

REPORT NUMBER: SINCAP-CAL-12-014

**NEW CAR ASSESSMENT PROGRAM (NCAP)
MOVING DEFORMABLE BARRIER SIDE IMPACT TEST**

**Toyota Motor Manufacturing, Texas, Inc
2013 Toyota Tacoma 4x2
Access Cab Pickup**

NHTSA No: MD5120

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



December 20, 2012

FINAL REPORT

**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF CRASHWORTHINESS STANDARDS
MAIL CODE: NVS-111
1200 NEW JERSEY AVE SE, ROOM W43-410
WASHINGTON, D.C. 20590**

This final test report was prepared for the U.S. Department of Transportation, National Highway Traffic Administration, in response to Contract Number DTNH22-09-D-00126.

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Date: December 20, 2012

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Date: December 20, 2012

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

1. Report No. SINCAP-CAL-13-014		2. Government Accession No.		3. Recipient's Catalog No.																																																			
4. Title and Subtitle Final Report of New Car Assessment Program Side Impact MDB Testing of a 2013 Toyota Tacoma 4x2 Access Cab Pickup NHTSA No.: MD5120				5. Report Date December 20, 2012																																																			
				6. Performing Organization Code CAL																																																			
Vanessa Walsh, Project Engineer David J. Travale, Technical Director				8. Performing Organization Report No. CAL-DOT-2013-014																																																			
9. Performing Organization Name and Address Calspan Corporation Transportation Test Operations P.O. Box 400 Buffalo, New York 14225				10. Work Unit No.																																																			
				11. Contract or Grant No. DTNH22-09-D-00126																																																			
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Office of Crashworthiness Standards (NVS-111) 1200 New Jersey Ave., SE, Room W43-410 Washington, D.C. 20590				13. Type of Report and Period Covered: Final Test Report November 9, 2012 - December 20, 2012																																																			
				14. Sponsoring Agency Code NVS-111																																																			
15. Supplementary Notes																																																							
16. Abstract A 55/28, (61.90 kph / 38.5 mph), 90° Moving Deformable Barrier NCAP Side Impact Test was conducted on the subject 2013 Toyota Tacoma 4x2 Access Cab Pickup 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 Calspan Corporation's Transportation Test Operations facility in Buffalo, New York on November 9, 2012. The impact velocity of the Moving Deformable Barrier (MDB) was 62.49 km/h, and the ambient temperature at the struck (driver's) side of the target vehicle at the time of impact was 6°C. The target vehicle's maximum post-test static crush was 206 mm located at level 2. The test vehicle's occupant performance data is as follows: <table border="1"> <thead> <tr> <th rowspan="2">Measurement Description</th> <th colspan="3">Driver ATD (ES-2re)</th> </tr> <tr> <th>Units</th> <th>IARV</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td> <td>N/A</td> <td>1000</td> <td>115.79</td> </tr> <tr> <td>Maximum Thoracic Rib Deflection</td> <td>mm</td> <td>44</td> <td>30.90</td> </tr> <tr> <td>Total Abdominal Force</td> <td>N</td> <td>2500</td> <td>807.47</td> </tr> <tr> <td>Pubic Symphysis Force</td> <td>N</td> <td>6000</td> <td>2347.61</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th rowspan="2">Measurement Description</th> <th colspan="3">Passenger ATD (SID-IIs)</th> </tr> <tr> <th>Units</th> <th>IARV</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td> <td>N/A</td> <td>1000</td> <td>245.64</td> </tr> <tr> <td>Lower Spine Resultant Acceleration</td> <td>G</td> <td>82</td> <td>65.42</td> </tr> <tr> <td>Total Pelvic Force (sum of acetabular and iliac forces)</td> <td>N</td> <td>5525</td> <td>4248.92</td> </tr> <tr> <td>Maximum Thoracic Rib Deflection</td> <td>mm</td> <td>38*</td> <td>33.22</td> </tr> <tr> <td>Maximum Abdominal Rib Deflection</td> <td>mm</td> <td>45*</td> <td>17.32</td> </tr> </tbody> </table> * 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.						Measurement Description	Driver ATD (ES-2re)			Units	IARV	Result	Head Injury Criteria (HIC ₃₆)	N/A	1000	115.79	Maximum Thoracic Rib Deflection	mm	44	30.90	Total Abdominal Force	N	2500	807.47	Pubic Symphysis Force	N	6000	2347.61	Measurement Description	Passenger ATD (SID-IIs)			Units	IARV	Result	Head Injury Criteria (HIC ₃₆)	N/A	1000	245.64	Lower Spine Resultant Acceleration	G	82	65.42	Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	4248.92	Maximum Thoracic Rib Deflection	mm	38*	33.22	Maximum Abdominal Rib Deflection	mm	45*	17.32
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19. Security Class. (of this report) UNCLASSIFIED		20. Security Class. (of this page) UNCLASSIFIED		21. No. of Pages 279	22. Price																																																		

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SECTION 1

TEST PURPOSE AND PROCEDURE

This moving deformable barrier side impact test is part of the MY 2013 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 2013 Toyota Tacoma 4x2 Access Cab Pickup. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Laboratory Test Procedure dated September 2012.

SECTION 2

SUMMARY OF TEST RESULTS

A 2013 Toyota Tacoma 4x2 Access Cab Pickup 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 62.49 km/h (38.83 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's Transportation Test Operations Center in Buffalo, New York on November 9, 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 September 2012. 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	115.79
Maximum Thorax Rib Deflection	mm	44	30.90
Combined Abdominal Force	N	2500	807.47
Pubic Symphysis Force	N	6000	2347.61

Measurement Description	Passenger ATD (SID-IIs)		
	Units	Threshold	Result
Head Injury Criteria (HIC36)		1000	245.64
Lower Spine (T12) Resultant Acceleration	G	82	65.42
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	4248.92
Maximum Thoracic Rib Deflection	mm	38*	33.22
Maximum Abdominal Rib Deflection	mm	45*	17.32

*Proposed IARV

SUPPLEMENTAL RESTRAINT INFORMATION

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

GENERAL COMMENTS:

1. P1 serial number - F033
2. P4 serial number - 303

Data Anomalies:

- LEFT FRONT SILL AY is questionable after 10 ms.
- LEFT REAR SILL AY is questionable saturated 8-13ms
- LEFT MID B-POST AY channel saturated 9-11 ms.

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: <u>2013 Toyota Tacoma 4x2 Access Cab Pickup</u>	NHTSA No.: <u>MD5120</u>	
Test Program: <u>NCAP Side MDB Impact Test</u>	Test Date: <u>11/9/2012</u>	

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	MD5120	Traction Control System (TCS)	Yes
Model Year	2013	Auto-Leveling System	No
Make	Toyota	Automatic Door Locks (ADL)	No
Model	Tacoma 4x2	Power Window Auto-Reverse	No
Body Style	Access Cab Pickup	Other Optional Feature	--
VIN	5TFTX4CN6DX022234	Driver Front Airbag	Yes
Body Color	Charcoal gray	Driver Curtain Airbag	Yes
Odometer Reading (km/mi)	50 / 31	Driver Head/Torso Airbag	No
Engine Displacement (L)	2.7	Driver Torso Airbag	Yes
Type/No. Cylinders	I4	Driver Torso/Pelvis Airbag	No
Engine Placement	Inline	Driver Pelvis Airbag	No
Transmission Type	Automatic	Driver Knee Airbag	No
Transmission Speeds	4-Speed	Rear Pass. Curtain Airbag	Yes
Overdrive	Yes	Rear Pass. Head/Torso Airbag	No
Final Drive	Rear 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 Pretensioner	Yes
Tilt Steering Wheel	Yes	Rear Pass. Seat Belt Pretensioner	No
Power Seats	No	Driver Load Limiter	Yes
Anti-Lock Brakes (ABS)	Yes	Rear Pass. Load Limiter	No
		Other Safety Restraint	--

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

No

DATA FROM CERTIFICATION LABEL

Manufactured By	Toyota Motor	GVWR (kg)	2,220
Date of Manufacture	08/12	GAWR Front (kg)	1,075
Vehicle Type	Access Cab Pickup	GAWR Rear (kg)	1,200

VEHICLE SEATING AND WEIGHT CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity (DSC)	2	2		4	
Capacity Weight (VCW) (kg)				475.0	(A)
DSC X 68.04 kg				272.2	(B)
Cargo Weight (RCLW) (kg)				202.8	(A-B)

VEHICLE SEAT TYPE

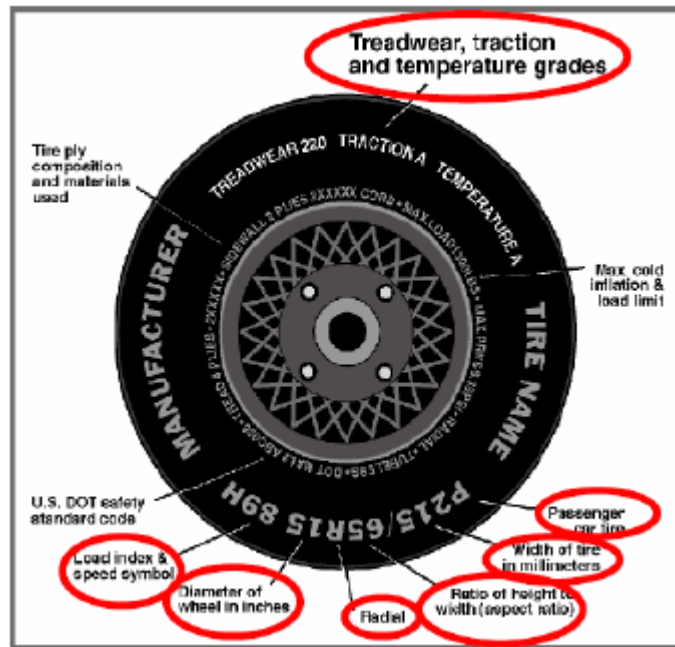
Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable	
						W/ Lever	W/ Knob
Front Seat	X					X	
Rear or Second Row Seat			Jump Seat		X		
Third Row seat							

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

Test Vehicle:	2013 Toyota Tacoma 4x2 Access Cab Pickup
Test Program:	NCAP Side MDB Impact Test

NHTSA No.: MD5120
Test Date: 11/9/2012

Collected for year, make, model, & VIN, all items circled in red, tire manufacturer and tire name.



VEHICLE TIRE INFORMATION

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	350	350
Cold Pressure (kPa)	210	230
Recommended Tire Size	P215/70R15	P215/70R15
Tire Size on Vehicle	P215/70R15	P215/70R15
Tire Manufacturer	Dunlop	Dunlop
Tire Model	Grand Trek	Grand Trek
Treadwear	300	300
Traction	B	B
Temperature Grades	B	B
Tire Plies Sidewall	1 Polyester	1 Polyester
Tire Plies Body	1 Polyester, 2 Steel, 1 Nylon	1 Polyester, 2 Steel, 1 Nylon
Load Index / Speed Symbol	97S	97S
Tire Material	RUBBER	RUBBER
DOT Safety Code Left	DAM3C8ER2412	DAM3C8ER2412
DOT Safety Code Right	DAM3C8ER2412	DAM3C8ER2412

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

Test Vehicle: 2013 Toyota Tacoma 4x2 Access Cab Pickup
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: MD5120
 Test Date: 11/9/2012

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	204	218	216	218
Tire Placard	kPa	210	210	230	230
Owner's Manual	kPa	210	210	230	230
As Tested	kPa	210	210	230	230

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	207	207	207	207

TEST VEHICLE AXLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	458.5	382.0		494.0	502.5		517.0	497.5	
Right	kg	442.0	360.0		449.0	462.5		454.5	447.0	
Ratio	%	55	45		49	51		51	49	
Totals	kg	900.5	742.0	1,642.5	943.0	965.0	1,908.0	971.5	944.5	1,916.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1,642.5	(A)
Sum of Actual Weight of 2 P572 ATDS Used	kg	136.8	(B)
Rated Cargo / Luggage Weight (RCLW)*	kg	136.0	(C)
Calculated Target Vehicle Test Weight (TVTW)	kg	1,915.3	(A+B+C)

* The maximum RCLW is 136 kg per test procedure

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

TEST VEHICLE ATTITUDES AND CG

Measurement Description	Units	Fully Loaded	As Tested	Meets Requirement***
LF	mm	792	797	Yes
RF	mm	803	808	Yes
RR	mm	820	812	Yes
LR	mm	813	811	Yes
Vehicle CG (Aft of Front Axle)	mm	1,594	1,635	
Vehicle CG (Left(+)/Right(-) from Longitudinal Centerline)	mm	-46	-35	

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

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

Test Vehicle:	<u>2013 Toyota Tacoma 4x2 Access Cab Pickup</u>	NHTSA No.:	<u>MD5120</u>
Test Program:	<u>NCAP Side MDB Impact Test</u>	Test Date:	<u>11/9/2012</u>

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Jack	3.8
Ballast / Equipment Added	81.8

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

Test Vehicle: <u>2013 Toyota Tacoma 4x2 Access Cab Pickup</u>	NHTSA No.: <u>MD5120</u>	
Test Program: <u>NCAP Side MDB Impact Test</u>	Test Date: <u>11/9/2012</u>	

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	--	Not Adjustable	--
Front Passenger Seat	--	Not Adjustable	--
Front Center Seat*	N/A	N/A	N/A
Struck Side Rear Seat	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed
Rear Center Seat*	N/A	N/A	N/A

**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	12.6	Not Adjustable	Max	-	-	-
			Mid	-	-	-
			Min	-	-	-
Front Passenger Seat	10.4	Not Adjustable	Max	-	-	-
			Mid	-	-	-
			Min	-	-	-
Front Center Seat*	N/A	N/A	Max	-	-	-
			Mid	-	-	-
			Min	-	-	-
Struck Side Rear Seat	8.7	Fixed	Max	-	-	-
			Mid	-	-	-
			Min	-	-	-
Non-Struck Side Rear Seat	7.1	Fixed	Max	-	-	-
			Mid	-	-	-
			Min	-	-	-
Rear Center Seat*	N/A	N/A	Max	-	-	-
			Mid	-	-	-
			Min	-	-	-

**if applicable*

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

Test Vehicle: 2013 Toyota Tacoma 4x2 Access Cab Pickup
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: MD5120
 Test Date: 11/9/2012

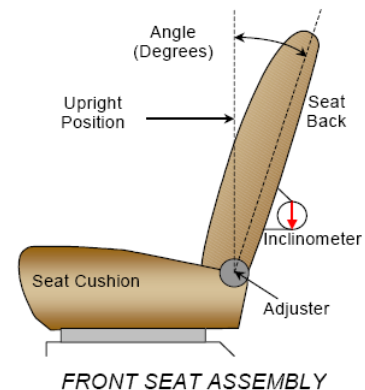
SEAT FORE / AFT POSITION

Seat	Total Fore / Aft Travel		Test Position from Forwardmost Position	
	mm	Detents*	mm	Detent*
Driver Seat	240	17 (0-16)	120	8
Front Passenger Seat	240	17 (0-16)	120	8
Front Center Seat*	N/A	N/A	N/A	N/A
Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Rear Center Seat*	N/A	N/A	N/A	N/A

**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	-6.2 to 43.5	27	1.6	4
Front Passenger Seat	-8.9 to 41.1	27	1.9	4
Front Center Seat*	N/A	N/A	N/A	N/A
Struck Side Rear Seat w/ Seated Dummy	Fixed	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Rear Center Seat*	N/A	N/A	N/A	N/A

**if applicable*

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

Test Vehicle: 2013 Toyota Tacoma 4x2 Access Cab Pickup
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: MD5120
 Test Date: 11/9/2012

SEAT BELT ANCHORAGE ADJUSTMENT

Seat belt anchorages are adjusted in accordance with the information provided by the manufacturer on Form No. 1. For this test zero is defined as the uppermost position

	Total # of Positions	Placed in Position #
Driver Seat	4	0
Rear Seat	4	0

HEAD RESTRAINT ADJUSTMENT

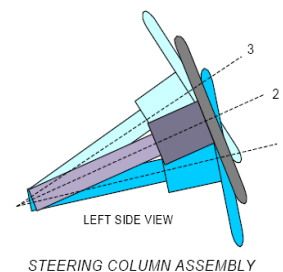
The driver's head restraint is adjusted to the highest and most full forward in-use position. The struck-side rear passenger's head restraint is adjusted to the lowest and most full forward in-use position. For this test zero is defined as the lowermost position.

	Total # of Positions	Placed in Position #
Driver Seat	4 (0-3)	3 - uppermost
Rear Seat	Fixed	Fixed

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.

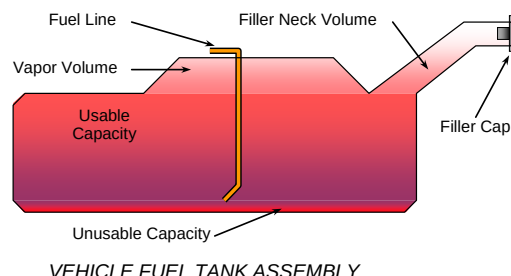
	Degrees	Fore/Aft Position (mm)
Lowermost – Position 1	22.9	0
Geometric Center – Position 2	24.5	10
Uppermost – Position 3	26.2	20
Telescoping Steering Wheel Travel		20
Test Position	24.5	10



FUEL PUMP

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

The vehicle is equipped with an electric fuel pump. The fuel filler neck is on the left side of the vehicle. The pump creates positive pressure in the fuel lines, pushing the gasoline to the engine. See form 1 for more information.



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

Test Vehicle: <u>2013 Toyota Tacoma 4x2 Access Cab Pickup</u>	NHTSA No.: <u>MD5120</u>	
Test Program: <u>NCAP Side MDB Impact Test</u>	Test Date: <u>11/9/2012</u>	

FUEL TANK CAPACITY

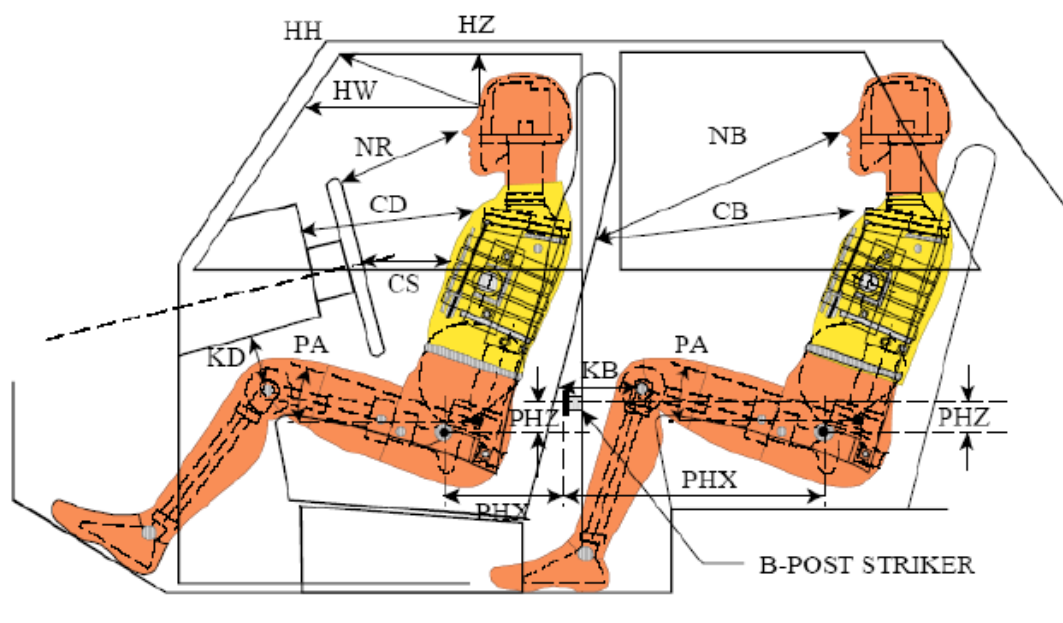
		Liters
Usable Capacity of "Standard Tank"	- see Form No. 1	79.9
Usable Capacity of "Optional Tank"	- see Form No. 1	N/A
Usable Capacity of Standard Tank	- see Owner's Manual	79.9
Usable Capacity of Optional Tank	- see Owner's Manual	N/A
93% of Usable Capacity		74.3
Actual Amount of Solvent Used in Test		74.2
1/3 of Usable Capacity		26.6

Is the Actual Amount of Solvent Used in the test equal to 93% $\pm$ 1% of the Usable Capacity stated in Form No. 1? ☒ **Yes** ☐ **No**

DATA SHEET NO. 3 DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2013 Toyota Tacoma 4x2 Access Cab Pickup
Test Program: NCAP Side MDB Impact Test

NHTSA No.: MD5120
Test Date: 11/9/2012



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

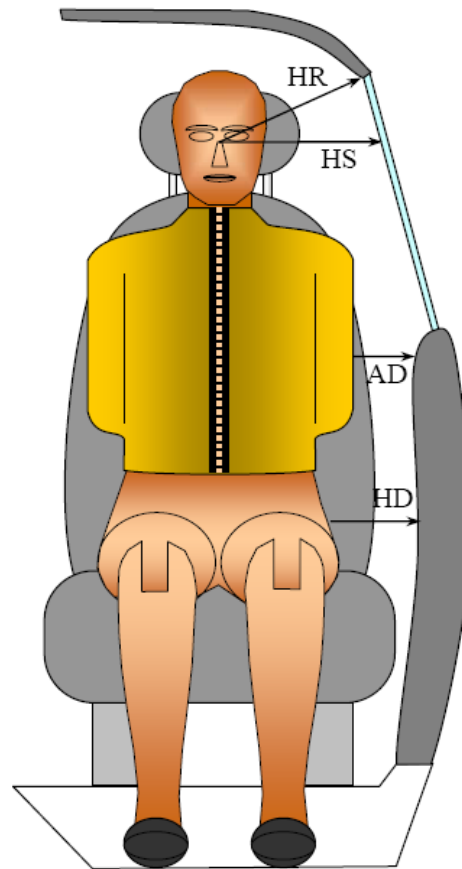
DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Pass. Code	Description	Driver (Serial No. F033)		Passenger (Serial No. 303)	
			Length (mm)	Angle	Length (mm)	Angle
HH		Header to Header	434			
HW		Header to Windshield	599			
HZ	HZ	Head to Roof Liner	180		257	
NR	NB	Nose to Rim/Seat Back	464		284	
CD	CB	Chest to Dash/Seat Back	598		281	
CS		Chest to Steering Wheel	465			
KD(L)/KDA(L)°	KB(L)/KBA(L)°	Left Knee to Dash/Seat Back	150	32.2	101	23.5
KD(R)/KDA(R)°	KB(R)/KBA(R)°	Right Knee to Dash/Seat Back	136	18.5	98	22.2
PAX°	PAX°	Pelvic Tilt Angle X		-24.7		12.4
	PAY°	Pelvic Tilt Angle Y				0.3
PHX	PHX	Hip Point to Striker (X-Axis)	202		461	
PHZ	PHZ	Hip Point to Striker (Z-Axis)	142		288	

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2013 Toyota Tacoma 4x2 Access Cab Pickup
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: MD5120
 Test Date: 11/9/2012



FRONT VIEW OF DUMMY

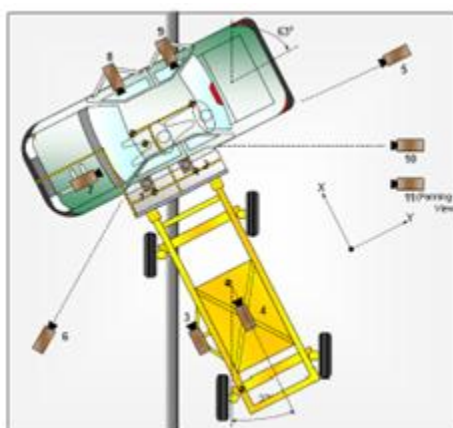
DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

Code	Measurement Description	Units	Driver (Serial No. F033)	Passenger (Serial No. 303)
HR	Head to Side Header	mm	210	259
HS	Head to Side Window	mm	335	395
AD	Arm to Door	mm	89	148
HD	Hip Point to Door	mm	120	142

DATA SHEET NO. 5
CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2013 Toyota Tacoma 4x2 Access Cab Pickup
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: MD5120
 Test Date: 11/9/2012



CAMERA LOCATIONS AND DATA

No.	Camera View	Coordinates (mm)			Lens Length (mm)	Operating Frame Rate (fps)
		X	Y	Z		
1	Overhead Overall	400	910	4328	14.5	1000
2	Overhead Close-up	0	910	4328	24	1000
3	Left Impact Point (MDB)	-1470	0	-847	12.5	1000
4	Side Overall (MDB)	-1170	0	-847	6.5	1000
5	Rear	0	11112	952	50	1000
6	Left Front	2797	-828	950	28	1000
7	Driver Front (OB)				12.5	1000
8	Driver Side (OB)				6.5	1000
9	Passenger Side (OB)				6.5	1000
10	Real-time Left Rear				Zoom	30
11	Real-time Inrun				Zoom	30

Notes: *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 function as intended: All cameras operated normally

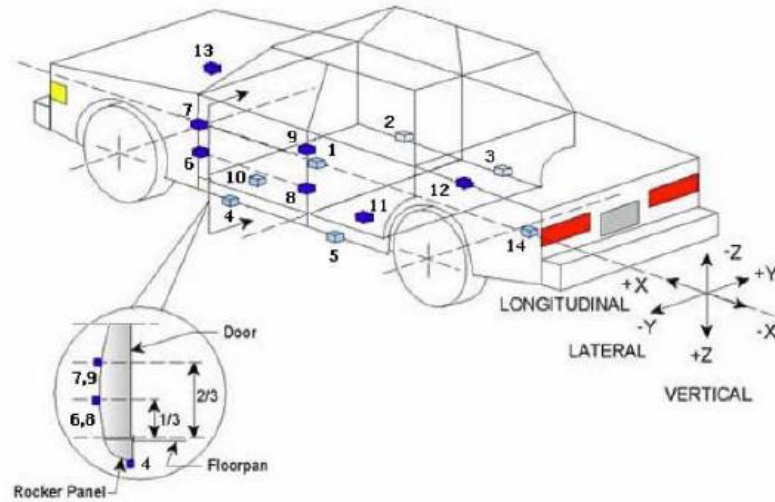
INSTRUMENTATION

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: 2013 Toyota Tacoma 4x2 Access Cab Pickup
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: MD5120
 Test Date: 11/9/2012



TEST VEHICLE ACCELEROMETER LOCATIONS

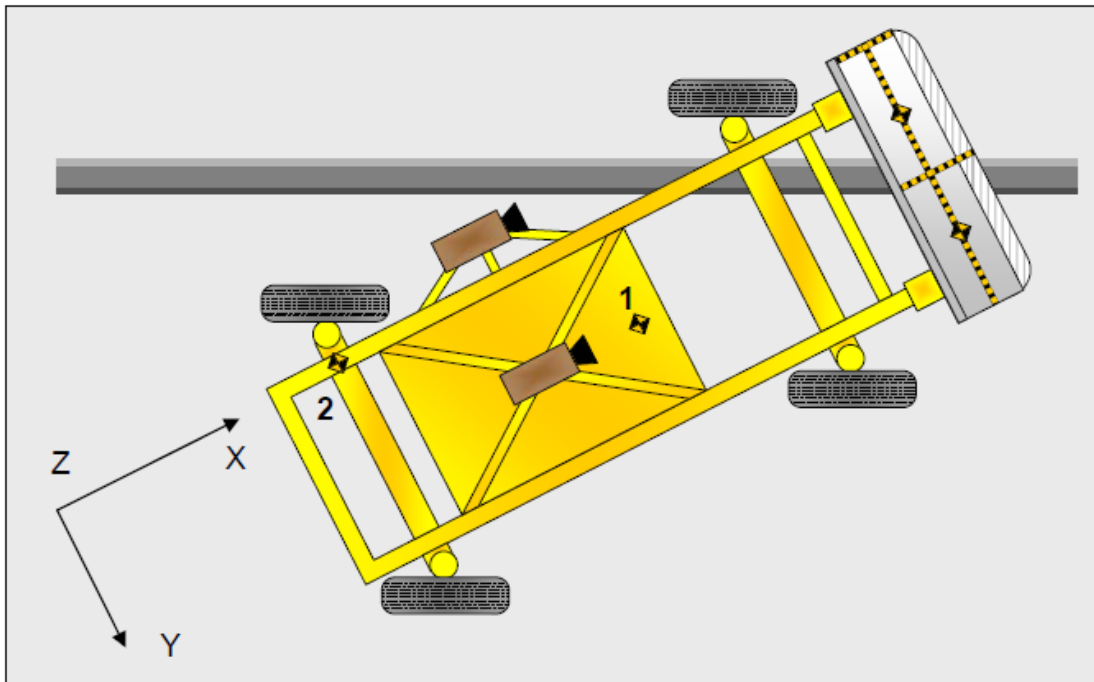
No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2,978	34	-625
2	Right Sill at Front Seat	3,482	652	-427
3	Right Sill at Rear Seat	2,648	657	-438
4	Left Sill at Front Door	3,462	-650	-427
5	Left Sill at Rear Door	2,652	-661	-434
6	A-Post Lower	3,874	-668	-538
7	A-Post Middle	3,780	-690	-1,156
8	B-Post Lower	2,865	-710	-743
9	B-Post Middle	2,851	-710	-966
10	Front Seat Track	2,920	-555	-445
11	Rear Seat Structure	2,338	-656	-521
12	Rt. Rear Occ. Compartment	2,659	412	-435
13	Engine Block	4,619	53	-931
14	Rear Above Axle	1,103	5	-661

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: 2013 Toyota Tacoma 4x2 Access Cab Pickup
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: MD5120
 Test Date: 11/9/2012



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: 2013 Toyota Tacoma 4x2 Access Cab Pickup
Test Program: NCAP Side MDB Impact Test

NHTSA No.: MD5120
Test Date: 11/9/2012

TEST DUMMY INFORMATION AND CONTACT POINTS

Dummy Body Part	Front Seat Dummy (ES-2re)	Rear Seat Dummy (SID-IIs)
Face	Curtain Airbag & Side Header	Curtain Airbag
Top of Head	Side Header & Curtain Airbag	Side Header
Left Side of Head	Side Header & Curtain Airbag	Curtain Airbag
Back of Head	Headrest	Headrest
Left Shoulder	Curtain Airbag & Torso Bag	Passenger's Side Door
Upper Torso	Torso Airbag & Seat Back	Passenger's Side Door
Lower Torso	Torso Airbag & Seat Back	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	No
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	Yes
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	N/A	0	0	0
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 inwards
Sill Separation	Deformed inwards but remained attached
Windshield Damage	None
Side Window Damage	None
Other Notable Effects	None

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

Test Vehicle: 2013 Toyota Tacoma 4x2 Access Cab Pickup
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: MD5120
 Test Date: 11/9/2012

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	Yes		
Knee Airbag	No	NA		
Side Airbag 1 - Curtain	Yes	Yes	Yes	Yes
Side Airbag 2 - Torso Airbag	Yes	Yes	No	NA
Seat Belt Pretensioner	Yes	Yes	No	NA
Seat Belt Load Limiter	Yes	Yes	No	NA
Other				

IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vehicle Wheel Base	mm		3233
Vertical Impact Reference Line (Aft of Front Axle - Intended Impact Point)	mm		508
Actual Impact Point (Aft of Frontal Axle)	mm		508
Horizontal Offset (+ forward / - rearward)	mm	+/- 50 of Intended Impact Point	0
Vertical Offset (+ down / - up)	mm	+/- 20 of Intended Impact Point	-1

DATA SHEET NO. 9
MDB SUMMARY OF RESULTS

Test Vehicle: 2013 Toyota Tacoma 4x2 Access Cab Pickup
Test Program: NCAP Side MDB Impact Test

NHTSA No.: MD5120
Test Date: 11/9/2012

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	62.49
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	62.44
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	89.5
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

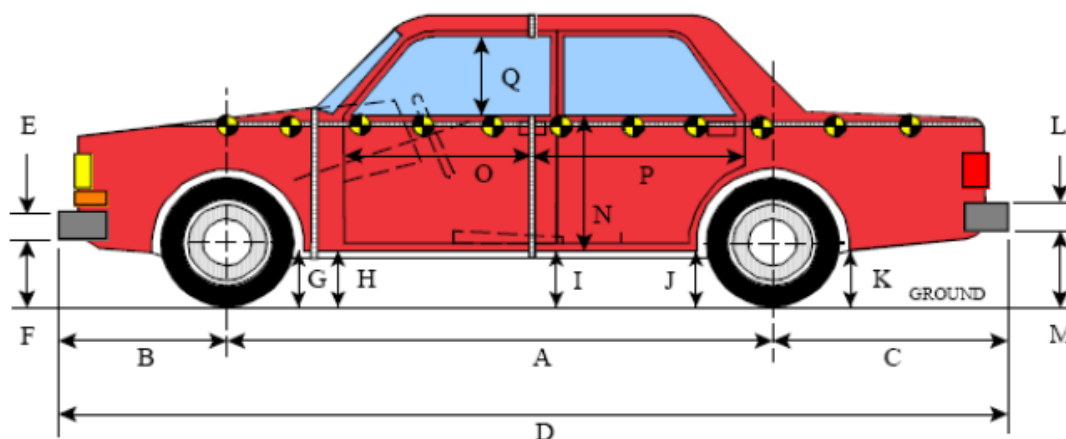
MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE

Vertical Location			From Centerline		Maximum Crush (mm)
Row	Description	Height (mm)	Distance (mm)	Direction	
A	Center of Bumper	432	800	Right	160
B	Top of Bumper	533	700	Right	131
C	Mid-Level	686	800	Right	126
D	Top of Stack	813	800	Right	160

DATA SHEET NO. 10
TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2013 Toyota Tacoma 4x2 Access Cab Pickup
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: MD5120
 Test Date: 11/9/2012



LEFT SIDE VIEW

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

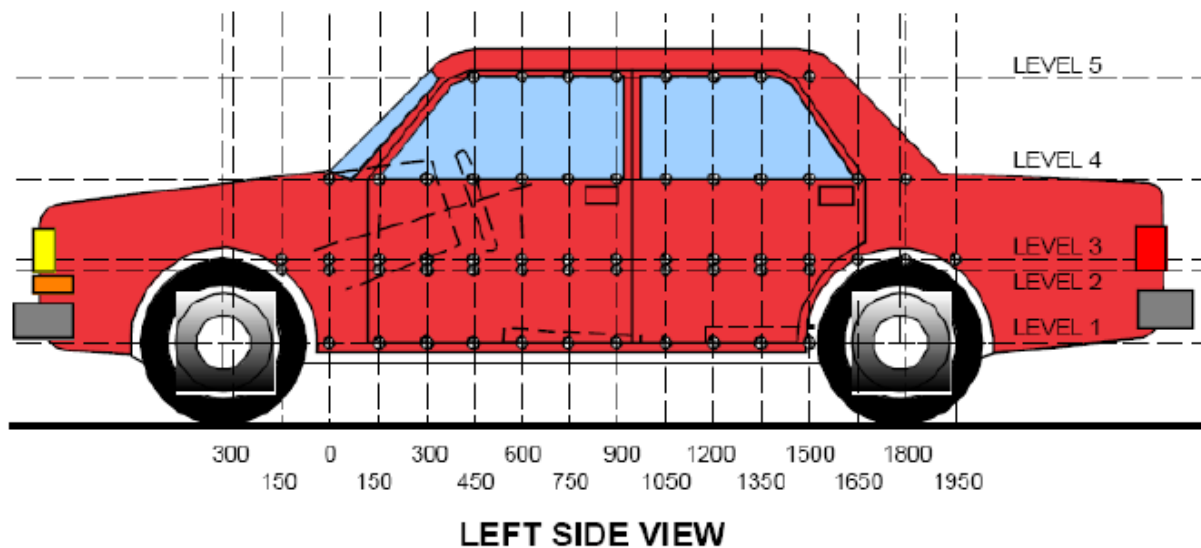
VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Description	Pre-Test	Post-Test	Difference
A	Wheelbase	3,233	3,216	-17
B	Front Axle to FSOV	848	837	-11
C	Rear Axle to RSOV	1,205	1,217	12
D	Total Length at Centerline	5,286	5,278	-8
E	Front Bumper Thickness	100	100	0
F	Front Bumper Bottom to Ground	378	391	13
G	Sill Height at Front Wheel Well	327	319	-8
H	Sill Height at Front Door Leading Edge	332	312	-20
I	Sill Height at B Pillar	333	309	-24
J1	Sill Height at Rear Wheel Well	343	331	-12
J2	Pinch Weld Height at Rear Wheel Well	230	221	-9
K	Sill Height Aft of Rear Wheel Well	355	374	19
L	Rear Bumper Thickness	217	217	0
M	Rear Bumper Bottom to Ground	372	377	5
N	Sill Height to Window Bottom of Front Window Sill	728	721	-7
O	Front Door Leading Edge to Impact CL	778	757	-21
P	Rear Door Trailing Edge to Impact CL	980	952	-28
Q	Front Window Opening	438	447	9
R	Right Side Length	5,269	5,248	-21
S	Left Side Length	5,270	5,242	-28
T	Maximum Vehicle Width	1,811	1,629	-182

DATA SHEET NO. 11
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2013 Toyota Tacoma 4x2 Access Cab Pickup
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: MD5120
 Test Date: 11/9/2012



MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Measurement Description	Units	Height Above Ground	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	mm	400	192	750
2	Driver Hip Point	mm	702	206	900
3	Mid-Door	mm	798	191	750
4	Window Sill	mm	1,056	85	1200
5	Window Top	mm	1,584	3	750

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: 2013 Toyota Tacoma 4x2 Access Cab Pickup
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: MD5120
 Test Date: 11/9/2012

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															
-750															
-600			910	784				907	793				3	-9	
-450			916	807				907	813				9	-6	
-300			918	821				902	823				16	-2	
-150		919	916	831			891	895	829			28	21	2	
0	887	915	915	838		842	876	879	832		45	39	36	6	
150	868	894	895	845		702	749	793	868		166	145	102	-23	
300	863	901	898	850		685	716	744	861		178	185	154	-11	
450	864	903	899	855		679	705	735	848		185	198	164	7	
600	866	898	901	858		675	693	721	834		191	205	180	24	
750	867	899	902	862	545	675	694	711	816	542	192	205	191	46	3
900	866	900	903	865	627	675	694	717	810	630	191	206	186	55	-3
1050	864	900	903	866	638	683	709	731	808	641	181	191	172	58	-3
1200	863	898	902	867	643	686	724	756	782	645	177	174	146	85	-2
1350	862	898	901	867	643	680	708	745	805	645	182	190	156	62	-2
1500	860	897	901	868	641	676	714	742	826	643	184	183	159	42	-2
1650	855	894	898	865	633	692	742	766	840	634	163	152	132	25	-1
1800	810	879	886	856		735	794	816	829		75	85	70	27	
1950	835	868	874	846		846	917	921	995		-11	-49	-47	-149	
2100	863	880	872	846		928	975	971	1006		-65	-95	-99	-160	
2250	875	907	899	844		995	1040	1046	1016		-120	-133	-147	-172	
2400		912	912	844			1061	1071	1017			-149	-159	-173	
2550			913	843				1077	1016				-164	-173	
2700			911	841				1081	1019				-170	-178	
2850				839					1021					-182	
3000				837					1023					-186	

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

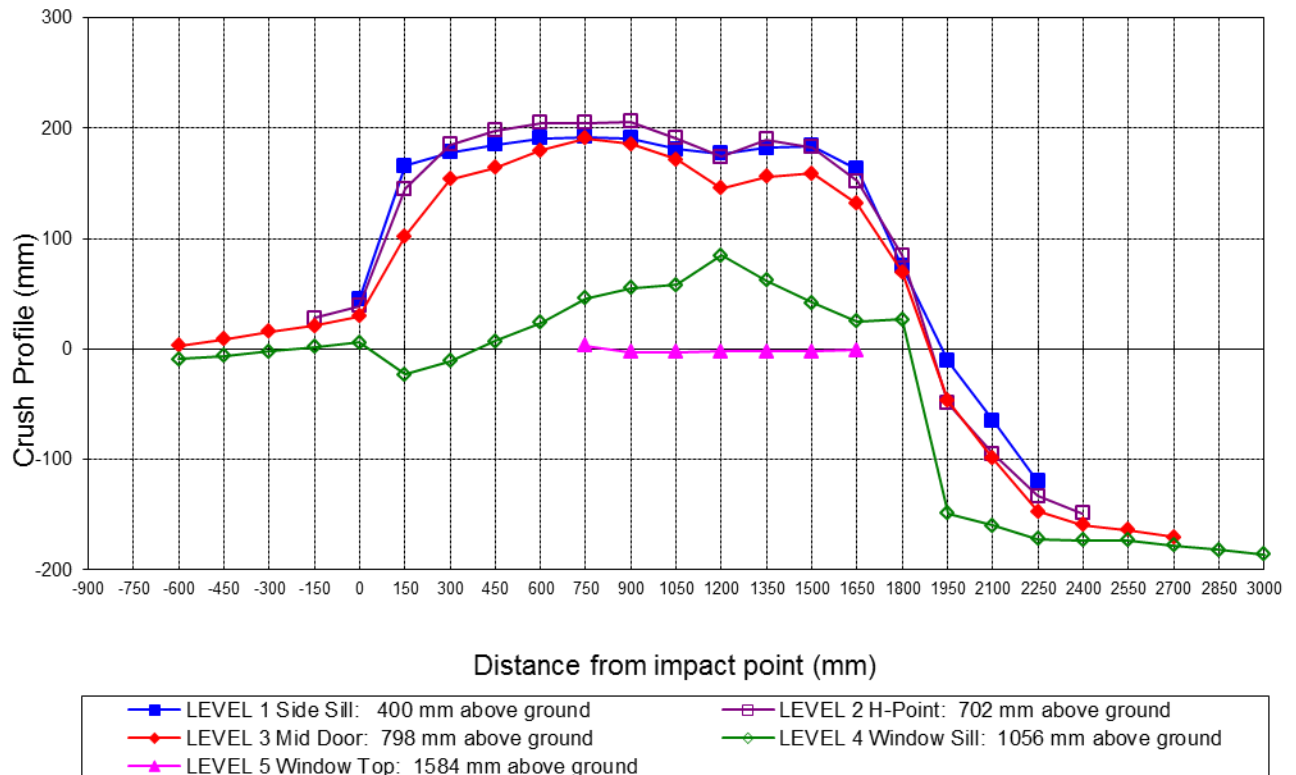
Test Vehicle: 2013 Toyota Tacoma 4x2 Access Cab
 Pickup

NHTSA No.: MD5120

Test Program: NCAP Side MDB Impact Test

Test Date: 11/9/2012

Vehicle Exterior Crush Measurements - Visual Representation



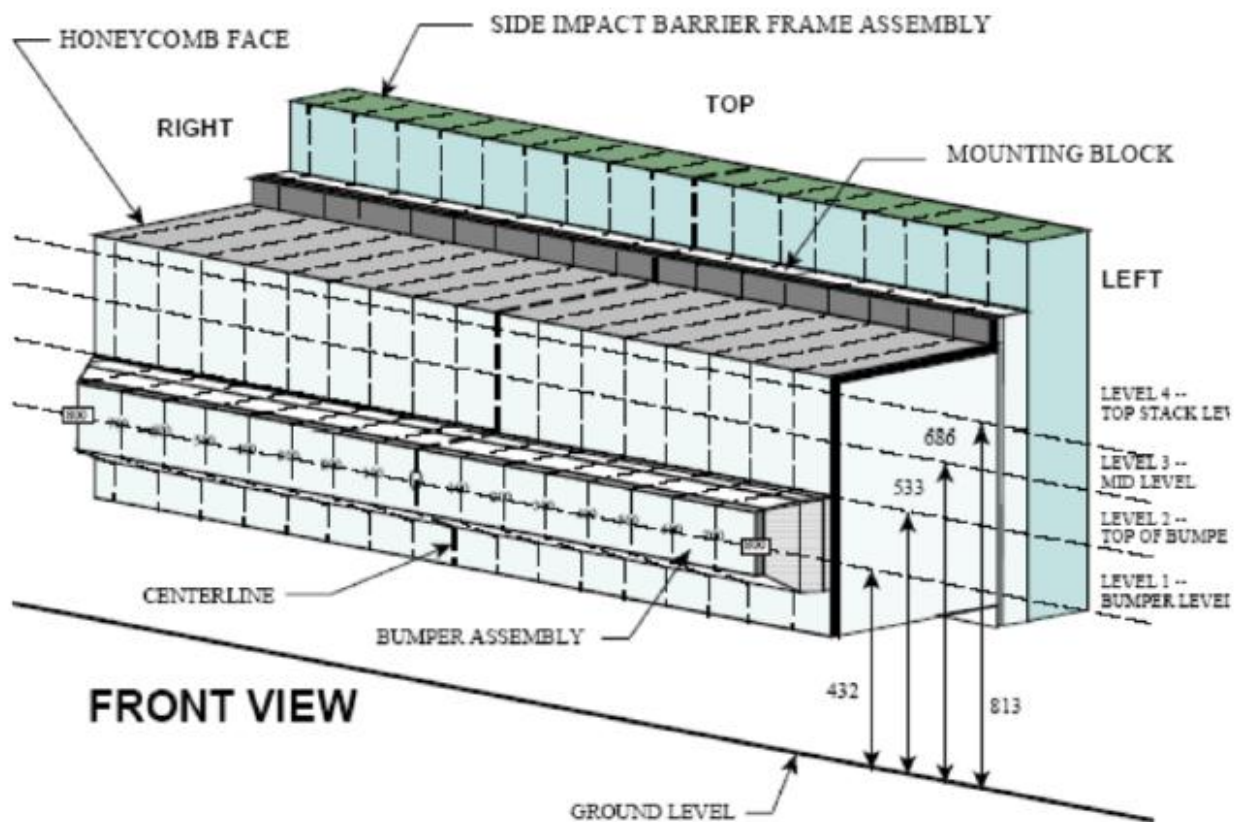
DATA SHEET NO. 12
MDB EXTERIOR STATIC CRUSH MEASUREMENTS

Test Vehicle: 2013 Toyota Tacoma Access Cab Pickup

NHTSA No.: MD5120

Test Program: NCAP Side MDB Impact Test

Test Date: 11/9/2012



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	160	131	107	103	104	109	113	107	103	101	103	105	107	109	112	121	135
2	131	105	96	93	91	92	93	89	85	84	87	91	93	95	97	100	115
3	126	82	55	36	33	30	37	28	24	25	24	25	29	37	48	61	85
4	160	118	88	74	75	82	88	70	50	48	49	53	62	78	88	118	157

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

Test Vehicle: <u>2013 Toyota Tacoma 4x2 Access Cab Pickup</u>	NHTSA No.: <u>MD5120</u>
Test Program: <u>NCAP Side MDB Impact Test</u>	Test Date: <u>11/9/2012</u>
Test Time: <u>1:26 PM</u>	Temperature: <u>6 ° C</u>

- | | |
|---|-----------------------------|
| A. From impact until vehicle motion ceases:
(Maximum allowable is 1 oz.) | 0 oz. |
| B. For the 5-minute period after motion ceases:
(Maximum allowable is 5 oz.) | 0 oz. |
| C. For the following 25 minutes:
(Maximum allowable is 1 oz./minute) | 0 oz. |
| D. Spillage Details: | <u>No Spillage Occurred</u> |

FMVSS NO. 301 STATIC ROLLOVER DATA



ROLLOVER SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	70	300	370
90° to 180°	64	300	364
180° to 270°	61	300	361
270° to 360°	68	300	368

FMVSS NO. 301 ROLLOVER SPILLAGE TABLE

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

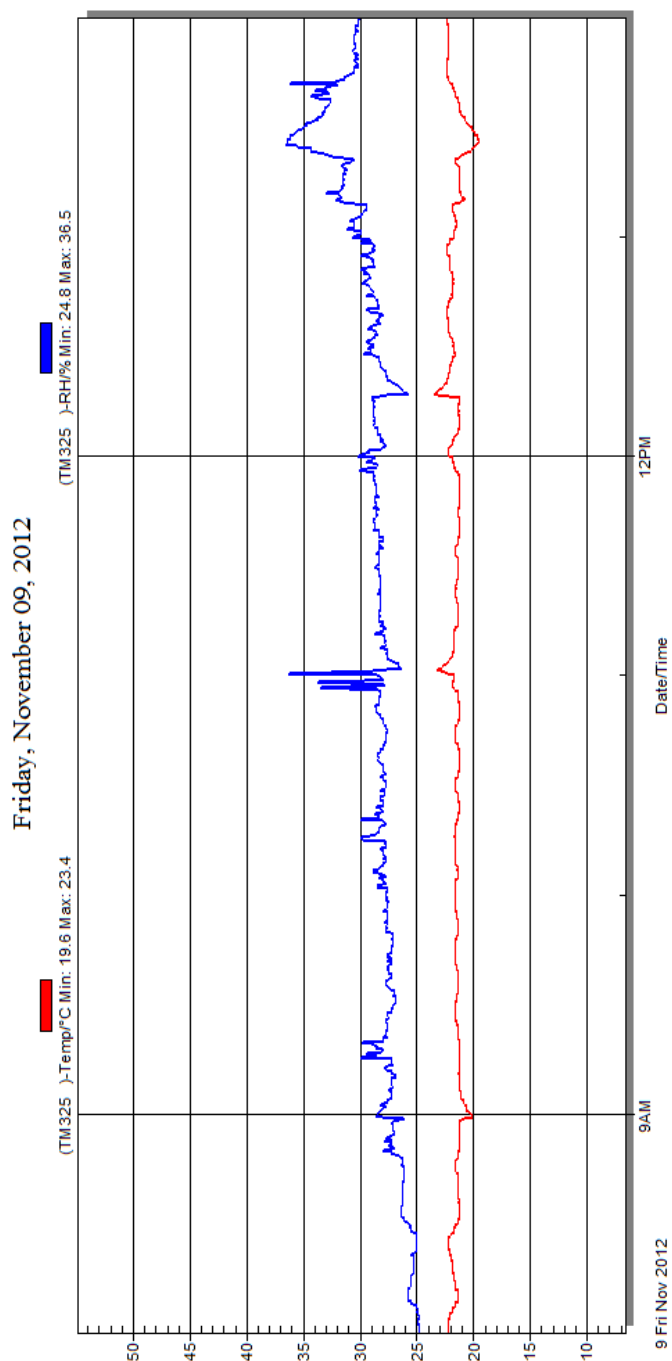
ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

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

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

Test Vehicle: 2013 Toyota Tacoma 4x2 Access Cab Pickup
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: MD5120
 Test Date: 11/9/2012



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 3/4 View of Test Vehicle



Figure A-2: As-Delivered Left Rear 3/4 View of Test Vehicle



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

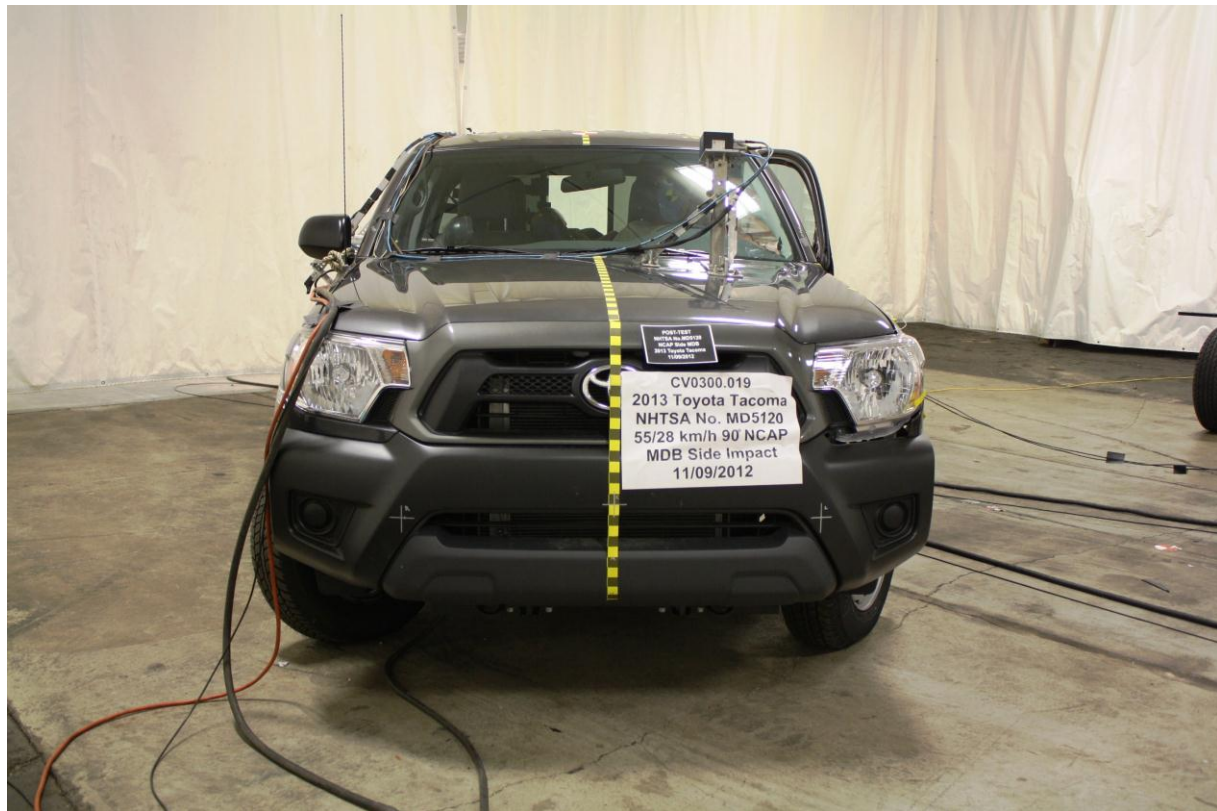


Figure A-4: Post-Test Frontal View of Test Vehicle



Figure A-5: Pre-Test Left Front $\frac{3}{4}$ View of Test Vehicle



Figure A-6: Post-Test Left Front $\frac{3}{4}$ 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

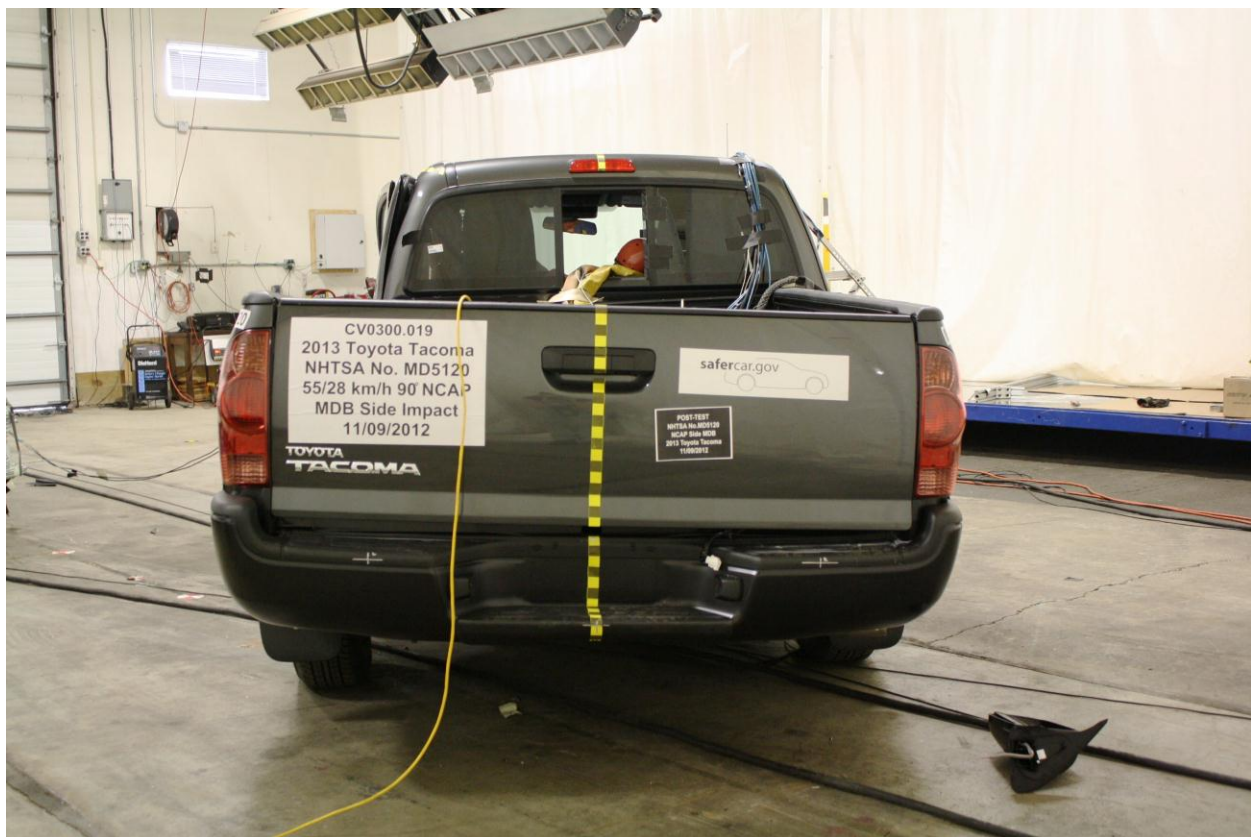


Figure A-12: Post-Test Rear Side View of Test Vehicle



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



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

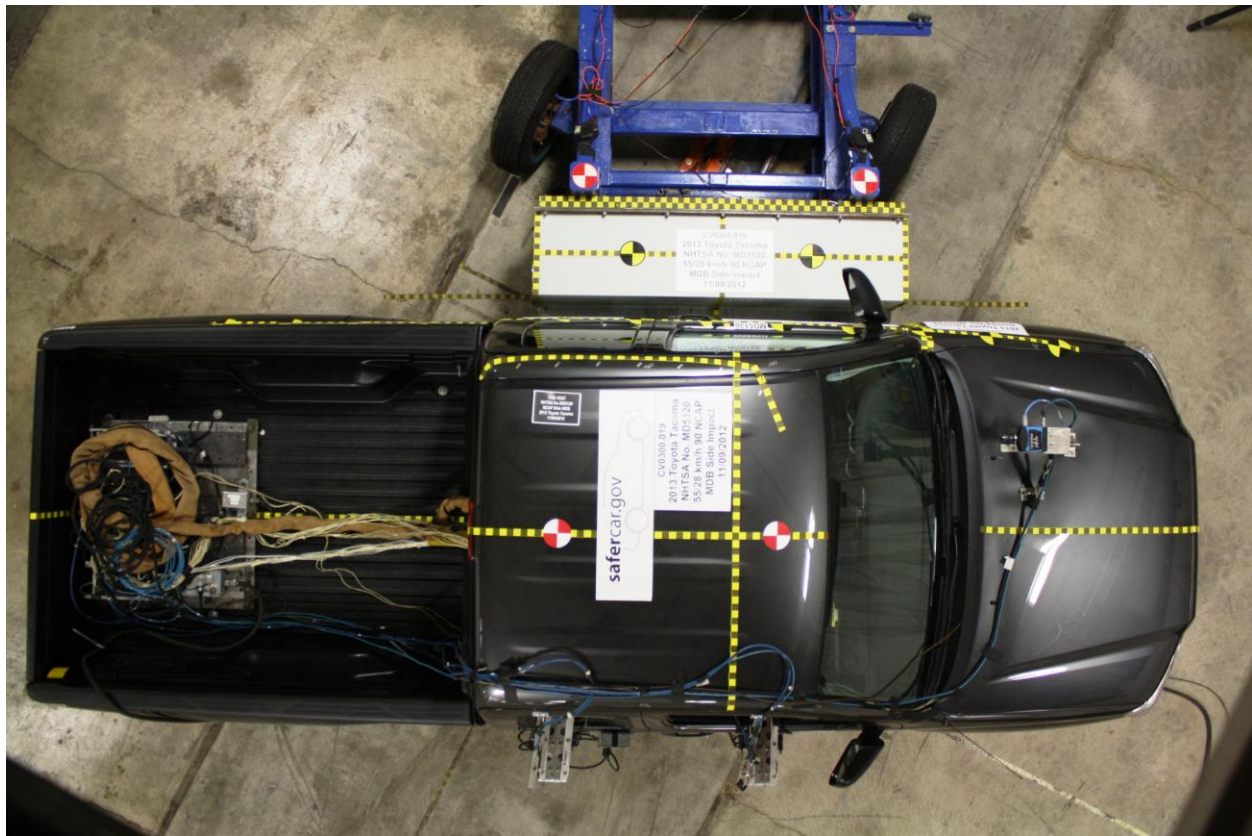


Figure A-15: Pre-Test Overhead View of the Test Area

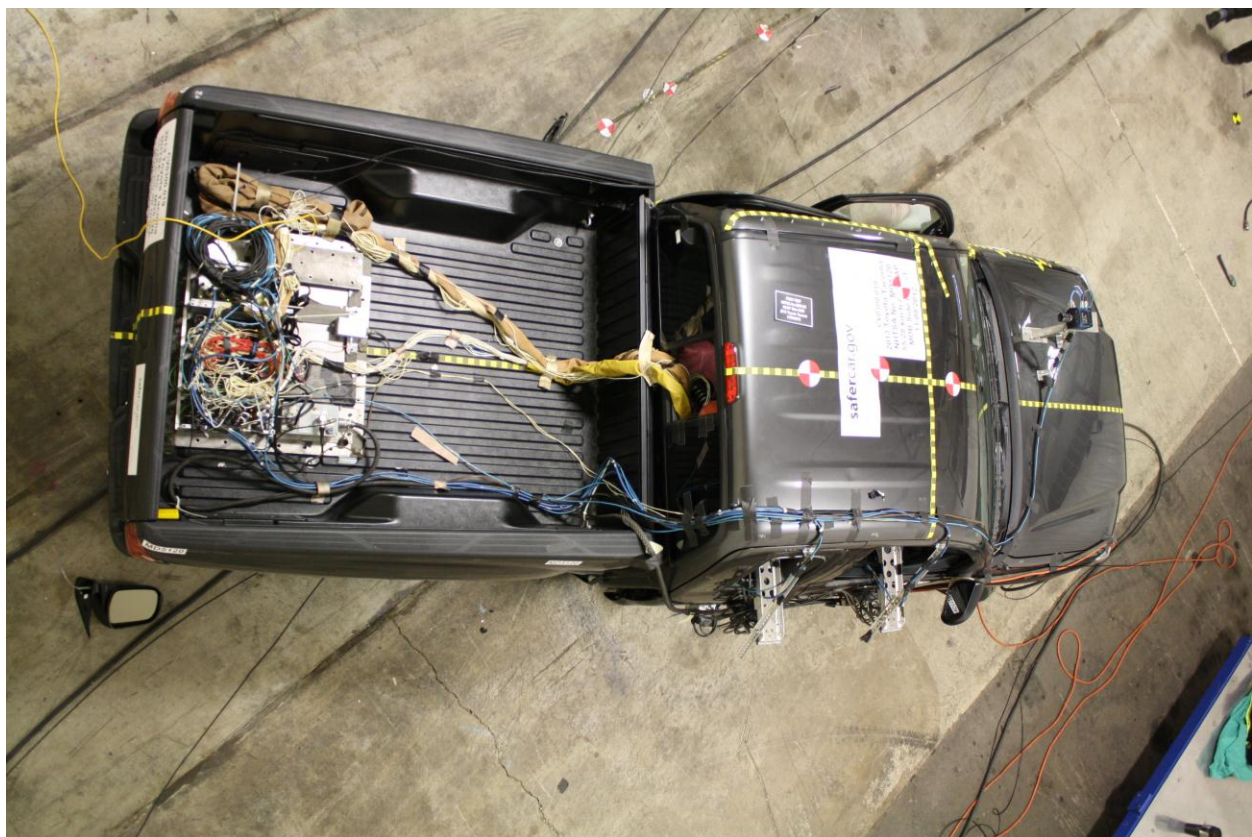


Figure A-16: Post-Test Overhead View of Test Area

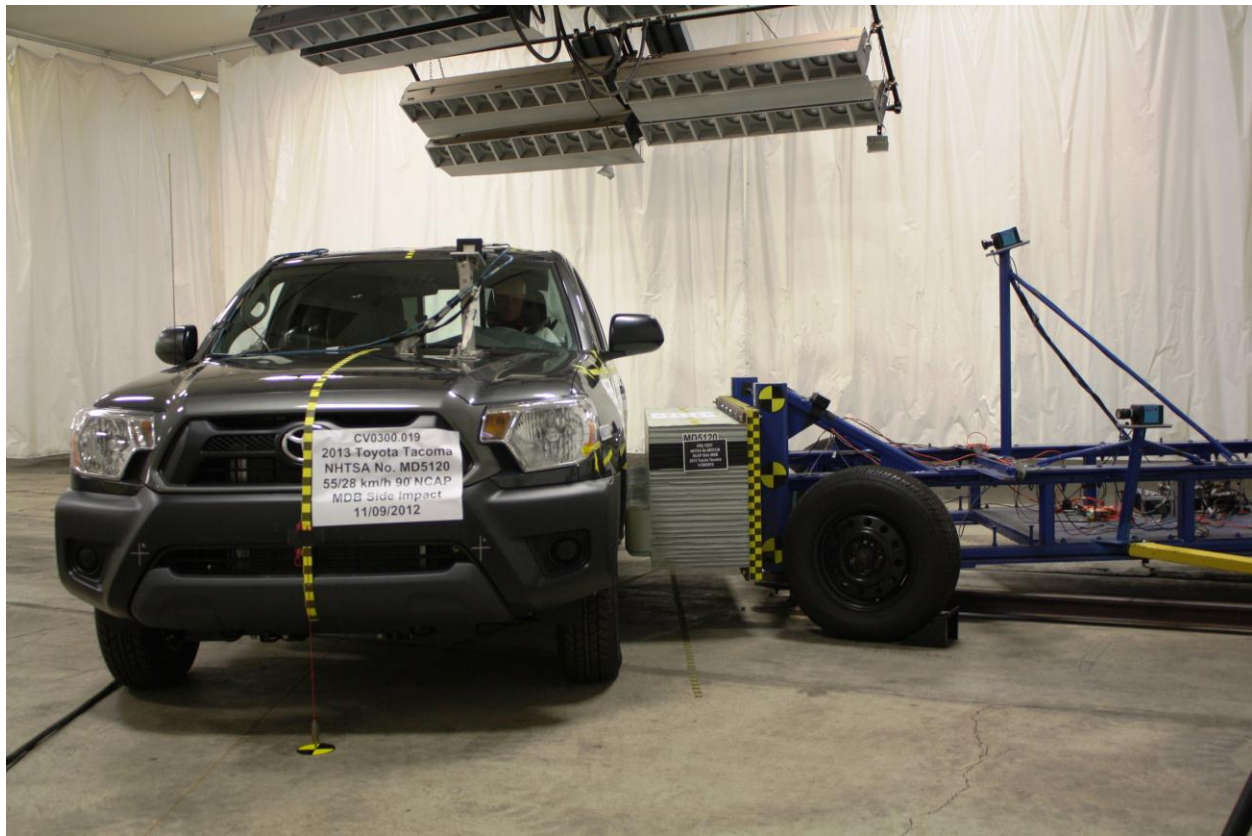


Figure A-17: Pre-Test Left Side View of MDB Positioned Against Side of Test Vehicle



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

Photo Not Applicable

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

Photo Not Applicable

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



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



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



Figure A-27: Pre-Test Left Side View of Driver Dummy Showing Belt 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

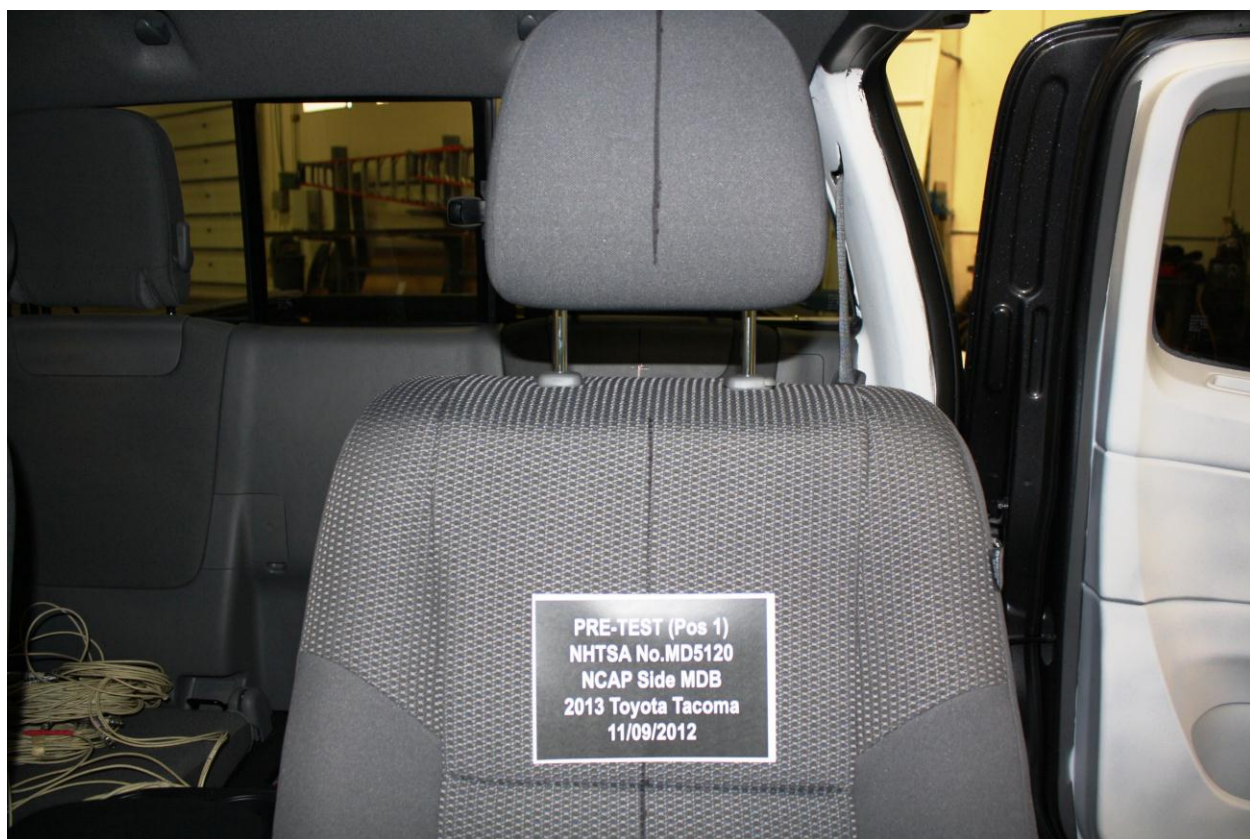


Figure A-30: Pre-Test Frontal View of Driver Seat Back Prior to Dummy Positioning



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

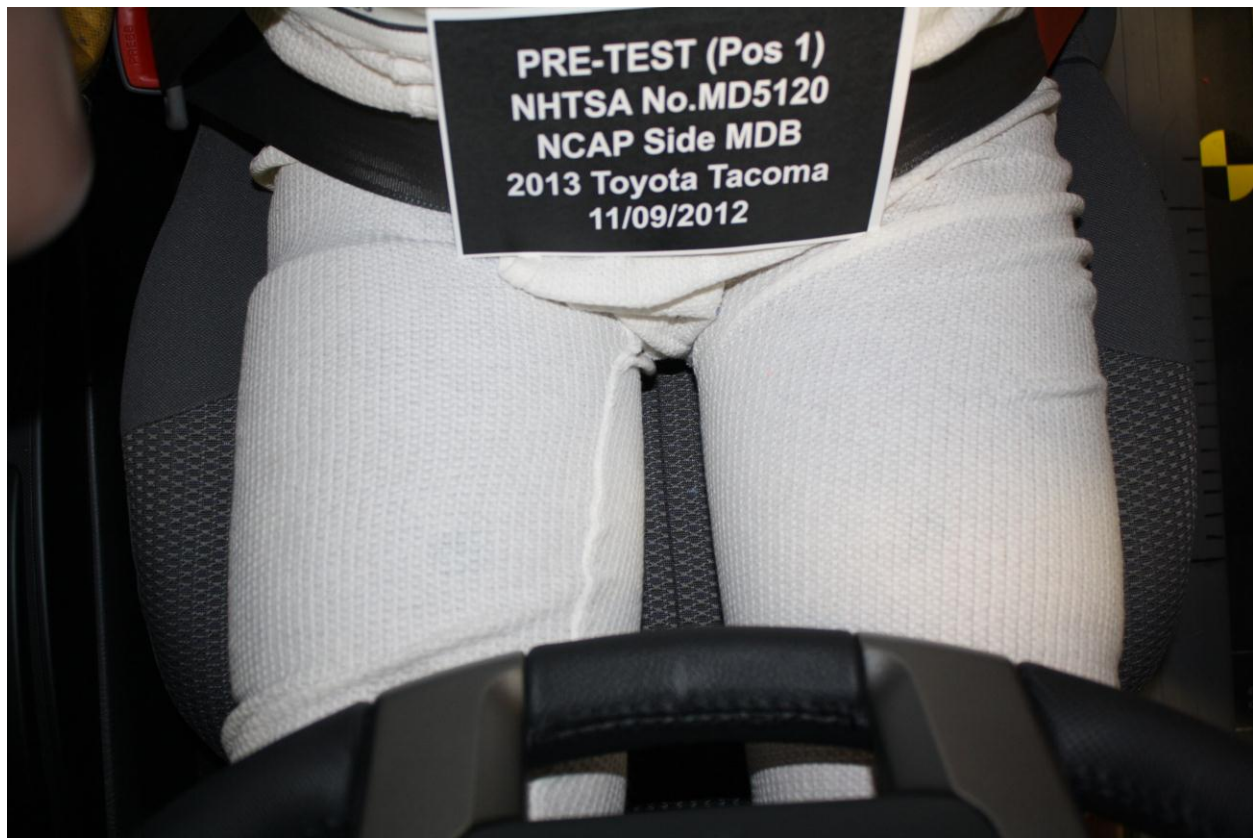


Figure A-33: Pre-Test Overhead View of Driver Dummy Thighs on Seat Pan



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



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

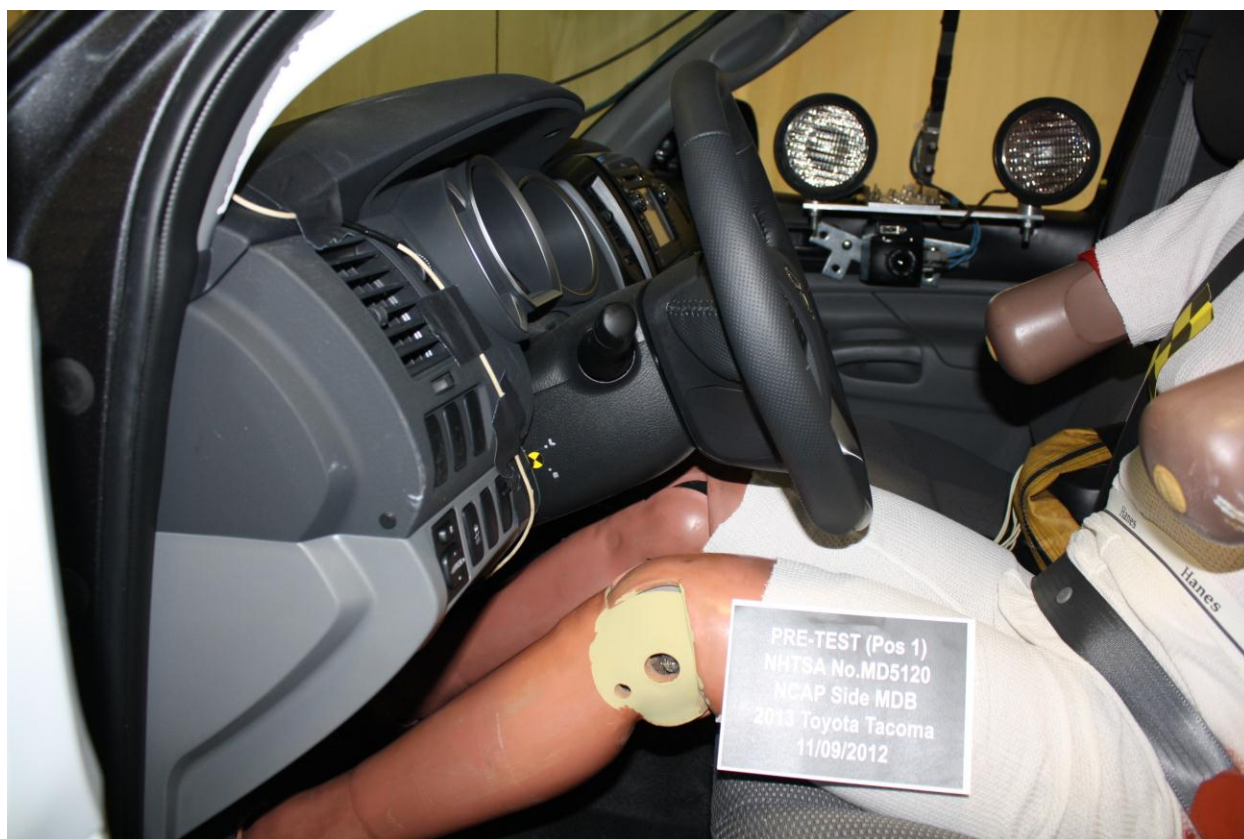


Figure A-36: Pre-Test Left Side View of Steering Wheel



Figure A-37: View of Disengaged Parking Brake



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

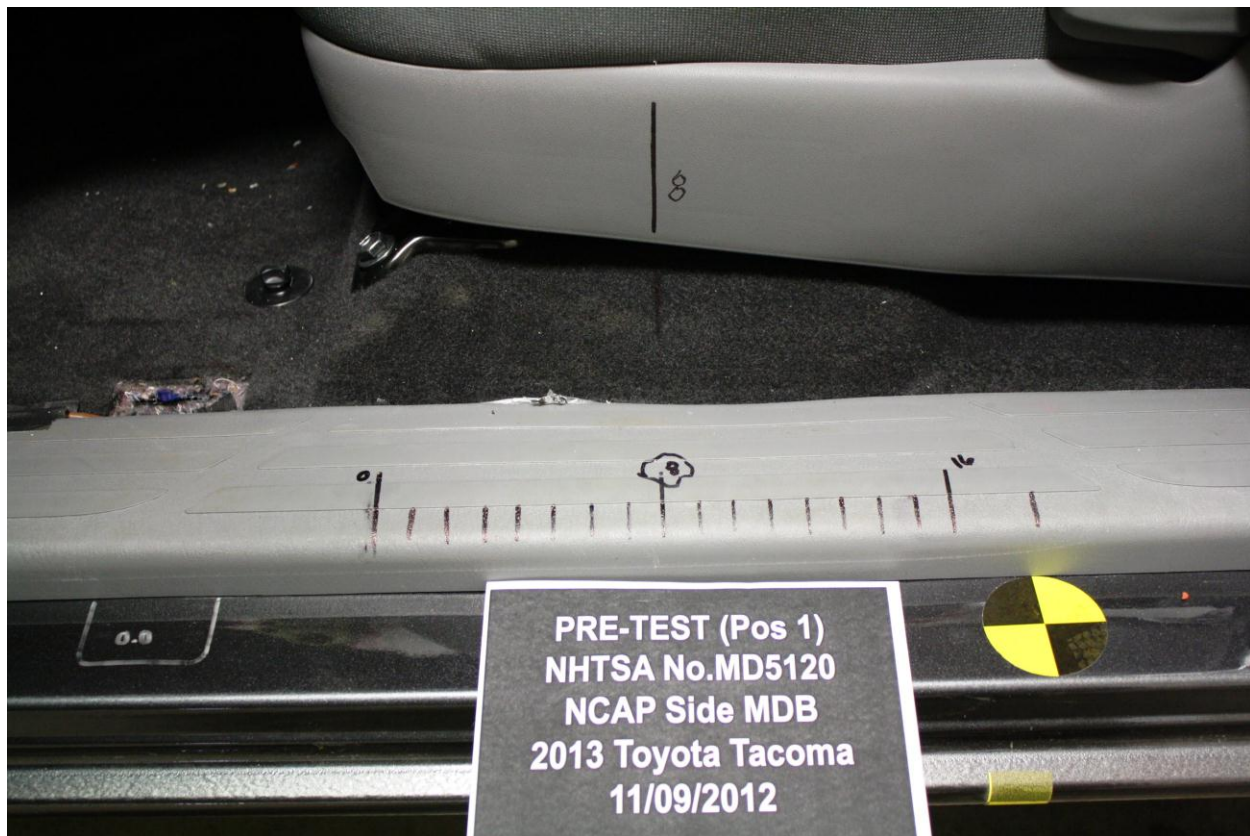


Figure A-39: Pre-test Close-Up Left Side View of Driver Seat Track



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

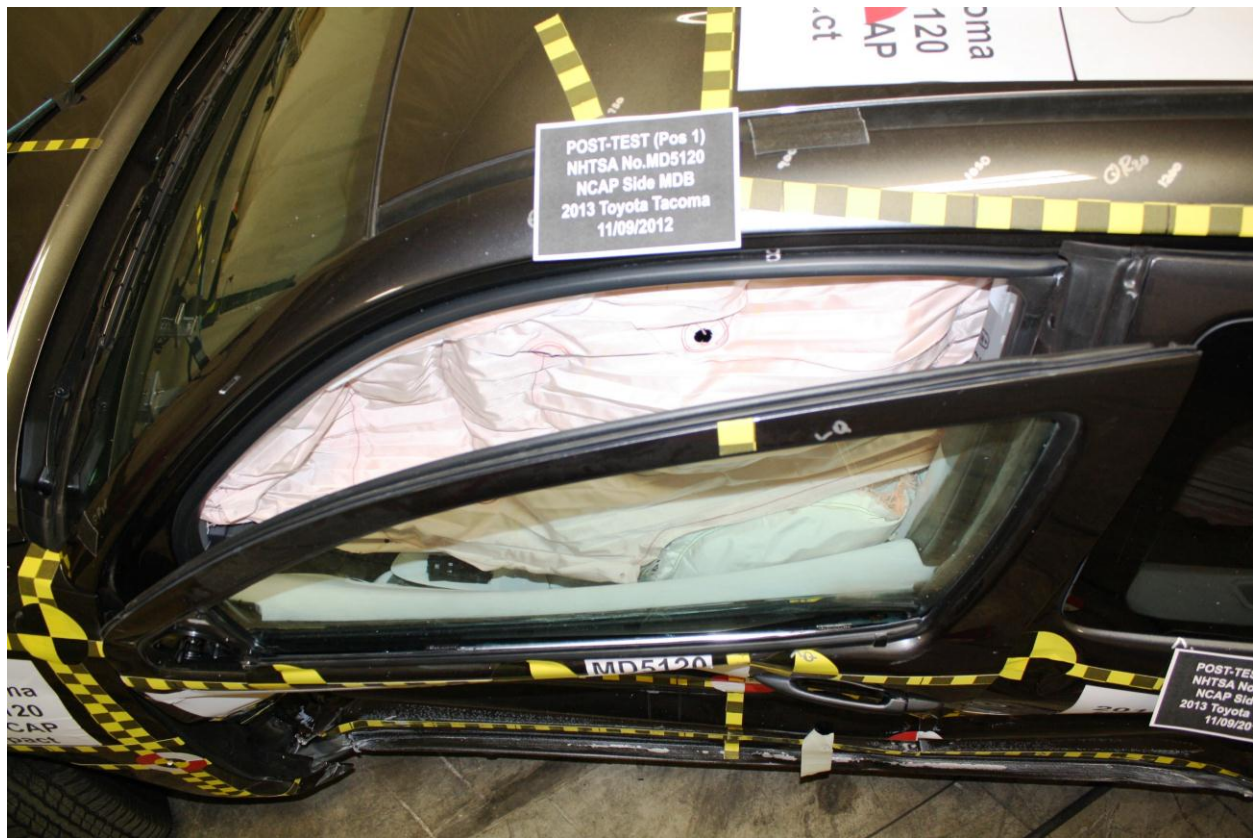


Figure A-43: Post-Test Driver Dummy and Door Clearance View



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

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



Figure A-54: Post-Test Driver Dummy Close-Up Knee Contact View



Figure A-55: Pre-Test Left Side View of Passenger Dummy Showing Belt and Chalking



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



Figure A-57: Post-Test Left Side View of Passenger Dummy Shoulder and Door Top View



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



Figure A-59: Pre-Test Frontal View of Rear Passenger Dummy Head and Shoulders in Relation to Head Restraint



Figure A-60: Pre-Test Overhead View of Rear Passenger Seat Pan Prior to Dummy Positioning



Figure A-61: Pre-Test Overhead View of Rear Passenger Dummy Thighs on Seat Pan



Figure A-62: Pre-Test View of Rear Passenger Dummy's Neck Showing Position of Adjustable Neck Bracket



Figure A-63: Pre-Test View of Rear Passenger Dummy's Head Showing Dummy's Head is Level



Figure A-64: Pre-Test Placement of Rear Passenger Dummy's Feet



Figure A-65: Pre-Test View of Belt Anchorage for Rear Passenger Dummy



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



Figure A-67: Pre-Test Close-Up Left Side View of Rear Passenger Seat Back



Figure A-68: Pre-Test Close-Up View of Rear Passenger Seat Back or Head Restraint



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



Figure A-70: Post-Test Passenger Dummy and Door Clearance View



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



Figure A-72: Post-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment



Figure A-73: Pre-Test Passenger Inner Door Panel View



Figure A-74: Post-Test Passenger Inner Door Panel View



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



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

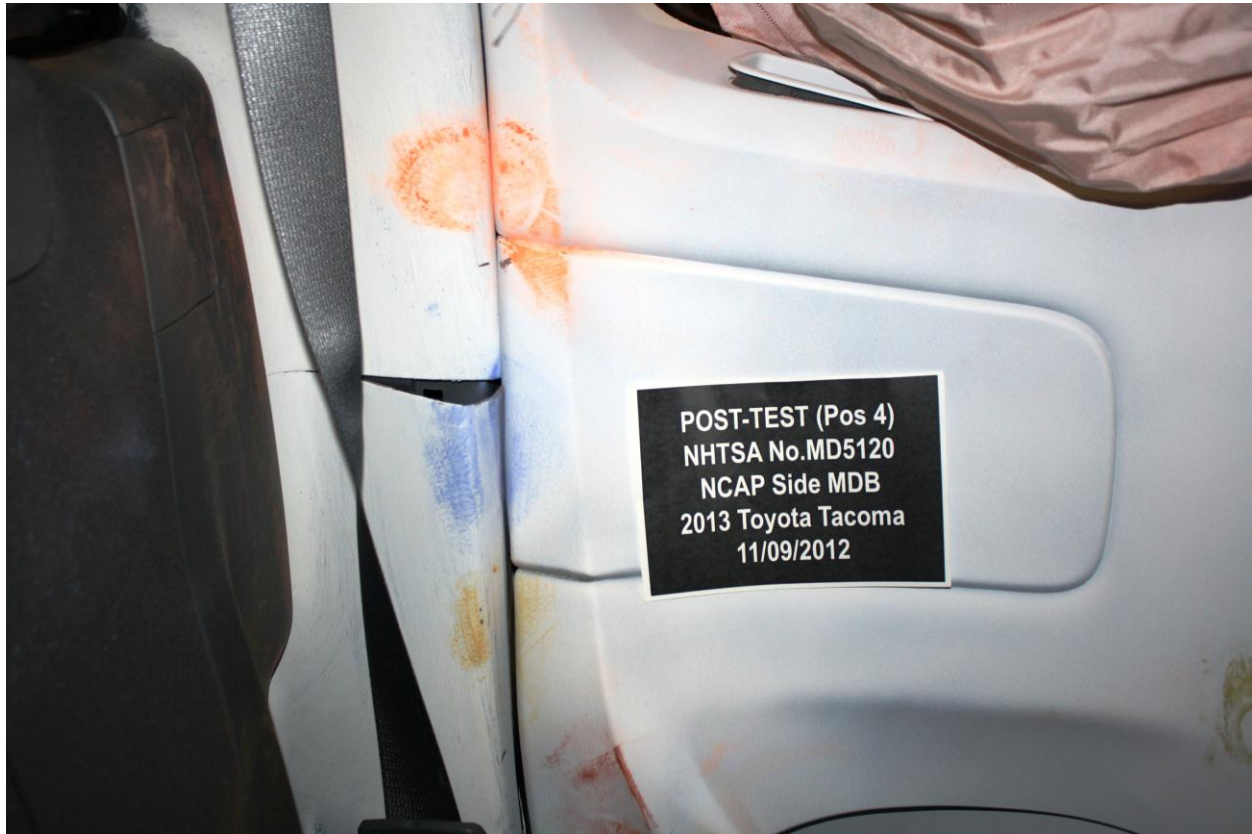


Figure A-77: Post-Test Rear Passenger Dummy Close-Up Torso Contact with Vehicle Interior View

Photo Not Applicable

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



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

Photo Not Applicable

Figure A-80: Post-Test Rear Passenger Dummy Close-Up Pelvis Contact with Side Airbag View



Figure A-81: Post-Test Rear Passenger Dummy Close-Up Knee Contact View



Figure A-82: Pre-Test View of Fuel Filler Cap or Fuel Filler Neck



Figure A-83: Post-Test View of Fuel Filler Cap or Fuel Filler Neck



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



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



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



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



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



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



Figure A-90: Pre-Test Right Side View of MDB Impactor Face



Figure A-91: Post-Test Right Side View of MDB Impactor Face



Figure A-92: Close-Up View of Vehicle's Certification Label



Figure A-93: Close-Up View of Vehicle's Tire Information Placard or Label

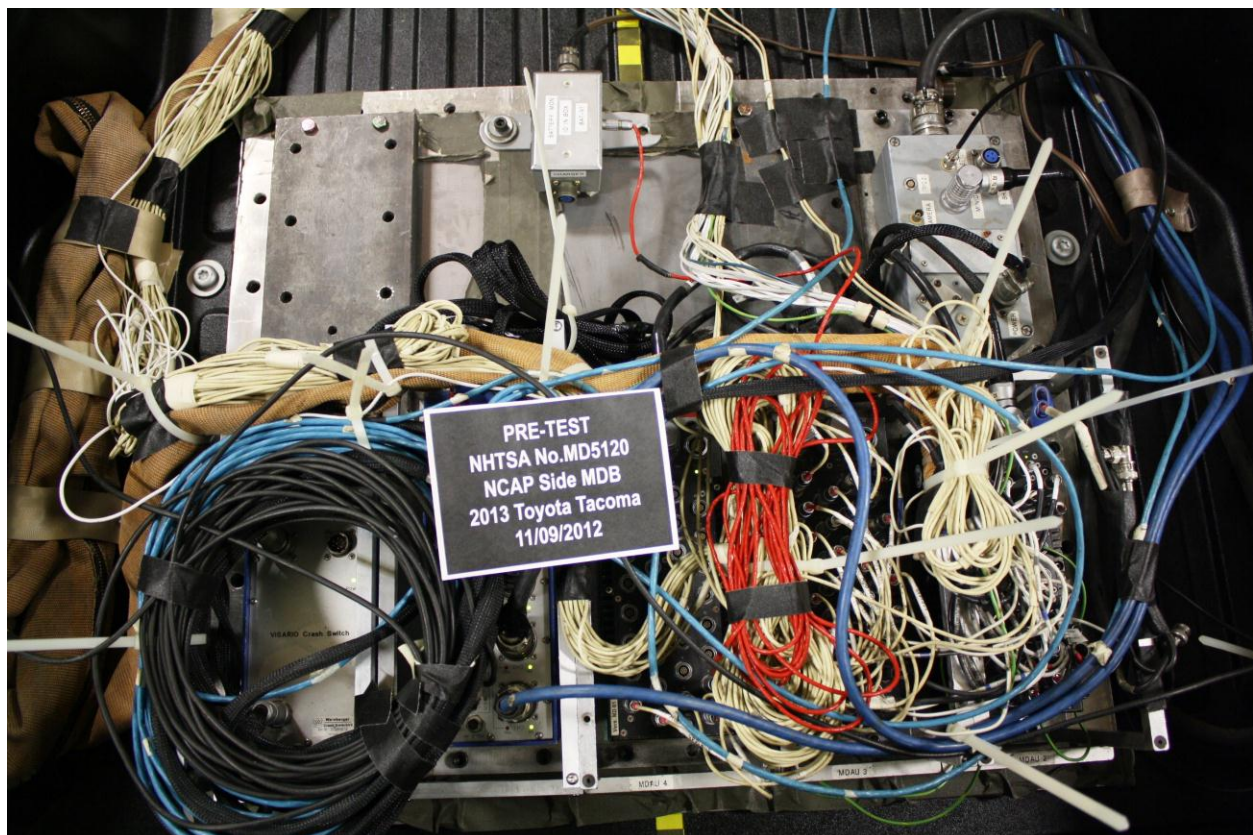


Figure A-94: Pre-Test Ballast View



Figure A-95: Post-Test Primary and Redundant Speed Trap Read-Out



Figure A-96: FMVSS No. 301 Static Rollover 0 Degrees



Figure A-97: FMVSS No. 301 Static Rollover 90 Degrees



Figure A-98: FMVSS No. 301 Static Rollover 180 Degrees



Figure A-99: FMVSS No. 301 Static Rollover 270 Degrees



Figure A-100: FMVSS No. 301 Static Rollover 360 Degrees



Figure A-101: Impact Event

TOYOTA
moving forward

DESC.: **TACOMA 4X2** ACCESS CAB
VIN: **5TFTX4CN6DX022234**
YR/MDL: 2013/114A
CLR: MAGNETIC GRAY MET./FF13 (01G3/13)
PORT/PLANT: San Antonio, TX/TMMTX RAILHEAD:

GOVERNMENT 5-STAR SAFETY RATINGS

Overall Vehicle Score	Not Rated
Based on the combined ratings of frontal, side and rollover. Should ONLY be compared to other vehicles of similar size and weight.	
Frontal Crash	Driver Passenger Not Rated
Based on the risk of injury in a frontal impact. Should ONLY be compared to other vehicles of similar size and weight.	
Side Crash	Front seat Not Rated
Based on the risk of injury in a side impact.	Rear seat Not Rated
Rollover	★★★★
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 1-888-327-4236

STANDARD EQUIPMENT

MECHANICAL & PERFORMANCE

- 2.7L D4CH 18V 4Cyl VVT-i 158HP Engine
- 4-Speed ECT-i Automatic Transmission
- Automatic Limited-Slip Differential
- Coil-Spring Double Wishbone Front Susp
- Rear Leaf Spring Susp with Staggered
- Outboard-Mounted Gas Shock Absorbers
- Front Stabilizer Bar
- Var-Assist Power Rack-&Pinion Steering
- Power-Assisted Fr Disc/Rr Drum Brakes
- 15" Steel Wheel, P185/70R15 Tires

SAFETY & CONVENIENCE

- Star Safety System, includes Vehicle Stability Control, Traction Control, Anti-lock Brake System (ABS), Electronic Brake Force Distribution, Brake Assist, & Smart Stop Technology (SST)
- Daytime Running Lights (DRL)
- Dr & Fr Pass Advanced Airbag System
- Seat-Mounted Side & Side Curtain Airbags
- 3-Point Seatbelts for All Seating Positions, Driver-Side ELR & ALJ/ELR on All Pass Str, Dr & Fr Pass Active Headrest
- Side-impact Door Beams
- Tire Pressure Monitor System (TPMS)

EXTERIOR

- Black Grille Insert, Bk Door Handles, Mirrors, Front/Rear Bumpers
- SMC Inner Bed w/Steel Outer Panels, Storage, Rail Caps & Removable Tiegate
- Deck Rail System w/4 Adj Tie-Down Cleats
- Rear Mudguards

INTERIOR

- Air Conditioning
- Power Windows & Door Locks
- Cloth Buckle Fr Seats w/ Pass Fold-Flat
- 6.1" Touch-Screen, AM/FM CD, 6 Spkr, BT USB, Aux Jack, Hands-Free Phone Capable
- Tilt/Telescoping Steering Wheel
- 2-Speed Windshield Wipers
- Dual 12V Aux Power Outlets
- LED-Illuminated Gauges & Digital Clock
- Three Front Cup Holders
- ***Full Tank of Gas***

MANUFACTURER'S SUGGESTED RETAIL PRICE \$21,215.00

OPTIONAL EQUIPMENT

FE	CP	20.	
50 State Emissions			
Convenience Package:			1,005.00
Power Mirrors, Remote Keyless Entry System, Cruise Control, Sliding Rear Window w/ Privacy Glass, Steering Wheel with Audio Controls			
All Weather Mats			100.00

EPA DOT Fuel Economy and Environment

Fuel Economy

21 MPG
combined city/hwy
4.8 gallons per 100 miles

Small Trucks range from 18 to 23 MPG. The best vehicle rates 112 MPG.

You spend \$1,150 more in fuel costs over 5 years compared to the average new vehicle.

Annual fuel Cost \$2,550

Fuel Economy & Greenhouse Gas Rating (better only)

5

Smog Rating (better only)

5

Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 23 MPG and costs \$11,400 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at \$3.56 per gallon. MPG is miles per gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.

fuel economy.gov
Calculate personalized estimates and compare vehicles

Gasoline Vehicle

DELIVERY PROCESSING AND HANDLING FEE 845.00

TOTAL \$23,165.00

The New Vehicle Limited Warranty provides 3-year/50,000 mile basic coverage, 5-year/100,000 mile powertrain coverage, plus 24-hour roadside assistance coverage. See Warranty and Maintenance Guide for details. An extended service contract may be available for the vehicle. Dealer dealer or details.

Manufacturer's suggested retail price includes manufacturer's recommended pre-delivery service. Gasoline, license and title fees, applicable taxes, state and local taxes and dealer and distributor installed options and accessories are not included in the manufacturer's suggested retail price.

Toyota Care, which covers normal factory scheduled maintenance for two years or 25,000 miles, whichever occurs first, is included as part of the sales price of the vehicle for qualifying buyers. See participating dealer for eligibility and coverage details.

Dealer Name / Address: 04077
FOLSOM LAKE TOYOTA
12747 FOLSOM BLVD.
FOLSOM CA 95630

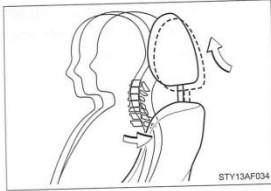
Ship to:

Get more info on this Toyota. Just snap and text this tag.

scan me Text 272005

Barcode

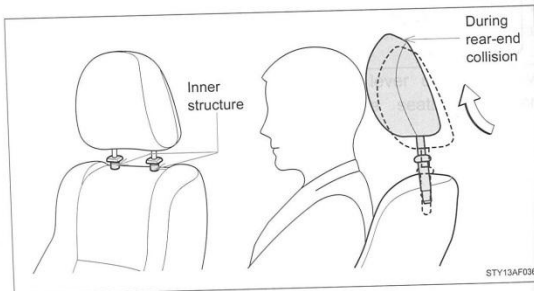
Figure A-102: Monroney Label

Active head restraints (Access Cab and Double Cab models only)

When the occupant's back presses against the seatback during a rear-end collision, the head restraint moves slightly forward to help reduce the risk of whiplash on the seat occupant.

Active head restraints

Even small forces applied to the seatback may cause the head restraint to move. Pushing up a locked head restraint forcibly may show the head restraint inner structure. These do not indicate problems.

**Waterproof and water-repellent seats (if equipped)**

Waterproof and water-repellent seats are installed in your vehicle; however,

CAUTION**Seat adjustment**

- Be careful that the seat does not hit passengers or luggage.
- Do not recline the seat more than necessary when the vehicle is in motion to reduce the risk of sliding under the lap belt. If the seat is too reclined, the lap belt may slide past the hips and apply restraint forces directly to the abdomen or your neck may contact the shoulder belt, increasing the risk of death or serious injury in the event of an accident.
- After adjusting the seat, make sure that the seat is locked in position.

After returning the seatback to the upright position

Observe the following precautions. Failure to do so may result in death or serious injury.

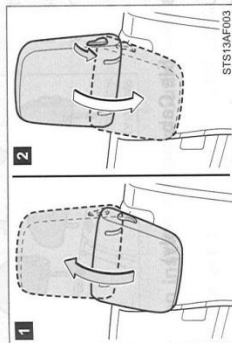
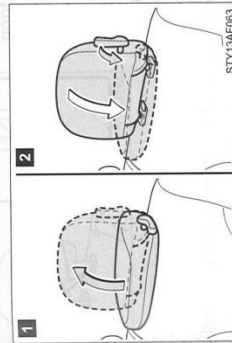
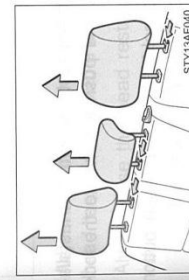
- Make sure the seatback is securely locked.
- Check that the seat belts are not twisted or caught in the seatback.
- Arrange the seat belts in the proper positions for ready use.

Caution while driving

- Vehicles with seatback table: Do not sit on or place anything on the folded seatback.
- Access Cab models only: Do not rest your foot on the press pedal behind the passenger seat.

1
Before driving

Figure A-103: Driver Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

1
Before driving**When using the rear head restraints****Access Cab models****Double Cab models****Removing the front head restraints****Bench type seat**

Pull the head restraint up while pushing the lock release button.

57

Figure A-104: 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

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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
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9	Driver Anterior Abdominal Force (Y) vs. Time	B-9
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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

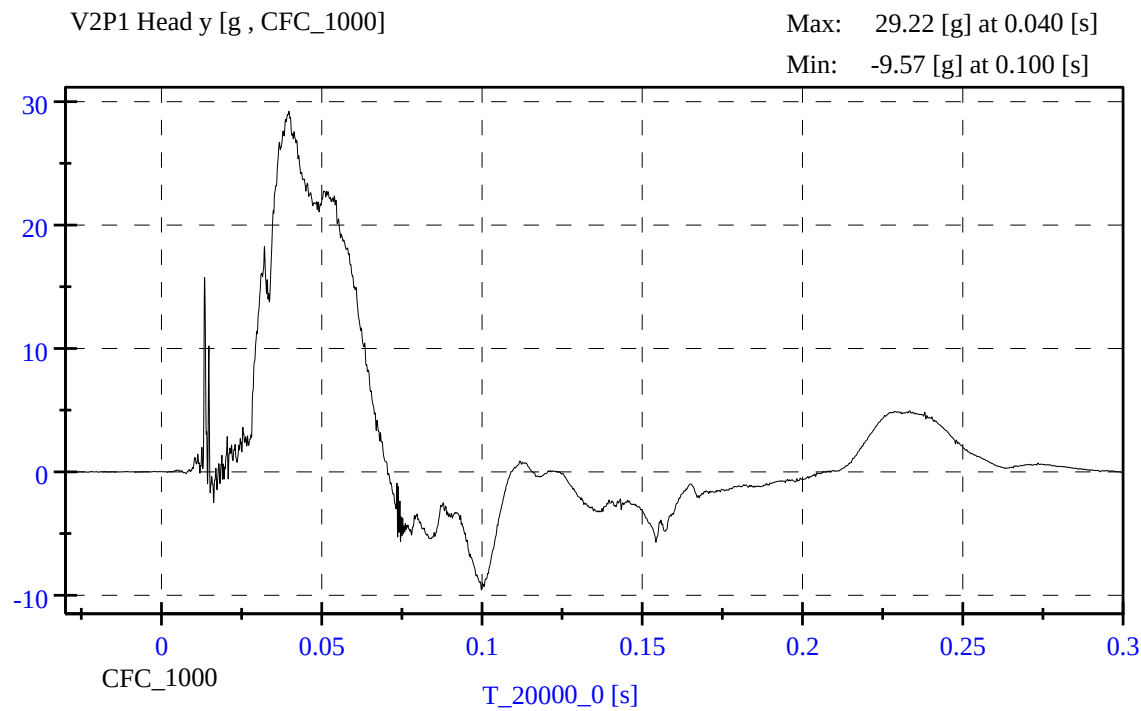
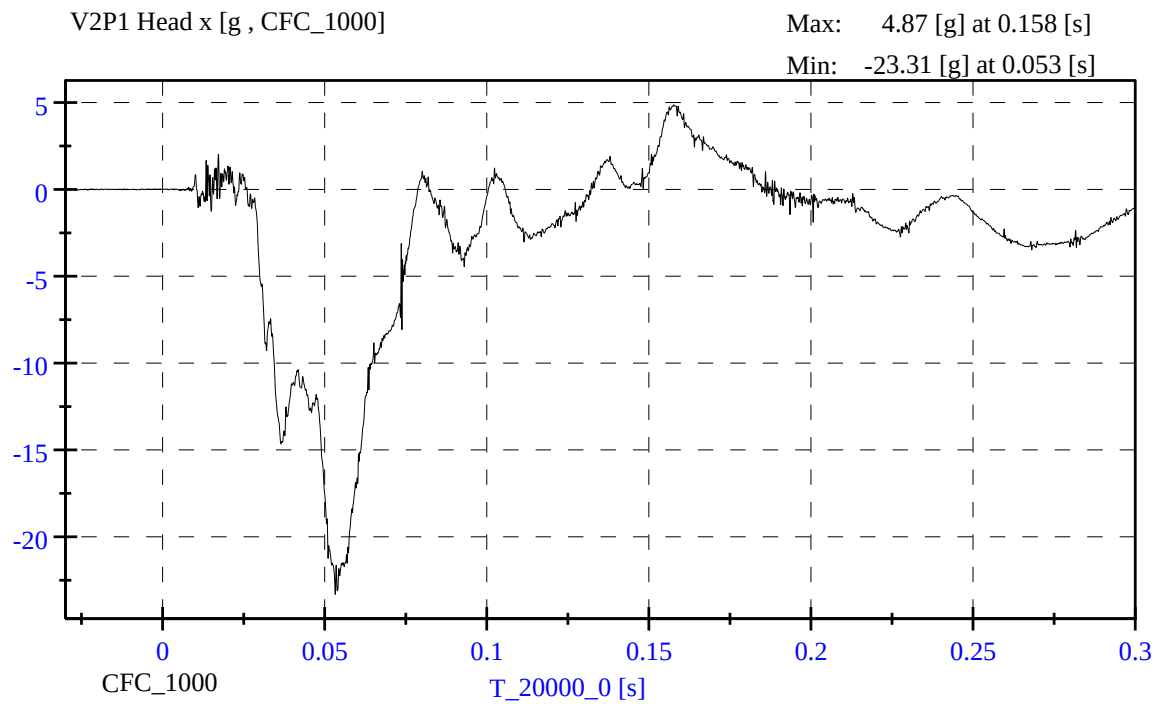
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Driver Lower Spine T12 Acceleration (Y)
Driver Lower Spine T12 Acceleration (Z)
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Passenger Middle Thorax Rib Deflection (Y)
Passenger Lower Thorax Rib Deflection (Y)
Passenger Upper Abdomen Rib Deflection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

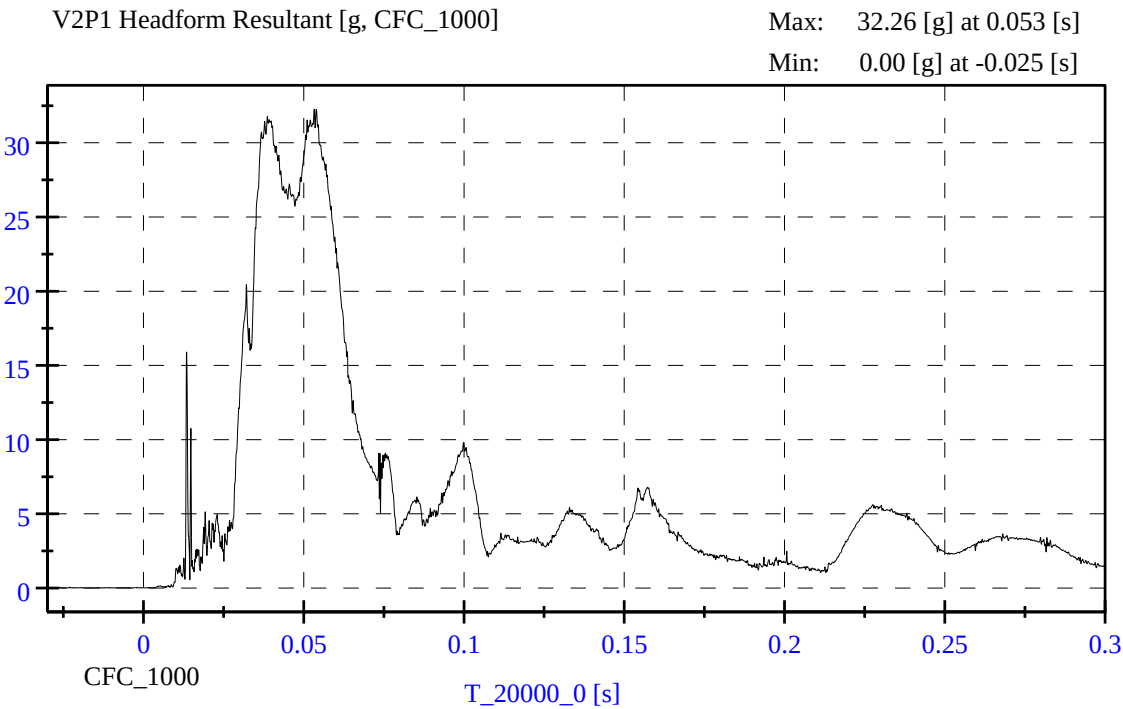
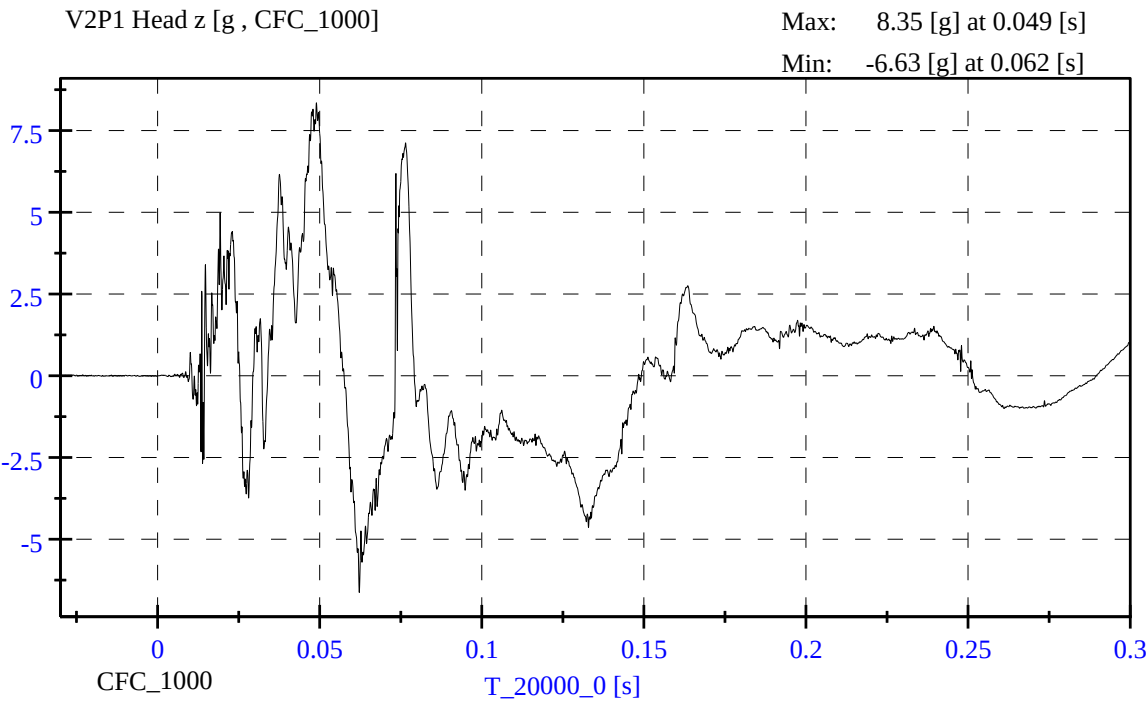
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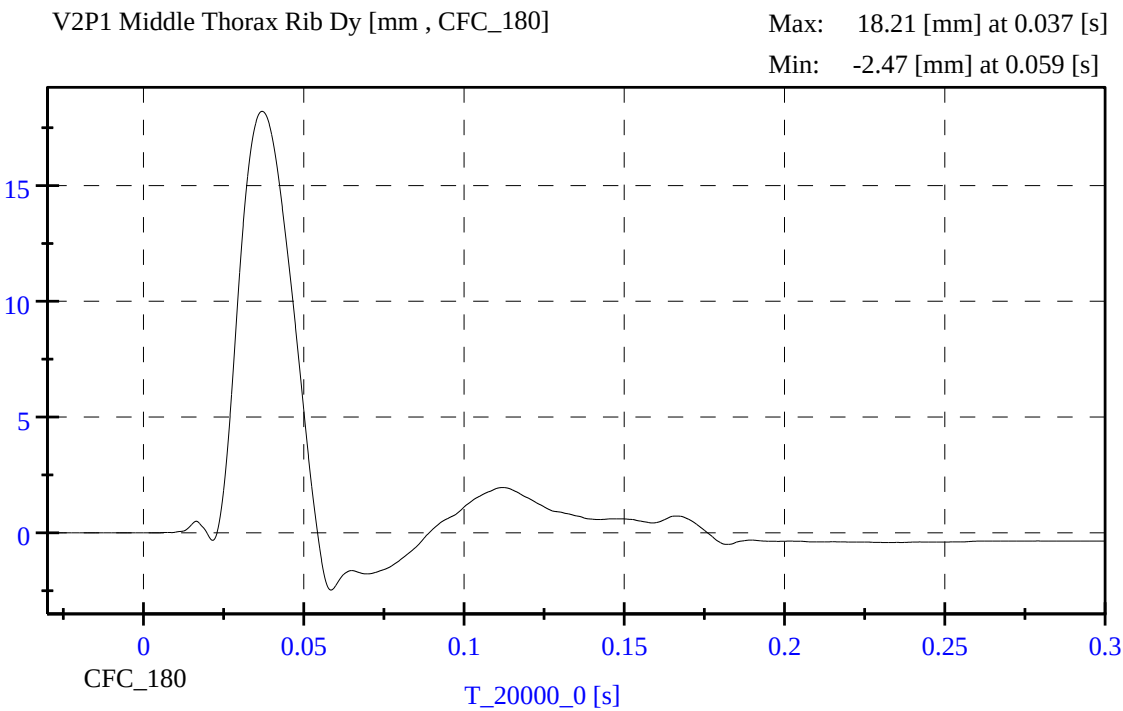
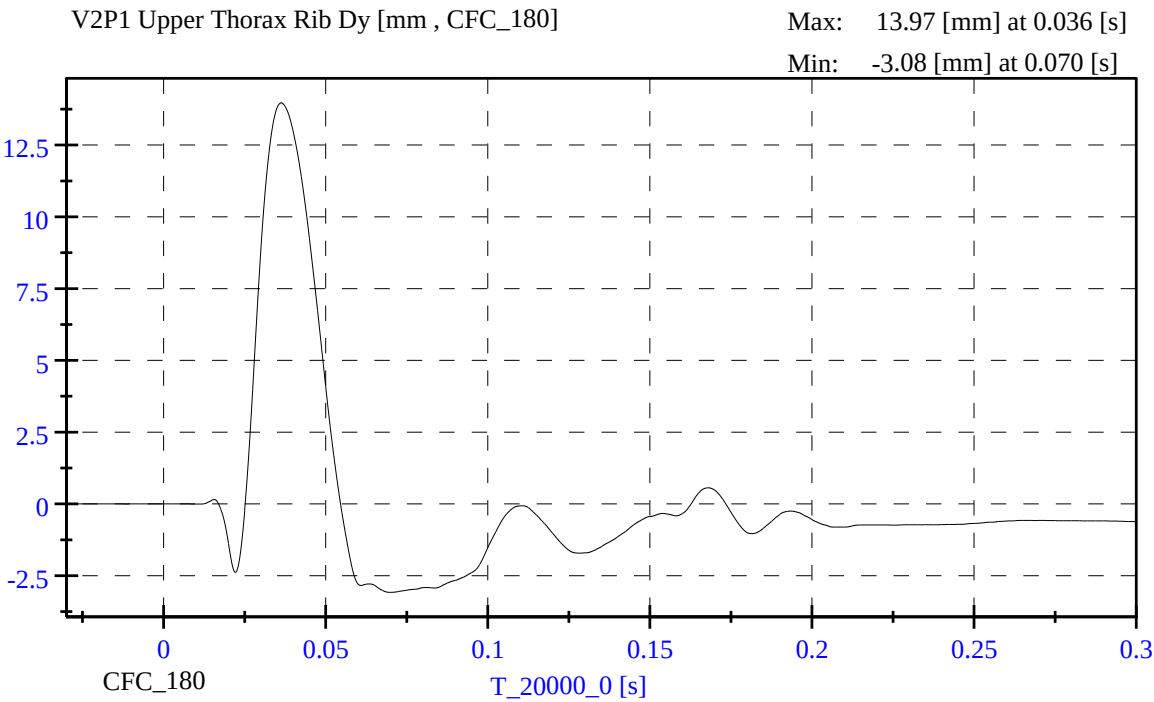
Vehicle Center of Gravity Acceleration (X)
Vehicle Center of Gravity Acceleration (Y)
Vehicle Center of Gravity Acceleration (Z)
Right Side Sill at Front Seat Acceleration (X)
Right Side Sill at Front Seat Acceleration (Y)
Right Side Sill at Front Seat Acceleration (Z)
Right Side Sill at Rear Seat Acceleration (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)

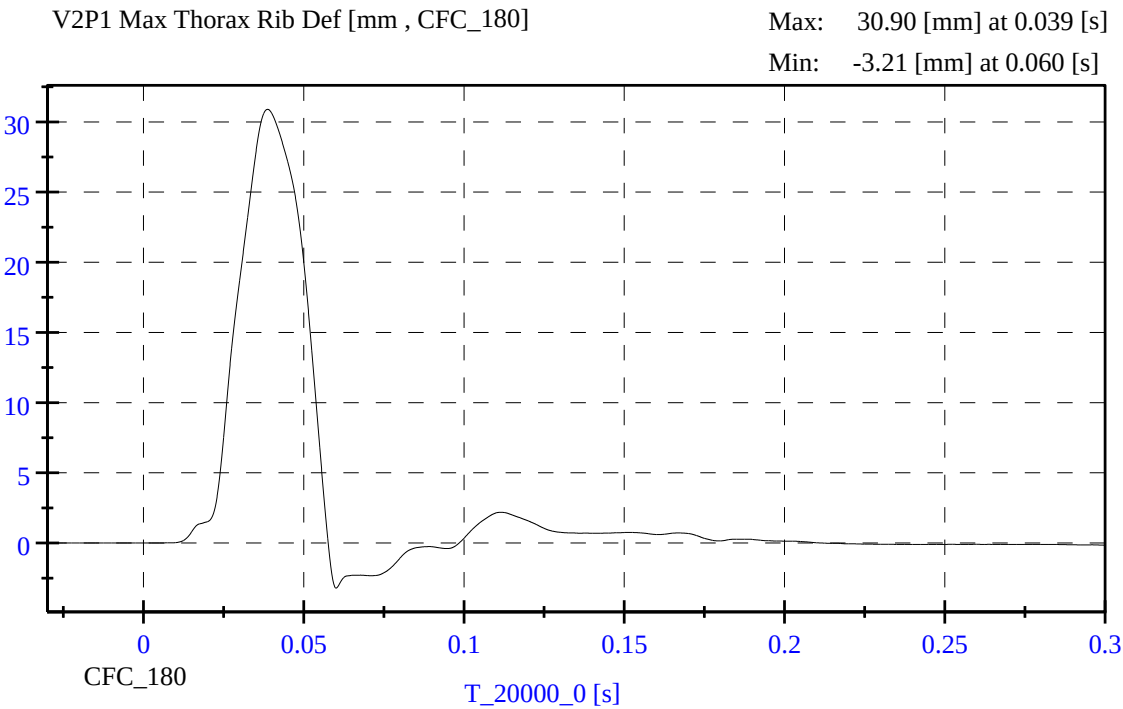
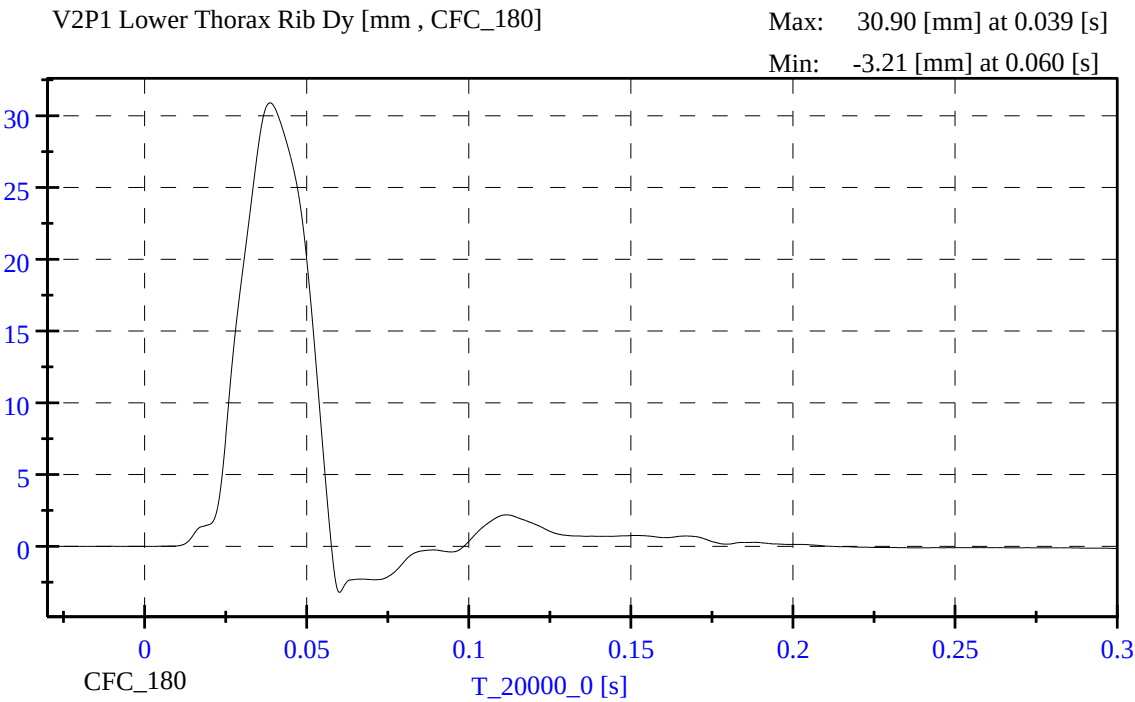
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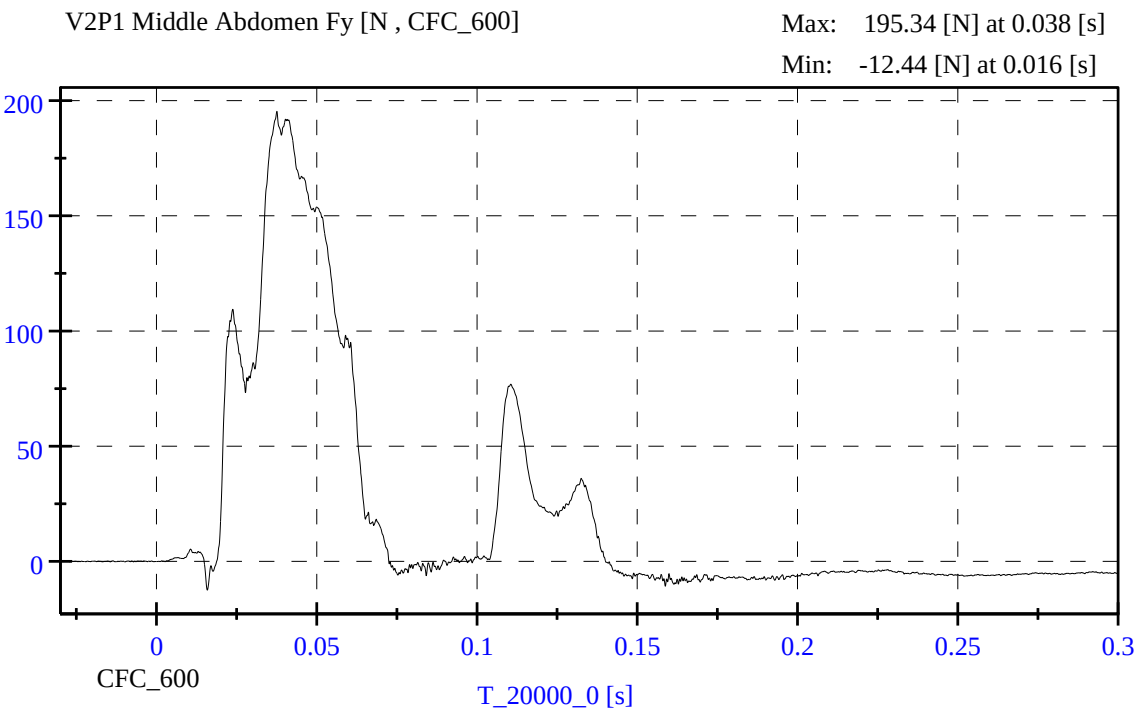
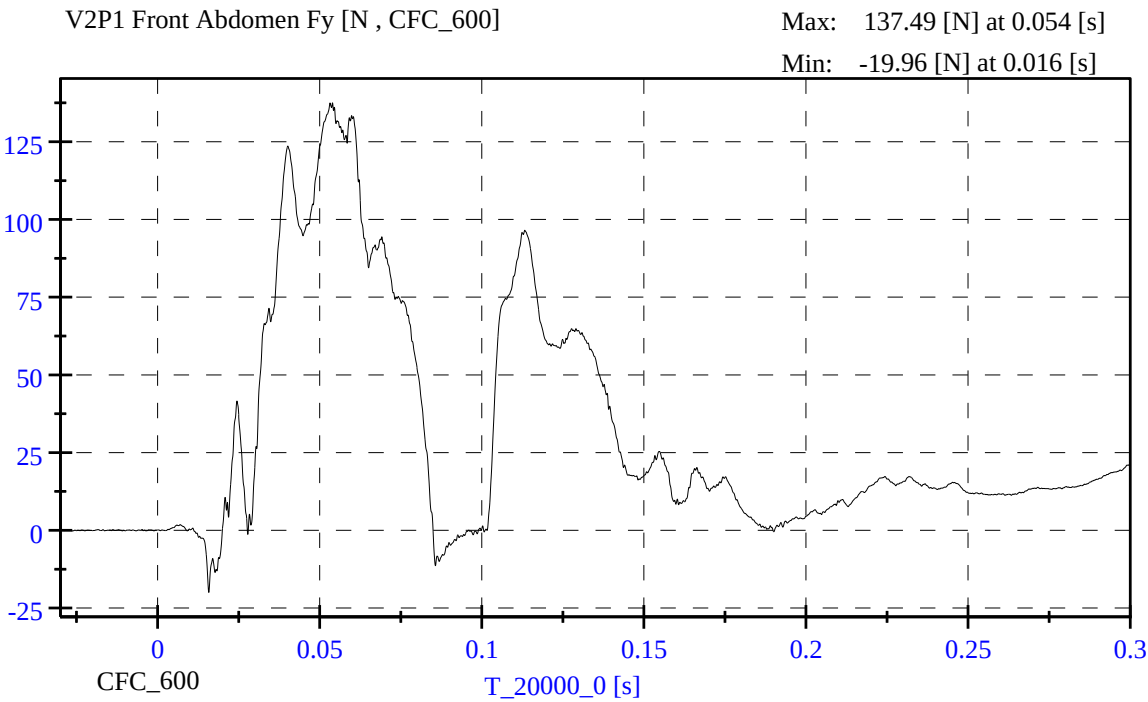
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MDB Center of Gravity Acceleration (Y)
MDB Center of Gravity Acceleration (Z)
MDB Rear Acceleration (X)
MDB Rear Acceleration (Y)
Left MDB Contact Switch
Right MDB Contact Switch

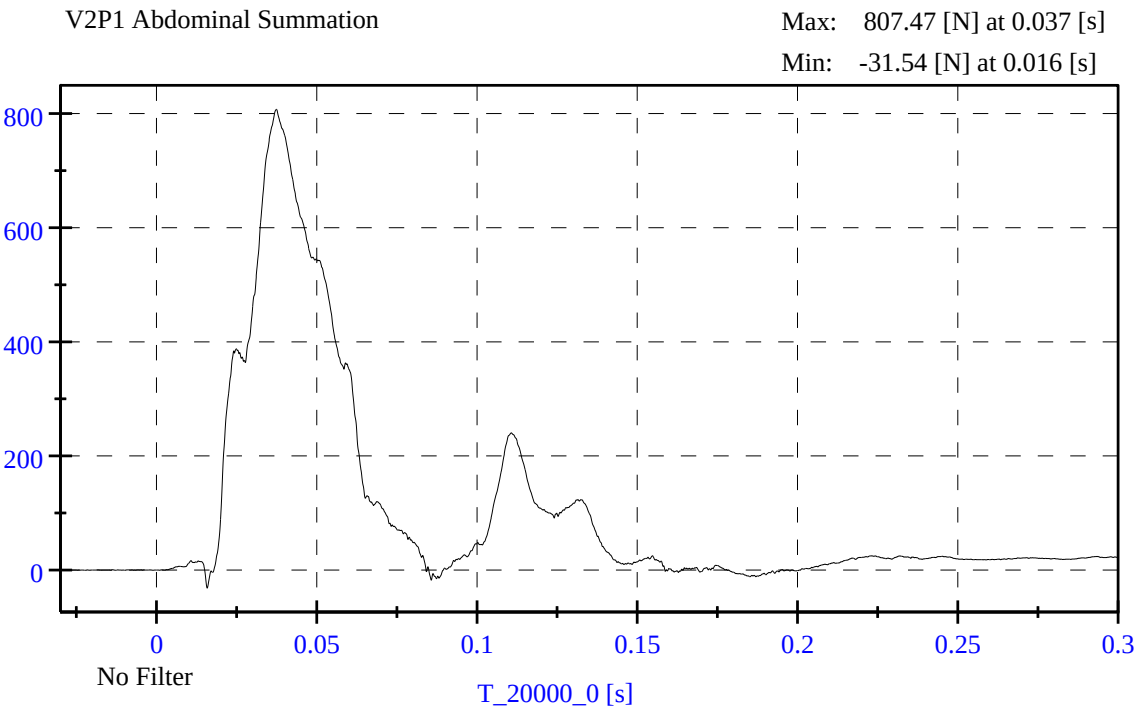
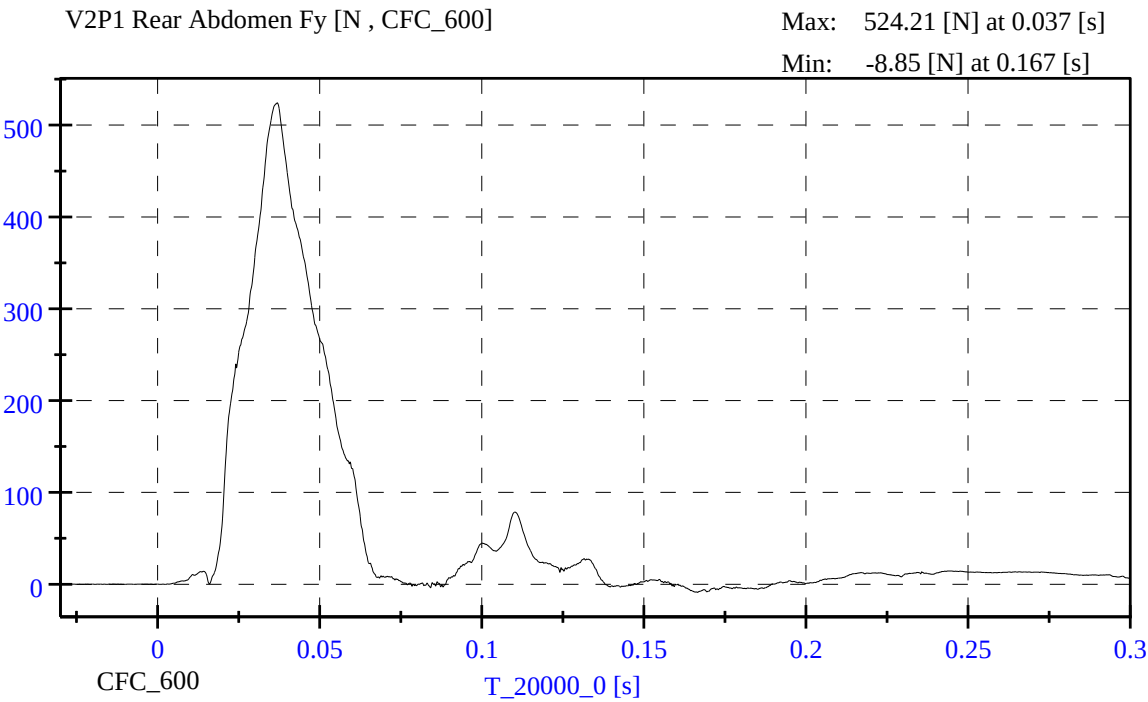


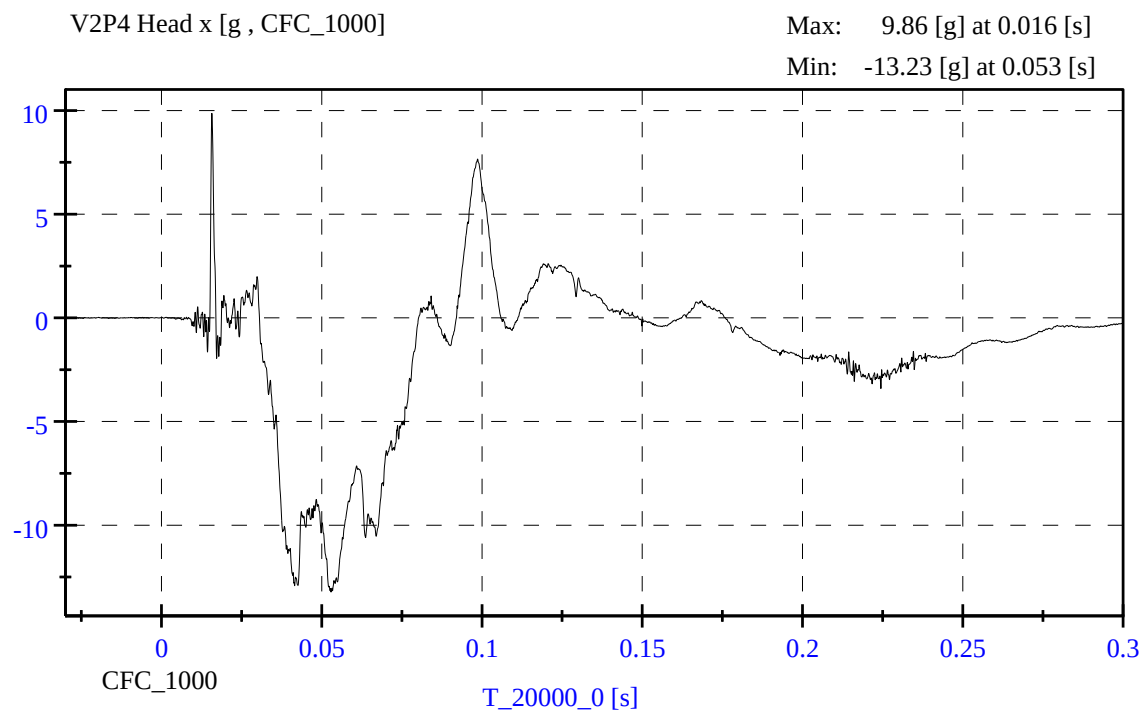
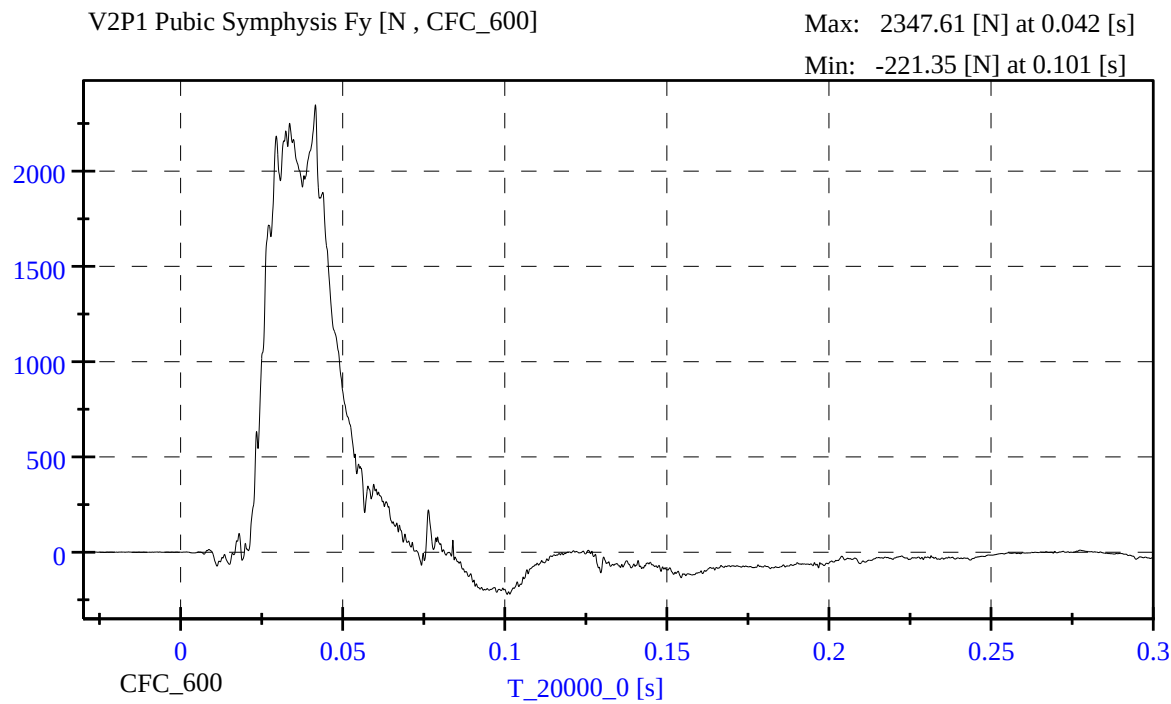


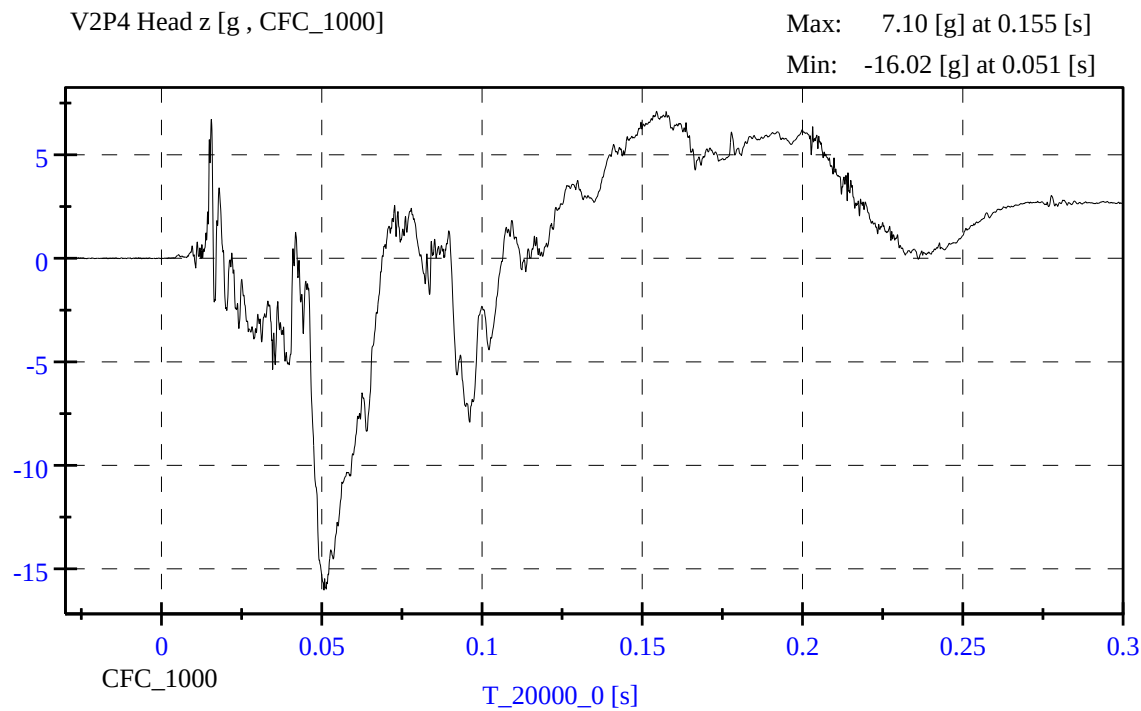
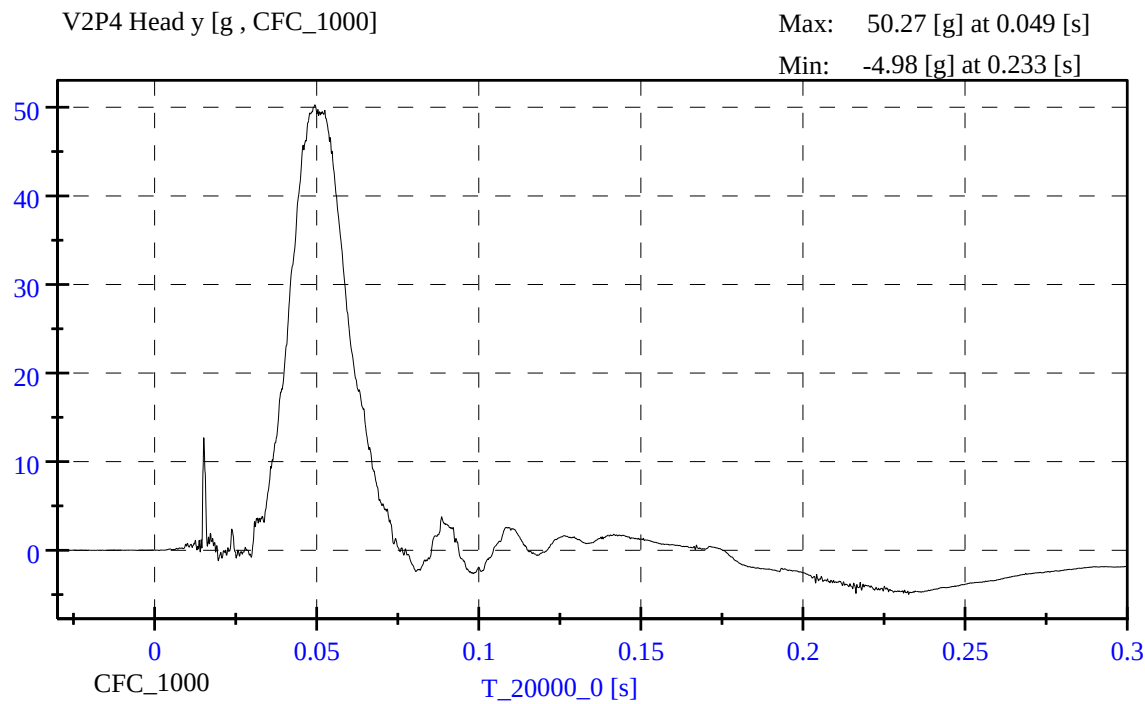


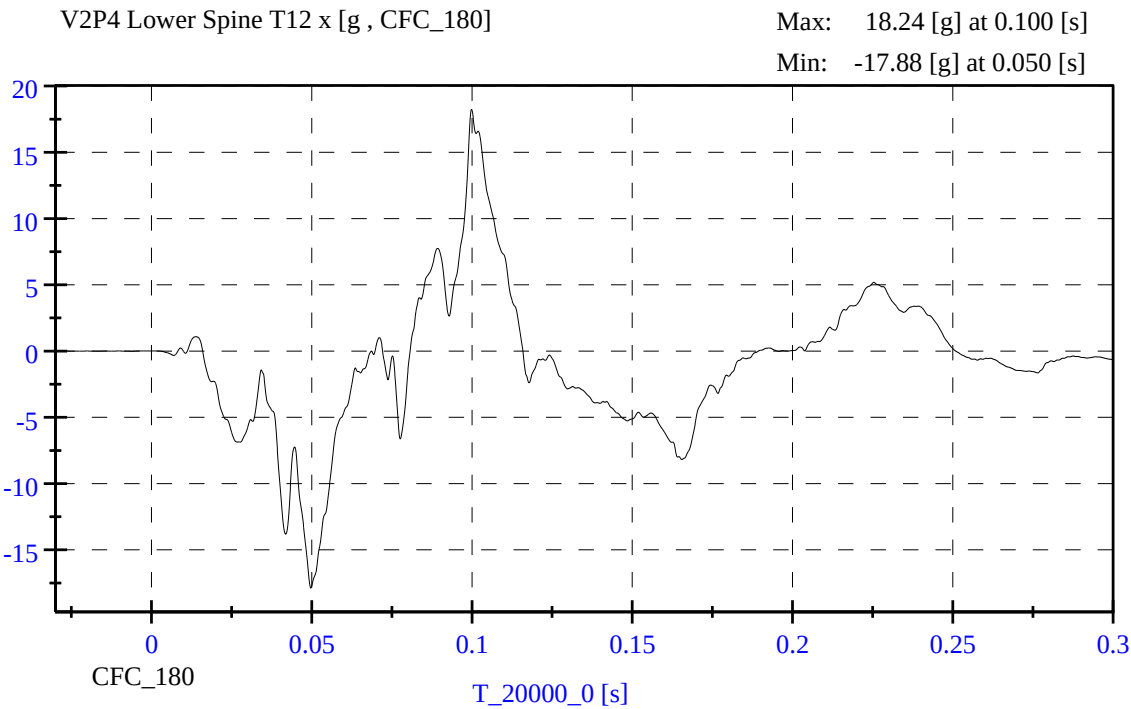
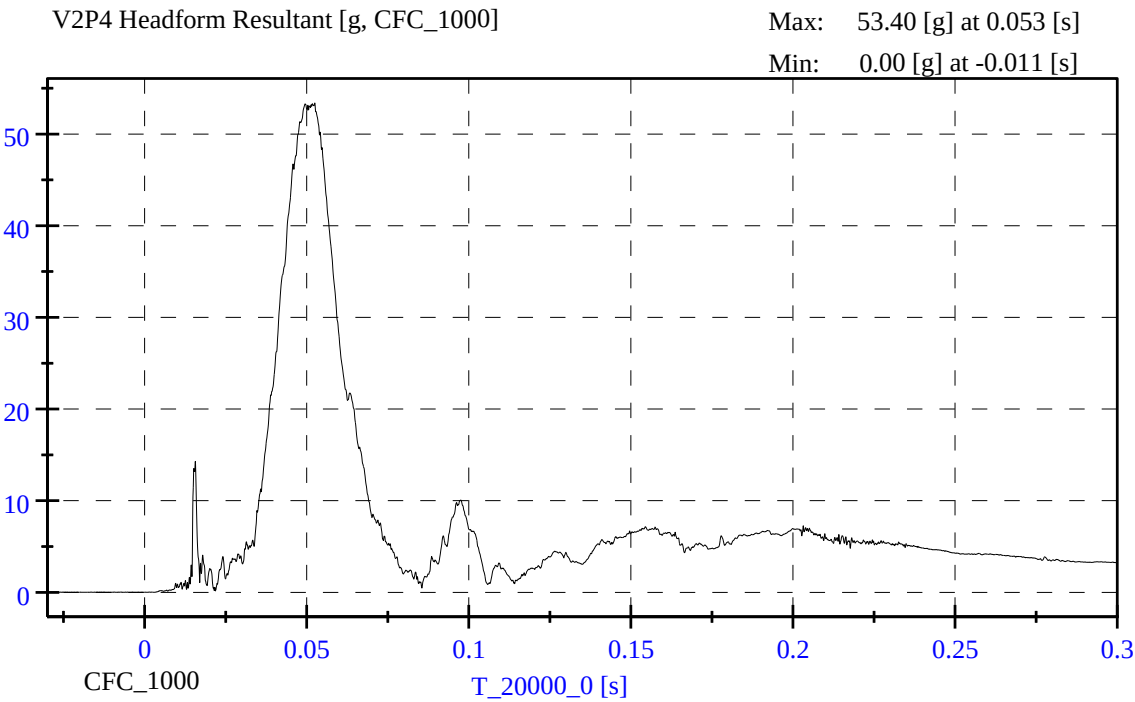


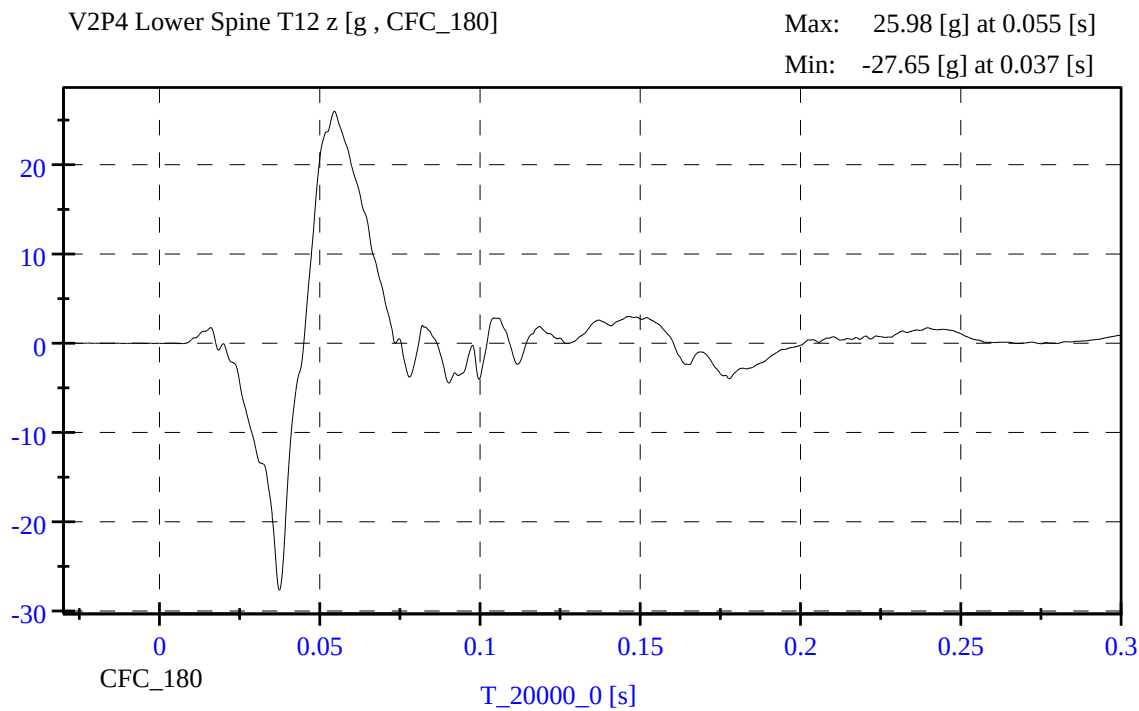
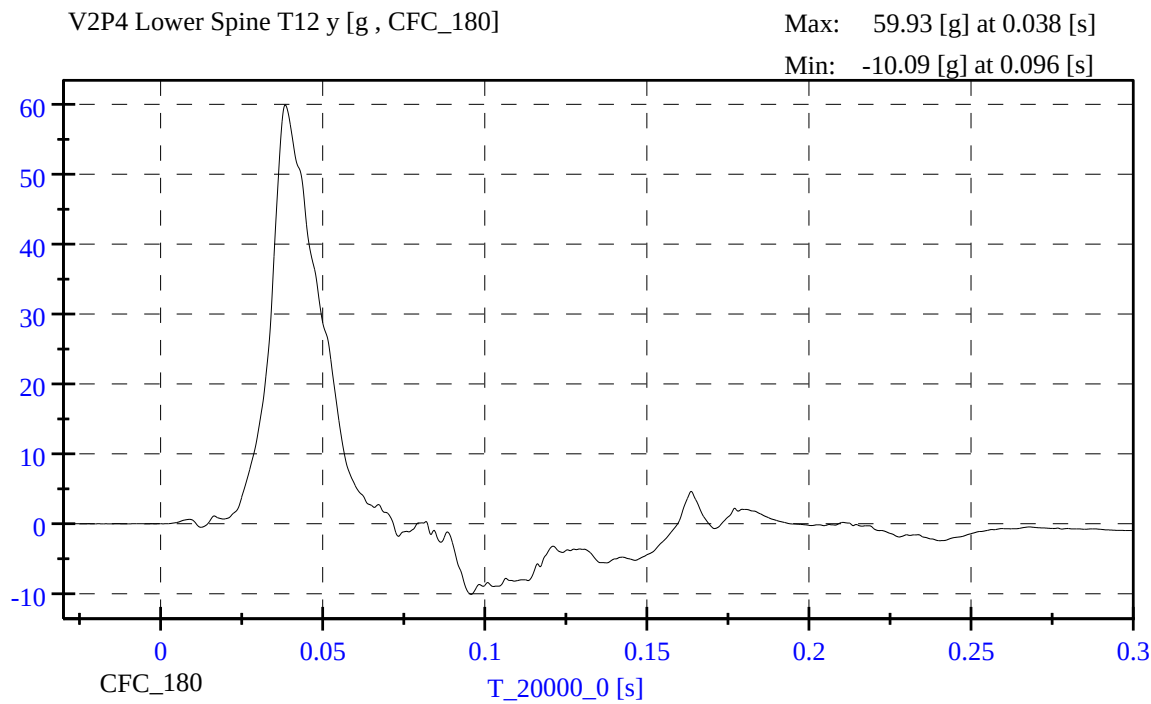


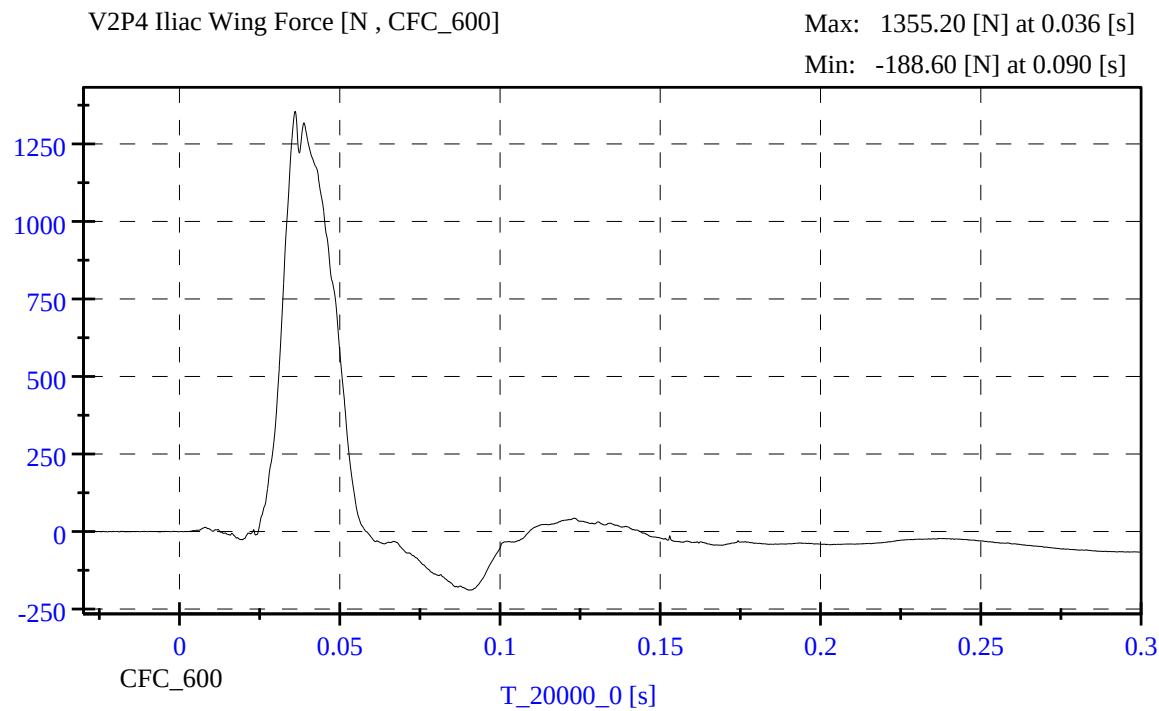
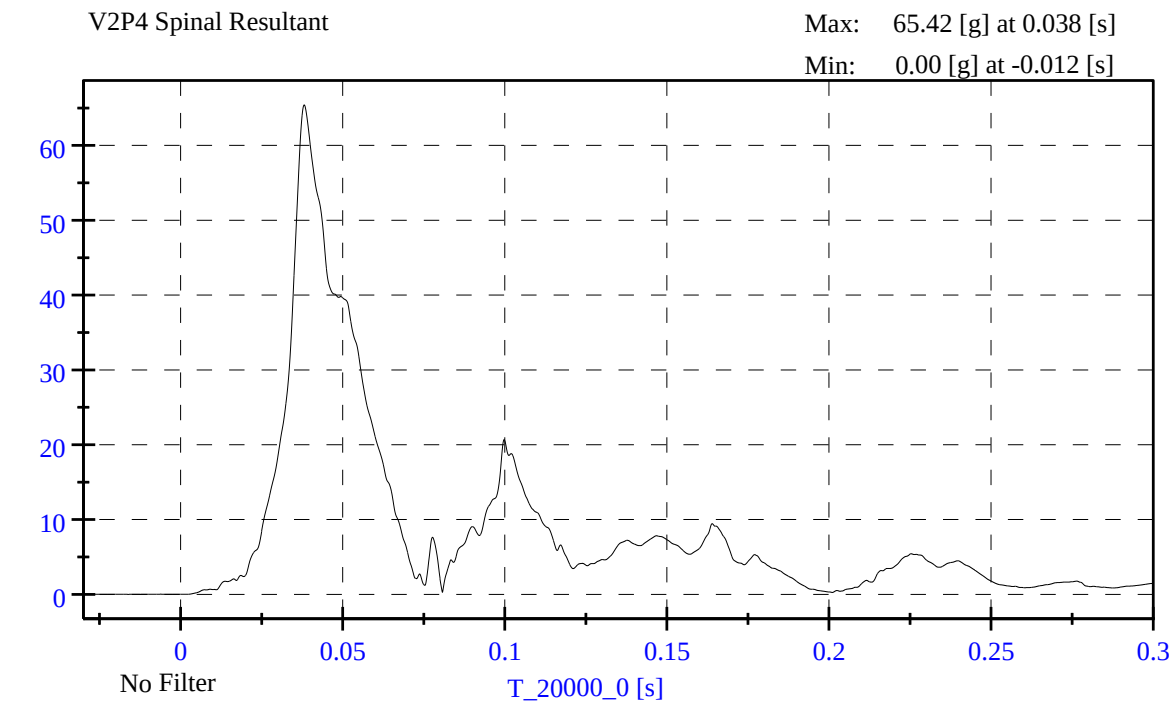


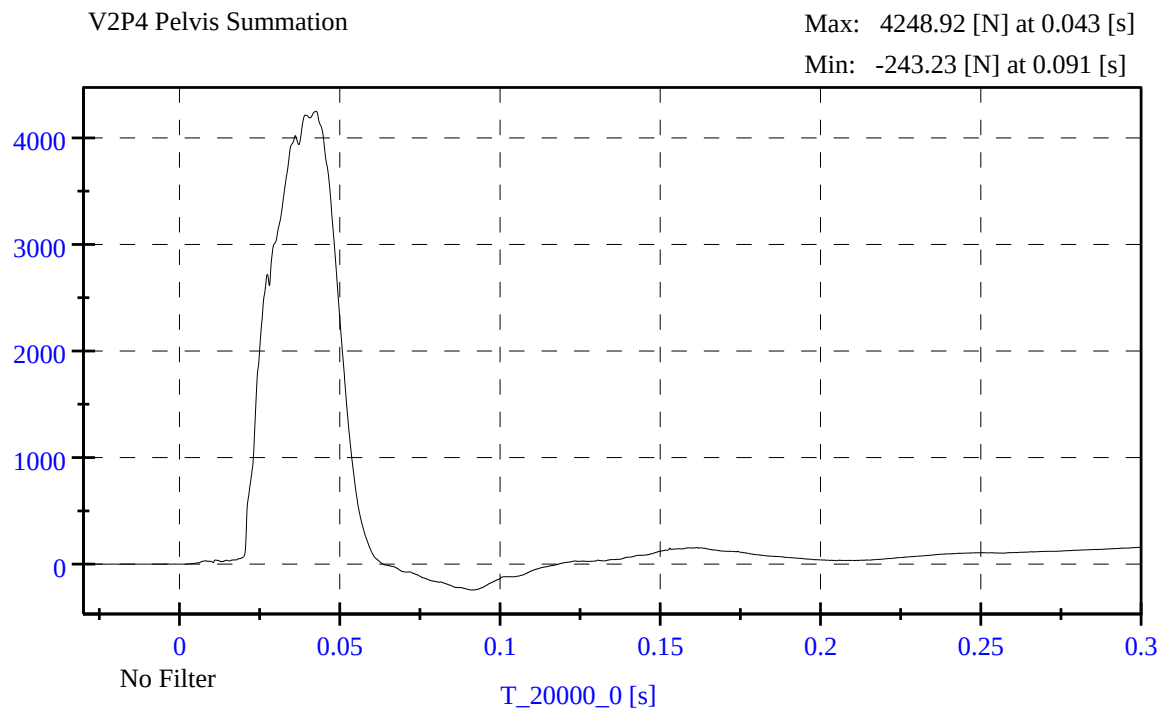
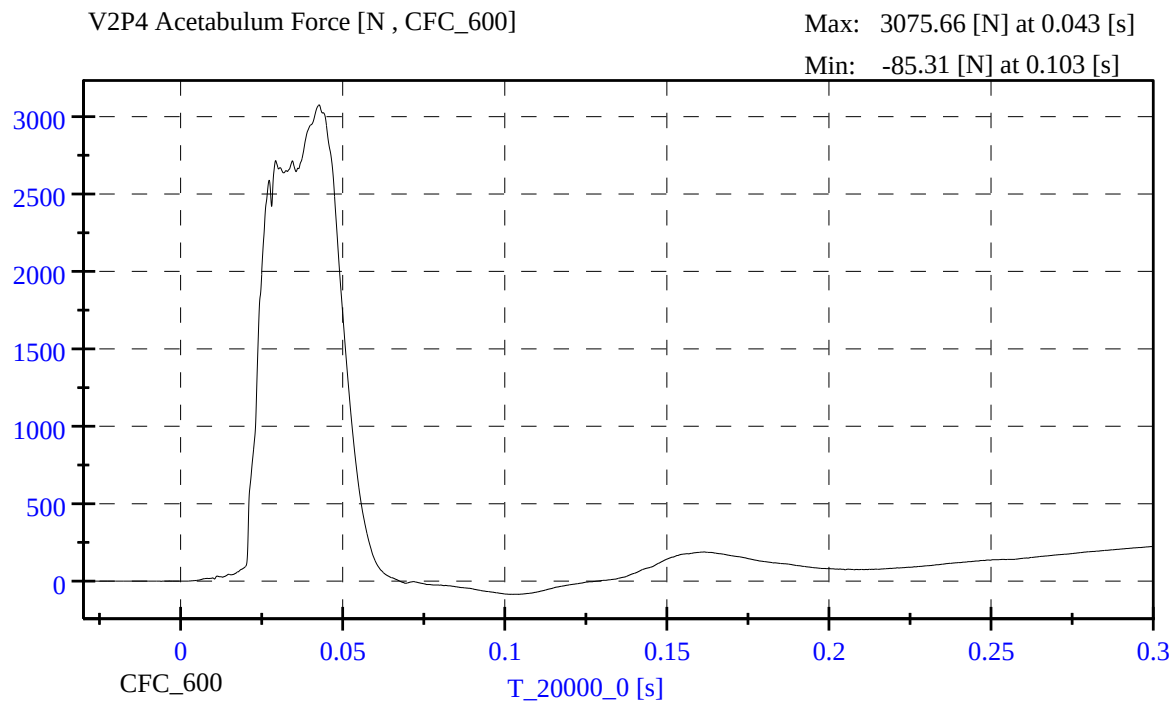












APPENDIX C

DUMMY PERFORMANCE CALIBRATION TEST DATA

CALIBRATION TEST RESULTS

PRE-TEST

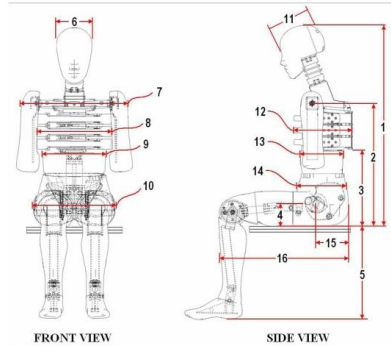
EUROSID 2 (ES-2RE) MALE – DRIVER ATD

SERIAL NO: F033

(CONFIGURED FOR LEFT SIDE IMPACT)

ES-2re External Measurements

NHTSA SN F033



Dim. No.	Description	Specification (mm)	Result (mm)	Pass/Fail
1	Sitting Height	900-918	913	Pass
2	Seat to Shoulder Joint	558-572	562	Pass
3	Seat to Lower Face of Thoracic Spine Box	346-356	354	Pass
4	Seat to Hip Joint (center of bolt)	97-103	100	Pass
5	Sole to Seat, Sitting	433-451	445	Pass
6	Head Width	152-158	155	Pass
7	Shoulder/Arm Width	461-479	465	Pass
8	Thorax Width	322-332	325	Pass
9	Abdomen Width	273-287	284	Pass
10	Pelvis Lap Width	359-373	367	Pass
11	Head Depth	196-206	199	Pass
12	Thorax Depth	262-272	270	Pass
13	Abdomen Depth	194-204	200	Pass
14	Pelvis Depth	235-245	237	Pass
15	Back of Buttocks to Hip Joint (center of bolt)	150-160	155	Pass
16	Back of Buttocks to Front Knee	597-615	602	Pass

Technician: MPG

Date: 11/5/12

VERIFICATION REPORT

Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:		Test Date:	10/31/2012
Test Number:	1	Test Time:	9:00:29 AM

Component Part Number	Component Serial Number
455-1007	1910934

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.8 deg C P
Humidity	10 -- 70	36 %RH P
Resultant Acceleration	125 -- 155	138 g P
Oscillation	0.0 -- 15.0	2.6 % P
Fore-Aft Acceleration	-15.00 -- 15.00	4.38 g P

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test Time: **9:00:29 AM**

Test Date: **10/31/2012**

VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Endevco	EGE-73BQEO	05H31-Z06	5/24/2012
Endevco	7264-2000	P63981	5/23/2012
Endevco	7264-2000	P64007	5/23/2012

Test Time: **9:00:29 AM**

Test Date: **10/31/2012**

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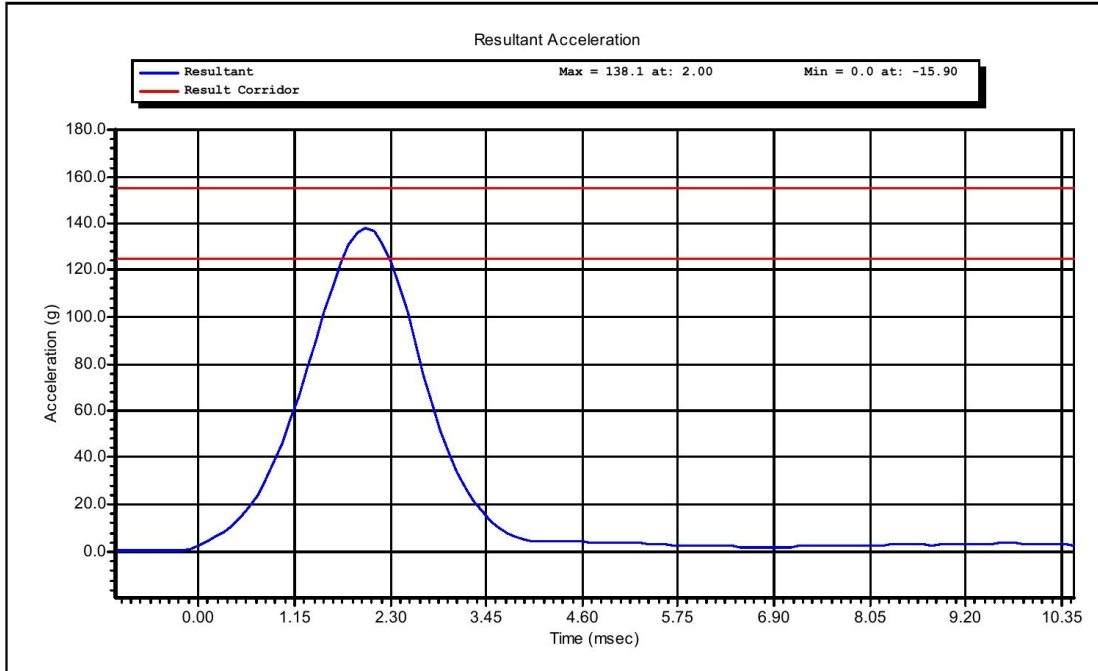


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Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:		Test Date:	10/31/2012
Test Number:	1	Test Time:	9:00:29 AM



Test Time: 9:00:29 AM

Test Date: 10/31/2012

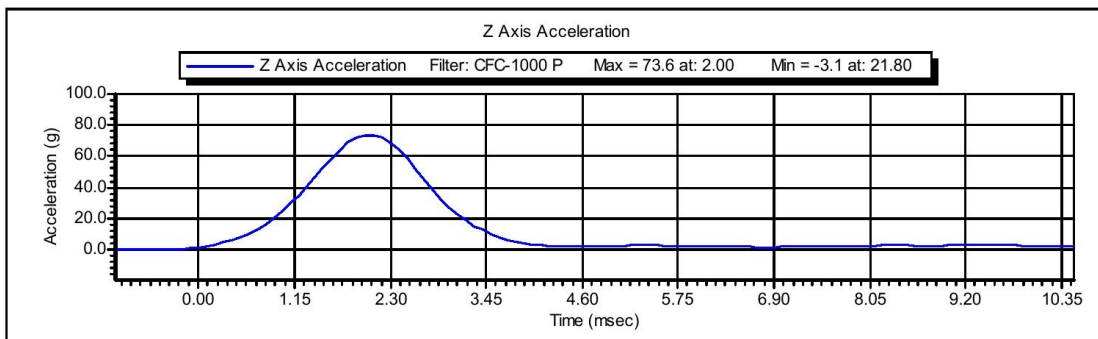
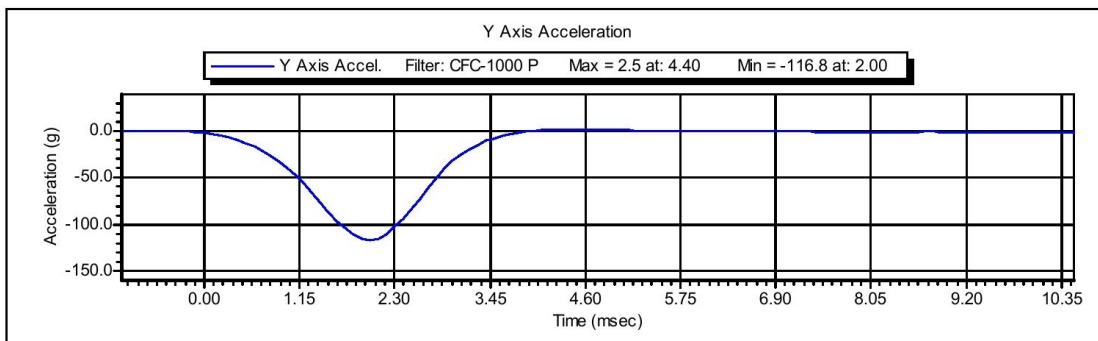
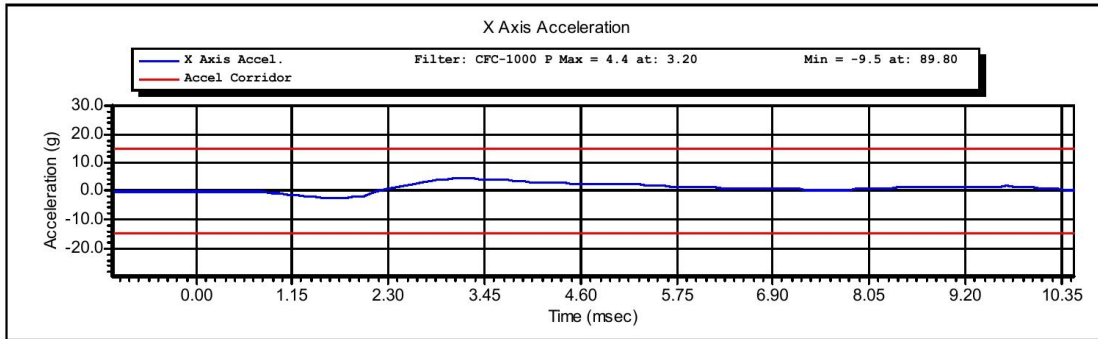
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



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Test Time: 9:00:29 AM

Test Date: 10/31/2012

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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:	F033		
Test ID:		Test Date:	10/31/2012
Test Number:	2	Test Time:	11:44:11 AM

Component Part Number	Component Serial Number
455-2002	175-200107085

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.3 deg C P
Humidity	10 -- 70	34 %RH P
Velocity	3.30 -- 3.50	3.45 m/s P
Maximum Neck Flexion Angle	49.0 -- 59.0	49.4 degrees P
Time At Maximum Neck Flexion	54.0 -- 66.0	58.9 ms P
Decay to Zero Degrees	53.0 -- 88.0	60.5 ms P
Velocity Corridor	--	P

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

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

Test Date: **10/31/2012**



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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	C15016	8/15/2012
DentonATD	7000428	094	5/30/2012
DentonATD	7000428	095	5/30/2012
DentonATD	7000428	093	5/30/2012

Test Time: 11:44:11 AM

Test Date: 10/31/2012

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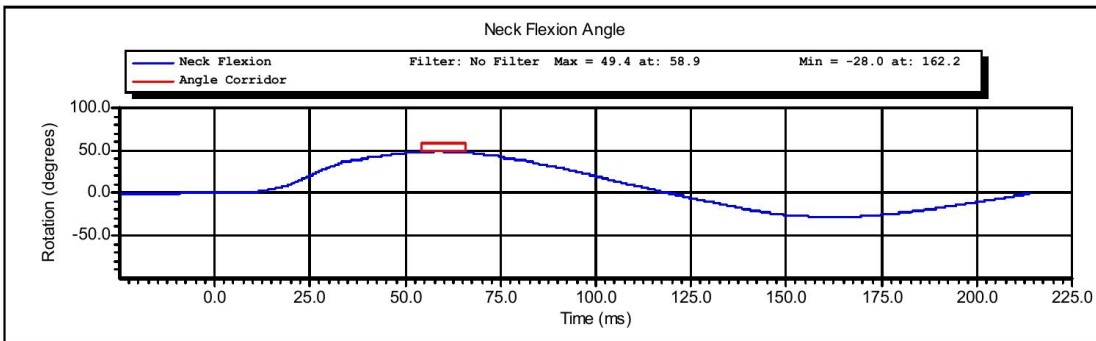
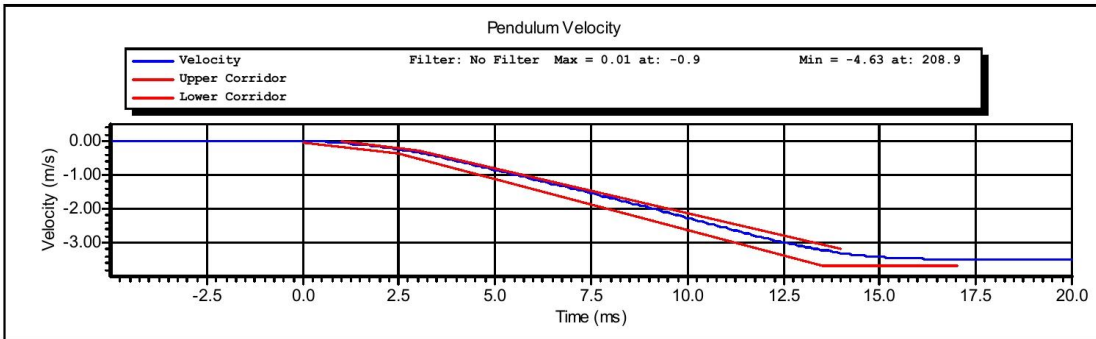


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Test Name:	Neck Flexion	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:		Test Date:	10/31/2012
Test Number:	2	Test Time:	11:44:11 AM



Test Time: 11:44:11 AM

Test Date: 10/31/2012

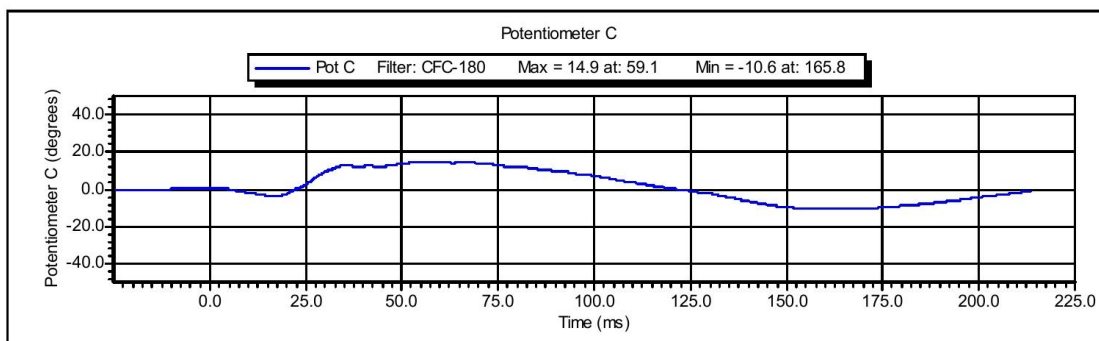
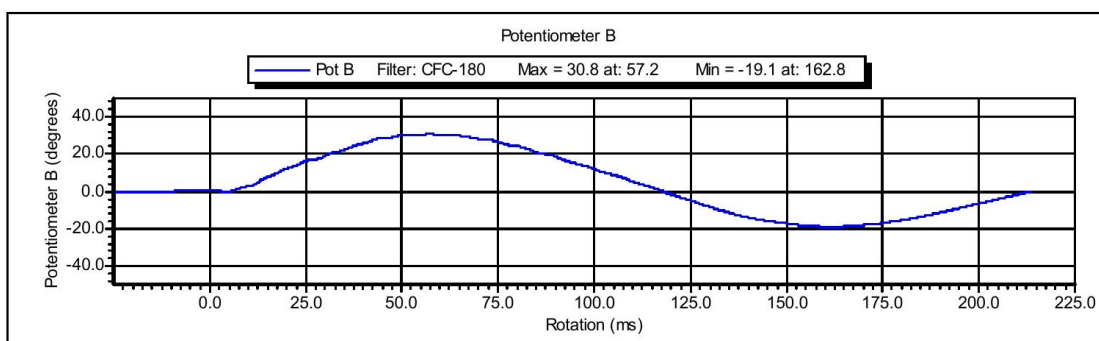
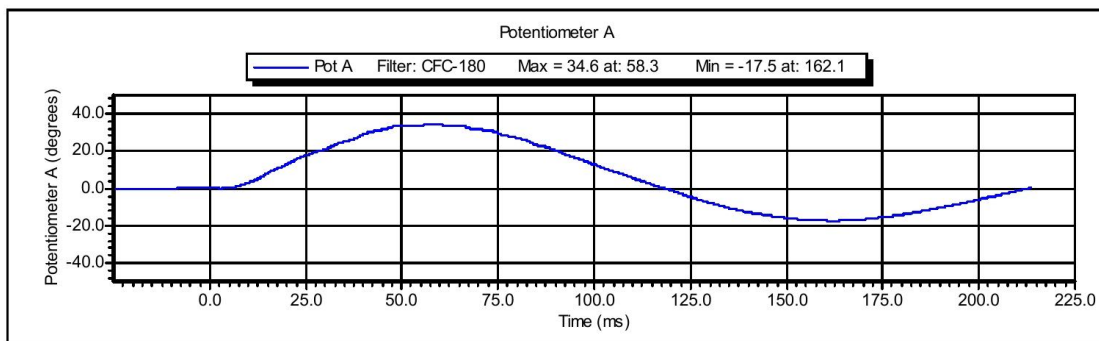
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Test Time: 11:44:11 AM

Test Date: 10/31/2012

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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:	F033		
Test ID:	Shoulder	Test Date:	11/5/2012
Test Number:	1	Test Time:	10:50:23 AM

Component Part Number	Component Serial Number
960715-313	07021

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.3 deg C P
Humidity	10.0 -- 70.0	19.3 %RH P
Velocity	4.20 -- 4.40	4.27 m/s P
Pendulum Acceleration	-10.50 -- -7.50	-9.65 g P

All test parameters are within specifications

Technician: **M. Goehle**

Supervisor: **D. Travale**

Test Time: **10:50:23 AM**

Test Date: **11/5/2012**



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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	5/25/2012

Test Time: 10:50:23 AM

Test Date: 11/5/2012

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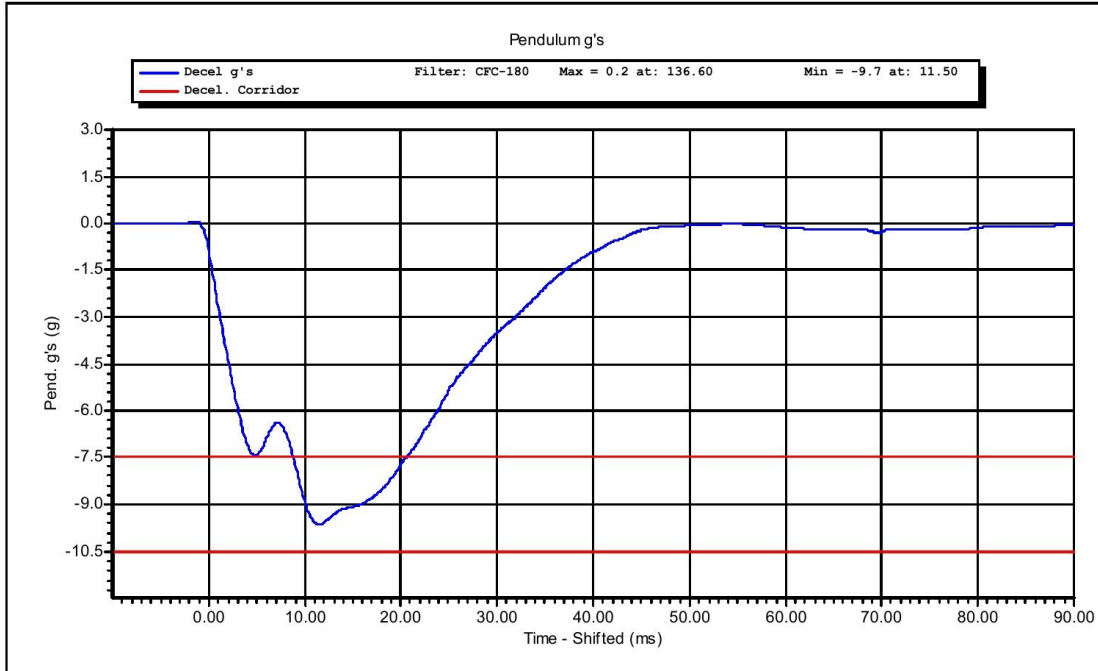


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Test Name:	Shoulder Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Shoulder	Test Date:	11/5/2012
Test Number:	1	Test Time:	10:50:23 AM



Test Time: 10:50:23 AM

Test Date: 11/5/2012

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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:	F033		
Test ID:	Upper Rib 4 m/s	Test Date:	11/2/2012
Test Number:	1	Test Time:	10:47:39 AM

Component Part Number	Component Serial Number
455-3100	07206

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.7 deg C P
Humidity	10.0 -- 70.0	29.9 %RH P
Velocity	3.90 -- 4.10	3.95 m/s P
Rib Displacement	-51.00 -- -46.00	-48.07 mm P
Drop Height	807.0 -- 823.0	815.0 mm P

All test parameters are within specifications

Technician: **M. Goehle**

Supervisor: **D. Travale**

Test Time: **10:47:39 AM**

Test Date: **11/2/2012**

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REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Honeywell	MLT-38000	DS-179	5/17/2012
DentonATD	Velocity Trap	1	1/11/2012
Endevco	7264-2000	P32222	5/23/2012

Test Time: 10:47:39 AM

Test Date: 11/2/2012

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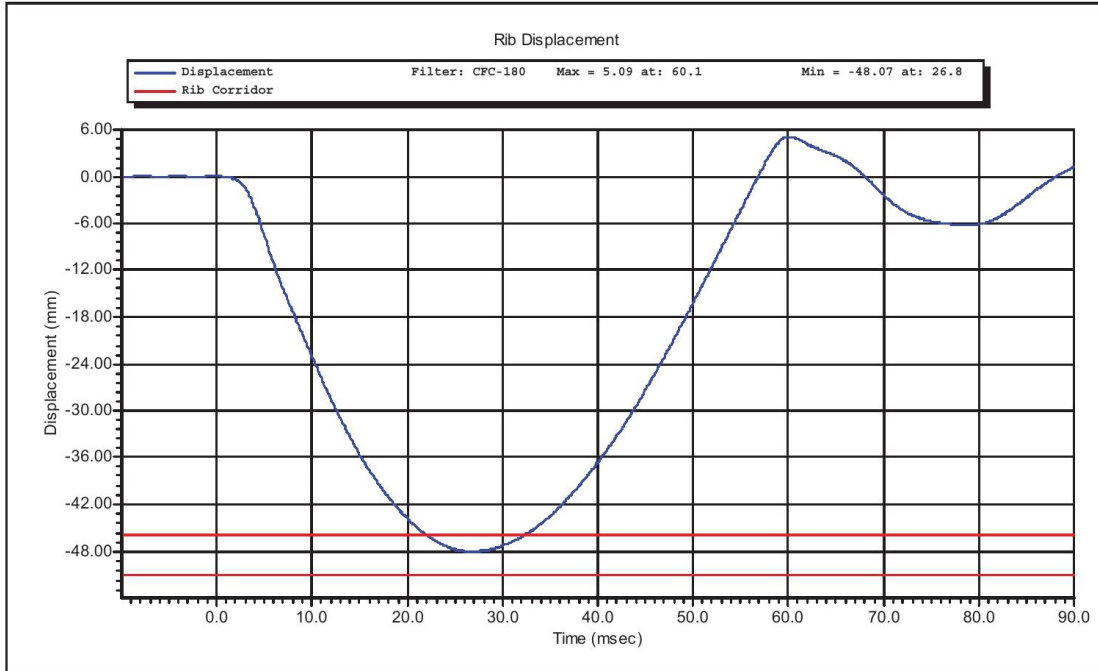


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Upper Rib 4 m/s	Test Date:	11/2/2012
Test Number:	1	Test Time:	10:47:39 AM



Test Time: 10:47:39 AM

Test Date: 11/2/2012

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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:	F033		
Test ID:	Upper Rib 3 m/s	Test Date:	11/2/2012
Test Number:	1	Test Time:	10:58:22 AM

Component Part Number	Component Serial Number
455-3100	07206

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.7 deg C P
Humidity	10.0 -- 70.0	29.3 %RH P
Velocity	2.90 -- 3.10	2.97 m/s P
Rib Displacement	-40.00 -- -36.00	-37.41 mm P
Drop Height	454 -- 464	459 mm P

All test parameters are within specifications

Technician: **M. Goehle**

Supervisor: **D. Travale**

Test Time: **10:58:22 AM**

Test Date: **11/2/2012**

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REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Honeywell	MLT-38000	DS-179	5/17/2012
DentonATD	Velocity Trap	1	1/11/2012
Endevco	7264-2000	P32222	5/23/2012

Test Time: 10:58:22 AM

Test Date: 11/2/2012

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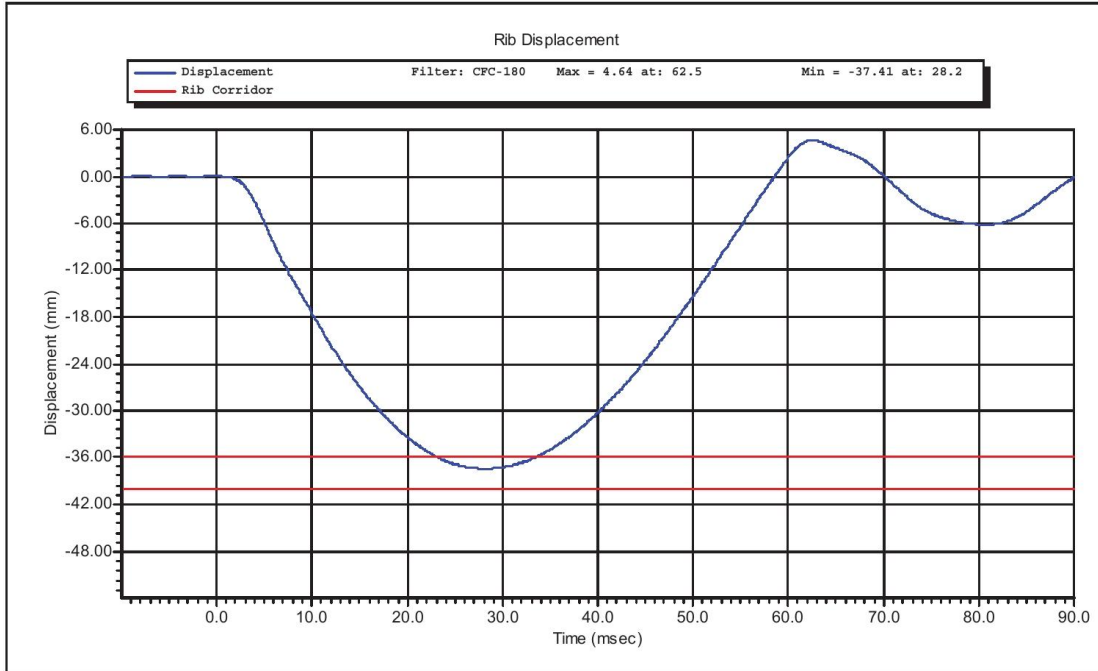


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Upper Rib 3 m/s	Test Date:	11/2/2012
Test Number:	1	Test Time:	10:58:22 AM



Test Time: 10:58:22 AM

Test Date: 11/2/2012

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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:	F033		
Test ID:	Middle Rib 4 m/s	Test Date:	11/2/2012
Test Number:	1	Test Time:	10:07:08 AM

Component Part Number	Component Serial Number
455-3100	07207

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.3 deg C P
Humidity	10.0 -- 70.0	29.6 %RH P
Velocity	3.90 -- 4.10	3.96 m/s P
Rib Displacement	-51.00 -- -46.00	-47.39 mm P
Drop Height	807.0 -- 823.0	815.0 mm P

All test parameters are within specifications

Technician: **M. Goehle**

Supervisor: **D. Travale**

Test Time: **10:07:08 AM**

Test Date: **11/2/2012**

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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-185	5/17/2012
DentonATD	Velocity Trap	1	1/11/2012
Endevco	7264-2000	P32222	5/23/2012

Test Time: 10:07:08 AM

Test Date: 11/2/2012

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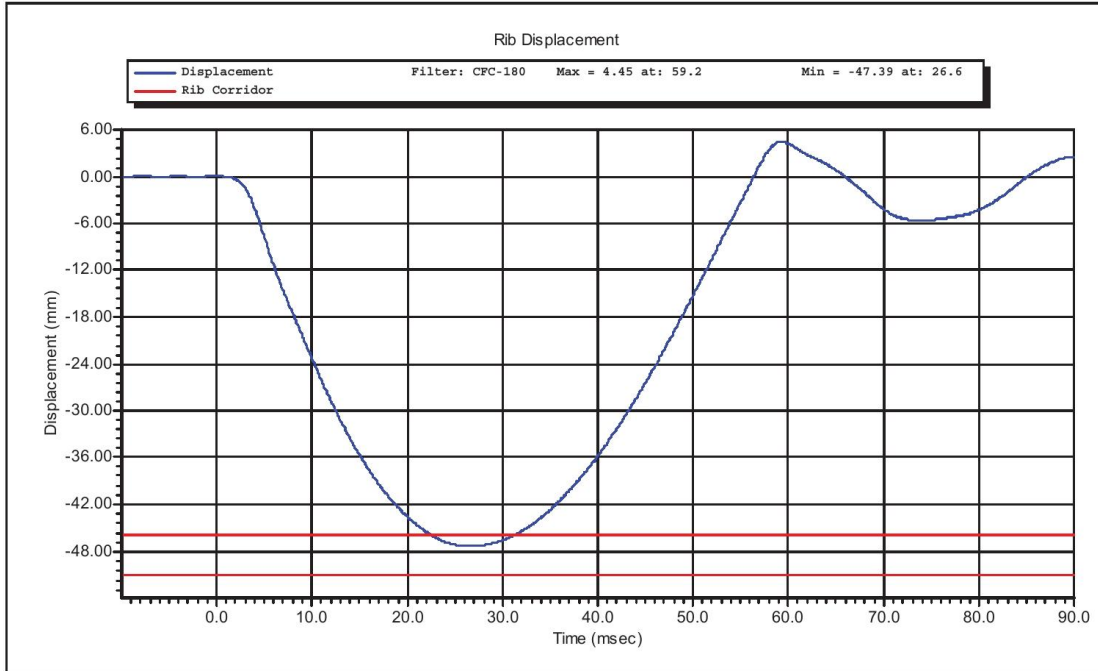


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Middle Rib 4 m/s	Test Date:	11/2/2012
Test Number:	1	Test Time:	10:07:08 AM



Test Time: 10:07:08 AM

Test Date: 11/2/2012

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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:	F033		
Test ID:	Middle Rib 3 m/s	Test Date:	11/2/2012
Test Number:	1	Test Time:	10:16:14 AM

Component Part Number	Component Serial Number
455-3100	07207

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.3 deg C P
Humidity	10.0 -- 70.0	29.0 %RH P
Velocity	2.90 -- 3.10	2.99 m/s P
Rib Displacement	-40.00 -- -36.00	-37.07 mm P
Drop Height	454 -- 464	459 mm P

All test parameters are within specifications

Technician: **M. Goehle**

Supervisor: **D. Travale**

Test Time: **10:16:14 AM**

Test Date: **11/2/2012**

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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-185	5/17/2012
DentonATD	Velocity Trap	1	1/11/2012
Endevco	7264-2000	P32222	5/23/2012

Test Time: 10:16:14 AM

Test Date: 11/2/2012

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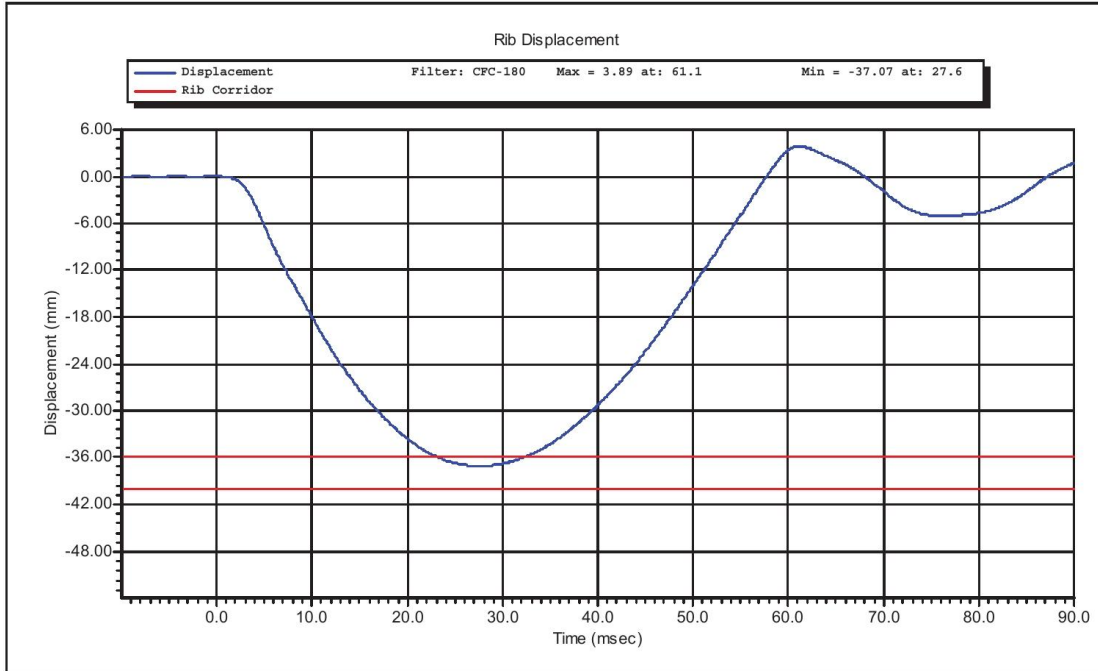


www.calspan.com

Calspan - Transportation Research Group

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

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Middle Rib 3 m/s	Test Date:	11/2/2012
Test Number:	1	Test Time:	10:16:14 AM



Test Time: 10:16:14 AM

Test Date: 11/2/2012

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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:	F033		
Test ID:	Lower Rib 4 m/s	Test Date:	11/2/2012
Test Number:	1	Test Time:	10:31:51 AM

Component Part Number	Component Serial Number
455-3100	07208

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.5 deg C P
Humidity	10.0 -- 70.0	29.8 %RH P
Velocity	3.90 -- 4.10	3.95 m/s P
Rib Displacement	-51.00 -- -46.00	-47.77 mm P
Drop Height	807.0 -- 823.0	815.0 mm P

All test parameters are within specifications

Technician: **M. Goehle**

Supervisor: **D. Travale**

Test Time: **10:31:51 AM**

Test Date: **11/2/2012**

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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-178	5/17/2012
DentonATD	Velocity Trap	1	1/11/2012
Endevco	7264-2000	P32222	5/23/2012

Test Time: 10:31:51 AM

Test Date: 11/2/2012

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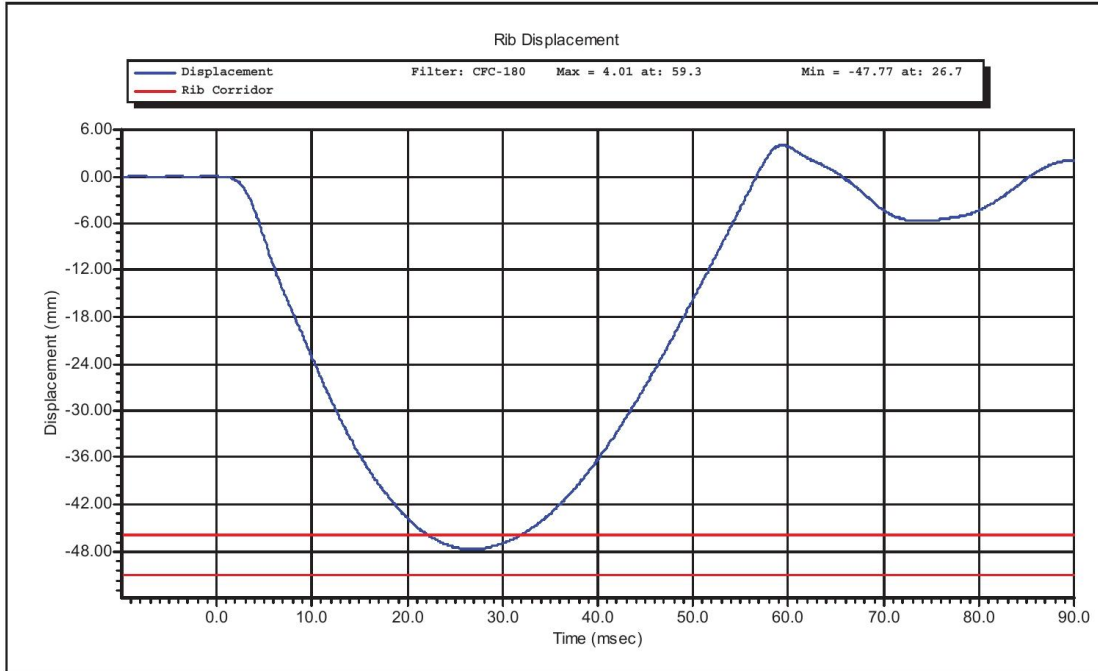


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Lower Rib 4 m/s	Test Date:	11/2/2012
Test Number:	1	Test Time:	10:31:51 AM



Test Time: 10:31:51 AM

Test Date: 11/2/2012

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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:	F033		
Test ID:	Lower Rib 3 m/s	Test Date:	11/2/2012
Test Number:	1	Test Time:	10:39:39 AM

Component Part Number	Component Serial Number
455-3100	07208

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.6 deg C P
Humidity	10.0 -- 70.0	30.2 %RH P
Velocity	2.90 -- 3.10	2.95 m/s P
Rib Displacement	-40.00 -- -36.00	-37.11 mm P
Drop Height	454 -- 464	459 mm P

All test parameters are within specifications

Technician: **M. Goehle**

Supervisor: **D. Travale**

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

Test Date: **11/2/2012**

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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-178	5/17/2012
DentonATD	Velocity Trap	1	1/11/2012
Endevco	7264-2000	P32222	5/23/2012

Test Time: 10:39:39 AM

Test Date: 11/2/2012

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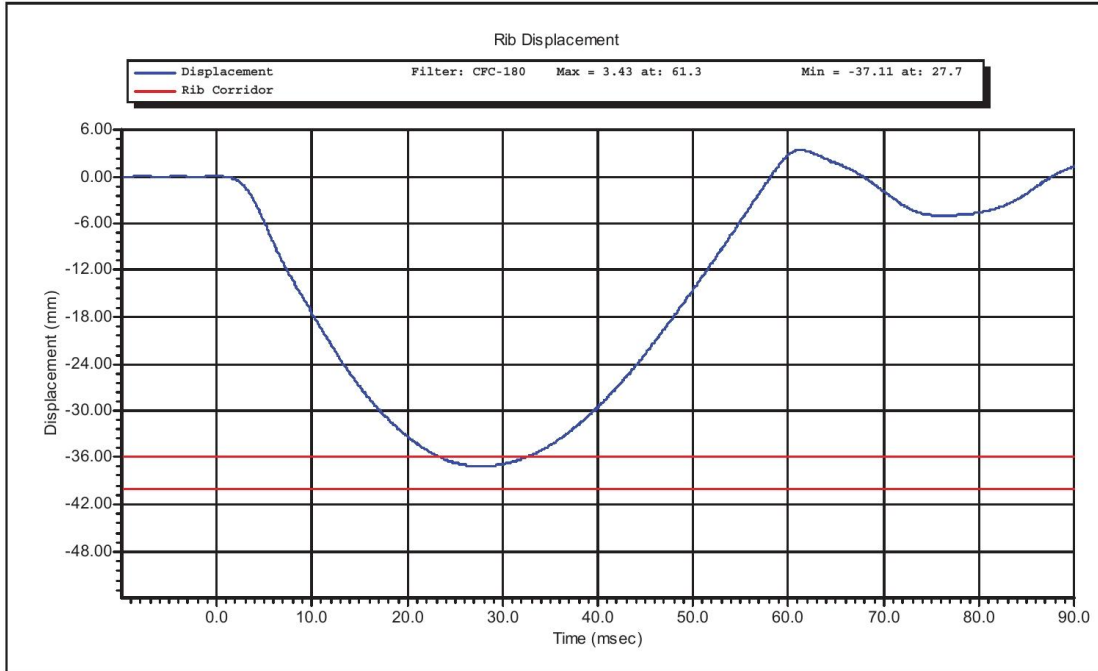


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Lower Rib 3 m/s	Test Date:	11/2/2012
Test Number:	1	Test Time:	10:39:39 AM



Test Time: 10:39:39 AM

Test Date: 11/2/2012

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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:	F033		
Test ID:	Thorax Full Body	Test Date:	11/5/2012
Test Number:	1	Test Time:	10:16:16 AM

Component Part Number	Component Serial Number
Upper Rib - 175-4002	07206
Middle Rib - 175-4002	07207
Lower Rib - 175-4002	07208

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.4 deg C P
Humidity	10.0 -- 70.0	19.1 %RH P
Velocity	5.40 -- 5.60	5.52 m/s P
Upper Rib Displacement	34.0 -- 41.0	36.2 mm P
Middle Rib Displacement	37.0 -- 45.0	41.0 mm P
Lower Rib Displacement	37.0 -- 44.0	40.4 mm P
Impactor Force	5100 -- 6200	5586 N P

All test parameters are within specifications

Technician: **M. Goehle**

Supervisor: **D. Travale**

Test Time: **10:16:16 AM**

Test Date: **11/5/2012**

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	5/25/2012
Honeywell	MLT-38000	DS-179	5/17/2012
Honeywell	MLT-38000	DS-185	5/17/2012
Honeywell	MLT-38000	DS-178	5/17/2012

Test Time: **10:16:16 AM**

Test Date: **11/5/2012**

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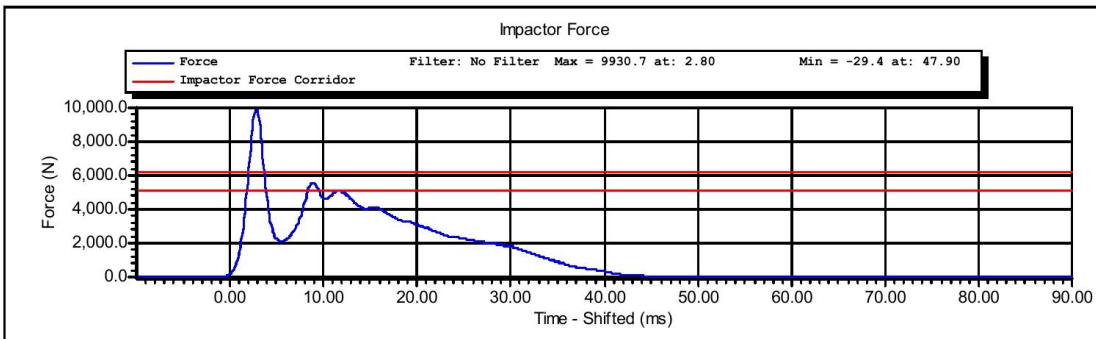
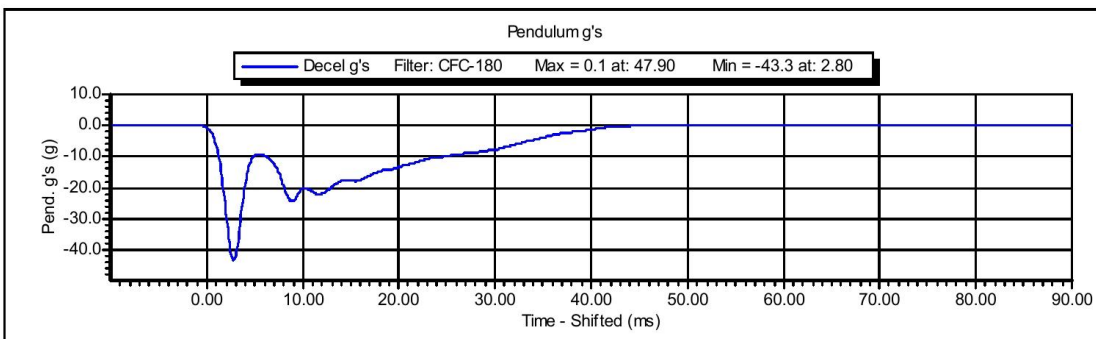


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Test Name:	Thorax Impact	Revision:	8/15/2008
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Thorax Full Body	Test Date:	11/5/2012
Test Number:	1	Test Time:	10:16:16 AM



Test Time: 10:16:16 AM

Test Date: 11/5/2012

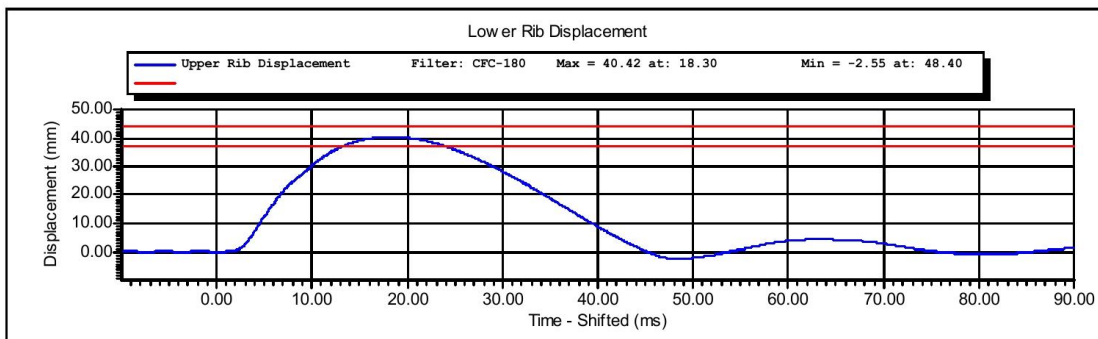
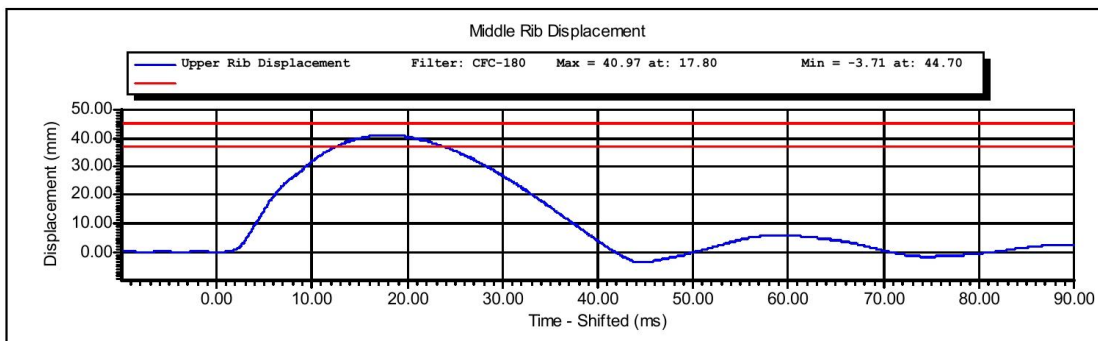
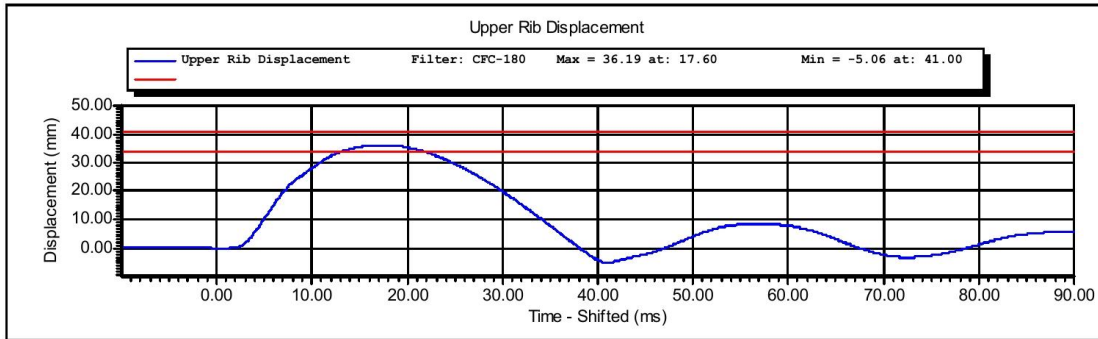
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Test Time: 10:16:16 AM

Test Date: 11/5/2012

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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:	F033		
Test ID:	Abdomen	Test Date:	11/5/2012
Test Number:	1	Test Time:	9:59:03 AM

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

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.7 deg C P
Humidity	10 -- 70	19 %RH P
Velocity	3.90 -- 4.10	4.03 m/s P
Peak Abdominal Force	-2.70 -- -2.20	-2.50 kN P
Time At Peak Abdominal Force	10.0 -- 12.3	10.7 ms P
Maximum Pendulum Force	-4.80 -- -4.00	-4.40 kN P
Time at Peak Pendulum Force	10.6 -- 13.0	10.8 ms P

All test parameters are within specifications

Technician: **M. Goehle**
 Supervisor: **D. Travale**

Test Time: **9:59:03 AM**

Test Date: **11/5/2012**



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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	5/25/2012
Denton	2631	LC-1524	5/24/2012
Denton	2631	LC-1523	5/24/2012
Denton	2631	LC-1530	5/24/2012

Test Time: 9:59:03 AM

Test Date: 11/5/2012

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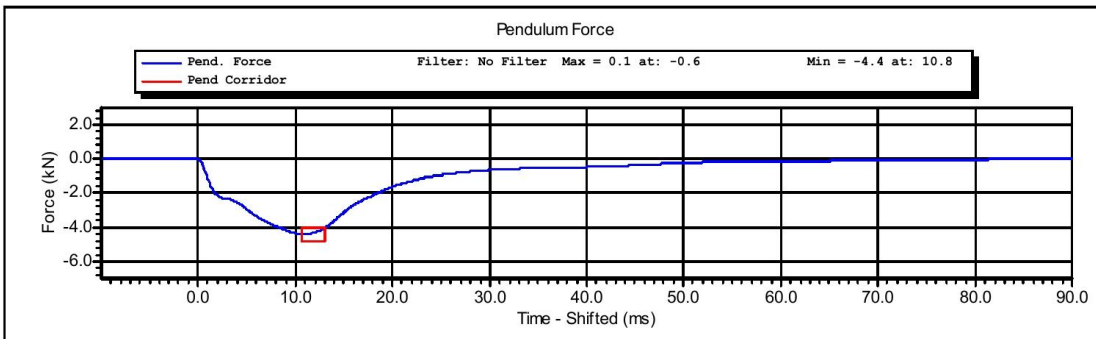
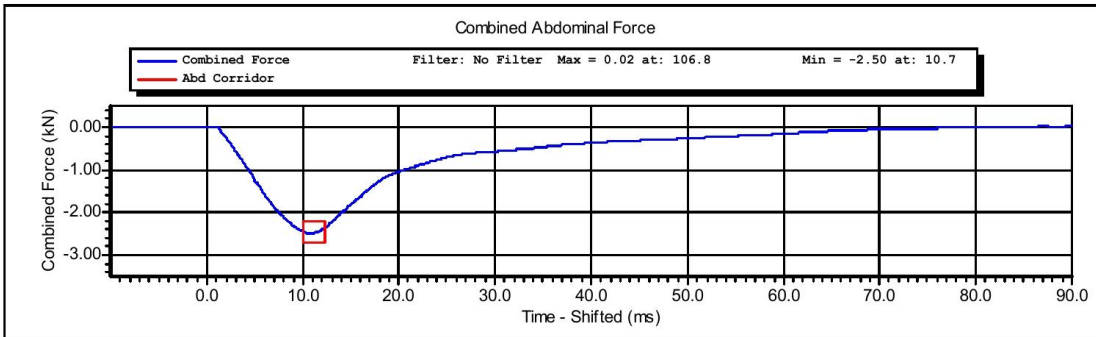


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Test Name:	Abdominal Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Abdomen	Test Date:	11/5/2012
Test Number:	1	Test Time:	9:59:03 AM



Test Time: 9:59:03 AM

Test Date: 11/5/2012

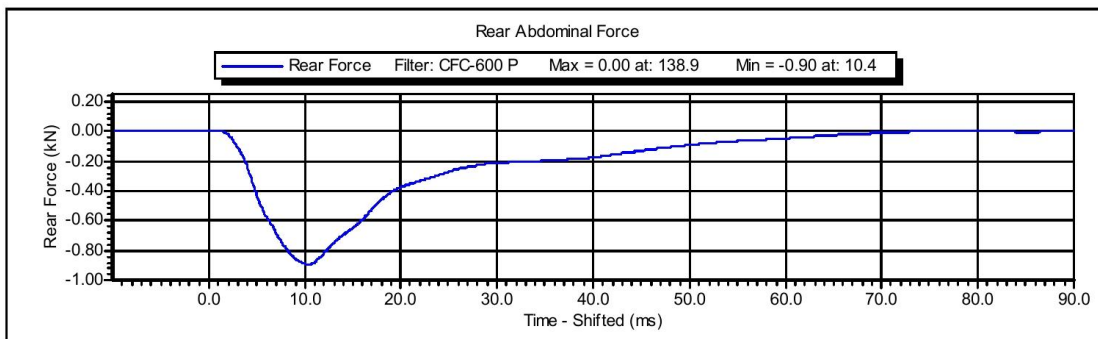
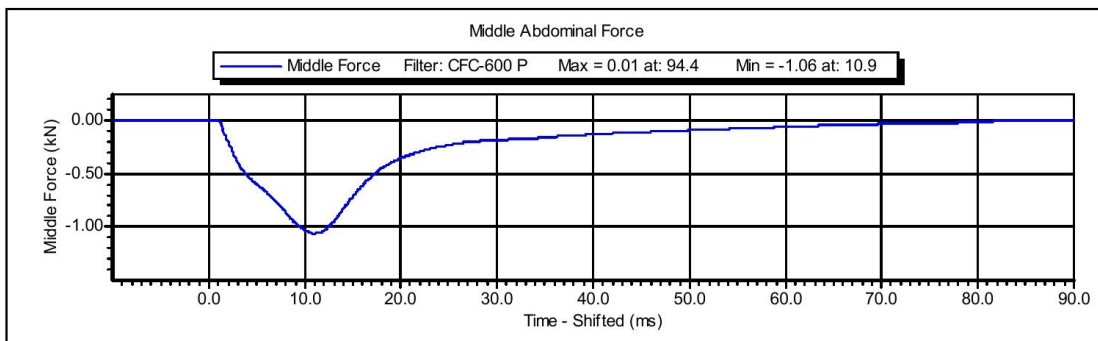
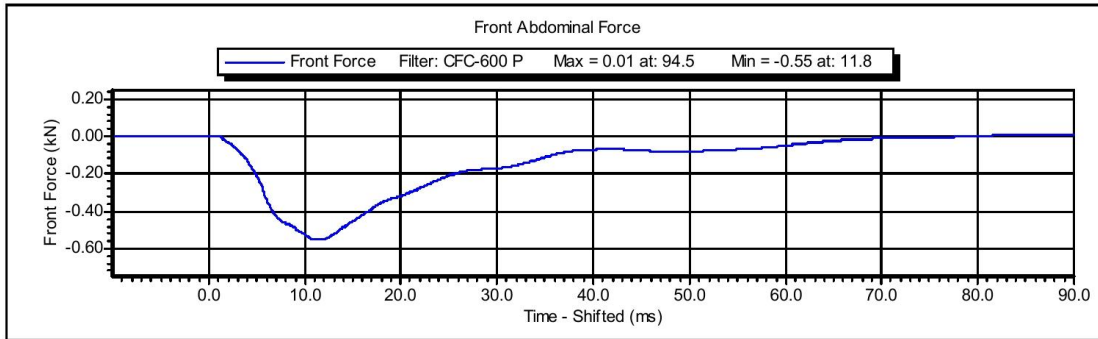
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Test Time: 9:59:03 AM

Test Date: 11/5/2012

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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:	F033		
Test ID:		Test Date:	11/1/2012
Test Number:	1	Test Time:	1:02:14 PM

Component Part Number	Component Serial Number
175-5501	DI8374

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.6 deg C P
Humidity	10 -- 70	39 %RH P
Velocity	5.95 -- 6.15	6.14 m/s P
Maximum Headform Flexion Angle	45.0 -- 55.0	45.1 degrees P
Time at Maximum Headform Flexion Angle	39.0 -- 53.0	44.4 ms P
Decay to Zero Degrees	37.0 -- 57.0	39.5 ms P
Velocity Corridor	--	P

All test parameters are within specifications

Technician: **S. Zito**

Supervisor: **D. Travale**

Test Time: **1:02:14 PM**

Test Date: **11/1/2012**



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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	C15016	8/15/2012
DentonATD	7000428	094	5/30/2012
DentonATD	7000428	095	5/30/2012
DentonATD	7000428	093	5/30/2012

Test Time: 1:02:14 PM

Test Date: 11/1/2012

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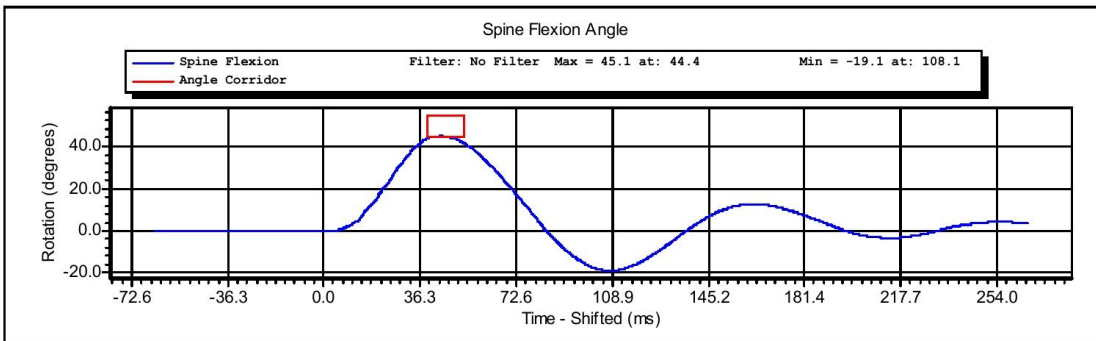
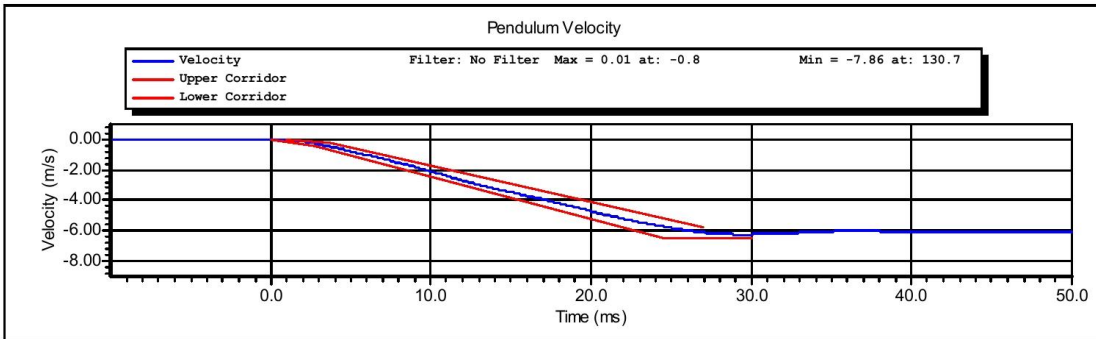


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Test Name:	Lumbar Spine	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:		Test Date:	11/1/2012
Test Number:	1	Test Time:	1:02:14 PM



Test Time: **1:02:14 PM**

Test Date: **11/1/2012**

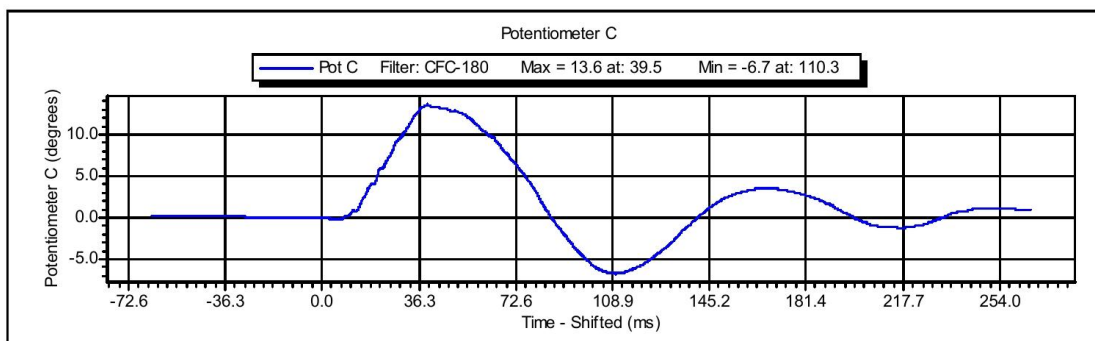
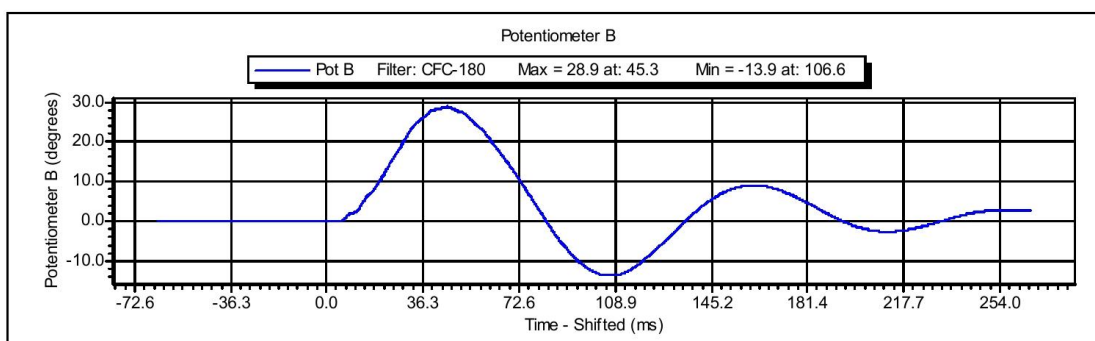
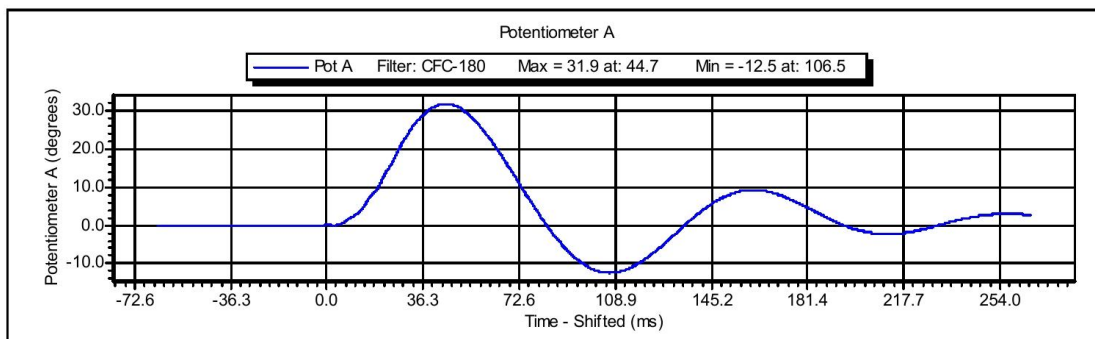
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Test Time: 1:02:14 PM

Test Date: 11/1/2012

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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:	F033		
Test ID:	Pelvis	Test Date:	11/5/2012
Test Number:	1	Test Time:	9:26:44 AM

Component Part Number	Component Serial Number
Pelvis 175-6050	07033

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.7 deg C P
Humidity	10 -- 70	20 %RH P
Velocity	4.20 -- 4.40	4.30 m/s P
Peak Pendulum Force	-5.40 -- -4.70	-4.97 kN P
Time at Peak Pendulum Force	11.80 -- 16.10	12.94 ms P
Peak Pubic Symphysis Force	-1.59 -- -1.23	-1.36 kN P
Time at Peak Pubic Symphysis Force	12.20 -- 17.00	14.04 ms P

All test parameters are within specifications

Technician: **M. Goehle**Supervisor: **D. Travale**Test Time: **9:26:44 AM**Test Date: **11/5/2012**



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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	5/25/2012
Denton	3096	LC-456Fy	5/24/2012

Test Time: 9:26:44 AM

Test Date: 11/5/2012

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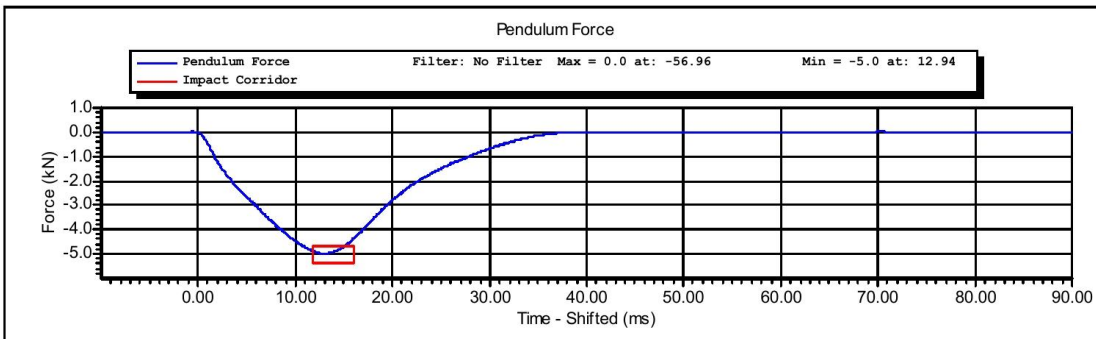
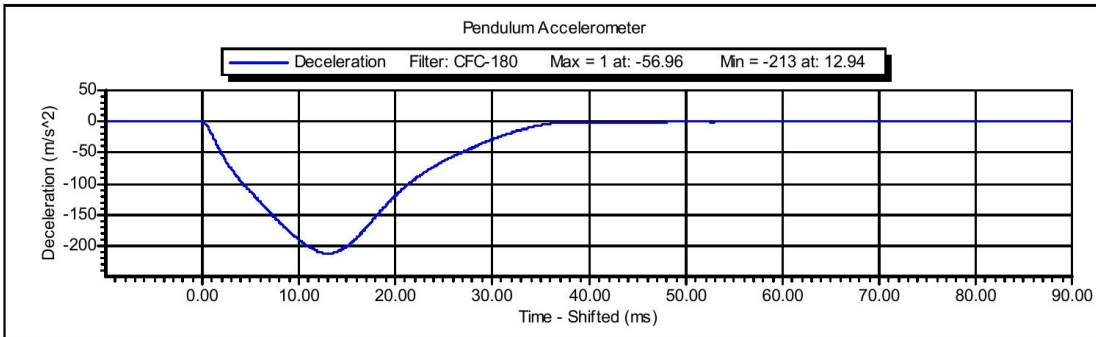


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Test Name:	Pelvis Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Pelvis	Test Date:	11/5/2012
Test Number:	1	Test Time:	9:26:44 AM



Test Time: **9:26:44 AM**

Test Date: **11/5/2012**

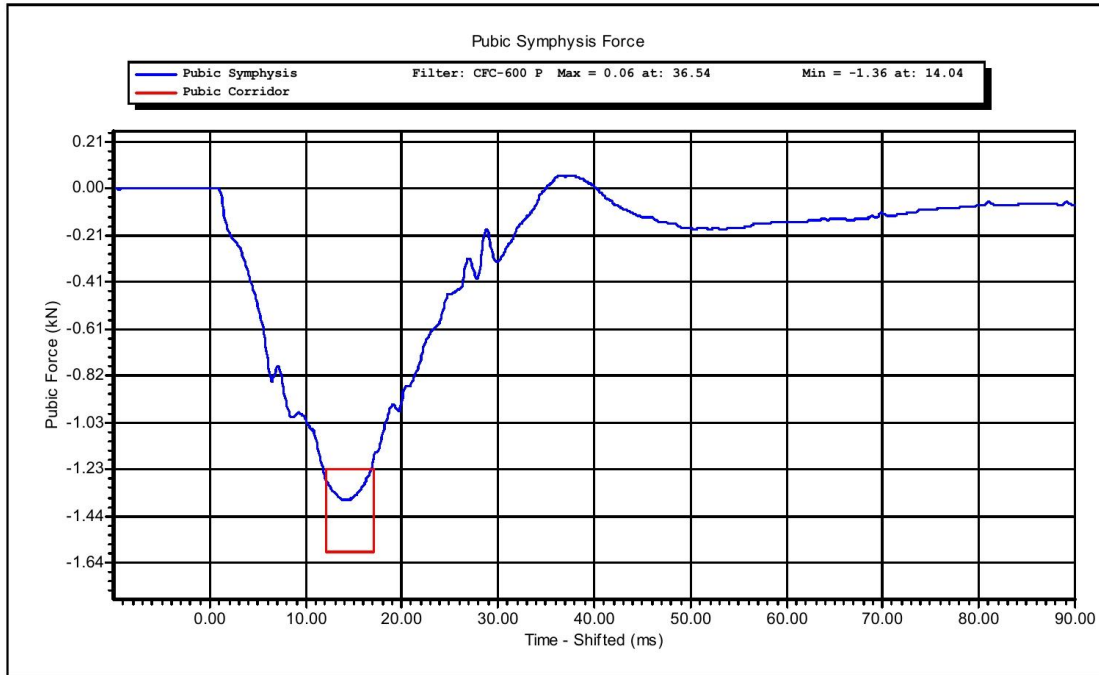
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Test Time: 9:26:44 AM

Test Date: 11/5/2012

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CALIBRATION TEST RESULTS

PRE-TEST

SID-IIS 5TH PERCENTILE FEMALE - PASSENGER ATD

SERIAL No: 303

(CONFIGURED FOR LEFT SIDE IMPACT)



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SID-IIsD External Measurements

ATD S/N 303

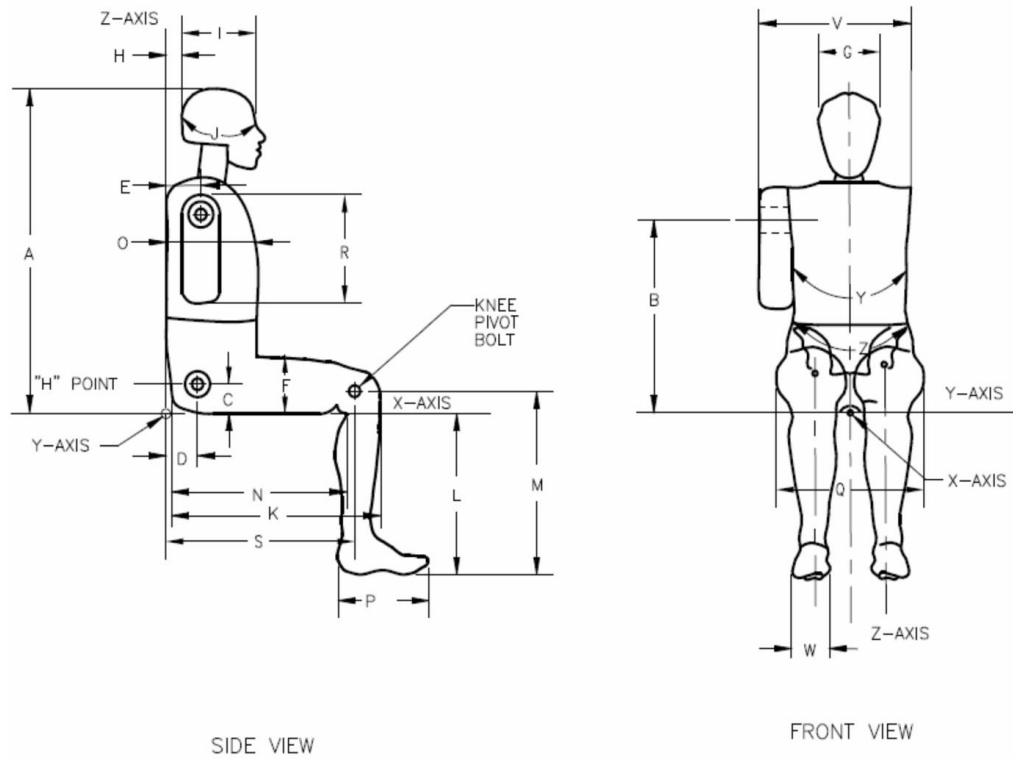
Symbol	Description	Specification	Results	Pass
		mm	Mm	
A	Sitting Height	772.0 - 788.0	785	Yes
B	Shoulder Pivot Height	437.0 - 453.0	450	Yes
C	H-Point Height	79.0 - 89.0	85	Yes
D	H-Point from Seat Back	141.0 - 151.0	146	Yes
E	Shoulder Pivot from Backline	97.0 - 107.0	100	Yes
F	Thigh Clearance	119.0 - 135.0	126	Yes
G	Head Breadth	140.0 - 148.0	145	Yes
H	Head Back from Backline	40.0 - 46.0	43	Yes
I	Head Depth	178.0 - 188.0	183	Yes
J	Head Circumference	541.0 - 551.0	548	Yes
K	Buttock to Knee Length	514.0 - 540.0	529	Yes
L	Popliteal Height	343.0 - 369.0	355	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	402	Yes
N	Buttock Popliteal Length	416.0 - 442.0	435	Yes
O	Chest Depth without Jacket	195.0 - 211.0	200	Yes
P	Foot Length (right)	216.0 - 232.0	222	Yes
P	Foot Length (left)	216.0 - 232.0	223	Yes
Q	Hip Breadth	313.0 - 323.0	317	Yes
R	Arm Length	249.0 - 259.0	252	Yes
S	Knee Joint to Seat back	478.0 - 493.0	481	Yes
V	Shoulder Width (only one arm installed)	341.0 - 357.0	350	Yes
W	Foot Width (right)	78.0 - 94.0	87	Yes
W	Foot Width (left)	78.0 - 94.0	87	Yes
Y	Chest Circumference with Jacket	851.0 - 881.0	877	Yes
Z	Waist Circumference	761.0 - 791.0	783	Yes

Technician: M. Goehle

Date: 11/2/2012

SID-IIIsD External Dimensions

Reference Diagram



VERIFICATION REPORT

Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	303		
Test ID:	Head Drop	Test Date:	10/31/2012
Test Number:	1	Test Time:	8:01:03 AM

Component Part Number	Component Serial Number
Head Skin - 180-1002	368

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.6 deg C P
Humidity	10 -- 70	36 %RH P
Resultant Acceleration	115.0 -- 137.0	128.6 g P
Oscillation	0.0 -- 15.0	2.8 % P
Fore-Aft Acceleration	-15.0 -- 15.0	-3.0 g P

All test parameters are within specifications

 Technician: **M. Goehle**

 Supervisor: **D. Travale**

 Test Time: **8:01:03 AM**

 Test Date: **10/31/2012**



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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	P59021	7/24/2012
Endevco	7264-2000	P52088	7/24/2012
Endevco	7264-2000	P58794	7/24/2012

Test Time: **8:01:03 AM**

Test Date: **10/31/2012**

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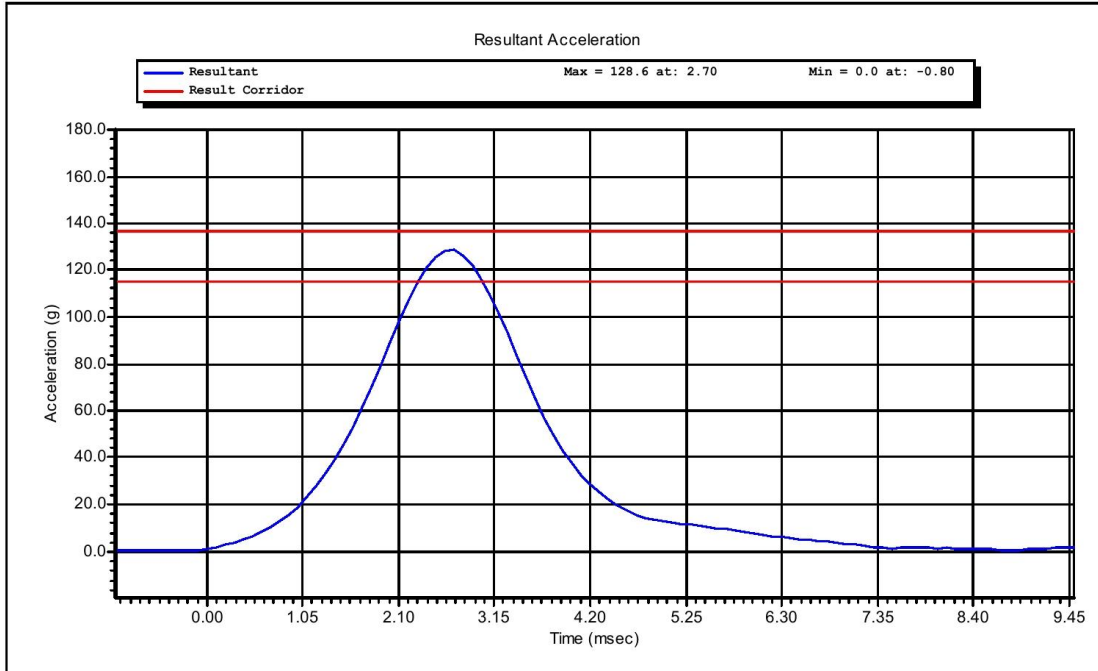


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Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	303		
Test ID:	Head Drop	Test Date:	10/31/2012
Test Number:	1	Test Time:	8:01:03 AM



Test Time: 8:01:03 AM

Test Date: 10/31/2012

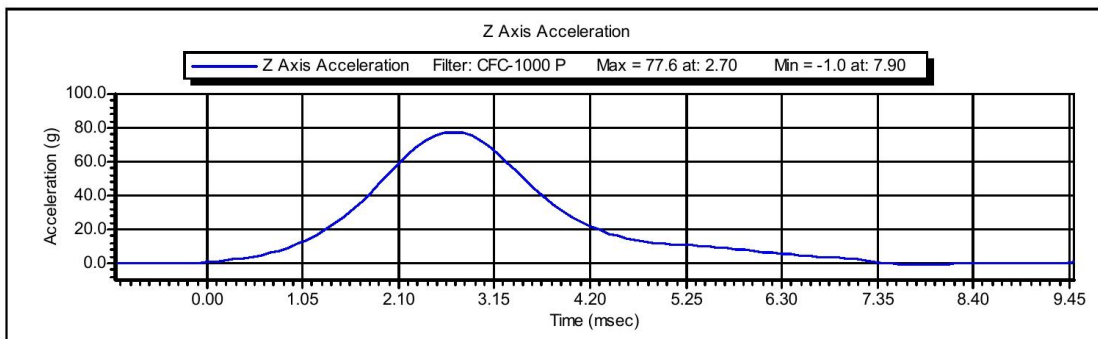
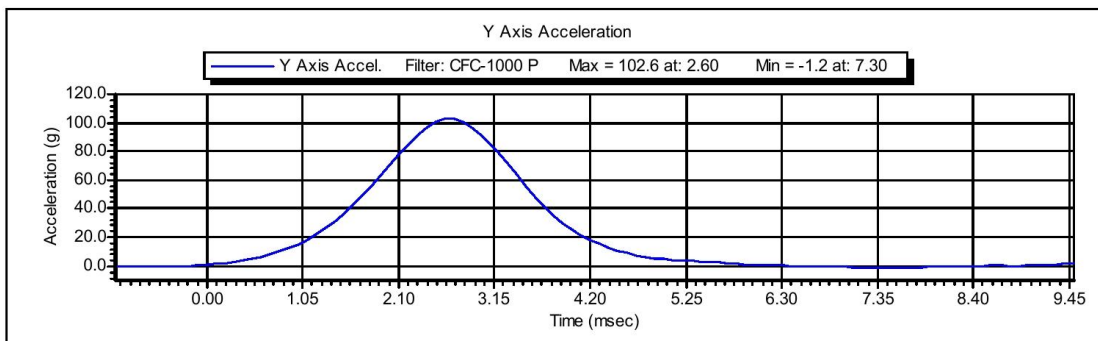
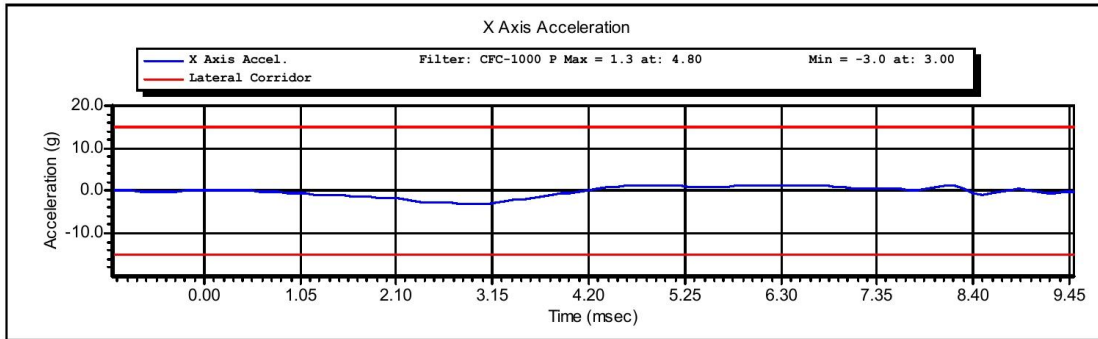
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Test Time: 8:01:03 AM

Test Date: 10/31/2012

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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-IIs		
ATD Serial Number:	303		
Test ID:	Neck Flexion	Test Date:	10/31/2012
Test Number:	1	Test Time:	9:24:26 AM

Component Part Number	Component Serial Number
Neck - 180-2000	777

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.6 deg C P
Humidity	10 -- 70	37 %RH P
Velocity	5.51 -- 5.63	5.60 m/s P
Pendulum Impulse at 10 ms	2.20 -- 2.80	2.26 m/s P
Pendulum Impulse at 15 ms	3.30 -- 4.10	3.33 m/s P
Pendulum Impulse at 20 ms	4.40 -- 5.40	4.56 m/s P
Pendulum Impulse at 25 ms	5.40 -- 6.10	5.48 m/s P
Pendulum Impulse between 25 and 100 ms	5.50 -- 6.20	5.67 m/s P
Max D Plane Rotation	71.0 -- 81.0	73.5 degrees P
Time at Max Rotation	50.0 -- 70.0	62.0 ms P
Moment about OC	-44.0 -- -36.0	-41.6 Nm P
Moment Decay to Zero	102.0 -- 126.0	119.3 ms P

All test parameters are within specifications

 Technician: **M. Goehle**

 Supervisor: **D. Travale**

 Test Time: **9:24:26 AM**

 Test Date: **10/31/2012**



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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	C15016	8/15/2012
Denton	1716A	LC-440 Fy	5/21/2012
Denton	1716A	LC-440 Mx	5/21/2012
DentonATD	78051-342	184	5/30/2012
DentonATD	78051-342	174	5/30/2012
DentonATD	78051-342	185	5/30/2012

Test Time: 9:24:26 AM

Test Date: 10/31/2012

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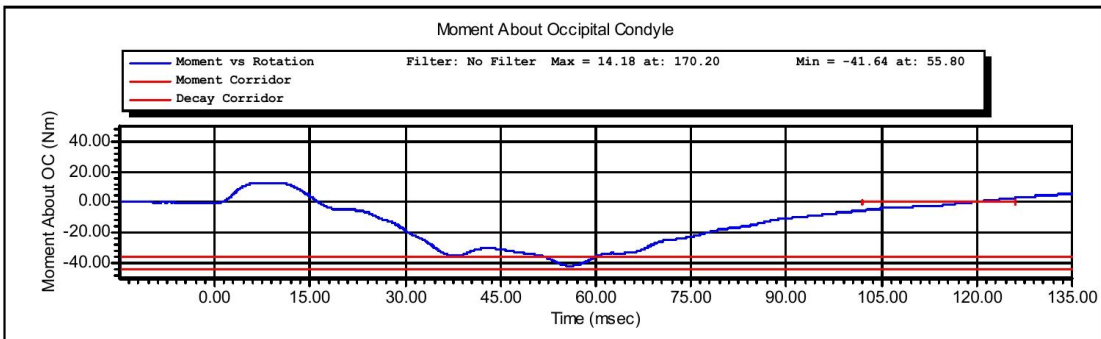
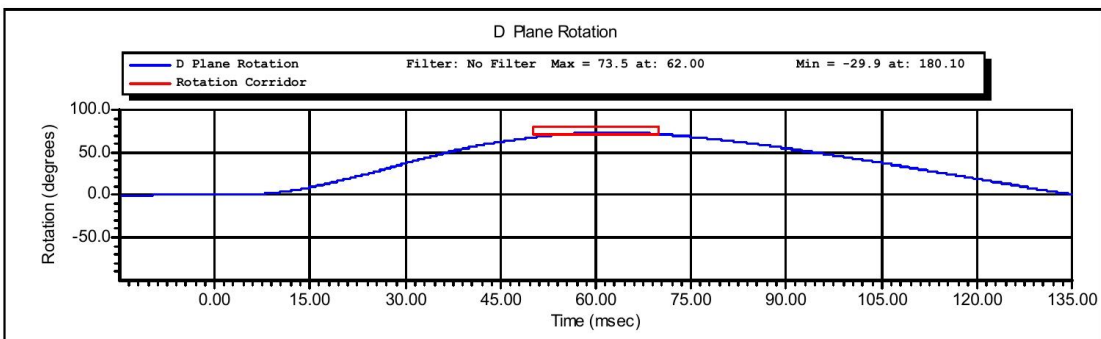


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Test Name:	Neck Pendulum	Revision:	8/24/2009
Sub Test Name:	Left Side	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	303		
Test ID:	Neck Flexion	Test Date:	10/31/2012
Test Number:	1	Test Time:	9:24:26 AM



Test Time: 9:24:26 AM

Test Date: 10/31/2012

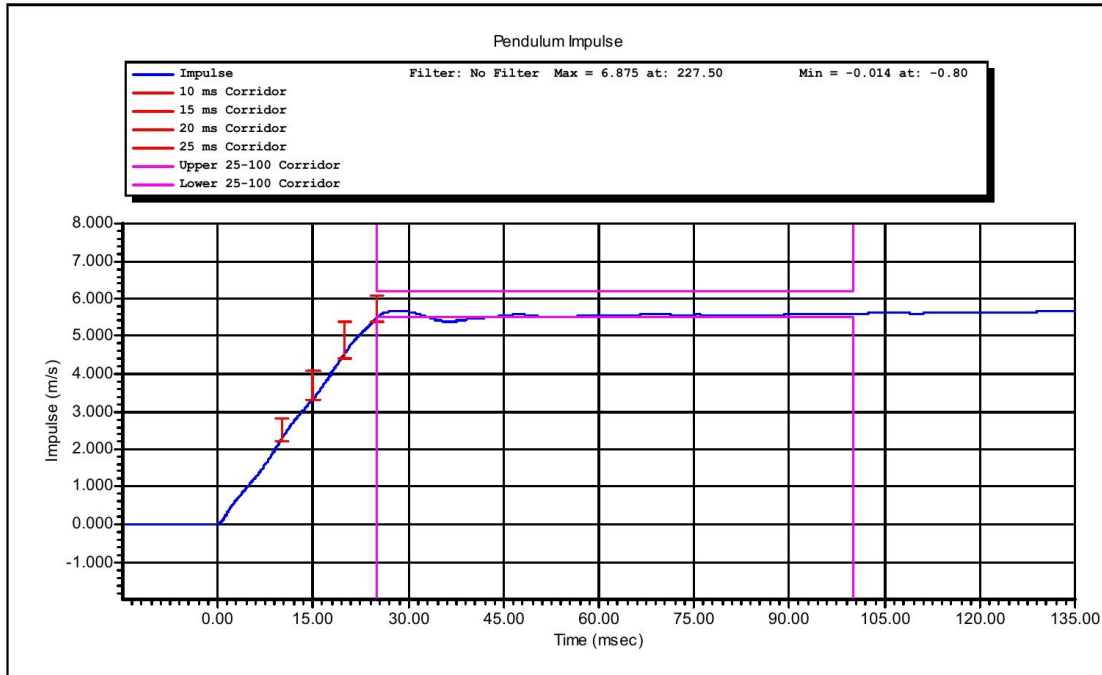
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Test Time: 9:24:26 AM

Test Date: 10/31/2012

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VERIFICATION REPORT

Test Name:	Shoulder Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	303		
Test ID:		Test Date:	11/1/2012
Test Number:	1	Test Time:	3:19:50 PM

Component Part Number	Component Serial Number
Left Arm 180-6011-1	951

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.10 deg C P
Humidity	10.0 -- 70.0	34.0 %RH P
Velocity	4.20 -- 4.40	4.32 m/s P
Probe Acceleration	13.0 -- 18.0	15.6 g P
Shoulder Deflection	28.0 -- 37.0	30.81 mm P
T1 Acceleration	17.0 -- 22.0	20.2 g P

All test parameters are within specifications

Technician: **M. Goehle**

Supervisor: **D. Travale**

Test Time: **3:19:50 PM**

Test Date: **11/1/2012**



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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	5/25/2012
Servo	180-3885	DS-1179	10/25/2012
Endevco	7264-2000	P63315	10/26/2012

Test Time: 3:19:50 PM

Test Date: 11/1/2012

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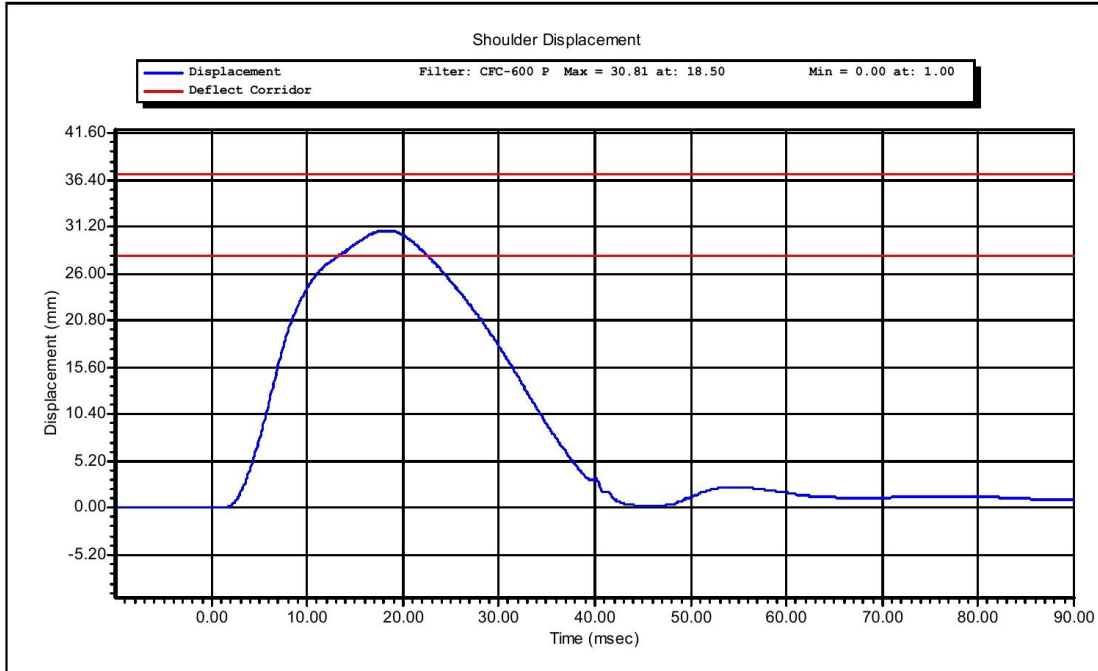


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Test Name:	Shoulder Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	303		
Test ID:		Test Date:	11/1/2012
Test Number:	1	Test Time:	3:19:50 PM



Test Time: 3:19:50 PM

Test Date: 11/1/2012

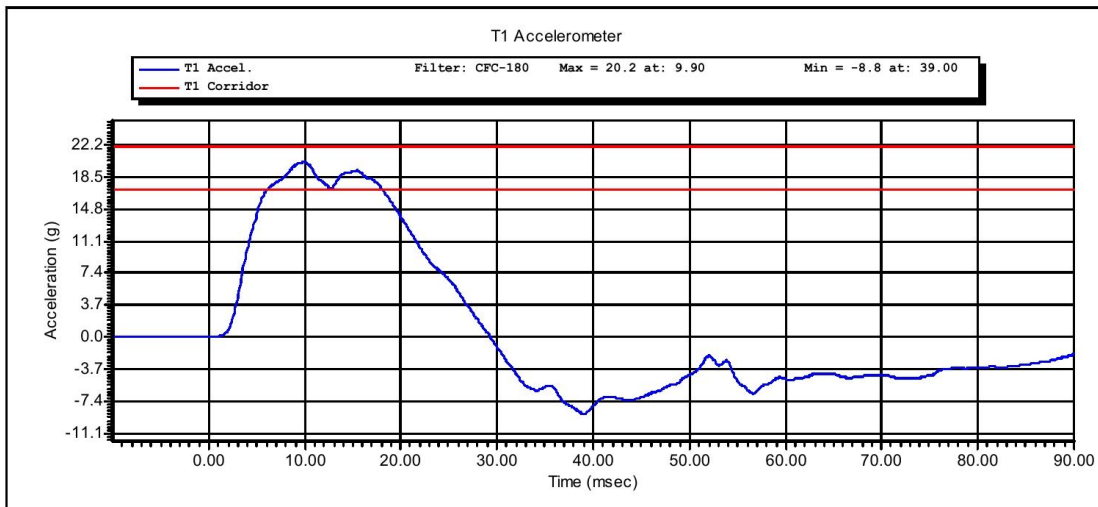
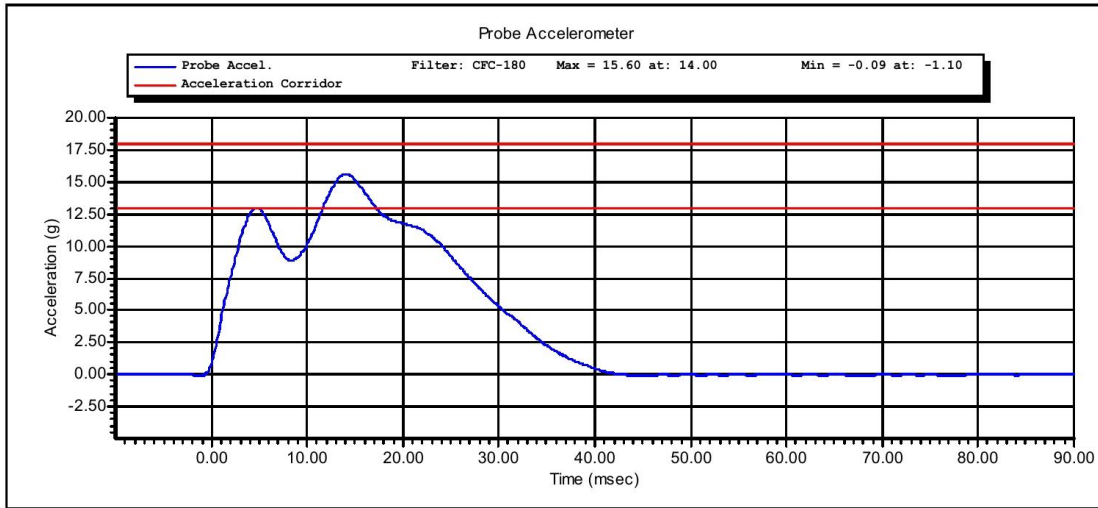
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Test Time: 3:19:50 PM

Test Date: 11/1/2012

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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-IIs		
ATD Serial Number:	303		
Test ID:		Test Date:	11/1/2012
Test Number:	1	Test Time:	3:57:47 PM

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

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.9 deg C P
Humidity	10 -- 70	34 %RH P
Velocity	4.20 -- 4.40	4.34 m/s P
Probe Acceleration	14.0 -- 18.0	16.2 g P
Upper Thorax Rib Deflection	32.0 -- 40.0	35.4 mm P
Mid Thorax Rib Deflection	39.0 -- 45.0	40.9 mm P
Lower Thorax Rib Deflection	35.0 -- 43.0	37.6 mm P
Upper Spine Acceleration T1	13.0 -- 17.0	15.0 g P
Lower Spine Acceleration T12	7.0 -- 11.0	9.6 g P

All test parameters are within specifications

Technician: **M. Goehle**

Supervisor: **D. Travale**

Test Time: **3:57:47 PM**

Test Date: **11/1/2012**



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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	5/25/2012
Servo	180-3885	DS-1199	10/25/2012
Servo	180-3885	DS-1246	10/24/2012
Servo	180-3885	DS-1256	10/25/2012
Endevco	7264-2000	P63315	10/26/2012
Endevco	7264-2000	P63861	10/25/2012

Test Time: 3:57:47 PM

Test Date: 11/1/2012

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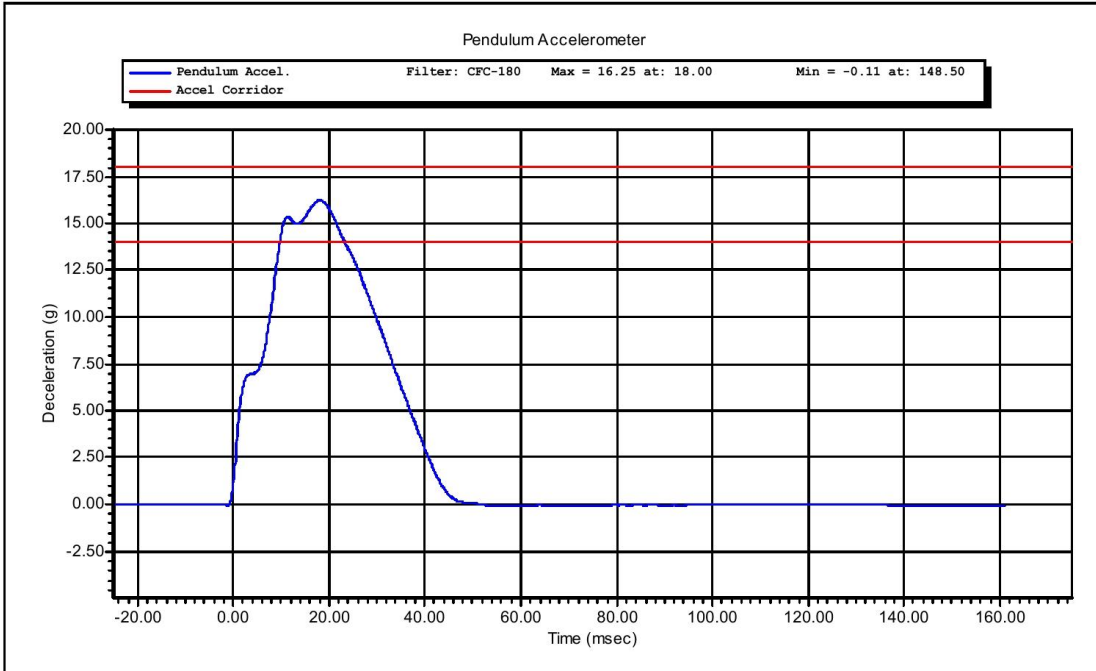


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Test Name:	Thorax Impact without Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	303		
Test ID:		Test Date:	11/1/2012
Test Number:	1	Test Time:	3:57:47 PM



Test Time: 3:57:47 PM

Test Date: 11/1/2012

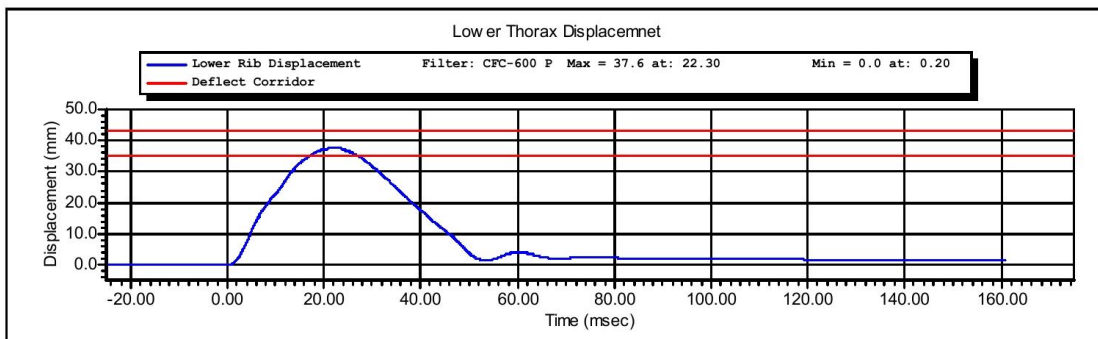
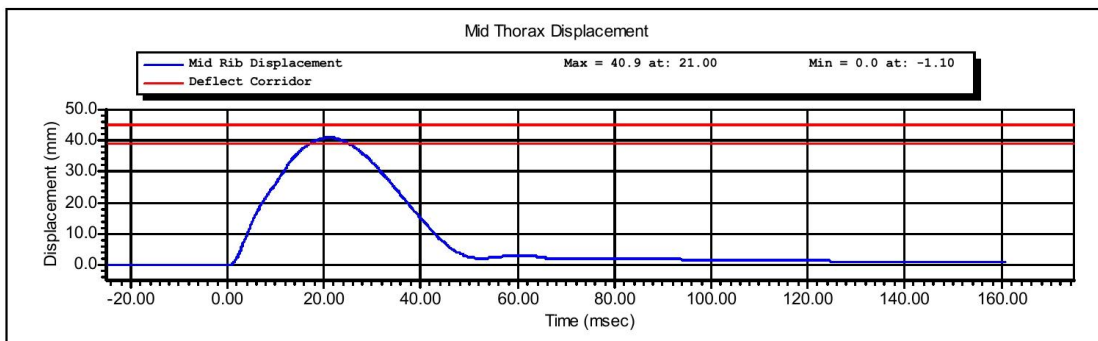
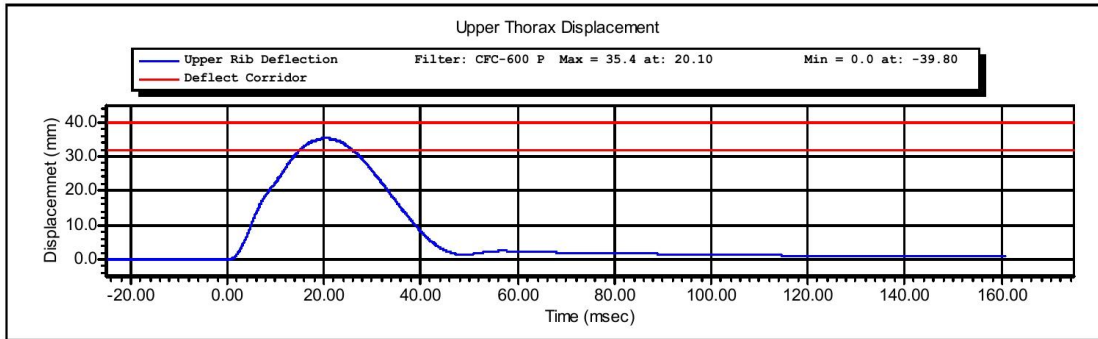
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Test Time: 3:57:47 PM

Test Date: 11/1/2012

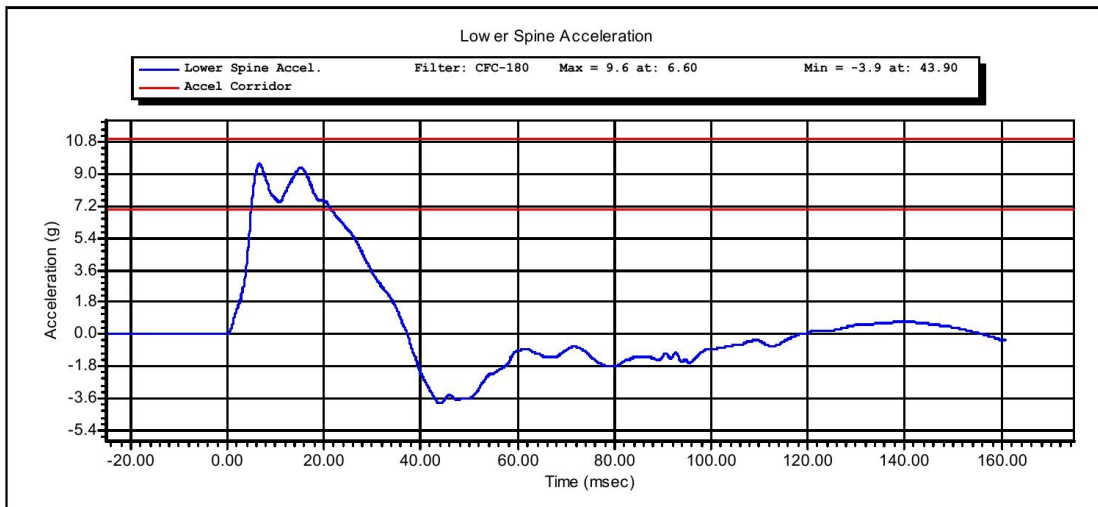
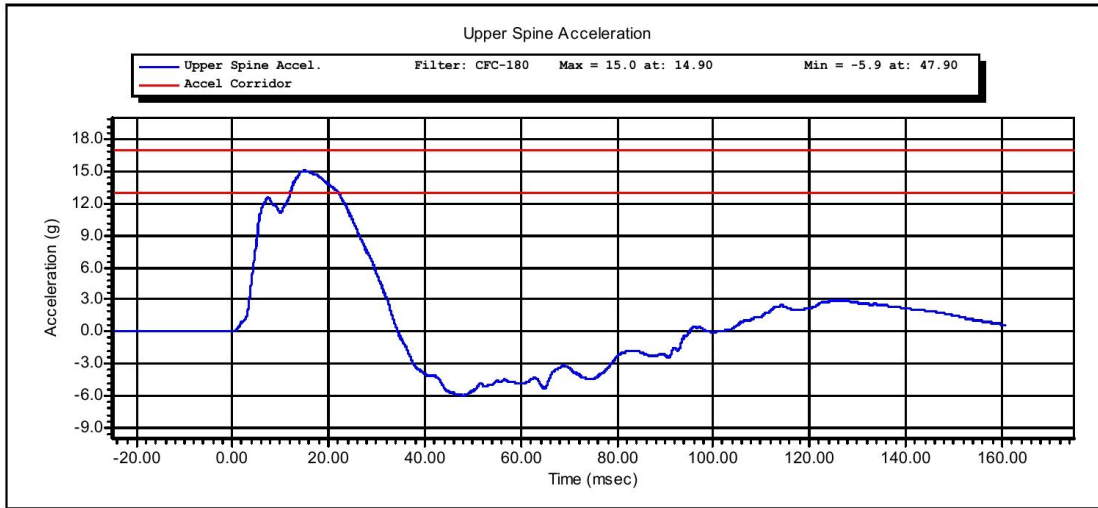
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Test Time: 3:57:47 PM

Test Date: 11/1/2012

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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-IIs		
ATD Serial Number:	303		
Test ID:	Thorax W/Arm	Test Date:	11/1/2012
Test Number:	3	Test Time:	2:31:36 PM

Component Part Number	Component Serial Number
Left Arm 180-6011-1	951

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.5 deg C P
Humidity	10 -- 70	36 %RH P
Velocity	6.60 -- 6.80	6.70 m/s P
Probe Acceleration after 5ms	30.0 -- 36.0	34.4 g P
Upper Thorax Rib Deflection	25.0 -- 32.0	26.40 mm P
Mid Thorax Rib Deflection	30.0 -- 36.0	30.72 mm P
Lower Thorax Rib Deflection	32.0 -- 38.0	32.00 mm P
Upper Spine Acceleration ("y")	34.0 -- 43.0	38.8 g P
Lower Spine Acceleration ("y")	29.0 -- 37.0	36.7 g P
Shoulder Deflection	31.0 -- 40.0	36.79 mm P

All test parameters are within specifications

Technician: **M. Goehle**

Supervisor: **D. Travale**

Test Time: **2:31:36 PM**

Test Date: **11/1/2012**



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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	5/25/2012
Servo	180-3885	DS-1199	10/25/2012
Servo	180-3885	DS-1246	10/24/2012
Servo	180-3885	DS-1256	10/25/2012
Endevco	7264-2000	P63315	10/26/2012
Endevco	7264-2000	P63861	10/25/2012
Servo	180-3885	DS-1179	10/25/2012

Test Time: 2:31:36 PM

Test Date: 11/1/2012

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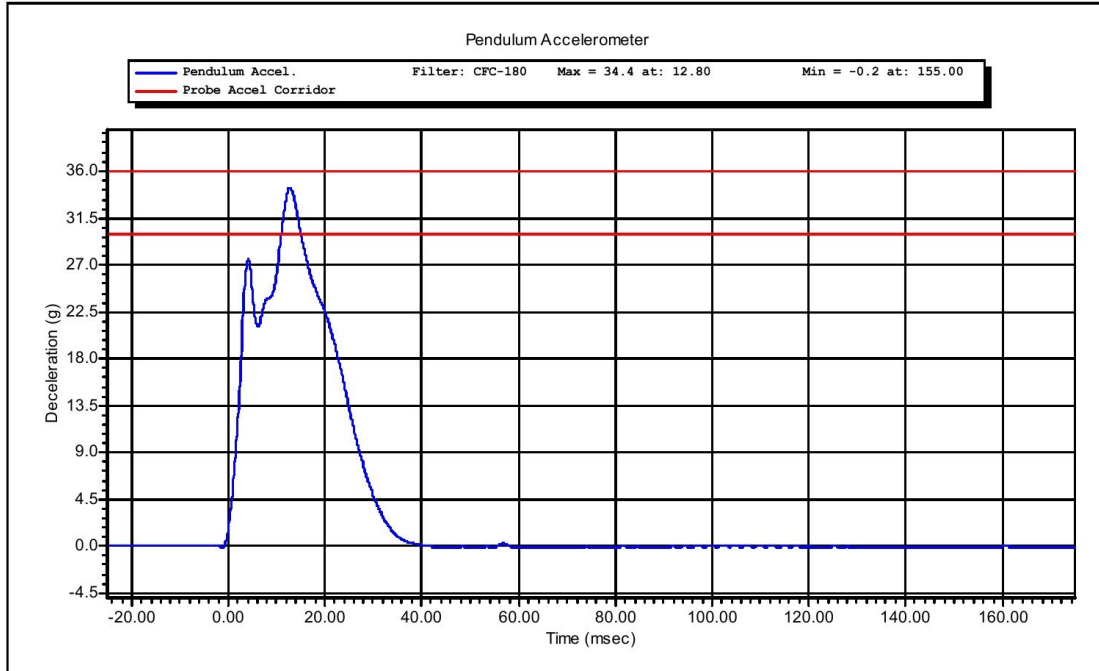


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Test Name:	Thorax Impact with Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	303		
Test ID:	Thorax W/Arm	Test Date:	11/1/2012
Test Number:	3	Test Time:	2:31:36 PM



Test Time: 2:31:36 PM

Test Date: 11/1/2012

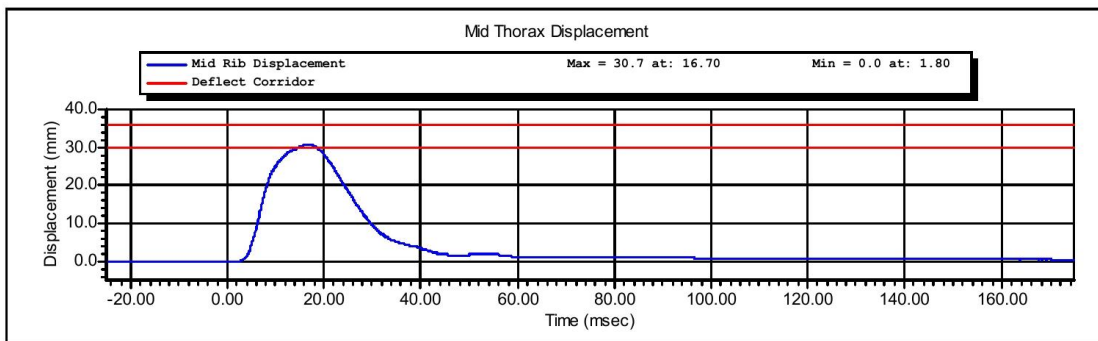
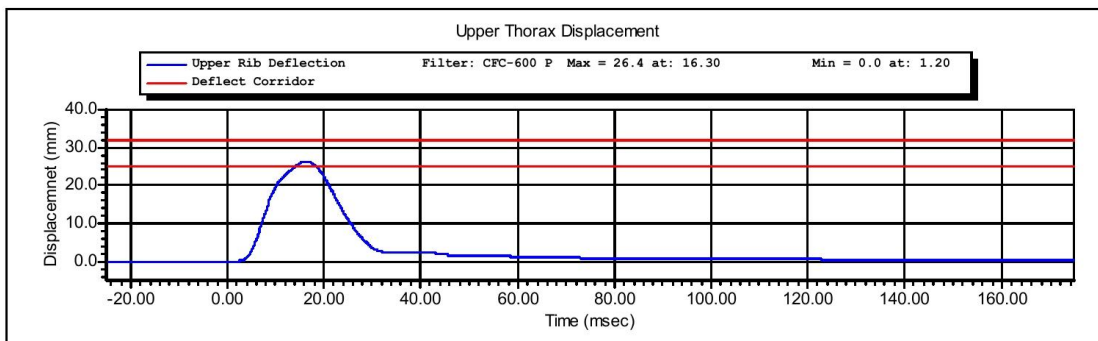
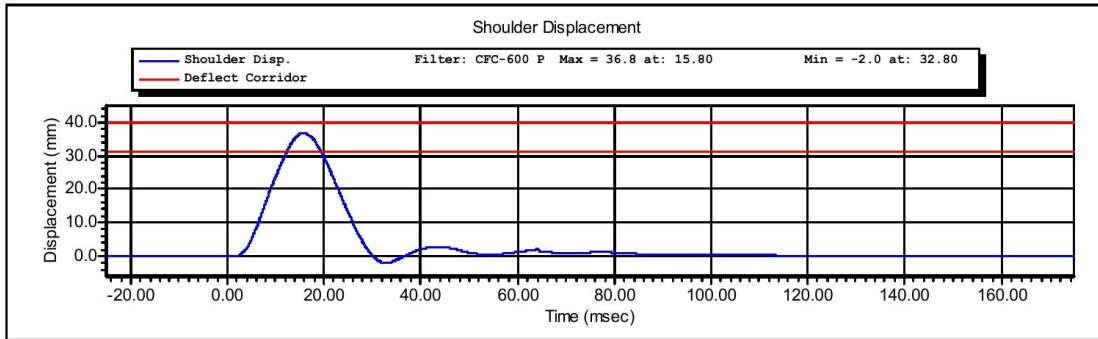
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Test Time: 2:31:36 PM

Test Date: 11/1/2012

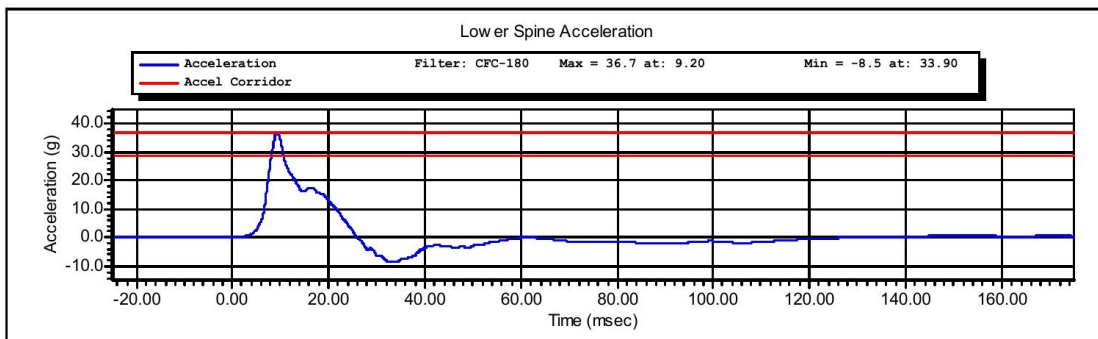
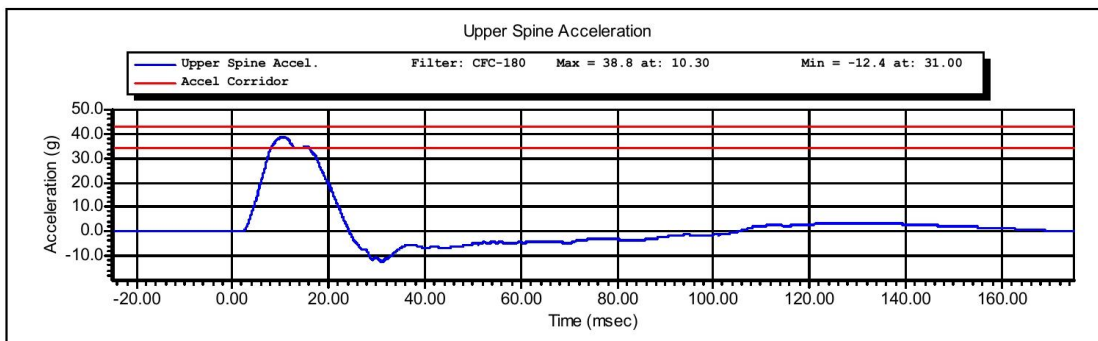
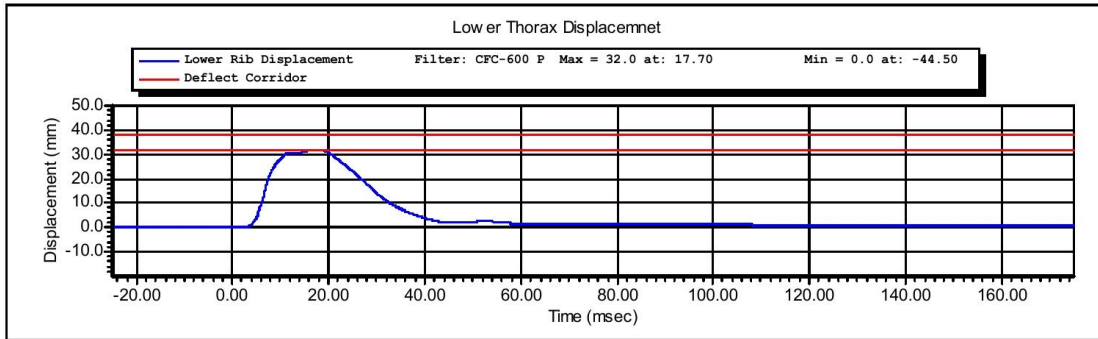
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Test Time: 2:31:36 PM

Test Date: 11/1/2012

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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:	303		
Test ID:	Abdomen	Test Date:	11/2/2012
Test Number:	1	Test Time:	9:14:06 AM

Component Part Number	Component Serial Number
Upper Abdomen Rib	1789
Lower Abdomen Rib	1790

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.4 deg C P
Humidity	10 -- 70	28 %RH P
Velocity	4.20 -- 4.40	4.32 m/s P
Probe Acceleration	12.0 -- 16.0	15.3 g P
Upper Abdominal Rib Deflection	36.0 -- 47.0	37.1 mm P
Lower Abdominal Rib Deflection	33.0 -- 44.0	37.7 mm P
Lower Spine Acceleration - T12	9.0 -- 14.0	12.2 g P

All test parameters are within specifications

Technician: **M. Goehle**Supervisor: **D. Travale**Test Time: **9:14:06 AM**Test Date: **11/2/2012**



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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	5/25/2012
Servo	180-3885	DS-1274	10/24/2012
Servo	180-3885	DS-1285	10/25/2012
Endevco	7264-2000	P63861	10/25/2012

Test Time: 9:14:06 AM

Test Date: 11/2/2012

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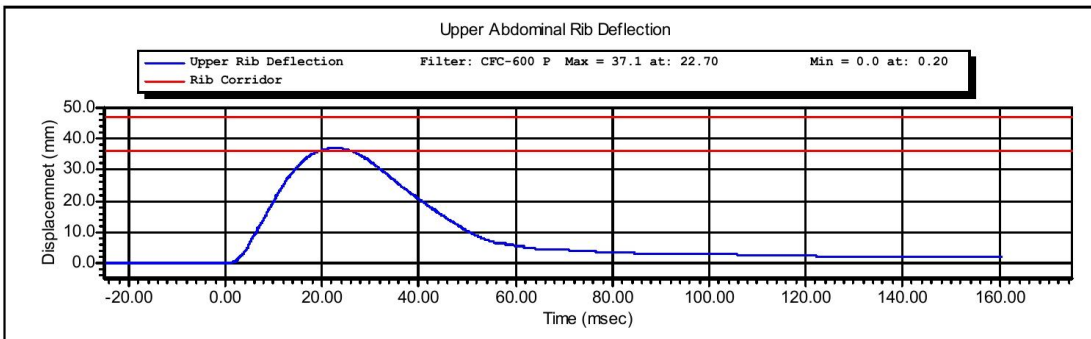
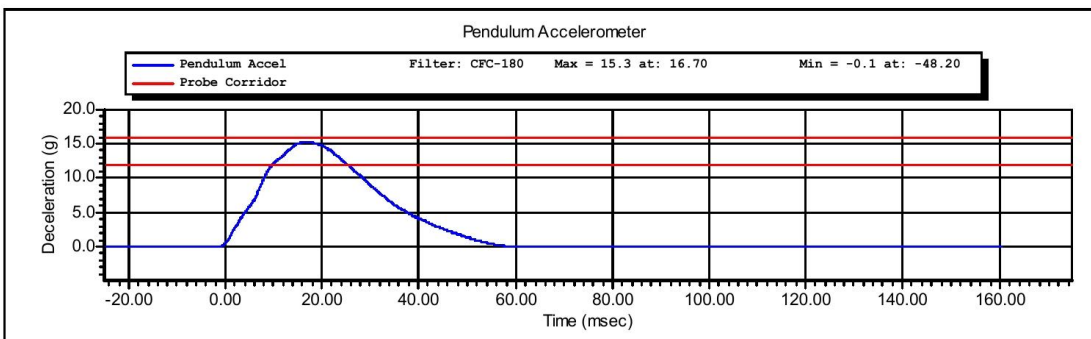


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Test Name:	Abdominal Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	303		
Test ID:	Abdomen	Test Date:	11/2/2012
Test Number:	1	Test Time:	9:14:06 AM



Test Time: 9:14:06 AM

Test Date: 11/2/2012

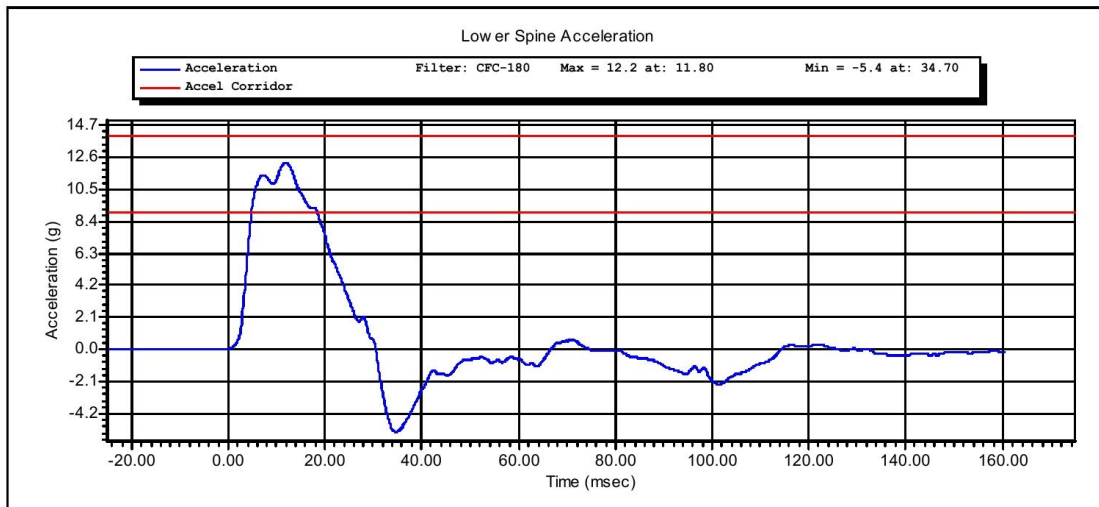
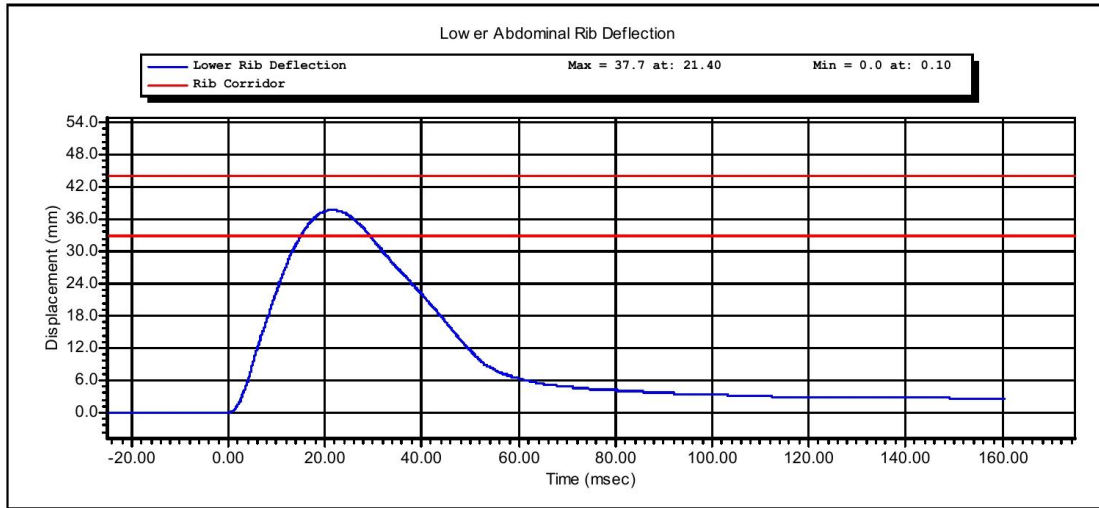
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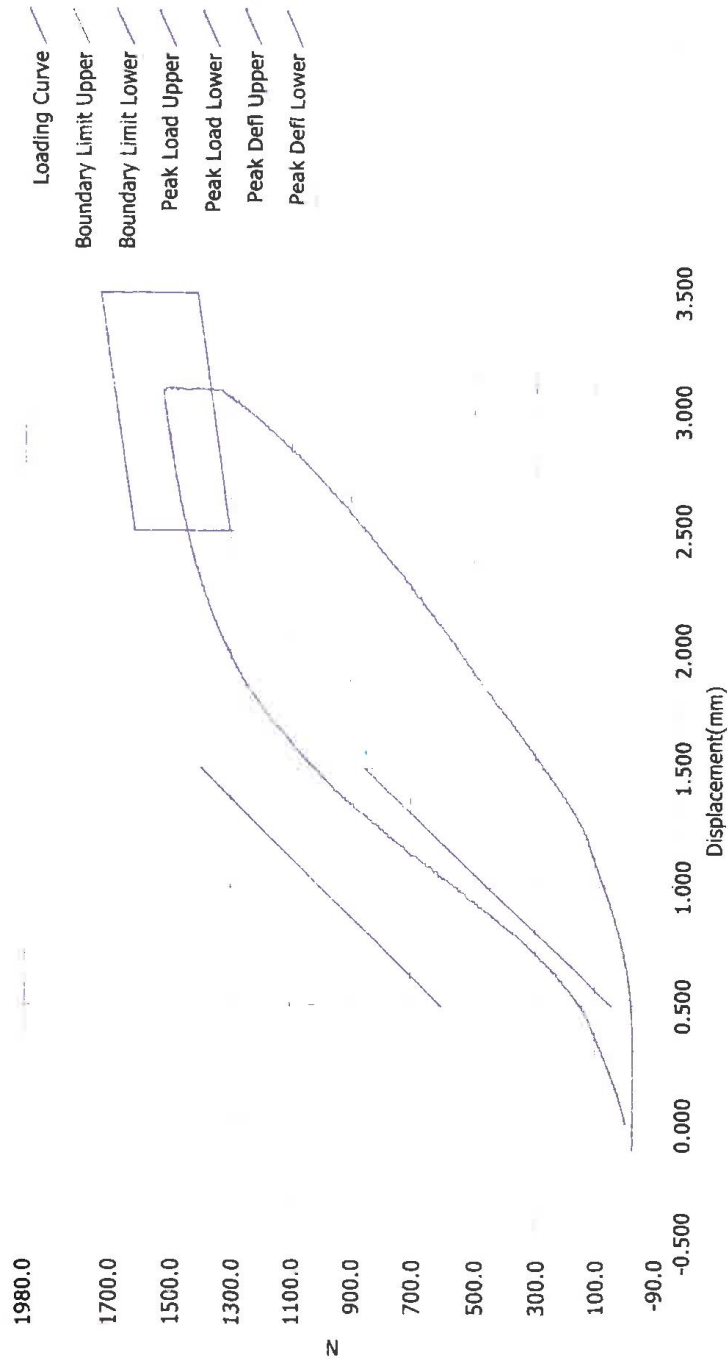


Test Time: 9:14:06 AM

Test Date: 11/2/2012

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Resultant Data - SIDIIs Plug Compression



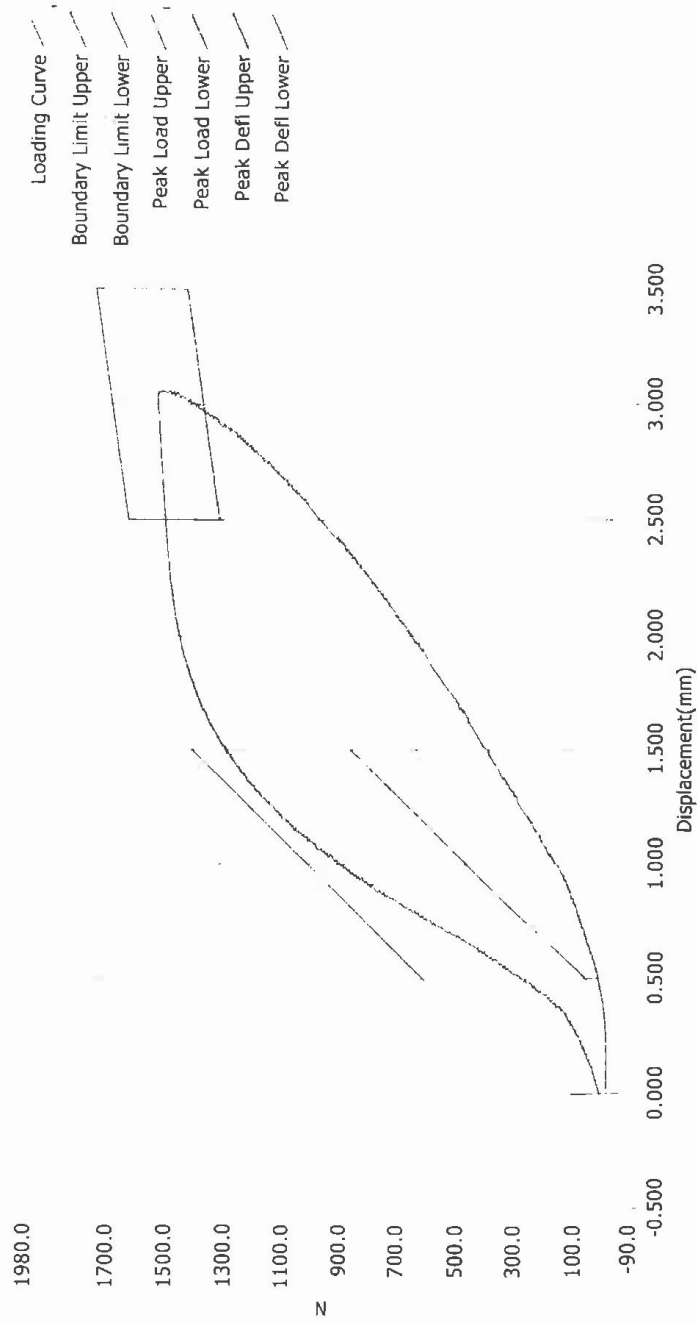
ATD Calibration Lab

303 Crash 11/9/12

Test ID	Part Serial Number	Test Date	Test Time
Cert ID	46460	9/22/2011	8:32 PM
	ATD Serial Number	ATD Type	
	N/A	SIDIIs	

Current Date : 9/22/2011 Current Time : 20:32:36

Resultant Data - SIDIIs Plug Compression



ATD Calibration Lab

303 Rev Cert 11/9/12

Test ID	Part Serial Number	Test Date	Test Time
Cert ID	ATD Serial Number	9/22/2010	12:45 PM
	36310	ATD Type	
		SIDIIs	

Current Date : 9/22/2010 Current Time : 12:46:33

VERIFICATION REPORT

Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Acetabulum Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	303		
Test ID:	Pelvis Acetabulum	Test Date:	11/2/2012
Test Number:	2	Test Time:	1:14:12 PM

Component Part Number	Component Serial Number
FTSS Cert Plug - 1512N	36310
Humanetics Crash Plug - 1513N	46460

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.1 deg C P
Humidity	10 -- 70	24 %RH P
Velocity	6.60 -- 6.80	6.60 m/s P
Peak Probe Acceleration	38.0 -- 47.0	43.7 g P
Peak Pelvis Acceleration	34.0 -- 42.0	41.7 g P
Peak Acetabulum Force	3.60 -- 4.30	3.84 kN P

All test parameters are within specifications

Technician: **M. Goehle**

Supervisor: **D. Travale**

Test Time: **1:14:12 PM**

Test Date: **11/2/2012**



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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	5/25/2012
Endevco	7264-2000	P51259	7/30/2012
FTSS	IF-520	LC-236 Fy	10/25/2012

Test Time: 1:14:12 PM

Test Date: 11/2/2012

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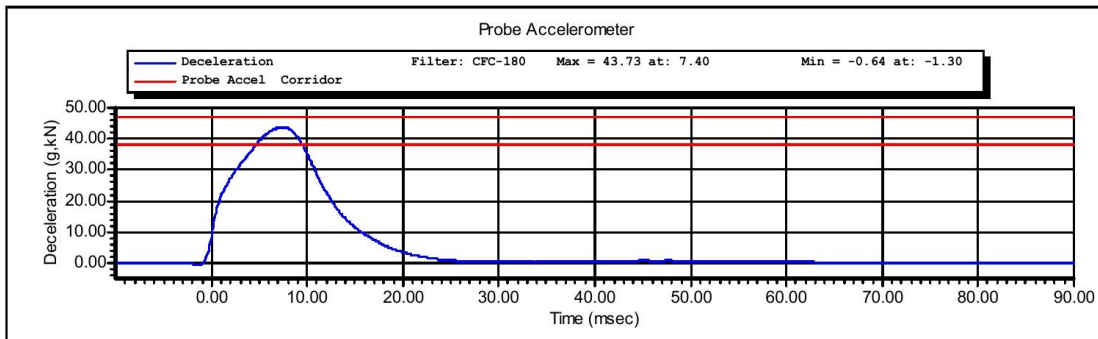
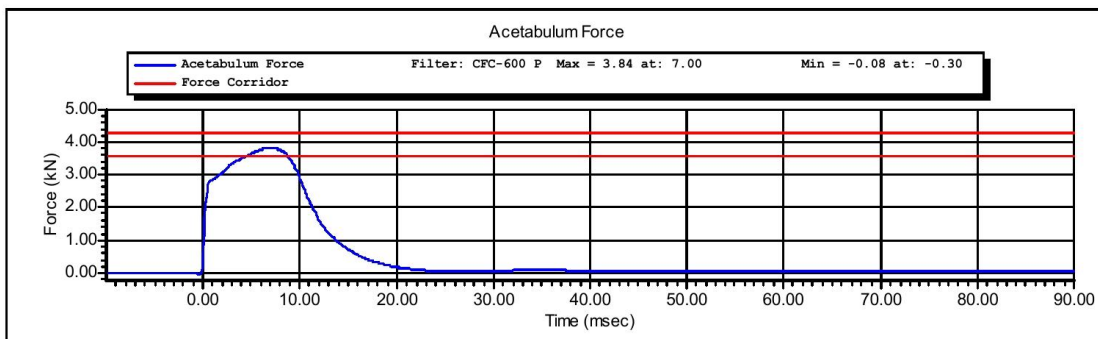


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Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Acetabulum Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	303		
Test ID:	Pelvis Acetabulum	Test Date:	11/2/2012
Test Number:	2	Test Time:	1:14:12 PM



Test Time: **1:14:12 PM**

Test Date: **11/2/2012**

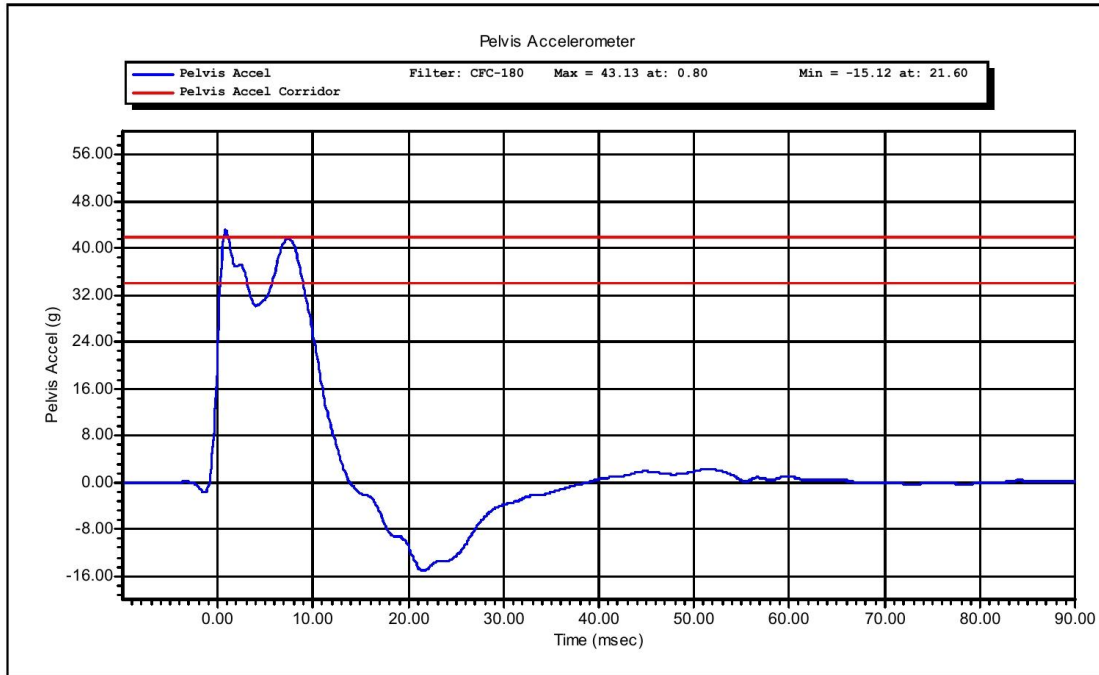
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Test Time: 1:14:12 PM

Test Date: 11/2/2012

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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:	303		
Test ID:	Pelvis Iliac Impact	Test Date:	10/31/2012
Test Number:	1	Test Time:	11:11:08 AM

Component Part Number	Component Serial Number
180-4343 Pelvis Flesh	881

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	30 %RH P
Velocity	4.20 -- 4.40	4.33 m/s P
Peak Probe Acceleration	36.0 -- 45.0	41.7 g P
Peak Pelvis Acceleration	28.0 -- 39.0	36.5 g P
Peak Iliac Force	4.10 -- 5.10	4.69 kN P

All test parameters are within specifications

Technician: **M. Goehle**

Supervisor: **D. Travale**

Test Time: **11:11:08 AM**

Test Date: **10/31/2012**



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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	5/25/2012
Endevco	7264-2000	P51259	7/30/2012
DentonATD	3228J	LC-280 Fy	10/24/2012

Test Time: 11:11:08 AM

Test Date: 10/31/2012

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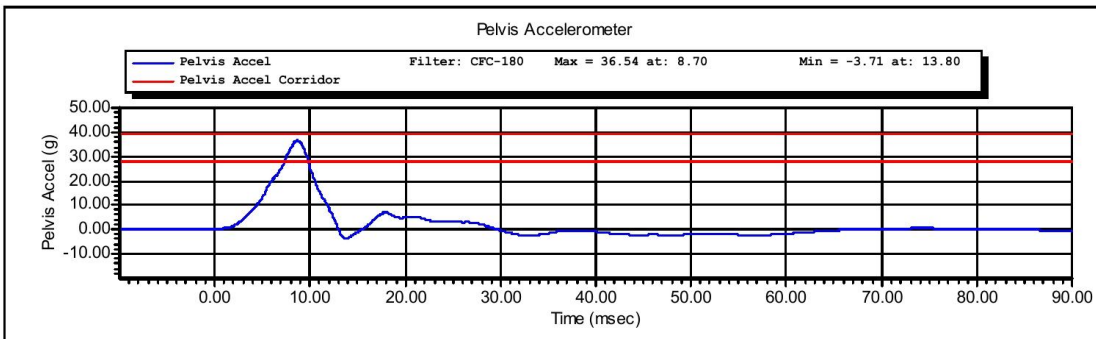
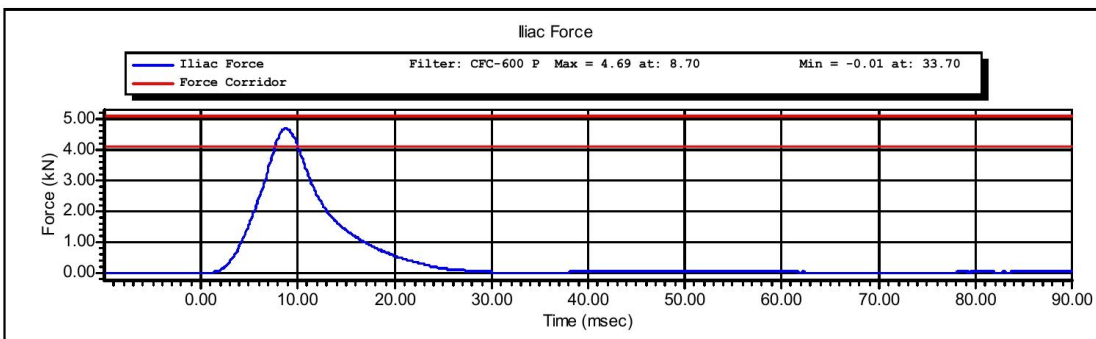


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Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Iliac Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	303		
Test ID:	Pelvis Iliac Impact	Test Date:	10/31/2012
Test Number:	1	Test Time:	11:11:08 AM



Test Time: 11:11:08 AM

Test Date: 10/31/2012

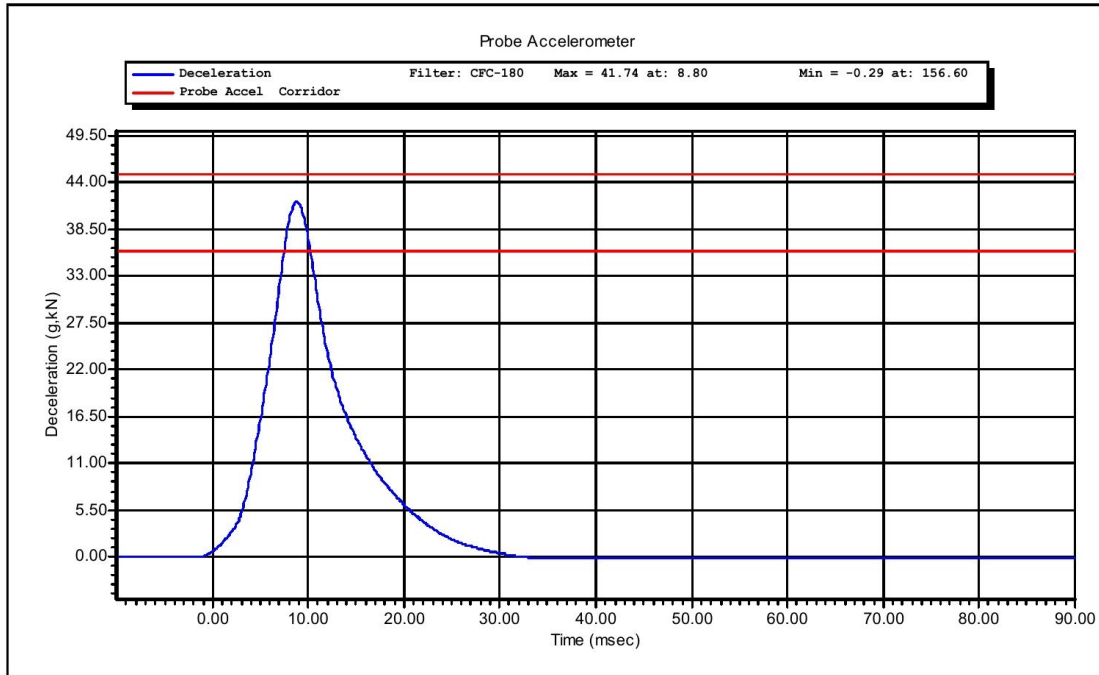
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Test Time: 11:11:08 AM

Test Date: 10/31/2012

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CALIBRATION TEST RESULTS

POST-TEST

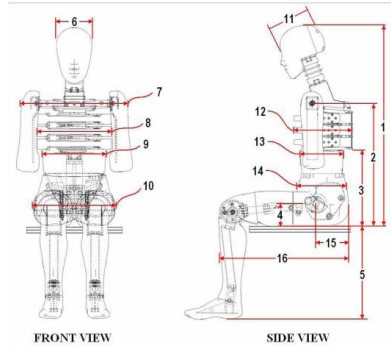
EUROSID 2 (ES-2RE) MALE – DRIVER ATD

SERIAL NO: F033

(CONFIGURED FOR LEFT SIDE IMPACT)

ES-2re External Measurements

NHTSA SN F033



Dim. No.	Description	Specification (mm)	Result (mm)	Pass/Fail
1	Sitting Height	900-918	915	Pass
2	Seat to Shoulder Joint	558-572	564	Pass
3	Seat to Lower Face of Thoracic Spine Box	346-356	354	Pass
4	Seat to Hip Joint (center of bolt)	97-103	100	Pass
5	Sole to Seat, Sitting	433-451	444	Pass
6	Head Width	152-158	155	Pass
7	Shoulder/Arm Width	461-479	465	Pass
8	Thorax Width	322-332	326	Pass
9	Abdomen Width	273-287	284	Pass
10	Pelvis Lap Width	359-373	367	Pass
11	Head Depth	196-206	199	Pass
12	Thorax Depth	262-272	270	Pass
13	Abdomen Depth	194-204	200	Pass
14	Pelvis Depth	235-245	237	Pass
15	Back of Buttocks to Hip Joint (center of bolt)	150-160	155	Pass
16	Back of Buttocks to Front Knee	597-615	601	Pass

Technician: M. Goehle

Date: 11/15/12

VERIFICATION REPORT

Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Head Drop	Test Date:	11/15/2012
Test Number:	1	Test Time:	7:43:26 AM

Component Part Number	Component Serial Number
455-1007	1910934

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.0 deg C P
Humidity	10 -- 70	23 %RH P
Resultant Acceleration	125 -- 155	142 g P
Oscillation	0.0 -- 15.0	3.1 % P
Fore-Aft Acceleration	-15.00 -- 15.00	8.09 g P

All test parameters are within specifications

Technician: **M. Goehle**

Supervisor: **D. Travale**

Test Time: **7:43:26 AM**

Test Date: **11/15/2012**



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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	P49204	7/30/2012
Endevco	7264-2000	P63981	5/23/2012
Endevco	7264-2000	P64007	5/23/2012

Test Time: 7:43:26 AM

Test Date: 11/15/2012

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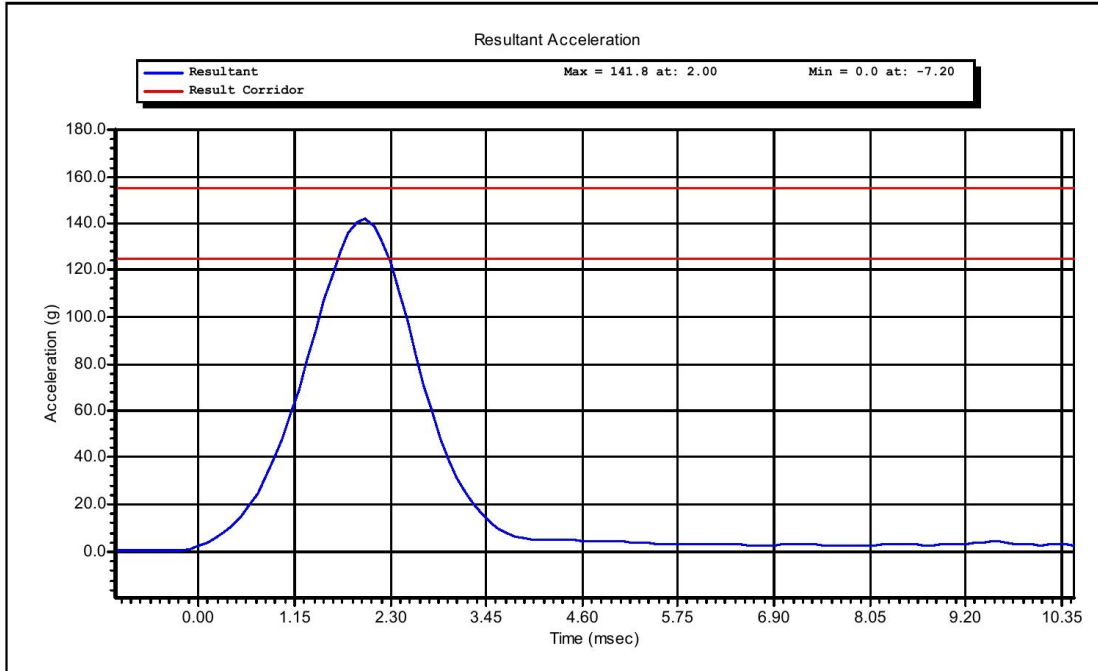


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Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Head Drop	Test Date:	11/15/2012
Test Number:	1	Test Time:	7:43:26 AM



Test Time: 7:43:26 AM

Test Date: 11/15/2012

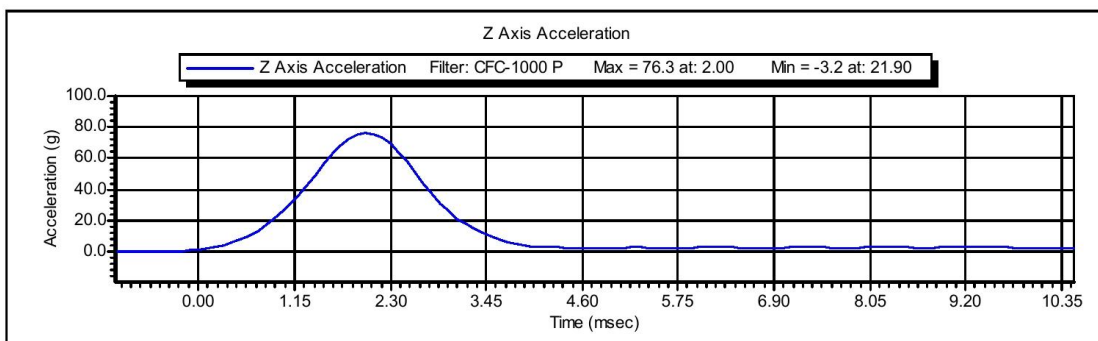
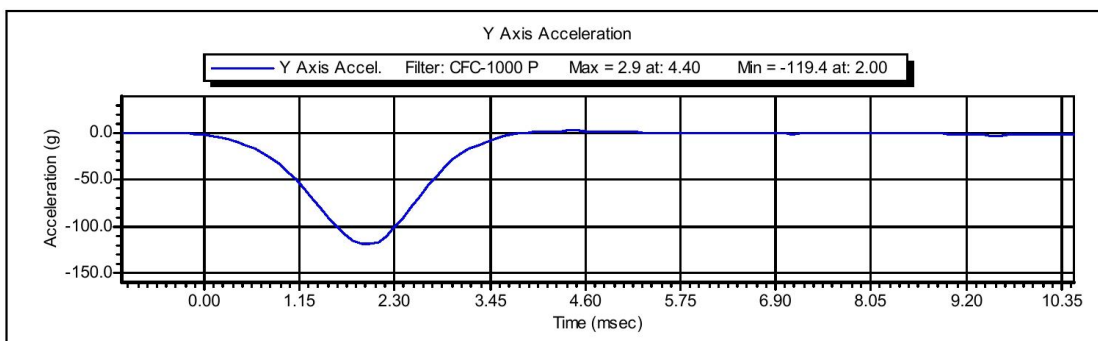
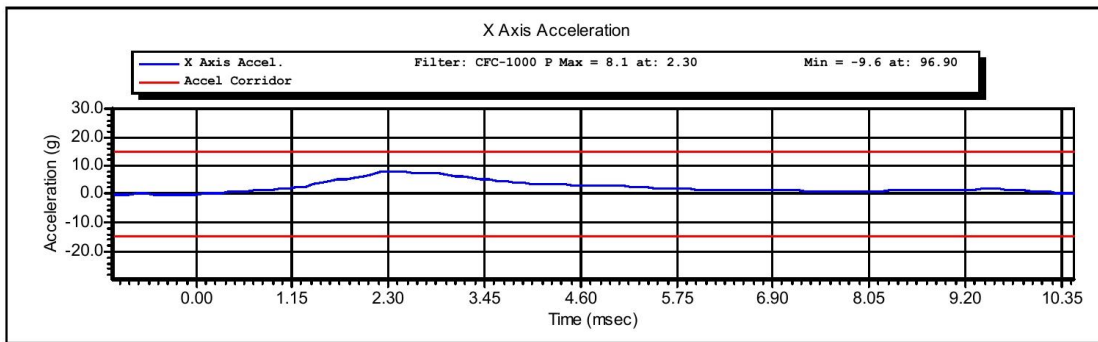
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Test Time: 7:43:26 AM

Test Date: 11/15/2012

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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:	F033		
Test ID:		Test Date:	11/14/2012
Test Number:	1	Test Time:	3:30:26 PM

Component Part Number	Component Serial Number
455-2002	175-200107085

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.9 deg C P
Humidity	10 -- 70	25 %RH P
Velocity	3.30 -- 3.50	3.44 m/s P
Maximum Neck Flexion Angle	49.0 -- 59.0	50.4 degrees P
Time At Maximum Neck Flexion	54.0 -- 66.0	59.7 ms P
Decay to Zero Degrees	53.0 -- 88.0	58.8 ms P
Velocity Corridor	--	P

All test parameters are within specifications

Technician: **A. Rudniski**

Supervisor: **D. Travale**

Test Time: **3:30:26 PM**

Test Date: **11/14/2012**



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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	C15016	8/15/2012
DentonATD	7000428	094	5/30/2012
DentonATD	7000428	095	5/30/2012
DentonATD	7000428	093	5/30/2012

Test Time: 3:30:26 PM

Test Date: 11/14/2012

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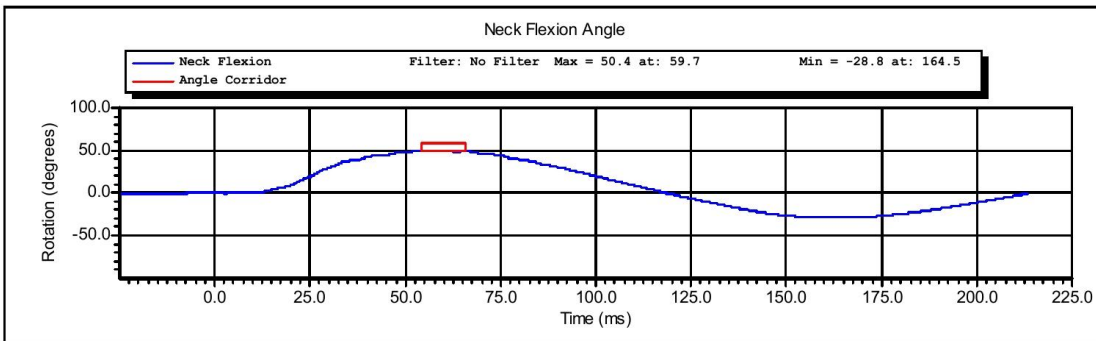
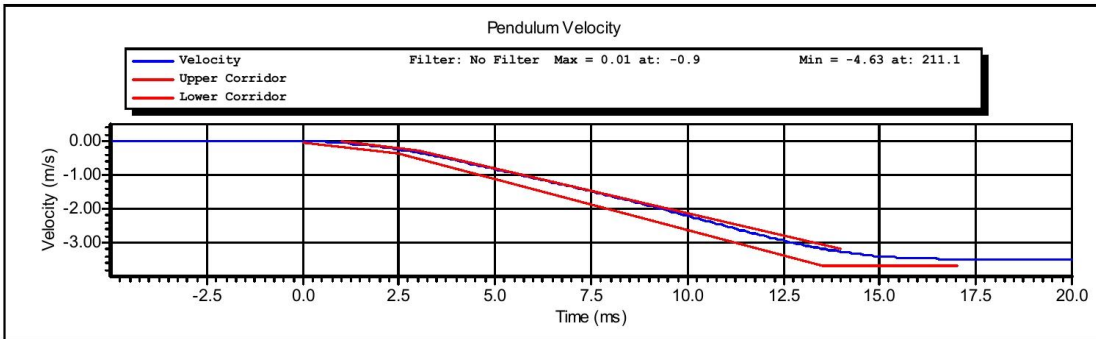


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Test Name:	Neck Flexion	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:		Test Date:	11/14/2012
Test Number:	1	Test Time:	3:30:26 PM



Test Time: 3:30:26 PM

Test Date: 11/14/2012

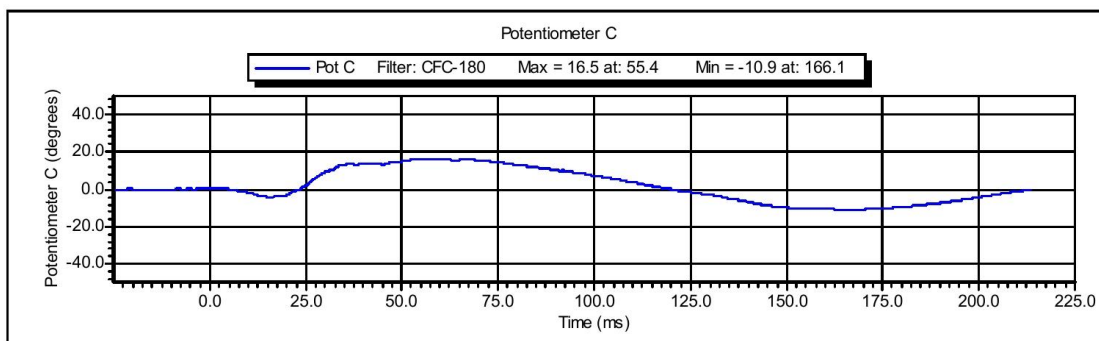
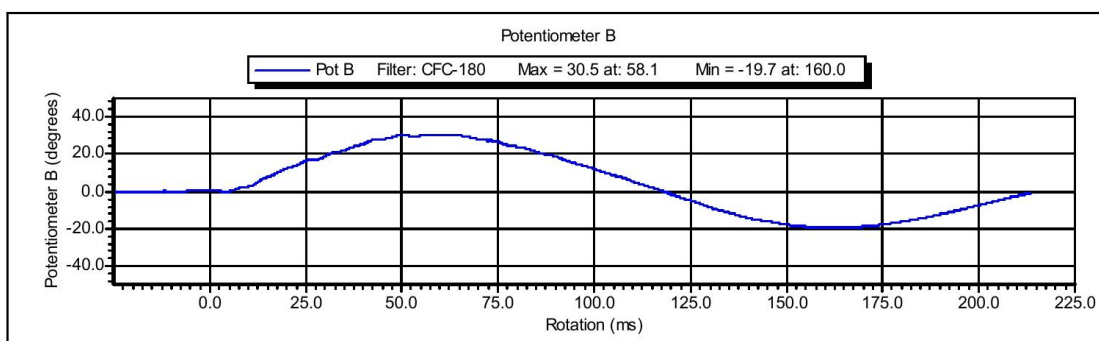
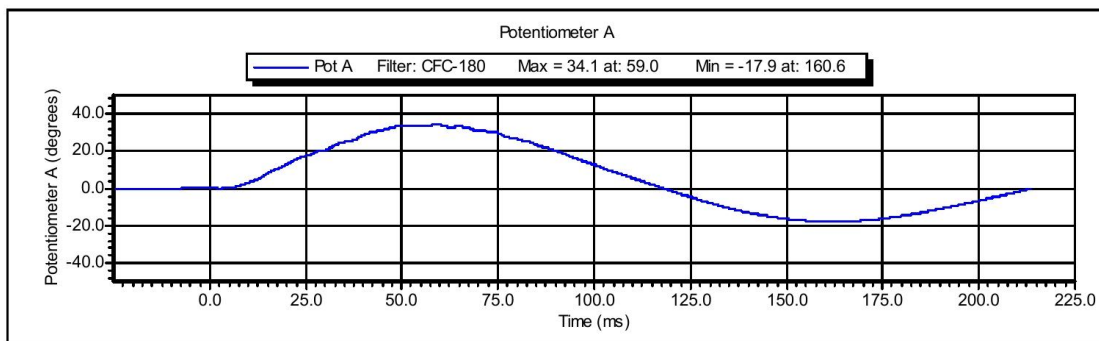
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Test Time: 3:30:26 PM

Test Date: 11/14/2012

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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:	F033		
Test ID:		Test Date:	11/14/2012
Test Number:	1	Test Time:	2:12:00 PM

Component Part Number	Component Serial Number
960715-313	07021

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.1 deg C P
Humidity	10.0 -- 70.0	24.0 %RH P
Velocity	4.20 -- 4.40	4.25 m/s P
Pendulum Acceleration	-10.50 -- -7.50	-9.27 g P

All test parameters are within specifications

Technician: **A. Rudniski**

Supervisor: **D. Travale**

Test Time: **2:12:00 PM**

Test Date: **11/14/2012**



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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	5/25/2012

Test Time: 2:12:00 PM

Test Date: 11/14/2012

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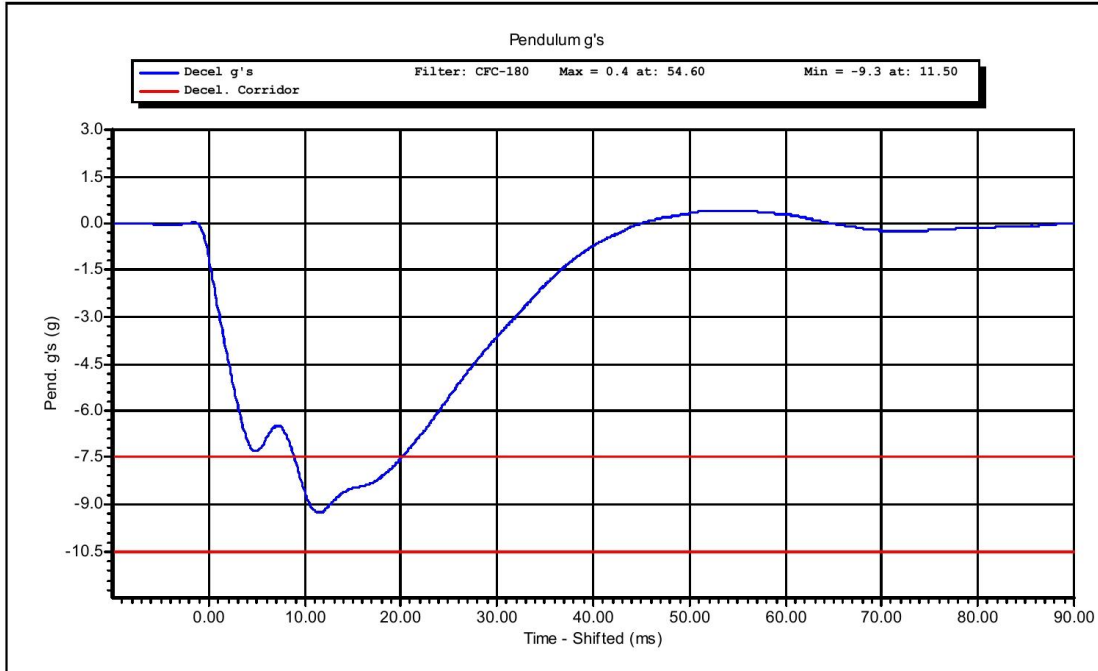


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Test Name:	Shoulder Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:		Test Date:	11/14/2012
Test Number:	1	Test Time:	2:12:00 PM



Test Time: 2:12:00 PM

Test Date: 11/14/2012

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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:	F033		
Test ID:	Upper Rib 4 m/s	Test Date:	11/13/2012
Test Number:	1	Test Time:	3:10:29 PM

Component Part Number	Component Serial Number
455-3100	07206

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.5 deg C P
Humidity	10.0 -- 70.0	46.0 %RH P
Velocity	3.90 -- 4.10	3.96 m/s P
Rib Displacement	-51.00 -- -46.00	-48.07 mm P
Drop Height	807.0 -- 823.0	815.0 mm P

All test parameters are within specifications

Technician: **A. Rudniski**

Supervisor: **D.Travale**

Test Time: **3:10:29 PM**

Test Date: **11/13/2012**



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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-179	5/17/2012
DentonATD	Velocity Trap	1	1/11/2012
Endevco	7264-2000	P32222	11/13/2012

Test Time: 3:10:29 PM

Test Date: 11/13/2012

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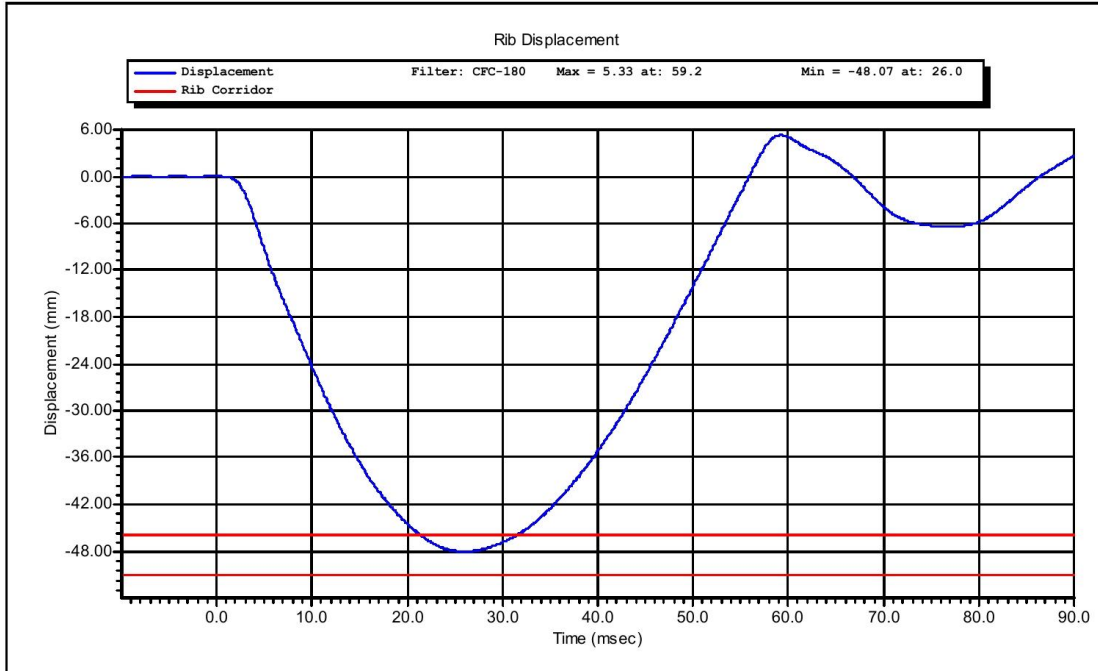


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Upper Rib 4 m/s	Test Date:	11/13/2012
Test Number:	1	Test Time:	3:10:29 PM



Test Time: 3:10:29 PM

Test Date: 11/13/2012

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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:			
Test ID:	Upper Rib 3 m/s	Test Date:	11/13/2012
Test Number:	1	Test Time:	3:28:50 PM

Component Part Number	Component Serial Number
455-3100	07206

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.6 deg C P
Humidity	10.0 -- 70.0	46.0 %RH P
Velocity	2.90 -- 3.10	2.98 m/s P
Rib Displacement	-40.00 -- -36.00	-37.57 mm P
Drop Height	454 -- 464	459 mm P

All test parameters are within specifications

Technician: **A. Rudniski**

Supervisor: **D. Travale**

Test Time: **3:28:50 PM**

Test Date: **11/13/2012**



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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-179	5/17/2012
DentonATD	Velocity Trap	1	1/11/2012
Endevco	7264-2000	P32222	11/13/2012

Test Time: 3:28:50 PM

Test Date: 11/13/2012

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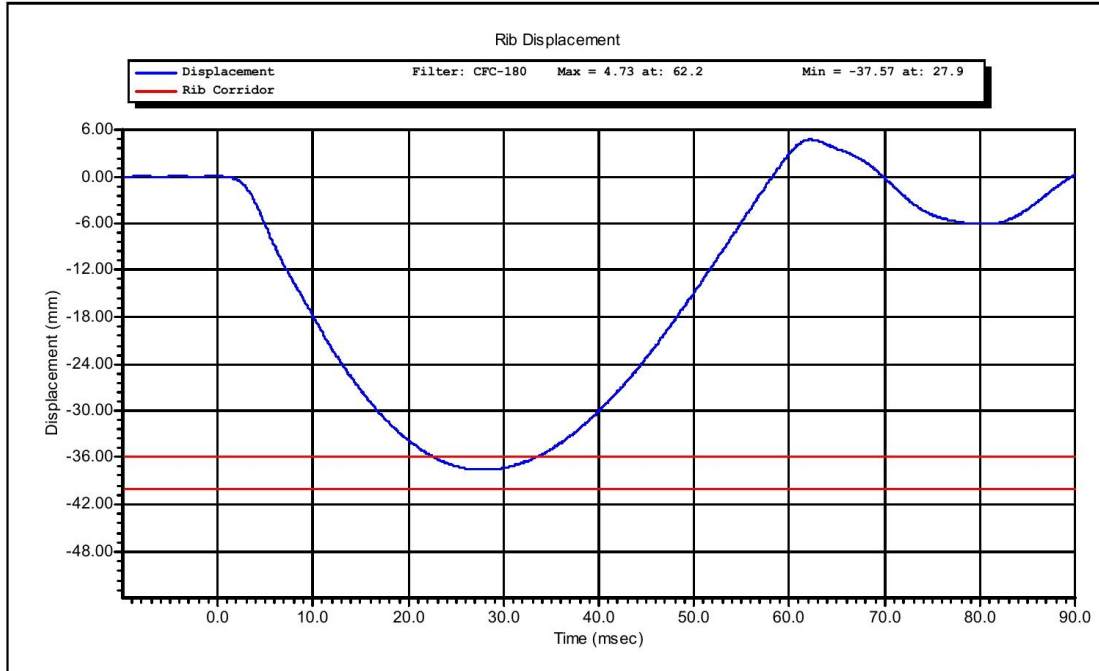


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:			
Test ID:	Upper Rib 3 m/s	Test Date:	11/13/2012
Test Number:	1	Test Time:	3:28:50 PM



Test Time: 3:28:50 PM

Test Date: 11/13/2012

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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:	F033		
Test ID:	Middle Rib 4 m/s	Test Date:	11/13/2012
Test Number:	1	Test Time:	3:35:12 PM

Component Part Number	Component Serial Number
455-3100	07207

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.6 deg C P
Humidity	10.0 -- 70.0	46.0 %RH P
Velocity	3.90 -- 4.10	3.96 m/s P
Rib Displacement	-51.00 -- -46.00	-47.85 mm P
Drop Height	807.0 -- 823.0	815.0 mm P

All test parameters are within specifications

Technician: **A. Rudniski**

Supervisor: **D. Travale**

Test Time: **3:35:12 PM**

Test Date: **11/13/2012**



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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-185	5/17/2012
DentonATD	Velocity Trap	1	1/11/2012
Endevco	7264-2000	P32222	11/13/2012

Test Time: 3:35:12 PM

Test Date: 11/13/2012

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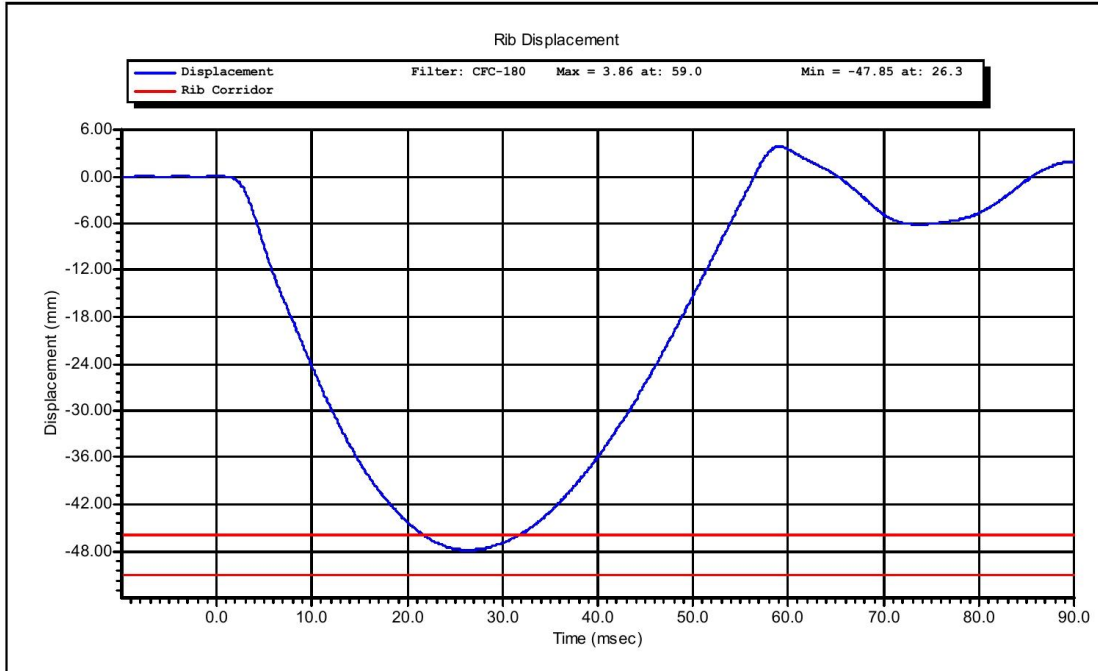


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Middle Rib 4 m/s	Test Date:	11/13/2012
Test Number:	1	Test Time:	3:35:12 PM



Test Time: 3:35:12 PM

Test Date: 11/13/2012

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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:	F033		
Test ID:	Middle Rib 3 m/s	Test Date:	11/13/2012
Test Number:	1	Test Time:	3:44:50 PM

Component Part Number	Component Serial Number
455-3100	07207

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.6 deg C P
Humidity	10.0 -- 70.0	46.0 %RH P
Velocity	2.90 -- 3.10	2.97 m/s P
Rib Displacement	-40.00 -- -36.00	-37.10 mm P
Drop Height	454 -- 464	459 mm P

All test parameters are within specifications

Technician: A. RudniskiSupervisor: D. Travale

Test Time: 3:44:50 PM

Test Date: 11/13/2012



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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-185	5/17/2012
DentonATD	Velocity Trap	1	1/11/2012
Endevco	7264-2000	P32222	11/13/2012

Test Time: 3:44:50 PM

Test Date: 11/13/2012

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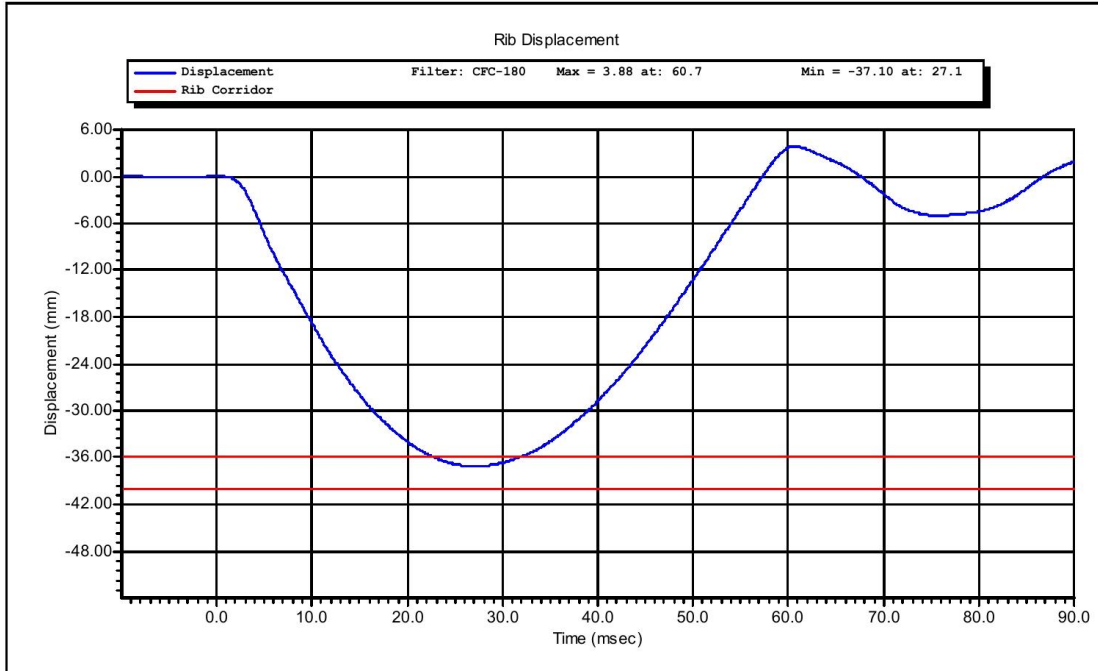


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Middle Rib 3 m/s	Test Date:	11/13/2012
Test Number:	1	Test Time:	3:44:50 PM



Test Time: 3:44:50 PM

Test Date: 11/13/2012

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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:	F033		
Test ID:	Lower Rib 4 m/s	Test Date:	11/13/2012
Test Number:	1	Test Time:	3:54:05 PM

Component Part Number	Component Serial Number
455-3100	07208

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.6 deg C P
Humidity	10.0 -- 70.0	46.0 %RH P
Velocity	3.90 -- 4.10	3.96 m/s P
Rib Displacement	-51.00 -- -46.00	-47.63 mm P
Drop Height	807.0 -- 823.0	815.0 mm P

All test parameters are within specifications

Technician: **A. Rudniski**

Supervisor: **D. Travale**

Test Time: **3:54:05 PM**

Test Date: **11/13/2012**



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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-178	5/17/2012
DentonATD	Velocity Trap	1	1/11/2012
Endevco	7264-2000	P32222	11/13/2012

Test Time: 3:54:05 PM

Test Date: 11/13/2012

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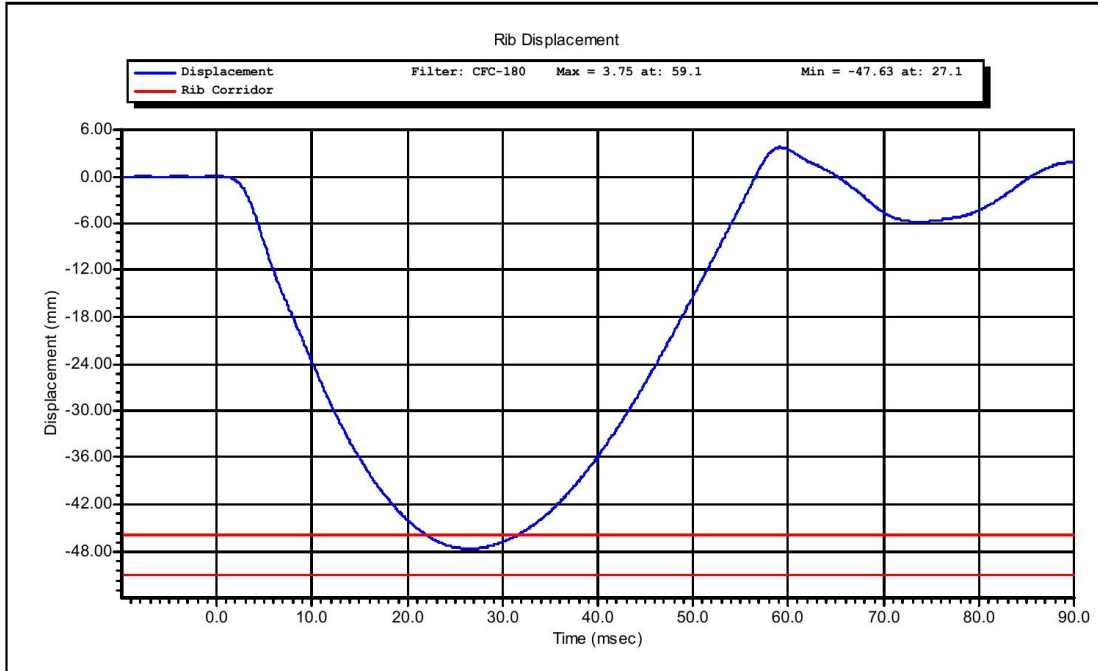


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Lower Rib 4 m/s	Test Date:	11/13/2012
Test Number:	1	Test Time:	3:54:05 PM



Test Time: 3:54:05 PM

Test Date: 11/13/2012

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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:	F033		
Test ID:	Lower Rib 3 m/s	Test Date:	11/13/2012
Test Number:	1	Test Time:	4:01:09 PM

Component Part Number	Component Serial Number
455-3100	07208

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.6 deg C P
Humidity	10.0 -- 70.0	46.0 %RH P
Velocity	2.90 -- 3.10	2.98 m/s P
Rib Displacement	-40.00 -- -36.00	-37.13 mm P
Drop Height	454 -- 464	459 mm P

All test parameters are within specifications

Technician: **A. Rudniski**

Supervisor: **D. Travale**

Test Time: **4:01:09 PM**

Test Date: **11/13/2012**



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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-178	5/17/2012
DentonATD	Velocity Trap	1	1/11/2012
Endevco	7264-2000	P32222	11/13/2012

Test Time: 4:01:09 PM

Test Date: 11/13/2012

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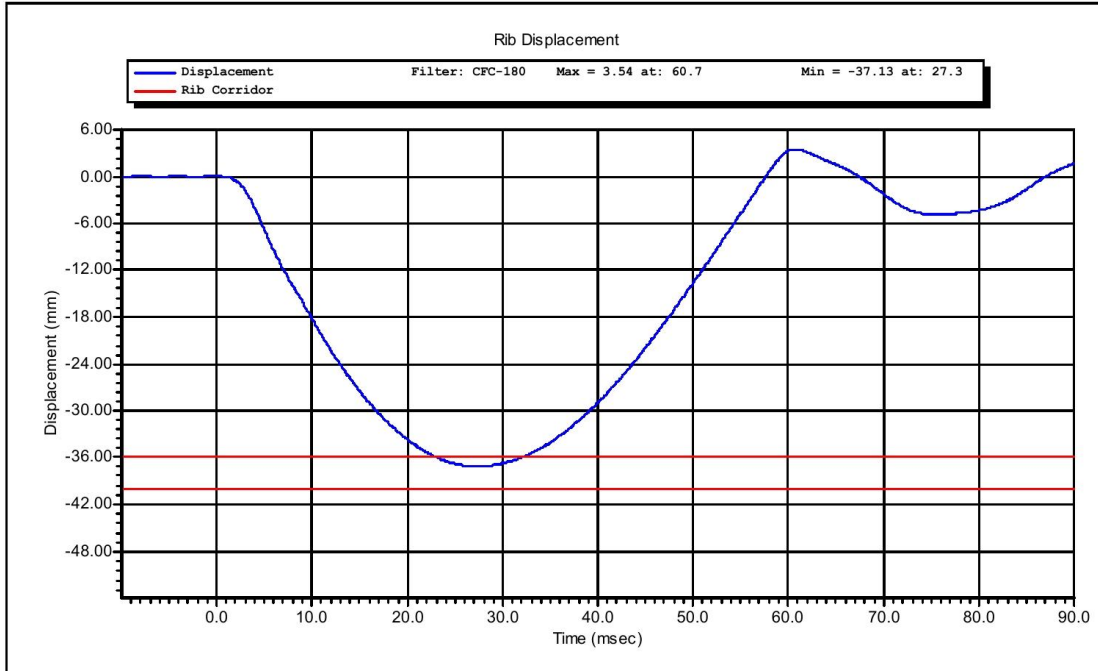


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Lower Rib 3 m/s	Test Date:	11/13/2012
Test Number:	1	Test Time:	4:01:09 PM



Test Time: 4:01:09 PM

Test Date: 11/13/2012

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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:	F033		
Test ID:		Test Date:	11/14/2012
Test Number:	1	Test Time:	1:40:00 PM

Component Part Number	Component Serial Number
Upper Rib - 175-4002	07206
Middle Rib - 175-4002	07207
Lower Rib - 175-4002	07208

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	24.0 %RH P
Velocity	5.40 -- 5.60	5.52 m/s P
Upper Rib Displacement	34.0 -- 41.0	36.9 mm P
Middle Rib Displacement	37.0 -- 45.0	41.5 mm P
Lower Rib Displacement	37.0 -- 44.0	40.4 mm P
Impactor Force	5100 -- 6200	5759 N P

All test parameters are within specifications

 Technician: **A. Rudniski**

 Supervisor: **D. Travale**

 Test Time: **1:40:00 PM**

 Test Date: **11/14/2012**



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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	5/25/2012
Honeywell	MLT-38000	DS-179	5/17/2012
Honeywell	MLT-38000	DS-185	5/17/2012
Honeywell	MLT-38000	DS-178	5/17/2012

Test Time: 1:40:00 PM

Test Date: 11/14/2012

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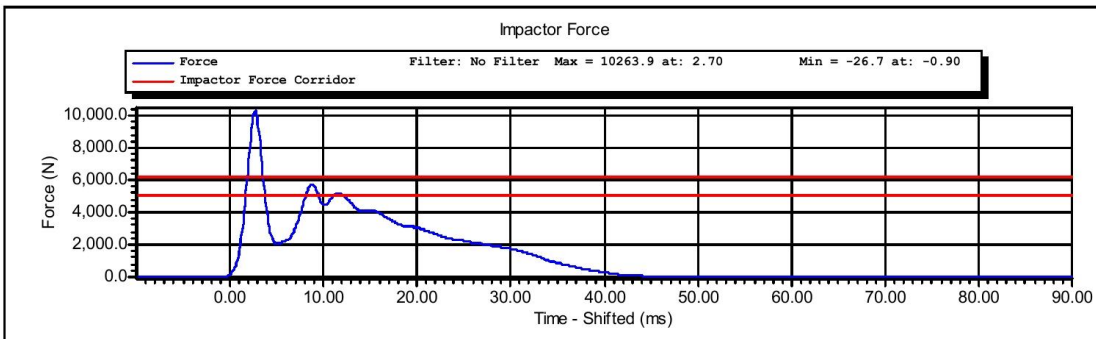
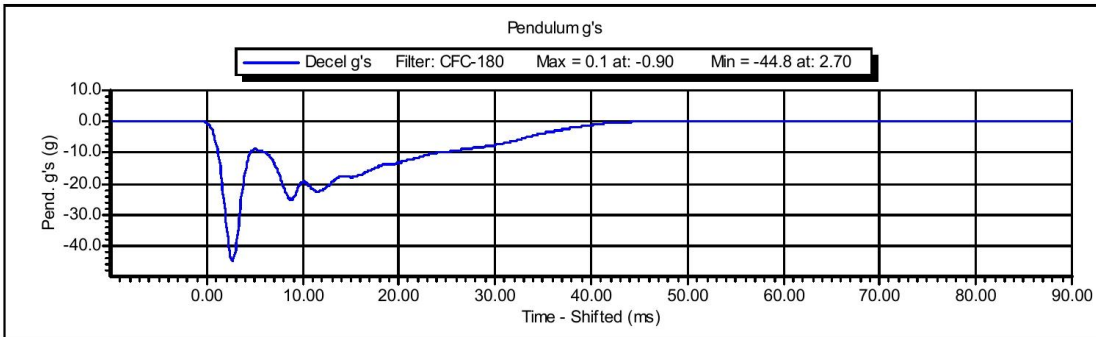


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Test Name:	Thorax Impact	Revision:	8/15/2008
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:		Test Date:	11/14/2012
Test Number:	1	Test Time:	1:40:00 PM



Test Time: 1:40:00 PM

Test Date: 11/14/2012

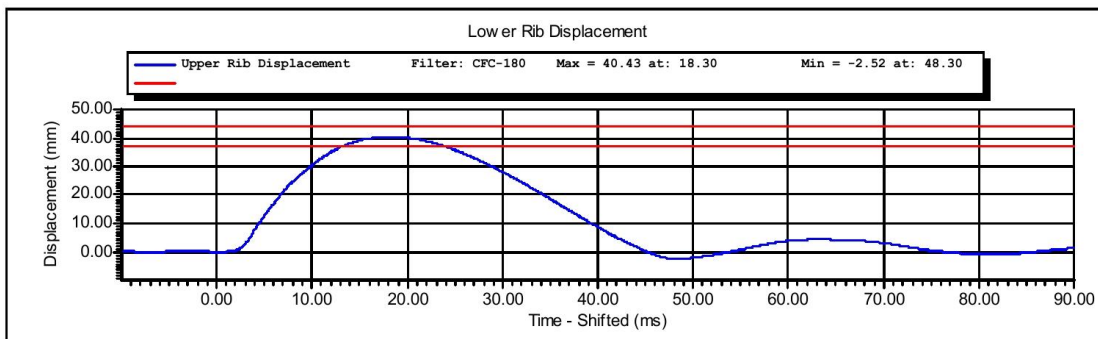
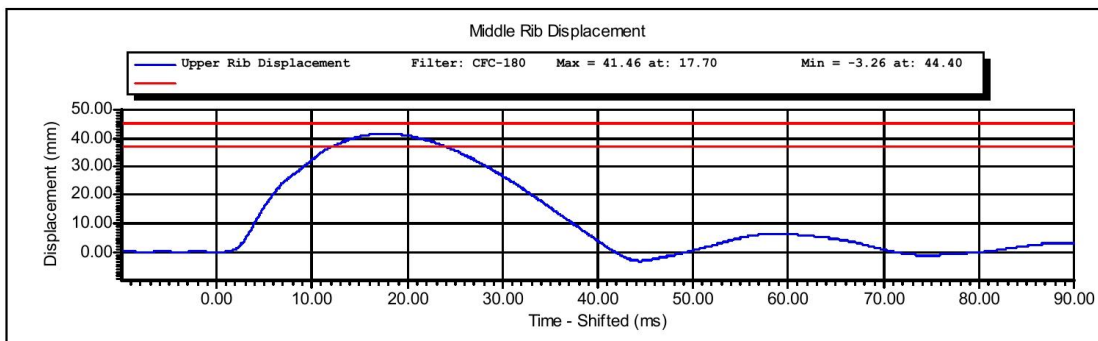
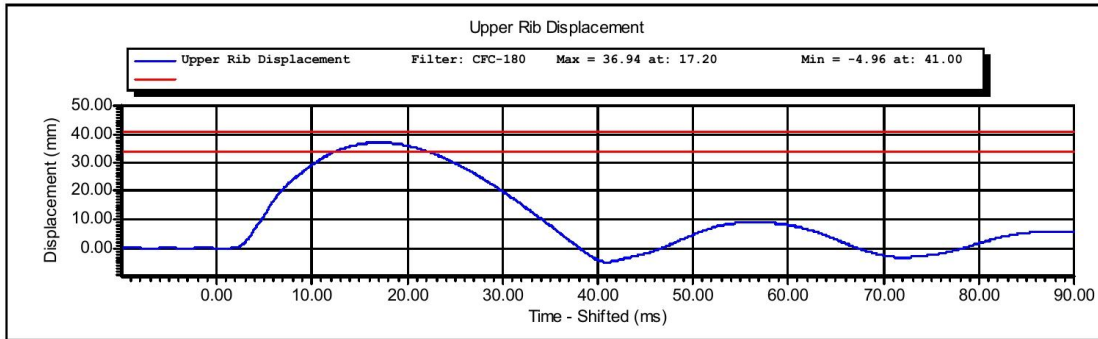
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Test Time: 1:40:00 PM

Test Date: 11/14/2012

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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:	F033		
Test ID:		Test Date:	11/14/2012
Test Number:	1	Test Time:	1:21:22 PM

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

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	24 %RH P
Velocity	3.90 -- 4.10	4.02 m/s P
Peak Abdominal Force	-2.70 -- -2.20	-2.48 kN P
Time At Peak Abdominal Force	10.0 -- 12.3	11.0 ms P
Maximum Pendulum Force	-4.80 -- -4.00	-4.47 kN P
Time at Peak Pendulum Force	10.6 -- 13.0	11.3 ms P

All test parameters are within specifications

Technician: **A. Rudniski**

Supervisor: **D. Travale**

Test Time: **1:21:22 PM**

Test Date: **11/14/2012**



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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	5/25/2012
Denton	2631	LC-1524	5/24/2012
Denton	2631	LC-1523	5/24/2012
Denton	2631	LC-1530	5/24/2012

Test Time: 1:21:22 PM

Test Date: 11/14/2012

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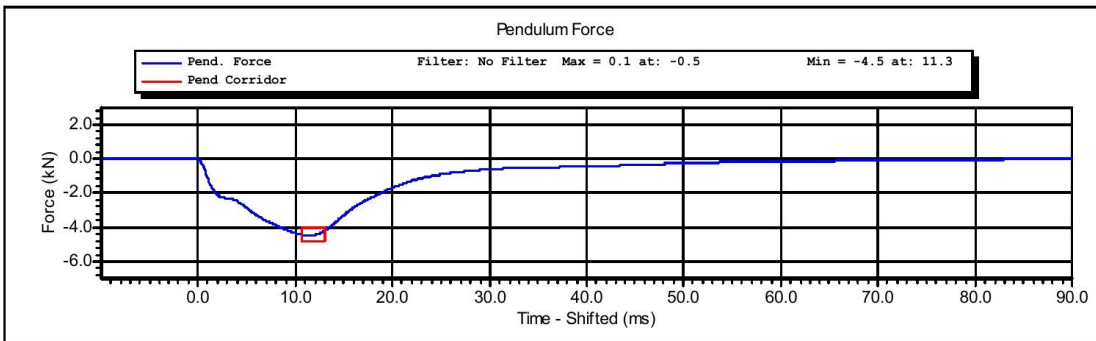
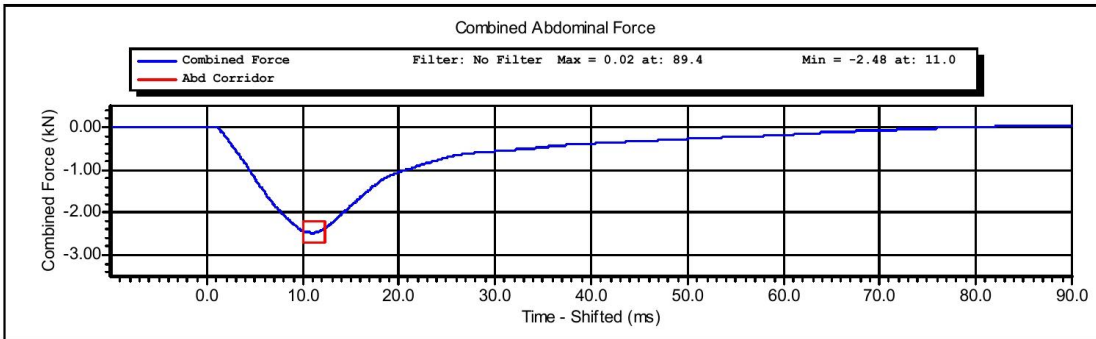


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Test Name:	Abdominal Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:		Test Date:	11/14/2012
Test Number:	1	Test Time:	1:21:22 PM



Test Time: 1:21:22 PM

Test Date: 11/14/2012

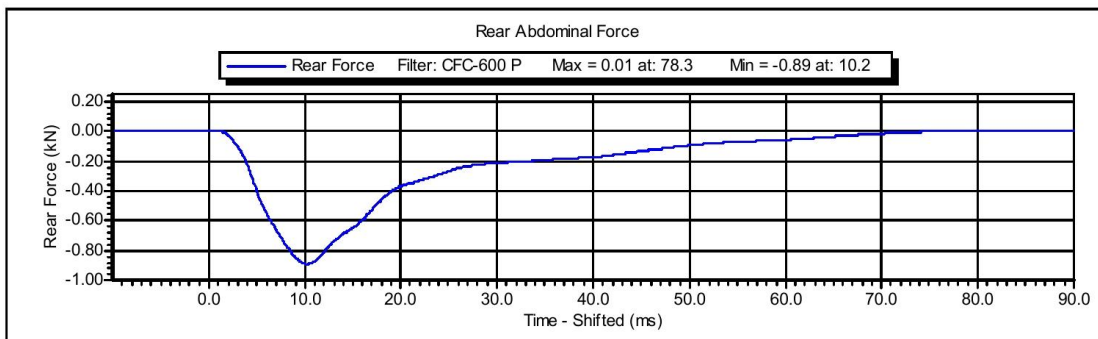
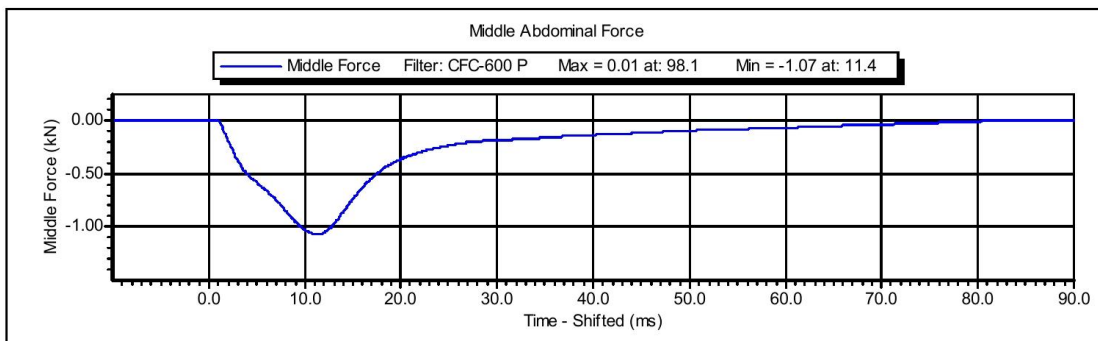
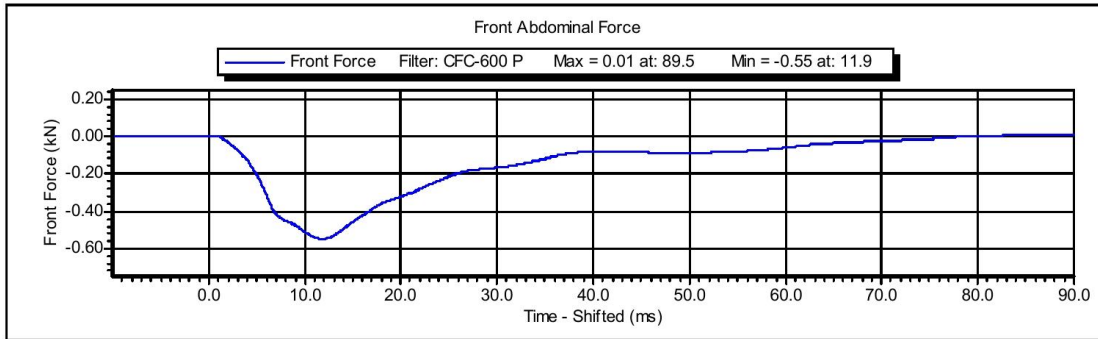
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Test Time: 1:21:22 PM

Test Date: 11/14/2012

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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:	F033		
Test ID:		Test Date:	11/14/2012
Test Number:	1	Test Time:	4:09:22 PM

Component Part Number	Component Serial Number
175-5501	DI8374

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.0 deg C P
Humidity	10 -- 70	25 %RH P
Velocity	5.95 -- 6.15	6.13 m/s P
Maximum Headform Flexion Angle	45.0 -- 55.0	46.0 degrees P
Time at Maximum Headform Flexion Angle	39.0 -- 53.0	43.9 ms P
Decay to Zero Degrees	37.0 -- 57.0	42.1 ms P
Velocity Corridor	--	P

All test parameters are within specifications

Technician: **A. Rudniski**

Supervisor: **D. Travale**

Test Time: **4:09:22 PM**

Test Date: **11/14/2012**



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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	C15016	8/15/2012
DentonATD	7000428	094	5/30/2012
DentonATD	7000428	095	5/30/2012
DentonATD	7000428	093	5/30/2012

Test Time: 4:09:22 PM

Test Date: 11/14/2012

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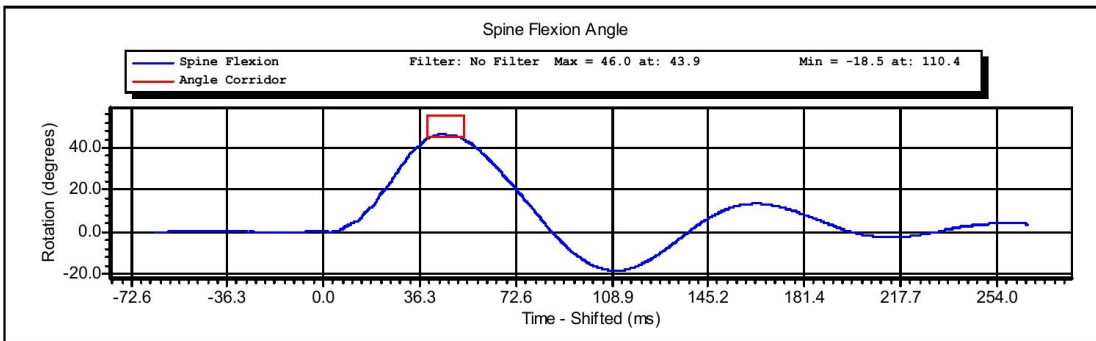
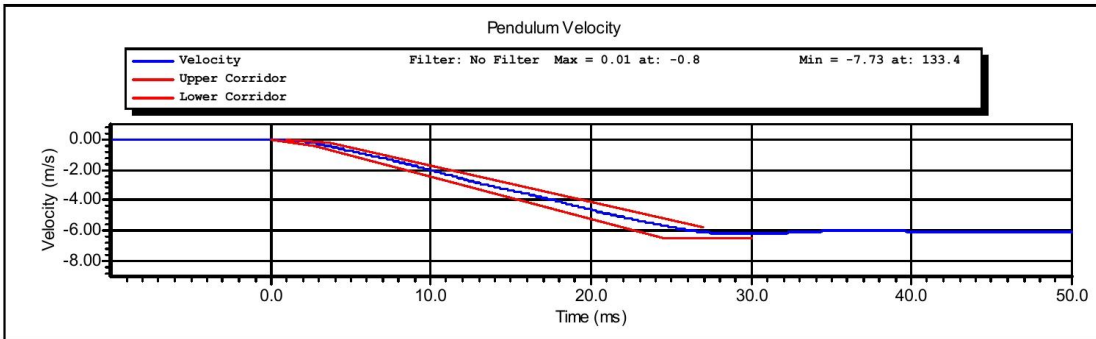


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Test Name:	Lumbar Spine	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:		Test Date:	11/14/2012
Test Number:	1	Test Time:	4:09:22 PM



Test Time: **4:09:22 PM**

Test Date: **11/14/2012**

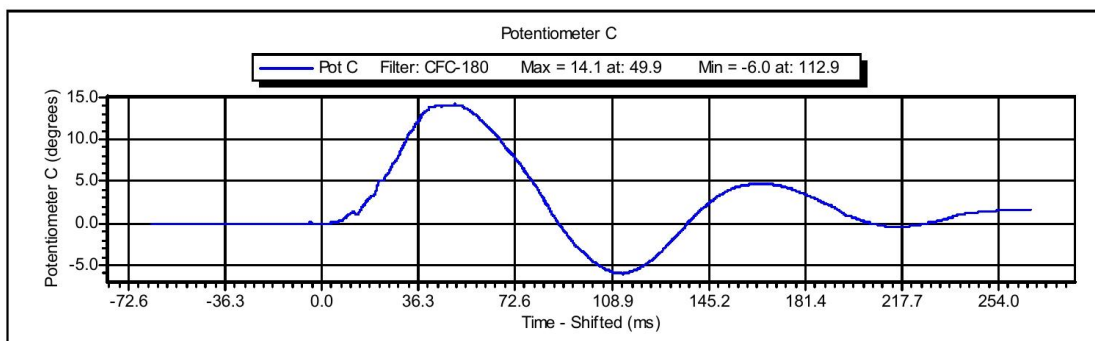
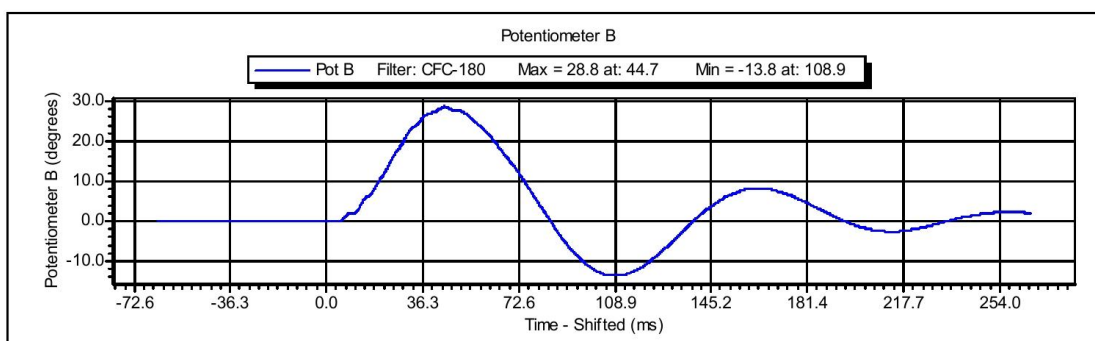
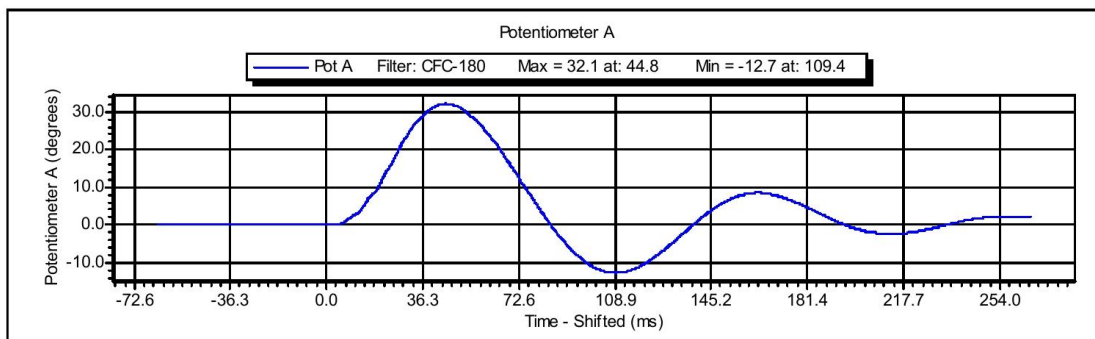
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Test Time: 4:09:22 PM

Test Date: 11/14/2012

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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:	F033		
Test ID:		Test Date:	11/14/2012
Test Number:	1	Test Time:	10:59:55 AM

Component Part Number	Component Serial Number
455-4003	07033

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	24 %RH P
Velocity	4.20 -- 4.40	4.35 m/s P
Peak Pendulum Force	-5.40 -- -4.70	-5.06 kN P
Time at Peak Pendulum Force	11.80 -- 16.10	13.26 ms P
Peak Pubic Symphysis Force	-1.59 -- -1.23	-1.36 kN P
Time at Peak Pubic Symphysis Force	12.20 -- 17.00	13.56 ms P

All test parameters are within specifications

Technician: **A. Rudniski**

Supervisor: **D. Travale**

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

Test Date: **11/14/2012**



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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	5/25/2012
Denton	3096	LC-456Fy	5/24/2012

Test Time: 10:59:55 AM

Test Date: 11/14/2012

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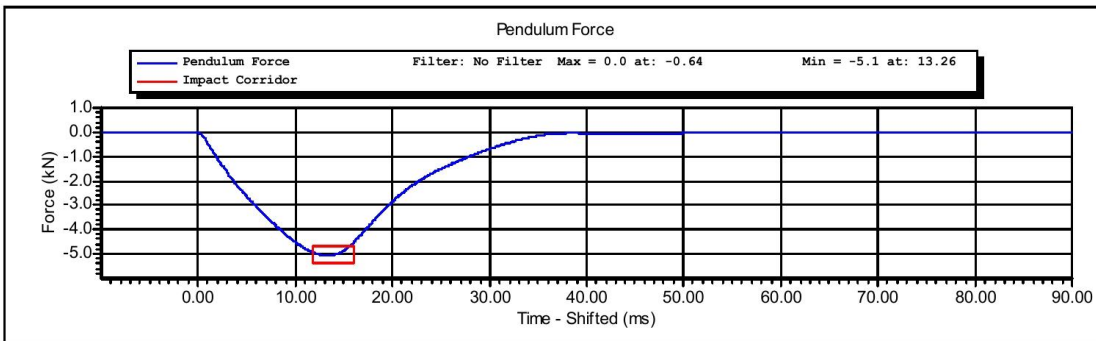
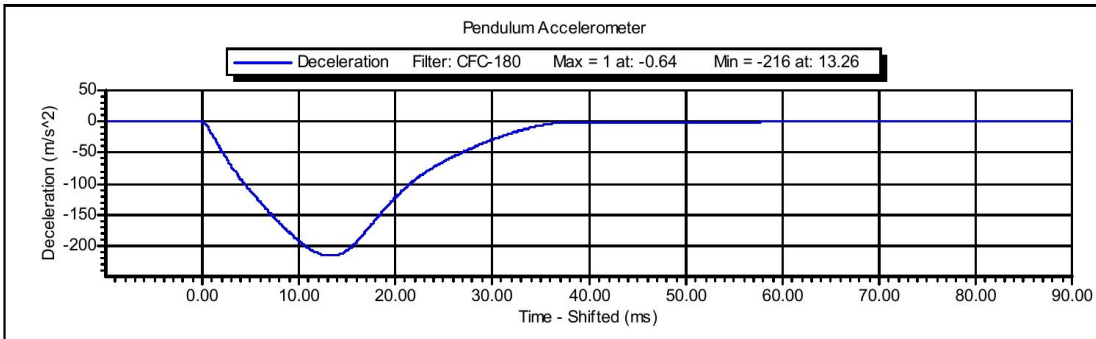


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Test Name:	Pelvis Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:		Test Date:	11/14/2012
Test Number:	1	Test Time:	10:59:55 AM



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

Test Date: **11/14/2012**

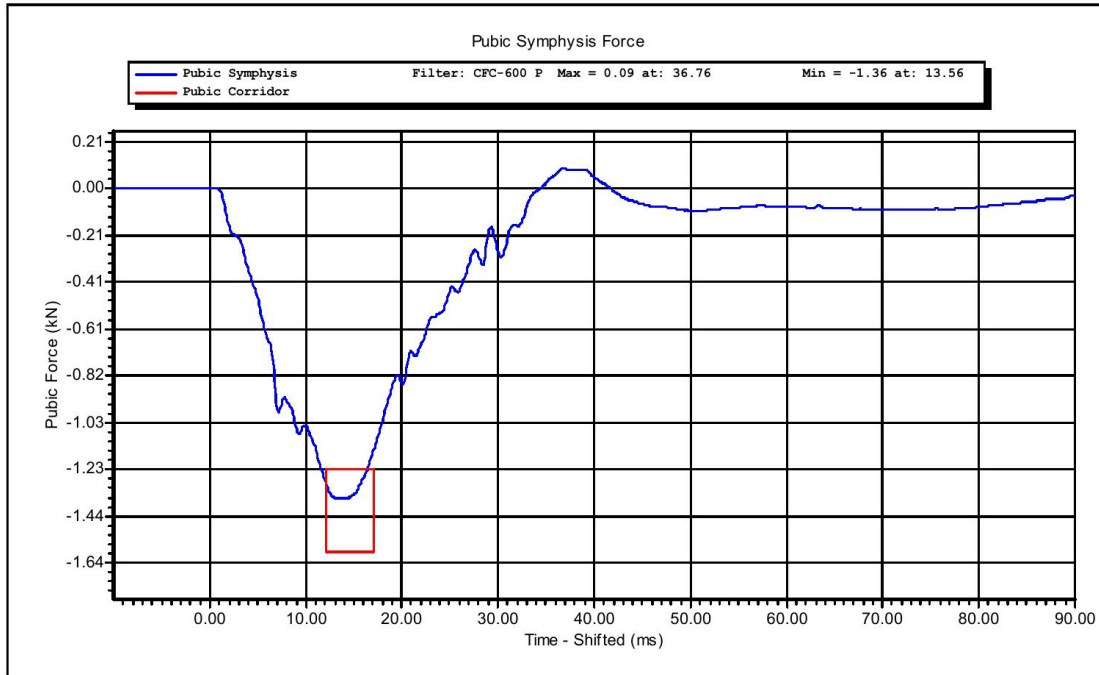
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Test Time: 10:59:55 AM

Test Date: 11/14/2012

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CALIBRATION TEST RESULTS

POST-TEST

SID-IIS 5TH PERCENTILE FEMALE - PASSENGER ATD

SERIAL No: 303

(CONFIGURED FOR LEFT SIDE IMPACT)



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SID-IIsD External Measurements

ATD S/N 303

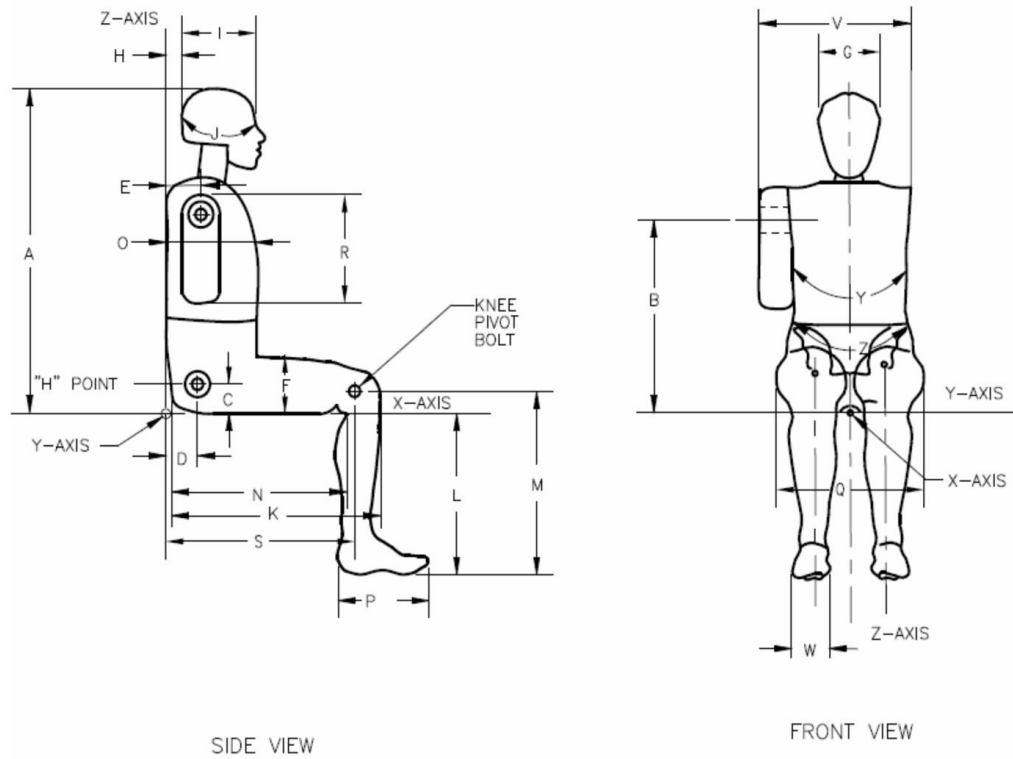
Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	784	Yes
B	Shoulder Pivot Height	437.0 - 453.0	450	Yes
C	H-Point Height	79.0 - 89.0	85	Yes
D	H-Point from Seat Back	141.0 - 151.0	146	Yes
E	Shoulder Pivot from Backline	97.0 - 107.0	100	Yes
F	Thigh Clearance	119.0 - 135.0	125	Yes
G	Head Breadth	140.0 - 148.0	145	Yes
H	Head Back from Backline	40.0 - 46.0	43	Yes
I	Head Depth	178.0 - 188.0	183	Yes
J	Head Circumference	541.0 - 551.0	547	Yes
K	Buttock to Knee Length	514.0 - 540.0	531	Yes
L	Popliteal Height	343.0 - 369.0	355	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	402	Yes
N	Buttock Popliteal Length	416.0 - 442.0	435	Yes
O	Chest Depth without Jacket	195.0 - 211.0	200	Yes
P	Foot Length (right)	216.0 - 232.0	222	Yes
P	Foot Length (left)	216.0 - 232.0	223	Yes
Q	Hip Breadth	313.0 - 323.0	317	Yes
R	Arm Length	249.0 - 259.0	252	Yes
S	Knee Joint to Seat back	478.0 - 493.0	482	Yes
V	Shoulder Width (only one arm installed)	341.0 - 357.0	351	Yes
W	Foot Width (right)	78.0 - 94.0	87	Yes
W	Foot Width (left)	78.0 - 94.0	87	Yes
Y	Chest Circumference with Jacket	851.0 - 881.0	874	Yes
Z	Waist Circumference	761.0 - 791.0	782	Yes

Technician: M. Goehle

Date: 11/15/2012

SID-IIIsD External Dimensions

Reference Diagram



VERIFICATION REPORT

Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	303		
Test ID:	Head Drop	Test Date:	11/15/2012
Test Number:	1	Test Time:	10:01:43 AM

Component Part Number	Component Serial Number
Head Skin - 180-1002	368

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.0 deg C P
Humidity	10 -- 70	25 %RH P
Resultant Acceleration	115.0 -- 137.0	122.2 g P
Oscillation	0.0 -- 15.0	2.8 % P
Fore-Aft Acceleration	-15.0 -- 15.0	-1.9 g P

All test parameters are within specifications

Technician: **M. Goehle**

Supervisor: **D. Travale**

Test Time: **10:01:43 AM**

Test Date: **11/15/2012**



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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	P59021	7/24/2012
Endevco	7264-2000	P52088	7/24/2012
Endevco	7264-2000	P58794	7/24/2012

Test Time: 10:01:43 AM

Test Date: 11/15/2012

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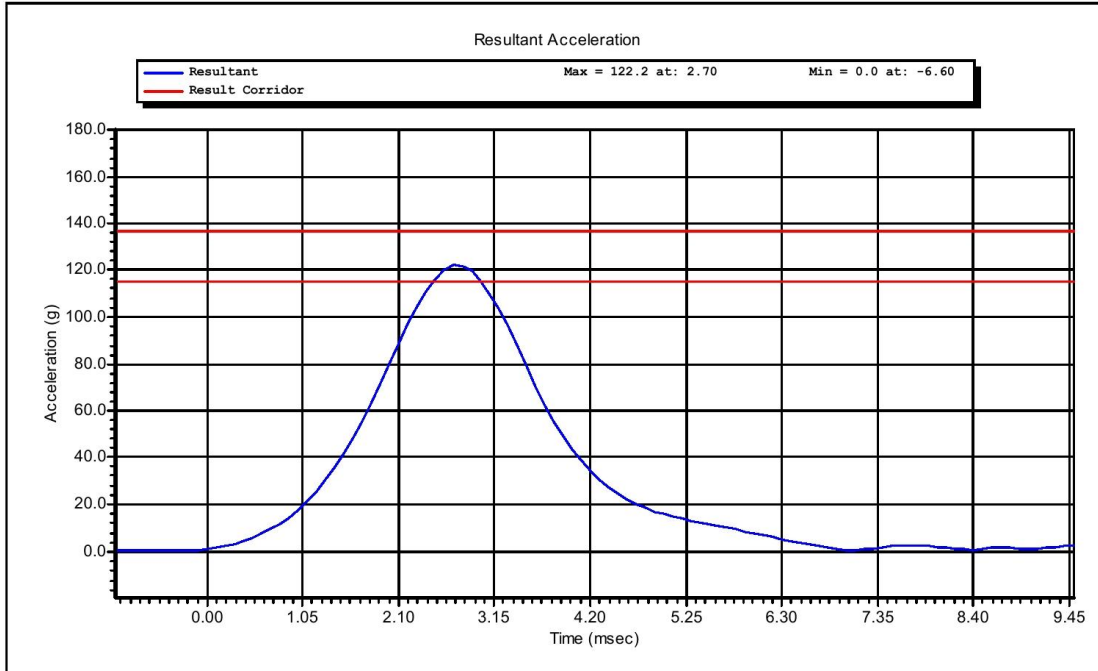


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Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	303		
Test ID:	Head Drop	Test Date:	11/15/2012
Test Number:	1	Test Time:	10:01:43 AM



Test Time: 10:01:43 AM

Test Date: 11/15/2012

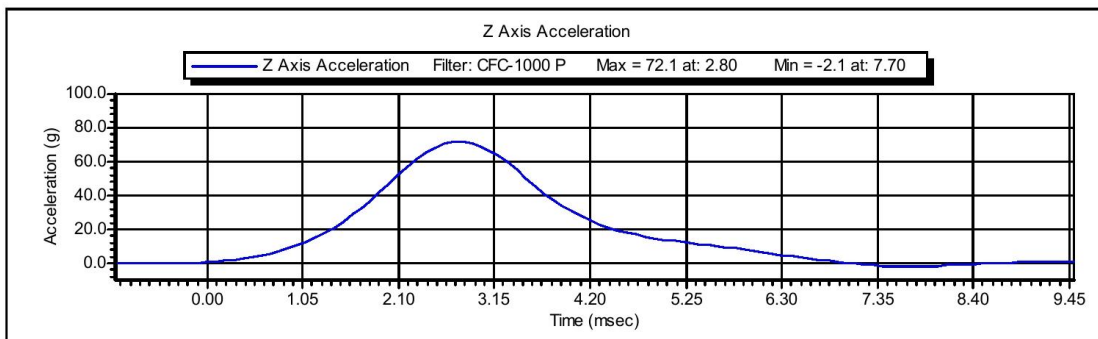
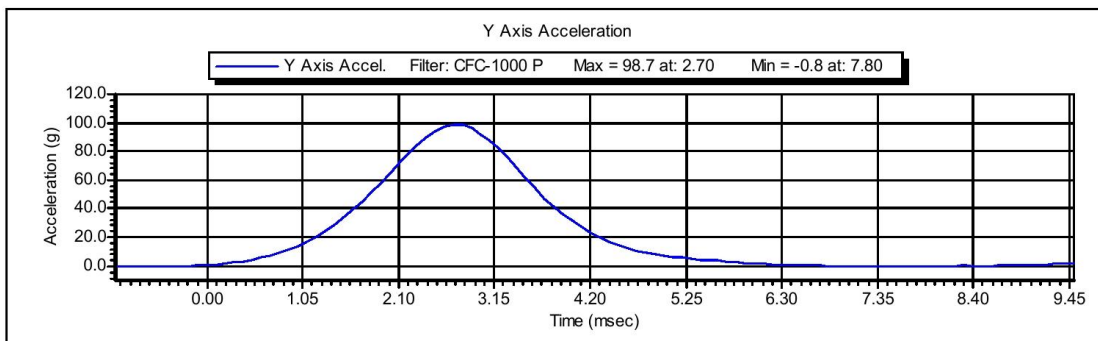
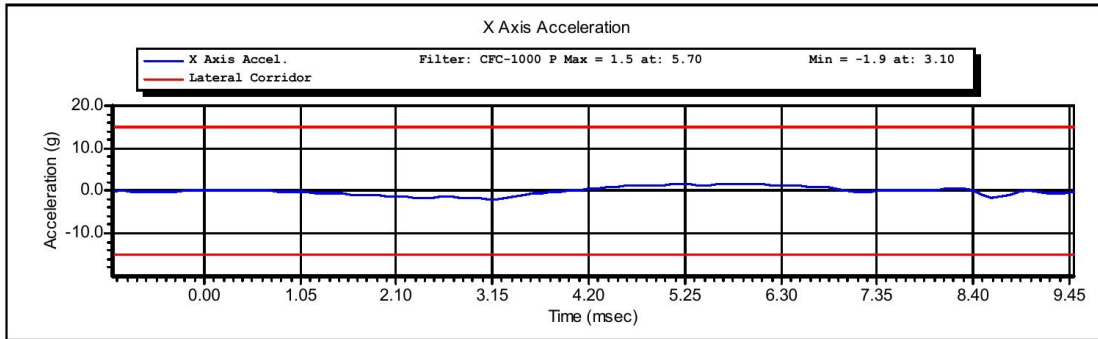
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Test Time: 10:01:43 AM

Test Date: 11/15/2012

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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-IIs		
ATD Serial Number:	303		
Test ID:	Neck Flexion	Test Date:	11/15/2012
Test Number:	3	Test Time:	11:49:07 AM

Component Part Number	Component Serial Number
Neck - 180-2000	777

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	5.59 m/s P
Pendulum Impulse at 10 ms	2.20 -- 2.80	2.59 m/s P
Pendulum Impulse at 15 ms	3.30 -- 4.10	3.79 m/s P
Pendulum Impulse at 20 ms	4.40 -- 5.40	5.12 m/s P
Pendulum Impulse at 25 ms	5.40 -- 6.10	5.58 m/s P
Pendulum Impulse between 25 and 100 ms	5.50 -- 6.20	5.62 m/s P
Max D Plane Rotation	71.0 -- 81.0	74.5 degrees P
Time at Max Rotation	50.0 -- 70.0	59.2 ms P
Moment about OC	-44.0 -- -36.0	-43.5 Nm P
Moment Decay to Zero	102.0 -- 126.0	115.1 ms P

All test parameters are within specifications

Technician: **M. Goehle**

Supervisor: **D. Travale**

Test Time: **11:49:07 AM**

Test Date: **11/15/2012**

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	C15016	8/15/2012
Denton	1716A	LC-440 Fy	5/21/2012
Denton	1716A	LC-440 Mx	5/21/2012
DentonATD	78051-342	184	5/30/2012
DentonATD	78051-342	174	5/30/2012
DentonATD	78051-342	185	5/30/2012

Test Time: 11:49:07 AM

Test Date: 11/15/2012

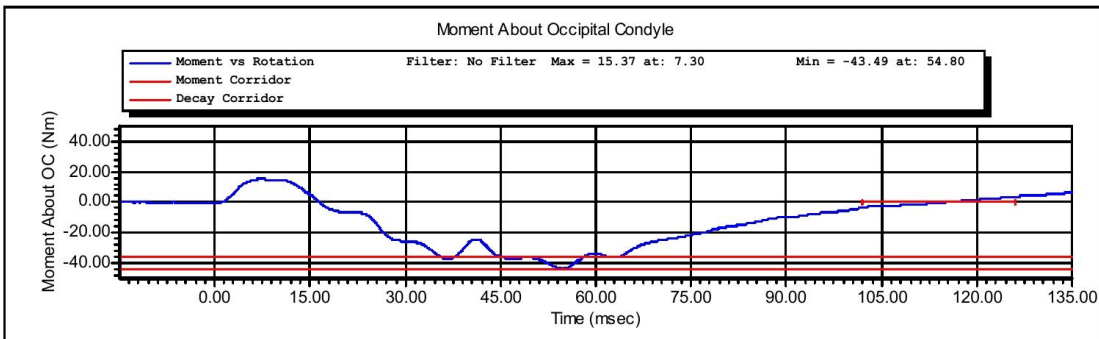
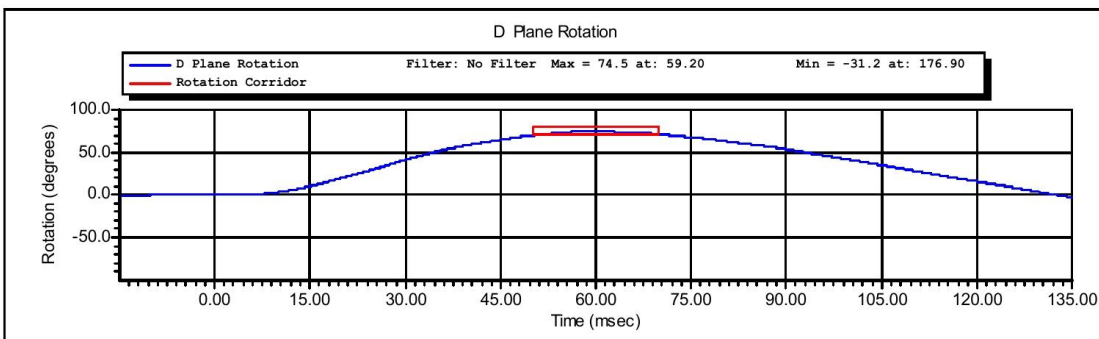


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Test Name:	Neck Pendulum	Revision:	8/24/2009
Sub Test Name:	Left Side	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	303		
Test ID:	Neck Flexion	Test Date:	11/15/2012
Test Number:	3	Test Time:	11:49:07 AM



Test Time: 11:49:07 AM

Test Date: 11/15/2012

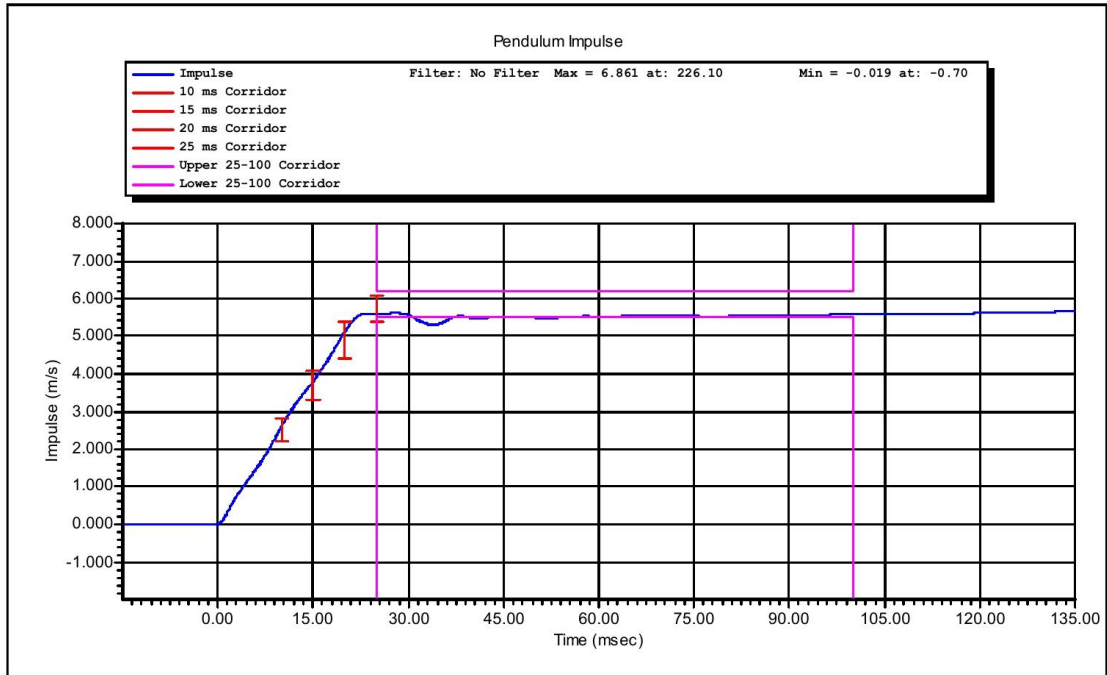
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Test Time: 11:49:07 AM

Test Date: 11/15/2012

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VERIFICATION REPORT

Test Name:	Shoulder Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	303		
Test ID:	Shoulder	Test Date:	11/15/2012
Test Number:	1	Test Time:	8:58:13 AM

Component Part Number	Component Serial Number
Left Arm 180-6011-1	951

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.10 deg C P
Humidity	10.0 -- 70.0	18.9 %RH P
Velocity	4.20 -- 4.40	4.32 m/s P
Probe Acceleration	13.0 -- 18.0	15.7 g P
Shoulder Deflection	28.0 -- 37.0	30.63 mm P
T1 Acceleration	17.0 -- 22.0	20.1 g P

All test parameters are within specifications

Technician: **M. Goehle**

Supervisor: **D. Travale**

Test Time: **8:58:13 AM**

Test Date: **11/15/2012**



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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	5/25/2012
Servo	180-3885	DS-1179	10/25/2012
Endevco	7264-2000	P63315	10/26/2012

Test Time: 8:58:13 AM

Test Date: 11/15/2012

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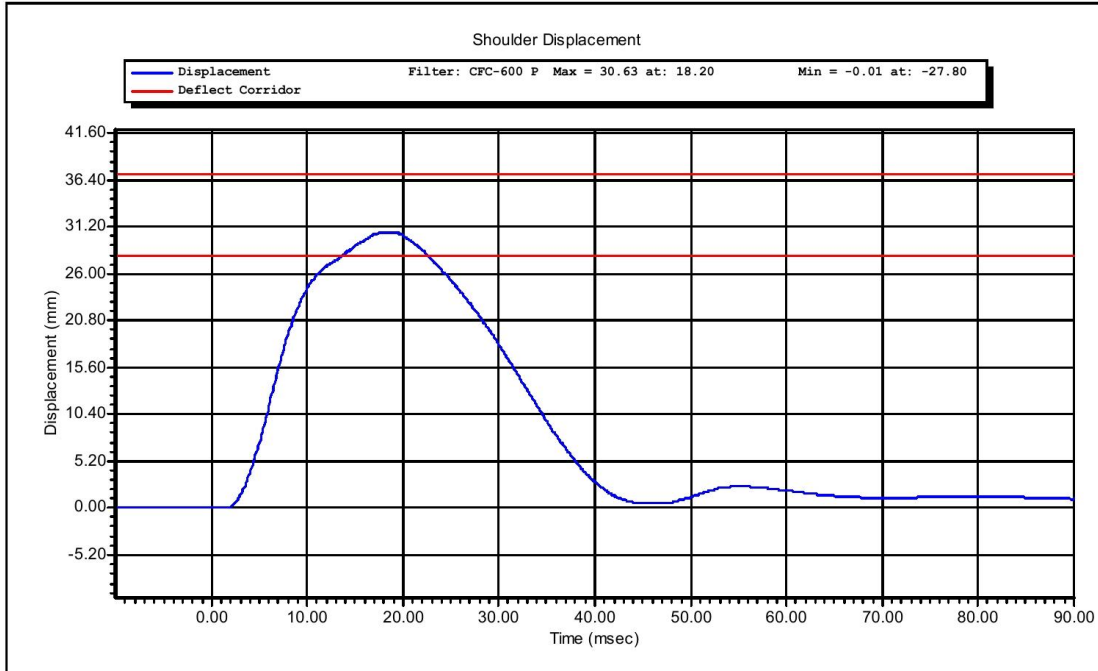


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Test Name:	Shoulder Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	303		
Test ID:	Shoulder	Test Date:	11/15/2012
Test Number:	1	Test Time:	8:58:13 AM



Test Time: 8:58:13 AM

Test Date: 11/15/2012

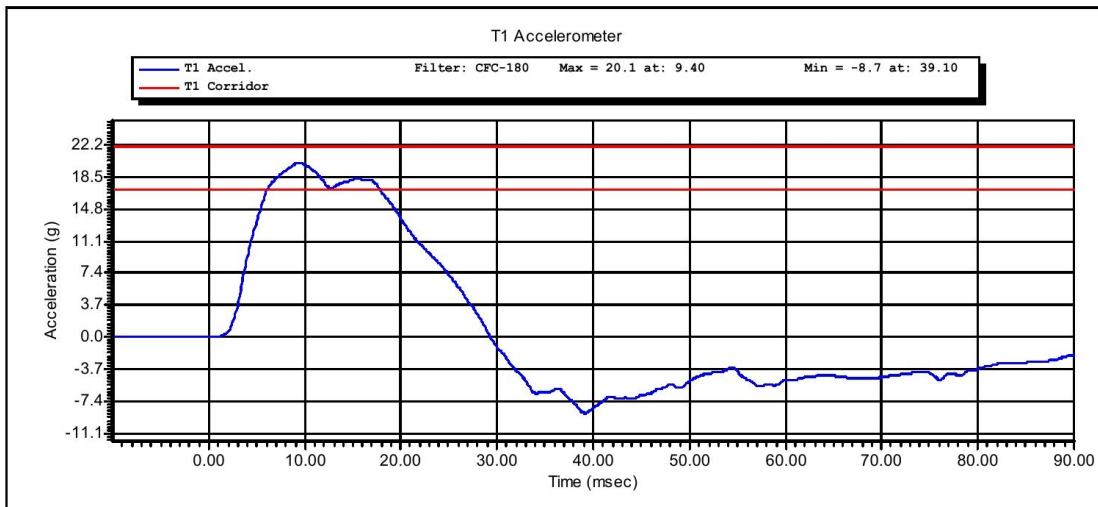
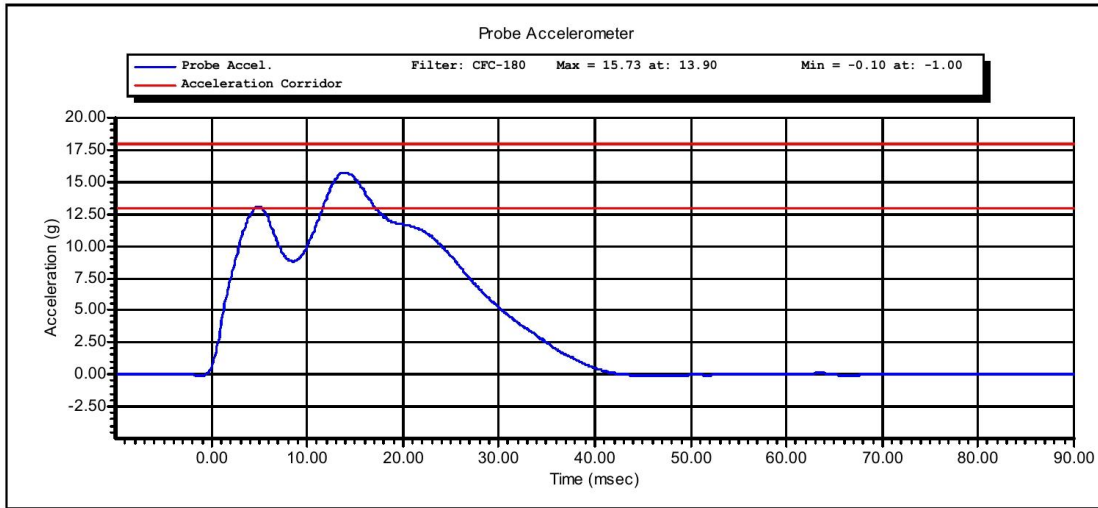
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Test Time: 8:58:13 AM

Test Date: 11/15/2012

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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-IIs		
ATD Serial Number:	303		
Test ID:	Thorax Without Arm	Test Date:	11/15/2012
Test Number:	1	Test Time:	8:45:43 AM

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

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.1 deg C P
Humidity	10 -- 70	19 %RH P
Velocity	4.20 -- 4.40	4.32 m/s P
Probe Acceleration	14.0 -- 18.0	16.7 g P
Upper Thorax Rib Deflection	32.0 -- 40.0	34.2 mm P
Mid Thorax Rib Deflection	39.0 -- 45.0	41.0 mm P
Lower Thorax Rib Deflection	35.0 -- 43.0	38.6 mm P
Upper Spine Acceleration T1	13.0 -- 17.0	15.2 g P
Lower Spine Acceleration T12	7.0 -- 11.0	10.0 g P

All test parameters are within specifications

Technician: **M. Goehle**Supervisor: **D. Travale**Test Time: **8:45:43 AM**Test Date: **11/15/2012**

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	5/25/2012
Servo	180-3885	DS-1199	10/25/2012
Servo	180-3885	DS-1246	10/24/2012
Servo	180-3885	DS-1256	10/25/2012
Endevco	7264-2000	P63315	10/26/2012
Endevco	7264-2000	P63861	10/25/2012

Test Time: **8:45:43 AM**Test Date: **11/15/2012**

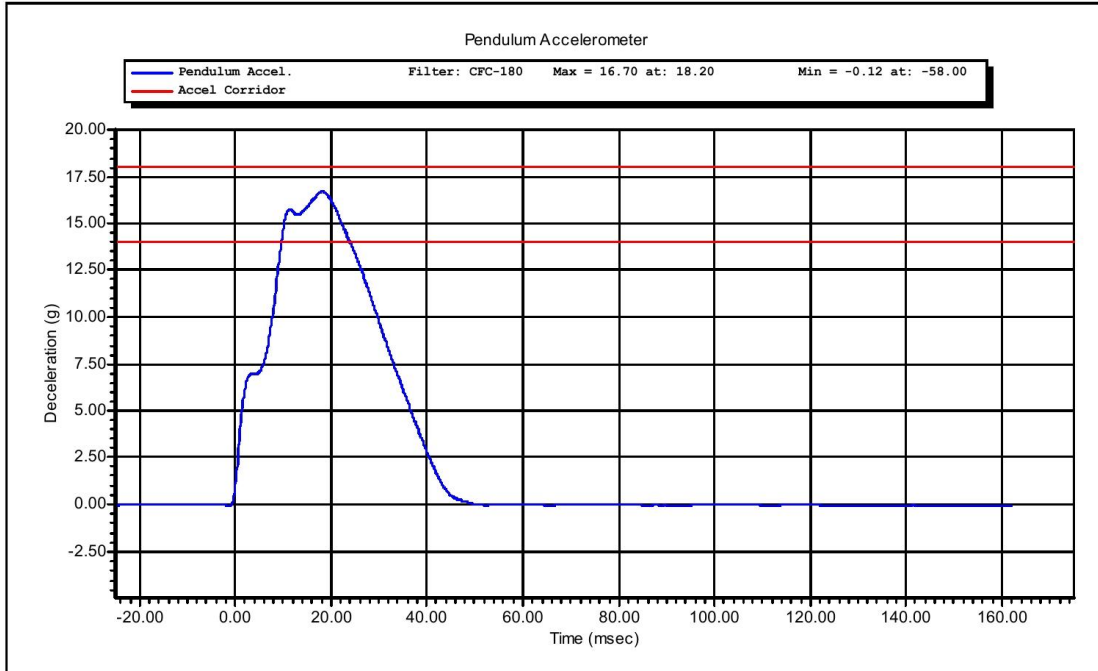


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Test Name:	Thorax Impact without Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	303		
Test ID:	Thorax Without Arm	Test Date:	11/15/2012
Test Number:	1	Test Time:	8:45:43 AM



Test Time: 8:45:43 AM

Test Date: 11/15/2012

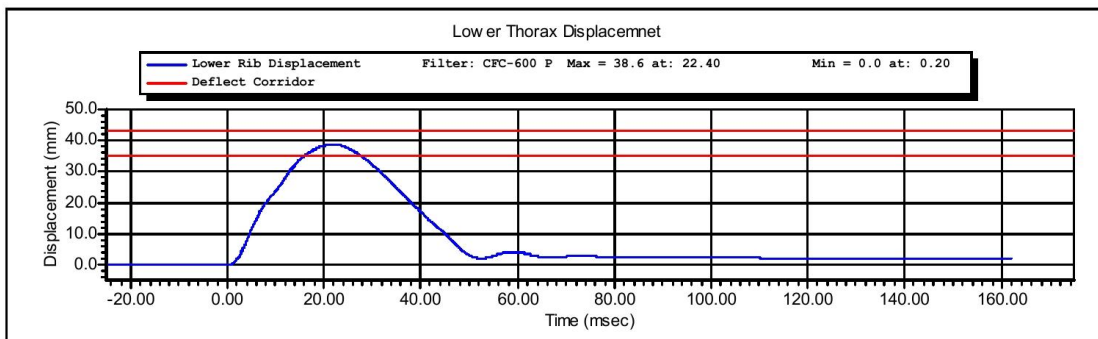
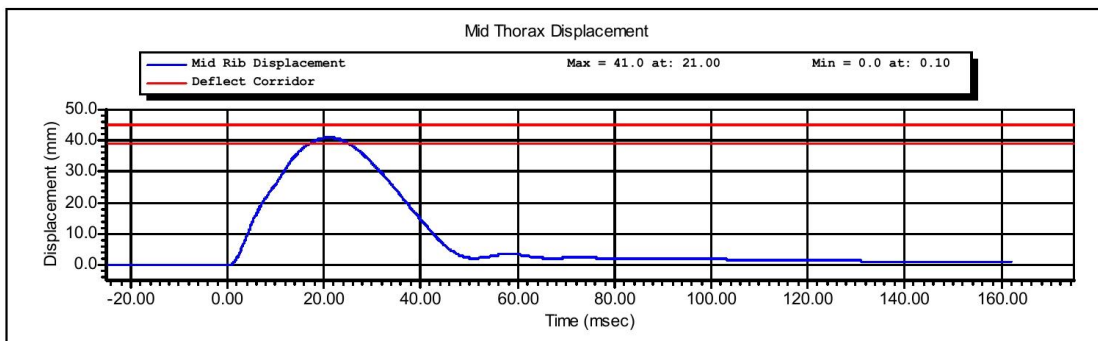
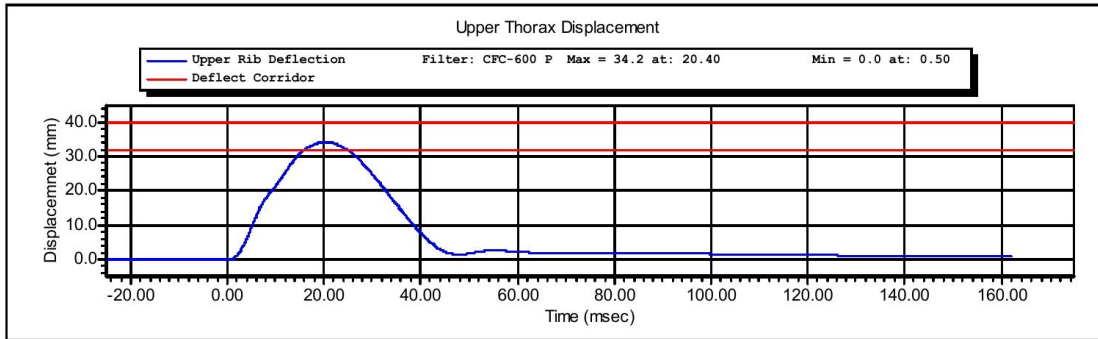
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Test Time: 8:45:43 AM

Test Date: 11/15/2012

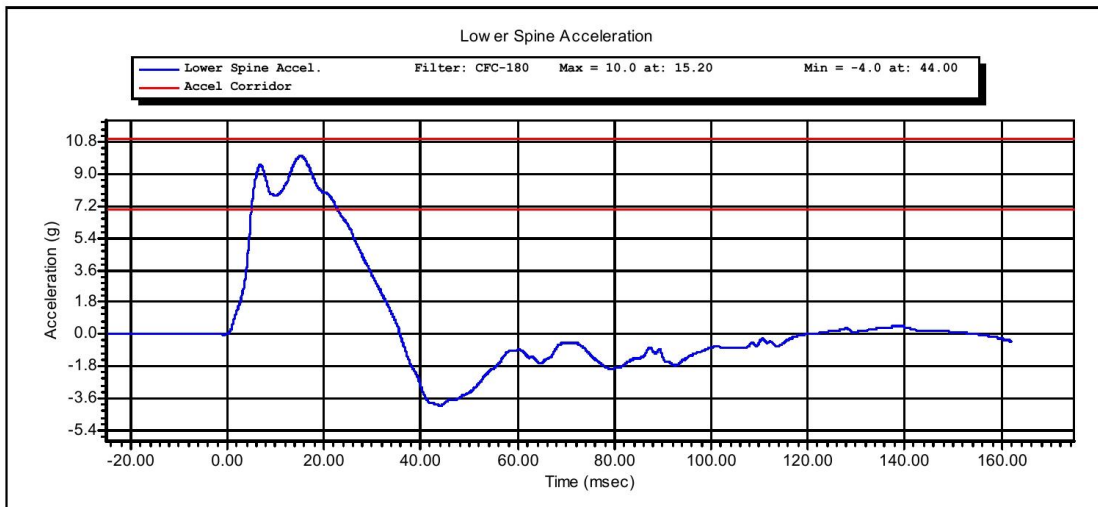
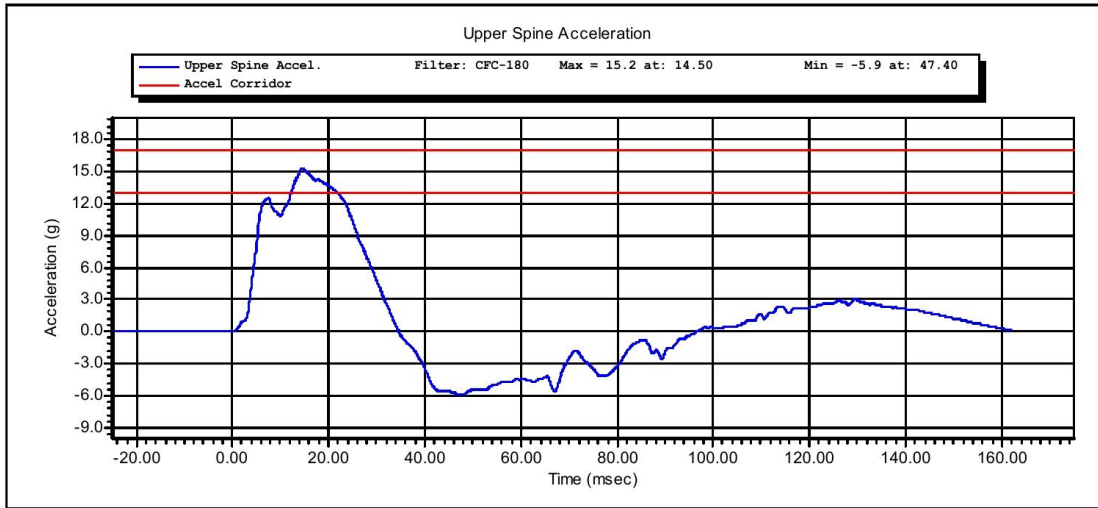
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Test Time: 8:45:43 AM

Test Date: 11/15/2012

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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-IIs		
ATD Serial Number:	303		
Test ID:	Thorax With Arm	Test Date:	11/15/2012
Test Number:	1	Test Time:	9:17:02 AM

Component Part Number	Component Serial Number
Left Arm 180-6011-1	951

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.1 deg C P
Humidity	10 -- 70	19 %RH P
Velocity	6.60 -- 6.80	6.71 m/s P
Probe Acceleration after 5ms	30.0 -- 36.0	34.6 g P
Upper Thorax Rib Deflection	25.0 -- 32.0	28.0 mm P
Mid Thorax Rib Deflection	30.0 -- 36.0	32.3 mm P
Lower Thorax Rib Deflection	32.0 -- 38.0	33.0 mm P
Upper Spine Acceleration ("y")	34.0 -- 43.0	38.1 g P
Lower Spine Acceleration ("y")	29.0 -- 37.0	36.6 g P
Shoulder Deflection	31.0 -- 40.0	37.0 mm P

All test parameters are within specifications

Technician: **M. Goehle**

Supervisor: **D. Travale**

Test Time: **9:17:02 AM**

Test Date: **11/15/2012**



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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	5/25/2012
Servo	180-3885	DS-1199	10/25/2012
Servo	180-3885	DS-1246	10/24/2012
Servo	180-3885	DS-1256	10/25/2012
Endevco	7264-2000	P63315	10/26/2012
Endevco	7264-2000	P63861	10/25/2012
Servo	180-3885	DS-1179	10/25/2012

Test Time: 9:17:02 AM

Test Date: 11/15/2012

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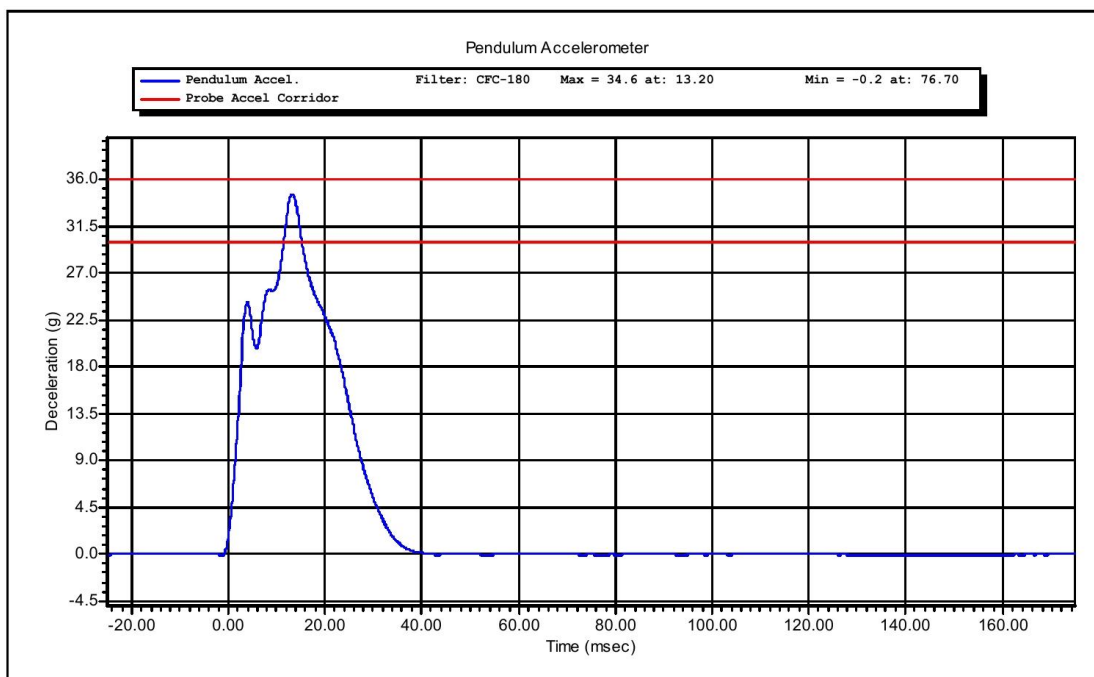


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Test Name:	Thorax Impact with Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	303		
Test ID:	Thorax With Arm	Test Date:	11/15/2012
Test Number:	1	Test Time:	9:17:02 AM



Test Time: 9:17:02 AM

Test Date: 11/15/2012

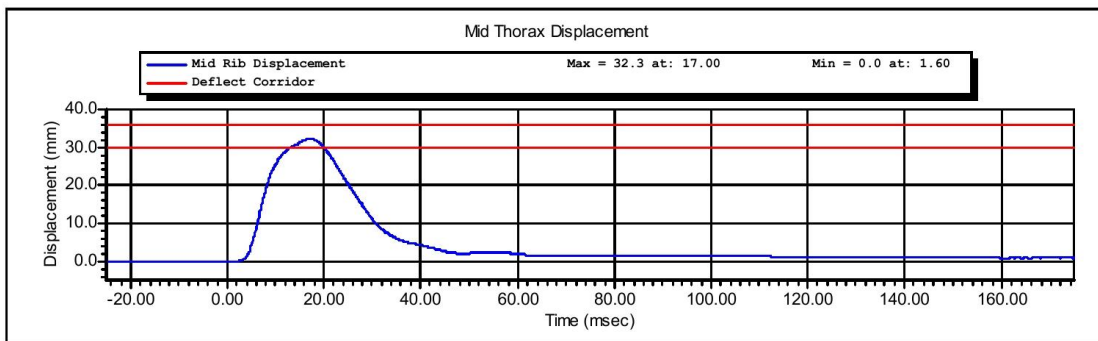
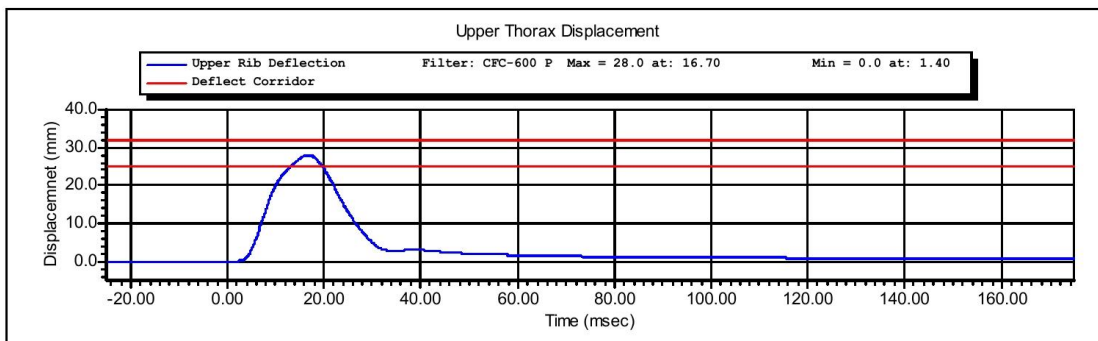
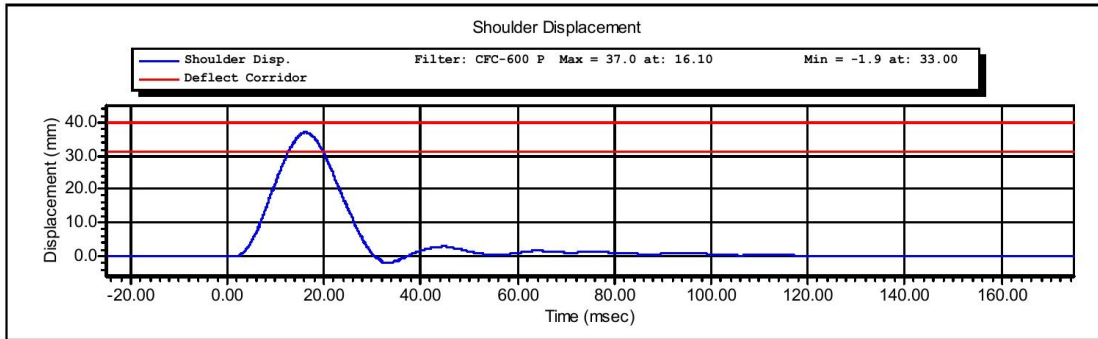
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Test Time: 9:17:02 AM

Test Date: 11/15/2012

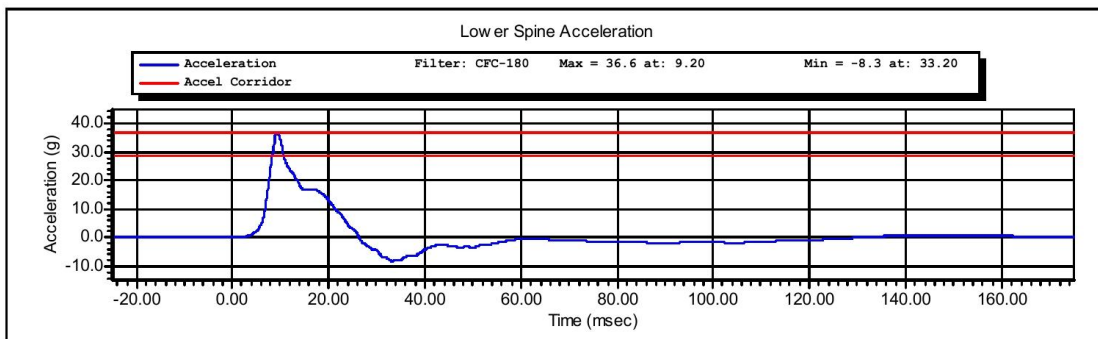
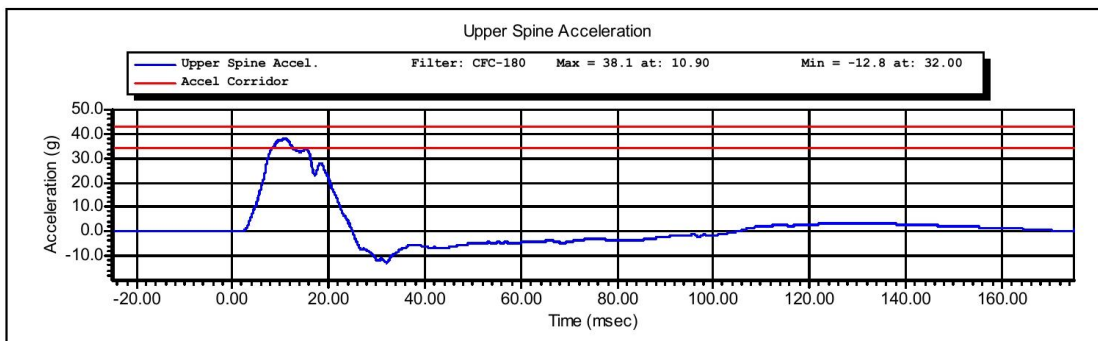
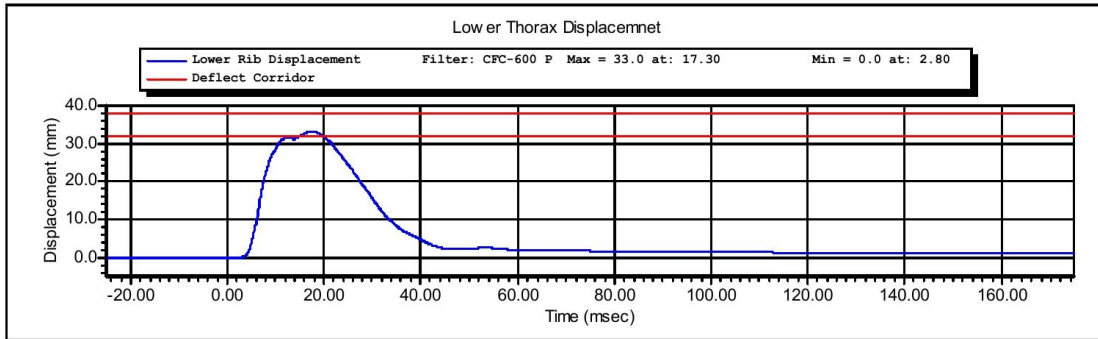
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Test Time: 9:17:02 AM

Test Date: 11/15/2012

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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:	303		
Test ID:	Abdomen	Test Date:	11/15/2012
Test Number:	1	Test Time:	8:34:26 AM

Component Part Number	Component Serial Number
Upper Abdomen Rib	1789
Lower Abdomen Rib	1790

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.0 deg C P
Humidity	10 -- 70	19 %RH P
Velocity	4.20 -- 4.40	4.32 m/s P
Probe Acceleration	12.0 -- 16.0	15.6 g P
Upper Abdominal Rib Deflection	36.0 -- 47.0	37.2 mm P
Lower Abdominal Rib Deflection	33.0 -- 44.0	38.1 mm P
Lower Spine Acceleration - T12	9.0 -- 14.0	12.1 g P

All test parameters are within specifications

Technician: **M. Goehle**Supervisor: **D. Travale**Test Time: **8:34:26 AM**Test Date: **11/15/2012**



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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	5/25/2012
Servo	180-3885	DS-1274	10/24/2012
Servo	180-3885	DS-1285	10/25/2012
Endevco	7264-2000	P63861	10/25/2012

Test Time: 8:34:26 AM

Test Date: 11/15/2012

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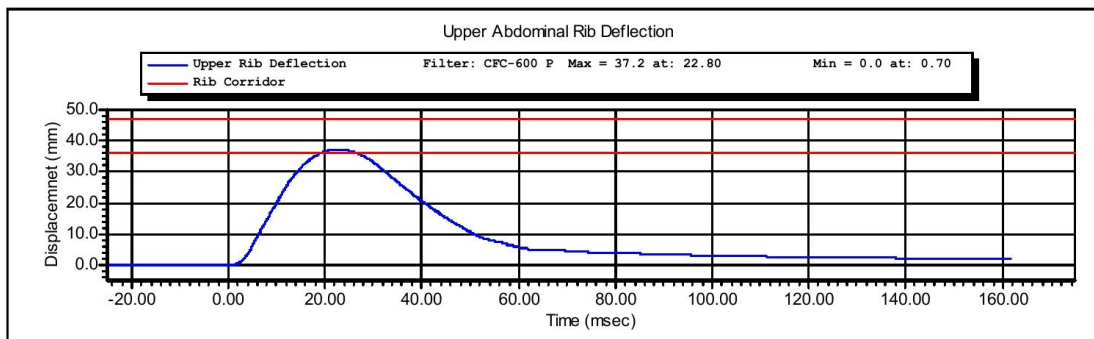
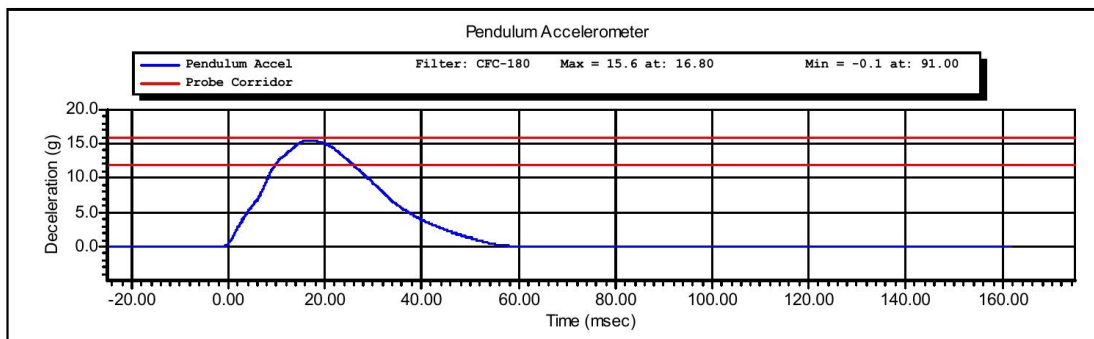


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Test Name:	Abdominal Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	303		
Test ID:	Abdomen	Test Date:	11/15/2012
Test Number:	1	Test Time:	8:34:26 AM



Test Time: 8:34:26 AM

Test Date: 11/15/2012

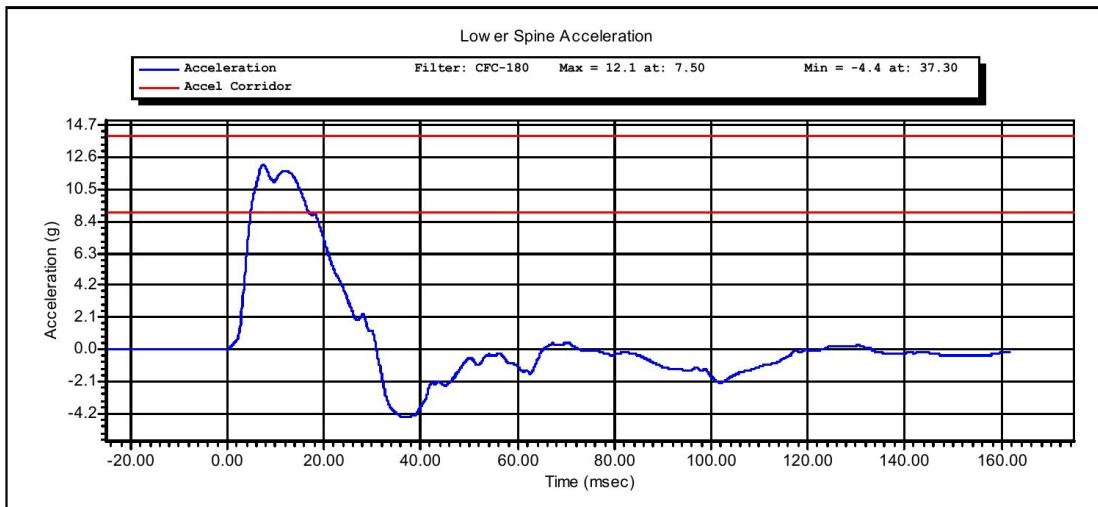
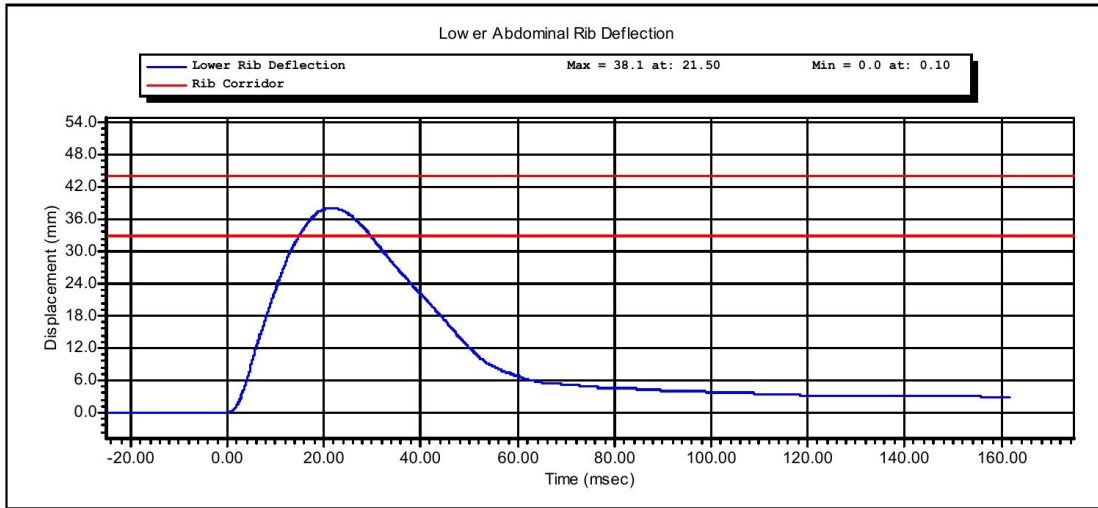
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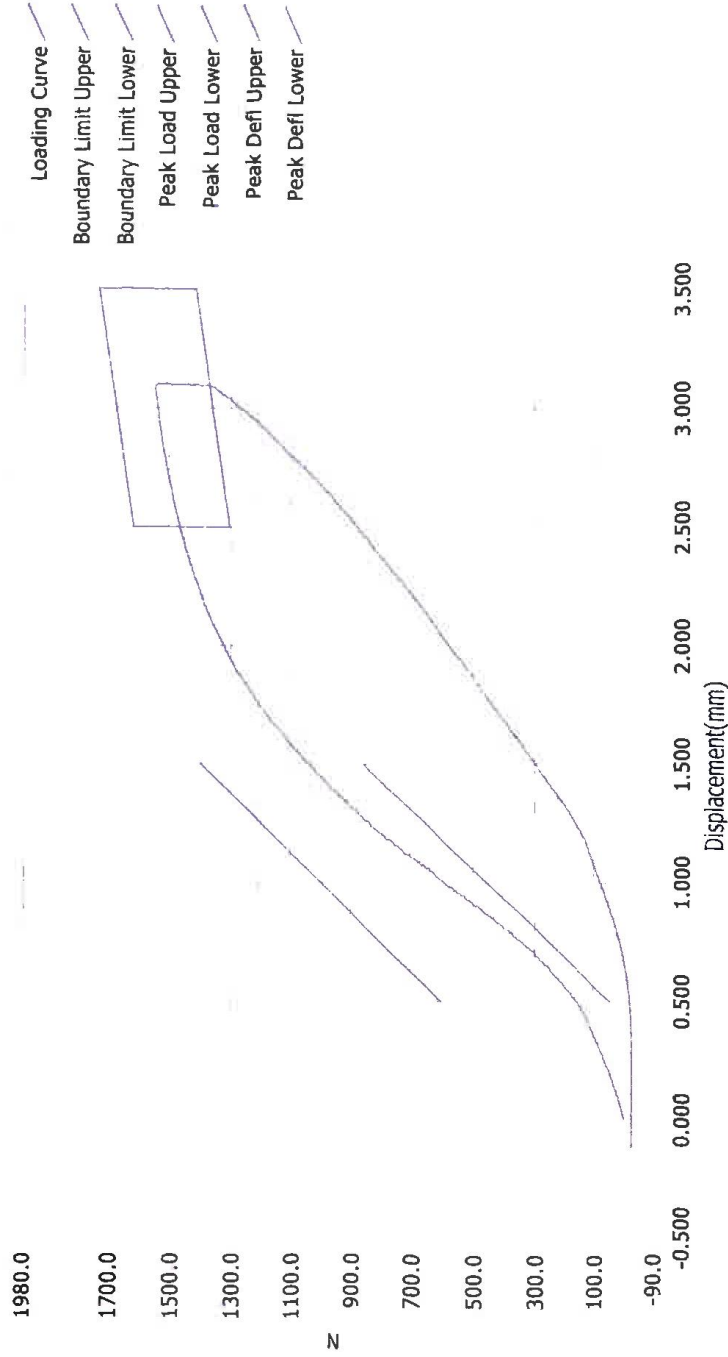


Test Time: 8:34:26 AM

Test Date: 11/15/2012

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Resultant Data - SIDIIs Plug Compression



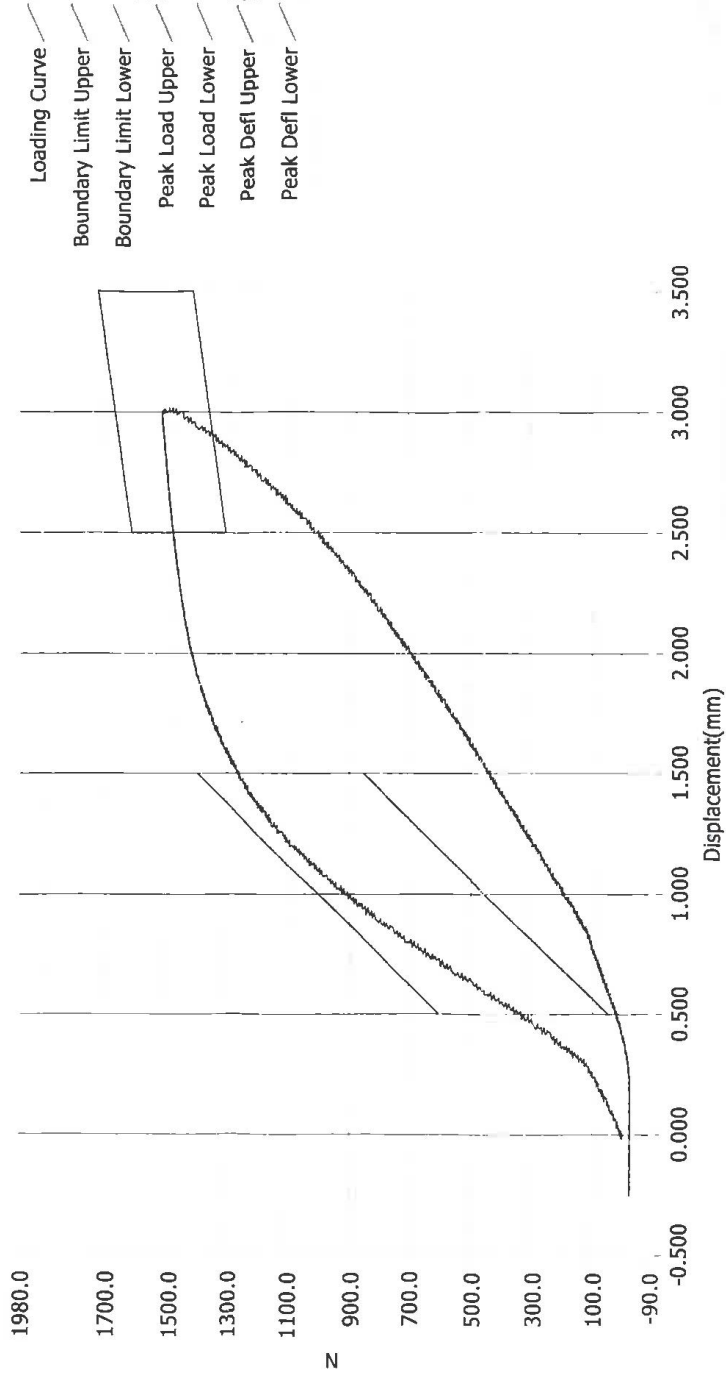
ATD Calibration Lab

Test ID	Part Serial Number	Test Date	Test Time
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Cert ID	ATD Serial Number	ATD Type	SIDIIIs
	N/A		

303-Crash Plug
11-15-12

Current Date : 9/22/2011 Current Time : 20:23:39

Resultant Data - SIDIIs Plug Compression



ATD Calibration Lab

Test ID
Part Serial Number
Test Date
Test Time

303-Cert plug
 11-15-12

Cert ID
ATD Serial Number
ATD Type

Current Date : 10/5/2010
 Current Time : 21:14:29

VERIFICATION REPORT

Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Acetabulum Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	303		
Test ID:	Acetabulum	Test Date:	11/15/2012
Test Number:	2	Test Time:	8:03:11 AM

Component Part Number	Component Serial Number
FTSS Cert Plug - 1519N	36790
Humanetics Crash Plug - 1543N	46454

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.0 deg C P
Humidity	10 -- 70	19 %RH P
Velocity	6.60 -- 6.80	6.61 m/s P
Peak Probe Acceleration	38.0 -- 47.0	44.3 g P
Peak Pelvis Acceleration	34.0 -- 42.0	41.8 g P
Peak Acetabulum Force	3.60 -- 4.30	3.90 kN P

All test parameters are within specifications

Technician: **M. Goehle**

Supervisor: **D. Travale**

Test Time: **8:03:11 AM**

Test Date: **11/15/2012**



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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	5/25/2012
Endevco	7264-2000	P51259	7/30/2012
FTSS	IF-520	LC-236 Fy	10/25/2012

Test Time: 8:03:11 AM

Test Date: 11/15/2012

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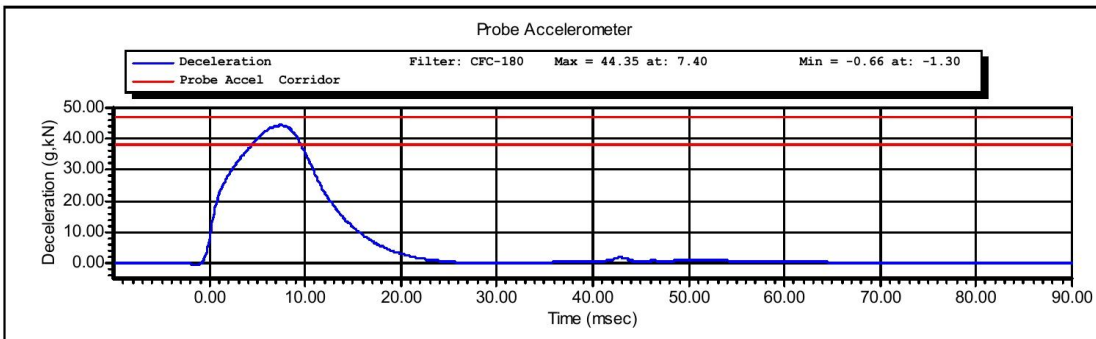
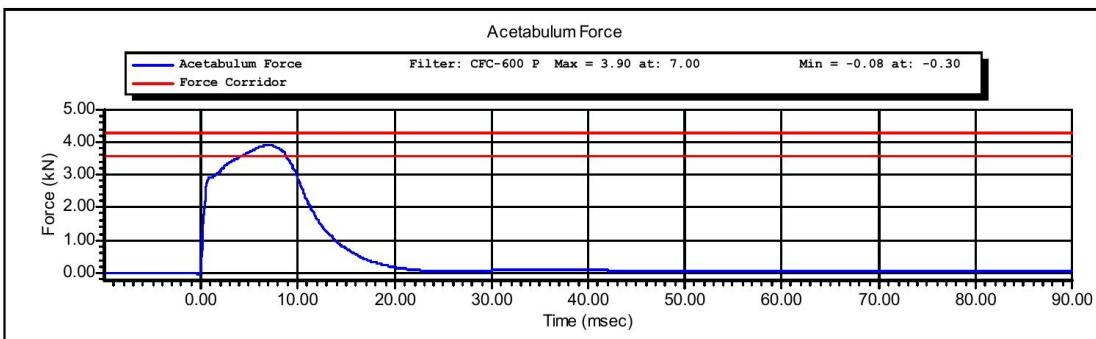


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Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Acetabulum Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	303		
Test ID:	Acetabulum	Test Date:	11/15/2012
Test Number:	2	Test Time:	8:03:11 AM



Test Time: **8:03:11 AM**

Test Date: **11/15/2012**

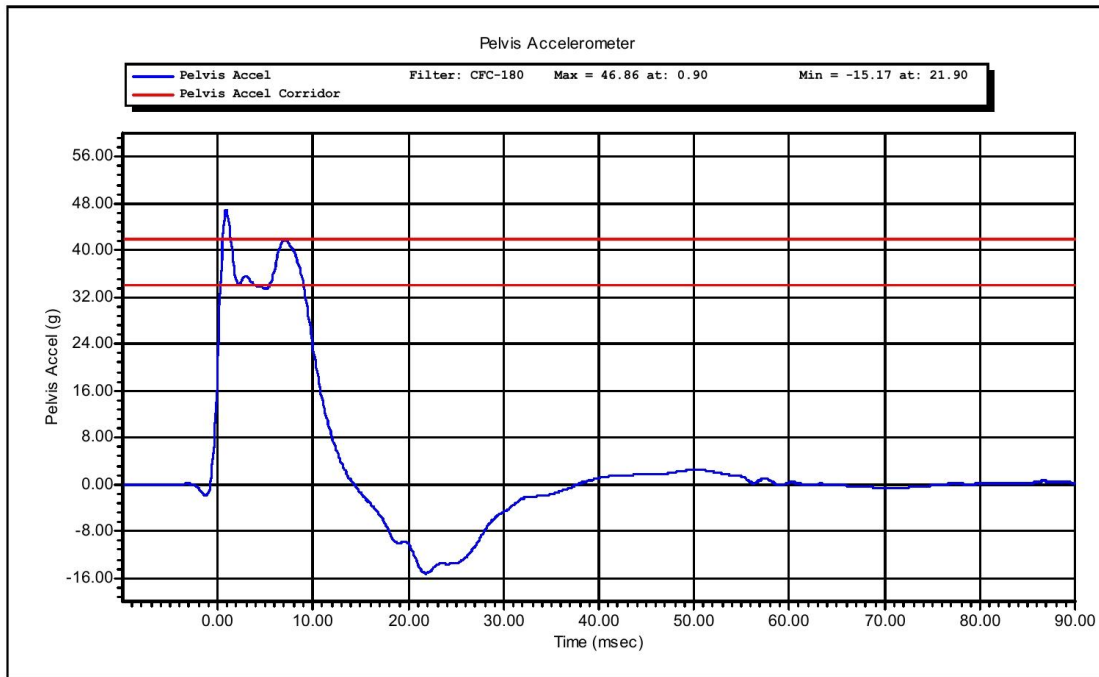
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Test Time: 8:03:11 AM

Test Date: 11/15/2012

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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:	303		
Test ID:		Test Date:	11/14/2012
Test Number:	1	Test Time:	5:33:56 PM

Component Part Number	Component Serial Number
180-4343 Pelvis Flesh	881

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.0 deg C P
Humidity	10 -- 70	25 %RH P
Velocity	4.20 -- 4.40	4.29 m/s P
Peak Probe Acceleration	36.0 -- 45.0	41.5 g P
Peak Pelvis Acceleration	28.0 -- 39.0	36.2 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 Time: **5:33:56 PM**

Test Date: **11/14/2012**



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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	5/25/2012
Endevco	7264-2000	P51259	7/30/2012
DentonATD	3228J	LC-280 Fy	10/24/2012

Test Time: 5:33:56 PM

Test Date: 11/14/2012

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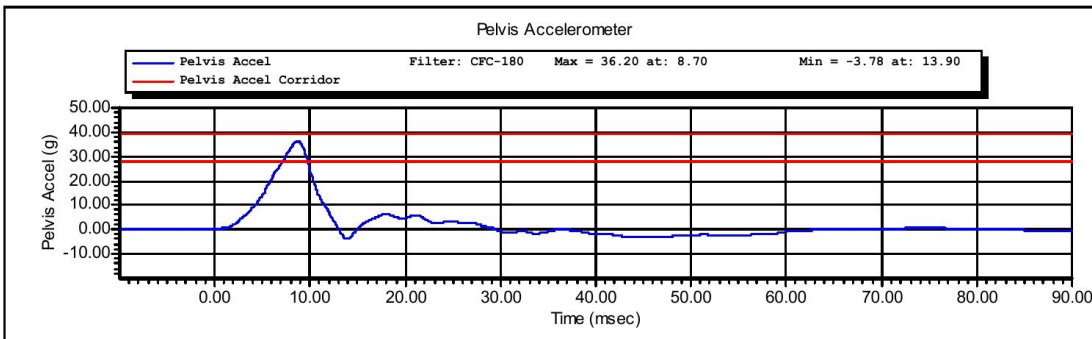
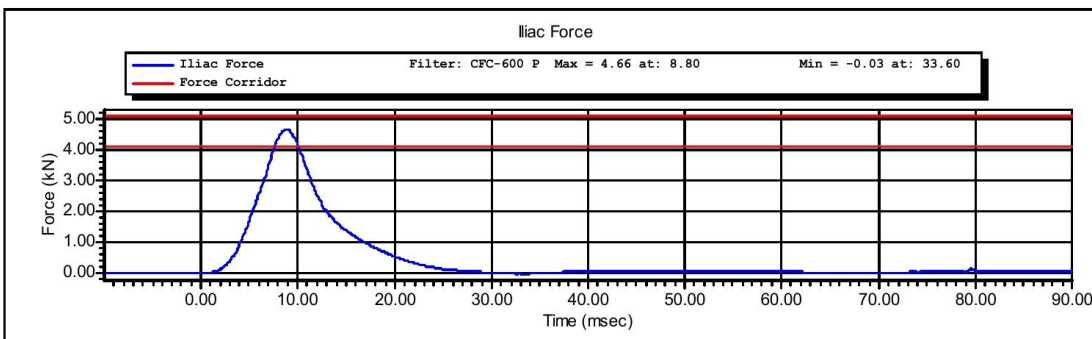


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Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Iliac Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	303		
Test ID:		Test Date:	11/14/2012
Test Number:	1	Test Time:	5:33:56 PM



Test Time: **5:33:56 PM**

Test Date: **11/14/2012**

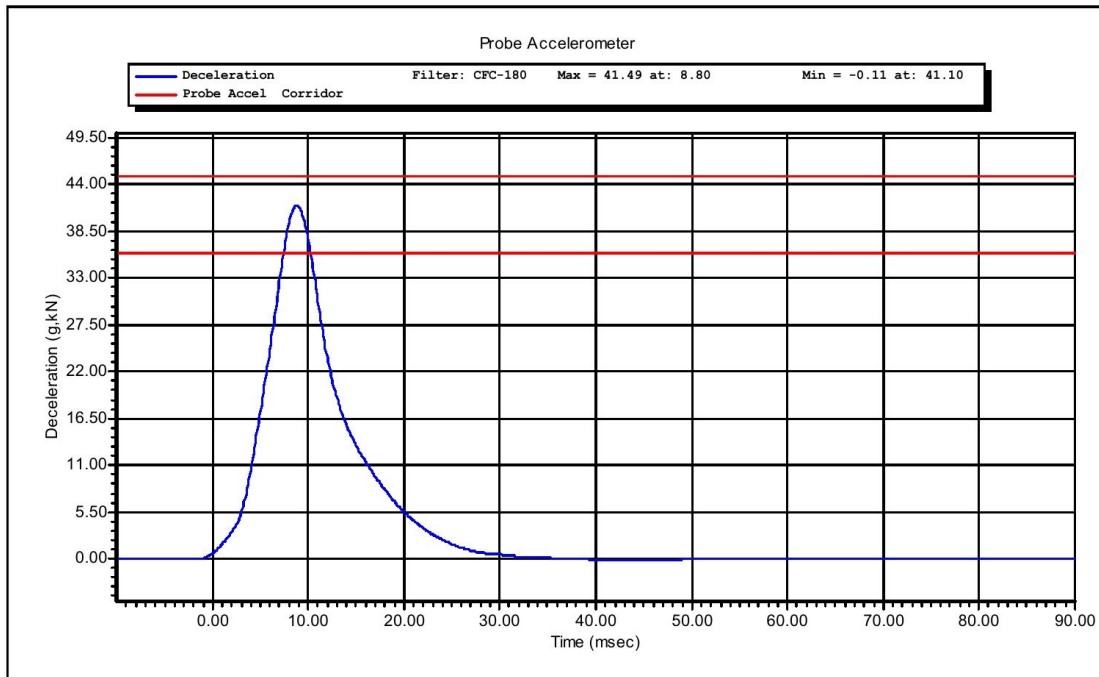
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Test Time: 5:33:56 PM

Test Date: 11/14/2012

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APPENDIX D

TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

Table 1 – Dummy Instrumentation (ES-2re)

			ES-2re S/N: F033		
			Serial Number	Manufacturer	Calibration Date
Head Accelerometers		X	P49204	ENDEVCO	7/30/2012
		Y	P63981	ENDEVCO	5/23/2012
		Z	P64007	ENDEVCO	5/23/2012
Thorax Rib Displacement Potentiometers	Upper	Y	179	HONEYWELL	5/17/2012
	Middle	Y	185	HONEYWELL	5/17/2012
	Lower	Y	178	HONEYWELL	5/17/2012
Abdomen Load Cells	Forward	Y	1524	DENTON	5/24/2012
	Middle	Y	1523	DENTON	5/24/2012
	Rear	Y	1530	DENTON	5/24/2012
Lower Spine Accelerometers (T12)		X	AAMD5	ENDEVCO	5/22/2012
		Y	J27457	ENDEVCO	5/22/2012
		Z	P52099	ENDEVCO	5/21/2012
Pubic Symphysis Load Cell		Y	456	DENTON	5/24/2012

Table 2 – Dummy Instrumentation (SID-IIs)

				SID-IIs S/N: 303		
				Serial Number	Manufacturer	Calibration Date
Head Accelerometers			X	P59021	ENDEVCO	7/24/2012
			Y	P52088	ENDEVCO	7/24/2012
			Z	P58794	ENDEVCO	7/24/2012
Displacement Potentiometers	Shoulder		Y			
	Thoracic Rib	Upper	Y	1199	FTSS	10/25/2012
		Middle	Y	1246	FTSS	10/24/2012
		Lower	Y	1256	FTSS	10/25/2012
	Abdominal Rib	Upper	Y	1274	FTSS	10/24/2012
		Lower	Y	1285	FTSS	10/25/2012
Lower Spine Accelerometers (T12)			X	P52023	ENDEVCO	10/26/2012
			Y	P63861	ENDEVCO	10/25/2012
			Z	P49213	ENDEVCO	10/24/2012
Acetabulum Load Cell			Y	236	DENTON	10/25/2012
Iliac Wing Load Cell			Y	280	DENTON	10/24/2012
Pelvis Plug (struck side)						
Pelvis Plug (non-struck side)						

Table 3 – Vehicle Instrumentation

Vehicle Instrumentation			Serial Number	Manufacturer	Calibration Date
1	Vehicle Center of Gravity	X	A081429	MS	9/26/2012
	Vehicle Center of Gravity	Y	A081447	MS	8/10/2012
	Vehicle Center of Gravity	Z	A081463	MS	8/10/2012
2	Right Sill at Front Seat	X	A081413	MS	8/10/2012
	Right Sill at Front Seat	Y	A081417	MS	8/10/2012
	Right Sill at Front Seat	Z	A081443	MS	8/10/2012
3	Right Sill at Rear Seat	X	A081436	MS	8/10/2012
	Right Sill at Rear Seat	Y	A081453	MS	8/10/2012
	Right Sill at Rear Seat	Z	A081456	MS	8/10/2012
4	Left Sill at Front Door	Y	A081414	MS	9/5/2012
5	Left Sill at Rear Door	Y	A081418	MS	9/4/2012
6	Left A-Post Lower	Y	A081455	MS	9/4/2012
7	Left A-Post Middle	Y	A070861	MS	9/5/2012
8	Left B-Post Lower	Y	A005901	MS	9/5/2012
9	Left B-Post Middle	Y	A081419	MS	9/5/2012
10	Front Seat Track	Y	A005899	MS	9/4/2012
11	Rear Seat Track or Structure	Y	A081437	MS	9/4/2012
12	Right Rear Occ. Compartment	Y	A005903	MS	9/5/2012
13	Engine Block	X	A081461	MS	8/10/2012
	Engine Block	Y	A081425	MS	8/10/2012
14	Rear Floorpan Above Axle	X	A081445	MS	8/10/2012
	Rear Floorpan Above Axle	Y	A005869	MS	8/10/2012
	Rear Floorpan Above Axle	Z	A081433	MS	8/10/2012

TABLE 4 – MDB Instrumentation

MDB Instrumentation		Serial Number	Manufacturer	Calibration Date
MDB Center of Gravity	X	C14901	ENDEVCO	9/14/2012
MDB Center of Gravity	Y	C16680	ENDEVCO	9/14/2012
MDB Center of Gravity	Z	CP30	ENDEVCO	9/14/2012
Left Frame at Rear Axle Centerline	X	C16507	ENDEVCO	9/14/2012
Left Frame at Rear Axle Centerline	Y	C16499	ENDEVCO	9/14/2012