

REPORT NUMBER: SNCAP-CAL-11-012

**NEW CAR ASSESSMENT PROGRAM (NCAP)
Moving Deformable Barrier Side Impact Test**

**General Motors Corp.
2011 Chevrolet Malibu 1LS
4 door sedan**

NHTSA NUMBER: MB0110

**PREPARED BY:
CALSPAN CORPORATION
P.O. BOX 400
BUFFALO, NEW YORK 14225**



October 19, 2010

FINAL REPORT

**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF CRASHWORTHINESS STANDARDS
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Date: _____

FINAL REPORT ACCEPTANCE BY OCWS:

Division Chief, New Car Assessment Program
NHTSA, Office of Crashworthiness Standards

Date: _____

COTR, New Car Assessment Program
NHTSA, Office of Crashworthiness Standards

Date: _____

Technical Report Documentation Page

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16. Abstract A 55/28 kph 90° Impact Moving Deformable Barrier NCAP Side Impact Test was conducted on the subject 2011 Chevrolet Malibu 1LS 4 door sedan in accordance with the specifications of the Office of Crashworthiness Standards Test Procedure for the generation of consumer information on vehicle side crash protection. This test was conducted at the Calspan Corporation Crash Test Facility in Buffalo, New York, on 8/27/2010. The impact velocity of the Moving Deformable Barrier (MDB) was 62.1 km/h, and the ambient temperature at the struck side (driver side) of the vehicle was 22°C. The target vehicle's maximum post test static crush was 241 mm at level 3. The test vehicle's performance was as follows: <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th colspan="4" style="text-align: center;">Driver ATD (ES-2re)</th> </tr> <tr> <th style="text-align: left;">Measurement Description</th> <th style="text-align: center;">Units</th> <th style="text-align: center;">Threshold</th> <th style="text-align: center;">Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">1000</td> <td style="text-align: center;">106.7</td> </tr> <tr> <td>Maximum Chest Deflection</td> <td style="text-align: center;">mm</td> <td style="text-align: center;">44</td> <td style="text-align: center;">38</td> </tr> <tr> <td>Total Abdominal Force</td> <td style="text-align: center;">N</td> <td style="text-align: center;">2500</td> <td style="text-align: center;">869</td> </tr> <tr> <td>Pubic Symphysis Force</td> <td style="text-align: center;">N</td> <td style="text-align: center;">6000</td> <td style="text-align: center;">2089</td> </tr> </tbody> </table> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th colspan="4" style="text-align: center;">Passenger ATD (SID-IIs)</th> </tr> <tr> <th style="text-align: left;">Measurement Description</th> <th style="text-align: center;">Units</th> <th style="text-align: center;">Threshold</th> <th style="text-align: center;">Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">1000</td> <td style="text-align: center;">243.2</td> </tr> <tr> <td>Lower Spine Resultant Acceleration</td> <td style="text-align: center;">G</td> <td style="text-align: center;">82</td> <td style="text-align: center;">25.1</td> </tr> <tr> <td>Total Pelvic Force (sum of acetabular and iliac forces)</td> <td style="text-align: center;">N</td> <td style="text-align: center;">5525</td> <td style="text-align: center;">3553</td> </tr> </tbody> </table>				Driver ATD (ES-2re)				Measurement Description	Units	Threshold	Result	Head Injury Criteria (HIC ₃₆)	N/A	1000	106.7	Maximum Chest Deflection	mm	44	38	Total Abdominal Force	N	2500	869	Pubic Symphysis Force	N	6000	2089	Passenger ATD (SID-IIs)				Measurement Description	Units	Threshold	Result	Head Injury Criteria (HIC ₃₆)	N/A	1000	243.2	Lower Spine Resultant Acceleration	G	82	25.1	Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	3553
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The two doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite doors did not open during the side impact event.																																															
17. Key Words New Car Assessment Program (NCAP) Side Impact MDB ES-2re SID-IIs		18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Adm. Technical Ref. Division, 1200 New Jersey Ave. SE Room W43-410 Washington, D.C. 20590																																													
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PURPOSE

This moving deformable barrier side impact test is part of the MY New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under contract number DTNH22-06-D-00126. The purpose of this test is to generate comparative side impact performance in a 2011 Chevrolet Malibu 1LS 4 door sedan. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Laboratory Test Procedure dated January 2010.

SUMMARY

A 2011 Chevrolet Malibu 1LS 4 door sedan was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 62.1 km/h (38.6 mph). The target vehicle was stationary and was positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by the Calspan Corporation Transportation Sciences Center on 8/27/2010. Pretest and post- test photographs of the test vehicle, the MDB and the dummies (ES-2re and SID-IIs) are included in this report.

Dummies were placed in the driver and left rear designated seating positions according to instructions specified in the OCWS Side Impact Laboratory Test Procedure, dated January 2010. The side impact event was documented by nine high-speed cameras. Camera locations are included in this report.

The Dummies were instrumented in the following manner:

DRIVER ATD (ES-2re)

Head Accelerometers

Thorax Rib 1 to Rib 3 Potentiometers

Abdomen Forward, Middle, and Rear Load Cells

Pubic Load Cell

Lower Spine Accelerometers

PASSENGER ATD (SID-IIs)

Head Accelerometers

Thorax Upper, Middle, and Lower Rib Potentiometers

Abdomen Upper and Lower Rib Load Cells

Acetabulum Load Cell

Iliac Load Cell

Lower Spine Accelerometers

Dummy injury values were recorded as follows:

	Driver ATD (ES-2re)		
Measurement Description	Units	Threshold	Result
Head Injury Criteria (HIC ₃₆)	N/A	1000	106.7
Maximum Chest Deflection	mm	44	38
Total Abdominal Force	N	2500	869
Pubic Symphysis Force	N	6000	2089

	Passenger ATD (SID-IIs)		
Measurement Description	Units	Threshold	Result
Head Injury Criteria (HIC ₃₆)	N/A	1000	243.2
Lower Spine Resultant Acceleration	G	82	25.1
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	3553

Supplemental restraint information is given below:

SUPPLEMENTAL RESTRAINT INFORMATION

Restraint Type	Left Front (Driver) Occupant Location 1		Left Rear (Passenger) Occupant Location 4	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	No	NA	NA
Knee Airbag	No	NA	NA	NA
Side Airbag 1 (Torso/Pelvis Airbag)	Yes	Yes	No	NA
Side Airbag 2 (Curtain Airbag.)	Yes	Yes	Yes	Yes
Seat Belt Pretensioner	Yes	Yes	No	NA
Seat Belt Load Limiter	Yes	No	No	NA

GENERAL COMMENTS

None

SECTION 2
DATA SHEETS

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2011 Chevrolet Malibu 1LS
Test Program: Side NCAP

NHTSA No.: MB0110
Test Date: 8/27/2010

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	MB0110	Anti-Lock Brakes	Yes
Model Year	2011	All-Wheel Drive	No
Make	Chevrolet	Power Steering	Yes
Model	Malibu 1LS	Driver Front Airbag	Yes
Body Style	4 door sedan	Driver Curtain Airbag	Yes
VIN	1G1ZB5E19BF100560	Driver Head/Torso Airbag	No
Body Color	Silver	Driver Torso Airbag	No
Delivery Date	7/22/2010	Driver Torso/Pelvis Airbag	Yes
Odometer Reading (km/mi)	63 mi	Driver Pelvis Airbag	No
Dealer	West Herr Cheverolet	Driver Knee Airbag	No
Transmission		Rear Pass. Curtain Airbag	Yes
Final Drive	Front Wheel	Rear Pass. Head/Torso Airbag	No
Type/No. Cylinders	VVT/4	Rear Pass. Torso Airbag	No
Engine Displacement (L)	2.4	Rear Pass. Torso/Pelvis Airbag	No
Engine Placement	Lateral	Rear Pass. Pelvis Airbag	No
Roof Rack	No	Pretensioners	Yes
Sunroof/T-Top	No	Load Limiters	Yes
Tinted Glass	No	Automatic Door Locks	Yes
Traction Control	Yes	Bucket Seats	Yes
Power Brakes	Yes	Tilt Steering	No
Front Disc	Yes	Other	
Rear Disc	Yes	Other	

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

DATA FROM CERTIFICATION LABEL

Manufactured By	General Motors	GVWR (kg)	1996
Date of Manufacture	6/10	GAWR Front (kg)	1044
		GAWR Rear (kg)	952

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity (DSC)	2	3		5	
Capacity Weight (VCW) (kg)				416.0	(A)
DSC x 68.04 (kg)				340.2	(B)
Cargo Weight (RCLW) (kg)				75.8	(A-B)

* Maximum allowable RCLW is 136 kg

VEHICLE SEAT TYPE

Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable	
						W/ Lever	W/ Knob
Front Seat	X					X	
Rear or Second Row Seat		X			X		
Third row seat							

Test Vehicle:	2011 Chevrolet Malibu 1LS	NHTSA No.:	MB0110
Test Program:	Side NCAP	Test Date:	8/27/2010

The diagram shows a cross-section of a tire with the following labels and specifications:

- Treadwear, traction and temperature grades:** TREADWEAR 220 TRACTION A TEMPERATURE A
- Tire ply composition and materials used:** TREAD 4 PLYS • 2XXXXY • SIDEWALL 2 PLYS 2XXXXX CORD • MAX LOAD 1300 LBS • MAX PRESS 35 PSI • RADIAL • TUBELESS • DOT M4J AB 6006
- Max. cold inflation & load limit:** MAX COLD INFLATION & LOAD LIMIT
- Manufacturer:** MANUFACTURER
- Tire Name:** TIRE NAME
- U.S. DOT safety standard code:** DOT M4J AB 6006
- Load index & speed symbol:** 89H
- Diameter of wheel in inches:** 15
- Radial:** RADIAL
- Ratio of height to width (aspect ratio):** 65
- Width of tire in millimeters:** 215
- Passenger car tire:** PASSENGER CAR TIRE

2-3

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

Test Vehicle: 2011 Chevrolet Malibu 1LS
 Test Program: Side NCAP

NHTSA No.: MB0110
 Test Date: 8/27/2010

TEST VEHICLE AXLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	480.5	316	796.5	524	401	925.0	529.5	410	939.5
Right	kg	461.5	297	758.5	456	372	828.0	470.5	359.5	830.0
Ratio	%	60.6%	39.4%		55.9%	44.1%		56.5%	43.5%	
Totals	kg	942.0	613.0	1555.0	980.0	73.0	1753.0	1000.0	769.5	1769.5

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1555.0	(A)
Sum of Actual Weight of 2 P572 ATDS Used	kg	129.3	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	75.8	(C)
Calculated Target Vehicle Test Weight (TVTW)	kg	17.60.1	(A+B+C)

TEST VEHICLE ATTITUDE AND CG

Measurement Description	Units	LF	RF	RR	LR	CG (aft of front axle)
Fully Loaded	mm	699	711	707	702	
As Tested (Fully Loaded $\pm$ 10 mm at each wheel well)	mm	705	715	707	698	1258

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	2853
Total Vehicle Length at Left Side	mm	4722
Total Vehicle Length at Centerline	mm	4869
Total Vehicle Length at Right Side	mm	4722
Weight of Ballast in Cargo Area	kg	44
Weight of Vehicle Components Removed	kg	0.0
Amount of Stoddard Solvent in Fuel Tank	L	57.4

Vehicle components removed to make Target Vehicle Test Weight:

None

TEST VEHICLE VERTICAL IMPACT LINE DATA

Measured Parameter	Units	Value
Target Impact Point Aft of Front Axle	mm	487
Actual Impact Point Aft of Front Axle	mm	496

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

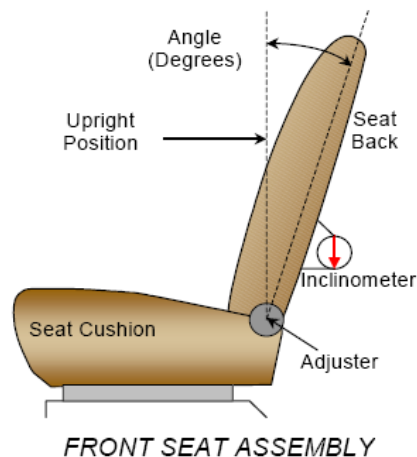
Test Vehicle: 2011 Chevrolet Malibu 1LS
 Test Program: Side NCAP

NHTSA No.: MB0110
 Test Date: 8/27/2010

NORMAL DESIGN RIDING POSITION

Driver seat: Seat placed in detent 12 (mid)
 position

Passenger Seat: Fixed seat



SEAT BACK ANGLES

	Degrees
Driver w/ Seated Dummy	18.9
Passenger w/ Seated Dummy	fixed

SEAT FORE/AFT POSITIONS

Manual Seat Fore/Aft: Driver

Fixed Seat: Rear Passenger

SEAT FORE/AFT POSITIONING

	Total Fore/Aft Travel	Placed in Position #
Driver Seat	24	12 (mid)
Rear Seat	N/A (fixed)	N/A (fixed)

SEAT BELT UPPER ANCHORAGES

Driver Adjustable D-Ring, Rear Passenger Fixed D-Ring

SEAT BELT UPPER ANCHORAGES

	Total # of Positions	Placed in Position #
Driver Seat	4	Full up
Rear Seat	N/A	N/A

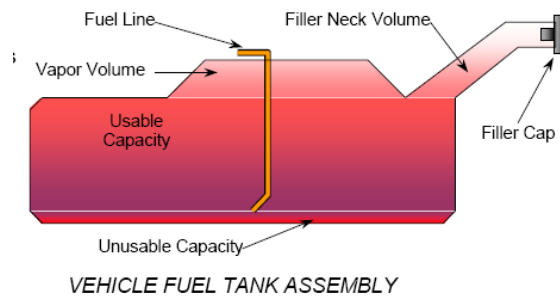
DATA SHEET NO. 2 (CONTINUED)
SEAT ADJUSTMENT, FUEL SYSTEMS, AND STEERING WHEEL DATA

Test Vehicle: 2011 Chevrolet Malibu 1LS
 Test Program: Side NCAP

NHTSA No.: MB0110
 Test Date: 8/27/2010

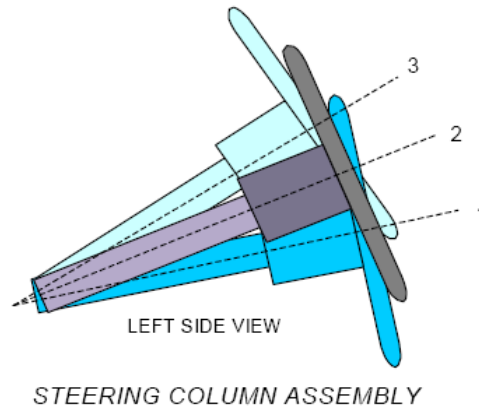
FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank"	16.3
Usable Capacity of "Optional Tank"	N/A
Usable Capacity Used for FMVSS 301	16.3
Actual Amount of Solvent Used	15.2



STEERING COLUMN ADJUSTMENT

Steering column incremental position tilt
 Steering column infinite position telescope



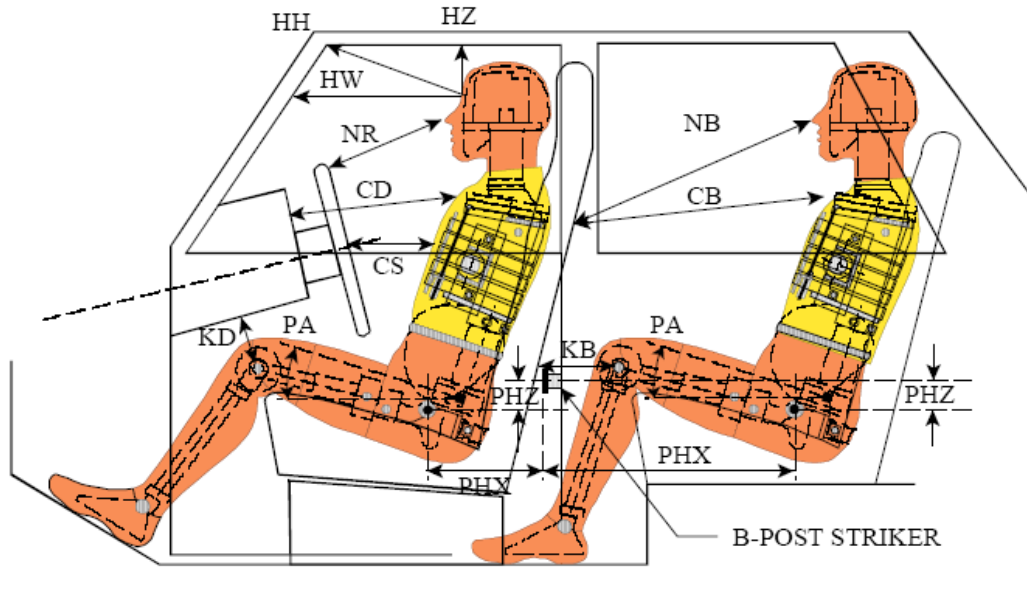
STEERING COLUMN POSITIONING

	Degrees	Fore/Aft Position (mm)
Lowermost - Position 1	21.4	
Geometric Center – Position 2	24.2	
Uppermost – Position 3	27.0	
Telescoping Steering Wheel Travel		50
Test Position	24.2	25

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2011 Chevrolet Malibu 1LS
 Test Program: Side NCAP

NHTSA No.: MB0110
 Test Date: 8/27/2010



LEFT SIDE VIEW

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

DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

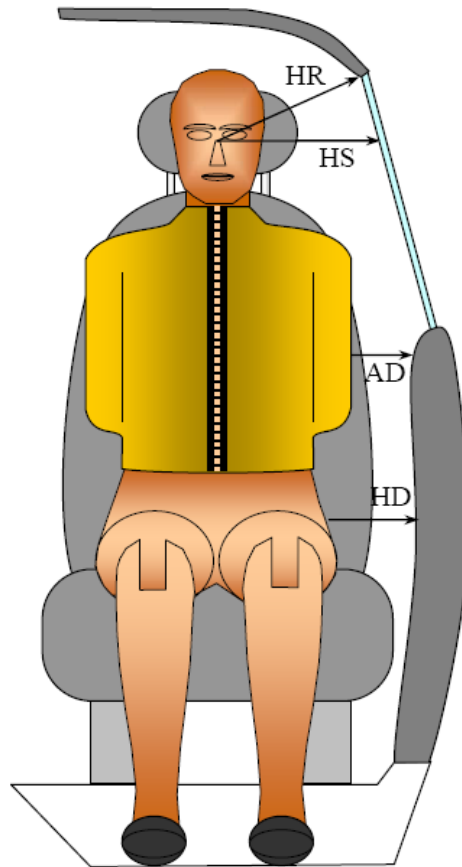
Driver Code	Pass. Code	Measurement Description	Driver S/N 033		Passenger S/N 300	
			Length (mm)	Angle	Length (mm)	Angle
HH		Header to Header	372	9.0		
HW		Header to Windshield	624	0.0		
HZ	HZ	Head to Roof	125	90.0	245	0.0
NR	NB	Nose to Rim/Seat Back	475	15.0	538	11.0
CD	CB	Chest to Dash/Seat Back	552	8.0	539	13.0
CS		Chest to Steering Wheel	333	0.0		
KDL	KBL	Left Knee to Dash/Seat Back	165	35.0	345	23.0
KDR	KBR	Right Knee to Dash/Seat Back	145	30.0	340	23.0
PA	PA	Pelvic Angle		26.9		17.5
PHX	PHX	H-Point to Striker (X-Axis)	206		270	
PHZ	PHZ	H-Point to Striker (Z-Axis)	117		295	
SA	SA	Seat Back Angle		18.9 *		fixed

* Measurement from the head restraint post

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2011 Chevrolet Malibu 1LS
Test Program: Side NCAP

NHTSA No.: MB0110
Test Date: 8/27/2010



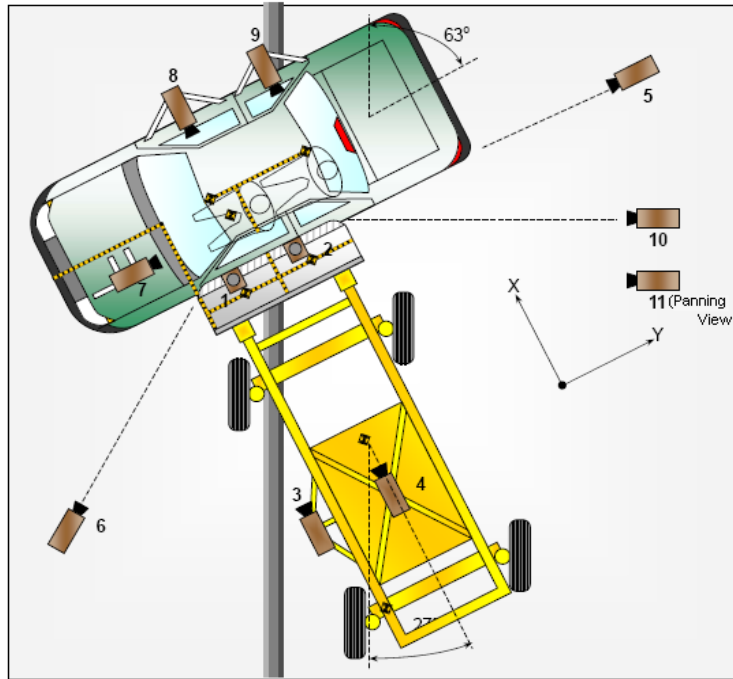
DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

Code	Description	Units	Driver S/N 033	Passenger S/N 300
HR	Head to Side Header	mm	150	232
HS	Head to Side Window	mm	302	370
AD	Arm to Door	mm	69	131
HD	H-point to Door	mm	171	165

DATA SHEET NO. 5
CAMERA LOCATIONS AND DATA

Test Vehicle: 2011 Chevrolet Malibu 1LS
Test Program: Side NCAP

NHTSA No.: MB0110
Test Date: 8/27/2010



CAMERA LOCATIONS AND DATA

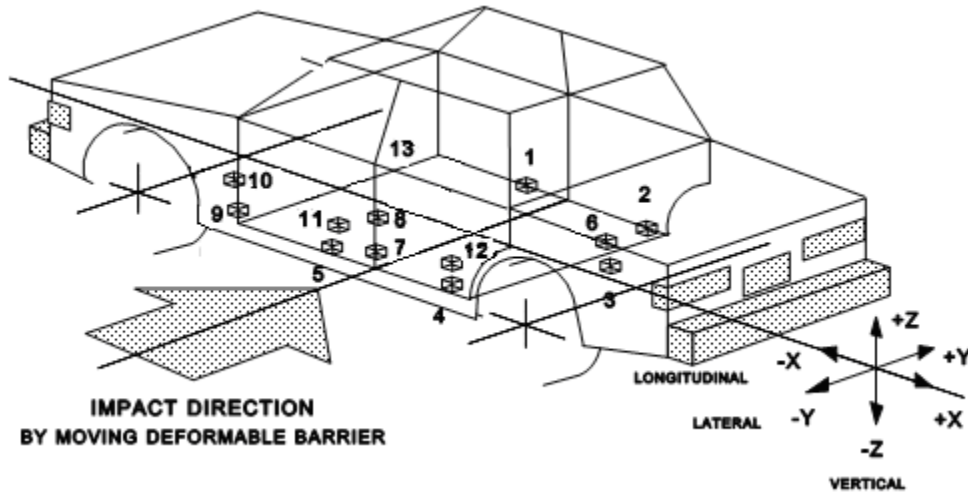
No.	Camera View	Location			Angle	Lens (mm)	Film Speed (fps)
		X	Y	Z			
1	Overhead Overall	72	812	-4880	-90	20	1000
2	Overhead Close-up	195	855	-4880	-90	28	1000
3	Left Impact Point (MDB)	-1470	0	-847	0	25	500
4	Side Overall (MDB)	-1140	838	-1586	-17	12.5	500
5	Rear				-3	50	1000
6	Left Front				-2	28	1000
7	Driver Front (OB)				-12	25	500
8	Driver Side (OB)				-4	12.5	500
9	Passenger Side (OB)				-1	12.5	500
10	Real-time Left Rear				-	-	24
11	Real-time Inrun				-	-	24

Reference: Impact Point projected to Ground
+X = To Front of MDB, +Y = To Right of MDB, +Z = Down
**All measurements accurate to ± 6 mm.*

DATA SHEET NO. 6
VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2011 Chevrolet Malibu 1LS
Test Program: Side NCAP

NHTSA No.: MB0110
Test Date: 8/27/2010



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

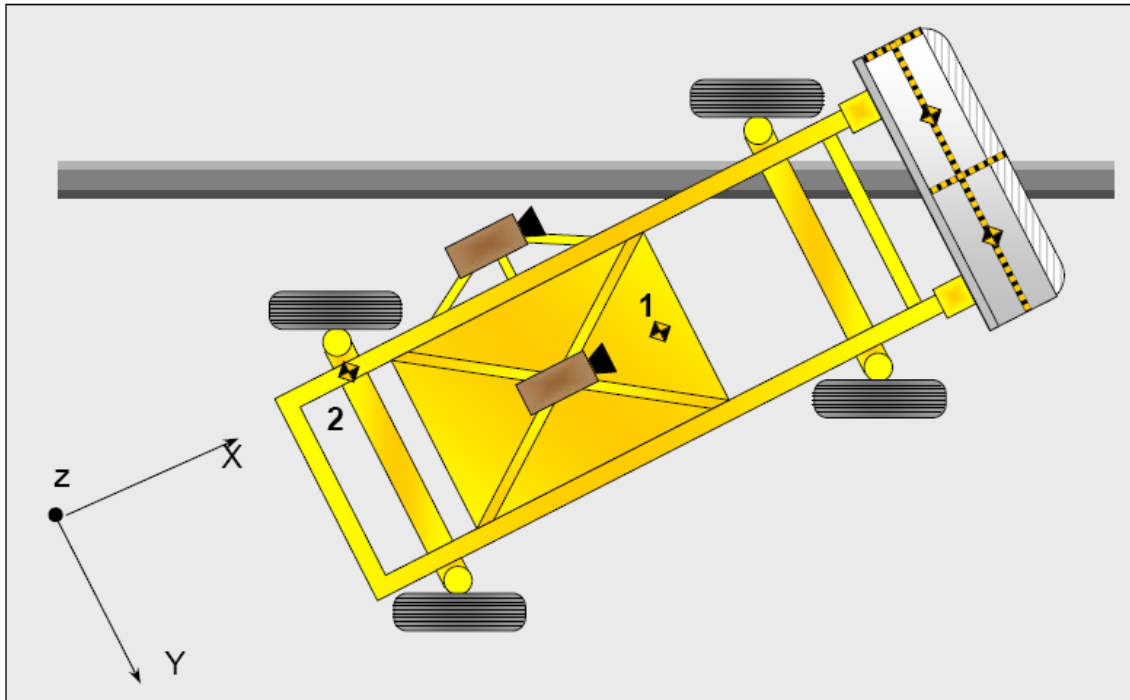
Loc. No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Right Sill at Front Seat	3121	678	265
2	Right Sill at Rear Seat	2200	677	269
3	Rear Floorpan Above Axle	1109	21	569
4	Left Sill at Rear Door	2192	-667	265
5	Left Sill at Front Door	3071	-677	291
6	Rt. Rear Occ. Compartment	2199	679	270
7	B-Post Lower	2360	-674	443
8	B-Post Middle	2292	-675	873
9	A-Post Lower	3298	-646	347
10	A-Post Middle	3340	-660	511
11	Front Seat Track	2464	-568	305
12	Rear Seat Structure	1246	-590	629
13	Vehicle CG	2660	-23	466

Reference: X – Rear surface of vehicle (+ forward)
Y – Vehicle centerline (+ to right)
Z – Ground plane (+ up)

DATA SHEET NO. 7
MDB ACCELEROMETER LOCATIONS

Test Vehicle: 2011 Chevrolet Malibu 1LS
 Test Program: Side NCAP

NHTSA No.: MB0110
 Test Date: 8/27/2010



MDB ACCELEROMETER LOCATIONS

Loc No.	Accelerometer Locations	Measurements		
		X	Y	Z
1	MDB CG	1859	0	-330
2	MDB Rear	386	-660	-660

Reference: X – Face of MDB (+ Forward)
 Y – MDB centerline (+ to right)
 Z – Ground plane (+ Down)

DATA SHEET NO. 8
TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2011 Chevrolet Malibu 1LS
 Test Program: Side NCAP

NHTSA No.: MB0110
 Test Date: 8/27/2010

MAXIMUM EXTERIOR STATIC CRUSH

Level	Measured Parameter	Units	Maximum Crush	Above Ground
1	Sill Top Height	mm	124	317
2	Occupant H-Point	mm	214	534
3	Mid Door	mm	241	640
4	Window Sill	mm	222	886
5	Window Top	mm	9	1375
	Maximum Penetration	mm	241	1375

INSTRUMENTATION

Driver Dummy Channels	16
Passenger Dummy Channels	16
Vehicle Structure Accelerometers	21
MDB Accelerometers	5
Total No. of Contact Switches	5 *
Total	63

* Vehicle manufacturer requested that certain contact switches not be installed on ATDs.

CAMERA COVERAGE

High-Speed Vehicle Onboard	3
High-Speed Offboard	4
High-Speed MDB Onboard	2
Real-Time Panning	2
Total	11

DATA SHEET NO. 9
MOVING DEFORMABLE BARRIER (MDB) SUMMARY OF RESULTS

Test Vehicle: 2011 Chevrolet Malibu 1LS
 Test Program: Side NCAP

NHTSA No.: MB0110
 Test Date: 8/27/2010

MDB SPECIFICATIONS

Measurement Description	Length (mm)
Overall Width of Framework Carriage	1250
Overall Length Including Honeycomb Frame	4120
Wheel Base of Framework Carriage	2590
CG Location of Front Axle	1104

MDB WEIGHTS

	Units	Front Axle	Rear Axle	Total
Left	kg	409.5	281.5	691.0
Right	kg	372.5	299.0	671.5
Ratio	%	57.4	42.6	-
Totals	kg	782.0	580.5	1362.5

SPEED AND IMPACT DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	62.1
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	62.2
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	90.3

MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE

Vertical Location			From Centerline		Maximum Crush
Row	Description	Height	Distance	Direction	
A	Center of Bumper	432	800	Right	514
B	Top of Bumper	533	700	Right	413
C	Mid-Level	686	800	Left	413
D	Top of Stack	813	800	Left	413

MDB INSTRUMENTATION

Accelerometers	5
Contact Switches	2

**DATA SHEET NO. 10
POST TEST OBSERVATIONS**

Test Vehicle: 2011 Chevrolet Malibu 1LS
Test Program: Side NCAP

NHTSA No.: MB0110
Test Date: 8/27/2010

TEST DUMMY INFORMATION AND CONTACT

Description	Front Seat Dummy (ES-2re)	Rear Seat Dummy (SID-IIs)
Dummy Type/Serial No.	033	300
Head Contact	Side curtain airbag; side header; back of head restraint	Side curtain airbag
Upper Torso Contact	Side torso airbag	Shoulder with door; upper door armrest
Lower Torso Contact	Side torso airbag	No contact
Left Knee Contact	No contact	Side door
Right Knee Contact	No contact	No contact

POST TEST DOOR OPENING AND SEAT TRACK INFORMATION

Description	Front	Rear
Left Side Doors	Jammed Shut	Jammed Shut
Right Side Doors	Remained closed and operational	Remained closed and operational
Hatch and Other Doors	N/A	Remained closed and operational
Seat Movement	None	N/A
Seat Back Failure	None	N/A

POST TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	Pillar intruded due to impact
Sill Separation	None
Windshield Damage	Front shattered but intact, Rear windshield - no damage
Window Damage	No damage
Other Notable Effects	None

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Left Front (Driver) Occupant Location 1		Left Rear (Passenger) Occupant Location 4	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	No	NA	NA
Knee Airbag	No	NA	NA	NA
Side Airbag 1 (Torso/Pelvis Airbag)	Yes	Yes	No	NA
Side Airbag 2 (Curtain Airbag.)	Yes	Yes	Yes	Yes
Seat Belt Pretensioner	Yes	Yes	No	NA
Seat Belt Load Limiter	Yes	No	No	NA

MDB LEFT EDGE IMPACT POINT DATA

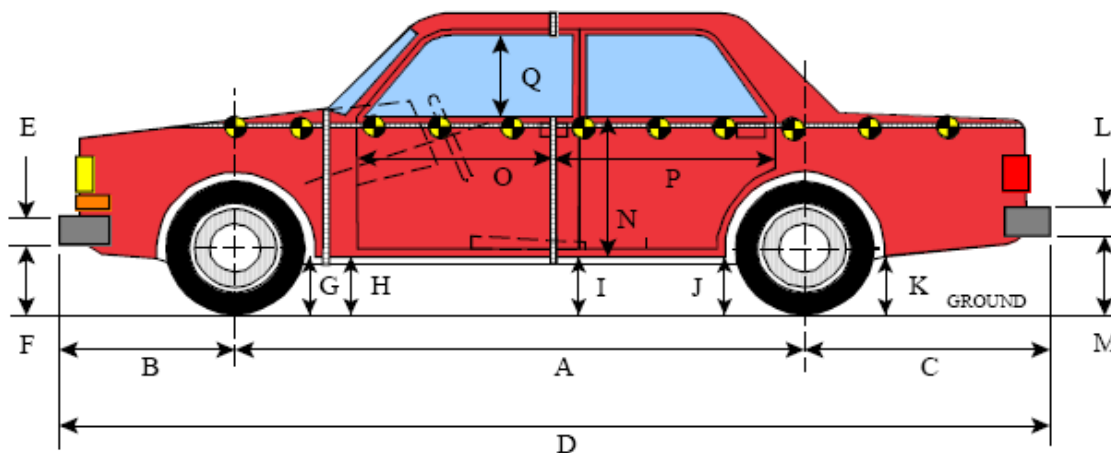
Measured Parameter	Units	Requirement	Value
Horizontal Offset	mm	+/- 50	-3
Vertical Offset	mm	+/- 20	0

DATA SHEET NO. 11

VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2011 Chevrolet Malibu 1LS
 Test Program: Side NCAP

NHTSA No.: MB0110
 Test Date: 8/27/2010



LEFT SIDE VIEW

All MEASUREMENTS IN (mm) WITH TOLERANCE OF ± 3 mm

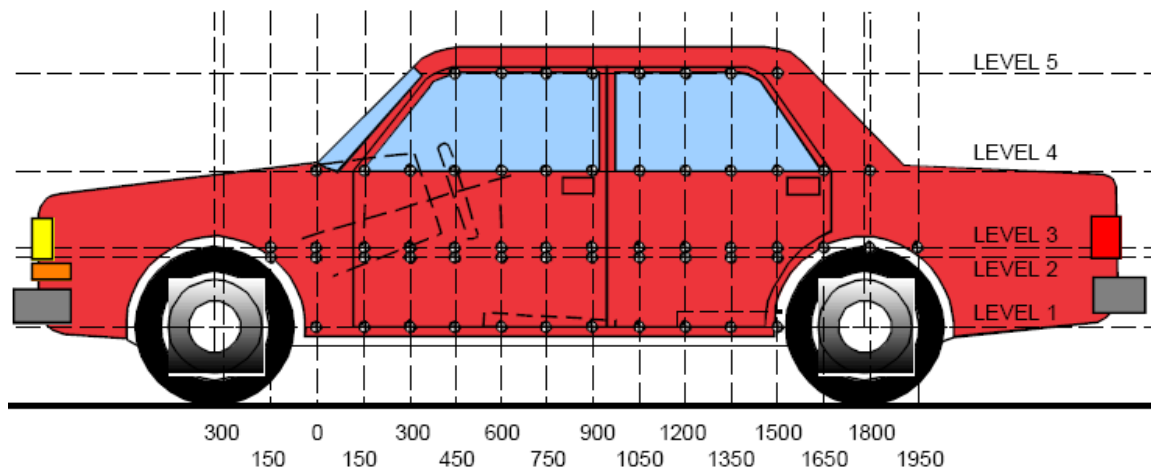
VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2853.3	2846.2	7.1
B	Front Axle to FSOV	983.0	987.6	-4.6
C	Rear Axle to RSOV	1032.4	1030.8	1.6
D	Total Length at Centerline	4868.6	4864.1	4.5
E	Front Bumper Thickness	65	65	0.0
F	Front Bumper Bottom to Ground	350	371	21.0
G	Sill Height at Front Wheel Well	152	143	-9.0
H	Sill Height at Front Door Leading Edge	167	165	-2.0
I	Sill Height at B Pillar	192	189	-3.0
J1	Sill Height at Rear Wheel Well	213	182	-24.0
J2	Pinch Weld Height at Rear Wheel Well	210	185	-25.0
K	Sill Height Aft of Rear Wheel Well	246	211	-35.0
L	Rear Bumper Thickness	235	235	0.0
M	Rear Bumper Bottom to Ground	425	388	-37.0
N	Sill Height to Window Bottom Sill	698.3	620.2	78.0
O	Front Door Leading Edge to Impact CL	884.6	835.8	48.8
P	Rear Door Trailing Edge to Impact CL	1204.7	1157.0	47.7
Q	Front Window Opening	425.1	430.3	-5.1
R	Right Side Length	4722.0	4721.0	1.0
S	Left Side Length	4722.3	4710.9	11.4
T	Vehicle Width at B Post	1774.1	1556.4	217.7

VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2011 Chevrolet Malibu 1LS
 Test Program: Side NCAP

NHTSA No.: MB0110
 Test Date: 8/27/2010



LEFT SIDE VIEW

Level	Measurement Description	Height Above Ground (mm)
1	Sill Top	317.1
2	Occupant H-Point	534.1
3	Mid-Door	640.4
4	Window Sill	886.4
5	Window Top	1375.4

NOTE: The above measurements should be taken along the vertical impact reference line. Vehicle measurements forward of the vertical impact reference line are negative.

DATA SHEET NO. 12 (CONTINUED)
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2011 Chevrolet Malibu 1LS
 Test Program: Side NCAP

NHTSA No.: MB0110
 Test Date: 8/27/2010

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900	-	854	840	-	-	-	858	845	-	-	-	-4	-5	-	-
-750	-	-	882	657	-	-	-	883	664	-	-	-	-1	-7	-
-600	-	-	-	723	-	-	-	-	727	-	-	-	-	-4	-
-450	-	-	-	780	-	-	-	-	782	-	-	-	-	-2	-
-300	-	-	-	819	-	-	-	-	819	-	-	-	-	0	-
-150	-	891	890	832	-	-	881	875	828	-	-	10	15	4	-
0	865	882	882	838	-	865	810	857	878	-	0	72	25	-40	-
150	864	882	886	845	-	758	699	772	809	-	106	183	114	36	-
300	864	882	886	852	-	747	679	737	775	-	117	203	149	77	-
450	864	882	886	858	-	740	675	708	751	-	124	207	178	107	-
600	864	882	887	862	-	744	675	699	741	-	120	207	188	121	-
750	864	881	887	865	580	752	680	677	731	579	112	201	210	134	1
900	864	881	887	853	589	766	667	681	718	585	98	214	206	135	4
1050	863	880	887	869	590	776	678	674	711	581	87	202	213	158	9
1200	861	880	886	869	589	780	682	660	701	582	81	198	226	168	7
1350	861	879	885	869	588	776	672	656	647	580	85	207	229	222	8
1500	861	877	883	868	586	770	675	648	672	580	91	202	235	196	6
1650	861	876	881	865	583	765	673	640	682	579	96	203	241	183	4
1800	860	874	878	861	575	809	713	667	691	575	51	161	211	170	0
1950	861	881	877	878	555	850	800	771	786	555	11	81	106	92	0
2100	-	-	888	854	383	-	-	863	825	383	-	-	25	29	0
2250	-	-	-	841	-	-	-	-	822	-	-	-	-	19	-
2400	-	-	-	832	-	-	-	-	819	-	-	-	-	13	-
2550	-	-	-	819	-	-	-	-	816	-	-	-	-	3	-
2700	-	875	864	806	-	-	870	862	809	-	-	5	2	-3	-
2850	-	826	818	789	-	-	826	820	797	-	-	0	-2	-8	-
3000	-	804	799	770	-	-	804	800	778	-	-	0	-1	-8	-

MAXIMUM CRUSH DATA

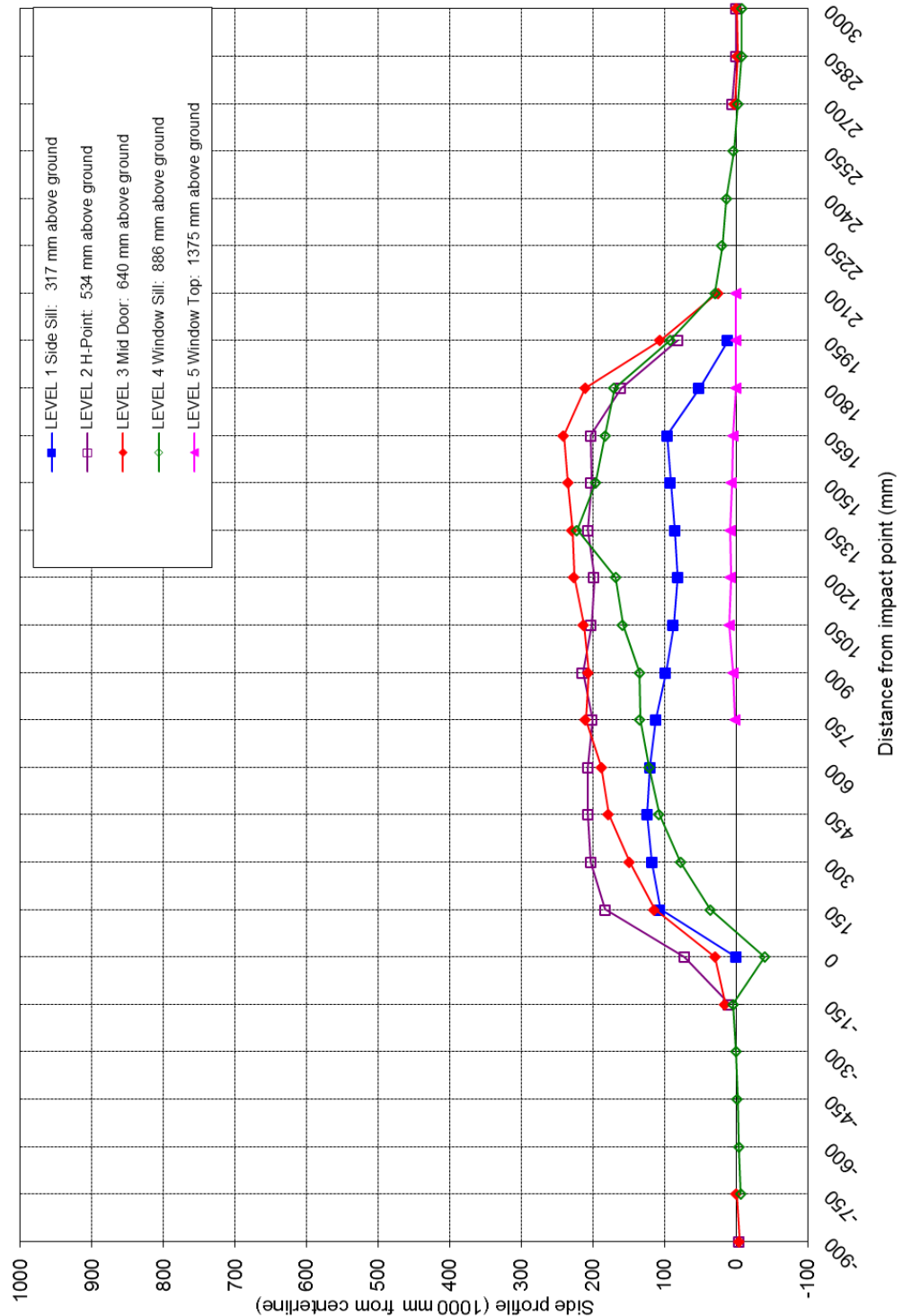
	Level 1	Level 2	Level 3	Level 4	Level 5
Maximum Crush (mm)	124	214	241	222	9
Distance From Impact (mm)	450	900	1650	1350	1050

NOTE: Pre-test measurements are taken when the vehicle is in the "As Tested" weight condition. Vehicle measurements forward of the vertical impact reference line are negative. The crush profile grid is established prior to test based on an estimated impact point.

DATA SHEET NO. 12 (CONTINUED)
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2011 Chevrolet Malibu 1LS
 Test Program: Side NCAP

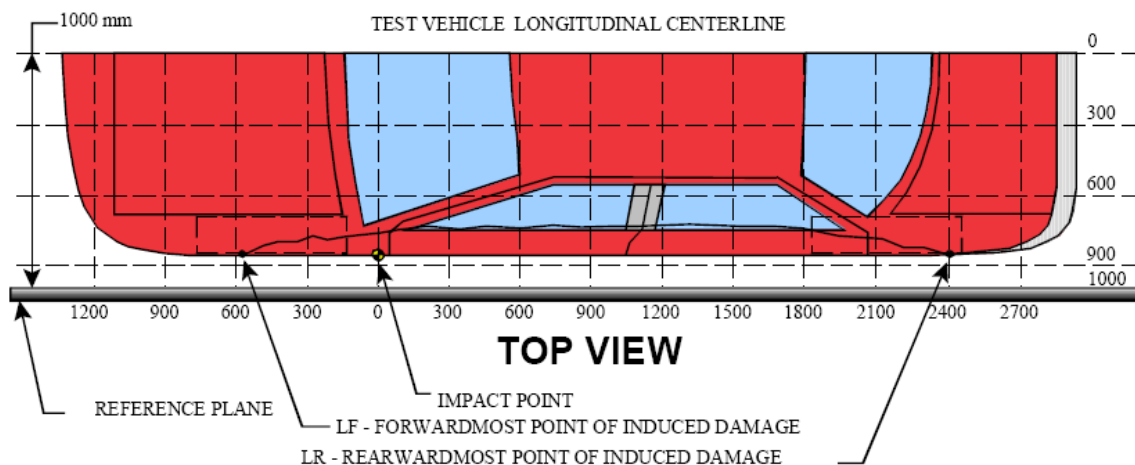
NHTSA No.: MB0110
 Test Date: 8/27/2010



DATA SHEET NO. 13
VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2011 Chevrolet Malibu 1LS
 Test Program: Side NCAP

NHTSA No.: MB0110
 Test Date: 8/27/2010



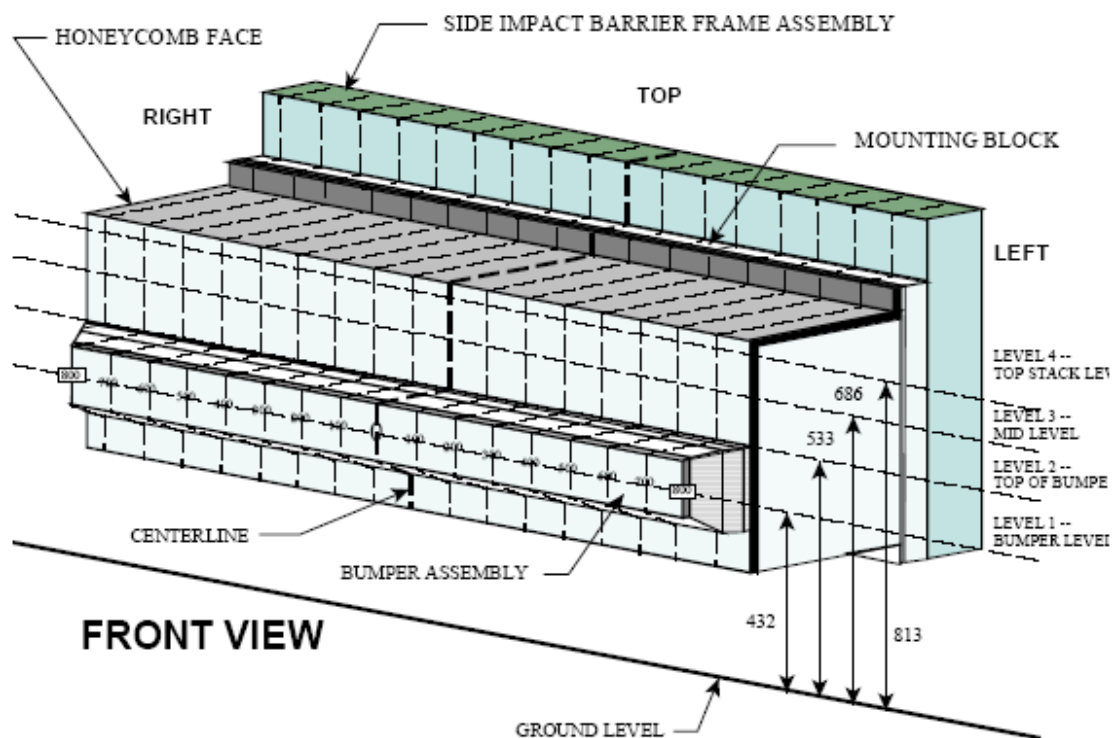
DAMAGE PROFILE DISTANCES

DPD	Distance From Impact Point (mm)	Level	Pre-Test (mm)	Post-Test (mm)	Maximum Static Crush (mm)
1	2400	4	181	184	3
2	1920	3	119	192	73
3	1440	3	117	350	233
4	960	3	119	331	212
5	0	3	118	323	205
6	0	2	110	125	15

DATA SHEET NO. 14
EXTERIOR STATIC CRUSH FOR IMPACTOR FACE

Test Vehicle: 2011 Chevrolet Malibu 1LS
 Test Program: Side NCAP

NHTSA No.: MB0110
 Test Date: 8/27/2010



NOTE: Dimensions are shown in millimeters, mm

DEFORMABLE BARRIER STATIC CRUSH

Stack Level	Distance Right of Center								C/L	Distance Left of Center							
	800	700	600	500	400	300	200	100		100	200	300	400	500	600	700	800
1	501	513	513	513	513	513	513	514	514	514	514	514	514	514	514	514	505
2	411	412	412	412	412	412	412	412	413	412	412	412	412	412	412	412	412
3	411	411	412	412	412	412	412	412	413	412	412	412	412	412	412	412	412
4	411	412	412	412	412	412	413	413	413	413	413	413	413	413	413	413	412

DATA SHEET NO. 15A
FMVSS NO. 301 FUEL SYSTEM INTEGRITY POST-IMPACT DATA

Test Vehicle: 2011 Chevrolet Malibu 1LS
 Test Program: Side NCAP

NHTSA No.: MB0110
 Test Date: 8/27/2010

Test Time: 4:25pm Temperature: 28° C

- A. From impact until vehicle motion ceases: None oz.
 (Maximum allowable is 1 oz.)
- B. For the 5-minute period after motion ceases: None oz.
 (Maximum allowable is 5 oz.)
- C. For the following 25 minutes: None oz.
 (Maximum allowable is 1 oz./minute)
- D. Spillage Details: N/A

FMVSS NO. 301 STATIC ROLLOVER DATA



ROLLOVER SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0 to 90	1:04	5:00	5:04
90 to 180	1:07	5:00	5:07
180 to 270	1:02	5:00	5:02
270 to 360	1:10	5:00	5:10

FMVSS NO. 301 ROLLOVER SPILLAGE TABLE

Test Phase	First 5 Minutes	Sixth Minute	Seventh Minute	Eighth Minute
0 to 90	None			
90 to 180	None			
180 to 270	None			
270 to 360	None			

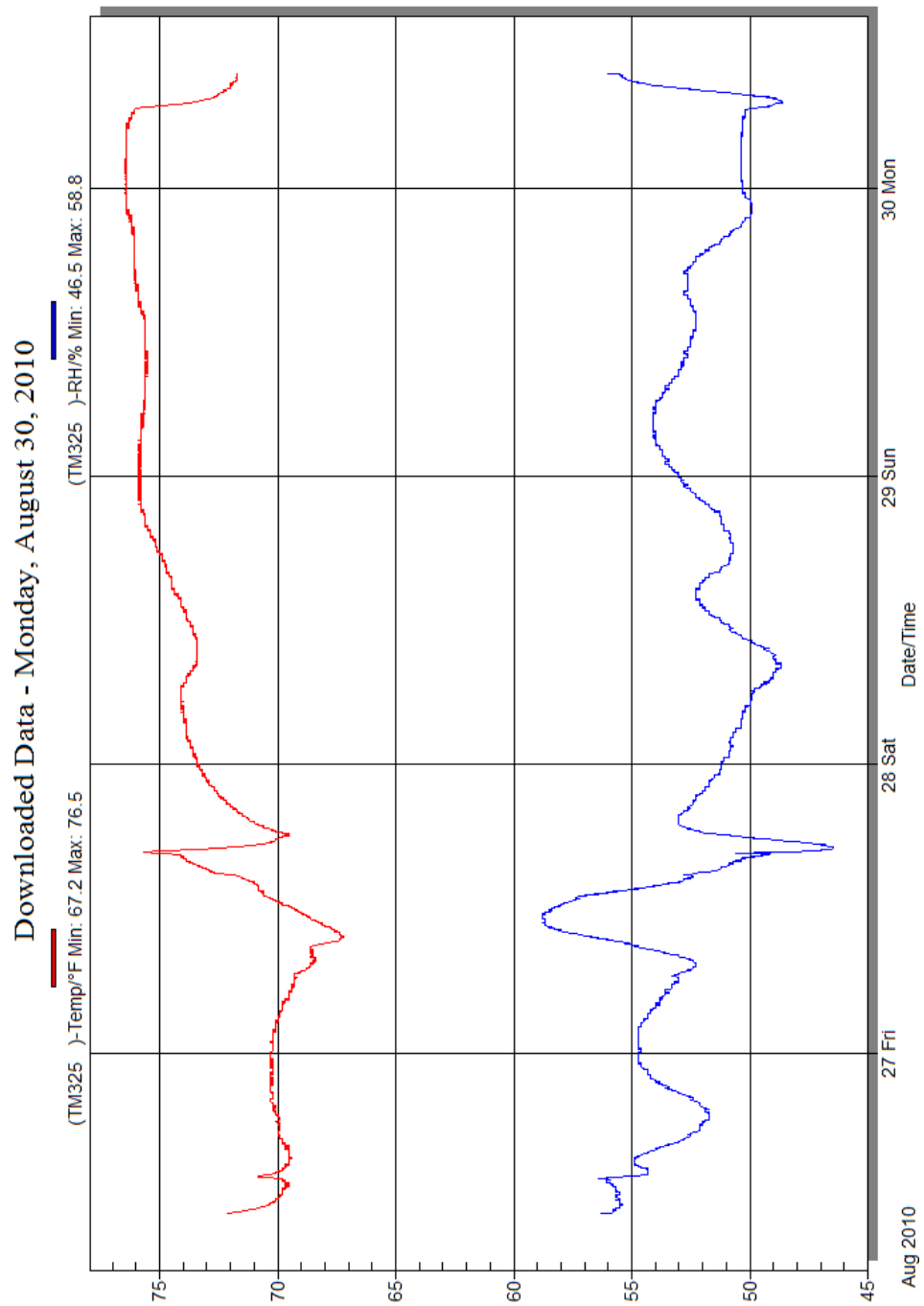
ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

Test Phase	Spillage Location
0 to 90	n/a
90 to 180	n/a
180 to 270	n/a
270 to 360	n/a

DATA SHEET NO. 16
DUMMY/VEHICLE TEMPERATURE STABILIZATION

Test Vehicle: 2011 Chevrolet Malibu 1LS
Test Program: Side NCAP

NHTSA No.: MB0110
Test Date: 8/27/2010



APPENDIX A
PHOTOGRAPHS

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Figure A-1: As-Delivered Right Front $\frac{3}{4}$ View of Test Vehicle



Figure A-2: As-Delivered Left Rear $\frac{3}{4}$ View of Test Vehicle



Figure A-3: Pre-Test Frontal View of Test Vehicle

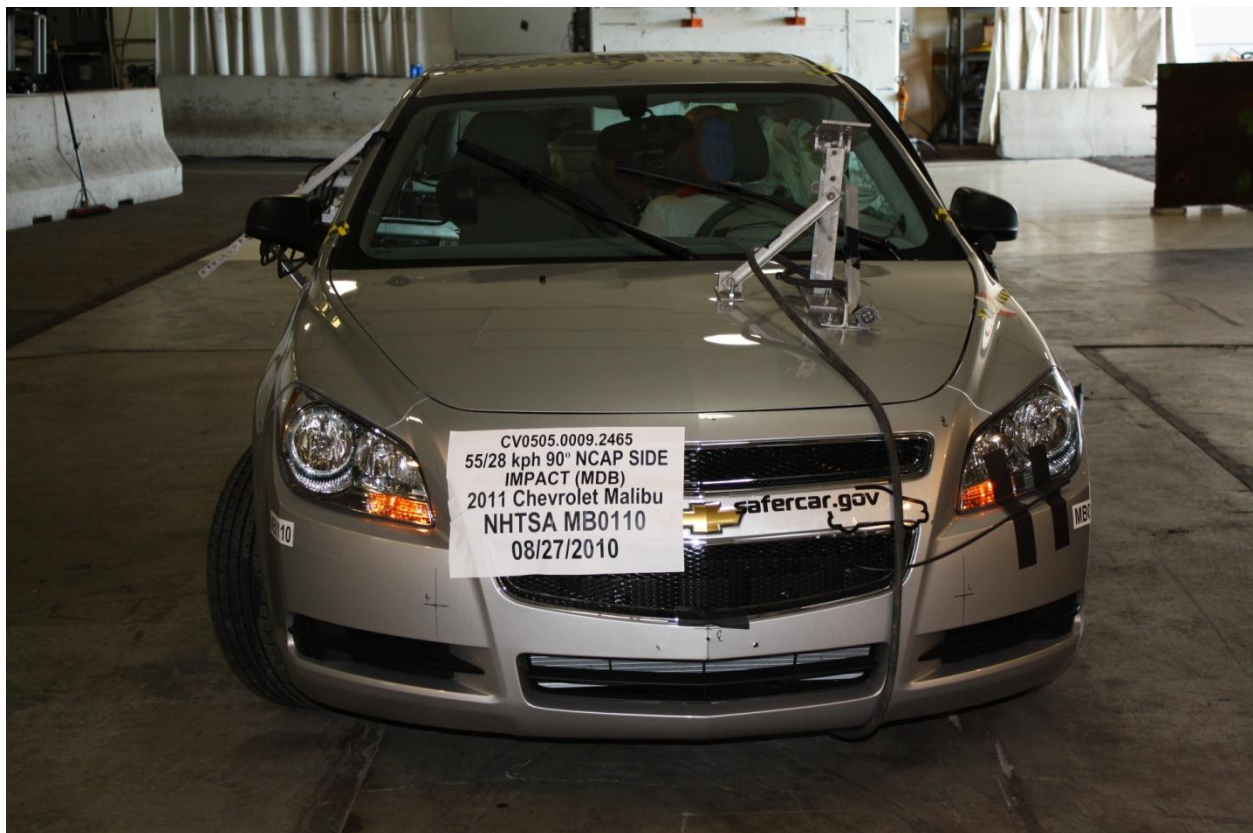


Figure A-4: Post-Test Frontal View of Test Vehicle

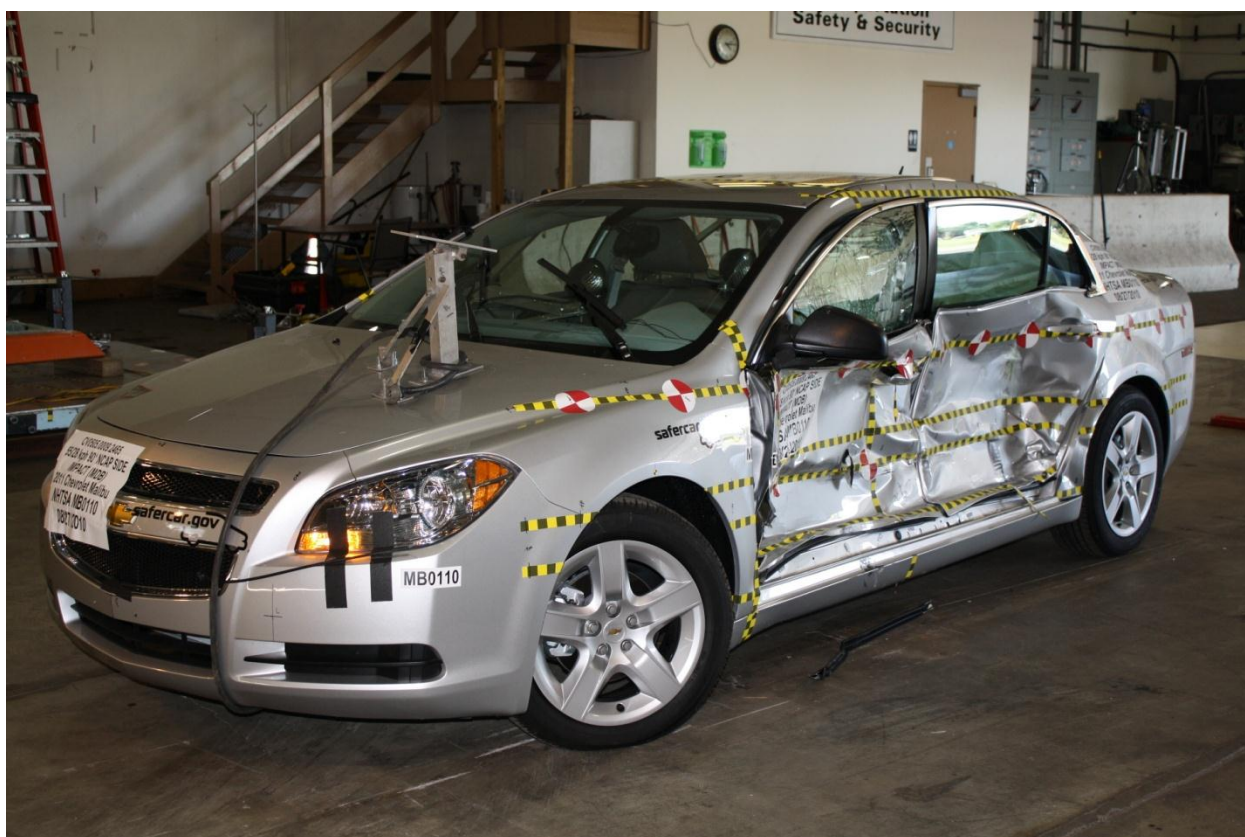




Figure A-7: Pre-Test Left Side View of Test Vehicle



Figure A-8: Post-Test Left Side View of Test Vehicle



Figure A-9: Pre-Test Left Rear $\frac{3}{4}$ View of Test Vehicle



Figure A-10: Post-Test Left Rear $\frac{3}{4}$ View of Test Vehicle

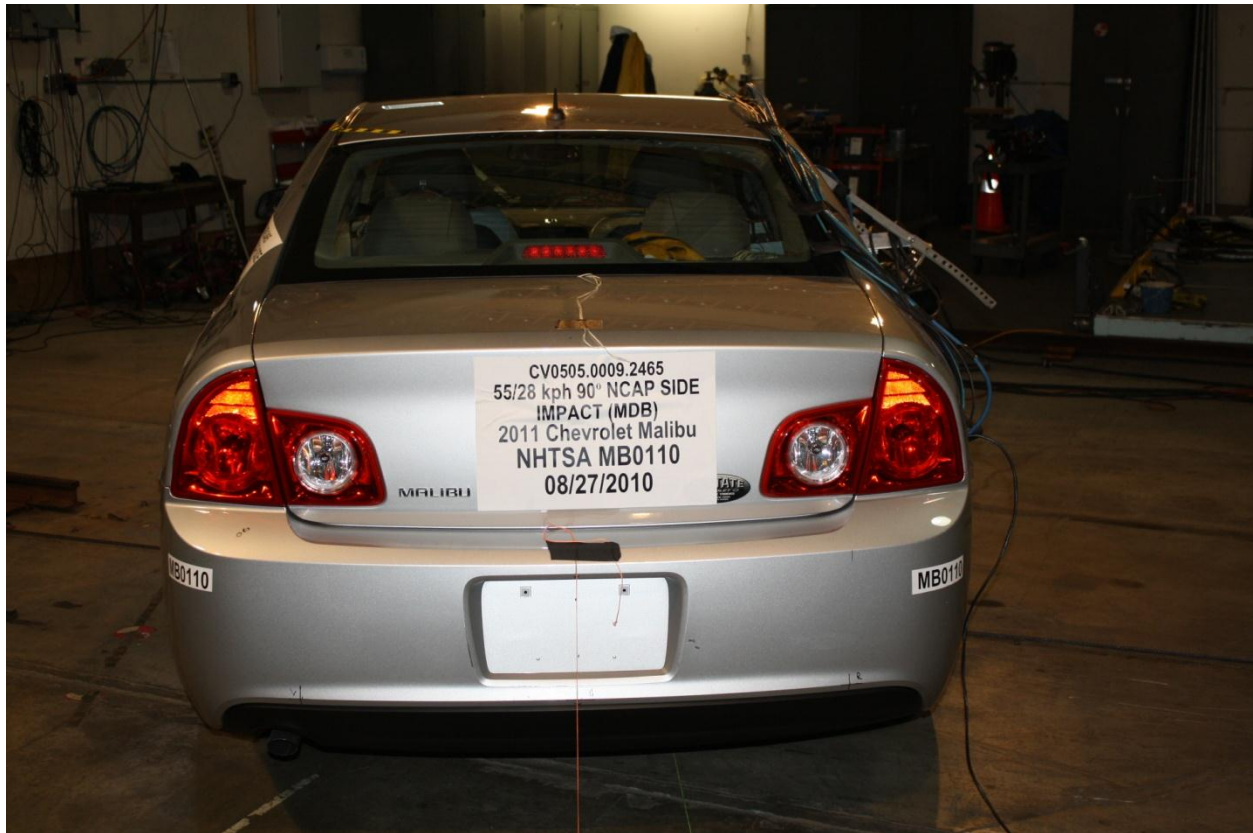


Figure A-11: Pre-Test Rear View of Test Vehicle



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



Figure A-13: Pre-Test Right Side View of Test Vehicle



Figure A-14: Post-Test Right Side View of Test Vehicle



Figure A-15: Pre-Test Overhead View of the Test Vehicle and MDB

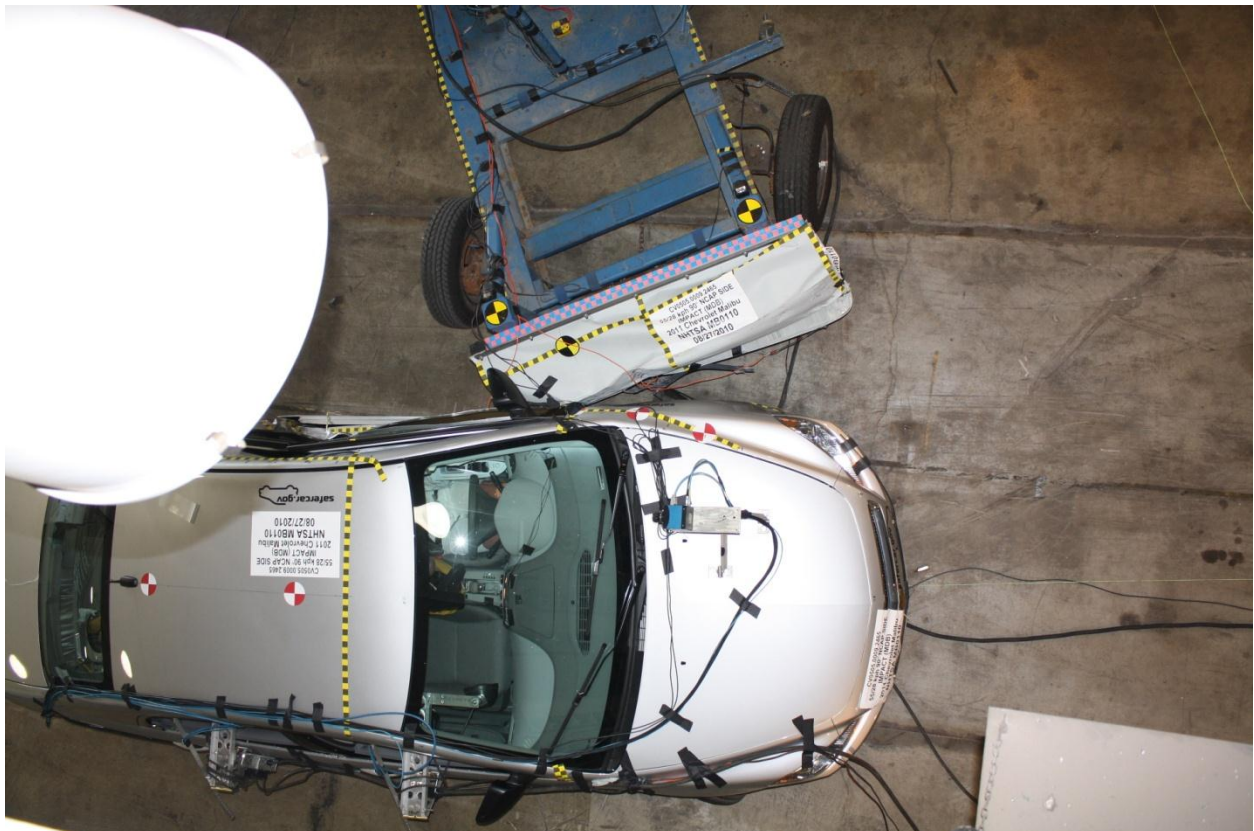


Figure A-16: Post-Test Overhead View of Test Vehicle and MDB



Figure A-17: Pre-Test Left Side View of MDB Positioned Against Side of Test Vehicle



Figure A-18: Pre-Test Right Side View of MDB Positioned Against Side of Test Vehicle



Figure A-19: Pre-Test Close-up View of Impact Point Target



Figure A-20: Post-Test Close-up View of Impact Point Target



Figure A-21: Pre-Test Left Front Door Lath Close-up

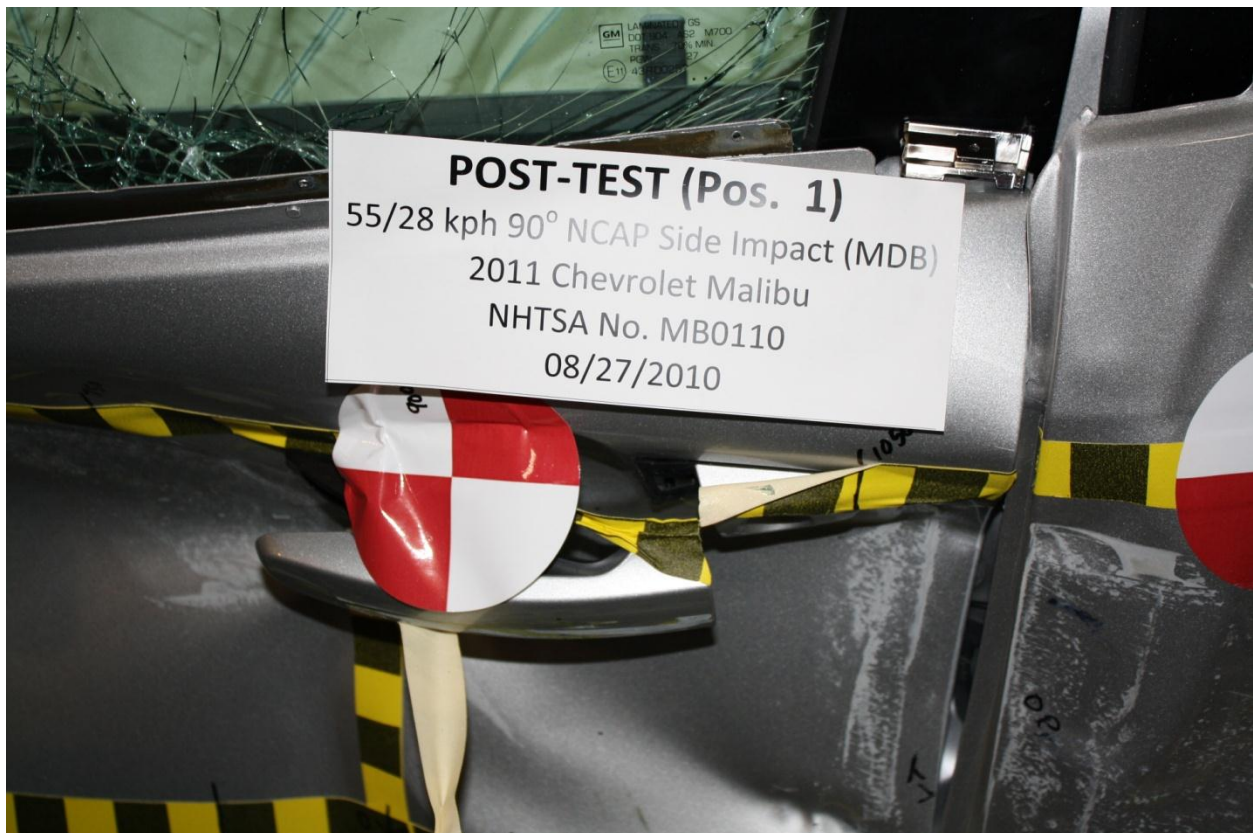


Figure A-22: Post-Test Left Front Door Lath Close-up

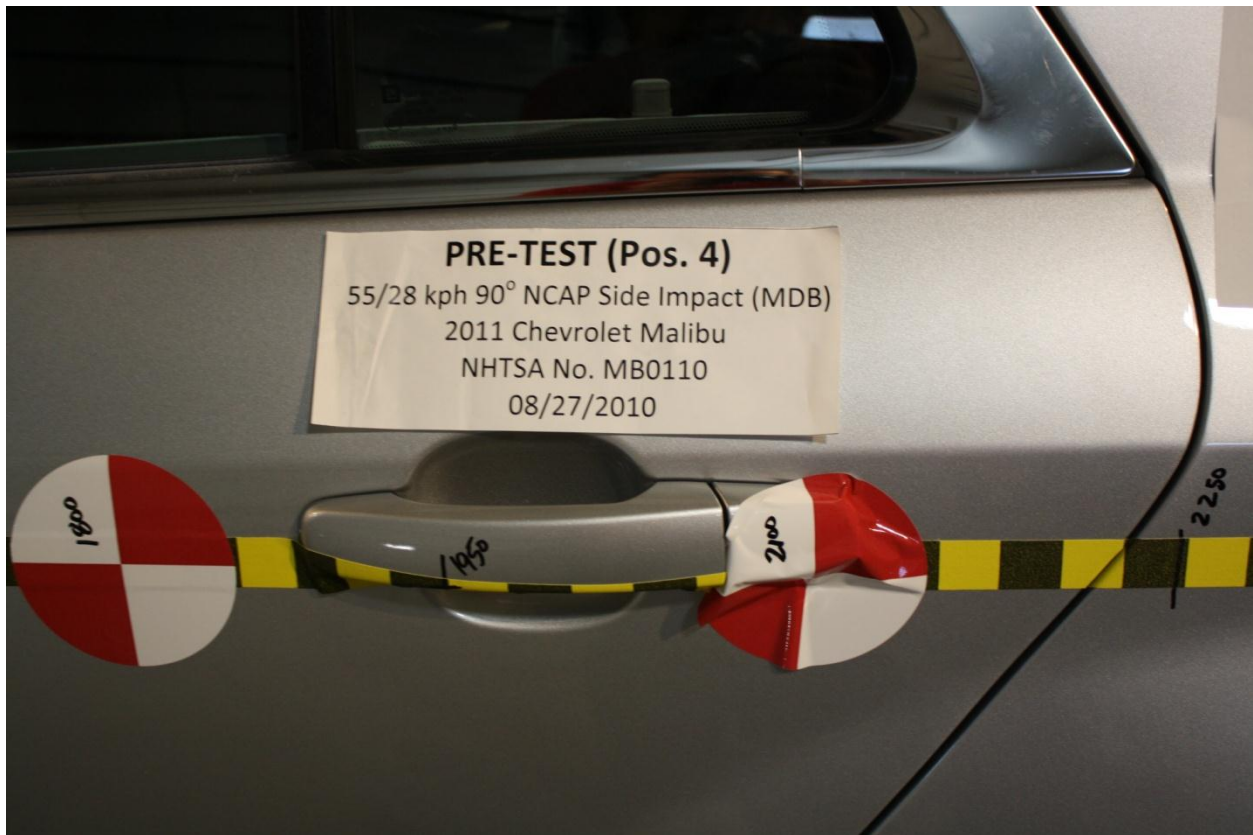


Figure A-23: Pre-Test Left Rear Door Latch Close-up



Figure A-24: Post-Test Left Rear Door Latch Close-up



Figure A-25: Pre-Test Front Close-up View of Driver Dummy

Photograph Not Available

Figure A-26: Post-Test Front Close-up View of Driver Dummy



Figure A-27: Pre-Test Left Side View of Driver Dummy Showing Belt, Chalking, and Contact Switches

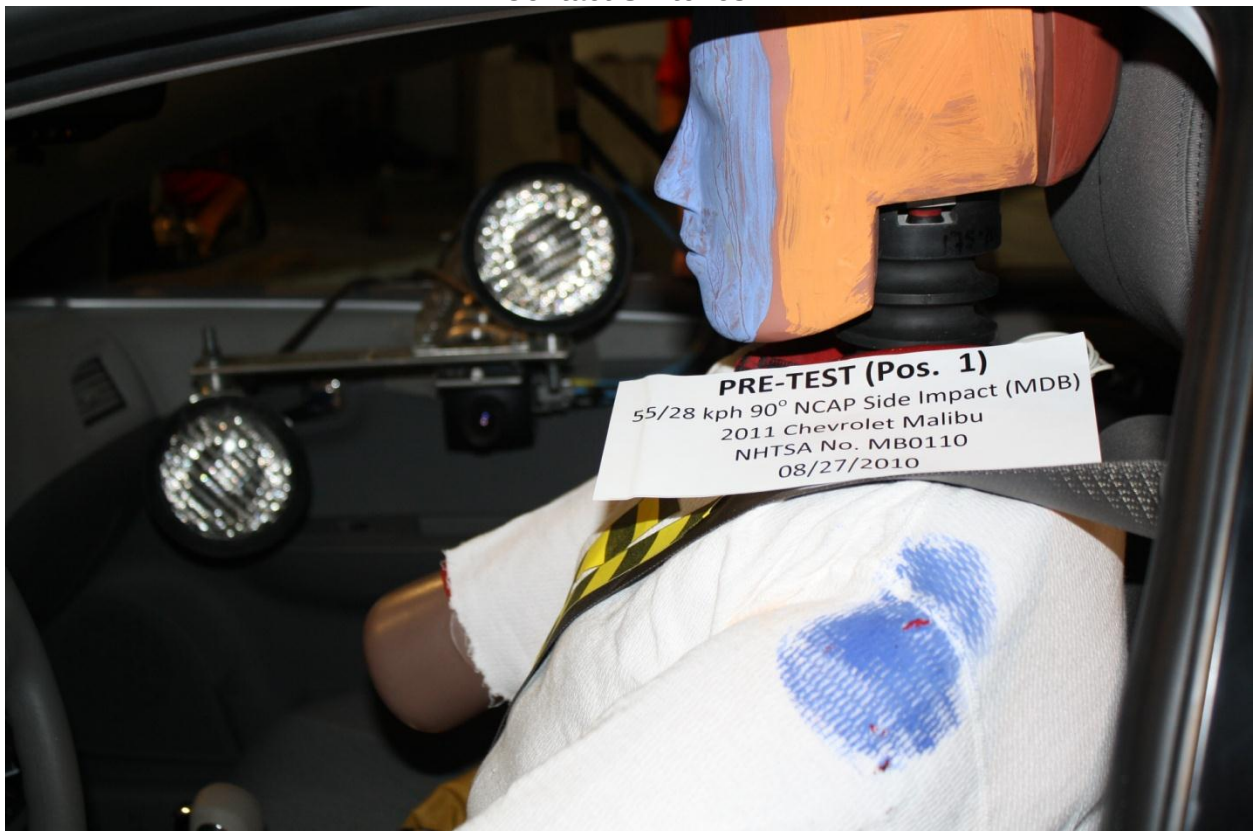


Figure A-28: Pre-Test Left Side View of Driver Dummy Shoulder and Door Top View



Figure A-29: Post-test Left Side View of Driver Dummy Shoulder and Door Top View



Figure A-30: Pre-Test Frontal View of Driver Seat Back Prior to Dummy Positioning



Figure A-31: Pre-Test Frontal View of Driver Dummy Head and Shoulders in Relation to Head Restraint



Figure A-32: Pre-Test Frontal View of Driver Seat Pan Prior to Dummy Positioning

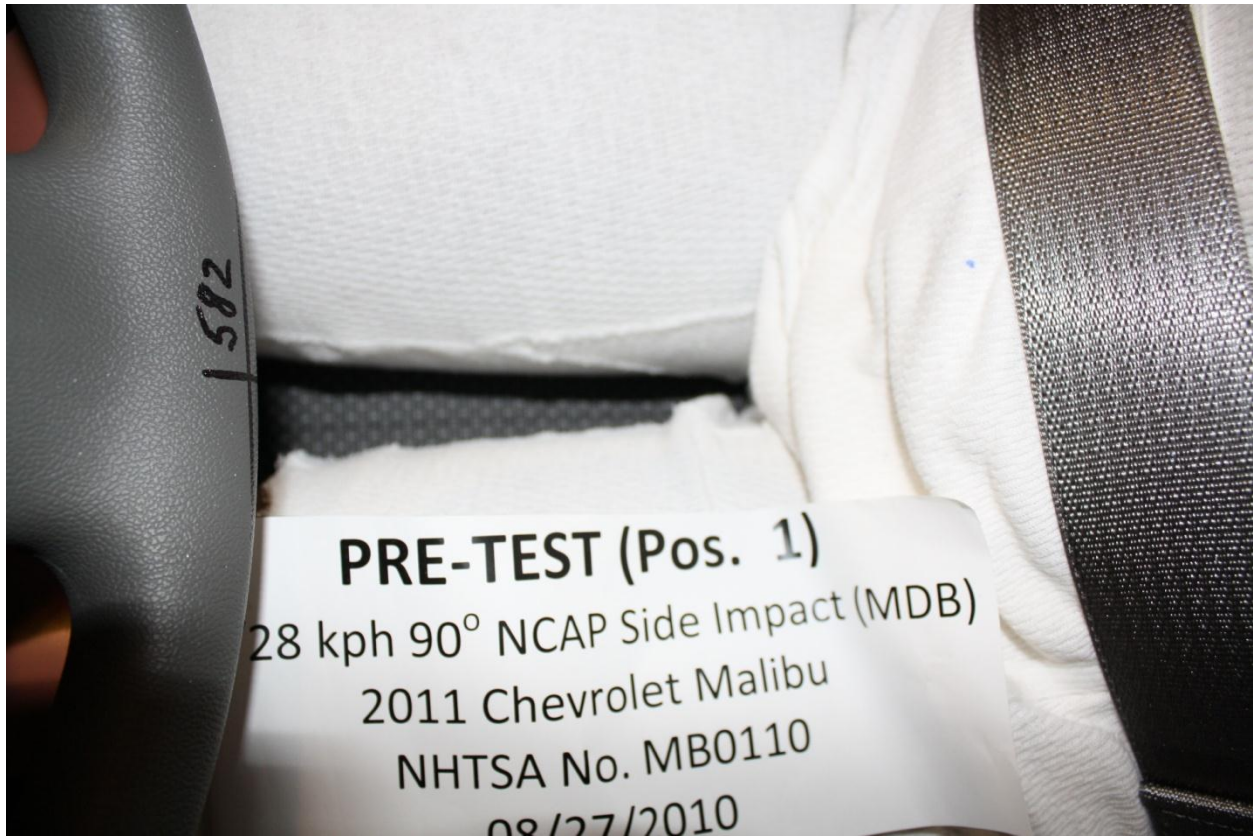


Figure A-33: Pre-Test Overhead View of Driver Dummy Thighs on Seat Pan



Figure A-34: Pre-Test Placement of Driver Dummy's Feet

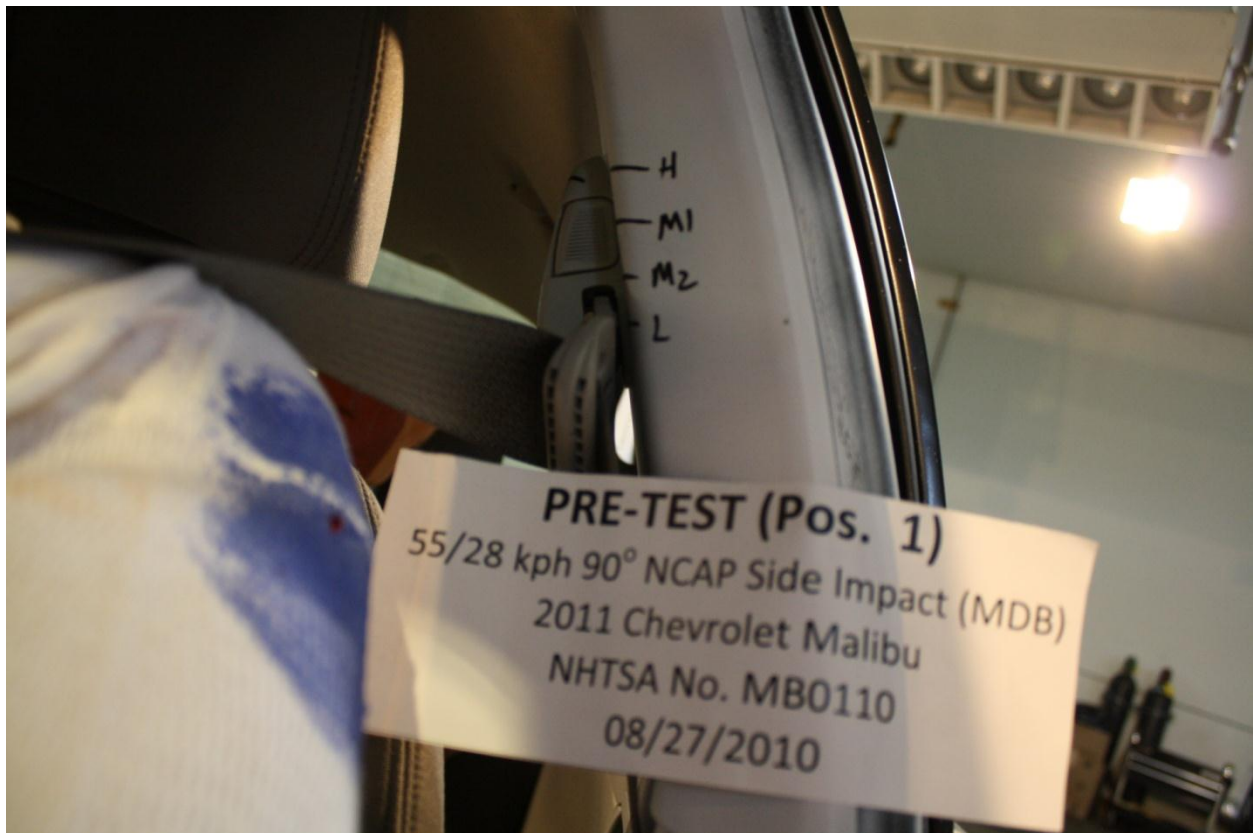


Figure A-35: Pre-Test View of Belt Anchorage for Driver Dummy to Show Position

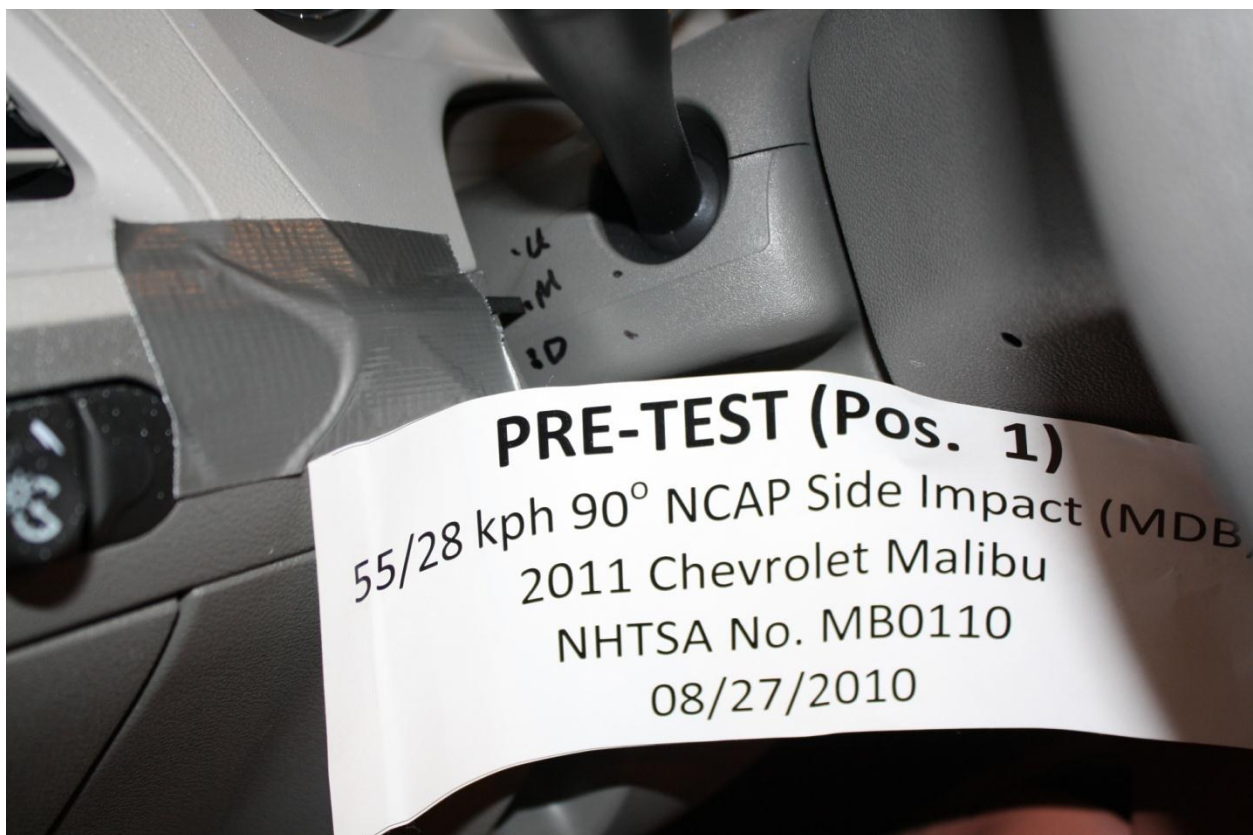


Figure A-36: Pre-Test Left Side View of Steering Wheel to Show Position



Figure A-37: Pre-Test View of Parking Brake



Figure A-38: Pre-test Close-up Left Side View of Driver Seat Track Showing Seat Positioning

Photograph Not Available

Figure A-39: Pre-test Close-up Left Side View of Driver Seat Back Showing Seat Back Positioning



Figure A-40: Pre-Test Close-Up View of Driver Seat Back or Head Restraint Showing Seat Back Test Position



Figure A-41: Pre-test Driver Dummy and Door Clearance View



Figure A-42: Post-test Driver Dummy and Door Clearance View



Figure A-43: Pre-test Right Side View of Driver Dummy and Front Seat of Occupant Compartment

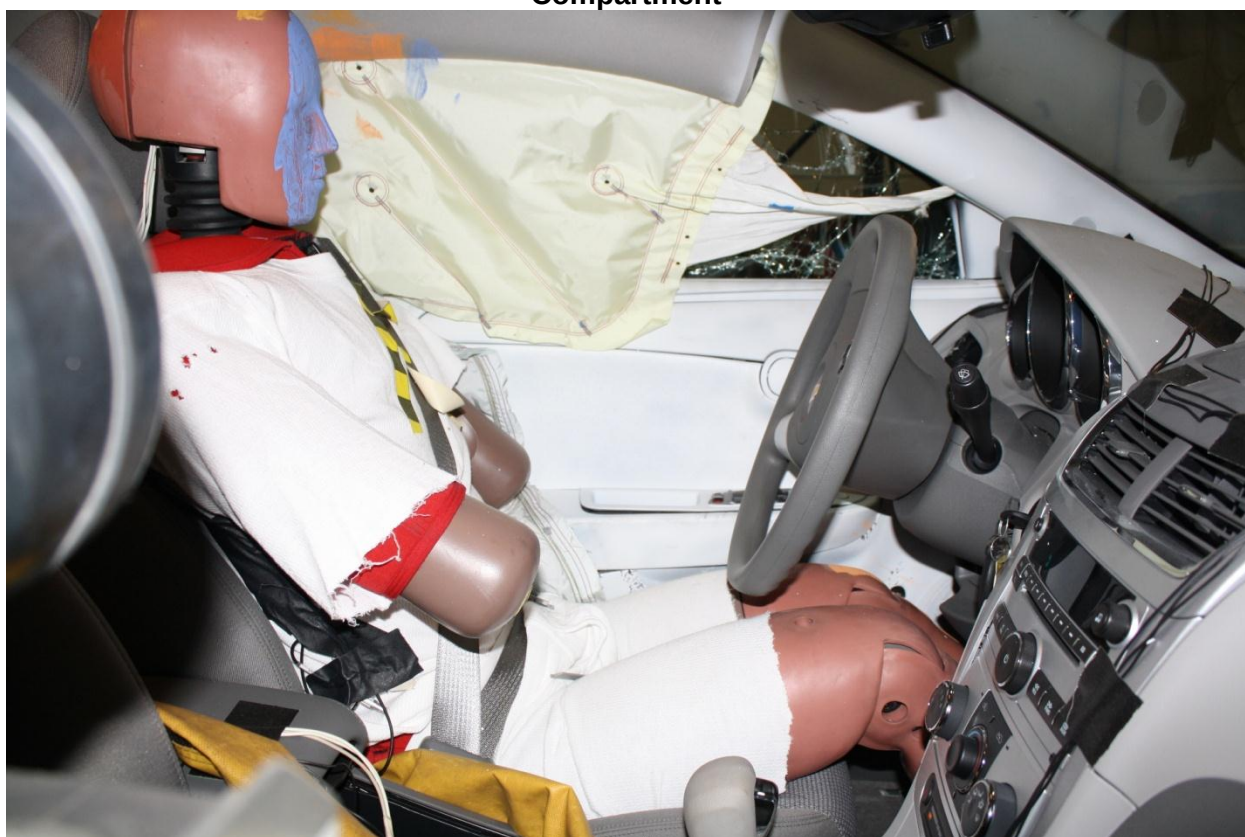


Figure A-44: Post-test Right Side View of Driver Dummy and Front Seat of Occupant Compartment



Figure A-45: Pre-test Driver Inner Door Panel View



Figure A-46: Post-test Driver Inner Door Panel View Showing Driver Dummy Contact Locations

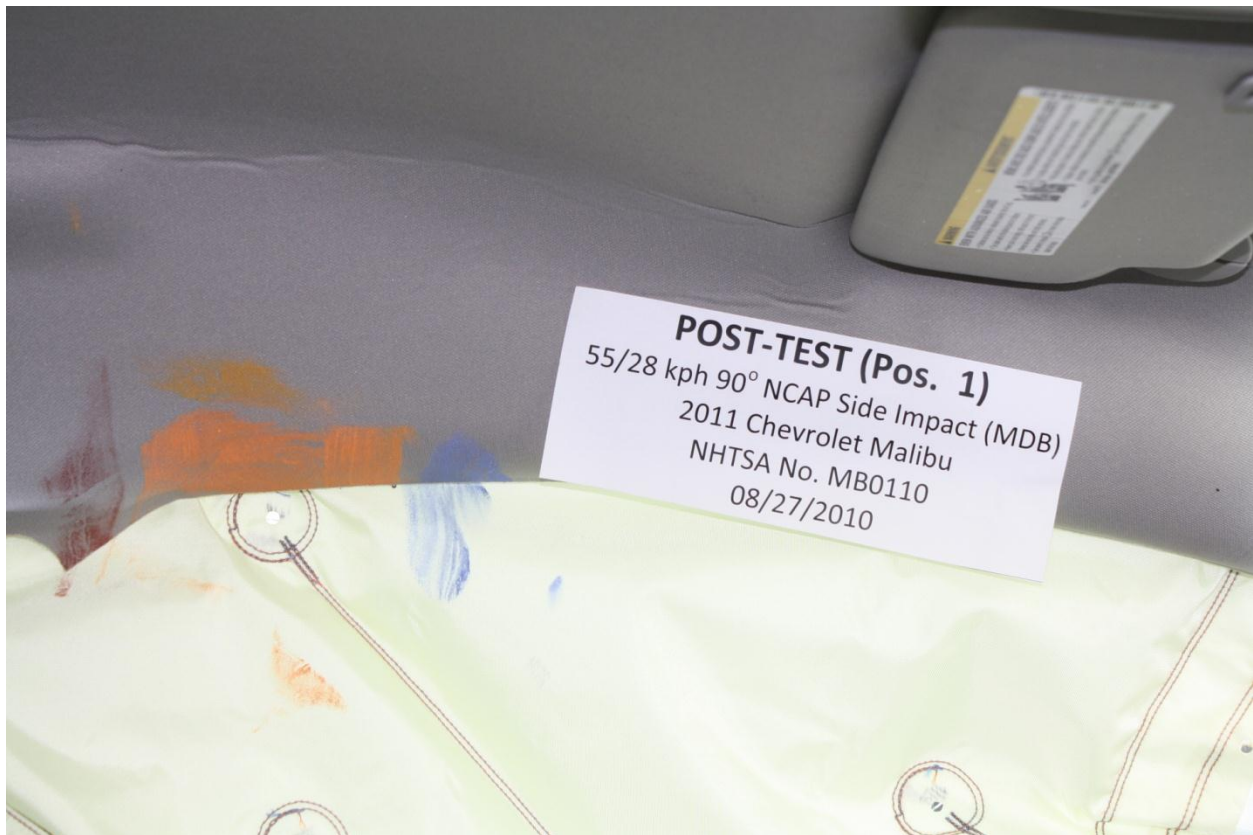


Figure A-47: Post-test Driver Dummy Close-Up Head Contact with Vehicle View

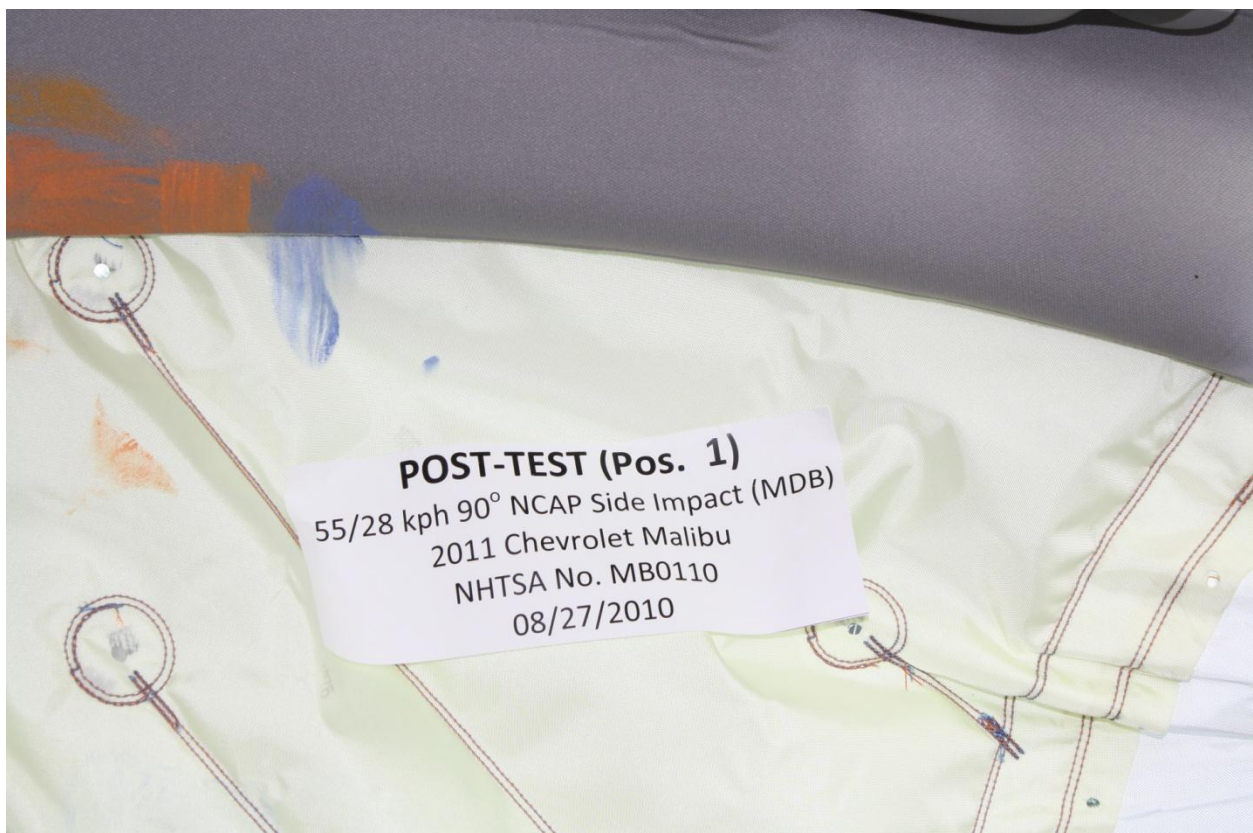


Figure A-48: Post-test Driver Dummy Close-Up Head Contact with Side Airbag View



Figure A-49: Post-Test Driver Dummy Close-Up Torso Contact with Vehicle Interior View

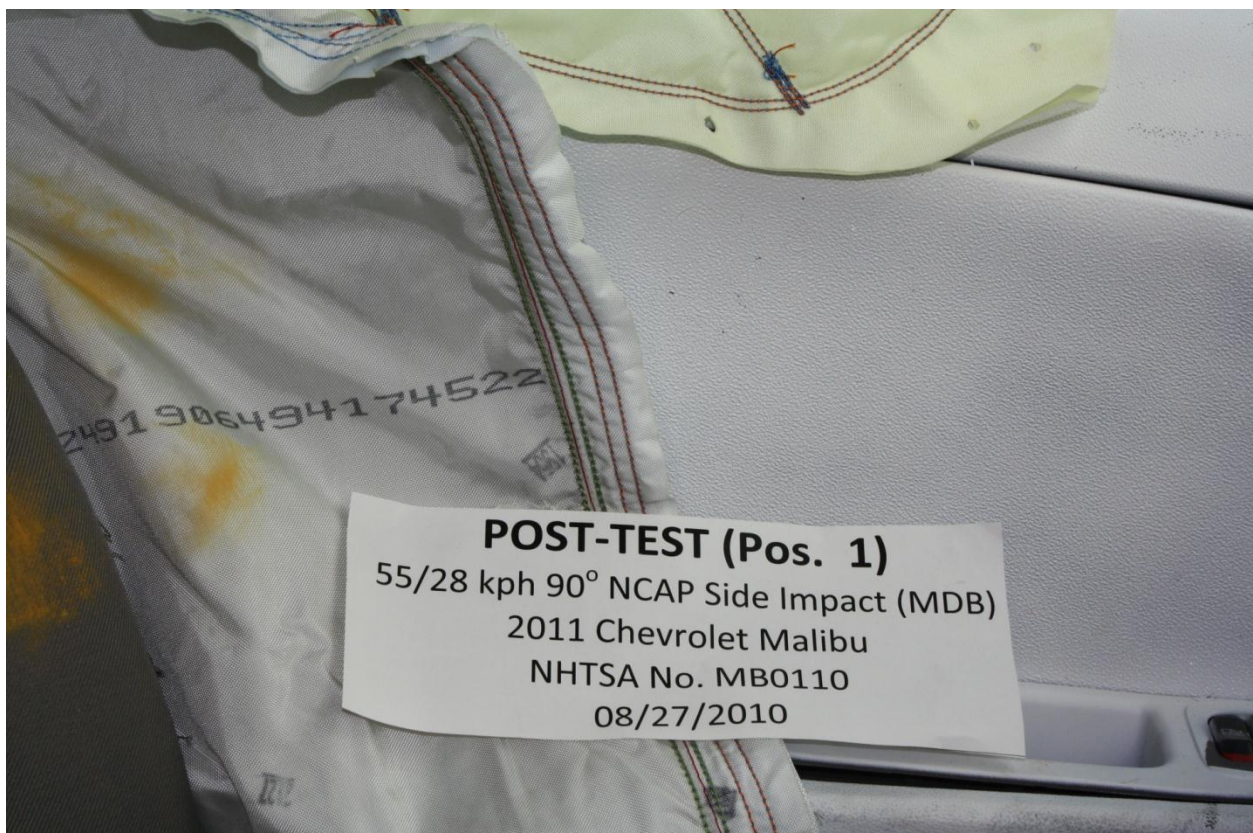


Figure A-50: Post-Test Driver Dummy Close-Up Torso Contact with Side Airbag View



Figure A-51: Post-Test Driver Dummy Close-Up Pelvis Contact View

Photograph Not Available

Figure A-52: Post-Test Driver Dummy Close-Up Pelvis Contact with Side Airbag View



Figure A-53: Pre-test Left Side View of Passenger Dummy Showing Belt, Chalking, and Contact Switches



Figure A-54: Pre-test Left Side View of Passenger Dummy Shoulder and Door Top View



Figure A-55: Post-test Left Side View of Passenger Dummy Shoulder and Door Top View



Figure A-56: Pre-Test Frontal View of Rear Passenger Seat Back Prior to Dummy Positioning



Figure A-57: Pre-Test Frontal View of Rear Passenger Dummy Head and Shoulders in Relation to Head Restraint



Figure A-58: Pre-Test Overhead View of Rear Passenger Seat Pan Prior to Dummy Positioning



Figure A-59: Pre-Test Overhead View of Rear Passenger Dummy Thighs on Seat Pan



Figure A-60: Pre-Test View of Rear Passenger Dummy's Neck Showing Position of Adjustable Neck Bracket



Figure A-61: Pre-Test View of Rear Passenger Dummy's Head Showing Dummy's Head is Level

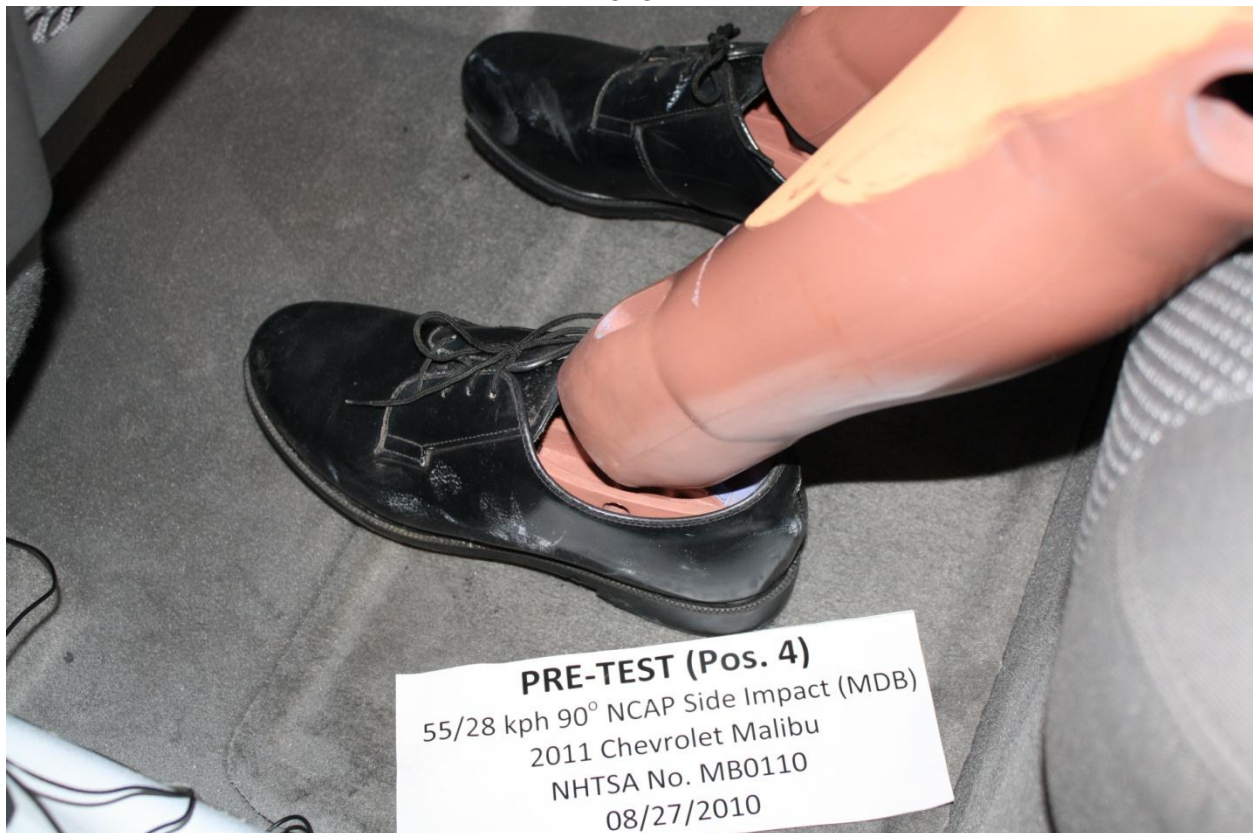


Figure A-62: Pre-Test Placement of Rear Passenger Dummy's Feet



Figure A-63: Pre-Test View of Belt Anchorage for Rear Passenger Dummy to Show Position



Figure A-64: Pre-test Close-Up Left Side View of Rear Passenger Seat Track Showing Test Position



Figure A-65: Pre-test Close-Up Left Side View of Rear Passenger Seat Back Showing Test Position

Photograph Not Available

Figure A-66: Pre-Test Close-Up View of Rear Passenger Seat Back or Head Restraint Showing Seat Back Test Position



Figure A-67: Pre-Test Passenger Dummy and Door Clearance View



Figure A-68: Post-Test Passenger Dummy and Door Clearance View



Figure A-69: Pre-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment



Figure A-70: Post-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment



Figure A-71: Pre-test Passenger Inner Door Panel View



Figure A-72: Post-test Passenger Inner Door Panel View Showing Rear Passenger Dummy Contact Locations

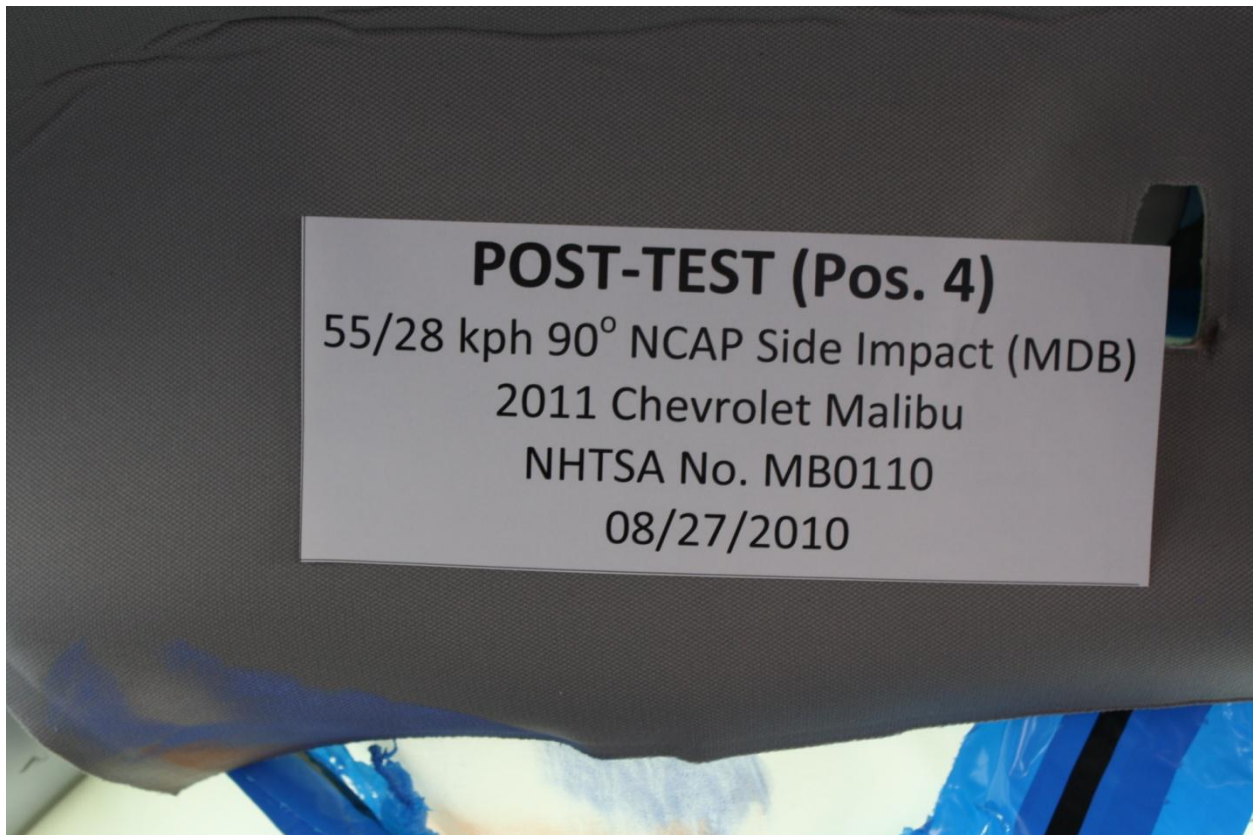


Figure A-73: Post-test Rear Passenger Dummy Close-Up Head Contact with Vehicle View



Figure A-74: Post-test Rear Passenger Dummy Close-Up Head Contact with Side Airbag View

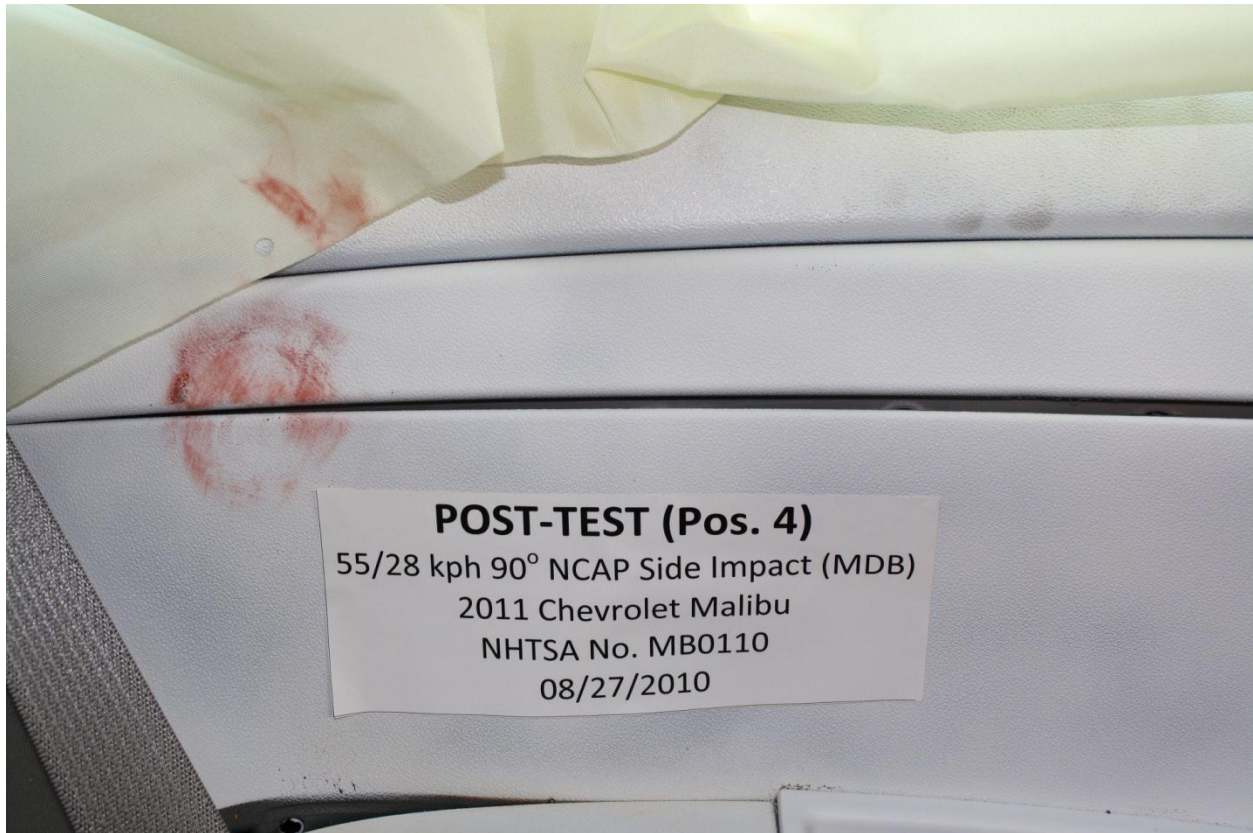


Figure A-75: Post-Test Rear Passenger Dummy Close-Up Torso Contact with Vehicle Interior View

Photograph Not Available

Figure A-76: Post-Test Rear Passenger Dummy Close-Up Torso Contact with Side Airbag View

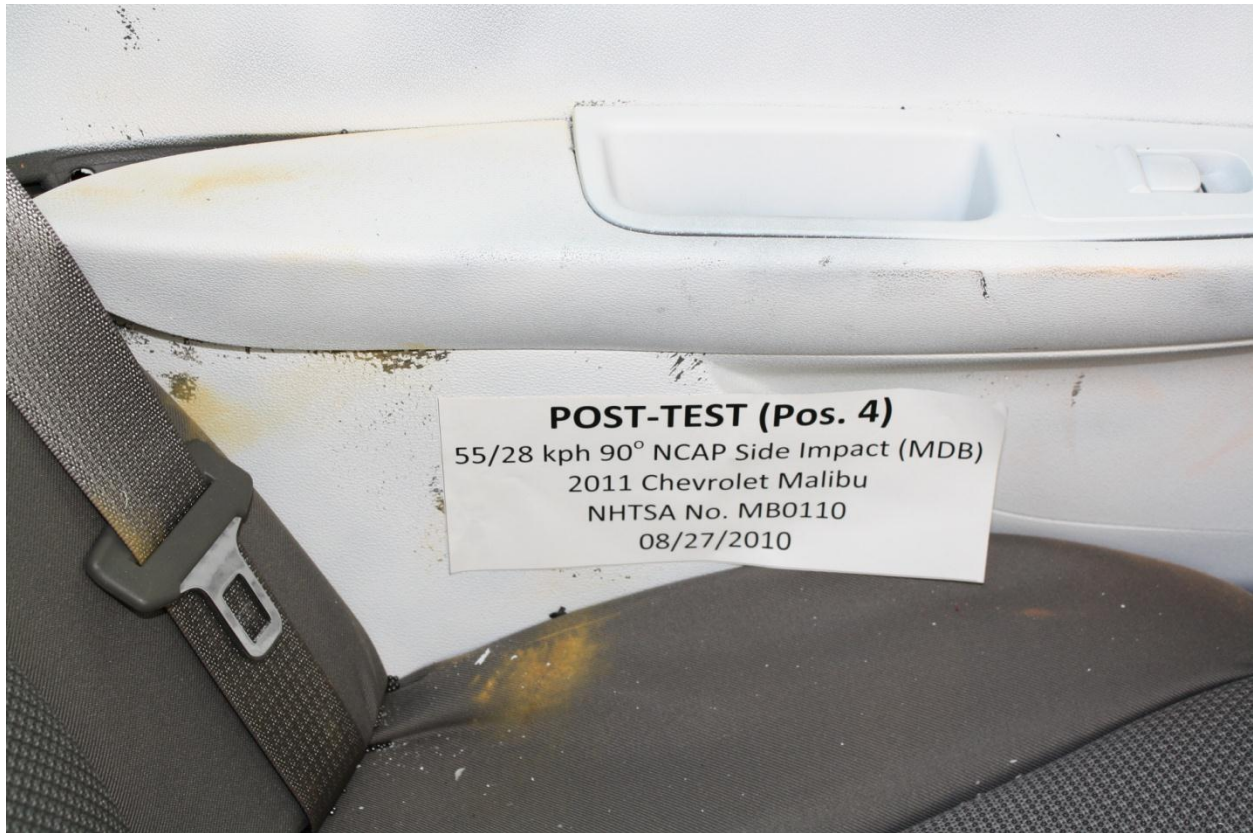


Figure A-77: Post-Test Rear Passenger Dummy Close-Up Pelvis Contact View

Photograph Not Available

Figure A-78: Post-Test Rear Passenger Dummy Close-Up Pelvis Contact with Side Airbag View

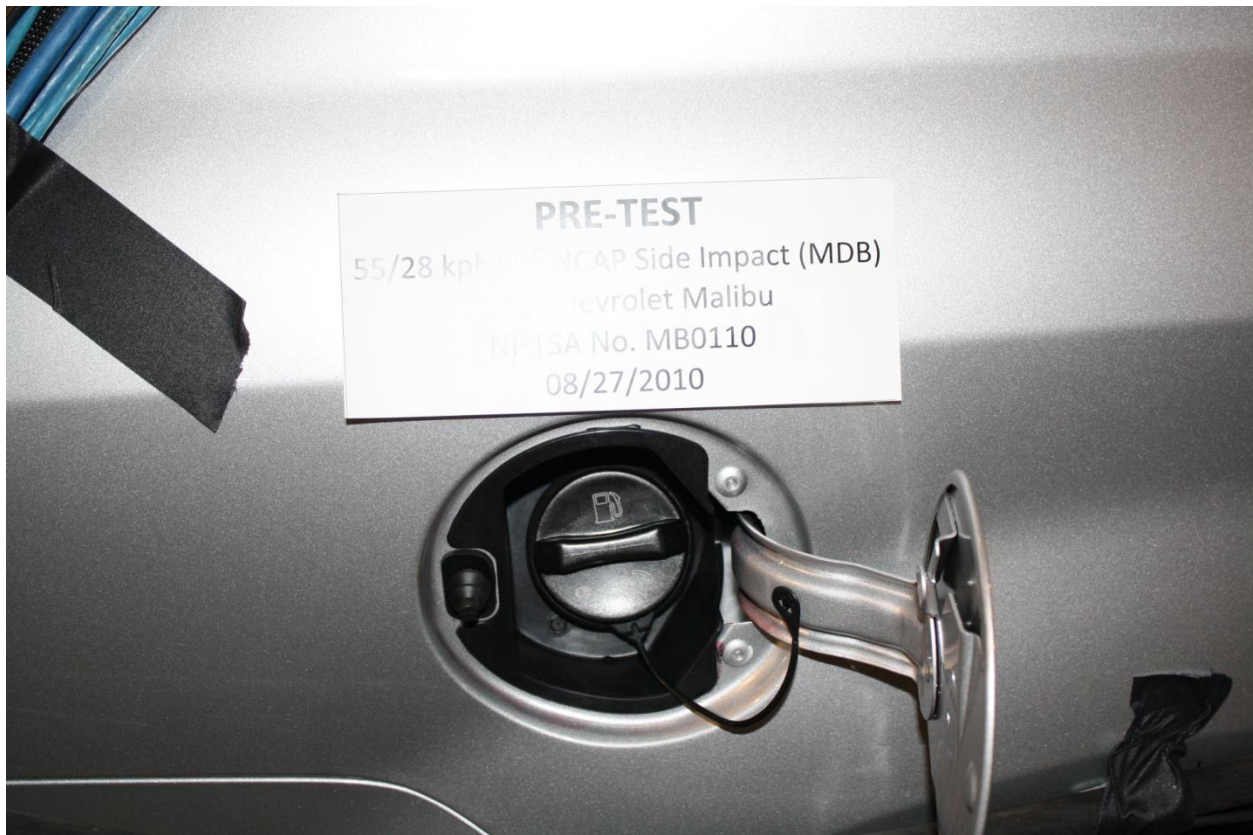


Figure A-79: Pre-Test View of Fuel Filler Cap or Fuel Filler Neck

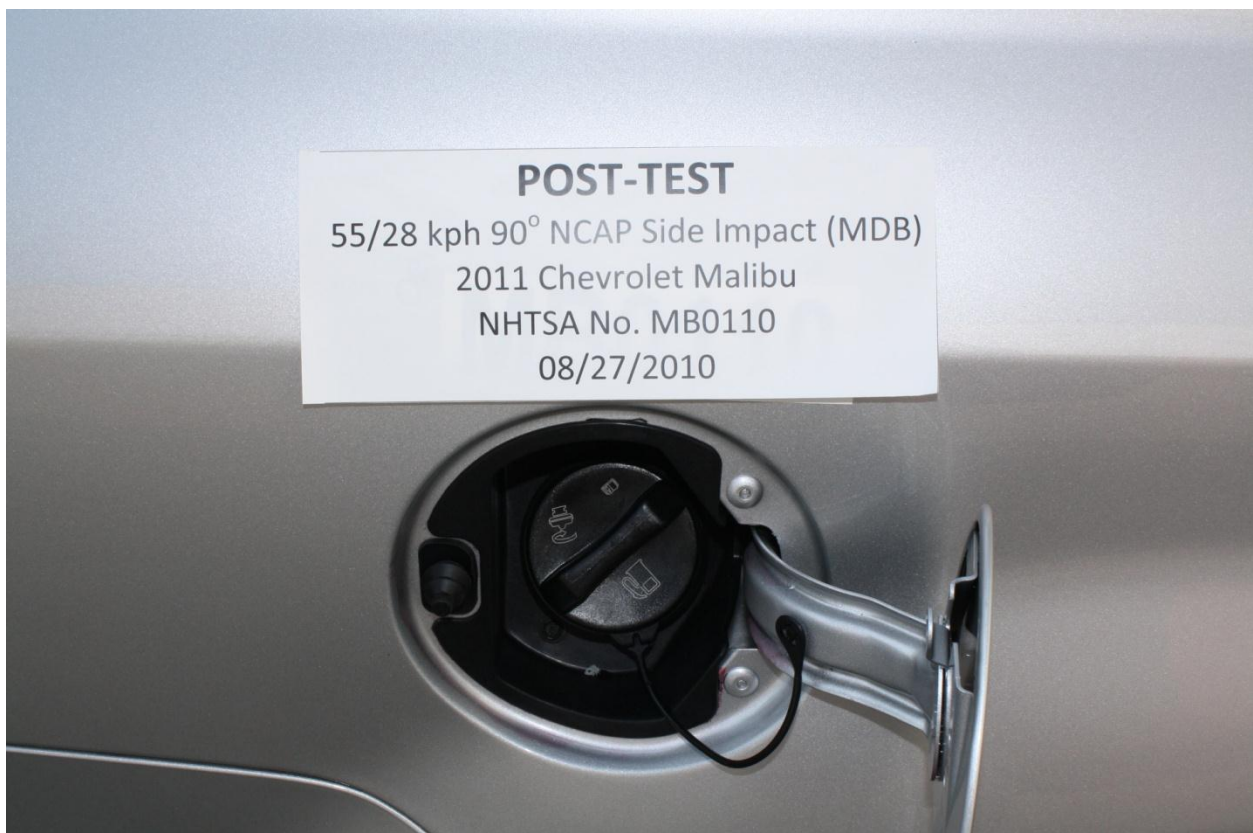


Figure A-80: Post-Test View of Fuel Filler Cap or Fuel Filler Neck



Figure A-81: Pre-Test Front View of MDB Impactor Face



Figure A-82: Post-Test Front View of MDB Impactor Face



Figure A-83: Pre-Test Top View of MDB Impactor Face



Figure A-84: Post-Test Top View of MDB Impactor Face



Figure A-85: Pre-Test Left Side View of MDB Impactor Face



Figure A-86: Post-Test Left Side View of MDB Impactor Face



Figure A-87: Pre-Test Right Side View of MDB Impactor Face

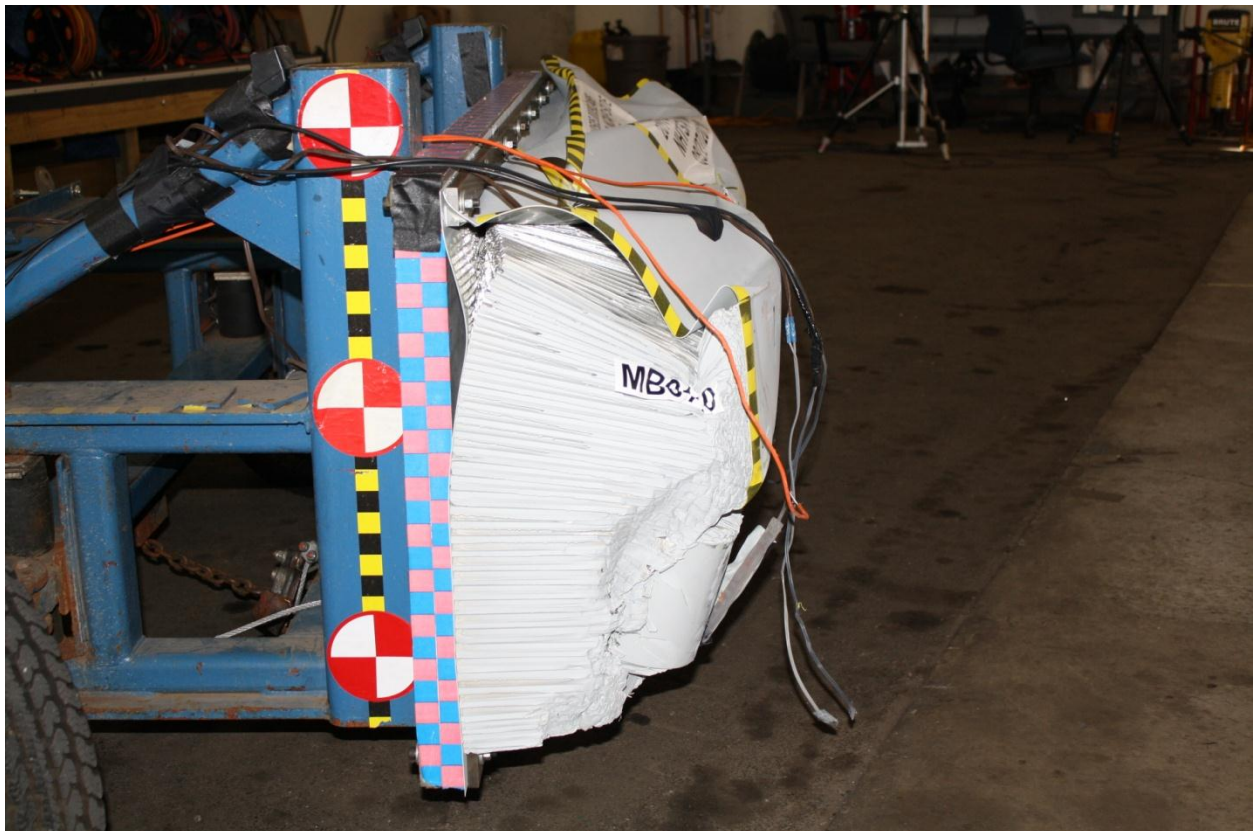


Figure A-88: Post-Test Right Side View of MDB Impactor Face

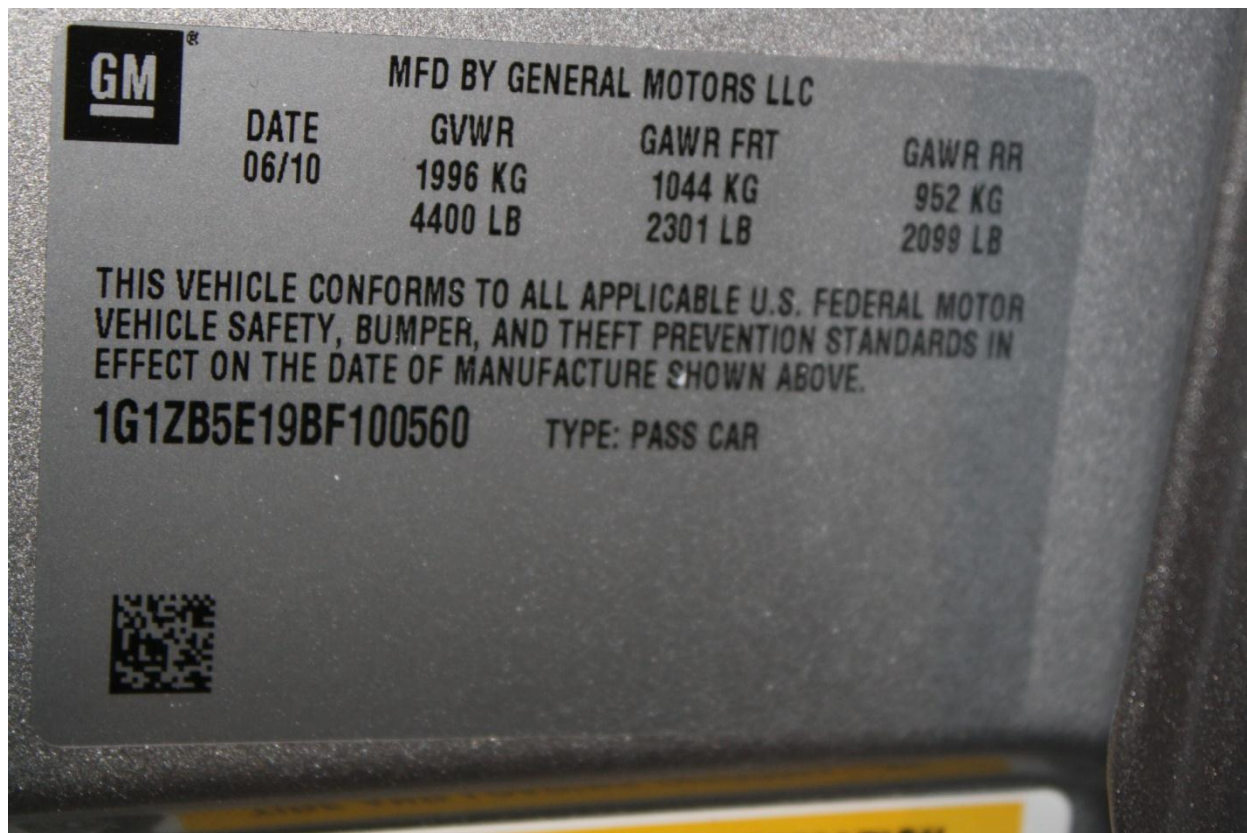


Figure A-89: Close-Up View of Vehicle's Certification Label



Figure A-90: Close-Up View of Vehicle's Tire Information Placard or Label

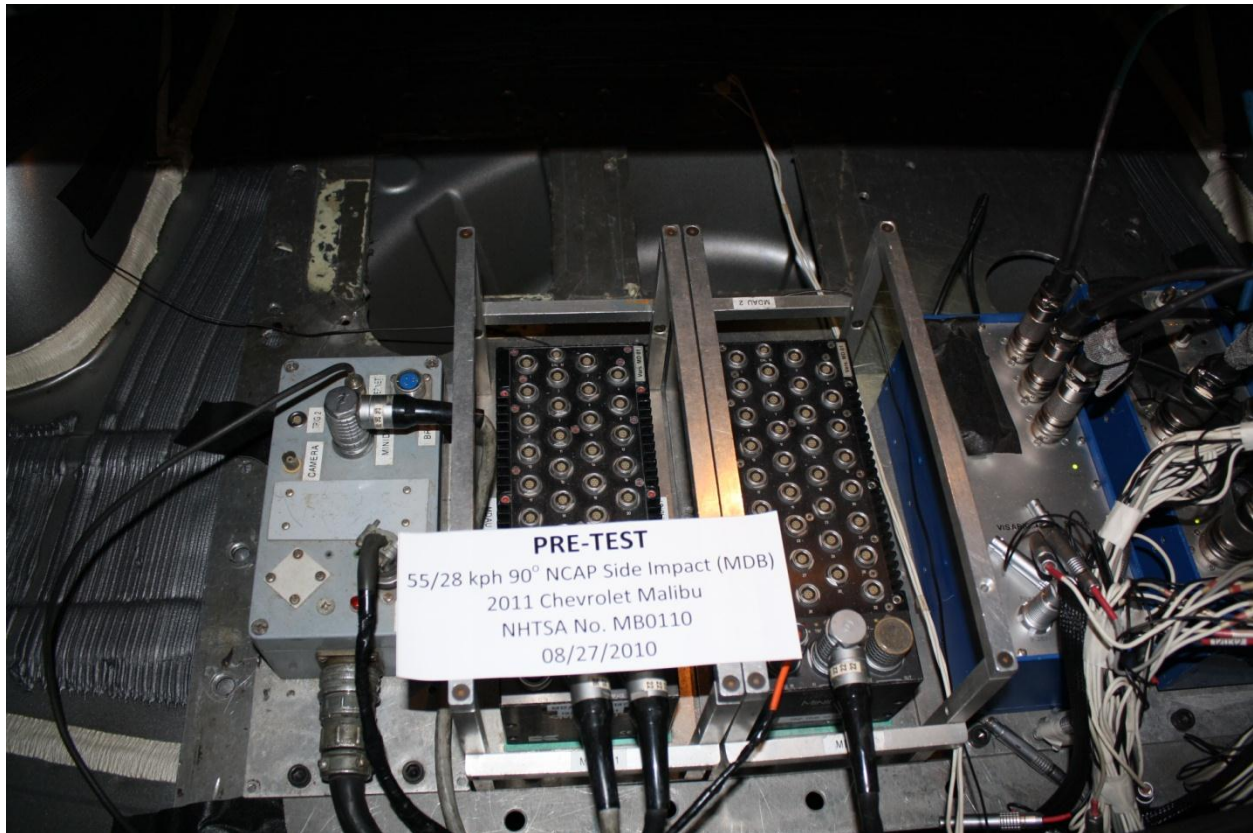


Figure A-91: Pre-Test Ballast View



Figure A-92: Post-Test Primary and Redundant Speed Trap Read-Out



Figure A-93: FMVSS No. 301 Rollover 0°

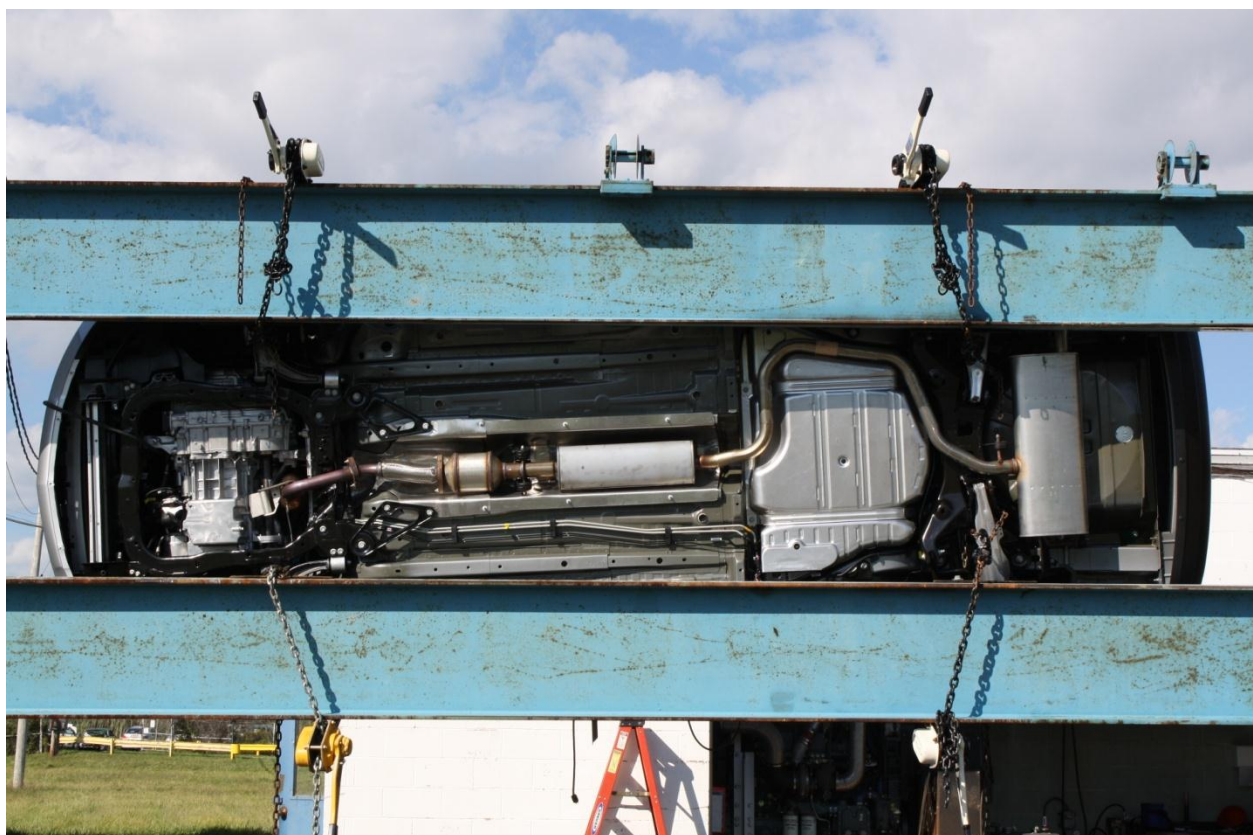


Figure A-94: FMVSS No. 301 Rollover 90°



Figure A-95: FMVSS No. 301 Rollover 180°



Figure A-96: FMVSS No. 301 Rollover 270°



Figure A-97: FMVSS No. 301 Rollover 360°



Figure A-98: Impact Event (Impact Side)



2011 MALIBU 1LS

EXTERIOR: SILVER ICE METALLIC
INTERIOR: TITANIUM

ENGINE: 2.4L DOHC MFI
TRANSMISSION: 6-SPEED AUTOMATIC

Visit us at www.chevy.com

STANDARD EQUIPMENT

ITEMS LISTED BELOW ARE INCLUDED AT NO EXTRA CHARGE IN THE STANDARD VEHICLE PRICE SHOWN.

- 5 YEAR / 100,000 MILE POWERTRAIN LIMITED WARRANTY SEE DEALER FOR DETAILS

MECHANICAL

- 2.4L ECOTEC DOHC VVT 4-CYL. ENG.
- TRANSMISSION, 6 SPD AUTOMATIC
- TAPSHIFT MANUAL SHIFT CONTROL
- 4-WHL. INDEPENDENT SUSPENSION

SAFETY & SECURITY

- AIR BAGS, DUAL FRONTAL, PASSENGER SENSING SYSTEM, HEAD CURTAIN SIDE AIR BAGS, FRONT/CUTBOARD REAR;
- SIDE IMPACT AIR BAGS, DRIVER AND FRONT PASSENGER
- ANTI-LOCK BRAKE SYSTEM, 4-WHEEL DISC
- STABILITRAK STABILITY CONTROL

- SYSTEM W/ TRACTION CONTROL
- REAR CHILD SEAT LATCH SYSTEM
- 8 MPHS ONSTAR DIRECTIONS & CONNECTIONS WITH AUTOMATIC CRASH RESPONSE AND TURN-BY-TURN NAVIGATION (ASK DEALER ABOUT GEOGRAPHIC COVERAGE)

EXTERIOR

- 17" FASCIA SPOKE WHEELS
- TOURING TIRES
- POWER OUTSIDE MIRRORS, FOLDING, BLACK

INTERIOR

- AIR CONDITIONING
- POWER DOOR LOCKS
- POWER WINDOWS, DRIVER EXPRESS DOWN
- POWER TRUNK RELEASE
- AM/FM STEREO W/ CD PLAYER
- XM RADIO - SERVICE SUBSCRIPTION SOLD SEPARATELY BY SIRIUS/XM AFTER 3 MONTHS

- POWER LUMBAR, DRIVER SEAT
- POWER HEIGHT ADJUST, DRIVER SEAT
- REAR WINDOW DEFOGGER
- SEAT, REAR SPLIT FOLDING
- DRIVER INFORMATION CENTER
- TILT AND TELESCOPIC STEERING WHEEL WITH CRUISE CONTROL
- REMOTE KEYLESS ENTRY
- TIRE SEALANT & INFLATOR KIT IN PLACE OF SPARE TIRE

OPTIONS & PRICING

MANUFACTURER'S SUGGESTED RETAIL PRICE

STANDARD VEHICLE PRICE \$21,075.00

OPTIONAL EQUIPMENT BY THE MANUFACTURER (DO NOT REPLACE STANDARD EQUIPMENT SHOWN)

COMPACT SPARE TIRE (REPLACES TIRE SEALANT AND INFLATOR KIT) 100.00

FLOOR MATS 80.00

TOTAL OPTIONS \$100.00
TOTAL VEHICLE & OPTIONS \$22,155.00
DESTINATION CHARGE 720.00
TOTAL VEHICLE PRICE* \$22,875.00

MB0110
#3
Rec 7/22
G3 miles

EPA Fuel Economy Estimates

CITY MPG

22

Expected range for most drivers
18 to 26 MPG

Estimated Annual Fuel Cost
\$1,502

based on 15,000 miles at \$2.60 per gallon

HIGHWAY MPG

33

Expected range for most drivers
27 to 39 MPG

Combined Fuel Economy

This Vehicle

26

12 26 30
ALL MID-SIZE CARS

Your actual mileage will vary depending on how you drive and maintain your vehicle.

ACC

See the FREE Fuel Economy Guide at dealers or www.fueleconomy.gov

GOVERNMENT SAFETY RATINGS

This vehicle has not been rated by the government for frontal crash, side crash or rollover risk.

Source: National Highway Traffic Safety Administration (NHTSA).

www.safercar.gov or 1-888-327-4236

PARTS CONTENT INFORMATION

FOR VEHICLES IN THIS COUNTRY:
U.S./CANADIAN PARTS CONTENT: 75%

NOTE: PARTS CONTENT DOES NOT INCLUDE FINAL ASSEMBLY, DISTRIBUTION, OR OTHER NON-PARTS COSTS.

FOR THIS VEHICLE:
FINAL ASSEMBLY POINT:
KANSAS CITY, KS U.S.A.
COUNTRY OF ORIGIN:
ENGINE: UNITED STATES
TRANSMISSION: MEXICO

This label has been applied pursuant to Federal law. Do not remove or alter. This label is the property of the manufacturer. The dealer is responsible for the accuracy of the information on this label. Dealer must not alter, add, or remove any information on this label or remove this label.

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GM-USA, INC. 2010-1000-0000

ORDER NO. NHT10 SALES CODE E
SALES MODEL CODE 12589
ORDER NO. 12579
FINAL ASSEMBLY:
KANSAS CITY, KS U.S.A.
VIN 1G1ZB5E18B100560

DEALER TO WHOM DELIVERED:
WEST HERR CHEVROLET OF HAMBURG
5025 SOUTHWESTERN BLVD
HAMBURG, NY 14075-2907



UL
1AG1400592

Figure A-99: Monroney Label

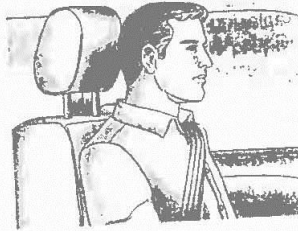
3-2 Seats and Restraints

Head Restraints

The vehicle's front and rear seats have adjustable head restraints in the outboard seating positions.

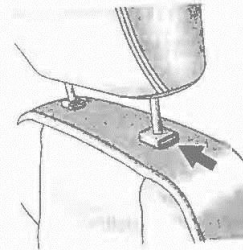
WARNING

With head restraints that are not installed and adjusted properly, there is a greater chance that occupants will suffer a neck/spinal injury in a crash. Do not drive until the head restraints for all occupants are installed and adjusted properly.



Adjust the head restraint so that the top of the restraint is at the same height as the top of the occupant's head. This position reduces the chance of a neck injury in a crash.

The height of the head restraint can be adjusted. Pull the head restraint up to raise it. Try to move the head restraint to make sure that it is locked in place.



To lower the head restraint, press the button located on top of the seatback, and push the head restraint down. Try to move the head restraint after the button is released to make sure that it is locked in place.

The vehicle's front and rear seat outboard head restraints are not designed to be removed.

Figure A-100: Driver Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

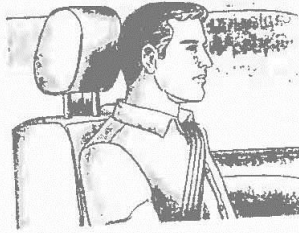
3-2 Seats and Restraints

Head Restraints

The vehicle's front and rear seats have adjustable head restraints in the outboard seating positions.

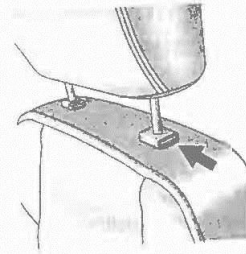
WARNING

With head restraints that are not installed and adjusted properly, there is a greater chance that occupants will suffer a neck/spinal injury in a crash. Do not drive until the head restraints for all occupants are installed and adjusted properly.



Adjust the head restraint so that the top of the restraint is at the same height as the top of the occupant's head. This position reduces the chance of a neck injury in a crash.

The height of the head restraint can be adjusted. Pull the head restraint up to raise it. Try to move the head restraint to make sure that it is locked in place.



To lower the head restraint, press the button located on top of the seatback, and push the head restraint down. Try to move the head restraint after the button is released to make sure that it is locked in place.

The vehicle's front and rear seat outboard head restraints are not designed to be removed.

Figure A-101: Left Rear Passenger Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

APPENDIX B
DUMMY RESPONSE DATA

The following data plots shall be included in this appendix:

TABLE OF DATA PLOTS
Driver & Passenger Dummy Instrumentation Plots
FILTERED DATA

No.	Description	Page
1	Driver Head Acceleration (X) Primary vs. Time	B-4
2	Driver Head Acceleration (Y) Primary vs. Time	B-4
3	Driver Head Acceleration (Z) Primary vs. Time	B-5
4	Driver Head Resultant Acceleration Primary vs. Time	B-5
5	Driver Upper Thorax Rib Deflection (Y) vs. Time	B-6
6	Driver Middle Thorax Rib Deflection (Y) vs. Time	B-6
7	Driver Lower Thorax Rib Deflection (Y) vs. Time	B-7
8	Driver Thorax Rib Deflection Maximum vs. Time	B-7
9	Driver Anterior Abdominal Force (Y) vs. Time	B-8
10	Driver Middle Abdominal Force (Y) vs. Time	B-8
11	Driver Posterior Abdominal Force (Y) vs. Time	B-9
12	Driver Total Abdominal Force (Y) vs. Time	B-9
13	Driver Pubic Symphysis Force (Y) vs. Time	B-10
14	Passenger Head Acceleration (X) vs. Time Primary	B-10
15	Passenger Head Acceleration (Y) vs. Time Primary	B-11
16	Passenger Head Acceleration (Z) vs. Time Primary	B-11
17	Passenger Head Resultant Acceleration Primary vs. Time	B-12
18	Passenger Lower Spine T12 Acceleration (X) vs. Time	B-12
19	Passenger Lower Spine T12 Acceleration (Y) vs. Time	B-13
20	Passenger Lower Spine T12 Acceleration (Z) vs. Time	B-13
21	Passenger Lower Spine T12 Resultant Acceleration vs. Time	B-14
22	Passenger Iliac Force on Impact Side (Y) vs. Time	B-14
23	Passenger Acetabulum Force on Impact Side (Y) vs. Time	B-15
24	Passenger Total Pelvic Force on Impact Side (Y) vs. Time	B-15

The following additional data for this test can be obtained from the Research and Development section of the NHTSA website. The website can be found at www.NHTSA.dot.gov.

Driver & Passenger Dummy Instrumentation Data

Driver Lower Spine T12 Acceleration (X)
Driver Lower Spine T12 Acceleration (Y)
Driver Lower Spine T12 Acceleration (Z)
Passenger Upper Thorax Rib Deflection (Y)
Passenger Middle Thorax Rib Deflection (Y)
Passenger Lower Thorax Rib Deflection (Y)
Passenger Upper Abdomen Rib Deflection (Y)
Passenger Lower Abdomen Rib Deflection (Y)
Driver Head Acceleration Redundant (X)
Driver Head Acceleration Redundant (Y)
Driver Head Acceleration Redundant (Z)
Driver Shoulder Contact Switch
Driver Torso Contact Switch
Driver Pelvis Contact Switch
Passenger Head Acceleration Redundant (X)
Passenger Head Acceleration Redundant (Y)
Passenger Head Acceleration Redundant (Z)
Passenger Shoulder Contact Switch
Passenger Torso Contact Switch
Passenger Pelvis Contact Switch

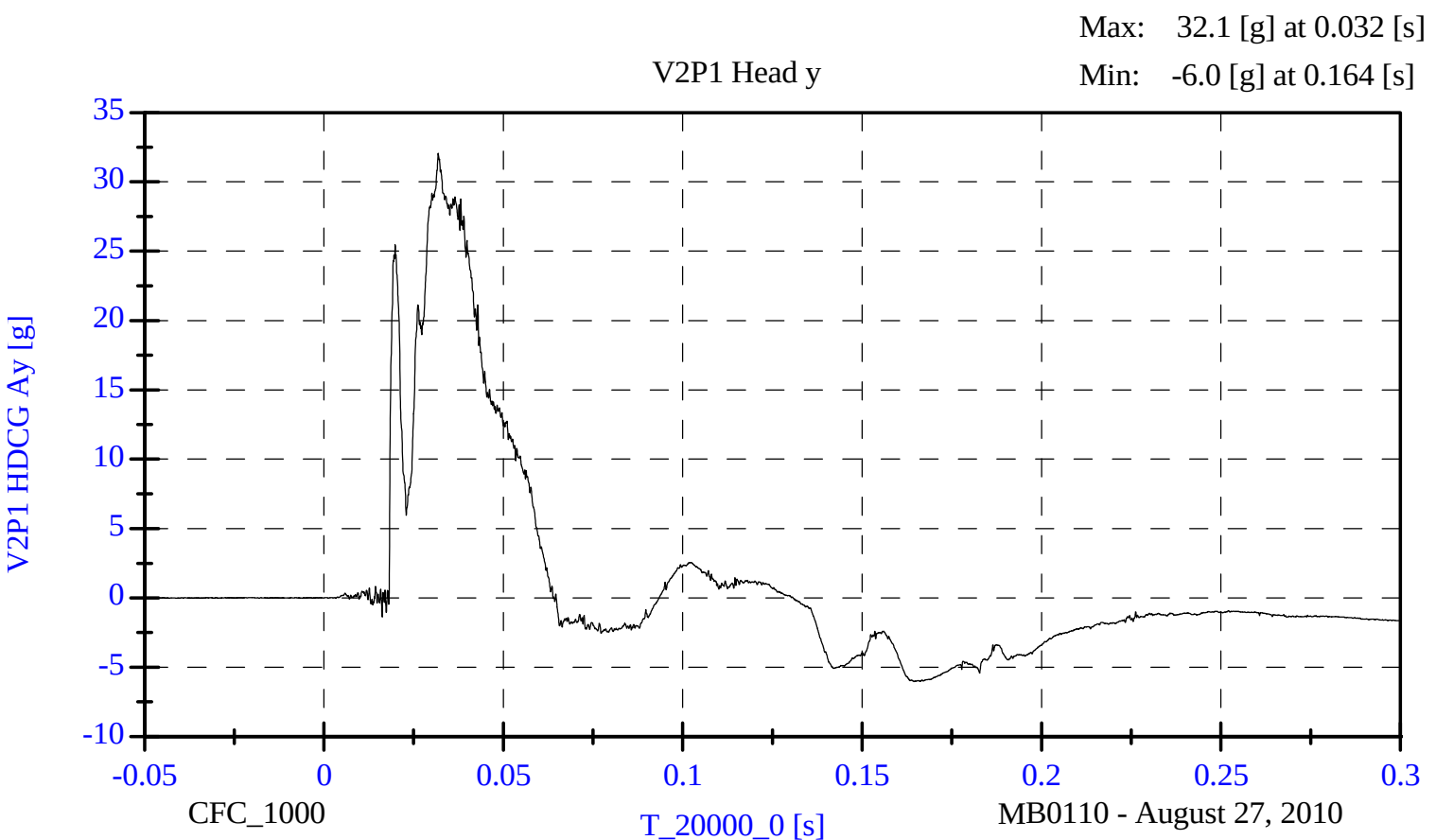
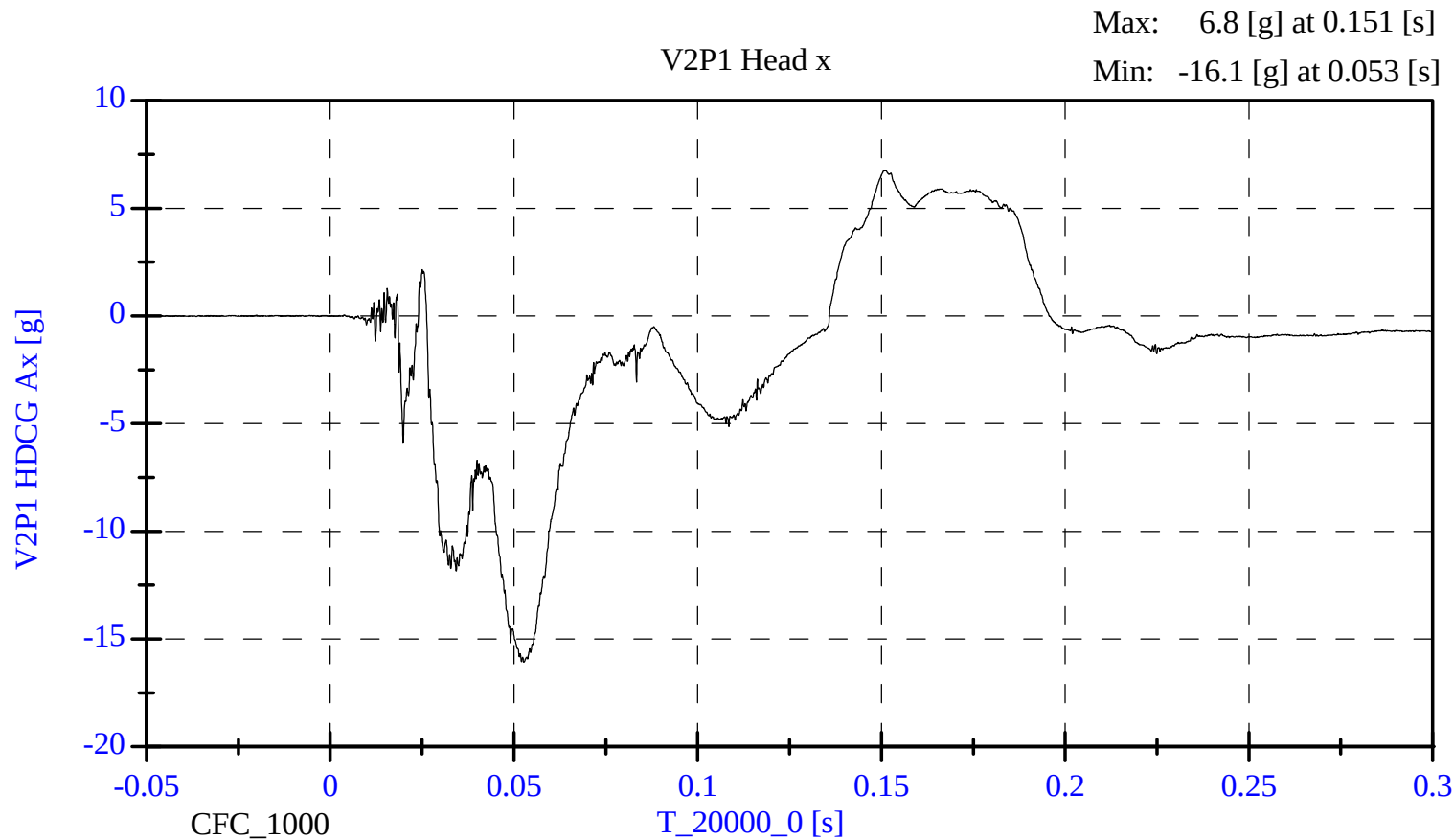
Vehicle Instrumentation Data

Driver Side Airbag Timing
Driver Side Curtain Airbag Timing
Passenger Side Airbag Timing (if applicable)
Passenger Side Curtain Airbag Timing (if different from Driver)
Right Side Sill at Front Seat Acceleration (X)
Right Side Sill at Front Seat Acceleration (Y)
Right Side Sill at Front Seat Acceleration (Z)
Right Side Sill at Rear Seat Acceleration (X)
Right Side Sill at Rear Seat Acceleration (Y)
Right Side Sill at Rear Seat Acceleration (Z)
Rear Floorpan Above Axle Acceleration (X)
Rear Floorpan Above Axle Acceleration (Y)
Rear Floorpan Above Axle Acceleration (Z)
Left Side Sill at Front Seat Acceleration (Y)
Left Side Sill at Rear Seat Acceleration (Y)
Right Rear Occupant Compartment Acceleration (Y)
Lower A-Post Acceleration (Y)
Upper A-Post Acceleration (Y)
Lower B-Post Acceleration (Y)
Upper B-Post Acceleration (Y)
Front Seat Track Acceleration (Y)

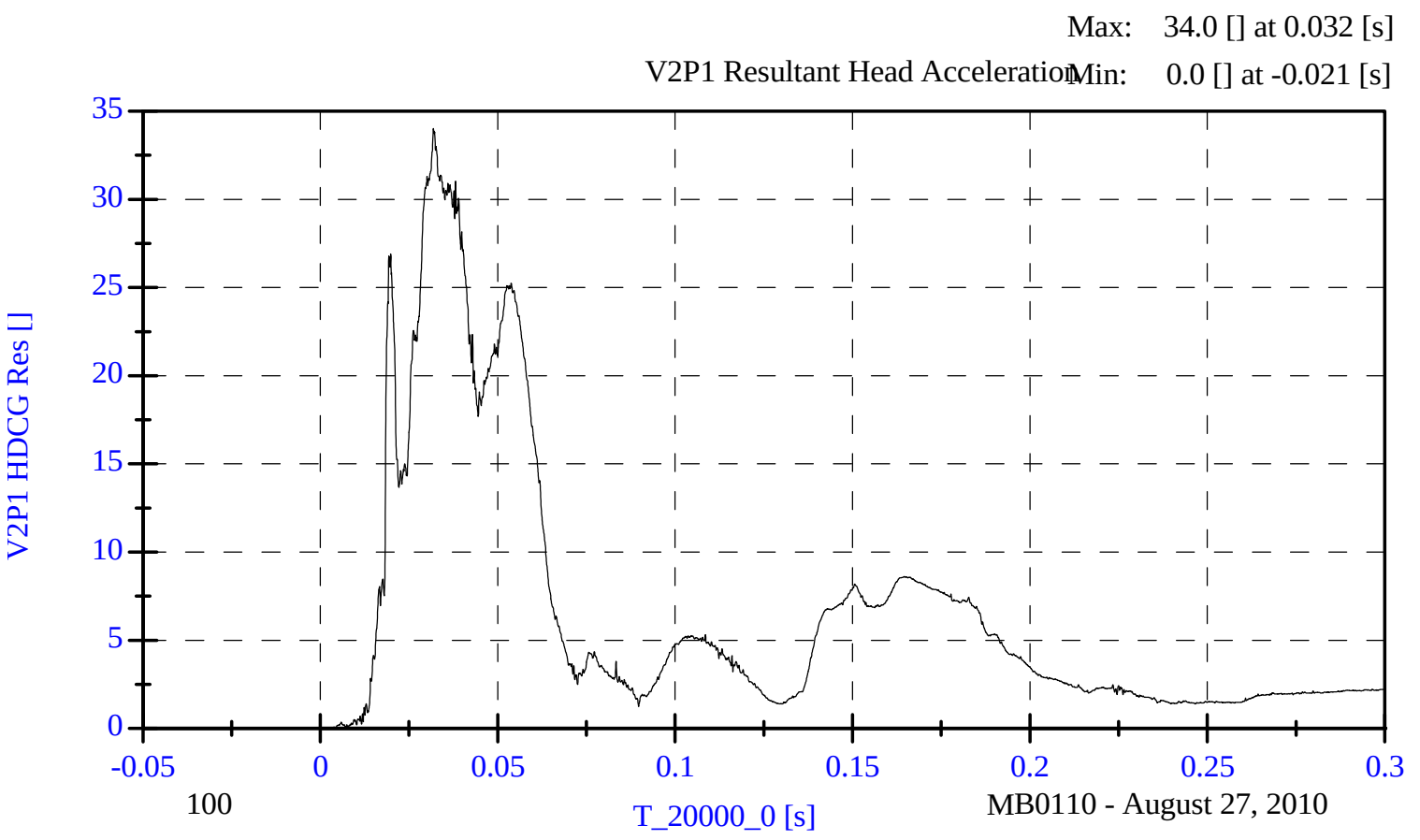
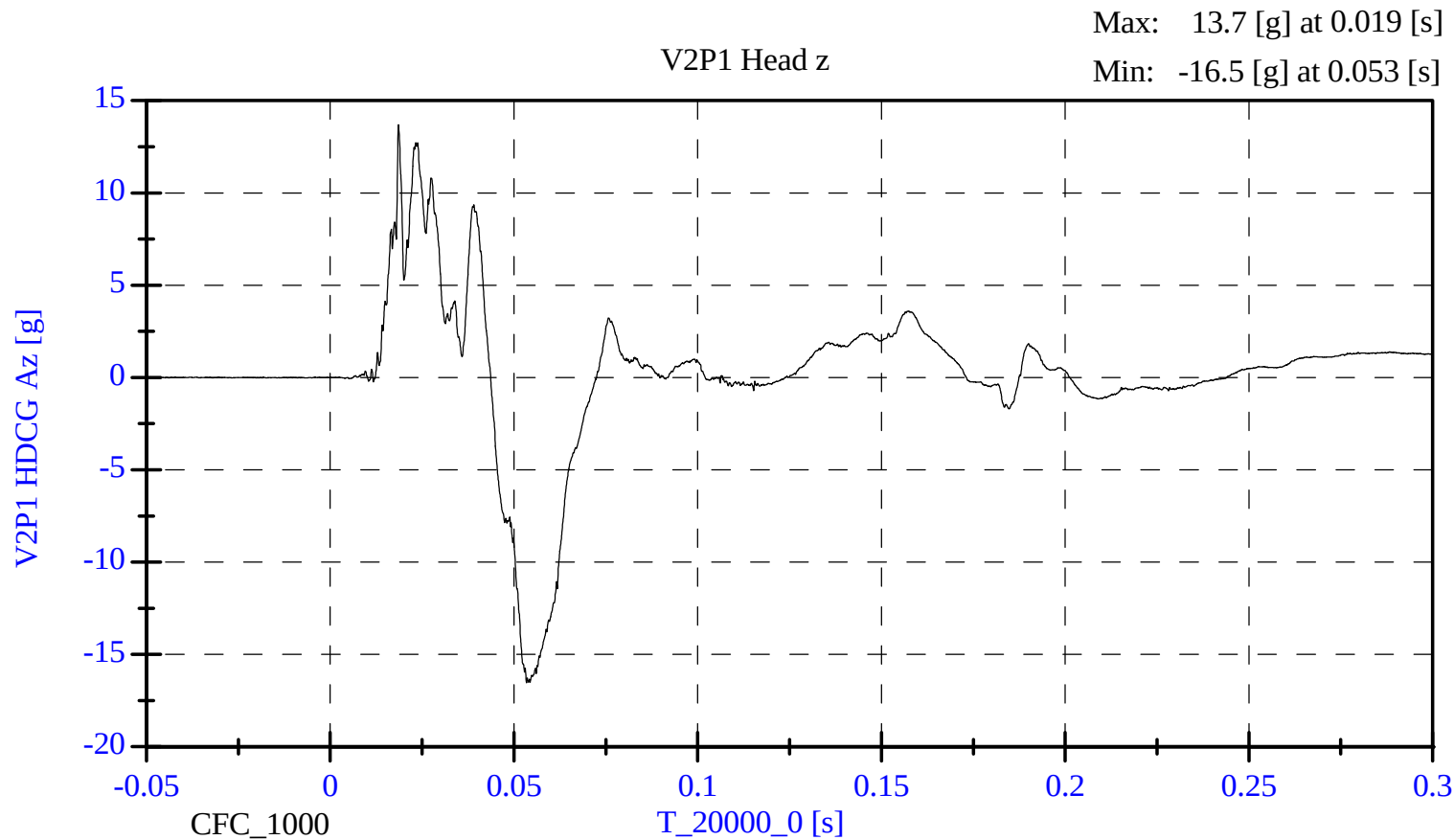
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Vehicle Center of Gravity Acceleration (Y)
Vehicle Center of Gravity Acceleration (Z)

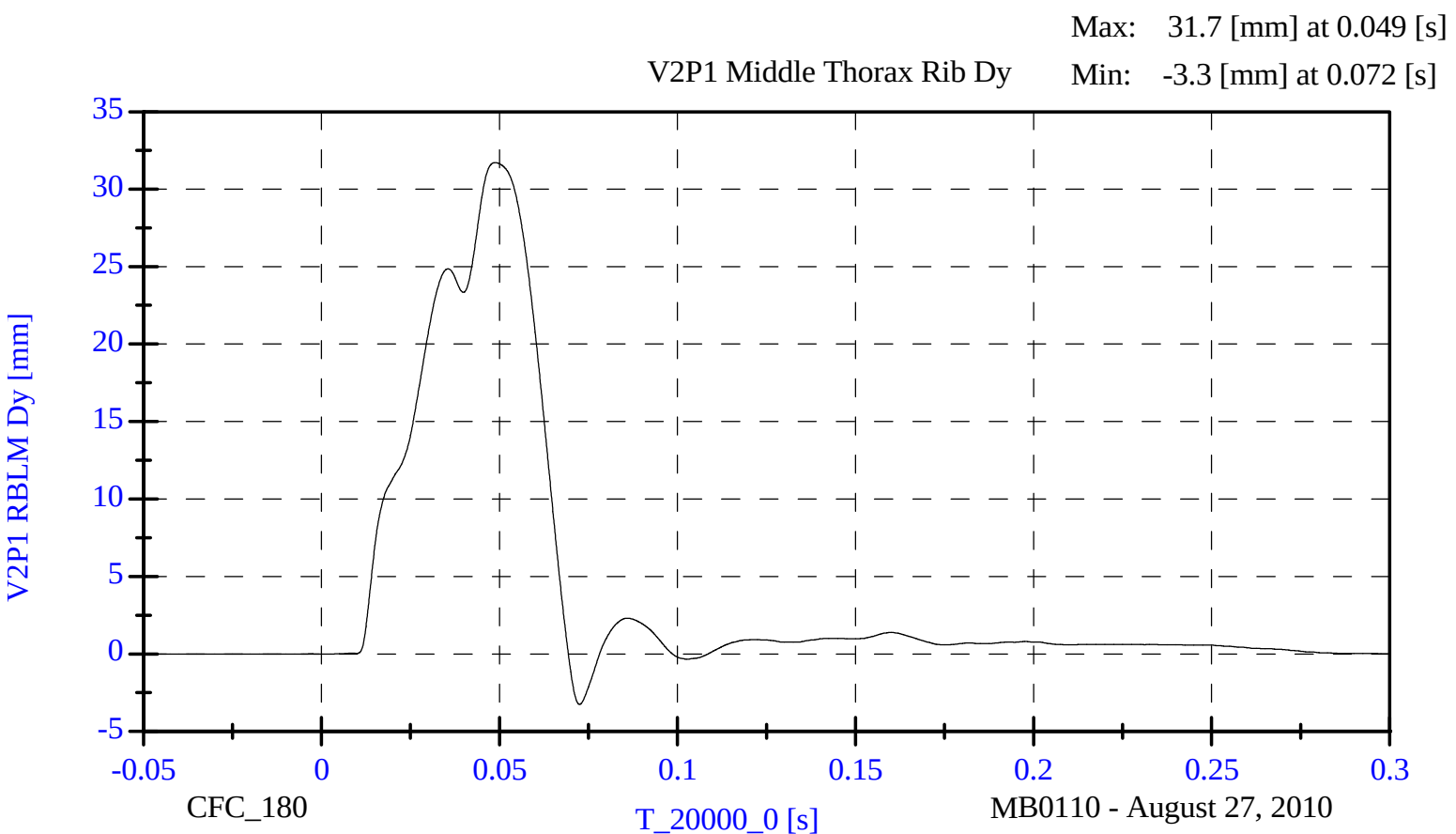
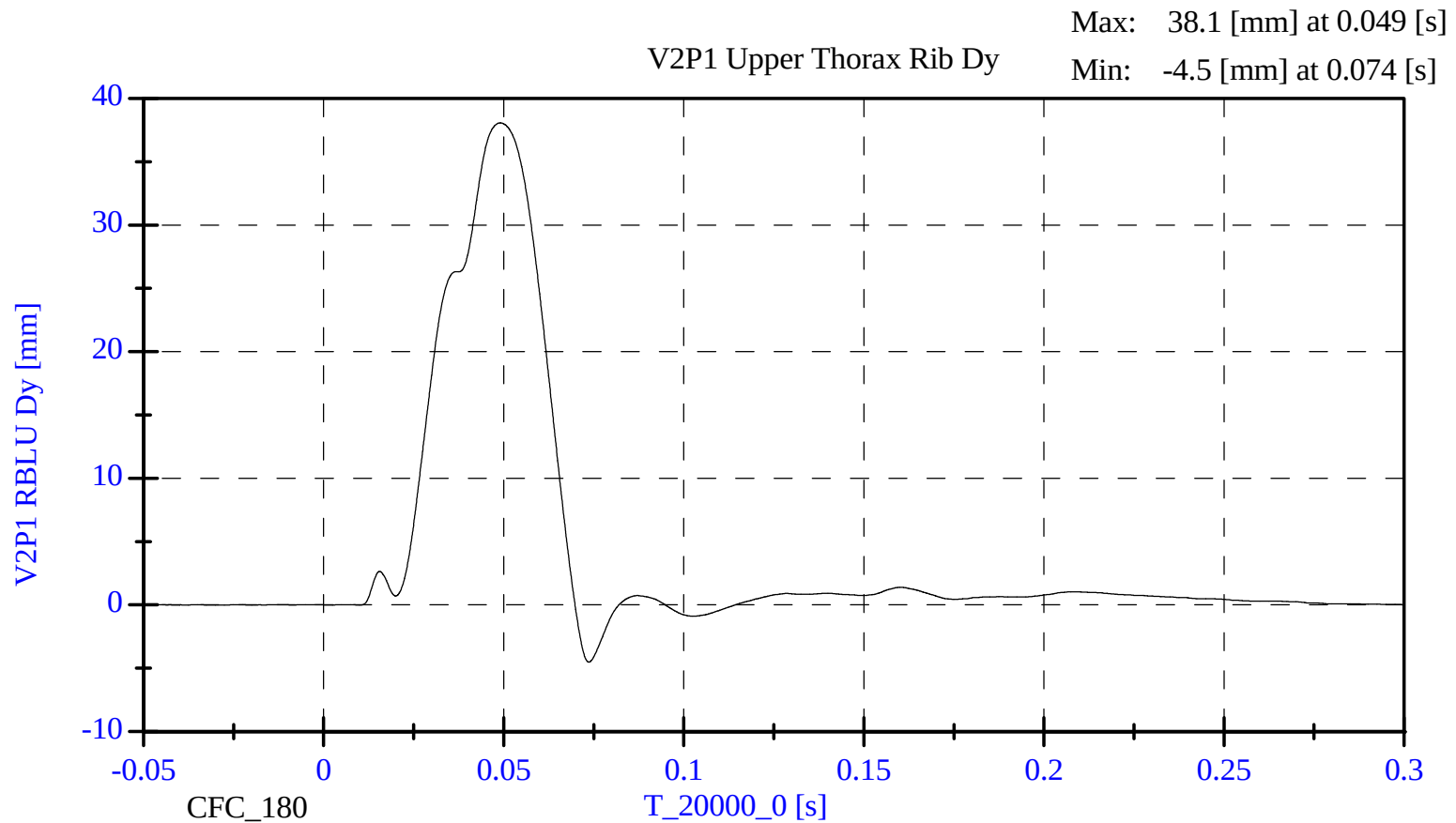
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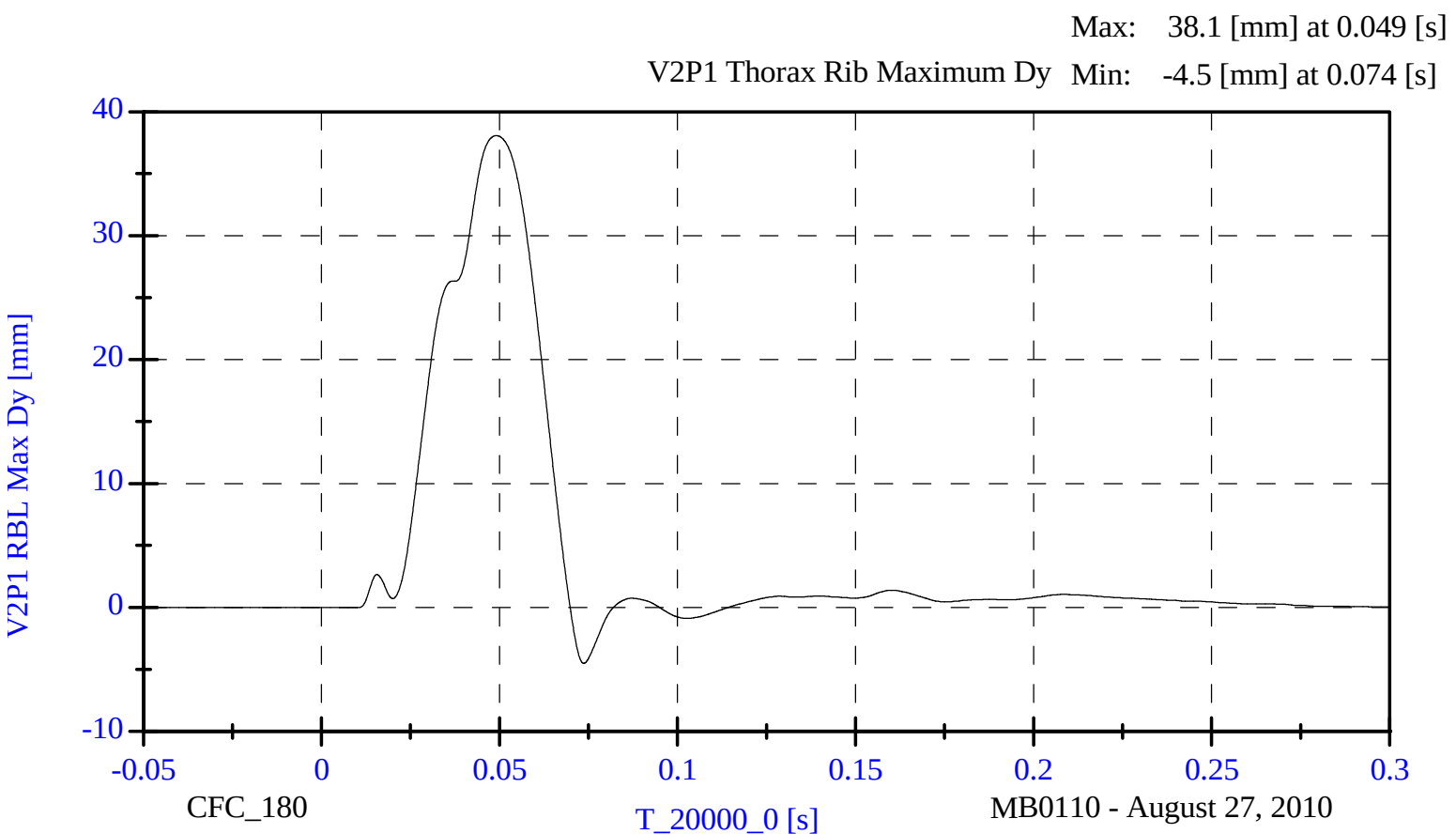
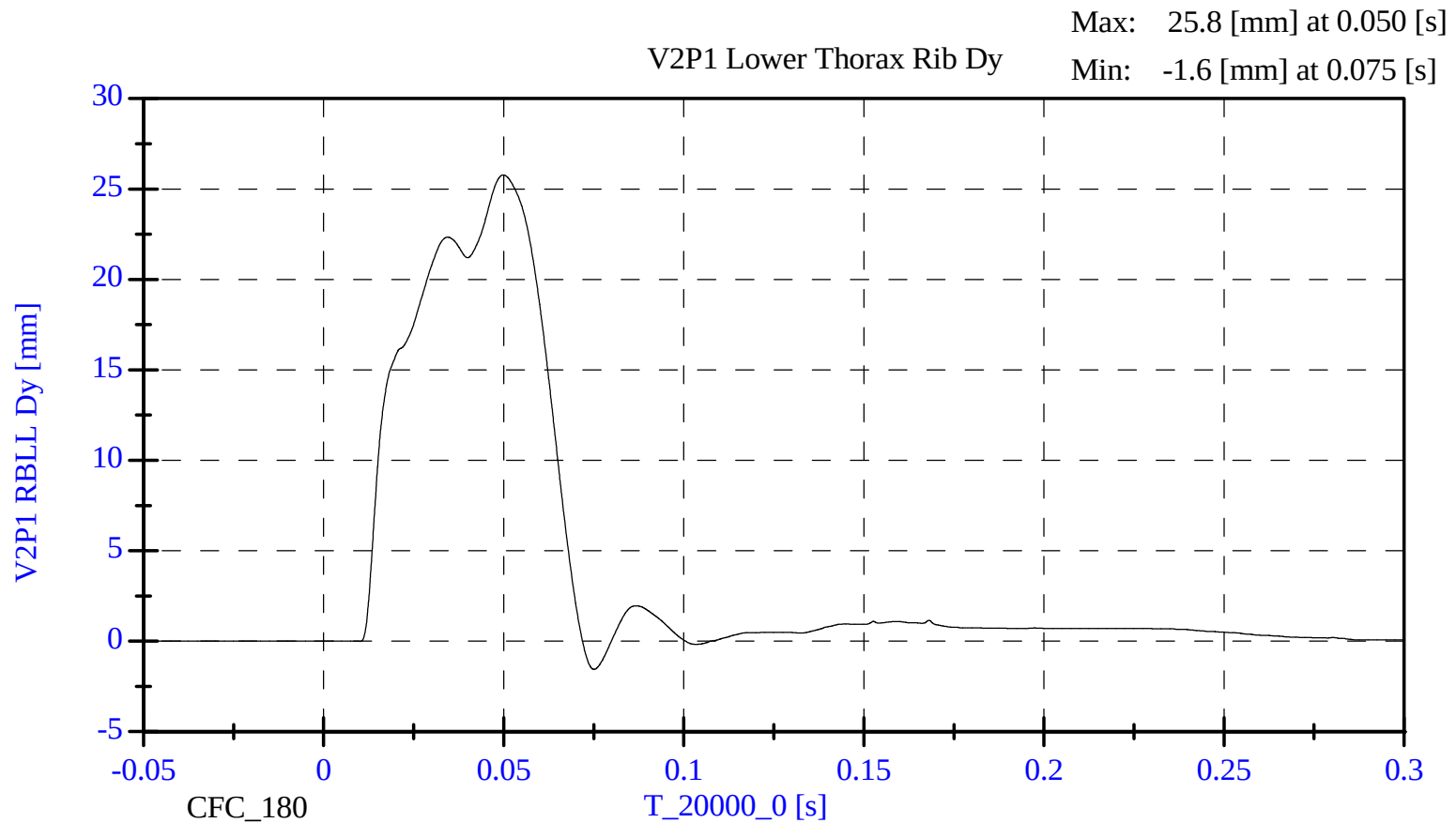
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MDB Center of Gravity Acceleration (Y)
MDB Center of Gravity Acceleration (Z)
MDB Rear Acceleration (X)
MDB Rear Acceleration (Y)
Left MDB Contact Switch
Right MDB Contact Switch

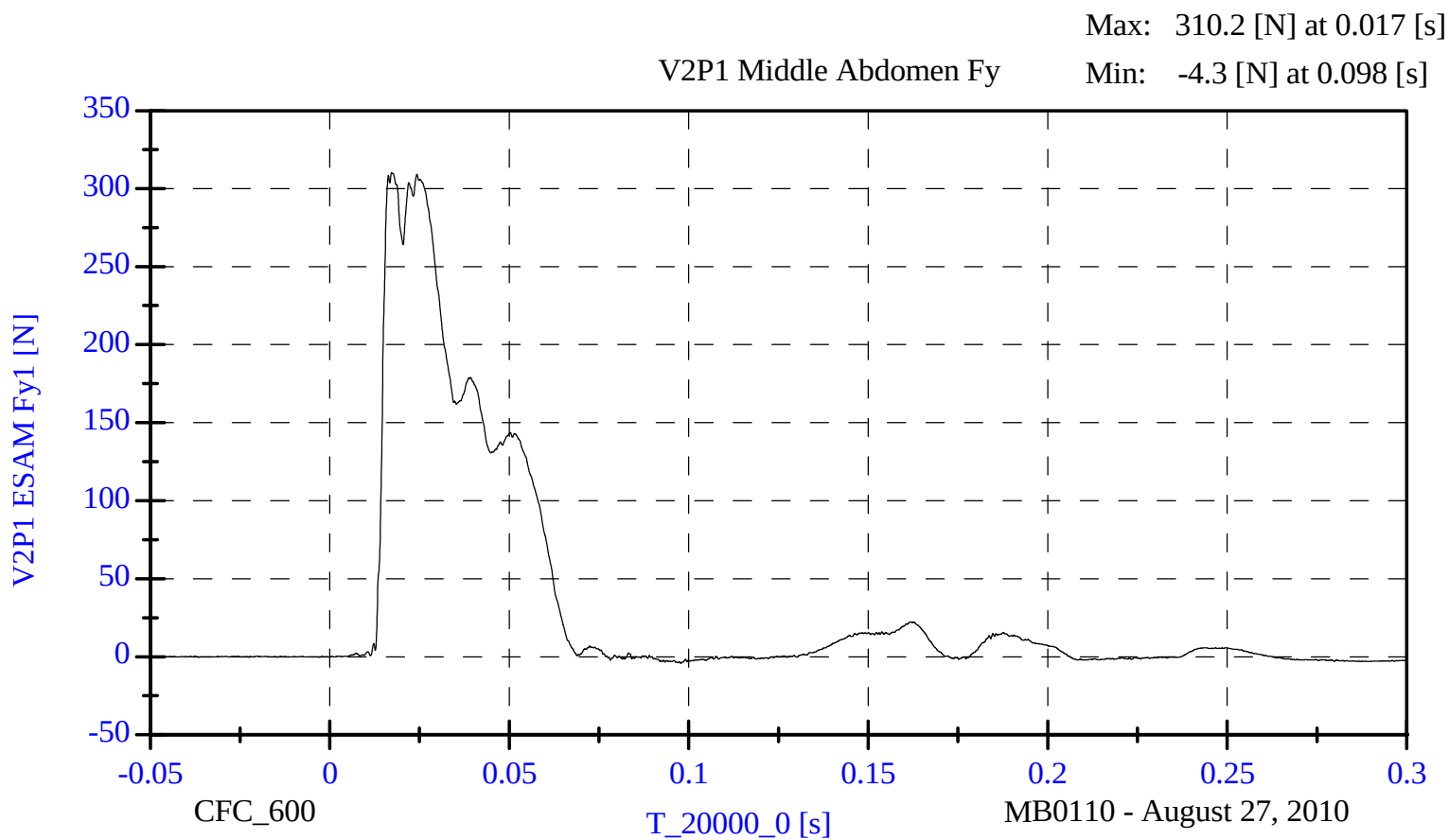
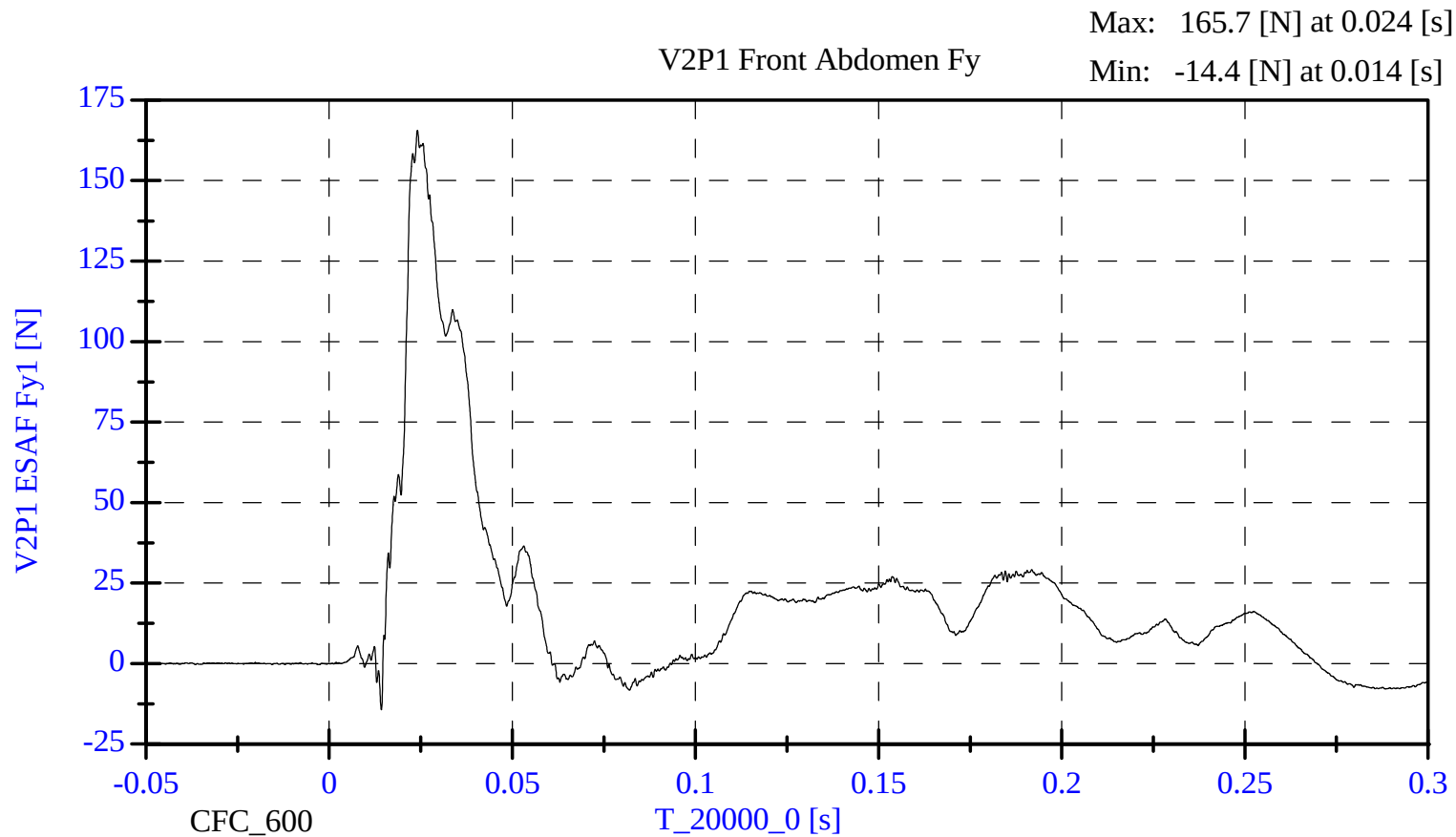


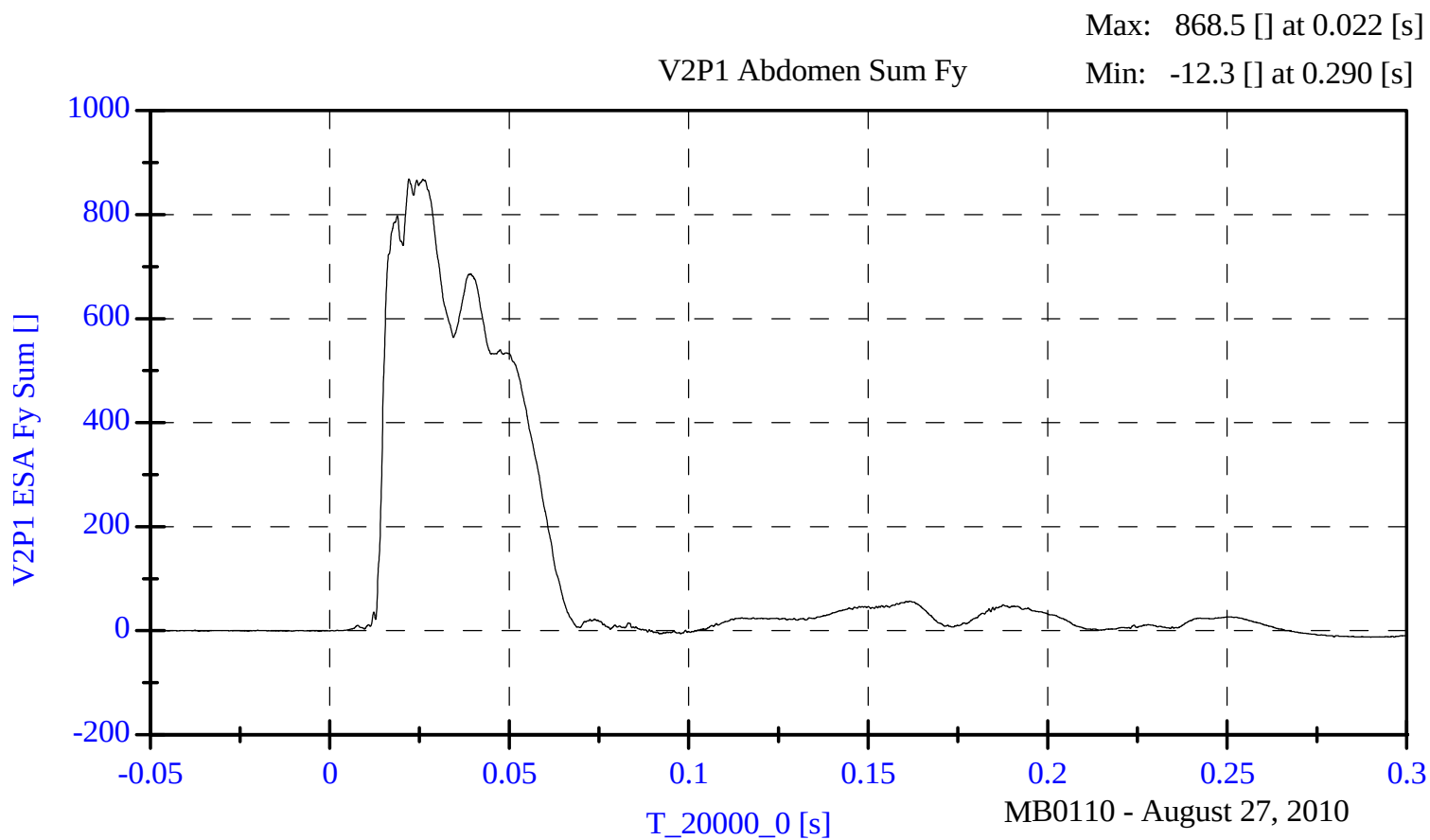
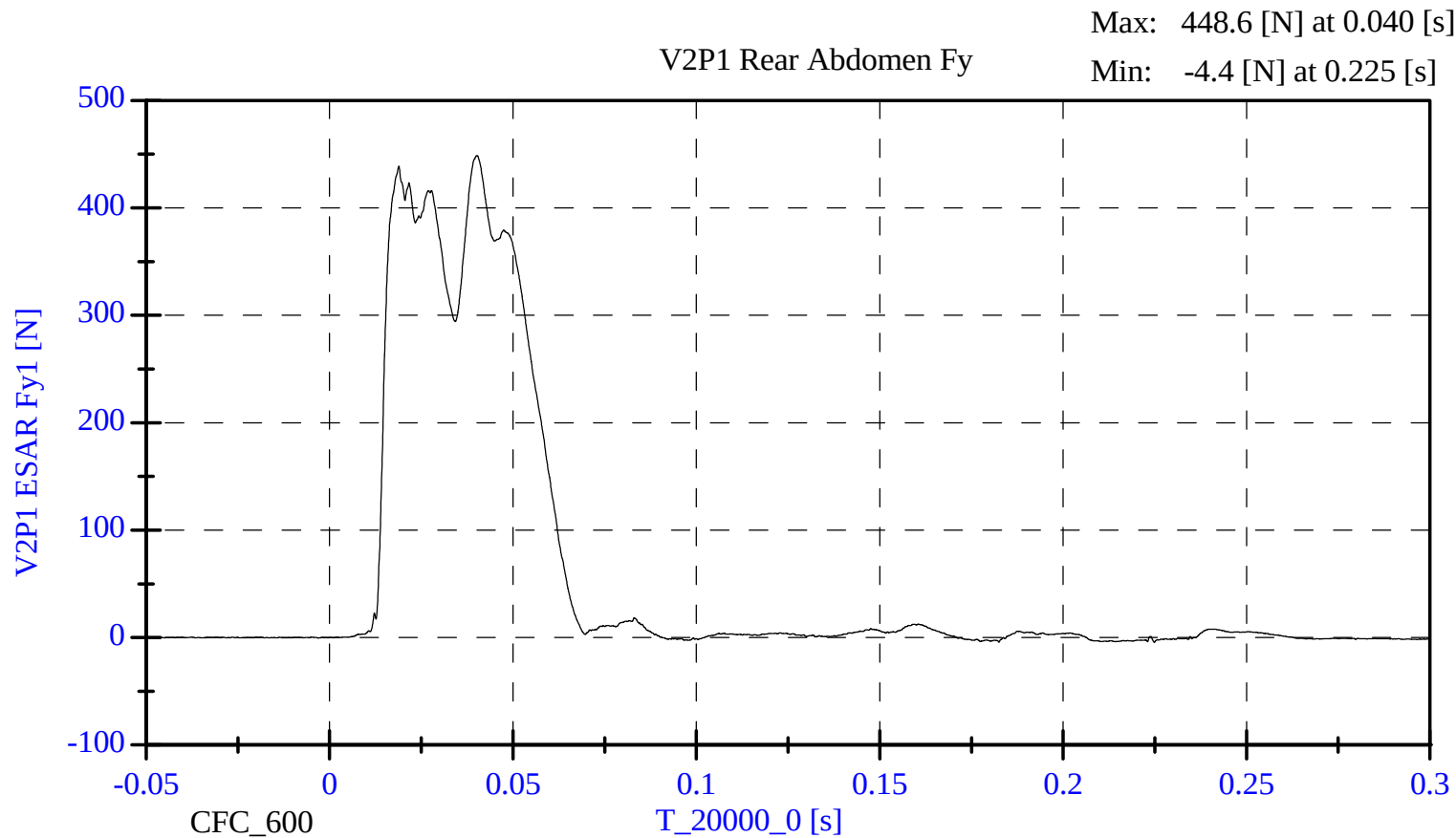
MB0110 - August 27, 2010

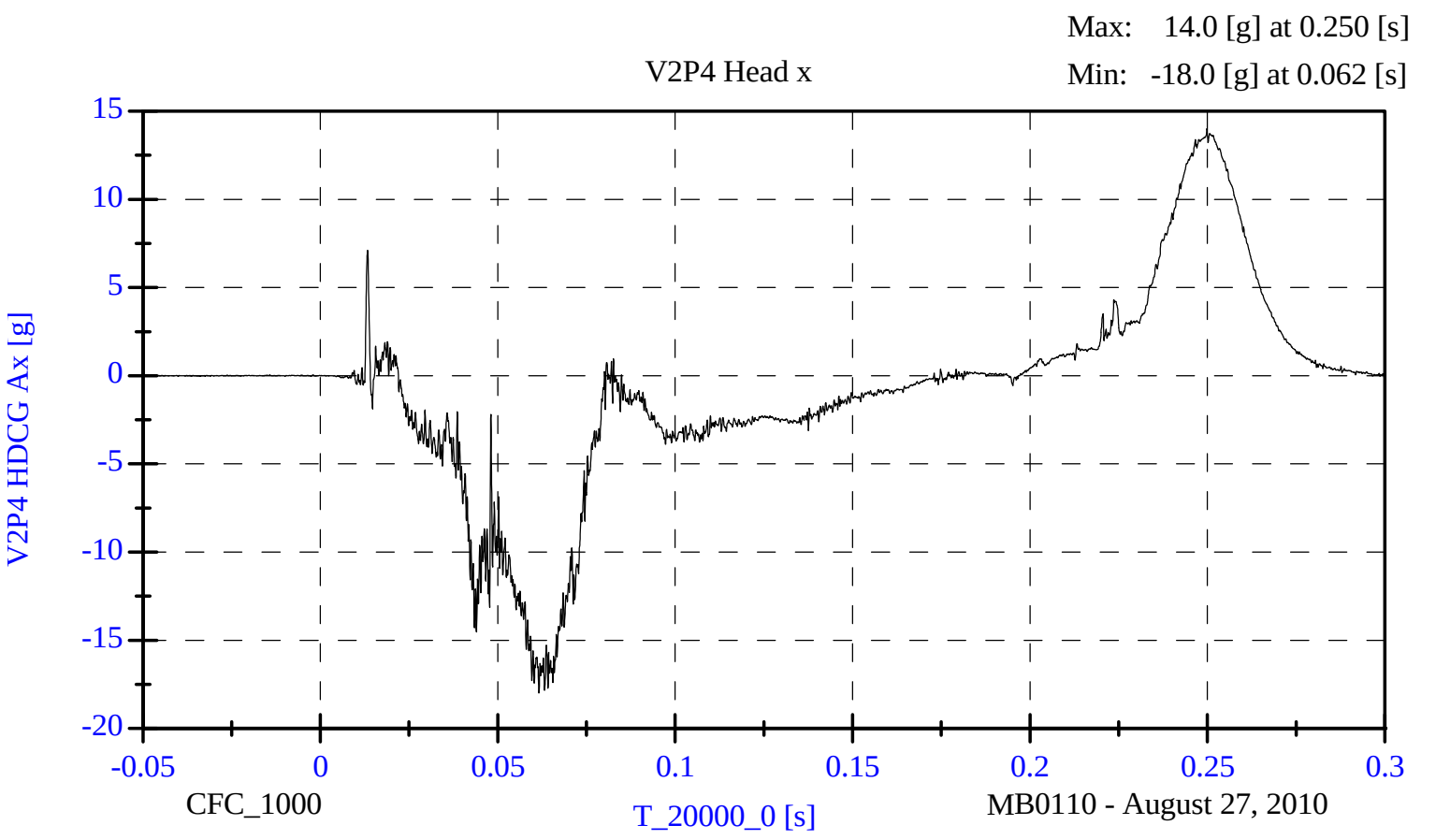
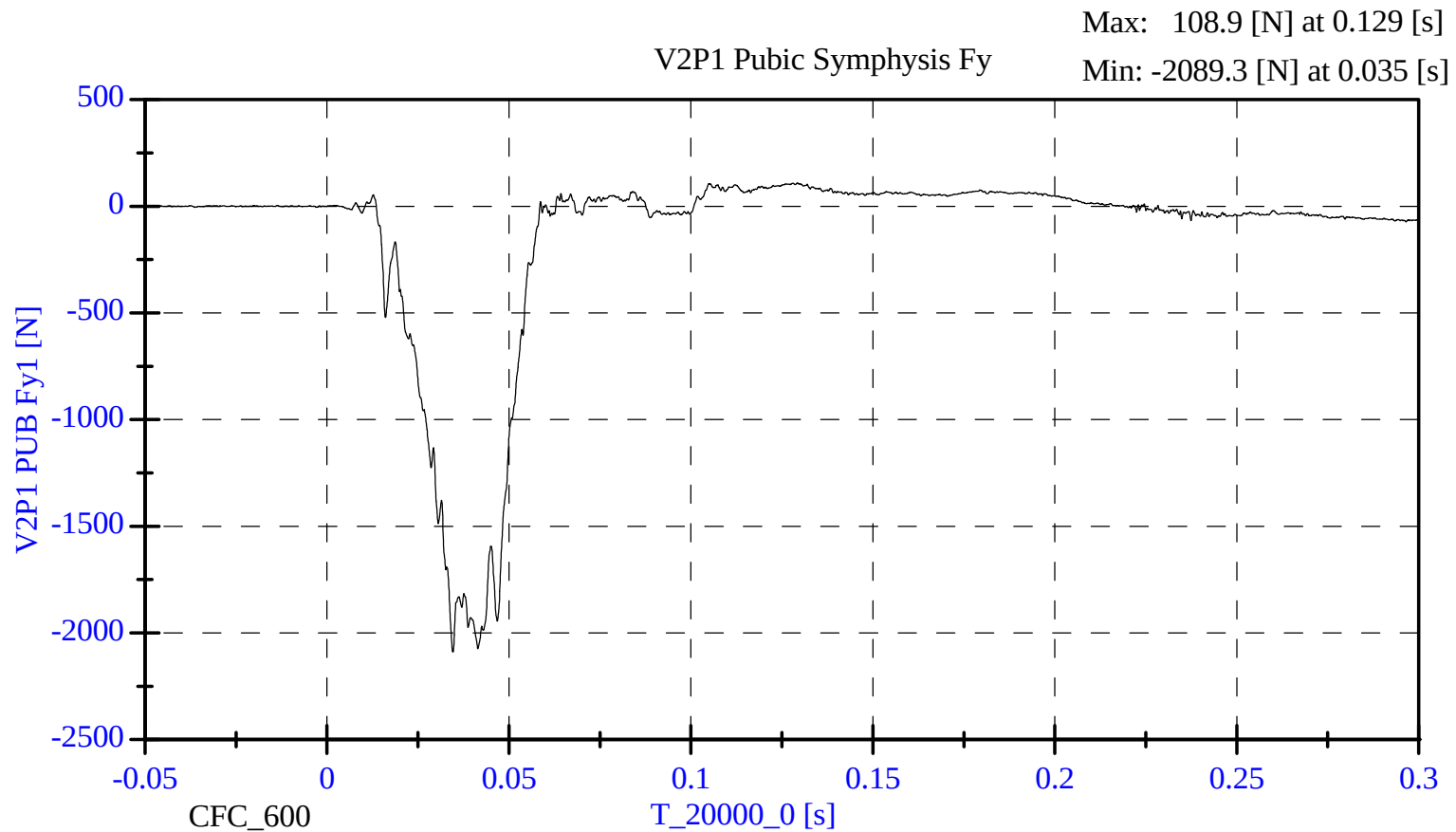


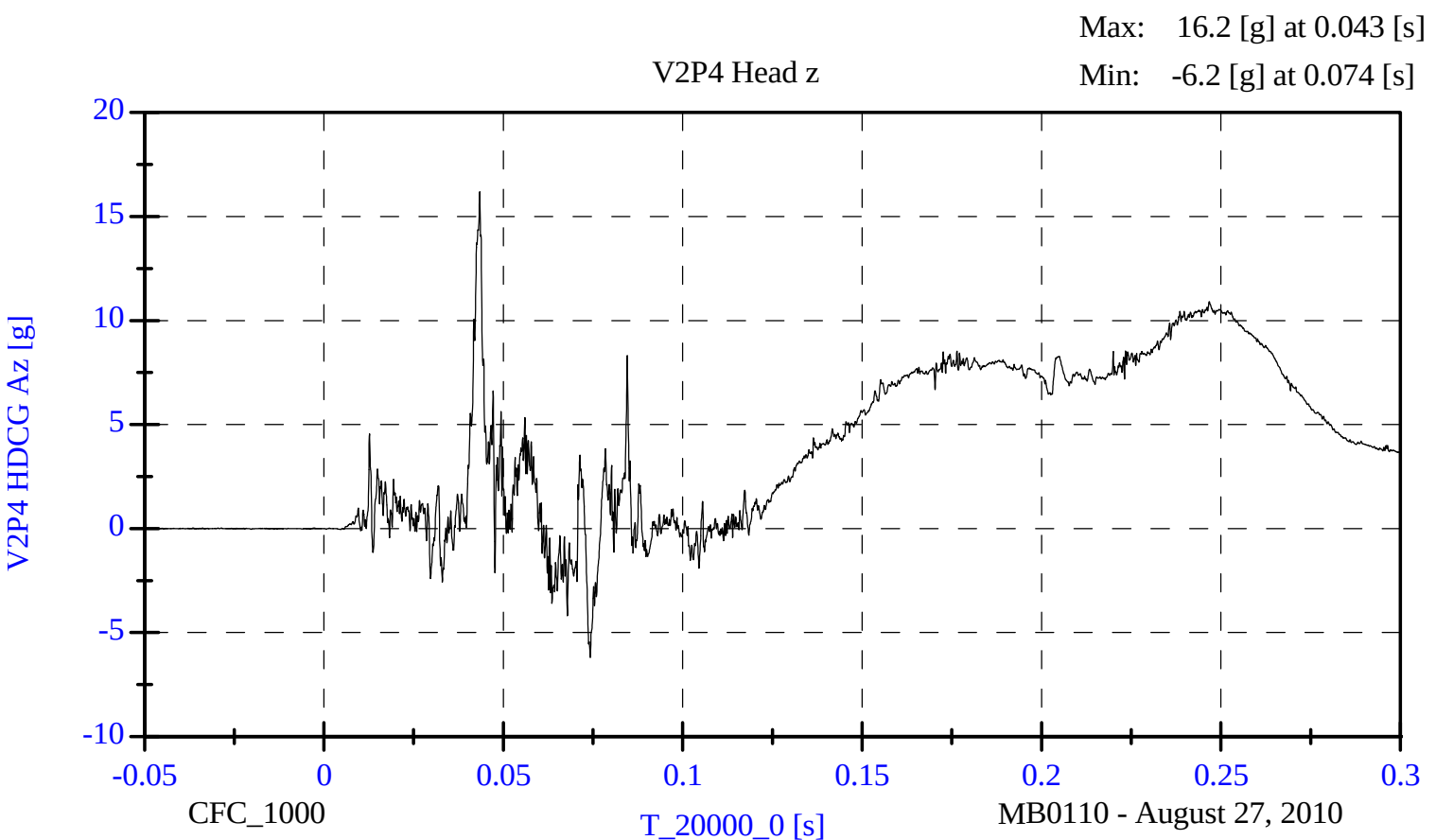
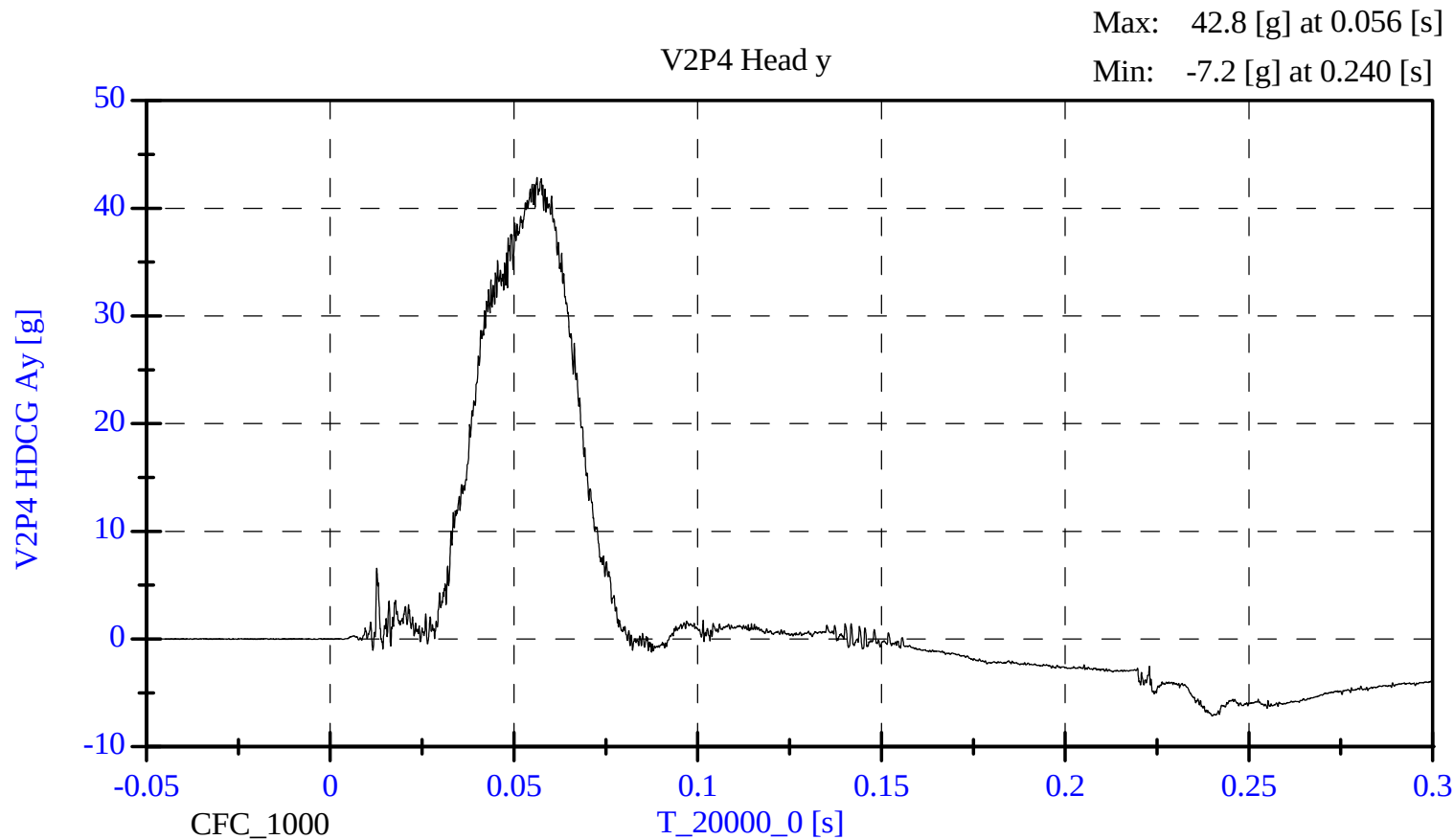




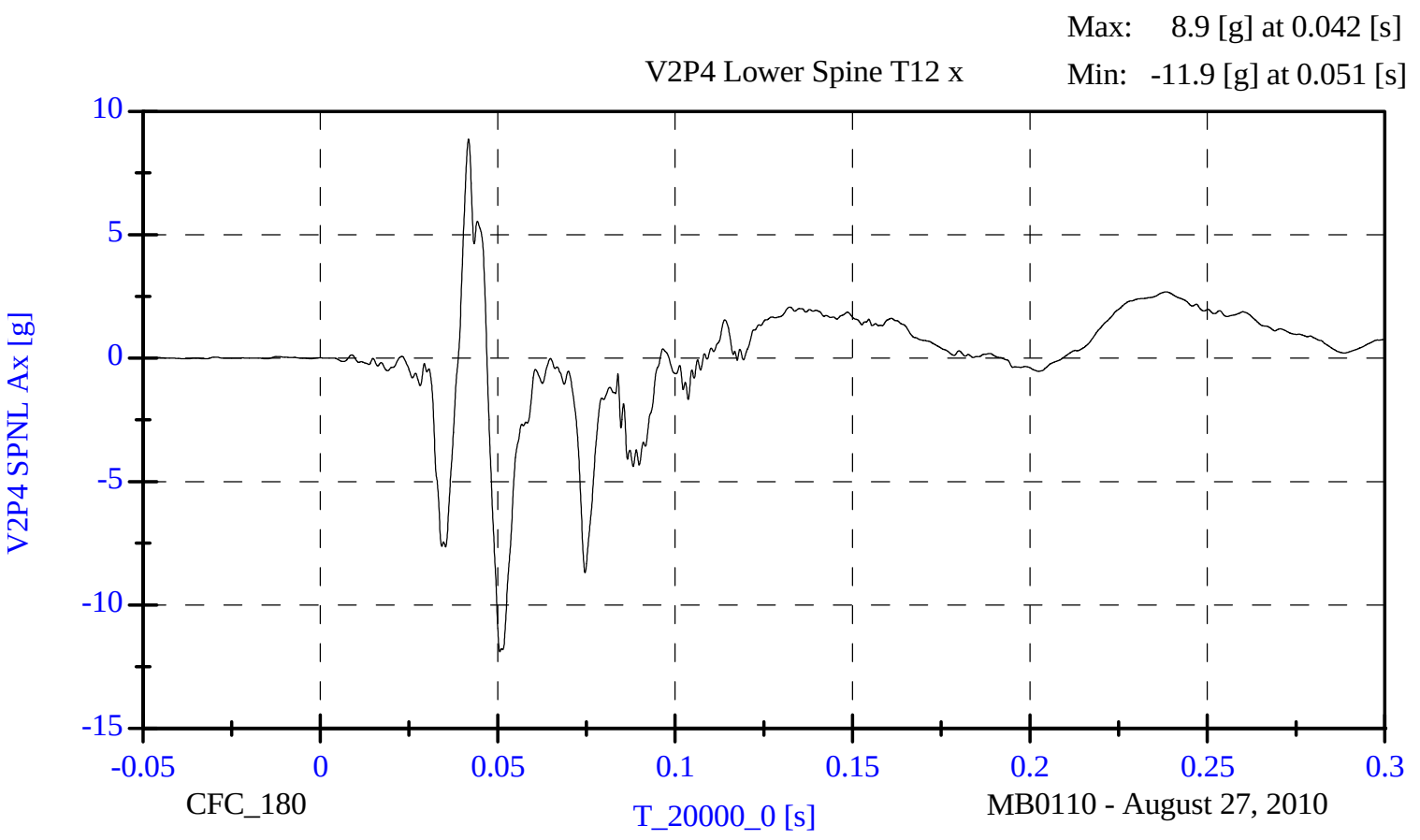
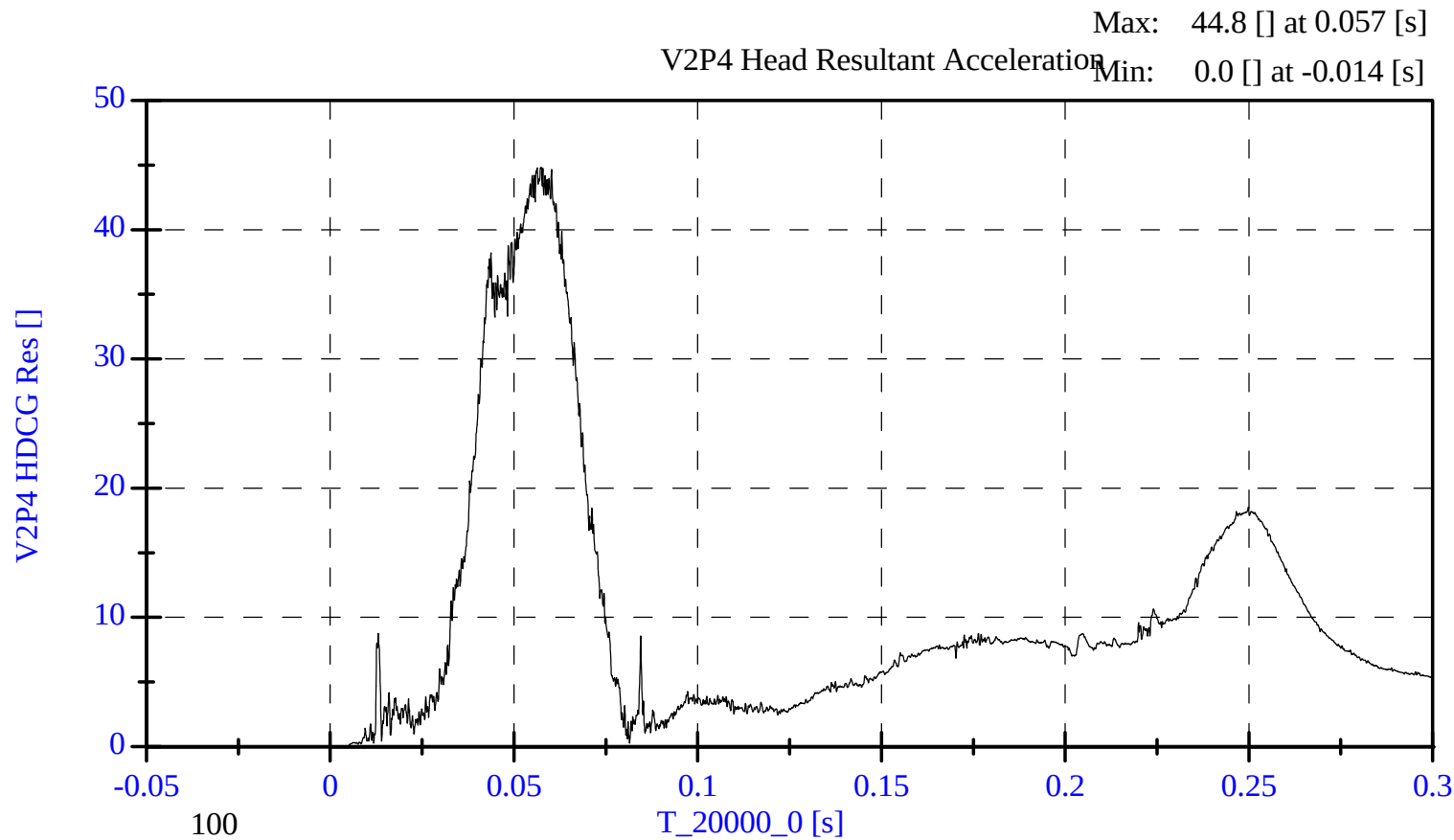


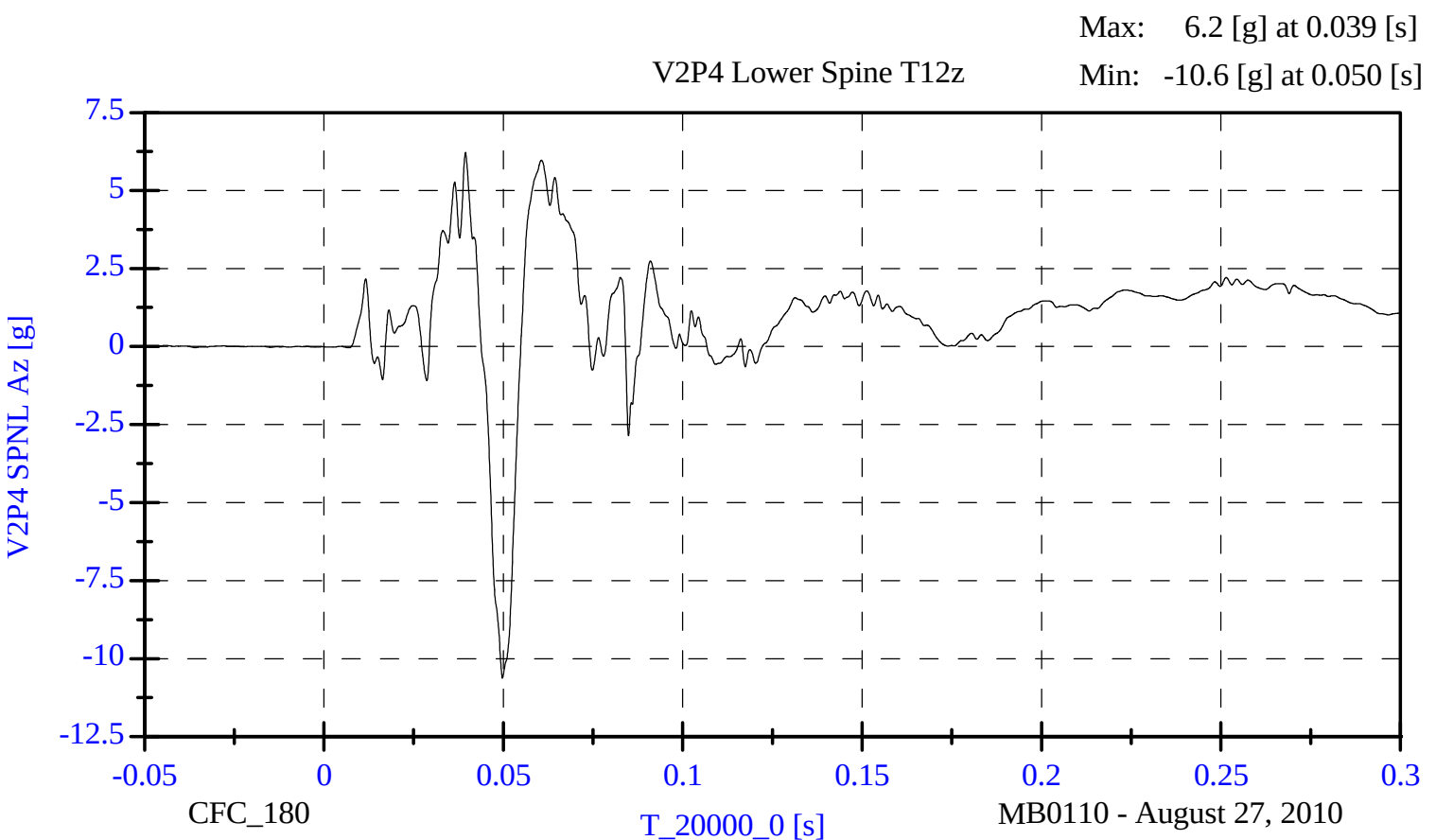
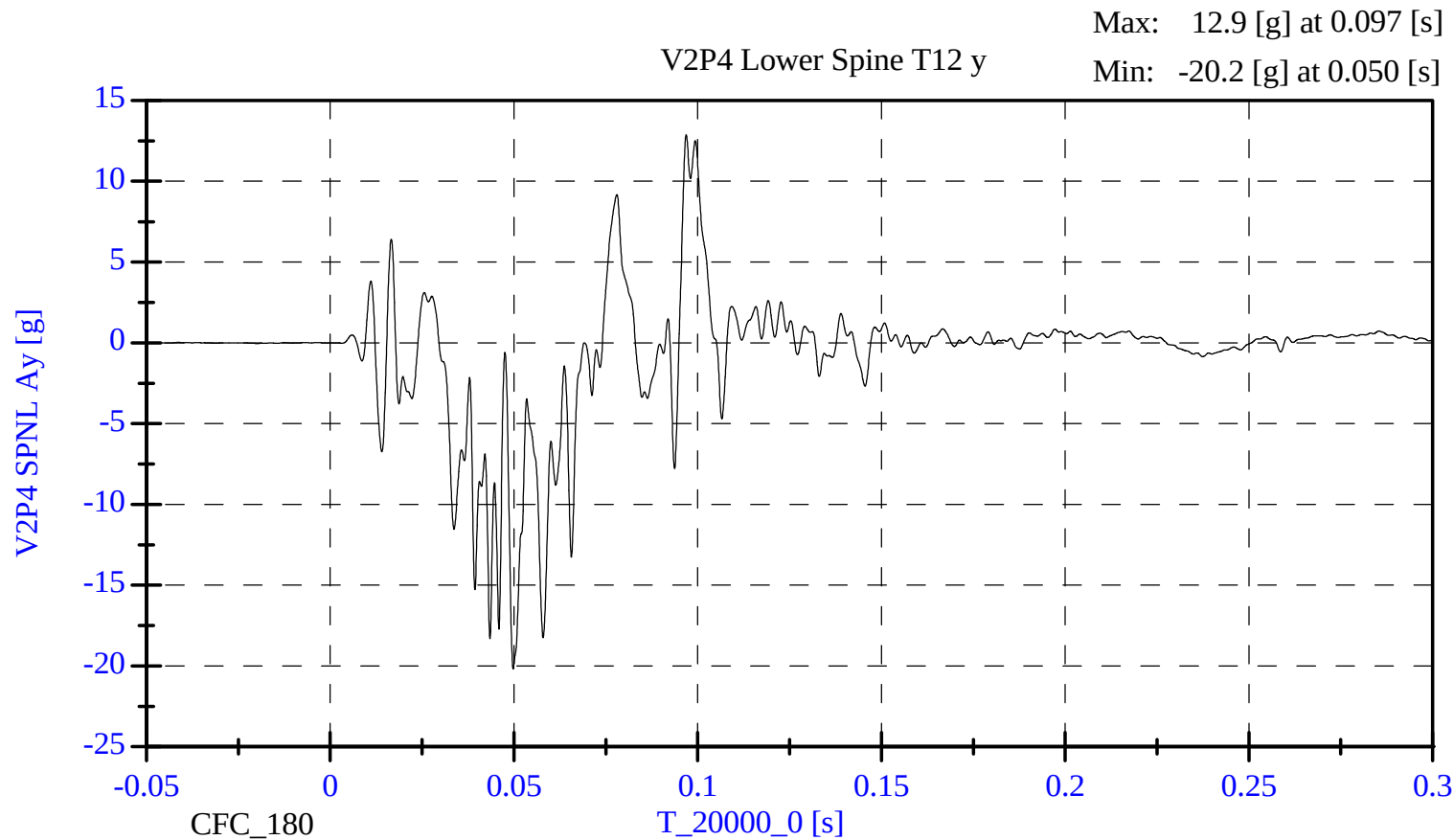




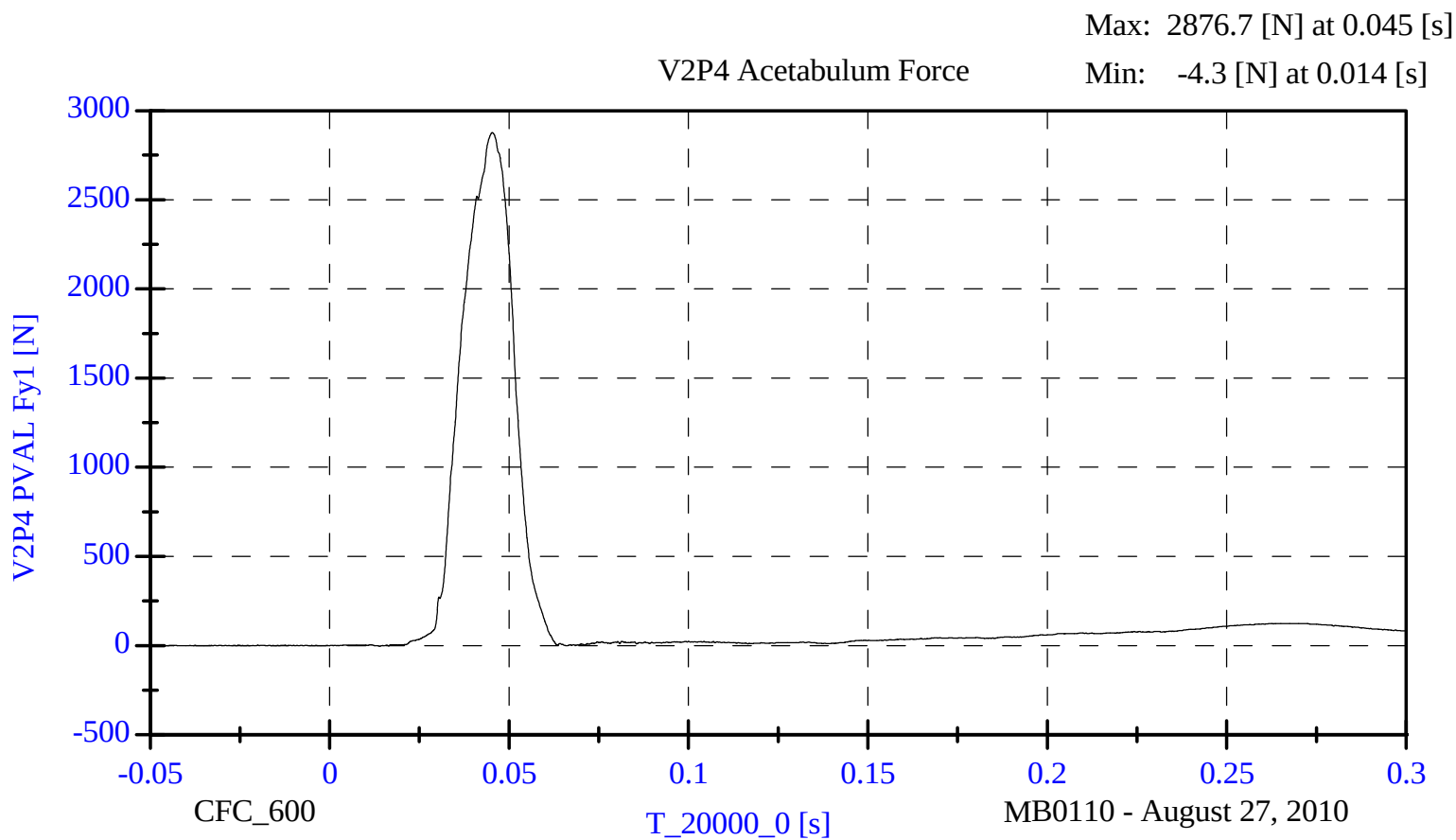
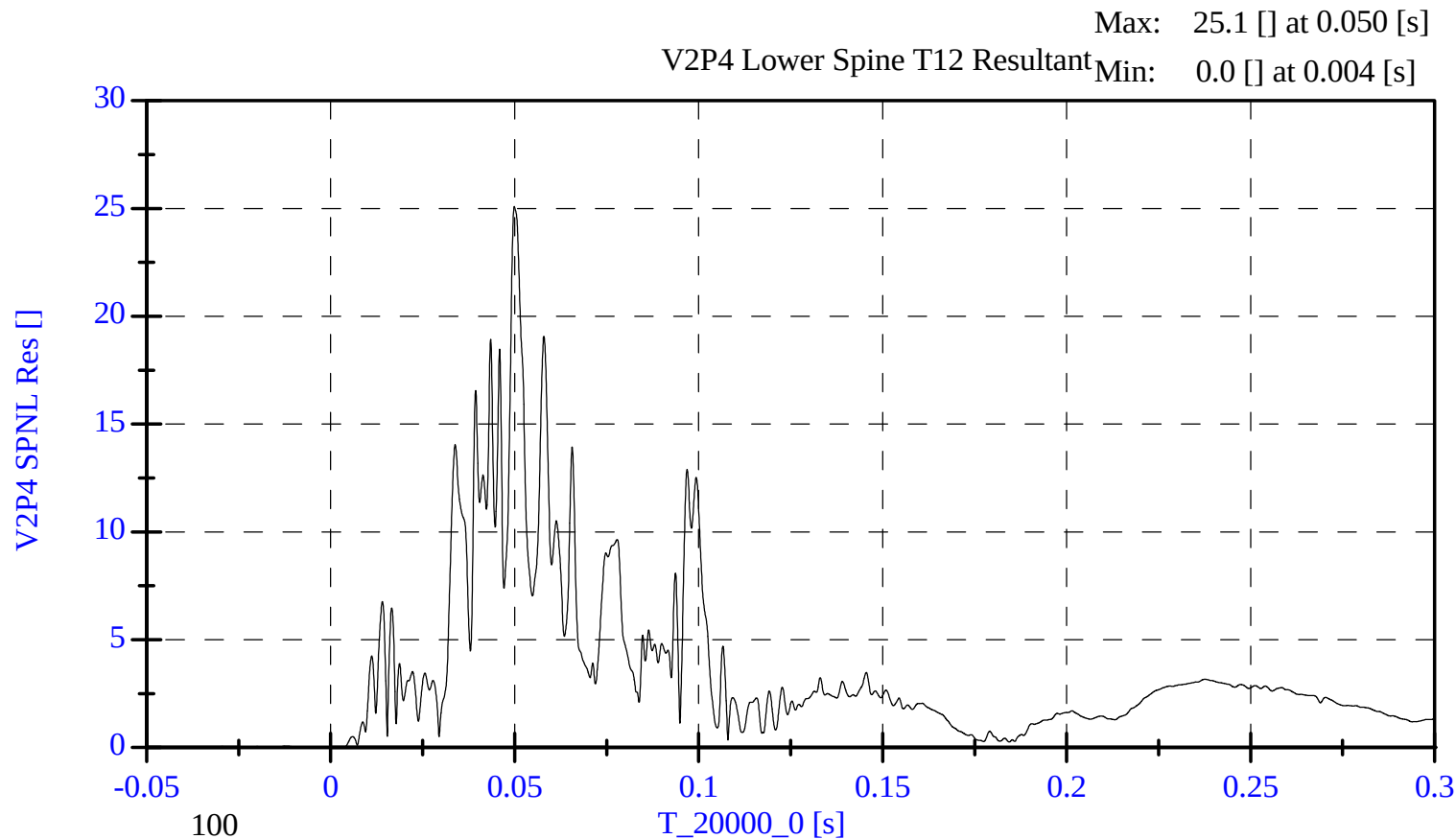


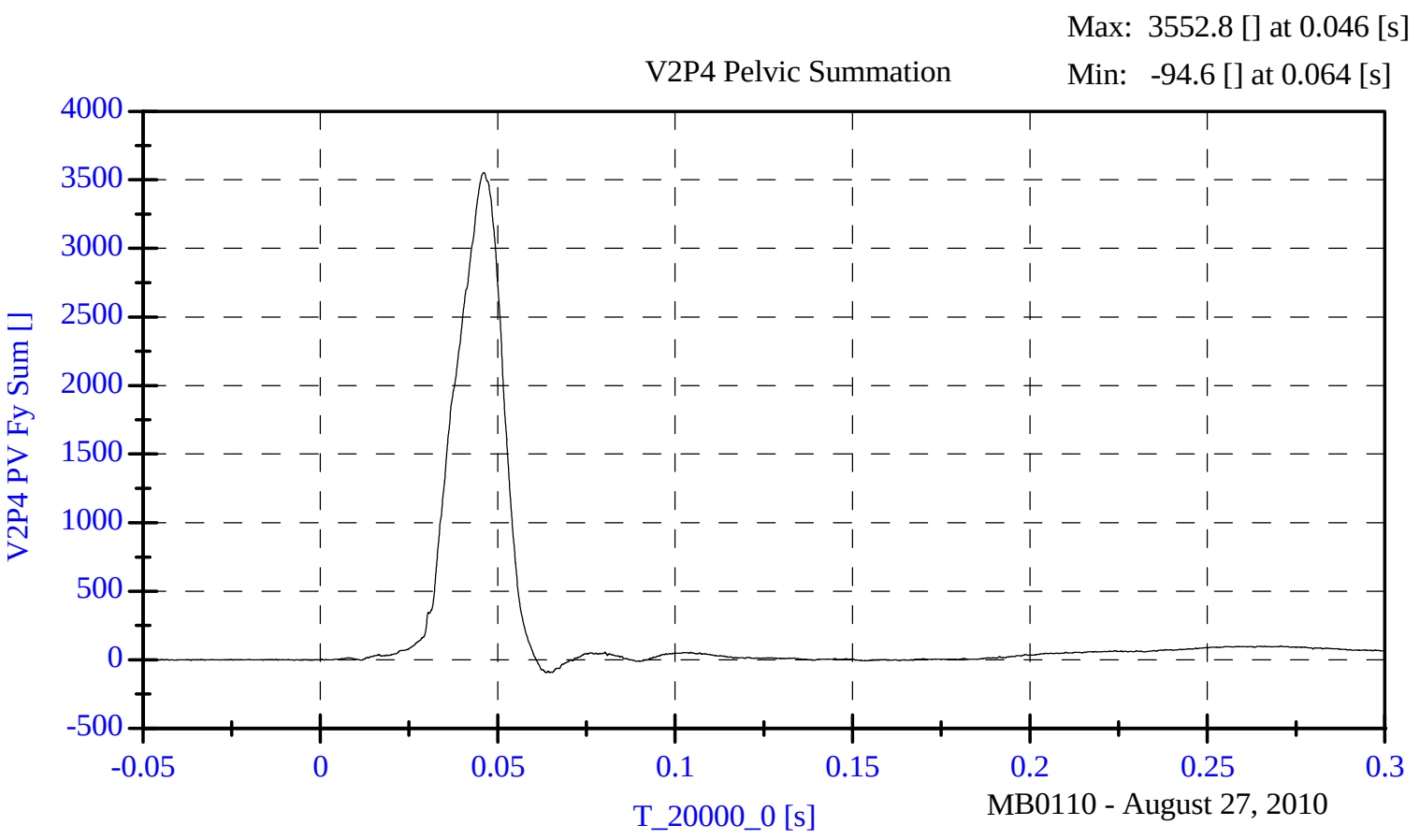
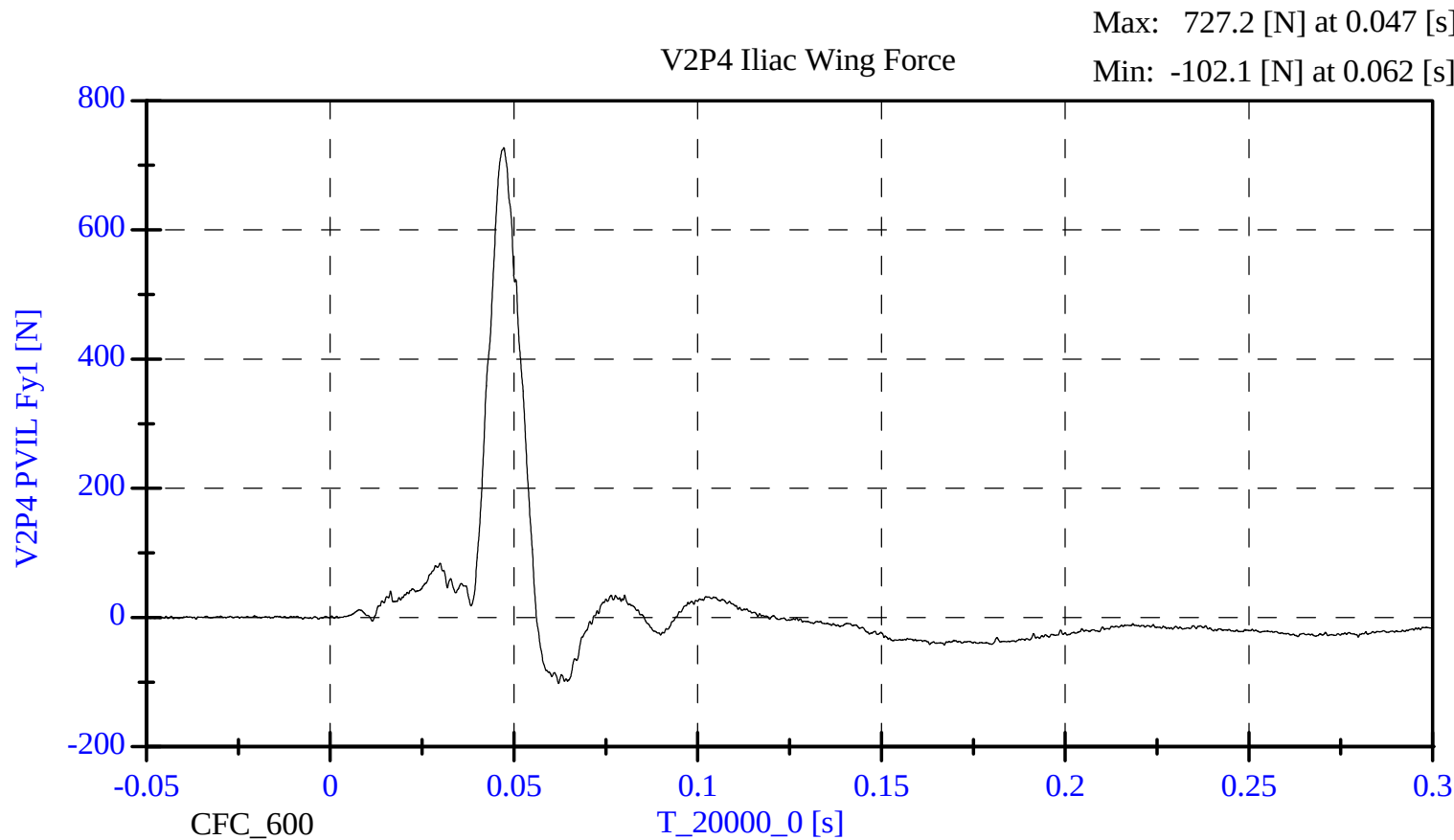
MB0110 - August 27, 2010





MB0110 - August 27, 2010





APPENDIX C
DUMMY CALIBRATION DATA

CALIBRATION TEST RESULTS

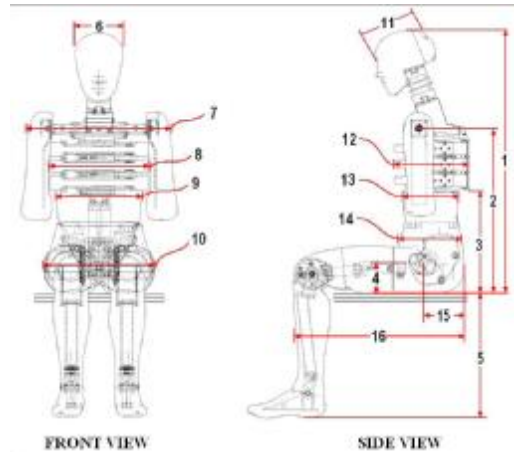
PRE-TEST

Es-2re No: 033

CONFIGURED FOR LEFT SIDE IMPACT

ES-2re External Measurements

NHTSA SN F033



Dim. No.	Description	Specification (mm)	Result (mm)	Pass/Fail
1	Sitting Height	900-918	906	Pass
2	Seat to Shoulder Joint	558-572	570	Pass
3	Seat to Lower Face of Thoracic Spine Box	346-356	354	Pass
4	Seat to Hip Joint (center of bolt)	97-103	101	Pass
5	Sole to Seat, Sitting	333-451	436	Pass
6	Head Width	152-158	153	Pass
7	Shoulder/Arm Width	461-479	466	Pass
8	Thorax Width	322-332	324	Pass
9	Abdomen Width	273-287	284	Pass
10	Pelvis Lap Width	359-373	368	Pass
11	Head Depth	196-206	202	Pass
12	Thorax Depth	262-272	267	Pass
13	Abdomen Depth	194-204	201	Pass
14	Pelvis Depth	235-245	236	Pass
15	Back of Buttocks to Hip Joint (center of bolt)	150-160	158	Pass
16	Back of Buttocks to Front Knee	597-615	603	Pass

Technician: AR

Date: 08/23/2010



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VERIFICATION REPORT

Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Head Drop	Test Date:	8/23/2010
Test Number:	1	Test Time:	11:00:45 AM

Component Part Number	Component Serial Number
455-1007	8473

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	62 %RH P
Resultant Acceleration	125 -- 155	134 g P
Oscillation	0.0 -- 15.0	3.3 % P
Fore-Aft Acceleration	-15.00 -- 15.00	6.10 g P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Head Drop**

Test Time: **11:00:45 AM**

Test Date: **8/23/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Endevco	7264-2000	P15526	7/25/2010
Endevco	7264-2000	P51949	5/26/2010
Endevco	7264-2000	P26269	4/6/2010

Test ID: **Head Drop**

Test Time: **11:00:45 AM**

Test Date: **8/23/2010**

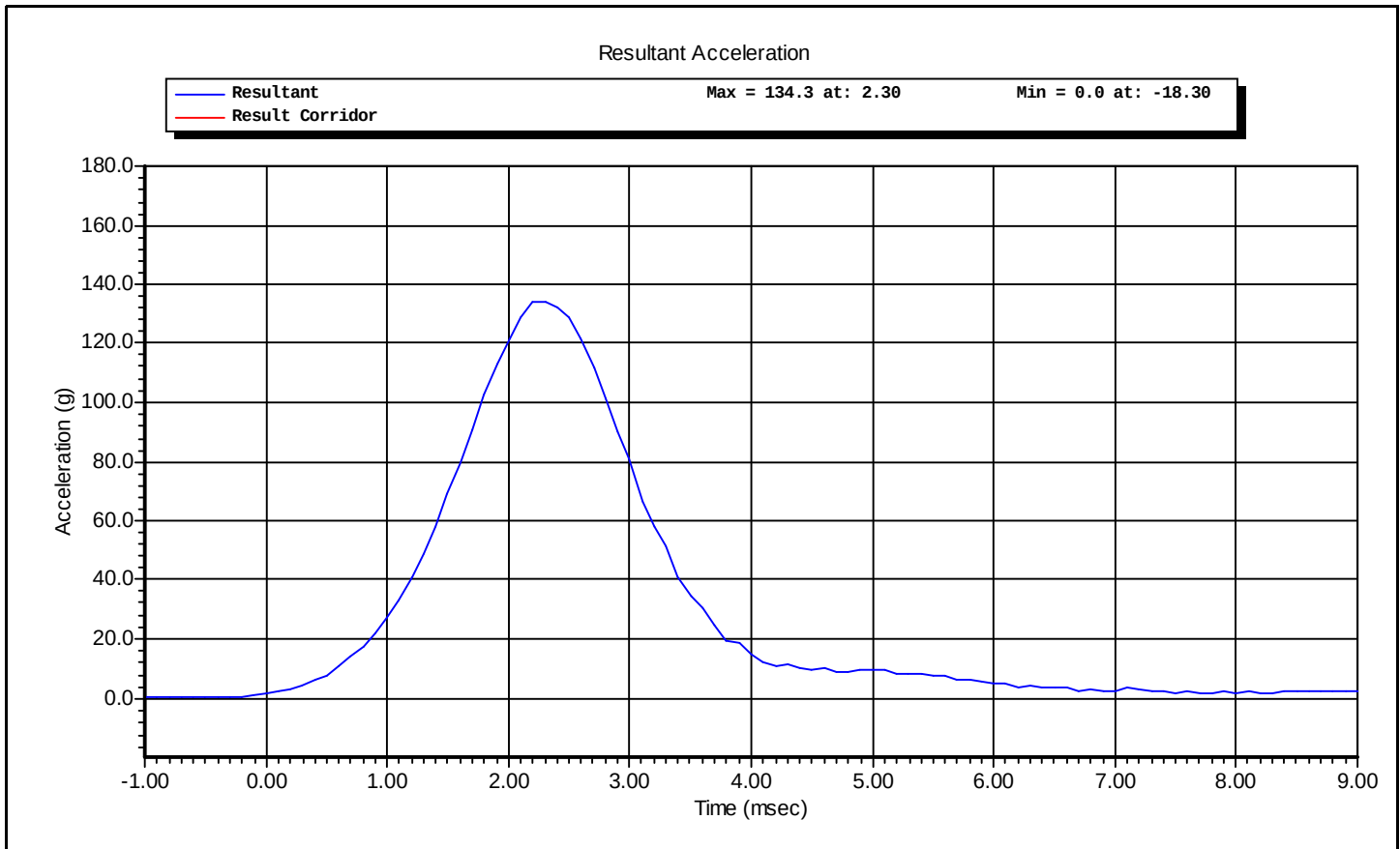


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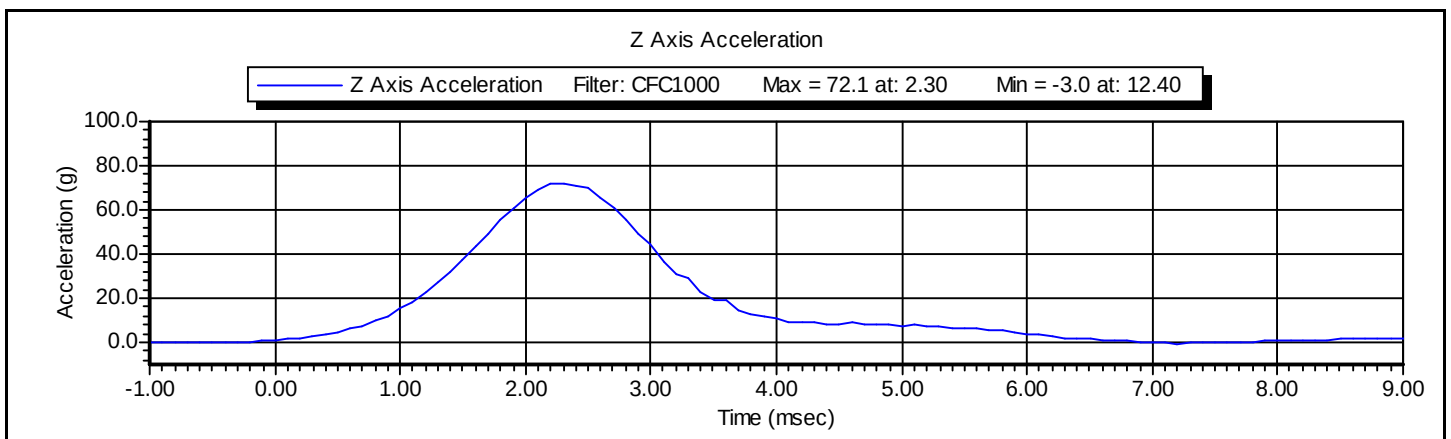
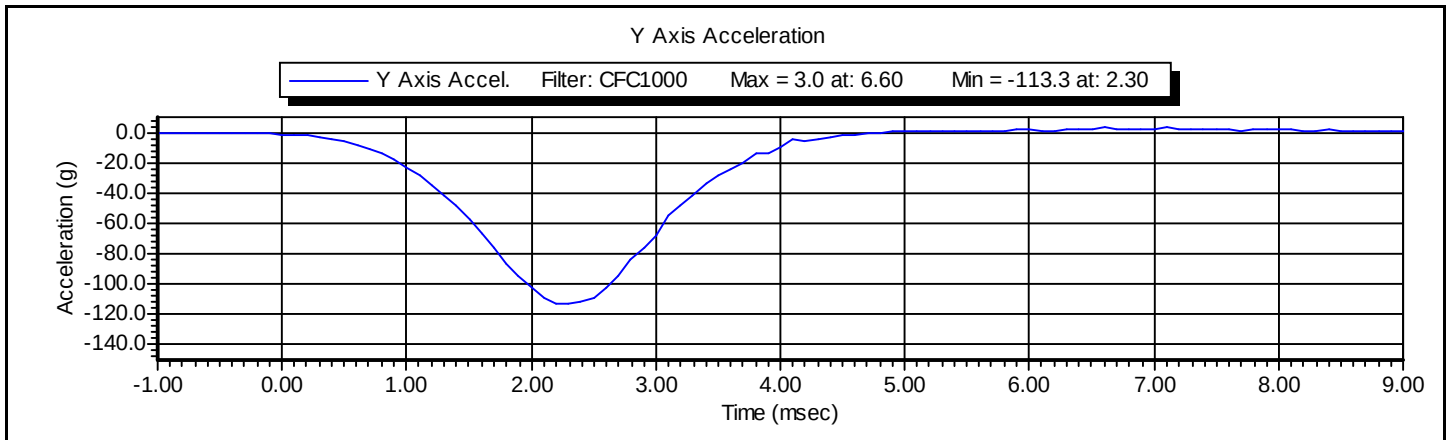
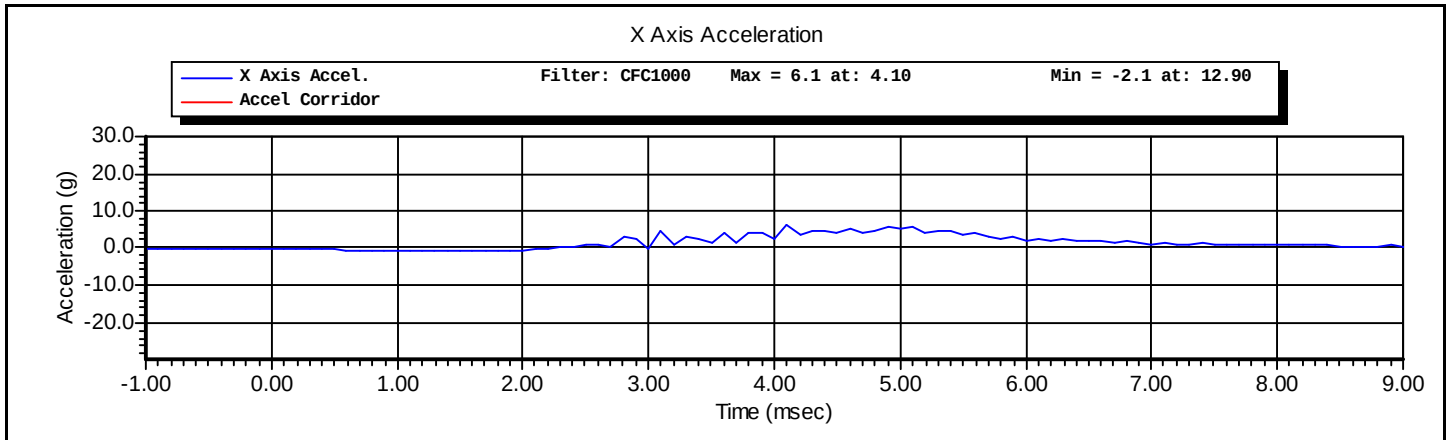
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Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Head Drop	Test Date:	8/23/2010
Test Number:	1	Test Time:	11:00:45 AM



Test ID: Head Drop

Test Time: 11:00:45 AM

Test Date: 8/23/2010





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VERIFICATION REPORT

Test Name:	Neck Flexion	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Neck Flexion	Test Date:	8/23/2010
Test Number:	1	Test Time:	11:48:05 AM

Component Part Number	Component Serial Number
455-2002	07085

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	65 %RH P
Velocity	3.30 -- 3.50	3.42 m/s P
Maximum Neck Flexion Angle	49.0 -- 59.0	51.6 degrees P
Time At Maximum Neck Flexion	54.0 -- 66.0	60.6 ms P
Decay to Zero Degrees	53.0 -- 88.0	56.4 ms P
Velocity Corridor	--	P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Neck Flexion**

Test Time: **11:48:05 AM**

Test Date: **8/23/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7231CT	C16510	5/10/2010
DentonATD	7000428	094	4/27/2010
DentonATD	7000428	095	4/27/2010
DentonATD	7000428	093	4/27/2010

Test ID: **Neck Flexion**

Test Time: **11:48:05 AM**

Test Date: **8/23/2010**



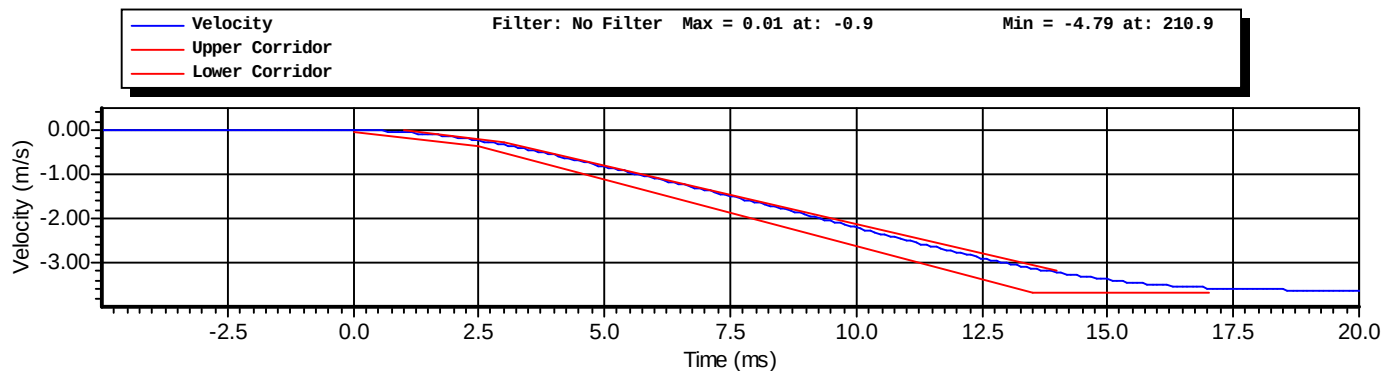
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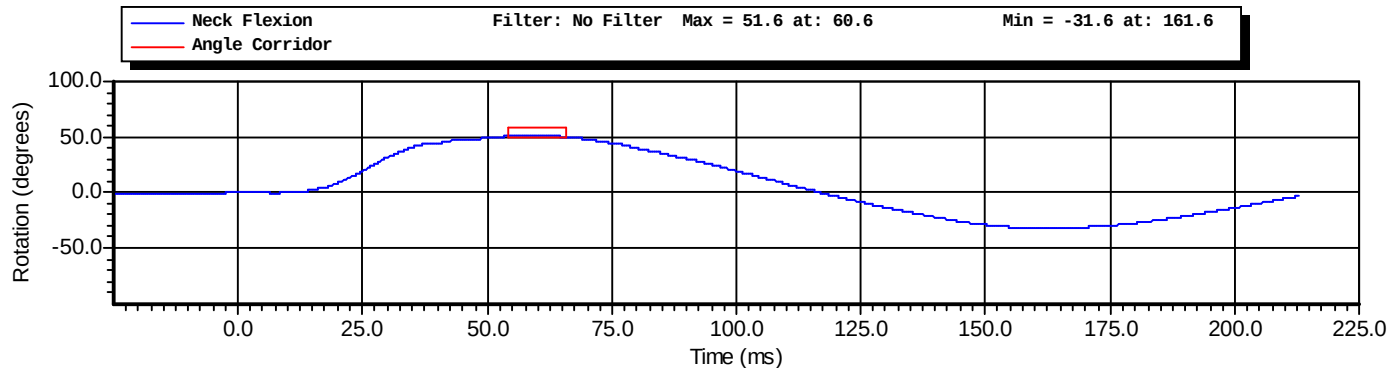
4455 Genesee Street, Buffalo, New York 14225 - Phone (716)632-7500

Test Name:	Neck Flexion	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Neck Flexion	Test Date:	8/23/2010
Test Number:	1	Test Time:	11:48:05 AM

Pendulum Velocity



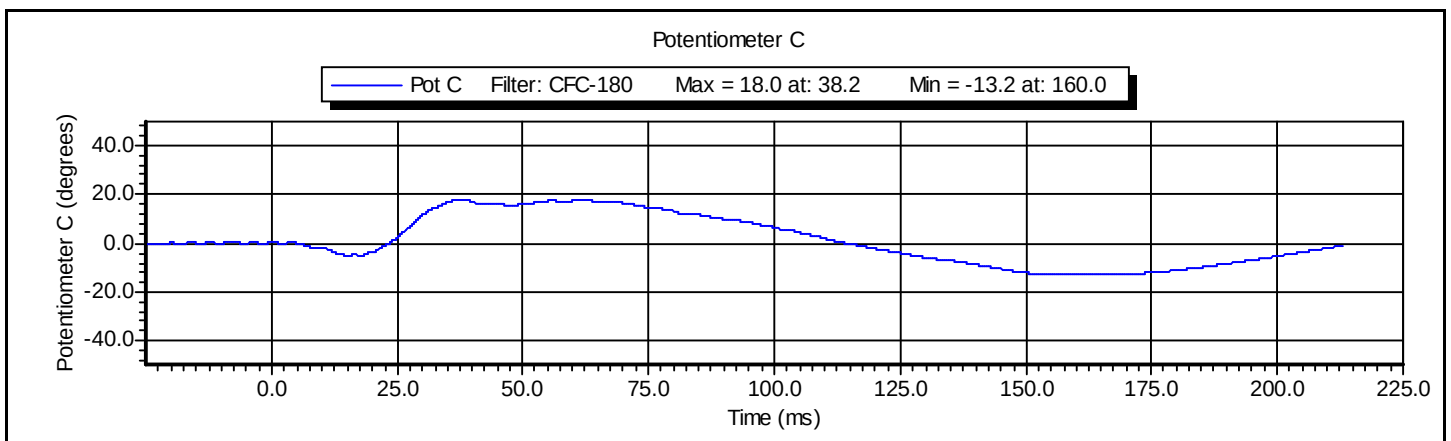
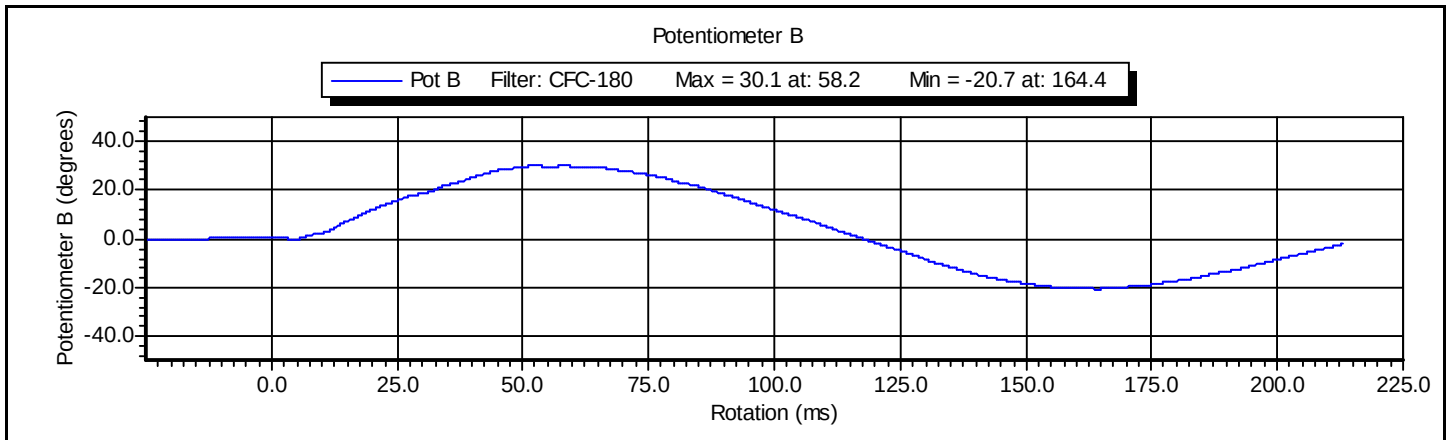
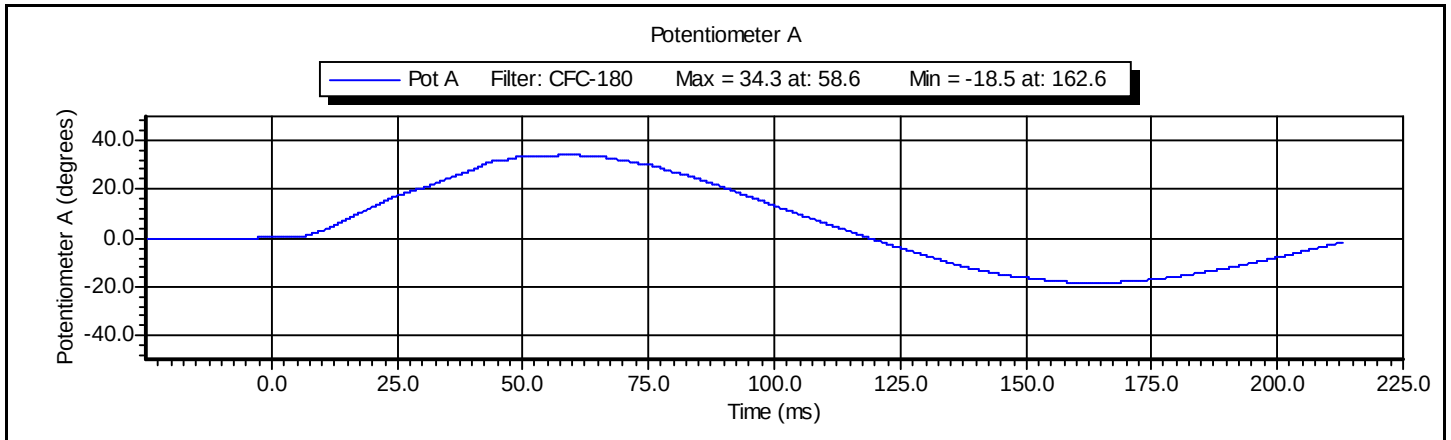
Neck Flexion Angle



Test ID: Neck Flexion

Test Time: 11:48:05 AM

Test Date: 8/23/2010





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VERIFICATION REPORT

Test Name:	Shoulder Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Shoulder	Test Date:	8/23/2010
Test Number:	1	Test Time:	4:34:33 PM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	58.0 %RH P
Velocity	4.20 -- 4.40	4.34 m/s P
Pendulum Acceleration	-10.50 -- -7.50	-9.07 g P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____
Supervisor: **D. Travale** Signature: _____

Test ID: **Shoulder**

Test Time: **4:34:33 PM**

Test Date: **8/23/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66927	4/20/2010

Test ID: **Shoulder**

Test Time: **4:34:33 PM**

Test Date: **8/23/2010**

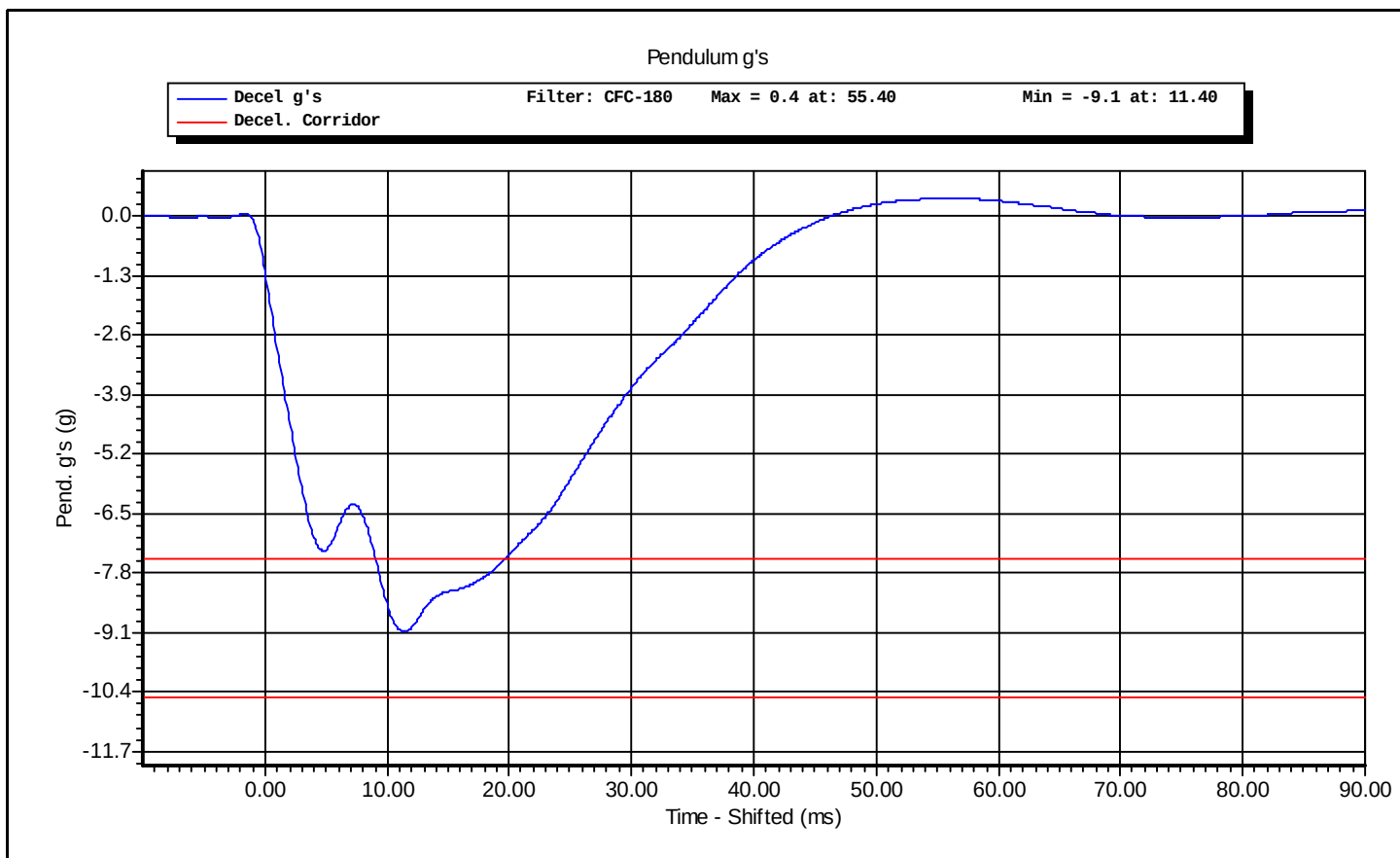


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Test Name:	Shoulder Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Shoulder	Test Date:	8/23/2010
Test Number:	1	Test Time:	4:34:33 PM



Test ID: **Shoulder**

Test Time: **4:34:33 PM**

Test Date: **8/23/2010**



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VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Lower Rib 4 m/s	Test Date:	8/23/2010
Test Number:	1	Test Time:	2:38:03 PM

Component Part Number	Component Serial Number
455-3100	LOWER

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	63.0 %RH P
Velocity	3.90 -- 4.10	3.98 m/s P
Rib Displacement	-51.00 -- -46.00	-47.41 mm P
Drop Height	807.0 -- 823.0	815.0 mm P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____
Supervisor: **D. Travale** Signature: _____

Test ID: **Lower Rib 4 m/s**

Test Time: **2:38:03 PM**

Test Date: **8/23/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Honeywell	MLT-38000	DS-178	4/23/2010
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P38216	6/22/2010

Test ID: **Lower Rib 4 m/s**

Test Time: **2:38:03 PM**

Test Date: **8/23/2010**

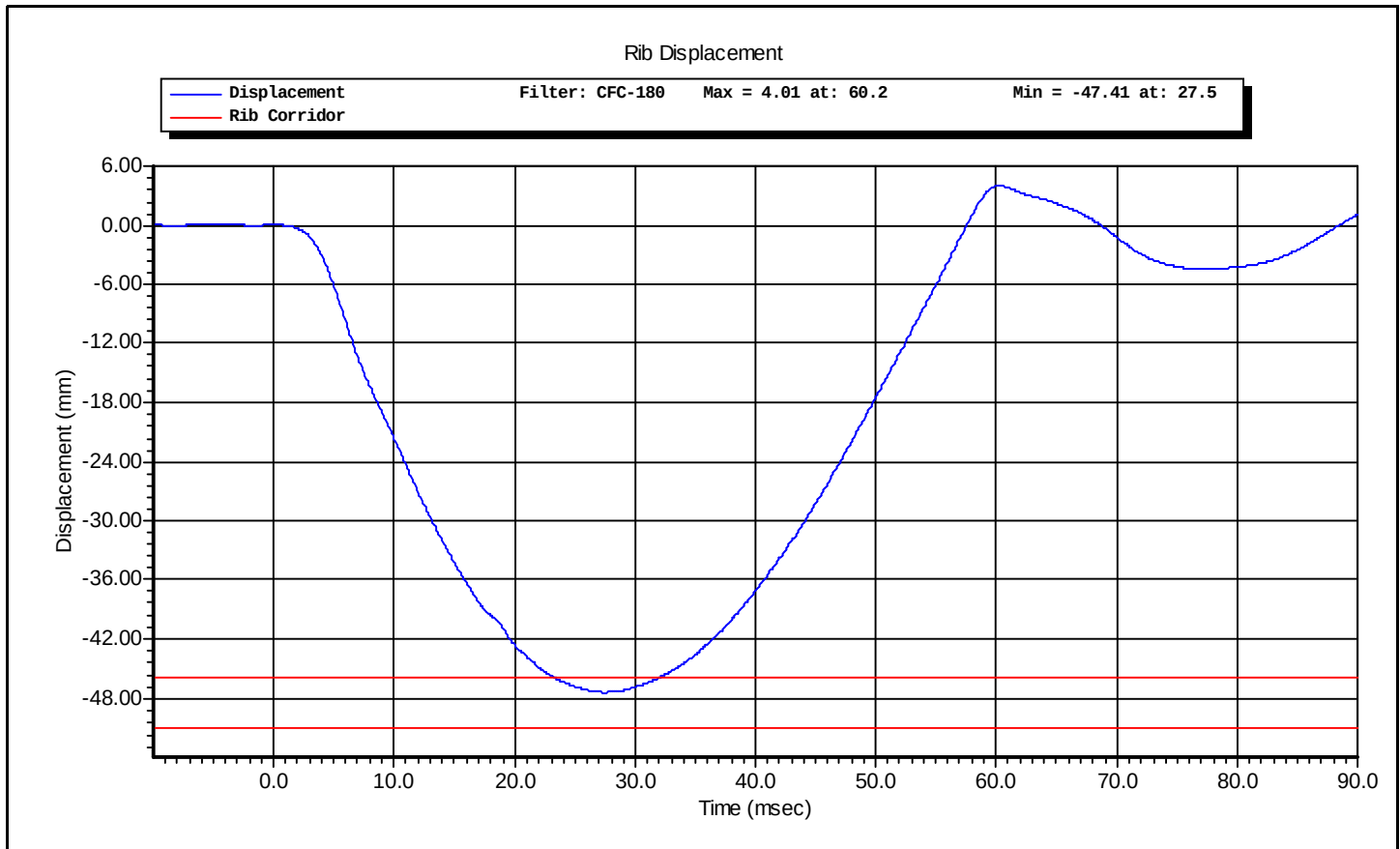


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Lower Rib 4 m/s	Test Date:	8/23/2010
Test Number:	1	Test Time:	2:38:03 PM



Test ID: Lower Rib 4 m/s Test Time: 2:38:03 PM

Test Date: 8/23/2010



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VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Lower Rib 3 m/s	Test Date:	8/23/2010
Test Number:	1	Test Time:	2:44:02 PM

Component Part Number	Component Serial Number
455-3100	LOWER

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	63.0 %RH P
Velocity	2.90 -- 3.10	2.97 m/s P
Rib Displacement	-40.00 -- -36.00	-37.01 mm P
Drop Height	454 -- 464	459 mm P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Lower Rib 3 m/s**

Test Time: **2:44:02 PM**

Test Date: **8/23/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Honeywell	MLT-38000	DS-178	4/23/2010
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P38216	6/22/2010

Test ID: **Lower Rib 3 m/s**

Test Time: **2:44:02 PM**

Test Date: **8/23/2010**

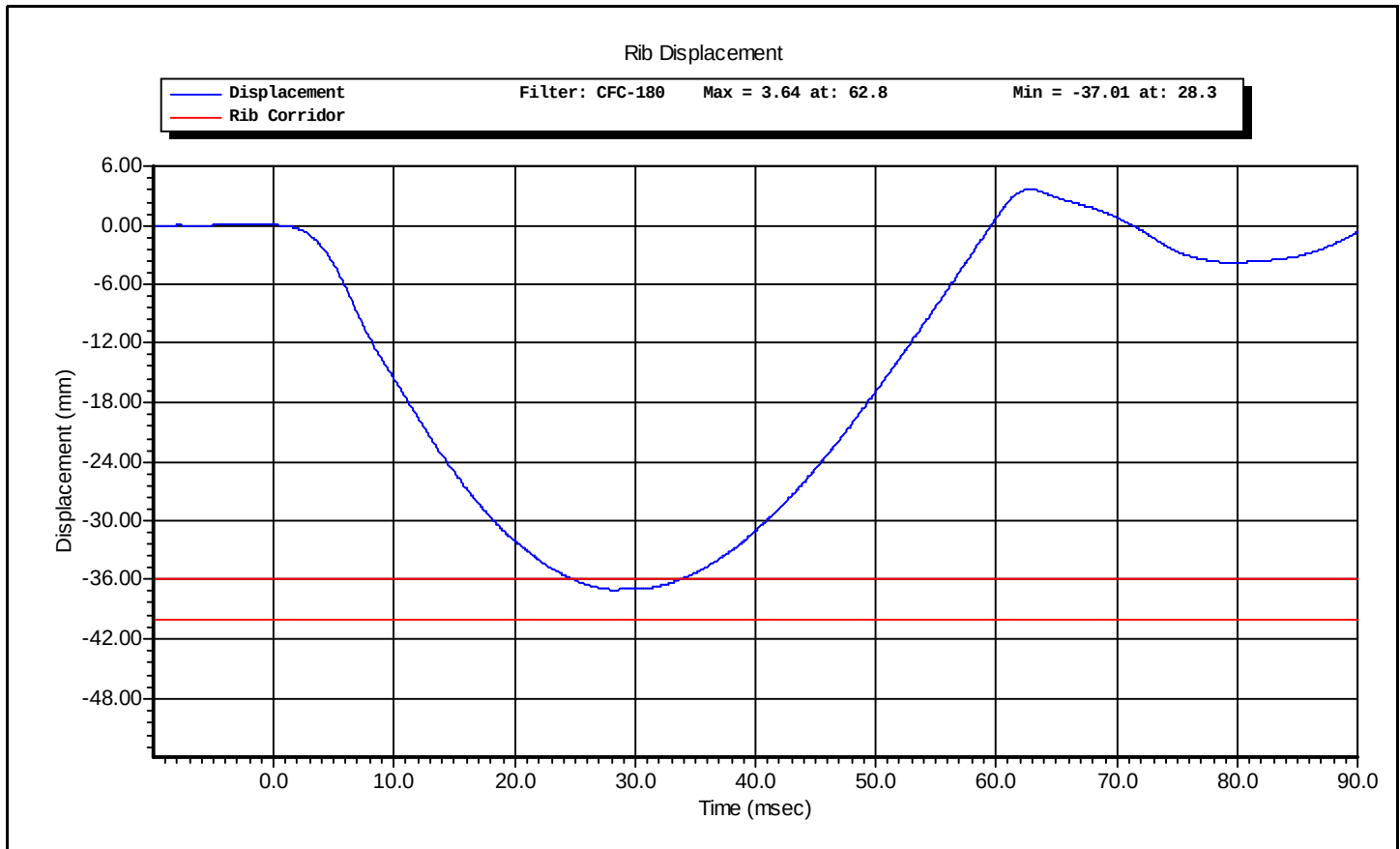


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Lower Rib 3 m/s	Test Date:	8/23/2010
Test Number:	1	Test Time:	2:44:02 PM



Test ID: Lower Rib 3 m/s Test Time: 2:44:02 PM

Test Date: 8/23/2010



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VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Rib Middle 4 m/s	Test Date:	8/23/2010
Test Number:	1	Test Time:	2:23:56 PM

Component Part Number	Component Serial Number
455-3100	MIDDLE

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	62.0 %RH P
Velocity	3.90 -- 4.10	3.98 m/s P
Rib Displacement	-51.00 -- -46.00	-47.41 mm P
Drop Height	807.0 -- 823.0	815.0 mm P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____
Supervisor: **D. Travale** Signature: _____

Test ID: **Rib Middle 4 m/s** Test Time: **2:23:56 PM**

Test Date: **8/23/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Honeywell	MLT-38000	DS-185	4/23/2010
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P38216	6/22/2010

Test ID: **Rib Middle 4 m/s**

Test Time: **2:23:56 PM**

Test Date: **8/23/2010**

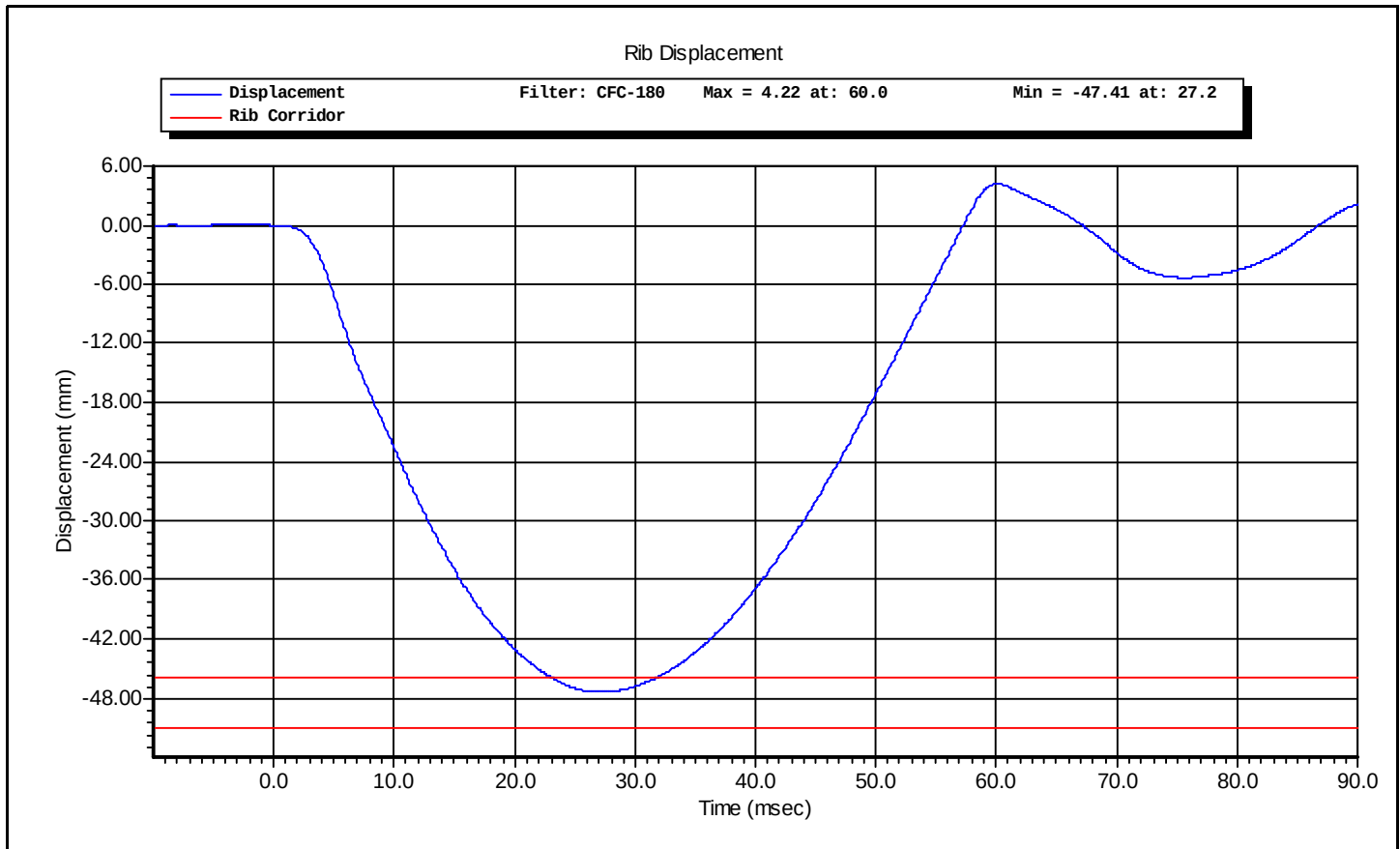


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Rib Middle 4 m/s	Test Date:	8/23/2010
Test Number:	1	Test Time:	2:23:56 PM



Test ID: Rib Middle 4 m/s Test Time: 2:23:56 PM

Test Date: 8/23/2010



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VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Middle Rib 3 m/s	Test Date:	8/23/2010
Test Number:	1	Test Time:	2:30:29 PM

Component Part Number	Component Serial Number
455-3100	MIDDLE

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	62.0 %RH P
Velocity	2.90 -- 3.10	2.92 m/s P
Rib Displacement	-40.00 -- -36.00	-36.46 mm P
Drop Height	454 -- 464	459 mm P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Middle Rib 3 m/s** Test Time: **2:30:29 PM**

Test Date: **8/23/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Honeywell	MLT-38000	DS-185	4/23/2010
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P38216	6/22/2010

Test ID: **Middle Rib 3 m/s**

Test Time: **2:30:29 PM**

Test Date: **8/23/2010**

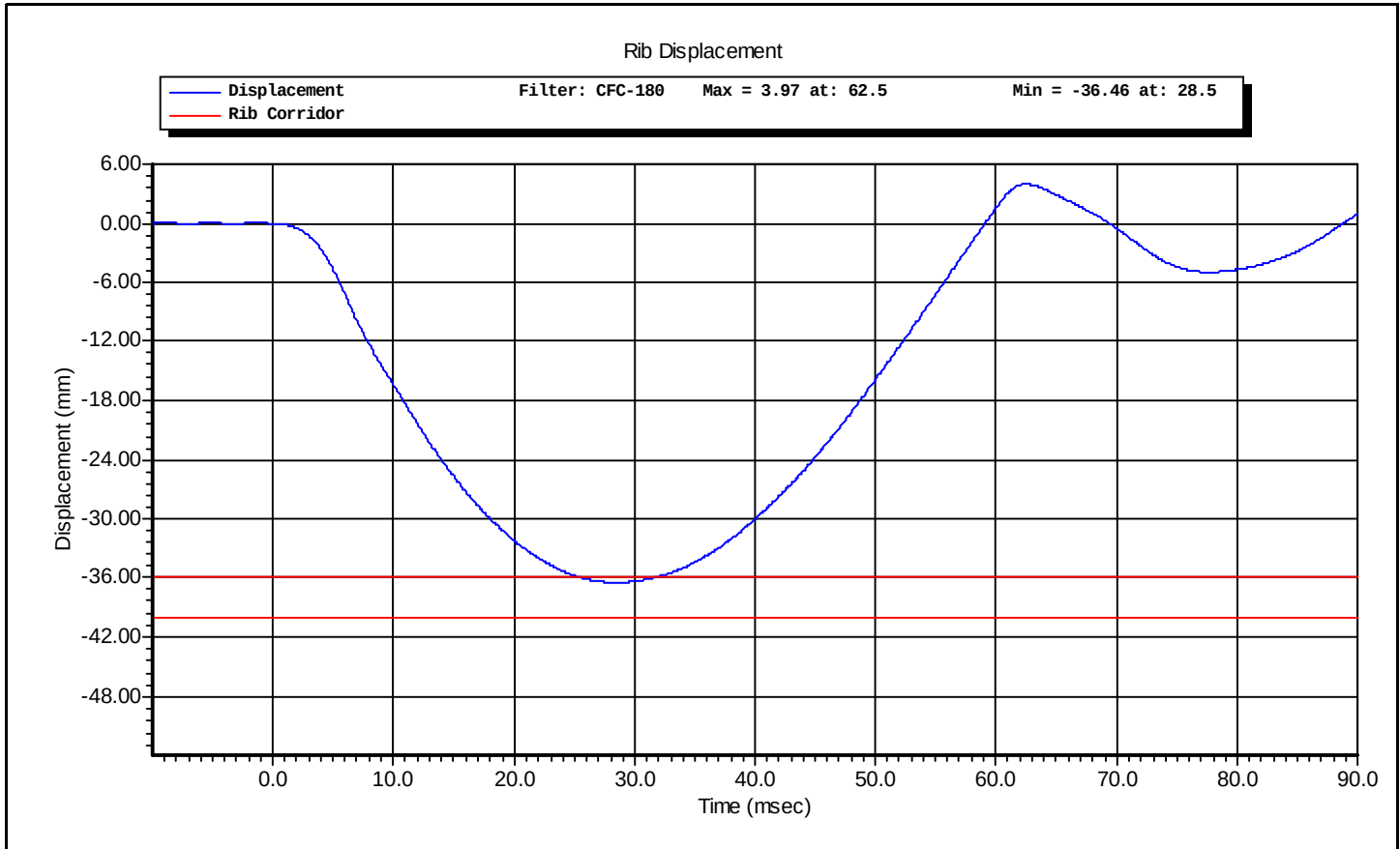


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Middle Rib 3 m/s	Test Date:	8/23/2010
Test Number:	1	Test Time:	2:30:29 PM



Test ID: Middle Rib 3 m/s Test Time: 2:30:29 PM

Test Date: 8/23/2010



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VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Upper Rib 4 m/s	Test Date:	8/23/2010
Test Number:	1	Test Time:	2:10:34 PM

Component Part Number	Component Serial Number
455-3100	UPPER

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	60.0 %RH P
Velocity	3.90 -- 4.10	3.99 m/s P
Rib Displacement	-51.00 -- -46.00	-47.45 mm P
Drop Height	807.0 -- 823.0	815.0 mm P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____
Supervisor: **D. Travale** Signature: _____

Test ID: **Upper Rib 4 m/s**

Test Time: **2:10:34 PM**

Test Date: **8/23/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Honeywell	MLT-38000	DS-179	4/23/2010
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P38216	6/22/2010

Test ID: **Upper Rib 4 m/s**

Test Time: **2:10:34 PM**

Test Date: **8/23/2010**

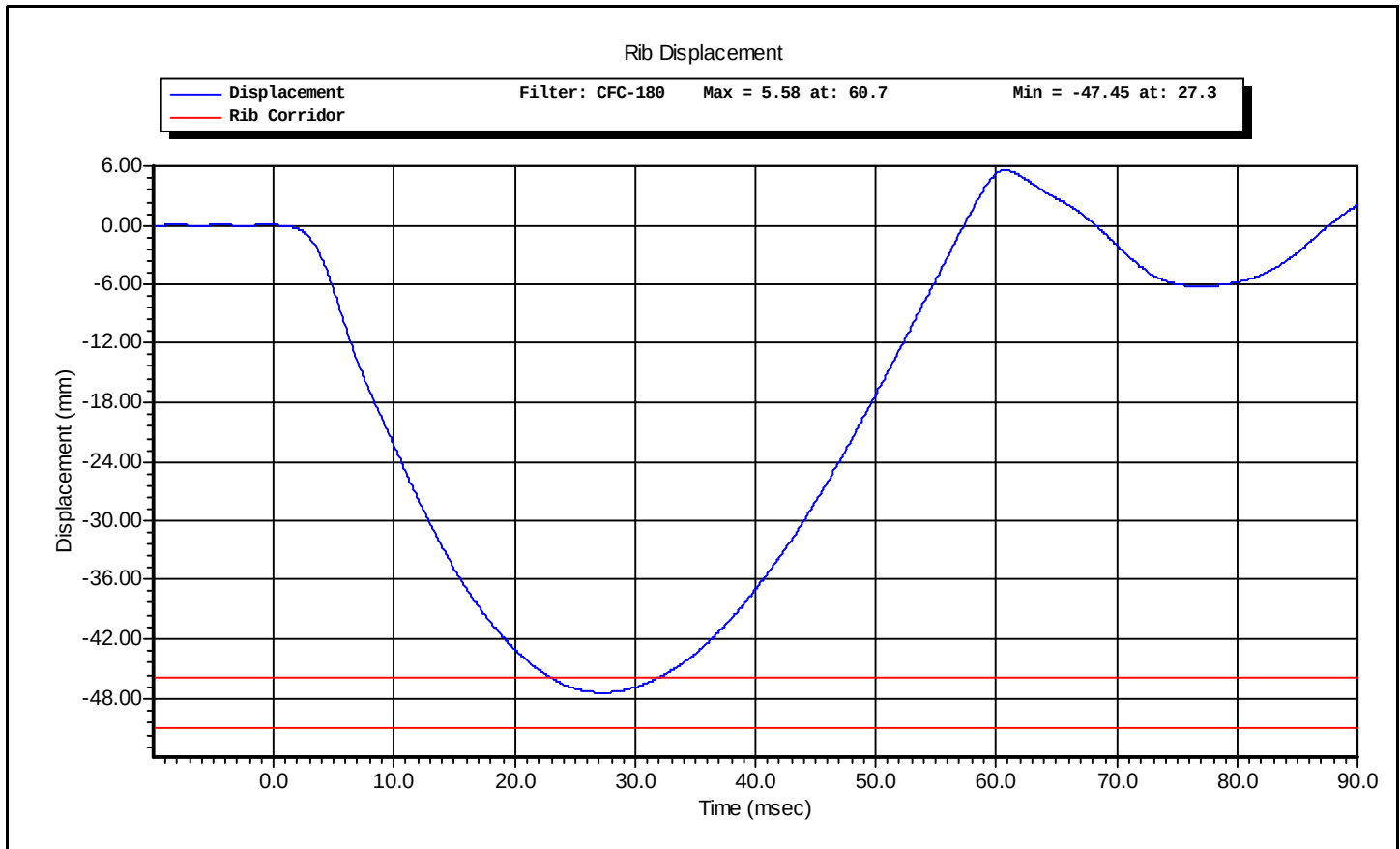


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Upper Rib 4 m/s	Test Date:	8/23/2010
Test Number:	1	Test Time:	2:10:34 PM



Test ID: Upper Rib 4 m/s

Test Time: 2:10:34 PM

Test Date: 8/23/2010



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VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Upper Rib 3 m/s	Test Date:	8/23/2010
Test Number:	1	Test Time:	2:19:41 PM

Component Part Number	Component Serial Number
455-3100	UPPER

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	61.0 %RH P
Velocity	2.90 -- 3.10	2.99 m/s P
Rib Displacement	-40.00 -- -36.00	-36.81 mm P
Drop Height	454 -- 464	459 mm P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Upper Rib 3 m/s**

Test Time: **2:19:41 PM**

Test Date: **8/23/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Honeywell	MLT-38000	DS-179	4/23/2010
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P38216	6/22/2010

Test ID: **Upper Rib 3 m/s**

Test Time: **2:19:41 PM**

Test Date: **8/23/2010**

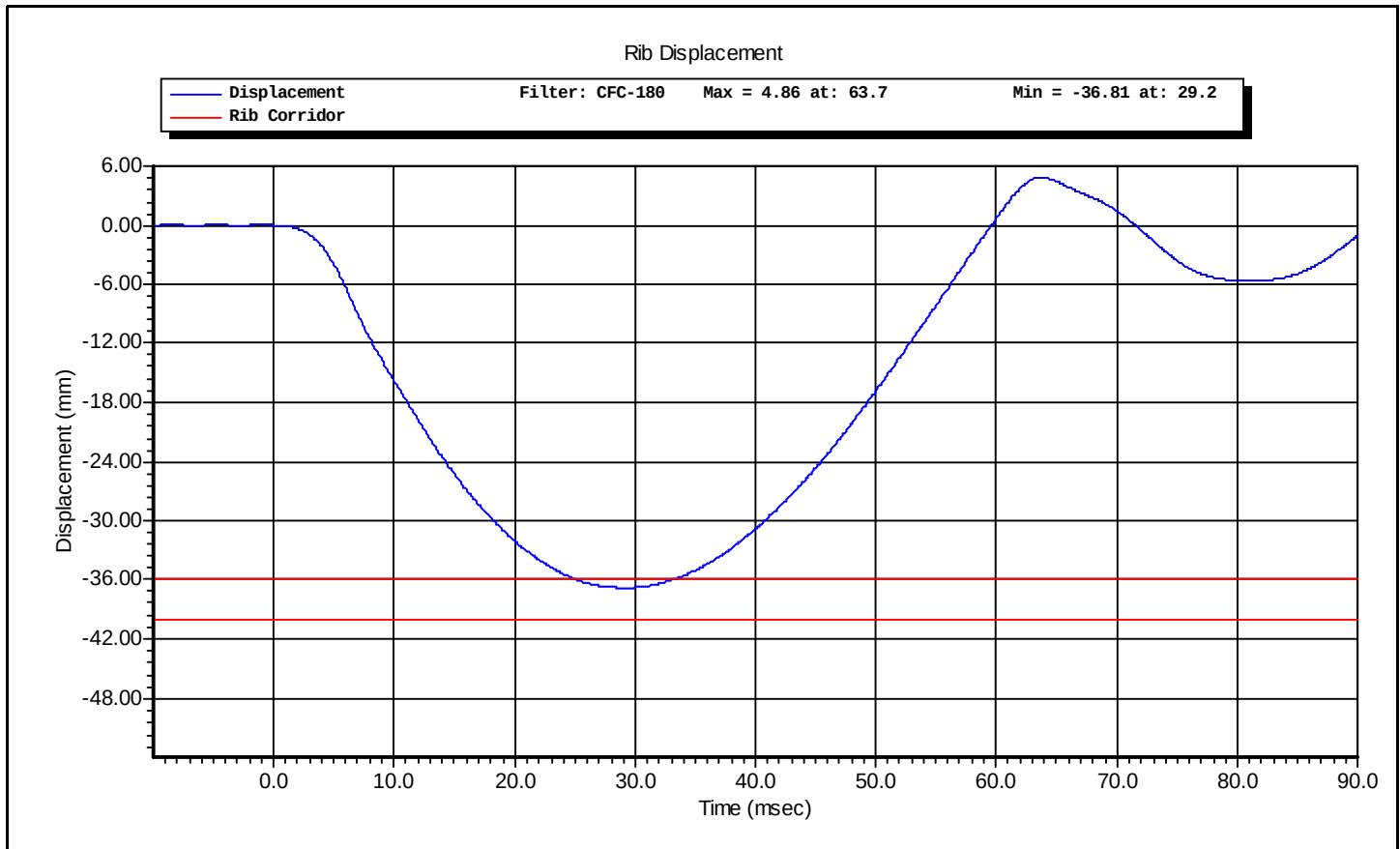


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Upper Rib 3 m/s	Test Date:	8/23/2010
Test Number:	1	Test Time:	2:19:41 PM



Test ID: Upper Rib 3 m/s Test Time: 2:19:41 PM

Test Date: 8/23/2010



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VERIFICATION REPORT

Test Name:	Thorax Impact	Revision:	8/15/2008
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Thorax	Test Date:	8/23/2010
Test Number:	1	Test Time:	5:50:31 PM

Component Part Number	Component Serial Number
Upper Rib - 175-4002	UPPER
Middle Rib - 175-4002	MIDDLE
Lower Rib - 175-4002	LOWER

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	58.0 %RH P
Velocity	5.40 -- 5.60	5.51 m/s P
Upper Rib Displacement	34.0 -- 41.0	36.8 mm P
Middle Rib Displacement	37.0 -- 45.0	41.1 mm P
Lower Rib Displacement	37.0 -- 44.0	40.9 mm P
Impactor Force	5100 -- 6200	5407 N P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____
Supervisor: **D. Travale** Signature: _____

Test ID: **Thorax**

Test Time: **5:50:31 PM**

Test Date: **8/23/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66927	4/20/2010
Honeywell	MLT-38000	DS-179	4/23/2010
Honeywell	MLT-38000	DS-185	4/23/2010
Honeywell	MLT-38000	DS-178	4/23/2010

Test ID: **Thorax**

Test Time: **5:50:31 PM**

Test Date: **8/23/2010**

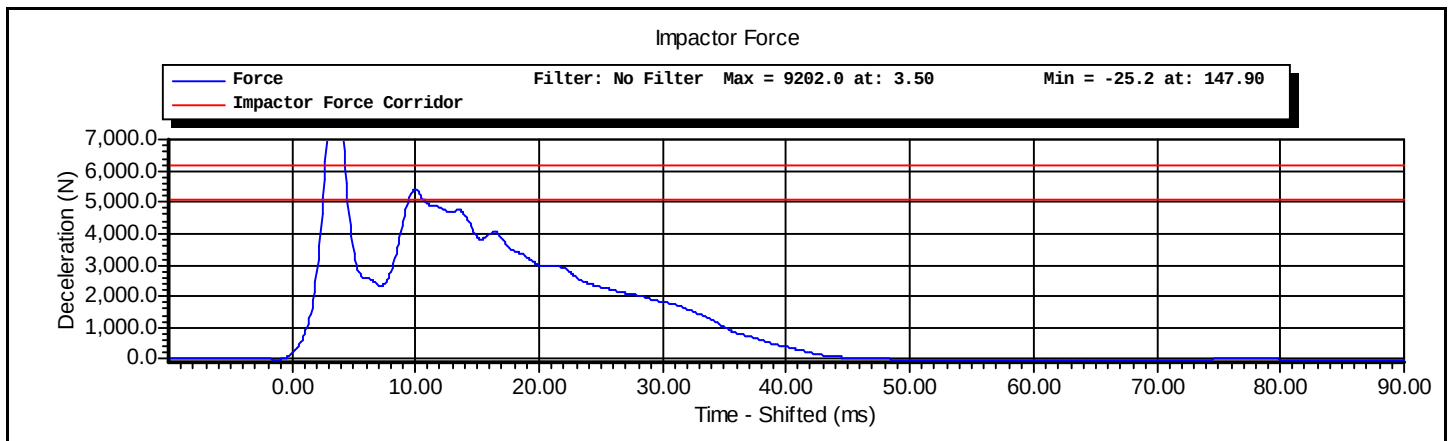
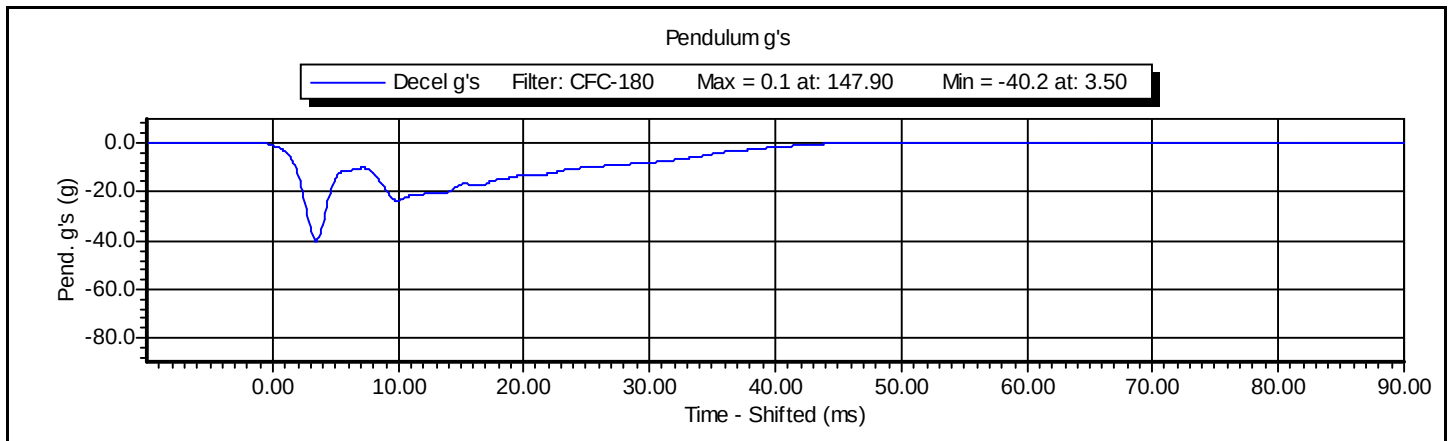


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Test Name:	Thorax Impact	Revision:	8/15/2008
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Thorax	Test Date:	8/23/2010
Test Number:	1	Test Time:	5:50:31 PM

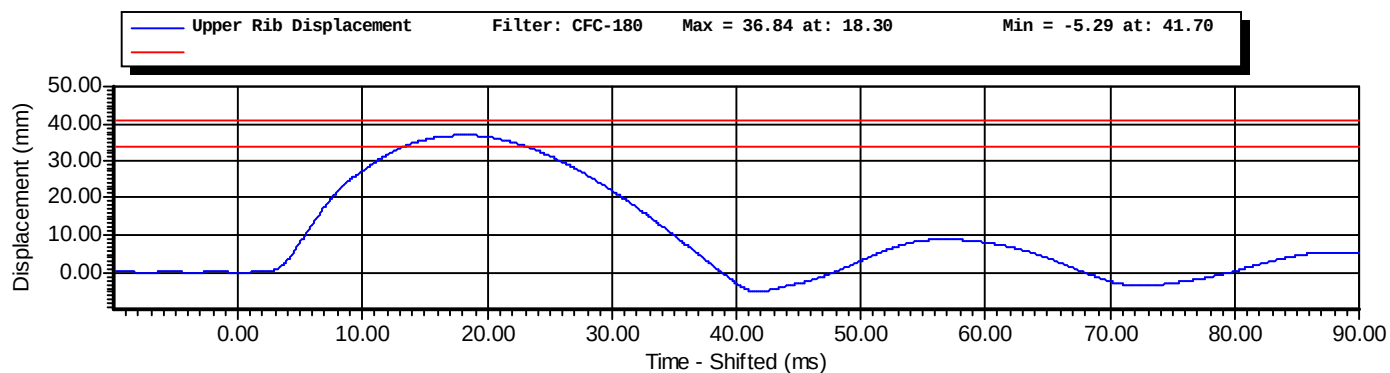


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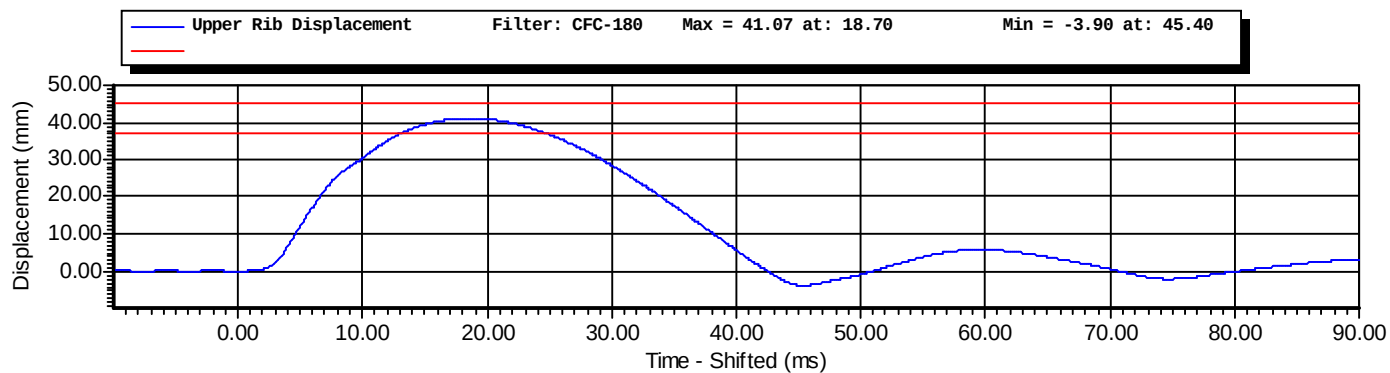
Test Time: 5:50:31 PM

Test Date: 8/23/2010

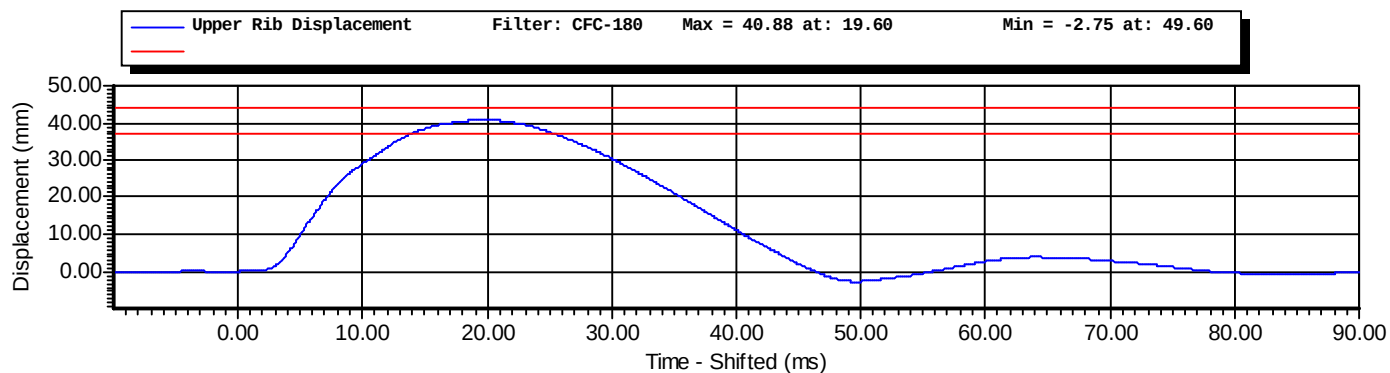
Upper Rib Displacement



Middle Rib Displacement



Lower Rib Displacement





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VERIFICATION REPORT

Test Name:	Abdominal Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Abdomen	Test Date:	8/23/2010
Test Number:	2	Test Time:	5:31:44 PM

Component Part Number	Component Serial Number
455-4001	07/136

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	58 %RH P
Velocity	3.90 -- 4.10	4.03 m/s P
Peak Abdominal Force	-2.70 -- -2.20	-2.53 kN P
Time At Peak Abdominal Force	10.0 -- 12.3	12.2 ms P
Maximum Pendulum Force	-4.80 -- -4.00	-4.30 kN P
Time at Peak Pendulum Force	10.6 -- 13.0	12.7 ms P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Abdomen**

Test Time: **5:31:44 PM**

Test Date: **8/23/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66927	4/20/2010
Denton	2631	LC-1524	4/22/2010
Denton	2631	LC-1523	4/22/2010
Denton	2631	LC-1530	4/22/2010

Test ID: **Abdomen**

Test Time: **5:31:44 PM**

Test Date: **8/23/2010**

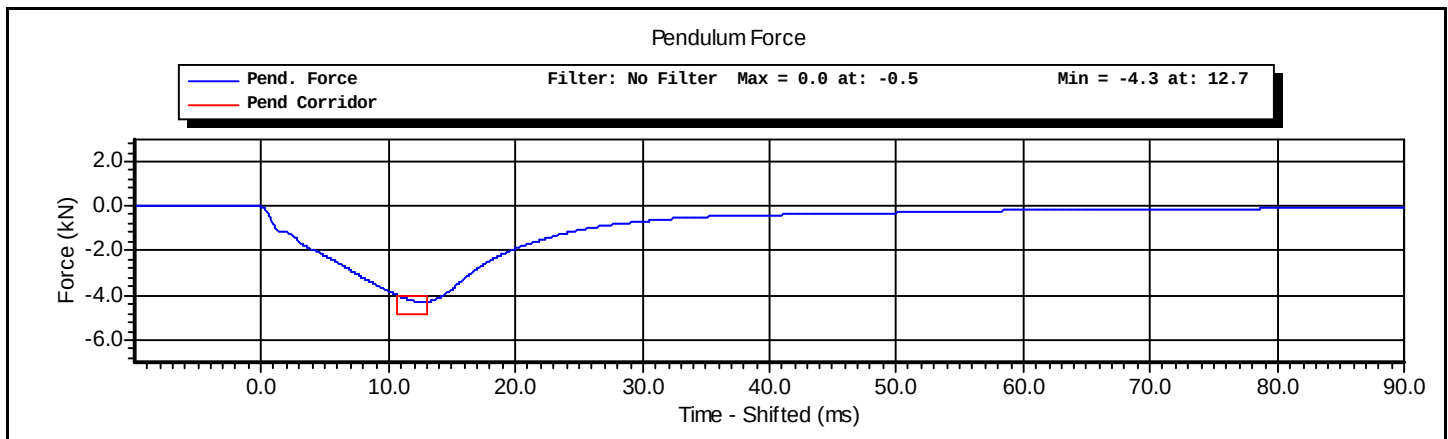
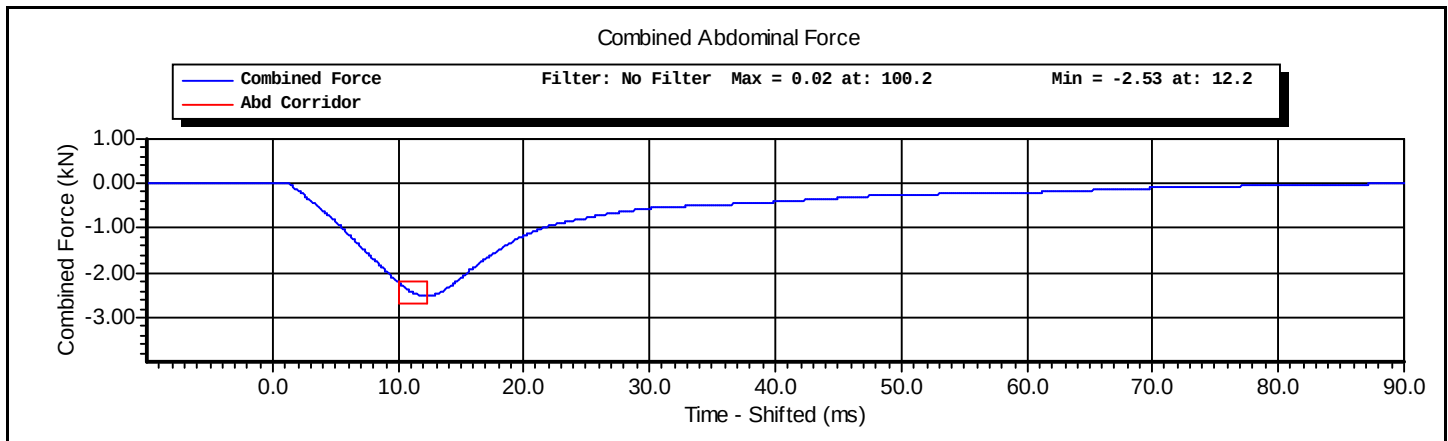


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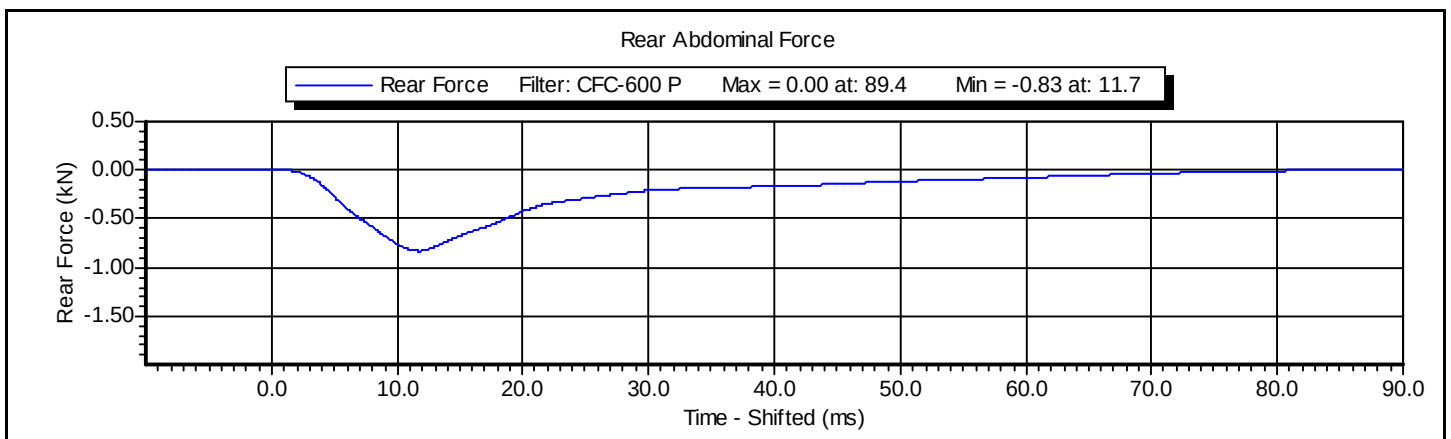
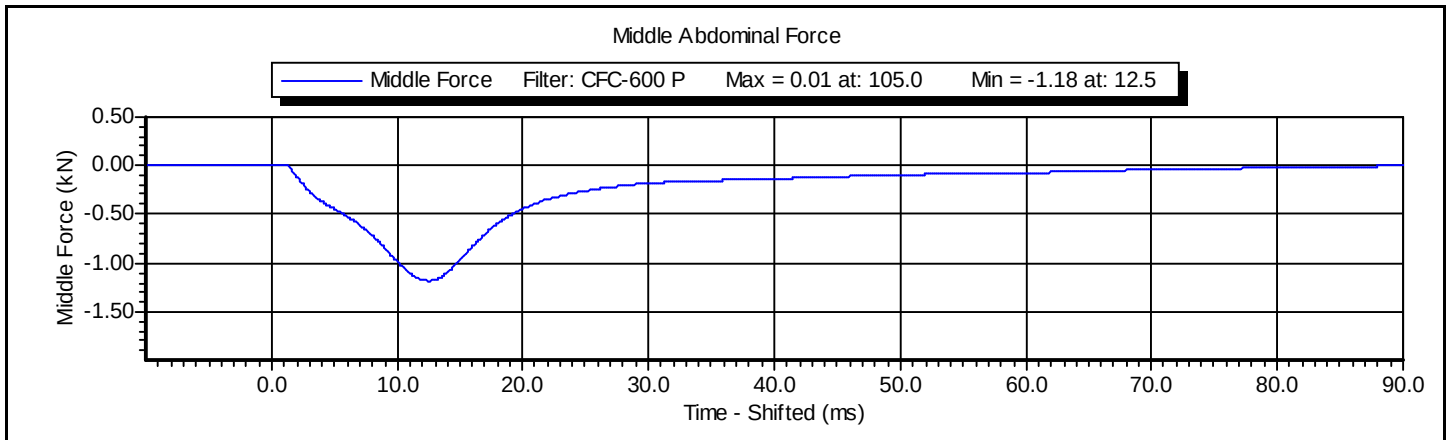
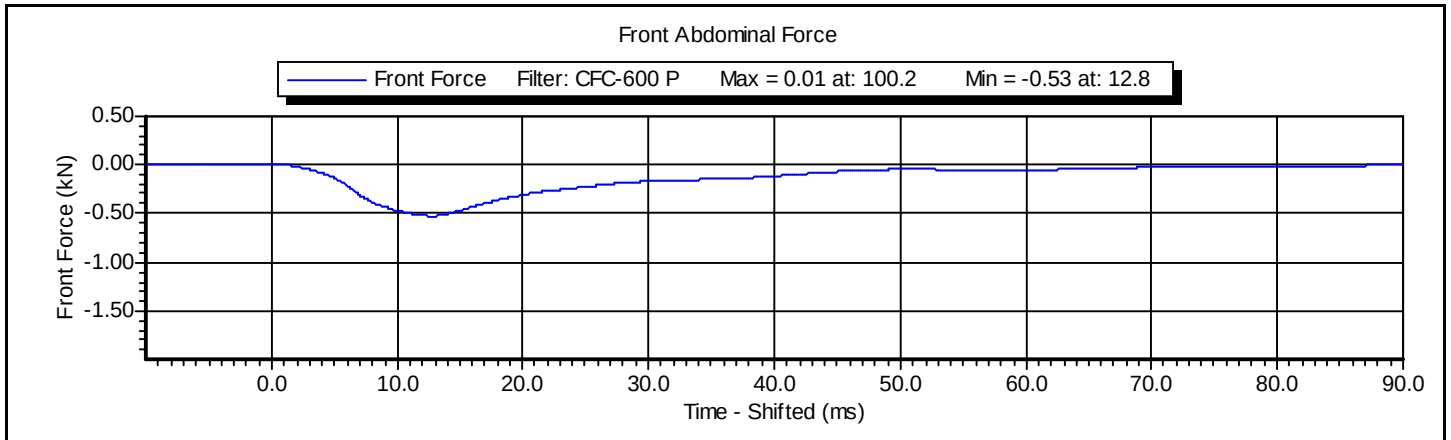
Test Name:	Abdominal Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Abdomen	Test Date:	8/23/2010
Test Number:	2	Test Time:	5:31:44 PM



Test ID: **Abdomen**

Test Time: **5:31:44 PM**

Test Date: **8/23/2010**





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VERIFICATION REPORT

Test Name:	Lumbar Spine	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Lumbar Spine	Test Date:	8/23/2010
Test Number:	3	Test Time:	3:04:41 PM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	60 %RH P
Velocity	5.95 -- 6.15	6.13 m/s P
Maximum Flexion Angle	45.0 -- 55.0	50.8 degrees P
Time at Maximum Flexion Angle	39.0 -- 53.0	45.5 ms P
Decay to Zero Degrees	37.0 -- 57.0	39.4 ms P
Velocity Corridor	--	P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____
Supervisor: **D. Travale** Signature: _____

Test ID: **Lumbar Spine**

Test Time: **3:04:41 PM**

Test Date: **8/23/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7231CT	C16510	5/10/2010
DentonATD	7000428	094	4/27/2010
DentonATD	7000428	095	4/27/2010
DentonATD	7000428	093	4/27/2010

Test ID: **Lumbar Spine**

Test Time: **3:04:41 PM**

Test Date: **8/23/2010**



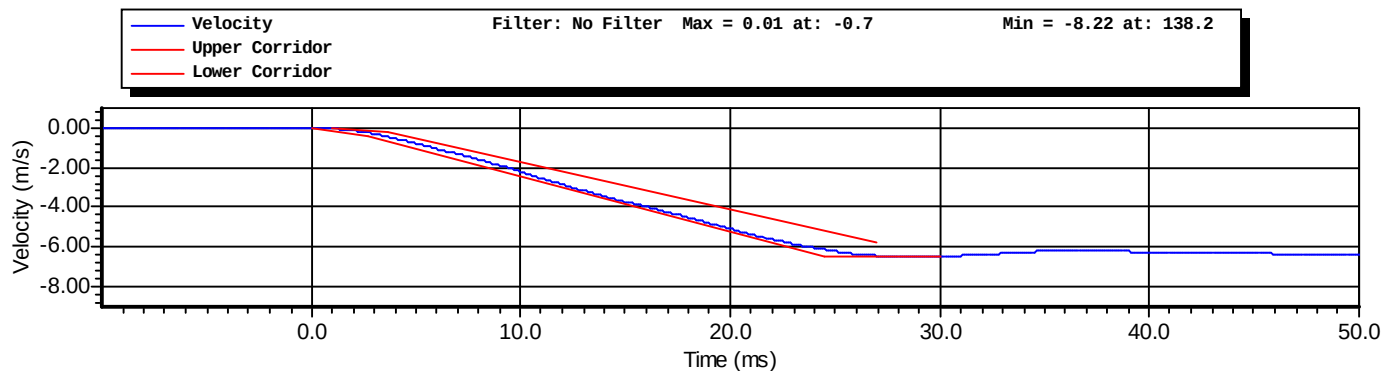
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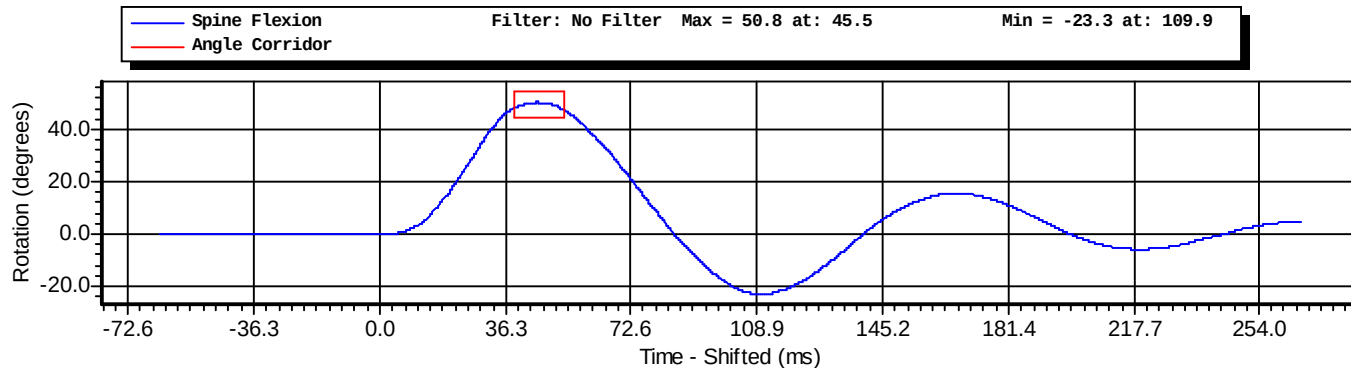
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Test Name:	Lumbar Spine	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Lumbar Spine	Test Date:	8/23/2010
Test Number:	3	Test Time:	3:04:41 PM

Pendulum Velocity

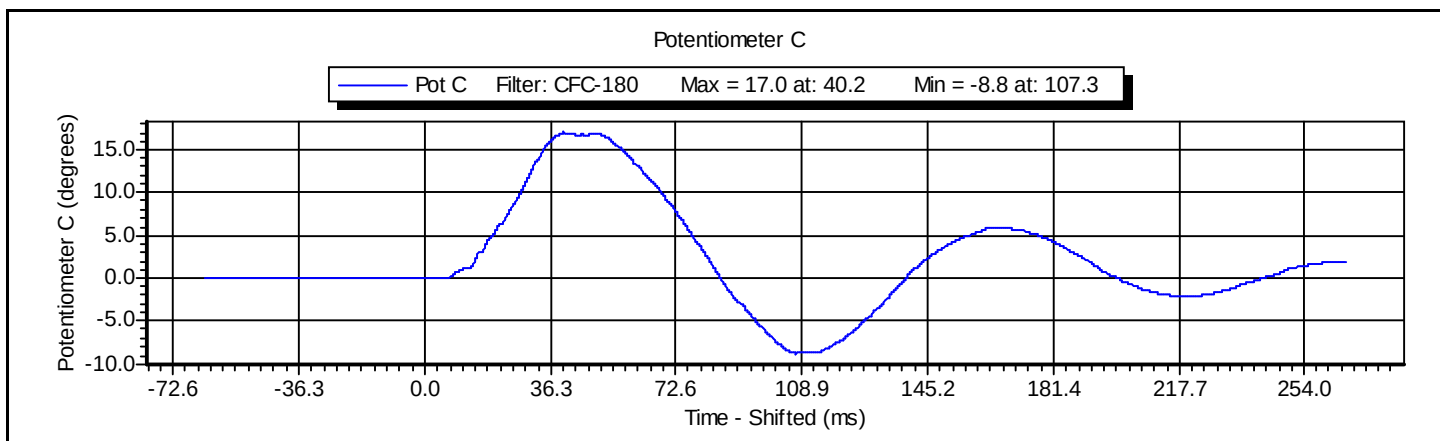
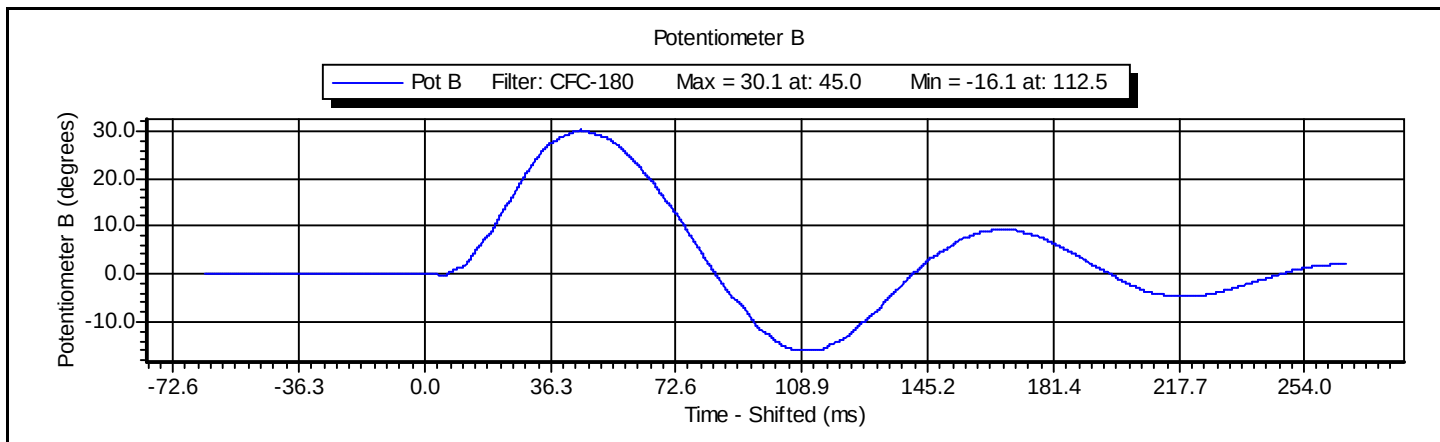
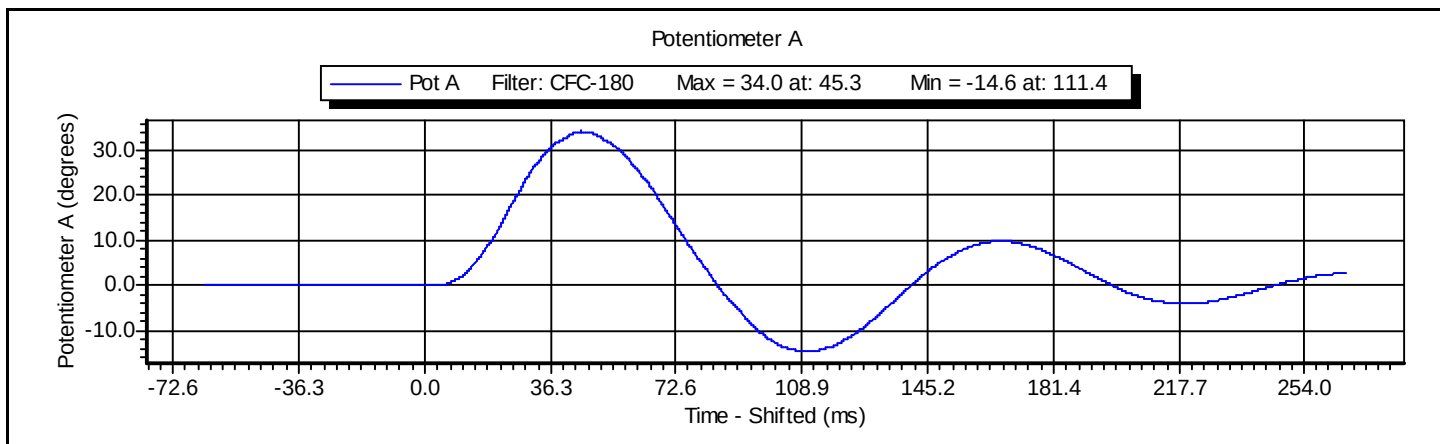


Spine Flexion Angle



Test ID: **Lumbar Spine** Test Time: **3:04:41 PM**

Test Date: **8/23/2010**





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VERIFICATION REPORT

Test Name:	Pelvis Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Pelvis	Test Date:	8/23/2010
Test Number:	1	Test Time:	3:55:38 PM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	22.2 deg C	P
Humidity	10	--	70	63 %RH	P
Velocity	4.20	--	4.40	4.34 m/s	P
Peak Pendulum Force	-5.40	--	-4.70	-5.00 kN	P
Time at Peak Pendulum Force	11.80	--	16.10	14.55 ms	P
Peak Pubic Symphysis Force	-1.59	--	-1.23	-1.36 kN	P
Time at Peak Pubic Symphysis Force	12.20	--	17.00	15.25 ms	P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____
Supervisor: **D. Travale** Signature: _____

Test ID: **Pelvis**

Test Time: **3:55:38 PM**

Test Date: **8/23/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66927	4/20/2010
Denton	3096	LC-456Fy	4/22/2010

Test ID: **Pelvis**

Test Time: **3:55:38 PM**

Test Date: **8/23/2010**

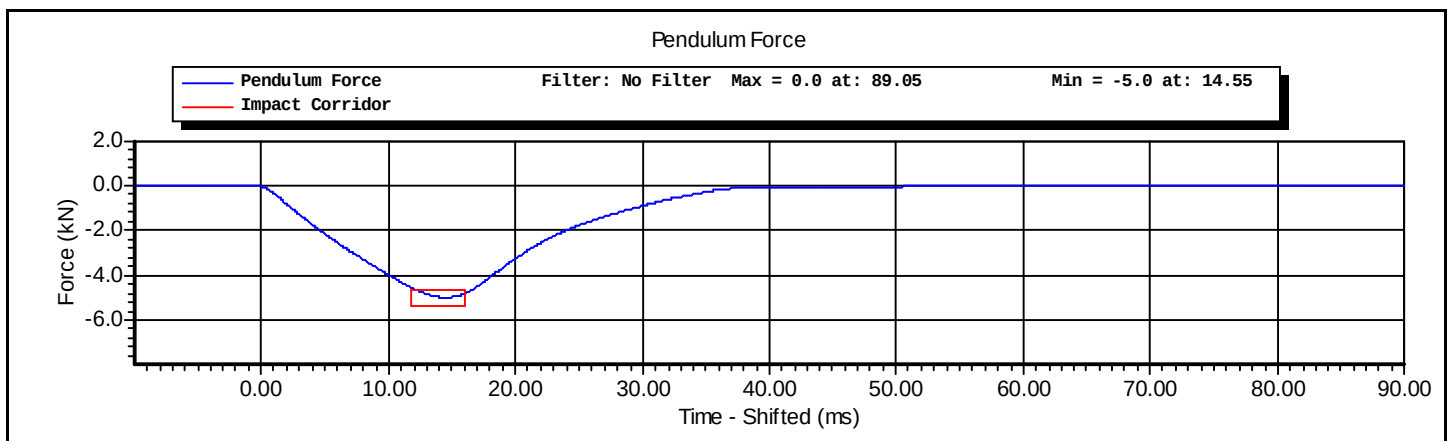
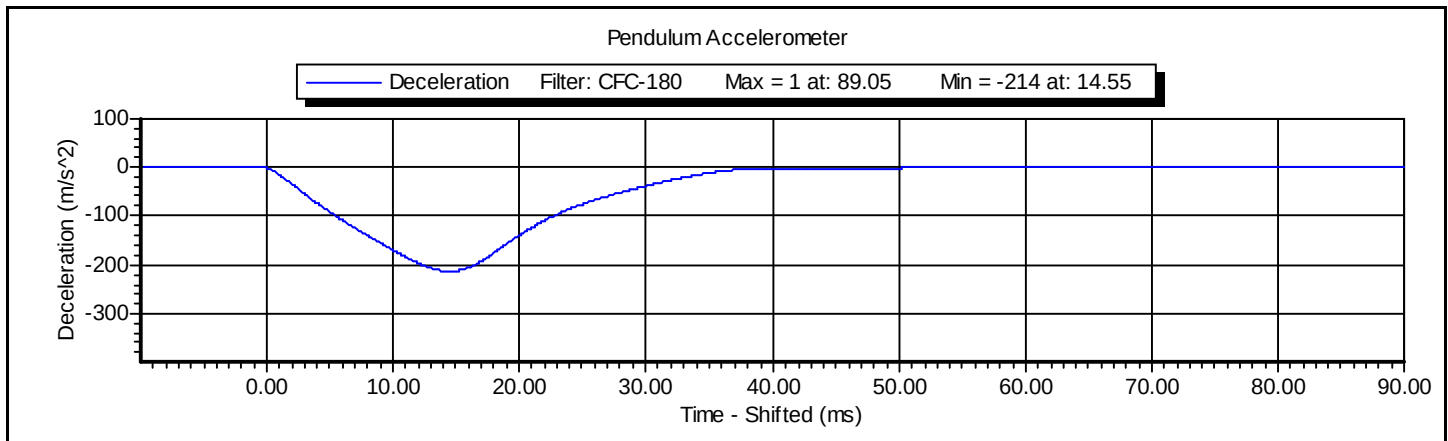


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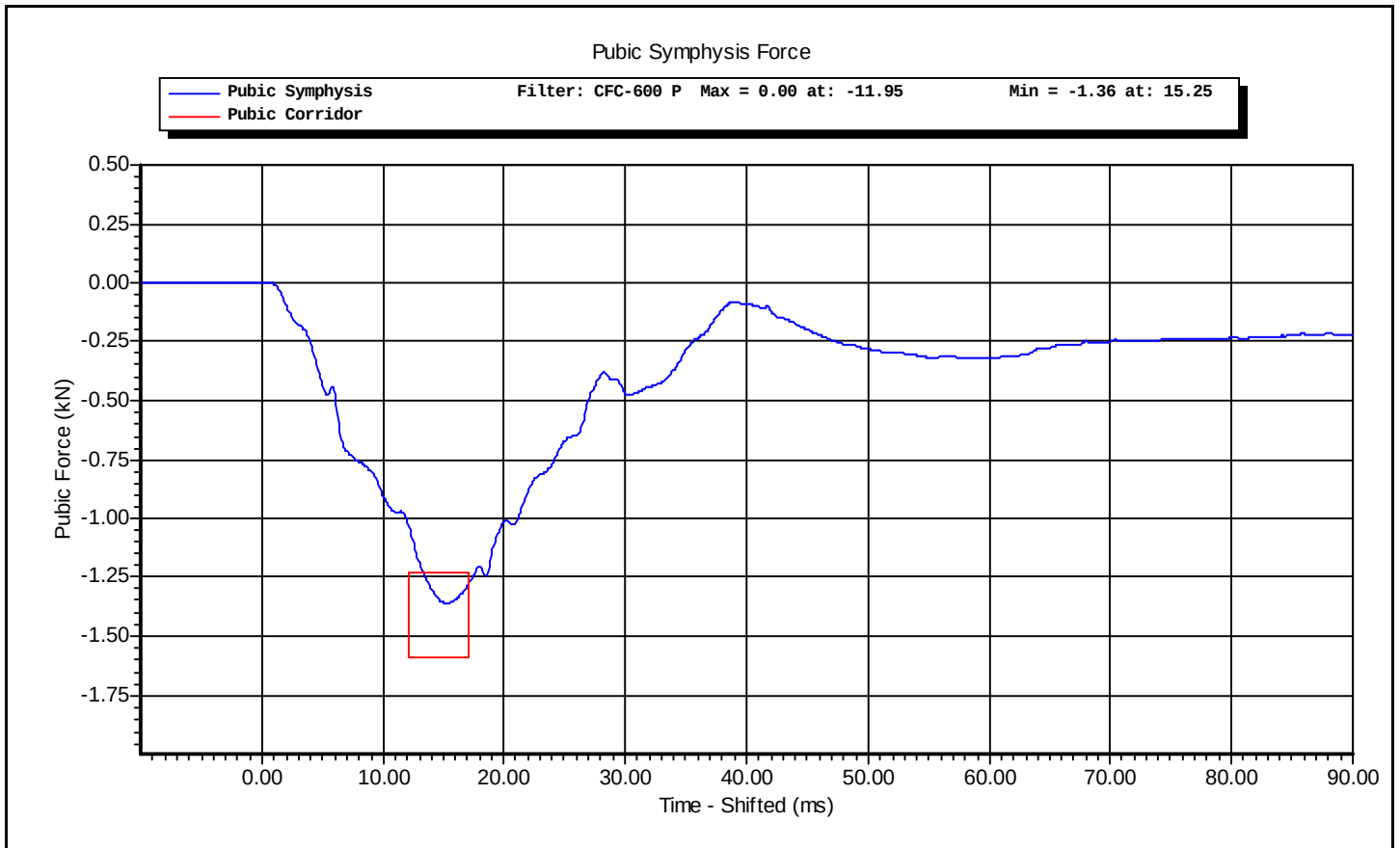
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Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Pelvis	Test Date:	8/23/2010
Test Number:	1	Test Time:	3:55:38 PM



Test ID: **Pelvis**

Test Time: **3:55:38 PM**

Test Date: **8/23/2010**



CALIBRATION TEST RESULTS

PRE-TEST

SID-IIs No: 300

CONFIGURED FOR LEFT SIDE IMPACT

SID-IIsD External Measurements

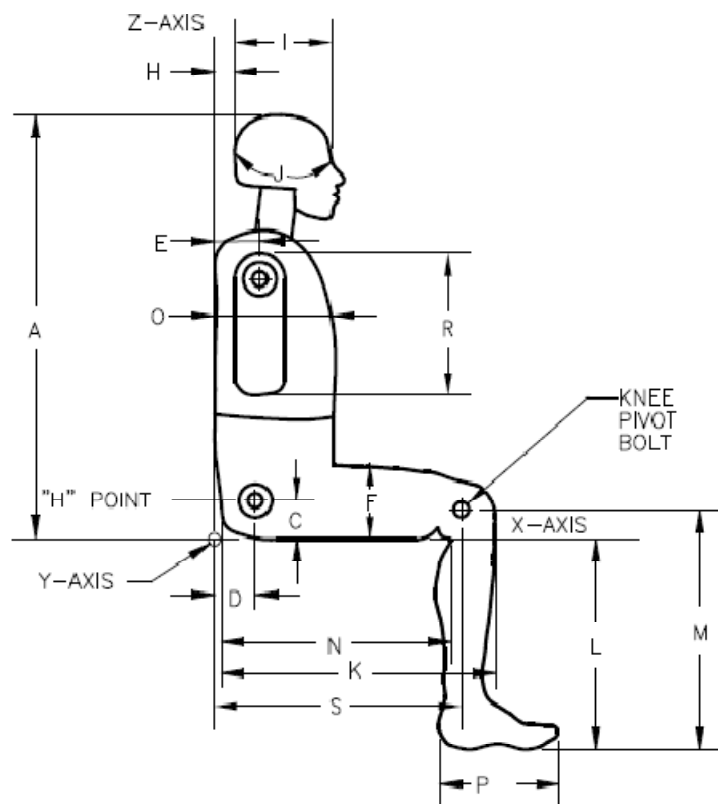
NHTSA ATD S/N 300

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	785	Yes
B	Shoulder Pivot Height	437.0 - 453.0	450	Yes
C	H-Point Height	79.0 - 89.0	87	Yes
D	H-Point from Seat Back	141.0 - 151.0	145	Yes
E	Shoulder Pivot from Backline	97.0 - 107.0	98	Yes
F	Thigh Clearance	119.0 - 135.0	125	Yes
G	Head Breadth	140.0 - 148.0	143	Yes
H	Head Back from Backline	40.0 - 46.0	42	Yes
I	Head Depth	178.0 - 188.0	181	Yes
J	Head Circumference	541.0 - 551.0	545	Yes
K	Buttock to Knee Length	514.0 - 540.0	523	Yes
L	Popliteal Height	343.0 - 369.0	365	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	395	Yes
N	Buttock Popliteal Length	416.0 - 442.0	430	Yes
O	Chest Depth without Jacket	195.0 - 211.0	205	Yes
P	Foot Length (right)	216.0 - 232.0	220	Yes
P	Foot Length (left)	216.0 - 232.0	220	Yes
Q	Hip Breadth	313.0 - 323.0	315	Yes
R	Arm Length	249.0 - 259.0	253	Yes
S	Knee Joint to Seat back	478.0 - 493.0	475	Yes
V	Shoulder Width (only one arm installed)	341.0 - 357.0	353	Yes
W	Foot Width (right)	78.0 - 94.0	85	Yes
W	Foot Width (left)	78.0 - 94.0	85	Yes
Y	Chest Circumference with Jacket	851.0 - 881.0	870	Yes
Z	Waist Circumference	761.0 - 791.0	773	Yes

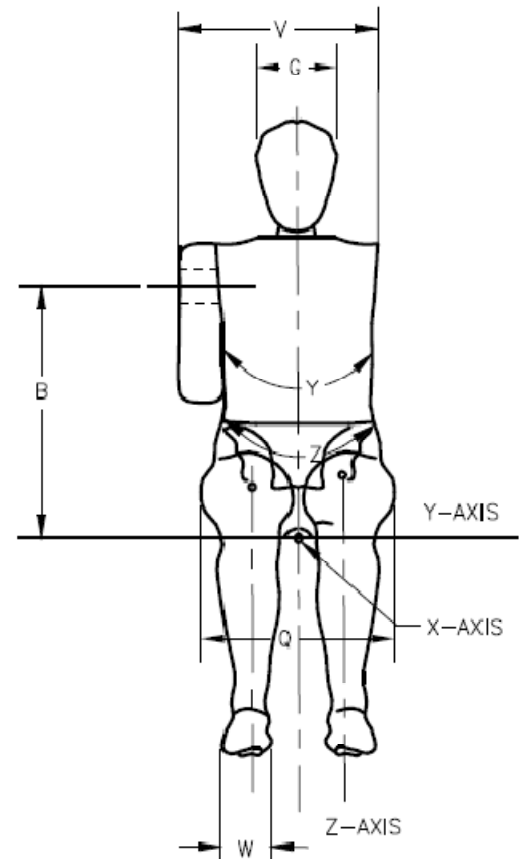
Technician: AR

Date: 8/23/2010

SID-IIIsD External Dimension Reference Diagram



SIDE VIEW



FRONT VIEW



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VERIFICATION REPORT

Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Head Drop	Test Date:	8/23/2010
Test Number:	1	Test Time:	6:50:25 PM

Component Part Number	Component Serial Number
Head Skin - 180-1002	1355

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	61 %RH P
Resultant Acceleration	115.0 -- 137.0	131.7 g P
Oscillation	0.0 -- 15.0	3.1 % P
Fore-Aft Acceleration	-15.0 -- 15.0	8.8 g P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____
Supervisor: **D. Travale** Signature: _____

Test ID: **Head Drop**

Test Time: **6:50:25 PM**

Test Date: **8/23/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Endevco	7264-2000	P51685	4/7/2010
Endevco	7264-2000	P51682	4/7/2010
Endevco	7264-2000	P51699	4/7/2010

Test ID: **Head Drop**

Test Time: **6:50:25 PM**

Test Date: **8/23/2010**

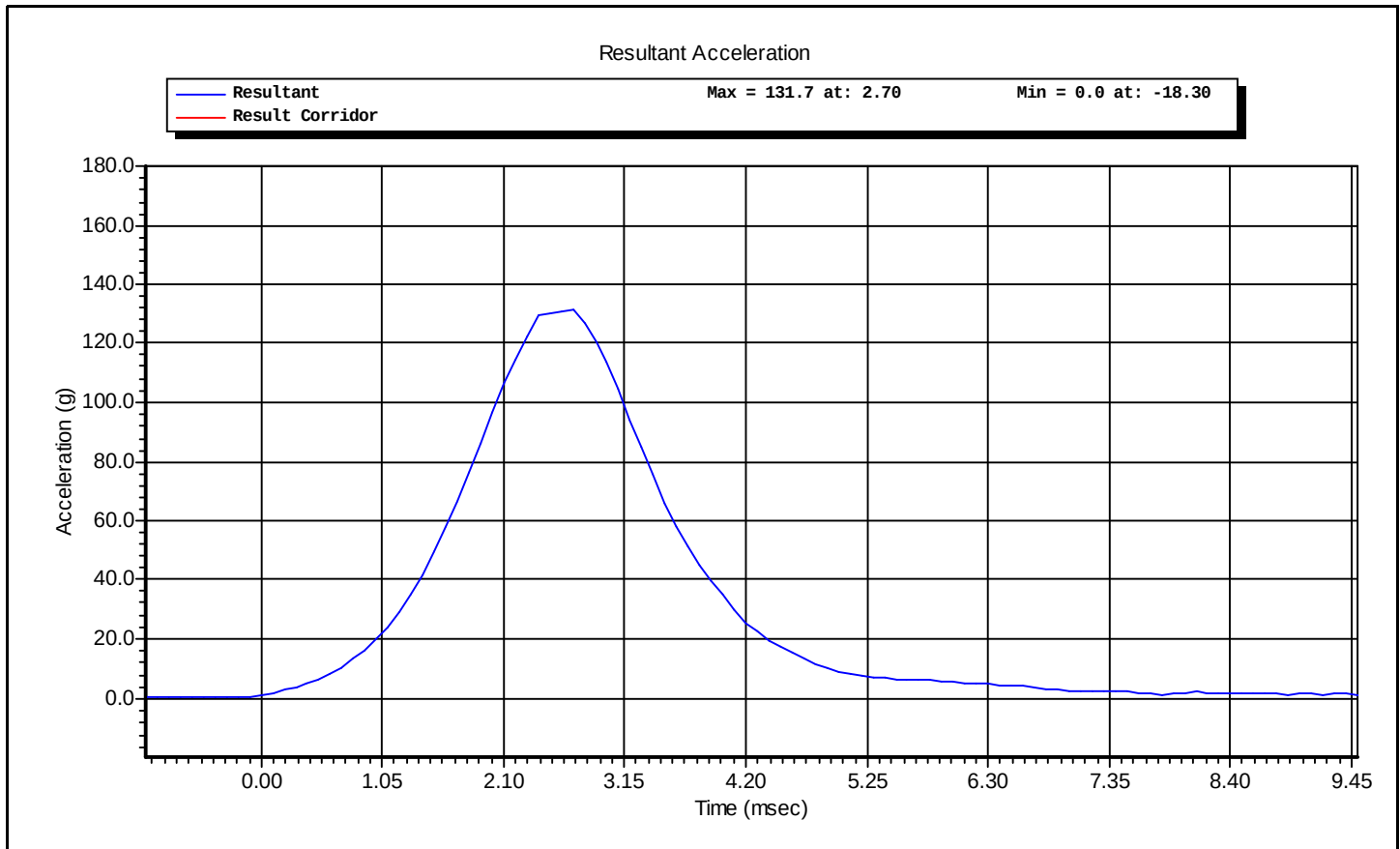


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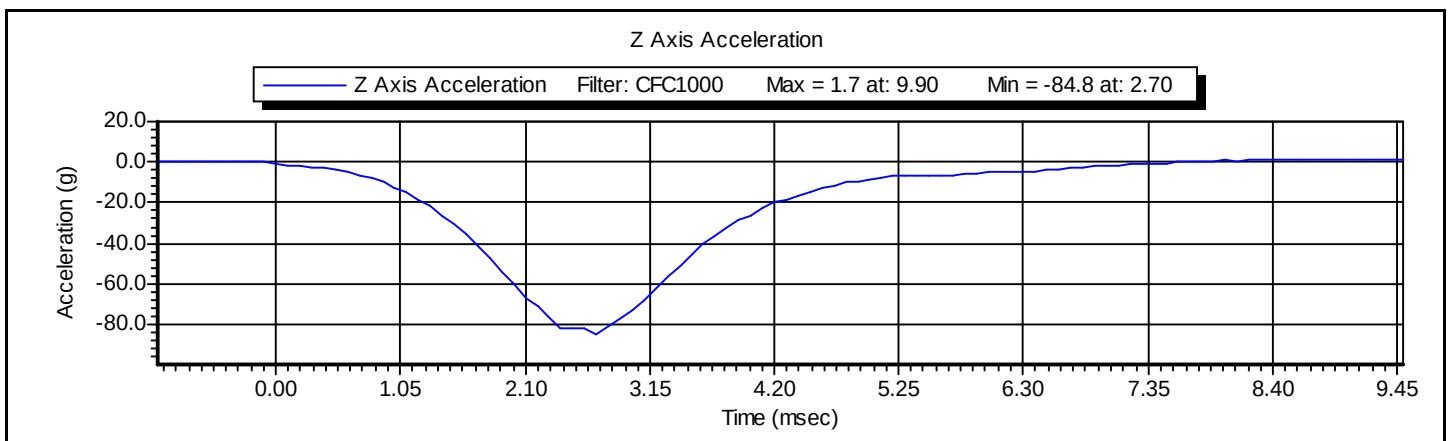
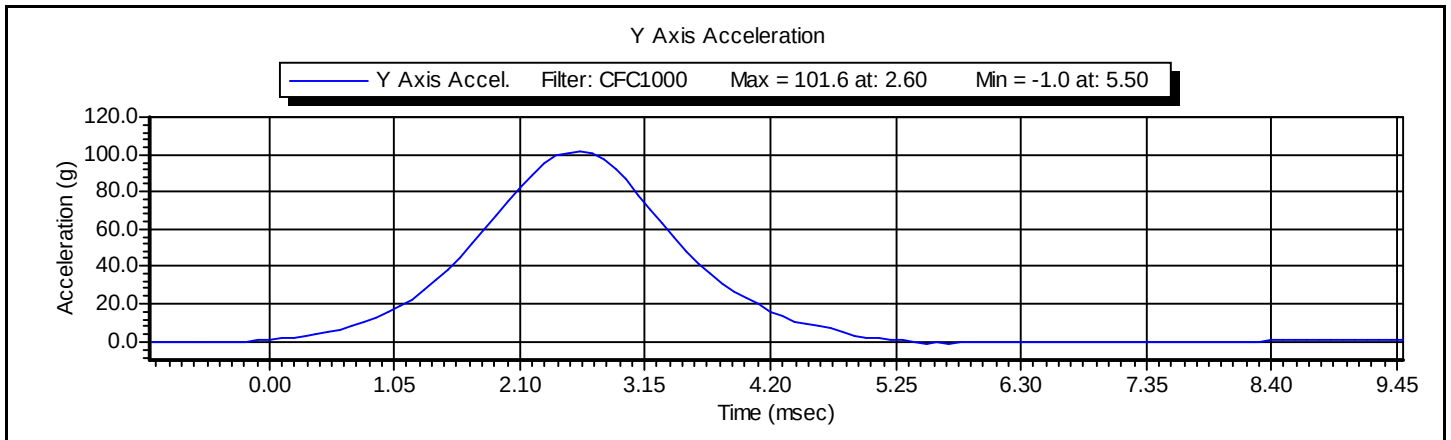
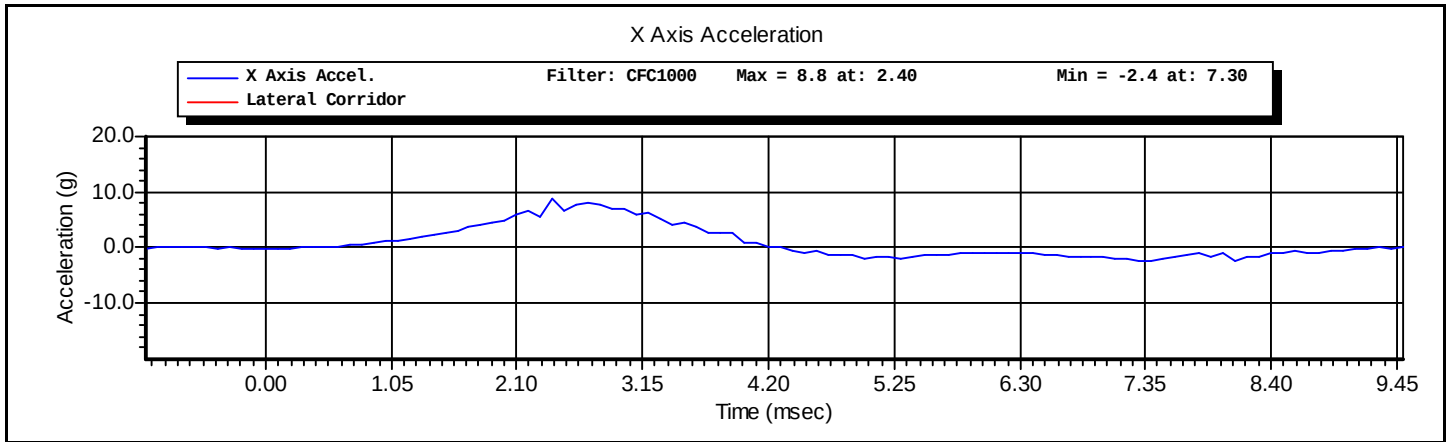
Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Head Drop	Test Date:	8/23/2010
Test Number:	1	Test Time:	6:50:25 PM



Test ID: Head Drop

Test Time: 6:50:25 PM

Test Date: 8/23/2010





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VERIFICATION REPORT

Test Name:	Neck Pendulum	Revision:	8/24/2009
Sub Test Name:	Left Side	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Neck Flexion	Test Date:	8/24/2010
Test Number:	1	Test Time:	10:07:12 AM

Component Part Number	Component Serial Number
Neck - 180-2000	787

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.7 deg C P
Humidity	10 -- 70	57 %RH P
Velocity	5.51 -- 5.63	5.57 m/s P
Pendulum Impulse at 10 ms	2.20 -- 2.80	2.65 m/s P
Pendulum Impulse at 15 ms	3.30 -- 4.10	3.82 m/s P
Pendulum Impulse at 20 ms	4.40 -- 5.40	5.25 m/s P
Pendulum Impulse at 25 ms	5.40 -- 6.10	5.88 m/s P
Pendulum Impulse between 25 and 100 ms	5.50 -- 6.20	5.91 m/s P
Max D Plane Rotation	71.0 -- 81.0	75.7 degrees P
Time at Max Rotation	50.0 -- 70.0	60.7 ms P
Moment about OC	-44.0 -- -36.0	-42.2 Nm P
Moment Decay to Zero	102.0 -- 126.0	116.3 ms P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Neck Flexion**

Test Time: **10:07:12 AM**

Test Date: **8/24/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7231CT	C16510	5/10/2010
Denton	1716A	LC-576 Fy	2/15/2010
Denton	1716A	LC-576 Mx	2/15/2010
DentonATD	78051-342	184	4/30/2010
DentonATD	78051-342	174	4/30/2010
DentonATD	78051-342	185	4/30/2010

Test ID: **Neck Flexion**

Test Time: **10:07:12 AM**

Test Date: **8/24/2010**



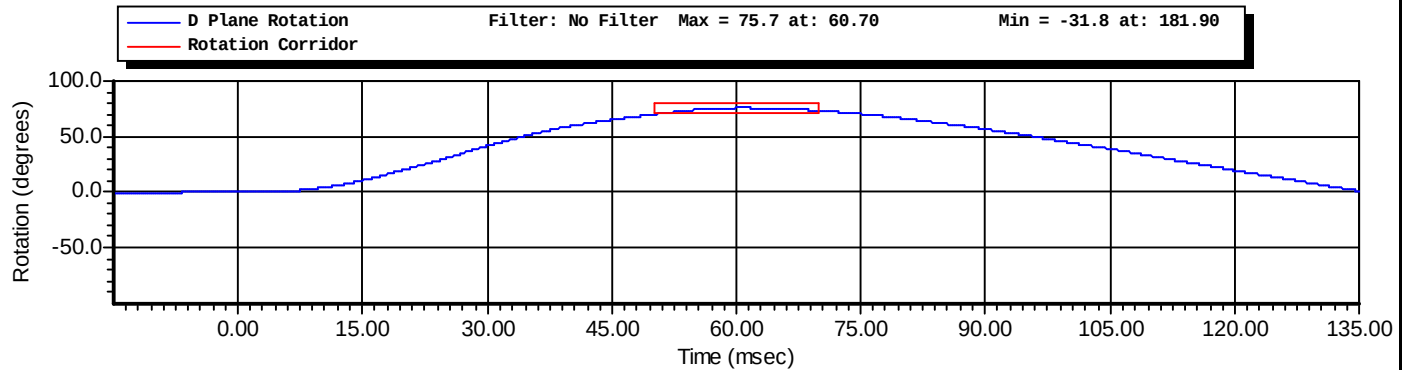
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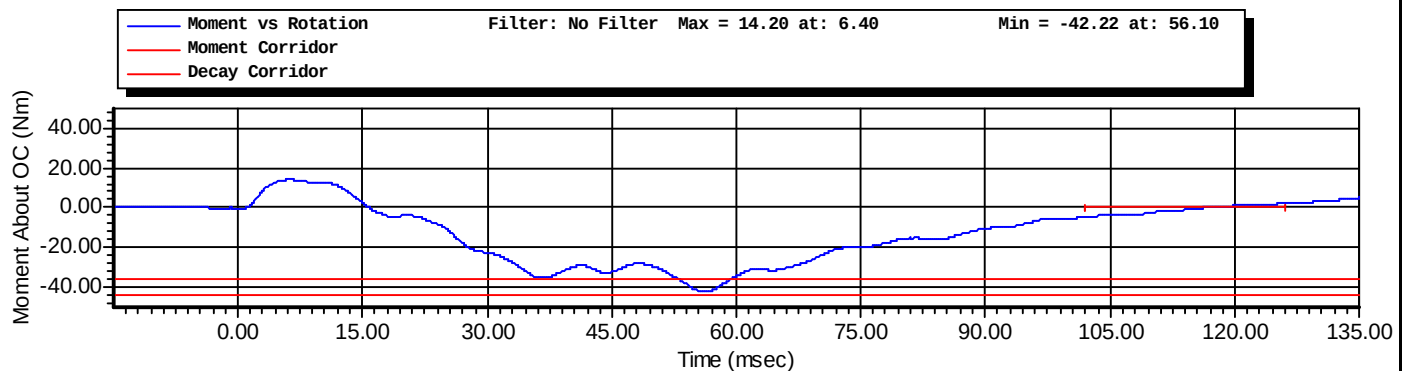
4455 Genesee Street, Buffalo, New York 14225 - Phone (716)632-7500

Test Name:	Neck Pendulum	Revision:	8/24/2009
Sub Test Name:	Left Side	Spec Type:	NHTSA
ATD Type:	SID-IIIs		
ATD Serial Number:	SID 300		
Test ID:	Neck Flexion	Test Date:	8/24/2010
Test Number:	1	Test Time:	10:07:12 AM

D Plane Rotation



Moment About Occipital Condyle

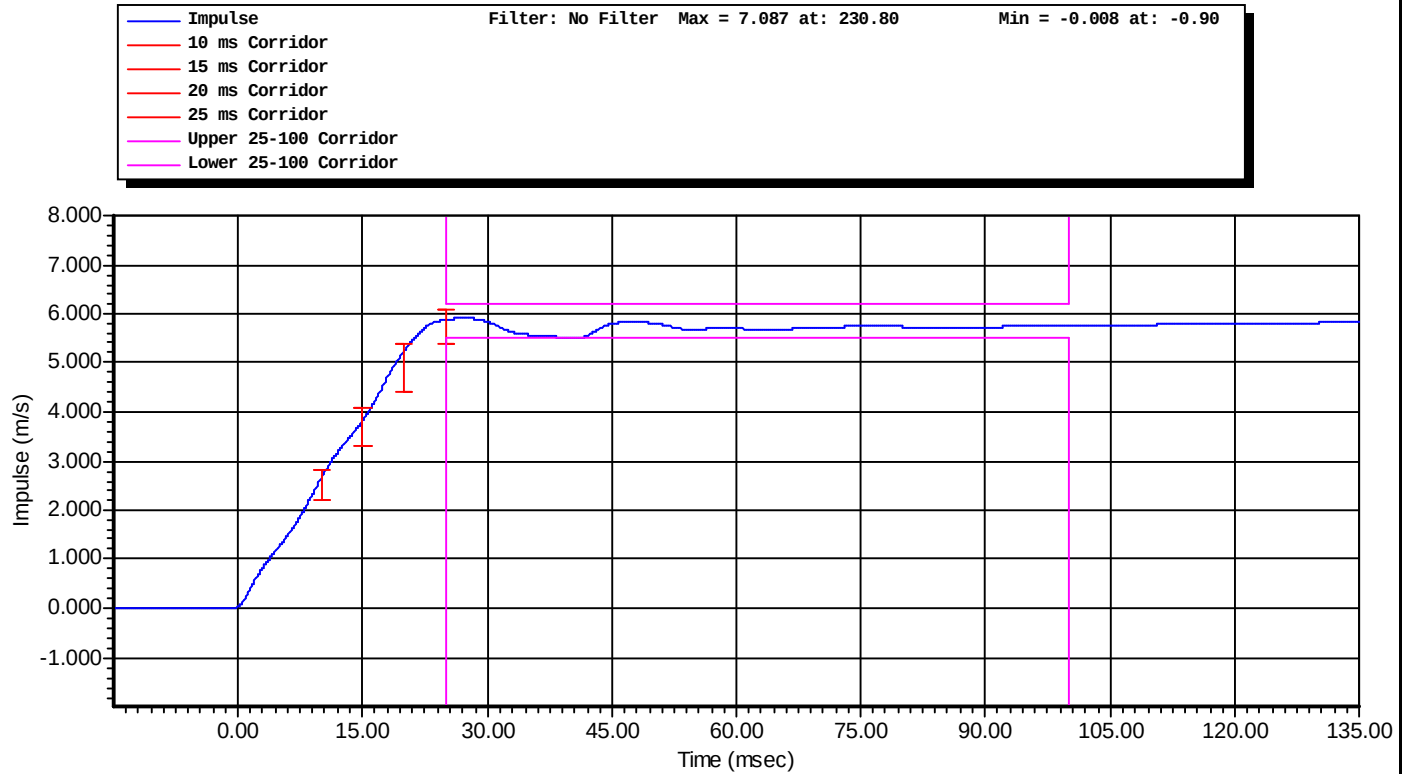


Test ID: Neck Flexion

Test Time: 10:07:12 AM

Test Date: 8/24/2010

Pendulum Impulse





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VERIFICATION REPORT

Test Name:	Shoulder Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Shoulder	Test Date:	8/24/2010
Test Number:	1	Test Time:	1:29:07 PM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.20 deg C P
Humidity	10.0 -- 70.0	53.0 %RH P
Velocity	4.20 -- 4.40	4.32 m/s P
Probe Acceleration	13.0 -- 18.0	16.1 g P
Shoulder Deflection	28.0 -- 37.0	33.56 mm P
T1 Acceleration	17.0 -- 22.0	19.2 g P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____
Supervisor: **D. Travale** Signature: _____

Test ID: **Shoulder**

Test Time: **1:29:07 PM**

Test Date: **8/24/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66927	4/20/2010
Servo	180-3885	DS-1063	4/7/2010
Endevco	7264-2000	P23904	3/15/2010

Test ID: **Shoulder**

Test Time: **1:29:07 PM**

Test Date: **8/24/2010**

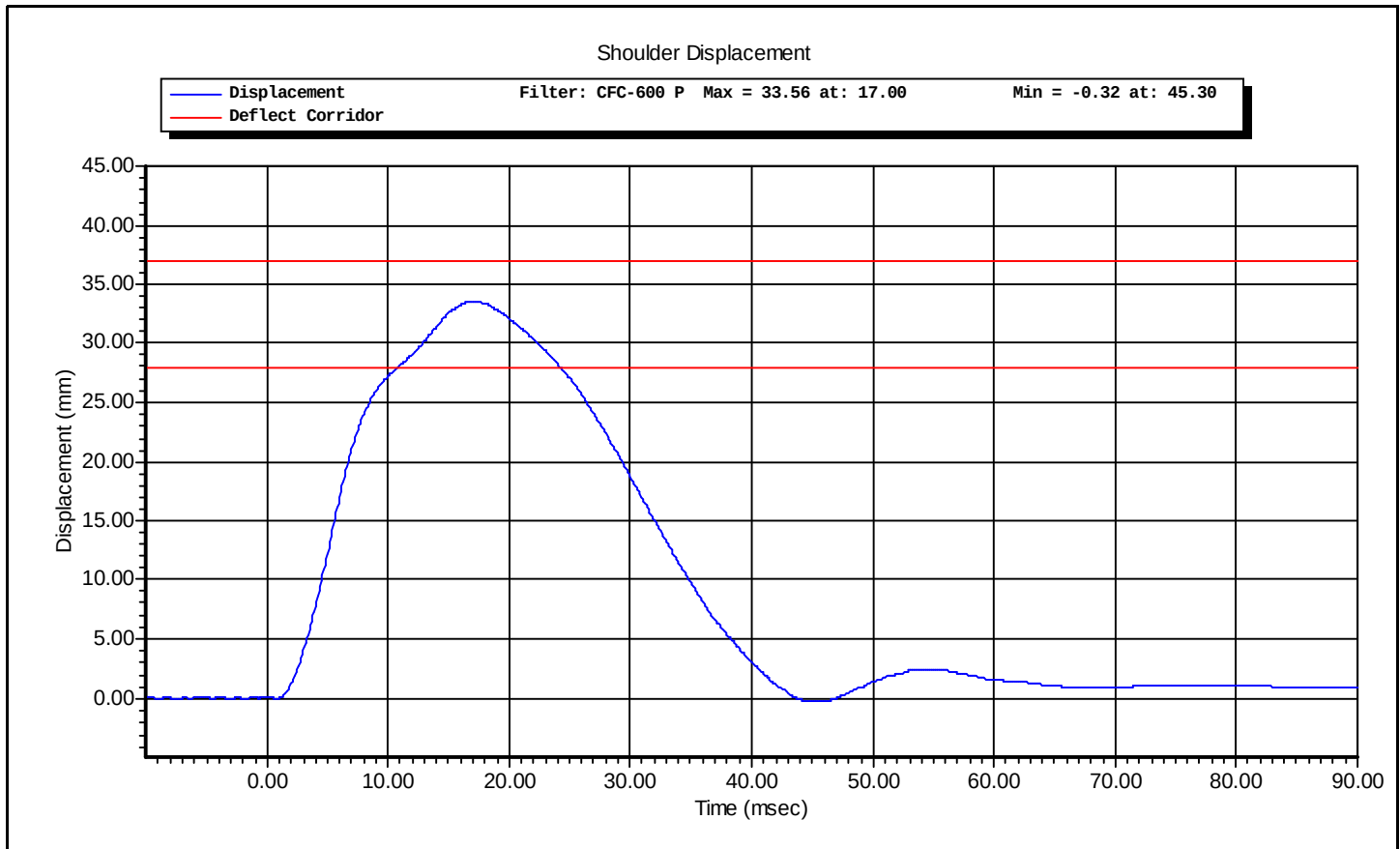


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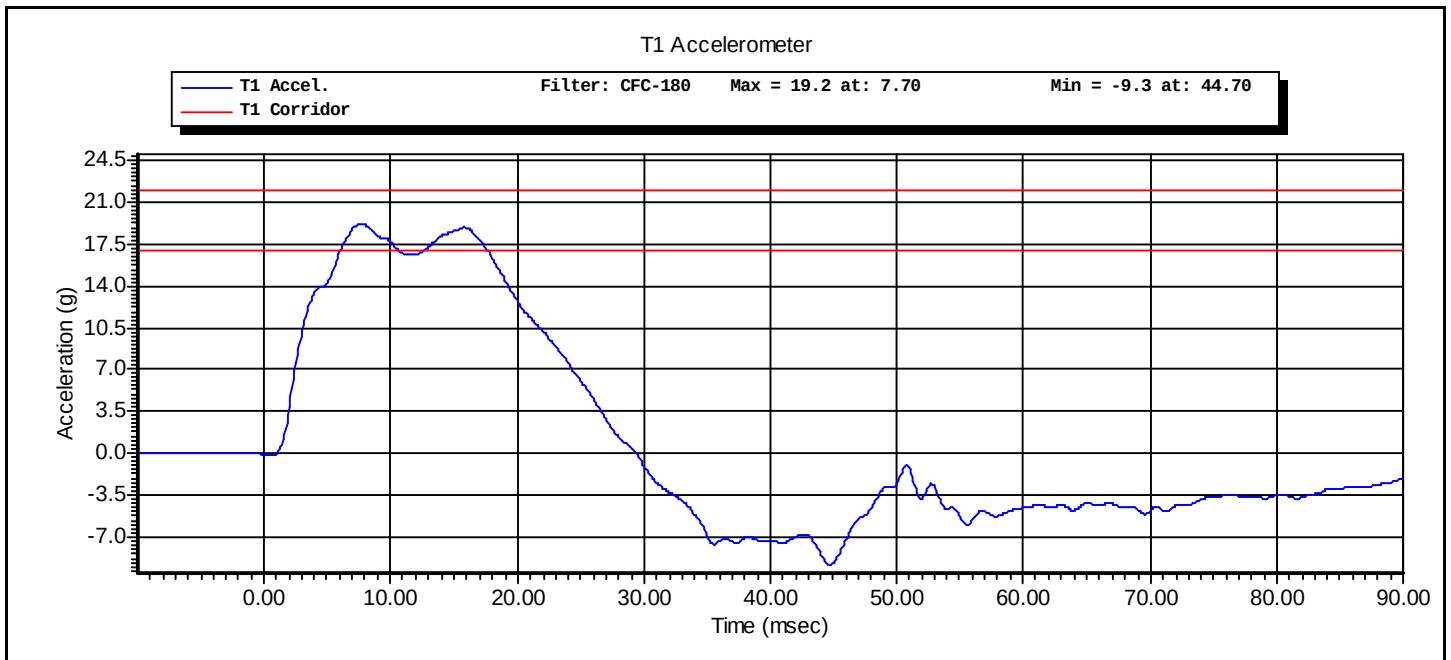
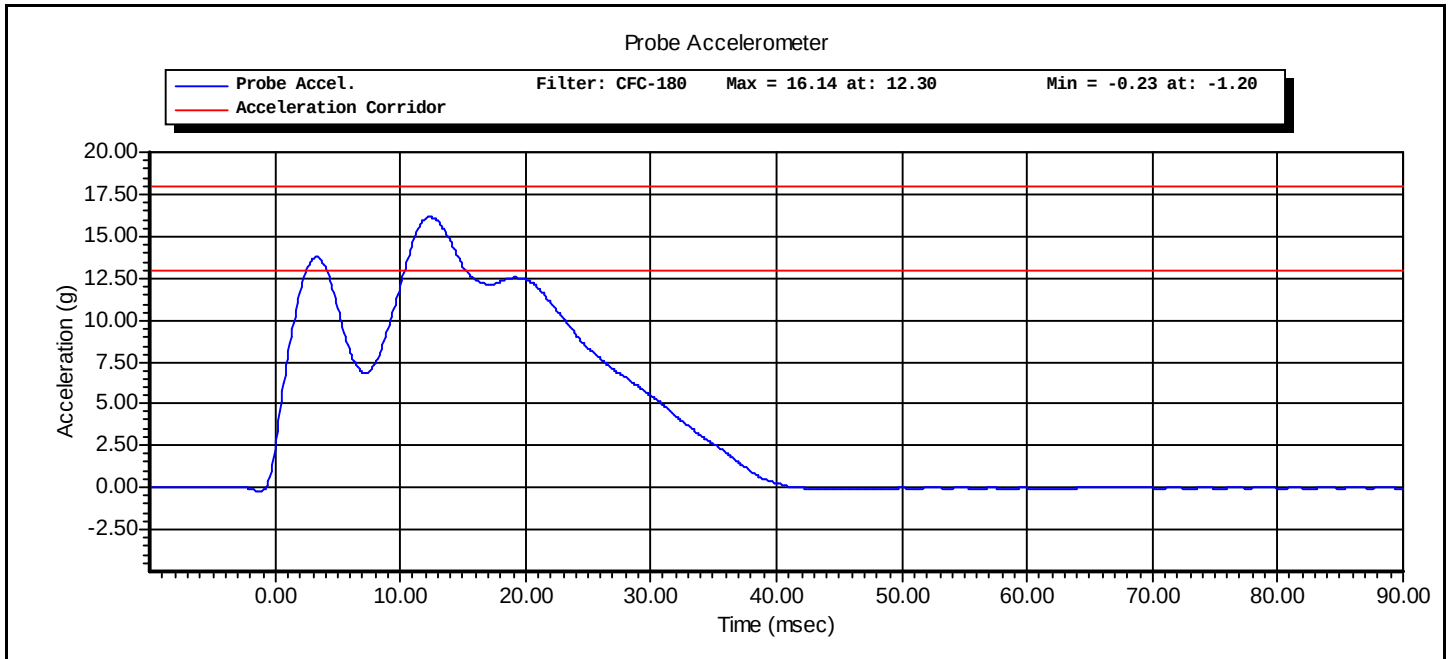
Test Name:	Shoulder Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Shoulder	Test Date:	8/24/2010
Test Number:	1	Test Time:	1:29:07 PM



Test ID: **Shoulder**

Test Time: **1:29:07 PM**

Test Date: **8/24/2010**





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VERIFICATION REPORT

Test Name:	Thorax Impact with Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Thorax With Arm	Test Date:	8/24/2010
Test Number:	2	Test Time:	3:53:05 PM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	22.2 deg C	P
Humidity	10	--	70	52 %RH	P
Velocity	6.60	--	6.80	6.72 m/s	P
Probe Acceleration after 5ms	30.0	--	36.0	33.4 g	P
Upper Thorax Rib Deflection	25.0	--	32.0	27.3 mm	P
Mid Thorax Rib Deflection	30.0	--	36.0	32.1 mm	P
Lower Thorax Rib Deflection	32.0	--	38.0	37.0 mm	P
Upper Spine Acceleration ("y")	34.0	--	43.0	40.4 g	P
Lower Spine Acceleration ("y")	29.0	--	37.0	33.0 g	P
Shoulder Deflection	31.0	--	40.0	37.9 mm	P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____
Supervisor: **D. Travale** Signature: _____

Test ID: **Thorax With Arm** Test Time: **3:53:05 PM**

Test Date: **8/24/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66927	4/20/2010
Servo	180-3885	DS-1121	4/7/2010
Servo	180-3885	DS-1151	4/7/2010
Servo	180-3885	DS-1156	4/7/2010
Endevco	7264-2000	P23904	3/15/2010
Endevco	7264-2000	P50078	7/2/2010
Servo	180-3885	DS-1063	4/7/2010

Test ID: **Thorax With Arm** Test Time: **3:53:05 PM**

Test Date: **8/24/2010**



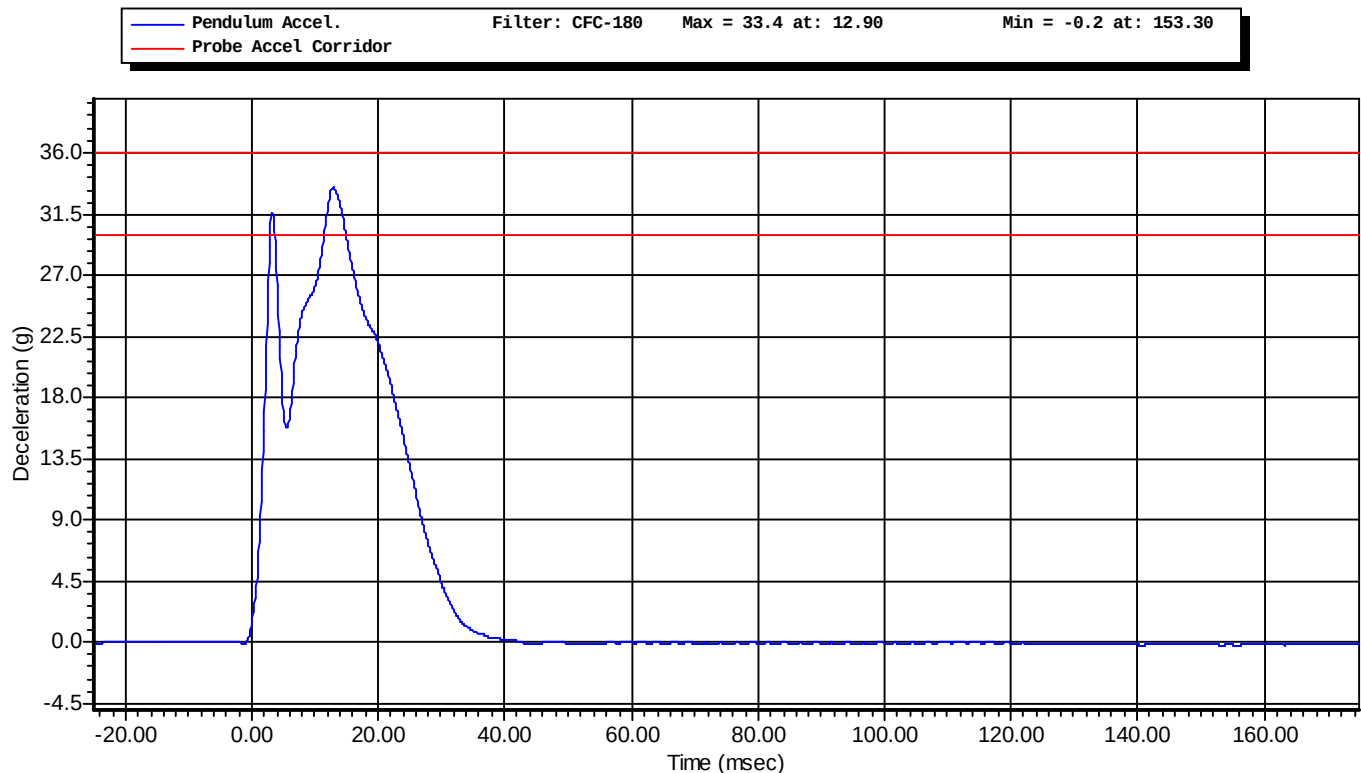
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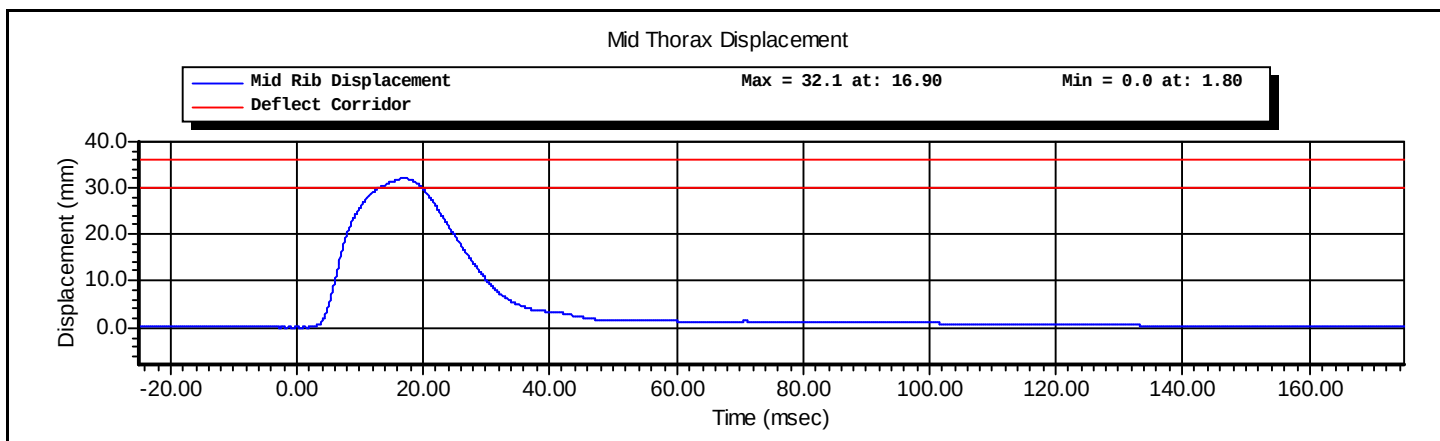
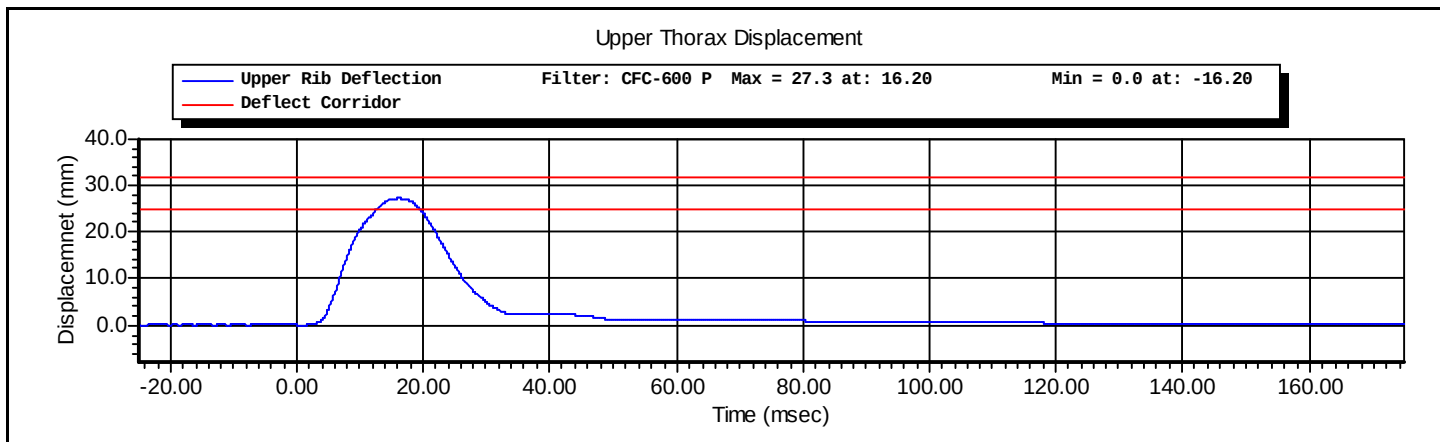
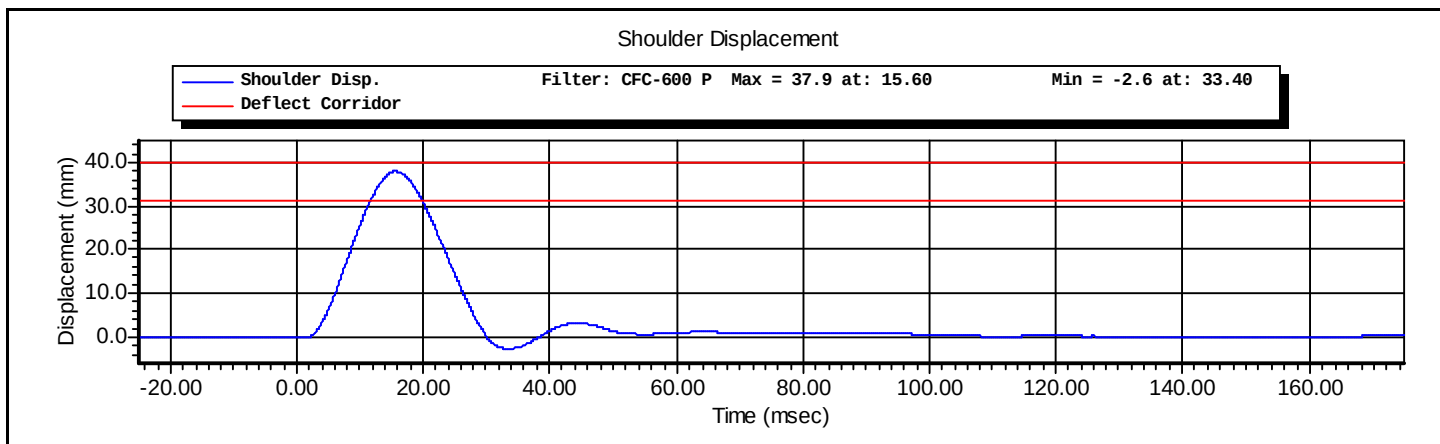
Test Name:	Thorax Impact with Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Thorax With Arm	Test Date:	8/24/2010
Test Number:	2	Test Time:	3:53:05 PM

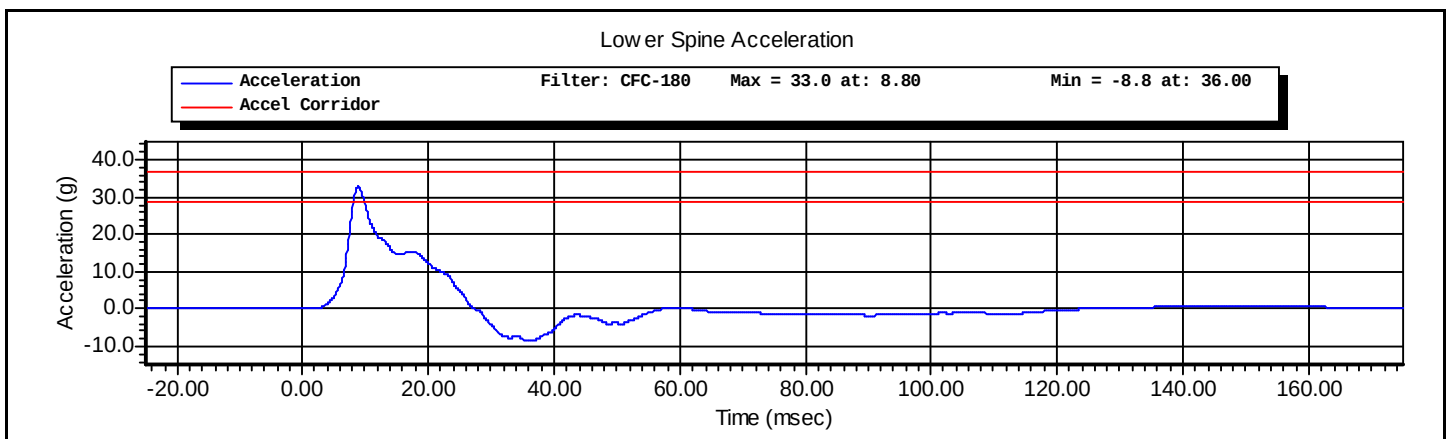
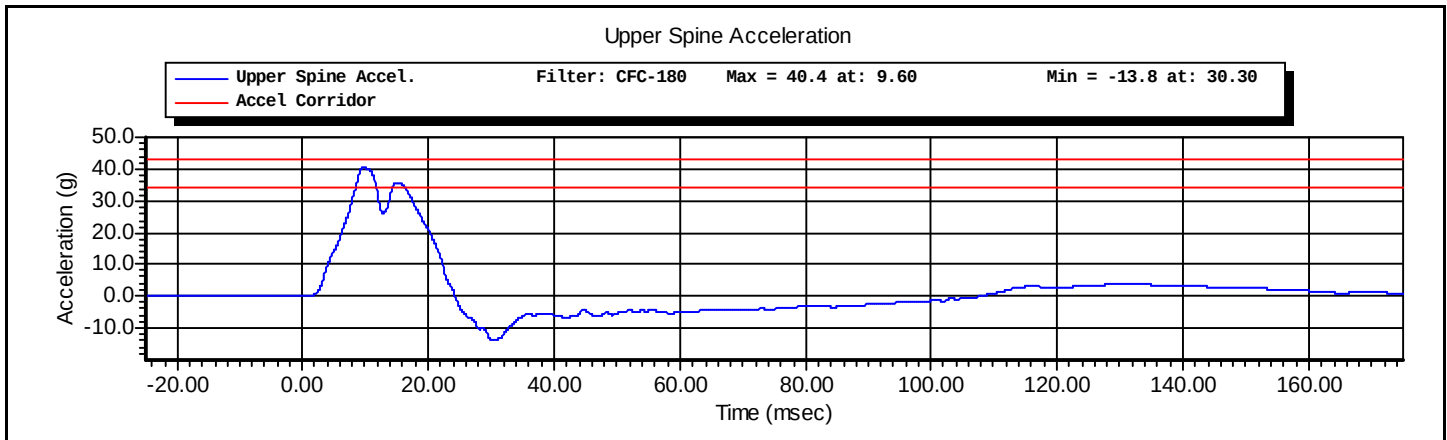
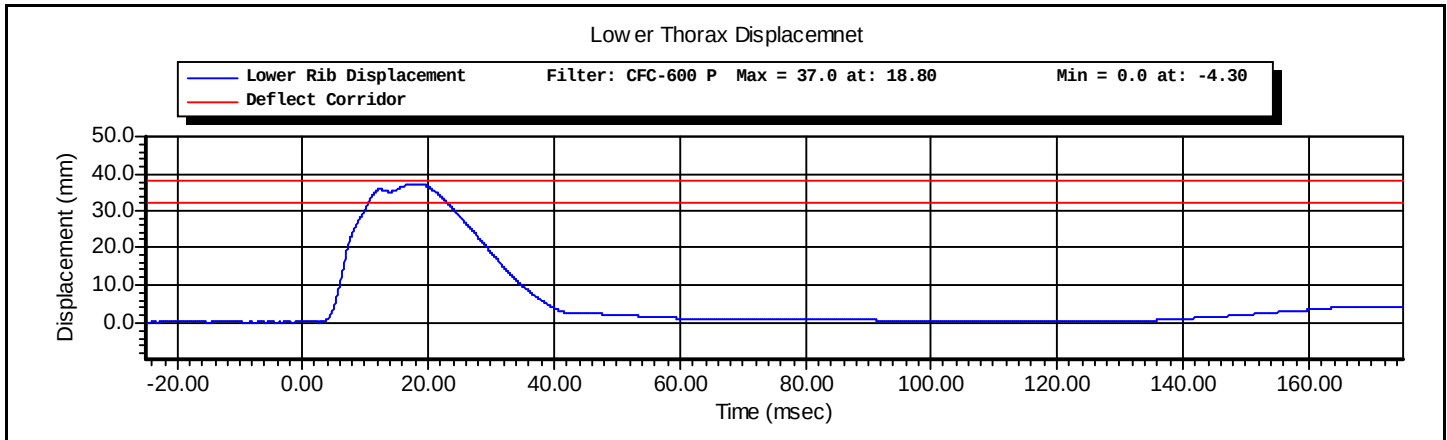
Pendulum Accelerometer



Test ID: Thorax With Arm Test Time: 3:53:05 PM

Test Date: 8/24/2010







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VERIFICATION REPORT

Test Name:	Thorax Impact without Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Thorax Without Arm	Test Date:	8/24/2010
Test Number:	1	Test Time:	2:54:43 PM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	22.2 deg C	P
Humidity	10	--	70	52 %RH	P
Velocity	4.20	--	4.40	4.36 m/s	P
Probe Acceleration	14.0	--	18.0	15.7 g	P
Upper Thorax Rib Deflection	32.0	--	40.0	36.0 mm	P
Mid Thorax Rib Deflection	39.0	--	45.0	42.1 mm	P
Lower Thorax Rib Deflection	35.0	--	43.0	41.8 mm	P
Upper Spine Acceleration T1	13.0	--	17.0	15.8 g	P
Lower Spine Acceleration T12	7.0	--	11.0	9.7 g	P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____
Supervisor: **D. Travale** Signature: _____

Test ID: **Thorax Without Arm** Test Time: **2:54:43 PM**

Test Date: **8/24/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66927	4/20/2010
Servo	180-3885	DS-1121	4/7/2010
Servo	180-3885	DS-1151	4/7/2010
Servo	180-3885	DS-1156	4/7/2010
Endevco	7264-2000	P23904	3/15/2010
Endevco	7264-2000	P50078	7/2/2010

Test ID: **Thorax Without Arm** Test Time: **2:54:43 PM**

Test Date: **8/24/2010**

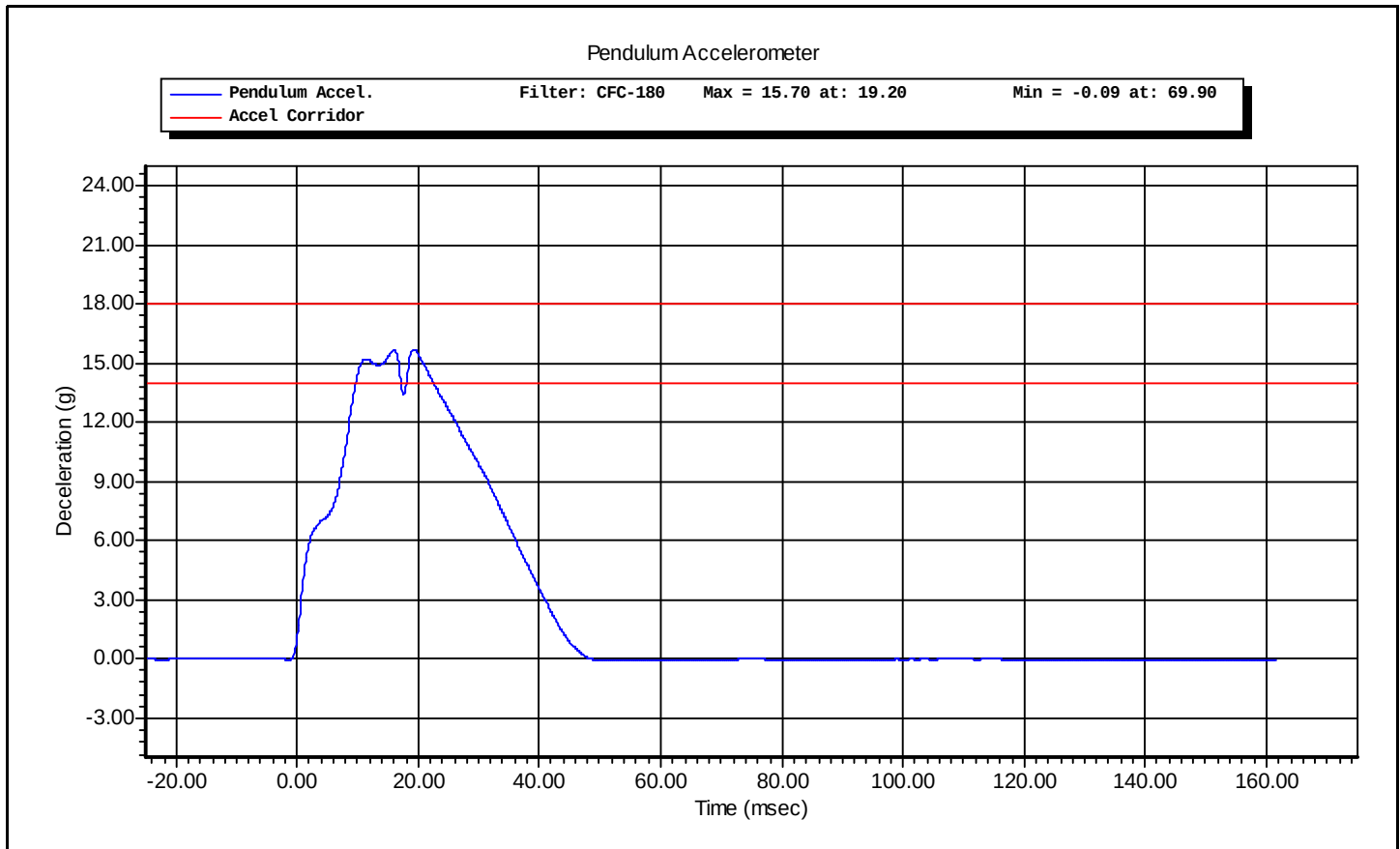


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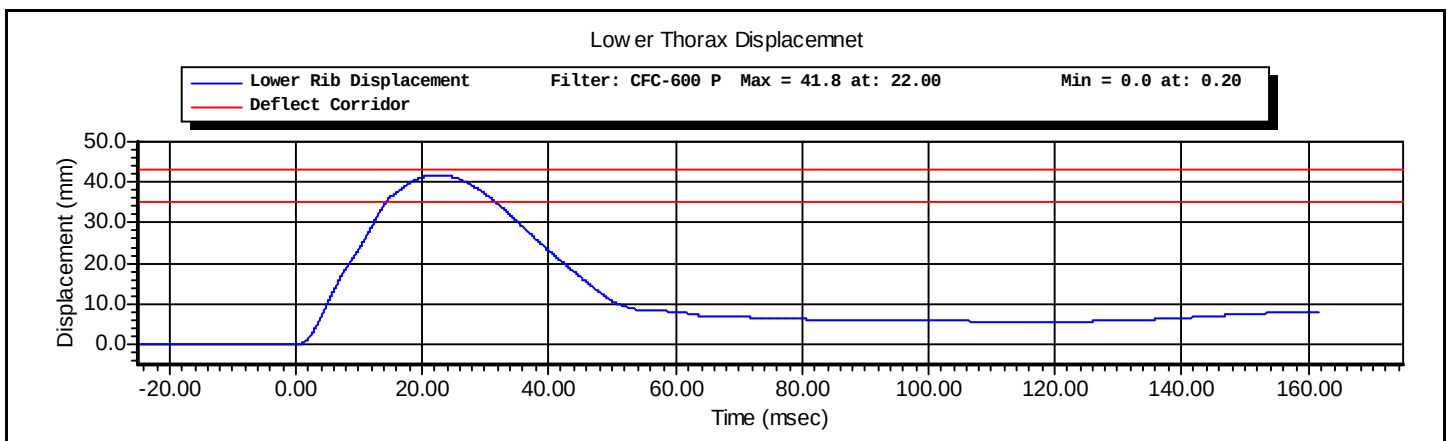
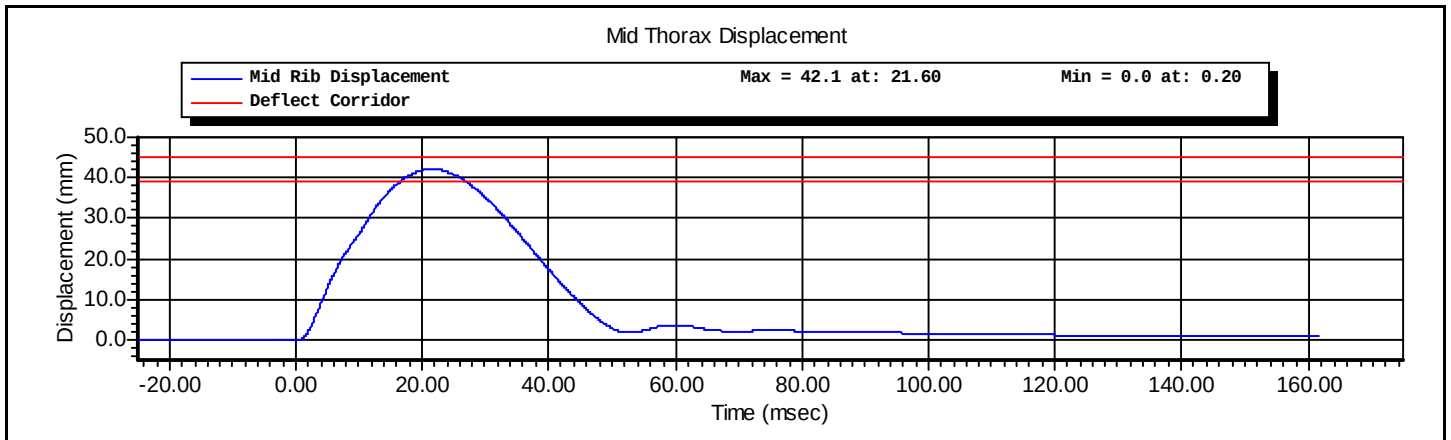
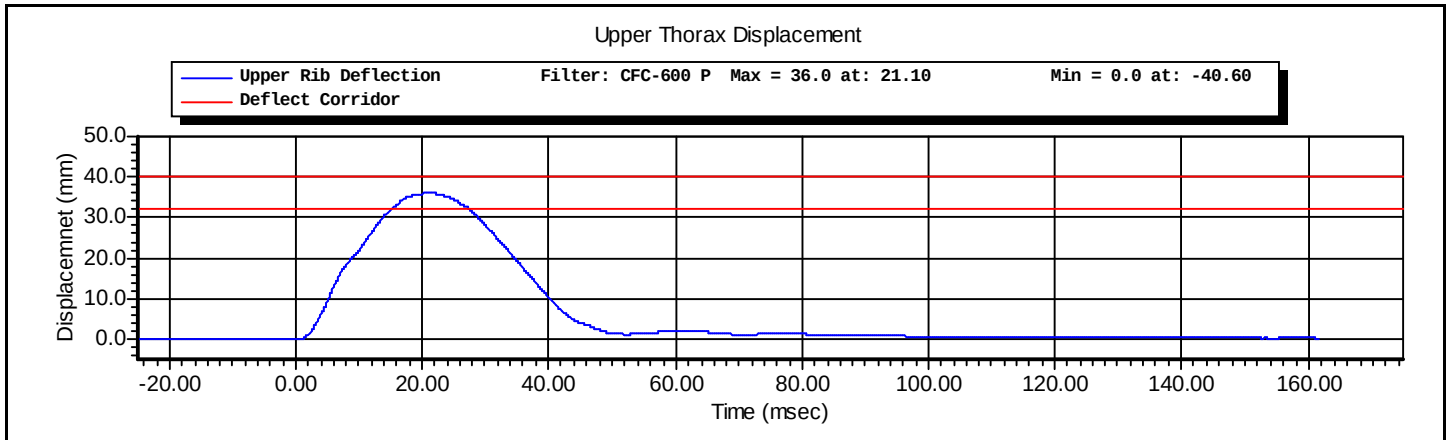
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Test Name:	Thorax Impact without Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Thorax Without Arm	Test Date:	8/24/2010
Test Number:	1	Test Time:	2:54:43 PM

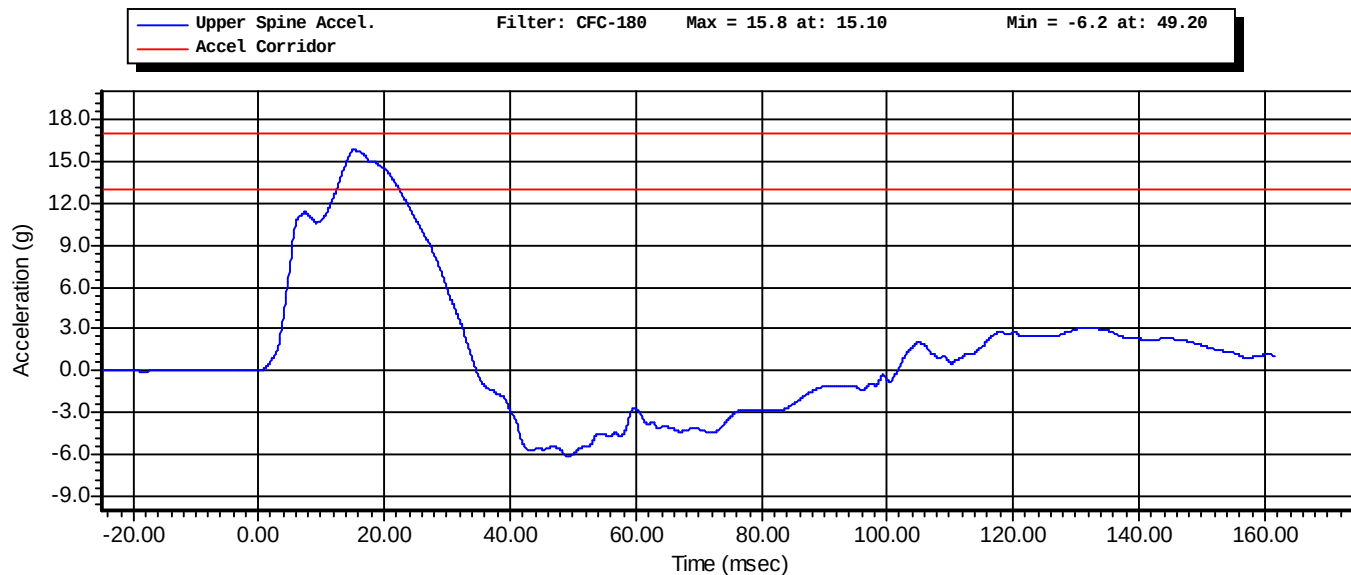


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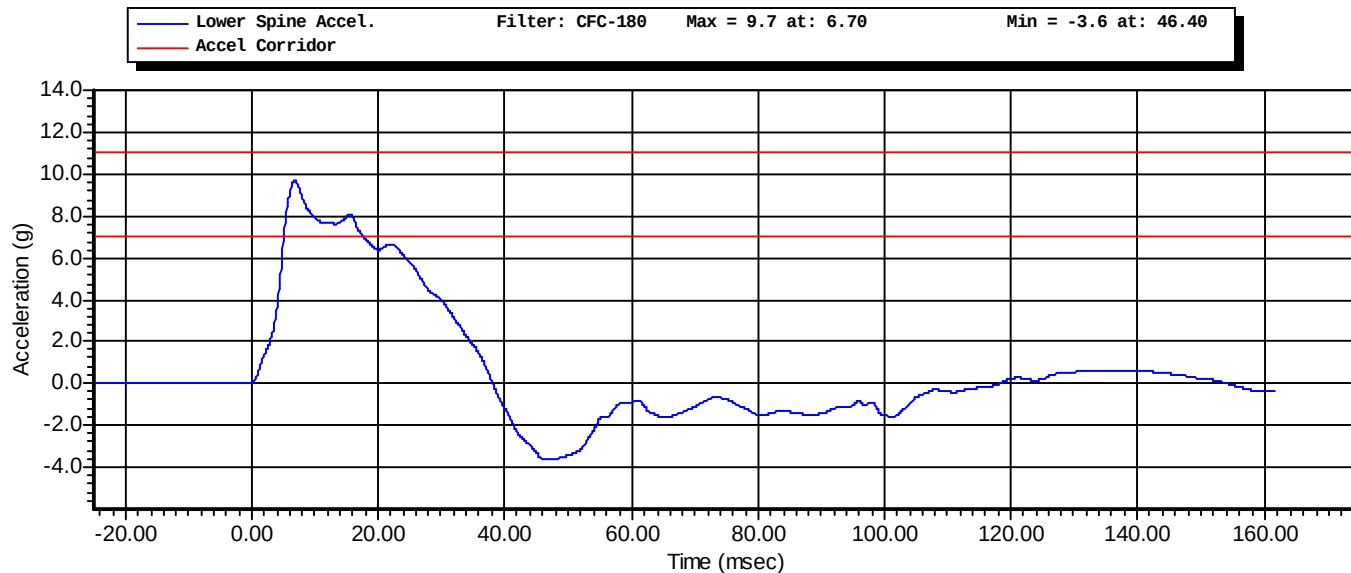
Test Date: 8/24/2010



Upper Spine Acceleration



Lower Spine Acceleration





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VERIFICATION REPORT

Test Name:	Abdominal Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Abdomen	Test Date:	8/24/2010
Test Number:	1	Test Time:	2:01:33 PM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	22.2 deg C	P
Humidity	10	--	70	54 %RH	P
Velocity	4.20	--	4.40	4.35 m/s	P
Probe Acceleration	12.0	--	16.0	14.8 g	P
Upper Abdominal Rib Deflection	36.0	--	47.0	39.2 mm	P
Lower Abdominal Rib Deflection	33.0	--	44.0	38.3 mm	P
Lower Spine Acceleration - T12	9.0	--	14.0	11.9 g	P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____
Supervisor: **D. Travale** Signature: _____

Test ID: **Abdomen**

Test Time: **2:01:33 PM**

Test Date: **8/24/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66927	4/20/2010
Servo	180-3885	DS-1162	4/7/2010
Servo	180-3885	DS-1232	4/7/2010
Endevco	7264-2000	P50078	7/2/2010

Test ID: **Abdomen**

Test Time: **2:01:33 PM**

Test Date: **8/24/2010**



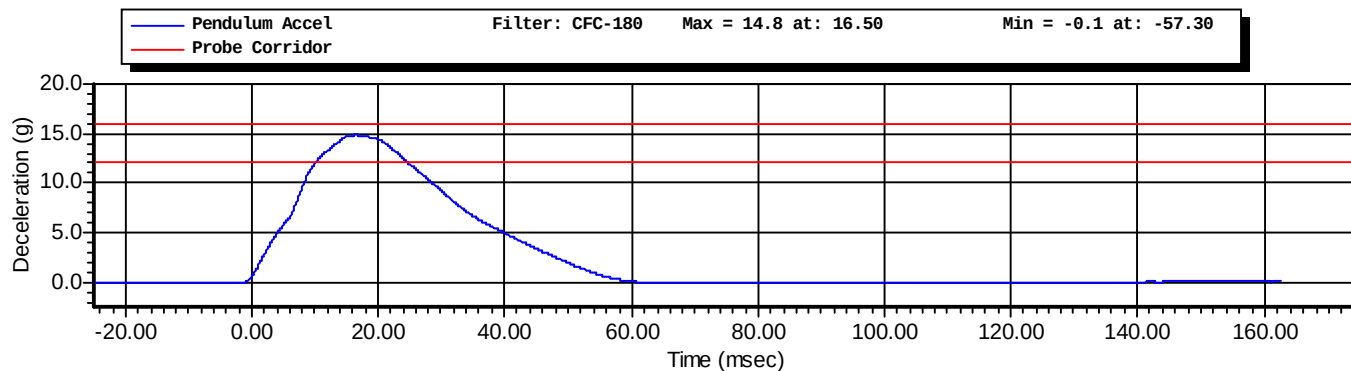
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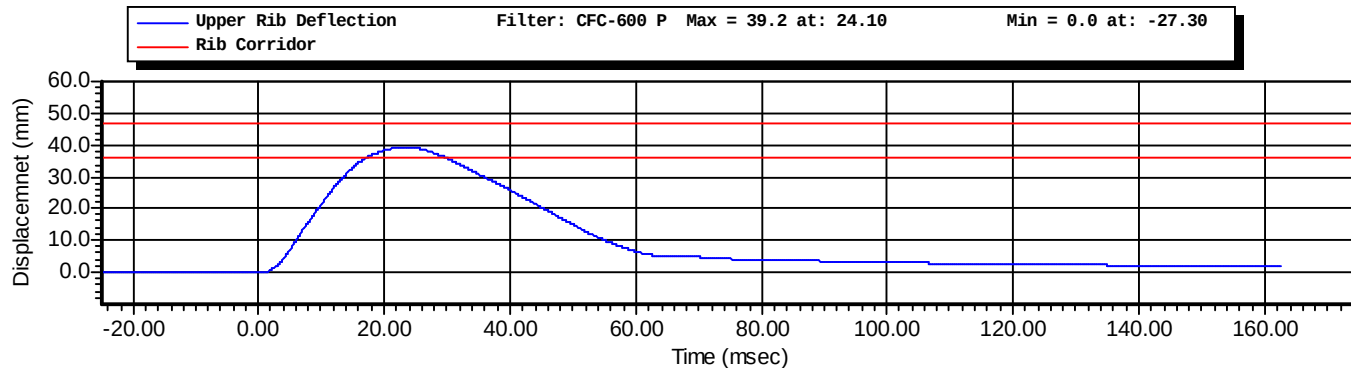
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Test Name:	Abdominal Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Abdomen	Test Date:	8/24/2010
Test Number:	1	Test Time:	2:01:33 PM

Pendulum Accelerometer



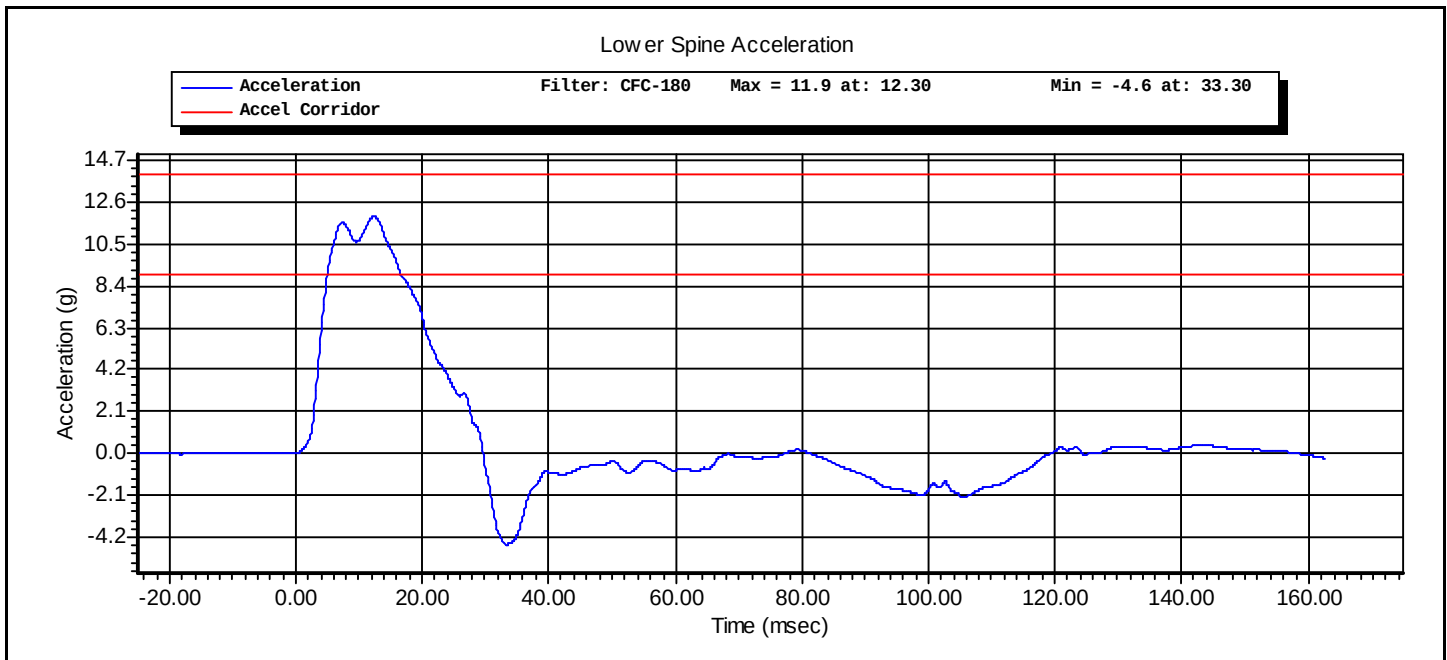
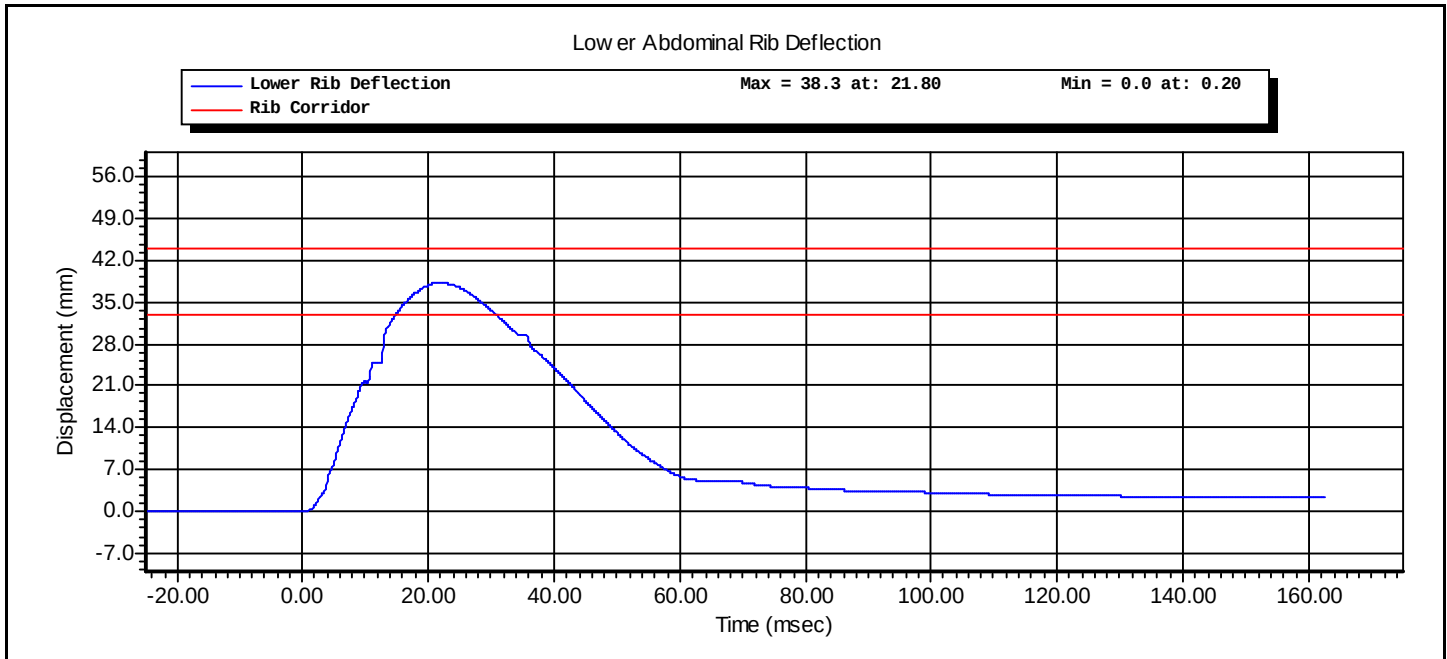
Upper Abdominal Rib Deflection



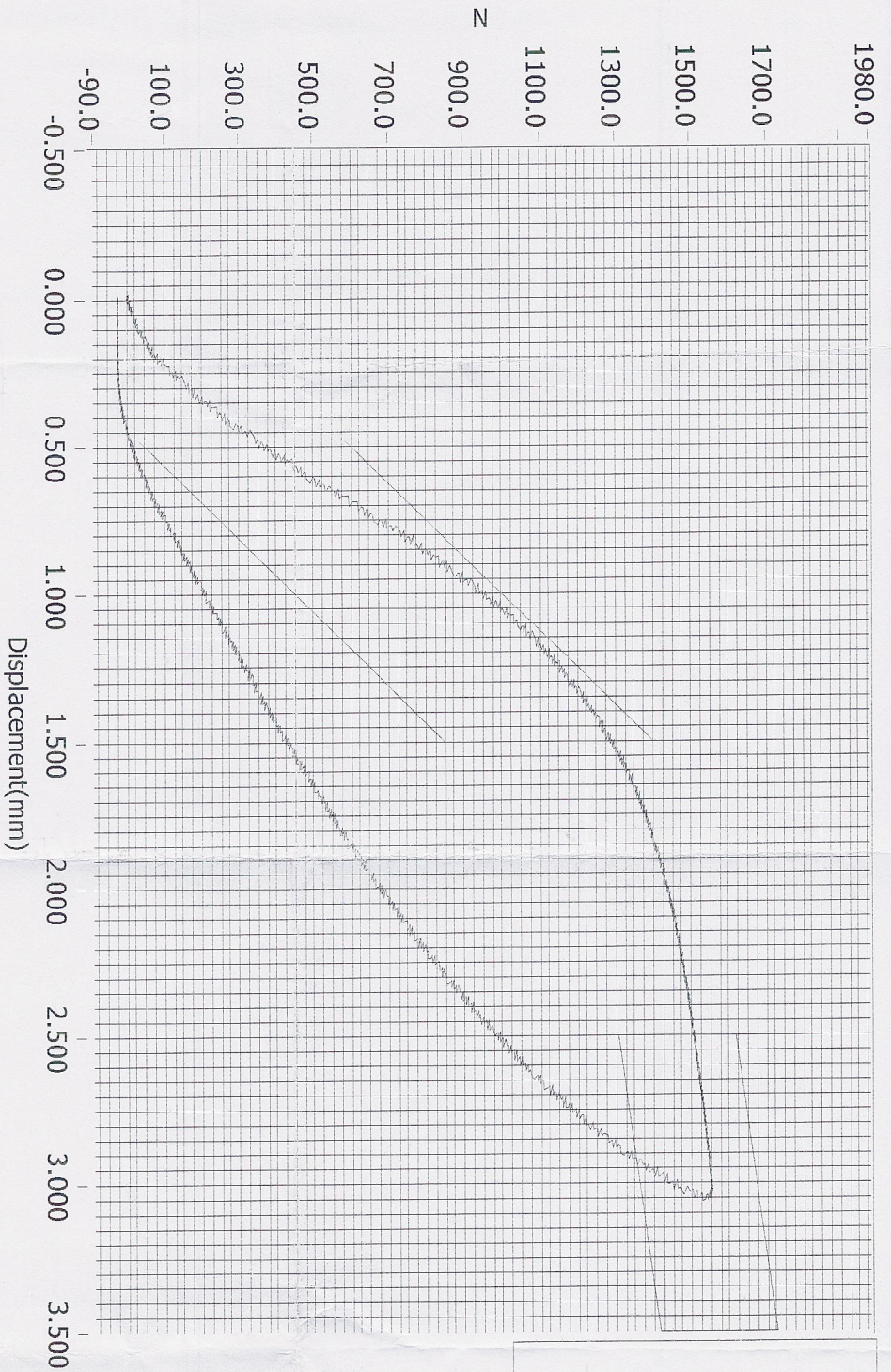
Test ID: **Abdomen**

Test Time: **2:01:33 PM**

Test Date: **8/24/2010**



Resultant Data - SIDIIs Plug Compression



ATD Calibration Lab

Test ID

Part Serial Number

Test Date

Test Time

Cert ID

ATD Serial Number

ATD Type

12461

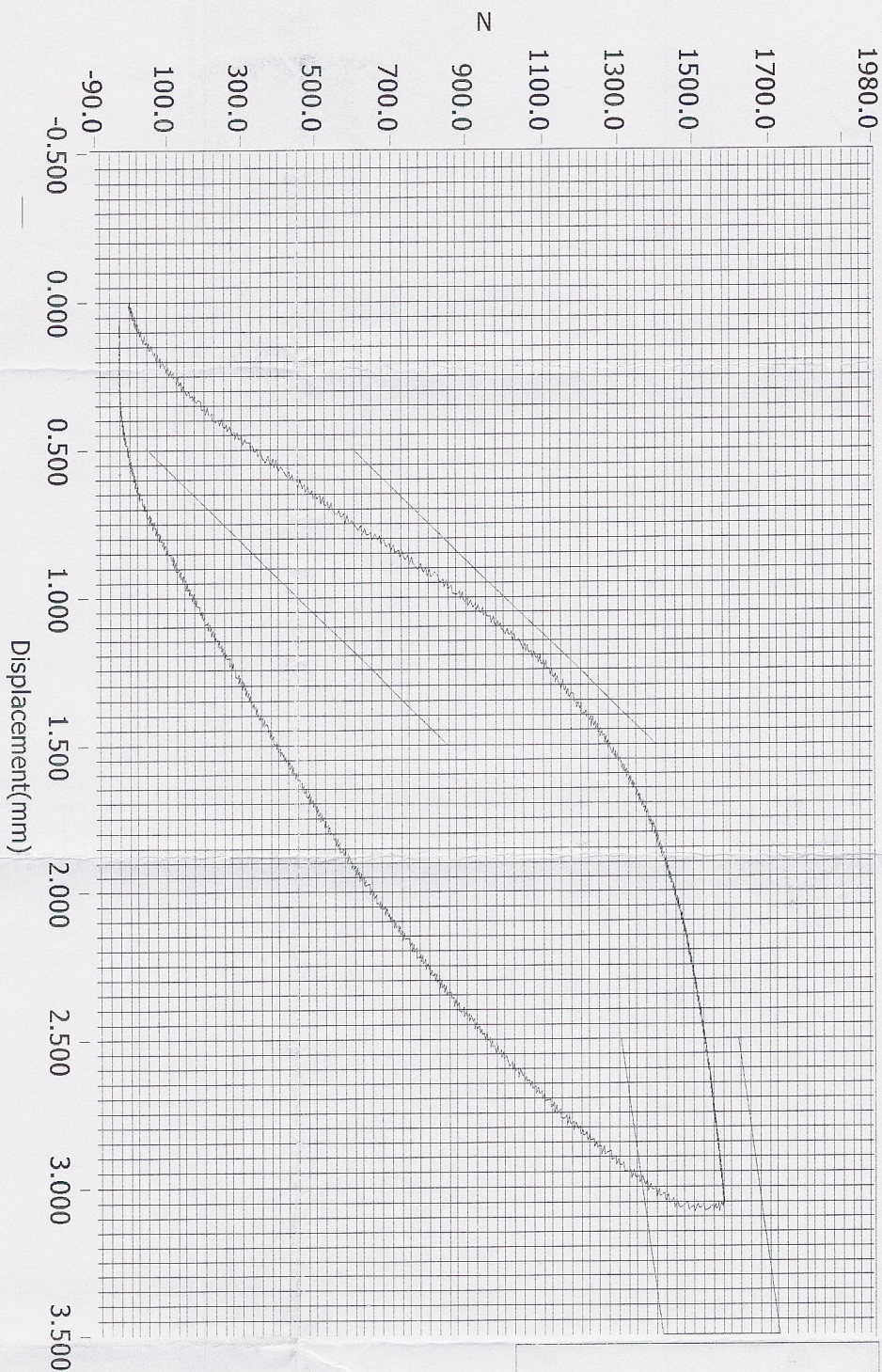
SIDIIs

Current Date : 7/9/2007

Current Time : 09:11:29

C

Resultant Data - SIDIIs Plug Compression



Loading Curve	<
Boundary Limit Upper	<
Boundary Limit Lower	<
Peak Load Upper	<
Peak Load Lower	<
Peak Defl Upper	<
Peak Defl Lower	<

ATD Calibration Lab

Test ID

Part Serial Number

Test Date

Test Time

Cert ID

ATD Serial Number

ATD Type

12282

SIDIIs

Current Date : 7/6/2007

Current Time : 07:58:07

FS



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VERIFICATION REPORT

Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Acetabulum Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Pelvis Acetabulum	Test Date:	8/24/2010
Test Number:	1	Test Time:	12:53:51 PM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	53 %RH P
Velocity	6.60 -- 6.80	6.66 m/s P
Peak Probe Acceleration	38.0 -- 47.0	44.9 g P
Peak Pelvis Acceleration	34.0 -- 42.0	40.9 g P
Peak Acetabulum Force	3.60 -- 4.30	4.12 kN P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____
Supervisor: **D. Travale** Signature: _____

Test ID: **Pelvis Acetabulum** Test Time: **12:53:51 PM**

Test Date: **8/24/2010**



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VERIFICATION REPORT

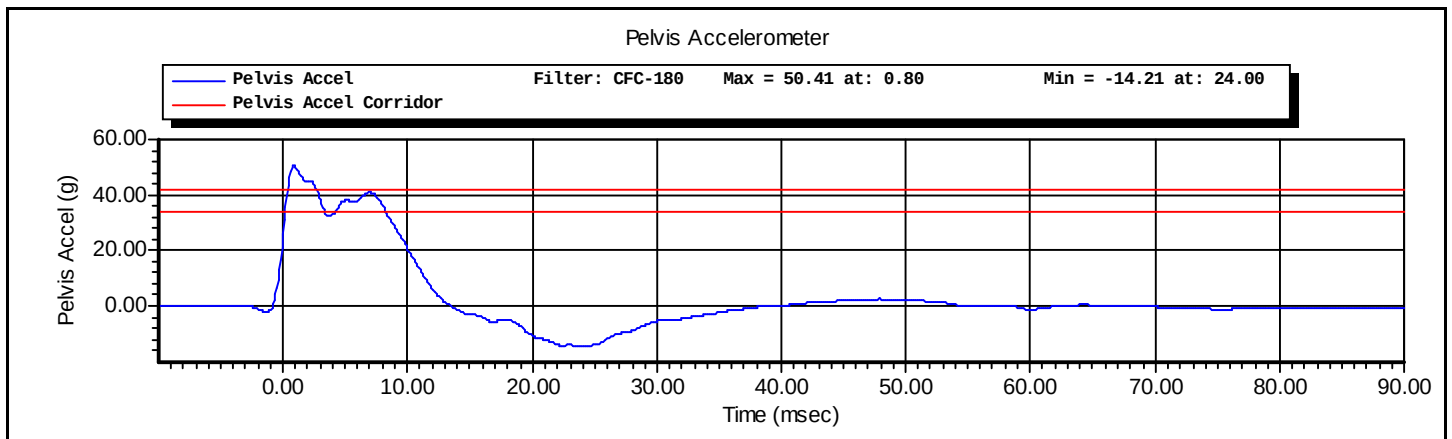
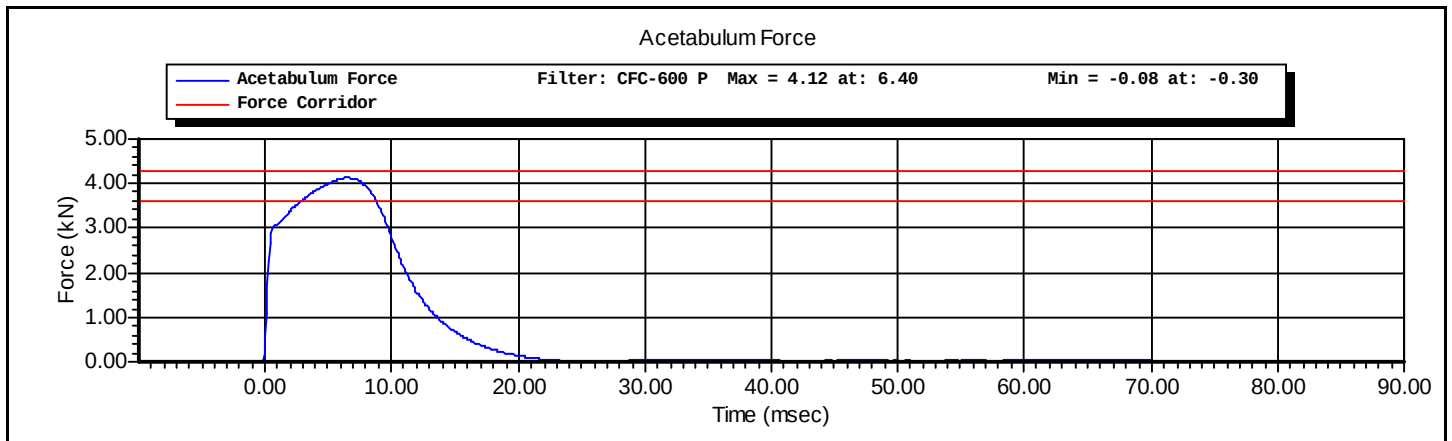
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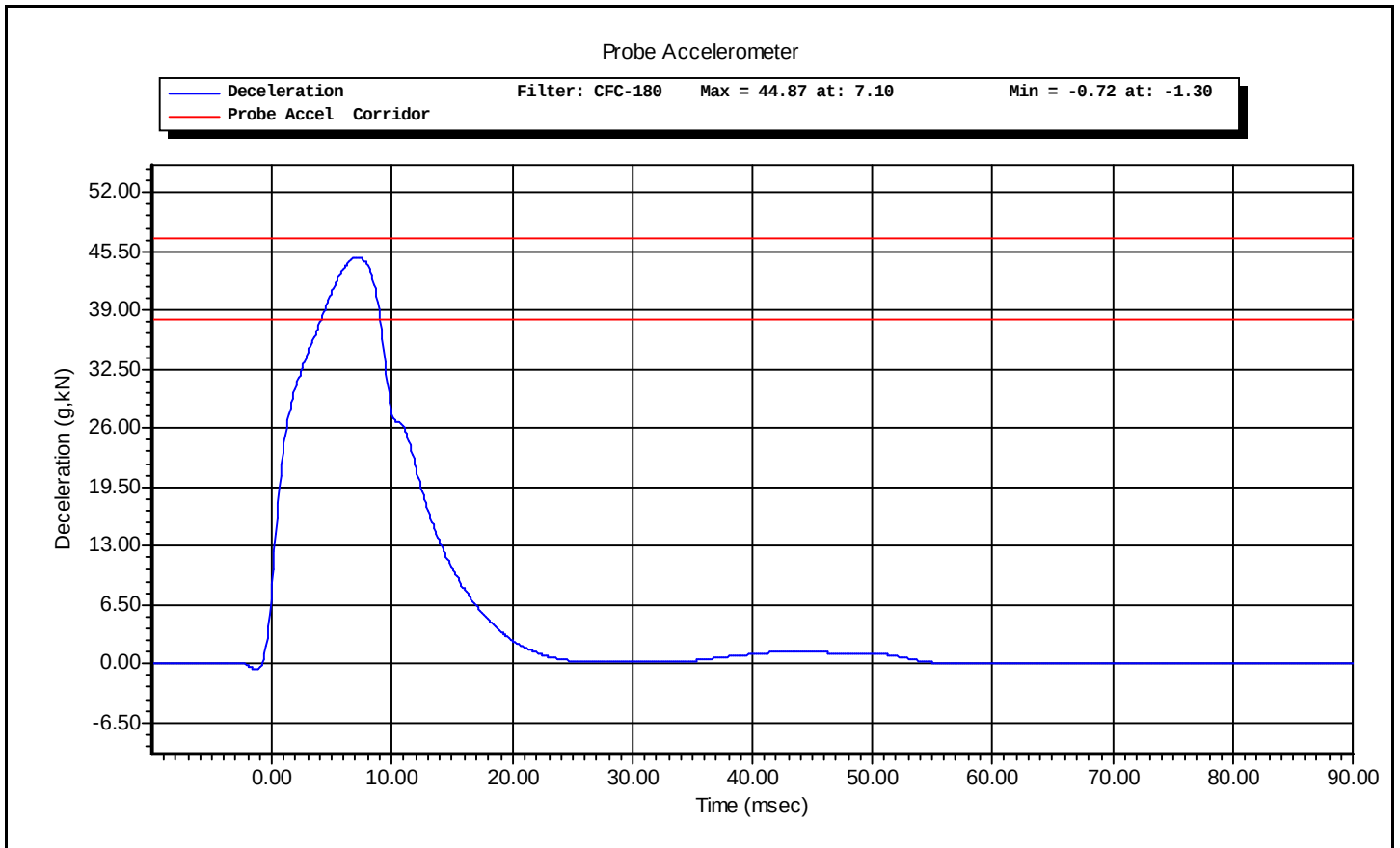
<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66927	4/20/2010
Endevco	7264-2000	P51671	4/12/2010
DentonATD	3249J	LC-275a	4/12/2010

Test ID: **Pelvis Acetabulum** Test Time: **12:53:51 PM**

Test Date: **8/24/2010**

Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Acetabulum Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Pelvis Acetabulum	Test Date:	8/24/2010
Test Number:	1	Test Time:	12:53:51 PM







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VERIFICATION REPORT

Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Iliac Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Pelvis Iliac	Test Date:	8/24/2010
Test Number:	1	Test Time:	11:45:14 AM

Component Part Number	Component Serial Number
-----------------------	-------------------------

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	59 %RH P
Velocity	4.20 -- 4.40	4.27 m/s P
Peak Probe Acceleration	36.0 -- 45.0	39.4 g P
Peak Pelvis Acceleration	28.0 -- 39.0	33.6 g P
Peak Iliac Force	4.10 -- 5.10	4.32 kN P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____
Supervisor: **D. Travale** Signature: _____

Test ID: **Pelvis Iliac**

Test Time: **11:45:14 AM**

Test Date: **8/24/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66927	4/20/2010
Endevco	7264-2000	P51671	4/12/2010
DentonATD	3228J	LC-279 Fy	4/12/2010

Test ID: **Pelvis Iliac**

Test Time: **11:45:14 AM**

Test Date: **8/24/2010**

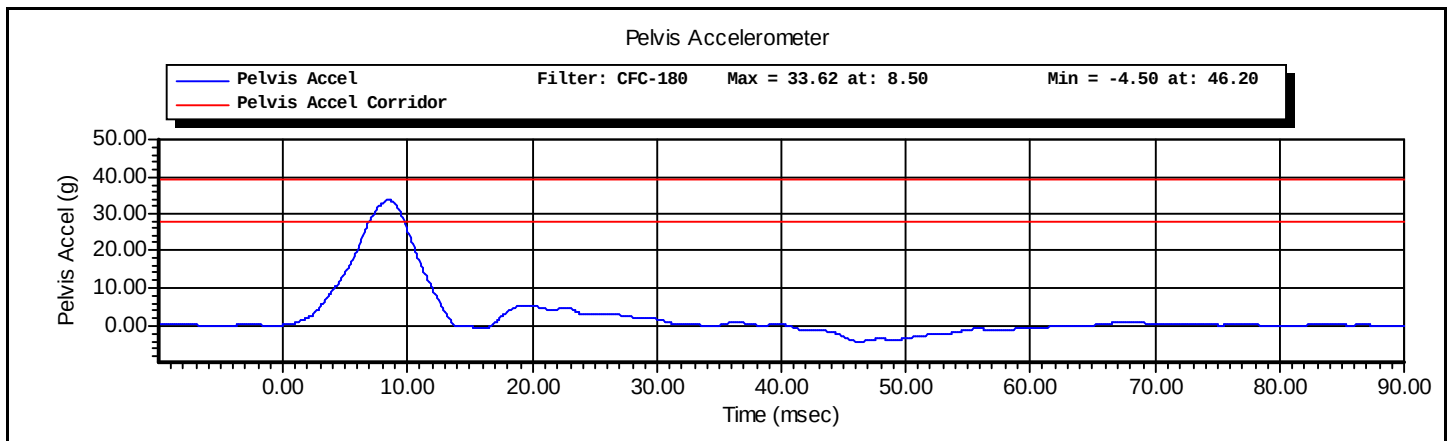
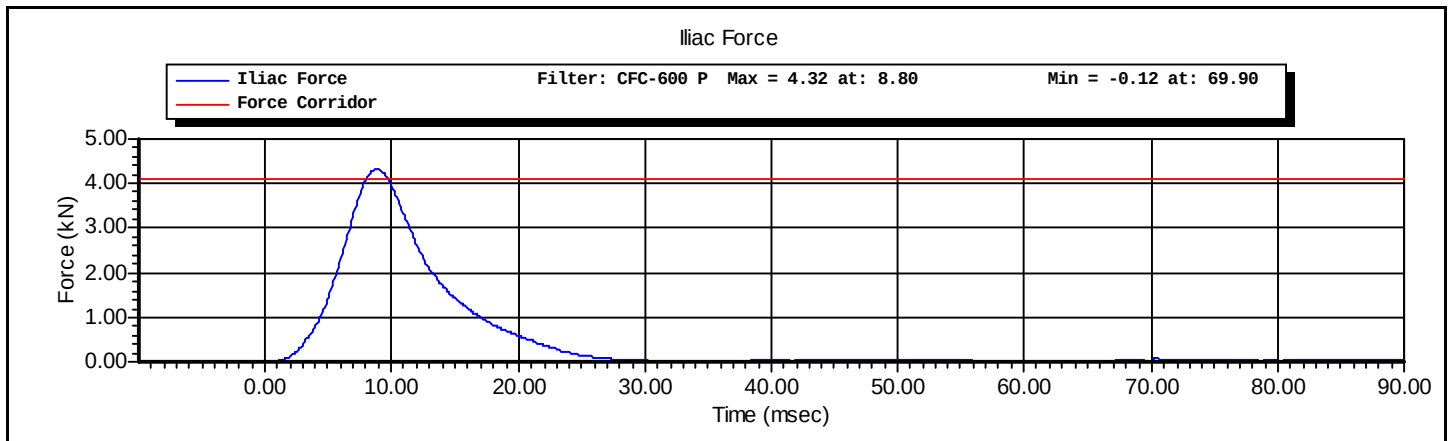


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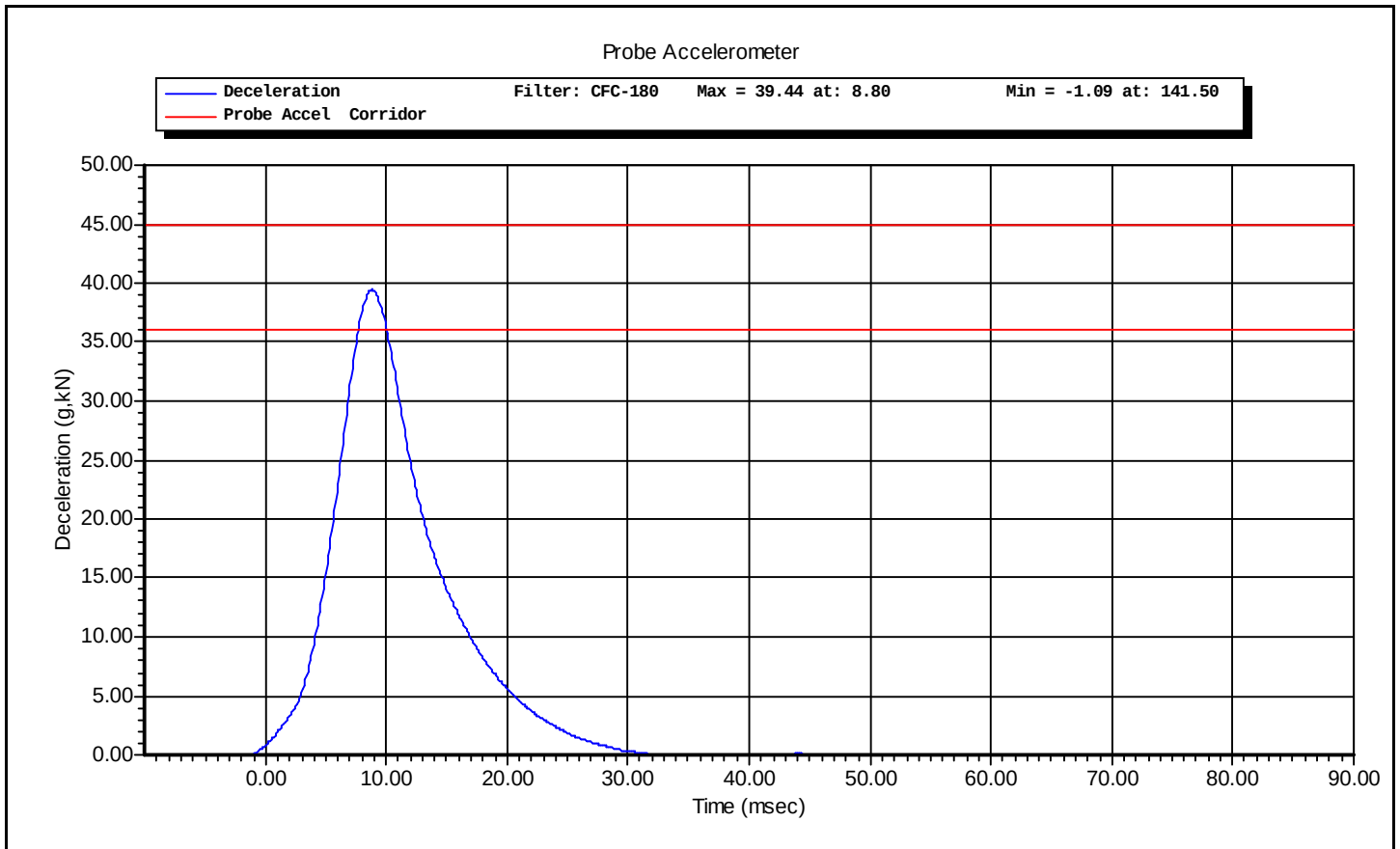
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Sub Test Name:	Iliac Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Pelvis Iliac	Test Date:	8/24/2010
Test Number:	1	Test Time:	11:45:14 AM



Test ID: **Pelvis Iliac**

Test Time: **11:45:14 AM**

Test Date: **8/24/2010**



CALIBRATION TEST RESULTS

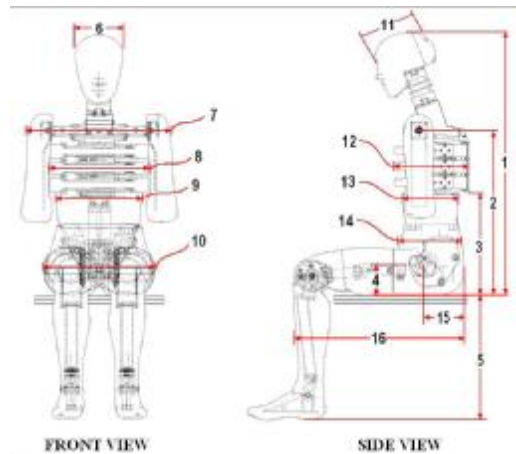
POST-TEST

ES2-re No: 033

CONFIGURED FOR LEFT SIDE IMPACT

ES-2re External Measurements

NHTSA SN F033



Dim. No.	Description	Specification (mm)	Result (mm)	Pass/Fail
1	Sitting Height	900-918	911	Pass
2	Seat to Shoulder Joint	558-572	562	Pass
3	Seat to Lower Face of Thoracic Spine Box	346-356	356	Pass
4	Seat to Hip Joint (center of bolt)	97-103	103	Pass
5	Sole to Seat, Sitting	433-451	444	Pass
6	Head Width	152-158	157	Pass
7	Shoulder/Arm Width	461-479	467	Pass
8	Thorax Width	322-332	327	Pass
9	Abdomen Width	273-287	284	Pass
10	Pelvis Lap Width	359-373	368	Pass
11	Head Depth	196-206	201	Pass
12	Thorax Depth	262-272	269	Pass
13	Abdomen Depth	194-204	201	Pass
14	Pelvis Depth	235-245	236	Pass
15	Back of Buttocks to Hip Joint (center of bolt)	150-160	154	Pass
16	Back of Buttocks to Front Knee	597-615	603	Pass

Technician: SZ

Date: 09/22/2010



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VERIFICATION REPORT

Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Head	Test Date:	9/21/2010
Test Number:	1	Test Time:	3:08:14 PM

Component Part Number	Component Serial Number
455-1007	8473

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	46 %RH P
Resultant Acceleration	125 -- 155	150 g P
Oscillation	0.0 -- 15.0	4.6 % P
Fore-Aft Acceleration	-15.00 -- 15.00	6.19 g P

All test parameters are within specifications

Technician: **S Zito** Signature: _____
Supervisor: **D Travale** Signature: _____

Test ID: **Head**

Test Time: **3:08:14 PM**

Test Date: **9/21/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Endevco	7264-2000	P15526	7/25/2010
Endevco	7264-2000	P51949	5/26/2010
Endevco	7264-2000	P26269	4/6/2010

Test ID: **Head**

Test Time: **3:08:14 PM**

Test Date: **9/21/2010**

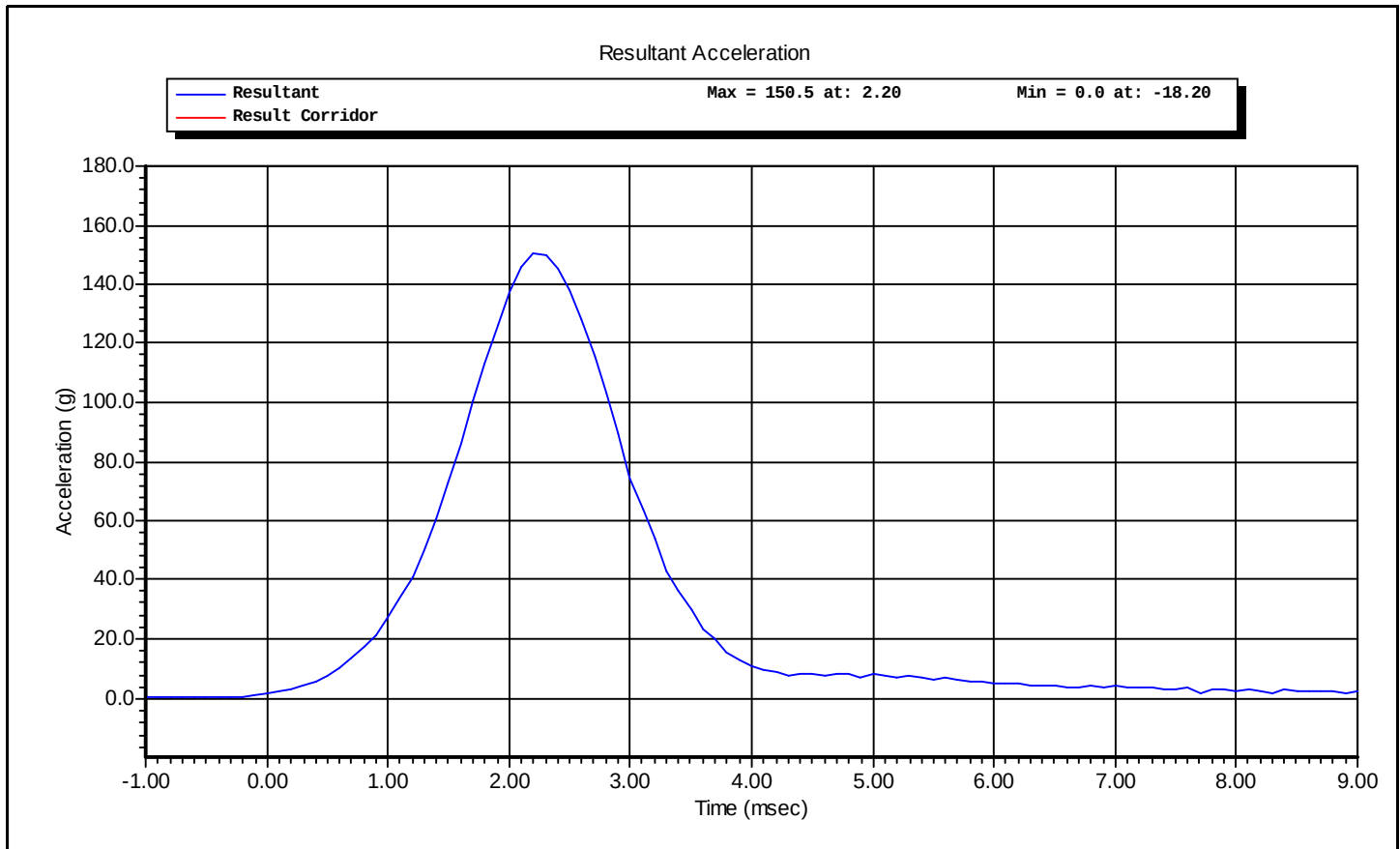


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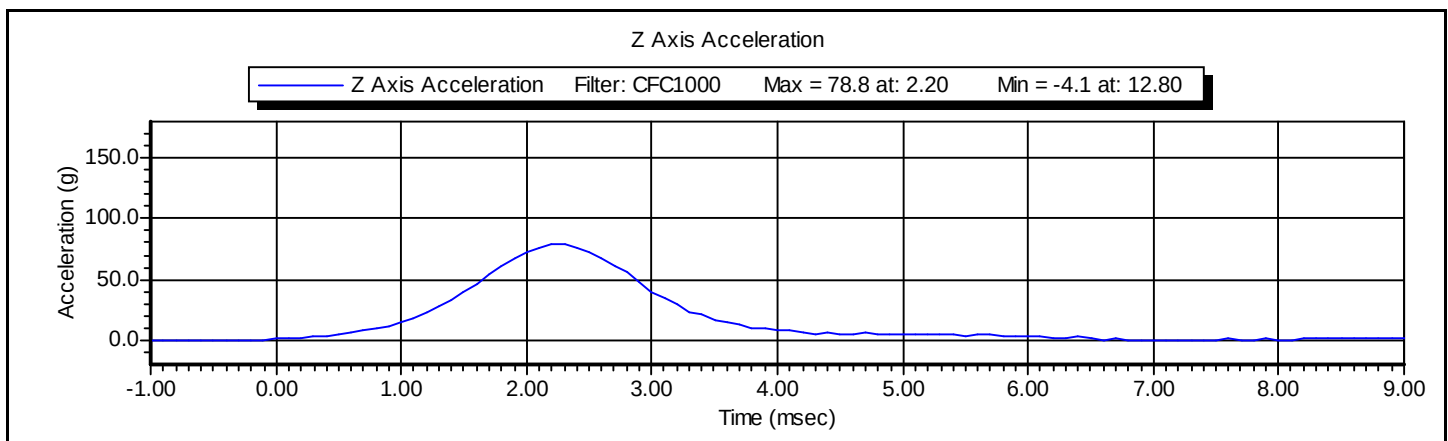
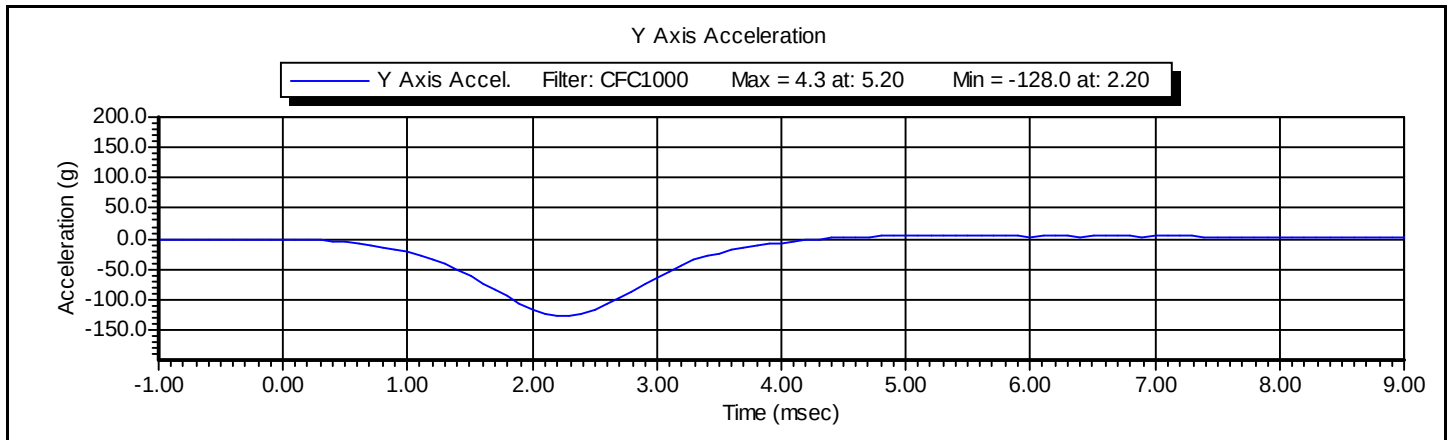
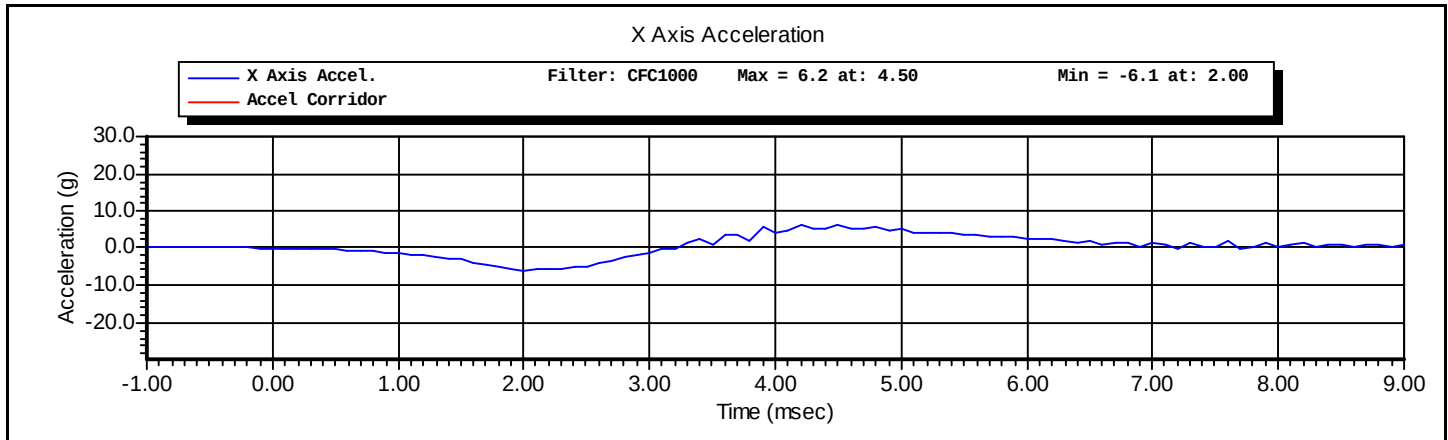
Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Head	Test Date:	9/21/2010
Test Number:	1	Test Time:	3:08:14 PM



Test ID: **Head**

Test Time: **3:08:14 PM**

Test Date: **9/21/2010**





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VERIFICATION REPORT

Test Name:	Neck Flexion	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Neck Flexion	Test Date:	9/22/2010
Test Number:	2	Test Time:	9:49:47 AM

Component Part Number	Component Serial Number
455-2002	07085

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	63 %RH P
Velocity	3.30 -- 3.50	3.41 m/s P
Maximum Neck Flexion Angle	49.0 -- 59.0	52.1 degrees P
Time At Maximum Neck Flexion	54.0 -- 66.0	58.9 ms P
Decay to Zero Degrees	53.0 -- 88.0	58.1 ms P
Velocity Corridor	--	P

All test parameters are within specifications

Technician: **A Rudniski** Signature: _____

Supervisor: **D Travale** Signature: _____

Test ID: **Neck Flexion**

Test Time: **9:49:47 AM**

Test Date: **9/22/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7231CT	C16510	5/10/2010
DentonATD	7000428	094	4/27/2010
DentonATD	7000428	095	4/27/2010
DentonATD	7000428	093	4/27/2010

Test ID: **Neck Flexion**

Test Time: **9:49:47 AM**

Test Date: **9/22/2010**



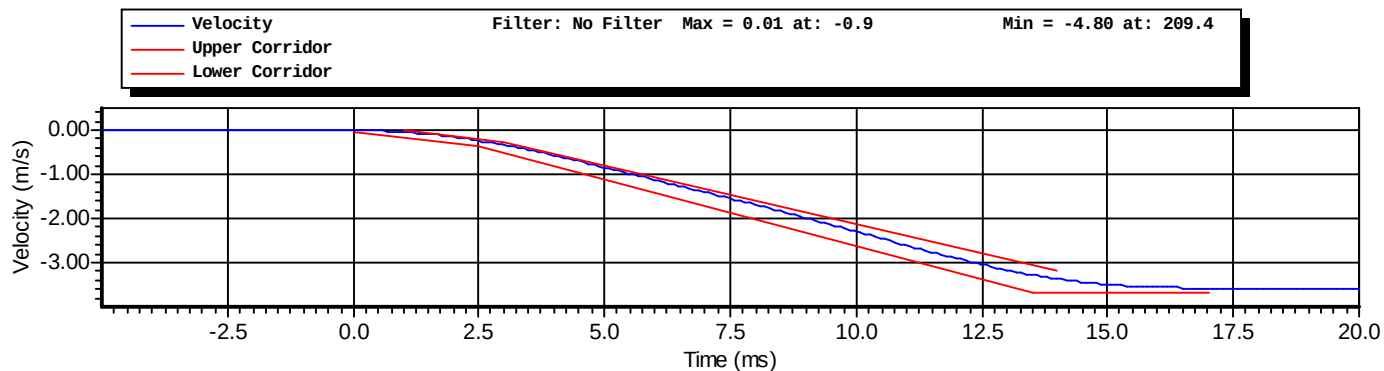
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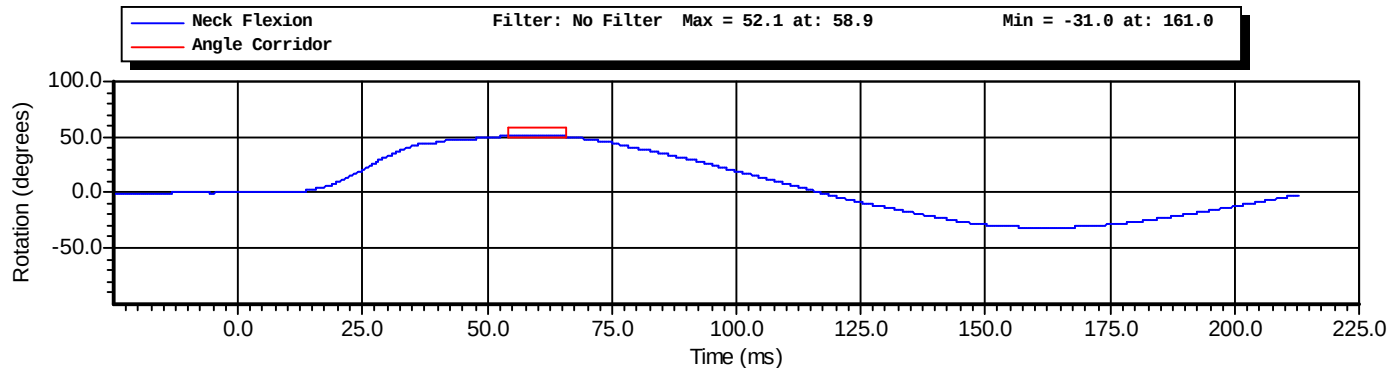
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Test Name:	Neck Flexion	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Neck Flexion	Test Date:	9/22/2010
Test Number:	2	Test Time:	9:49:47 AM

Pendulum Velocity



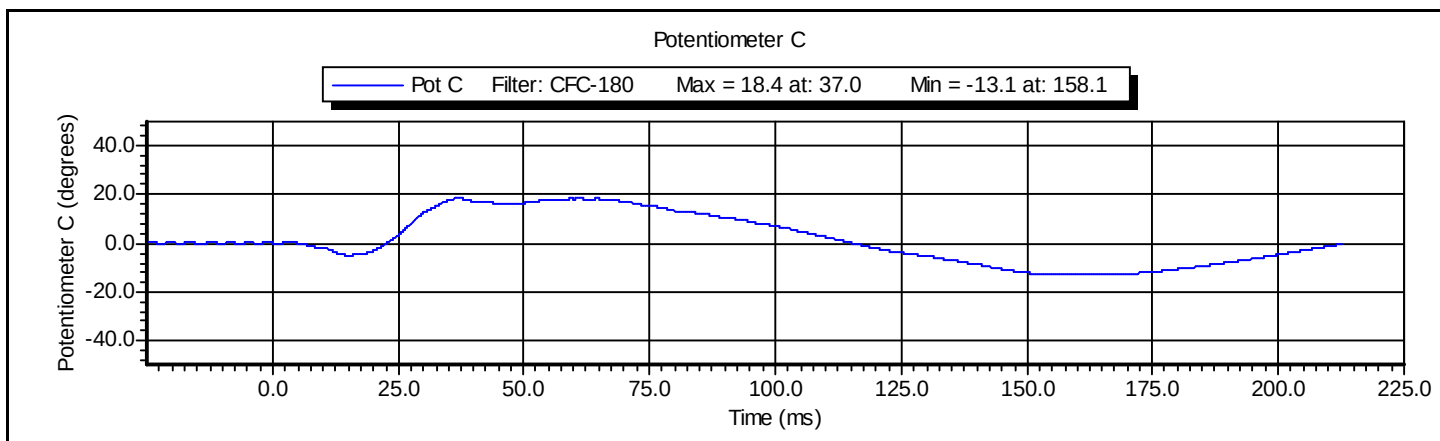
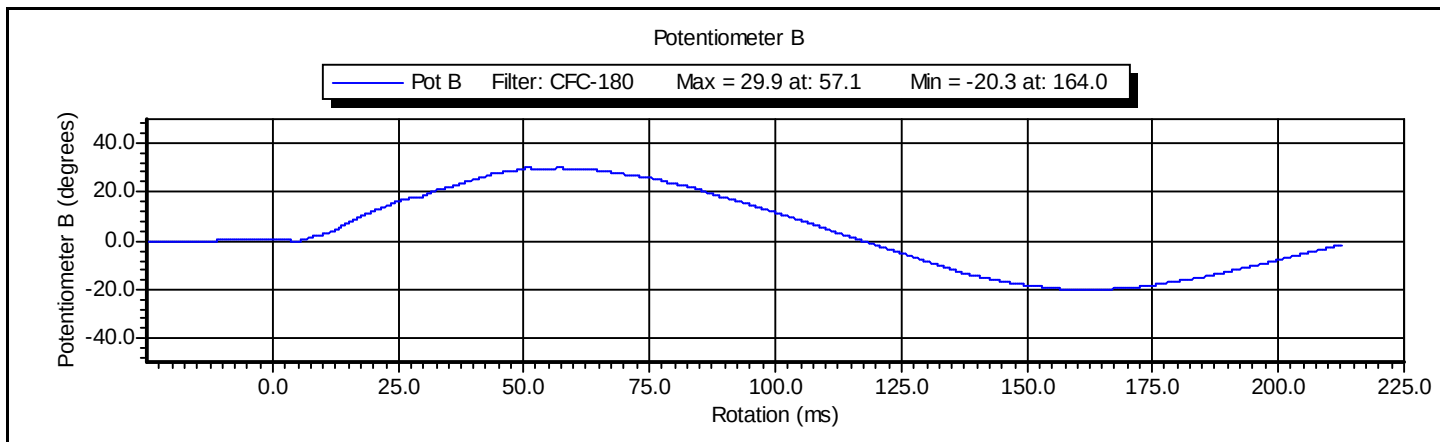
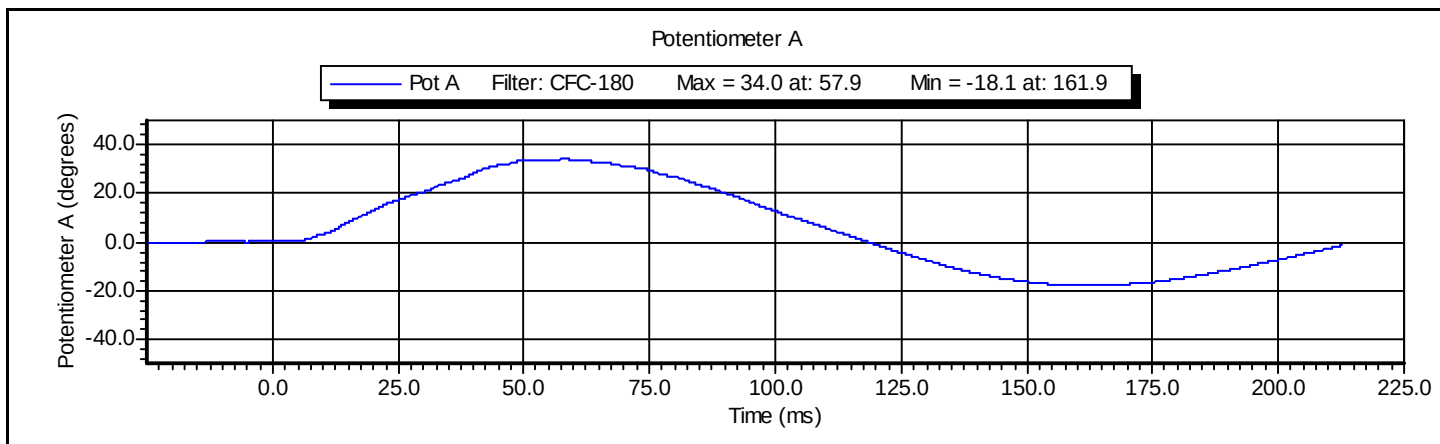
Neck Flexion Angle



Test ID: Neck Flexion

Test Time: 9:49:47 AM

Test Date: 9/22/2010





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VERIFICATION REPORT

Test Name:	Shoulder Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Shoulder	Test Date:	9/20/2010
Test Number:	1	Test Time:	2:25:34 PM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	22.2 deg C	P
Humidity	10.0	--	70.0	36.0 %RH	P
Velocity	4.20	--	4.40	4.34 m/s	P
Pendulum Acceleration	-10.50	--	-7.50	-9.33 g	P

All test parameters are within specifications

Technician: **S Zito** Signature: _____

Supervisor: **D Travale** Signature: _____

Test ID: **Shoulder**

Test Time: **2:25:34 PM**

Test Date: **9/20/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66927	4/20/2010

Test ID: **Shoulder**

Test Time: **2:25:34 PM**

Test Date: **9/20/2010**

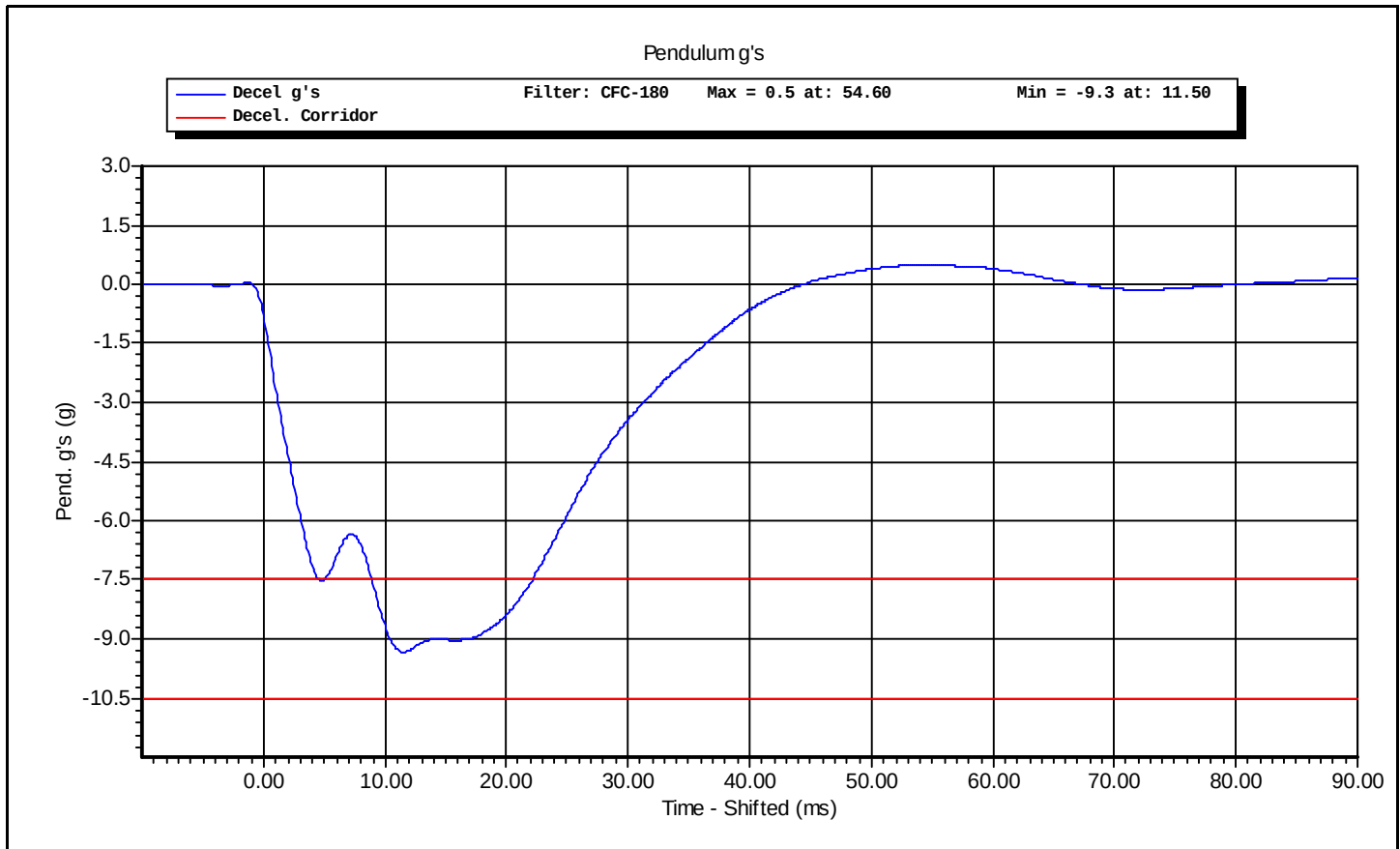


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Test Name:	Shoulder Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Shoulder	Test Date:	9/20/2010
Test Number:	1	Test Time:	2:25:34 PM



Test ID: **Shoulder**

Test Time: **2:25:34 PM**

Test Date: **9/20/2010**



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VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Lower Rib 4 m/s	Test Date:	9/20/2010
Test Number:	1	Test Time:	3:54:47 PM

Component Part Number	Component Serial Number
455-3100	LOWER RIB

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	34.0 %RH P
Velocity	3.90 -- 4.10	3.97 m/s P
Rib Displacement	-51.00 -- -46.00	-48.78 mm P
Drop Height	807.0 -- 823.0	815.0 mm P

All test parameters are within specifications

Technician: **S Zito** Signature: _____
Supervisor: **D Travale** Signature: _____

Test ID: **Lower Rib 4 m/s**

Test Time: **3:54:47 PM**

Test Date: **9/20/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Honeywell	MLT-38000	DS-178	4/23/2010
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P38216	6/22/2010

Test ID: **Lower Rib 4 m/s**

Test Time: **3:54:47 PM**

Test Date: **9/20/2010**

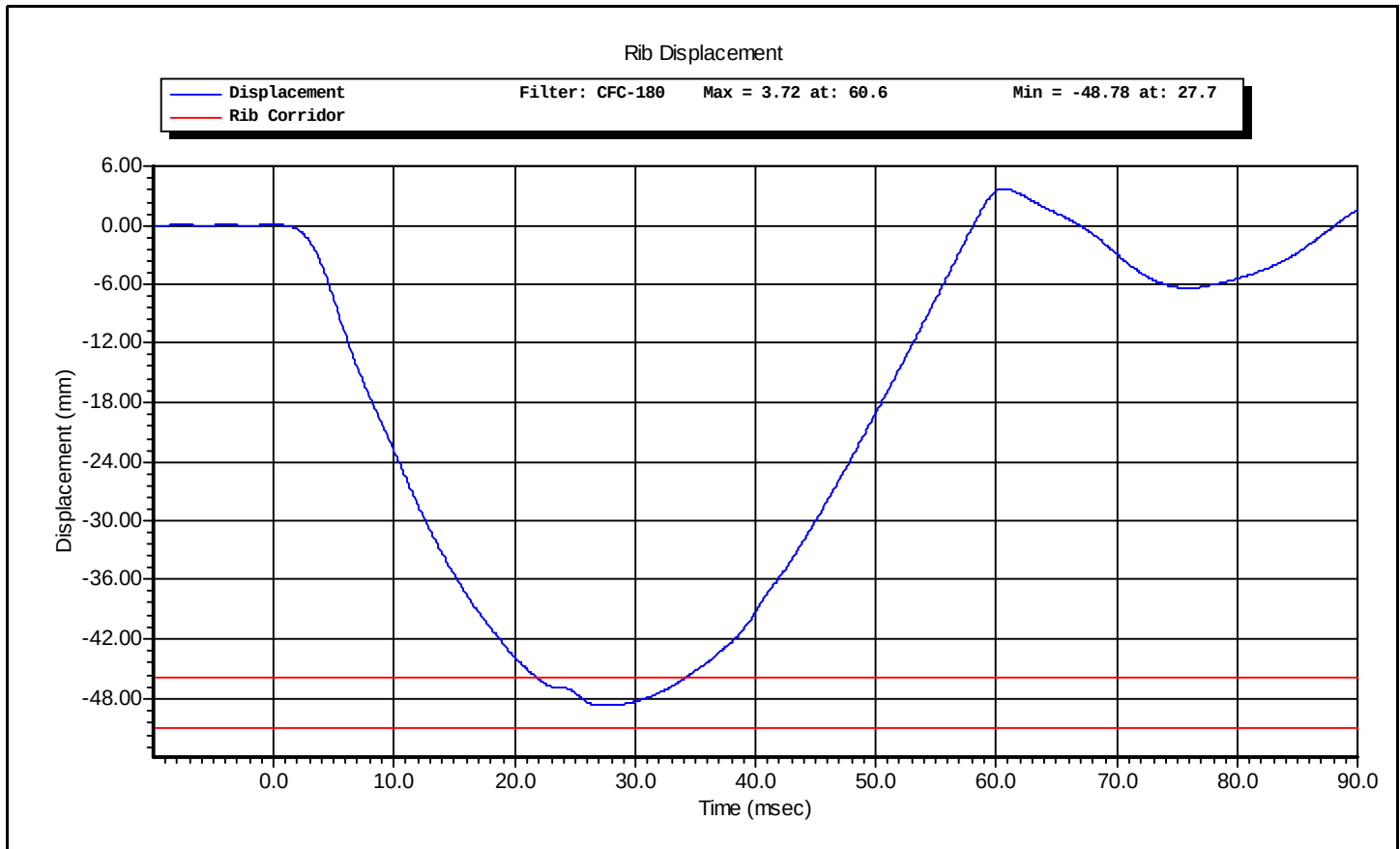


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Lower Rib 4 m/s	Test Date:	9/20/2010
Test Number:	1	Test Time:	3:54:47 PM



Test ID: Lower Rib 4 m/s Test Time: 3:54:47 PM

Test Date: 9/20/2010



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VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Lower Rib 3m/s	Test Date:	9/20/2010
Test Number:	1	Test Time:	4:00:57 PM

Component Part Number	Component Serial Number
455-3100	LOWER RIB

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	34.0 %RH P
Velocity	2.90 -- 3.10	2.98 m/s P
Rib Displacement	-40.00 -- -36.00	-38.17 mm P
Drop Height	454 -- 464	459 mm P

All test parameters are within specifications

Technician: **S Zito** Signature: _____
Supervisor: **D Travale** Signature: _____

Test ID: **Lower Rib 3m/s**

Test Time: **4:00:57 PM**

Test Date: **9/20/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Honeywell	MLT-38000	DS-178	4/23/2010
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P38216	6/22/2010

Test ID: **Lower Rib 3m/s**

Test Time: **4:00:57 PM**

Test Date: **9/20/2010**

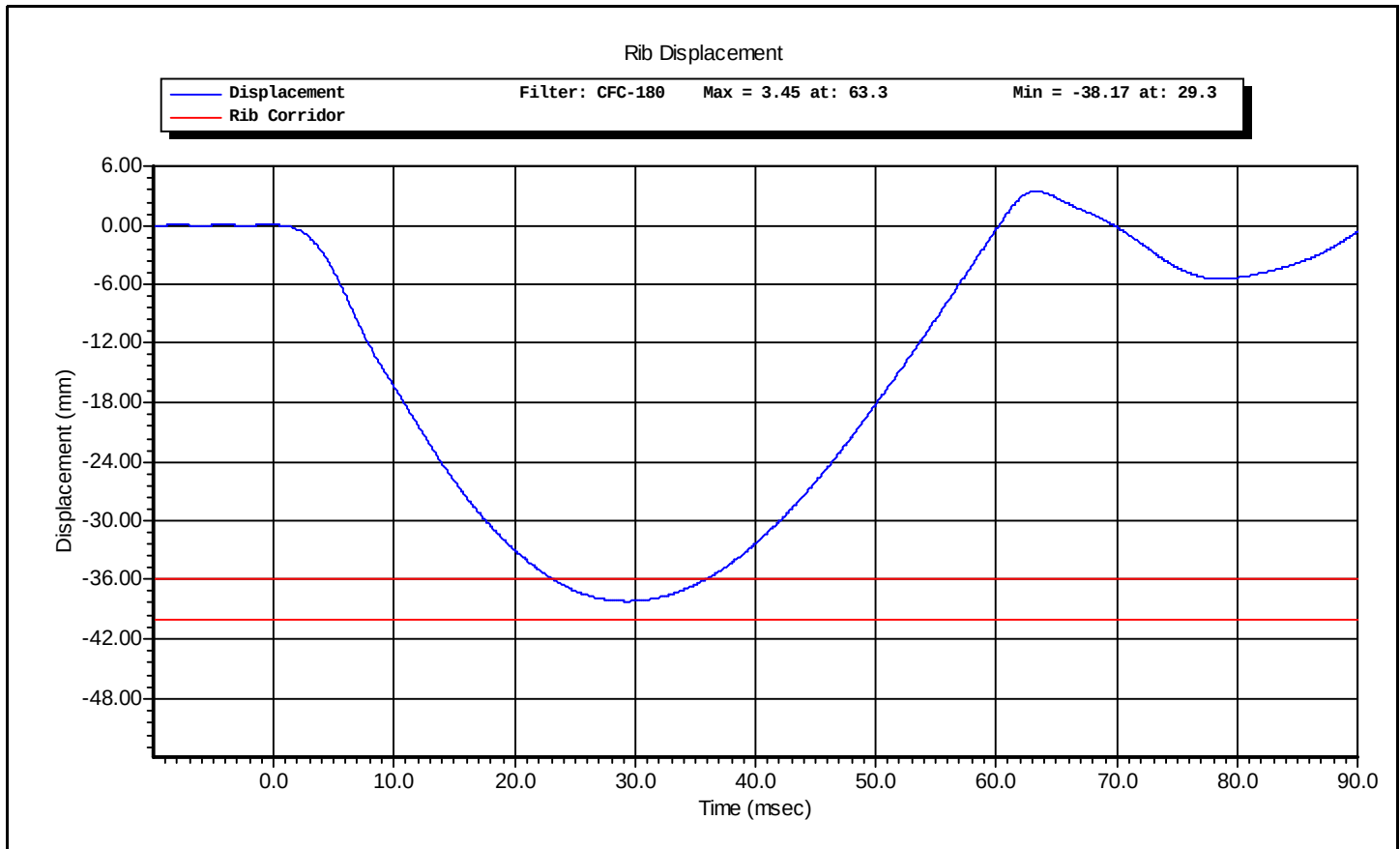


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Lower Rib 3m/s	Test Date:	9/20/2010
Test Number:	1	Test Time:	4:00:57 PM



Test ID: Lower Rib 3m/s Test Time: 4:00:57 PM

Test Date: 9/20/2010



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VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Middle 4m/s	Test Date:	9/20/2010
Test Number:	1	Test Time:	3:21:18 PM

Component Part Number	Component Serial Number
455-3100	MIDDLE

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	34.0 %RH P
Velocity	3.90 -- 4.10	3.99 m/s P
Rib Displacement	-51.00 -- -46.00	-47.85 mm P
Drop Height	807.0 -- 823.0	815.0 mm P

All test parameters are within specifications

Technician: **S Zito** Signature: _____

Supervisor: **D Travale** Signature: _____

Test ID: **Middle 4m/s**

Test Time: **3:21:18 PM**

Test Date: **9/20/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Honeywell	MLT-38000	DS-185	4/23/2010
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P38216	6/22/2010

Test ID: **Middle 4m/s**

Test Time: **3:21:18 PM**

Test Date: **9/20/2010**

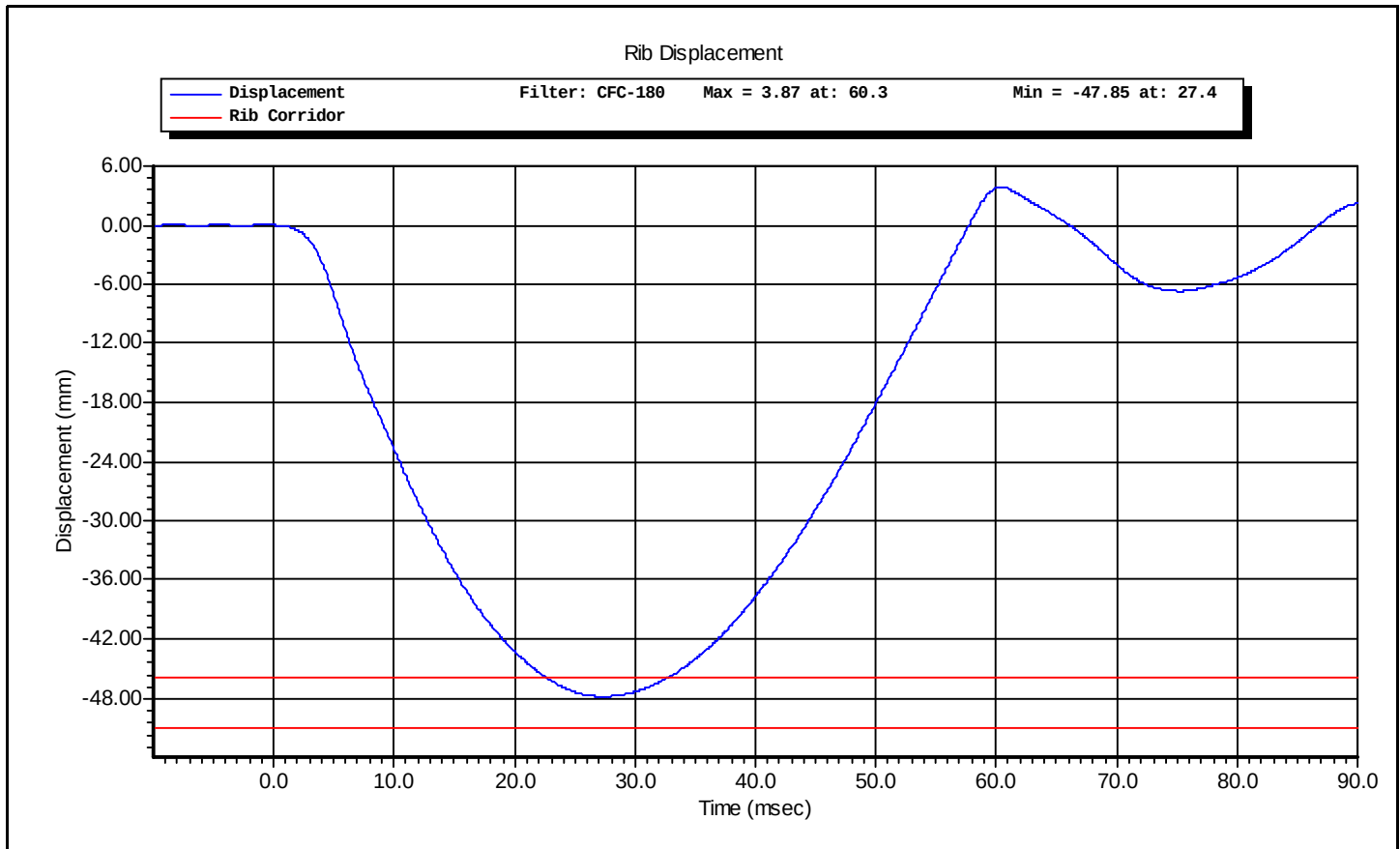


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Middle 4m/s	Test Date:	9/20/2010
Test Number:	1	Test Time:	3:21:18 PM



Test ID: Middle 4m/s

Test Time: 3:21:18 PM

Test Date: 9/20/2010



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VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Middle Rib 3 m/s	Test Date:	9/20/2010
Test Number:	1	Test Time:	3:27:37 PM

Component Part Number	Component Serial Number
455-3100	MIDDLE

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	34.0 %RH P
Velocity	2.90 -- 3.10	2.97 m/s P
Rib Displacement	-40.00 -- -36.00	-37.50 mm P
Drop Height	454 -- 464	459 mm P

All test parameters are within specifications

Technician: **S Zito** Signature: _____
Supervisor: **D Travale** Signature: _____

Test ID: **Middle Rib 3 m/s** Test Time: **3:27:37 PM**

Test Date: **9/20/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Honeywell	MLT-38000	DS-185	4/23/2010
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P38216	6/22/2010

Test ID: **Middle Rib 3 m/s**

Test Time: **3:27:37 PM**

Test Date: **9/20/2010**

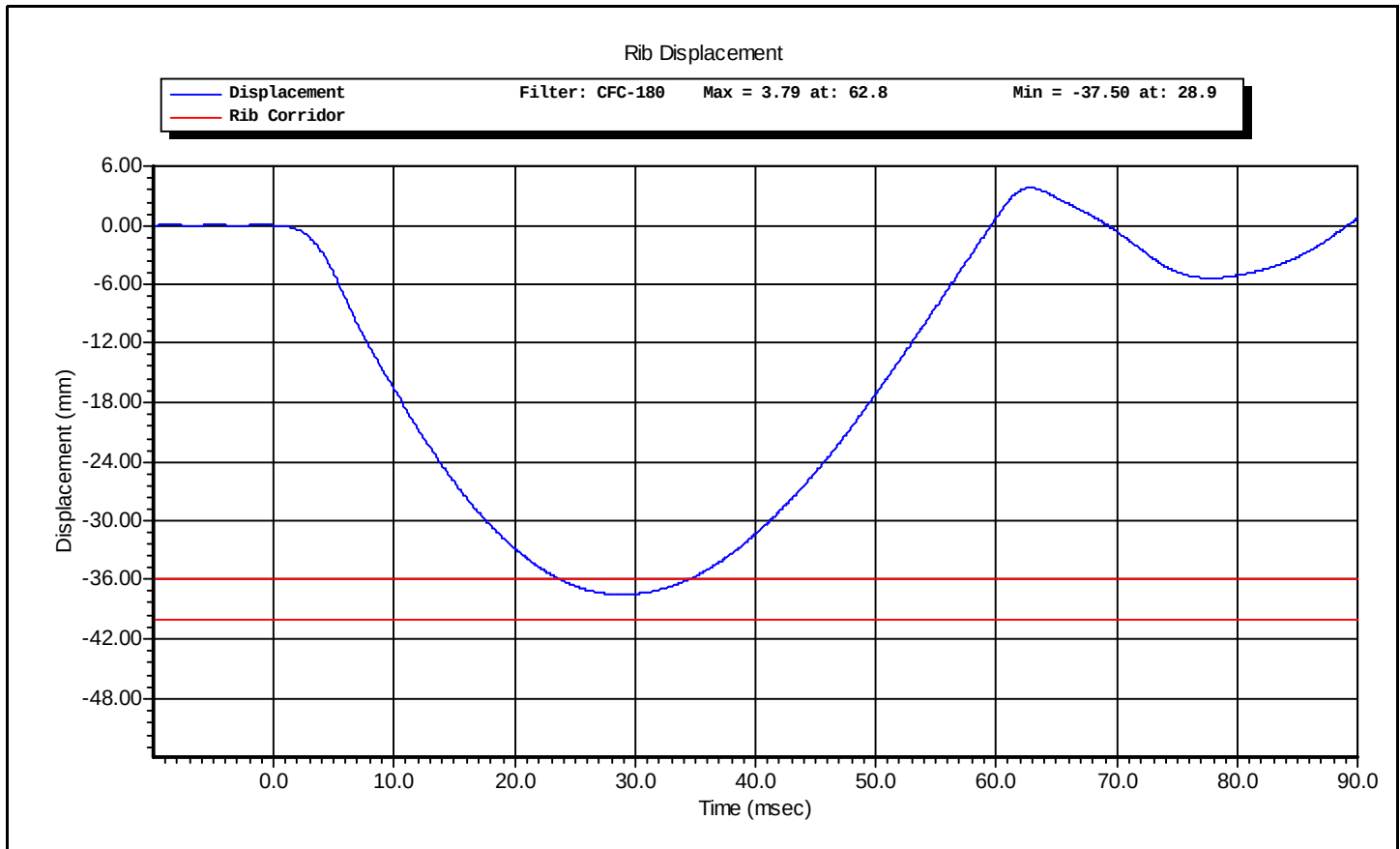


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Middle Rib 3 m/s	Test Date:	9/20/2010
Test Number:	1	Test Time:	3:27:37 PM



Test ID: Middle Rib 3 m/s Test Time: 3:27:37 PM

Test Date: 9/20/2010



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VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Upper Rib 4 m/s	Test Date:	9/20/2010
Test Number:	1	Test Time:	3:06:40 PM

Component Part Number	Component Serial Number
455-3100	UPPER

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	34.0 %RH P
Velocity	3.90 -- 4.10	3.97 m/s P
Rib Displacement	-51.00 -- -46.00	-49.05 mm P
Drop Height	807.0 -- 823.0	815.0 mm P

All test parameters are within specifications

Technician: **S. Zito** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Upper Rib 4 m/s**

Test Time: **3:06:40 PM**

Test Date: **9/20/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Honeywell	MLT-38000	DS-179	4/23/2010
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P38216	6/22/2010

Test ID: **Upper Rib 4 m/s**

Test Time: **3:06:40 PM**

Test Date: **9/20/2010**

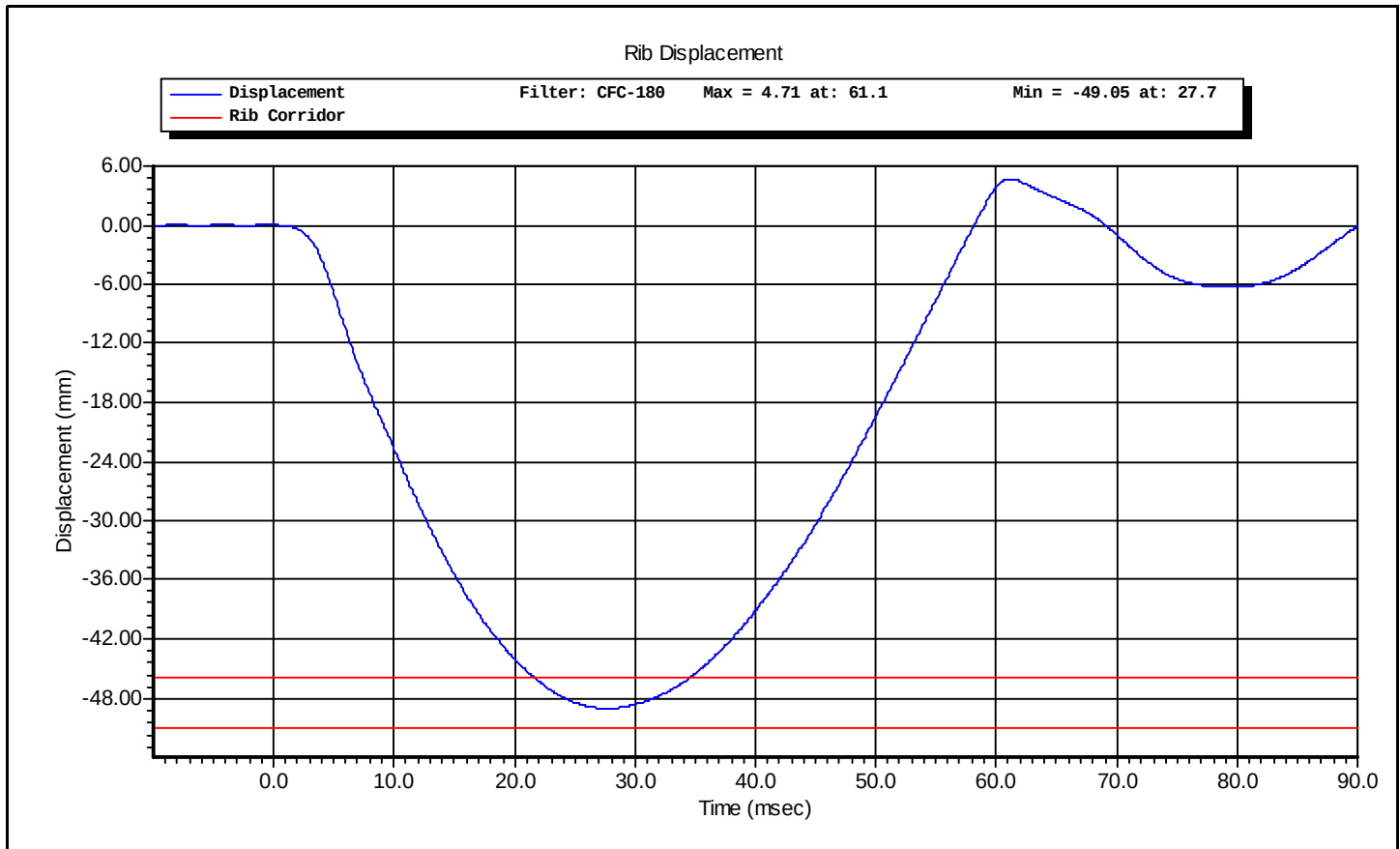


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Upper Rib 4 m/s	Test Date:	9/20/2010
Test Number:	1	Test Time:	3:06:40 PM



Test ID: Upper Rib 4 m/s Test Time: 3:06:40 PM

Test Date: 9/20/2010



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VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Upper Rib 3 m/s	Test Date:	9/20/2010
Test Number:	1	Test Time:	3:14:28 PM

Component Part Number	Component Serial Number
455-3100	UPPER

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	34.0 %RH P
Velocity	2.90 -- 3.10	2.98 m/s P
Rib Displacement	-40.00 -- -36.00	-38.12 mm P
Drop Height	454 -- 464	459 mm P

All test parameters are within specifications

Technician: **S Zito** Signature: _____
Supervisor: **D Travale** Signature: _____

Test ID: **Upper Rib 3 m/s**

Test Time: **3:14:28 PM**

Test Date: **9/20/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Honeywell	MLT-38000	DS-179	4/23/2010
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P38216	6/22/2010

Test ID: **Upper Rib 3 m/s**

Test Time: **3:14:28 PM**

Test Date: **9/20/2010**

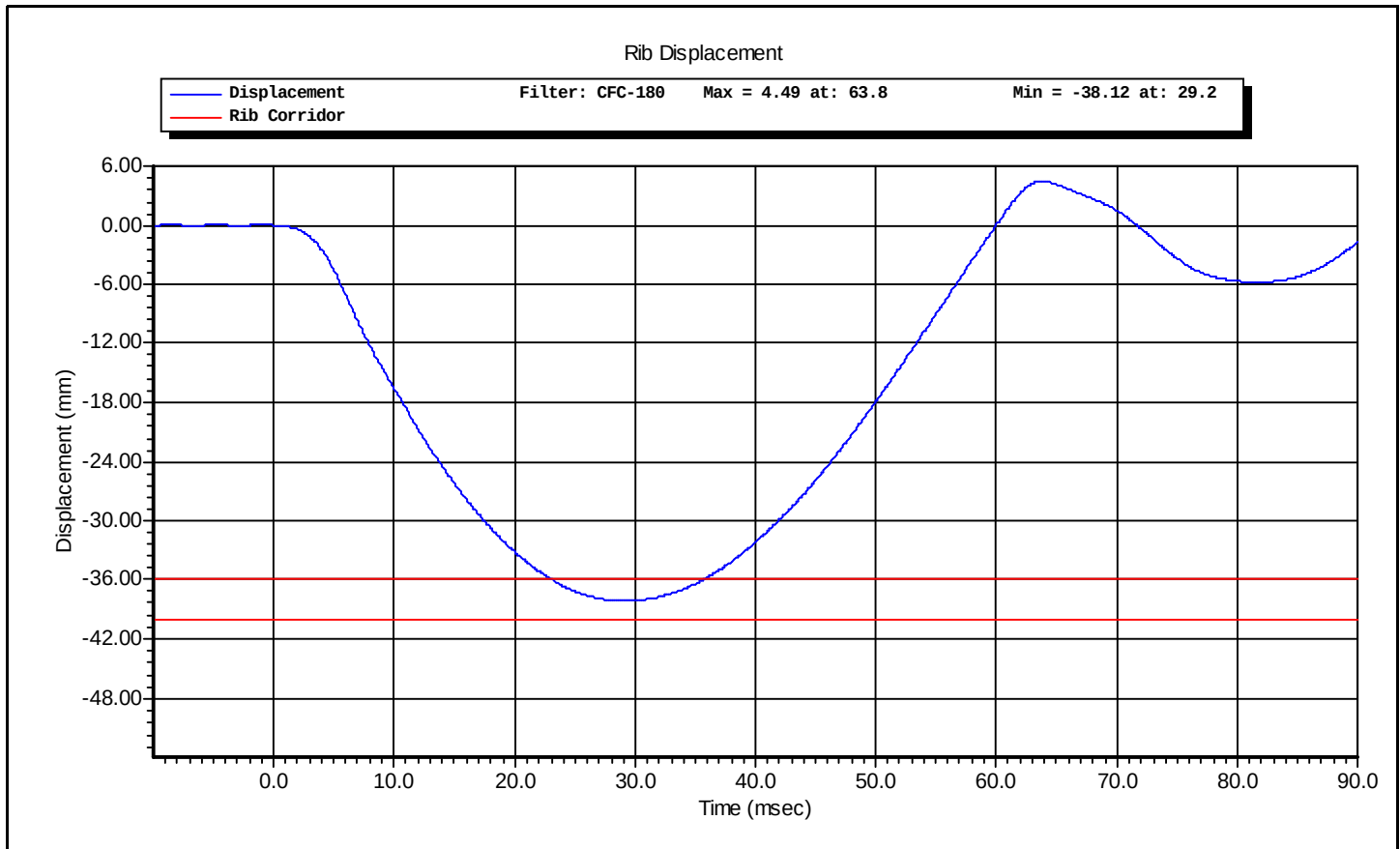


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Upper Rib 3 m/s	Test Date:	9/20/2010
Test Number:	1	Test Time:	3:14:28 PM



Test ID: Upper Rib 3 m/s

Test Time: 3:14:28 PM

Test Date: 9/20/2010



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VERIFICATION REPORT

Test Name:	Thorax Impact	Revision:	8/15/2008
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	033		
Test ID:	Thorax	Test Date:	9/20/2010
Test Number:	1	Test Time:	4:30:58 PM

Component Part Number	Component Serial Number
Upper Rib - 175-4002	UPPER
Middle Rib - 175-4002	MIDDLE
Lower Rib - 175-4002	LOWER

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	34.0 %RH P
Velocity	5.40 -- 5.60	5.49 m/s P
Upper Rib Displacement	34.0 -- 41.0	37.6 mm P
Middle Rib Displacement	37.0 -- 45.0	41.5 mm P
Lower Rib Displacement	37.0 -- 44.0	41.3 mm P
Impactor Force	5100 -- 6200	5221 N P

All test parameters are within specifications

Technician: **S. Zito** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Thorax**

Test Time: **4:30:58 PM**

Test Date: **9/20/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66927	4/20/2010
Honeywell	MLT-38000	DS-179	4/23/2010
Honeywell	MLT-38000	DS-185	4/23/2010
Honeywell	MLT-38000	DS-178	4/23/2010

Test ID: **Thorax**

Test Time: **4:30:58 PM**

Test Date: **9/20/2010**



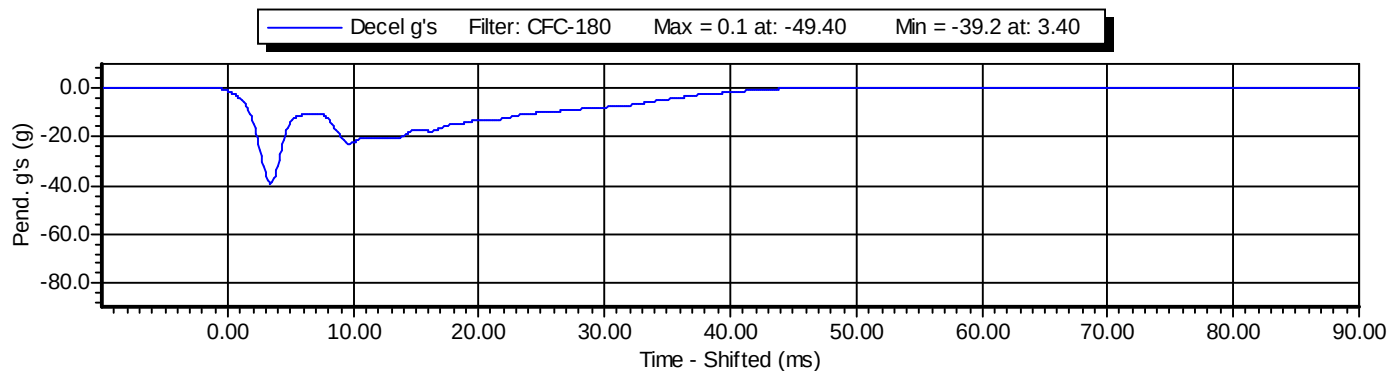
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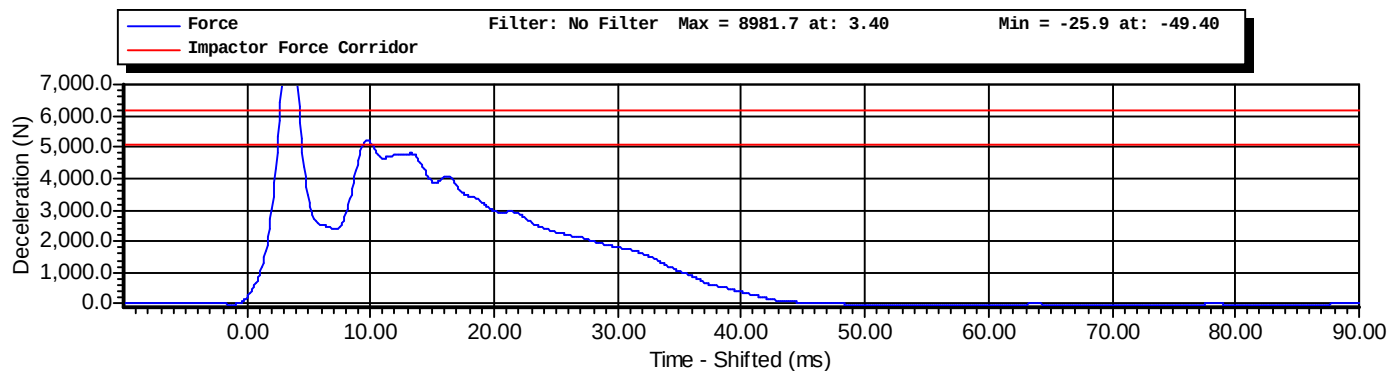
4455 Genesee Street, Buffalo, New York 14225 - Phone (716)632-7500

Test Name:	Thorax Impact	Revision:	8/15/2008
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	033		
Test ID:	Thorax	Test Date:	9/20/2010
Test Number:	1	Test Time:	4:30:58 PM

Pendulum g's



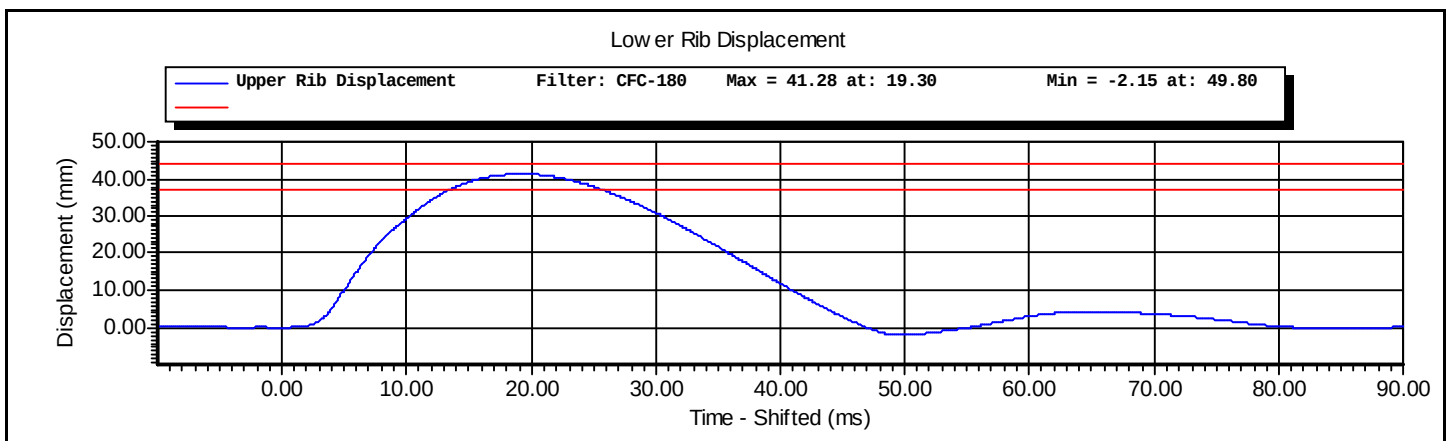
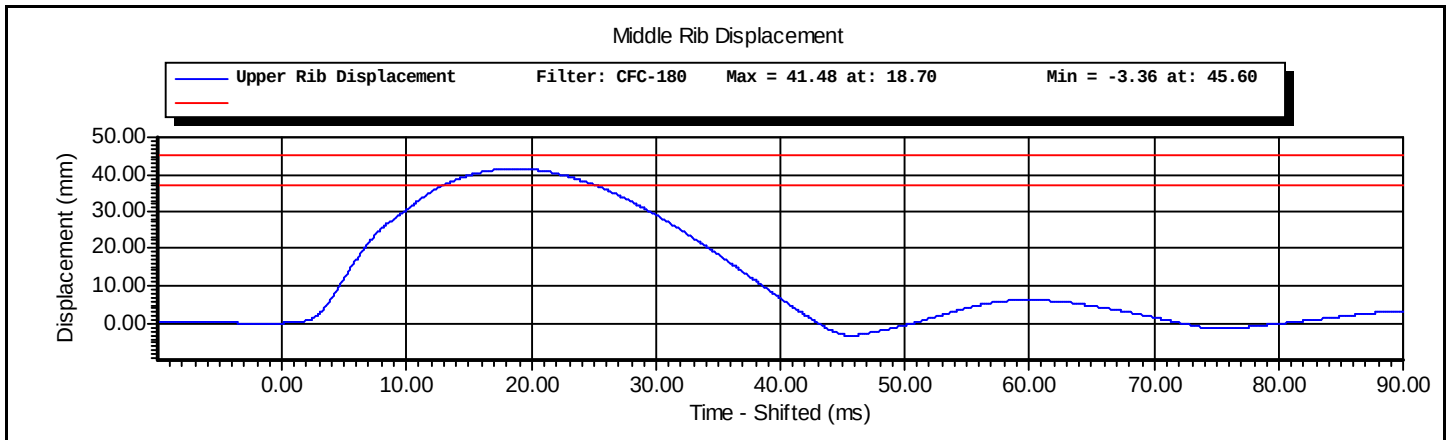
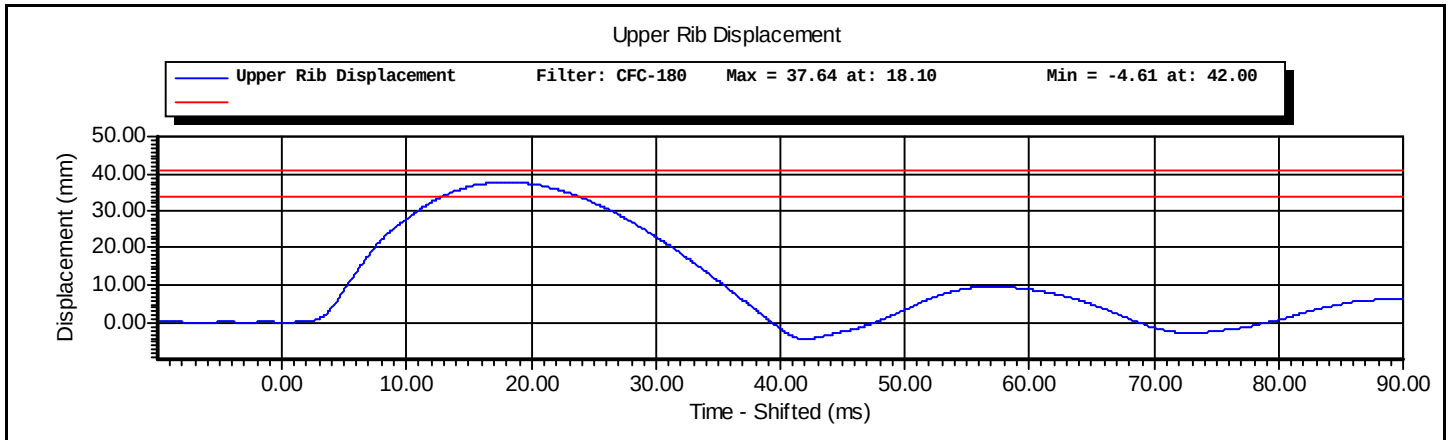
Impactor Force



Test ID: Thorax

Test Time: 4:30:58 PM

Test Date: 9/20/2010





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VERIFICATION REPORT

Test Name:	Abdominal Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	ABDOMEN	Test Date:	9/20/2010
Test Number:	1	Test Time:	1:38:18 PM

Component Part Number	Component Serial Number
455-4001	07/136

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	22.2 deg C	P
Humidity	10	--	70	36 %RH	P
Velocity	3.90	--	4.10	4.02 m/s	P
Peak Abdominal Force	-2.70	--	-2.20	-2.42 kN	P
Time At Peak Abdominal Force	10.0	--	12.3	11.4 ms	P
Maximum Pendulum Force	-4.80	--	-4.00	-4.21 kN	P
Time at Peak Pendulum Force	10.6	--	13.0	11.9 ms	P

All test parameters are within specifications

Technician: **S Zito** Signature: _____

Supervisor: **D Travale** Signature: _____

Test ID: **ABDOMEN**

Test Time: **1:38:18 PM**

Test Date: **9/20/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66927	4/20/2010
Denton	2631	LC-1524	4/22/2010
Denton	2631	LC-1523	4/22/2010
Denton	2631	LC-1530	4/22/2010

Test ID: **ABDOMEN**

Test Time: **1:38:18 PM**

Test Date: **9/20/2010**



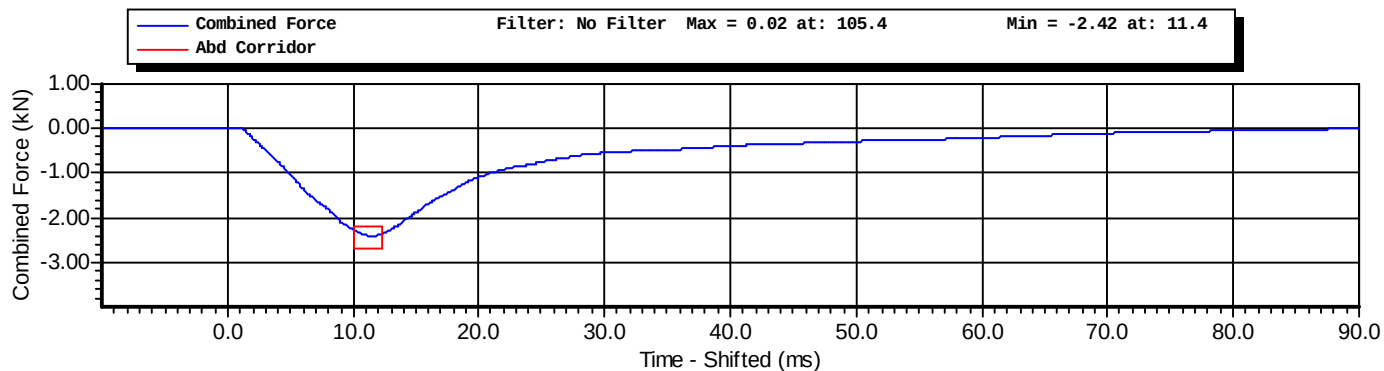
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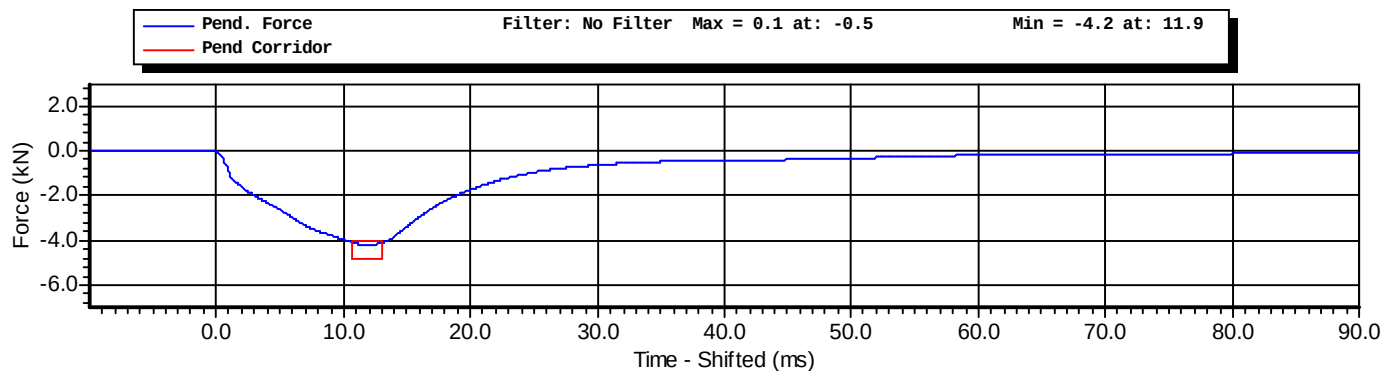
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Test Name:	Abdominal Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	ABDOMEN	Test Date:	9/20/2010
Test Number:	1	Test Time:	1:38:18 PM

Combined Abdominal Force



Pendulum Force

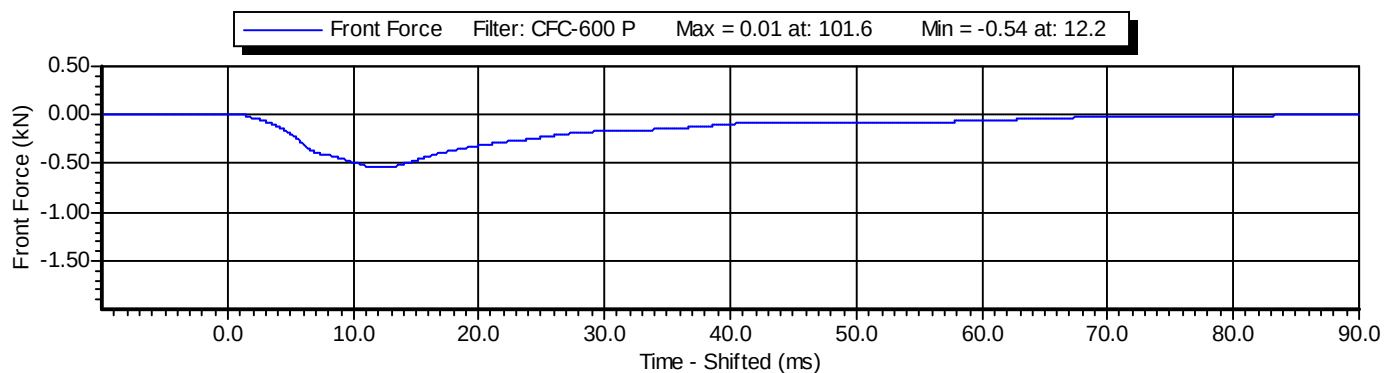


Test ID: **ABDOMEN**

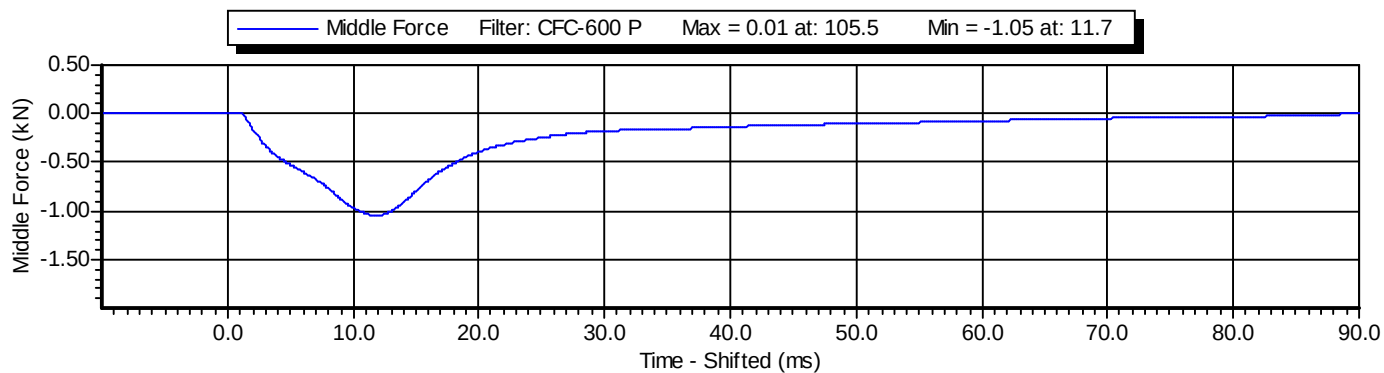
Test Time: **1:38:18 PM**

Test Date: **9/20/2010**

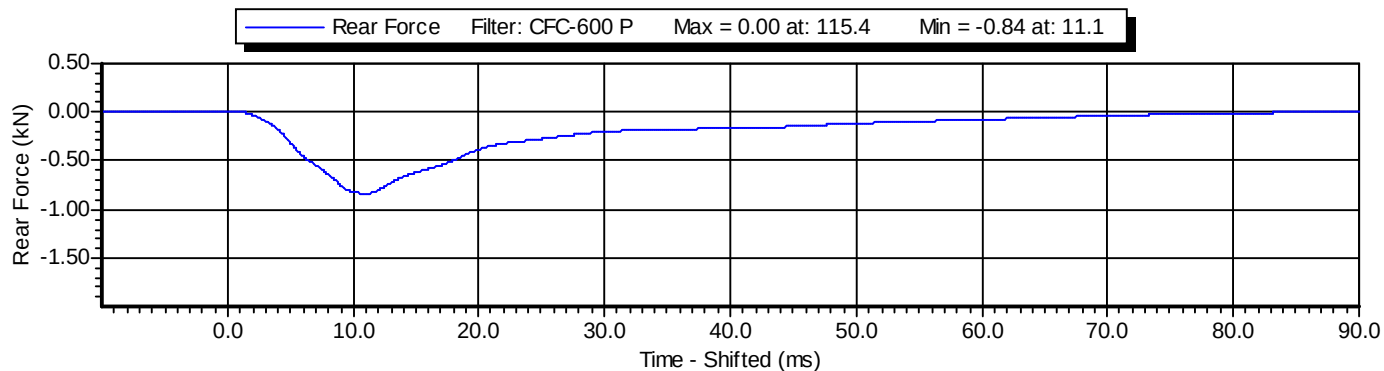
Front Abdominal Force



Middle Abdominal Force



Rear Abdominal Force





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VERIFICATION REPORT

Test Name:	Lumbar Spine	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Lumbar Spine	Test Date:	9/22/2010
Test Number:	1	Test Time:	10:59:08 AM

Component Part Number	Component Serial Number
175-5501	19-0545

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	63 %RH P
Velocity	5.95 -- 6.15	6.14 m/s P
Maximum Headform Flexion Angle	45.0 -- 55.0	45.5 degrees P
Time at Maximum Headform Flexion Angle	39.0 -- 53.0	42.7 ms P
Decay to Zero Degrees	37.0 -- 57.0	38.3 ms P
Velocity Corridor	--	P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Lumbar Spine**

Test Time: **10:59:08 AM**

Test Date: **9/22/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7231CT	C16510	5/10/2010
DentonATD	7000428	094	4/27/2010
DentonATD	7000428	095	4/27/2010
DentonATD	7000428	093	4/27/2010

Test ID: **Lumbar Spine**

Test Time: **10:59:08 AM**

Test Date: **9/22/2010**



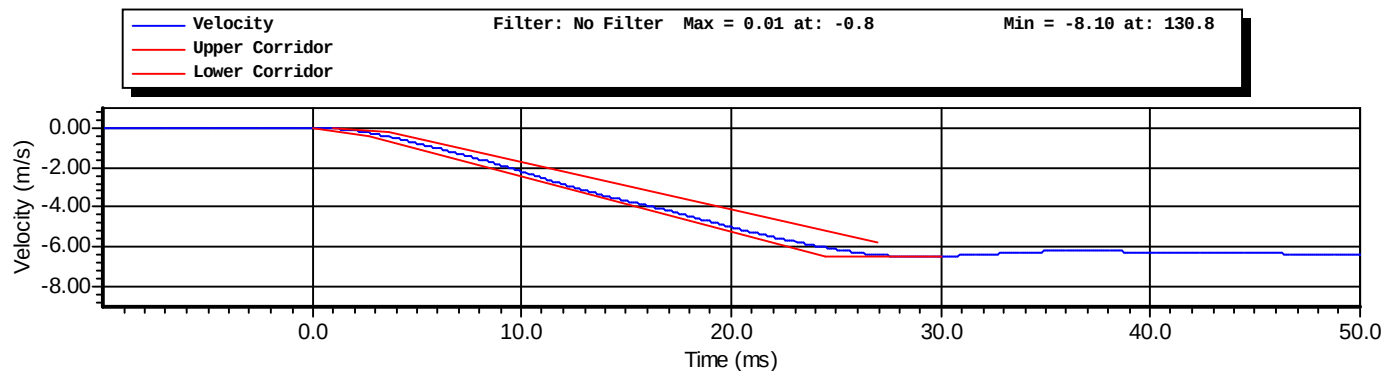
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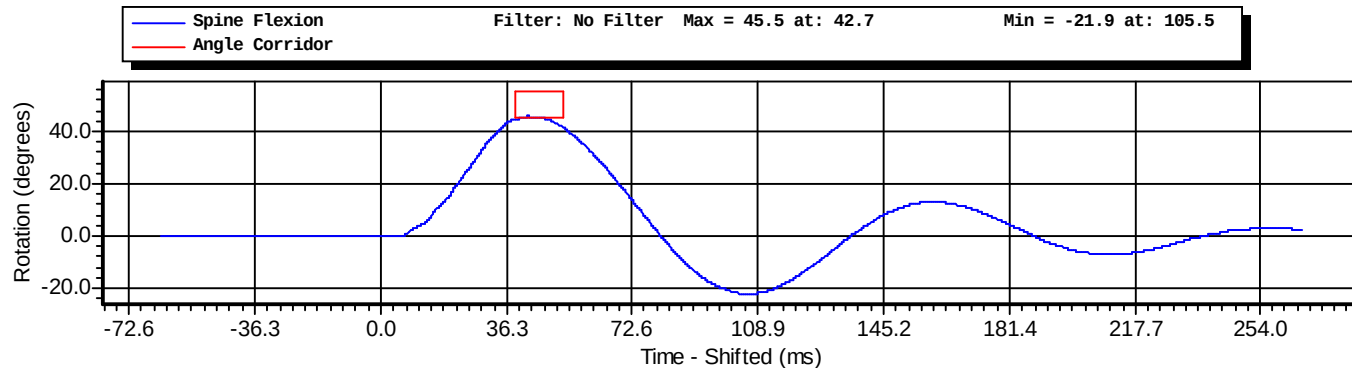
4455 Genesee Street, Buffalo, New York 14225 - Phone (716)632-7500

Test Name:	Lumbar Spine	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Lumbar Spine	Test Date:	9/22/2010
Test Number:	1	Test Time:	10:59:08 AM

Pendulum Velocity

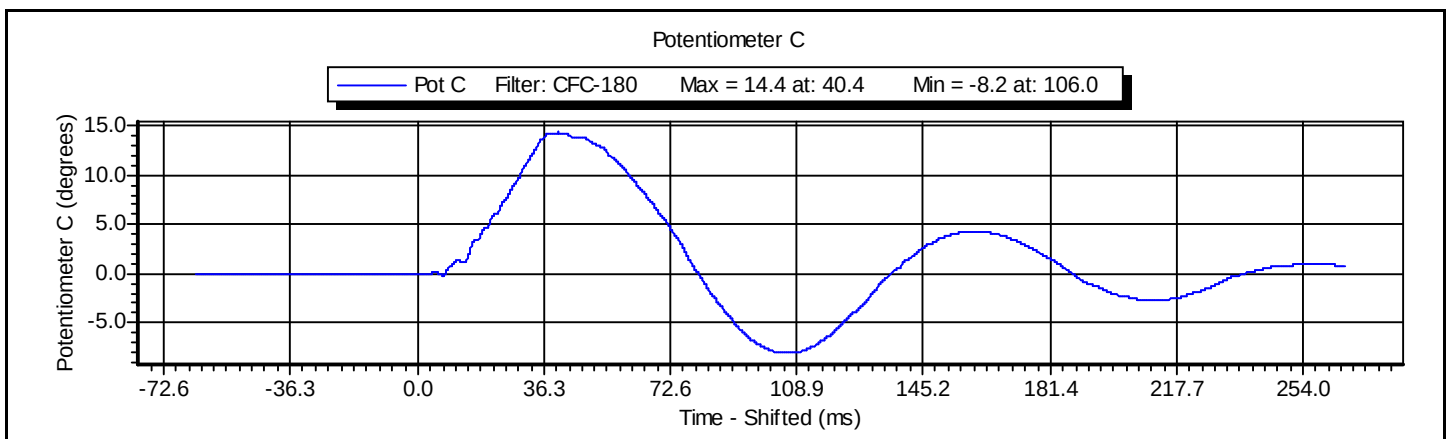
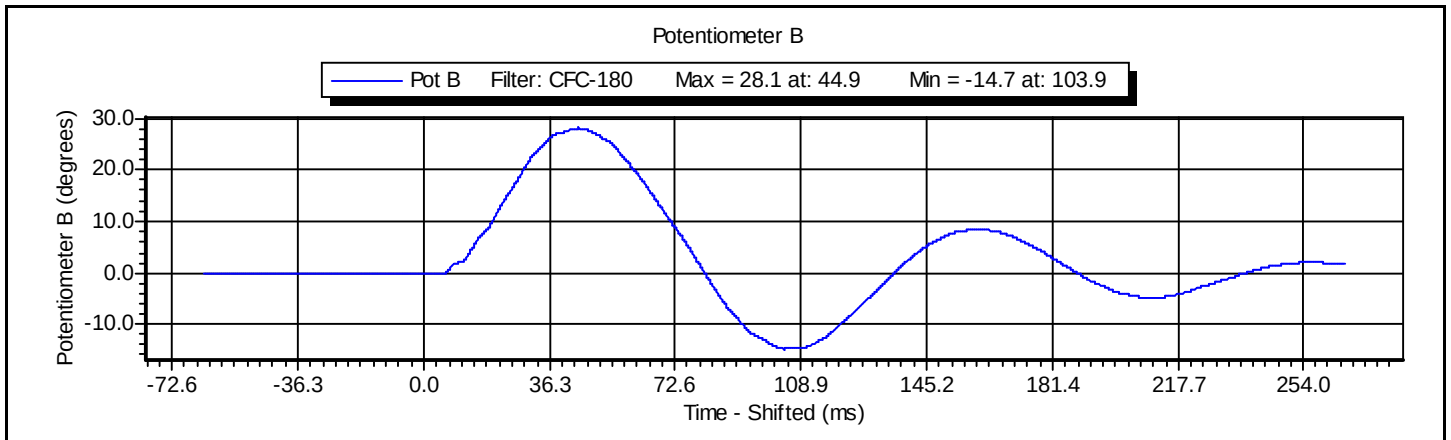
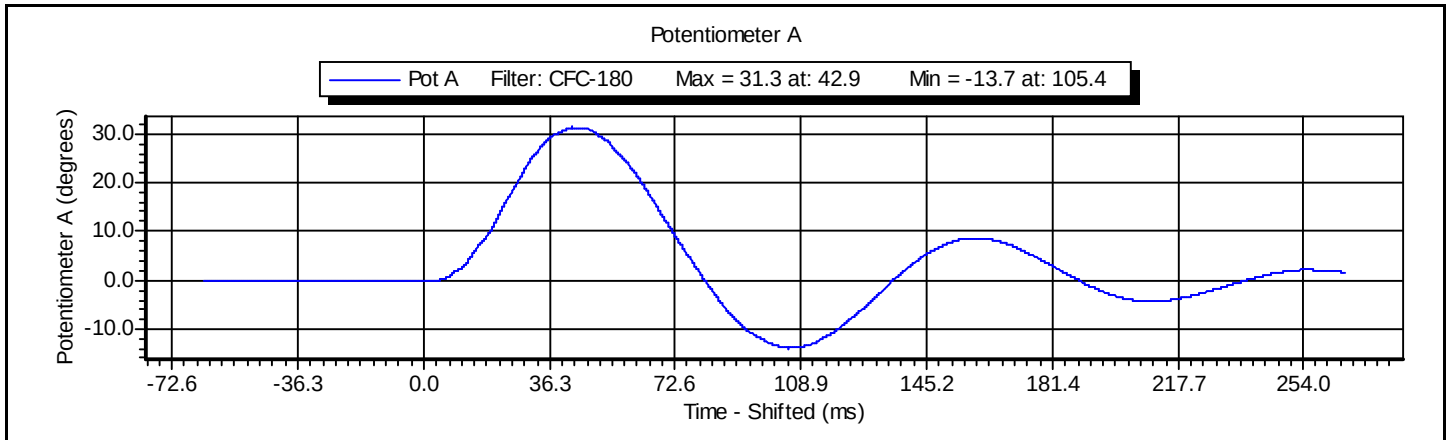


Spine Flexion Angle



Test ID: **Lumbar Spine** Test Time: **10:59:08 AM**

Test Date: **9/22/2010**





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VERIFICATION REPORT

Test Name:	Pelvis Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Pelvis	Test Date:	9/20/2010
Test Number:	1	Test Time:	12:59:20 PM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	22.2 deg C	P
Humidity	10	--	70	39 %RH	P
Velocity	4.20	--	4.40	4.35 m/s	P
Peak Pendulum Force	-5.40	--	-4.70	-4.96 kN	P
Time at Peak Pendulum Force	11.80	--	16.10	14.11 ms	P
Peak Pubic Symphysis Force	-1.59	--	-1.23	-1.36 kN	P
Time at Peak Pubic Symphysis Force	12.20	--	17.00	15.61 ms	P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____
Supervisor: **D. Travale** Signature: _____

Test ID: **Pelvis**

Test Time: **12:59:20 PM**

Test Date: **9/20/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66927	4/20/2010
Denton	3096	LC-456Fy	4/22/2010

Test ID: **Pelvis**

Test Time: **12:59:20 PM**

Test Date: **9/20/2010**



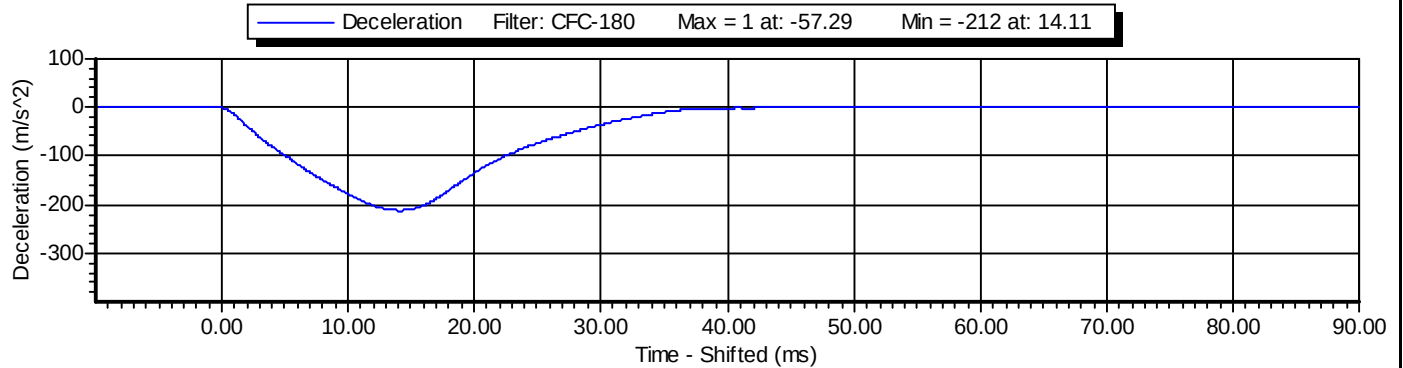
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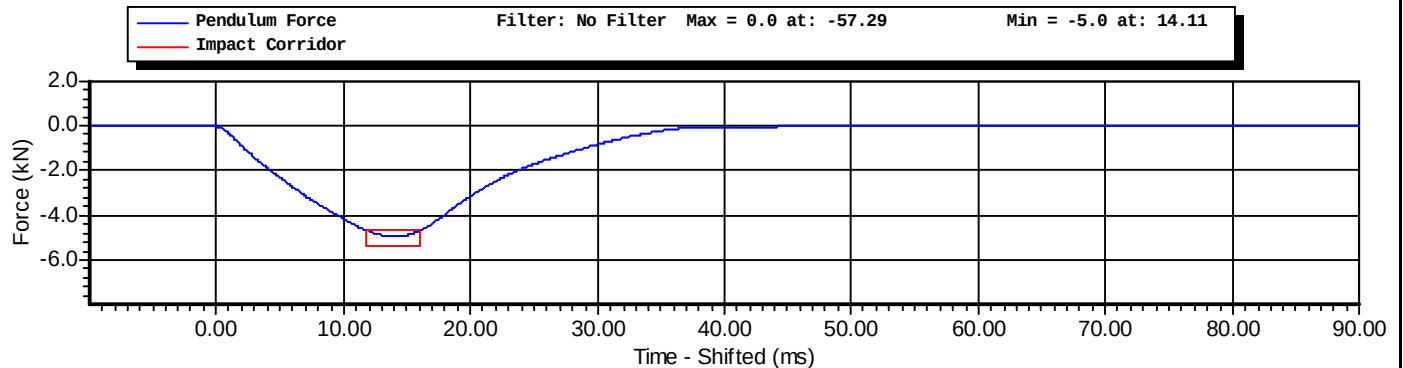
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Test Name:	Pelvis Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Pelvis	Test Date:	9/20/2010
Test Number:	1	Test Time:	12:59:20 PM

Pendulum Accelerometer



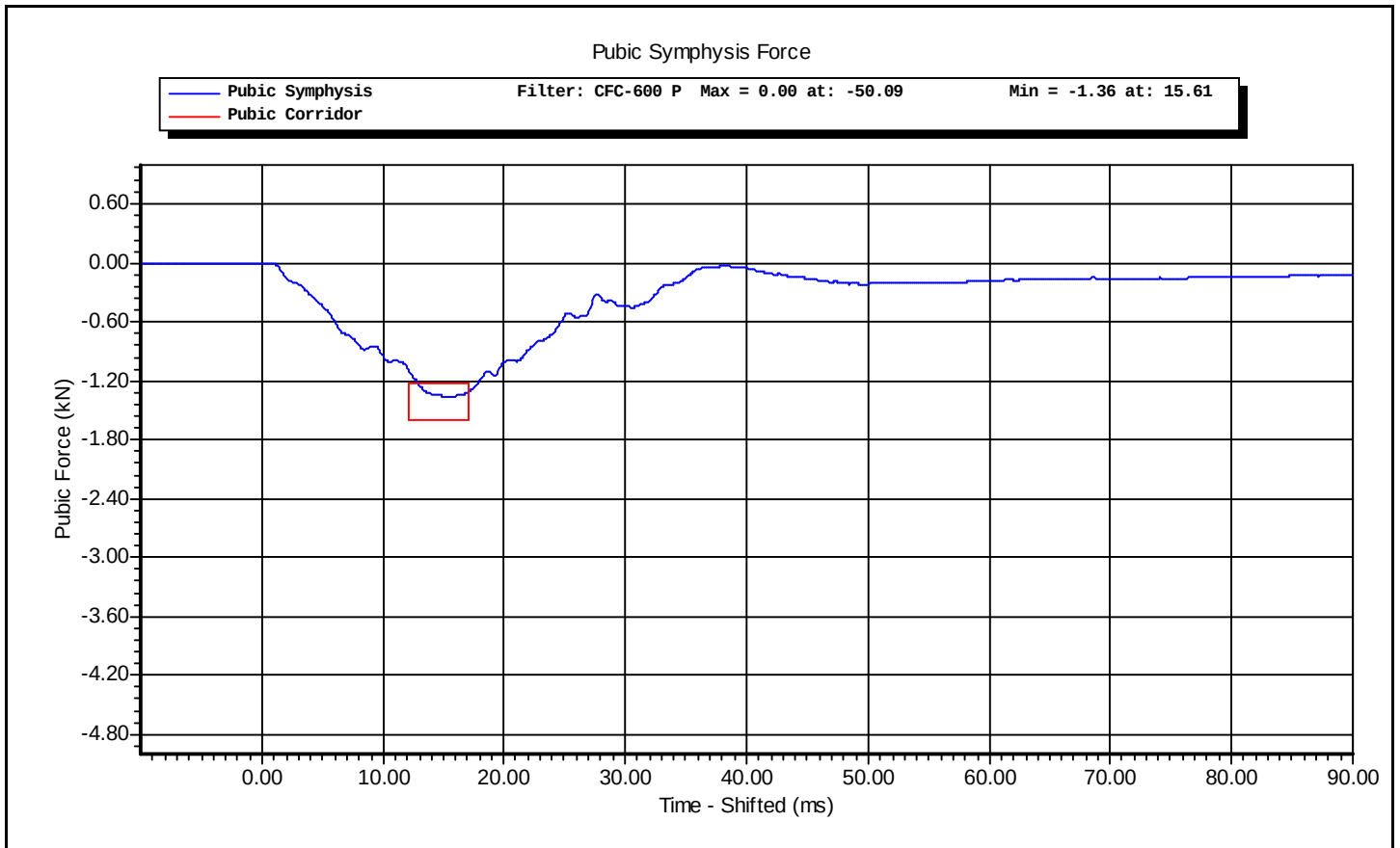
Pendulum Force



Test ID: **Pelvis**

Test Time: **12:59:20 PM**

Test Date: **9/20/2010**



CALIBRATION TEST RESULTS

POST-TEST

SID-IIs No: 300

CONFIGURED FOR LEFT SIDE IMPACT

SID-IIsD External Measurements

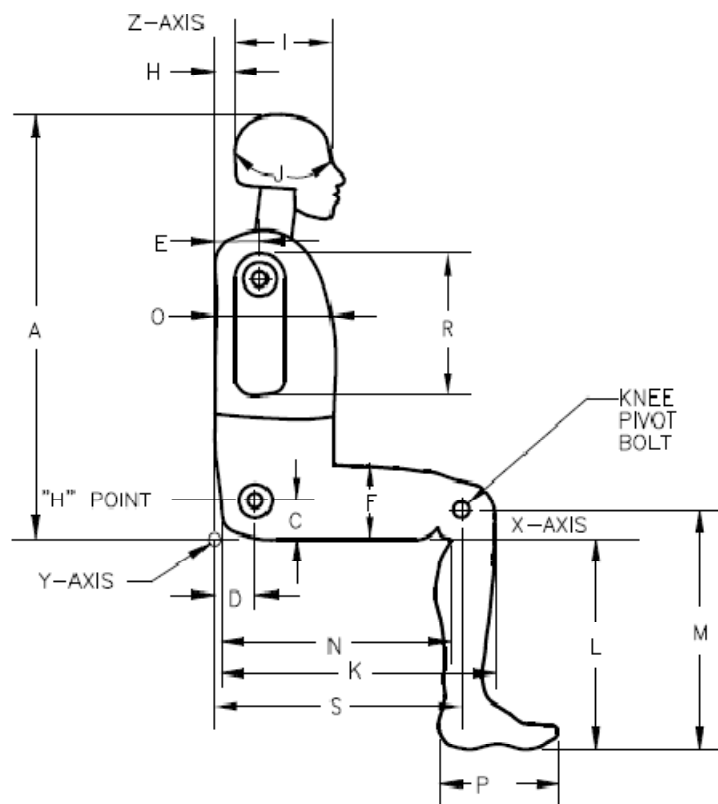
NHTSA ATD S/N 300

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	785	Yes
B	Shoulder Pivot Height	437.0 - 453.0	450	Yes
C	H-Point Height	79.0 - 89.0	87	Yes
D	H-Point from Seat Back	141.0 - 151.0	145	Yes
E	Shoulder Pivot from Backline	97.0 - 107.0	98	Yes
F	Thigh Clearance	119.0 - 135.0	125	Yes
G	Head Breadth	140.0 - 148.0	143	Yes
H	Head Back from Backline	40.0 - 46.0	42	Yes
I	Head Depth	178.0 - 188.0	181	Yes
J	Head Circumference	541.0 - 551.0	545	Yes
K	Buttock to Knee Length	514.0 - 540.0	523	Yes
L	Popliteal Height	343.0 - 369.0	365	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	395	Yes
N	Buttock Popliteal Length	416.0 - 442.0	430	Yes
O	Chest Depth without Jacket	195.0 - 211.0	205	Yes
P	Foot Length (right)	216.0 - 232.0	220	Yes
P	Foot Length (left)	216.0 - 232.0	220	Yes
Q	Hip Breadth	313.0 - 323.0	315	Yes
R	Arm Length	249.0 - 259.0	253	Yes
S	Knee Joint to Seat back	478.0 - 493.0	475	Yes
V	Shoulder Width (only one arm installed)	341.0 - 357.0	353	Yes
W	Foot Width (right)	78.0 - 94.0	85	Yes
W	Foot Width (left)	78.0 - 94.0	85	Yes
Y	Chest Circumference with Jacket	851.0 - 881.0	870	Yes
Z	Waist Circumference	761.0 - 791.0	773	Yes

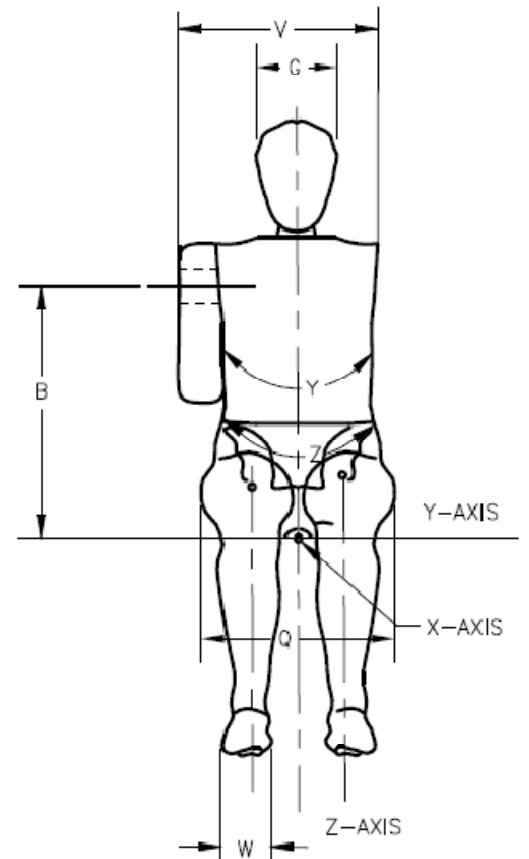
Technician: AR

Date: 10/4/2010

SID-IIIsD External Dimension Reference Diagram



SIDE VIEW



FRONT VIEW



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VERIFICATION REPORT

Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Head Drop	Test Date:	9/28/2010
Test Number:	1	Test Time:	4:26:36 PM

Component Part Number	Component Serial Number
Head Skin - 180-1002	1355

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	60 %RH P
Resultant Acceleration	115.0 -- 137.0	132.0 g P
Oscillation	0.0 -- 15.0	2.5 % P
Fore-Aft Acceleration	-15.0 -- 15.0	7.5 g P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Head Drop**

Test Time: **4:26:36 PM**

Test Date: **9/28/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Endevco	7264-2000	P51685	4/7/2010
Endevco	7264-2000	P51682	4/7/2010
Endevco	7264-2000	P51699	4/7/2010

Test ID: **Head Drop**

Test Time: **4:26:36 PM**

Test Date: **9/28/2010**

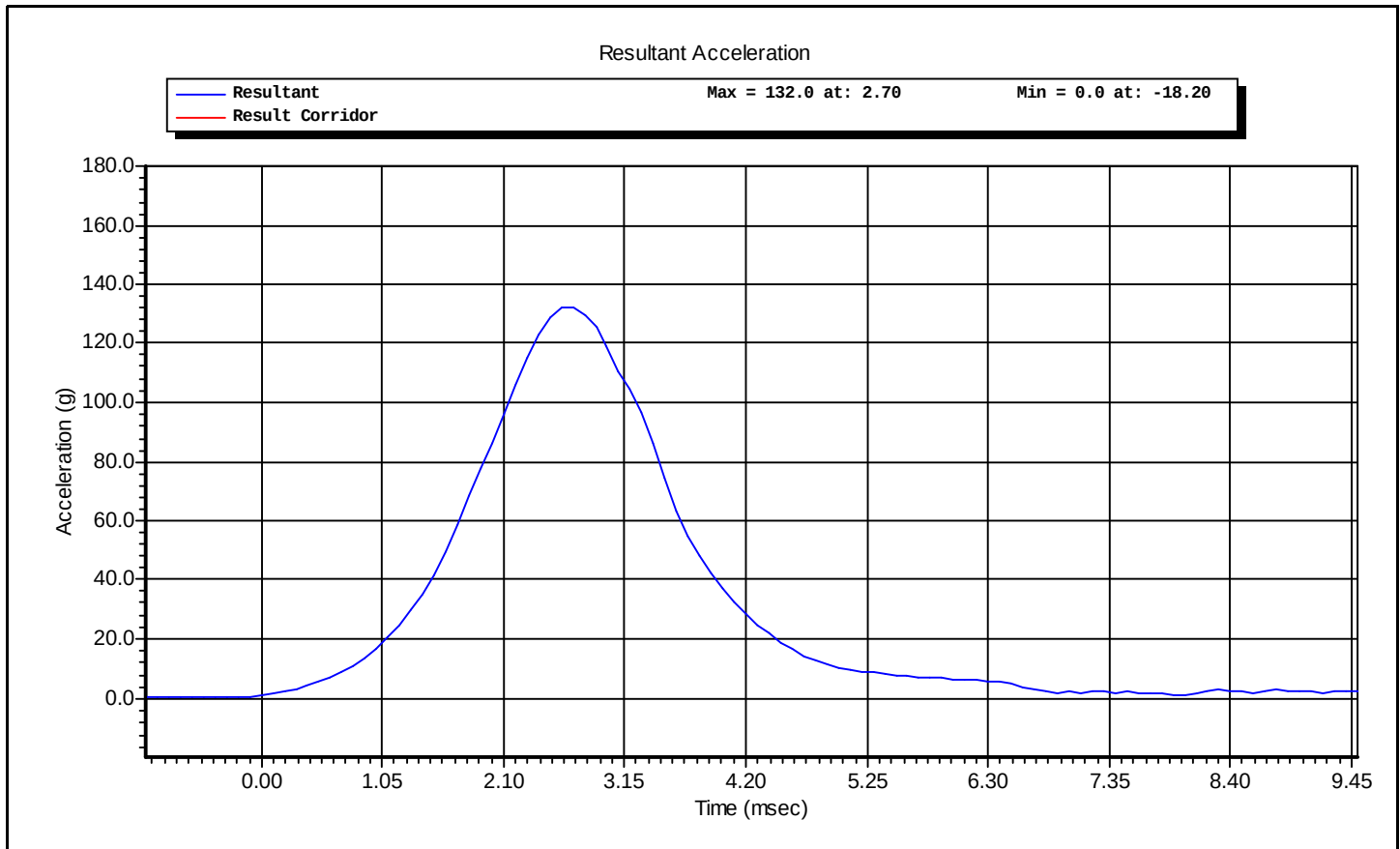


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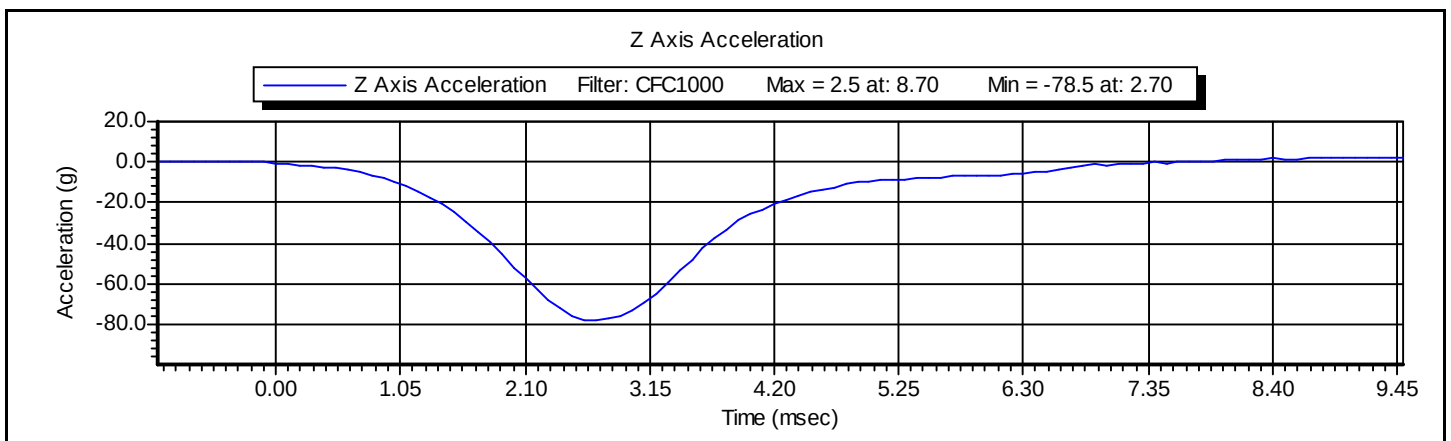
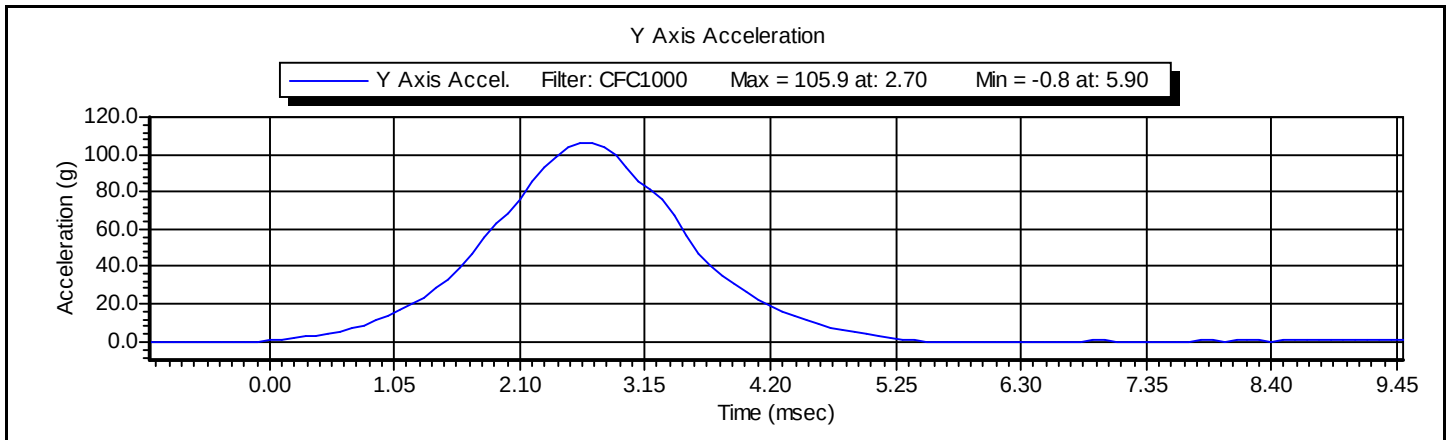
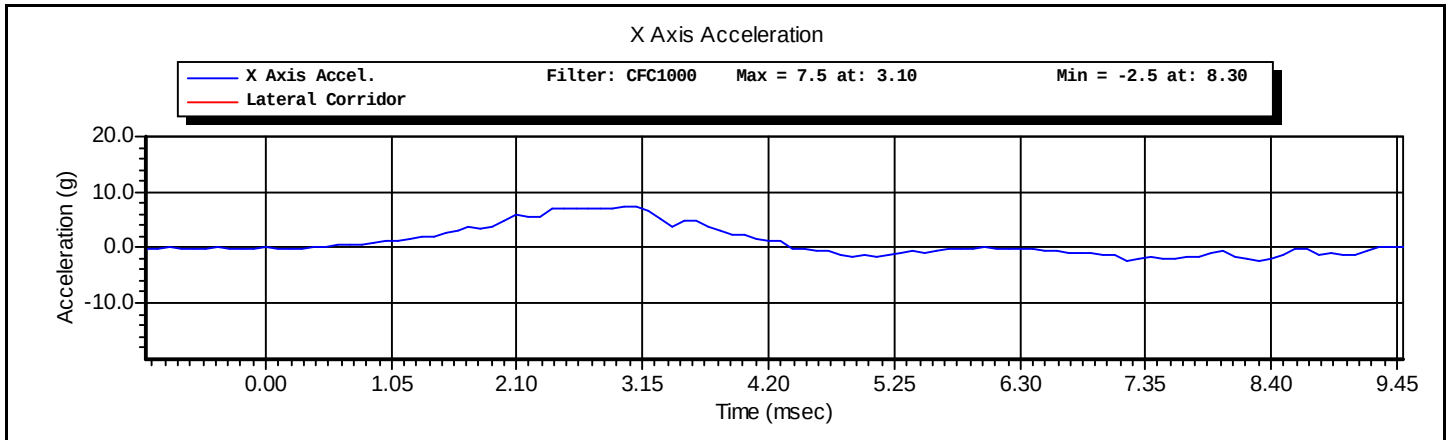
Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Head Drop	Test Date:	9/28/2010
Test Number:	1	Test Time:	4:26:36 PM



Test ID: Head Drop

Test Time: 4:26:36 PM

Test Date: 9/28/2010





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VERIFICATION REPORT

Test Name:	Neck Pendulum	Revision:	8/24/2009
Sub Test Name:	Left Side	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Neck Flexion	Test Date:	9/28/2010
Test Number:	1	Test Time:	3:21:13 PM

Component Part Number	Component Serial Number
Neck - 180-2000	787

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	60 %RH P
Velocity	5.51 -- 5.63	5.55 m/s P
Pendulum Impulse at 10 ms	2.20 -- 2.80	2.57 m/s P
Pendulum Impulse at 15 ms	3.30 -- 4.10	3.80 m/s P
Pendulum Impulse at 20 ms	4.40 -- 5.40	5.24 m/s P
Pendulum Impulse at 25 ms	5.40 -- 6.10	5.86 m/s P
Pendulum Impulse between 25 and 100 ms	5.50 -- 6.20	5.90 m/s P
Max D Plane Rotation	71.0 -- 81.0	74.2 degrees P
Time at Max Rotation	50.0 -- 70.0	60.3 ms P
Moment about OC	-44.0 -- -36.0	-43.5 Nm P
Moment Decay to Zero	102.0 -- 126.0	114.5 ms P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Neck Flexion**

Test Time: **3:21:13 PM**

Test Date: **9/28/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7231CT	C16510	5/10/2010
Denton	1716A	LC-576 Fy	2/15/2010
Denton	1716A	LC-576 Mx	2/15/2010
DentonATD	78051-342	184	4/30/2010
DentonATD	78051-342	174	4/30/2010
DentonATD	78051-342	185	4/30/2010

Test ID: **Neck Flexion**

Test Time: **3:21:13 PM**

Test Date: **9/28/2010**



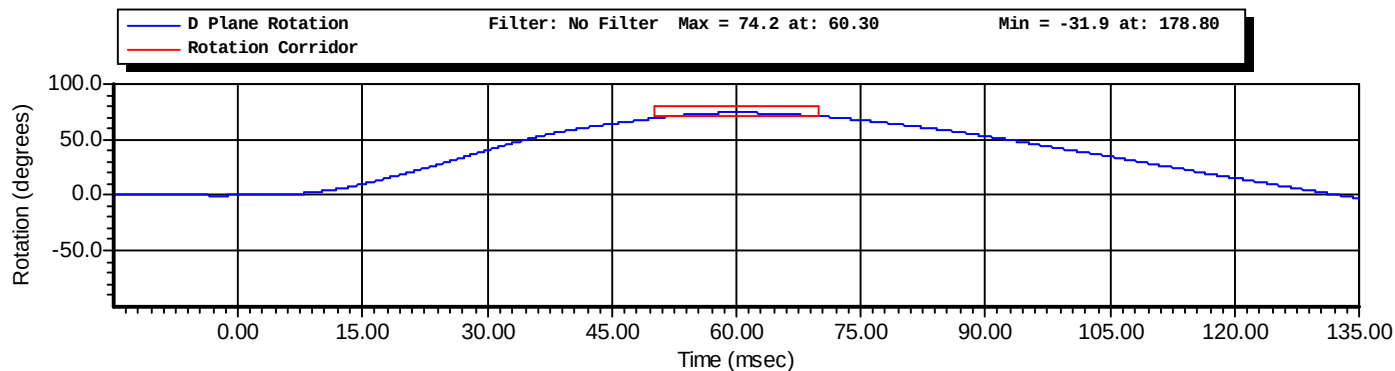
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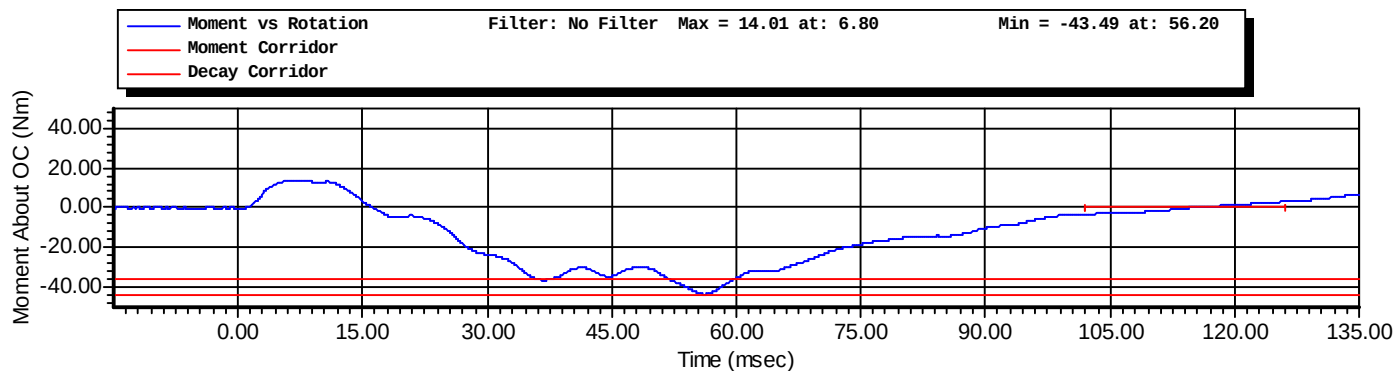
4455 Genesee Street, Buffalo, New York 14225 - Phone (716)632-7500

Test Name:	Neck Pendulum	Revision:	8/24/2009
Sub Test Name:	Left Side	Spec Type:	NHTSA
ATD Type:	SID-IIIs		
ATD Serial Number:	SID 300		
Test ID:	Neck Flexion	Test Date:	9/28/2010
Test Number:	1	Test Time:	3:21:13 PM

D Plane Rotation



Moment About Occipital Condyle

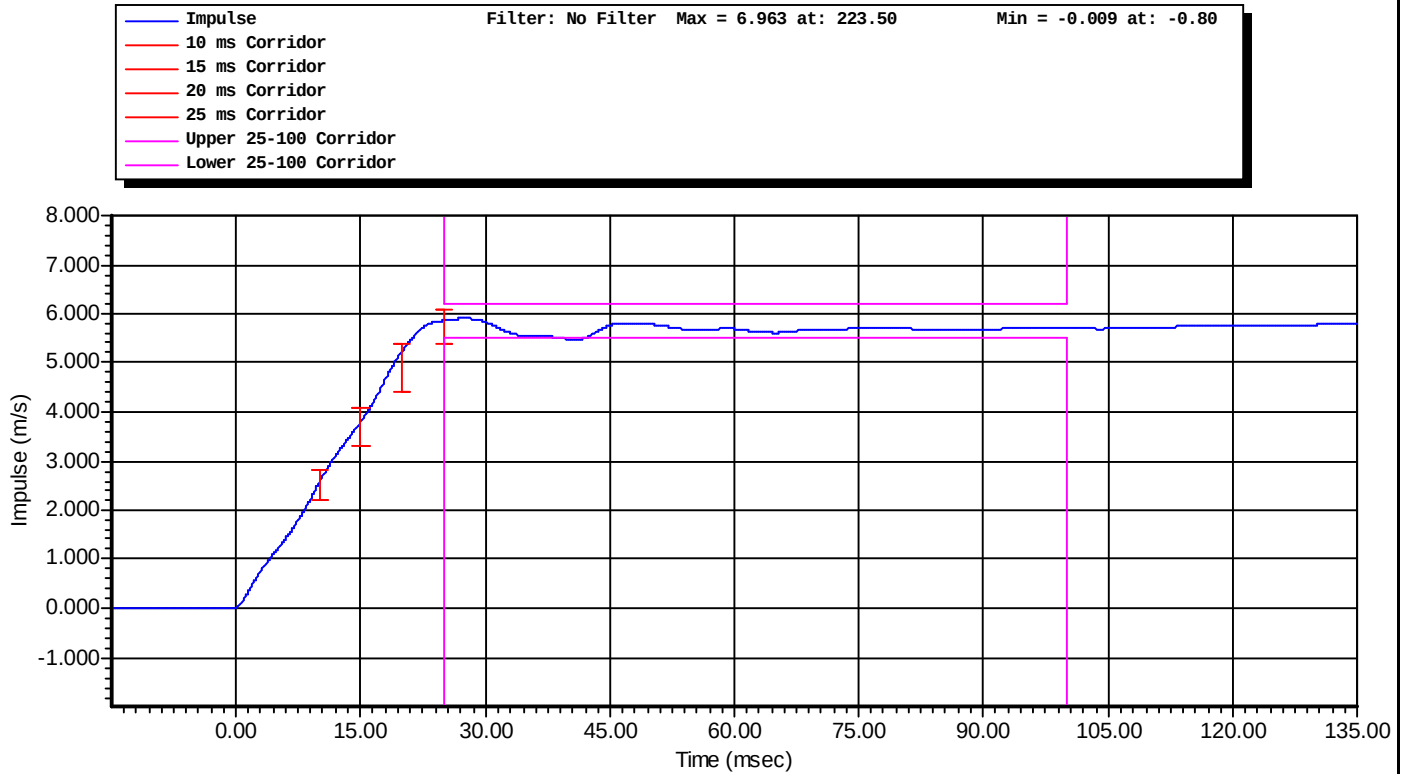


Test ID: Neck Flexion

Test Time: 3:21:13 PM

Test Date: 9/28/2010

Pendulum Impulse





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VERIFICATION REPORT

Test Name:	Shoulder Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Shoulder	Test Date:	10/4/2010
Test Number:	1	Test Time:	2:13:19 PM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.20 deg C P
Humidity	10.0 -- 70.0	41.0 %RH P
Velocity	4.20 -- 4.40	4.33 m/s P
Probe Acceleration	13.0 -- 18.0	16.4 g P
Shoulder Deflection	28.0 -- 37.0	31.8 mm P
T1 Acceleration	17.0 -- 22.0	20.1 g P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____
Supervisor: **D. Travale** Signature: _____

Test ID: **Shoulder**

Test Time: **2:13:19 PM**

Test Date: **10/4/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66927	4/20/2010
Servo	180-3885	DS-1063	4/7/2010
Endevco	7264-2000	P26269	10/1/2010

Test ID: **Shoulder**

Test Time: **2:13:19 PM**

Test Date: **10/4/2010**

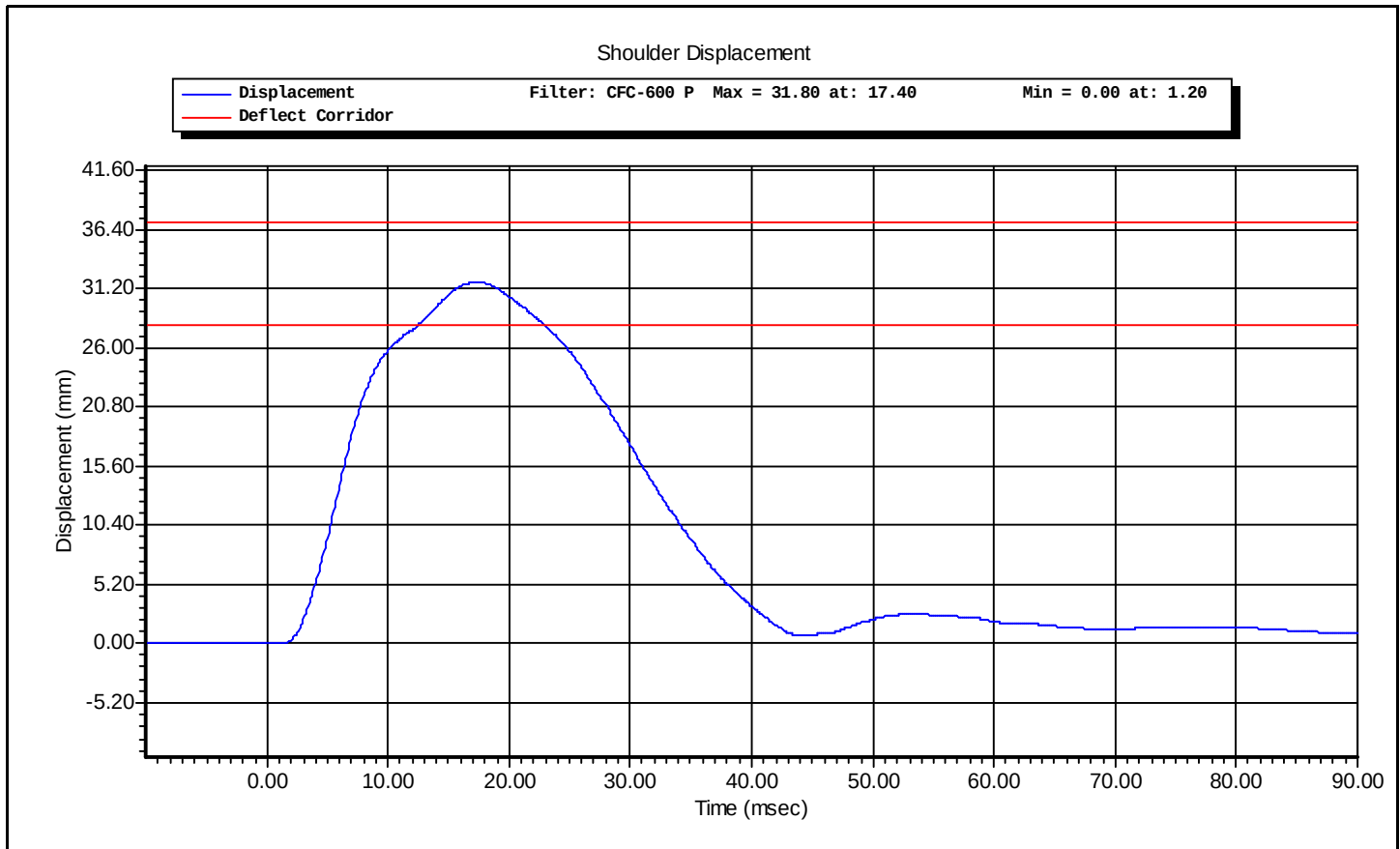


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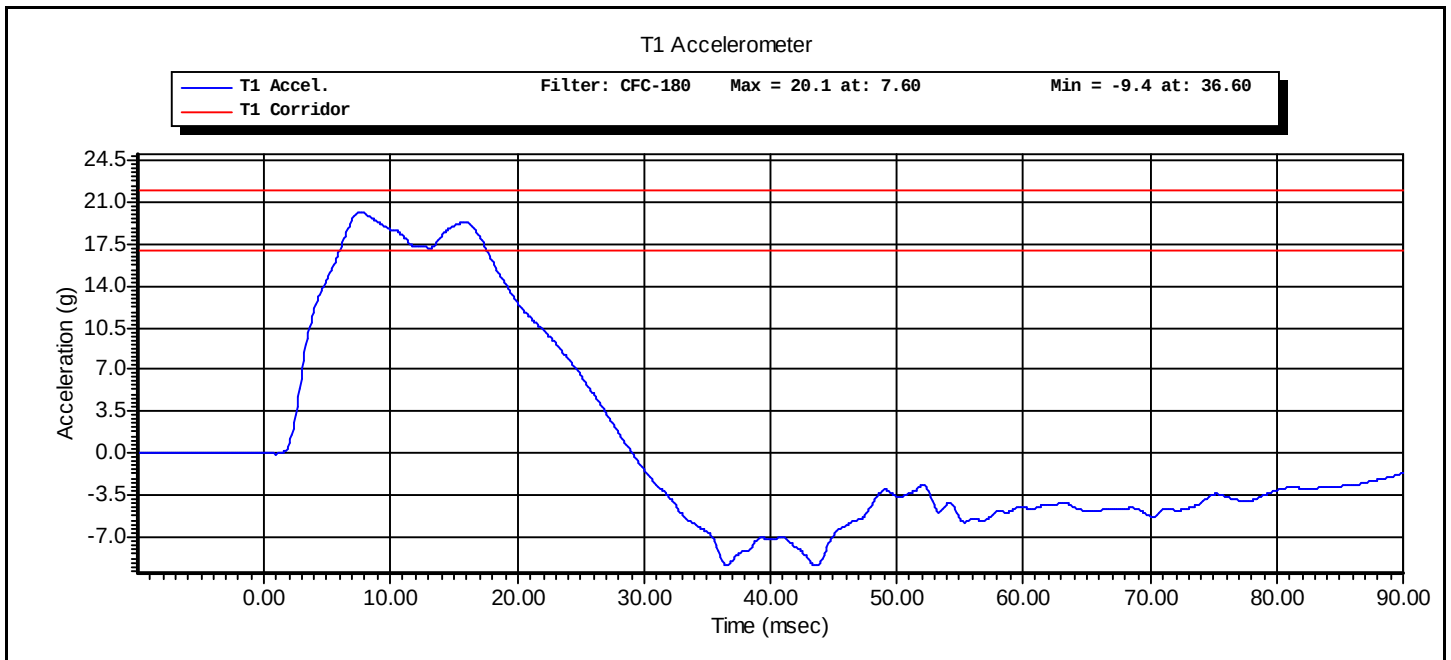
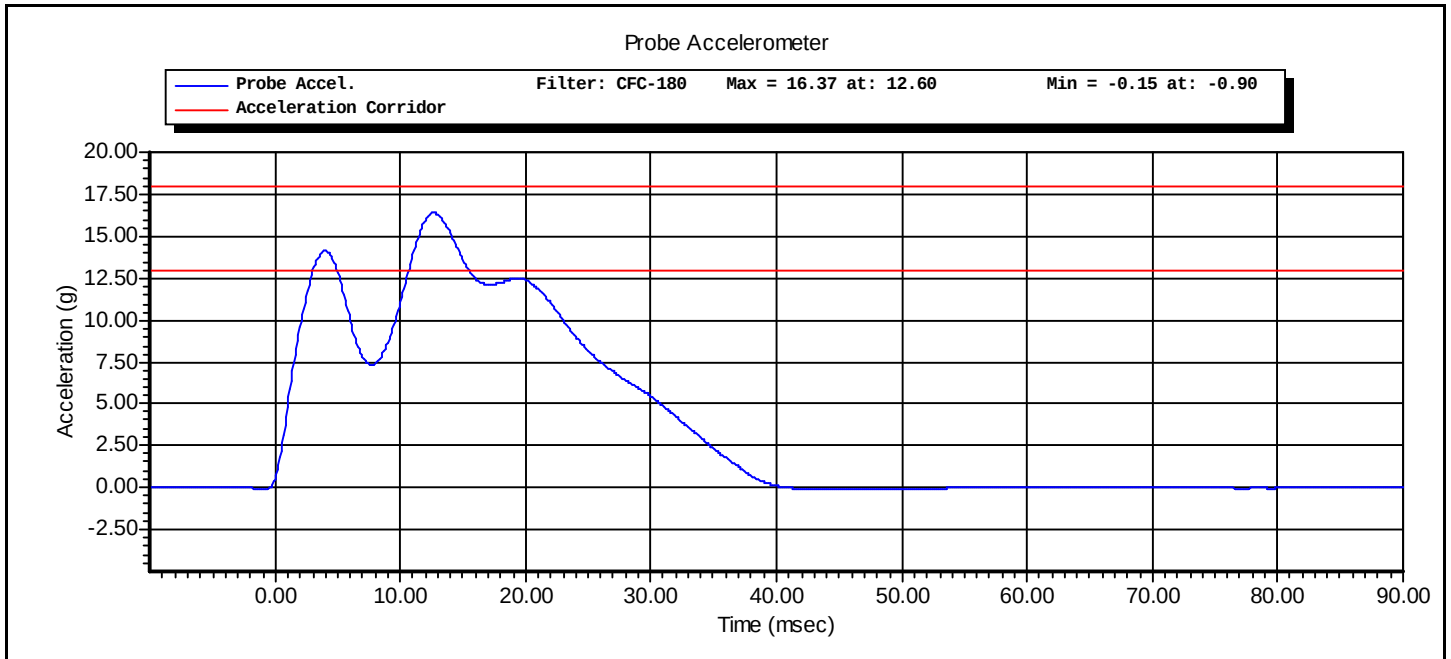
Test Name:	Shoulder Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Shoulder	Test Date:	10/4/2010
Test Number:	1	Test Time:	2:13:19 PM



Test ID: **Shoulder**

Test Time: **2:13:19 PM**

Test Date: **10/4/2010**





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VERIFICATION REPORT

Test Name:	Thorax Impact with Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Thorax With Arm	Test Date:	10/4/2010
Test Number:	1	Test Time:	2:56:40 PM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	22.2 deg C	P
Humidity	10	--	70	41 %RH	P
Velocity	6.60	--	6.80	6.70 m/s	P
Probe Acceleration after 5ms	30.0	--	36.0	34.0 g	P
Upper Thorax Rib Deflection	25.0	--	32.0	26.7 mm	P
Mid Thorax Rib Deflection	30.0	--	36.0	31.3 mm	P
Lower Thorax Rib Deflection	32.0	--	38.0	36.5 mm	P
Upper Spine Acceleration ("y")	34.0	--	43.0	40.6 g	P
Lower Spine Acceleration ("y")	29.0	--	37.0	35.6 g	P
Shoulder Deflection	31.0	--	40.0	36.7 mm	P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____
Supervisor: **D. Travale** Signature: _____

Test ID: **Thorax With Arm** Test Time: **2:56:40 PM**

Test Date: **10/4/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66927	4/20/2010
Servo	180-3885	DS-1121	4/7/2010
Servo	180-3885	DS-1151	4/7/2010
Servo	180-3885	DS-1156	4/7/2010
Endevco	7264-2000	P26269	10/1/2010
Endevco	7264-2000	P64147	9/20/2010
Servo	180-3885	DS-1063	4/7/2010

Test ID: **Thorax With Arm** Test Time: **2:56:40 PM**

Test Date: **10/4/2010**

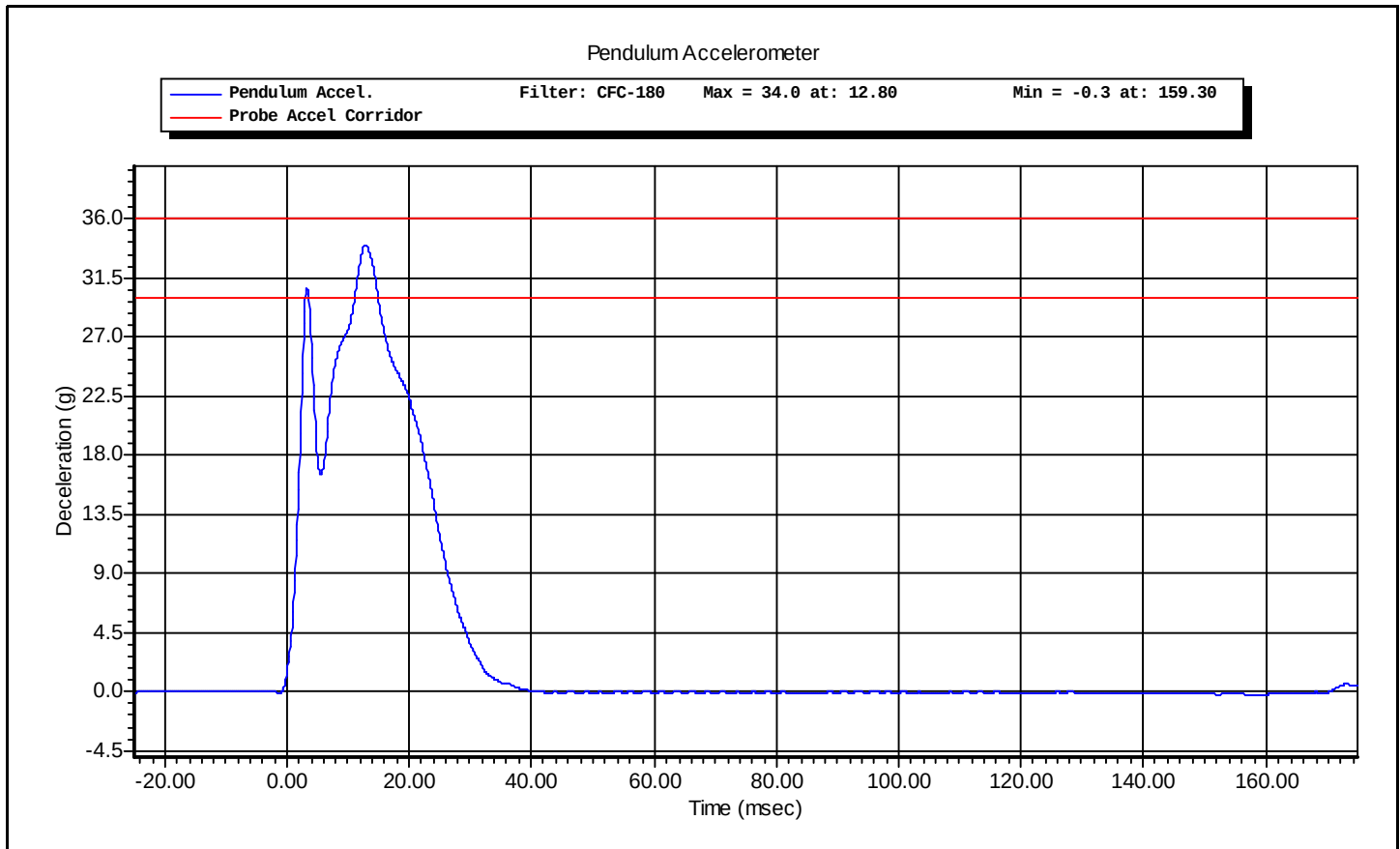


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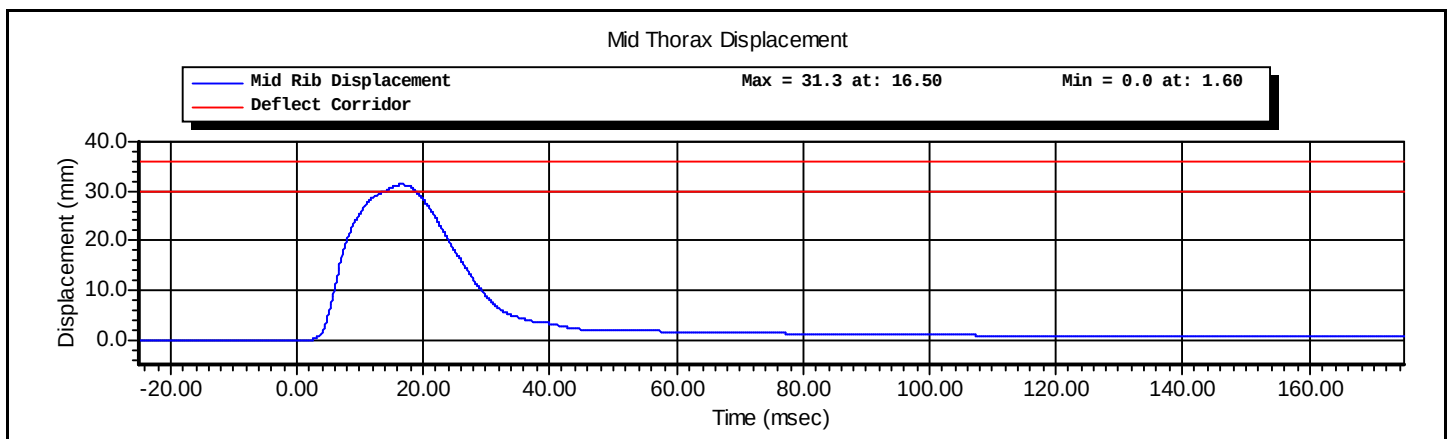
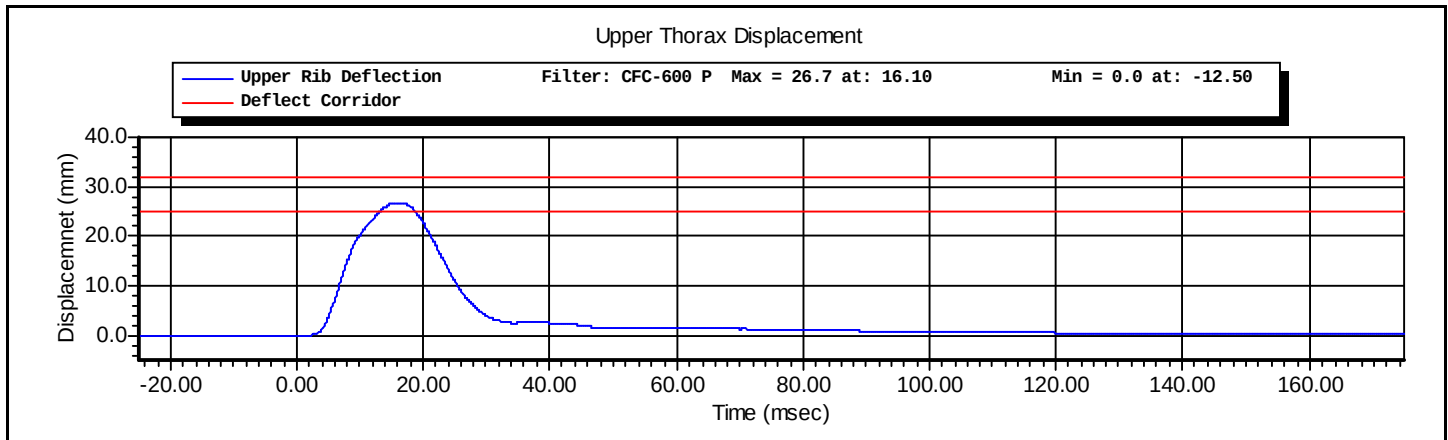
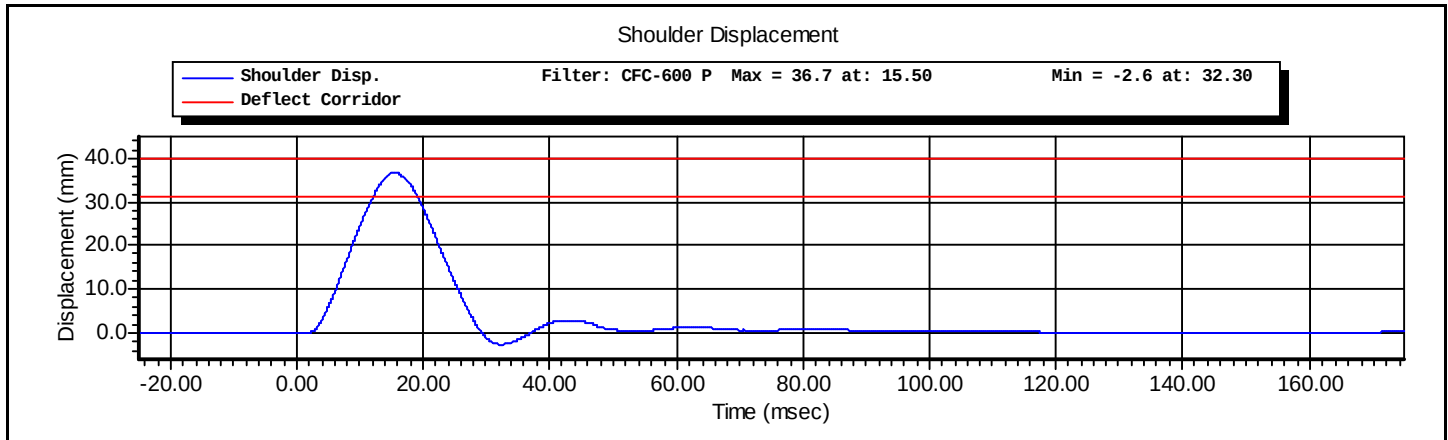
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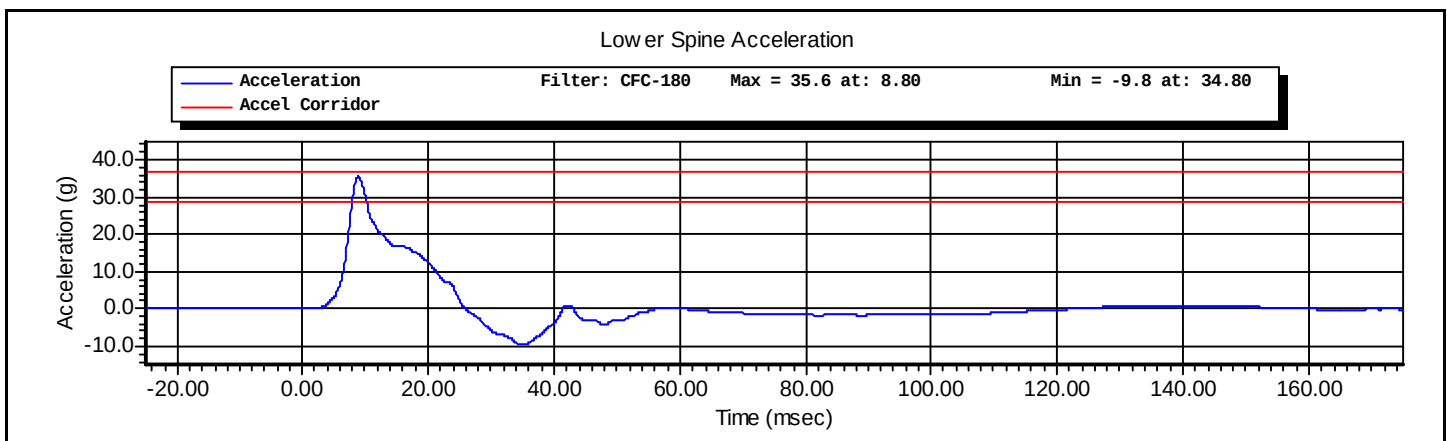
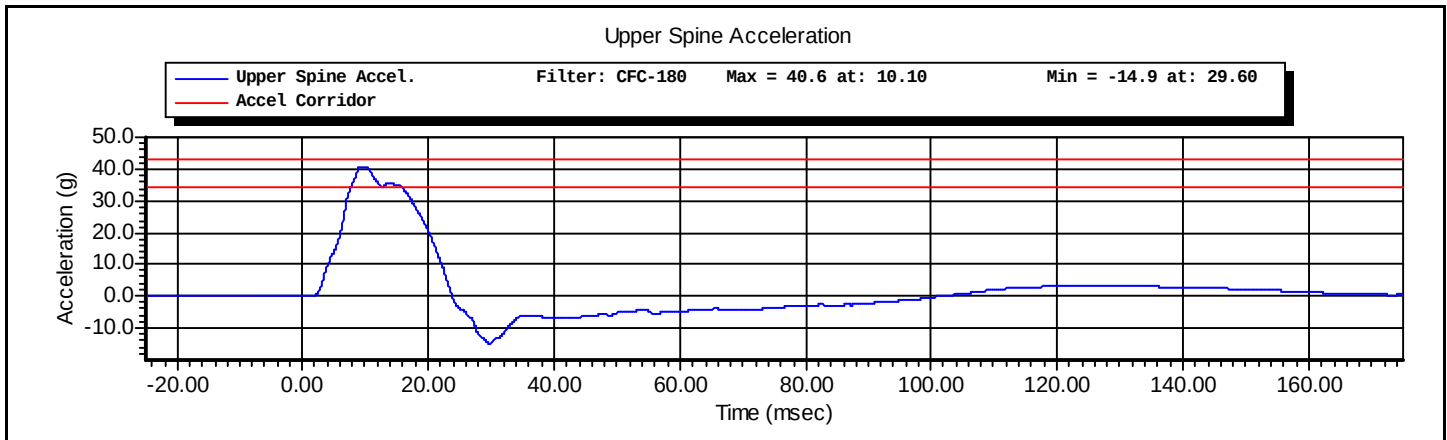
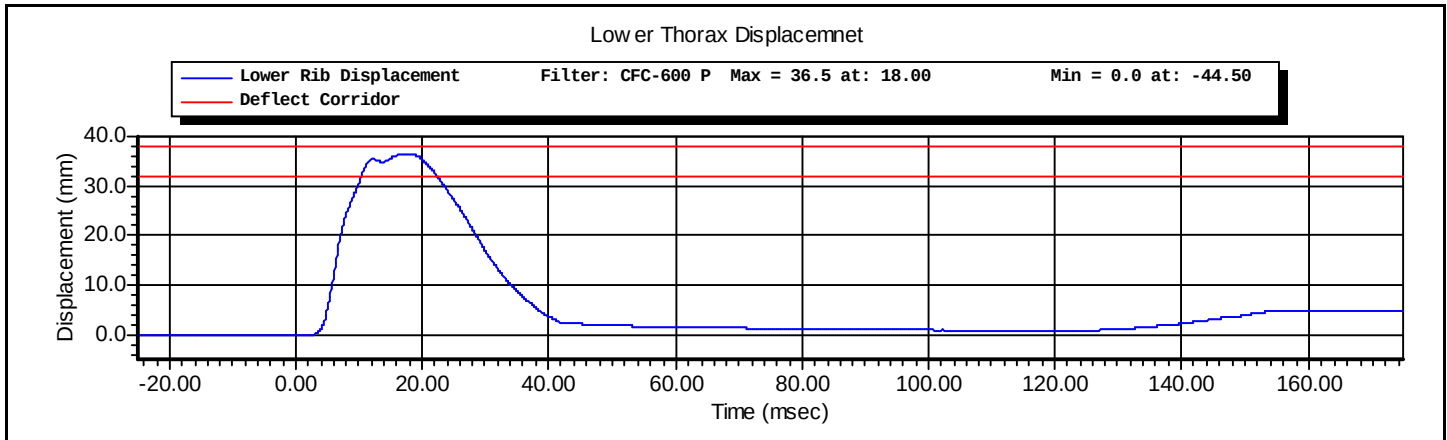
Test Name:	Thorax Impact with Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Thorax With Arm	Test Date:	10/4/2010
Test Number:	1	Test Time:	2:56:40 PM



Test ID: **Thorax With Arm** Test Time: **2:56:40 PM**

Test Date: **10/4/2010**







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VERIFICATION REPORT

Test Name:	Thorax Impact without Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Thorax Without Arm	Test Date:	10/4/2010
Test Number:	1	Test Time:	2:01:13 PM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	22.2 deg C	P
Humidity	10	--	70	40 %RH	P
Velocity	4.20	--	4.40	4.35 m/s	P
Probe Acceleration	14.0	--	18.0	16.0 g	P
Upper Thorax Rib Deflection	32.0	--	40.0	35.8 mm	P
Mid Thorax Rib Deflection	39.0	--	45.0	41.2 mm	P
Lower Thorax Rib Deflection	35.0	--	43.0	40.9 mm	P
Upper Spine Acceleration T1	13.0	--	17.0	16.1 g	P
Lower Spine Acceleration T12	7.0	--	11.0	10.3 g	P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____
Supervisor: **D. Travale** Signature: _____

Test ID: **Thorax Without Arm** Test Time: **2:01:13 PM**

Test Date: **10/4/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66927	4/20/2010
Servo	180-3885	DS-1121	4/7/2010
Servo	180-3885	DS-1151	4/7/2010
Servo	180-3885	DS-1156	4/7/2010
Endevco	7264-2000	P26269	10/1/2010
Endevco	7264-2000	P64147	9/20/2010

Test ID: **Thorax Without Arm** Test Time: **2:01:13 PM**

Test Date: **10/4/2010**

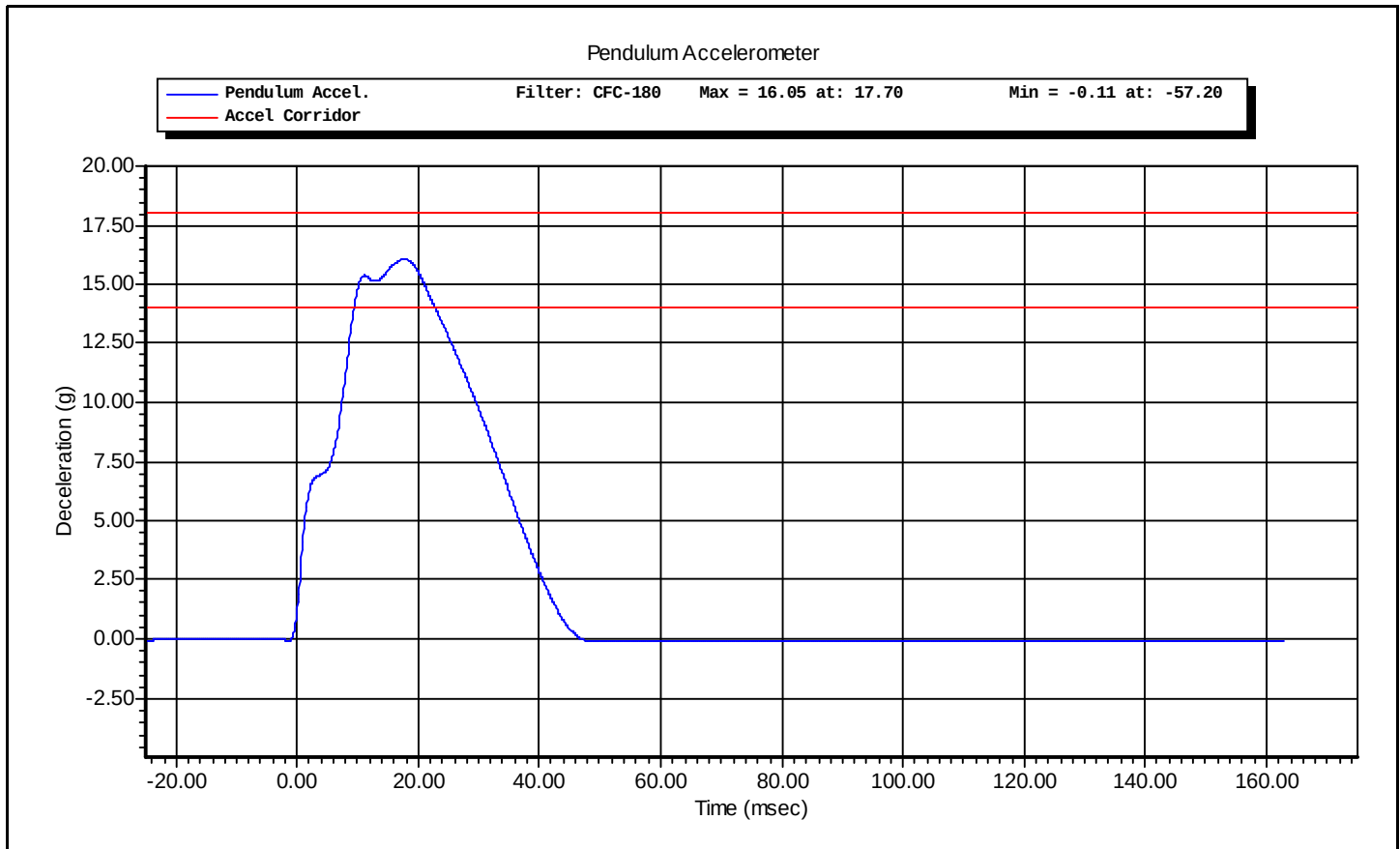


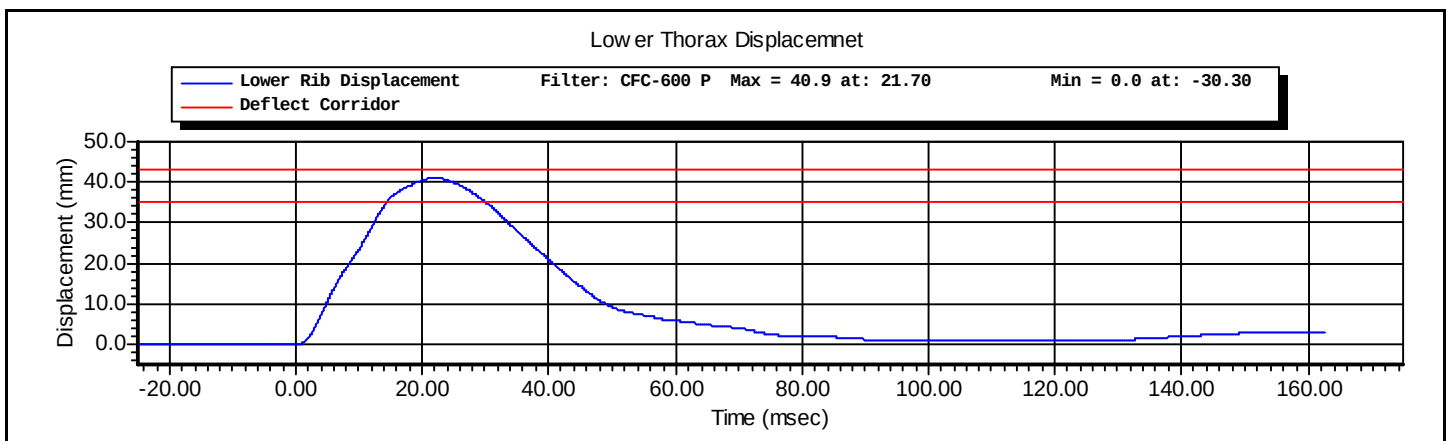
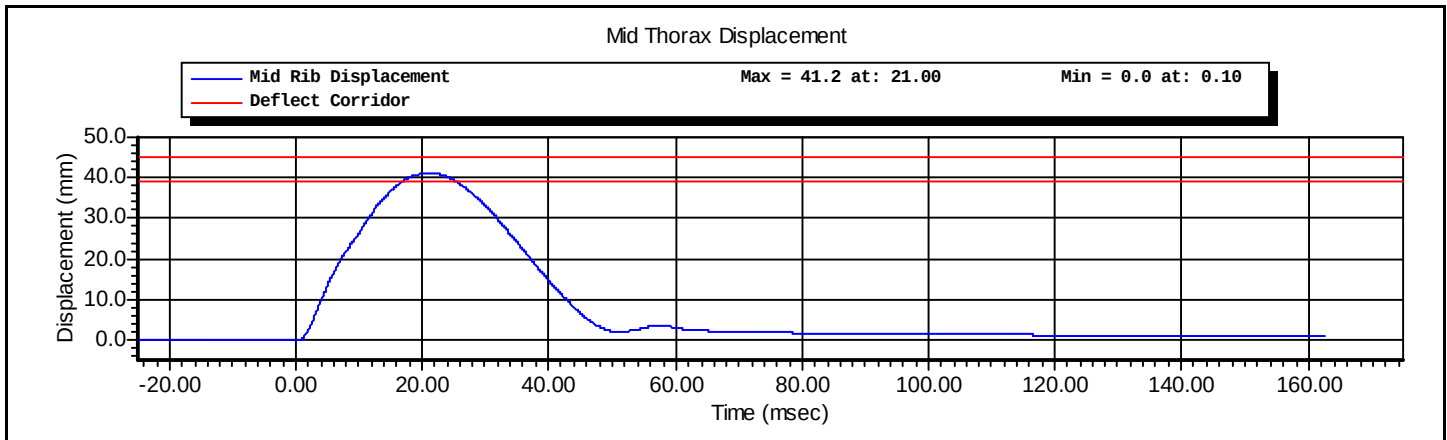
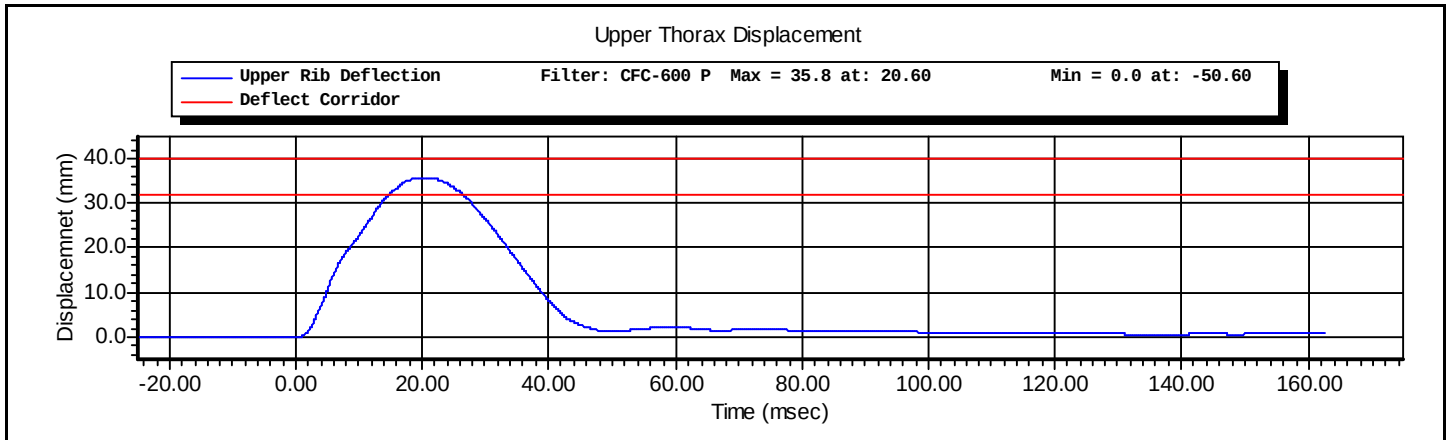
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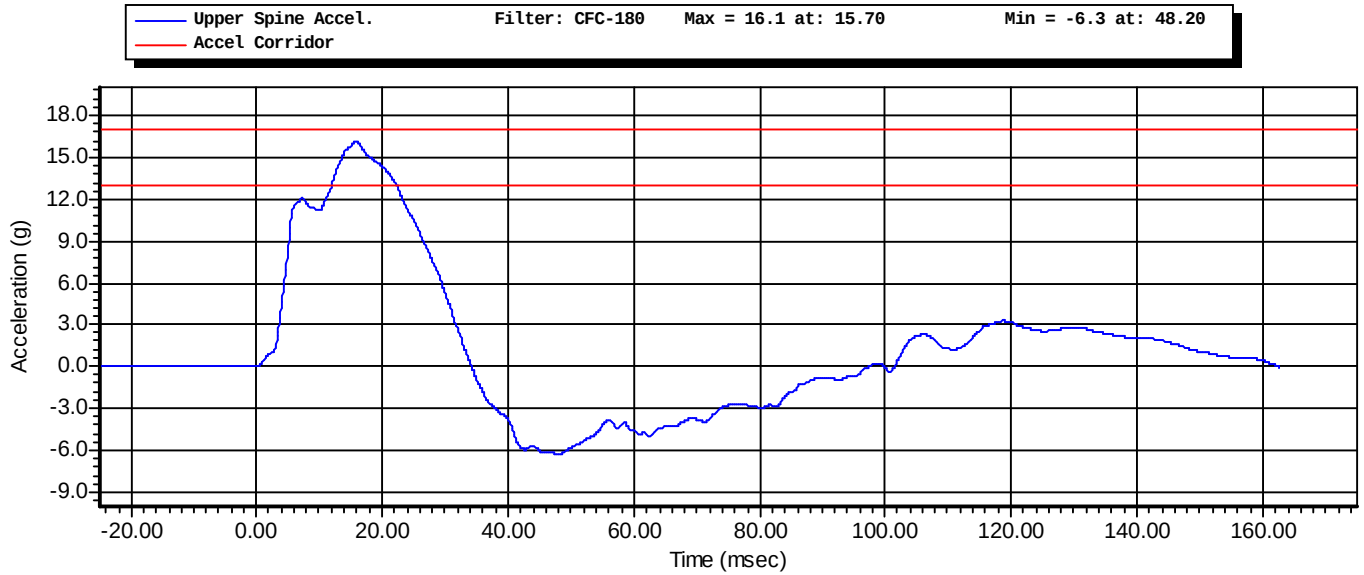
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Test Name:	Thorax Impact without Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Thorax Without Arm	Test Date:	10/4/2010
Test Number:	1	Test Time:	2:01:13 PM

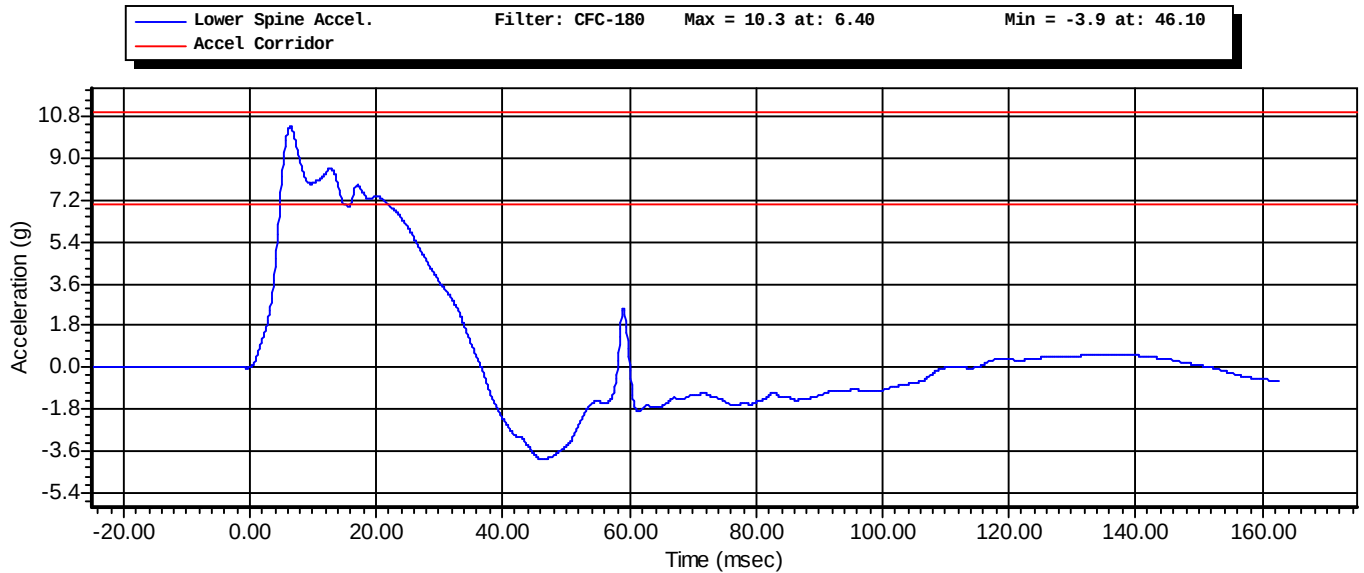




Upper Spine Acceleration



Lower Spine Acceleration





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VERIFICATION REPORT

Test Name:	Abdominal Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Abdomen	Test Date:	10/4/2010
Test Number:	1	Test Time:	2:37:39 PM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	22.2 deg C	P
Humidity	10	--	70	42 %RH	P
Velocity	4.20	--	4.40	4.35 m/s	P
Probe Acceleration	12.0	--	16.0	15.5 g	P
Upper Abdominal Rib Deflection	36.0	--	47.0	39.6 mm	P
Lower Abdominal Rib Deflection	33.0	--	44.0	34.4 mm	P
Lower Spine Acceleration - T12	9.0	--	14.0	12.7 g	P

All test parameters are within specifications

Technician: **A Rudniski** Signature: _____
Supervisor: **D. Travale** Signature: _____

Test ID: **Abdomen**

Test Time: **2:37:39 PM**

Test Date: **10/4/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66927	4/20/2010
Servo	180-3885	DS-1162	4/7/2010
Servo	180-3885	DS-1232	4/7/2010
Endevco	7264-2000	P64147	9/20/2010

Test ID: **Abdomen**

Test Time: **2:37:39 PM**

Test Date: **10/4/2010**



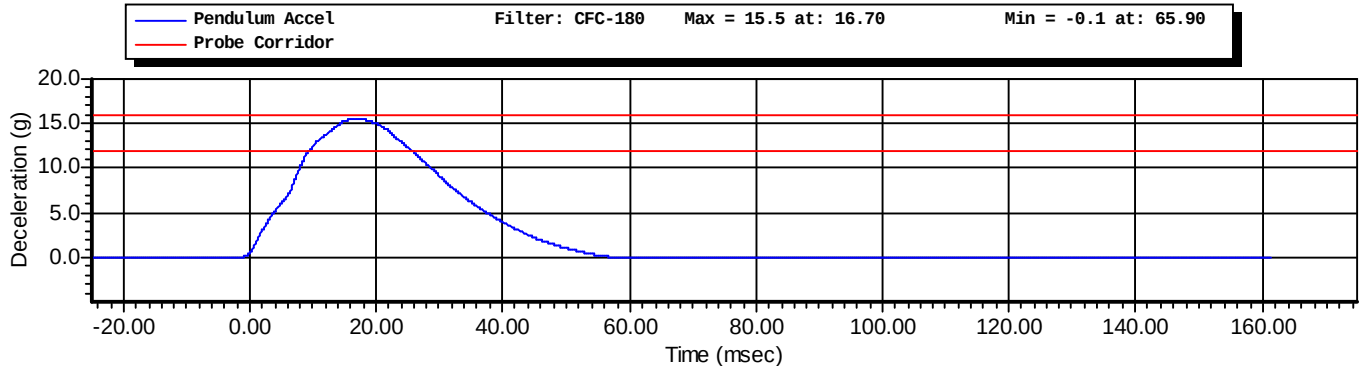
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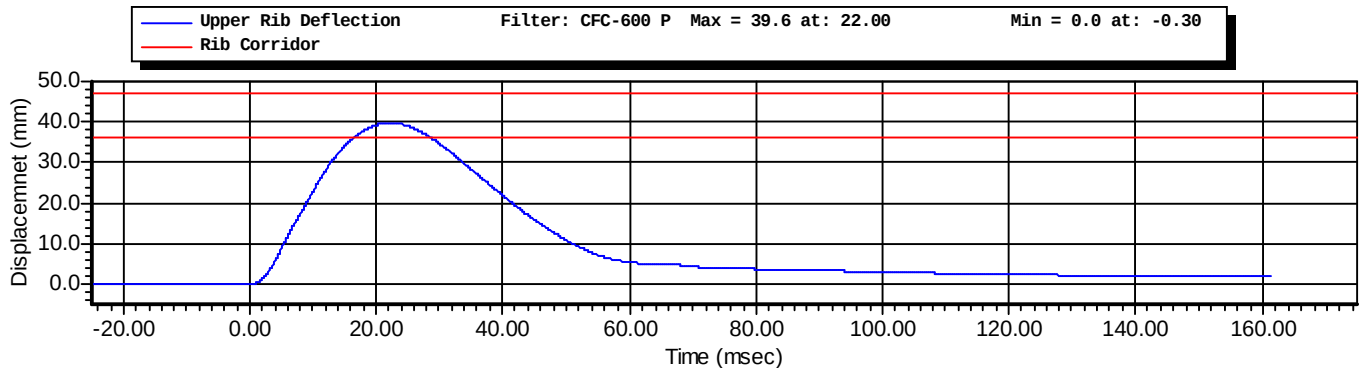
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Test Name:	Abdominal Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Abdomen	Test Date:	10/4/2010
Test Number:	1	Test Time:	2:37:39 PM

Pendulum Accelerometer



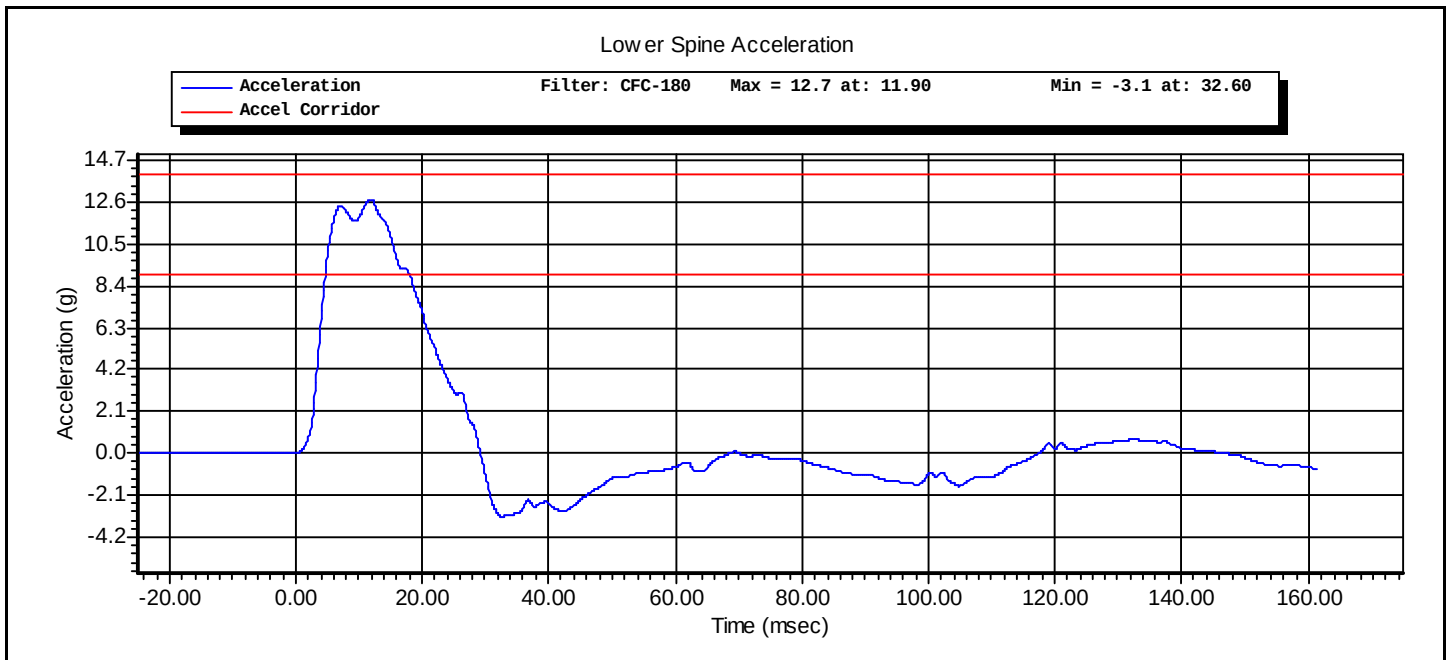
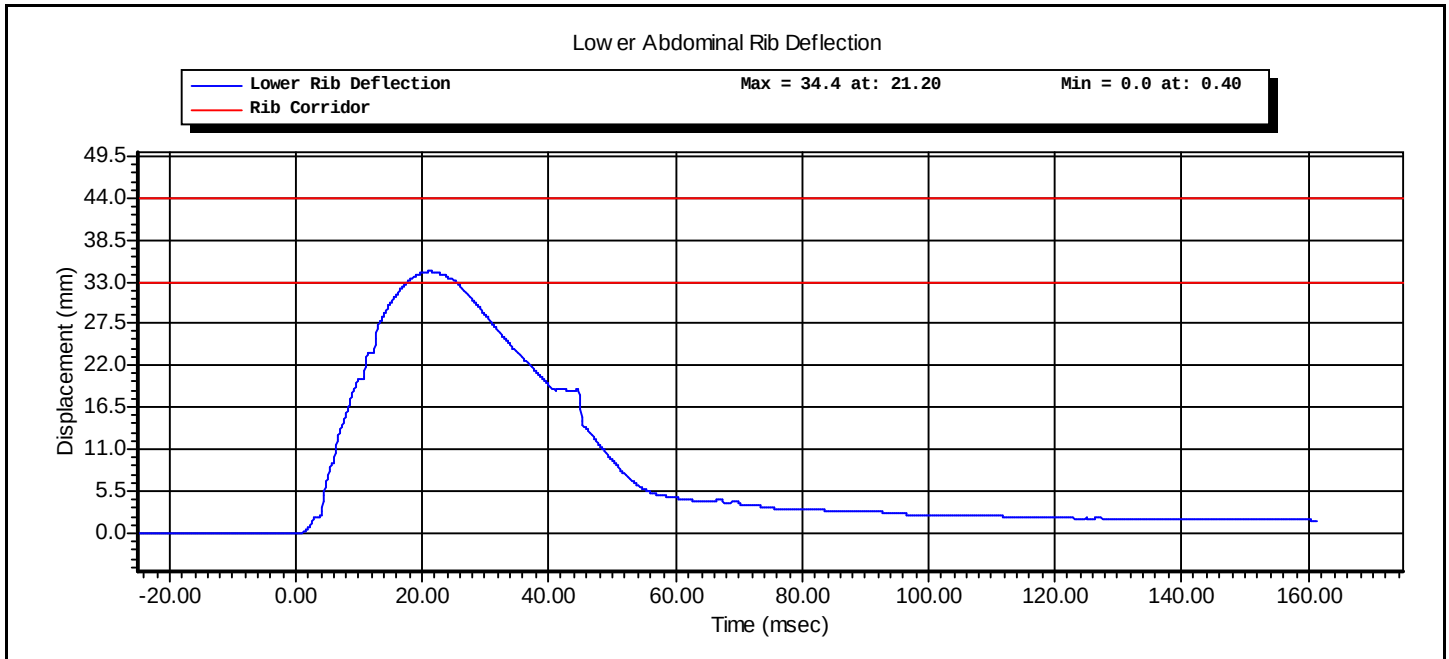
Upper Abdominal Rib Deflection



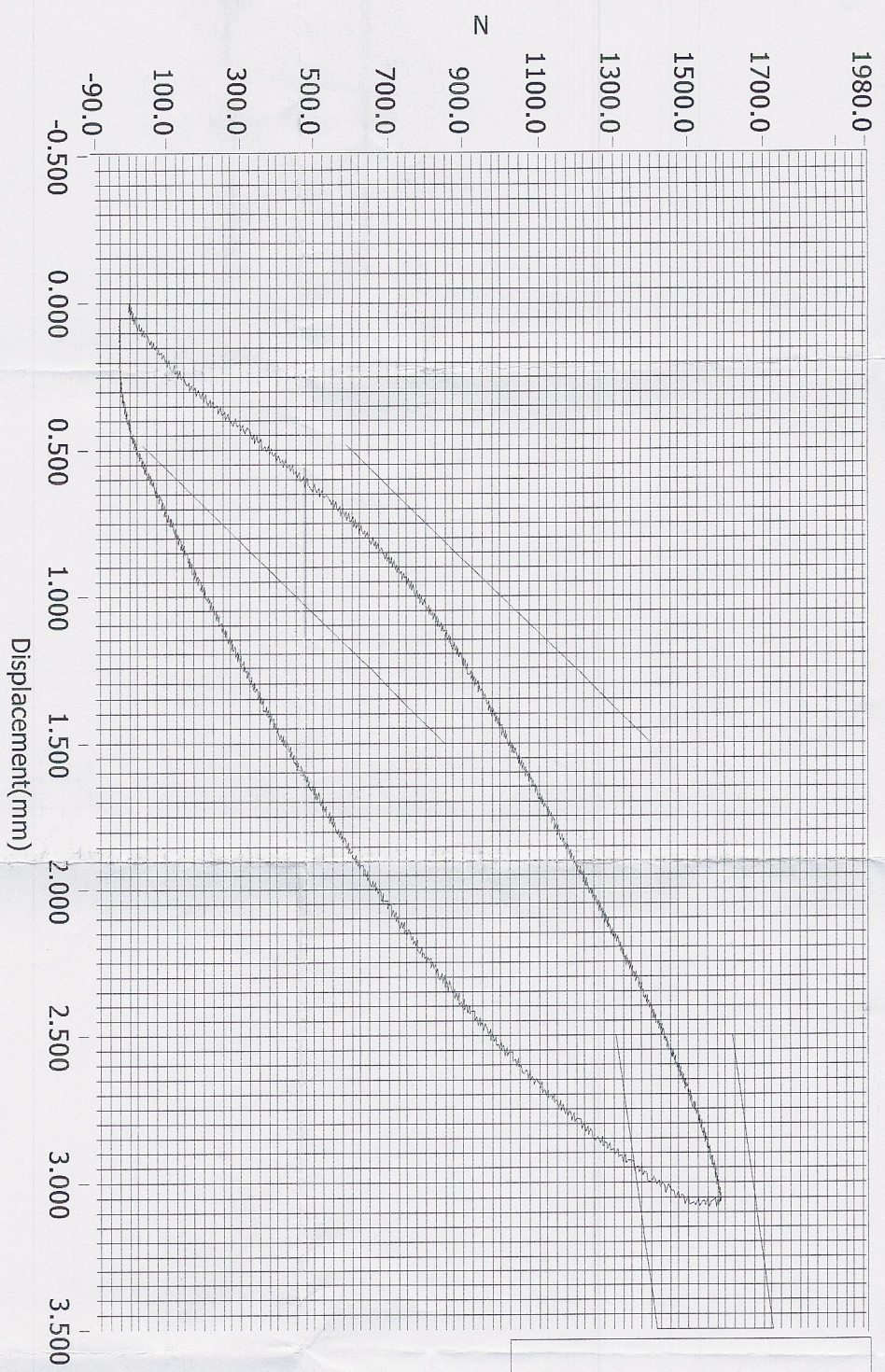
Test ID: **Abdomen**

Test Time: **2:37:39 PM**

Test Date: **10/4/2010**



Resultant Data - SIDIIs Plug Compression



Loading Curve	<
Boundary Limit Upper	<
Boundary Limit Lower	<
Peak Load Upper	<
Peak Load Lower	<
Peak Defl Upper	<
Peak Defl Lower	<

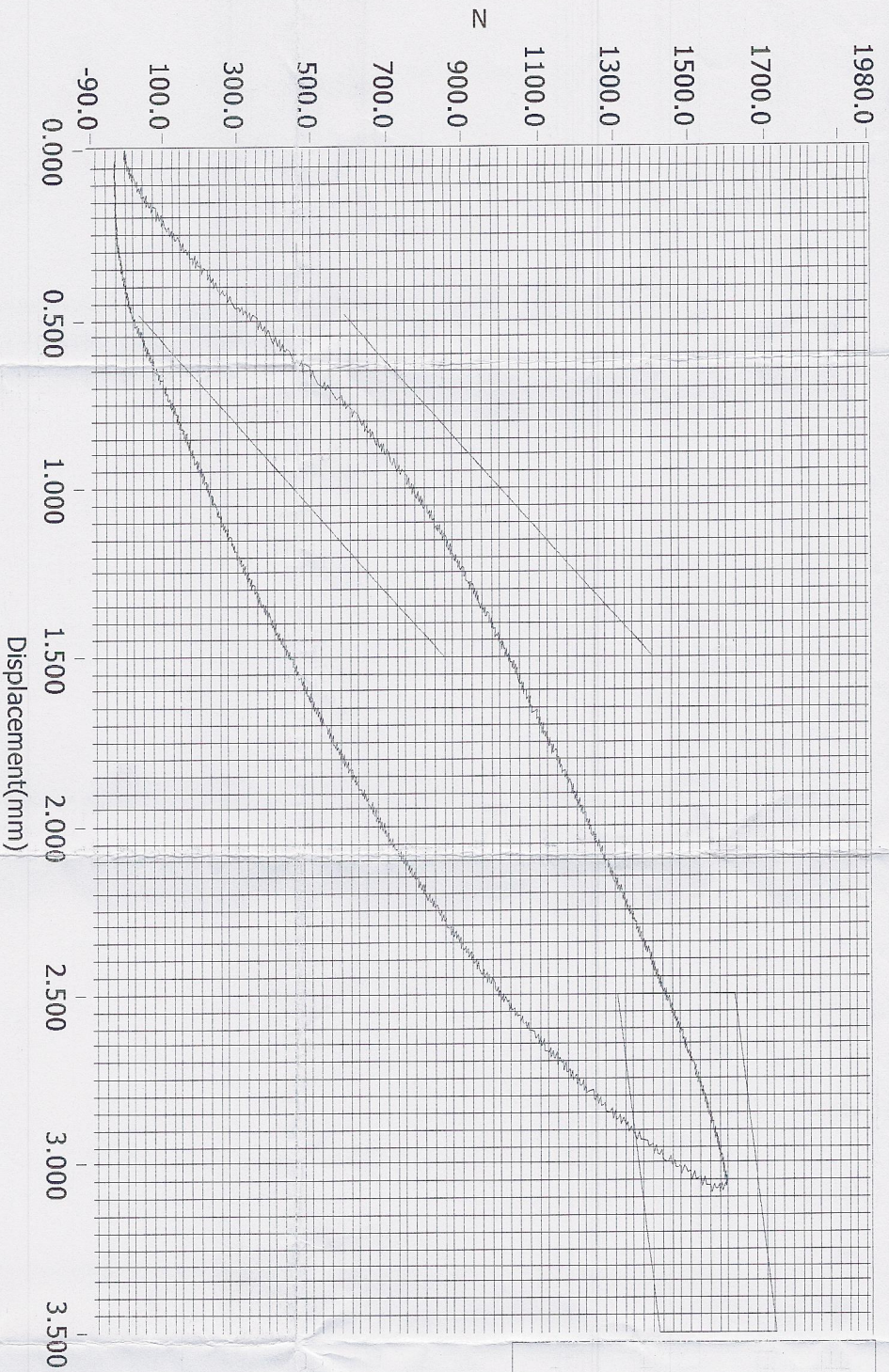
ATD Calibration Lab

Test ID	Part Serial Number	Test Date	Test Time
Cert ID	ATD Serial Number	ATD Type	
	11997	SIDIIs	

Current Date : 6/26/2007

Current Time : 16:15:40

Resultant Data - SIDIIs Plug Compression



Loading Curve	<
Boundary Limit Upper	<
Boundary Limit Lower	<
Peak Load Upper	<
Peak Load Lower	<
Peak Defl Upper	<
Peak Defl Lower	<

ATD Calibration Lab

Test ID

Part Serial Number

Test Date

Test Time

Cert ID

ATD Serial Number

ATD Type

11858

SIDIIs

Current Date : 6/22/2007

Current Time : 13:51:58

FS



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VERIFICATION REPORT

Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Acetabulum Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Acetabulum	Test Date:	10/4/2010
Test Number:	1	Test Time:	11:44:25 AM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	39 %RH P
Velocity	6.60 -- 6.80	6.62 m/s P
Peak Probe Acceleration	38.0 -- 47.0	45.7 g P
Peak Pelvis Acceleration	34.0 -- 42.0	41.4 g P
Peak Acetabulum Force	3.60 -- 4.30	4.22 kN P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____
Supervisor: **D. Travale** Signature: _____

Test ID: **Acetabulum**

Test Time: **11:44:25 AM**

Test Date: **10/4/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66927	4/20/2010
Endevco	7264-2000	P51671	4/12/2010
DentonATD	3249J	LC-275a	4/12/2010

Test ID: **Acetabulum**

Test Time: **11:44:25 AM**

Test Date: **10/4/2010**



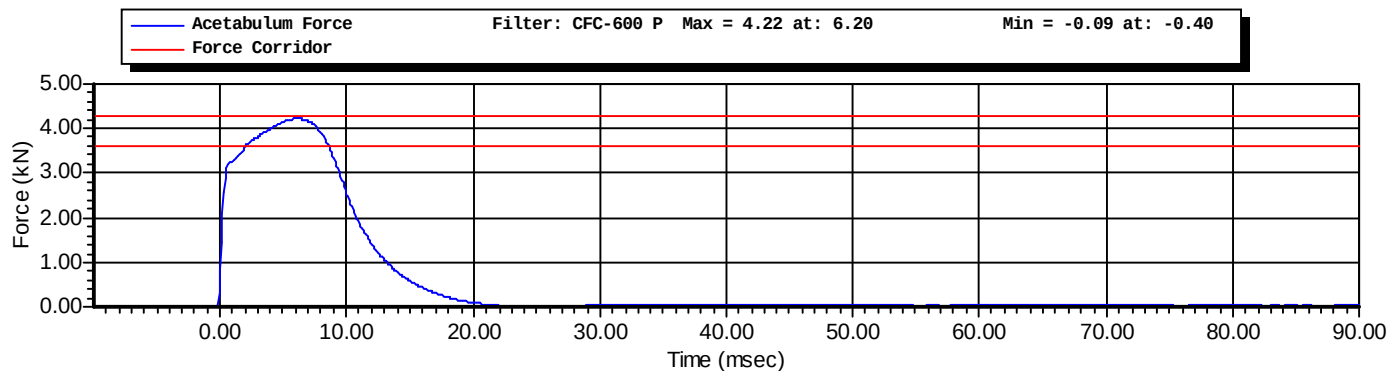
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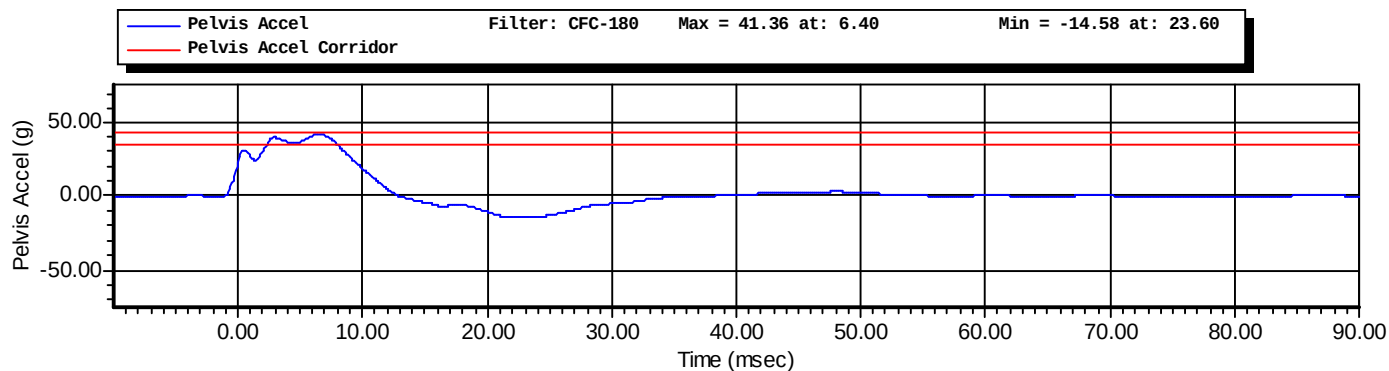
4455 Genesee Street, Buffalo, New York 14225 - Phone (716)632-7500

Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Acetabulum Impact	Spec Type:	NHTSA
ATD Type:	SID-IIIs		
ATD Serial Number:	SID 300		
Test ID:	Acetabulum	Test Date:	10/4/2010
Test Number:	1	Test Time:	11:44:25 AM

Acetabulum Force



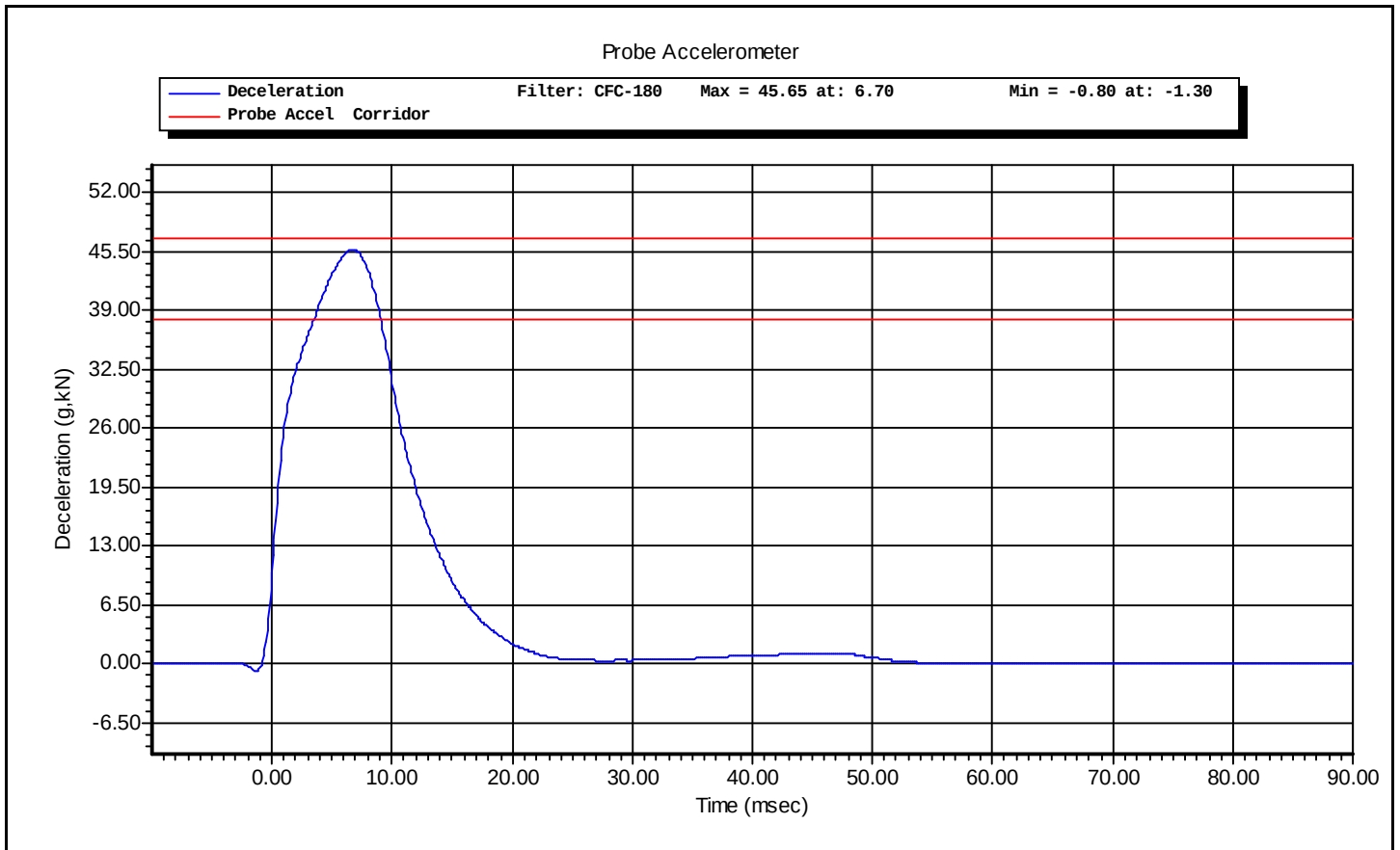
Pelvis Accelerometer



Test ID: **Acetabulum**

Test Time: **11:44:25 AM**

Test Date: **10/4/2010**





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VERIFICATION REPORT

Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Iliac Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID-300		
Test ID:	Pelvis Iliac	Test Date:	10/4/2010
Test Number:	2	Test Time:	11:12:17 AM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	39 %RH P
Velocity	4.20 -- 4.40	4.27 m/s P
Peak Probe Acceleration	36.0 -- 45.0	42.1 g P
Peak Pelvis Acceleration	28.0 -- 39.0	38.2 g P
Peak Iliac Force	4.10 -- 5.10	4.81 kN P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____
Supervisor: **D. Travale** Signature: _____

Test ID: **Pelvis Iliac**

Test Time: **11:12:17 AM**

Test Date: **10/4/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66927	4/20/2010
Endevco	7264-2000	P51671	4/12/2010
DentonATD	3228J	LC-279 Fy	4/12/2010

Test ID: **Pelvis Illiac**

Test Time: **11:12:17 AM**

Test Date: **10/4/2010**

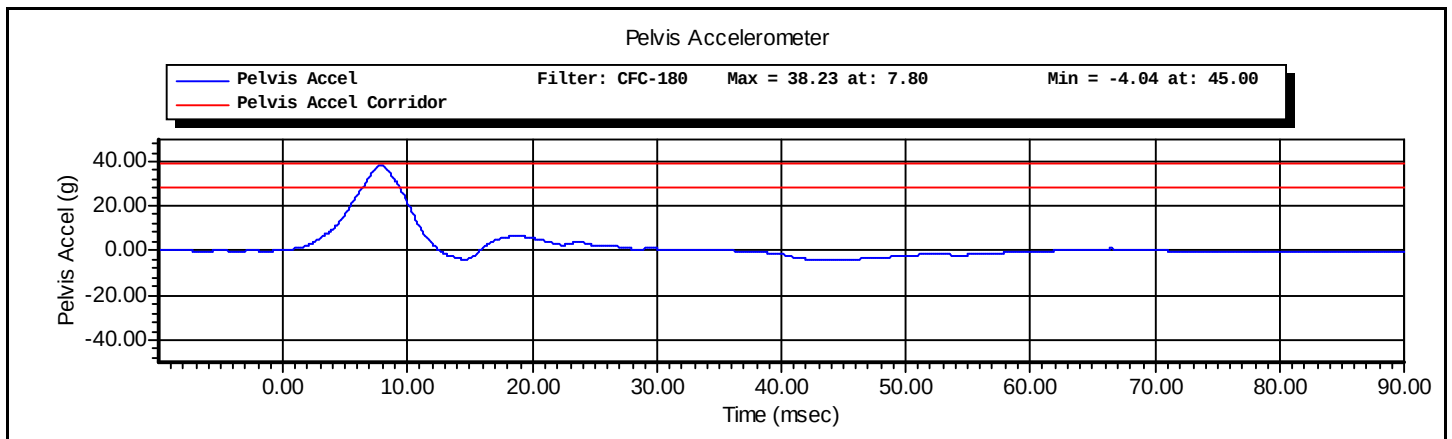
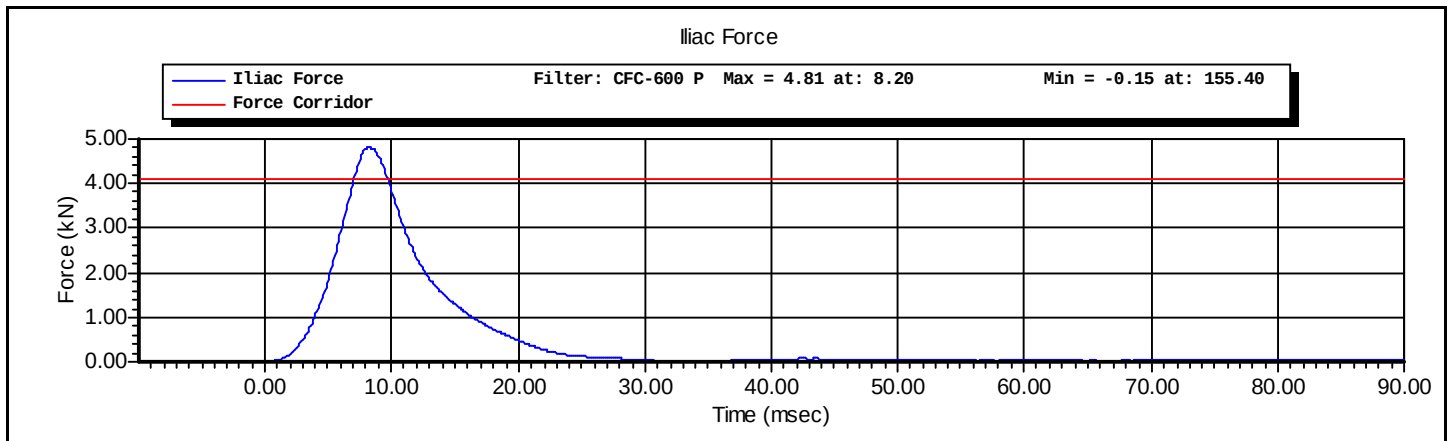


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Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Iliac Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID-300		
Test ID:	Pelvis Iliac	Test Date:	10/4/2010
Test Number:	2	Test Time:	11:12:17 AM



Test ID: **Pelvis Iliac**

Test Time: **11:12:17 AM**

Test Date: **10/4/2010**

