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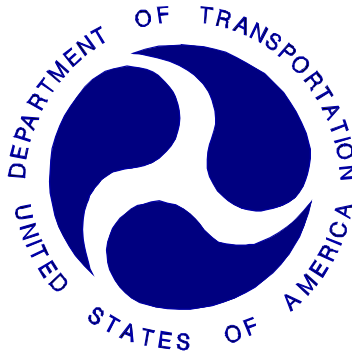
**NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST**

TOYOTA MOTOR MANUFACTURING, INDIANA, INC.
2005 TOYOTA SIENNA
MPV

NHTSA NUMBER: M55104

GENERAL DYNAMICS TEST NUMBER: 8642-NCAP-53

GENERAL DYNAMICS
ADVANCED INFORMATION ENGINEERING SERVICES
TRANSPORTATION SCIENCES CENTER
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December 8, 2004

FINAL REPORT

PREPARED FOR:

U. S. DEPARTMENT OF TRANSPORTATION
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 Toyota Sienna MPV was performed at General Dynamics crash test facility in Buffalo, New York, on December 8, 2004 . The impact velocity was 56.33 kph and the temperature at the barrier face was 21.0 °C. The maximum post-test vehicle crush was 541 mm. The test vehicle was equipped with 3-point restraint systems, 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)	472.7	44.8	-36.3	-3685.4	-3443.5
Passenger (064)	403.5	39.4	-26.8	-3674.1	-3426.9
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 56.33 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 56.33 kph frontal barrier impact test was conducted in accordance with the Office of Crashworthiness Standards Laboratory Indicant Test procedure.

1.2 TEST PROCEDURE

This 56.33 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 installed 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 calibrated previous to this test. 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 196 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 Toyota Sienna MPV at a velocity of 56.33 kph. The test was performed at General Dynamics on December 8, 2004 . 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	472.7	44.8	-36.3	-3685.4	-3443.5	N/A	0
Passenger ATD	403.5	39.4	-26.8	-3674.1	-3426.9	N/A	0

AUTOMATIC DOOR LOCK SUMMARY

ADL Equipped Test Vehicle:	Yes
ADL Activation Status:	Yes (System can not be deactivated)
Door Lock Condition:	Locked

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 541 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 center of the airbag, the back of the head to the outboard half 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 right half of the airbag, the back of the head to the outboard half of the head restraint, the chest to the airbag and the left and right knees to the glove compartment door.

The 2005 Toyota Sienna MPV 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.:	<u>M55104</u>	Test Mode:	<u>56.3 kph Frontal Barrier</u>
Test Date:	<u>December 8, 2004</u>	Time:	<u>13:20</u> Temperature: <u>21.0</u> °C
Vehicle Make/Model/Body Style:	<u>2005 Toyota Sienna MPV</u>		
Vehicle Test Weight:	<u>2165.0</u>	kg	
Vehicle/Barrier Impact Angle:	<u>0</u>	°	
Impact Velocity:	<u>56.33</u>	kph	
Maximum Static Crush:	<u>541</u>	mm	
Vehicle Rebound:	<u>791</u>	mm	
<u>DUMMIES:</u>	<u>DRIVER</u>	<u>PASSENGER</u>	
Type:	<u>572E</u>	<u>572E</u>	
Restraint System:	<u>Three point safety belt with shoulder belt pretensioner and force limiters, airbag, knee bolster and head restraint</u>	<u>Three point safety belt with shoulder belt pretensioner and force limiters, airbag, knee bolster and head restraint</u>	
Number of Data Channels:	<u>196</u>		
Number of Cameras:	<u>1</u>	Real Time	
	<u>16</u>	High Speed	
<u>DOOR OPENING DATA:</u>	<u>Closed, latched and operable without tools - Left Front</u>		
	<u>Closed, latched and operable without tools - Right Front</u>		
Front Seat(s) Data:	<u>DRIVER</u>	<u>PASSENGER</u>	
Seat Track Failure: (mm of shift)	<u>0</u>	<u>0</u>	
Seat Back Failure:	<u>None</u>	<u>None</u>	
<u>VISIBLE DUMMY CONTACT POINTS:</u>	<u>DRIVER</u>	<u>PASSENGER</u>	
Head:	<u>The face to the center of the airbag, the back of the head to the outboard half of the head restraint</u>	<u>The face to the right half of the airbag, the back of the head to the outboard half of the head restraint</u>	
Abdomen:	<u>-</u>	<u>-</u>	
Chest:	<u>Airbag</u>	<u>Airbag</u>	
Knees:	<u>Knee bolster</u>	<u>Glove compartment door</u>	

DATA SHEET NO. 2 GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 2005 Toyota Sienna MPV

NHTSA No. : M55104 ; VIN: 5TDZA23C55S224049 ; Color: Red

Engine Data: 6 cylinders; - CID; 3.3 Liters; - cc

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

Transmission Data: 5 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: X ADLs; X A/C; X Pwr.Strg.; X Pwr. Brakes

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

Date Received: 11/19/2004 ; Odometer Reading 251 km

Selling Dealer: Kent Brown Toyota

& Address: 951 County Route 64, Elmira, NY 14903

DATA FROM TIRE VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured by: Toyota Motor Manufacturing, Indiana, Inc.

Date of Manufacture 09/04

GVWR: 2580 kg; GAWR: 1290 kg FRONT; 1290 kg REAR

DATA FROM TIRE PLACARD:

Recommended Tire Size: P215/65R16

* Recommended Cold Tire Pressure: 240 kpa FRONT; 240 kpa REAR

DATA FROM TIRE SIDEWALL:

Size of Tires on Test Vehicle: P215/65R16 96T ; Manufacturer: Dunlop SP4000

Tire Pressure with Maximum Capacity Vehicle Load: Front: 350 kPa; Rear: 350 kPa

Treadwear: 320 ; Traction: A ; Temperature: A

VEHICLE CAPACITY DATA:

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

Number of Occupants: 2 Front; 5 Rear; 7 Total

Vehicle Capacity Weight (VCW) = 606 kg

No. of Occupants x 68.04 kg = 476.28 kg

Rated Cargo/Luggage Weight (RCLW) = 129.72 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>536.5</u>	kg	Right Rear	=	<u>390.0</u>	kg
Left Front	=	<u>547.0</u>	kg	Left Rear	=	<u>415.0</u>	kg
TOTAL FRONT	=	<u>1083.5</u>	kg	TOTAL REAR	=	<u>805.0</u>	kg
TOTAL DELIVERED WEIGHT	=	<u>1888.5</u>	kg				
% of Total Front of Vehicle Weight	=	<u>57.4</u>		% of Total Rear Weight	=	<u>42.6</u>	%

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight (UDW)	=	<u>1888.5</u>	kg
Rated Cargo/Luggage Weight (RCLW)	=	<u>129.72</u>	kg
Weight of 2 p.572 Dummies @ 76 each	=	<u>152</u>	kg
TARGET TEST WEIGHT	=	<u>2170.2</u>	kg

WEIGHT OF TEST VEHICLE WITH TWO DUMMIES AND 124.5 KG OF CARGO WEIGHT:

Right Front	=	<u>564.5</u>	kg	Right Rear	=	<u>491.5</u>	kg
Left Front	=	<u>610.5</u>	kg	Left Rear	=	<u>498.5</u>	kg
TOTAL FRONT	=	<u>1175.0</u>	kg	TOTAL REAR	=	<u>990.0</u>	kg
TOTAL TEST WEIGHT	=	<u>2165.0</u>	kg				
% of Total Front Weight	=	<u>54.3</u>	%	% of Total Rear Weight	=	<u>45.7</u>	%
Weight of Ballast Secured in Vehicle Trunk Area	=	<u>45</u>	kg				
Vehicle Components Removed for Weight Reduction:		<u>None</u>					

VEHICLE ATTITUDE (all dimension in millimeters):

AS DELIVERED:	RF	<u>772</u>	LF	<u>774</u>	RR	<u>778</u>	LR	<u>771</u>
FULLY LOADED:	RF	<u>756</u>	LF	<u>752</u>	RR	<u>752</u>	LR	<u>747</u>
AS TESTED:	RF	<u>758</u>	LF	<u>755</u>	RR	<u>752</u>	LR	<u>748</u>
Vehicle's Wheel Base:		<u>3023</u>	mm					
Location of Vehicle's C.G.:		<u>1382</u>	mm rearward of front wheel center.					

FUEL SYSTEM DATA:

Fuel System Capacity From Owner's Manual	=	<u>79</u>	liters
Usable Capacity Figure Furnished by COTR	=	<u>79.5</u>	liters
Test Volume Range (92 to 94% of Usable Capacity)	=	<u>73.14</u>	to <u>74.73</u> liters
ACTUAL TEST VOLUME	=	<u>73.4</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: Tank	– ahead of the rear axle left of the vehicle center line and inboard of the frame rail;		
Lines	– Left side of the vehicle underbody, inboard of the left frame rail; Filler neck – Right rear quarter panel above the rear axle.		

DATA SHEET NO. 3 POST IMPACT DATA

TYPE OF TEST:

Type of Test: Frontal Barrier Impact Angle: 0°
Test Date: December 8, 2004 Time: 13:20 Temperature: 21.0 °C
Vehicle NHTSA No.: M55104
Required Impact Velocity Range: 55.5 to 57.1 kph

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

Trap No. 1 = 56.33 kph; Trap No. 2 = 56.33 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>5012</u> ; C/L = <u>5081</u> ; Right = <u>5011</u>
Post-Test	Left = <u>4545</u> ; C/L = <u>4540</u> ; Right = <u>4558</u>
Crush	Left = <u>467</u> ; C/L = <u>541</u> ; Right = <u>453</u>
AVERAGE	= <u>487</u> mm

VEHICLE REBOUND: (From rigid barrier only.)

Distance from front of test vehicle to impact point:

	Left = <u>784</u> ; C/L = <u>761</u> ; Right = <u>828</u>
AVERAGE	= <u>791</u> mm

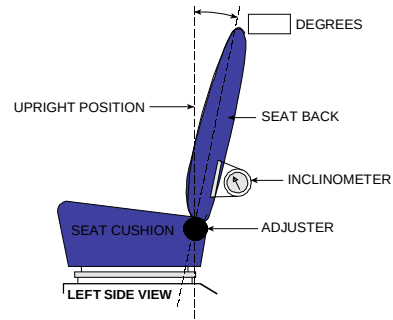
DATA SHEET NO. 4 TEST VEHICLE INFORMATION

VEHICLE IDENTIFICATION:

Model Year : 2005 Vehicle Model: Toyota Sienna Body Style : MPV

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.



FRONT SEAT ASSEMBLY

Seat back angle for driver's seat: 3 degrees (from upright position)

Measurement instructions: The seatback was positioned 12.0 degrees back from the forward-most locking position (detent 6, where the forward-most detent is defined as 0).

Seat back angle for passenger's seat: 3 degrees (from upright position)

Measurement instructions: The seatback was positioned 14.0 degrees back from the forward-most locking position (detent 7, where the forward-most detent is defined as 0).

2. SEAT FORE AND AFT POSITIONING:

Positioning of the driver's seat: There was no detent available at the middle of the absolute fore/aft travel.

The seat was positioned full down at the first detent rearward of the absolute mid-fore/aft travel, 120 mm forward of its rearmost position where the fore/aft travel is 245 mm. (detent 8, where the forward-most detent is defined as 0 and there are 17 detents total)

Positioning of the passenger's seat: The seat was positioned at middle of its absolute fore/aft travel, 120 mm forward of its rearmost position where the fore/aft travel is 240 mm. (detent 8 where the forward-most detent is defined as 0 and there are 17 detents total)

3. FUEL TANK CAPACITY DATA:

3.1 A. "Usable Capacity" of the standard equipment fuel tank is 79.5 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 = 79.5 liters

3.2 Amount of Stoddard solvent added to vehicle(s) used for certification test(s) = 73.4 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.

The fuel pump operates briefly when the ignition key is turned to the 'ON' position and continuously 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.

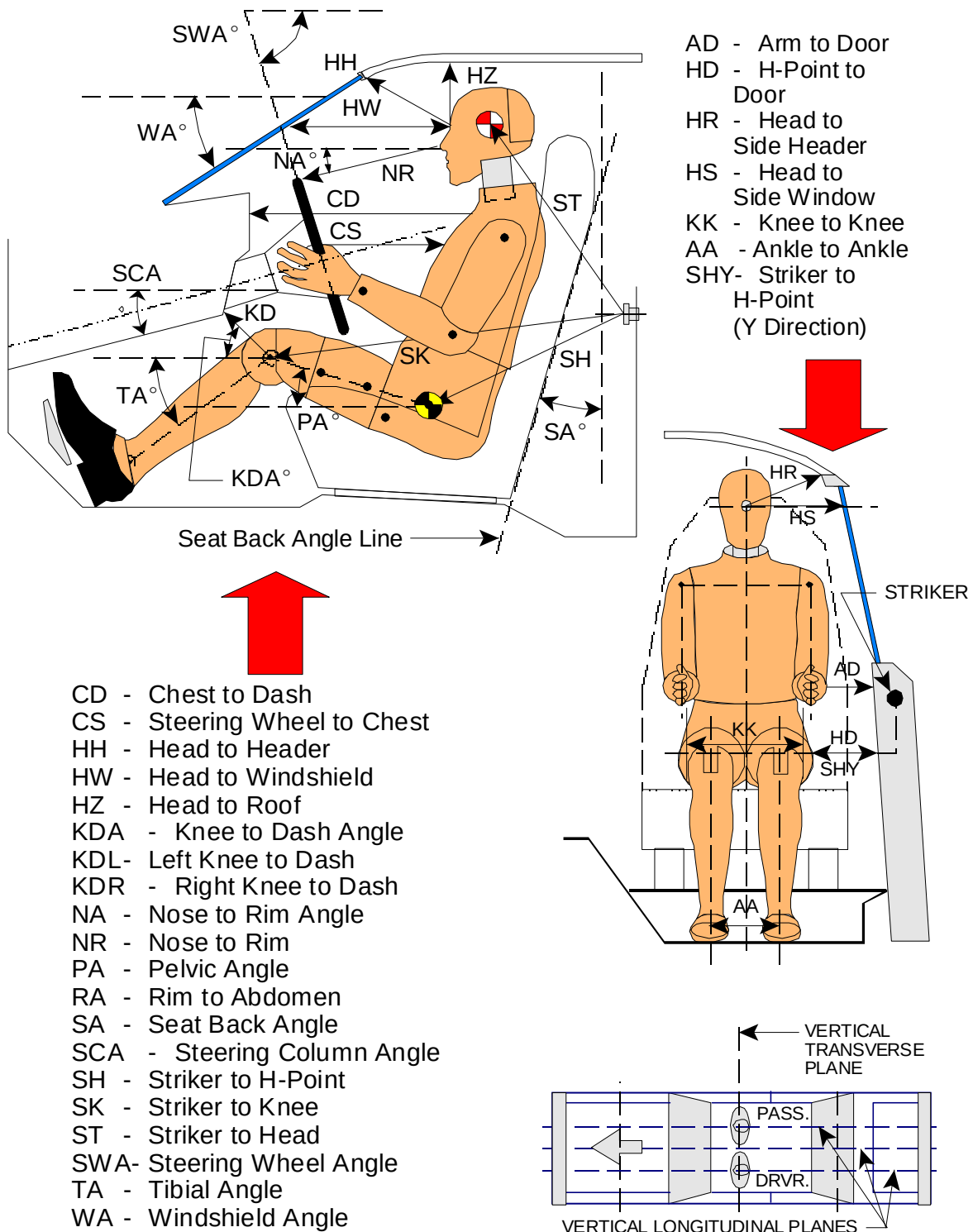
Operational Instructions: Positioned at mid-telescope/mid-tilt. (tilted 1.8 degrees down from its upper-most locking position)

5. SEAT BELT UPPER ANCHORAGE:

Nominal design riding position: Positioned in detent 1, where the upper-most detent is defined as 0 and there are 4 detents total.

6. AUTOMATIC DOOR LOCKS: Is test vehicle equipped with ADLs? X Yes; - No;
Does vehicle owner's manual describe how to deactivate ADLs? - Yes; X No; - N/A
Comments: Doors were locked for the test.

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



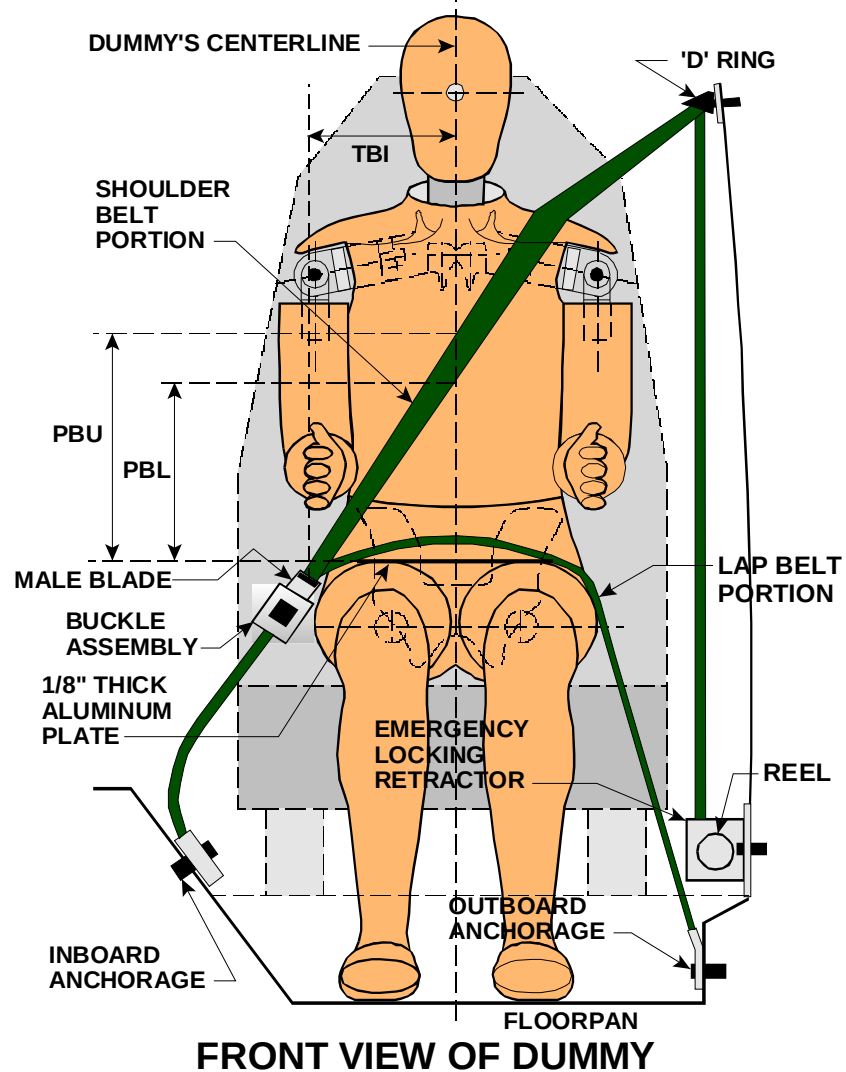
DATA SHEET NO. 5 FRONT SEAT DUMMY POSITIONING MEASUREMENTS IN VEHICLE (cont.)

	DRIVER (Serial #061)			PASS. (Serial #064)		
WA ^o	29.1 deg.			N/A		
SWA ^o	63.2 deg.			N/A		
SCA ^o	26.8 deg.			N/A		
SA ^o	3 deg. (from upright position)			3 deg. (from upright position)		
HZ	234			215		
HH	425			393		
HW	750			712		
HR	294			300		
NR	435	Angle	13 deg.	N/A		
CD	554			580		
CS	313			N/A		
RA	199			N/A		
KDL	125	Angle (KDA)	25 deg.	132		
KDR	133			122	Angle (KDA)	19 deg.
PA ^o	25.0 deg.			25.0 deg.		
TA ^o	55.0 deg.			50.0 deg.		
KK	390			325		
AA	290			212		
ST	470	Angle	13 deg.	477	Angle	13 deg.
SK	644	Angle	98 deg.	639	Angle	98 deg.
SH	304	Angle	124 deg.	300	Angle	122 deg.
SHY	268			270		
HS	372			383		
HD	138			135		
AD	124			140		

Dimensions in millimeters

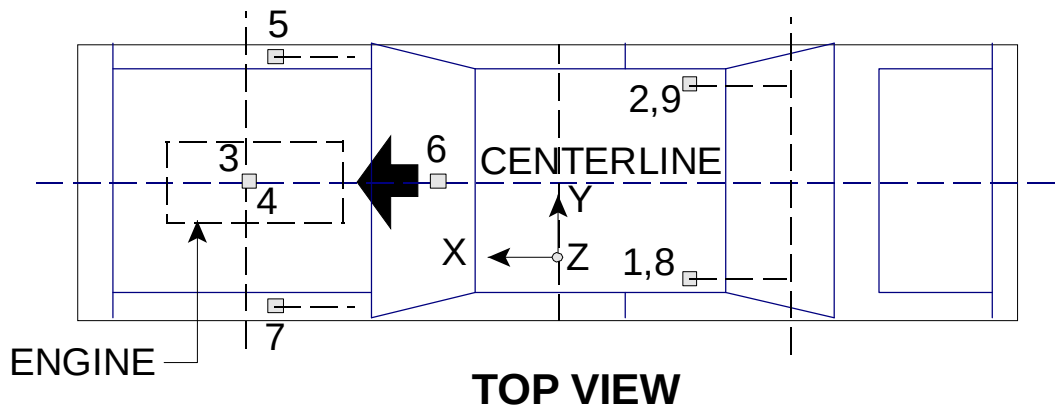
DATA SHEET NO. 6 SEAT BELT POSITIONING DATA

SEAT BELT POSITIONING DATA

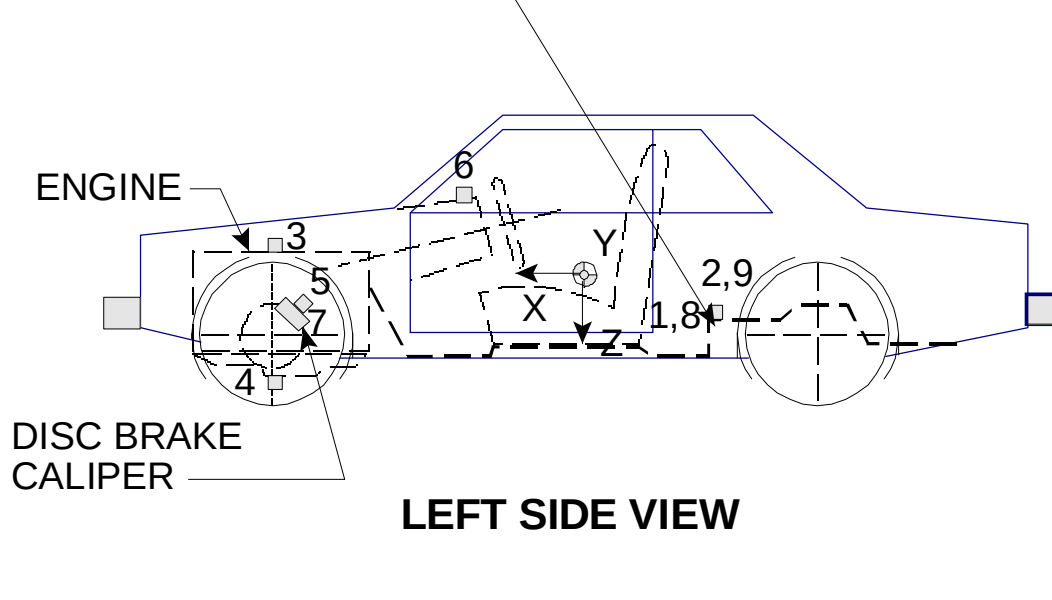


	DRIVER DUMMY (mm)	PASSENGER DUMMY (mm)
PBU -- Top surface of alum. plate to upper edge	340	352
PBL-- Top surface of alum. plate to belt lower edge	260	270
LAP BELT TENSION	10 N	10 N
SHOULDER BELT TENSION	Retractor	Retractor

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	4316	425	-851
4	Bottom of Engine	4082	698	-423
5	Disc Brake Caliper @ Right Side	4244	-62	-304
6	Instrument Panel	3355	0	-959
7	Disc Brake Caliper @Left Side	4080	-682	-416
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	3.7	114.8	-32.0	65.9
2	Right Rear Seat Cross Member X	3.2	113.9	-35.2	45.2
3	Top of Engine Block	†	-	†	-
4	Bottom of Engine	51.6	44.1	-141.5	31.4
5	Disc Brake Caliper @ Right Side	31.4	74.7	-97.5	35.1
6	Instrument Panel	††	-	††	-
7	Disc Brake Caliper @Left Side	39.1	71.2	-97.9	46.4
8	Left Rear Seat Cross Member Z	8.1	28.7	-14.2	20.5
9	Right Rear Seat Cross Member Z	10.6	58.0	-20.4	37.6

† Cable damaged at 29 ms.

†† Transducer failed.

DATA SHEET NO. 8 DUMMY INJURY CRITERIA VALUES

Vehicle Year/Make/Model/Body Style: 2005 Toyota Sienna MPV

NHTSA Test No.: M55104 Test Date: December 8, 2004

		MAXIMUM VALUE							
		Driver				Passenger			
DESCRIPTION	Unit	Pos	msec	Neg	msec	Pos	msec	Neg	msec
Head 9 Array X Arm Y	g	6.3	57.3	-18.2	76.9	3.1	58.5	-13.7	96.9
Head 9 Array X Arm Z	g	18.7	60.1	-5.1	151.5	24.9	83.1	-5.0	152.7
Head 9 Array Y Arm X	g	2.5	122.9	-56.1	77.6	0.1	10.1	-54.6	84.6
Head 9 Array Y Arm Z	g	16.2	80.9	-6.9	107.4	19.1	84.6	-7.7	117.8
Head 9 Array Z Arm X	g	1.7	20.5	-56.2	74.5	1.9	26.5	-50.7	93.2
Head 9 Array Z Arm Y	g	6.4	171.0	-16.9	85.8	3.2	58.3	-14.0	100.8
Head X	g	0.0	-17.2	-52.4	81.7	0.1	14.0	-52.3	84.9
Head Y	g	3.7	164.2	-11.7	95.3	3.9	52.8	-12.2	104.8
Head Z	g	15.2	78.7	-6.1	107.0	19.0	88.4	-5.8	117.3
Head Resultant	g	54.9	81.3	-	-	55.2	84.9	-	-
Redundant Head X	g	0.5	199.0	-52.3	81.3	0.1	7.1	-51.7	84.4
Redundant Head Y	g	3.6	163.7	-12.9	95.5	3.7	46.1	-12.6	104.9
Redundant Head Z	g	14.9	78.7	-5.7	107.3	19.1	88.4	-5.9	117.6
Redundant Head Resultant	g	54.9	81.3	-	-	54.9	84.4	-	-
Upper Neck Fx	N	364.2	70.4	-260.1	141.2	426.9	99.8	-314.5	81.3
Upper Neck Fy	N	132.8	165.8	-93.3	76.4	73.4	55.3	-69.9	170.7
Upper Neck Fz	N	1788.1	79.8	-150.2	123.8	882.0	83.8	-130.8	122.0
Upper Neck F Resultant	N	1800.0	79.7	-	-	912.4	83.7	-	-
Upper Neck Mx	N-m	11.2	170.0	-11.7	129.4	22.6	111.6	-5.0	157.0
Upper Neck My	N-m	24.3	152.1	-14.4	108.6	16.7	100.4	-40.5	81.6
Upper Neck Mz	N-m	20.2	110.2	-4.8	166.0	11.4	115.5	-3.1	192.3
Upper Neck M Resultant	N-m	25.4	153.2	-	-	41.2	81.4	-	-
Chest X	g	1.8	123.6	-45.1	77.7	1.9	161.9	-42.0	77.2
Chest Y	g	5.4	74.8	-3.8	51.5	3.7	50.2	-9.2	100.2
Chest Z	g	5.5	36.5	-7.4	114.8	13.7	86.9	-7.5	77.6
Chest Resultant	g	45.5	77.6	-	-	42.7	77.3	-	-

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

Vehicle Year/Make/Model/Body Style: 2005 Toyota Sienna MPV

NHTSA Test No.: M55104 Test Date: December 8, 2004

		MAXIMUM VALUE							
		Driver				Passenger			
DESCRIPTION	Unit	Pos	msec	Neg	msec	Pos	msec	Neg	msec
Redundant Chest X	g	2.0	124.0	-44.5	80.0	1.7	149.8	-40.8	77.2
Redundant Chest Y	g	5.4	74.8	-4.0	51.9	4.0	50.4	-9.0	100.2
Redundant Chest Z	g	5.6	79.5	-7.3	115.0	13.9	86.9	-7.9	77.6
Redundant Chest Resultant	g	44.9	80.0	-	-	41.5	77.3	-	-
Chest Displacement	mm	0.0	-16.9	-36.3	86.2	0.0	-34.7	-26.8	88.5
Pelvic X	g	2.4	98.0	-56.3	53.2	3.8	102.1	-58.1	57.3
Pelvic Y	g	10.2	96.3	-5.0	35.6	6.5	62.0	-9.8	87.4
Pelvic Z	g	2.5	20.6	-22.1	59.9	3.1	36.0	-28.4	74.8
Pelvic Resultant	g	58.6	53.2	-	-	61.3	60.8	-	-
Left Femur	N	466.4	41.2	-3685.4	52.7	394.3	36.0	-3674.1	63.3
Right Femur	N	1129.7	44.9	-3443.5	54.2	875.8	36.8	-3426.9	63.2
Left Upper Tibia Mx	N-m	15.2	53.3	-14.9	63.4	49.9	76.4	-14.3	133.9
Left Upper Tibia My	N-m	68.6	59.1	-16.0	111.9	91.6	49.0	-17.6	120.6
Left Lower Tibia Fz	N	102.2	127.2	-1758.7	31.1	103.7	129.8	-1806.7	37.7
Left Lower Tibia Mx	N-m	15.0	61.2	-21.8	83.4	12.7	82.0	-7.2	105.7
Left Lower Tibia My	N-m	25.0	91.4	-46.1	59.8	33.3	38.2	-77.9	48.5
Right Upper Tibia Mx	N-m	†	-	†	-	21.2	83.5	-37.6	36.7
Right Upper Tibia My	N-m	117.4	45.7	-26.3	99.4	135.3	36.7	-91.9	86.2
Right Lower Tibia Fz	N	113.7	119.3	-3793.2	59.6	106.9	130.1	-1896.3	39.6
Right Lower Tibia Mx	N-m	13.9	51.5	-53.7	63.3	31.8	36.2	-48.2	42.1
Right Lower Tibia My	N-m	110.7	85.6	-77.7	45.3	285.7	82.0	-113.2	36.4
Left Foot Aft Ax	g	19.8	14.6	-66.7	61.1	††	-	††	-
Left Foot Aft Az	g	17.6	48.1	-68.2	61.6	13.0	28.8	-37.6	34.1
Left Foot Fore Az	g	45.6	14.6	-83.2	62.6	58.0	37.2	-96.2	49.9
Right Foot Aft Ax	g	34.5	53.7	-137.1	44.0	26.4	87.4	-124.4	36.5
Right Foot Aft Az	g	15.3	60.2	-78.2	50.4	25.9	59.8	-171.4	35.7
Right Foot Fore Az	g	132.0	60.8	-143.0	42.5	122.9	41.4	-438.8	35.4
Lap Belt Load	N	4813.1	52.9	-2.5	-48.8	4843.1	57.5	0.9	-50.0
Torso Belt	N	5673.6	57.1	-13.9	8.4	4884.3	53.3	-26.8	184.5

† Transducer failed at 17 ms.

†† Transducer failed.

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

Vehicle Year/Make/Model/Body Style: 2005 Toyota Sienna MPV

NHTSA Test No.: M55104 Test Date: December 8, 2004

HEAD INJURY CRITERIA (HIC)				
	HIC**	t ₁ (msec)	t ₂ (msec)	Average Acceleration t ₁ to t ₂
Position #1 - Driver	472.7	62.6	98.6	44.4
Position #2 - Passenger	403.5	72.0	108.0	41.7

** 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	44.8	76.8	80.9	388.7
Position #2 - Passenger	39.4	76.3	79.3	314.7

* 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 Toyota Sienna MPV

NHTSA Test No.: M55104 Test Date: December 8, 2004

HEAD INJURY CRITERIA (HIC) REDUNDANT				
	HIC**	t ₁ (msec)	t ₂ (msec)	Average Acceleration t ₁ to t ₂
Position #1 - Driver	474.4	62.6	98.7	44.5
Position #2 - Passenger	394.6	71.9	107.9	41.3

** 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	44.3	77.2	80.9	374.3
Position #2 - Passenger	38.2	76.2	79.2	288.7

* 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

1775

1896

Shoulder belt length as measured
on Part 572 Dummy.

940

982

Lap belt length as measured
on Part 572 Dummy.

835

914

BELT STRETCH DATA:

Measured mechanically.

0 mm/m

0 mm/m

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 14 mm molding.

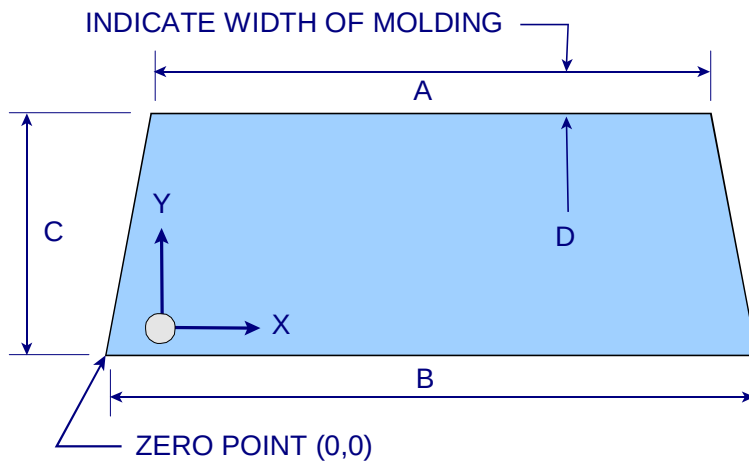
FMVSS 212 REQUIREMENTS:

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	2460	2460	100.0%
LEFT SIDE	2460	2460	100.0%
TOTAL	4920	4920	100.0%

AREA OF RETENTION FAILURE:



DIMENSIONS (mm)	
A	1380
B	1800
C	870
D	14

FRONT VIEW OF WINDSHIELD

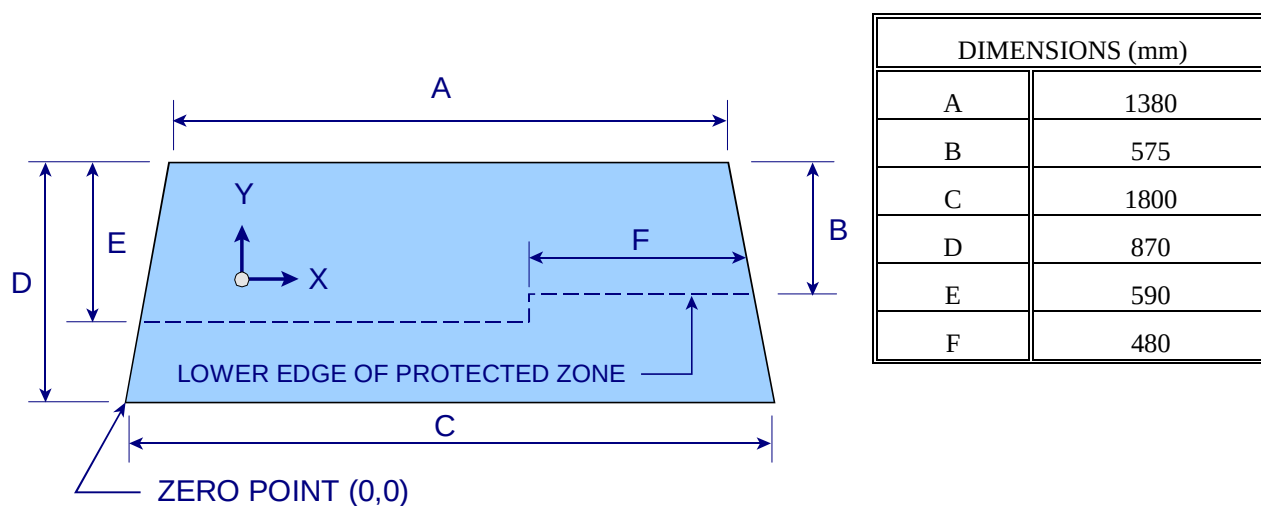
FAILURE DETAILS: None

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.	-	-

DATA SHEET NO. 12 FMVSS NO. 301-75 "FUEL SYSTEM INTEGRITY" POST IMPACT TEST DATA

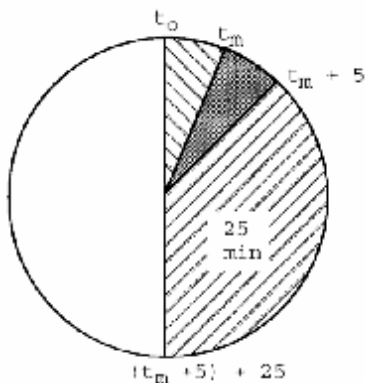
NHTSA TEST No.: M55104 TEST DATE: December 8, 2004
VEHICLE MAKE/MODEL: 2005 Toyota Sienna MPV

The test vehicle was filled from 92% to 94% of the manufacture's "usable" capacity. The electric fuel pump was operating if it will operate without engine operation. Two Part 572 anthropomorphic test devices were located at each of the front designated seating positions.

=====

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)

FUEL SPILLAGE MEASUREMENT:



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

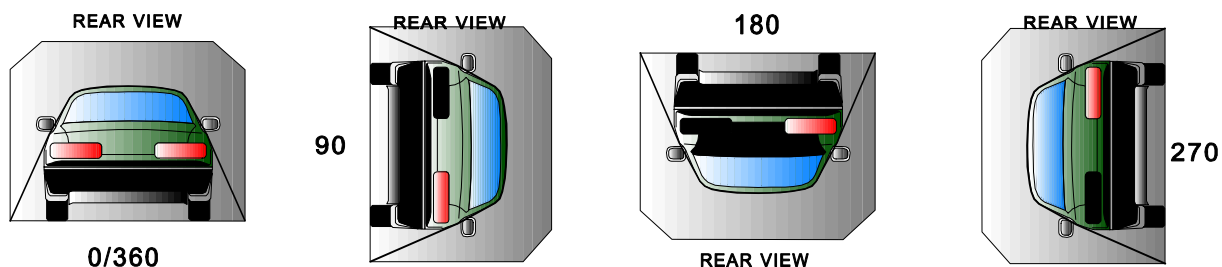
ACTUAL	MAX ALLOWED
0	28 g
0	141 g
0	28 g/min.

SOLVENT SPILLAGE DETAILS: None

DATA SHEET NO. 13 - ROLLOVER DATA

Vehicle: 2005 Toyota Sienna MPV

NHTSA No.: M55104



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	7	seconds	5	minutes	6	minutes	7	seconds	7	minutes
90° - 180°	1	minutes	2	seconds	5	minutes	6	minutes	2	seconds	7	minutes
180°-270°	1	minutes	6	seconds	5	minutes	6	minutes	6	seconds	7	minutes
270°-360°	1	minutes	11	seconds	5	minutes	6	minutes	11	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:

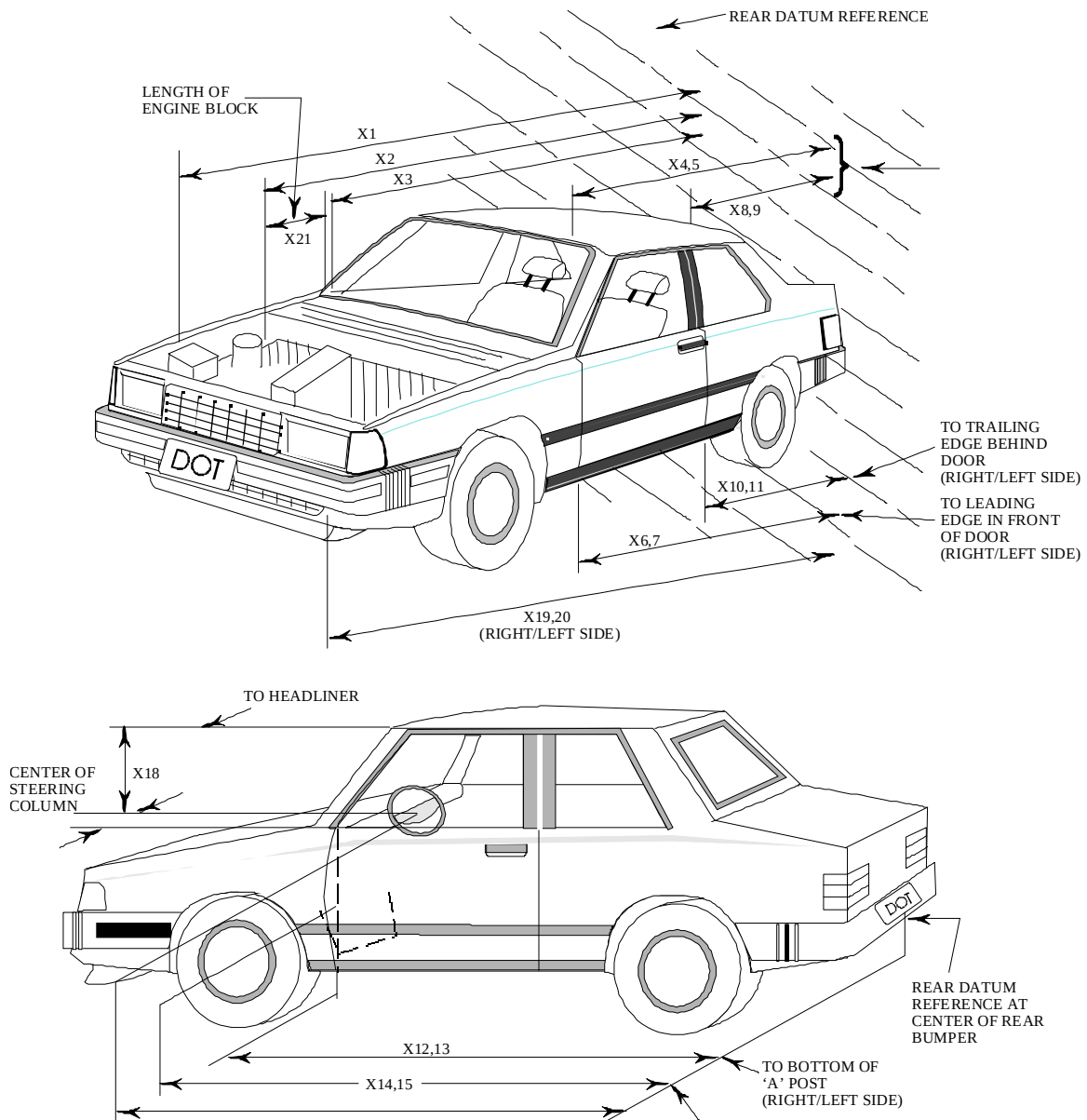
Rollover Stage	First 5 minutes from onset of rotation (g)	6th min. (g)	7th min. (g)	8th min. (if required) (g)
0° - 90°	0	0	0	N/A
90° - 180°	0	0	0	N/A
180°-270°	0	0	0	N/A
270°-360°	0	0	0	N/A

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

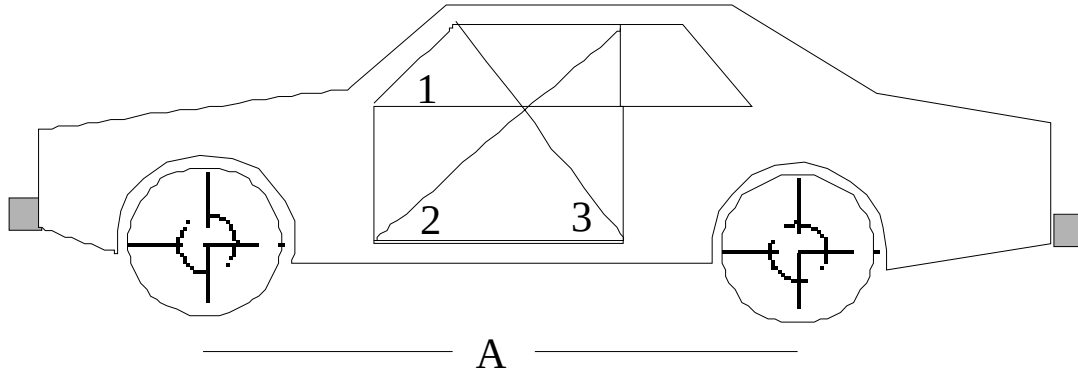


DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)

No.		Pre-Test	Post-Test	Difference
X1	Total Length of Vehicle at Centerline	5081	4540	541
X2	Rear Surface of Vehicle to Front of Engine	4495	4247	248
X3	Rear Surface of Vehicle to Firewall	4232	4109	123
X4	Rear Surface of Vehicle to Upper Leading Edge of Right Door	3655	3654	1
X5	Rear Surface of Vehicle to Upper Leading Edge of Left Door	3655	3654	1
X6	Rear Surface of Vehicle to Lower Leading Edge of Right Door	3573	3576	-3
X7	Rear Surface of Vehicle to Lower Leading Edge of Left Door	3577	3579	-2
X8	Rear Surface of Vehicle to Upper Trailing Edge of Right Door	2586	2587	-1
X9	Rear Surface of Vehicle to Upper Trailing Edge of Left Door	2587	2586	1
X10	Rear Surface of Vehicle to Lower Trailing Edge of Right Door	2570	2571	-1
X11	Rear Surface of Vehicle to Lower Trailing Edge of Left Door	2569	2572	-3
X12	Rear Surface of Vehicle to Bottom of "A" Post of Right Side	3662	3685	-23
X13	Rear Surface of Vehicle to Bottom of "A" Post of Left Side	3669	3676	-7
X14	Rear Surface of Vehicle to Firewall, Right Side	4223	4075	148
X15	Rear Surface of Vehicle to Firewall, Left Side	4162	4102	60
X16	Rear Surface of Vehicle to Steering Column	3223	3236	-13
X17	Center of Steering Column to "A" Post	325	294	31
X18	Center of Steering Column to Headliner	461	460	1
X19	Rear Surface of Vehicle to Right Side of Front Bumper	5011	4558	453
X20	Rear Surface of Vehicle to Left Side of Front Bumper	5012	4545	467
X21	Length of Engine Block	376	376	0
RD	Rear Surface of Vehicle to Right Side of Dash Panel	3400	3384	16
CD	Rear Surface of Vehicle to Center of Dash Panel	3423	3376	47
LD	Rear Surface of Vehicle to Left Side of Dash Panel	3402	3391	11

All Dimensions in mm

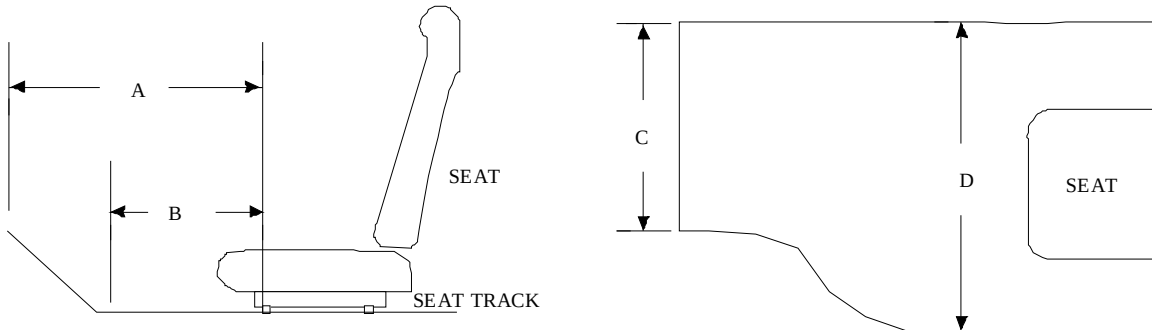
DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)
 VEHICLE INTRUSION MEASUREMENTS
 DOOR OPENING WIDTH



UNITS (mm)	LEFT			RIGHT		
MEASUREMENT	1	2	3	1	2	3
BEFORE TEST	1010	1542	1129	1010	1545	1130
AFTER TEST	1008	1541	1130	1008	1545	1131
DIFFERENCE	2	1	-1	2	0	-1

UNITS (mm)	A = WHEELBASE LEFT	A = WHEELBASE RIGHT
BEFORE TEST	3023	3023
AFTER TEST	2949	2964
DIFFERENCE	74	59

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



DRIVER

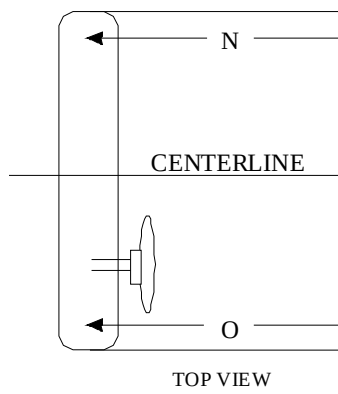
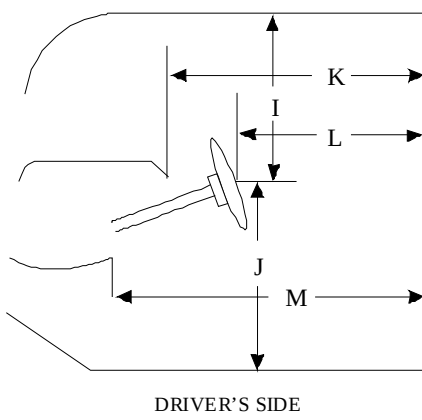
Measurement	Pre-Test	Post-Test	Difference
A	716	631	85
B	480	473	7
C	437	438	-1
D	443	440	3

PASSENGER

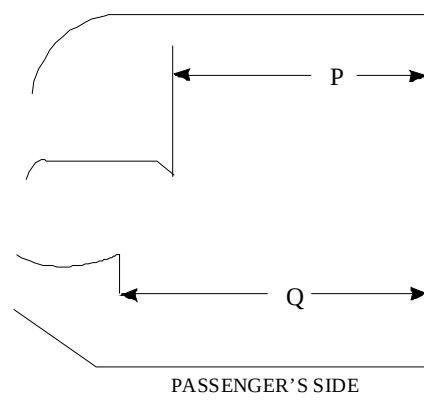
Measurement	Pre-Test	Post-Test	Difference
A	699	476	223
B	469	457	12
C	435	421	14
D	440	439	1

Units = mm

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



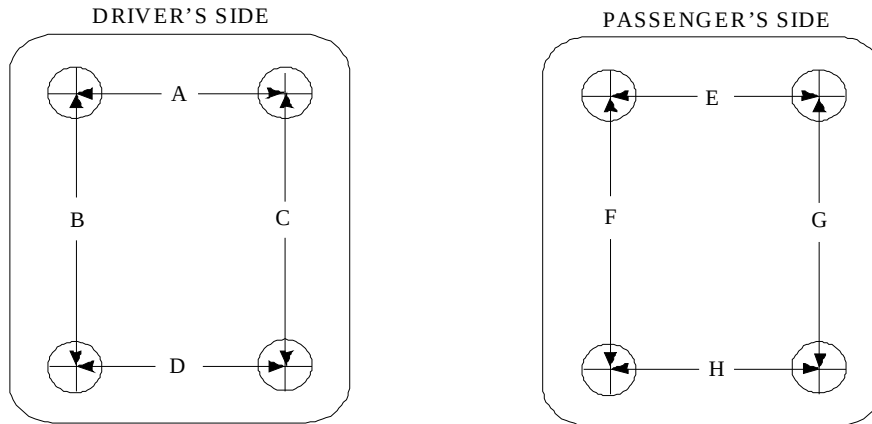
MEASUREMENTS
FROM C-PILLAR
BELT ANCHORAGE



Measurement	Pre-Test	Post-Test	Difference
I	461	460	1
J	705	713	-8
K	2359	2333	26
L	2152	2167	-15
M	2402	2379	23
N	2331	2315	16
O	2331	2322	9
P = K (PASS.)	2457	2431	26
Q = M (PASS.)	2388	2341	47

Units = mm

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

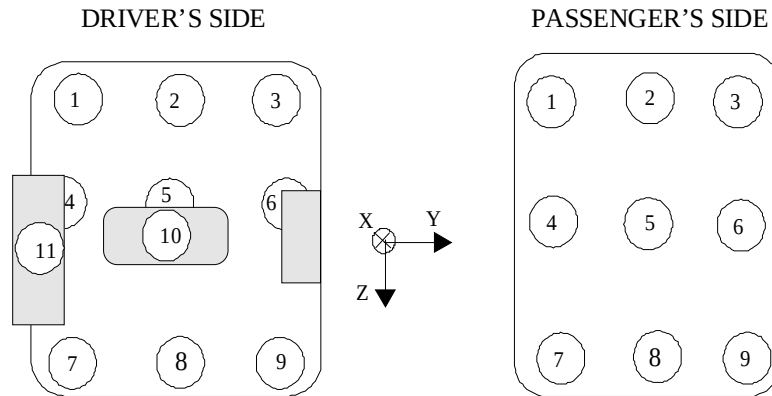


TOP VIEW THROUGH FLOOR PAN

Measurement	Pre-Test	Post-Test	Difference
A	437	438	-1
B	339	340	-1
C	287	273	14
D	443	440	3
E	435	421	14
F	316	313	3
G	319	287	32
H	440	439	1

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	3843	3780	63	-627	-677	50
2	3869	3785	84	-609	-667	58
3	3855	3737	118	-625	-690	65
4	3765	3750	15	-503	-530	27
5	3771	3744	27	-492	-525	33
6	3780	3729	51	-494	-538	44
7	3640	3638	2	-433	-431	-2
8	3633	3627	6	-427	-434	7
9	3638	3616	22	-431	-446	15
10	3682	3695	-13	-592	-604	12
11	3678	3670	8	-501	-510	9

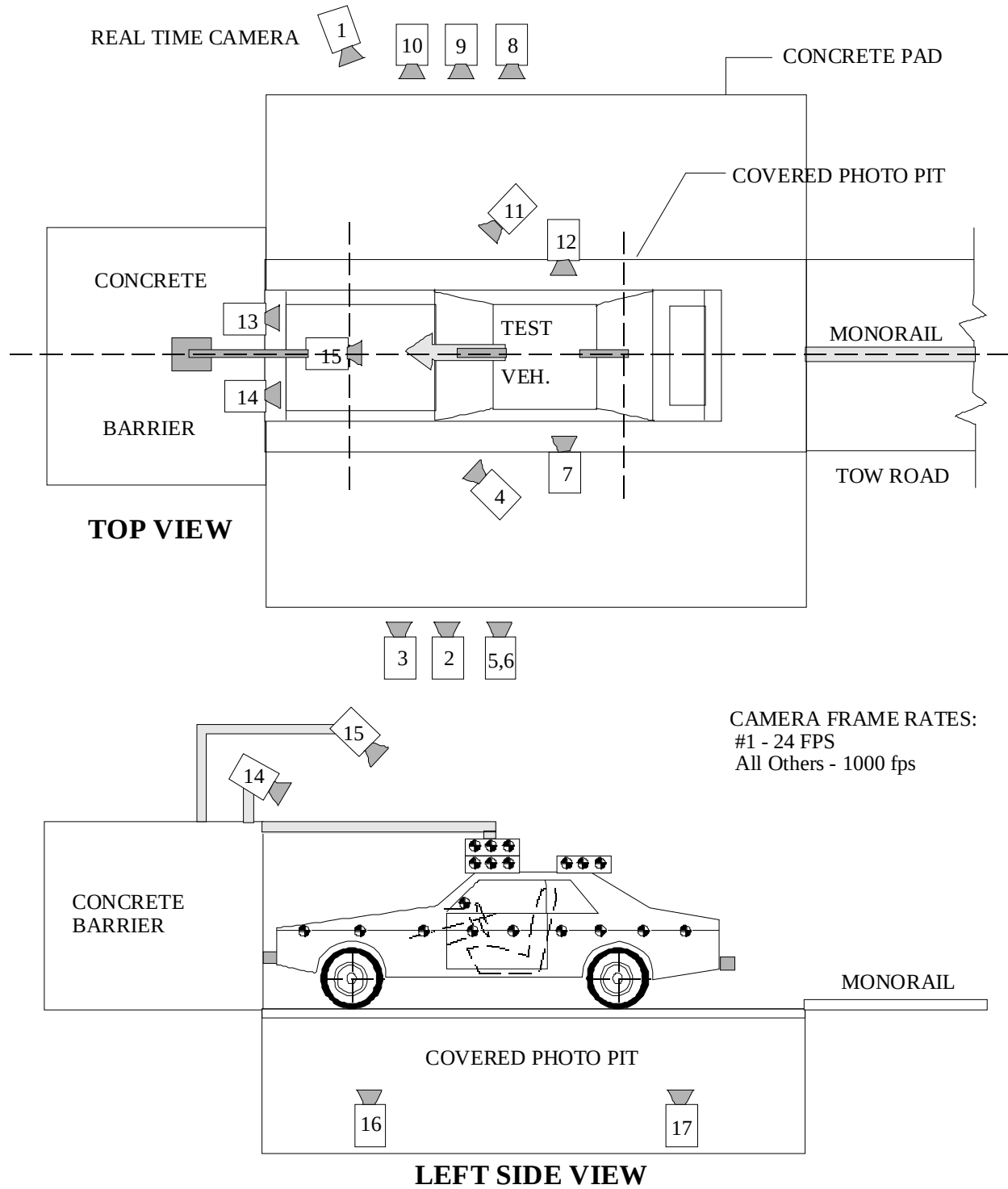
Passenger Side Toe-pan Measurements

Toe-pan Location	X Deformation (mm)			Z Deformation (mm)		
	Pre-Test	Post-Test	Difference	Pre-Test	Post-Test	Difference
1	3845	3648	197	-623	-679	56
2	3849	3626	223	-613	-688	75
3	3798	3676	122	-641	-675	34
4	3758	3692	66	-494	-546	52
5	3762	3643	119	-490	-539	49
6	3739	3653	86	-503	-535	32
7	3617	3588	29	-435	-439	4
8	3618	3608	10	-433	-427	-6
9	3609	3607	2	-428	-426	-2

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.: M55104 Vehicle: 2005 Toyota Sienna MPV

CAMERA NO.	VIEW	CAMERA POSITIONS (mm)*			ANGLE (deg)**	FILM PLANE TO HEAD TARGET	LENS (mm)	SPEED (fps)
		X	Y	Z				
1	Real-Time Camera	-	-	-	-	-	-	24
2	Overall Left Side	7495	1595	1062	-4.0	7094	24	1000
3	Left Side View	8110	925	1110	-2.1	7709	25	1000
4	Driver and Interior View	7460	2587	2062	-7.9	-	35	500
5	Steering Column (Bottom)	8068	1937	1172	-2.4	7667	25	1000
6	Steering Column (Top)	8068	1937	1782	-6.6	7667	25	1000
7	Left CRS View	3135	3150	2300	-24.2	-	28	500
8	Overall Right Side	7605	1985	1035	-1.5	7964	24	500
9	Right Side View	8065	1228	1064	-2.6	8424	25	1000
10	Right Passenger View	8600	1366	1425	-2.3	8959	35	1000
11	Passenger and Interior View	7692	2658	1995	-7.7	-	35	500
12	Right CRS View	3115	2730	2300	-22.2	-	28	500
13	Passenger Front View	620	-92	1987	-34.4	-	13	500
14	Driver Front View	620	-92	1987	-35.6	-	13	500
15	Windshield View	0	-530	3374	-49.0	-	13	500
16	Pit View of Engine	0	615	-3048	90	-	13	500
17	Pit View of Fuel Tank	0		-3048	90	-	13	500

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

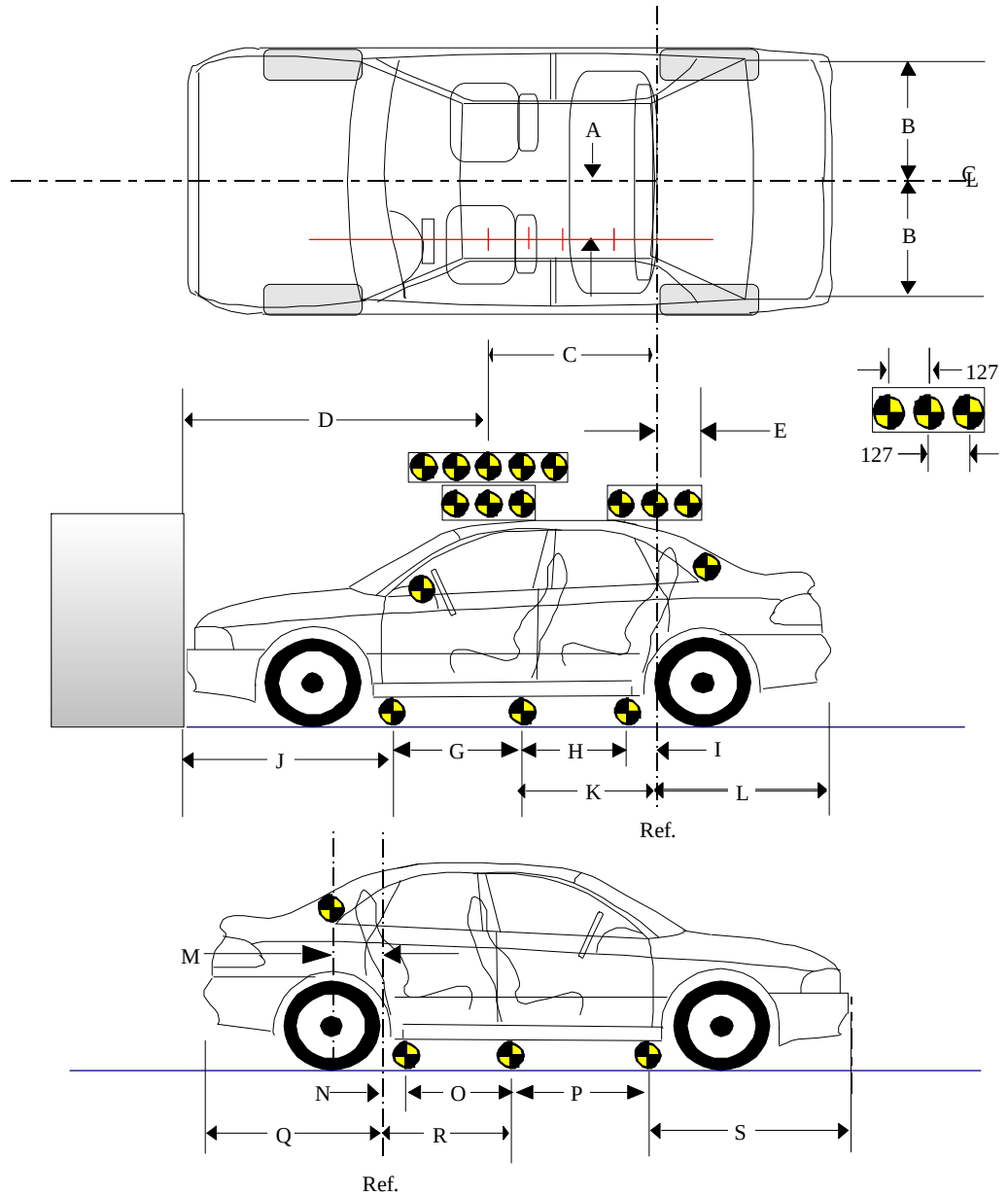
Y = film plane to impact location N.T. indicates No Timing

Z = film plane to ground

DATA SHEET NO. 16 VEHICLE REFERENCE PHOTO TARGET LOCATIONS

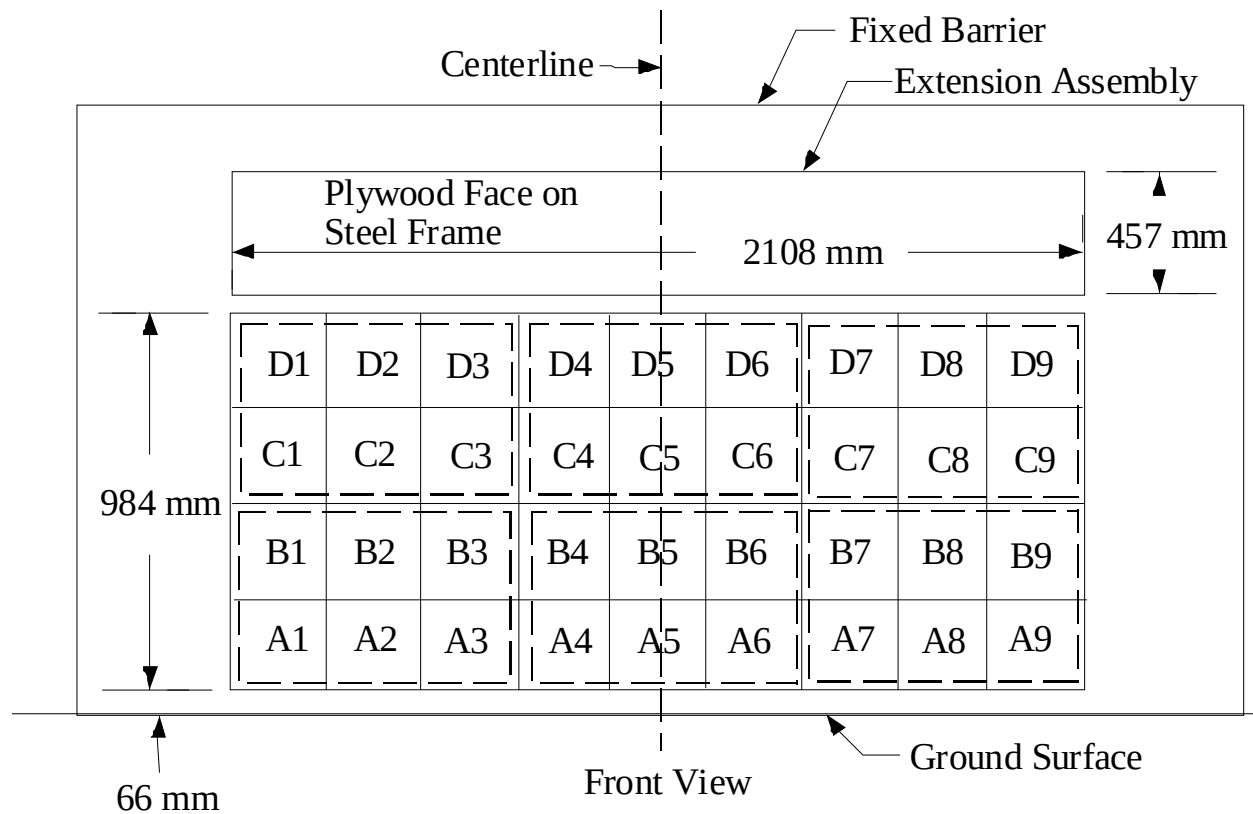
(Dimensions in millimeters)

A	435
B	760
C	1222
D	2440
E	348
F	1959
G	1022
H	1027
I	127
J	1478
K	1154
L	1426
M	350
N	129
O	1027
P	1022
Q	1425
R	1156
S	1478



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.: M55104; Test Date: December 8, 2004 ; Technician: Lawrence Q. Valvo

Vehicle Model Year/Make/Model: 2005 Toyota Sienna MPV

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

B. Size of vent holes: (mm²) 450 -Driver 1963 -Passenger

C. Total vent area: (mm²) 900 -Driver 3926 -Passenger

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

Driver: 650 -Height; 650 -Width; 260 -Depth

Passenger: 700 -Height; 360 -Width; 450 -Depth

E. Is the air bag tethered?

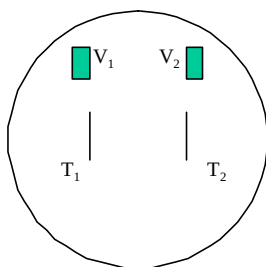
Driver: X -Yes; - -No; If yes, record length of tether- 295

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

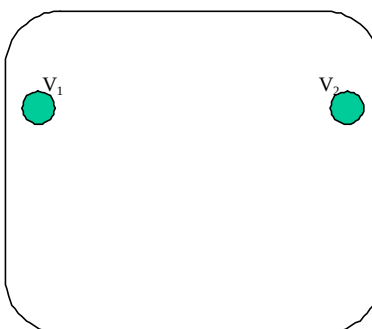
Sketch the air bag showing the location of the vent holes, how the bag is tethered, and where the bag is tethered. Also describe how the tethers are attached to the bag and the steering wheel.

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

Driver



Passenger



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

Driver: Air bag: GA120-08190, 0819400476

Generator: N/A

Passenger: Air bag: 2404438, 970008893 02.09.04 S

Generator: N/A

DATA SHEET NO. 19 ACCIDENT INVESTIGATION DIVISION DATA

FOR FRONTAL BARRIER IMPACT

Vehicle Make/Model/Body Style: Toyota Sienna MPV

NHTSA Test No.: M55104 VIN: 5TDZA23C55S224049

Model Year: 2005 Build Date: 09/04 Test Date: December 8, 2004

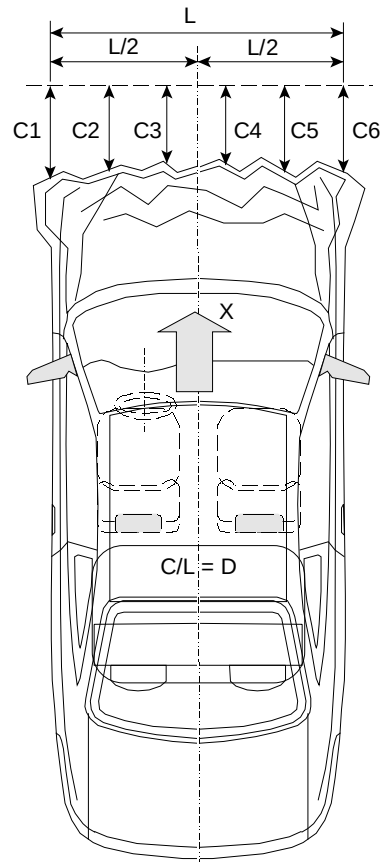
Vehicle Size Category: MPV Test Weight: 2165.0 kg

Vehicle Wheelbase: 3023 mm; Front Overhang: 976 mm; Overall Width: 1965 mm

Collision Deformation Classification (CDC) Code: 12FDEW4

Crush Depth Dimensions

	PRE (mm)	POST (mm)	DIFF (mm)
C1 =	4863	4581	282
C2 =	5007	4546	461
C3 =	5073	4577	496
C4 =	5073	4590	483
C5 =	5006	4559	447
C6 =	4861	4546	315



Midpoint of Damage: D = Vehicle Centerline (Longitudinal)

Length of Damaged Region: L1= 1647 mm

L2= 823.5 mm

L5= 329.4 mm

APPENDIX A
PHOTOGRAPHS

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A-31	Post-Test Driver Head Location	A-34
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A-41	Post-Test Driver Floor Pan View	A-44
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A-47	Post-Test Passenger Position View	A-50
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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
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A-56	Post-Test Passenger Head View	A-59
A-57	Post-Test Passenger Contact To Airbag	A-60
A-58	Rollover View	A-61
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Figure A-1 LOAD CELL LOCATIONS

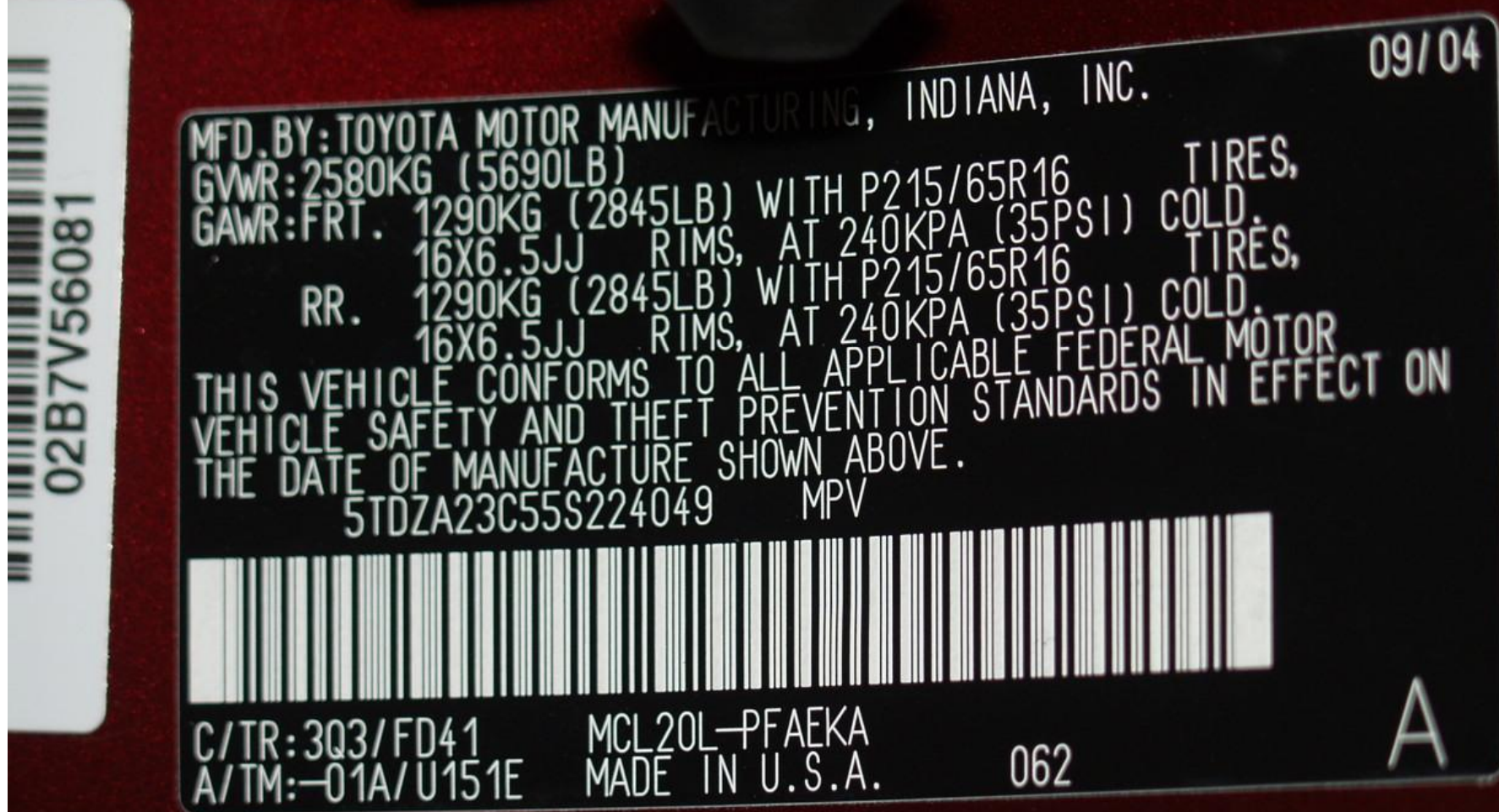


Figure A-2 VEHICLE CERTIFICATION PLACARD



TIRE AND LOADING INFORMATION
SEE OWNER'S MANUAL FOR ADDITIONAL INFORMATION
RENSEIGNEMENTS RELATIFS AUX PNEUS ET À LA CHARGE DU VÉHICULE
CONSULTER LE GUIDE DU PROPRIÉTAIRE POUR DE PLUS AMPLES RENSEIGNEMENTS

SEATING CAPACITY	TOTAL	FRONT	REAR
NOMBRE DE PLACES	TOTAL: 7	AVANT: 2	ARRIERE: 5

The combined weight of occupants and cargo should never exceed 606KG OR 1335LBS
 La charge du véhicule (occupants et baggages) ne doit jamais dépasser 606KG OR 1335LBS

ORIGINAL TIRE SIZE DIMENSIONS DES PNEUS D'ORIGINE		COLD TIRE INFLATION PRESSURE PRESSION DE GONFLAGE À FROID	
FRONT/AVANT	P215/65R16	FRONT/AVANT	240 kPa, 35 PSI
REAR/ARRIERE	P215/65R16	REAR/ARRIERE	240 kPa, 35 PSI
COMPACT SIZE SPARE TIRE DIMENSIONS DU PNEU SECOURS COMPACT		COLD TIRE INFLATION PRESSURE PRESSION DE GONFLAGE À FROID	
T155/80R17		420 kPa, 60 PSI	

02B7V



02B7V56081

Figure A-3 VEHICLE TIRE PLACARD



Figure A-4 RIGHT FRONT, AS RECEIVED



Figure A-5 LEFT REAR, AS RECEIVED

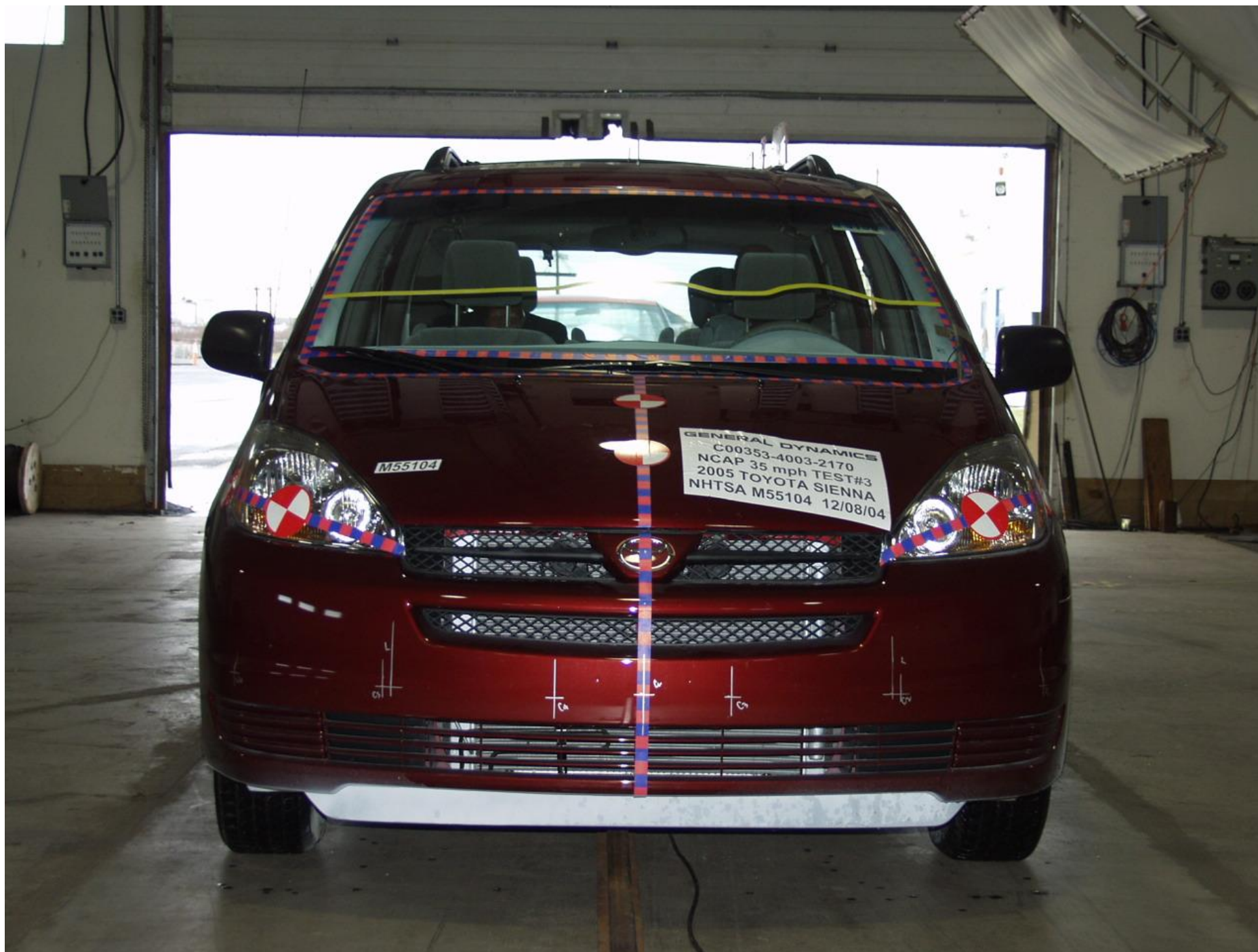


Figure A-6 PRE-TEST FRONT VIEW



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

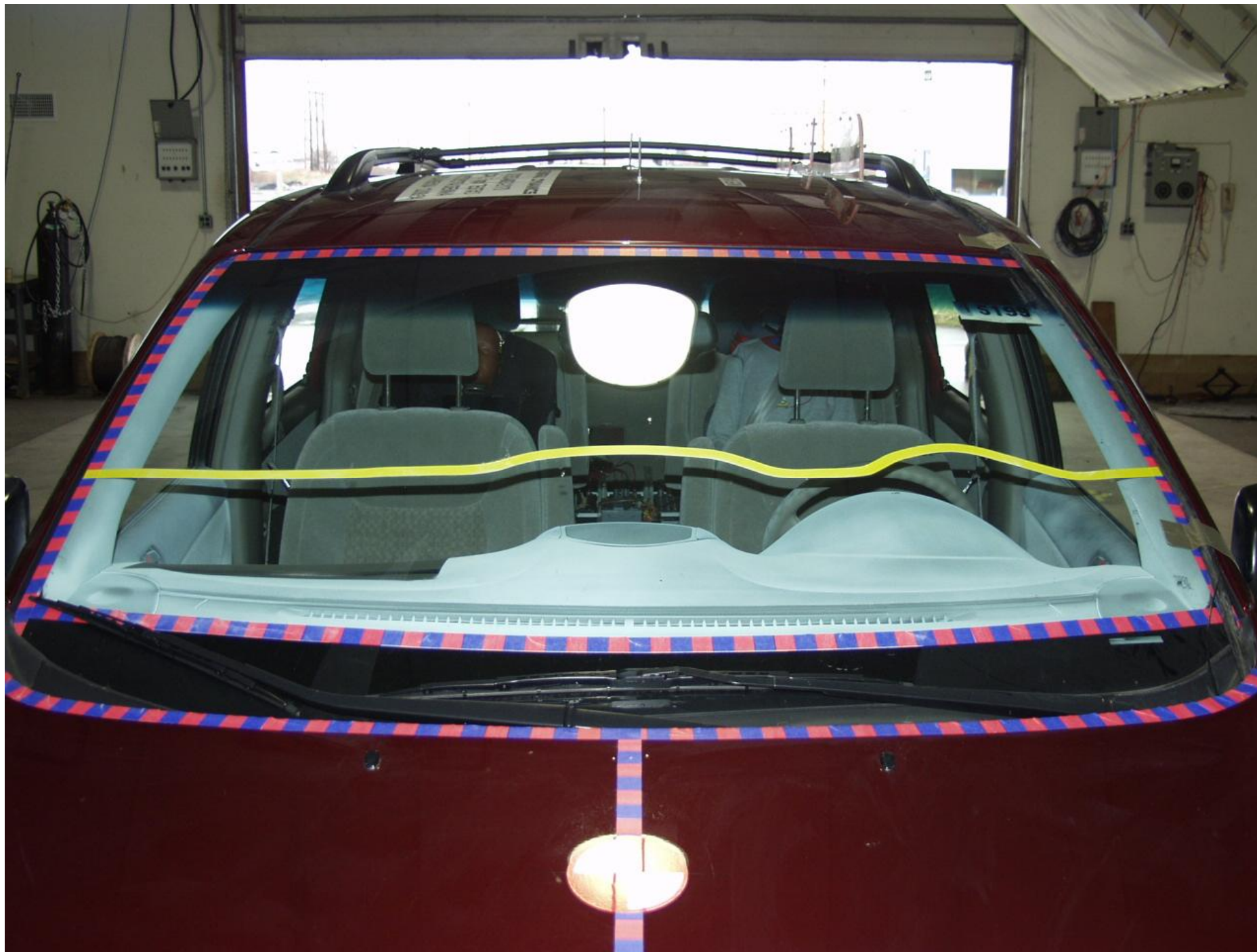


Figure A-18 PRE-TEST WINDSHIELD VIEW



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

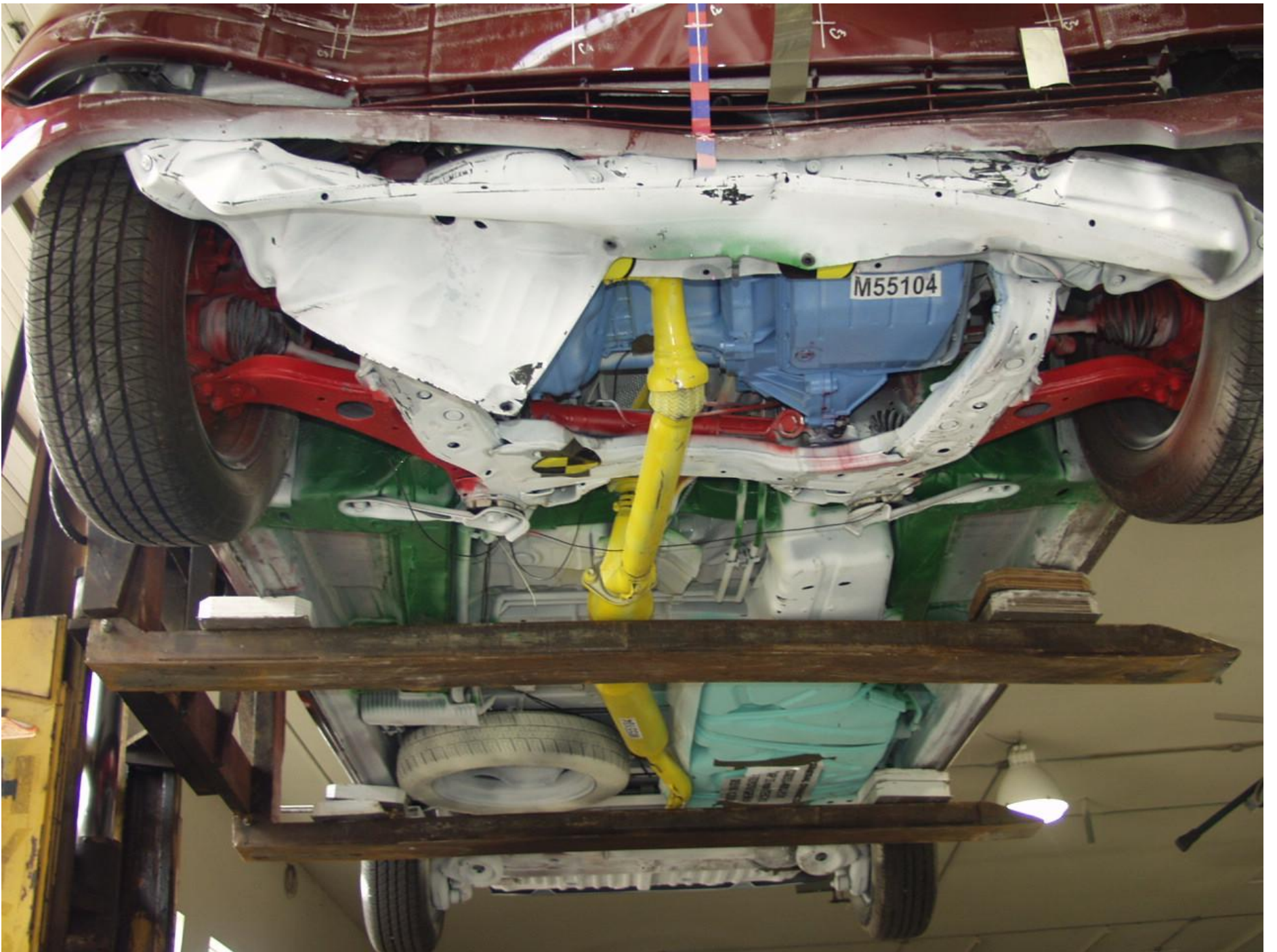


Figure A-25 POST-TEST FRONT UNDERBODY VIEW



Figure A-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



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. M55104

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

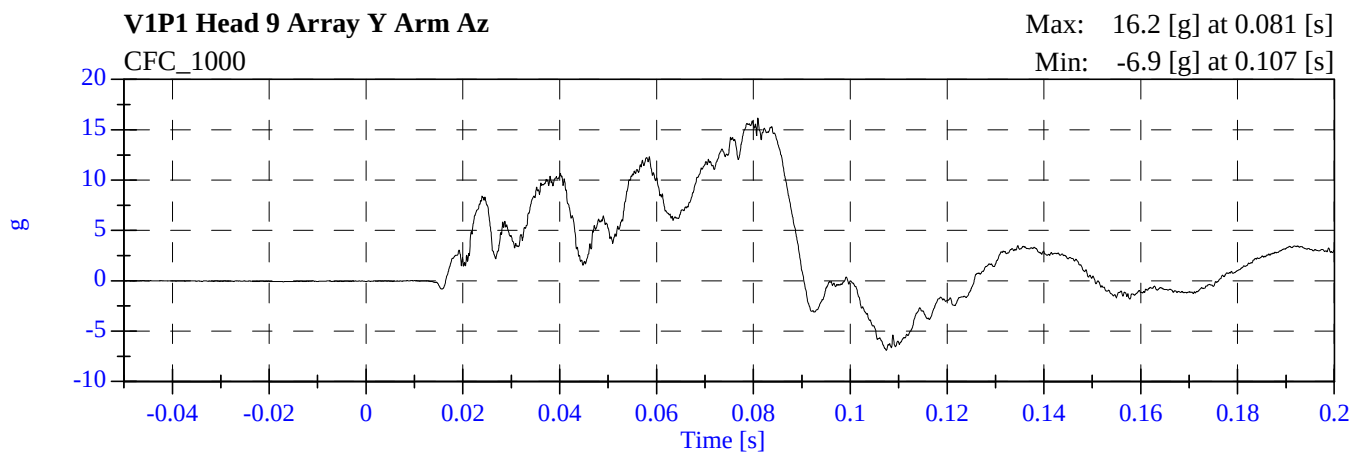
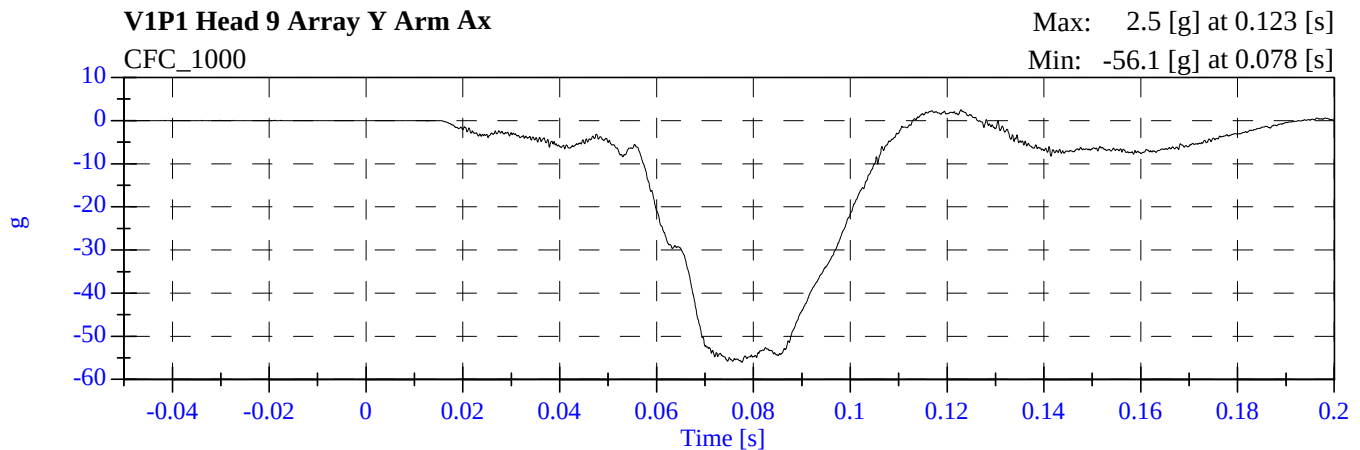
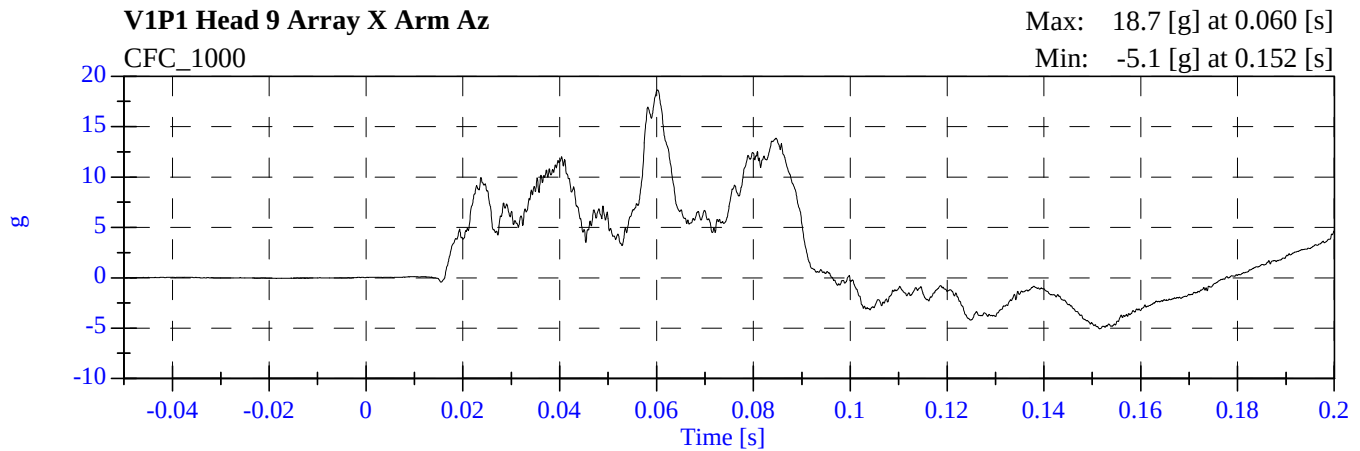
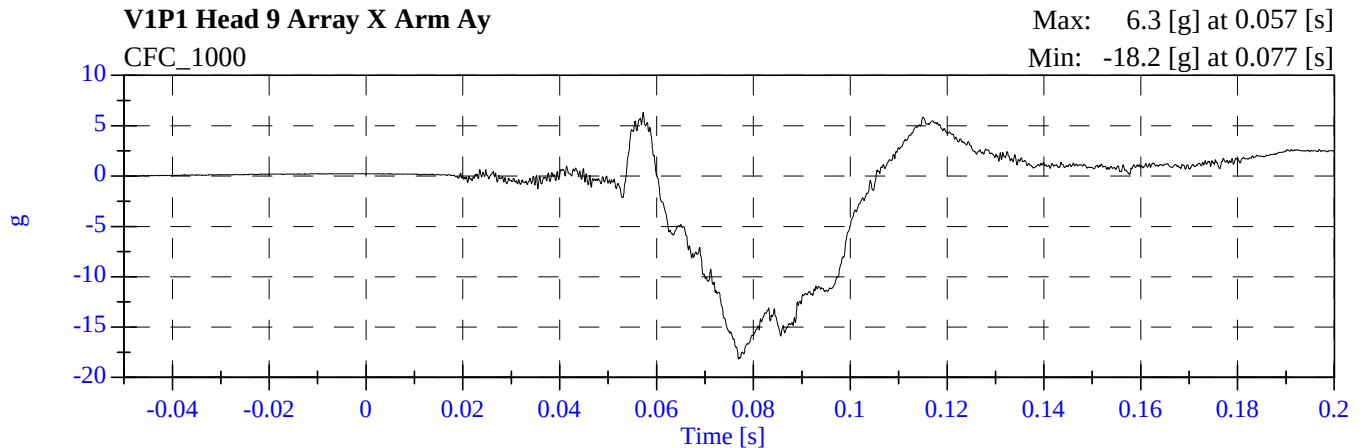
Table of Data Plots (Continued)

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
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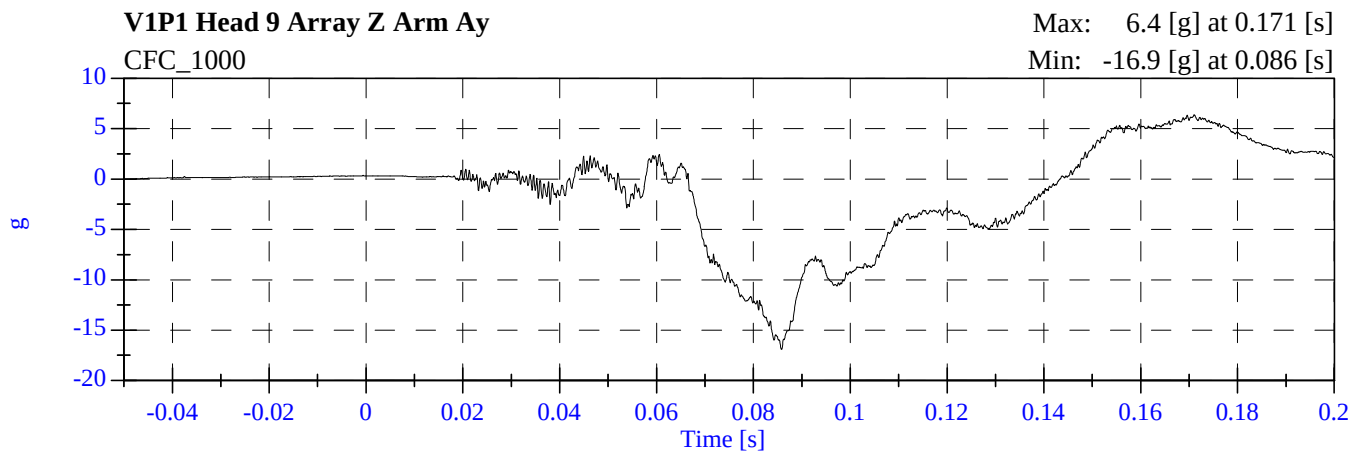
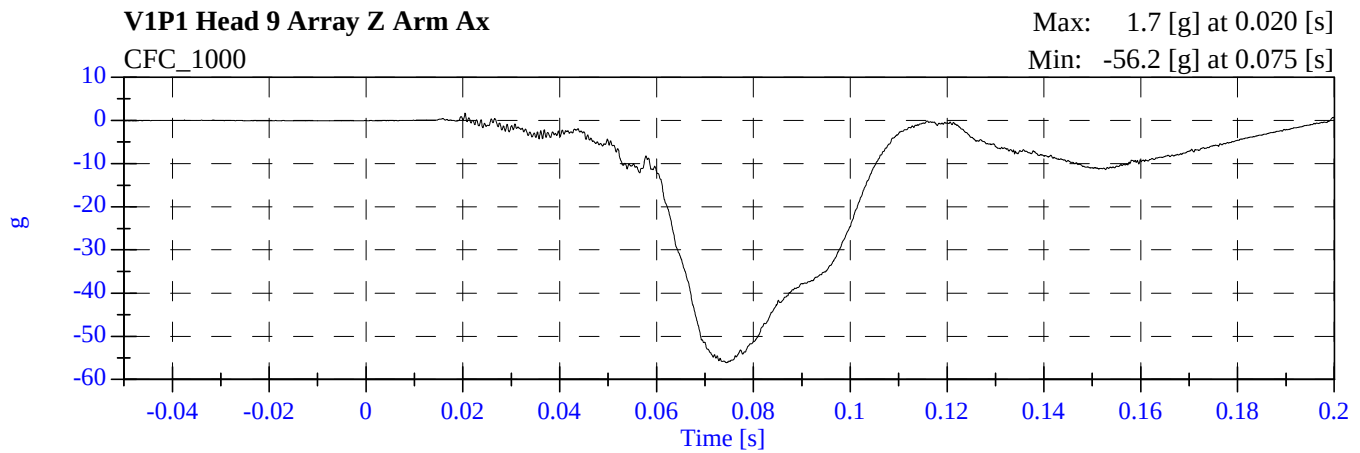
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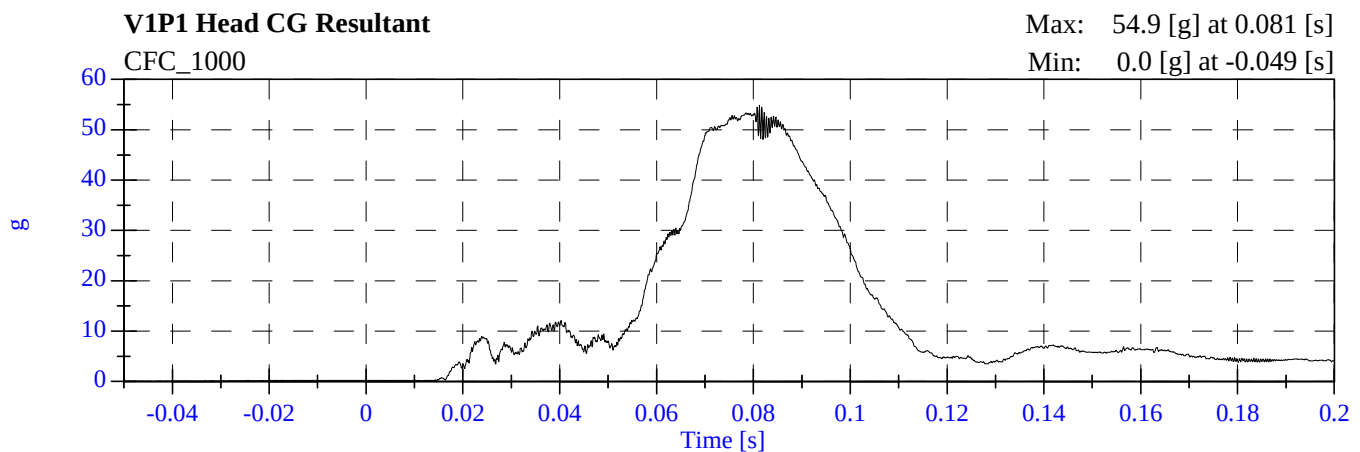
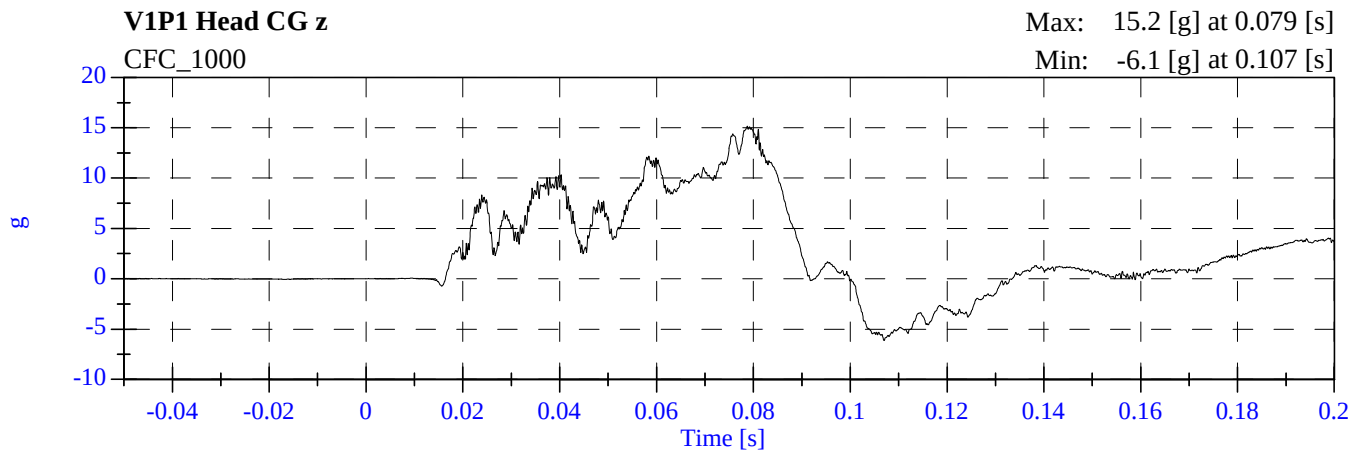
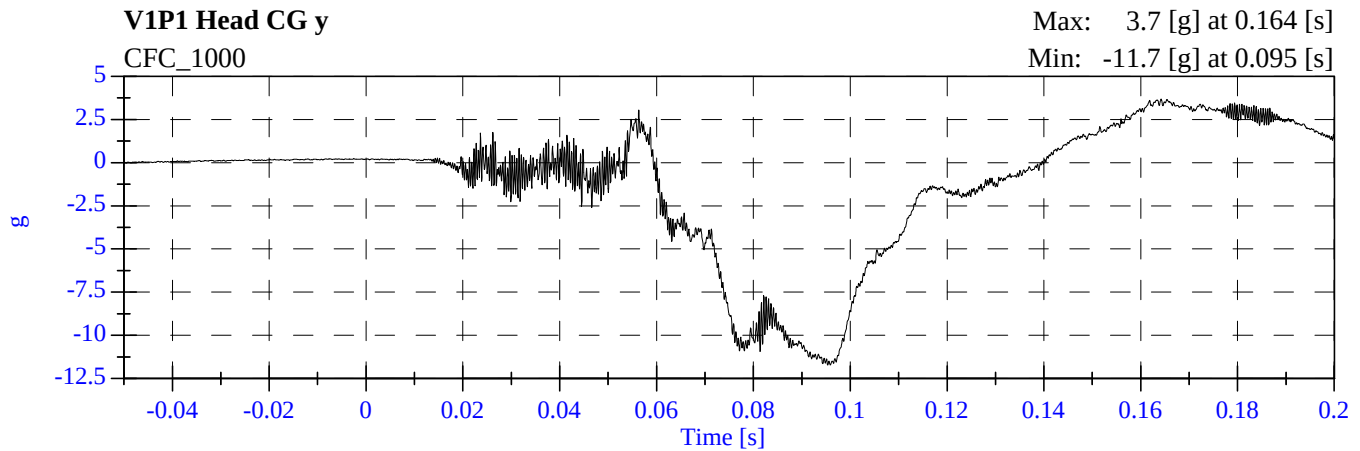
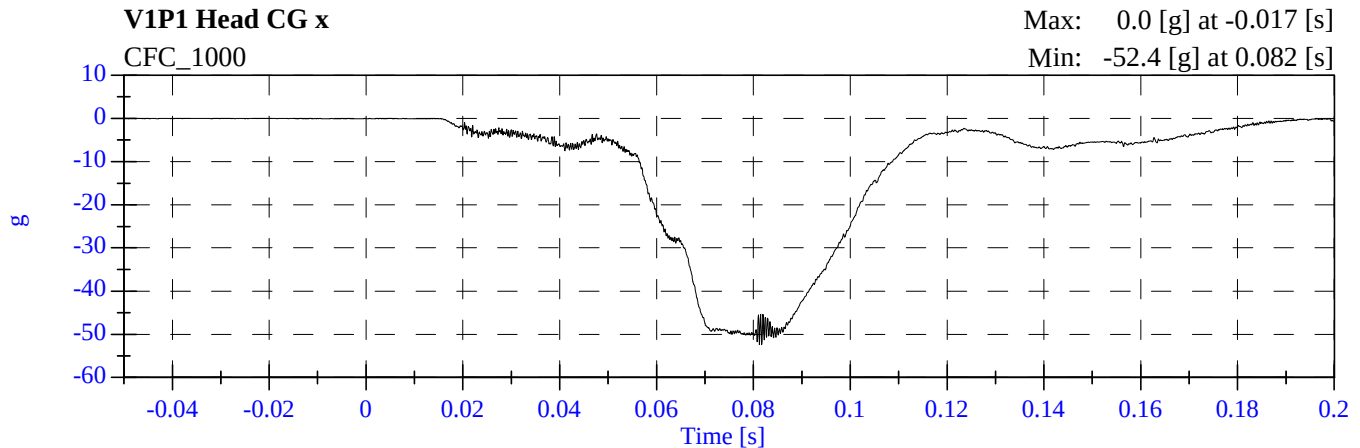
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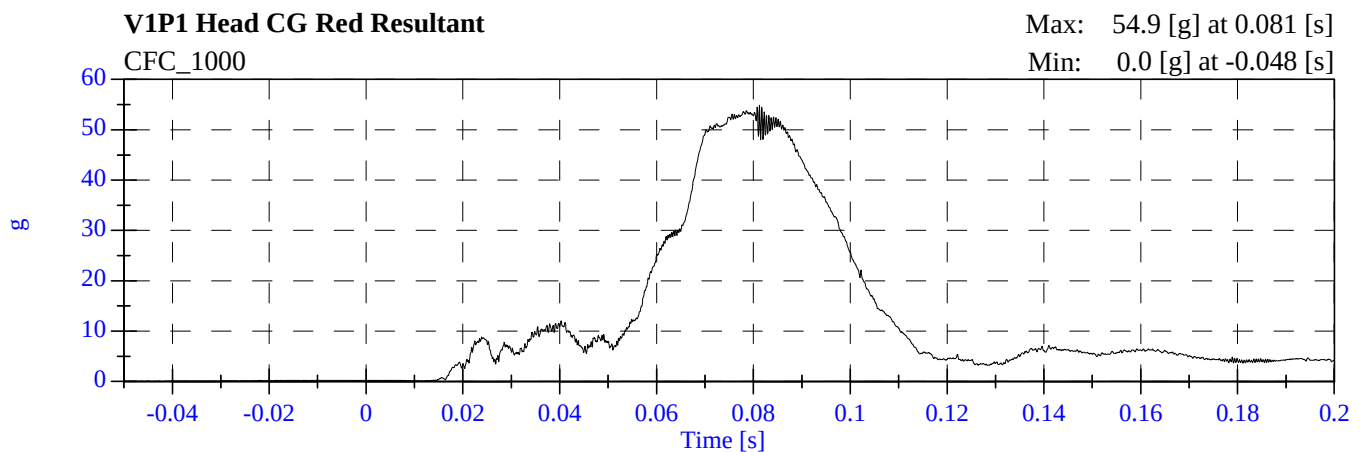
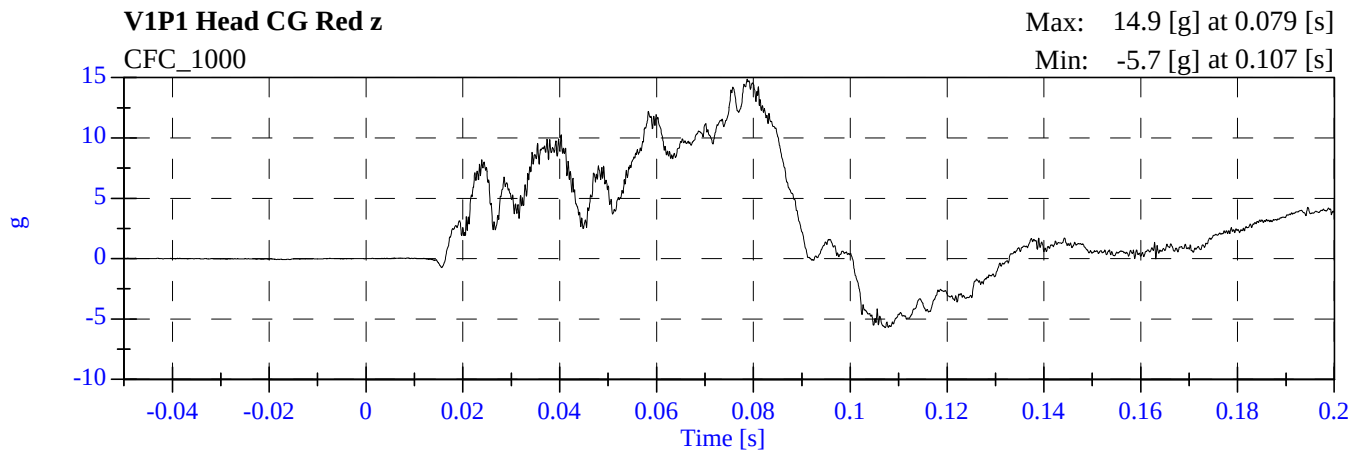
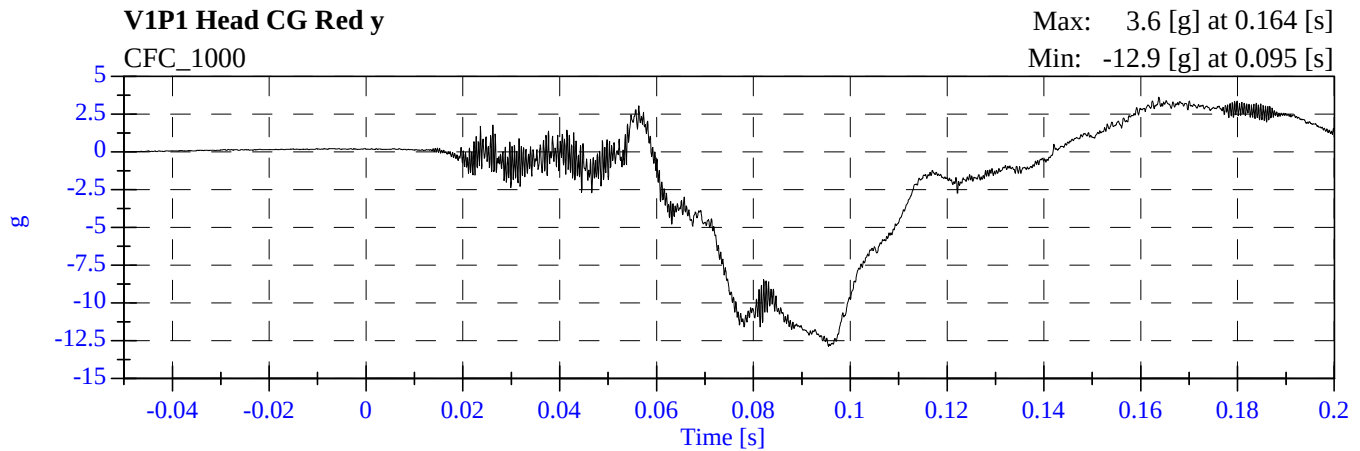
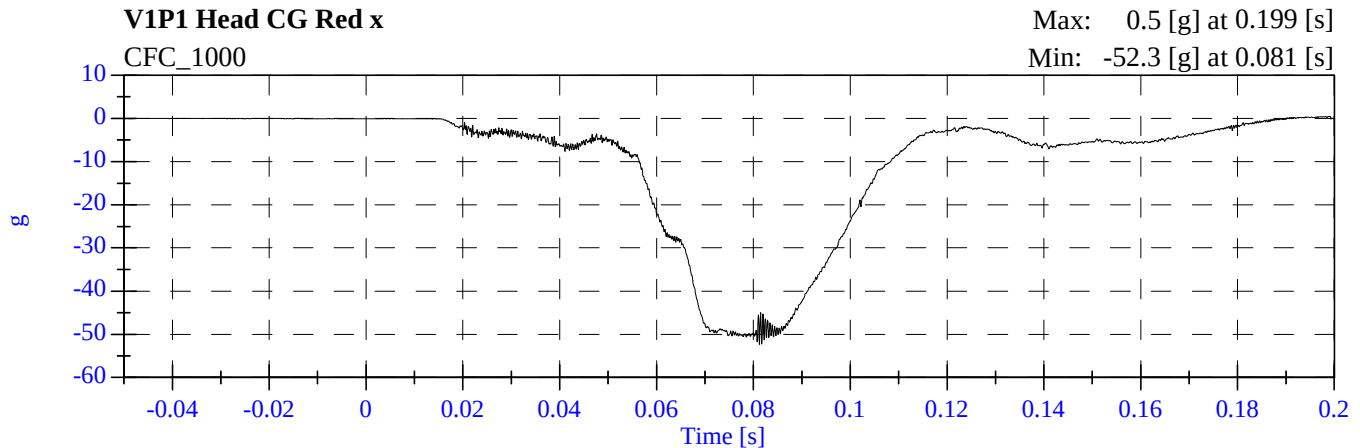
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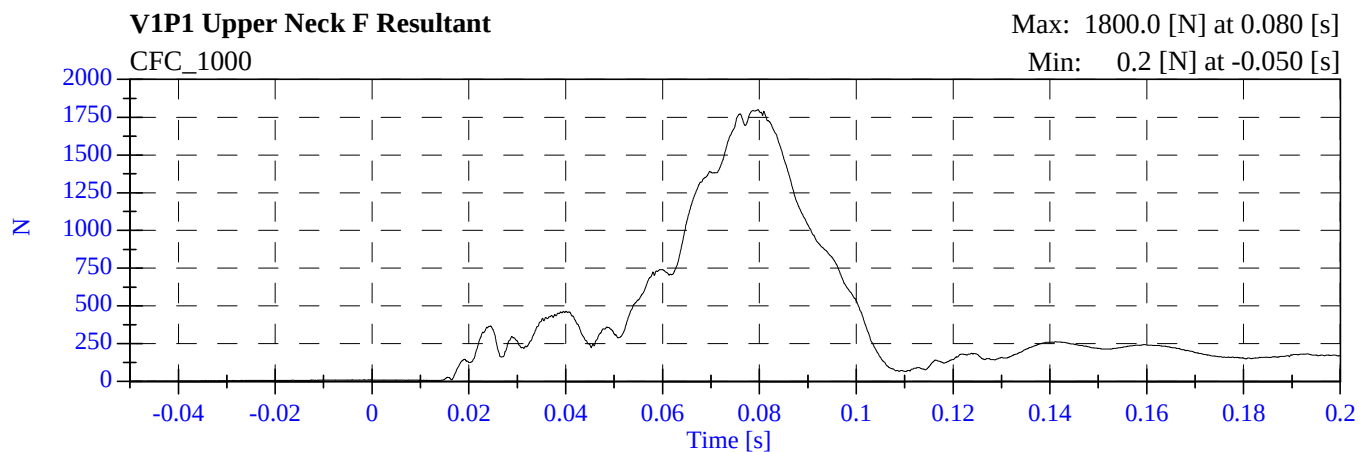
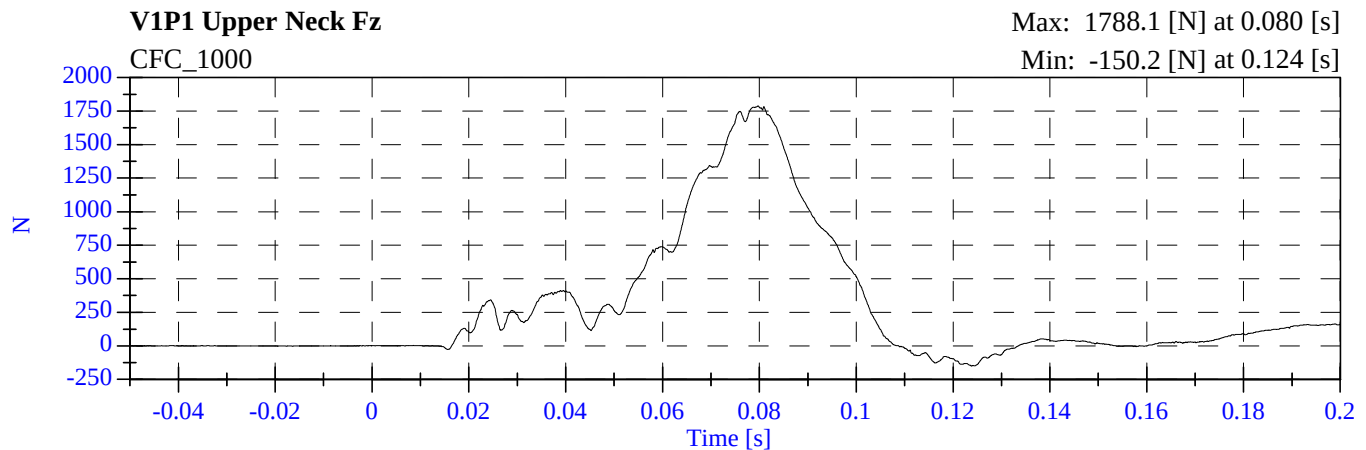
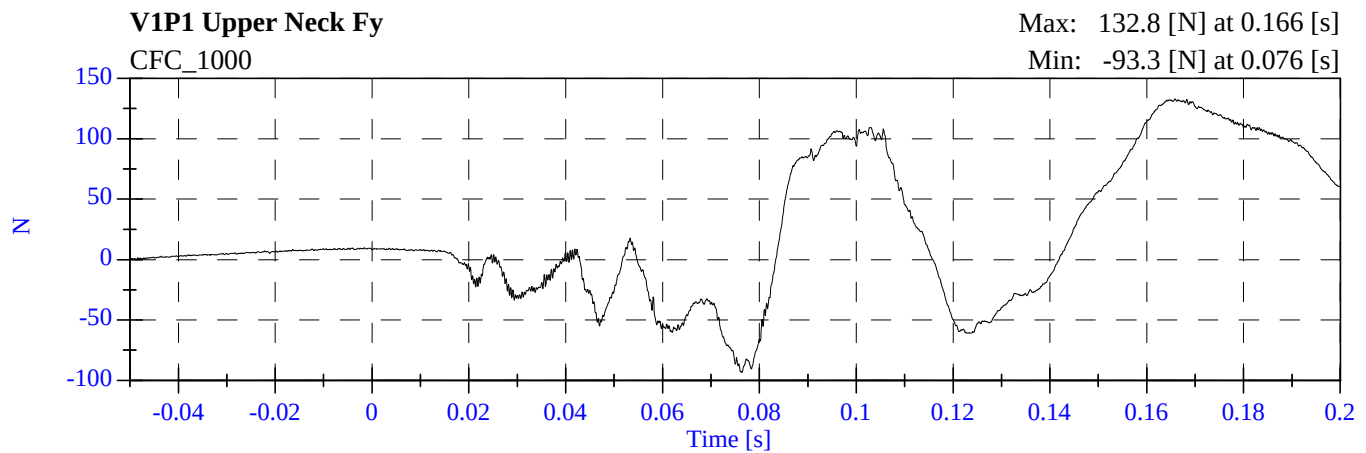
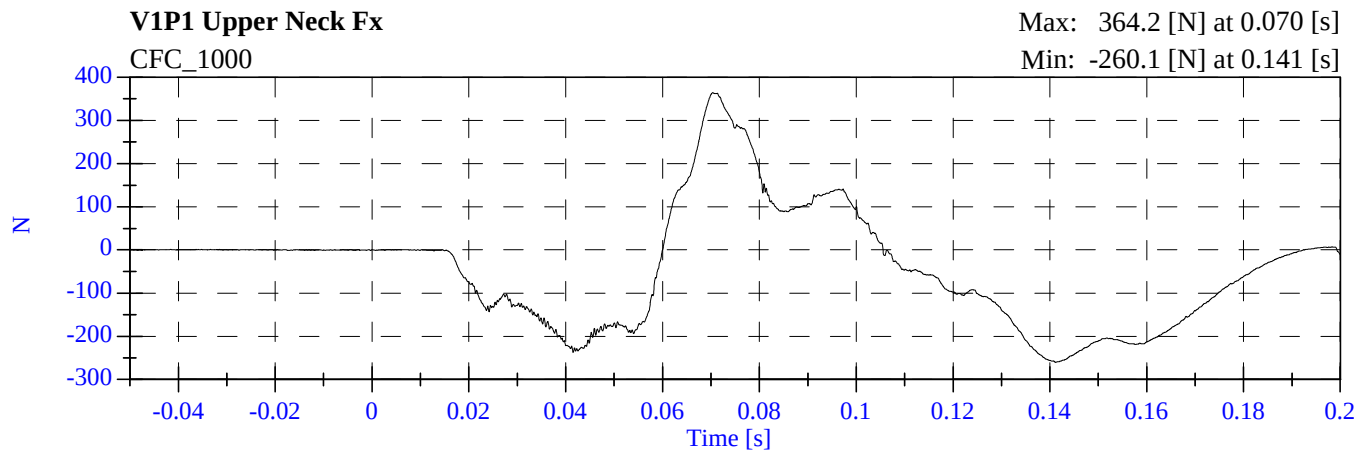


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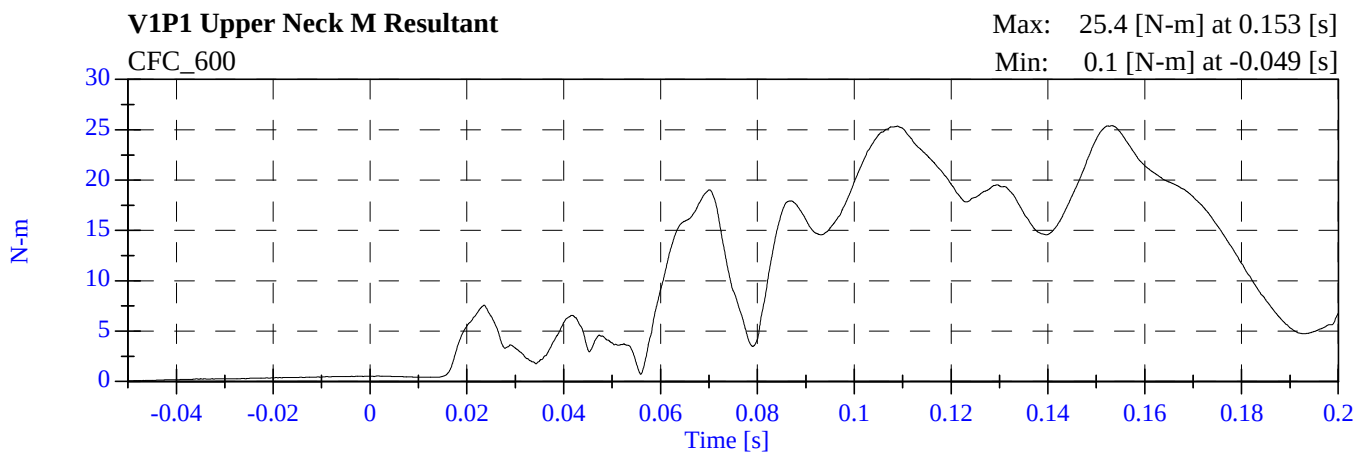
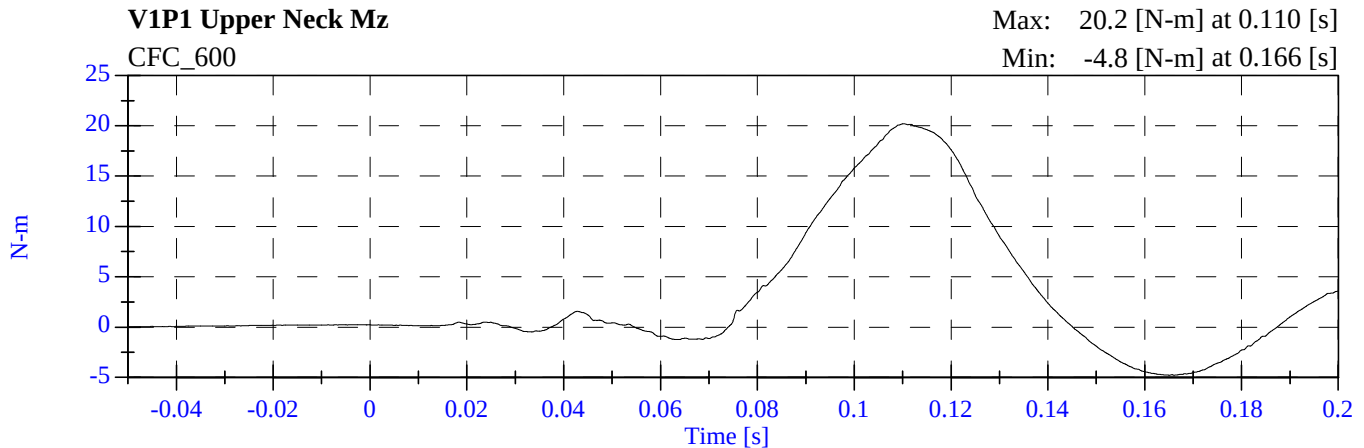
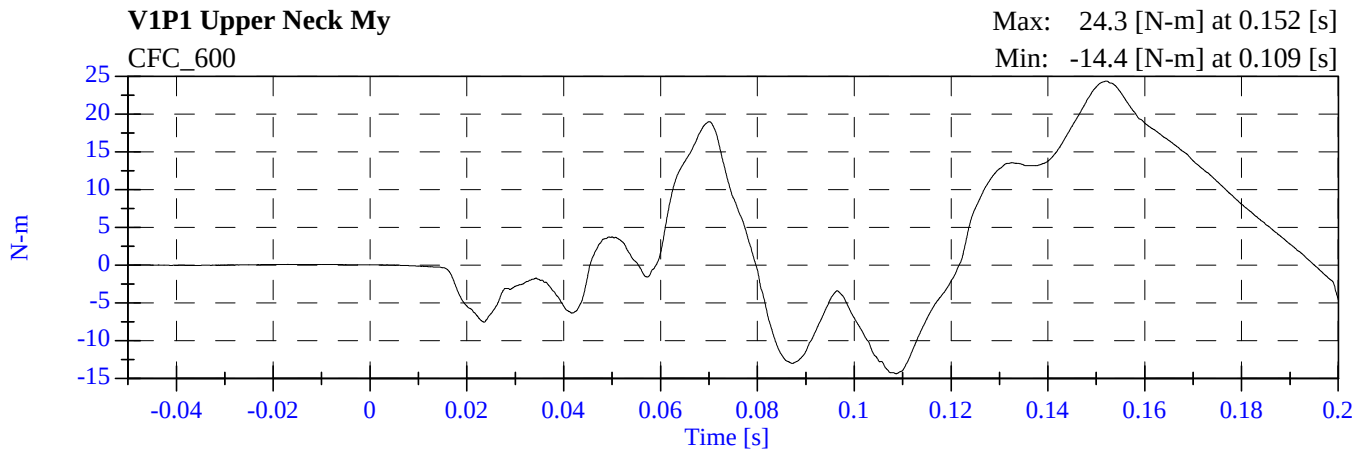
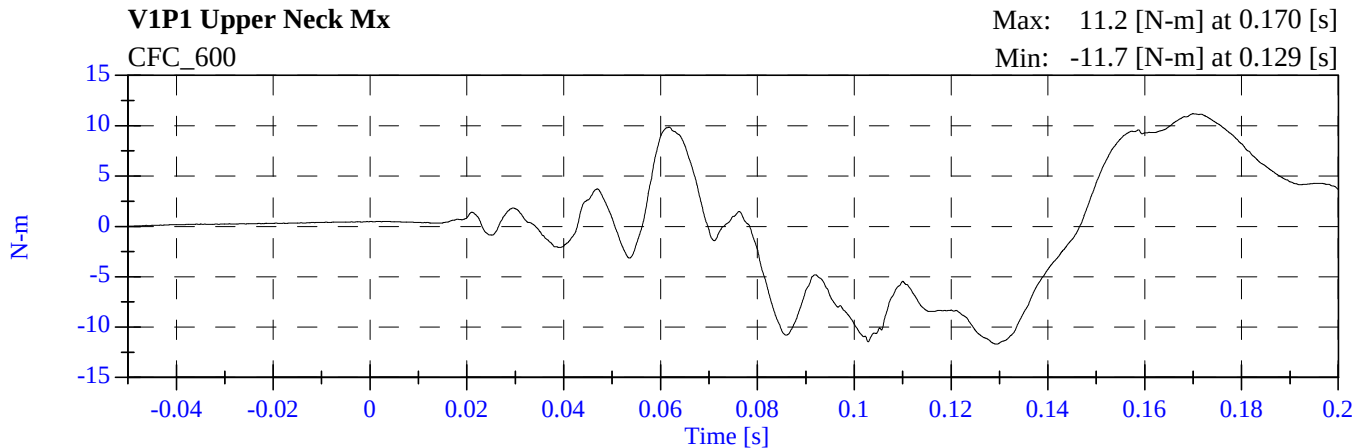
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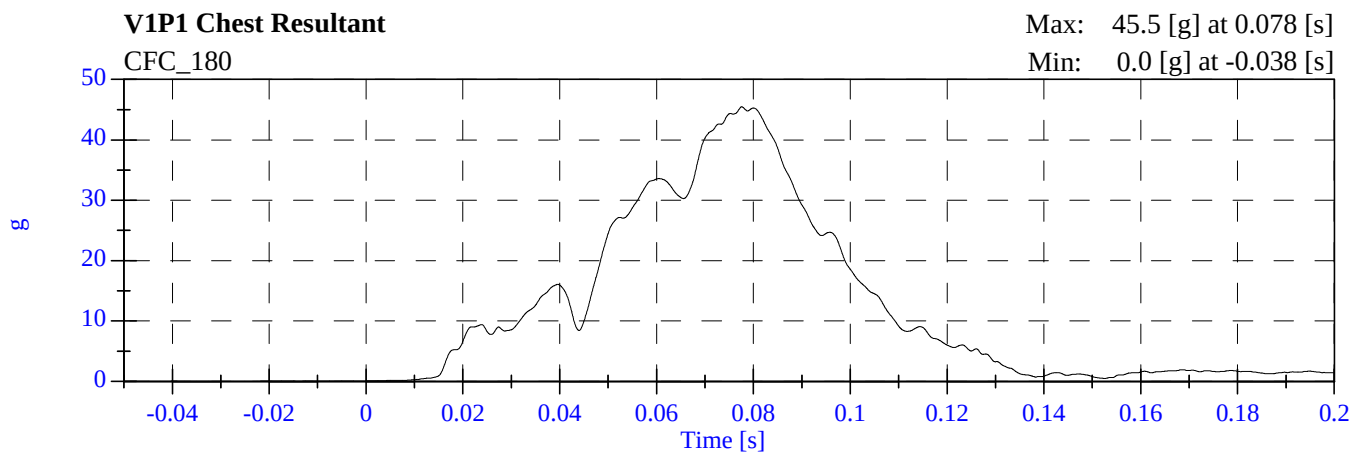
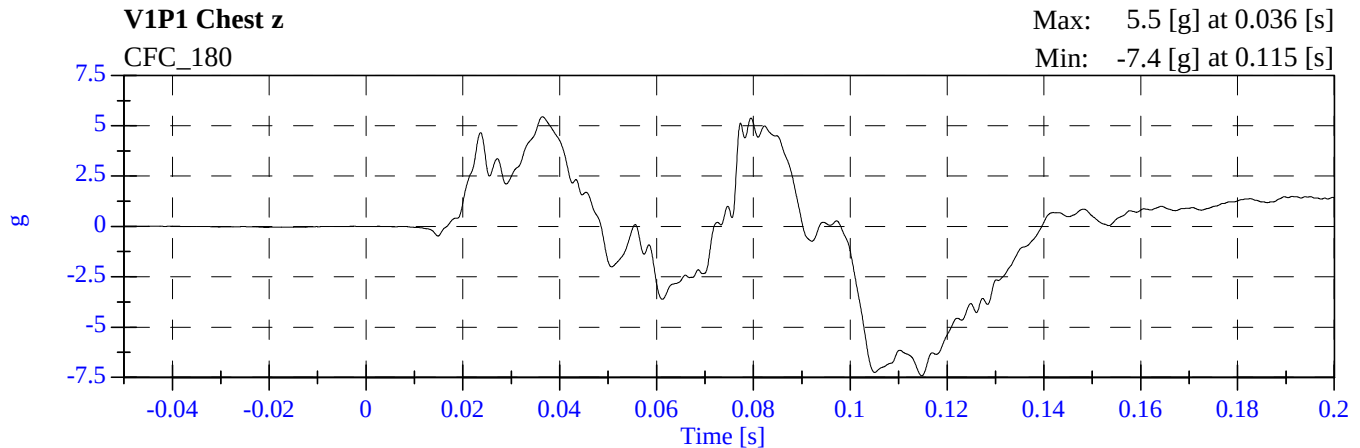
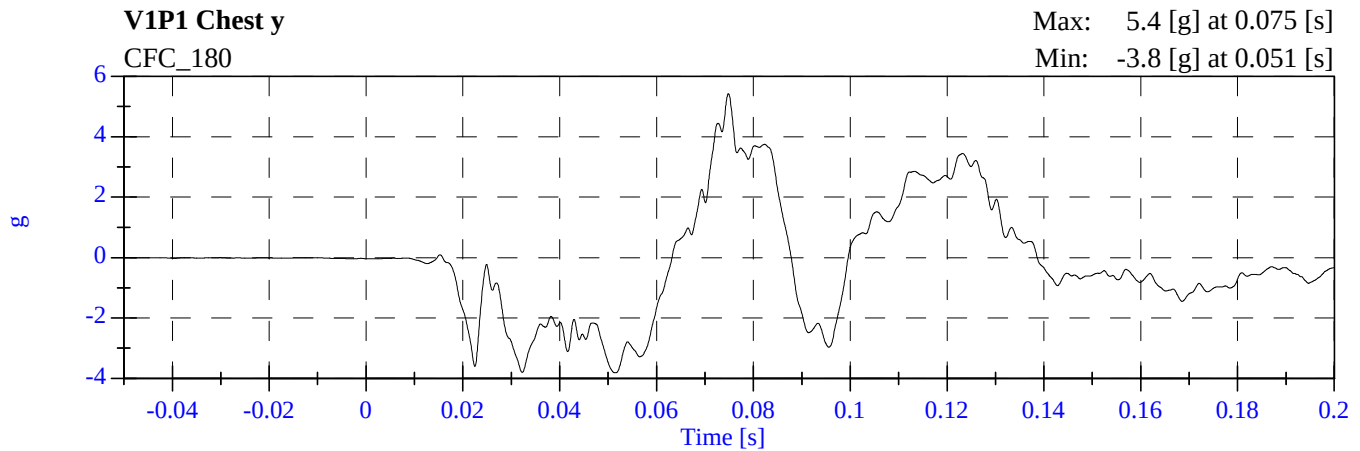
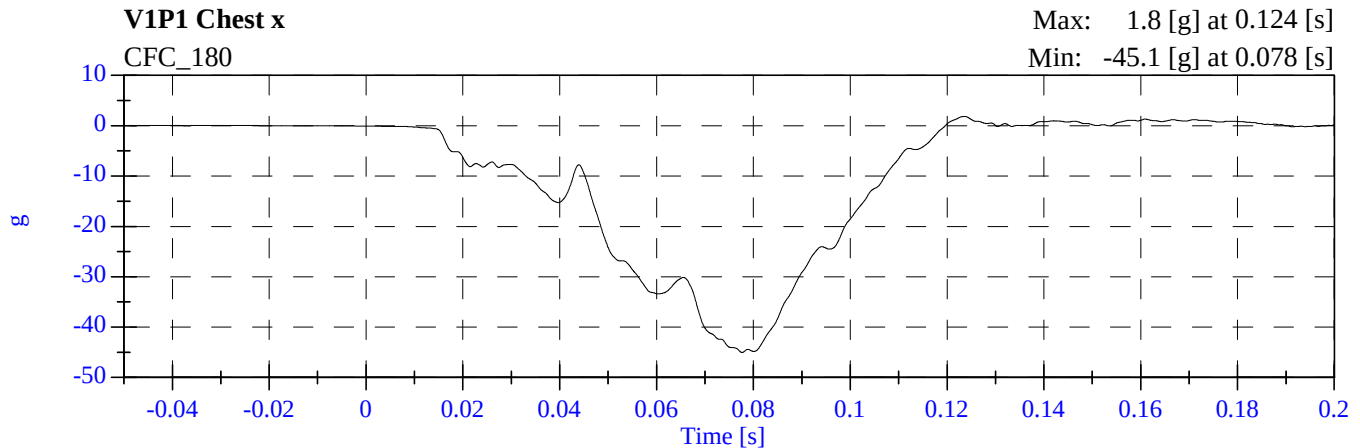
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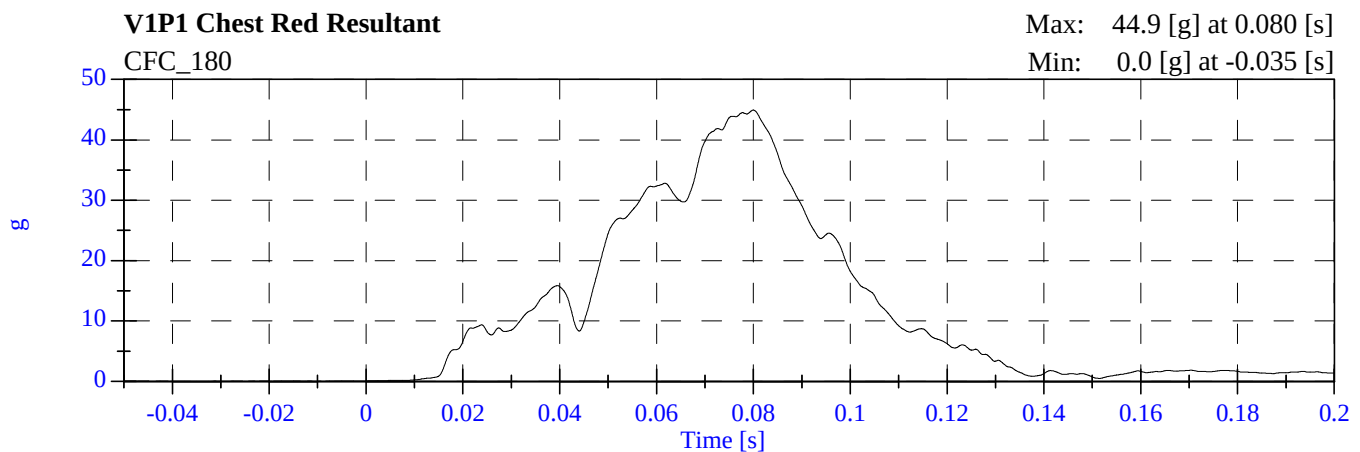
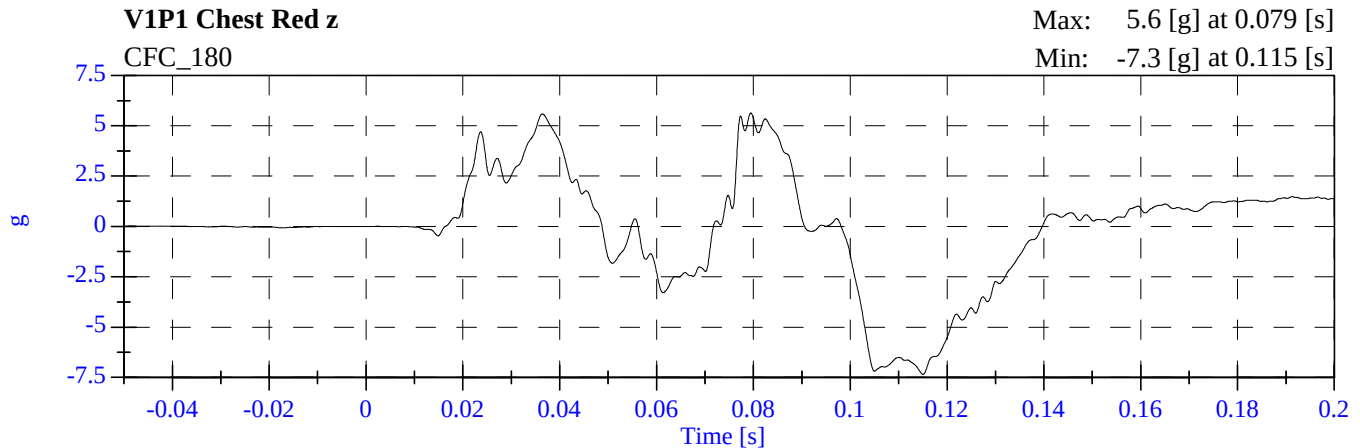
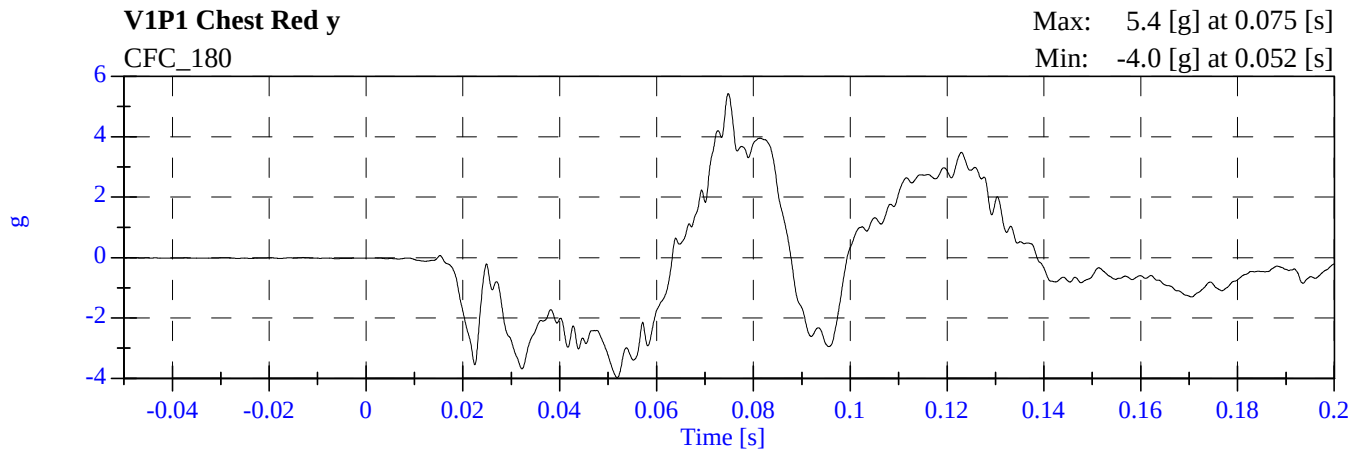
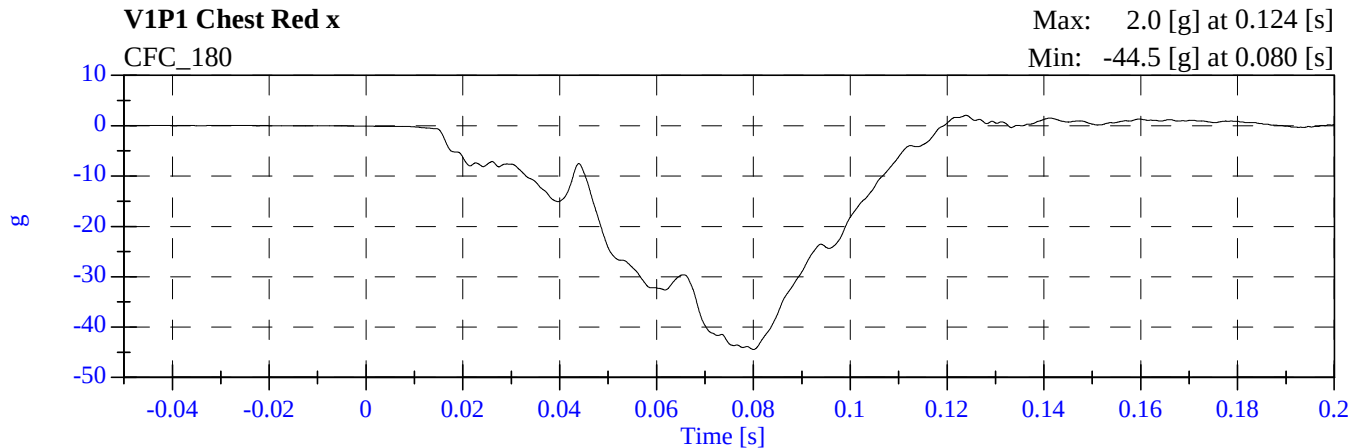
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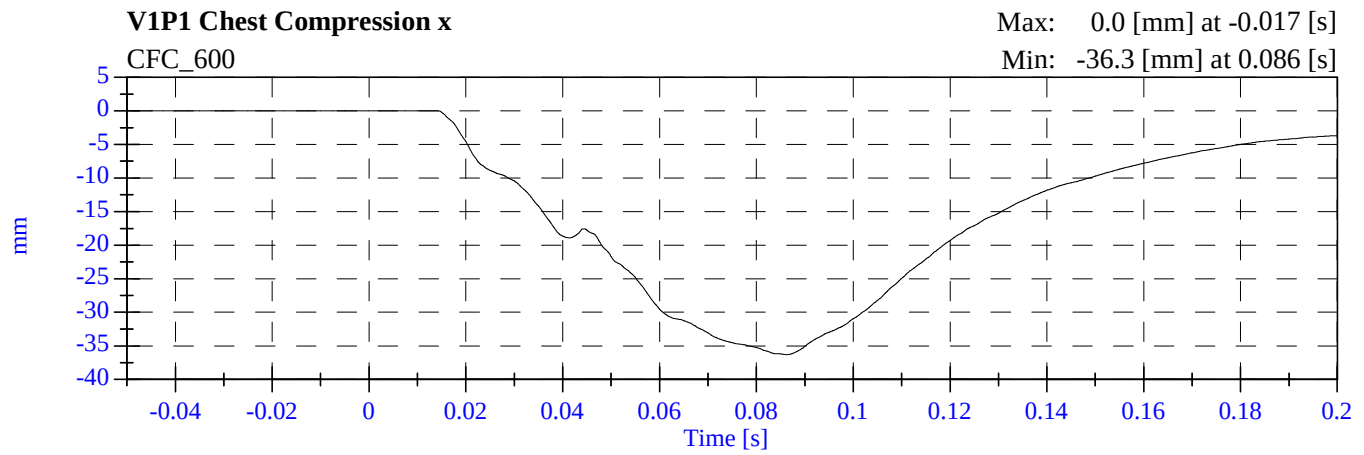


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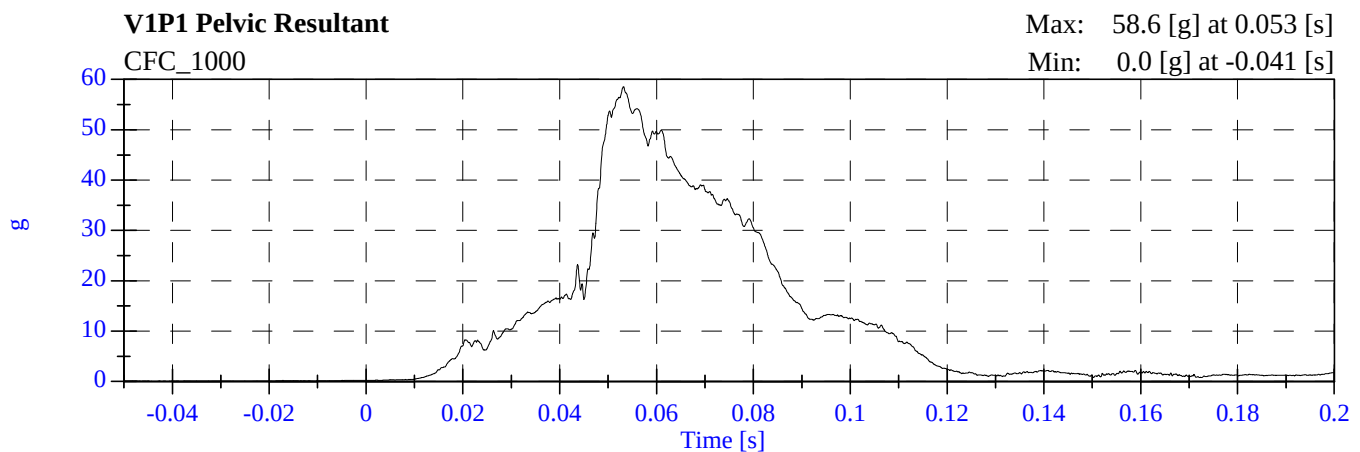
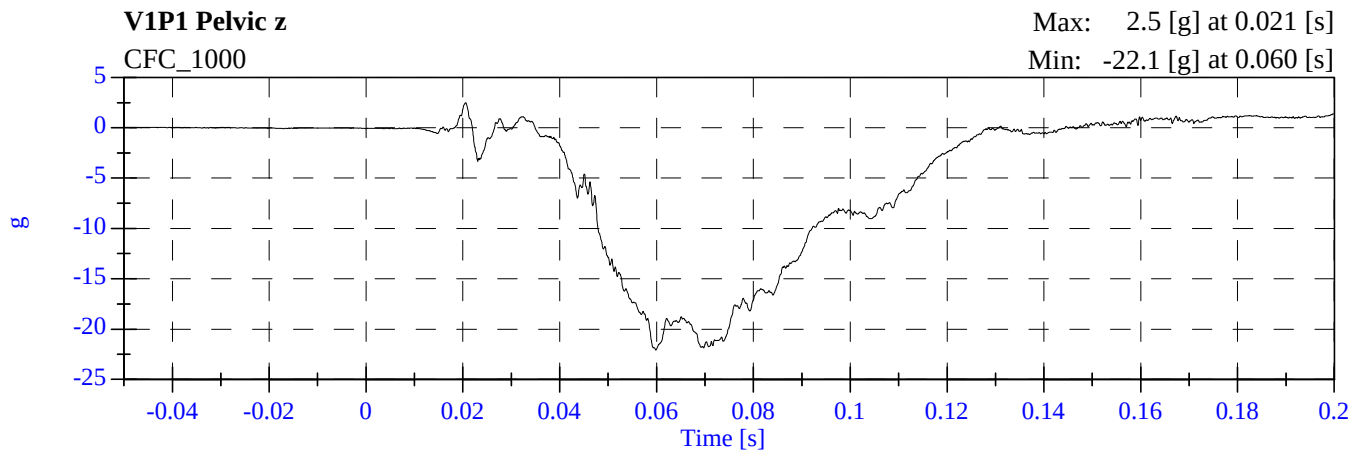
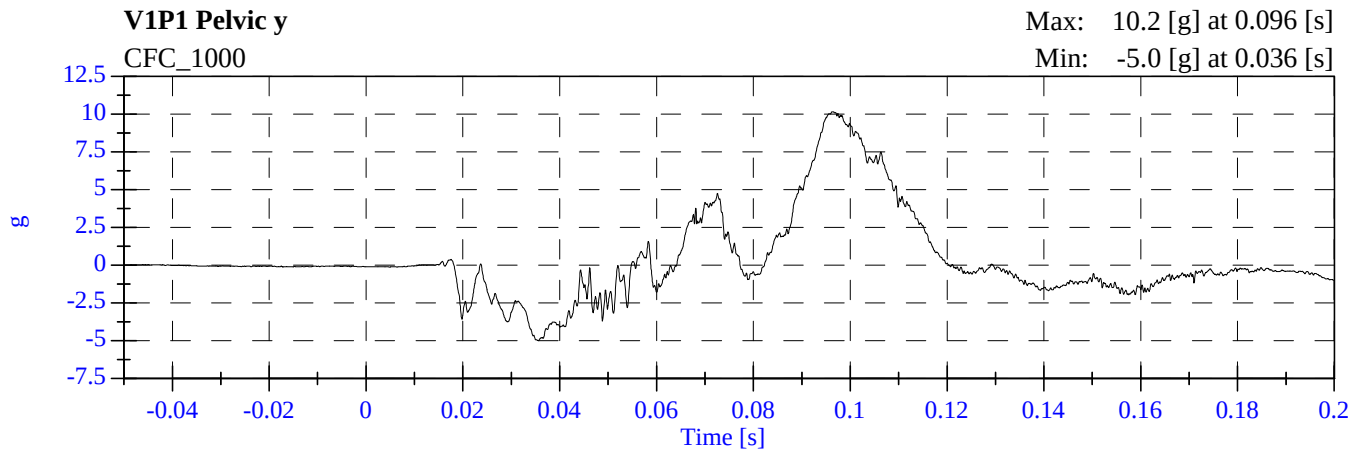
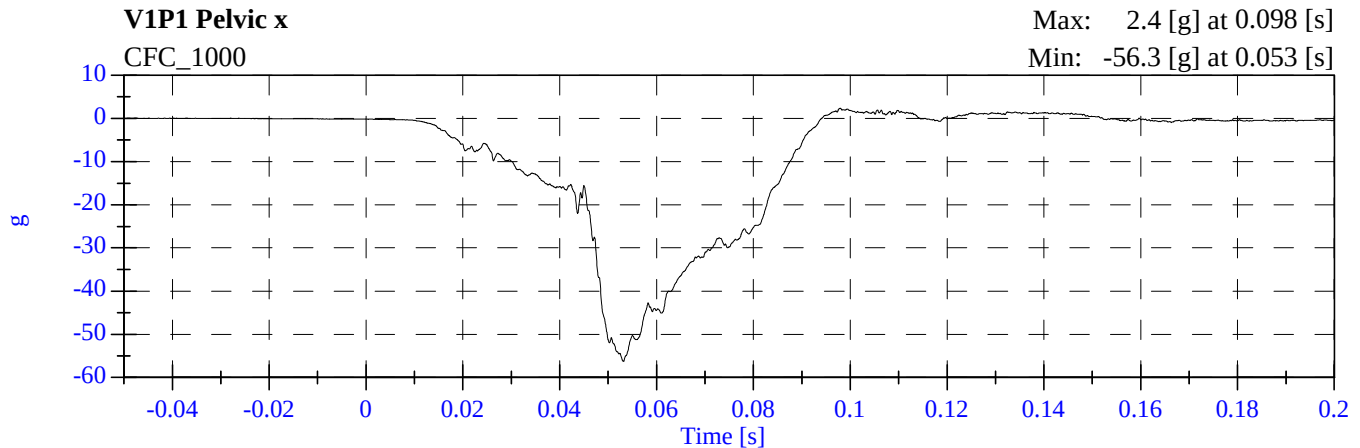


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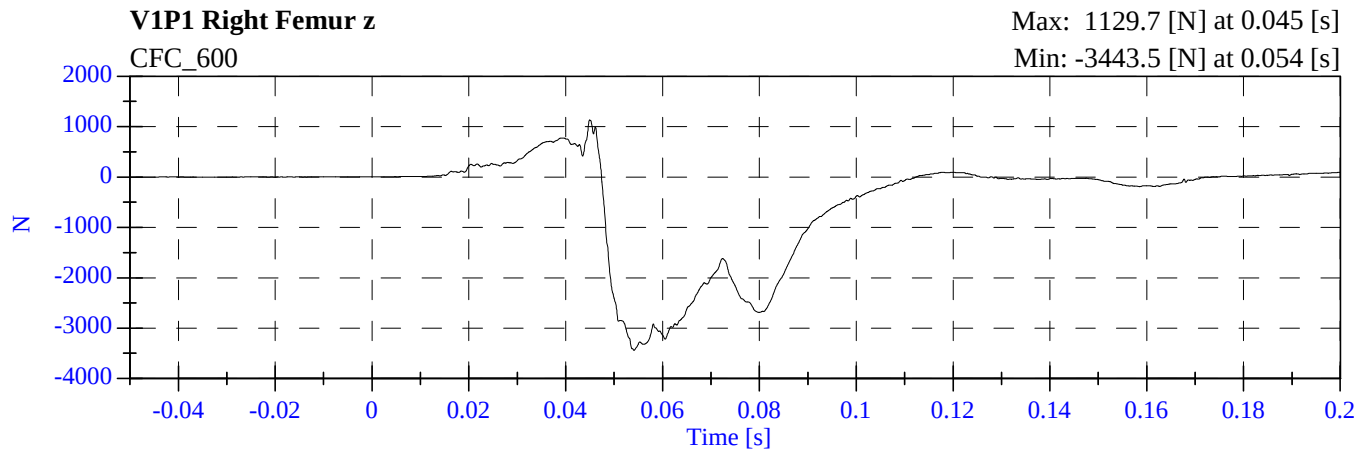
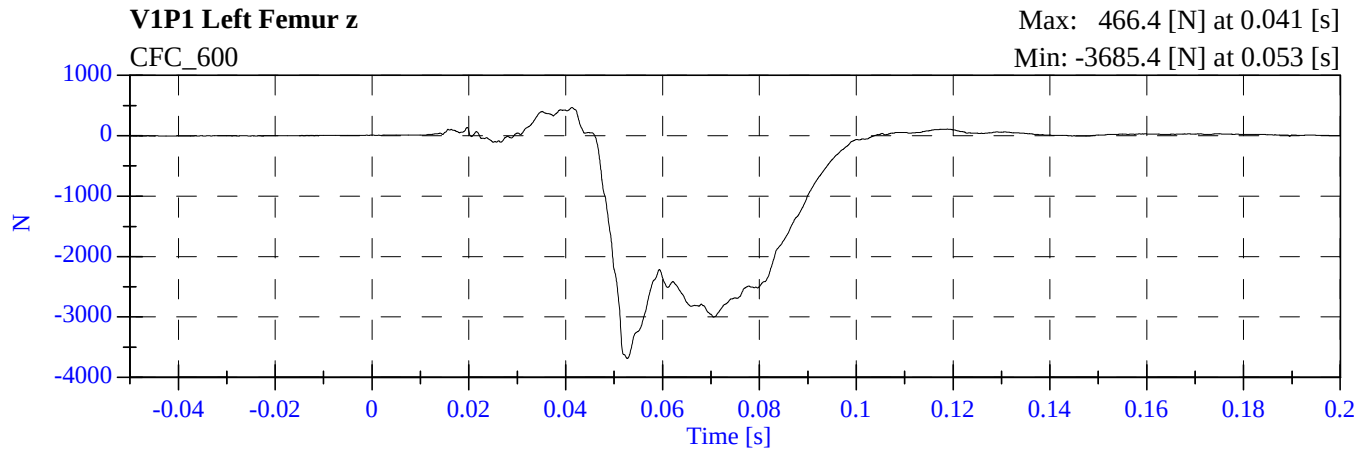
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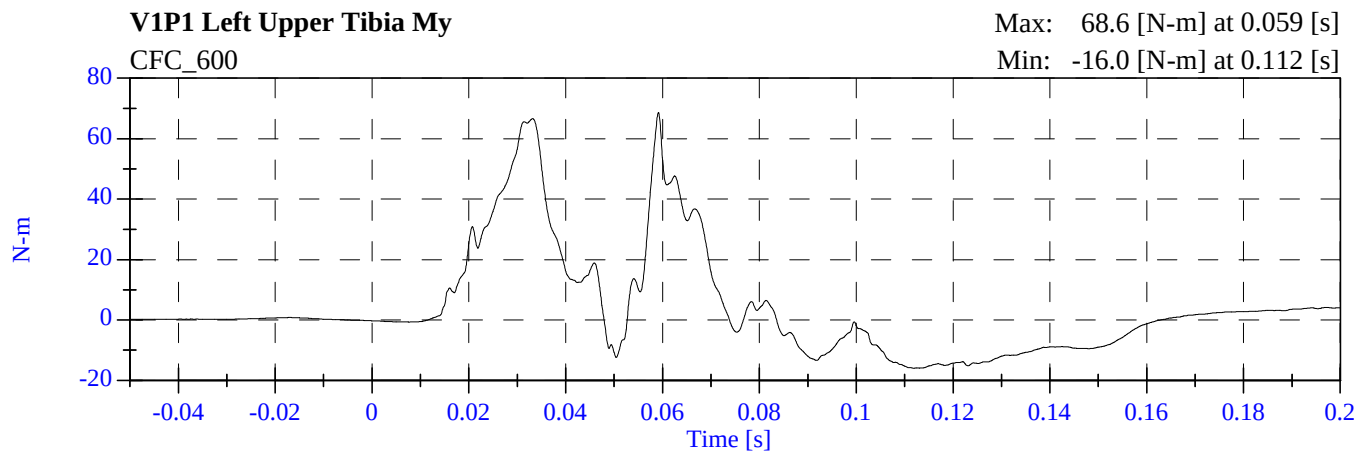
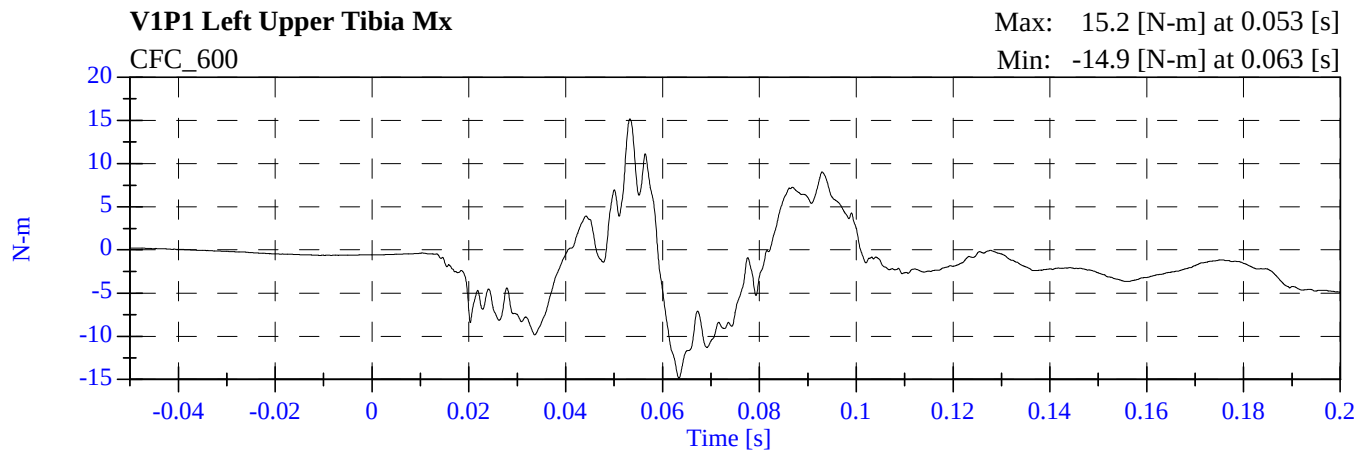
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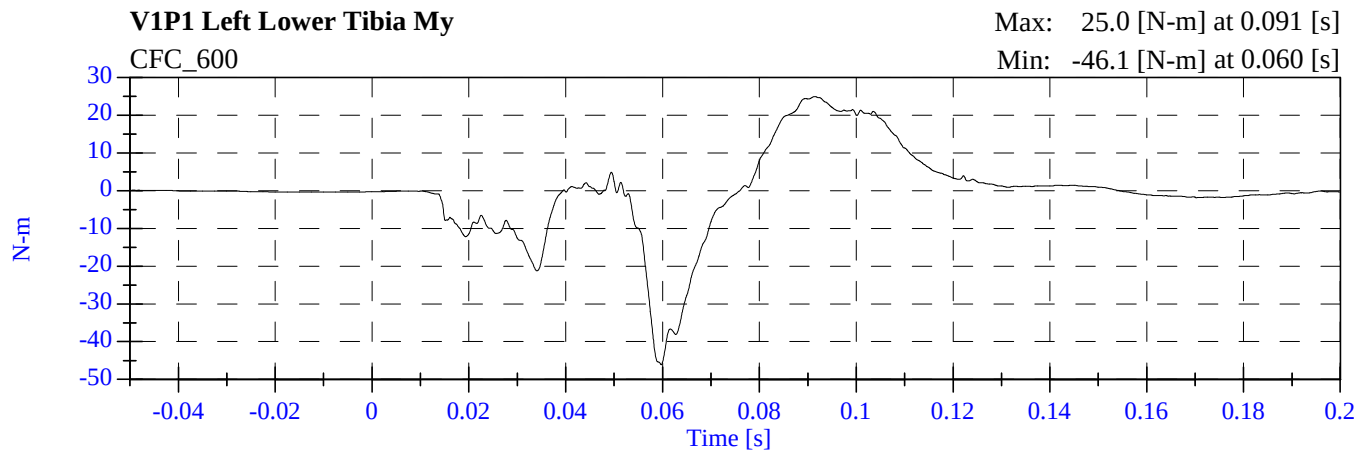
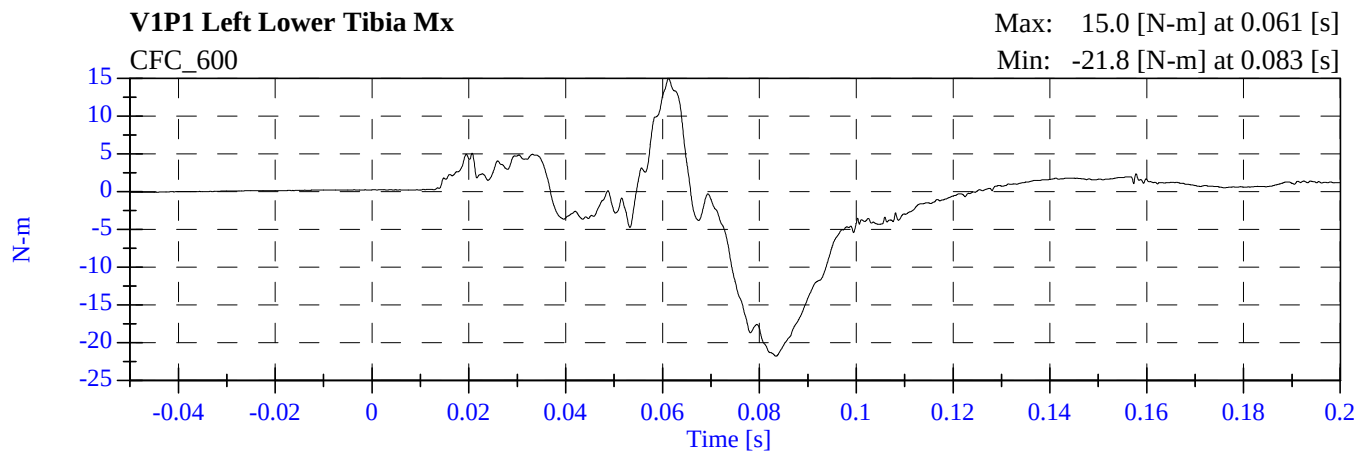
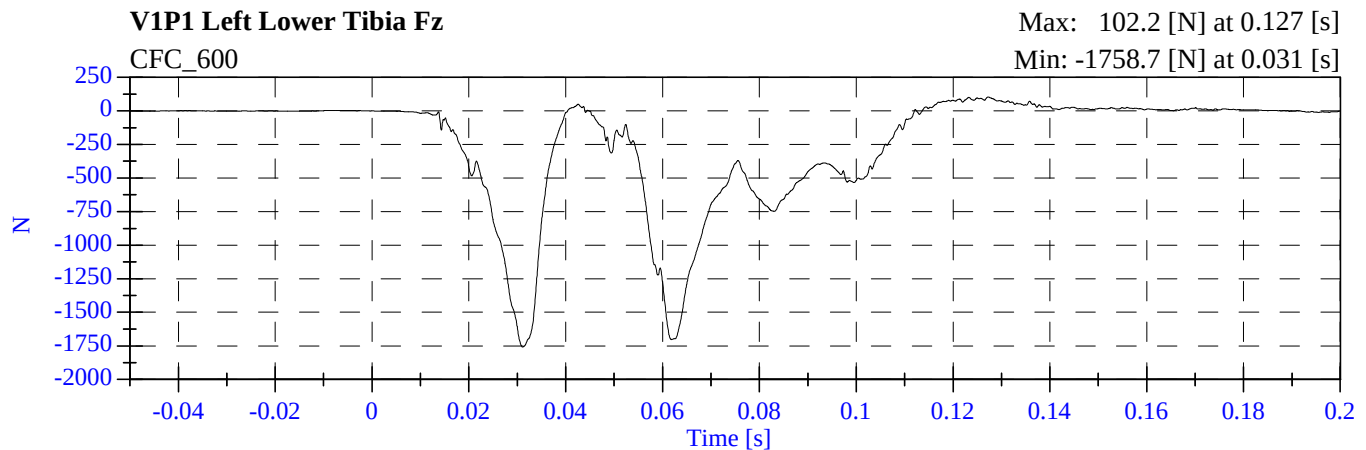
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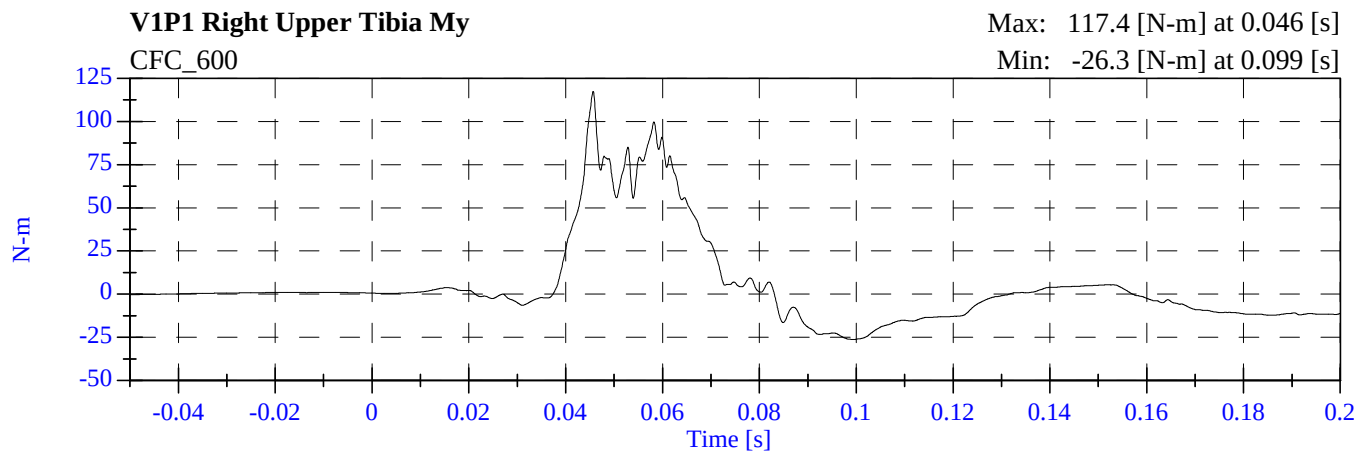
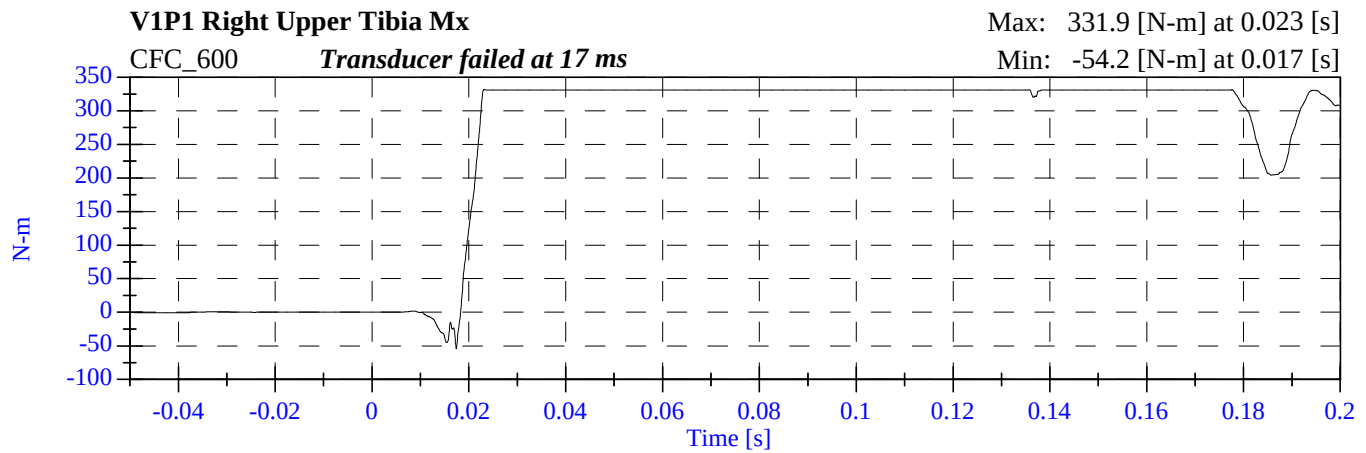
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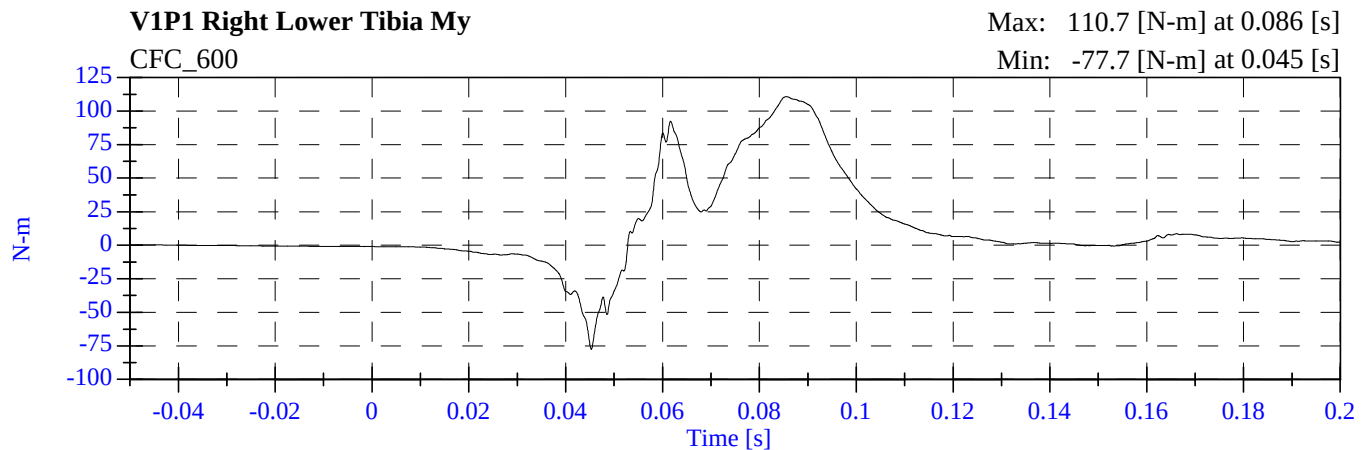
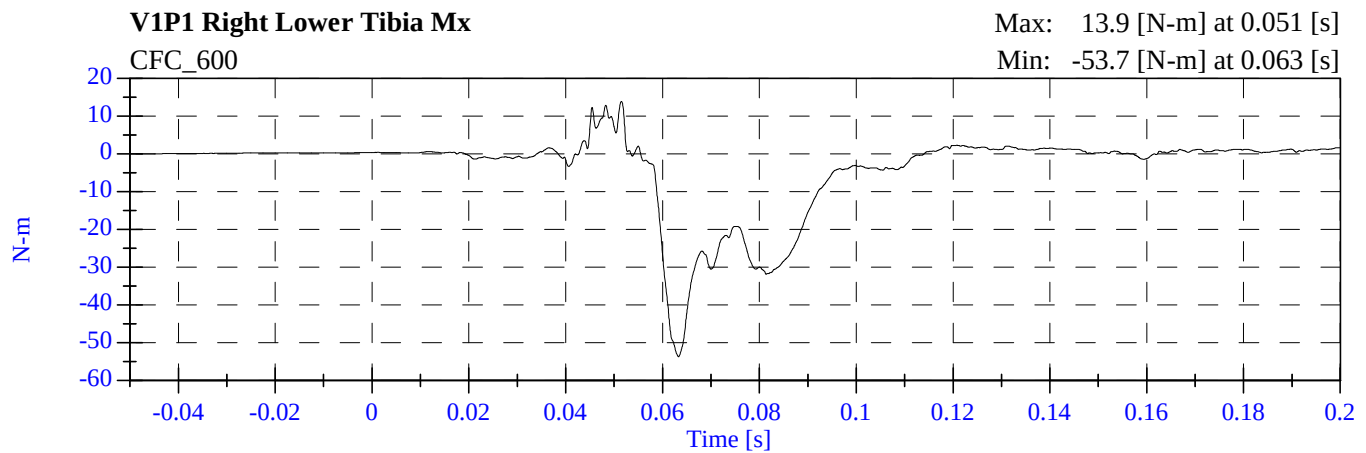
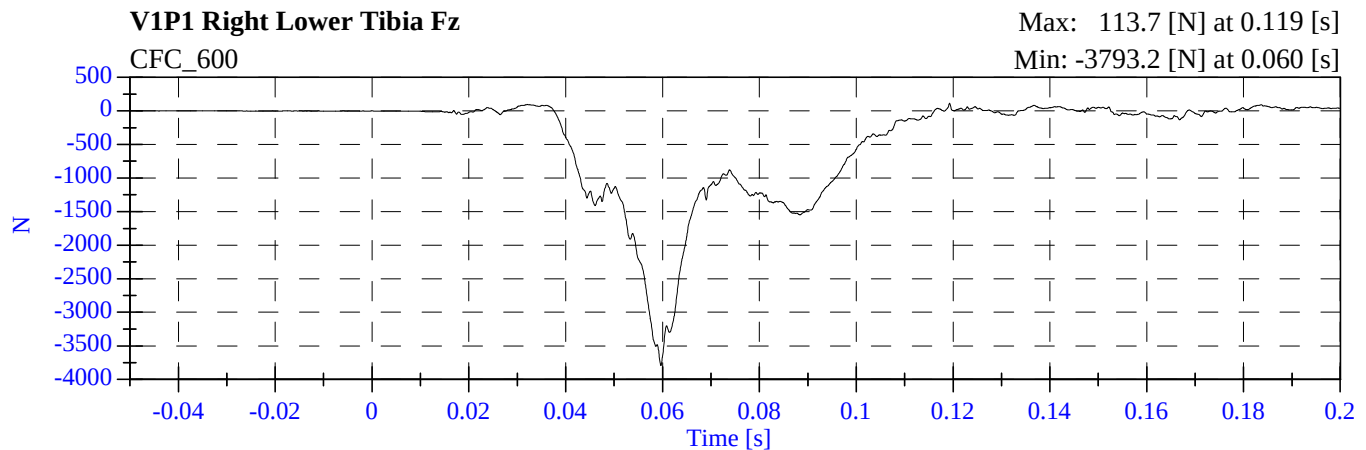
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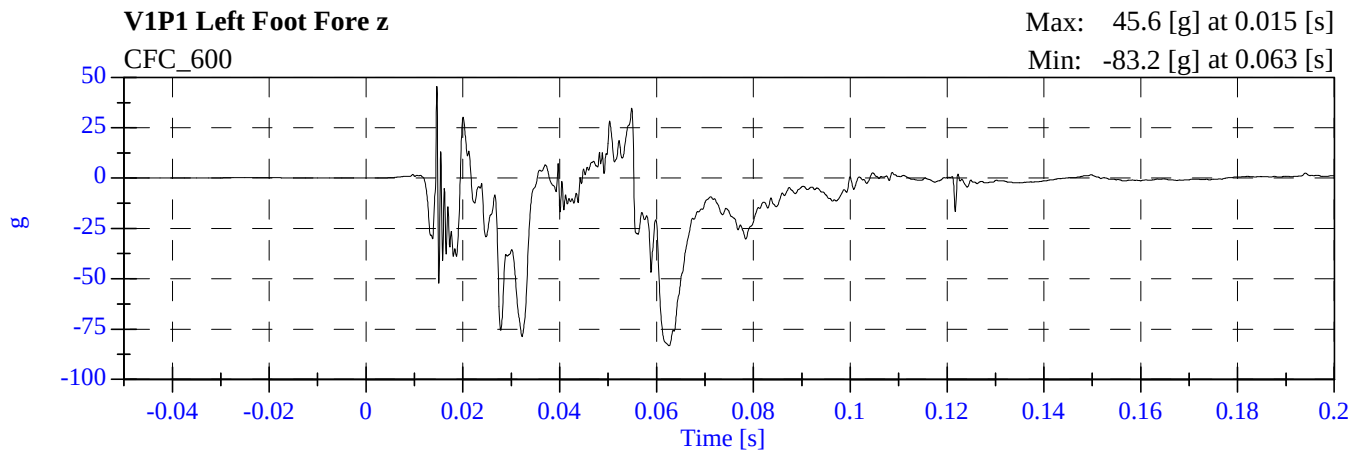
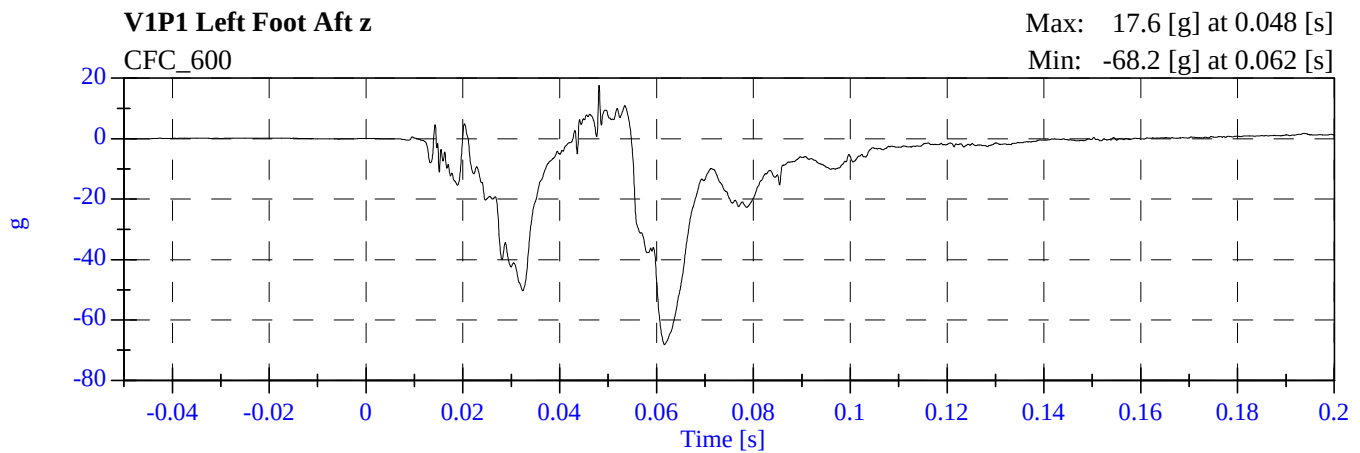
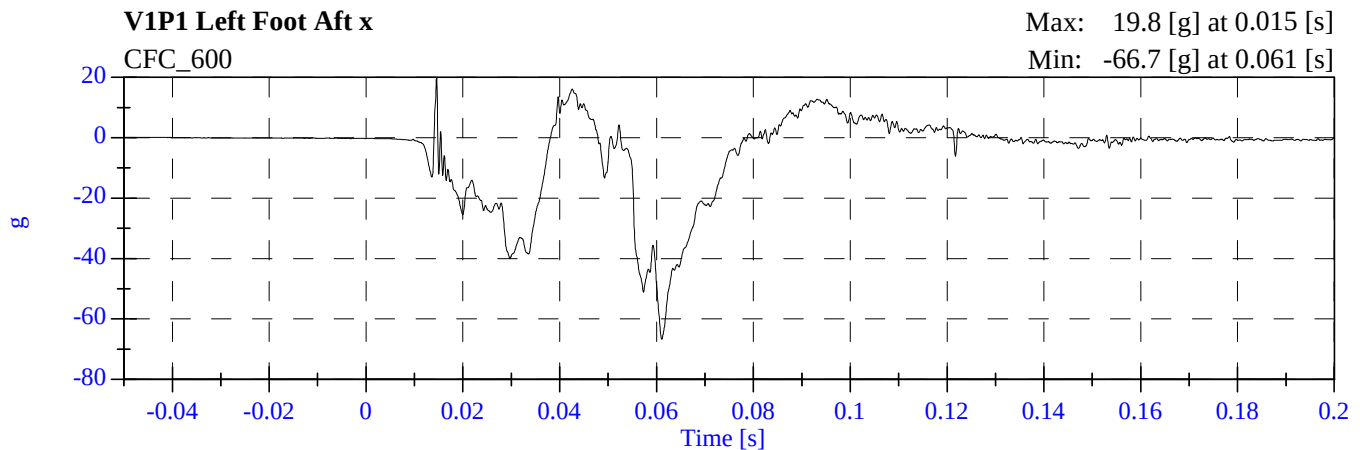
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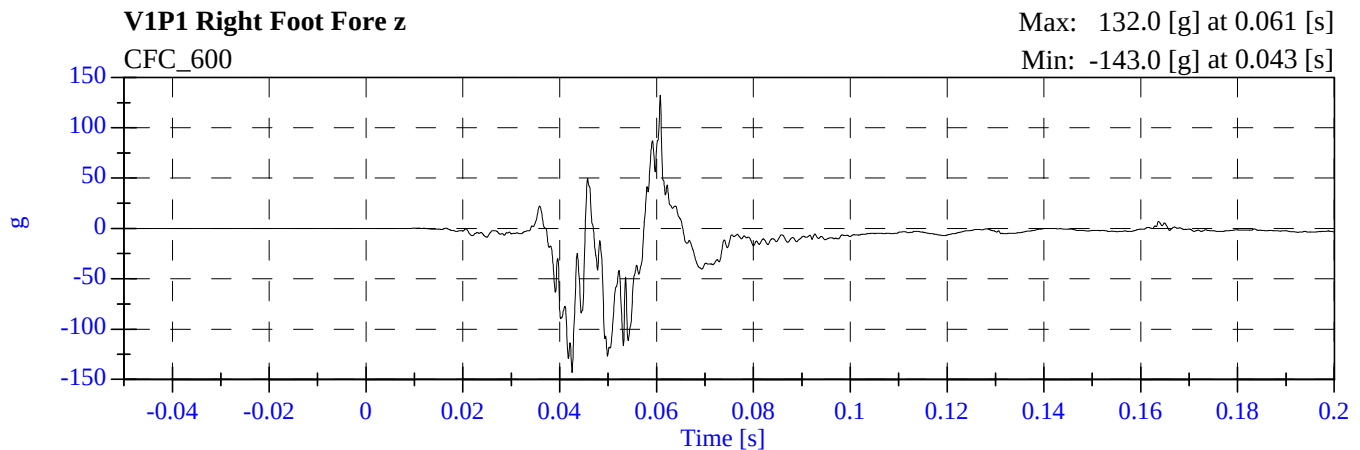
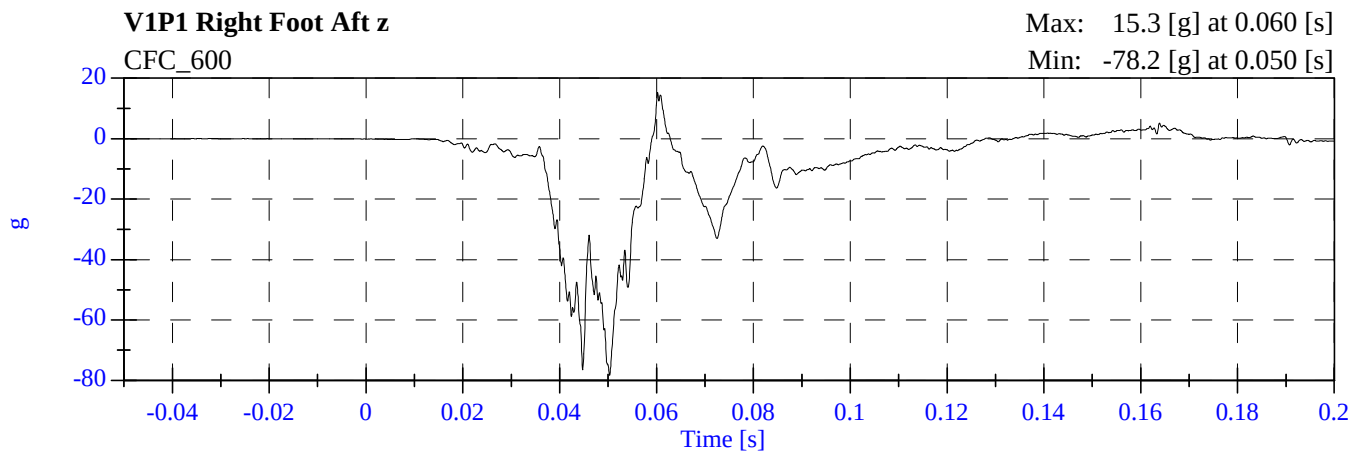
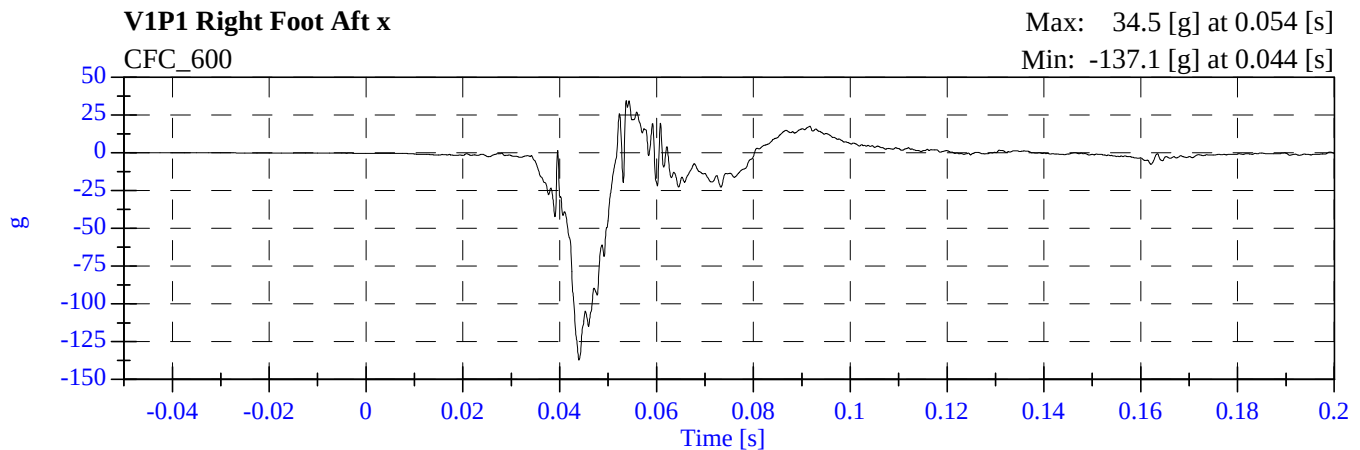
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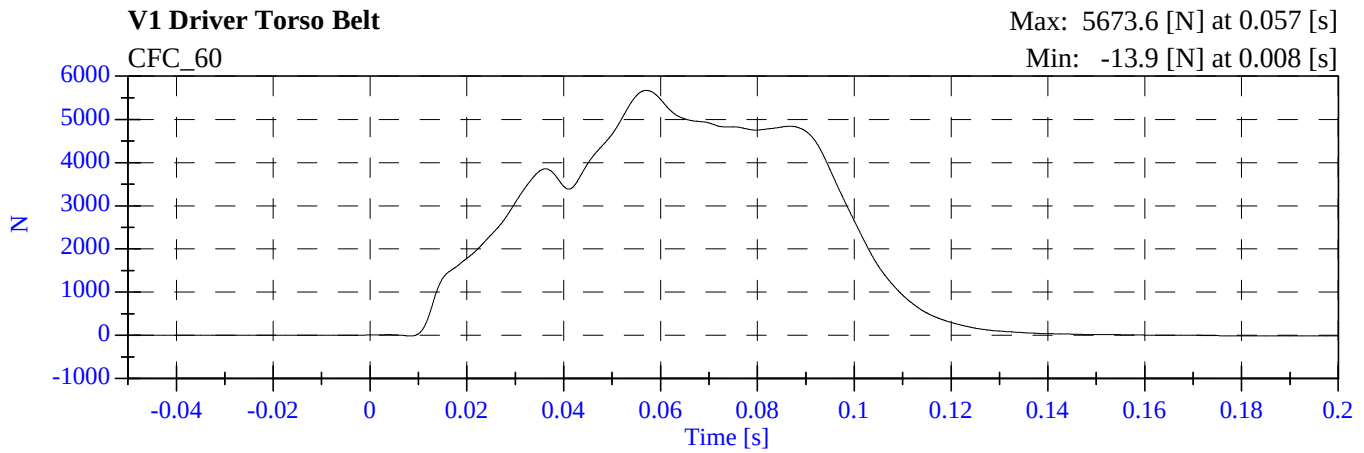
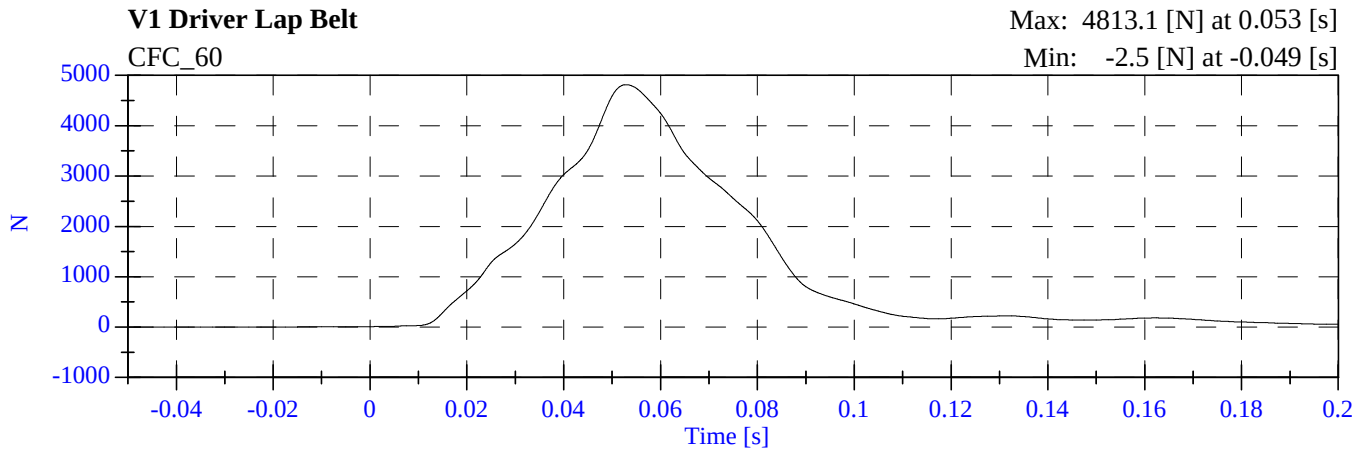
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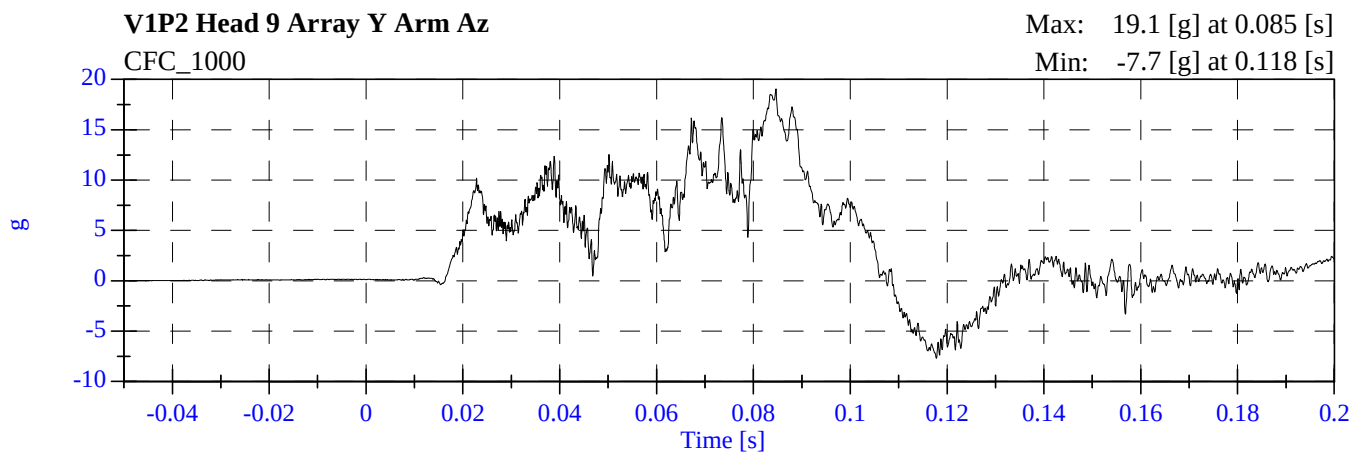
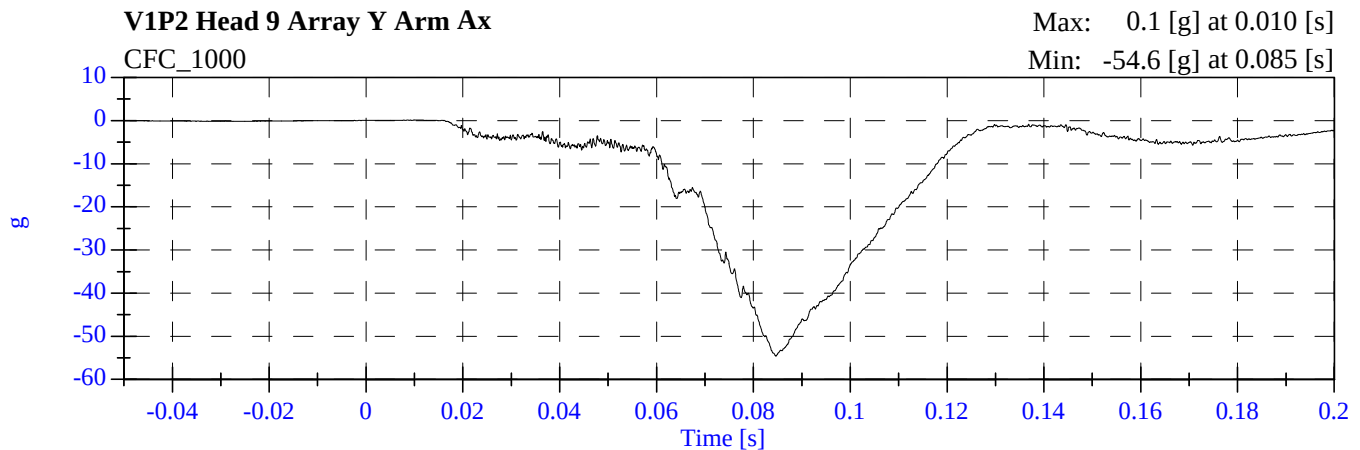
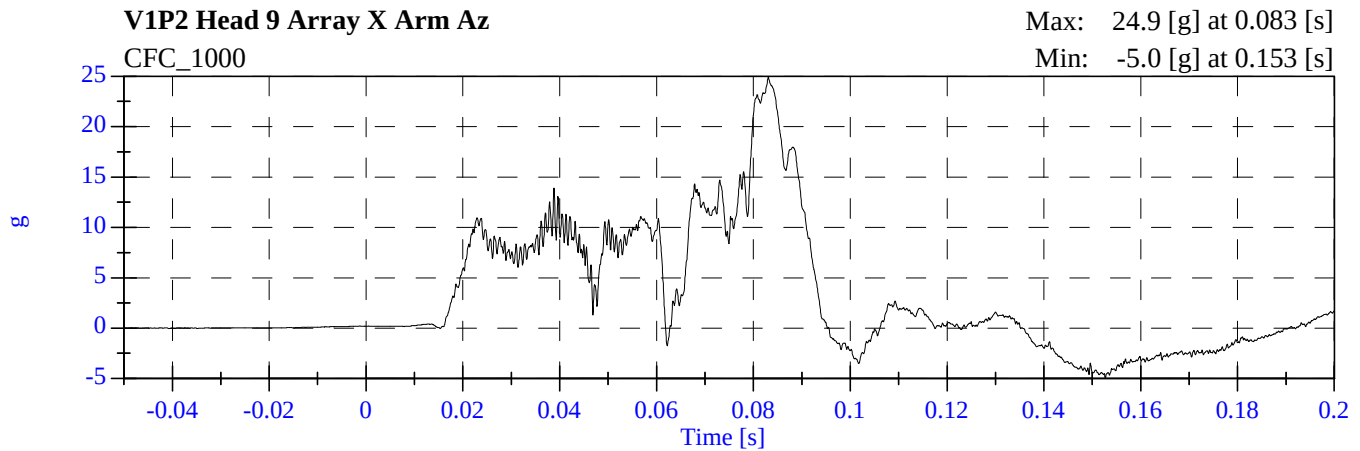
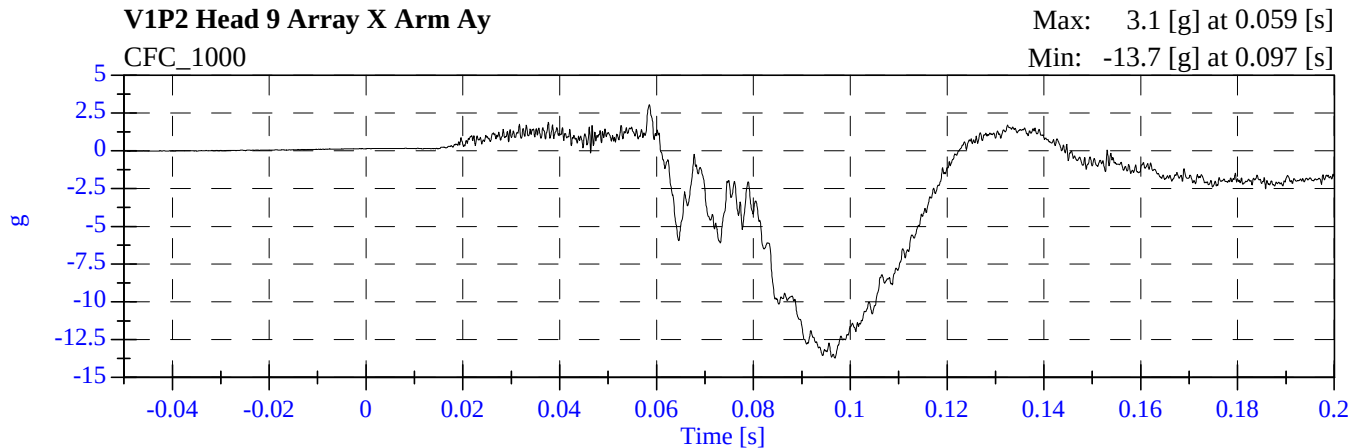
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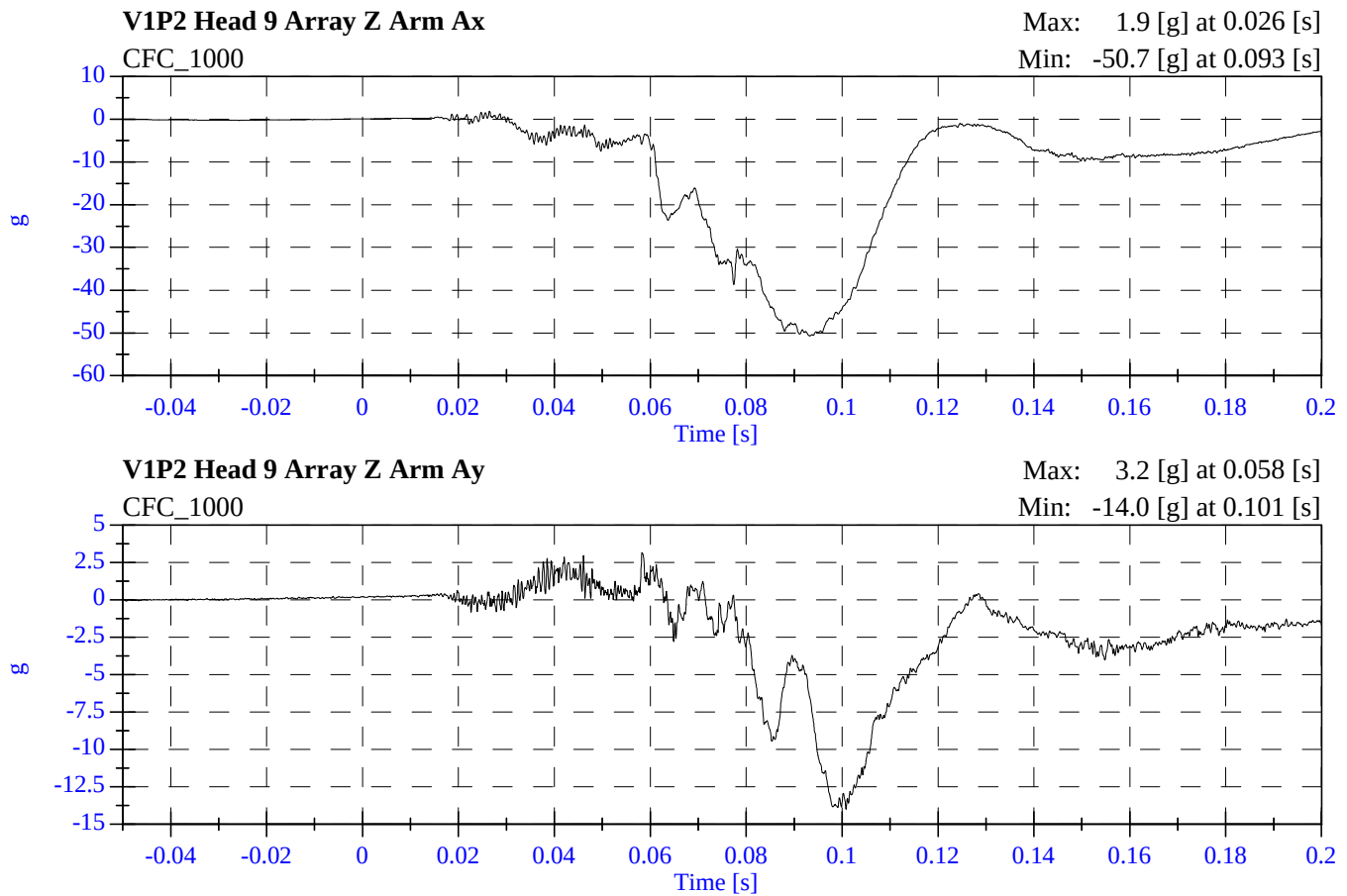
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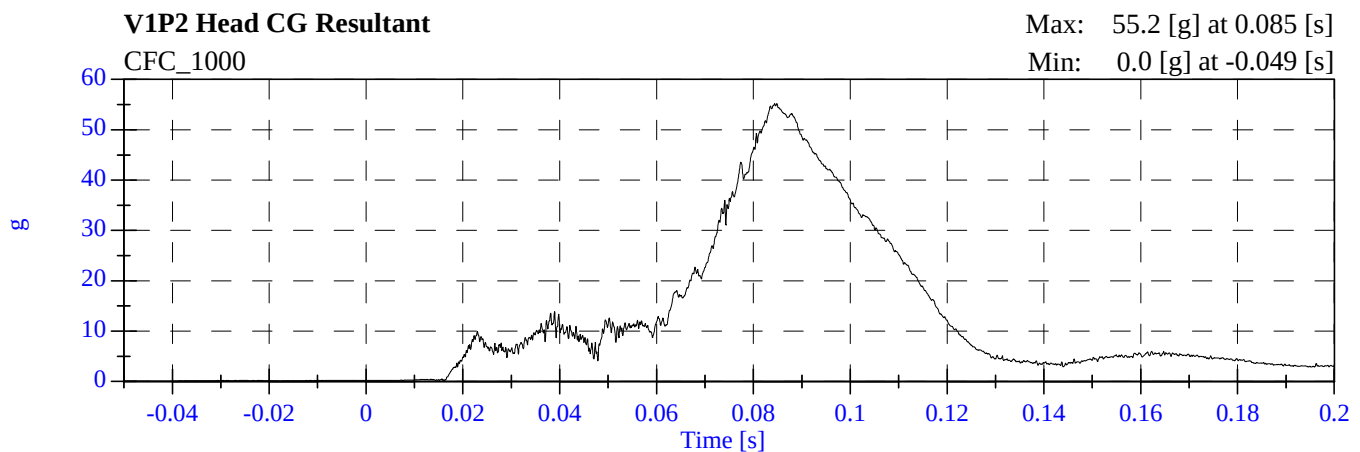
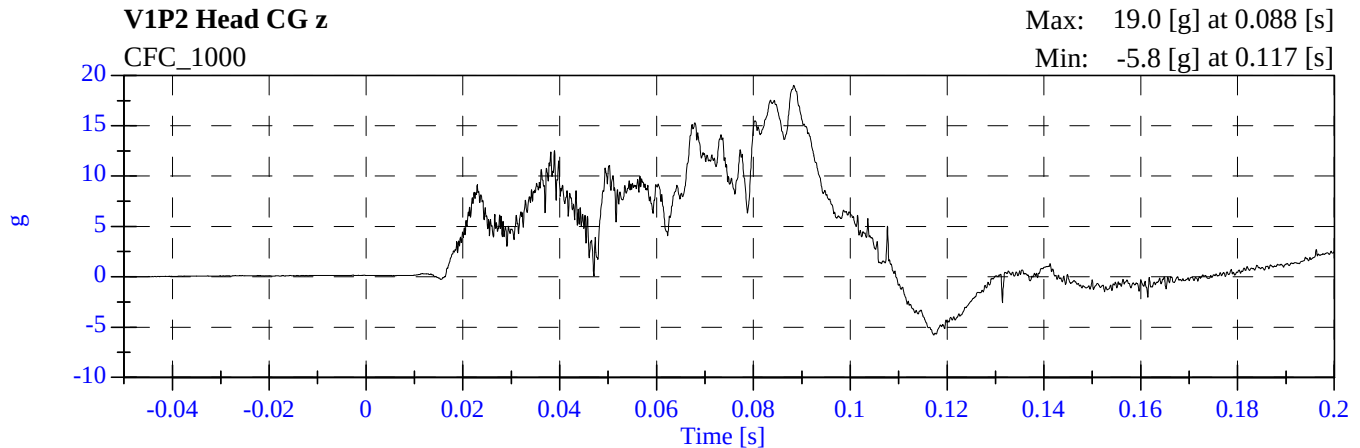
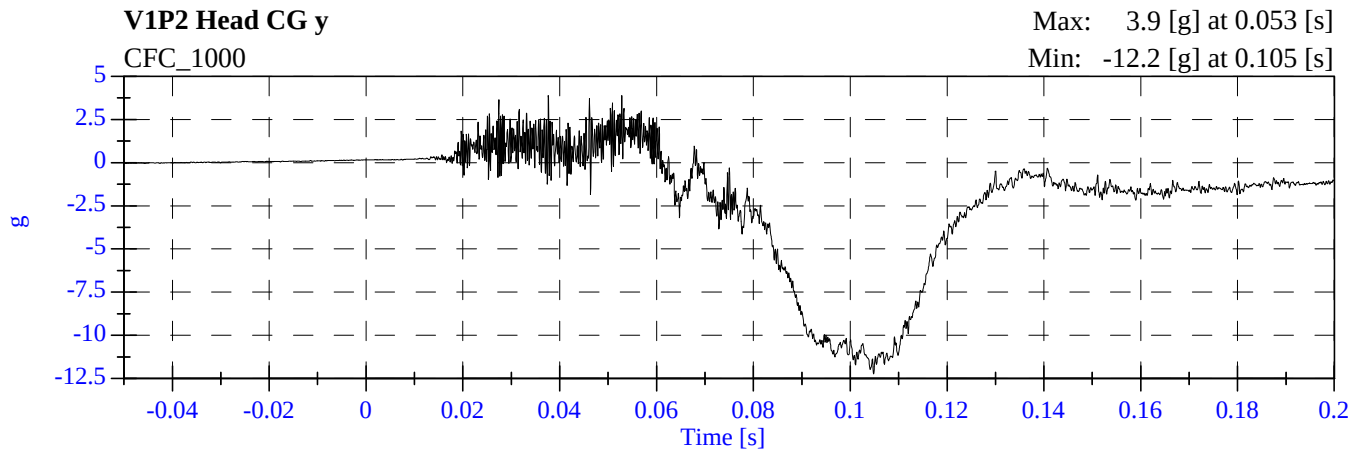
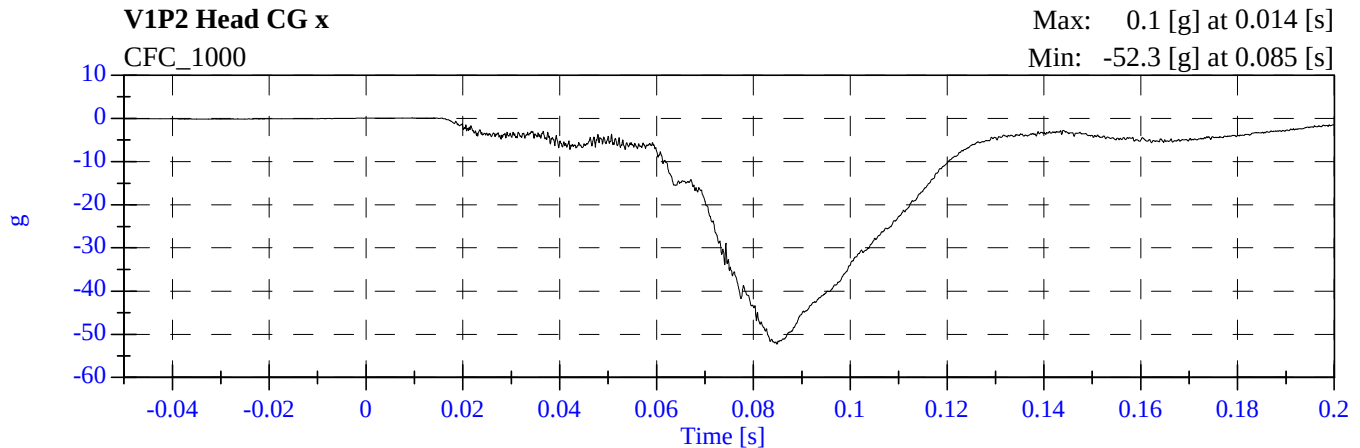


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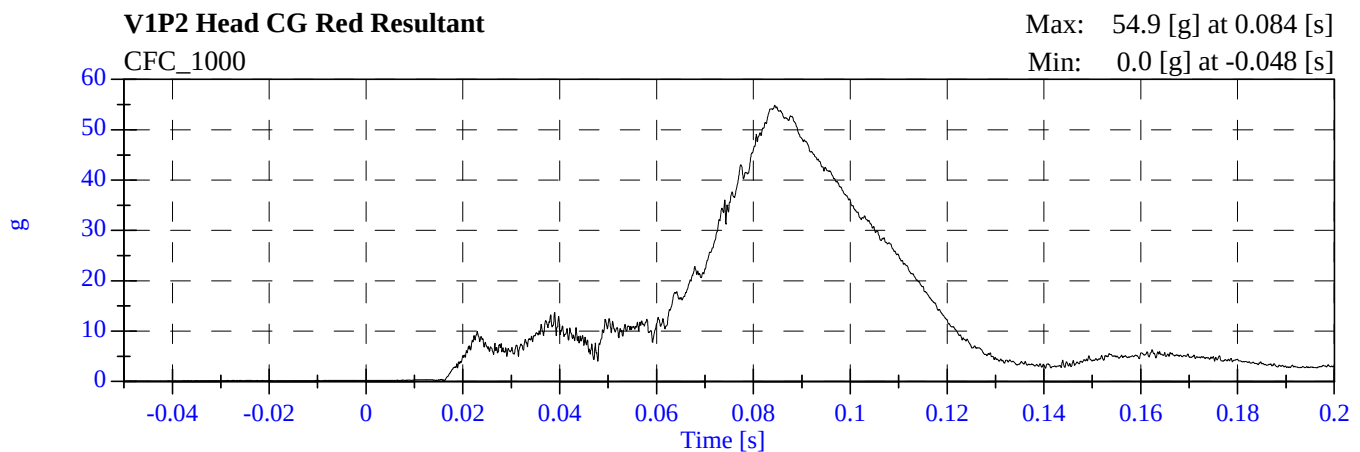
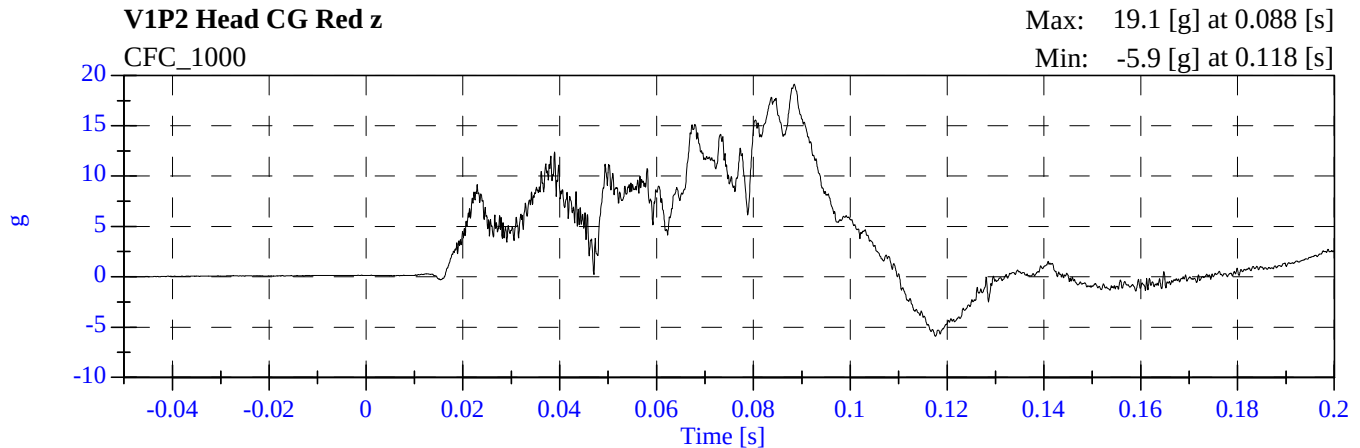
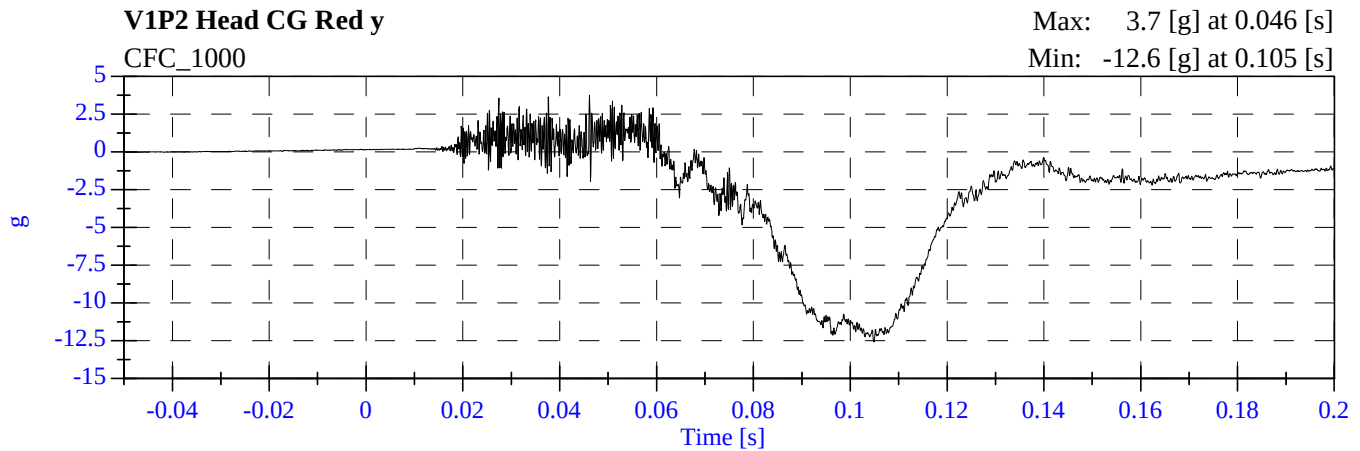
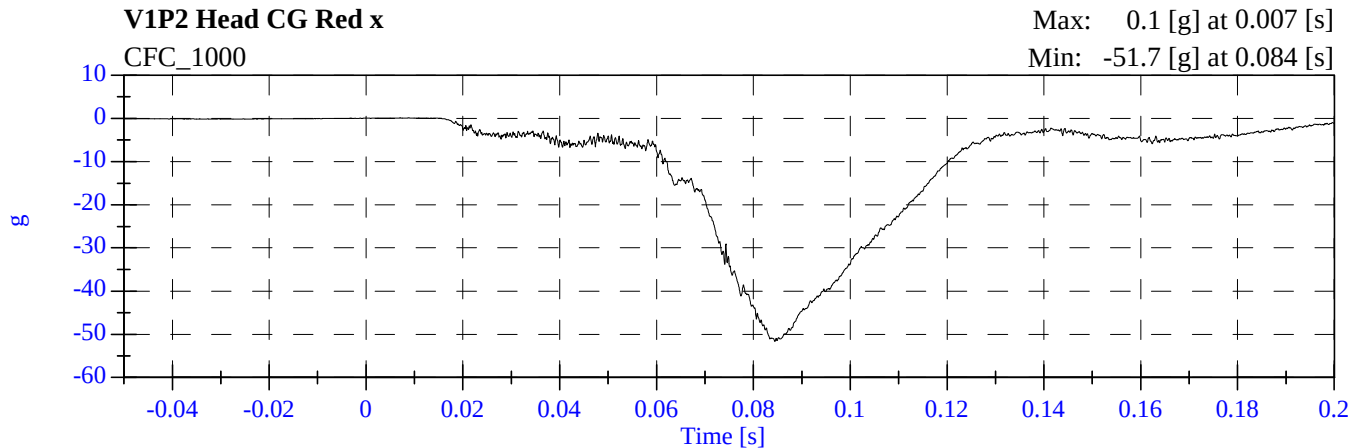
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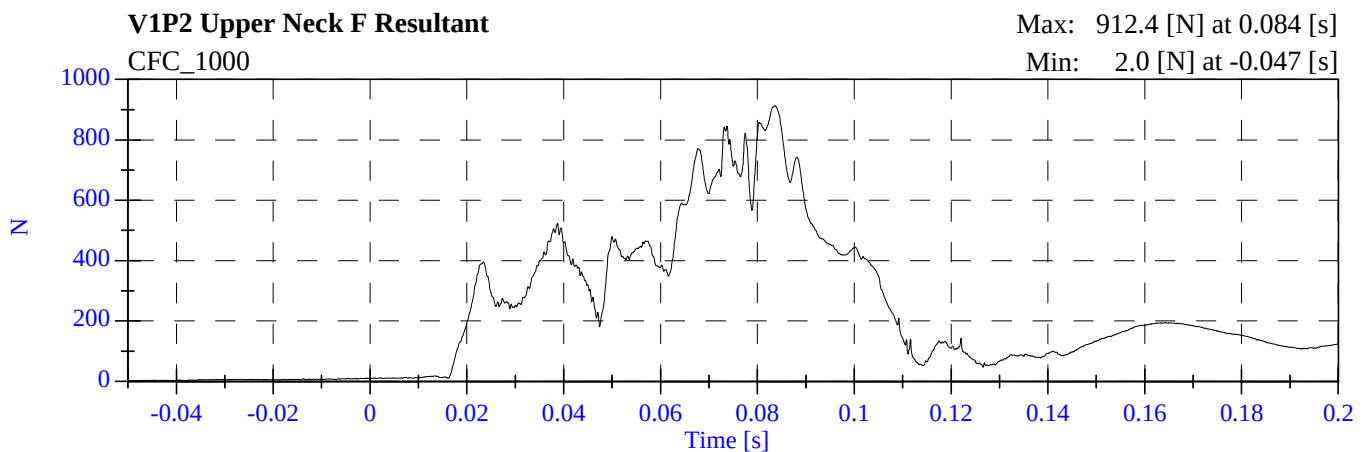
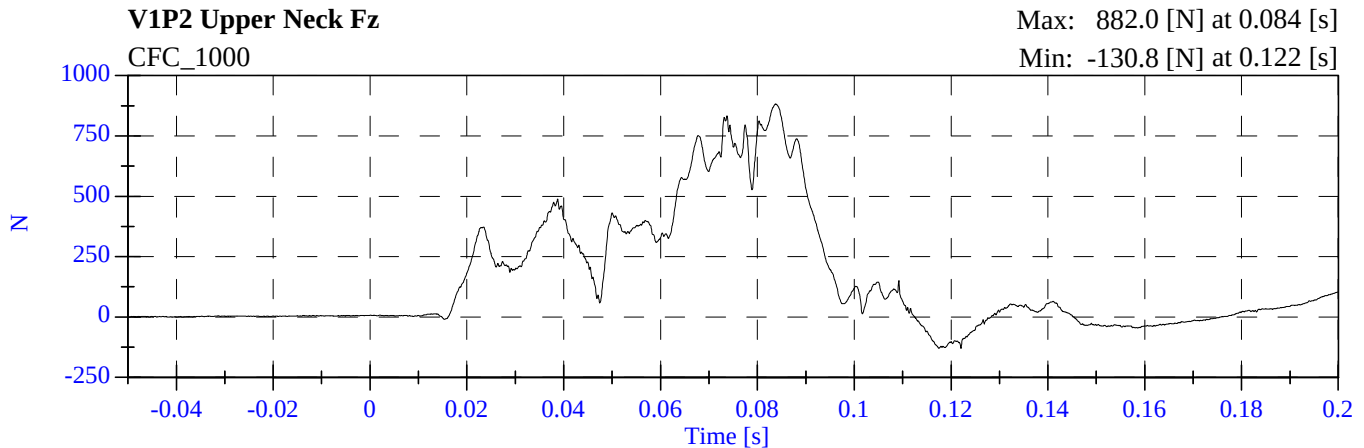
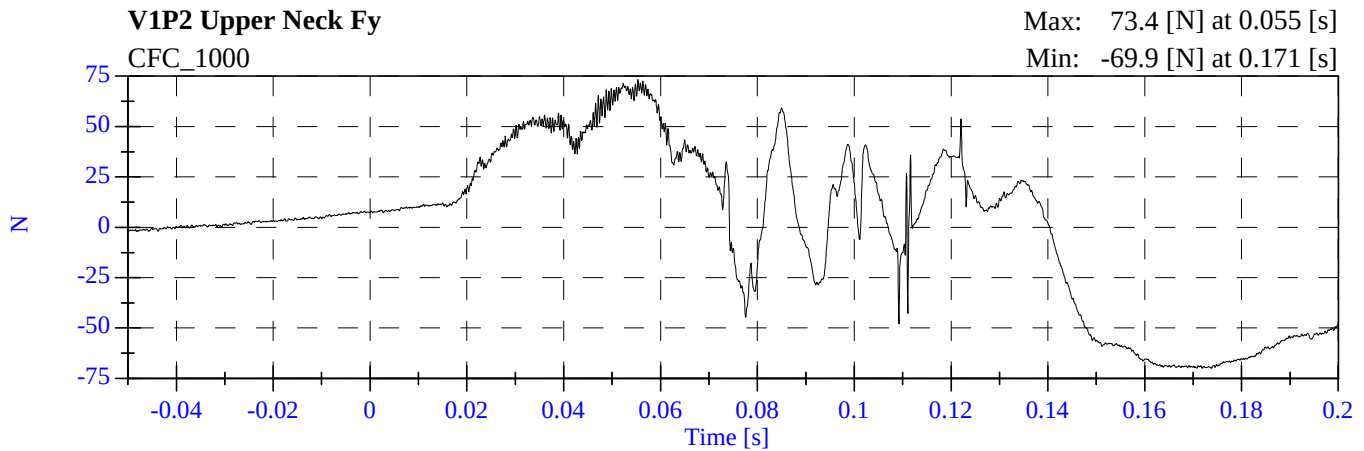
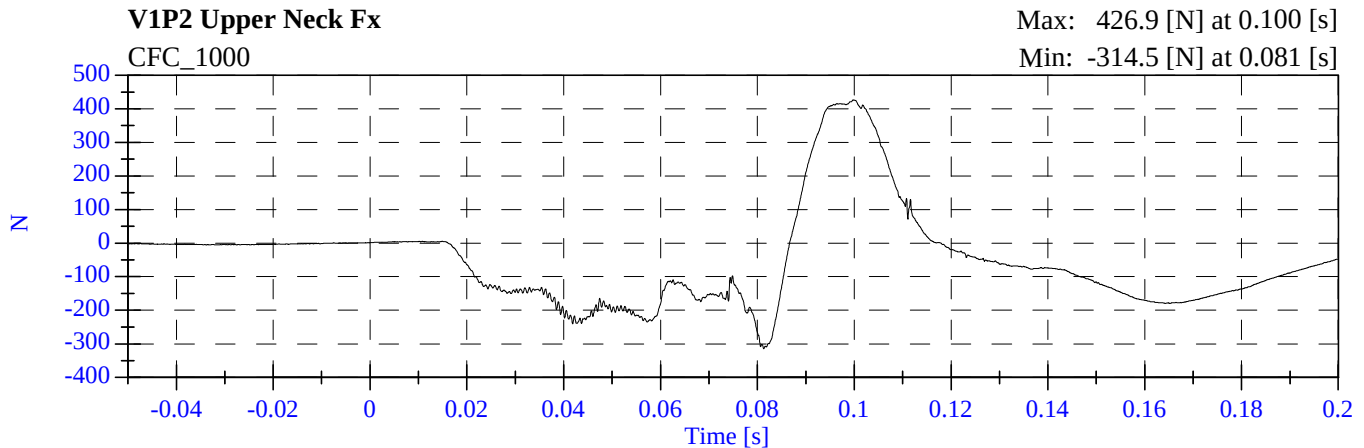
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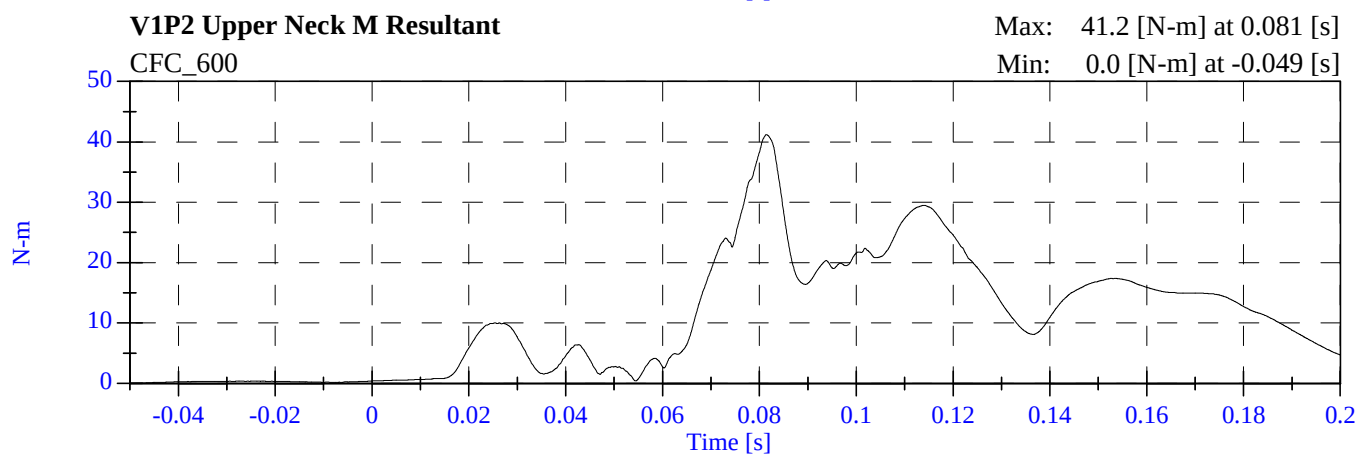
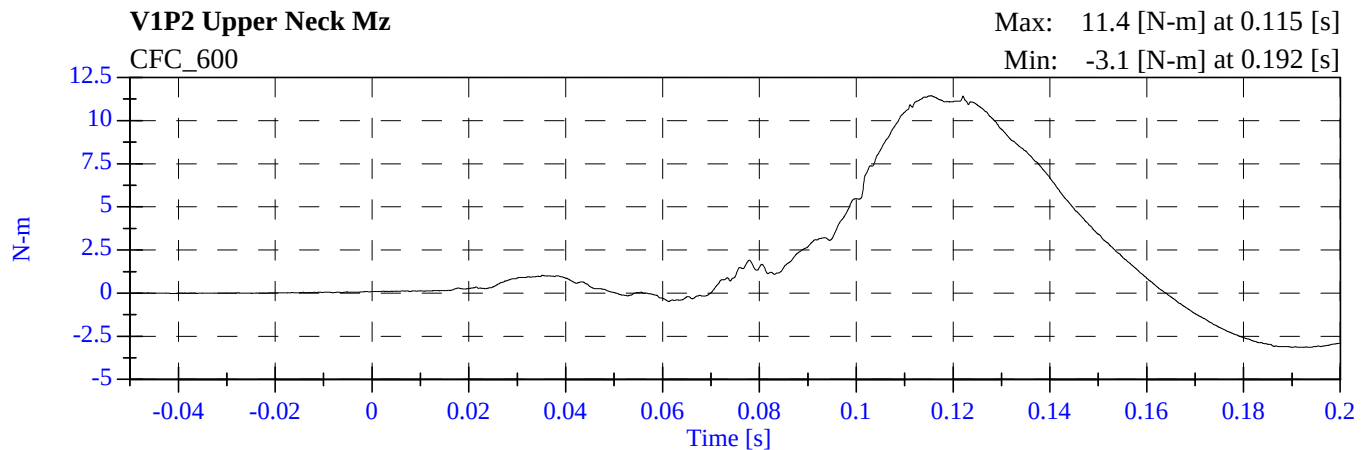
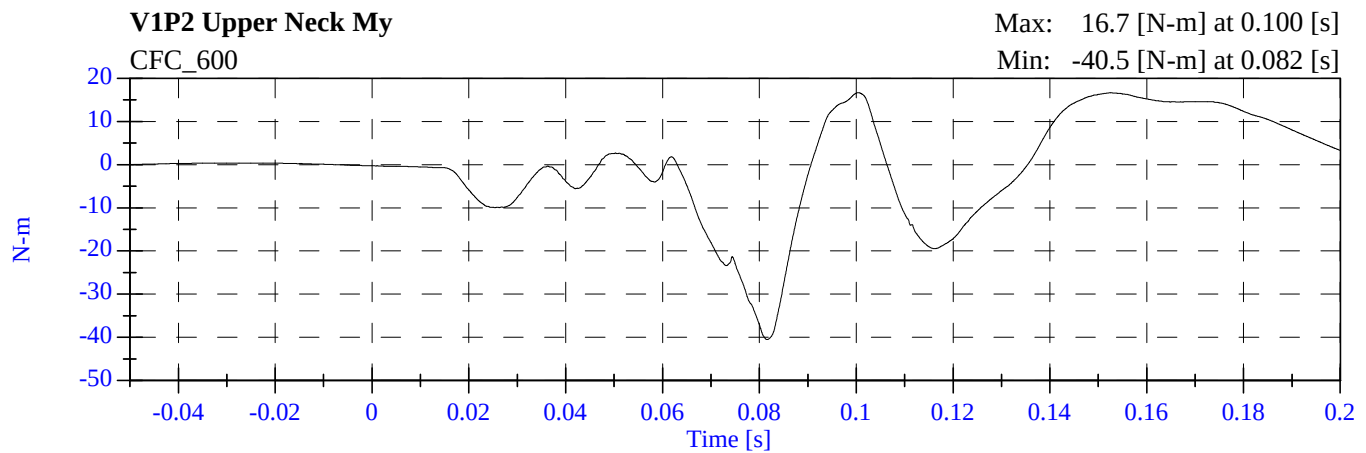
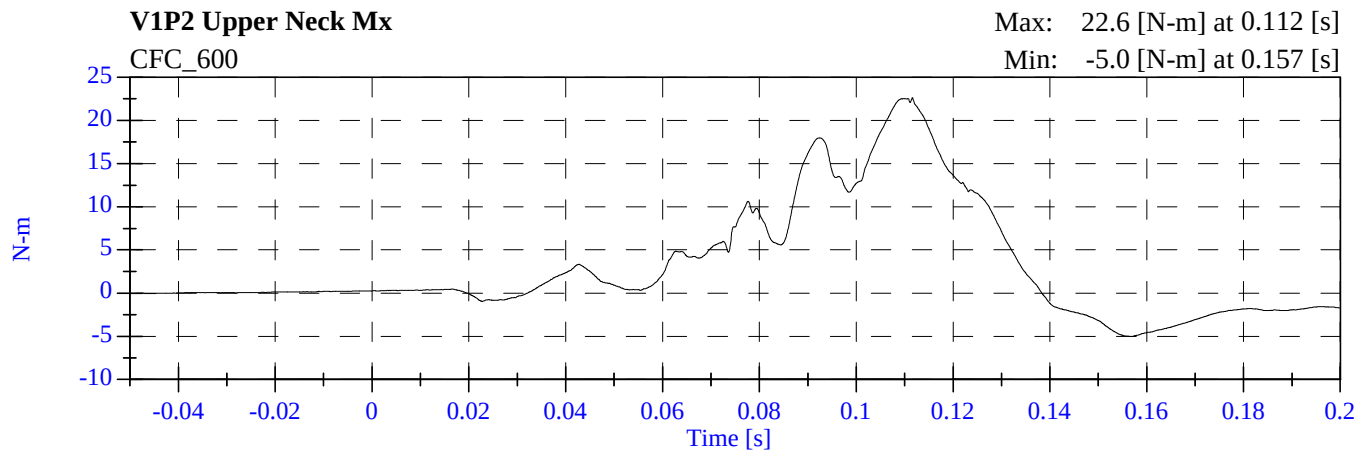
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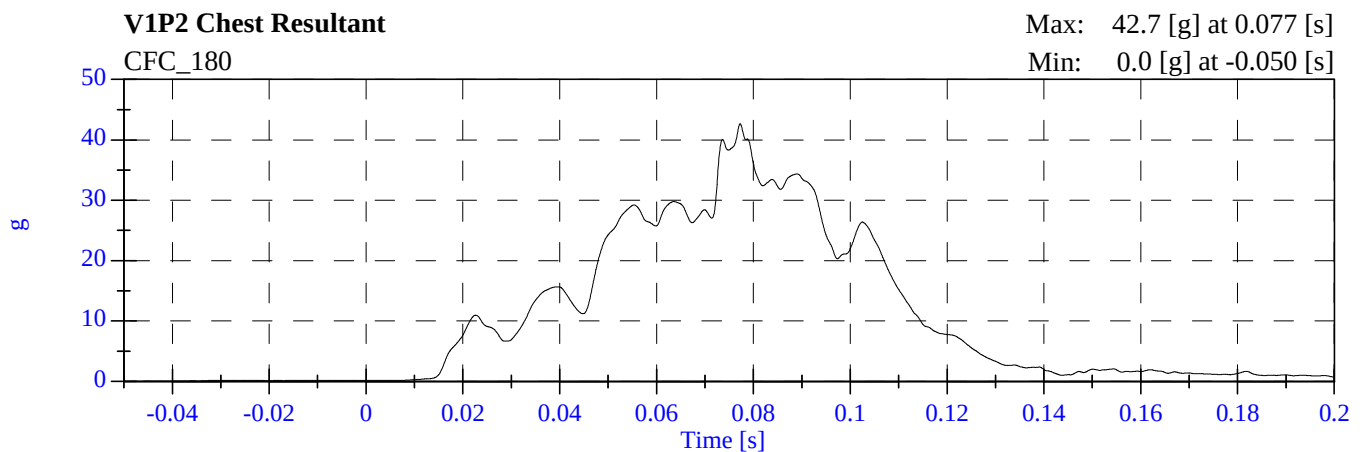
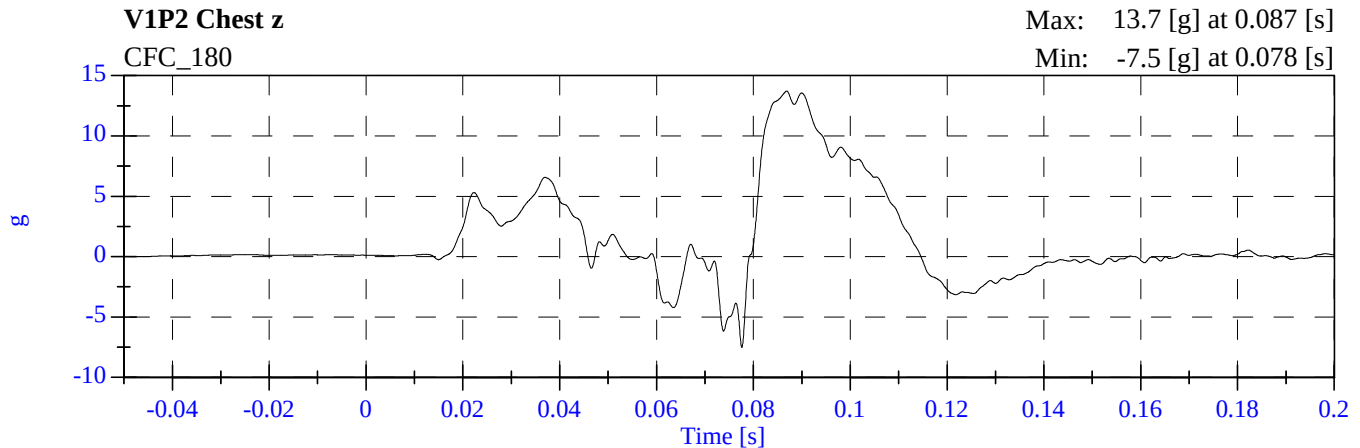
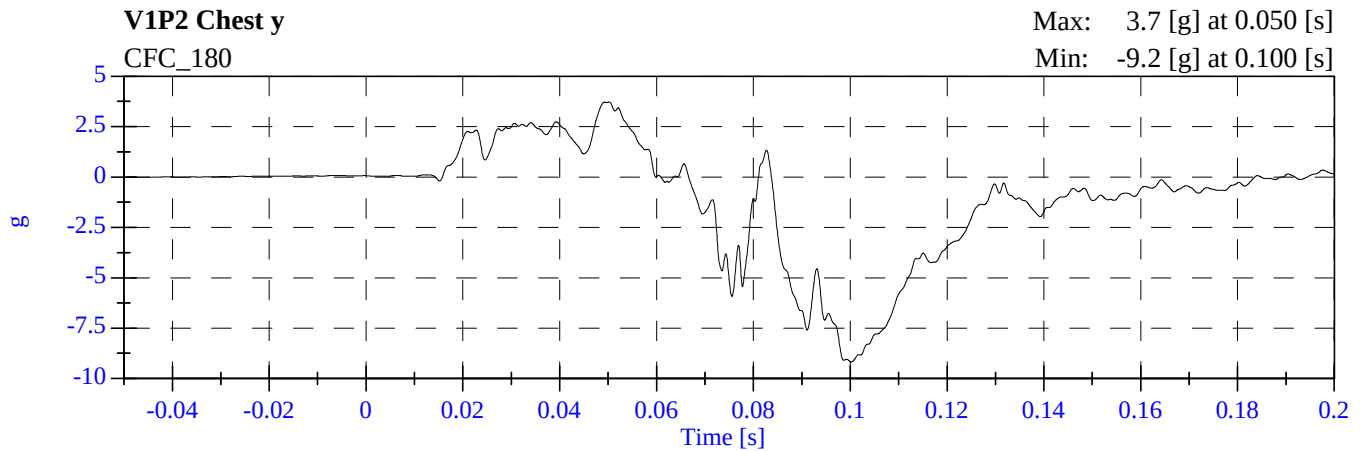
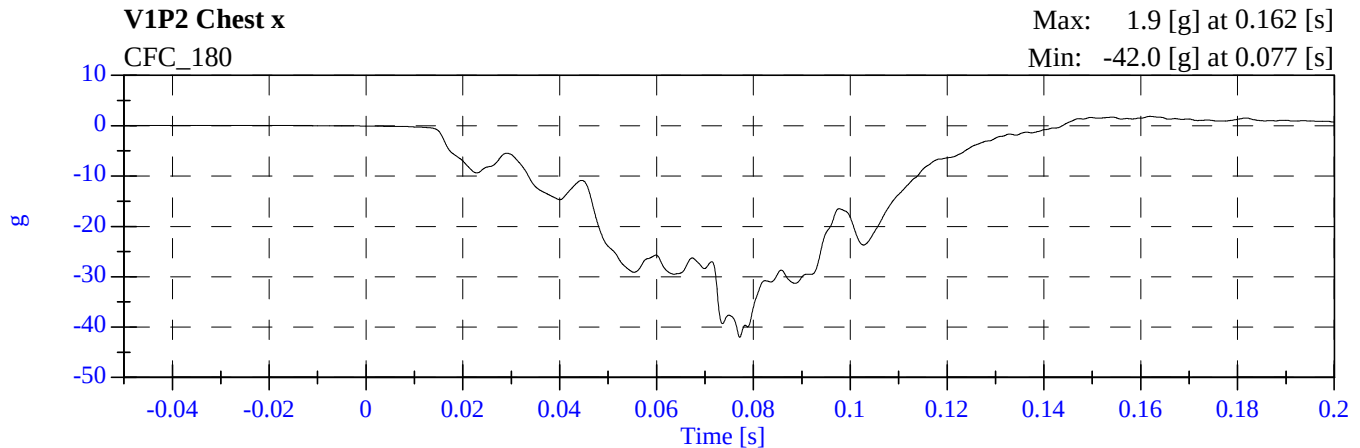


2005 NCAP Test 3 - 2005 Toyota Sienna M55104 - December 08, 2004

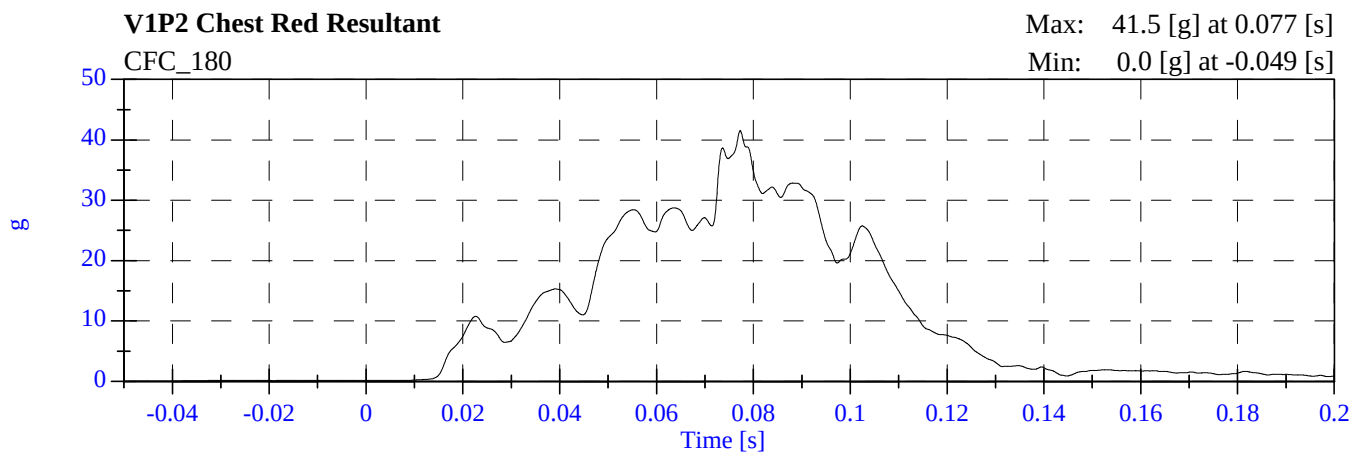
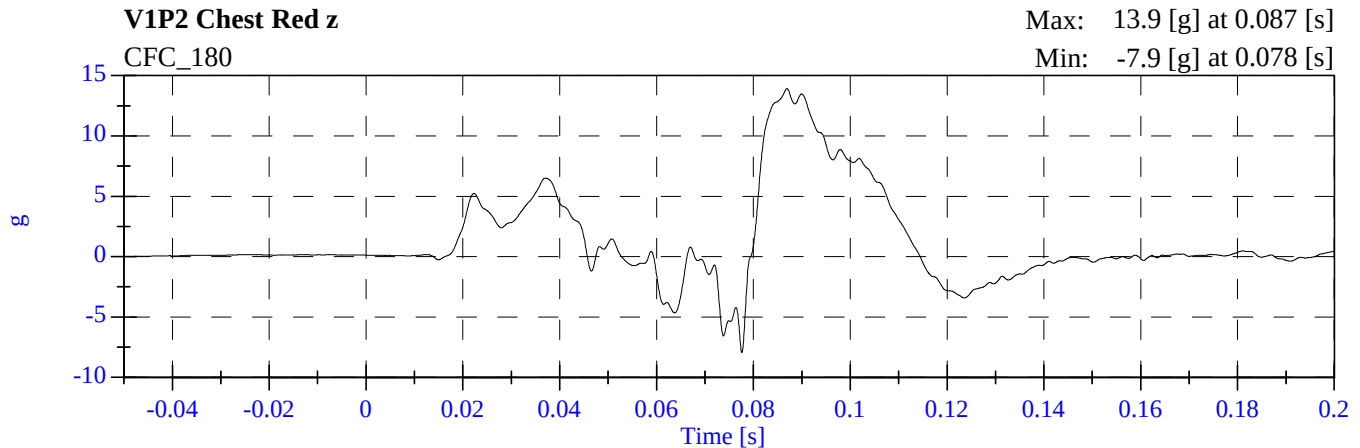
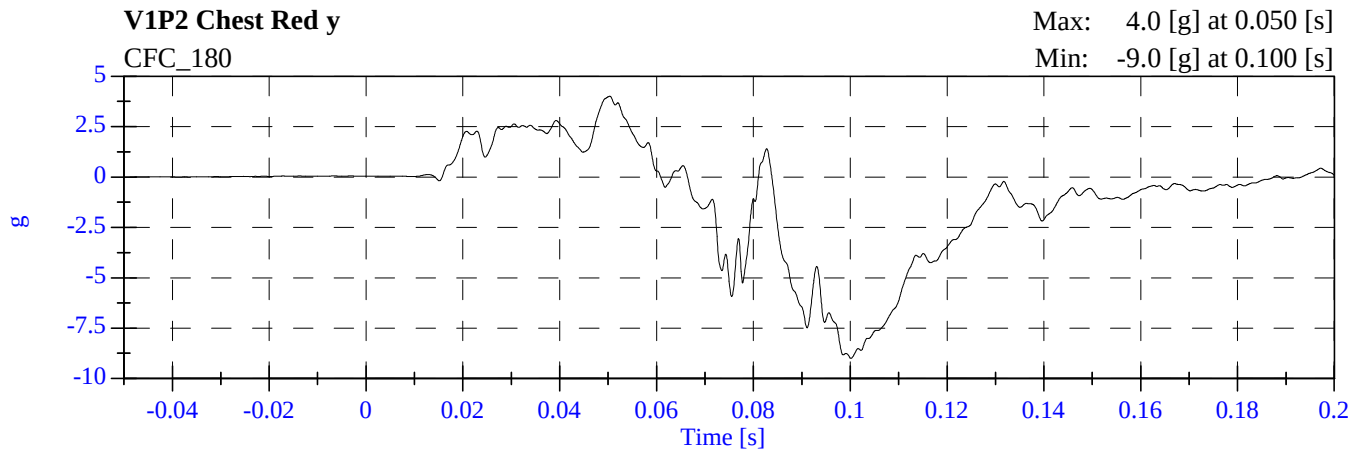
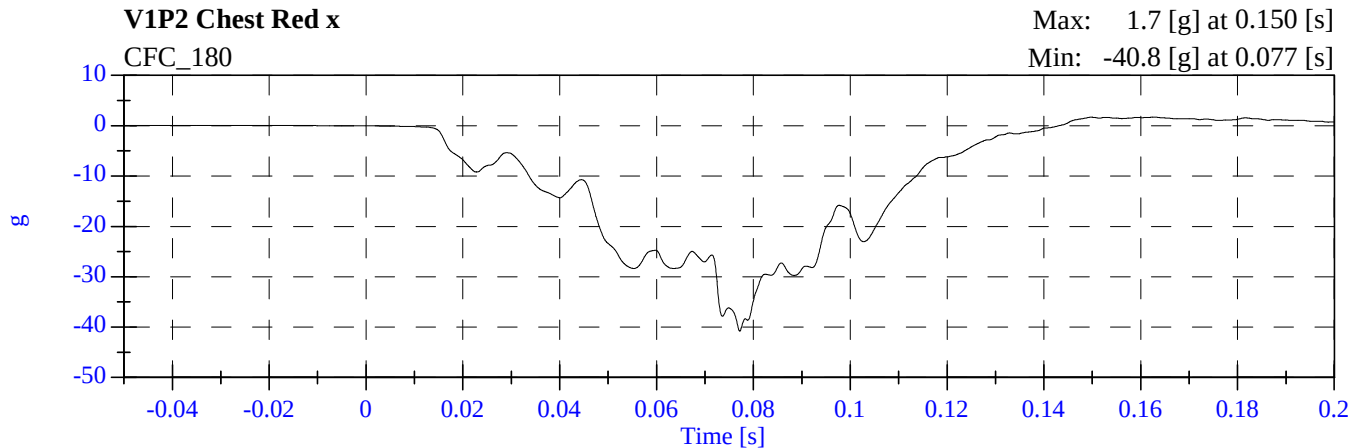


2005 NCAP Test 3 - 2005 Toyota Sienna

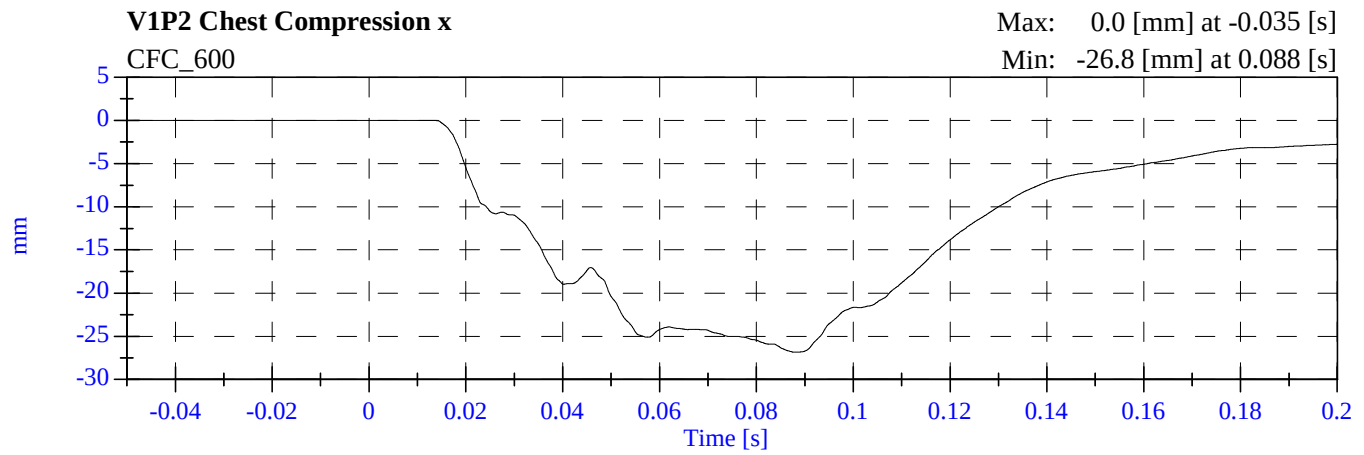
M55104 - December 08, 2004



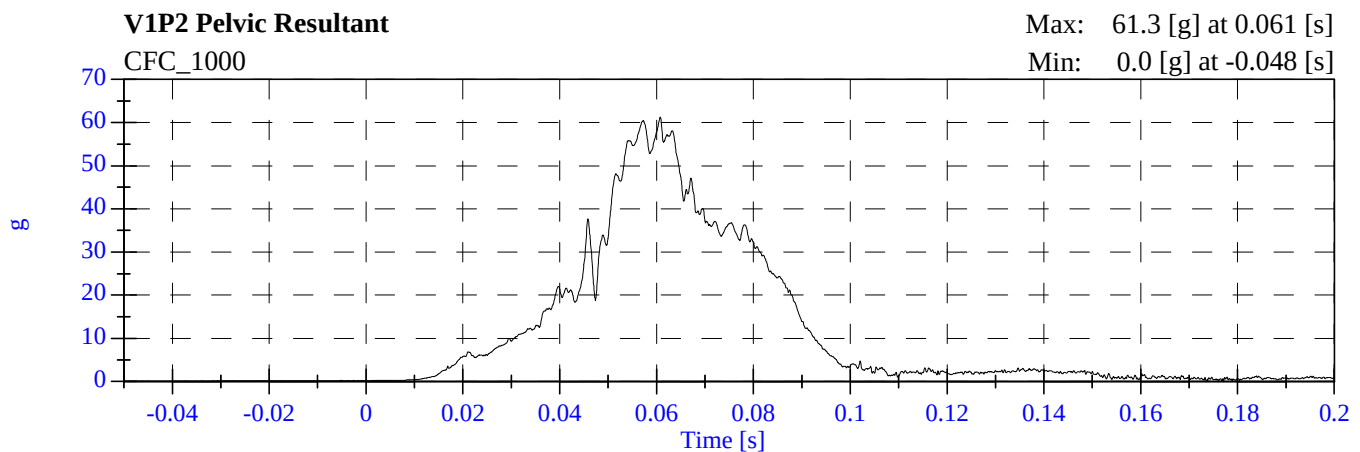
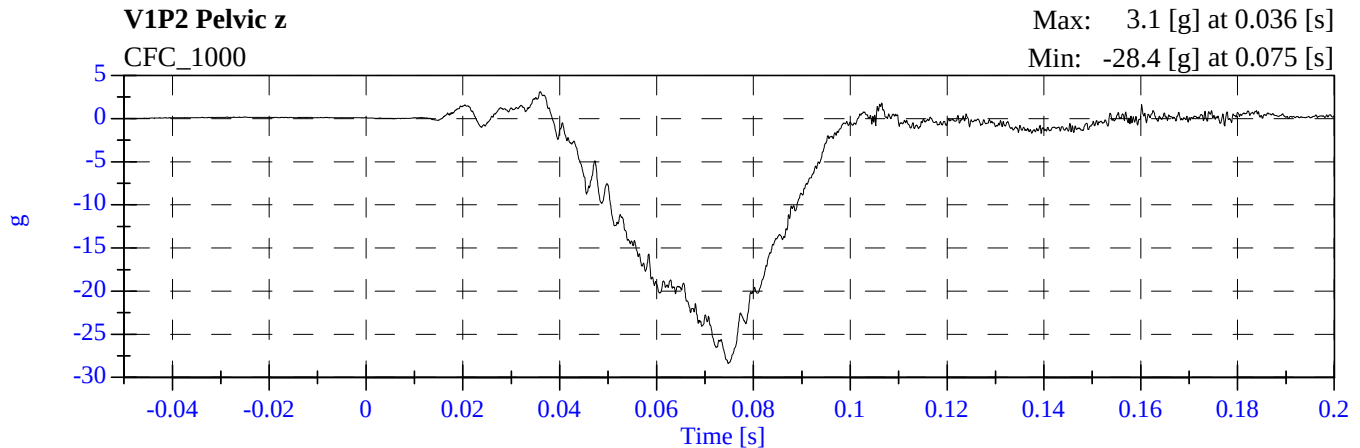
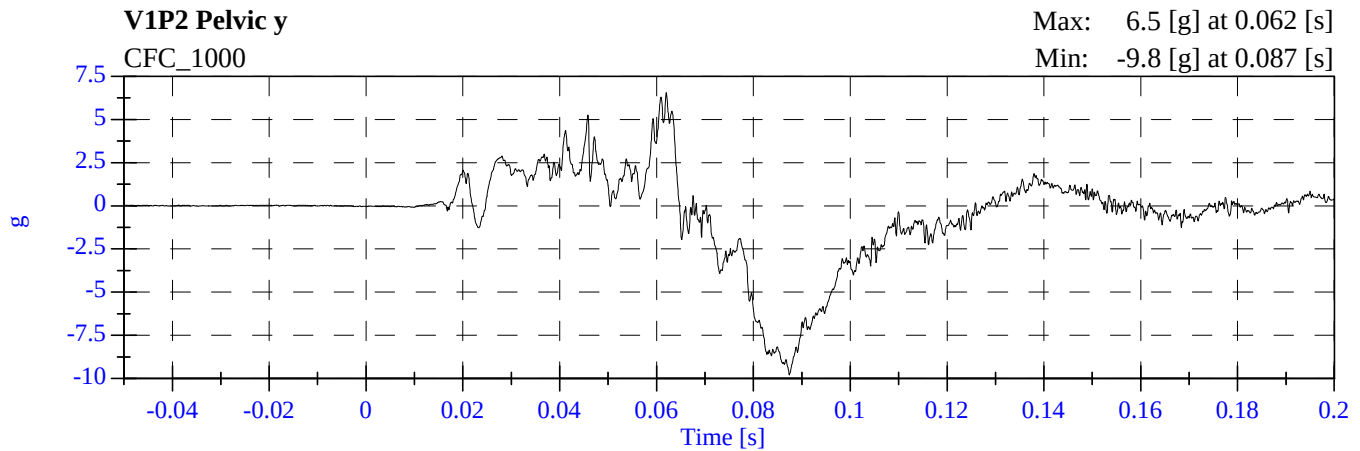
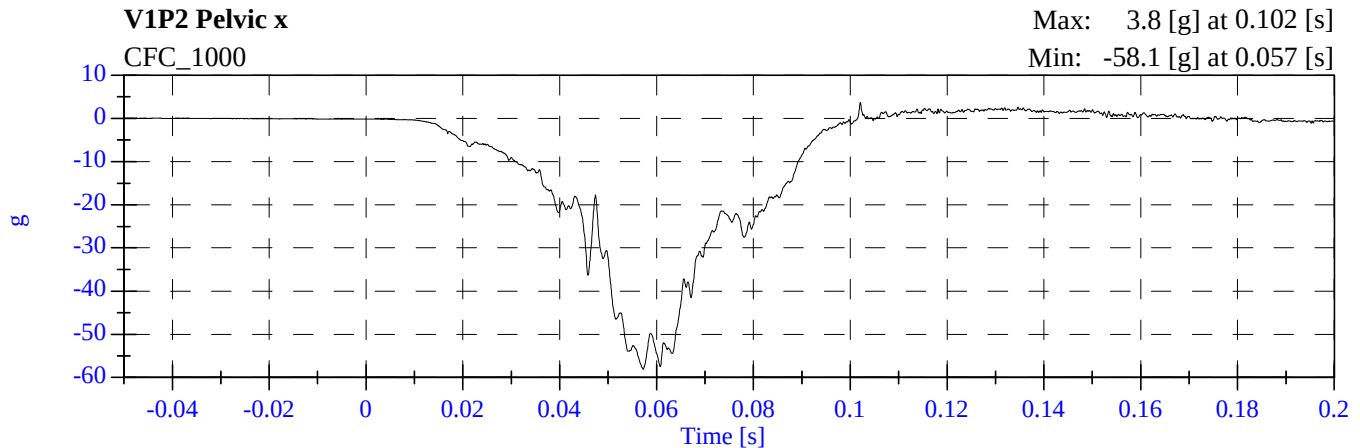
2005 NCAP Test 3 - 2005 Toyota Sienna M55104 - December 08, 2004



2005 NCAP Test 3 - 2005 Toyota Sienna
M55104 - December 08, 2004

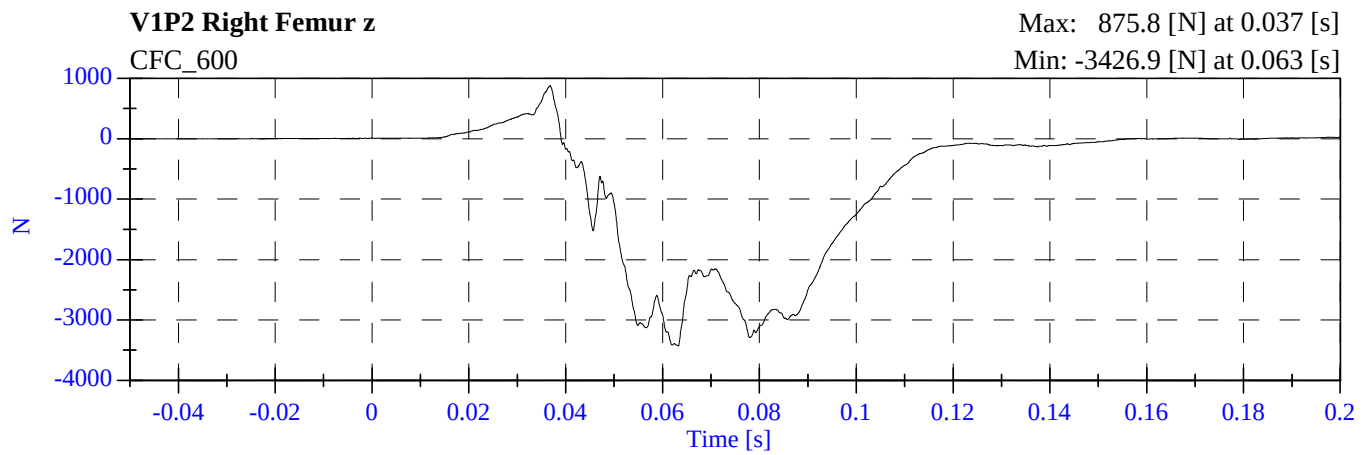
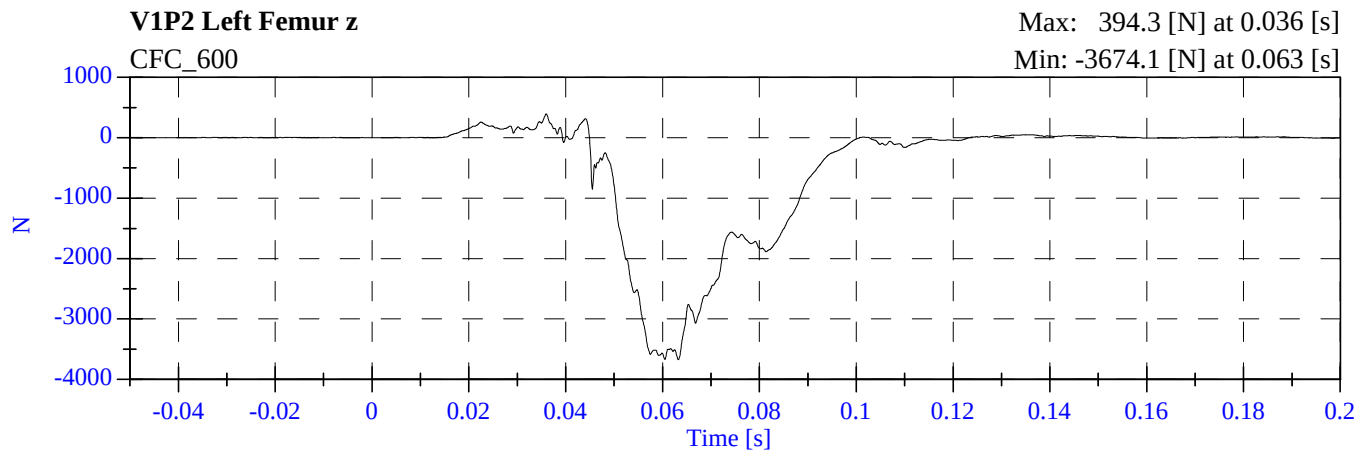


2005 NCAP Test 3 - 2005 Toyota Sienna M55104 - December 08, 2004



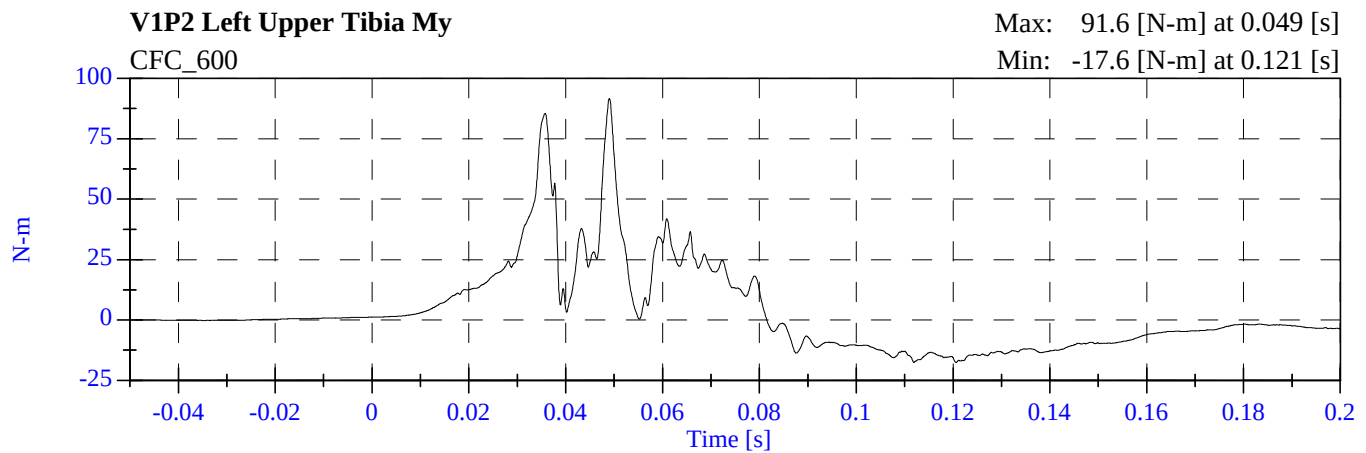
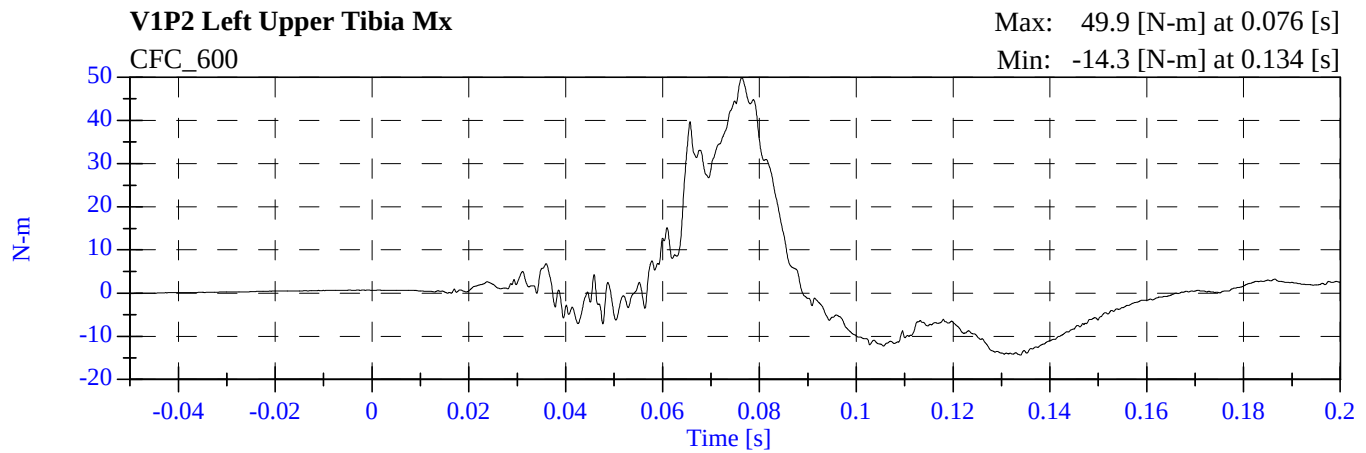
2005 NCAP Test 3 - 2005 Toyota Sienna

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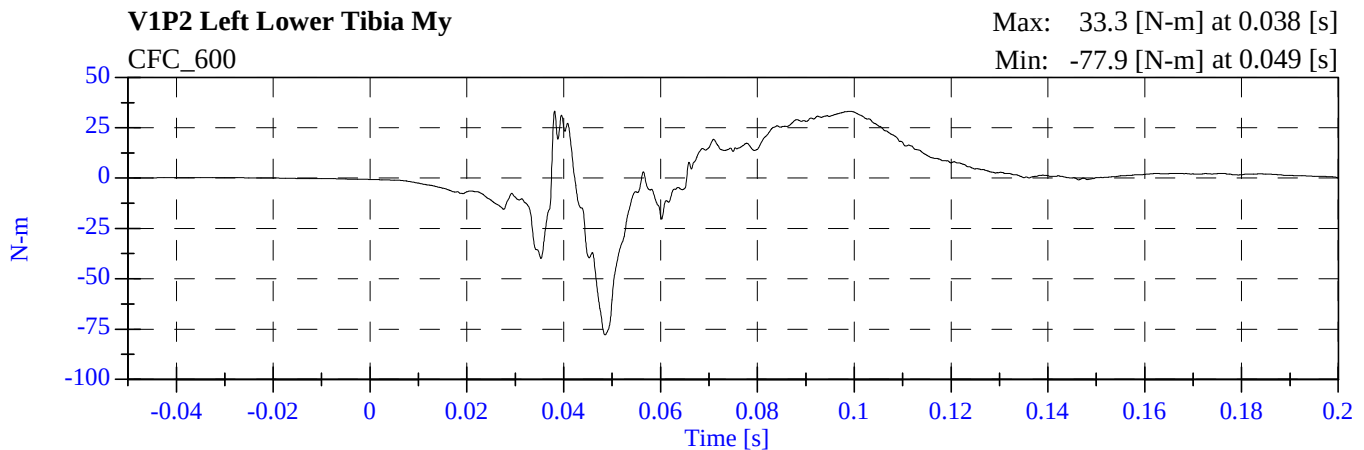
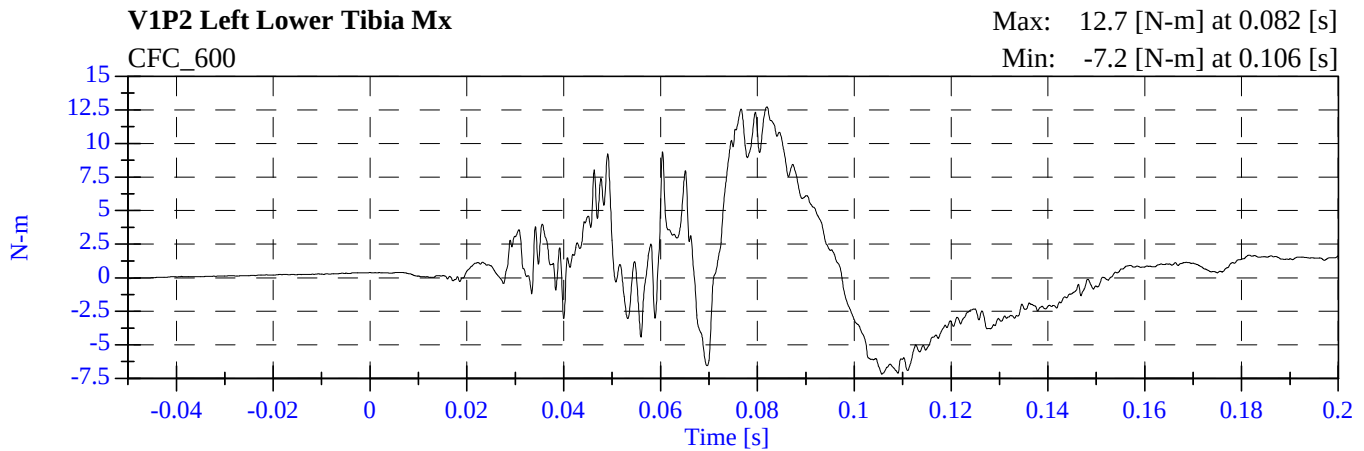
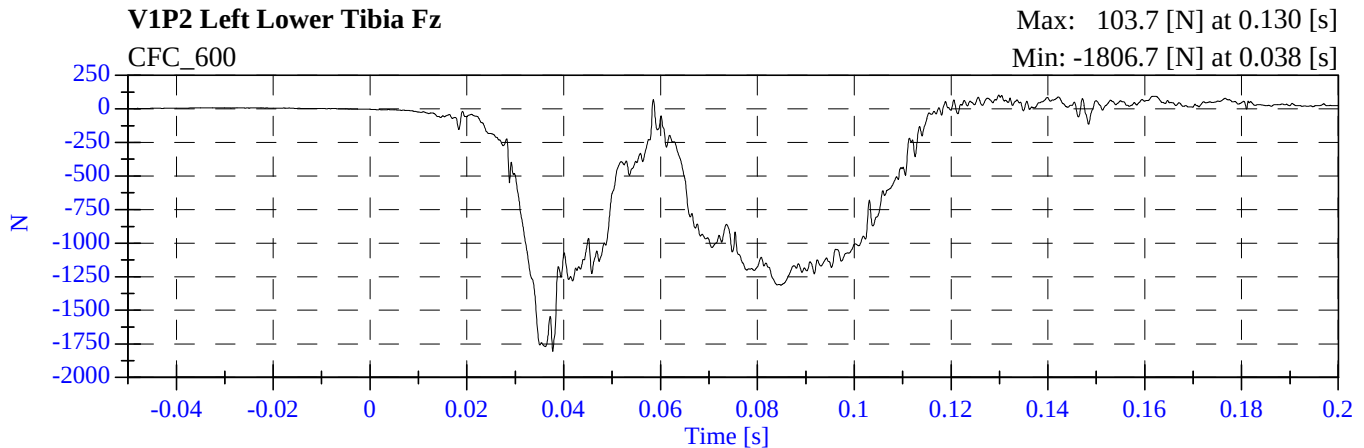
2005 NCAP Test 3 - 2005 Toyota Sienna

M55104 - December 08, 2004



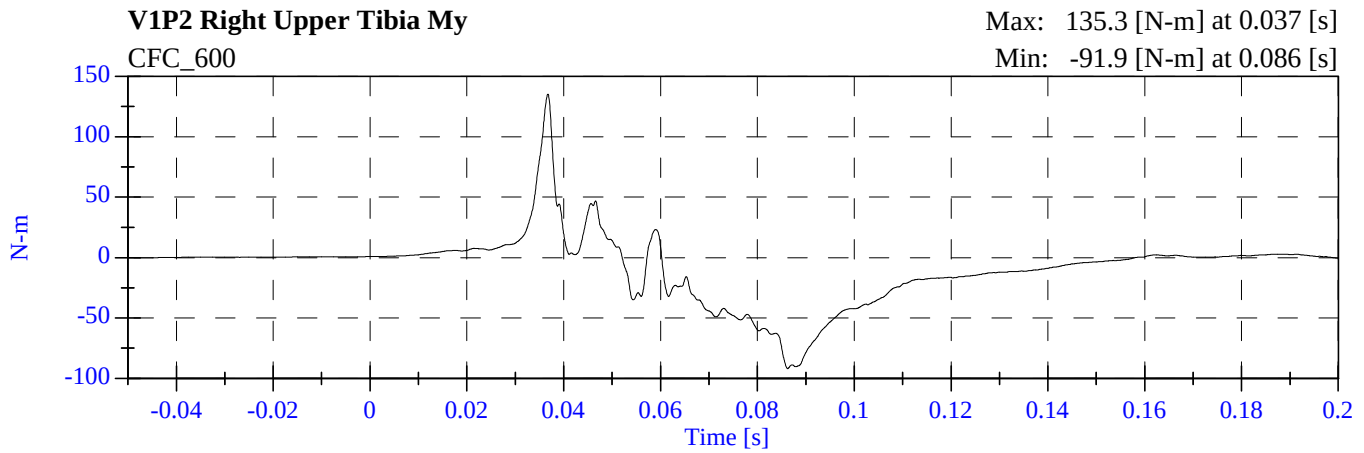
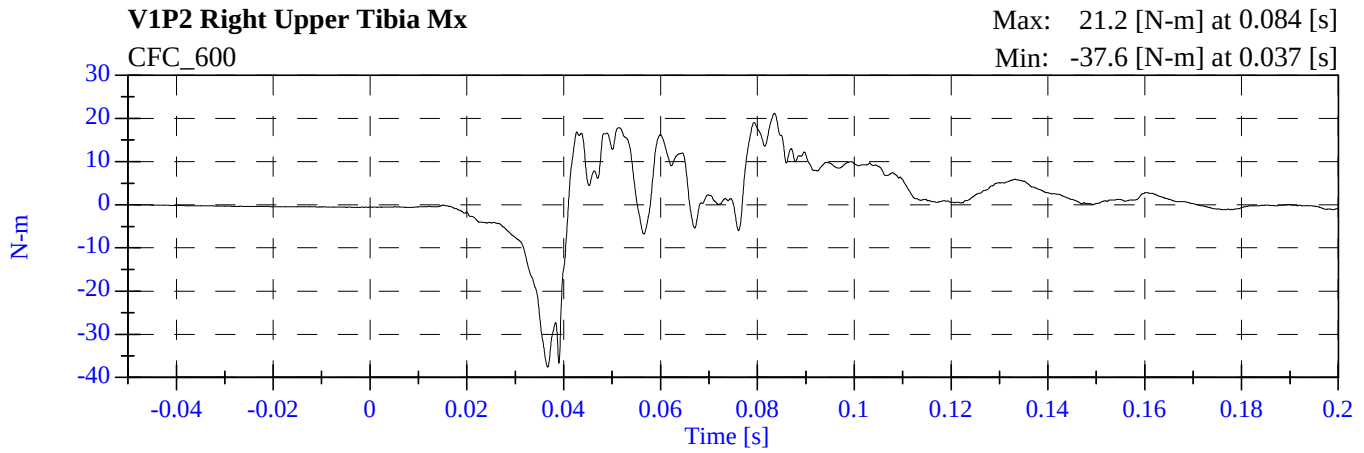
2005 NCAP Test 3 - 2005 Toyota Sienna

M55104 - December 08, 2004



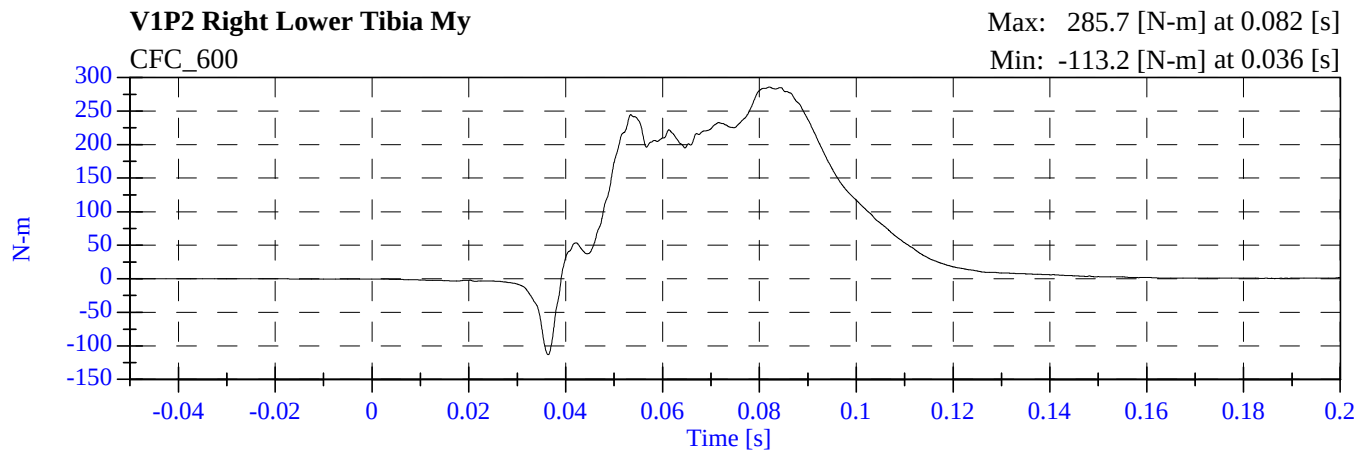
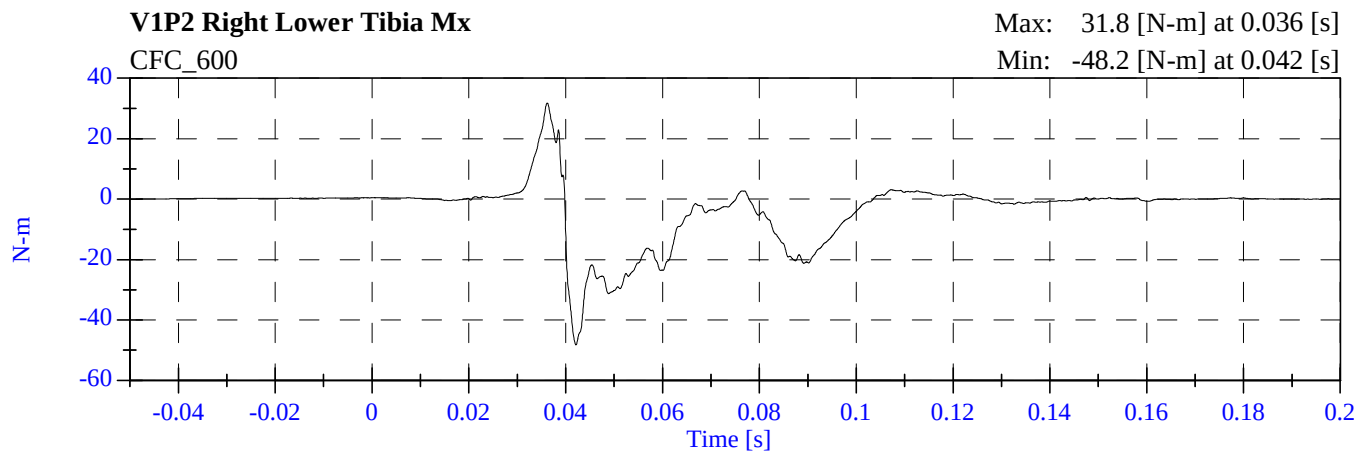
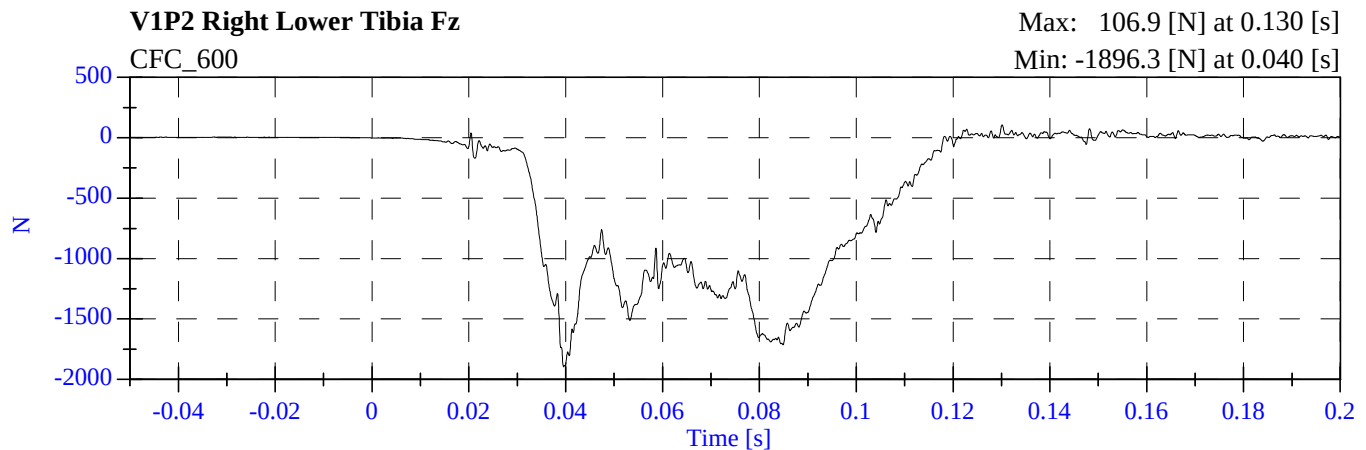
2005 NCAP Test 3 - 2005 Toyota Sienna

M55104 - December 08, 2004



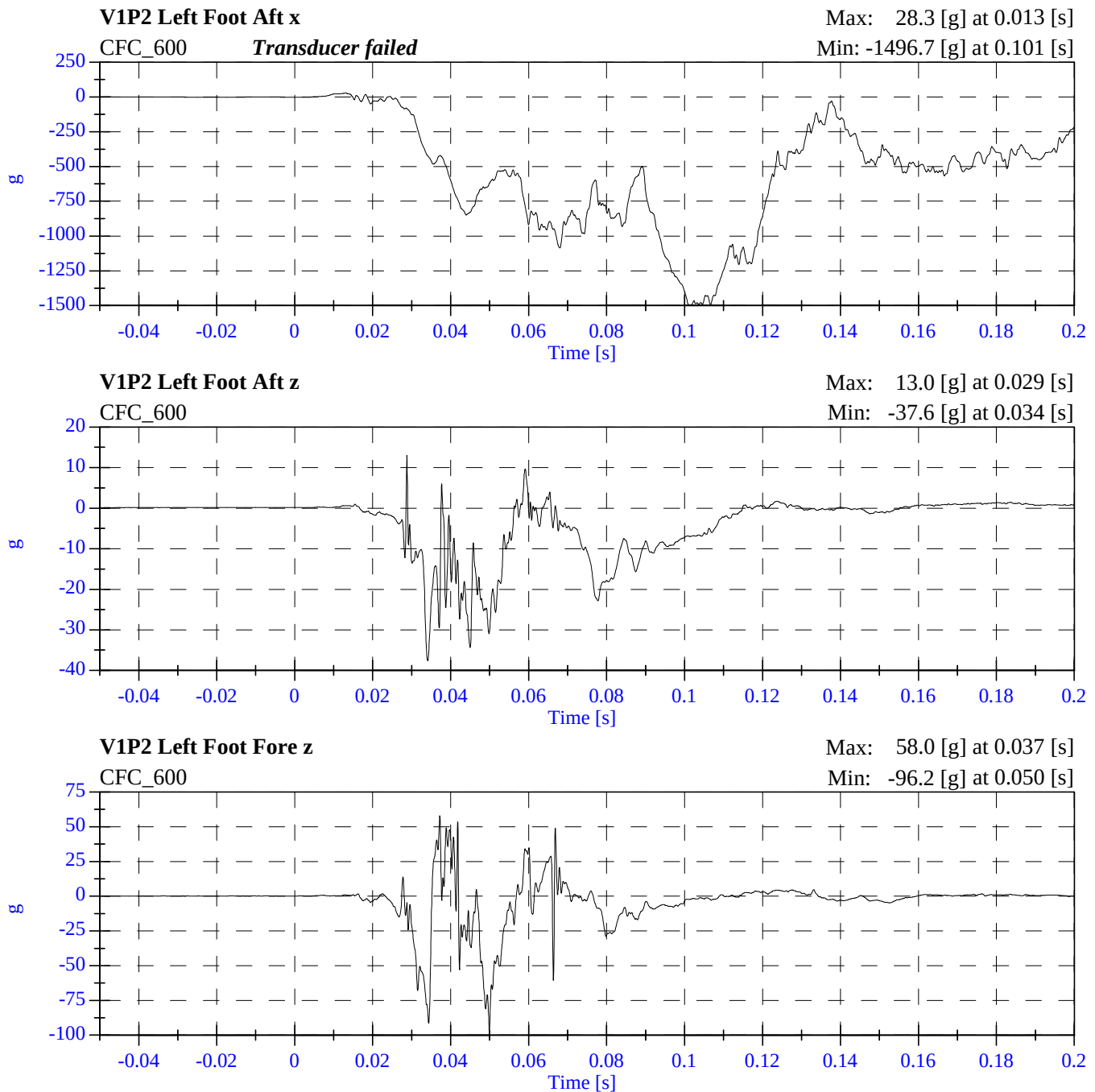
2005 NCAP Test 3 - 2005 Toyota Sienna

M55104 - December 08, 2004

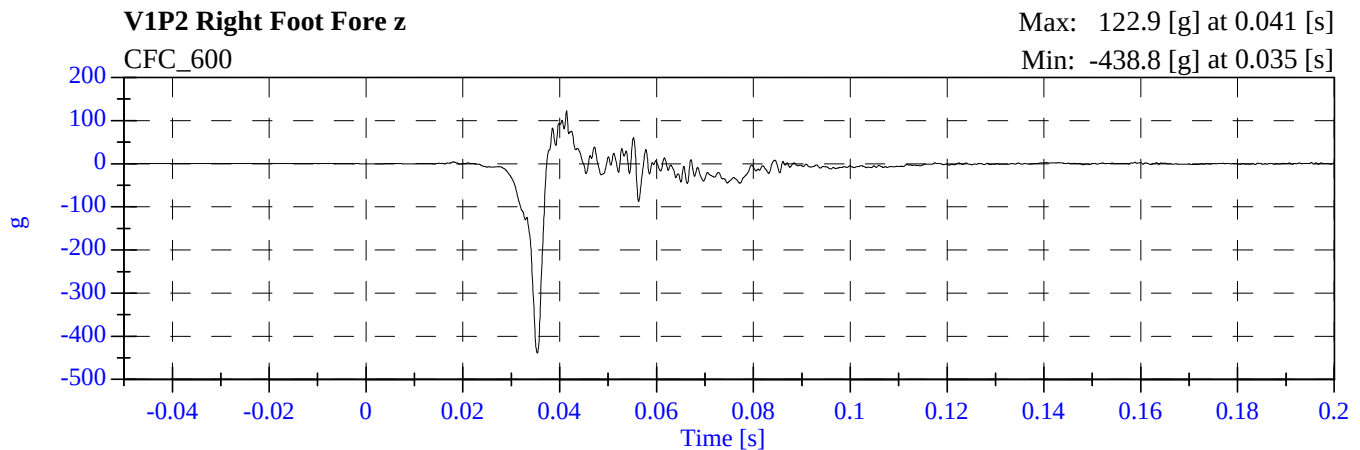
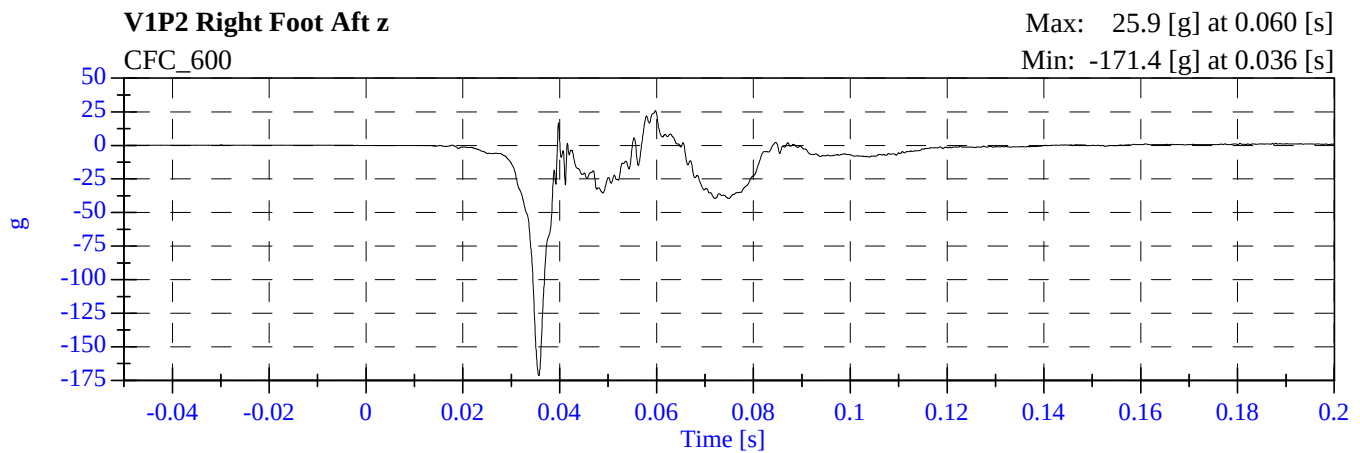
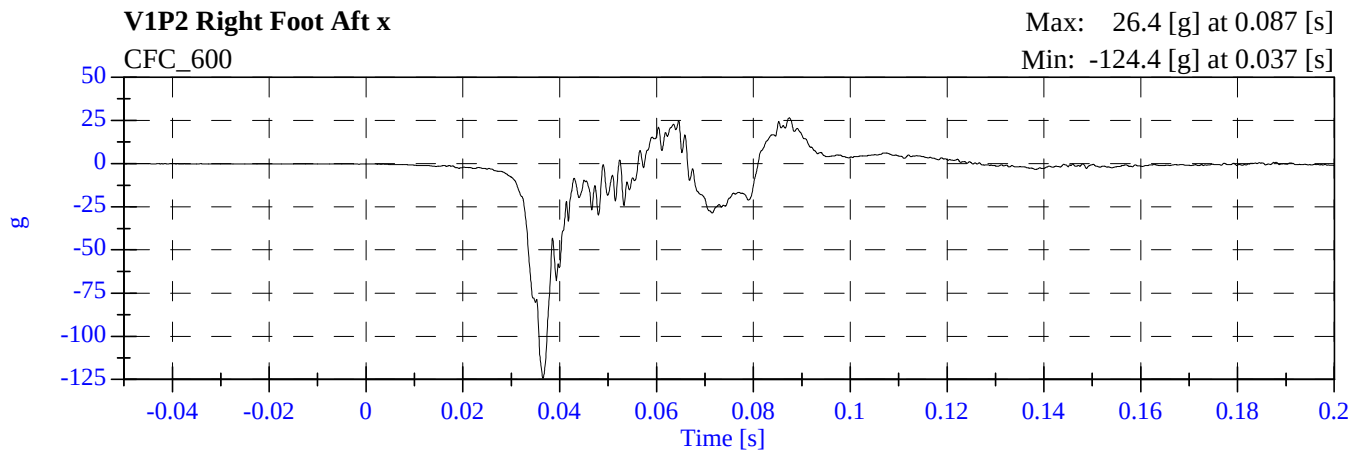


2005 NCAP Test 3 - 2005 Toyota Sienna

M55104 - December 08, 2004

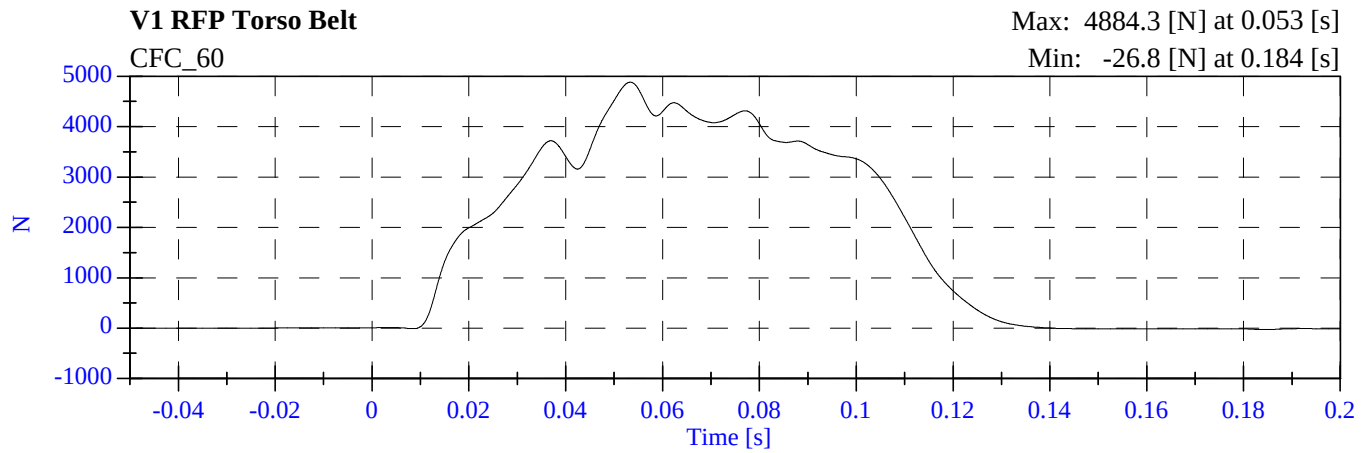
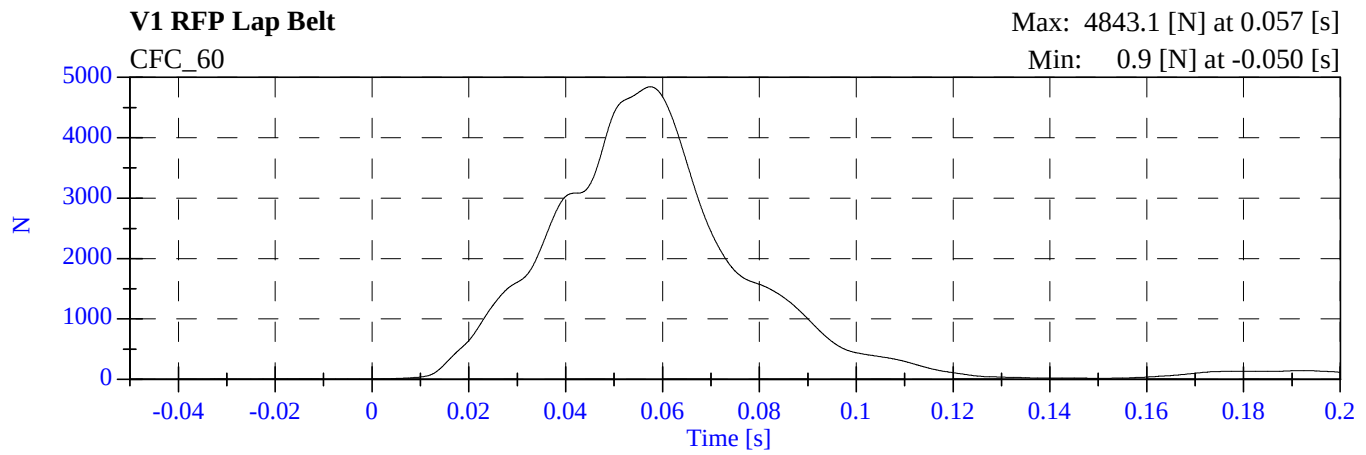


2005 NCAP Test 3 - 2005 Toyota Sienna M55104 - December 08, 2004

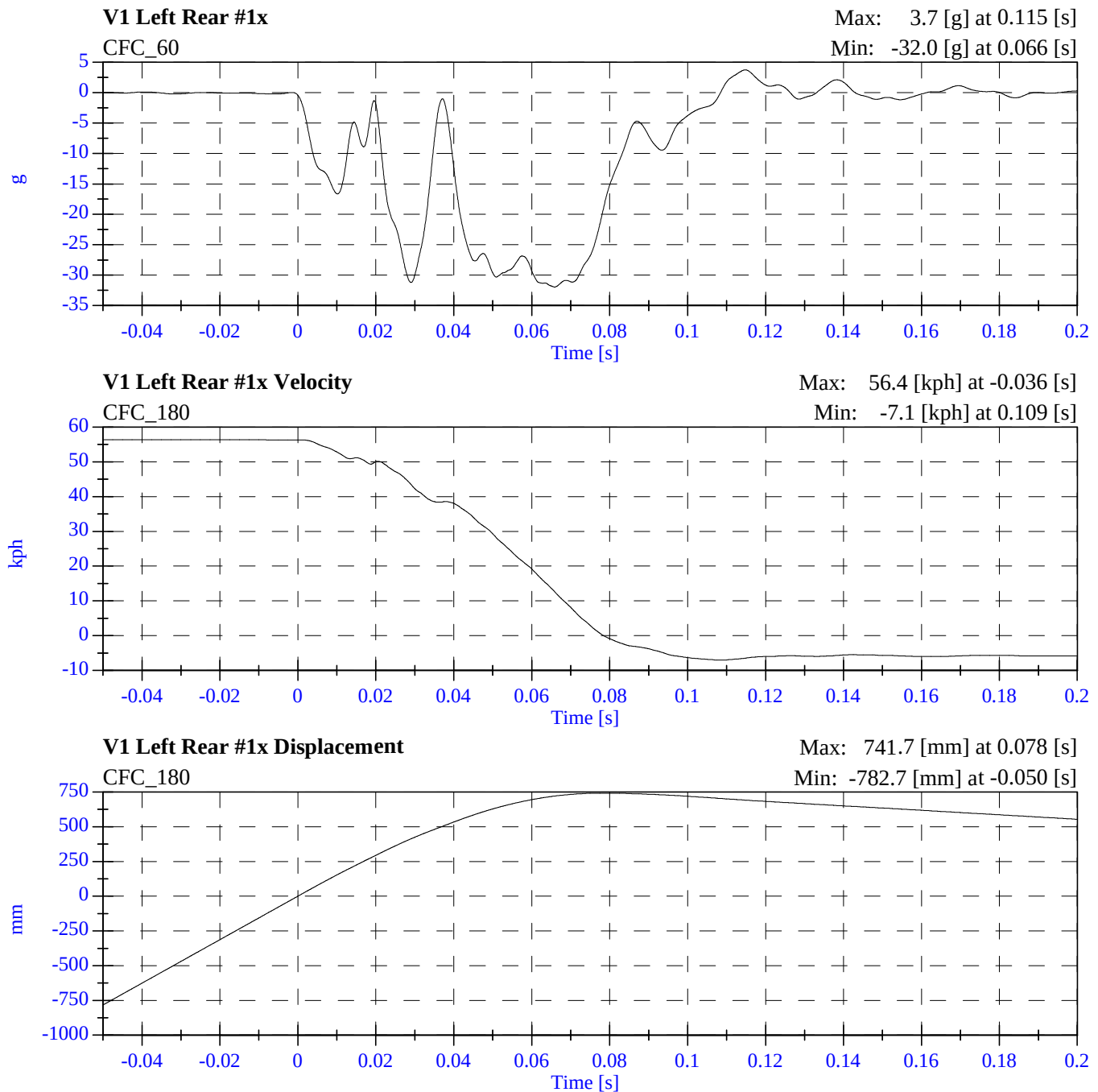


2005 NCAP Test 3 - 2005 Toyota Sienna

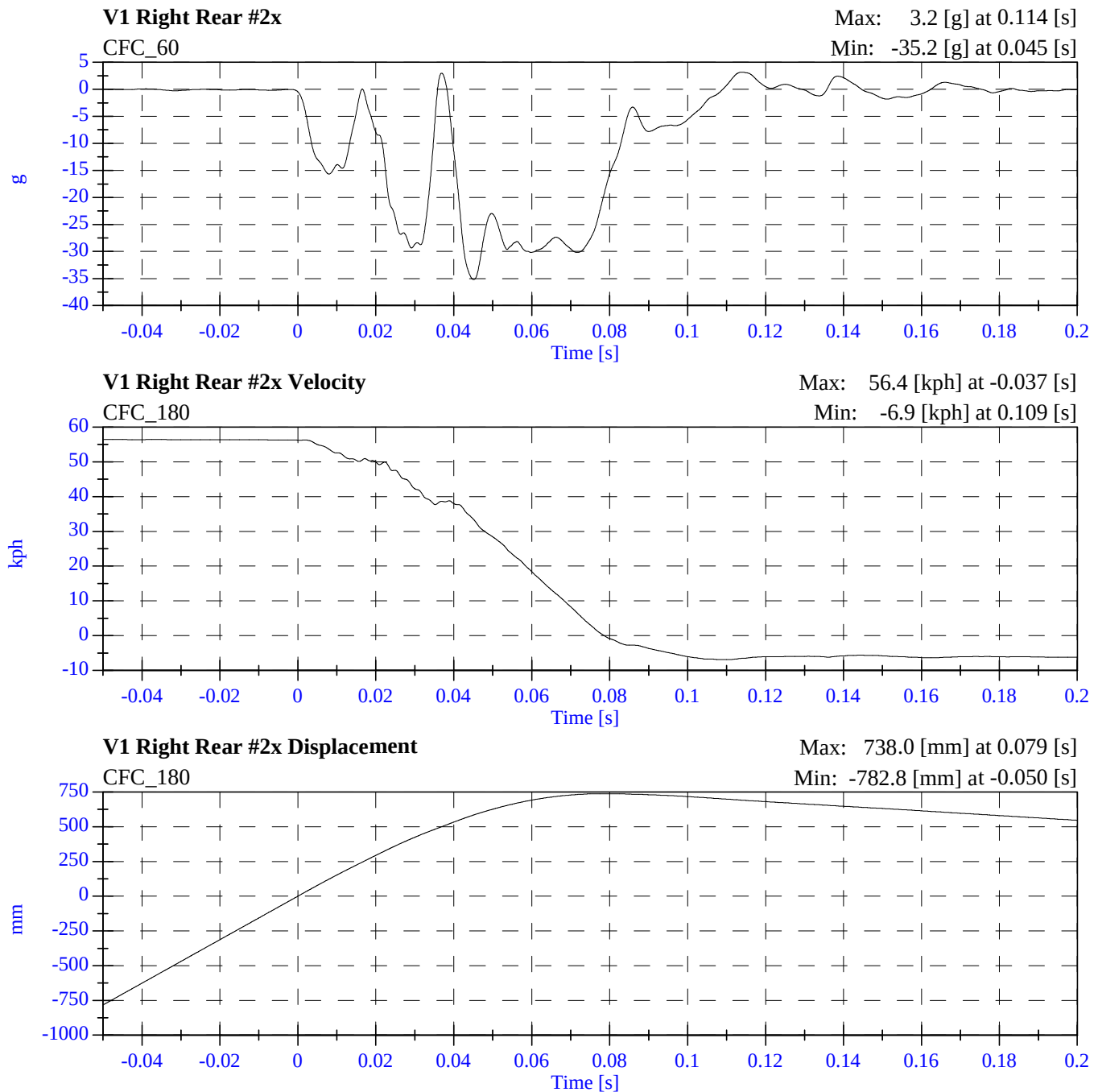
M55104 - December 08, 2004



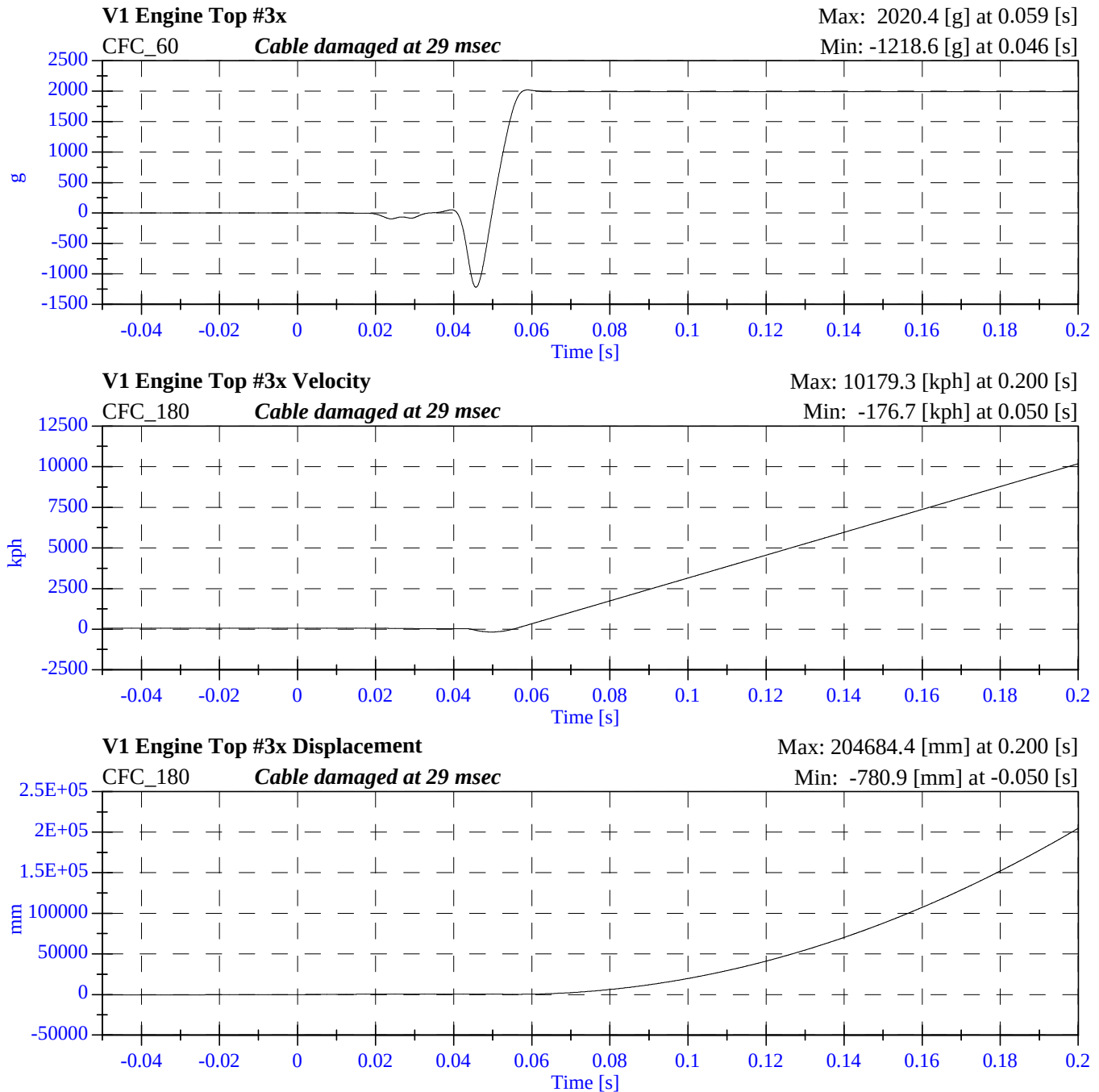
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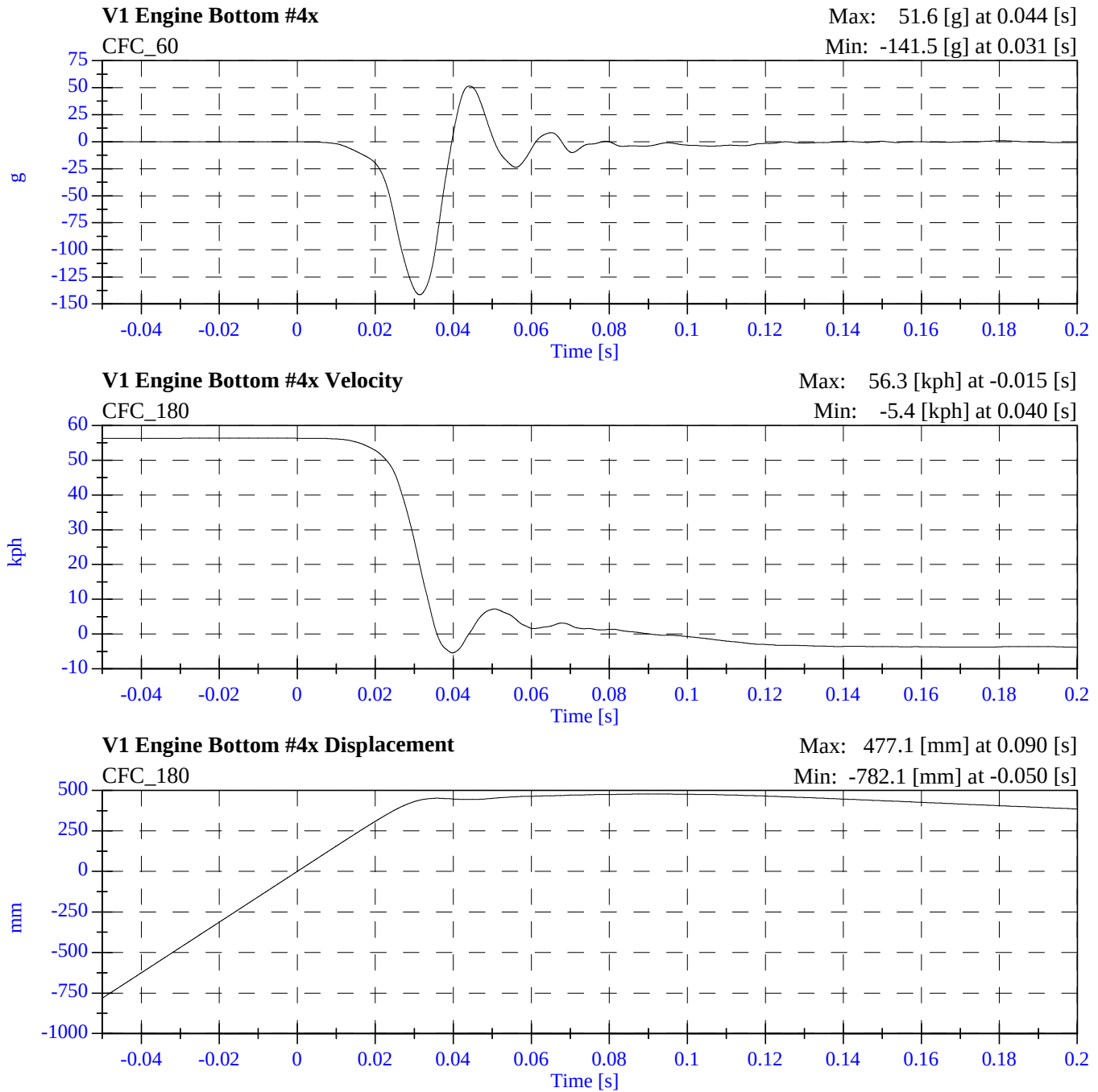
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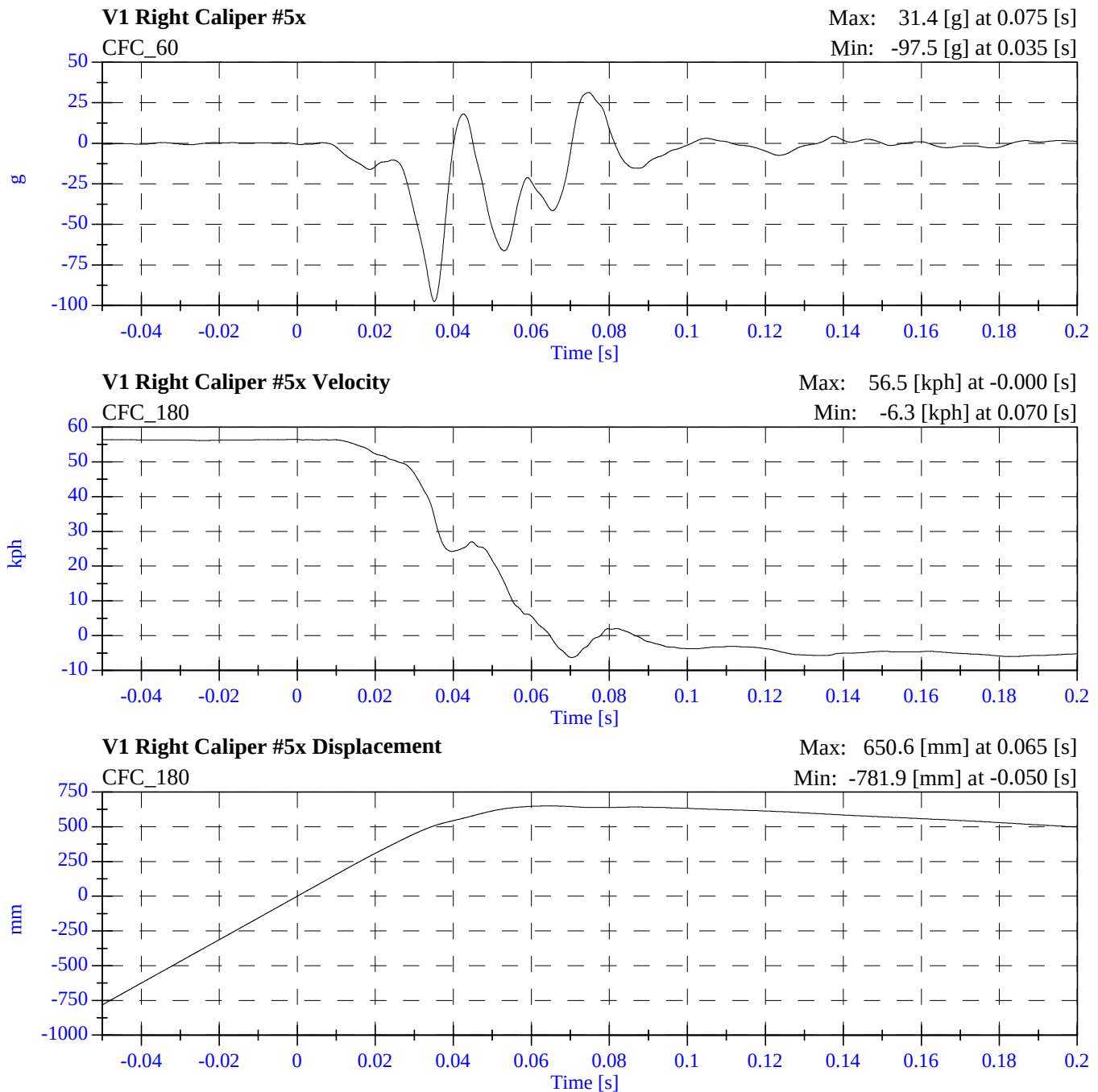
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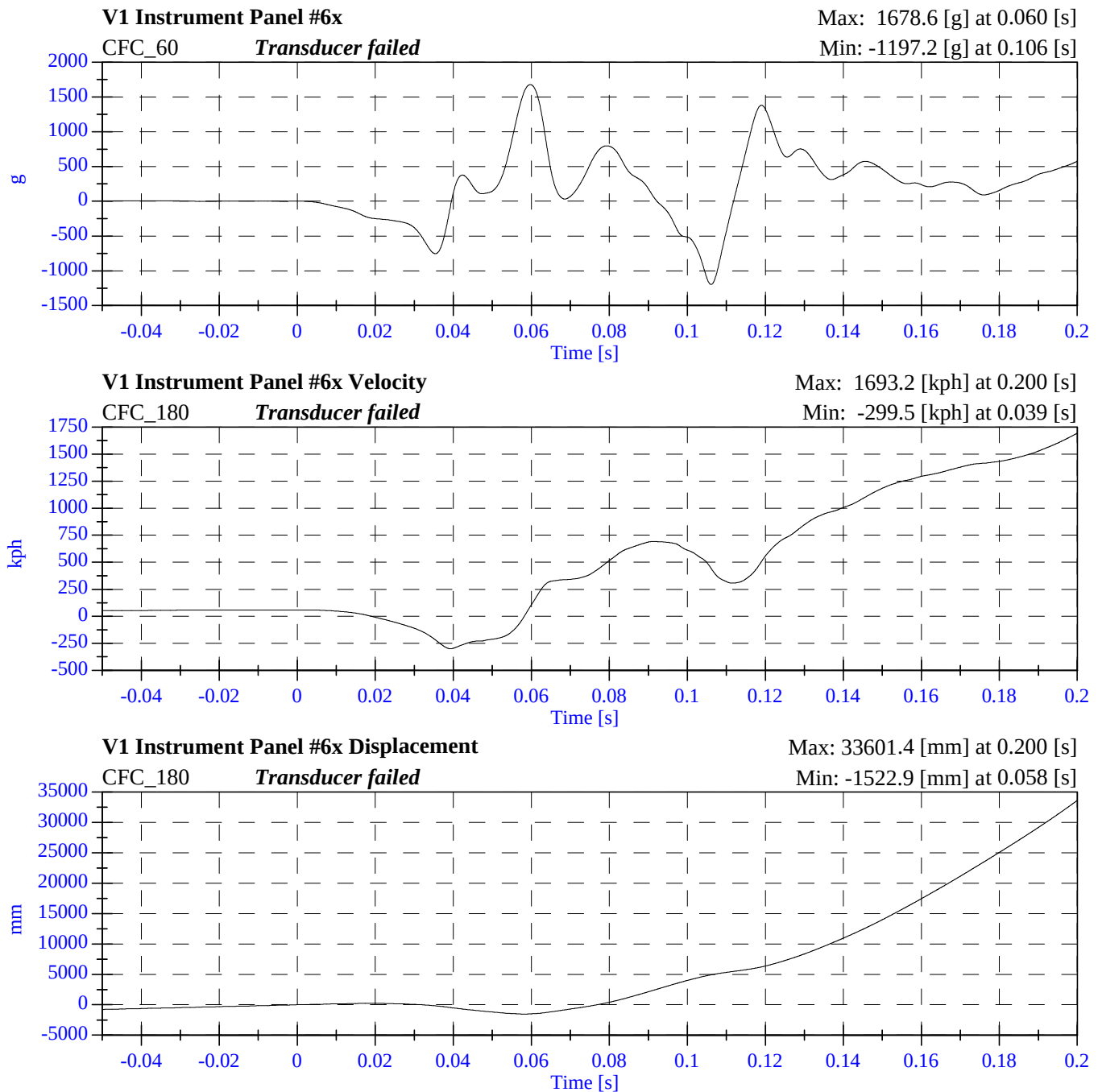
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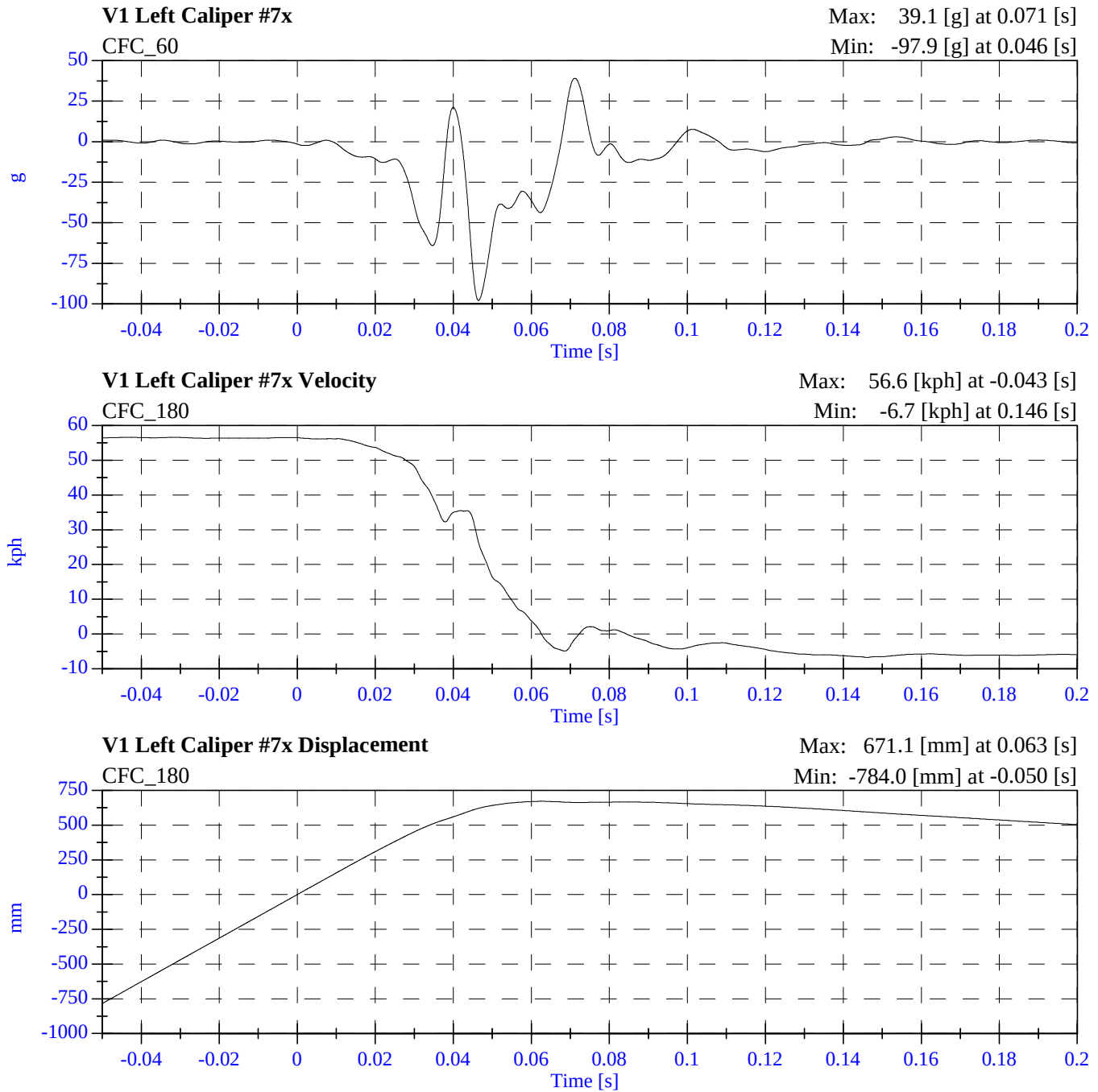
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2005 NCAP Test 3 - 2005 Toyota Sienna M55104 - December 08, 2004

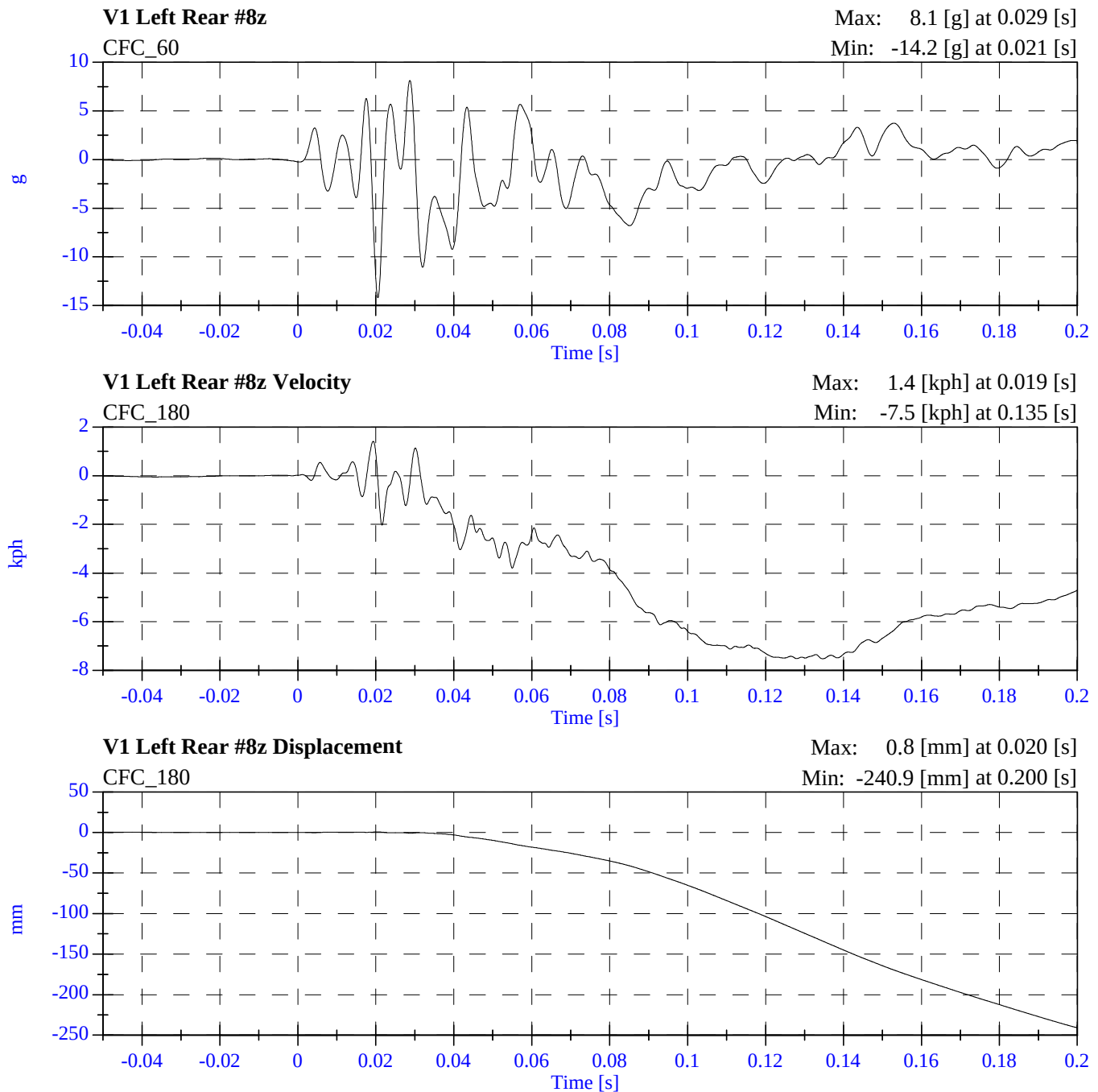


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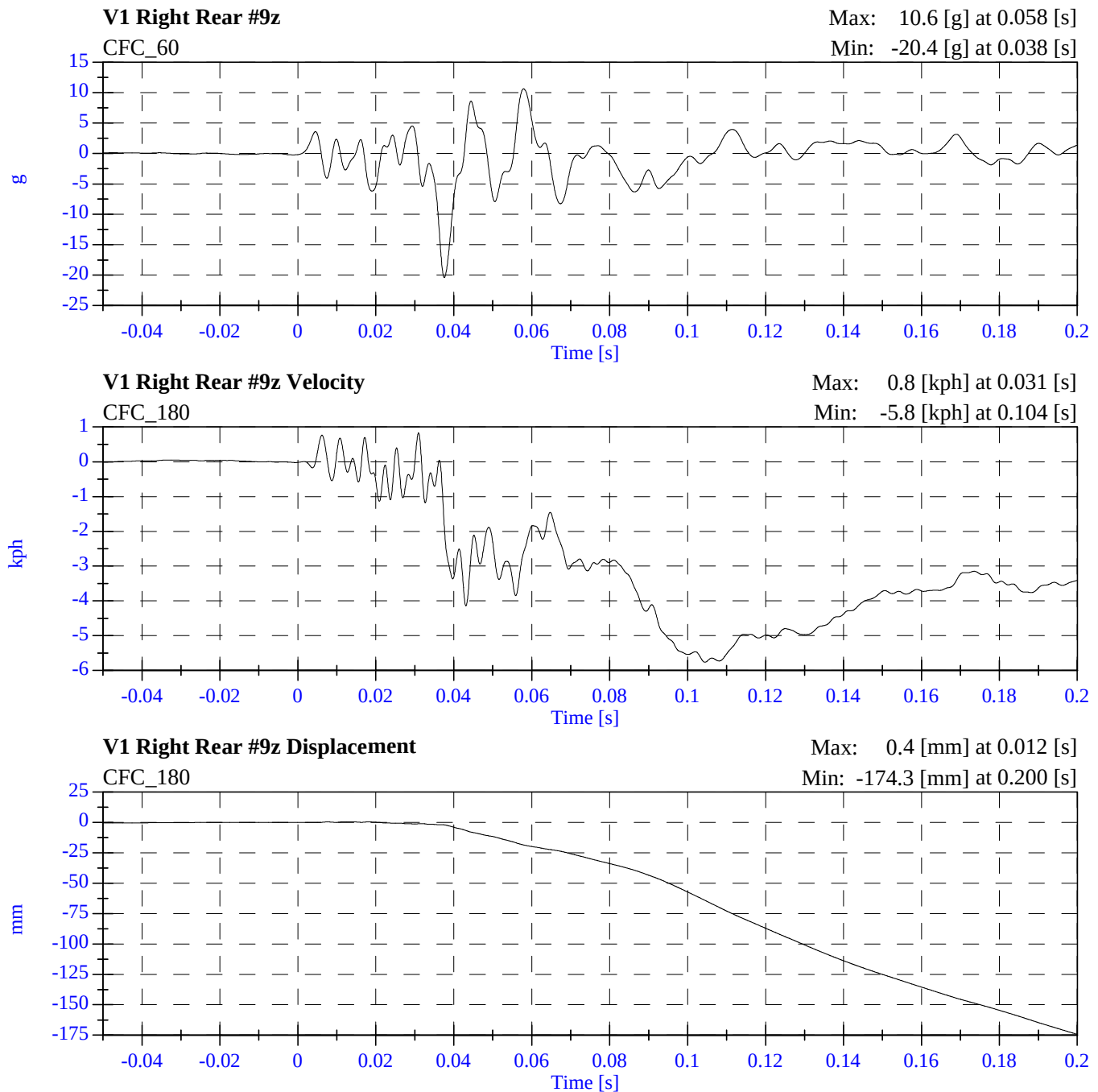


2005 NCAP Test 3 - 2005 Toyota Sienna

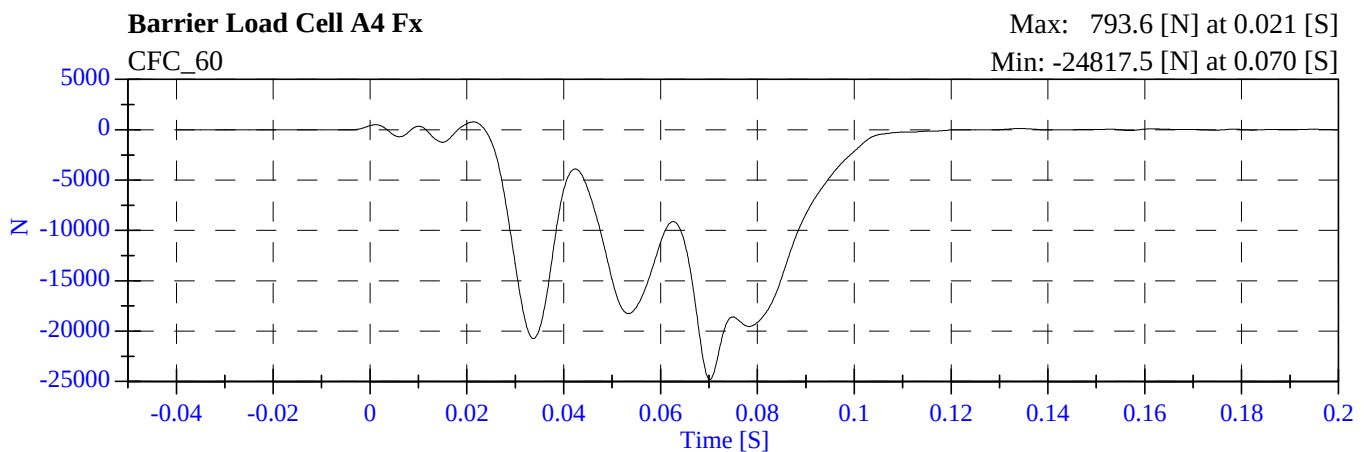
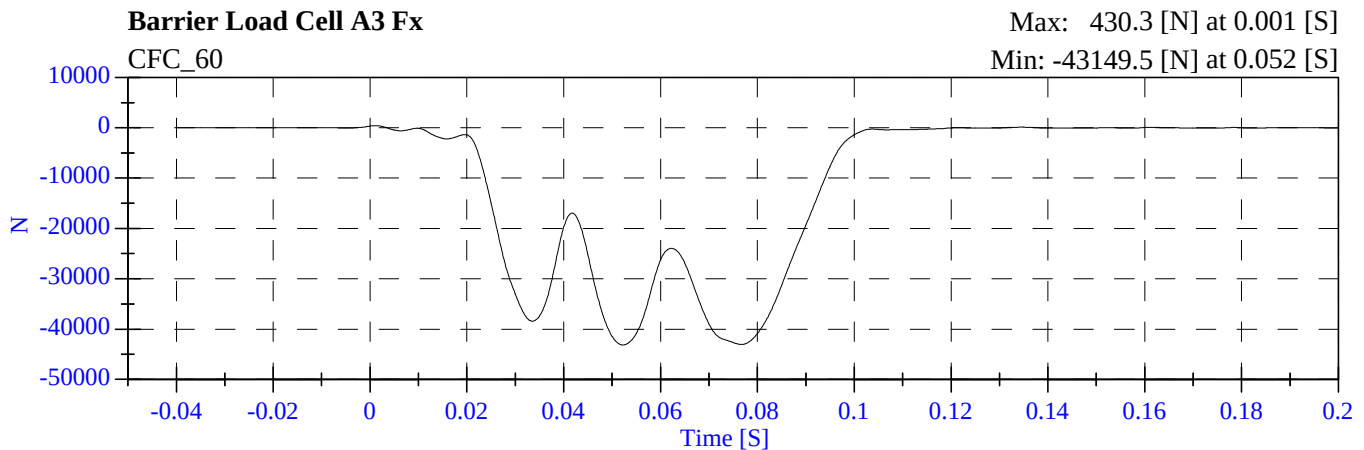
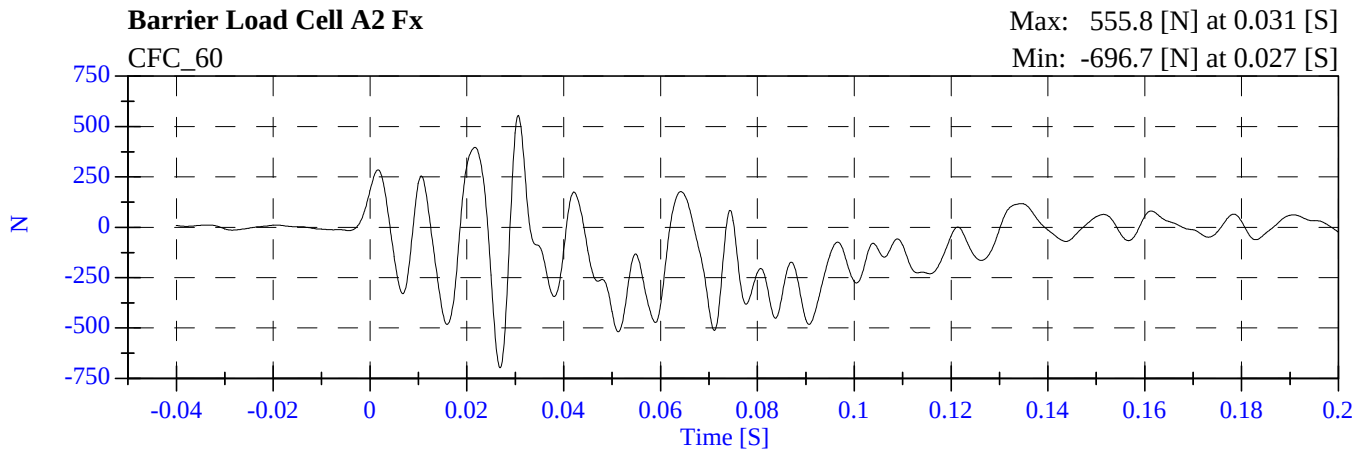
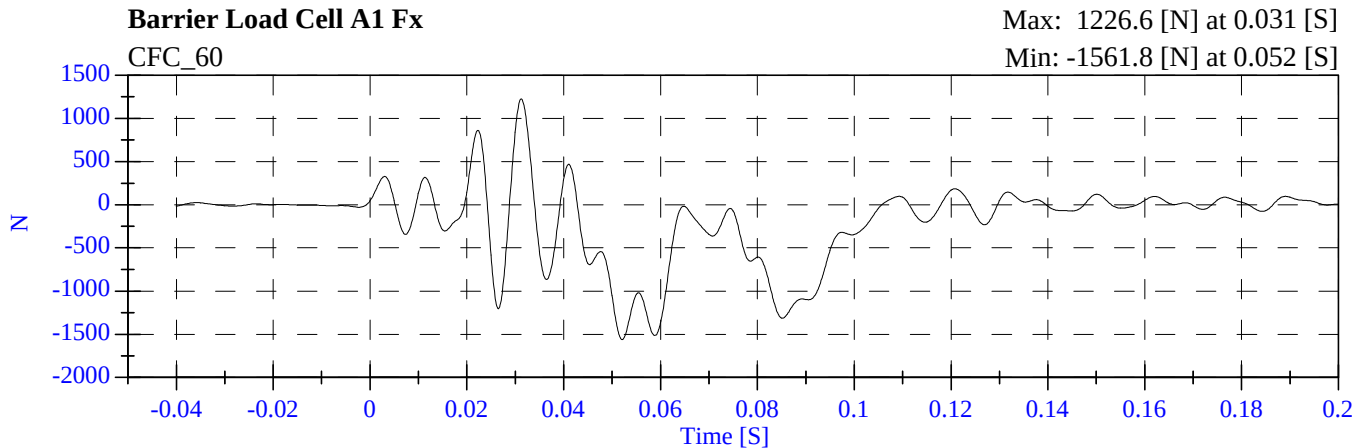
M55104 - December 08, 2004



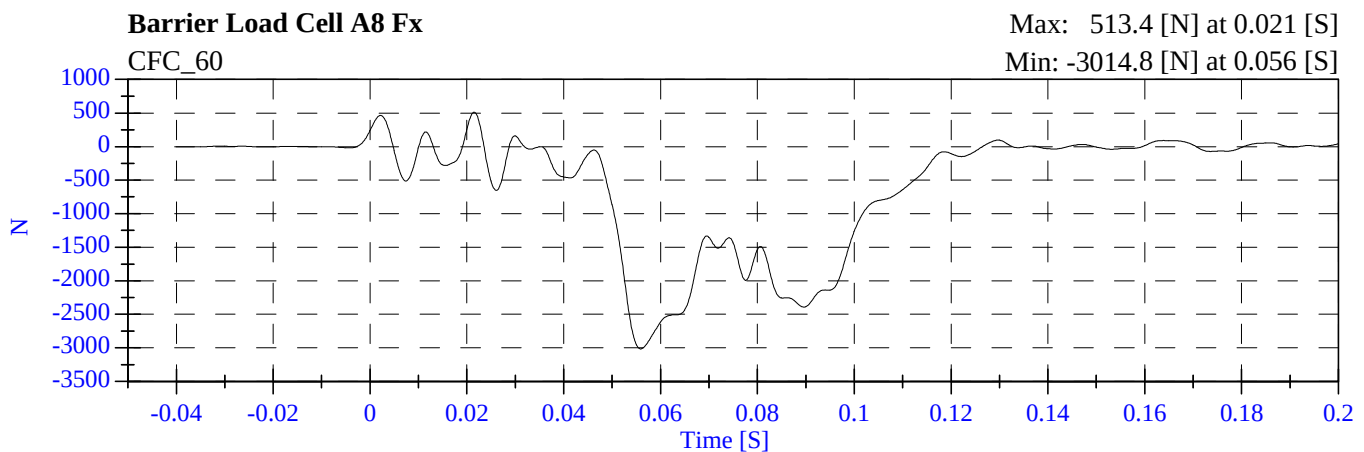
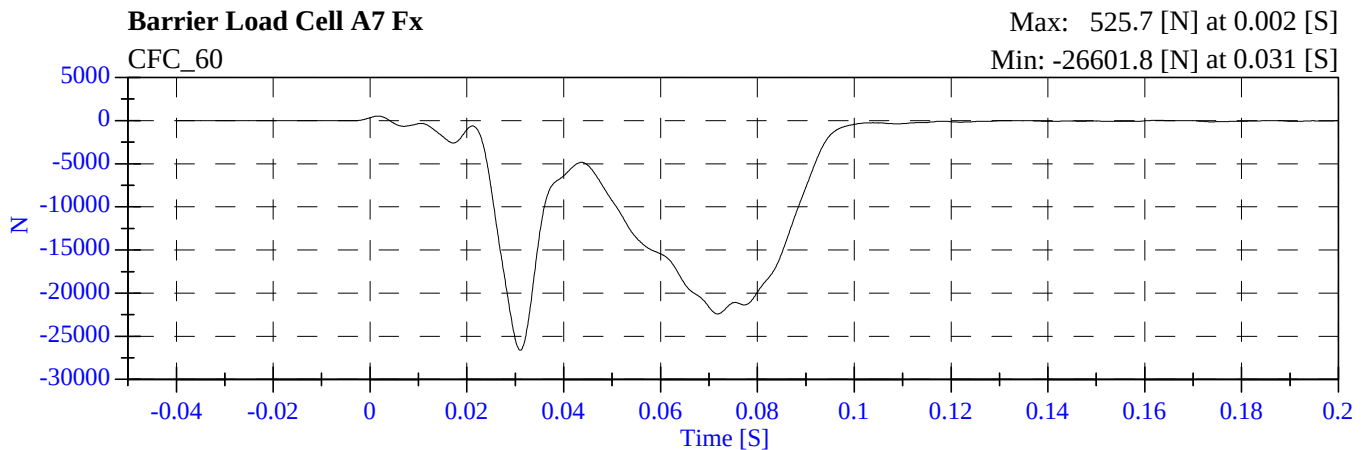
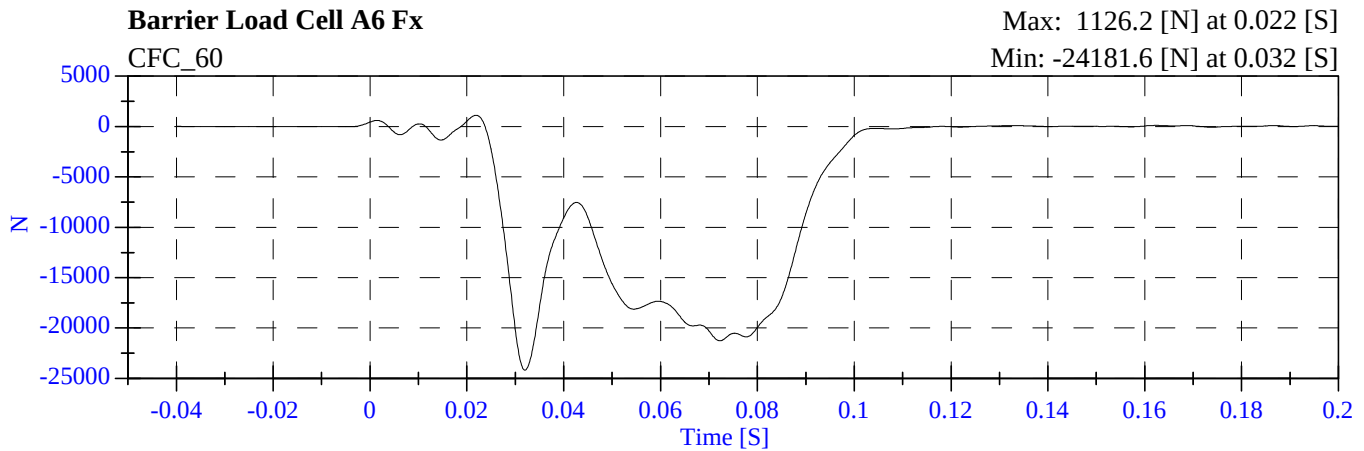
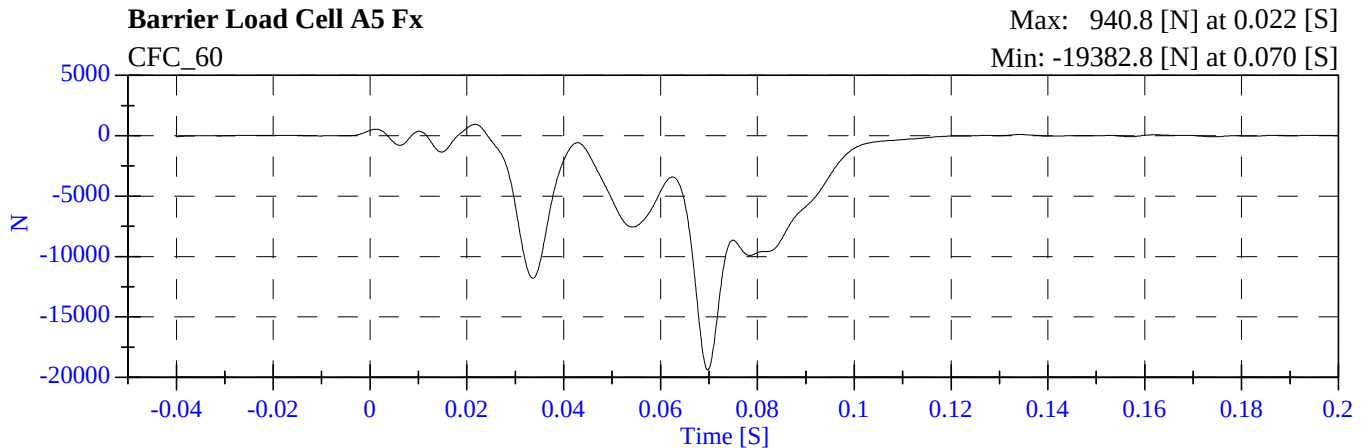
2005 NCAP Test 3 - 2005 Toyota Sienna M55104 - December 08, 2004



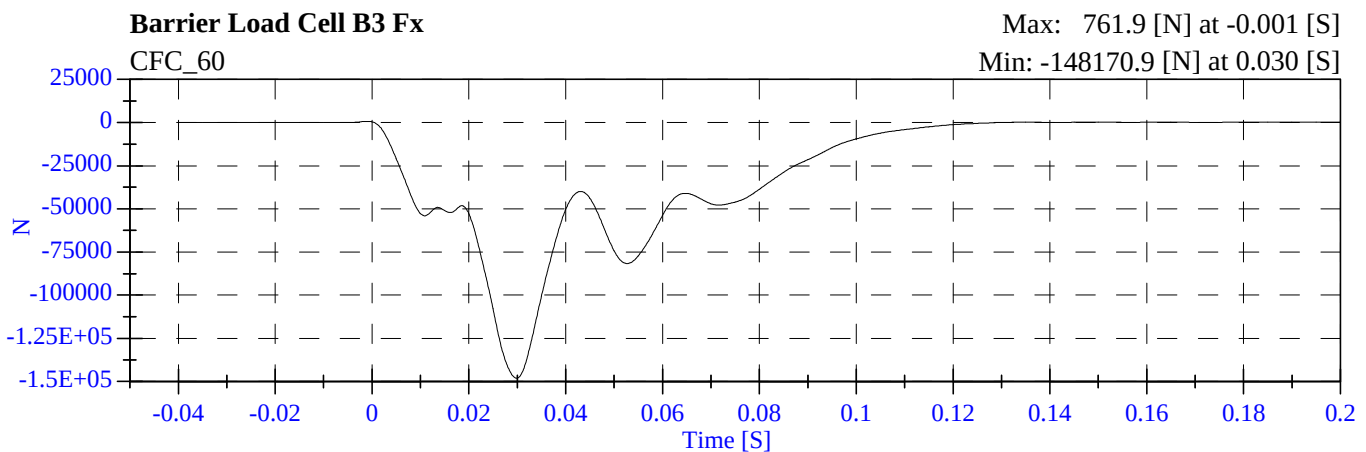
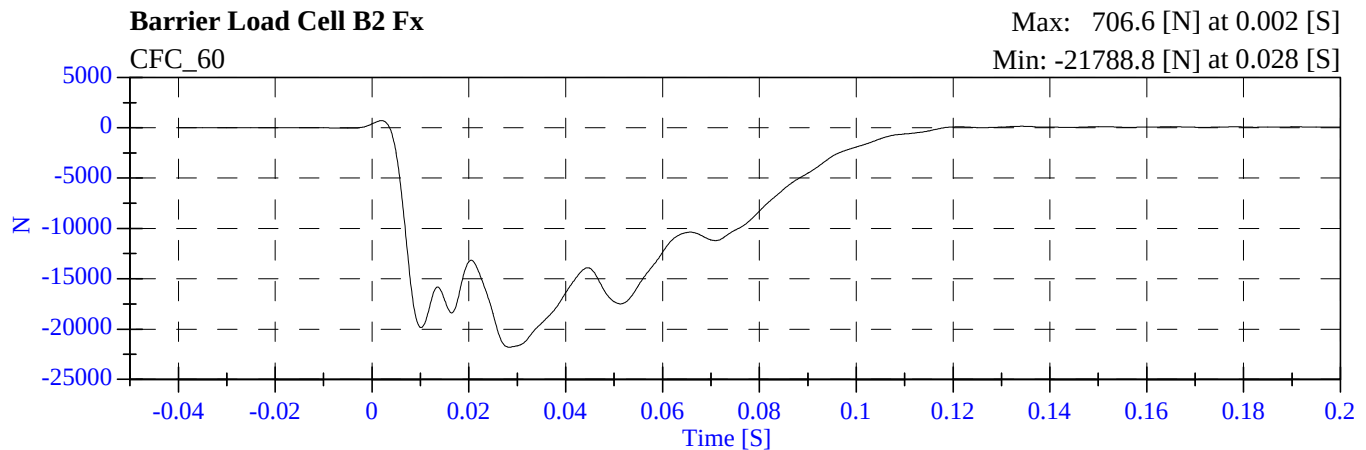
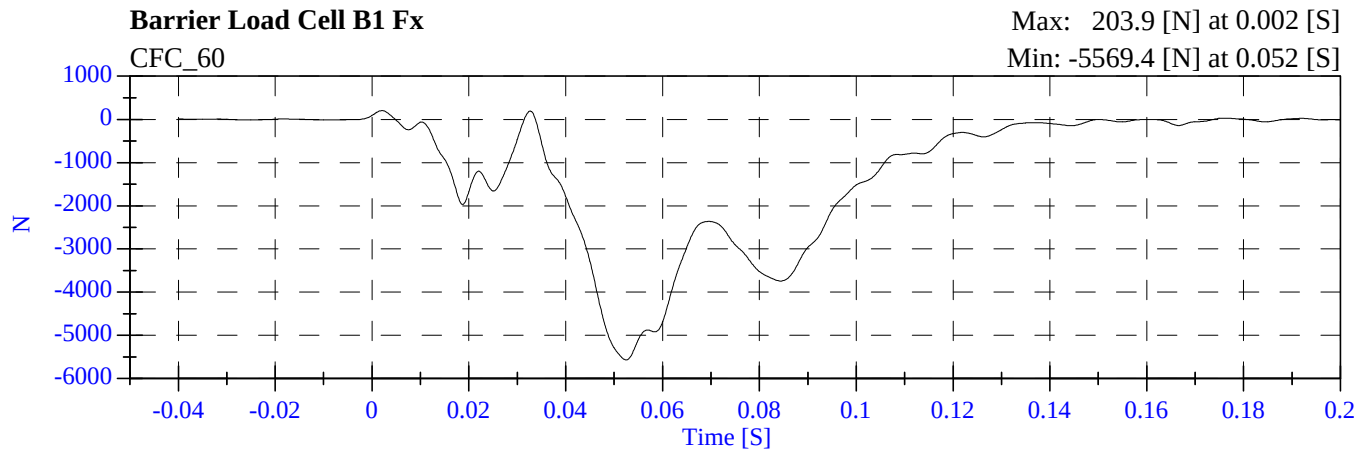
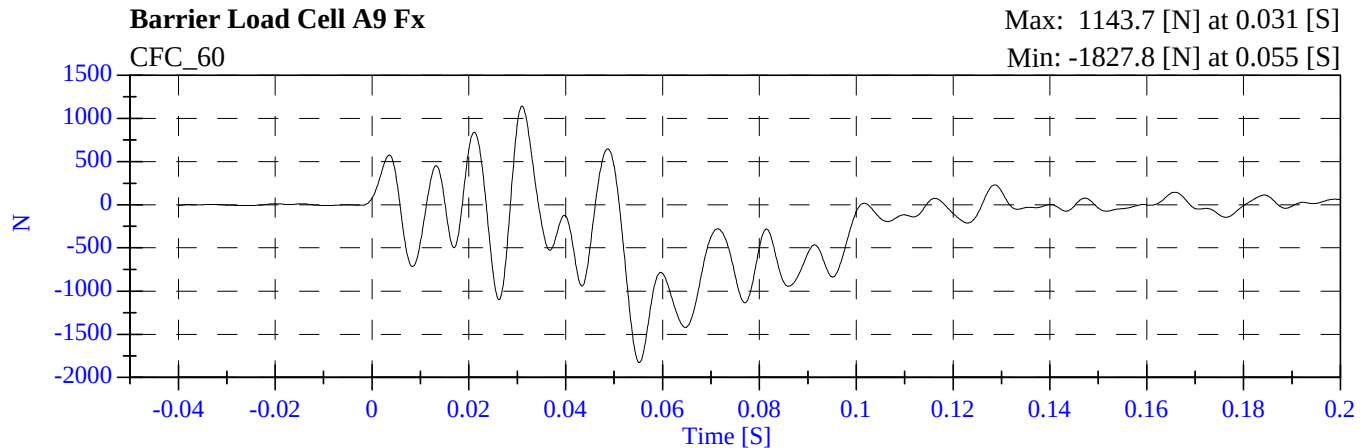
2005 NCAP Test 3 - 2005 Toyota Sienna M55104 - December 08, 2004



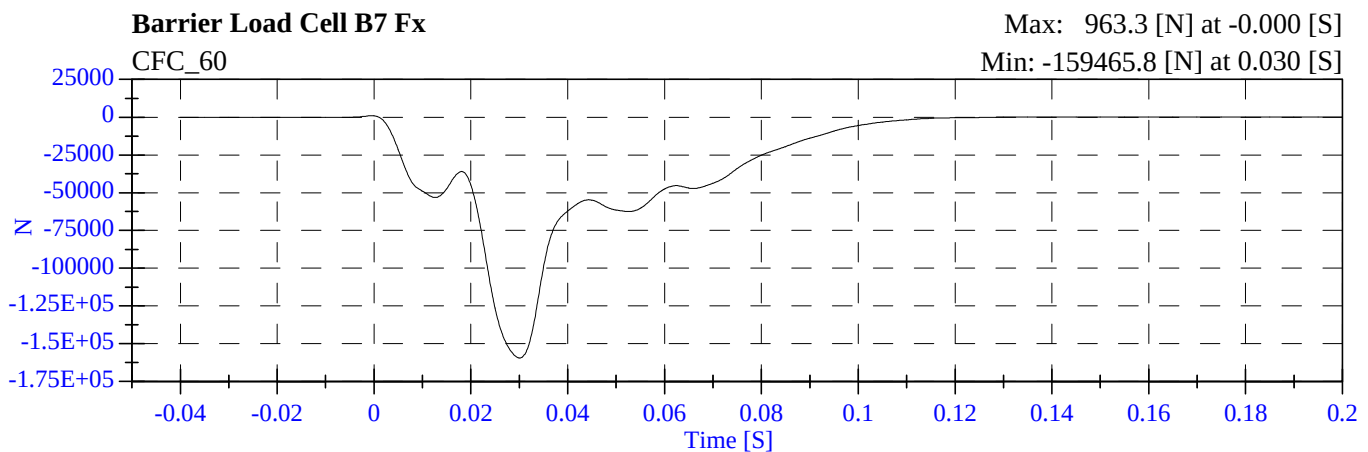
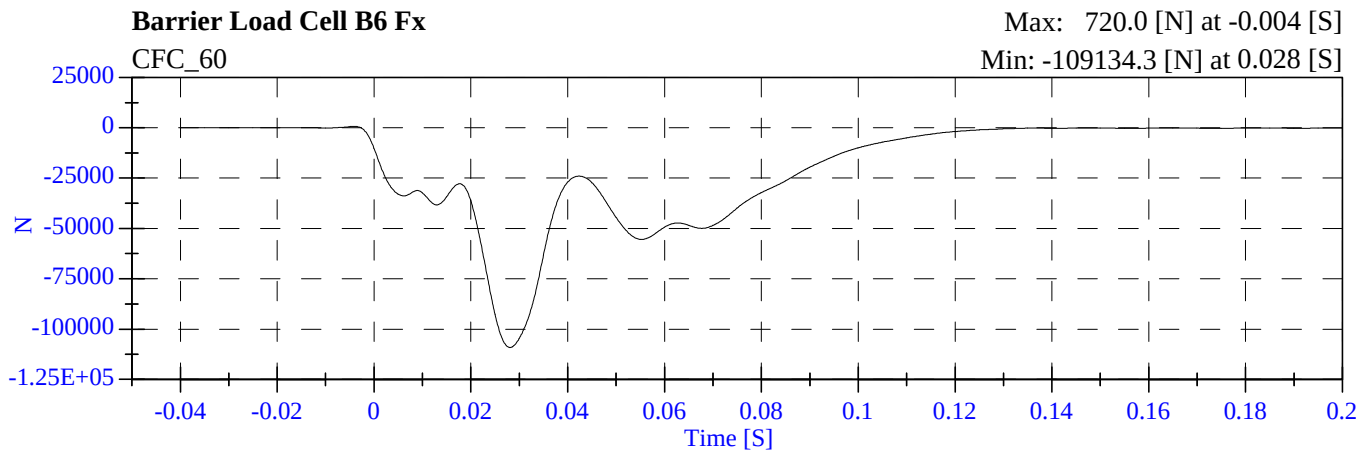
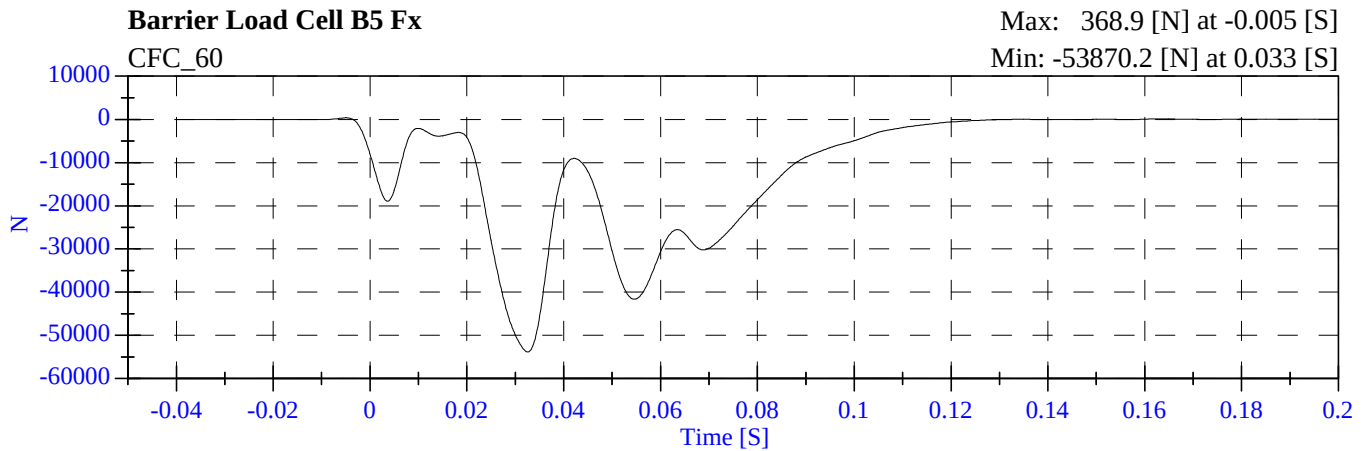
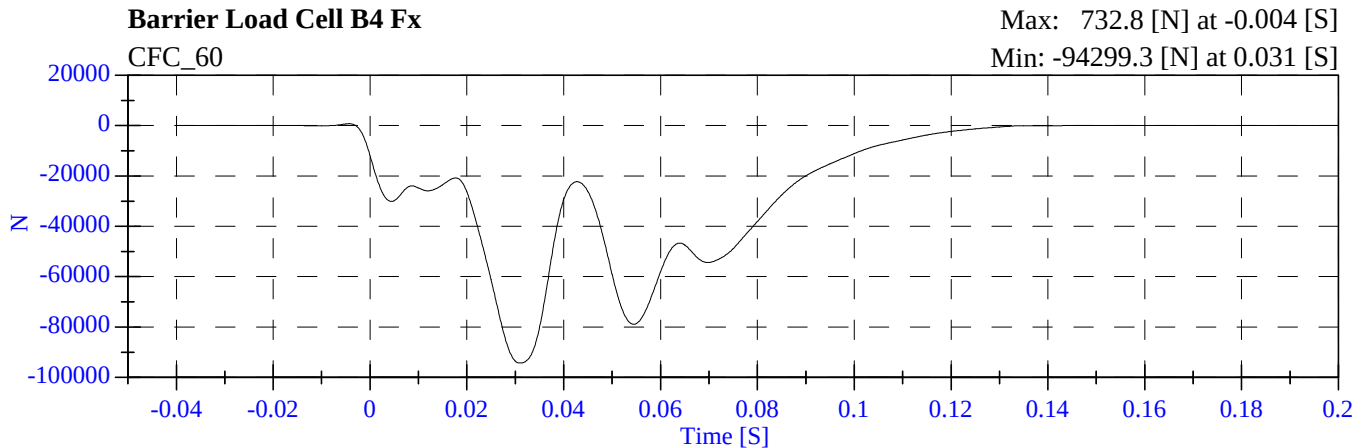
2005 NCAP Test 3 - 2005 Toyota Sienna M55104 - December 08, 2004



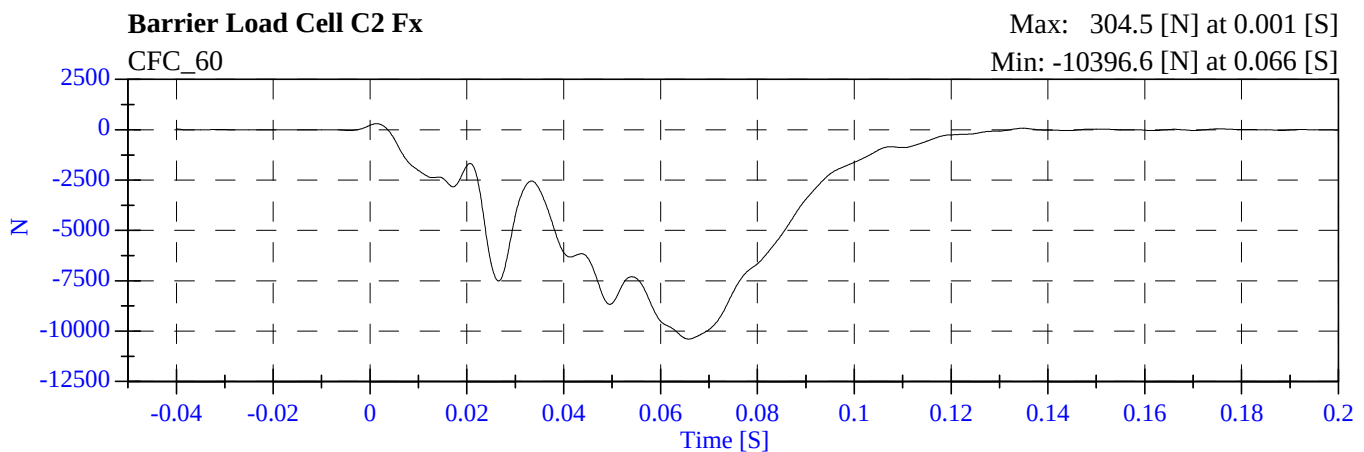
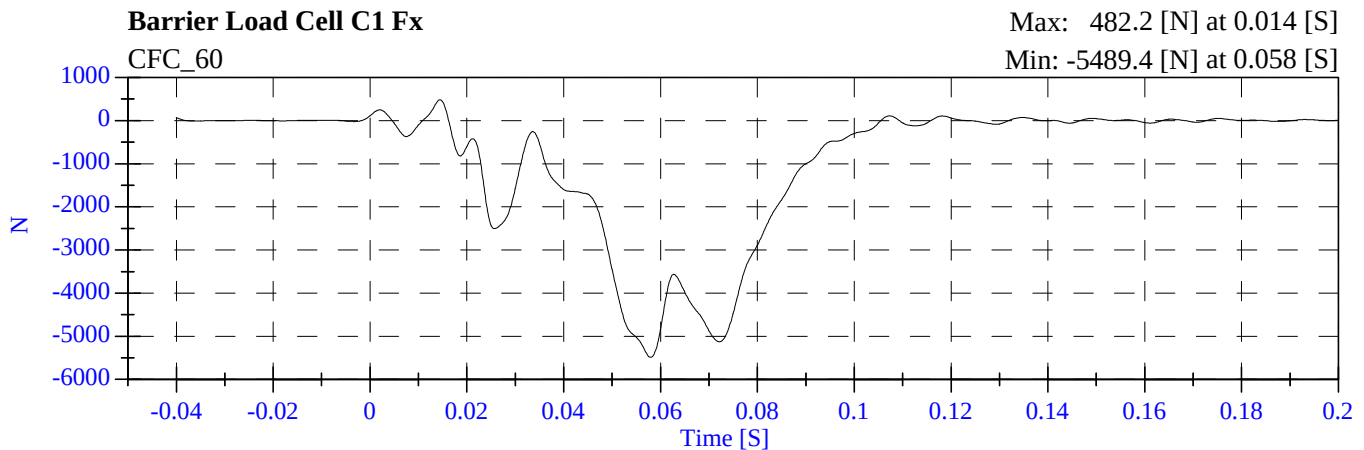
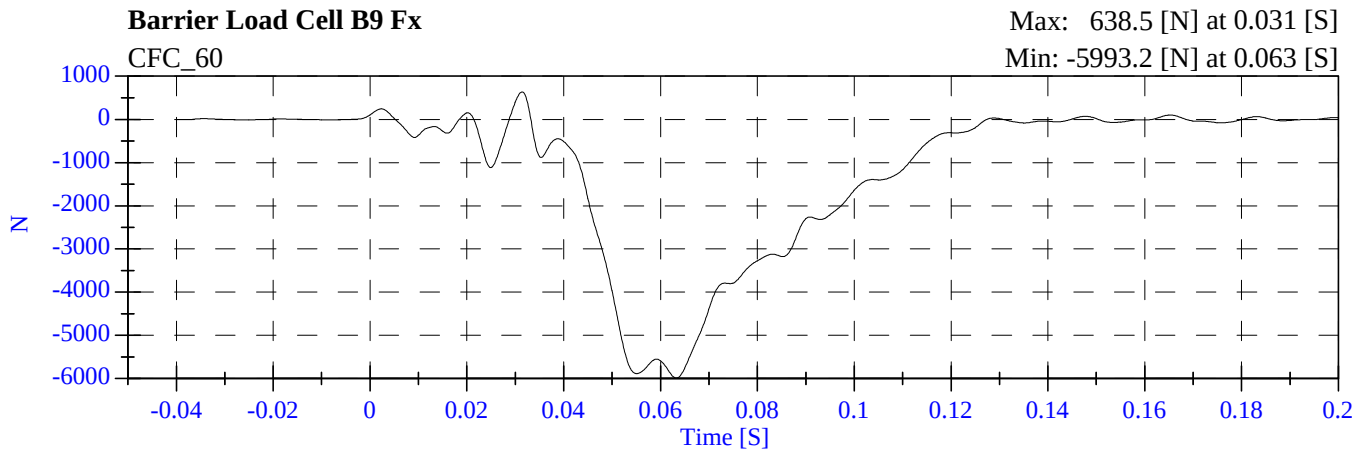
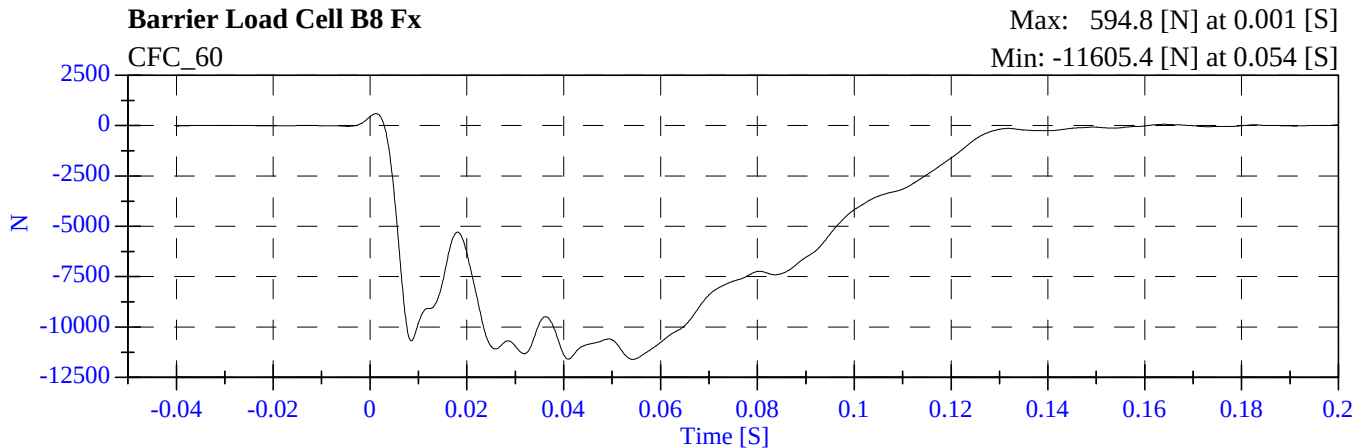
2005 NCAP Test 3 - 2005 Toyota Sienna M55104 - December 08, 2004



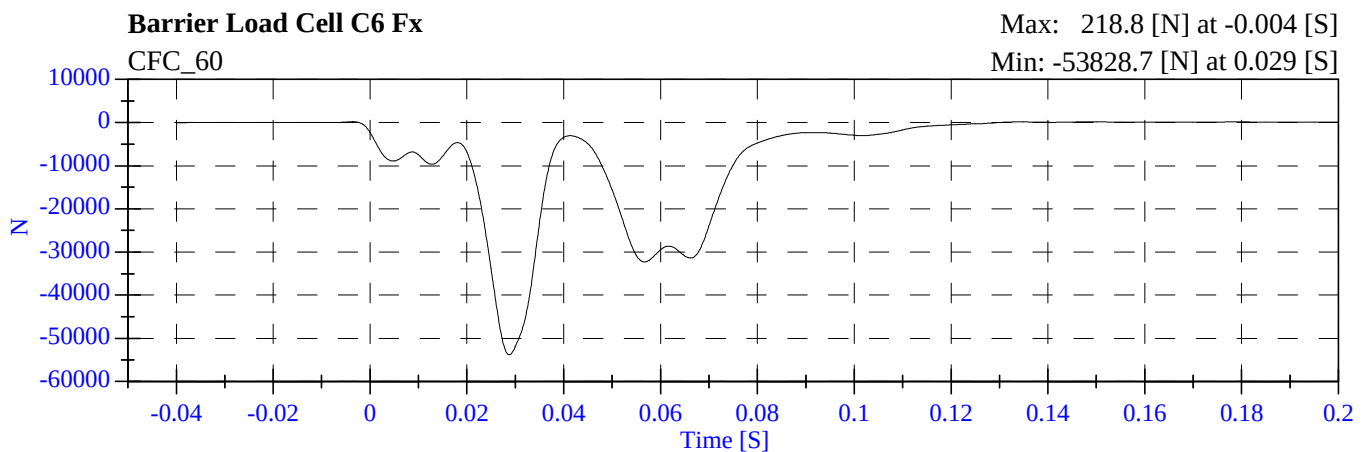
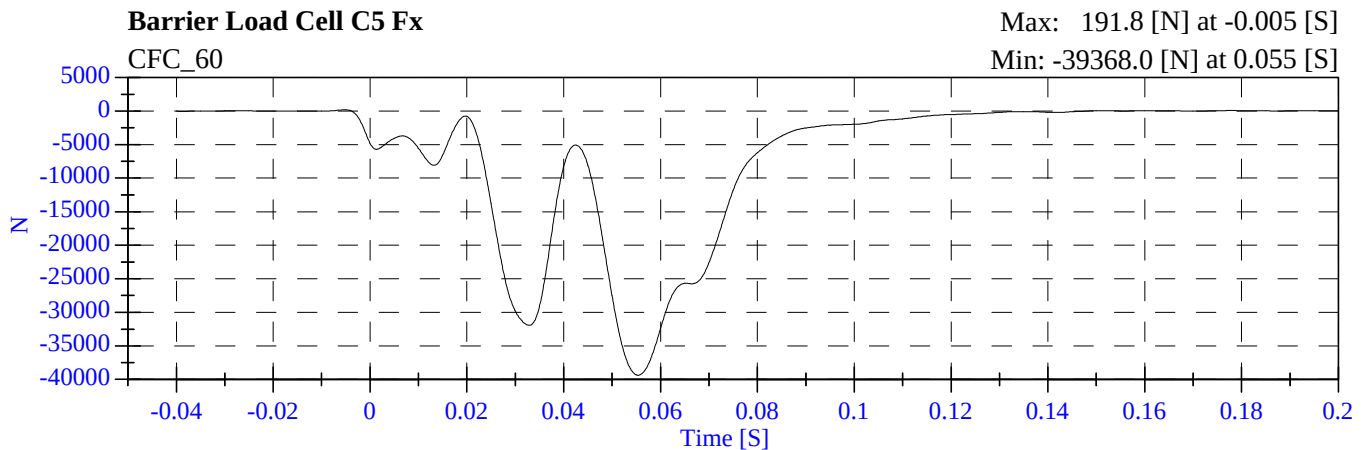
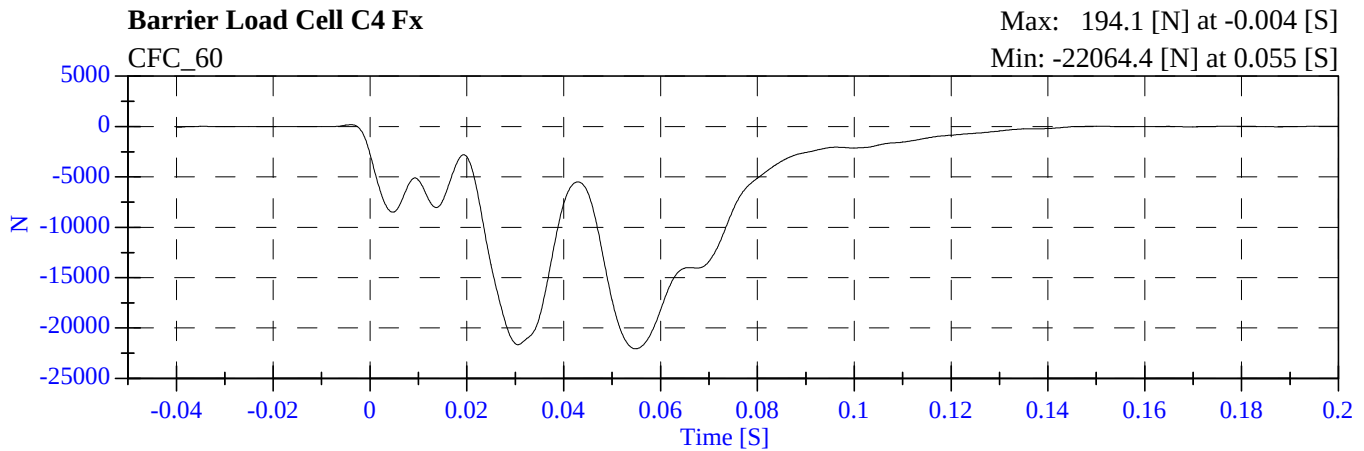
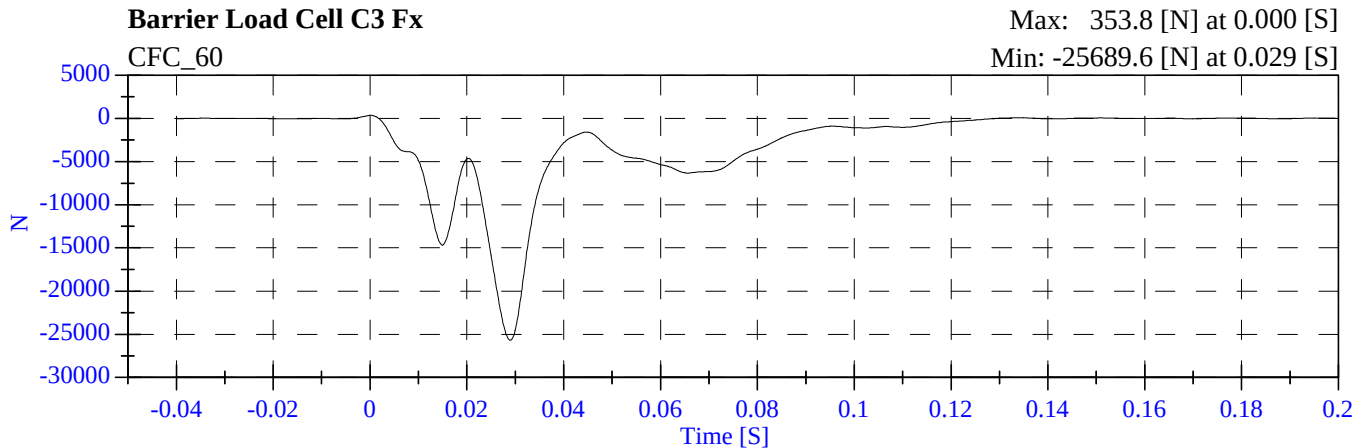
2005 NCAP Test 3 - 2005 Toyota Sienna M55104 - December 08, 2004



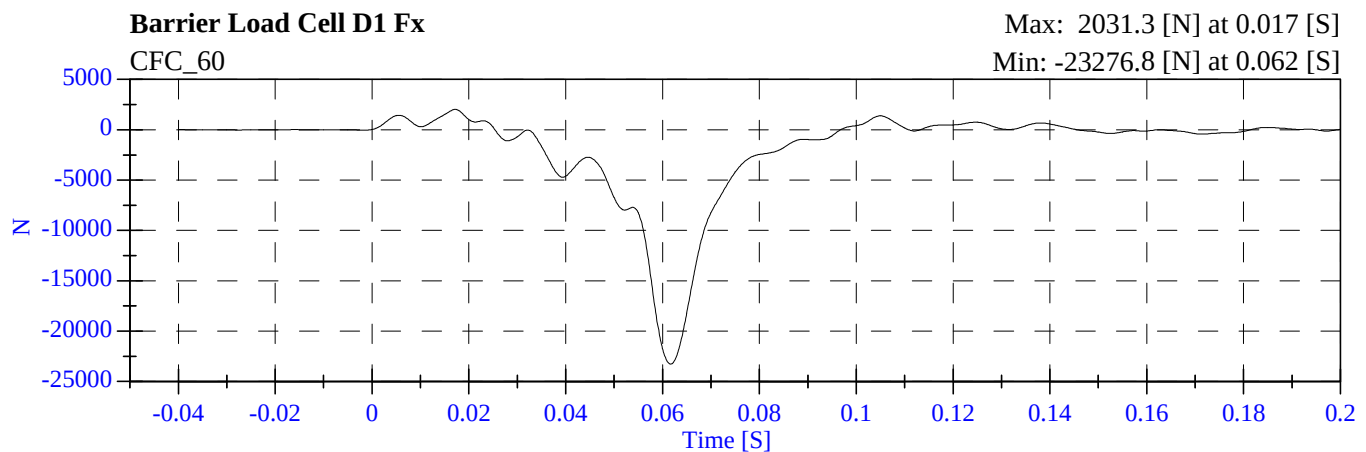
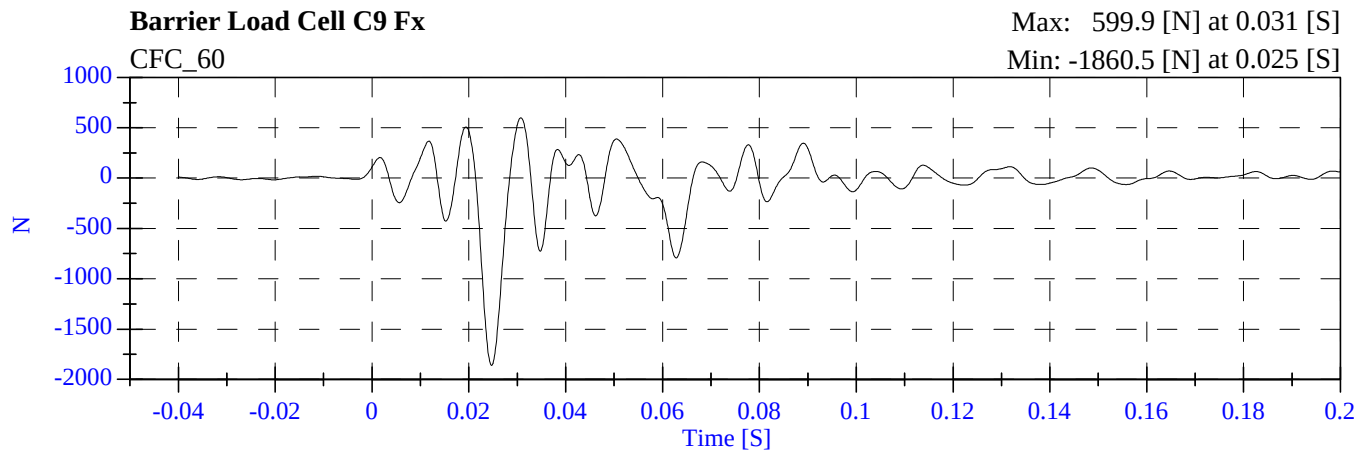
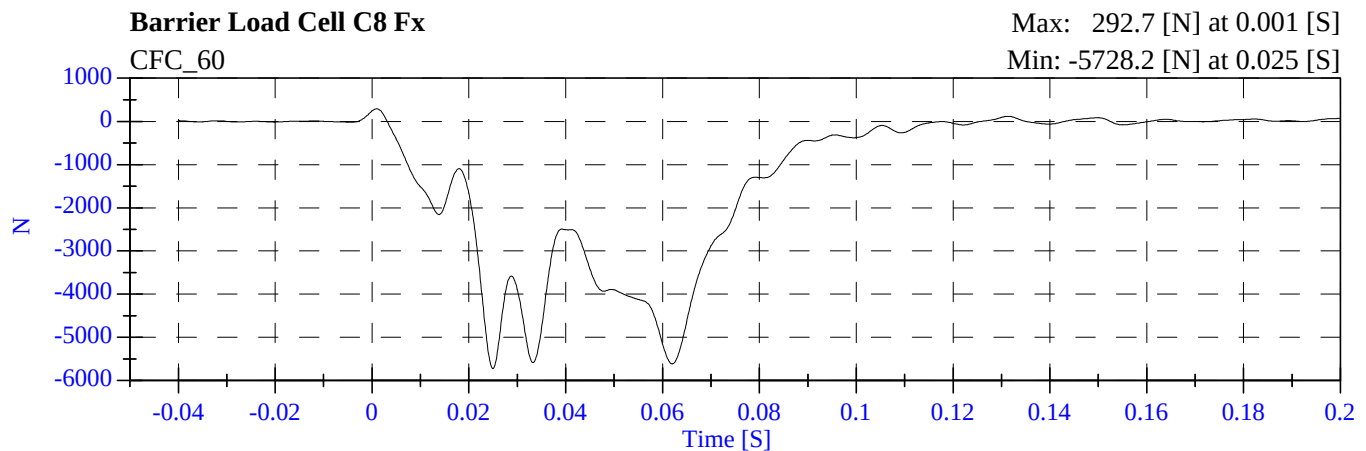
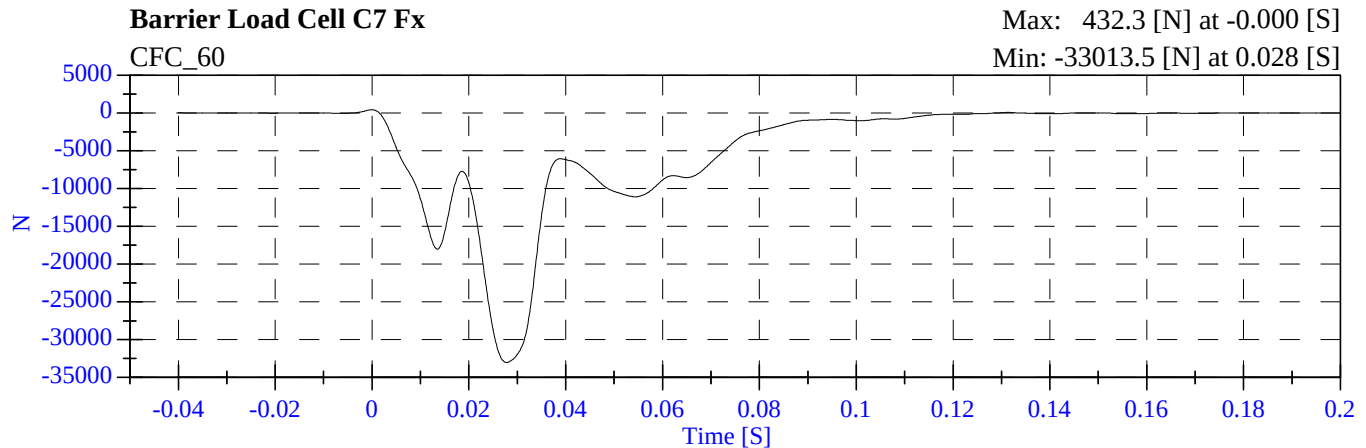
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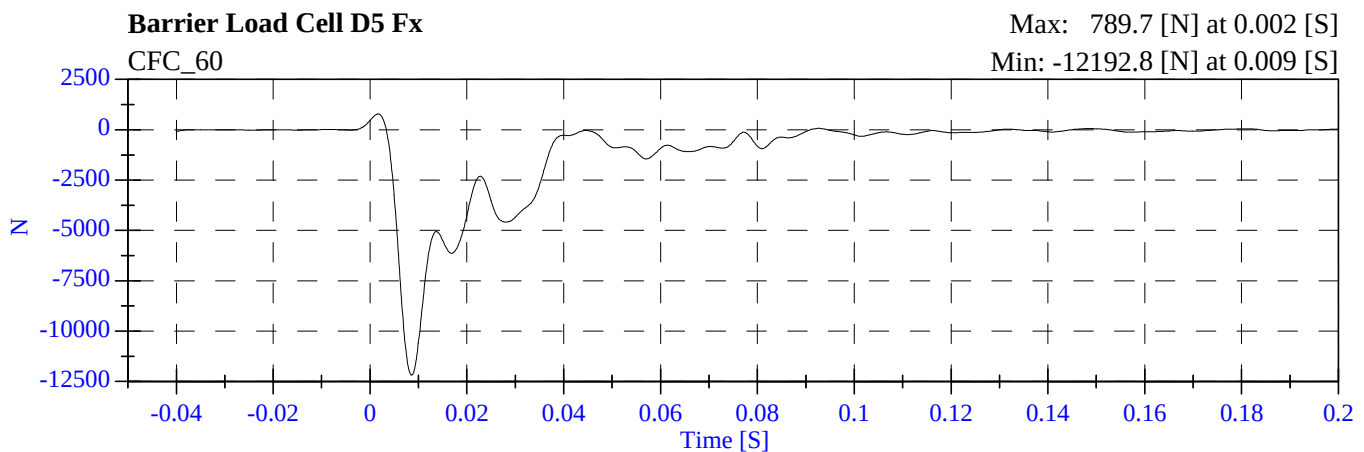
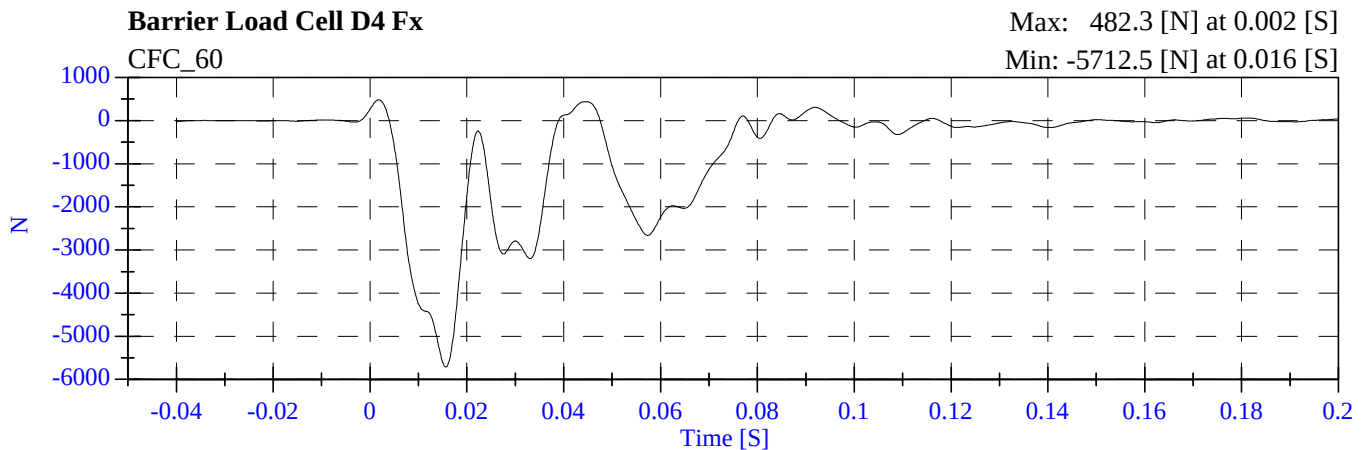
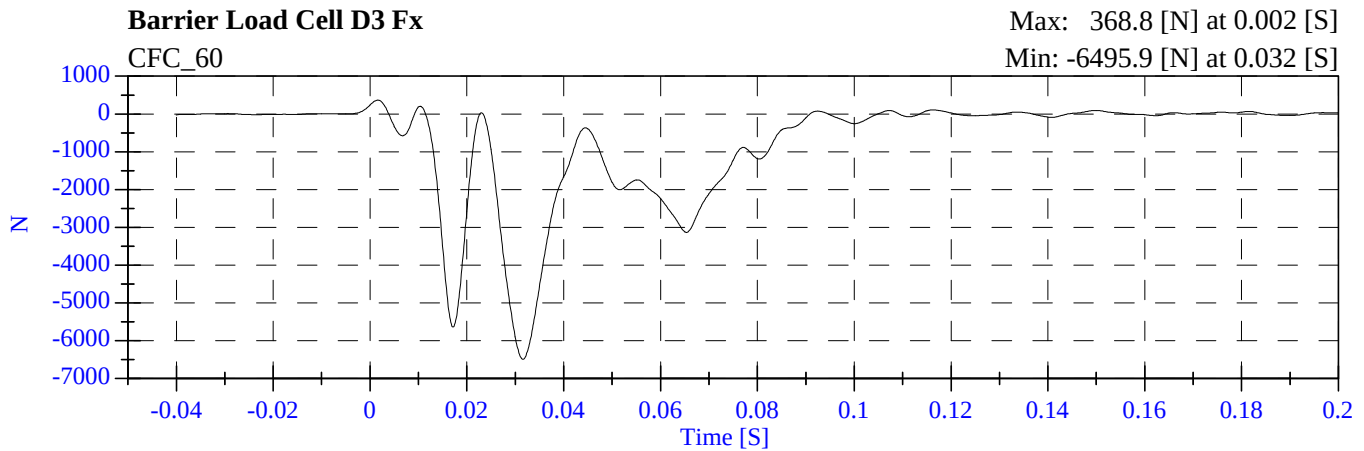
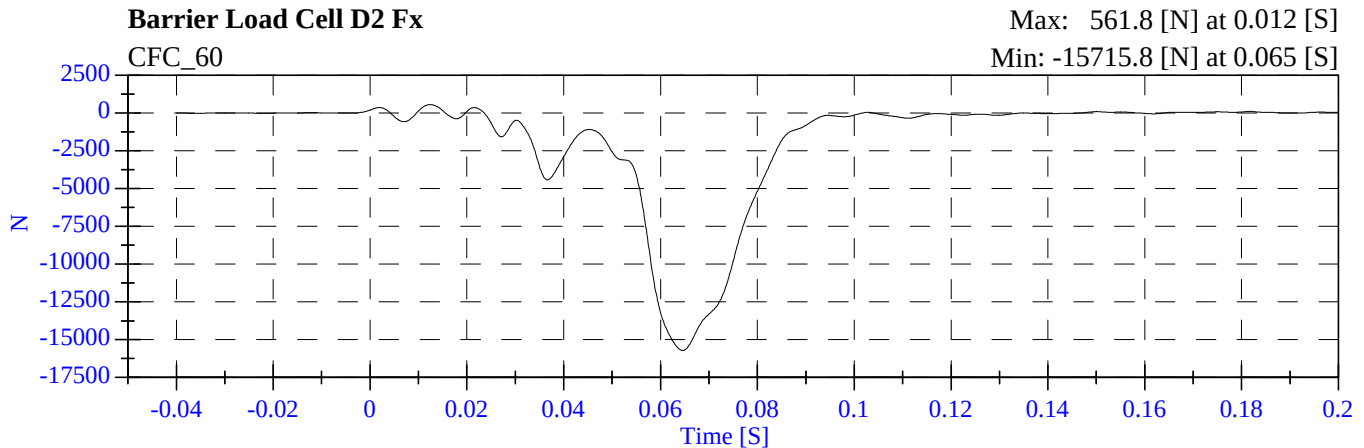


2005 NCAP Test 3 - 2005 Toyota Sienna M55104 - December 08, 2004

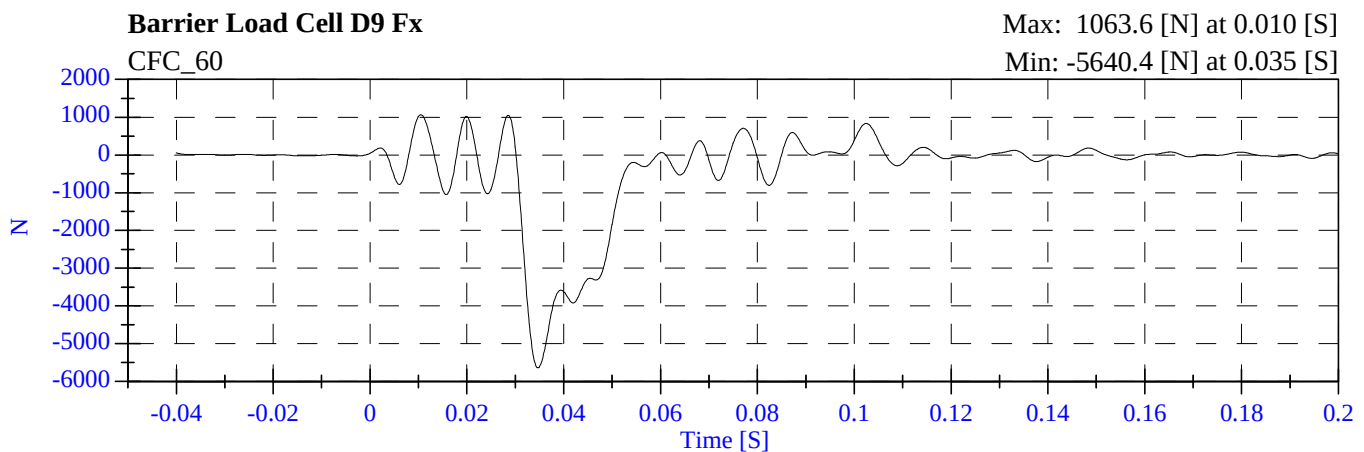
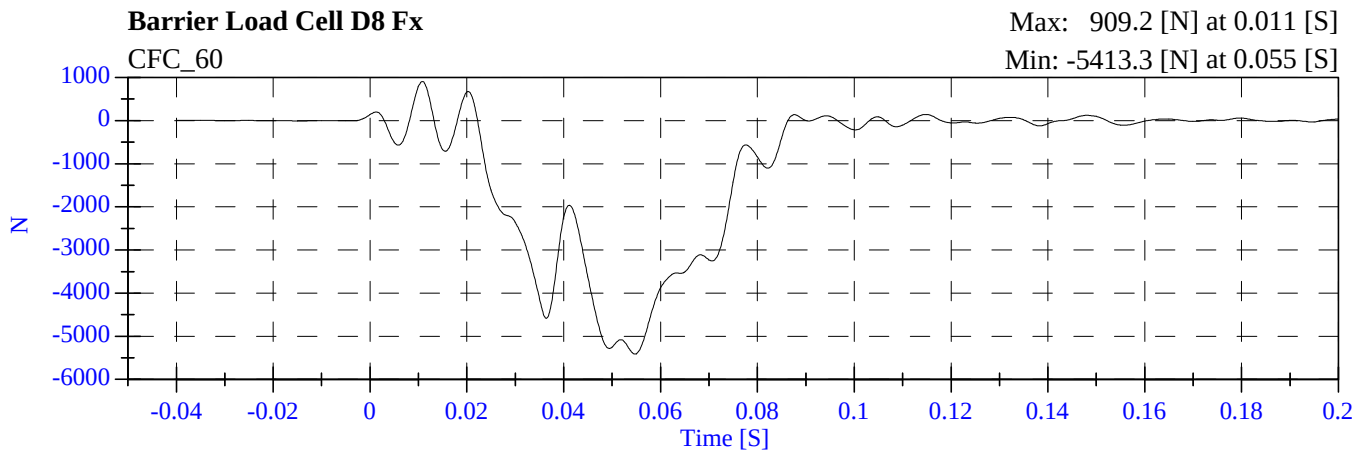
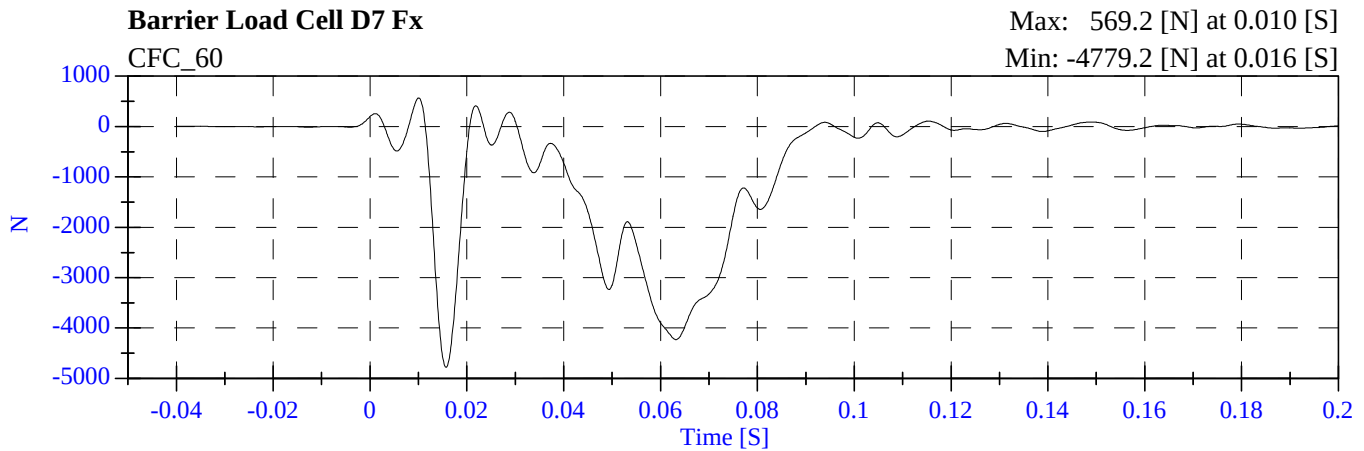
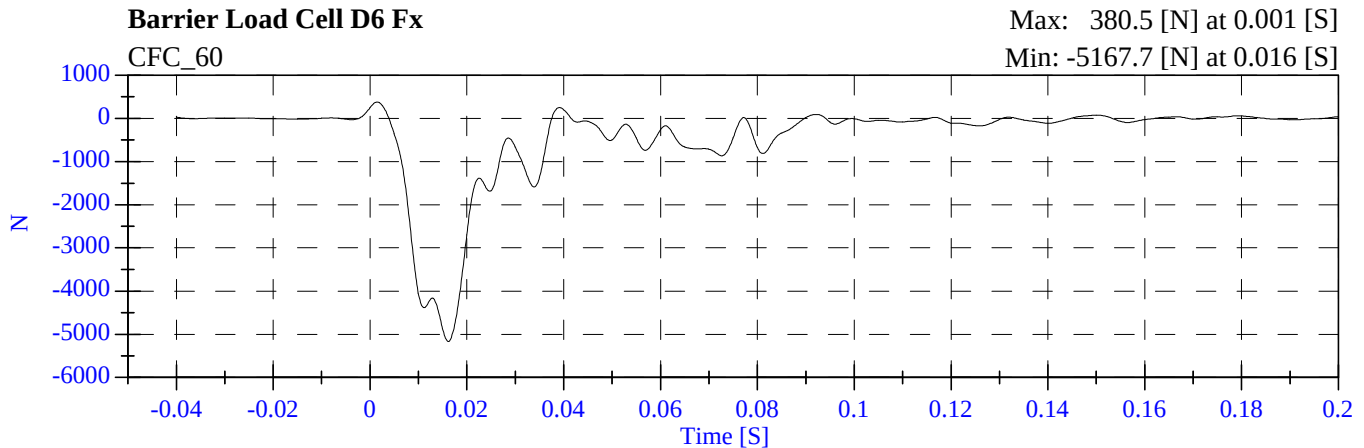


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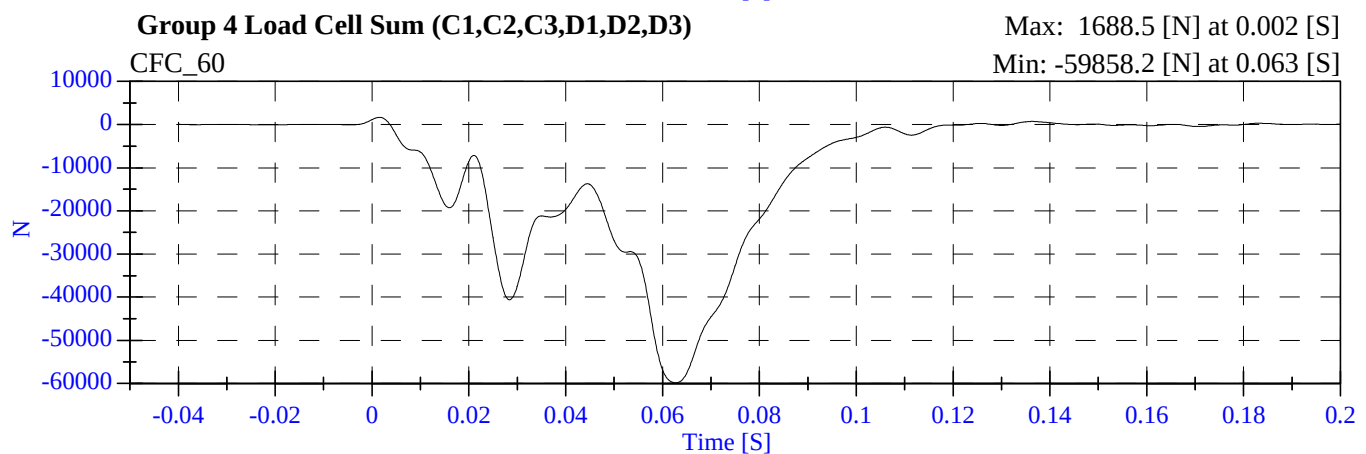
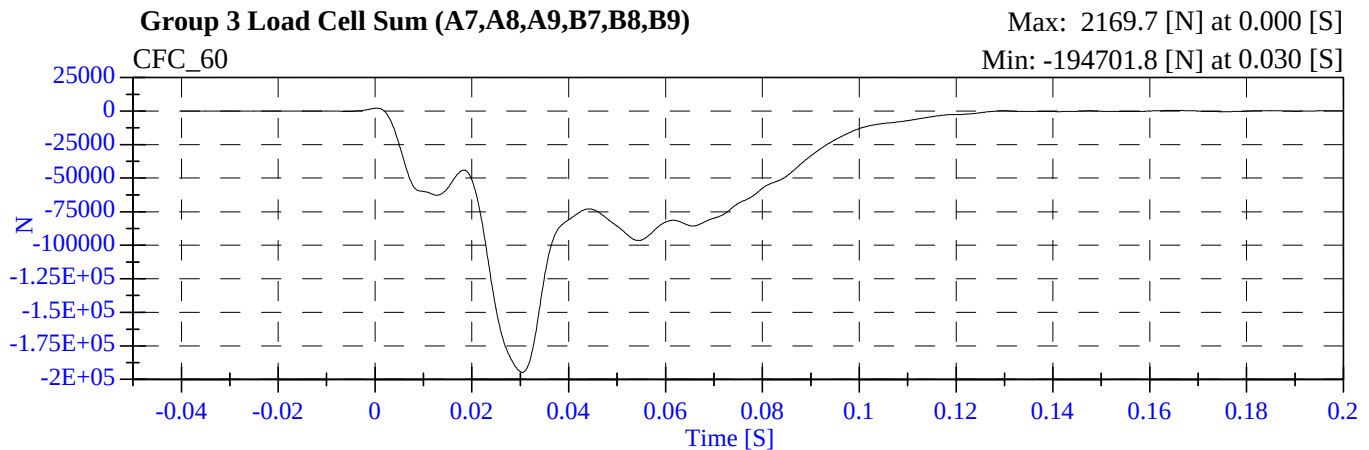
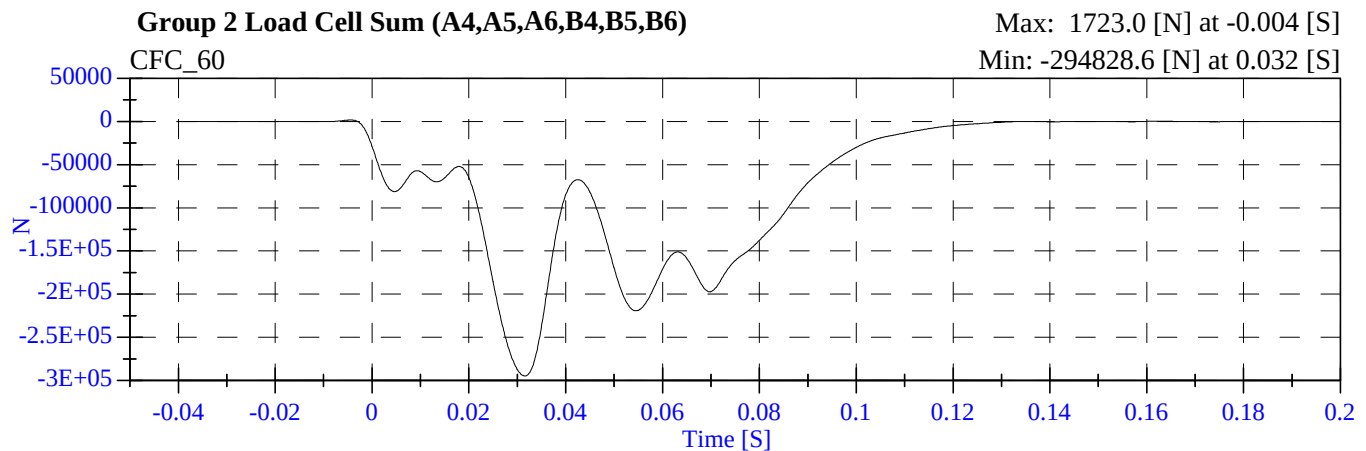
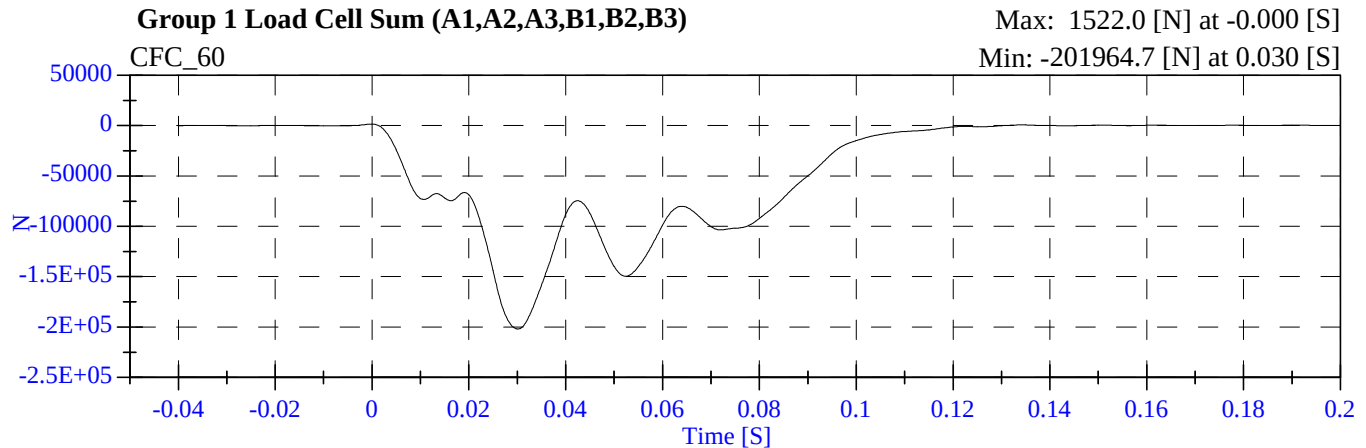
M55104 - December 08, 2004



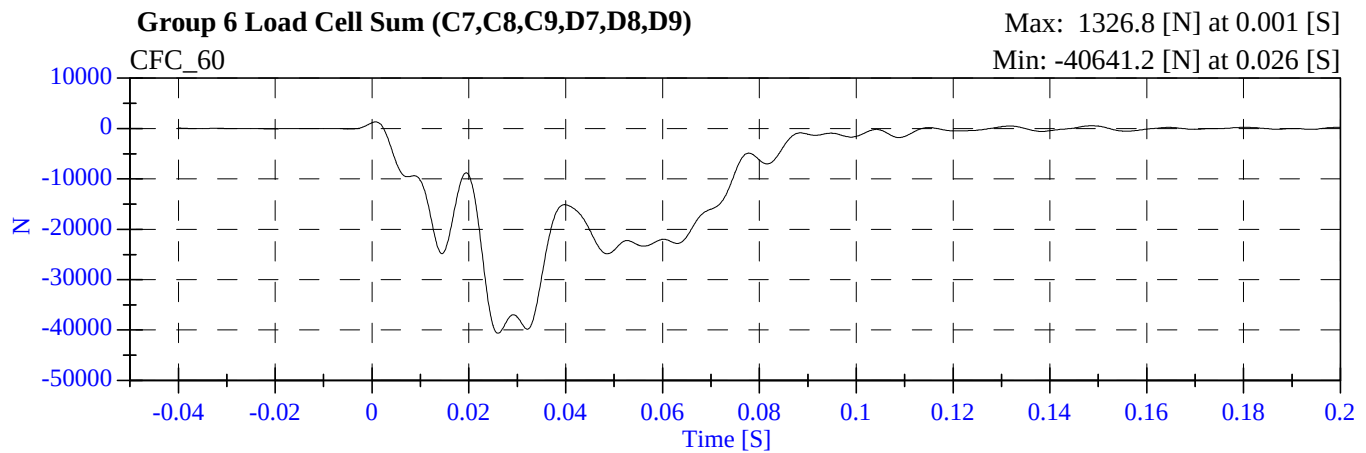
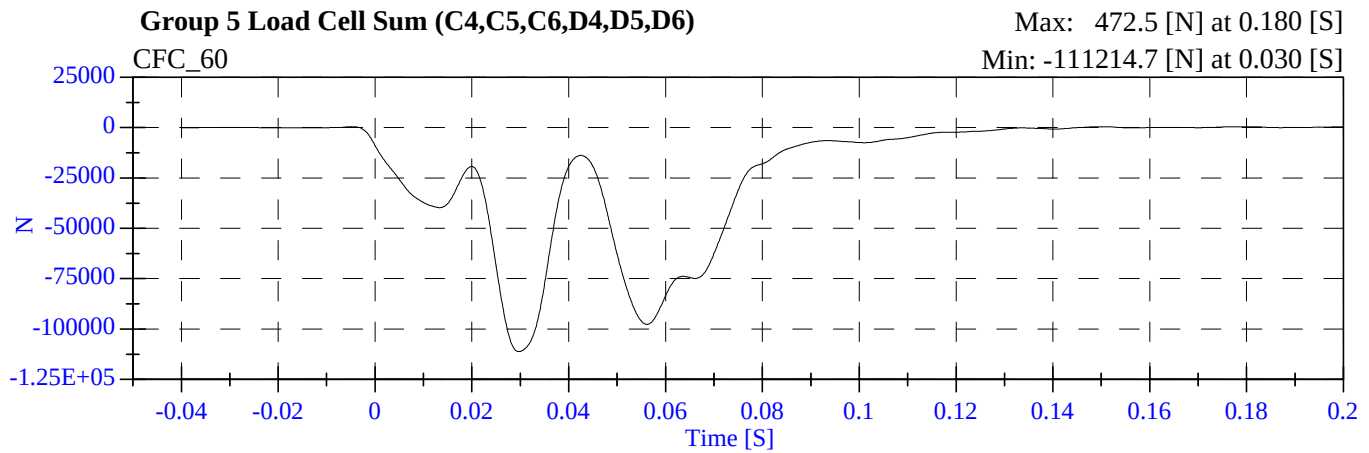
2005 NCAP Test 3 - 2005 Toyota Sienna M55104 - December 08, 2004



2005 NCAP Test 3 - 2005 Toyota Sienna M55104 - December 08, 2004

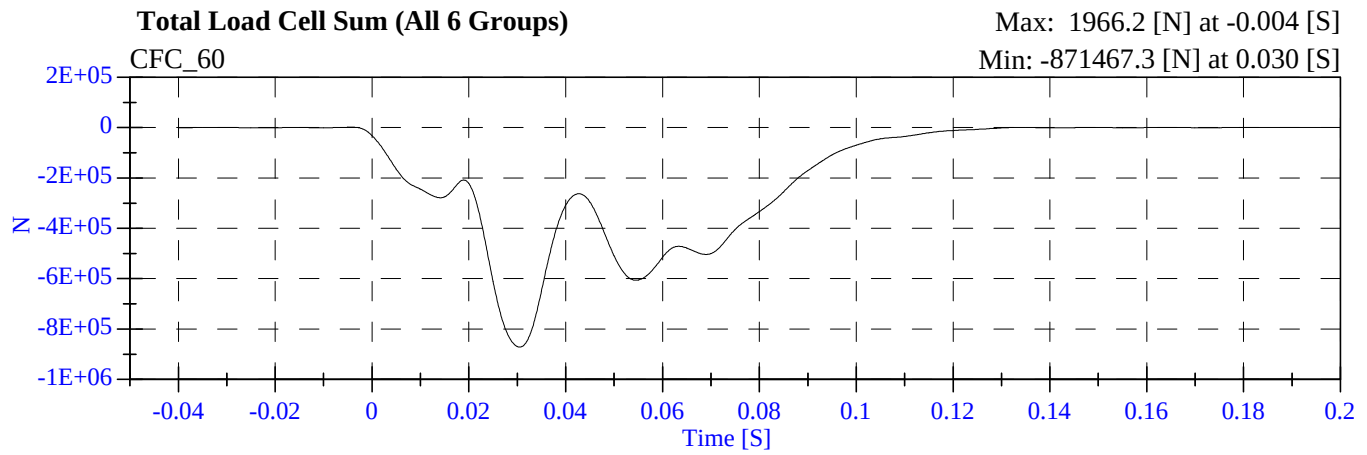


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2005 NCAP Test 3 - 2005 Toyota Sienna

M55104 - December 08, 2004



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:

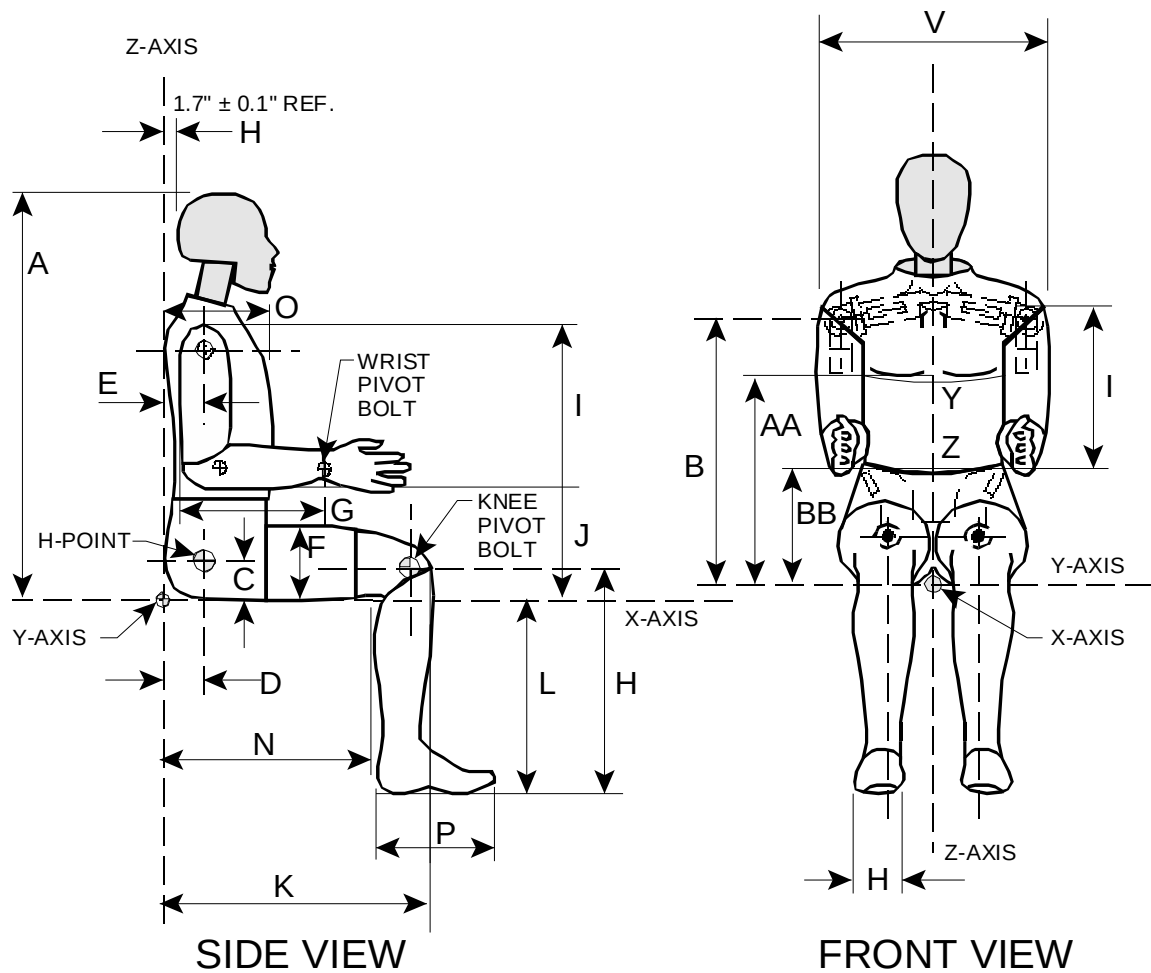
<u>Position No./Location</u>	<u>Serial No.</u>	<u>Completion Date</u>
#1/Driver	061	November 16, 2004
#2/Right Front Passenger	064	November 16, 2004

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 November 12, 2004
Workfile 061H 11-12-04

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	66-78 Deg F	72
Relative Humidity	10% - 70%	19.00
Peak Resultant Acceleration	225-275 G's	259.60
Peak Lateral Acceleration	15 G's Max	7.76
Is Acceleration Curve Unimodal?	YES	YES

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
NECK FLEXION TEST

Dummy Serial Number	061	
Sequential Test Number	7	
Date	11-15-2004	6 Axis Neck Transducer
Workfile	061 H-N7 11-15-04	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		69-72 Deg F	70.00
Relative Humidity		10% - 70%	35.00
Impact Velocity		22.60 - 23.40 Ft/s	23.10
Pendulum Deceleration	10 ms	22.50 - 27.50 G's	23.07
	20 ms	17.60 - 22.60 G's	22.58
	30 ms	12.50 - 18.50 G's	17.63
Max Pendulum G's Above 30 ms		29 G's Max	17.63
Deceleration - Time Curve Decay Time to 5 G's		34 - 42 ms	38.50
D Plane Rotation	Max	64 - 78 Deg	64.96
	Time	57 - 64 ms	57.00
Moment About Occipital Condyle	Max	65 - 80 Ft-Lbs	67.63
	Time	47 - 58 ms	48.60
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 ms	118.00
Positive Moment - Time Curve Decay Time to Zero		97 - 107 ms	97.00

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK EXTENSION TEST

Dummy Serial Number	061	
Sequential Test Number	3	
Date	11-15-2004	6 Axis Neck Transducer
Workfile	061ext H-N3 11-15-04	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		69-72 Deg F	70.00
Relative Humidity		10% - 70%	35.00
Impact Velocity		19.50 - 20.30 Ft/s	20.10
Pendulum Deceleration	10 ms	17.20 - 21.20 G's	17.24
	20 ms	14.00 - 19.00 G's	14.99
	30 ms	11.00 - 16.00 G's	12.51
Max Pendulum G's Above 30 ms		22 G's Max	12.51
Deceleration - Time Curve Decay Time to 5 G's		38 - 46 ms	45.70
D Plane Rotation	Max	81 - 106 Deg	82.58
	Time	72 - 82 ms	79.50
Moment About Occipital Condyle	Max	-59.0 - -39.0 Ft-Lbs	-44.81
	Time	65 - 79 ms	65.60
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 ms	169.70
Positive Moment - Time Curve Decay Time to Zero		120 - 148 ms	144.40

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
THORAX IMPACT TEST

Dummy Serial Number 061
Sequential Test Number 1
Date 11-16-2004
Workfile 061 Torso 11-16-04

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	69-72 Deg F	70.00
Relative Humidity	10% - 70%	35.00
Pendulum Velocity	21.6 - 22.4 Ft/s	22.35
Maximum Deflection	2.50 - 2.86 in	2.52
Maximum Resistive Force	1160 - 1325 Lbs	1245.63
Internal Hysteresis	69 - 85 %	73.65

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
KNEE IMPACT TEST

Dummy Serial Number 061
Sequential Test Number 1
Date 11/15/2004
Workfile 061LF 11-15-04/ 061RF 11-15-04

TEST PARAMETER	SPECIFICATION	TEST RESULTS
LEFT KNEE		
Temperature	66 - 78 Deg F	70.00
Relative Humidity	10% - 70%	35.00
Probe Velocity	6.8 - 7.0 Ft/s	7.00
Peak Knee Impact Force	1060 - 1300 Lbs	1296.37
RIGHT KNEE		
Temperature	66 - 78 Deg F	70.00
Relative Humidity	10% - 70%	35.00
Probe Velocity	6.8 - 7.0 Ft/s	7.00
Peak Knee Impact Force	1060 - 1300 Lbs	1258.68

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
EXTERNAL DIMENSIONS

Dummy Serial Number 061
Sequential Test Number 1
Date November 16, 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 2
Date 11-13-2004
Workfile 064 H2 11-13-04

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	66-78 Deg F	70.0
Relative Humidity	10% - 70%	35.00
Peak Resultant Acceleration	225-275 G's	255.41
Peak Lateral Acceleration	15 G's Max	10.03
Is Acceleration Curve Unimodal?	YES	YES

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
NECK FLEXION TEST

Dummy Serial Number	064	
Sequential Test Number	3	
Date	11-16-2004	6 Axis Neck Transducer
Workfile	064 Flex H-N3 11-16-04	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		69-72 Deg F	70.00
Relative Humidity		10% - 70%	35.00
Impact Velocity		22.60 - 23.40 Ft/s	23.10
Pendulum Deceleration	10 ms	22.50 - 27.50 G's	22.70
	20 ms	17.60 - 22.60 G's	19.73
	30 ms	12.50 - 18.50 G's	15.95
Max Pendulum G's Above 30 ms		29 G's Max	21.73
Deceleration - Time Curve Decay Time to 5 G's		34 - 42 ms	42.0
D Plane Rotation	Max	64 - 78 Deg	66.47
	Time	57 - 64 ms	62.00
Moment About Occipital Condyle	Max	65 - 80 Ft-Lbs	67.52
	Time	47 - 58 ms	54.70
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 ms	125.00
Positive Moment - Time Curve Decay Time to Zero		97 - 107 ms	97.60

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
NECK EXTENSION TEST

Dummy Serial Number	064	
Sequential Test Number	2	
Date	11-15-2004	6 Axis Neck Transducer
Workfile	064 ext H-N2 11-15-04	

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature		69-72 Deg F	70.00
Relative Humidity		10% - 70%	35.00
Impact Velocity		19.50 - 20.30 Ft/s	20.10
Pendulum Deceleration	10 ms	17.20 - 21.20 G's	19.98
	20 ms	14.00 - 19.00 G's	18.86
	30 ms	11.00 - 16.00 G's	15.91
Max Pendulum G's Above 30 ms		22 G's Max	15.91
Deceleration - Time Curve Decay Time to 5 G's		38 - 46 ms	38.10
D Plane Rotation	Max	81 - 106 Deg	94.41
	Time	72 - 82 ms	76.10
Moment About Occipital Condyle	Max	-59.0 - -39.0 Ft-Lbs	-50.65
	Time	65 - 79 ms	70.50
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 ms	162.20
Positive Moment - Time Curve Decay Time to Zero		120 - 148 ms	142.20

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
THORAX IMPACT TEST

Dummy Serial Number 064
Sequential Test Number 1
Date 11-16-2004
Workfile 064 Torso 11-16-04

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	69-72 Deg F	70.00
Relative Humidity	10% - 70%	35.00
Pendulum Velocity	21.6 - 22.4 Ft/s	22.40
Maximum Deflection	2.50 - 2.86 in	2.54
Maximum Resistive Force	1160 - 1325 Lbs	1233.84
Internal Hysteresis	69 - 85 %	75.35

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
KNEE IMPACT TEST

Dummy Serial Number 064
Sequential Test Number 1
Date 11/15/2004
Workfile 064LF 11-15-04/ 064RF 11-15-04

TEST PARAMETER	SPECIFICATION	TEST RESULTS
LEFT KNEE		
Temperature	66 - 78 Deg F	70.00
Relative Humidity	10% - 70%	35.00
Probe Velocity	6.8 - 7.0 Ft/s	7.00
Peak Knee Impact Force	1060 - 1300 Lbs	1200.16
RIGHT KNEE		
Temperature	66 - 78 Deg F	70.00
Relative Humidity	10% - 70%	35.00
Probe Velocity	6.8 - 7.0 Ft/s	7.00
Peak Knee Impact Force	1060 - 1300 Lbs	1293.28

Remarks:

Laboratory Technician:

B. Swiecicki

PART 572E
EXTERNAL DIMENSIONS

Dummy Serial Number 064
Sequential Test Number 1
Date November 16, 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	12-Jul-04	10-Jan-05
	X Arm Z	ENDEVCO	AC-P32455	12-Jul-04	10-Jan-05
	Y Arm X	ENDEVCO	AC-P32227	12-Jul-04	10-Jan-05
	Y Arm Z	ENDEVCO	AC-P32139	12-Jul-04	10-Jan-05
	Z Arm X	ENDEVCO	AC-P32197	12-Jul-04	10-Jan-05
	Z Arm Y	ENDEVCO	AC-P32464	12-Jul-04	10-Jan-05
Head	X	ENDEVCO	AC-P32276	12-Jul-04	10-Jan-05
	Y	ENDEVCO	AC-P32146	12-Jul-04	10-Jan-05
	Z	ENDEVCO	AC-P32217	12-Jul-04	10-Jan-05
Head	X (R)	ENDEVCO	AC-P32289	12-Jul-04	10-Jan-05
	Y (R)	ENDEVCO	AC-P32225	12-Jul-04	10-Jan-05
	Z (R)	ENDEVCO	AC-P32453	12-Jul-04	10-Jan-05
Neck Load Cell	X	DENTON	LC-1633FX	5-Aug-04	3-Feb-05
	Y	DENTON	LC-1633FY	5-Aug-04	3-Feb-05
	Z	DENTON	LC-1633FZ	5-Aug-04	3-Feb-05
Neck Moment	X	DENTON	LC-1633MX	5-Aug-04	3-Feb-05
	Y	DENTON	LC-1633MY	5-Aug-04	3-Feb-05
	Z	DENTON	LC-1633MZ	5-Aug-04	3-Feb-05
Chest	X	ENDEVCO	AC-P16863	19-Jul-04	17-Jan-05
	Y	ENDEVCO	AC-P17283	19-Jul-04	17-Jan-05
	Z	ENDEVCO	AC-P23640	14-Jul-04	12-Jan-05
Chest	X (R)	ENDEVCO	AC-P17235	14-Jul-04	12-Jan-05
	Y (R)	ENDEVCO	AC-P17285	19-Jul-04	17-Jan-05
	Z (R)	ENDEVCO	AC-P14393	14-Jul-04	12-Jan-05
Chest Deflection	X	SERVO	DS-061	11-Nov-04	12-May-05
Pelvic	X	ENDEVCO	AC-P23939	8-Sep-04	9-Mar-05
	Y	ENDEVCO	AC-P23999	8-Sep-04	9-Mar-05
	Z	ENDEVCO	AC-P23993	8-Sep-04	9-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	5-Nov-04	6-May-05
Right Femur Load Cell	Fz	GSE	LC-657	5-Nov-04	6-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-200MX	14-Sep-04	15-Mar-05
	My	DENTON	LC-200MY	14-Sep-04	15-Mar-05
Right Lower Tibia	Fz	DENTON	LC-129FZ	10-Aug-04	8-Feb-05
	Mx	DENTON	LC-129MX	10-Aug-04	8-Feb-05
	My	DENTON	LC-129MY	10-Aug-04	8-Feb-05
Left Foot Rear	X	ENDEVCO	AC-AJ8C0	8-Nov-04	9-May-05
	Z	ENDEVCO	AC-J19868	8-Nov-04	9-May-05
Left Foot Front	Z	ENDEVCO	AC-J34378	8-Nov-04	9-May-05
Right Foot Rear	X	ENTRAN	AC-01G18-F15	8-Nov-04	9-May-05
	Z	ENTRAN	AC-01G18-F14	8-Nov-04	9-May-05
Right Foot Front	Z	ENTRAN	AC-00L13-F04	8-Nov-04	9-May-05
Lap Belt Load Cell		LEBOW	LC-712	1-Nov-04	2-May-05
Shoulder Belt Load Cell		FIRST TECHNOLOGY	LC-170	1-Nov-04	2-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	26-Jul-04	24-Jan-05
	X Arm Z	ENDEVCO	AC-P32218	4-Nov-04	5-May-05
	Y Arm X	ENDEVCO	AC-P14965	26-Jul-04	24-Jan-05
	Y Arm Z	ENDEVCO	AC-P18948	20-Jul-04	18-Jan-05
	Z Arm X	ENDEVCO	AC-P18785	7-Sep-04	8-Mar-05
	Z Arm Y	ENDEVCO	AC-P23926	20-Jul-04	18-Jan-05
Head	X	ENDEVCO	AC-P18524	19-Aug-04	17-Feb-05
	Y	ENDEVCO	AC-P18518	19-Aug-04	17-Feb-05
	Z	ENDEVCO	AC-P18533	19-Aug-04	17-Feb-05
Head	X (R)	ENDEVCO	AC-P18514	19-Aug-04	17-Feb-05
	Y (R)	ENDEVCO	AC-P18688	19-Aug-04	17-Feb-05
	Z (R)	ENDEVCO	AC-P18531	19-Aug-04	17-Feb-05
Neck Load Cell	X	DENTON	LC-1634FX	5-Aug-04	3-Feb-05
	Y	DENTON	LC-1634FY	5-Aug-04	3-Feb-05
	Z	DENTON	LC-1634FZ	5-Aug-04	3-Feb-05
Neck Moment	X	DENTON	LC-1634MX	5-Aug-04	3-Feb-05
	Y	DENTON	LC-1634MY	5-Aug-04	3-Feb-05
	Z	DENTON	LC-1634MZ	5-Aug-04	3-Feb-05
Chest	X	ENDEVCO	AC-P17141	19-Jul-04	17-Jan-05
	Y	ENDEVCO	AC-P16832	19-Jul-04	17-Jan-05
	Z	ENDEVCO	AC-P17152	19-Jul-04	17-Jan-05
Chest	X (R)	ENDEVCO	AC-P16286	19-Jul-04	17-Jan-05
	Y (R)	ENDEVCO	AC-P17242	19-Jul-04	17-Jan-05
	Z (R)	ENDEVCO	AC-P16591	7-Oct-04	7-Apr-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	5-Nov-04	6-May-05
Right Femur Load Cell	Fz	GSE	LC-654	5-Nov-04	6-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	8-Feb-05
	My	DENTON	LC-265MY	10-Aug-04	8-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	ENTRAN	AC-01J02-F09	8-Nov-04	9-May-05
	Z	ENTRAN	AC-01G18-F03	8-Nov-04	9-May-05
Left Foot Front	Z	ENTRAN	AC-01G18-F05	8-Nov-04	9-May-05
Right Foot Rear	X	ENDEVCO	AC-J36176	8-Nov-04	9-May-05
	Z	ENDEVCO	AC-J18662	8-Nov-04	9-May-05
Right Foot Front	Z	ENDEVCO	AC-J18059	8-Nov-04	9-May-05
Lap Belt Load Cell		LEBOW	LC-711	1-Nov-04	2-May-05
Shoulder Belt Load Cell		FIRST TECHNOLOGY	LC-175	1-Nov-04	2-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	9-Jul-04	7-Jan-05
Right Rear Seat Crossmember X	GS SENSORS	AC-9440-017	9-Jul-04	7-Jan-05
Top of Engine	ICS	AC-FGP36	20-Aug-04	18-Feb-05
Bottom of Engine	ICS	AC-FGP45	24-Aug-04	22-Feb-05
Right Disc Brake Caliper	ICS	AC-FGP38	20-Aug-04	18-Feb-05
Instrument Panel	GS SENSORS	AC-9444-038	9-Jul-04	7-Jan-05
Left Disc Brake Caliper	GS SENSORS	AC-9450-039	9-Jul-04	7-Jan-05
Left Seat Rear Crossmember Z	GS SENSORS	AC-9440-023	9-Jul-04	7-Jan-05
Right Seat Rear Crossmember Z	GS SENSORS	AC-9440-032	9-Jul-04	7-Jan-05

REPORT NUMBER: CAL-05-03

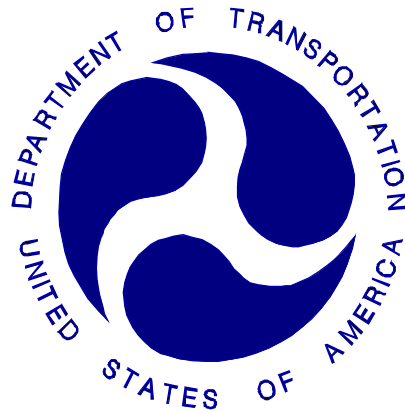
NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST

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

NHTSA NUMBER: M55104

GENERAL DYNAMICS REPORT NUMBER: 8642-NCAP-53

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



December 8, 2004

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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FINAL REPORT ACCEPTANCE BY:

Accepted By:

Acceptance Date:

TECHNICAL REPORT STANDARD TITLE PAGE

1. Report No. CAL-05-03	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.: M55104		5. Report Date December 8, 2004	
		6. Performing Organization Code CAL	
7. Author(s) Lawrence Q. Valvo, Project Engineer David J. Travale, Program Manager		8. Performing Organization Report No. 8642-NCAP-53	
9. Performing Organization Name and Address General Dynamics Transportation Sciences Center P.O. Box 400 Buffalo, New York 14225		10. Work Unit No.	
		11. Contract or Grant No. DTNH22-01-D-32005	
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Office of Crashworthiness Standards Mail Code: NVS-111 400 Seventh SW, Room 5313 Washington, D.C. 20590		13. Type of Report and Period Covered Final Report, December 2004	
		14. Sponsoring Agency Code NVS-111	
15. Supplementary Notes			
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 CRS was placed in Position 4 (P4). This test was conducted at the General Dynamics Crash Test Facility in Buffalo, New York, on December 8, 2004.			
ATD Position		HIC 15	HIC 36
P3 (Right Rear) (040)		432.9	657.7
P4 (Left Rear) (009)		458.6	871.9
			Clip (3 ms)
			37.7
			46.7
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 M55104

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 56.33 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 432.9, maximum chest deceleration over 3 ms was 37.7 g's. The left rear child dummy's HIC (15 ms) was 458.6, maximum chest deceleration over 3 ms was 46.7 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	Closed, Latched and Operable without tools

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 top and back of the head to the child restraint and vehicle head restraint	The chin to the chest and the back of the head to the child restraint
Upper Torso Contact:	The chin to the chest	The chin to the chest
Lower Torso Contact:	None	None
Left Knee Contact:	None	The left foot to the outboard half of the P1 seatback
Right Knee Contact:	None	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. M55104

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Delivered Weight of Vehicle with Maximum Fluids = 1888.5 kg (A)

AS TESTED WEIGHT OF VEHICLE

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

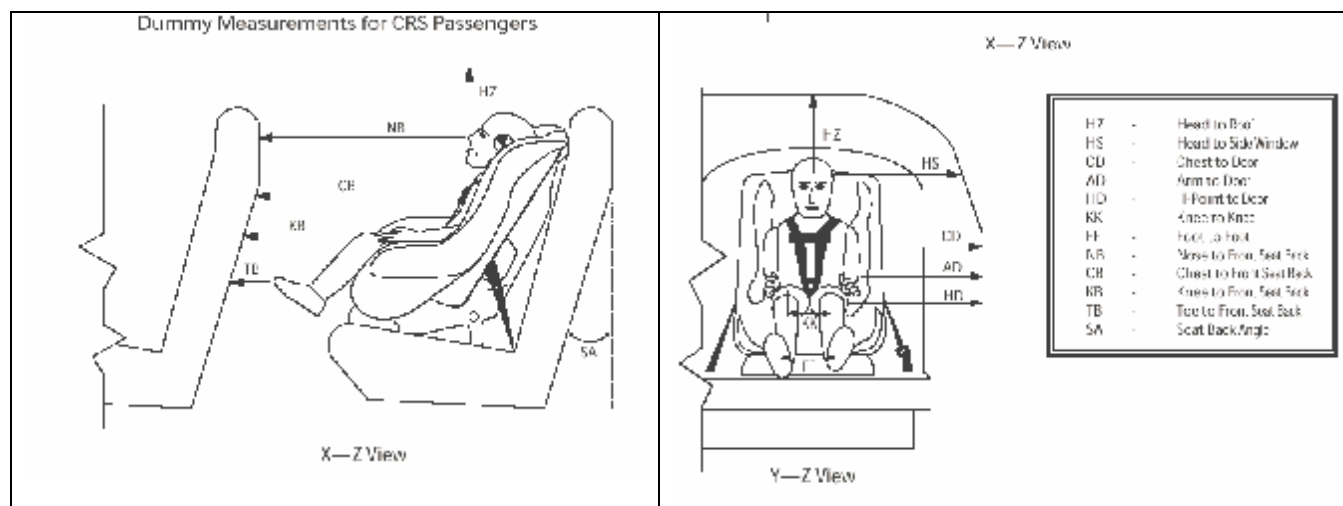
Left Front	=	<u>610.5</u>	kg	Left Rear	=	<u>498.5</u>	kg
Right Front	=	<u>564.5</u>	kg	Right Rear	=	<u>491.5</u>	kg
TOTAL FRONT	=	<u>1175.0</u>	kg	TOTAL REAR	=	<u>990.0</u>	kg
TOTAL TEST WEIGHT =		<u>2165.0</u>	kg				

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. M55104



Measurement	(mm)	(mm)
	P3 CRS (040)	P4 CRS (009)
SA	19.2 °	19.2 °
HS	442	370
CD	416	435
AD	288	265
HD	337	331
HZ	420	227
NB	694	751
CB	528	628
KB	108	123
FF	99	140
KB – LEFT	500	450
KB – RIGHT	500	446
TB – LEFT	206	173
TB – RIGHT	204	173
Top Tether Anchor to CRS		
Angle	N/A	N/A
Length	670†	N/A
X	-65	N/A
Y	0	N/A
Z	-540	N/A

All dimensions in mm (unless noted)

P3 – Right Rear Passenger (CRS #1)

P4 – Left Rear Passenger (CRS #2)

† The vehicle tether anchor is located at the bottom of the P3 seat back. The tether was routed along the top of the seatback (beneath the head restraint) and down the back of the seatback to the anchor. The total length of the tether is 670 mm. The direct distance between the CRS tether attachment and the vehicle tether anchor is 544 mm.

DATA SHEET 4

CHILD DUMMY INJURY CRITERIA VALUES

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

NHTSA No. M55104

DESCRIPTION	Unit	MAXIMUM VALUE							
		Position #3				Position #4			
		Pos	msec	Neg	msec	Pos	msec	Neg	msec
Head X	g	81.2	187.2	-30.0	115.1	0.6	30.3	-27.4	125.8
Head Y	g	8.9	122.7	-7.2	186.8	2.2	163.1	-7.8	109.5
Head Z	g	67.0	91.2	-3.9	41.1	75.4	90.0	-1.6	29.2
Head Resultant	g	86.6	187.4	-	-	78.5	90.0	-	-
Upper Neck Fx	N	47.4	178.7	-429.1	115.6	11.9	29.8	-855.7	124.4
Upper Neck Fy	N	112.8	191.5	-27.7	123.8	112.5	89.3	-278.6	116.2
Upper Neck Fz	N	2041.5	91.2	-64.2	41.1	2479.2	90.3	-38.1	62.6
Upper Neck F Resultant	N	2062.2	91.2	-	-	2579.2	90.3	-	-
Upper Neck Mx	N-m	3.3	198.7	-1.9	156.4	8.9	109.1	-13.0	89.3
Upper Neck My	N-m	6.6	154.0	-12.9	194.0	4.4	141.5	-34.7	75.3
Upper Neck Mz	N-m	2.8	198.5	-1.7	126.3	0.1	-37.1	-8.9	90.1
Upper Neck M Resultant	N-m	13.1	194.2	-	-	35.5	75.9	-	-
Left Clavicle Fx	N	-	-	-	-	35.7	199.3	-3370.5	86.8
Left Clavicle Fz	N	-	-	-	-	1116.7	83.7	-526.4	99.1
Right Clavicle Fx	N	-	-	-	-	145.7	92.3	-148.4	119.8
Right Clavicle Fz	N	-	-	-	-	116.0	91.4	-131.2	94.7
Chest X	g	6.4	177.8	-32.4	95.0	1.8	195.3	-44.7	73.8
Chest Y	g	6.7	88.8	-2.3	116.0	5.9	198.9	-17.3	66.0
Chest Z	g	25.0	92.2	-28.2	68.5	11.8	87.7	-14.0	63.9
Chest Resultant	g	38.6	95.2	-	-	47.8	74.0	-	-
Chest Displacement	g	0.0	21.3	-21.4	115.0	0.0	-32.4	-48.5	108.2
Lumbar Fx	N	-	-	-	-	839.4	117.8	-577.4	62.4
Lumbar Fy	N	-	-	-	-	1.5	3.6	-1170.8	104.5
Lumbar Fz	N	-	-	-	-	1092.3	125.0	-1607.2	63.7
Lumbar F Resultant	N	-	-	-	-	1834.6	63.6	-	-
Lumbar Mx	Nm	-	-	-	-	18.3	170.2	-129.0	94.7
Lumbar My	Nm	-	-	-	-	94.0	135.2	-5.7	68.8
Lumbar Mz	Nm	-	-	-	-	54.9	94.7	-0.3	27.1
Lumbar M Resultant	Nm	-	-	-	-	144.4	94.8	-	-

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. M55104

		MAXIMUM VALUE							
		Position #3				Position #4			
DESCRIPTION	Unit	Pos	msec	Neg	msec	Pos	msec	Neg	msec
Pelvic X	g	6.5	134.5	-40.3	73.3	6.9	142.4	-57.0	72.0
Pelvic Y	g	6.7	72.9	-3.1	86.1	13.0	104.8	-12.4	61.2
Pelvic Z	g	21.0	190.2	-33.7	75.8	3.2	114.4	-19.1	75.6
Pelvic Resultant	g	51.7	75.7	-	-	59.7	69.8	-	-
Left Lower ASIS Fx	N	-	-	-	-	0.6	13.7	-354.2	70.3
Left Upper ASIS Fx	N	-	-	-	-	78.5	125.3	-80.5	68.1
Right Lower ASIS Fx	N	-	-	-	-	0.6	14.8	-385.2	115.4
Right Upper ASIS Fx	N	-	-	-	-	219.9	115.4	-119.0	163.2
Left Femur Force	N	-	-	-	-	1728.5	68.6	-116.5	141.2
Right Femur Force	N	-	-	-	-	1835.1	68.8	-154.8	143.1
Latch Belt Load	N	3589.8	81.1	-98.7	145.5	-	-	-	-
Tether Belt Load	N	1321.3	108.4	-57.9	198.7	-	-	-	-
Lap Belt Load	N	-	-	-	-	5318.6	71.6	-14.2	149.7
Shoulder Belt Load	N	-	-	-	-	6042.6	78.5	-16.9	164.5

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. M55104

	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	432.9	85.4	100.4	60.8	657.7	79.0	115.0	50.7
Position #4 - Left	458.6	81.7	96.7	62.3	871.9	75.1	111.1	56.7

	CLIP SUMMARY*			
	CLIP (g's)	t ₁ (msec)	t ₂ (msec)	CSI
Position #3 - Right	37.7	93.6	96.6	417.3
Position #4 - Left	46.7	72.4	75.4	401.2

* 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	-116.5	141.2	-154.8	143.1

DATA SHEET NO. 5

CRS PERFORMANCE DATA

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

NHTSA No. M55104

		MAXIMUM VALUE			
DESCRIPTION	Unit	Positive	Time (ms)	Negative	Time (ms)
P3 CRS X	g	8.3	183.0	-46.0	57.1
P3 CRS Y	g	3.2	178.7	-6.9	195.5
P3 CRS Z	g	23.7	194.0	-22.1	187.2
P3 CRS Resultant	g	46.5	57.1	-	-

DATA SHEET NO. 5

CRS PERFORMANCE DATA (CONTINUED)

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

NHTSA No. M55104

POSITION #3 CRS POST-TEST INSPECTION (Serial No. 3672098 P1 – 22JAN04)

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. JJ0917041915525 - 091704)

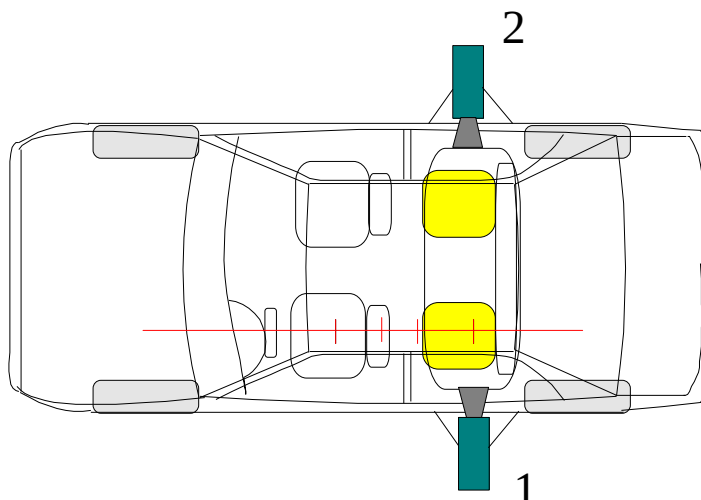
LOCATION	DAMAGE	REMARKS
Upper Tether Strap	NA	NA
Upper Tether Buckle	NA	NA
Upper Tether Hook	NA	NA
Vehicle Upper Tether Anchor	NA	NA
Lower Anchor Strap	NA	NA
Lower Anchor Buckle	NA	NA
Lower Anchor Hooks	NA	NA
Vehicle Lower CRS Anchors	NA	NA
Five Point Harness Connections	NA	NA
Cracks on CRS	No	None
Fabric 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. M55104



Camera No.	View	Coordinates (millimeters)			Angle (deg.)	Lens (mm)	Film Speed (fps)
		X*	Y*	Z*			
1	Left side CRS lateral view	3135	3150	2300	-24.2	28	500
2	Right side CRS lateral view	3115	2730	2300	-22.2	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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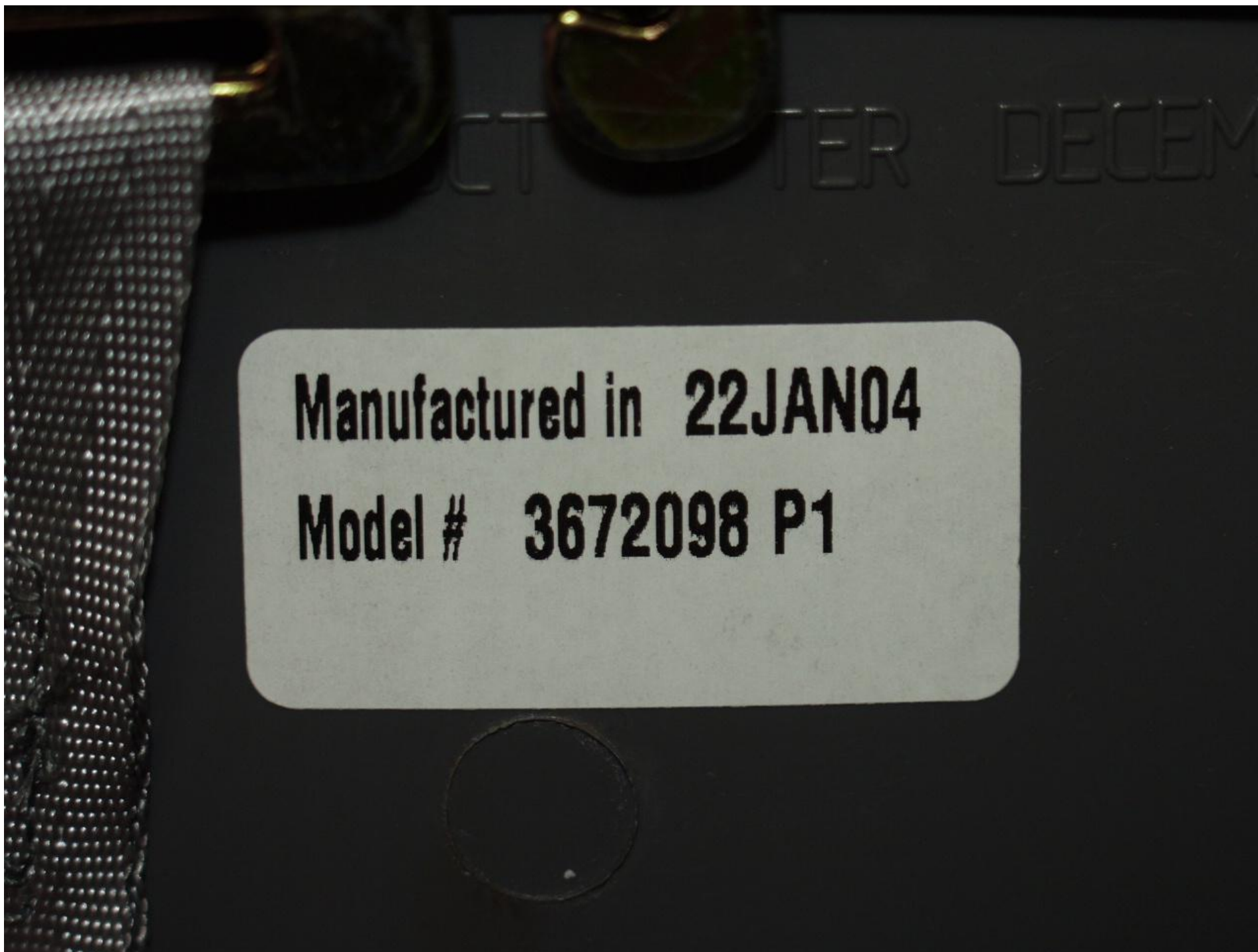


Figure 3-1 CLOSE-UP VIEW OF POSITION 3 CRS LABEL



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

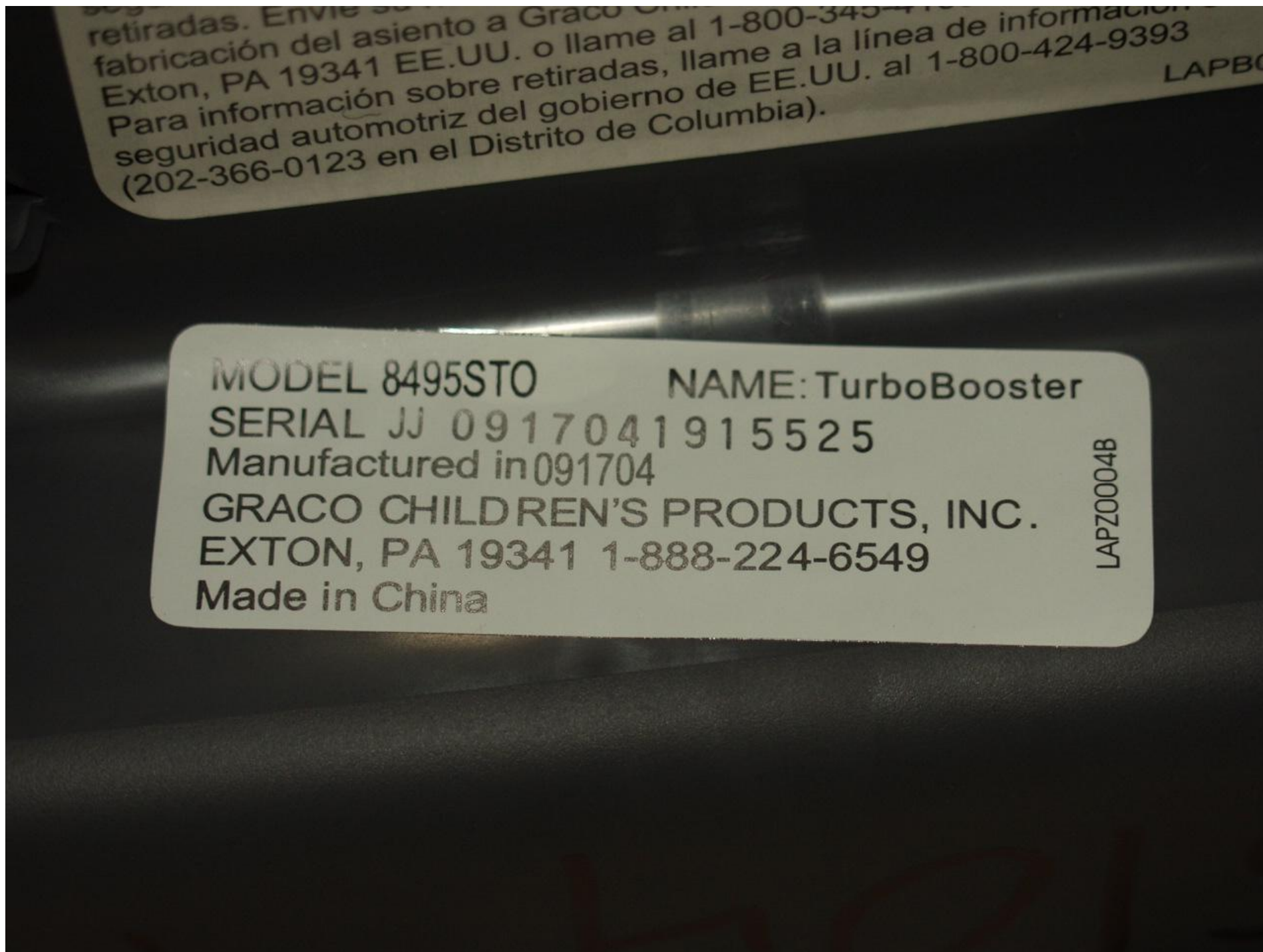


Figure 3-10 CLOSE-UP VIEW OF POSITION 4 CRS LABEL



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 3-15 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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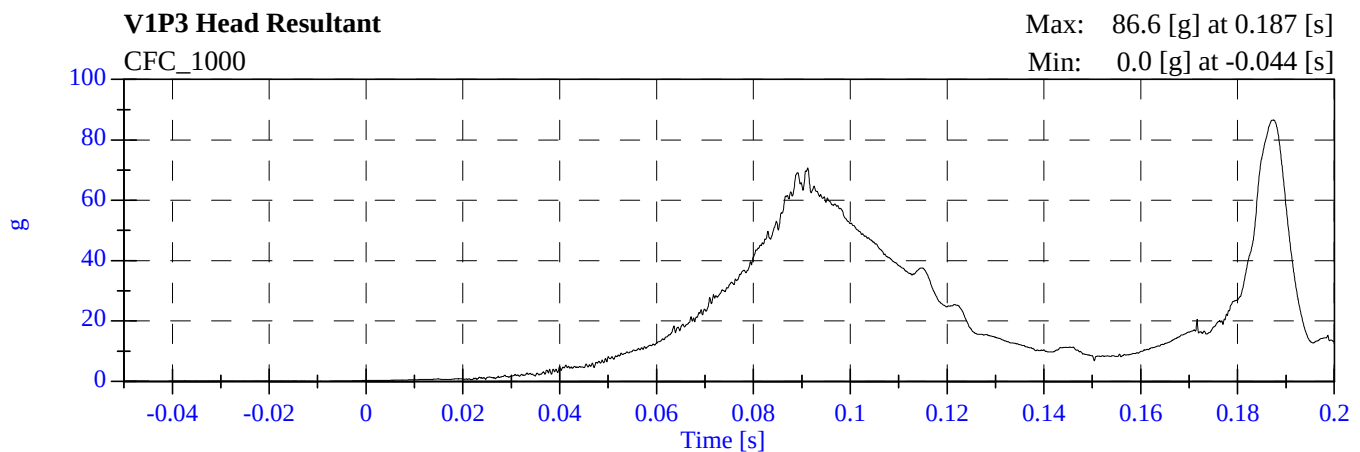
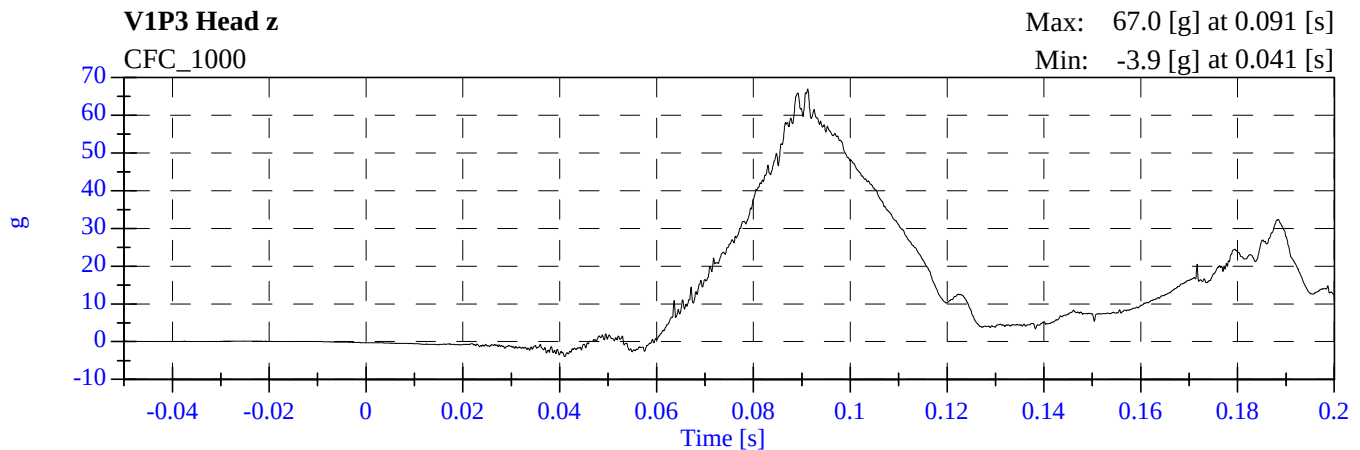
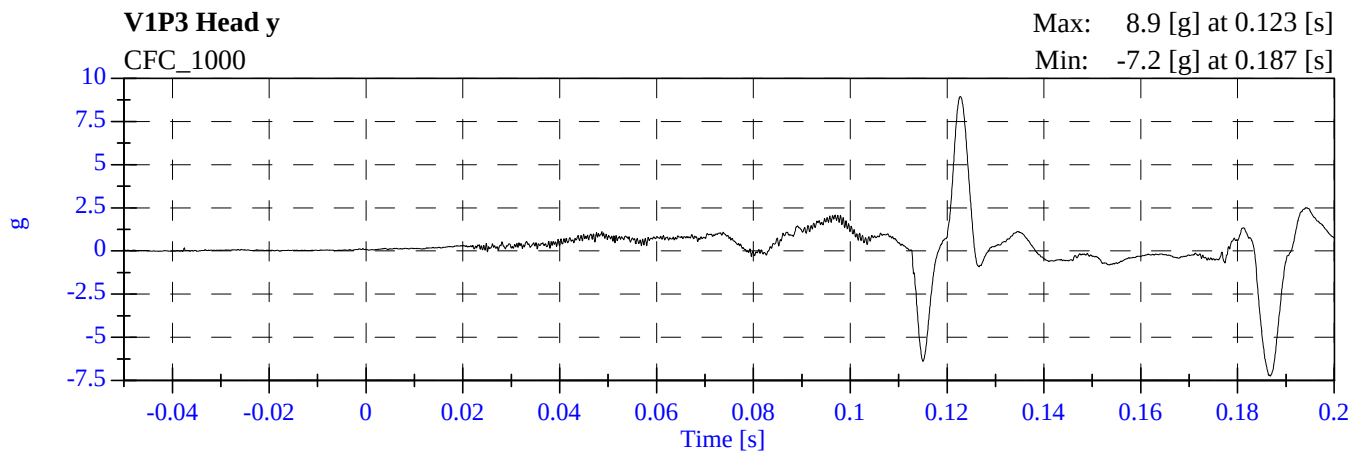
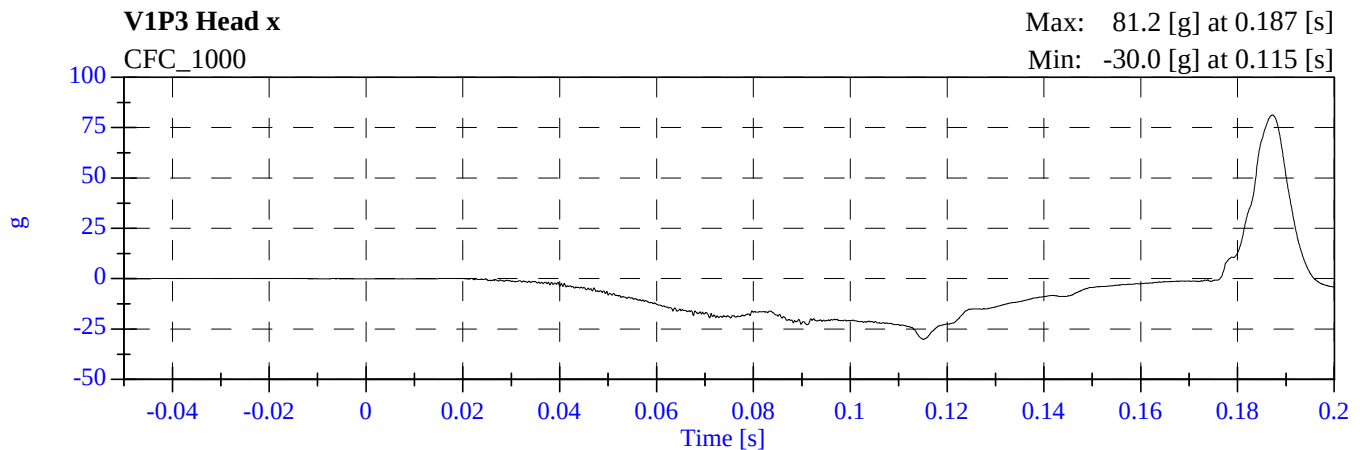
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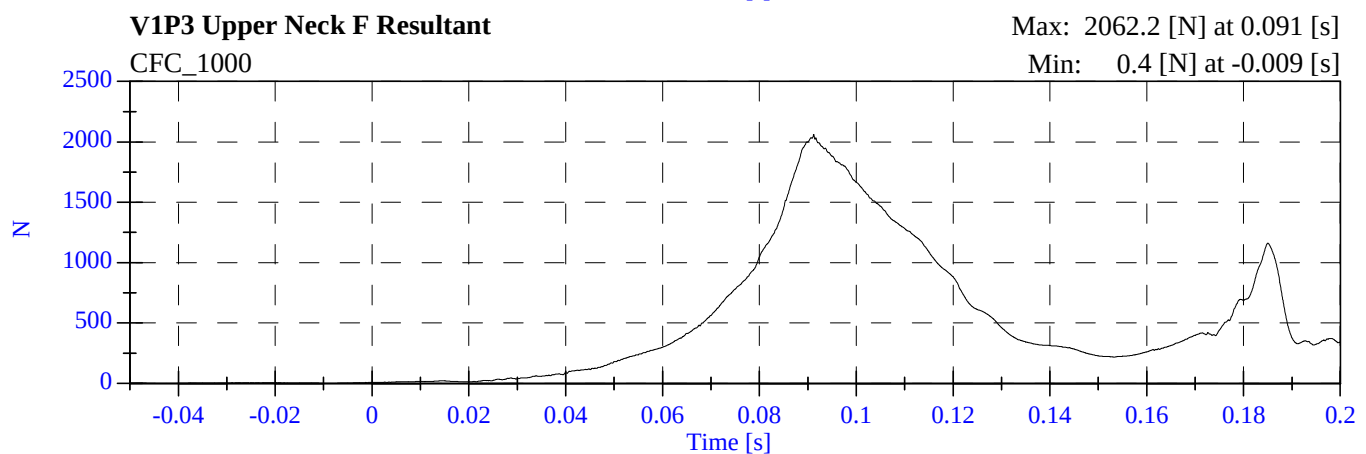
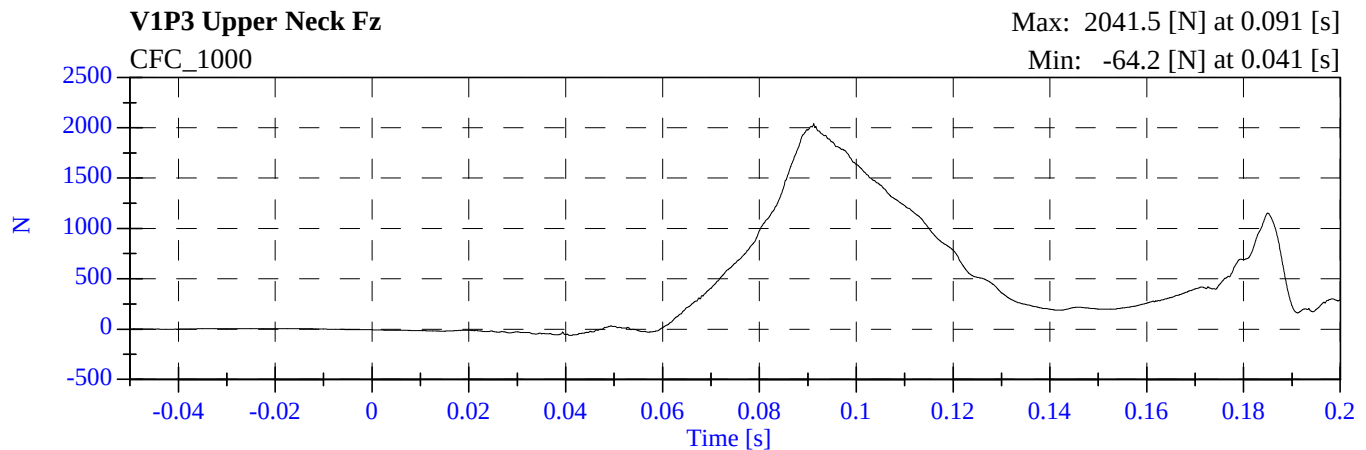
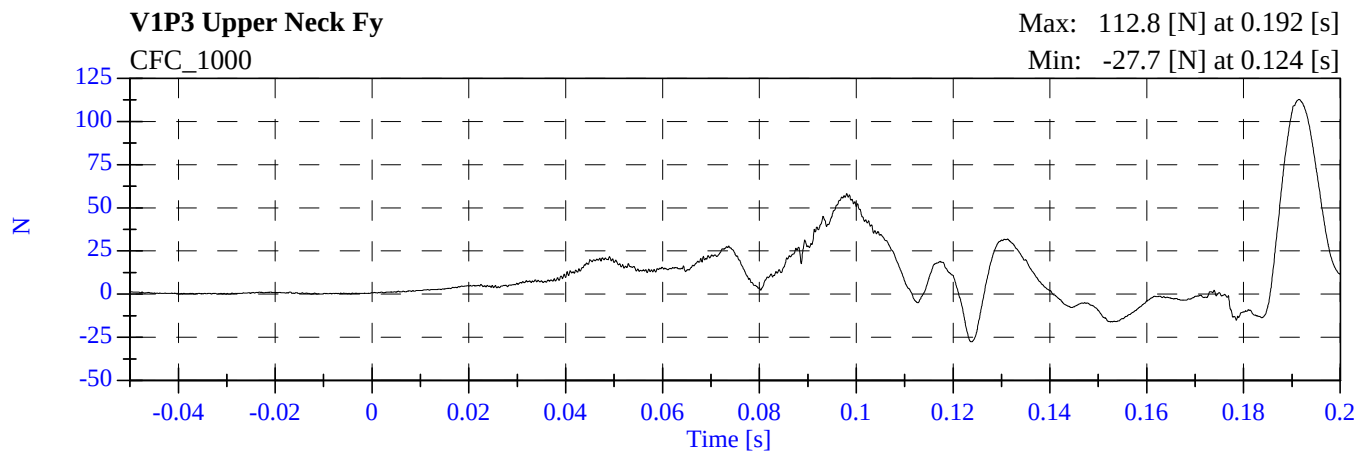
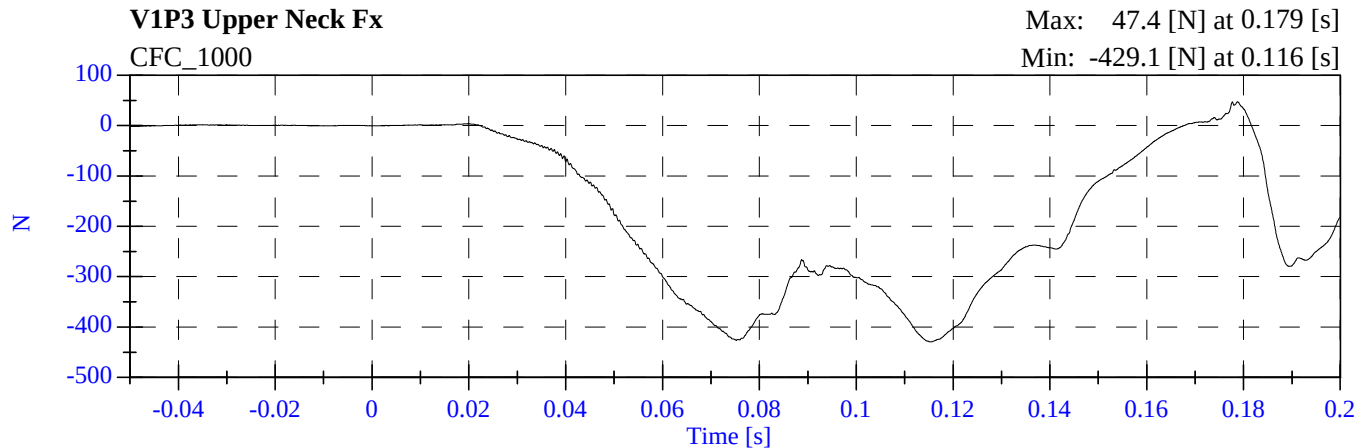
PLOT	PLOT NAME[UNITS, CHANNEL FILTER CLASS]	PAGE
50	V1P4 Chest x [g, CFC_180]	4-18
51	V1P4 Chest y [g, CFC_180]	4-18
52	V1P4 Chest z [g, CFC_180]	4-18
53	V1P4 Chest Resultant [g, CFC_180]	4-18
54	V1P4 Chest Displacement [mm, CFC_600]	4-19
55	V1P4 Lumbar Fx [N, CFC_1000]	4-20
56	V1P4 Lumbar Fy [N, CFC_1000]	4-20
57	V1P4 Lumbar Fz [N, CFC_1000]	4-20
58	V1P4 Lumbar F Resultant [N, CFC_1000]	4-20
59	V1P4 Lumbar Mx [N-m, CFC_1000]	4-21
60	V1P4 Lumbar My [N-m, CFC_1000]	4-21
61	V1P4 Lumbar Mz [N-m, CFC_1000]	4-21
62	V1P4 Lumbar M Resultant [N-m, CFC_1000]	4-21
63	V1P4 Pelvic x [g, CFC_1000]	4-22
64	V1P4 Pelvic y [g, CFC_1000]	4-22
65	V1P4 Pelvic z [g, CFC_1000]	4-22
66	V1P4 Pelvic Resultant [g, CFC_1000]	4-22
67	V1P4 Left Lower ASIS Fx [N, CFC_600]	4-23
68	V1P4 Left Upper ASIS Fx [N, CFC_600]	4-23
69	V1P4 Right Lower ASIS Fx [N, CFC_600]	4-23
70	V1P4 Right Upper ASIS Fx [N, CFC_600]	4-23
71	V1P4 Left Femur [N, CFC_600]	4-24
72	V1P4 Right Femur [N, CFC_600]	4-24
73	V1P4 Lap Belt [N, CFC_60]	4-25
74	V1P4 Shoulder Belt [N, CFC_60]	4-25

2005 NCAP Test 3 - 2005 Toyota Sienna

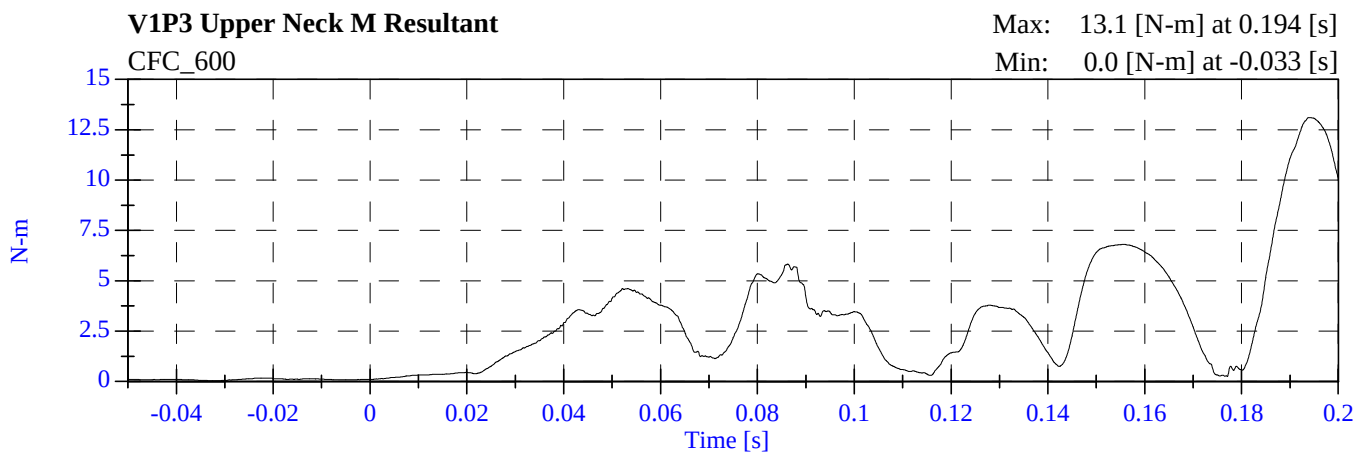
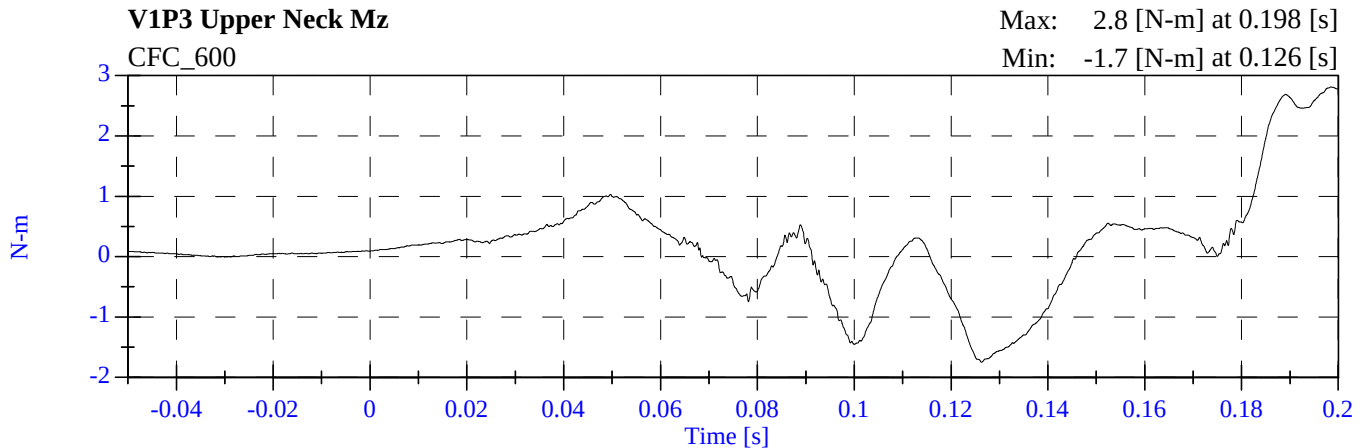
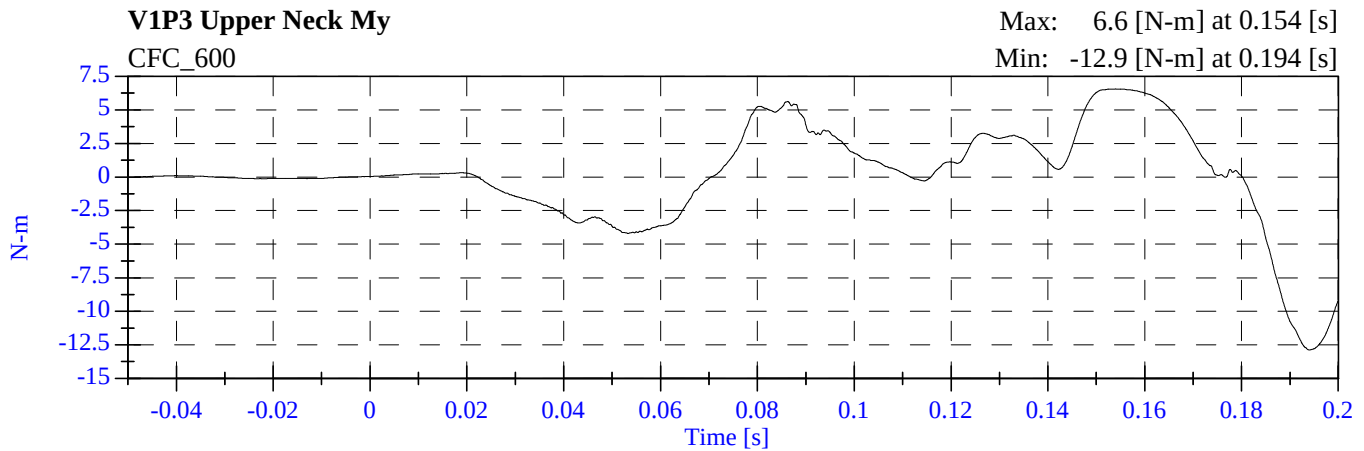
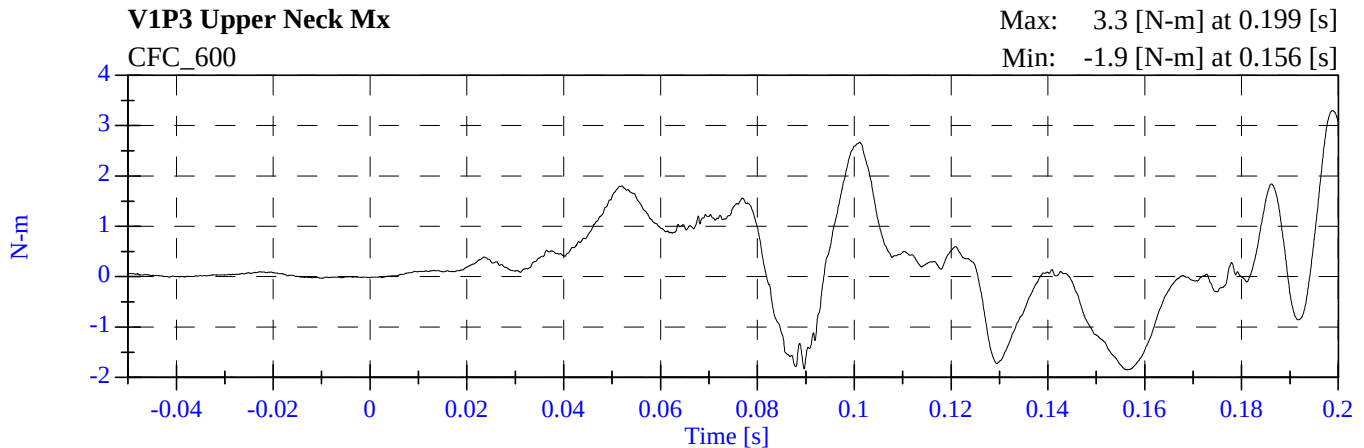
M55104 - December 08, 2004



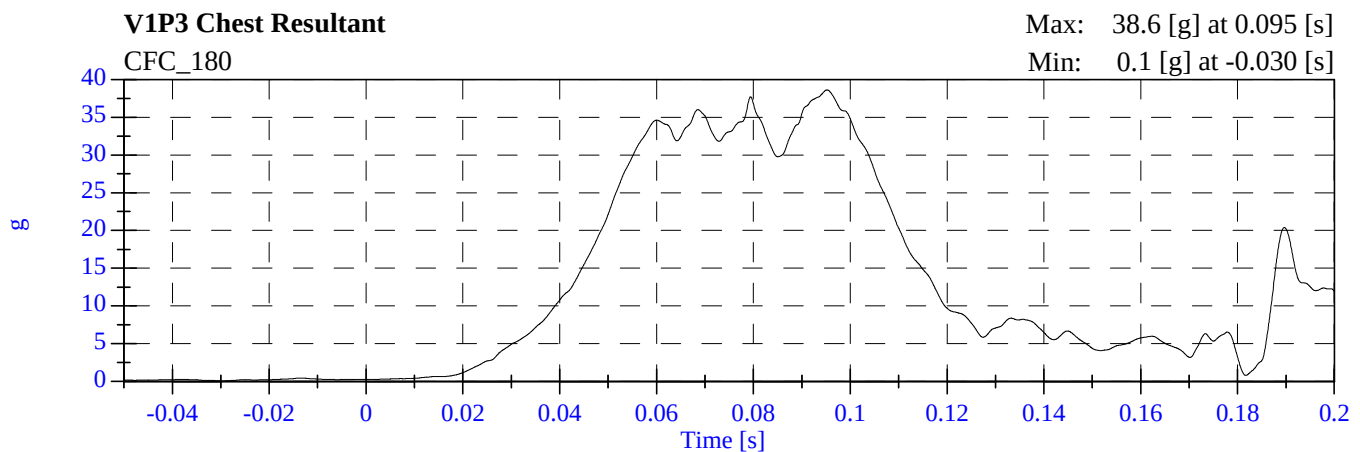
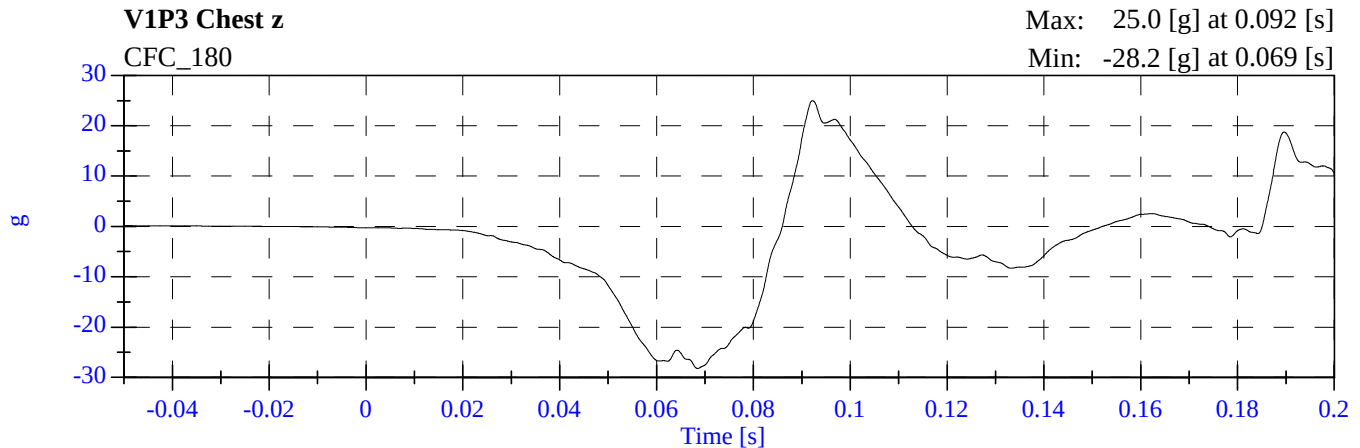
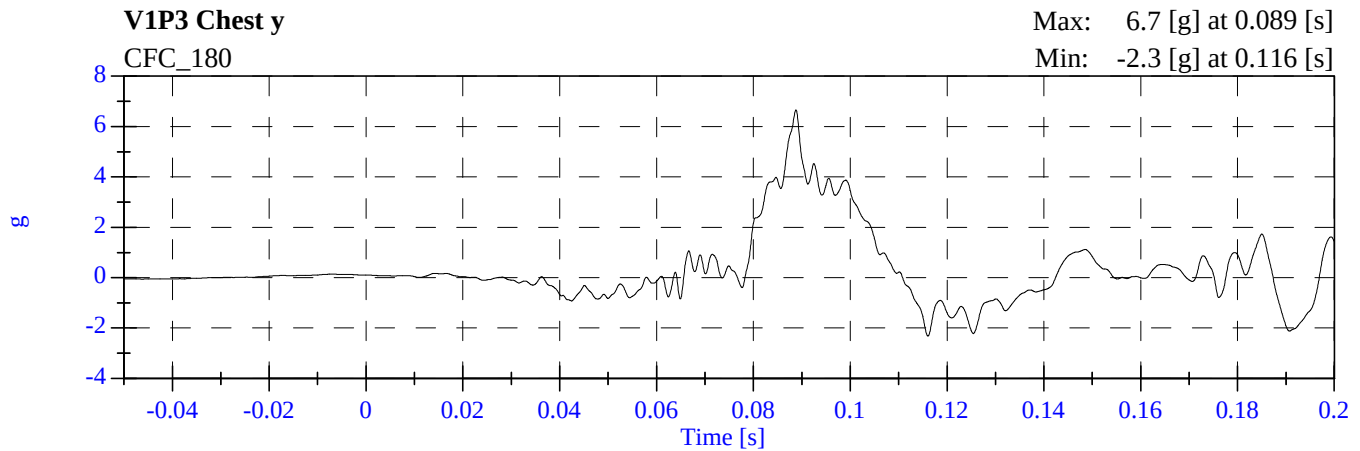
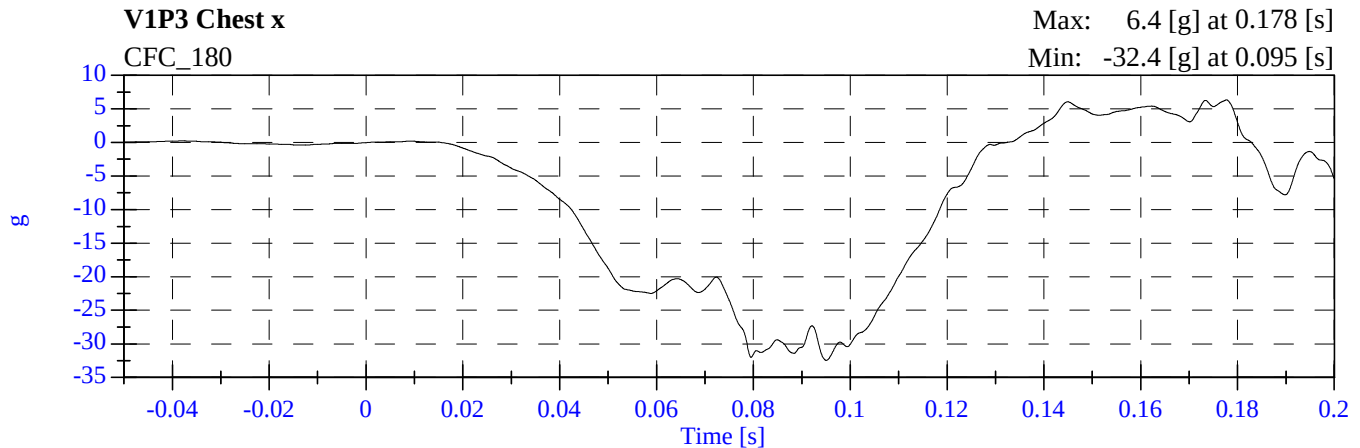
2005 NCAP Test 3 - 2005 Toyota Sienna M55104 - December 08, 2004



2005 NCAP Test 3 - 2005 Toyota Sienna M55104 - December 08, 2004

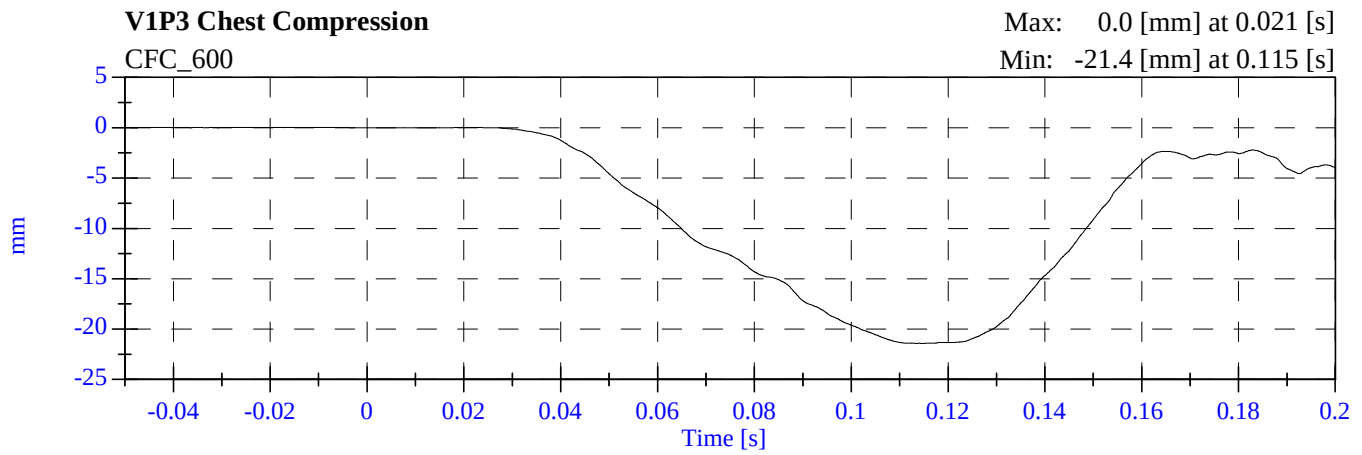


2005 NCAP Test 3 - 2005 Toyota Sienna M55104 - December 08, 2004



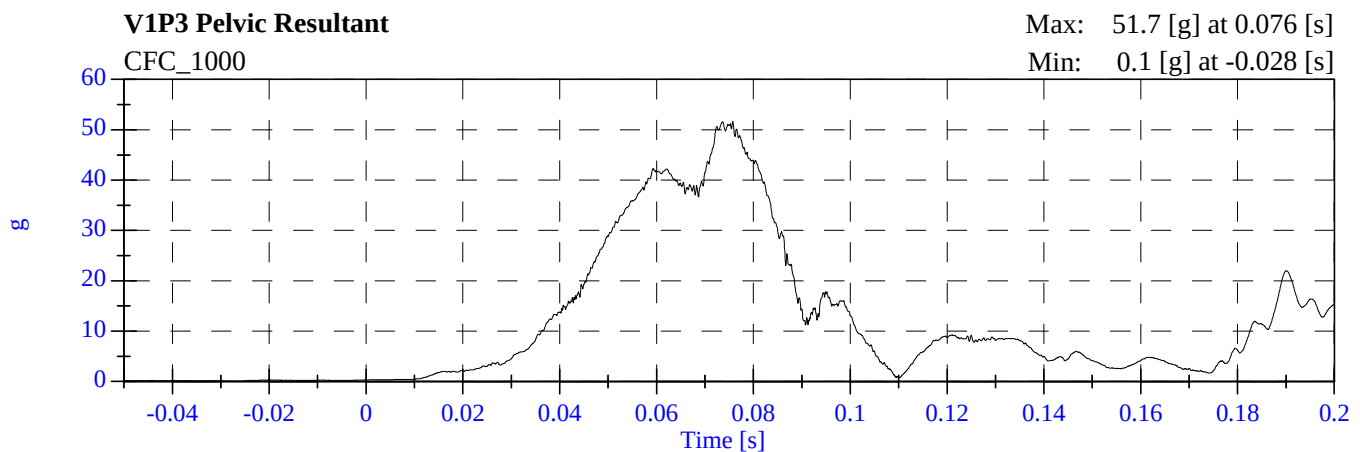
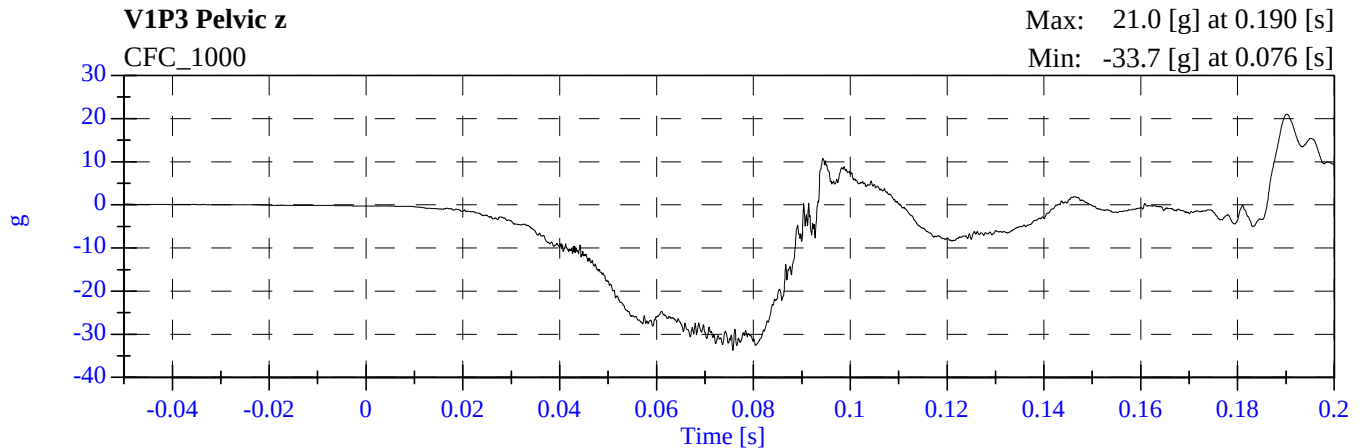
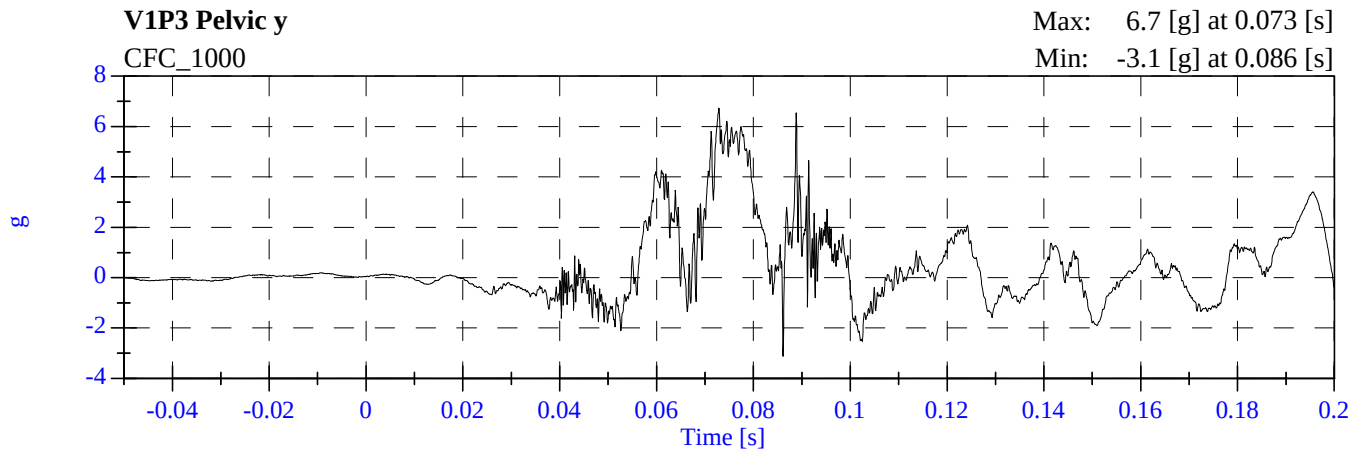
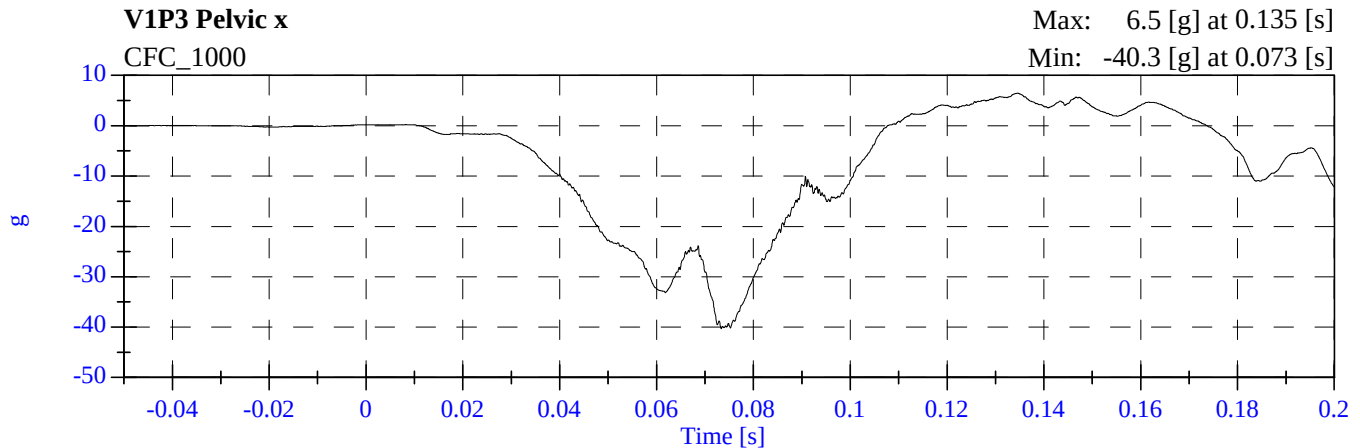
2005 NCAP Test 3 - 2005 Toyota Sienna

M55104 - December 08, 2004



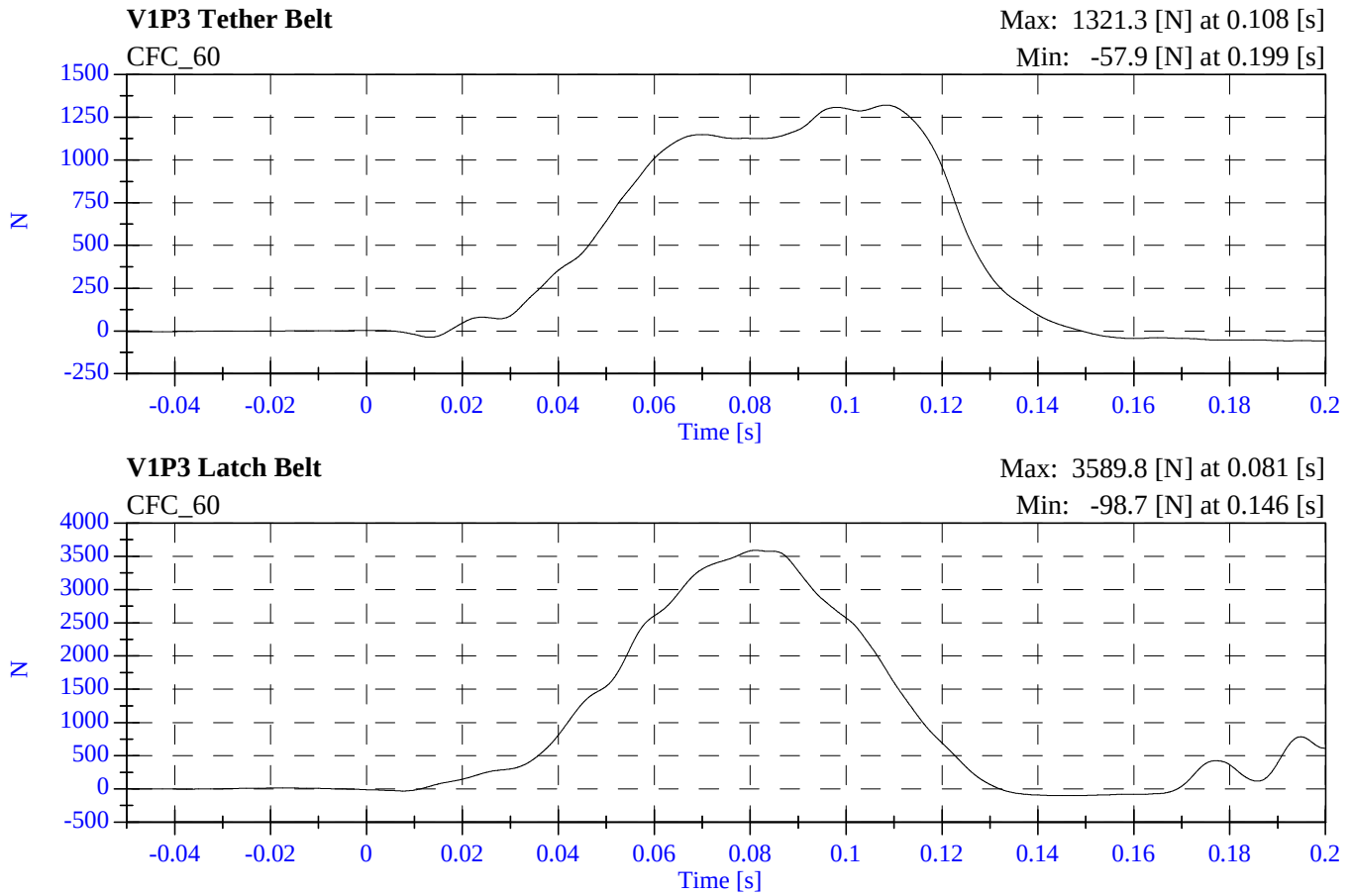
2005 NCAP Test 3 - 2005 Toyota Sienna

M55104 - December 08, 2004



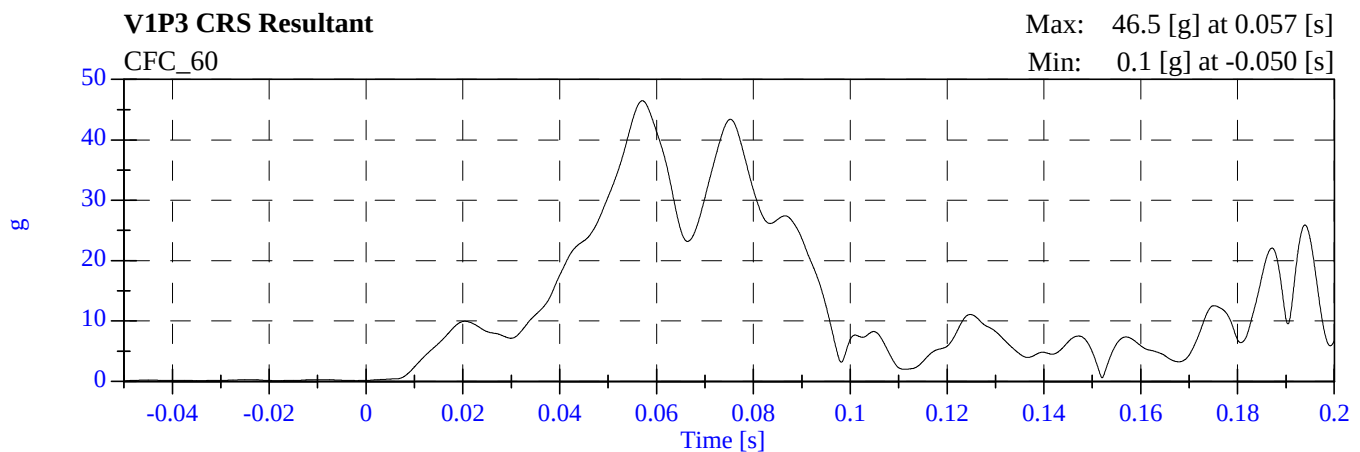
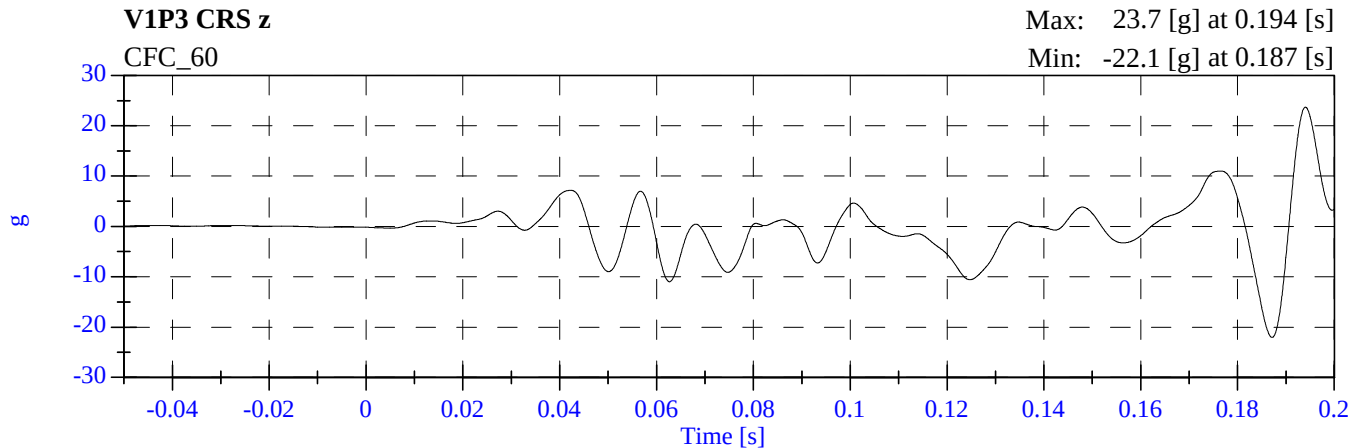
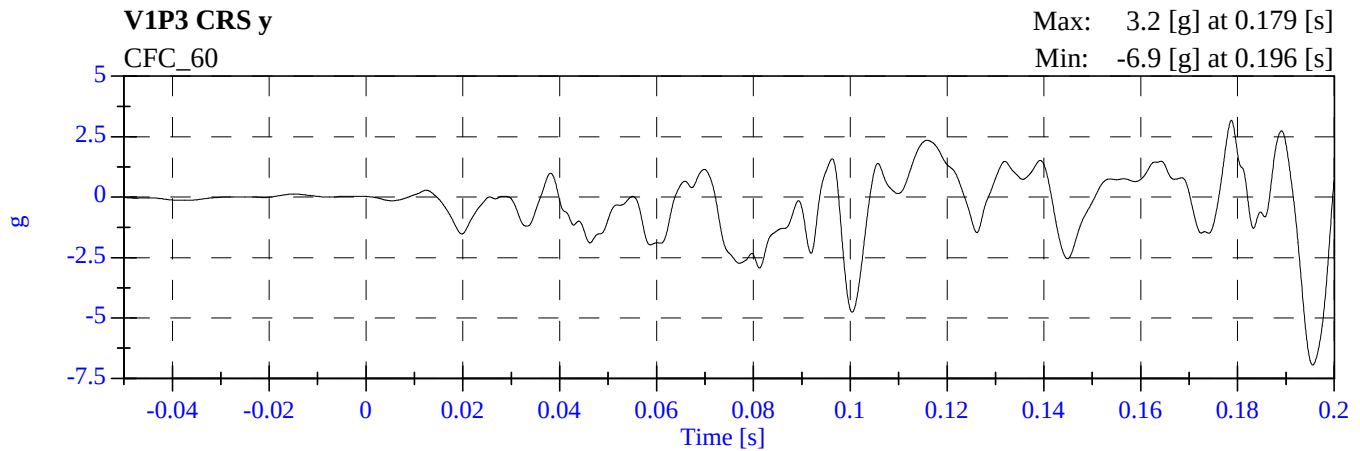
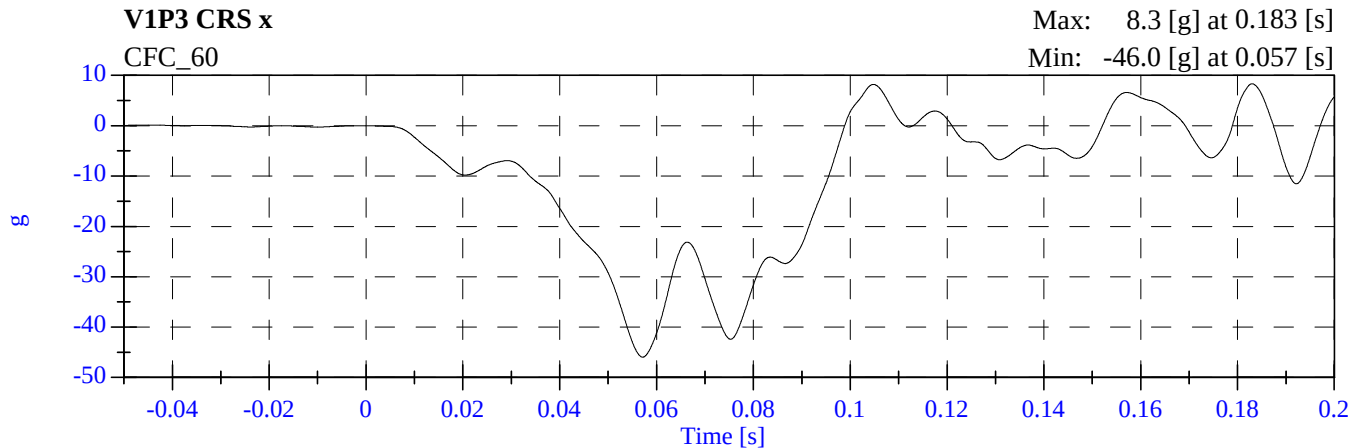
2005 NCAP Test 3 - 2005 Toyota Sienna

M55104 - December 08, 2004



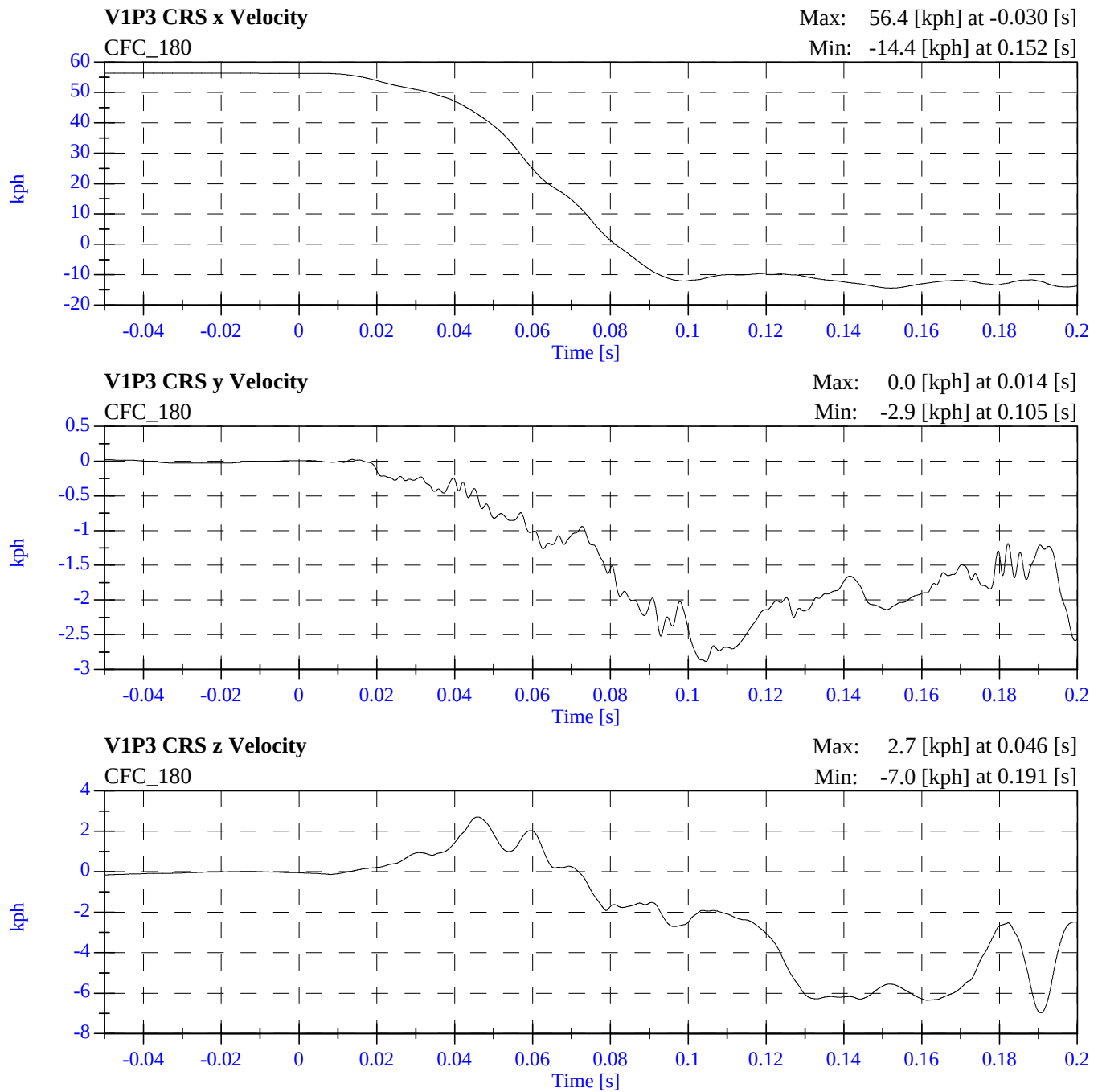
2005 NCAP Test 3 - 2005 Toyota Sienna

M55104 - December 08, 2004



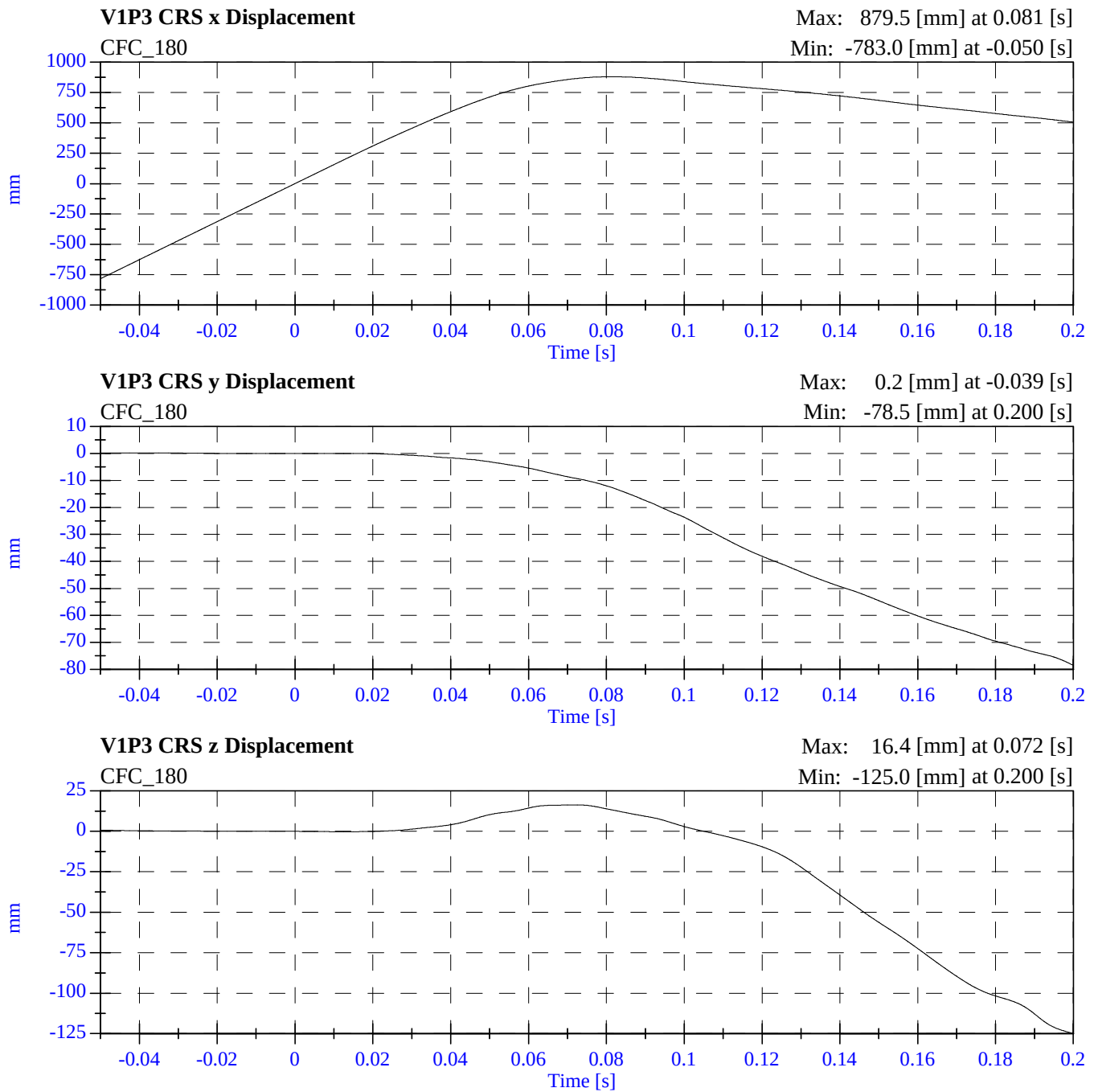
2005 NCAP Test 3 - 2005 Toyota Sienna

M55104 - December 08, 2004



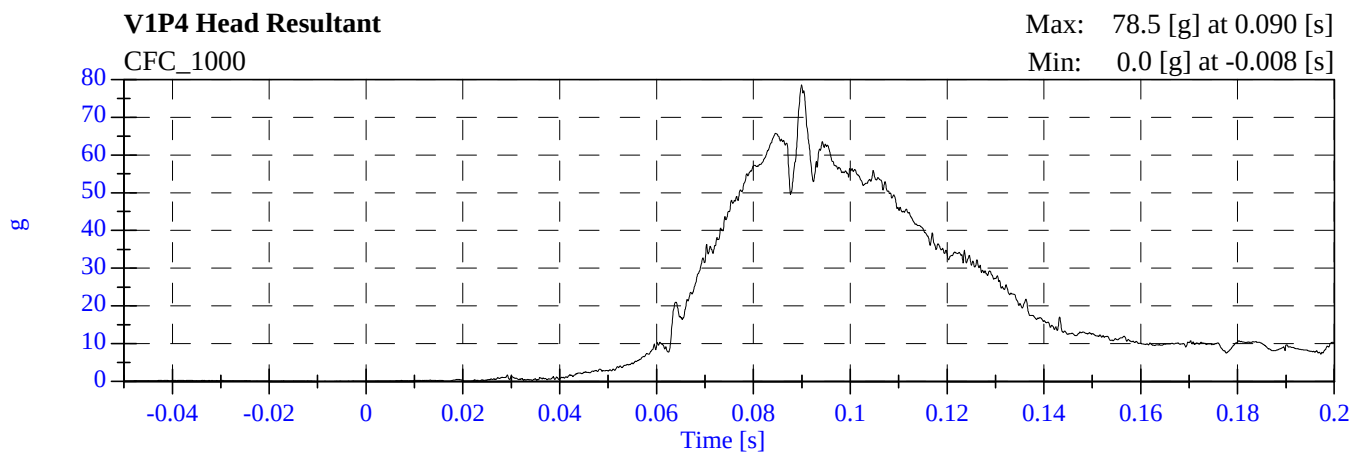
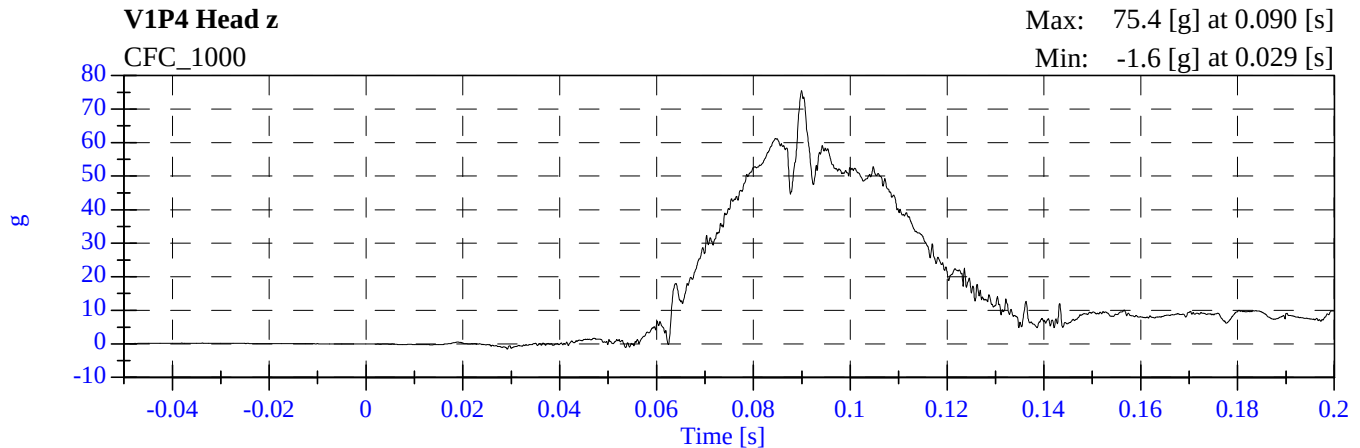
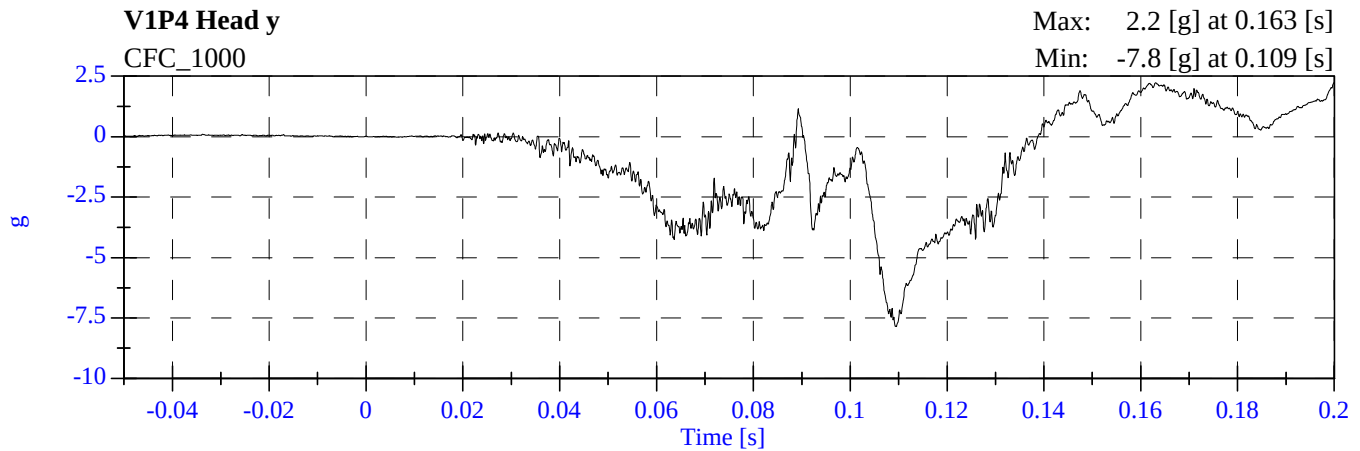
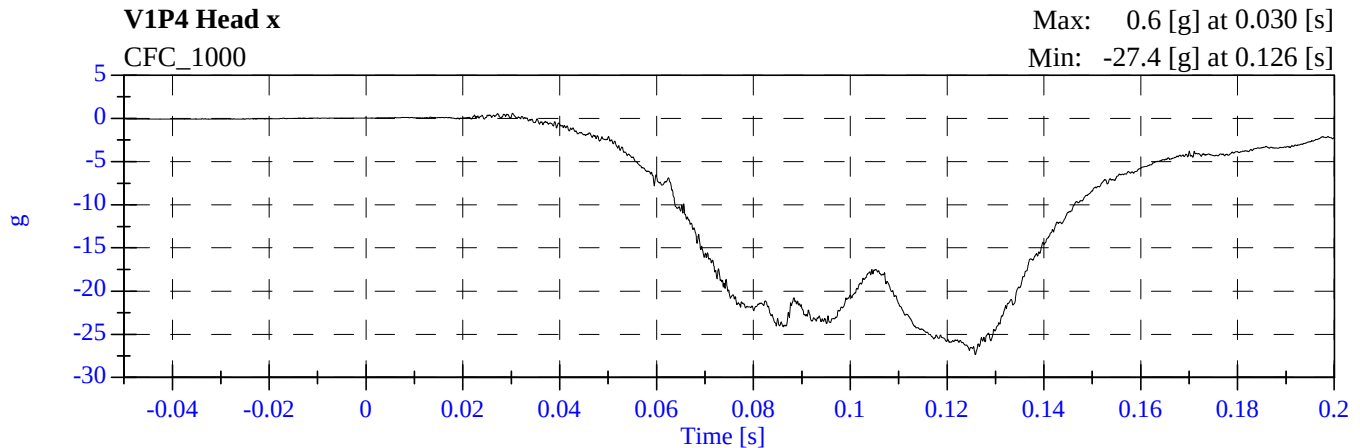
2005 NCAP Test 3 - 2005 Toyota Sienna

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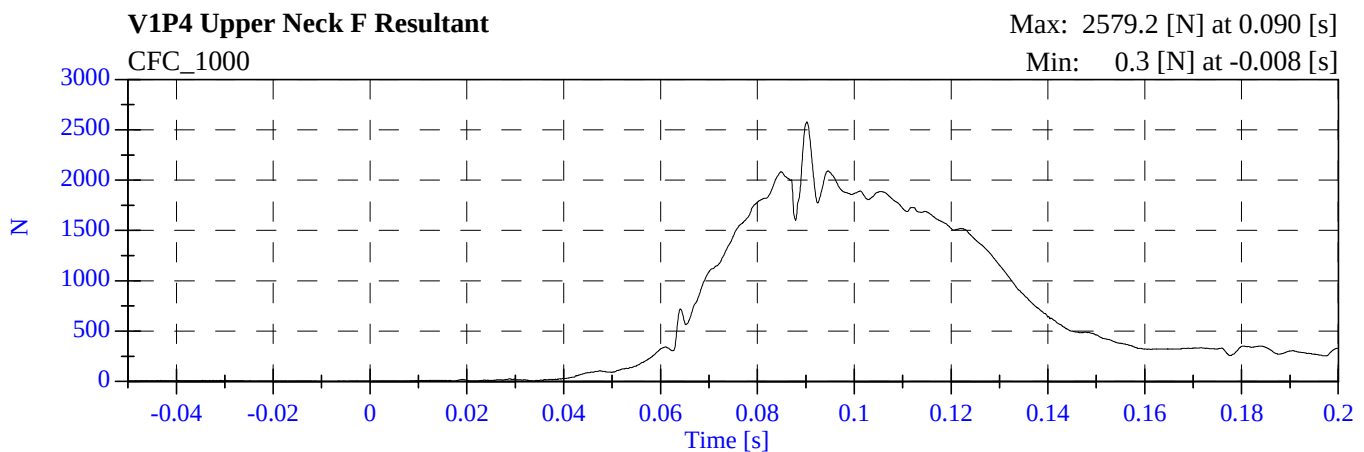
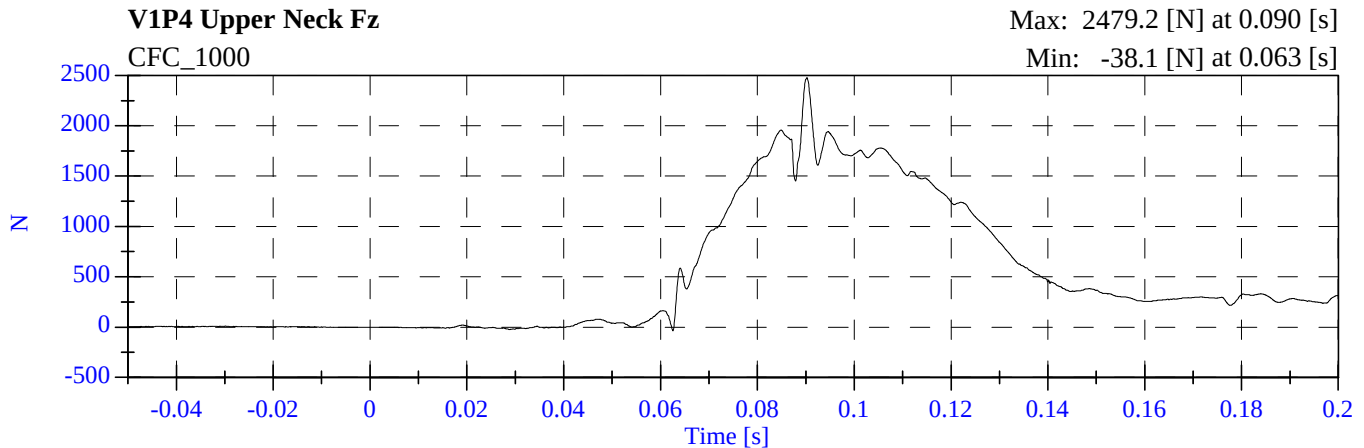
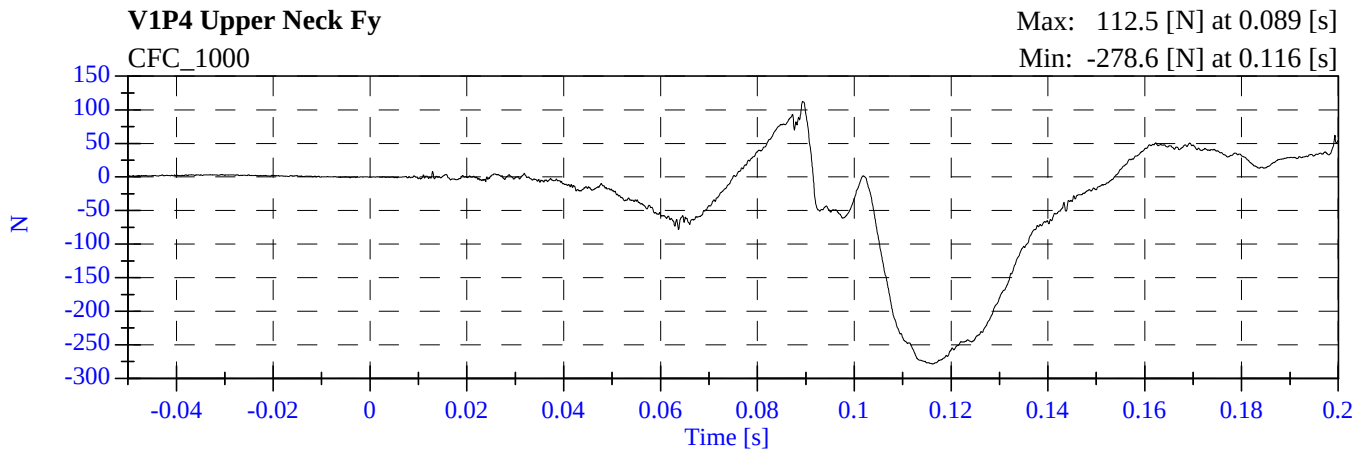
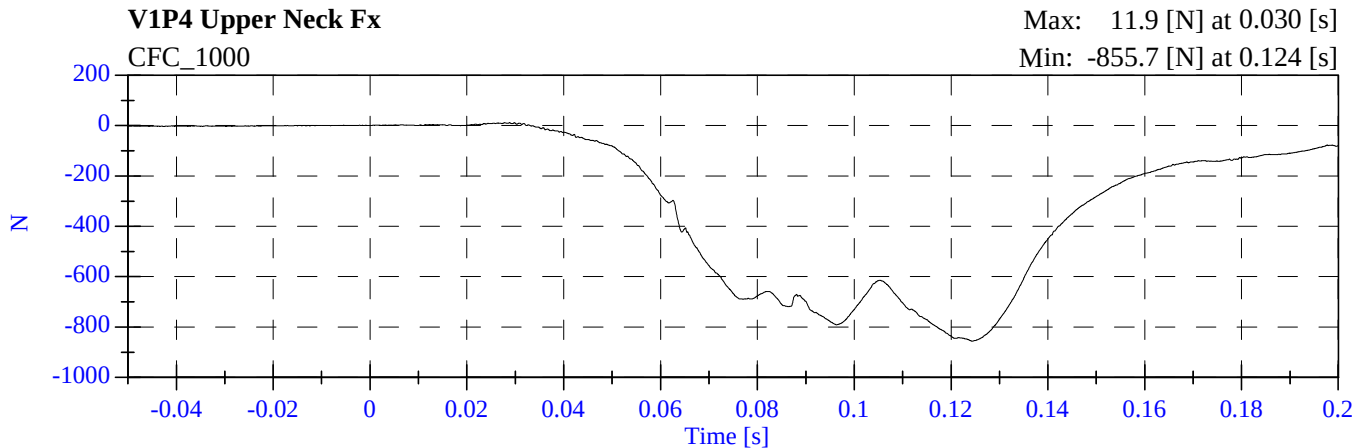


2005 NCAP Test 3 - 2005 Toyota Sienna

M55104 - December 08, 2004

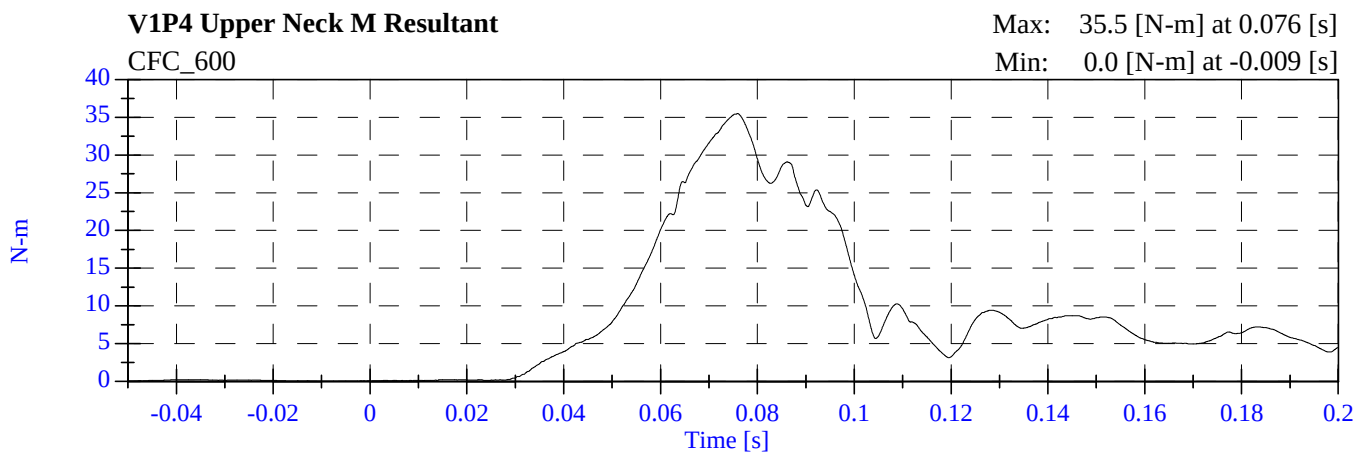
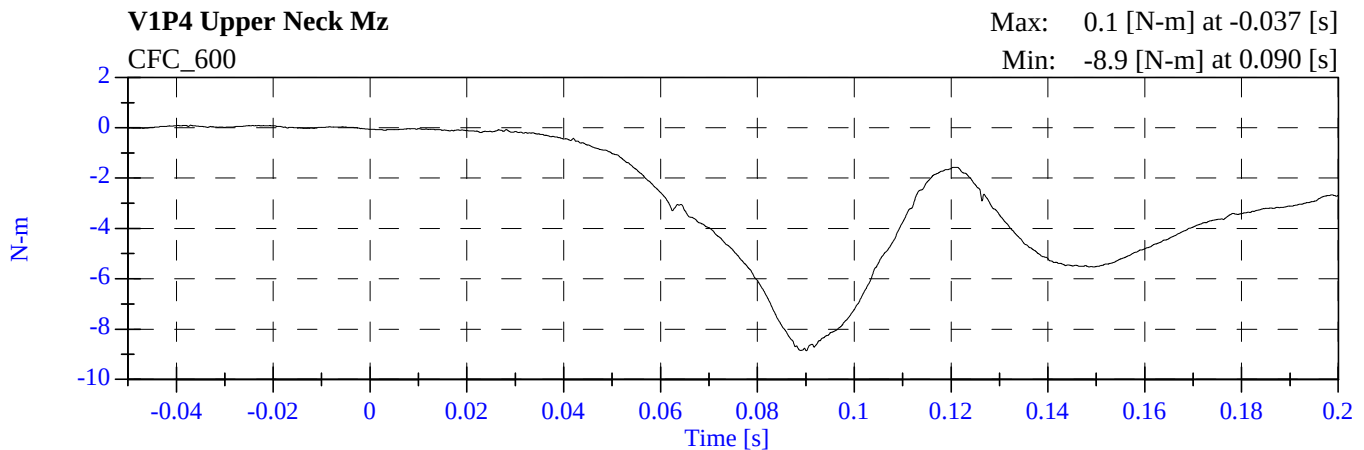
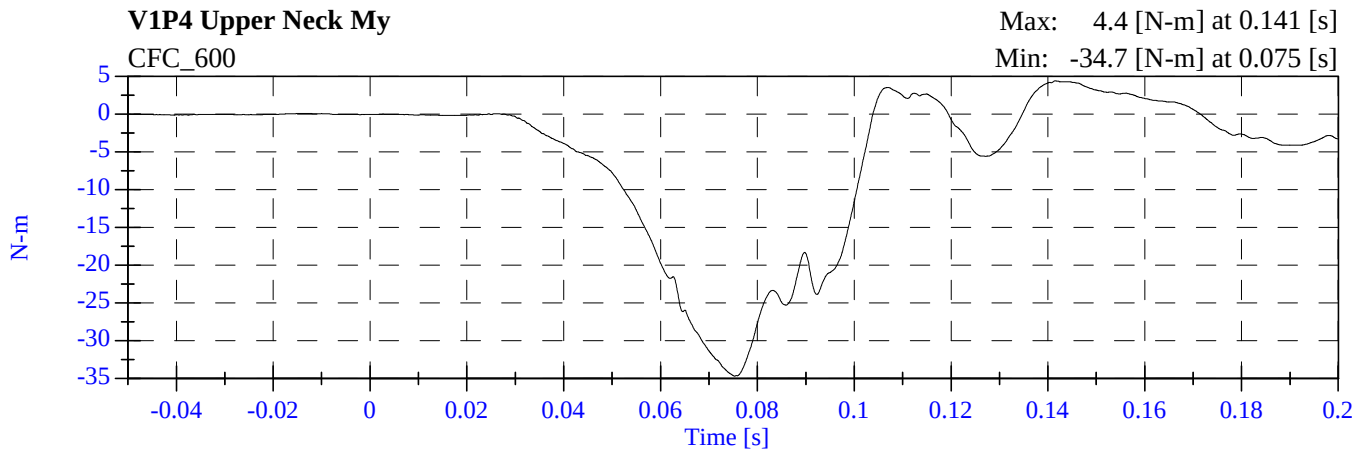
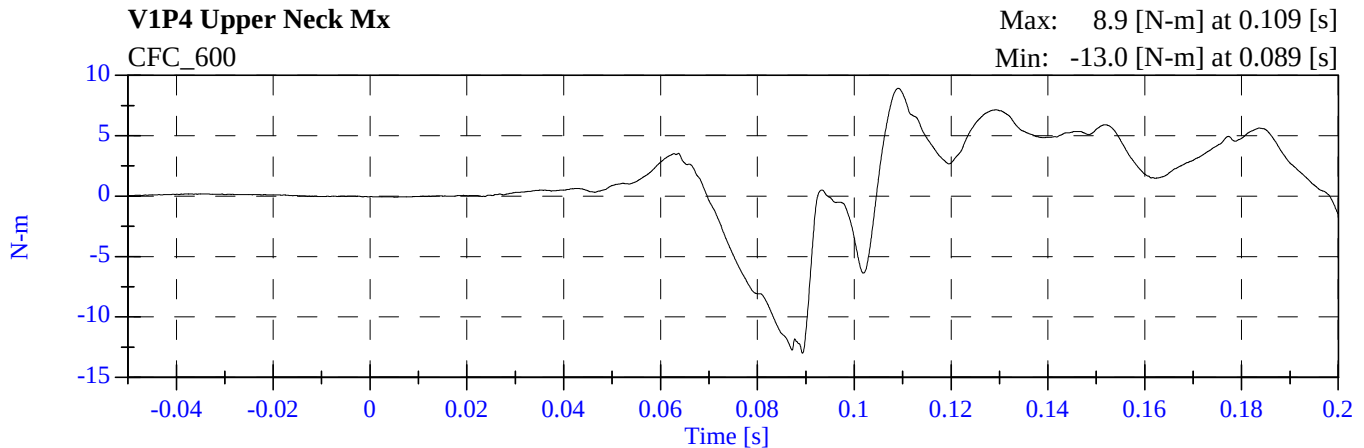


2005 NCAP Test 3 - 2005 Toyota Sienna M55104 - December 08, 2004



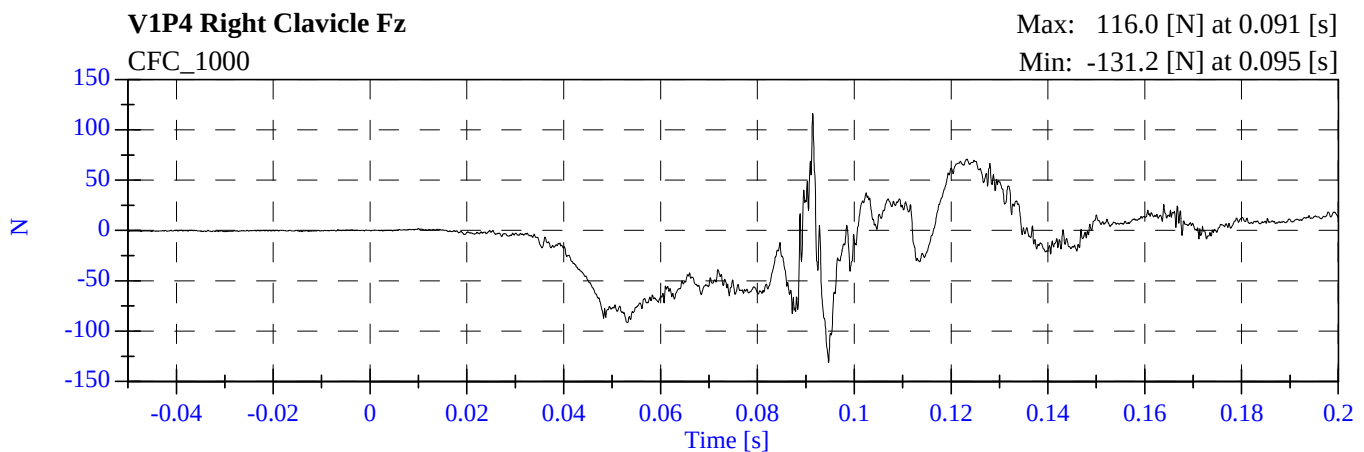
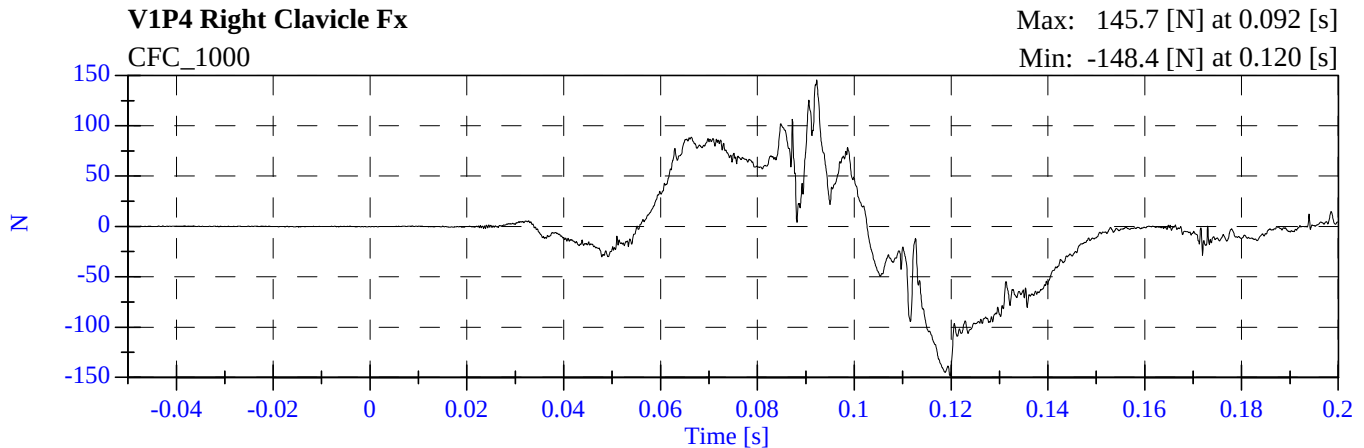
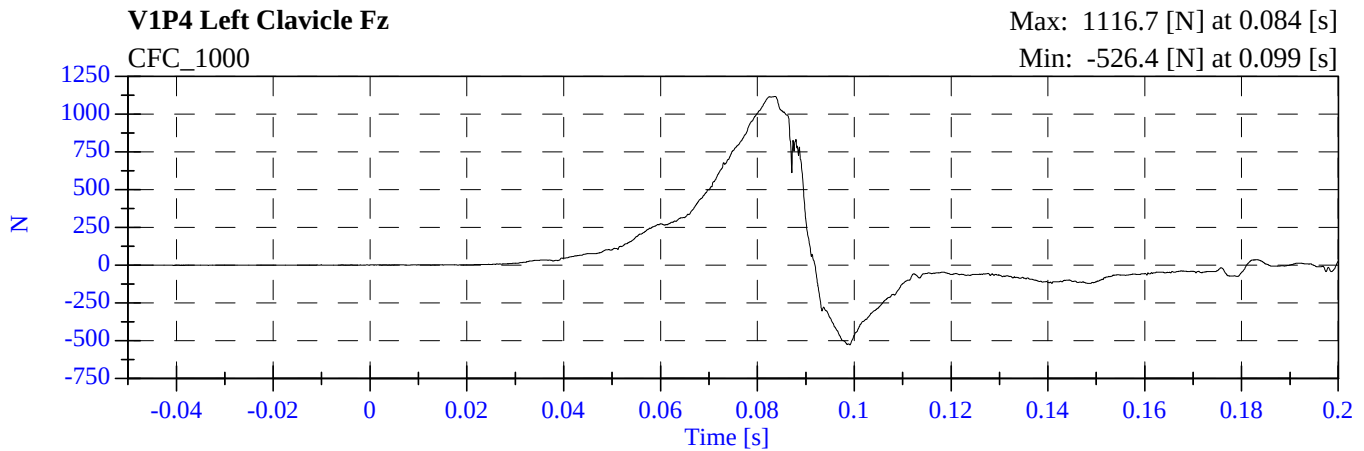
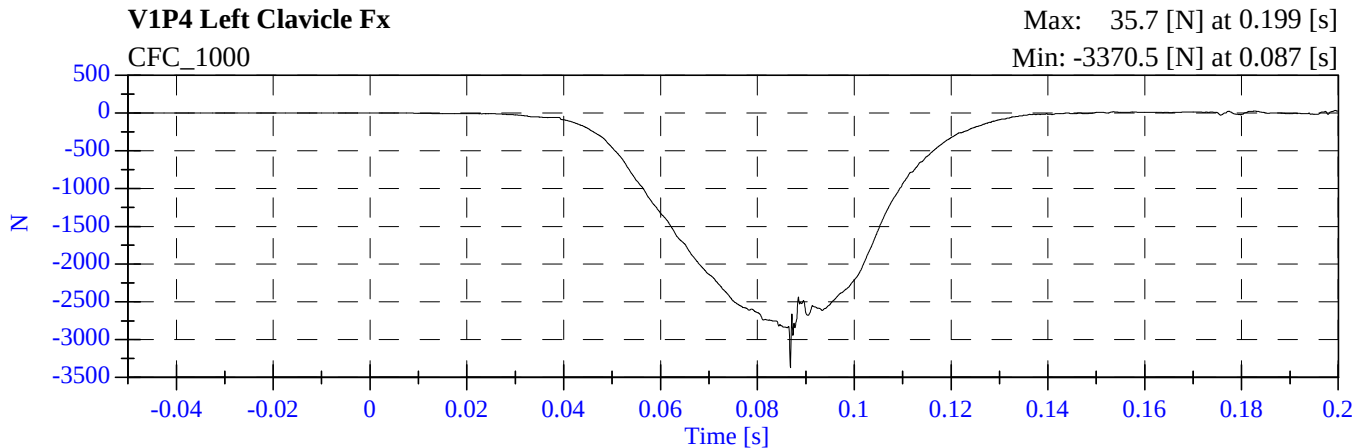
2005 NCAP Test 3 - 2005 Toyota Sienna

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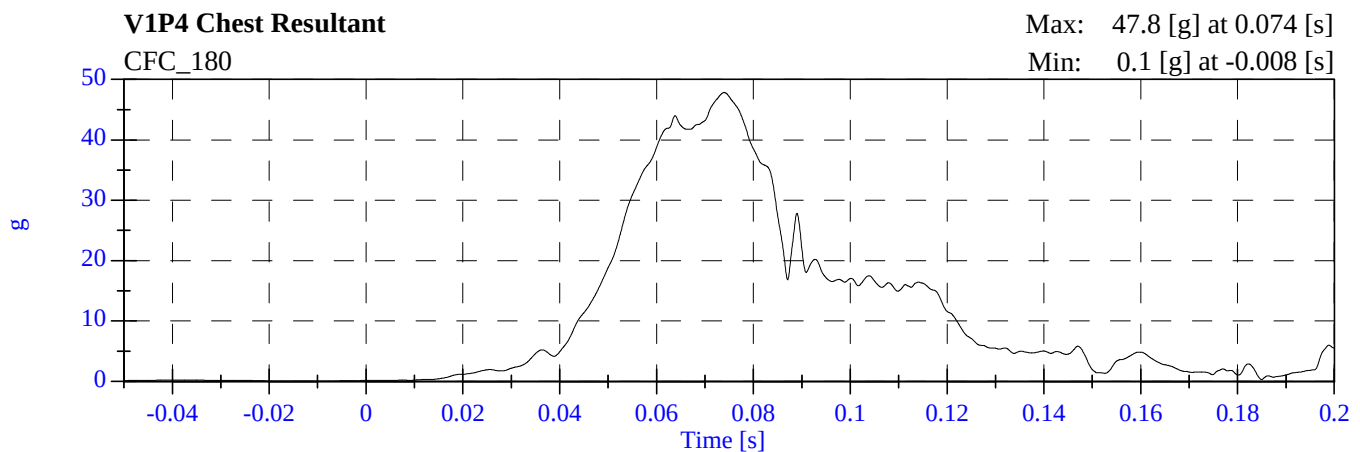
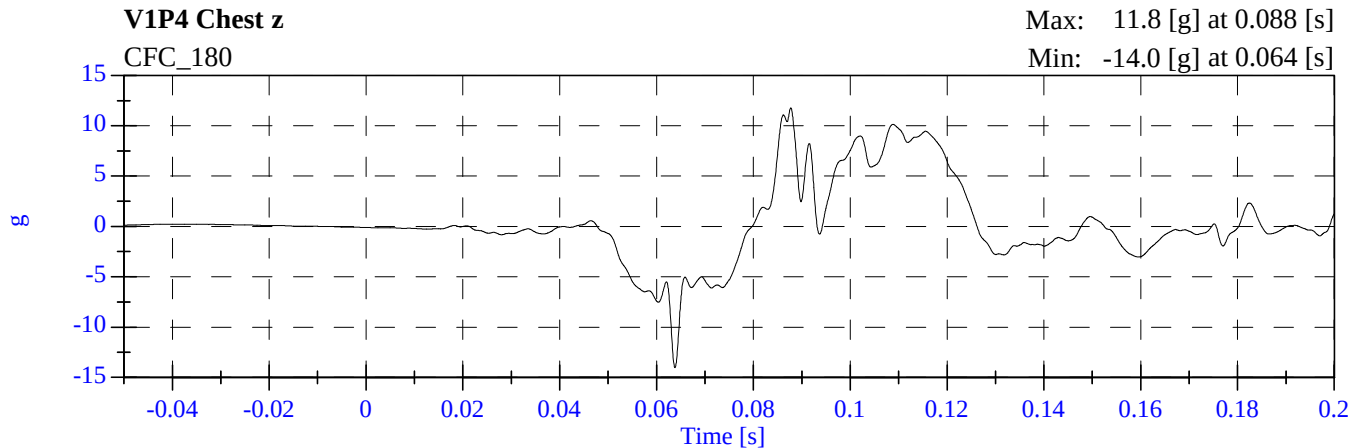
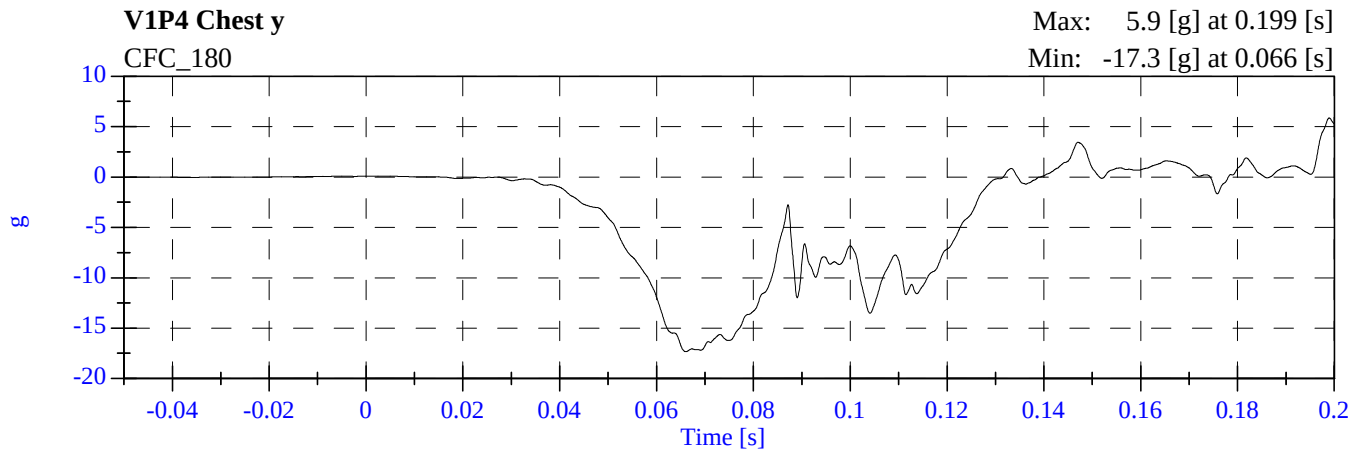
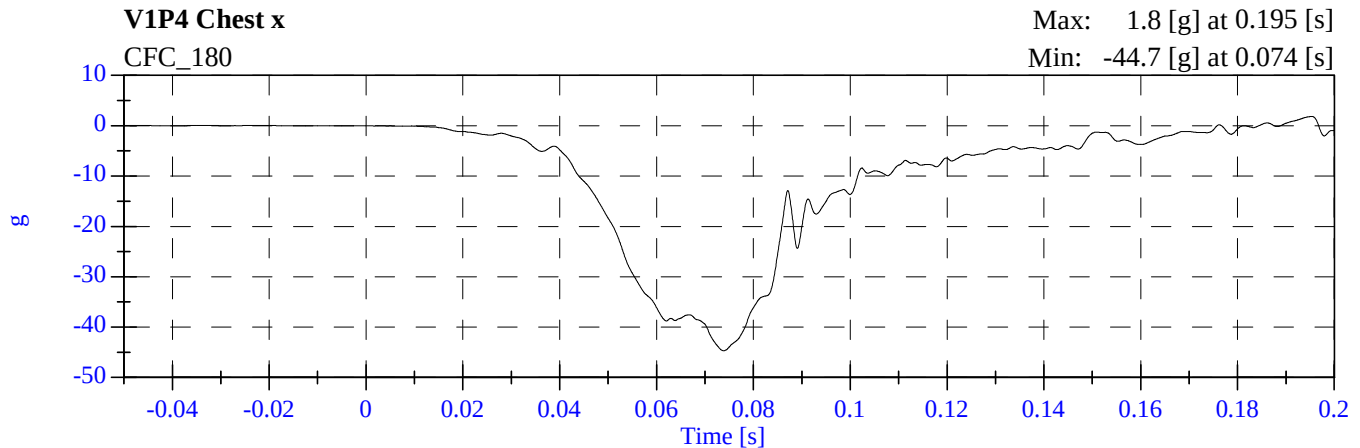
2005 NCAP Test 3 - 2005 Toyota Sienna

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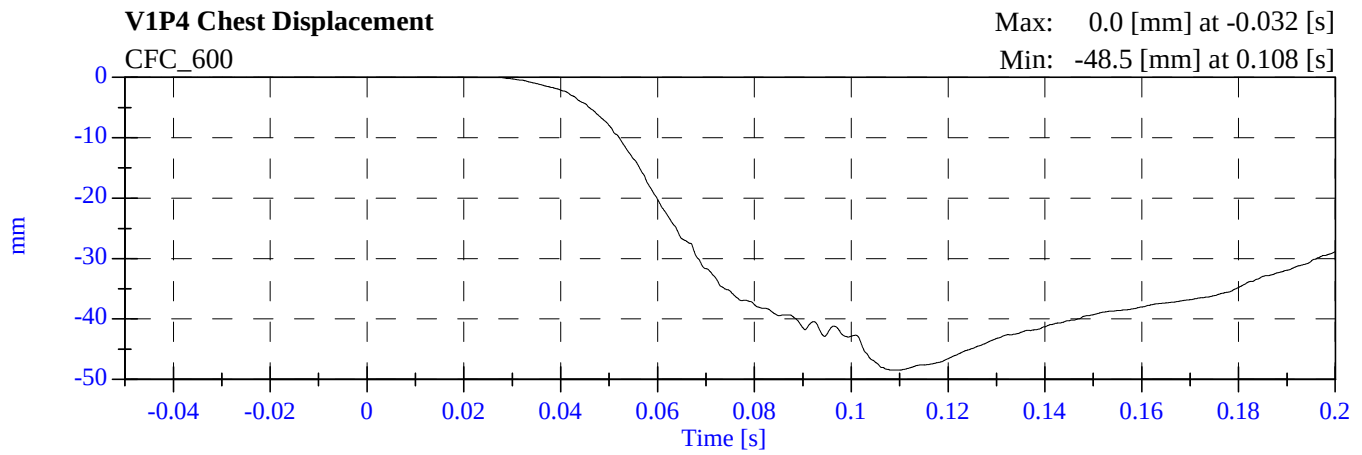


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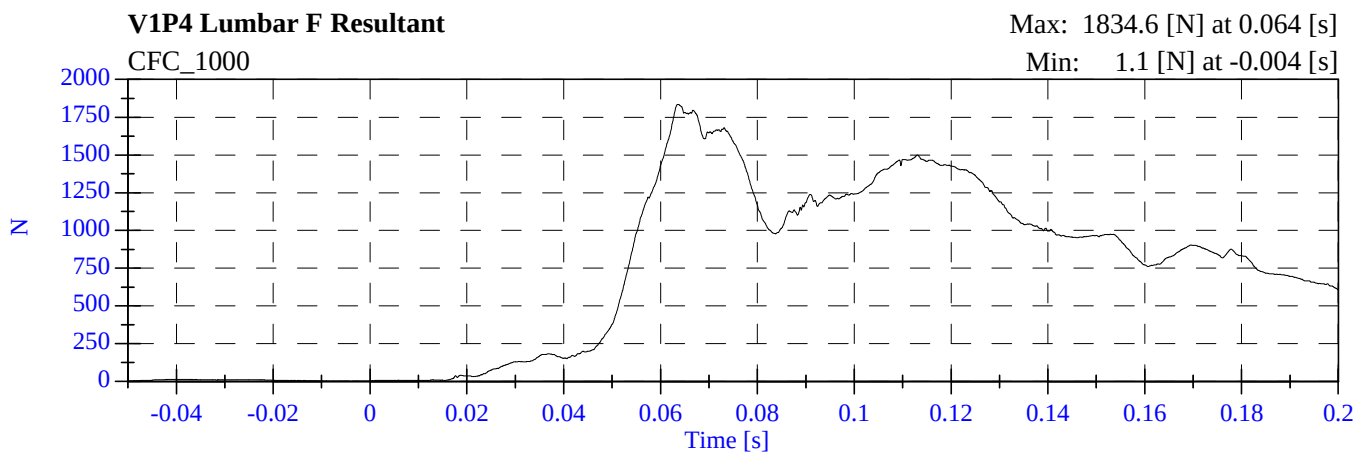
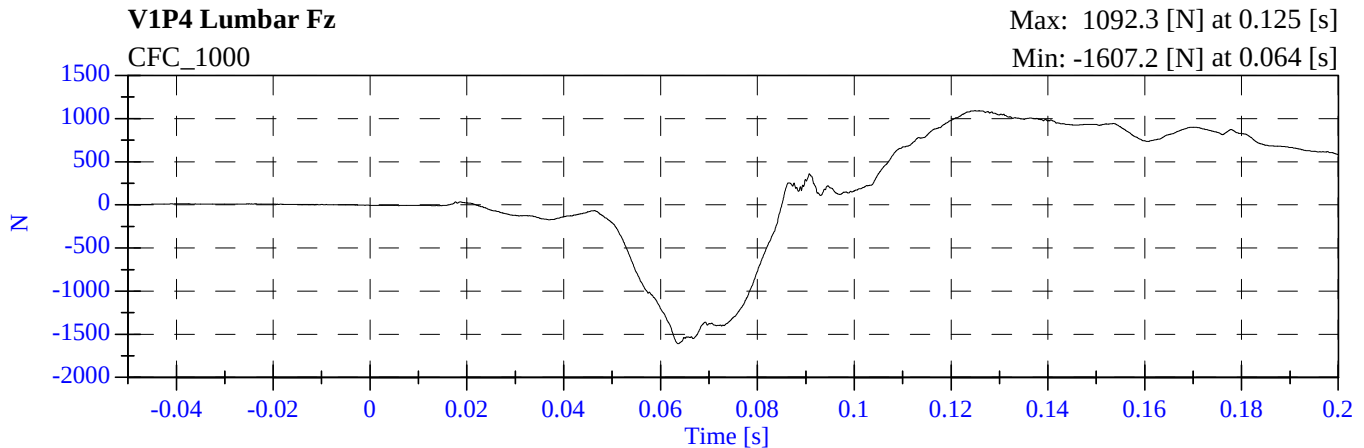
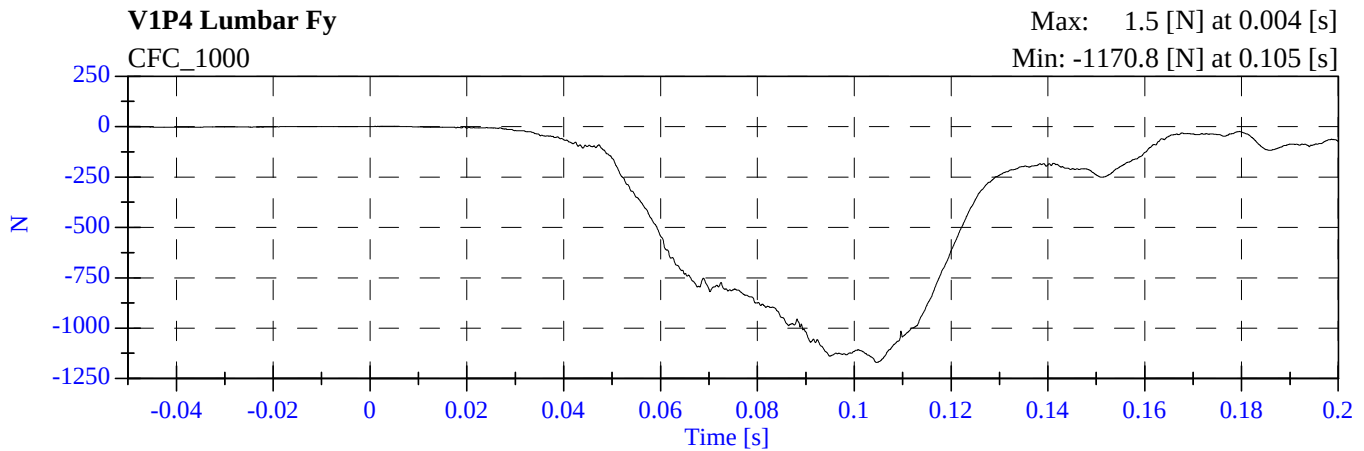
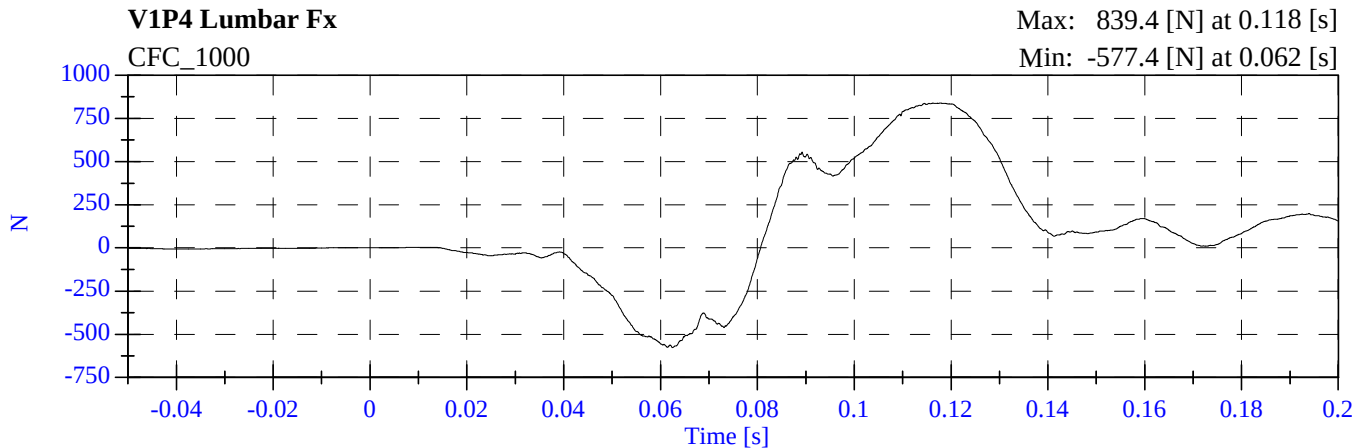
M55104 - December 08, 2004



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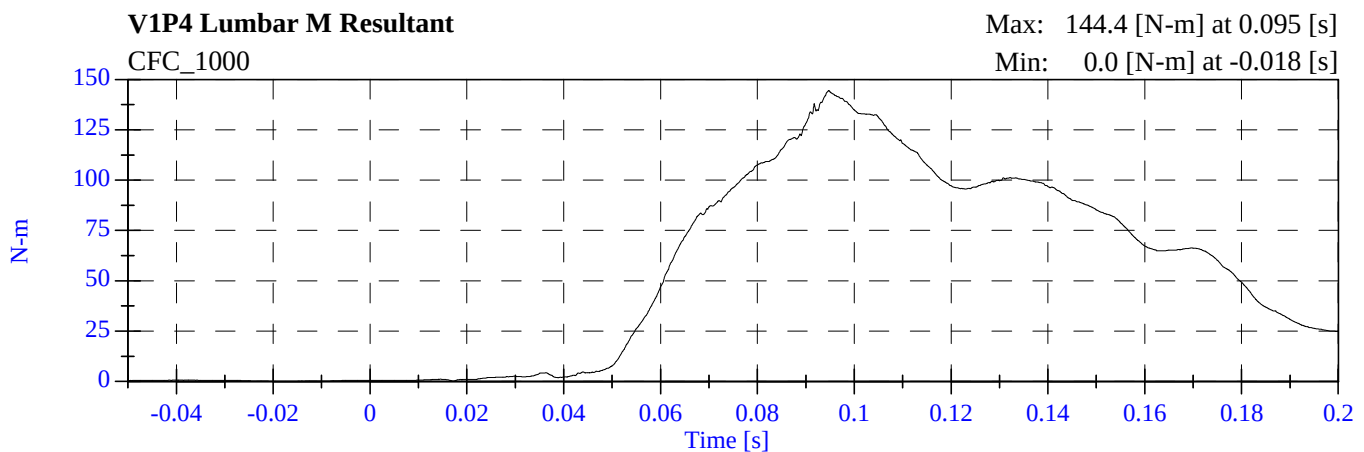
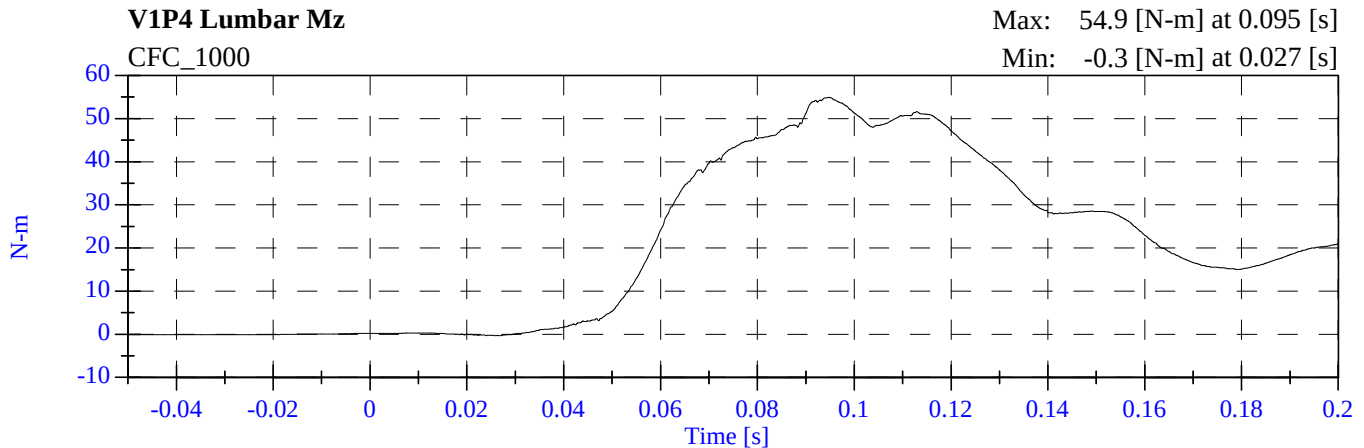
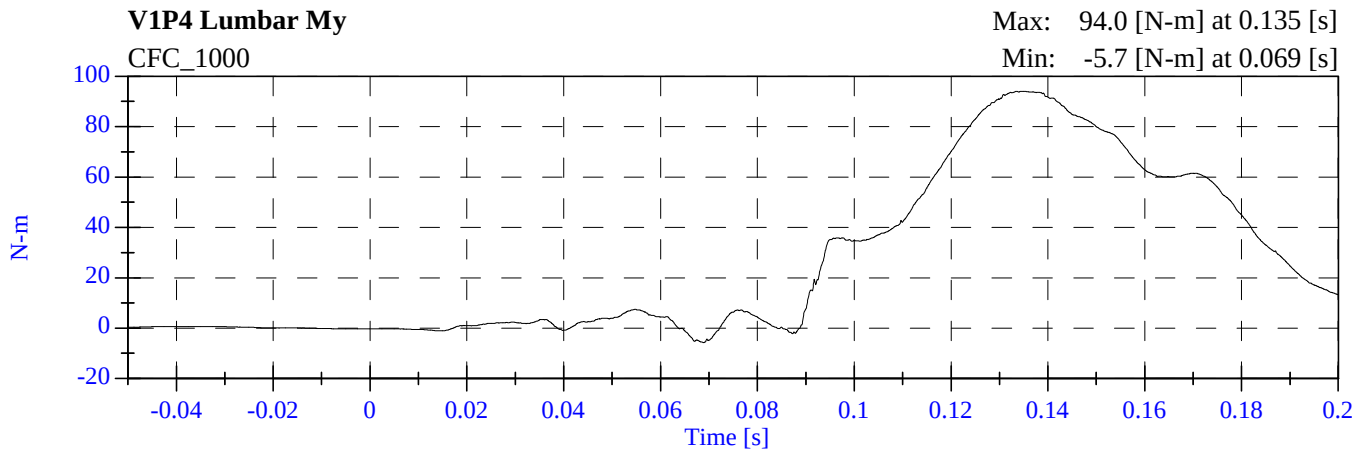
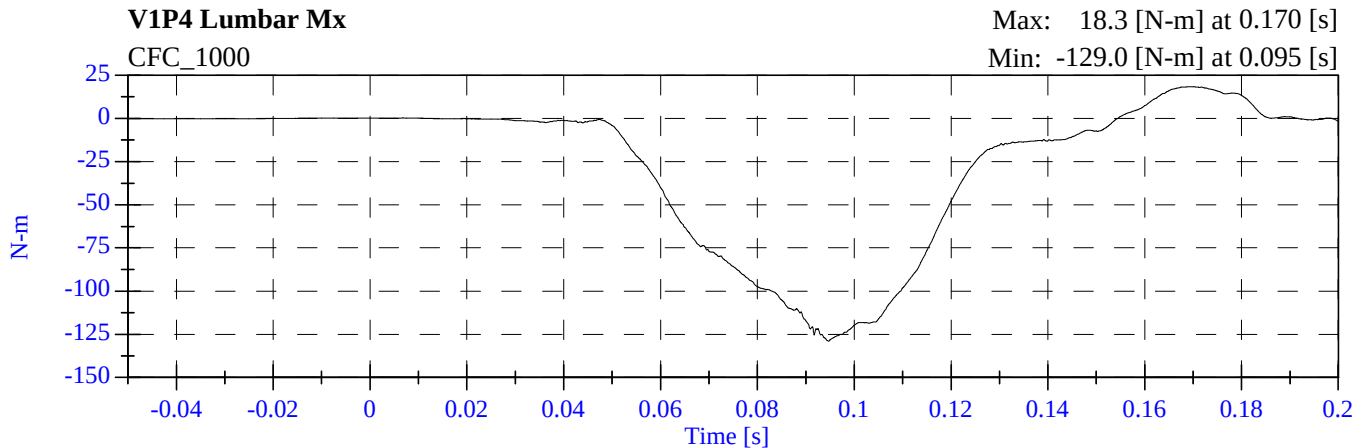


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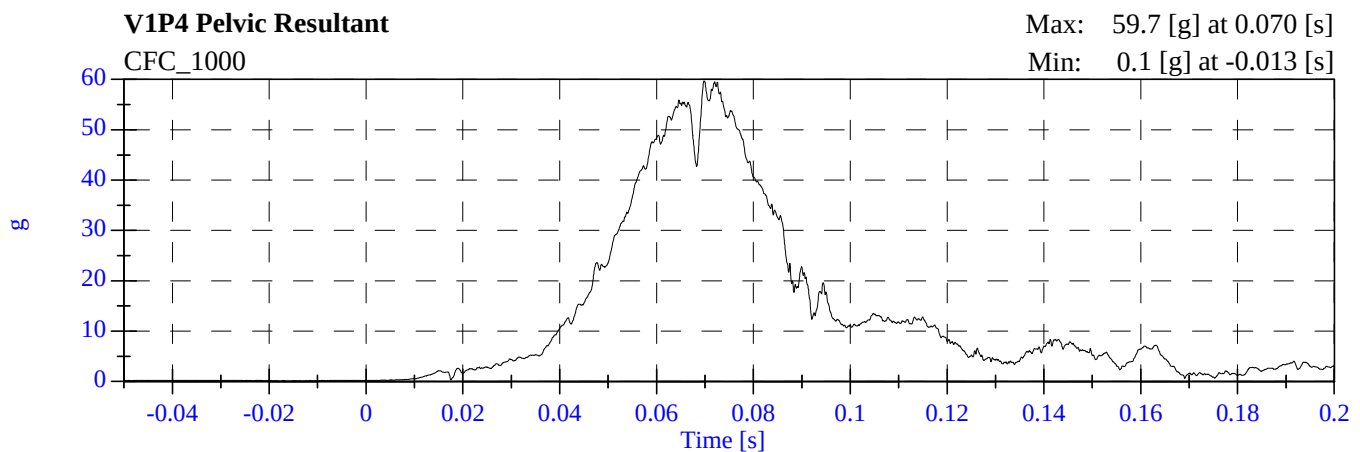
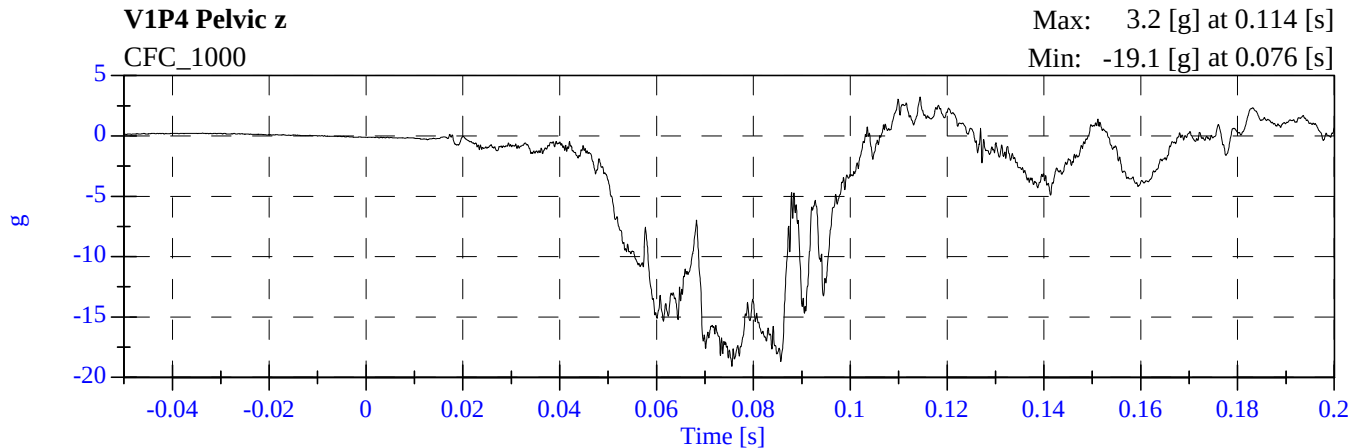
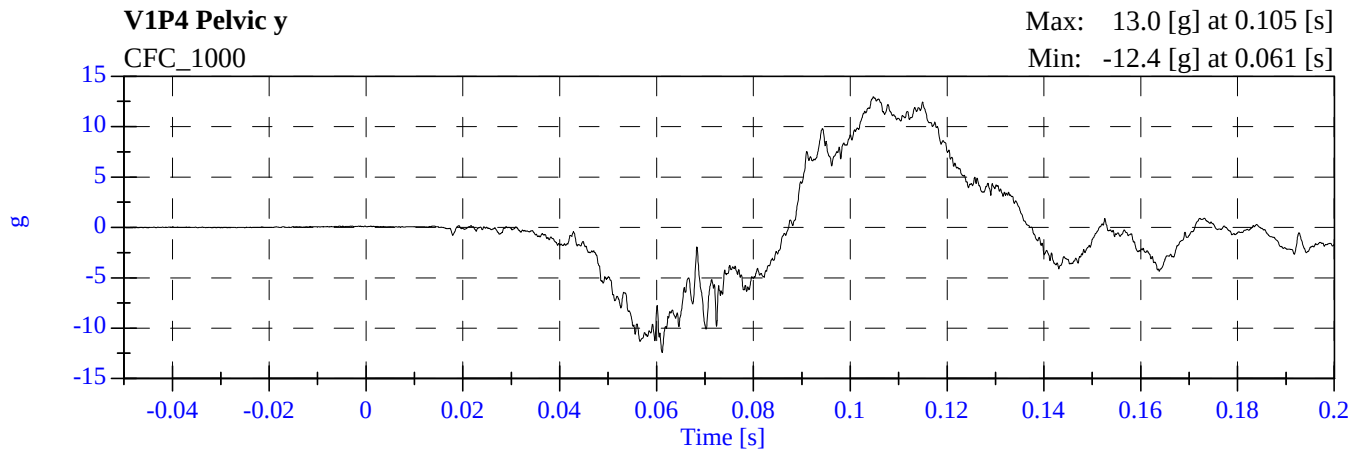
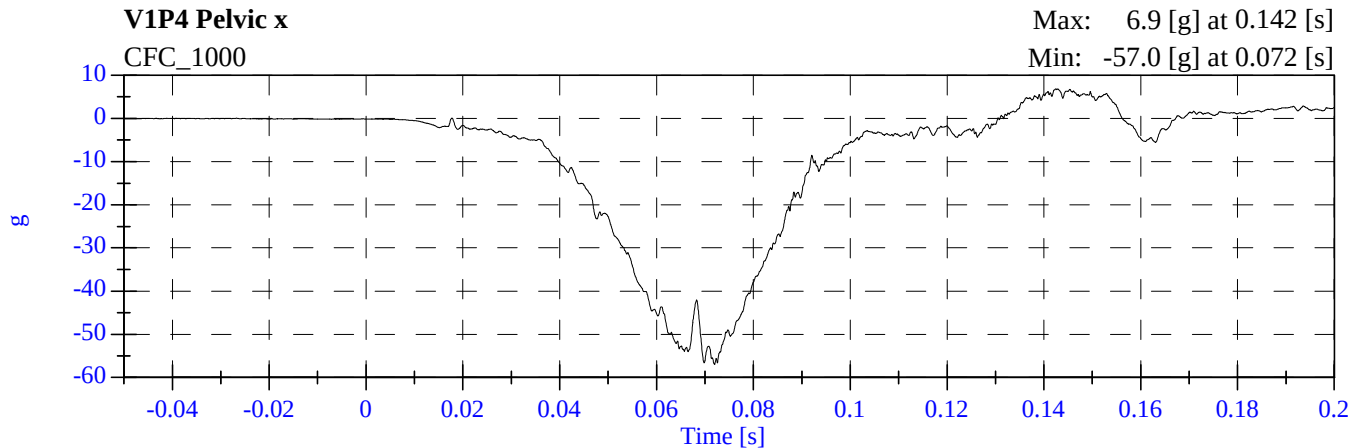
2005 NCAP Test 3 - 2005 Toyota Sienna

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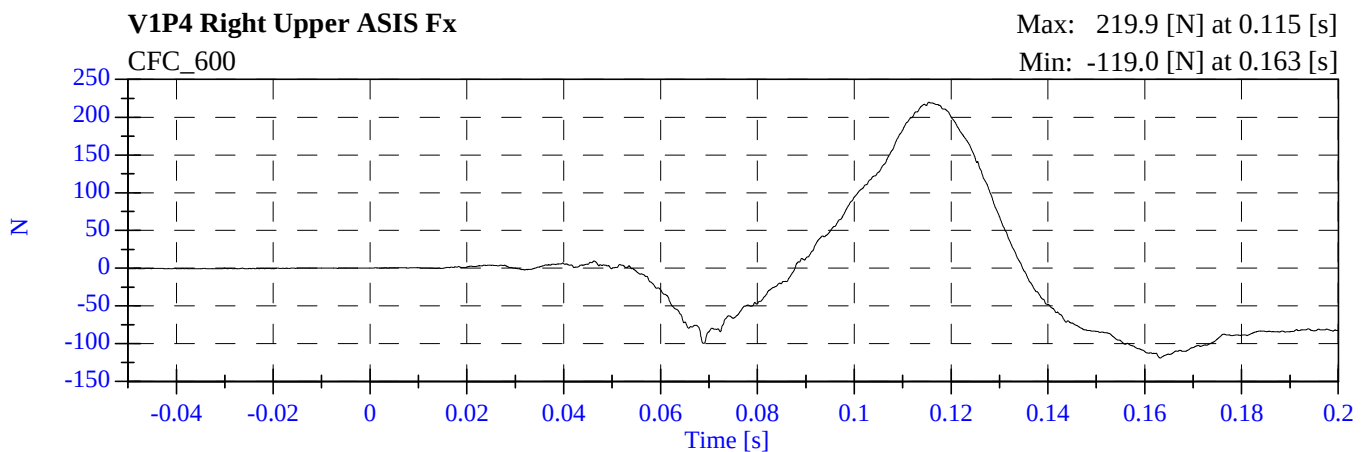
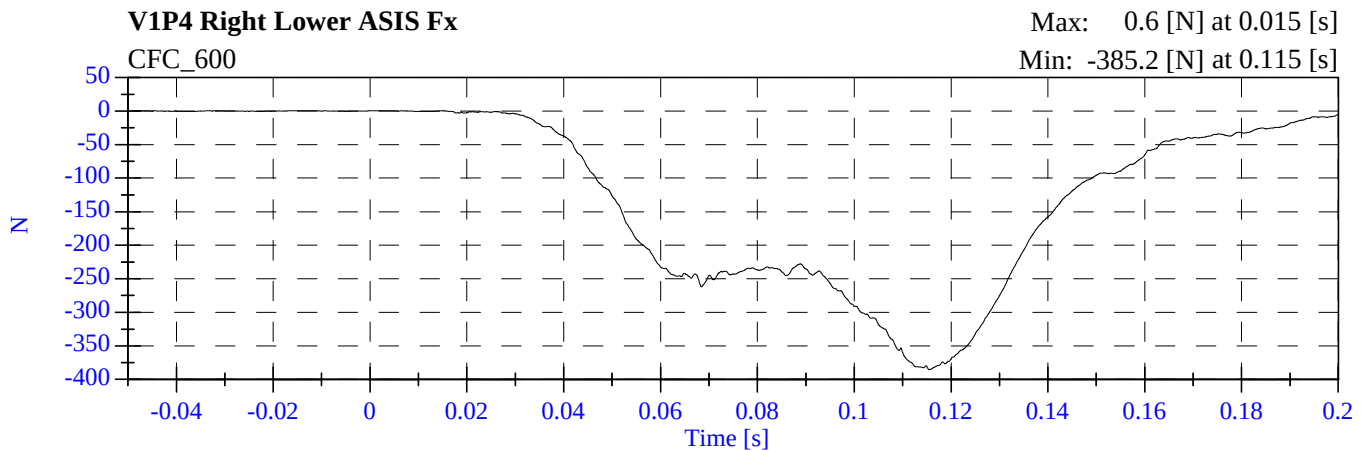
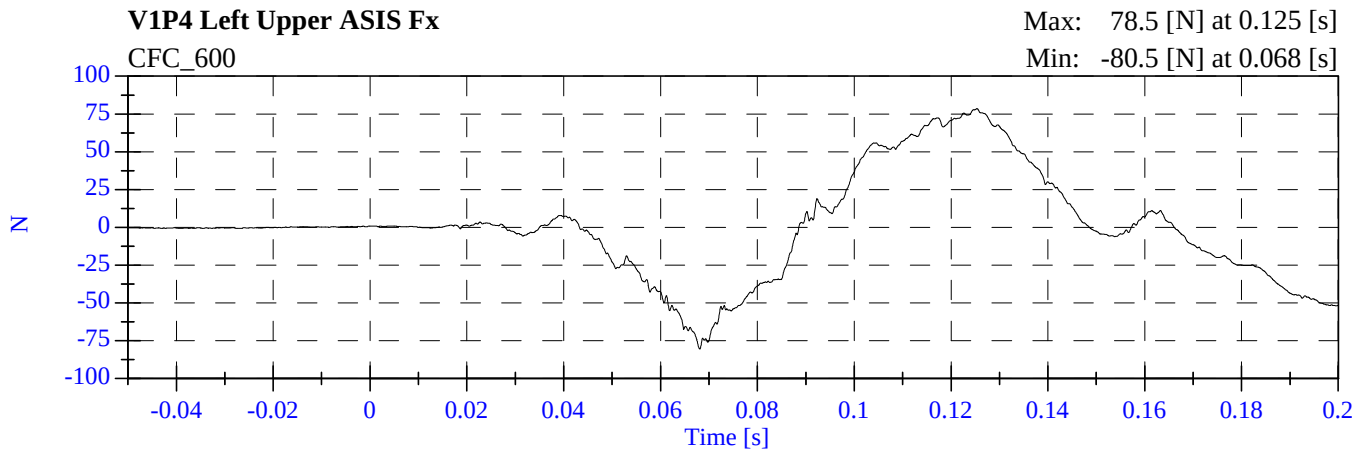
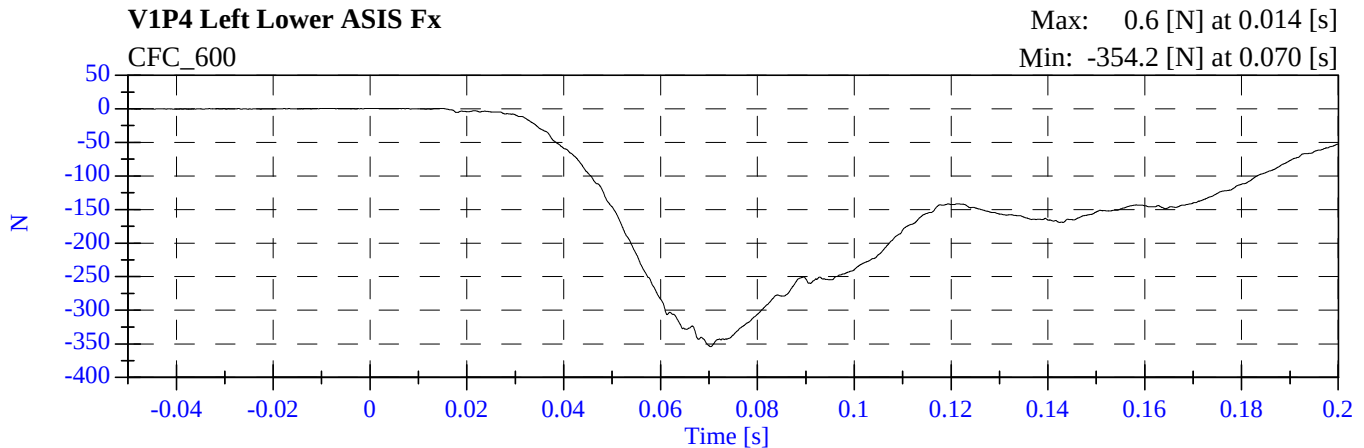


2005 NCAP Test 3 - 2005 Toyota Sienna

M55104 - December 08, 2004

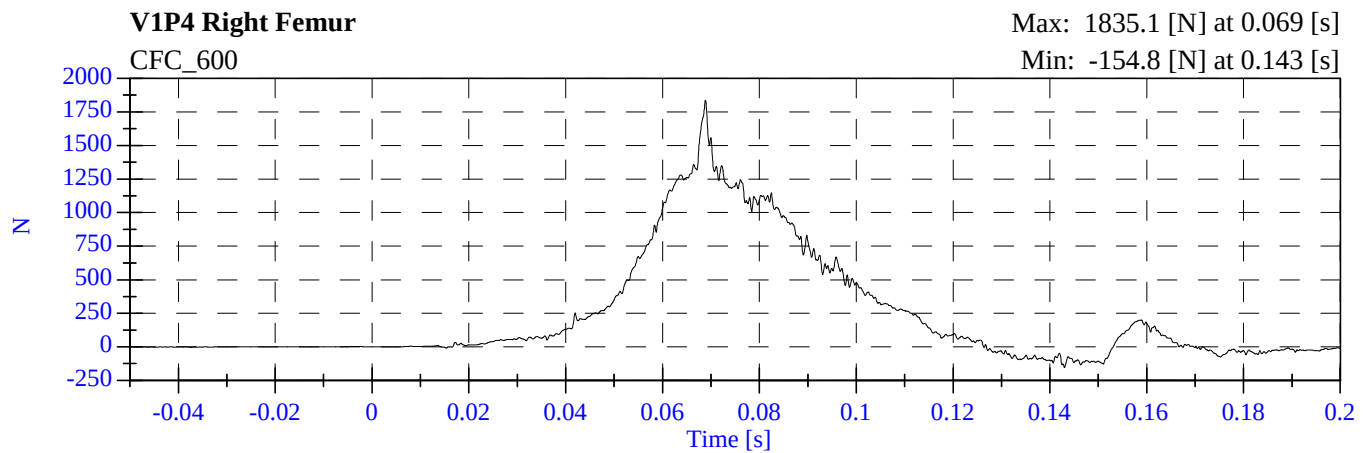
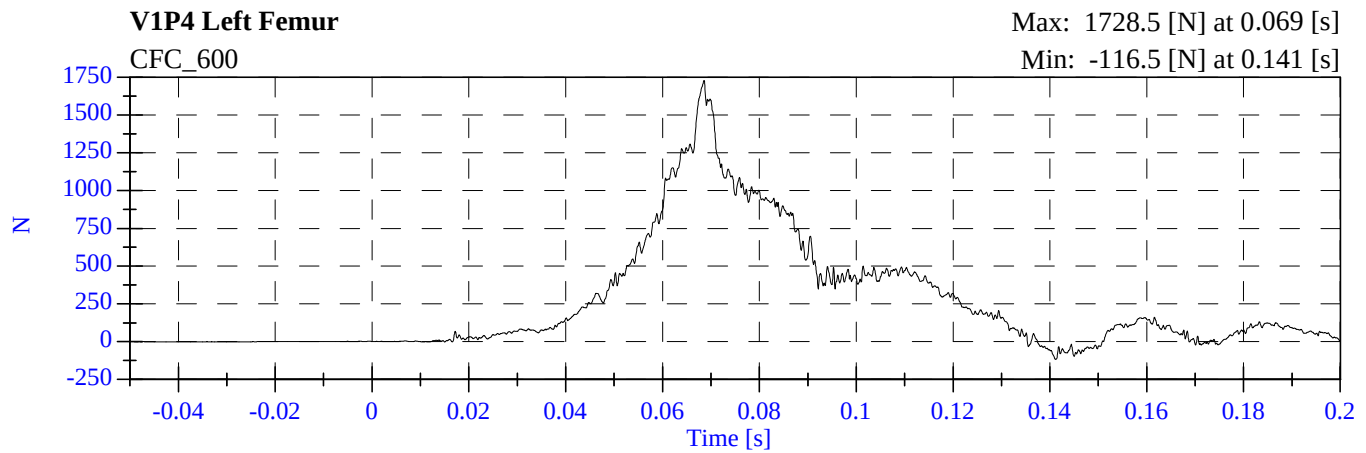


2005 NCAP Test 3 - 2005 Toyota Sienna M55104 - December 08, 2004



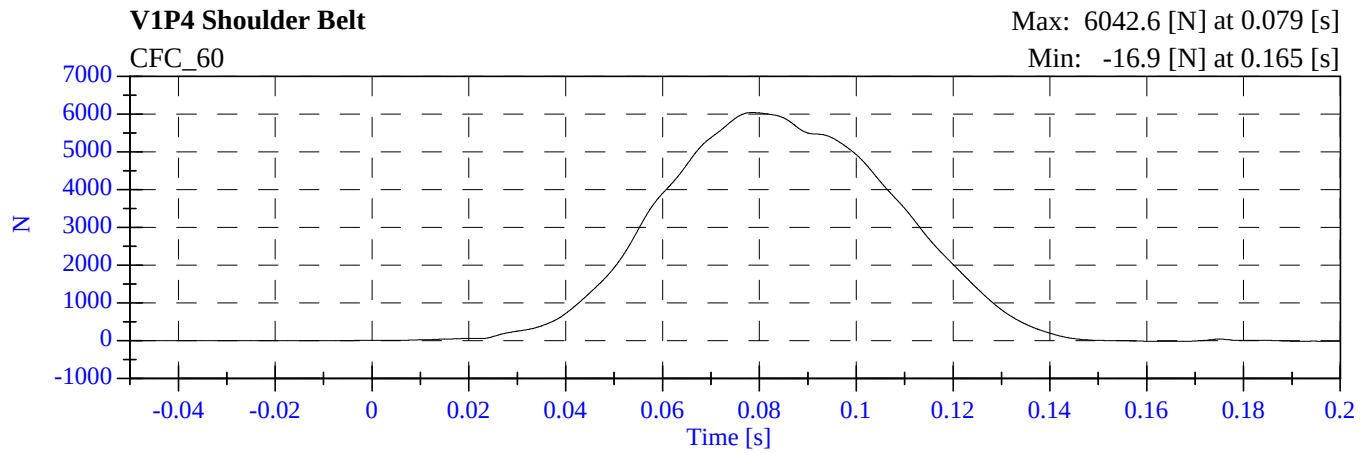
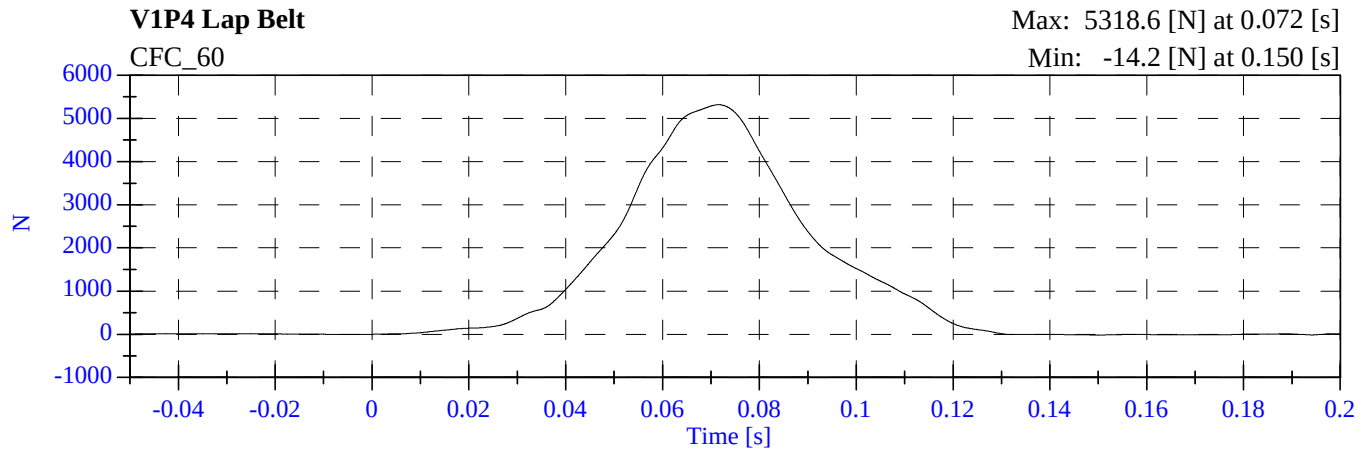
2005 NCAP Test 3 - 2005 Toyota Sienna

M55104 - December 08, 2004



2005 NCAP Test 3 - 2005 Toyota Sienna

M55104 - December 08, 2004



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

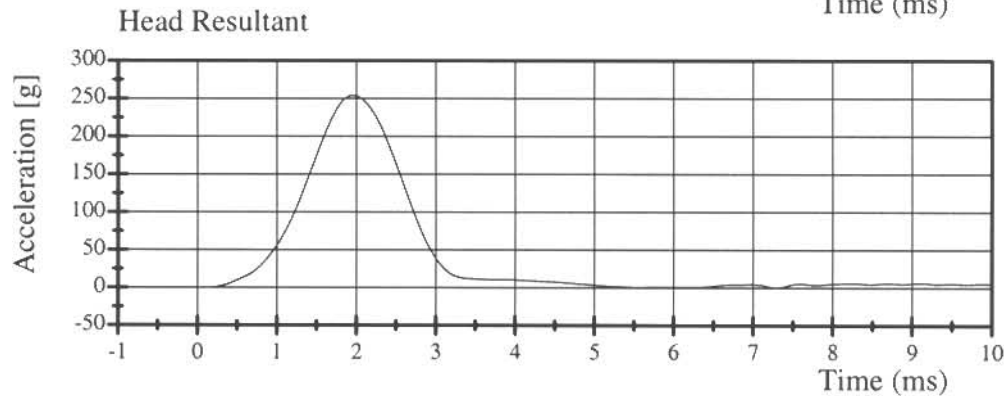
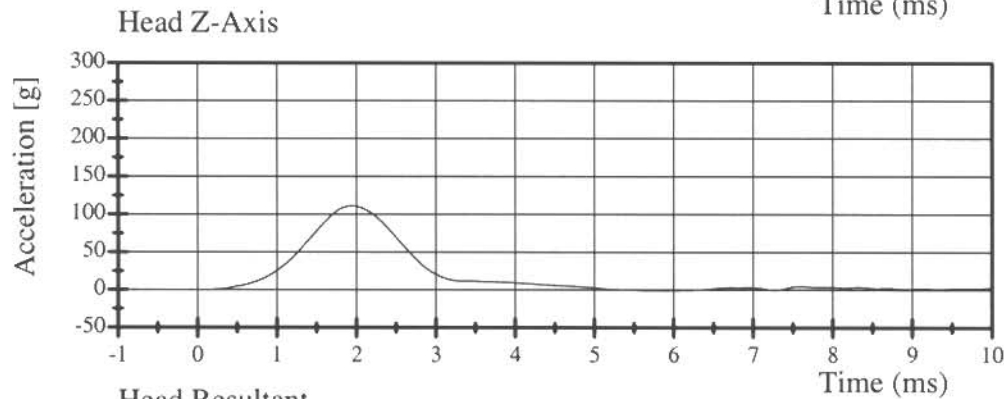
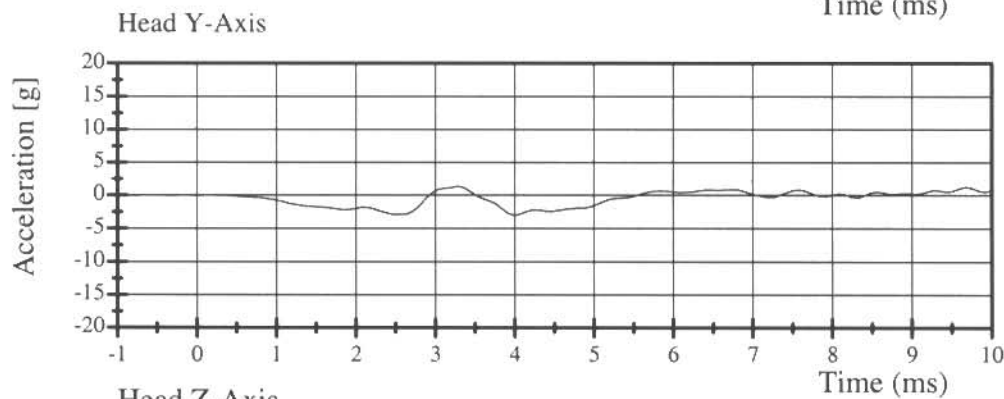
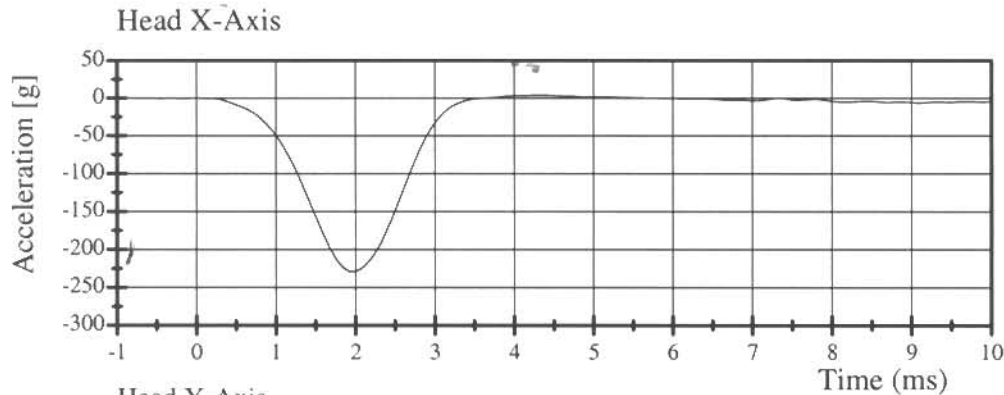


Transportation Research Center Inc.

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



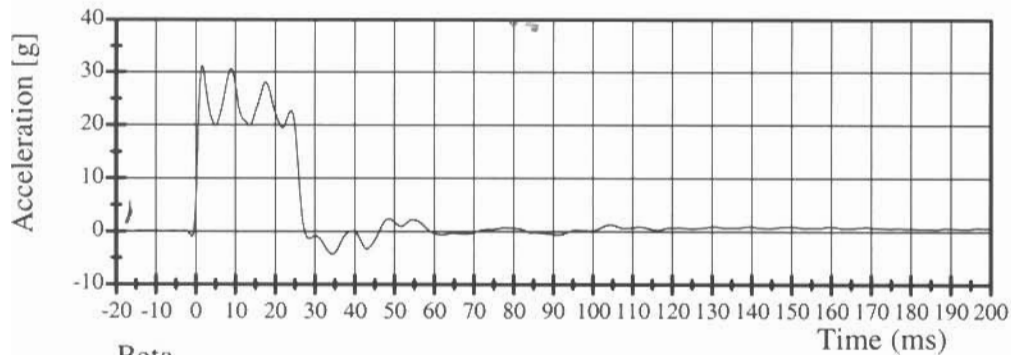
Transportation Research Center Inc.

572P Neck Flexion Test

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

Test Date 08/06/2004

Pendulum Deceleration

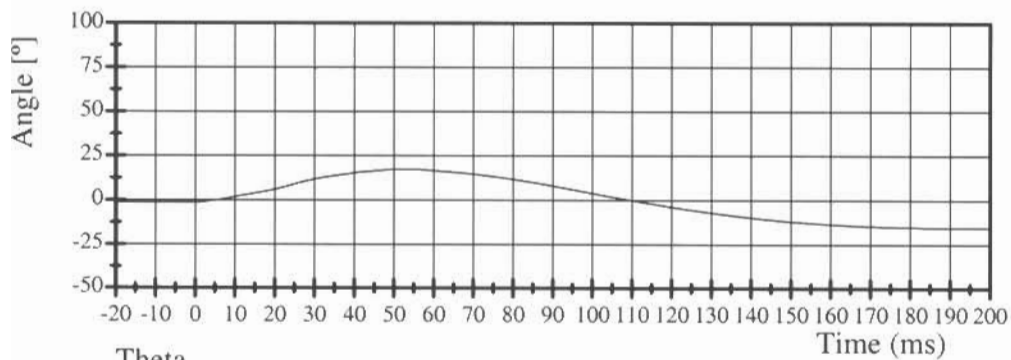


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Max: 31.2 g at 1.7 ms

Min: -4.3 g at 34.4 ms

Beta

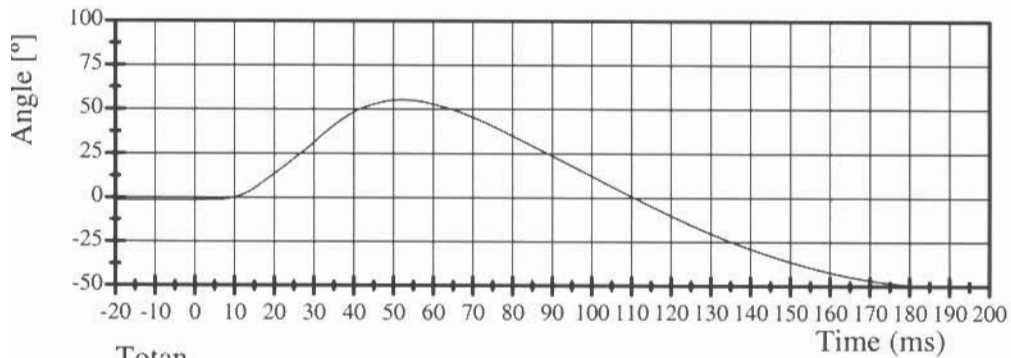


Filter Class: 60

Max: 17.4 ° at 52.0 ms

Min: -15.4 ° at 192.4 ms

Theta

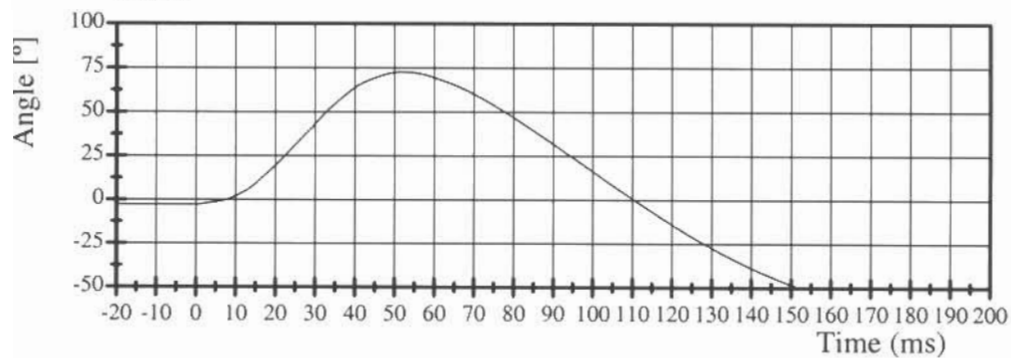


Filter Class: 60

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

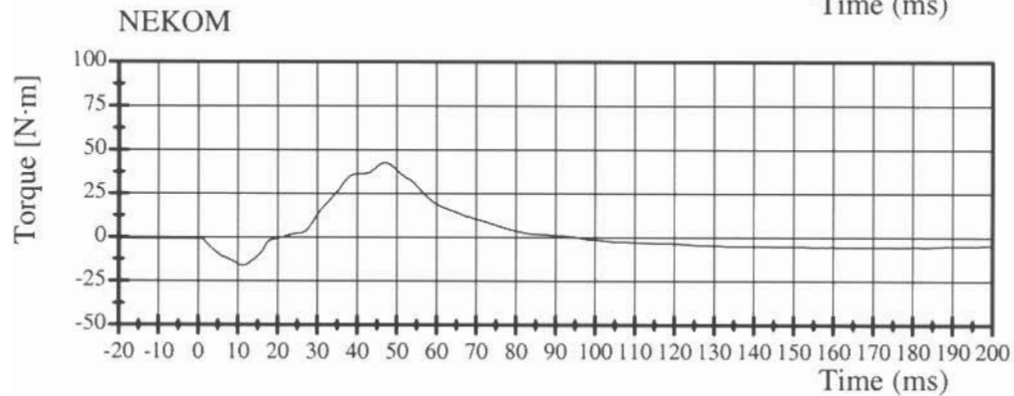
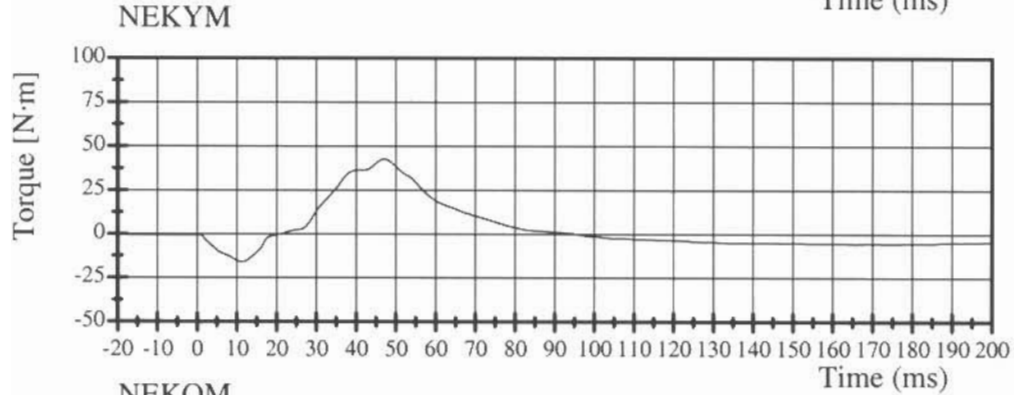
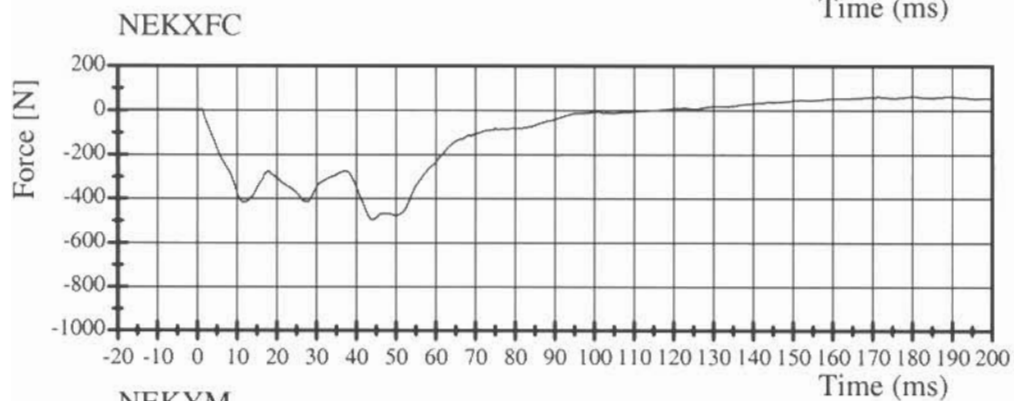
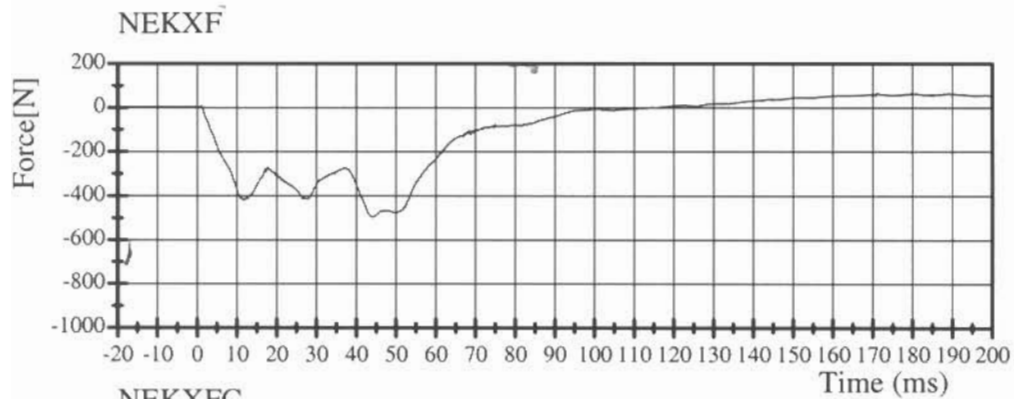
Min: -65.4 ° at 192.3 ms

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

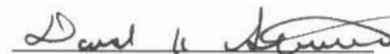
Test meets specifications.

Comments:

Technician



Approved



08.06.2004 10:06:41 1000

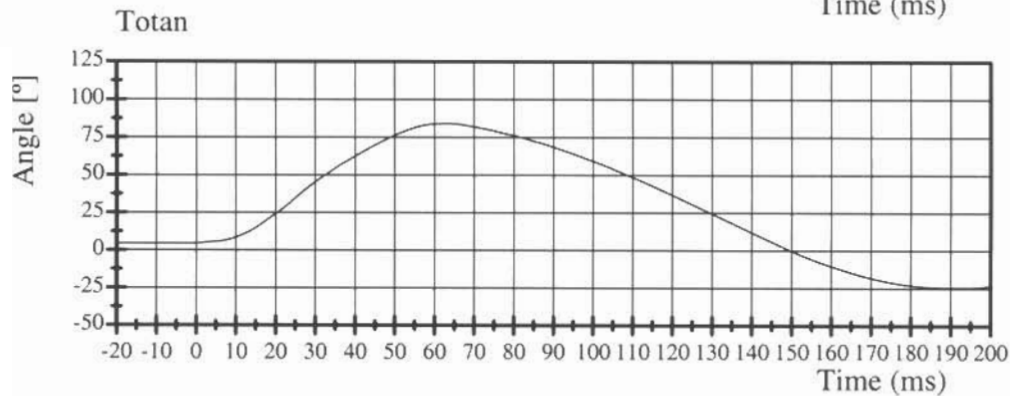
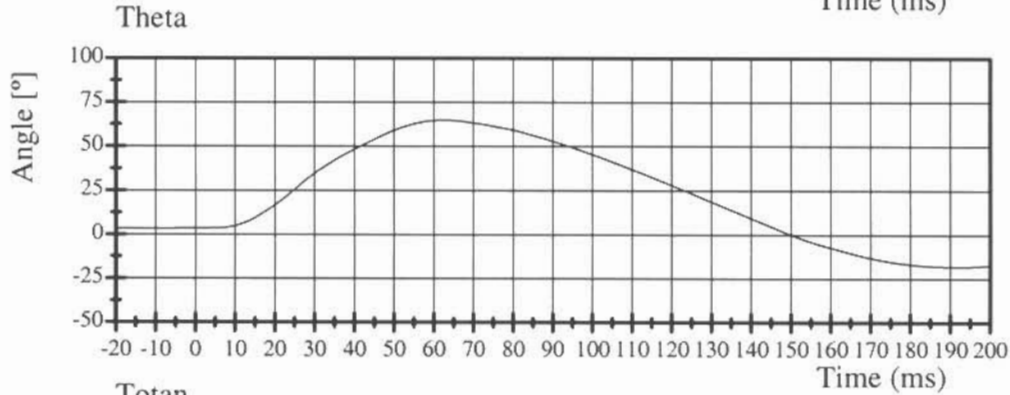
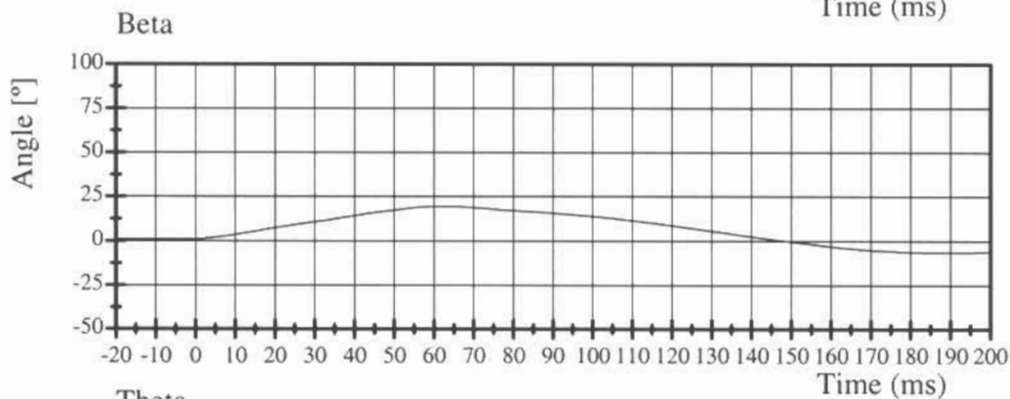
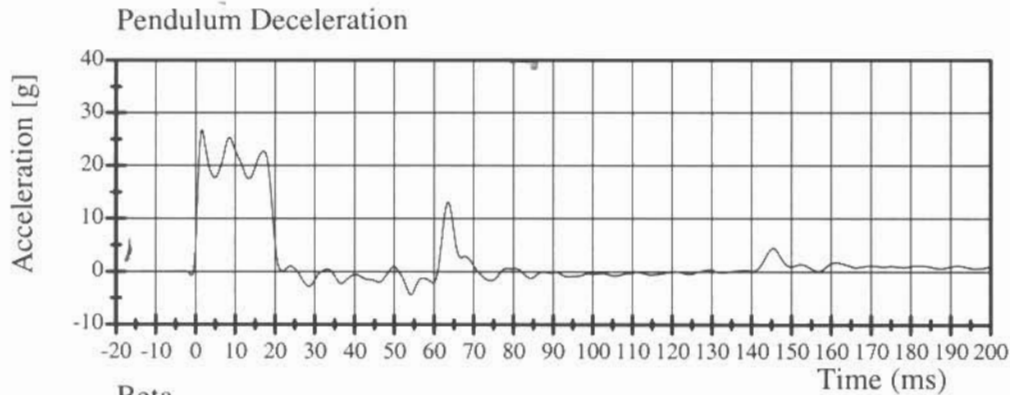


Transportation Research Center Inc.

572P Neck Extension Test

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

Test Date 08/06/2004

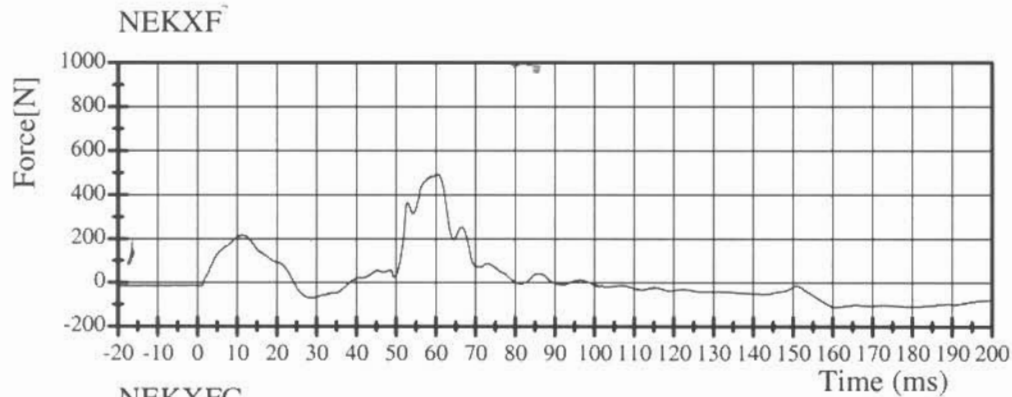


Transportation Research Center Inc.

572P Neck Extension Test

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

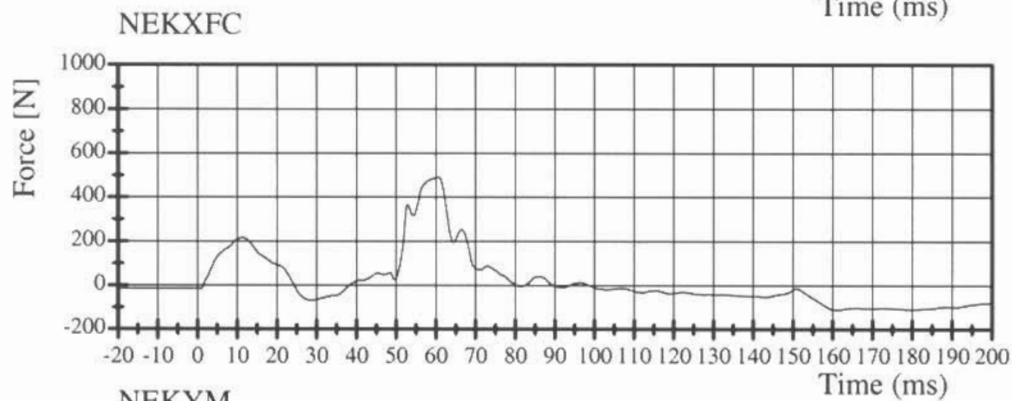
Test Date 08/06/2004



Filter Class: 1000

Max: 491.8 N at 60.8 ms

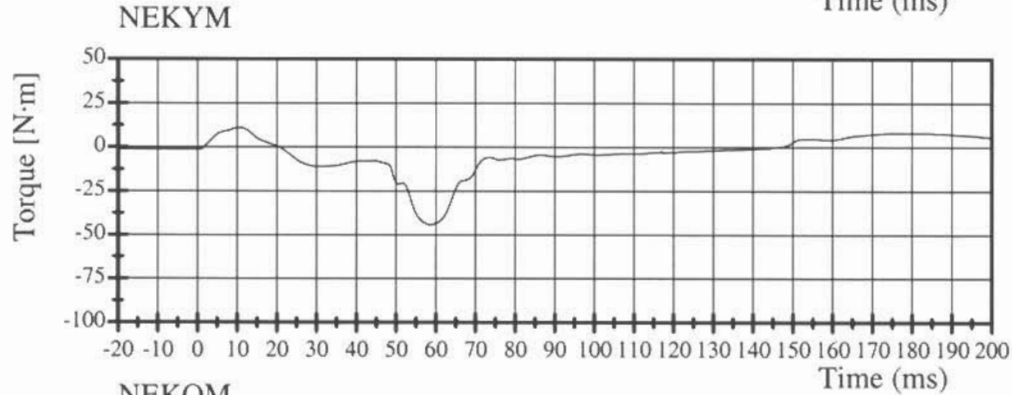
Min: -111.4 N at 161.0 ms



Filter Class: 600

Max: 491.8 N at 60.6 ms

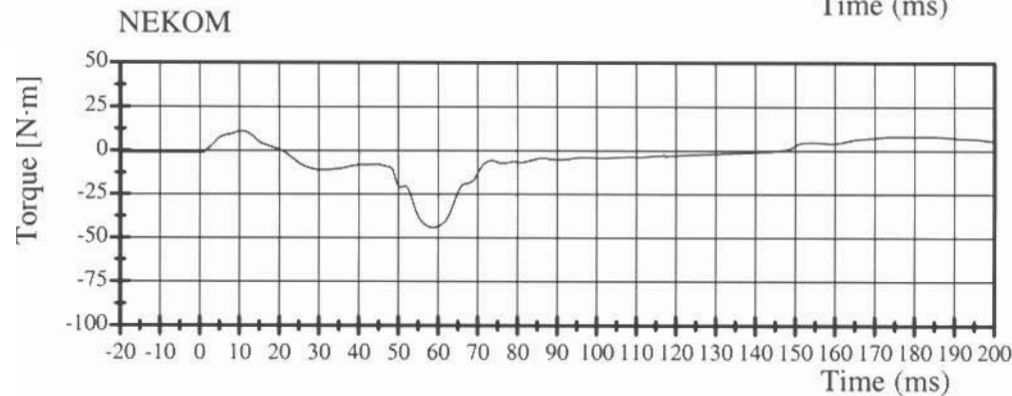
Min: -111.3 N at 161.0 ms



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



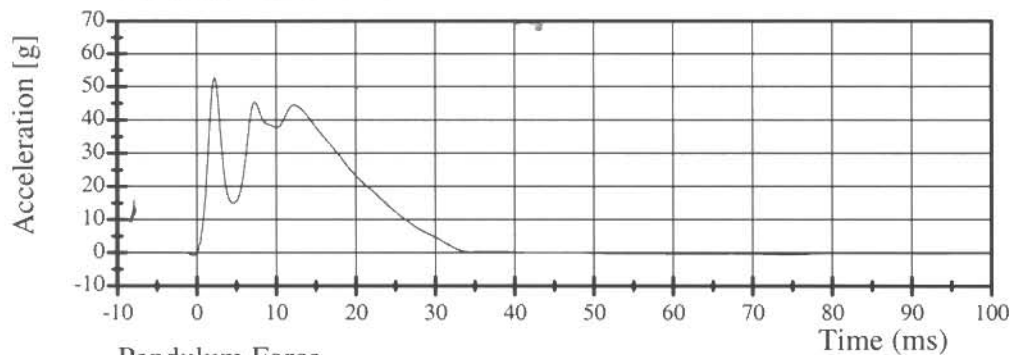
Transportation Research Center Inc.

572P Thorax Test

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

Test Date 08/05/2004

Pendulum Deceleration

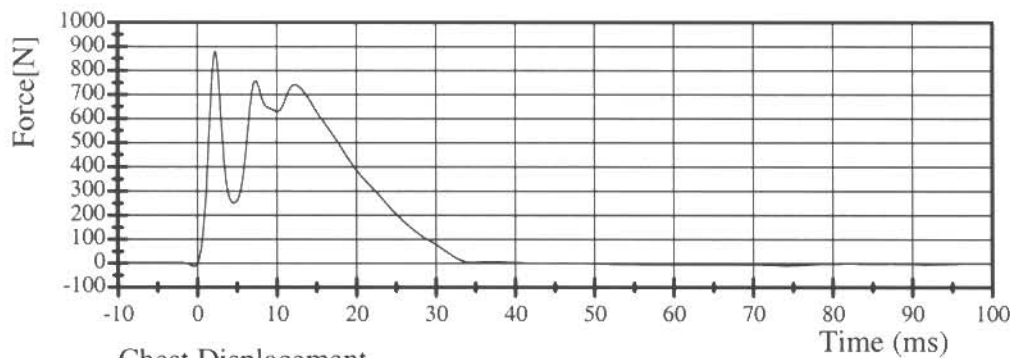


Filter Class: 180

Max: 52.8 g at 2.2 ms

Min: -0.7 g at -0.4 ms

Pendulum Force

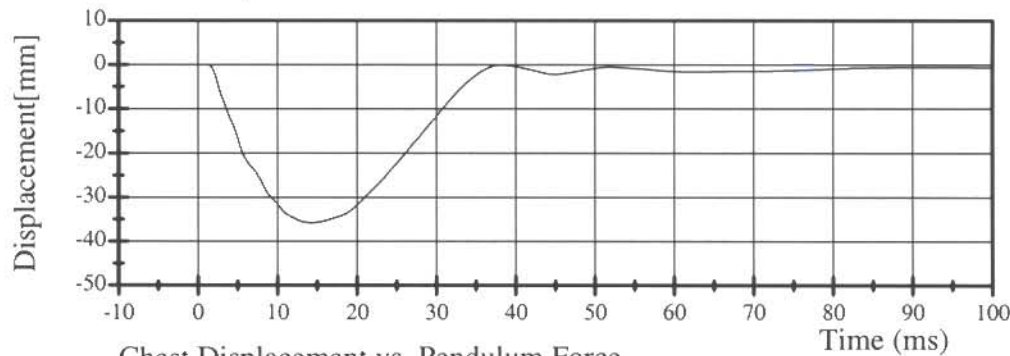


Filter Class: 180

Max: 880.2 N at 2.2 ms

Min: -11.7 N at -0.4 ms

Chest Displacement

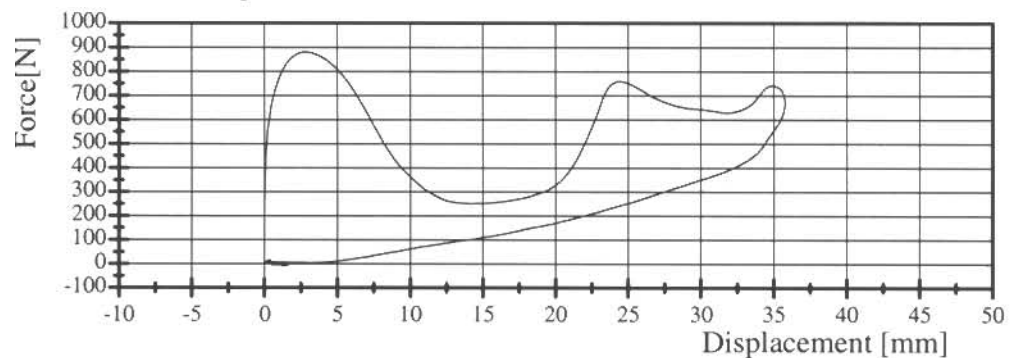


Filter Class: 600

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

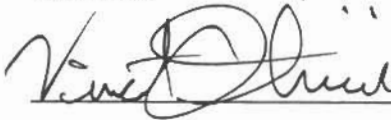
Test Date 07/26/2004

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

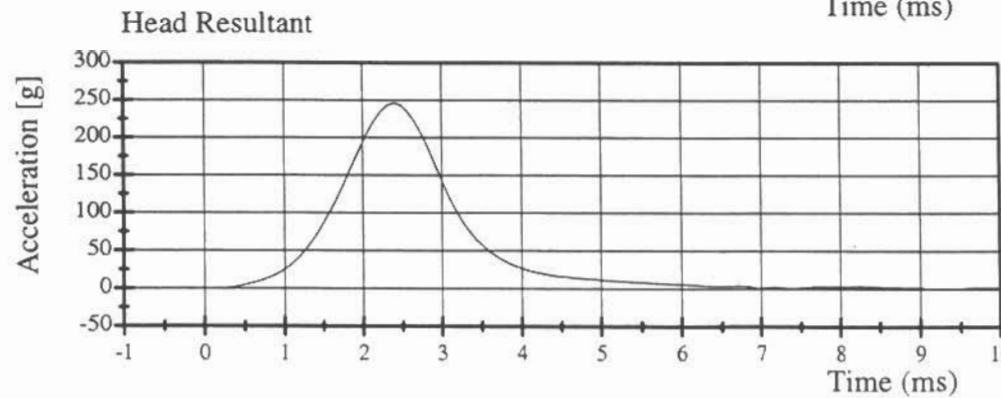
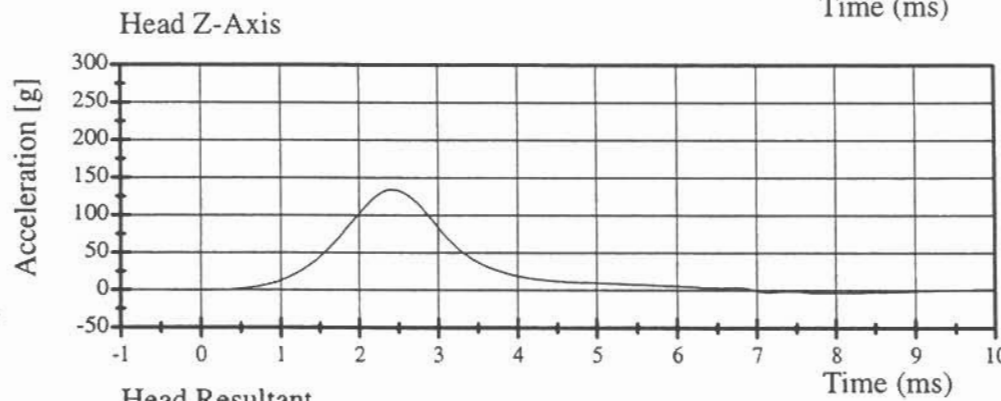
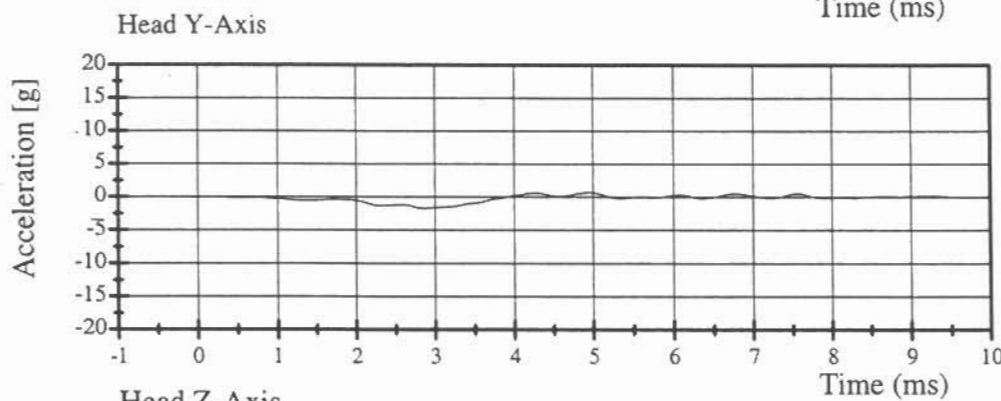
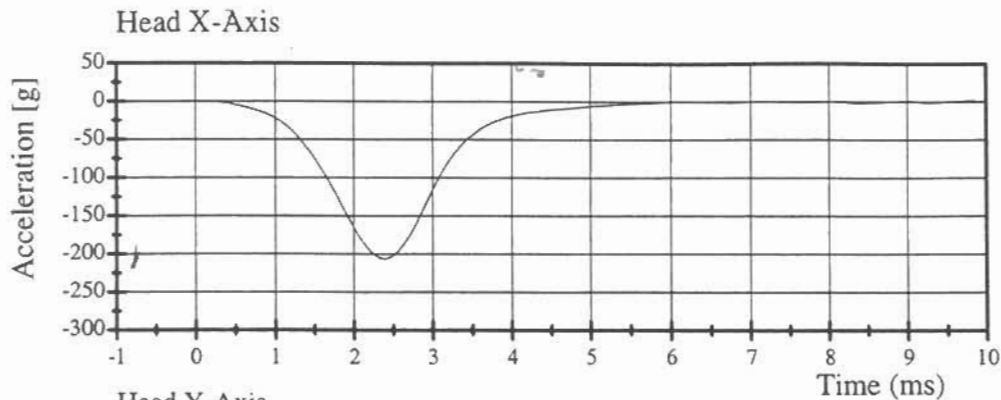


Transportation Research Center Inc.

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

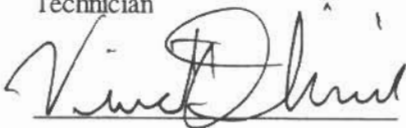
Test Date 07/29/2004

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



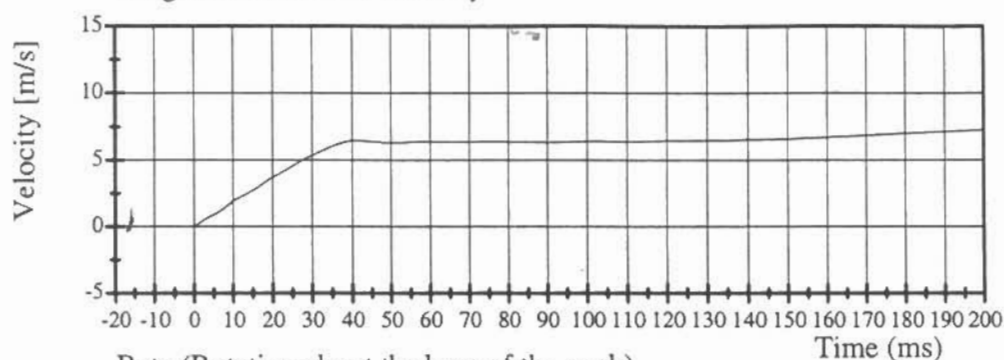
Transportation Research Center Inc.

Neck Flexion Test

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

Test Date 07/29/2004

Integrated Pendulum Velocity

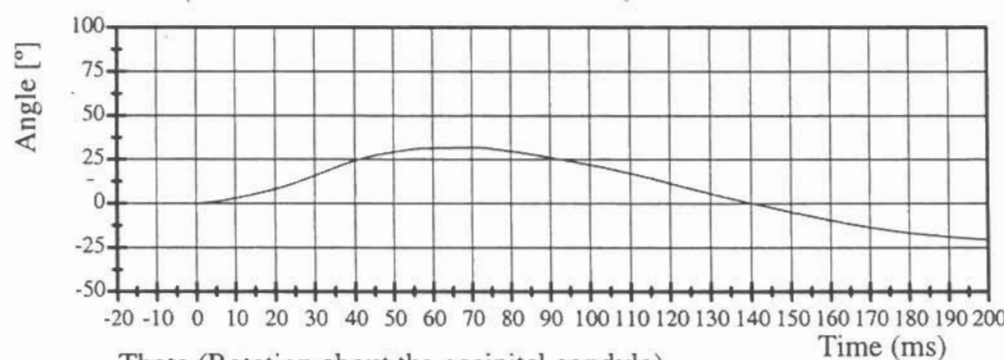


Filter Claßs: 180

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)

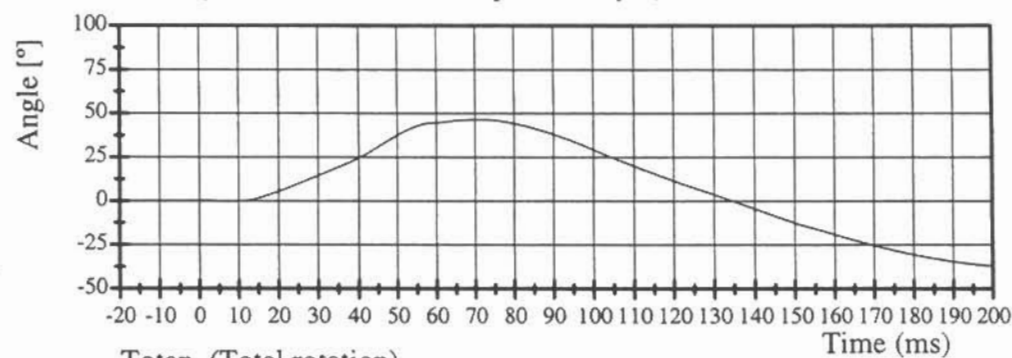


Filter Class: 60

Max: 32.0 ° at 68.8 ms

Min: -21.0 ° at 212.4 ms

Theta (Rotation about the occipital condyle)

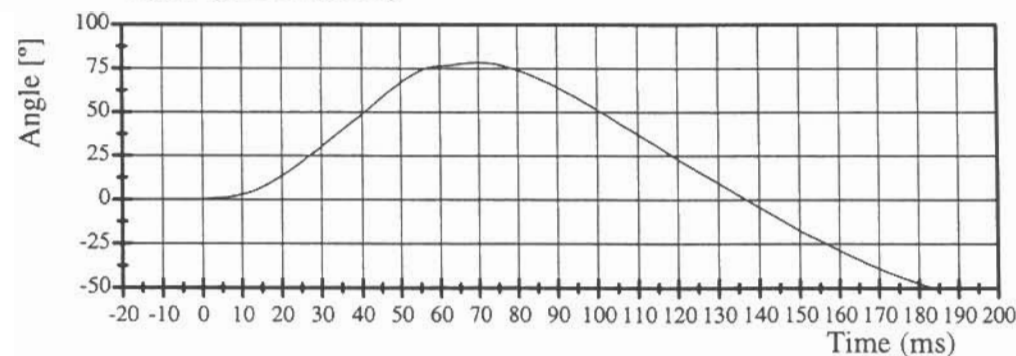


Filter Class: 60

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

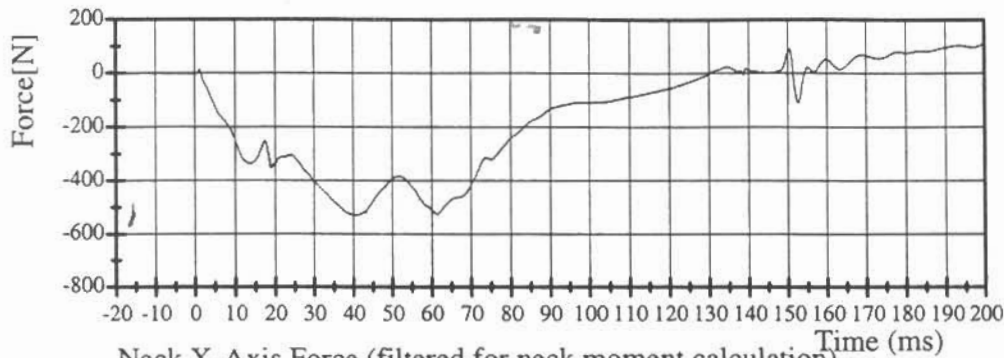
Transportation Research Center Inc.

Neck Flexion Test

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

Test Date 07/29/2004

Neck X-Axis Force

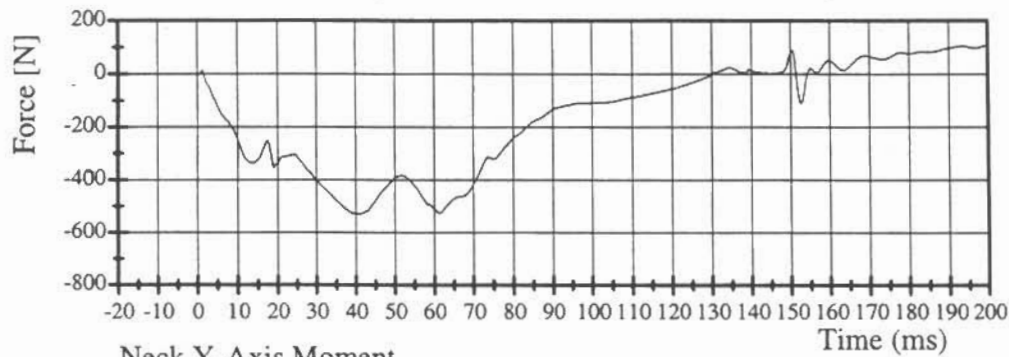


Filter Class: 1000

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)

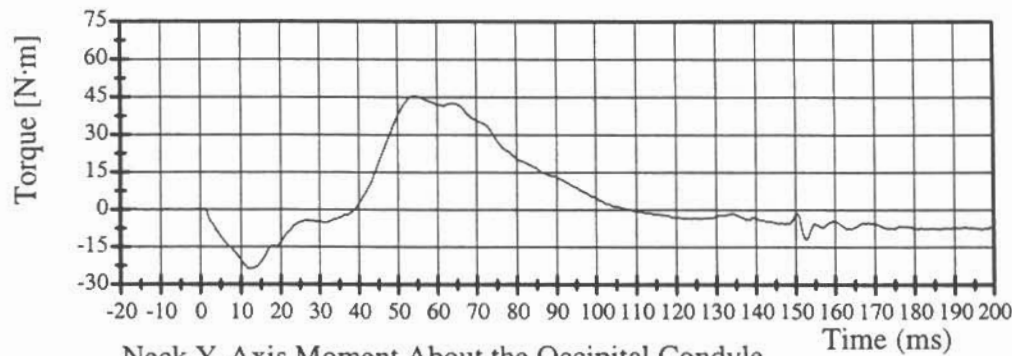


Filter Class: 600

Max: 110.2 N at 201.4 ms

Min: -529.2 N at 40.6 ms

Neck Y-Axis Moment

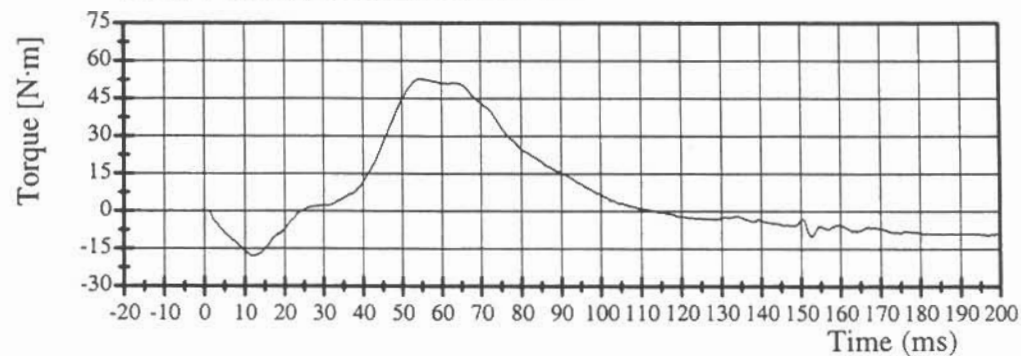


Filter Class: 600

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



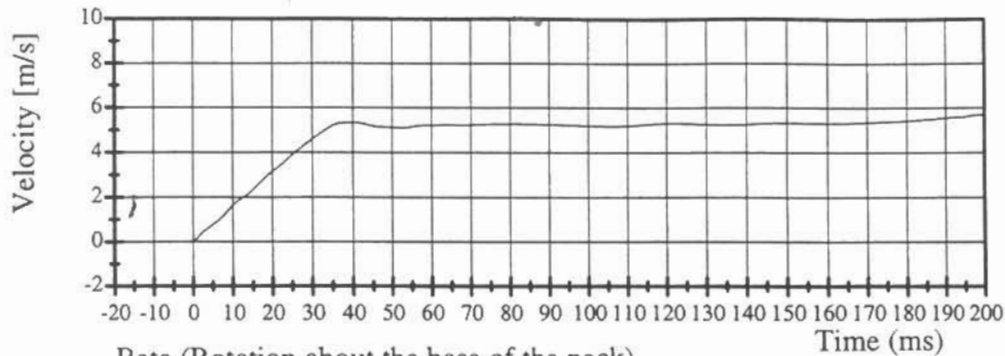
Transportation Research Center Inc.

Neck Extension Test

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

Test Date 07/29/2004

Integrated Pendulum Velocity

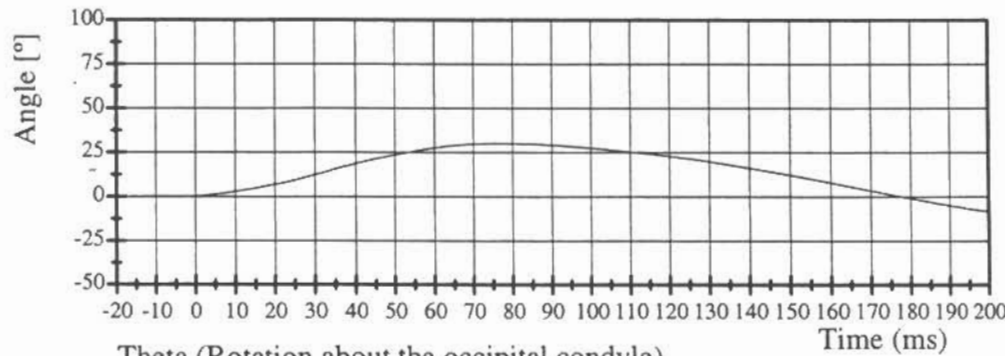


Filter Class: 180

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)

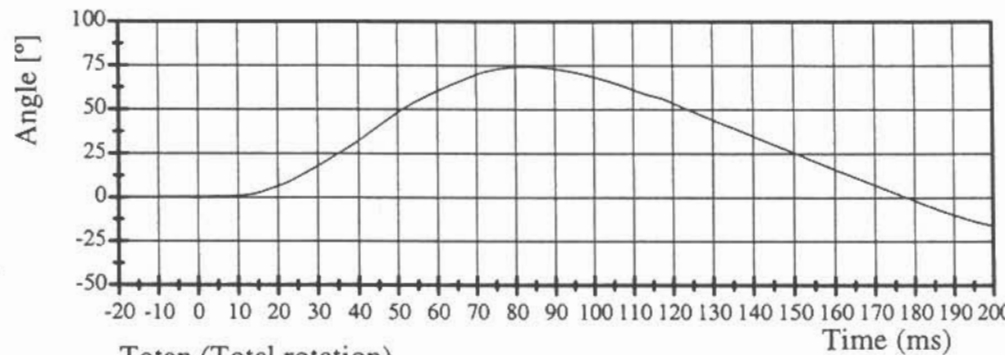


Filter Class: 60

Max: 30.0 ° at 73.8 ms

Min: -12.9 ° at 232.6 ms

Theta (Rotation about the occipital condyle)

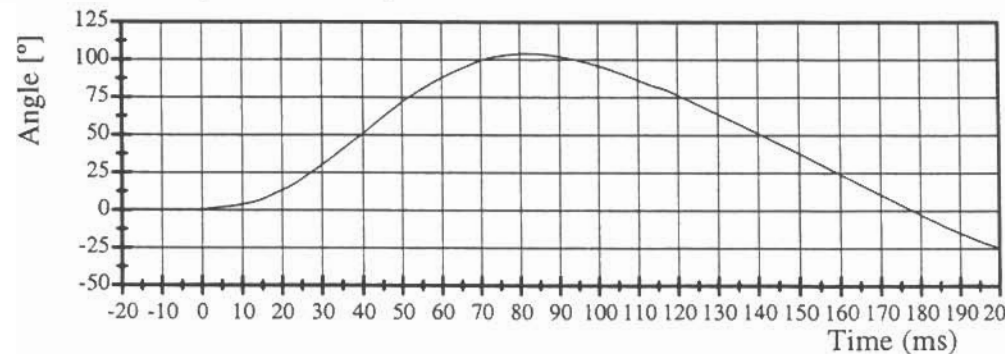


Filter Class: 60

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

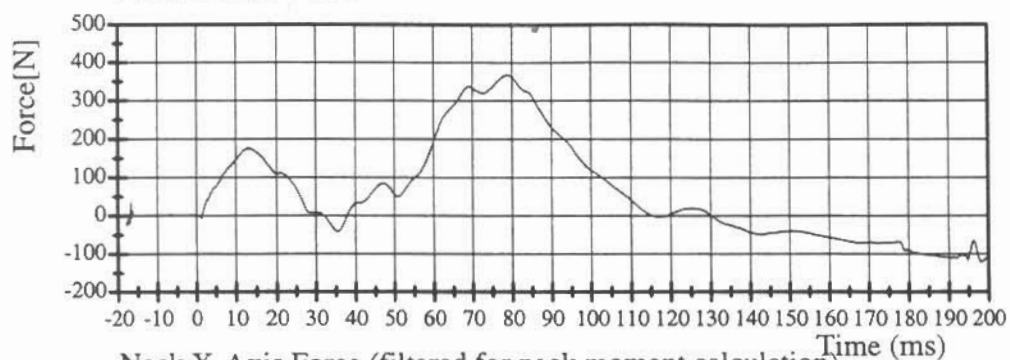
Transportation Research Center Inc.

Neck Extension Test

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

Test Date 07/29/2004

Neck X-Axis Force

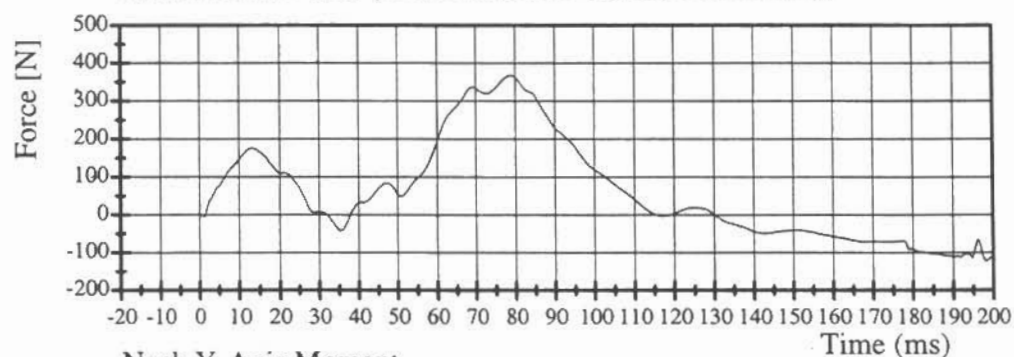


Filter Class: 1000

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)

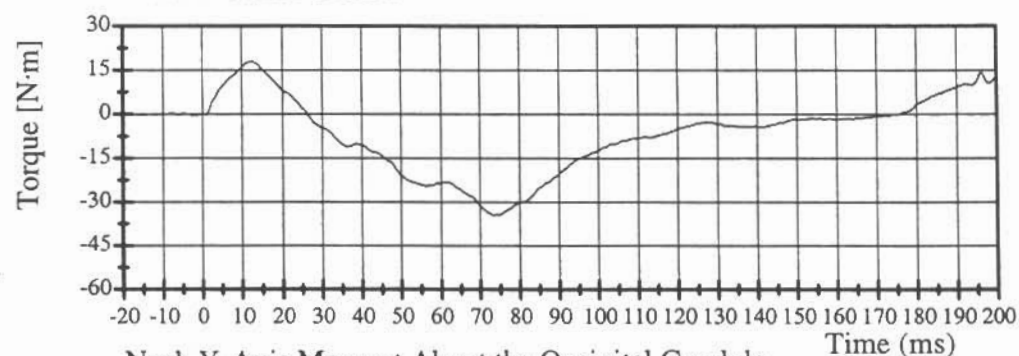


Filter Class: 600

Max: 367.4 N at 78.9 ms

Min: -140.3 N at 211.0 ms

Neck Y-Axis Moment

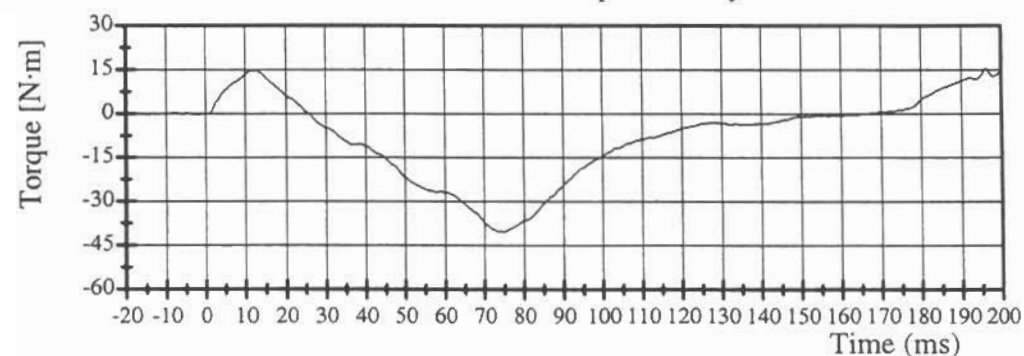


Filter Class: 600

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

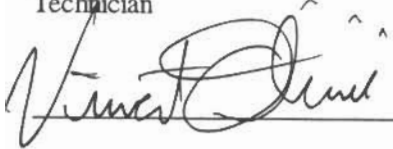
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
Pendulum Velocity	5.88 - 6.12 m/s	5.88	Yes
Maximum Chest Deflection	-47.0 - (-39.0) mm	-42.5 mm	Yes
Peak Impact Probe Force Within Compression Corridor	1830 - 2330 N	2312 N	Yes
Internal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

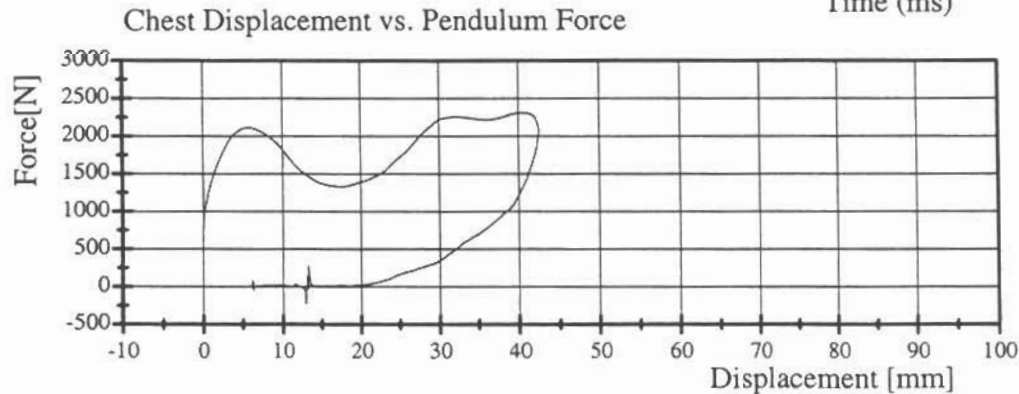
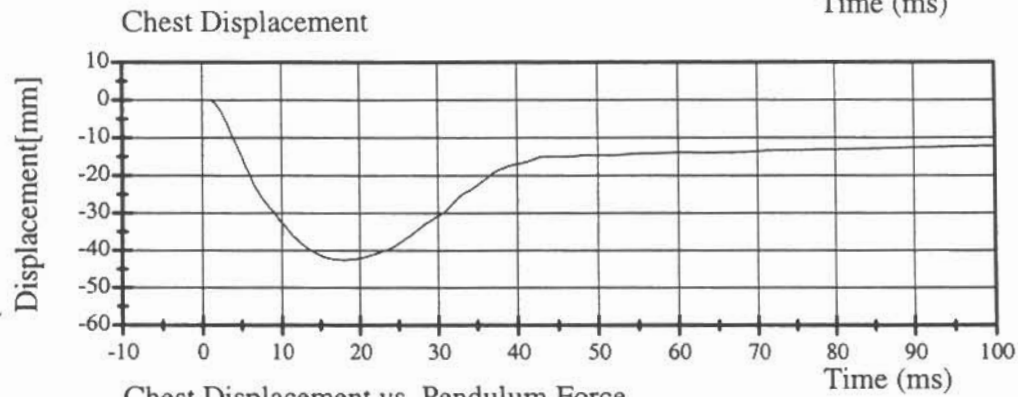
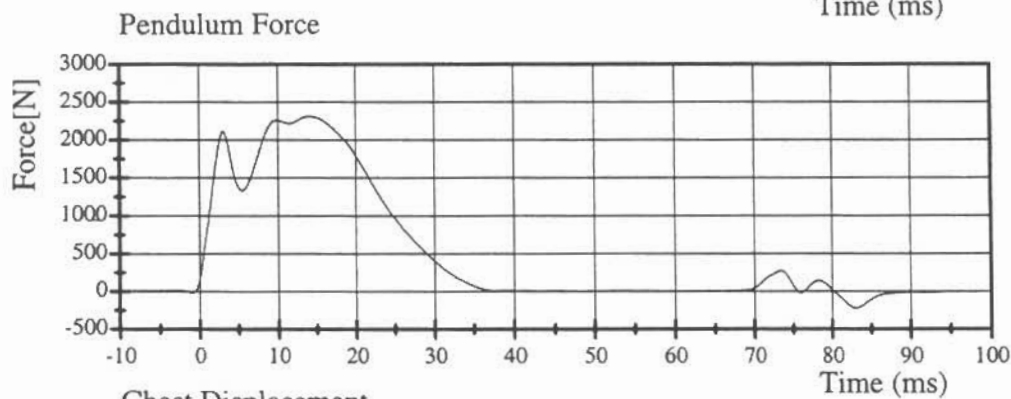
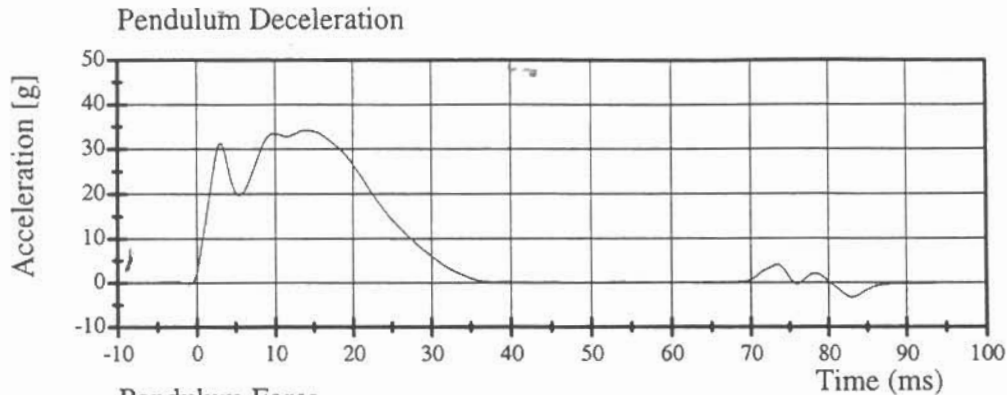


Transportation Research Center Inc.

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



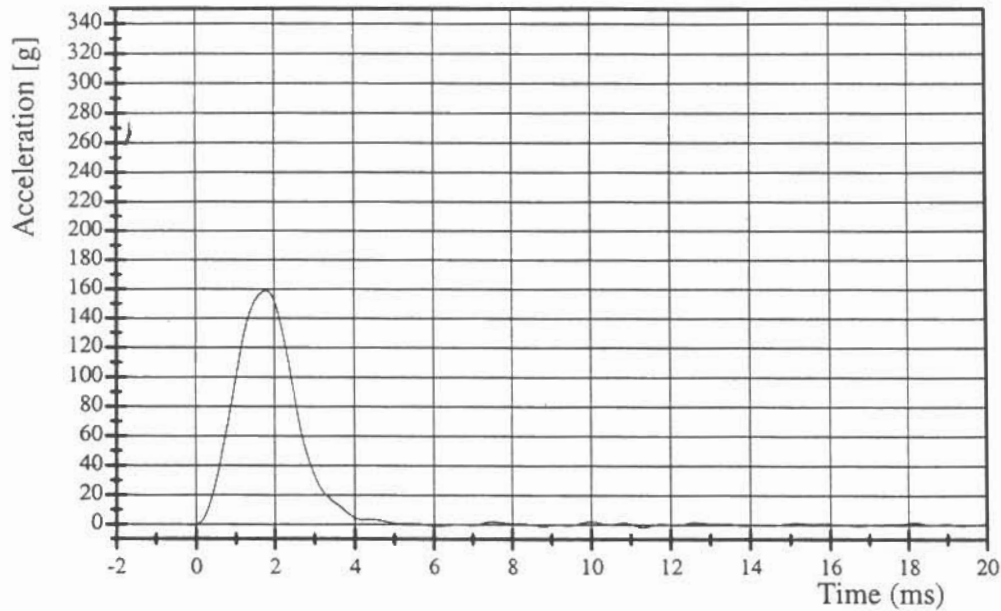
Transportation Research Center Inc.

Left Knee Test

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

Test Date 07/30/2004

Pendulum Deceleration

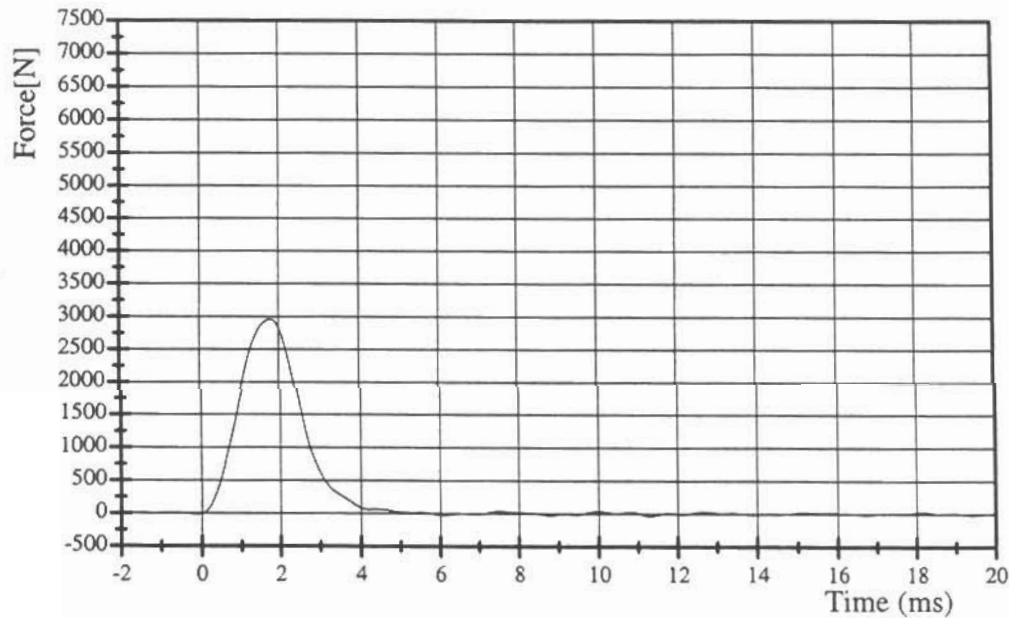


Filter Class: 600

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

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



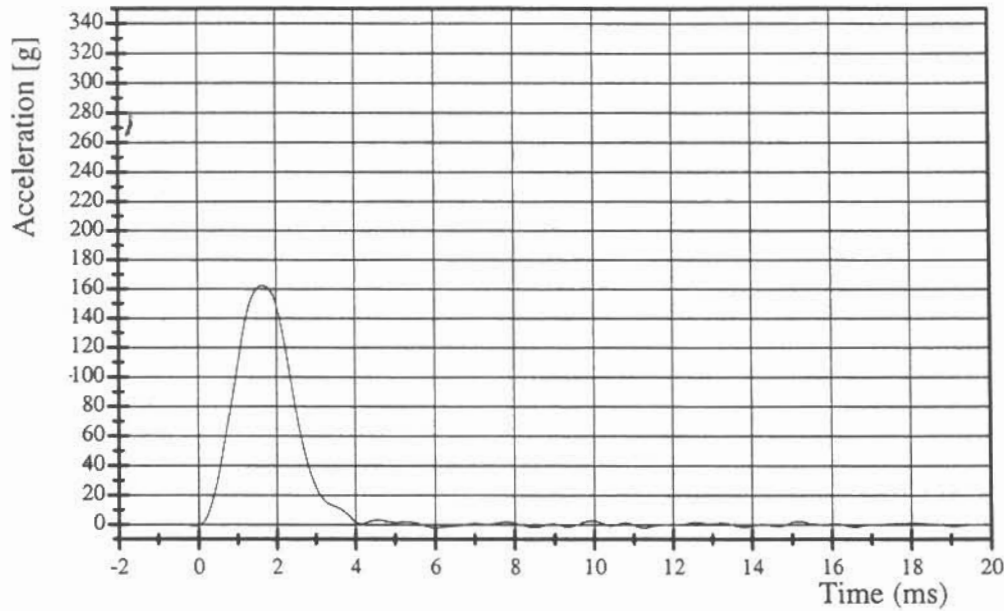
Transportation Research Center Inc.

Right Knee Test

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

Test Date 07/30/2004

Pendulum Deceleration

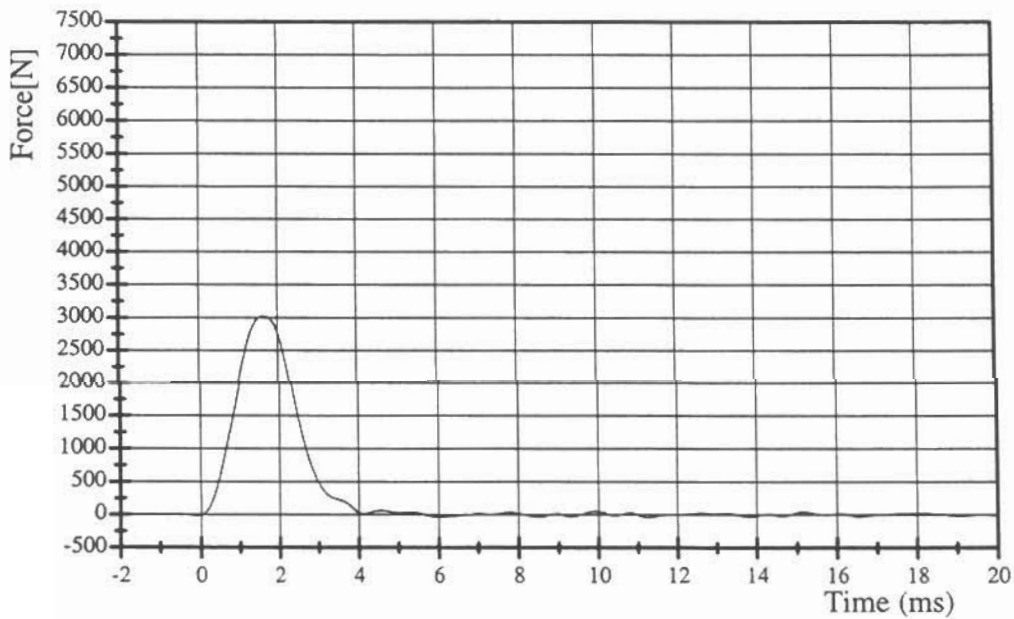


Filter Class: 600

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	22-Jul-04
HEAD AY	AC-J19501	ENDEVCO	21-Jul-04
HEAD AZ	AC-J27466	ENDEVCO	22-Jul-04
UPPER NECK FX	LC-210FX	DENTON	2-Aug-04
UPPER NECK FY	LC-210FY	DENTON	2-Aug-04
UPPER NECK FZ	LC-210FZ	DENTON	2-Aug-04
UPPER NECK MX	LC-210MX	DENTON	2-Aug-04
UPPER NECK MY	LC-210MY	DENTON	2-Aug-04
UPPER NECK MZ	LC-210MZ	DENTON	2-Aug-04
CHEST AX	AC-J20047	ENDEVCO	22-Jul-04
CHEST AY	AC-CC92H	ENDEVCO	22-Jul-04
CHEST AZ	AC-J29006	ENDEVCO	22-Jul-04
CHEST DISPLACEMENT X	DS-040	SERVO	2-Aug-04
PELVIS AX	AC-01G18-F09	ENTRAN	27-Oct-04
PELVIS AY	AC-J27525	ENDEVCO	22-Jul-04
PELVIS AZ	AC-J17988	ENDEVCO	22-Jul-04
TETHER BELT LOAD	LC-170	FIRST TECHNOLOGY	1-Nov-04
LATCH BELT LOAD	LC-174	FIRST TECHNOLOGY	1-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-706	LEBOW	1-Nov-04
TORSO BELT LOAD	LC-156	FIRST TECHNOLOGY	1-Nov-04

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

CRS INSTRUMENTATION

	CRS Accelerometers		
	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
P3 CRS AX	AC-J37980	ENDEVCO	7-Oct-04
P3 CRS AY	AC-J38127	ENDEVCO	7-Oct-04
P3 CRS AZ	AC-J37854	ENDEVCO	7-Oct-04