

REPORT NUMBER: SINCAP-CAL-12-027

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

**Ford Motor Co.
2012 Ford Transit Connect XLT Wagon**

NHTSA No: MC0217

**PREPARED BY:
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April 12, 2012

FINAL REPORT

**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF CRASHWORTHINESS STANDARDS
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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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15. Supplementary Notes

16. Abstract

A 55/28 kph 90° Moving Deformable Barrier NCAP Side Impact Test was conducted on the subject 2012 Ford Transit Connect XLT Wagon 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 2/3/2012.

The impact velocity of the Moving Deformable Barrier (MDB) was 62.15 km/h, and the ambient temperature at the struck (driver's) side of the target vehicle at the time of impact was 2°C. The target vehicle post-test maximum crush was 274 mm at level 3. The test vehicle's performance was as follows:

Measurement Description	Driver ATD (ES-2re)		
	Units	IARV	Result
Head Injury Criteria (HIC ₃₆)	N/A	1000	83.49
Maximum Thoracic Rib Deflection	mm	44	49.42
Total Abdominal Force	N	2500	767.17
Pubic Symphysis Force	N	6000	-1620.40

Measurement Description	Passenger ATD (SID-IIs)		
	Units	IARV	Result
Head Injury Criteria (HIC ₃₆)	N/A	1000	322.52
Resultant Lower Spine Acceleration	G	82	55.15
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	3869.63
Maximum Thoracic Rib Deflection	mm	38*	13.99
Maximum Abdominal Rib Deflection	mm	45*	8.63

* Proposed IARV

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.

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SECTION 1
TEST PURPOSE AND PROCEDURE

PURPOSE

This moving deformable barrier side impact test is part of the MY 2012 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 2012 Ford Transit Connect XLT Wagon. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Laboratory Test Procedure dated August 2011.

SECTION 2

SUMMARY OF TEST RESULTS

SUMMARY

A 2012 Ford Transit Connect XLT Wagon 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 62.15 km/h (38.62 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 in Buffalo, New York on February 03, 2012. 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 August 2011. The side impact event was documented by 9 high-speed and 2 real-time cameras. Camera locations are included in this report.

The Dummies were instrumented in the following manner:

DRIVER ATD (ES-2re)

- Primary and redundant head CG tri-axial accelerometers
- Chest upper rib, middle rib, and lower rib y-axis displacement potentiometers
- Abdomen forward, middle, and rear y-axis load cells
- Lower spine (T12) tri-axial accelerometers
- Public symphysis y-axis load cell

PASSENGER ATD (SID-IIs)

- Primary and redundant head CG tri-axial accelerometers
- Chest upper rib, middle rib, and lower rib y-axis displacement potentiometers
- Abdomen upper rib and lower rib y-axis displacement potentiometers
- Lower spine (T12) tri-axial accelerometers
- Acetabulum and iliac wing y-axis load cells

Appendix B contains the vehicle and dummy response data. Dummy configuration and performance verification data can be found in APPENDIX C of this report.

DUMMY INJURY VALUES

Measurement Description	Driver ATD (ES-2re)		
	Units	Threshold	Result
Head Injury Criteria (HIC36)		1000	83.49
Maximum Thorax Rib Deflection	mm	44	49.42
Combined Abdominal Force	N	2500	767.17
Pubic Symphysis Force	N	6000	-1620.40

Measurement Description	Passenger ATD (SID-IIs)		
	Units	Threshold	Result
Head Injury Criteria (HIC36)		1000	322.52
Lower Spine (T12) Resultant Acceleration	G	82	55.15
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	3869.63
Maximum Thoracic Rib Deflection	mm	38*	13.99
Maximum Abdominal Rib Deflection	mm	45*	8.63

*Proposed IARV

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

GENERAL COMMENTS:

- P1 serial number - F034
- P4 serial number – 300
- Camera No.1 does not have a time stamp due to an internal malfunction and needs to be sent back to the manufacturer for repair.

SECTION 3 Occupant and Vehicle Information

This section contains information reporting for the following Data Sheets:

Data Sheet No. 1 - General Test and Vehicle Parameter Data

Data Sheet No. 2 – Seat, Seat Belt, Steering Wheel Adjustment and Fuel System Data

Data Sheet No. 3 – Dummy Longitudinal Clearance Dimensions

Data Sheet No. 4 – Dummy Lateral Clearance Dimensions

Data Sheet No. 5 – Camera and Instrumentation Data

Data Sheet No. 6 – Test Vehicle Accelerometer Locations

Data Sheet No. 7 – MDB Accelerometer Locations

Data Sheet No. 8 – Post-Test Observations

Data Sheet No. 9 – MDB Summary of Results

Data Sheet No. 10 – Test Vehicle Profile Measurements

Data Sheet No. 11 – Test Vehicle Exterior Crush Measurements

Data Sheet No. 12 – MDB Exterior Static Crush Measurements

Data Sheet No. 13 – FMVSS No. 301 Static Rollover Results

Data Sheet No. 14 – Dummy/Vehicle Temperature and Humidity Stabilization Data

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

Test Vehicle: 2012 Ford Transit Connect XLT Wagon
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: MC0217
 Test Date: 2/3/2012

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	MC0217	Traction Control System (TCS)	Yes
Model Year	2012	Auto-Leveling System	No
Make	Ford	Automatic Door Locks (ADL)	Yes
Model	Transit Connect XLT	Power Window Auto-Reverse	No
Body Style	Van	Other Optional Feature	--
VIN	NM0KS9CN4CT076819	Driver Front Airbag	Yes
Body Color	Dark blue	Driver Curtain Airbag	No
Odometer Reading (km/mi)	251 / 156	Driver Head/Torso Airbag	Yes
Engine Displacement (L)	2.0	Driver Torso Airbag	No
Type/No. Cylinders	I4	Driver Torso/Pelvis Airbag	No
Engine Placement	Transverse	Driver Pelvis Airbag	No
Transmission Type	Automatic	Driver Knee Airbag	No
Transmission Speeds	4-Speed	Rear Pass. Curtain Airbag	No
Overdrive	Yes	Rear Pass. Head/Torso Airbag	No
Final Drive	Front Wheel Drive	Rear Pass. Torso Airbag	No
Roof Rack	No	Rear Pass. Torso/Pelvis Airbag	No
Sunroof/T-Top	No	Rear Pass. Pelvis Airbag	No
Running Boards	No	Driver Seat Belt Pretensioners	Yes
Tilt Steering Wheel	Yes	Rear Pass. Seat Belt Pretensioners	No
Power Seats	No	Driver Load Limiter	Yes
Anti-Lock Brakes (ABS)	Yes	Rear Pass. Load Limiter	No
All-Wheel Drive (AWD)	No	Other Safety Restraint	--
Does owner's manual provide instructions to turn off automatic door locks?			No

DATA FROM CERTIFICATION LABEL

Manufactured By	Ford Motor Co.	GVWR (kg)	2,252
Date of Manufacture	7/11	GAWR Front (kg)	1,130
Vehicle Type	Van	GAWR Rear (kg)	1,243

VEHICLE SEATING AND WEIGHT CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity (DSC)	2	3		5	
Capacity Weight (VCW) (kg)				635.0	(A)
DSC X 68.04 kg				340.2	(B)
Cargo Weight (RCLW) (kg)				294.8	(A-B)

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					
Third Row seat							

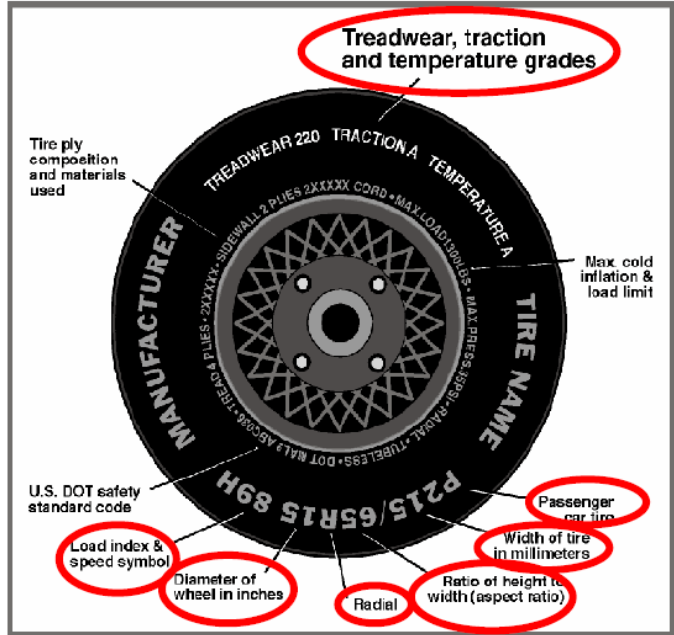
DATA SHEET NO. 1 ... (CONTINUED)
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2012 Ford Transit Connect XLT Wagon
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: MC0217
 Test Date: 2/3/2012

VEHICLE TIRE INFORMATION

Collect year, make, model, VIN, items circled in red, and tire manufacturer and tire name.



TIRE PLACARD INFORMATION

Measured Parameter	Front	Rear
Recommended Cold Tire Pressure (kPa)	275	340
Recommended Tire Size	P205/65R15	P205/65R15

TIRE SIDEWALL INFORMATION

Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	340	340
Tire Size on Vehicle	P205/65R15	P205/65R15
Tire Manufacturer	Continental	Continental
Tire Name	Contipro Contact	Contipro Contact
Tire Type	All season	All season
Tire Width	205	205
Aspect Ratio	65	65
Radial	Yes	Yes
Wheel Diameter	648	648
Load Index/Speed	95T	95T
Treadwear	540	540
Traction Grade	A	A
Temperature Grade	A	A
Tire Material	Rubber	Rubber

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

Test Vehicle: 2012 Ford Transit Connect XLT Wagon
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: MC0217
 Test Date: 2/3/2012

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	275	275	340	340
Tire Placard	kPa	275	275	340	340
Owner's Manual	kPa	275	275	340	340
As Tested	kPa	275	340	275	340

MDB TIRE SPECIFICATIONS

	Units	Requirement	LF	RF	LR	RR
Tire Size		P205/75R15	P205/75R15	P205/75R15	P205/75R15	P205/75R15
Tire Pressure	kPa	200 ± 21	214	200	207	207

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	460.5	341		485	466		516	460.5	
Right	kg	412.5	358		445	440		422.5	447	
Ratio	%	56	44		51	49		51	49	
Totals	kg	873	699	1,572	930	906	1,836	938.5	907.5	1,846

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1,572.0	(A)
Sum of Actual Weight of 2 P572 ATDS Used	kg	136.8	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	136.1	(C)
Calculated Target Vehicle Test Weight (TVTW)	kg	1,844.9	(A+B+C)

Does the measured As Test Vehicle Weight lie within the required weight range (i.e.

Calculated Test Vehicle Target Weight – 4.5 kg to – 9 kg)? Yes No

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
None	0
Ballast / Equipment Added	83.6

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

Test Vehicle: 2012 Ford Transit Connect XLT Wagon
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: MC0217
 Test Date: 2/3/2012

TEST VEHICLE ATTITUDE AND CG

Measurement Description	Units	Fully Loaded	As Tested	Meets Requirement**
LF	mm	713	717	Yes
RF	mm	715	721	Yes
RR	mm	774	769	Yes
LR	mm	767	772	Yes
Vehicle CG (Aft of Front Axle)	mm	1,432	1,437	
Vehicle CG (Left+)/Right(-) from Longitudinal Centerline)	mm	45	28	

*** The "As Tested" vehicle attitude measurements must be equal to or within ± 10 mm of the "Fully Loaded" vehicle attitude measurements at each wheel well. Indicate "Yes" or "No" for "Meets Requirements".

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

Test Vehicle: 2012 Ford Transit Connect XLT Wagon
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: MC0217
 Test Date: 2/3/2012

SEAT POSITIONING

The driver's seat, front center seat (if applicable), and right front passenger's seat should be set to the mid-track, lowest, mid-angle position. The struck-side rear passenger's seat, rear center seat, and non-struck side rear passengers' seats should be set to the rear-most, lowest, mid-angle position.

SCRL ANGLE RANGE

Seat	SCRL (°)		
	Max	Min	Mid
Driver Seat	11.4	6.4	8.9
Front Passenger Seat	-	Not Adjustable	-
Front Center Seat*			
Struck Side Rear Seat	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed
Rear Center Seat*	Fixed	Fixed	Fixed

**if applicable*

SEAT HEIGHT AND ANGLE

Seat	As Tested SCRL Angle (Mid) (°)	As Tested SCRP Height (mm)	SCRP Height Position	SCRP Height (mm)		
				Rearmost	Mid-Fore/Aft	Forward-Most
Driver Seat	8.9	28	Max	50	54	57
			Mid	25	28	29
			Min	0	3	5
Front Passenger Seat	Not Adjustable		Max			
			Mid			
			Min			
Front Center Seat*	NA		Max			
			Mid			
			Min			
Struck Side Rear Seat	Fixed	Fixed	Max			
			Mid			
			Min			
Non-Struck Side Rear Seat	Fixed	Fixed	Max			
			Mid			
			Min			
Rear Center Seat*	Fixed	Fixed	Max			
			Mid			
			Min			

**if applicable*

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

Test Vehicle: 2012 Ford Transit Connect XLT Wagon
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: MC0217
 Test Date: 2/3/2012

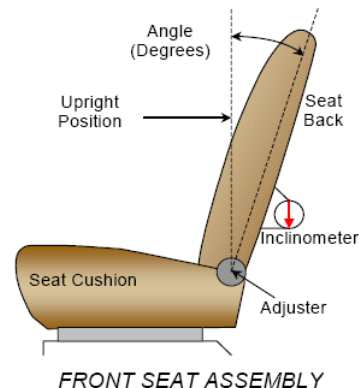
SEAT FORE / AFT POSITION

Seat	Total Fore / Aft Travel		Test Position from Forwardmost Position	
	mm	Detents*	mm	Detent*
Driver Seat	220	23	-	11
Front Passenger Seat	220	23	-	11
Front Center Seat*				
Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Rear Center Seat*	Fixed	Fixed	Fixed	Fixed

*if applicable

SEAT BACK ANGLE ADJUSTMENT

The driver's seat back is positioned to the manufacturer's designated design angle. The front center and front passenger's seat backs are positioned in a similar manner as the driver's seat back. The struck side rear seat back is positioned such that the dummy's head is level. The rear center and non-struck side rear outboard seat backs are positioned in a similar manner as the struck-side rear seat back.



Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents*	Degrees	Detents*
Driver Seat w/ Seated Dummy	-20 to 35.7	-	25.5 ¹ (Seatback) 4.3 ² (Headrest)	-
Front Passenger Seat	-21.2 to 34.7	-	3.5 (Headrest)	-
Front Center Seat*				
Struck Side Rear Seat w/ Seated Dummy	Fixed	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Rear Center Seat*	Fixed	Fixed	Fixed	Fixed

*if applicable

- 1- Measured on seatback 13 inches up from right pivot target
- 2- Angle on head rest post 13 inches up from right pivot target

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

Test Vehicle: 2012 Ford Transit Connect XLT Wagon
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: MC0217
 Test Date: 2/3/2012

SEAT BELT ANCHORAGE ADJUSTMENT

Seat belt anchorages are adjusted in accordance with the information provided by the manufacturer on Form No. 1.

	Total No. of Positions	Placed in Position
Driver Seat	4	0
Rear Seat	Fixed	Fixed

HEAD RESTRAINT ADJUSTMENT

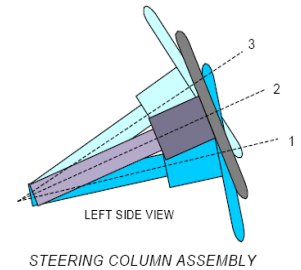
The driver's head restraint is adjusted to the highest and most full forward in-use position. The struck-side rear passenger's head restraint is adjusted to the lowest and most full forward in-use position.

	Total No. of Positions	Placed in Position
Driver Seat	3	0
Rear Seat	2	1

STEERING COLUMN ADJUSTMENT

Steering wheel and column adjustments are made so that the steering wheel hub is at the center of its geometric locus it describes when it moves through its full range of motion.

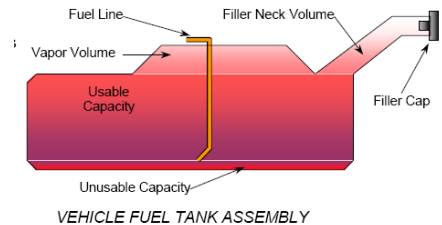
	Degrees	Fore/Aft Position (mm)
Lowermost - Position 1	17.5	
Geometric Center – Position 2	24.2	
Uppermost – Position 3	30.9	
Telescoping Steering Wheel Travel		26
Test Position	24.3	13



FUEL PUMP

Describe the fuel pump type, details about how it operates, and the location of the fuel filler neck.

Electric fuel pump operates when the ignition is in the 'on' position
and the engine is running. The fuel filler cap is located above
the right rear wheel.



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

Test Vehicle: 2012 Ford Transit Connect XLT Wagon NHTSA No.: MC0217
 Test Program: NCAP Side MDB Impact Test Test Date: 2/3/2012

FUEL TANK CAPACITY

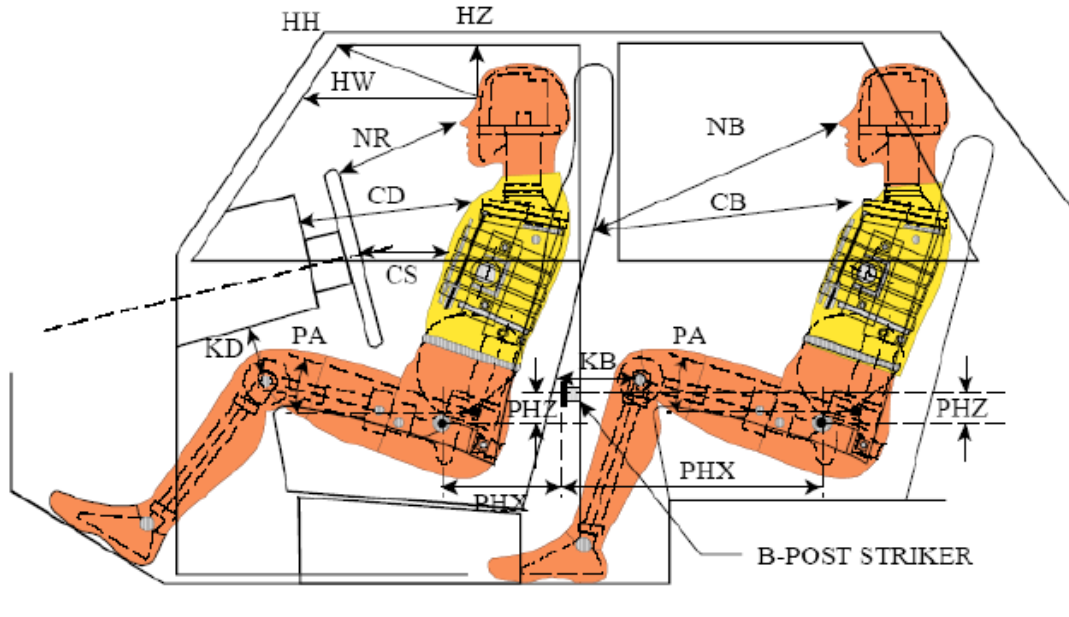
	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	56.0
Usable Capacity of "Optional Tank" (see Form No. 1)	
Usable Capacity of Standard Tank (see Owner's Manual)	56.0
Usable Capacity of Optional Tank (see Owner's Manual)	
93% of Usable Capacity	52.1
Actual Amount of Solvent Used in Test	52.2
1/3 of Usable Capacity	18.7

Is the Actual Amount of Solvent Used in the test equal to 93% ± 1% of the Usable Capacity stated in Form No. 1? **Yes** **No**

**DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS**

Test Vehicle: 2012 Ford Transit Connect XLT Wagon
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: MC0217
 Test Date: 2/3/2012



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

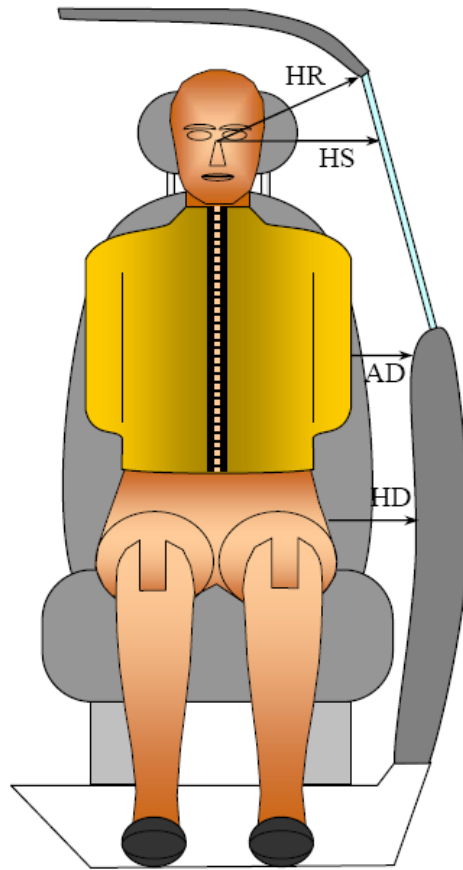
DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Pass. Code	Measurement Description	Driver (Serial No. F034)		Passenger (Serial No. 300)	
			Length (mm)	Angle	Length (mm)	Angle
HH		Header to Header	506			
HW		Header to Windshield	735			
HZ	HZ	Head to Roof Liner	442		579	
NR	NB	Nose to Rim/Seat Back	437		525	
CD	CB	Chest to Dash/Seat Back	600		524	
CS		Chest to Steering Wheel	276			
KD(L)/KDA(L)°	KB(L)/KBA(L)°	Left Knee to Dash/Seat Back	132	21.7	273	23.3
KD(R)/KDA(R)°	KB(R)/KBA(R)°	Right Knee to Dash/Seat Back	133	20.6	278	19.2
PAX°	PAX°	Pelvic Tilt Angle X		-20.2		19.5
	PAY°	Pelvic Tilt Angle Y				0.2
PHX	PHX	Hip Point to Striker (X-Axis)	271		342	
PHZ	PHZ	Hip Point to Striker (Z-Axis)	227		177	

**DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS**

Test Vehicle: 2012 Ford Transit Connect XLT Wagon
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: MC0217
 Test Date: 2/3/2012



FRONT VIEW OF DUMMY

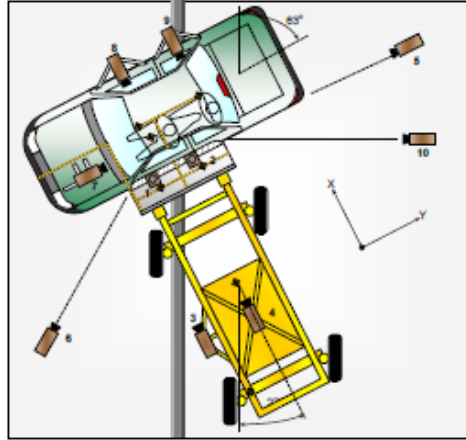
DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

Code	Measurement Description	Units	Driver (Serial No. F034)	Passenger (Serial No. 300)
HR	Head to Side Header	Mm	342	458
HS	Head to Side Window	Mm	414	401
AD	Arm to Door	Mm	75	125
HD	Hip Point to Door	Mm	164	181

**DATA SHEET NO. 5
CAMERA AND INSTRUMENTATION DATA**

Test Vehicle: 2012 Ford Transit Connect XLT Wagon
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: MC0217
 Test Date: 2/3/2012



CAMERA LOCATIONS AND DATA

No.	Camera View	Coordinates (mm)			Lens Length (mm)	Operating Frame Rate (fps)
		X	Y	Z		
1	Overhead Overall	305	0	5150	14	1000
2	Overhead Close-up	0	0	5150	28	1000
3	Left Impact Point (MDB)	-1470	0	-847	25	1000
4	Side Overall (MDB)	-1140	838	-1587	12.5	1000
5	Rear	5230	9830	1000	50	1000
6	Left Front	2550	1512	920	24	1000
7	Driver Front (OB)				25	500
8	Driver Side (OB)				12.5	500
9	Passenger Side (OB)				12.5	500
10	Real-time Left Rear				-	30
11	Real-time Inrun				-	30

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

If applicable, explain why camera(s) did not operate as intended: Camera No.1 does not have a time stamp due to an internal malfunction and needs to be sent back to the manufacturer for repair.

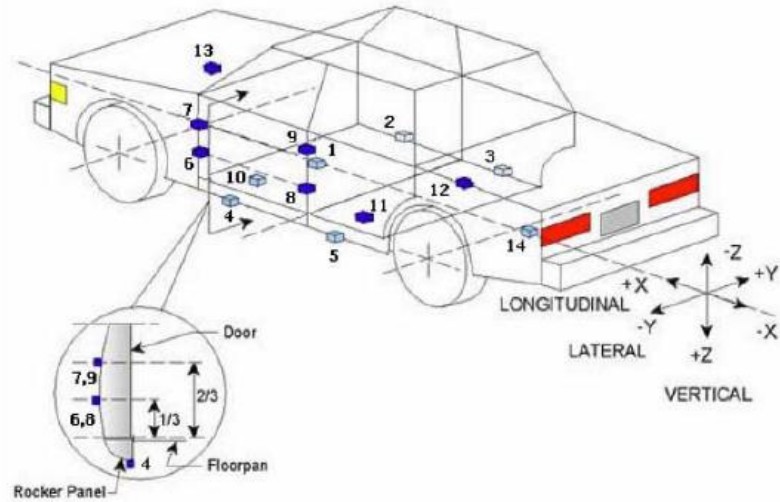
INSTRUMENTATION

Driver Dummy Channels	16
Passenger Dummy Channels	16
Vehicle Structure Accelerometers	23
MDB Accelerometers	7
Total	62

DATA SHEET NO. 6
TEST VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2012 Ford Transit Connect XLT Wagon
Test Program: NCAP Side MDB Impact Test

NHTSA No.: MC0217
Test Date: 2/3/2012



TEST VEHICLE ACCELEROMETER LOCATIONS

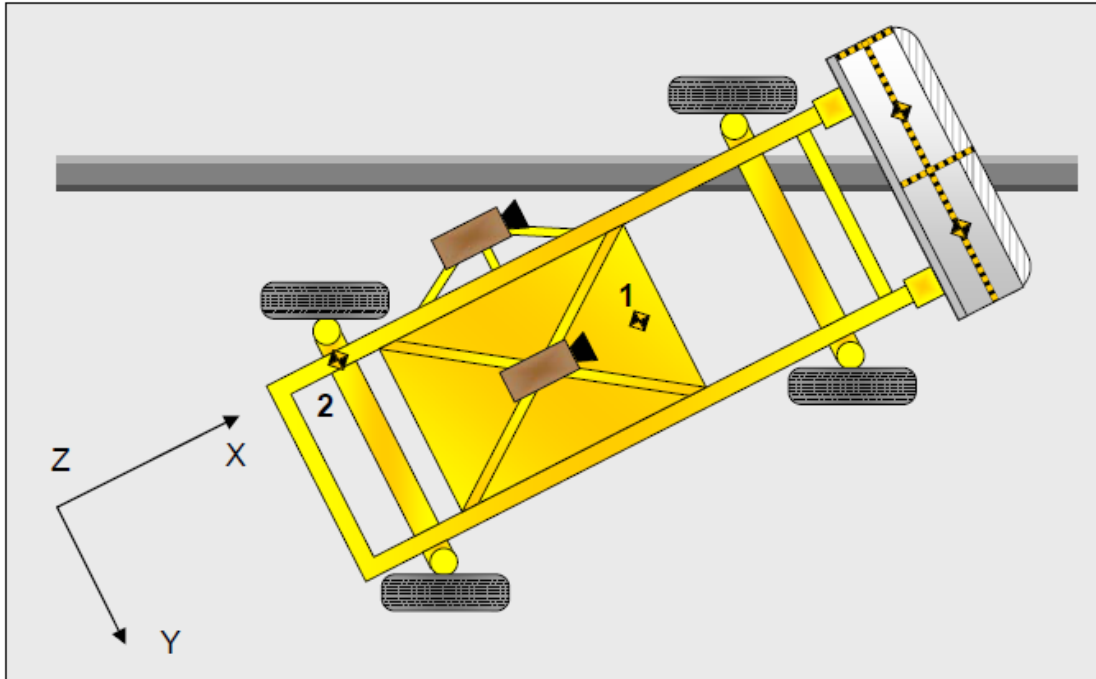
No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2,076	-1	-485
2	Right Sill at Front Seat	2,920	652	-359
3	Right Sill at Rear Seat	1,944	644	-436
4	Left Sill at Front Door	2,938	-643	-376
5	Left Sill at Rear Door	1,986	-643	-428
6	A-Post Lower	3,096	-621	-558
7	A-Post Middle	3,162	-671	-1,140
8	B-Post Lower	2,127	-657	-567
9	B-Post Middle	2,099	-658	-1,054
10	Front Seat Track	2,259	-533	-440
11	Rear Seat Structure	1,328	17	-550
12	Rt. Rear Occ. Compartment	2,032	339	-393
13	Engine Block	3,889	330	-804
14	Rear Above Axle	798	-5	-559

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: 2012 Ford Transit Connect XLT Wagon
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: MC0217
 Test Date: 2/3/2012



MDB ACCELEROMETER LOCATIONS

No.	Accelerometer Location	Coordinates (mm)		
		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
POST-TEST OBSERVATIONS**

Test Vehicle: 2012 Ford Transit Connect XLT Wagon
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: MC0217
 Test Date: 2/3/2012

TEST DUMMY INFORMATION AND CONTACT POINTS

Dummy Body Part	Front Seat Dummy (ES-2re)	Rear Seat Dummy (SID-IIs)
Face	None	Passenger's Side Window
Top of Head	None	Passenger's Side Window
Left Side of Head	Head/Torso Airbag	Passenger's Side Window
Back of Head	Head Rest	Head Rest
Left Shoulder	Head/Torso Airbag	Passenger's Side Door
Upper Torso	Head/Torso Airbag	Passenger's Side Door
Lower Torso	Driver's Side Door	Passenger's Side Door
Left Hip	Driver's Side Door	Passenger's Side Door
Left Knee	Driver's Side Door	Passenger's Side Door

POST-TEST DOOR PERFORMANCE

Description	Struck Side		Non-Struck Side		Rear Hatch/ Other
	Front	Rear	Front	Rear	
Remained Closed and Operational	No	No	Yes	Yes	Yes
Total Separation from Vehicle at Hinges or Latches	No	No	No	No	No
Latch or Hinge Systems Pulled Out of Their Anchorages	No	No	No	No	No
Disengaged from Latched Position	No	No	No	No	No
Latch Separated from Striker	No	No	No	No	No
Jammed Shut	Yes	Yes	No	No	No
If Door Opened at Striker, Width of Opening at Striker (mm)	NA	NA	NA	NA	NA

POST-TEST SEAT PERFORMANCE

Description	Struck Side		Non-Struck Side	
	Front	Rear	Front	Rear
Seat Movement Along Seat Track	No	No	No	No
Seat Disengagement from Floor pan	No	No	No	No
Seat Back Movement from Initial Position	No	No	No	No
Seat Back Collapse	No	No	No	No

POST-TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	Deformed inward but remained intact
Sill Separation	None
Windshield Damage	None
Side Window Damage	Driver's window shattered during impact event
Other Notable Effects	None

**DATA SHEET NO. 8 ... (CONTINUED)
POST-TEST OBSERVATIONS**

Test Vehicle: 2012 Ford Transit Connect XLT Wagon
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: MC0217
 Test Date: 2/3/2012

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Struck Side Driver		Struck Side Rear Passenger	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	No		
Knee Airbag	No	No		
Head/Torso Airbag	Yes	Yes	No	No
Curtain Airbag	No	No	No	No
Seat Belt Pretensioner	Yes	Yes	No	No
Seat Belt Load Limiter	Yes	Yes	No	No
Other				

IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vehicle Wheel Base	mm		2913
Vertical Impact Reference Line (Aft of Front Axle - Intended Impact Point)	mm		508
Actual Impact Point (Aft of Frontal Axle)	mm		504
Horizontal Offset (+ forward / - rearward)	mm	+/- 50 of Intended Impact Point	4
Vertical Offset (+ down / - up)	mm	+/- 20 of Intended Impact Point	4

**DATA SHEET NO. 9
MDB SUMMARY OF RESULTS**

Test Vehicle: 2012 Ford Transit Connect XLT Wagon
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: MC0217
 Test Date: 2/3/2012

MDB SPECIFICATIONS

Measurement Description	Length (mm)
Overall Width of Framework Carriage	1,250
Overall Length Including Honeycomb Frame	4,120
Wheelbase of Framework Carriage	2,600
CG Location of Front Axle	1,120

MDB WEIGHTS

	Units	Front Axle	Rear Axle	Total
Left	kg	392.5	297.5	690.0
Right	kg	386.0	291.5	677.5
Ratio	%	57.4%	42.6%	100.0%
Totals	kg	778.5	589.0	1367.5

SPEED AND ANGLE AT IMPACT DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	62.2
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	62.0
MDB CL to Target Vehicle CL	Degrees	88.5 to 91.5	90.0
MDB Forward Line of Motion to Target Vehicle CL	Degrees	62.5 to 63.5	63.0
MDB Crabbed angle to MDB Forward Line of Motion	Degrees	26.0 to 28.0	27.0

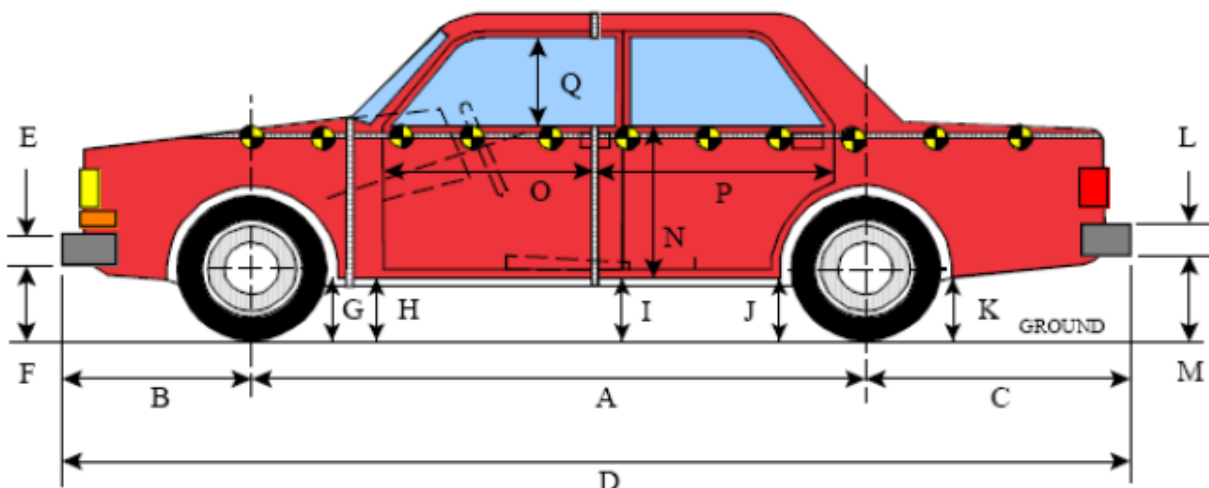
MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE

Vertical Location			From Centerline		Maximum Crush (mm)
Row	Description	Height (mm)	Distance (mm)	Direction	
A	Center of Bumper	432	800	Right	153
B	Top of Bumper	533	700	Right	131
C	Mid-Level	686	800	Right	129
D	Top of Stack	813	800	Right	148

DATA SHEET NO. 10
TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2012 Ford Transit Connect XLT Wagon
Test Program: NCAP Side MDB Impact Test

NHTSA No.: MC0217
Test Date: 2/3/2012



LEFT SIDE VIEW

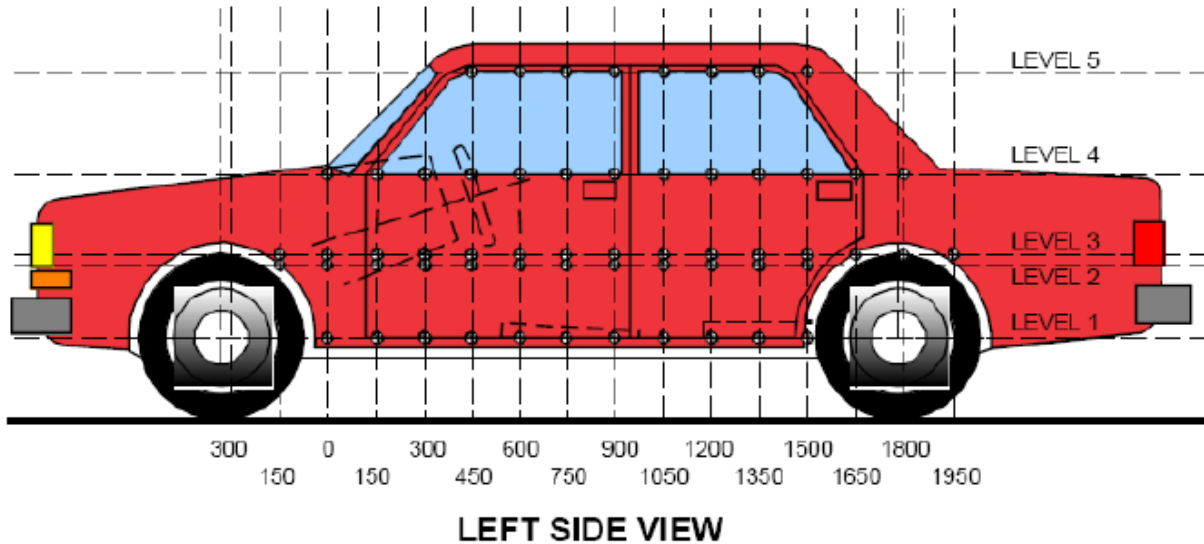
All MEASUREMENTS IN (mm) WITH TOLERANCE OF ± 3 mm

Code	Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2,913	2,912	-1
B	Front Axle to FSOV	918	909	-9
C	Rear Axle to RSOV	740	740	0
D	Total Length at Centerline	4,571	4,562	-9
E	Front Bumper Thickness	120	120	0
F	Front Bumper Bottom to Ground	431	470	39
G	Sill Height at Front Wheel Well	233	247	14
H	Sill Height at Front Door Leading Edge	328	251	-77
I	Sill Height at B Pillar	241	268	27
J1	Sill Height at Rear Wheel Well	257	291	34
J2	Pinch Weld Height at Rear Wheel Well	222	264	42
K	Sill Height Aft of Rear Wheel Well	295	298	3
L	Rear Bumper Thickness	160	160	0
M	Rear Bumper Bottom to Ground	242	334	92
N	Sill Height to Window Bottom of Front Window Sill	705	671	-34
O	Front Door Leading Edge to Impact CL	926	832	-94
P	Rear Door Trailing Edge to Impact CL	1,173	1,114	-59
Q	Front Window Opening	615	633	18
R	Right Side Length	4,496	4,494	-2
S	Left Side Length	4,492	4,460	-32
T	Vehicle Width at B-Pillar	1,755	1,509	-246

DATA SHEET NO. 11
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2012 Ford Transit Connect XLT Wagon
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: MC0217
 Test Date: 2/3/2012



MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Measurement Description	Height Above Ground (mm)	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	291	187	750
2	Driver Hip Point	582	247	1200
3	Mid-Door	684	274	1200
4	Window Sill	892	237	1200
5	Window Top	1,709	30	900

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. 11 ... (CONTINUED)
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2012 Ford Transit Connect XLT Wagon
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: MC0217
 Test Date: 2/3/2012

EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

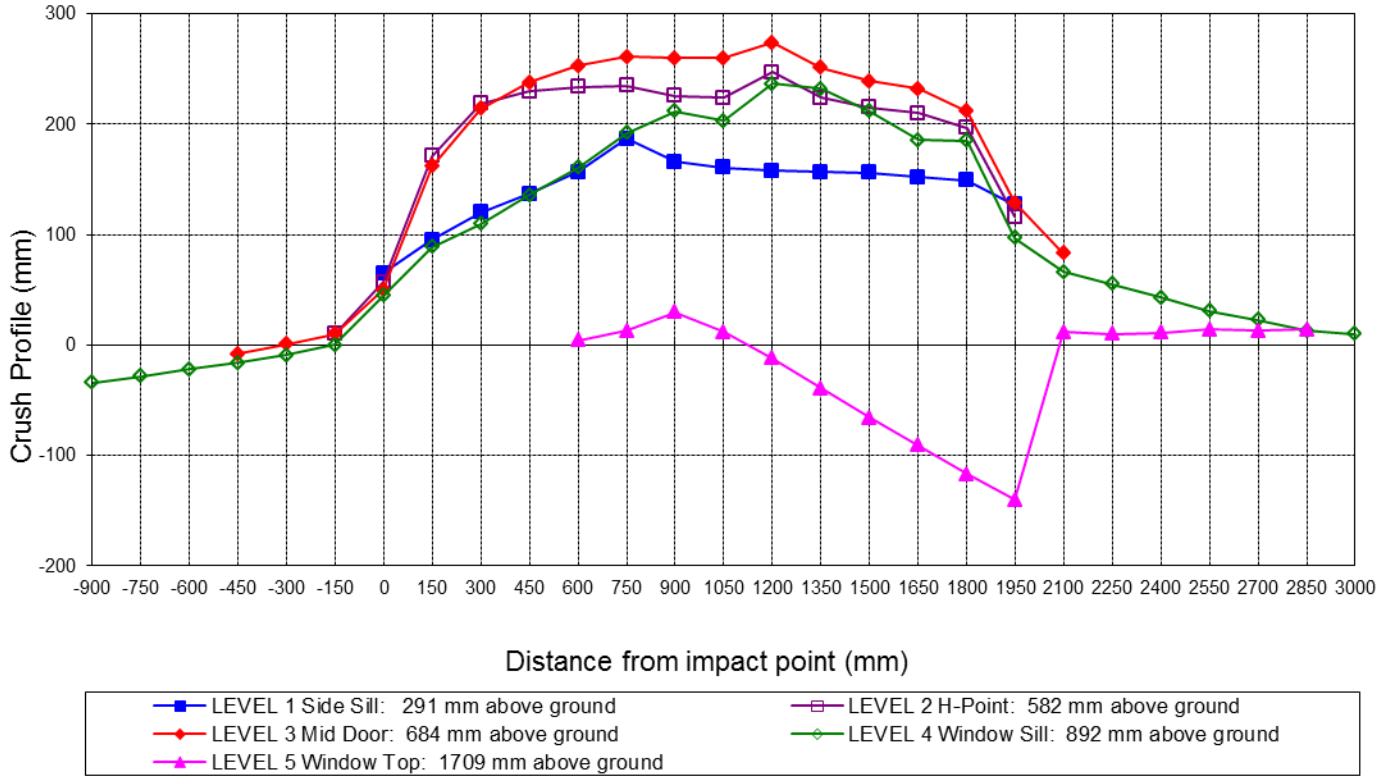
	Pre-Test					Post-Test					Difference					
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	
-900				726					760						-34	
-750				783					811						-28	
-600				805					827						-22	
-450			864	816				872	832					-8	-16	
-300			862	823				861	832					1	-9	
-150		852	840	830			842	830	830				10	10	0	
0	808	843	843	835		743	786	795	790		65	57	48	45		
150	807	842	849	840		712	671	687	751		95	171	162	89		
300	806	845	853	847		686	626	639	737		120	219	214	110		
450	806	848	857	852		669	618	619	716		137	230	238	136		
600	806	850	860	856	700	649	616	607	695	696	157	234	253	161	4	
750	806	852	864	859	709	619	617	603	667	696	187	235	261	192	13	
900	808	854	866	863	710	642	628	606	651	680	166	226	260	212	30	
1050	807	855	868	864	711	646	631	608	661	699	161	224	260	203	12	
1200	807	855	867	863	715	649	608	593	626	727	158	247	274	237	-12	
1350	807	855	867	863	717	650	631	616	631	756	157	224	251	232	-39	
1500	806	855	866	862	718	650	640	627	650	784	156	215	239	212	-66	
1650	804	855	867	861	720	652	645	635	675	811	152	210	232	186	-91	
1800	804	854	867	860	720	655	657	655	675	837	149	197	212	185	-117	
1950	803	858	862	859	720	676	742	733	762	860	127	116	129	97	-140	
2100			883	856	719			800	790	707			83	66	12	
2250				854	719				799	709				55	10	
2400				851	719				808	708				43	11	
2550				847	719				816	705				31	14	
2700				844	717				821	704				23	13	
2850				839	715				826	701				13	14	
3000				818					808					10		

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. 11 (CONTINUED)
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2012 Ford Transit Connect XLT Wagon
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: MC0217
 Test Date: 2/3/2012

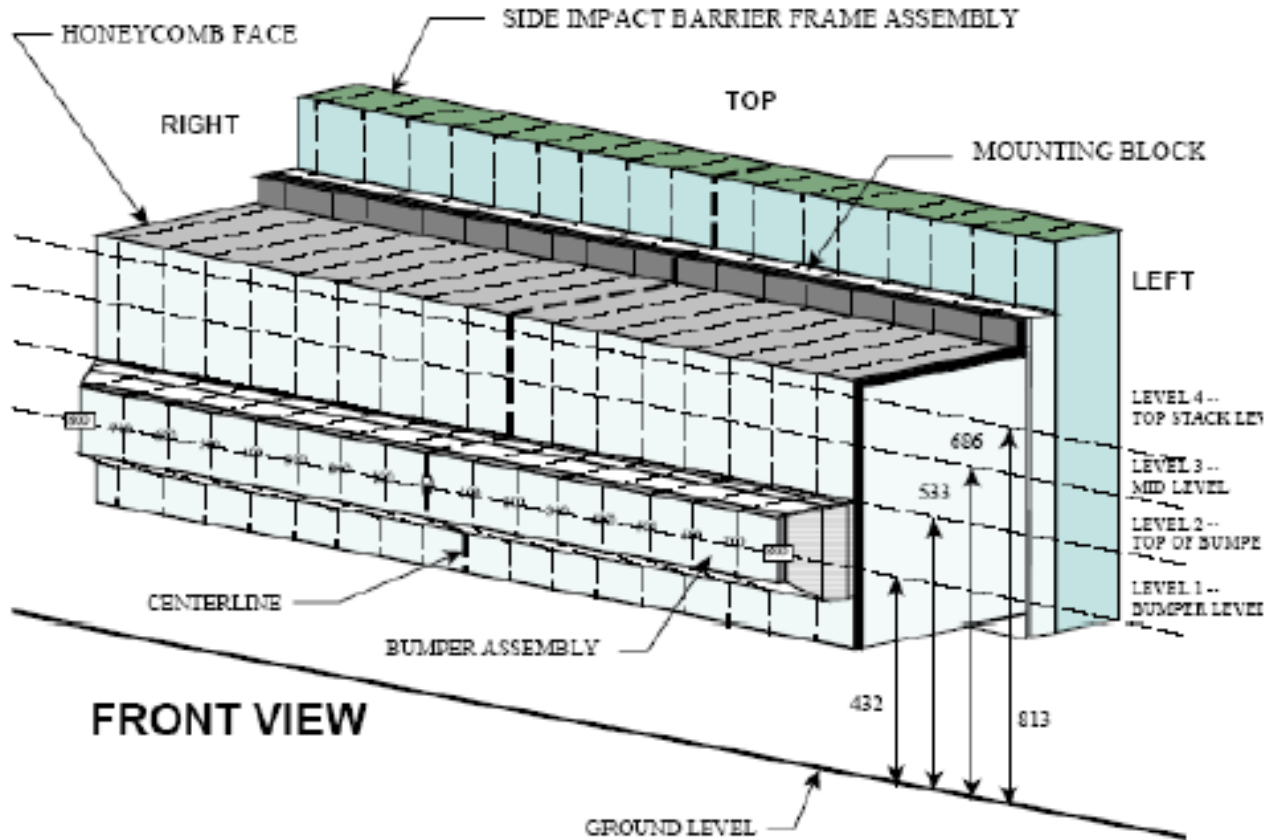


Vehicle Exterior Crush Measurements - Visual Representation

DATA SHEET NO. 12
MDB EXTERIOR STATIC CRUSH MEASUREMENTS

Test Vehicle: 2012 Ford Transit Connect XLT Wagon
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: MC0217
 Test Date: 2/3/2012



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	153	142	135	132	130	129	130	129	128	124	122	121	121	122	124	125	125
2	131	124	117	112	107	103	101	98	94	89	88	86	84	84	83	84	85
3	129	113	97	88	75	58	39	50	57	42	29	29	32	39	53	70	96
4	148	110	86	68	58	41	38	57	82	66	57	57	71	84	101	116	132

All dimensions in millimeters.

**DATA SHEET NO. 13
FMVSS NO. 301 STATIC ROLLOVER RESULTS**

Test Vehicle: 2012 Ford Transit Connect XLT Wagon NHTSA No.: MC0217
 Test Program: NCAP Side MDB Impact Test Test Date: 2/3/2012

Test Time: 1:25 PM Temperature: 2° 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: No Spillage Occurred

FMVSS NO. 301 STATIC ROLLOVER DATA



ROLLOVER SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	72	300	372
90° to 180°	65	300	365
180° to 270°	66	300	366
270° to 360°	70	300	370

FMVSS NO. 301 ROLLOVER SPILLAGE TABLE (units in ounces)

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

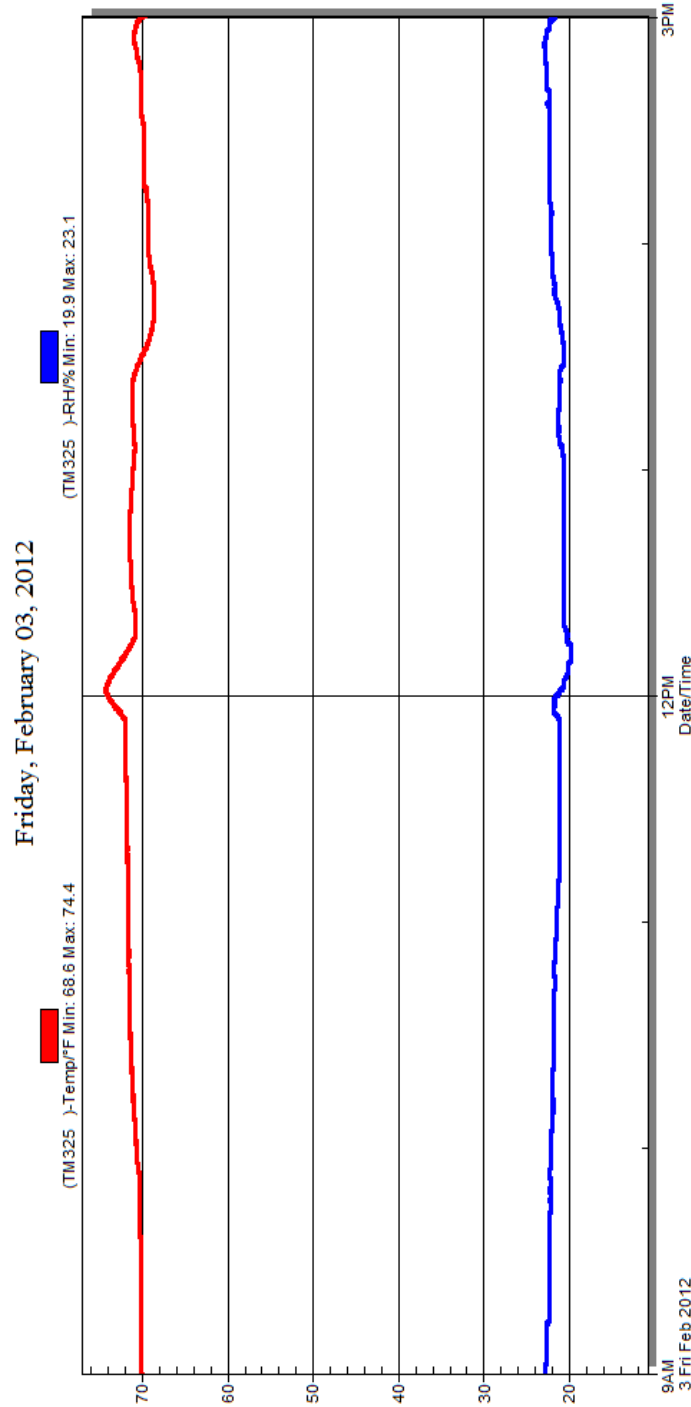
ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

Test Phase	Spillage Location
0° to 90°	
90° to 180°	
180° to 270°	
270° to 360°	

DATA SHEET NO. 14
DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION DATA

Test Vehicle: 2012 Ford Transit Connect XLT Wagon
 Test Program: Side MDB NCAP

NHTSA No.: MC0217
 Test Date: 2/3/2012



Temperature and Humidity Stabilization Chart/Data for Dummies and Test Vehicle

APPENDIX A
PHOTOGRAPHS

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Figure A-1: As-Delivered Right Front ¾ View of Test Vehicle



Figure A-2: As-Delivered Left Rear ¾ View of Test Vehicle



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



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



Figure A-5: Pre-Test Left Front 3/4 View of Test Vehicle



Figure A-6: Post-Test Left Front 3/4 View of Test Vehicle

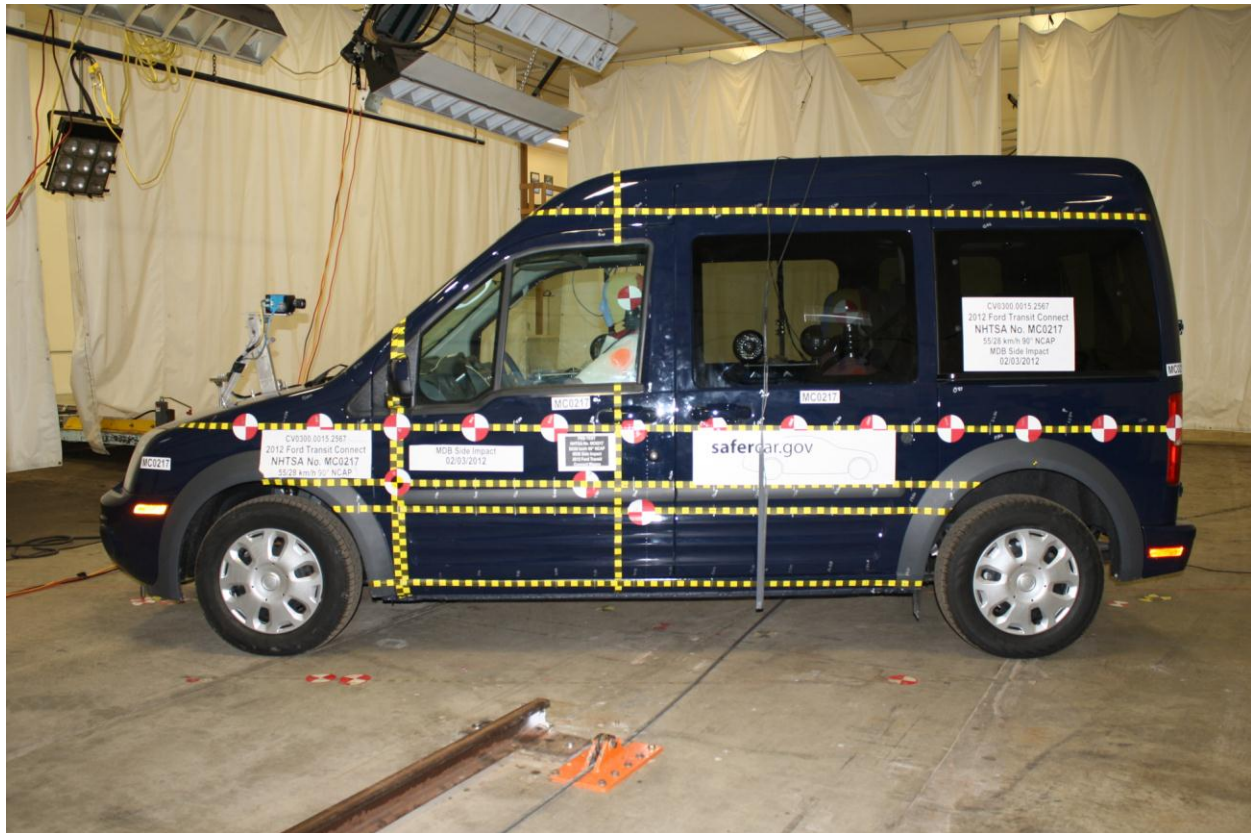


Figure A-7: Pre-Test Left Side View of Test Vehicle



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



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



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



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



Figure A-12: Post-Test Rear Side 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 Area



Figure A-16: Post-Test Overhead View of Test Area



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



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

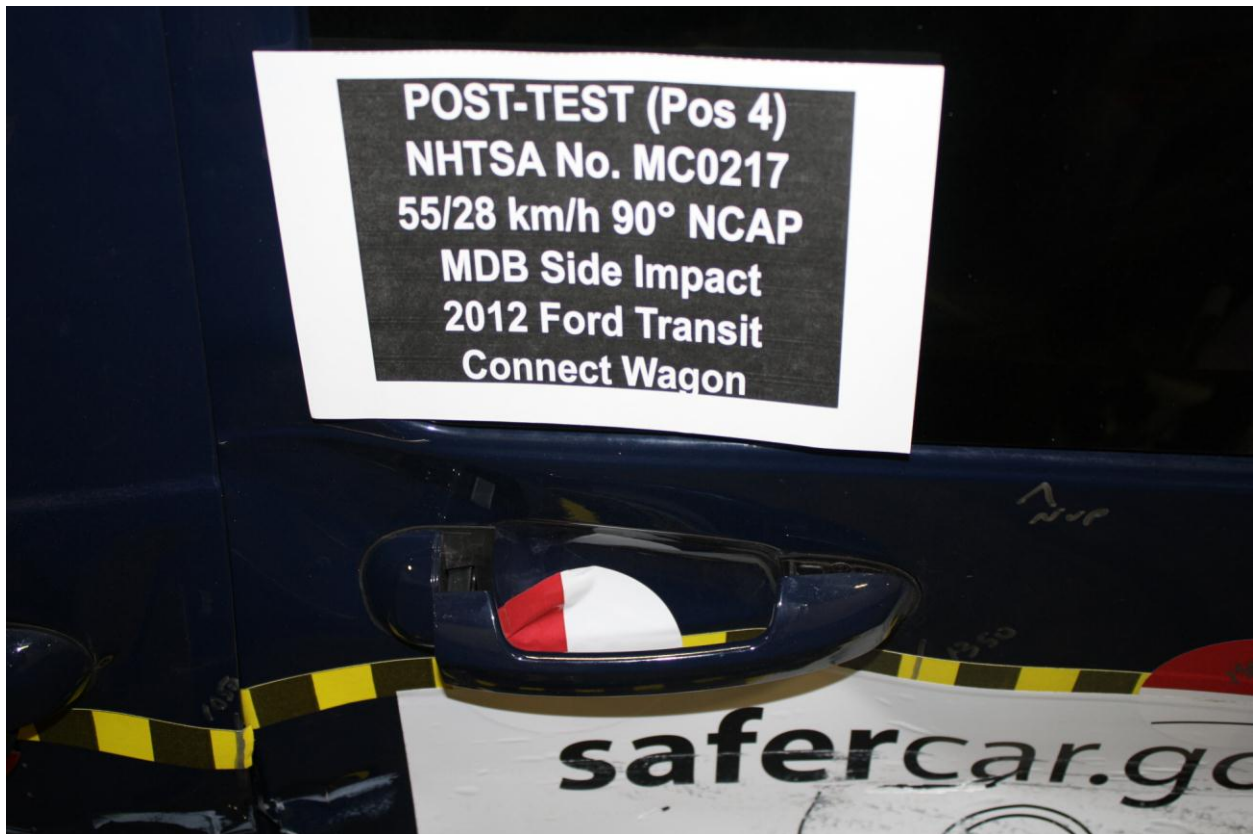


Figure A-24: Post-Test Left Rear Door Latch Close-Up



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



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 and Chalking



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



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



Figure A-37: View of Disengaged Parking Brake



Figure A-38: Pre-Test View of Parking Brake



Figure A-39: Pre-test Close-Up Left Side View of Driver Seat Track



Figure A-40: Pre-Test Close-Up Left Side View of Driver Seat Back

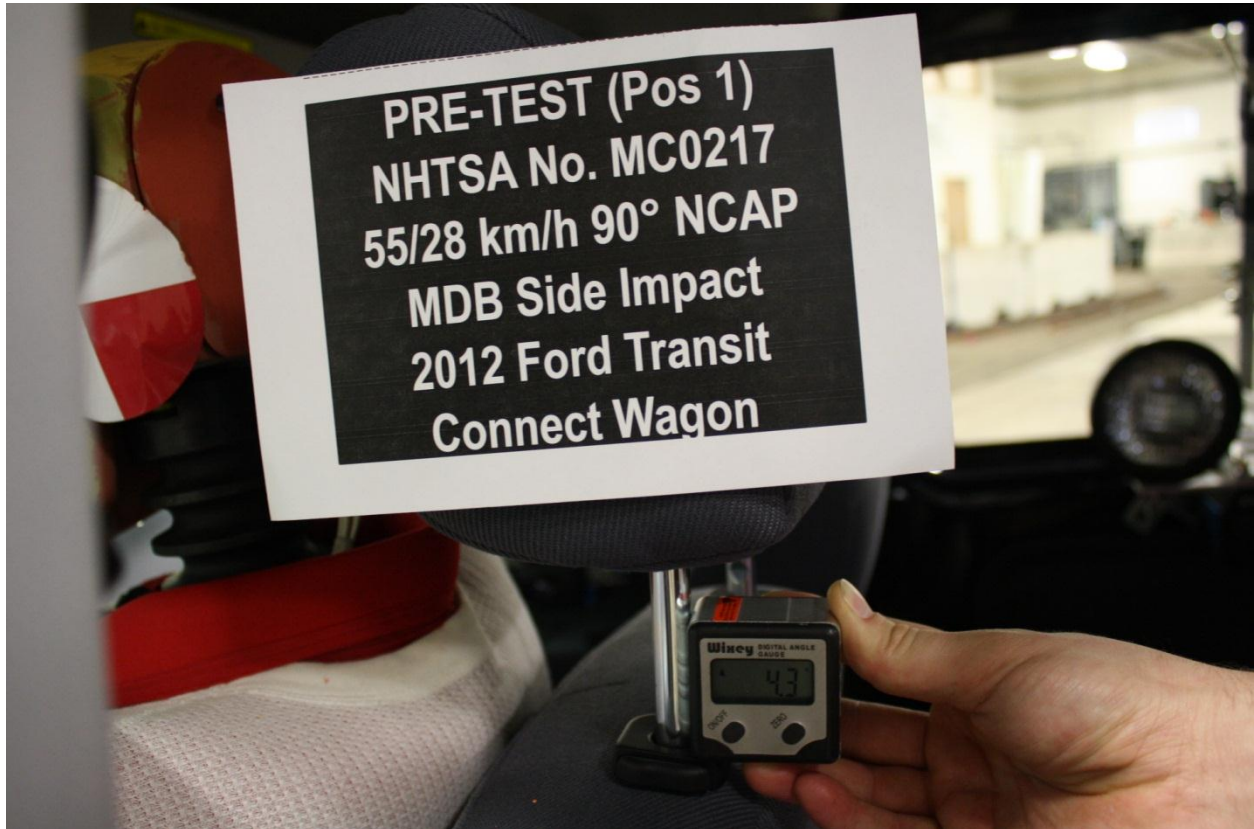


Figure A-41: Pre-Test Close-Up View of Driver Seat Back or Head Restraint



Figure A-42: Pre-Test Driver Dummy and Door Clearance View



Figure A-43: Post-Test Driver Dummy and Door Clearance View



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



Figure A-45: Post-Test Right Side View of Driver Dummy and Front Seat of Occupant Compartment



Figure A-46: Pre-Test Driver Inner Door Panel View



Figure A-47: Post-Test Driver Inner Door Panel View



Figure A-48: Post-Test Driver Dummy Close-Up Head Contact with Vehicle View

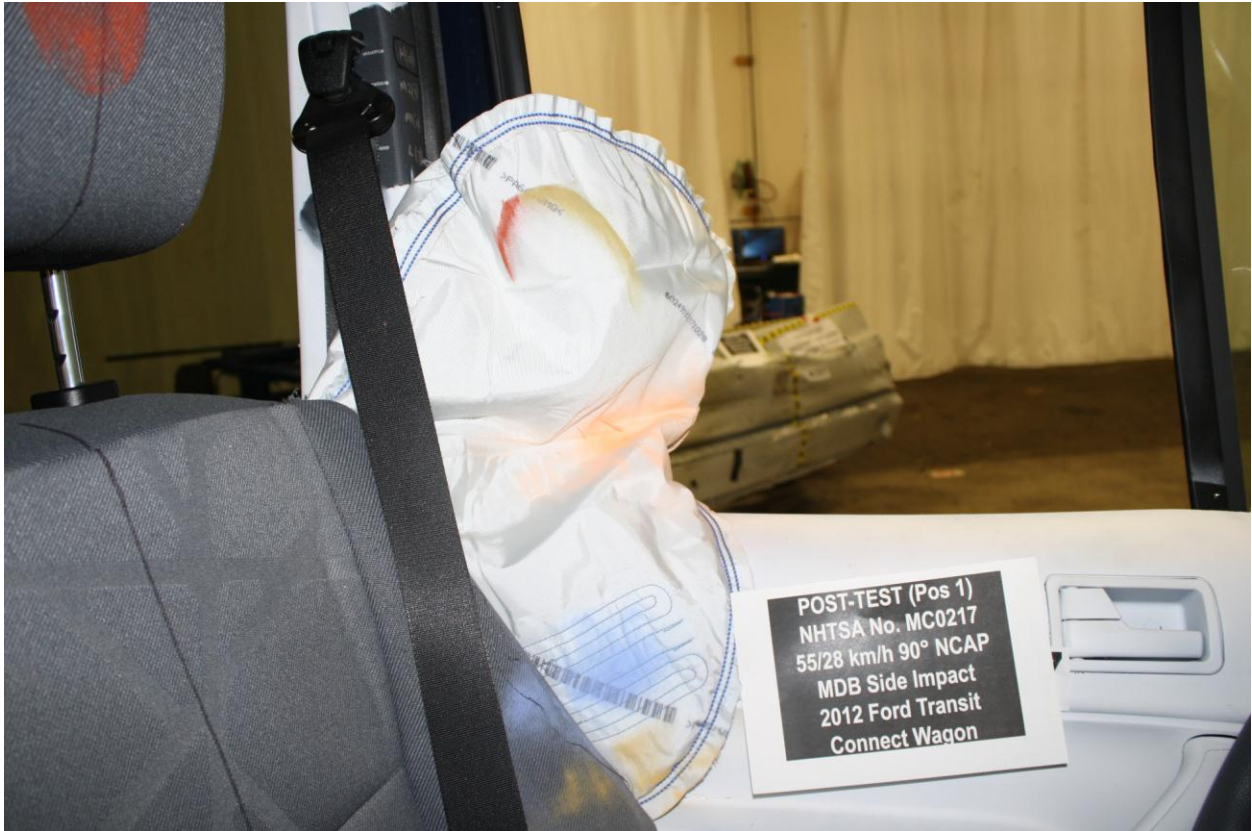


Figure A-49: Post-Test Driver Dummy Close-Up Head Contact with Side Airbag View



Figure A-50: Post-Test Driver Dummy Close-Up Torso Contact with Vehicle Interior View

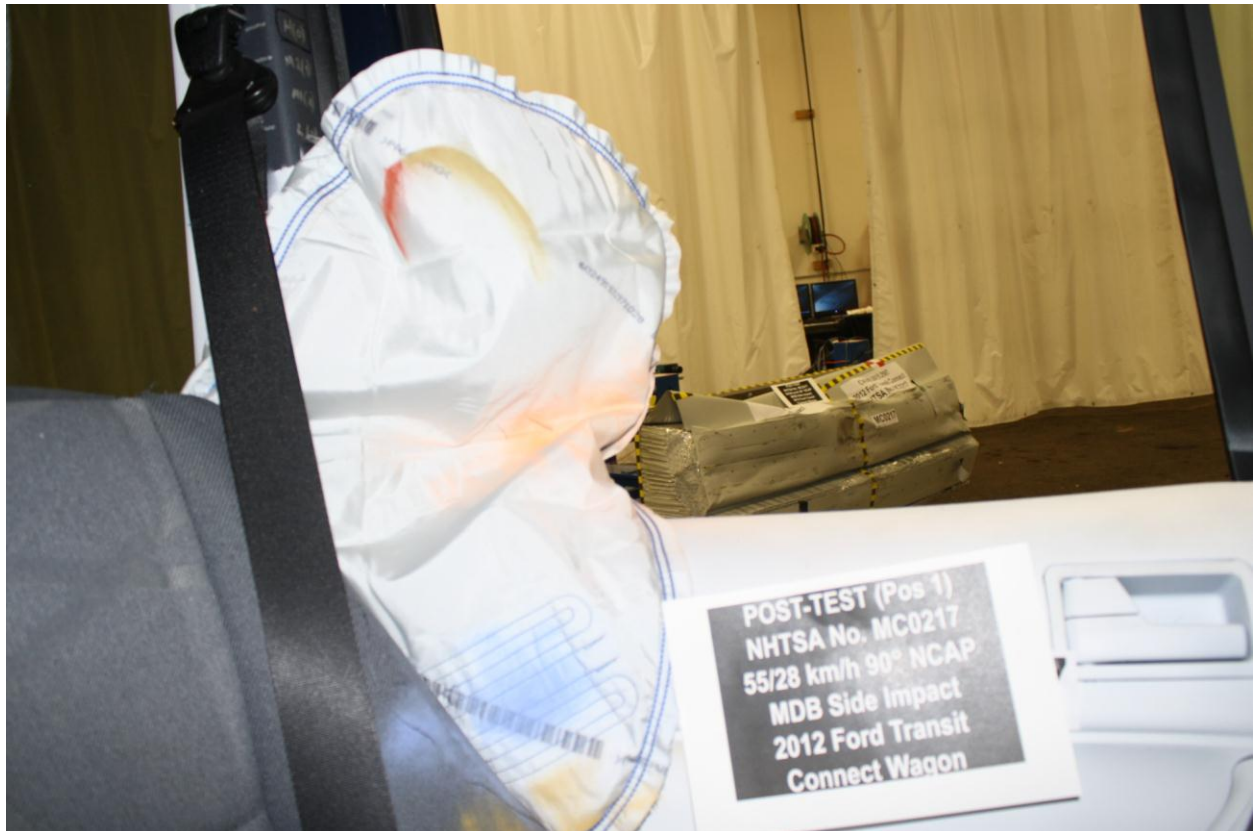


Figure A-51: Post-Test Driver Dummy Close-Up Torso Contact with Side Airbag View



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

Photo Not Applicable

No Pelvis Airbag

Figure A-53: Post-Test Driver Dummy Close-Up Pelvis Contact with Side Airbag View



Figure A-54: Pre-Test Left Side View of Passenger Dummy Showing Belt and Chalking



PRE-TEST (Pos 4)
NHTSA No. MC0217
55/28 km/h 90° NCAP
MDB Side Impact
2012 Ford Transit
Connect Wagon

Figure A-55: Pre-Test Left Side View of Passenger Dummy Shoulder and Door Top View



POST-TEST (Pos 4)
NHTSA No. MC0217
55/28 km/h 90° NCAP
MDB Side Impact
2012 Ford Transit
Connect Wagon

Figure A-56: Post-Test Left Side View of Passenger Dummy Shoulder and Door Top View



Figure A-57: Pre-Test Frontal View of Rear Passenger Seat Back Prior to Dummy Positioning



Figure A-58: Pre-Test Frontal View of Rear Passenger Dummy Head and Shoulders in Relation to Head Restraint



Figure A-59: Pre-Test Overhead View of Rear Passenger Seat Pan Prior to Dummy Positioning



Figure A-60: Pre-Test Overhead View of Rear Passenger Dummy Thighs on Seat Pan



Figure A-61: Pre-Test View of Rear Passenger Dummy's Neck Showing Position of Adjustable Neck Bracket



Figure A-62: Pre-Test View of Rear Passenger Dummy's Head Showing Dummy's Head is Level



Figure A-63: Pre-Test Placement of Rear Passenger Dummy's Feet



Figure A-64: Pre-Test View of Belt Anchorage for Rear Passenger Dummy



Figure A-65: Pre-Test Close-Up Left Side View of Rear Passenger Seat Track



Figure A-66: Pre-Test Close-Up Left Side View of Rear Passenger Seat Back



Figure A-67: Pre-Test Close-Up View of Rear Passenger Seat Back or Head Restraint



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



Figure A-69: Post-Test Passenger Dummy and Door Clearance View



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



Figure A-71: Post-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment



Figure A-72: Pre-Test Passenger Inner Door Panel View



Figure A-73: Post-test Passenger Inner Door Panel View

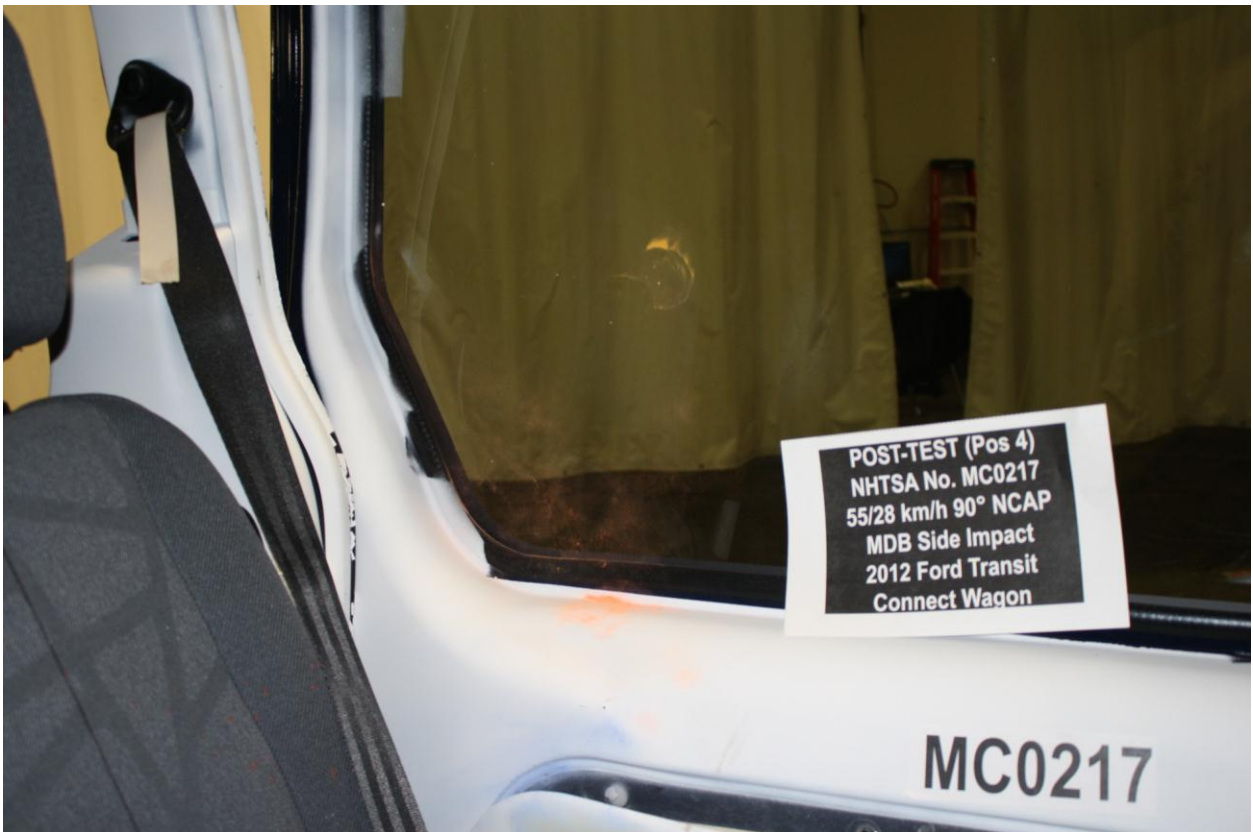


Figure A-74: Post-Test Rear Passenger Dummy Close-Up Head Contact with Vehicle View

Photo Not Applicable

No Side Airbag

Figure A-75: Post-Test Rear Passenger Dummy Close-Up Head Contact with Side Airbag View

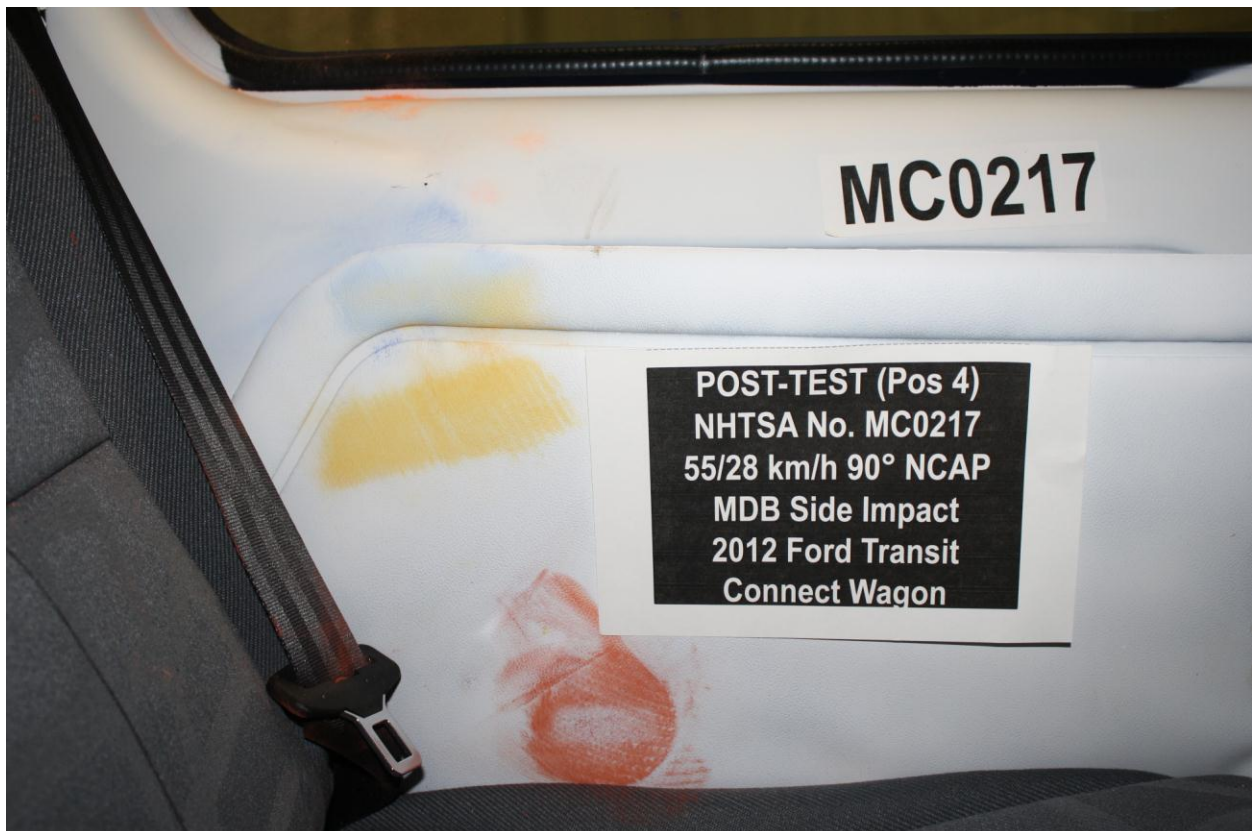


Figure A-76: Post-Test Rear Passenger Dummy Close-Up Torso Contact with Vehicle Interior View

Photo Not Applicable

No Side Airbag

Figure A-77: Post-Test Rear Passenger Dummy Close-Up Torso Contact with Side Airbag View

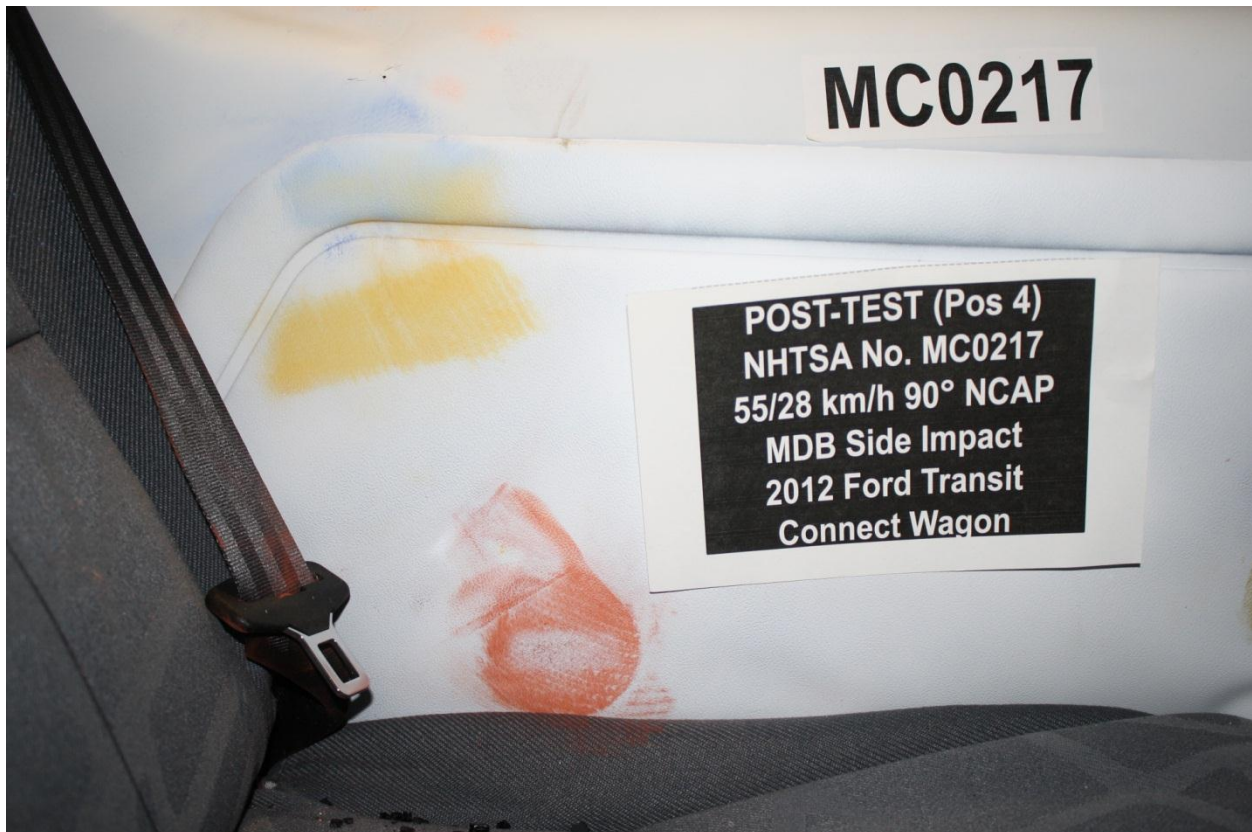


Figure A-78: Post-Test Rear Passenger Dummy Close-Up Pelvis Contact View

Photo Not Applicable

No Side Airbag

Figure A-79: Post-Test Rear Passenger Dummy Close-Up Pelvis Contact with Side Airbag View



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



Figure A-81: Post-Test View of Fuel Filler Cap or Fuel Filler Neck



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



Figure A-83: Post-Test Front View of MDB Impactor Face



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

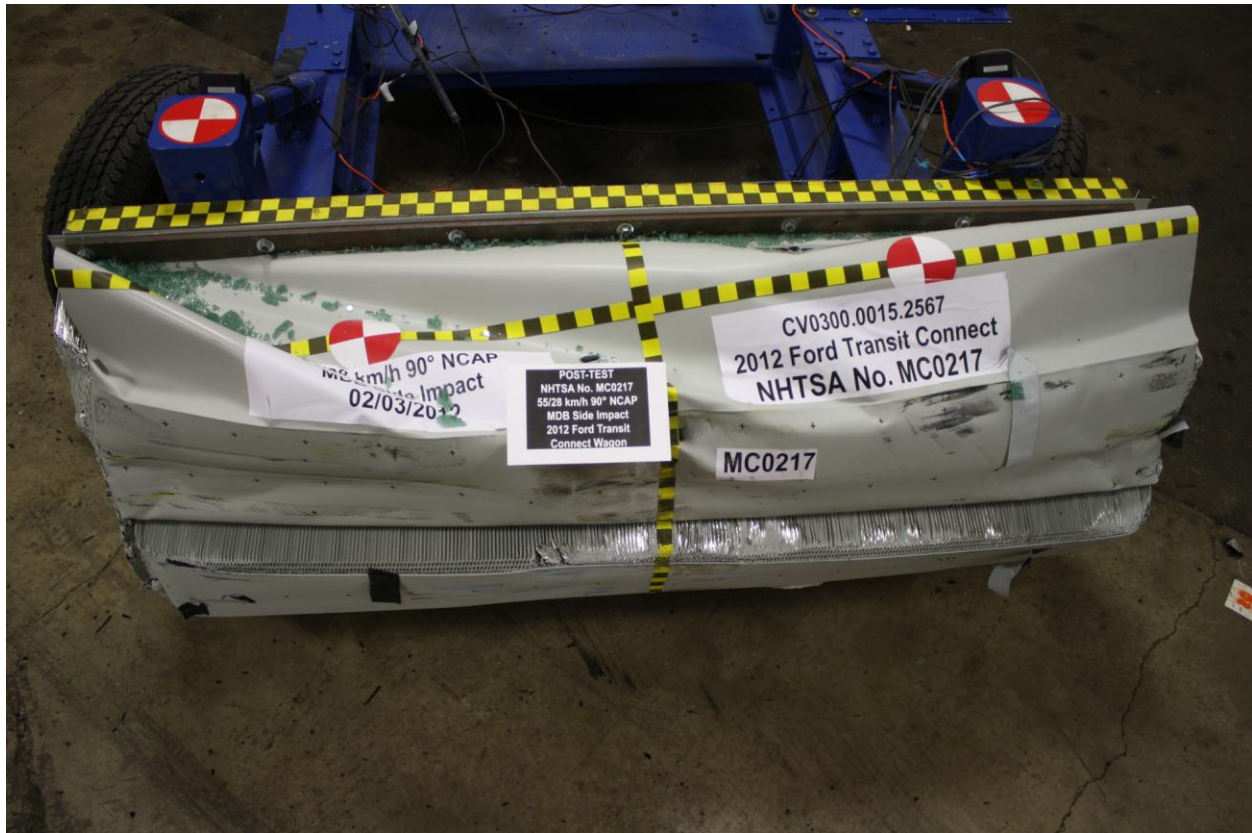


Figure A-85: Post-Test Top View of MDB Impactor Face



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



Figure A-87: Post-Test Left Side View of MDB Impactor Face



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



Figure A-89: Post-Test Right Side View of MDB Impactor Face

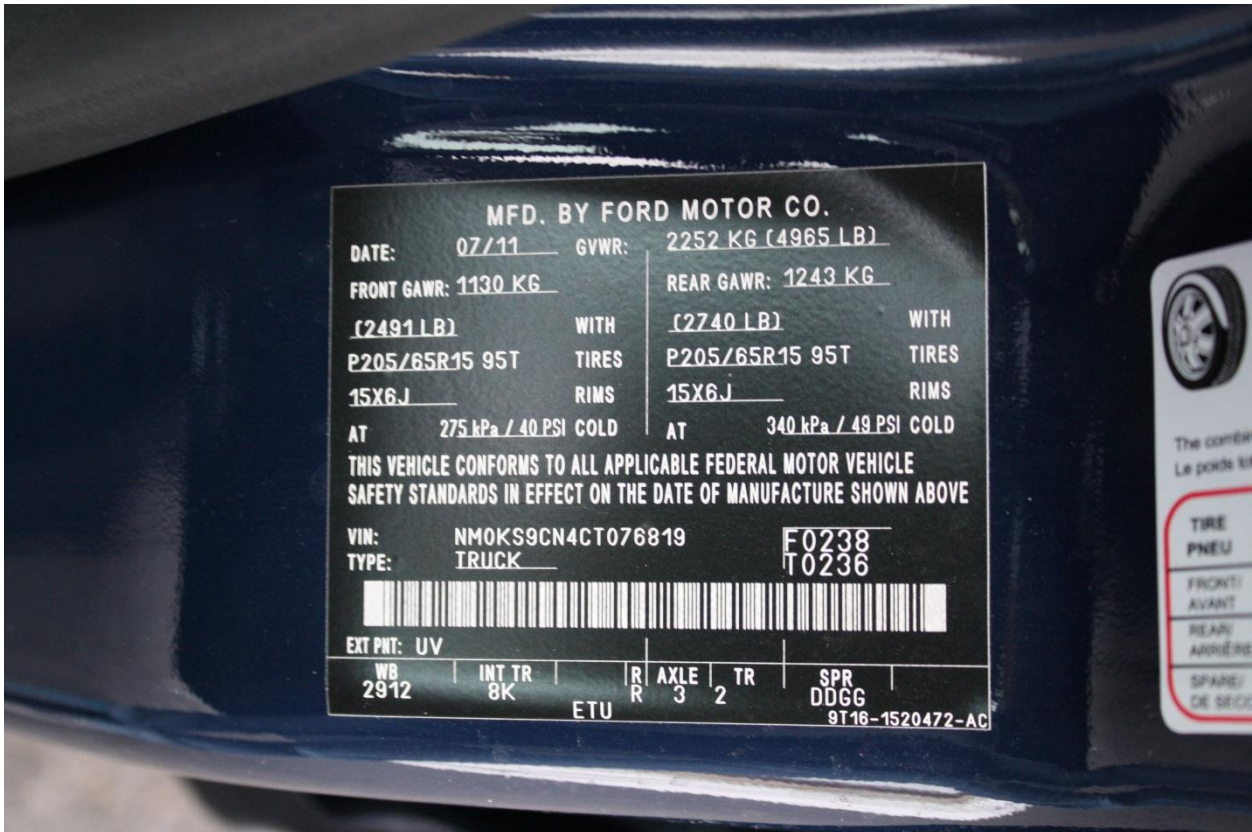


Figure A-90: Close-Up View of Vehicle's Certification Label



Figure A-91: Close-Up View of Vehicle's Tire Information Placard or Label

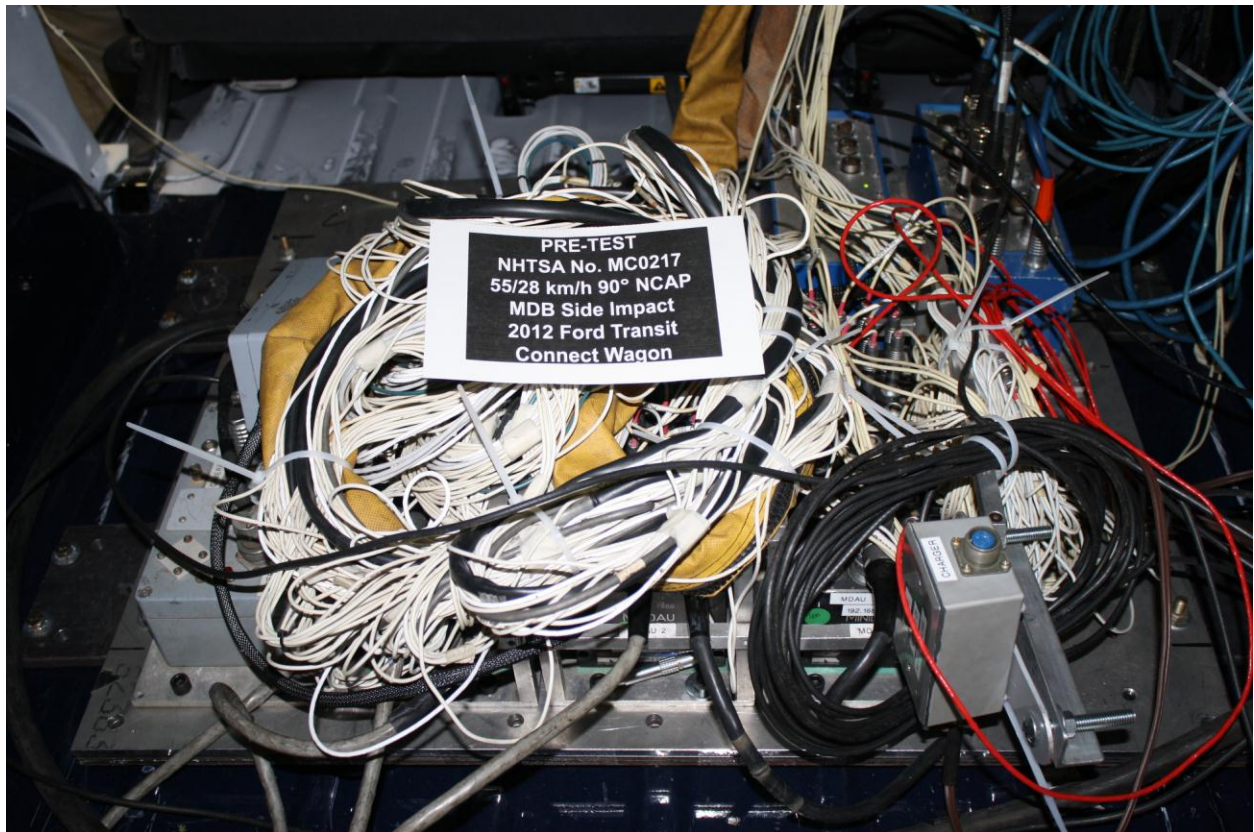


Figure A-92: Pre-Test Ballast View



Figure A-93: Post-Test Primary and Redundant Speed Trap Read-Out



Figure A-94: FMVSS No. 301 Static Rollover 0 Degrees



Figure A-95: FMVSS No. 301 Static Rollover 90 Degrees



Figure A-96: FMVSS No. 301 Static Rollover 180 Degrees

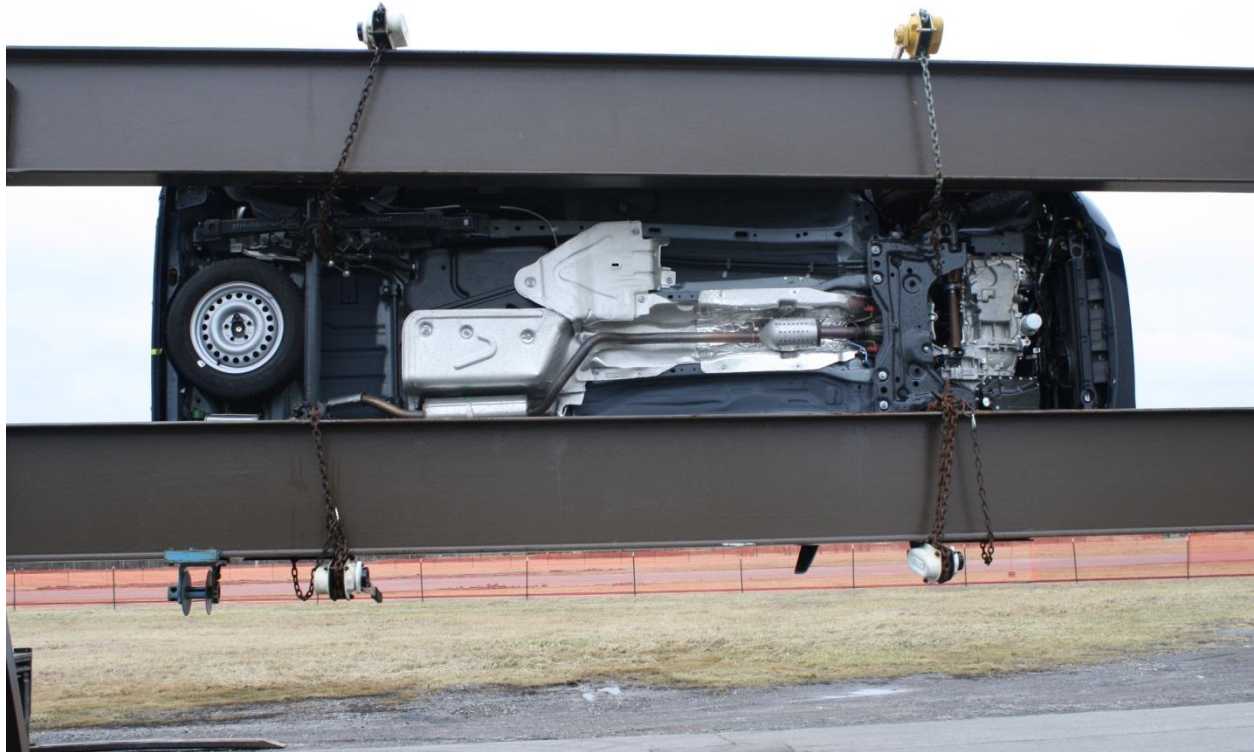


Figure A-97: FMVSS No. 301 Static Rollover 270 Degrees



Figure A-98: FMVSS No. 301 Static Rollover 360 Degrees



Figure A-99: Impact Event

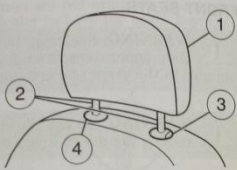
		VEHICLE DESCRIPTION TRANSIT CONNECT			2012 XLT PREMIUM WAGON XLT 6-PASSENGER 2.0L I4 DURATEC GAS ENGINE 4 SPD AUTO TRANSAXLE W/ O/D	EXTERIOR DARK BLUE INTERIOR DARK GRAY CLOTH	CT 076819
STANDARD EQUIPMENT INCLUDED AT NO EXTRA CHARGE							
EXTERIOR • PLATINUM GRILLE • BUMPERS - BODY COLOR • DOOR HANDLES - BODY COLOR • DEFROSTER PACKAGE • DOORS - DUAL SLIDING SIDE, 180-DEGREE HINGED, REAR • INTEGRATED SPOTTER MIRRORS • MOLDINGS - BODY SIDE, GREY • WHEEL LID - GREY • WHEELS, 15" STEEL W/COVER • INTEGRATED FOG LAMPS • FLIP OUT REAR QTR GLASS		FUNCTIONAL • FLR CYRING-CRPT FRT/ANYL RR • OVERHEAD STORAGE SHELF • POWER GROUP SAFETY/SECURITY • AIR BAGS - FRONT AND SIDE • ADVANCETRAC W/RSC • COLLAPSING STEERING COLUMN • 4-WHEEL ABS W/ TPMS		WARRANTY • 3YR/36,000 BUMPER / BUMPER • 3YR/60,000 POWERTRAIN • 3YR/60,000 ROADSIDE ASSIST		PRICE INFORMATION STANDARD VEHICLE PRICE ORDER CODE 320A Manufacturer's Suggested Retail Price \$23,585.00	
INTERIOR • AIR COND. MANUAL FRONT • AM/FM STEREO/CD, W/4 SPKRS • BUCKET SEATS-MANUAL 6-WAY • DRIVER, 4-WAY FRONT PASS • 3-PASS, 60/40 BENCH SEAT • DOME LAMPS - FRT, MID & RR		OPTIONAL EQUIPMENT REVERSE SENSING SYSTEM 280.00 NOKIA BLUETOOTH SYSTEM 220.00 FRONT LICENSE PLATE BRACKET NO CHARGE TOTAL OPTIONS 500.00		TOTAL VEHICLE & OPTIONS 24,085.00 DESTINATION & DELIVERY 825.00			
EPA Fuel Economy Estimates							
CITY MPG 22 Expected range for most drivers 18 to 26 MPG	Estimated Annual Fuel Cost \$2,314 based on 15,000 miles at \$3.70 per gallon		HIGHWAY MPG 27 Expected range for most drivers 22 to 32 MPG	Combined Fuel Economy This Vehicle 24 All SUVs			
See the FREE Fuel Economy Guide at dealers or www.fueleconomy.gov							
SOLD TO 41X 310 Northport Ford 7800 N. 76th St. Milwaukee WI 53223	ONE RH79	DEALER NO. 41X 310	METHOD OF TRANSP. RAIL ITEM #: 41-T115 O/T 2				
SHP TO	TWO	NMOKSBCN4CT076819 					
SHP THROUGH	FINAL ASSEMBLY POINT OTOSAN	BH263 N RB2 X 250 000030 08 26 11					
EXTENDED SERVICE PLAN Ford Extended Service Plan is the only service contract backed by Ford and honored at all Ford and Lincoln Mercury Dealers. Ask your dealer for prices and additional details or see our website at www.ford-esp.com.							
Frontal Crash Star ratings based on the risk of injury in a frontal impact. Frontal ratings should ONLY be compared to other vehicles of similar size and weight.		Driver Passenger	Not Rated				
Side Crash Star ratings based on the risk of injury in a side impact.		Front seat Rear seat	Not Rated				
Rollover Star ratings based on the risk of rollover in a single vehicle crash.		★ ★ ★					
Star ratings range from 1 to 5 stars (★ ★ ★ ★ ★), with 5 being the highest. Source: National Highway Traffic Safety Administration (NHTSA).							
www.safercar.gov or call 1-888-327-4236							

Figure A-100: Monroney Label

Seating and Safety Restraints

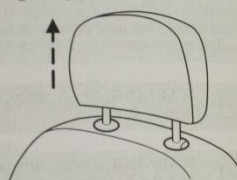
The adjustable head restraints consist of:

- a trimmed energy absorbing foam and structure (1),
- two steel stems (2),
- a guide sleeve adjust/release button (3),
- and a guide sleeve unlock/remove button (4).

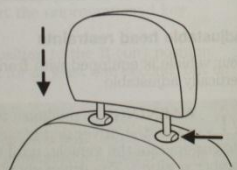


To adjust the head restraint, do the following:

1. Adjust the seatback to an upright driving/riding position.
2. Raise the head restraint by pulling up on the head restraint.



3. Lower the head restraint by pressing and holding the guide sleeve adjust/release button and pushing down on the head restraint.



Properly adjust the head restraint so that the top of the head restraint is even with the top of your head and positioned as close as possible to the back of your head. For occupants of extremely tall stature, adjust the head restraint to its full up position.

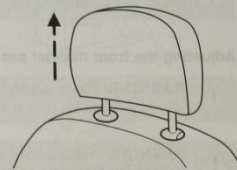
86

Seating and Safety Restraints

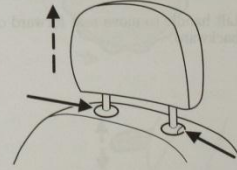
WARNING: The adjustable head restraint is a safety device. Whenever possible it should be installed and properly adjusted when the seat is occupied.

To remove the adjustable head restraint, do the following:

1. Pull up the head restraint until it reaches the highest adjustment position.

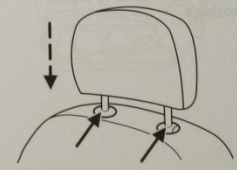


2. Use a push tool, such as a key, to press the unlock/remove button located on the side of the guide sleeve and, at the same time, press the adjust/release button, then pull the head restraint upward.



To reinstall the adjustable head restraint, do the following:

1. Insert the two stems into the guide sleeve collars.
2. Push the head restraint down until it locks.



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

Seating and Safety Restraints

REAR SEATS

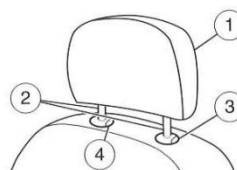
Second row adjustable head restraints (if equipped)

Your vehicle may be equipped with head restraints that are vertically adjustable.

WARNING: To minimize the risk of neck injury in the event of a crash, the driver and passenger occupants should not sit in and/or operate the vehicle, until the head restraint is placed in its proper position. The driver should never adjust the head restraint while the vehicle is in motion.

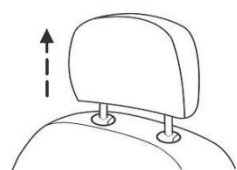
The adjustable head restraints consist of:

- a trimmed energy absorbing foam and structure (1),
- two steel stems (2),
- a guide sleeve adjust/release button (3),
- and a red guide sleeve unlock/remove button (4).



To adjust the head restraint, do the following:

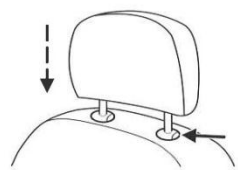
1. Adjust the seatback to an upright driving/riding position.
2. Raise the head restraint by pulling up on the head restraint.



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Seating and Safety Restraints

3. Lower the head restraint by pressing and holding the guide sleeve adjust/release button and pushing down on the head restraint.

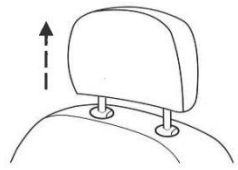


Properly adjust the head restraint so that the top of the head restraint is even with the top of your head and positioned as close as possible to the back of your head. For occupants of extremely tall stature, adjust the head restraint to its full up position.

WARNING: The adjustable head restraint is a safety device. Whenever possible it should be installed and properly adjusted when the seat is occupied.

To remove the adjustable head restraint, do the following:

1. Pull up the head restraint until it reaches the highest adjustment position.



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Figure A-102: Left Rear Passenger Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

APPENDIX B

VEHICLE AND DUMMY RESPONSE DATA PLOTS

TABLE OF DATA PLOTS
Driver & Passenger Dummy Instrumentation Plots

Fig.	Description	Page
1	Driver Head Acceleration (X) Primary vs. Time	B-5
2	Driver Head Acceleration (Y) Primary vs. Time	B-5
3	Driver Head Acceleration (Z) Primary vs. Time	B-6
4	Driver Head Resultant Acceleration Primary vs. Time	B-6
5	Driver Upper Thorax Rib Deflection (Y) vs. Time	B-7
6	Driver Middle Thorax Rib Deflection (Y) vs. Time	B-7
7	Driver Lower Thorax Rib Deflection (Y) vs. Time	B-8
8	Driver Thorax Rib Deflection Maximum vs. Time	B-8
9	Driver Anterior Abdominal Force (Y) vs. Time	B-9
10	Driver Middle Abdominal Force (Y) vs. Time	B-9
11	Driver Posterior Abdominal Force (Y) vs. Time	B-10
12	Driver Total Abdominal Force (Y) vs. Time	B-10
13	Driver Pubic Symphysis Force (Y) vs. Time	B-11
14	Passenger Head Acceleration (X) vs. Time Primary	B-11
15	Passenger Head Acceleration (Y) vs. Time Primary	B-12
16	Passenger Head Acceleration (Z) vs. Time Primary	B-12
17	Passenger Head Resultant Acceleration Primary vs. Time	B-13
18	Passenger Lower Spine T12 Acceleration (X) vs. Time	B-13
19	Passenger Lower Spine T12 Acceleration (Y) vs. Time	B-14
20	Passenger Lower Spine T12 Acceleration (Z) vs. Time	B-14
21	Passenger Lower Spine T12 Resultant Acceleration vs. Time	B-15
22	Passenger Iliac Force on Impact Side (Y) vs. Time	B-15
23	Passenger Acetabulum Force on Impact Side (Y) vs. Time	B-16
24	Passenger Total Pelvic Force on Impact Side (Y) vs. Time	B-16

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.

Additional Driver & Passenger Dummy Instrumentation Data

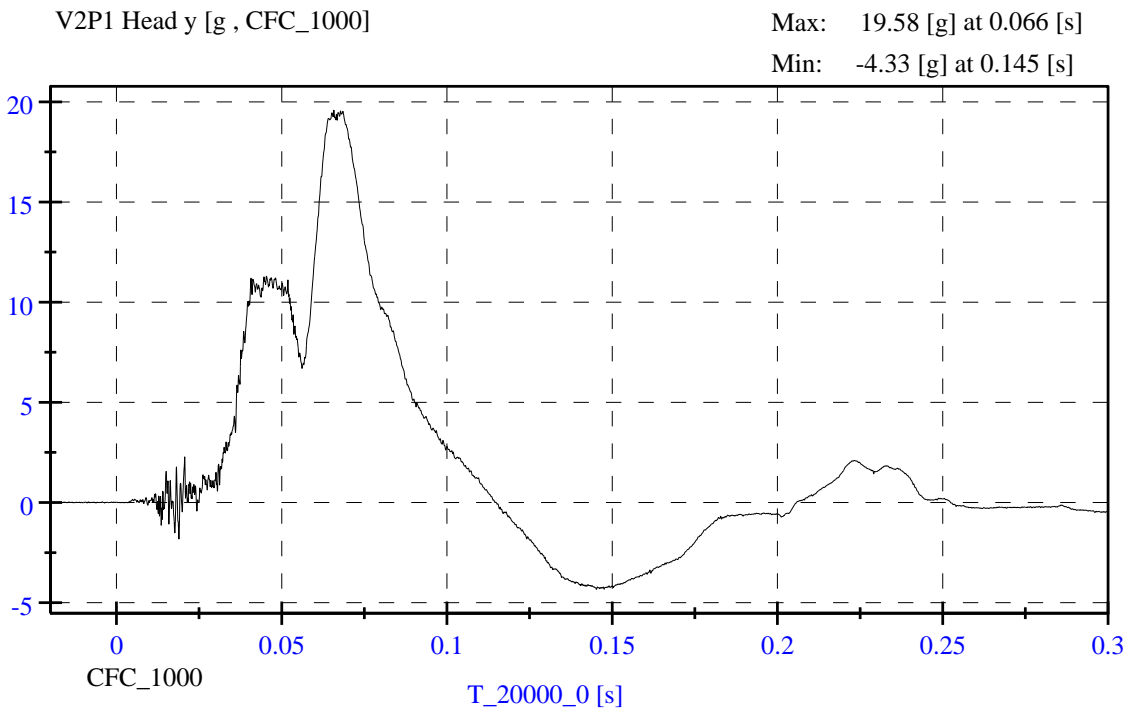
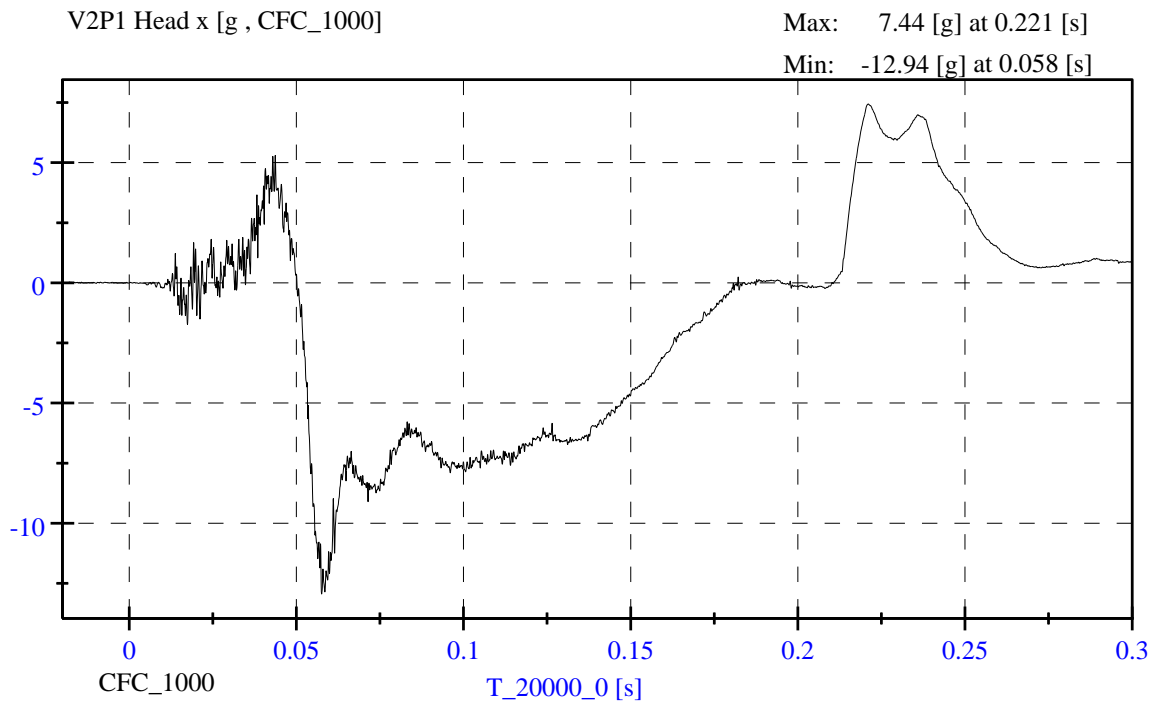
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Driver Lower Spine T12 Acceleration (Y)
Driver Lower Spine T12 Acceleration (Z)
Passenger Upper Thorax Rib Deflection (Y)
Passenger Middle Thorax Rib Deflection (Y)
Passenger Lower Thorax Rib Deflection (Y)
Passenger Upper Abdomen Rib Deflection (Y)
Passenger Lower Abdomen Rib Deflection (Y)
Driver Head Acceleration Redundant (X)
Driver Head Acceleration Redundant (Y)
Driver Head Acceleration Redundant (Z)
Passenger Head Acceleration Redundant (X)
Passenger Head Acceleration Redundant (Y)
Passenger Head Acceleration Redundant (Z)

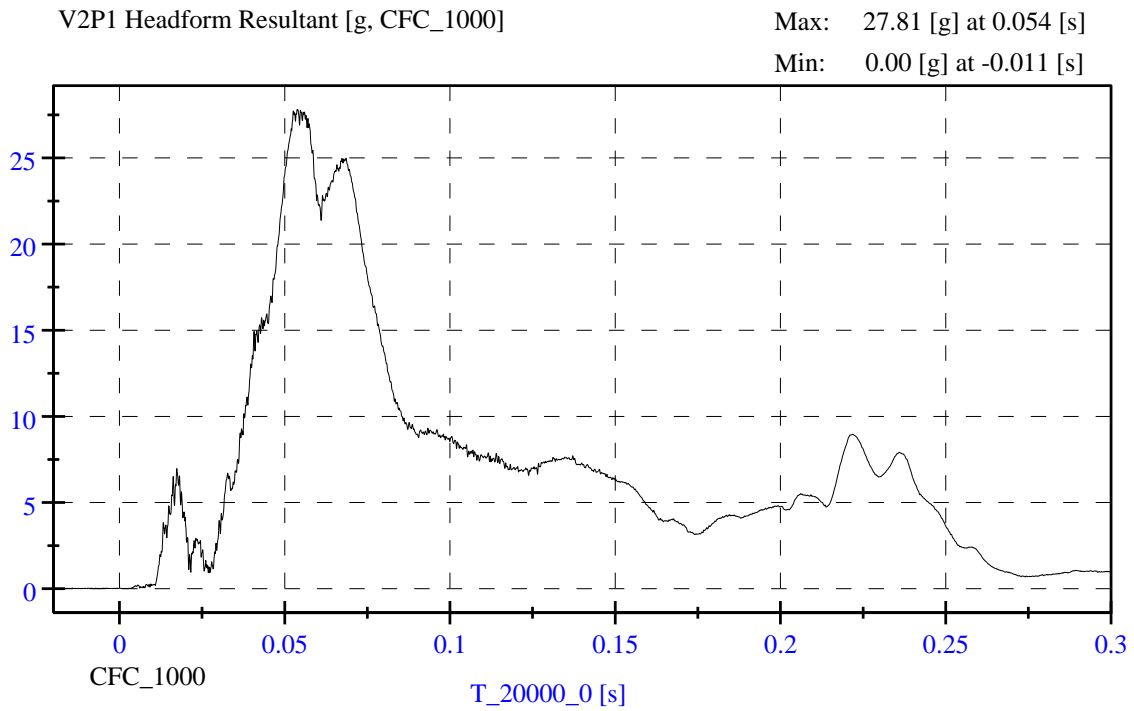
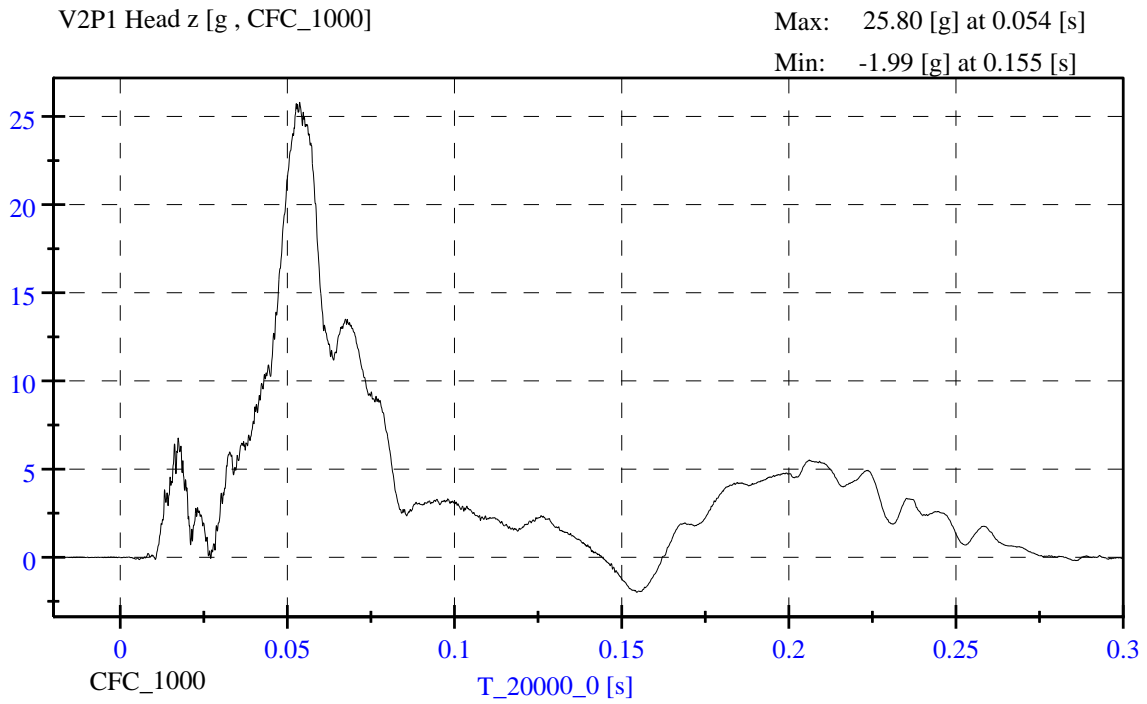
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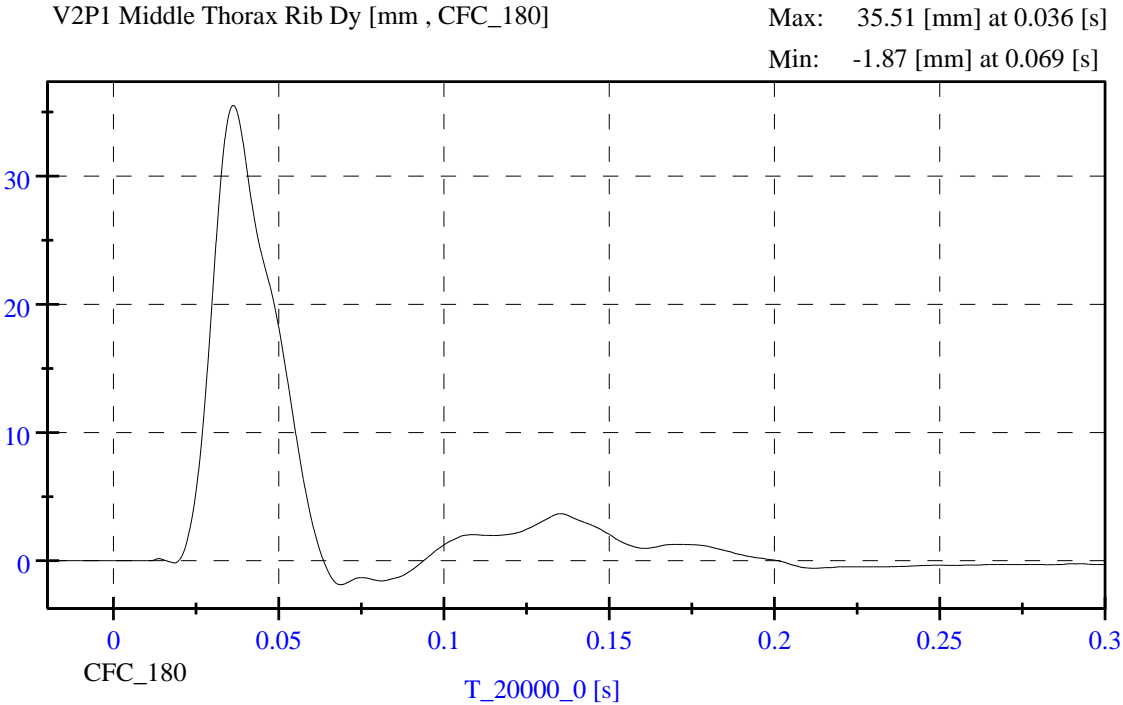
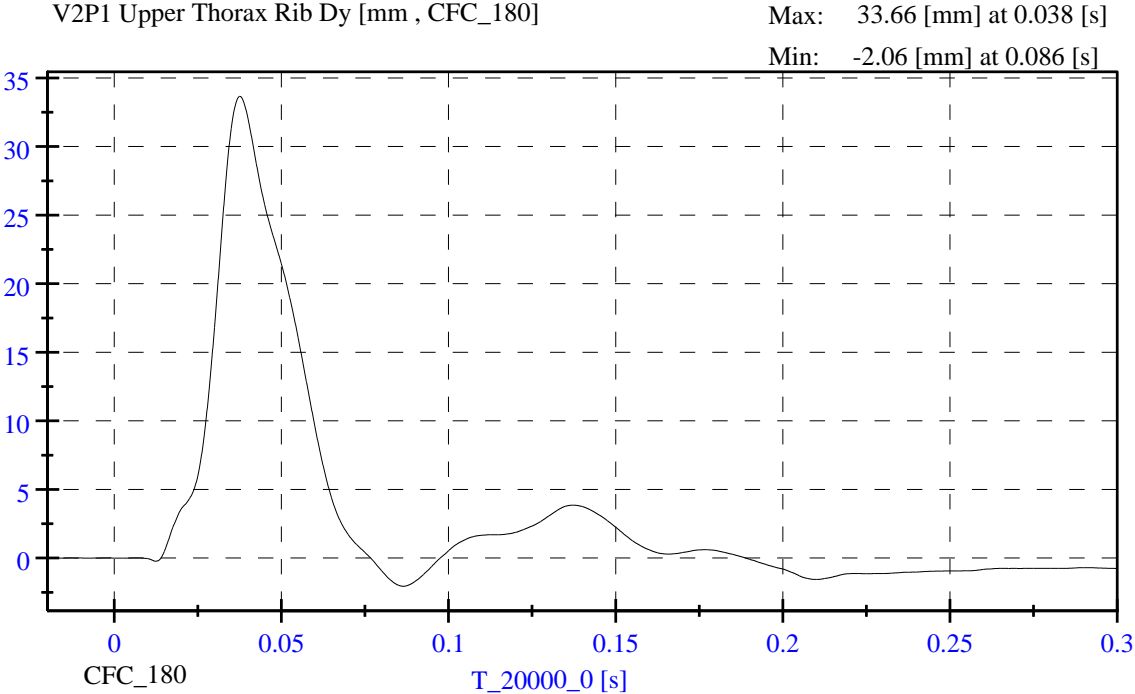
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Vehicle Center of Gravity Acceleration (Y)
Vehicle Center of Gravity Acceleration (Z)
Right Side Sill at Front Seat Acceleration (X)
Right Side Sill at Front Seat Acceleration (Y)
Right Side Sill at Front Seat Acceleration (Z)
Right Side Sill at Rear Seat Acceleration (X)
Right Side Sill at Rear Seat Acceleration (Y)
Right Side Sill at Rear Seat Acceleration (Z)
Left Side Sill at Front Seat Acceleration (Y)
Left Side Sill at Rear Seat Acceleration (Y)
Lower A-Post Acceleration (Y)
Middle A-Post Acceleration (Y)
Lower B-Post Acceleration (Y)
Middle B-Post Acceleration (Y)
Front Seat Track Acceleration (Y)
Rear Seat Structure Acceleration (Y)
Right Rear Occupant Compartment Acceleration (Y)
Engine Block (X)
Engine Block (Y)
Rear Floorpan Above Axle Acceleration (X)
Rear Floorpan Above Axle Acceleration (Y)
Rear Floorpan Above Axle Acceleration (Z)

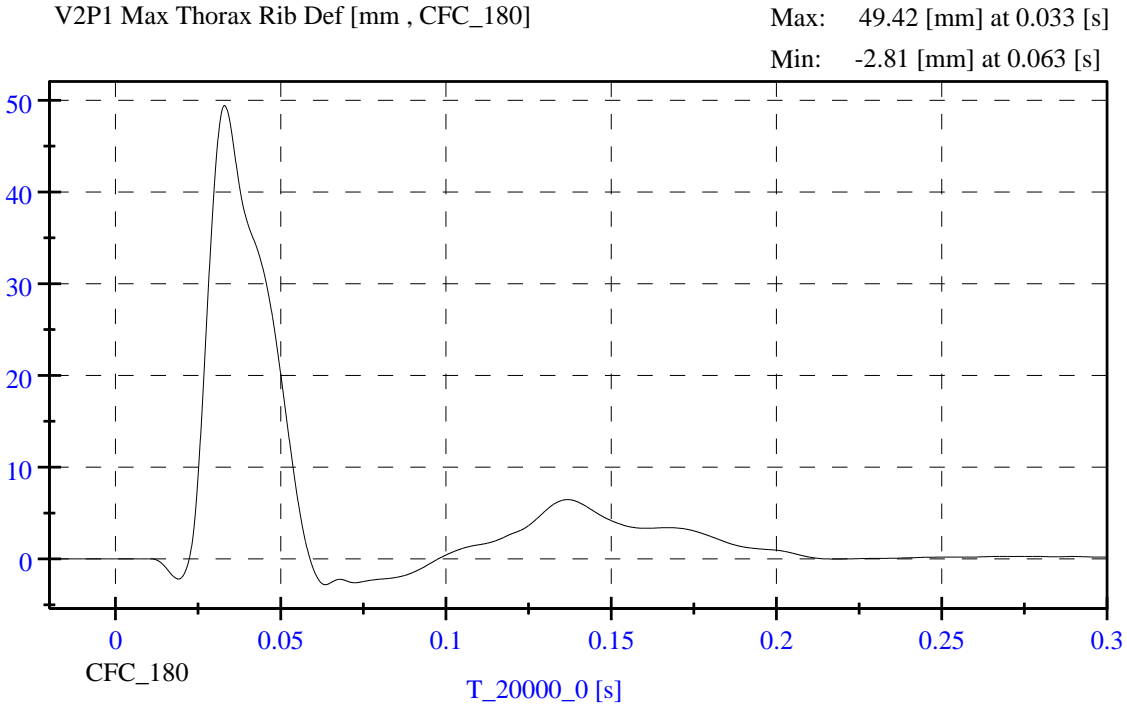
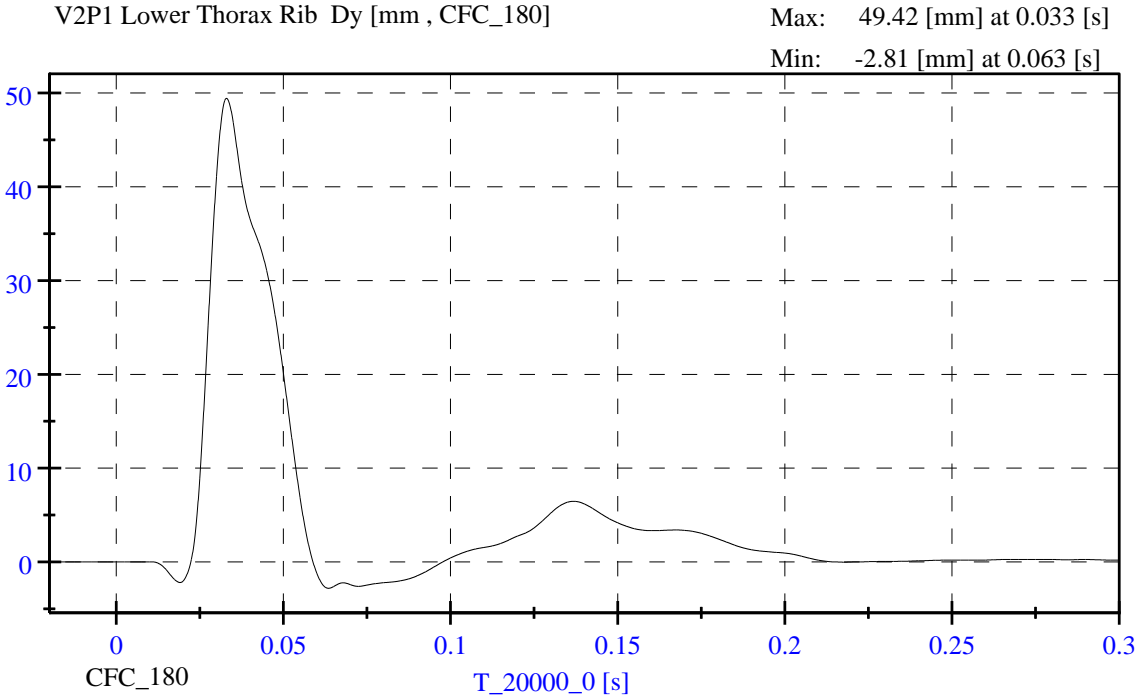
MDB Instrumentation Data

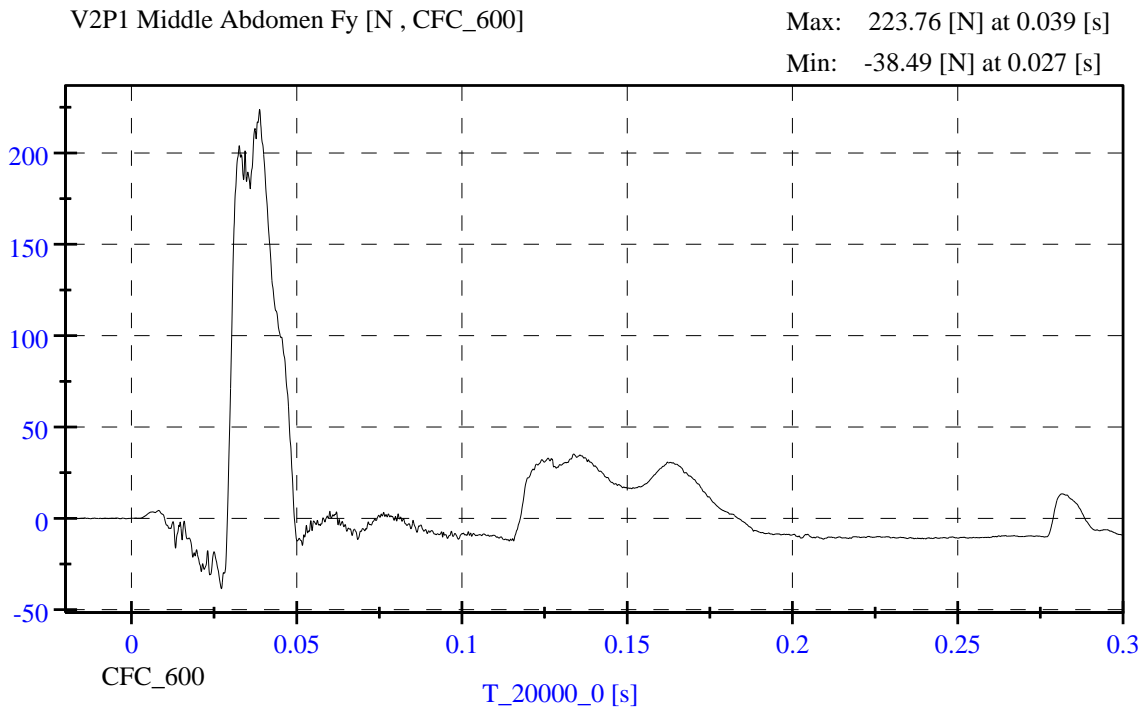
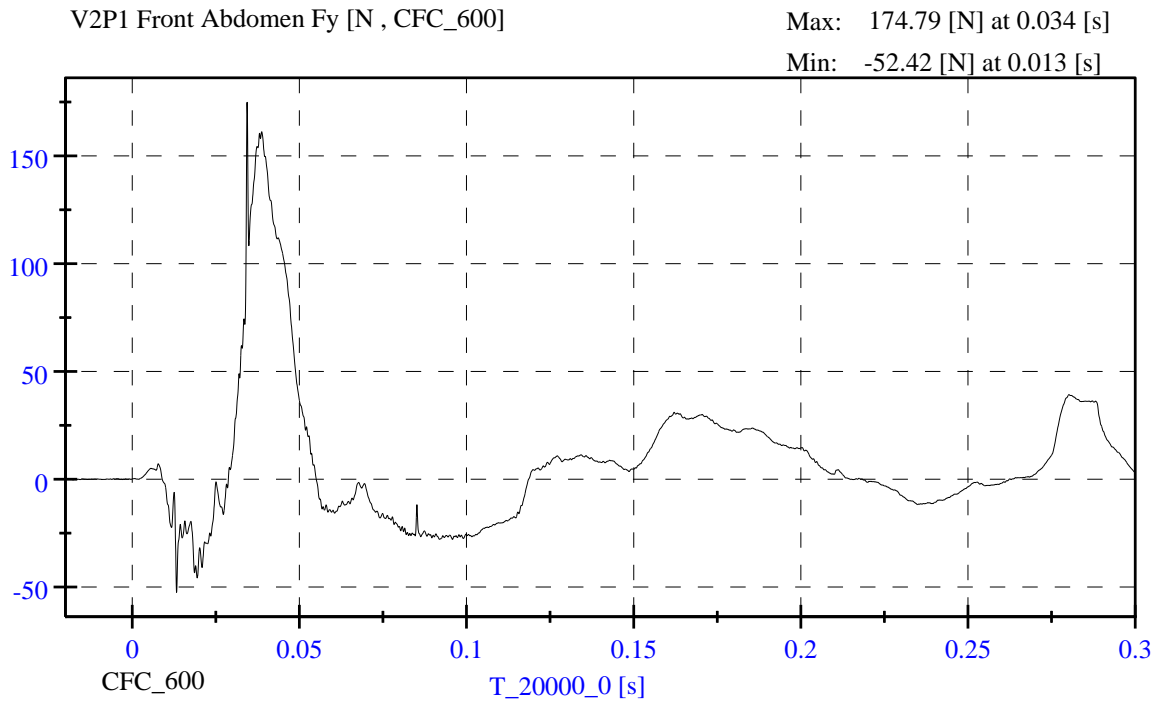
MDB Center of Gravity Acceleration (X)
MDB Center of Gravity Acceleration (Y)
MDB Center of Gravity Acceleration (Z)
MDB Rear Acceleration (X)
MDB Rear Acceleration (Y)
Left MDB Contact Switch
Right MDB Contact Switch

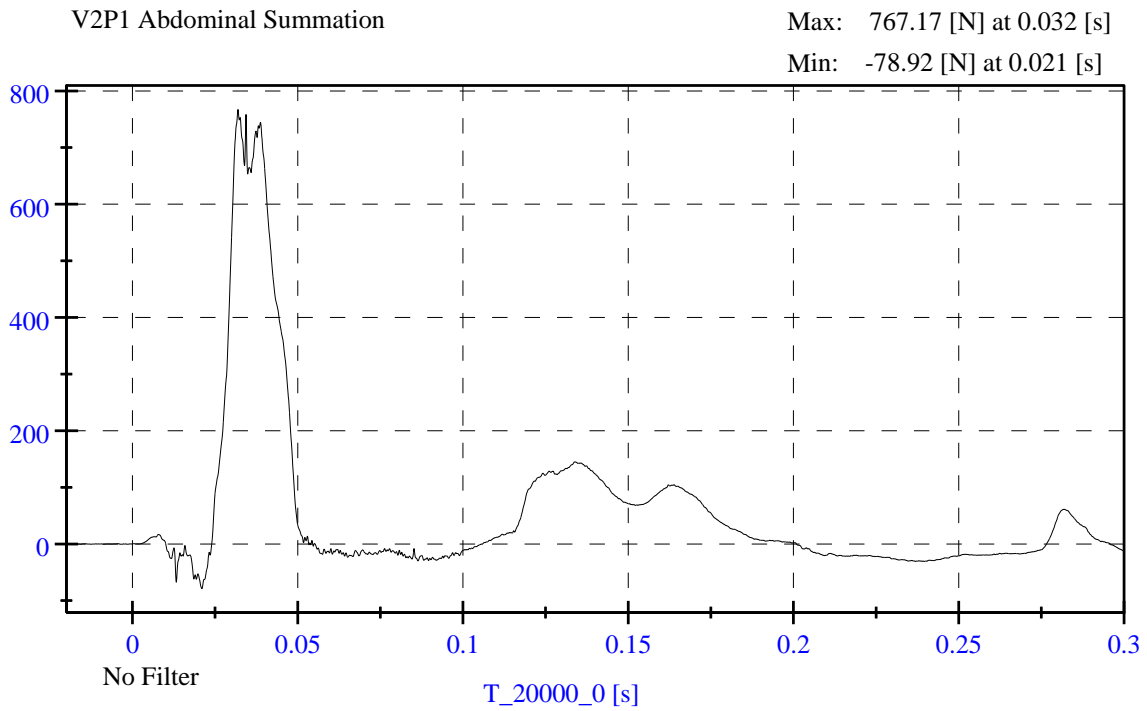
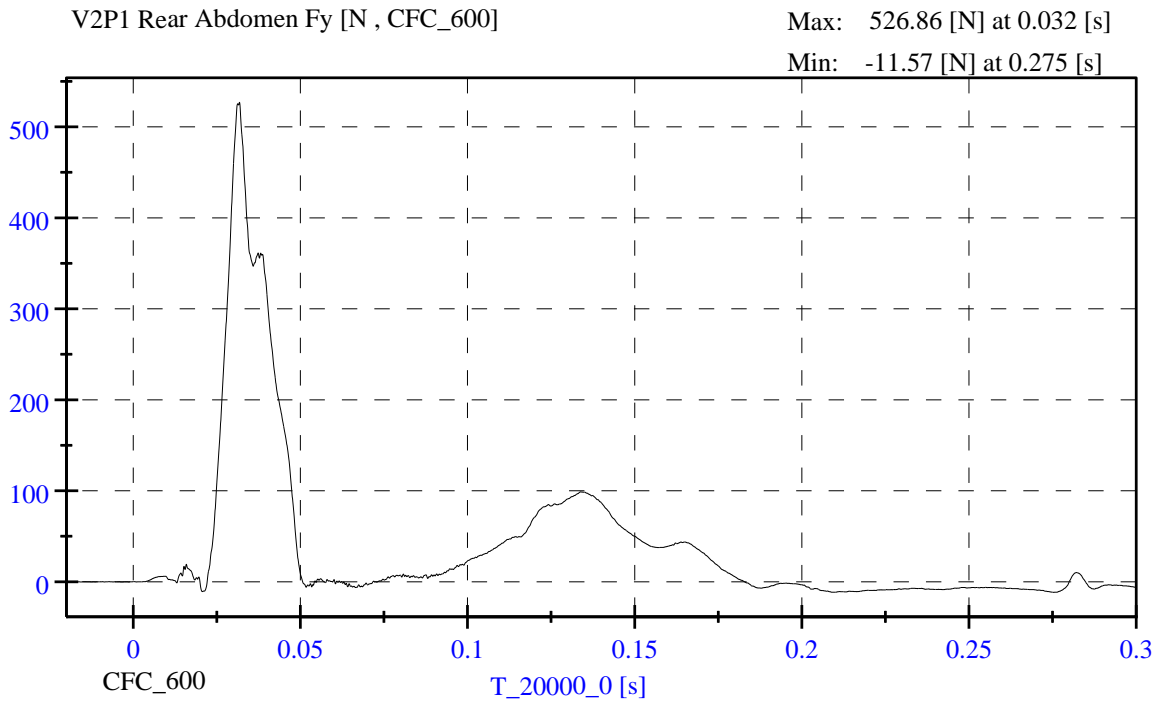


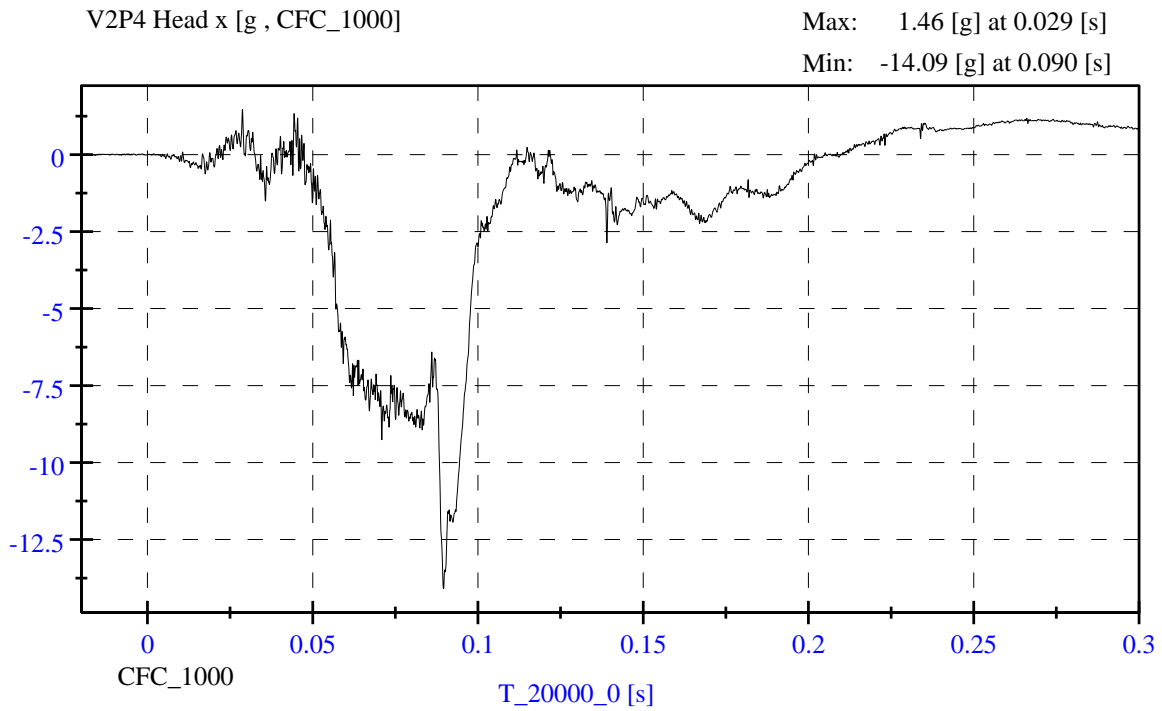
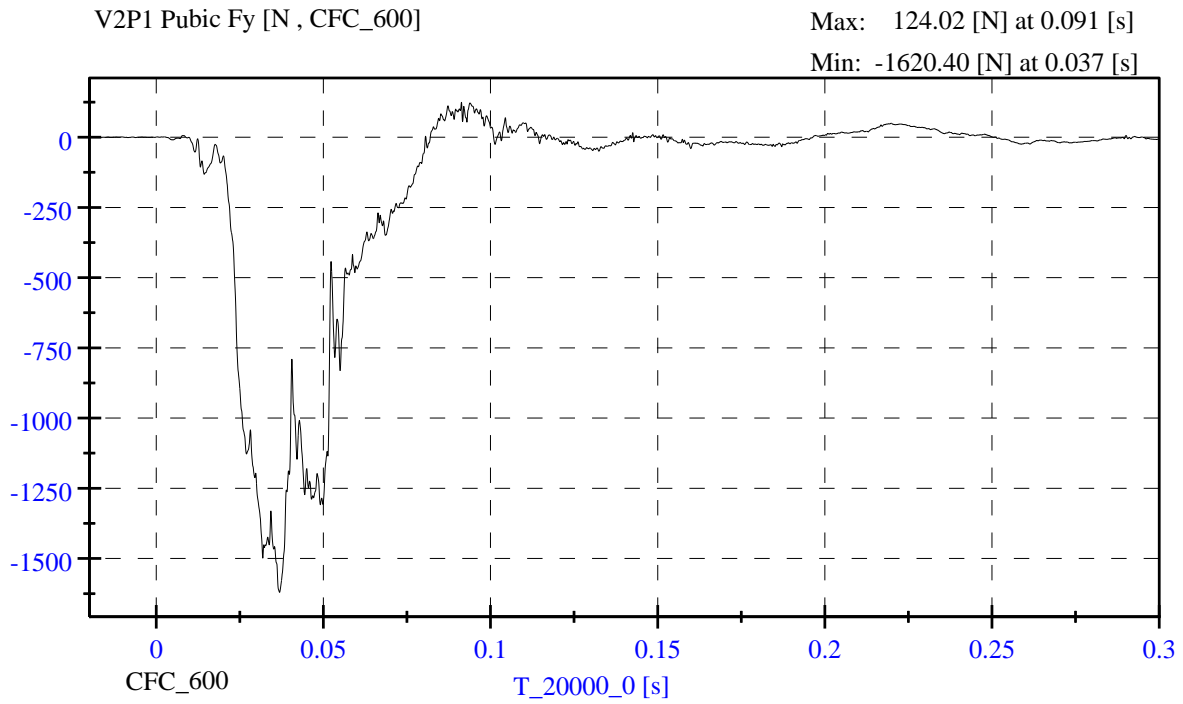


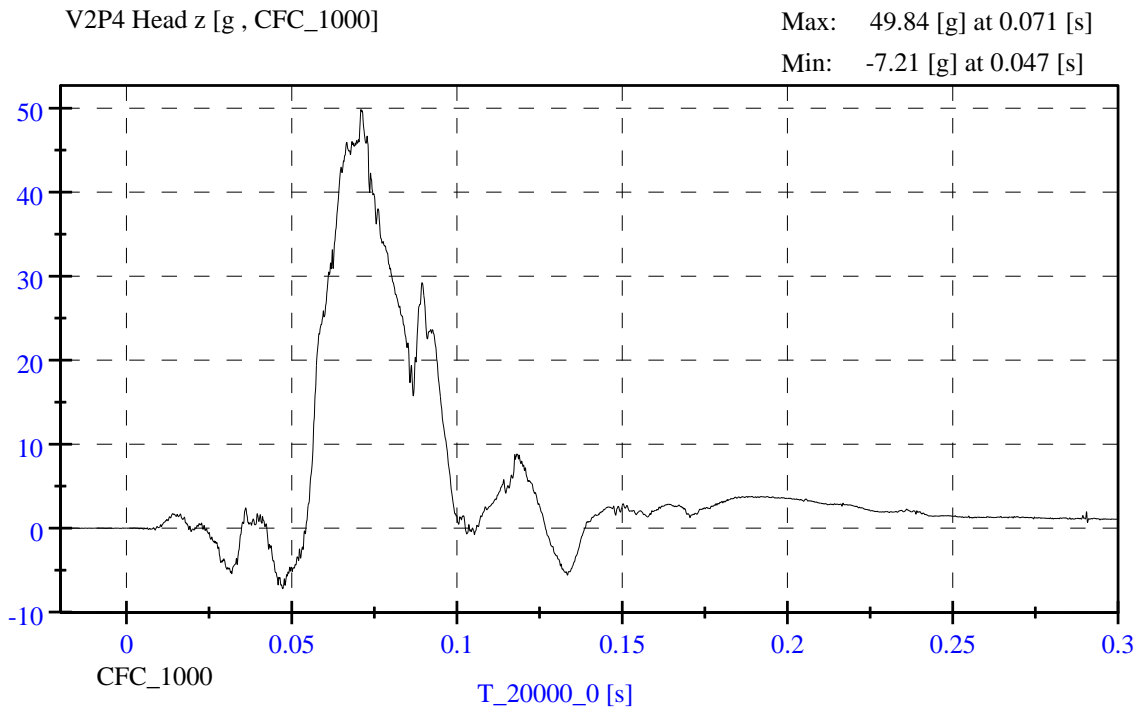
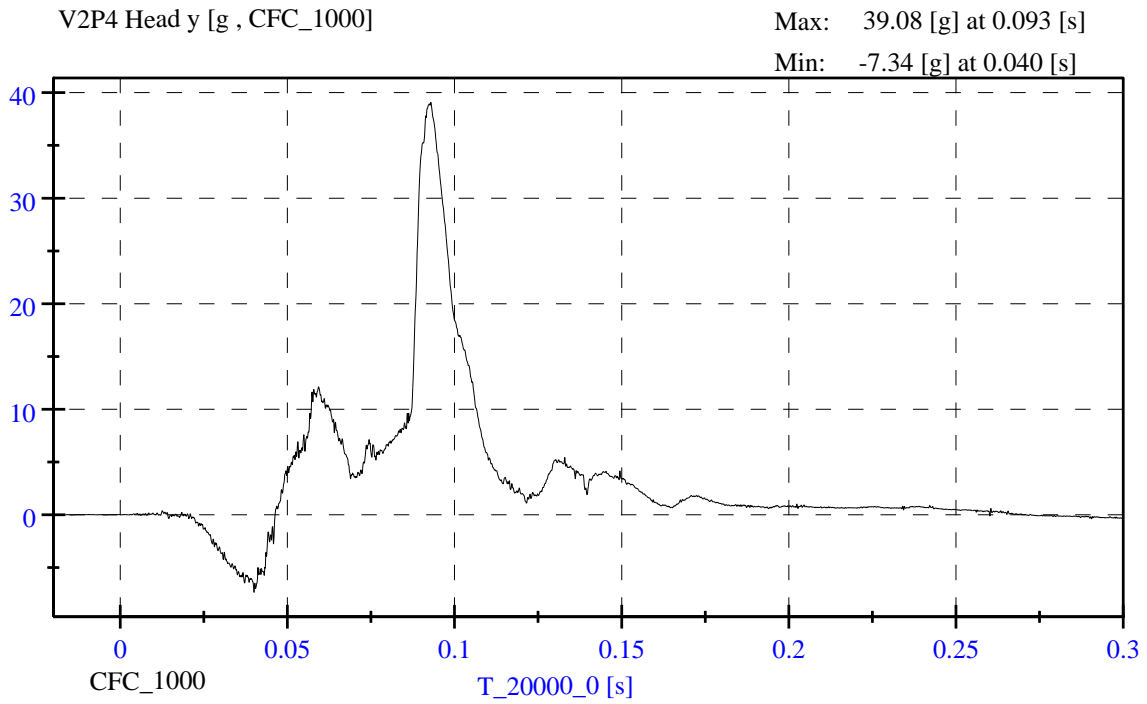


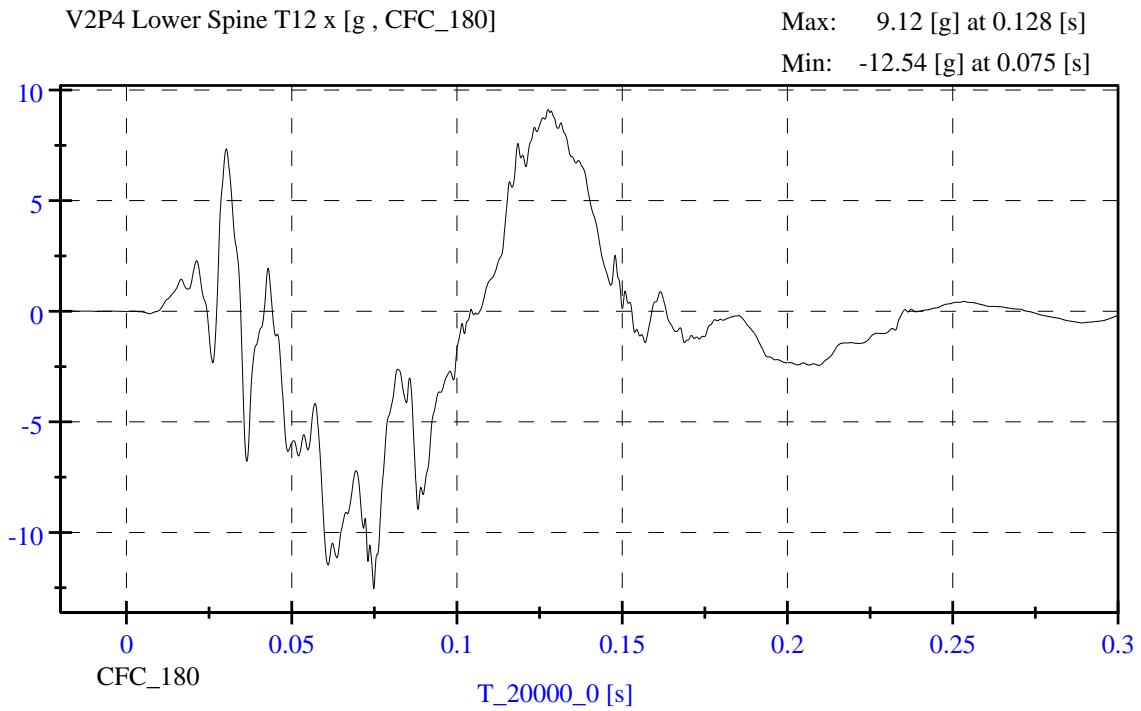
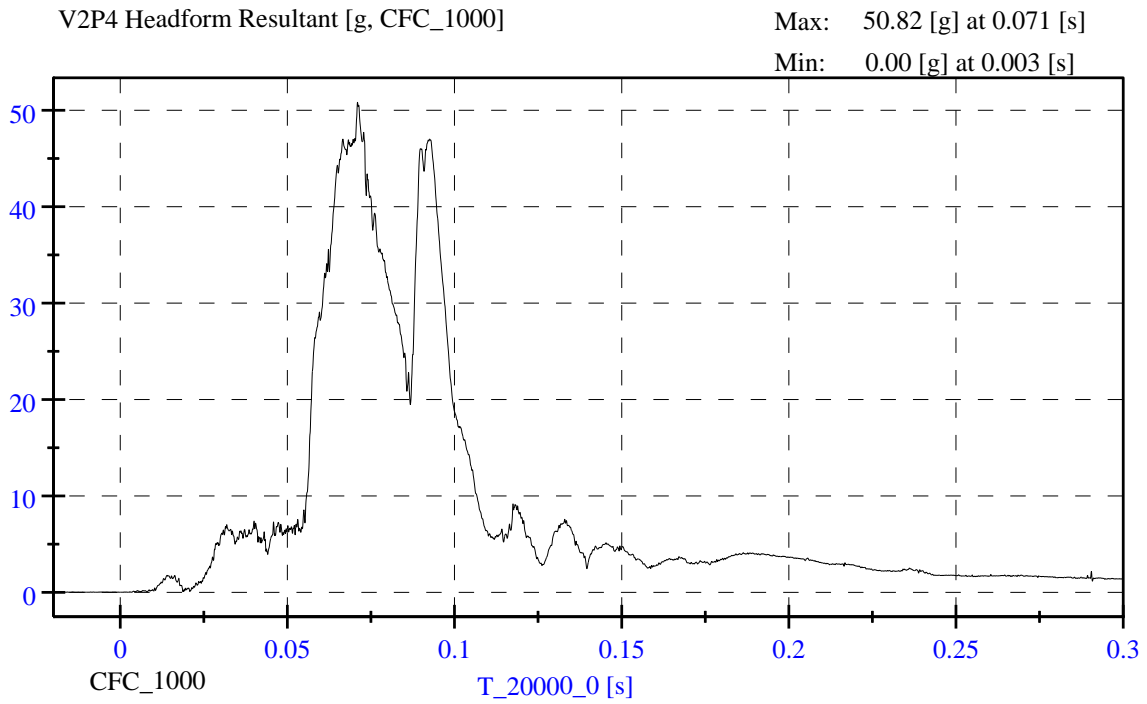


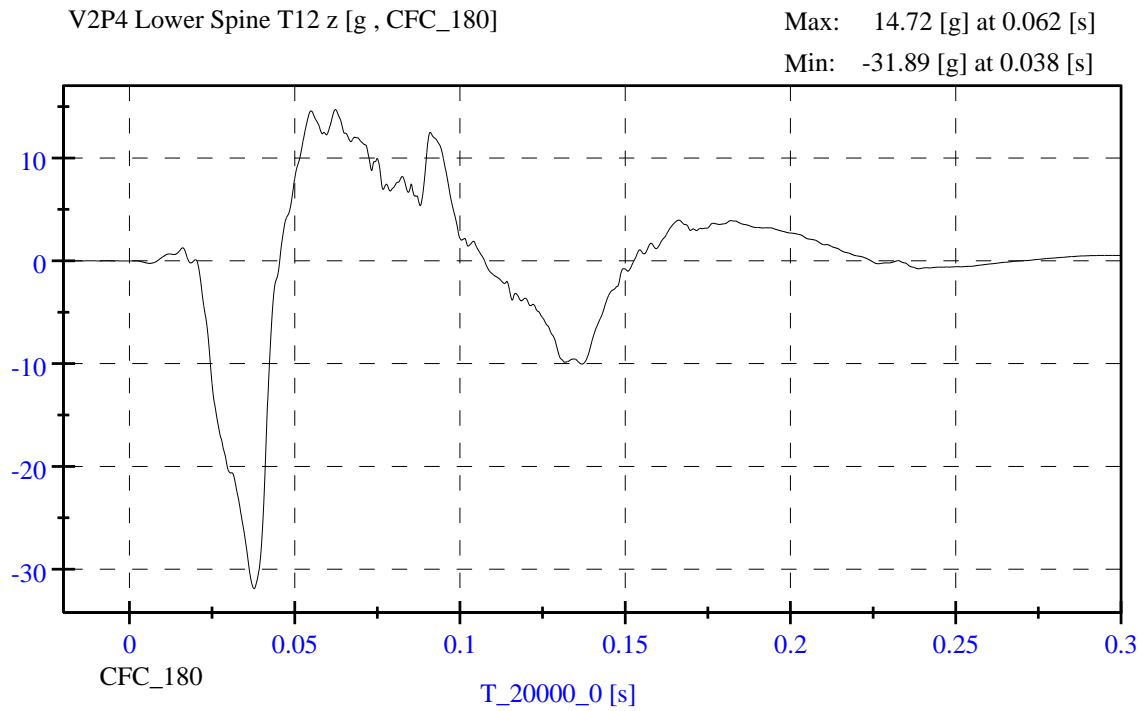
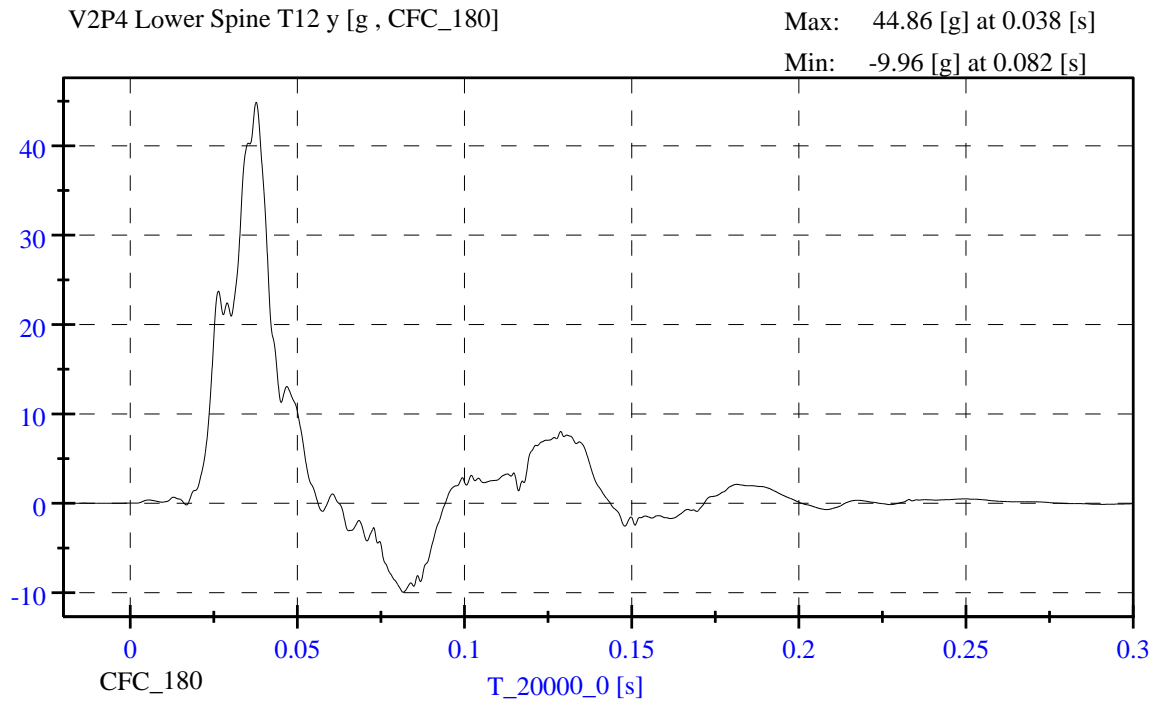


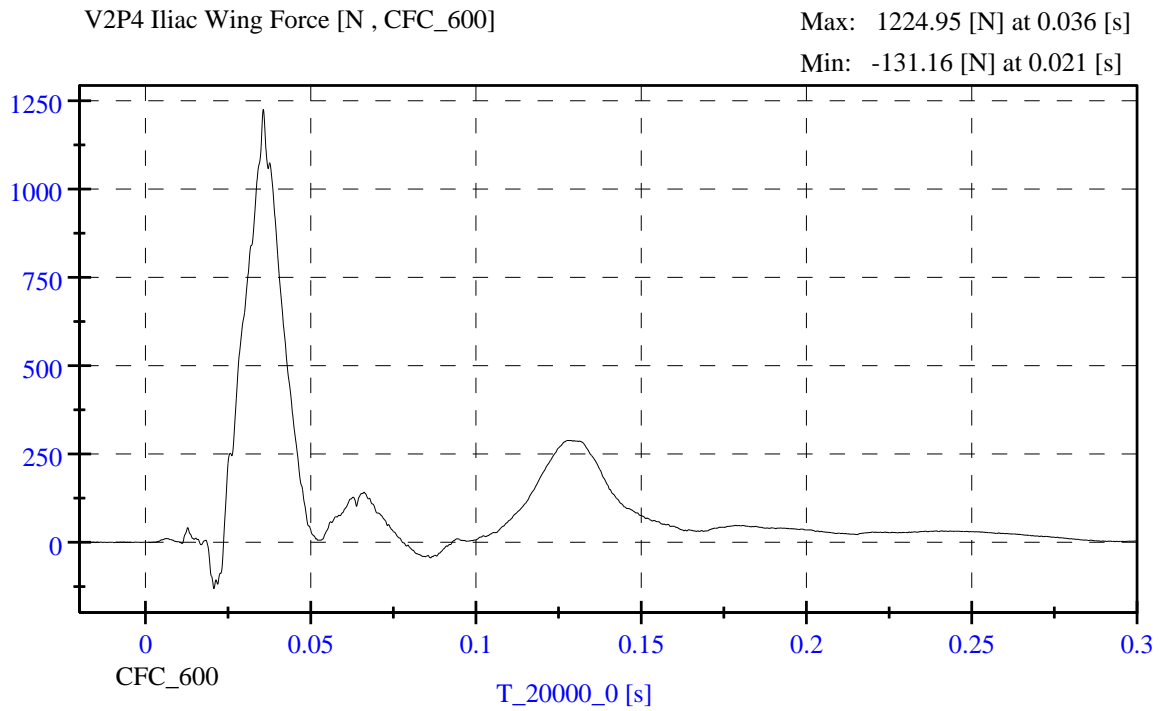
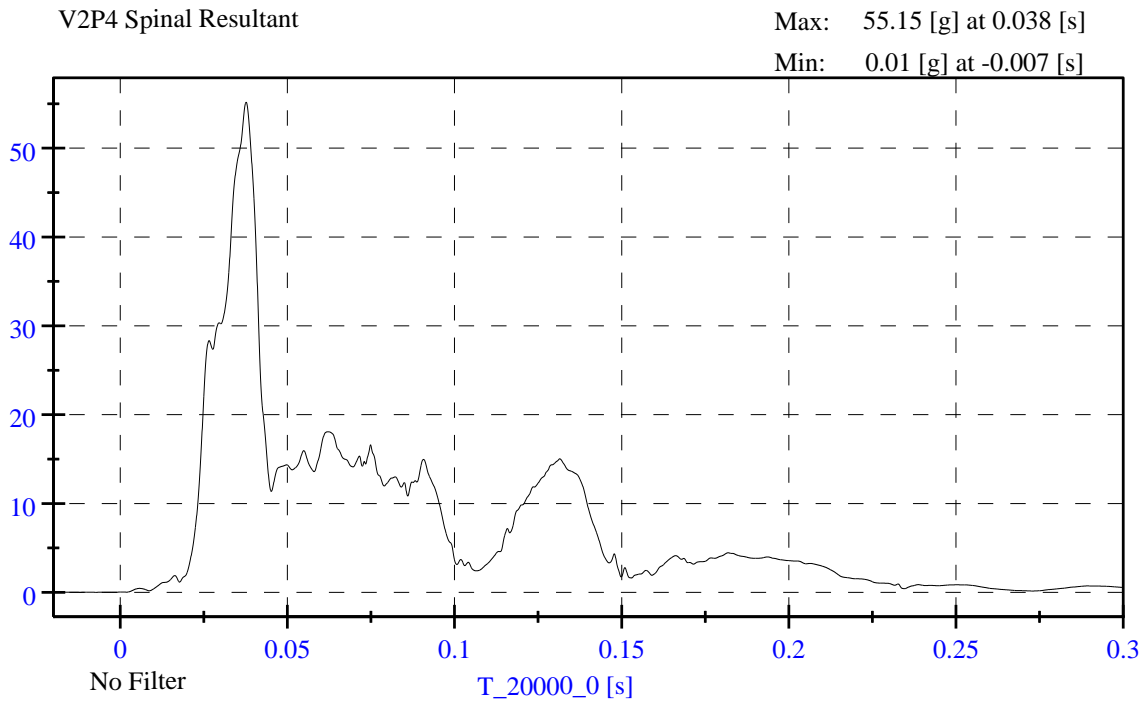


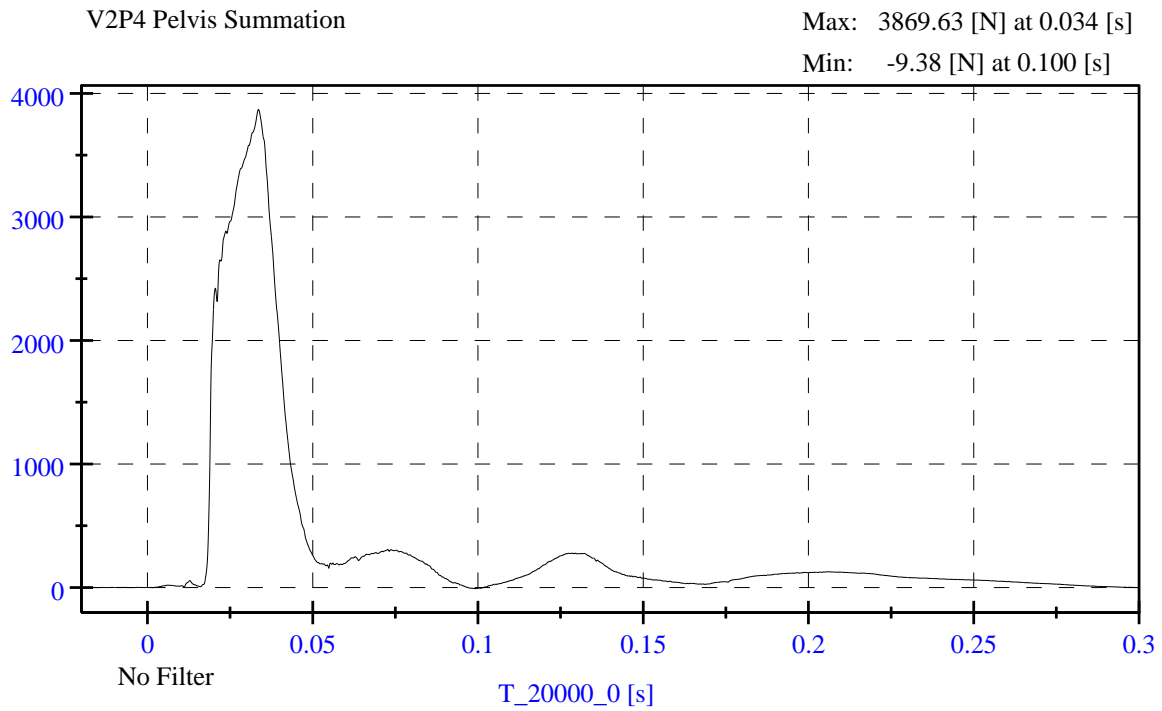
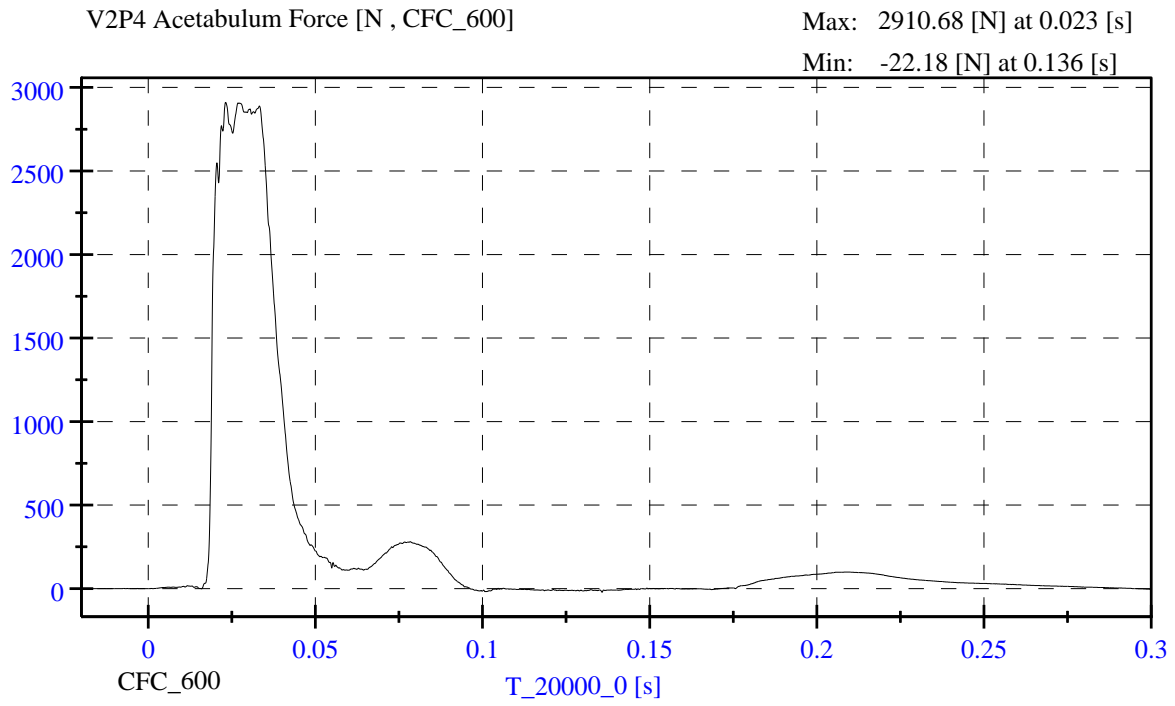












APPENDIX C
DUMMY PERFORMANCE CALIBRATION TEST DATA

TABLE OF CALIBRATION TEST RESULTS

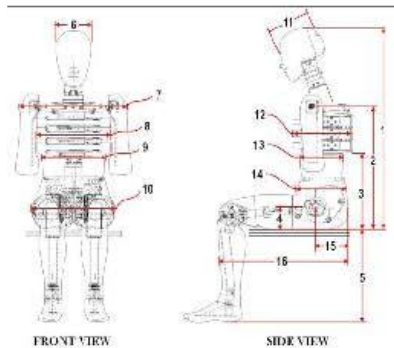
PRE-TEST

Es-2re No: F034

CONFIGURED FOR LEFT SIDE IMPACT

ES-2re External Measurements

NHTSA S/N F034



Dim. No.	Description	Specification (mm)	Result (mm)	Pass/Fail
1	Sitting Height	900-918	915	Pass
2	Seat to Shoulder Joint	558-572	560	Pass
3	Seat to Lower Face of Thoracic Spine Box	346-356	355	Pass
4	Seat to Hip Joint (center of bolt)	97-103	98	Pass
5	Sole to Seat, Sitting	433-451	440	Pass
6	Head Width	152-158	154	Pass
7	Shoulder/Arm Width	461-479	465	Pass
8	Thorax Width	322-332	327	Pass
9	Abdomen Width	273-287	285	Pass
10	Pelvis Lap Width	359-373	369	Pass
11	Head Depth	196-206	199	Pass
12	Thorax Depth	262-272	268	Pass
13	Abdomen Depth	194-204	203	Pass
14	Pelvis Depth	235-245	239	Pass
15	Back of Buttocks to Hip Joint (center of bolt)	150-160	159	Pass
16	Back of Buttocks to Front Knee	597-615	605	Pass

Technician: MG

Date: 1/31/2012



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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:	F034		
Test ID:		Test Date:	1/24/2012
Test Number:	1	Test Time:	9:06:16 AM

Component Part Number	Component Serial Number
455-1007	1916409

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.2 deg C P
Humidity	10 -- 70	26 %RH P
Resultant Acceleration	125 -- 155	145 g P
Oscillation	0.0 -- 15.0	10.6 % P
Fore-Aft Acceleration	-15.00 -- 15.00	-7.35 g P

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test ID:

Test Time: **9:06:16 AM**

Test Date: **1/24/2012**



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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	P58737	9/29/2011
Endevco	7264-2000	P52022	9/29/2011
Endevco	7264-2000	P52040	9/29/2011

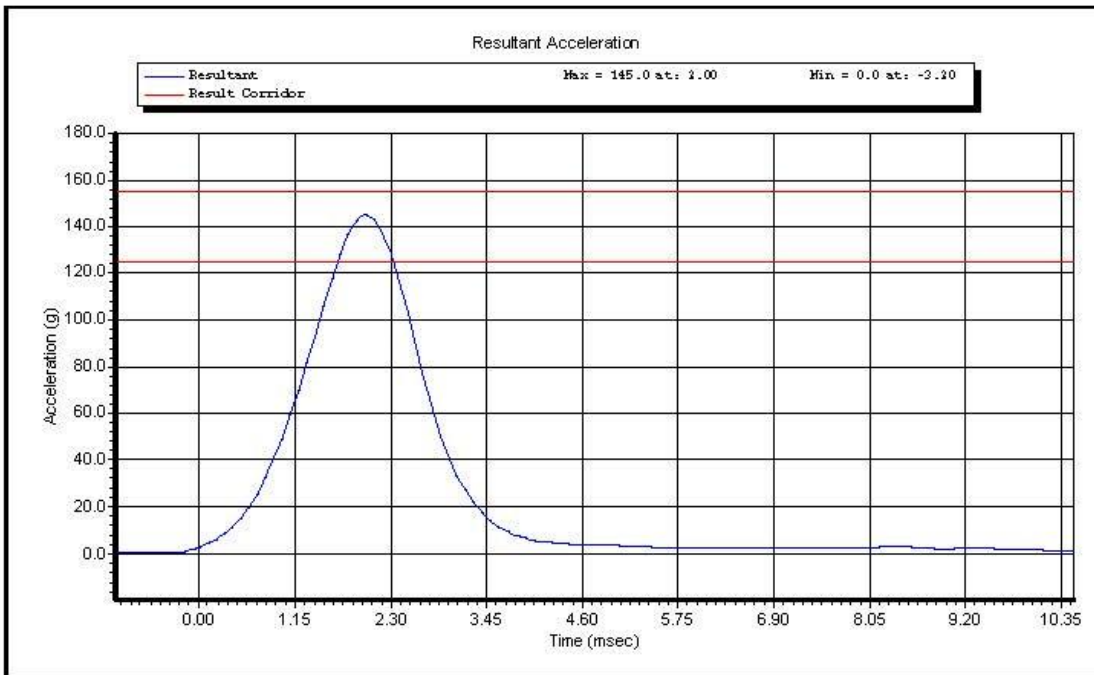
Test ID:

Test Time: **9:06:16 AM**

Test Date: **1/24/2012**



Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F034		
Test ID:		Test Date:	1/24/2012
Test Number:	1	Test Time:	9:06:16 AM



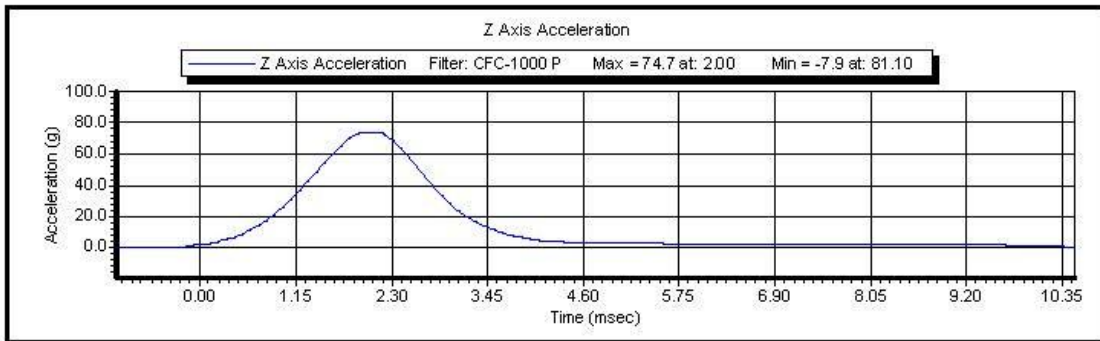
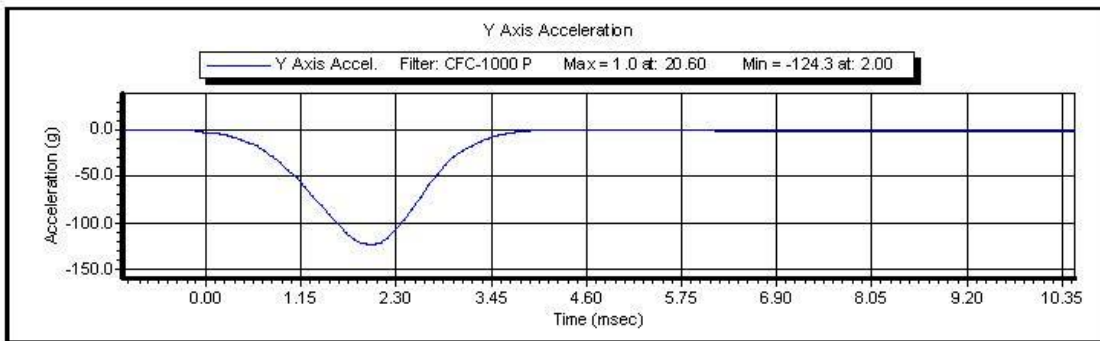
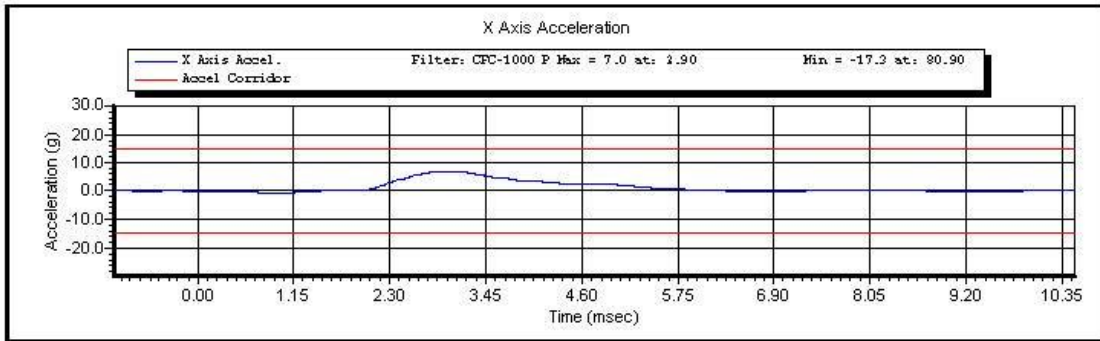
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Test Time: **9:06:16 AM**

Test Date: **1/24/2012**

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1 of 2



Test ID:

Test Time: 9:06:16 AM

Test Date: 1/24/2012

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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:	F034		
Test ID:		Test Date:	1/23/2012
Test Number:	1	Test Time:	9:53:29 AM

Component Part Number	Component Serial Number
455-2002	07066

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.8 deg C P
Humidity	10 -- 70	27 %RH P
Velocity	3.30 -- 3.50	3.46 m/s P
Maximum Neck Flexion Angle	49.0 -- 59.0	52.6 degrees P
Time At Maximum Neck Flexion	54.0 -- 66.0	59.3 ms P
Decay to Zero Degrees	53.0 -- 88.0	63.5 ms P
Velocity Corridor	--	P

All test parameters are within specifications

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

Test ID:

Test Time: **9:53:29 AM**

Test Date: **1/23/2012**

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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	1/11/2012
Endevco	7231CT	C165 10	10/3/2011
DentonATD	7000428	094	4/25/2011
DentonATD	7000428	095	4/25/2011
DentonATD	7000428	093	4/25/2011

Test ID:

Test Time: **9:53:29 AM**

Test Date: **1/23/2012**

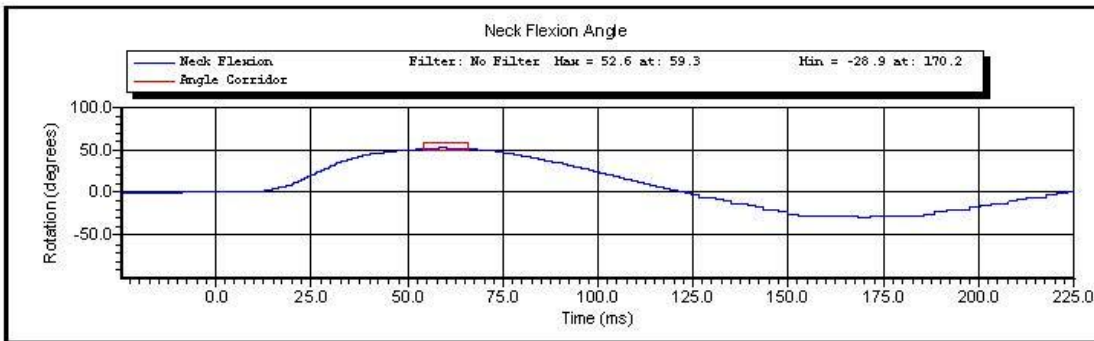
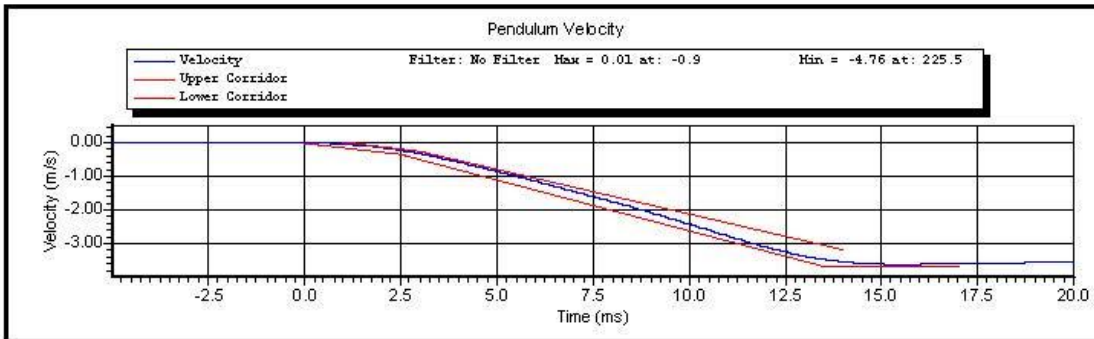
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Test Name:	Neck Flexion	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F034		
Test ID:		Test Date:	1/23/2012
Test Number:	1	Test Time:	9:53:29 AM



Test ID:

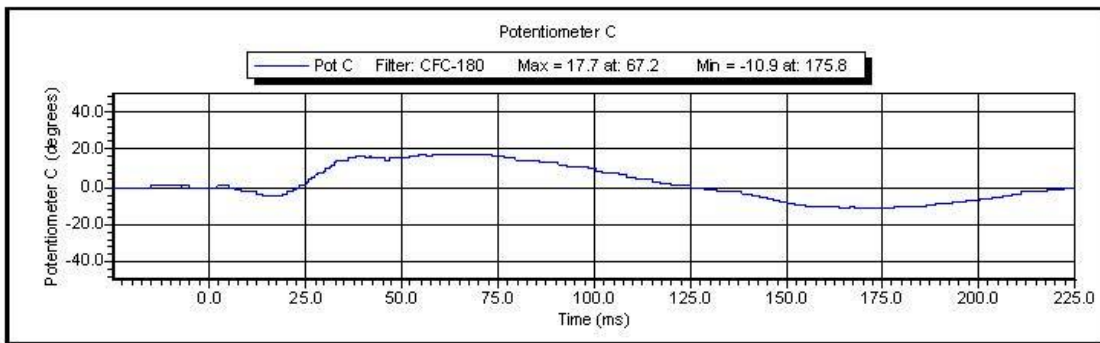
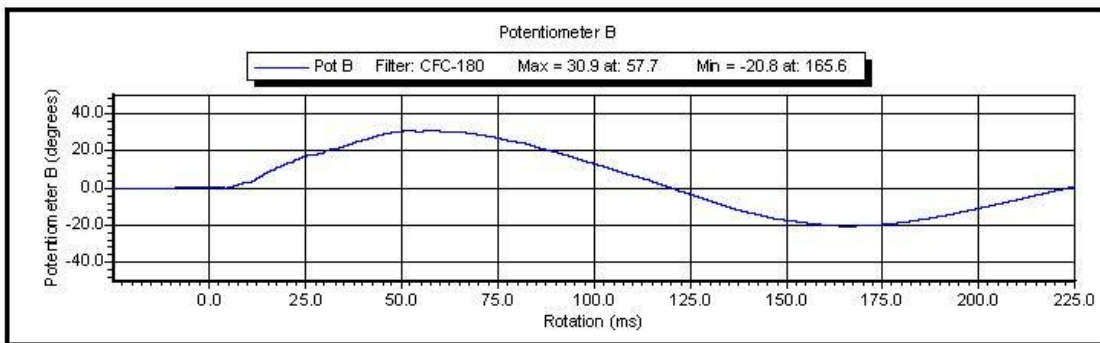
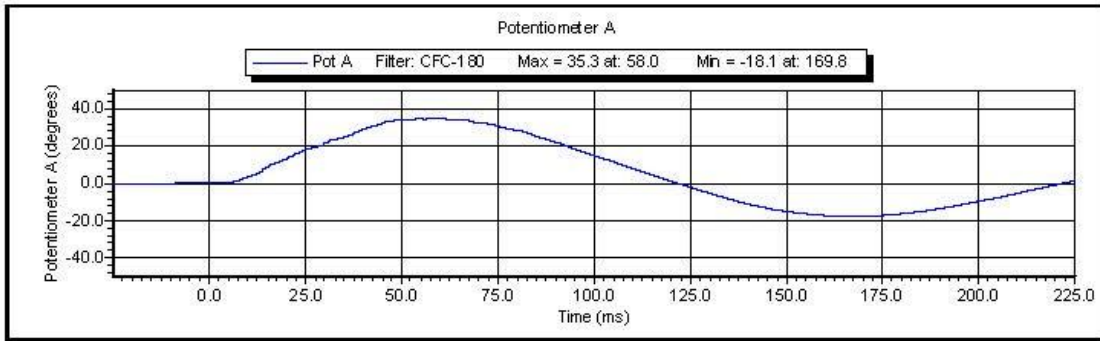
Test Time: **9:53:29 AM**

Test Date: **1/23/2012**

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Test ID:

Test Time: 9:53:29 AM

Test Date: 1/23/2012

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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:	F034		
Test ID:		Test Date:	1/26/2012
Test Number:	1	Test Time:	2:27:21 PM

Component Part Number	Component Serial Number
960715-313 Arm	07018

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	25.0 %RH P
Velocity	4.20 -- 4.40	4.23 m/s P
Pendulum Acceleration	-10.50 -- -7.50	-9.96 g P

All test parameters are within specifications

Technician: **A. Rudniski**

Supervisor: **D. Travale**

Test ID:

Test Time: **2:27:21 PM**

Test Date: **1/26/2012**



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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	1/11/2012
Endevco	7231CT	AGHF5	1/24/2012

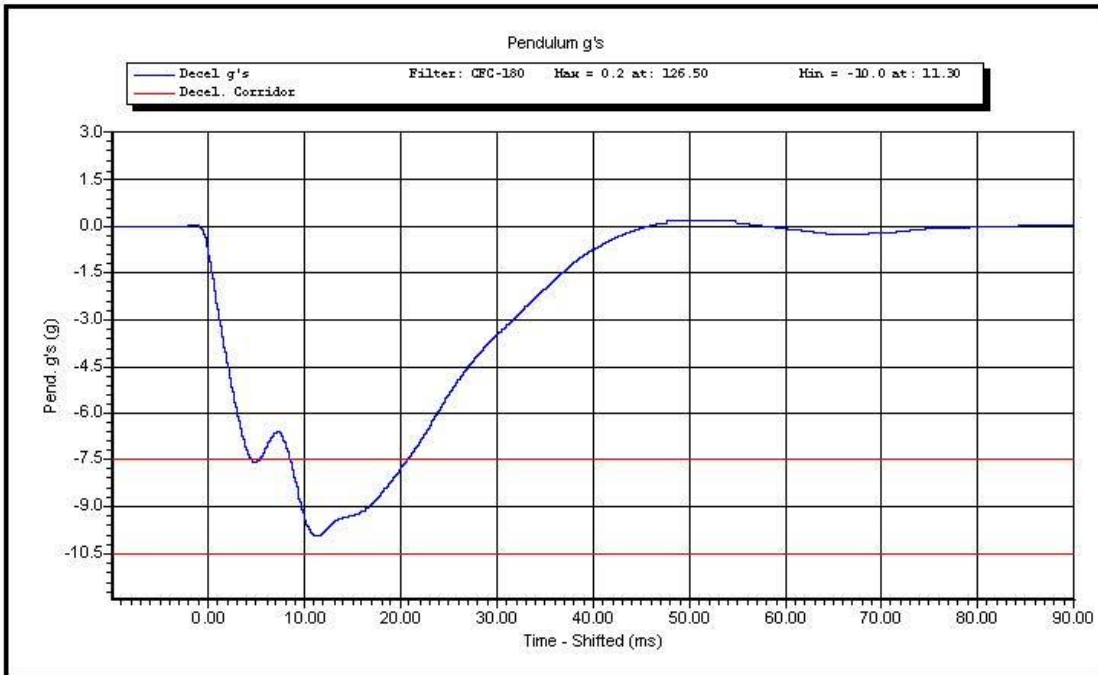
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Test Time: 2:27:21 PM

Test Date: 1/26/2012



Test Name:	Shoulder Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F034		
Test ID:		Test Date:	1/26/2012
Test Number:	1	Test Time:	2:27:21 PM



Test ID:

Test Time: **2:27:21 PM**

Test Date: **1/26/2012**

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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:	F034		
Test ID:	Upper Rib 4.0 m/s	Test Date:	1/23/2012
Test Number:	1	Test Time:	10:59:55 AM

Component Part Number	Component Serial Number
455-3100	07203

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	29.0 %RH P
Velocity	3.90 -- 4.10	3.97 m/s P
Rib Displacement	-51.00 -- -46.00	-48.23 mm P
Drop Height	807.0 -- 823.0	815.0 mm P

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test ID: **Upper Rib 4.0 m/s**

Test Time: **10:59:55 AM**

Test Date: **1/23/2012**

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REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Honeywell	MLT 38000	DS-183	8/31/2011
DentonATD	Velocity Trap	1	1/11/2012
Endevco	7264-2000	P32222	10/14/2011

Test ID: **Upper Rib 4.0 m/s**

Test Time: **10:59:55 AM**

Test Date: **1/23/2012**

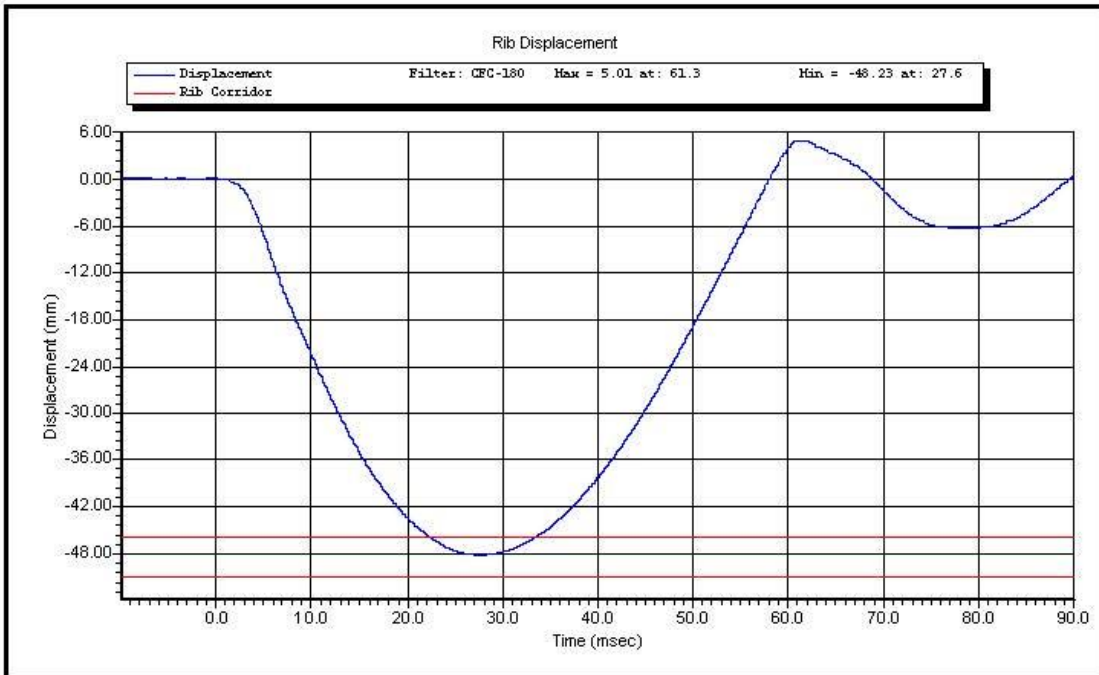
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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F034		
Test ID:	Upper Rib 4.0 m/s	Test Date:	1/23/2012
Test Number:	1	Test Time:	10:59:55 AM



Test ID: **Upper Rib 4.0 m/s**

Test Time: **10:59:55 AM**

Test Date: **1/23/2012**

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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:	F034		
Test ID:	Upper Rib 3.0 m/s	Test Date:	1/23/2012
Test Number:	1	Test Time:	11:10:19 AM

Component Part Number	Component Serial Number
455-3100	07203

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	29.0 %RH P
Velocity	2.90 -- 3.10	2.91 m/s P
Rib Displacement	-40.00 -- -36.00	-36.96 mm P
Drop Height	454 -- 464	459 mm P

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test ID: **Upper Rib 3.0 m/s**

Test Time: **11:10:19 AM**

Test Date: **1/23/2012**

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REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Honeywell	MLT 38000	DS-183	8/31/2011
DentonATD	Velocity Trap	1	1/11/2012
Endevco	7264-2000	P32222	10/14/2011

Test ID: **Upper Rib 3.0 m/s**

Test Time: **11:10:19 AM**

Test Date: **1/23/2012**

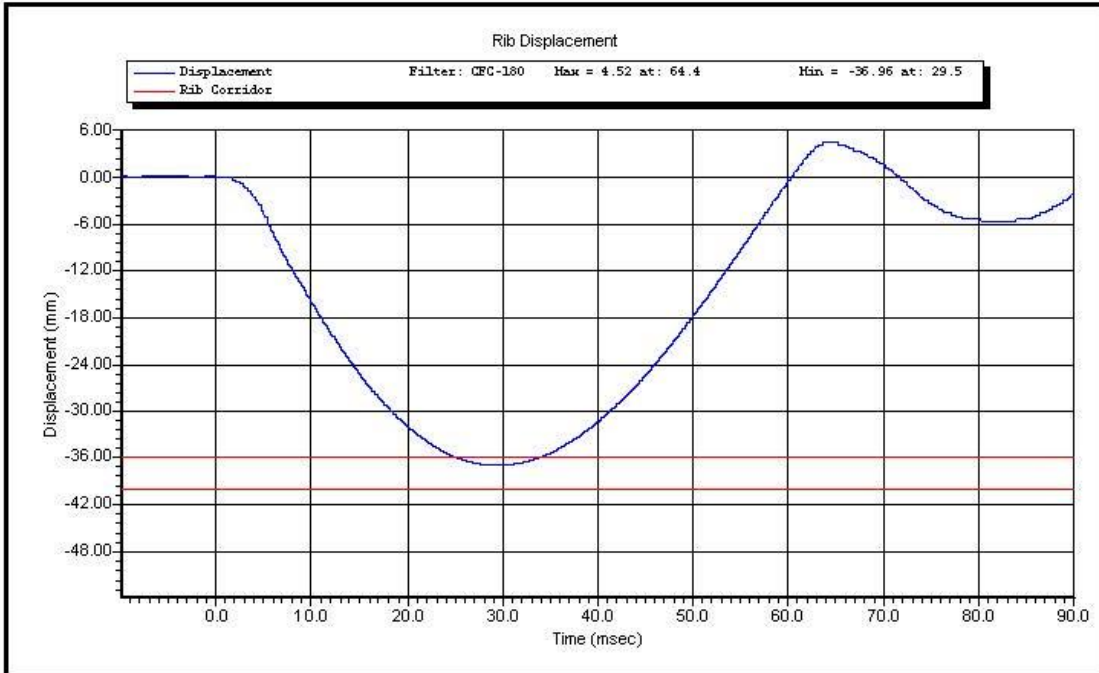
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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F034		
Test ID:	Upper Rib 3.0 m/s	Test Date:	1/23/2012
Test Number:	1	Test Time:	11:10:19 AM



Test ID: **Upper Rib 3.0 m/s** Test Time: **11:10:19 AM**

Test Date: **1/23/2012**

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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:	F034		
Test ID:	Middle Rib 4.0 m/s	Test Date:	1/23/2012
Test Number:	1	Test Time:	11:20:14 AM

Component Part Number	Component Serial Number
455-3100	07205

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	29.0 %RH P
Velocity	3.90 -- 4.10	3.96 m/s P
Rib Displacement	-51.00 -- -46.00	-47.99 mm P
Drop Height	807.0 -- 823.0	815.0 mm P

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test ID: **Middle Rib 4.0 m/s** Test Time: **11:20:14 AM**

Test Date: **1/23/2012**

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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-184	8/31/2011
DentonATD	Velocity Trap	1	1/11/2012
Endevco	7264-2000	P32222	10/14/2011

Test ID: **Middle Rib 4.0 m/s**

Test Time: **11:20:14 AM**

Test Date: **1/23/2012**

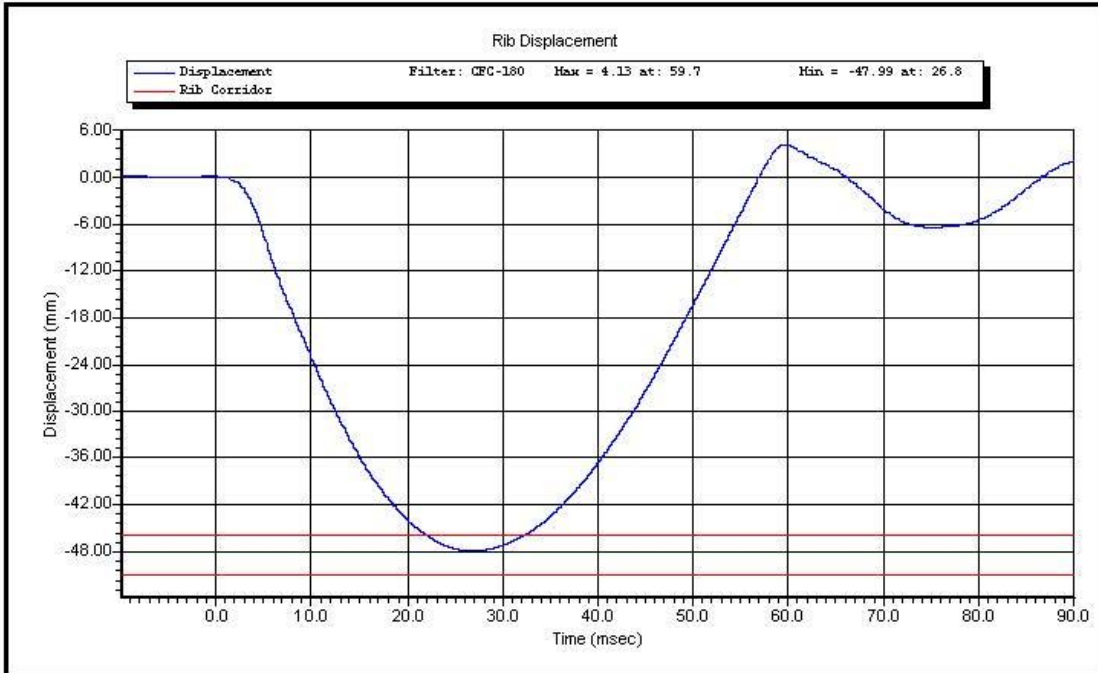
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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F034		
Test ID:	Middle Rib 4.0 m/s	Test Date:	1/23/2012
Test Number:	1	Test Time:	11:20:14 AM



Test ID: **Middle Rib 4.0 m/s** Test Time: **11:20:14 AM**

Test Date: **1/23/2012**

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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:	F034		
Test ID:	Middle Rib 3.0 m/s	Test Date:	1/23/2012
Test Number:	1	Test Time:	11:38:41 AM

Component Part Number	Component Serial Number
455-3100	07205

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	29.0 %RH P
Velocity	2.90 -- 3.10	2.96 m/s P
Rib Displacement	-40.00 -- -36.00	-37.24 mm P
Drop Height	454 -- 464	459 mm P

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test ID: **Middle Rib 3.0 m/s** Test Time: **11:38:41 AM**

Test Date: **1/23/2012**

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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-184	8/31/2011
DentonATD	Velocity Trap	1	1/11/2012
Endevco	7264-2000	P32222	10/14/2011

Test ID: **Middle Rib 3.0 m/s**

Test Time: **11:38:41 AM**

Test Date: **1/23/2012**

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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:	F034		
Test ID:	Middle Rib 3.0 m/s	Test Date:	1/23/2012
Test Number:	1	Test Time:	11:38:41 AM



Test ID: **Middle Rib 3.0 m/s** Test Time: **11:38:41 AM**

Test Date: **1/23/2012**

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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:	F034		
Test ID:	Lower Rib 4.0 m/s	Test Date:	1/23/2012
Test Number:	1	Test Time:	1:12:33 PM

Component Part Number	Component Serial Number
455-3100	07209

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.5 deg C P
Humidity	10.0 -- 70.0	31.0 %RH P
Velocity	3.90 -- 4.10	3.96 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**

Supervisor: **D. Travale**

Test ID: **Lower Rib 4.0 m/s** Test Time: **1:12:33 PM**

Test Date: **1/23/2012**

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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-182	8/31/2011
DentonATD	Velocity Trap	1	1/11/2012
Endevco	7264-2000	P32222	10/14/2011

Test ID: **Lower Rib 4.0 m/s** Test Time: **1:12:33 PM**

Test Date: **1/23/2012**

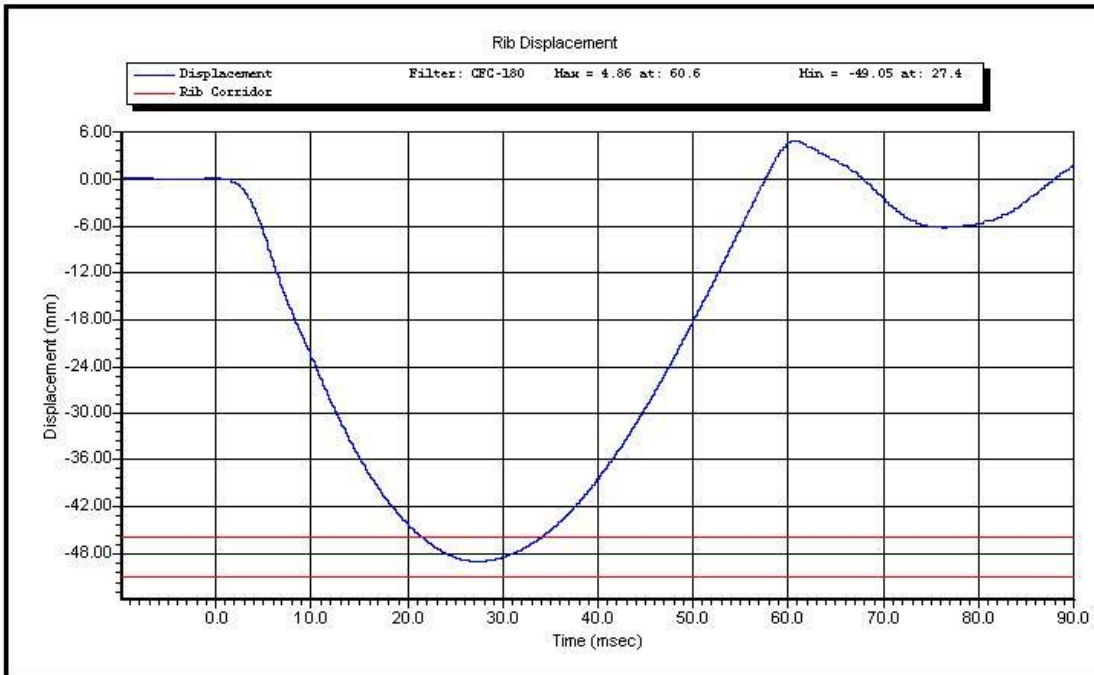
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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F034		
Test ID:	Lower Rib 4.0 m/s	Test Date:	1/23/2012
Test Number:	1	Test Time:	1:12:33 PM



Test ID: **Lower Rib 4.0 m/s** Test Time: **1:12:33 PM**

Test Date: **1/23/2012**

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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:	F034		
Test ID:	Lower Rib 3.0 m/s	Test Date:	1/23/2012
Test Number:	1	Test Time:	1:26:13 PM

Component Part Number	Component Serial Number
455-3100	07209

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.5 deg C P
Humidity	10.0 -- 70.0	31.0 %RH P
Velocity	2.90 -- 3.10	2.97 m/s P
Rib Displacement	-40.00 -- -36.00	-38.38 mm P
Drop Height	454 -- 464	459 mm P

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test ID: **Lower Rib 3.0 m/s**

Test Time: **1:26:13 PM**

Test Date: **1/23/2012**

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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-182	8/31/2011
DentonATD	Velocity Trap	1	1/11/2012
Endevco	7264-2000	P32222	10/14/2011

Test ID: **Lower Rib 3.0 m/s**

Test Time: **1:26:13 PM**

Test Date: **1/23/2012**

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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:	F034		
Test ID:	Lower Rib 3.0 m/s	Test Date:	1/23/2012
Test Number:	1	Test Time:	1:26:13 PM



Test ID: **Lower Rib 3.0 m/s** Test Time: **1:26:13 PM** Test Date: **1/23/2012**

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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:	F034		
Test ID:		Test Date:	1/26/2012
Test Number:	1	Test Time:	2:00:06 PM

Component Part Number	Component Serial Number
Upper Rib - 175-4002	7203
Middle Rib - 175-4002	7205
Lower Rib - 175-4002	7209

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	25.0 %RH P
Velocity	5.40 -- 5.60	5.48 m/s P
Upper Rib Displacement	34.0 -- 41.0	37.9 mm P
Middle Rib Displacement	37.0 -- 45.0	41.7 mm P
Lower Rib Displacement	37.0 -- 44.0	41.7 mm P
Impactor Force	5100 -- 6200	5576 N P

All test parameters are within specifications

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

Test ID:

Test Time: **2:00:06 PM**

Test Date: **1/26/2012**



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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	1/11/2012
Endevco	7231CT	AGHF5	1/24/2012
Honeywell	MLT 38000	DS-183	8/31/2011
Honeywell	MLT 38000	DS-184	8/31/2011
Honeywell	MLT 38000	DS-182	8/31/2011

Test ID:

Test Time: 2:00:06 PM

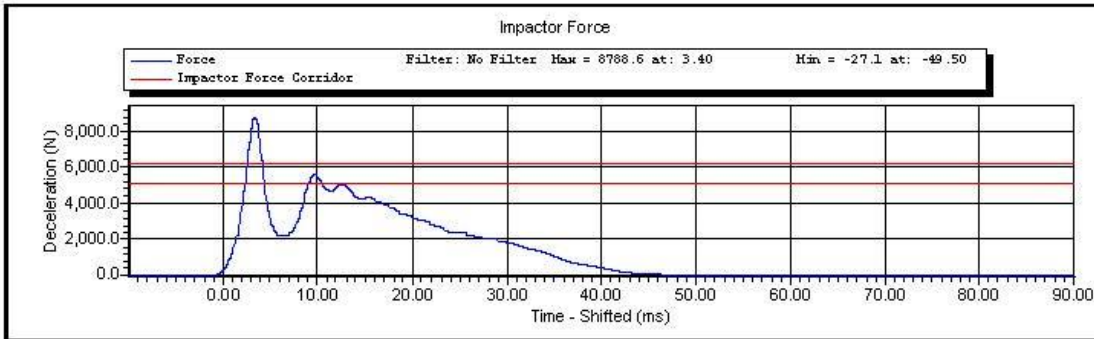
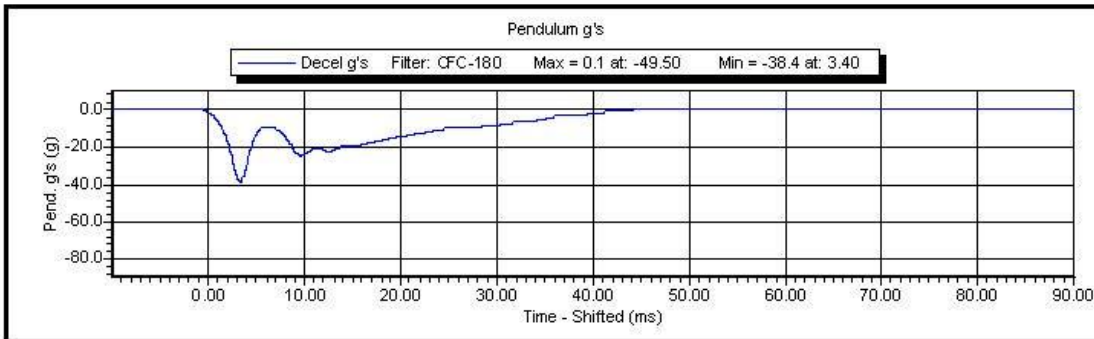
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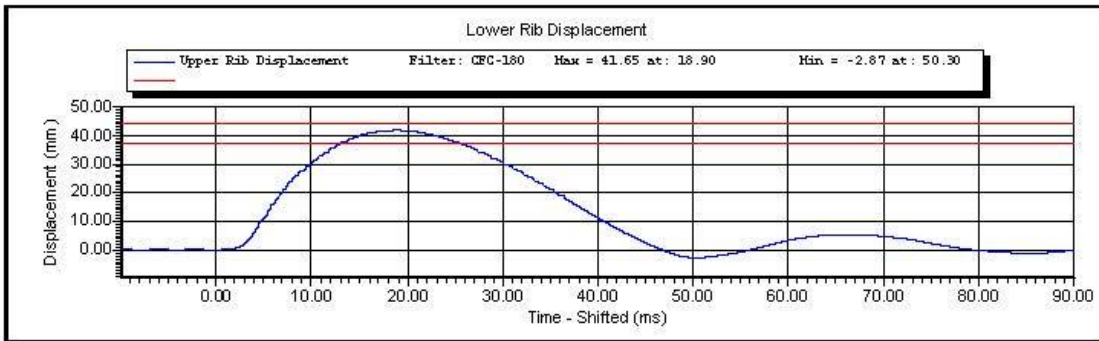
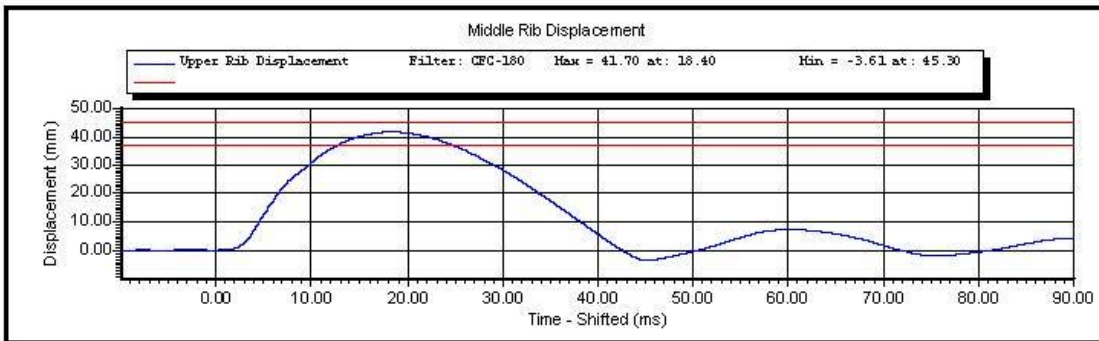
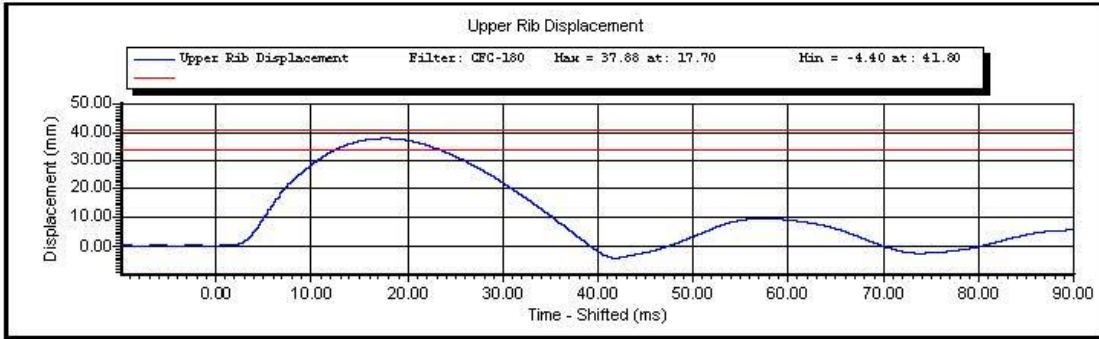
Test Name:	Thorax Impact	Revision:	8/15/2008
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F034		
Test ID:		Test Date:	1/26/2012
Test Number:	1	Test Time:	2:00:06 PM



Test ID:

Test Time: **2:00:06 PM**

Test Date: **1/26/2012**



Test ID:

Test Time: 2:00:06 PM

Test Date: 1/26/2012

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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:	F034		
Test ID:		Test Date:	1/26/2012
Test Number:	1	Test Time:	1:32:39 PM

Component Part Number	Component Serial Number
455-4001 Abdomen Insert	0483

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.1 deg C P
Humidity	10 -- 70	25 %RH P
Velocity	3.90 -- 4.10	4.01 m/s P
Peak Abdominal Force	-2.70 -- -2.20	-2.58 kN P
Time At Peak Abdominal Force	10.0 -- 12.3	10.5 ms P
Maximum Pendulum Force	-4.80 -- -4.00	-4.66 kN P
Time at Peak Pendulum Force	10.6 -- 13.0	10.6 ms P

All test parameters are within specifications

Technician: **A. Rudniski**

Supervisor: **D. Travale**

Test ID:

Test Time: **1:32:39 PM**

Test Date: **1/26/2012**



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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	1/11/2012
Endevco	7231CT	AGHF5	1/24/2012
Denton	2631	LC-1512	3/25/2011
Denton	2631	LC-1526	3/25/2011
Denton	2631	LC-1516	3/25/2011

Test ID:

Test Time: 1:32:39 PM

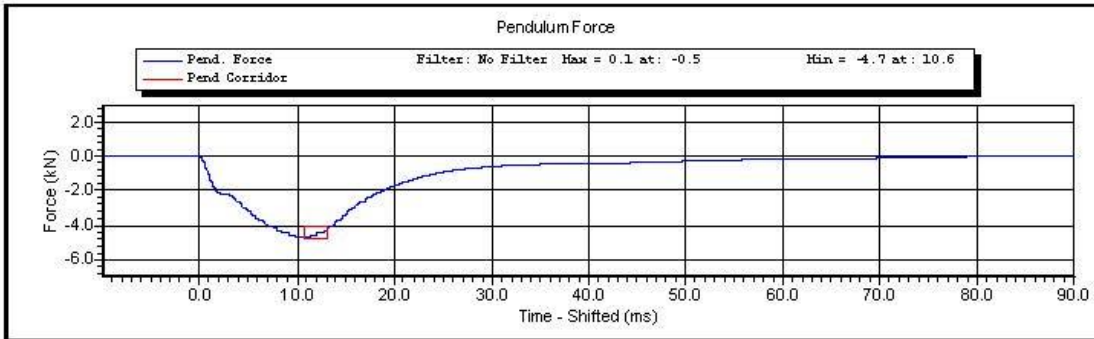
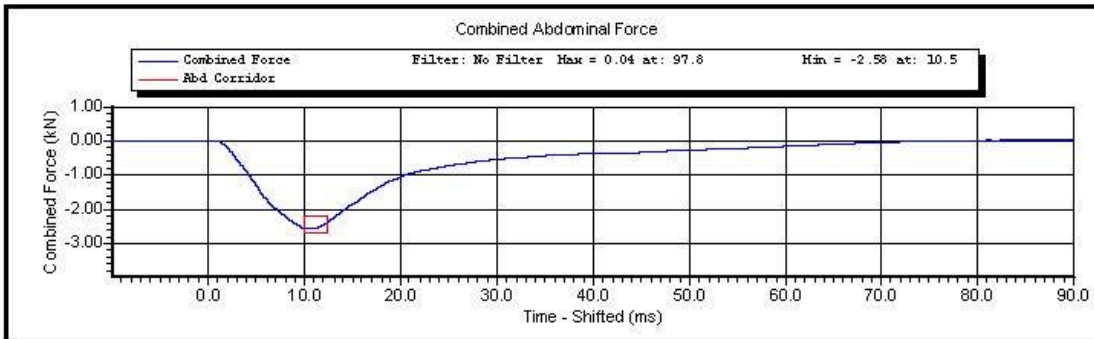
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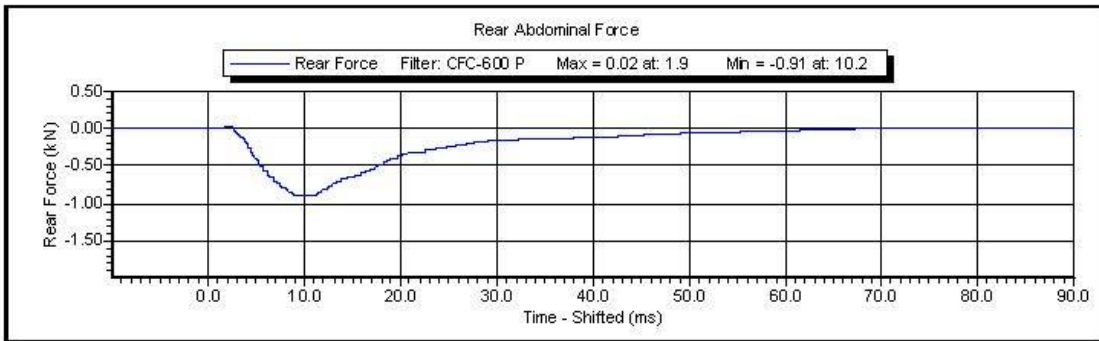
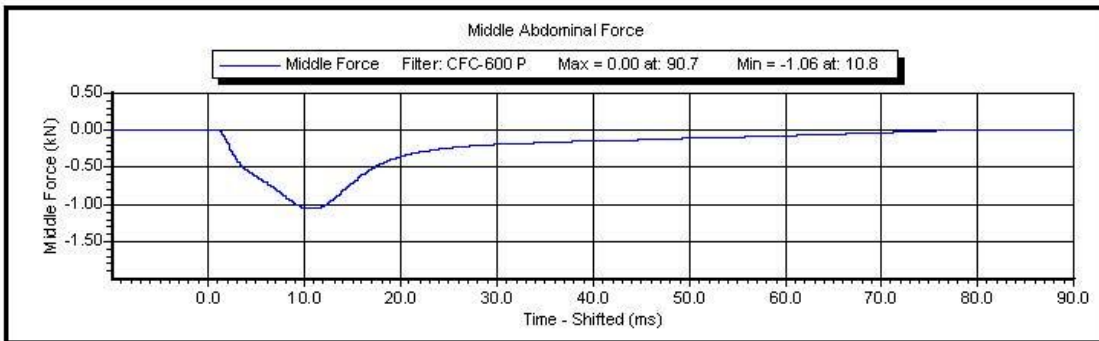
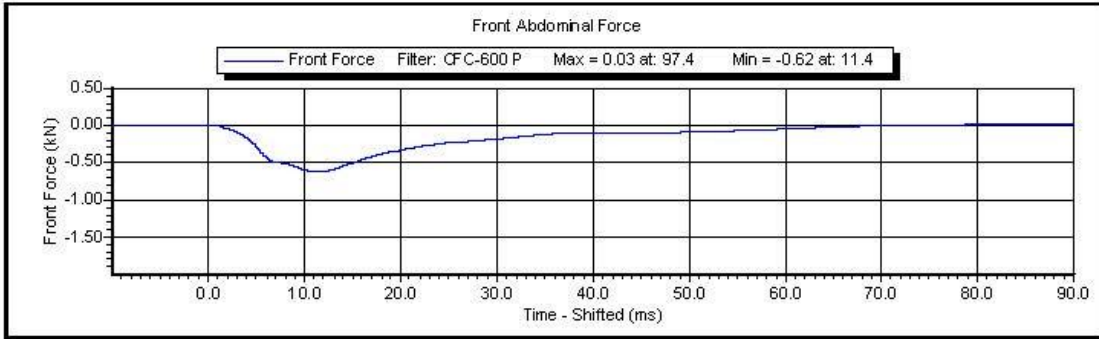
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Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F034		
Test ID:		Test Date:	1/26/2012
Test Number:	1	Test Time:	1:32:39 PM



Test ID:

Test Time: **1:32:39 PM**

Test Date: **1/26/2012**



Test ID:

Test Time: 1:32:39 PM

Test Date: 1/26/2012

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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:	F034		
Test ID:		Test Date:	1/30/2012
Test Number:	1	Test Time:	10:46:01 AM

Component Part Number	Component Serial Number
175-5501	15050329A

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.4 deg C P
Humidity	10 -- 70	19 %RH P
Velocity	5.95 -- 6.15	6.14 m/s P
Maximum Headform Flexion Angle	45.0 -- 55.0	48.4 degrees P
Time at Maximum Headform Flexion Angle	39.0 -- 53.0	46.5 ms P
Decay to Zero Degrees	37.0 -- 57.0	38.9 ms P
Velocity Corridor	--	P

All test parameters are within specifications

Technician: **A. Rudniski**

Supervisor: **D. Travale**

Test ID:

Test Time: **10:46:01 AM**

Test Date: **1/30/2012**

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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	1/11/2012
Endevco	7231CT	C16510	10/3/2011
DentonATD	7000428	094	4/25/2011
DentonATD	7000428	095	4/25/2011
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Test ID:

Test Time: **10:46:01 AM**

Test Date: **1/30/2012**

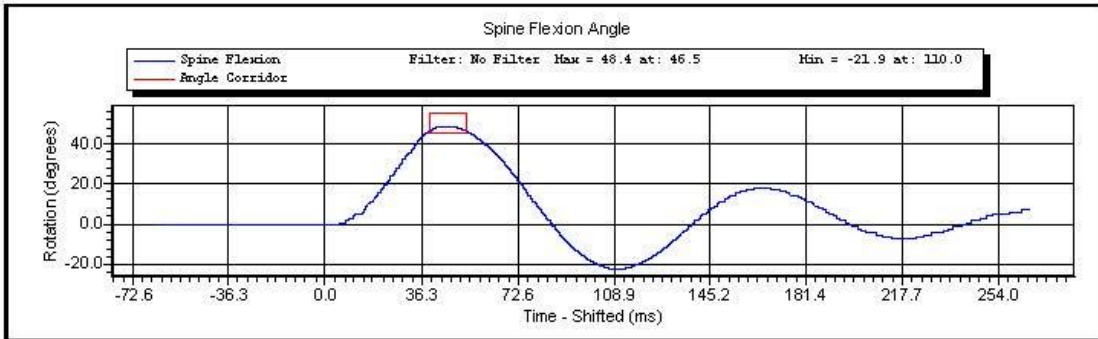
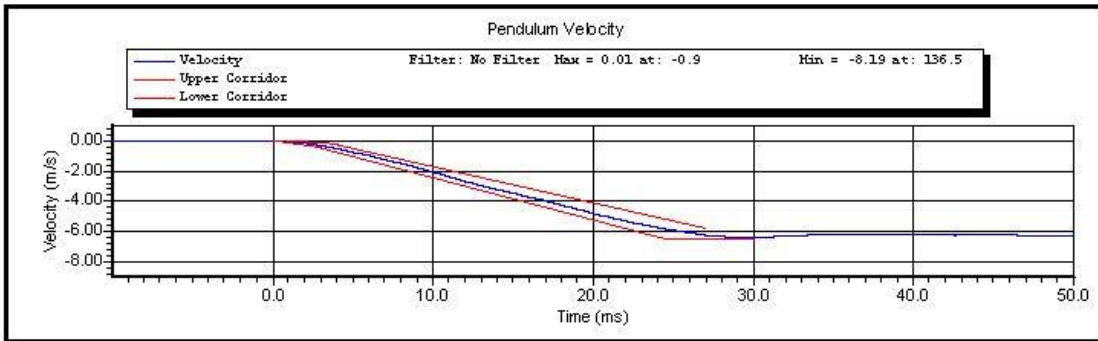
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Test Name:	Lumbar Spine	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F034		
Test ID:		Test Date:	1/30/2012
Test Number:	1	Test Time:	10:46:01 AM



Test ID:

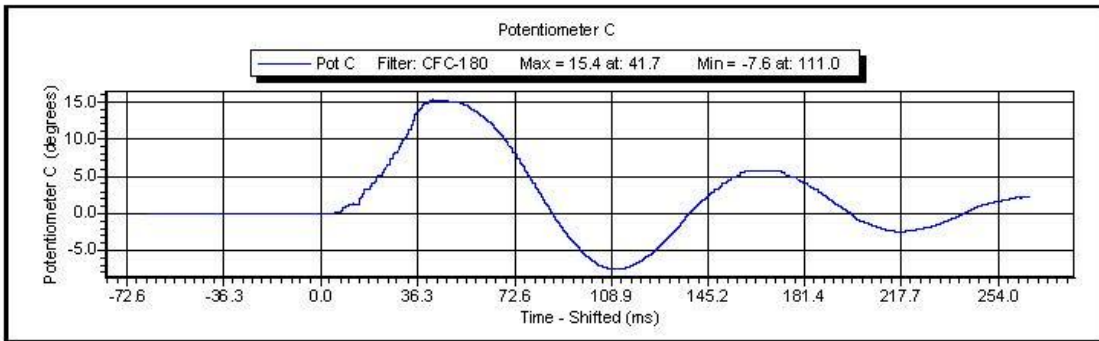
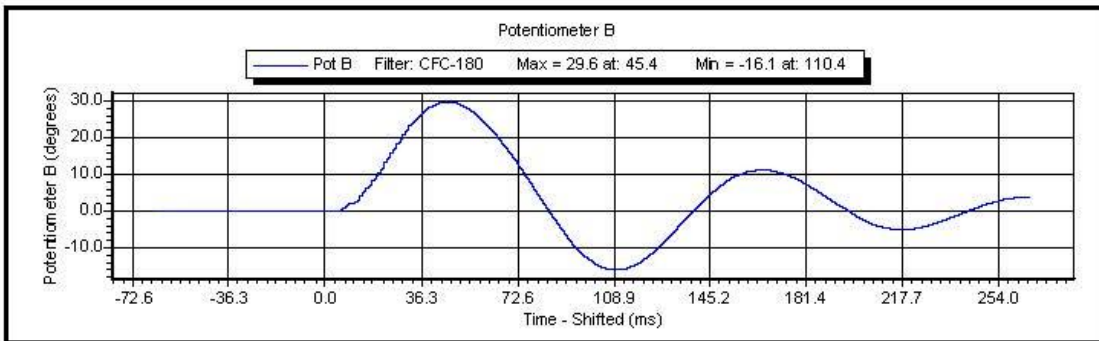
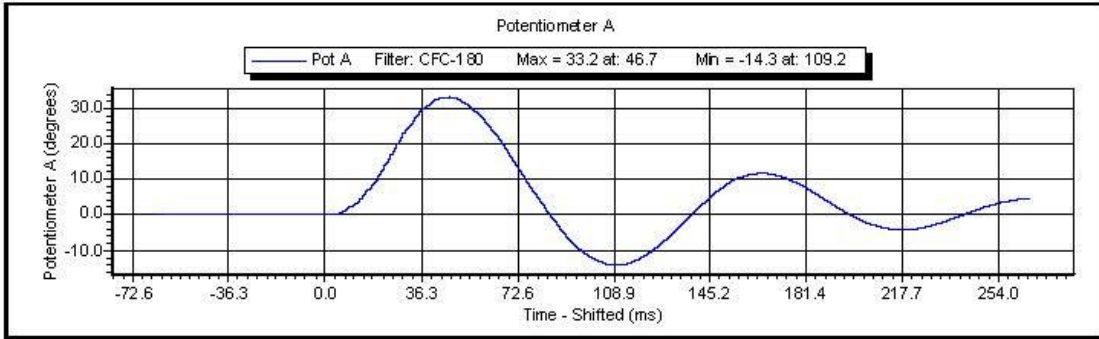
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Test Date: **1/30/2012**

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Test ID:

Test Time: 10:46:01 AM

Test Date: 1/30/2012

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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:	F034		
Test ID:		Test Date:	1/26/2012
Test Number:	1	Test Time:	12:55:10 PM

Component Part Number	Component Serial Number
455-4003 Pelvis	0703L

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.9 deg C P
Humidity	10 -- 70	25 %RH P
Velocity	4.20 -- 4.40	4.33 m/s P
Peak Pendulum Force	-5.40 -- -4.70	-5.06 kN P
Time at Peak Pendulum Force	11.80 -- 16.10	13.53 ms P
Peak Pubic Symphysis Force	-1.59 -- -1.23	-1.39 kN P
Time at Peak Pubic Symphysis Force	12.20 -- 17.00	14.53 ms P

All test parameters are within specifications

Technician: **A. Rudniski**

Supervisor: **D. Travale**

Test ID:

Test Time: **12:55:10 PM**

Test Date: **1/26/2012**



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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	1/11/2012
Endevco	7231CT	AGHF5	1/24/2012
Denton	3096	LC-465Fy	8/31/2011

Test ID:

Test Time: 12:55:10 PM

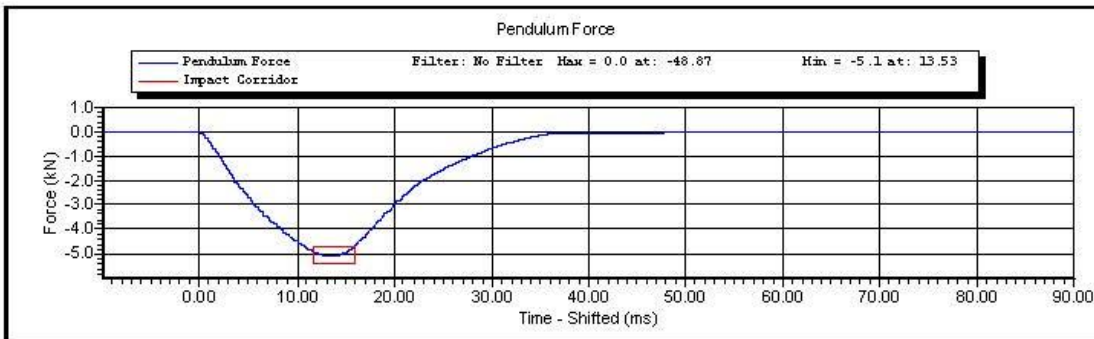
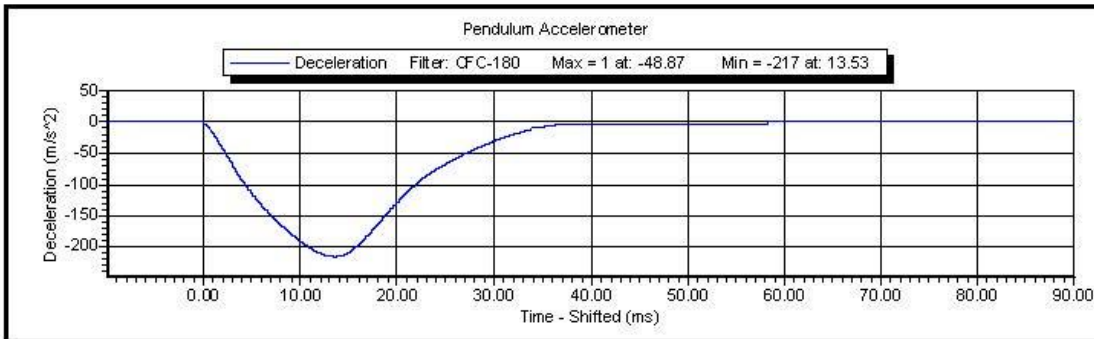
Test Date: 1/26/2012

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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:	F034		
Test ID:		Test Date:	1/26/2012
Test Number:	1	Test Time:	12:55:10 PM



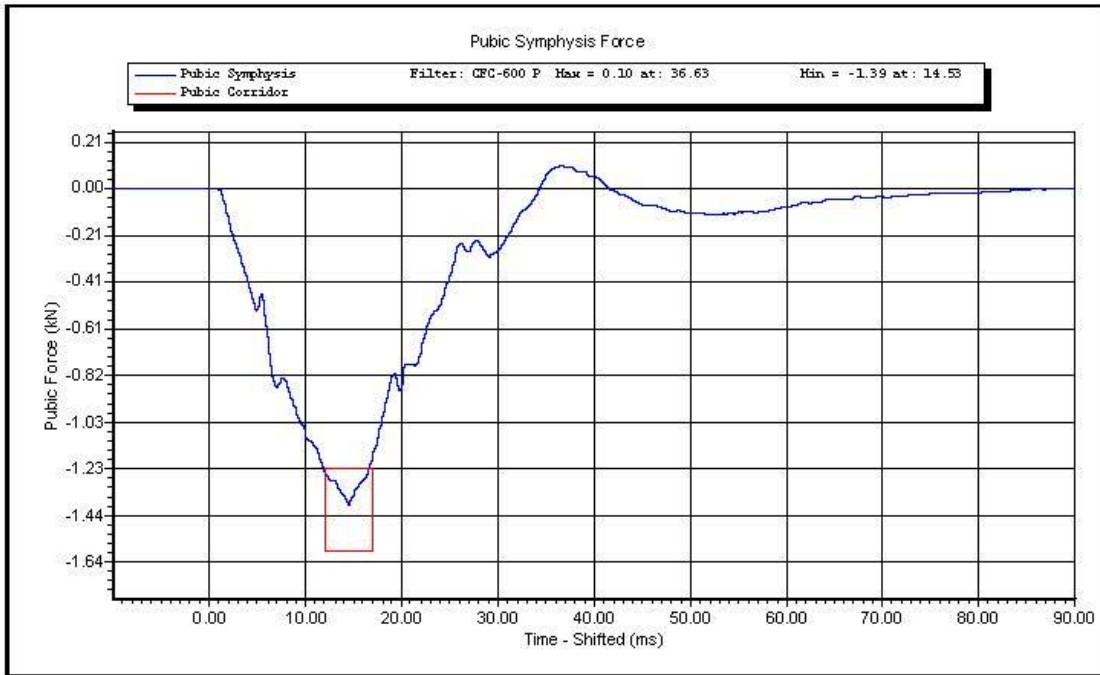
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Test Time: **12:55:10 PM**

Test Date: **1/26/2012**

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Test ID:

Test Time: 12:55:10 PM

Test Date: 1/26/2012

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CALIBRATION TEST RESULTS

PRE-TEST

SID-IIs No: 300

CONFIGURED FOR LEFT SIDE IMPACT



SID-IIsD External Measurements

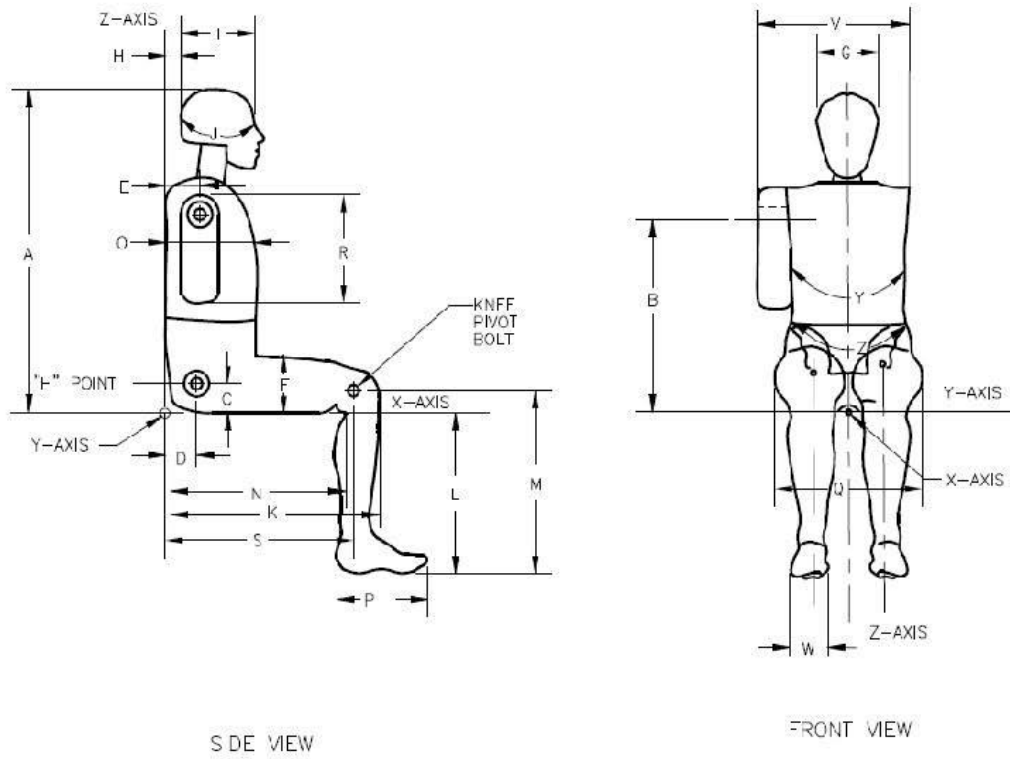
NHTSA ATD S/N 300

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	782	Yes
B	Shoulder Pivot Height	437.0 - 453.0	440	Yes
C	H-Point Height	79.0 - 89.0	83	Yes
D	H-Point from Seat Back	141.0 - 151.0	143	Yes
E	Shoulder Pivot from Backline	97.0 - 107.0	98	Yes
F	Thigh Clearance	119.0 - 135.0	122	Yes
G	Head Breadth	140.0 - 148.0	143	Yes
H	Head Back from Backline	40.0 - 46.0	43	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	525	Yes
L	Popliteal Height	343.0 - 369.0	352	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	397	Yes
N	Buttock Popliteal Length	416.0 - 442.0	433	Yes
O	Chest Depth without Jacket	195.0 - 211.0	204	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	316	Yes
R	Arm Length	249.0 - 259.0	253	Yes
S	Knee Joint to Seat back	478.0 - 493.0	483	Yes
V	Shoulder Width (only one arm installed)	341.0 - 357.0	345	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	866	Yes
Z	Waist Circumference	761.0 - 791.0	776	Yes

Technician: AR

Date: 12/21/2011

SID-IIsD External Dimension Reference Diagram





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VERIFICATION REPORT

Test Name:	Head Drop	Revision:	12/4/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	300		
Test ID:		Test Date:	12/21/2011
Test Number:	1	Test Time:	1:54:13 PM

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

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.0 deg C P
Humidity	10 -- 70	41 %RH P
Resultant Acceleration	115.0 -- 137.0	129.3 g P
Oscillation	0.0 -- 15.0	6.9 % P
Fore-Aft Acceleration	-15.0 -- 15.0	-2.9 g P

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test ID:

Test Time: **1:54:13 PM**

Test Date: **12/21/2011**



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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	P71271	8/12/2011
Endevco	7264-2000	P71281	8/12/2011
Endevco	7264-2000	P71298	8/12/2011

Test ID:

Test Time: **1:54:13 PM**

Test Date: **12/21/2011**

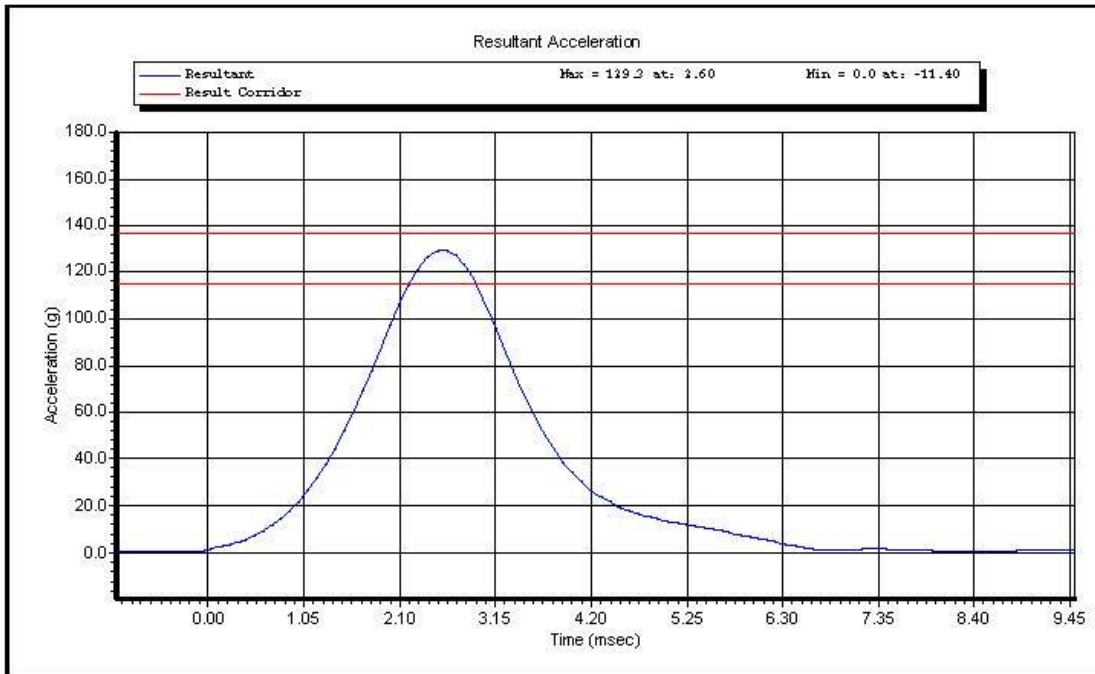


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Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	300		
Test ID:		Test Date:	12/21/2011
Test Number:	1	Test Time:	1:54:13 PM



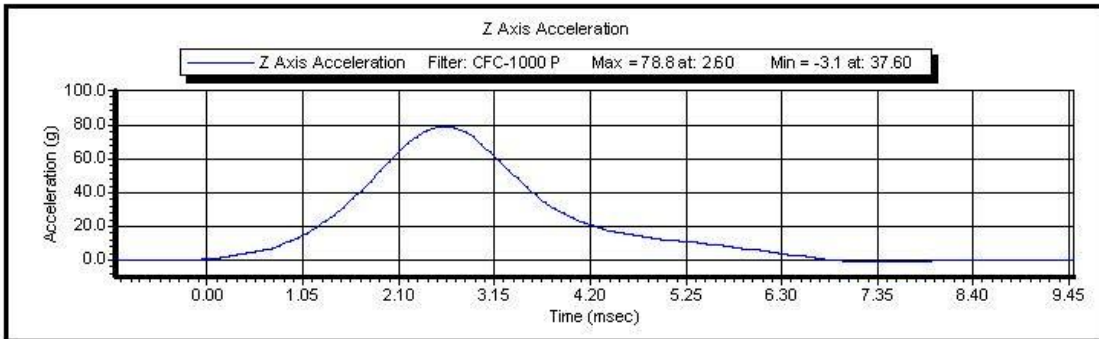
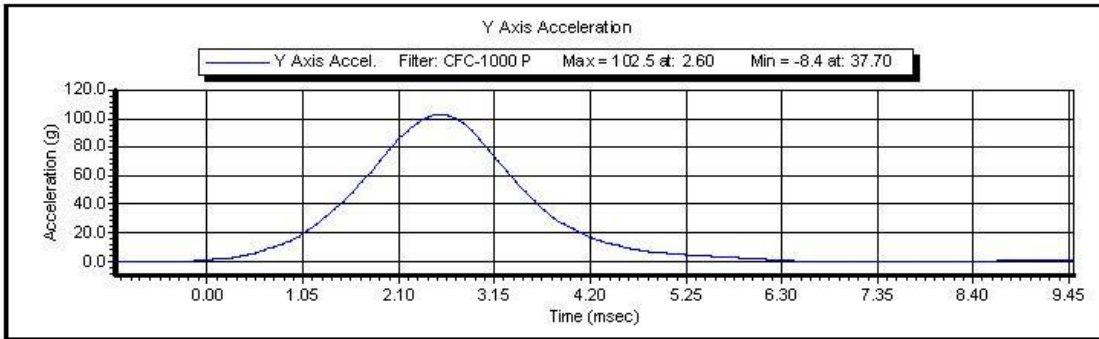
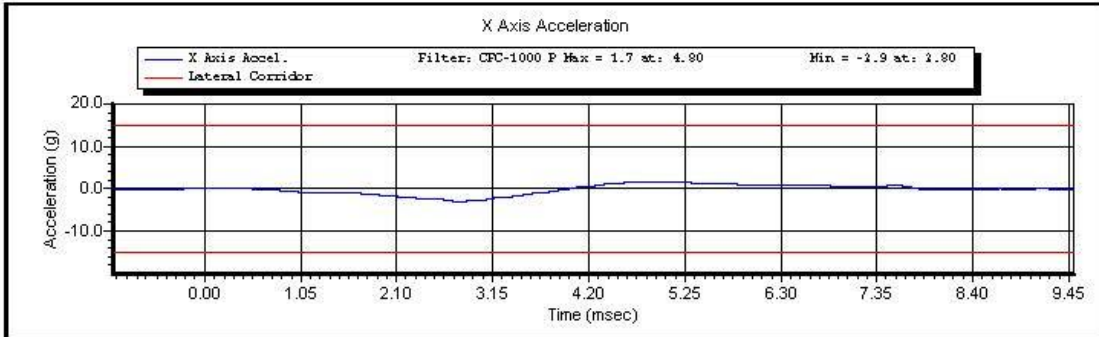
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Test Time: **1:54:13 PM**

Test Date: **12/21/2011**

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1 of 2



Test ID:

Test Time: 1:54:13 PM

Test Date: 12/21/2011

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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-11s		
ATD Serial Number:	300		
Test ID:		Test Date:	12/21/2011
Test Number:	1	Test Time:	4:02:11 PM

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

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.0 deg C P
Humidity	10 -- 70	45 %RH P
Velocity	5.51 -- 5.63	5.59 m/s P
Pendulum Impulse at 10 ms	2.20 -- 2.80	2.22 m/s P
Pendulum Impulse at 15 ms	3.30 -- 4.10	3.32 m/s P
Pendulum Impulse at 20 ms	4.40 -- 5.40	4.52 m/s P
Pendulum Impulse at 25 ms	5.40 -- 6.10	5.45 m/s P
Pendulum Impulse between 25 and 100 ms	5.50 -- 6.20	5.76 m/s P
Max D Plane Rotation	71.0 -- 81.0	73.5 degrees P
Time at Max Rotation	50.0 -- 70.0	61.9 ms P
Moment about OC	-44.0 -- -36.0	-40.9 Nm P
Moment Decay to Zero	102.0 -- 126.0	114.6 ms P

All test parameters are within specifications

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

Test ID:

Test Time: **4:02:11 PM**

Test Date: **12/21/2011**



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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	1/11/2011
Endevco	7231CT	C16510	10/3/2011
Denton	1716A	LC-2192Fy	8/31/2011
Denton	1716A	LC-2192Mx	8/31/2011
DentonATD	78051-342	184	5/8/2011
DentonATD	78051-342	174	5/8/2011
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Test ID:

Test Time: **4:02:11 PM**

Test Date: **12/21/2011**

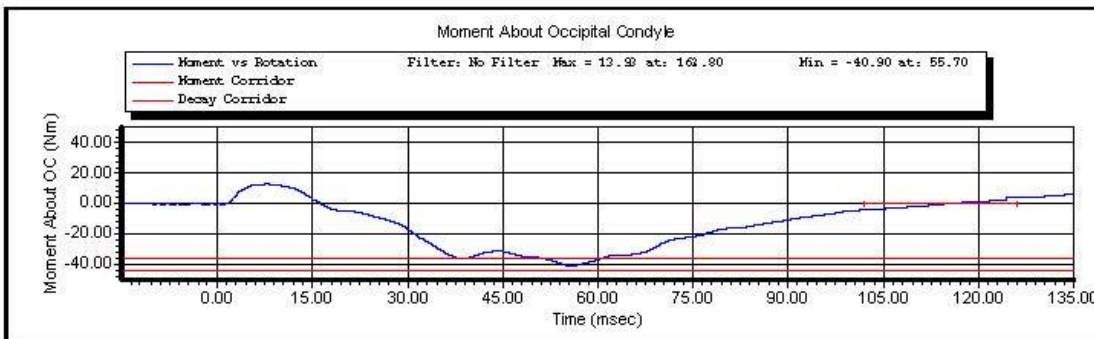
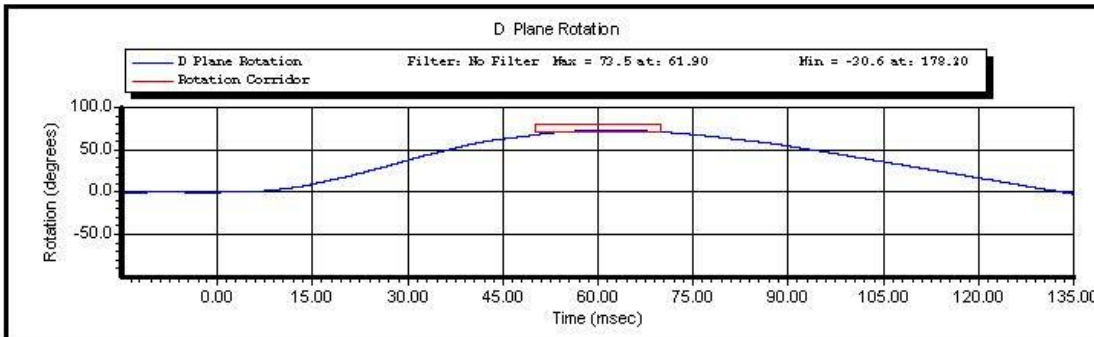


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Test Name:	Neck Pendulum	Revision:	8/24/2009
Sub Test Name:	Left Side	Spec Type:	NHTSA
ATD Type:	SID-11s		
ATD Serial Number:	300		
Test ID:		Test Date:	12/21/2011
Test Number:	1	Test Time:	4:02:11 PM



Test ID:

Test Time: **4:02:11 PM**

Test Date: **12/21/2011**

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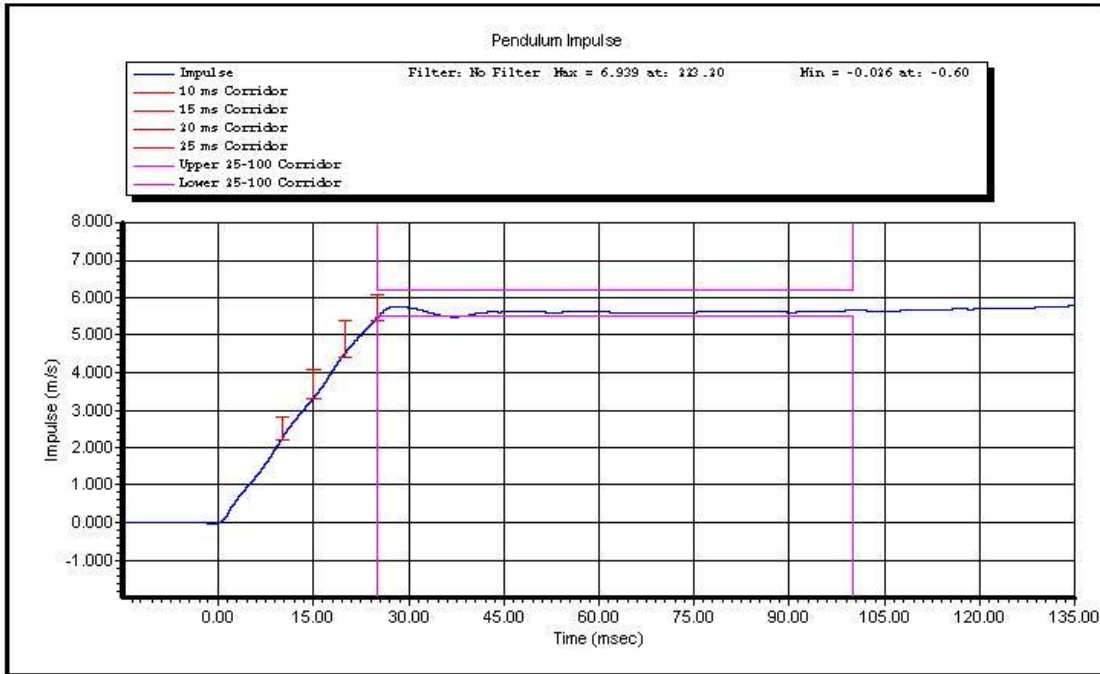
1 of 2



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Test ID:

Test Time: 4:02:11 PM

Test Date: 12/21/2011

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VERIFICATION REPORT

Test Name:	Shoulder Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-11s		
ATD Serial Number:	300		
Test ID:		Test Date:	12/22/2011
Test Number:	1	Test Time:	2:51:32 PM

Component Part Number	Component Serial Number
Shoulder Rib 180-3355	168
Left Arm 180-6011-1	822

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.00 deg C P
Humidity	10.0 -- 70.0	32.8 %RH P
Velocity	4.20 -- 4.40	4.24 m/s P
Probe Acceleration	13.0 -- 18.0	16.2 g P
Shoulder Deflection	28.0 -- 37.0	29.5 mm P
T1 Acceleration	17.0 -- 22.0	20.5 g P

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test ID:

Test Time: **2:51:32 PM**

Test Date: **12/22/2011**



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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	1/11/2011
Endevco	7231CT	AGHF5	12/14/2011
Servo	180-3885	DS-1063	10/31/2011
Endevco	7264-2000	P58806	11/3/2011

Test ID:

Test Time: **2:51:32 PM**

Test Date: **12/22/2011**

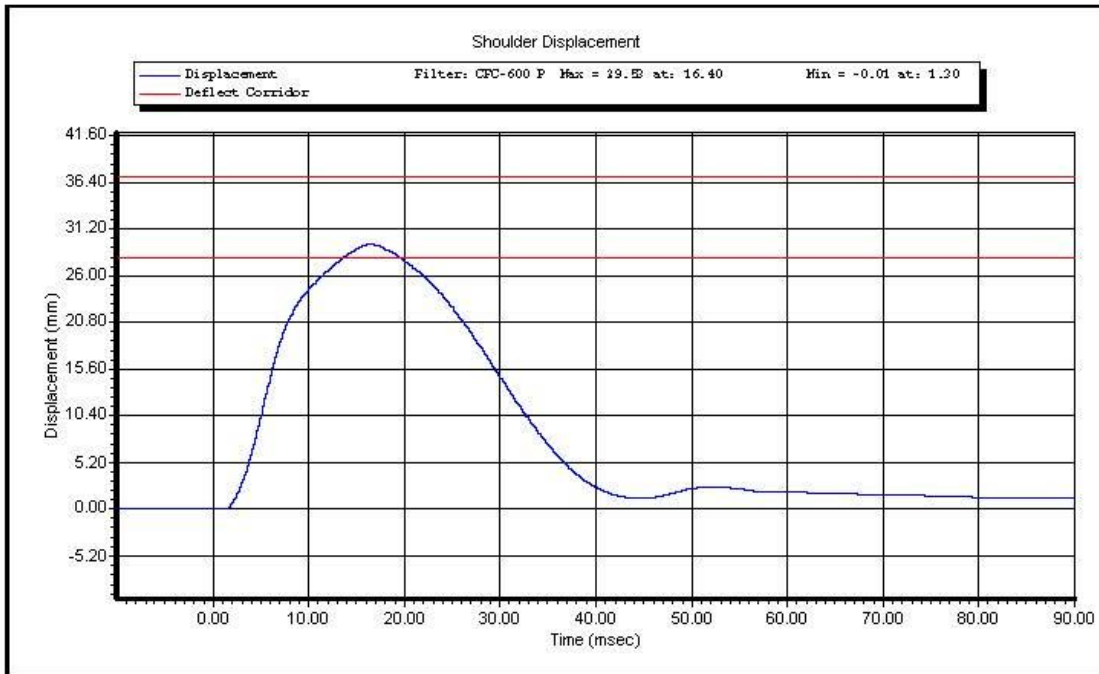


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4455 Genesee Street, Buffalo, New York 14225 - Phone (716)632-7500

Test Name:	Shoulder Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	300		
Test ID:		Test Date:	12/22/2011
Test Number:	1	Test Time:	2:51:32 PM



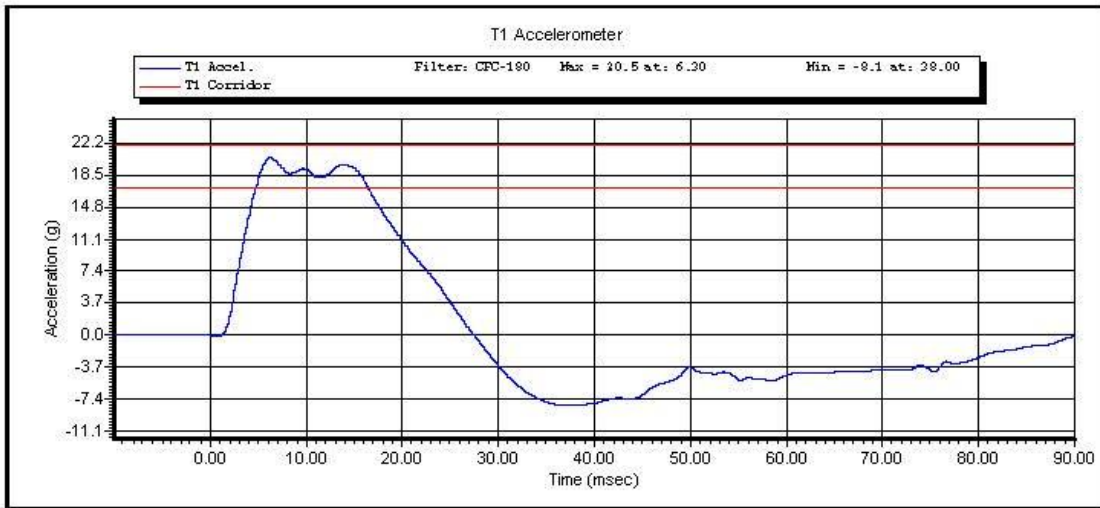
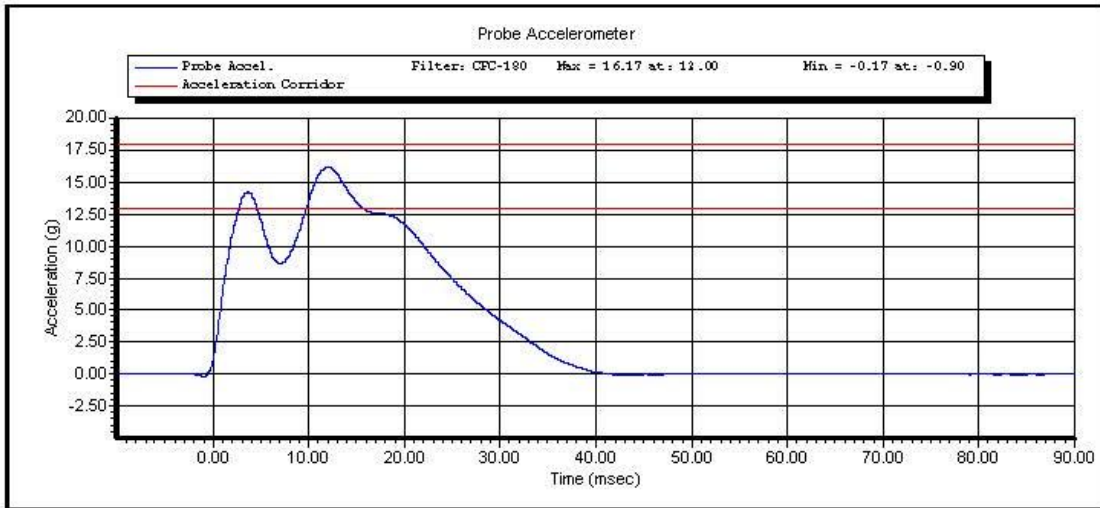
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Test Time: **2:51:32 PM**

Test Date: **12/22/2011**

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1 of 2



Test ID:

Test Time: 2:51:32 PM

Test Date: 12/22/2011

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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-11s		
ATD Serial Number:	300		
Test ID:		Test Date:	1/3/2012
Test Number:	3	Test Time:	11:07:24 AM

Component Part Number	Component Serial Number
Thorax Ribs 1, 2, 3 180-3362	2024, 2061, 2062
Shoulder Rib 180-3355	168
Left Arm 180-6011-1	822

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.4 deg C P
Humidity	10 -- 70	17 %RH P
Velocity	6.60 -- 6.80	6.75 m/s P
Probe Acceleration after 5ms	30.0 -- 36.0	36.0 g P
Upper Thorax Rib Deflection	25.0 -- 32.0	27.0 mm P
Mid Thorax Rib Deflection	30.0 -- 36.0	32.9 mm P
Lower Thorax Rib Deflection	32.0 -- 38.0	34.4 mm P
Upper Spine Acceleration ("y")	34.0 -- 43.0	39.7 g P
Lower Spine Acceleration ("y")	29.0 -- 37.0	33.3 g P
Shoulder Deflection	31.0 -- 40.0	33.2 mm P

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test ID:

Test Time: **11:07:24 AM**

Test Date: **1/3/2012**



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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	1/11/2011
Endevco	7231CT	AGHF5	1/3/2012
Servo	180-3885	DS-1121	10/29/2011
Servo	180-3885	DS-1151	10/31/2011
Servo	180-3885	DS-1156	10/31/2011
Endevco	7264-2000	P58806	11/3/2011
Endevco	7264-2000	P64147	11/1/2011
Servo	180-3885	DS-1063	10/31/2011

Test ID:

Test Time: 11:07:24 AM

Test Date: 1/3/2012

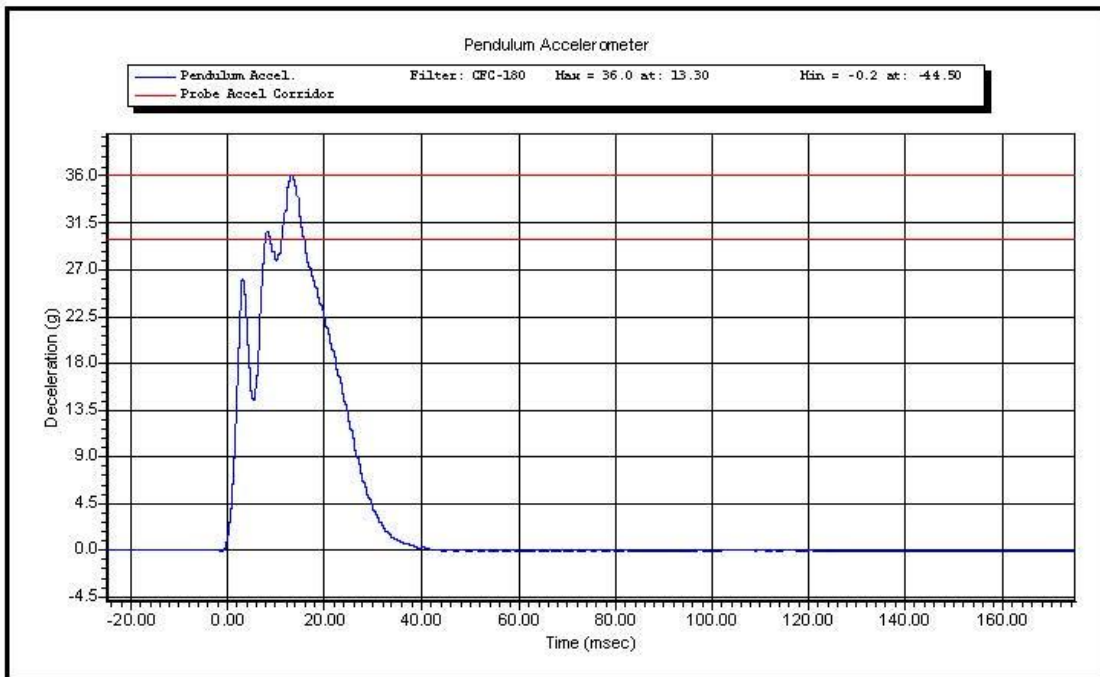


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Test Name:	Thorax Impact with Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	300		
Test ID:		Test Date:	1/3/2012
Test Number:	3	Test Time:	11:07:24 AM



Test ID:

Test Time: **11:07:24 AM**

Test Date: **1/3/2012**

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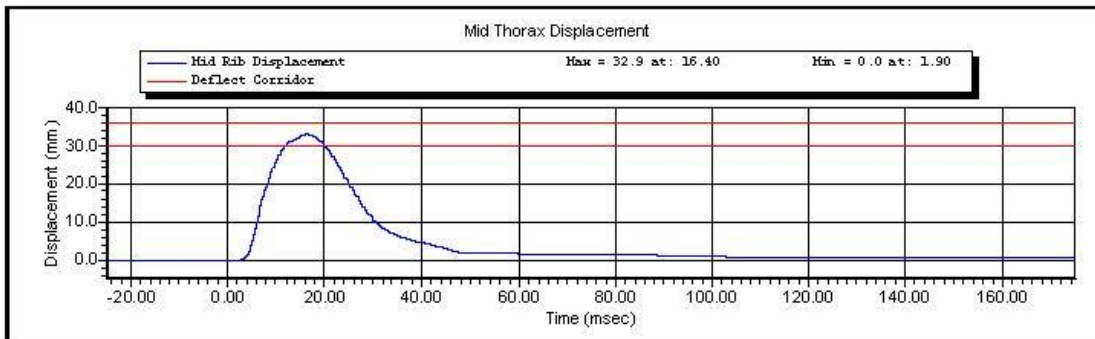
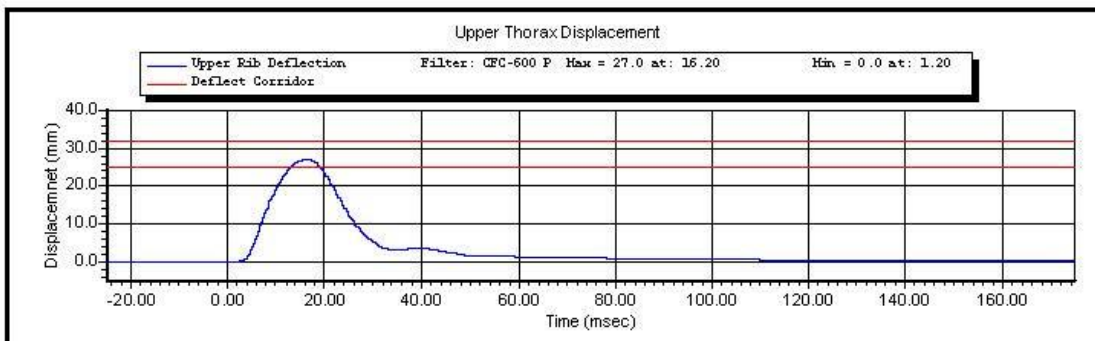
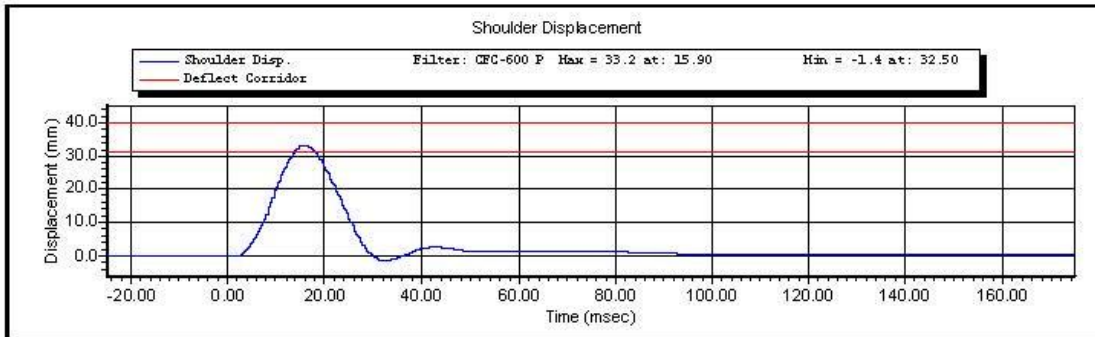
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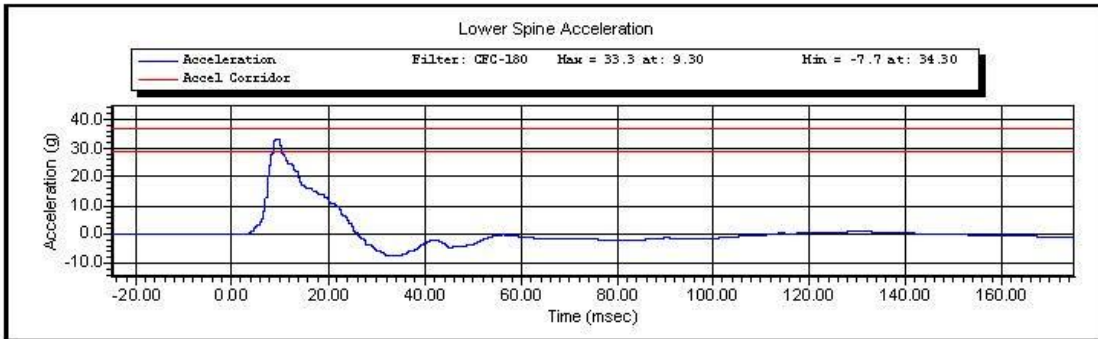
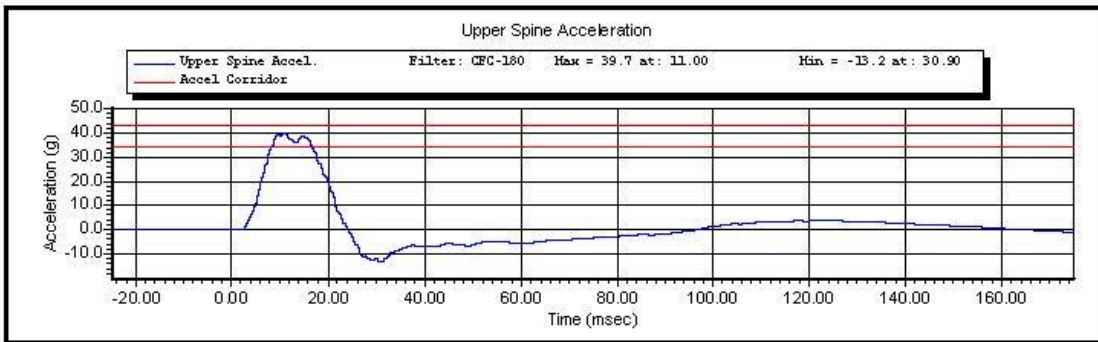
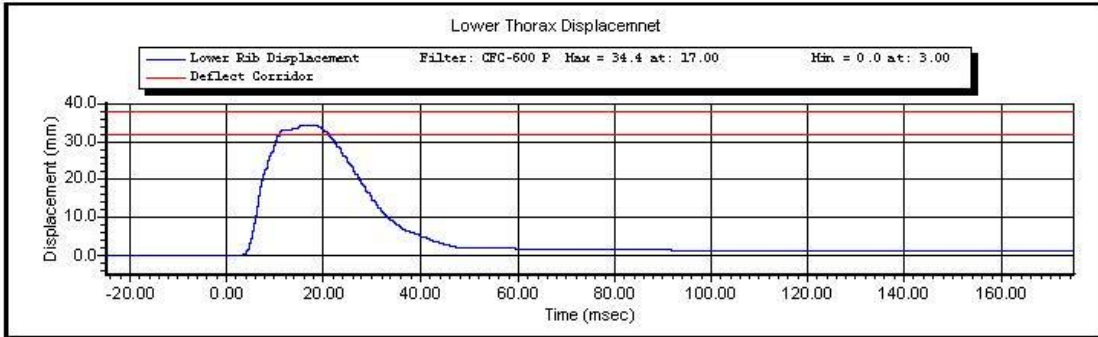
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Test Date: 1/3/2012

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2 of 3



Test ID:

Test Time: 11:07:24 AM

Test Date: 1/3/2012

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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-11s		
ATD Serial Number:	300		
Test ID:		Test Date:	12/22/2011
Test Number:	1	Test Time:	3:18:50 PM

Component Part Number	Component Serial Number
Thorax Ribs 1, 2, 3	2024, 2061, 2062

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.1 deg C P
Humidity	10 -- 70	33 %RH P
Velocity	4.20 -- 4.40	4.37 m/s P
Probe Acceleration	14.0 -- 18.0	16.4 g P
Upper Thorax Rib Deflection	32.0 -- 40.0	37.4 mm P
Mid Thorax Rib Deflection	39.0 -- 45.0	43.1 mm P
Lower Thorax Rib Deflection	35.0 -- 43.0	38.8 mm P
Upper Spine Acceleration T1	13.0 -- 17.0	16.1 g P
Lower Spine Acceleration T12	7.0 -- 11.0	8.7 g P

All test parameters are within specifications

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

Test ID:

Test Time: **3:18:50 PM**

Test Date: **12/22/2011**



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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	1/11/2011
Endevco	7231CT	AGHF5	12/14/2011
Servo	180-3885	DS-1121	10/29/2011
Servo	180-3885	DS-1151	10/31/2011
Servo	180-3885	DS-1156	10/31/2011
Endevco	7264-2000	P58806	11/3/2011
Endevco	7264-2000	P64147	11/1/2011

Test ID:

Test Time: **3:18:50 PM**

Test Date: **12/22/2011**

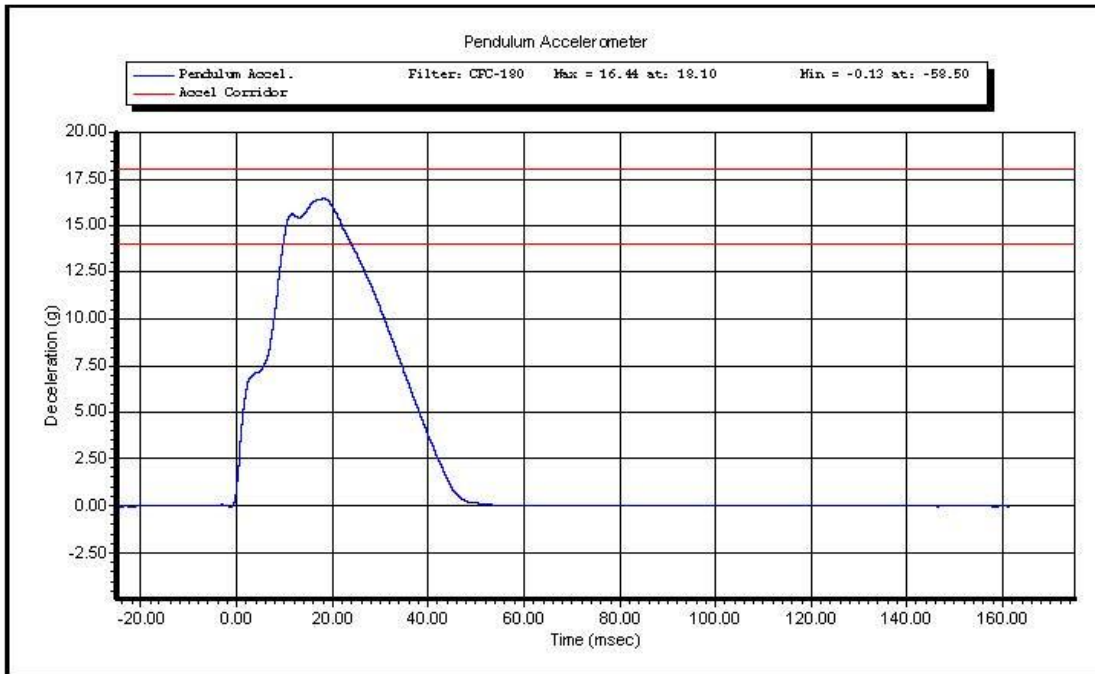


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Test Name:	Thorax Impact without Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	300		
Test ID:		Test Date:	12/22/2011
Test Number:	1	Test Time:	3:18:50 PM



Test ID:

Test Time: **3:18:50 PM**

Test Date: **12/22/2011**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

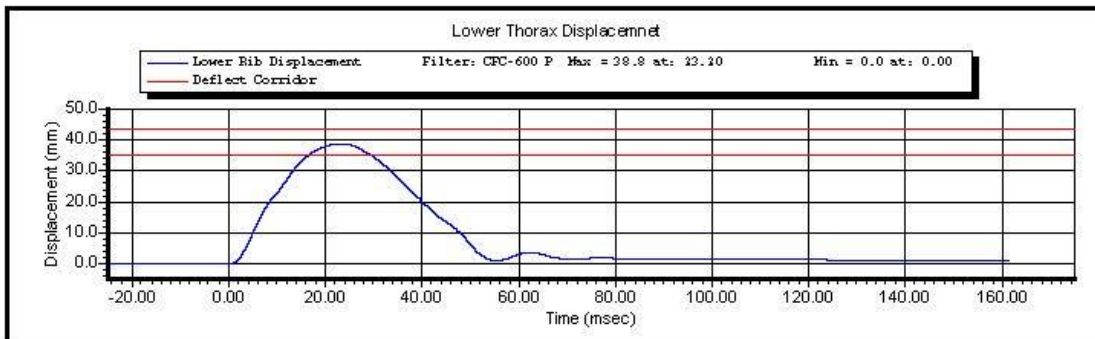
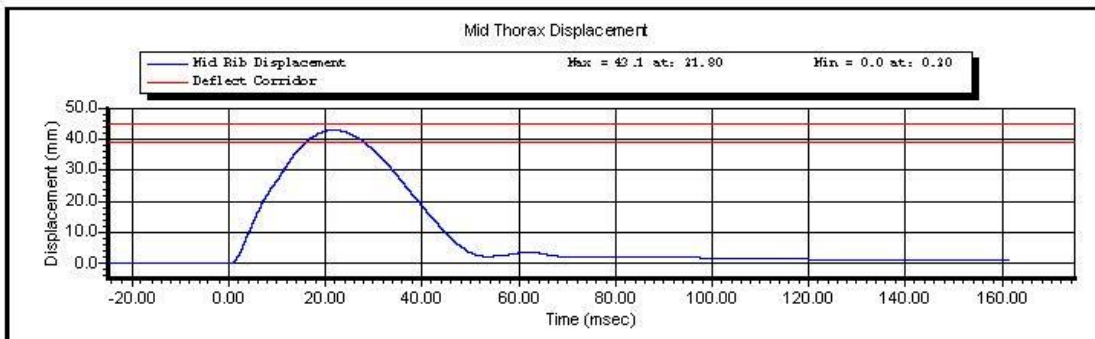
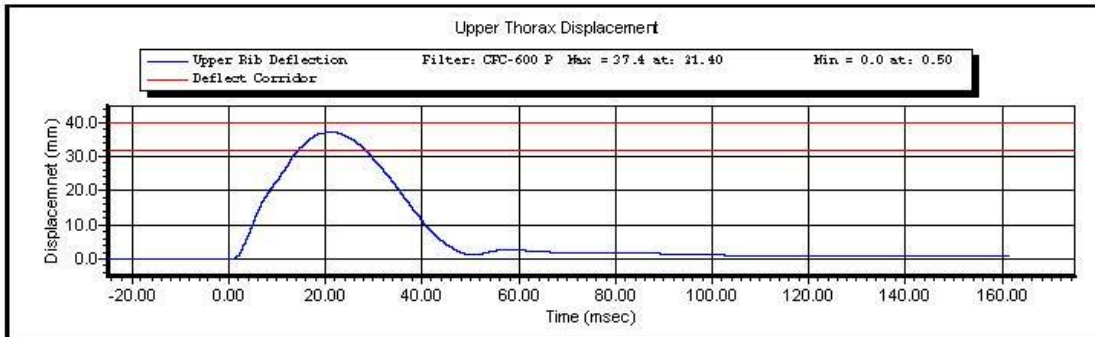
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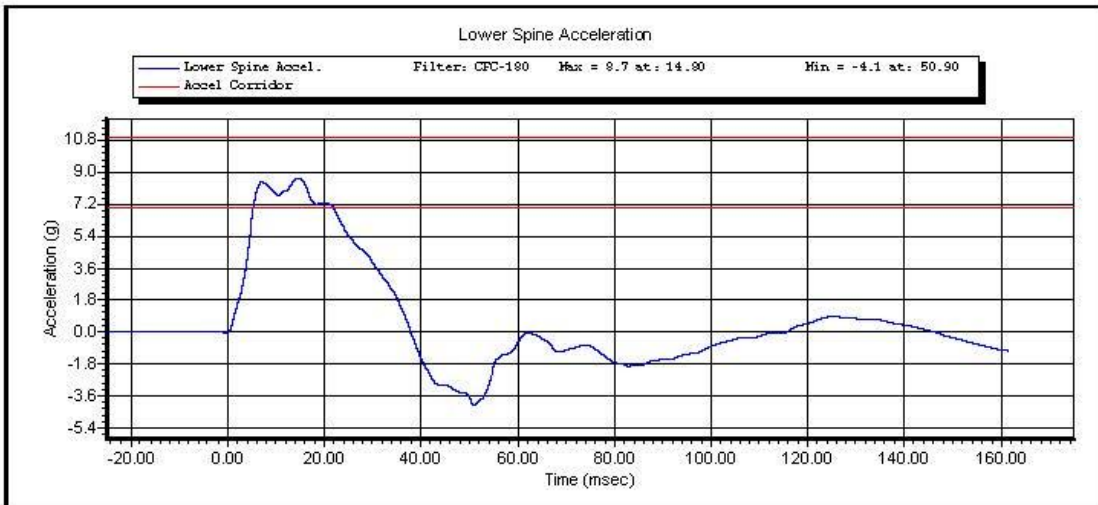
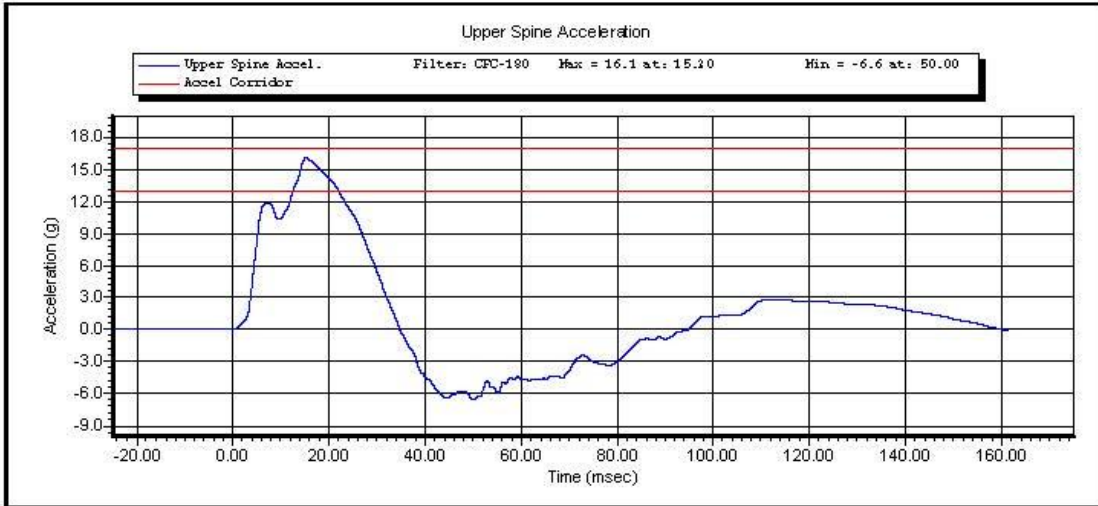
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Test Date: 12/22/2011

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2 of 3



Test ID:

Test Time: 3:18:50 PM

Test Date: 12/22/2011

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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:	300		
Test ID:		Test Date:	12/22/2011
Test Number:	1	Test Time:	3:42:17 PM

Component Part Number	Component Serial Number
Abdomen Ribs 4, 5	2024, 2061

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.1 deg C P
Humidity	10 -- 70	33 %RH P
Velocity	4.20 -- 4.40	4.38 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	37.7 mm P
Lower Spine Acceleration - T12	9.0 -- 14.0	12.3 g P

All test parameters are within specifications

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

Test ID:

Test Time: **3:42:17 PM**

Test Date: **12/22/2011**



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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	1/11/2011
Endevco	7231CT	AGHF5	12/14/2011
Servo	180-3885	DS-1162	11/3/2011
Servo	180-3885	DS-1622	11/3/2011
Endevco	7264-2000	P64147	11/1/2011

Test ID:

Test Time: **3:42:17 PM**

Test Date: **12/22/2011**

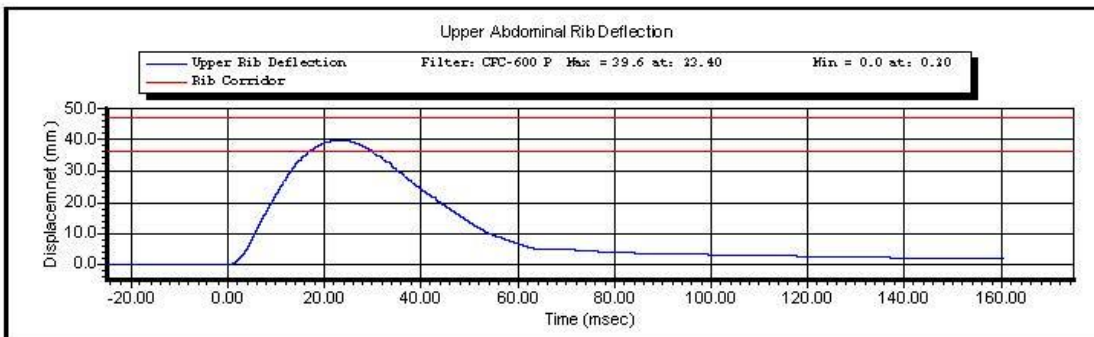
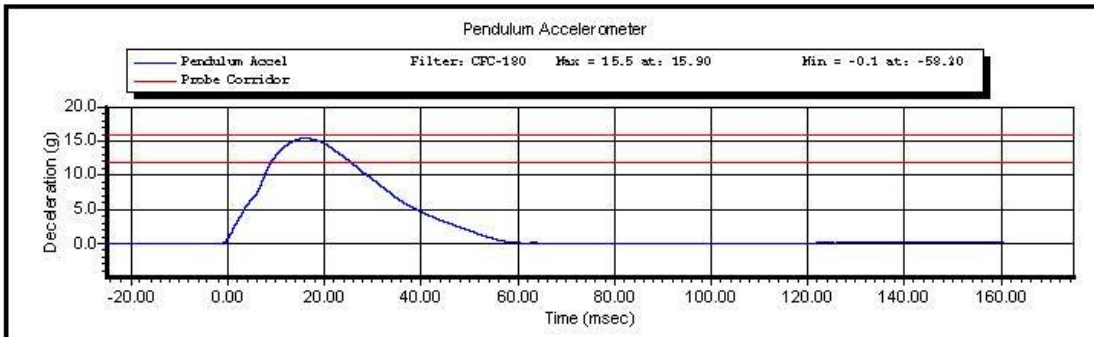


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Test Name:	Abdominal Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	300		
Test ID:		Test Date:	12/22/2011
Test Number:	1	Test Time:	3:42:17 PM



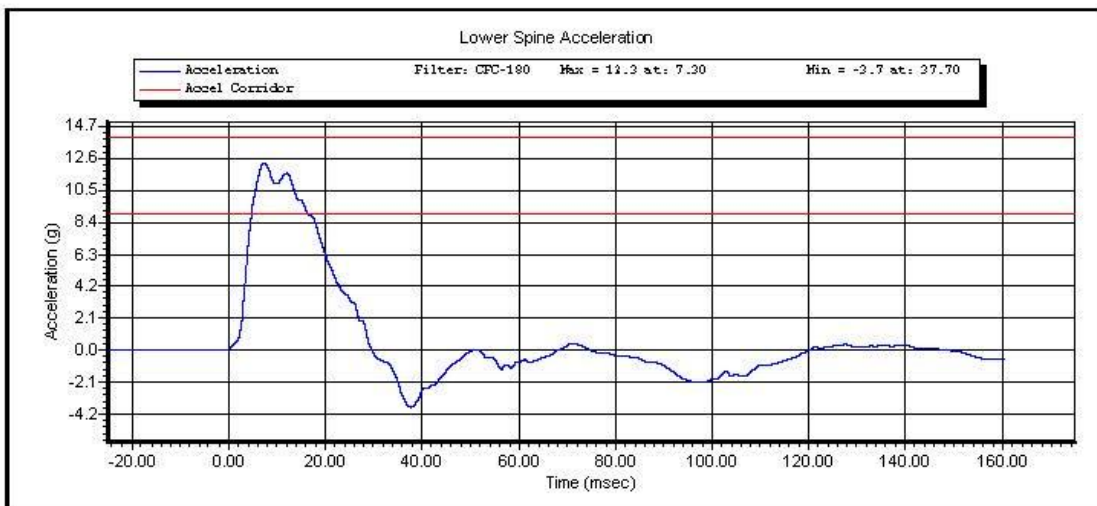
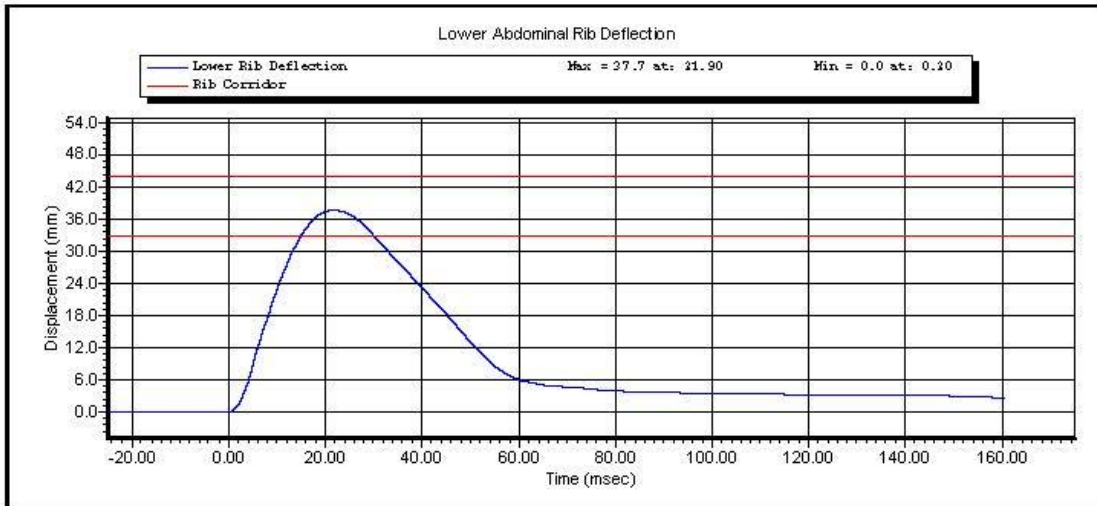
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Test Date: **12/22/2011**

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1 of 2



Test ID:

Test Time: 3:42:17 PM

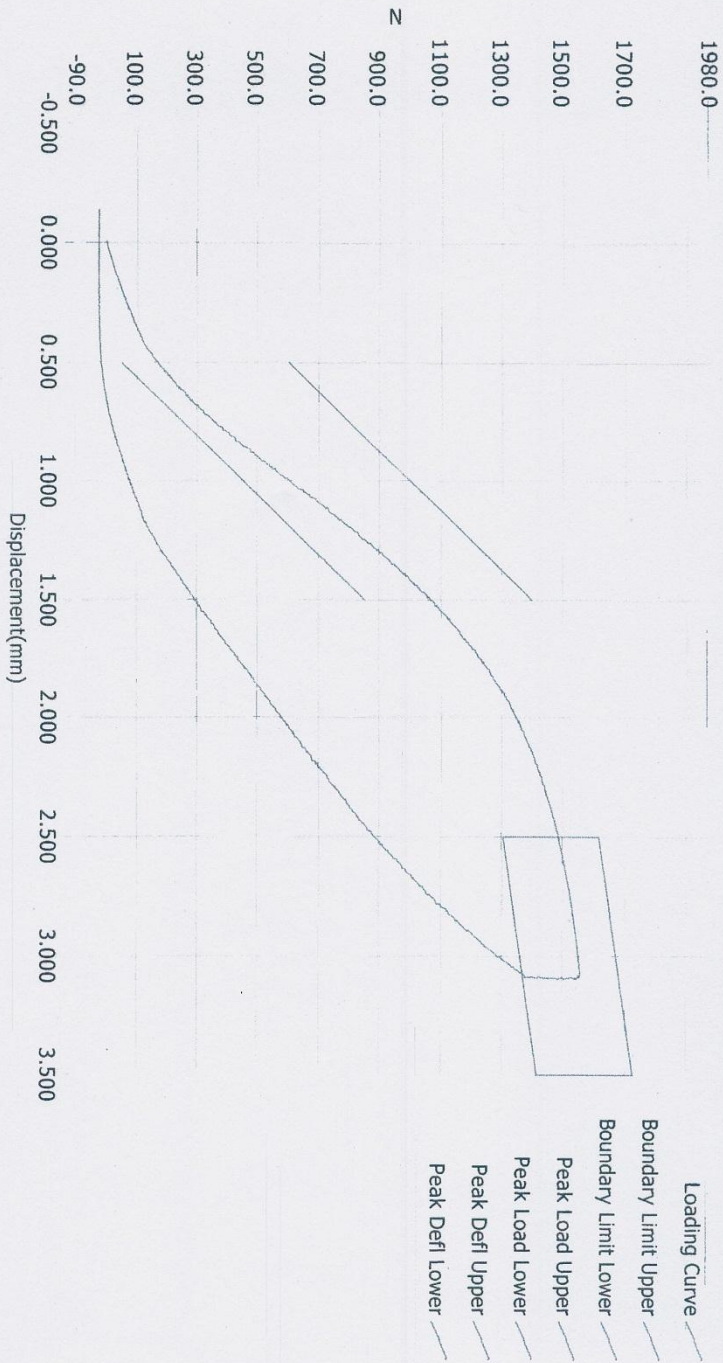
Test Date: 12/22/2011

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CERT

Resultant Data - SIDIIS Plug Compression



ATD Calibration Lab

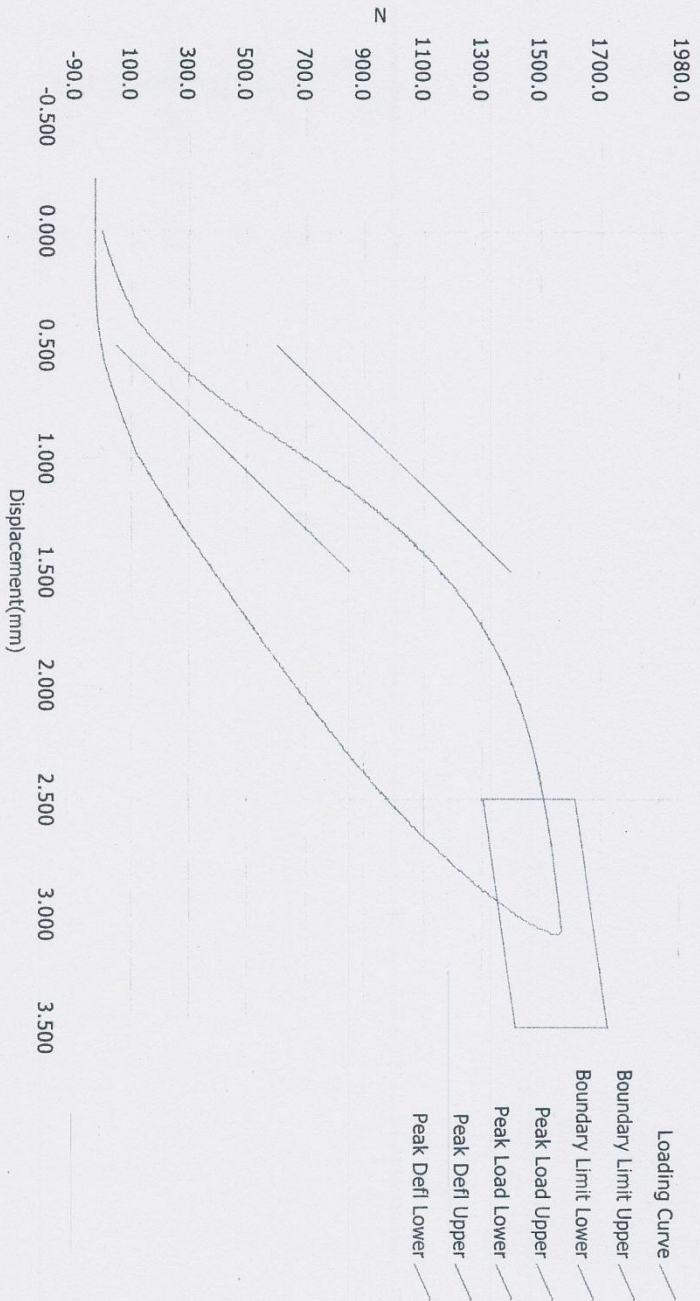
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Cert ID	ATD Serial Number	ATD Type	
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Current Date : 9/22/2011

Current Time : 20:59:25

CRASH

Resultant Data - SIDIIS Plug Compression



ATTD Calibration Lab

<u>Test ID</u>	<u>Part Serial Number</u>	<u>Test Date</u>	<u>Test Time</u>
<u>Cert ID</u>	<u>ATD Serial Number</u>	<u>ATD Type</u>	
	N/A	SIDIIS	

Current Date : 9/20/2011 Current Time : 22:15:48



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VERIFICATION REPORT

Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Acetabulum Impact	Spec Type:	NHTSA
ATD Type:	SID-11s		
ATD Serial Number:	300		
Test ID:		Test Date:	1/3/2012
Test Number:	1	Test Time:	11:54:57 AM

Component Part Number	Component Serial Number
180-4343 Pelvis Flesh	D13396
Humanetics Cert Plug	46469
Humanetics Test Plug	46017

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.7 deg C P
Humidity	10 -- 70	17 %RH P
Velocity	6.60 -- 6.80	6.61 m/s P
Peak Probe Acceleration	38.0 -- 47.0	46.5 g P
Peak Pelvis Acceleration	34.0 -- 42.0	41.3 g P
Peak Acetabulum Force	3.60 -- 4.30	3.88 kN P

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test ID:

Test Time: **11:54:57 AM**

Test Date: **1/3/2012**



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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	1/11/2011
Endevco	7231CT	AGHF5	1/3/2012
Endevco	7264-2000	P15526	10/31/2011
DentonATD	3249J	LC-275a	11/3/2011

Test ID:

Test Time: 11:54:57 AM

Test Date: 1/3/2012

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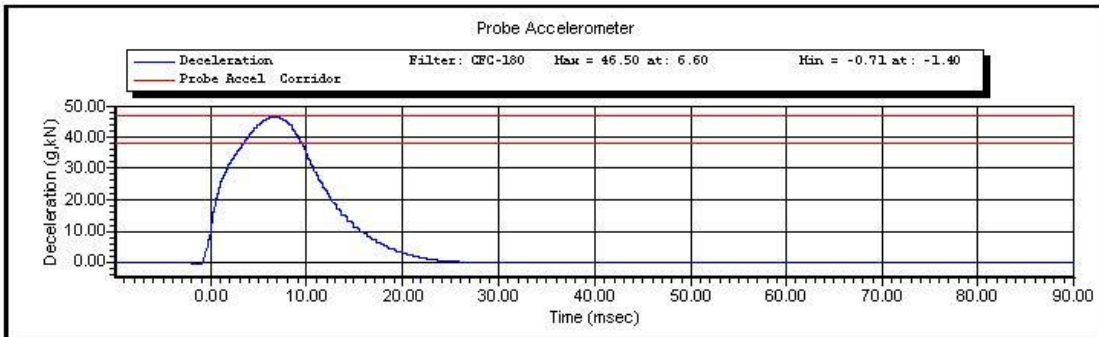
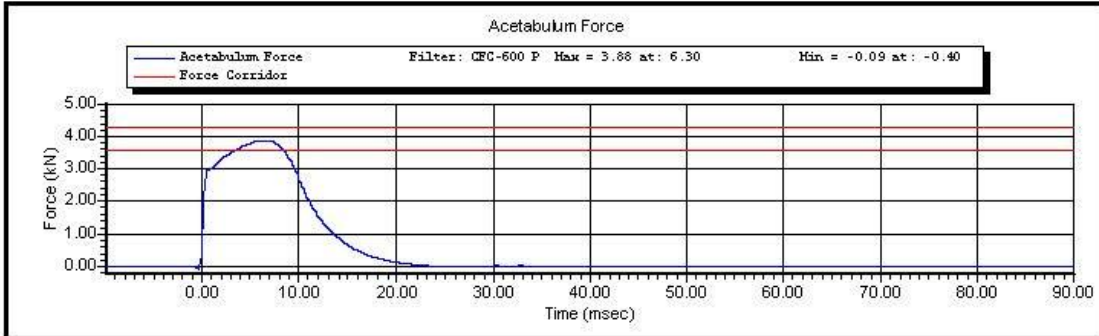


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Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Acetabulum Impact	Spec Type:	NHTSA
ATD Type:	SID-11s		
ATD Serial Number:	300		
Test ID:		Test Date:	1/3/2012
Test Number:	1	Test Time:	11:54:57 AM



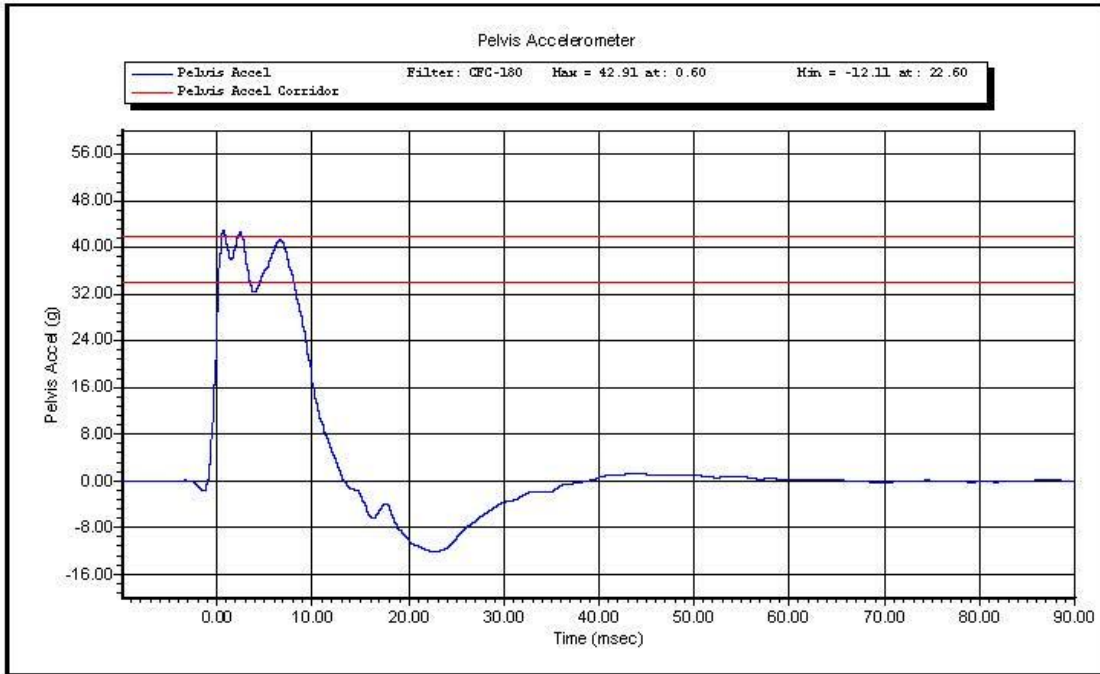
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Test Time: **11:54:57 AM**

Test Date: **1/3/2012**

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1 of 2



Test ID:

Test Time: 11:54:57 AM

Test Date: 1/3/2012

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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:	300		
Test ID:		Test Date:	12/22/2011
Test Number:	1	Test Time:	10:23:06 AM

Component Part Number	Component Serial Number
180-4343 Pelvis Flesh	DG396

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.7 deg C P
Humidity	10 -- 70	35 %RH P
Velocity	4.20 -- 4.40	4.31 m/s P
Peak Probe Acceleration	36.0 -- 45.0	42.2 g P
Peak Pelvis Acceleration	28.0 -- 39.0	33.7 g P
Peak Iliac Force	4.10 -- 5.10	4.66 kN P

All test parameters are within specifications

Technician: **A. Rudniski**

Supervisor: **D. Travale**

Test ID:

Test Time: **10:23:06 AM**

Test Date: **12/22/2011**



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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	1/11/2011
Endevco	7231CT	AGHF5	12/14/2011
Endevco	7264-2000	P15526	10/31/2011
DentonATD	3228J	LC-279 Fy	11/3/2011

Test ID:

Test Time: **10:23:06 AM**

Test Date: **12/22/2011**

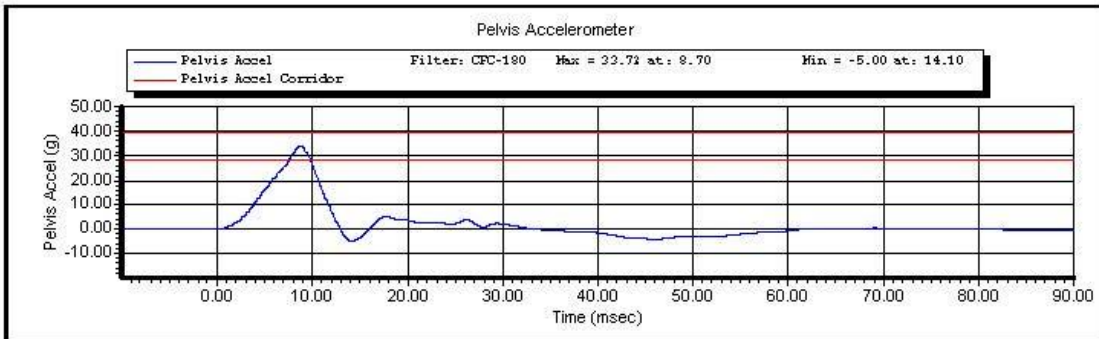
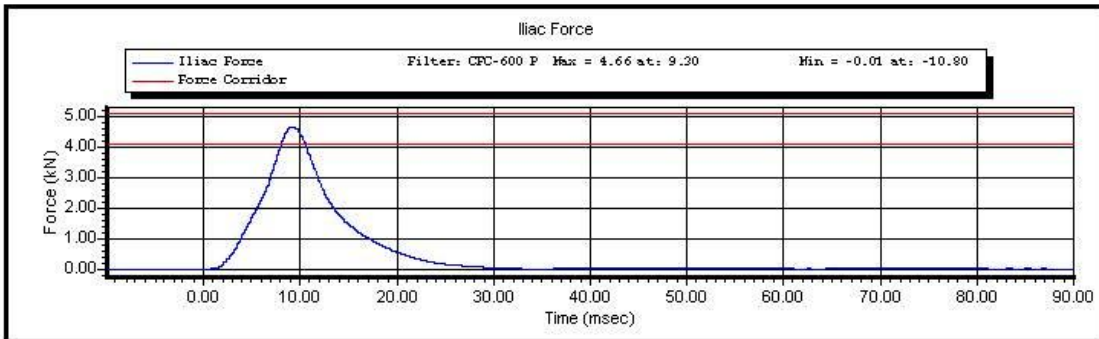


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Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Iliac Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	300		
Test ID:		Test Date:	12/22/2011
Test Number:	1	Test Time:	10:23:06 AM



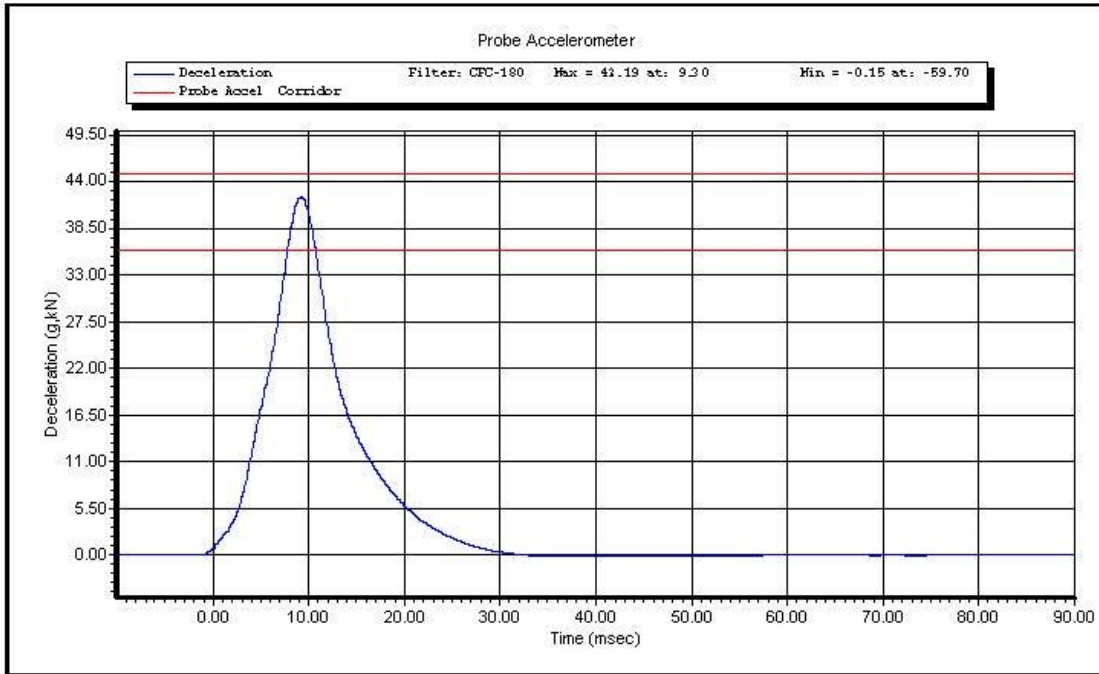
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Test Time: **10:23:06 AM**

Test Date: **12/22/2011**

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Test ID:

Test Time: 10:23:06 AM

Test Date: 12/22/2011

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CALIBRATION TEST RESULTS

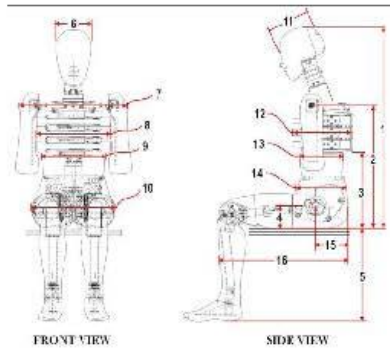
POST-TEST

ES2-re No: F034

CONFIGURED FOR LEFT SIDE IMPACT

ES-2re External Measurements

NHTSA S/N F034



Dim. No.	Description	Specification (mm)	Result (mm)	Pass/Fail
1	Sitting Height	900-918	915	Pass
2	Seat to Shoulder Joint	558-572	560	Pass
3	Seat to Lower Face of Thoracic Spine Box	346-356	355	Pass
4	Seat to Hip Joint (center of bolt)	97-103	98	Pass
5	Sole to Seat, Sitting	433-451	440	Pass
6	Head Width	152-158	154	Pass
7	Shoulder/Arm Width	461-479	465	Pass
8	Thorax Width	322-332	327	Pass
9	Abdomen Width	273-287	285	Pass
10	Pelvis Lap Width	359-373	369	Pass
11	Head Depth	196-206	199	Pass
12	Thorax Depth	262-272	268	Pass
13	Abdomen Depth	194-204	203	Pass
14	Pelvis Depth	235-245	239	Pass
15	Back of Buttocks to Hip Joint (center of bolt)	150-160	159	Pass
16	Back of Buttocks to Front Knee	597-615	605	Pass

Technician: MG

Date: 2/8/2012



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VERIFICATION REPORT

Test Name:	Head Drop	Revision:	12/4/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F034		
Test ID:		Test Date:	2/8/2012
Test Number:	2	Test Time:	1:01:27 PM

Component Part Number	Component Serial Number
455-1007	1916409

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.8 deg C P
Humidity	10 -- 70	21 %RH P
Resultant Acceleration	125 -- 155	146 g P
Oscillation	0.0 -- 15.0	2.1 % P
Fore-Aft Acceleration	-15.00 -- 15.00	6.05 g P

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test ID:

Test Time: **1:01:27 PM**

Test Date: **2/8/2012**



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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	P58737	9/29/2011
Endevco	7264-2000	P52022	9/29/2011
Endevco	7264-2000	P52040	9/29/2011

Test ID:

Test Time: **1:01:27 PM**

Test Date: **2/8/2012**

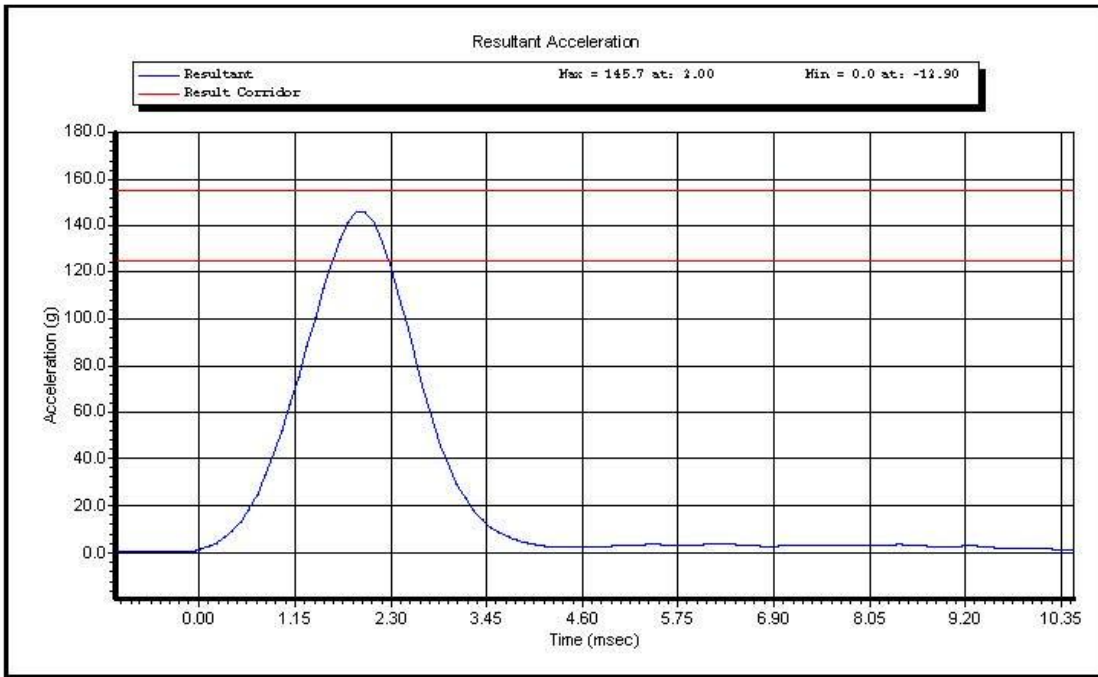


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Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F034		
Test ID:		Test Date:	2/8/2012
Test Number:	2	Test Time:	1:01:27 PM



Test ID:

Test Time: **1:01:27 PM**

Test Date: **2/8/2012**

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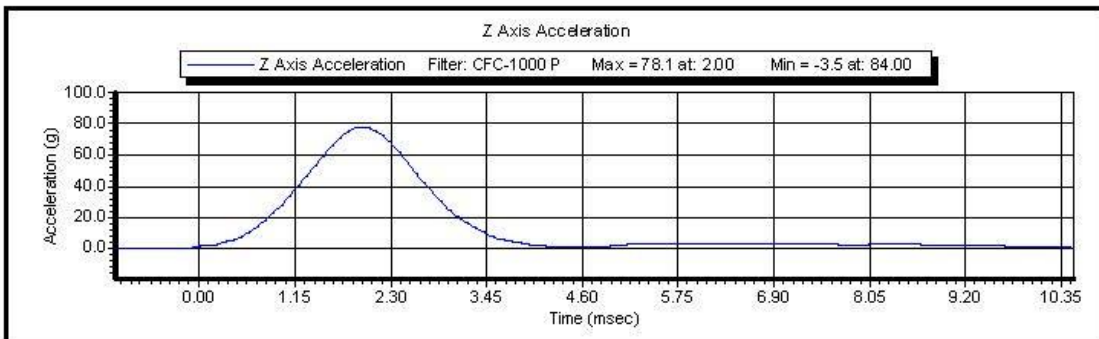
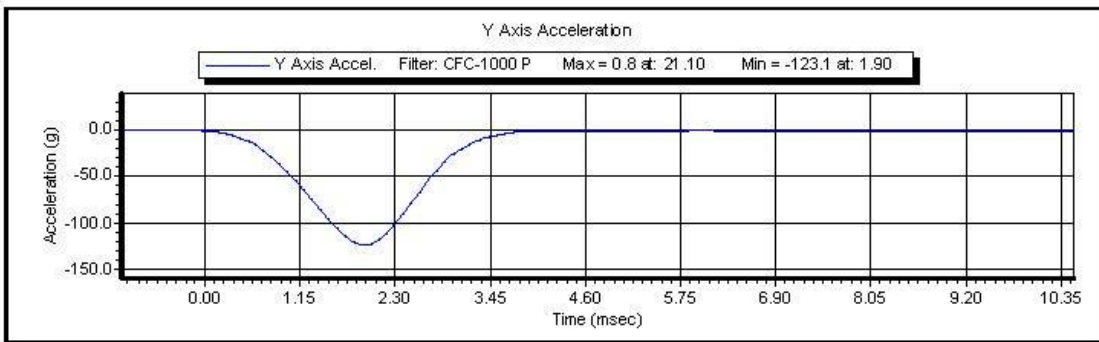
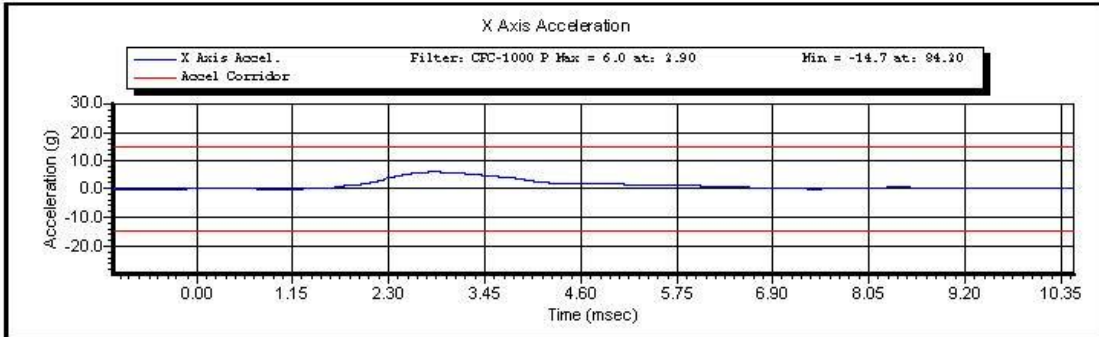
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Test ID:

Test Time: 1:01:27 PM

Test Date: 2/8/2012

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VERIFICATION REPORT

Test Name:	Neck Flexion	Revision:	12/4/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F034		
Test ID:		Test Date:	2/8/2012
Test Number:	1	Test Time:	11:39:32 AM

Component Part Number	Component Serial Number
455-2002	07066

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.4 deg C P
Humidity	10 -- 70	24 %RH P
Velocity	3.30 -- 3.50	3.45 m/s P
Maximum Neck Flexion Angle	49.0 -- 59.0	51.4 degrees P
Time At Maximum Neck Flexion	54.0 -- 66.0	61.4 ms P
Decay to Zero Degrees	53.0 -- 88.0	61.8 ms P
Velocity Corridor	--	P

All test parameters are within specifications

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

Test ID:

Test Time: **11:39:32 AM**

Test Date: **2/8/2012**



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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	1/11/2012
Endevco	7231CT	C165 10	10/3/2011
DentonATD	7000428	094	4/25/2011
DentonATD	7000428	095	4/25/2011
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Test ID:

Test Time: **11:39:32 AM**

Test Date: **2/8/2012**

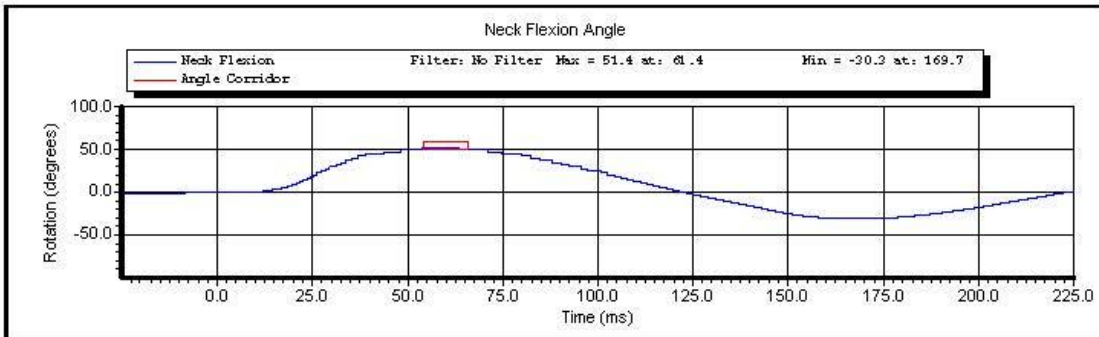
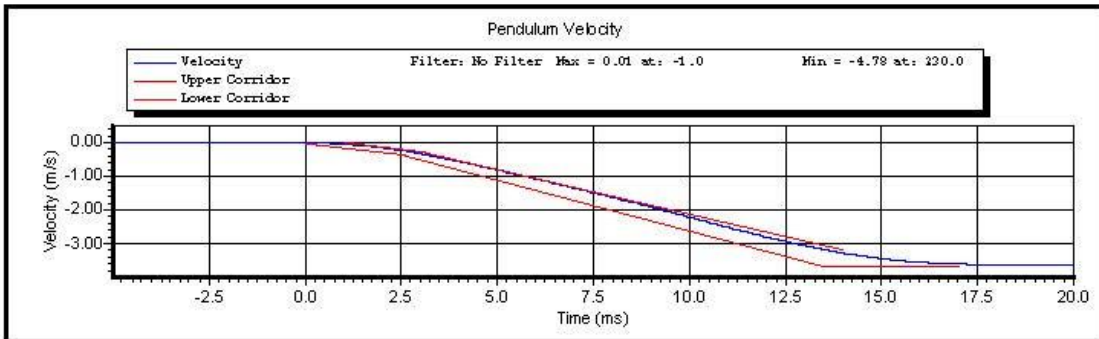


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Test Name:	Neck Flexion	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F034		
Test ID:		Test Date:	2/8/2012
Test Number:	1	Test Time:	11:39:32 AM



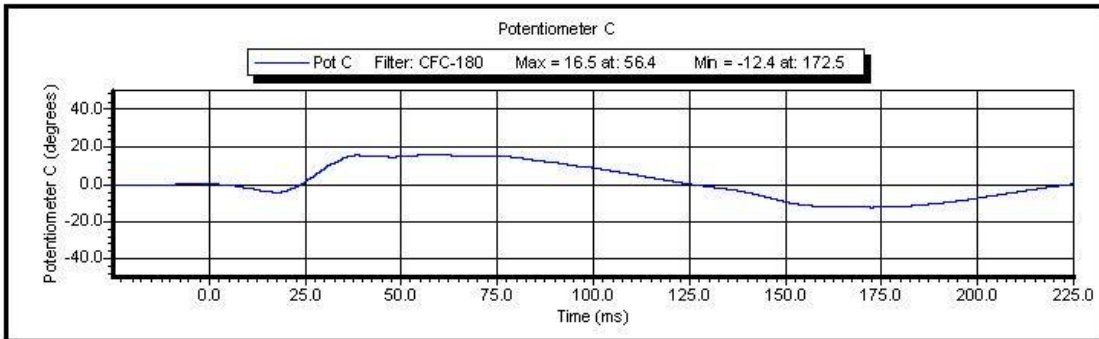
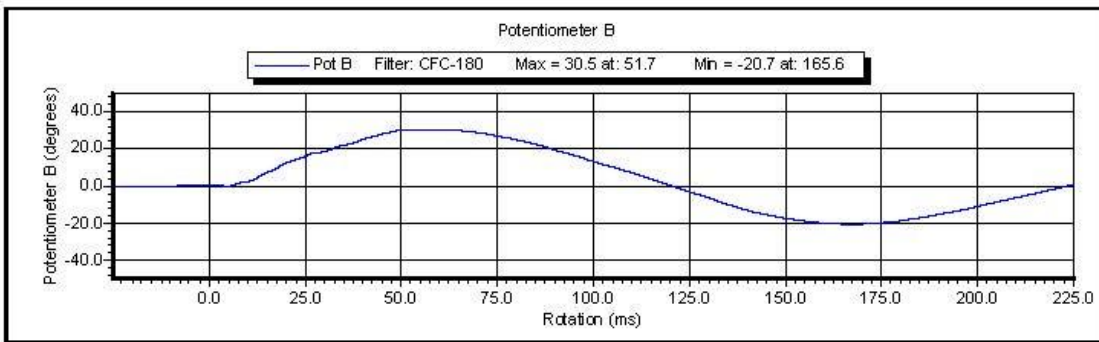
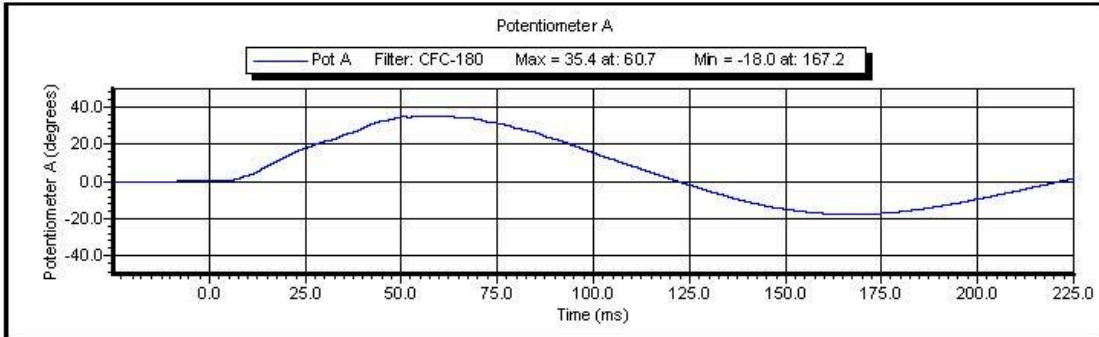
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Test Time: **11:39:32 AM**

Test Date: **2/8/2012**

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1 of 2



Test ID:

Test Time: 11:39:32 AM

Test Date: 2/8/2012

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VERIFICATION REPORT

Test Name:	Shoulder Impact	Revision:	12/4/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F034		
Test ID:		Test Date:	2/9/2012
Test Number:	1	Test Time:	2:38:49 PM

Component Part Number	Component Serial Number
960715-313 Arm	07018

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.1 deg C P
Humidity	10.0 -- 70.0	28.0 %RH P
Velocity	4.20 -- 4.40	4.23 m/s P
Pendulum Acceleration	-10.50 -- -7.50	-9.90 g P

All test parameters are within specifications

Technician: **A. Rudniski**

Supervisor: **D. Travale**

Test ID:

Test Time: **2:38:49 PM**

Test Date: **2/9/2012**



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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	1/11/2012
Endevco	7231CT	C14953	2/8/2012

Test ID:

Test Time: **2:38:49 PM**

Test Date: **2/9/2012**

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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:	F034		
Test ID:		Test Date:	2/9/2012
Test Number:	1	Test Time:	2:38:49 PM



Test ID:

Test Time: **2:38:49 PM**

Test Date: **2/9/2012**

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VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/4/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F034		
Test ID:	Upper Rib 4.0	Test Date:	2/8/2012
Test Number:	1	Test Time:	2:40:37 PM

Component Part Number	Component Serial Number
455-3100	07203

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.4 deg C P
Humidity	10.0 -- 70.0	27.0 %RH P
Velocity	3.90 -- 4.10	3.96 m/s P
Rib Displacement	-51.00 -- -46.00	-47.70 mm P
Drop Height	807.0 -- 823.0	815.0 mm P

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test ID: **Upper Rib 4.0**

Test Time: **2:40:37 PM**

Test Date: **2/8/2012**



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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-183	8/31/2011
DentonATD	Velocity Trap	1	1/11/2012
Endevco	7264-2000	P32222	10/14/2011

Test ID: **Upper Rib 4.0**

Test Time: **2:40:37 PM**

Test Date: **2/8/2012**

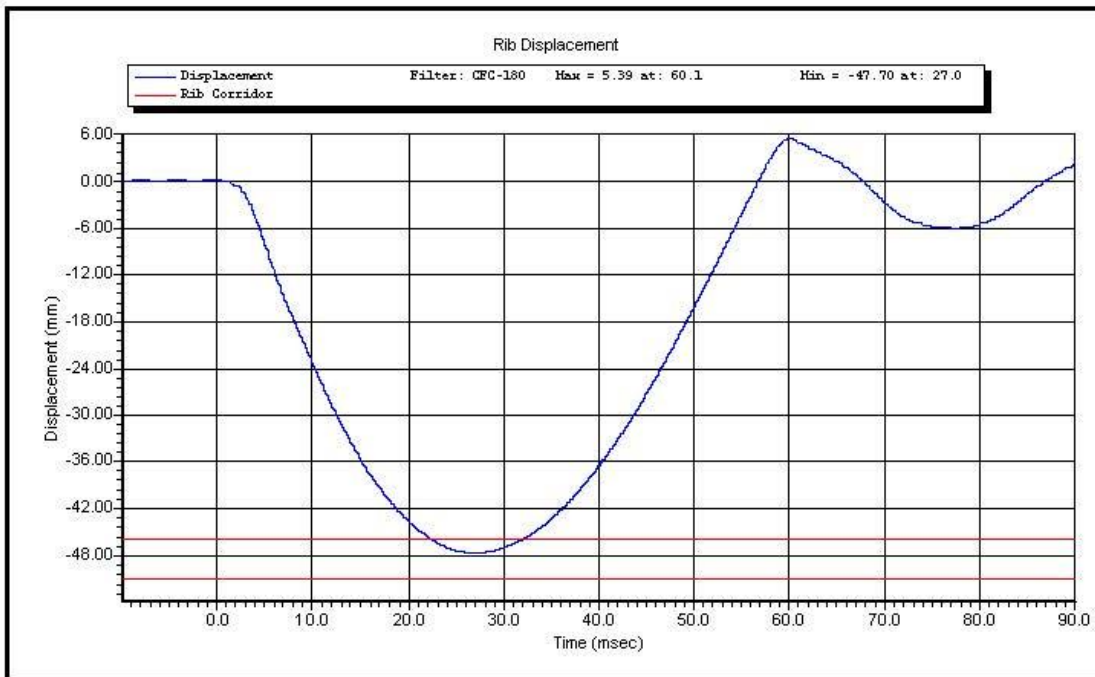


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F034		
Test ID:	Upper Rib 4.0	Test Date:	2/8/2012
Test Number:	1	Test Time:	2:40:37 PM



Test ID: **Upper Rib 4.0**

Test Time: **2:40:37 PM**

Test Date: **2/8/2012**

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VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/4/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F034		
Test ID:	Upper Rib 3.0	Test Date:	2/8/2012
Test Number:	1	Test Time:	2:46:35 PM

Component Part Number	Component Serial Number
455-3100	07203

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.3 deg C P
Humidity	10.0 -- 70.0	27.2 %RH P
Velocity	2.90 -- 3.10	2.95 m/s P
Rib Displacement	-40.00 -- -36.00	-36.95 mm P
Drop Height	454 -- 464	459 mm P

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test ID: **Upper Rib 3.0**

Test Time: **2:46:35 PM**

Test Date: **2/8/2012**



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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-183	8/31/2011
DentonATD	Velocity Trap	1	1/11/2012
Endevco	7264-2000	P32222	10/14/2011

Test ID: **Upper Rib 3.0**

Test Time: **2:46:35 PM**

Test Date: **2/8/2012**

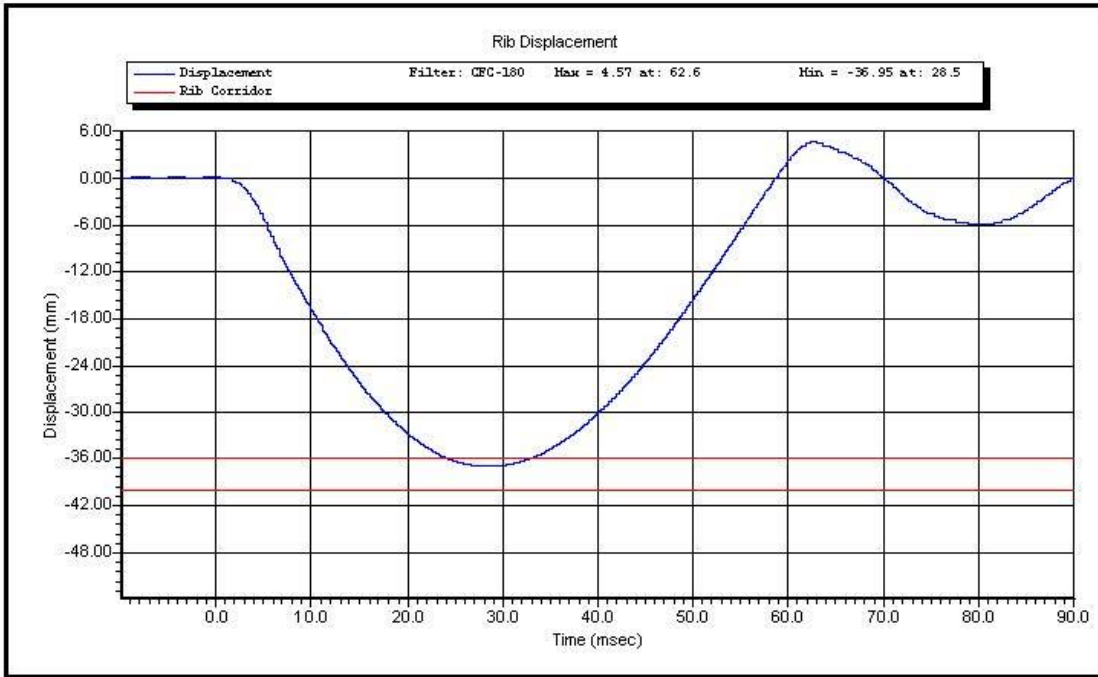


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F034		
Test ID:	Upper Rib 3.0	Test Date:	2/8/2012
Test Number:	1	Test Time:	2:46:35 PM



Test ID: **Upper Rib 3.0** Test Time: **2:46:35 PM**

Test Date: **2/8/2012**

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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:	F034		
Test ID:		Test Date:	2/9/2012
Test Number:	1	Test Time:	2:56:16 PM

Component Part Number	Component Serial Number
Upper Rib - 175-4002	7203
Middle Rib - 175-4002	7205
Lower Rib - 175-4002	7209

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.1 deg C P
Humidity	10.0 -- 70.0	27.0 %RH P
Velocity	5.40 -- 5.60	5.48 m/s P
Upper Rib Displacement	34.0 -- 41.0	36.8 mm P
Middle Rib Displacement	37.0 -- 45.0	41.4 mm P
Lower Rib Displacement	37.0 -- 44.0	40.9 mm P
Impactor Force	5100 -- 6200	5892 N P

All test parameters are within specifications

Technician: **A. Rudniski**

Supervisor: **D. Travale**

Test ID:

Test Time: **2:56:16 PM**

Test Date: **2/9/2012**



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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	1/11/2012
Endevco	7231CT	C14953	2/8/2012
Honeywell	MLT 38000	DS-183	8/31/2011
Honeywell	MLT 38000	DS-184	8/31/2011
Honeywell	MLT 38000	DS-182	8/31/2011

Test ID:

Test Time: **2:56:16 PM**

Test Date: **2/9/2012**

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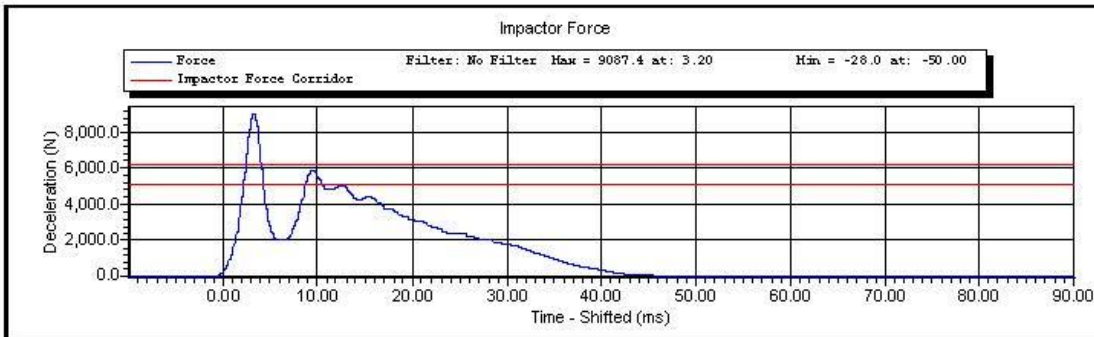
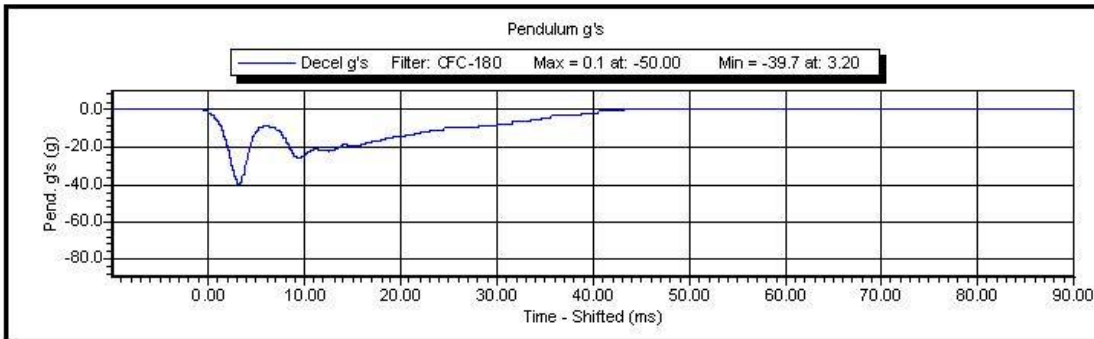


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Test Name:	Thorax Impact	Revision:	8/15/2008
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F034		
Test ID:		Test Date:	2/9/2012
Test Number:	1	Test Time:	2:56:16 PM



Test ID:

Test Time: **2:56:16 PM**

Test Date: **2/9/2012**

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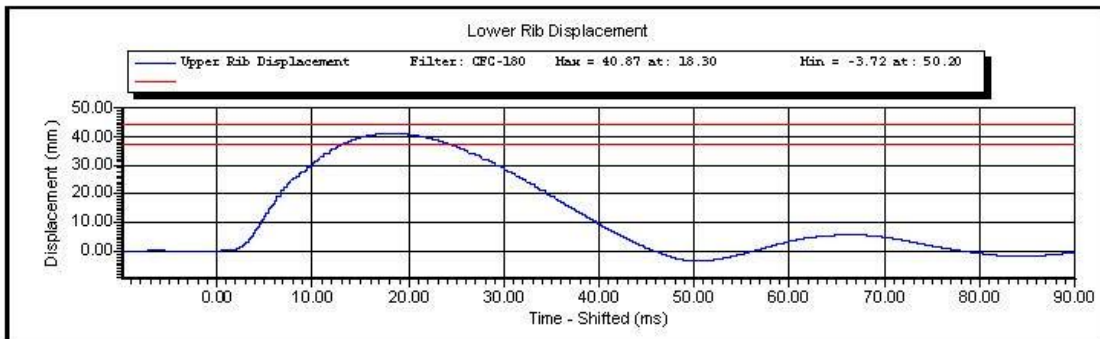
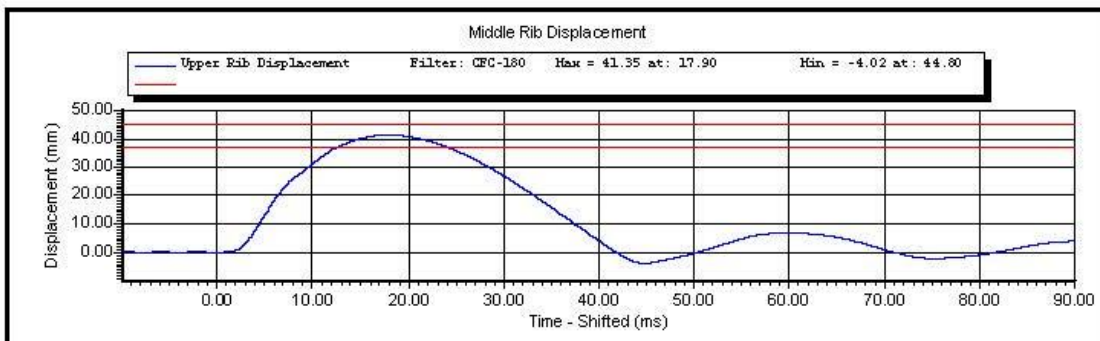
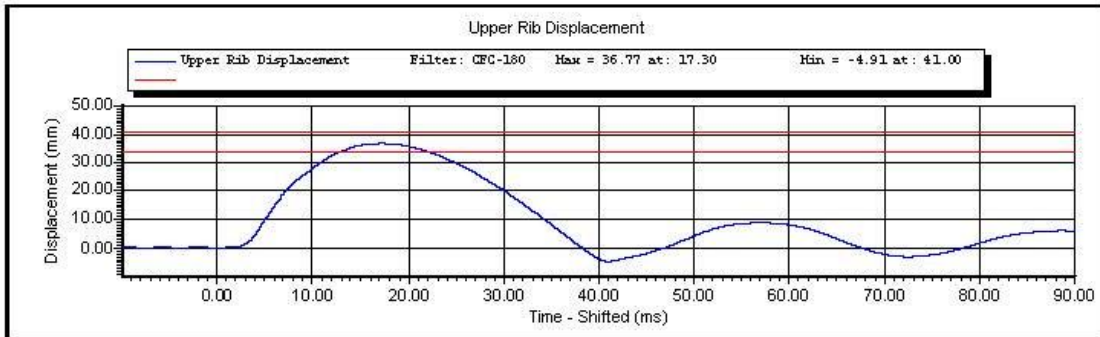
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Test ID:

Test Time: 2:56:16 PM

Test Date: 2/9/2012

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VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/4/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F034		
Test ID:	Middle Rib 4.0	Test Date:	2/8/2012
Test Number:	1	Test Time:	3:12:15 PM

Component Part Number	Component Serial Number
455-3100	07205

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.4 deg C P
Humidity	10.0 -- 70.0	28.0 %RH P
Velocity	3.90 -- 4.10	3.96 m/s P
Rib Displacement	-51.00 -- -46.00	-47.52 mm P
Drop Height	807.0 -- 823.0	815.0 mm P

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test ID: **Middle Rib 4.0**

Test Time: **3:12:15 PM**

Test Date: **2/8/2012**



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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-184	8/31/2011
DentonATD	Velocity Trap	1	1/11/2012
Endevco	7264-2000	P32222	10/14/2011

Test ID: **Middle Rib 4.0**

Test Time: **3:12:15 PM**

Test Date: **2/8/2012**

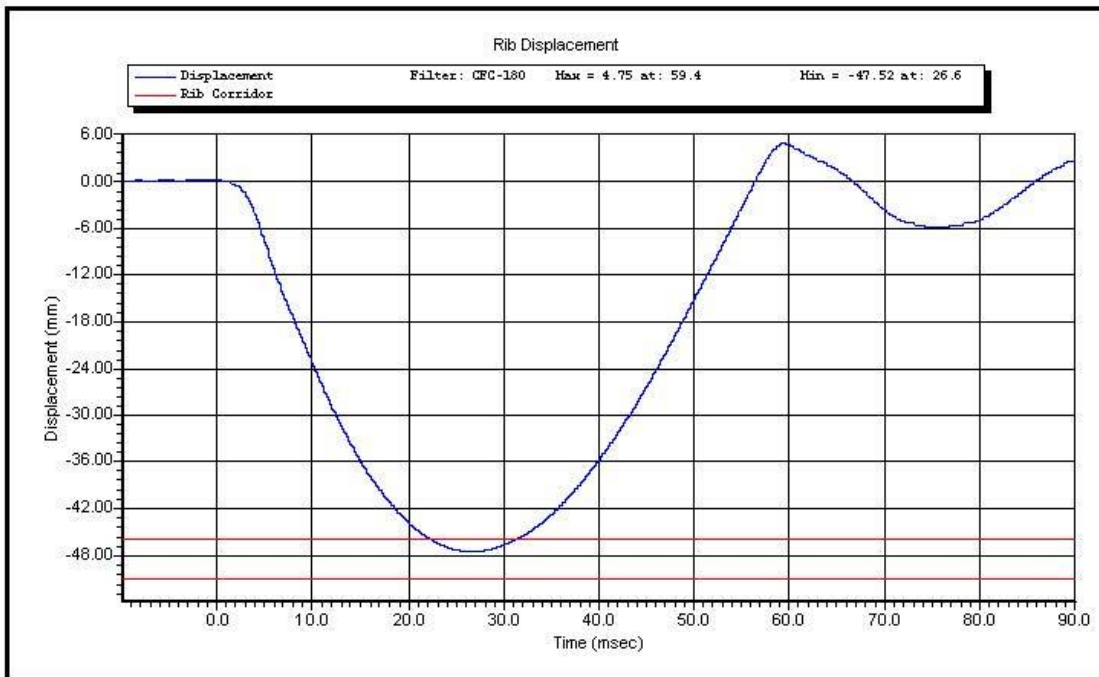


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F034		
Test ID:	Middle Rib 4.0	Test Date:	2/8/2012
Test Number:	1	Test Time:	3:12:15 PM



Test ID: **Middle Rib 4.0** Test Time: **3:12:15 PM**

Test Date: **2/8/2012**

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VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/4/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F034		
Test ID:	Middle Rib 3.0	Test Date:	2/8/2012
Test Number:	1	Test Time:	3:19:14 PM

Component Part Number	Component Serial Number
455-3100	07205

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.4 deg C P
Humidity	10.0 -- 70.0	27.3 %RH P
Velocity	2.90 -- 3.10	2.97 m/s P
Rib Displacement	-40.00 -- -36.00	-37.19 mm P
Drop Height	454 -- 464	459 mm P

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test ID: **Middle Rib 3.0**

Test Time: **3:19:14 PM**

Test Date: **2/8/2012**



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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-184	8/31/2011
DentonATD	Velocity Trap	1	1/11/2012
Endevco	7264-2000	P32222	10/14/2011

Test ID: **Middle Rib 3.0**

Test Time: **3:19:14 PM**

Test Date: **2/8/2012**

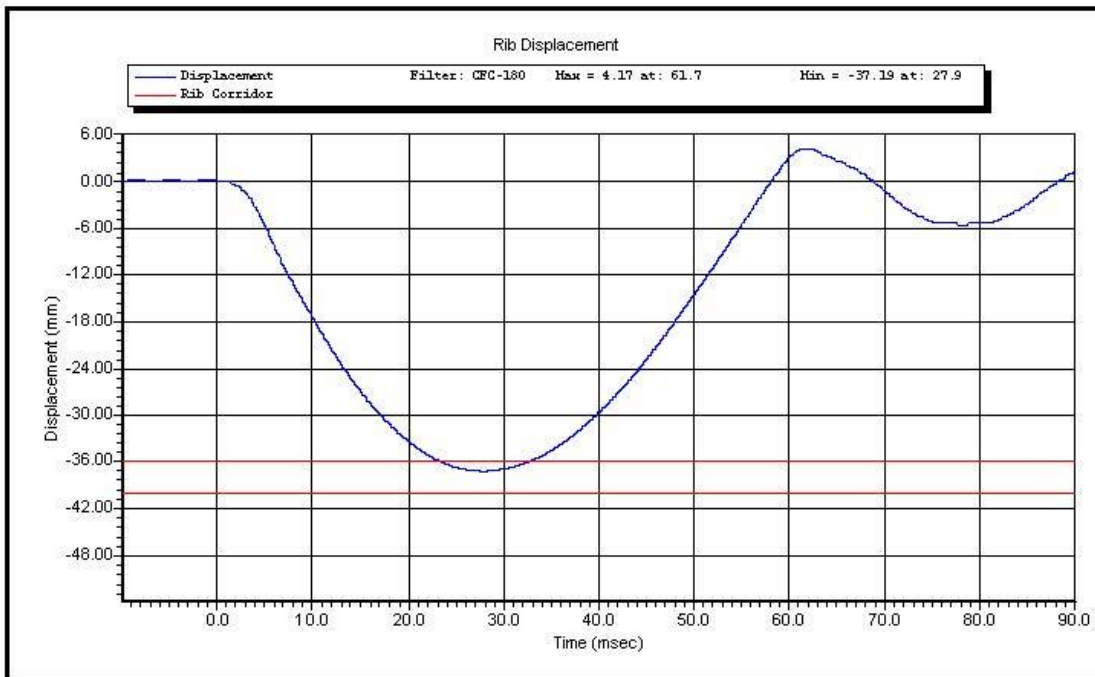


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F034		
Test ID:	Middle Rib 3.0	Test Date:	2/8/2012
Test Number:	1	Test Time:	3:19:14 PM



Test ID: **Middle Rib 3.0** Test Time: **3:19:14 PM**

Test Date: **2/8/2012**

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VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/4/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F034		
Test ID:	Lower Rib 4.0	Test Date:	2/8/2012
Test Number:	1	Test Time:	3:42:54 PM

Component Part Number	Component Serial Number
455-3100	07209

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.3 deg C P
Humidity	10.0 -- 70.0	27.0 %RH P
Velocity	3.90 -- 4.10	3.96 m/s P
Rib Displacement	-51.00 -- -46.00	-48.12 mm P
Drop Height	807.0 -- 823.0	815.0 mm P

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test ID: **Lower Rib 4.0**

Test Time: **3:42:54 PM**

Test Date: **2/8/2012**



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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-182	8/31/2011
DentonATD	Velocity Trap	1	1/11/2012
Endevco	7264-2000	P32222	10/14/2011

Test ID: **Lower Rib 4.0**

Test Time: **3:42:54 PM**

Test Date: **2/8/2012**

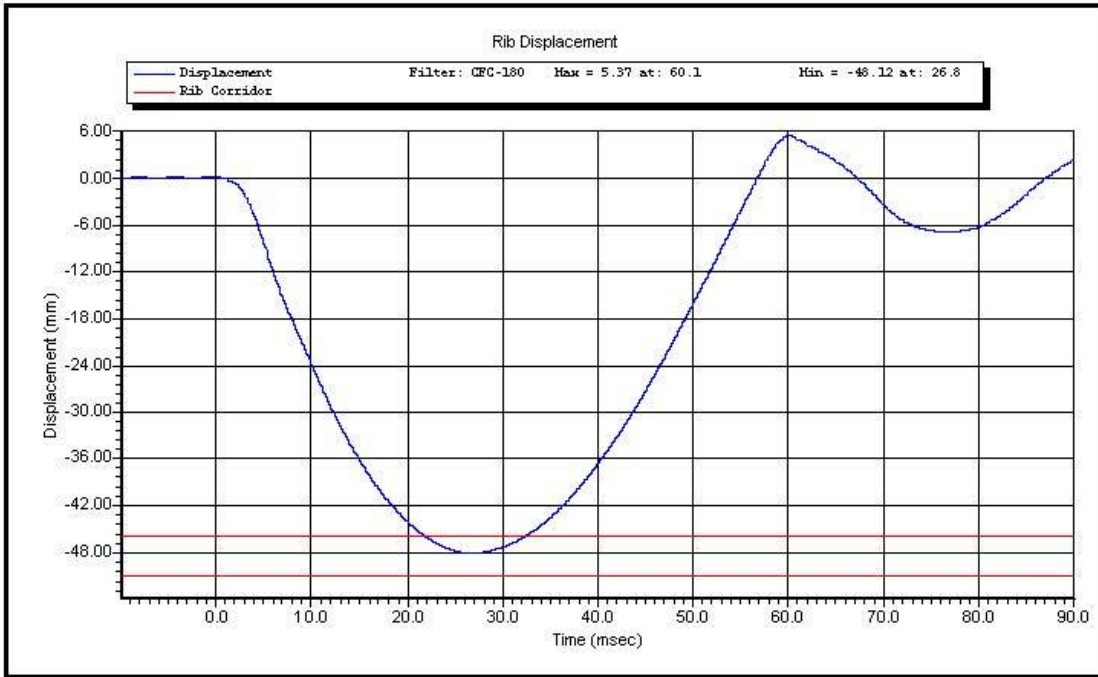


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F034		
Test ID:	Lower Rib 4.0	Test Date:	2/8/2012
Test Number:	1	Test Time:	3:42:54 PM



Test ID: **Lower Rib 4.0** Test Time: **3:42:54 PM** Test Date: **2/8/2012**

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VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/4/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F034		
Test ID:	Lower Rib 3.0	Test Date:	2/8/2012
Test Number:	1	Test Time:	3:49:58 PM

Component Part Number	Component Serial Number
455-3100	07209

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.2 deg C P
Humidity	10.0 -- 70.0	27.2 %RH P
Velocity	2.90 -- 3.10	2.99 m/s P
Rib Displacement	-40.00 -- -36.00	-37.62 mm P
Drop Height	454 -- 464	459 mm P

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test ID: **Lower Rib 3.0**

Test Time: **3:49:58 PM**

Test Date: **2/8/2012**



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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-182	8/31/2011
DentonATD	Velocity Trap	1	1/11/2012
Endevco	7264-2000	P32222	10/14/2011

Test ID: **Lower Rib 3.0**

Test Time: **3:49:58 PM**

Test Date: **2/8/2012**

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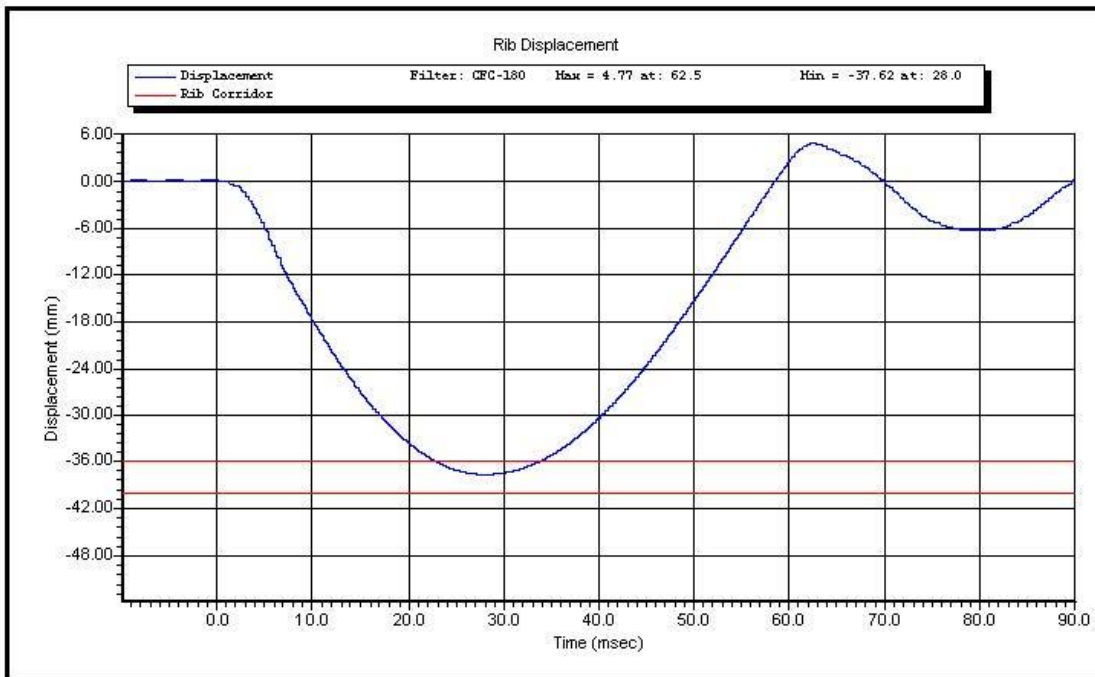


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F034		
Test ID:	Lower Rib 3.0	Test Date:	2/8/2012
Test Number:	1	Test Time:	3:49:58 PM



Test ID: **Lower Rib 3.0**

Test Time: **3:49:58 PM**

Test Date: **2/8/2012**

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VERIFICATION REPORT

Test Name:	Abdominal Impact	Revision:	12/4/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F034		
Test ID:		Test Date:	2/10/2012
Test Number:	3	Test Time:	8:26:54 AM

Component Part Number	Component Serial Number
455-4001 Abdominal Insert	04.83

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.6 deg C P
Humidity	10 -- 70	30 %RH P
Velocity	3.90 -- 4.10	4.10 m/s P
Peak Abdominal Force	-2.70 -- -2.20	-2.68 kN P
Time At Peak Abdominal Force	10.0 -- 12.3	10.7 ms P
Maximum Pendulum Force	-4.80 -- -4.00	-4.76 kN P
Time at Peak Pendulum Force	10.6 -- 13.0	10.6 ms P

All test parameters are within specifications

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

Test ID:

Test Time: **8:26:54 AM**

Test Date: **2/10/2012**



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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	1/11/2012
Endevco	7231CT	C14953	2/8/2012
Denton	2631	LC-1512	3/25/2011
Denton	2631	LC-1526	3/25/2011
Denton	2631	LC-1516	3/25/2011

Test ID:

Test Time: **8:26:54 AM**

Test Date: **2/10/2012**

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2 of 2

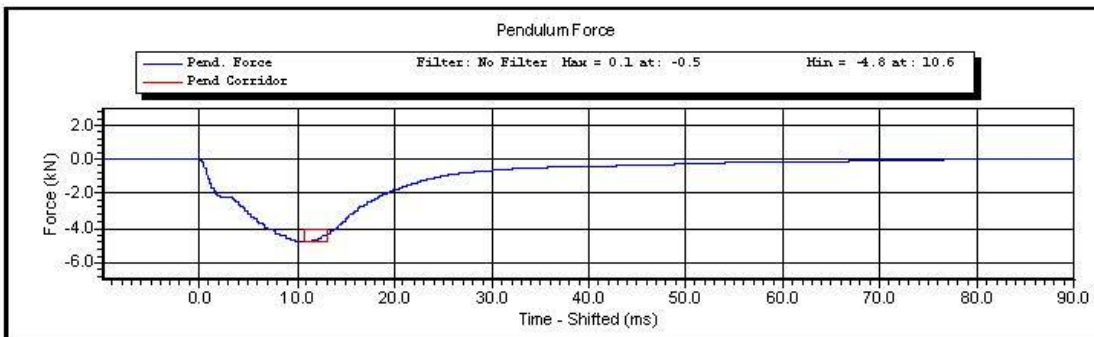
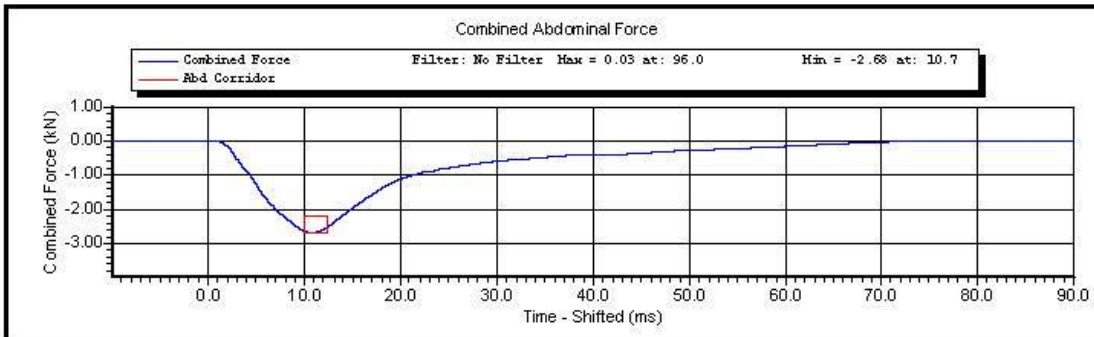


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Test Name:	Abdominal Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F034		
Test ID:		Test Date:	2/10/2012
Test Number:	3	Test Time:	8:26:54 AM



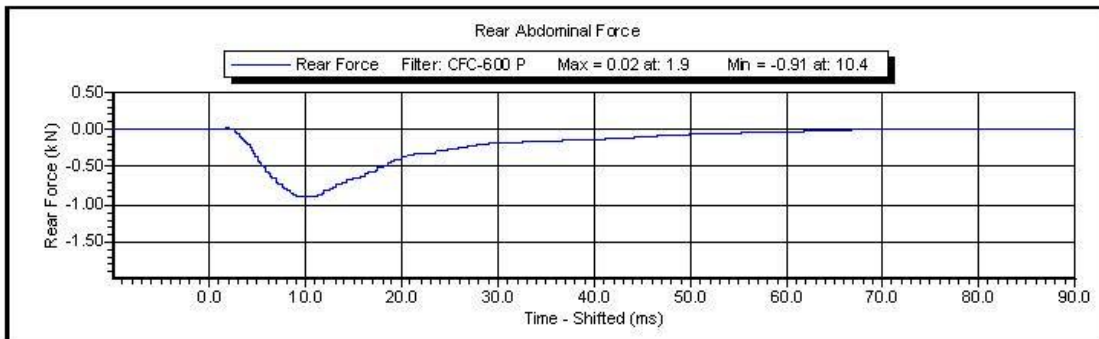
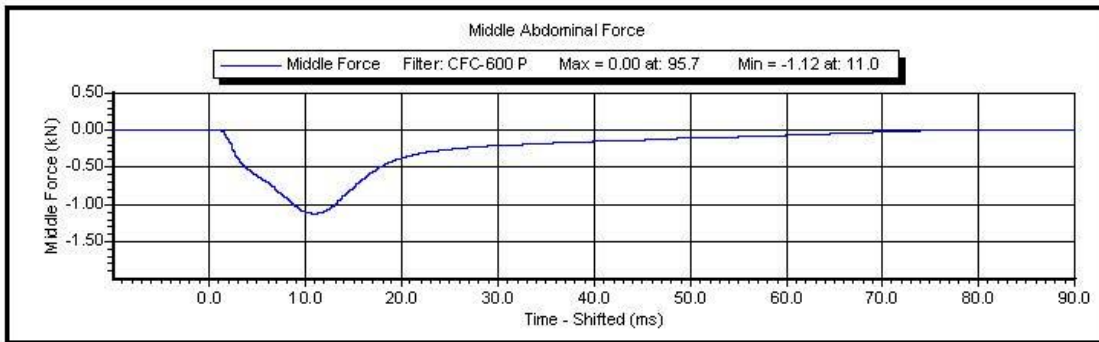
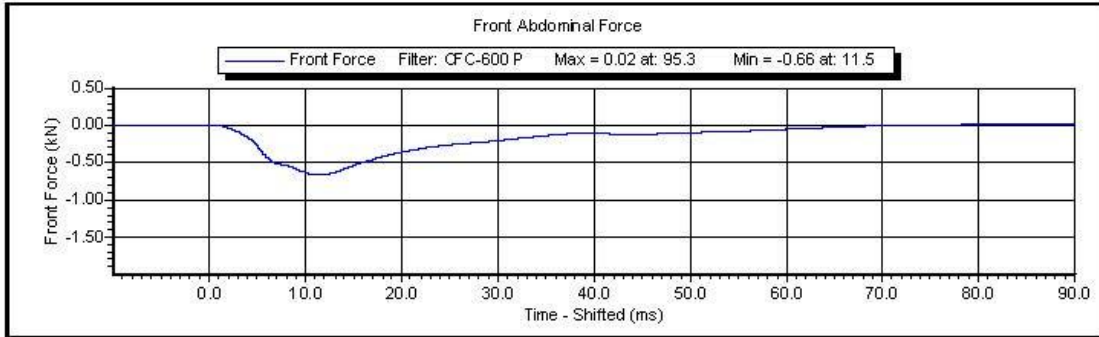
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Test Date: **2/10/2012**

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1 of 2



Test ID:

Test Time: 8:26:54 AM

Test Date: 2/10/2012

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VERIFICATION REPORT

Test Name:	Lumbar Spine	Revision:	12/4/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F034		
Test ID:		Test Date:	2/9/2012
Test Number:	1	Test Time:	10:00:27 AM

Component Part Number	Component Serial Number
175-5501 Lumbar Spine	15050329A

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.9 deg C P
Humidity	10 -- 70	23 %RH P
Velocity	5.95 -- 6.15	6.14 m/s P
Maximum Headform Flexion Angle	45.0 -- 55.0	46.6 degrees P
Time at Maximum Headform Flexion Angle	39.0 -- 53.0	46.3 ms P
Decay to Zero Degrees	37.0 -- 57.0	38.0 ms P
Velocity Corridor	--	P

All test parameters are within specifications

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

Test ID:

Test Time: **10:00:27 AM**

Test Date: **2/9/2012**



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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	1/11/2012
Endevco	7231CT	C16510	10/3/2011
DentonATD	7000428	094	4/25/2011
DentonATD	7000428	095	4/25/2011
DentonATD	7000428	093	4/25/2011

Test ID:

Test Time: **10:00:27 AM**

Test Date: **2/9/2012**

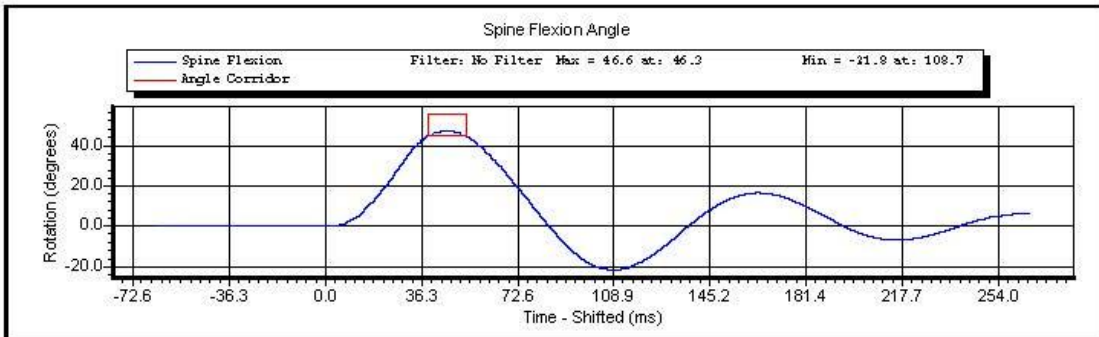
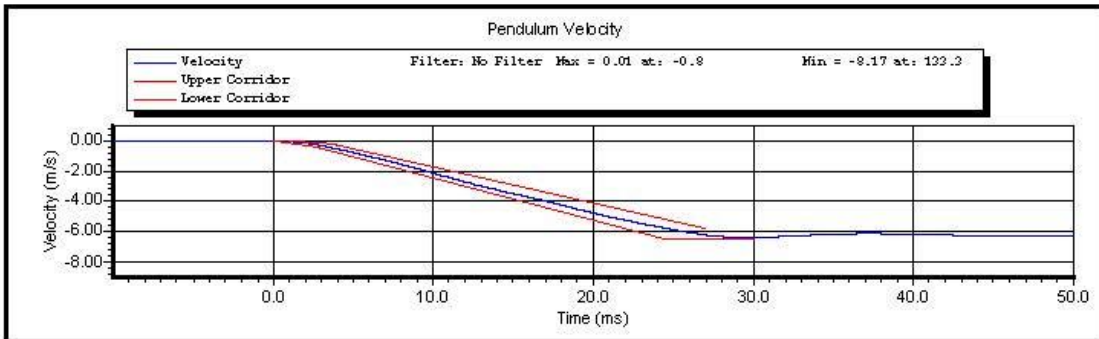


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Test Name:	Lumbar Spine	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F034		
Test ID:		Test Date:	2/9/2012
Test Number:	1	Test Time:	10:00:27 AM



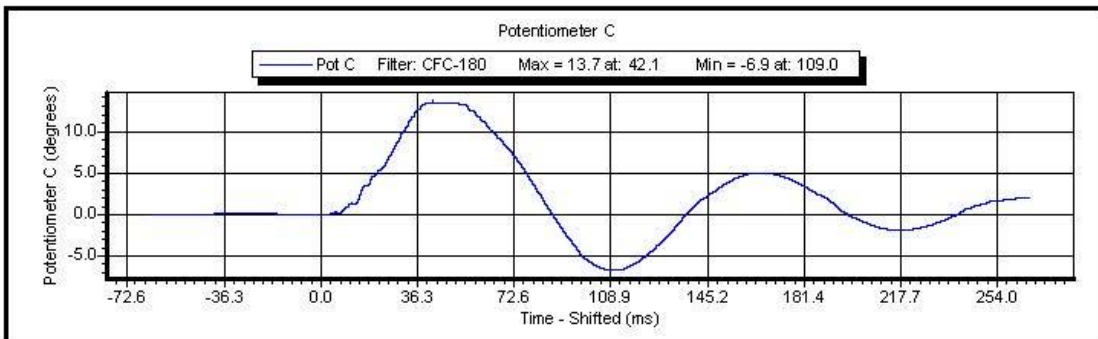
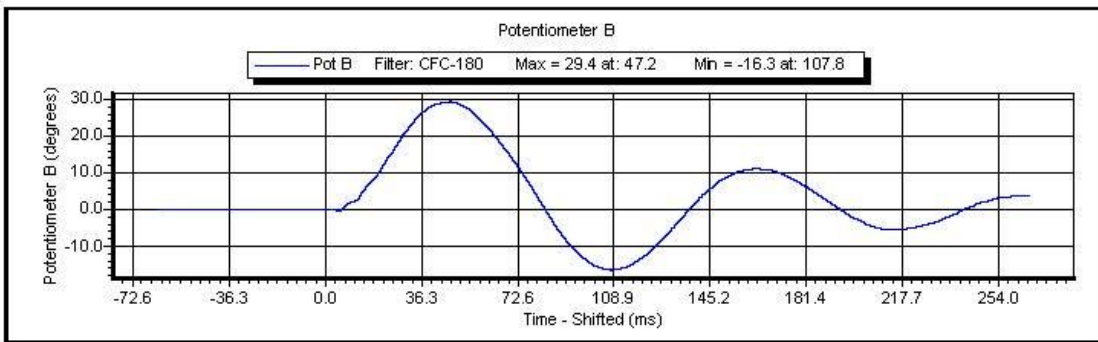
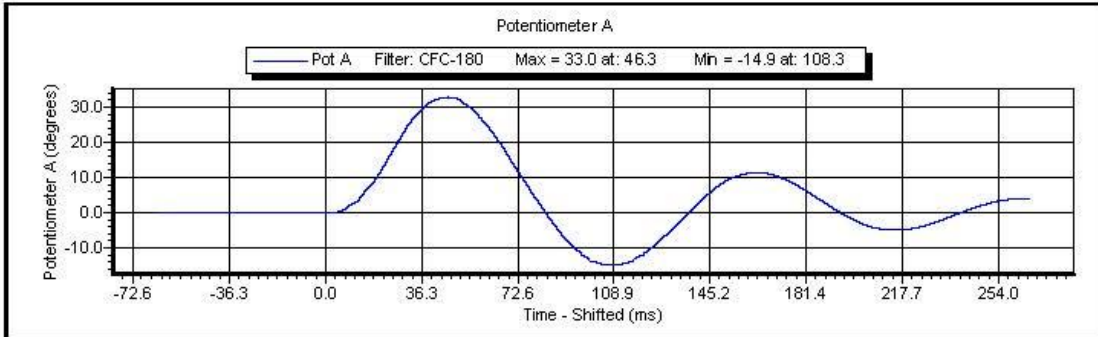
Test ID:

Test Time: **10:00:27 AM**

Test Date: **2/9/2012**

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1 of 2



Test ID:

Test Time: 10:00:27 AM

Test Date: 2/9/2012

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VERIFICATION REPORT

Test Name:	Pelvis Impact	Revision:	12/4/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F034		
Test ID:		Test Date:	2/9/2012
Test Number:	2	Test Time:	2:04:19 PM

Component Part Number	Component Serial Number
455-4003 Pelvis	0703L

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	27 %RH P
Velocity	4.20 -- 4.40	4.33 m/s P
Peak Pendulum Force	-5.40 -- -4.70	-5.13 kN P
Time at Peak Pendulum Force	11.80 -- 16.10	13.61 ms P
Peak Pubic Symphysis Force	-1.59 -- -1.23	-1.36 kN P
Time at Peak Pubic Symphysis Force	12.20 -- 17.00	15.21 ms P

All test parameters are within specifications

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

Test ID:

Test Time: **2:04:19 PM**

Test Date: **2/9/2012**



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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	1/11/2012
Endevco	7231CT	C14953	2/8/2012
Denton	3096	LC-465Fy	8/31/2011

Test ID:

Test Time: **2:04:19 PM**

Test Date: **2/9/2012**

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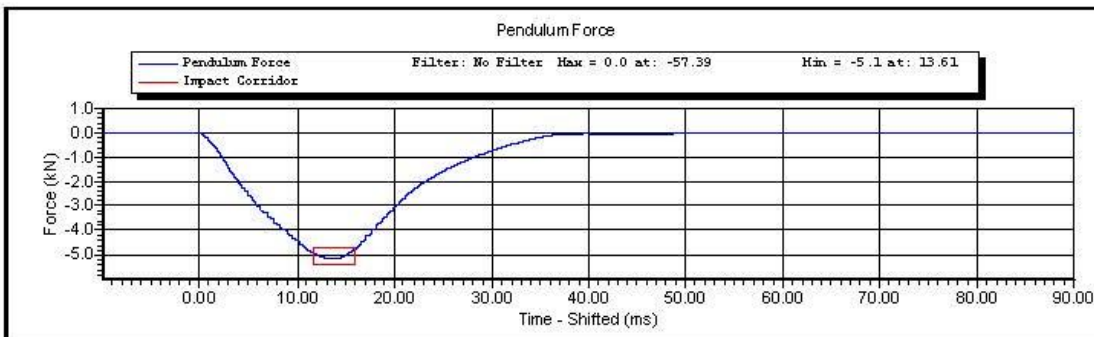
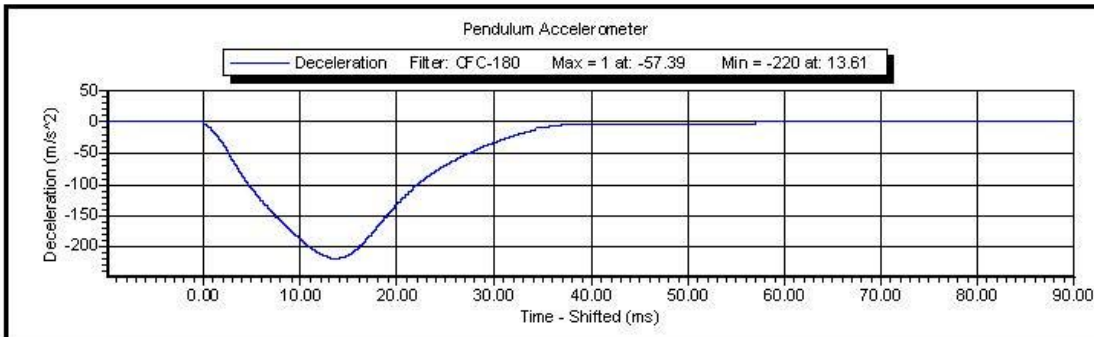


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Test Name:	Pelvis Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F034		
Test ID:		Test Date:	2/9/2012
Test Number:	2	Test Time:	2:04:19 PM



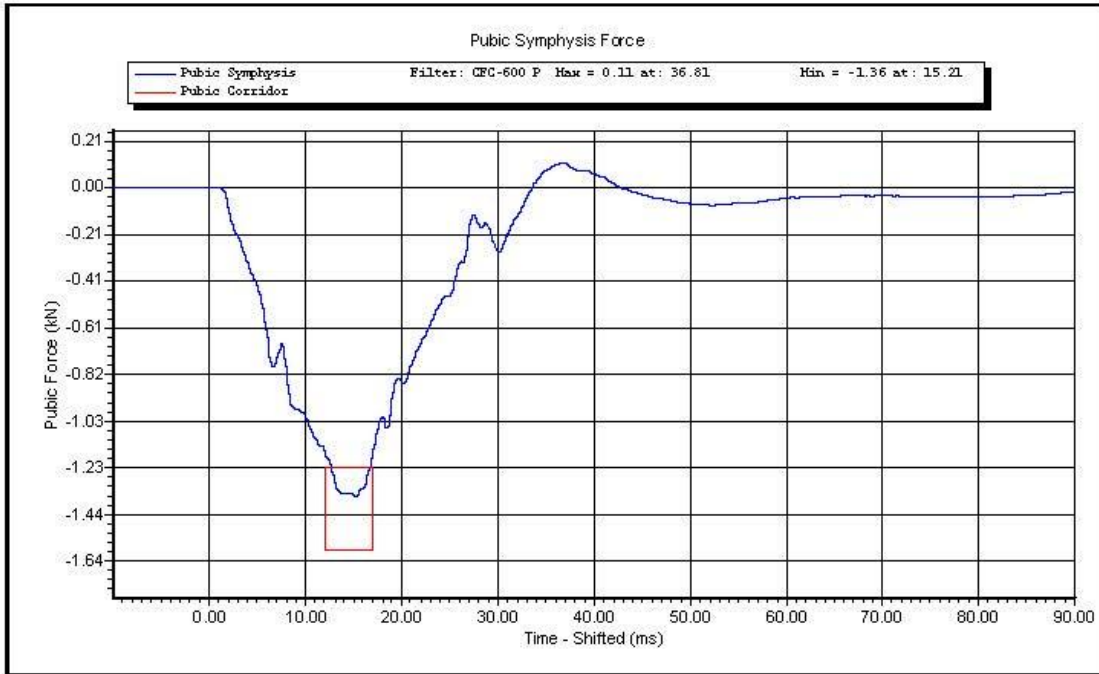
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Test Time: **2:04:19 PM**

Test Date: **2/9/2012**

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1 of 2



Test ID:

Test Time: **2:04:19 PM**

Test Date: **2/9/2012**

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CALIBRATION TEST RESULTS

POST-TEST

SID-IIs No: 300

CONFIGURED FOR LEFT SIDE IMPACT



SID-ItsD External Measurements

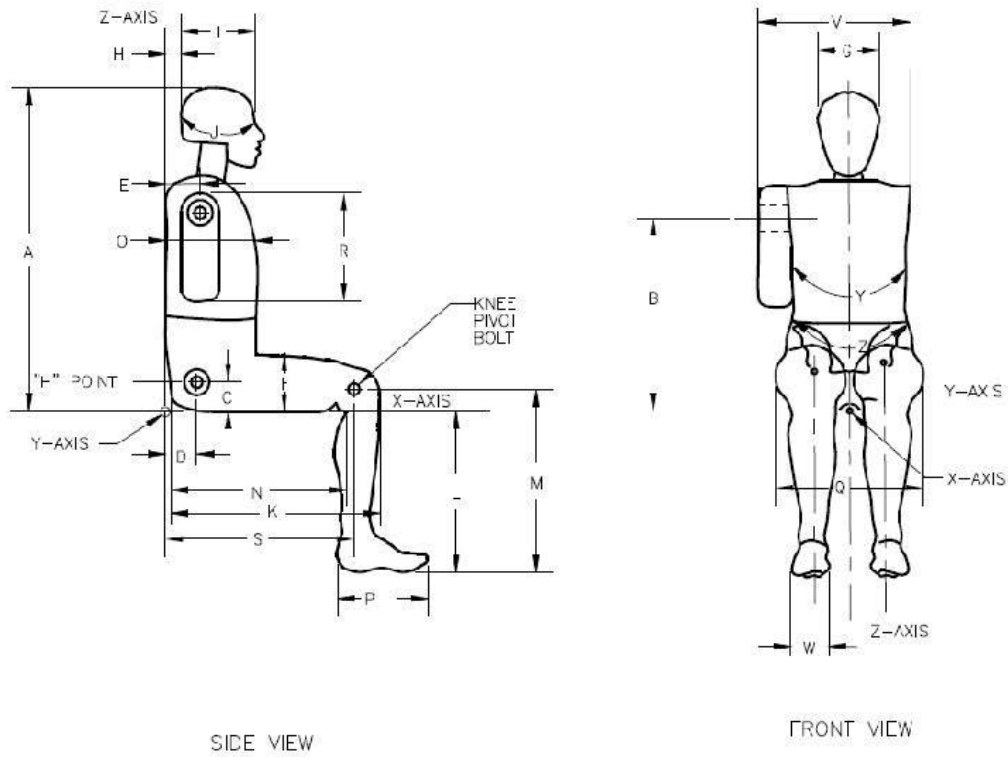
NHTSA ATD S/N 300

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	782	Yes
B	Shoulder Pivot Height	437.0 - 453.0	439	Yes
C	H-Point Height	79.0 - 89.0	83	Yes
D	H-Point from Seat Back	141.0 - 151.0	144	Yes
E	Shoulder Pivot from Backline	97.0 - 107.0	98	Yes
F	Thigh Clearance	119.0 - 135.0	122	Yes
G	Head Breadth	140.0 - 148.0	143	Yes
H	Head Back from Backline	40.0 - 46.0	43	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	525	Yes
L	Popliteal Height	343.0 - 369.0	352	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	397	Yes
N	Buttock Popliteal Length	416.0 - 442.0	433	Yes
O	Chest Depth without Jacket	195.0 - 211.0	204	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	316	Yes
R	Arm Length	249.0 - 259.0	253	Yes
S	Knee Joint to Seat back	478.0 - 493.0	483	Yes
V	Shoulder Width (only one arm installed)	341.0 - 357.0	345	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	866	Yes
Z	Waist Circumference	761.0 - 791.0	777	Yes

Technician: AR

Date: 2/9/2012

SID-IIIsD External Dimension Reference Diagram





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VERIFICATION REPORT

Test Name:	Head Drop	Revision:	12/4/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-11s		
ATD Serial Number:	300		
Test ID:		Test Date:	2/9/2012
Test Number:	1	Test Time:	9:05:36 AM

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

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.4 deg C P
Humidity	10 -- 70	25 %RH P
Resultant Acceleration	115.0 -- 137.0	123.2 g P
Oscillation	0.0 -- 15.0	0.0 % P
Fore-Aft Acceleration	-15.0 -- 15.0	4.4 g P

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test ID:

Test Time: **9:05:36 AM**

Test Date: **2/9/2012**



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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	10/31/2011
Endevco	7264-2000	P51682	10/31/2011
Endevco	7264-2000	P51699	10/31/2011

Test ID:

Test Time: **9:05:36 AM**

Test Date: **2/9/2012**

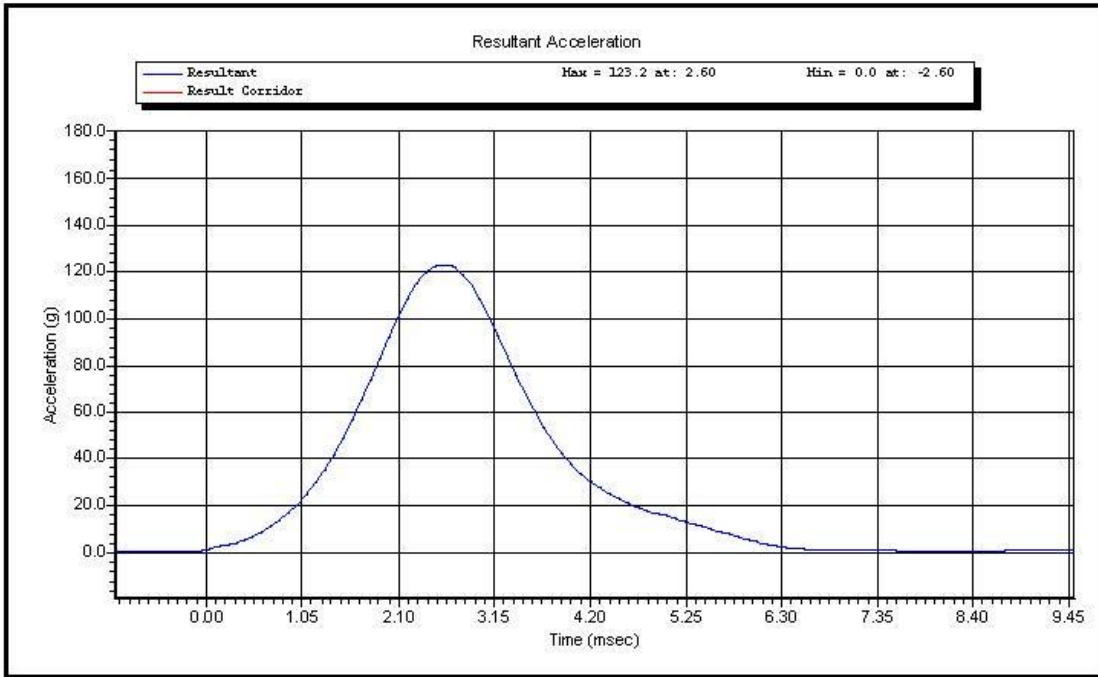


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Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	300		
Test ID:		Test Date:	2/9/2012
Test Number:	1	Test Time:	9:05:36 AM



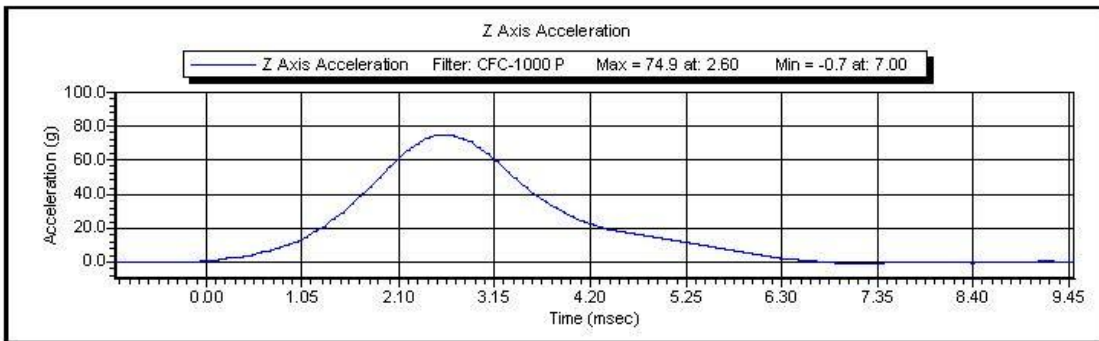
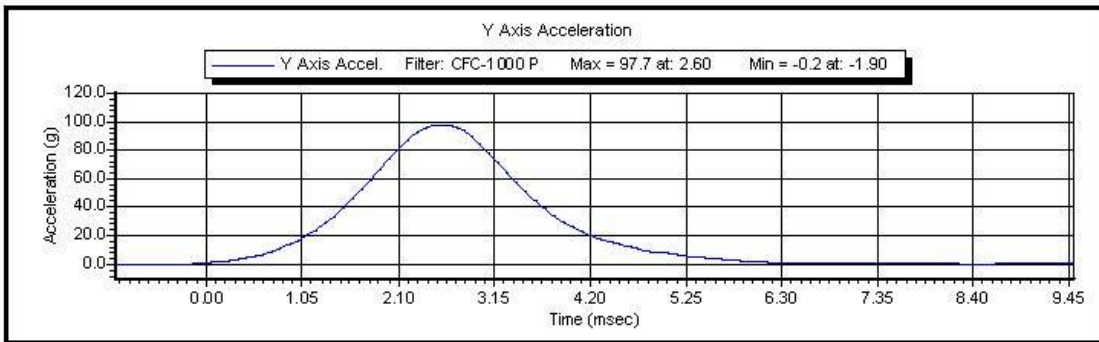
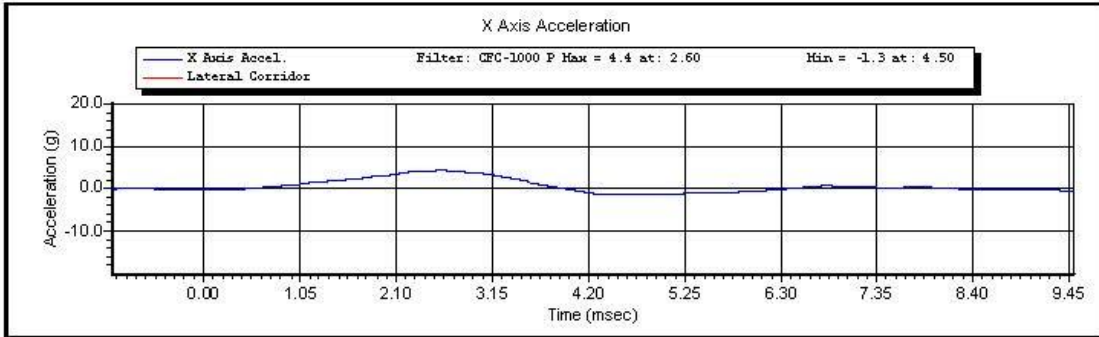
Test ID:

Test Time: **9:05:36 AM**

Test Date: **2/9/2012**

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1 of 2



Test ID:

Test Time: 9:05:36 AM

Test Date: 2/9/2012

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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-11s		
ATD Serial Number:	300		
Test ID:		Test Date:	2/10/2012
Test Number:	2	Test Time:	3:17:17 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	22 %RH P
Velocity	5.51 -- 5.63	5.56 m/s P
Pendulum Impulse at 10 ms	2.20 -- 2.80	2.50 m/s P
Pendulum Impulse at 15 ms	3.30 -- 4.10	3.59 m/s P
Pendulum Impulse at 20 ms	4.40 -- 5.40	4.78 m/s P
Pendulum Impulse at 25 ms	5.40 -- 6.10	5.63 m/s P
Pendulum Impulse between 25 and 100 ms	5.50 -- 6.20	5.75 m/s P
Max D Plane Rotation	71.0 -- 81.0	75.6 degrees P
Time at Max Rotation	50.0 -- 70.0	61.2 ms P
Moment about OC	-44.0 -- -36.0	-41.9 Nm P
Moment Decay to Zero	102.0 -- 126.0	113.9 ms P

All test parameters are within specifications

Technician: **A. Rudniski**

Supervisor: **D. Travale**

Test ID:

Test Time: **3:17:17 PM**

Test Date: **2/10/2012**



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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	1/11/2012
Endevco	7231CT	C16510	10/3/2011
Denton	1716A	LC-1591 Fy	6/20/2011
Denton	1716A	LC-1591 Mx	6/20/2011
DentonATD	78051-342	184	5/8/2011
DentonATD	78051-342	174	5/8/2011
DentonATD	78051-342	185	5/8/2011

Test ID:

Test Time: **3:17:17 PM**

Test Date: **2/10/2012**

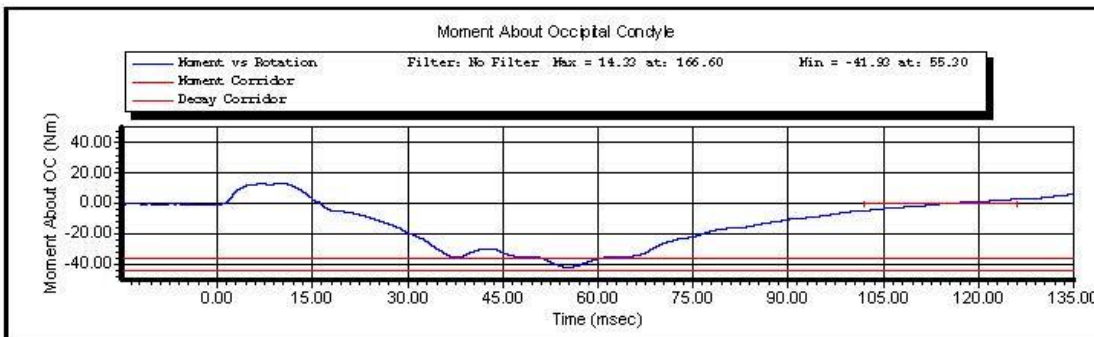
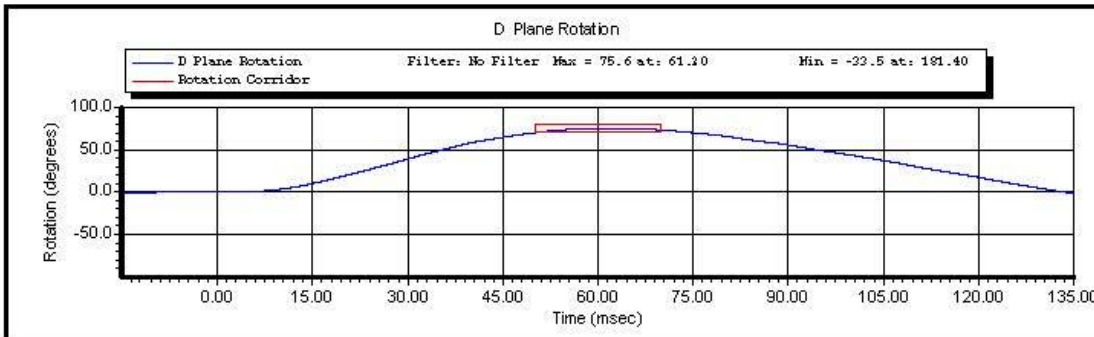


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Test Name:	Neck Pendulum	Revision:	8/24/2009
Sub Test Name:	Left Side	Spec Type:	NHTSA
ATD Type:	SID-11s		
ATD Serial Number:	300		
Test ID:		Test Date:	2/10/2012
Test Number:	2	Test Time:	3:17:17 PM



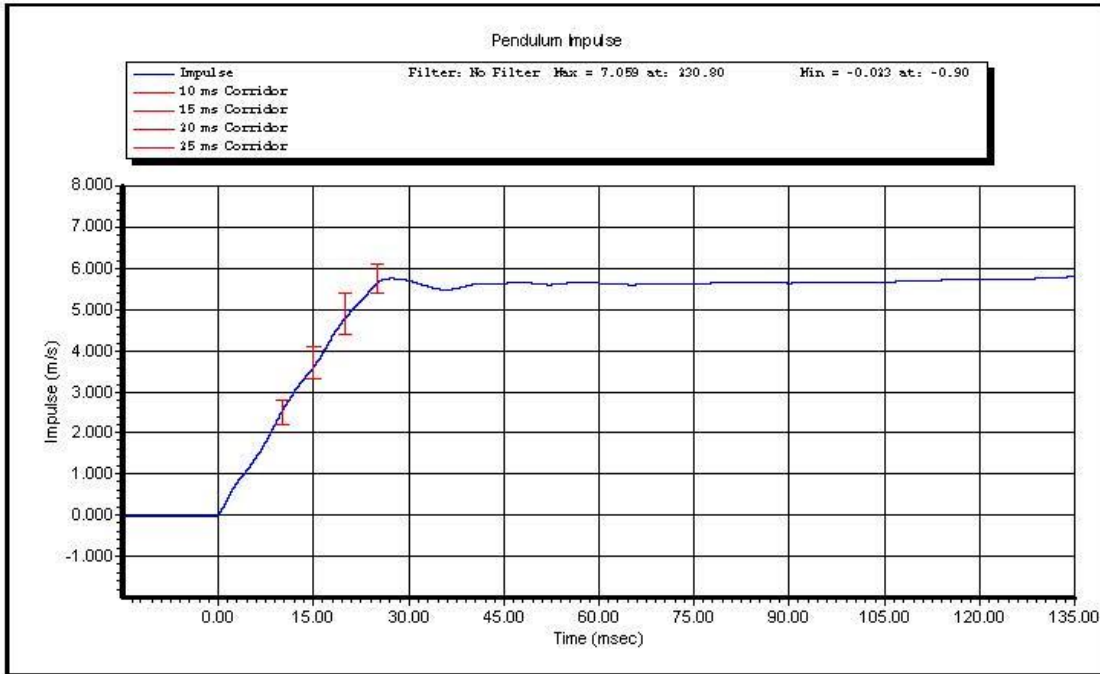
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Test Time: **3:17:17 PM**

Test Date: **2/10/2012**

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1 of 2



Test ID:

Test Time: 3:17:17 PM

Test Date: 2/10/2012

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VERIFICATION REPORT

Test Name:	Shoulder Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-11s		
ATD Serial Number:	300		
Test ID:		Test Date:	2/10/2012
Test Number:	1	Test Time:	11:25:06 AM

Component Part Number	Component Serial Number
Shoulder Rib 180-3355	168
Left Arm 180-6011-1	822

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.60 deg C P
Humidity	10.0 -- 70.0	27.0 %RH P
Velocity	4.20 -- 4.40	4.34 m/s P
Probe Acceleration	13.0 -- 18.0	16.3 g P
Shoulder Deflection	28.0 -- 37.0	30.0 mm P
T1 Acceleration	17.0 -- 22.0	20.9 g P

All test parameters are within specifications

Technician: **A. Rudniski**

Supervisor: **D. Travale**

Test ID:

Test Time: **11:25:06 AM**

Test Date: **2/10/2012**



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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	1/11/2012
Endevco	7231CT	C14953	2/8/2012
Servo	180-3885	DS-1063	10/31/2011
Endevco	7264-2000	P58806	11/3/2011

Test ID:

Test Time: 11:25:06 AM

Test Date: 2/10/2012

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2 of 2

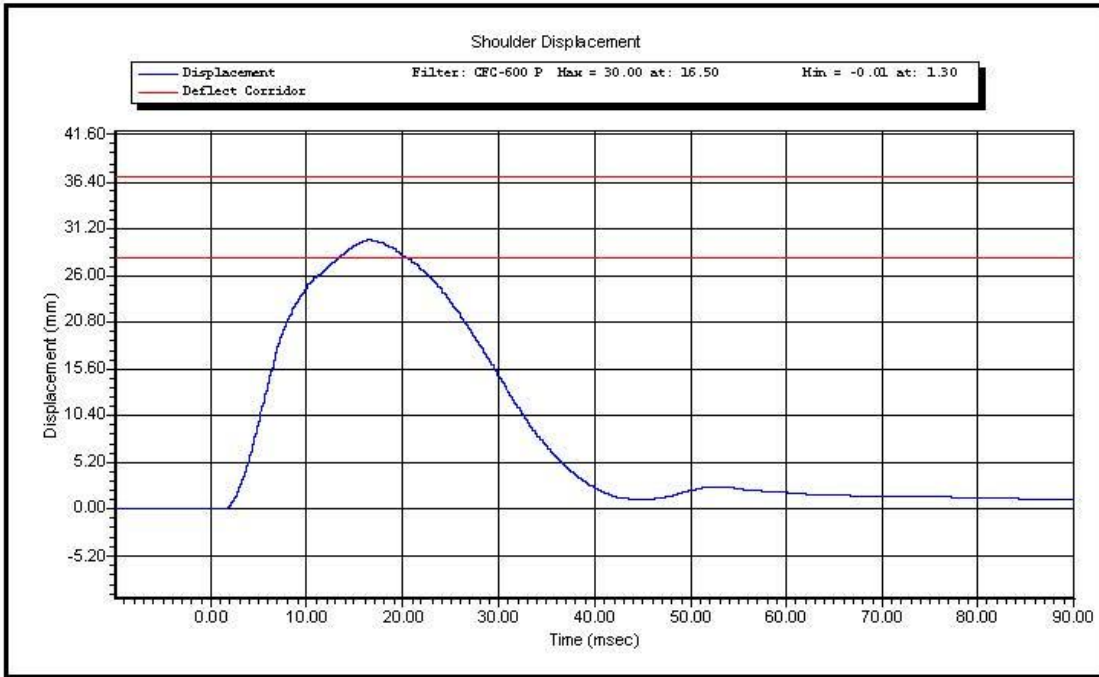


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Test Name:	Shoulder Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	300		
Test ID:		Test Date:	2/10/2012
Test Number:	1	Test Time:	11:25:06 AM



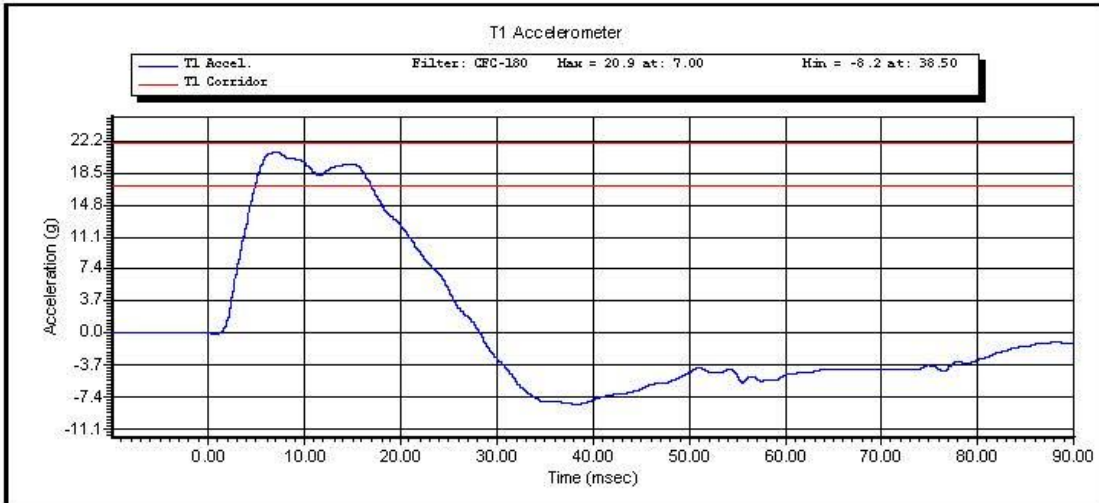
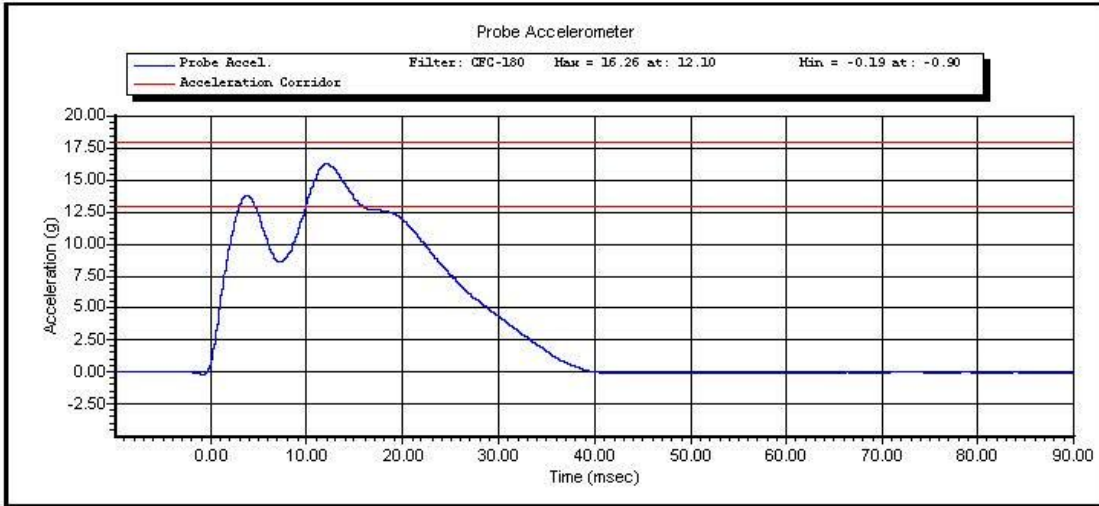
Test ID:

Test Time: **11:25:06 AM**

Test Date: **2/10/2012**

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1 of 2



Test ID:

Test Time: 11:25:06 AM

Test Date: 2/10/2012

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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-11s		
ATD Serial Number:	300		
Test ID:		Test Date:	2/10/2012
Test Number:	2	Test Time:	2:50:48 PM

Component Part Number	Component Serial Number
Thorax Ribs 1, 2, 3 180-3362	2024, 2061, 2062
Shoulder Rib 180-3355	168
Left Arm 180-6011-1	822

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.6 deg C P
Humidity	10 -- 70	27 %RH P
Velocity	6.60 -- 6.80	6.75 m/s P
Probe Acceleration after 5ms	30.0 -- 36.0	35.0 g P
Upper Thorax Rib Deflection	25.0 -- 32.0	27.3 mm P
Mid Thorax Rib Deflection	30.0 -- 36.0	32.4 mm P
Lower Thorax Rib Deflection	32.0 -- 38.0	33.5 mm P
Upper Spine Acceleration ("y")	34.0 -- 43.0	41.7 g P
Lower Spine Acceleration ("y")	29.0 -- 37.0	34.1 g P
Shoulder Deflection	31.0 -- 40.0	34.3 mm P

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test ID:

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

Test Date: **2/10/2012**



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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	1/11/2012
Endevco	7231CT	C14953	2/8/2012
Servo	180-3885	DS-1121	10/29/2011
Servo	180-3885	DS-1151	10/31/2011
Servo	180-3885	DS-1156	10/31/2011
Endevco	7264-2000	P58806	11/3/2011
Endevco	7264-2000	P64147	11/1/2011
Servo	180-3885	DS-1063	10/31/2011

Test ID:

Test Time: 2:50:48 PM

Test Date: 2/10/2012

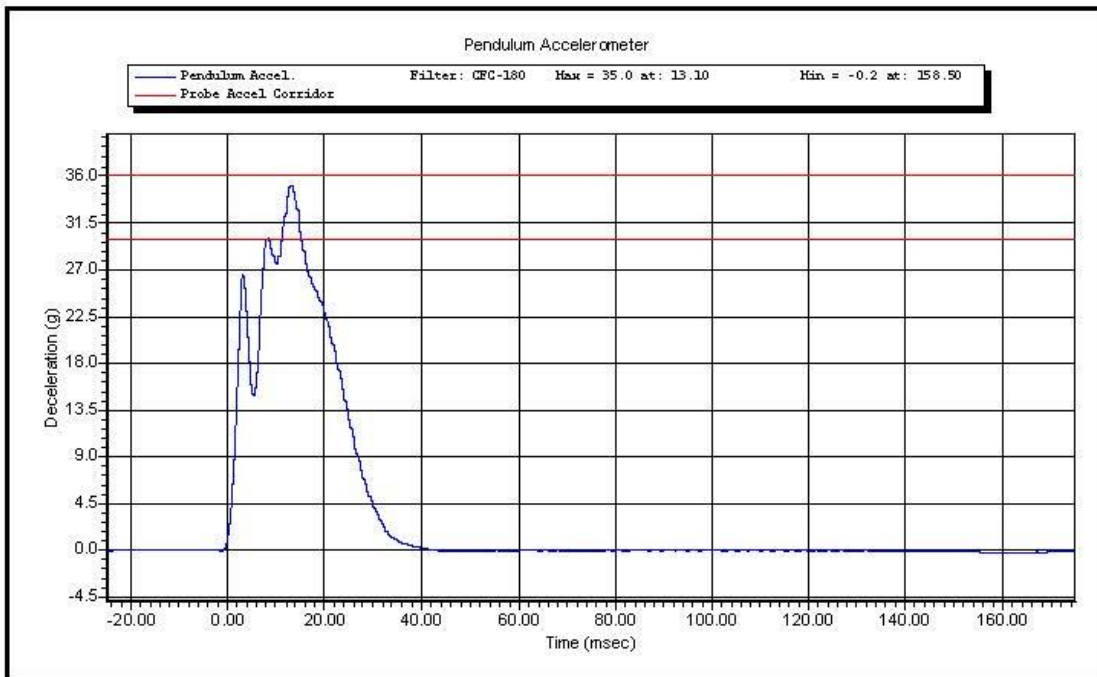


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Test Name:	Thorax Impact with Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	300		
Test ID:		Test Date:	2/10/2012
Test Number:	2	Test Time:	2:50:48 PM



Test ID:

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

Test Date: **2/10/2012**

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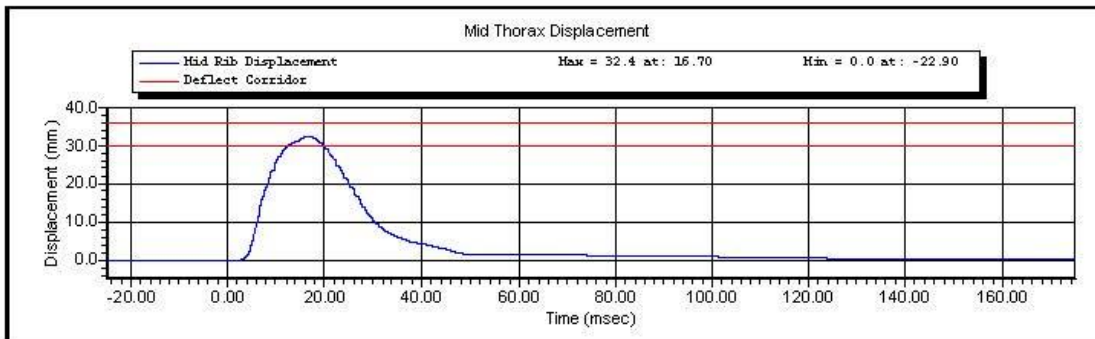
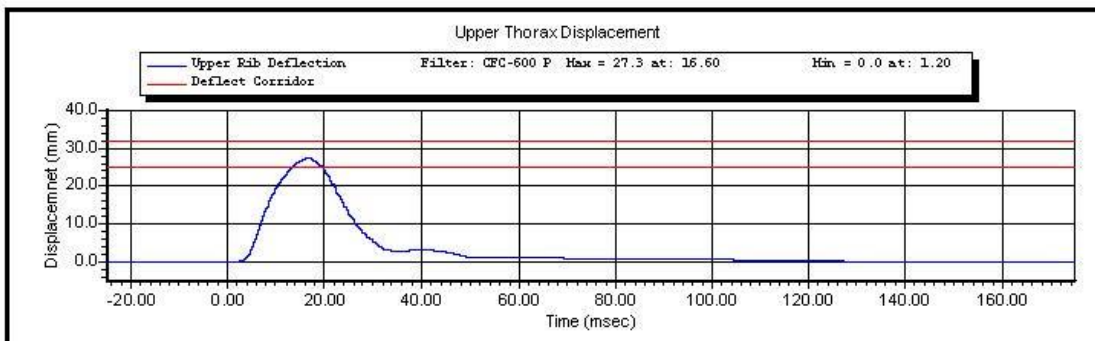
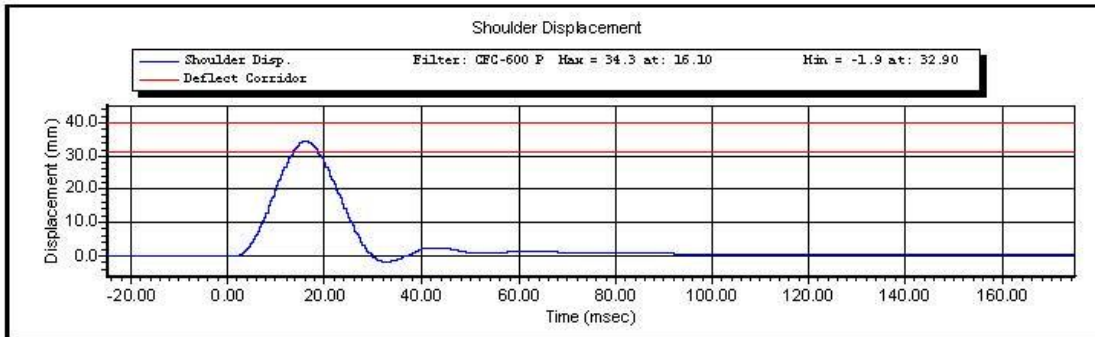
1 of 3



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Test ID:

Test Time: 2:50:48 PM

Test Date: 2/10/2012

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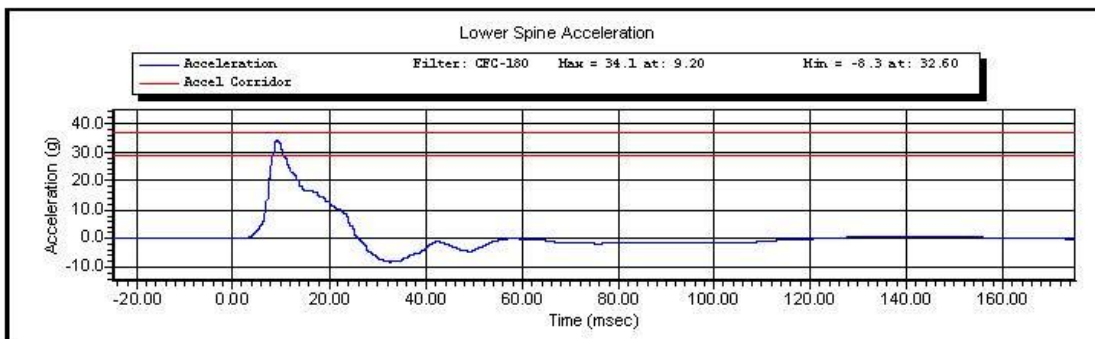
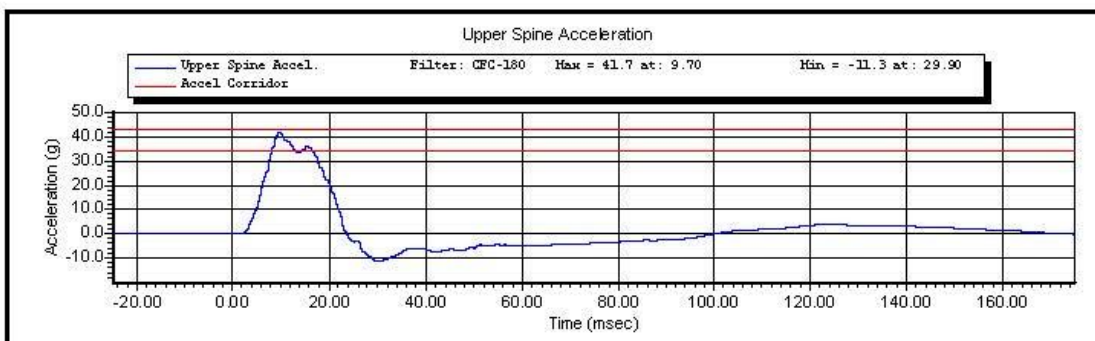
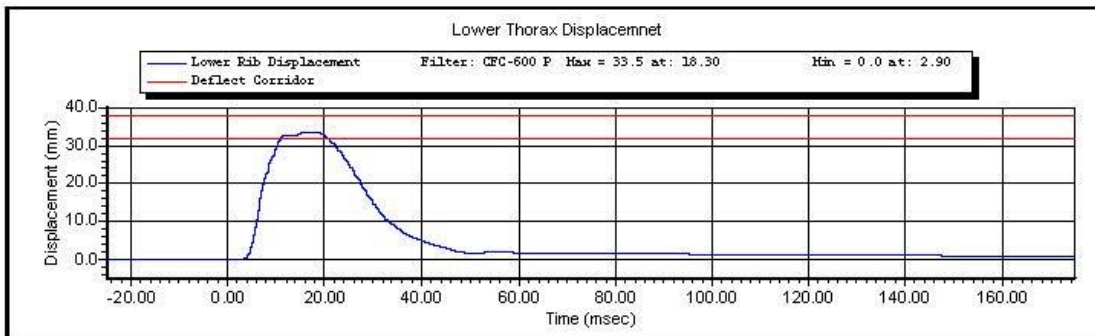
2 of 3



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Test ID:

Test Time: 2:50:48 PM

Test Date: 2/10/2012

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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-11s		
ATD Serial Number:	300		
Test ID:		Test Date:	2/10/2012
Test Number:	2	Test Time:	3:52:00 PM

Component Part Number	Component Serial Number
Thorax Ribs 1, 2, 3	2024, 2061, 2062

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.8 deg C P
Humidity	10 -- 70	27 %RH P
Velocity	4.20 -- 4.40	4.36 m/s P
Probe Acceleration	14.0 -- 18.0	16.4 g P
Upper Thorax Rib Deflection	32.0 -- 40.0	36.3 mm P
Mid Thorax Rib Deflection	39.0 -- 45.0	42.0 mm P
Lower Thorax Rib Deflection	35.0 -- 43.0	38.5 mm P
Upper Spine Acceleration T1	13.0 -- 17.0	15.8 g P
Lower Spine Acceleration T12	7.0 -- 11.0	9.6 g P

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test Time: **3:52:00 PM**

Test Date: **2/10/2012**



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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	1/11/2012
Endevco	7231CT	C14953	2/8/2012
Servo	180-3885	DS-1121	10/29/2011
Servo	180-3885	DS-1151	10/31/2011
Servo	180-3885	DS-1156	10/31/2011
Endevco	7264-2000	P58806	11/3/2011
Endevco	7264-2000	P64147	11/1/2011

Test Time: 3:52:00 PM

Test Date: 2/10/2012

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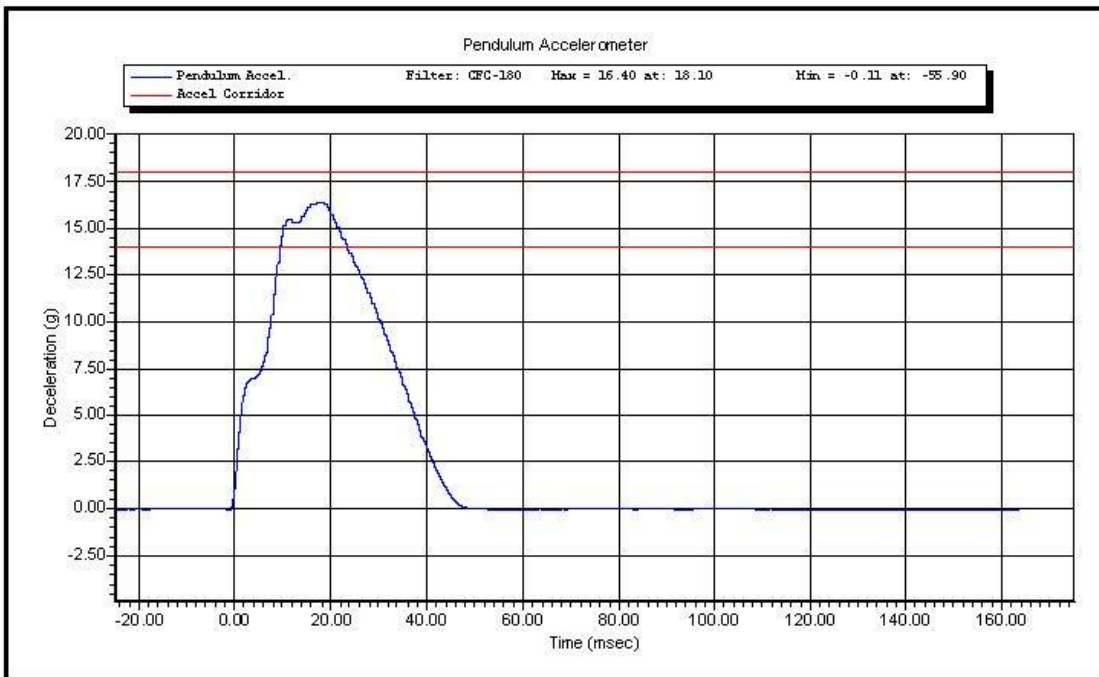


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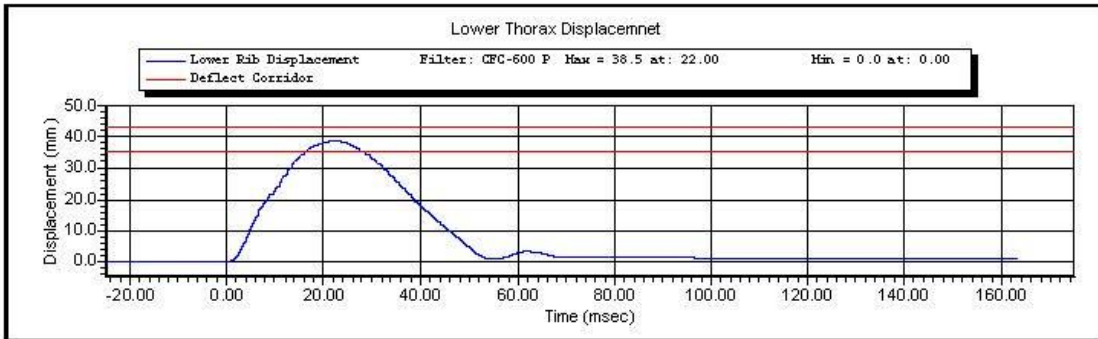
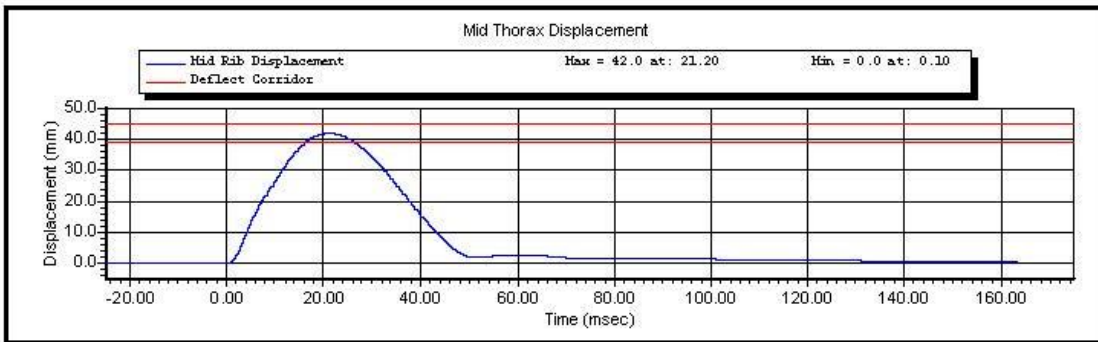
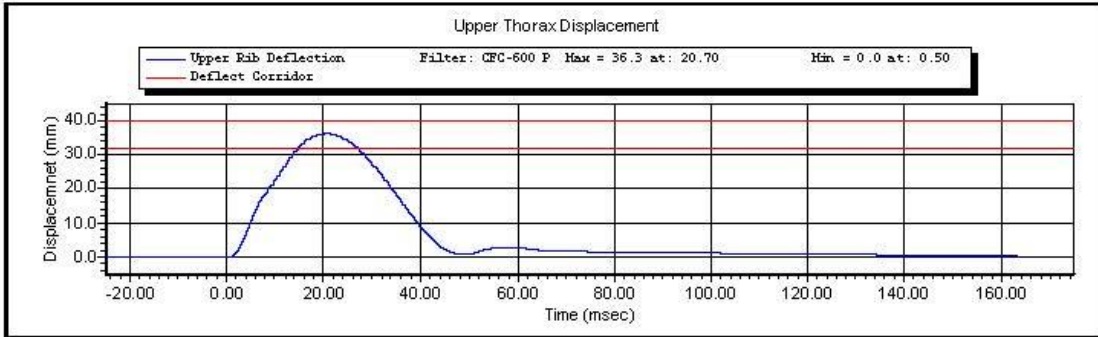
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Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	300		
Test ID:		Test Date:	2/10/2012
Test Number:	2	Test Time:	3:52:00 PM



Test Time: **3:52:00 PM**

Test Date: **2/10/2012**

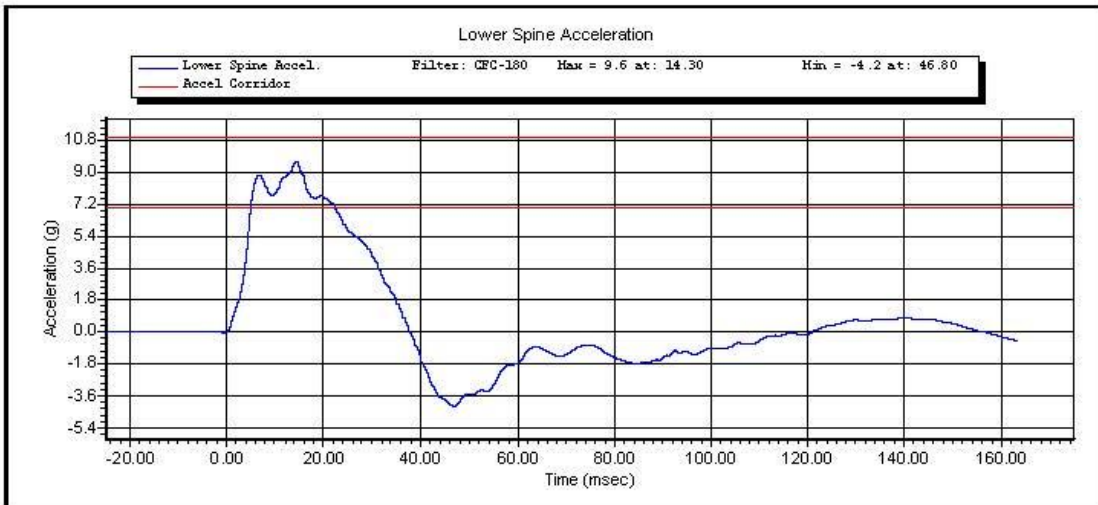
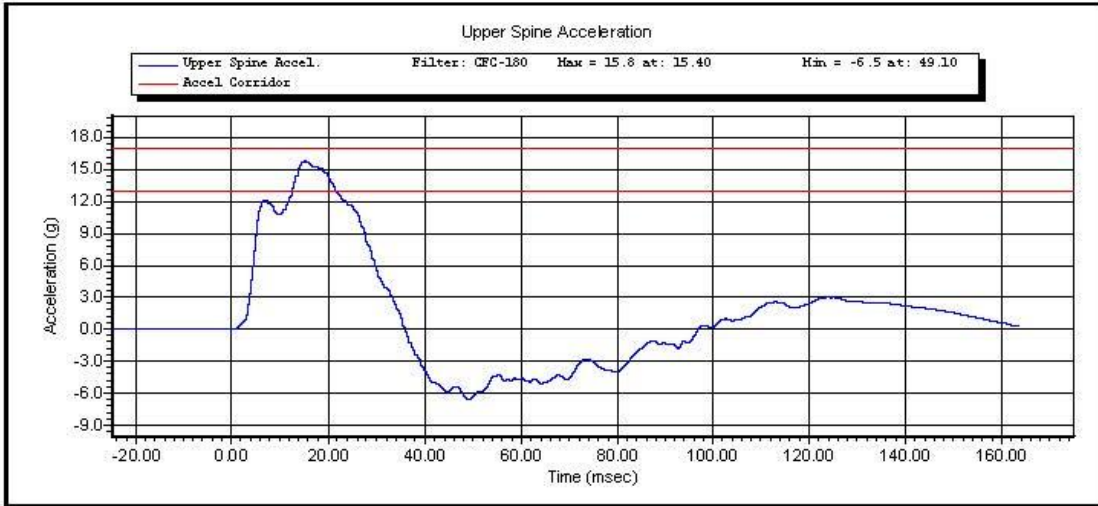
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



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Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test Time: 3:52:00 PM

Test Date: 2/10/2012

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VERIFICATION REPORT

Test Name:	Abdominal Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-11s		
ATD Serial Number:	300		
Test ID:		Test Date:	2/10/2012
Test Number:	1	Test Time:	10:47:47 AM

Component Part Number	Component Serial Number
Abdomen Ribs 4, 5	2024, 2061

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.5 deg C P
Humidity	10 -- 70	28 %RH P
Velocity	4.20 -- 4.40	4.33 m/s P
Probe Acceleration	12.0 -- 16.0	15.6 g P
Upper Abdominal Rib Deflection	36.0 -- 47.0	40.1 mm P
Lower Abdominal Rib Deflection	33.0 -- 44.0	35.1 mm P
Lower Spine Acceleration - T12	9.0 -- 14.0	12.5 g P

All test parameters are within specifications

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

Test ID:

Test Time: **10:47:47 AM**

Test Date: **2/10/2012**



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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	1/11/2012
Endevco	7231CT	C14953	2/8/2012
Servo	180-3885	DS-1162	11/3/2011
Servo	180-3885	DS-1622	11/3/2011
Endevco	7264-2000	P64147	11/1/2011

Test ID:

Test Time: **10:47:47 AM**

Test Date: **2/10/2012**

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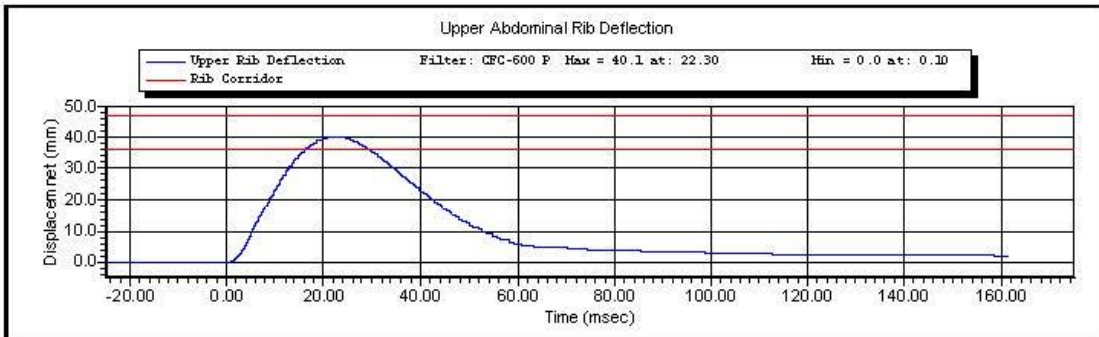
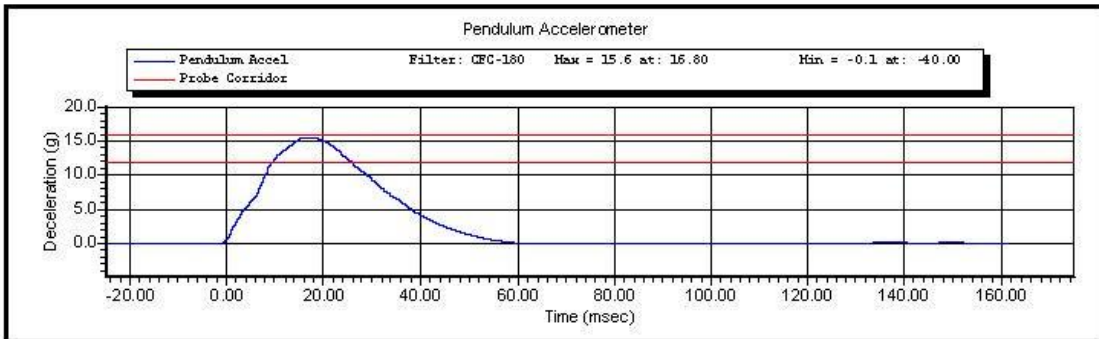


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Test Name:	Abdominal Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-11s		
ATD Serial Number:	300		
Test ID:		Test Date:	2/10/2012
Test Number:	1	Test Time:	10:47:47 AM



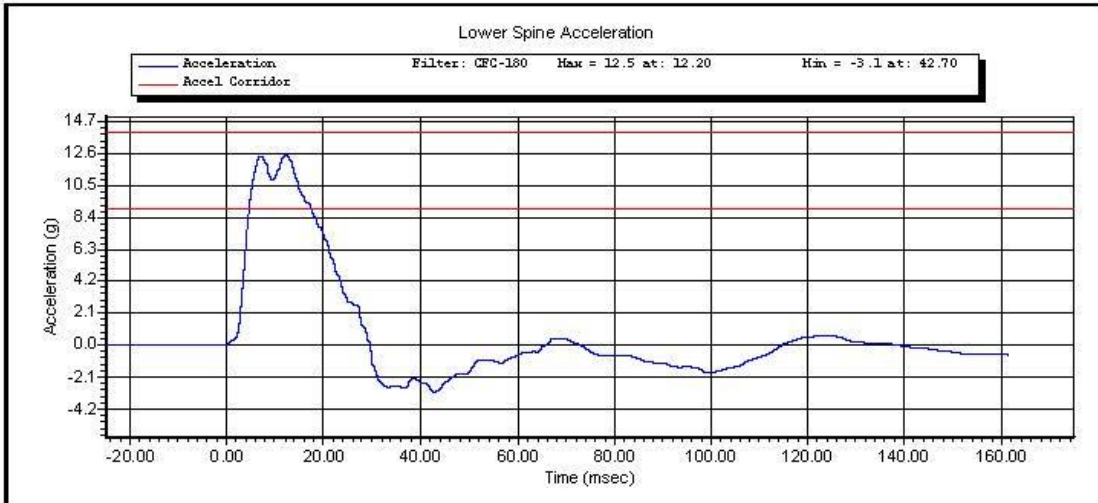
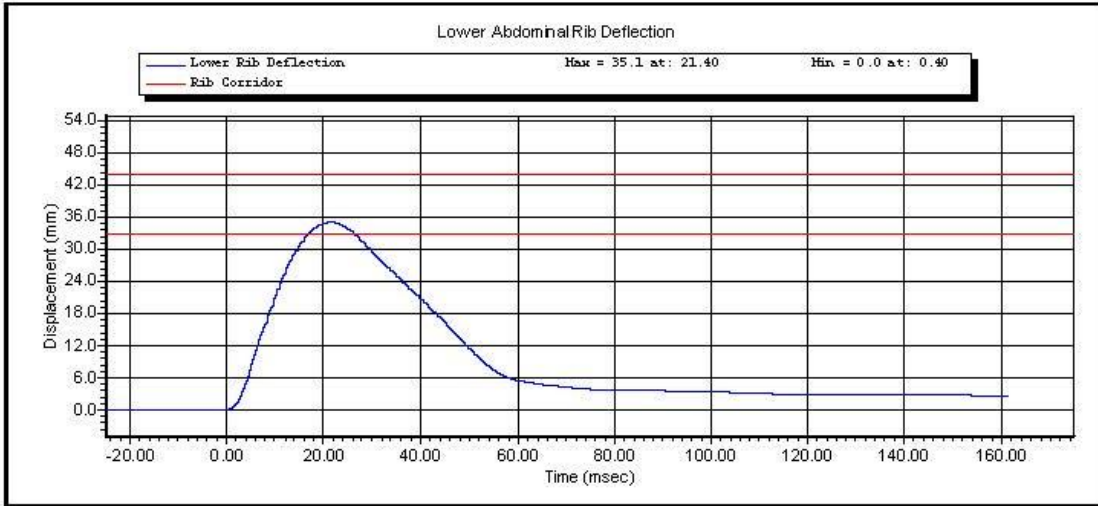
Test ID:

Test Time: **10:47:47 AM**

Test Date: **2/10/2012**

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1 of 2



Test ID:

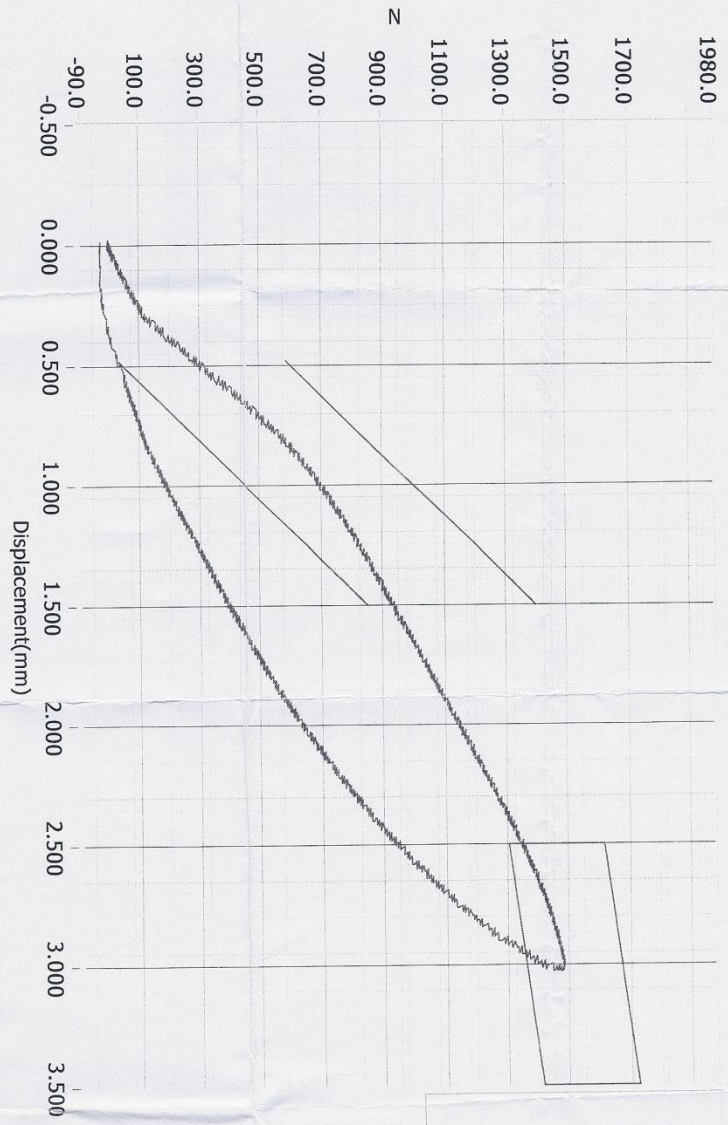
Test Time: 10:47:47 AM

Test Date: 2/10/2012

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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

<u>Test ID</u>	<u>Part Serial Number</u>	<u>Test Date</u>	<u>Test Time</u>
<u>Cert ID</u>	<u>ATD Serial Number</u>	<u>ATD Type</u>	
	36633	SIDIIS	
<u>Current Date</u> : 9/27/2010	<u>Current Time</u> : 18:24:44		



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VERIFICATION REPORT

Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Acetabulum Impact	Spec Type:	NHTSA
ATD Type:	SID-11s		
ATD Serial Number:	300		
Test ID:		Test Date:	2/10/2012
Test Number:	1	Test Time:	10:12:23 AM

Component Part Number	Component Serial Number
180-4343 Pelvis Flesh Humanetics Cert Plug - 1480N	DJ0890 36633

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.4 deg C P
Humidity	10 -- 70	28 %RH P
Velocity	6.60 -- 6.80	6.65 m/s P
Peak Probe Acceleration	38.0 -- 47.0	42.4 g P
Peak Pelvis Acceleration	34.0 -- 42.0	40.4 g P
Peak Acetabulum Force	3.60 -- 4.30	3.75 kN P

All test parameters are within specifications

Technician: **A. Rudniski**

Supervisor: **D. Travale**

Test ID:

Test Time: **10:12:23 AM**

Test Date: **2/10/2012**



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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	1/11/2012
Endevco	7231CT	AGHF5	2/3/2012
Endevco	7264-2000	P66941	1/25/2012
DentonATD	3249J	LC-275a	11/3/2011

Test ID:

Test Time: **10:12:23 AM**

Test Date: **2/10/2012**

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2 of 2

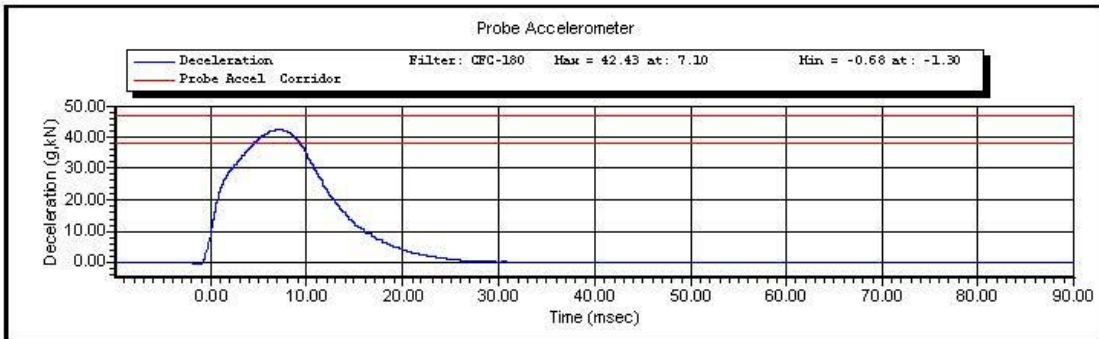
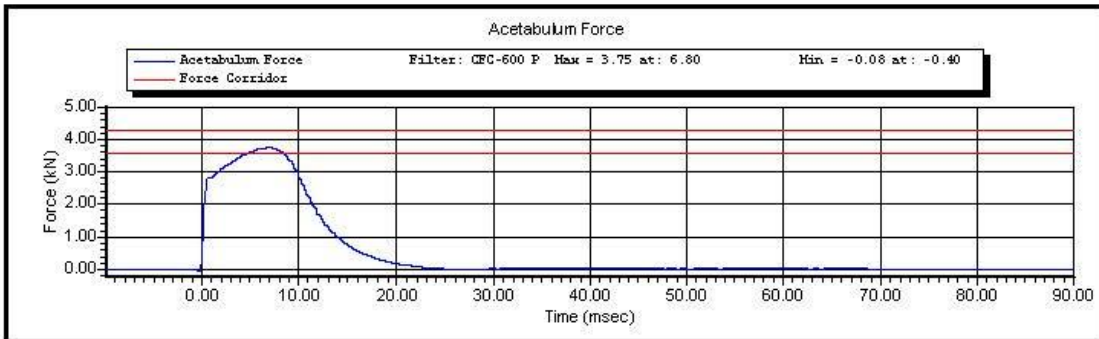


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Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Acetabulum Impact	Spec Type:	NHTSA
ATD Type:	SID-11s		
ATD Serial Number:	300		
Test ID:		Test Date:	2/10/2012
Test Number:	1	Test Time:	10:12:23 AM



Test ID:

Test Time: **10:12:23 AM**

Test Date: **2/10/2012**

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1 of 2



Test ID:

Test Time: 10:12:23 AM

Test Date: 2/10/2012

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VERIFICATION REPORT

Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Iliac Impact	Spec Type:	NHTSA
ATD Type:	SID-11s		
ATD Serial Number:	300		
Test ID:		Test Date:	2/10/2012
Test Number:	1	Test Time:	9:22:38 AM

Component Part Number	Component Serial Number
180-4343 Pelvis Flesh	DJ0890

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.7 deg C P
Humidity	10 -- 70	28 %RH P
Velocity	4.20 -- 4.40	4.33 m/s P
Peak Probe Acceleration	36.0 -- 45.0	42.0 g P
Peak Pelvis Acceleration	28.0 -- 39.0	31.4 g P
Peak Iliac Force	4.10 -- 5.10	4.34 kN P

All test parameters are within specifications

Technician: **A. Rudniski**

Supervisor: **D. Travale**

Test ID:

Test Time: **9:22:38 AM**

Test Date: **2/10/2012**



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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	1/11/2012
Endevco	7231CT	AF5B3	11/18/2011
Endevco	7264-2000	P66941	1/25/2012
DentonATD	3228J	LC-279 Fy	11/3/2011

Test ID:

Test Time: **9:22:38 AM**

Test Date: **2/10/2012**

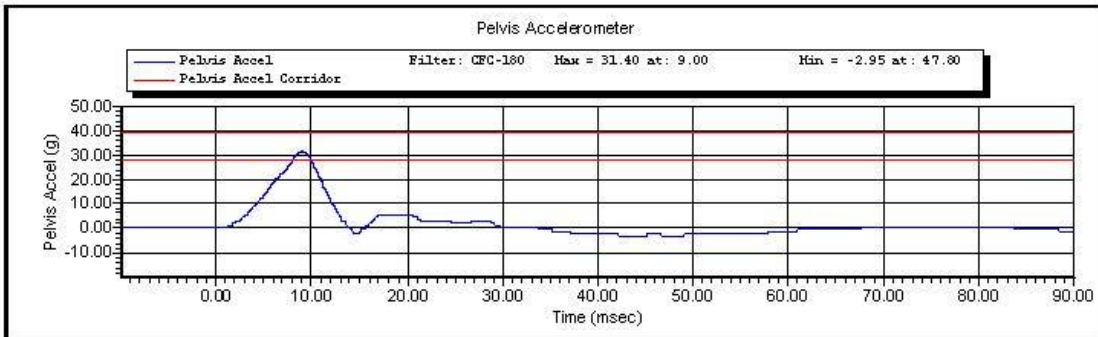
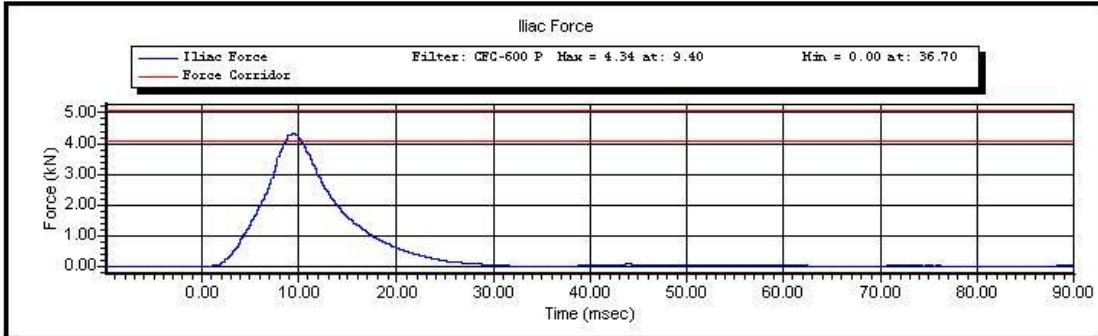


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4455 Genesee Street, Buffalo, New York 14225 - Phone (716)632-7500

Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Iliac Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	300		
Test ID:		Test Date:	2/10/2012
Test Number:	1	Test Time:	9:22:38 AM



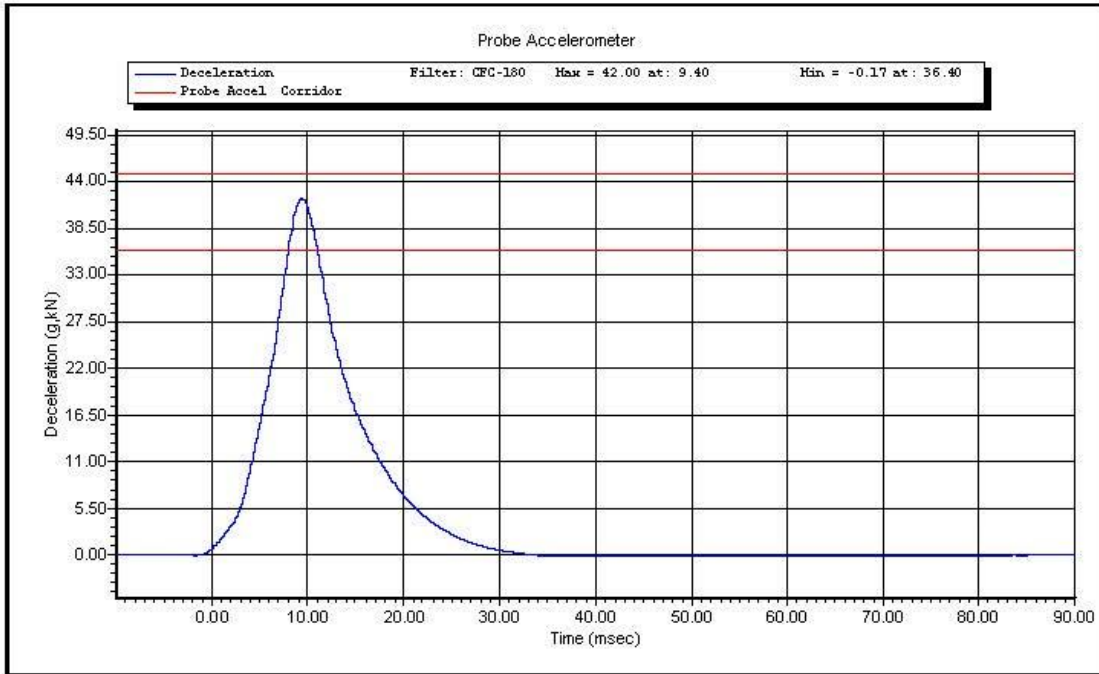
Test ID:

Test Time: **9:22:38 AM**

Test Date: **2/10/2012**

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1 of 2



Test ID:

Test Time: 9:22:38 AM

Test Date: 2/10/2012

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APPENDIX D

Test Equipment and Instrumentation Calibration Data

Table 1 – Dummy Instrumentation (ES-2re)

		ES-2re S/N: 034			
		Serial Number	Manufacturer	Calibration Date	
Head Accelerometers		X	P58737	Endevco	9/29/2011
		Y	P52022	Endevco	9/29/2011
		Z	P52040	Endevco	9/29/2011
Head Accelerometers Redundant		RX	P58843	Endevco	9/29/2011
		RY	P51668	Endevco	9/29/2011
		RZ	P51327	Endevco	9/29/2011
Thorax Rub Displacement Potentiometers	Upper	Y	183	Honeywell	8/31/2011
	Middle	Y	184	Honeywell	8/31/2011
	Lower	Y	182	Honeywell	8/31/2011
Abdominal Load Cells	Upper	Y	1512	Denton	6/3/2011
	Middle	Y	1526	Denton	6/3/2011
	Lower	Y	1516	Denton	6/3/2011
Lower Spine Accelerometers (T12)		X	P51979	Endevco	1/5/2011
		Y	P51873	Endevco	8/17/2011
		Z	P52152	Endevco	8/17/2011
Public Symphysis Load Cell		Y	465	Denton	8/31/2011

Table 2 – Dummy Instrumentation (SID-IIs)

		SID-IIs S/N: 300				
		Serial Number	Manufacturer	Calibration Date		
Head Accelerometers		X	P51685	Endevco	10/31/2011	
		Y	P51682	Endevco	10/31/2011	
		Z	P51699	Endevco	10/31/2011	
Head Accelerometers Redundant		RX	P51701	Endevco	10/31/2011	
		RY	P45019	Endevco	10/31/2011	
		RZ	P51690	Endevco	10/31/2011	
Displacement Potentiometer	Thoracic Rib	Upper	Y	1121	FTSS	10/29/2011
		Middle	Y	1151	FTSS	10/31/2011
		Lower	Y	1156	FTSS	10/31/2011
	Abdominal Rib	Upper	Y	1162	FTSS	10/29/2011
		Lower	Y	11622	FTSS	10/31/2011
Lower Spine Accelerometers (T12)		X	P58883	Endevco	10/31/2011	
		Y	P64147	Endevco	10/31/2011	
		Z	P58786	Endevco	10/31/2011	
Acetabulum Load Cell		Y	275	Denton	11/3/2011	
Lilac Wing Load Cell		Y	279Fy	Denton	11/3/2011	

Table 3 – Vehicle Instrumentation

Vehicle Instrumentation			Serial Number	Manufacturer	Calibration Date
1	Vehicle Center of Gravity	X	A081456	MS	10/4/2011
	Vehicle Center of Gravity	Y	A081436	MS	10/4/2011
	Vehicle Center of Gravity	Z	A081453	MS	10/4/2011
2	Right Side Sill at Front Seat	X	P69809	Endevco	8/10/2011
	Right Side Sill at Front Seat	Y	P69798	Endevco	8/10/2011
	Right Side Sill at Front Seat	Z	P71294	Endevco	10/4/2011
3	Right Side Sill at Rear Seat	X	P35786	Endevco	10/4/2011
	Right Side Sill at Rear Seat	Y	P16289	Endevco	9/15/2011
	Right Side Sill at Rear Seat	Z	P32219	Endevco	10/4/2011
4	Left Side Sill at Front Door	Y	A081457	MS	10/4/2011
5	Left Side Sill at Rear Door	Y	A081443	MS	10/4/2011
6	Left A-Post Lower	Y	A081412	MS	10/4/2011
7	Left A-Post Middle	Y	A081424	MS	10/4/2011
8	Left B-Post Lower	Y	A081414	MS	10/4/2011
9	Left B-Post Middle	X	A081431	MS	10/4/2011
10	Front Seat Track	Y	A081410	MS	10/4/2011
11	Rear Seat Track or Structure	Y	A081447	MS	10/4/2011
12	Right Rear Occ. Compartment	Y	A081413	MS	10/4/2011
13	Engine Block	X	A034971	MS	10/4/2011
	Engine Block	Y	A027662	MS	10/4/2011
14	Rear Floorpan Above Axle	X	P18532	Endevco	10/4/2011
	Rear Floorpan Above Axle	Y	P39743	Endevco	10/4/2011
	Rear Floorpan Above Axle	Z	P23303	Endevco	10/4/2011

TABLE 4 – MDB Instrumentation

MDB Instrumentation		Serial Number	Manufacturer	Calibration Date
MDB Center of Gravity	X	C14901	Endevco	10/4/2011
MDB Center of Gravity	Y	C16680	Endevco	10/4/2011
MDB Center of Gravity	Z	CP30	Endevco	10/4/2011
Left Frame at Rear Axle Centerline	X	C16507	Endevco	10/4/2011
Left Frame at Rear Axle Centerline	Y	C16499	Endevco	10/4/2011