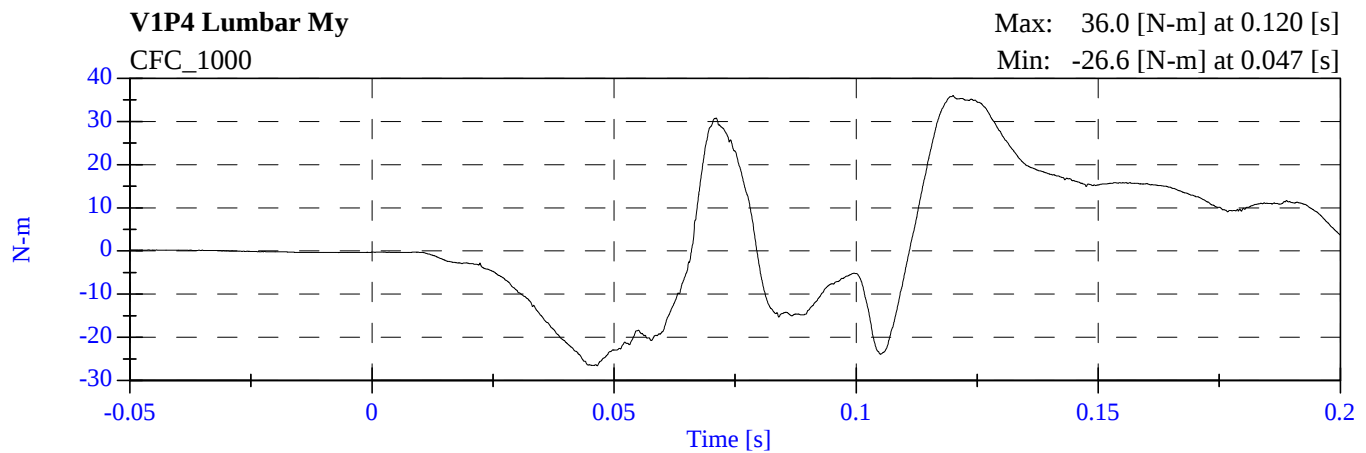
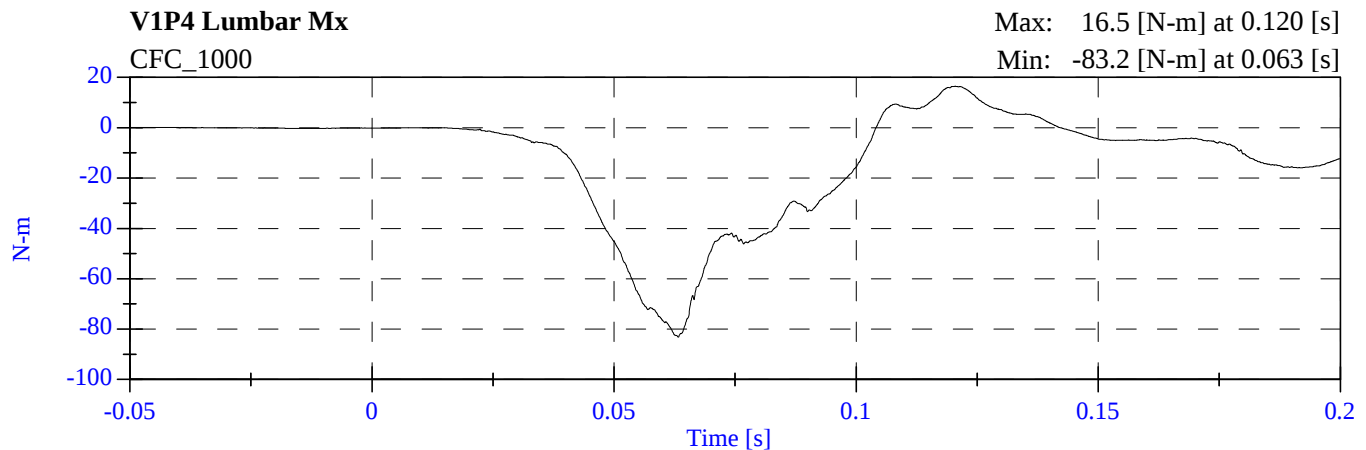
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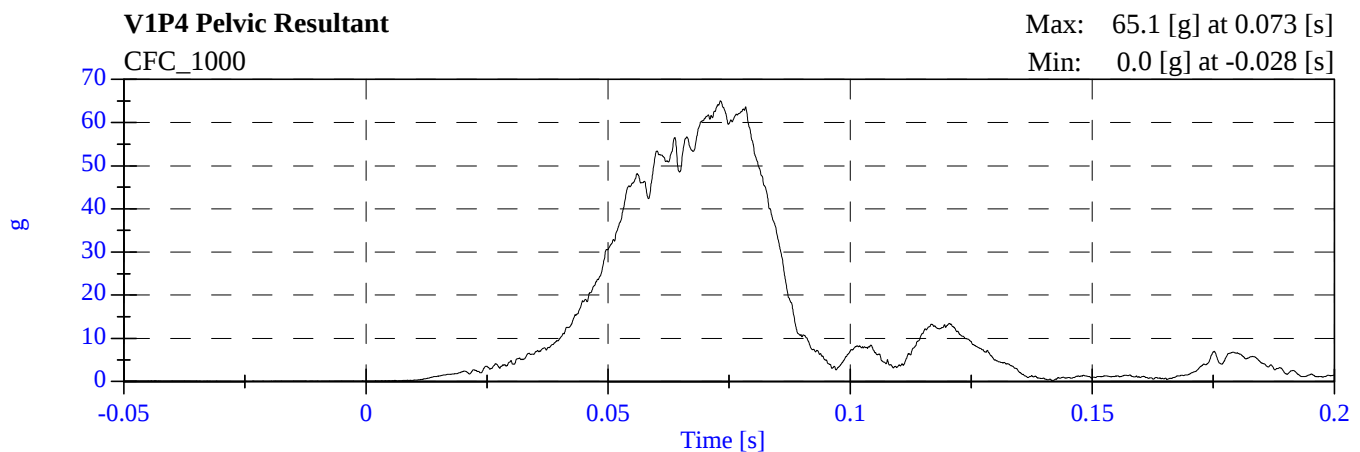
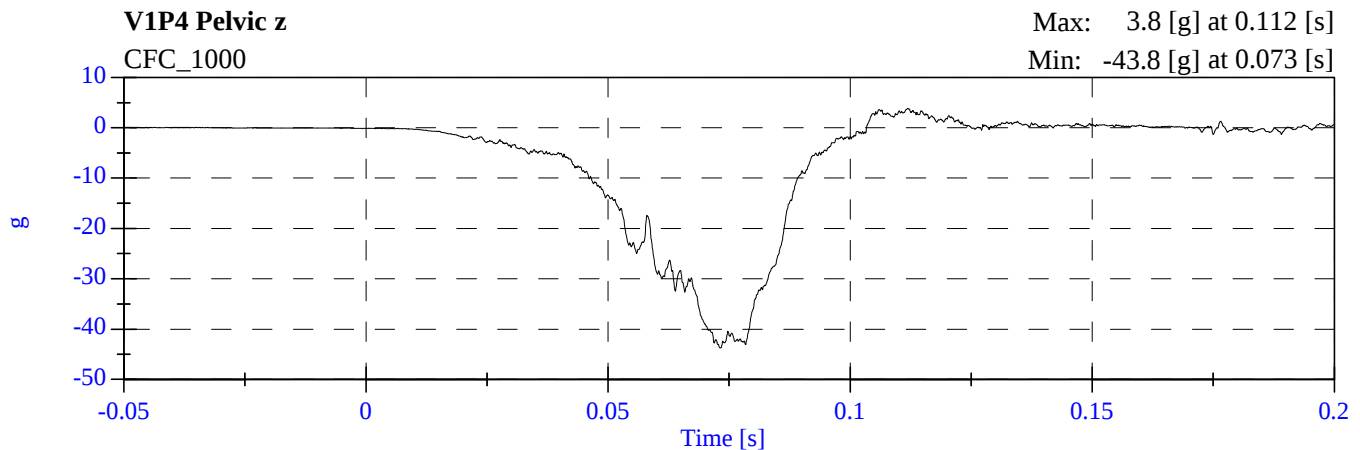
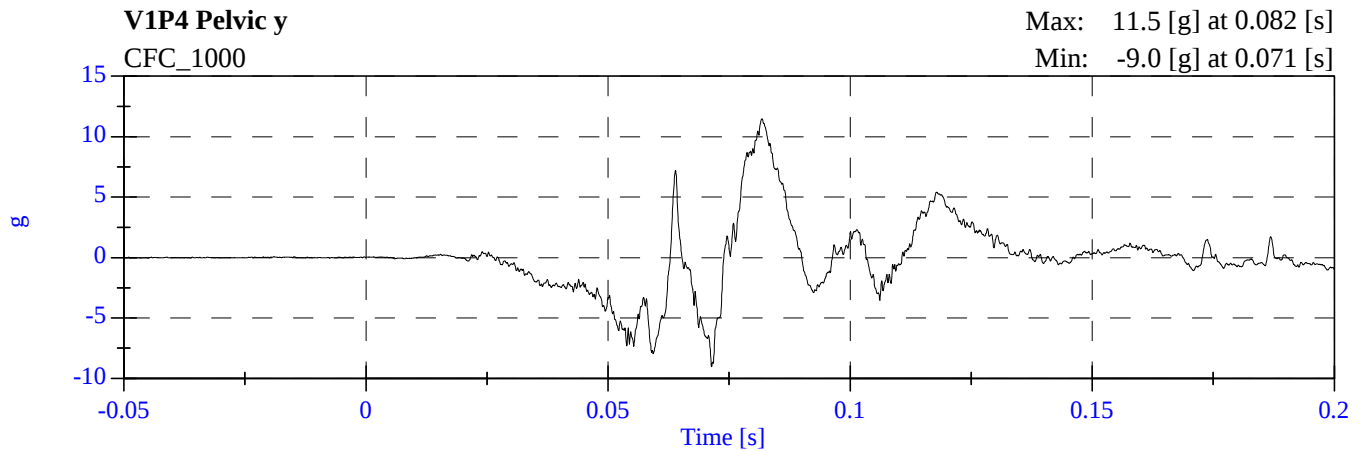
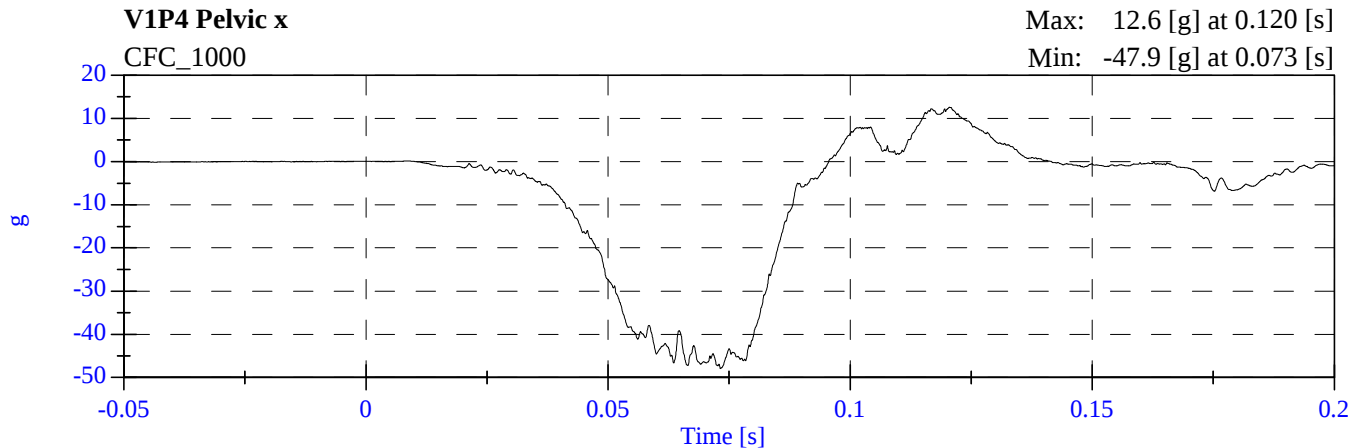
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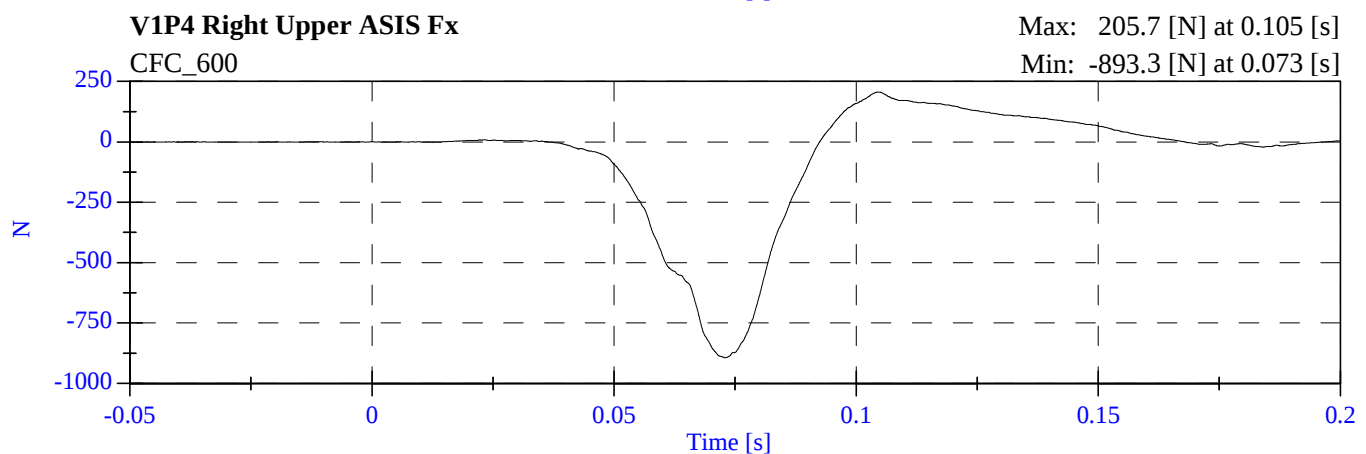
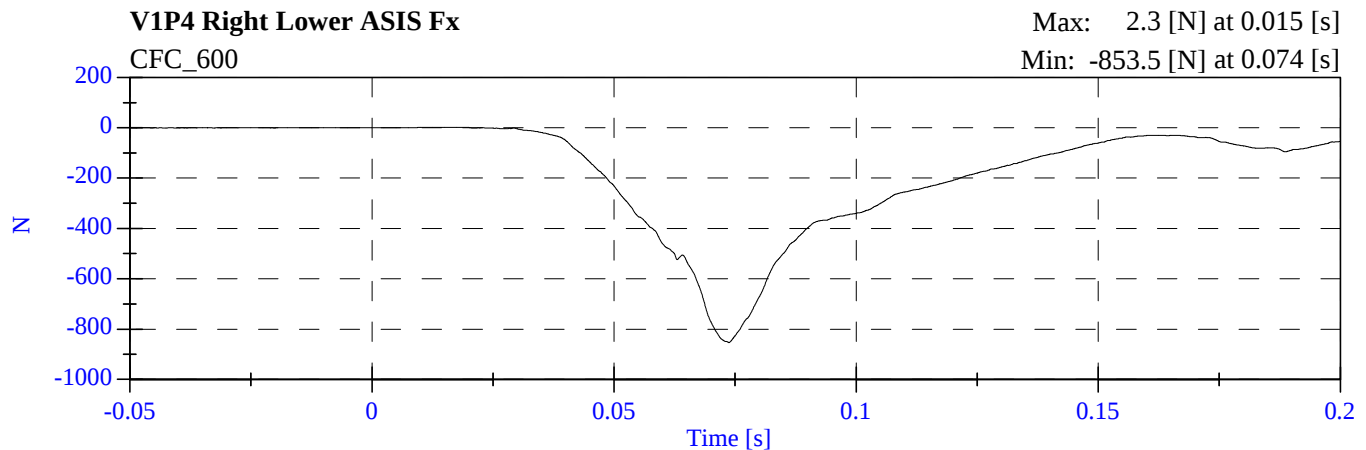
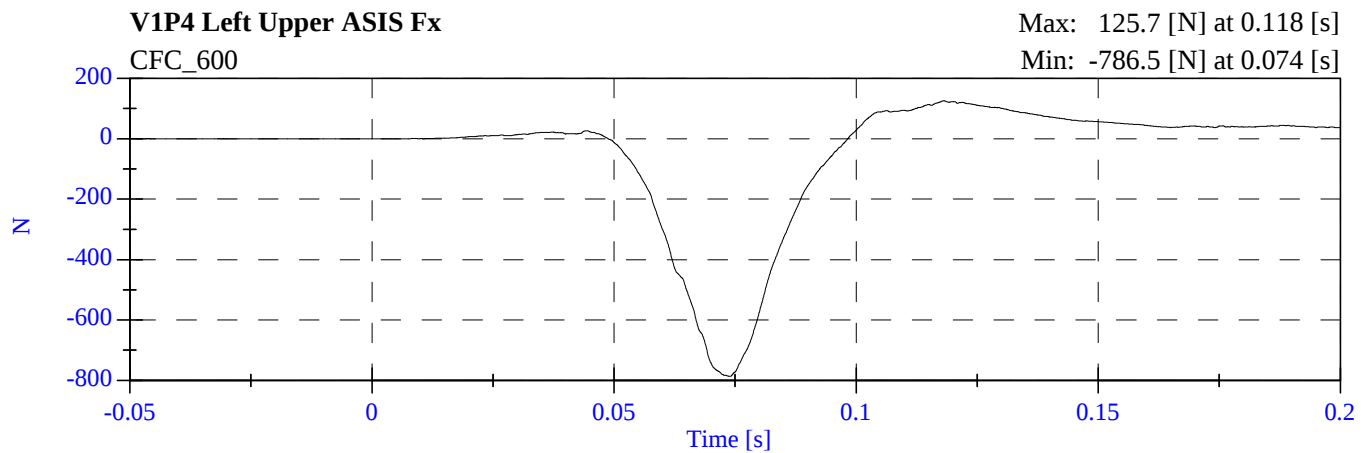
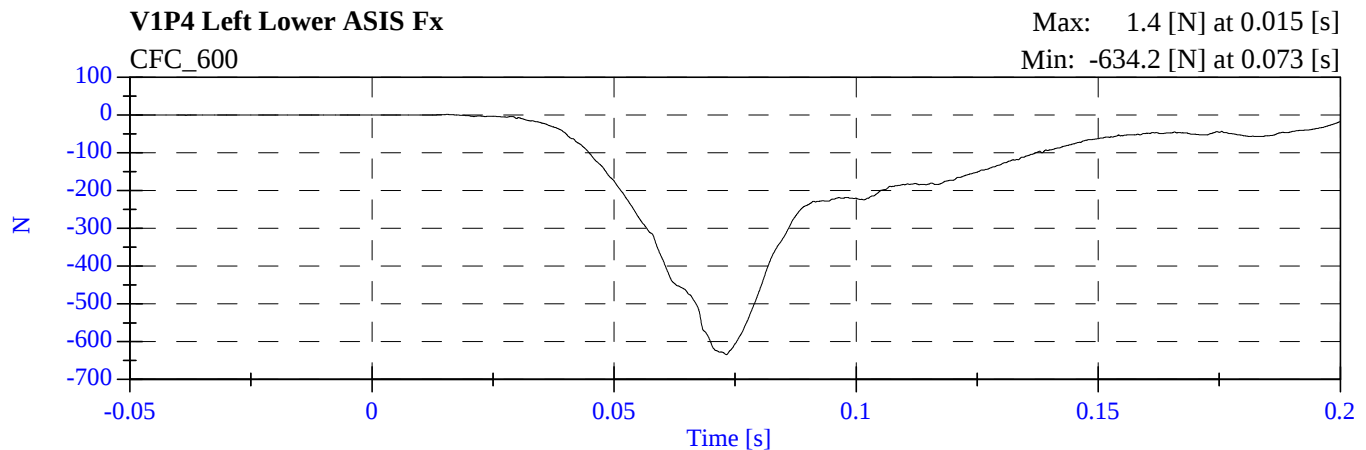
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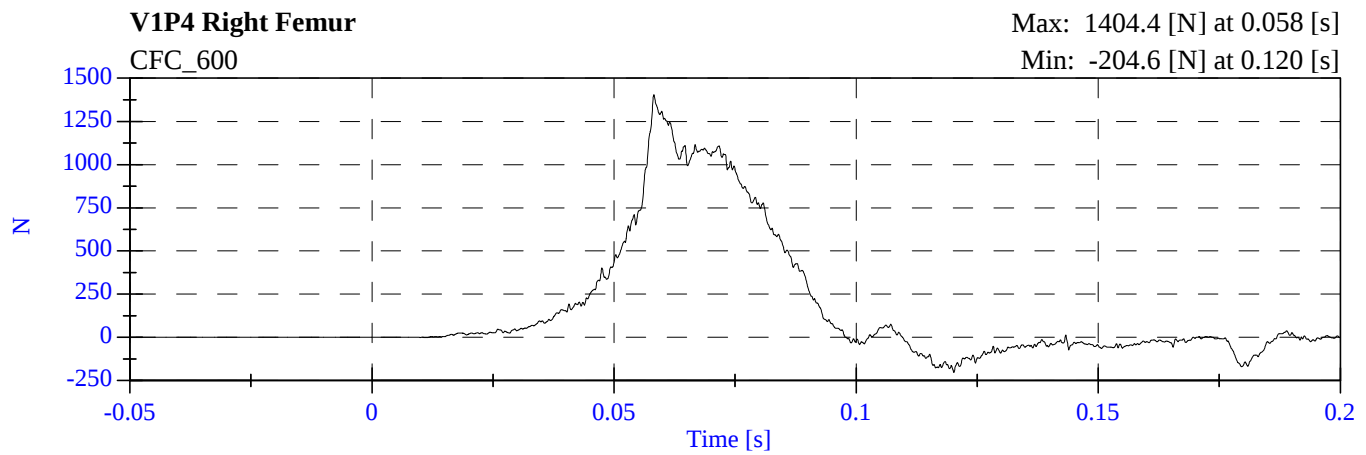
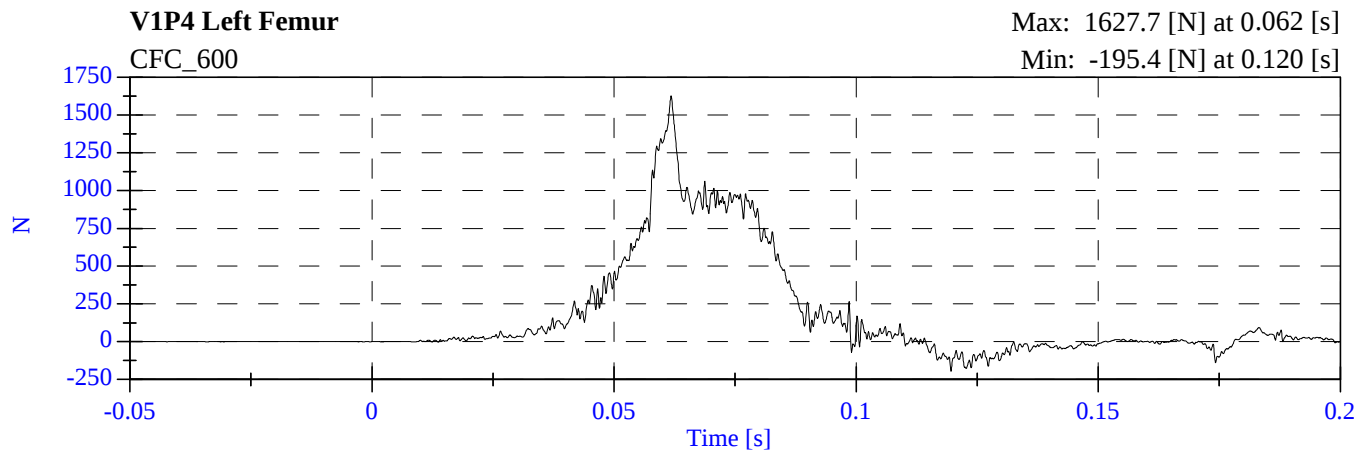
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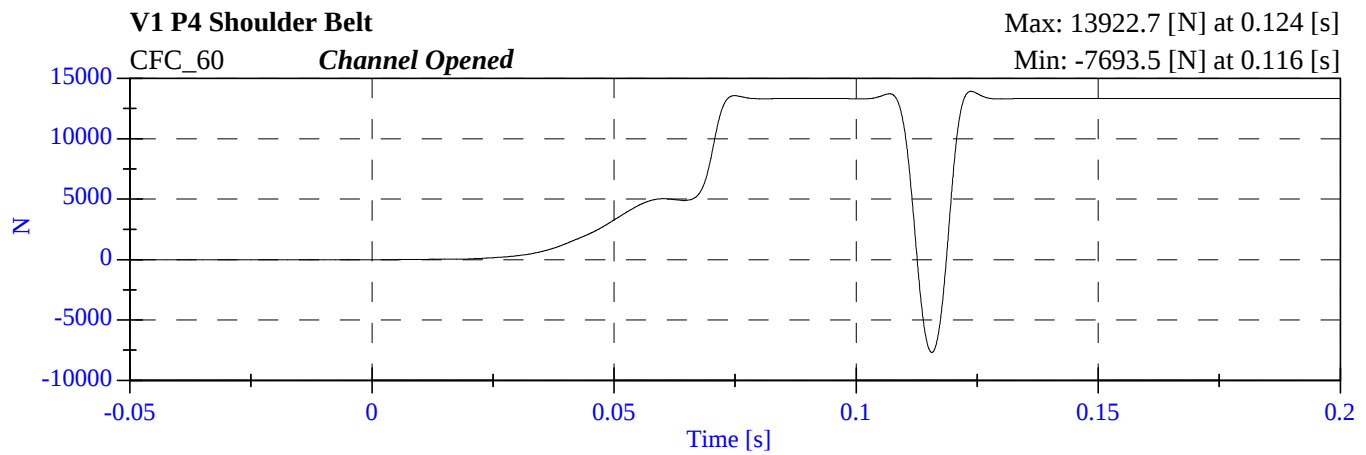
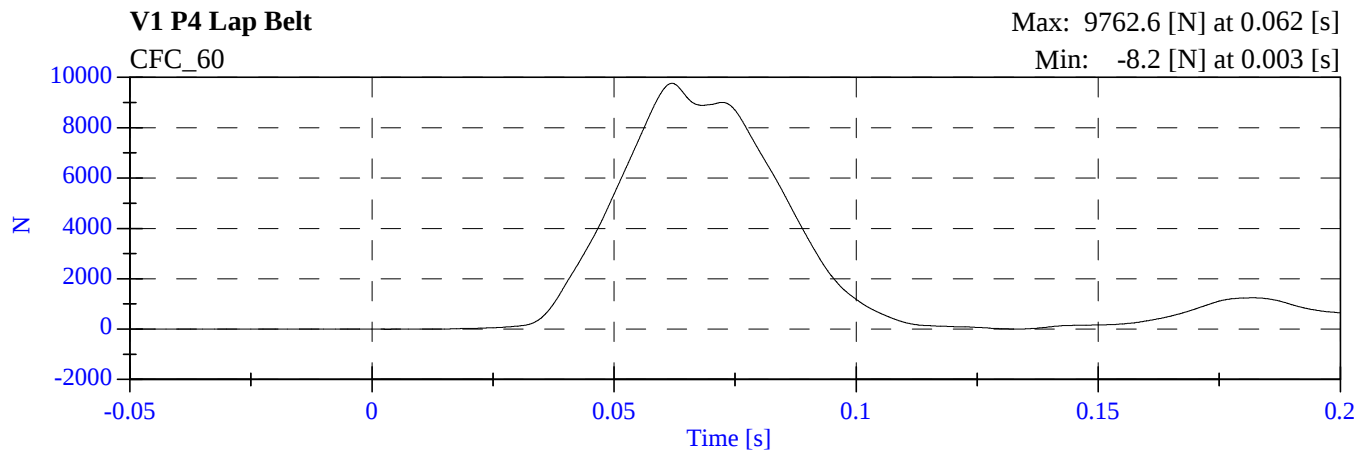
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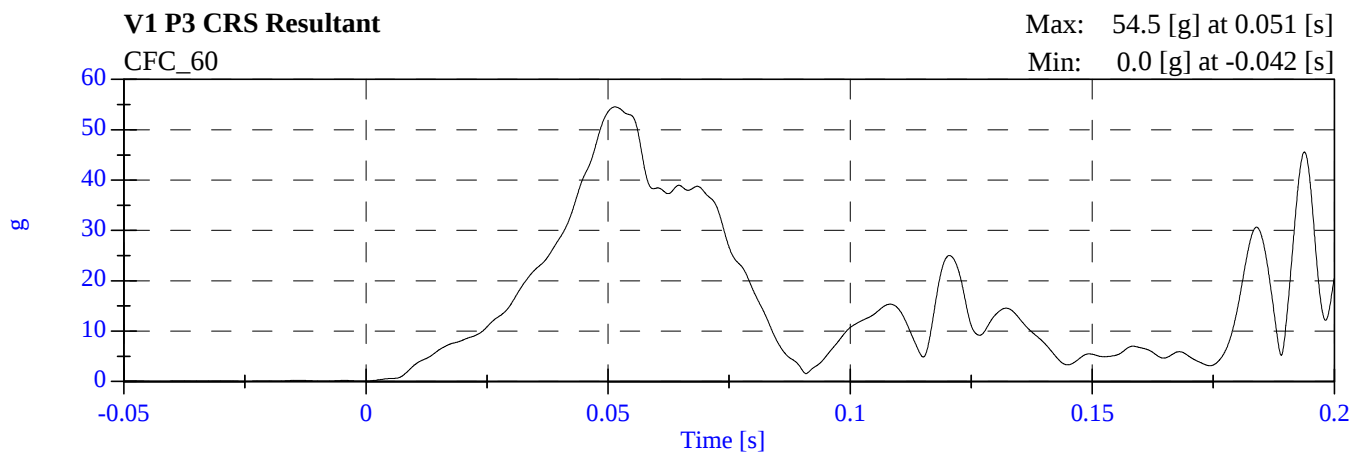
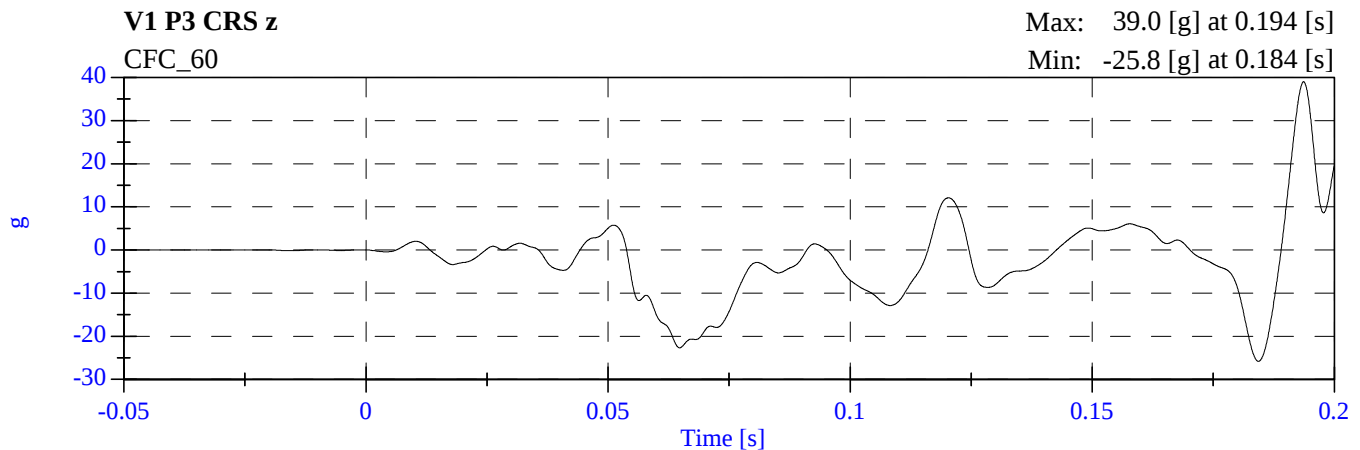
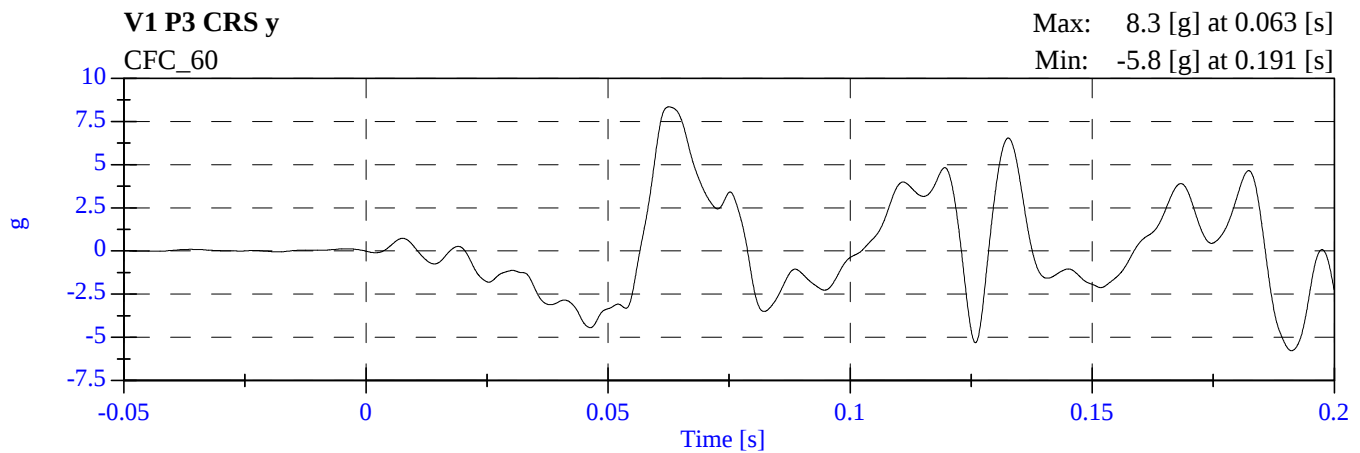
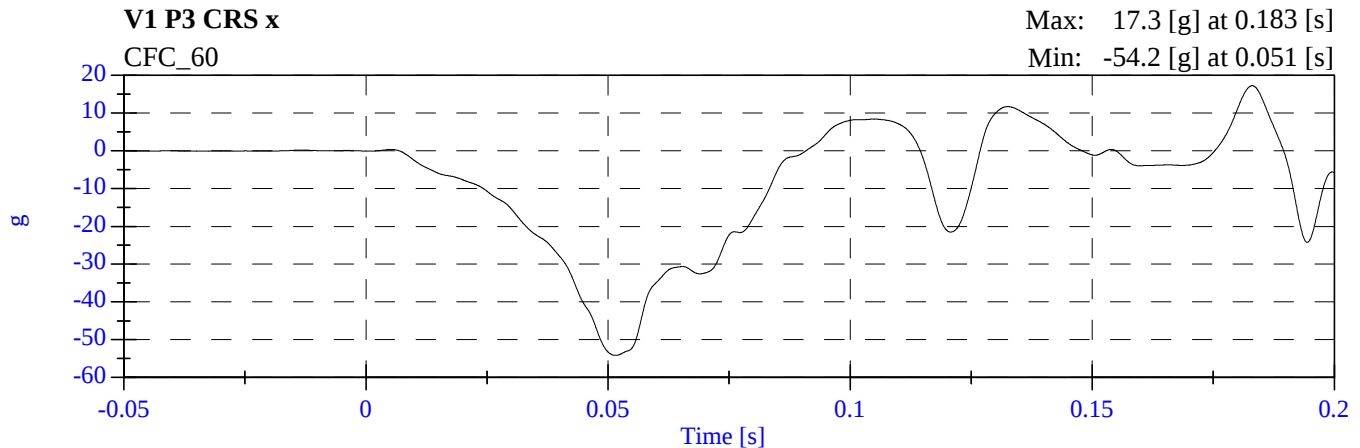
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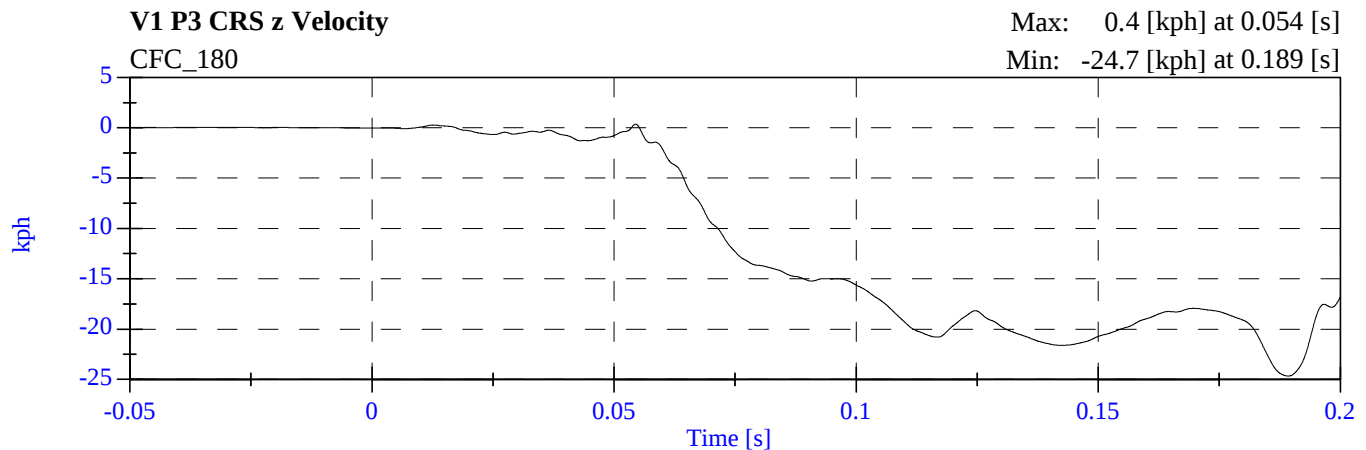
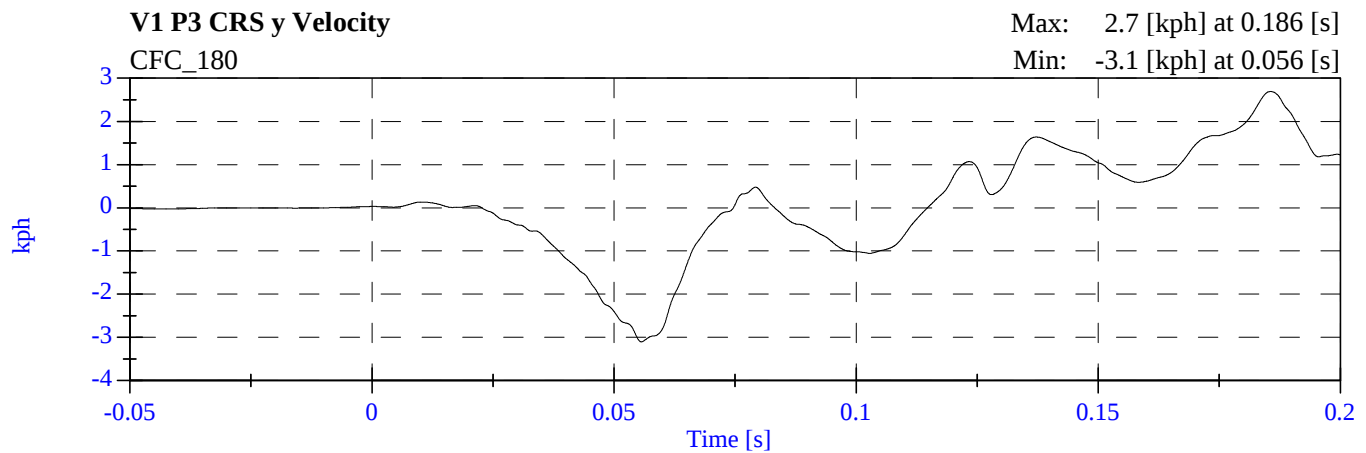
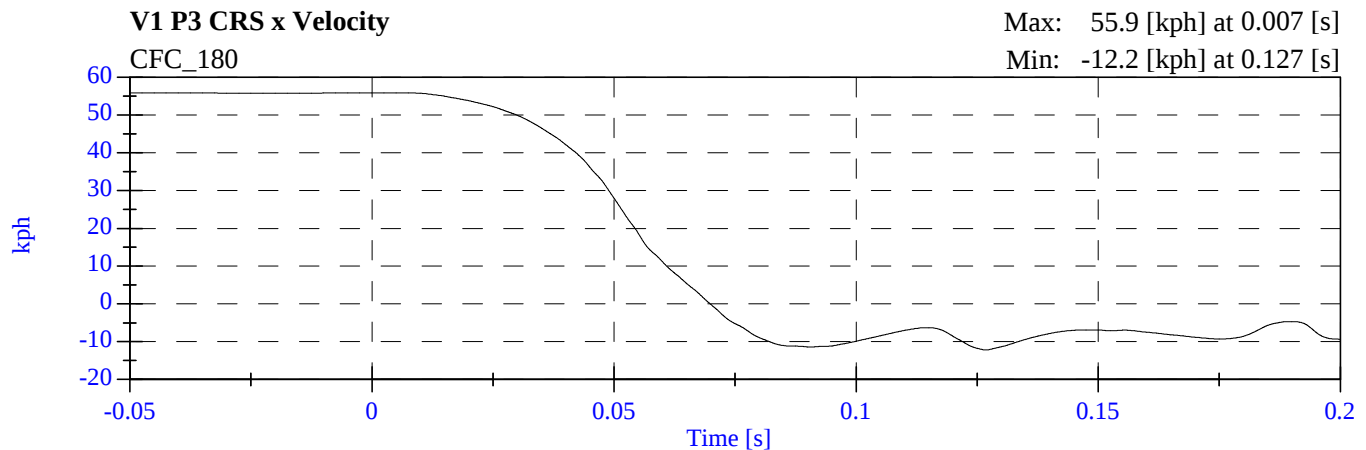
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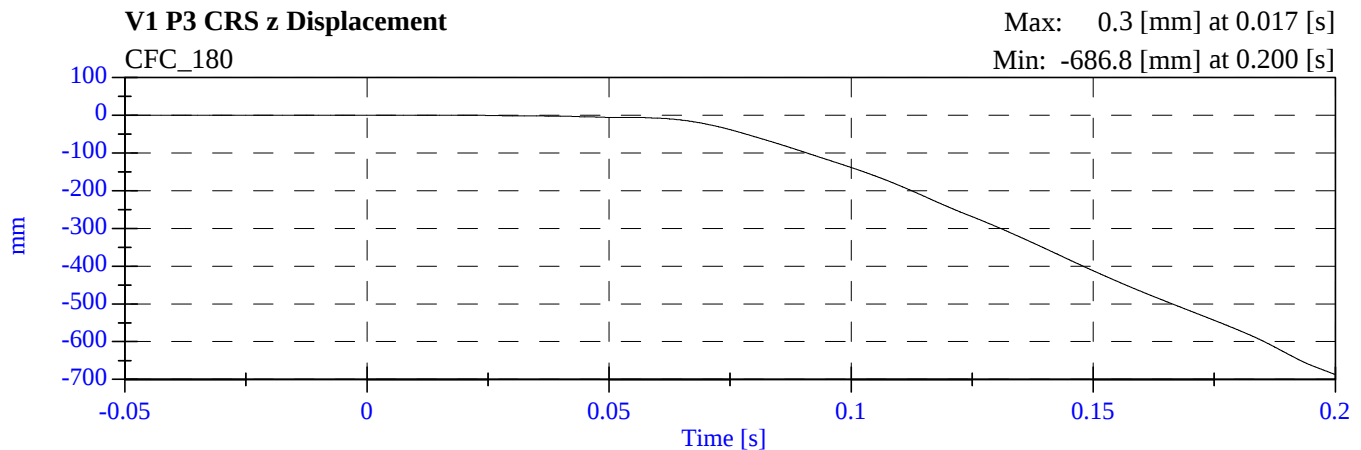
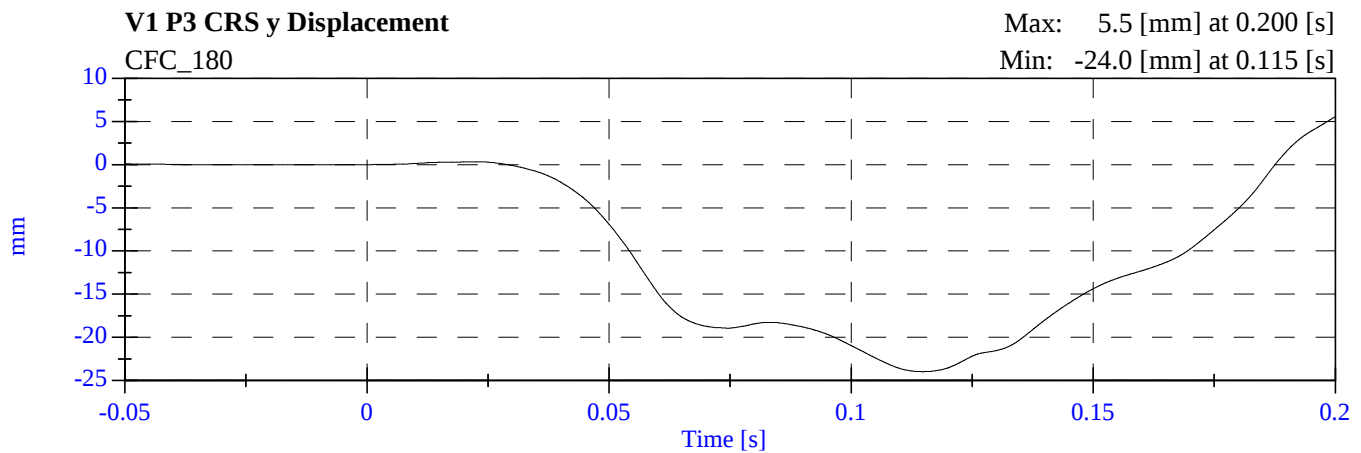
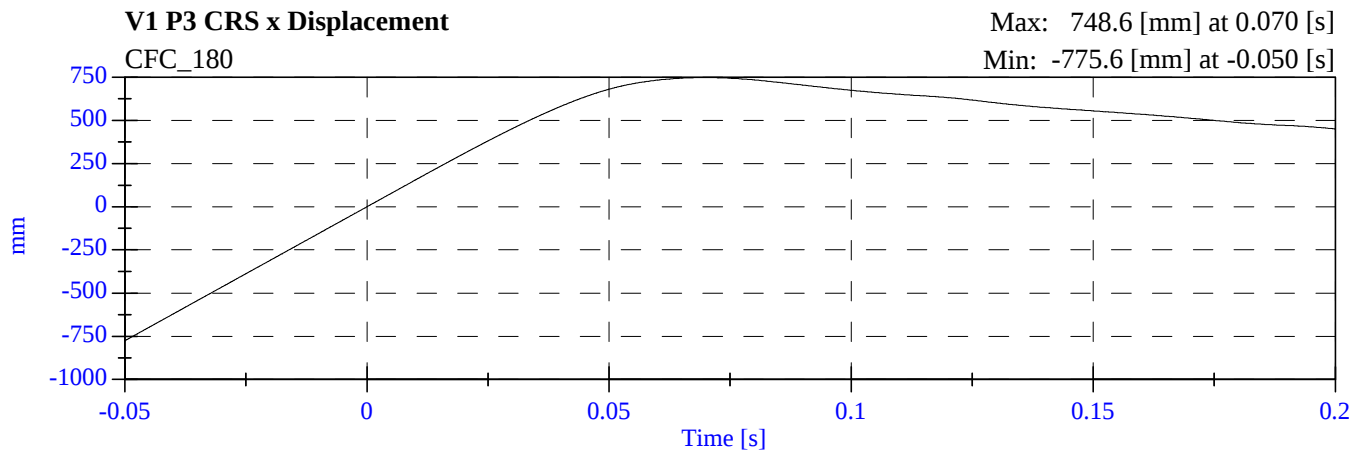
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2005 NCAP Test 5 - 2005 Suzuki Verona M50503 - January 27, 2005



2005 NCAP Test 5 - 2005 Suzuki Verona M50503 - January 27, 2005



SECTION 5

CHILD DUMMY CALIBRATION INFORMATION

**Transportation Research Center
Inc.**

ATD Calibration Report

for

VRTC

**HIII 3 Year Old Serial No. 040
Calibration No. 04**



Transportation Research Center Inc.
P.O. Box B-67
10820 St. Rt. 347
East Liberty, OH 43319-0367

Transportation Research Center Inc.
572P HIII 3 Year Old Dummy
External Dimensions
Serial No. 040 Calibration No. 04
08/06/04

Test Parameter	Dimension	Specification	Results	Pass
Total Sitting Height	A	538.5 - 553.7 mm	550 mm	Yes
Shoulder Pivot Height	B	307.3 - 322.6 mm	315 mm	Yes
Hip Pivot Height	C	33.0 - 43.2 mm	40 mm	Yes
Hip Pivot from Backline	D	56.9 - 67.1 mm	63 mm	Yes
Shoulder Pivot from Backline	E	58.4 - 68.6 mm	66 mm	Yes
Thigh Clearance	F	81.0 - 91.2 mm	85 mm	Yes
Back of Elbow to Finger Tip	G	247.4 - 262.6 mm	254 mm	Yes
Head Back to Backline	H	48.3 - 58.4 mm	53 mm	Yes
Shoulder to Elbow Length	I	185.0 - 200.7 mm	197 mm	Yes
Elbow Rest Height	J	133.6 - 148.8 mm	140 mm	Yes
Buttock to Knee Length	K	287.3 - 302.5 mm	295 mm	Yes
Popliteal Height	L	221.0 - 236.2 mm	226 mm	Yes
Knee to Floor Height	M	241.6 - 256.8 mm	251 mm	Yes
Buttock Popliteal Length	N	217.9 - 233.2 mm	224 mm	Yes
Chest Depth with Jacket	O	134.6 - 149.9 mm	143 mm	Yes
Foot Length	P	137.7 - 147.8 mm	140 mm	Yes
Stature	Q	932.2 - 957.6 mm	944 mm	Yes
Buttock to Knee Pivot Length	R	251.5 - 261.6 mm	254 mm	Yes
Head Breadth	S	128.3 - 143.5 mm	135 mm	Yes
Head Depth	T	167.4 - 182.6 mm	175 mm	Yes
Hip Breadth	U	200.7 - 215.9 mm	205 mm	Yes
Shoulder Breadth	V	236.5 - 251.7 mm	243 mm	Yes
Foot Breadth	W	53.6 - 63.8 mm	57 mm	Yes
Head Circumference	X	500.4 - 515.6 mm	502 mm	Yes
Chest Circumference with Jacket	Y	527.1 - 552.5 mm	543 mm	Yes
Waist Circumference	Z	527.1 - 552.5 mm	545 mm	Yes
Reference Location for Chest Circumference	AA	248.9 - 259.1 mm	254 mm	Yes
Reference Location for Waist Circumference	BB	160.0 - 170.2 mm	165 mm	Yes

Technician



Approved





Transportation Research Center Inc.

572P Head Drop Test

HIII 3 Year Old Serial No. 040 Calibration No. 04 - 2

Test Date 08/05/2004

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	53 %	Yes
Peak Resultant Acceleration	250 - 280 g	254.1 g	Yes
Peak Lateral Acceleration	15 g Max	-3.0 g	Yes
Is Acceleration Curve Unimodal?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician



Approved

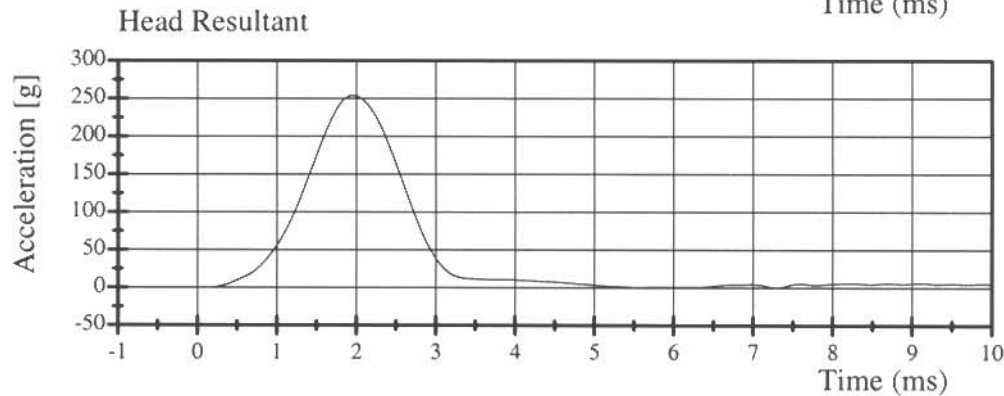
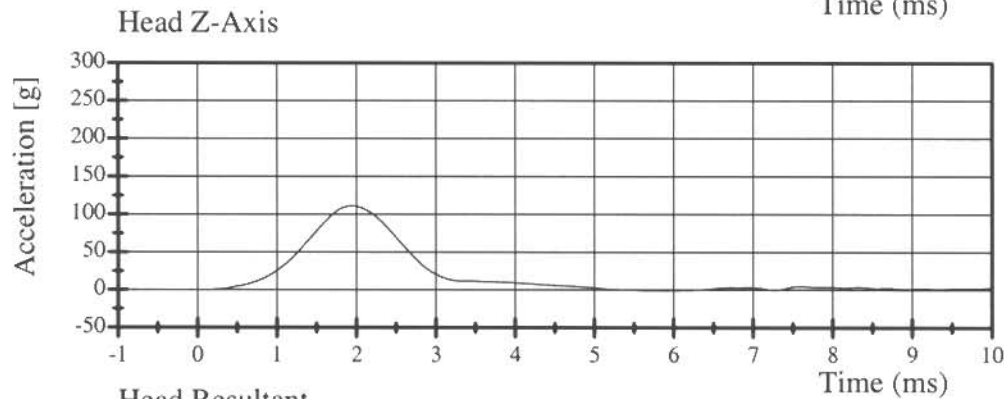
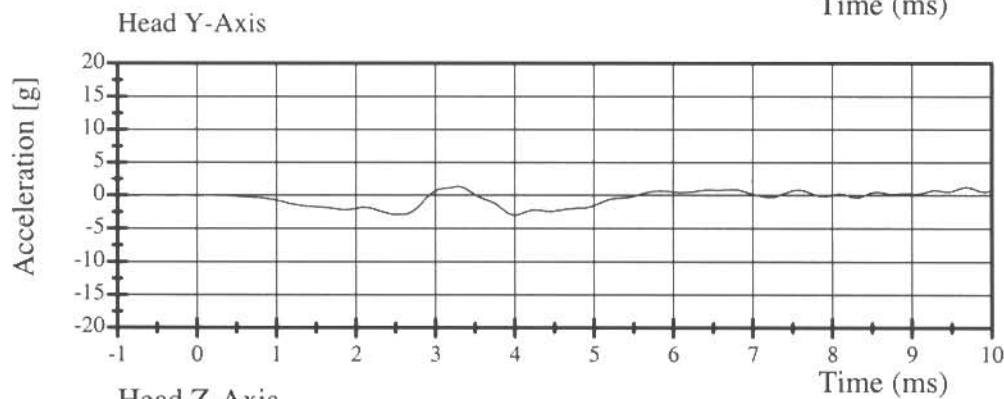
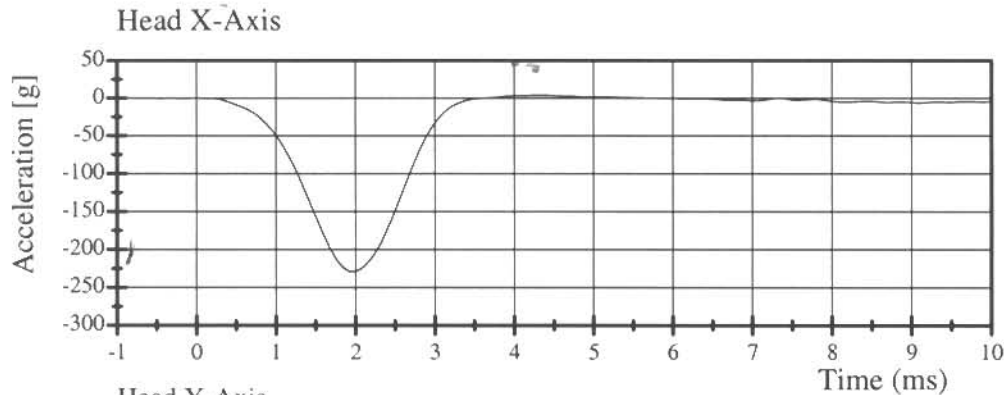


Transportation Research Center Inc.

572P Head Drop Test

HIII 3 Year Old Serial No. 040 Calibration No. 04 - 2

Test Date 08/05/2004



Transportation Research Center Inc.

572P Neck Flexion Test - 6 Channel Transducer

HIII 3 Year Old Serial No. 040 Calibration No. 04 - 1

Test Date 08/06/2004

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	47 %	Yes
Impact Velocity	5.40 - 5.60 m/s	5.58 m/s	Yes
Integrated Pendulum Velocity			
10 ms	2.00 - 2.70 m/s	2.44 m/s	Yes
15 ms	3.00 - 4.00 m/s	3.50 m/s	Yes
20 ms	4.00 - 5.10 m/s	4.76 m/s	Yes
Peak D Plane Rotation	70 - 82 °	72.7 °	Yes
Peak Moment About Occipital Condyles (During time interval rotation is within specified corridors)	42.0 - 53.0 N·m	42.70 N·m	Yes
Positive Moment Decay Time To 10 N·m	60 - 80 ms	70.72 ms	Yes

Test meets specifications.

Comments:

Technician



Approved



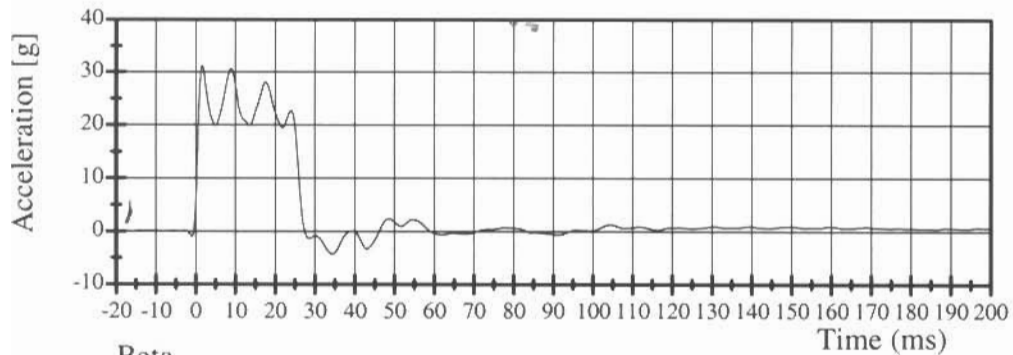
Transportation Research Center Inc.

572P Neck Flexion Test

HIII 3 Year Old Serial No. 040 Calibration No. 04 - 1

Test Date 08/06/2004

Pendulum Deceleration

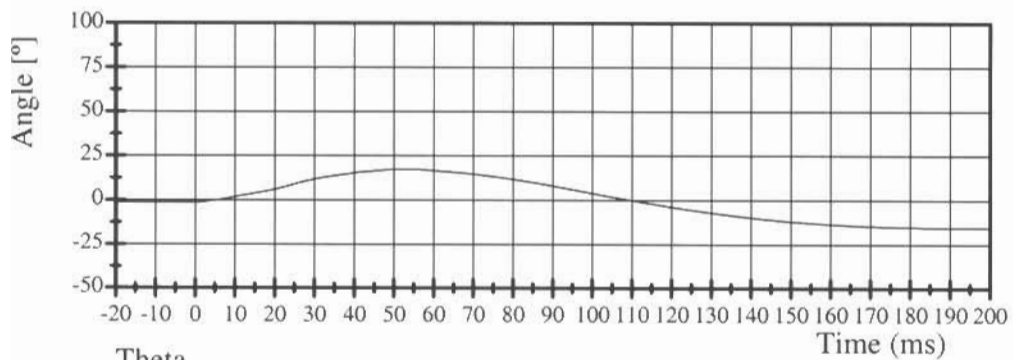


Filter Class: 180

Max: 31.2 g at 1.7 ms

Min: -4.3 g at 34.4 ms

Beta

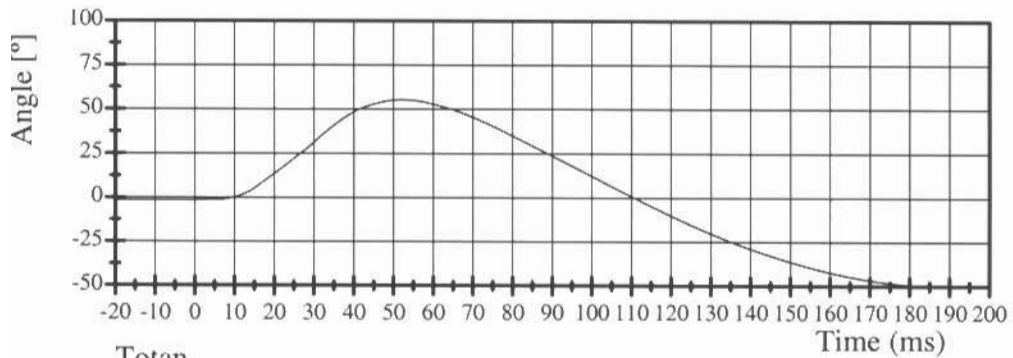


Filter Class: 60

Max: 17.4 ° at 52.0 ms

Min: -15.4 ° at 192.4 ms

Theta

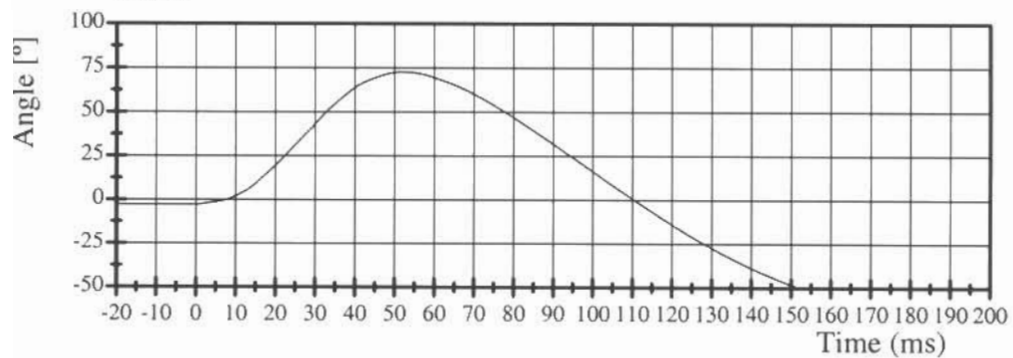


Filter Class: 60

Max: 55.3 ° at 52.0 ms

Min: -50.0 ° at 192.3 ms

Totan



Filter Class: 60

Max: 72.7 ° at 52.0 ms

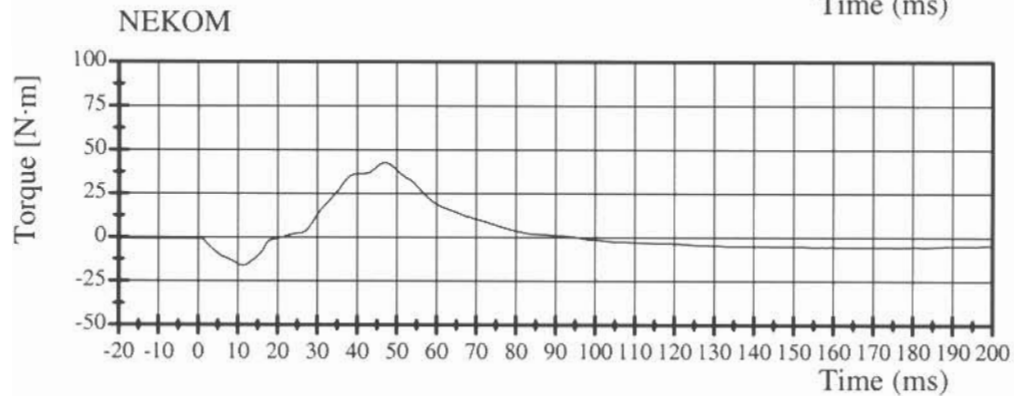
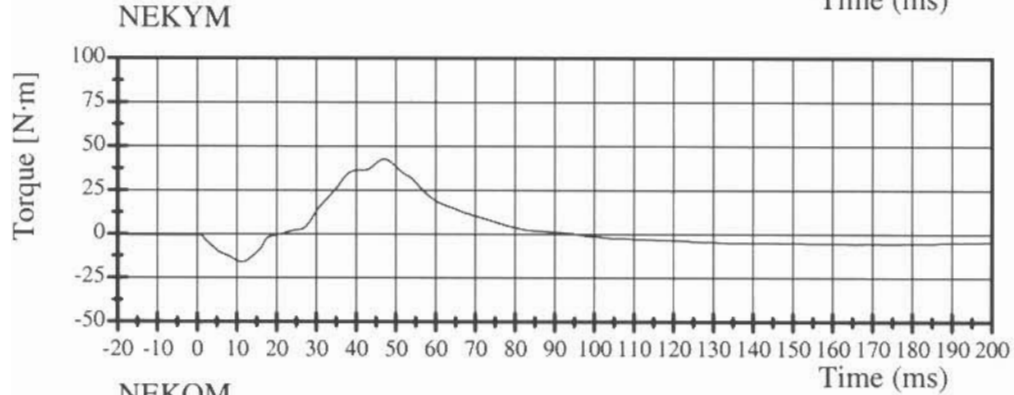
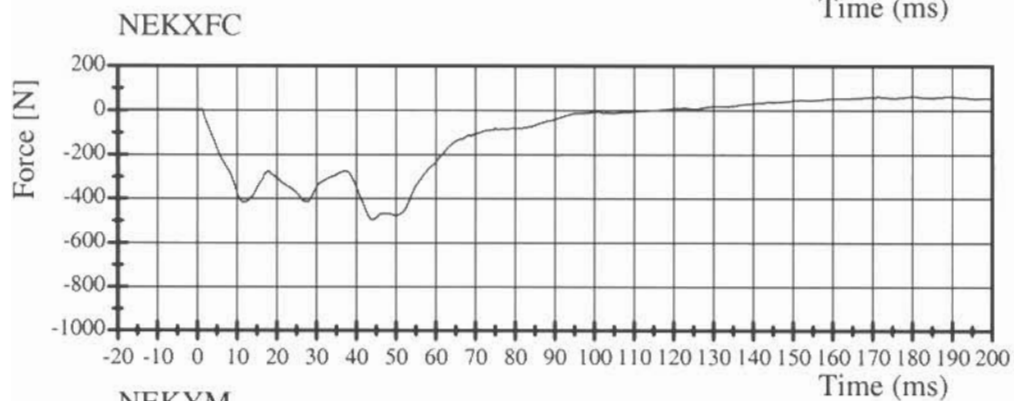
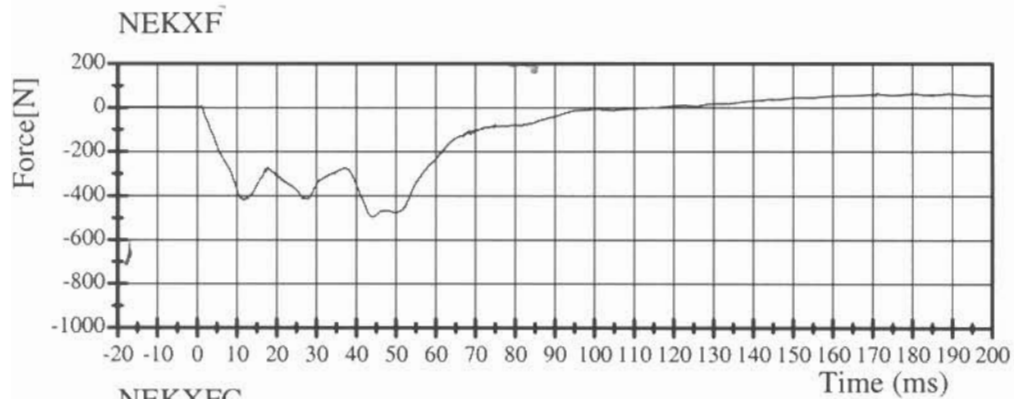
Min: -65.4 ° at 192.3 ms

Transportation Research Center Inc.

572P Neck Flexion Test

HIII 3 Year Old Serial No. 040 Calibration No. 04 - 1

Test Date 08/06/2004



Transportation Research Center Inc.

572P Neck Extension Test - 6 Channel Transducer

HIII 3 Year Old Serial No. 040 Calibration No. 04 - 3

Test Date 08/06/2004

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.8 °C	Yes
Relative Humidity	10 - 70 %	48 %	Yes
Impact Velocity	3.55 - 3.75 m/s	3.66 m/s	Yes
Integrated Pendulum Velocity			
10 ms	1.00 - 1.40 m/s	1.19 m/s	Yes
15 ms	1.90 - 2.50 m/s	2.10 m/s	Yes
20 ms	2.80 - 3.50 m/s	2.86 m/s	Yes
Peak D Plane Rotation	83 - 93 °	84.2 °	Yes
Peak Moment About Occipital Condyles (During time interval rotation is within specified corridors)	-53.3 - (-43.7) N·m	-44.22 N·m	Yes
Positive Moment Decay Time To -10 N·m	60 - 80 ms	70.80 ms	Yes

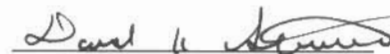
Test meets specifications.

Comments:

Technician



Approved



08.06.2004 10:06:41 1000

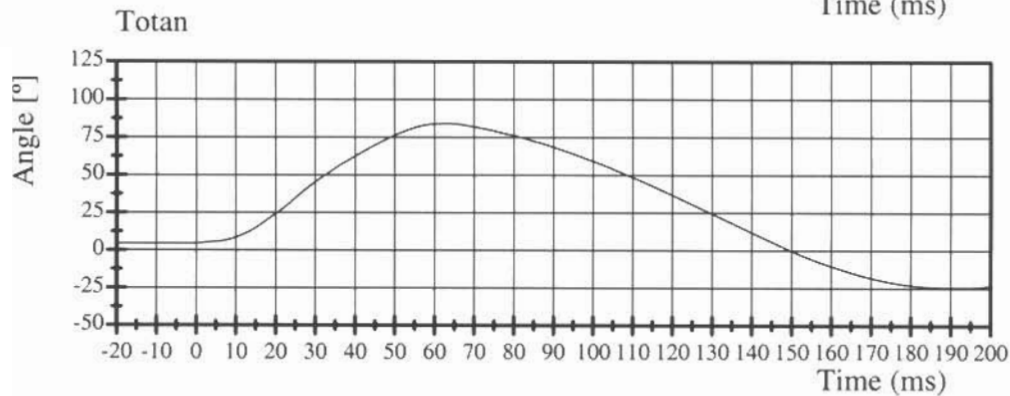
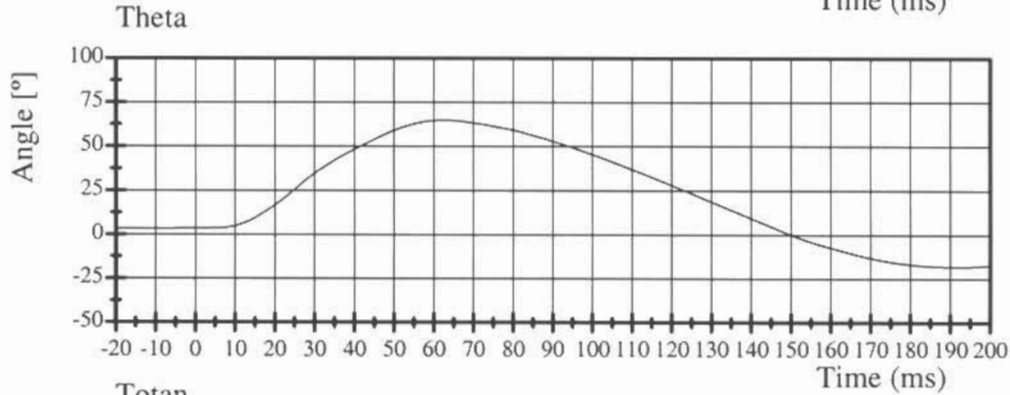
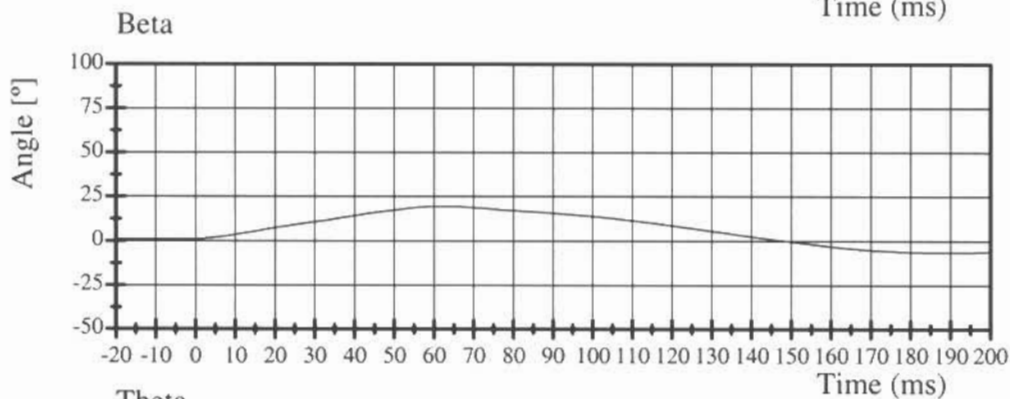
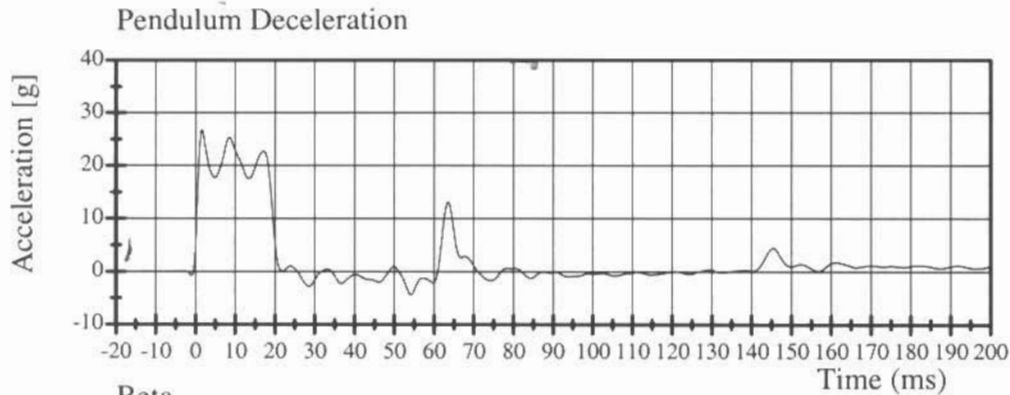


Transportation Research Center Inc.

572P Neck Extension Test

HIII 3 Year Old Serial No. 040 Calibration No. 04 - 3

Test Date 08/06/2004

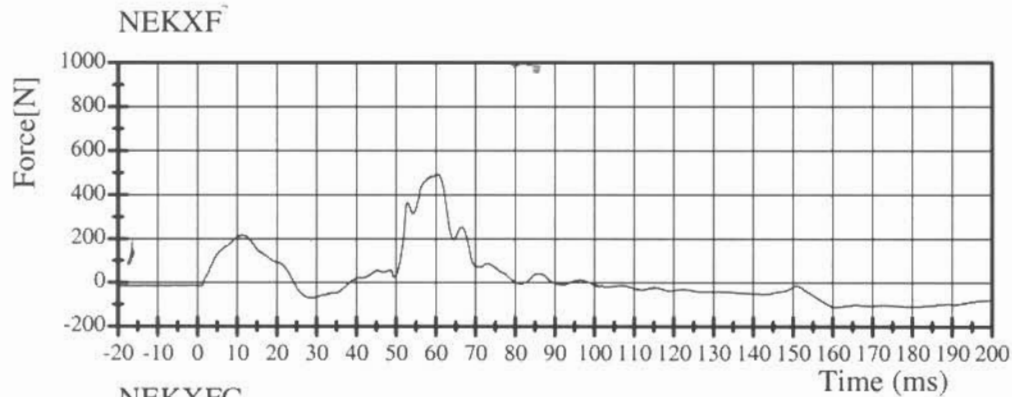


Transportation Research Center Inc.

572P Neck Extension Test

HIII 3 Year Old Serial No. 040 Calibration No. 04 - 3

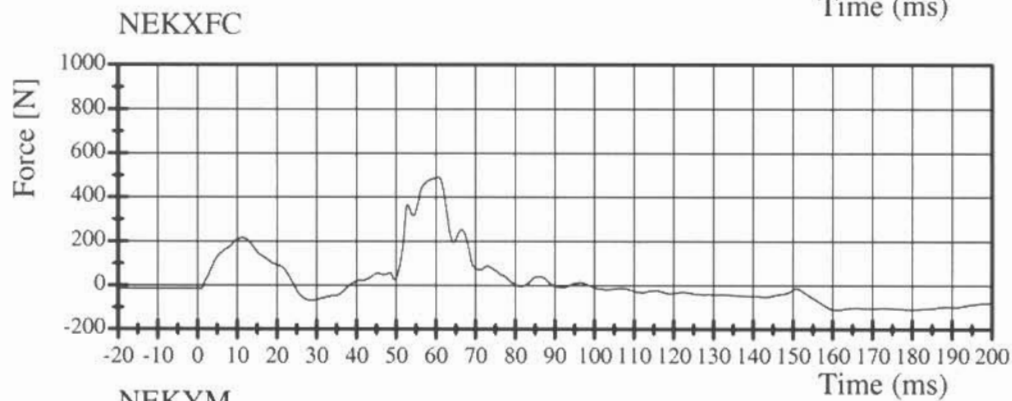
Test Date 08/06/2004



Filter Class: 1000

Max: 491.8 N at 60.8 ms

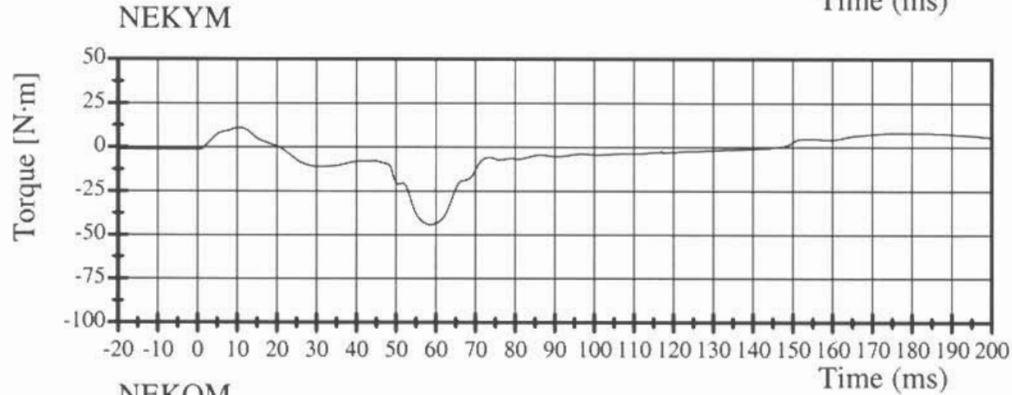
Min: -111.4 N at 161.0 ms



Filter Class: 600

Max: 491.8 N at 60.6 ms

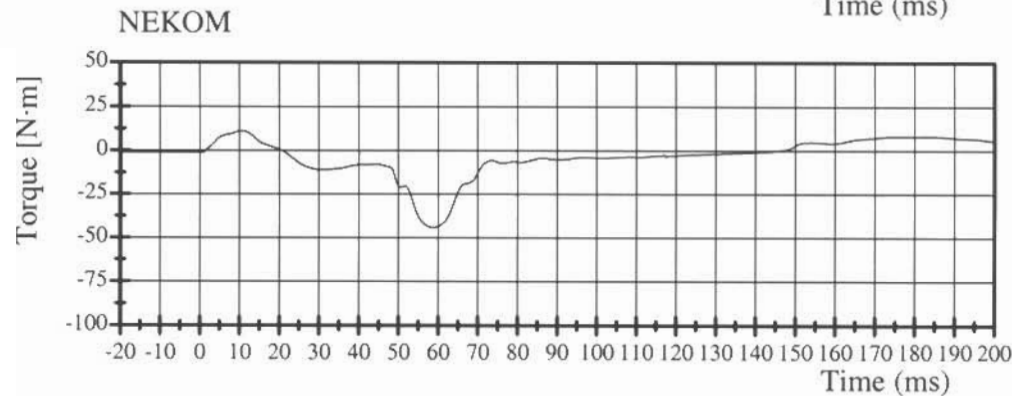
Min: -111.3 N at 161.0 ms



Filter Class: 600

Max: 11.1 N·m at 10.4 ms

Min: -44.2 N·m at 58.6 ms



Filter Class: 600

Max: 11.1 N·m at 10.4 ms

Min: -44.2 N·m at 58.6 ms

Transportation Research Center Inc.

572P Thorax Test

HIH 3 Year Old Serial No. 040 Calibration No. 04 - 1

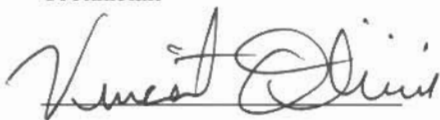
Test Date 08/05/2004

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	53 %	Yes
Pendulum Velocity	5.90 - 6.10 m/s	5.97 m/s	Yes
Maximum Chest Deflection	-38.0 - (-32.0) mm	-35.8 mm	Yes
Peak Impact Probe Force Within Compression Corridor	680 - 810 N	741 N	Yes
Internal Hysteresis	65 - 85 %	67 %	Yes
Maximum Force Between 12.5 mm & 32 mm Of Deflection	<= 910	758	Yes

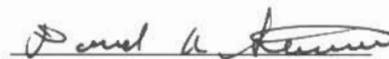
Test meets specifications.

Comments:

Technician



Approved



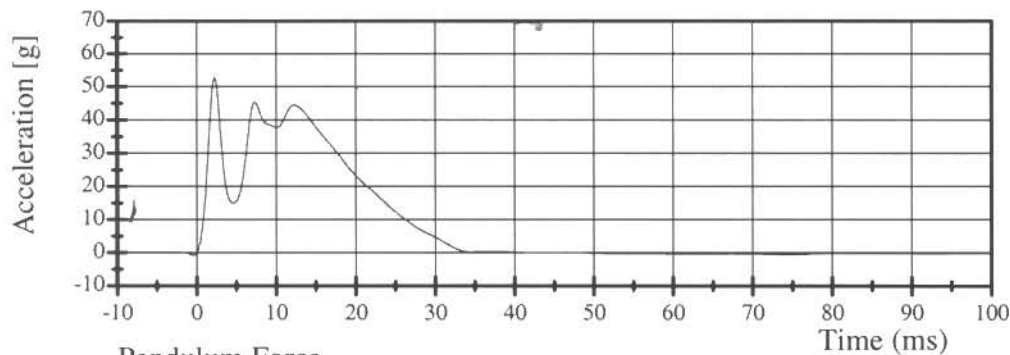
Transportation Research Center Inc.

572P Thorax Test

HIII 3 Year Old Serial No. 040 Calibration No. 04 - 1

Test Date 08/05/2004

Pendulum Deceleration

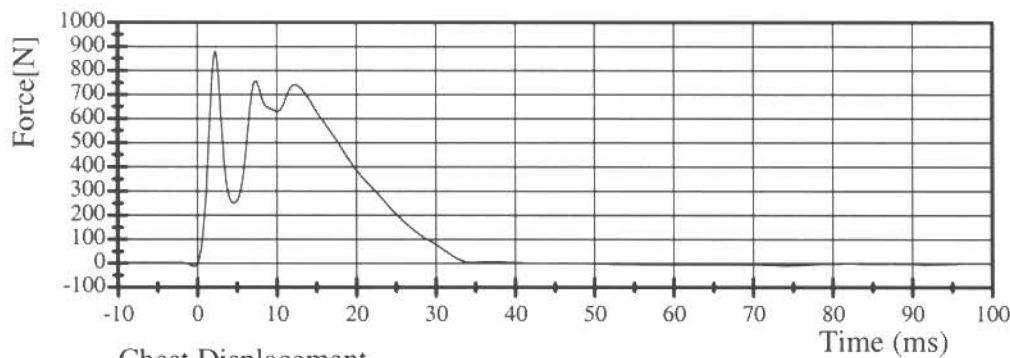


Filter Class: 180

Max: 52.8 g at 2.2 ms

Min: -0.7 g at -0.4 ms

Pendulum Force

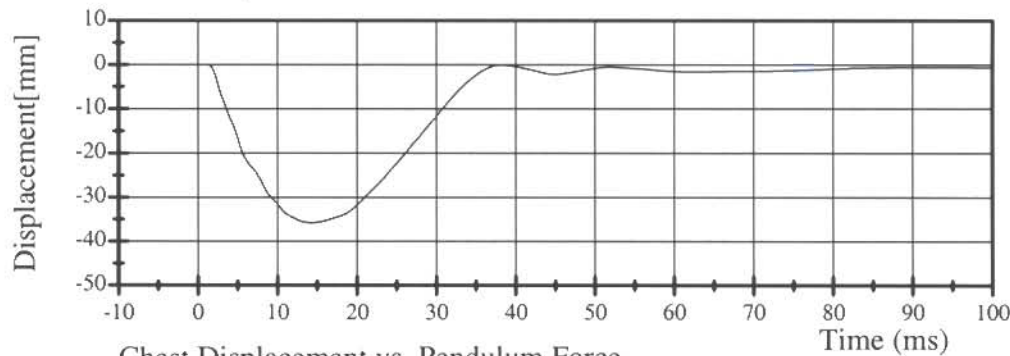


Filter Class: 180

Max: 880.2 N at 2.2 ms

Min: -11.7 N at -0.4 ms

Chest Displacement

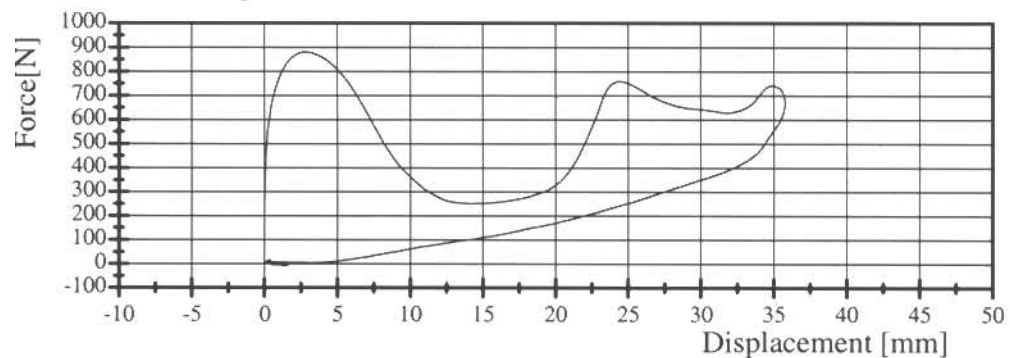


Filter Class: 600

Max: 0.0 mm at -80.0 ms

Min: -35.8 mm at 14.3 ms

Chest Displacement vs. Pendulum Force



TRANSPORTATION RESEARCH CENTER INC.

TORSO FLEXION TEST

HYBRID III THREE-YEAR-OLD

CAL DATE: 04-Aug-04

TRC, INC.

TEST NO: 040C04TF1

572 P SN 040 TORSO FLEX CAL 04

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 – 25.6 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY	10 – 70 %	56 %
INITIAL ANGLE OF UNSUPPORTRED DUMMY	<= 15 DEG. REFERENCED TO VERTICAL	8.3 DEG.
MAXIMUM FORCE AT 45 DEG. DURING 10 SECOND PERIOD	130 – 180 N	165.3 N
RETURN ANGLE		5.4 °
DIFFERENCE BETWEEN RETURN ANGLE & INTIAL ANGLE	+/- 8 ° OF INTIAL ANGLE	2.9 °
RATE	0.5° - 1.5°/sec	1.06 °/sec

TEST MEETS SPECIFICATIONS

TECHNICIAN



Transportation Research Center Inc.

ATD Calibration Report

for

VRTC

**HIII 10 Year Old
Serial No. D009
Calibration No. 01**



Transportation Research Center Inc.
P.O. Box B-67
10820 St. Rt. 347
East Liberty, OH 43319-0367

Transportation Research Center Inc.
572N HHH 10 Year Old Dummy
External Dimensions
Serial No. D009 Calibration No. 01
Date: 8/02/04

Symbol	Description	Specification*	Results	Pass
		mm	mm	
A	Total Sitting Height	710.3 - 736.6	726	Yes
B	Shoulder Pivot Height	384.8 - 405.1	395	Yes
C	Hip Pivot Height	77.5 - 87.6	84	Yes
D	Hip Pivot from Backline	133.1 - 143.3	142	Yes
E	Shoulder Pivot from Backline	80.0 - 90.2	85	Yes
F	Thigh Clearance	105.4 - 120.6	112	Yes
G	Back of Elbow to Wrist Pivot	227.4 - 242.6	233	Yes
H	Head Back to Backline	45.8 - 50.8	48	Yes
I	Shoulder to Elbow Length	269.2 - 284.5	271	Yes
J	Elbow Rest Height	137.2 - 157.5	145	Yes
K	Buttock to Knee Length	463.6 - 483.9	475	Yes
L	Popliteal Height	321.3 - 341.6	335	Yes
M	Knee to Floor Height	370.4 - 388.6	380	Yes
N	Buttock Popliteal Height	367.0 - 387.4	375	Yes
O	Chest Depth without Jacket	157.5 - 172.7	163	Yes
P	Foot Length	188.0 - 203.2	194	Yes
Q	Standing Height (A-C+R-D+M)	1296.7 REF	1299	
R	Buttock to Knee Pivot Length	414.0 - 434.3	419	Yes
S	Head Breadth	137.1 - 147.3	142	Yes
T	Head Depth	177.8 - 188.0	182	Yes
U	Hip Breadth	256.6 - 271.8	264	Yes
V	Shoulder Breadth	307.4 - 322.6	315	Yes
W	Foot Breadth	68.6 - 83.8	75	Yes
X	Head Circumference	528.3 - 548.7	538	Yes
Y	Chest Circumference with Jacket	690.9 - 716.3	704	Yes
Z	Waist Circumference	696.0 - 721.4	706	Yes
AA	Reference Location for Chest Circumference	337.8 - 348.0	342	Yes
BB	Reference Location for Waist Circumference	* *	182	

* With specification revisions provided by VRTC 08/02/04

** Measured 1 cm below top rear surface of pelvis flesh, parallel to pelvis rim

Technician



Approved




Transportation Research Center Inc.

Head Drop Test

HIII 10 Year Old Serial No. D009 Calibration No. 01 - 2

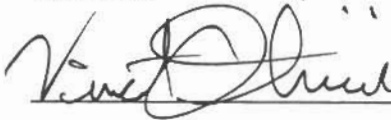
Test Date 07/26/2004

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	22.0 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
Peak Resultant Acceleration	240 - 295 g	246.4 g	Yes
Peak Lateral Acceleration	15 g Max	-1.7 g	Yes
Oscillations After Main Pulse	Less Than 10% of Peak Resultant Acceleration?	Yes	Yes

Test meets specifications.

Comments:

Technician



Approved



07.26.2004 11:13:55 609

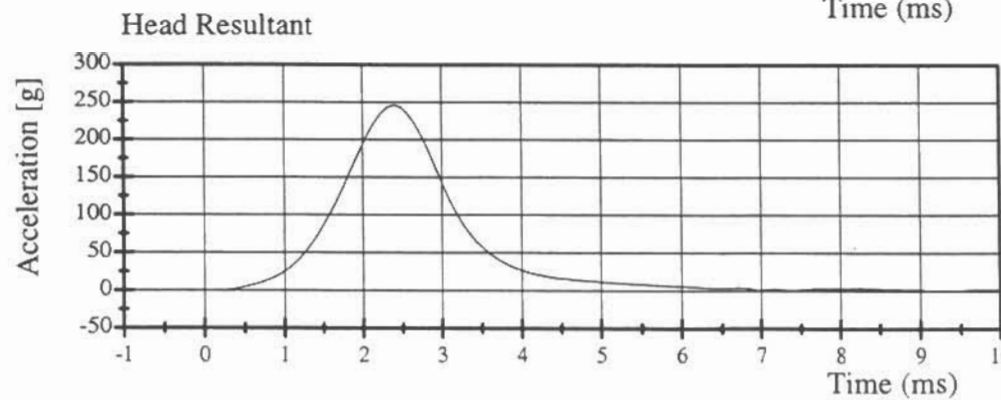
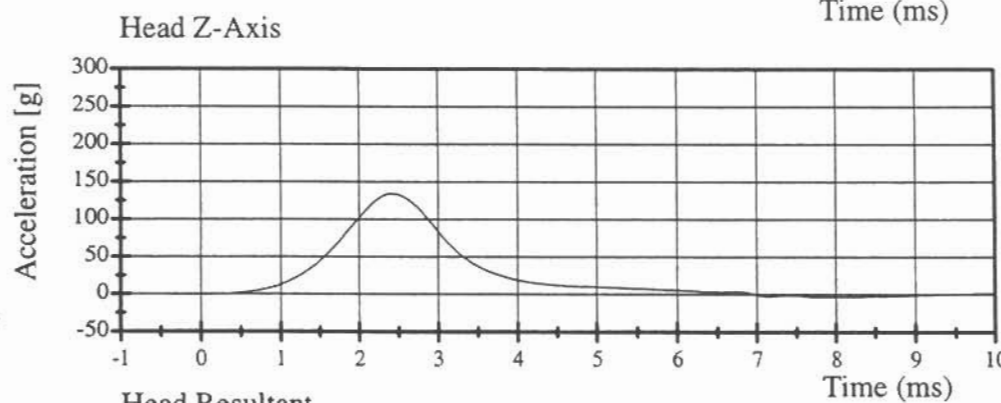
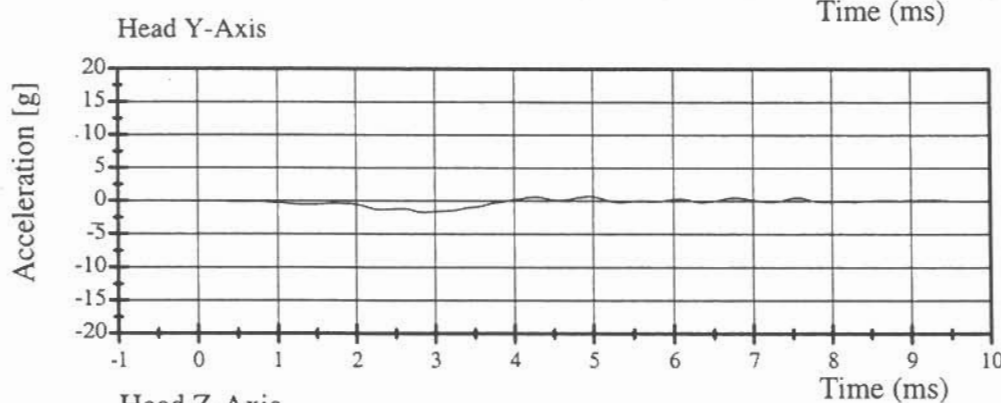
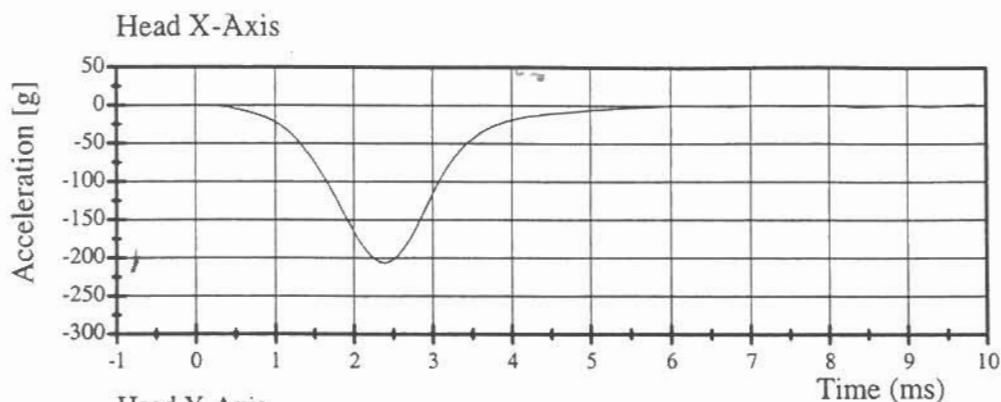


Transportation Research Center Inc.

Head Drop Test

HIII 10 Year Old Serial No. D009 Calibration No. 01 - 2

Test Date 07/26/2004



Transportation Research Center Inc.

Neck Flexion Test - 6 Channel Transducer

HIII 10 Year Old Serial No. D009 Calibration No. 01 - 1

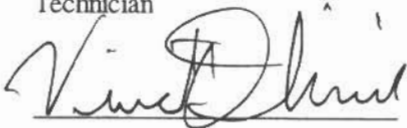
Test Date 07/29/2004

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	50 %	Yes
Impact Velocity	5.98 - 6.22 m/s	6.11 m/s	Yes
Integrated Pendulum Velocity			
10 ms	1.64 - 2.04 m/s	1.90 m/s	Yes
20 ms	3.04 - 4.04 m/s	3.71 m/s	Yes
30 ms	4.45 - 5.65 m/s	5.35 m/s	Yes
Peak D Plane Rotation	74.0 - 88.0 °	78.4 °	Yes
Peak Moment About Occipital Condyles (During time interval rotation is within specified corridors)	51.0 - 65.0 N·m	52.85 N·m	Yes
Positive Moment Decay Time To 10 N·m	85 - 105 ms	95.84 ms	Yes

Test meets specifications.

Comments:

Technician



Approved



07.29.2004 13:28:39 593



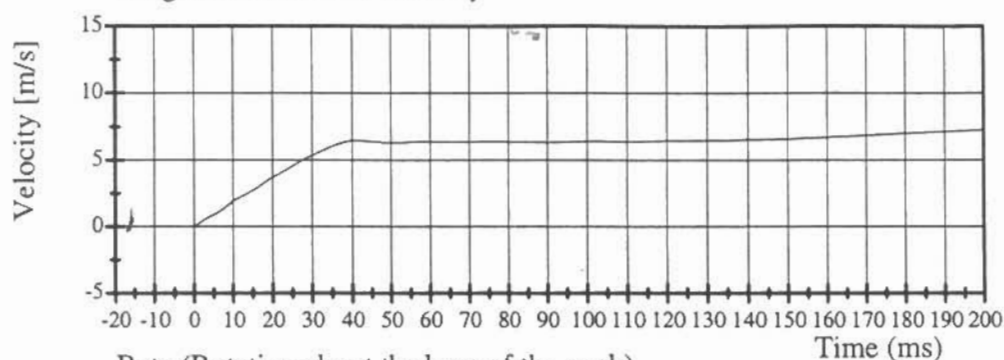
Transportation Research Center Inc.

Neck Flexion Test

HIII 10 Year Old Serial No. D009 Calibration No. 01 - 1

Test Date 07/29/2004

Integrated Pendulum Velocity

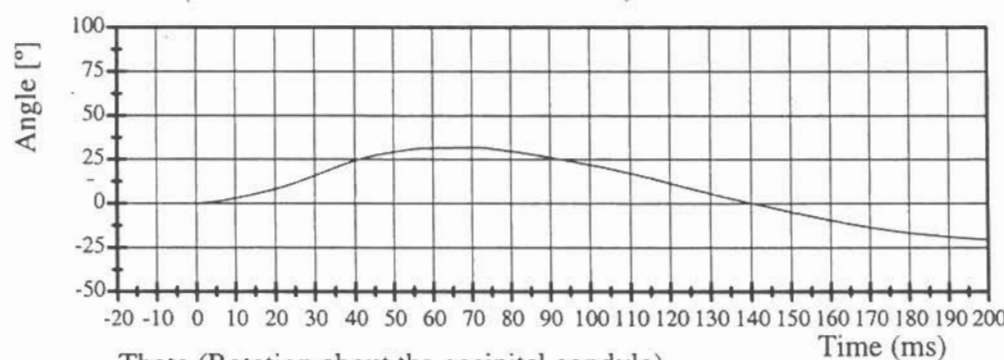


Filter Claßs: 180

Max: 7.95 m/s at 952.6 ms

Min: -0.00 m/s at -30.2 ms

Beta (Rotation about the base of the neck)

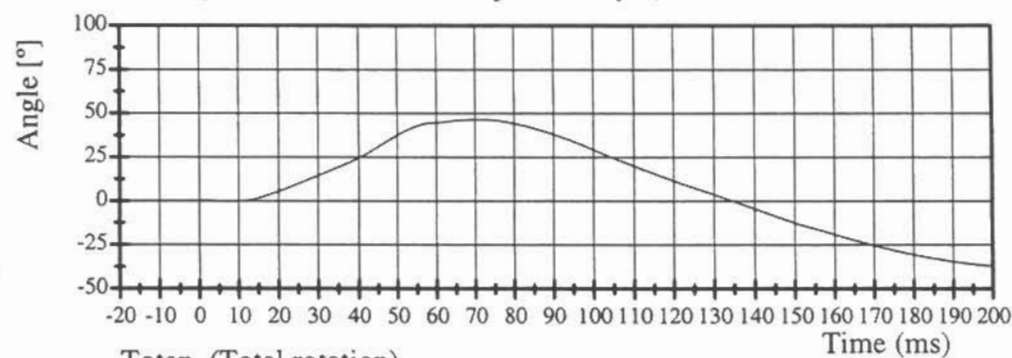


Filter Class: 60

Max: 32.0 ° at 68.8 ms

Min: -21.0 ° at 212.4 ms

Theta (Rotation about the occipital condyle)

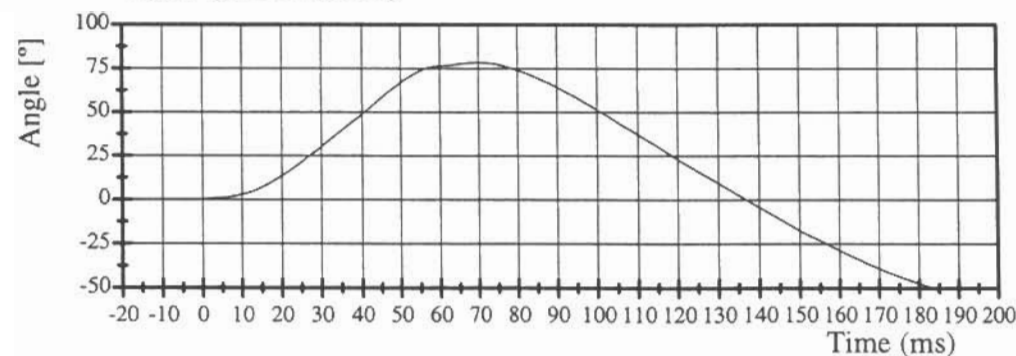


Filter Class: 60

Max: 46.4 ° at 71.0 ms

Min: -38.3 ° at 212.4 ms

Totan (Total rotation)



Filter Class: 60

Max: 78.4 ° at 69.7 ms

Min: -59.2 ° at 212.4 ms

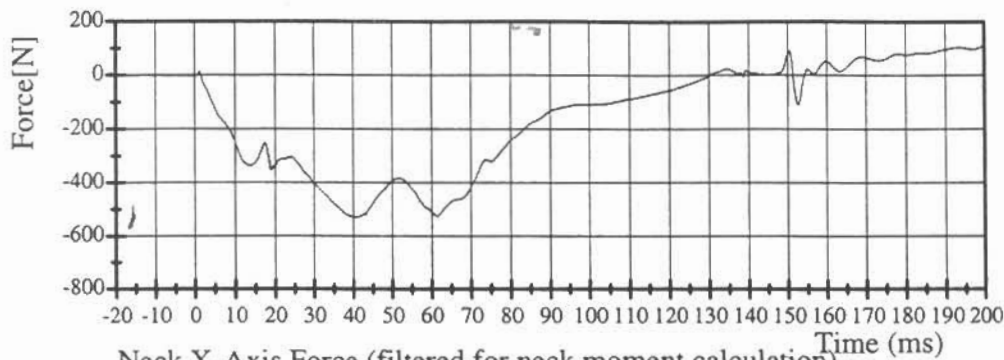
Transportation Research Center Inc.

Neck Flexion Test

HIII 10 Year Old Serial No. D009 Calibration No. 01 - 1

Test Date 07/29/2004

Neck X-Axis Force

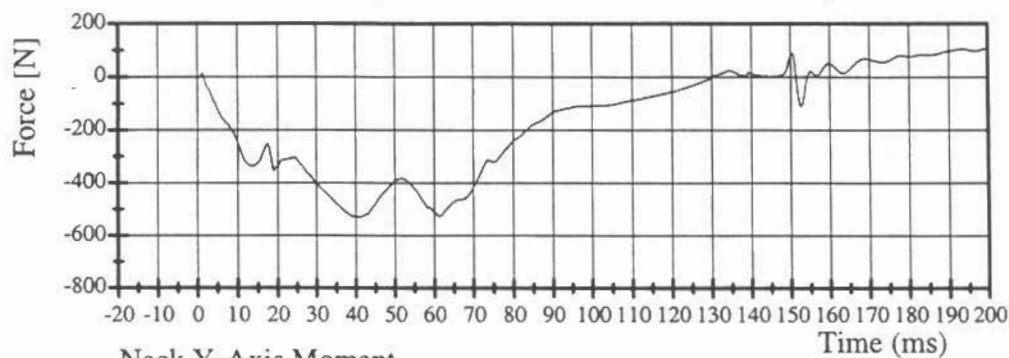


Filter Class: 1000

Max: 110.5 N at 201.4 ms

Min: -529.4 N at 40.5 ms

Neck X-Axis Force (filtered for neck moment calculation)

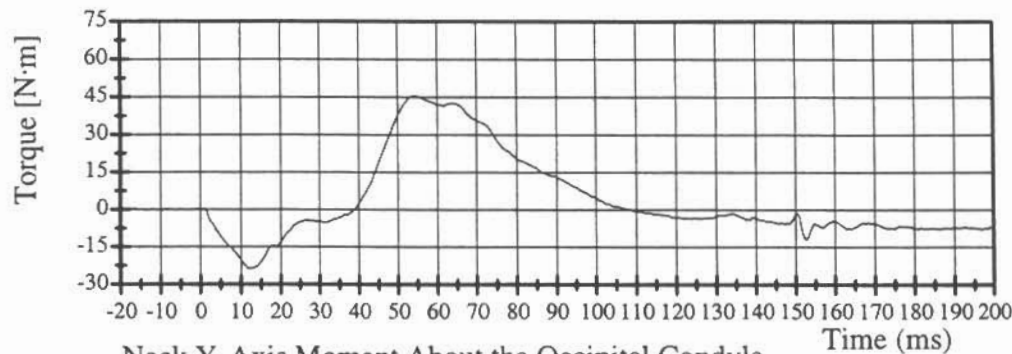


Filter Class: 600

Max: 110.2 N at 201.4 ms

Min: -529.2 N at 40.6 ms

Neck Y-Axis Moment

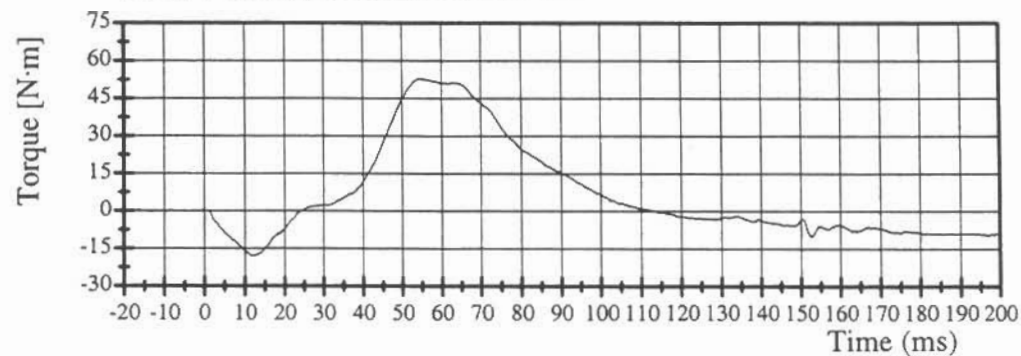


Filter Class: 600

Max: 45.5 N·m at 54.1 ms

Min: -23.6 N·m at 11.8 ms

Neck Y-Axis Moment About the Occipital Condyle



Filter Class: 600

Max: 52.9 N·m at 55.3 ms

Min: -18.0 N·m at 11.7 ms

Transportation Research Center Inc.

Neck Extension Test - 6 Channel Transducer

HIII 10 Year Old Serial No. D009 Calibration No. 01 - 1

Test Date 07/29/2004

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	48 %	Yes
Impact Velocity	4.91 - 5.15 m/s	5.01 m/s	Yes
Integrated Pendulum Velocity			
10 ms	1.49 - 1.89 m/s	1.62 m/s	Yes
20 ms	2.88 - 3.68 m/s	3.15 m/s	Yes
30 ms	4.20 - 5.20 m/s	4.60 m/s	Yes
Peak D Plane Rotation	98.5 - 113.5 °	104.2 °	Yes
Peak Moment About Occipital Condyles (During time interval rotation is within specified corridors)	(-47.0) - (-35.0) N·m	-40.40 N·m	Yes
Negative Moment Decay Time To -10 N·m	100 - 120 ms	107.36 ms	Yes

Test meets specifications.

Comments:

Technician

Vince Oliveri

Approved

V. J. Watter

07.29.2004 14:22:22 724



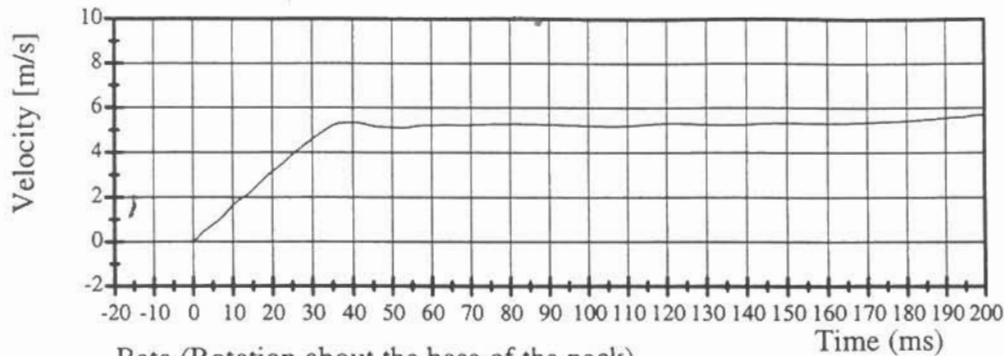
Transportation Research Center Inc.

Neck Extension Test

HIII 10 Year Old Serial No. D009 Calibration No. 01 - 1

Test Date 07/29/2004

Integrated Pendulum Velocity

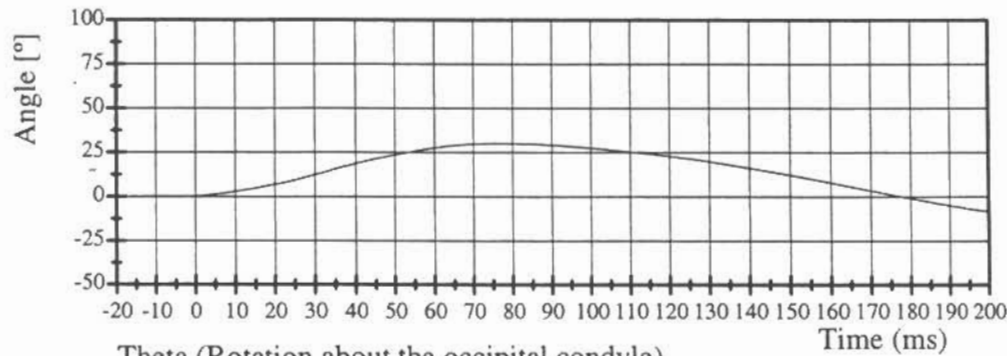


Filter Class: 180

Max: 6.7 m/s at 857.0 ms

Min: -0.0 m/s at -0.6 ms

Beta (Rotation about the base of the neck)

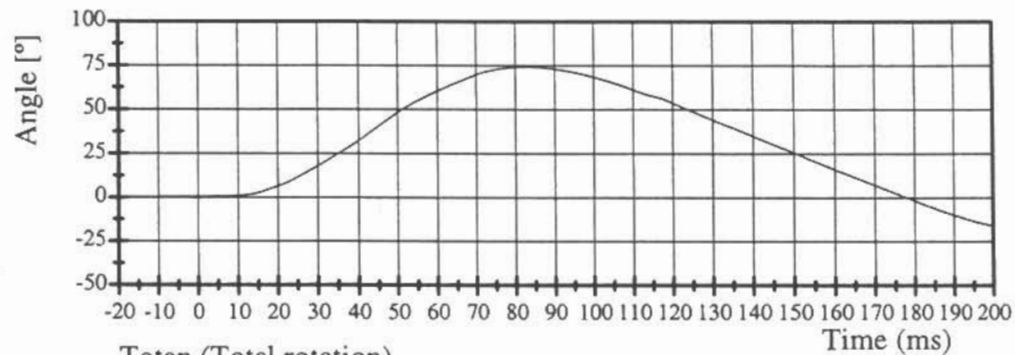


Filter Class: 60

Max: 30.0 ° at 73.8 ms

Min: -12.9 ° at 232.6 ms

Theta (Rotation about the occipital condyle)

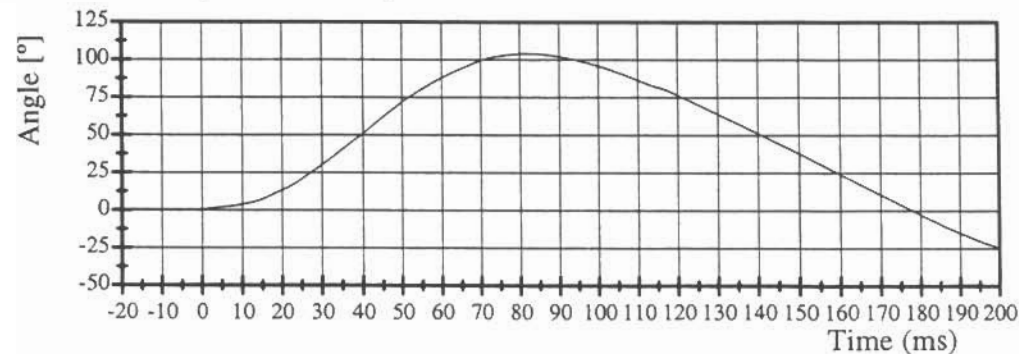


Filter Class: 60

Max: 74.3 ° at 82.9 ms

Min: -23.5 ° at 229.0 ms

Totan (Total rotation)



Filter Class: 60

Max: 104.2 ° at 82.5 ms

Min: -36.4 ° at 229.3 ms

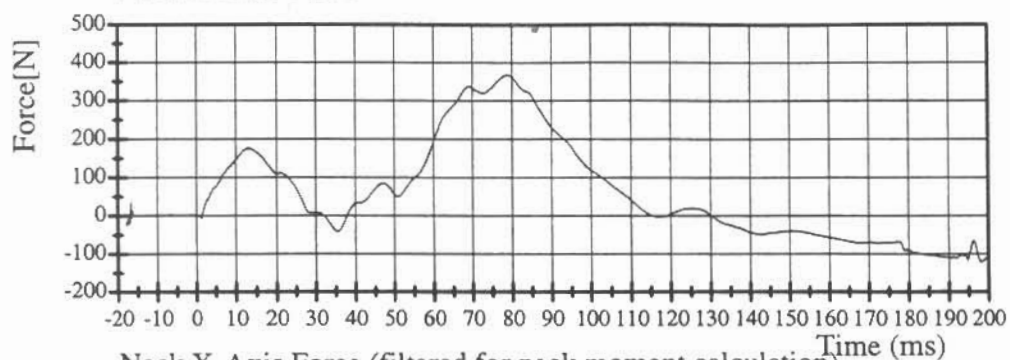
Transportation Research Center Inc.

Neck Extension Test

HIII 10 Year Old Serial No. D009 Calibration No. 01 - 1

Test Date 07/29/2004

Neck X-Axis Force

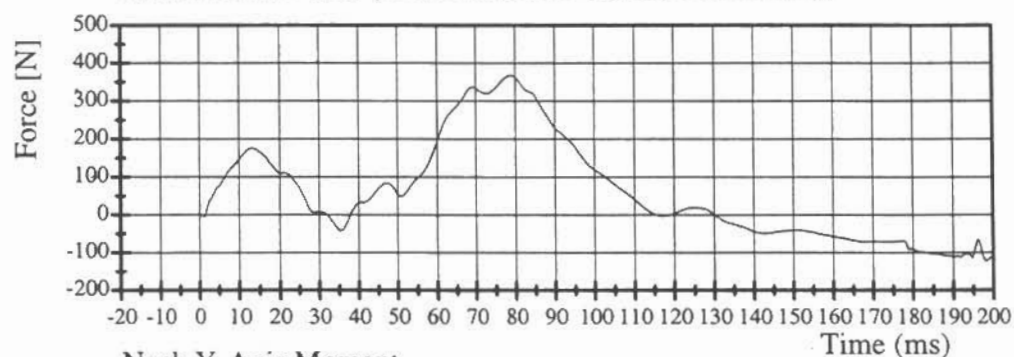


Filter Class: 1000

Max: 367.7 N at 78.9 ms

Min: -140.6 N at 211.0 ms

Neck X-Axis Force (filtered for neck moment calculation)

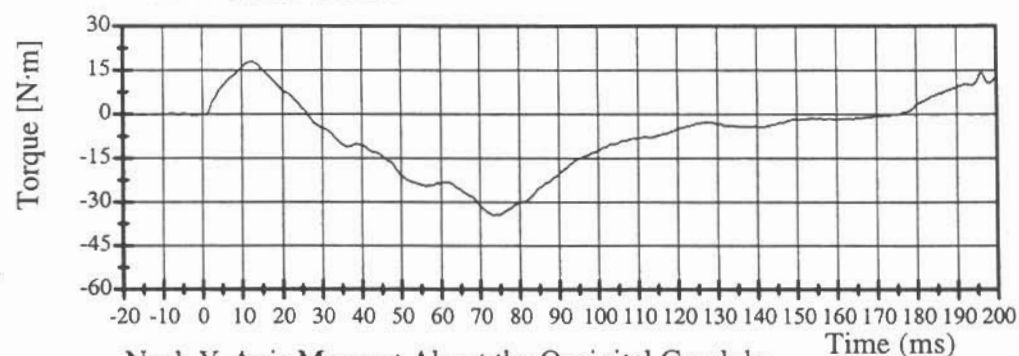


Filter Class: 600

Max: 367.4 N at 78.9 ms

Min: -140.3 N at 211.0 ms

Neck Y-Axis Moment

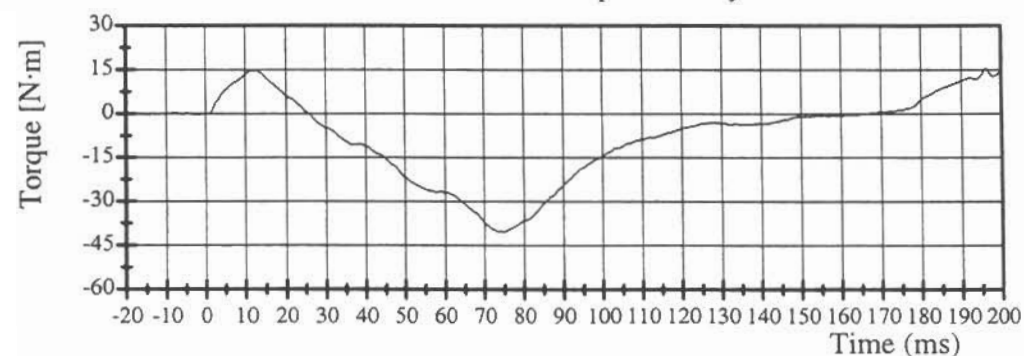


Filter Class: 600

Max: 17.9 N·m at 12.6 ms

Min: -34.6 N·m at 73.4 ms

Neck Y-Axis Moment About the Occipital Condyle



Filter Class: 600

Max: 16.8 N·m at 224.0 ms

Min: -40.4 N·m at 74.7 ms

Transportation Research Center Inc.

Thorax Test

HIII 10 Year Old Serial No. D009 Calibration No. 01 - 8

Test Date 08/02/2004

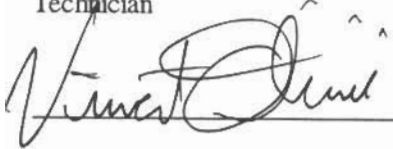
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
Pendulum Velocity	5.88 - 6.12 m/s	5.88	Yes
Maximum Chest Deflection	-47.0 - (-39.0) mm	-42.5 mm	Yes
Peak Impact Probe Force Within Compression Corridor	1830 - 2330 N	2312 N	Yes
Internal Hysteresis	65 - 85 %	83.6 %	Yes

Test Meets Specifications.

Comments:

New rib stiffeners and replacement rib set # 22030024A installed.

Technician



Approved



08.02.2004 15:21:42 1166

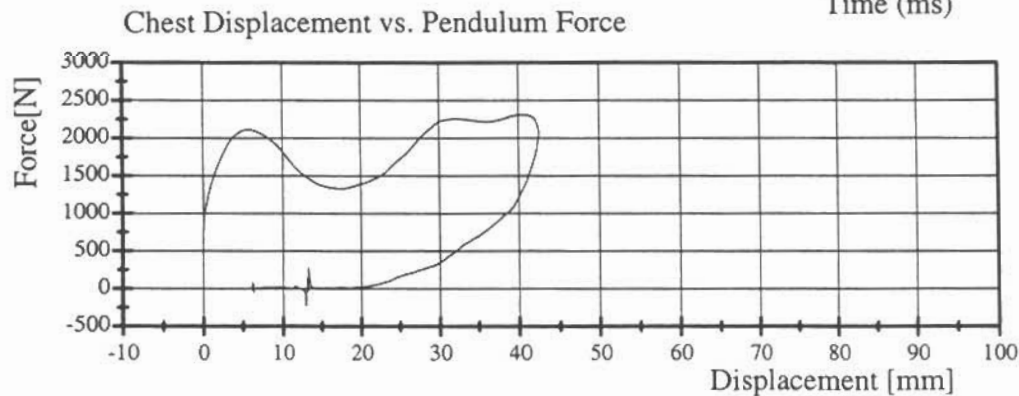
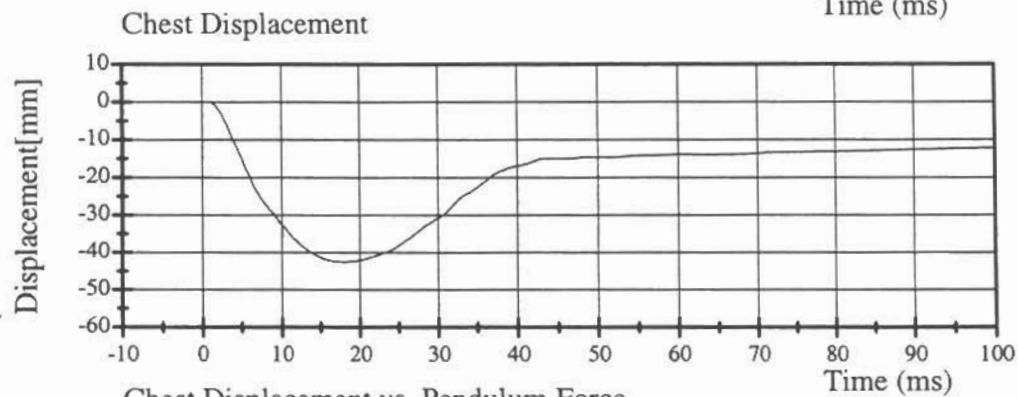
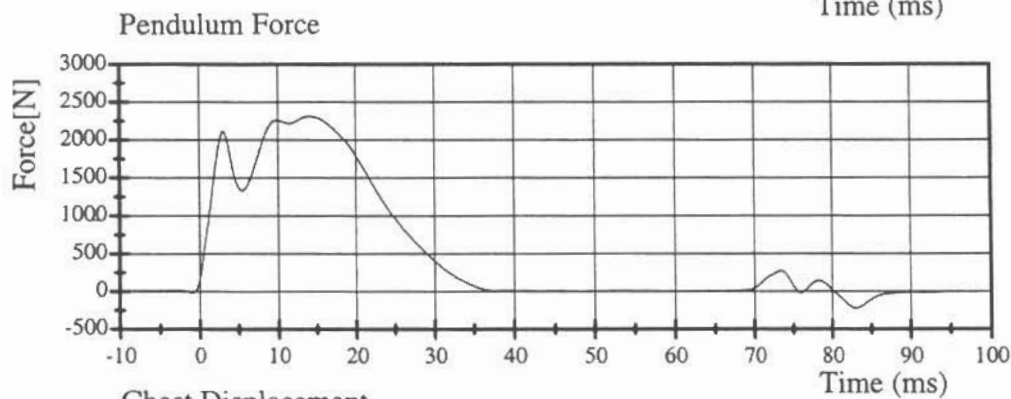
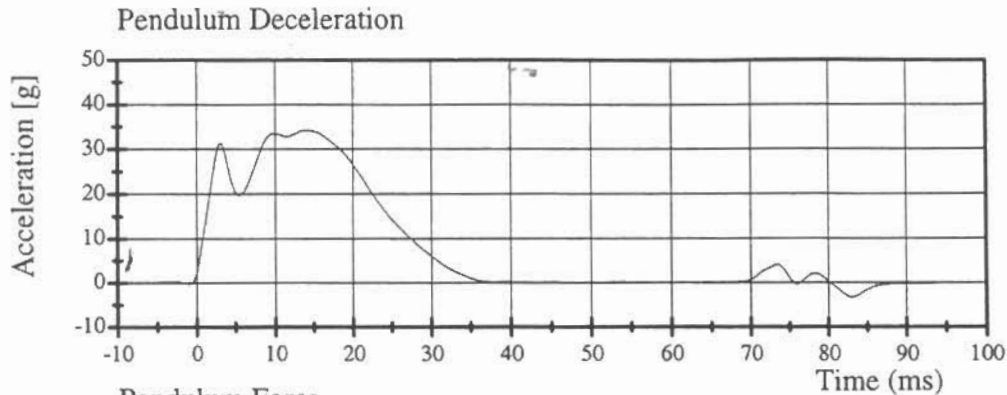


Transportation Research Center Inc.

Thorax Test

HIII 10 Year Old Serial No. D009 Calibration No. 01 - 8

Test Date 08/02/2004



TRANSPORTATION RESEARCH CENTER INC.

TORSO FLEXION TEST

HYBRID III TEN YEAR-OLD

CAL DATE: 23-Jul-04

TRC, INC.

TEST NO: D009C01TF8

SND009 TORSO FLEX CAL 01

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	20.6 – 22.2° C	21.7 ° C
RELATIVE HUMIDITY	10 – 70 %	50 %
INITIAL ANGLE OF UNSUPPORTRED DUMMY	<= 20° REFERENCED TO VERTICAL	15.0 °
MAXIMUM FORCE AT 35 DEG. DURING 10 SECOND PERIOD	180 - 240 N	232.3 N
RETURN ANGLE		19.6 °
DIFFERENCE BETWEEN RETURN ANGLE & INTIAL ANGLE	+/- 8 ° OF INTIAL ANGLE	4.6 °
RATE	0.5° - 1.5°/sec	1.00 °/sec

TEST MEETS SPECIFICATIONS

Comments:

TECHNICIAN



Transportation Research Center Inc.

Left Knee Test

HIII 10 Year Old Serial No. D009 Calibration No. 01 - 1

Test Date 07/30/2004

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	55 %	Yes
Pendulum Velocity	2.07 - 2.13 m/s	2.09 m/s	Yes
Maximum Pendulum Force	2560 - 3140 N	2958 N	Yes

Test meets specifications.

Comments:

Technician



Approved



07.30.2004 15:10:53 1855



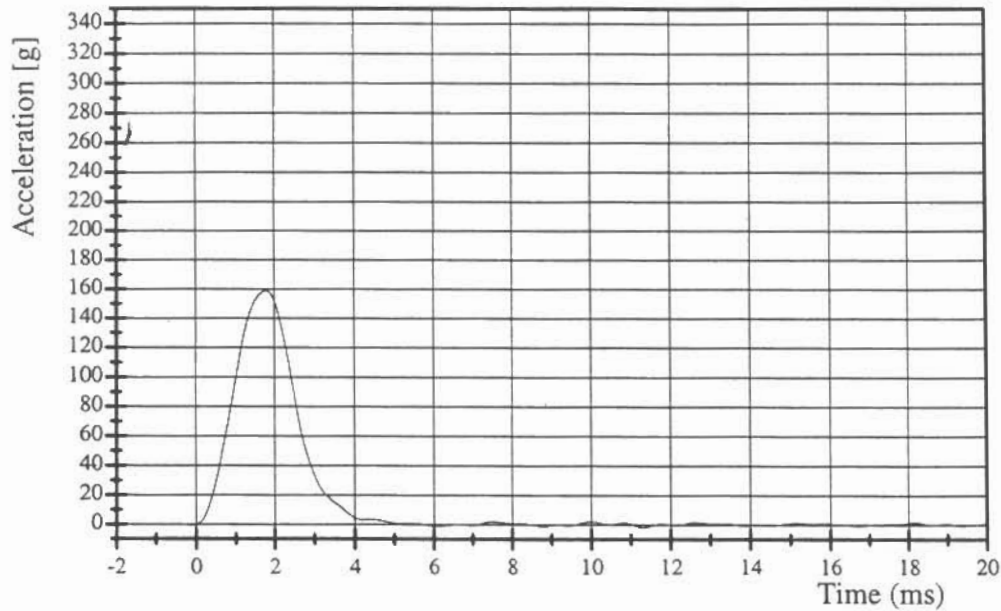
Transportation Research Center Inc.

Left Knee Test

HIII 10 Year Old Serial No. D009 Calibration No. 01 - 1

Test Date 07/30/2004

Pendulum Deceleration

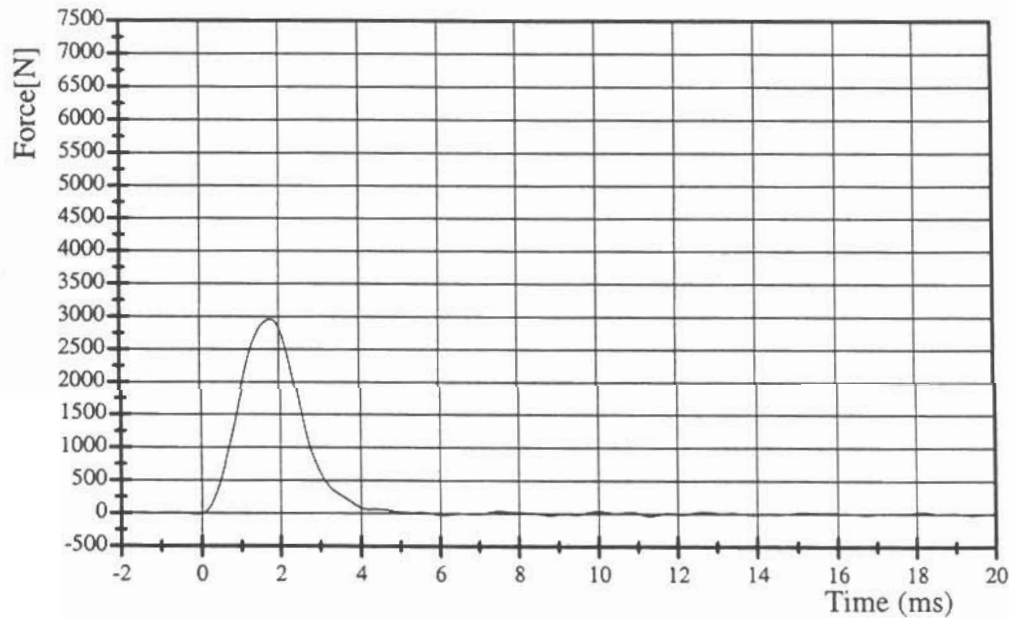


Filter Class: 600

Max: 158.8 g at 1.8 ms

Min: -1.9 g at 11.3 ms

Pendulum Force



Filter Class: 600

Max: 2958.4 N at 1.8 ms

Min: -34.8 N at 11.3 ms

07.30.2004 15:10:54 1855



Transportation Research Center Inc.

Right Knee Test

HIII 10 Year Old Serial No. D009 Calibration No. 01 - 1

Test Date 07/30/2004

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	55 %	Yes
Pendulum Velocity	2.07 - 2.13 m/s	2.09 m/s	Yes
Maximum Pendulum Force	2560 - 3140 N	3022 N	Yes

Test meets specifications.

Comments:

Technician



Approved



07.30.2004 15:24:00 1854



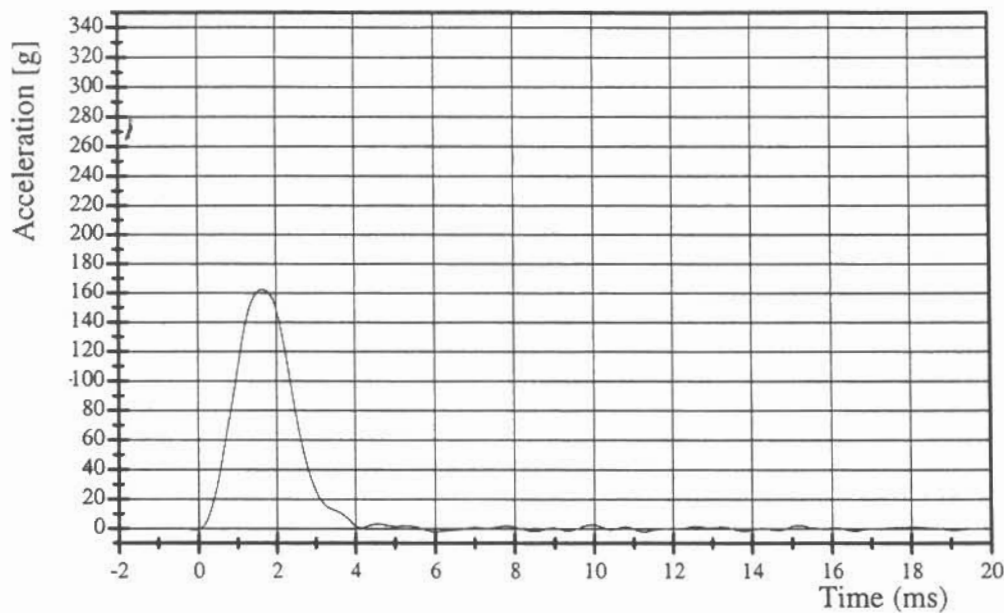
Transportation Research Center Inc.

Right Knee Test

HIII 10 Year Old Serial No. D009 Calibration No. 01 - 1

Test Date 07/30/2004

Pendulum Deceleration

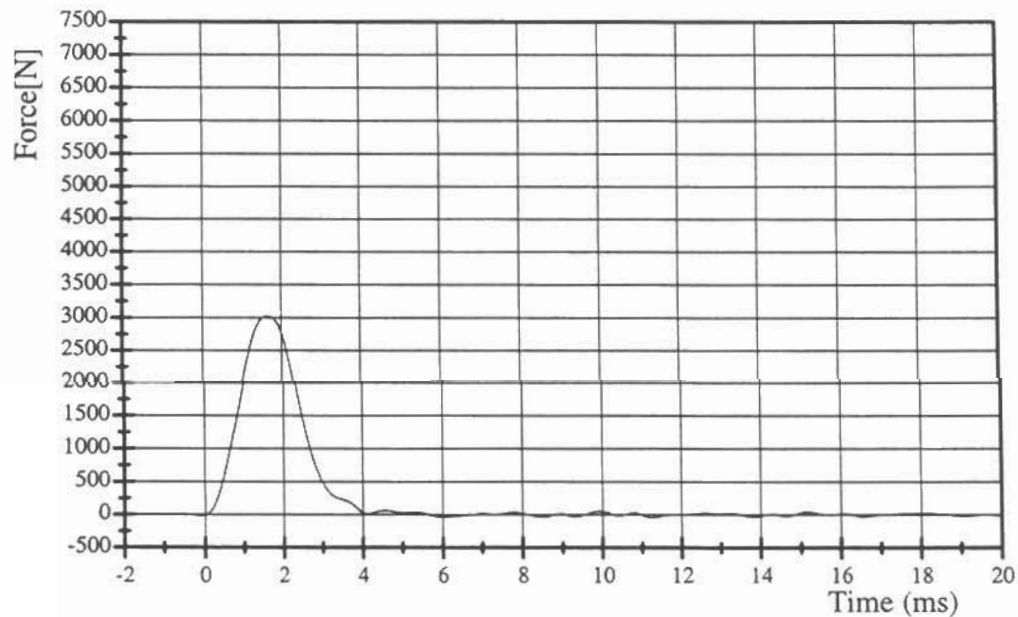


Filter Class: 600

Max: 162.2 g at 1.7 ms

Min: -2.2 g at 11.3 ms

Pendulum Force



Filter Class: 600

Max: 3022.0 N at 1.7 ms

Min: -40.4 N at 11.3 ms

SECTION 6

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

HYBRID III INSTRUMENTATION

	POSITION #3 (RIGHT) SERIAL NO.: 3672098 P1 - 22JAN04		
	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
HEAD AX	AC-J36611	ENDEVCO	25-Jan-05
HEAD AY	AC-P35789	ENDEVCO	04-Jan-05
HEAD AZ	AC-J27466	ENDEVCO	25-Jan-05
UPPER NECK FX	LC-210Fx	Denton	02-Aug-04
UPPER NECK FY	LC-210Fy	Denton	02-Aug-04
UPPER NECK FZ	LC-210Fz	Denton	02-Aug-04
UPPER NECK MX	LC-210Mx	Denton	02-Aug-04
UPPER NECK MY	LC-210My	Denton	02-Aug-04
UPPER NECK MZ	LC-210Mz	Denton	02-Aug-04
CHEST AX	AC-J20047	ENDEVCO	25-Jan-05
CHEST AY	AC-CC92H	ENDEVCO	25-Jan-05
CHEST AZ	AC-J29006	ENDEVCO	25-Jan-05
CHEST DISPLACEMENT X	DS-040	SERVO	02-Aug-04
PELVIS AX	AC-01G18-F09	ENTRAN	25-Jan-05
PELVIS AY	AC-J27525	ENDEVCO	25-Jan-05
PELVIS AZ	AC-J17988	ENDEVCO	25-Jan-05
TETHER BELT LOAD	LC-174	First Technology	01-Nov-04
LATCH BELT LOAD	LC-712	LEBOW	01-Nov-04

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

HYBRID III INSTRUMENTATION

	POSITION #4 (LEFT) SERIAL NO.: JJ 0917041915543 - 091704		
	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
HEAD AX	AC-P16616	ENDEVCO	16-Aug-04
HEAD AY	AC-P16628	ENDEVCO	16-Aug-04
HEAD AZ	AC-P23178	ENDEVCO	16-Aug-04
UPPER NECK FX	LC-1625Fx	DENTON	20-Jul-04
UPPER NECK FY	LC-1625Fy	DENTON	20-Jul-04
UPPER NECK FZ	LC-1625Fz	DENTON	20-Jul-04
UPPER NECK MX	LC-1625Mx	DENTON	20-Jul-04
UPPER NECK MY	LC-1625My	DENTON	20-Jul-04
UPPER NECK MZ	LC-1625Mz	DENTON	20-Jul-04
Left Clavicle Fx	LC-075LFx	Denton	26-Aug-04
Left Clavicle Fz	LC-075LFz	DENTON	26-Aug-04
Right Clavicle Fx	LC-075RFx	Denton	26-Aug-04
Right Clavicle Fz	LC-075RFz	Denton	26-Aug-04
CHEST AX	AC-P32224	ENDEVCO	16-Aug-04
CHEST AY	AC-P32204	ENDEVCO	16-Aug-04
CHEST AZ	AC-P16625	ENDEVCO	16-Aug-04
CHEST DISPLACEMENT X	DS-009	SERVO	21-Jul-04
LUMBAR FX	LC-135Fx	DENTON	26-Aug-04
LUMBAR FY	LC-135Fy	DENTON	26-Aug-04
LUMBAR FZ	LC-135Fz	DENTON	26-Aug-04
LUMBAR MX	LC-135Mx	DENTON	26-Aug-04
LUMBAR MY	LC-135My	DENTON	26-Aug-04
LUMBAR MZ	LC-135Mz	DENTON	26-Aug-04
PELVIS AX	AC-P23940	ENDEVCO	16-Aug-04
PELVIS AY	AC-P23804	ENDEVCO	12-Nov-04
PELVIS AZ	AC-P18741	ENDEVCO	16-Aug-04
LEFT LOWER ASIS FX	LC-089LLFx	Denton	25-Aug-04
LEFT UPPER ASIS FX	LC-089LUFx	Denton	25-Aug-04
RIGHT LOWER ASIS FX	LC-089RLFx	Denton	25-Aug-04
RIGHT UPPER ASIS FX	LC-089RUFx	Denton	25-Aug-04
LEFT FEMUR	LC-237	DENTON	21-Jul-04
RIGHT FEMUR	LC-238	DENTON	21-Jul-04
LAP BELT LOAD	LC-711	LEBOW	01-Nov-04
SHOULDER BELT LOAD	LC-175	First Technology	01-Nov-04

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

CRS INSTRUMENTATION

	CRS Accelerometers		
	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
P3 CRS AX	AC-J32185	ENDEVCO	04-Nov-04
P3 CRS AY	AC-J30041	ENDEVCO	10-Jan-05
P3 CRS AZ	AC-J33843	ENDEVCO	08-Sep-04