

REPORT NUMBER: SNCAP-CAL-11-013

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

**General Motors Corporation
2011 Chevrolet Silverado
Extended Cab**

NHTSA NUMBER: MB0116

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



November 17, 2010

FINAL REPORT

**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF CRASHWORTHINESS STANDARDS
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WASHINGTON, D.C. 20590**

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Prepared by: _____
Bethany Koetje, Project Engineer

Date: _____

Approved by: _____
David Travale, Program Manager
Transportation Sciences Center

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° Moving Deformable Barrier NCAP Side Impact Test was conducted on the subject 2011 Chevrolet Silverado Extended Cab 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 9/24/2010. The impact velocity of the Moving Deformable Barrier (MDB) was 62.0 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 404 mm at level 2. The test vehicle's performance was as follows: <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th colspan="2"></th> <th colspan="2" 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;">36.6</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;">13.5</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;">641.0</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;">-1605.2</td> </tr> </tbody> </table> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th colspan="2"></th> <th colspan="2" 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;">68.8</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;">Ch. Lost</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;">1405.7</td> </tr> </tbody> </table>						Driver ATD (ES-2re)		Measurement Description	Units	Threshold	Result	Head Injury Criteria (HIC ₃₆)	N/A	1000	36.6	Maximum Chest Deflection	mm	44	13.5	Total Abdominal Force	N	2500	641.0	Pubic Symphysis Force	N	6000	-1605.2			Passenger ATD (SID-IIs)		Measurement Description	Units	Threshold	Result	Head Injury Criteria (HIC ₃₆)	N/A	1000	68.8	Lower Spine Resultant Acceleration	G	82	Ch. Lost	Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	1405.7
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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 2011 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under contract number DTNH22-09-D-00126. The purpose of this test is to generate comparative side impact performance in a 2011 Chevrolet Silverado Extended Cab. 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 Silverado Extended Cab 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 km/h (38.53 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 9/24/2010. 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 Potentiometers

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	36.645
Maximum Chest Deflection	mm	44	13.534
Total Abdominal Force	N	2500	641.019
Pubic Symphysis Force	N	6000	-1605.204

	Passenger ATD (SID-IIs)		
Measurement Description	Units	Threshold	Result
Head Injury Criteria (HIC ₃₆)	N/A	1000	68.787
Lower Spine Resultant Acceleration	G	82	Channel Lost
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	1405.714

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		No		
Knee Airbag	No	NA		
Side Airbag 1 (Curtain)	Yes	Yes	Yes	Yes
Side Airbag 2 (Torso/Pelvis Airbag)	Yes	Yes	NA	NA
Seat Belt Pretensioner	Yes	No	NA	NA
Seat Belt Load Limiter	Yes	No	NA	NA

GENERAL COMMENTS

None

SECTION 2
DATA SHEETS

**DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA**

Test Vehicle:	2011 Chevrolet Silverado Extended Cab	NHTSA No.:	MB0116
Test Program:	Side MDB NCAP	Test Date:	9/24/2010

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	MB0116	Anti-Lock Brakes	Yes
Model Year	2011	All-Wheel Drive	No
Make	Chevrolet	Power Steering	Yes
Model	Silverado	Driver Front Airbag	Yes
Body Style	Extended Cab	Driver Curtain Airbag	Yes
VIN	1GCRCPEX1BZ121339	Driver Head/Torso Airbag	No
Body Color	Blue Granite Metallic	Driver Torso Airbag	No
Delivery Date	08/06/2010	Driver Torso/Pelvis Airbag	Yes
Odometer Reading (km/mi)	21/13	Driver Pelvis Airbag	No
Dealer	Glen Campbell	Driver Knee Airbag	No
Transmission	4-speed Automatic	Rear Pass. Curtain Airbag	Yes
Final Drive	Rear Wheel Drive	Rear Pass. Head/Torso Airbag	No
Type/No. Cylinders	V6	Rear Pass. Torso Airbag	No
Engine Displacement (L)	4.3	Rear Pass. Torso/Pelvis Airbag	No
Engine Placement	Transverse	Rear Pass. Pelvis Airbag	No
Roof Rack	No	Pretensioners	Yes
Sunroof/T-Top	No	Load Limiters	Yes
Tinted Glass	No	Automatic Door Locks	No
Traction Control	Yes	Bucket Seats	No
Power Brakes	Yes	Tilt Steering	Yes
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)	2903
Date of Manufacture	07/10	GAWR Front (kg)	1633
		GAWR Rear (kg)	1701

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity (DSC)	3	3	-	6	
Capacity Weight (VCW) (kg)				672	(A)
DSC x 68.04 (kg)				408.2	(B)
Cargo Weight (RCLW) (kg)				263.8*	(A-B)

* Maximum allowable RCLW is 136 kg

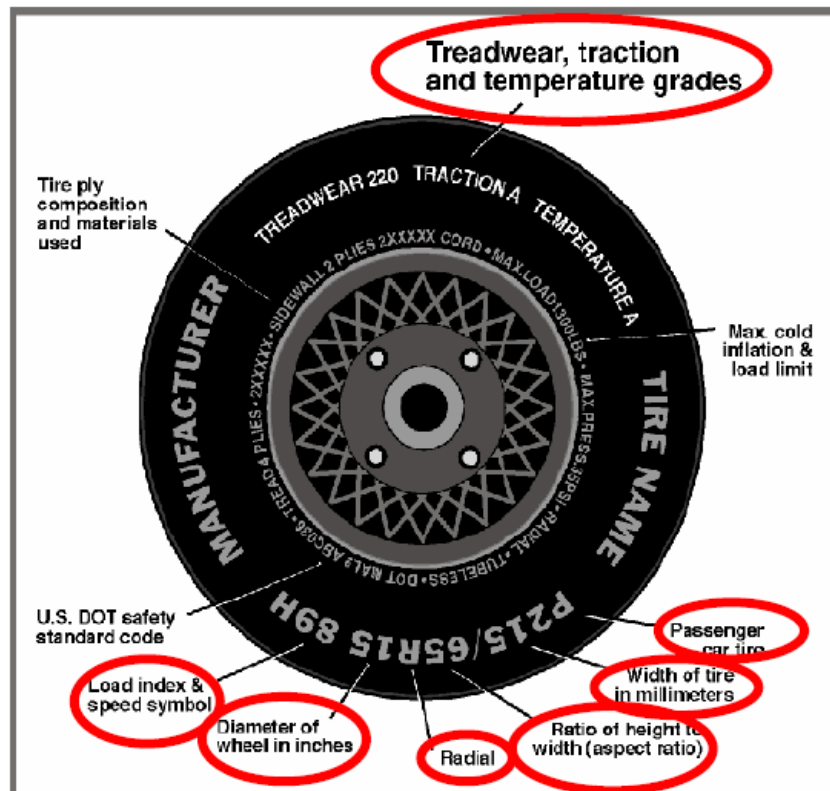
VEHICLE SEAT TYPE

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							

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

Test Vehicle: 2011 Chevrolet Silverado Extended Cab	NHTSA No.: MB0116
Test Program: Side MDB NCAP	Test Date: 9/24/2010

VEHICLE TIRE INFORMATION



	Front	Rear
Max. Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	240	240
Recommended Tire Size	P245/70R17 T	P245/70R17 T
Tire Size on Vehicle	P245/70R17 T	P245/70R17 T
Tire Manufacturer	General	General
Tire Model	Grabber HTS	Grabber HTS
Treadwear	840	840
Traction	A	A
Temperature Grades	B	B
Tire Plies Sidewall	2 ply polyester	2 ply polyester
Tire Plies Body	2 ply Polyester + 2 ply Steel	2 ply Polyester + 2 ply Steel
Load Index/Speed Symbol	108T	108T
Tire Material		
DOT Safety Code Right	A383 BN1 2710	A383 BN1 2810
DOT Safety Code Left	A383 BN1 2710	A383 BN1 2810

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

Test Vehicle: 2011 Chevrolet Silverado Extended Cab	NHTSA No.: MB0116
Test Program: Side MDB NCAP	Test Date: 9/24/2010

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	654.5	464.5	1119	703.5	562.5	1266	707.5	573.5	1281
Right	kg	636.0	450.0	1086	666.5	540.5	1207	649.0	548.0	1197
Ratio	%	58.5	41.5		54.4	44.6		54.7	45.3	
Totals	kg	1290.5	914.5	2205	1370	1103	2473	1356.5	1121.5	2478

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	2205	(A)
Sum of Actual Weight of 2 P572 ATDS Used	kg	140.6	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	136	(C)
Calculated Target Vehicle Test Weight (TVTW)	kg	2482	(A+B+C)

TEST VEHICLE ATTITUDE AND CG

Measurement Description	Units	LF	RF	RR	LR	CG (aft of front axle)
Fully Loaded	mm	916	926	983	973	
As Tested (Fully Loaded $\pm$ 10 mm at each wheel well)	mm	917	929	981	984	1632

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	3658
Total Vehicle Length at Left Side	mm	5770
Total Vehicle Length at Centerline	mm	5835
Total Vehicle Length at Right Side	mm	5768
Weight of Ballast in Cargo Area	kg	761.0
Weight of Vehicle Components Removed	kg	0.0
Amount of Stoddard Solvent in Fuel Tank	L	90.5

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	508
Actual Impact Point Aft of Front Axle	mm	504

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

Test Vehicle: 2011 Chevrolet Silverado
Extended Cab
 Test Program: Side MDB NCAP

NHTSA No.: MB0116
 Test Date: 9/24/2010

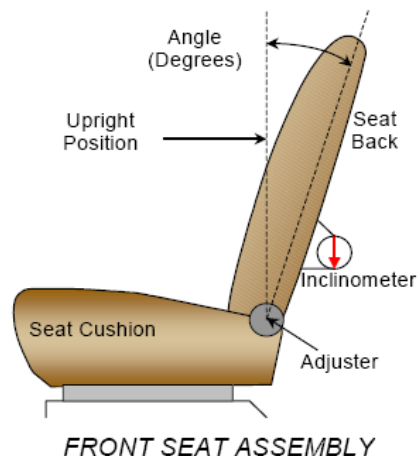
NORMAL DESIGN RIDING POSITION

Driver seat: Manual fore/aft, seat back

 Passenger Seat: Fixed

SEAT BACK ANGLES

	Degrees
Driver w/ Seated Dummy	6.7
Passenger w/ Seated Dummy	fixed



SEAT FORE/AFT POSITIONS

Manual driver seat adjustment placed at midpoint of 25 detents, Fixed Rear seat

SEAT FORE/AFT POSITIONING

	Total Fore/Aft Travel	Placed in Position #
Driver Seat	25	12
Rear Seat	NA	NA

SEAT BELT UPPER ANCHORAGES

Rear Seat Fixed D-ring position. Driver upper belt anchorage positioned at topmost of 3 detents

SEAT BELT UPPER ANCHORAGES

	Total # of Positions	Placed in Position #
Driver Seat	3	0 (upper most)
Rear Seat	NA	NA

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

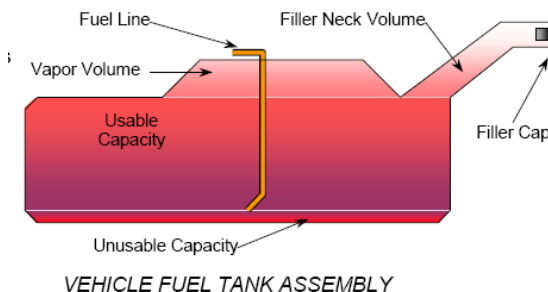
Test Vehicle: 2011 Chevrolet Silverado
Extended Cab
 Test Program: Side MDB NCAP

NHTSA No.: MB0116
 Test Date: 9/24/2010

FUEL TANK CAPACITY

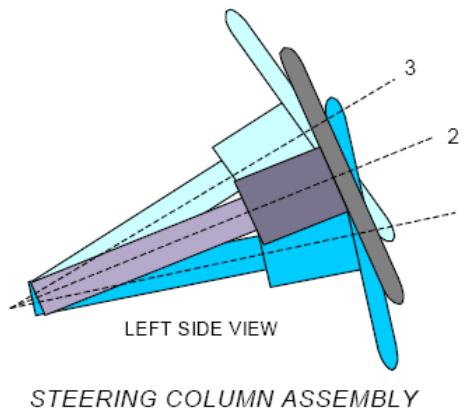
	Liters
Usable Capacity of "Standard Tank"	97.5
Usable Capacity of "Optional Tank"	NA
Usable Capacity Used for FMVSS 301	97.5
Actual Amount of Solvent Used	90.5

Fuel evacuated according to the specifications
 provided in FORM 1 by the vehicle
 manufacturer



STEERING COLUMN ADJUSTMENT

5 steering wheel detents, test position is 2, with
 The uppermost detent defined as zero



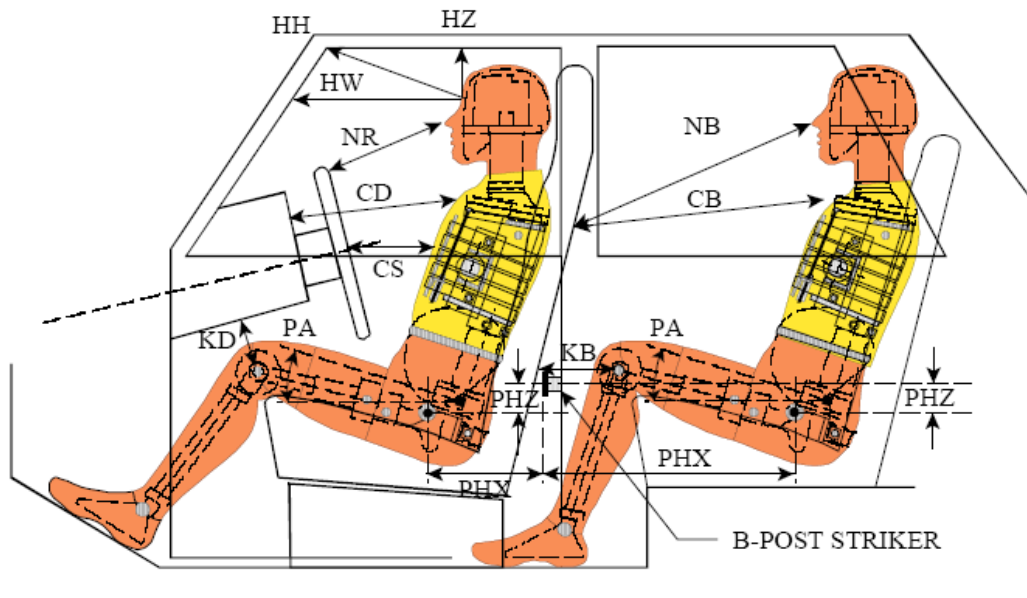
STEERING COLUMN POSITIONING

	Degrees	Fore/Aft Position (mm)
Lowermost - Position 1		
Geometric Center – Position 2	20	
Uppermost – Position 3		
Telescoping Steering Wheel Travel		50
Test Position	20	25

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: **2011 Chevrolet Silverado**
Extended Cab
 Test Program: **Side MDB NCAP**

NHTSA No.: **MB0116**
 Test Date: **9/24/2010**



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

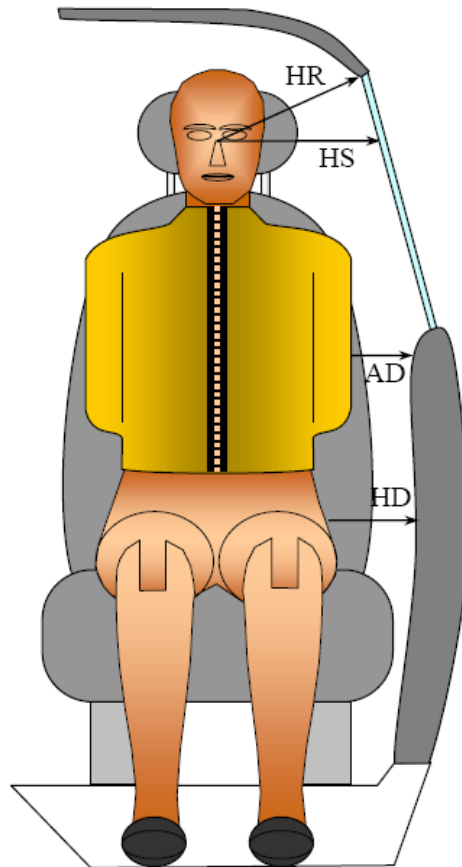
Driver Code	Pass. Code	Measurement Description	Driver S/N 33		Passenger S/N 300	
			Length (mm)	Angle	Length (mm)	Angle
HH		Header to Header	397	15		
HW		Header to Windshield	606	0		
HZ	HZ	Head to Roof	203		318	90
NR	NB	Nose to Rim/Seat Back	400	14	414	14
CD	CB	Chest to Dash/Seat Back	511	10	436	22
CS		Chest to Steering Wheel	290			
KDL	KBL	Left Knee to Dash/Seat Back	170	28	185	24
KDR	KBR	Right Knee to Dash/Seat Back	160		191	35
PA	PA	Pelvic Angle		0.7		19.5
PHX	PHX	H-Point to Striker (X-Axis)	431		375	
PHZ	PHZ	H-Point to Striker (Z-Axis)	378		409	
SA	SA	Seat Back Angle		78 *		22

* Measurement from the head restraint post

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2011 Chevrolet Silverado
Extended Cab
 Test Program: Side MDB NCAP

NHTSA No.: MB0116
 Test Date: 9/24/2010



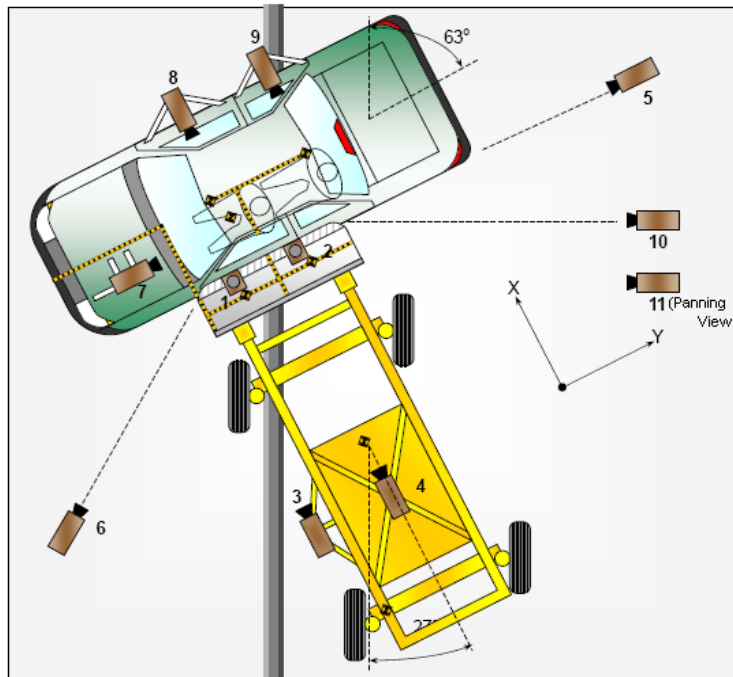
DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

Code	Description	Units	Driver S/N 33	Passenger S/N 300
HR	Head to Side Header	mm	195	275
HS	Head to Side Window	mm	327	374
AD	Arm to Door	mm	121	171
HD	H-point to Door	mm	137	204

DATA SHEET NO. 5
CAMERA LOCATIONS AND DATA

Test Vehicle: **2011 Chevrolet Silverado**
Extended Cab
Test Program: **Side MDB NCAP**

NHTSA No.: **MB0116**
Test Date: **9/24/2010**



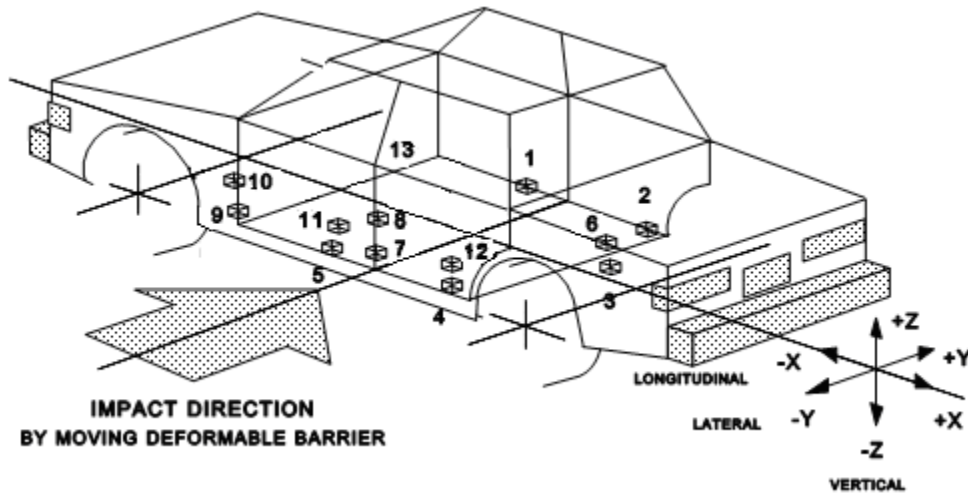
CAMERA LOCATIONS AND DATA

No.	Camera View	Location			Angle	Lens (mm)	Film Speed (fps)
		X	Y	Z			
1	Overhead Wide View	72	812	-4880	-90	20	1000
2	Overhead Close-up View	195	855	-4880	-90	24	1000
3	Impact Point	-1470	0	-847	0	25	500
4	Struck-Side View at Impact	-1140	838	-1586	-17	12.5	500
5	Rear Impact View of Struck Side	3860	310	940	-1.5	50	1000
6	Front Oblique Impact View of Struck Side	2801	295	930	-0.5	24	1000
7	Driver Dummy Front View (OB)	515	490	1610	-8.5	25	500
8	Driver Dummy Side View (OB)	1645	785	1120	-1.7	12.5	500
9	Rear Passenger Dummy Side View (OB)	1660	1590	1120	-3.5	12.5	500
10	Real-time Rear View of Impact				-	-	24
11	Real-time Pan View of Impact				-	-	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 Silverado Extended Cab	NHTSA No.: MB0116
Test Program: Side MDB NCAP	Test Date: 9/24/2010



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

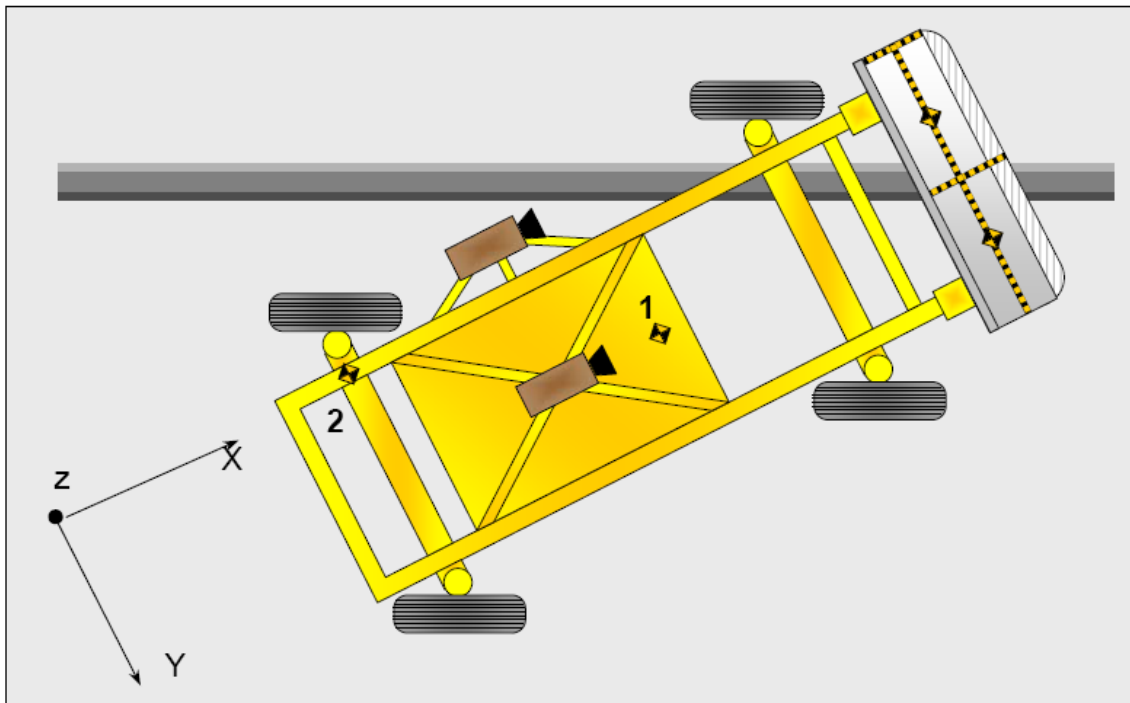
Loc. No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Right Sill at Front Seat	3945.0	709.0	510.0
2	Right Sill at Rear Seat	3015.0	711.0	530.0
3	Rear Floorpan Above Axle	1076.0	-14.0	801.0
4	Left Sill at Rear Door	3031.0	-704.0	523.0
5	Left Sill at Front Door	3914.0	-720.0	503.0
6	B-Post Lower	3136.0	-775.0	663.0
7	B-Post Middle	3144.0	-793.0	1269.0
8	A-Post Lower	4204.0	-763.0	574.0
9	A-Post Middle	3684.0	-159.0	649.0
10	Front Seat Track	3373.0	-615.0	634.0
11	Rear Seat Structure	2469.0	-737.0	703.0
12	Vehicle CG	3900.0	30.0	668.0

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

DATA SHEET NO. 7
MDB ACCELEROMETER LOCATIONS

Test Vehicle: 2011 Chevrolet Silverado
Extended Cab
 Test Program: Side MDB NCAP

NHTSA No.: MB0116
 Test Date: 9/24/2010



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 Silverado Extended Cab	NHTSA No.: MB0116
Test Program: Side NCAP	Test Date: 9/24/2010

MAXIMUM EXTERIOR STATIC CRUSH

Level	Measured Parameter	Units	Maximum Crush	Above Ground
1	Sill Top Height	mm	407	462
2	Occupant H-Point	mm	377	764
3	Mid Door	mm	334	854
4	Window Sill	mm	204	1126
5	Window Top	mm	105	1744
	Maximum Penetration	mm	407	462

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 Silverado Extended Cab	NHTSA No.: MB0116
Test Program: Side MDB NCAP	Test Date: 9/24/2010

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	1140

MDB WEIGHTS

	Units	Front Axle	Rear Axle	Total
Left	kg	406.5	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 Silverado NHTSA No.: MB0116
Extended Cab
 Test Program: Side NCAP Test Date: 9/24/2010

TEST DUMMY INFORMATION AND CONTACT

Description	Front Seat Dummy (ES-2re)	Rear Seat Dummy (SID-IIs)
Dummy Type/Serial No.	33	300
Head Contact	Curtain Airbag	Curtain Airbag
Upper Torso Contact	Side Torso/Pelvis Airbag	Rear Door Trim/ C-pillar Trim
Lower Torso Contact	Side Torso/Pelvis Airbag	Rear Door Trim
Left Knee Contact	Door Trim Panel	Rear Door Trim Panel

POST TEST DOOR OPENING AND SEAT TRACK INFORMATION

Description	Front	Rear
Left Side Doors	Jammed shut (0 mm)	Jammed shut (0 mm)
Right Side Doors	Closed and operational (0 mm)	Closed and operational (0 mm)
Hatch and Other Doors	Closed and operational (0 mm)	
Seat Movement	NA	NA
Seat Back Failure	None	None

POST TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	Intruded Inboard from Side Impact
Sill Separation	None
Windshield Damage	None
Window Damage	None
Other Notable Effects	None

SUPPLEMENTAL RESTRAINT INFORMATION

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

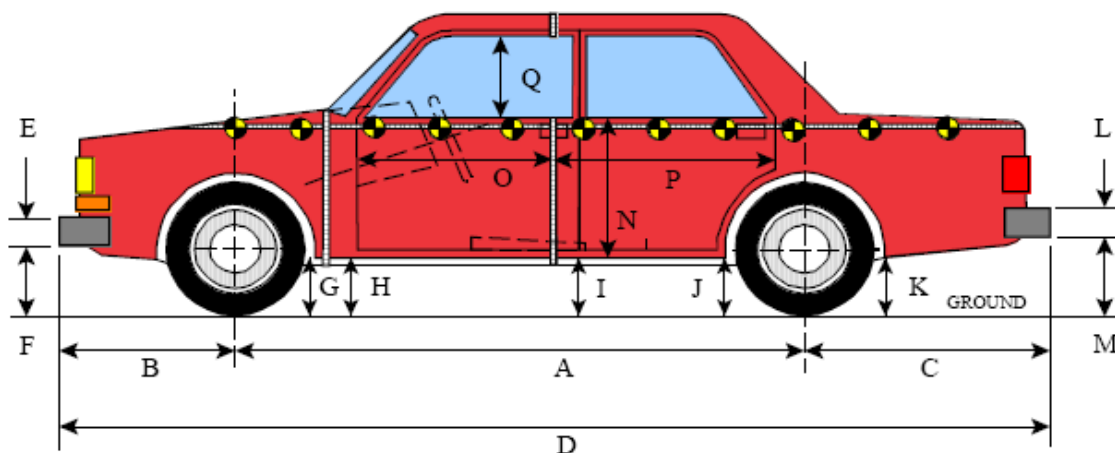
MDB LEFT EDGE IMPACT POINT DATA

Measured Parameter	Units	Requirement	Value
Horizontal Offset	mm	+/- 50	+4 forward
Vertical Offset	mm	+/- 20	+1 above

**DATA SHEET NO. 11
VEHICLE PROFILE MEASUREMENTS**

Test Vehicle: **2011 Chevrolet Silverado
Extended Cab**
Test Program: **Side MDB NCAP**

NHTSA No.: **MB0116**
Test Date: **9/24/2010**



LEFT SIDE VIEW

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

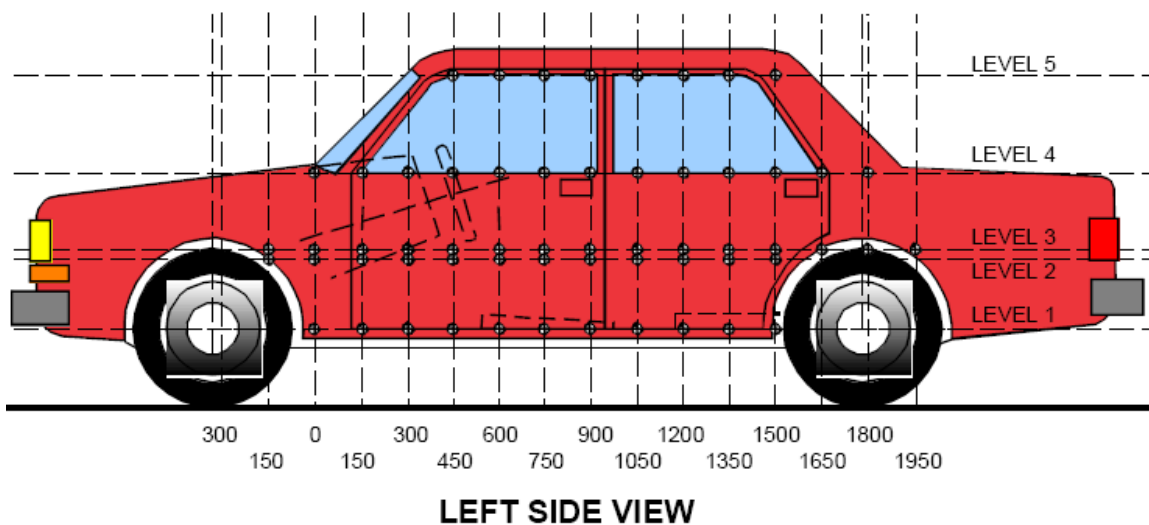
VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Description	Pre-Test	Post-Test	Difference
A	Wheelbase	3658	3628	-30
B	Front Axle to FSOV	1010	1034	25
C	Rear Axle to RSOV	1167	1161	-6
D	Total Length at Centerline	5835	5822	-13
E	Front Bumper Thickness	360	360	0
F	Front Bumper Bottom to Ground	280	298	18
G	Sill Height at Front Wheel Well	348	345	-3
H	Sill Height at Front Door Leading Edge	356	361	5
I	Sill Height at B Pillar	365	380	15
J1	Sill Height at Rear Wheel Well	277	270	-7
J2	Pinch Weld Height at Rear Wheel Well	371	438	67
K	Sill Height Aft of Rear Wheel Well	420	454	34
L	Rear Bumper Thickness	239	239	0
M	Rear Bumper Bottom to Ground	487	488	1
N	Sill Height to Window Bottom Sill	824	821	-2
O	Front Door Leading Edge to Impact CL	811	807	-4
P	Rear Door Trailing Edge to Impact CL	1102	1021	-80
Q	Front Window Opening	533	533	0
R	Right Side Length	5755	5744	-11
S	Left Side Length	5752	5732	-20
T	Vehicle Width at B Post	1991	1707	-284

DATA SHEET NO. 12
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2011 Chevrolet Silverado
Extended Cab
 Test Program: Side MDB NCAP

NHTSA No.: MB0116
 Test Date: 9/24/2010



Level	Measurement Description	Height Above Ground (mm)
1	Sill Top	462
2	Occupant H-Point	764
3	Mid-Door	854
4	Window Sill	1126
5	Window Top	1744

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 Silverado**
Extended Cab
 Test Program: **Side MDB NCAP**

NHTSA No.: **MB0116**
 Test Date: **9/24/2010**

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900	--	--	--	914	--	--	--	--	894	--	--	--	--	20	--
-750	--	--	--	933	--	--	--	--	900	--	--	--	--	33	--
-600	--	--	--	948	--	--	--	--	903	--	--	--	--	45	--
-450	--	--	--	958	--	--	--	--	902	--	--	--	--	56	--
-300	--	--	--	963	--	--	--	--	895	--	--	--	--	68	--
-150	--	--	1015	959	--	--	--	898	879	--	--	--	117	80	--
0	958	994	994	944	--	779	854	859	853	--	179	140	135	91	--
150	942	987	986	947	--	645	757	810	866	--	297	230	176	81	--
300	943	989	988	951	--	620	730	789	860	--	323	259	199	91	--
450	944	991	990	954	--	600	716	777	850	--	344	275	213	104	--
600	943	993	992	958	--	598	701	763	838	--	345	292	229	120	--
750	944	994	993	960	712	592	691	750	827	824	352	303	243	133	-112
900	944	995	994	963	727	591	680	737	815	822	353	315	257	148	-95
1050	943	996	995	966	731	603	660	725	803	812	340	336	270	163	-81
1200	943	997	996	967	734	596	689	713	790	801	347	308	283	177	-67
1350	940	995	995	968	737	566	669	683	764	719	374	326	312	204	18
1500	938	995	995	968	739	531	618	661	792	741	407	377	334	176	-2
1650	935	994	994	969	740	542	659	709	816	761	393	335	285	153	-21
1800	933	993	994	970	742	597	728	757	853	781	336	265	237	117	-39
1950	931	991	992	969	738	669	803	812	848	633	262	188	180	121	105
2100	926	988	988	966	--	863	941	946	938	--	63	47	42	28	--
2250	927	990	991	968	--	867	946	950	942	--	60	44	41	26	--
2400	928	993	993	971	--	873	952	956	946	--	55	41	37	25	--
2550	949	1011	1013	988	--	896	972	978	965	--	53	39	35	23	--
2700	--	1015	1017	999	--	--	980	986	977	--	--	35	31	22	--
2850	--	--	--	1003	--	--	--	--	983	--	--	--	--	20	--

MAXIMUM CRUSH DATA

	Level 1	Level 2	Level 3	Level 4	Level 5
Maximum Crush (mm)	407	377	334	204	105
Distance From Impact (mm)	1500	1500	1500	1350	1950

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.

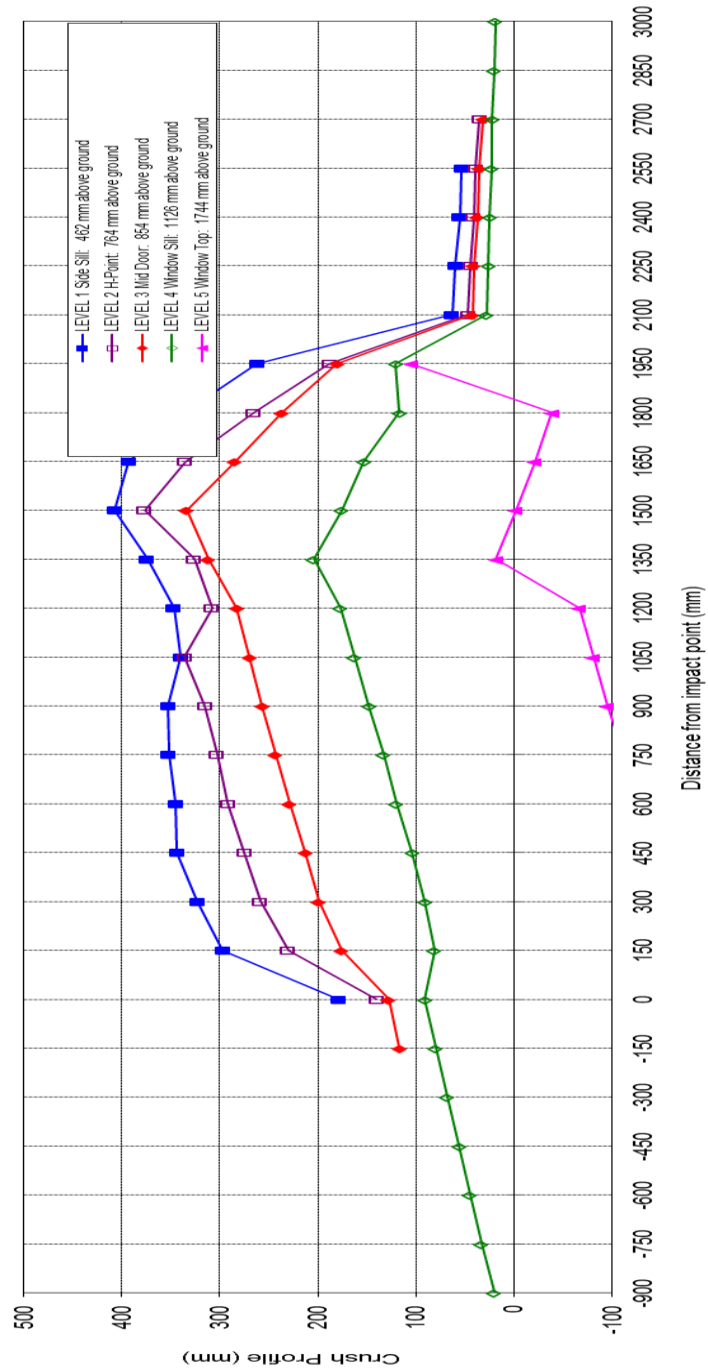
DATA SHEET NO. 12 (CONTINUED)
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: **2011 Chevrolet Silverado**
Extended Cab

Test Program: **Side MDB NCAP**

NHTSA No.: **MB0116**

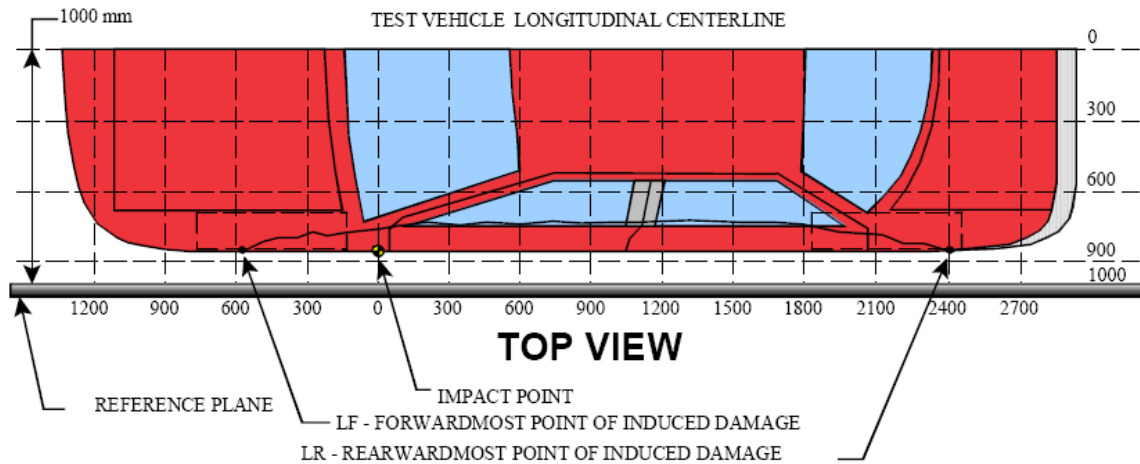
Test Date: **9/24/2010**



DATA SHEET NO. 13
VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: **2011 Chevrolet Silverado**
Extended Cab
 Test Program: **Side MDB NCAP**

NHTSA No.: **MB0116**
 Test Date: **9/24/2010**



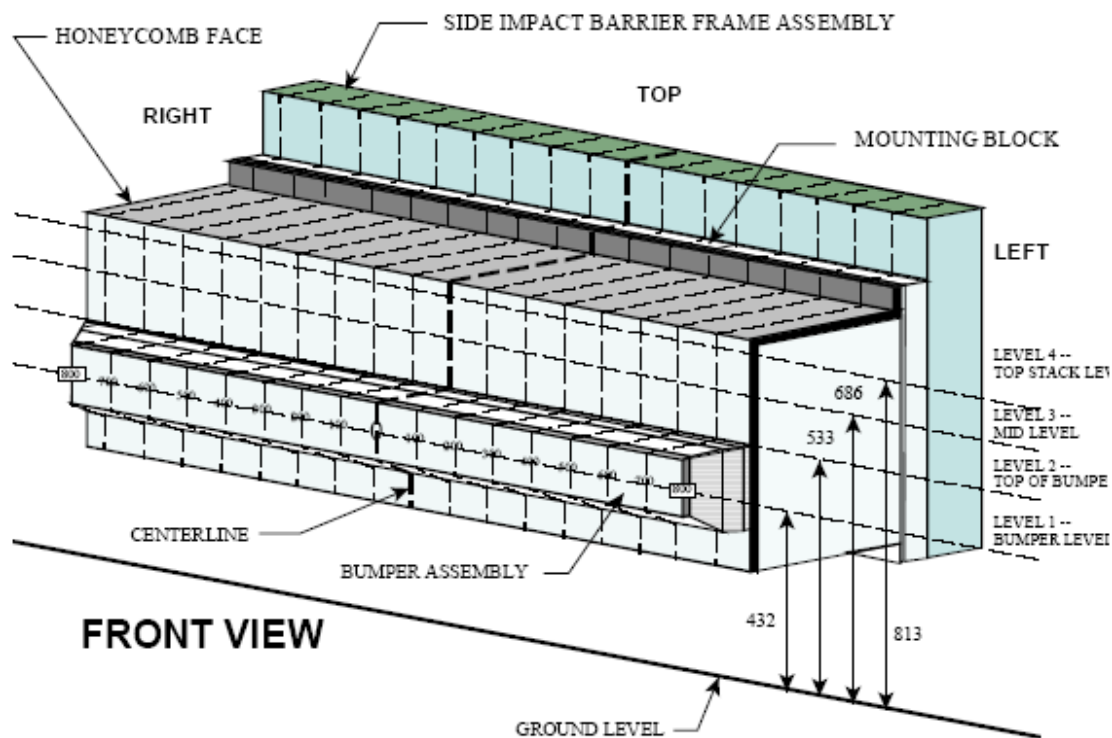
DAMAGE PROFILE DISTANCES

DPD	Distance From Impact Point (mm)	Level	Pre-Test (mm)	Post-Test (mm)	Maximum Static Crush (mm)
1	2000	462	71	266	195
2	1570	462	63	464	401
3	1140	462	57	401	344
4	710	462	56	406	350
5	0	462	57	377	320
6	-150	854	-15	102	117

DATA SHEET NO. 14
EXTERIOR STATIC CRUSH FOR IMPACTOR FACE

Test Vehicle: 2011 Chevrolet Silverado
Extended Cab
 Test Program: Side MDB NCAP

NHTSA No.: MB0116
 Test Date: 9/24/2010



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	412	413	413	413	413	413	413	413	413	413	412

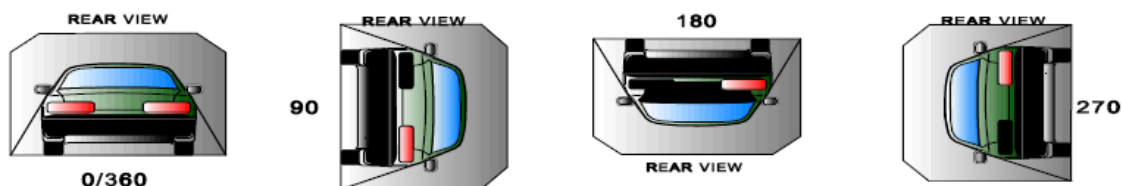
DATA SHEET NO. 15A
FMVSS NO. 301 FUEL SYSTEM INTEGRITY POST-IMPACT DATA

Test Vehicle: 2011 Chevrolet Silverado NHTSA No.: MB0116
Extended Cab
Test Program: Side MDB NCAP Test Date: 9/24/2010

Test Time: 14:00 Temperature: 19° C

- A. From impact until vehicle motion ceases: 0 oz.
(Maximum allowable is 1 oz.)
B. For the 5-minute period after motion ceases: 0 oz.
(Maximum allowable is 5 oz.)
C. For the following 25 minutes: 0 oz.
(Maximum allowable is 1 oz./minute)
D. Spillage Details: None

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	6:04
90 to 180	1:04	5:00	6:04
180 to 270	1:09	5:00	6:09
270 to 360	1:07	5:00	6:07

FMVSS NO. 301 ROLLOVER SPILLAGE TABLE

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

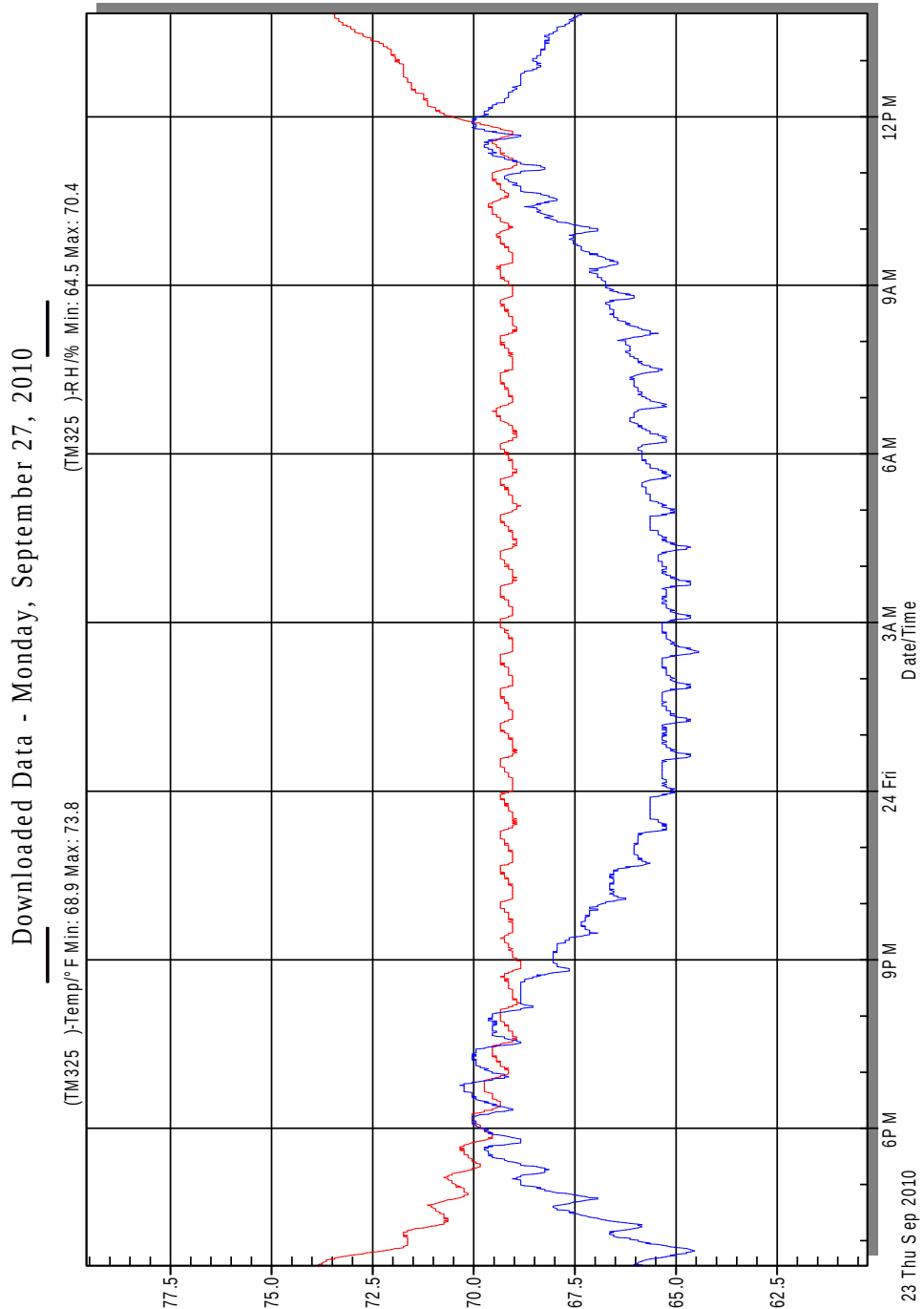
ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

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

DATA SHEET NO. 16
DUMMY/VEHICLE TEMPERATURE STABILIZATION

Test Vehicle: 2011 Chevrolet Silverado
Extended Cab
Test Program: Side MDB NCAP

NHTSA No.: MB0116
Test Date: 9/24/2010



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

Photo Not Available

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



Photo Not Available

Figure A-6: Post-Test Left Front ¾ 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

Photo Not Available

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

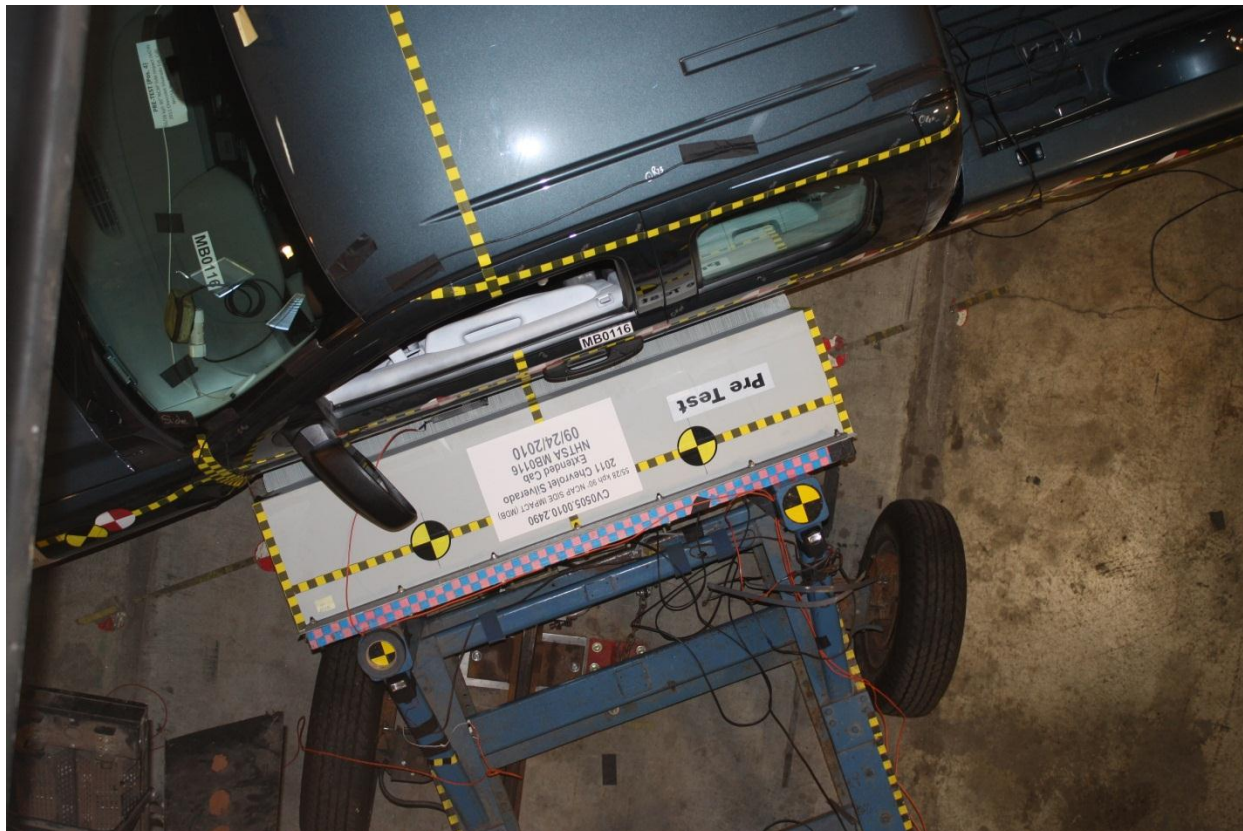


Figure A-15: Pre-Test Overhead View of the Test Vehicle and MDB

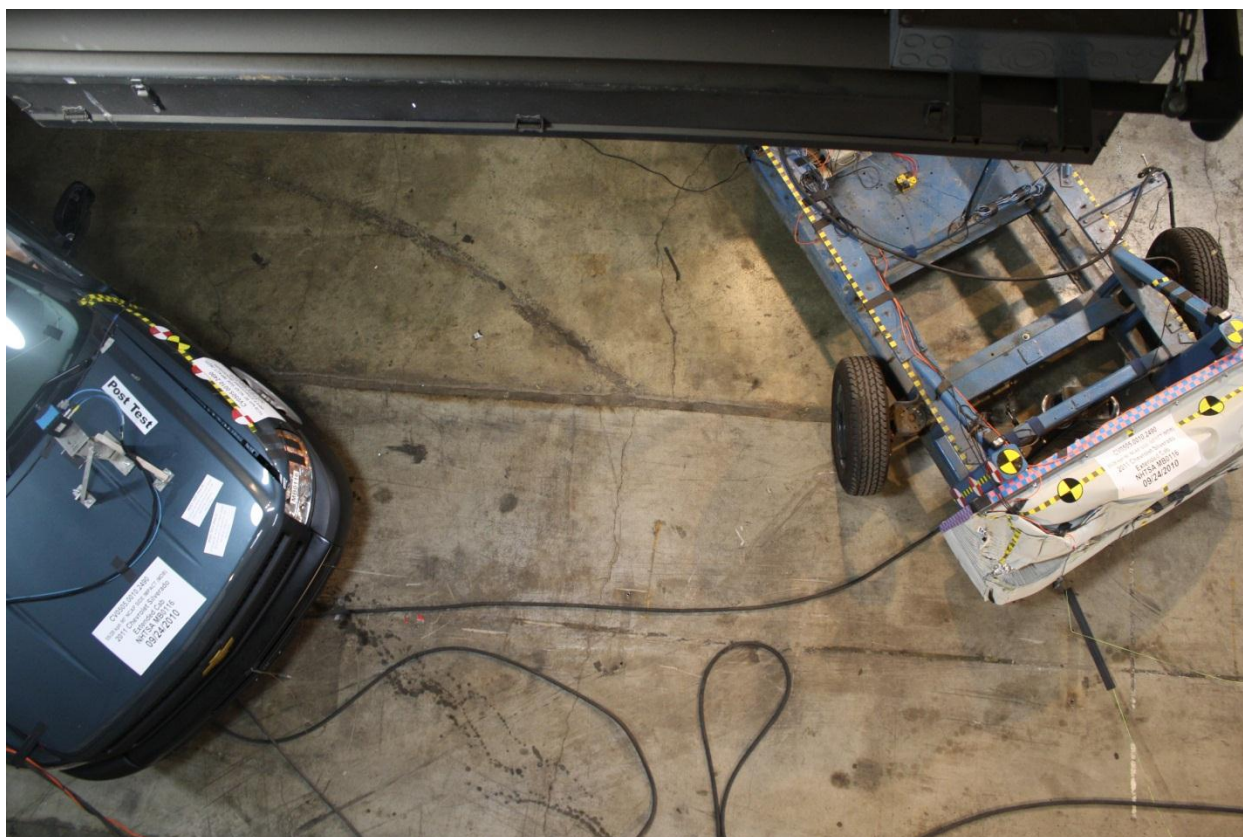


Figure A-16: Post-Test Overhead View of Test Vehicle and MDB



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

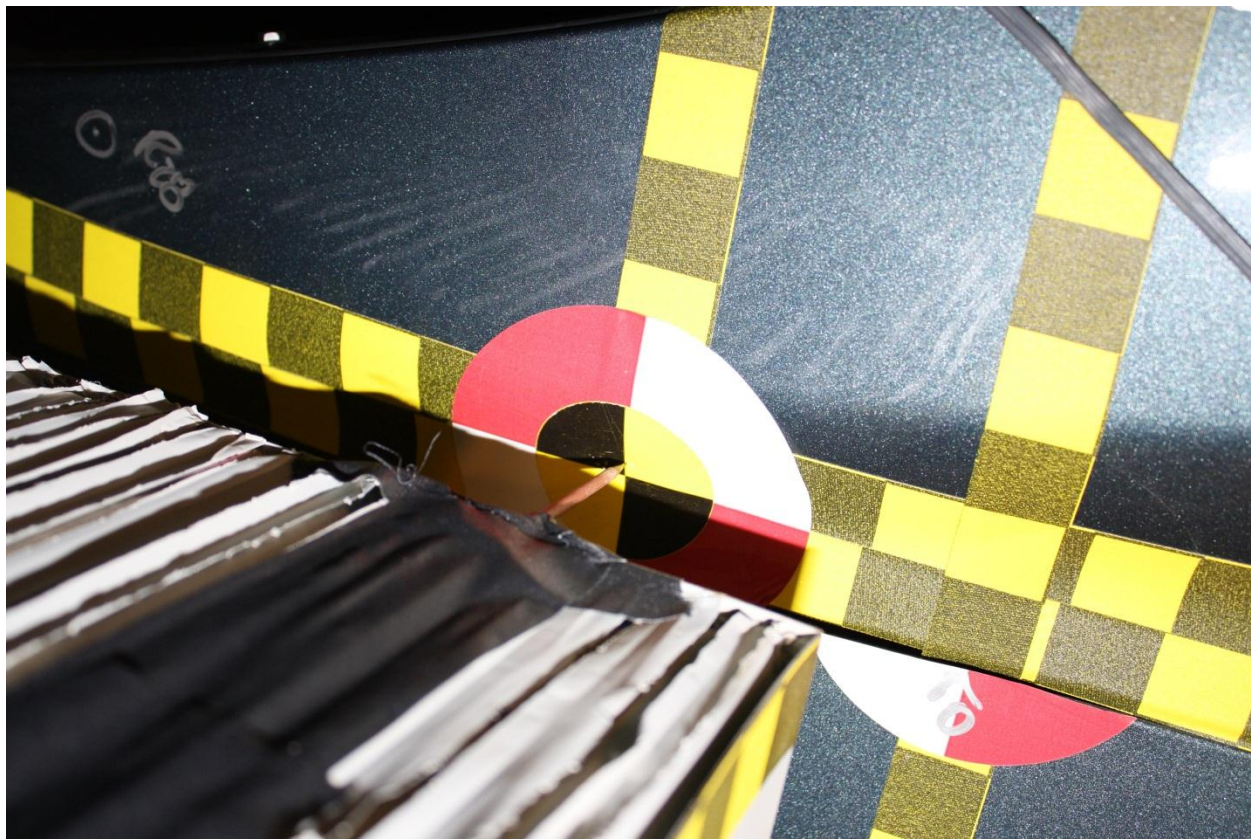


Figure A-19: Pre-Test Close-up View of Impact Point Target

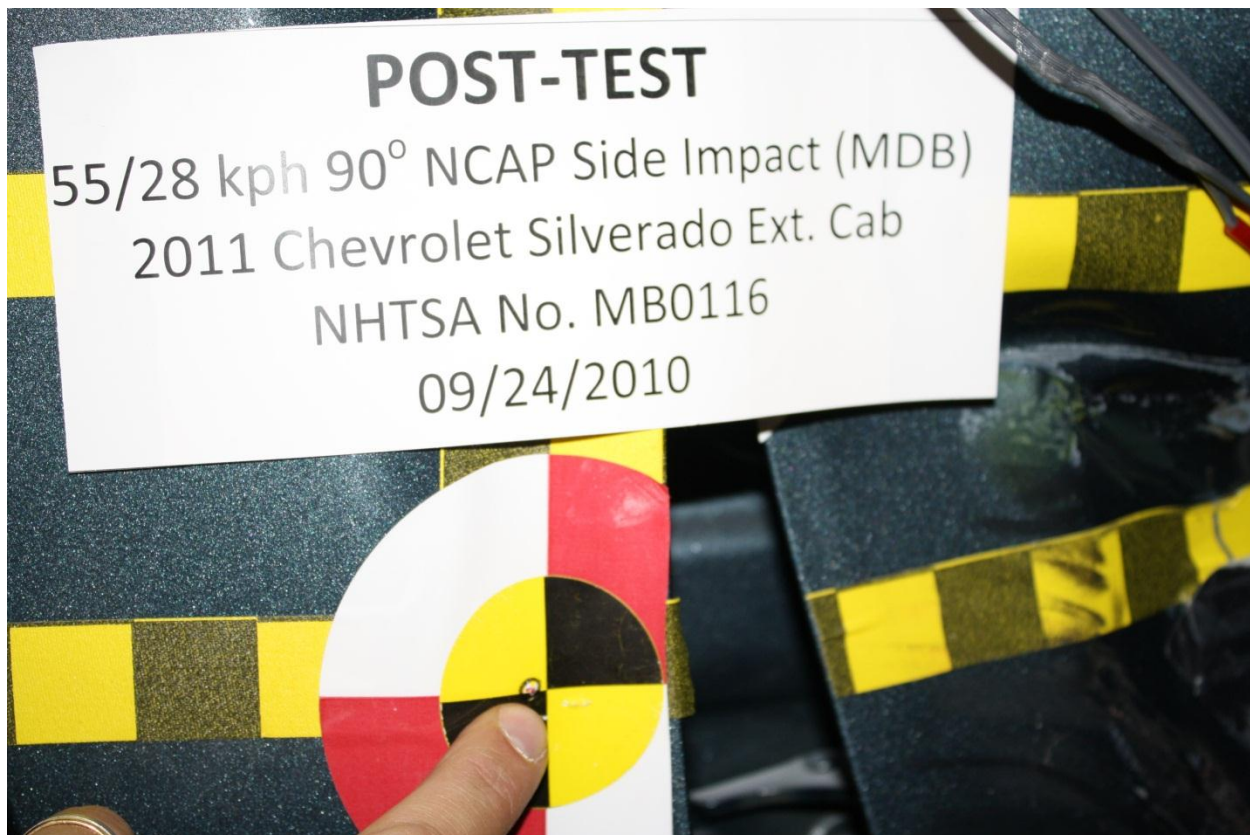


Figure A-20: Post-Test Close-up View of Impact Point Target



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



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

Photo Not Applicable

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

Photo Not Applicable

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



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



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

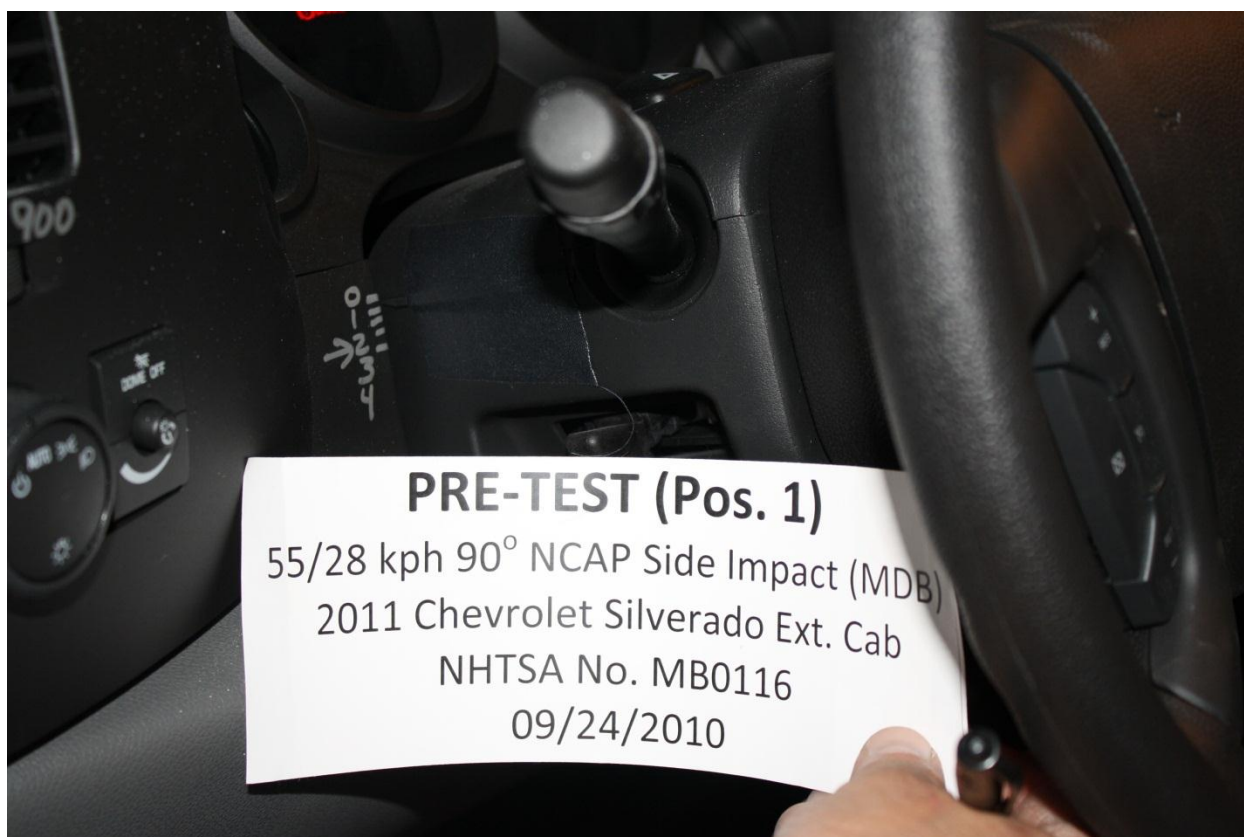


Figure A-36: Pre-Test Left Side View of Steering Wheel to Show Position



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

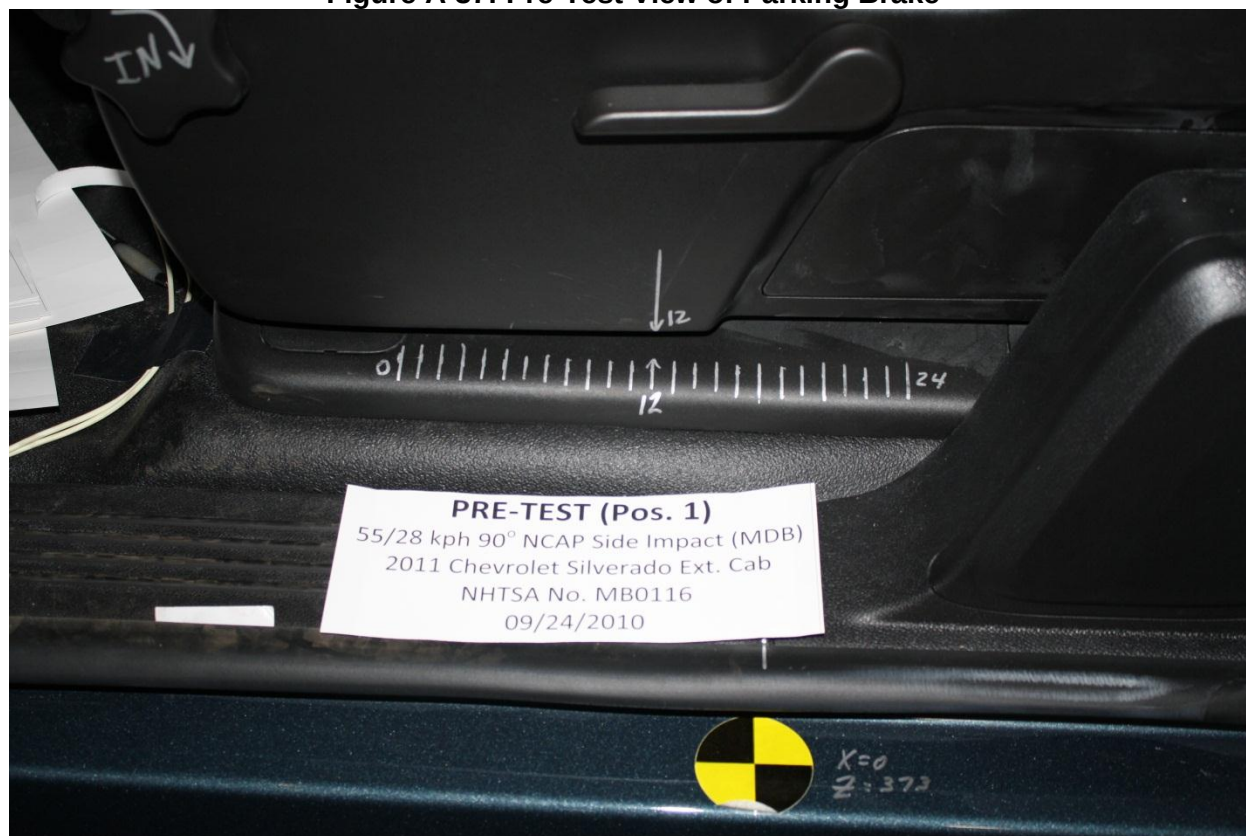


Figure A-38: Pre-test Close-up Left Side View of Driver Seat Track Showing Seat Positioning

Photo 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

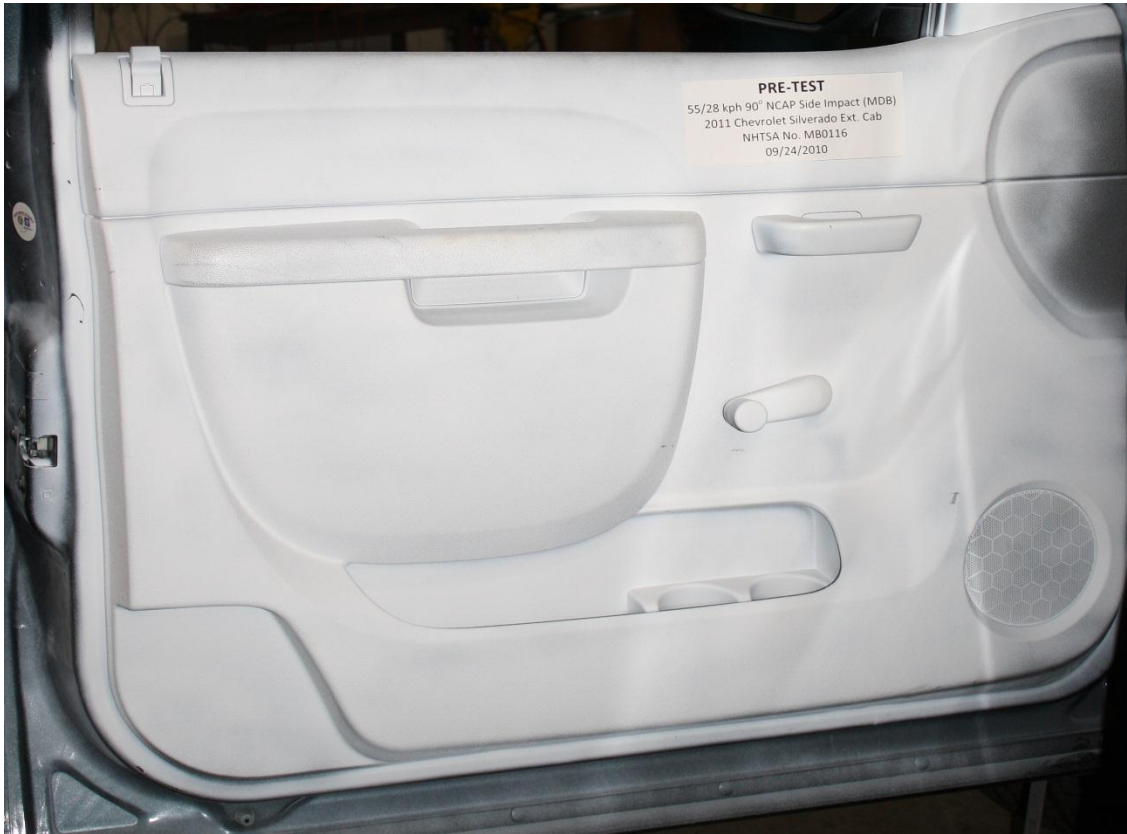


Figure A-45: Pre-test Driver Inner Door Panel View

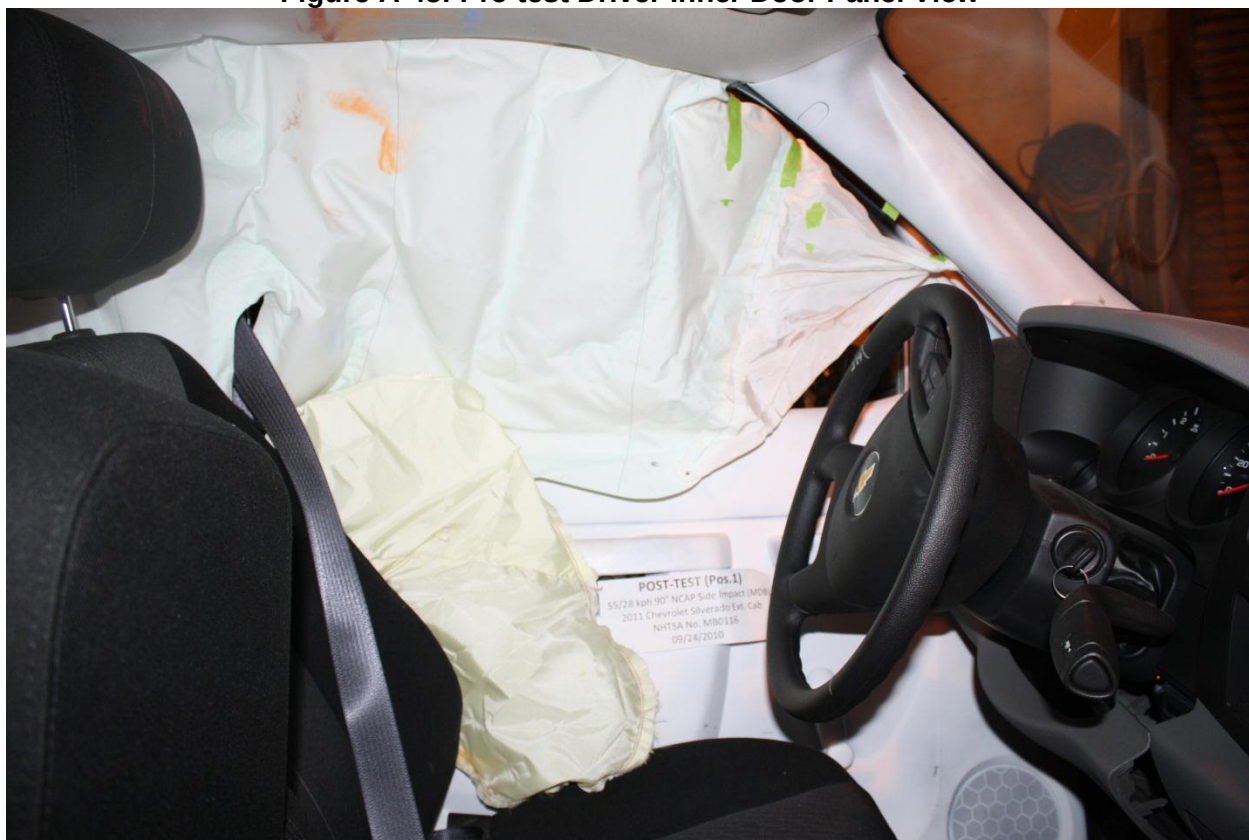


Figure A-46: Post-test Driver Inner Door Panel View Showing Driver Dummy Contact Locations



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

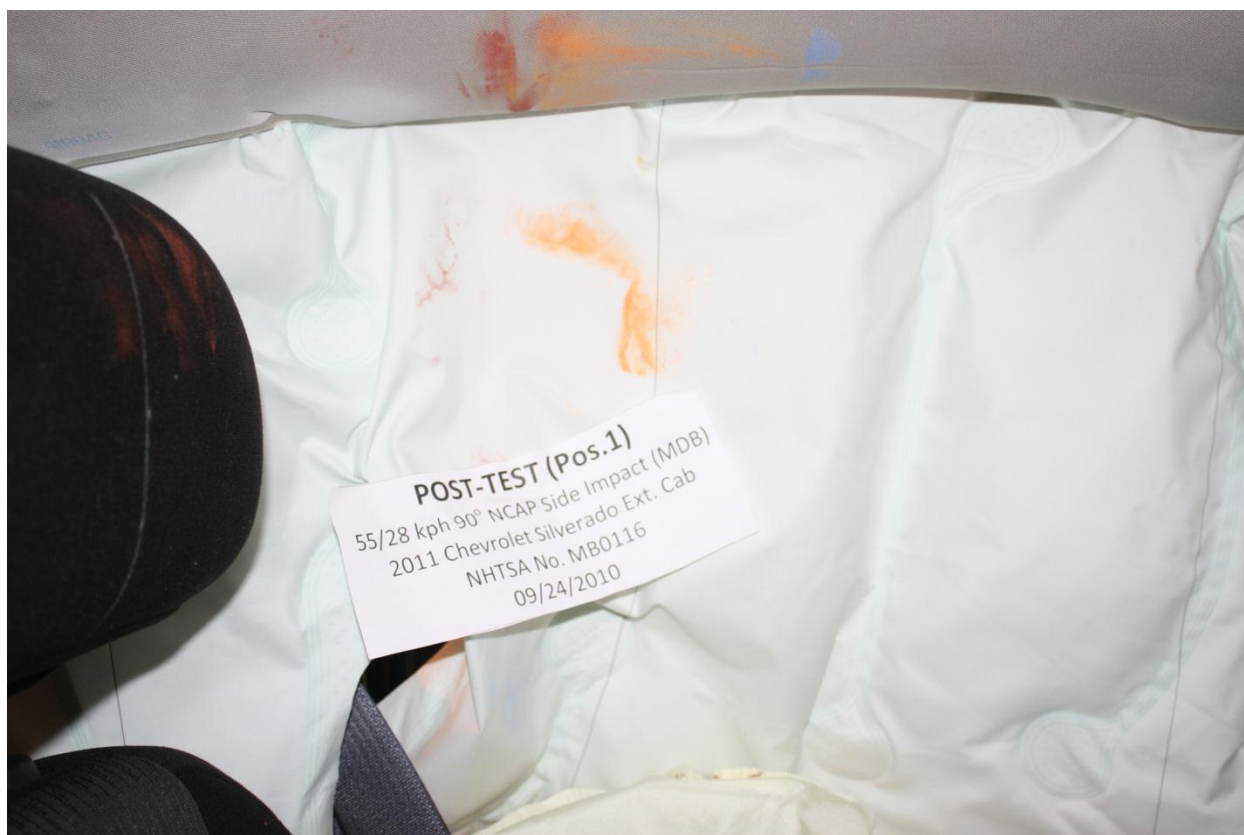


Figure A-48: Post-test Driver Dummy Close-Up Head Contact with Side Airbag View

Photo Not Applicable

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

Photo Not Applicable

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

Photo Not Applicable

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

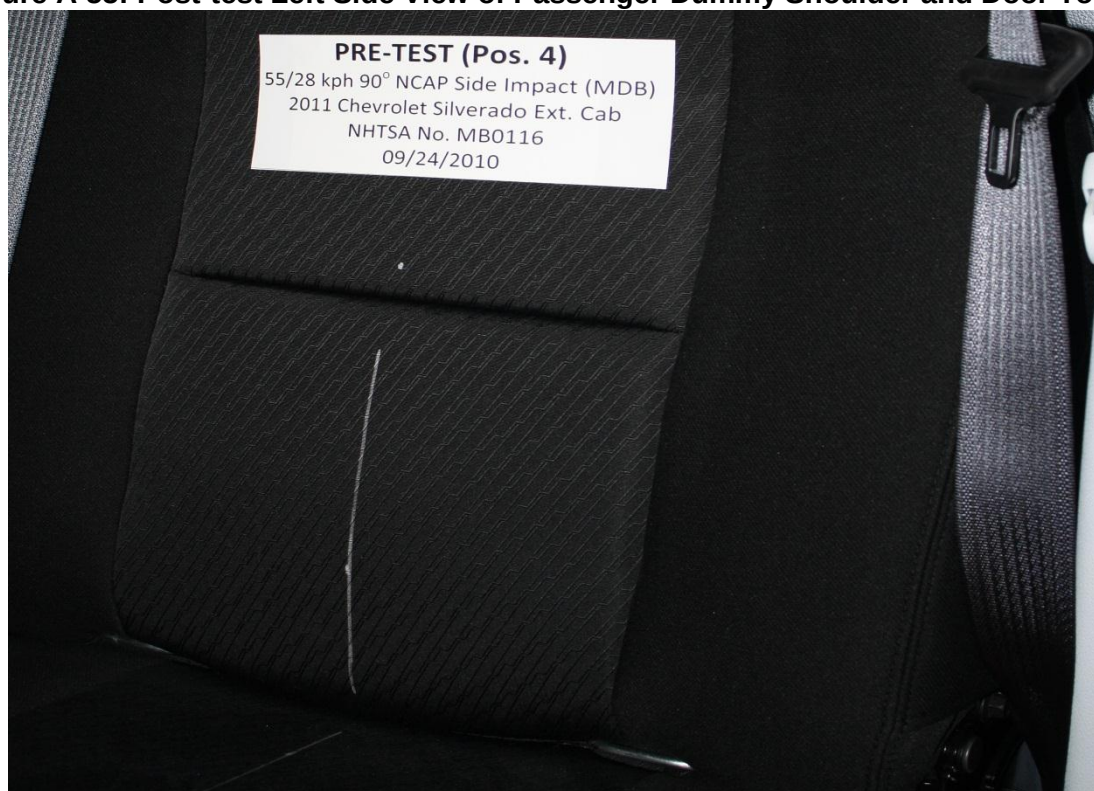


Figure A-56: Pre-Test Frontal View of Rear Passenger Seat Back Prior to Dummy Positioning

Photo Not Available

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

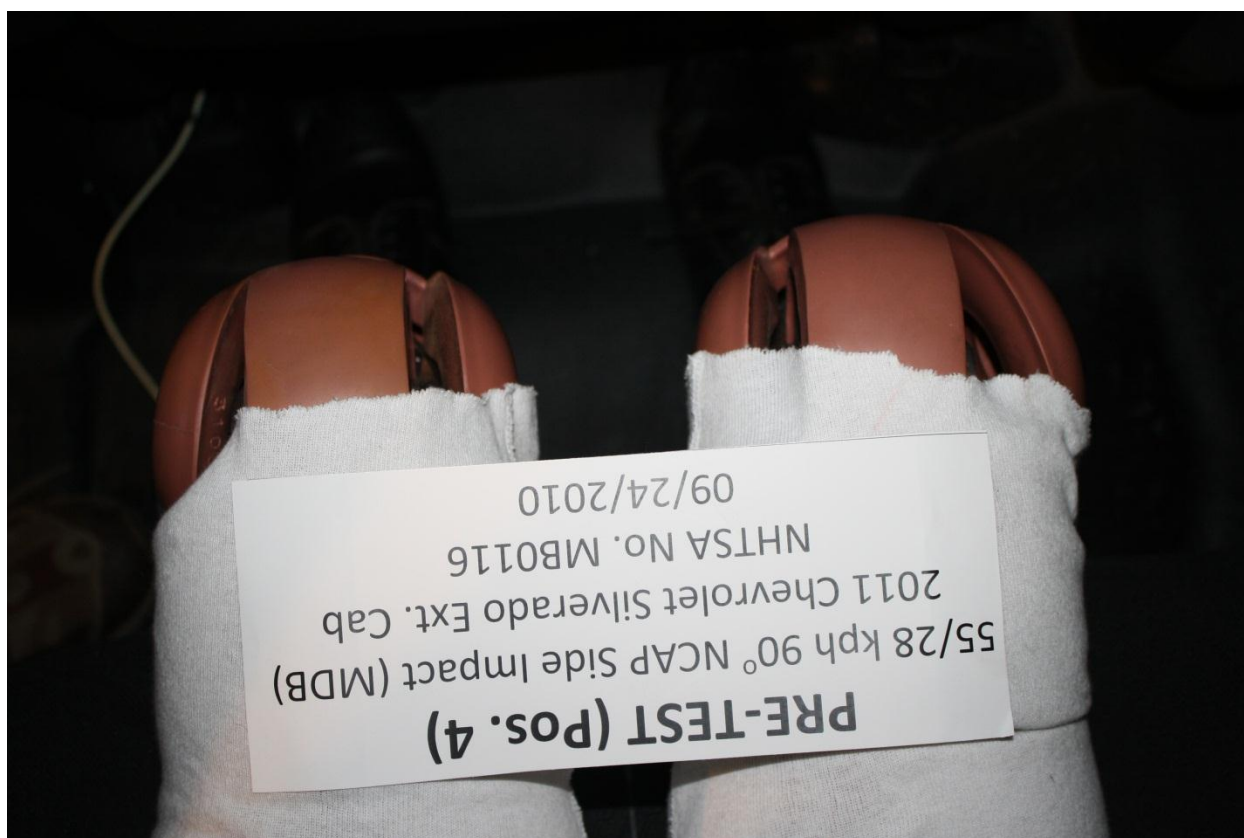


Figure A-59: Pre-Test Overhead View of Rear Passenger Dummy Thighs on Seat Pan



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

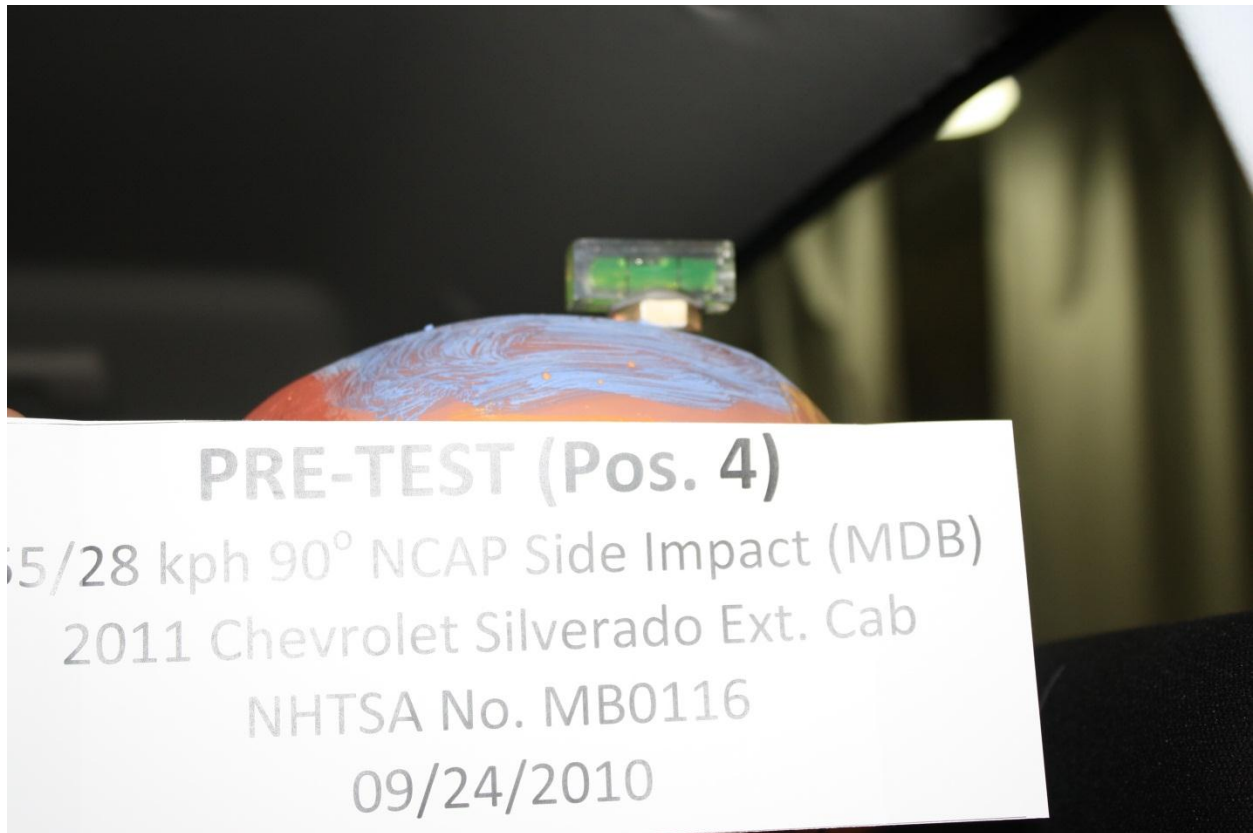


Figure A-61: Pre-Test View of Rear Passenger Dummy's Head Showing Dummy's Head is Level



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

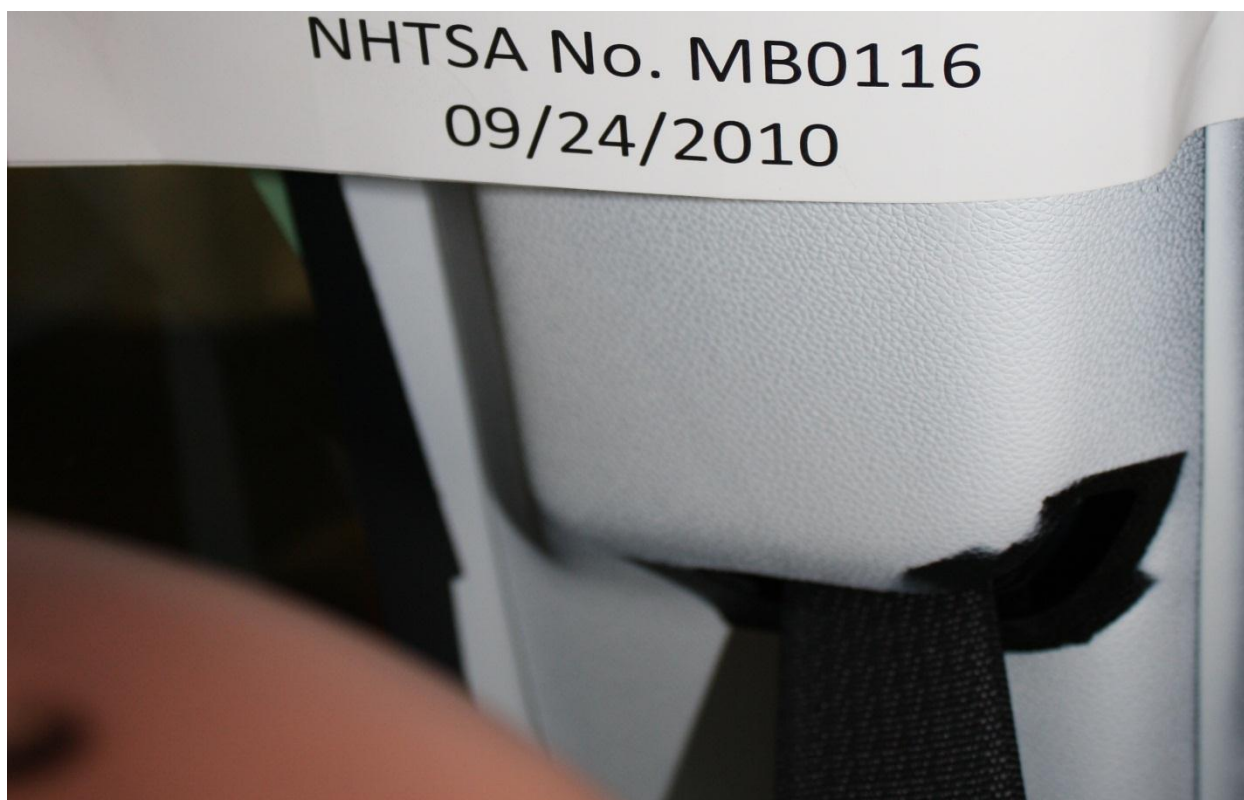


Figure A-63: Pre-Test View of Belt Anchorage for Rear Passenger Dummy to Show Position



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

Photo Not Applicable

Seat Back Fixed

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



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

Photo Not Available

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

Photo Not Applicable

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

Photo Not Applicable

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

Photo Not Available

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

Photo Not Available

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

Photo Not Available

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

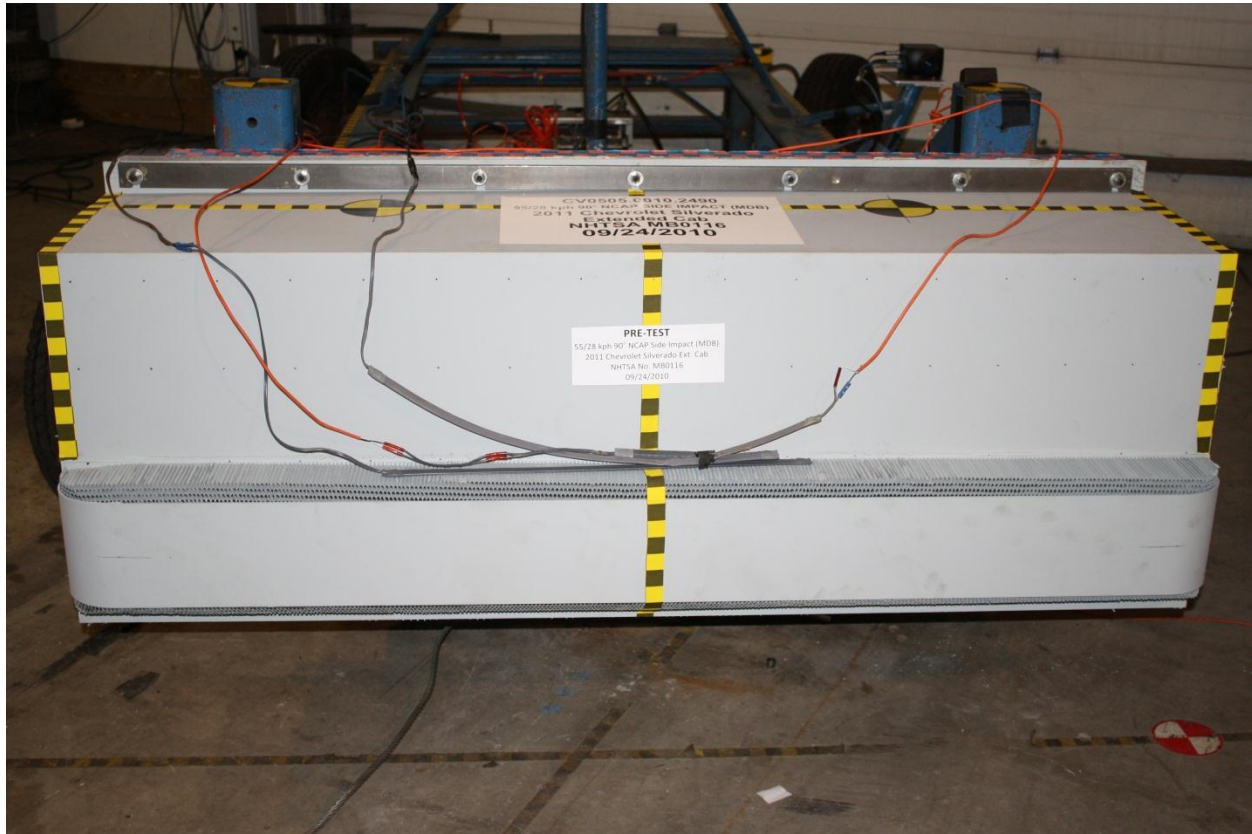


Figure A-81: Pre-Test Front View of MDB Impactor Face



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

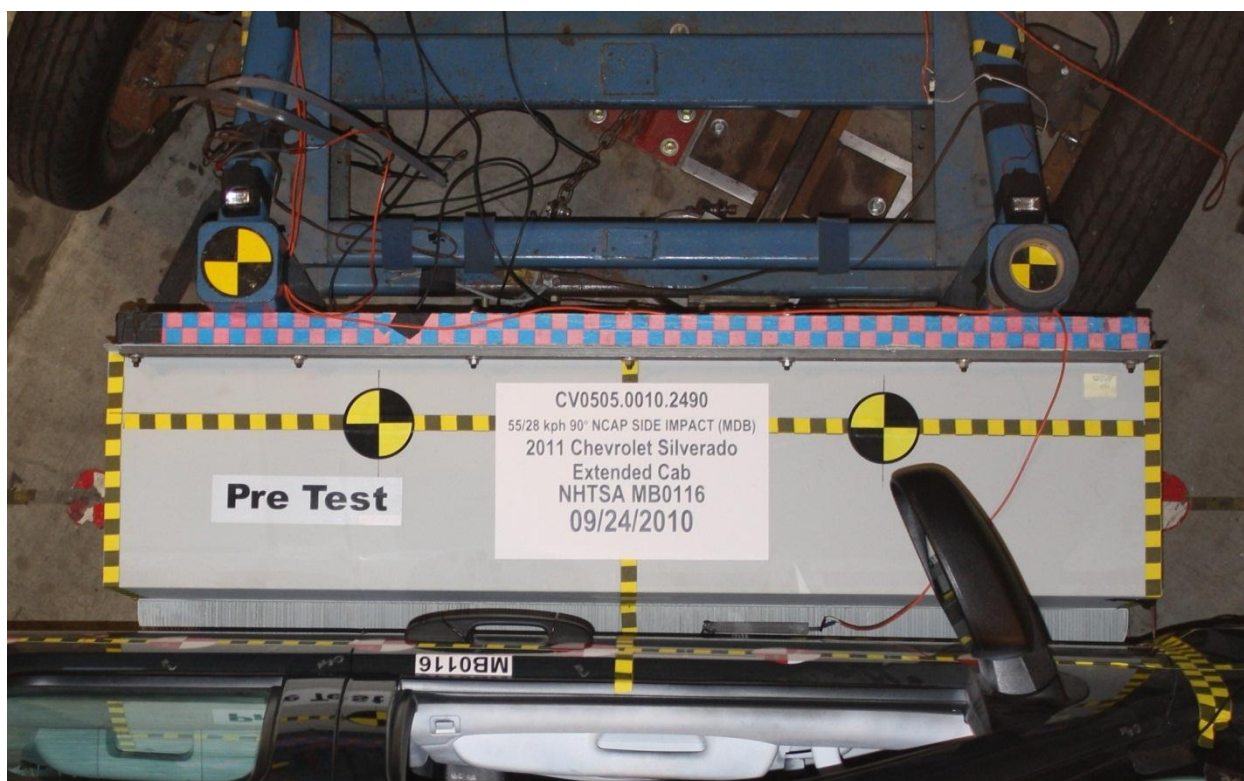


Figure A-83: Pre-Test Top View of MDB Impactor Face



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

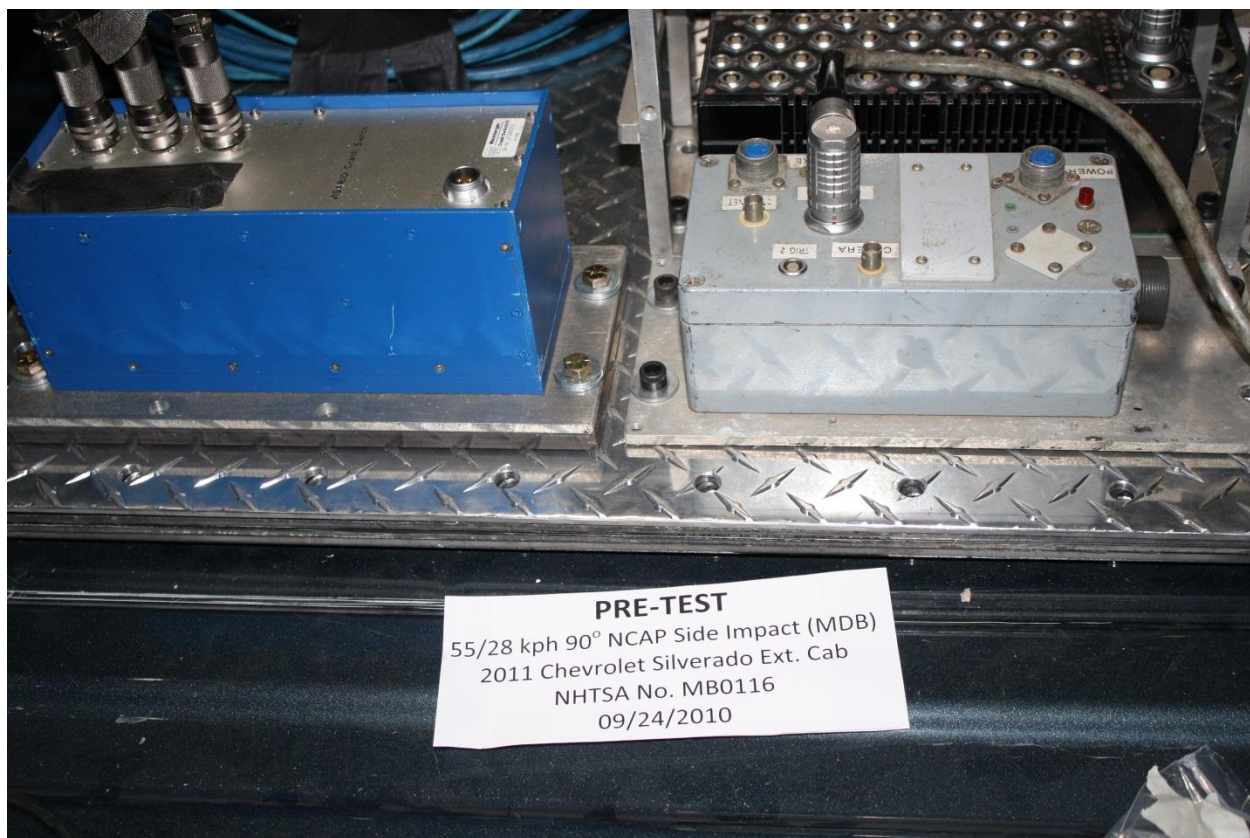


Figure A-91: Pre-Test Ballast View



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)

CHEVROLET 2011 SILVERADO 1500 2WD CAB WT

EXTERIOR: BLUE GRANITE METALLIC
INTERIOR: DARK TITANIUM

VIN: 1G1YB1H11E1100000
4-SPD AUTOMATIC TRANSMISSION

MSRP: \$24,999

STANDARD EQUIPMENT

1. 16" ALUMINUM WHEELS
2. 16" ALUMINUM WHEELS
3. 16" ALUMINUM WHEELS
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100. 16" ALUMINUM WHEELS

EPA Fuel Economy Estimates

CITY MPG: 15
Estimated Annual Fuel Cost: \$2,293
HIGHWAY MPG: 20
Combined Fuel Economy: 17

SAFETY RATING

Frontal Crash: 4 stars
Side Crash: 4 stars
Rollover: 4 stars

PARTS CONTENT INFORMATION

FOR VEHICLES IN THIS COUNTRY
U.S. CANADIAN PARTS CONTENT: 81%
MAJOR SOURCES OF FOREIGN PARTS
COUNTRY: MEXICO

FOR THIS VEHICLE:
FRONT ASSEMBLY POINT:
ROCKFORD, IL U.S.A.
COUNTRY OF ORIGIN:
ENGINE: UNITED STATES
TRANSMISSION: MEXICO

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

See the FREE Safety Rating Guide at www.safercar.gov

See the FREE Parts Content Guide at www.partscontent.com

Figure A-99: Monroney Label

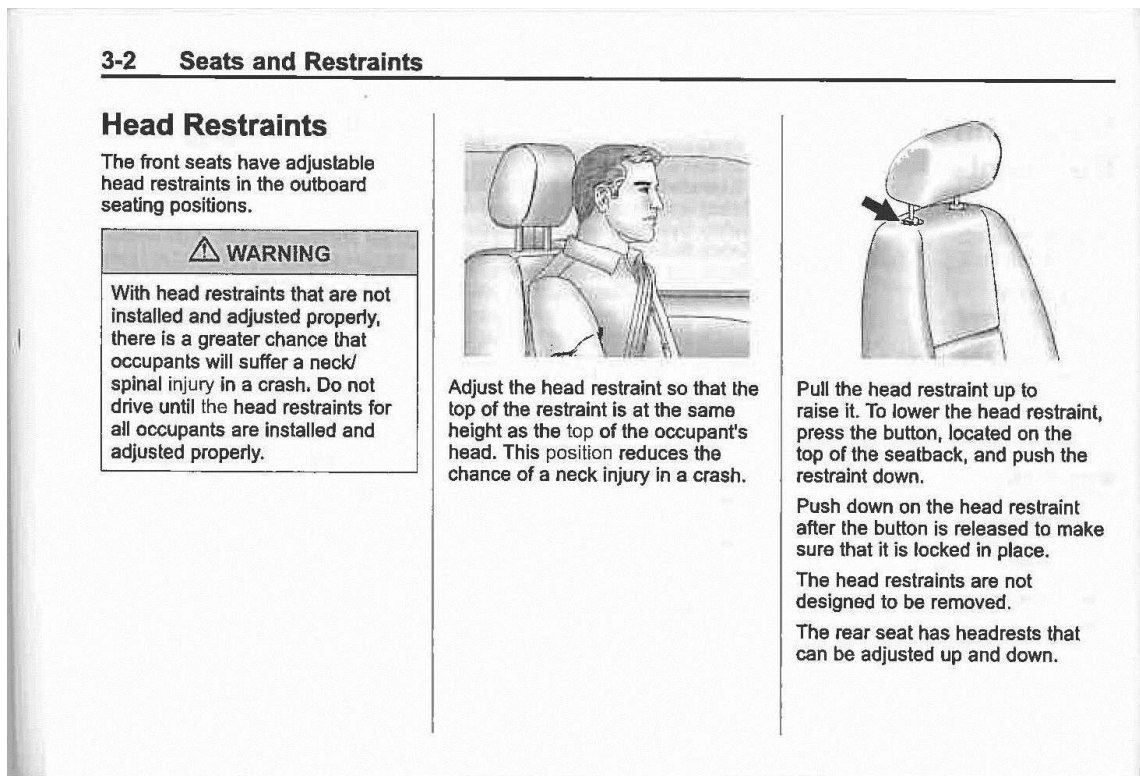


Figure A-100: Driver Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

Photo Not Available

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

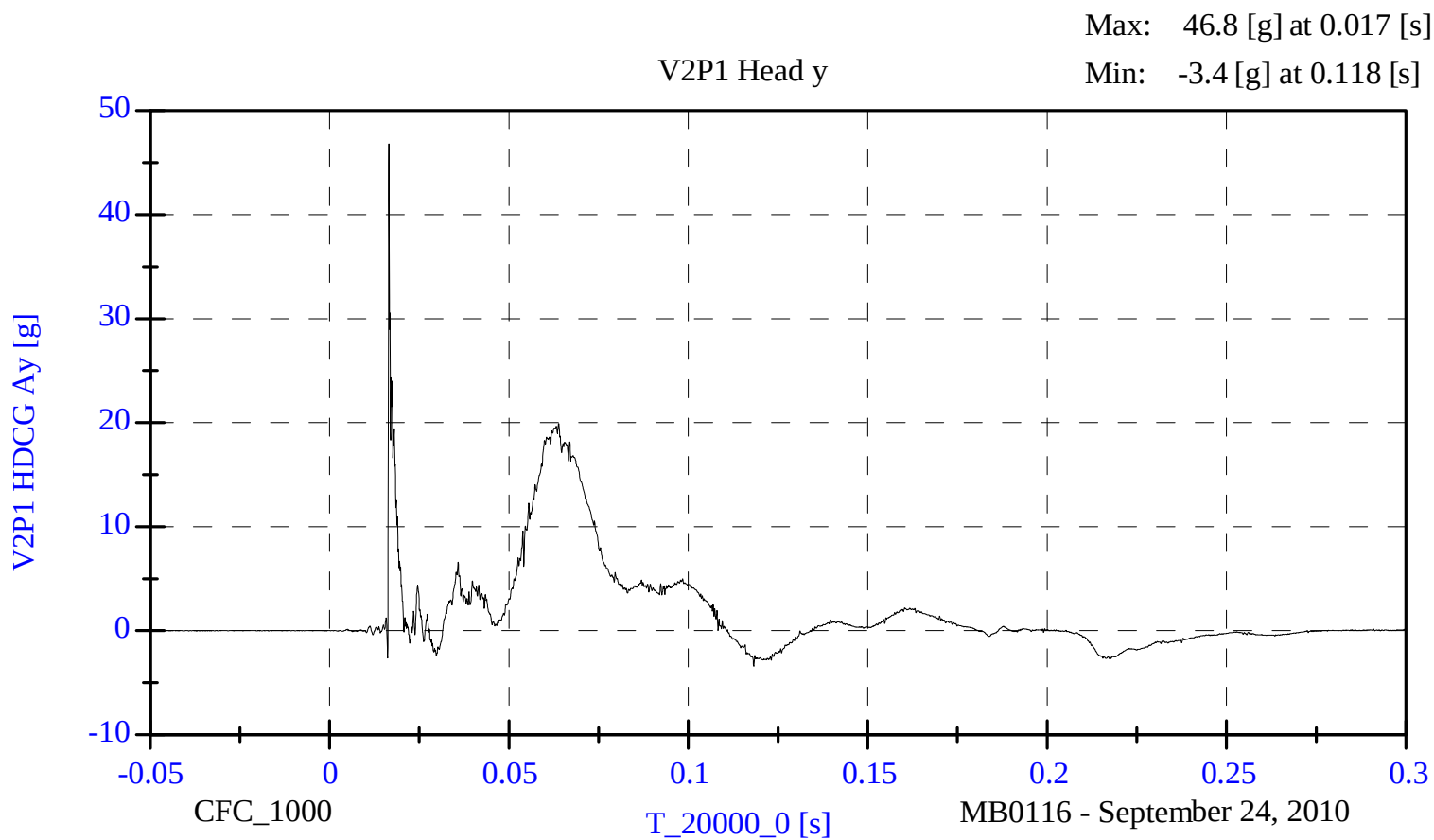
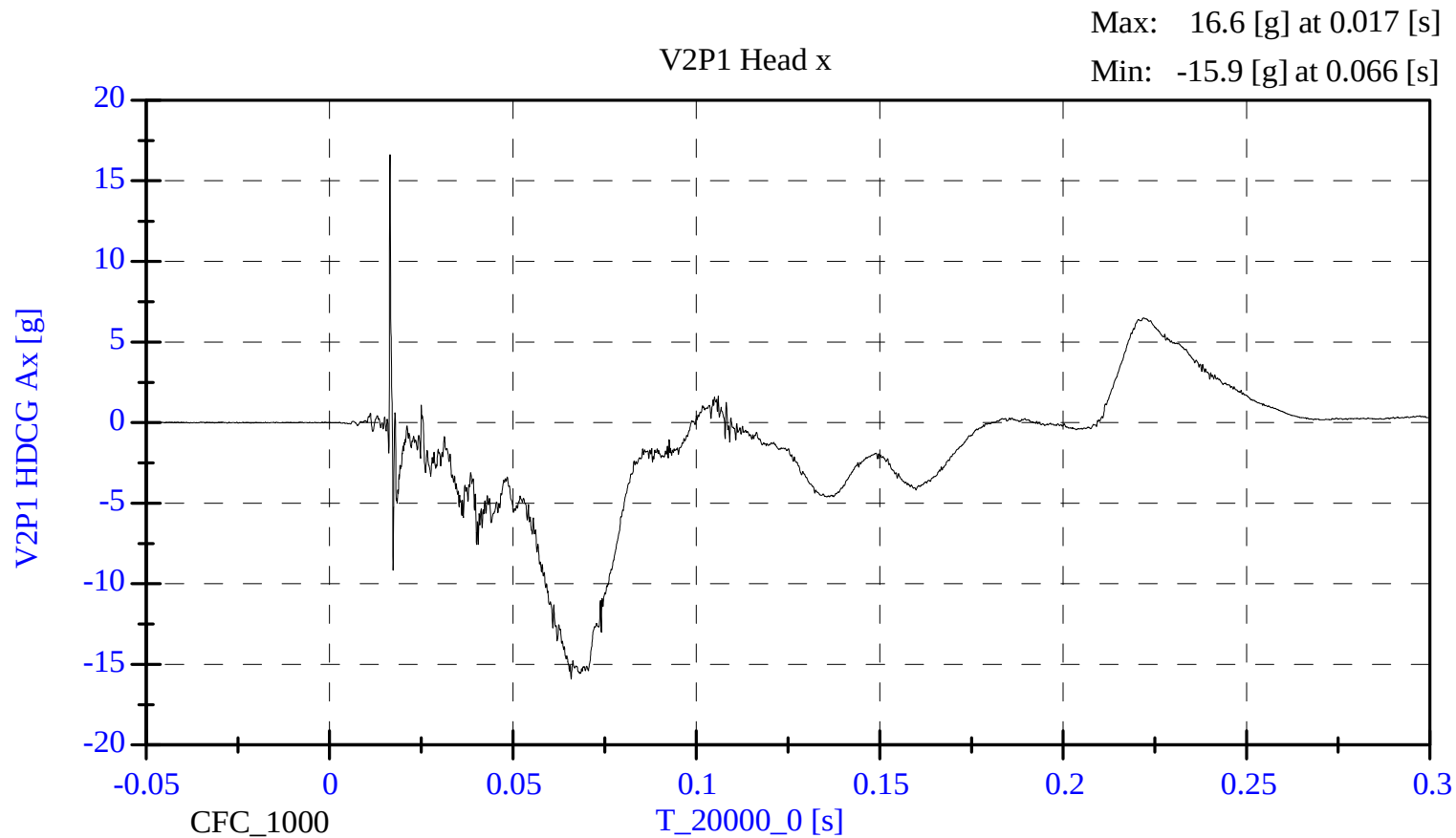
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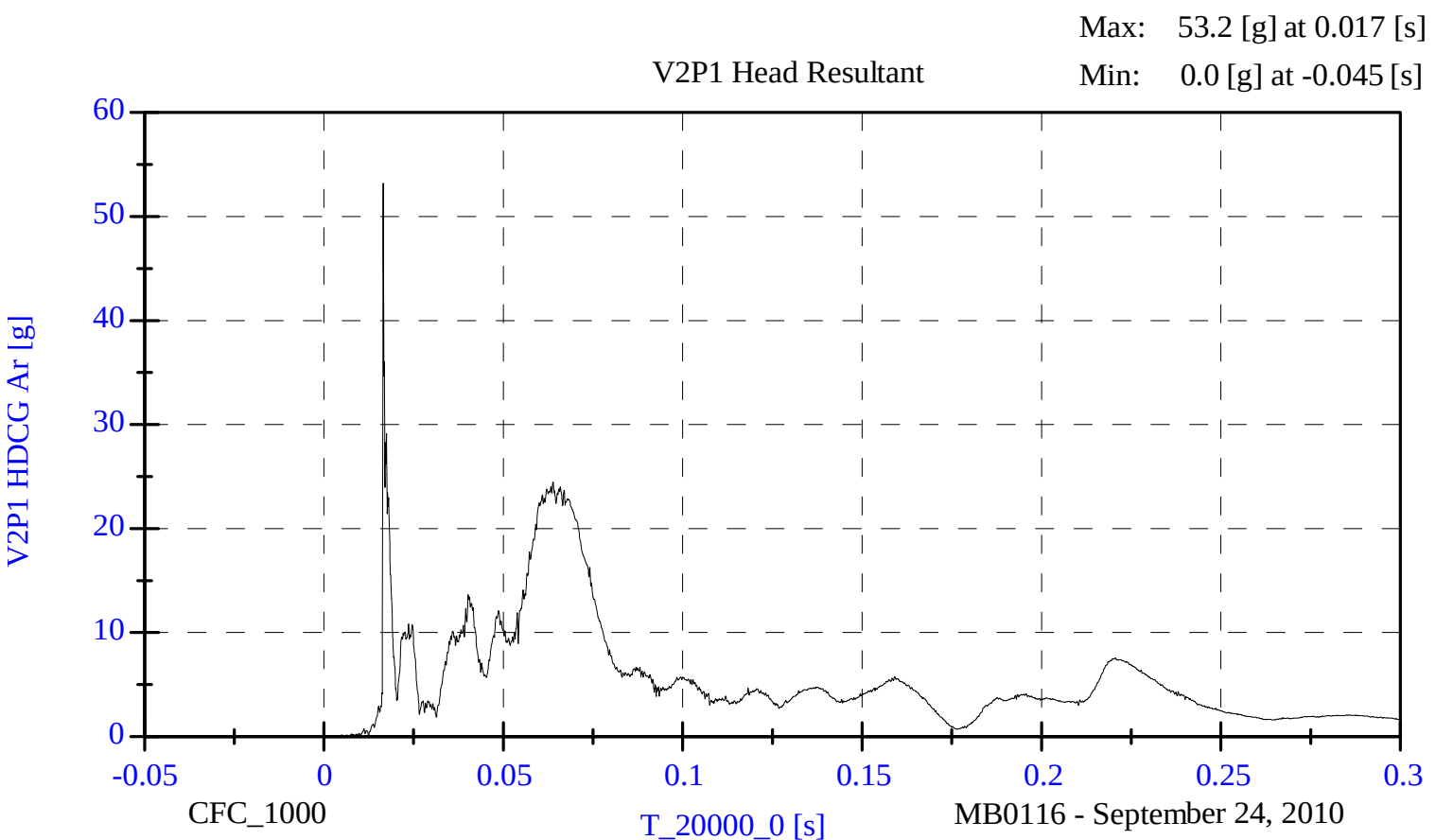
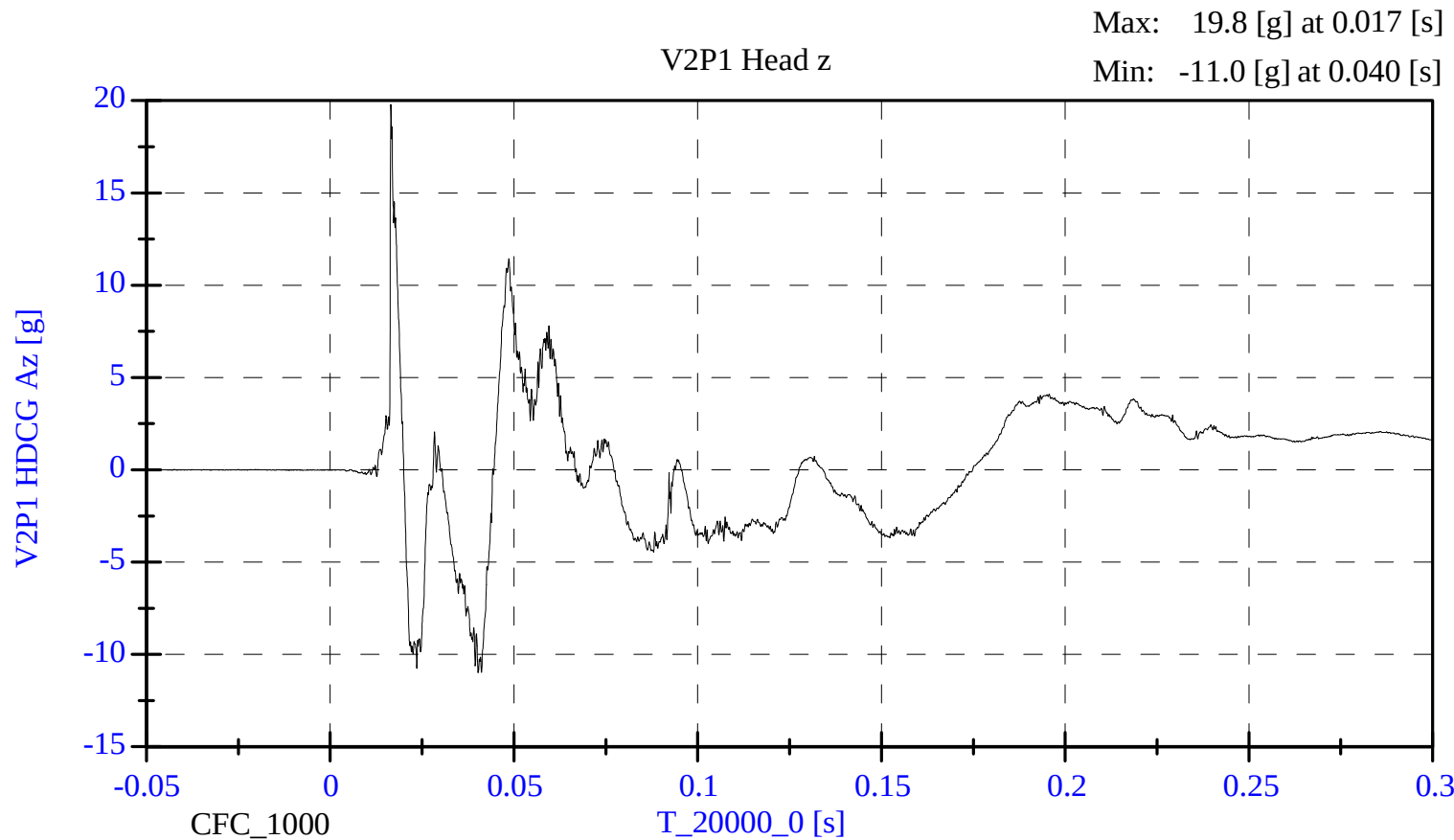
Driver Side Airbag Timing
Driver Side Curtain Airbag Timing
Passenger Side Airbag Timing (if applicable)
Passenger Side Curtain Airbag Timing (if different from Driver)
Right Side Sill at Front Seat Acceleration (X)
Right Side Sill at Front Seat Acceleration (Y)
Right Side Sill at Front Seat Acceleration (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)

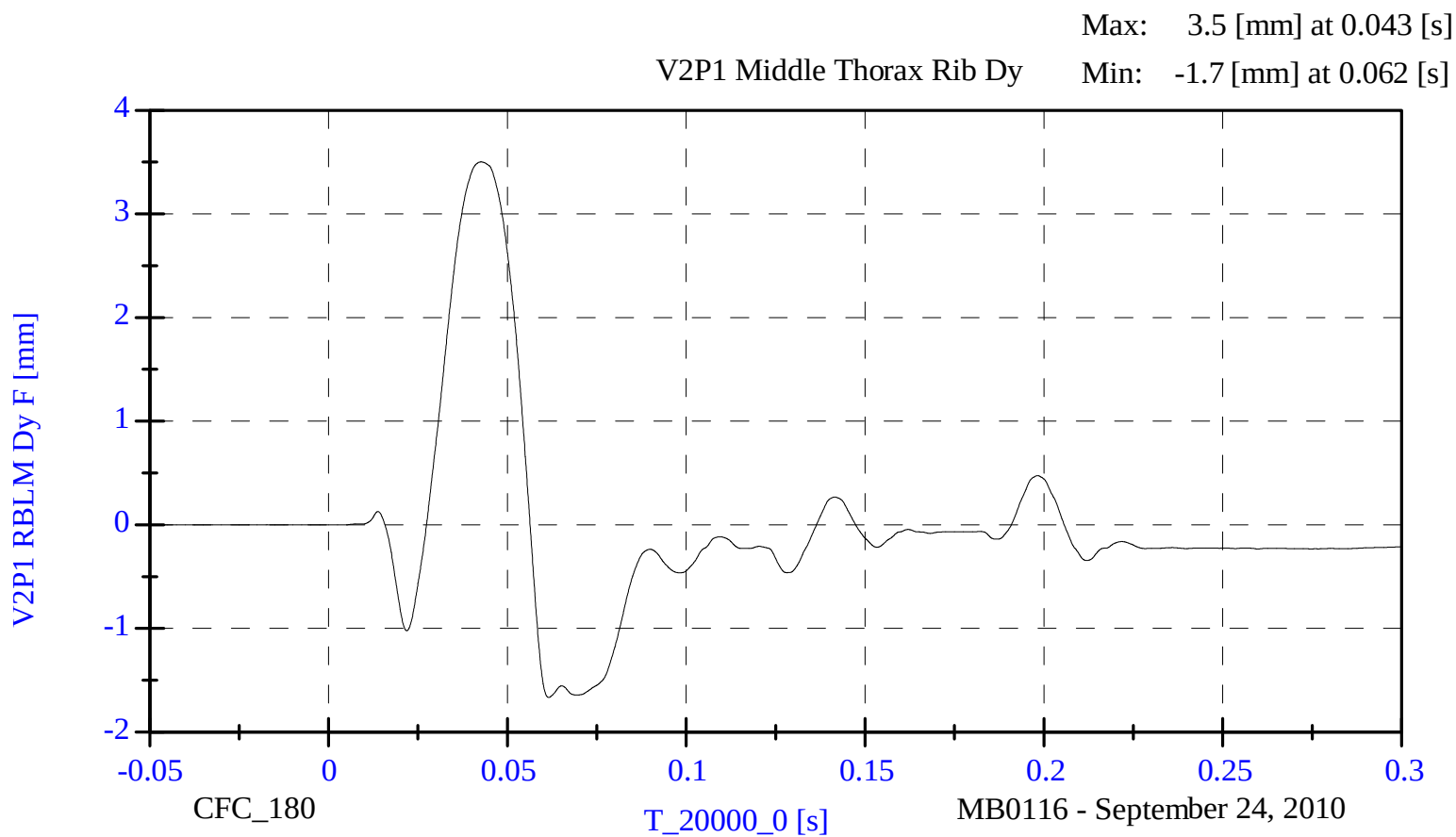
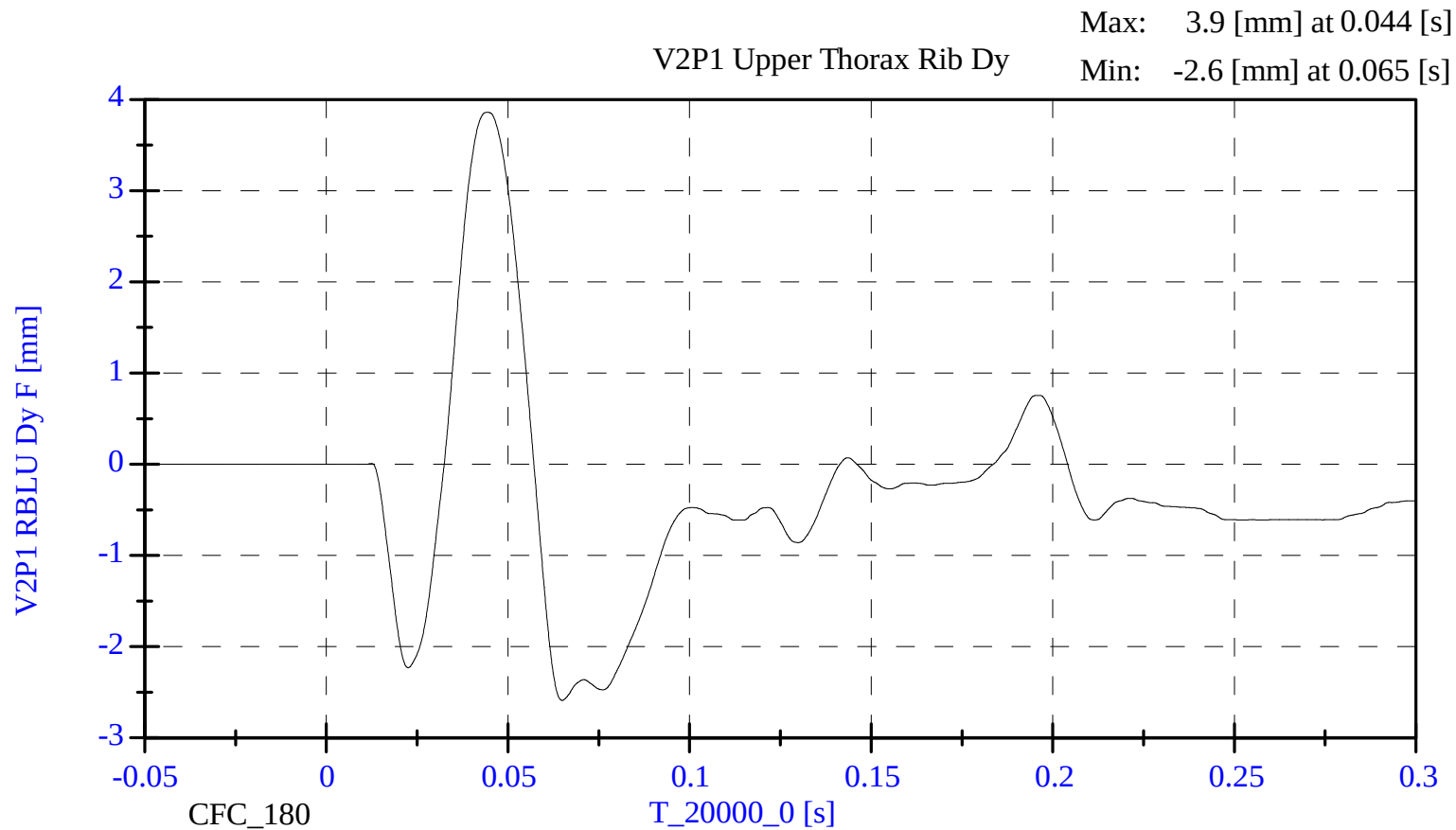
Rear Seat Track Acceleration (Y)
Vehicle Center of Gravity Acceleration (X)
Vehicle Center of Gravity Acceleration (Y)
Vehicle Center of Gravity Acceleration (Z)

MDB Instrumentation Data

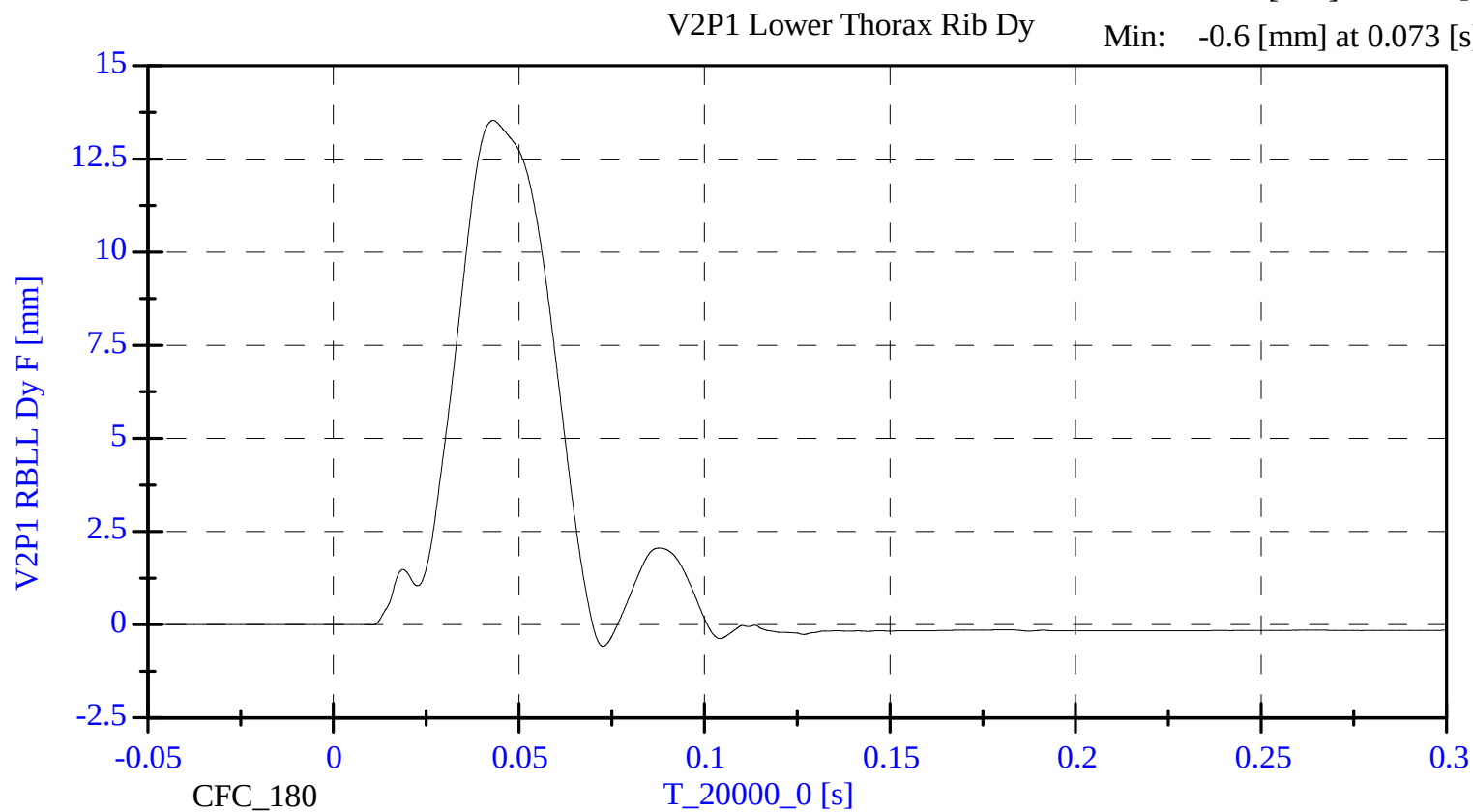
MDB Center of Gravity Acceleration (X)
MDB Center of Gravity Acceleration (Y)
MDB Center of Gravity Acceleration (Z)
MDB Rear Acceleration (X)
MDB Rear Acceleration (Y)
Left MDB Contact Switch
Right MDB Contact Switch



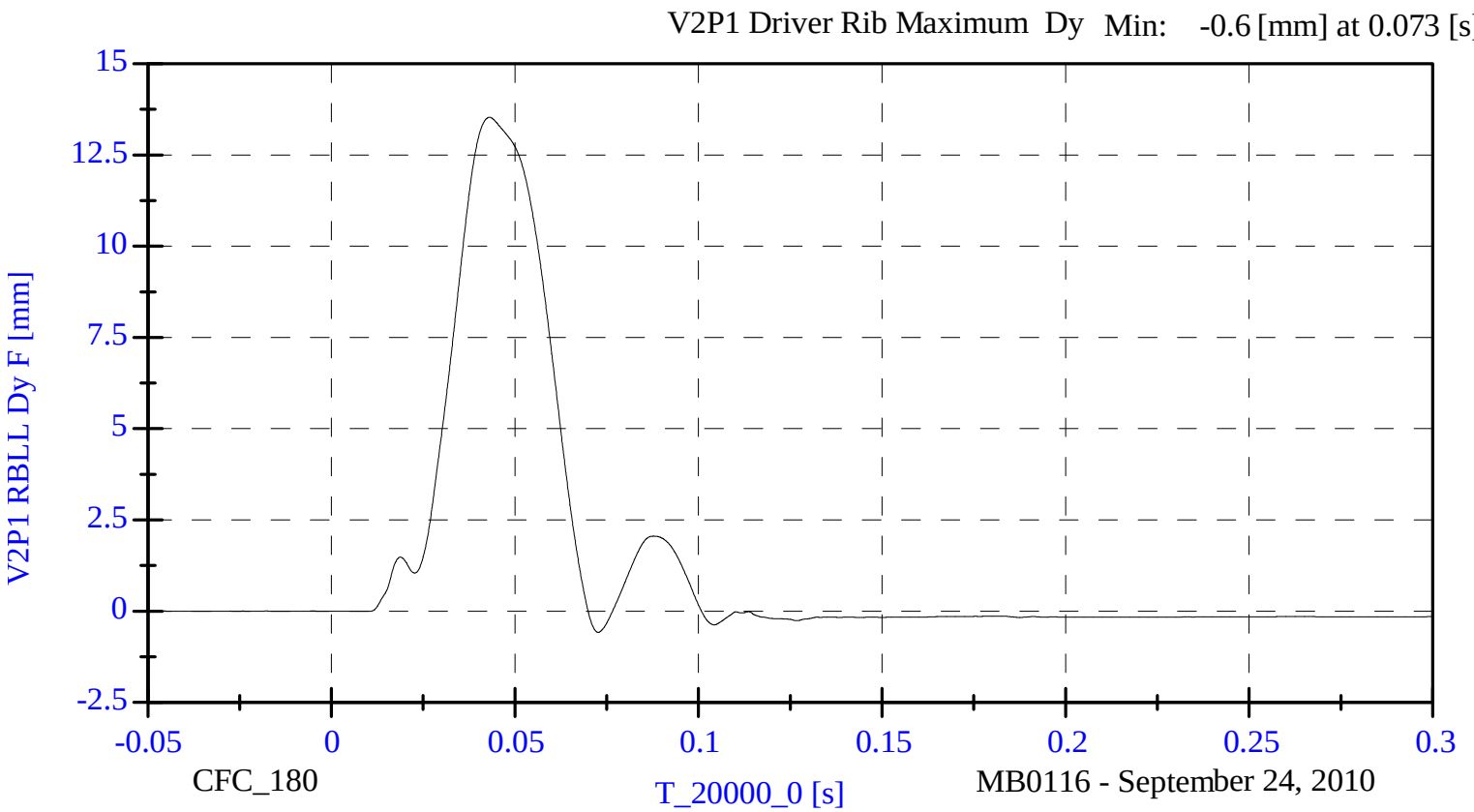




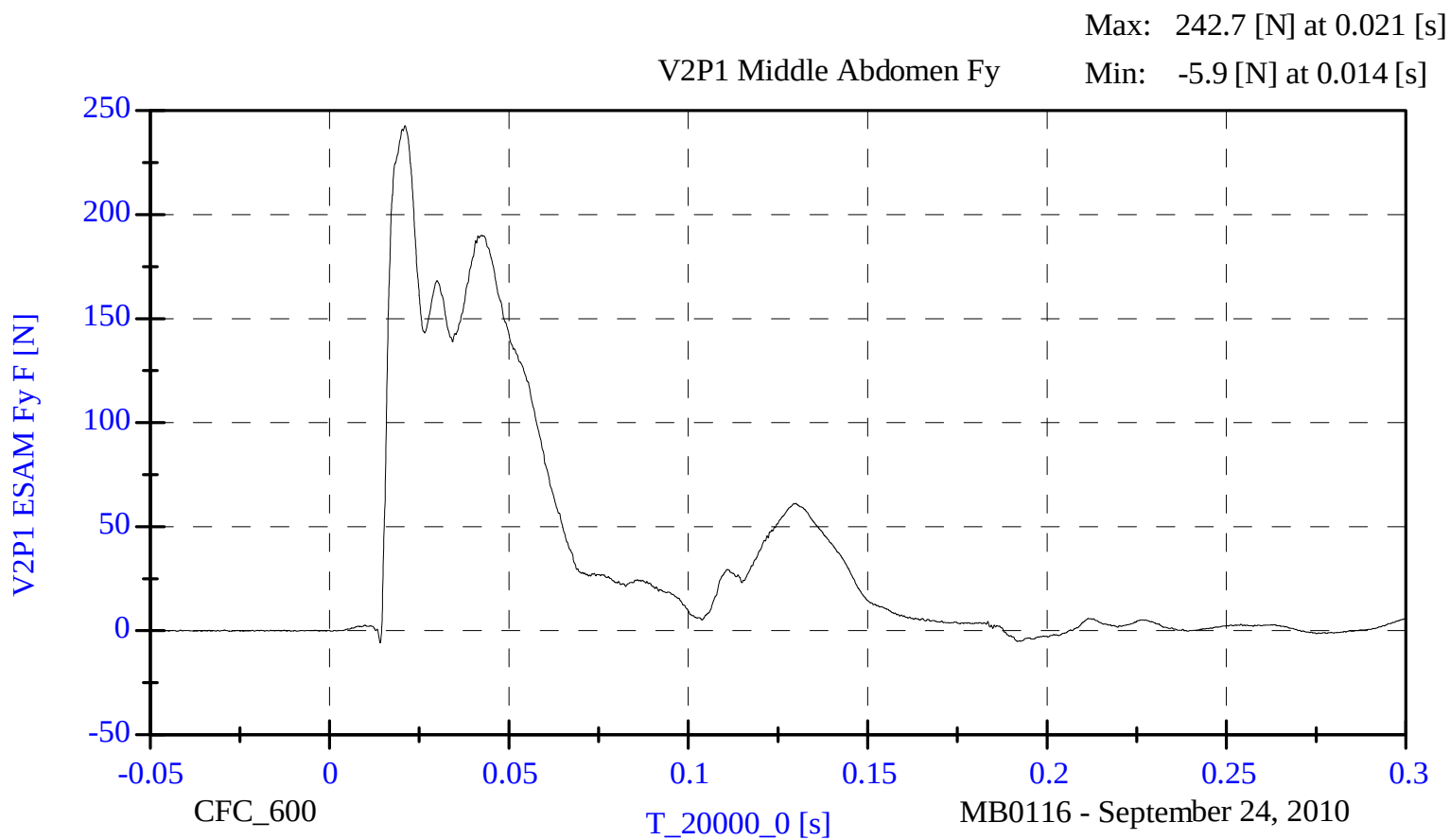
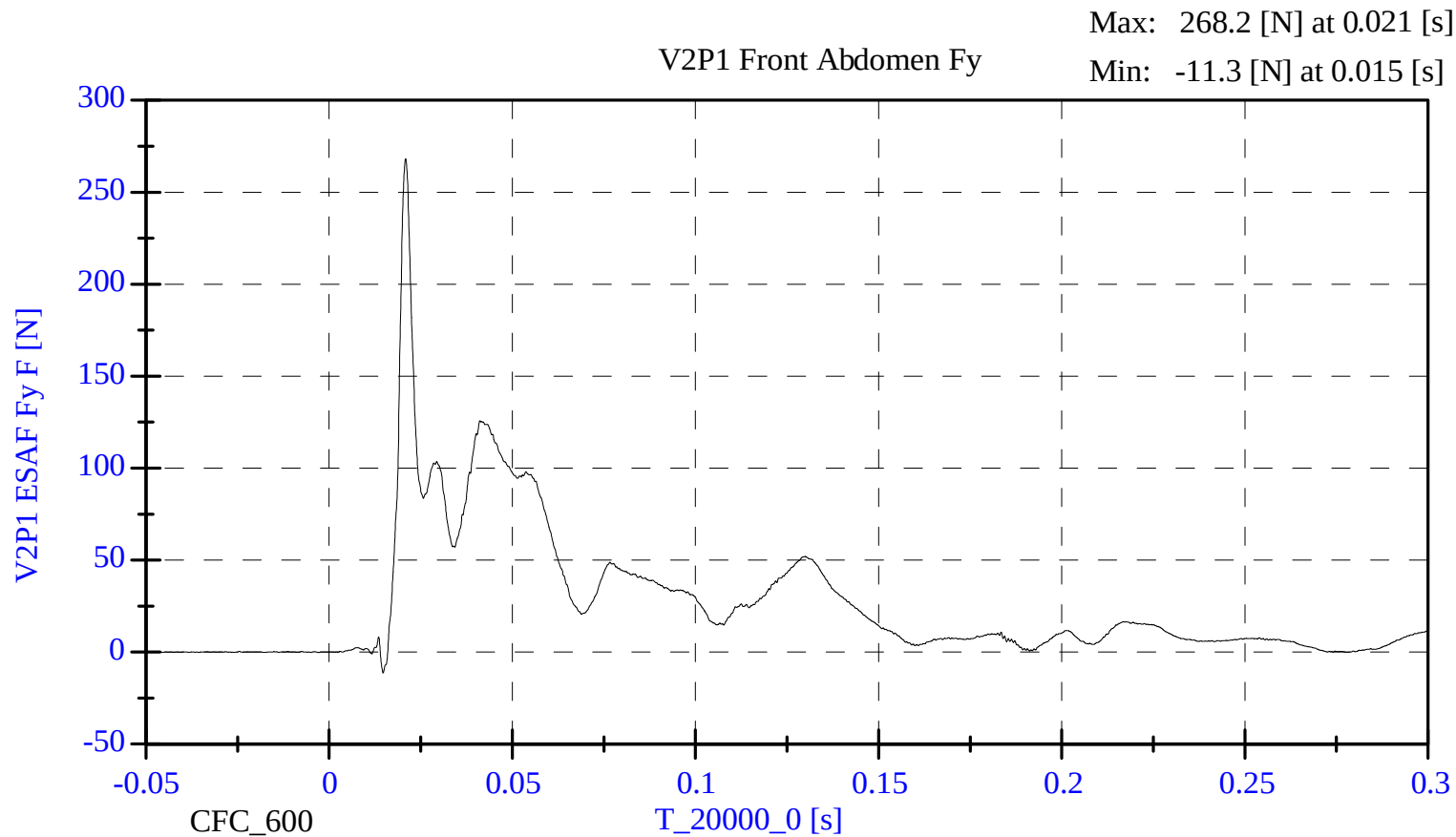
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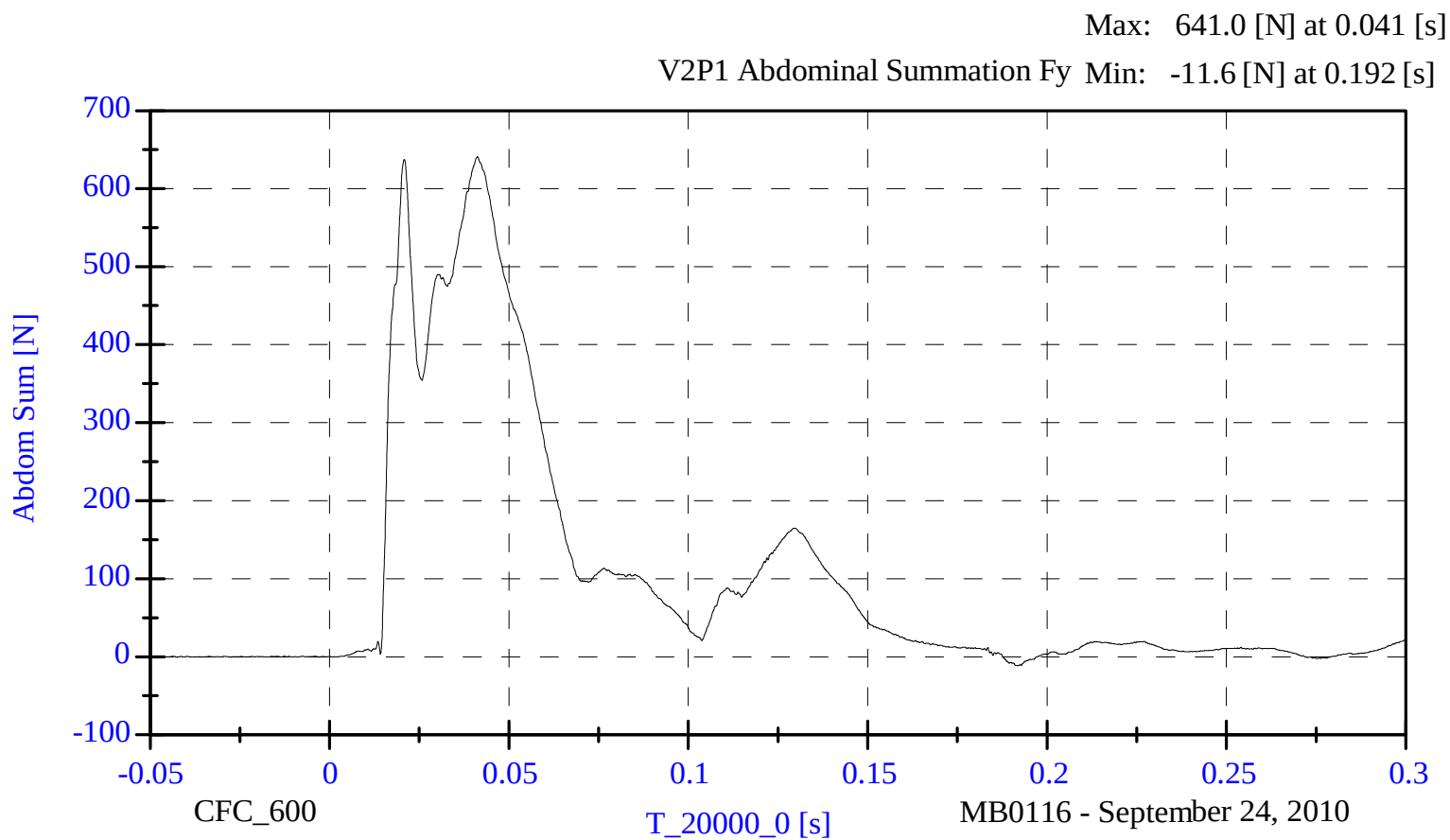
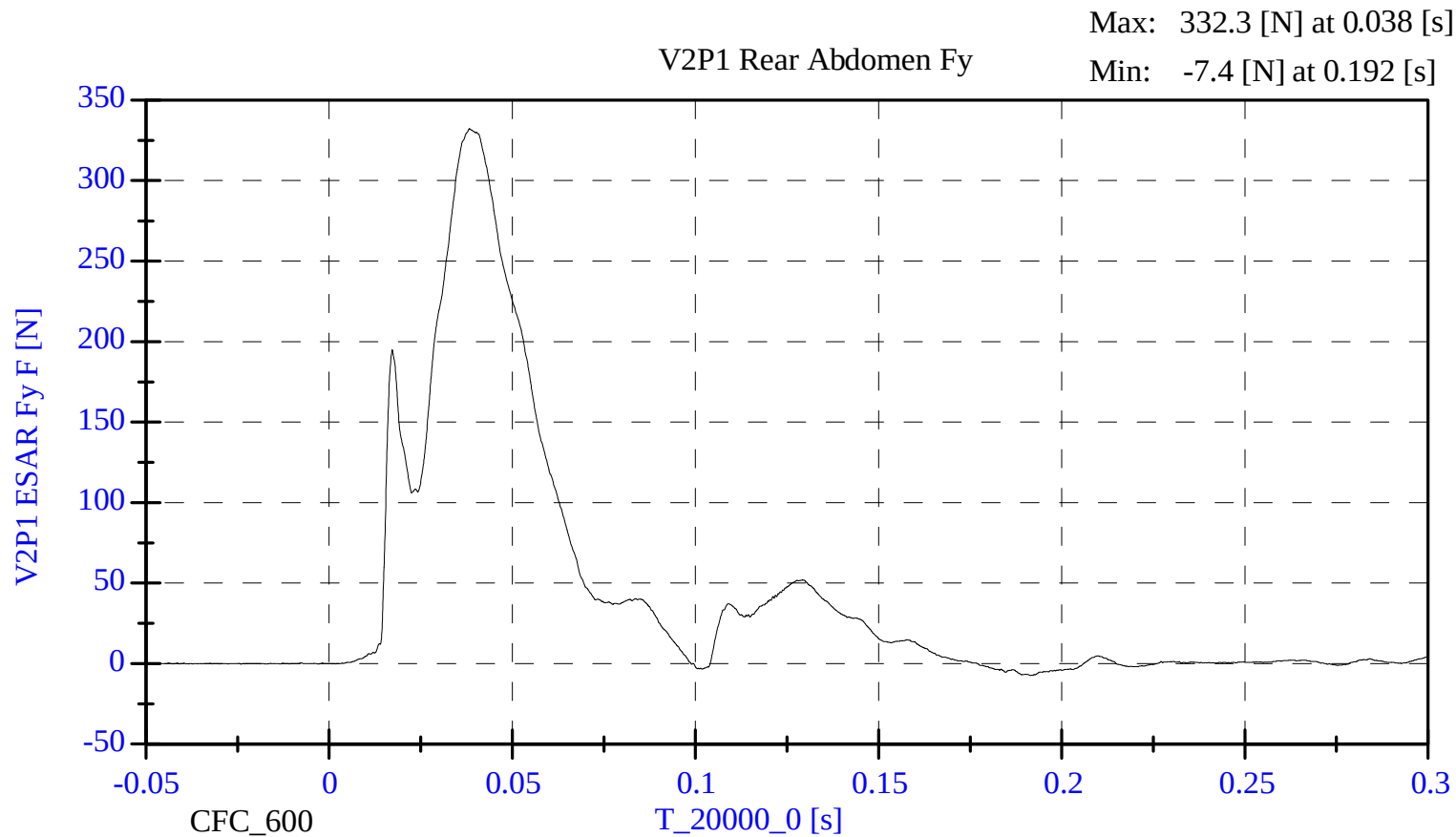


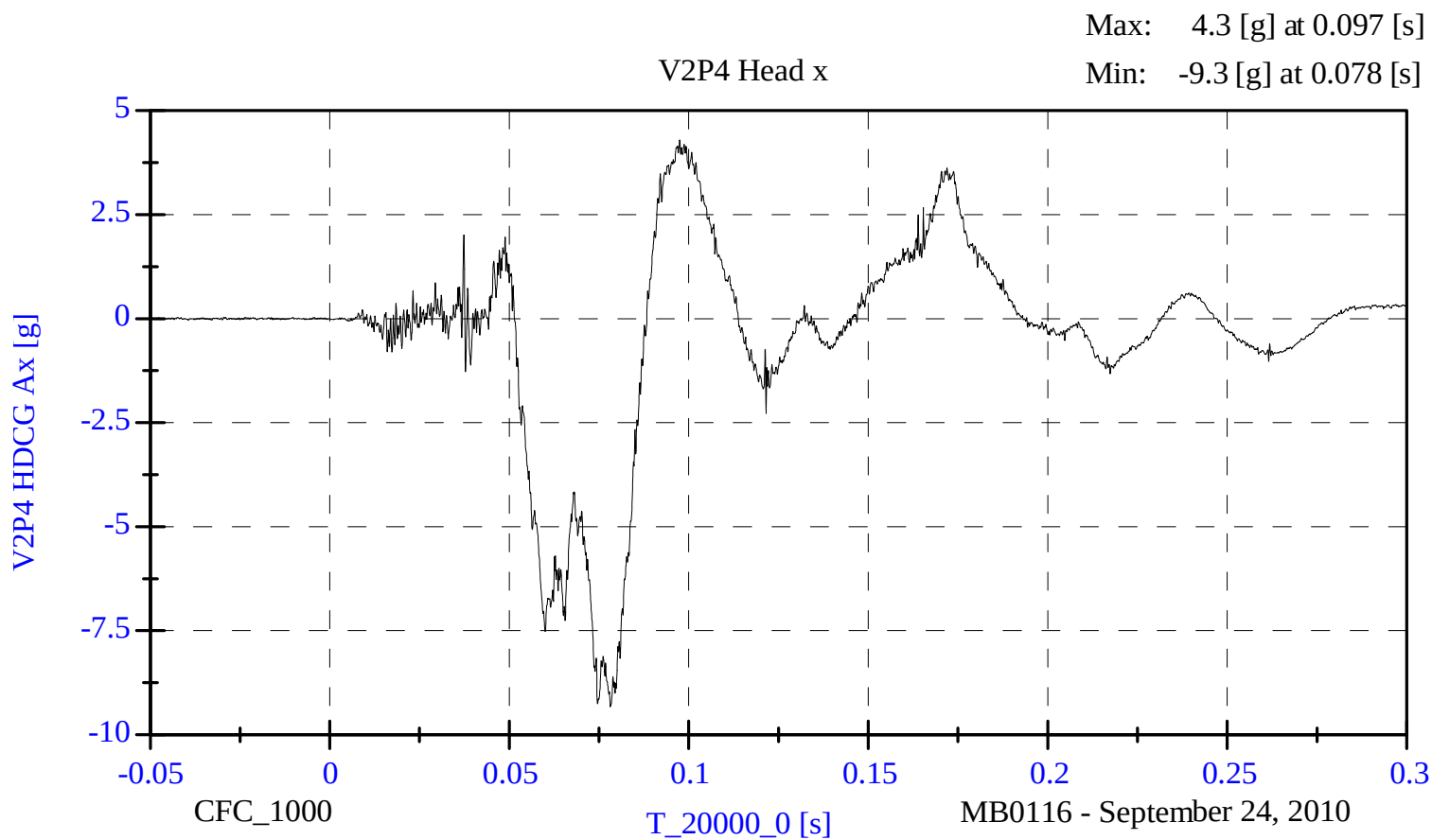
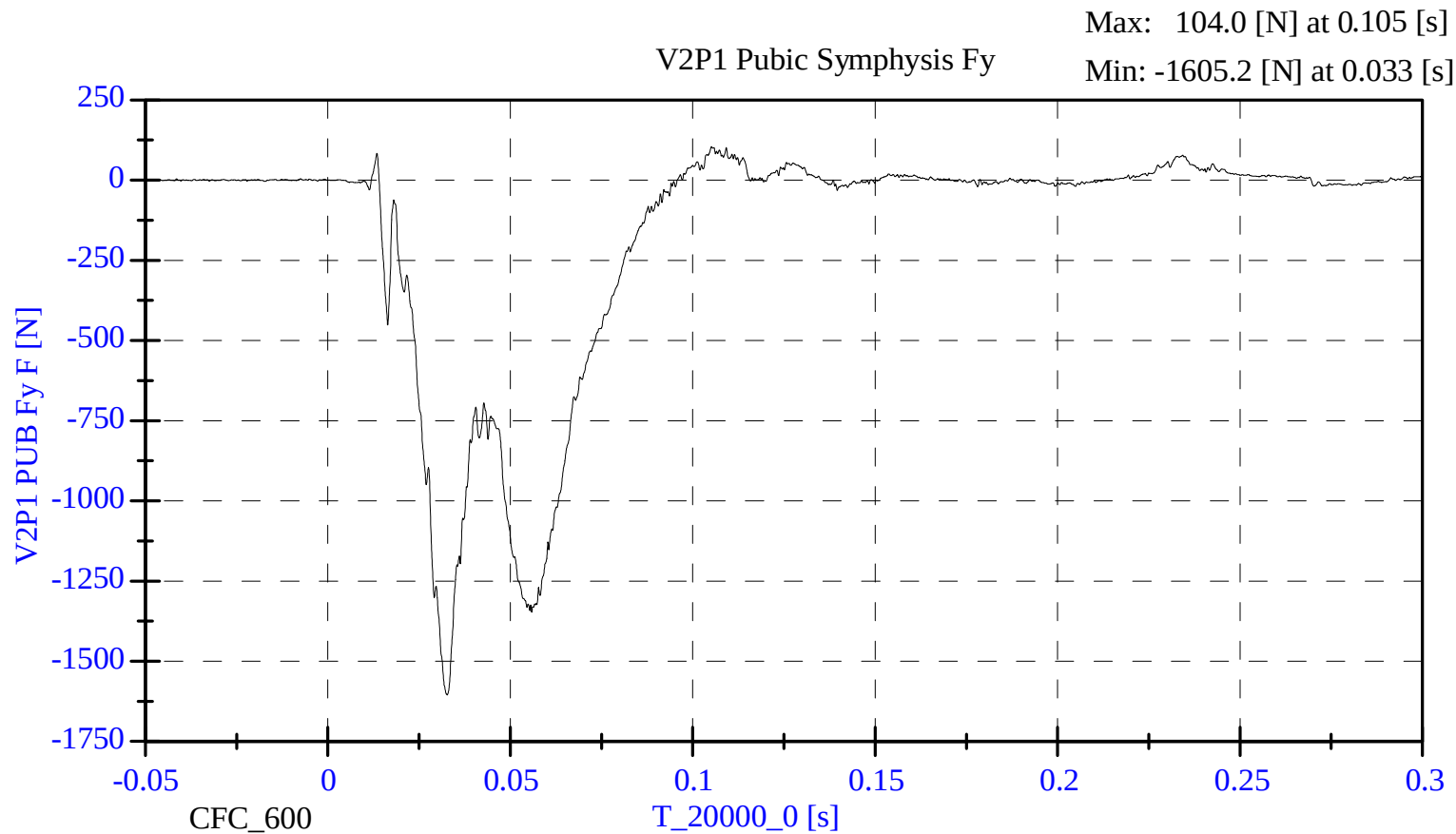
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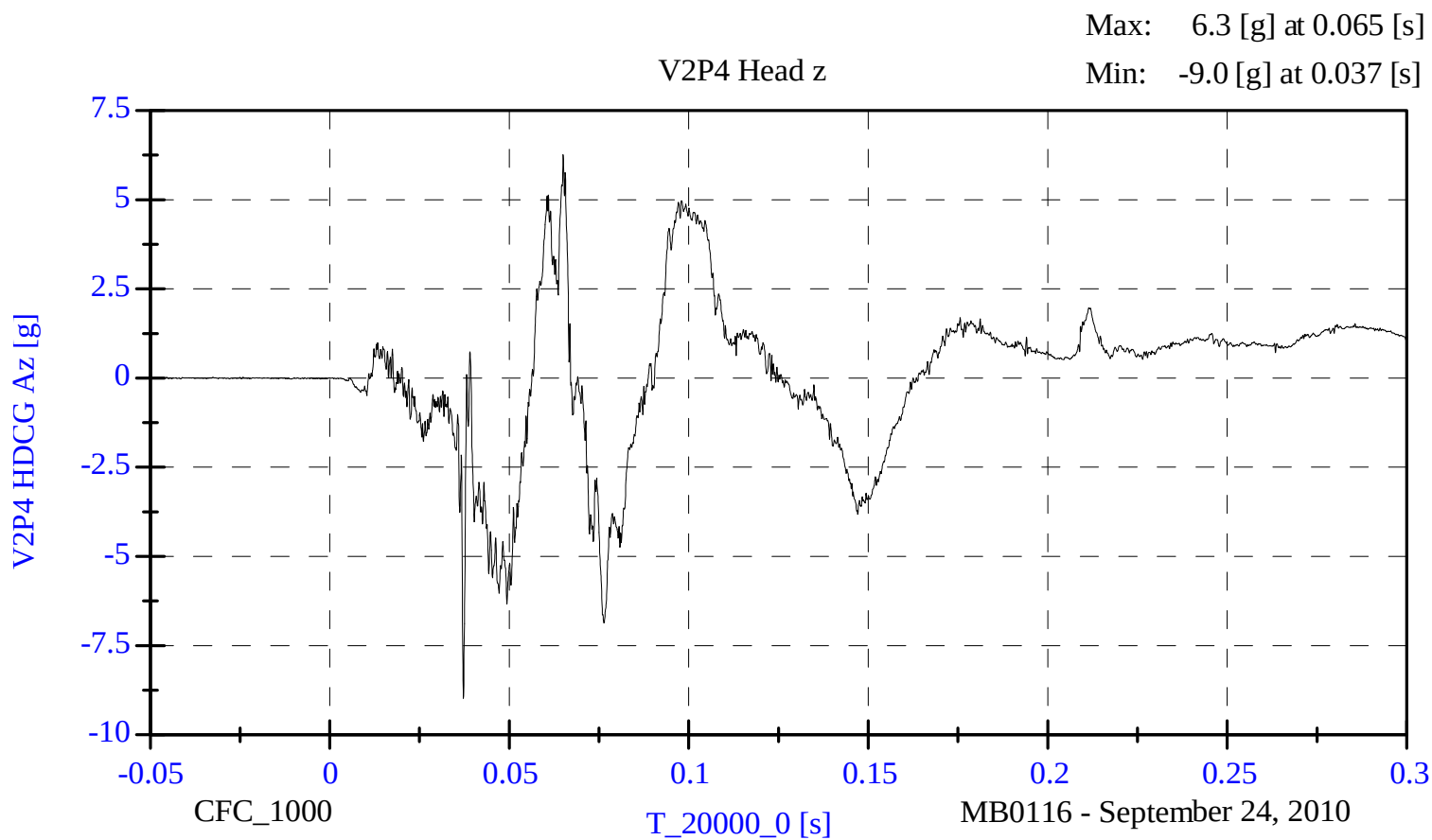
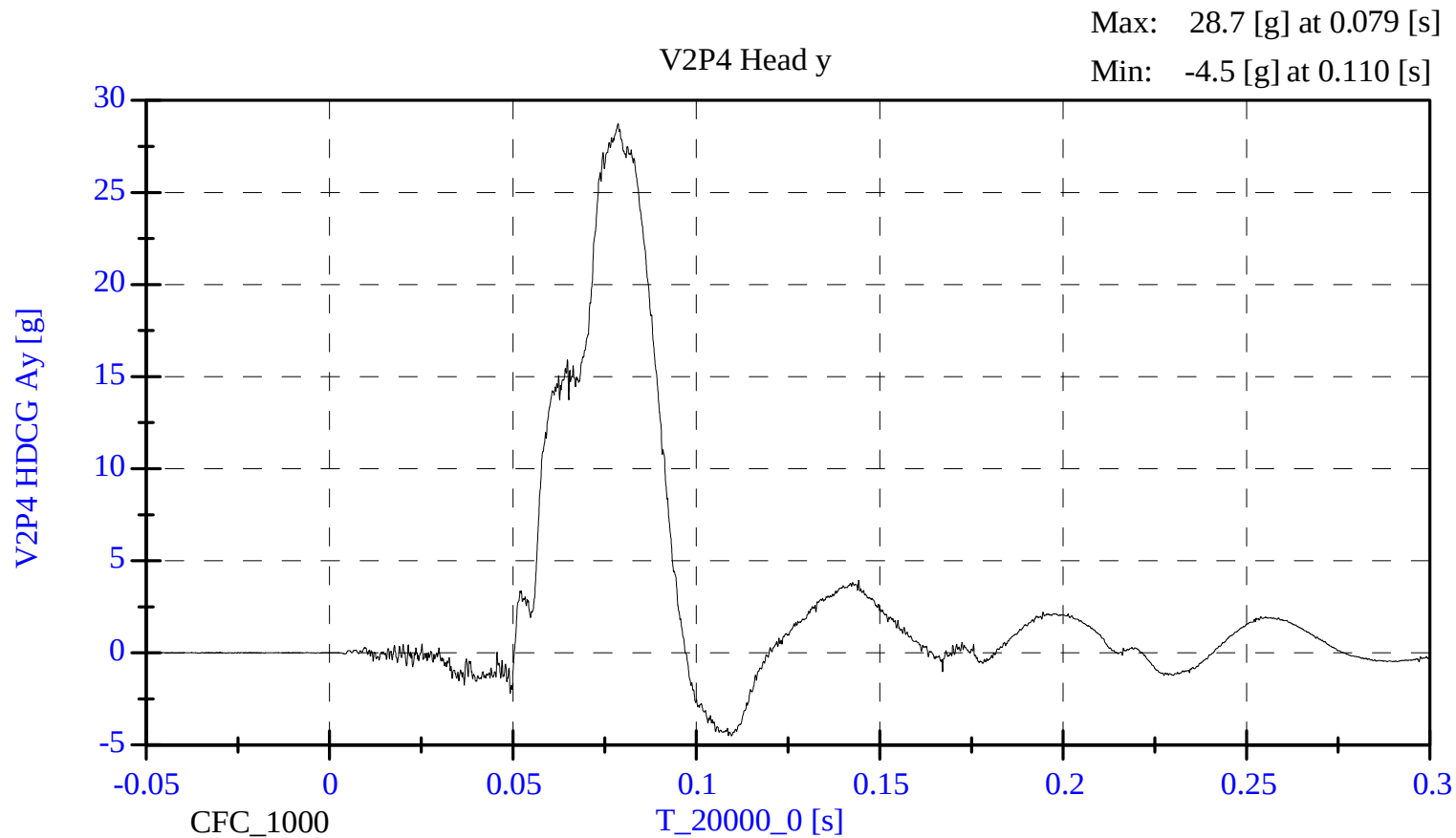


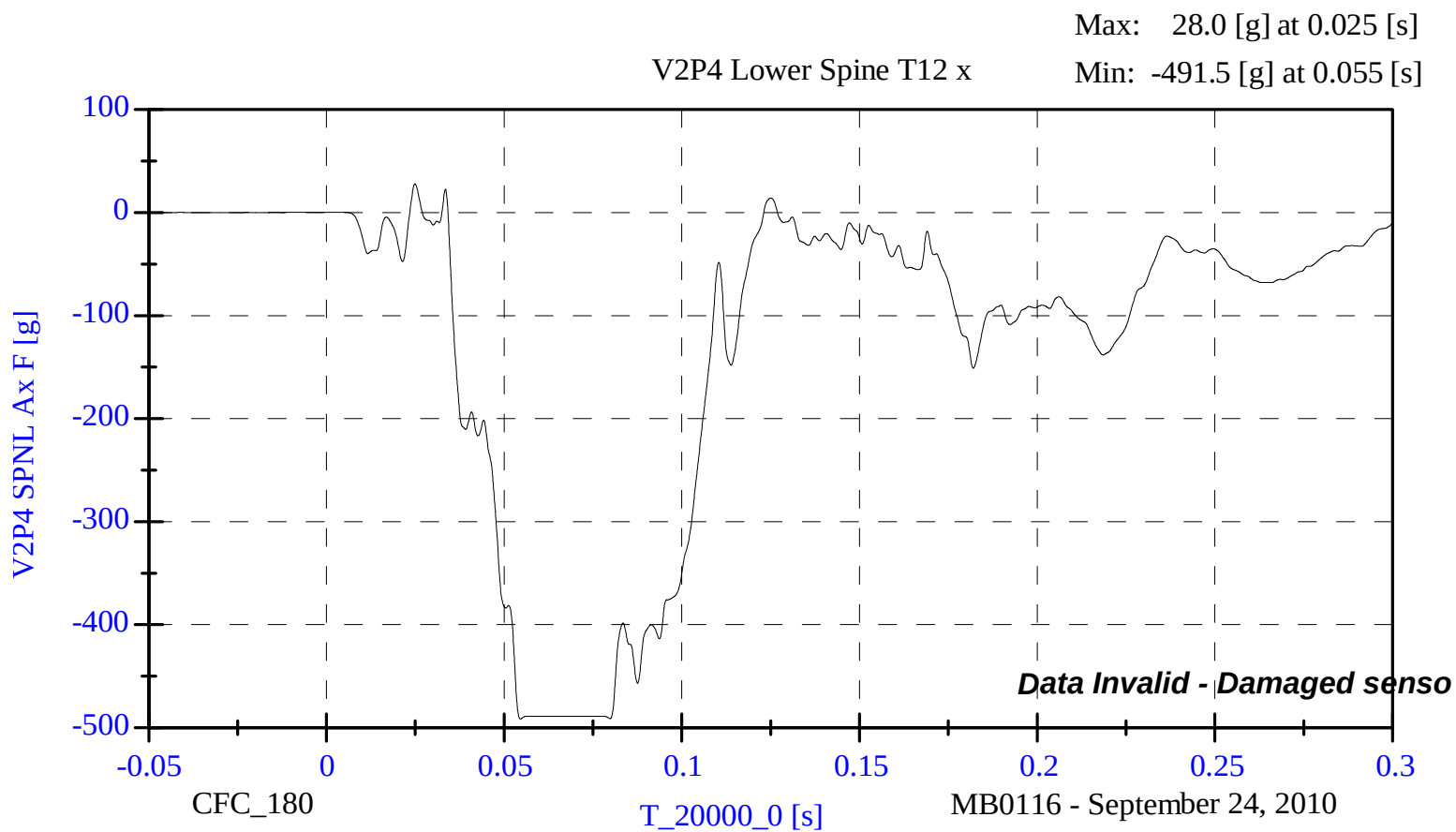
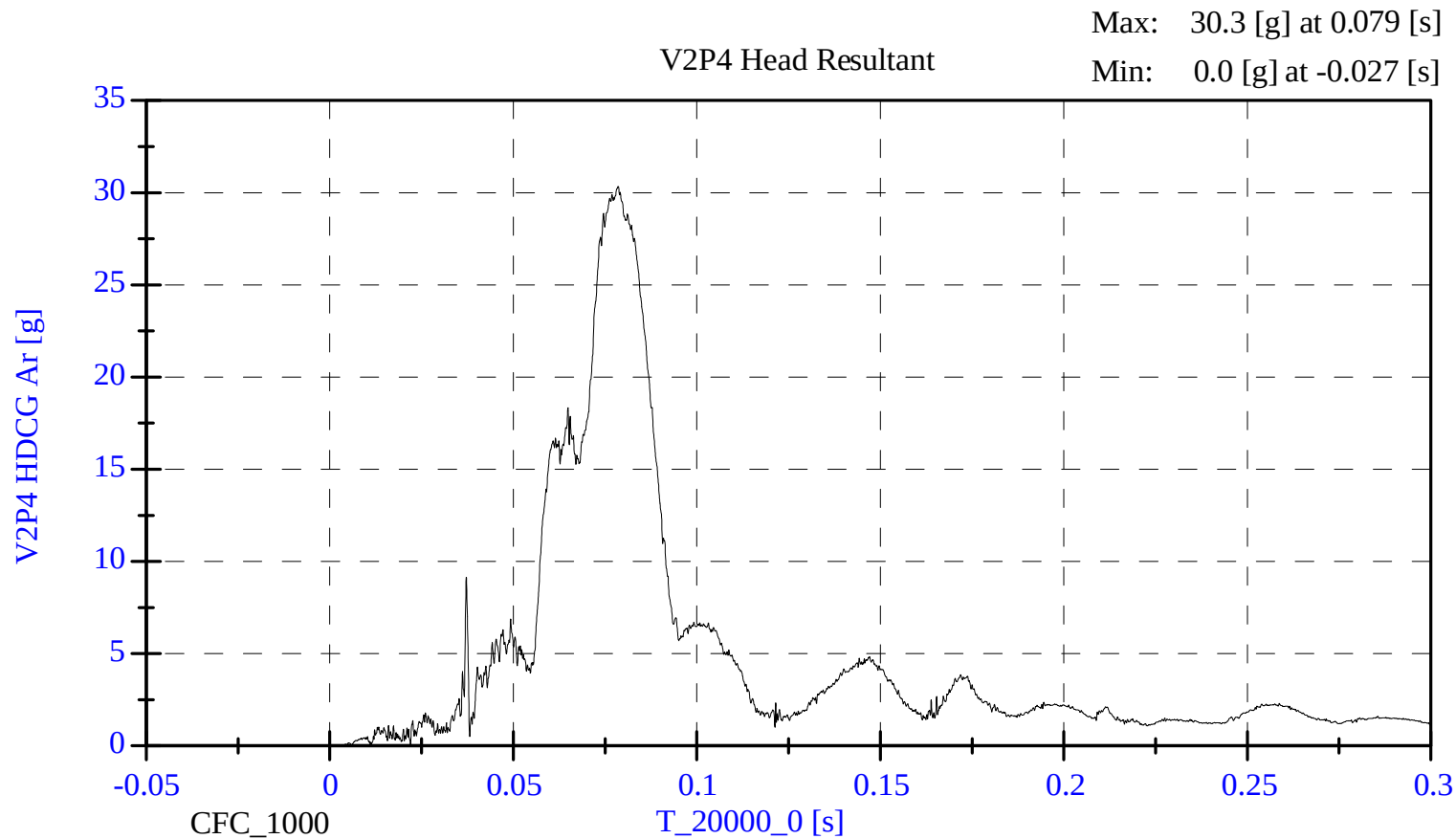
MB0116 - September 24, 2010

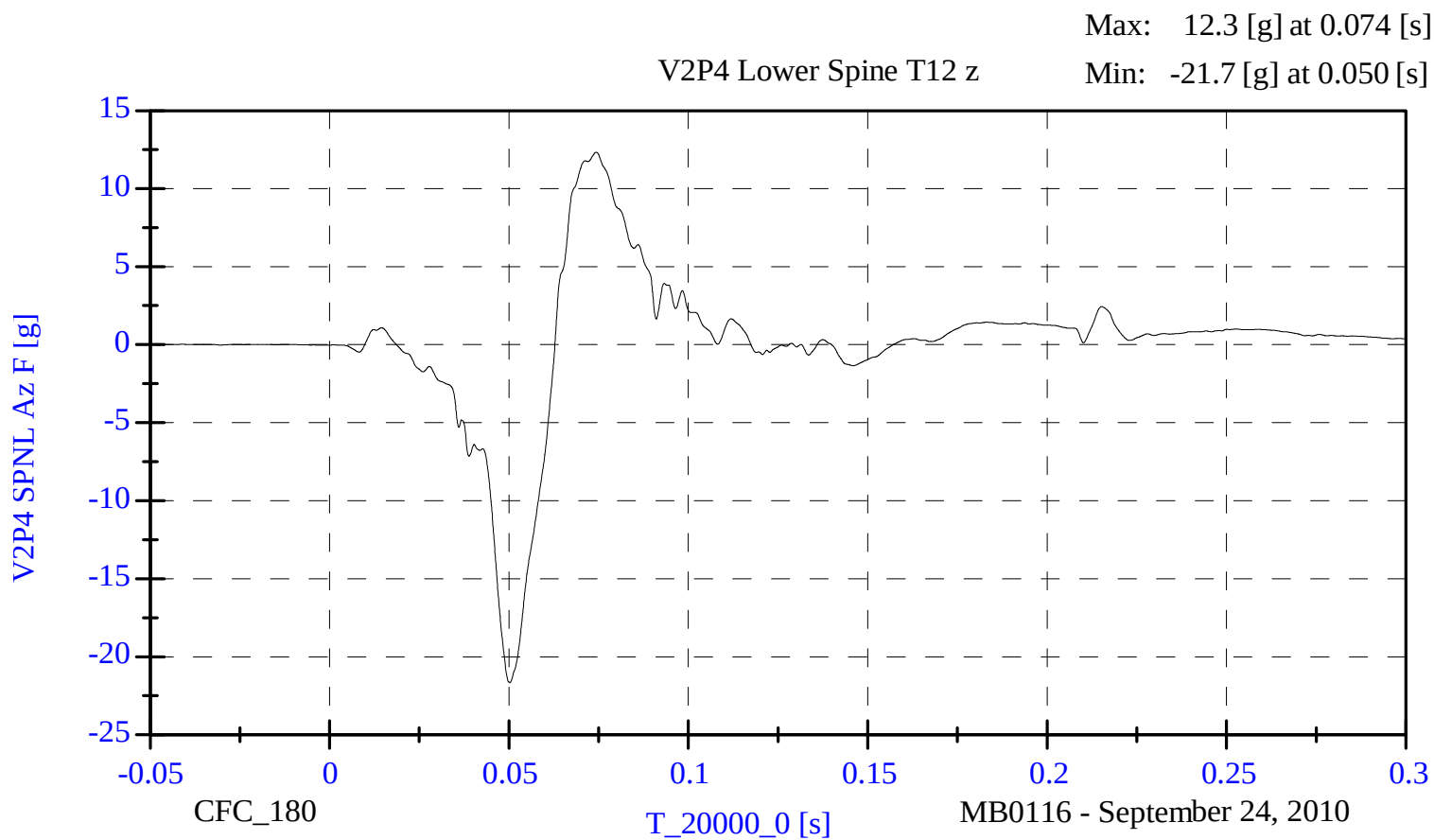
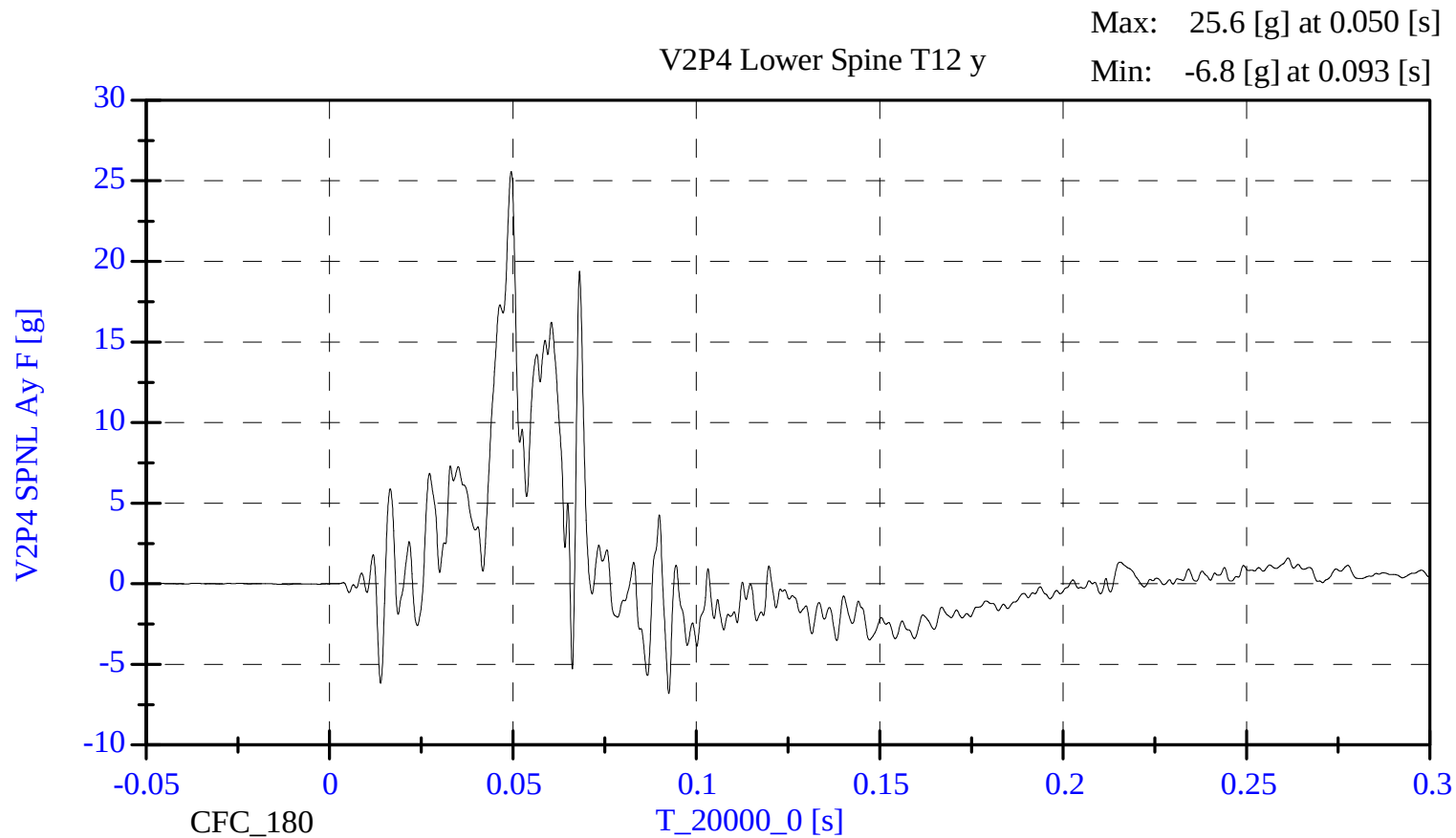


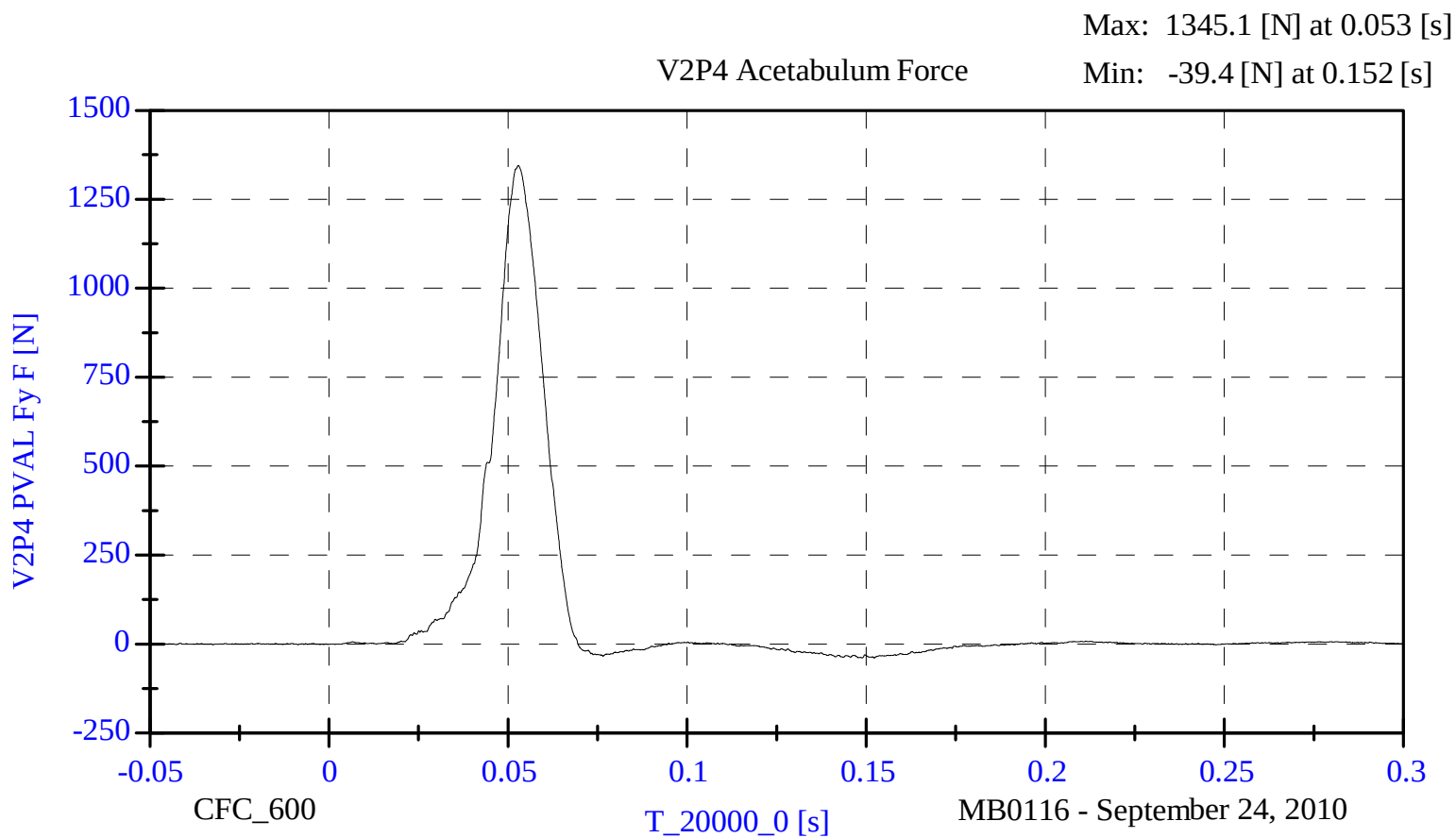
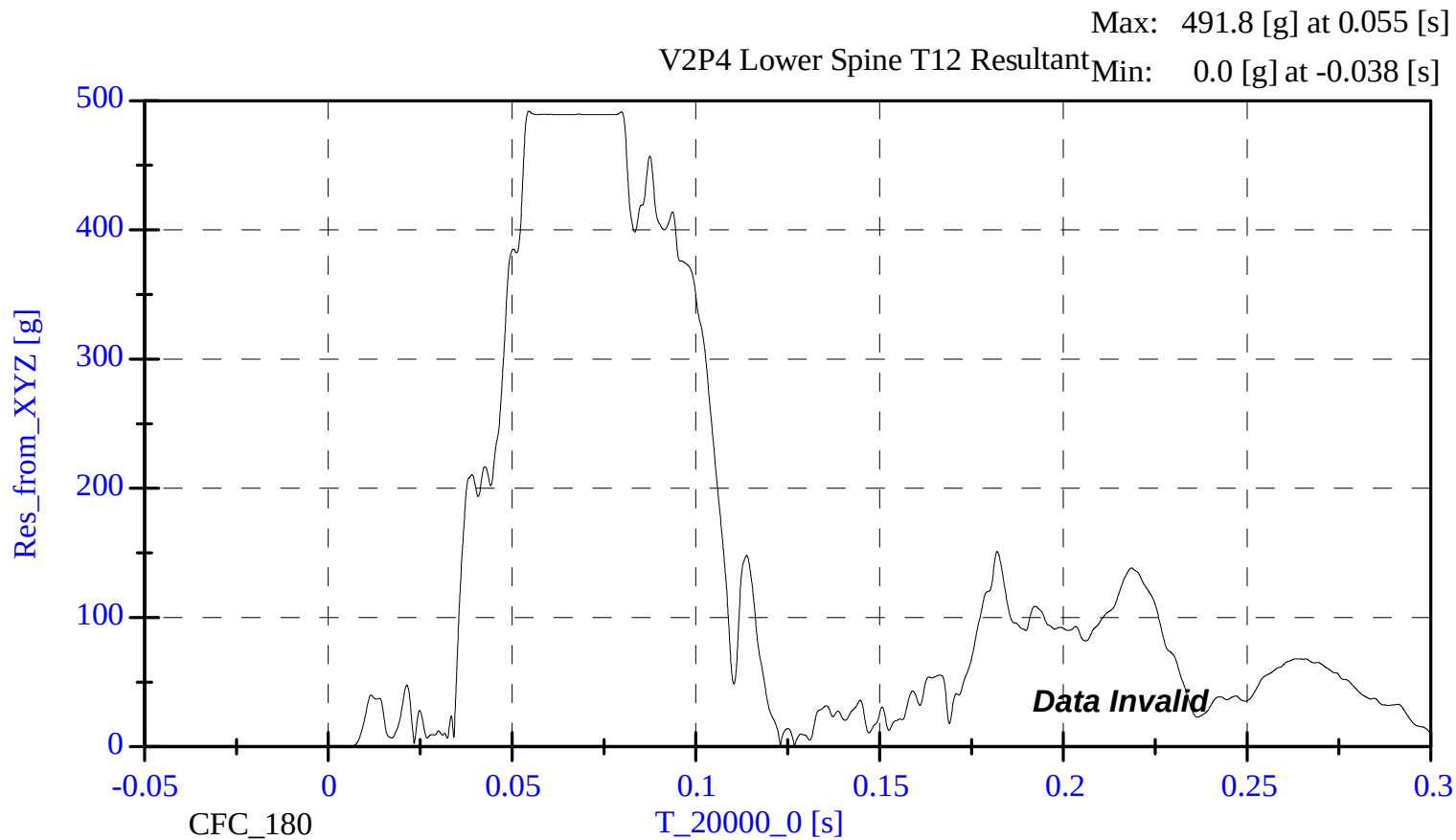


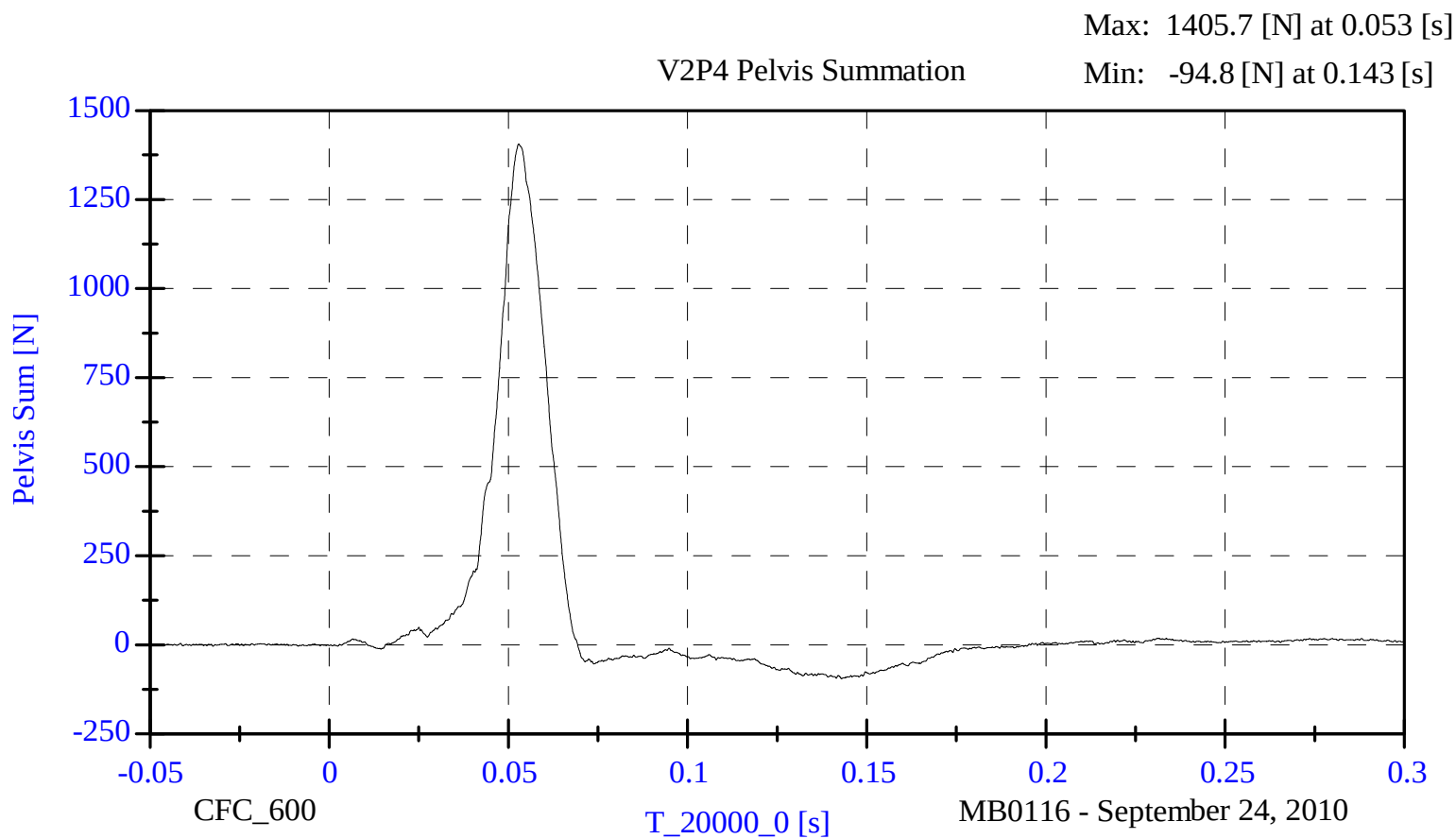
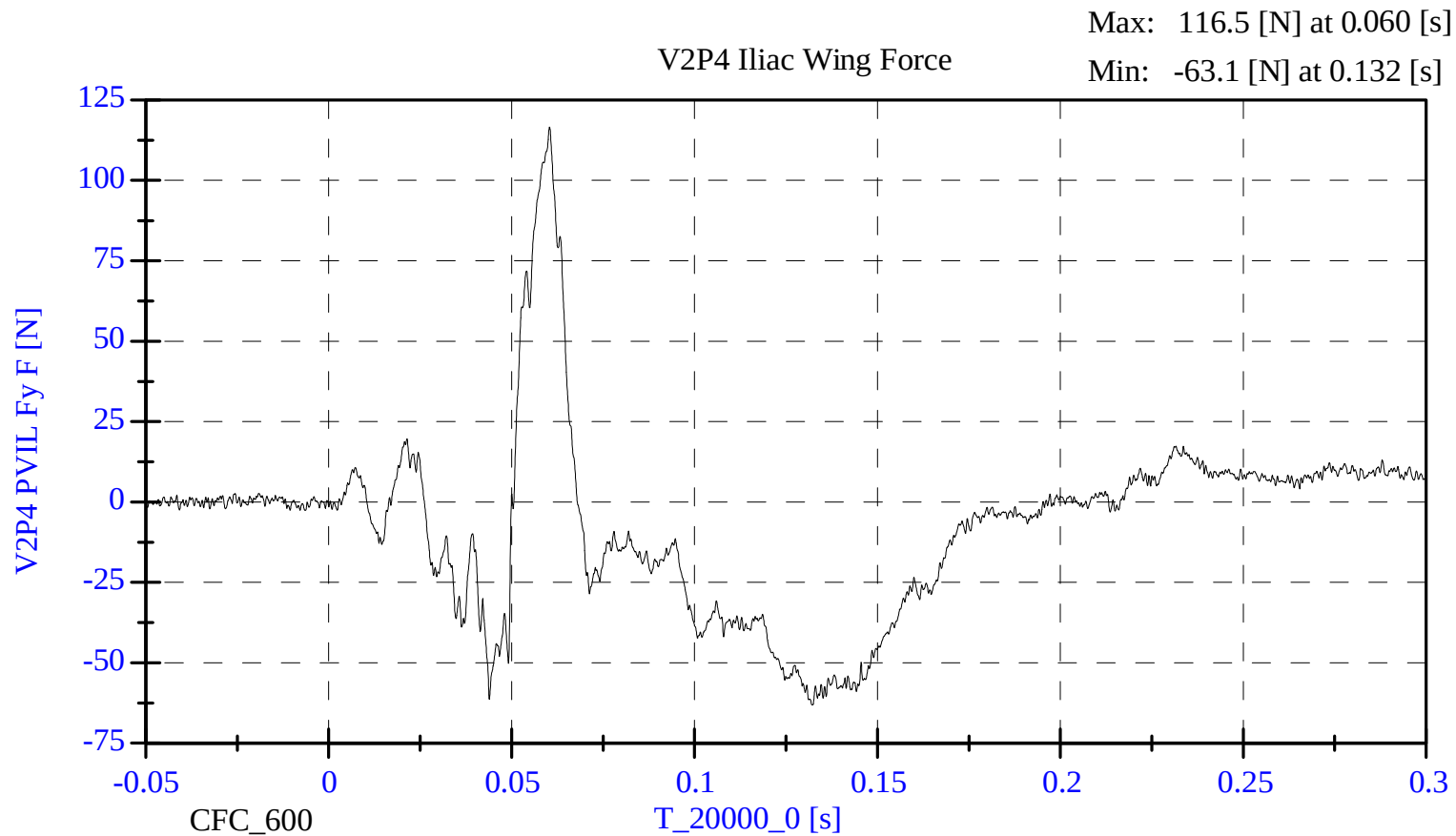












APPENDIX C
DUMMY CALIBRATION DATA

CALIBRATION TEST RESULTS

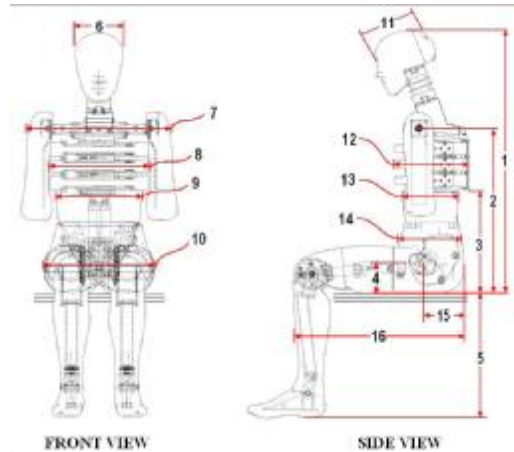
PRE-TEST

Es-2re No: 33

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**

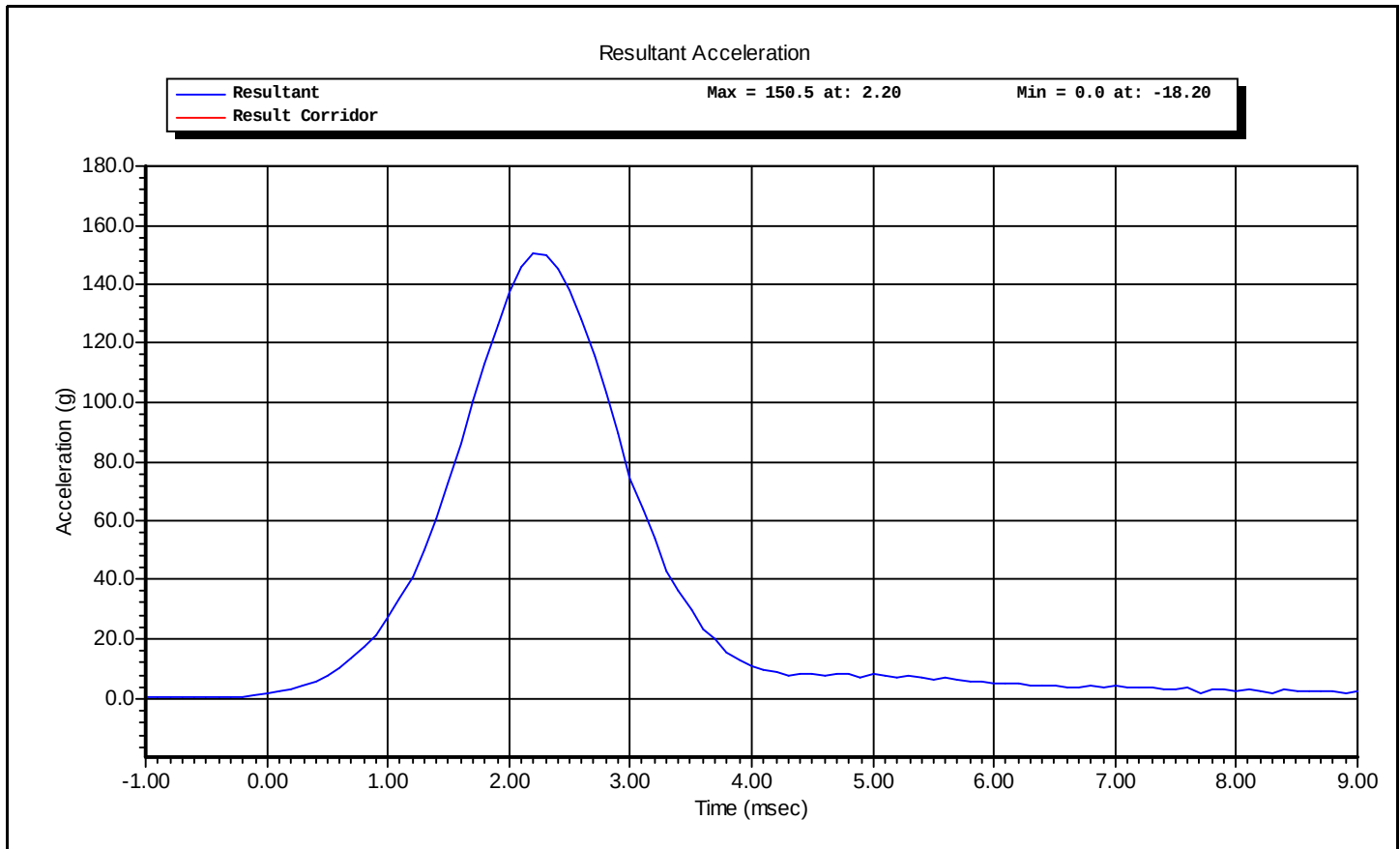


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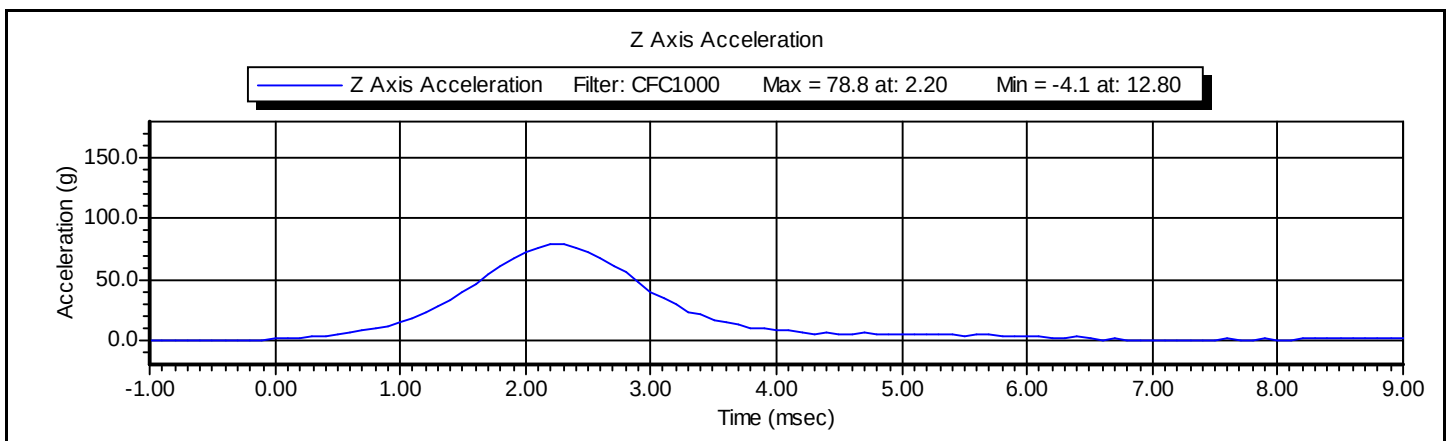
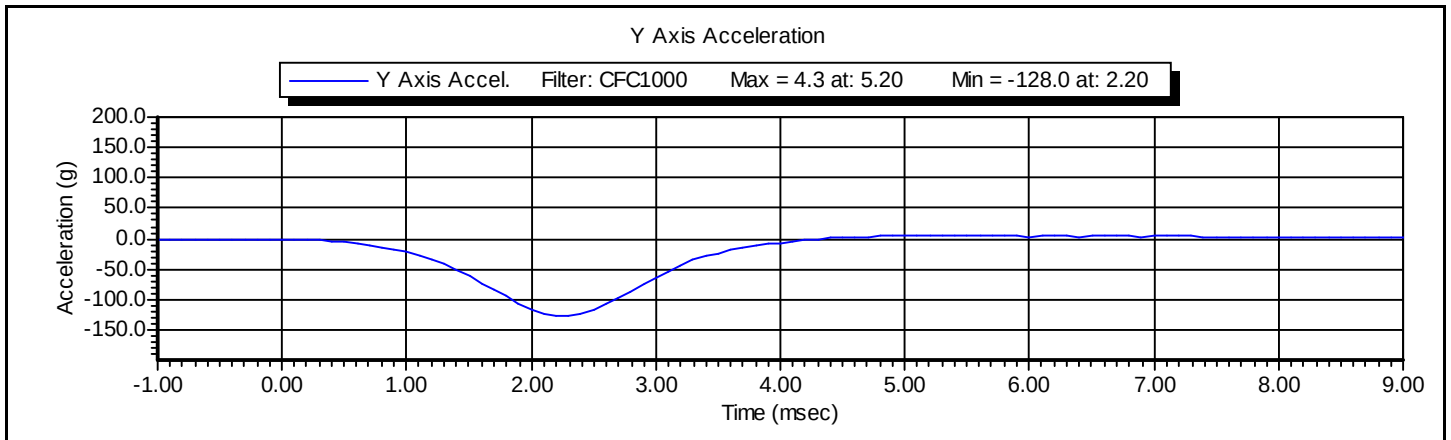
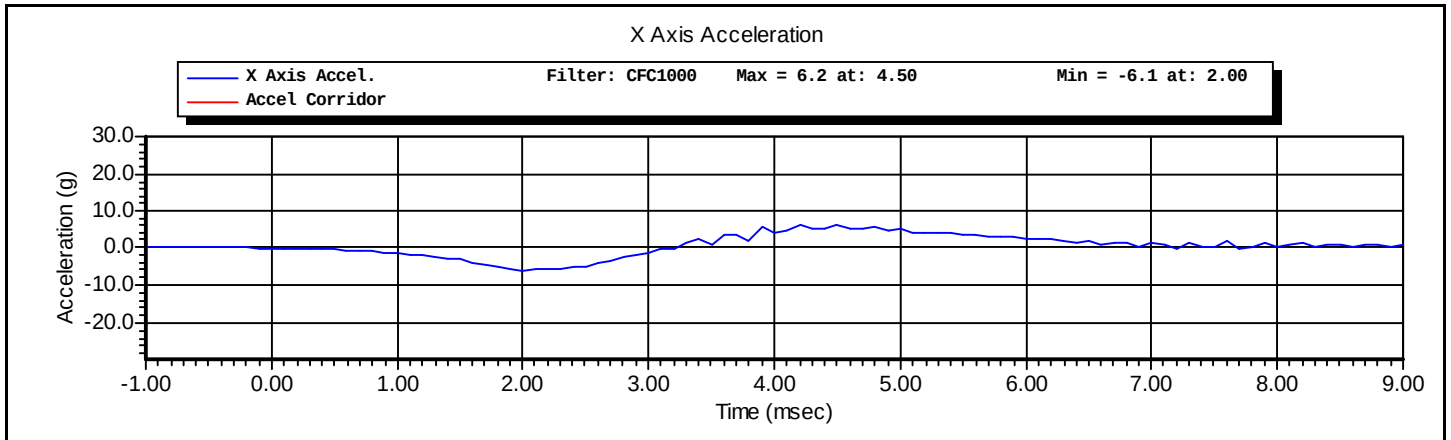
Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Head	Test Date:	9/21/2010
Test Number:	1	Test Time:	3:08:14 PM



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**



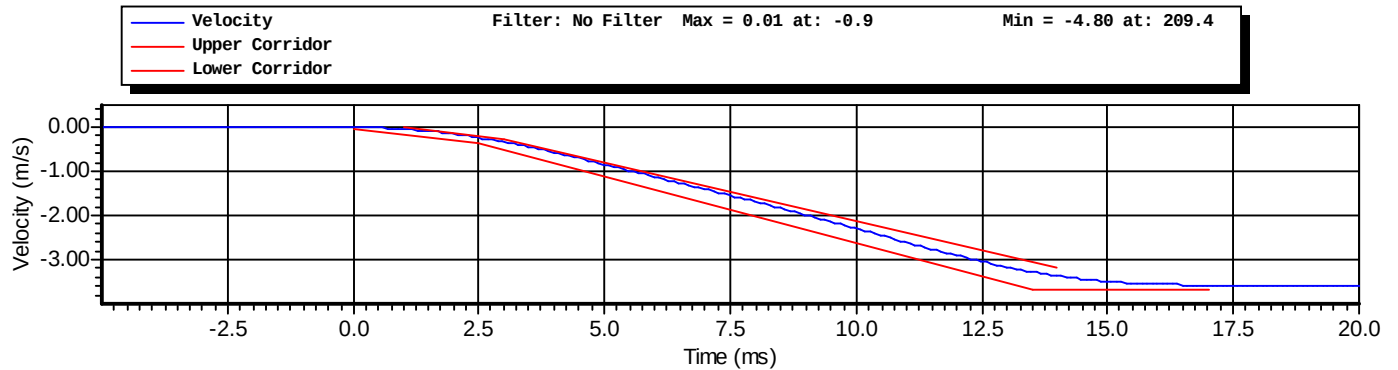
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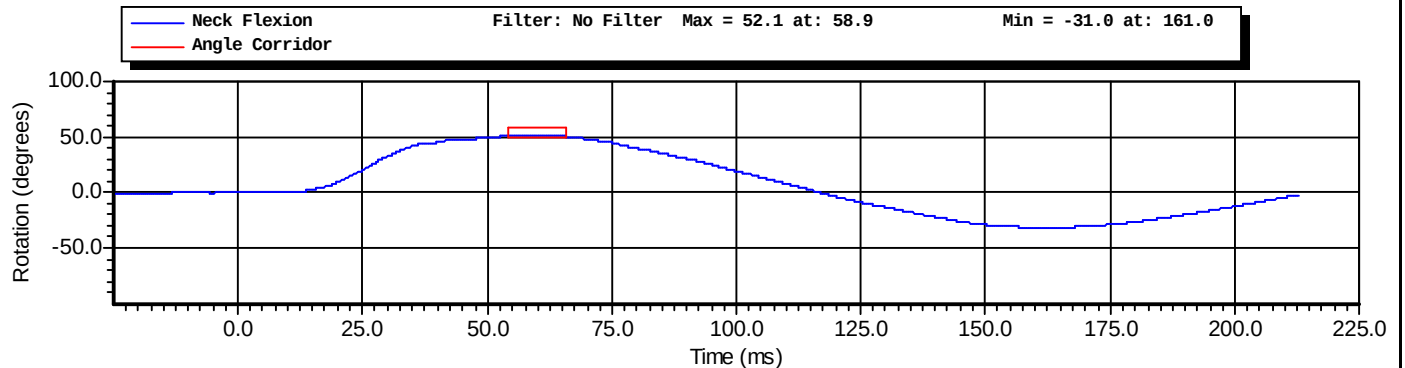
4455 Genesee Street, Buffalo, New York 14225 - Phone (716)632-7500

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:	9/22/2010
Test Number:	2	Test Time:	9:49:47 AM

Pendulum Velocity



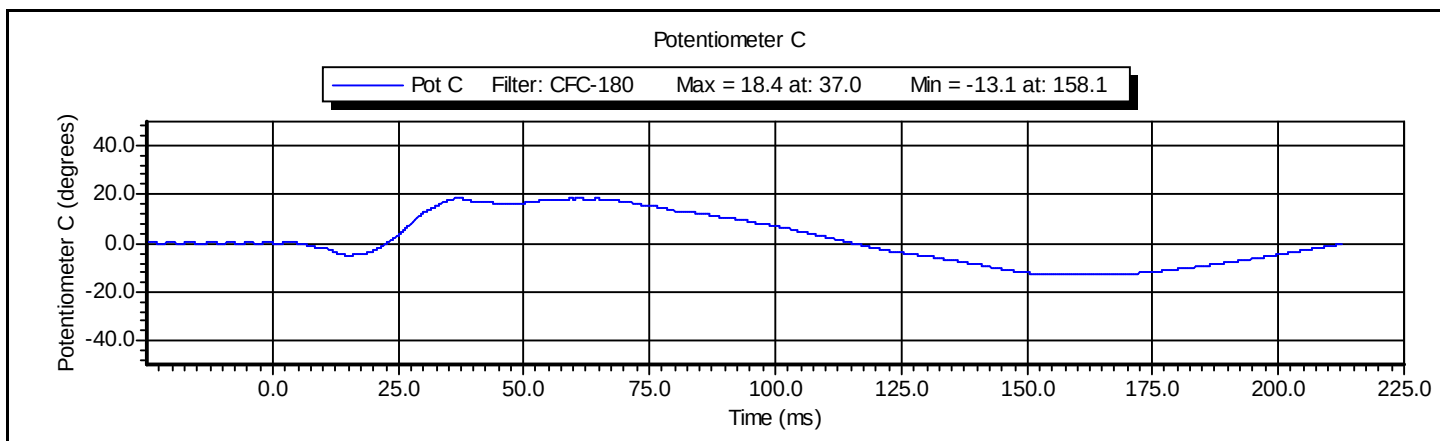
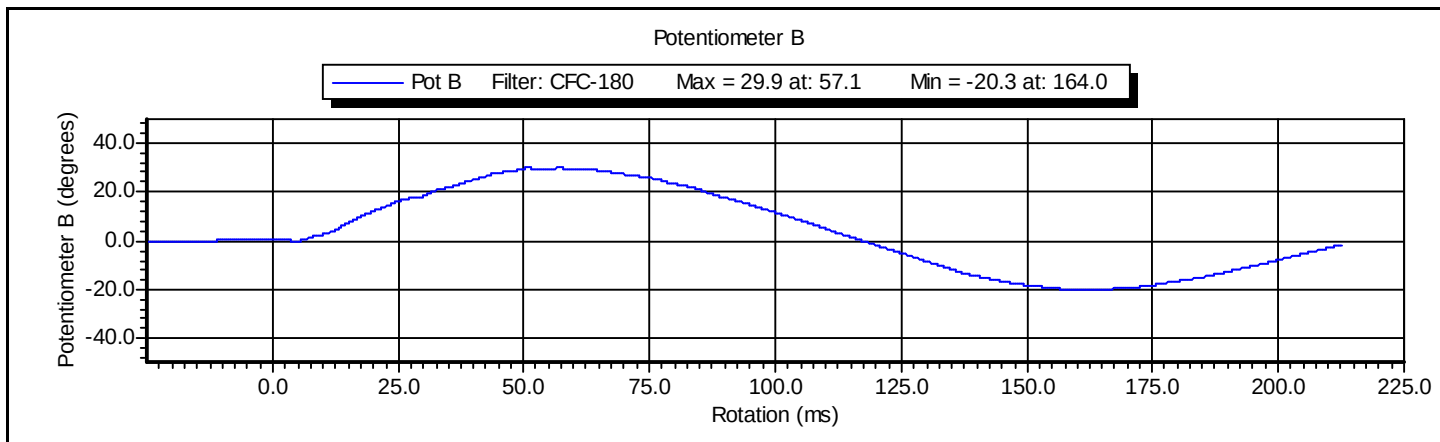
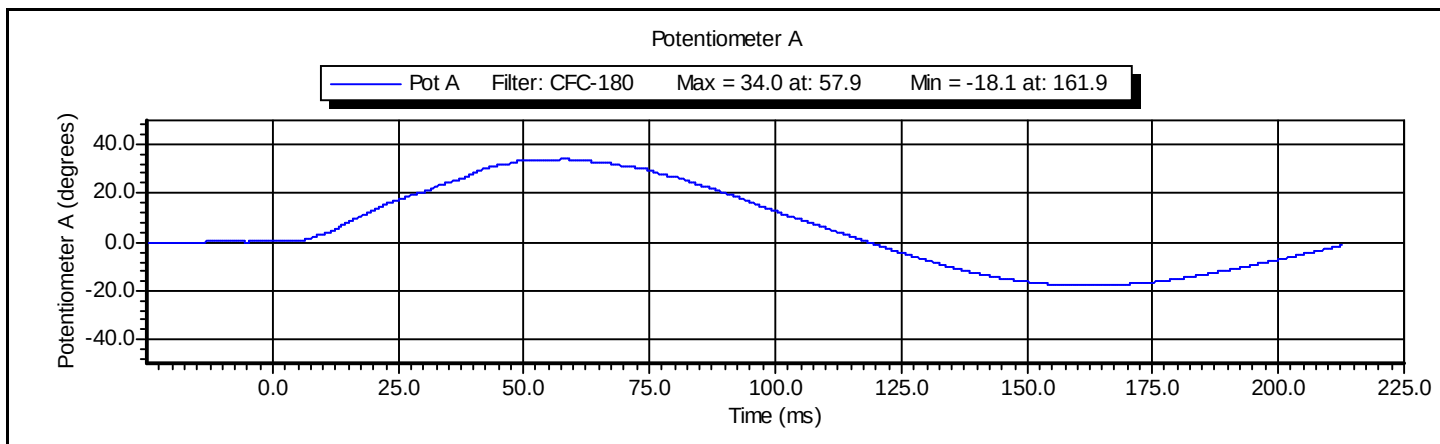
Neck Flexion Angle



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**

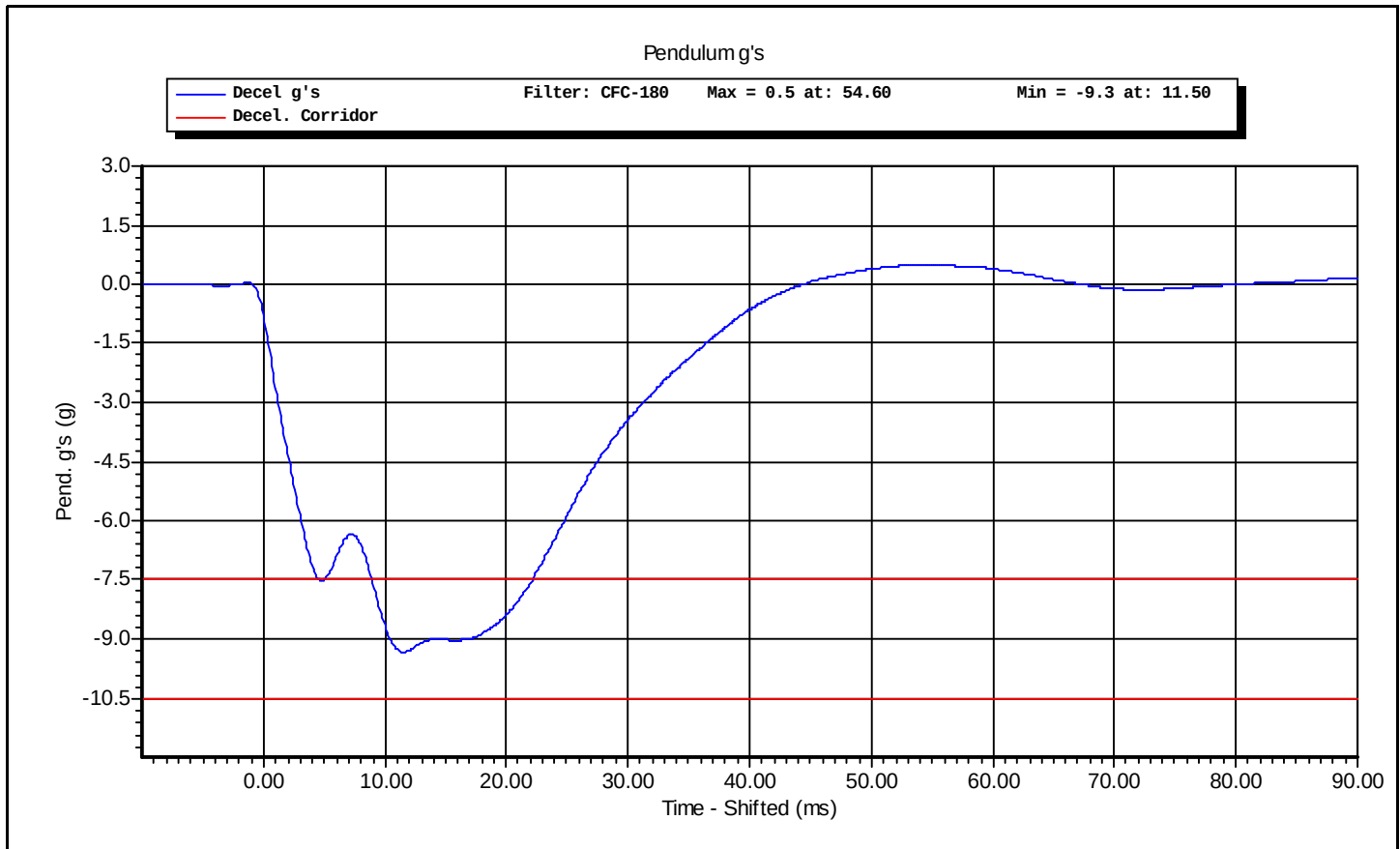


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Test Name:	Shoulder Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Shoulder	Test Date:	9/20/2010
Test Number:	1	Test Time:	2:25:34 PM



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**

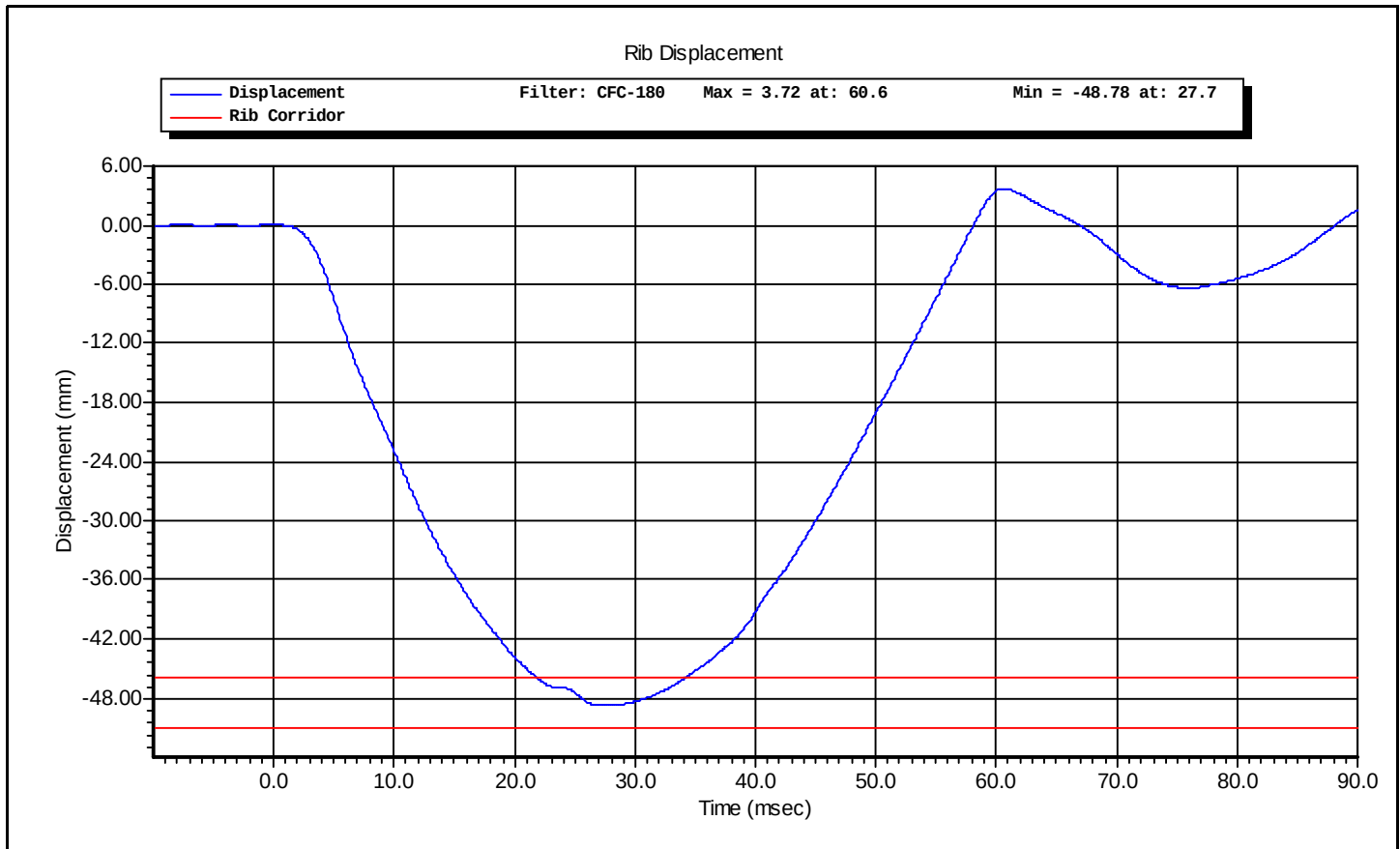


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Lower Rib 4 m/s	Test Date:	9/20/2010
Test Number:	1	Test Time:	3:54:47 PM



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**

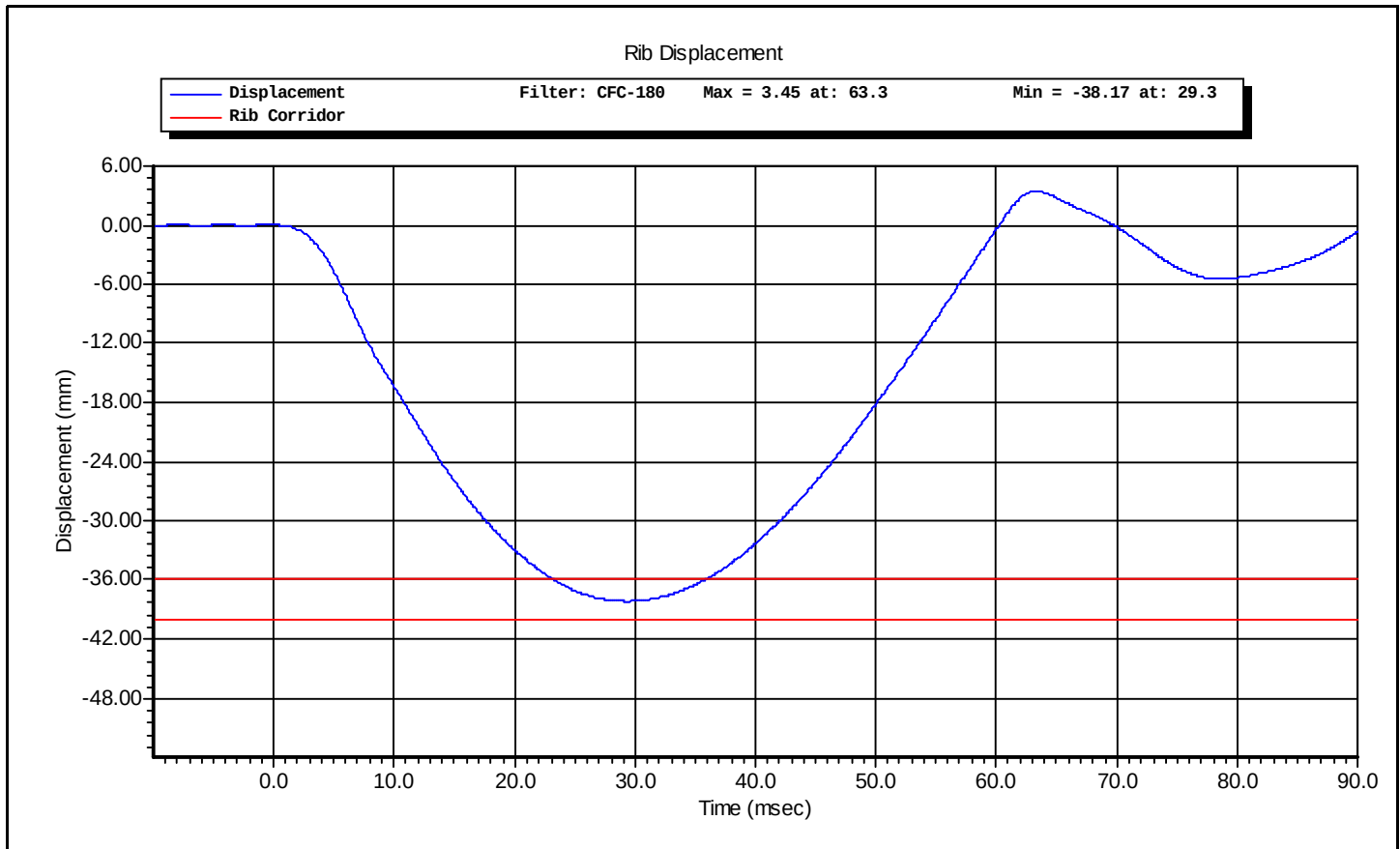


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Lower Rib 3m/s	Test Date:	9/20/2010
Test Number:	1	Test Time:	4:00:57 PM



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**

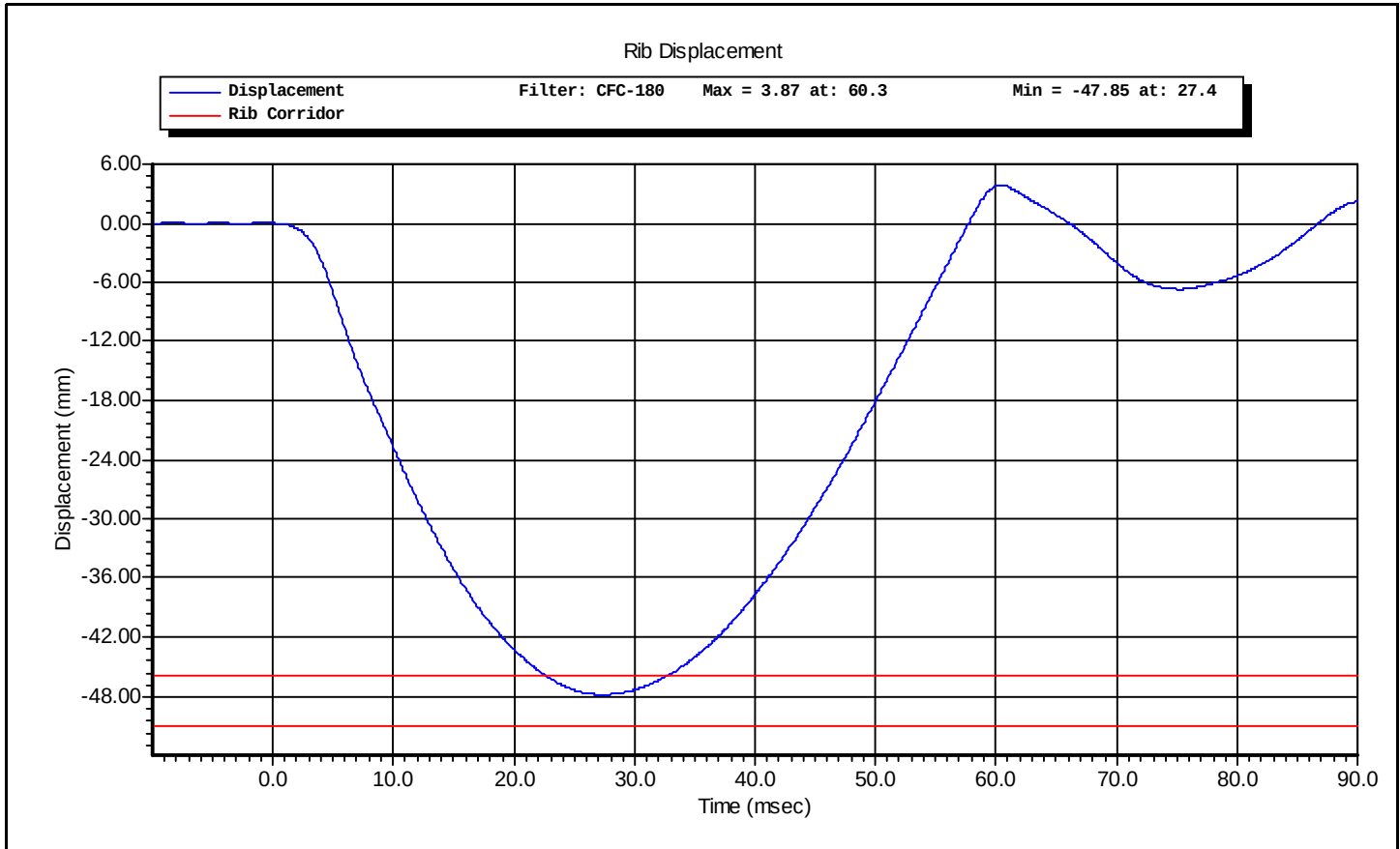


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Middle 4m/s	Test Date:	9/20/2010
Test Number:	1	Test Time:	3:21:18 PM



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**

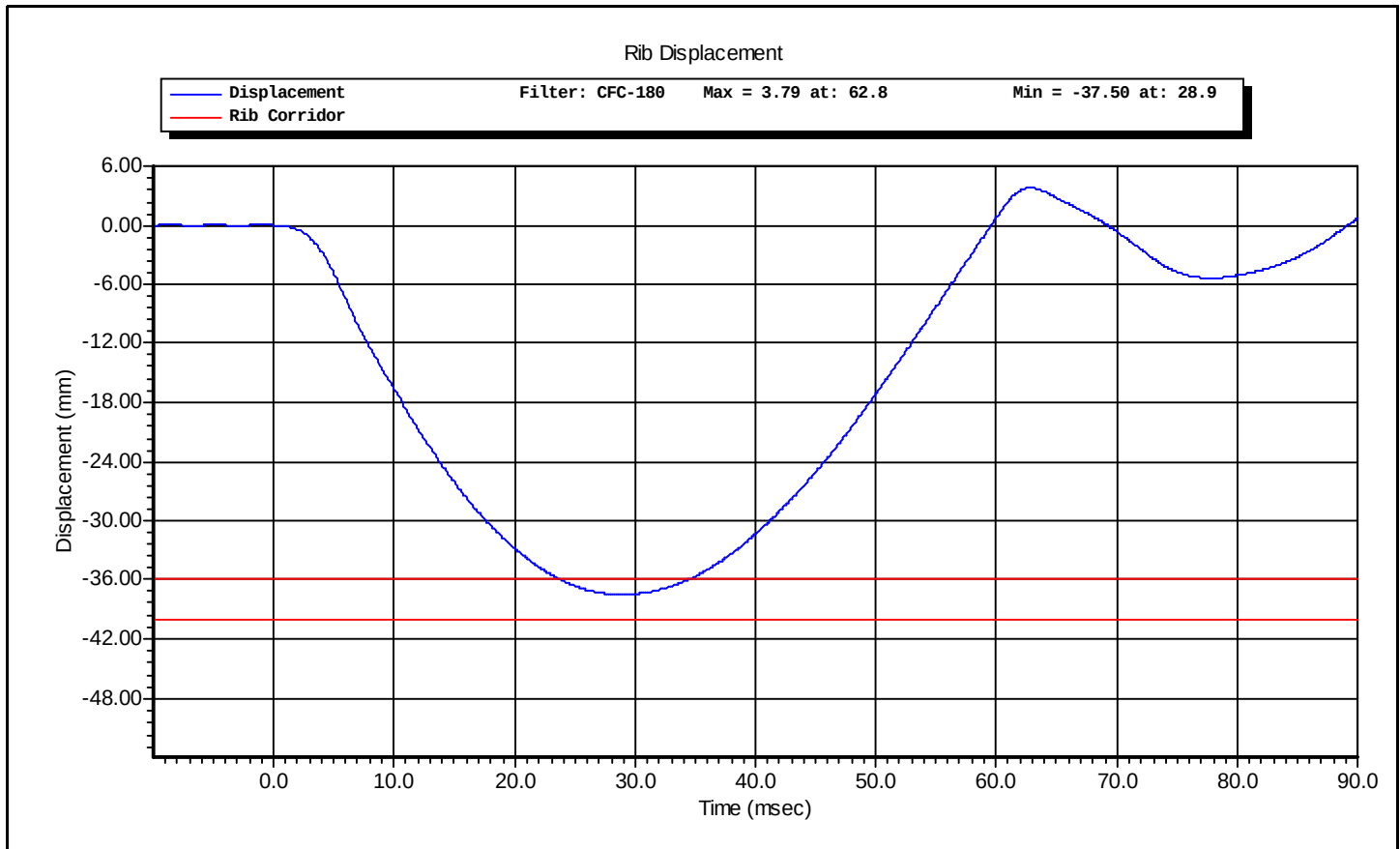


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Middle Rib 3 m/s	Test Date:	9/20/2010
Test Number:	1	Test Time:	3:27:37 PM



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**

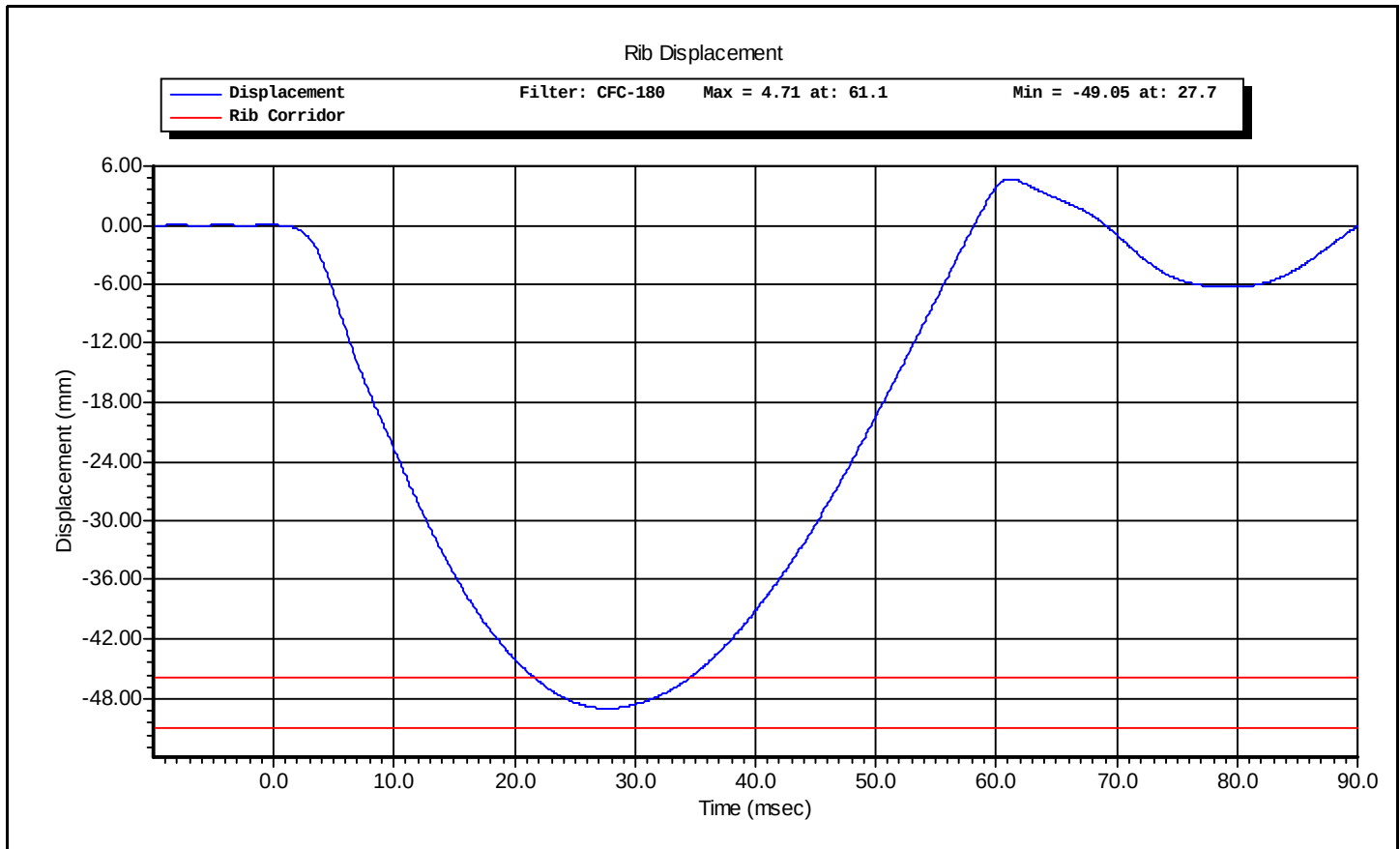


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Upper Rib 4 m/s	Test Date:	9/20/2010
Test Number:	1	Test Time:	3:06:40 PM



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**

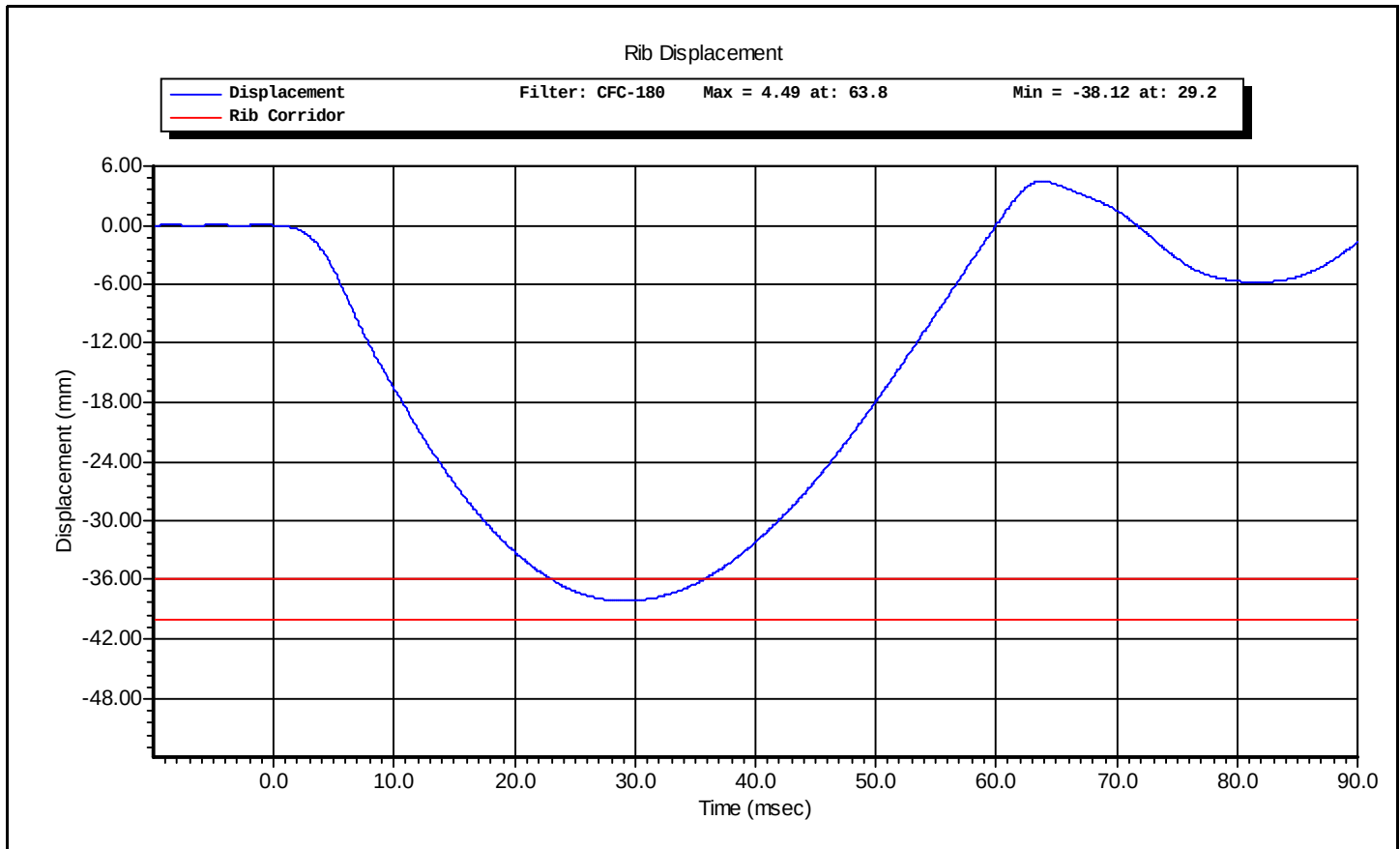


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Upper Rib 3 m/s	Test Date:	9/20/2010
Test Number:	1	Test Time:	3:14:28 PM



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**

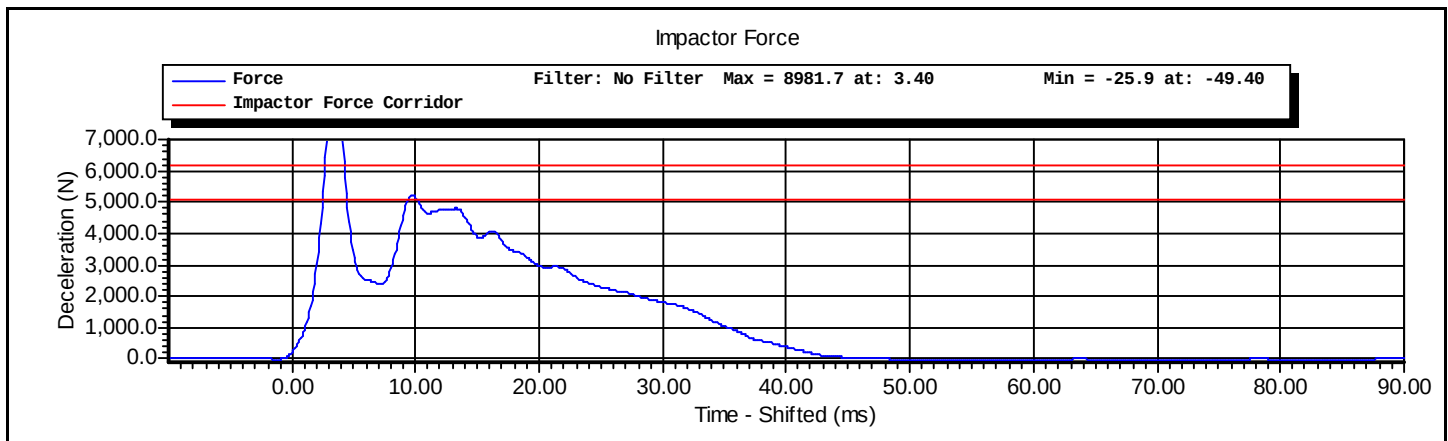
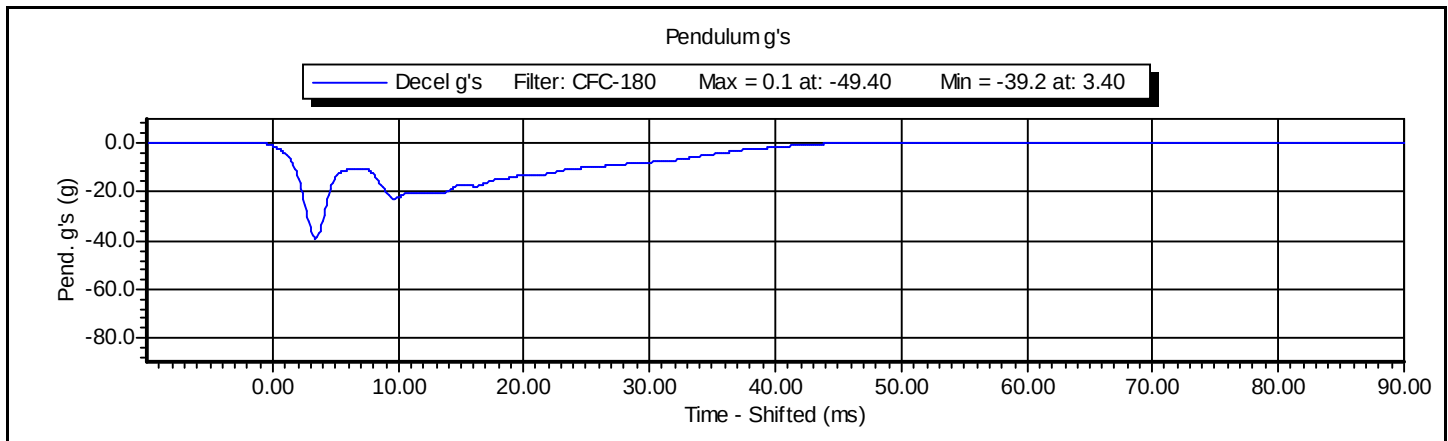


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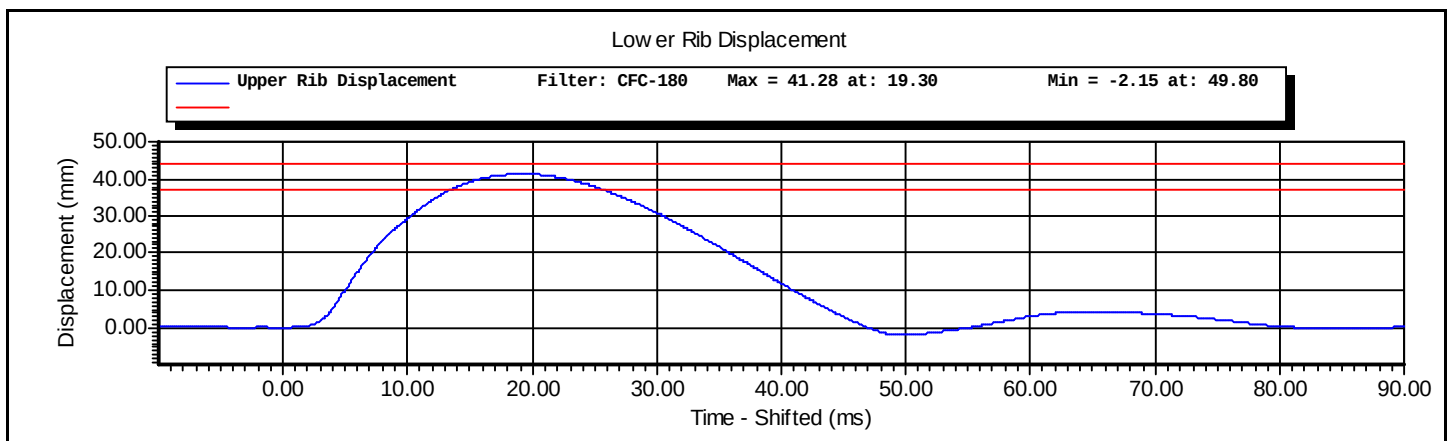
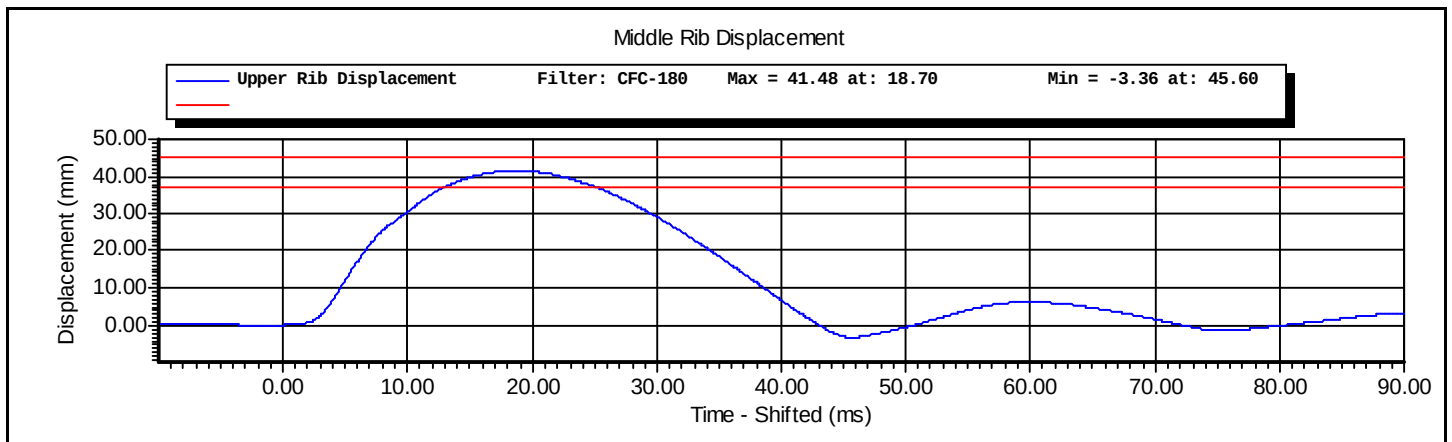
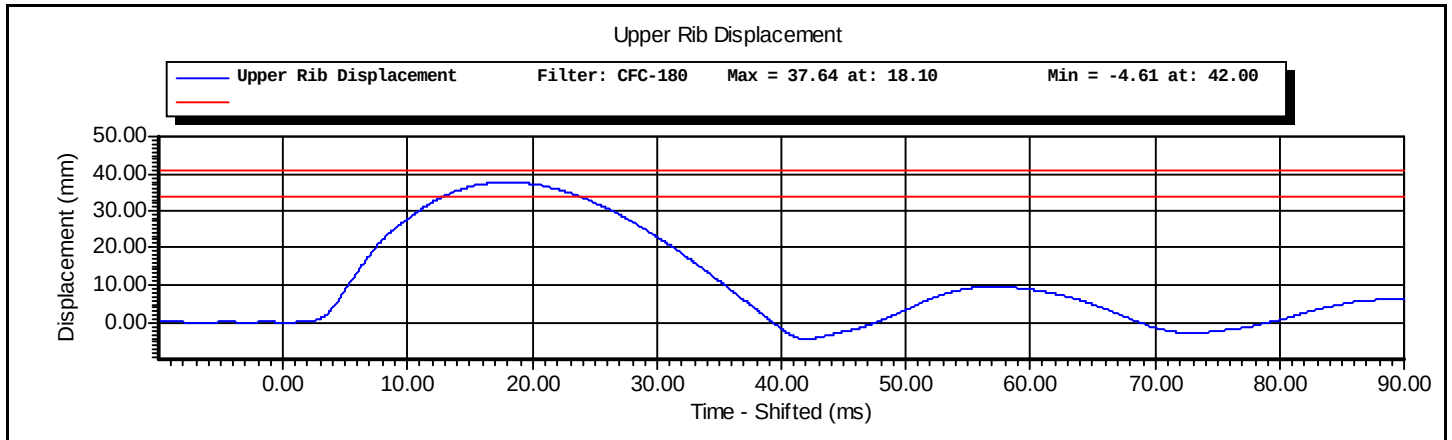
Test Name:	Thorax Impact	Revision:	8/15/2008
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	033		
Test ID:	Thorax	Test Date:	9/20/2010
Test Number:	1	Test Time:	4:30:58 PM



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**

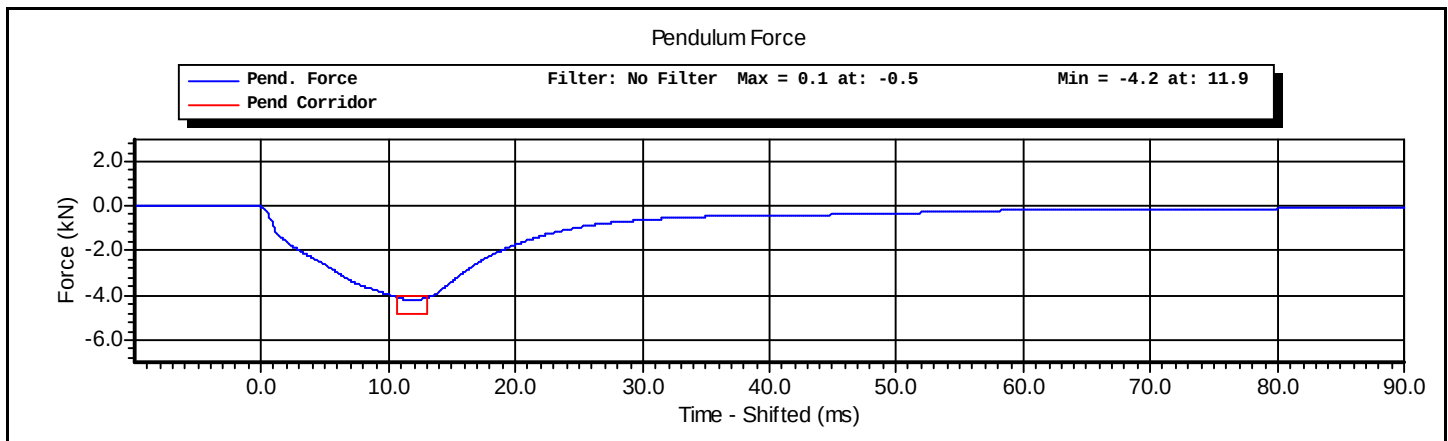
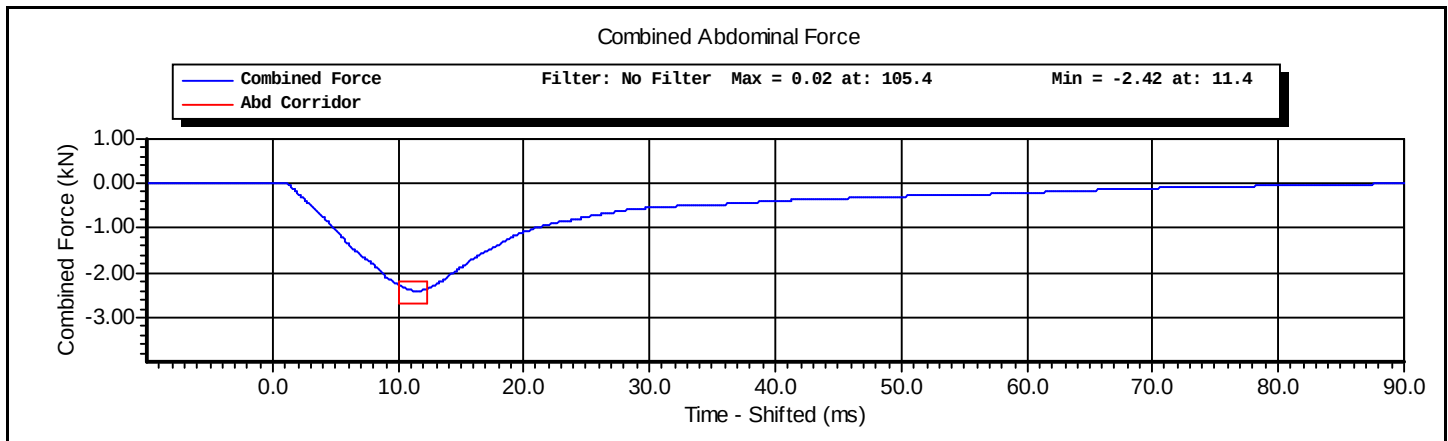


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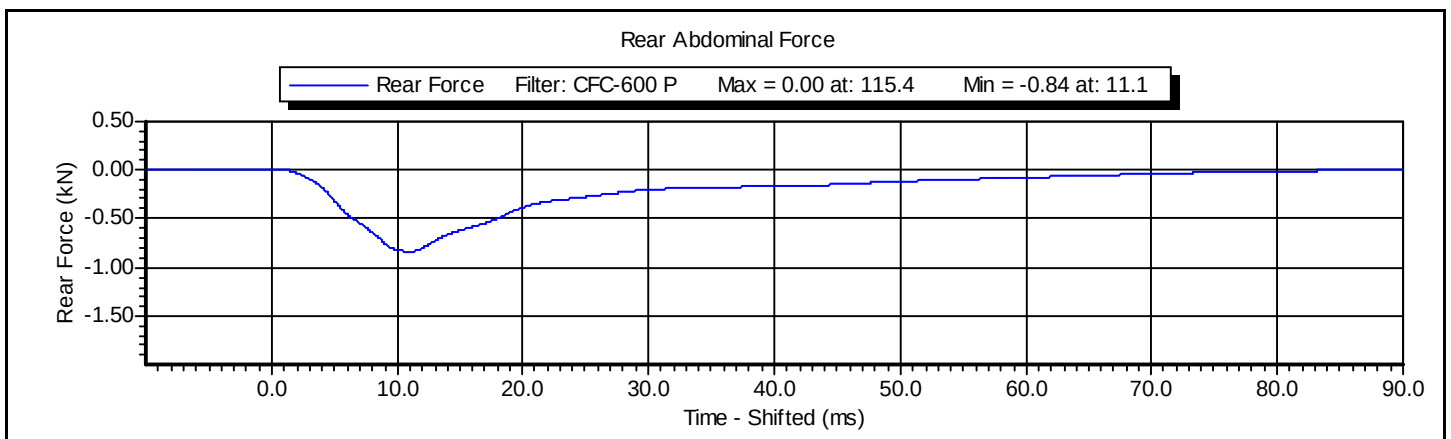
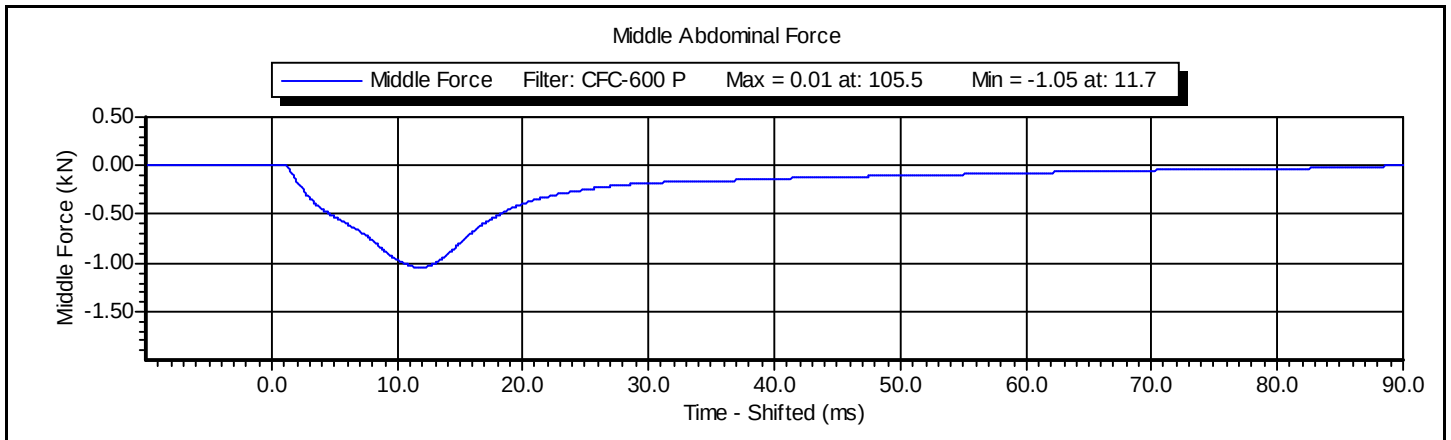
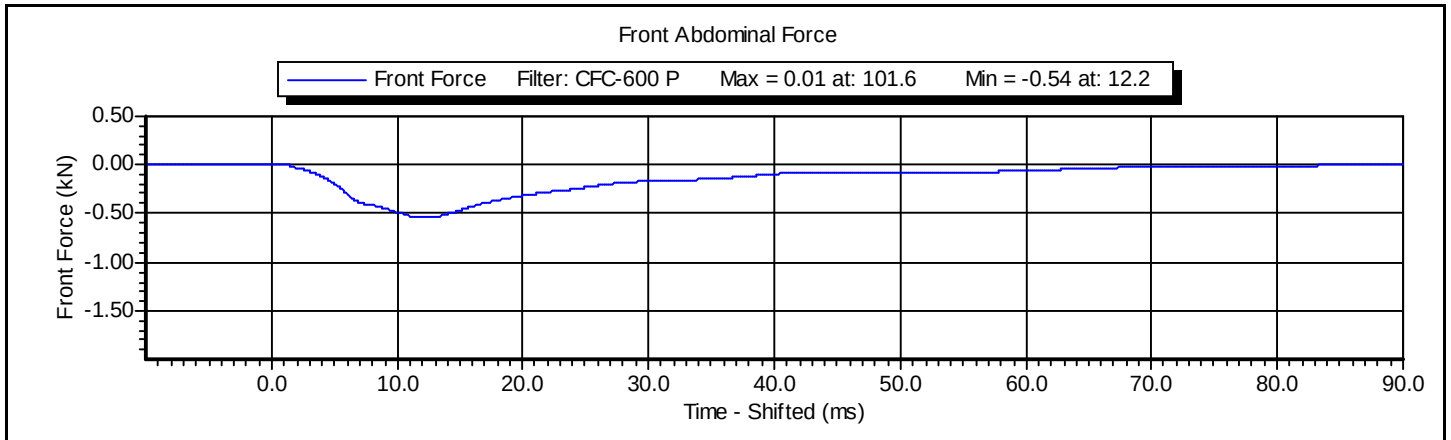
Test Name:	Abdominal Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	ABDOMEN	Test Date:	9/20/2010
Test Number:	1	Test Time:	1:38:18 PM



Test ID: **ABDOMEN**

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

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





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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:	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**



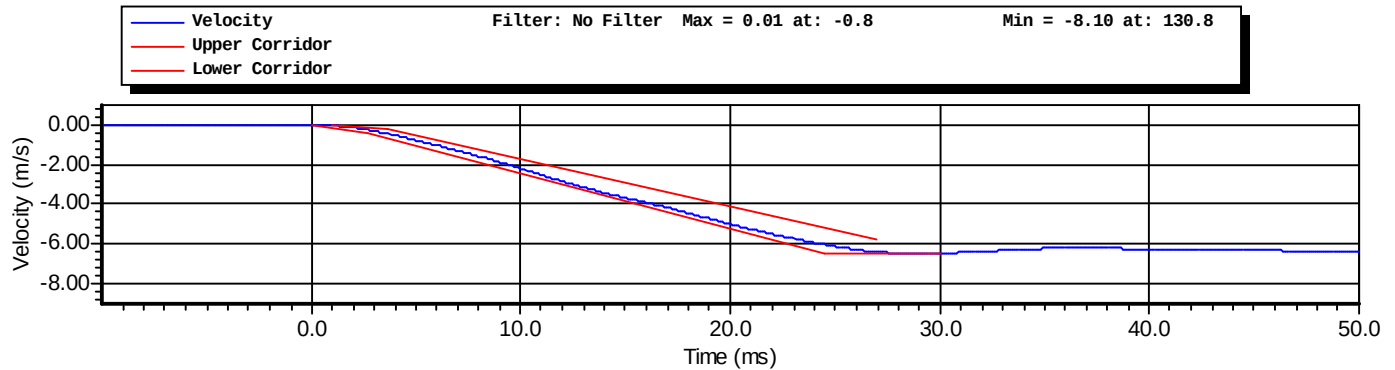
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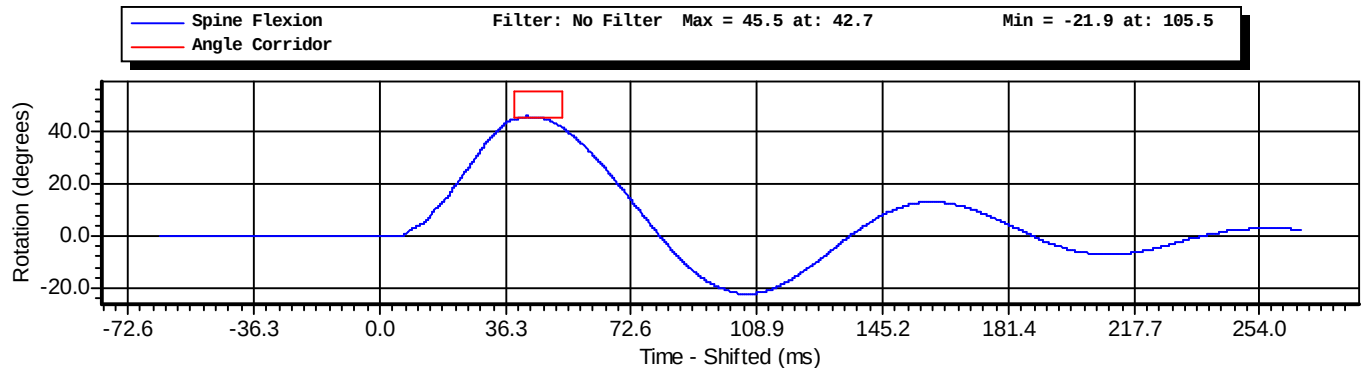
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Test Name:	Lumbar Spine	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Lumbar Spine	Test Date:	9/22/2010
Test Number:	1	Test Time:	10:59:08 AM

Pendulum Velocity



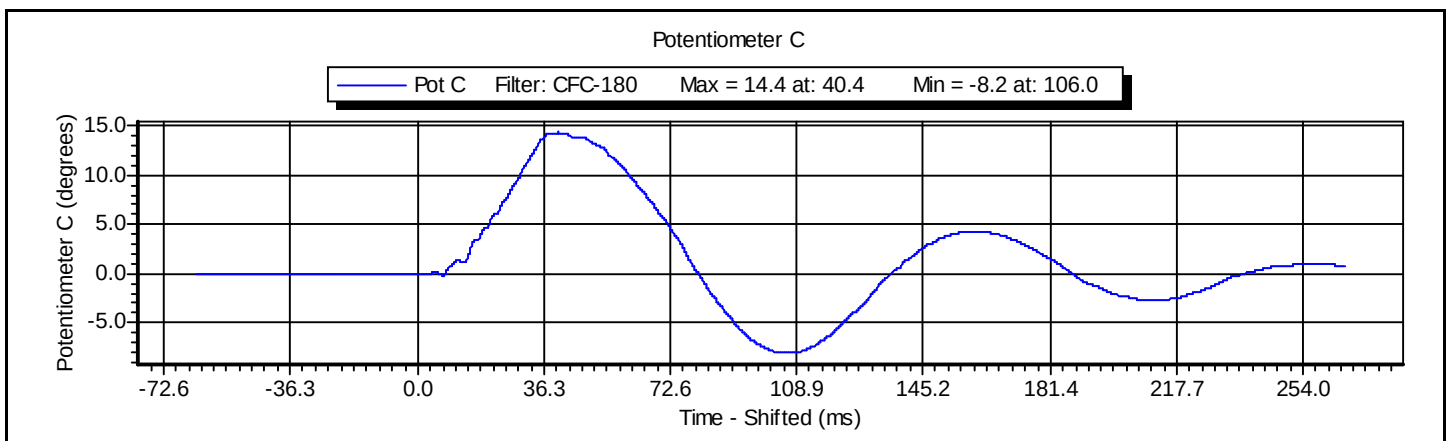
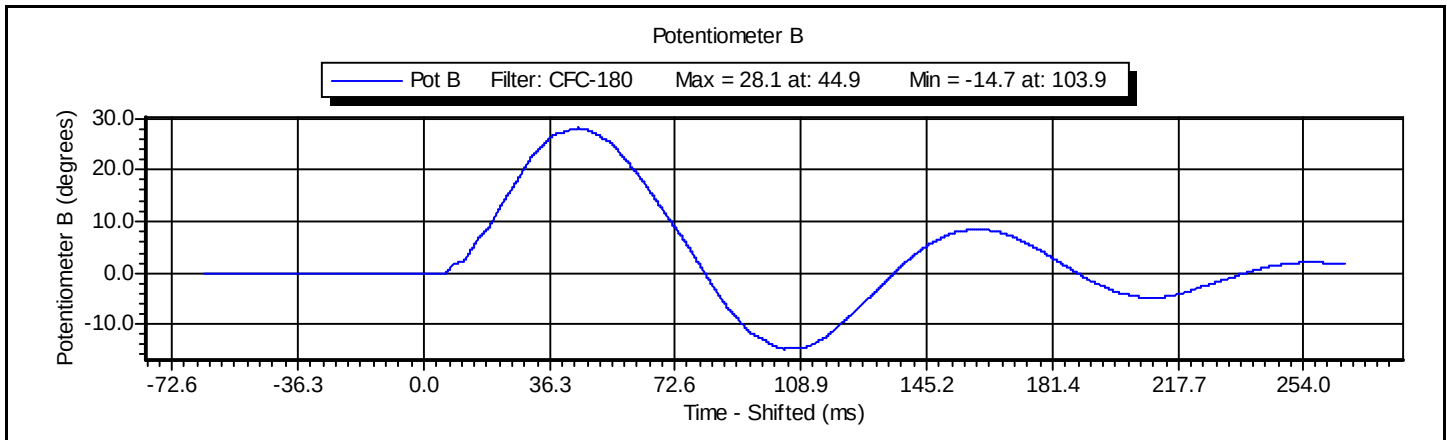
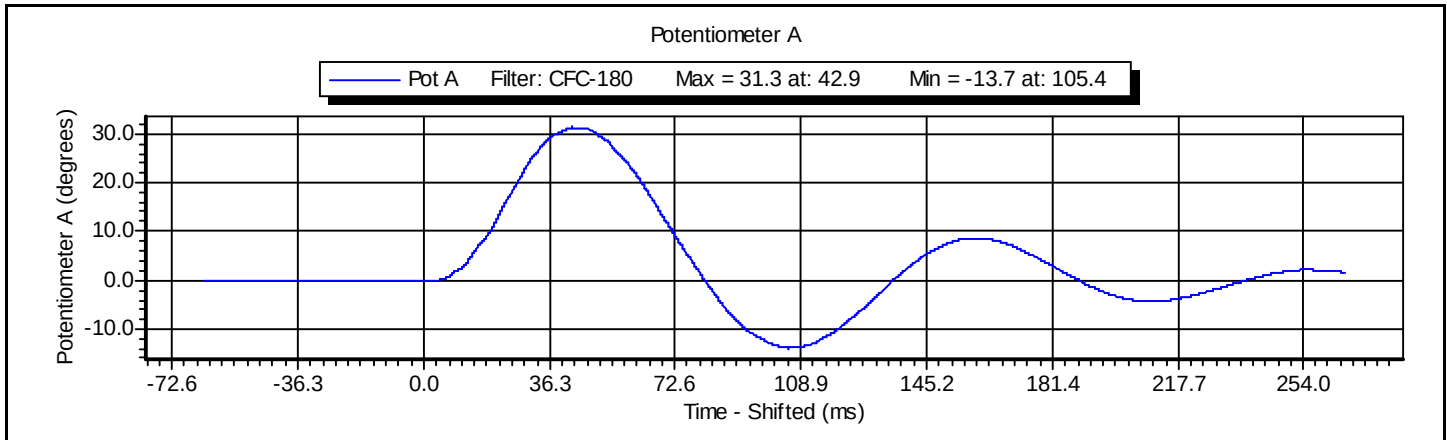
Spine Flexion Angle



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**



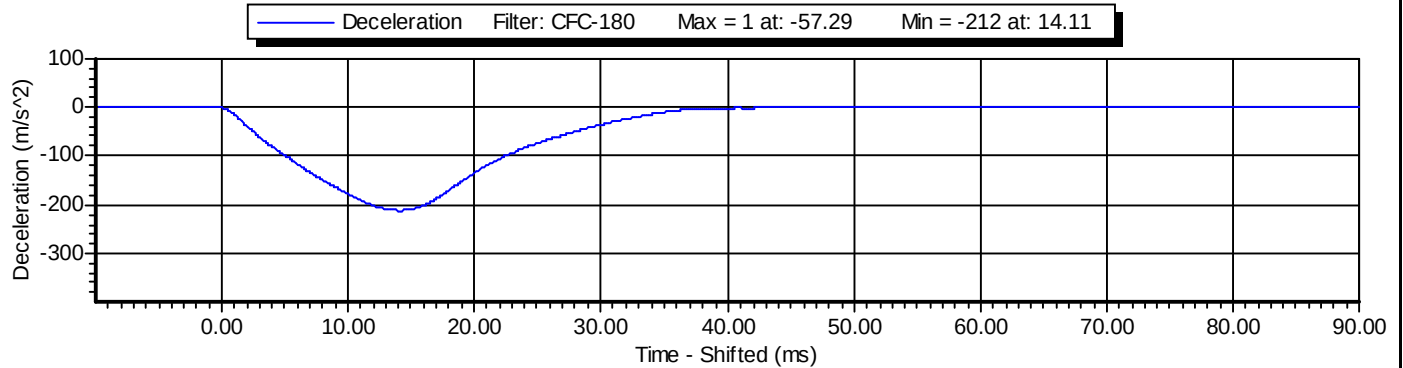
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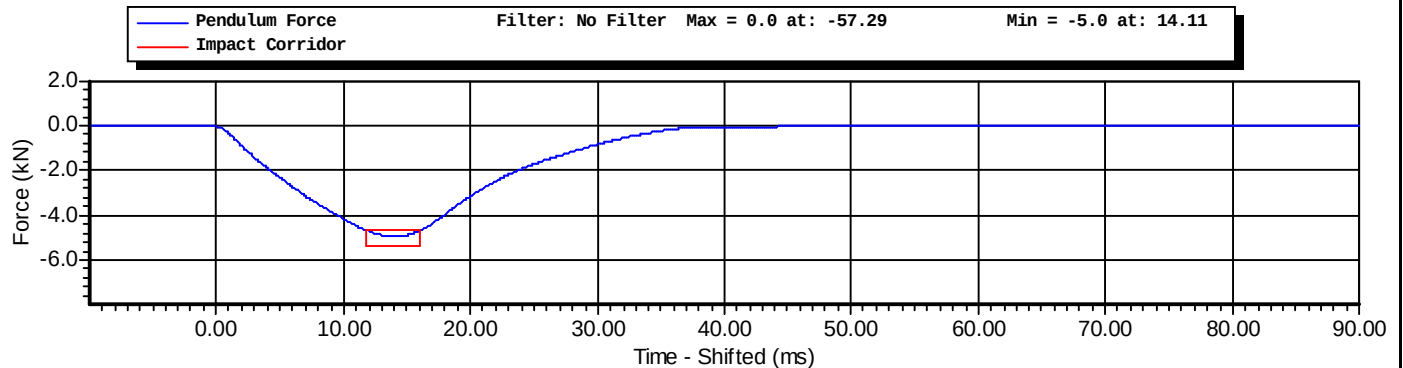
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Test Name:	Pelvis Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Pelvis	Test Date:	9/20/2010
Test Number:	1	Test Time:	12:59:20 PM

Pendulum Accelerometer



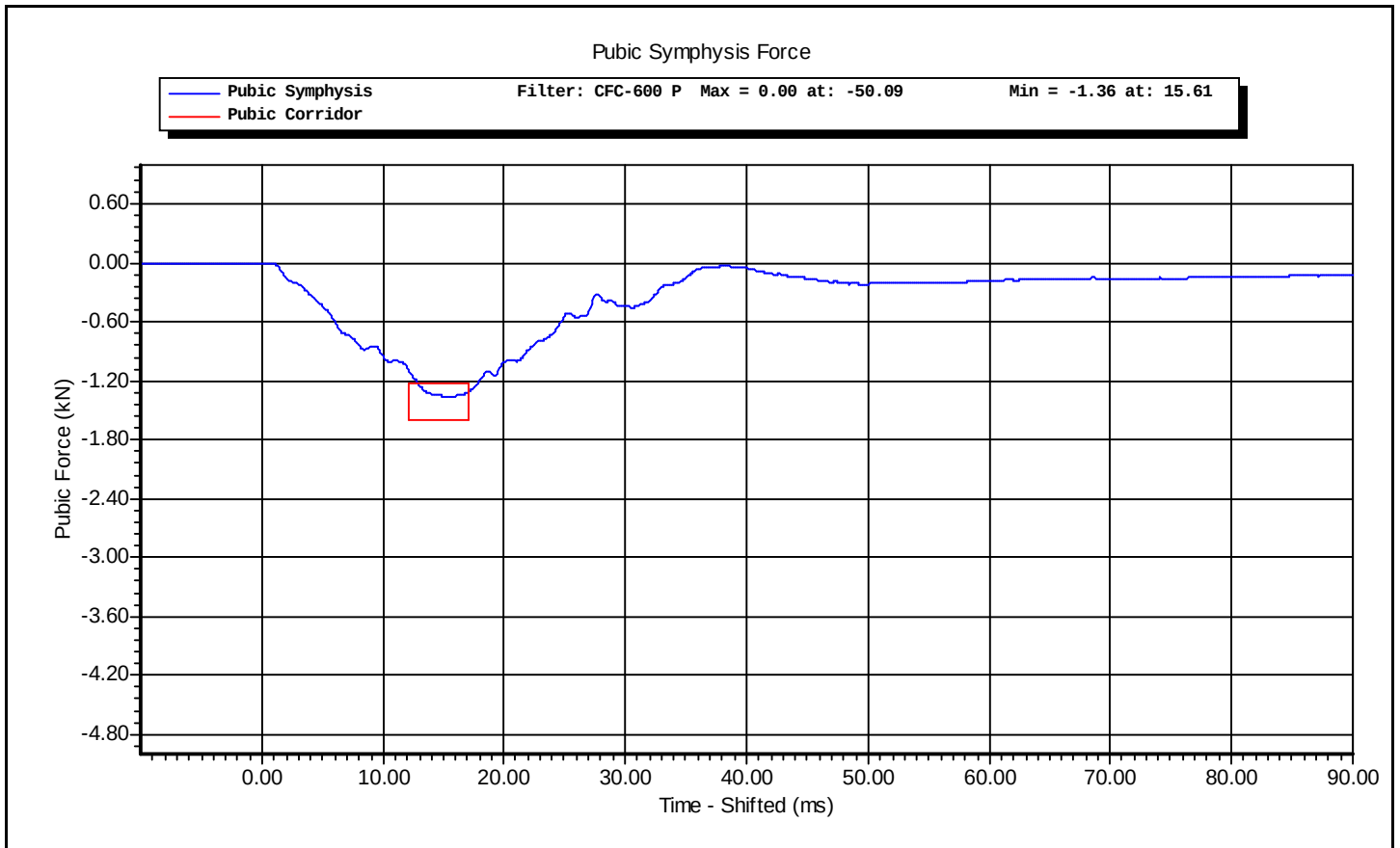
Pendulum Force



Test ID: **Pelvis**

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

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



CALIBRATION TEST RESULTS

PRE-TEST

SID-IIs No: 300

CONFIGURED FOR LEFT SIDE IMPACT

SID-IIsD External Measurements

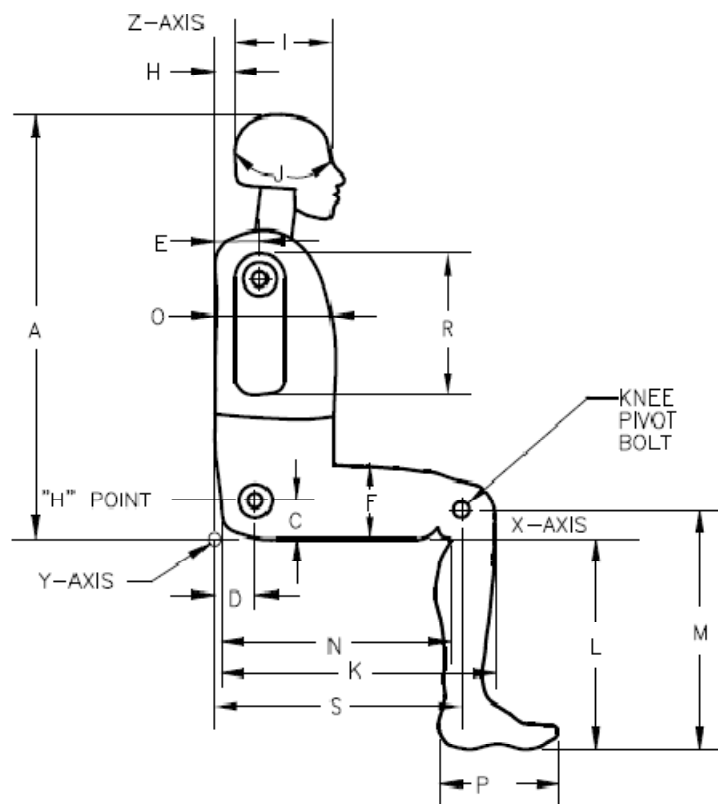
NHTSA ATD S/N 300

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

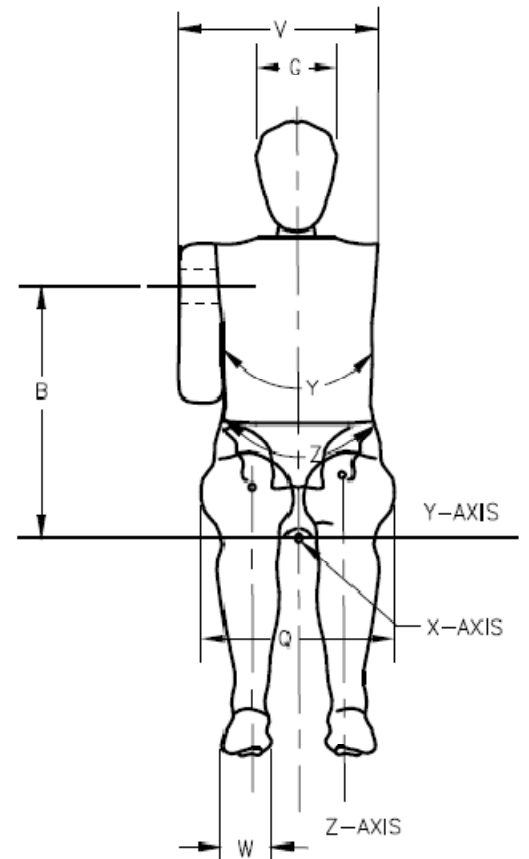
Technician: AR

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**

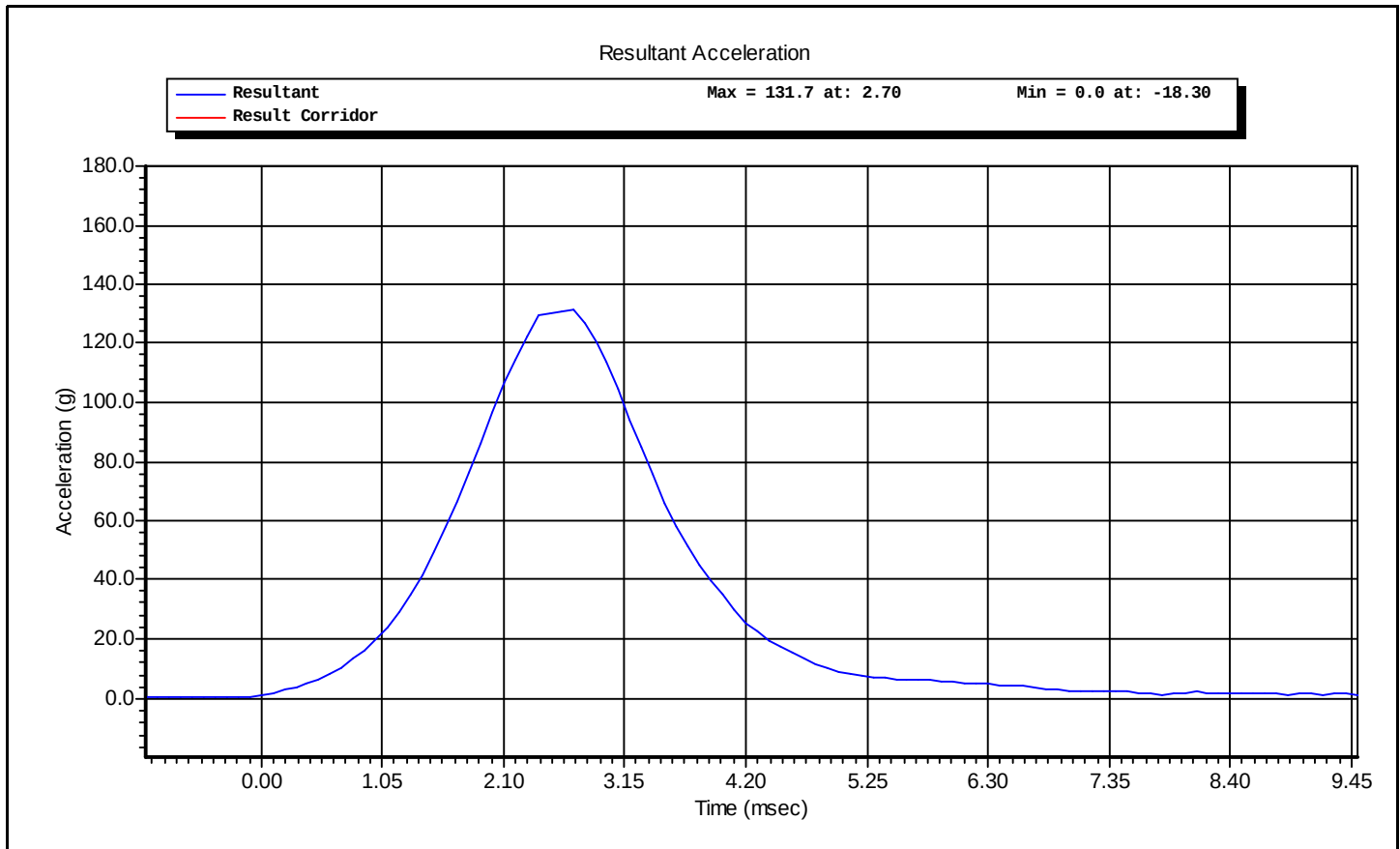


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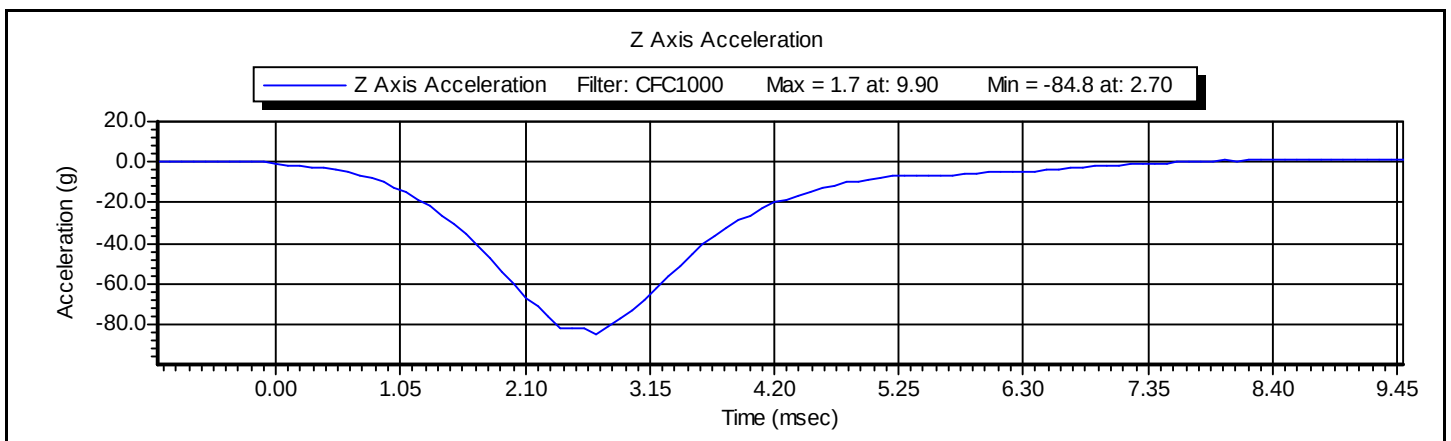
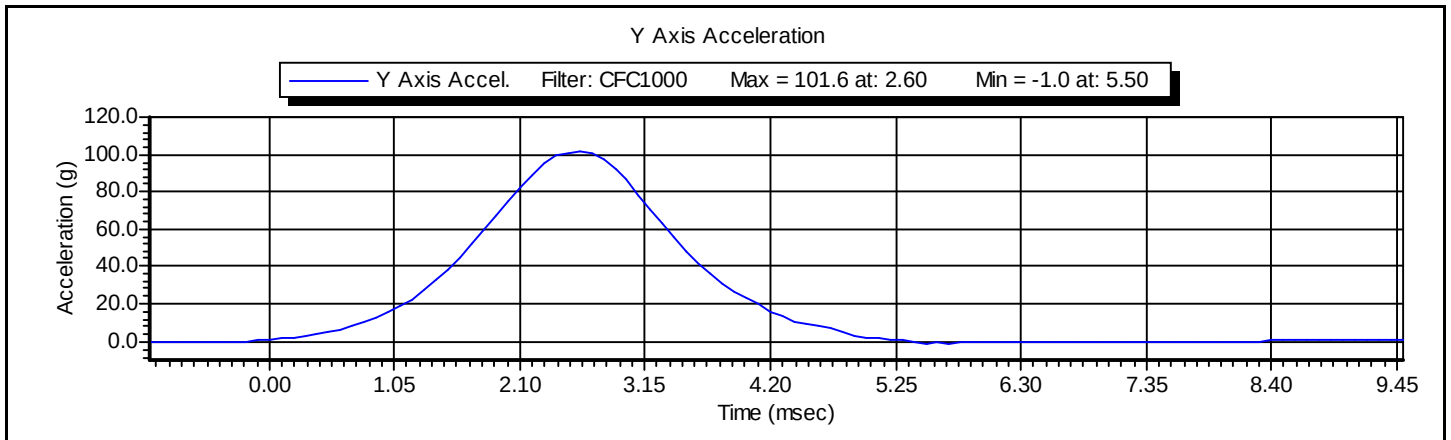
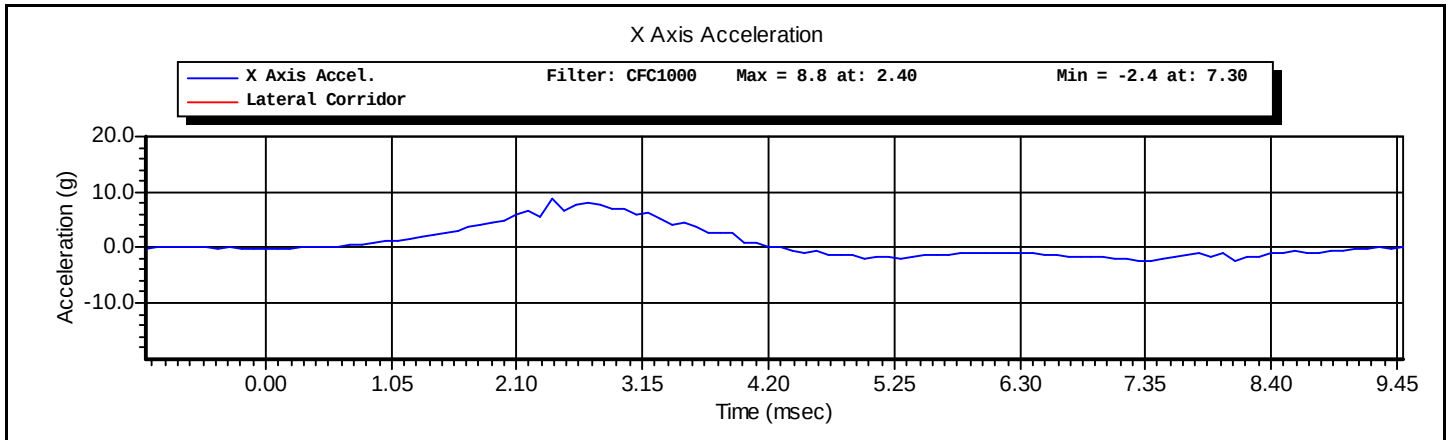
Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Head Drop	Test Date:	8/23/2010
Test Number:	1	Test Time:	6:50:25 PM



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**



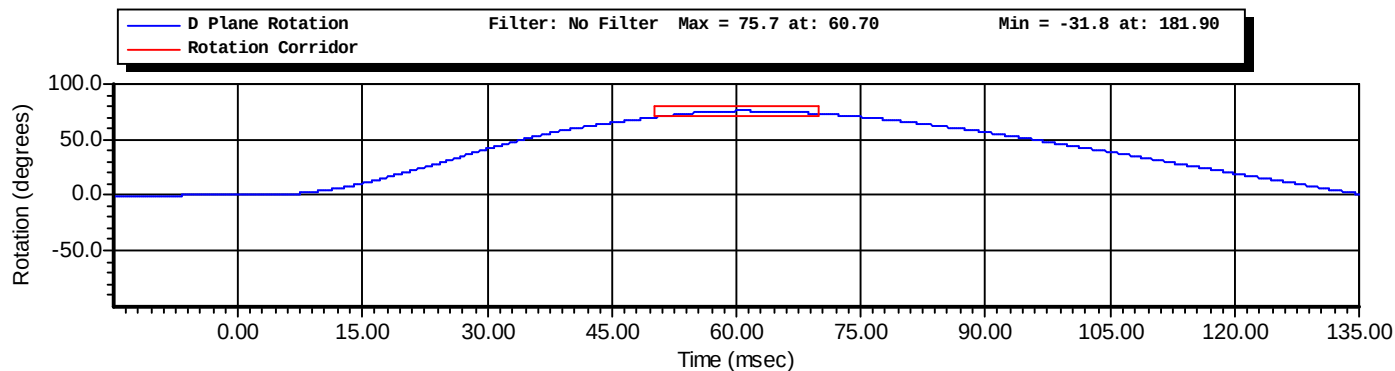
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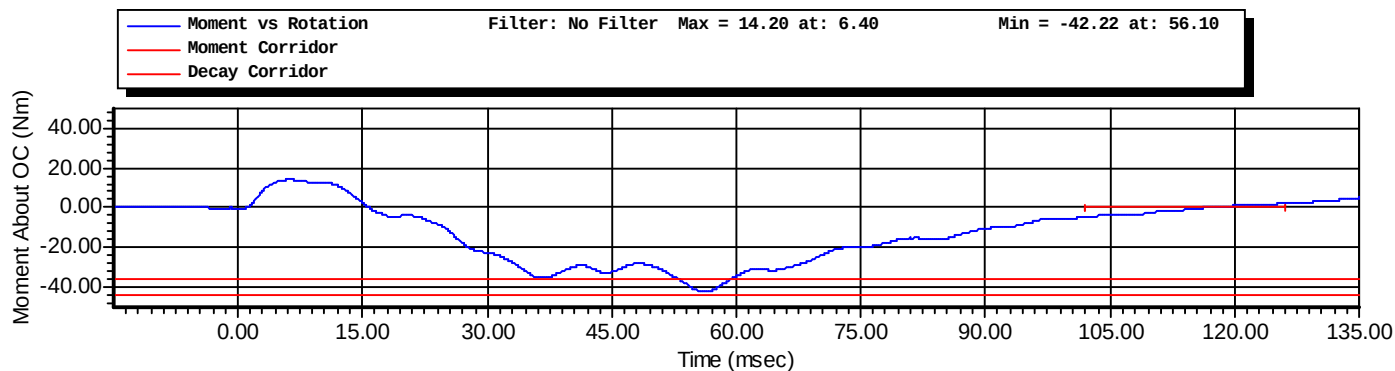
4455 Genesee Street, Buffalo, New York 14225 - Phone (716)632-7500

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

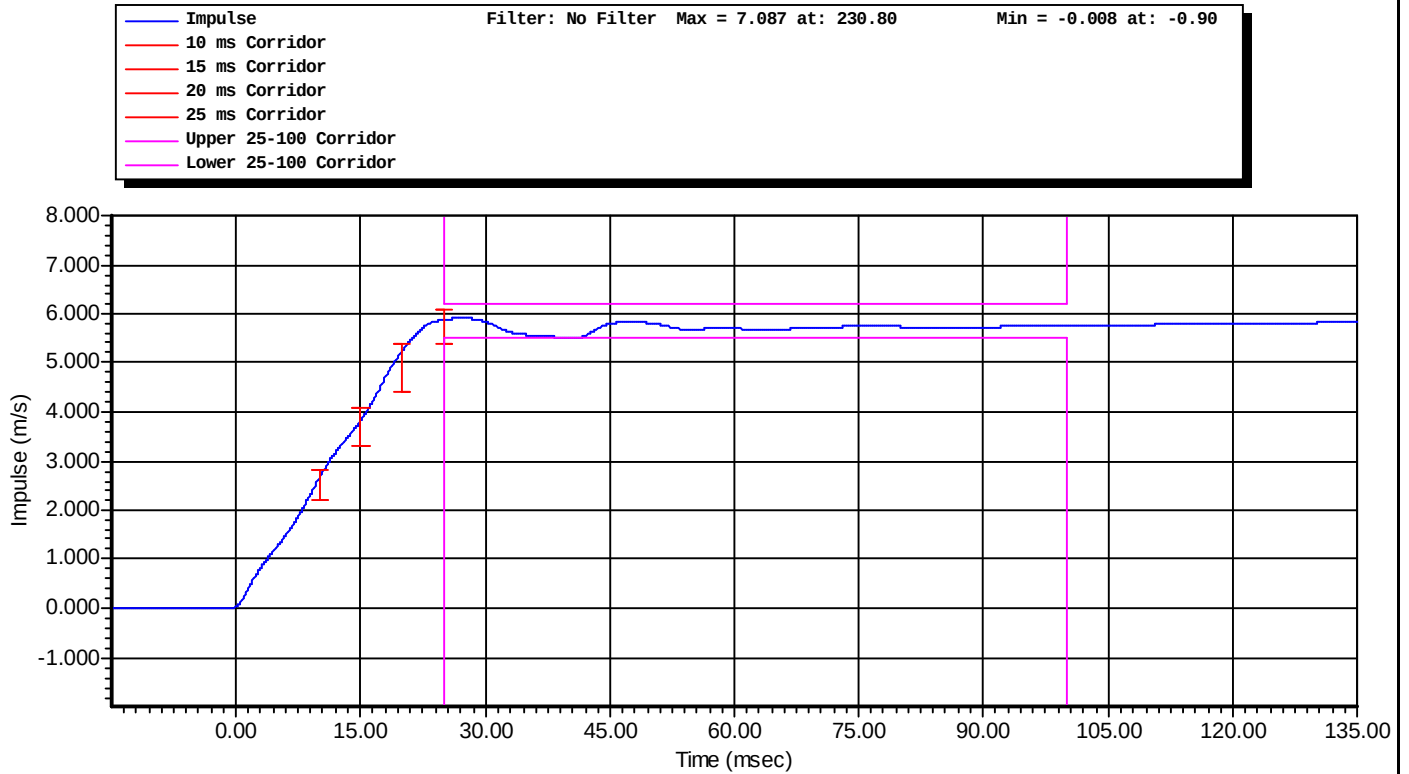


Test ID: Neck Flexion

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**

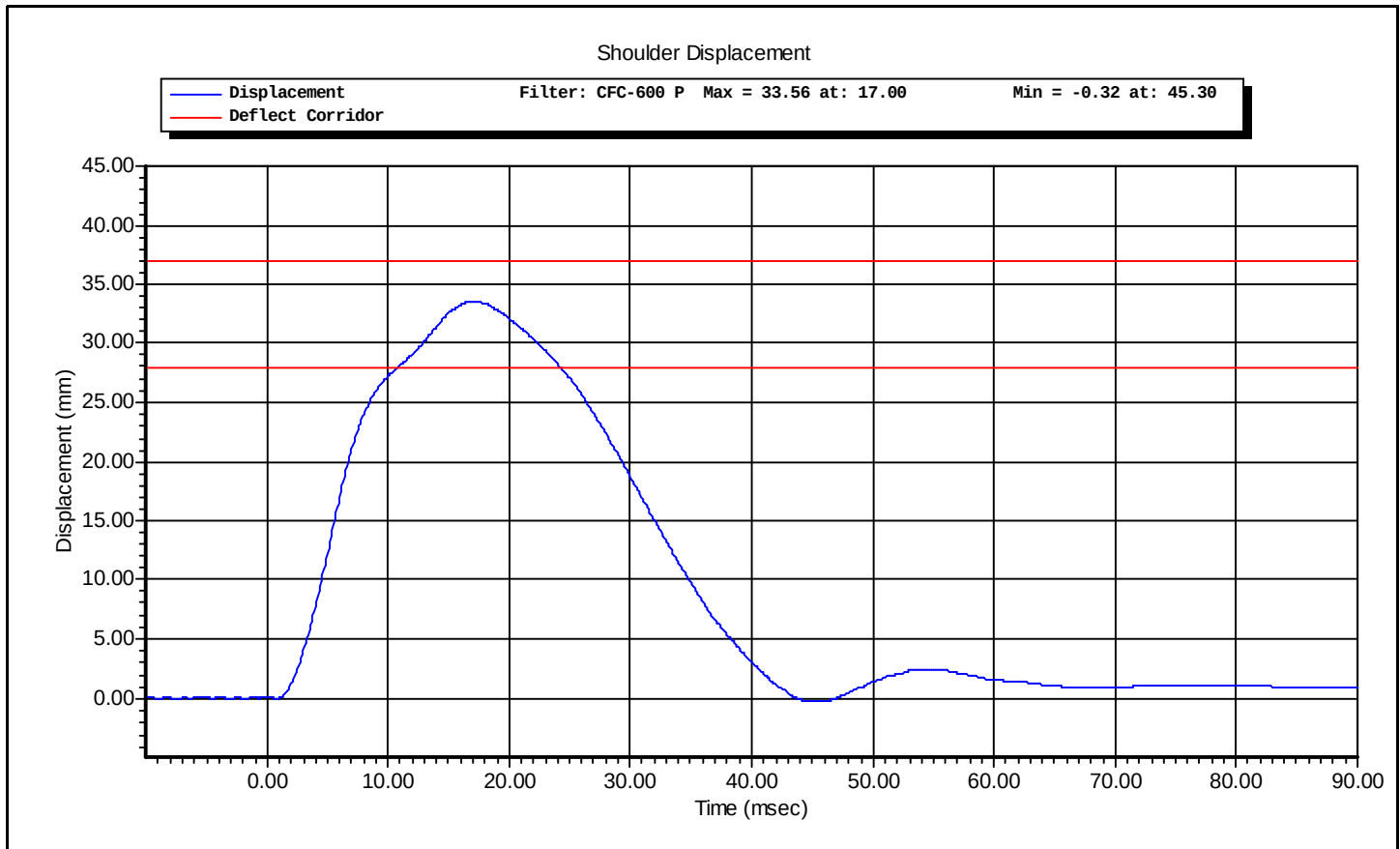


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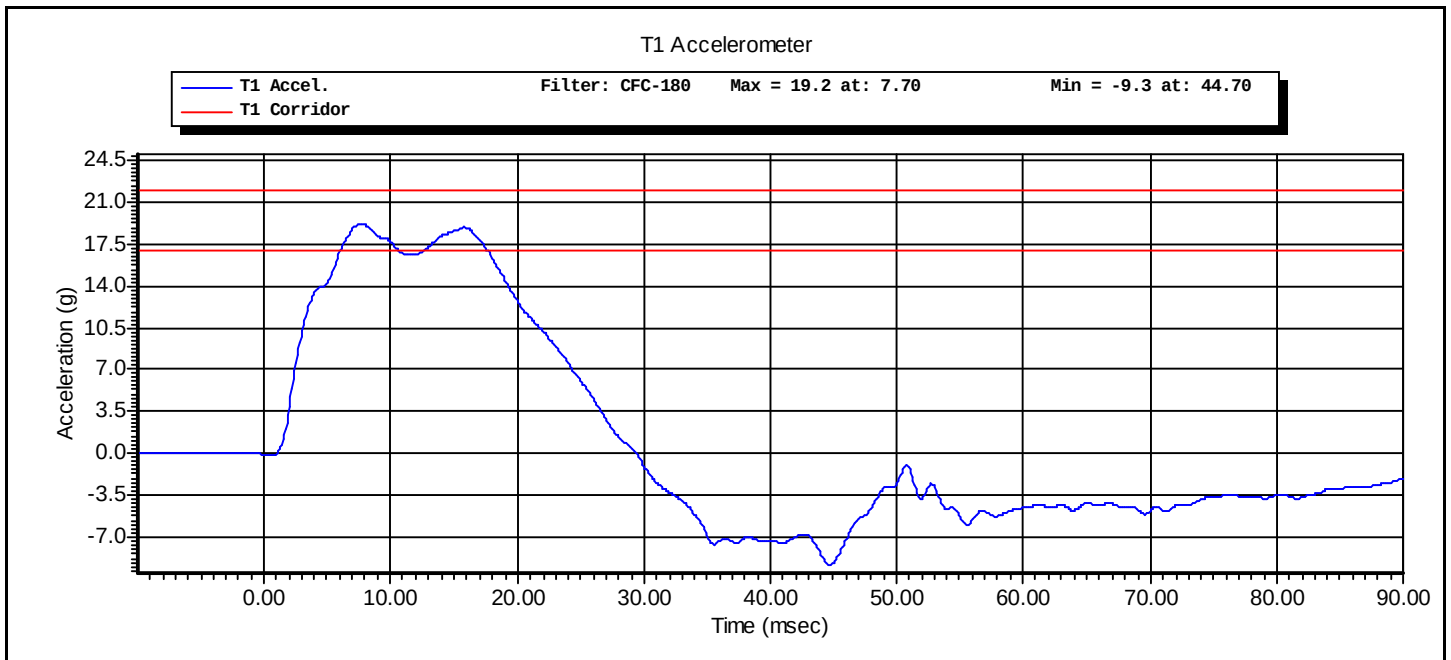
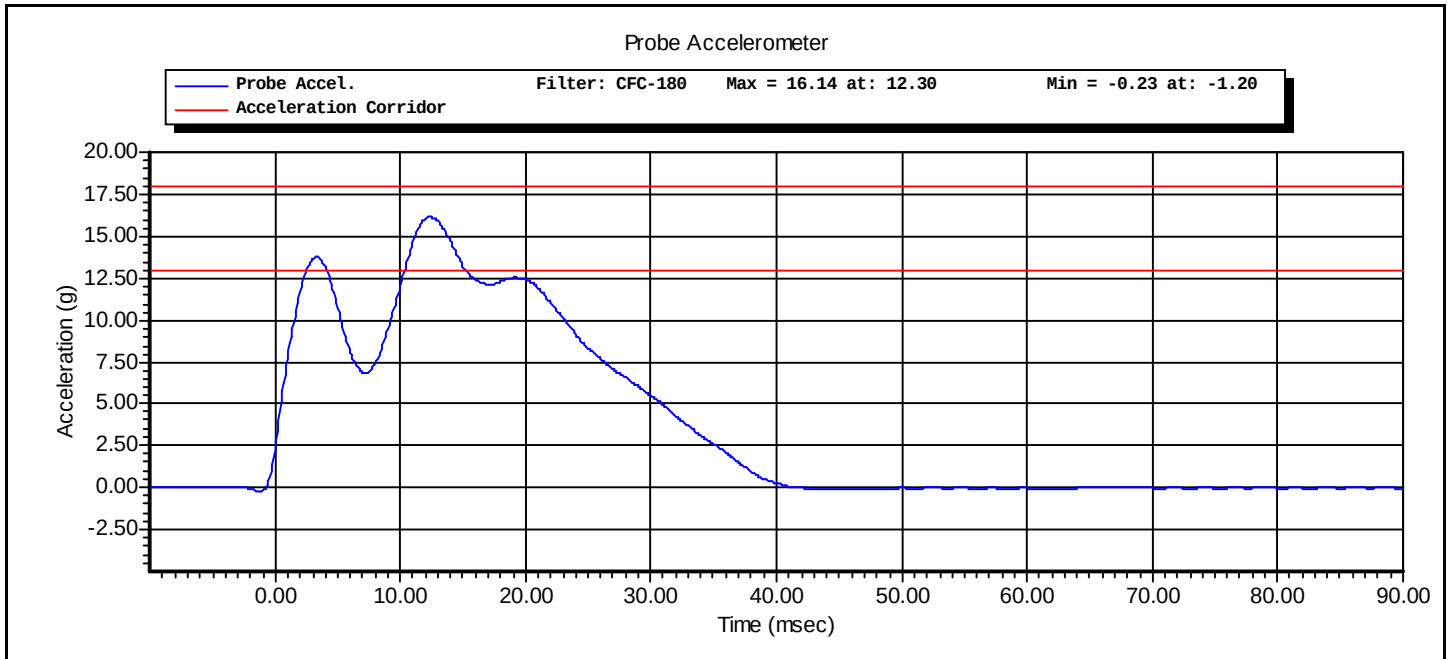
Test Name:	Shoulder Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Shoulder	Test Date:	8/24/2010
Test Number:	1	Test Time:	1:29:07 PM



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**

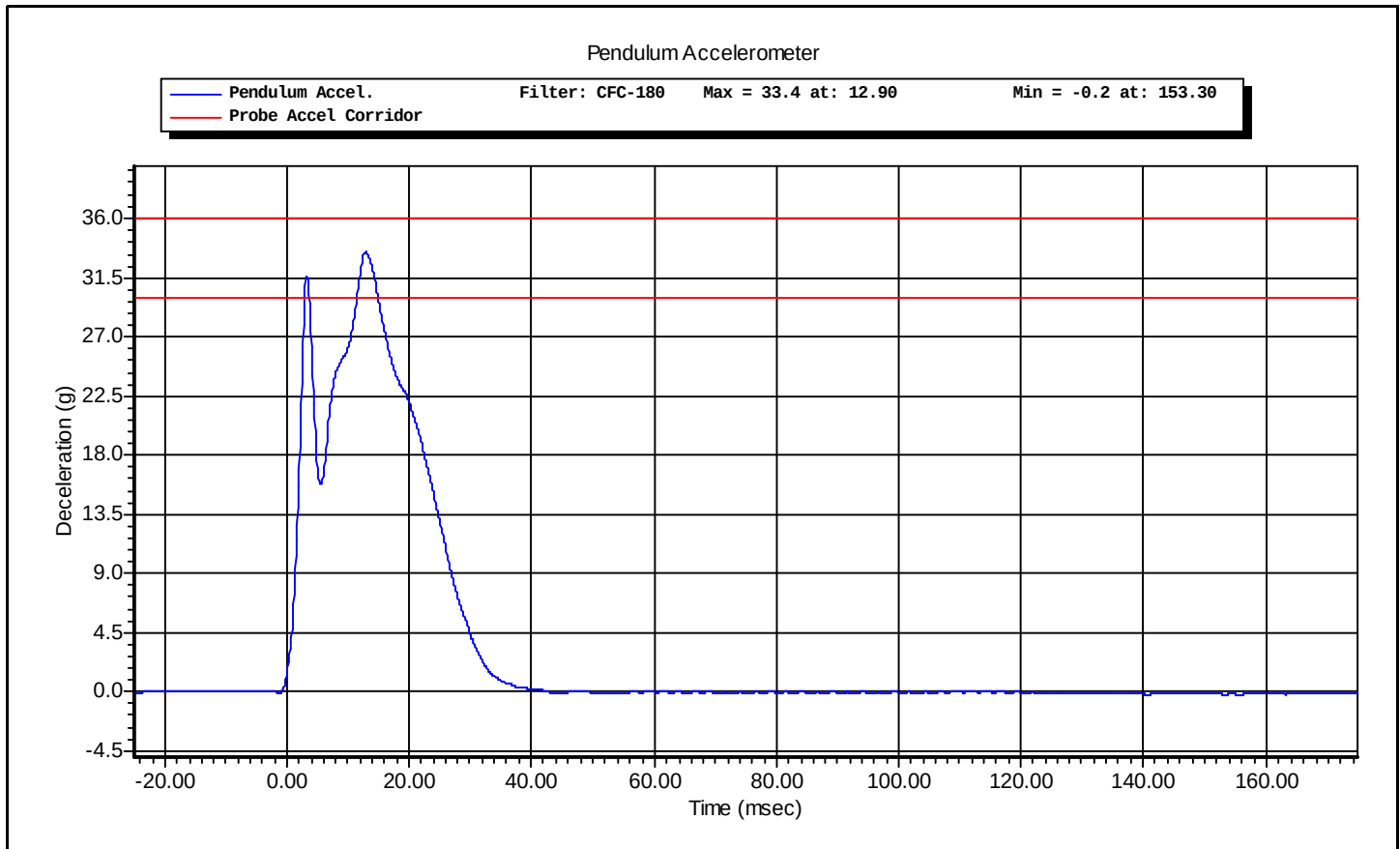


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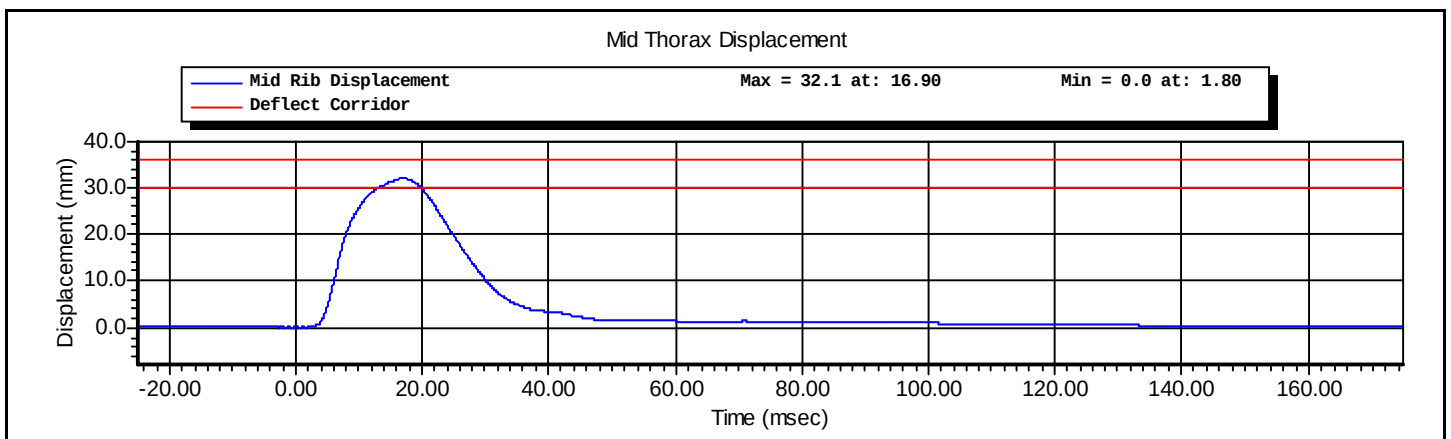
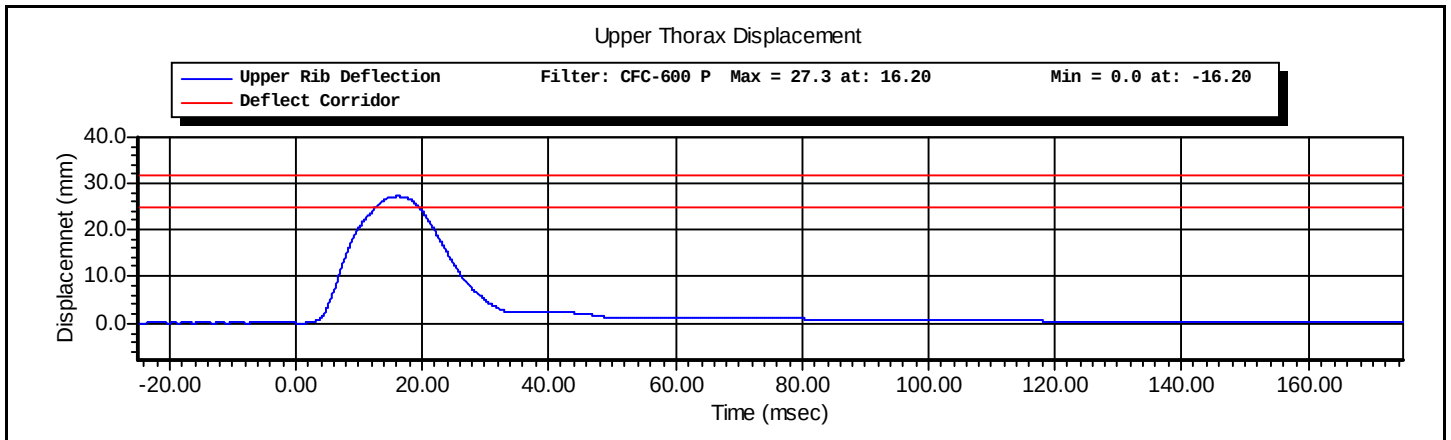
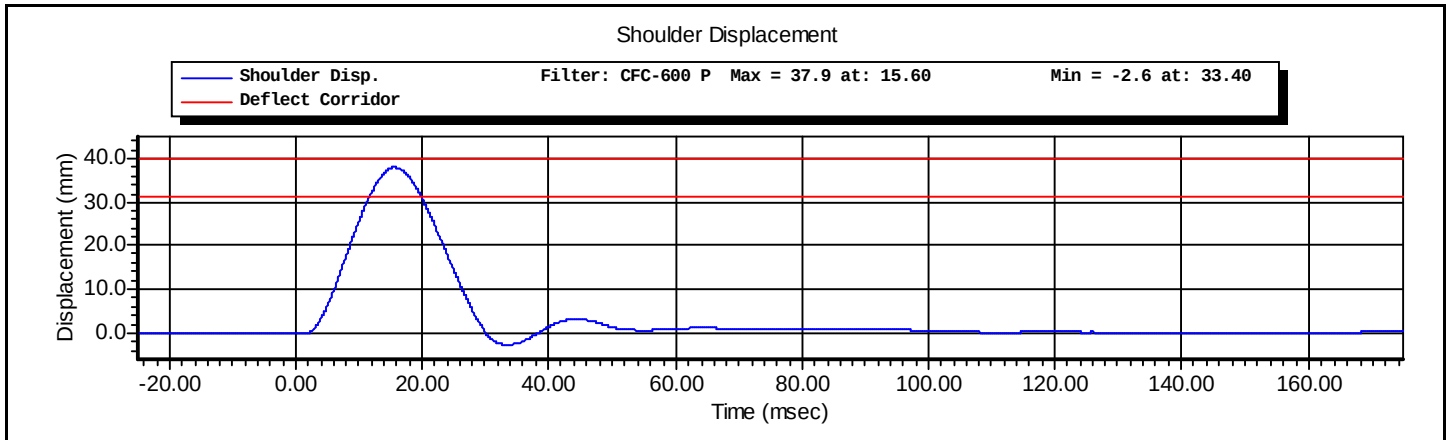
4455 Genesee Street, Buffalo, New York 14225 - Phone (716)632-7500

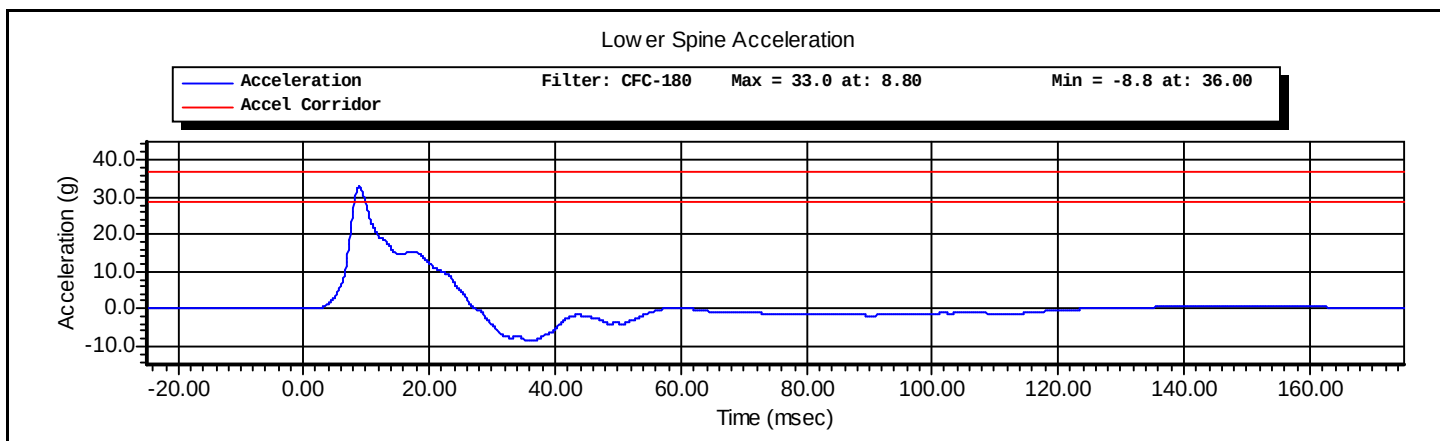
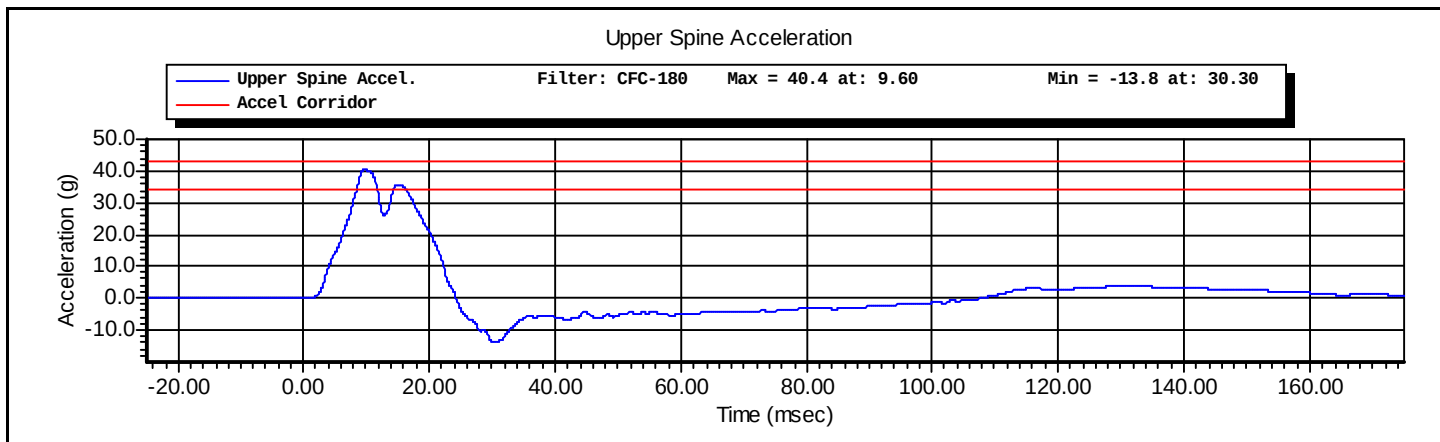
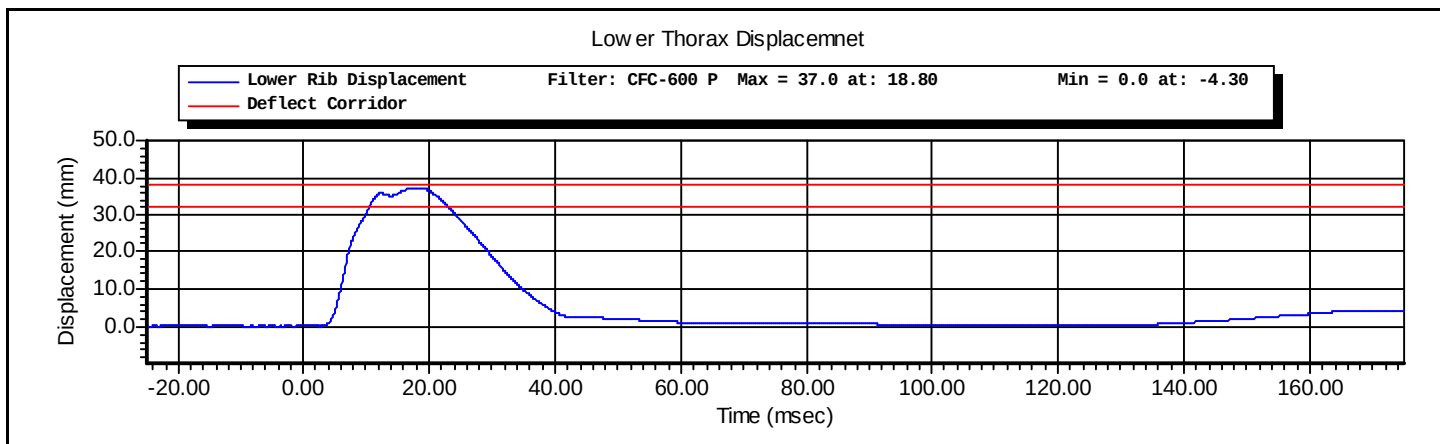
Test Name:	Thorax Impact with Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Thorax With Arm	Test Date:	8/24/2010
Test Number:	2	Test Time:	3:53:05 PM



Test 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**



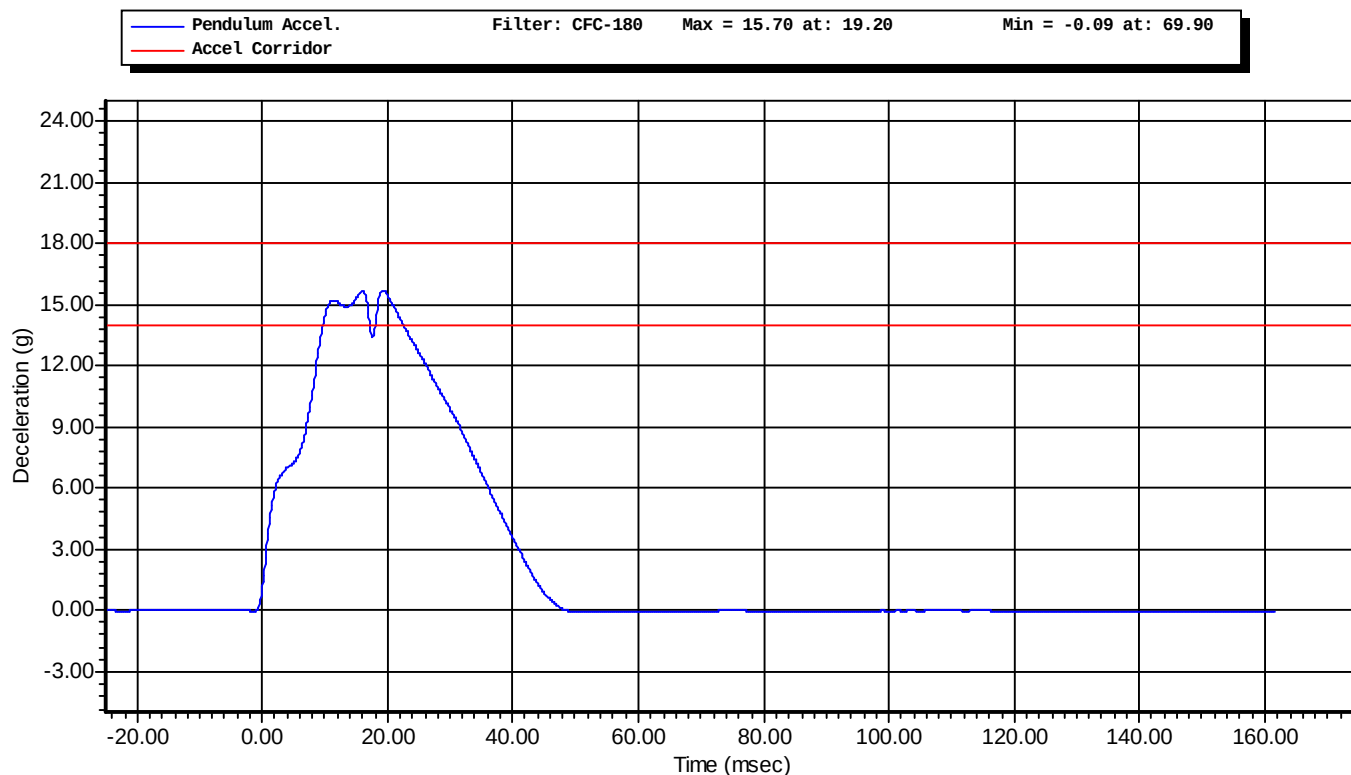
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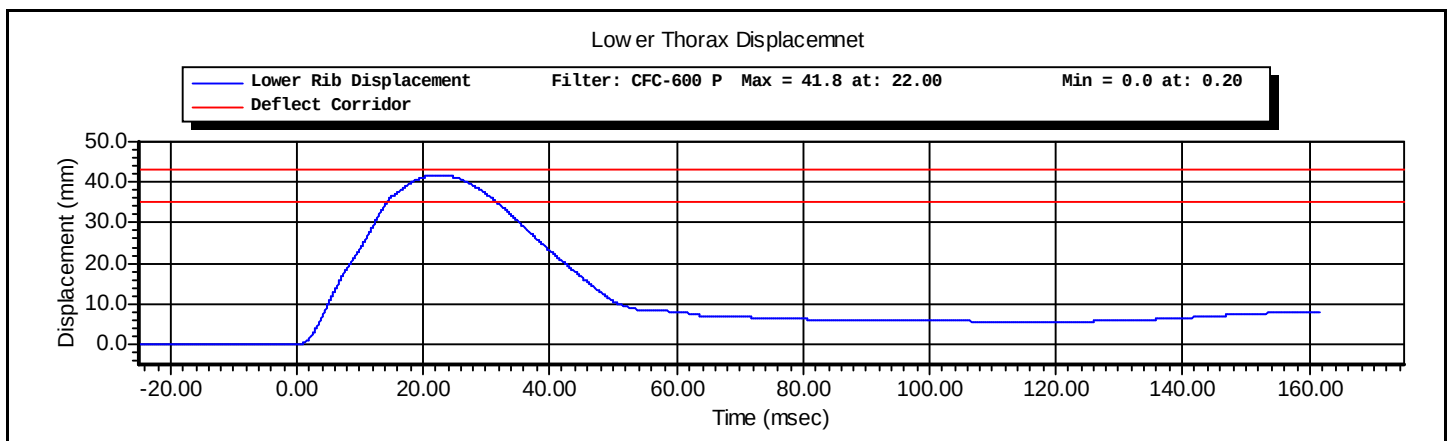
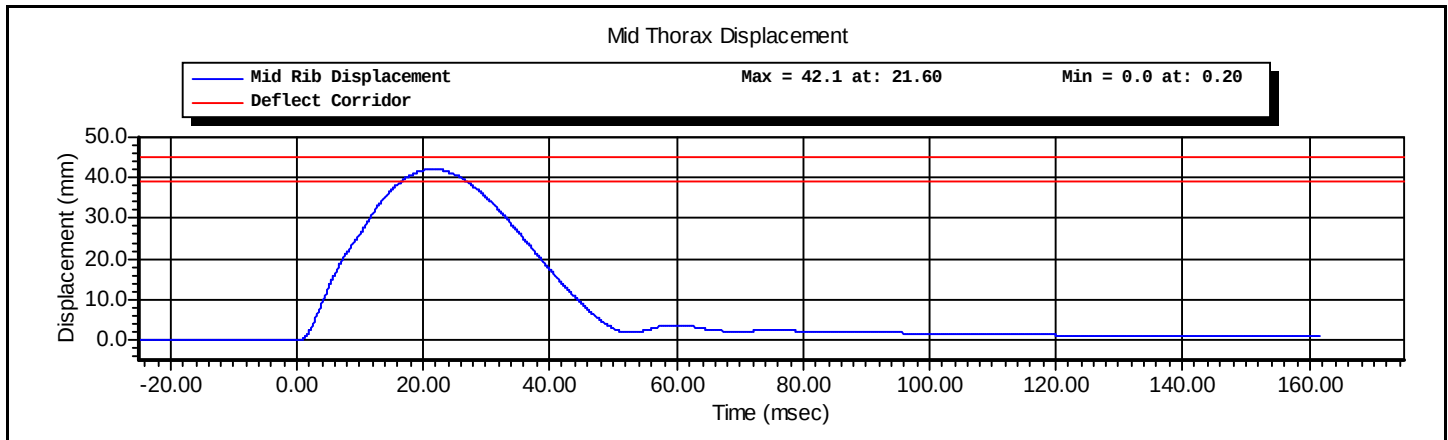
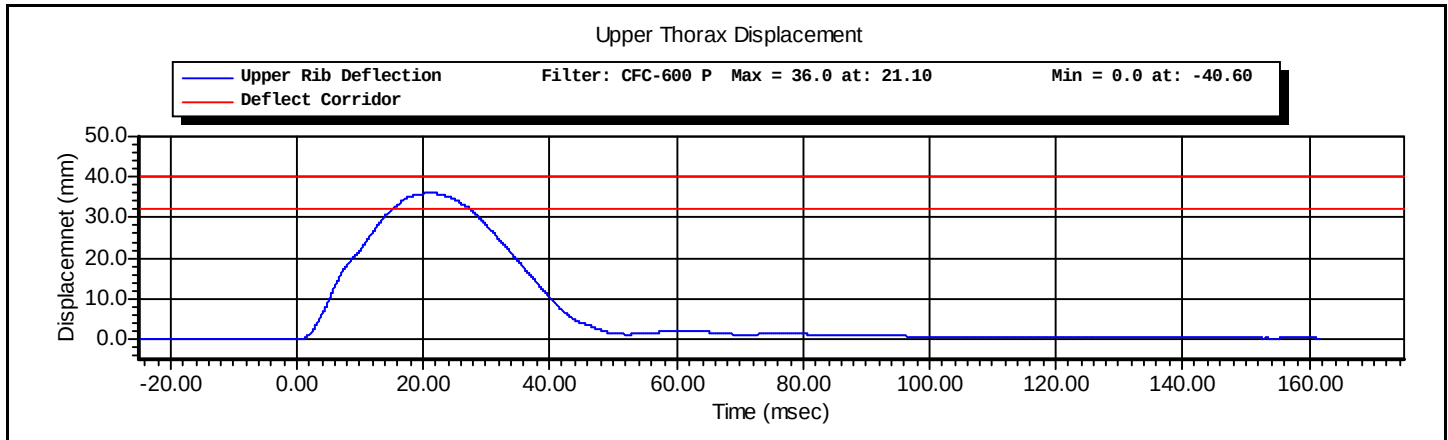
Test Name:	Thorax Impact without Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Thorax Without Arm	Test Date:	8/24/2010
Test Number:	1	Test Time:	2:54:43 PM

Pendulum Accelerometer

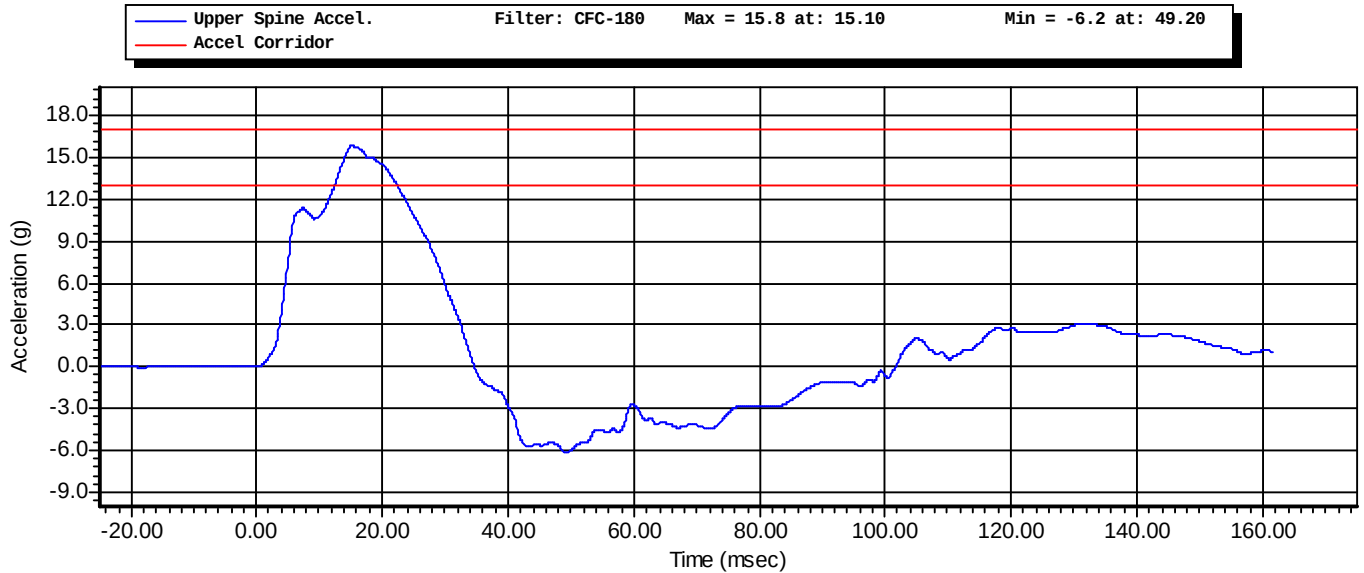


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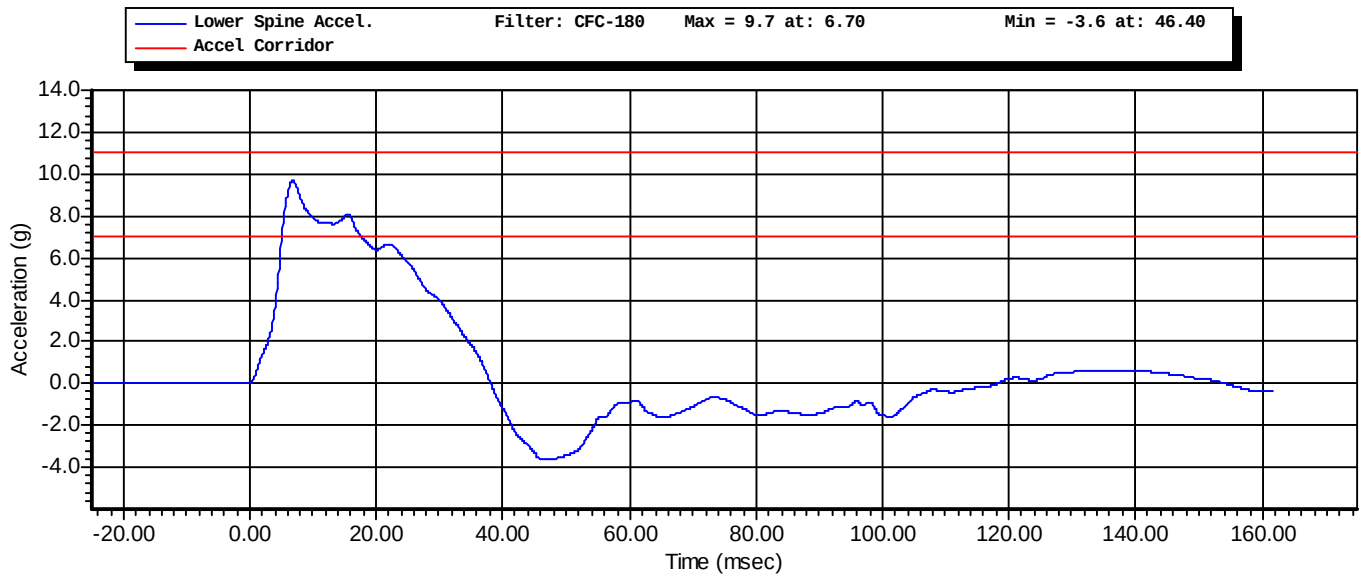
Test Date: 8/24/2010



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**



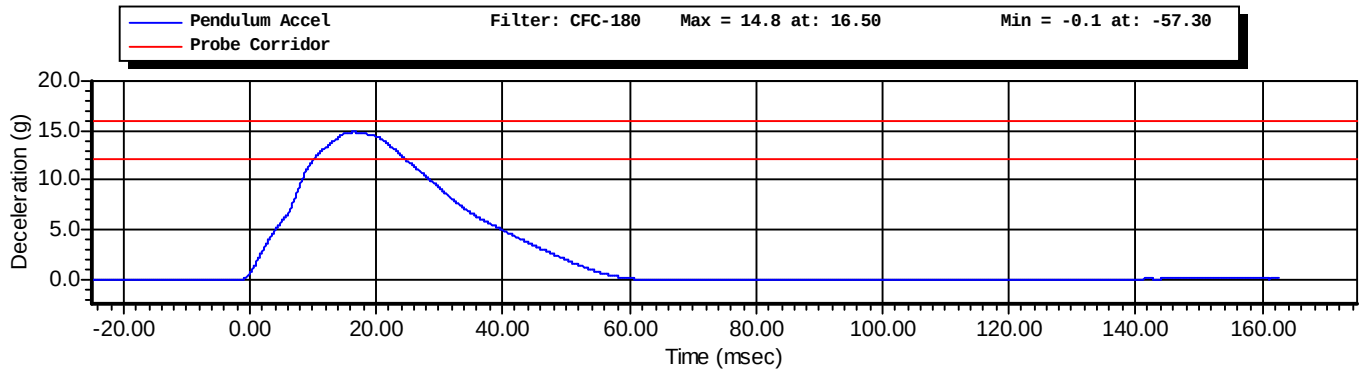
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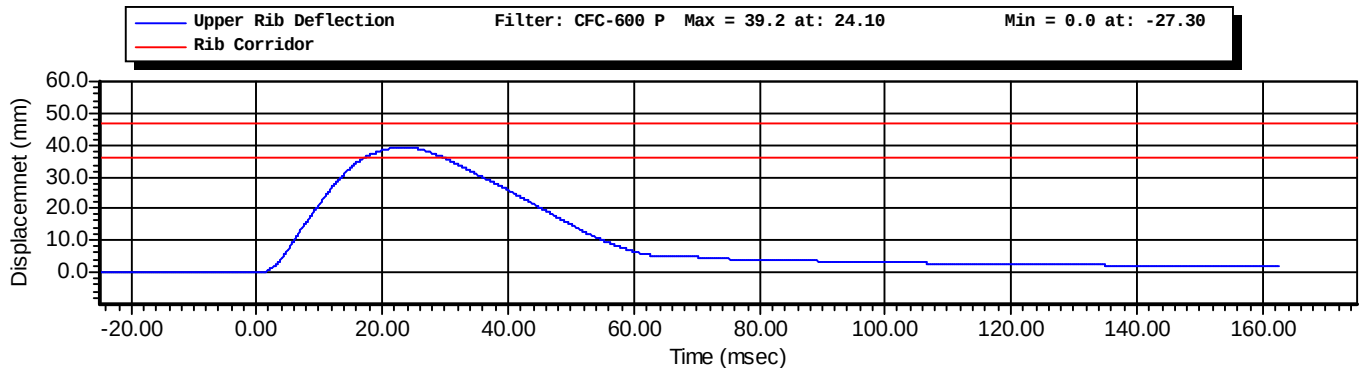
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Test Name:	Abdominal Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Abdomen	Test Date:	8/24/2010
Test Number:	1	Test Time:	2:01:33 PM

Pendulum Accelerometer



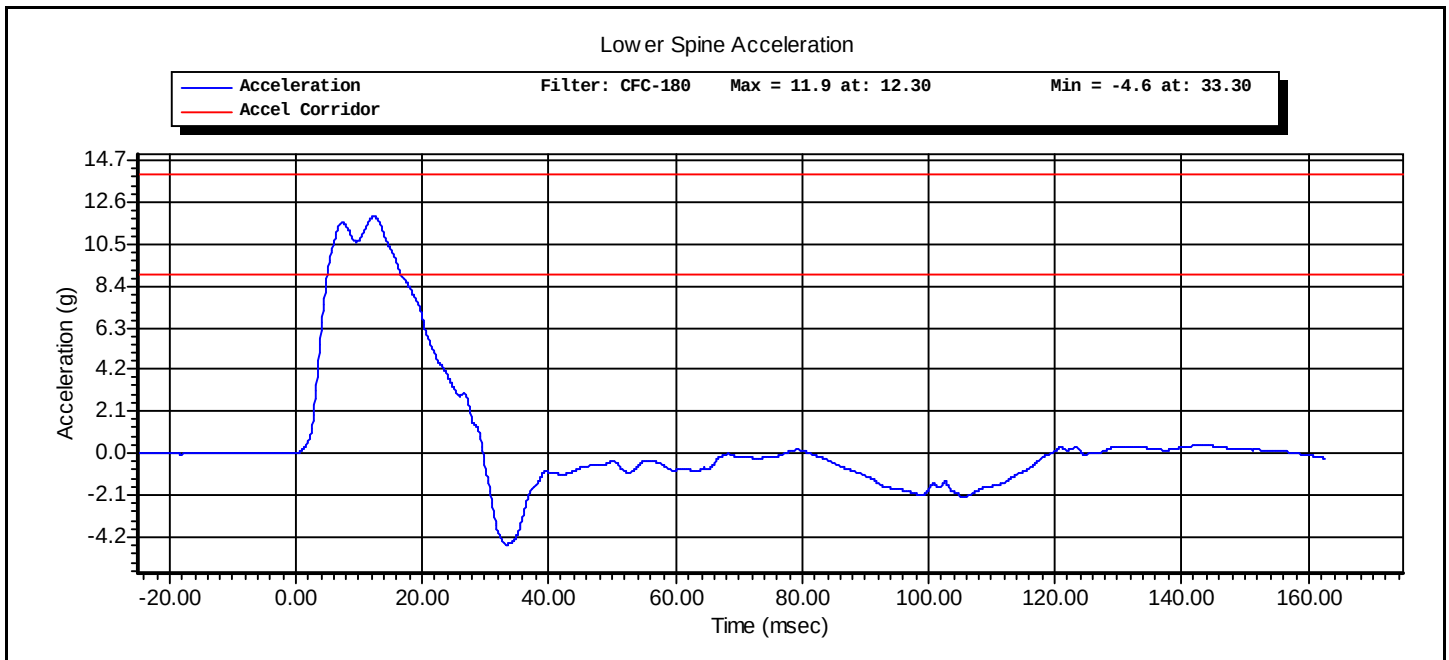
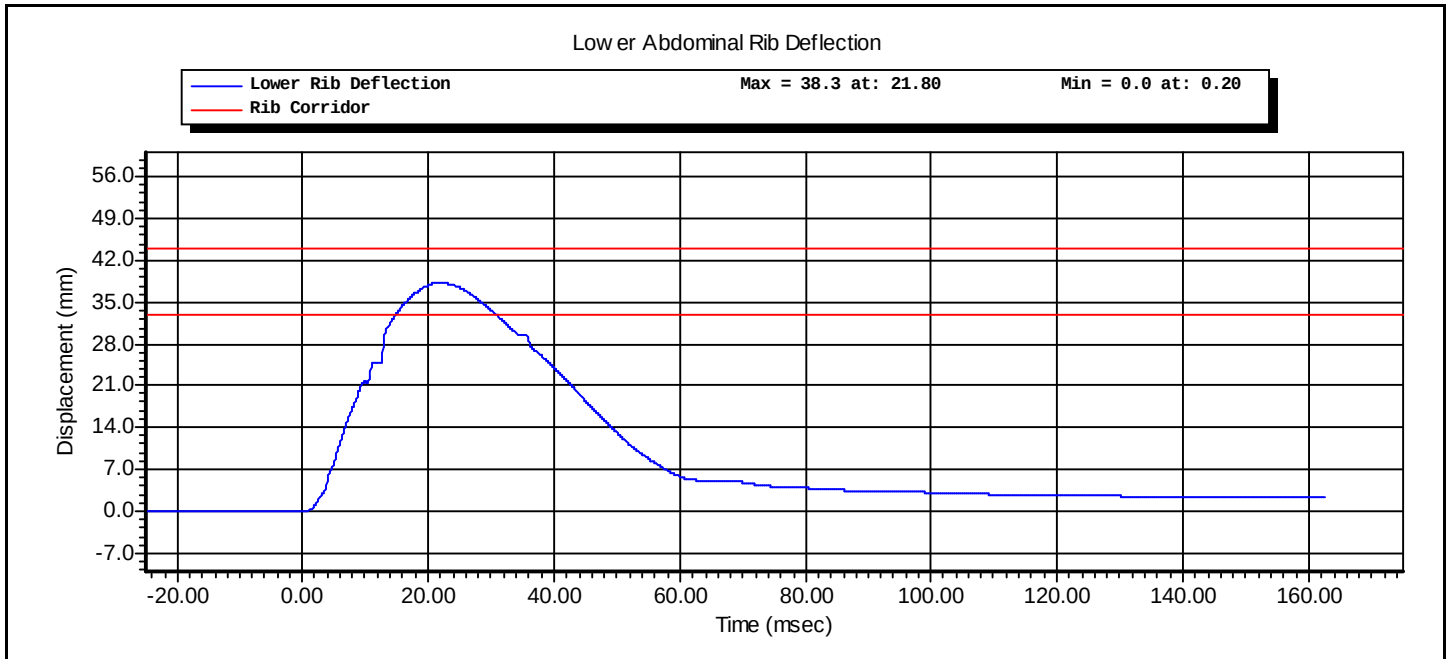
Upper Abdominal Rib Deflection



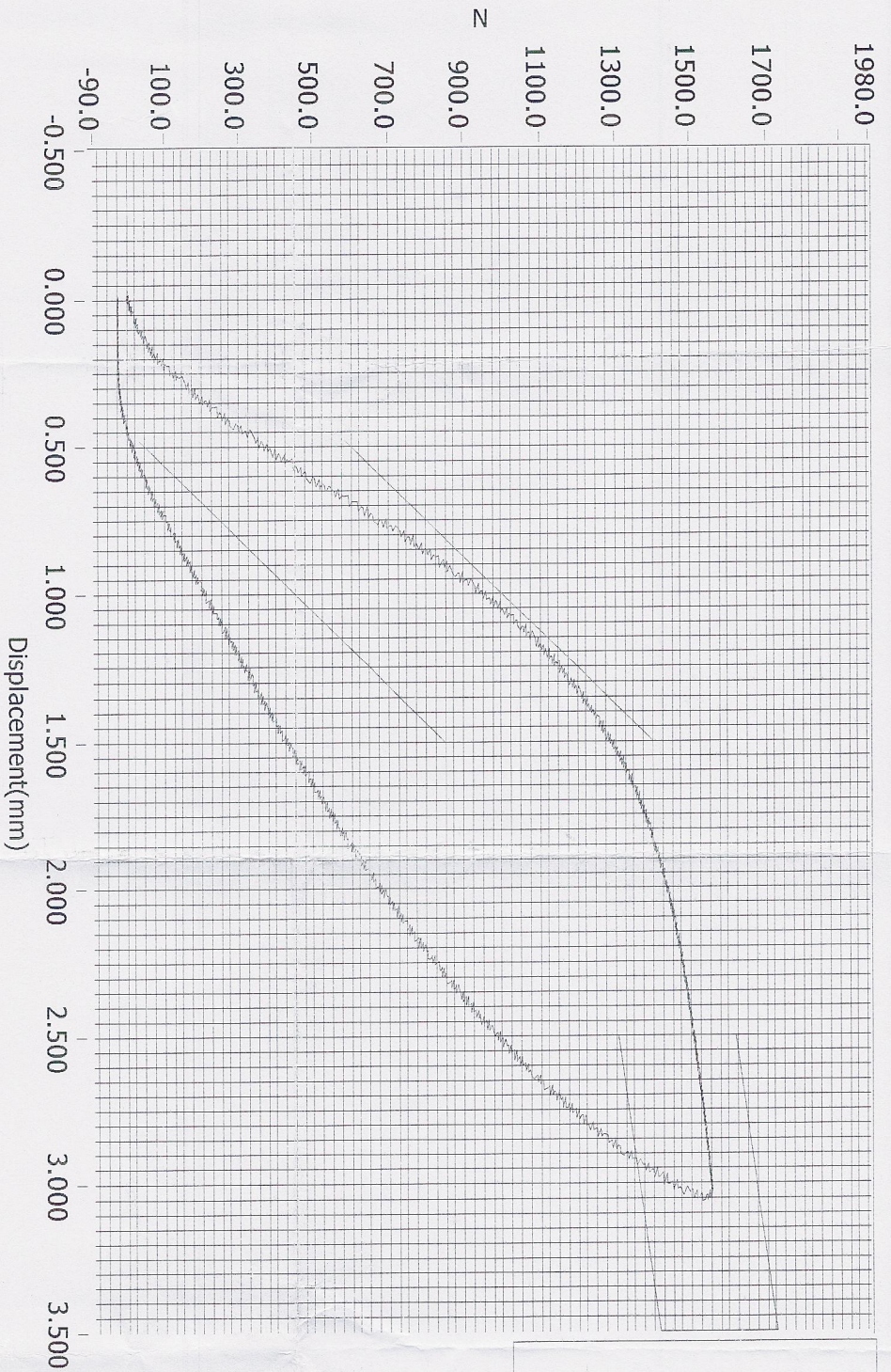
Test ID: **Abdomen**

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

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



Resultant Data - SIDIIs Plug Compression



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

12461

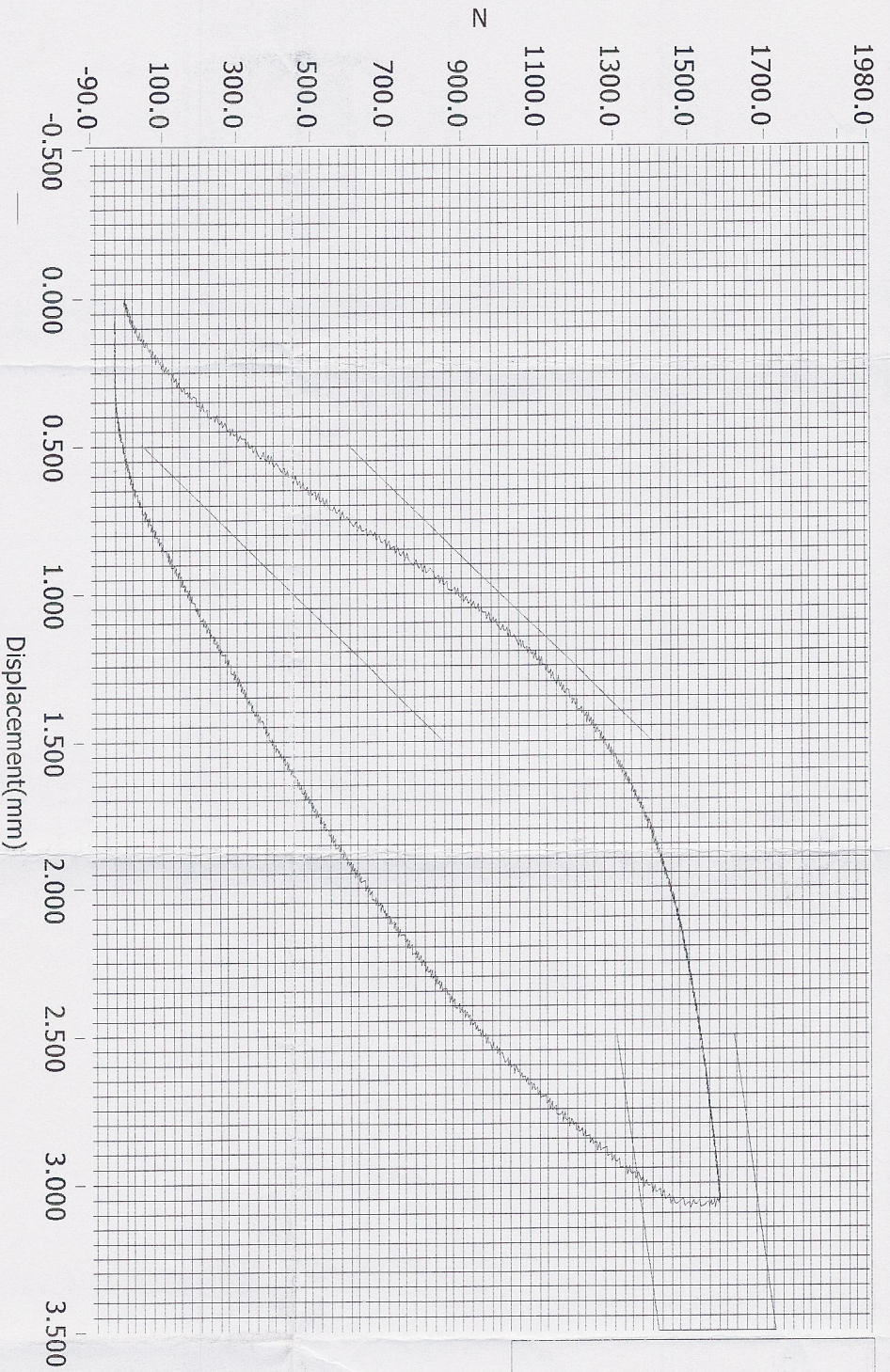
SIDIIs

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

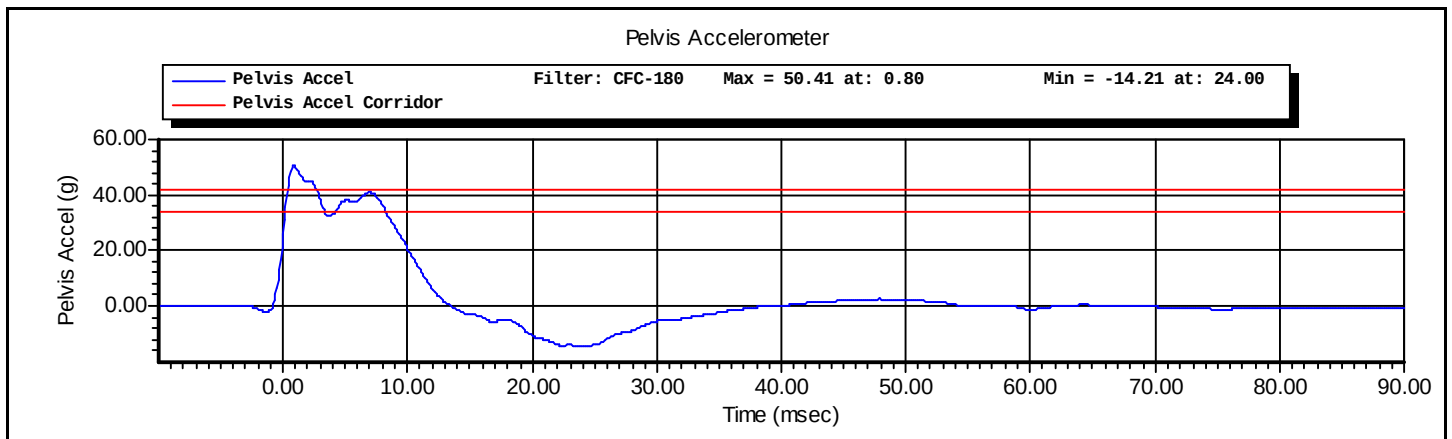
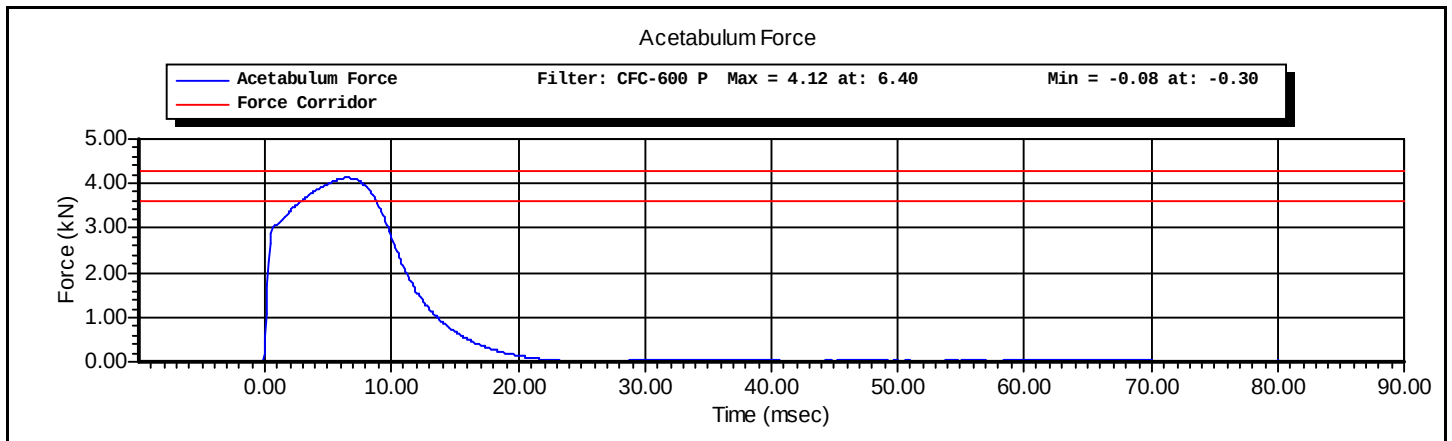
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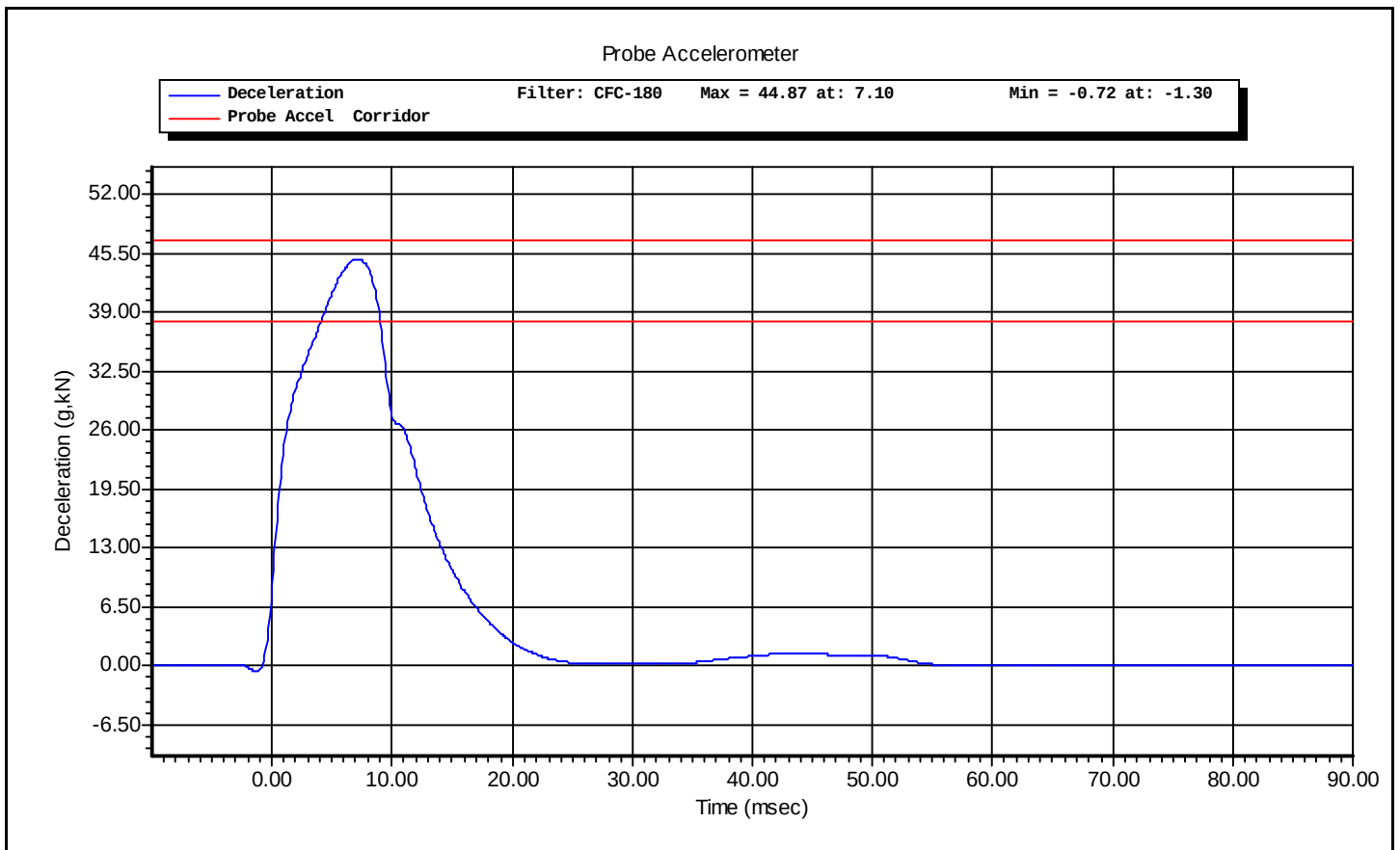
<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66927	4/20/2010
Endevco	7264-2000	P51671	4/12/2010
DentonATD	3249J	LC-275a	4/12/2010

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**

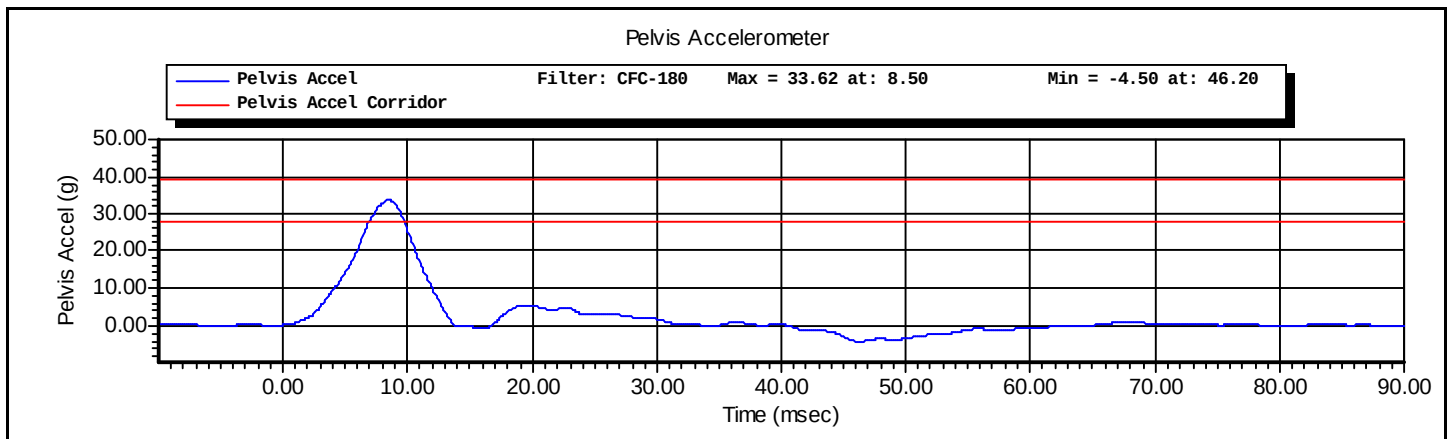
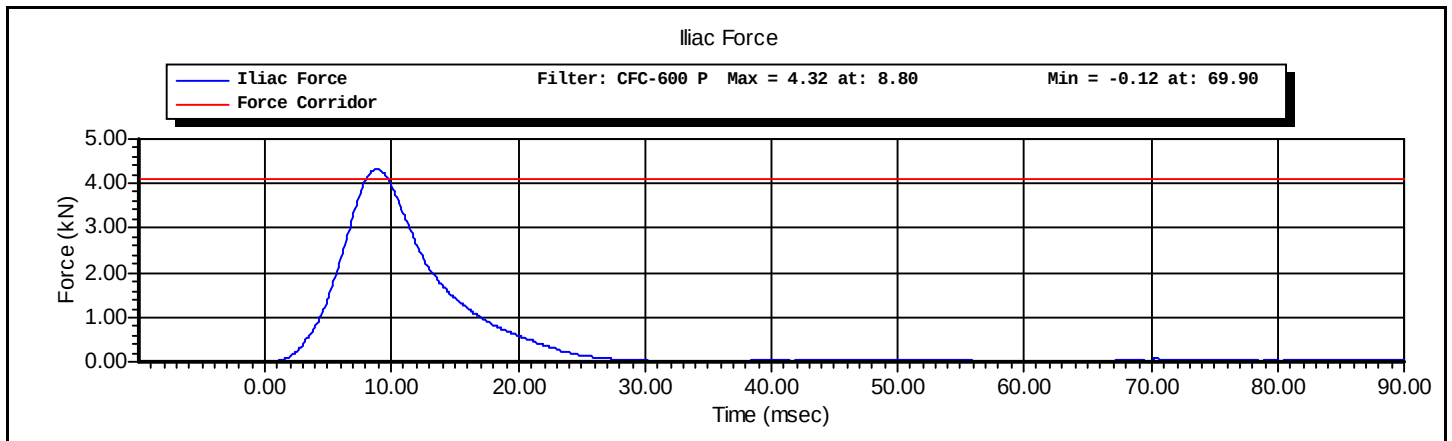


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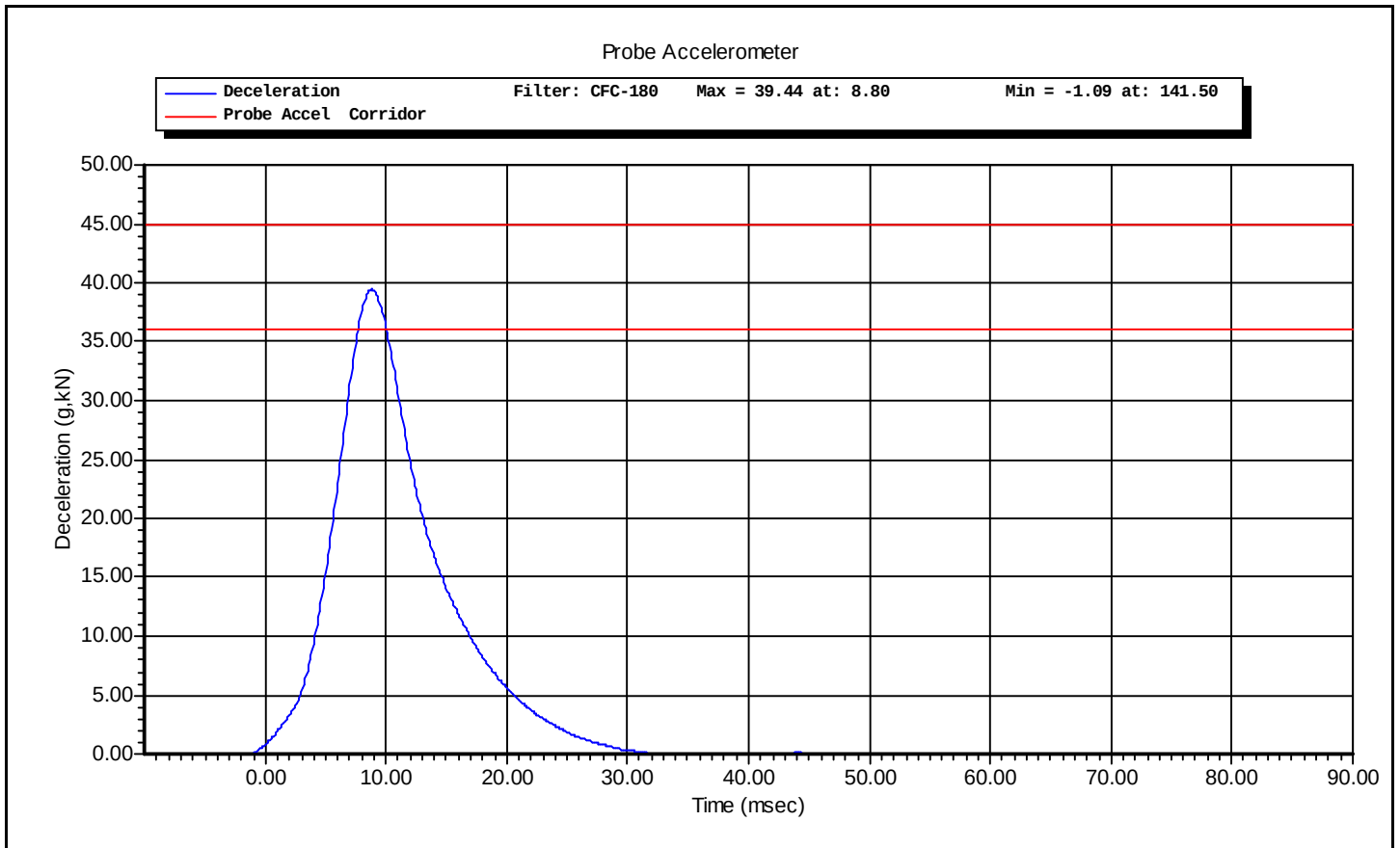
Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Iliac Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Pelvis Iliac	Test Date:	8/24/2010
Test Number:	1	Test Time:	11:45:14 AM



Test ID: **Pelvis Iliac**

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

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



CALIBRATION TEST RESULTS

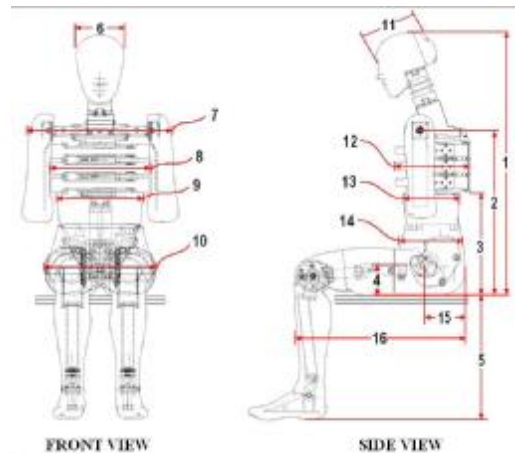
POST-TEST

ES2-re No: 33

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	909	Pass
2	Seat to Shoulder Joint	558-572	564	Pass
3	Seat to Lower Face of Thoracic Spine Box	346-356	354	Pass
4	Seat to Hip Joint (center of bolt)	97-103	100	Pass
5	Sole to Seat, Sitting	433-451	444	Pass
6	Head Width	152-158	159	Pass
7	Shoulder/Arm Width	461-479	470	Pass
8	Thorax Width	322-332	323	Pass
9	Abdomen Width	273-287	281	Pass
10	Pelvis Lap Width	359-373	370	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	238	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: 09/29/2010



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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:	9/29/2010
Test Number:	1	Test Time:	10:13:39 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	54 %RH P
Resultant Acceleration	125 -- 155	153 g P
Oscillation	0.0 -- 15.0	5.9 % P
Fore-Aft Acceleration	-15.00 -- 15.00	5.99 g P

All test parameters are within specifications

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

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

Test ID: **Head Drop**

Test Time: **10:13:39 AM**

Test Date: **9/29/2010**



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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	P51681	9/20/2010
Endevco	7264-2000	P51949	5/26/2010
Endevco	7264-2000	P51695	9/20/2010

Test ID: **Head Drop**

Test Time: **10:13:39 AM**

Test Date: **9/29/2010**

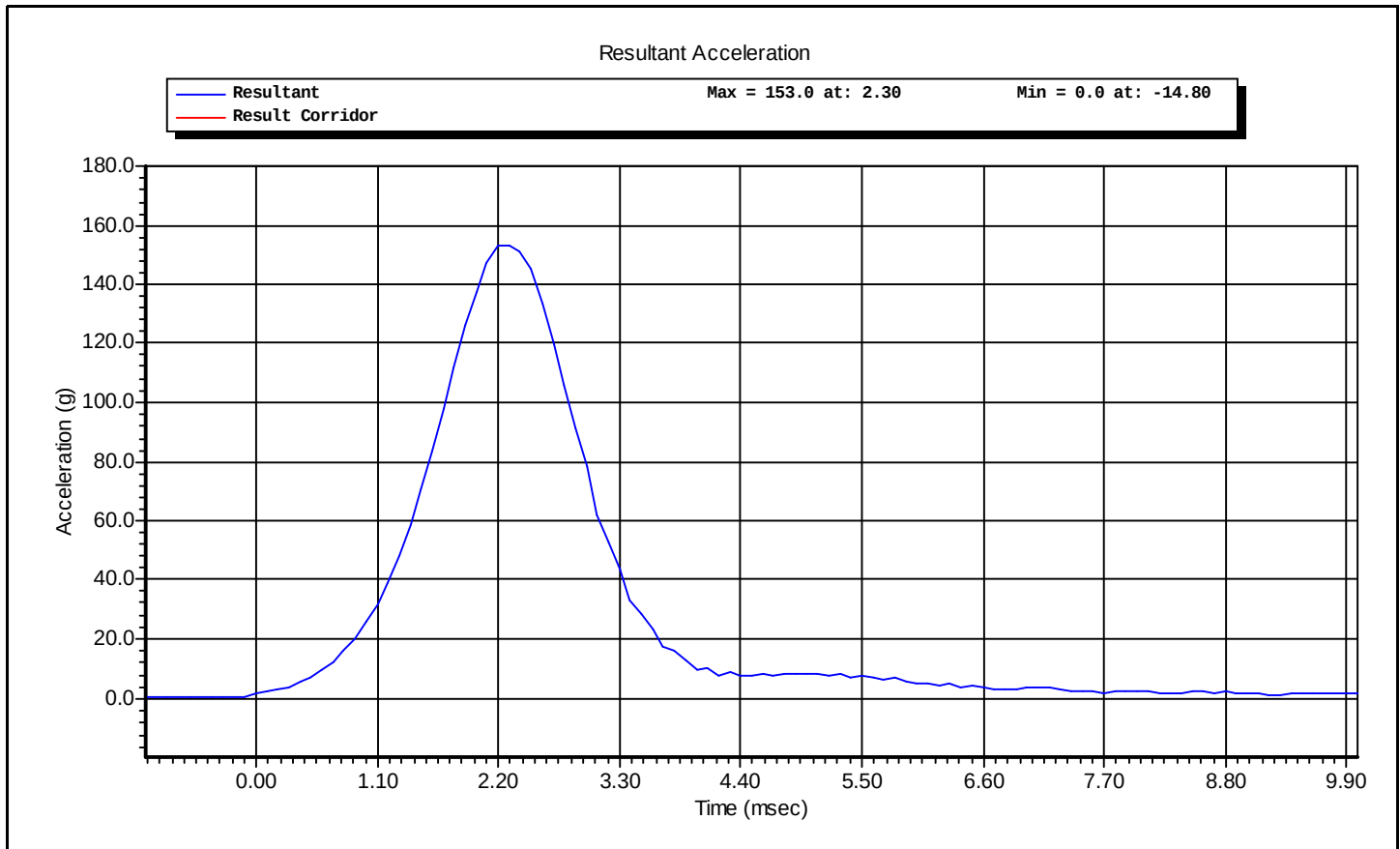


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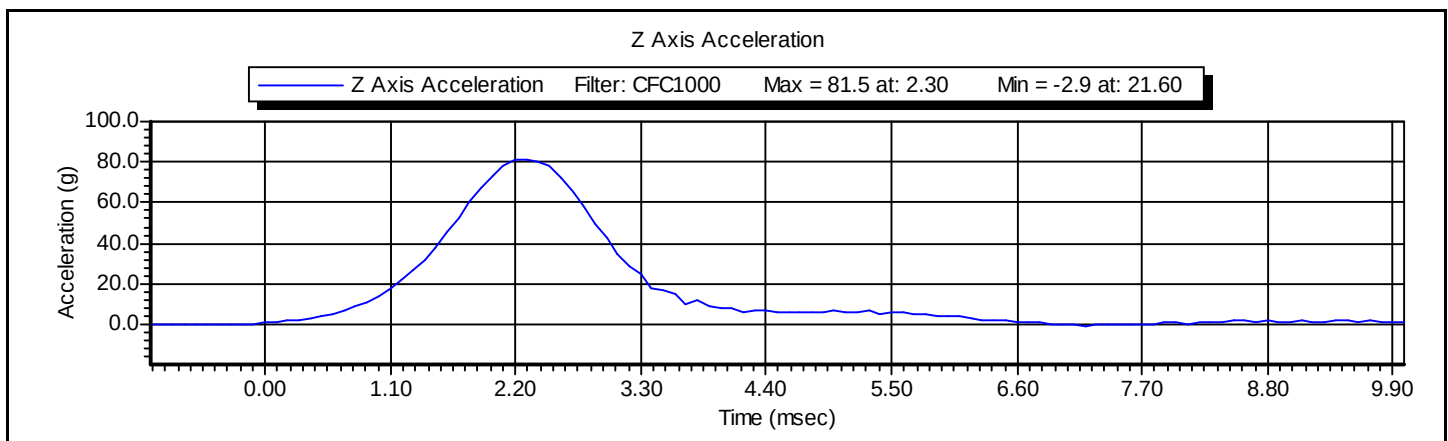
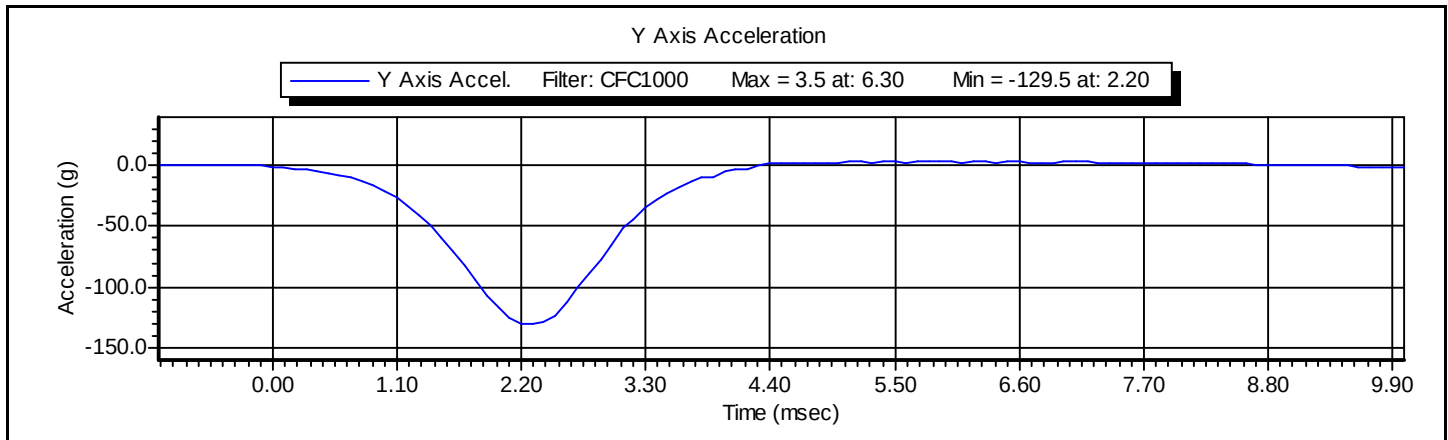
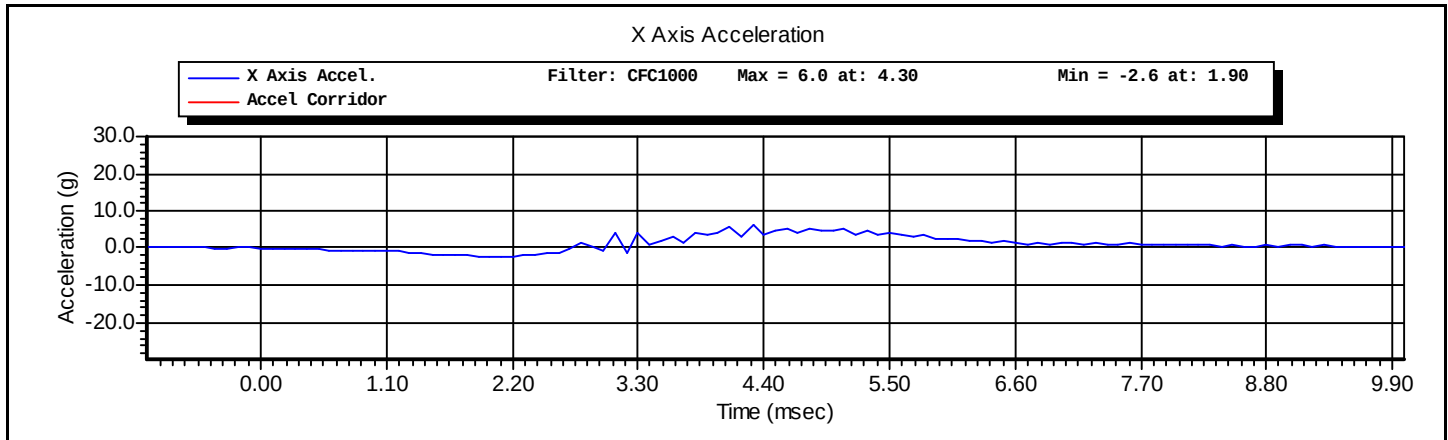
Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Head Drop	Test Date:	9/29/2010
Test Number:	1	Test Time:	10:13:39 AM



Test ID: **Head Drop**

Test Time: **10:13:39 AM**

Test Date: **9/29/2010**





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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:	9/29/2010
Test Number:	1	Test Time:	10:50:50 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	53 %RH P
Velocity	3.30 -- 3.50	3.42 m/s P
Maximum Neck Flexion Angle	49.0 -- 59.0	52.6 degrees P
Time At Maximum Neck Flexion	54.0 -- 66.0	59.6 ms P
Decay to Zero Degrees	53.0 -- 88.0	58.5 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: **10:50:50 AM**

Test Date: **9/29/2010**



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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: **10:50:50 AM**

Test Date: **9/29/2010**



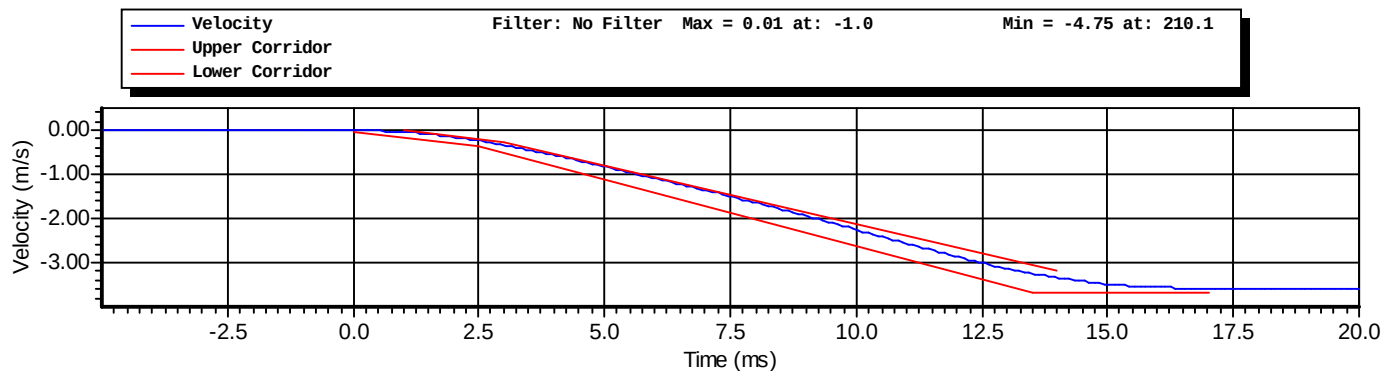
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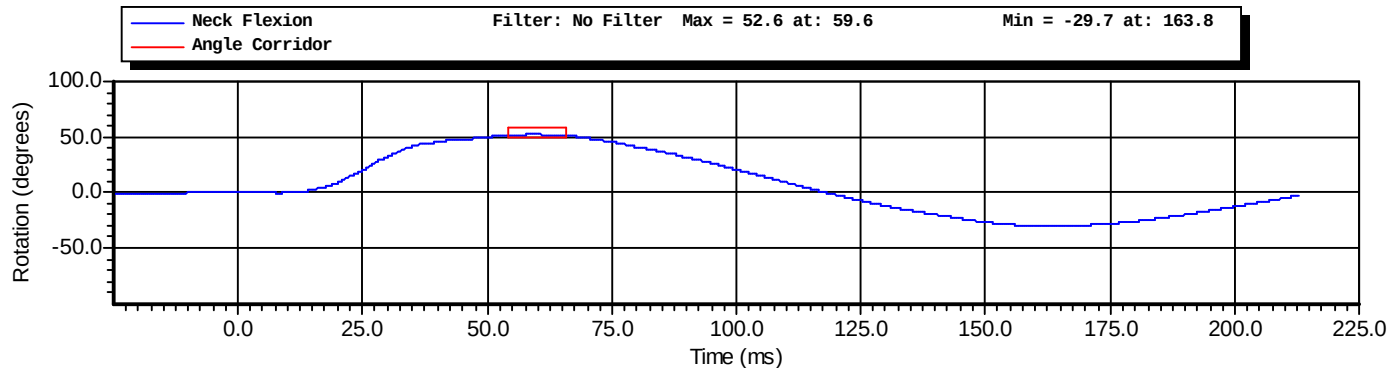
4455 Genesee Street, Buffalo, New York 14225 - Phone (716)632-7500

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:	9/29/2010
Test Number:	1	Test Time:	10:50:50 AM

Pendulum Velocity



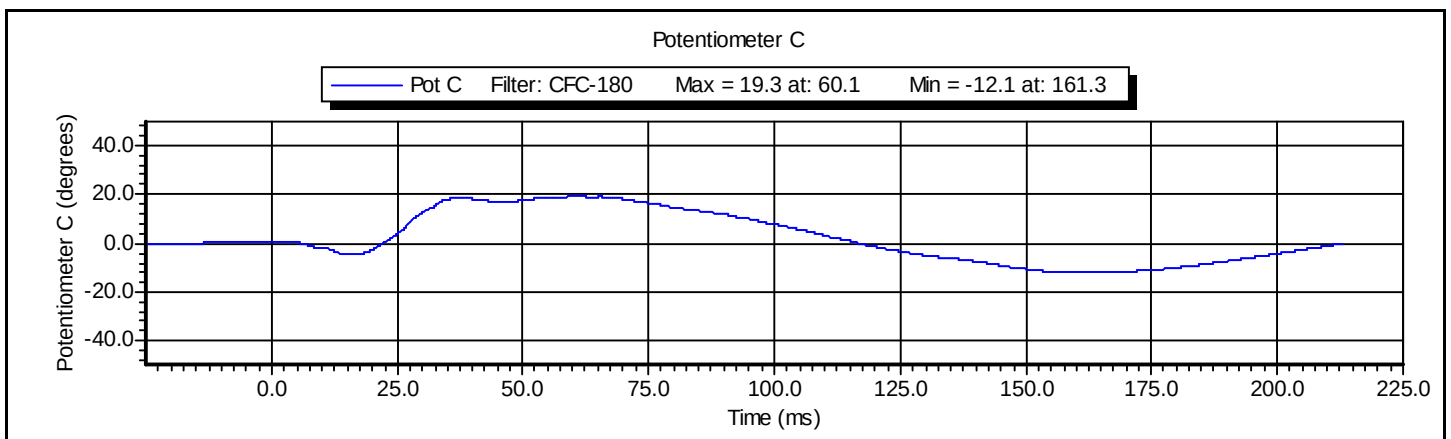
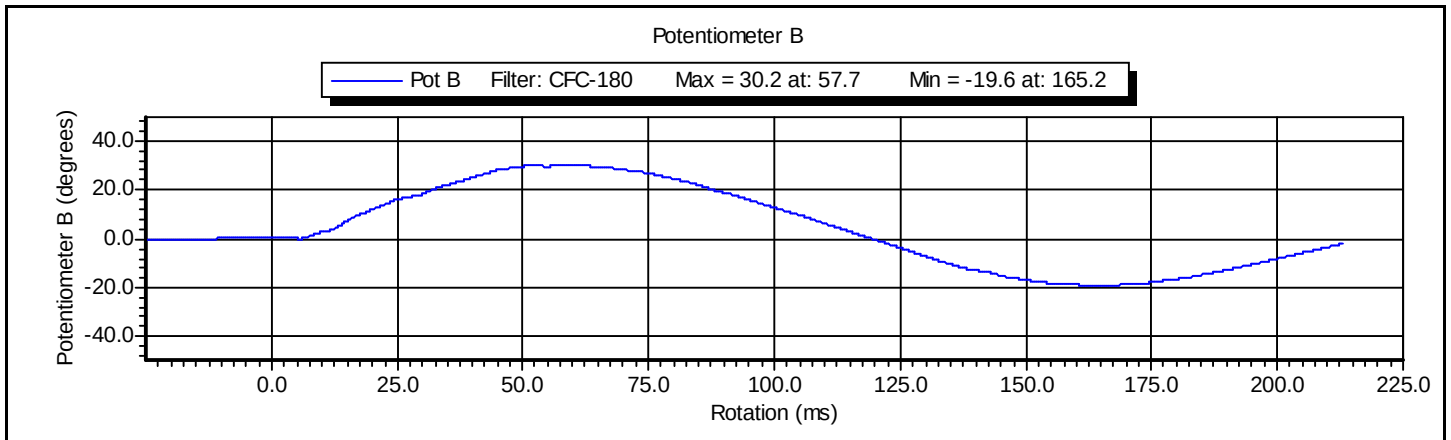
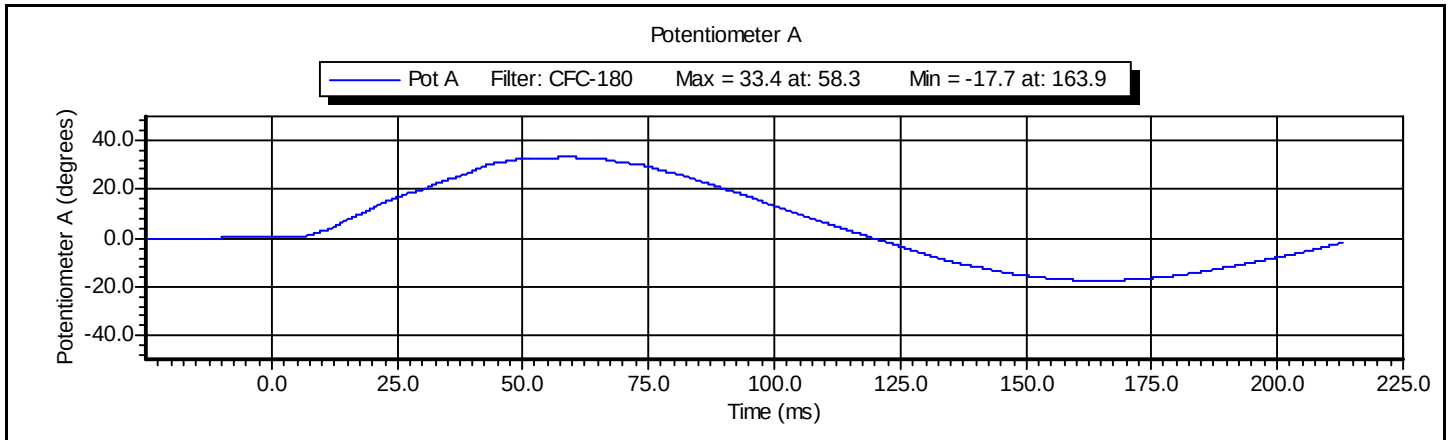
Neck Flexion Angle



Test ID: Neck Flexion

Test Time: 10:50:50 AM

Test Date: 9/29/2010





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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:	9/29/2010
Test Number:	1	Test Time:	3:28:09 PM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	51.0 %RH P
Velocity	4.20 -- 4.40	4.33 m/s P
Pendulum Acceleration	-10.50 -- -7.50	-9.59 g P

All test parameters are within specifications

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

Test ID: **Shoulder**

Test Time: **3:28:09 PM**

Test Date: **9/29/2010**



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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: **3:28:09 PM**

Test Date: **9/29/2010**

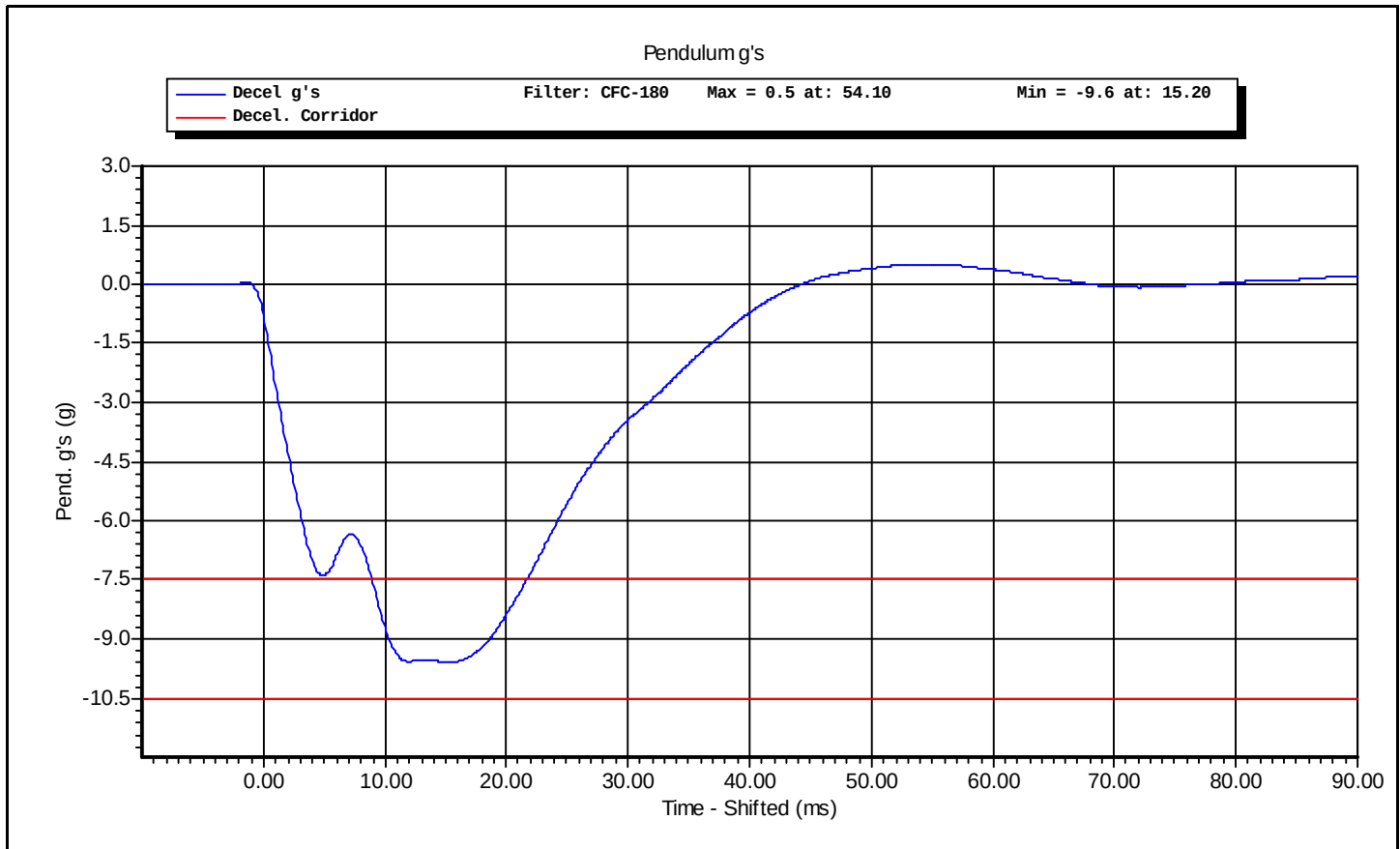


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Test Name:	Shoulder Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Shoulder	Test Date:	9/29/2010
Test Number:	1	Test Time:	3:28:09 PM



Test ID: **Shoulder**

Test Time: **3:28:09 PM**

Test Date: **9/29/2010**



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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:	9/29/2010
Test Number:	1	Test Time:	1:26:14 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	52.0 %RH P
Velocity	3.90 -- 4.10	3.97 m/s P
Rib Displacement	-51.00 -- -46.00	-48.63 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: **1:26:14 PM**

Test Date: **9/29/2010**



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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: **1:26:14 PM**

Test Date: **9/29/2010**

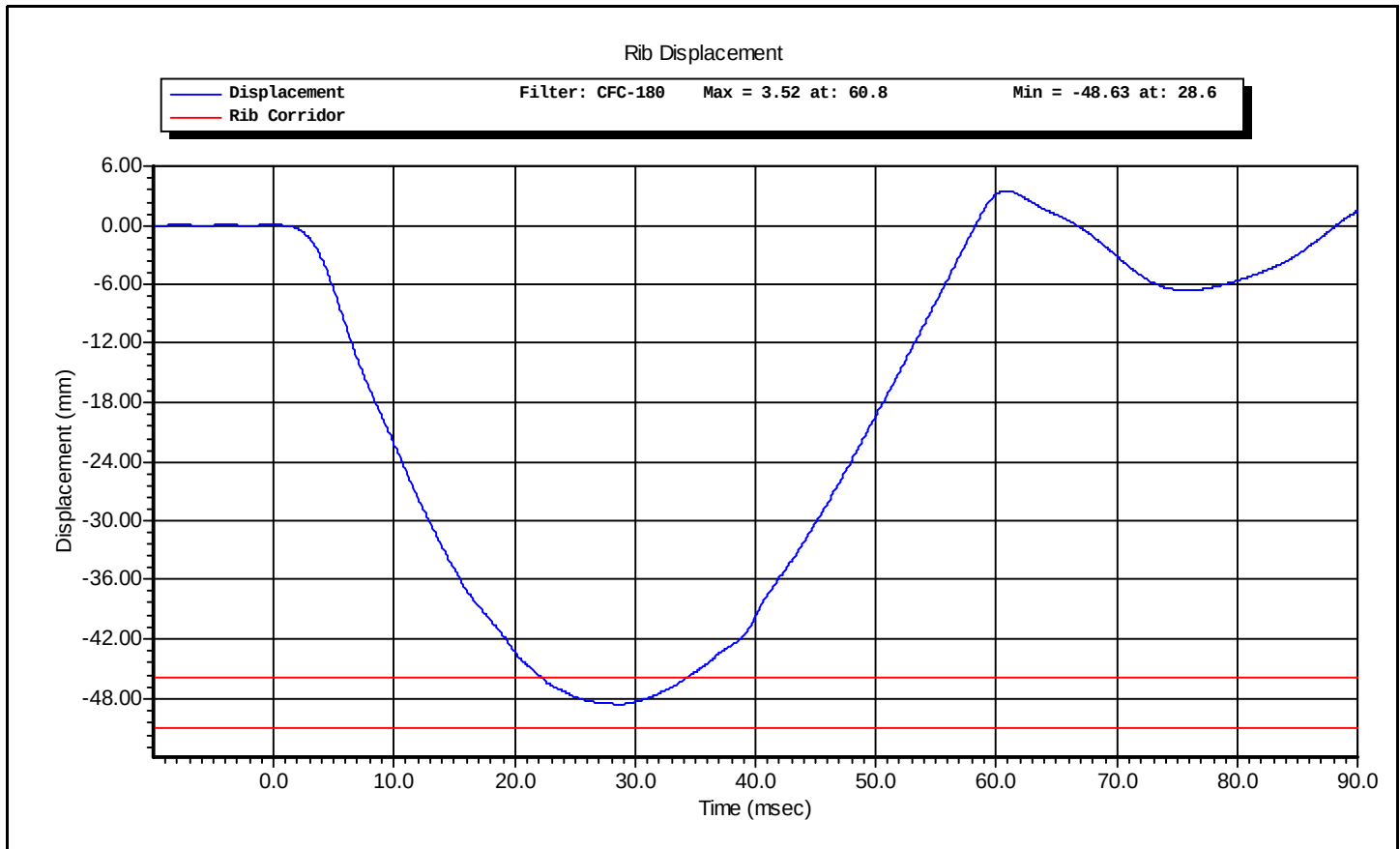


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Lower Rib 4 m/s	Test Date:	9/29/2010
Test Number:	1	Test Time:	1:26:14 PM



Test ID: Lower Rib 4 m/s Test Time: 1:26:14 PM

Test Date: 9/29/2010



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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:	9/29/2010
Test Number:	1	Test Time:	1:33:55 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	52.0 %RH P
Velocity	2.90 -- 3.10	2.96 m/s P
Rib Displacement	-40.00 -- -36.00	-38.08 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: **1:33:55 PM**

Test Date: **9/29/2010**



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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: **1:33:55 PM**

Test Date: **9/29/2010**

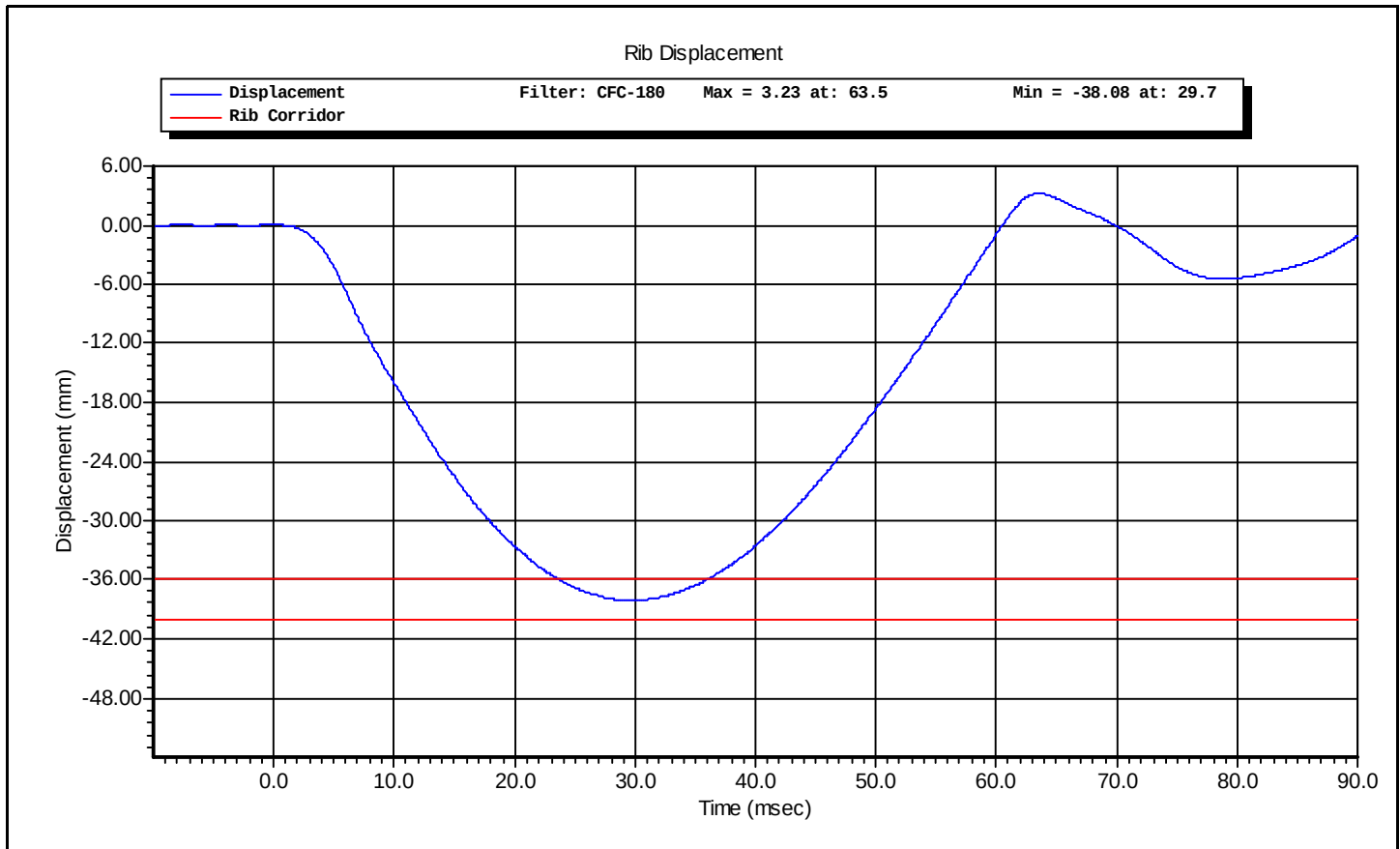


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Lower Rib 3 m/s	Test Date:	9/29/2010
Test Number:	1	Test Time:	1:33:55 PM



Test ID: Lower Rib 3 m/s Test Time: 1:33:55 PM

Test Date: 9/29/2010



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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 Rib 4 m/s	Test Date:	9/29/2010
Test Number:	1	Test Time:	12:54:26 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	50.0 %RH P
Velocity	3.90 -- 4.10	3.99 m/s P
Rib Displacement	-51.00 -- -46.00	-47.96 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: **Middle Rib 4 m/s** Test Time: **12:54:26 PM**

Test Date: **9/29/2010**



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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 4 m/s**

Test Time: **12:54:26 PM**

Test Date: **9/29/2010**

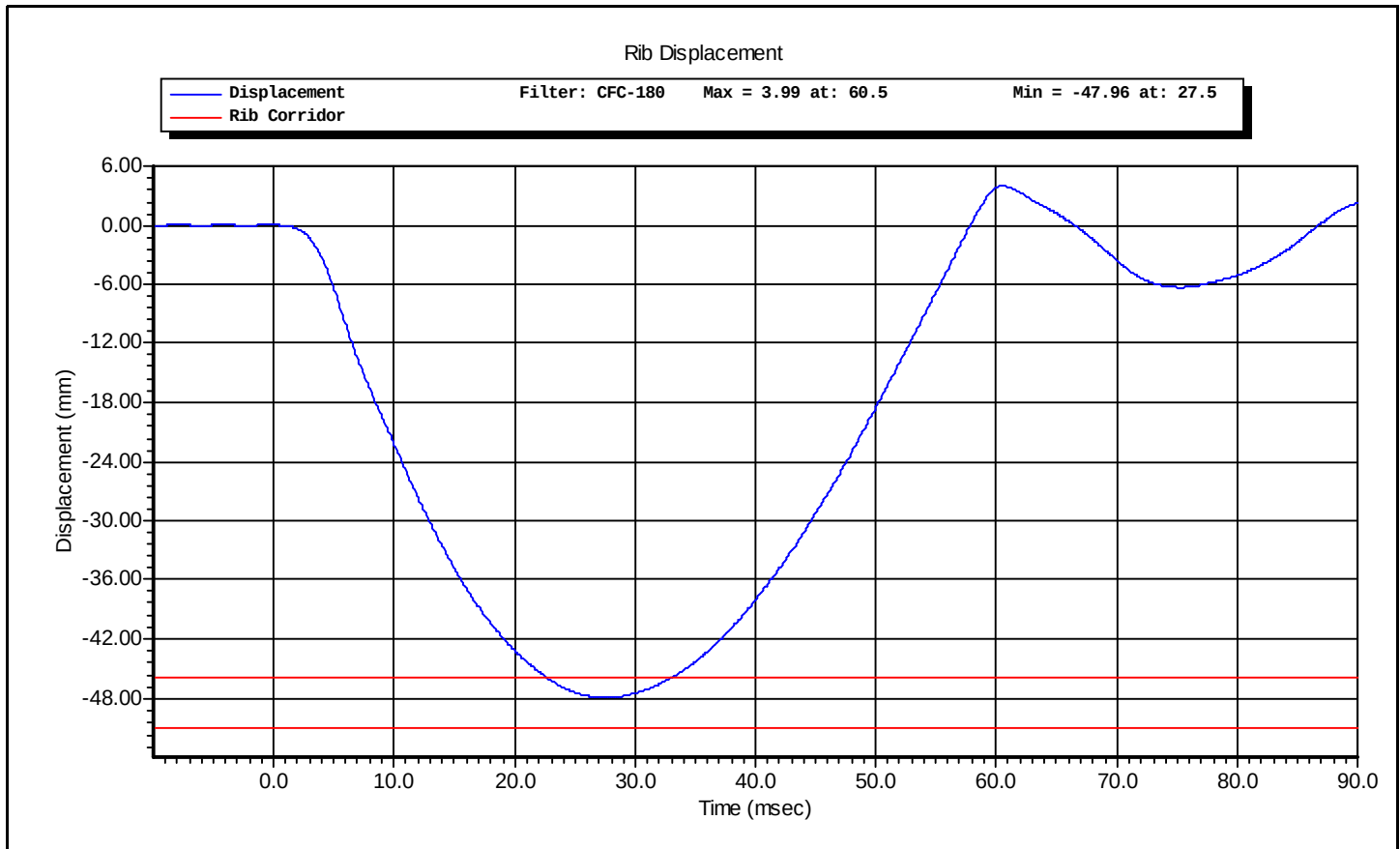


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Middle Rib 4 m/s	Test Date:	9/29/2010
Test Number:	1	Test Time:	12:54:26 PM



Test ID: Middle Rib 4 m/s Test Time: 12:54:26 PM

Test Date: 9/29/2010



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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:	9/29/2010
Test Number:	1	Test Time:	1:12:19 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	52.0 %RH P
Velocity	2.90 -- 3.10	2.97 m/s P
Rib Displacement	-40.00 -- -36.00	-37.57 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: **1:12:19 PM**

Test Date: **9/29/2010**



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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: **1:12:19 PM**

Test Date: **9/29/2010**

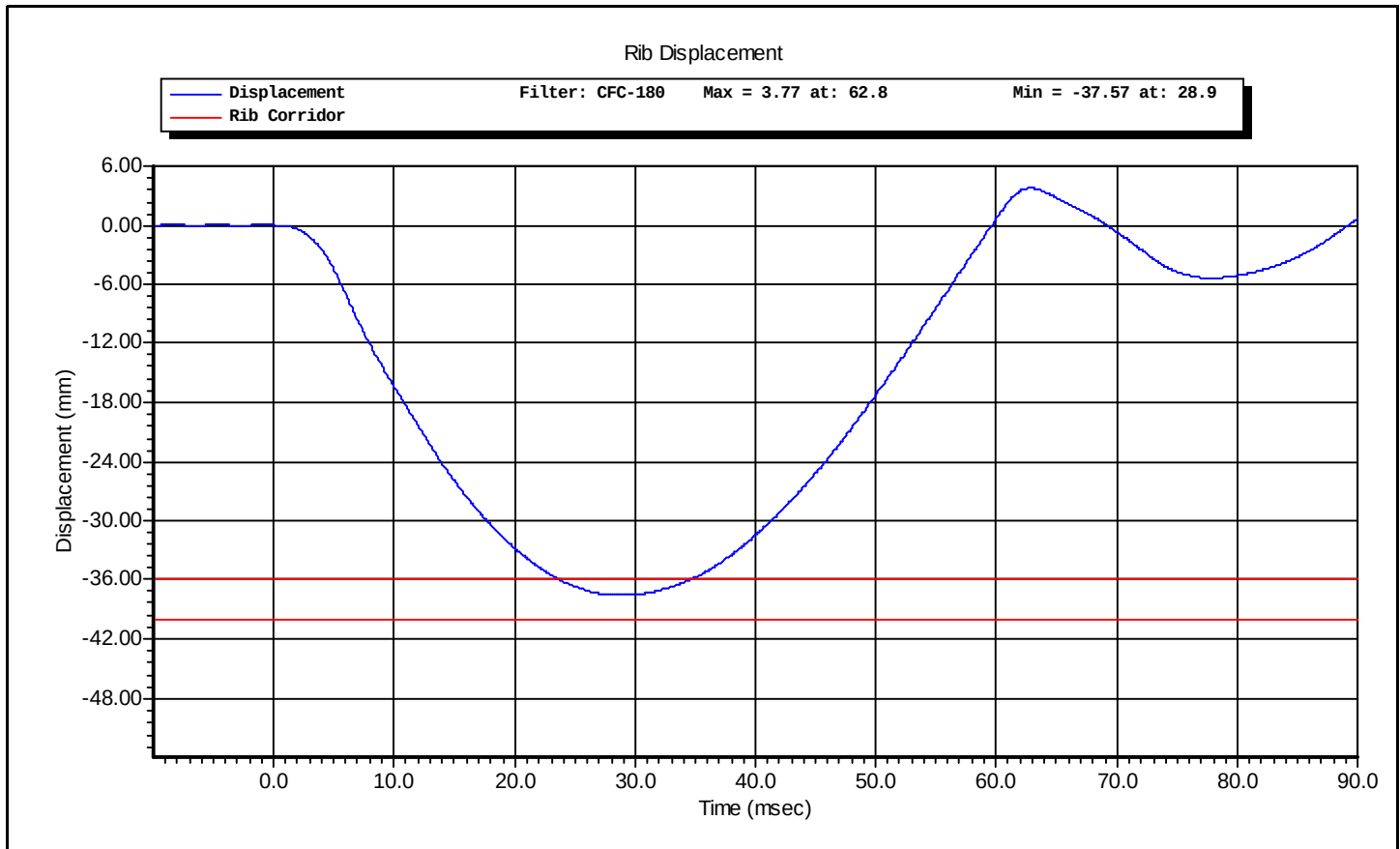


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Middle Rib 3 m/s	Test Date:	9/29/2010
Test Number:	1	Test Time:	1:12:19 PM



Test ID: Middle Rib 3 m/s Test Time: 1:12:19 PM

Test Date: 9/29/2010



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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:	9/29/2010
Test Number:	1	Test Time:	11:57:15 AM

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	52.0 %RH P
Velocity	3.90 -- 4.10	3.96 m/s P
Rib Displacement	-51.00 -- -46.00	-48.96 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: **11:57:15 AM**

Test Date: **9/29/2010**



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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: **11:57:15 AM**

Test Date: **9/29/2010**

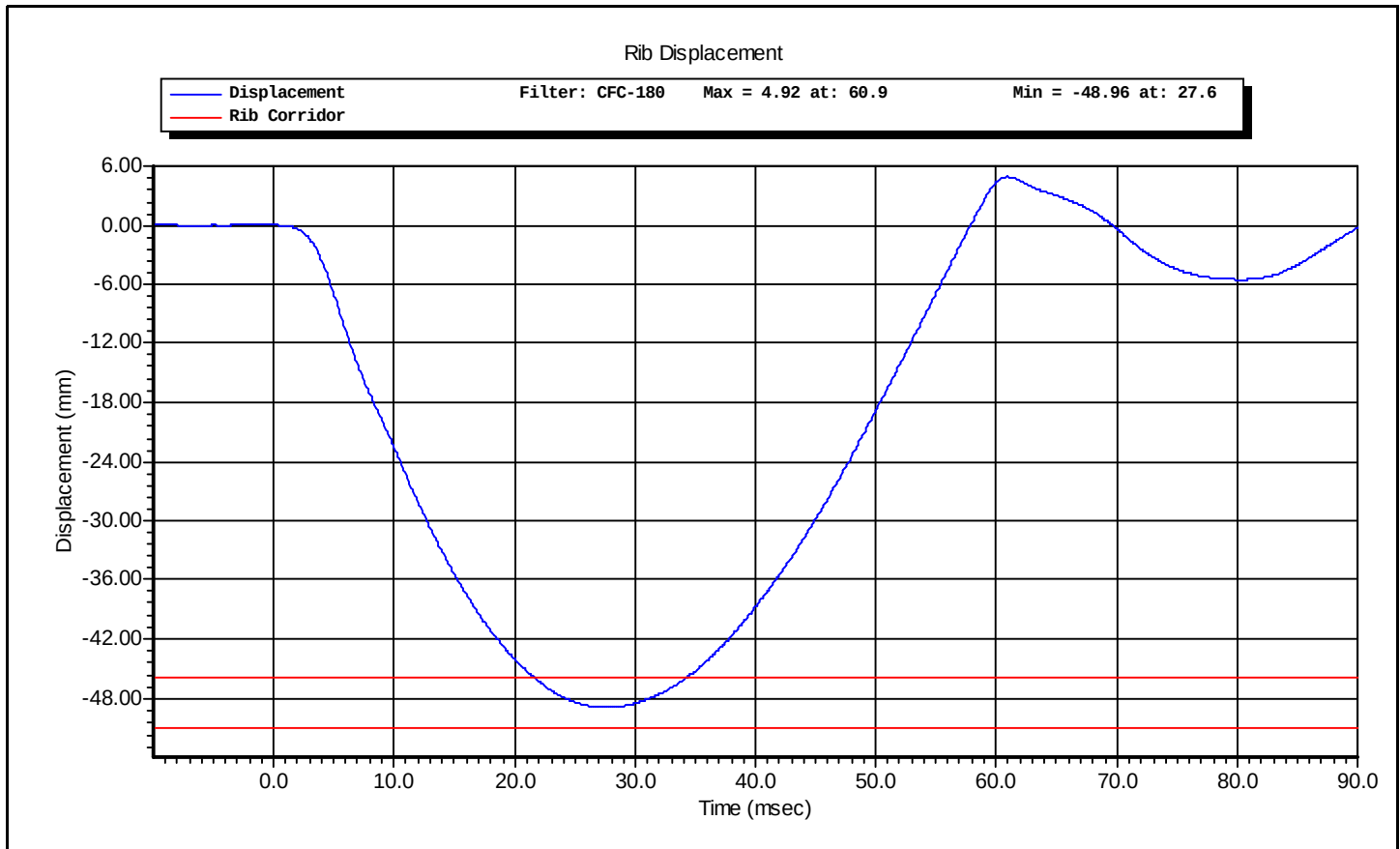


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Upper Rib 4 m/s	Test Date:	9/29/2010
Test Number:	1	Test Time:	11:57:15 AM



Test ID: Upper Rib 4 m/s Test Time: 11:57:15 AM

Test Date: 9/29/2010



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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 3.0 m/s	Test Date:	9/29/2010
Test Number:	1	Test Time:	12:03:45 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	53.0 %RH P
Velocity	2.90 -- 3.10	2.98 m/s P
Rib Displacement	-40.00 -- -36.00	-37.82 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 3.0 m/s** Test Time: **12:03:45 PM**

Test Date: **9/29/2010**



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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 3.0 m/s** Test Time: **12:03:45 PM**

Test Date: **9/29/2010**

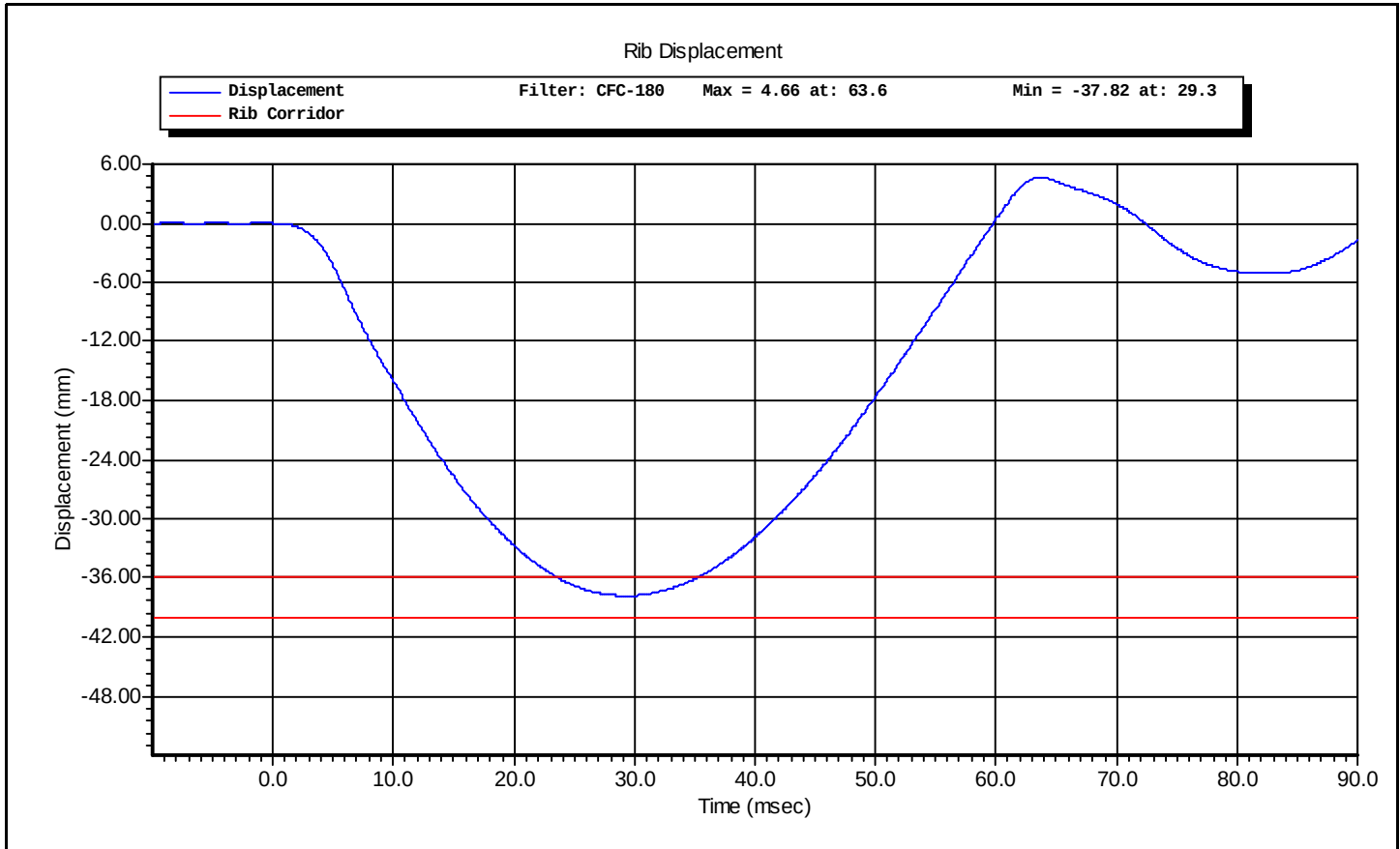


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Upper Rib 3.0 m/s	Test Date:	9/29/2010
Test Number:	1	Test Time:	12:03:45 PM



Test ID: Upper Rib 3.0 m/s Test Time: 12:03:45 PM

Test Date: 9/29/2010



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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:	9/29/2010
Test Number:	1	Test Time:	2:48:50 PM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	22.2 deg C	P
Humidity	10.0	--	70.0	52.0 %RH	P
Velocity	5.40	--	5.60	5.49 m/s	P
Upper Rib Displacement	34.0	--	41.0	37.1 mm	P
Middle Rib Displacement	37.0	--	45.0	41.0 mm	P
Lower Rib Displacement	37.0	--	44.0	41.0 mm	P
Impactor Force	5100	--	6200	5216 N	P

All test parameters are within specifications

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

Test ID: **Thorax**

Test Time: **2:48:50 PM**

Test Date: **9/29/2010**



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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: **2:48:50 PM**

Test Date: **9/29/2010**

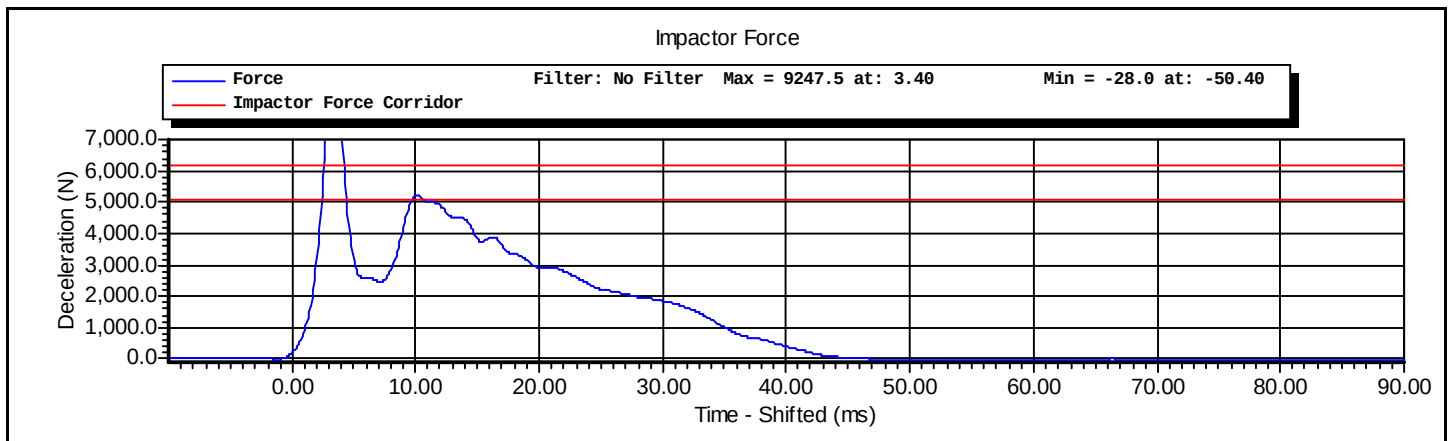
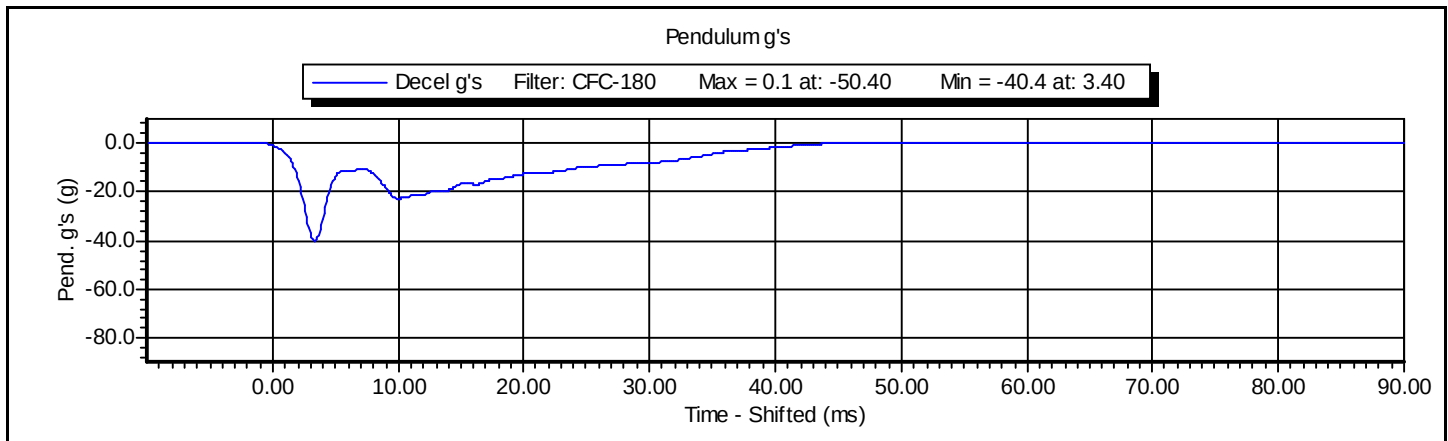


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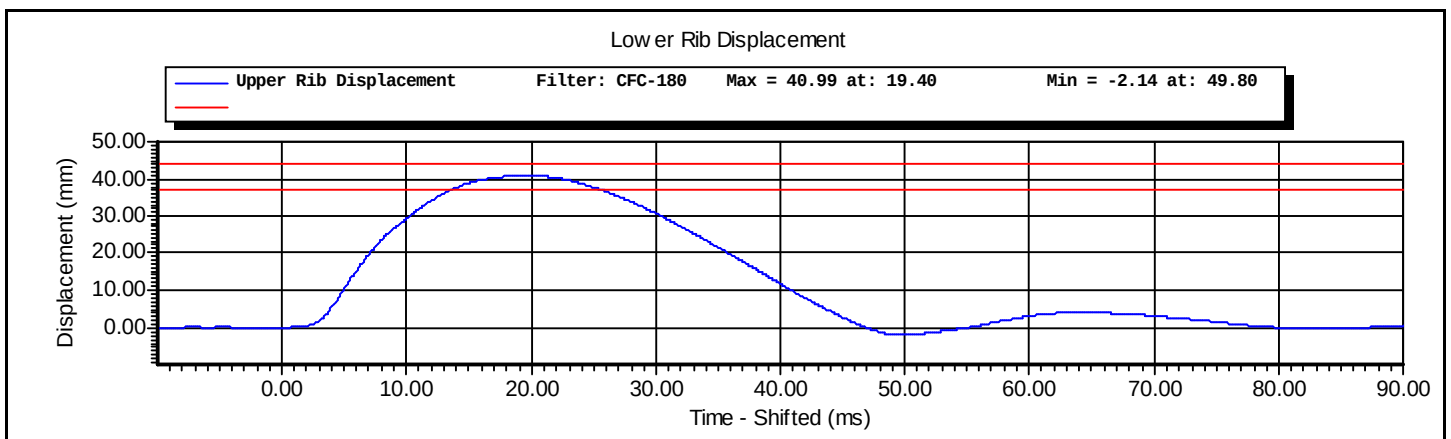
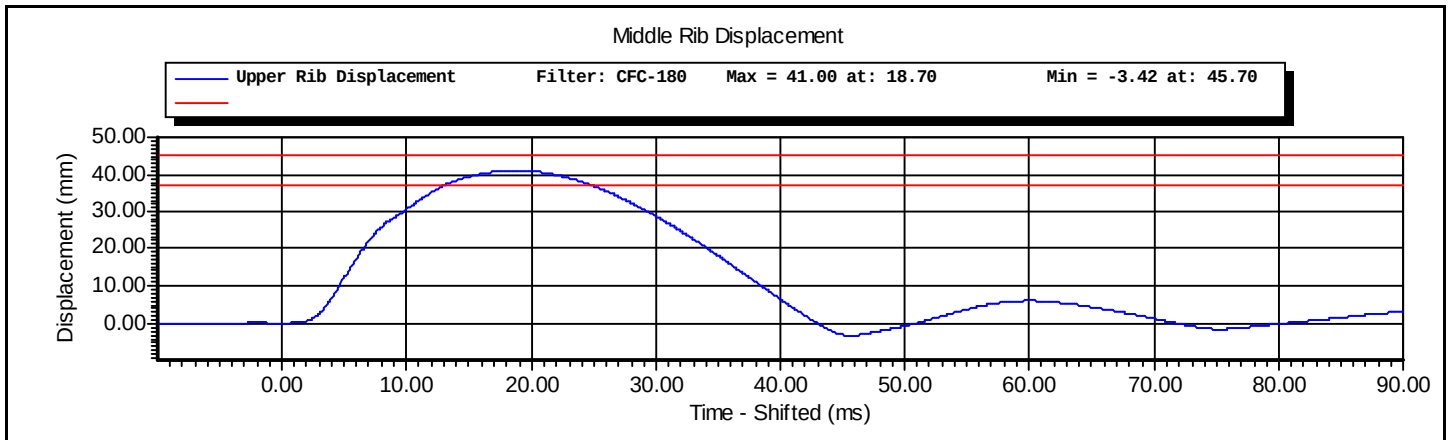
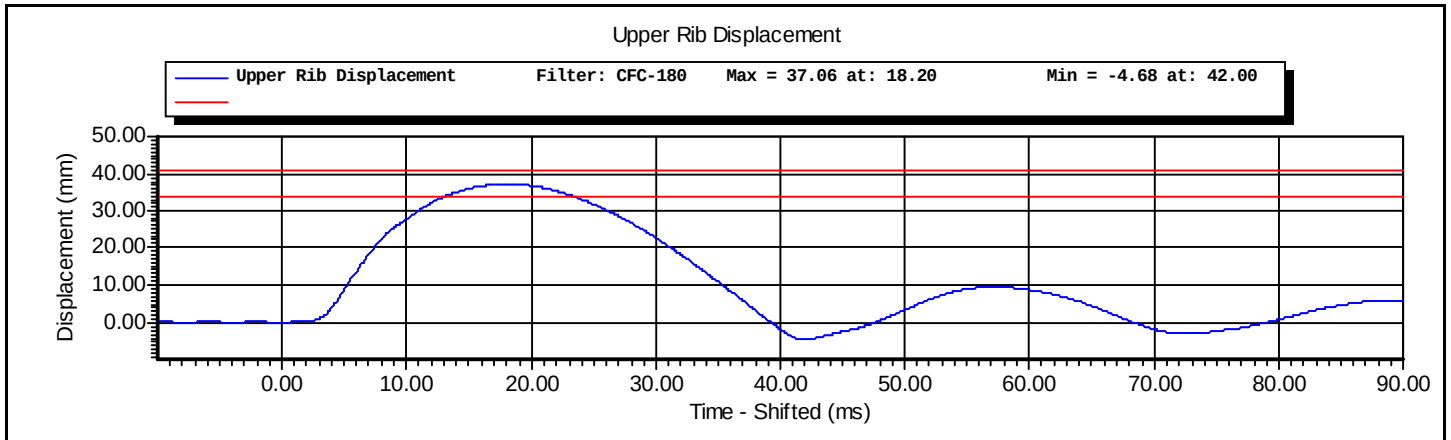
Test Name:	Thorax Impact	Revision:	8/15/2008
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Thorax	Test Date:	9/29/2010
Test Number:	1	Test Time:	2:48:50 PM



Test ID: **Thorax**

Test Time: **2:48:50 PM**

Test Date: **9/29/2010**





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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:	9/29/2010
Test Number:	1	Test Time:	2:24:10 PM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	22.2 deg C	P
Humidity	10	--	70	50 %RH	P
Velocity	3.90	--	4.10	4.02 m/s	P
Peak Abdominal Force	-2.70	--	-2.20	-2.46 kN	P
Time At Peak Abdominal Force	10.0	--	12.3	11.7 ms	P
Maximum Pendulum Force	-4.80	--	-4.00	-4.22 kN	P
Time at Peak Pendulum Force	10.6	--	13.0	12.0 ms	P

All test parameters are within specifications

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

Test ID: **Abdomen**

Test Time: **2:24:10 PM**

Test Date: **9/29/2010**



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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: **2:24:10 PM**

Test Date: **9/29/2010**

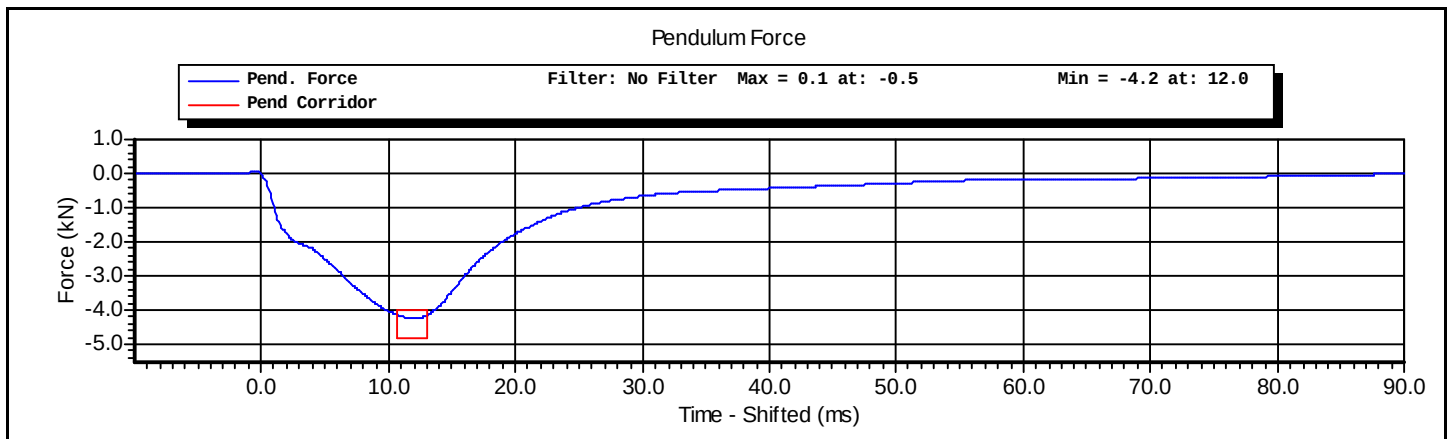
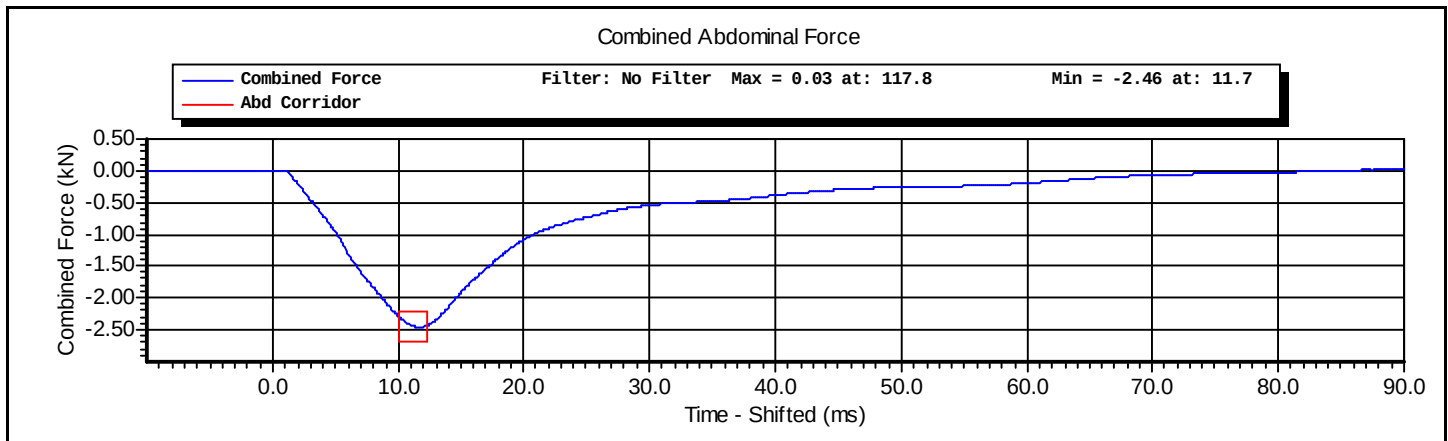


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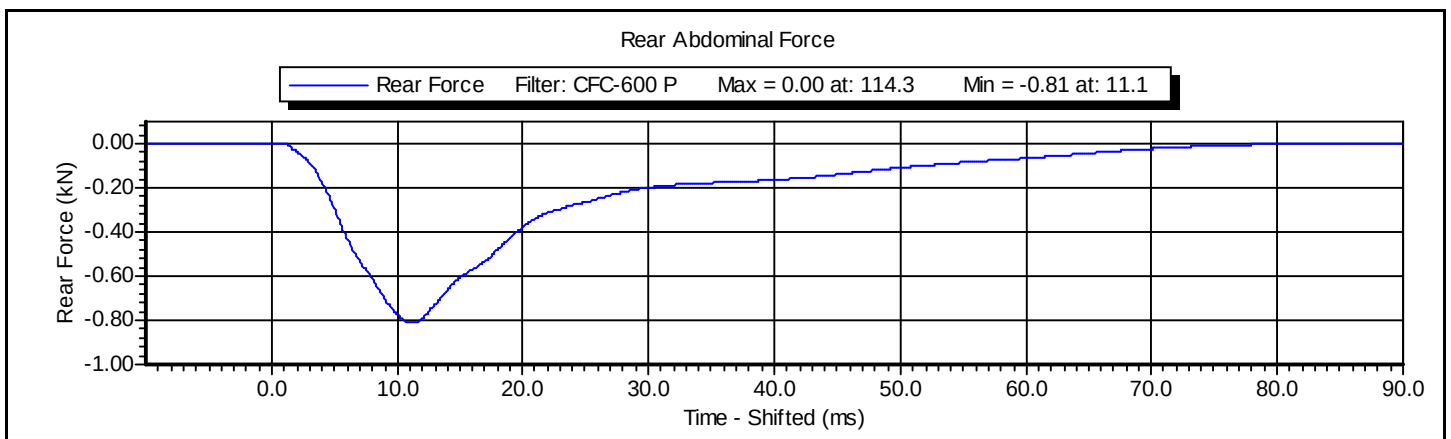
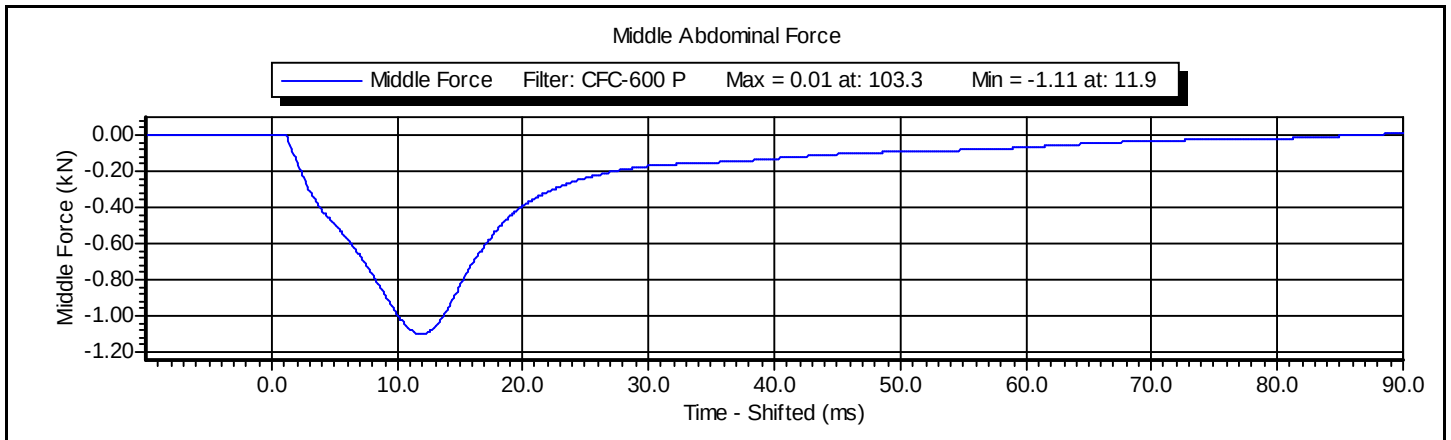
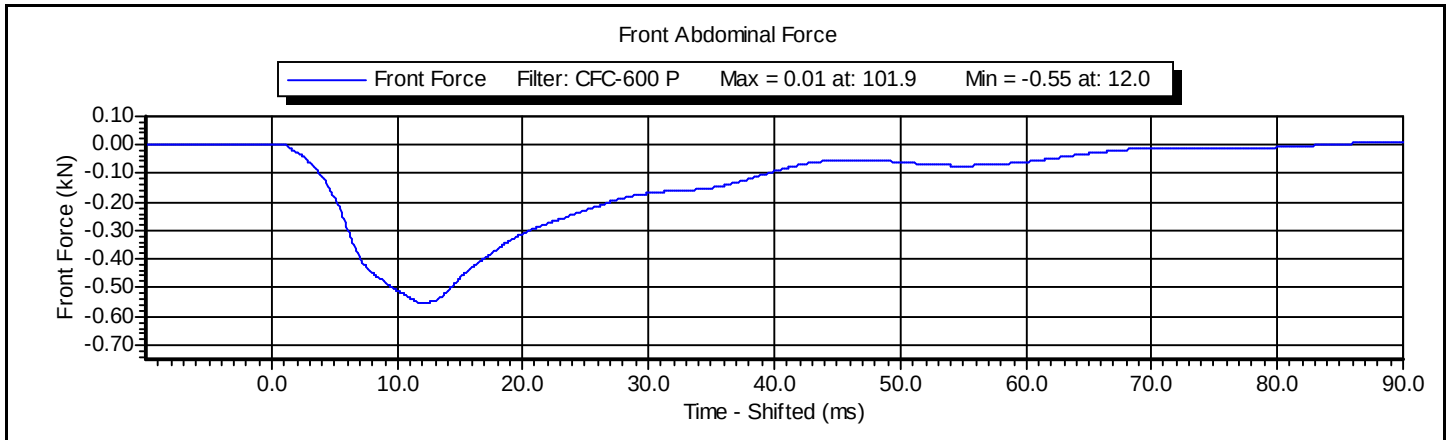
Test Name:	Abdominal Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Abdomen	Test Date:	9/29/2010
Test Number:	1	Test Time:	2:24:10 PM



Test ID: **Abdomen**

Test Time: **2:24:10 PM**

Test Date: **9/29/2010**





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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:	9/29/2010
Test Number:	1	Test Time:	11:21:23 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	52 %RH P
Velocity	5.95 -- 6.15	6.14 m/s P
Maximum Headform Flexion Angle	45.0 -- 55.0	46.3 degrees P
Time at Maximum Headform Flexion Angle	39.0 -- 53.0	41.9 ms P
Decay to Zero Degrees	37.0 -- 57.0	39.2 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: **11:21:23 AM**

Test Date: **9/29/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

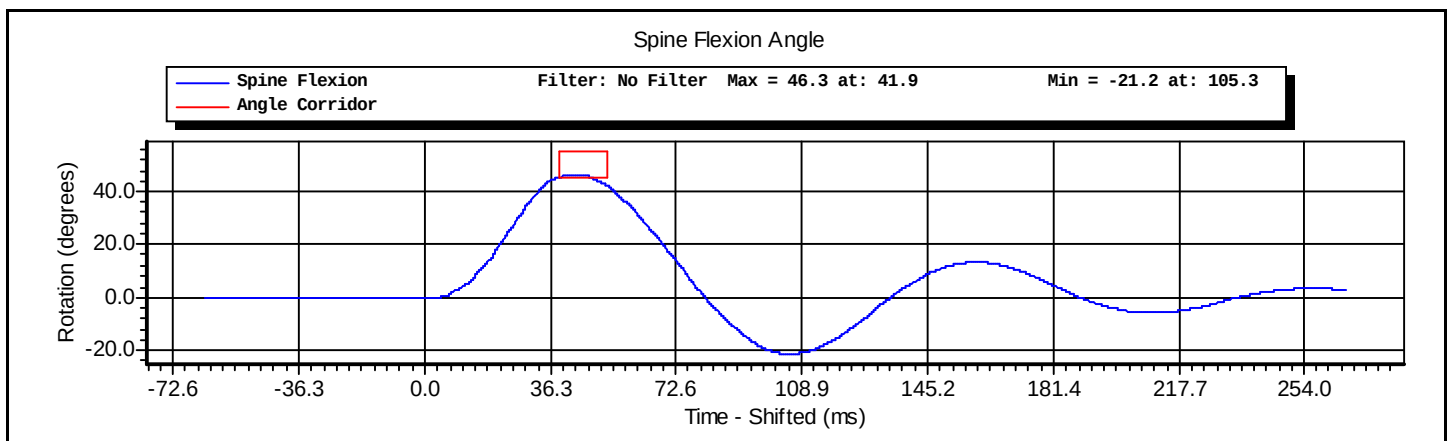
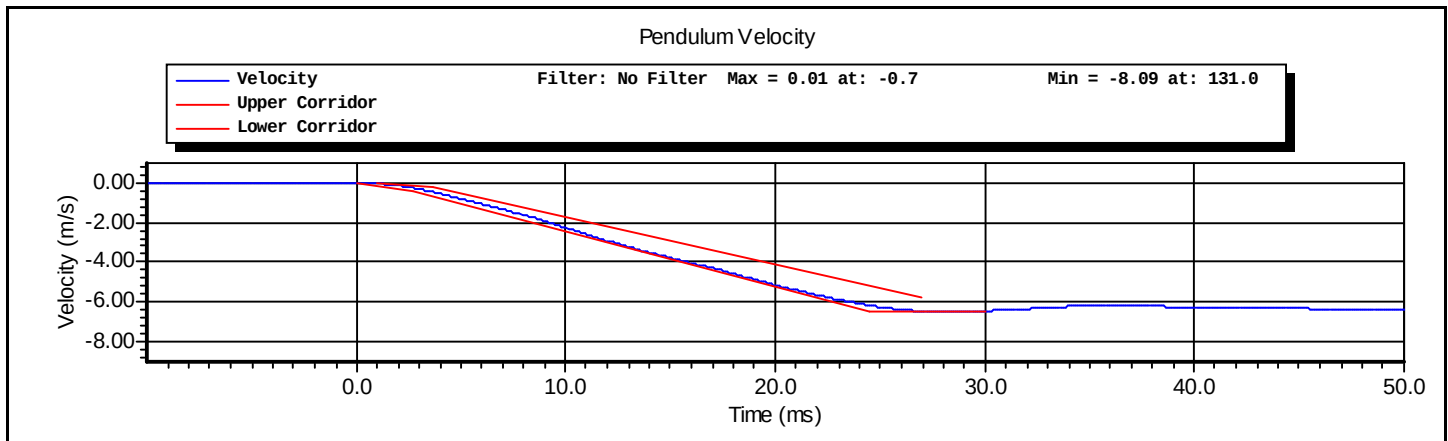
<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7231CT	C16510	5/10/2010
DentonATD	7000428	094	4/27/2010
DentonATD	7000428	095	4/27/2010
DentonATD	7000428	093	4/27/2010

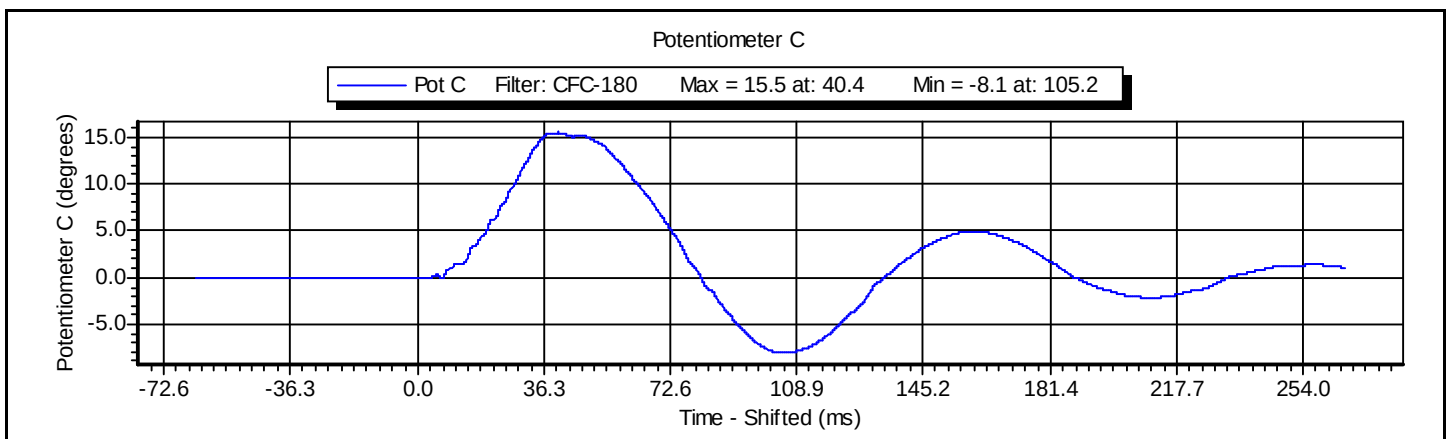
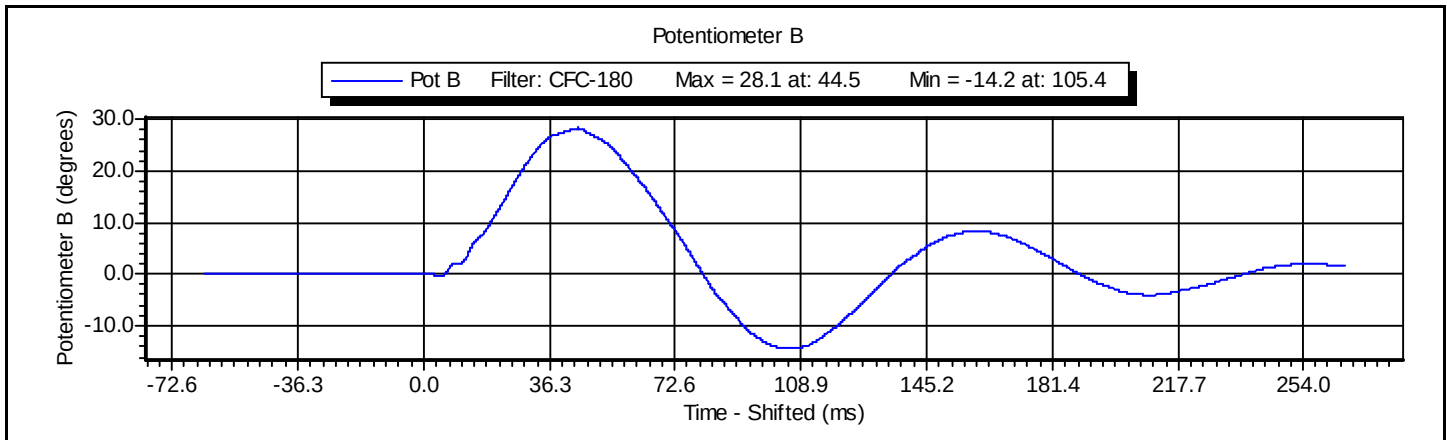
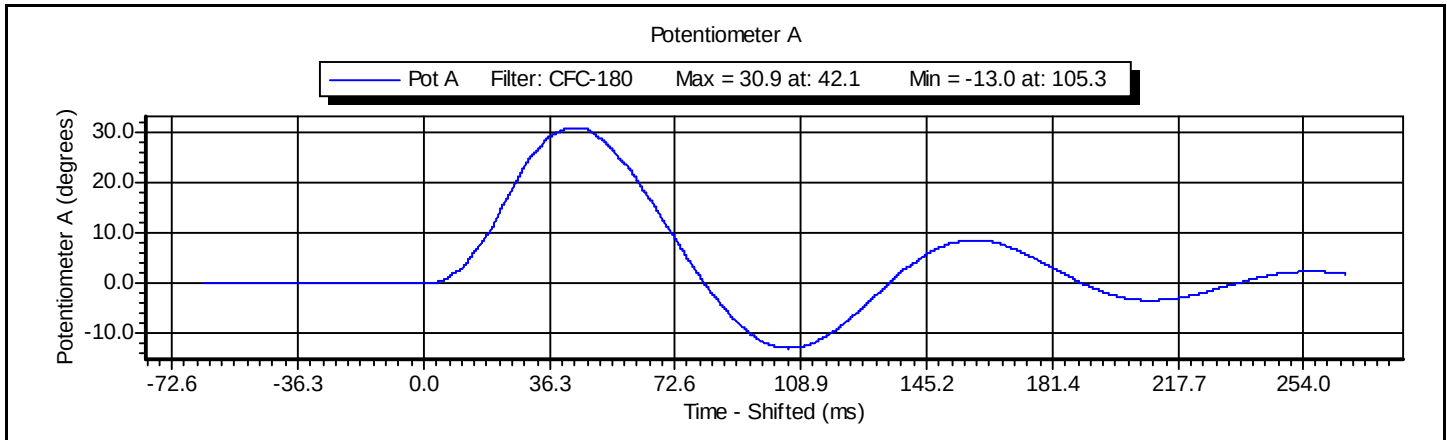
Test ID: **Lumbar Spine**

Test Time: **11:21:23 AM**

Test Date: **9/29/2010**

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:	9/29/2010
Test Number:	1	Test Time:	11:21:23 AM







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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:	9/29/2010
Test Number:	1	Test Time:	2:01:04 PM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	22.2 deg C	P
Humidity	10	--	70	53 %RH	P
Velocity	4.20	--	4.40	4.32 m/s	P
Peak Pendulum Force	-5.40	--	-4.70	-4.93 kN	P
Time at Peak Pendulum Force	11.80	--	16.10	14.67 ms	P
Peak Pubic Symphysis Force	-1.59	--	-1.23	-1.39 kN	P
Time at Peak Pubic Symphysis Force	12.20	--	17.00	16.17 ms	P

All test parameters are within specifications

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

Test ID: **Pelvis**

Test Time: **2:01:04 PM**

Test Date: **9/29/2010**



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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: **2:01:04 PM**

Test Date: **9/29/2010**



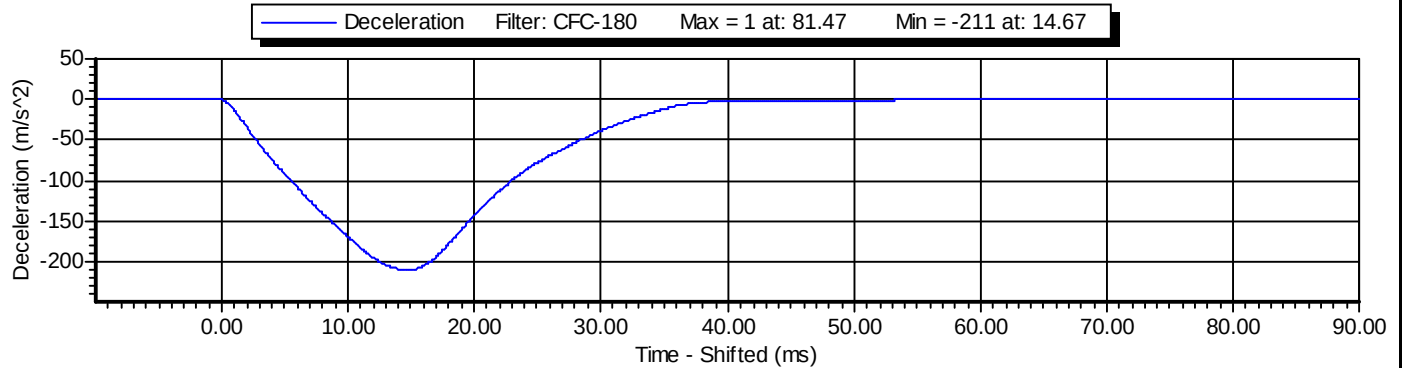
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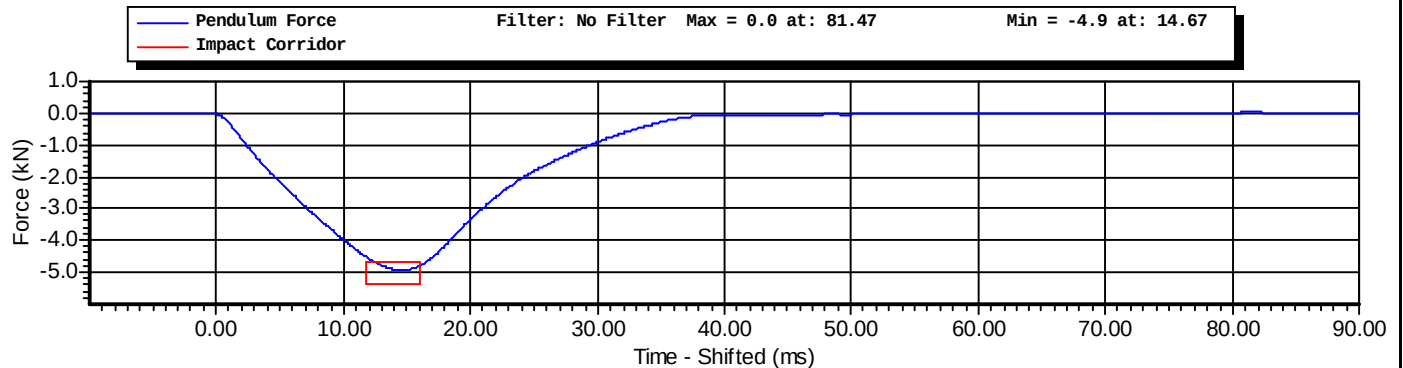
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Test Name:	Pelvis Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Pelvis	Test Date:	9/29/2010
Test Number:	1	Test Time:	2:01:04 PM

Pendulum Accelerometer



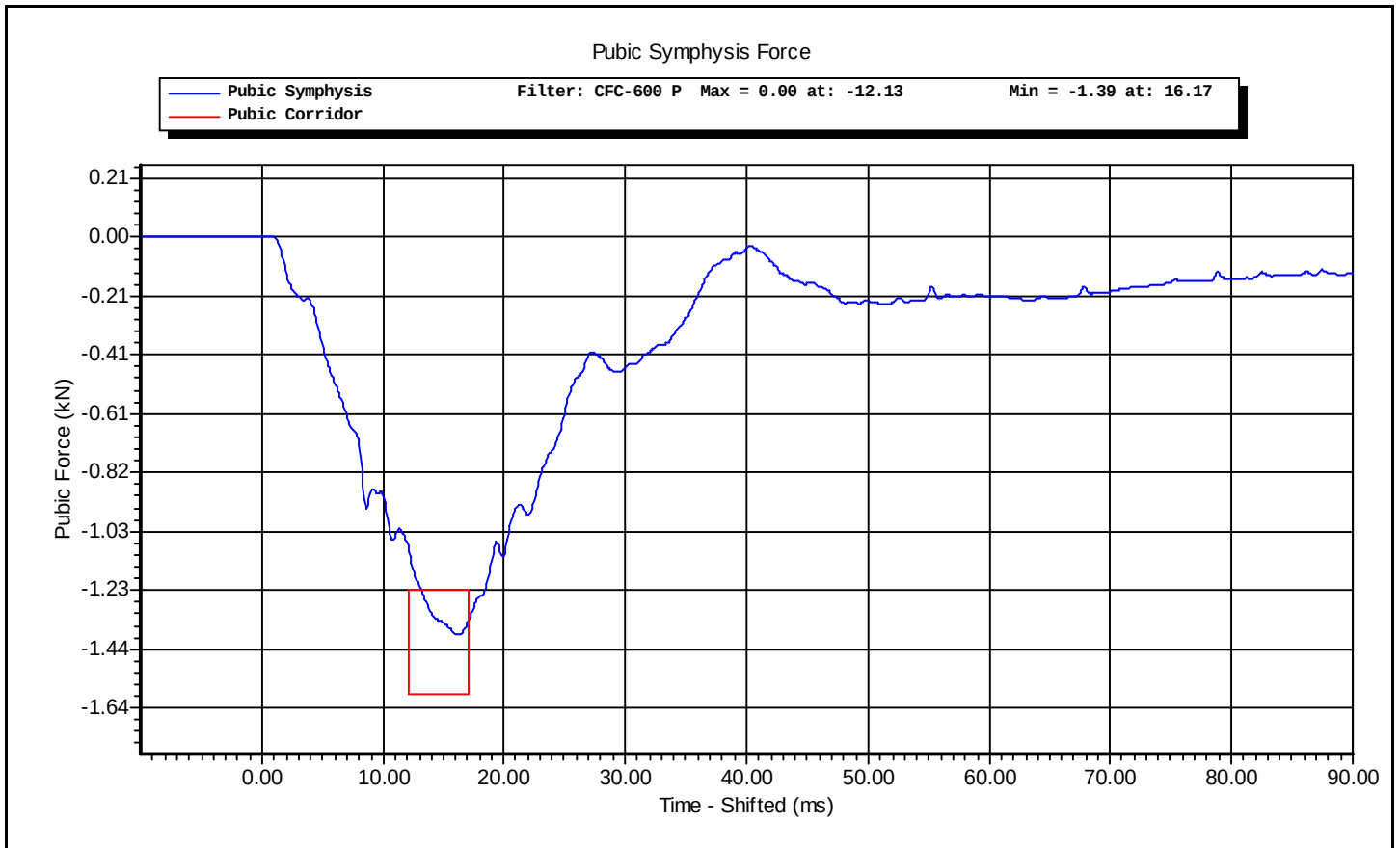
Pendulum Force



Test ID: **Pelvis**

Test Time: **2:01:04 PM**

Test Date: **9/29/2010**



CALIBRATION TEST RESULTS

POST-TEST

SID-IIs No: 300

CONFIGURED FOR LEFT SIDE IMPACT

SID-IIsD External Measurements

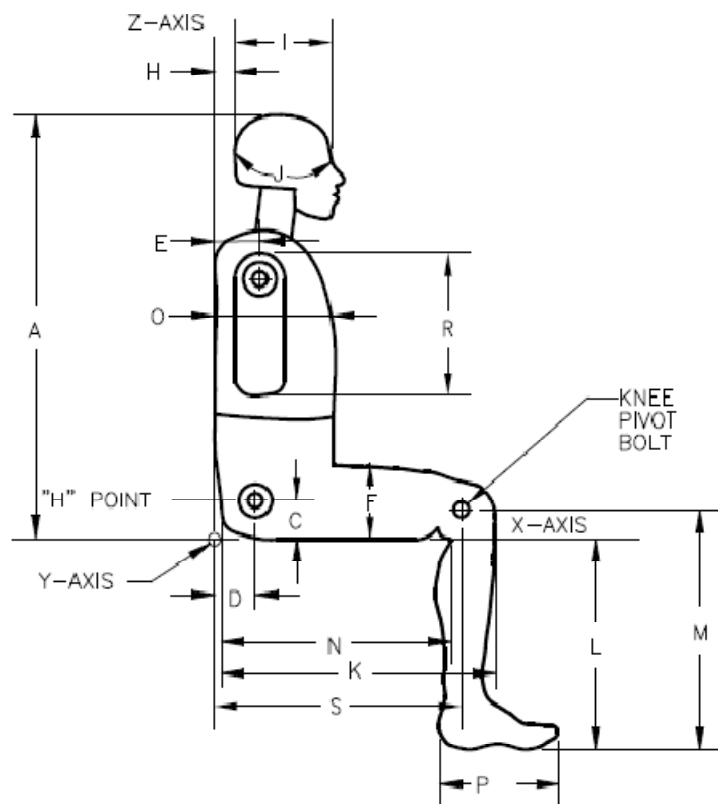
NHTSA ATD S/N 300

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

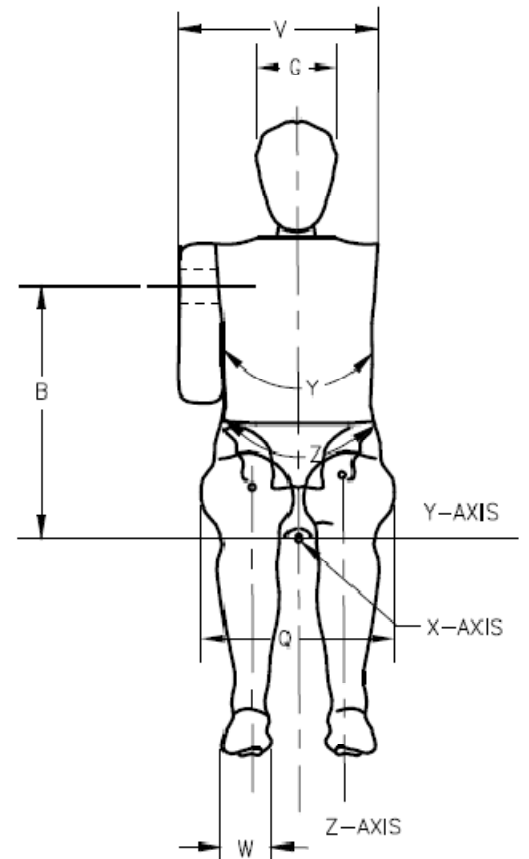
Technician: AR

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**

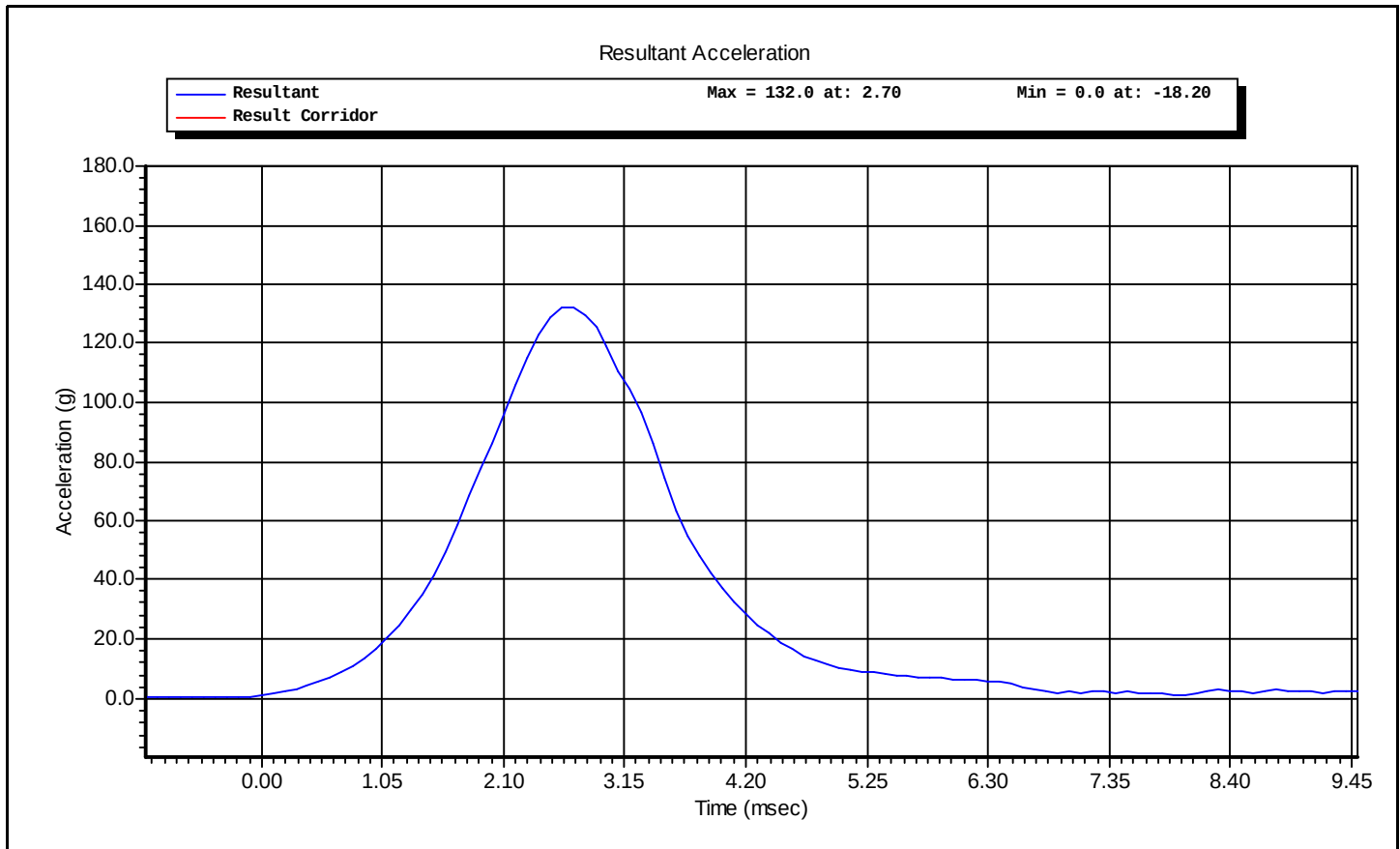


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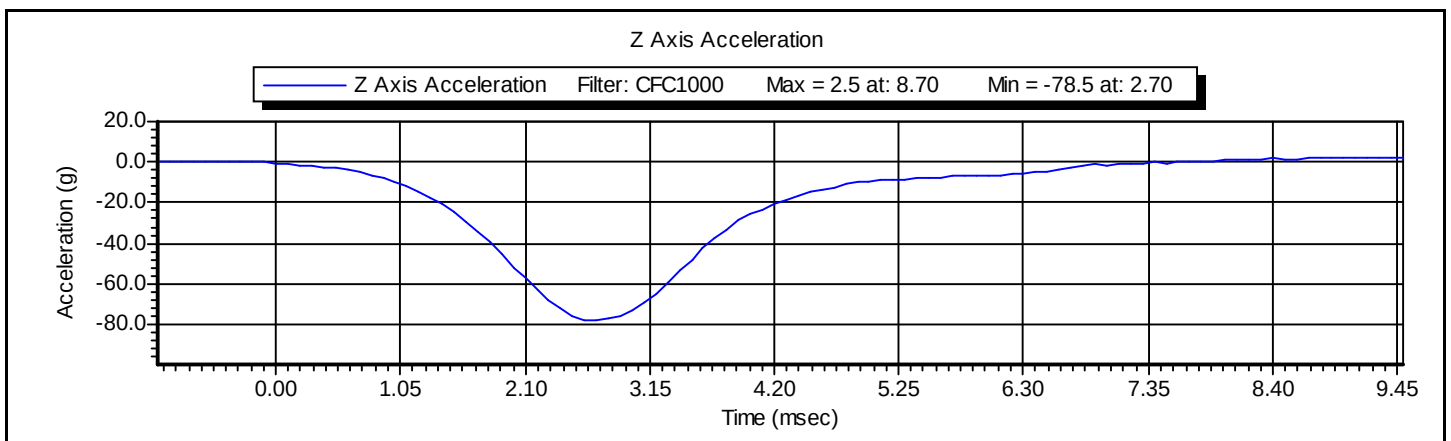
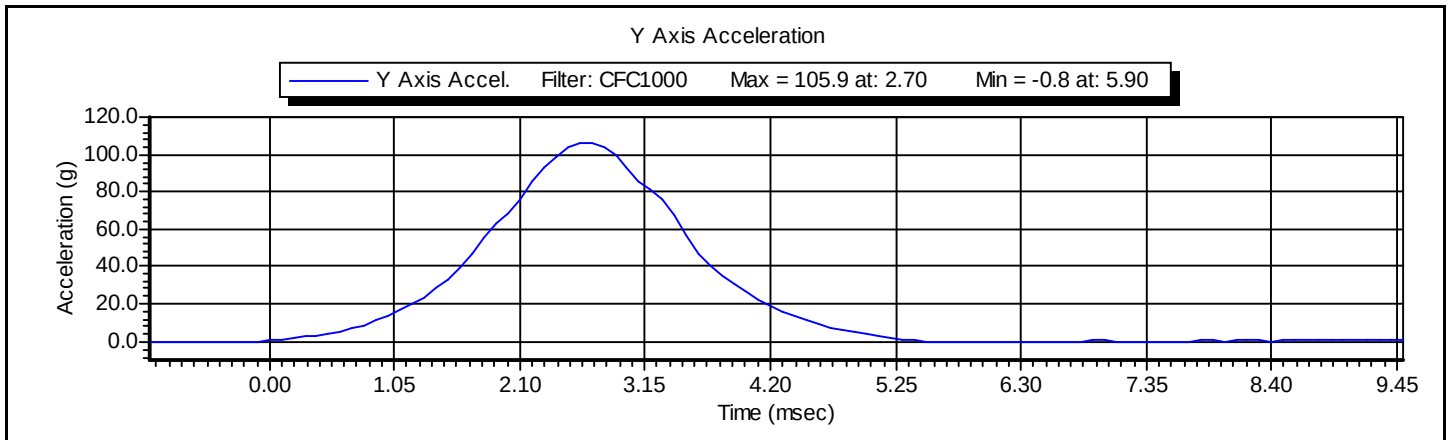
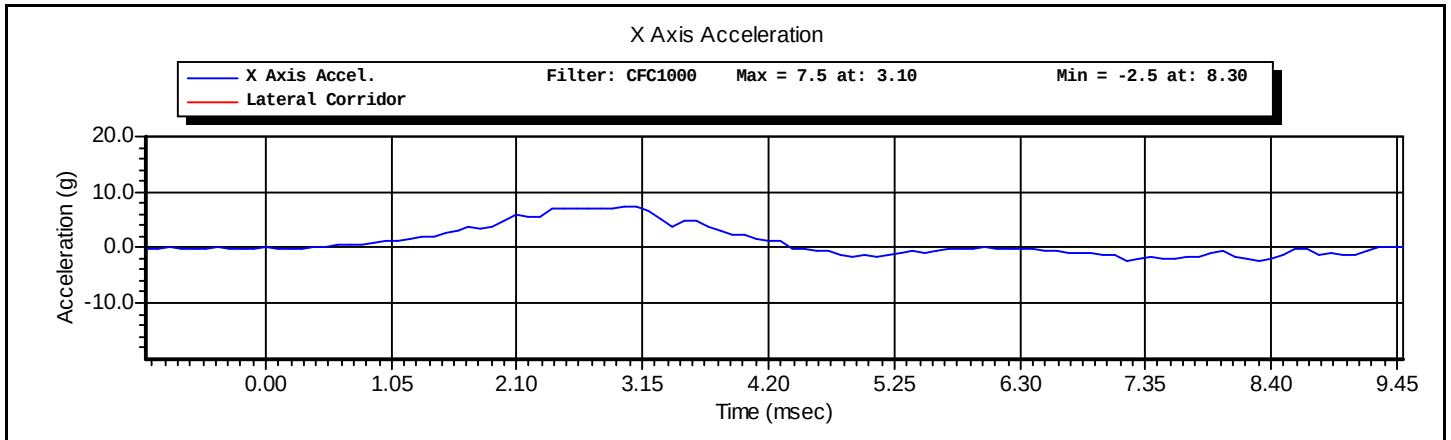
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Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Head Drop	Test Date:	9/28/2010
Test Number:	1	Test Time:	4:26:36 PM



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**



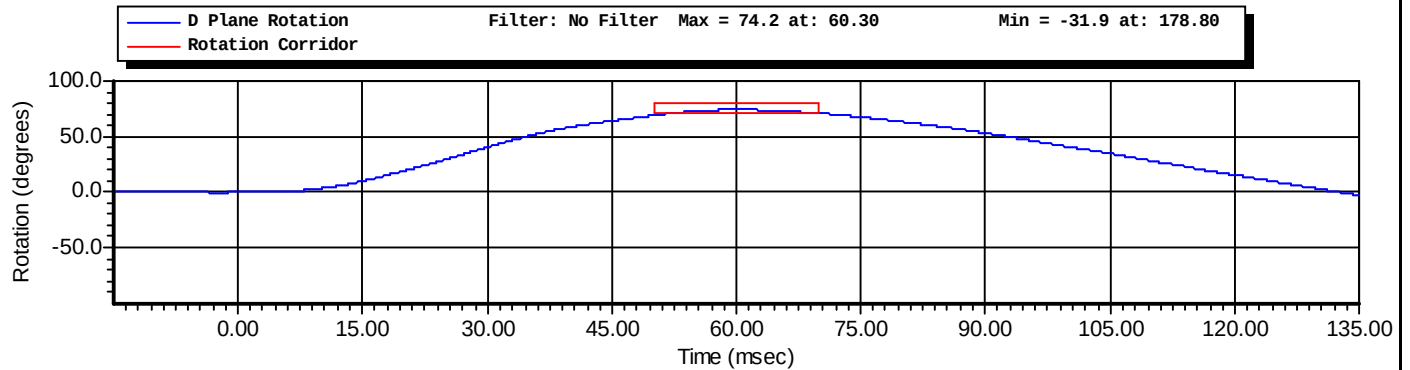
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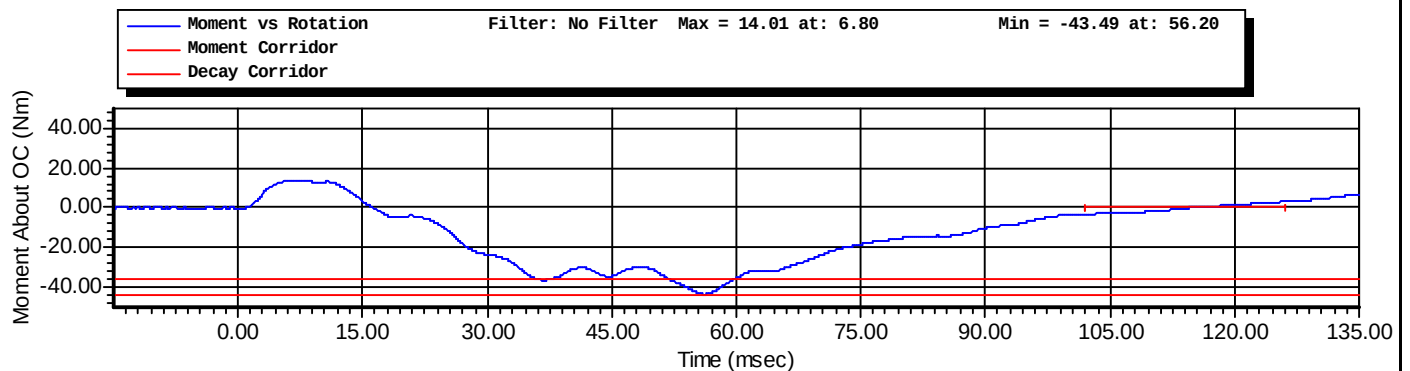
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Test Name:	Neck Pendulum	Revision:	8/24/2009
Sub Test Name:	Left Side	Spec Type:	NHTSA
ATD Type:	SID-IIIs		
ATD Serial Number:	SID 300		
Test ID:	Neck Flexion	Test Date:	9/28/2010
Test Number:	1	Test Time:	3:21:13 PM

D Plane Rotation



Moment About Occipital Condyle

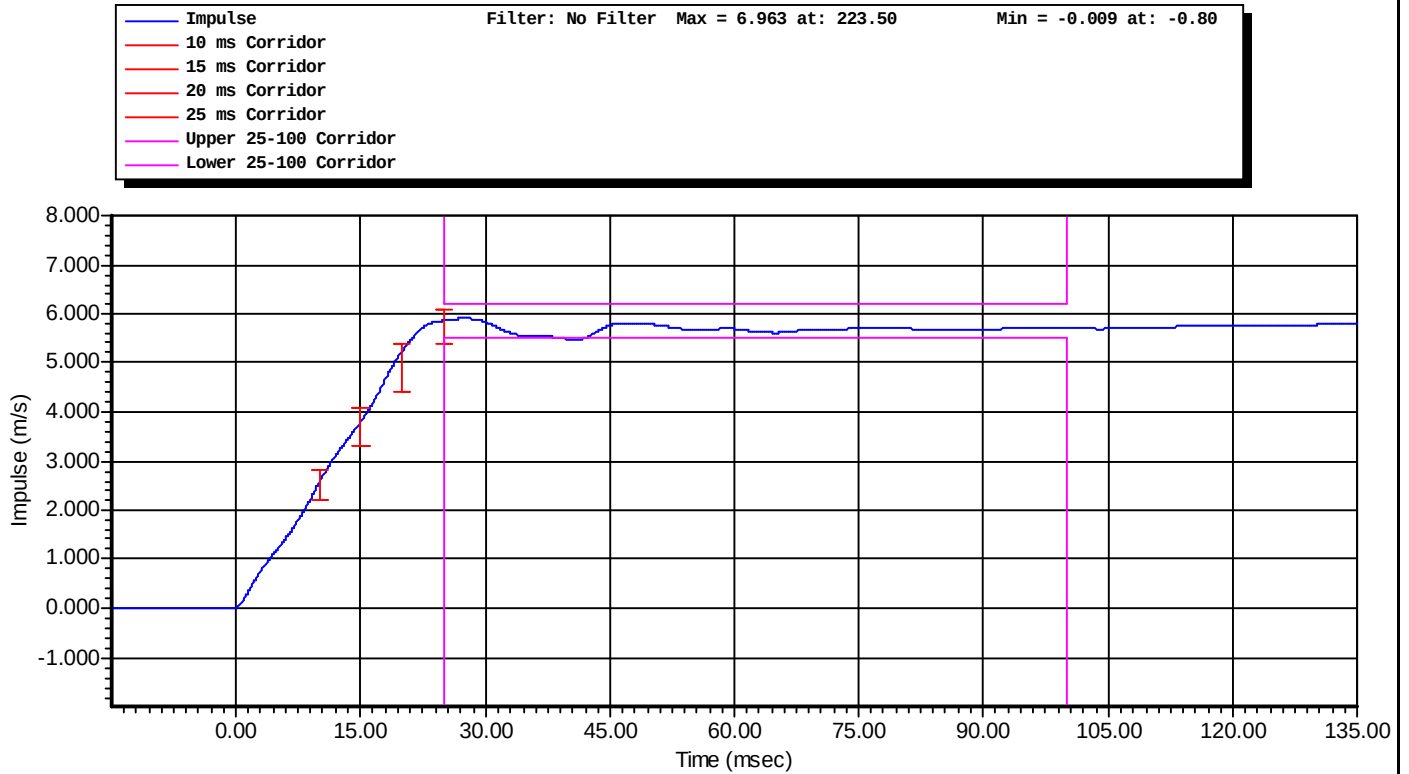


Test ID: Neck Flexion

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**

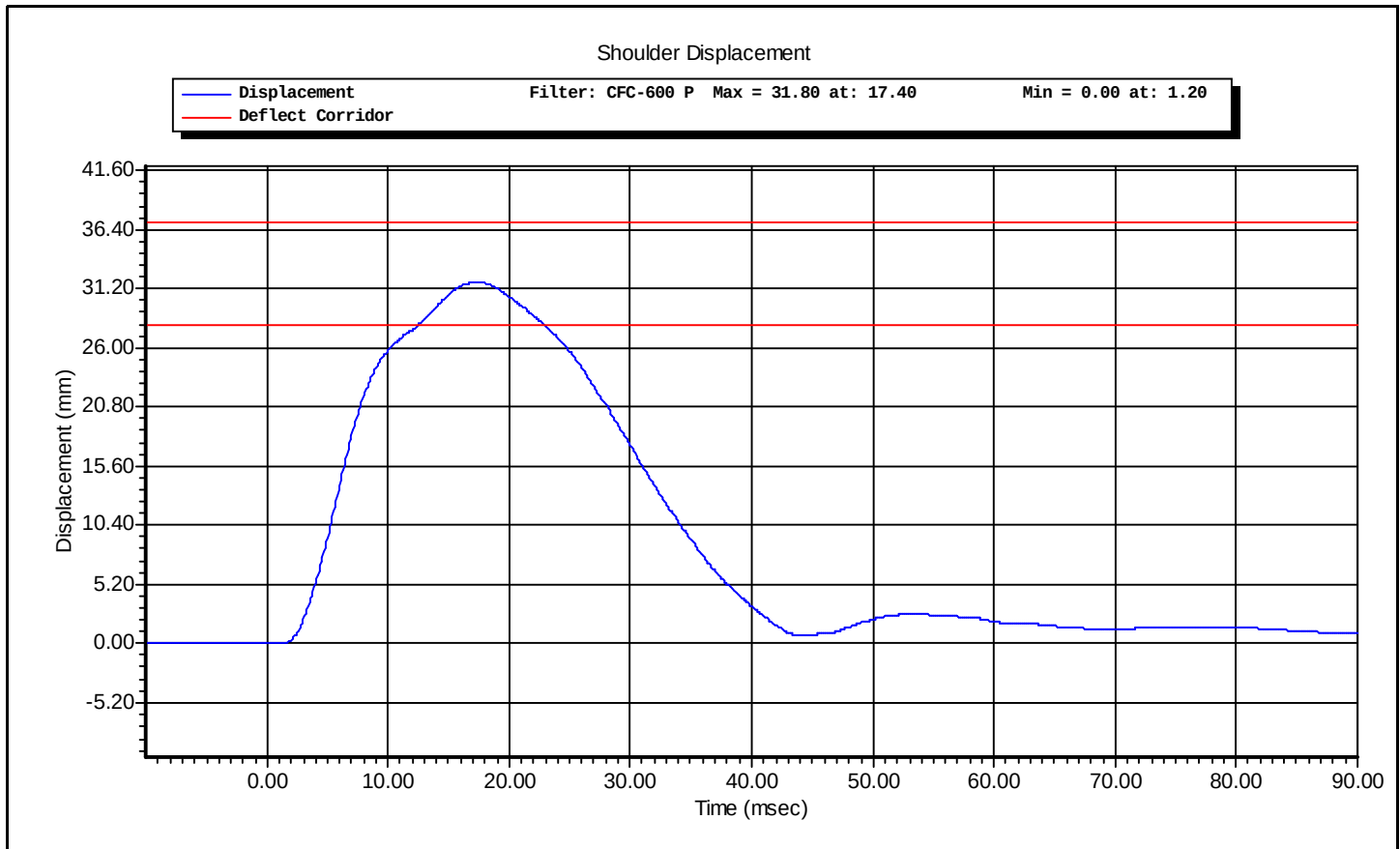


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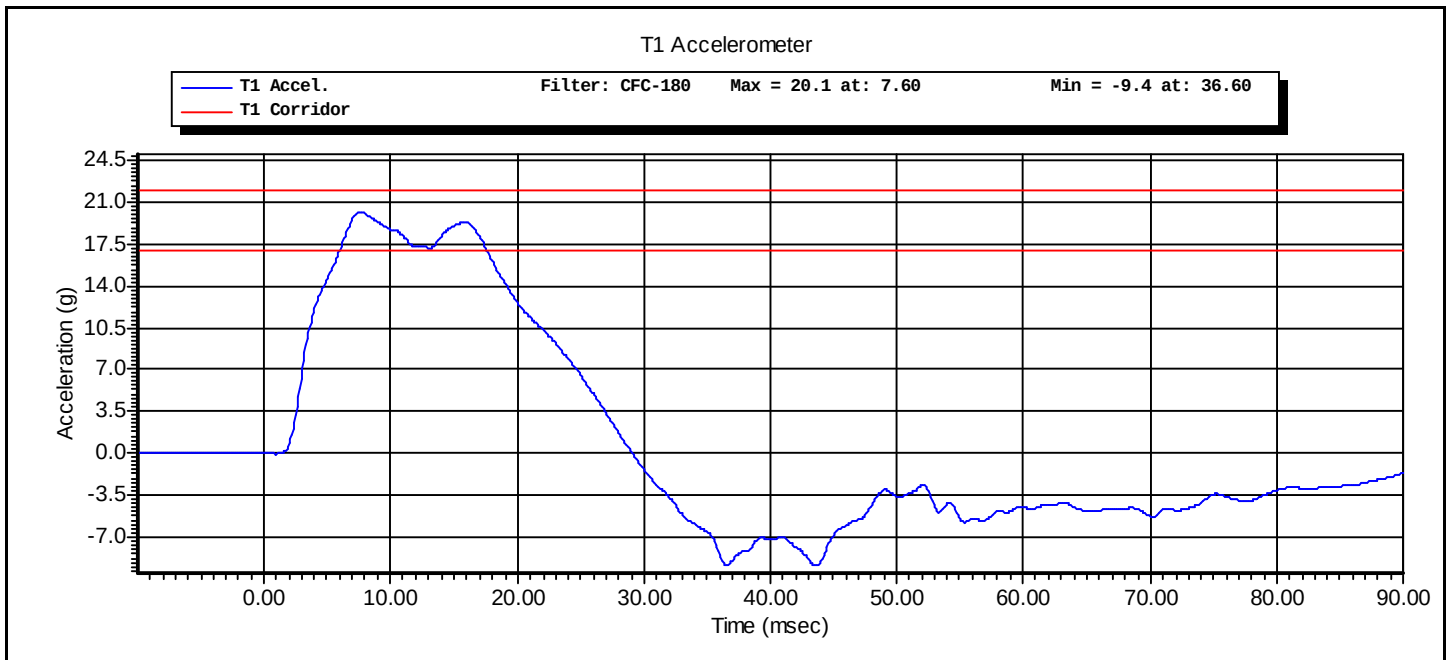
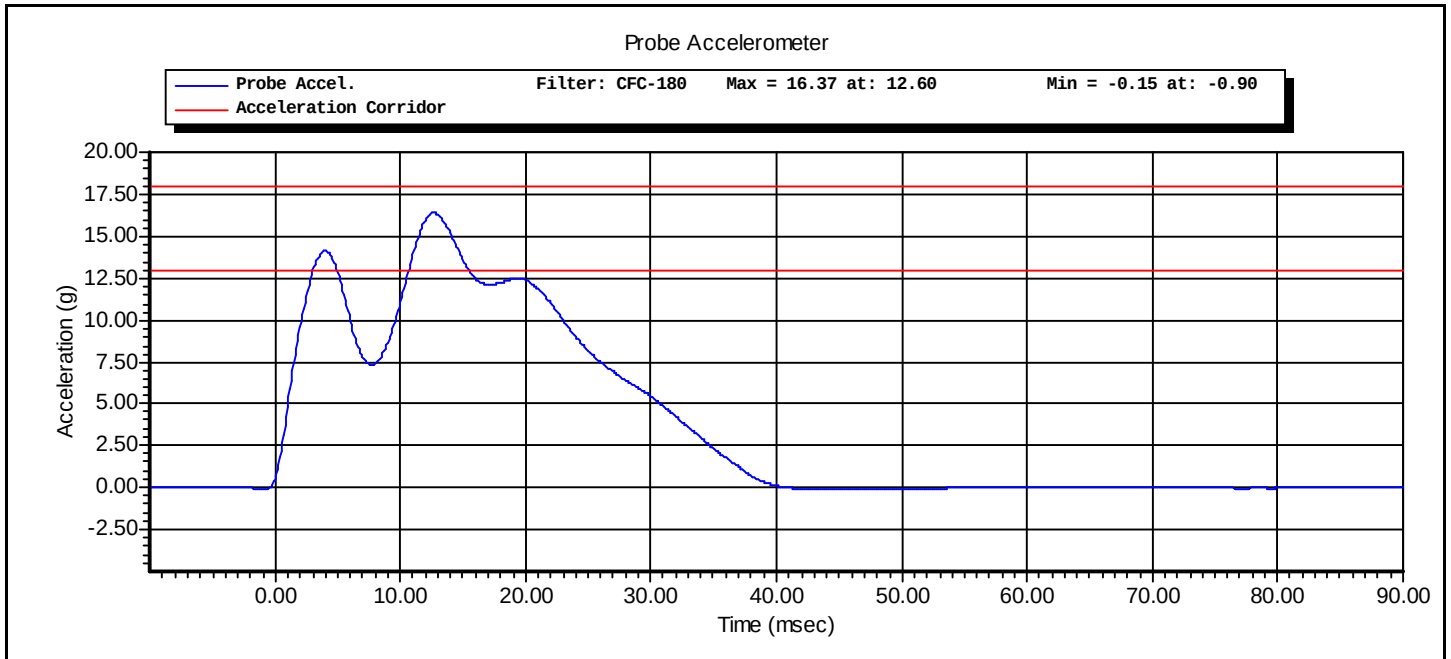
Test Name:	Shoulder Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Shoulder	Test Date:	10/4/2010
Test Number:	1	Test Time:	2:13:19 PM



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**

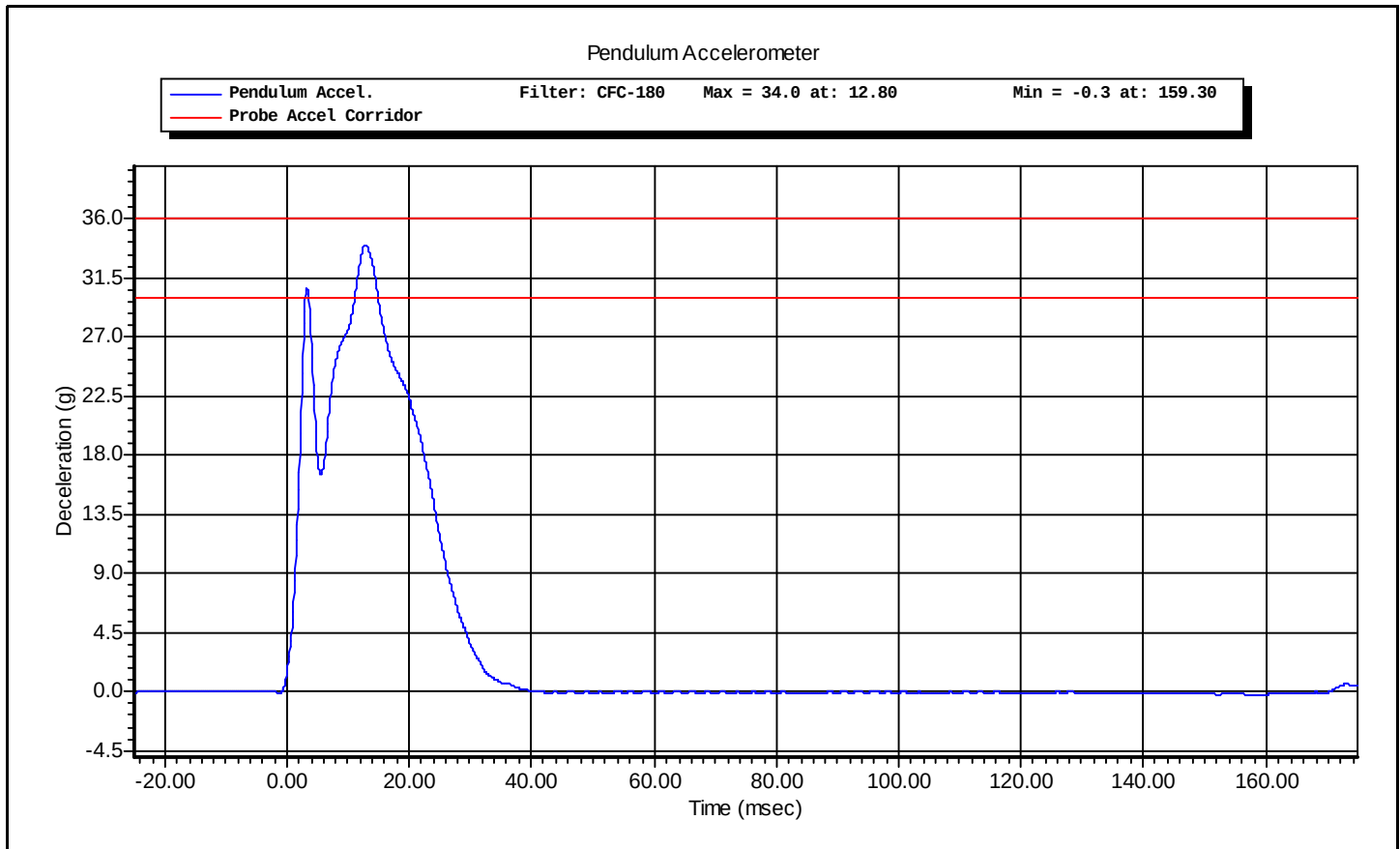


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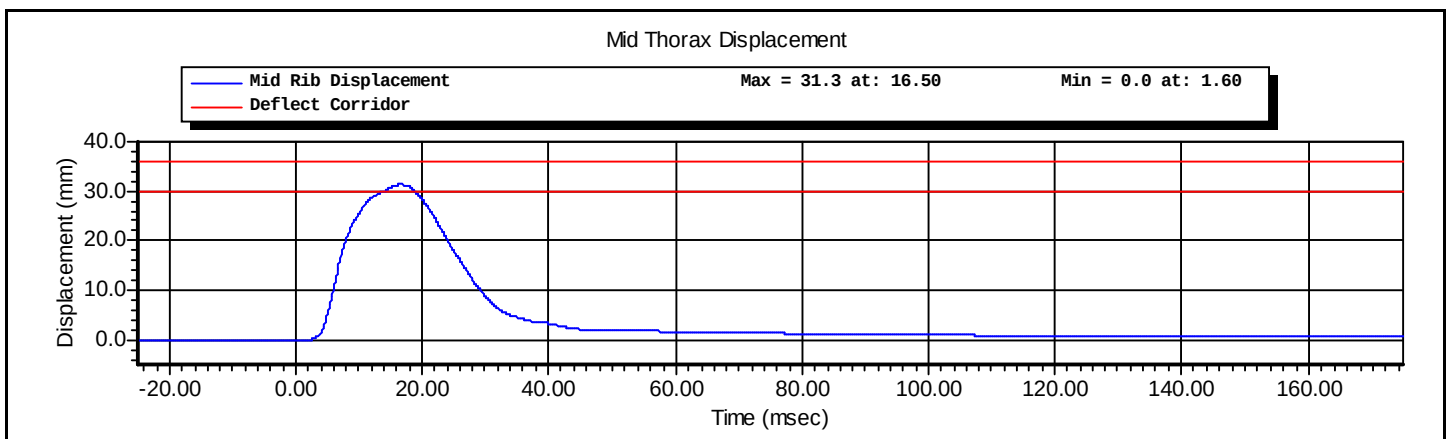
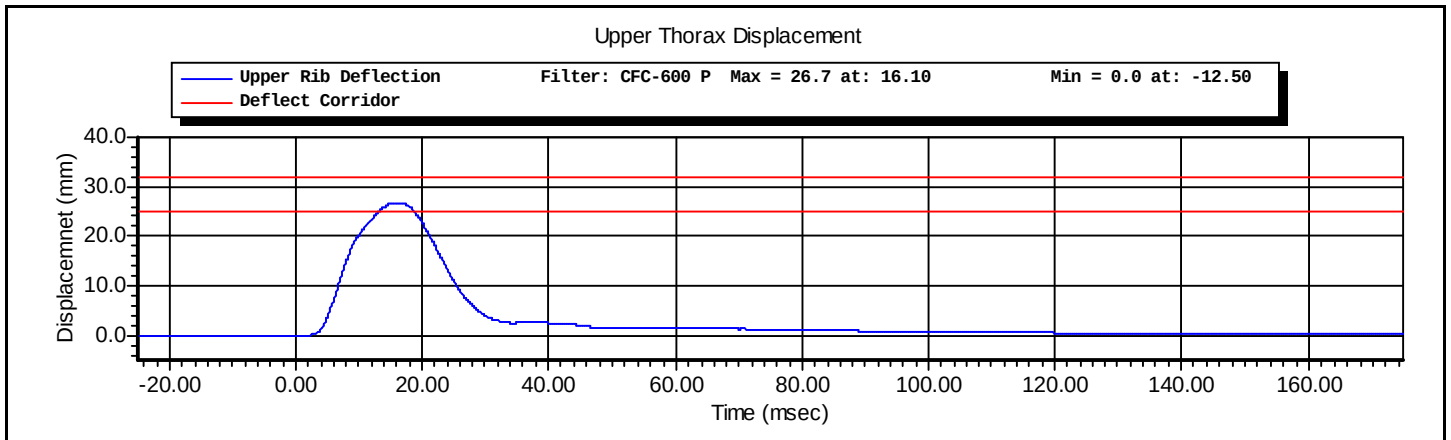
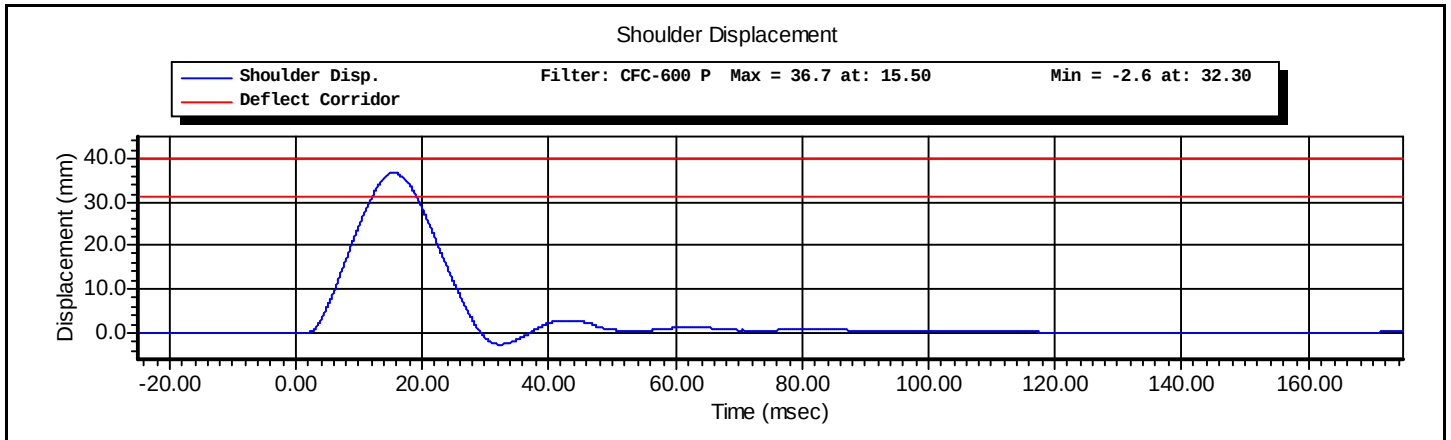
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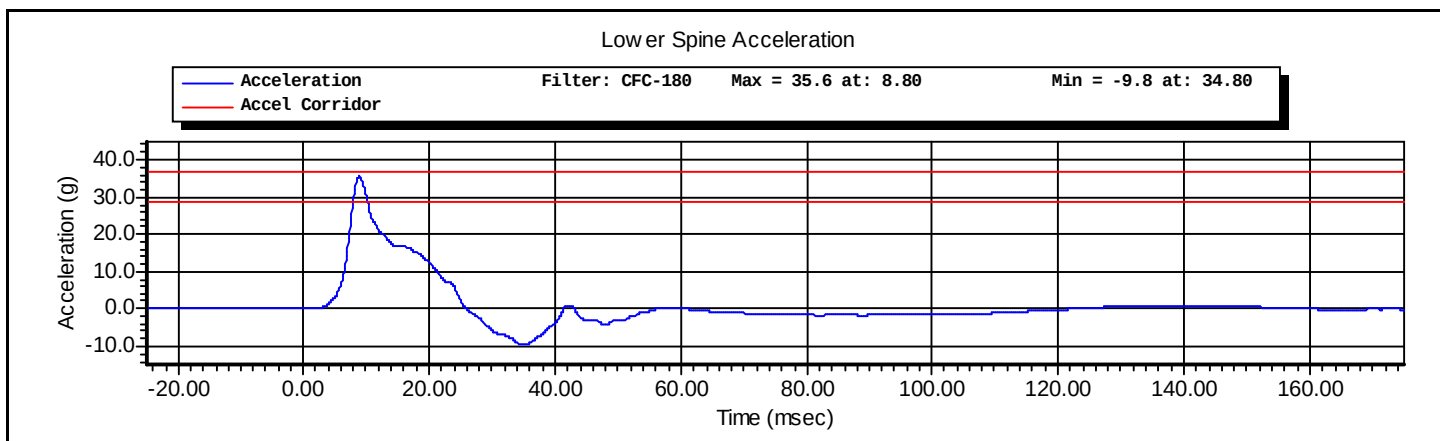
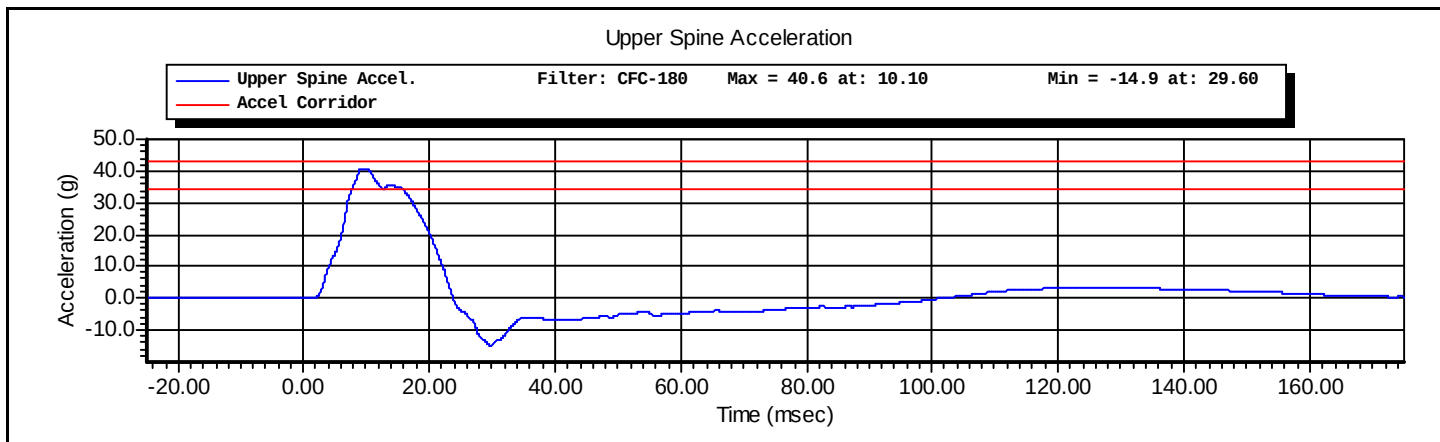
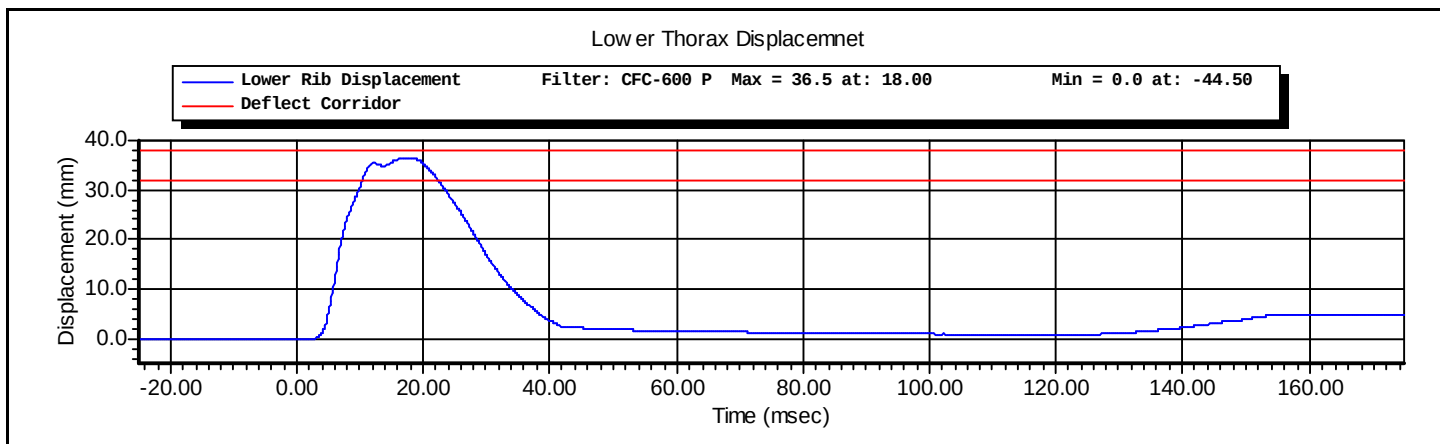
Test Name:	Thorax Impact with Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Thorax With Arm	Test Date:	10/4/2010
Test Number:	1	Test Time:	2:56:40 PM



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**

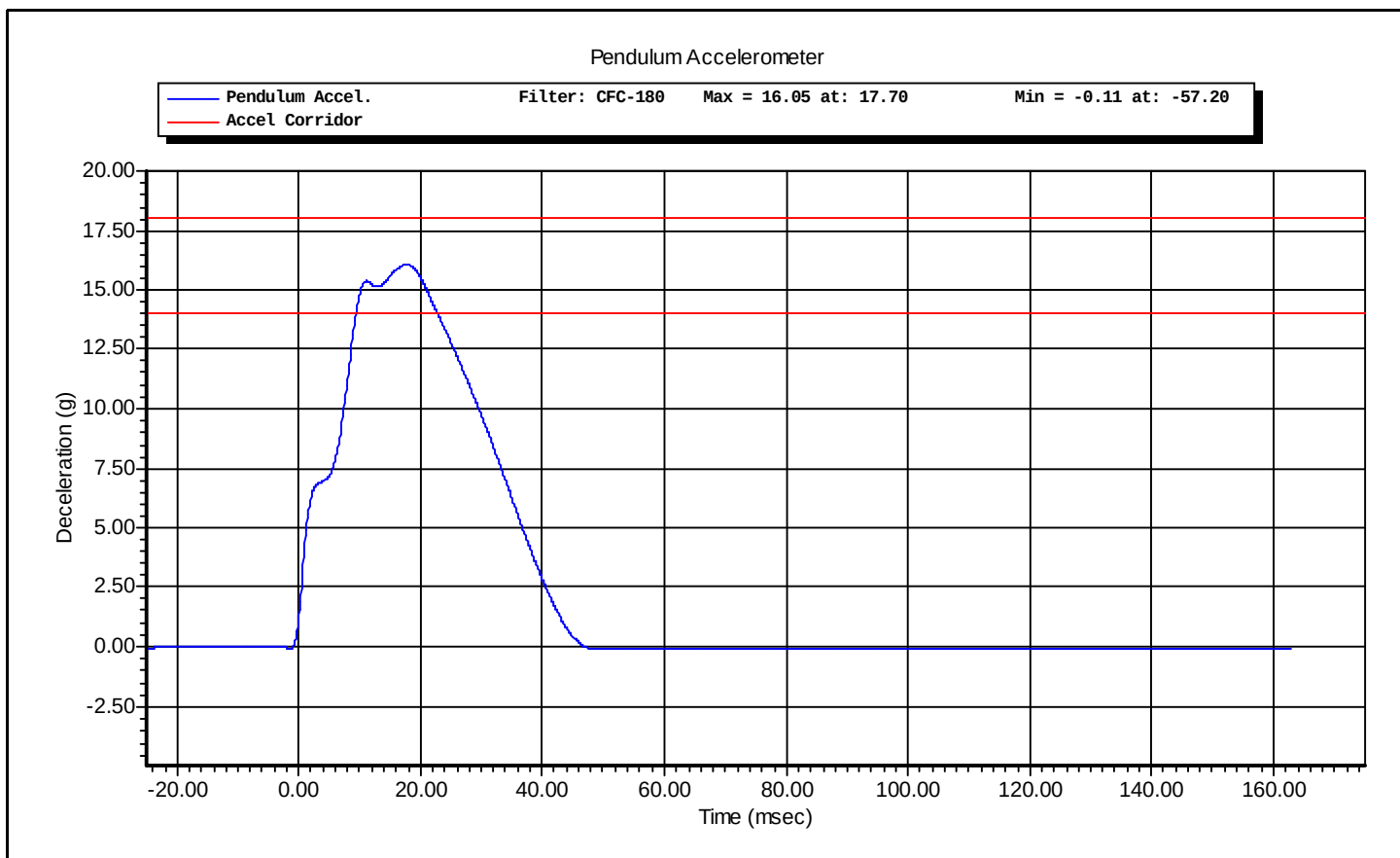


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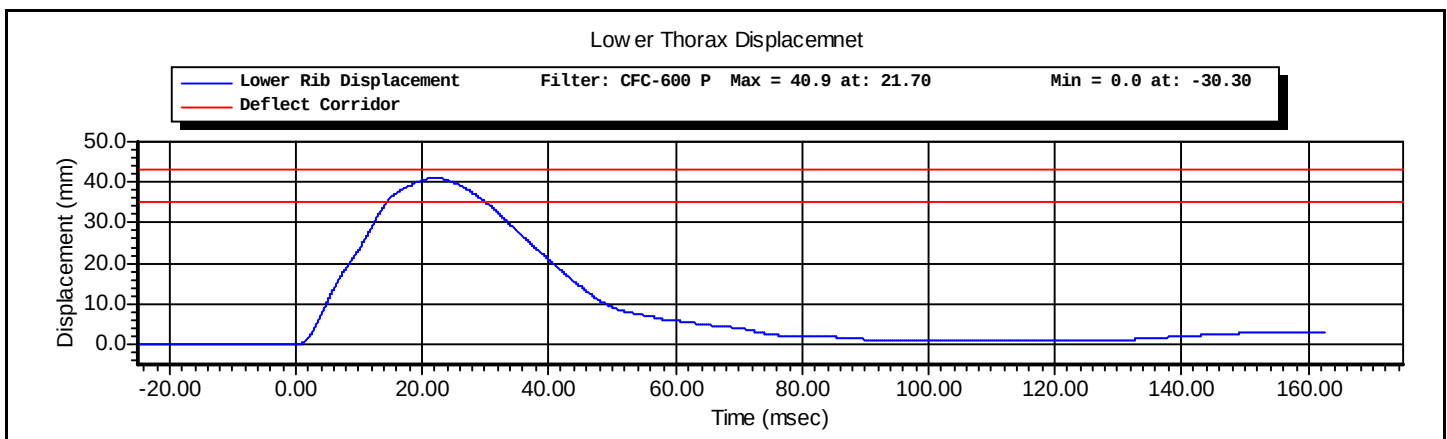
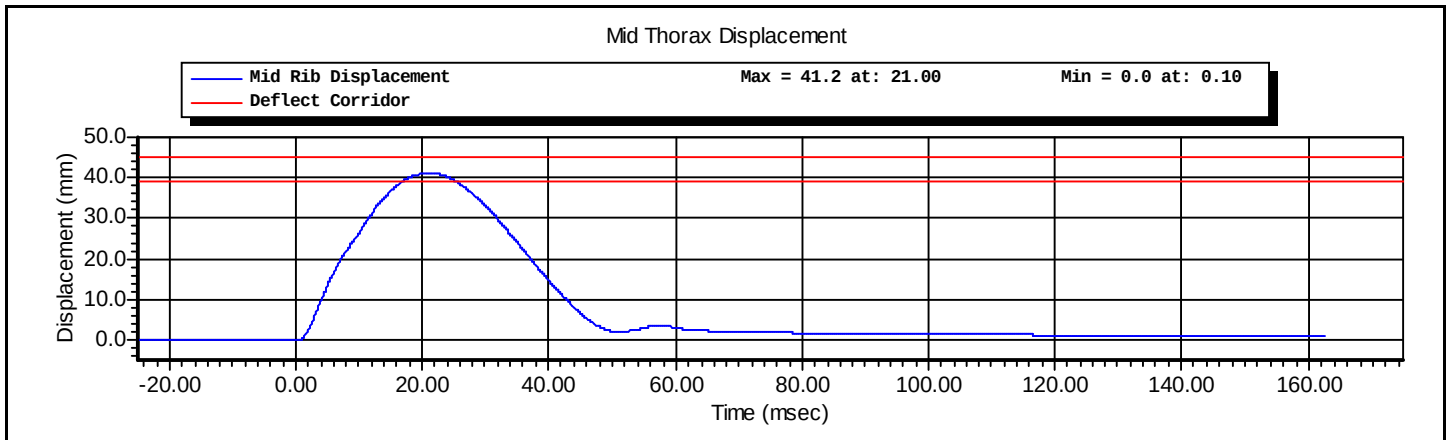
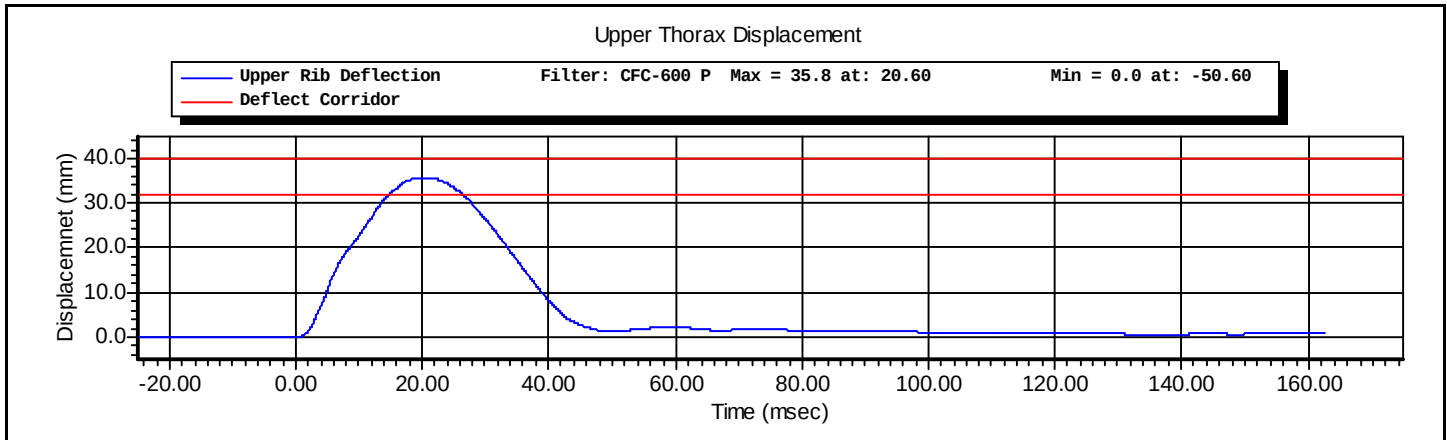
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Test Name:	Thorax Impact without Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Thorax Without Arm	Test Date:	10/4/2010
Test Number:	1	Test Time:	2:01:13 PM

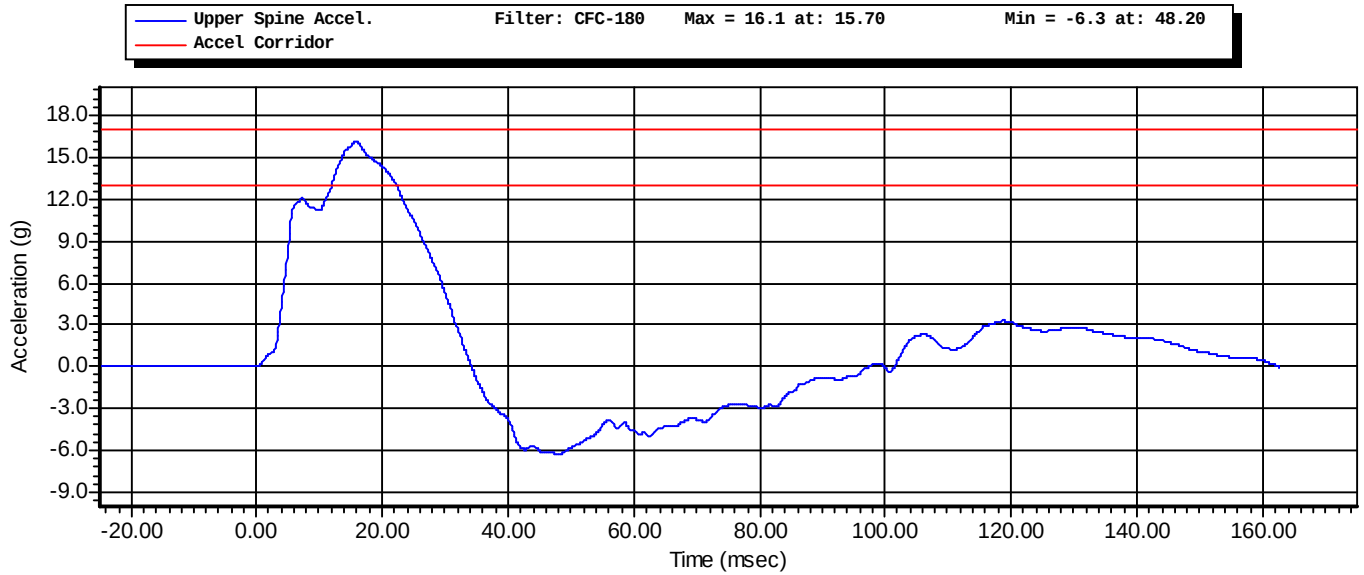


Test ID: Thorax Without Arm Test Time: 2:01:13 PM

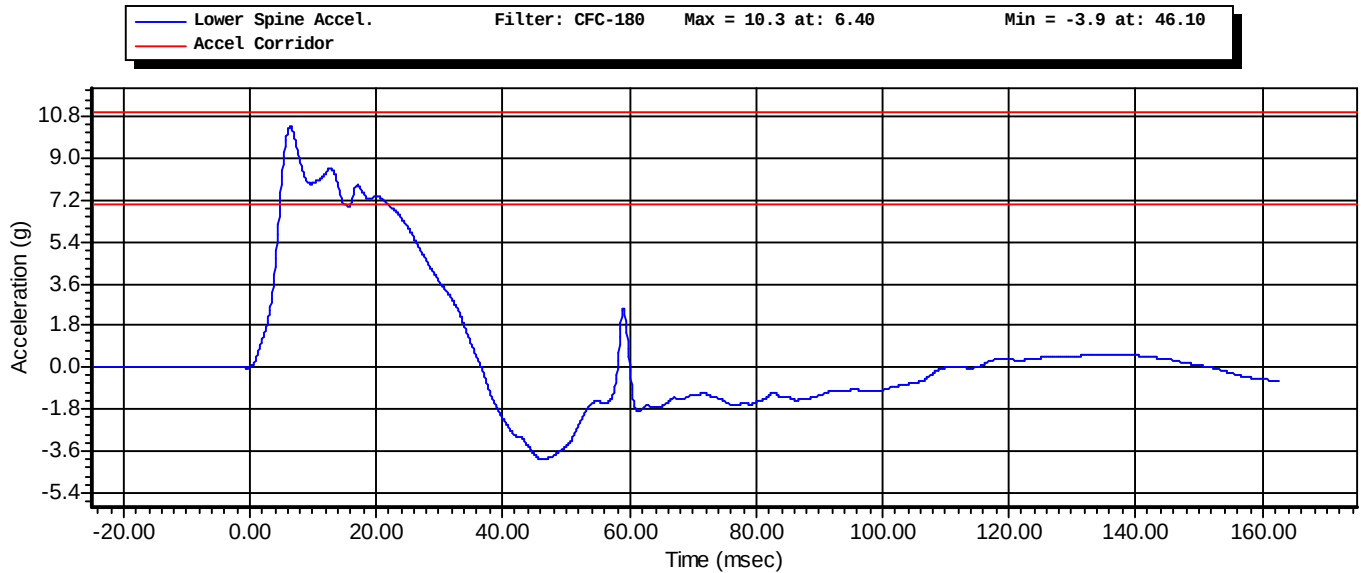
Test Date: 10/4/2010



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:	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**



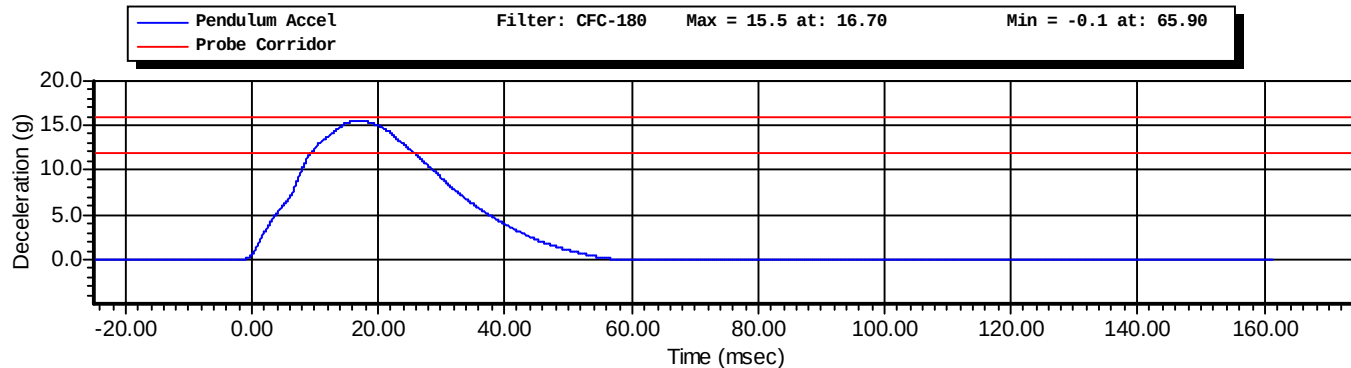
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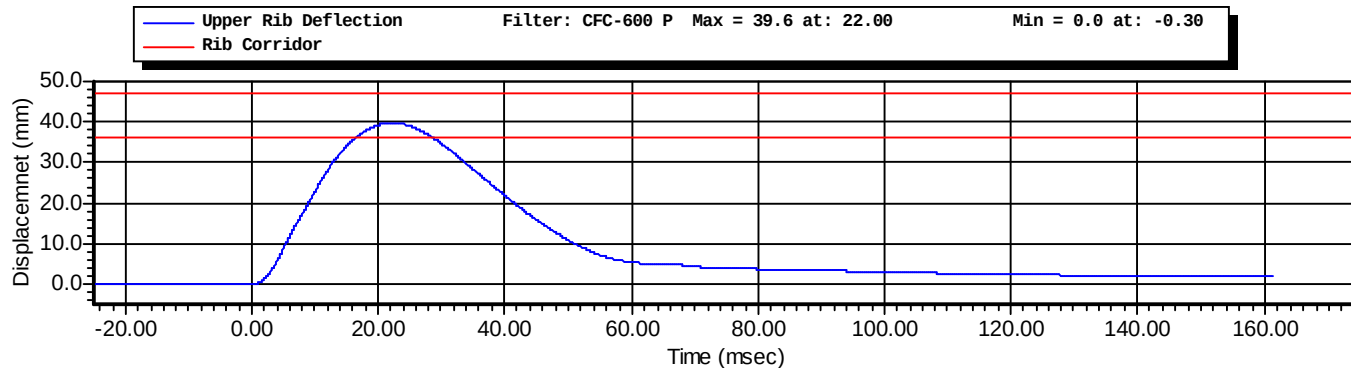
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Test Name:	Abdominal Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Abdomen	Test Date:	10/4/2010
Test Number:	1	Test Time:	2:37:39 PM

Pendulum Accelerometer



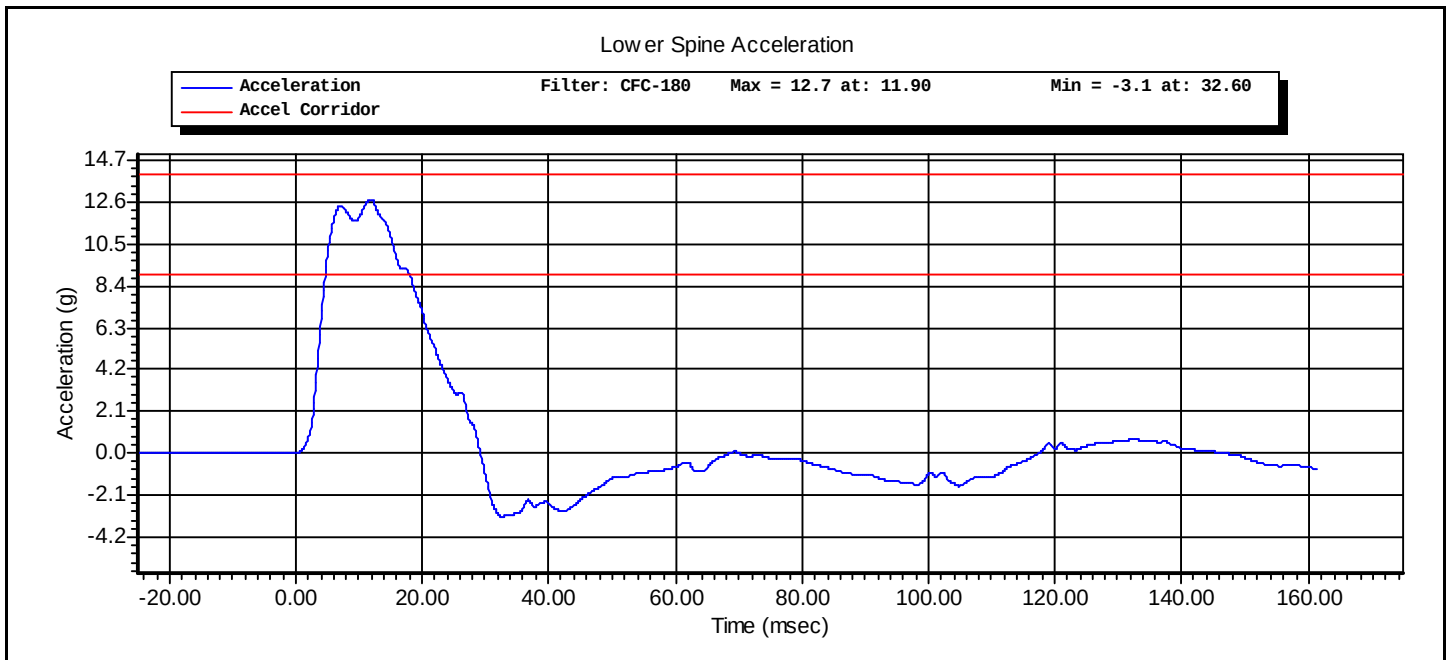
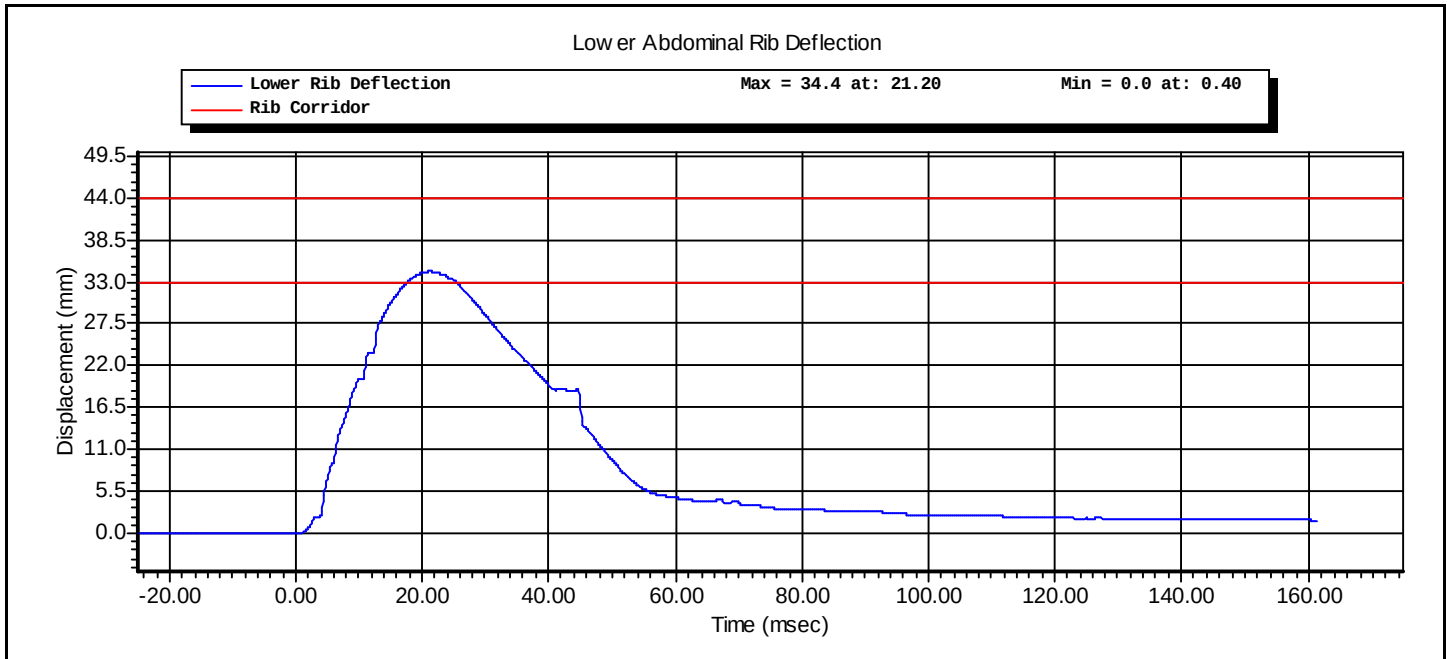
Upper Abdominal Rib Deflection



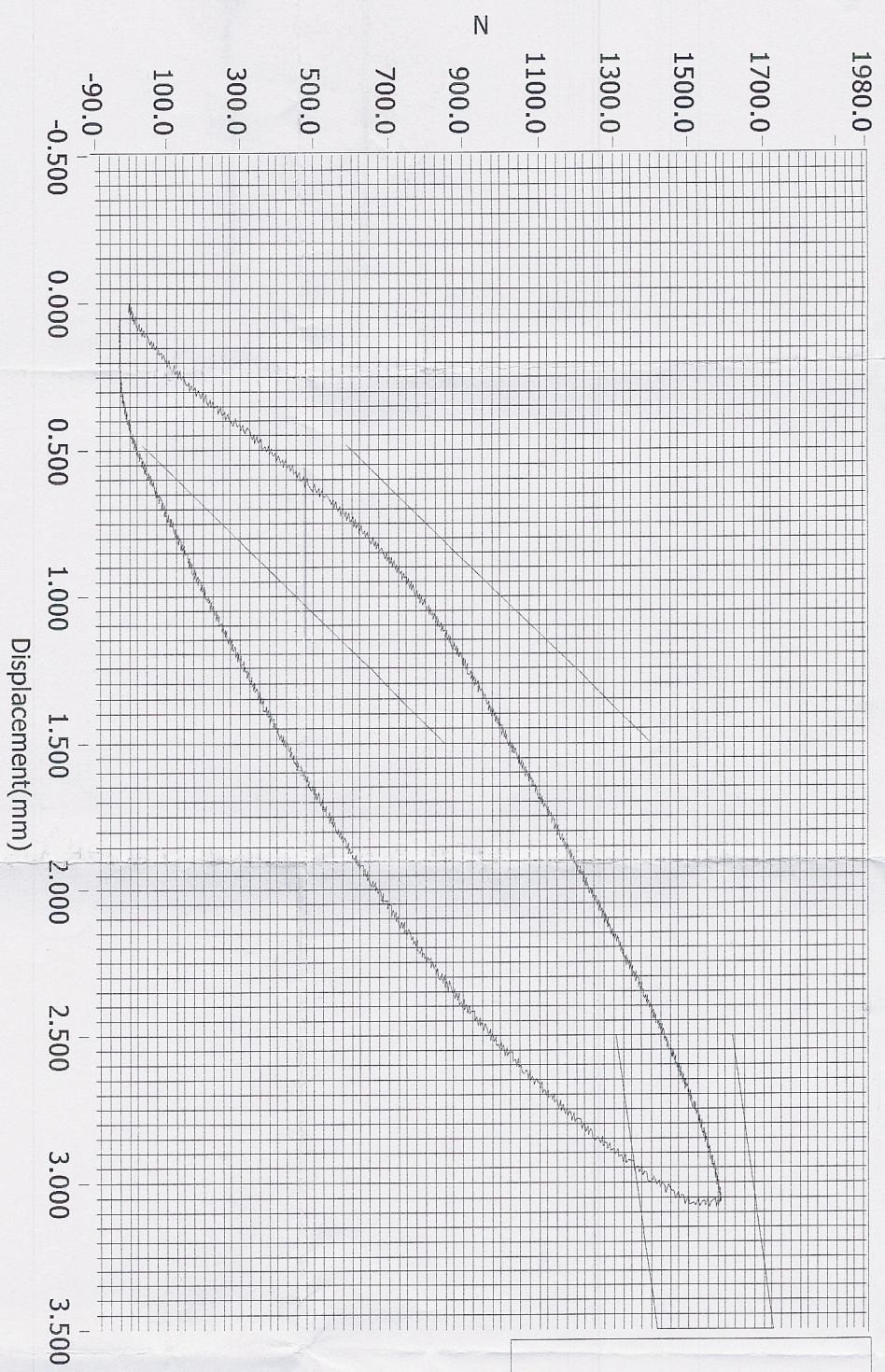
Test ID: **Abdomen**

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

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



Resultant Data - SIDIIs Plug Compression



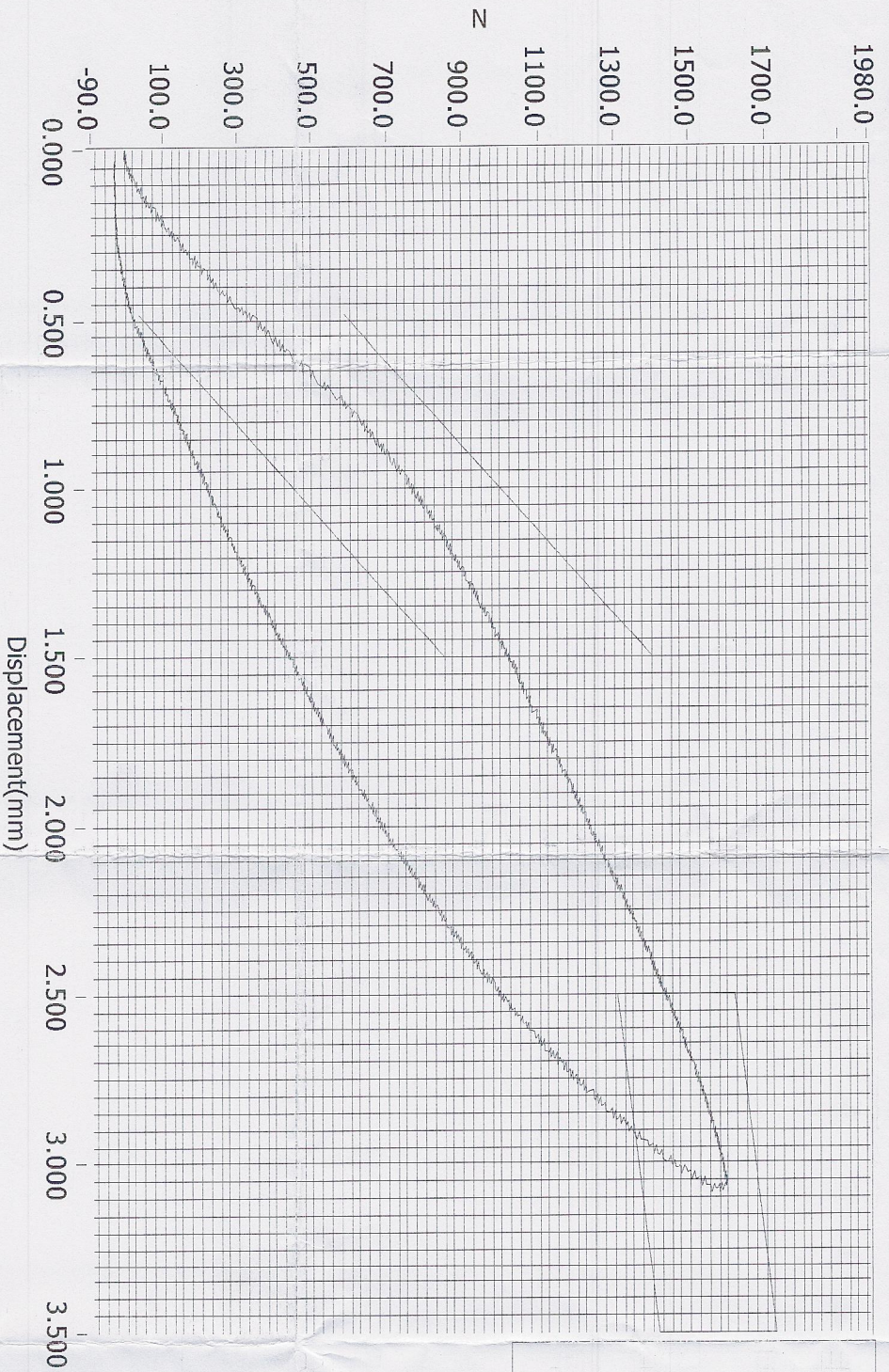
Loading Curve	<
Boundary Limit Upper	<
Boundary Limit Lower	<
Peak Load Upper	<
Peak Load Lower	<
Peak Defl Upper	<
Peak Defl Lower	<

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**



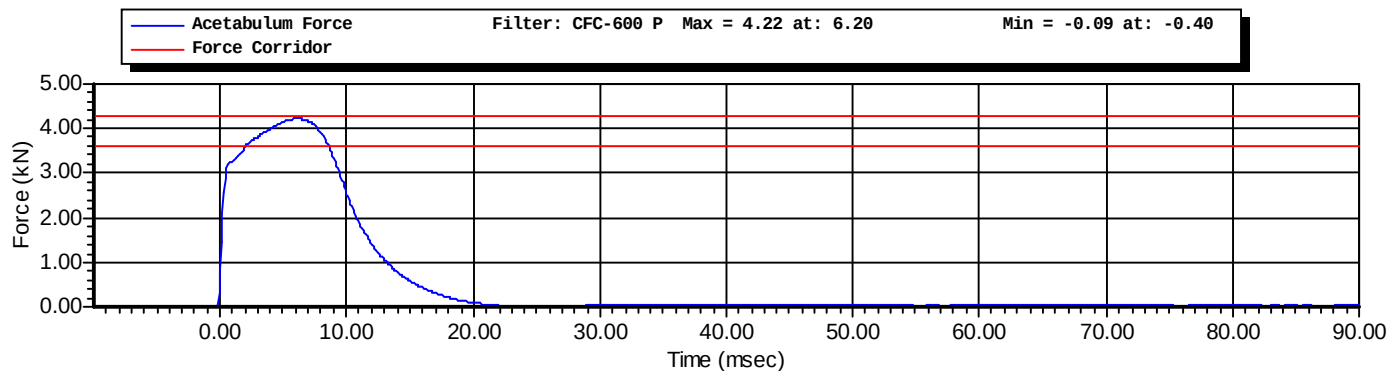
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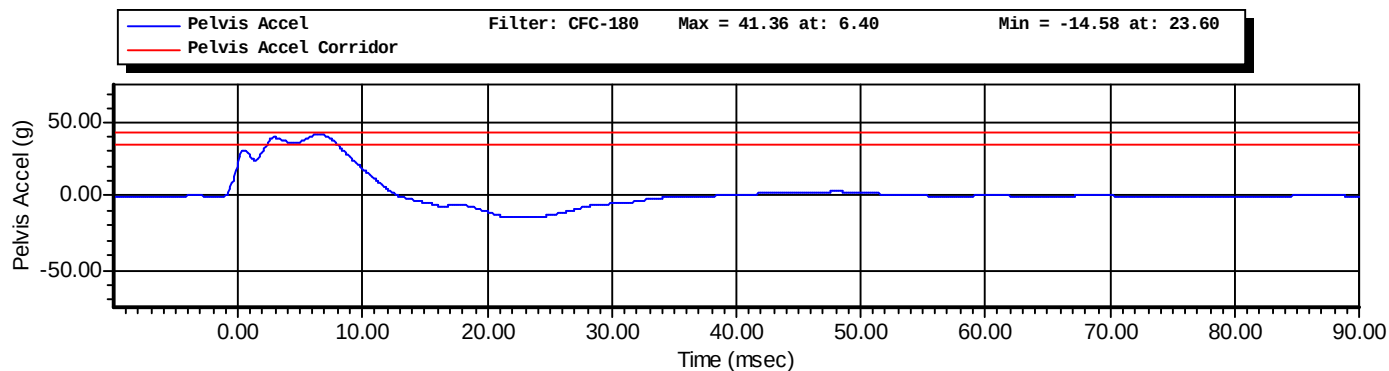
4455 Genesee Street, Buffalo, New York 14225 - Phone (716)632-7500

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

Acetabulum Force



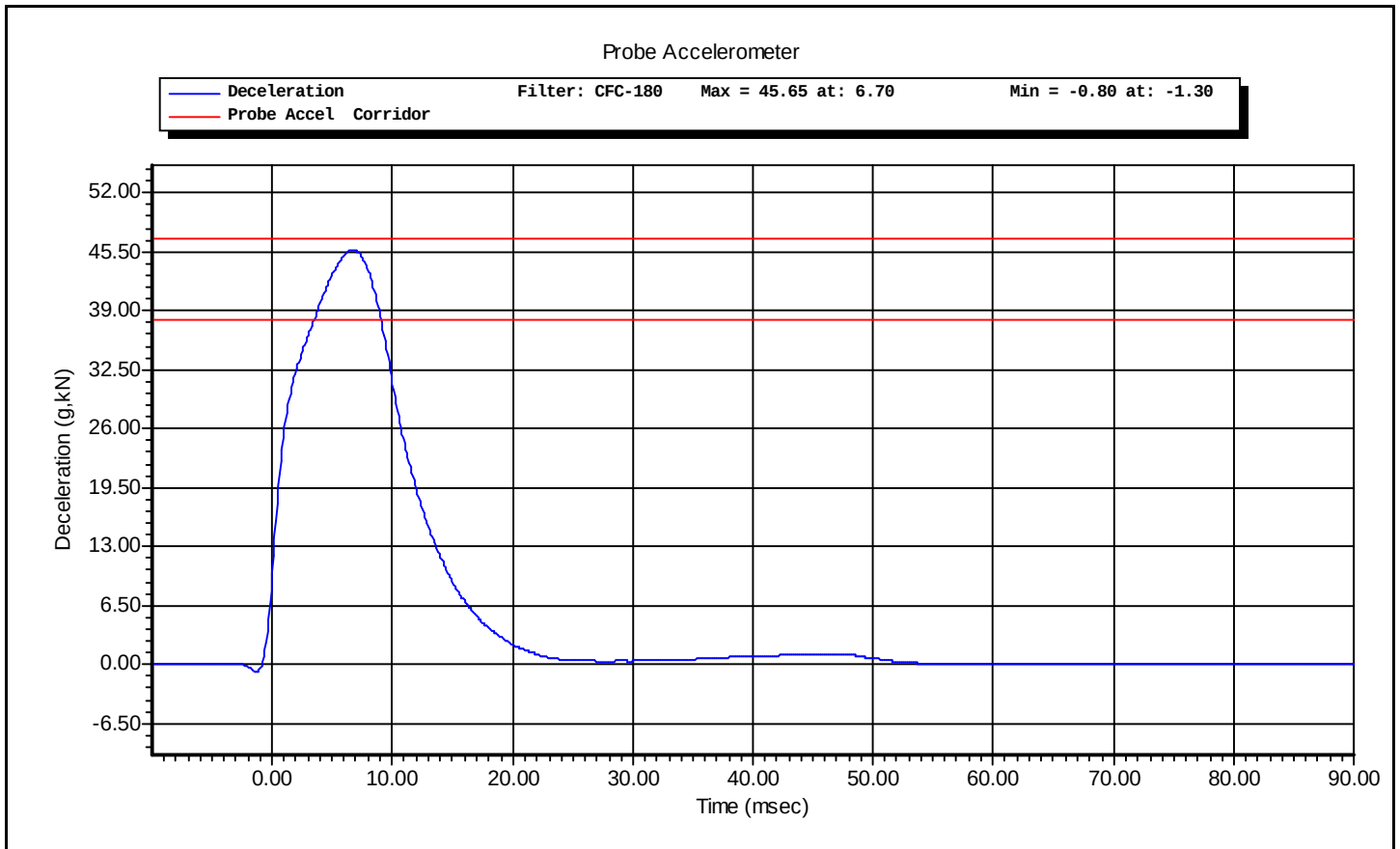
Pelvis Accelerometer



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**

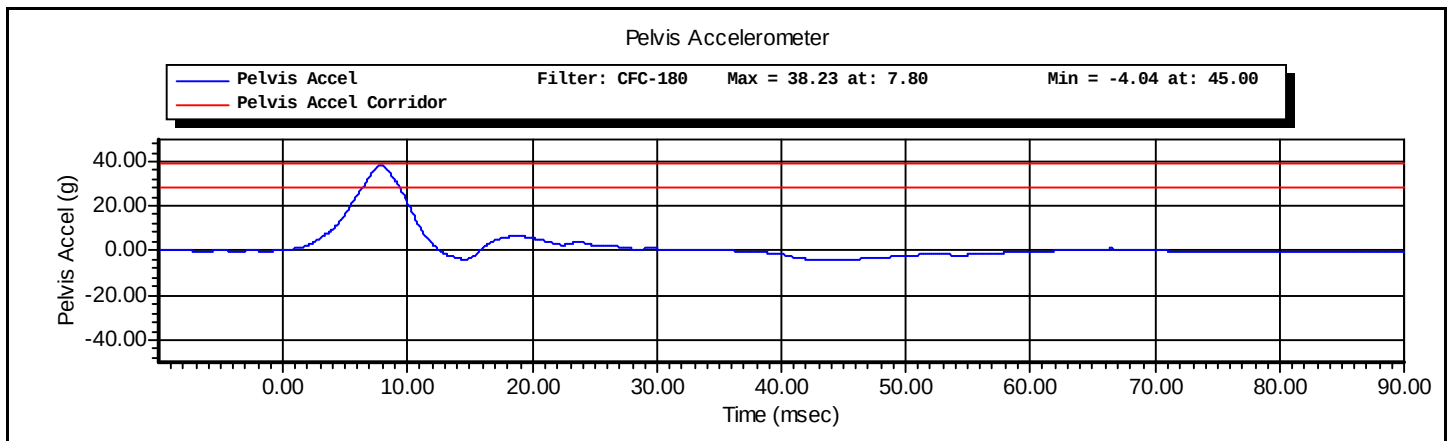
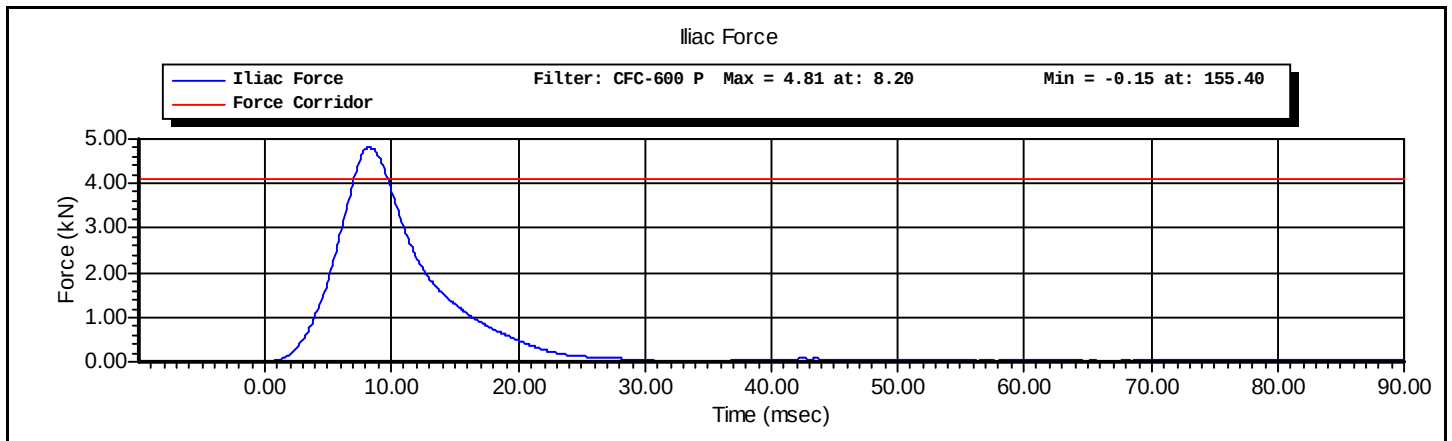


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Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Iliac Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID-300		
Test ID:	Pelvis Iliac	Test Date:	10/4/2010
Test Number:	2	Test Time:	11:12:17 AM



Test ID: **Pelvis Iliac**

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

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

