

REPORT NUMBER: SINCAP-MGA-2012-024

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

**GENERAL MOTORS LLC
2012 Chevrolet Suburban 2WD 1/2 Ton LT SUV
NHTSA No.: MC0104**

**MGA RESEARCH CORPORATION
5000 Warren Road
Burlington, WI 53105**



Test Date: November 8, 2011

Final Report Date: November 11, 2011

FINAL REPORT

**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, DC 20590**

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Approval Date: November 11, 2011

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: _____

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

Date: _____

Technical Report Documentation Page

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15. Supplementary Notes																																																							
16. Abstract A 55/28 km/h 90° Moving Deformable Barrier NCAP Side Impact Test was conducted on the subject 2012 Chevrolet Suburban 2WD 1/2 Ton LT SUV in accordance with the specifications of the Office of Crashworthiness Standards NCAP Side Laboratory Test Procedure for the generation of consumer information on vehicle side crash protection. The test was conducted at MGA Research Corporation, in Burlington, Wisconsin, on November 8, 2011. The impact velocity of the Moving Deformable Barrier (MDB) was 62.5 km/h, and the ambient temperature at the struck (driver's) side of the target vehicle at the time of impact was 21.1°C. The target vehicle post-test maximum crush was 260 mm at level 1. The test vehicle's performance was as follows: <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th></th> <th colspan="3">Driver ATD (ES-2re)</th> </tr> <tr> <th>Measurement Description</th> <th>Units</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td> <td>N/A</td> <td>1000</td> <td>27</td> </tr> <tr> <td>Maximum Thorax Rib Deflection</td> <td>mm</td> <td>44</td> <td>12</td> </tr> <tr> <td>Total Abdominal Force</td> <td>N</td> <td>2500</td> <td>474</td> </tr> <tr> <td>Pubic Symphysis Force</td> <td>N</td> <td>6000</td> <td>1342</td> </tr> </tbody> </table> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th></th> <th colspan="3">Passenger ATD (SID-IIs)</th> </tr> <tr> <th>Measurement Description</th> <th>Units</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td> <td>N/A</td> <td>1000</td> <td>28</td> </tr> <tr> <td>Resultant Lower Spine Acceleration</td> <td>Gs</td> <td>82</td> <td>18</td> </tr> <tr> <td>Total Pelvic Force (sum of acetabular and iliac forces)</td> <td>N</td> <td>5525</td> <td>431</td> </tr> <tr> <td>Maximum Thoracic Rib Deflection</td> <td>mm</td> <td>38*</td> <td>11</td> </tr> <tr> <td>Maximum Abdomen Rib Deflection</td> <td>mm</td> <td>45*</td> <td>5</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.					Driver ATD (ES-2re)			Measurement Description	Units	Threshold	Result	Head Injury Criteria (HIC ₃₆)	N/A	1000	27	Maximum Thorax Rib Deflection	mm	44	12	Total Abdominal Force	N	2500	474	Pubic Symphysis Force	N	6000	1342		Passenger ATD (SID-IIs)			Measurement Description	Units	Threshold	Result	Head Injury Criteria (HIC ₃₆)	N/A	1000	28	Resultant Lower Spine Acceleration	Gs	82	18	Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	431	Maximum Thoracic Rib Deflection	mm	38*	11	Maximum Abdomen Rib Deflection	mm	45*	5
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SECTION 1

TEST PURPOSE AND PROCEDURE

This moving deformable barrier side impact test is part of the MY 2012 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-09-D-00124. The purpose of this test is to generate comparative side impact performance in a 2012 Chevrolet Suburban 2WD 1/2 Ton LT SUV. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Side NCAP Laboratory Test Procedure dated August 2011.

SECTION 2 SUMMARY OF TEST RESULTS

A 2012 Chevrolet Suburban 2WD 1/2 Ton LT SUV 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 62.5 km/h (38.9 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 MGA Research Corporation in Burlington, Wisconsin, on November 8, 2011. 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 NCAP Side Laboratory Test Procedure dated August 2011. The side impact event was documented by eleven (11) 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 Triaxial 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) Triaxial Accelerometers
Pubic Symphysis Y-Axis Load Cell

PASSENGER ATD (SID-IIs)

Primary and Redundant Head CG Triaxial 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) Triaxial Accelerometers
Acetabulum and Iliac Wing Y-Axis Load Cells

Appendix B contains the dummy response data. Dummy configuration and performance verification data can be found in Appendix C of this report. Appendix D contains the test equipment and instrumentation calibration data.

Dummy Injury readings were recorded as follows:

DUMMY INJURY VALUES

	Driver ATD (ES-2re)		
Measurement Description	Units	Threshold	Result
Head Injury Criteria (HIC ₃₆)	N/A	1000	27
Maximum Thorax Rib Deflection	mm	44	12
Combined Abdominal Force	N	2500	474
Pubic Symphysis Force	N	6000	1342

	Passenger ATD (SID-IIs)		
Measurement Description	Units	Threshold	Result
Head Injury Criteria (HIC ₃₆)	N/A	1000	28
Resultant Lower Spine Acceleration	Gs	82	18
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	431
Maximum Thoracic Rib Deflection	mm	38*	11
Maximum Abdomen Rib Deflection	mm	45*	5

*Proposed IARV

Supplemental restraint information is given below:

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

The test data can be found on the NHTSA website at www.nhtsa.dot.gov

GENERAL COMMENTS

There was no valid data collected for:

Left Lower A-Post Y after 1 msec.

Left Mid B-Post Y is questionable between 12-20 msec.

Driver Seat Track Y after 11 msec.

Left Rear Seat Y is questionable between 37-44 msec.

Car rolled 90° after impact. See Photo on Page A-52.

MGA does not endorse or certify products. The manufacturer's name appears solely for identification purposes.

SECTION 3
OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2012 Chevrolet Suburban 2WD 1/2 Ton LT SUV NHTSA No. MC0104
 Test Program: NCAP Side MDB Impact Test Test Date: 11/08/2011

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	MC0104	Traction Control System (TCS)	Yes
Model Year	2012	Auto-Leveling System	No
Make	Chevrolet	Automatic Door Locks (ADL)	Yes
Model	Suburban	Power Window Auto-Reverse	No
Body Style	MPV	Other Optional Feature	N/A
VIN	1GNSCJE0XCR128414	Driver Front Airbag	Yes
Body Color	Gold Mist Metallic	Driver Curtain Airbag	Yes
Odometer Reading (km/mi)	42 / 26	Driver Head/Torso Airbag	No
Engine Displacement (L)	5.3	Driver Torso Airbag	No
Type/No. Cylinders	8	Driver Torso/Pelvis Airbag	Yes
Engine Placement	Longitudinal	Driver Pelvis Airbag	No
Transmission Type	Automatic	Driver Knee Airbag	No
Transmission Speeds	6	Rear Pass. Curtain Airbag	Yes
Overdrive	Yes	Rear Pass. Head/Torso Airbag	No
Final Drive	Rear	Rear Pass. Torso Airbag	No
Roof Rack	Yes	Rear Pass. Torso/Pelvis Airbag	No
Sunroof/T-Top	No	Rear Pass. Pelvis Airbag	No
Running Boards	Yes	Driver Seat Belt Pretensioner	Yes
Tilt Steering Wheel	Yes	Rear Pass. Seat Belt Pretensioner	No
Power Seats	Yes	Driver Load Limiter	Yes
Anti-Lock Brakes (ABS)	Yes	Rear Pass. Load Limiter	No
All Wheel Drive (AWD)	No	Other Safety Restraint	N/A
Does owner's manual provide instruction to turn off automatic door locks?			No

DATA FROM CERTIFICATION LABEL

Manufactured By	General Motors LLC	GVWR (kg)	3266
Date of Manufacture	09/11	GAWR Front (kg)	1588
Vehicle Type	MPV	GAWR Rear (kg)	1905

VEHICLE SEATING AND WEIGHT CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity (DSC)	2	3	3	8	
Capacity Weight (VCW) (kg)				656	(A)
DSC x 68.04 kg				544	(B)
Rated Cargo and Luggage Weight (RCLW)				112	(A-B)

VEHICLE SEAT TYPE

Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable	
						Manual	Power
Front Seat	X					w/lever	
Rear or Second Row			X		X		
Third Row Seat			X		X		

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

Test Vehicle: 2012 Chevrolet Suburban 2WD 1/2 Ton LT SUV

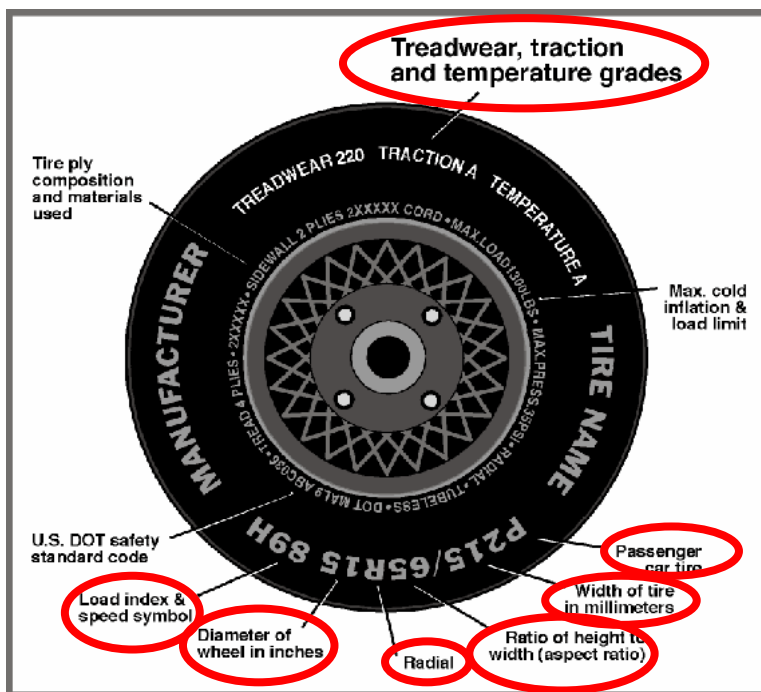
NHTSA No.

MC0104

Test Program: NCAP Side MDB Impact Test

Test Date: 11/08/2011

VEHICLE TIRE INFORMATION



TIRE PLACARD INFORMATION

Measured Parameter	Front	Rear
Recommended Cold Tire Pressure (kPa)	210	210
Recommended Tire Size	P265/70R17	P265/70R17

TIRE SIDEWALL INFORMATION

Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	300	300
Tire Size on Vehicle	P265/70R17	P265/70R17
Tire Manufacturer	Goodyear	Goodyear
Tire Name	Wrangler HP	Wrangler HP
Tire Type	Passenger	Passenger
Tire Width	265	265
Aspect Ratio	70	70
Radial	Yes	Yes
Wheel Diameter	17	17
Load Index/Speed Symbol	113S	113S
Treadwear	340	340
Traction Grade	A	A
Temperature Grade	B	B
Tire Material	Rubber	Rubber

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

Test Vehicle: 2012 Chevrolet Suburban 2WD 1/2 Ton LT SUV NHTSA No. MC0104
 Test Program: NCAP Side MDB Impact Test Test Date: 11/08/2011

TEST PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kpa	210	210	210	210
Tire Placard	kpa	210	210	210	210
Owner's Manual	kpa				
As Tested	kpa	210	210	210	210

MDB TIRE SPECIFICATIONS

	Requirement	Units	LF	RF	LR	RR
Tire Size	P205/75R15	N/A	P205/75R15	P205/75R15	P205/75R15	P205/75R15
Tire	200 ± 21	kpa	220	220	220	220

TEST VEHICLE AXLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	666.3	654.5		703.5	753.9		710.3	772.9	
Right	kg	661.9	626.0		673.6	712.6		654.6	712.2	
Ratio	%	50.9	49.1		48.4	51.6		47.9	52.1	
Totals	kg	1328.2	1280.5	2608.7	1377.1	1466.5	2843.6	1364.9	1485.1	2850.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	2608.7	(A)
Sum of Actual Weight of 2 P572 ATDs Used	kg	129.3	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	112	(C)
Calculated Vehicle Target Weight (TVTW)	kg	2850.0	(A+B+C)

Does the measured As Tested Vehicle Weight lie within the required weight range (i.e. Calculated Test Vehicle Target Weight – 4.5 kg to 9 kg)? **YES**

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Weight of Ballast, if any	76.2
Right tail light, rear cargo area carpet, right side mirror	7.7

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

Test Vehicle: 2012 Chevrolet Suburban 2WD 1/2 Ton LT SUV NHTSA No. MC0104
 Test Program: NCAP Side MDB Impact Test Test Date: 11/08/2011

TEST VEHICLE ATTITUDES AND CG

	Units	Fully Loaded	As Tested	Meets Requirement***
Left Front	mm	887	889	Yes
Right Front	mm	905	901	Yes
Right Rear	mm	936	934	Yes
Left Rear	mm	917	924	Yes
Vehicle CG (Aft of Front Axle)	mm	1725	1707	
Vehicle CG (Left (+) / Right (-) from Longitudinal Centerline)	mm	34	21	

*** The "As Tested" vehicle attitude measurements must be equal to or within ± 10 mm of the "Fully Loaded" vehicle attitude measurements at each wheel well.

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

Test Vehicle: 2012 Chevrolet Suburban 2WD 1/2 Ton LT SUV NHTSA No. MC0104
 Test Program: NCAP Side MDB Impact Test Test Date: 11/08/2011

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 passenger's seats should be set to the rear-most, lowest, mid-angle position.

SCRL ANGLE RANGE

Seat	SCRL (°)		
	Max	Min	Mid
Driver Seat	17.7	5.8	11.8
Front Passenger Seat	17.7	5.8	11.8
Front Center Seat			
Struck Side Rear Seat	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed

SEAT HEIGHT AND ANGLE

Seat	As Tested SCRL Angle (Mid) (°)	As Tested SCR Height (mm)	SCR Height Position	SCR Height (mm)		
				Rear- most	Mid- Fore/Aft	Forward- Most
Driver Seat	11.8	0	Max	40	40	40
	11.8	0	Mid	20	20	20
	11.8	0	Min	0	0	0
Front Passenger Seat	11.8	0	Max	40	40	40
	11.8	0	Mid	20	20	20
	11.8	0	Min	0	0	0
Front Center Seat			Max			
			Mid			
			Min			
Struck Side Rear Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
	Fixed	Fixed	Mid	Fixed	Fixed	Fixed
	Fixed	Fixed	Min	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
	Fixed	Fixed	Mid	Fixed	Fixed	Fixed
	Fixed	Fixed	Min	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
	Fixed	Fixed	Mid	Fixed	Fixed	Fixed
	Fixed	Fixed	Min	Fixed	Fixed	Fixed

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

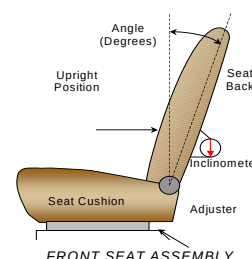
Test Vehicle: 2012 Chevrolet Suburban 2WD 1/2 Ton LT SUV NHTSA No. MC0104
 Test Program: NCAP Side MDB Impact Test Test Date: 11/08/2011

SEAT FORE/AFT POSITIONS

Seat	Total Fore/Aft Travel		Test Position from Forward-most Position	
	mm	Detents	mm	Detent
Driver Seat	240		120	
Front Passenger Seat	228		114	
Front Center Seat				
Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Non-Struck Side	Fixed	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed	Fixed

SEAT BACK ANGLE ADJUSTMENT

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



Seat	Total Seat Back Angle Range		Test Position from Vertical	
	Degrees	Detents	Degrees	Detent
Driver Seat w/Seated Dummy	50.0		7.3	8 th (1 st as 0)
Front Passenger Seat	50.2		7.9	NA
Front Center Seat				
Struck Side Rear Seat	Fixed		18.6*	Fixed
Non-Struck Side Rear Seat	Fixed		18.8*	Fixed
Rear Center Seat	Fixed		18.6*	Fixed

* split bench, angles are measured on seatbacks.

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

Test Vehicle: 2012 Chevrolet Suburban 2WD 1/2 Ton LT SUV NHTSA No. MC0104
 Test Program: NCAP Side MDB Impact Test Test Date: 11/08/2011

SEAT BELT ANCHORAGE ADJUSTMENT

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

	Total # of Positions	Placed in Position #
Driver Seat	5 detents (1 st as 1)	0 (uppermost as 0)
Rear Seat	Fixed	Not Applicable

HEAD RESTRAINT ADJUSTMENT

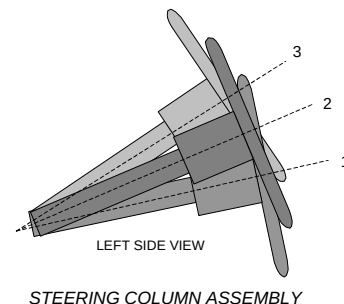
The driver's head restraint is adjusted to the highest and most full forward in-use position. The struck-side rear passenger's head restraint is adjusted to the lowest and most full forward in-use position.

	Total # of Positions	Placed in Position #
Driver Seat	4 (1 st as 1)	Highest
Rear Seat	Fixed	Not Applicable

STEERING COLUMN ADJUSTMENT

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

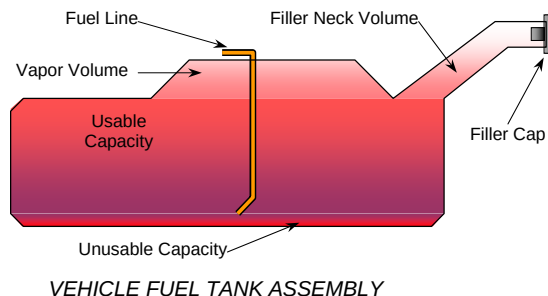
	Degrees	Fore/Aft Position (mm)
Lowermost, Position 1	79.2	
Geometric Center, Position 2	69.2	
Uppermost, Position 3	59.2	
Telescoping Steering Wheel Travel		
Test Position	69.2	



FUEL PUMP

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

The vehicle is equipped with an electric fuel pump. Pump will run when engine is running. Also, it will run briefly when ignition key is turned to the "on" position without starting the engine. The fuel pipe is on the left side.



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

Test Vehicle: 2012 Chevrolet Suburban 2WD 1/2 Ton LT SUV NHTSA No. MC0104
 Test Program: NCAP Side MDB Impact Test Test Date: 11/08/2011

FUEL TANK CAPACITY DATA

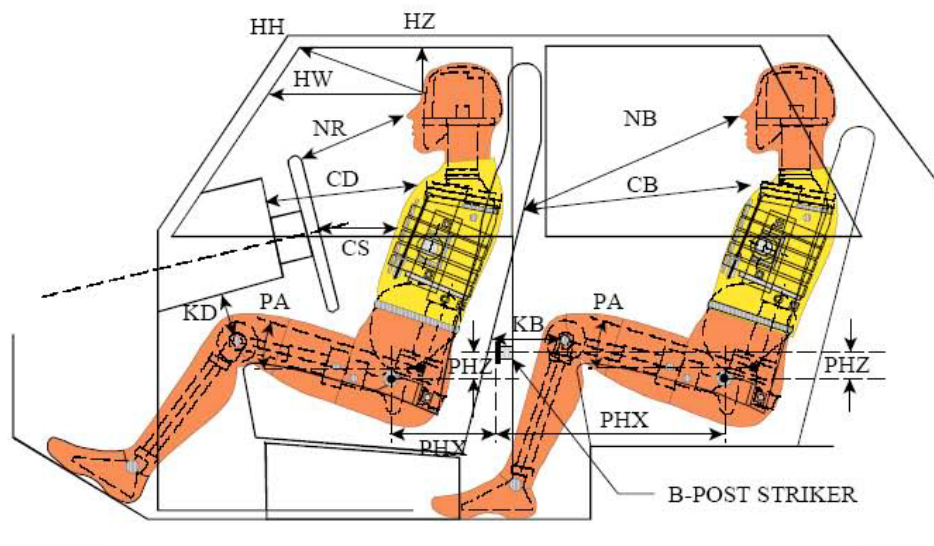
	Liters
Usable Capacity of "Standard" Tank (see Form No. 1)	117.3
Usable Capacity of "Optional" Tank (see Form No. 1)	
Usable Capacity of Standard Tank as Specified in Owner's Manual	119.2
Usable Capacity of Optional Tank as Specified in Owner's Manual	
93% of Usable Capacity	109.1
Actual Amount of Solvent Used	109.1
1/3 of Usable Capacity	39.1

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**

DATA SHEET NO. 3 DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2012 Chevrolet Suburban 2WD 1/2 Ton LT SUV
Test Program: NCAP Side MDB Impact Test

NHTSA No. MC0104
Test Date: 11/08/2011



LEFT SIDE VIEW

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

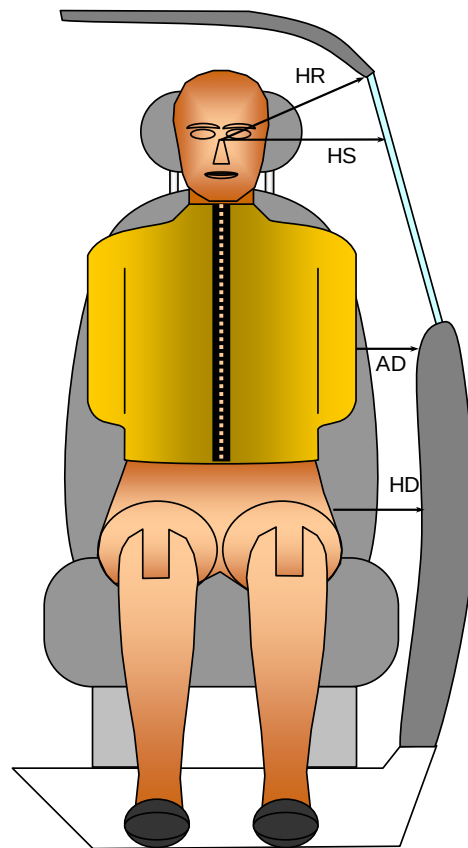
DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Pass. Code	Measurement Description	Driver S/N 032		Passenger S/N 306	
			Length (mm)	Angle(°)	Length (mm)	Angle(°)
HH		Head to Header	424	11.8		
HW		Head to Windshield	639			
HZ	HZ	Head to Roof Liner	201		278	
NR	NB	Nose to Rim/Seat Back	435	21.0	611	7.6
CD	CB	Chest to Dashboard/Seat Back	510	9.2	606	14.5
CS		Chest to Steering Wheel	333	13.6		
KDL	KBL	Left Knee to Dash/Seat Back	151	28.8	307	16.1
KDR	KBR	Right Knee to Dash/Seat Back	138	26.7	304	19.4
PAX	PAX	Pelvic Tilt Angle X		20.8		22.1
	PAY	Pelvic Tilt Angle Y		-0.6		-0.3
PHX	PHX	Hip Point to Striker (X-Axis)	319		301	
PHZ	PHZ	Hip Point to Striker (Z-Axis)	10		20	

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2012 Chevrolet Suburban 2WD 1/2 Ton LT SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MC0104
 Test Date: 11/08/2011



FRONT VIEW OF DUMMY

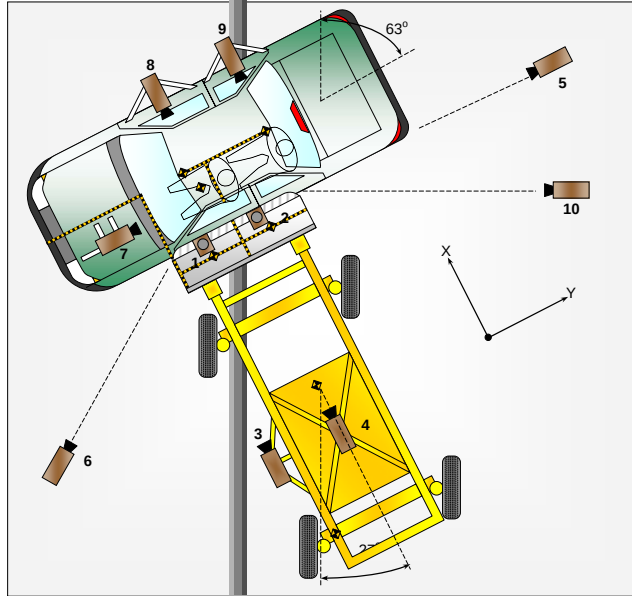
DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

Code	Measurement Description	Units	Driver S/N 032	Passenger S/N 306
HR	Head to Side Header	mm	150	264
HS	Head to Side Window	mm	303	367
AD	Arm to Door	mm	95	159
HD	Hip Point to Door	mm	140	224

DATA SHEET NO. 5 CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2012 Chevrolet Suburban 2WD 1/2 Ton LT SUV
Test Program: NCAP Side MDB Impact Test

NHTSA No. MC0104
Test Date: 11/08/2011



CAMERA LOCATIONS AND DATA

No.	Camera View	Coordinates (mm)			Lens Length (mm)	Operating Frame Rate (fps)
		X*	Y*	Z*		
1	Overhead Overall	-130	160	-5050	14	1000
2	Overhead Close-Up	70	40	-5050	20	1000
3	Left Impact Point (MDB)				50	1000
4	Side Overall (MDB)				16	1000
5	Rear	70	5020	-1100	20	1000
6	Left Front	4290	-4960	-1180	24	1000
7	Driver Front (OB)				16	1000
8	Driver Side (OB)				8	1000
9	Passenger Side (OB)				8	1000
10	Real Time Left Rear					30
11	Real Time Inrun					30

Reference: Impact Point projected to Ground; +X = To Front of MDB, + Y = To Right of MDB, +Z = Down

* All measurements accurate to ± 6 mm

Explain why camera(s) did not operate as intended: Not Applicable

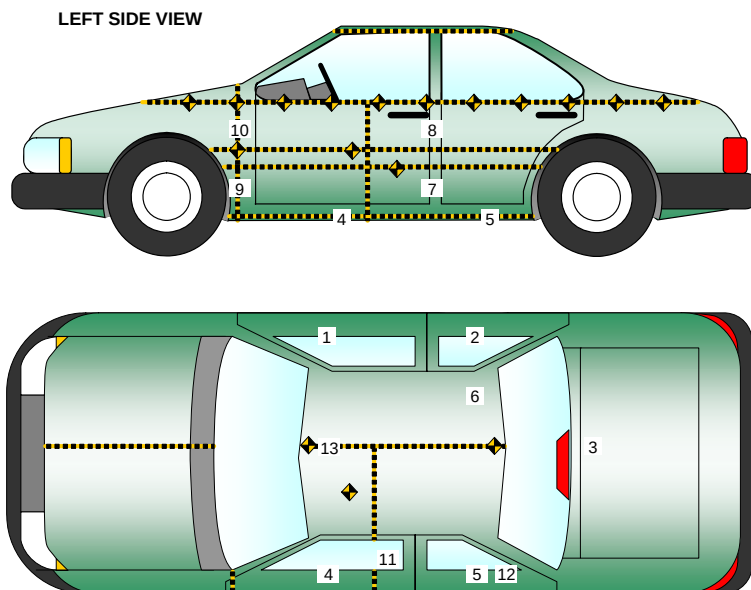
INSTRUMENTATION

Driver Dummy Channels	16
Passenger Dummy Channels	16
Vehicle Structure Accelerometers	23
MDB Accelerometers	5
MDB Contacts	2
Total	62

DATA SHEET NO. 6 **TEST VEHICLE ACCELEROMETER LOCATIONS**

Test Vehicle: 2012 Chevrolet Suburban 2WD 1/2 Ton LT SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MC0104
 Test Date: 11/08/2011



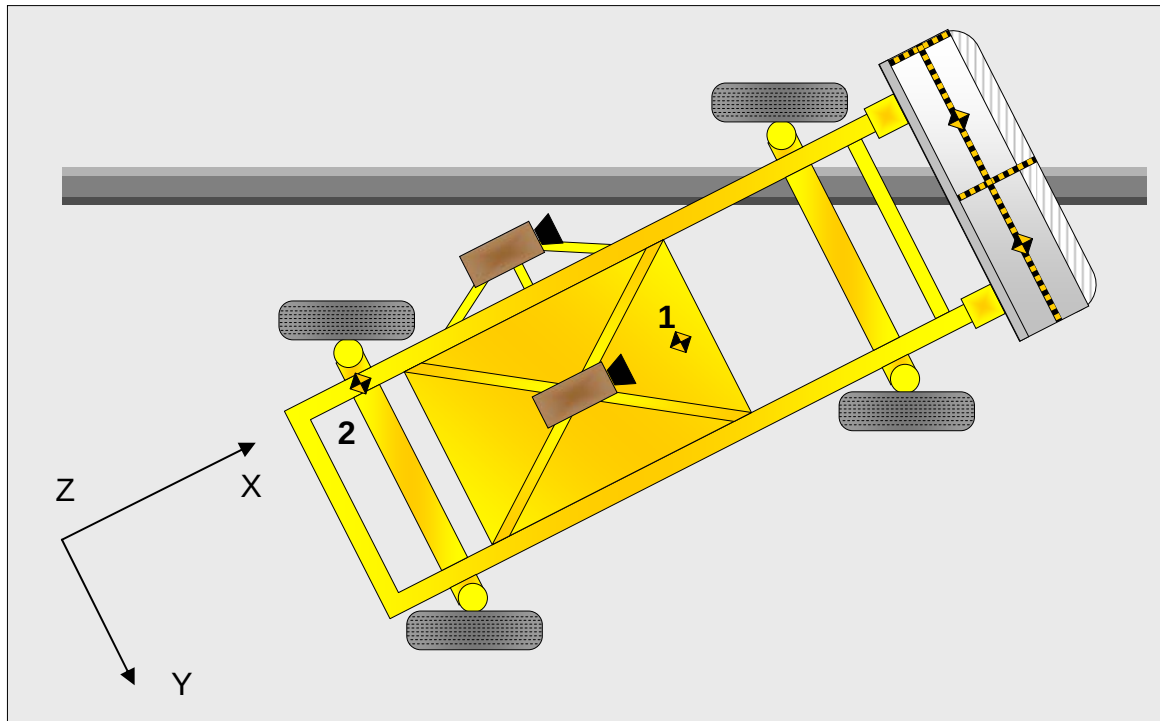
TEST VEHICLE ACCELEROMETER LOCATIONS

Accelerometer Location				
No.	ID	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	3136	60	-635
2	Right Sill at Front Seat	3333	805	-480
3	Right Sill at Rear Seat	2492	810	-485
4	Left Sill at Front Door	3397	-805	-440
5	Left Sill at Rear Door	2527	-810	-455
6	Left Lower A-Post	4022	-794	-798
7	Left Middle A-Post	4045	-891	-1013
8	Left Lower B-Post	2857	-821	-748
9	Left Middle B-Post	2857	-819	-1017
10	Front Seat Track	3210	-605	-652
11	Rear Seat Structure	2535	-525	-628
12	Rt. Rear Occ. Compartment	2440	470	-592
13	Engine Block	4695	0	-1150
14	Rear Above Axle	1336	0	-796

Reference: X – Rear Surface of Vehicle (+ forward)
 Y - Vehicle Centerline (+ to right)
 Z - Ground Plane (+ down)

DATA SHEET NO. 7
MDB ACCELEROMETER LOCATIONS

Test Vehicle: 2012 Chevrolet Suburban 2WD 1/2 Ton LT SUV NHTSA No. MC0104
 Test Program: NCAP Side MDB Impact Test Test Date: 11/08/2011



MDB ACCELEROMETER LOCATIONS

Loc. No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	MDB CG	-1105	0	-330
2	MDB Rear	-2580	-650	-625

Reference: X - MDB Face (+ forward)
 Y - MDB Centerline (+ to right)
 Z - Ground Plane (+ down)

DATA SHEET NO. 8
POST-TEST OBSERVATIONS

Test Vehicle: 2012 Chevrolet Suburban 2WD 1/2 Ton LT SUV NHTSA No. MC0104
Test Program: NCAP Side MDB Impact Test Test Date: 11/08/2011

TEST DUMMY INFORMATION AND CONTACT POINTS

Description	Front Seat Dummy (ES-2re)	Rear Seat Dummy (SID-IIs)
Face	Curtain Airbag	None
Top of Head	Curtain Airbag, Side Header	Curtain Airbag
Left Side of Head	Curtain Airbag	Curtain Airbag
Back of Head	Curtain Airbag, Headrest	Curtain Airbag, Center Seatback
Left Shoulder	Side Airbag	Door Panel
Upper Torso	Side Airbag	Seatback
Lower Torso	Side Airbag, Seatback	Door Panel
Left Hip	Side Airbag, Seatback	None
Left Knee	None	Door Panel

POST-TEST DOOR PERFORMANCE

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

POST-TEST SEAT PERFORMANCE

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

POST-TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	No Separation
Sill Separation	None
Windshield Damage	None
Side Window Damage	None
Other Notable Effects	Car rolled 90° after impact. See Photo on Page A-52.

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

Test Vehicle: 2012 Chevrolet Suburban 2WD 1/2 Ton LT SUV NHTSA No. MC0104
 Test Program: NCAP Side MDB Impact Test Test Date: 11/08/2011

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vehicle Wheel Base	mm		3310
Vertical Impact Reference Line (Aft of Front Axle) (Intended Impact Point)	mm		508
Actual Impact Point (Aft of Front Axle)	mm		516
Horizontal Offset (+forward / -rearward)	mm	+/- 50 of intended impact point	-8
Vertical Offset (+down / -up)	mm	+/- 20 of intended impact point	-2

DATA SHEET NO. 9
MDB SUMMARY OF RESULTS

Test Vehicle: 2012 Chevrolet Suburban 2WD 1/2 Ton LT SUV NHTSA No. MC0104
 Test Program: NCAP Side MDB Impact Test Test Date: 11/08/2011

MDB SPECIFICATIONS

Measurement Description	Length (mm)
Overall Width of Framework Carriage	1252
Overall Length Including Honeycomb Face	4115
Wheelbase of Framework Carriage	2592
CG Location aft of Front Axle	1129

MDB WEIGHTS

	Units	Front Axle	Rear Axle	Total
Left	kg	411.8	281.6	
Right	kg	356.8	311.3	
Ratio	%	56.5	43.5	
Totals	kg	768.6	592.9	1361.5

SPEED AND ANGLE AT IMPACT DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	62.5
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	62.3
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	90.0
MDB Forward Line of Motion to Target Vehicle CL	degrees	62.5 to 63.5	63.1
MDB Crabbed Angle to MDB Forward Line of Motion	degrees	26 to 28	26.9

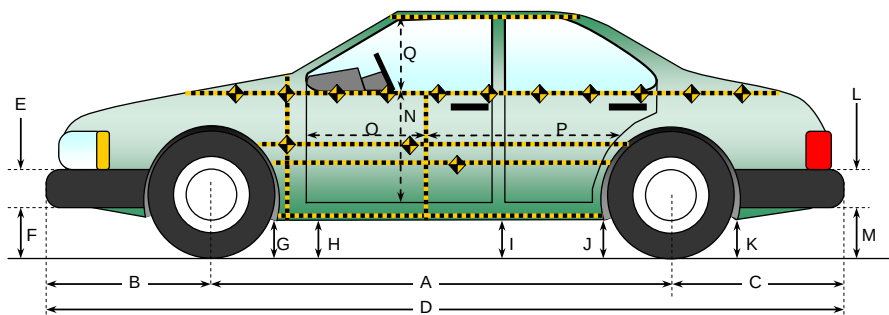
MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE

Vertical Location			From Centerline		Maximum Crush
Row	Description	Height	Distance	Direction	
A	Center of Bumper	432	800	Right	128
B	Top of Bumper	533	800	Left	184
C	Mid-Level	686	800	Left	218
D	Top of Stack	813	800	Left	217

DATA SHEET NO. 10
TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2012 Chevrolet Suburban 2WD 1/2 Ton LT SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MC0104
 Test Date: 11/08/2011



All measurements in (mm) with tolerance of ± 3 mm

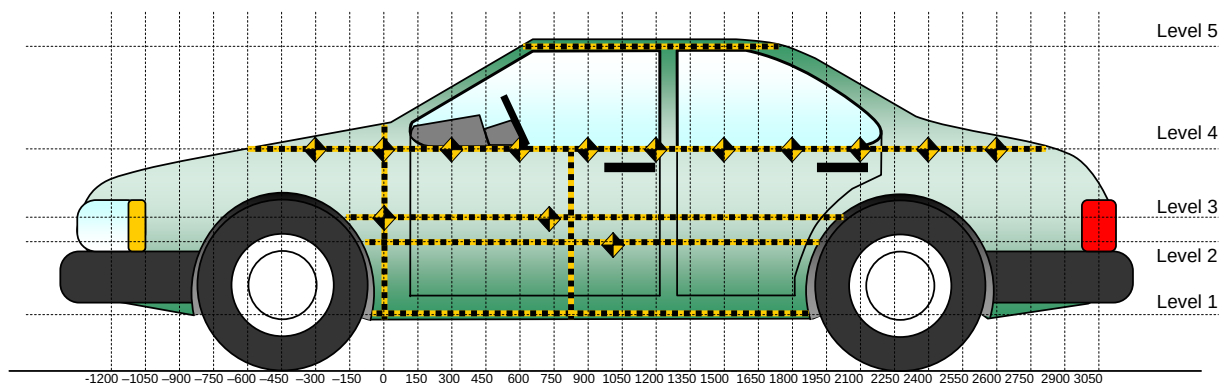
LEFT SIDE VIEW

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	3310	3290	20
B	Front Axle to FSOV	1000	1000	0
C	Rear Axle to RSOV	1345	1345	0
D	Total Length at Centerline	5655	5635	20
E	Front Bumper Thickness	115	115	0
F	Front Bumper Bottom to Ground	305	300	5
G	Sill Height at Front Wheel Well	264	217	47
H	Sill Height at Front Door Leading Edge	275	304	-29
I	Sill Height at B Pillar	283	267	16
J1	Sill Height at Rear Wheel Well	286	195	91
J2	Pinch Weld Height at Rear Wheel Well	283	288	-5
K	Sill Height Aft of Rear Wheel Well	354	354	0
L	Rear Bumper Thickness	165	165	0
M	Rear Bumper Bottom to Ground	502	487	15
N	Sill Height to Window Bottom Sill	866	824	42
O	Front Door Leading Edge to Impact CL	810	807	3
P	Rear Door Trailing Edge to Impact CL	1348	1320	28
Q	Front Window Opening	530	625	-95
R	Right Side Length	4793	4815	-22
S	Left Side Length	4793	4765	28
T	Vehicle Width at B Post	1982	1767	215

DATA SHEET NO. 11 **TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS**

Test Vehicle: 2012 Chevrolet Suburban 2WD 1/2 Ton LT SUV NHTSA No. MC0104
Test Program: NCAP Side MDB Impact Test Test Date: 11/08/2011



All Measurements Shown in mm

LEFT SIDE VIEW

MAXIMUM EXTERIOR CRUSH MEAUREMENTS

Level	Measurement Description	Height Above Ground (mm)	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	420	260	1500
2	Mid Door	795	235	1050
3	Occupant Hip Point	852	211	1200
4	Window Sill	1193	114	1350
5	Window Top	1746	24	2100

Note: The measurements are taken along the vertical impact reference line.
Vehicle measurements forward of the vertical impact reference line are negative.

DATA SHEET NO. 11 (CONTINUED)
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2012 Chevrolet Suburban 2WD 1/2 Ton LT SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MC0104
 Test Date: 11/08/2011

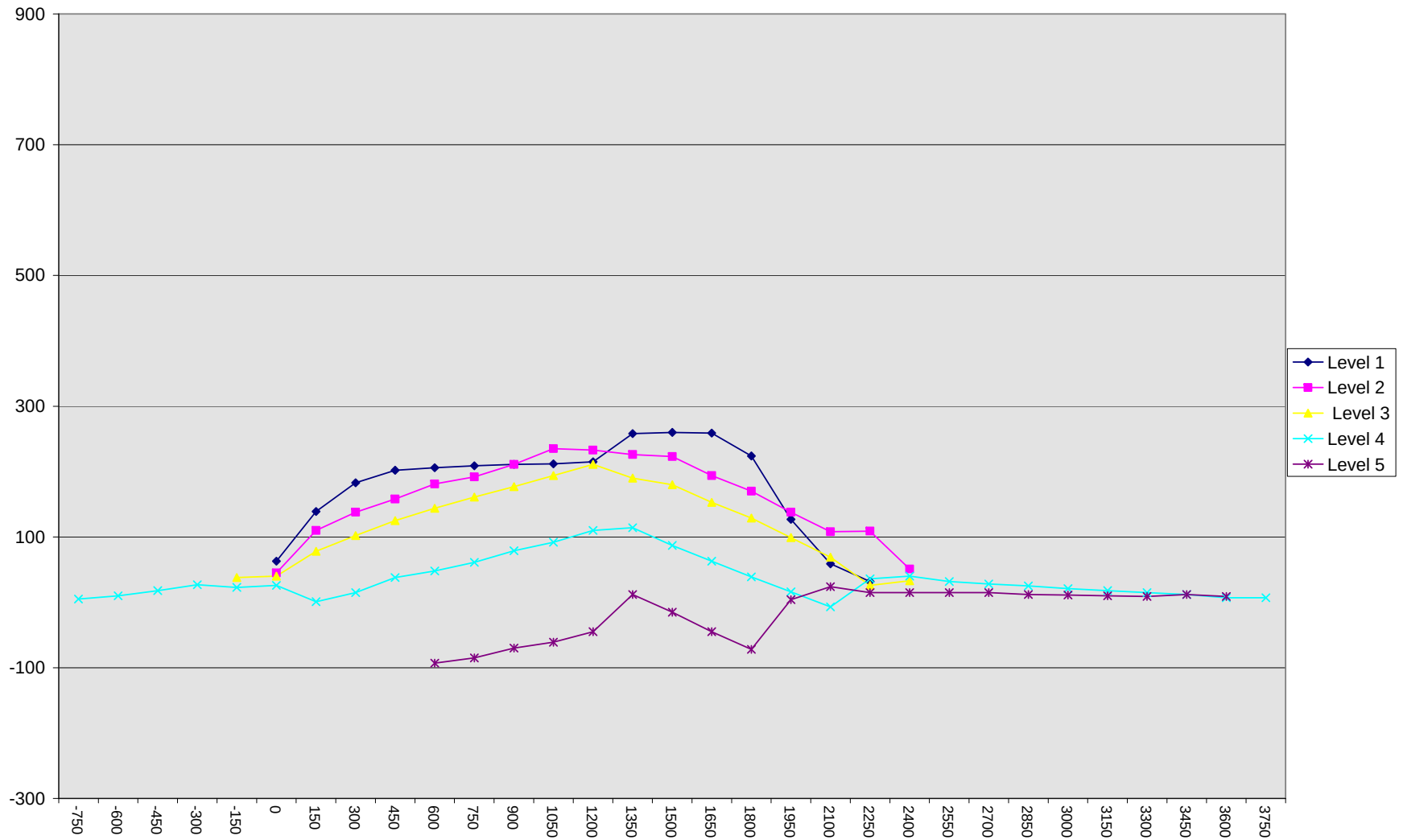
	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-750				223					228					5	
-600				212					222					10	
-450				202					220					18	
-300				195					222					27	
-150			98	190				136	213				38	23	
0	169	113	120	184		232	158	160	210		63	45	40	26	
150	189	119	121	177		328	229	199	178		139	110	78	1	
300	188	118	118	173		371	256	220	188		183	138	102	15	
450	186	115	115	182		388	273	240	220		202	158	125	38	
600	182	113	114	180	401	388	294	258	228	308	206	181	144	48	-93
750	183	111	111	173	395	392	303	272	234	310	209	192	161	61	-85
900	182	110	111	167	390	393	321	288	246	320	211	211	177	79	-70
1050	182	110	110	163	391	394	345	304	255	330	212	235	194	92	-61
1200	183	109	110	159	387	398	342	321	269	342	215	233	211	110	-45
1350	182	110	110	156	386	440	336	300	270	398	258	226	190	114	12
1500	182	107	110	156	385	442	330	290	243	370	260	223	180	87	-15
1650	181	109	110	155	384	440	303	263	218	339	259	194	153	63	-45
1800	180	110	111	155	384	404	280	240	194	312	224	170	129	39	-72
1950	181	110	111	153	382	308	248	210	169	386	127	138	99	16	4
2100	182	111	111	152	380	241	219	180	145	404	59	108	69	-7	24
2250	181	112	112	152	380	213	221	138	188	395	32	109	26	36	15
2400		94	93	153	380		145	126	193	395		51	33	40	15
2550				155	379				189	394				32	15
2700				156	379				184	394				28	15
2850				158	381				183	393				25	12
3000				159	382				180	393				21	11
3150				162	385				180	395				18	10
3300				165	388				180	397				15	9
3450				168	390				180	402				12	12
3600				175	398				182	407				7	9
3750				180					187					7	

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 the test based on an estimated impact point.

DATA SHEET NO. 11 (CONTINUED)
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2012 Chevrolet Suburban 2WD 1/2 Ton LT SUV
Test Program: NCAP Side MDB Impact Test

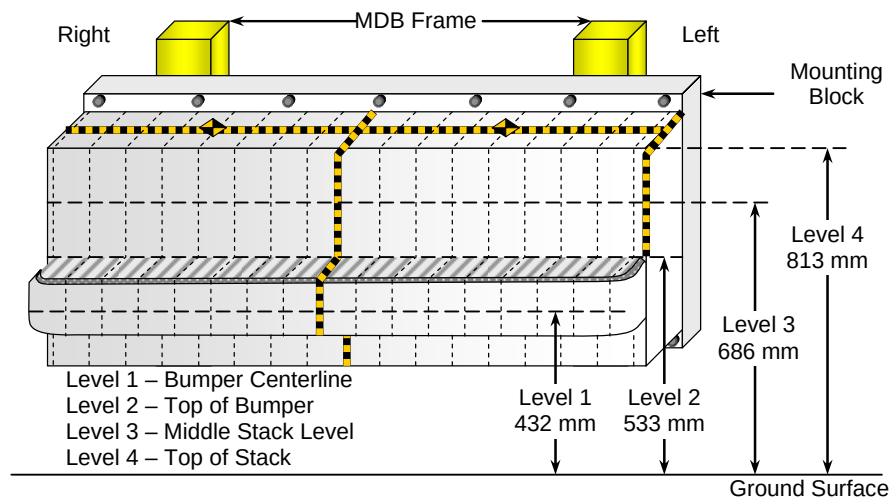
NHTSA No. MC0104
Test Date: 11/08/2011



DATA SHEET NO. 12
MDB EXTERIOR STATIC CRUSH MEASUREMENTS

Test Vehicle: 2012 Chevrolet Suburban 2WD 1/2 Ton LT SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MC0104
 Test Date: 11/08/2011



FRONT VIEW

DEFORMABLE BARRIER STATIC CRUSH

Stack Level	Distance Right of Center (mm)								C _L	Distance Left of Center (mm)							
	800	700	600	500	400	300	200	100		100	200	300	400	500	600	700	800
4	217	167	129	102	93	86	105	113	84	69	66	68	75	83	97	113	138
3	218	167	112	73	63	53	52	53	52	57	63	65	68	73	80	85	108
2	184	124	108	94	78	73	68	70	68	70	79	80	95	105	110	122	88
1	108	115	115	116	116	117	118	118	119	120	120	121	123	123	124	127	128

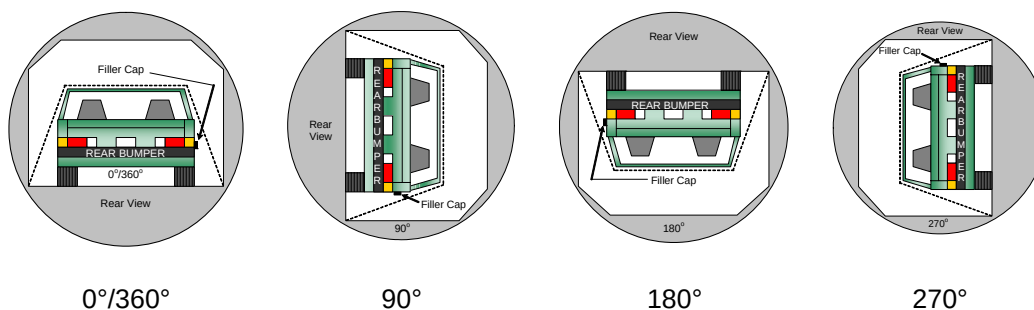
DATA SHEET NO. 13
FMVSS 301 FUEL SYSTEM INTEGRITY POST-IMPACT DATA

Test Vehicle: 2012 Chevrolet Suburban 2WD 1/2 Ton LT SUV NHTSA No. MC0104
 Test Program: NCAP Side MDB Impact Test Test Date: 11/08/2011

Test Time: 11:10 am Temperature: 21.1° C

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

FMVSS 301 STATIC ROLLOVER DATA



ROLLOVER SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	163	300	463
90° to 180°	146	300	446
180° to 270°	136	300	436
270° to 360°	163	300	463

FMVSS 301 ROLLOVER SPILLAGE TABLE (units in ounces)

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

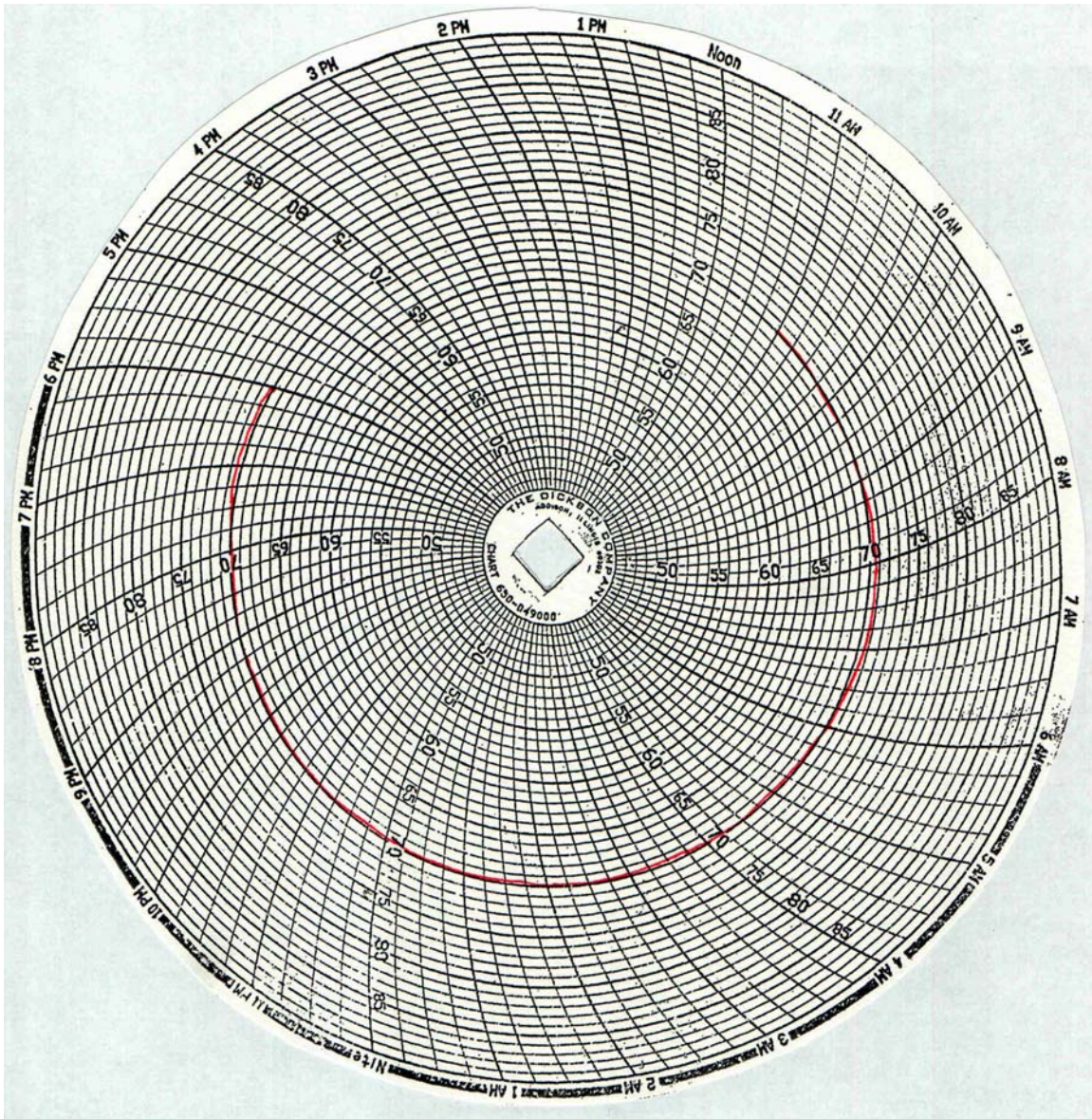
ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

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

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

Test Vehicle: 2012 Chevrolet Suburban 2WD 1/2 Ton LT SUV
Test Program: NCAP Side MDB Impact Test

NHTSA No. MC0104
Test Date: 11/08/2011



APPENDIX A
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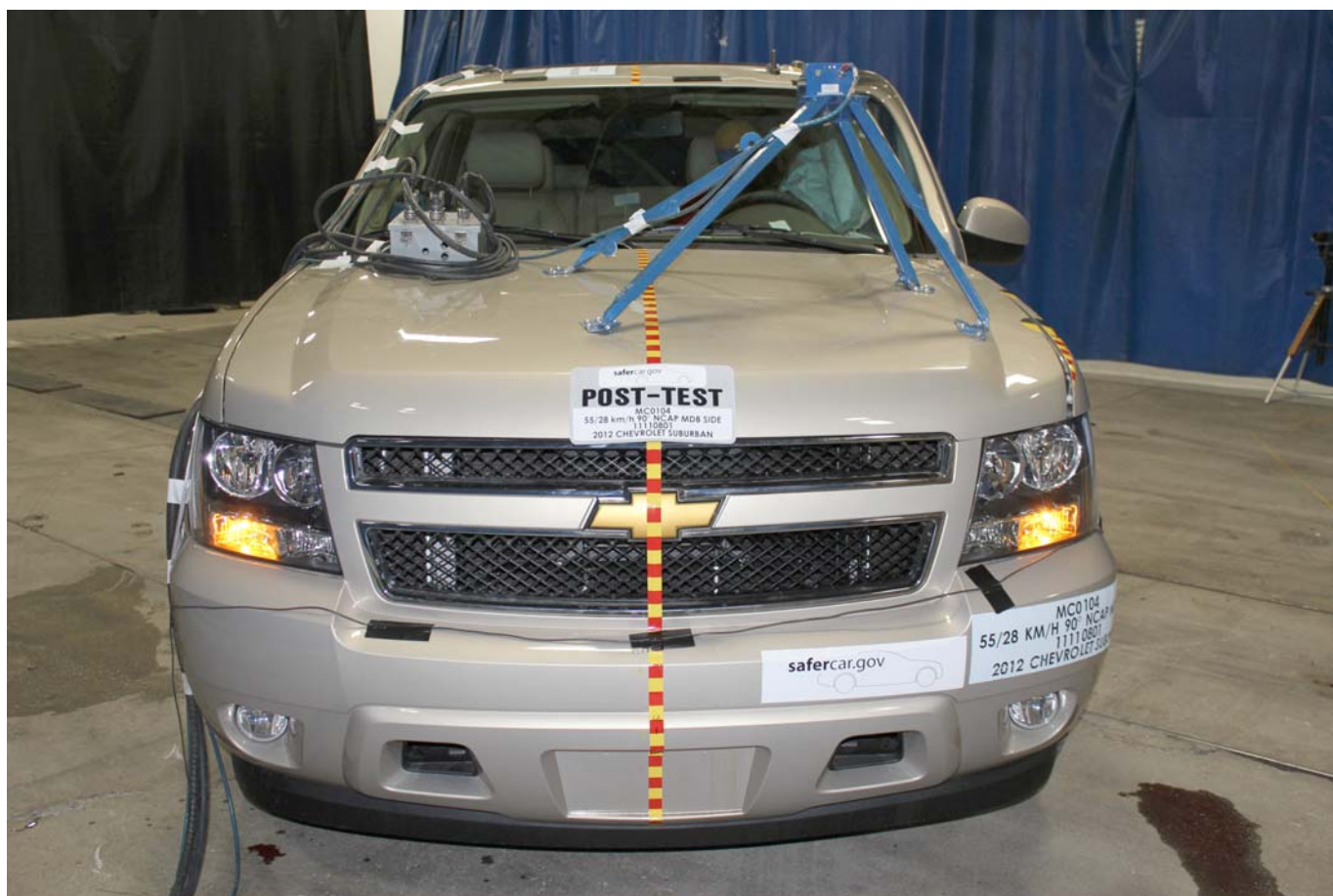
As Delivered Right Front Three-Quarter View of Test Vehicle



As Delivered Left Rear Three-Quarter View of Test Vehicle



Pre-Test Frontal View of Test Vehicle



Post-Test Frontal View of Test Vehicle



Pre-Test Left Front Three-Quarter View of Test Vehicle



Post-Test Left Front Three-Quarter View of Test Vehicle



Pre-Test Left Side View of Test Vehicle



Post-Test Left Side View of Test Vehicle



Pre-Test Left Three-Quarter Rear View of Test Vehicle



Post-Test Left Three-Quarter Rear View of Test Vehicle



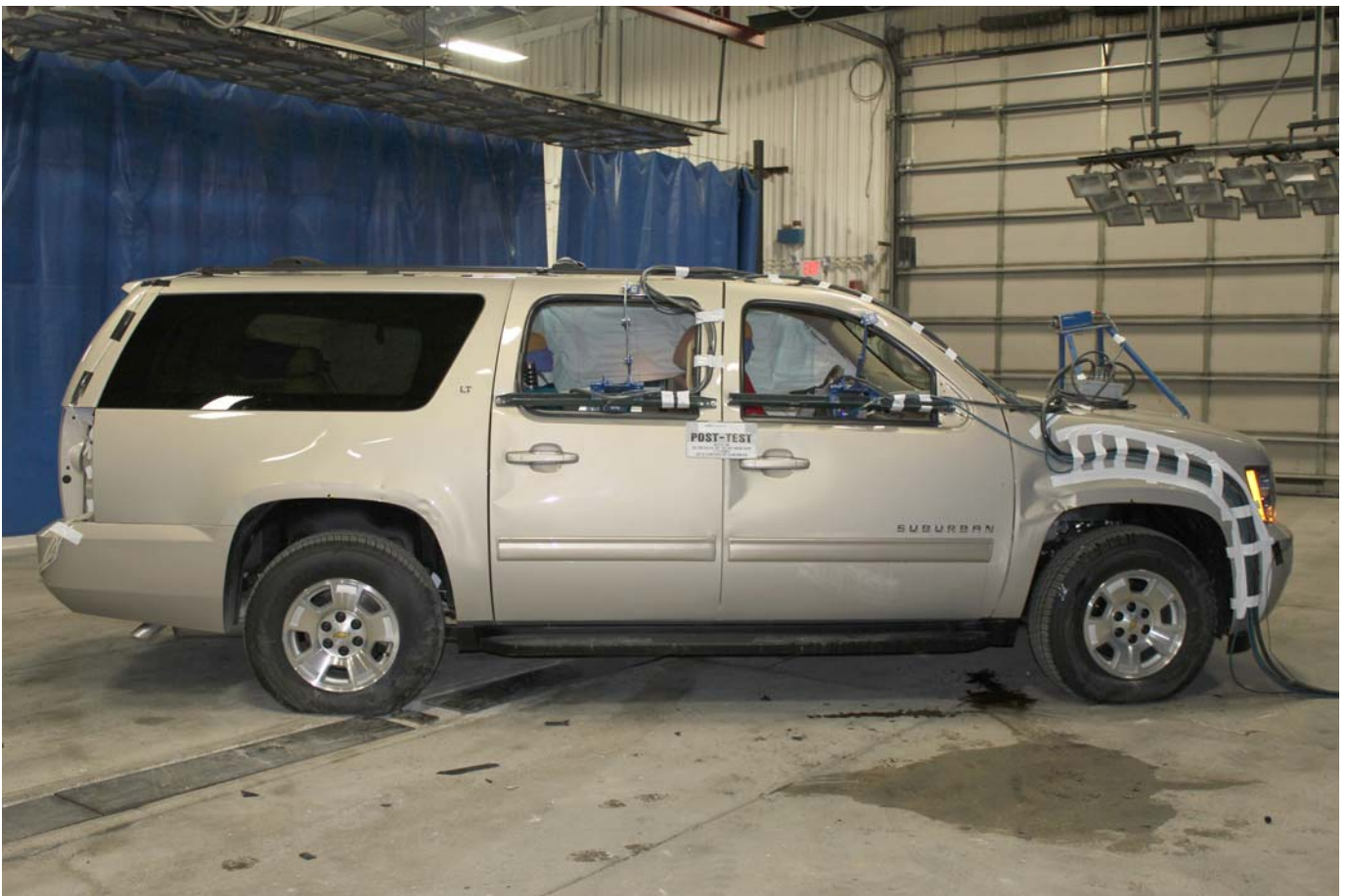
Pre-Test Rear View of Test Vehicle



Post-Test Rear View of Test Vehicle



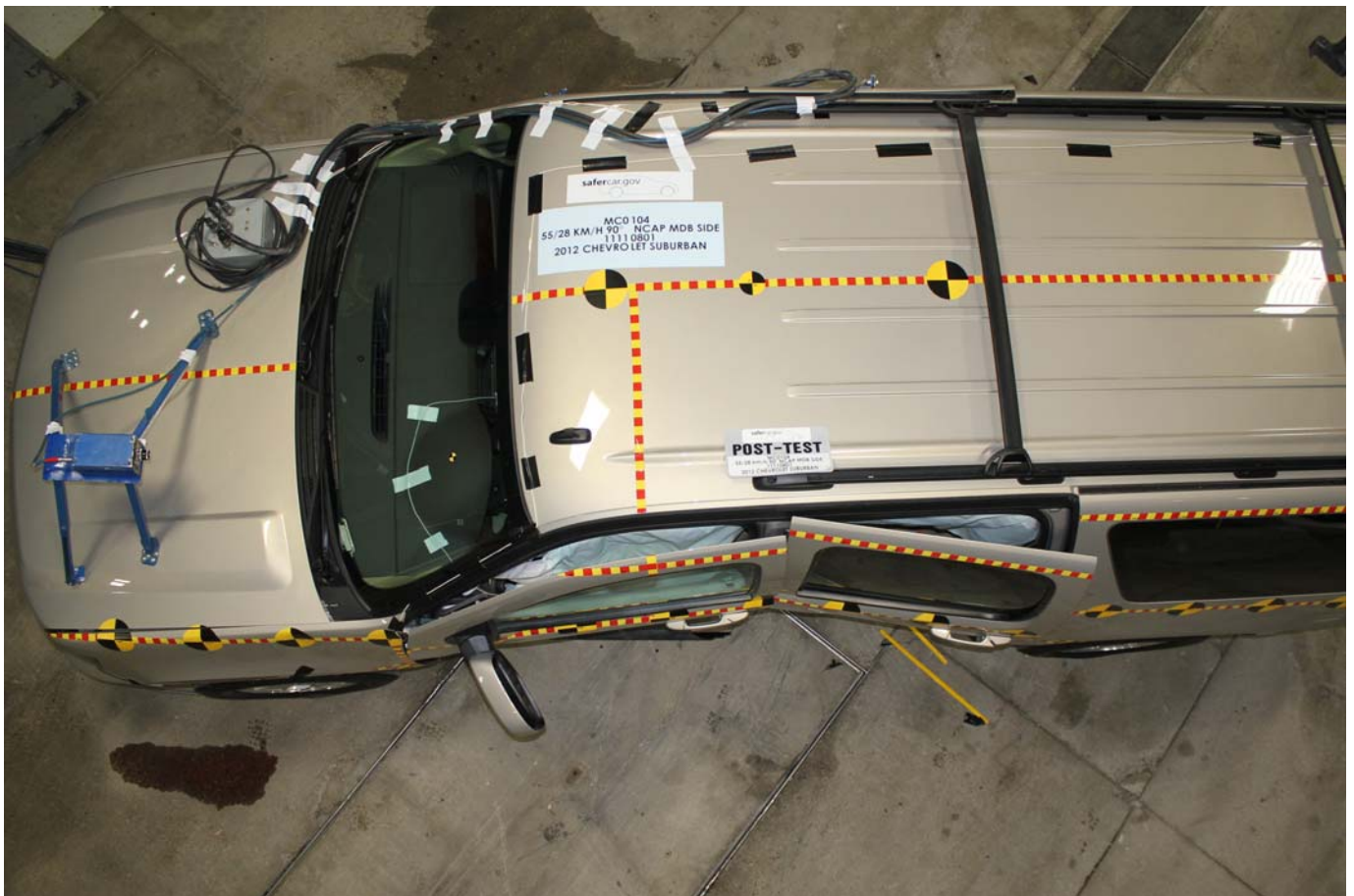
Pre-Test Right Side View of Test Vehicle



Post-Test Right Side View of Test Vehicle



Pre-Test Overhead View of Test Area



Post-Test Overhead View of Test Area



Pre-Test Left Side View of MDB Positioned Against Side of Test Vehicle



Pre-Test Right Side View of MDB Positioned Against Side of Test Vehicle



Pre-Test Close-Up View of Impact Point Target



Post-Test Close-Up View of Impact Point Target



Pre-Test Left Front Door Latch Close-Up



Post-Test Left Front Door Latch Close-Up



Pre-Test Left Rear Door Latch Close-Up



Post-Test Left Rear Door Latch Close-Up



Pre-Test Front Close-Up View of Driver Dummy



Post-Test Front Close-Up View of Driver Dummy



Pre-Test Left Side View of Driver Dummy Showing Belt and Chalking



Pre-Test Left Side View of Driver Dummy Shoulder and Door Top View



Post-Test Left Side View of Driver Dummy Shoulder and Door Top View



Pre-Test Frontal View of Driver Seat Back Prior to Dummy Positioning



Pre-Test Frontal View of Driver Dummy Head and Shoulders in Relation to Head Restraint



Pre-Test Frontal View of Driver Seat Pan Prior to Dummy Positioning



Pre-Test Overhead View of Driver Dummy Thighs on Seat Pan



Pre-Test Placement of Driver Dummy's Feet



Pre-Test View of Belt Anchorage for Driver Dummy



Pre-Test Left Side View of Steering Wheel



Pre-Test View of Disengaged Parking Brake



Pre-Test View of Parking Brake



Pre-Test Close-Up Left Side View of Driver Seat Track



Pre-Test Close-Up Left Side View of Driver Seat Back



Pre-Test Close-Up View of Driver Seat Back or Head Restraint



Pre-Test Driver Dummy and Door Clearance View



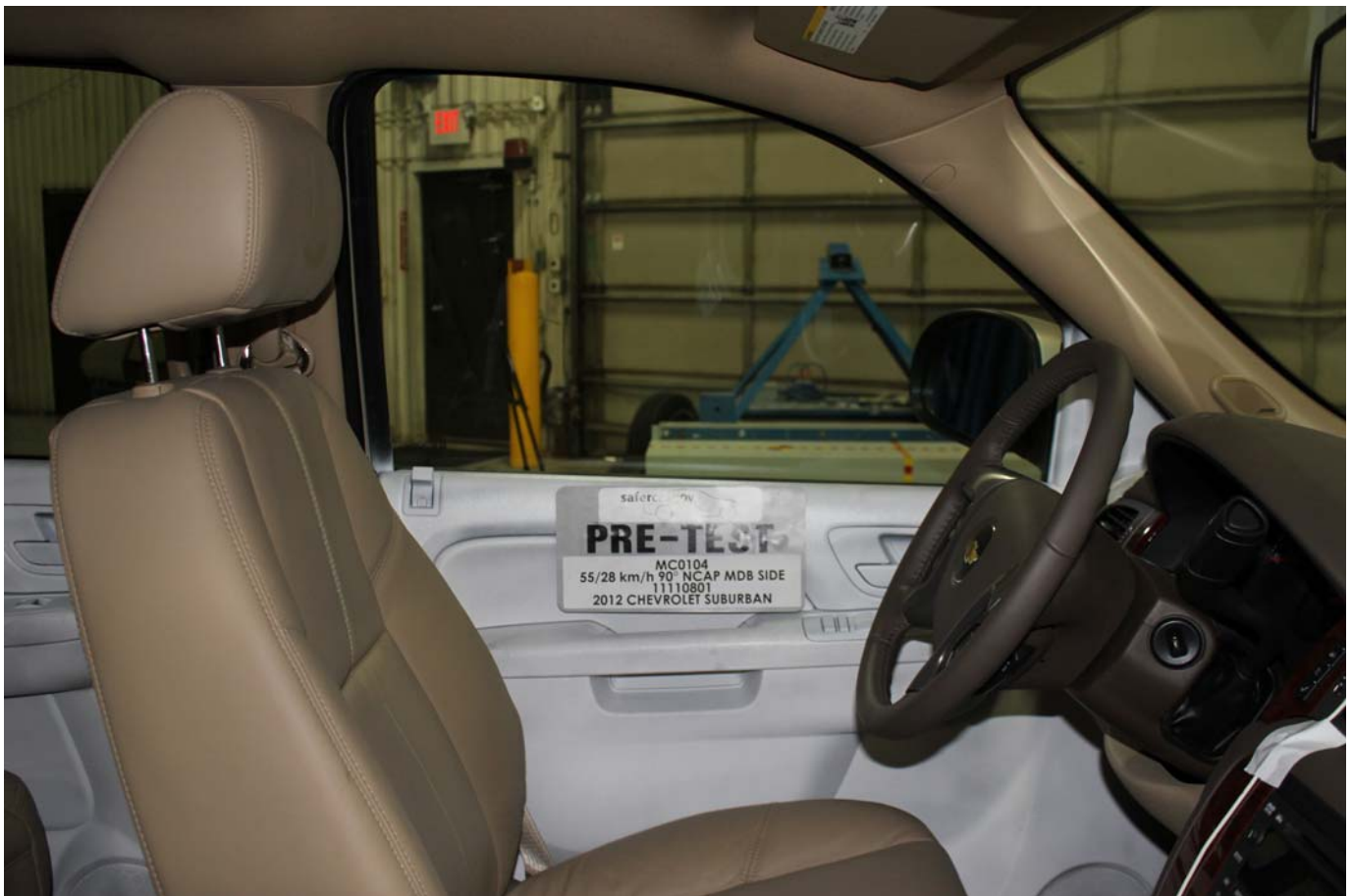
Post-Test Driver Dummy and Door Clearance View



Pre-Test Right Side View of Driver Dummy and Front Seat of Occupant Compartment



Post-Test Right Side View of Driver Dummy and Front Seat of Occupant Compartment



Pre-Test Driver Inner Door Panel View



Post-Test Driver Inner Door Panel View



Post-Test Driver Dummy Close-up Head Contact with Vehicle Interior View



Post-Test Driver Dummy Close-up Head Contact with Side Airbag View



Post-Test Driver Dummy Close-up Torso Contact with Vehicle Interior View



Post-Test Driver Dummy Close-up Torso Contact with Side Airbag View



Post-Test Driver Dummy Close-up Pelvis Contact with Vehicle Interior View



Post-Test Driver Dummy Close-up Pelvis Contact with Side Airbag View



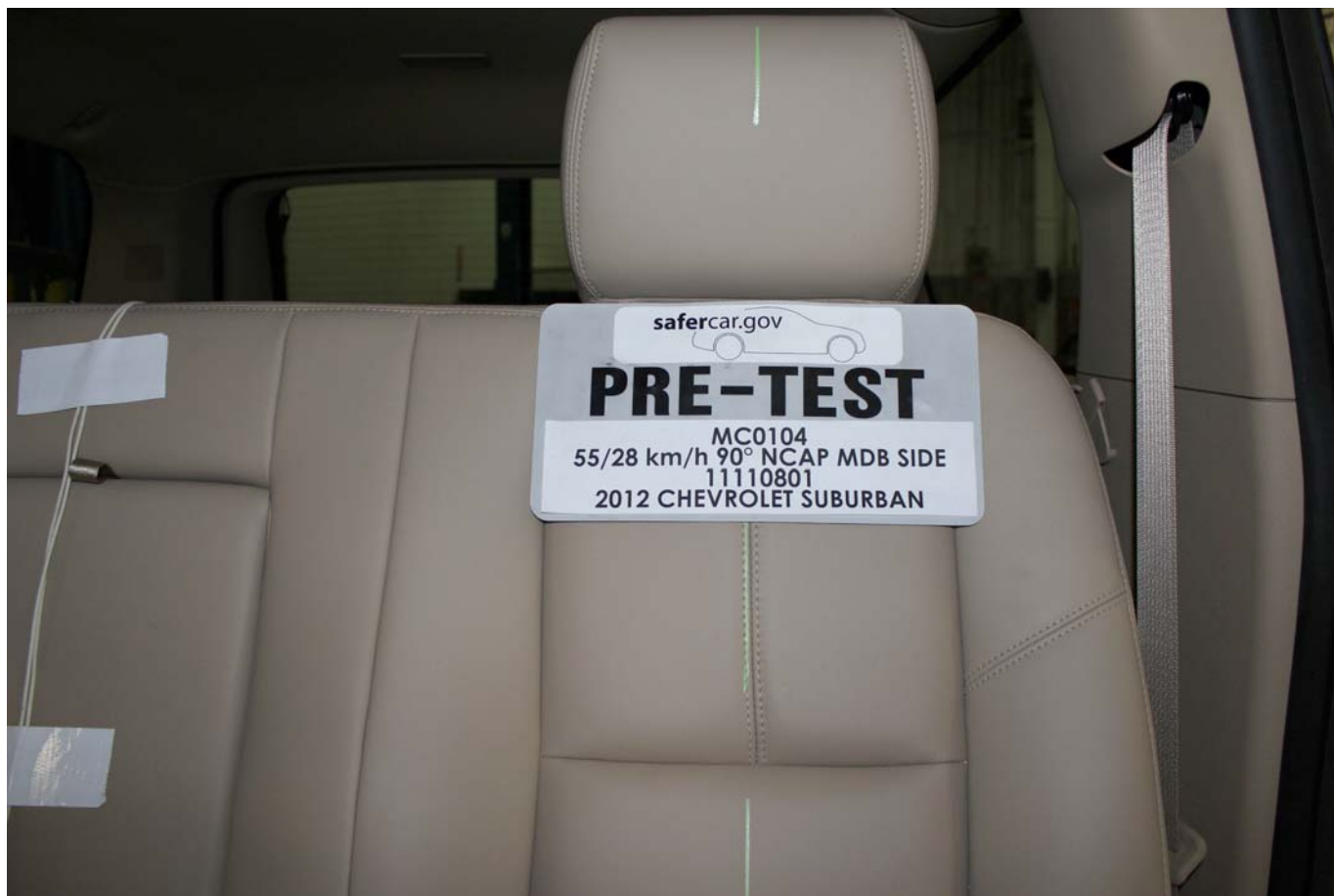
Pre-Test Left Side View of Rear Passenger Dummy Showing Belt and Chalking



Pre-Test Left Side View of Rear Passenger Dummy Shoulder and Door Top View



Post-Test Left Side View of Rear Passenger Dummy Shoulder and Door Top View



Pre-Test Frontal View of Rear Passenger Seat Back Prior to Dummy Positioning



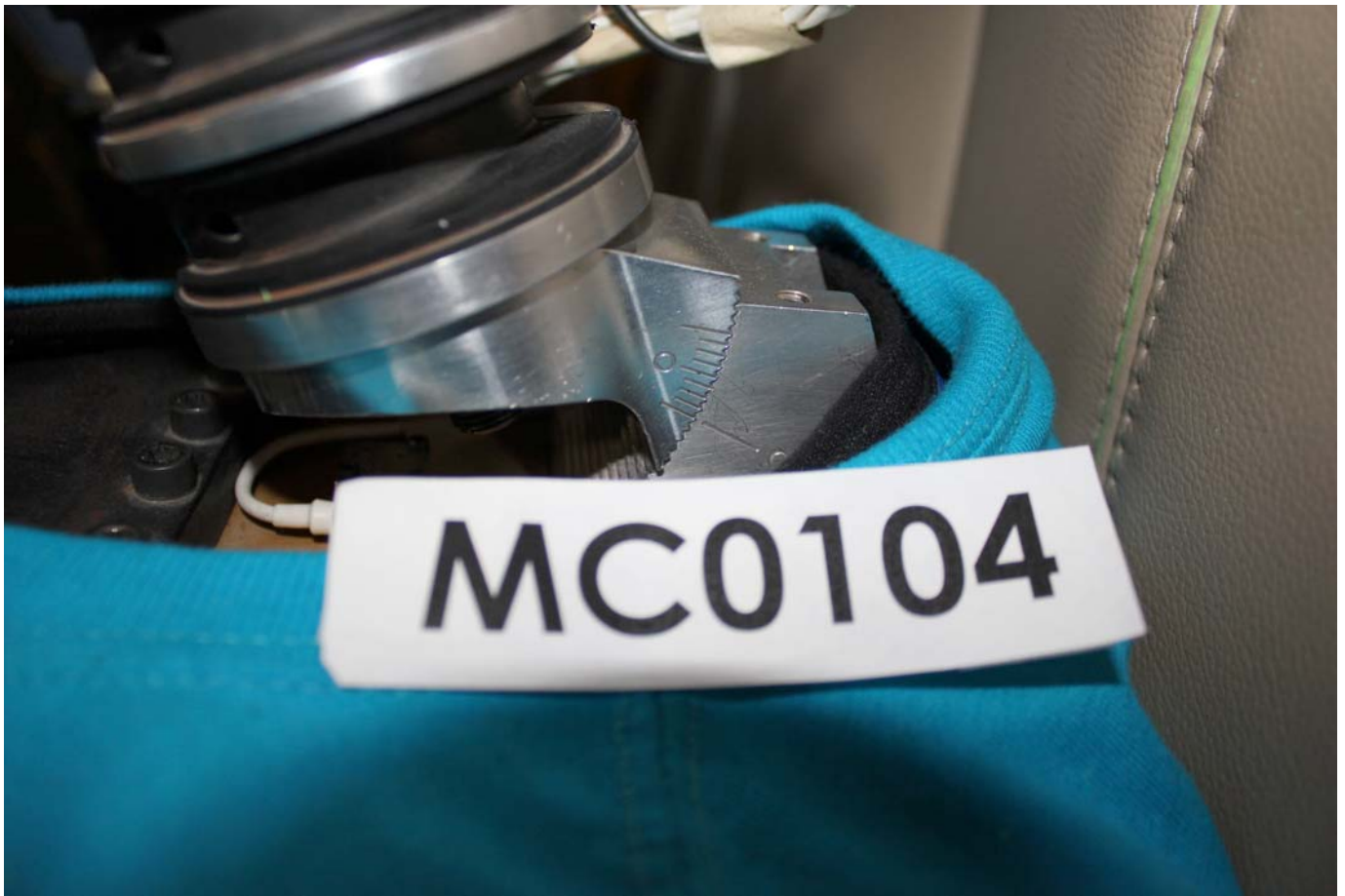
Pre-Test Frontal View of Rear Passenger Dummy Head and Shoulders in Relation to Head Restraint



Pre-Test Overhead View of Rear Passenger Seat Pan Prior to Dummy Positioning



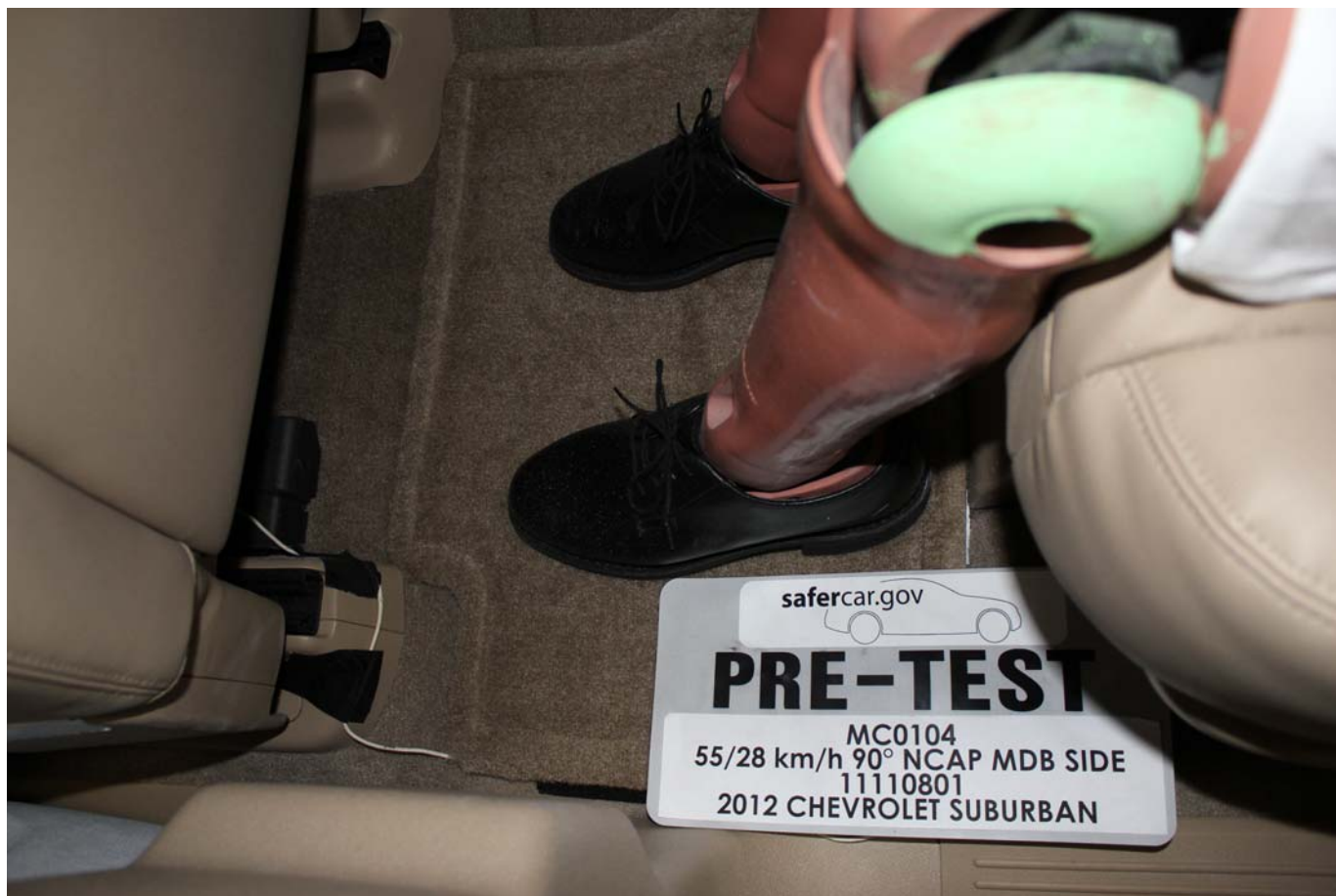
Pre-Test Overhead View of Rear Passenger Dummy Thighs on Seat Pan



Pre-Test View of Rear Passenger Dummy's Neck Showing Position of Adjustable Neck Bracket



Pre-Test View of Rear Passenger Dummy's Head Showing Dummy's Head is Level



Pre-Test Placement of Rear Passenger Dummy's Feet



Pre-Test View of Belt Anchorage for Rear Passenger Dummy



Pre-Test Close-Up Left Side View of Rear Passenger Seat Track



Pre-Test Close-Up Left Side View of Rear Passenger Seat Back



Pre-Test Close-up View of Rear Passenger Seat Back or Head Restraint



Pre-Test Rear Passenger Dummy and Door Clearance View



Post-Test Rear Passenger Dummy and Door Clearance View



Pre-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment



Post-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment



Pre-Test Rear Passenger Inner Door Panel View



Post-Test Rear Passenger Inner Door Panel View



Post-Test Rear Passenger Dummy Close-up Head Contact with Vehicle Interior View



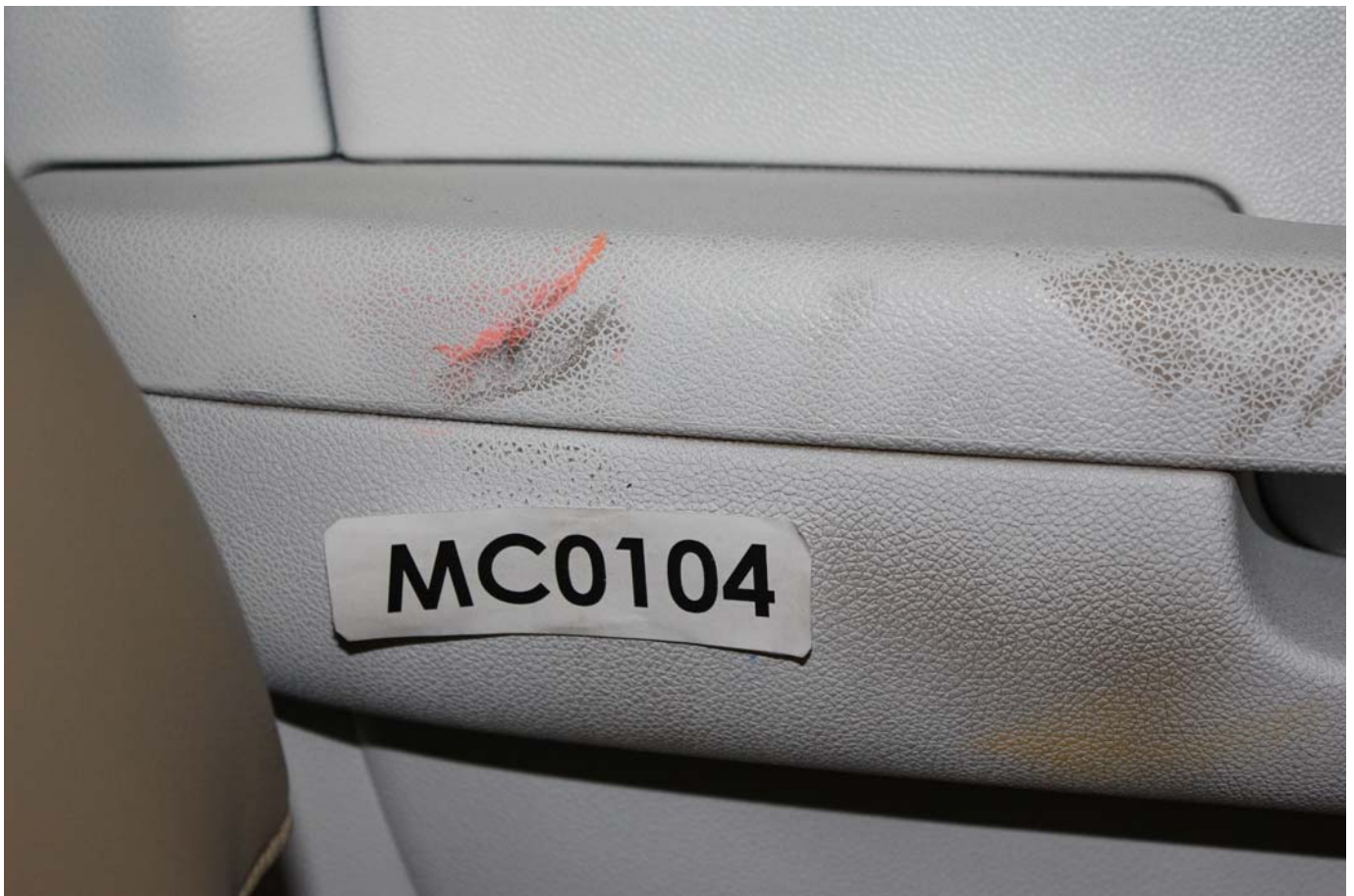
Post-Test Rear Passenger Dummy Close-up Head Contact with Side Airbag View



Post-Test Rear Passenger Dummy Close-up Torso Contact with Vehicle Interior View

PHOTOGRAPH NOT APPLICABLE

Post-Test Rear Passenger Dummy Close-up Torso Contact with Side Airbag View



Post-Test Rear Passenger Dummy Close-up Pelvis Contact with Vehicle Interior View

PHOTOGRAPH NOT APPLICABLE

Post-Test Rear Passenger Dummy Close-up Pelvis Contact with Side Airbag View



Pre-Test View of Fuel Filler Cap or Fuel Filler Neck



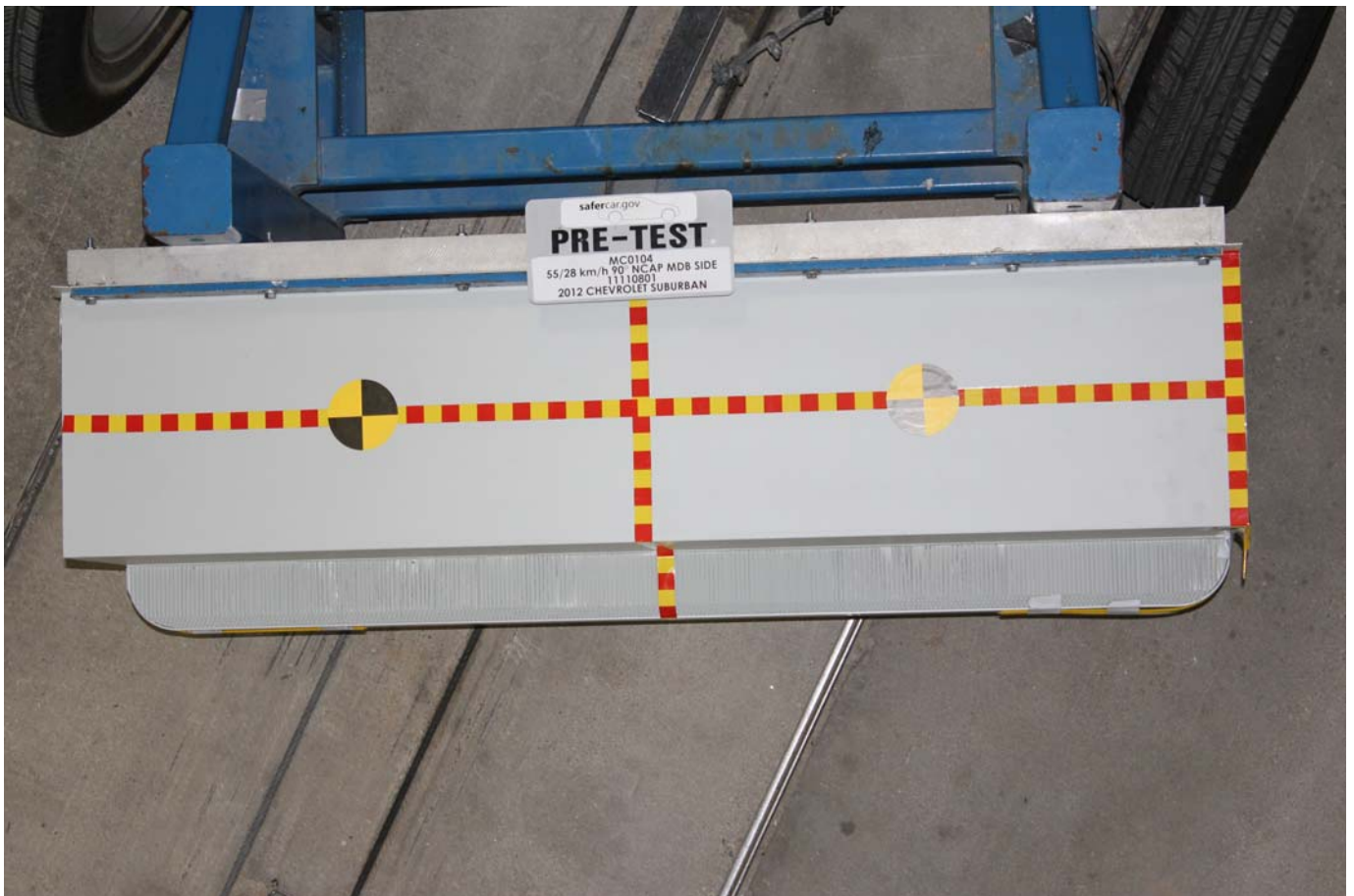
Post-Test View of Fuel Filler Cap or Fuel Filler Neck



Pre-Test Front View of MDB Impactor Face



Post-Test Front View of MDB Impactor Face



Pre-Test Top View of MDB Impactor Face



Post-Test Top View of MDB Impactor Face



Pre-Test Left Side View of MDB Impactor Face



Post-Test Left Side View of MDB Impactor Face



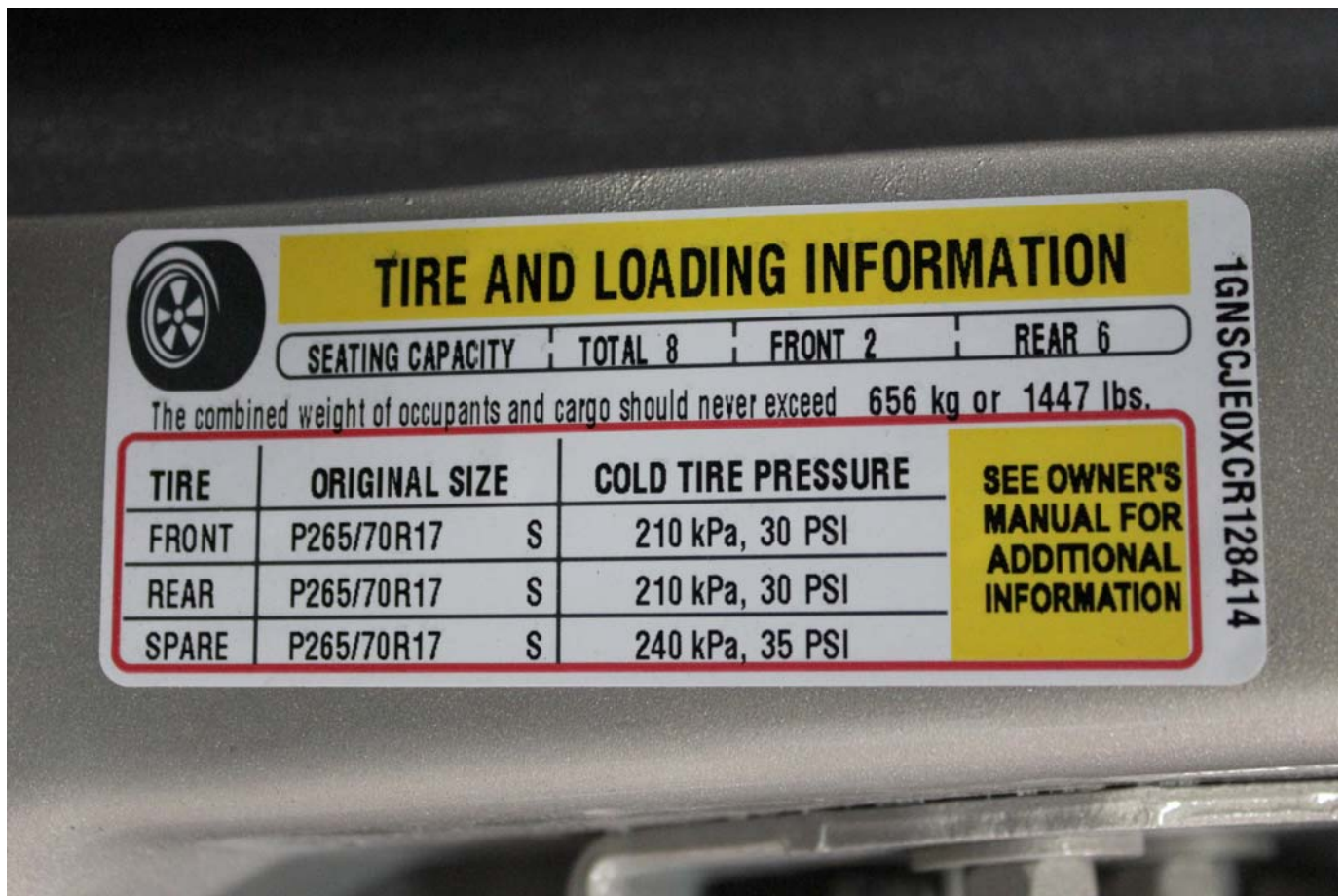
Pre-Test Right Side View of MDB Impactor Face



Post-Test Right Side View of MDB Impactor Face



Close-Up View of Vehicle's Certification Label



Close-Up View of Vehicle's Tire Information Placard or Label



Pre-Test Ballast View



Post-Test Primary and Redundant Speed Trap Read-Out



FMVSS No. 301 Static Rollover 0 Degrees



FMVSS No. 301 Static Rollover 90 Degrees



FMVSS No. 301 Static Rollover 180 Degrees



FMVSS No. 301 Static Rollover 270 Degrees



FMVSS No. 301 Static Rollover 360 Degrees



Impact Event



CHEVROLET

2012 SUBURBAN 2WD 1/2 TON LT

**EXTERIOR: GOLD MIST METALLIC
INTERIOR: LIGHT CASHMERE/DARK
CASHMERE**

**ENGINE: VORTEC 5.3L SFI V8
TRANSMISSION: 6 SPEED AUTOMATIC**

STANDARD EQUIPMENT

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

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

MECHANICAL

- ENGINE, VORTEC 5.3L SFI V8 WITH ACTIVE FUEL MANAGEMENT & FLEX FUEL CAPABILITY
- TRANSMISSION, 6 SPD AUTOMATIC
- PREMIUM RIDE SUSPENSION
- TRAILER SWAY CONTROL
- DIFFERENTIAL, LOCKING REAR FULLY AUTOMATIC
- BRAKE ASSIST, HILL START

SAFETY & SECURITY

- 6 MOS. ONSTAR DIRECTIONS & CONNECTIONS W/ AUTOMATIC CRASH RESPONSE, TURN-BY-TURN NAVIGATION, AND ONSTAR REMOTE LINK (ASK DEALER ABOUT

GEOGRAPHIC COVERAGE

- ANTI-LOCK BRAKES, 4 WHEEL DISC
- STABILITRAK-STABILITY CONTROL SYSTEM W/ TRACTION CONTROL
- AIR BAGS, FRONTAL, DRIVER & FRONT PASSENGER
- SEAT MOUNTED SIDE IMPACT AIRBAGS, DRIVER AND RIGHT FRONT PASSENGER
- HEAD CURTAIN SIDE AIRBAGS W/ ROLL-OVER PROTECTION
- TIRE PRESSURE MONITOR (EXCL. SPARE TIRE)

INTERIOR

- SEATS, FRONT BUCKET, LEATHER APPOINTED
- DRIVER & FRONT PASSENGER HEATED SEATS
- PWR SEAT ADJUSTER, DRIVER
- PWR SEAT ADJUSTER, FRONT PASSENGER
- 2ND ROW BENCH SEAT

- 3-PASSENGER, 3RD ROW SEAT
- POWER DOOR LOCKS
- POWER WINDOWS, DRIVER EXPRESS DOWN
- CRUISE CONTROL
- ADJUSTABLE PEDALS
- LEATHER WRAP STEERING WHEEL
- STEERING WHEEL CONTROLS
- AIR CONDITIONING, TRI ZONE AUTO CLIMATE CONTROL
- XM RADIO + SERVICE SUBSCRIPTION SOLD SEPARATELY BY SIRIUSXM AFTER 3 MTHS
- AUDIO SYSTEM - BOSE PREMIUM
- AM/FM STEREO CD PLAYER WITH AUX INPUT JACK
- AUDIO CONTROLS, REAR SEAT
- BLUETOOTH FOR PHONE
- USB PORT
- REAR PARKING ASSIST
- REMOTE VEHICLE START

EXTERIOR

- POWER HEATED OUTSIDE MIRRORS
- FOG LAMPS, FRONT
- WHEELS, 17" ALUMINUM
- LIFTGATE W/ LIFTGLASS
- TRAILERING EQUIPMENT
- BODY SIDE MOLDING, BODY COLOR
- RUNNING BOARDS, ASSIST STEPS
- LUGGAGE RACK SIDE RAILS
- LUGGAGE RACK CENTER RAILS
- SPARE TIRE, 17"

OPTIONS & PRICING

MANUFACTURER'S SUGGESTED RETAIL PRICE

STANDARD VEHICLE PRICE \$45,675.00

OPTIONS INSTALLED BY THE MANUFACTURER (MAY REPLACE STANDARD EQUIPMENT SHOWN)

- HEAVY DUTY COOLING PACKAGE: 230.00
- ENGINE OIL COOLING SYSTEM
- TRANSMISSION OIL COOLER

Visit us at www.chevy.com

REAR SEAT ENTERTAINMENT SYSTEM, 1,395.00	
3RD ROW DVD SCREEN	
REAR VISION CAMERA SYSTEM,	450.00
INSIDE REARVIEW MIRROR W/	
REAR CAMERA DISPLAY	
7,200 LB GVW RATING	INC.
REAR AXLE 3.42 RATIO	INC.
TOTAL OPTIONS	\$2,075.00
TOTAL VEHICLE & OPTIONS	\$47,750.00
DESTINATION CHARGE	\$50.00

TOTAL VEHICLE PRICE* \$48,700.00

EPA Fuel Economy Estimates

GASOLINE CITY MPG

15

Expected range for most drivers
12 to 18 MPG

*Fuel economy when operating on E85 will yield different values than gasoline. See Fuel Economy Guide for more information.

**FLEXIBLE FUEL VEHICLE*
GASOLINE + ETHANOL (E85)**

**Estimated Annual Fuel Cost
\$3,263**

based on 15,000 miles at
\$3.70 per gallon of GASOLINE

**Combined GASOLINE
Fuel Economy
This vehicle**

17

GASOLINE HIGHWAY MPG

21

Expected range for most drivers
17 to 25 MPG

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

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

GOVERNMENT SAFETY RATINGS

Frontal Crash	Driver Passenger	Not Rated
Star ratings based on the risk of injury in a frontal impact. Frontal ratings should ONLY be compared to other vehicles of similar size and weight.	Not Rated	Not Rated
Side Crash	Front seat Rear seat	Not Rated
Star ratings based on the risk of injury in a side impact.	Not Rated	Not Rated
Rollover		★★★
Star ratings based on the risk of rollover in a single vehicle crash.		
Star rating 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

PARTS CONTENT INFORMATION

FOR VEHICLES IN THIS CARLINE:
U.S./CANADIAN PARTS CONTENT: 60%
MAJOR SOURCES OF FOREIGN PARTS CONTENT: MEXICO 33%

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

FOR THIS VEHICLE:
FINAL ASSEMBLY POINT:
ARLINGTON, TX U.S.A.
COUNTRY OF ORIGIN:
ENGINE: UNITED STATES
TRANSMISSION: UNITED STATES

This label has been applied pursuant to Federal law - Do not remove prior to delivery to the ultimate purchaser. This label is the manufacturer's Recommended Pre-Customer Service. Does not include dealer installed options and accessories not listed above, local taxes or license fees.

ORDER NUMBER SALES CODE #
SALES MODEL CODE 001006
DEALER NO 0540
FINAL ASSEMBLY
ARLINGTON, TX, U.S.A.
VIN 1GN5CJE0XCR126414

DEALER TO WHOM DELIVERED
JIM GLOVER CHEVROLET
2130 E SKELLY DR
TULSA, OK 74129-3410



3A
1A29728613

Monroney Label

Head Restraints

⚠ WARNING

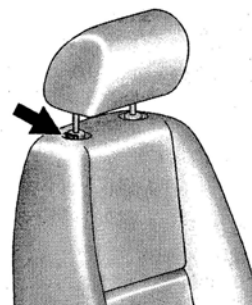
With head restraints that are not installed and adjusted properly, there is a greater chance that occupants will suffer a neck/spinal injury in a crash. Do not drive until the head restraints for all occupants are installed and adjusted properly.



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

Front Seats

The front seats have adjustable head restraints in the outboard seating positions.



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

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

The front seat outboard head restraints are not designed to be removed.

Driver Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

Rear Seats

The vehicle's second-row seats have head restraints in the outboard seating positions that cannot be adjusted.

The vehicle's third-row seats, if equipped, have adjustable headrests in the outboard seating positions.

The height of the headrest can be adjusted. Pull the headrest up to raise it. To lower the headrest, push down on the headrest.

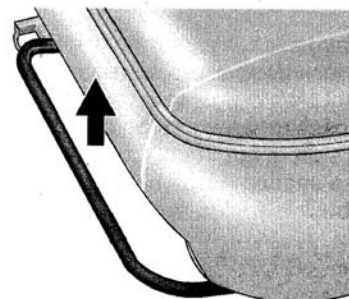
Rear seat head restraints and headrests are not designed to be removed.

Front Seats

Seat Adjustment

⚠ WARNING

You can lose control of the vehicle if you try to adjust a manual driver seat while the vehicle is moving. The sudden movement could startle and confuse you, or make you push a pedal when you do not want to. Adjust the driver seat only when the vehicle is not moving.



To adjust the seat:

1. Lift the bar under the front edge of the seat cushion to unlock the seat.
2. Slide the seat to the desired position and release the bar.
3. Try to move the seat back and forth to be sure the seat is locked in place.

Left Rear Passenger Head Restraint Use and Adjustment Information from Vehicle Owner's Manual



Post-Test Vehicle Position



Post-Test Rear Passenger Dummy Close-up Knee Contact with Vehicle Interior View



Post-Test Left Rear Door Opening

APPENDIX B

DUMMY RESPONSE DATA PLOTS

TABLE OF DATA PLOTS
Driver Dummy Instrumentation Plots

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

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

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

Vehicle Instrumentation Data

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 Track Acceleration (Y)
Right Rear Occupant Compartment Acceleration (Y)
Engine Block (X)
Engine Block (Y)
Rear Floorpan Above Axle Acceleration (X)
Rear Floorpan Above Axle Acceleration (Y)
Rear Floorpan Above Axle Acceleration (Z)

MDB Instrumentation Data

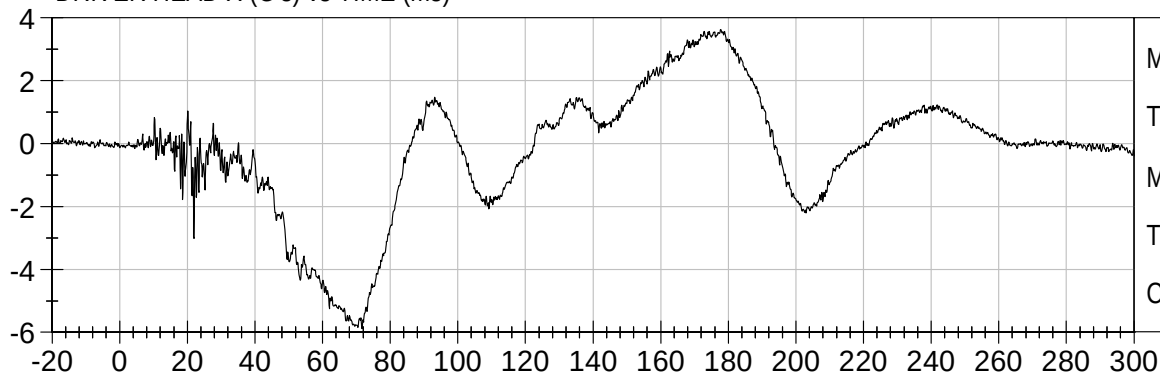
MDB Center of Gravity Acceleration (X)
MDB Center of Gravity Acceleration (Y)
MDB Center of Gravity Acceleration (Z)
MDB Rear Acceleration (X)
MDB Rear Acceleration (Y)
Left MDB Contact Switch
Right MDB Contact Switch



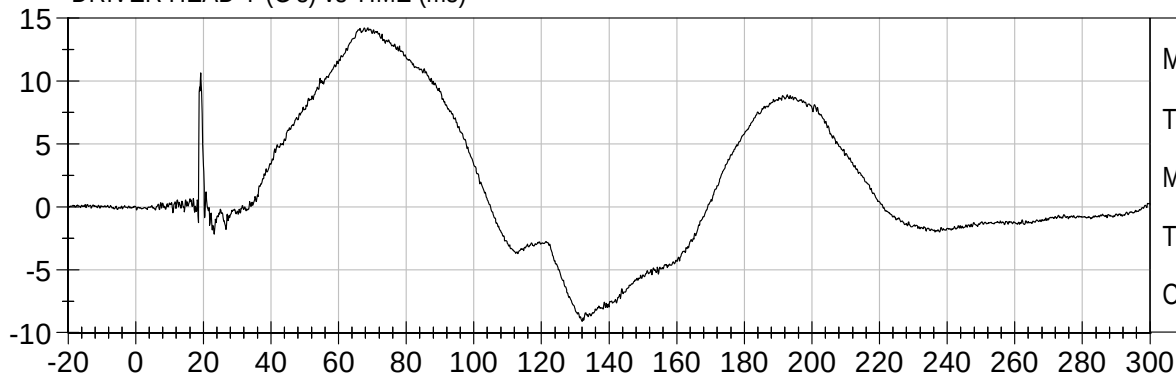
55/28 km/h 90° NCAP MDB Side Impact
2012 Chevrolet Suburban - MC0104

Test Date: 11/08/2011
Speed: 38.9 mph (62.5 km/h)

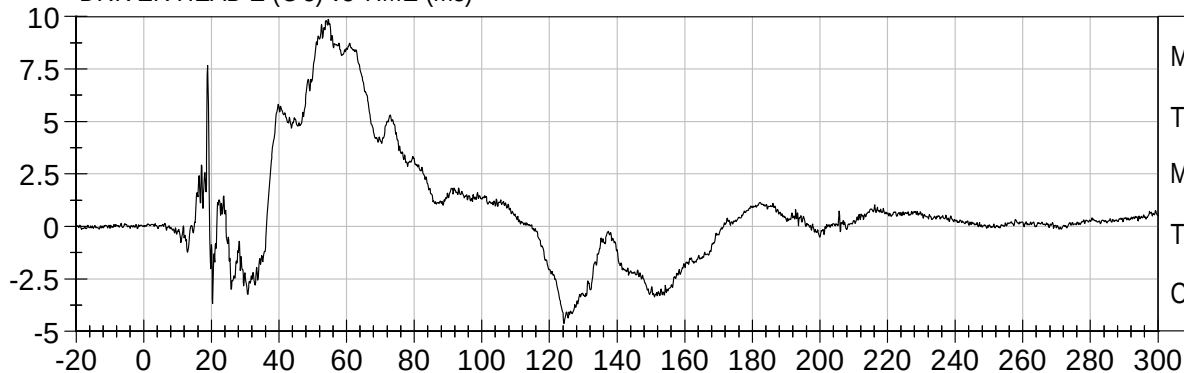
DRIVER HEAD X (G's) vs TIME (ms)



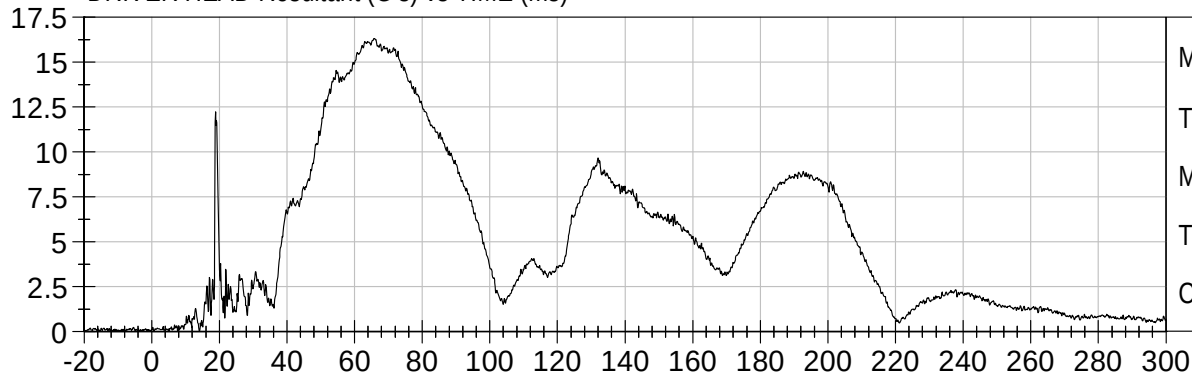
DRIVER HEAD Y (G's) vs TIME (ms)

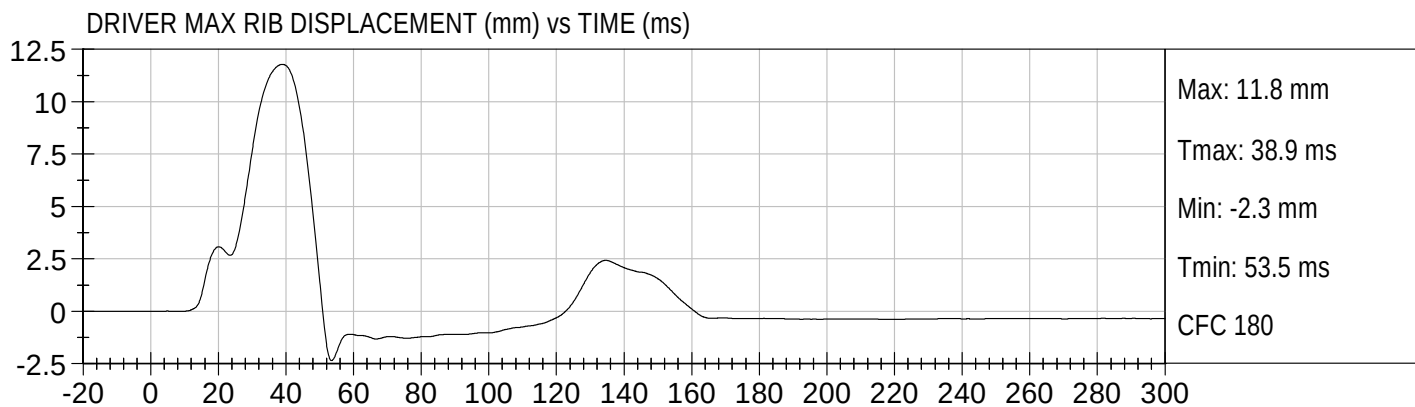
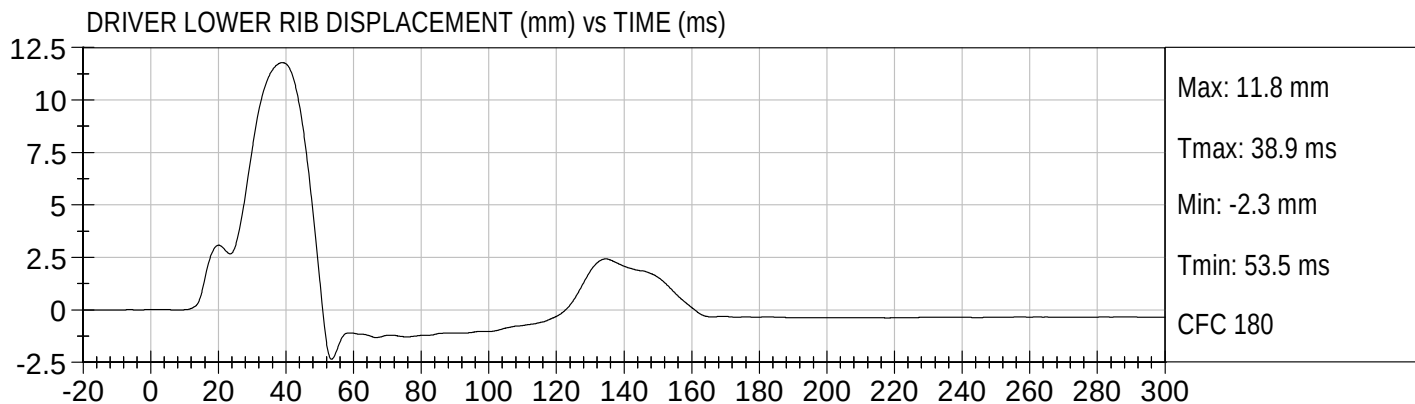
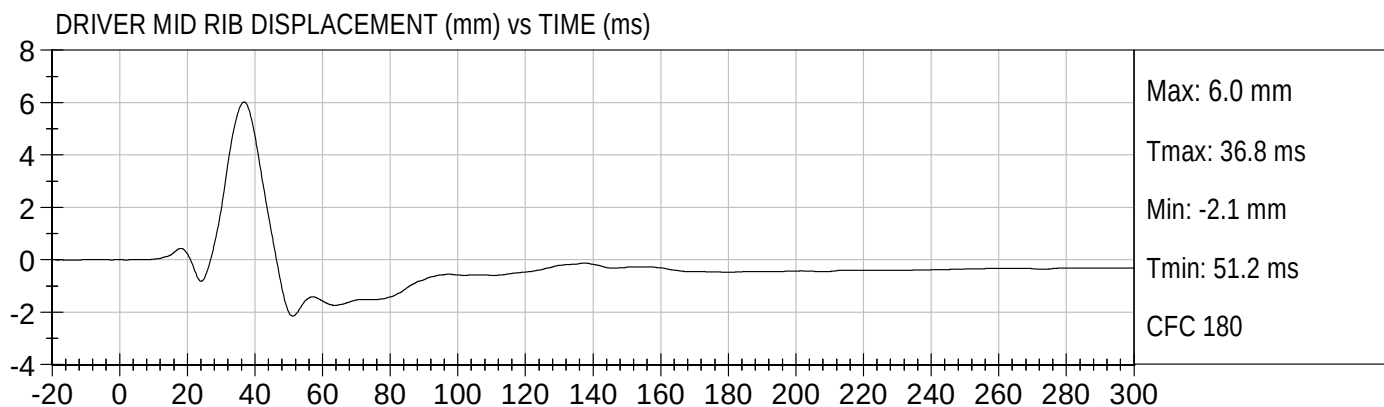
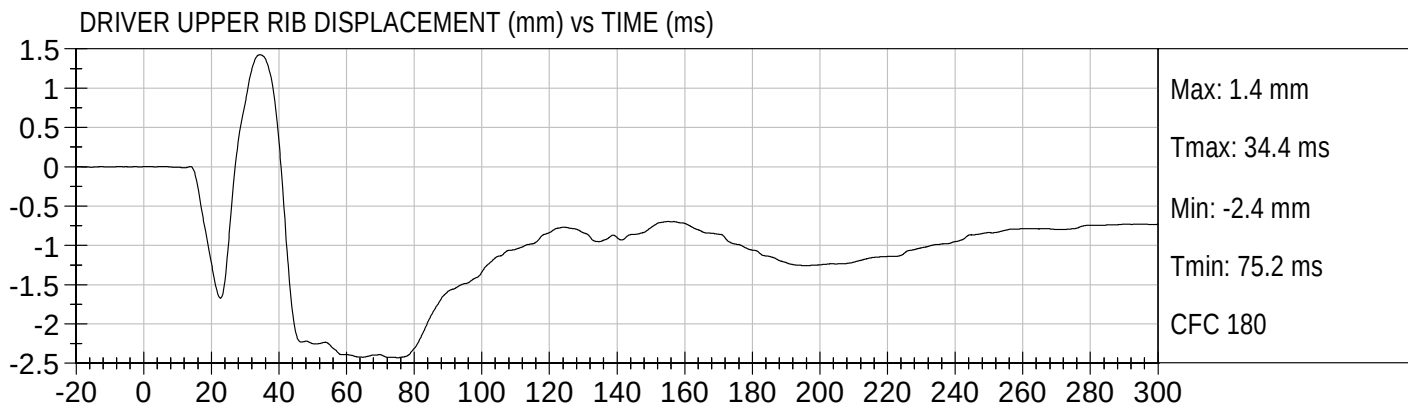


DRIVER HEAD Z (G's) vs TIME (ms)



DRIVER HEAD Resultant (G's) vs TIME (ms)

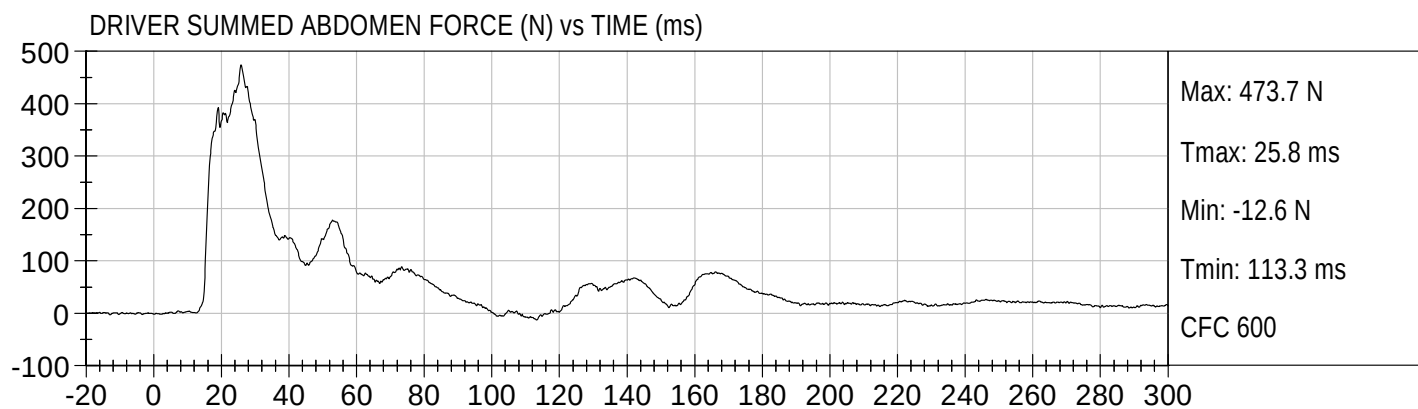
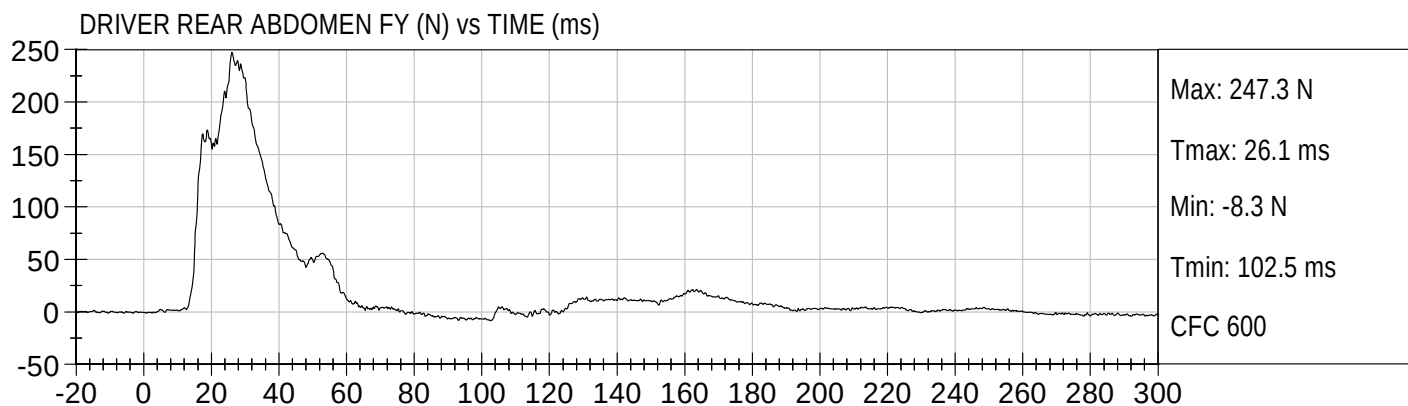
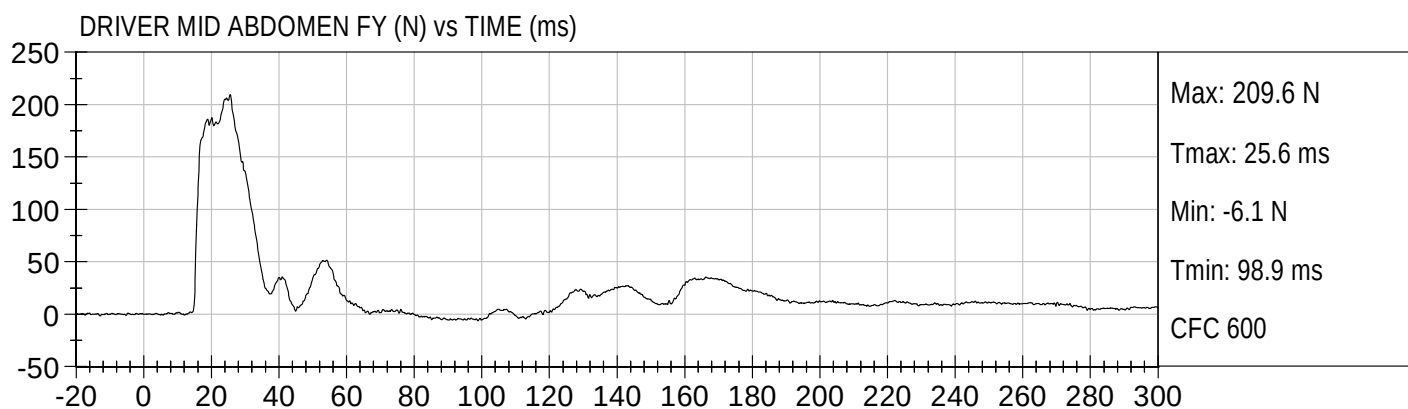
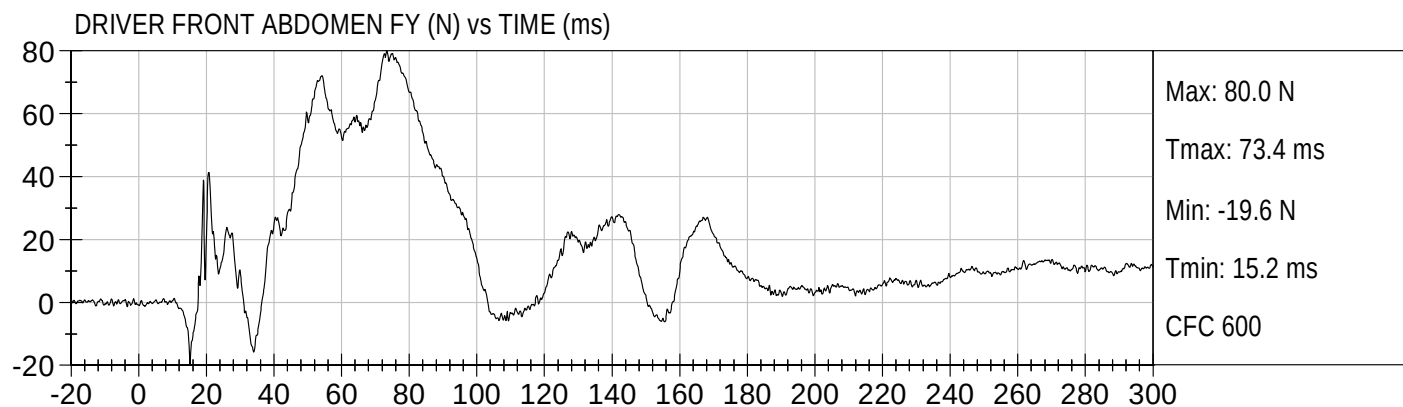






55/28 km/h 90° NCAP MDB Side Impact
2012 Chevrolet Suburban - MC0104

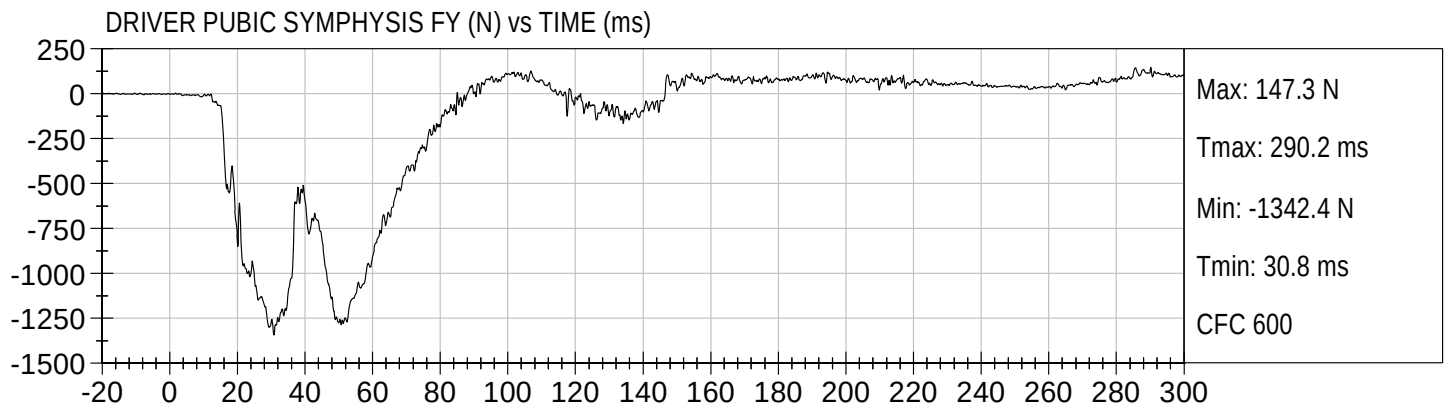
Test Date: 11/08/2011
Speed: 38.9 mph (62.5 km/h)





55/28 km/h 90° NCAP MDB Side Impact
2012 Chevrolet Suburban - MC0104

Test Date: 11/08/2011
Speed: 38.9 mph (62.5 km/h)

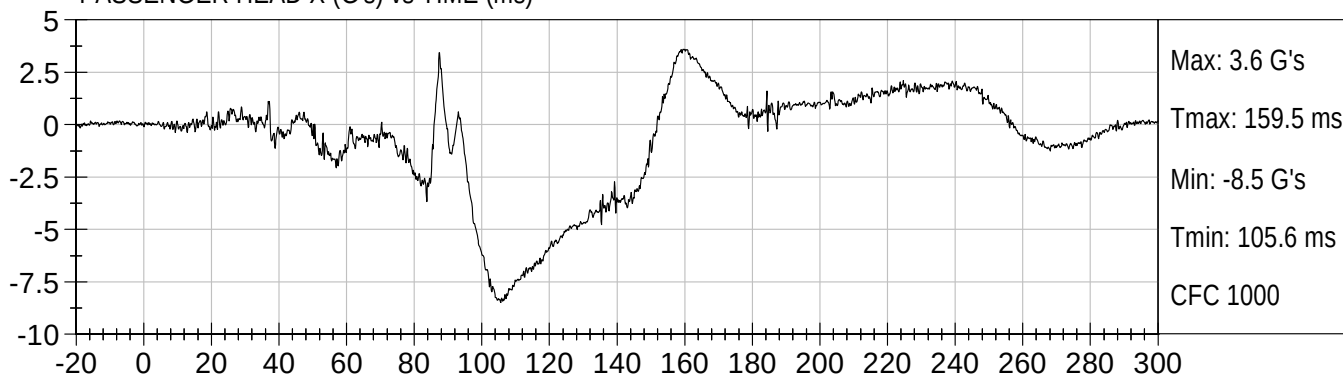




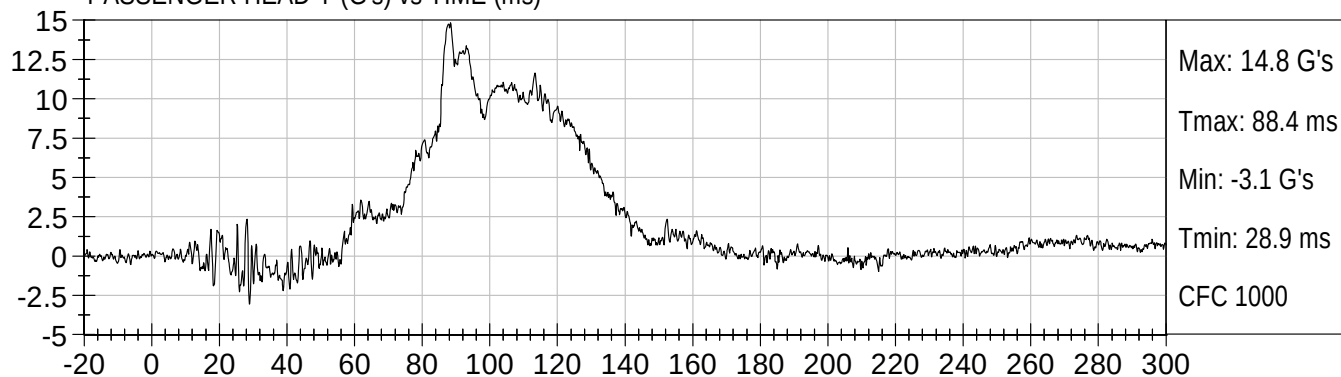
55/28 km/h 90° NCAP MDB Side Impact
2012 Chevrolet Suburban - MC0104

Test Date: 11/08/2011
Speed: 38.9 mph (62.5 km/h)

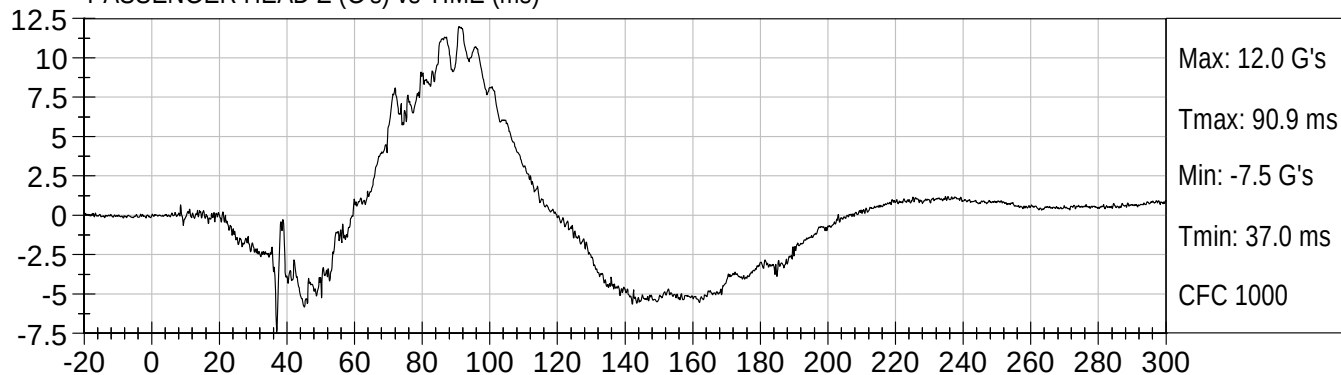
PASSENGER HEAD X (G's) vs TIME (ms)



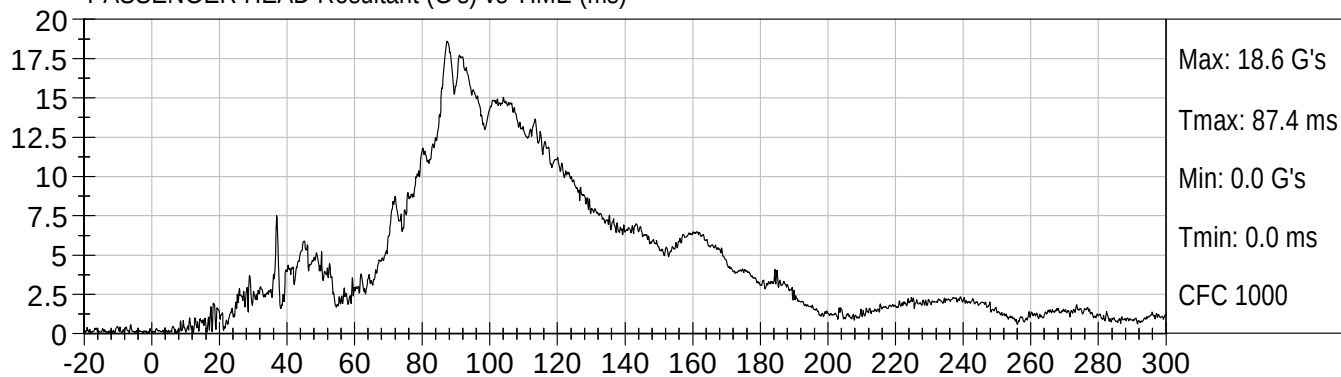
PASSENGER HEAD Y (G's) vs TIME (ms)



PASSENGER HEAD Z (G's) vs TIME (ms)



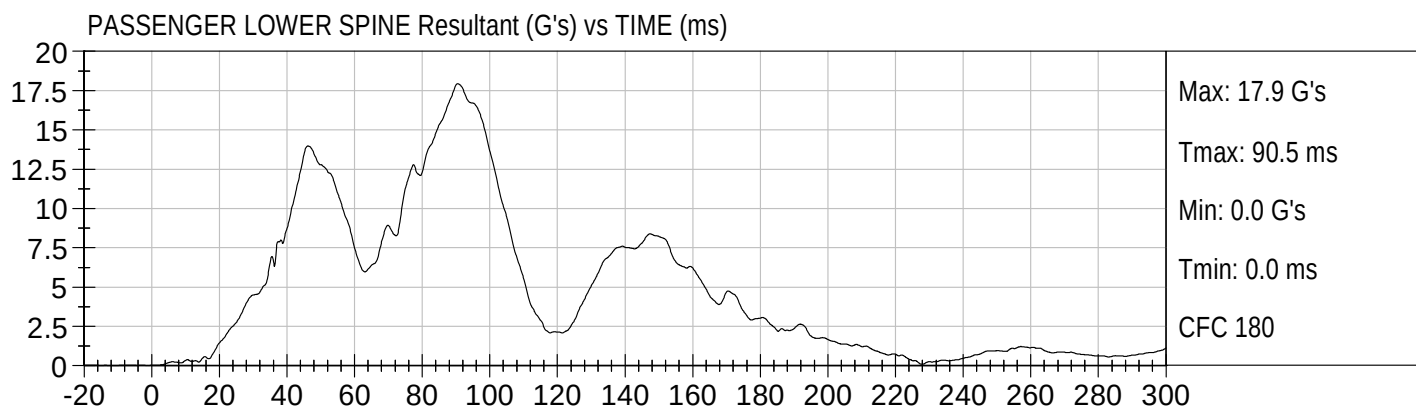
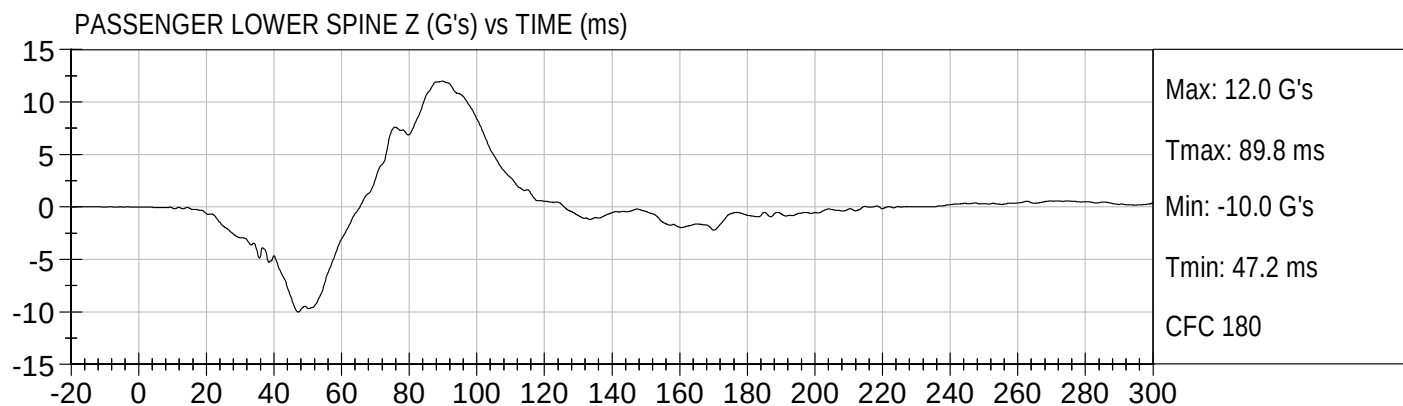
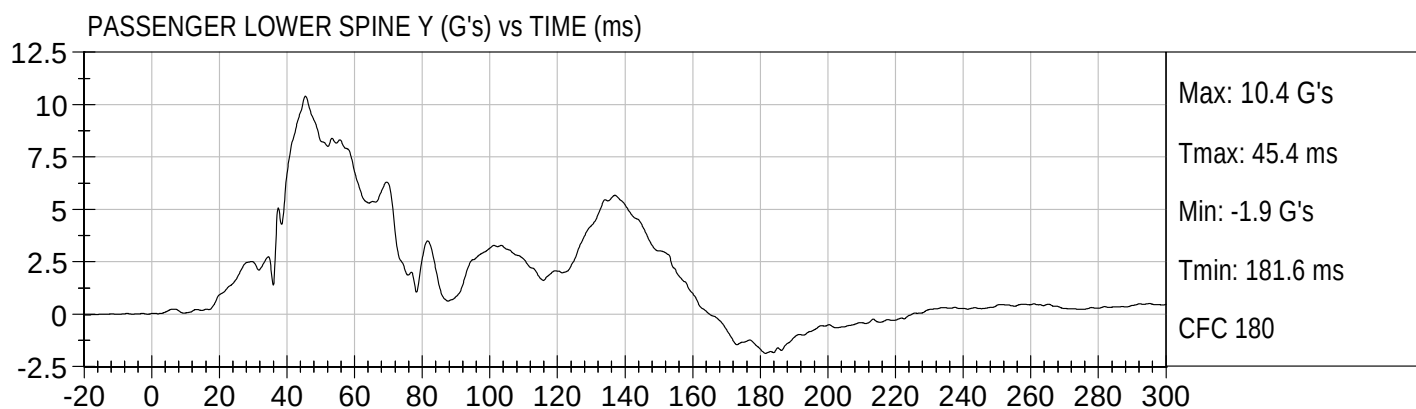
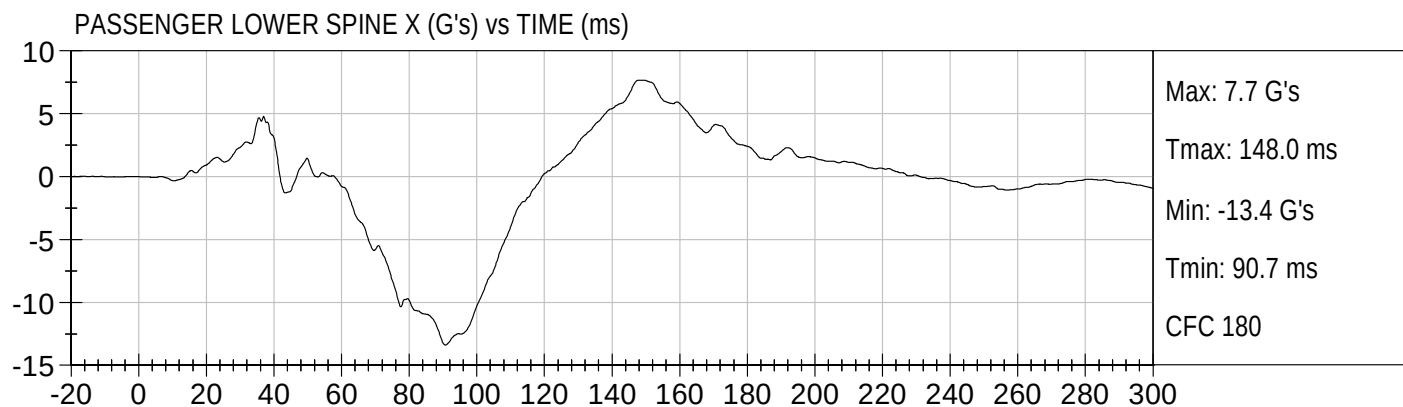
PASSENGER HEAD Resultant (G's) vs TIME (ms)





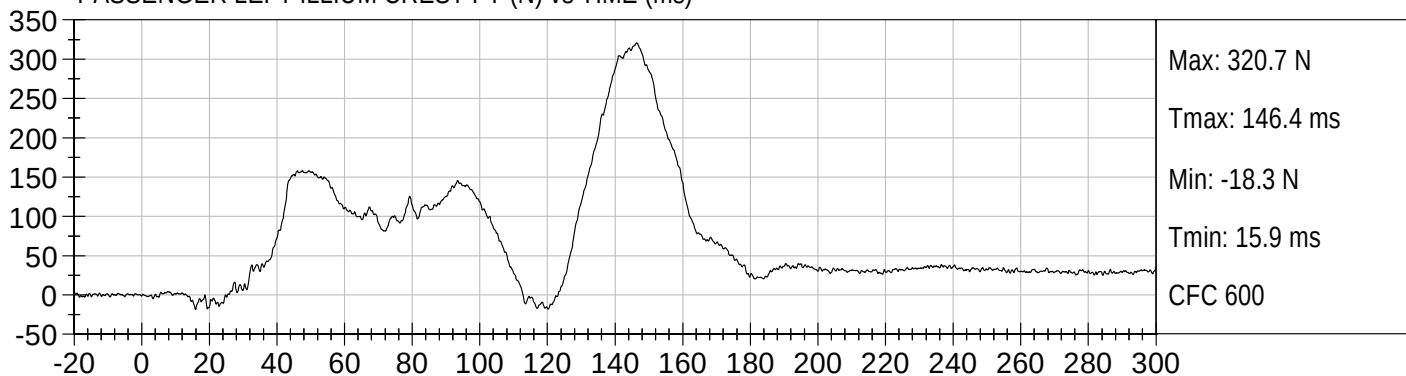
55/28 km/h 90° NCAP MDB Side Impact
2012 Chevrolet Suburban - MC0104

Test Date: 11/08/2011
Speed: 38.9 mph (62.5 km/h)

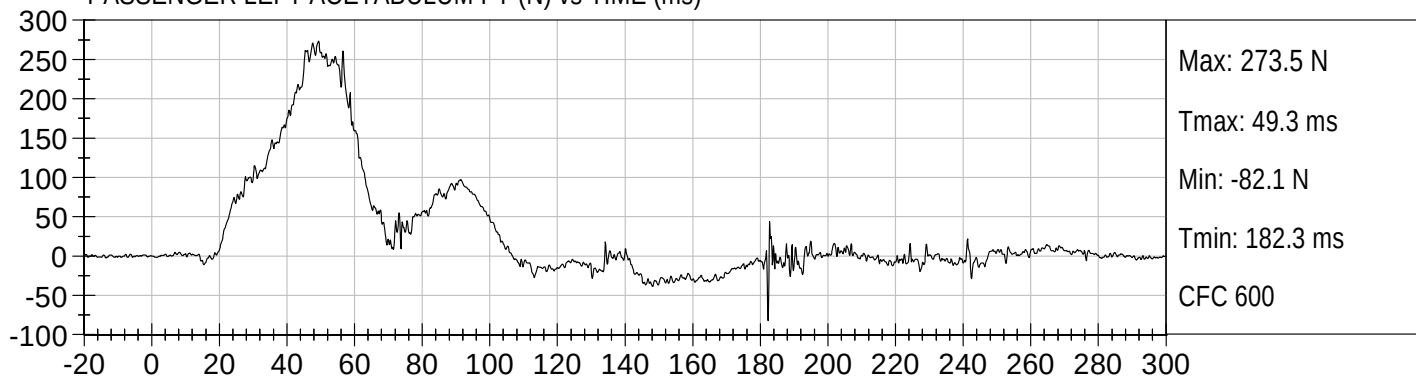




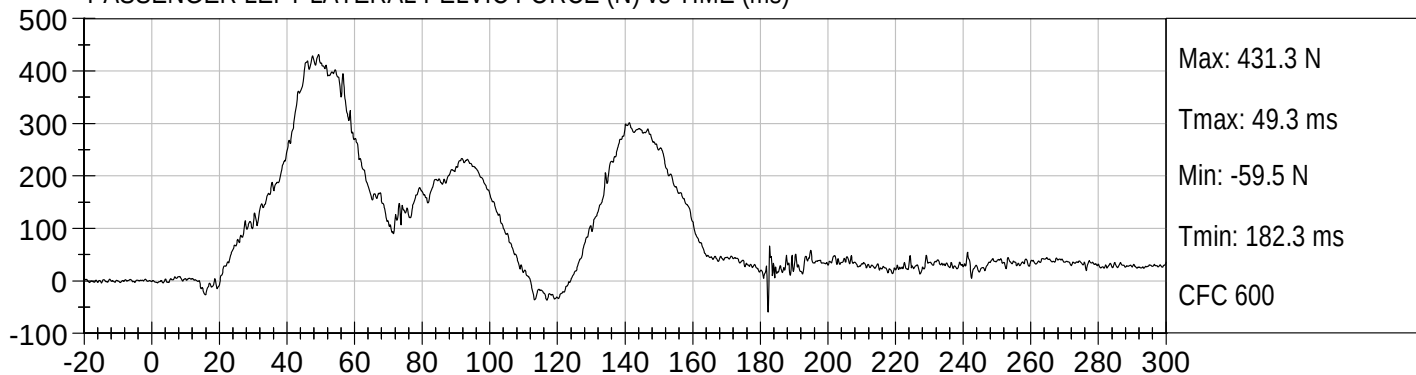
PASSENGER LEFT ILLIUM CREST FY (N) vs TIME (ms)



PASSENGER LEFT ACETABULUM FY (N) vs TIME (ms)



PASSENGER LEFT LATERAL PELVIC FORCE (N) vs TIME (ms)



APPENDIX C

DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

ES-2re External Measurements
SN: 032

No.	Name	Spec. (mm)	Result	Pass/Fail
1	Sitting Height	900 - 918	915	Pass
2	Seat to Shoulder Joint	558 - 572	568	Pass
3	Seat to Lower Face of Thoracic Spine Box	346 - 356	355	Pass
4	Seat to Hip Joint (center of bolt)	97 - 103	98	Pass
5	Sole to Seat, Sitting	333 - 451	440	Pass
6	Head Width	152 - 158	157	Pass
7	Shoulder/Arm Width	461 - 479	464	Pass
8	Thorax Width	322 - 332	323	Pass
9	Abdomen Width	273 - 287	281	Pass
10	Pelvis Lap Width	359 - 373	370	Pass
11	Head Depth	196 - 206	203	Pass
12	Thorax Depth	262 - 272	264	Pass
13	Abdomen Depth	194 - 204	196	Pass
14	Pelvis Depth	235 - 245	236	Pass
15	Back of Buttocks to Hip Joint (center of bolt)	150 - 160	151	Pass
16	Back of Buttocks to Front Knee	597 - 615	607	Pass

MGA RESEARCH CORPORATION

HEAD DROP TEST

ES-2re DUMMY

ATD Serial No: 032Test ID: D113661

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	36	Pass
Peak Resultant Acceleration	G's	125 to 155	153	Pass
Peak Lateral Acceleration	G's	+/- 15	-13	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 15% of peak	Yes	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

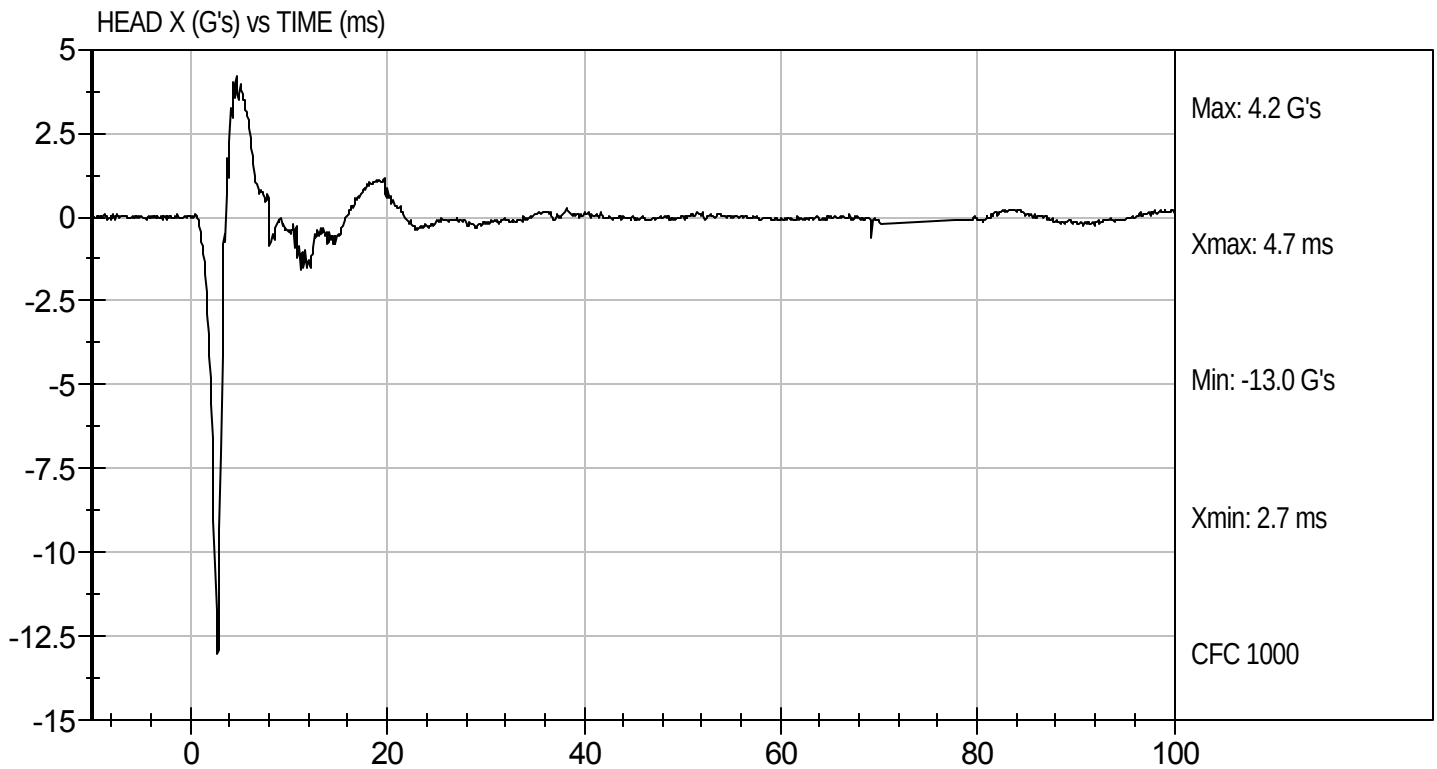
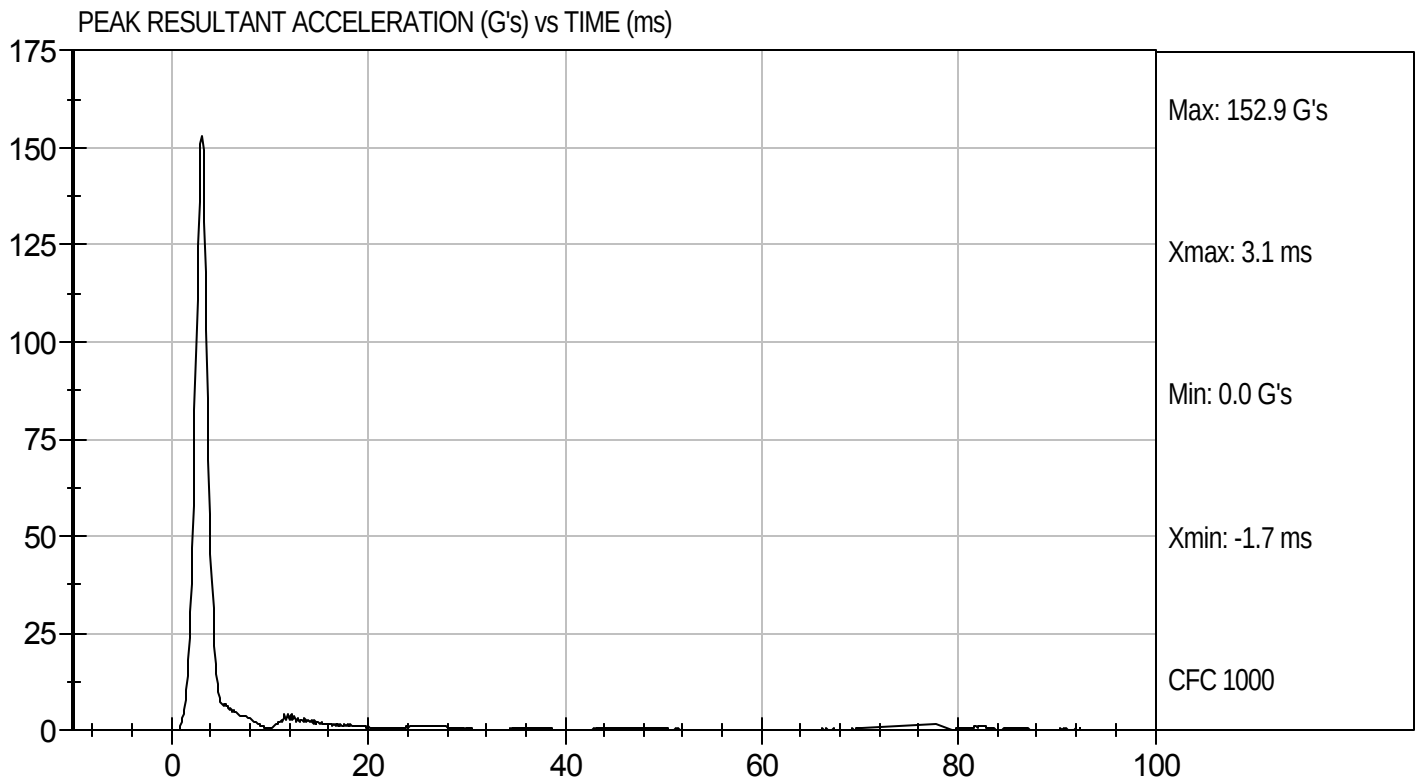
11/3/11
Test Date

David Winkelbauer
Approved By



Test Desc: Head Drop
Component ID: D113661

Test Date: 11/3/11
Velocity: 0 ft/s, 0 m/s

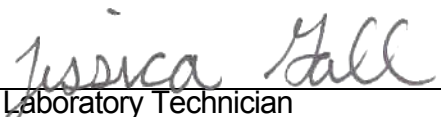


MGA RESEARCH CORPORATION
NECK PENDULUM TEST
ES-2re DUMMY

ATD Serial No: 032

Test I.D: D113662

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	18.0 to 22.0	21.2	Pass
Laboratory Relative Humidity		%	10 to 70	36	Pass
Pendulum Speed		m/s	3.3 to 3.5	3.5	Pass
Pendulum Deceleration	1 ms	m/s	0.00 to -0.05	-0.03	Pass
	3 ms	m/s	-0.25 to -0.375	-0.33	Pass
	14 ms	m/s	-3.20 to -3.70	-3.27	Pass
Maximum Flexion Angle		deg	49.0 to 59.0	52.6	Pass
Time of Maximum Flexion Angle		ms	54.0 to 66.0	62.7	Pass
Head Rotation Decay Time to 0 degree		ms	53.0 to 88.0	57.3	Pass
Overall Test Results					Pass


 Laboratory Technician

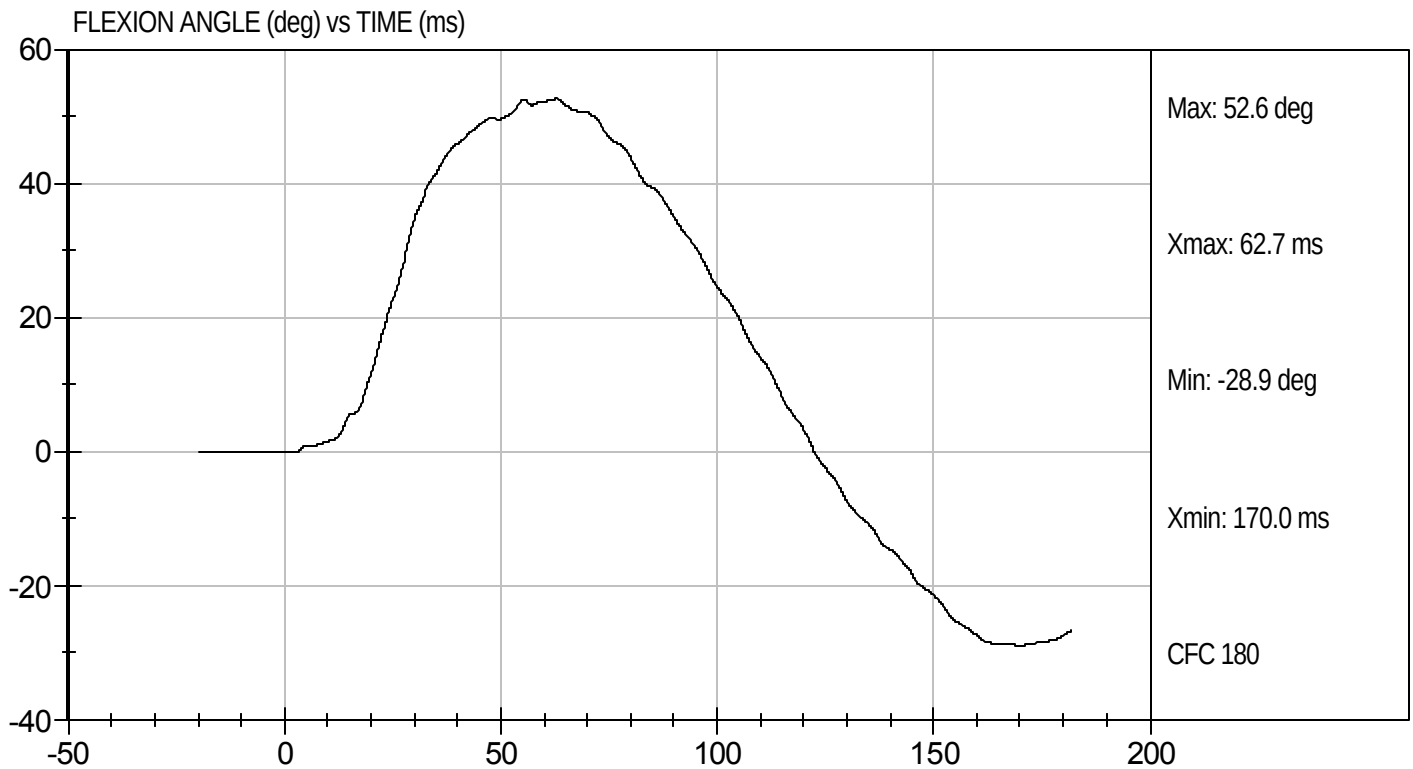
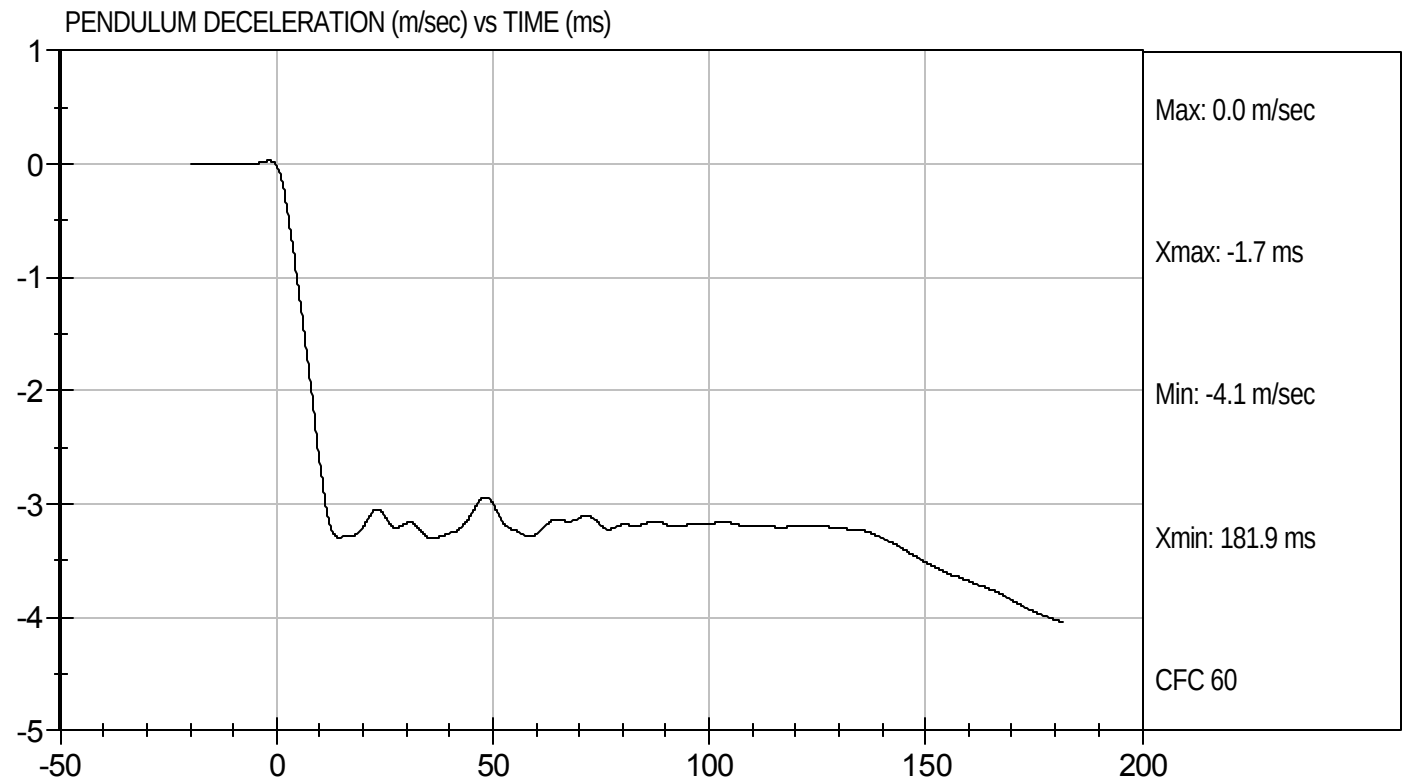
11/3/11
 Test Date


 Approved By



Test Desc: Neck Bending
Component ID: D113662

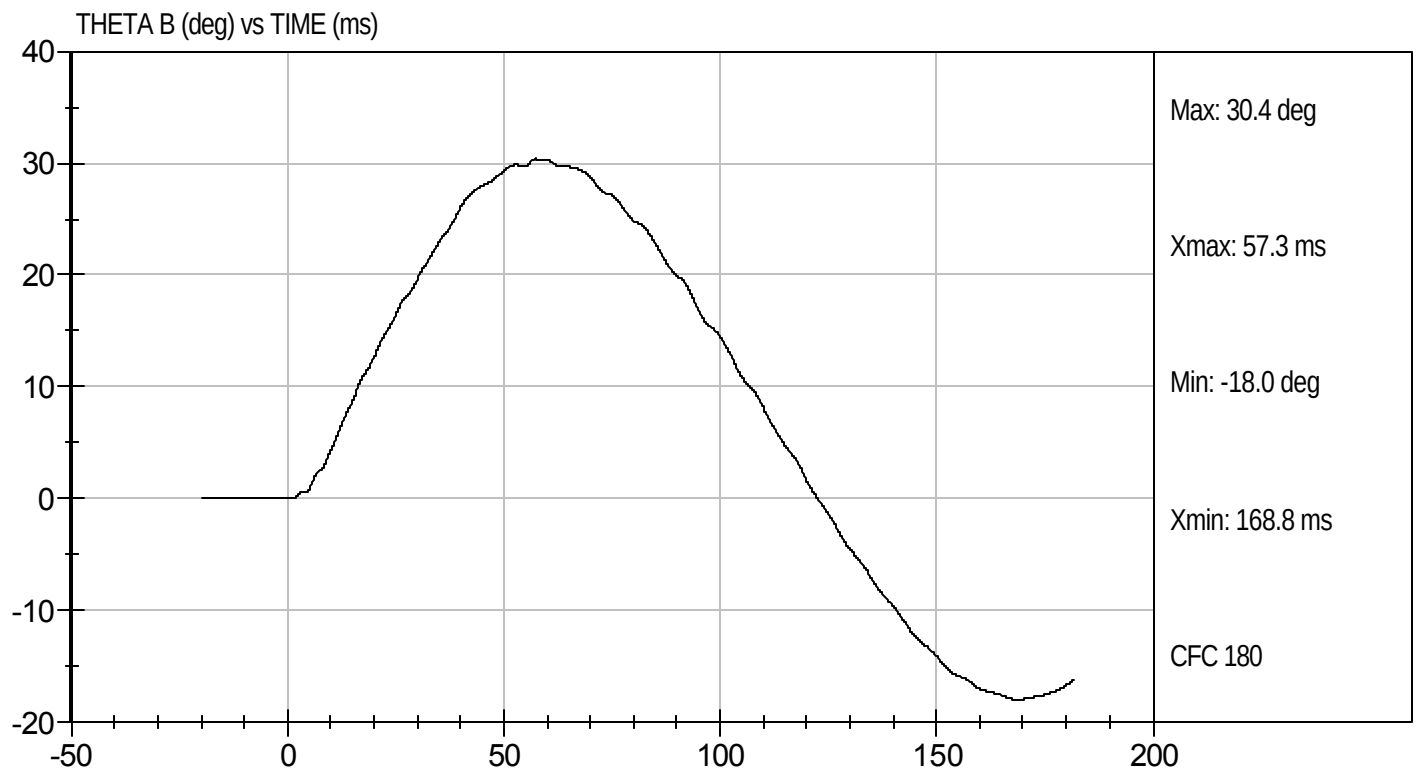
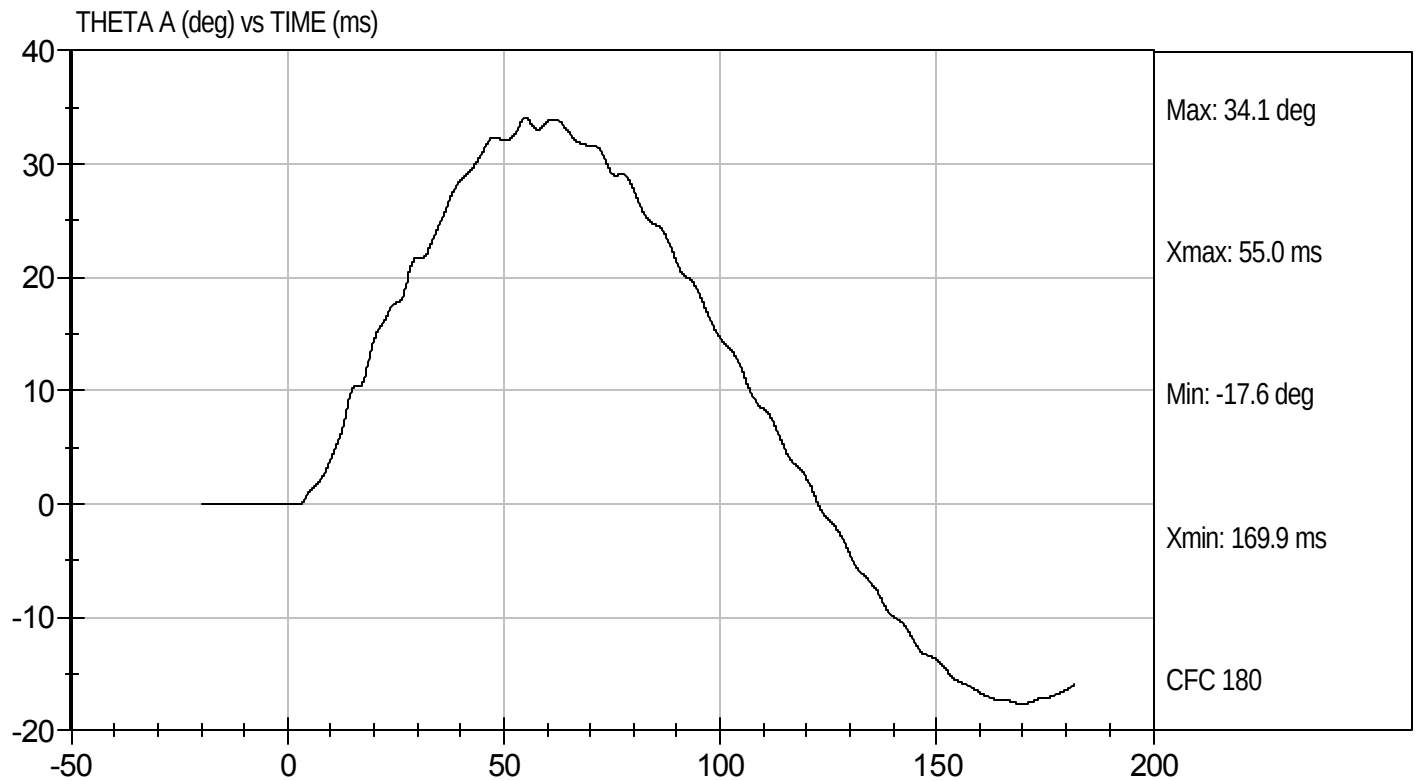
Test Date: 11/3/11
Velocity: 11.42 ft/s, 3.48 m/s





Test Desc: Neck Bending
Component ID: D113662

Test Date: 11/3/11
Velocity: 11.42 ft/s, 3.48 m/s



MGA RESEARCH CORPORATION
SHOULDER IMPACT TEST
ES-2re DUMMY

ATD Serial No: 032

Test I.D: D113663

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.0	Pass
Laboratory Relative Humidity	%	10 to 70	36	Pass
Pendulum Speed	m/s	4.2 to 4.4	4.3	Pass
Peak Shoulder Acceleration	G's	7.5 to 10.5	8.9	Pass
Time of Peak Shoulder Acceleration	ms	NA	13.0	Pass
Overall Test Results			Pass	


Laboratory Technician

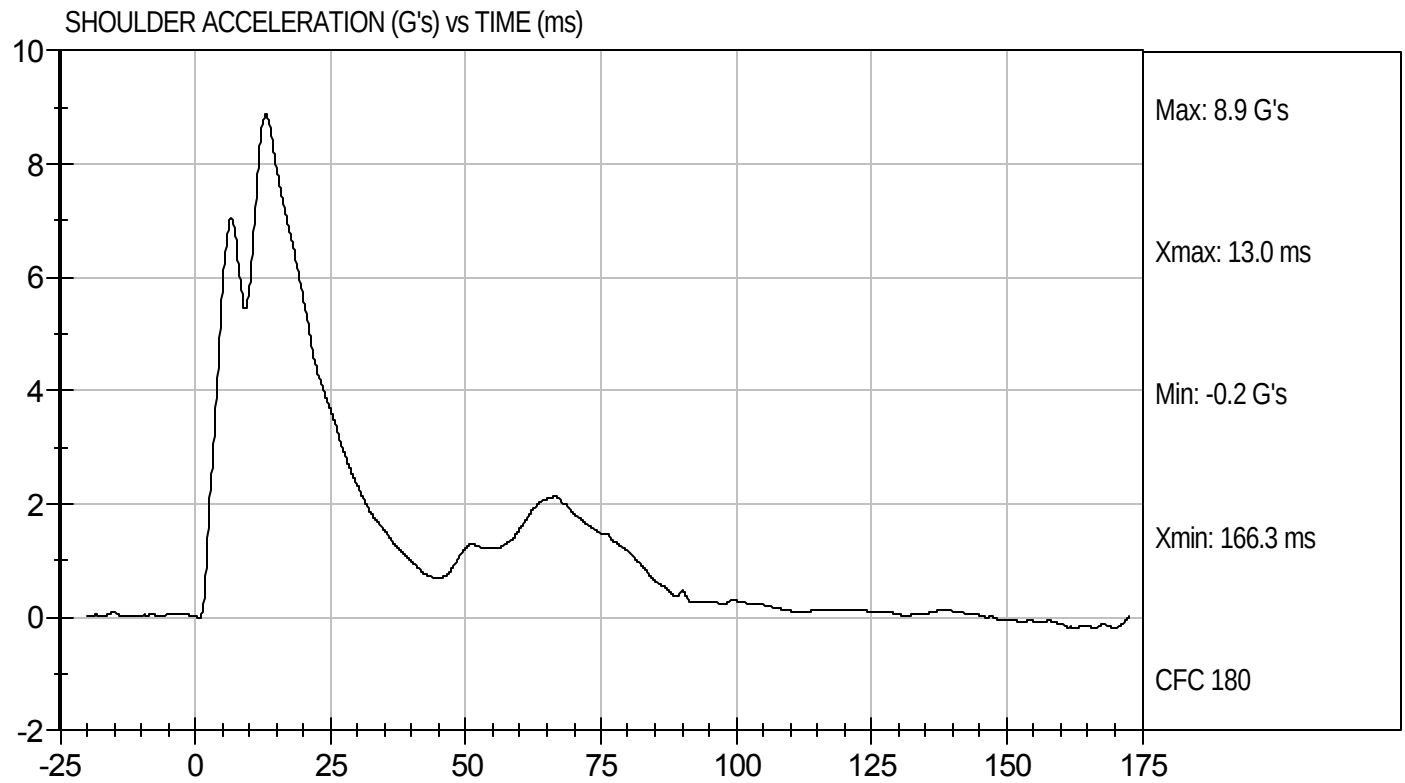
11/2/11
Test Date


Approved By



Test Desc: Shoulder Impact
Component ID: D113663

Test Date: 11/2/11
Velocity: 14.24 ft/s, 4.3 m/s



MGA RESEARCH CORPORATION

UPPER RIB TEST

ES-2re DUMMY

ATD Serial No: 032

Test I.D: D113664

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.0	Pass
Laboratory Relative Humidity	%	10 to 70	36	Pass
Displacement at 3 m/s	mm	36.0 to 40.0	37.7	Pass
Displacement at 4 m/s	mm	46.0 to 51.0	48.3	Pass
			Overall Test Results	Pass


Laboratory Technician

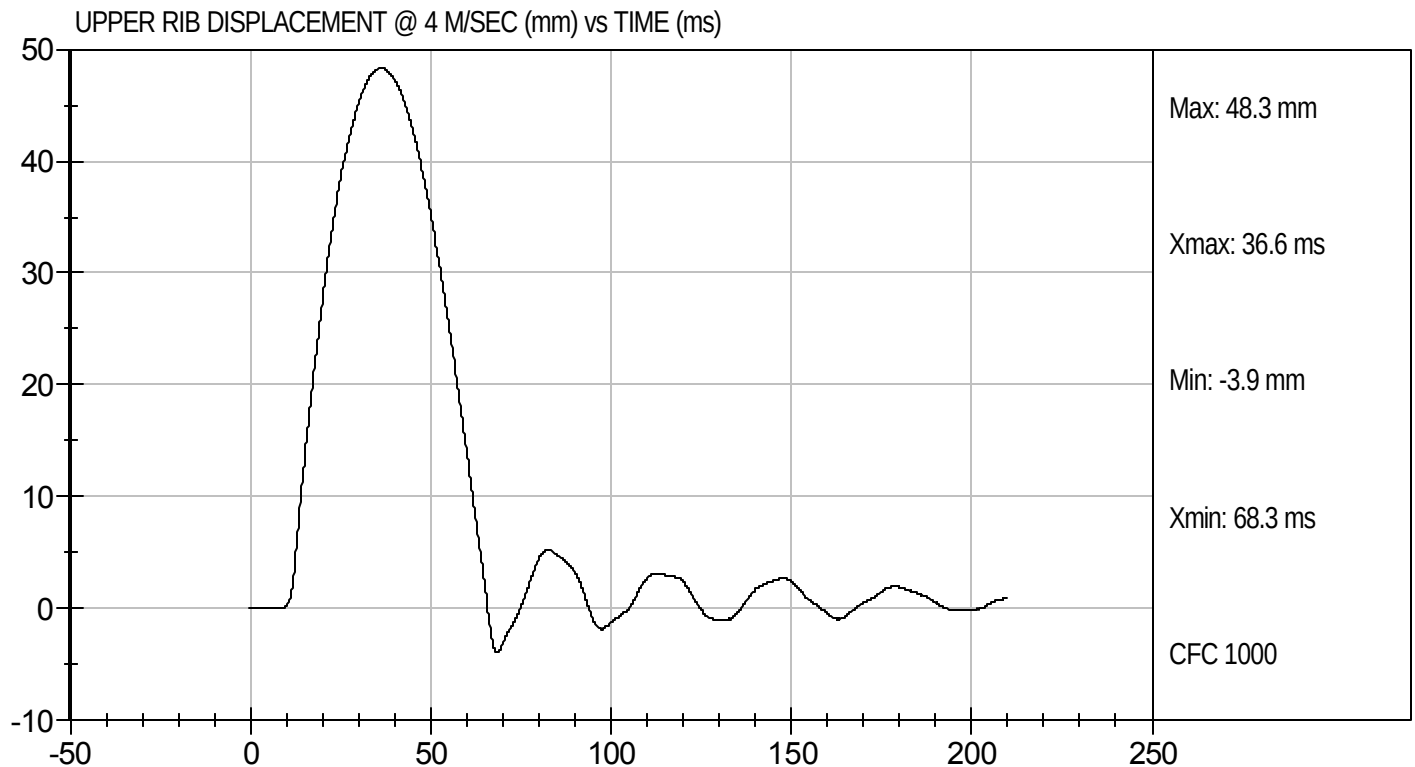
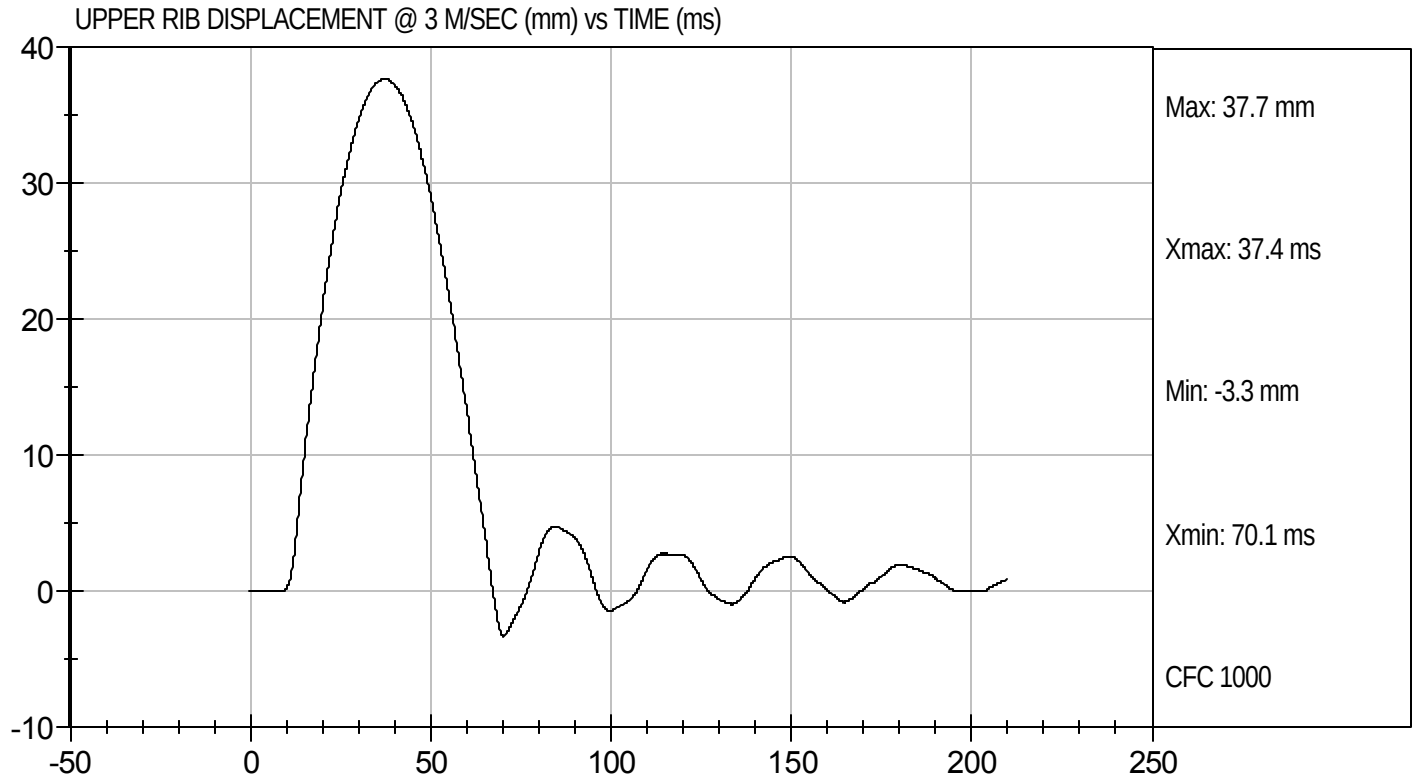
11/3/11
Test Date


Approved By



Test Desc: Rib Impact - Upper
Component ID: D113664

Test Date: 11/3/11



MGA RESEARCH CORPORATION

**MID RIB TEST
ES-2re DUMMY**

ATD Serial No: 032

Test I.D: D113665

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.0	Pass
Laboratory Relative Humidity	%	10 to 70	36	Pass
Displacement at 3 m/s	mm	36.0 to 40.0	37.5	Pass
Displacement at 4 m/s	mm	46.0 to 51.0	47.9	Pass
			Overall Test Results	Pass


Laboratory Technician

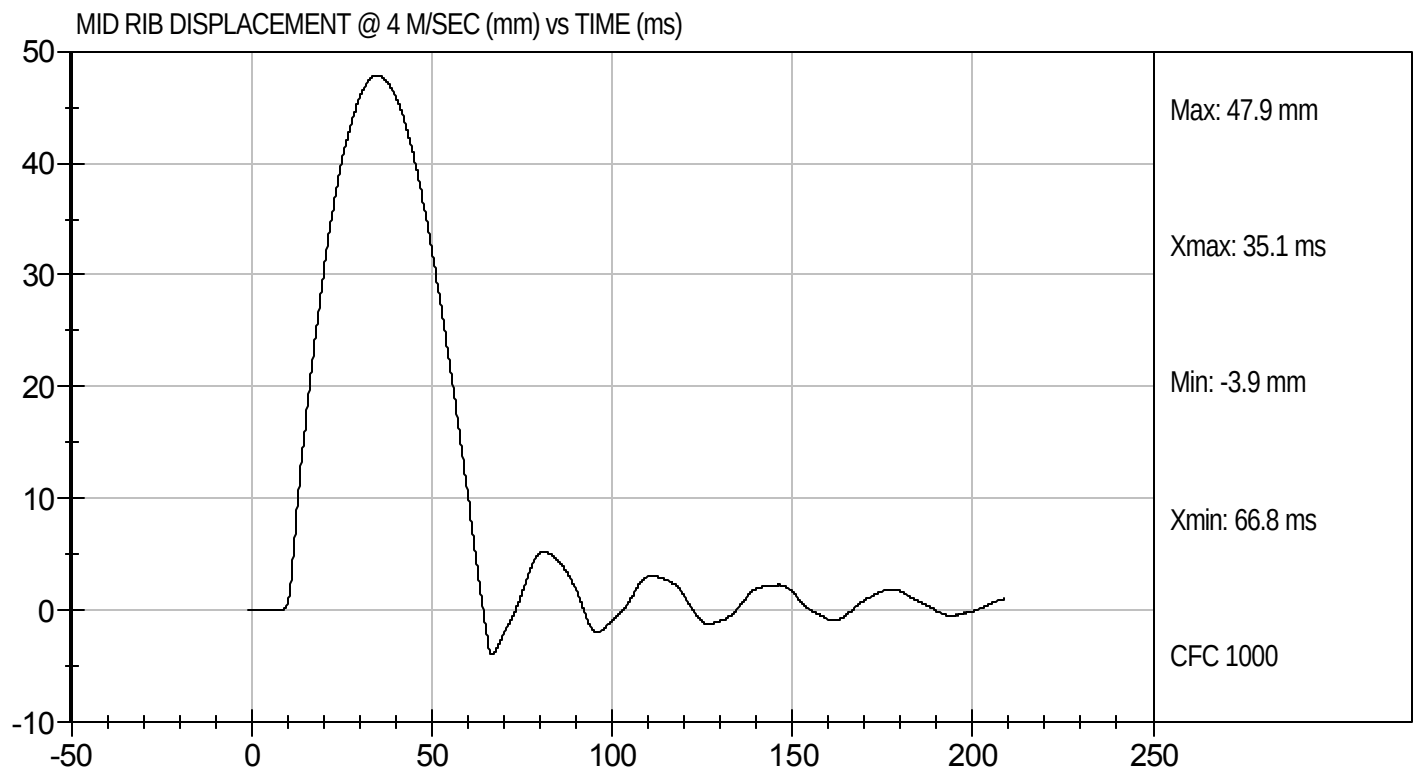
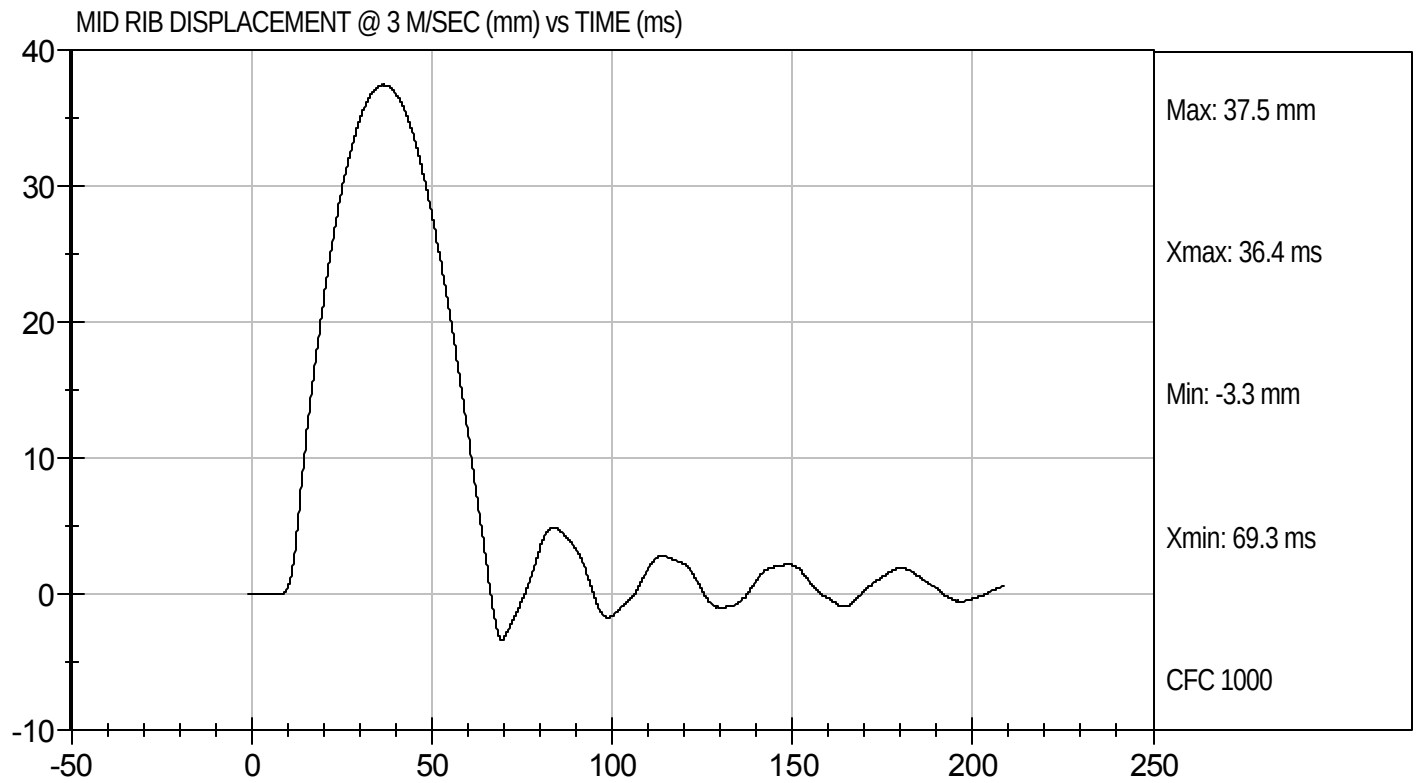
11/3/11
Test Date


Approved By



Test Desc: Rib Impact - Mid
Component ID: D113665

Test Date: 11/3/11



MGA RESEARCH CORPORATION

LOWER RIB TEST

ES-2re DUMMY

ATD Serial No: 032

Test I.D: D113666

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.0	Pass
Laboratory Relative Humidity	%	10 to 70	36	Pass
Displacement at 3 m/s	mm	36.0 to 40.0	37.8	Pass
Displacement at 4 m/s	mm	46.0 to 51.0	48.2	Pass
			Overall Test Results	Pass


Laboratory Technician

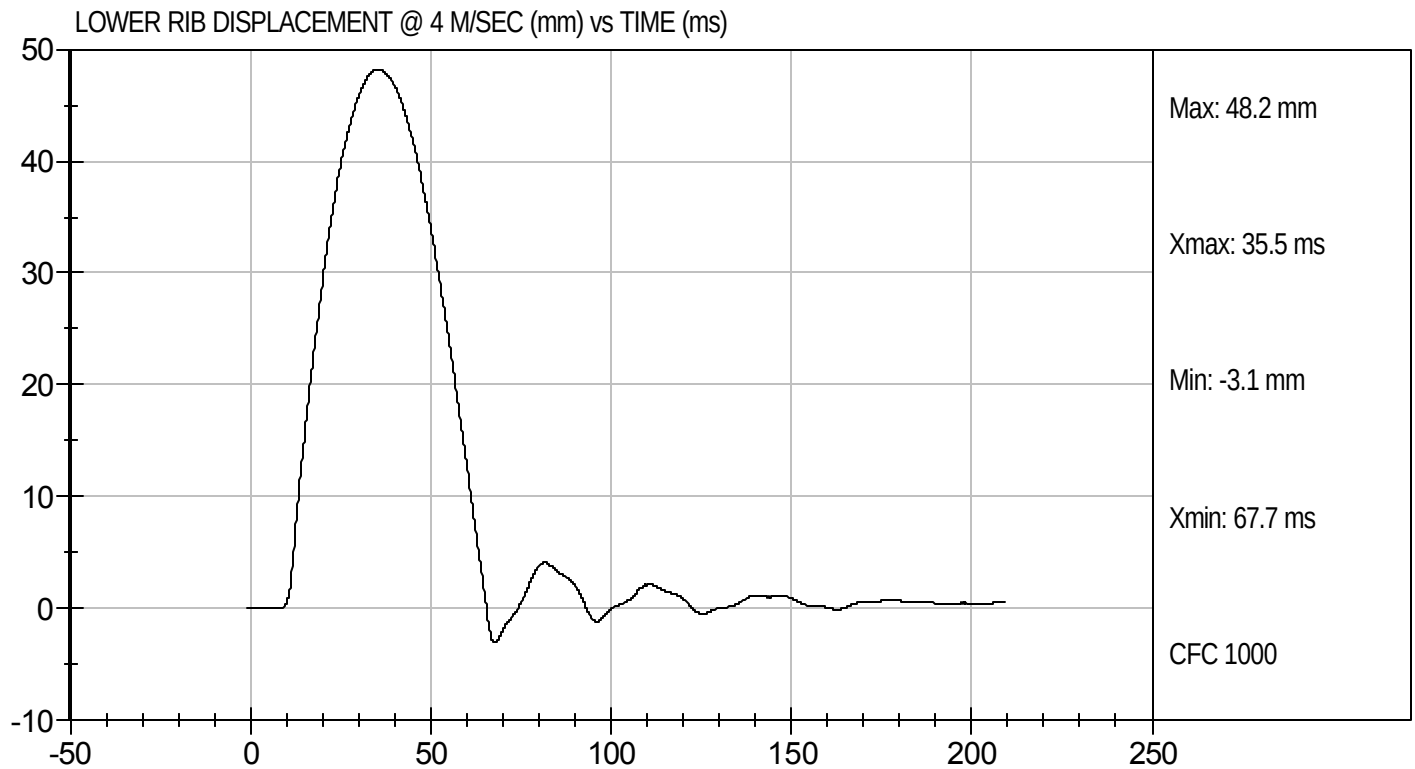
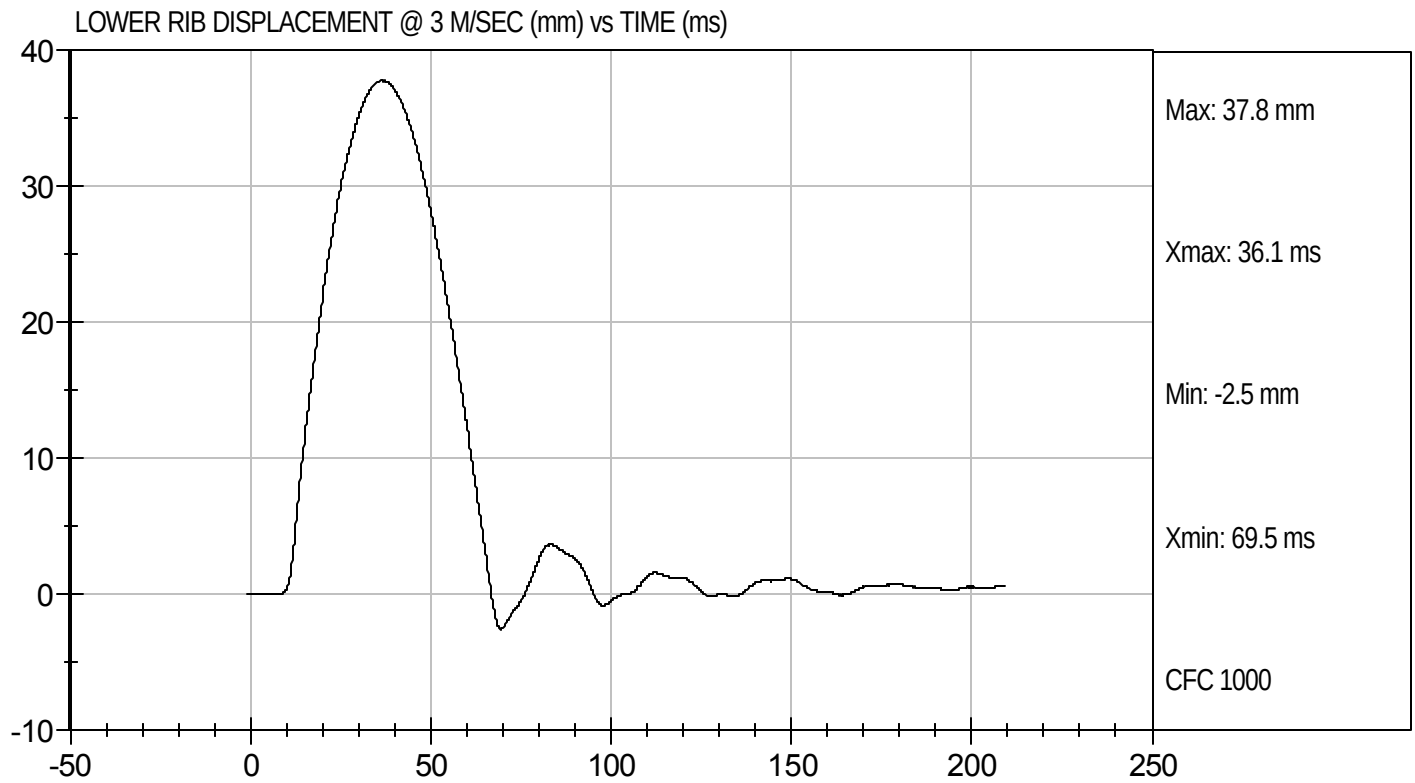
11/3/11
Test Date


Approved By



Test Desc: Rib Impact - Lower
Component ID: D113666

Test Date: 11/3/11

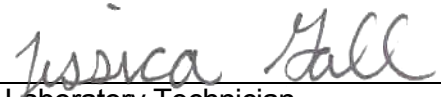


MGA RESEARCH CORPORATION
FULL BODY THORAX IMPACT TEST
ES-2re DUMMY

ATD Serial No: 032

Test I.D: D113660

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.0	Pass
Humidity	%	10 to 70	36	Pass
Probe Speed	m/s	5.40 to 5.60	5.58	Pass
Maximum Impactor Force (after 6 ms)	kN	5.10 to 6.20	5.19	Pass
Upper Rib Displacement	mm	34.0 to 41.0	37.3	Pass
Middle Rib Displacement	mm	37.0 to 45.0	39.8	Pass
Lower Rib Displacement	mm	37.0 to 44.0	39.0	Pass
Overall Test Results			Pass	


Laboratory Technician

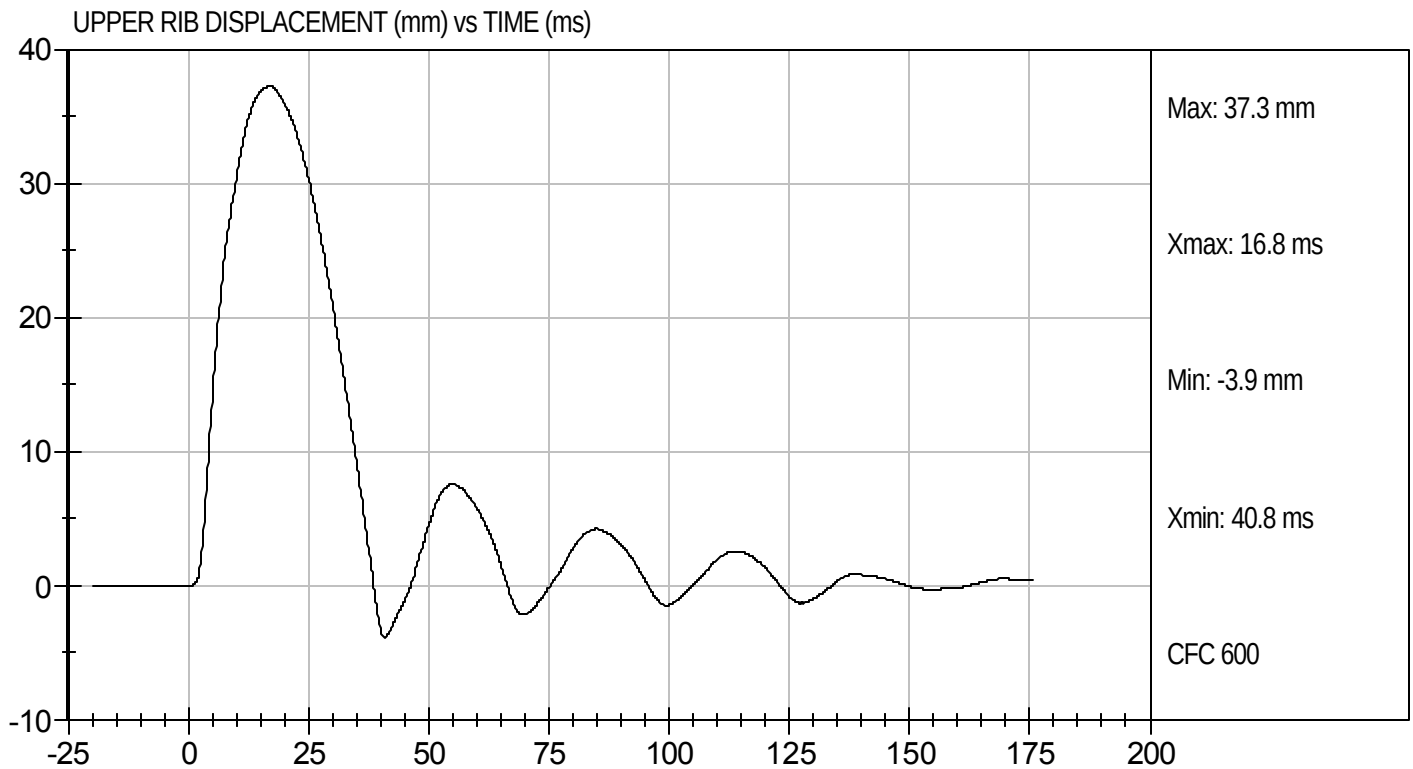
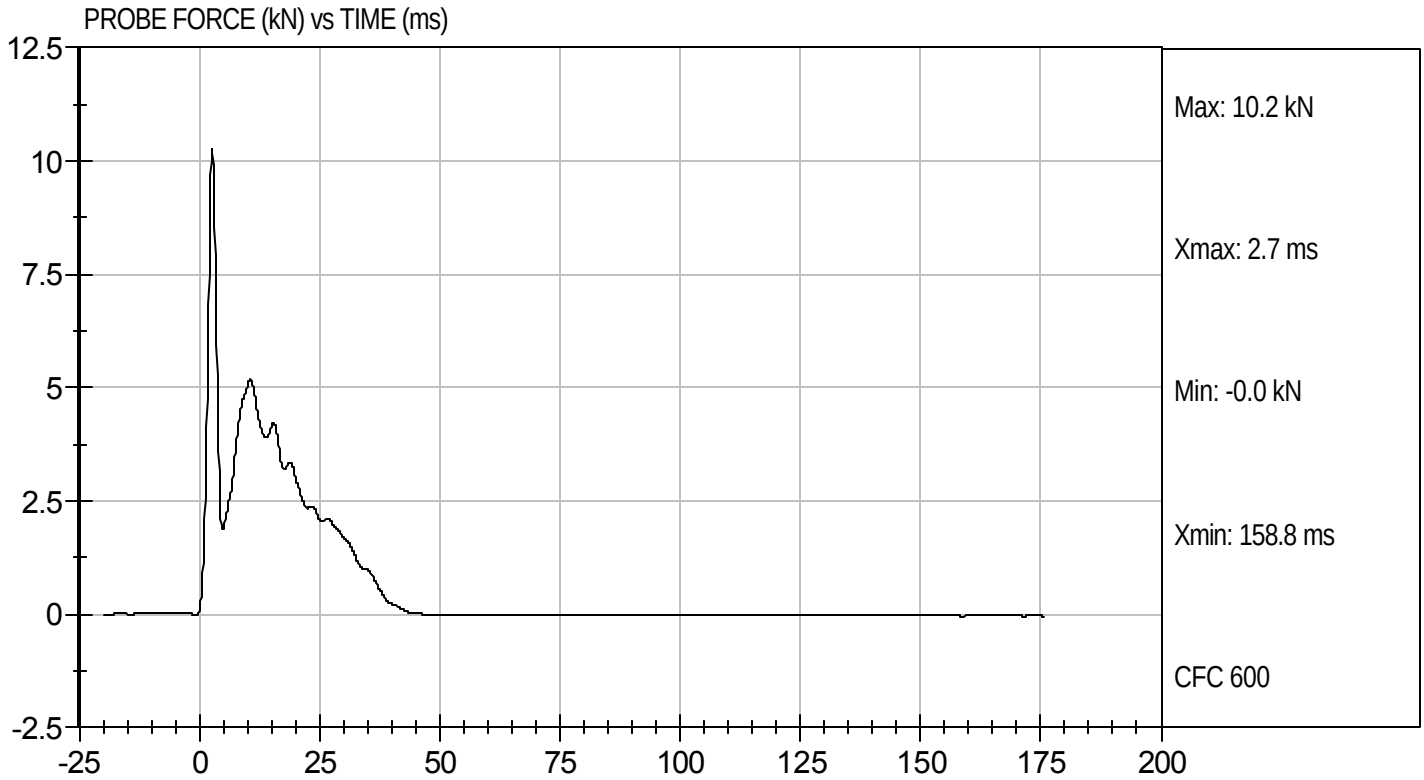
11/2/11
Test Date


Approved By



Test Desc: Thorax Impact
Component ID: D113660

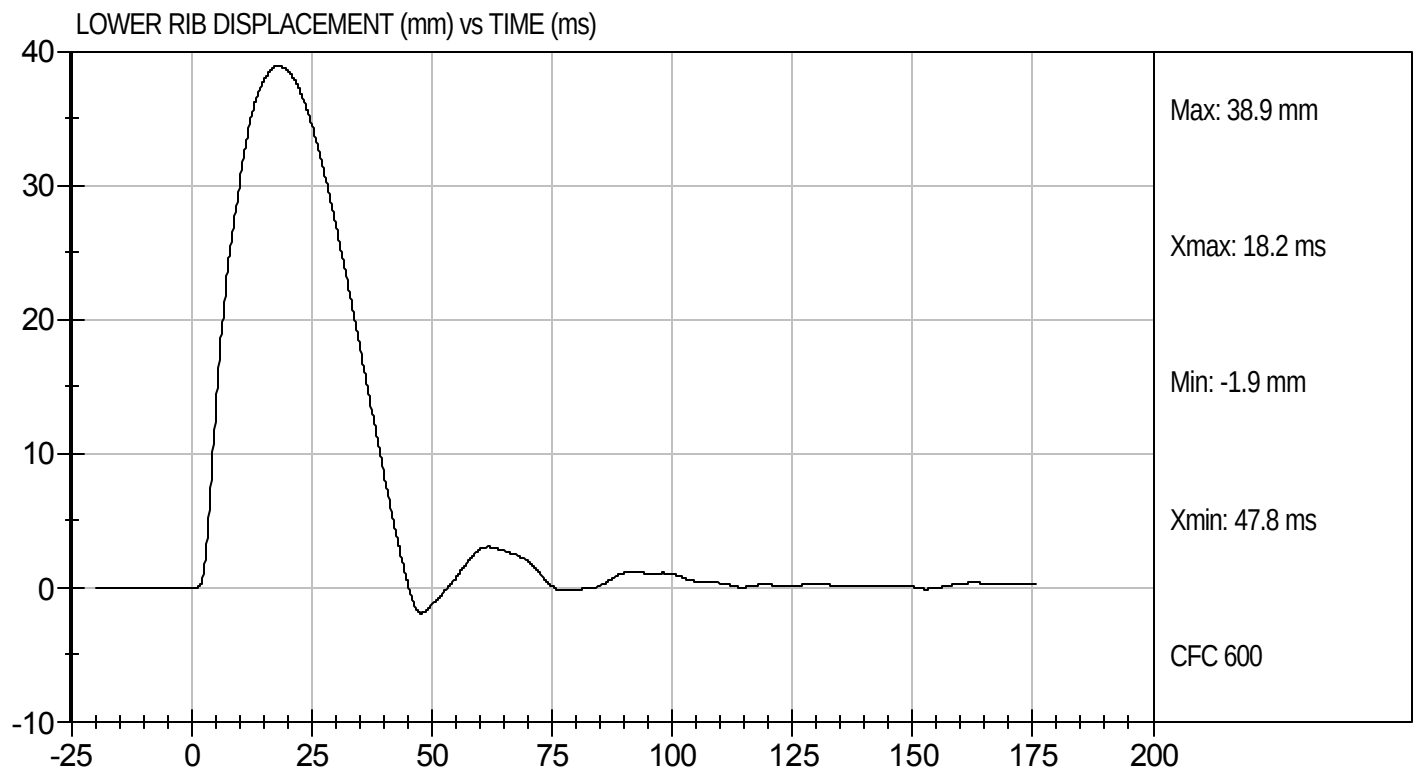
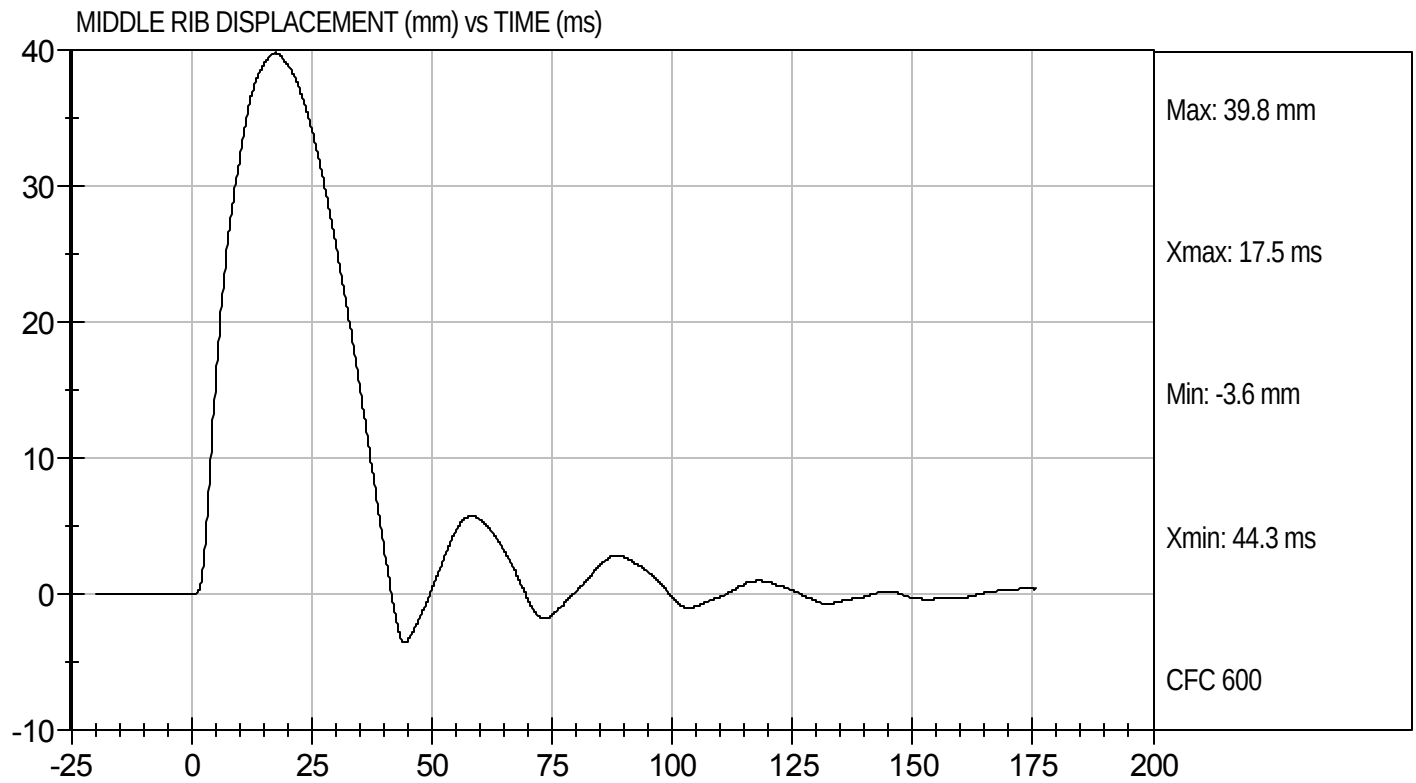
Test Date: 11/2/11
Velocity: 18.31 ft/s, 5.58 m/s





Test Desc: Thorax Impact
Component ID: D113660

Test Date: 11/2/11
Velocity: 18.31 ft/s, 5.58 m/s



MGA RESEARCH CORPORATION

ABDOMEN TEST

ES-2re DUMMY

ATD Serial No: 032

Test I.D: D113667

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.0	Pass
Laboratory Relative Humidity	%	10 to 70	36	Pass
Probe Speed	m/s	3.90 to 4.10	4.03	Pass
Maximum Impact Force	kN	4.00 to 4.80	4.18	Pass
Time of Maximum Impact Force	ms	10.60 to 13.00	10.80	Pass
Maximum Total Abdomen Force	kN	2.20 to 2.70	2.44	Pass
Time of Maximum Abdomen Force	ms	10.00 to 12.30	10.30	Pass
Overall Test Results				Pass


Laboratory Technician

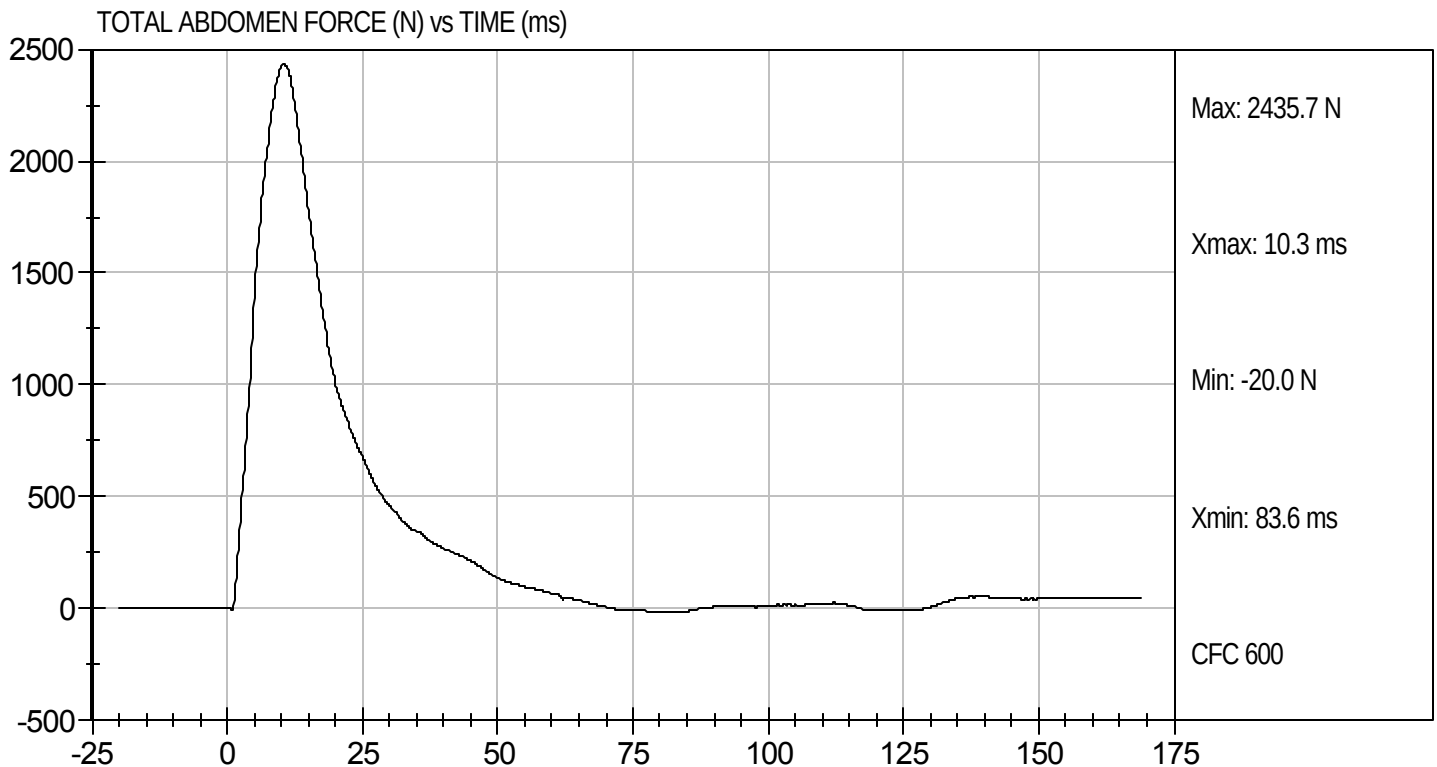
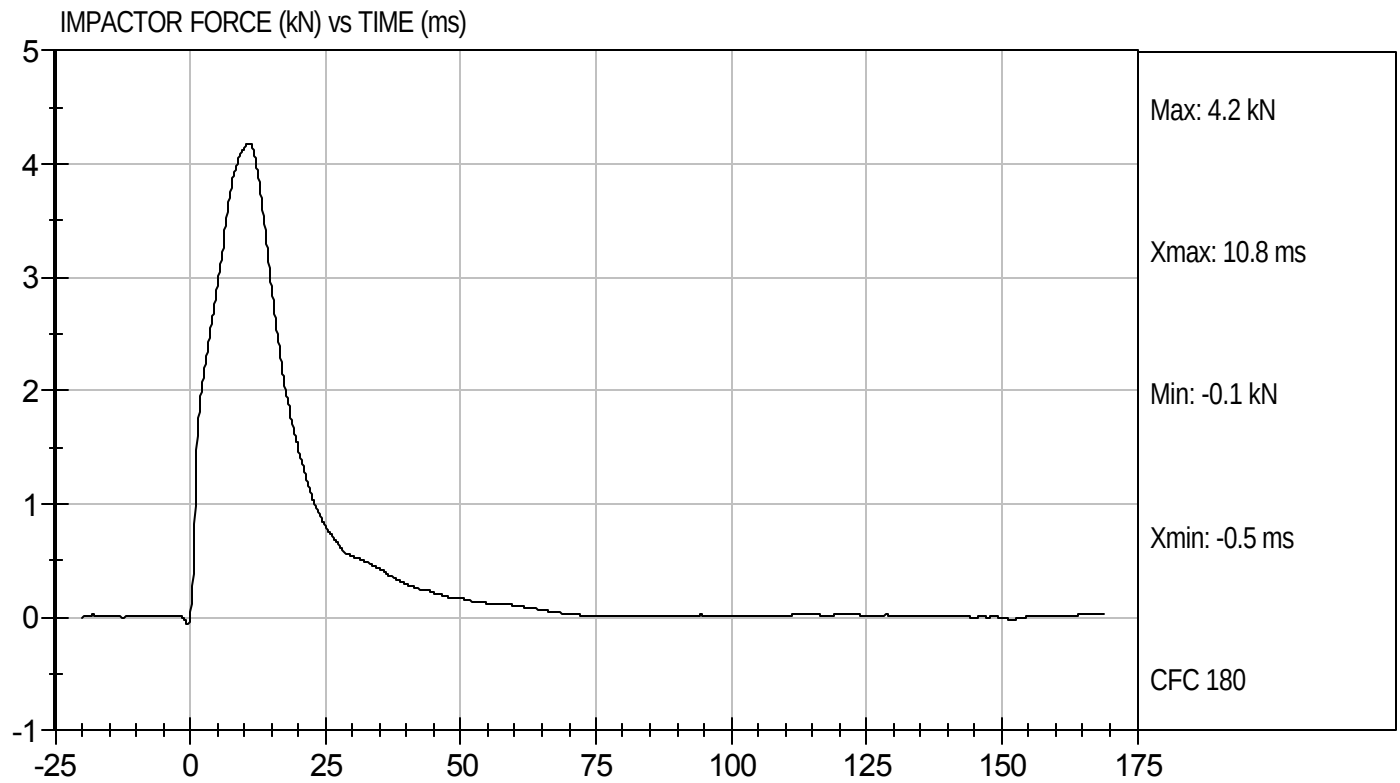
11/2/11
Test Date


Approved By



Test Desc: Abdomen Impact
Component ID: D113667

Test Date: 11/2/11
Velocity: 13.22 ft/s, 4.03 m/s

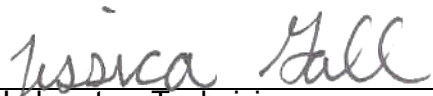


MGA RESEARCH CORPORATION
LUMBAR SPINE TEST
ES-2re DUMMY

ATD Serial No: 032

Test I.D: D113668

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity		%	10 to 70	34	Pass
Pendulum Speed		m/s	5.95 to 6.15	6.12	Pass
Pendulum Deceleration	1 ms	m/s	-0.05 to 0.00	-0.01	Pass
	3.7 ms	m/s	-0.425 to -0.24	-0.40	Pass
	27 ms	m/s	-6.50 to -5.80	-5.80	Pass
	30 ms	m/s	>= -6.5	-6.37	Pass
Maximum Flexion Angle		deg	45.0 to 55.0	49.4	Pass
Time of Maximum Flexion Angle		ms	39.0 to 53.0	45.6	Pass
Headform Rotation Decay to Initial Position		ms	37 to 57	45	Pass
Overall Results				Pass	


 Laboratory Technician

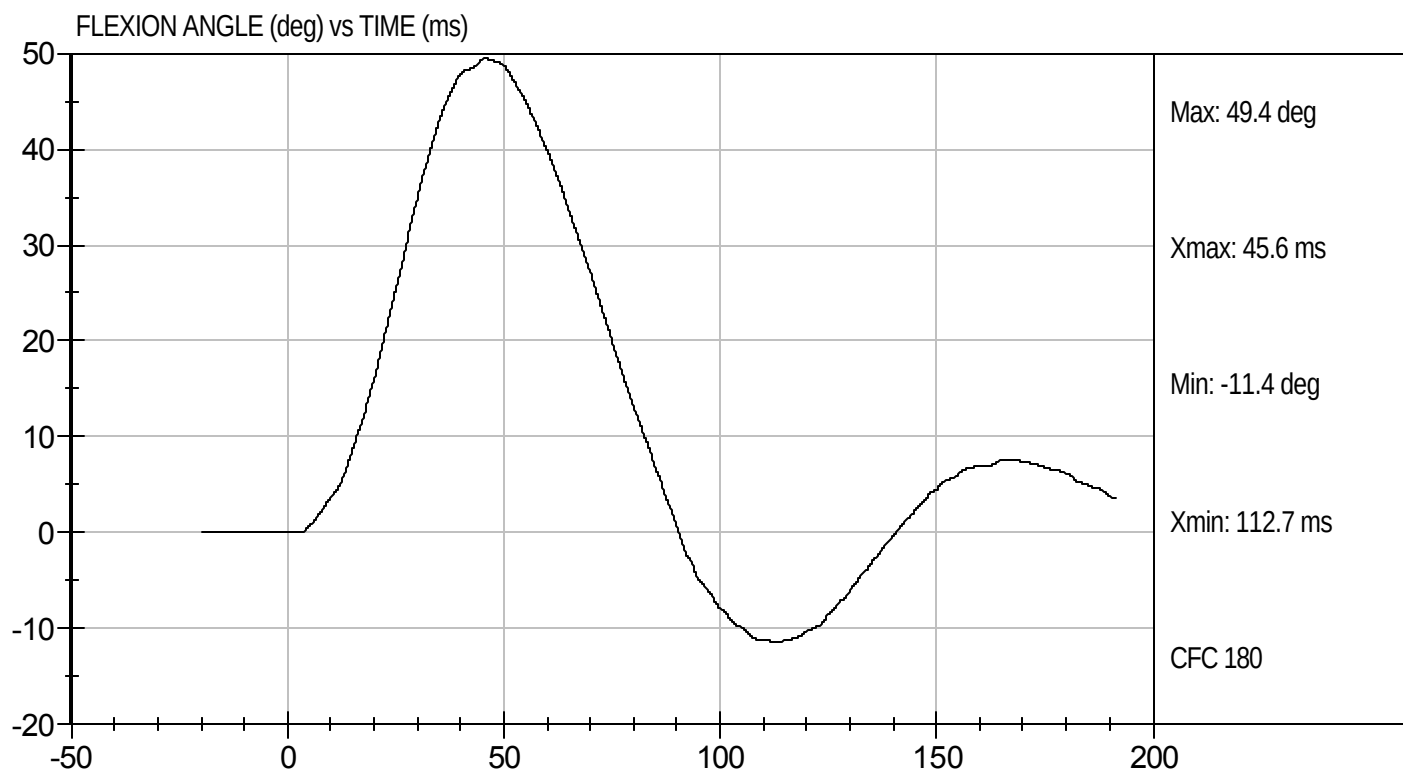
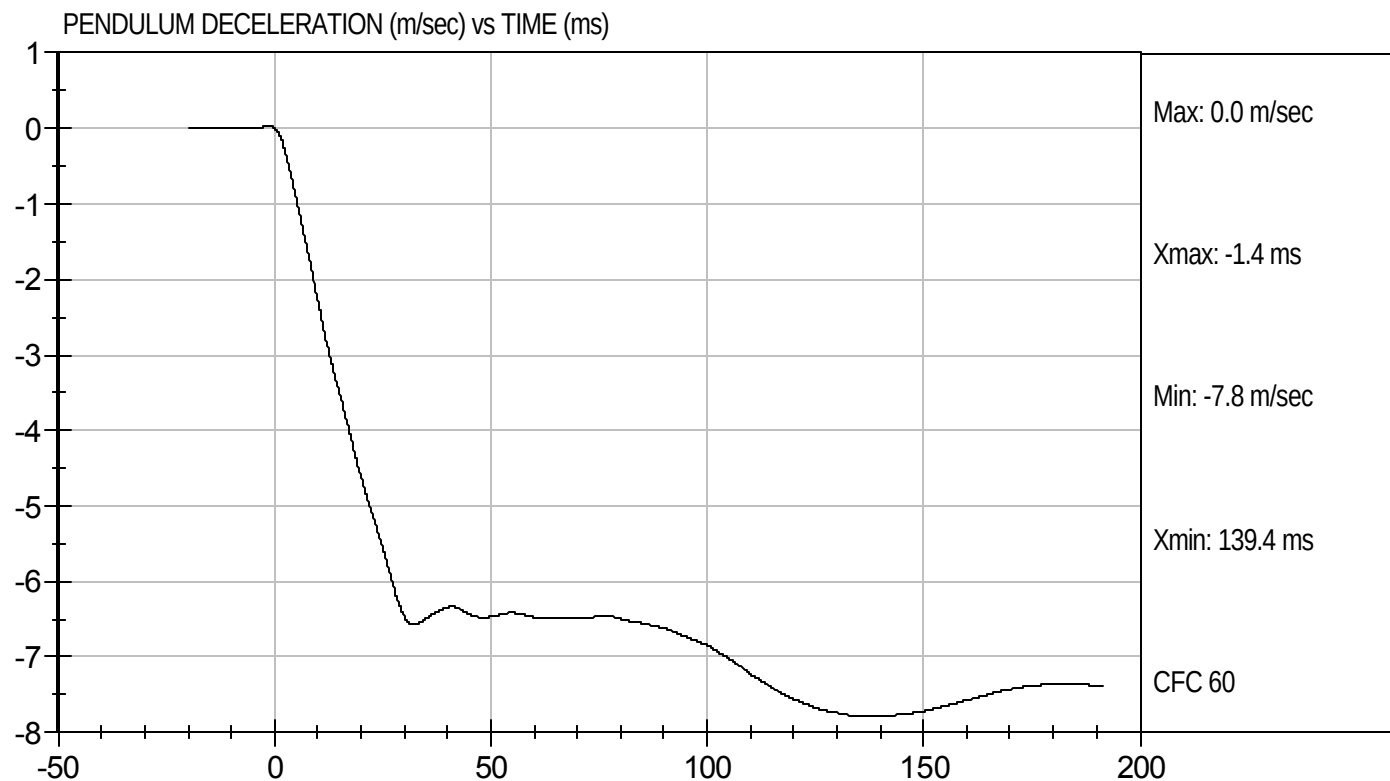
11/3/11
 Test Date


 Approved By



Test Desc: Lumbar Bending
Component ID: D113668

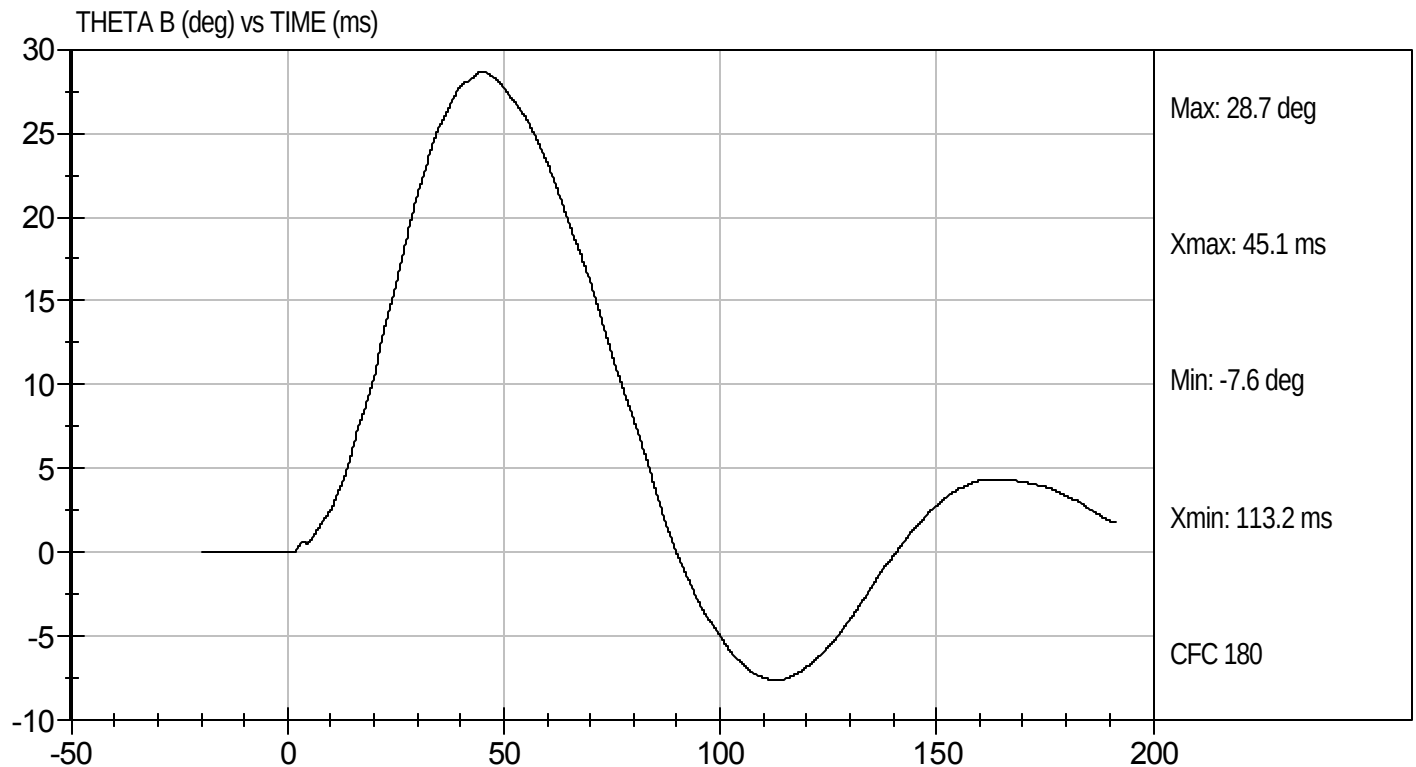
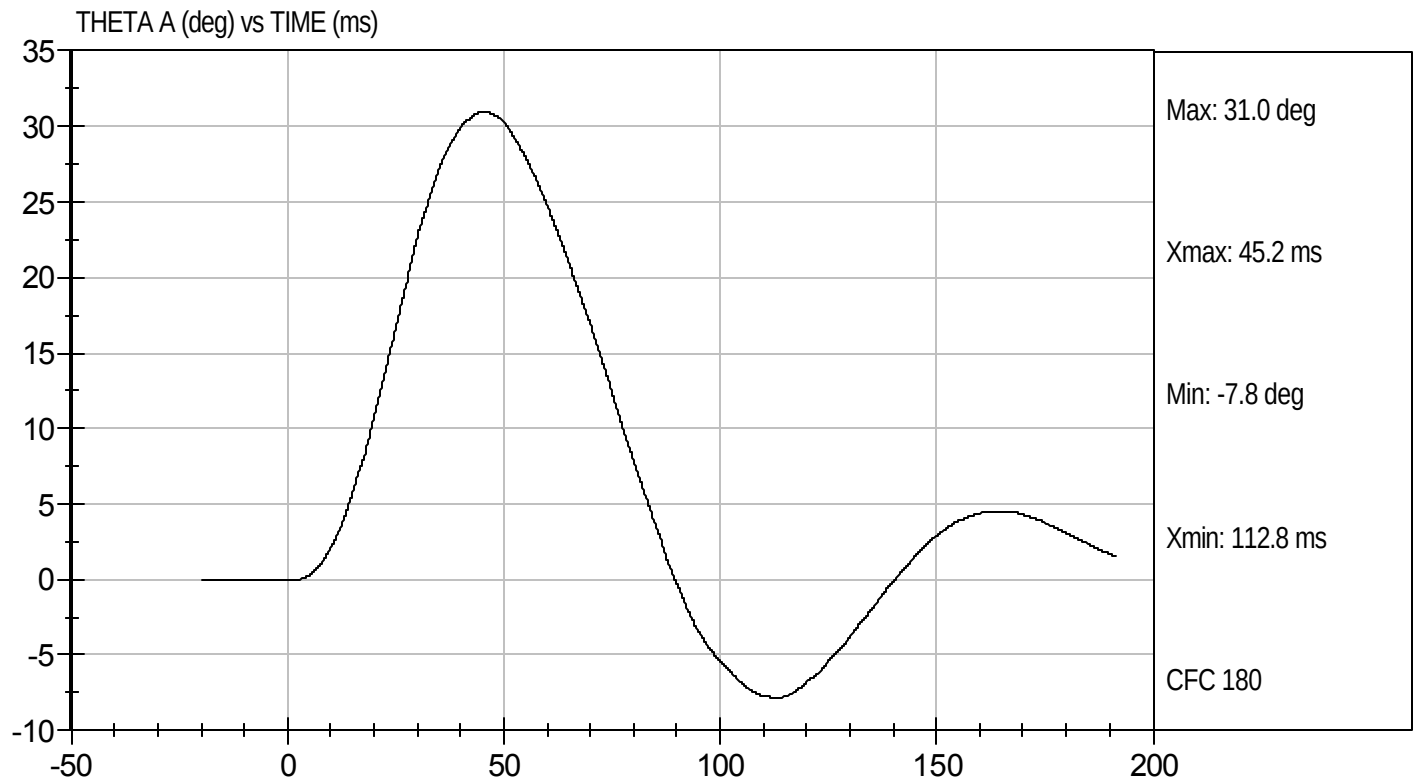
Test Date: 11/3/11
Velocity: 20.08 ft/s, 6.12 m/s





Test Desc: Lumbar Bending
Component ID: D113668

Test Date: 11/3/11
Velocity: 20.08 ft/s, 6.12 m/s



MGA RESEARCH CORPORATION

PELVIS TEST
ES-2re DUMMYATD Serial No: 032Test I.D: D113669

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.0	Pass
Laboratory Relative Humidity	%	10 to 70	36	Pass
Probe Speed	m/s	4.20 to 4.40	4.30	Pass
Maximum Impactor Force	kN	4.70 to 5.40	4.72	Pass
Time of Maximum Impactor Force	ms	11.80 to 16.10	13.20	Pass
Maximum Pubic Force	kN	1.23 to 1.59	1.34	Pass
Time of Maximum Pubic Force	ms	12.20 to 17.00	13.40	Pass
Overall Test Results				Pass


Laboratory Technician

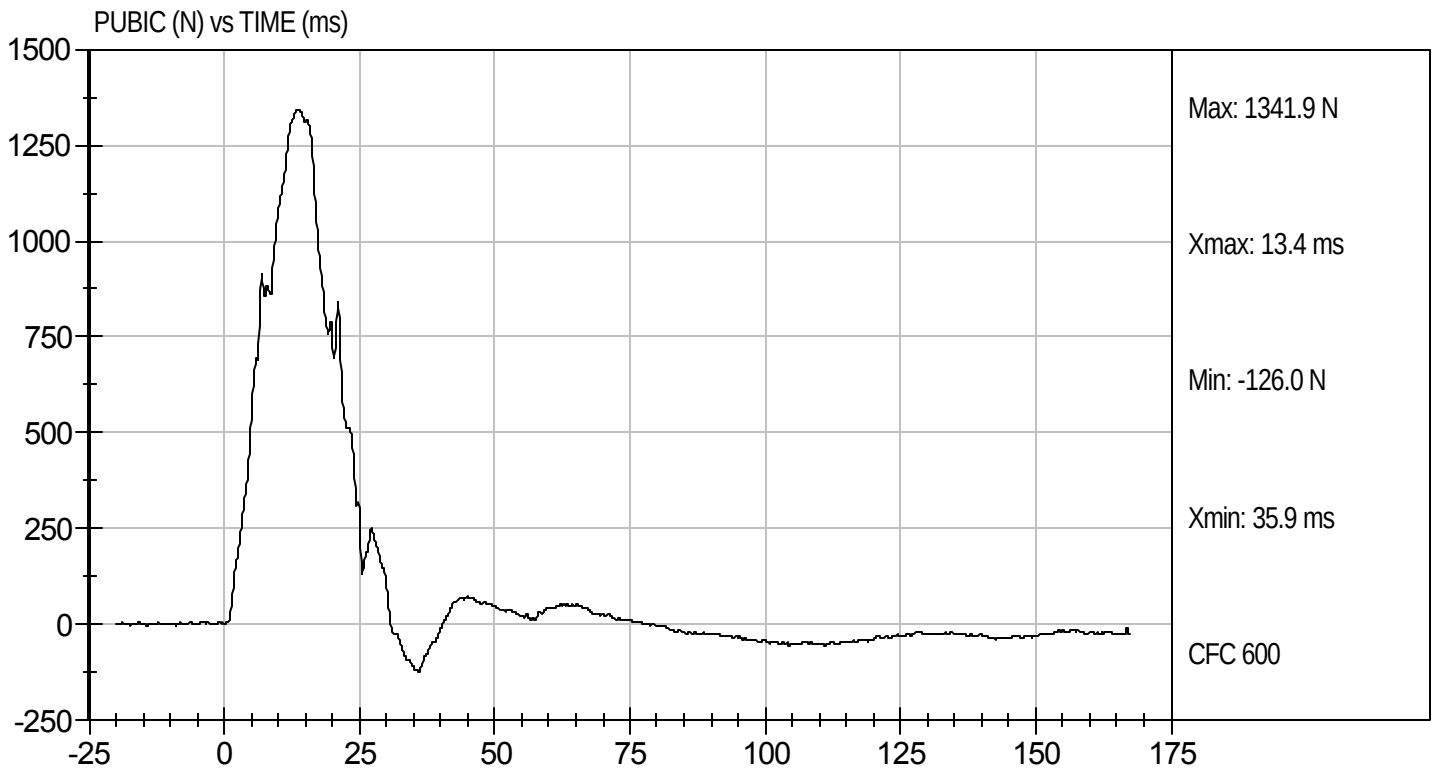
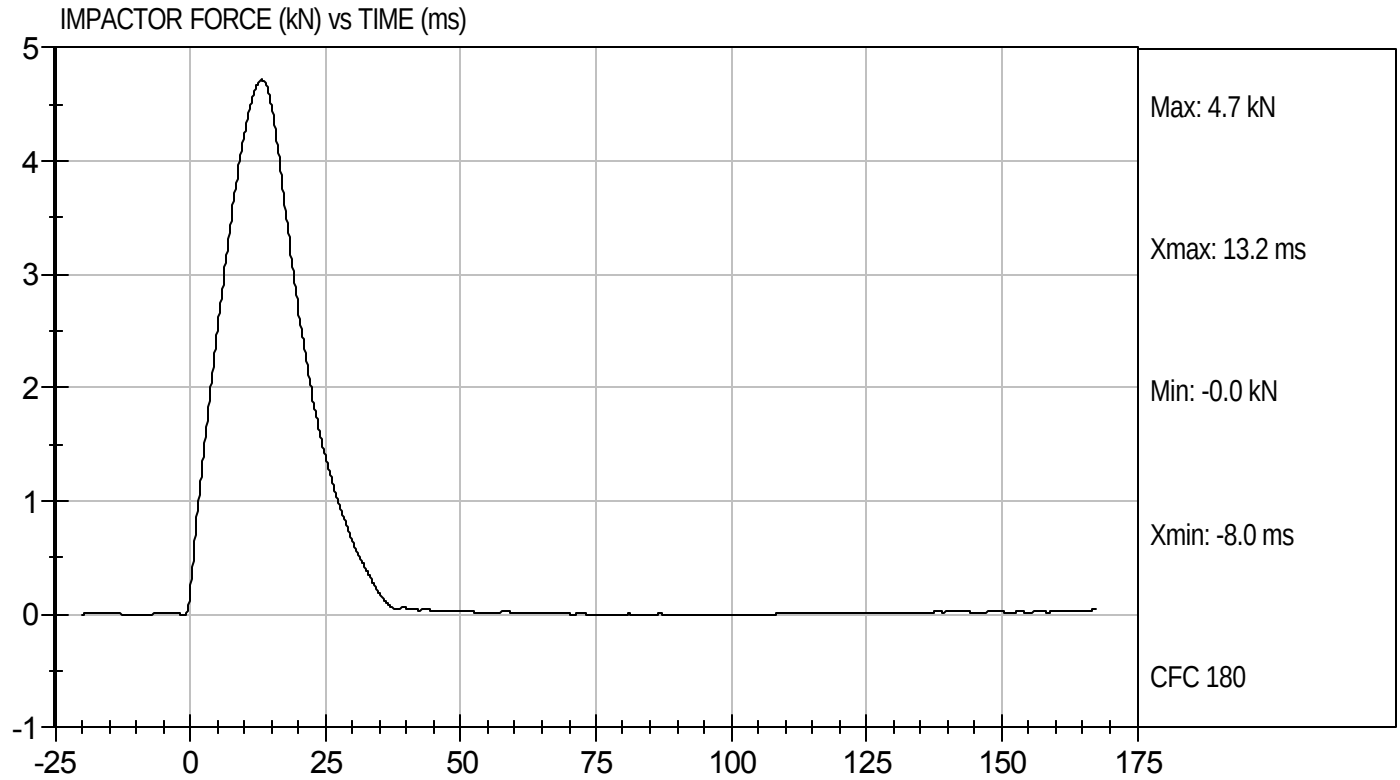
11/2/11
Test Date


Approved By



Test Desc: Pelvis Impact
Component ID: D113669

Test Date: 11/2/11
Velocity: 14.12 ft/s, 4.30 m/s



MGA RESEARCH CORPORATION

HEAD DROP TEST

ES-2re DUMMY

ATD Serial No: 032

Test ID: D113741

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	29	Pass
Peak Resultant Acceleration	G's	125 to 155	146	Pass
Peak Lateral Acceleration	G's	+/- 15	-8.1	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 15% of peak	Yes	Pass
Overall Test Results				Pass


Laboratory Technician

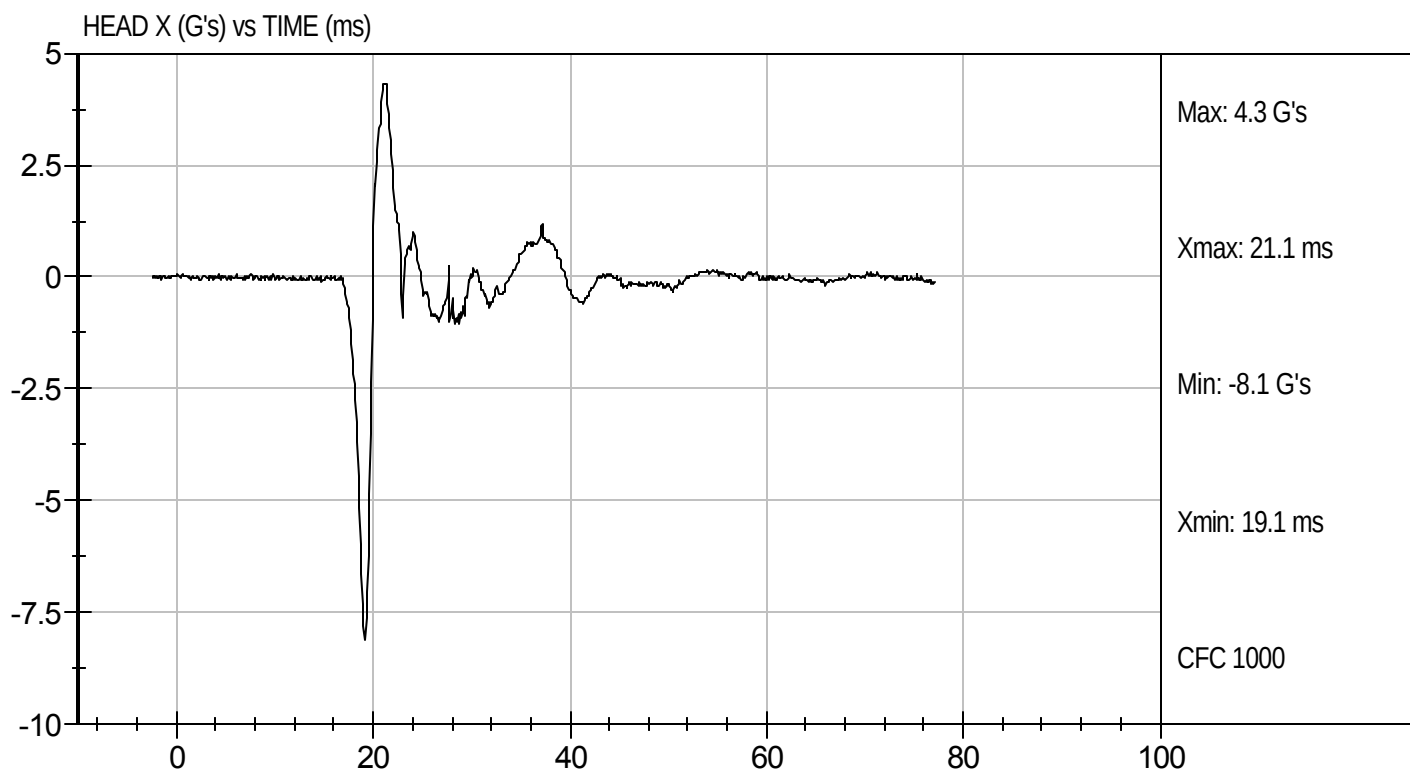
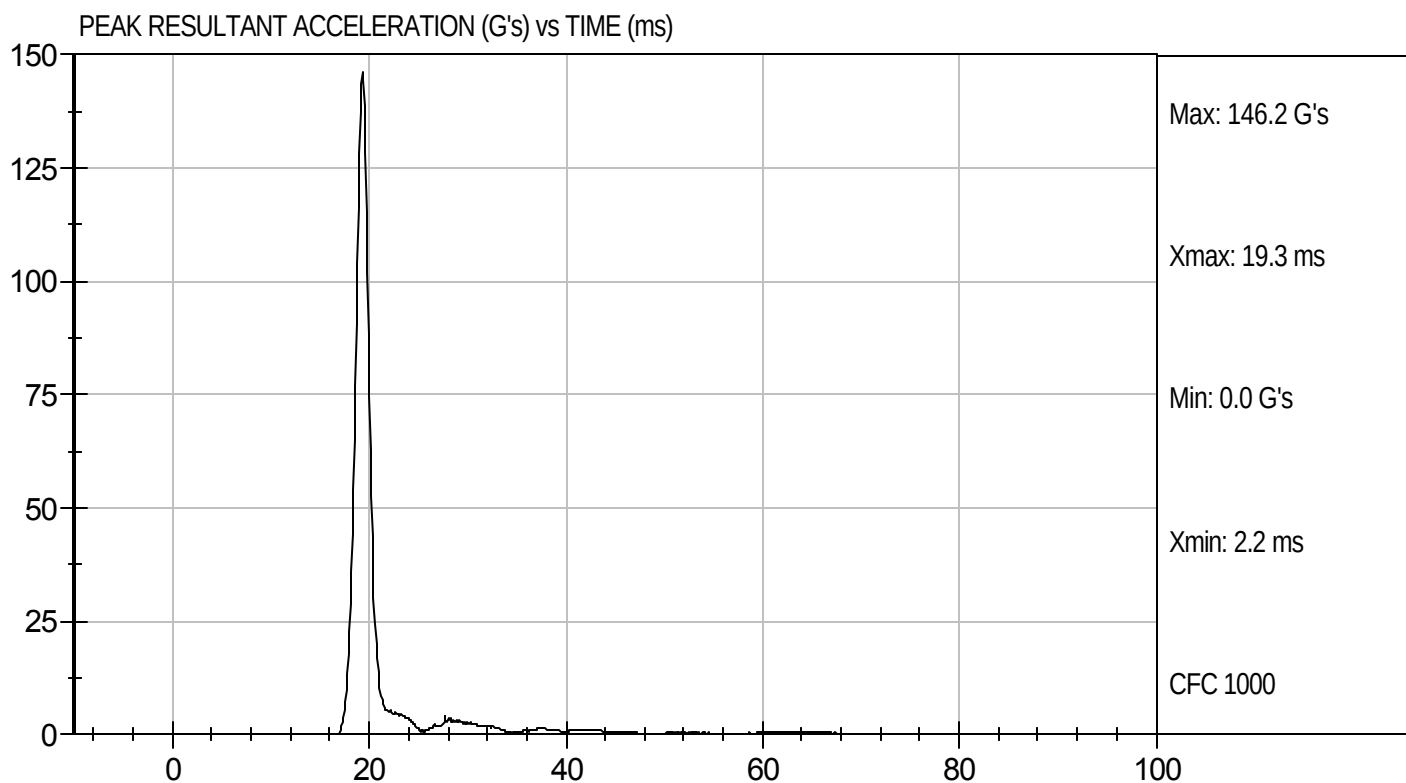
11/10/11
Test Date


Approved By



Test Desc: Head Drop
Component ID: D113741

Test Date: 11/10/11
Velocity: 0 ft/s, 0 m/s

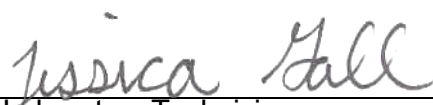


MGA RESEARCH CORPORATION
NECK PENDULUM TEST
ES-2re DUMMY

ATD Serial No: 032

Test I.D: D113742

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	18.0 to 22.0	21.3	Pass
Laboratory Relative Humidity		%	10 to 70	33	Pass
Pendulum Speed		m/s	3.3 to 3.5	3.4	Pass
Pendulum Deceleration	1 ms	m/s	0.00 to -0.05	-0.02	Pass
	3 ms	m/s	-0.25 to -0.375	-0.33	Pass
	14 ms	m/s	-3.20 to -3.70	-3.30	Pass
Maximum Flexion Angle		deg	49.0 to 59.0	53.6	Pass
Time of Maximum Flexion Angle		ms	54.0 to 66.0	59.6	Pass
Head Rotation Decay Time to 0 degree		ms	53.0 to 88.0	55.2	Pass
Overall Test Results					Pass


 Laboratory Technician

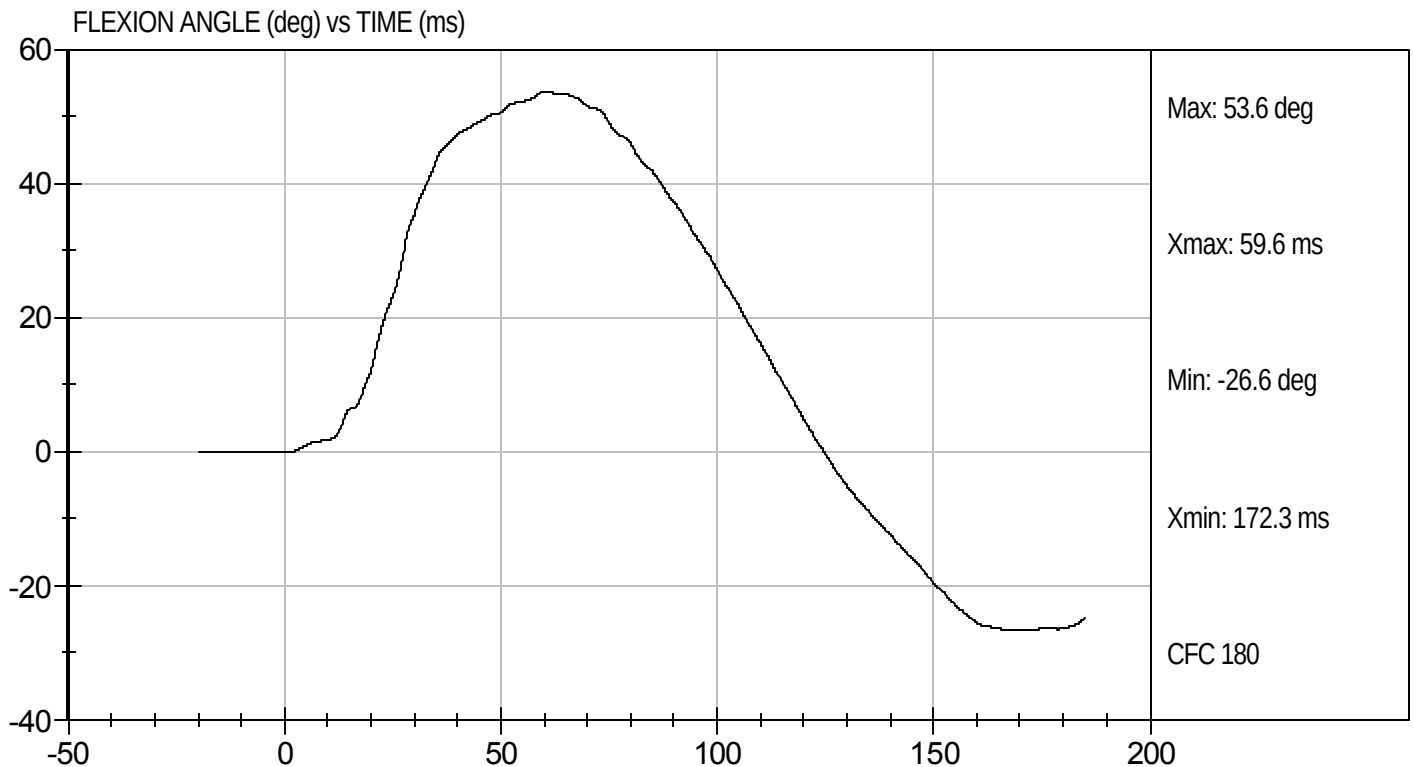
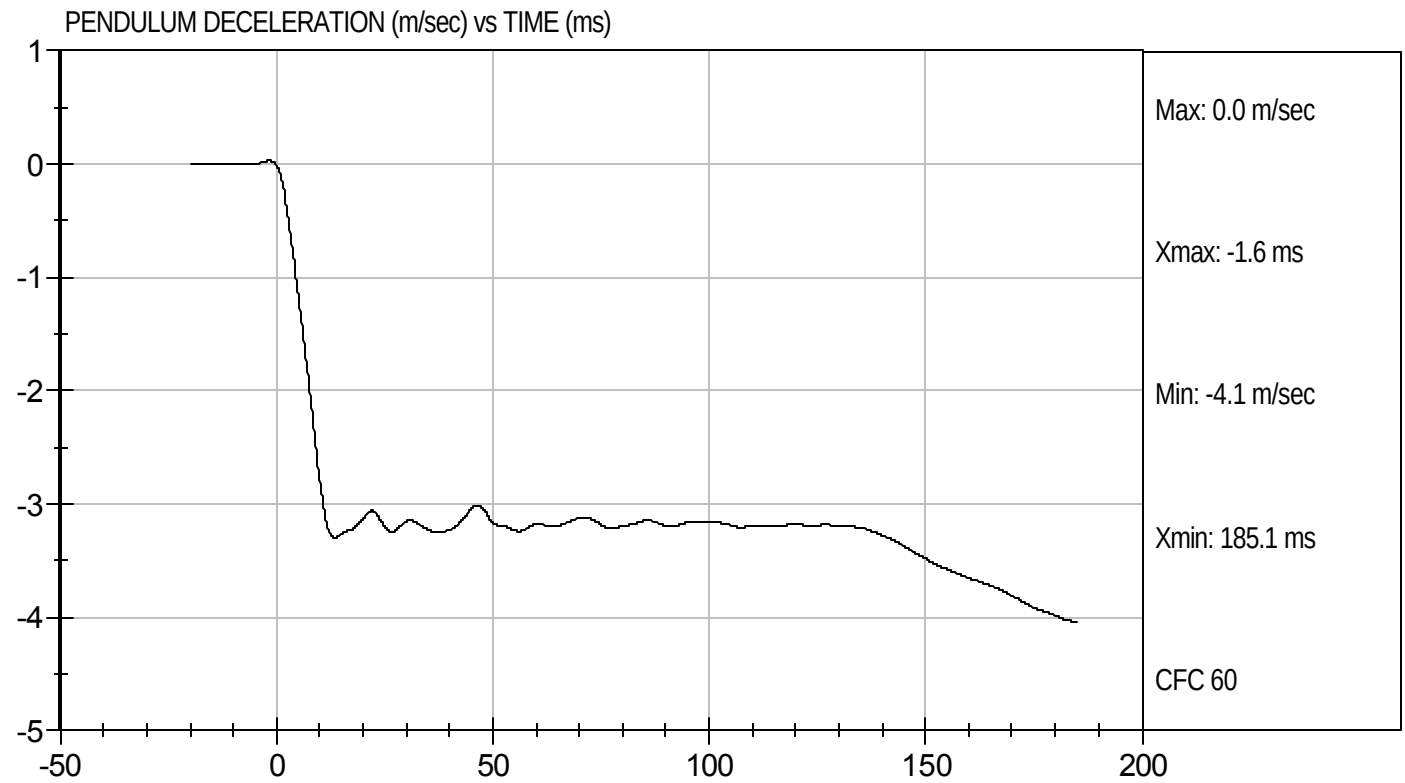
11/09/11
 Test Date


 Approved By



Test Desc: Neck Bending
Component ID: D113742

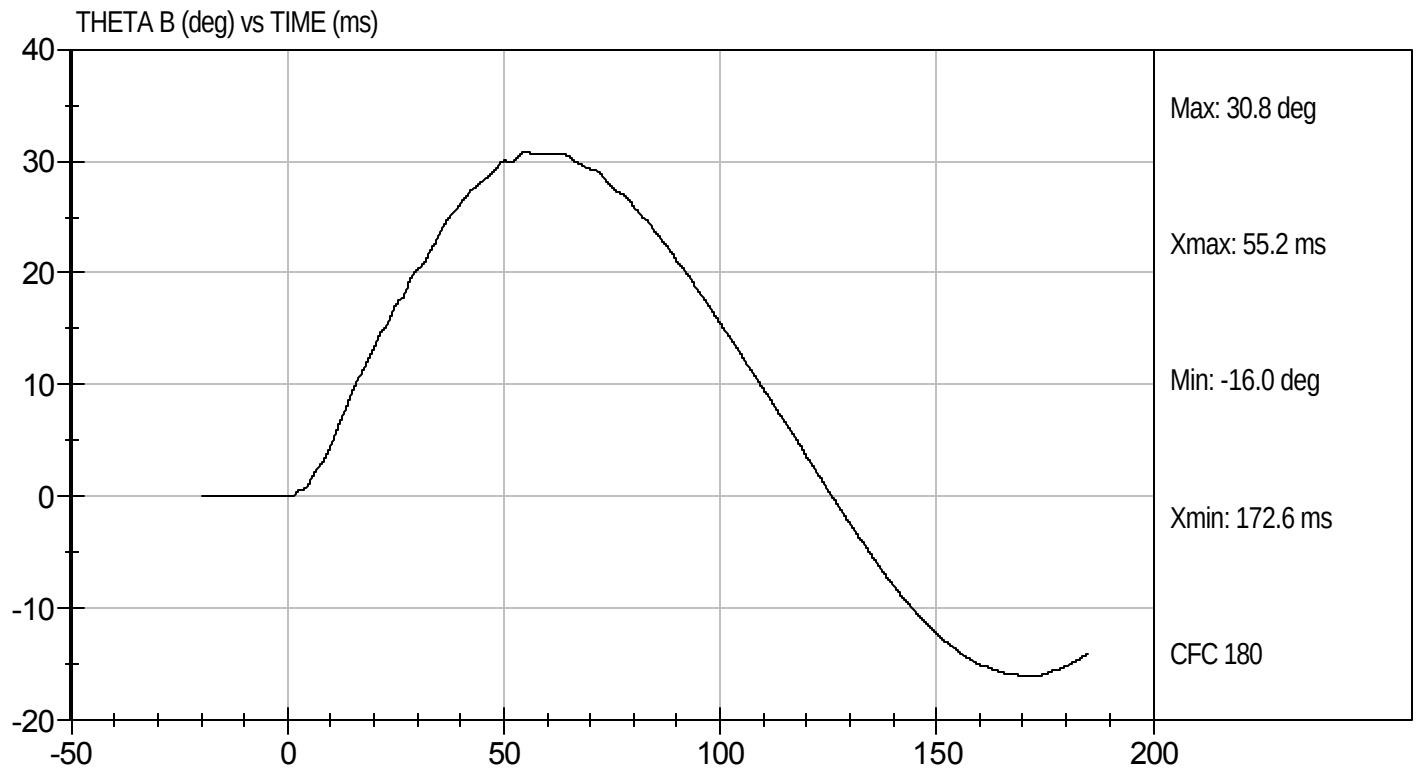
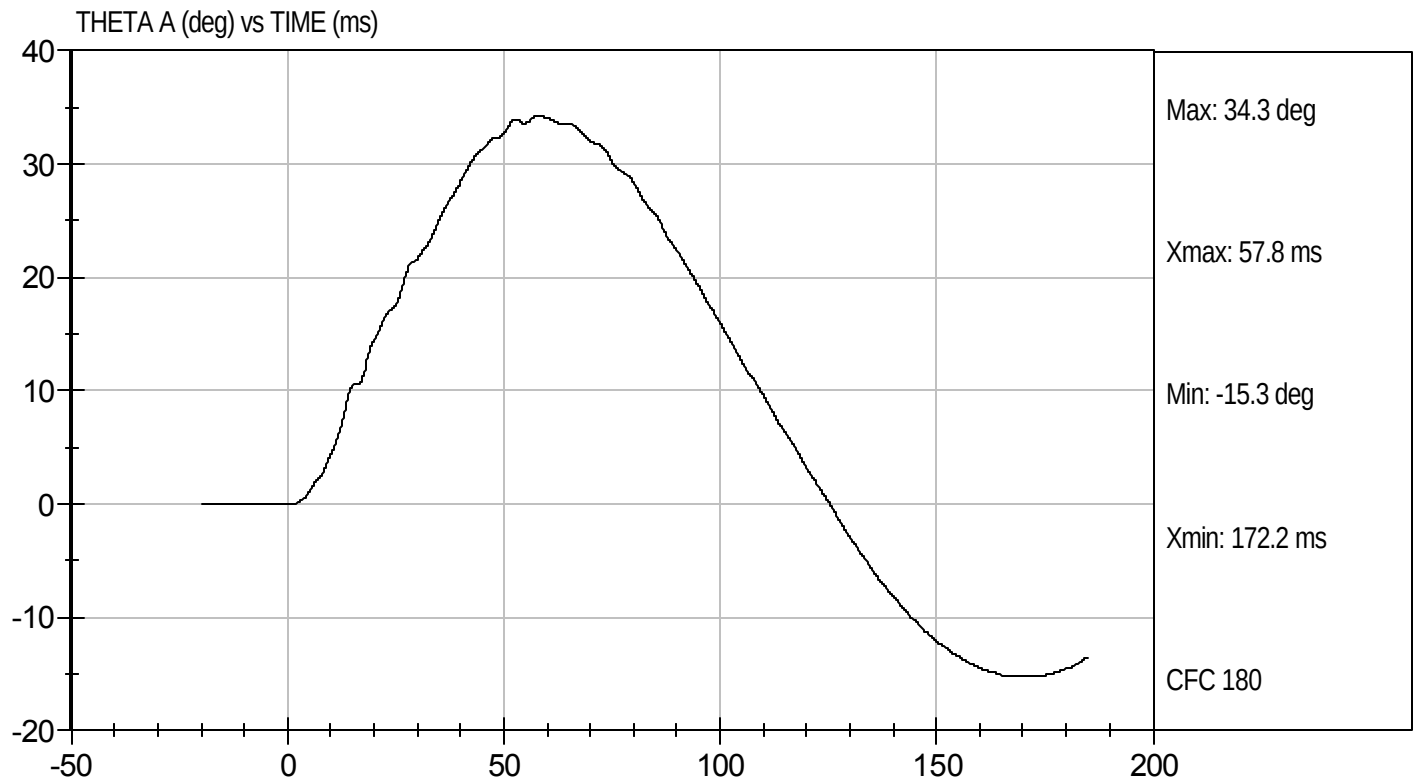
Test Date: 11/09/11
Velocity: 11.25 ft/s, 3.43 m/s





Test Desc: Neck Bending
Component ID: D113742

Test Date: 11/09/11
Velocity: 11.25 ft/s, 3.43 m/s



MGA RESEARCH CORPORATION
SHOULDER IMPACT TEST
ES-2re DUMMY

ATD Serial No: 032

Test I.D: D113743

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	31	Pass
Pendulum Speed	m/s	4.2 to 4.4	4.3	Pass
Peak Shoulder Acceleration	G's	7.5 to 10.5	9.5	Pass
Time of Peak Shoulder Acceleration	ms	NA	13.3	Pass
Overall Test Results			Pass	



Laboratory Technician

11/10/11

Test Date

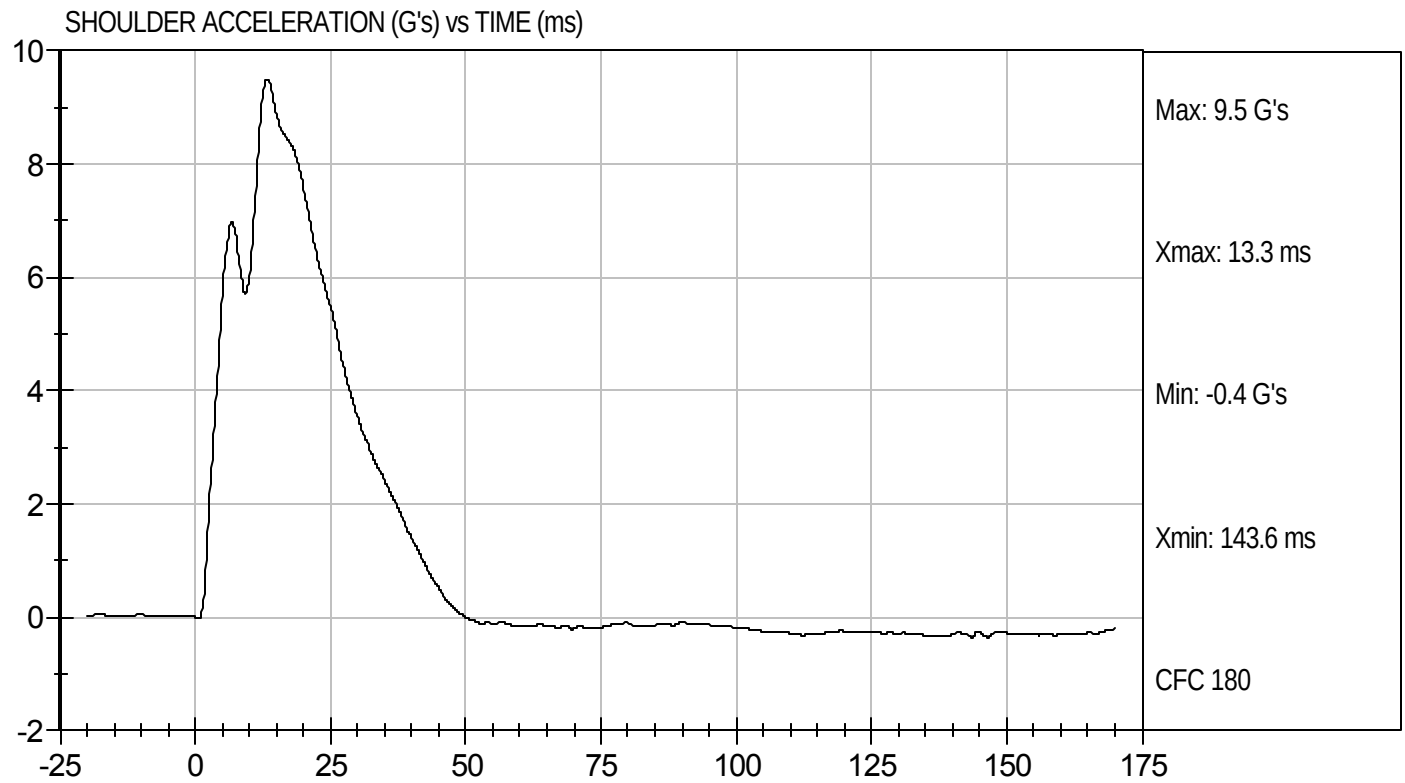


Approved By



Test Desc: Shoulder Impact
Component ID: D113743

Test Date: 11/10/11
Velocity: 14.24 ft/s, 4.3 m/s



MGA RESEARCH CORPORATION

UPPER RIB TEST

ES-2re DUMMY

ATD Serial No: 032

Test I.D: D113744

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	32	Pass
Displacement at 3 m/s	mm	36.0 to 40.0	37.8	Pass
Displacement at 4 m/s	mm	46.0 to 51.0	47.7	Pass
			Overall Test Results	Pass


Laboratory Technician

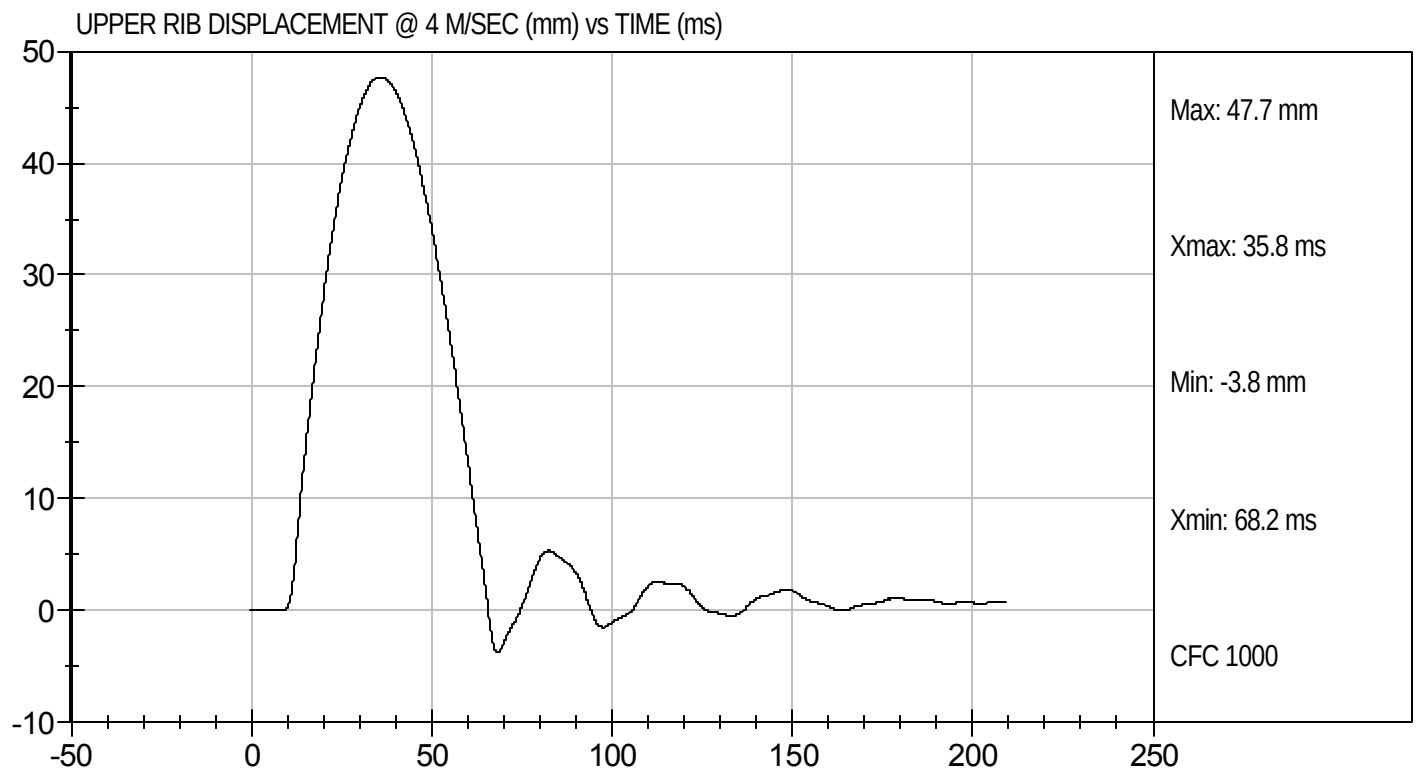
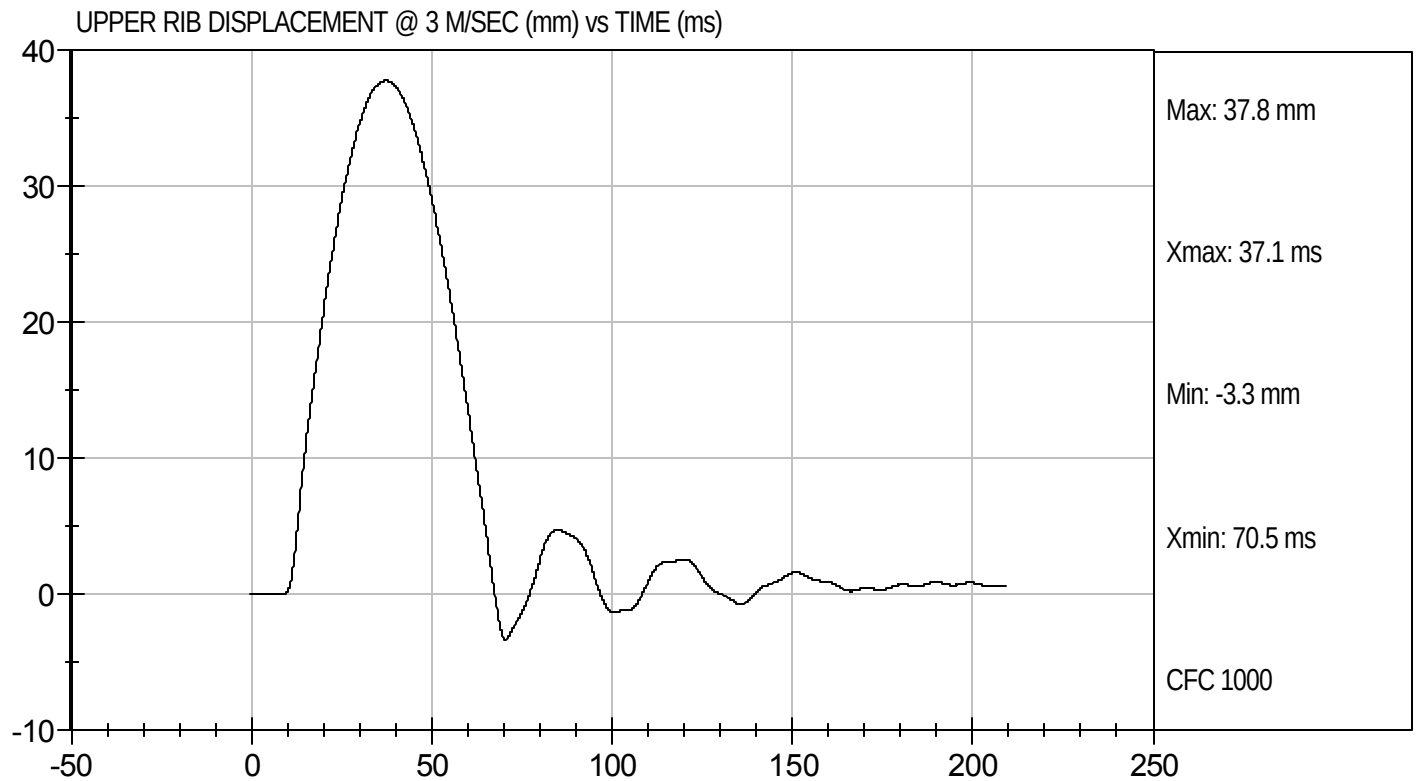
11/9/11
Test Date


Approved By



Test Desc: Rib Impact - Upper
Component ID: D113744

Test Date: 11/9/11



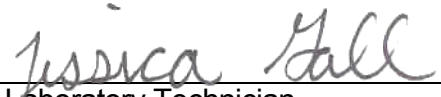
MGA RESEARCH CORPORATION

MID RIB TEST
ES-2re DUMMY

ATD Serial No: 032

Test I.D: D113745

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	32	Pass
Displacement at 3 m/s	mm	36.0 to 40.0	37.0	Pass
Displacement at 4 m/s	mm	46.0 to 51.0	47.2	Pass
Overall Test Results			Pass	


Laboratory Technician

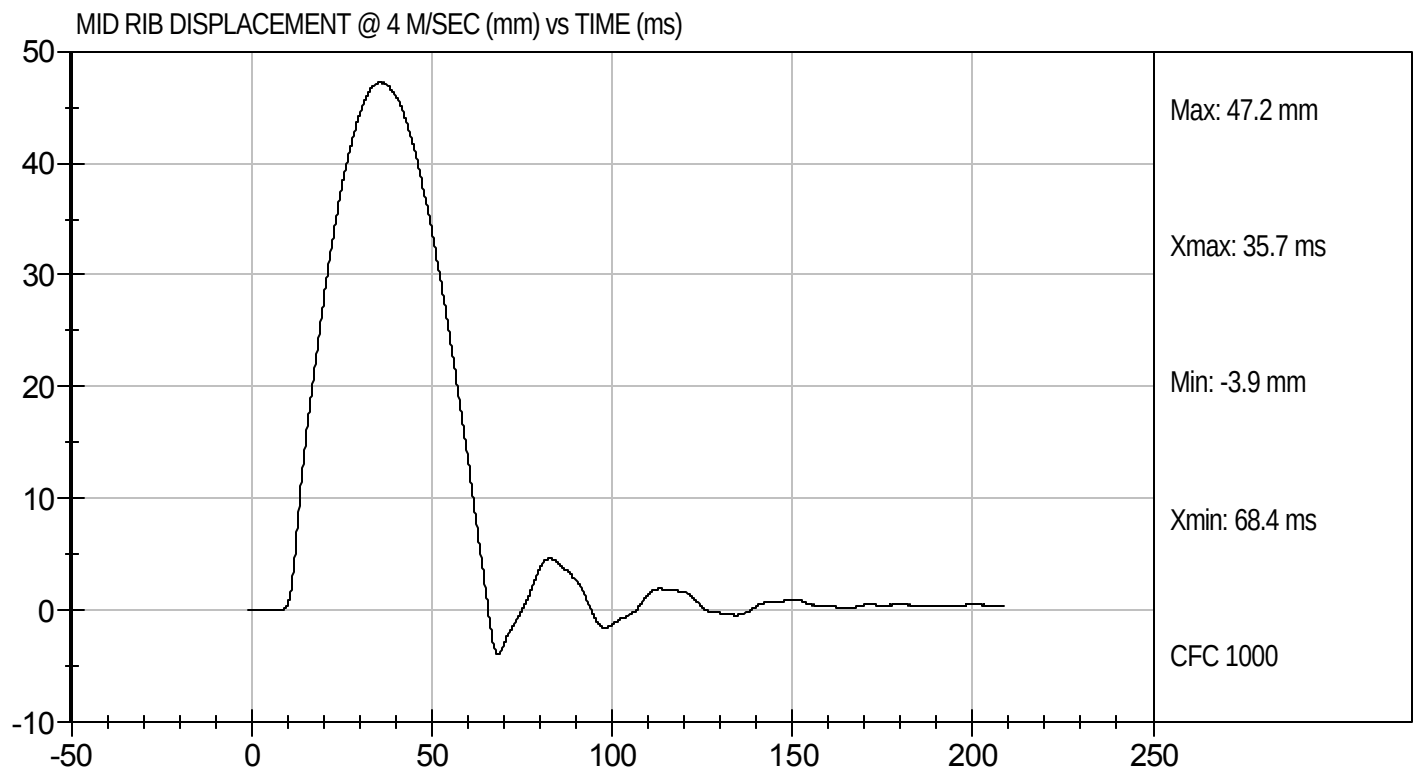
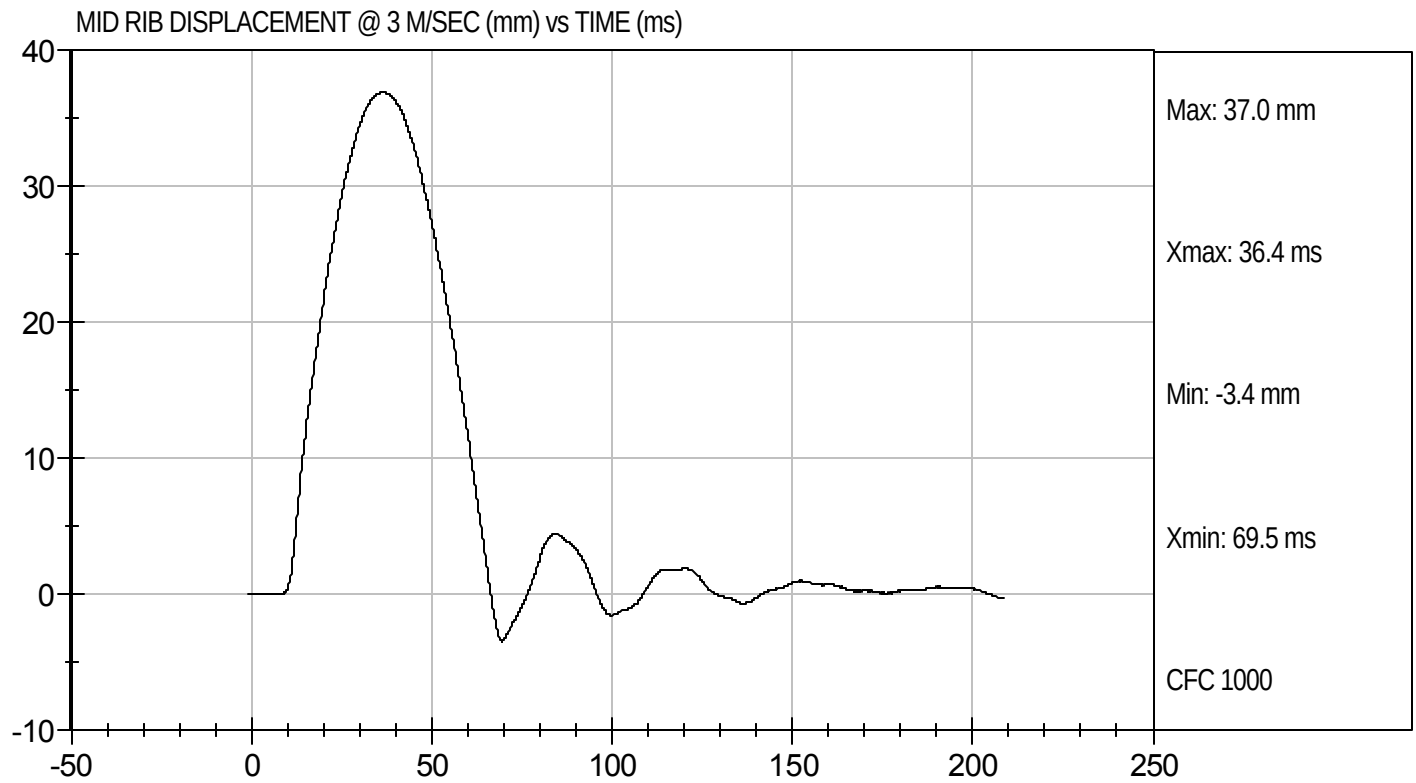
11/9/11
Test Date


Approved By



Test Desc: Rib Impact - Mid
Component ID: D113745

Test Date: 11/9/11



MGA RESEARCH CORPORATION

LOWER RIB TEST

ES-2re DUMMY

ATD Serial No: 032

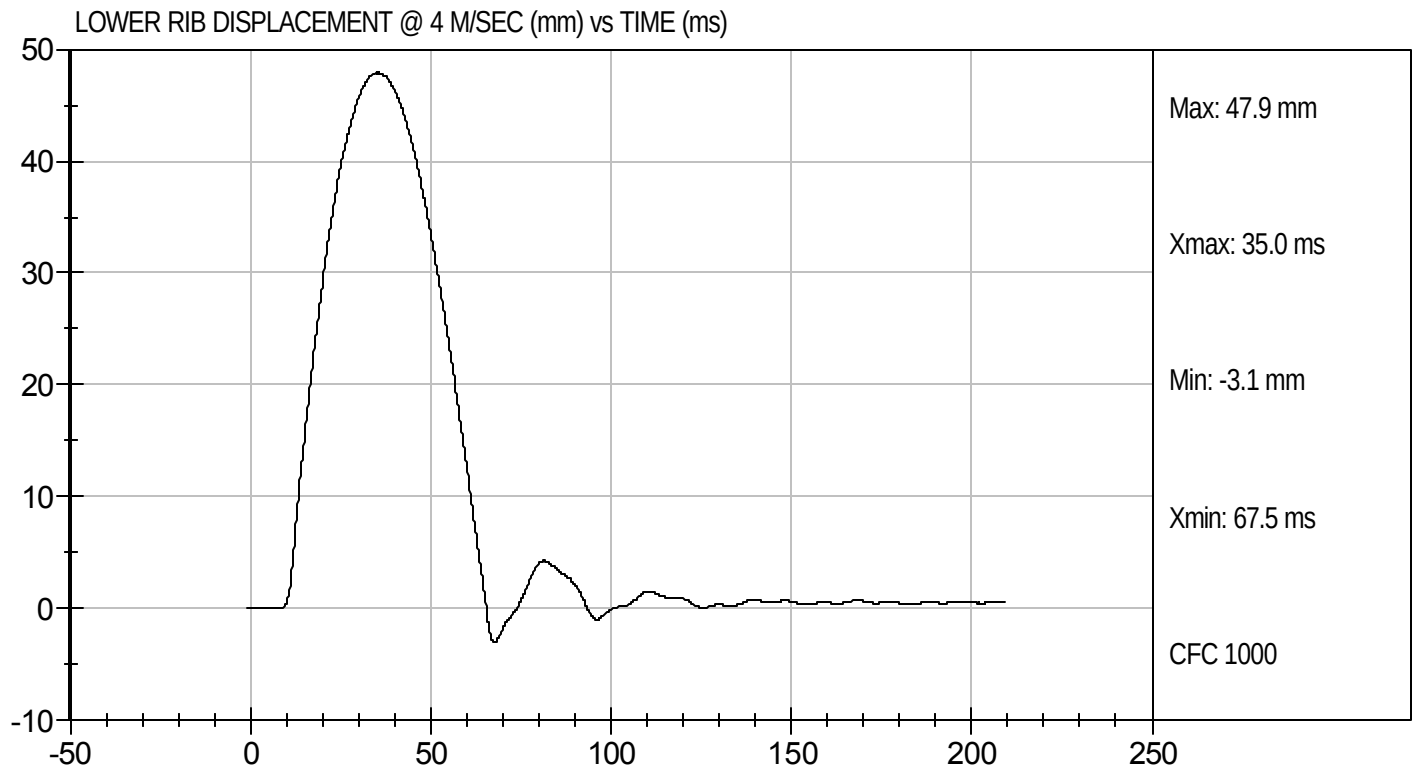
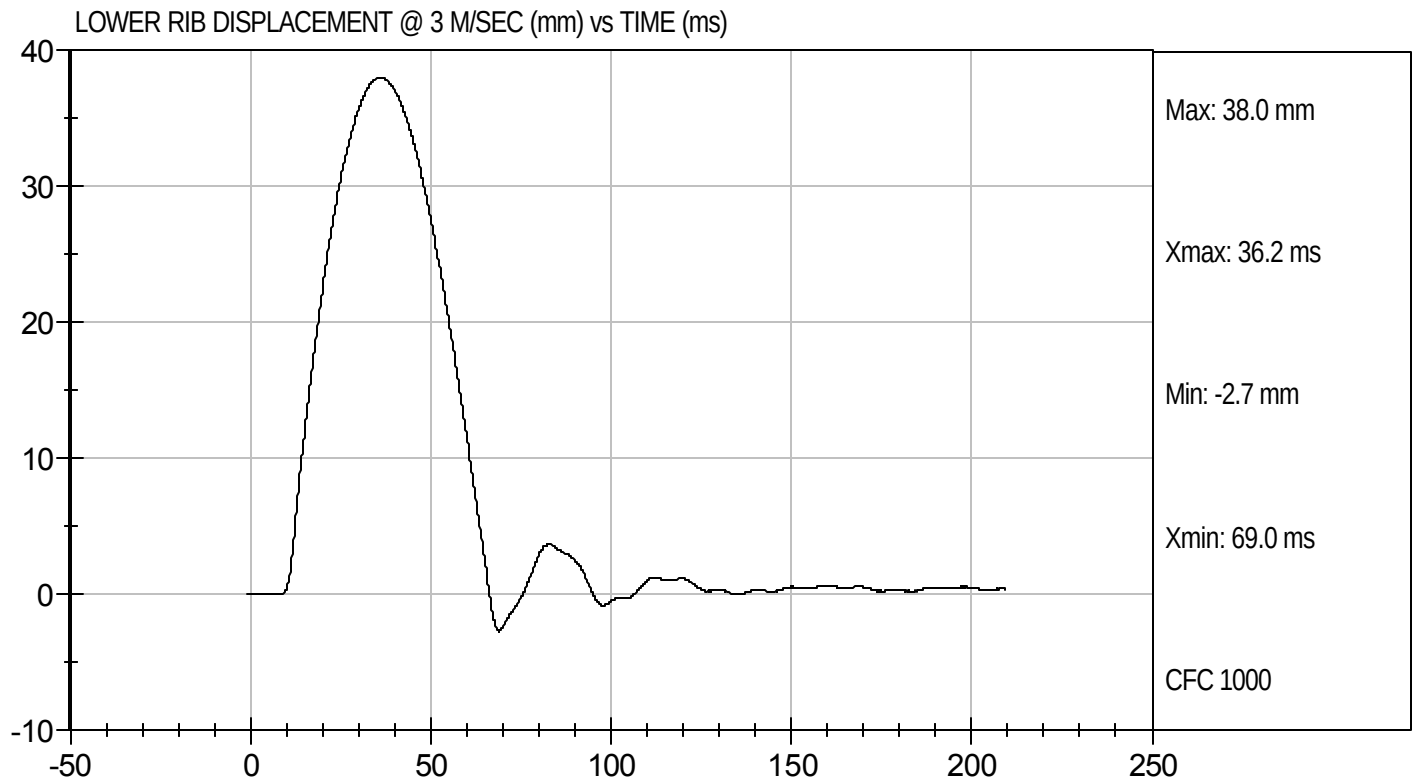
Test I.D: D113746

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	32	Pass
Displacement at 3 m/s	mm	36.0 to 40.0	38.0	Pass
Displacement at 4 m/s	mm	46.0 to 51.0	47.9	Pass
Overall Test Results			Pass	


Laboratory Technician

11/9/11
Test Date


Approved By



MGA RESEARCH CORPORATION
FULL BODY THORAX IMPACT TEST
ES-2re DUMMY

ATD Serial No: 032

Test I.D: D113740

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.4	Pass
Humidity	%	10 to 70	31	Pass
Probe Speed	m/s	5.40 to 5.60	5.58	Pass
Maximum Impactor Force (after 6 ms)	kN	5.10 to 6.20	5.57	Pass
Upper Rib Displacement	mm	34.0 to 41.0	35.5	Pass
Middle Rib Displacement	mm	37.0 to 45.0	38.7	Pass
Lower Rib Displacement	mm	37.0 to 44.0	38.7	Pass
Overall Test Results			Pass	


Laboratory Technician

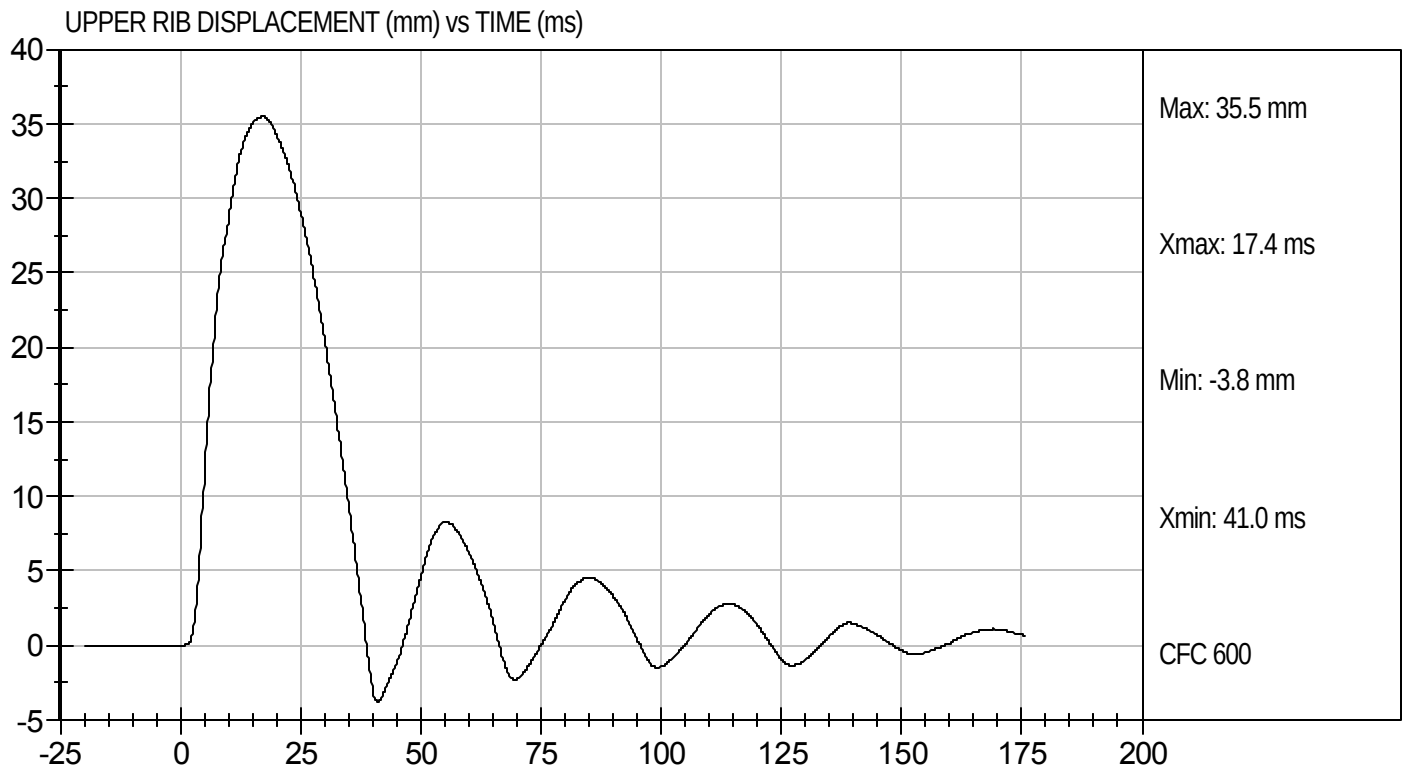
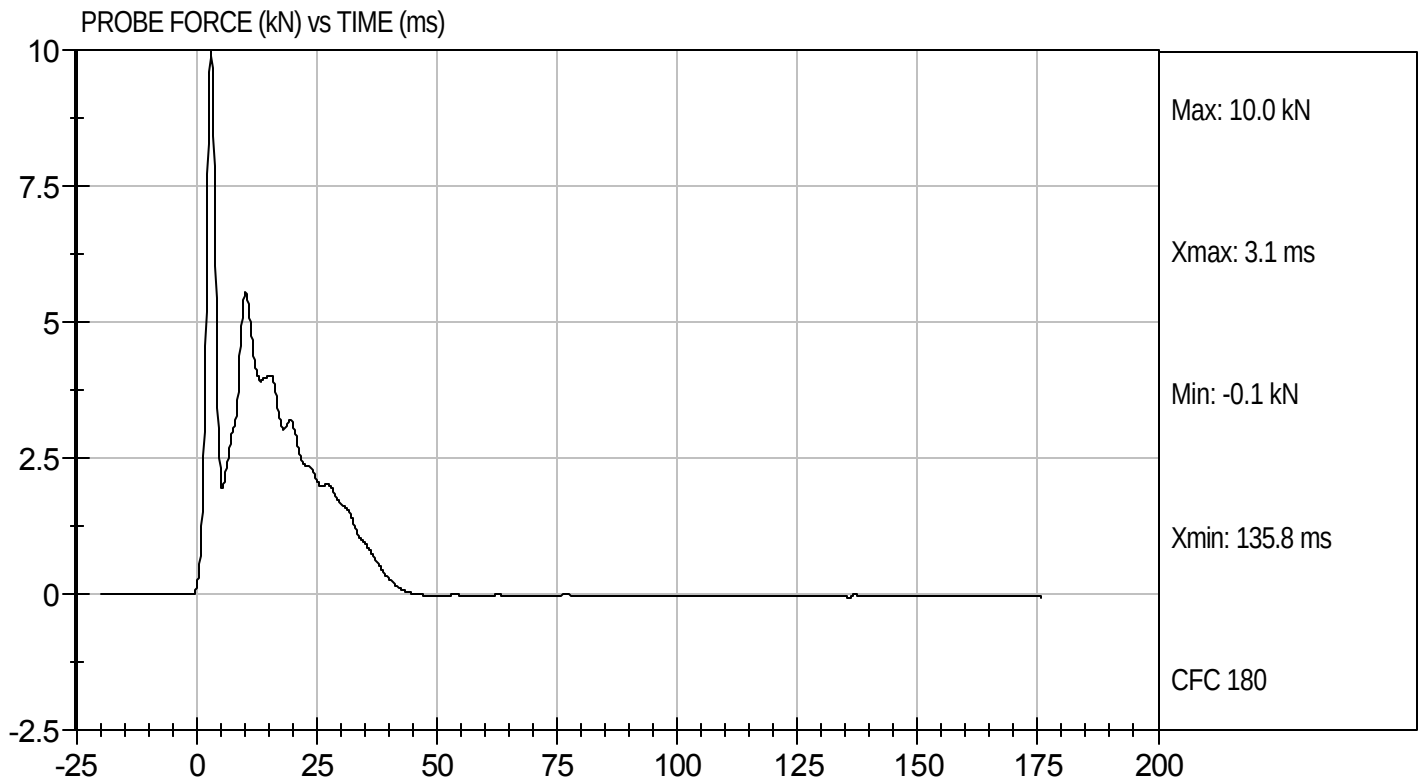
11/10/11
Test Date


Approved By



Test Desc: Thorax Impact
Component ID: D113740

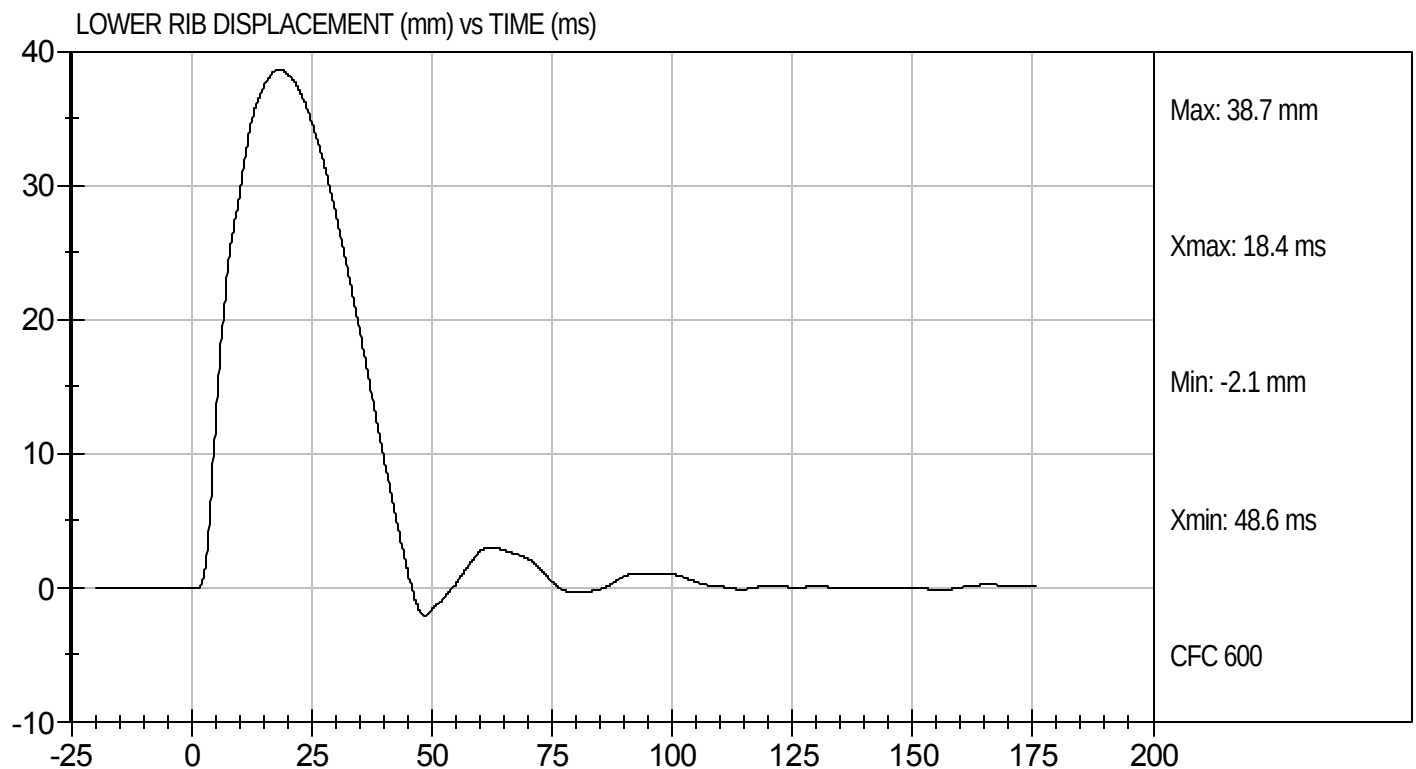
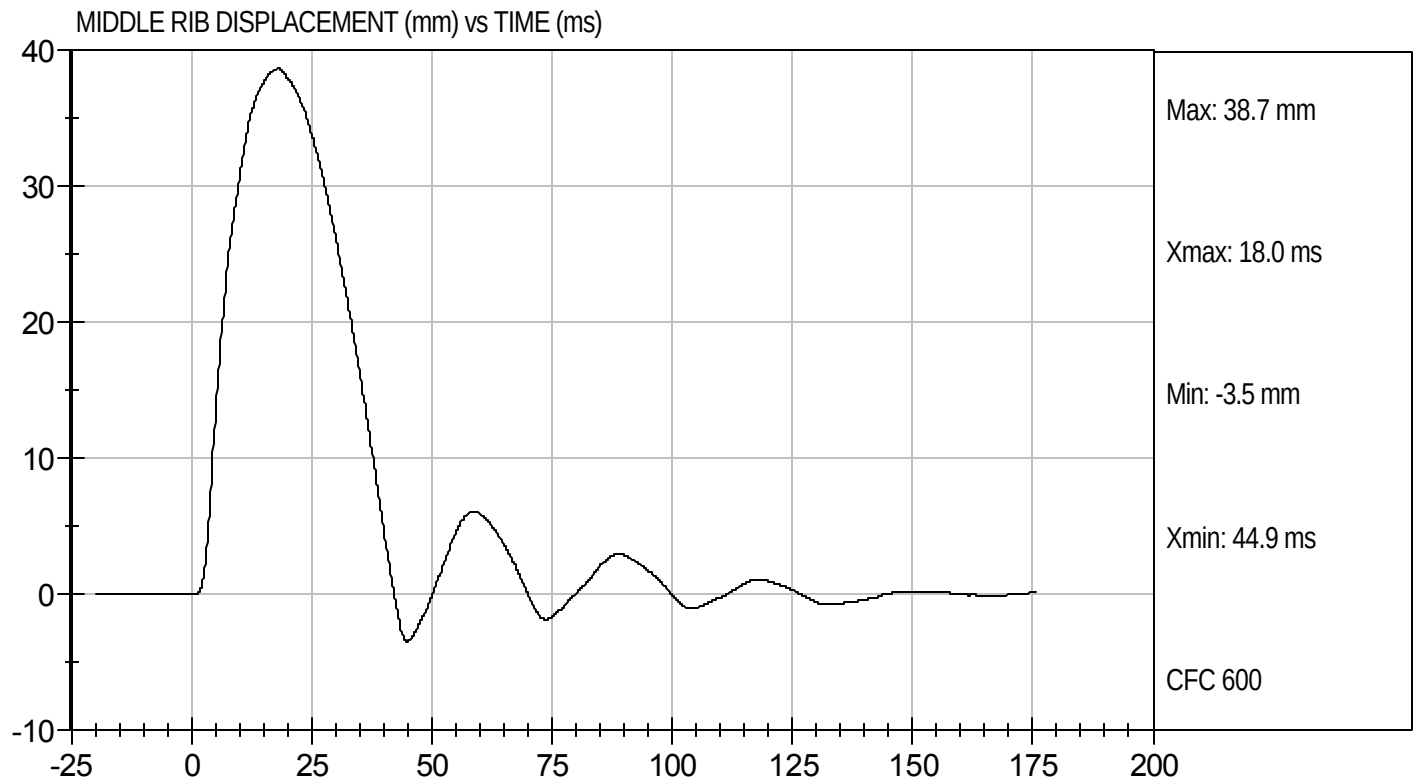
Test Date: 11/10/11
Velocity: 18.31 ft/s, 5.58 m/s





Test Desc: Thorax Impact
Component ID: D113740

Test Date: 11/10/11
Velocity: 18.31 ft/s, 5.58 m/s



MGA RESEARCH CORPORATION

ABDOMEN TEST

ES-2re DUMMY

ATD Serial No: 032

Test I.D: D113747

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Speed	m/s	3.90 to 4.10	4.06	Pass
Maximum Impact Force	kN	4.00 to 4.80	4.16	Pass
Time of Maximum Impact Force	ms	10.60 to 13.00	11.20	Pass
Maximum Total Abdomen Force	kN	2.20 to 2.70	2.40	Pass
Time of Maximum Abdomen Force	ms	10.00 to 12.30	10.90	Pass
Overall Test Results			Pass	

Jessica Hall
Laboratory Technician

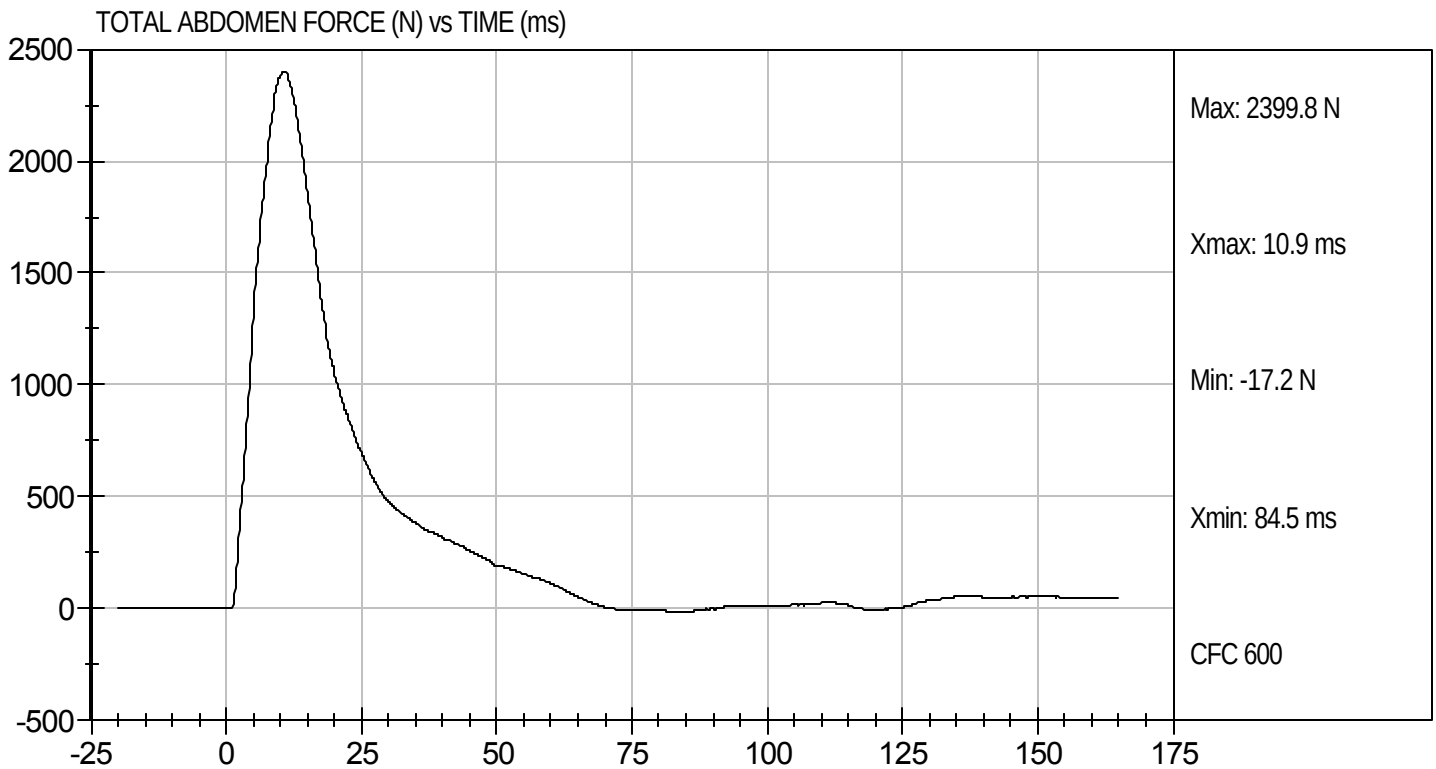
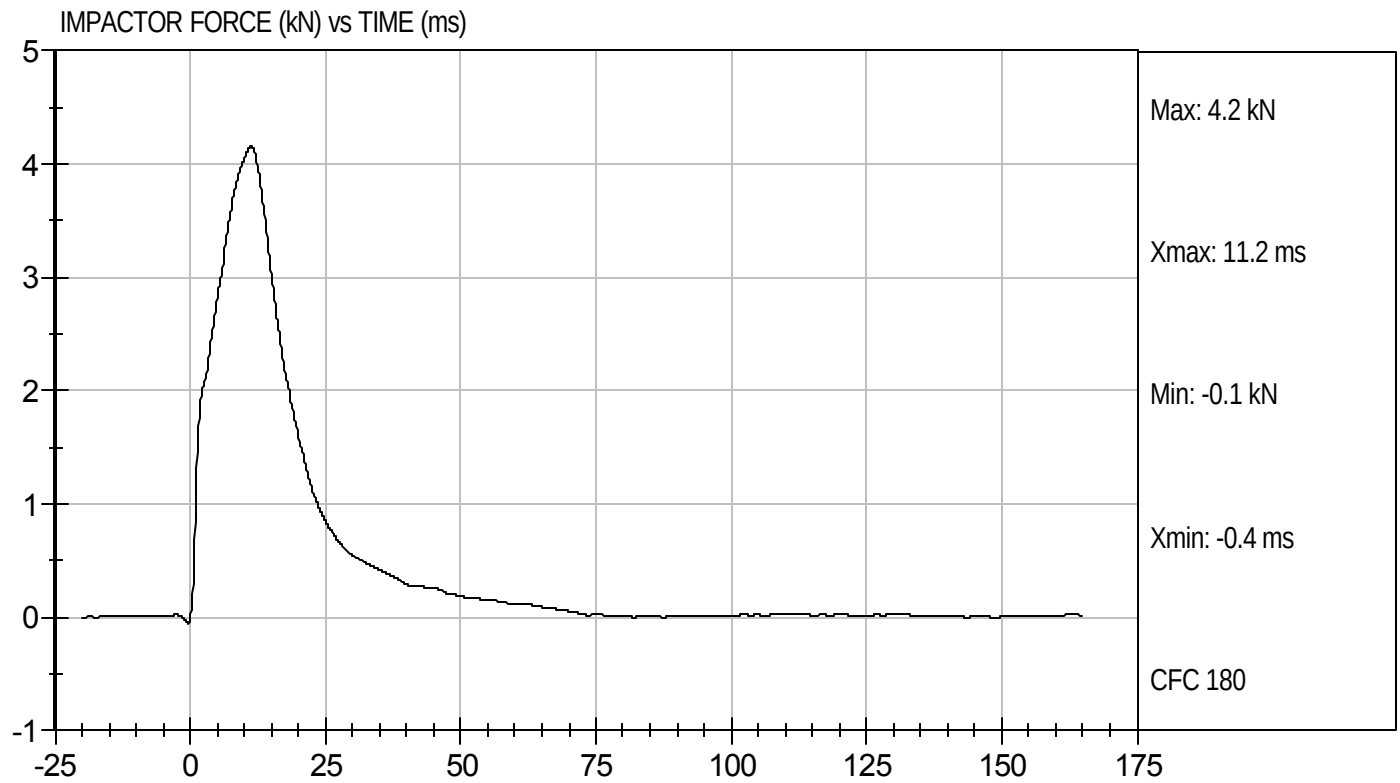
11/10/11
Test Date

David Winkelbauer
Approved By



Test Desc: Abdomen Impact
Component ID: D113747

Test Date: 11/10/11
Velocity: 13.33 ft/s, 4.06 m/s

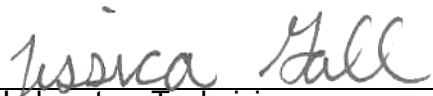


MGA RESEARCH CORPORATION
LUMBAR SPINE TEST
ES-2re DUMMY

ATD Serial No: 032

Test I.D: D113748

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity		%	10 to 70	33	Pass
Pendulum Speed		m/s	5.95 to 6.15	6.05	Pass
Pendulum Deceleration	1 ms	m/s	-0.05 to 0.00	-0.00	Pass
	3.7 ms	m/s	-0.425 to -0.24	-0.42	Pass
	27 ms	m/s	-6.50 to -5.80	-5.96	Pass
	30 ms	m/s	>= -6.5	-5.90	Pass
Maximum Flexion Angle		deg	45.0 to 55.0	49.3	Pass
Time of Maximum Flexion Angle		ms	39.0 to 53.0	44.3	Pass
Headform Rotation Decay to Initial Position		ms	37 to 57	43	Pass
Overall Results					Pass


 Laboratory Technician

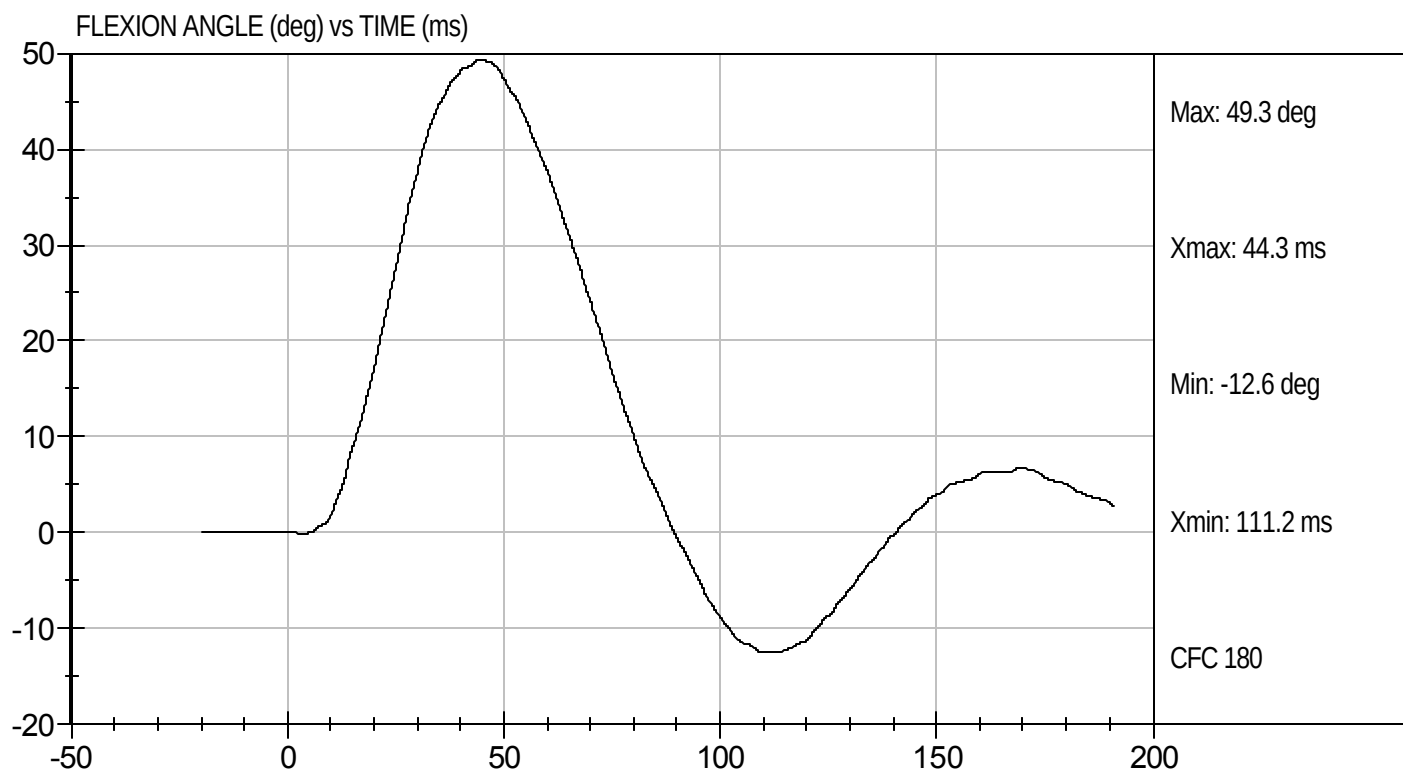
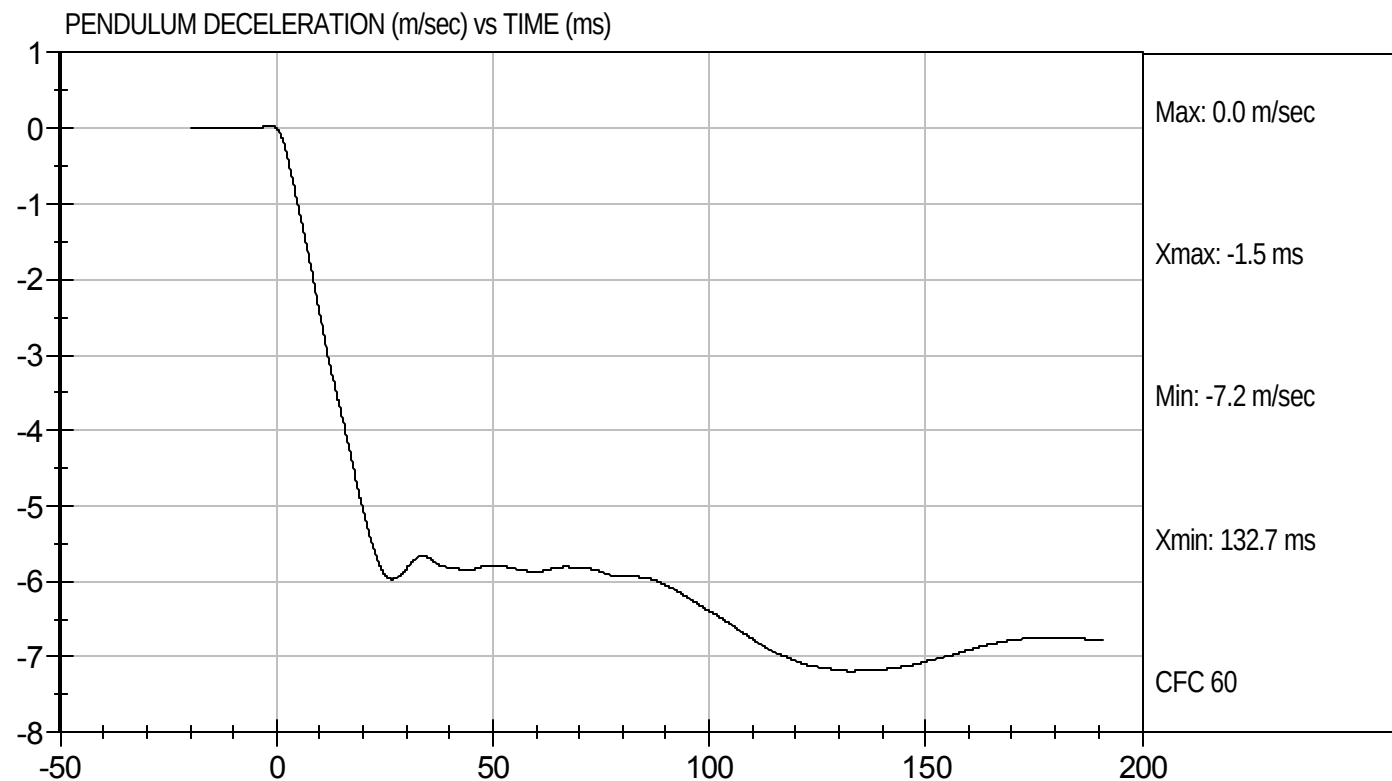
11/09/11
 Test Date


 Approved By



Test Desc: Lumbar Bending
Component ID: D113748

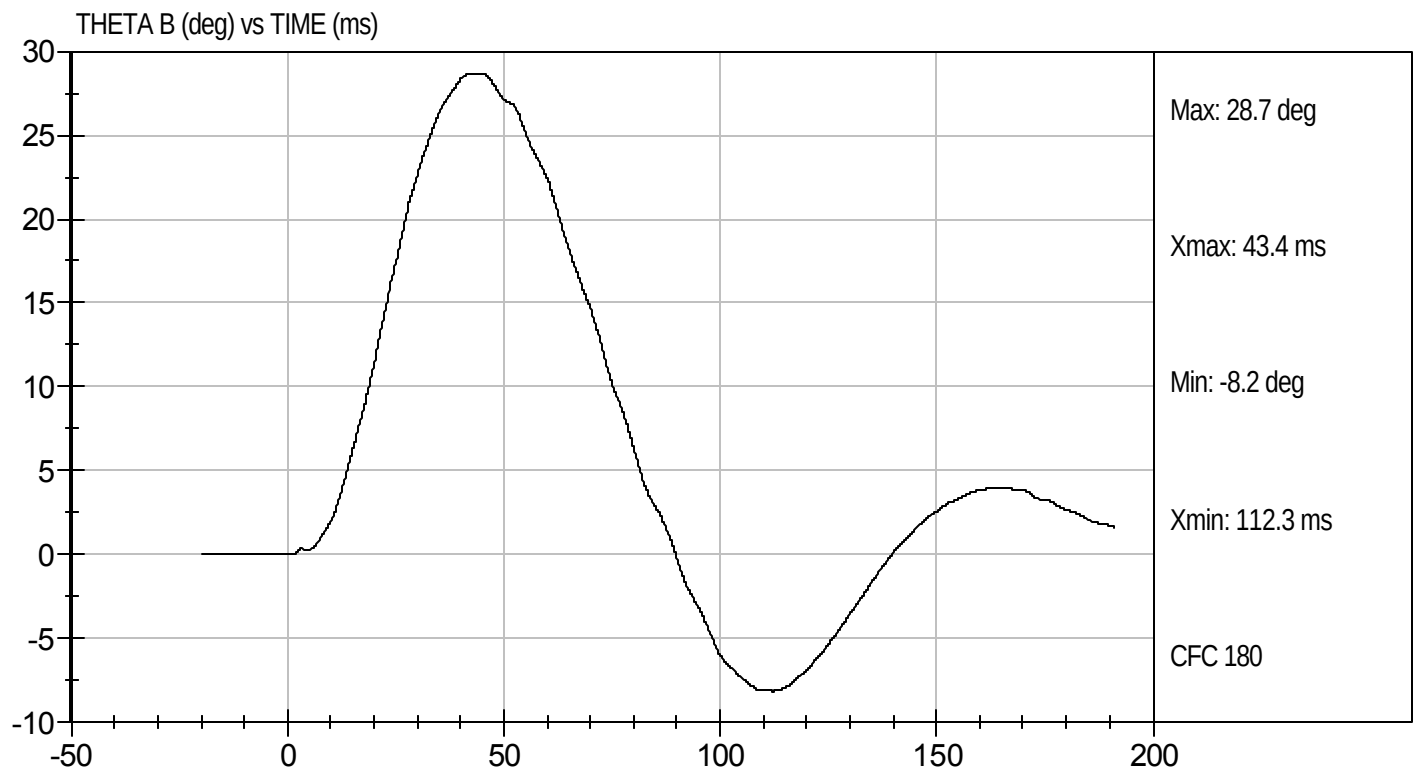
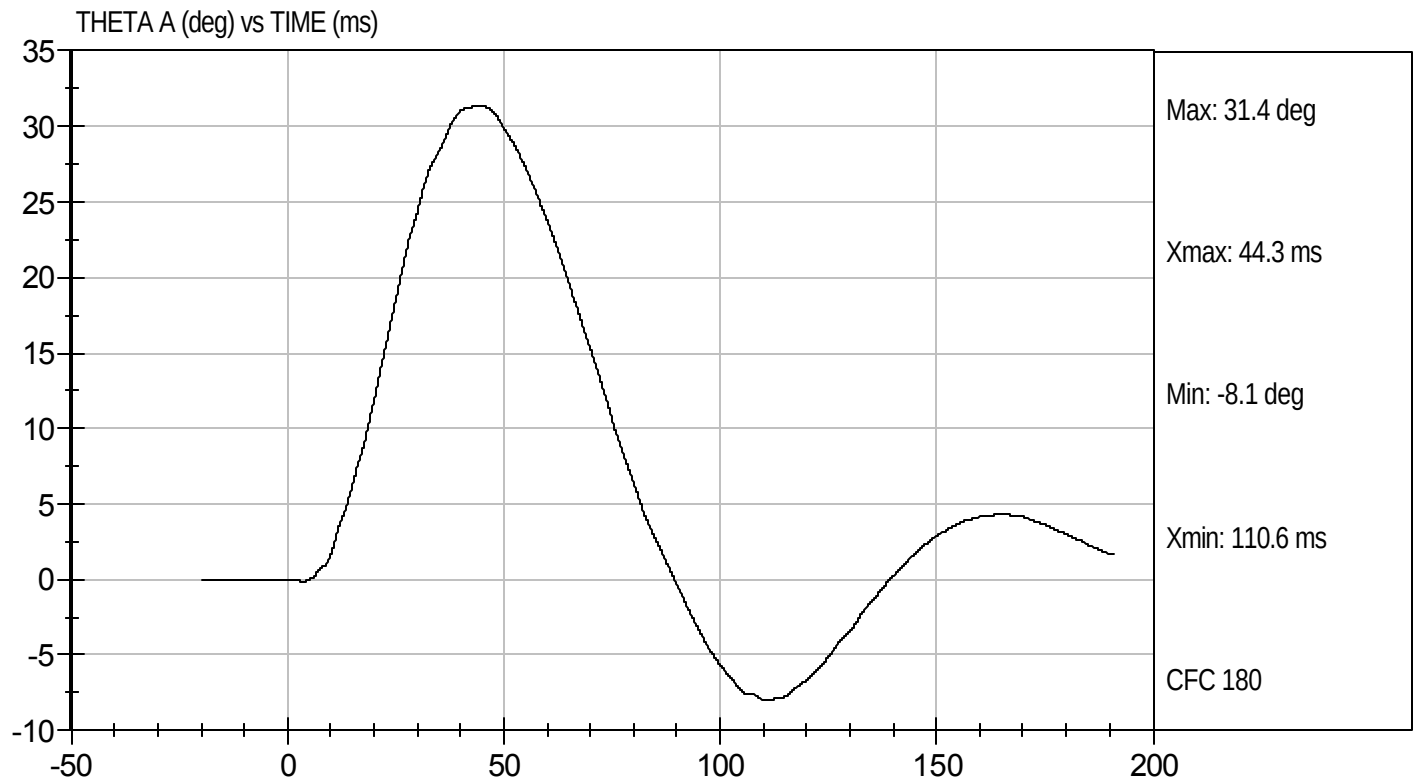
Test Date: 11/09/11
Velocity: 19.86 ft/s, 6.05 m/s





Test Desc: Lumbar Bending
Component ID: D113748

Test Date: 11/09/11
Velocity: 19.86 ft/s, 6.05 m/s



MGA RESEARCH CORPORATION

**PELVIS TEST
ES-2re DUMMY**

ATD Serial No: 032

Test I.D: D113749

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Speed	m/s	4.20 to 4.40	4.30	Pass
Maximum Impactor Force	kN	4.70 to 5.40	4.99	Pass
Time of Maximum Impactor Force	ms	11.80 to 16.10	13.30	Pass
Maximum Pubic Force	kN	1.23 to 1.59	1.48	Pass
Time of Maximum Pubic Force	ms	12.20 to 17.00	14.60	Pass
Overall Test Results				Pass


Laboratory Technician

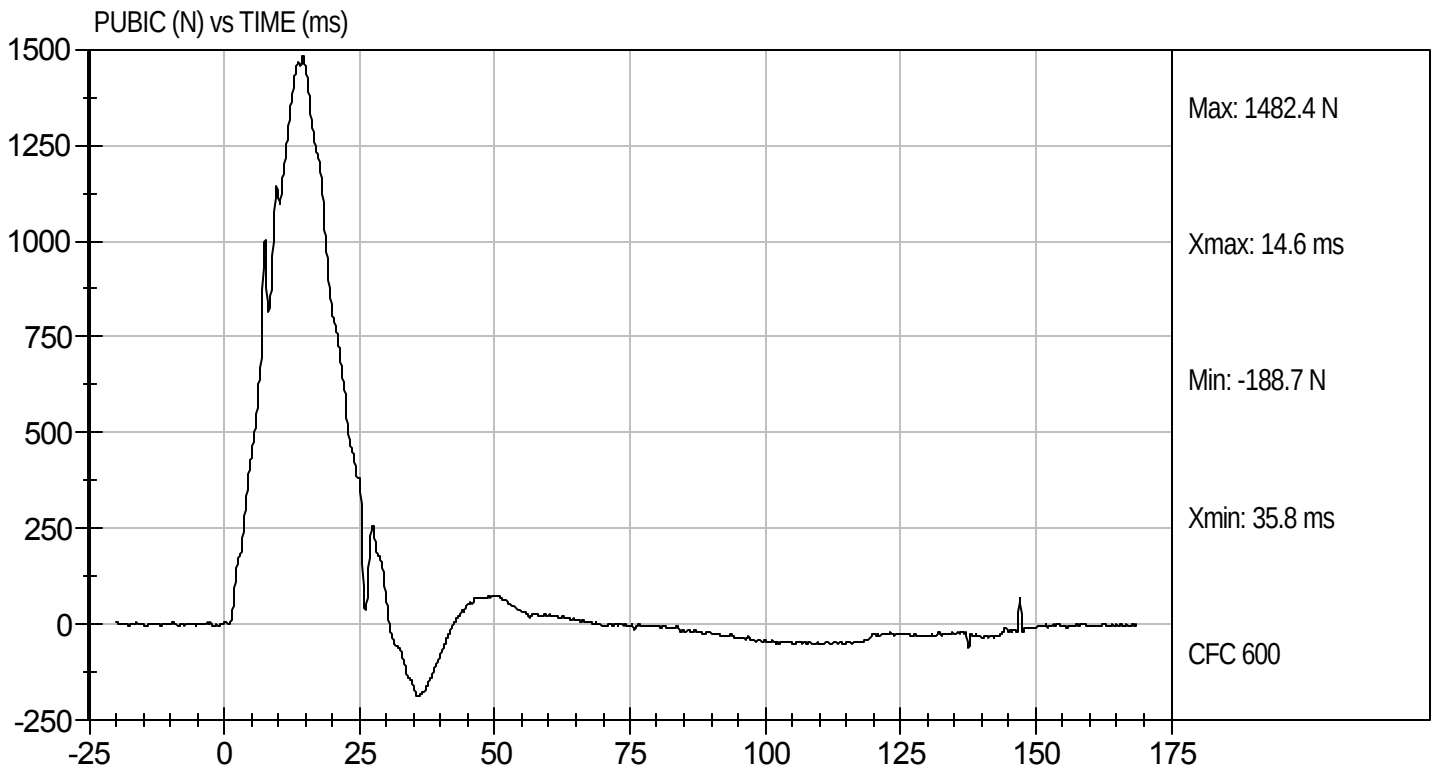
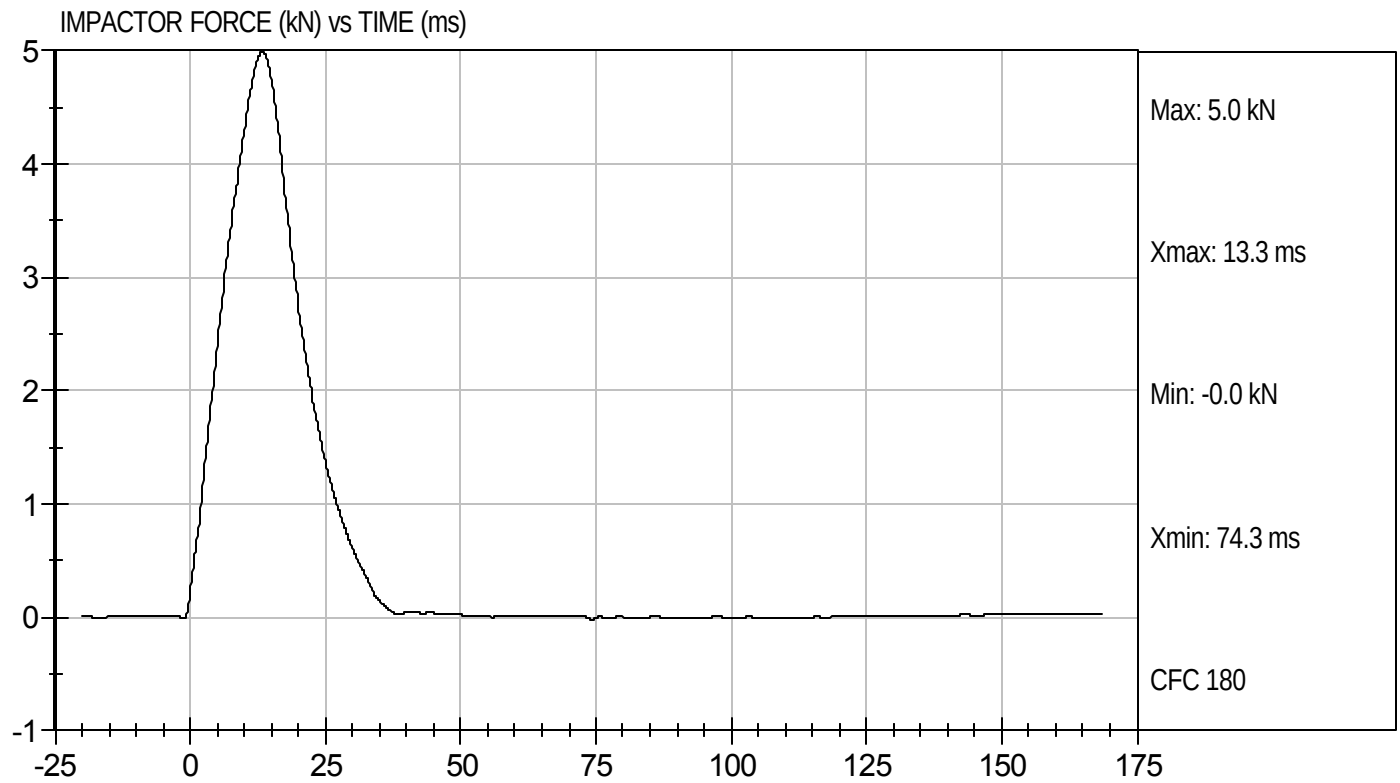
11/10/11
Test Date


Approved By



Test Desc: Pelvis Impact
Component ID: D113749

Test Date: 11/10/11
Velocity: 14.12 ft/s, 4.30 m/s



SID-IIsD External Measurements
SN: 306

No.	Name	Spec. (mm)	Result	Pass/Fail
A	Sitting Height	772 - 788	785	Pass
B	Shoulder Pivot Height	437 - 453	449	Pass
C	H-point Height	79 - 89	86	Pass
D	H-point from Seatback	141 - 151	147	Pass
E	Shoulder Pivot from Backline	97 - 107	99	Pass
F	Thigh Clearance	119 -135	120	Pass
G	Head Breadth	140 - 148	141	Pass
H	Head Back from Backline	40 - 46	45	Pass
I	Head Depth	178 - 188	182	Pass
J	Head Circumference	541 - 551	550	Pass
K	Buttock to Knee Length	514 - 540	538	Pass
L	Popliteal Height	343 - 369	349	Pass
M	Knee Pivot to Floor Height	392 - 409	394	Pass
N	Buttock Popliteal Length	416 - 442	435	Pass
O	Chest Depth w/o Jacket	195 - 211	198	Pass
P	Foot Length	216 - 232	222	Pass
Q	Hip Breadth (w/ pelvic plugs)	313 - 323	317	Pass
R	Arm Length	249 - 259	250	Pass
S	Knee Joint to Seatback	477 - 493	483	Pass
V	Shoulder Width	341 - 357	351	Pass
W	Foot Width	78 - 94	82	Pass
Y	Chest Circumference w/ jacket	851 - 881	863	Pass
Z	Waist Circumference	761 - 791	782	Pass

MGA RESEARCH CORPORATION
HEAD DROP TEST
SID-Its BUILD LEVEL D DUMMY

ATD Serial No: 306

Test ID: D113671

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	34	Pass
Peak Resultant Acceleration	G's	115 to 137	123	Pass
Peak Lateral Acceleration	G's	+/- 15	-2.1	Pass
Unimodal	N/A	<15%	Yes	Pass
Overall Test Results				Pass



Laboratory Technician

11/2/11
Test Date

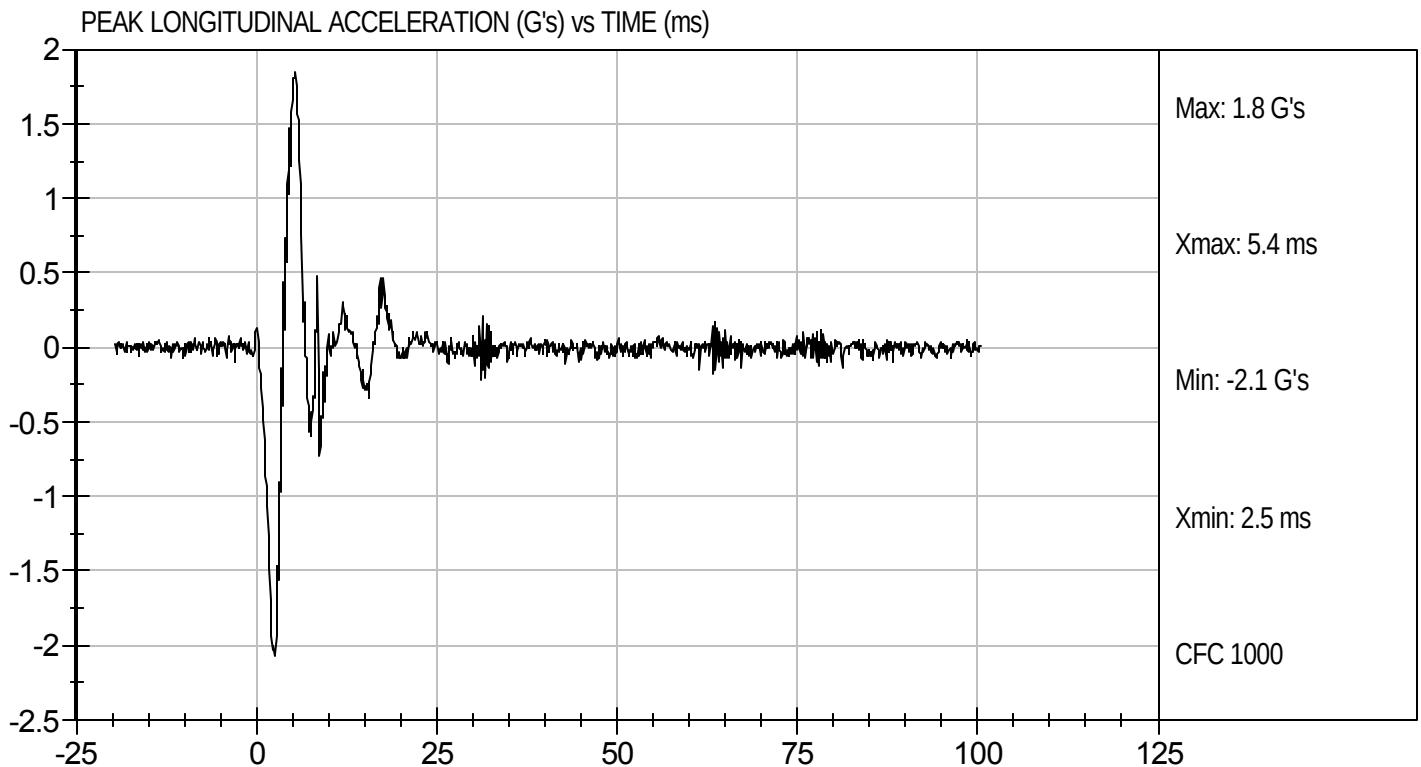
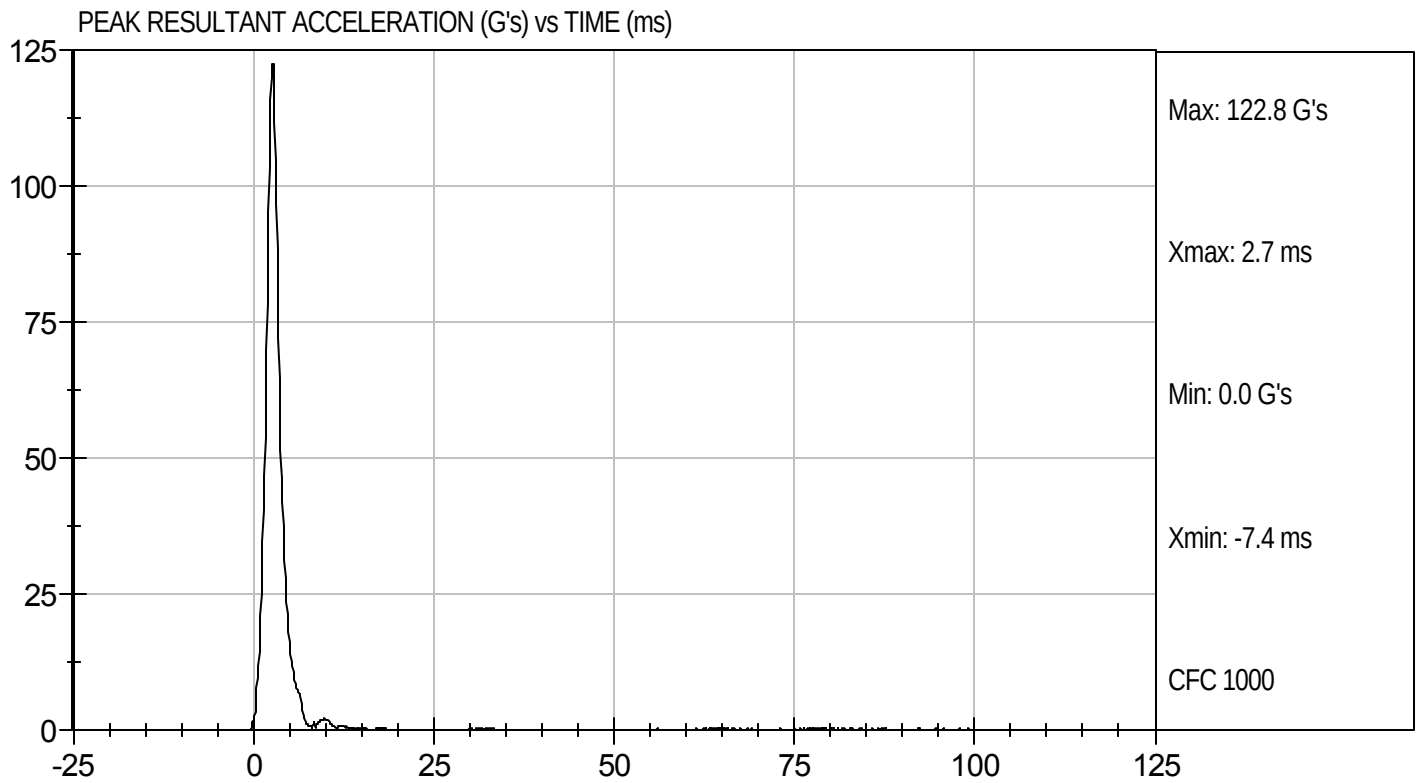


Approved By



Test Desc: Head Drop
Component ID: D113671

Test Date: 11/2/11
Velocity: 0 ft/s, 0 m/s



MGA RESEARCH CORPORATION
LATERAL NECK PENDULUM TEST
SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

Test I.D: D113672

Tested Parameter		Units	Specification	Result	Pass/Fail
Temperature		deg C	20.6 to 22.2	21.1	Pass
Humidity		%	10 to 70	36	Pass
Impact Velocity		m/s	5.51 to 5.63	5.58	Pass
Delta Velocity	10 ms	m/s	2.20 to 2.80	2.39	Pass
	15 ms	m/s	3.30 to 4.10	3.40	Pass
	20 ms	m/s	4.40 to 5.40	4.55	Pass
	25 ms	m/s	5.40 to 6.10	5.40	Pass
	25-100 ms	m/s	5.50 to 6.20	5.62	Pass
Maximum D-Plane Rotation		deg	71 to 81	71	Pass
Time of Maximum D-Plane Rotation		ms	50 to 70	58	Pass
Maximum Occipital Condyle Moment during Rotation Interval Nm			-44 to -36	-42	Pass
Time of Moment Decay to 0 Nm		ms	102 to 126	114	Pass
Overall Test Results				Pass	


 Laboratory Technician

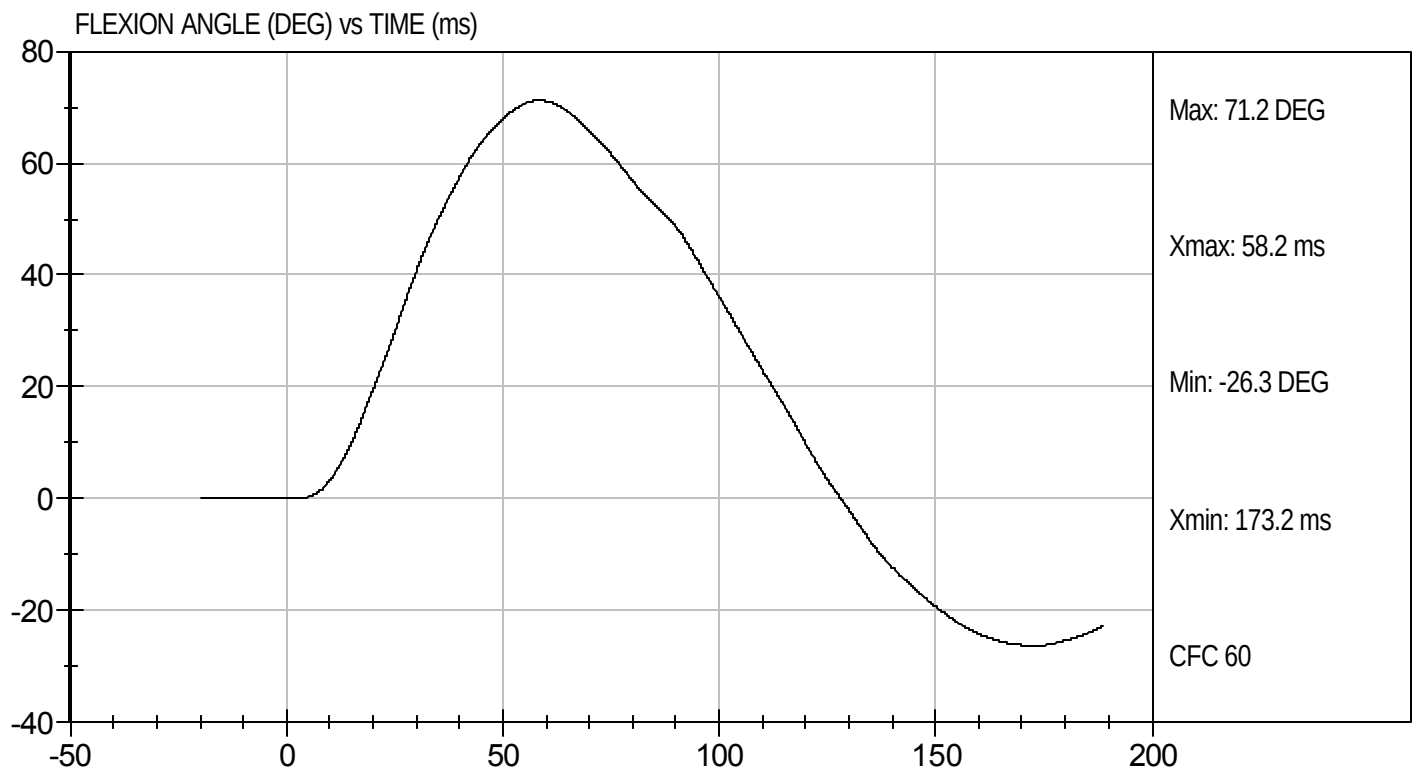
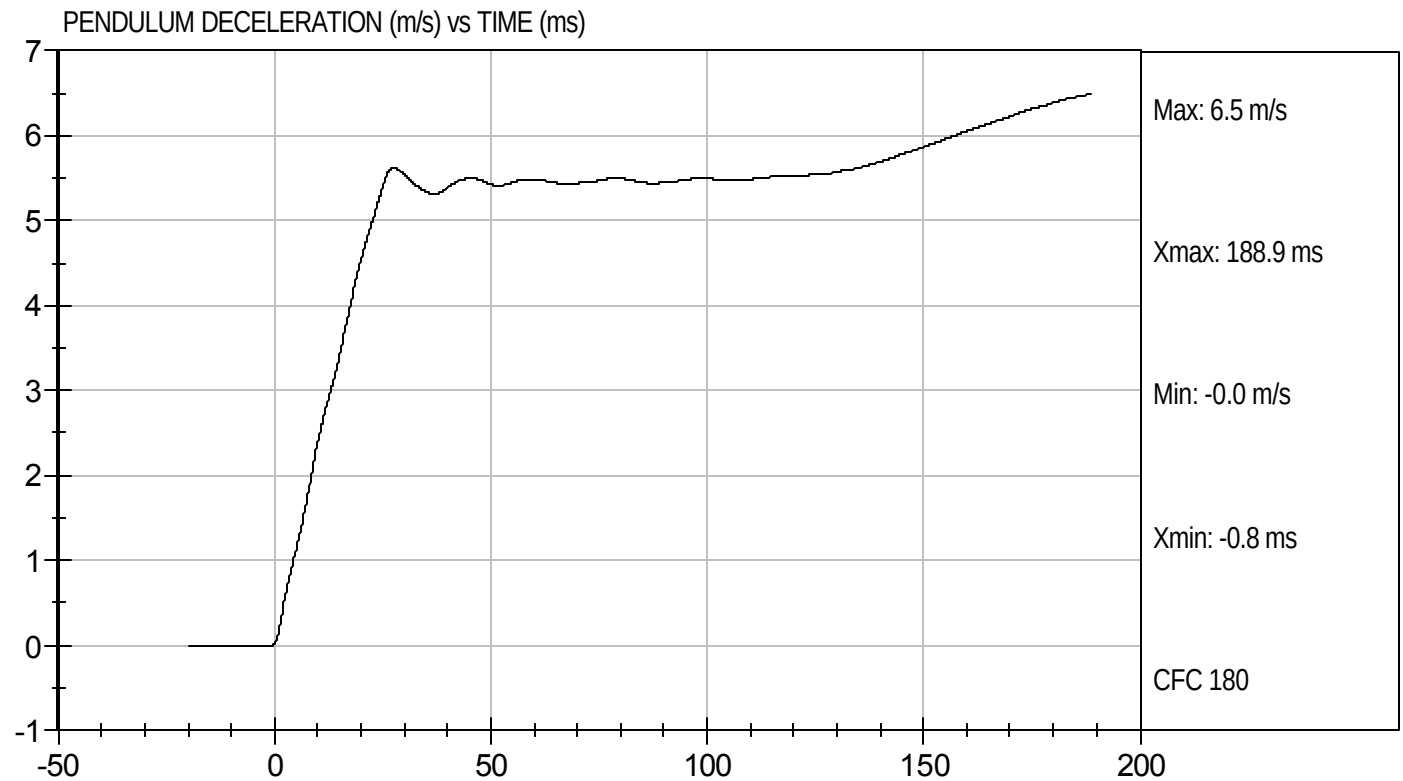
11/2/11
 Test Date


 Approved By



Test Desc: Neck Bending
Component ID: D113672

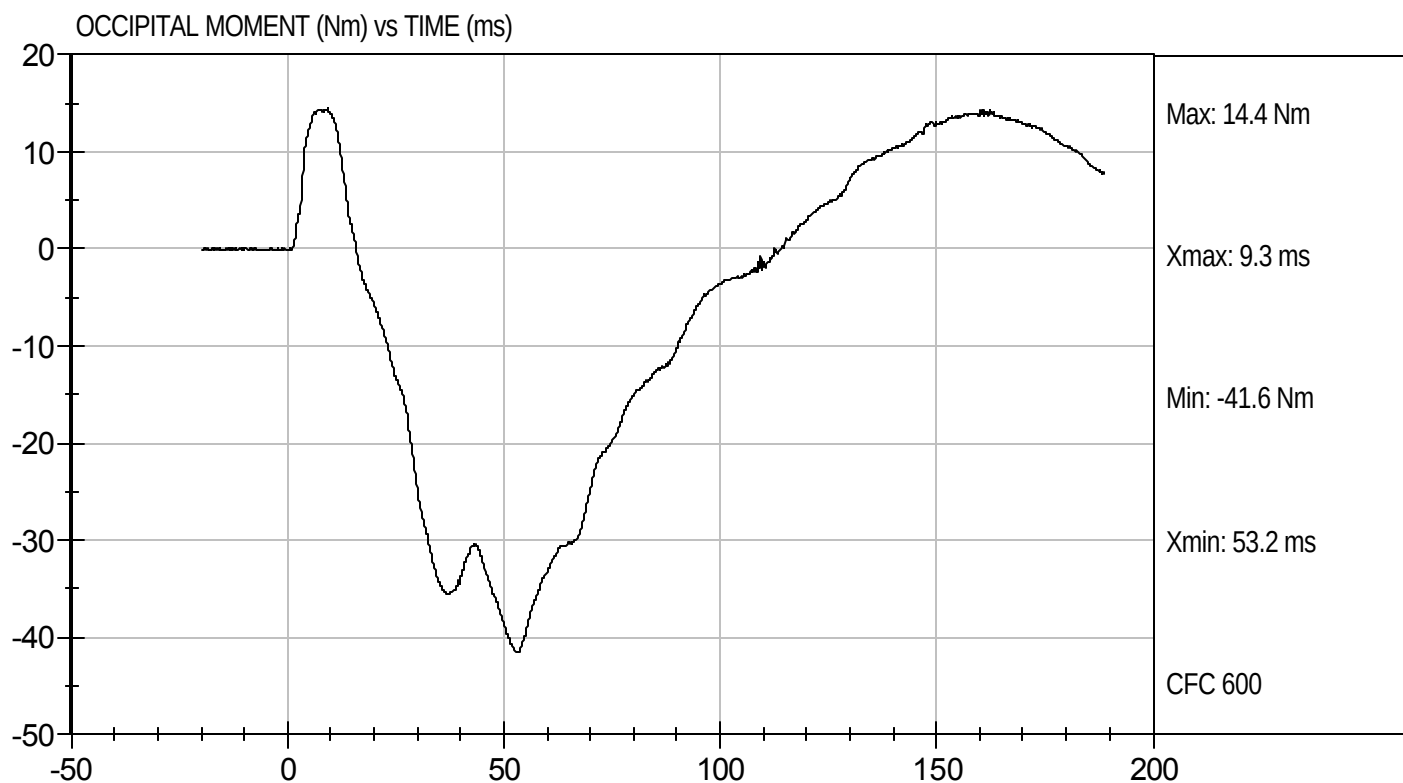
Test Date: 11/2/11
Velocity: 18.32 ft/s, 5.58 m/s





Test Desc: Neck Bending
Component ID: D113672

Test Date: 11/2/11
Velocity: 18.32 ft/s, 5.58 m/s



MGA RESEARCH CORPORATION
SHOULDER IMPACT TEST
SID-11s BUILD LEVEL D DUMMY

ATD Serial No: 306

Test ID: D113673

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	33	Pass
Impact Velocity	m/s	4.20 to 4.40	4.38	Pass
Maximum Probe Acceleration	G's	13 to 18	16	Pass
Shoulder Displacement	mm	28 to 37	28	Pass
Upper Spine (T1) Y Acceleration	G's	17 to 22	19	Pass
Overall Test Results				Pass



Laboratory Technician

11/3/11
Test Date

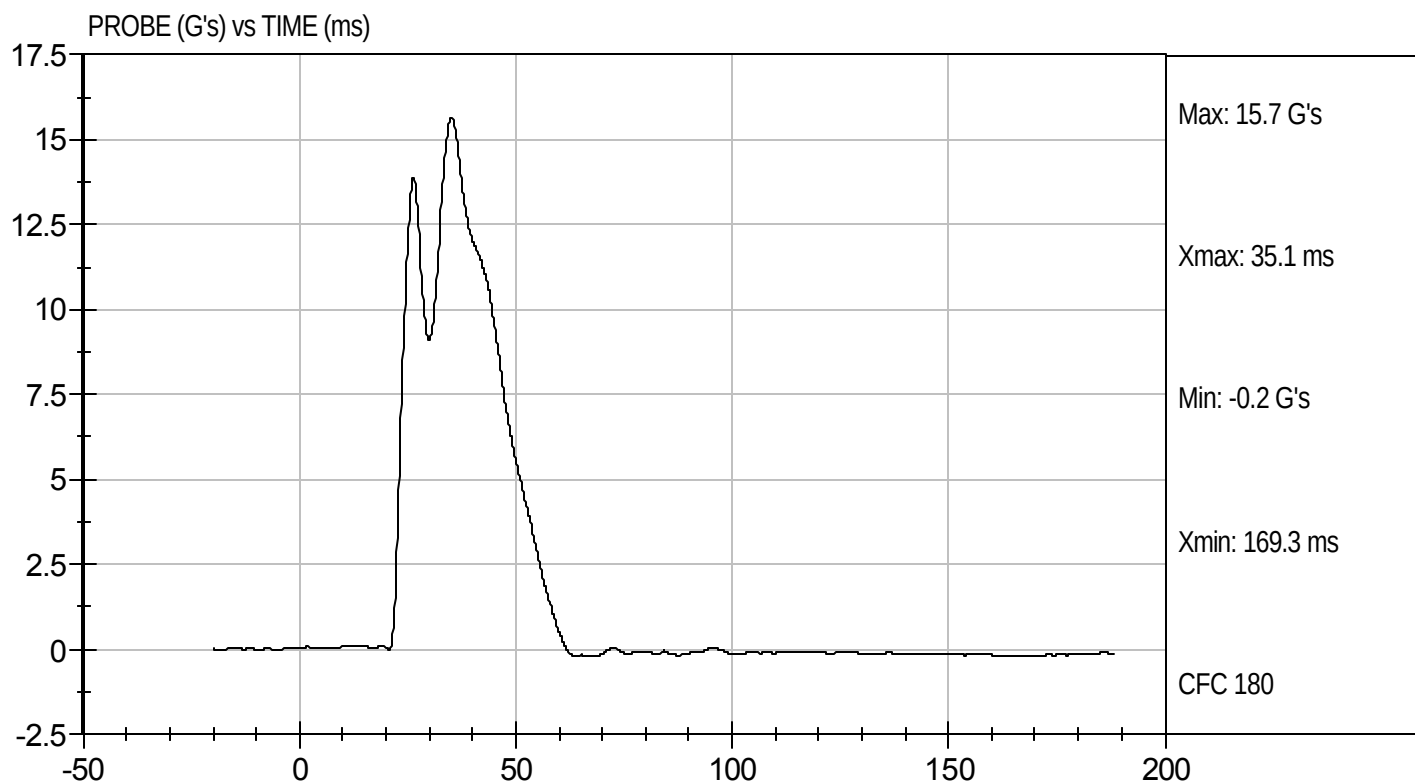


Approved By



Test Desc: Shoulder Impact
Component ID: D113673

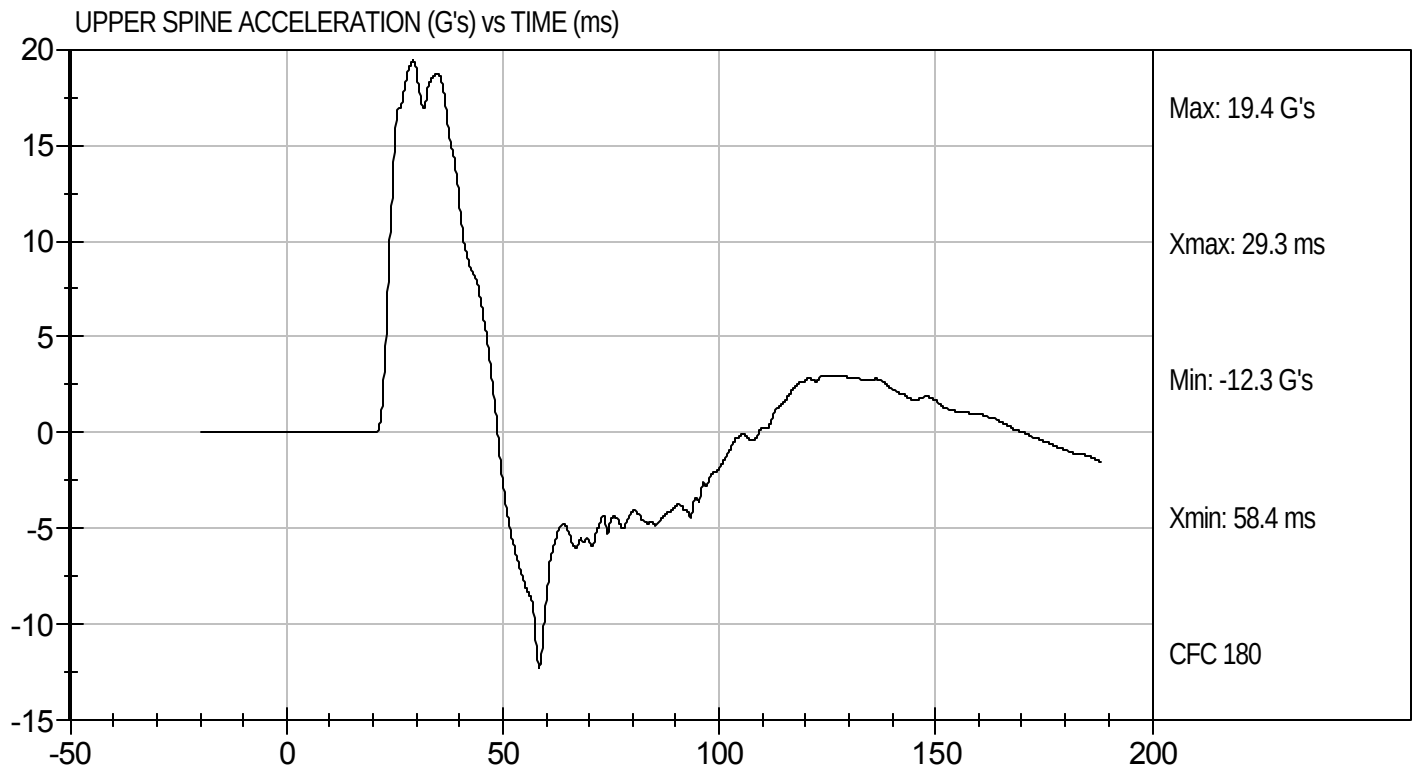
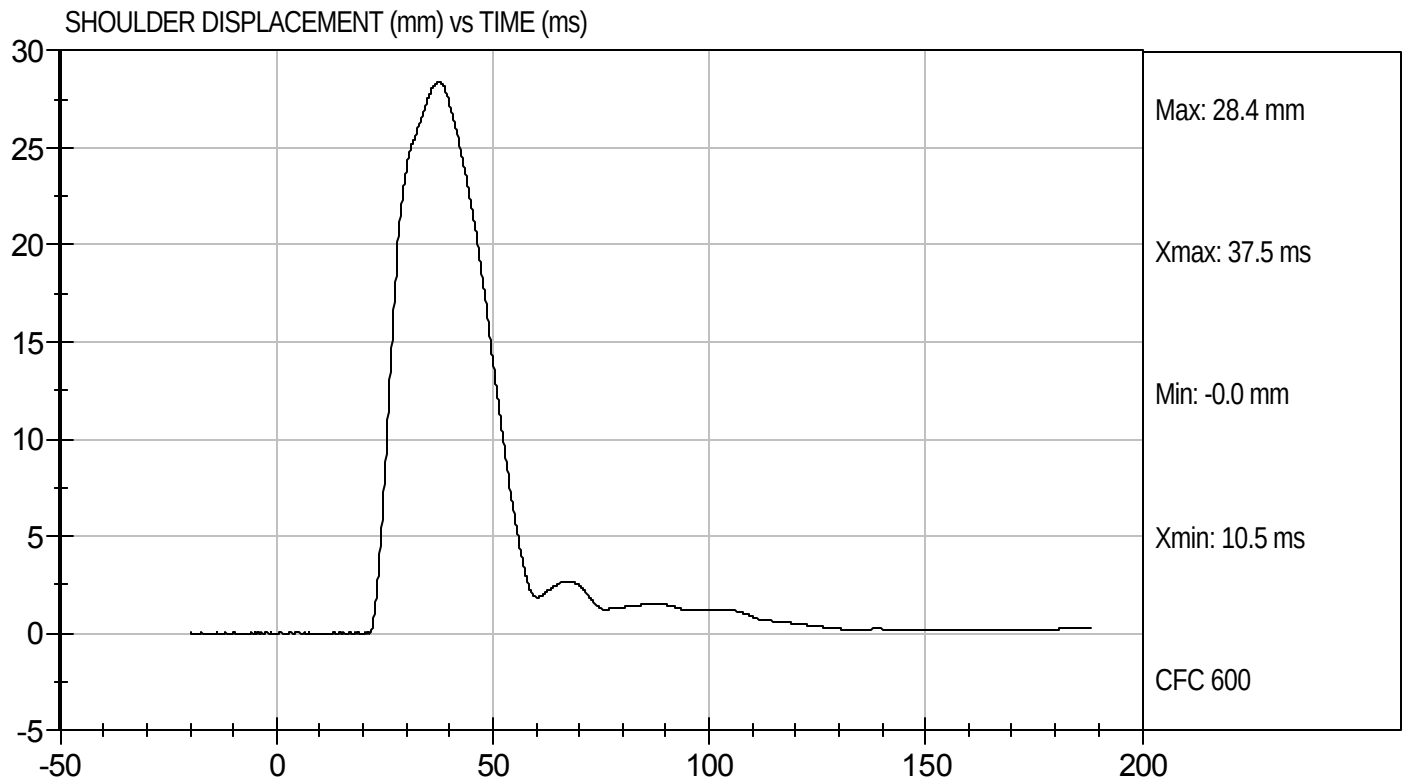
Test Date: 11/3/11
Velocity: 14.36 ft/s, 4.38 m/s





Test Desc: Shoulder Impact
Component ID: D113673

Test Date: 11/3/11
Velocity: 14.36 ft/s, 4.38 m/s



MGA RESEARCH CORPORATION
THORAX (WITH ARM) IMPACT TEST
SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

Test I.D: D113674

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.1	Pass
Humidity	%	10 to 70	33	Pass
Impact Velocity	m/s	6.60 to 6.80	6.77	Pass
Peak Impactor Acceleration	G's	30 to 36	34	Pass
Shoulder Displacement	mm	31 to 40	31	Pass
Upper Rib Displacement	mm	25 to 32	28	Pass
Middle Rib Displacement	mm	30 to 36	31	Pass
Lower Rib Displacement	mm	32 to 38	34	Pass
Upper Spine (T1) Y Acceleration	G's	34 to 43	40	Pass
Lower Spine (T12) Y Acceleration	G's	29 to 37	31	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

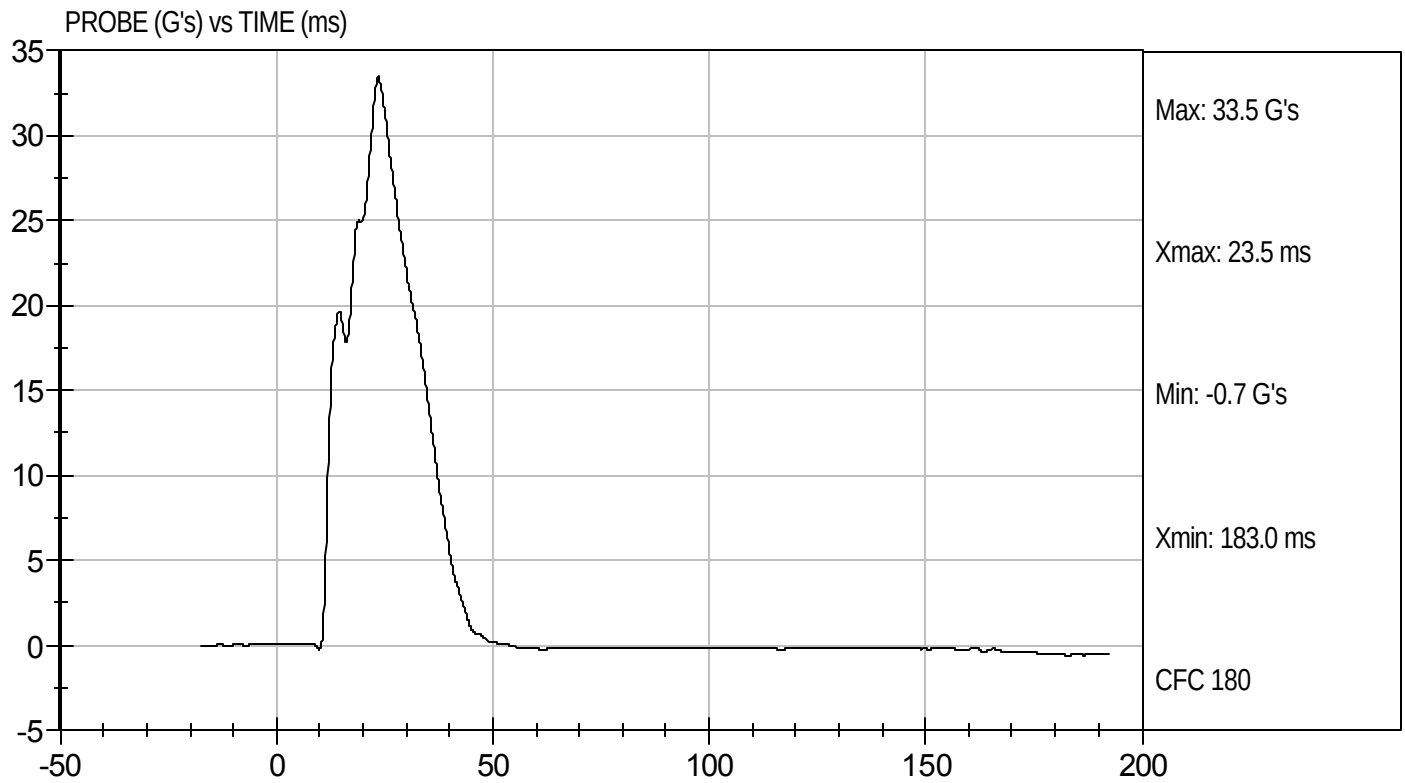
11/3/11
Test Date

David Winkelbauer
Approved By



Test Desc: Thorax With Arm
Component ID: D113674

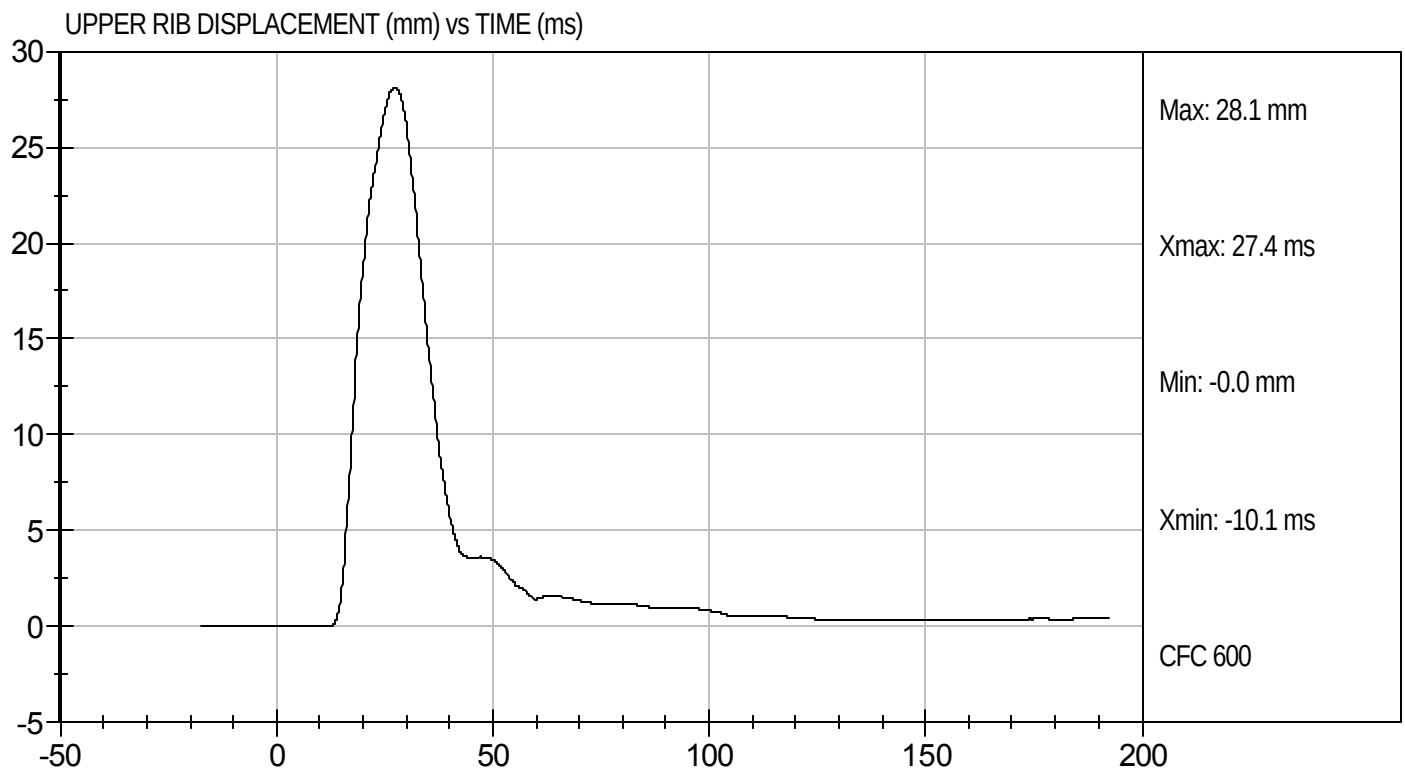
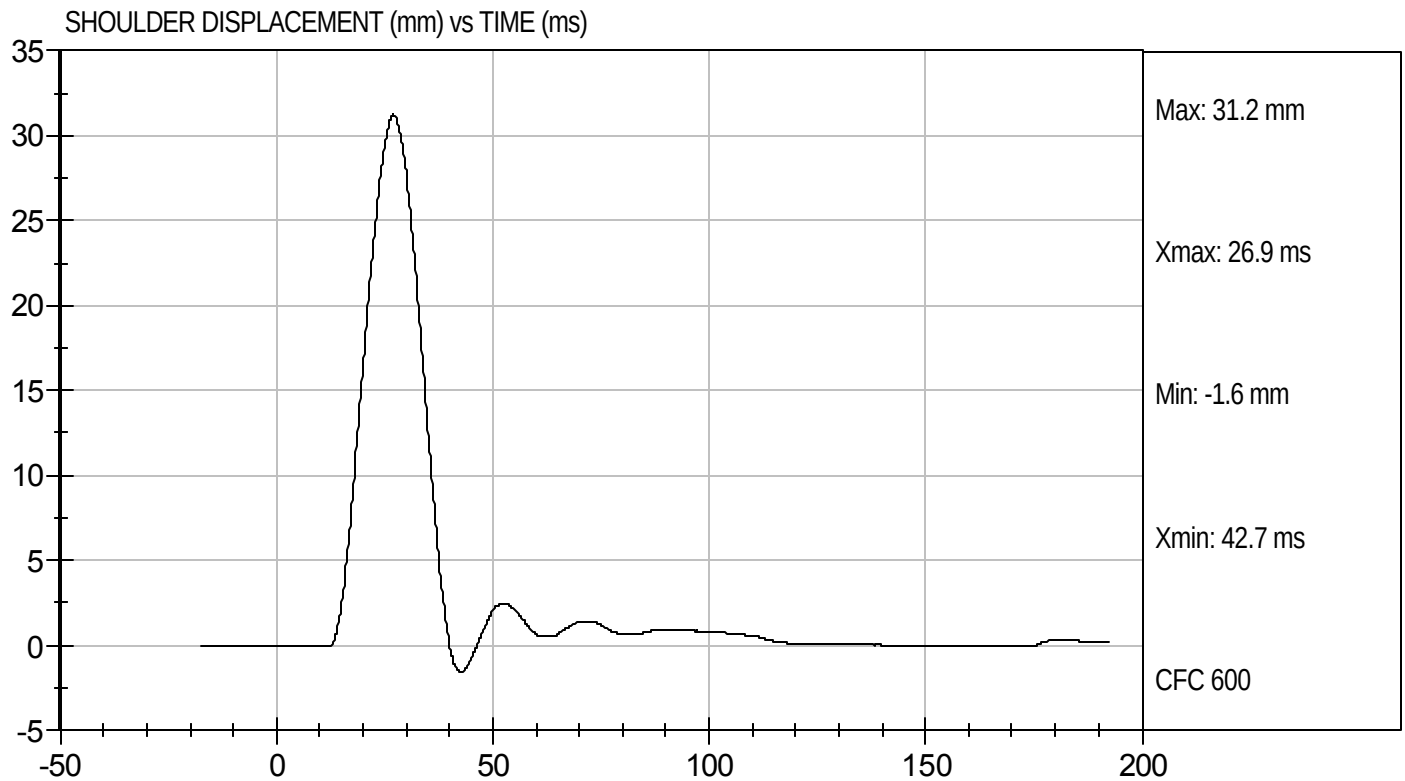
Test Date: 11/3/11
Velocity: 22.22 ft/s, 6.77 m/s





Test Desc: Thorax With Arm
Component ID: D113674

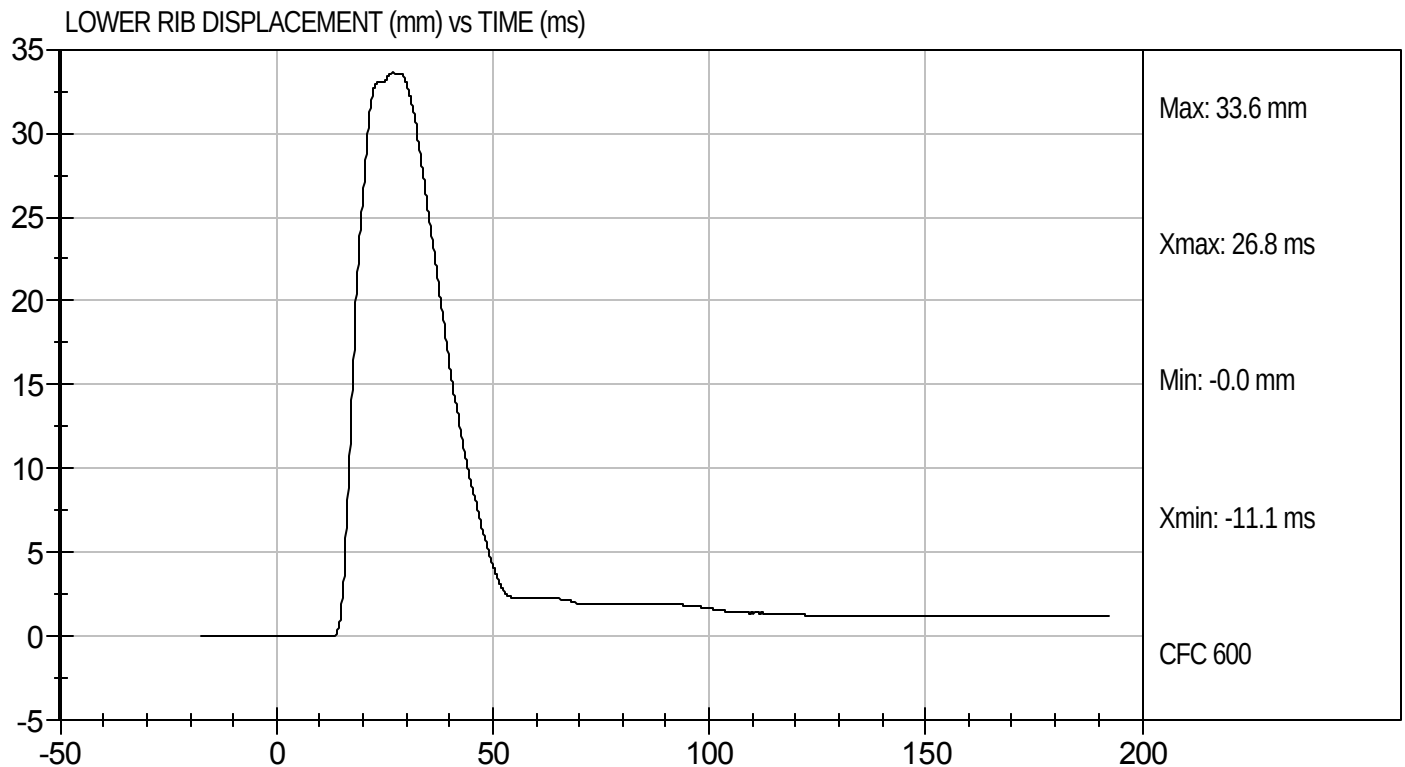
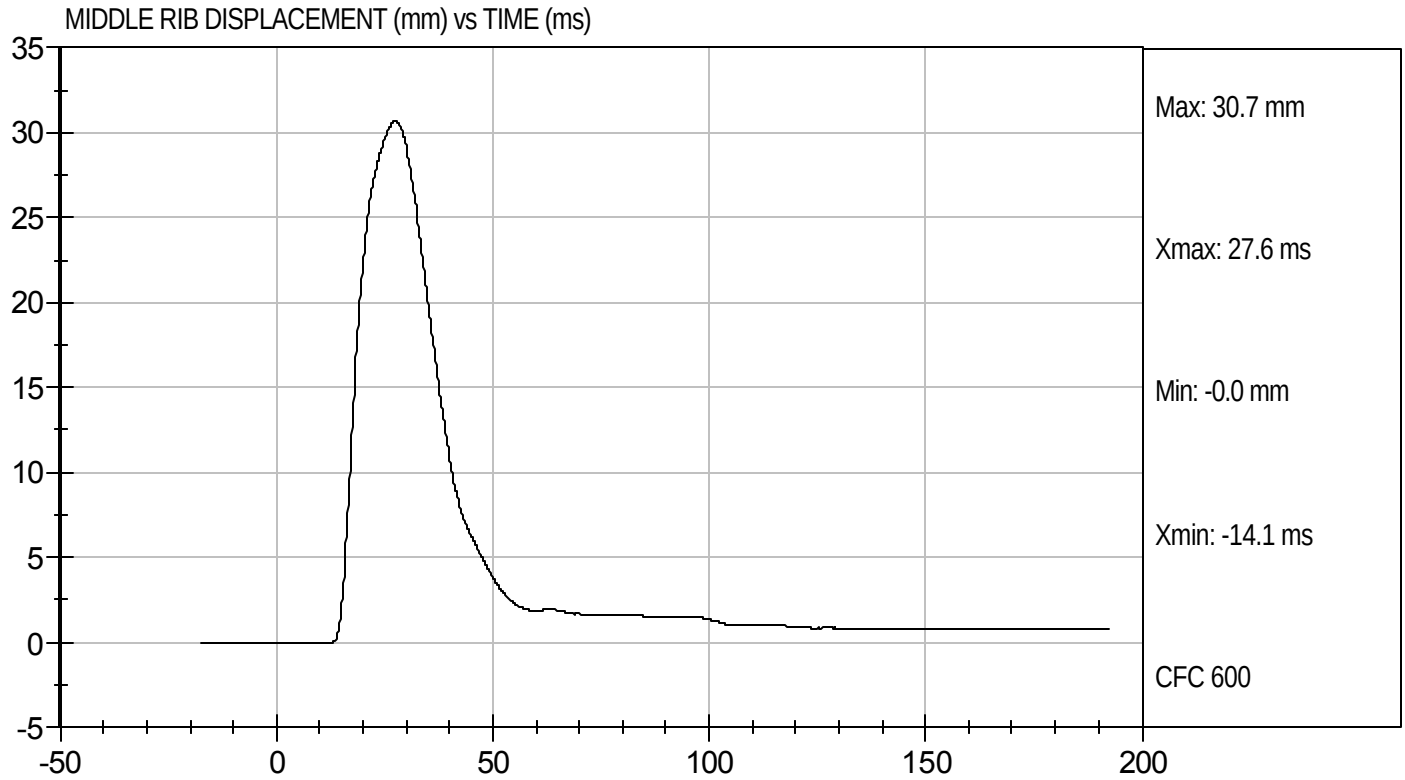
Test Date: 11/3/11
Velocity: 22.22 ft/s, 6.77 m/s





Test Desc: Thorax With Arm
Component ID: D113674

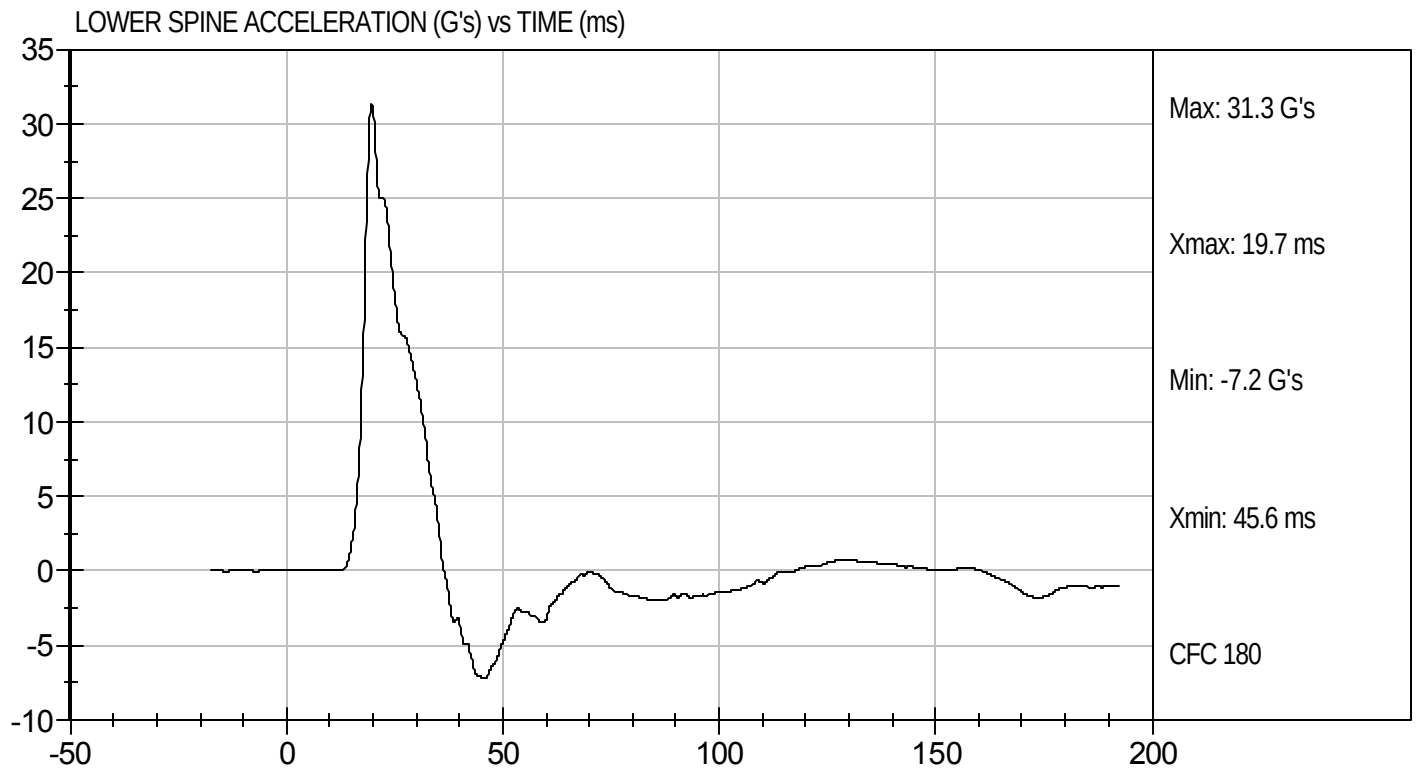
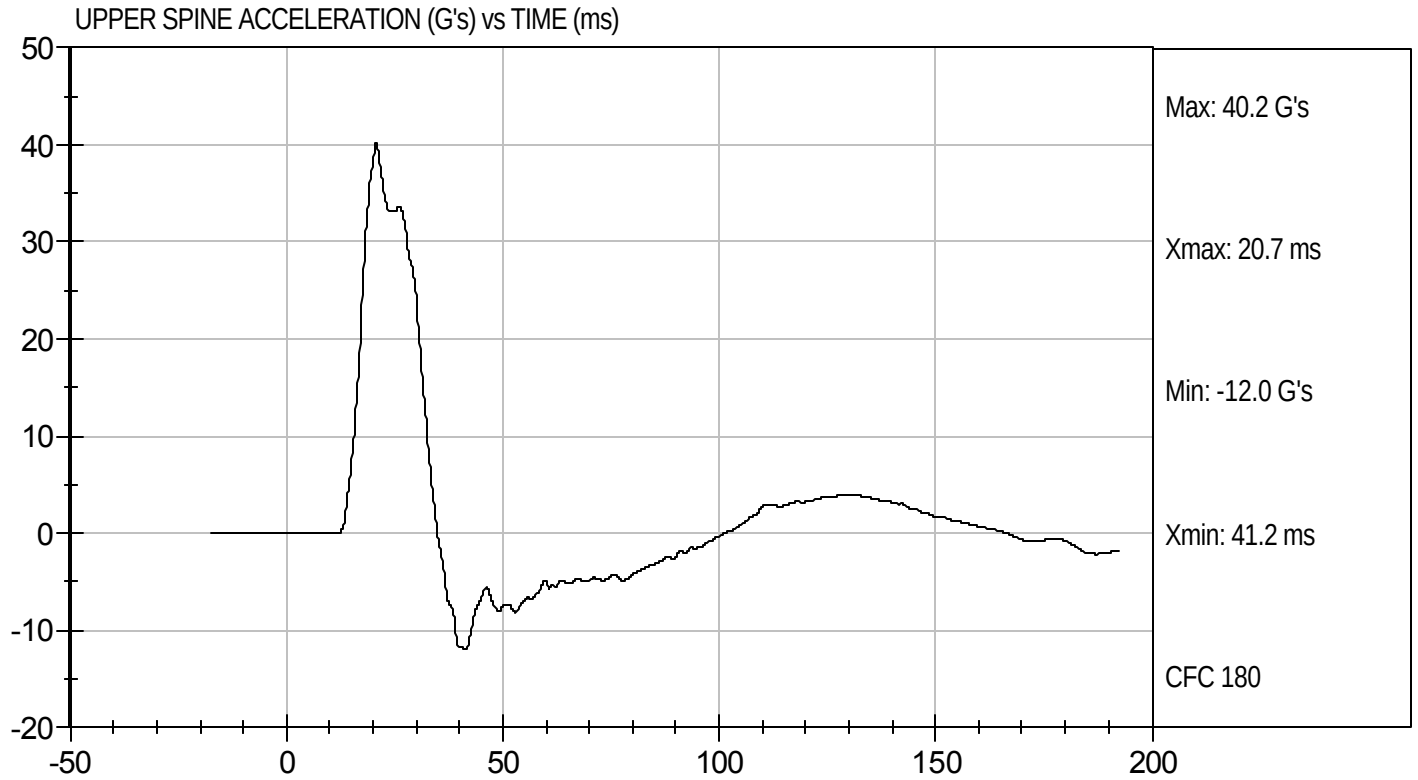
Test Date: 11/3/11
Velocity: 22.22 ft/s, 6.77 m/s





Test Desc: Thorax With Arm
Component ID: D113674

Test Date: 11/3/11
Velocity: 22.22 ft/s, 6.77 m/s



MGA RESEARCH CORPORATION
THORAX (WITHOUT ARM) IMPACT TEST
SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

Test I.D: D113675

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.1	Pass
Humidity	%	10 to 70	33	Pass
Impact Velocity	m/s	4.20 to 4.40	4.34	Pass
Peak Impactor Force	G's	14 to 18	16	Pass
Upper Rib Displacement	mm	32 to 40	37	Pass
Middle Rib Displacement	mm	39 to 45	41	Pass
Lower Rib Displacement	mm	35 to 43	40	Pass
Upper Spine (T1) Y Acceleration	G's	13 to 17	15	Pass
Lower Spine (T12) Y Acceleration	G's	7 to 11	10	Pass
Overall Test Results			Pass	


Laboratory Technician

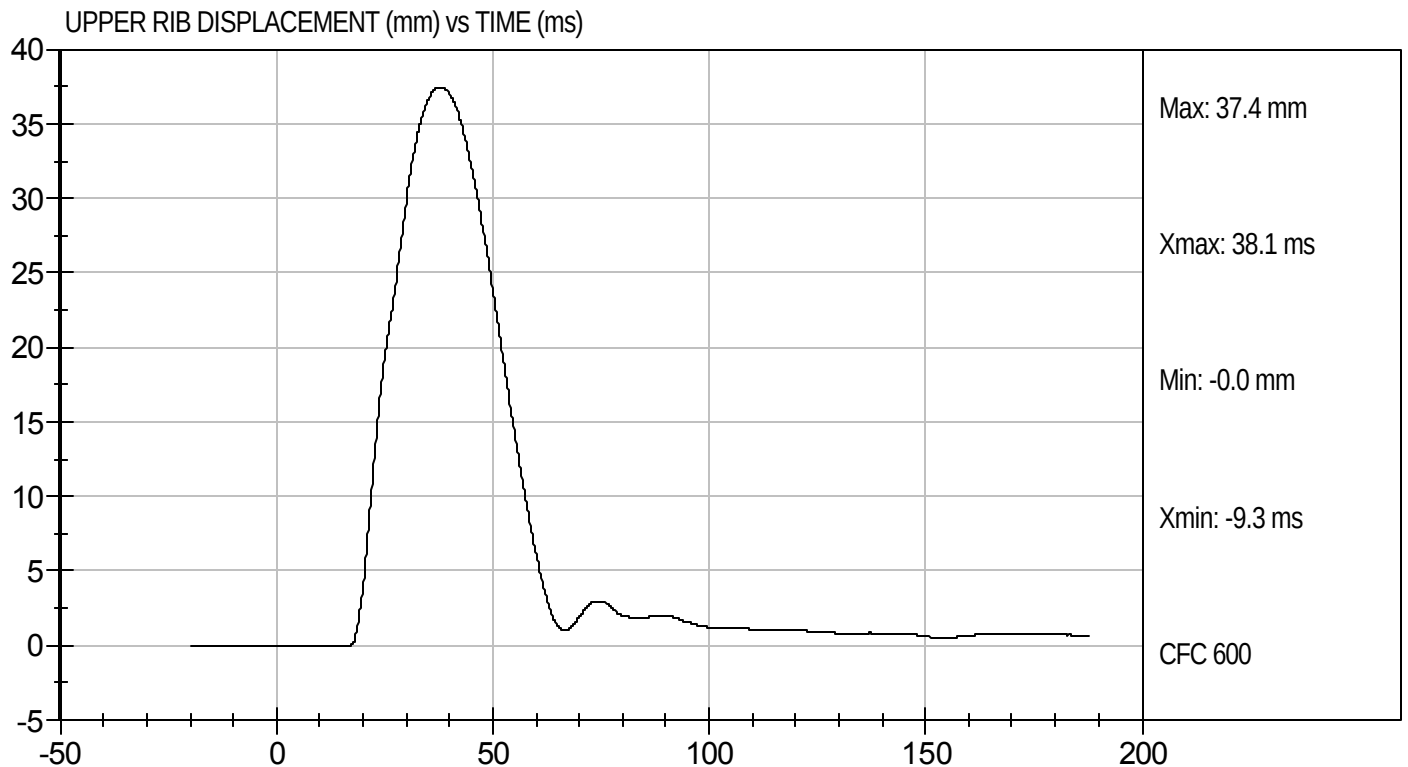
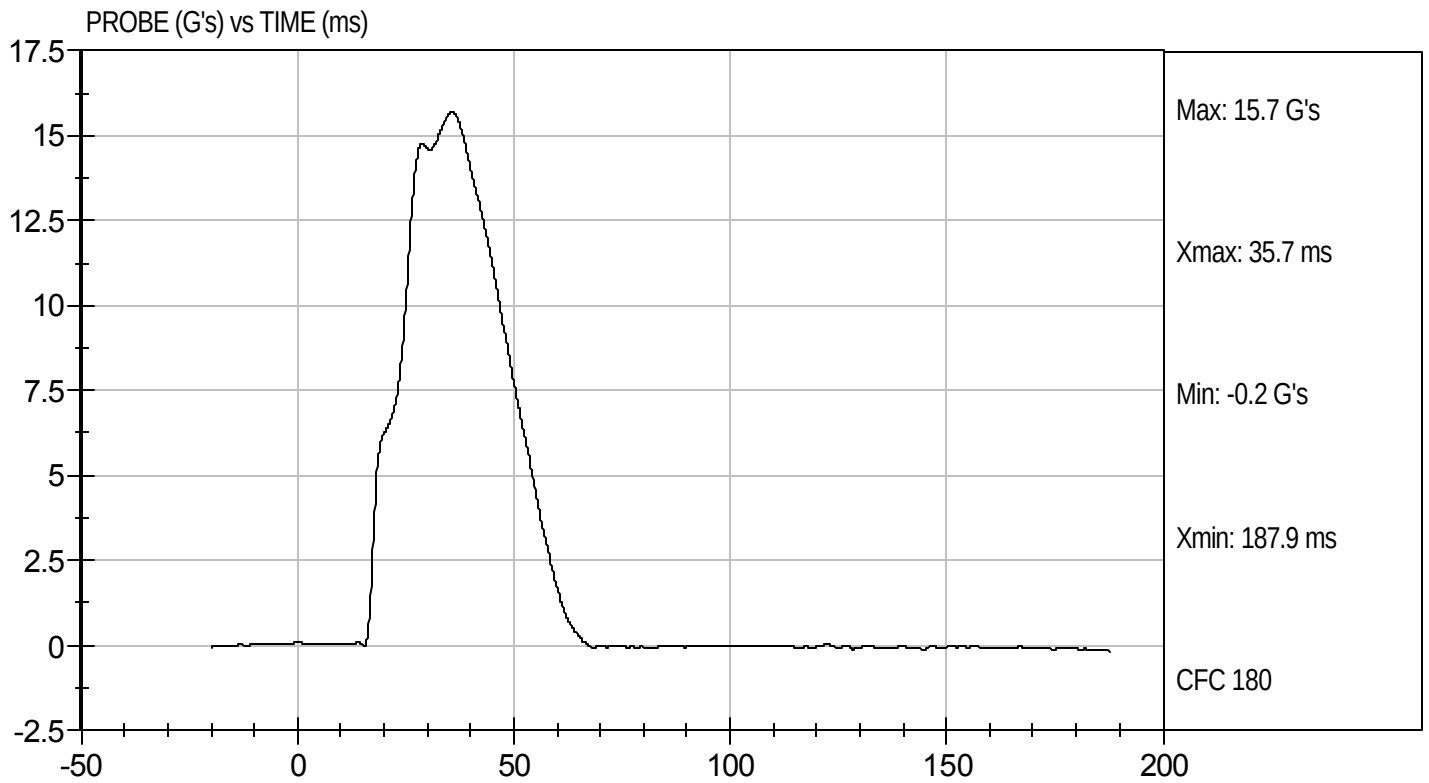
11/3/11
Test Date


Approved By



Test Desc: Thorax Without Arm
Component ID: D113675

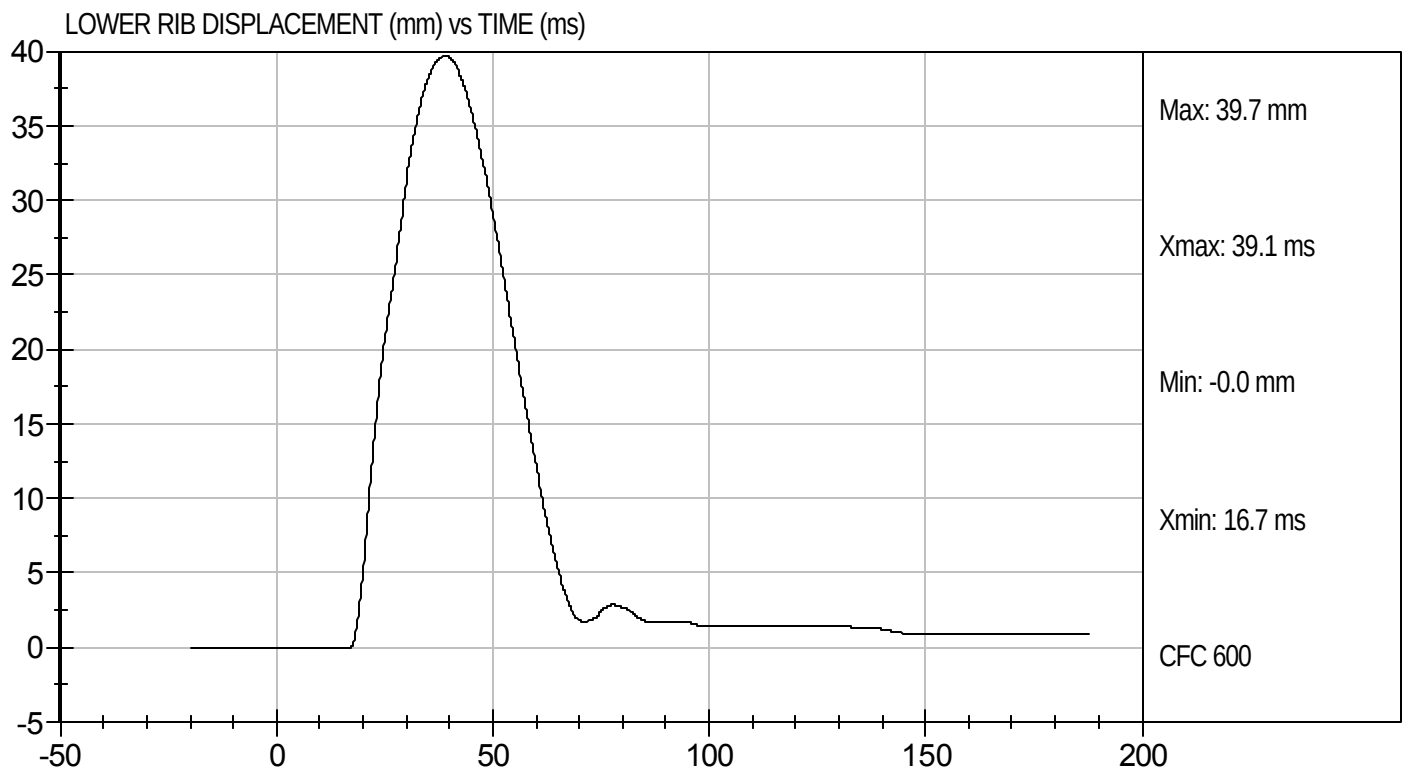
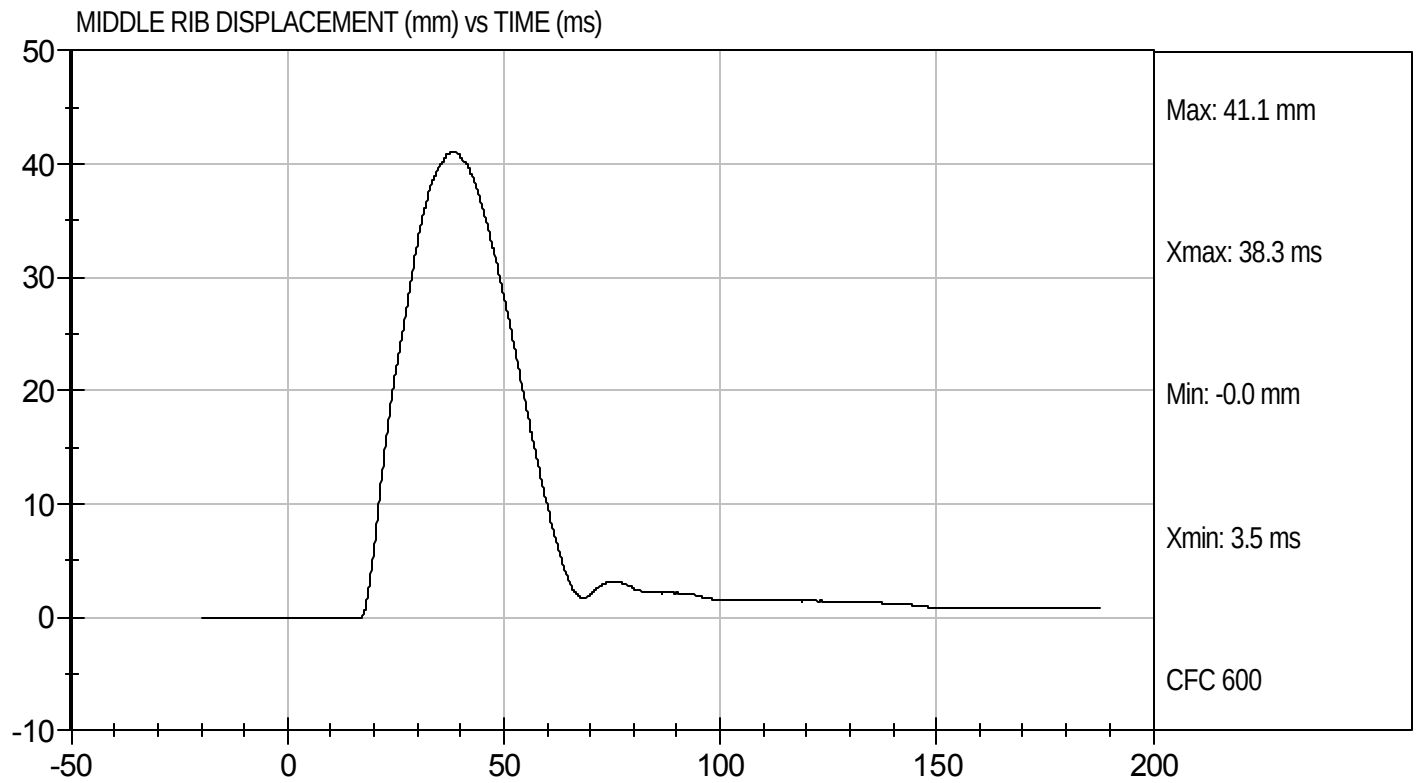
Test Date: 11/3/11
Velocity: 14.25 ft/s, 4.34 m/s





Test Desc: Thorax Without Arm
Component ID: D113675

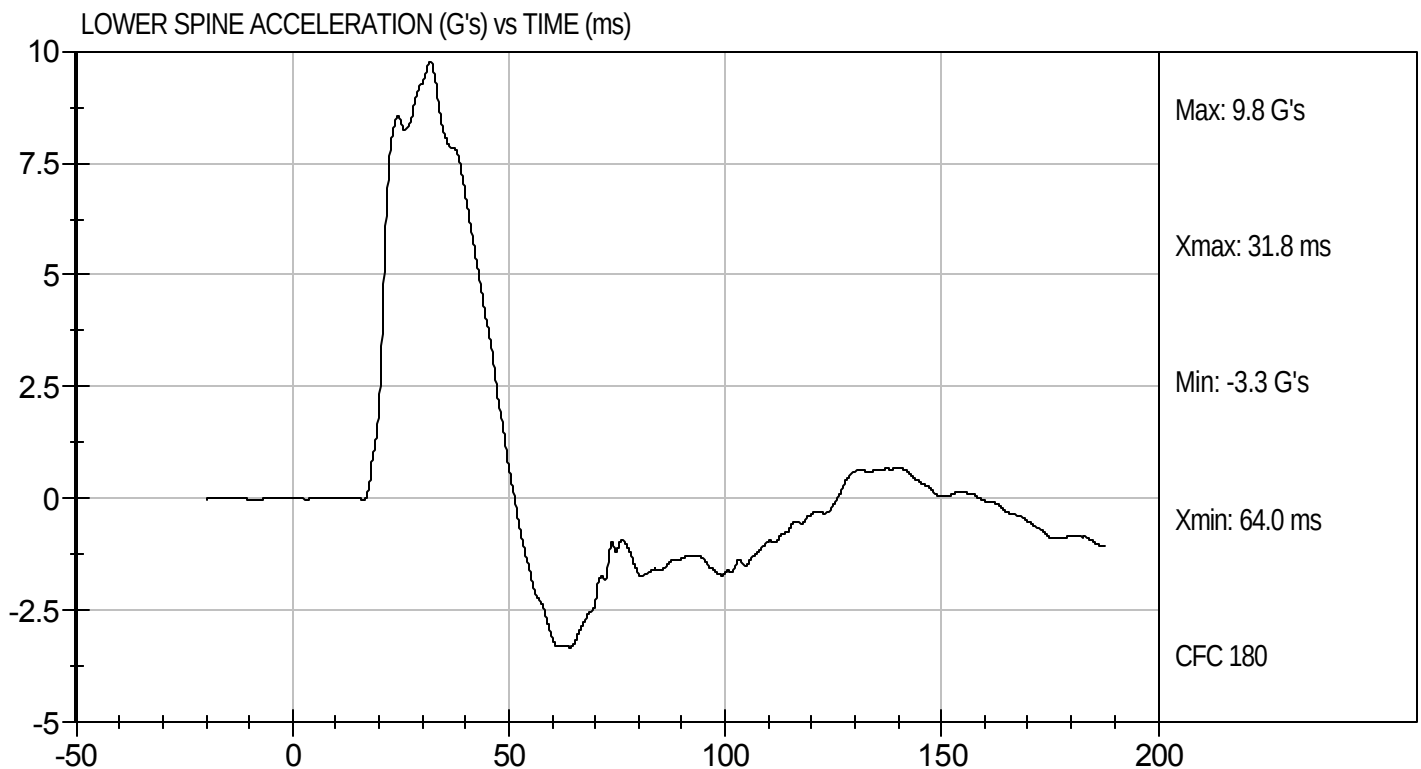
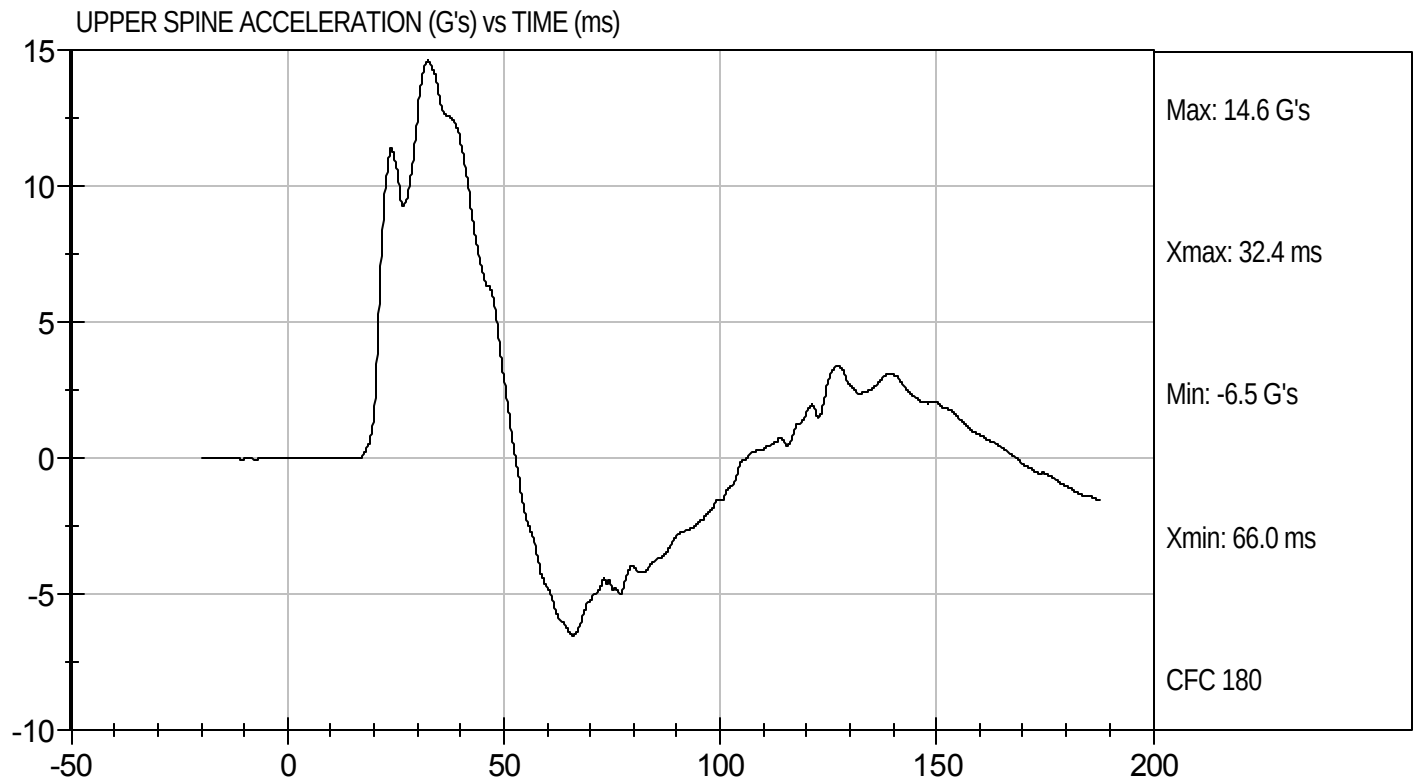
Test Date: 11/3/11
Velocity: 14.25 ft/s, 4.34 m/s





Test Desc: Thorax Without Arm
Component ID: D113675

Test Date: 11/3/11
Velocity: 14.25 ft/s, 4.34 m/s



MGA RESEARCH CORPORATION
ABDOMINAL IMPACT TEST
SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

Test I.D: D113676

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.3	Pass
Humidity	%	10 to 70	32	Pass
Impact Velocity	m/s	4.20 to 4.40	4.30	Pass
Peak Impactor Acceleration	G's	12 to 16	14	Pass
Upper Rib Displacement	mm	36 to 47	41	Pass
Lower Rib Displacement	mm	33 to 44	37	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	11	Pass
			Overall Test Results	Pass


Laboratory Technician

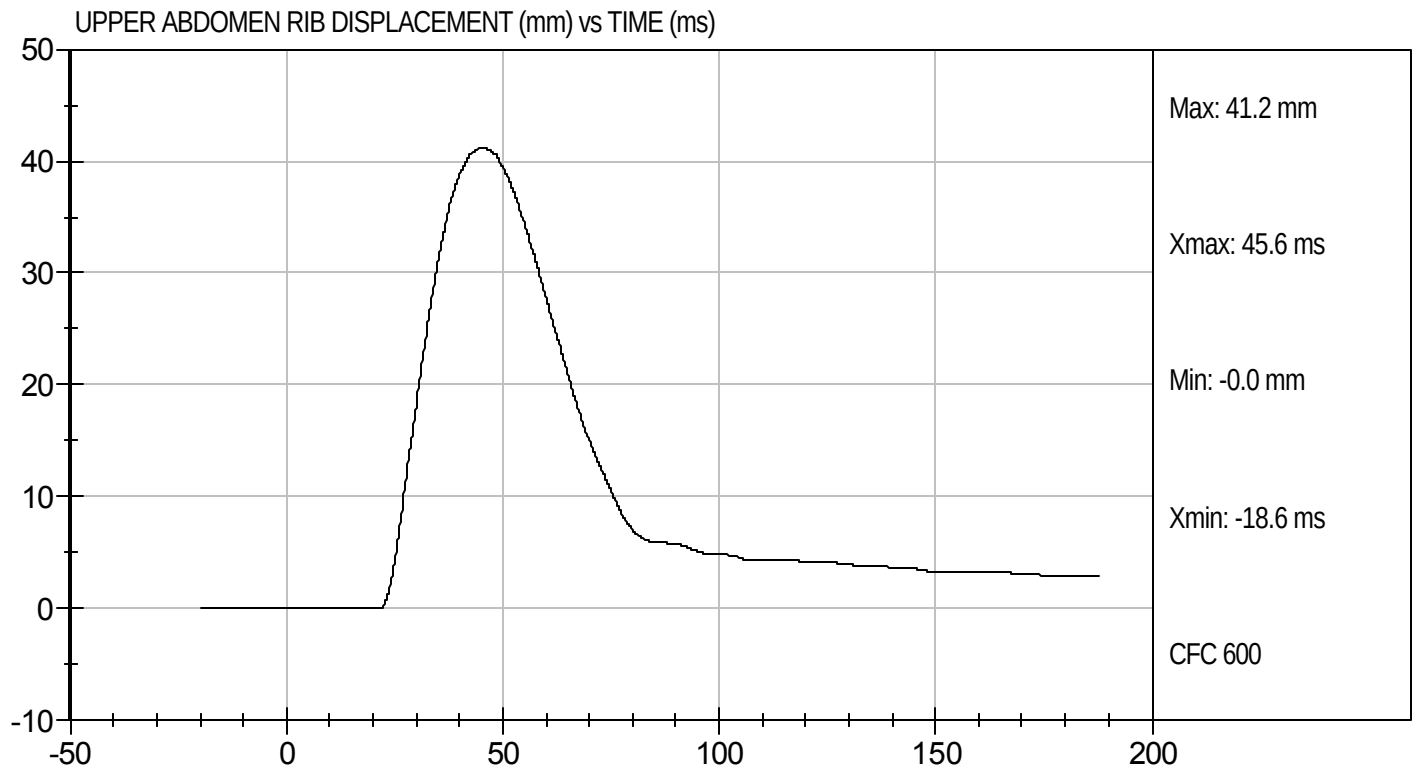
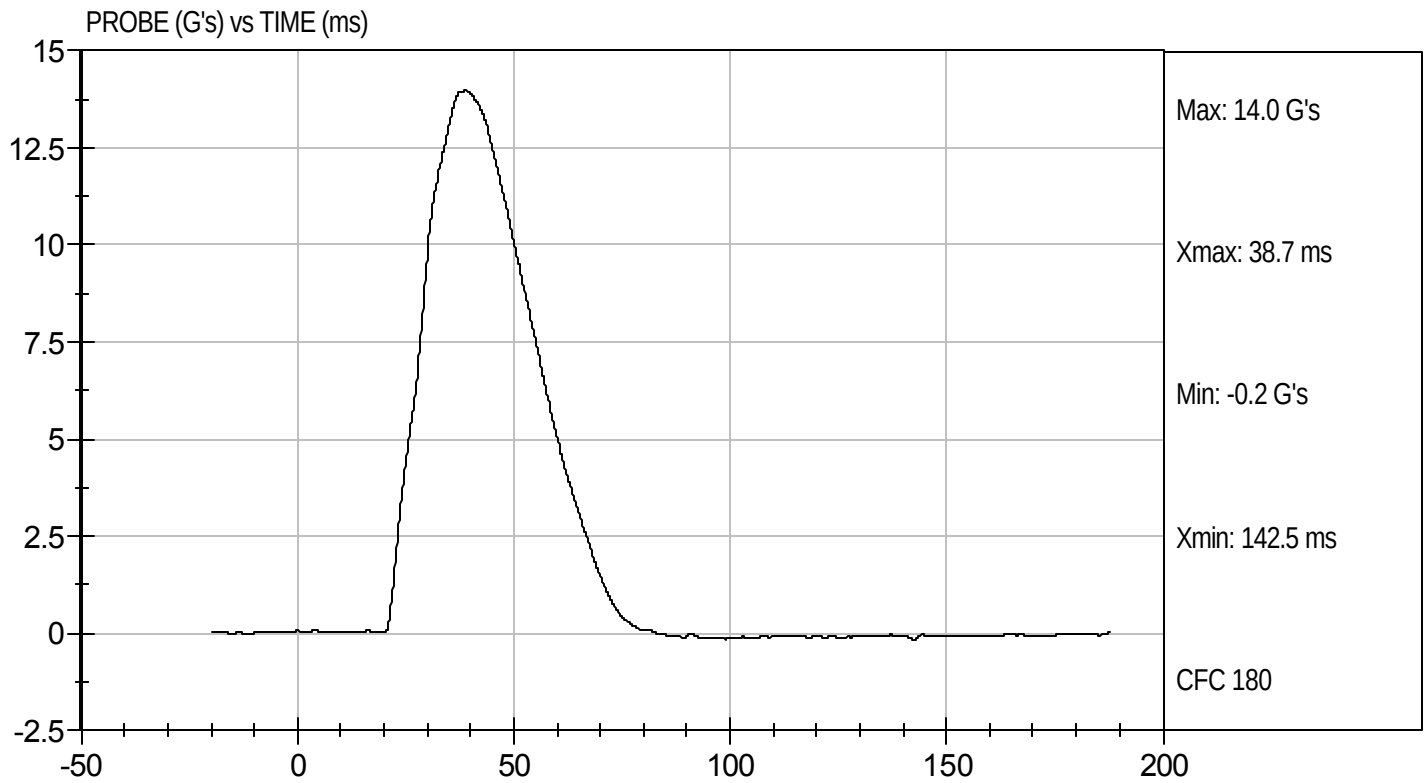
11/3/11
Test Date


Approved By



Test Desc: Abdomen Impact
Component ID: D113676

Test Date: 11/3/11
Velocity: 14.12 ft/s, 4.30 m/s

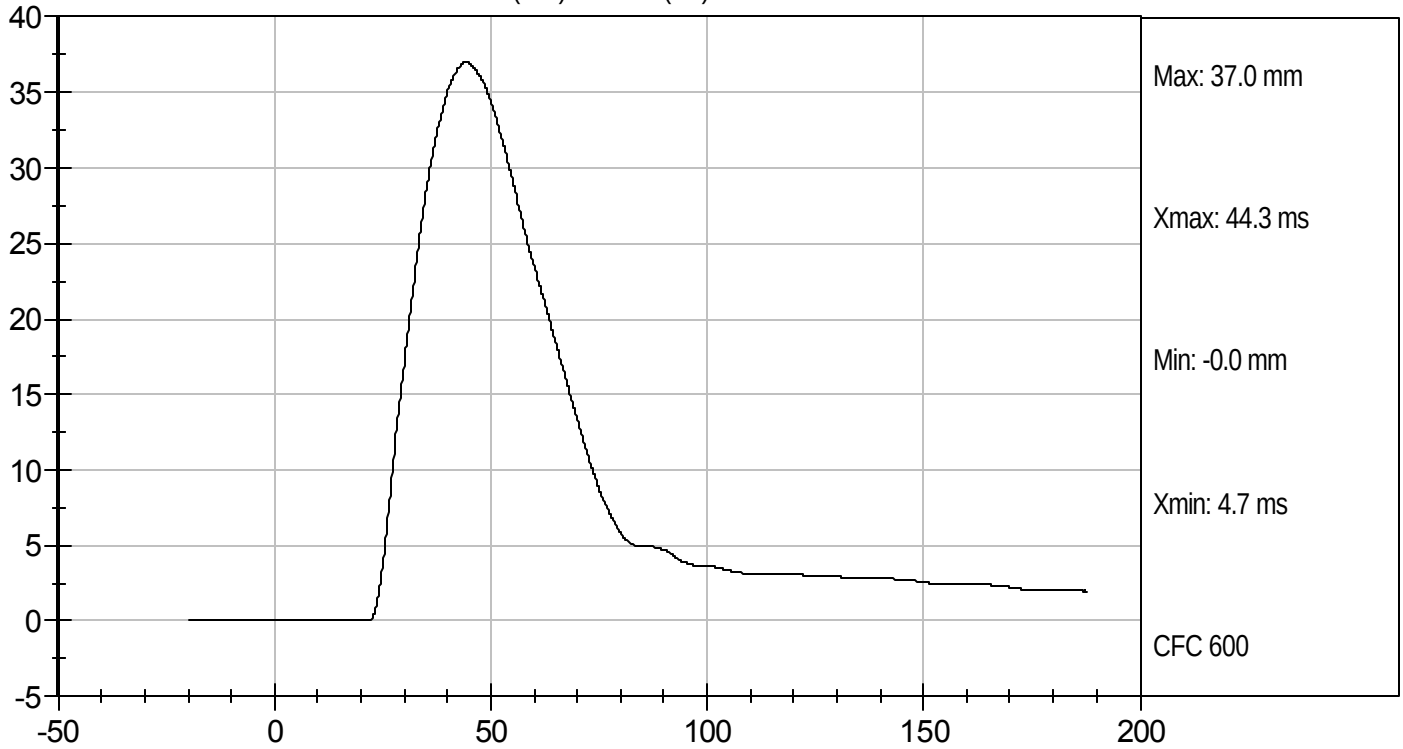




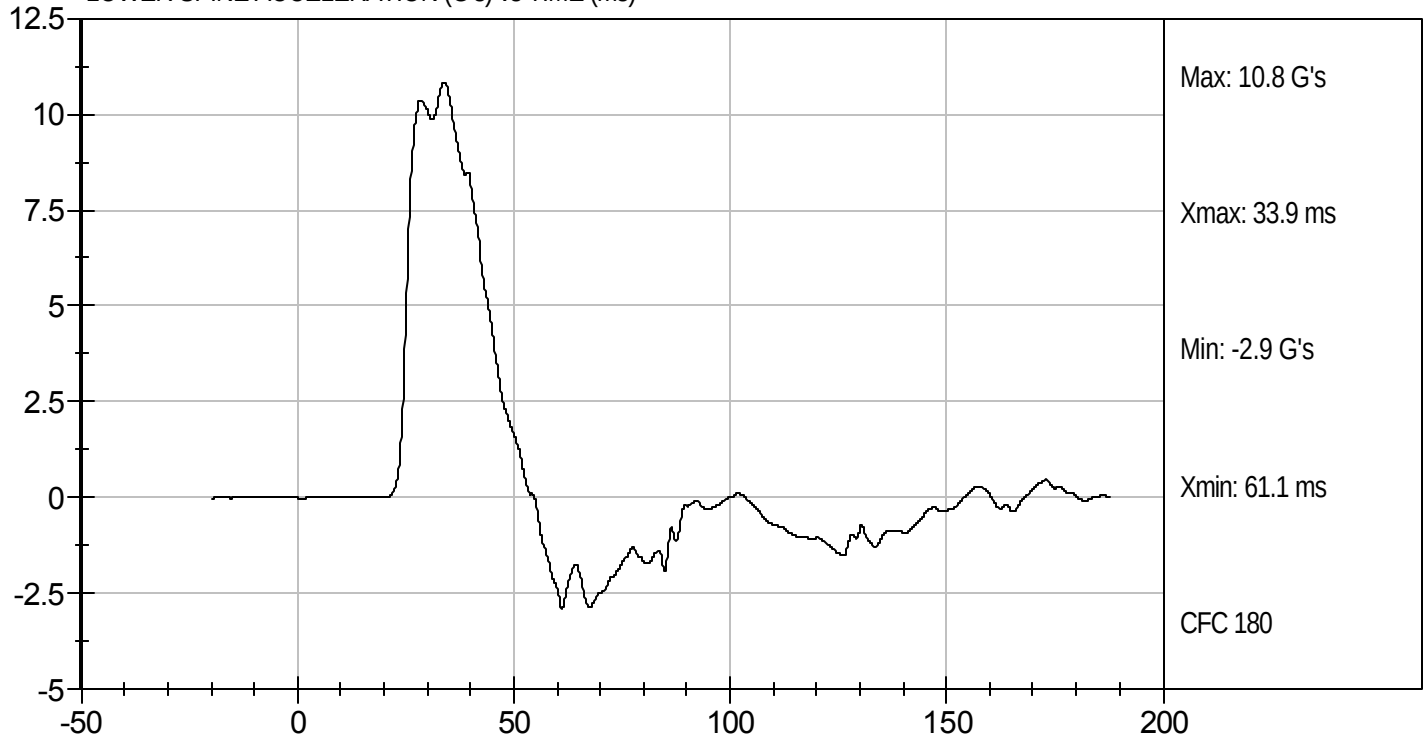
Test Desc: Abdomen Impact
Component ID: D113676

Test Date: 11/3/11
Velocity: 14.12 ft/s, 4.30 m/s

LOWER ABDOMEN RIB DISPLACEMENT (mm) vs TIME (ms)



LOWER SPINE ACCELERATION (G's) vs TIME (ms)

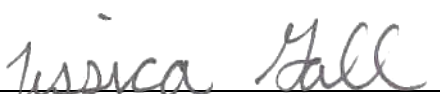


MGA RESEARCH CORPORATION
PELVIS IMPACT TEST
SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

Test I.D: D113677

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.2	Pass
Humidity	%	10 to 70	31	Pass
Impact Velocity	m/s	6.60 to 6.80	6.74	Pass
Peak Impactor Acceleration	G's	38 to 47	42	Pass
Pelvis Y Acceleration after 6 ms	G's	34 to 42	39	Pass
Peak Acetabulum Force	N	3600 to 4300	3763	Pass
Overall Test Results				Pass


Laboratory Technician

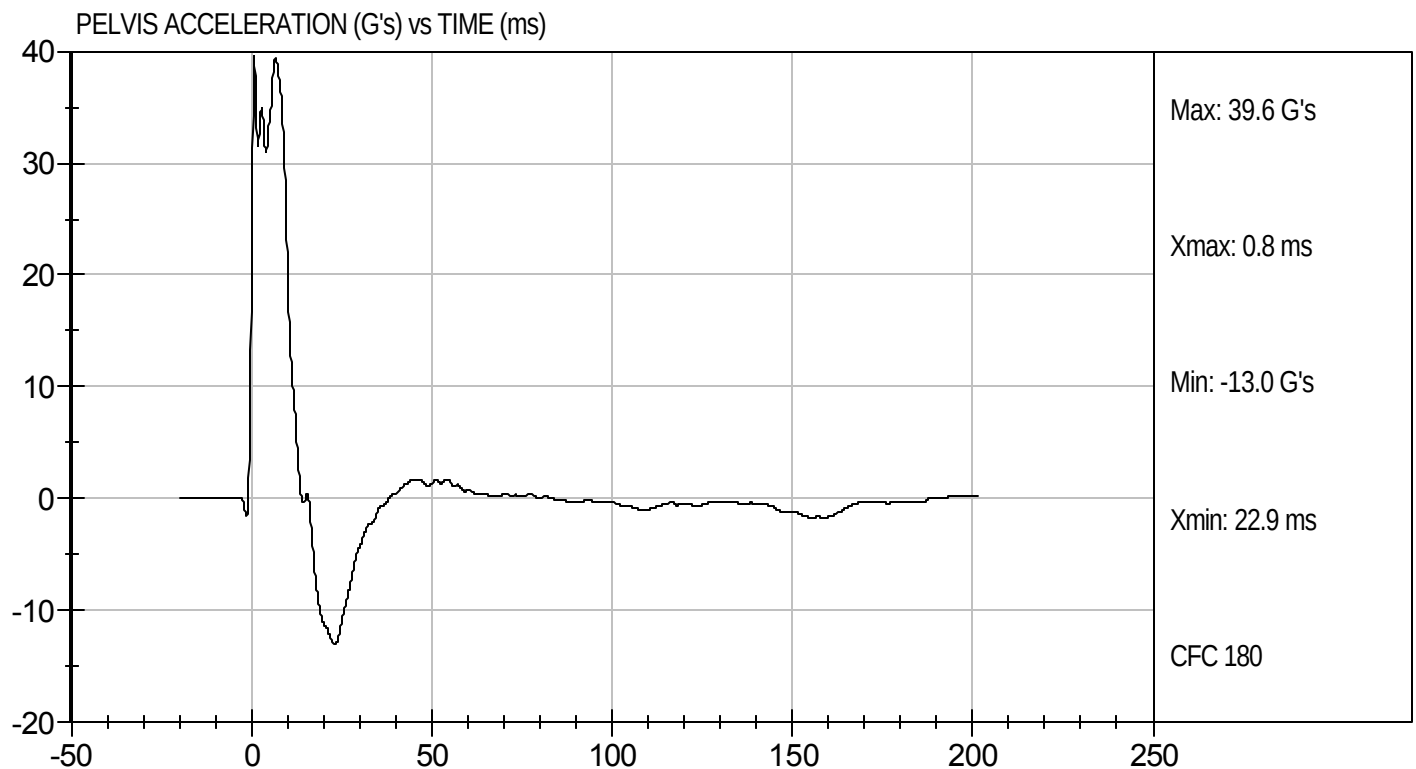
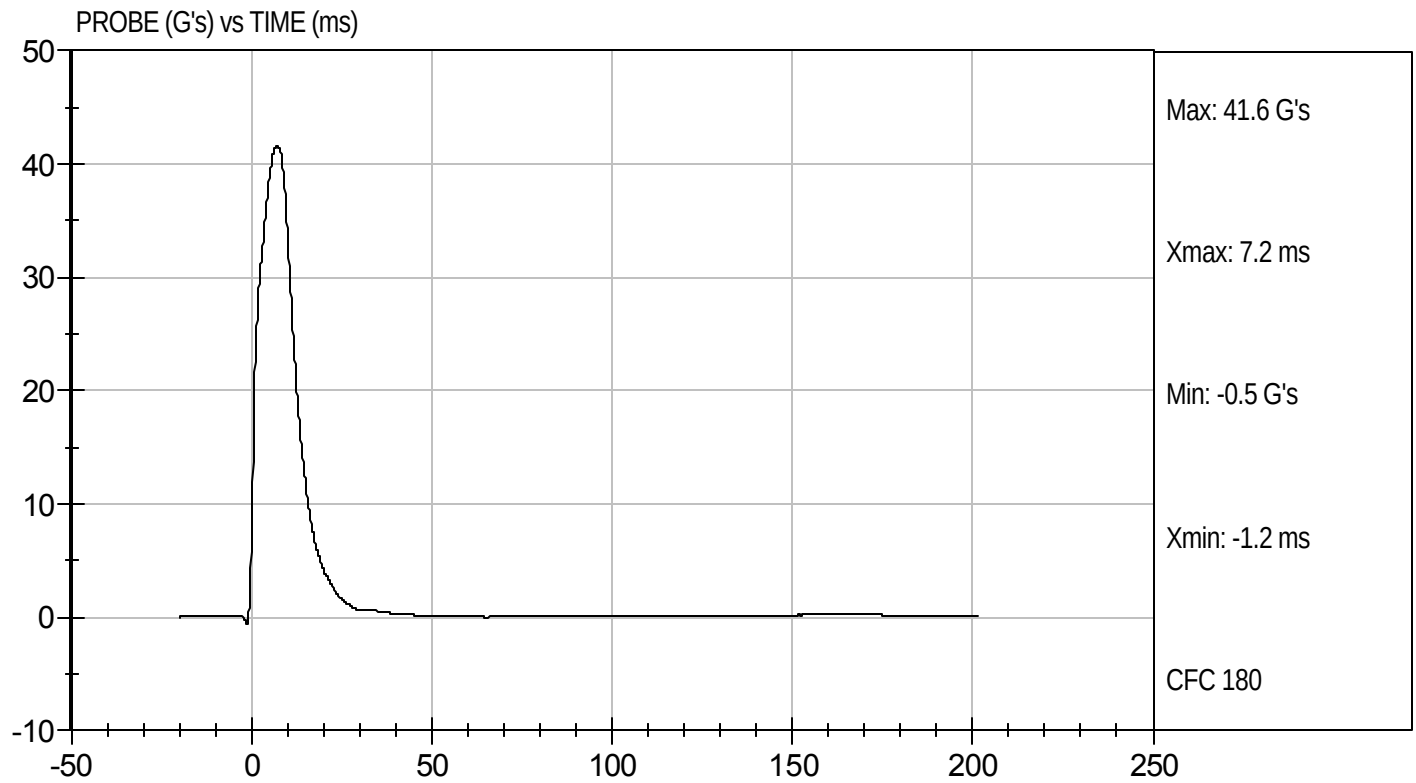
11/3/11
Test Date


Approved By



Test Desc: Pelvis Impact
Component ID: D113677

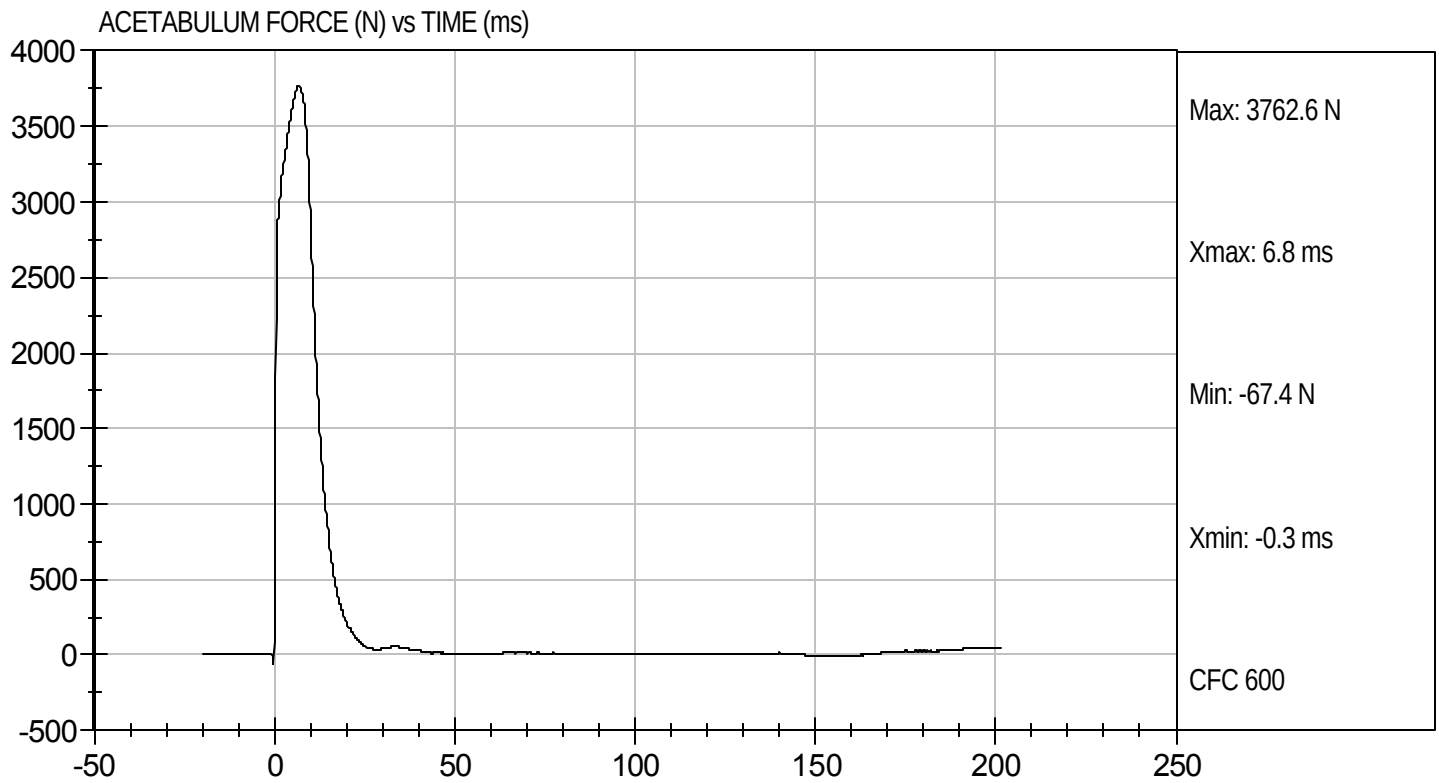
Test Date: 11/3/11
Velocity: 22.12 ft/s, 6.74 m/s





Test Desc: Pelvis Impact
Component ID: D113677

Test Date: 11/3/11
Velocity: 22.12 ft/s, 6.74 m/s

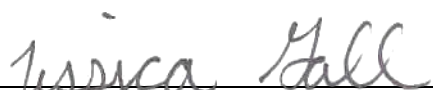


MGA RESEARCH CORPORATION
ILIAC IMPACT TEST
SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

Test I.D: D113678

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.3	Pass
Humidity	%	10 to 70	32	Pass
Impact Velocity	m/s	4.20 to 4.40	4.38	Pass
Peak Impactor Acceleration	G's	36 to 45	39	Pass
Pelvis Y Acceleration	G's	28 to 39	33	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	4722	Pass
Overall Test Results			Pass	


Laboratory Technician

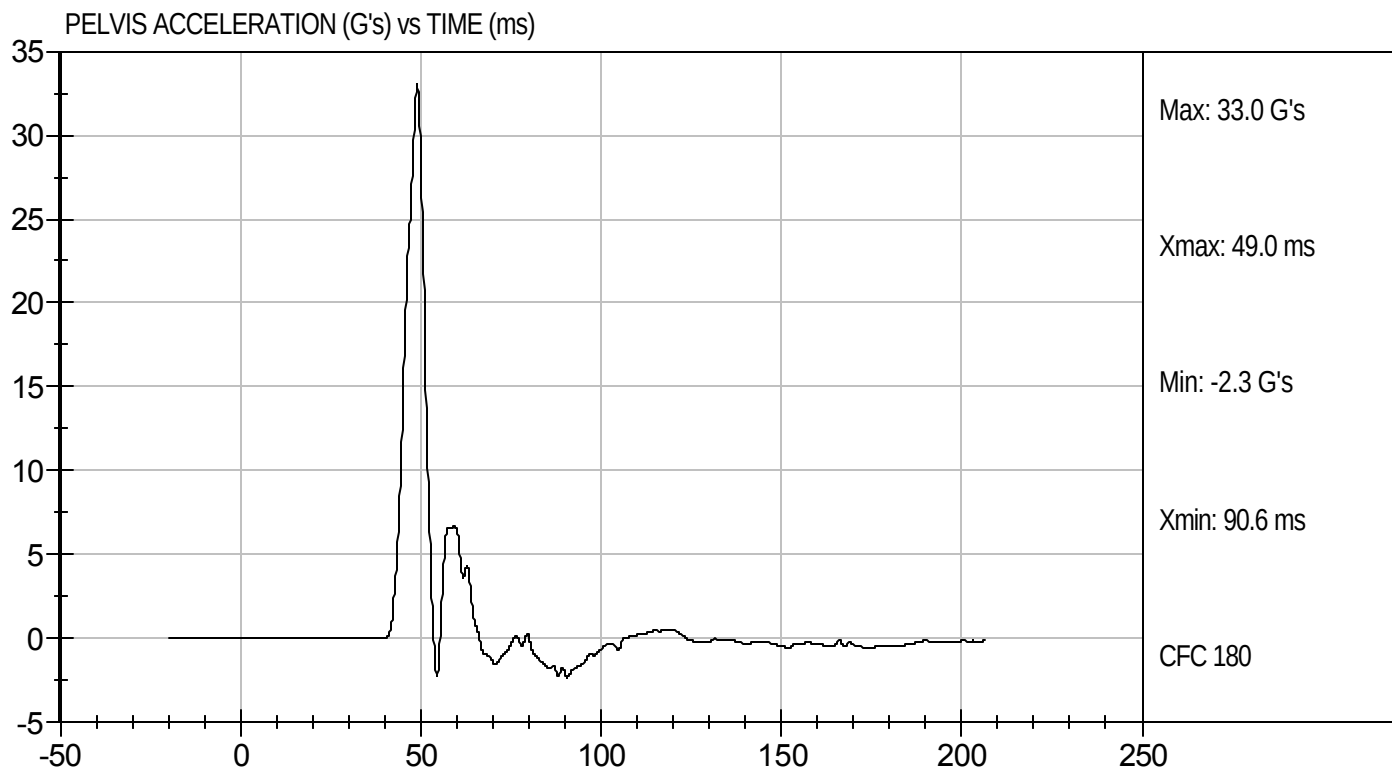
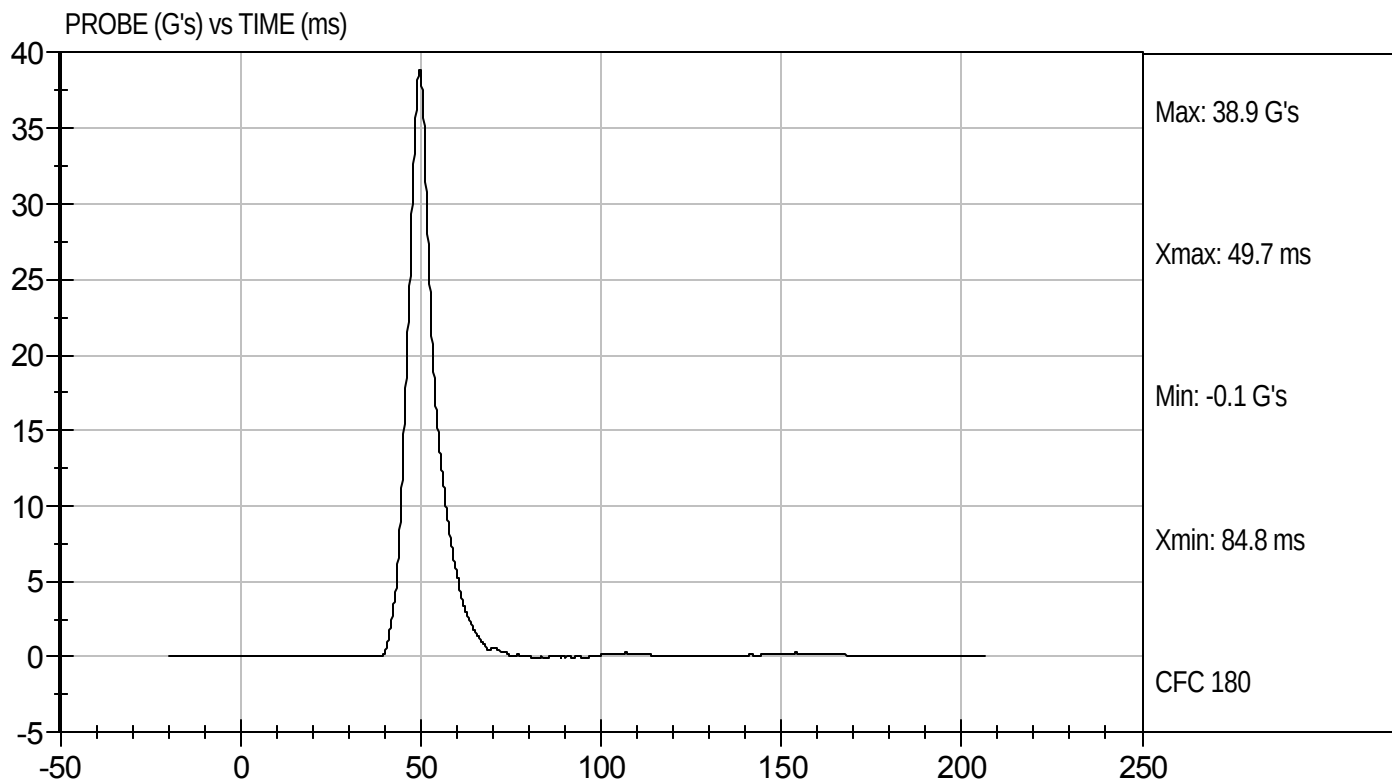
11/3/11
Test Date


Approved By



Test Desc: Iliac Impact
Component ID: D113678

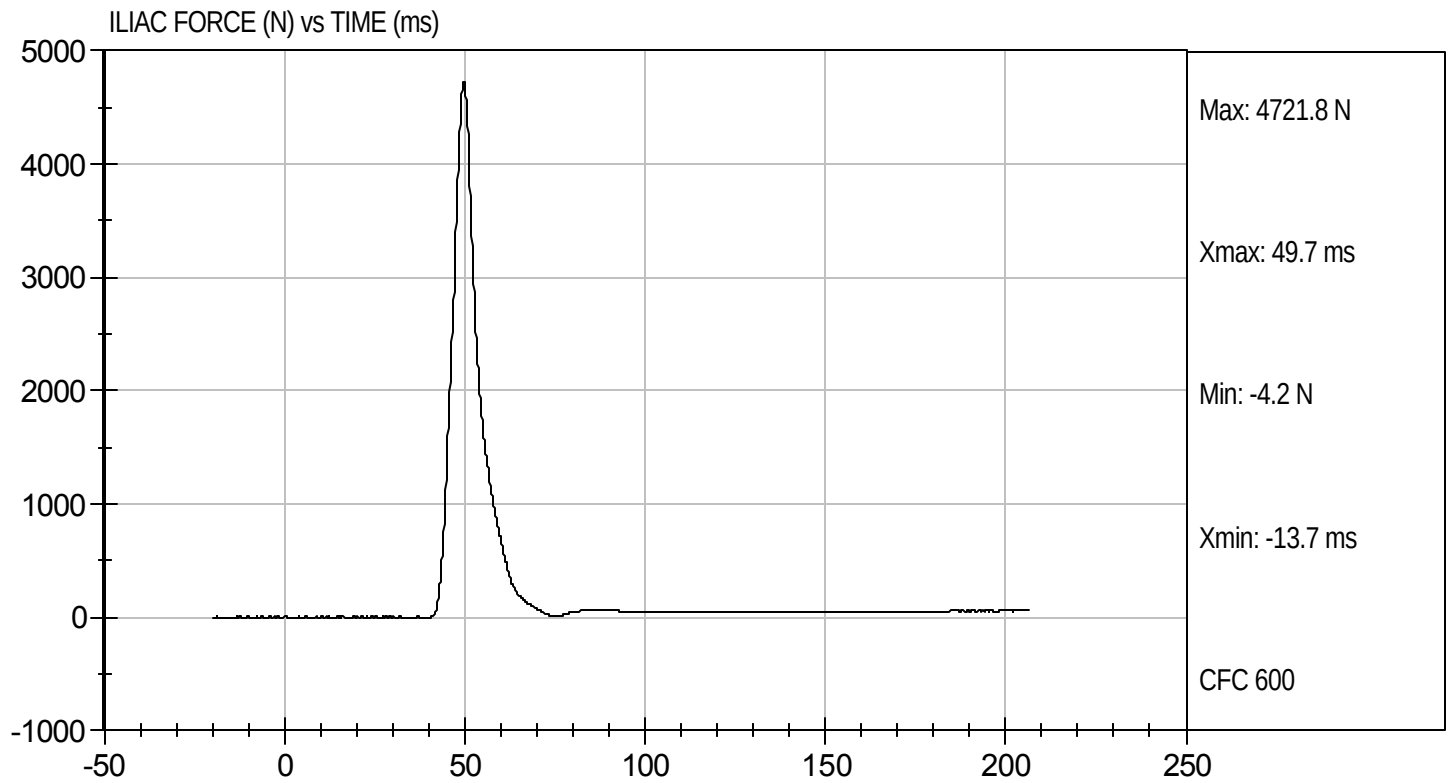
Test Date: 11/3/11
Velocity: 14.36 ft/s, 4.38 m/s





Test Desc: Iliac Impact
Component ID: D113678

Test Date: 11/3/11
Velocity: 14.36 ft/s, 4.38 m/s



MGA RESEARCH CORPORATION
HEAD DROP TEST
SID-Its BUILD LEVEL D DUMMY

ATD Serial No: 306

Test ID: D113731

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	40	Pass
Peak Resultant Acceleration	G's	115 to 137	120	Pass
Peak Lateral Acceleration	G's	+/- 15	-4.3	Pass
Unimodal	N/A	<15%	Yes	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

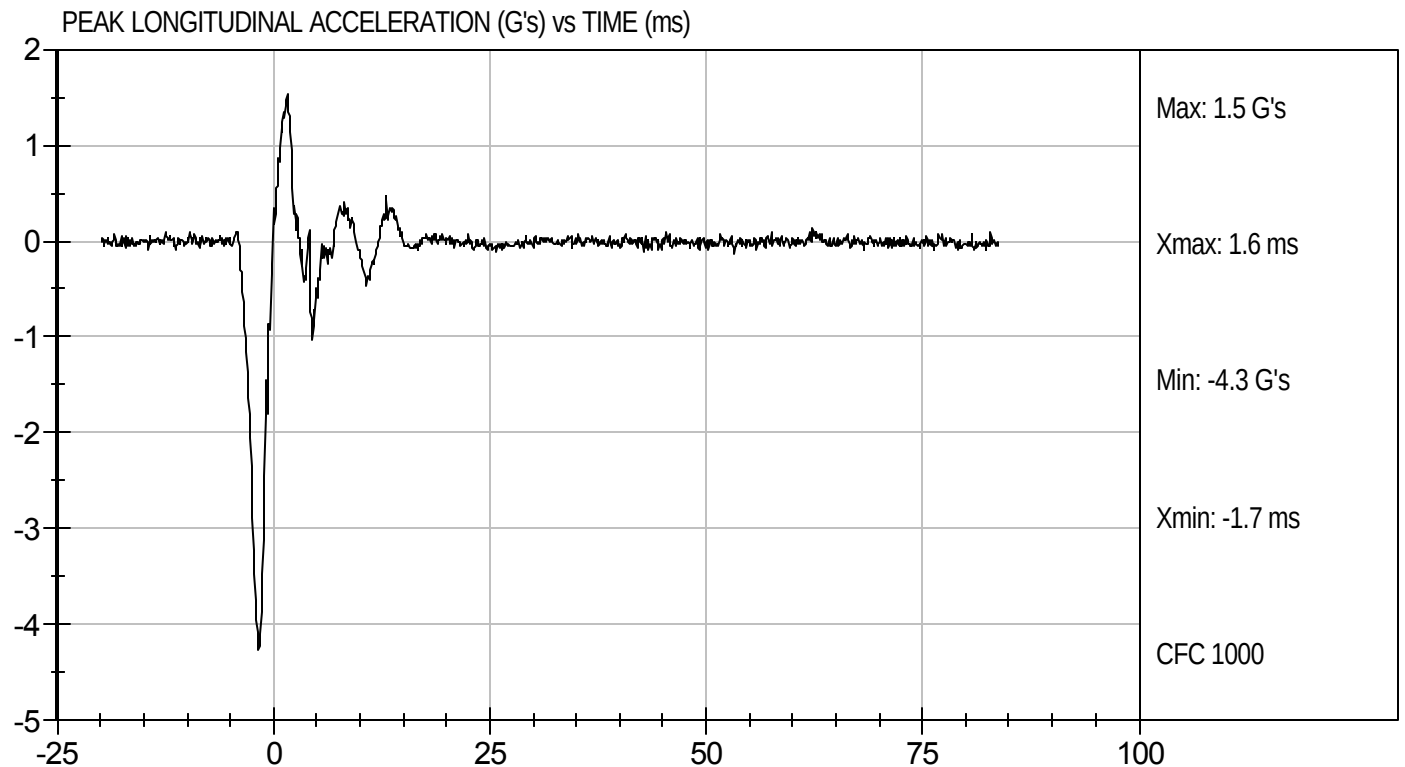
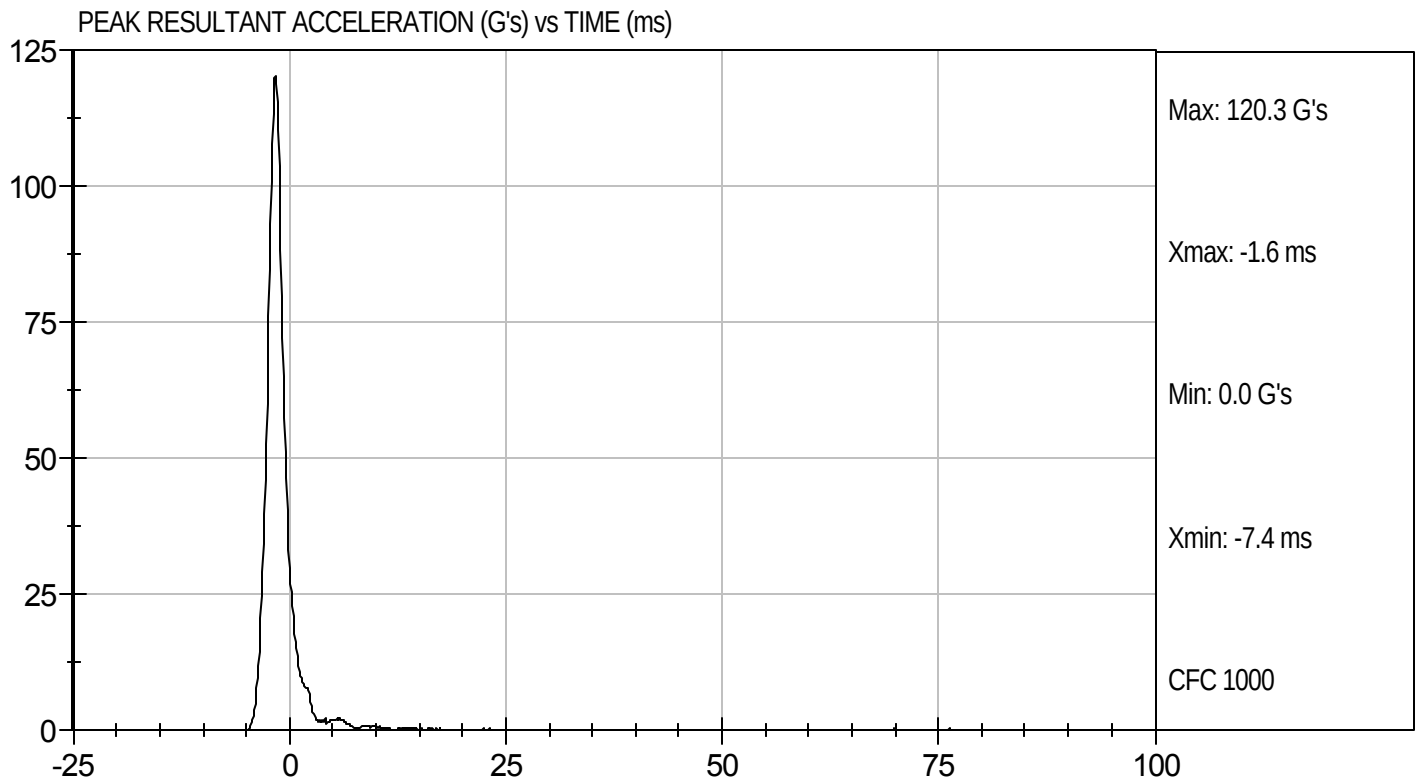
11/9/11
Test Date

David Winkelbauer
Approved By



Test Desc: Head Drop
Component ID: D113731

Test Date: 11/9/11
Velocity: 0 ft/s, 0 m/s

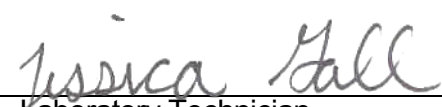


MGA RESEARCH CORPORATION
LATERAL NECK PENDULUM TEST
SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

Test I.D.: D113732

Tested Parameter		Units	Specification	Result	Pass/Fail
Temperature		deg C	20.6 to 22.2	21.2	Pass
Humidity		%	10 to 70	40	Pass
Impact Velocity		m/s	5.51 to 5.63	5.52	Pass
Delta Velocity	10 ms	m/s	2.20 to 2.80	2.47	Pass
	15 ms	m/s	3.30 to 4.10	3.48	Pass
	20 ms	m/s	4.40 to 5.40	4.65	Pass
	25 ms	m/s	5.40 to 6.10	5.45	Pass
	25-100 ms	m/s	5.50 to 6.20	5.52	Pass
Maximum D-Plane Rotation		deg	71 to 81	72	Pass
Time of Maximum D-Plane Rotation		ms	50 to 70	58	Pass
Maximum Occipital Condyle Moment during Rotation Interval Nm			-44 to -36	-40	Pass
Time of Moment Decay to 0 Nm		ms	102 to 126	117	Pass
Overall Test Results				Pass	


 Laboratory Technician

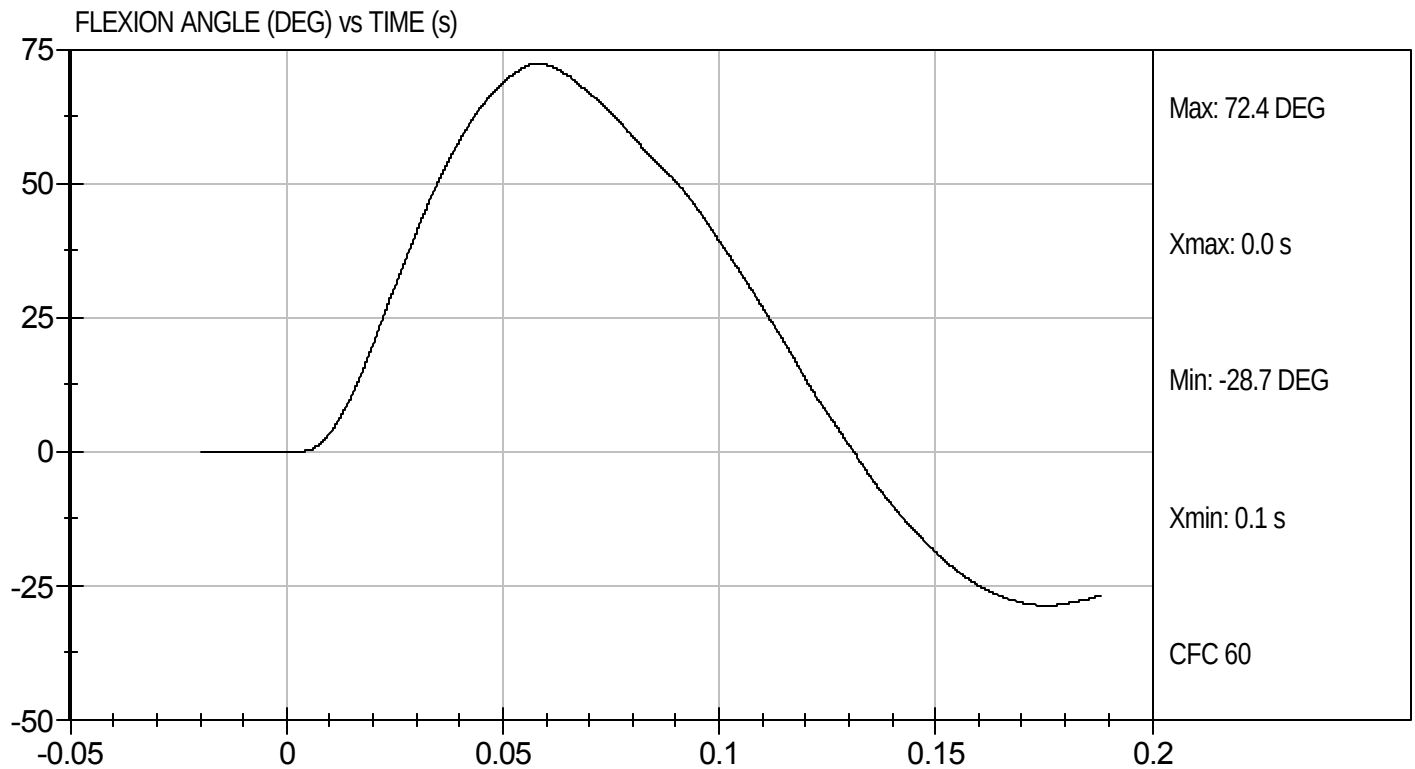
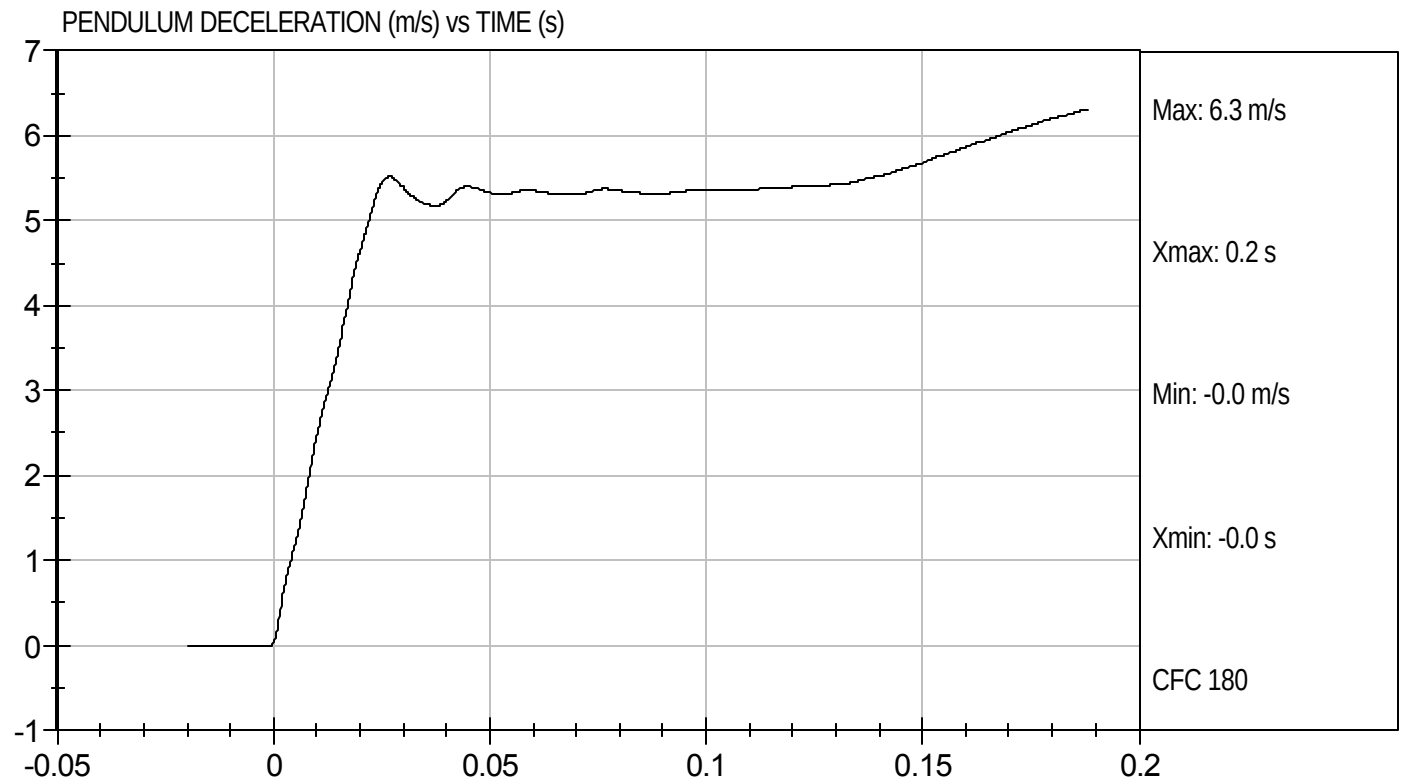
11/9/11
 Test Date


 Approved By



Test Desc: Neck Bending
Component ID: D113732

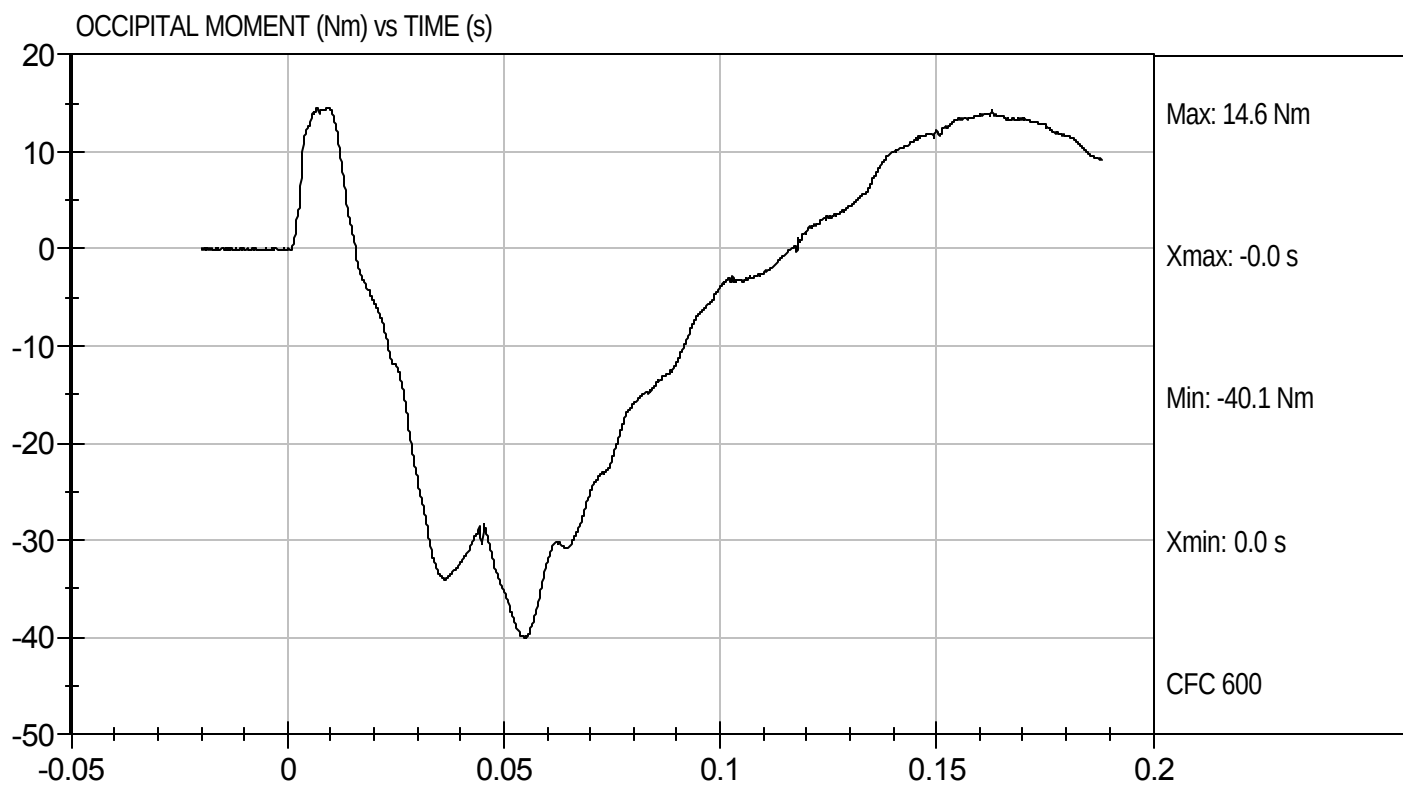
Test Date: 11/9/11
Velocity: 18.12 ft/s, 5.52 m/s





Test Desc: Neck Bending
Component ID: D113732

Test Date: 11/9/11
Velocity: 18.12 ft/s, 5.52 m/s

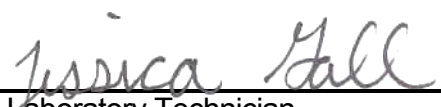


MGA RESEARCH CORPORATION
SHOULDER IMPACT TEST
SID-Its BUILD LEVEL D DUMMY

ATD Serial No: 306

Test ID: D113733

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	39	Pass
Impact Velocity	m/s	4.20 to 4.40	4.34	Pass
Maximum Probe Acceleration	G's	13 to 18	15	Pass
Shoulder Displacement	mm	28 to 37	29	Pass
Upper Spine (T1) Y Acceleration	G's	17 to 22	19	Pass
Overall Test Results				Pass


Laboratory Technician

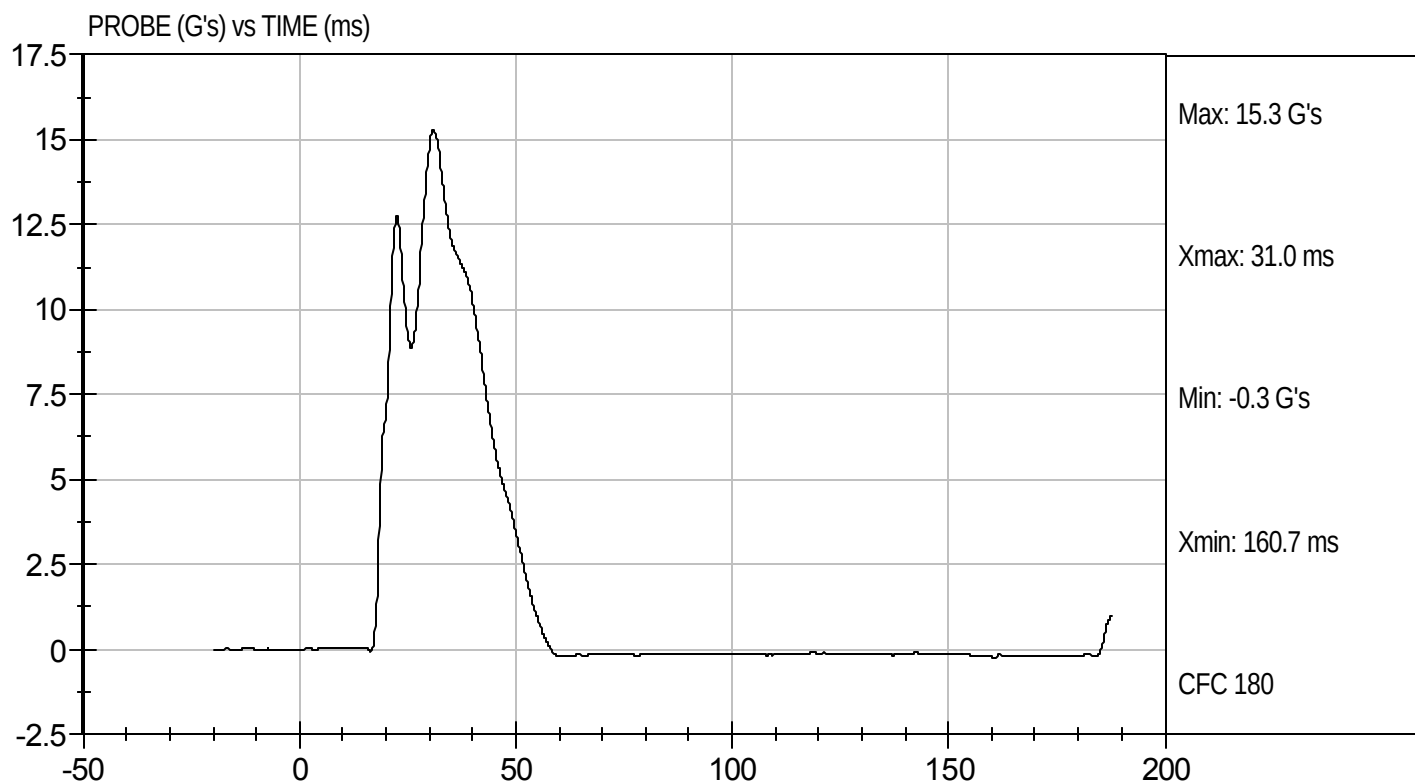
11/9/11
Test Date


Approved By



Test Desc: Shoulder Impact
Component ID: D113733

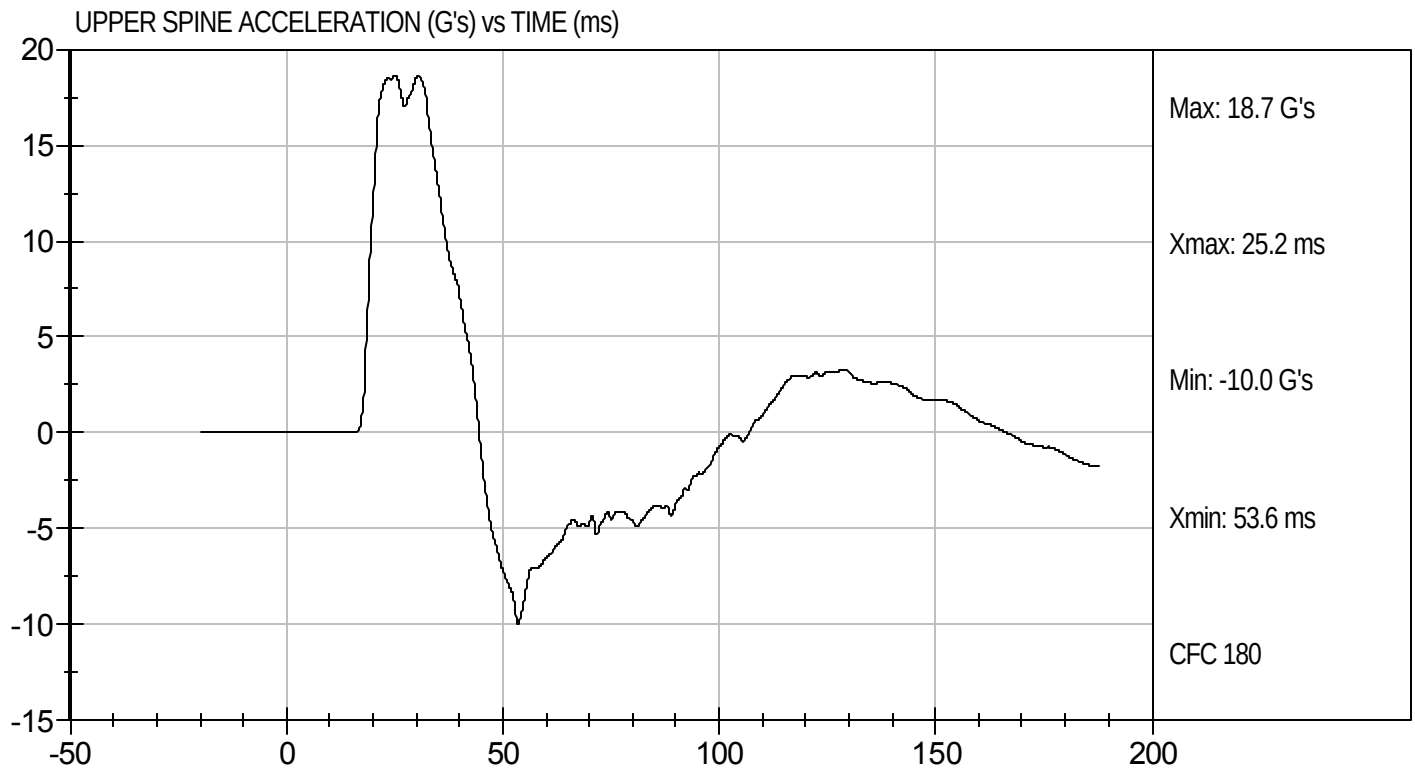
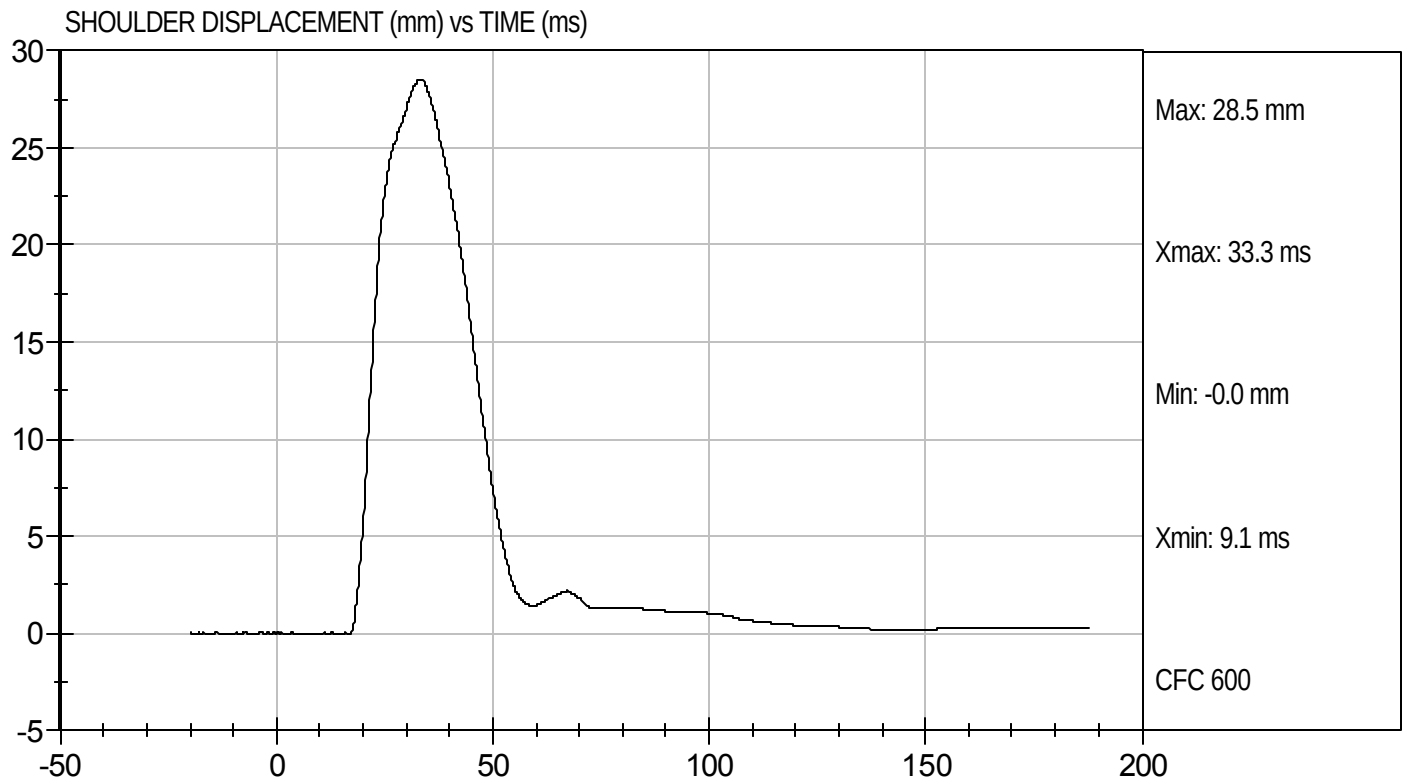
Test Date: 11/9/11
Velocity: 14.25 ft/s, 4.34 m/s





Test Desc: Shoulder Impact
Component ID: D113733

Test Date: 11/9/11
Velocity: 14.25 ft/s, 4.34 m/s



MGA RESEARCH CORPORATION
THORAX (WITH ARM) IMPACT TEST
SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

Test I.D: D113734

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.3	Pass
Humidity	%	10 to 70	39	Pass
Impact Velocity	m/s	6.60 to 6.80	6.77	Pass
Peak Impactor Acceleration	G's	30 to 36	33	Pass
Shoulder Displacement	mm	31 to 40	31	Pass
Upper Rib Displacement	mm	25 to 32	28	Pass
Middle Rib Displacement	mm	30 to 36	31	Pass
Lower Rib Displacement	mm	32 to 38	34	Pass
Upper Spine (T1) Y Acceleration	G's	34 to 43	39	Pass
Lower Spine (T12) Y Acceleration	G's	29 to 37	31	Pass
Overall Test Results				Pass


 Laboratory Technician

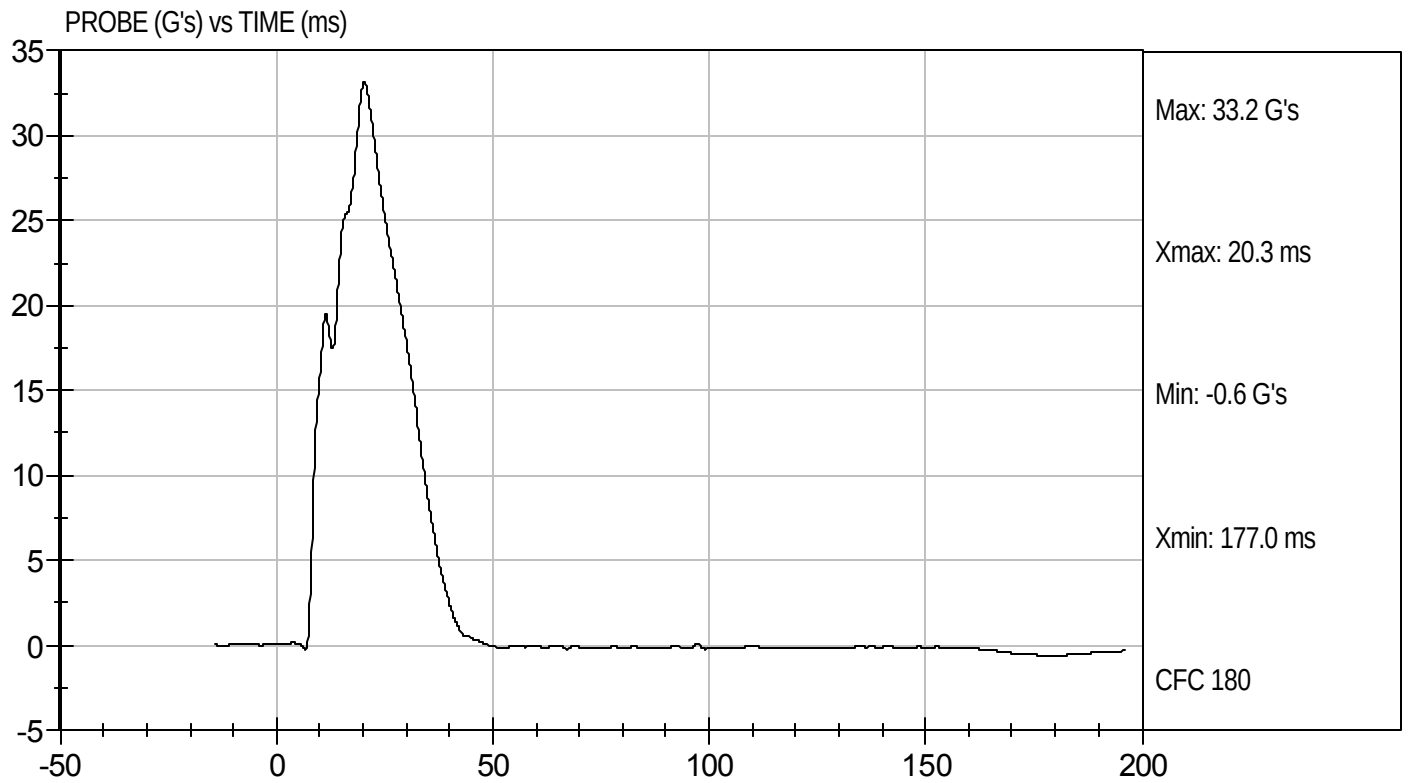
11/9/11
 Test Date


 Approved By



Test Desc: Thorax With Arm
Component ID: D113734

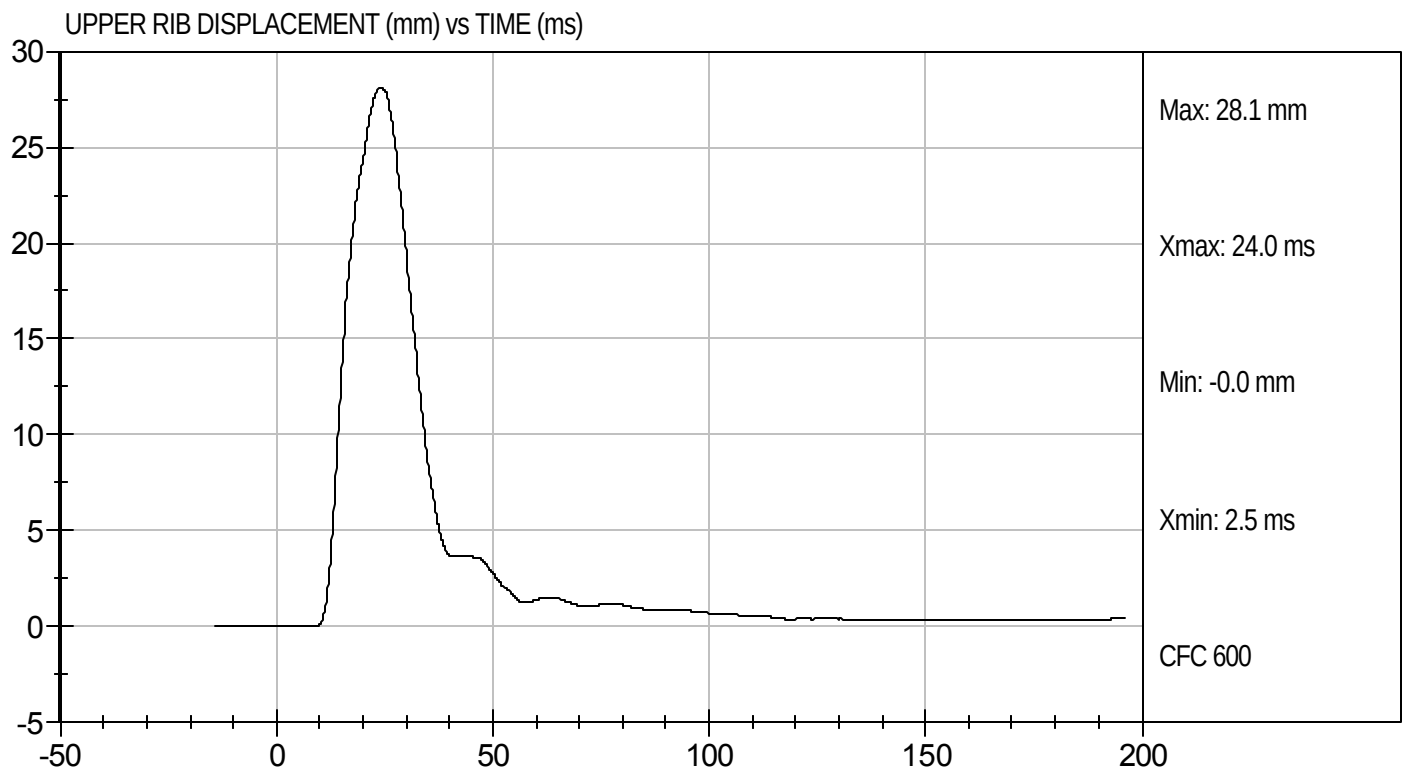
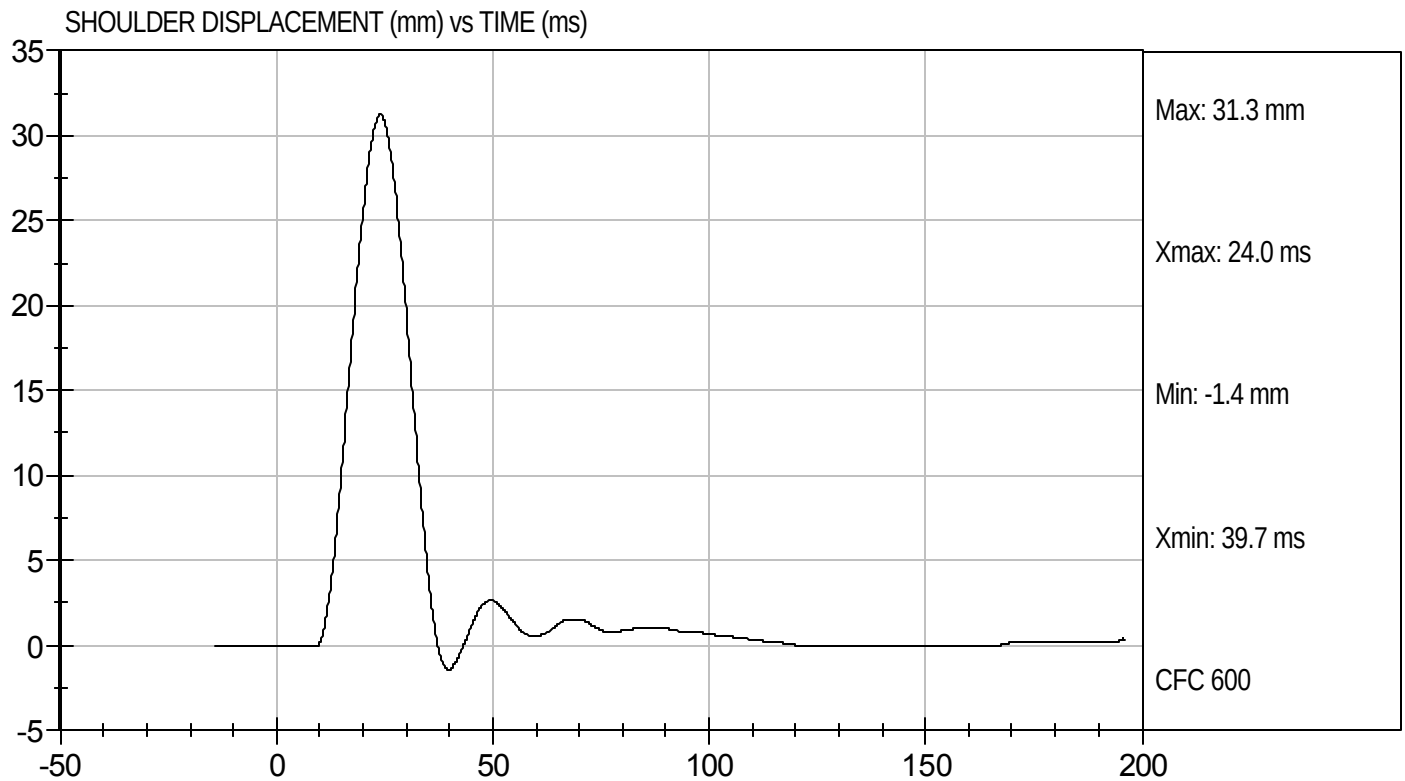
Test Date: 11/9/11
Velocity: 22.22 ft/s, 6.77 m/s





Test Desc: Thorax With Arm
Component ID: D113734

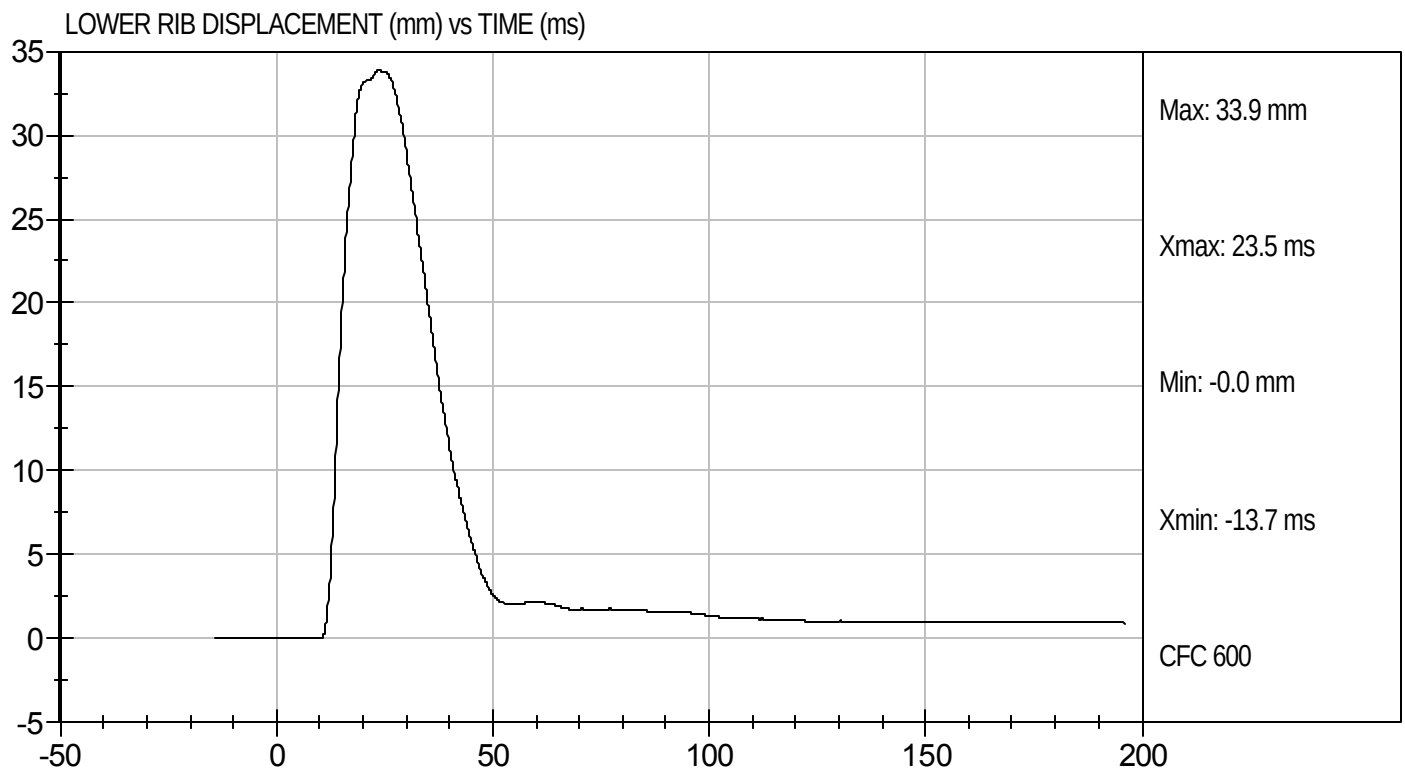
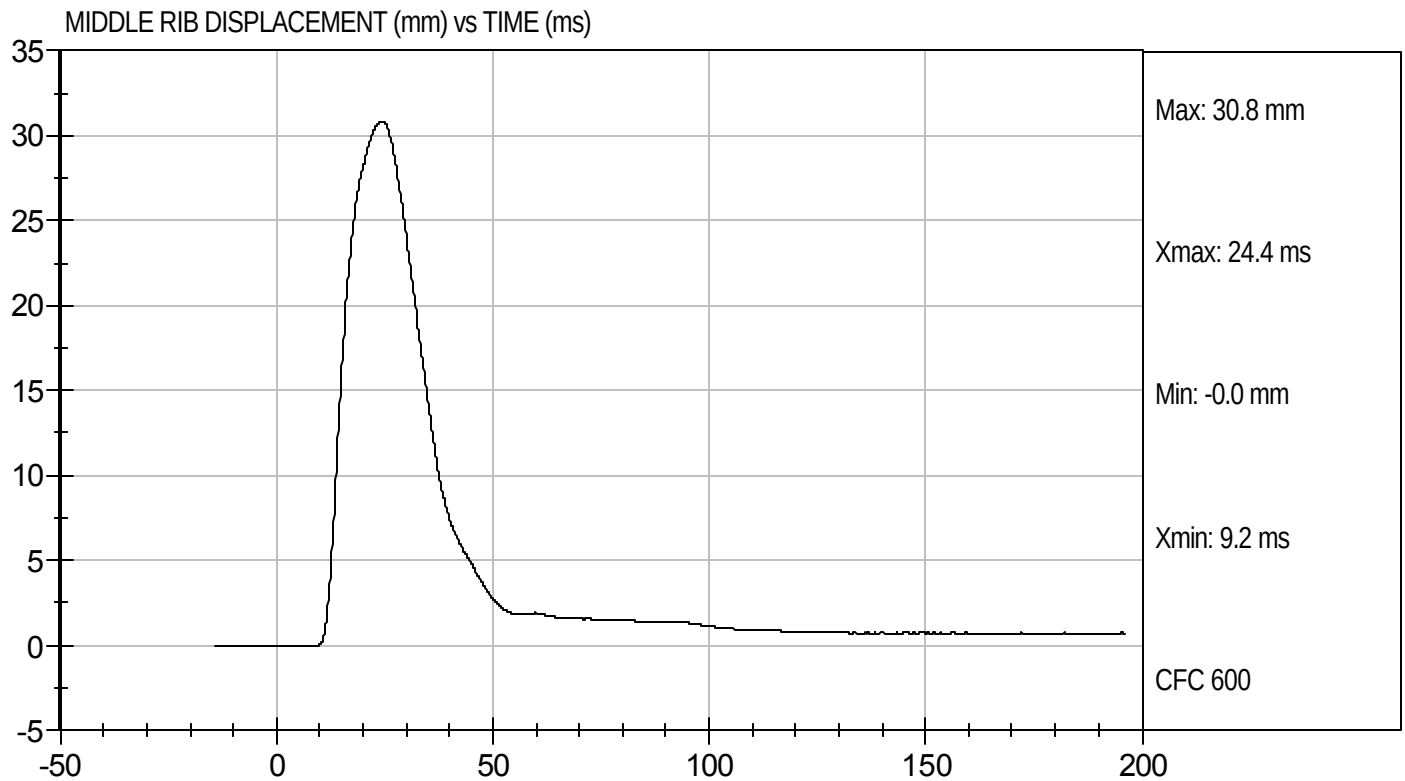
Test Date: 11/9/11
Velocity: 22.22 ft/s, 6.77 m/s





Test Desc: Thorax With Arm
Component ID: D113734

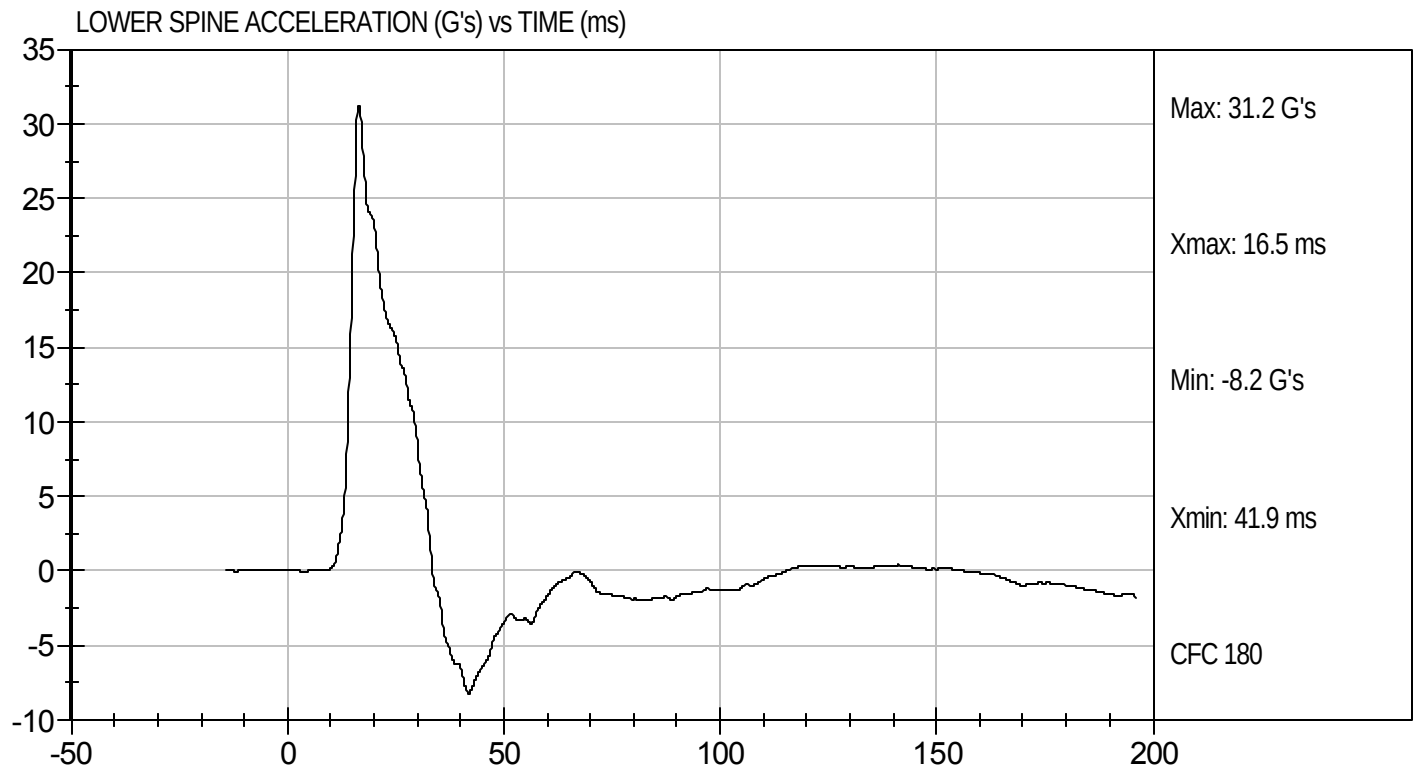
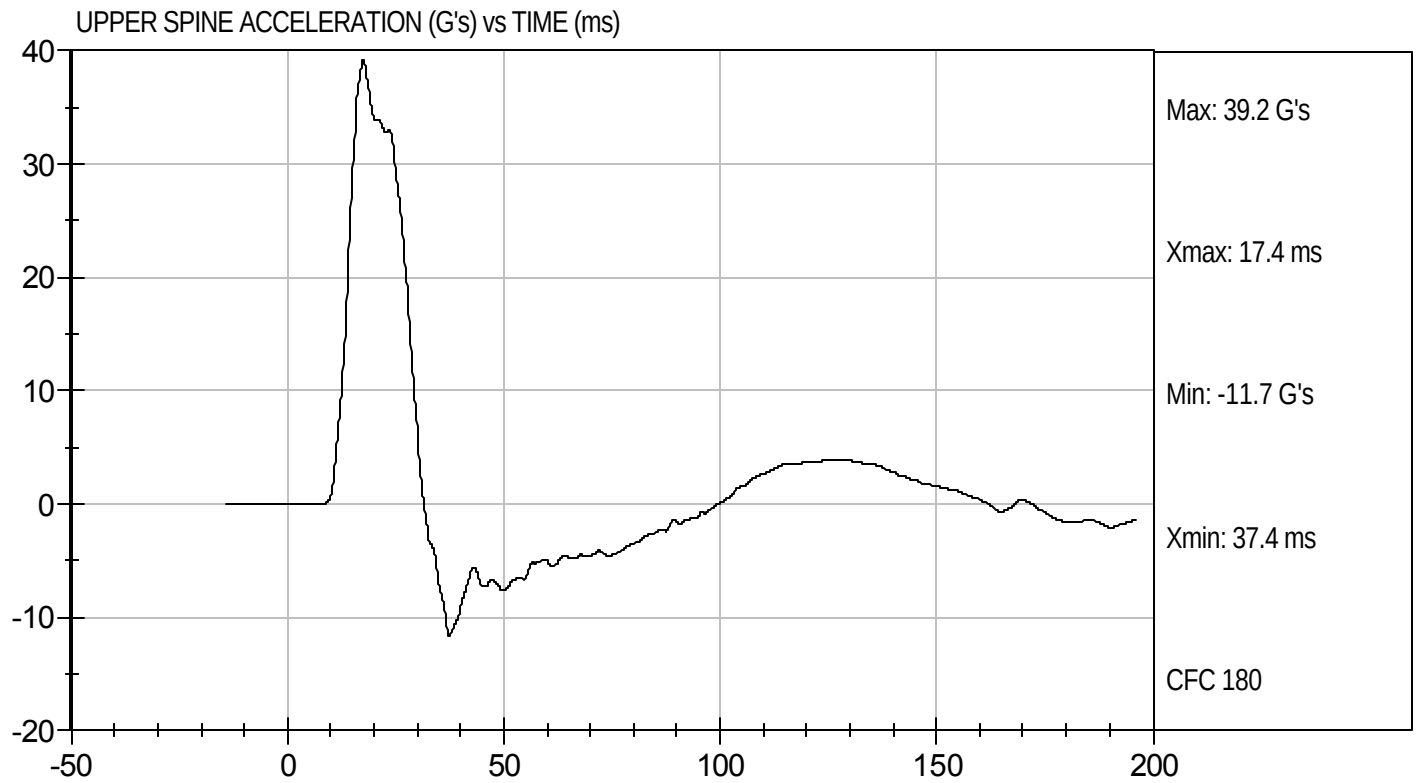
Test Date: 11/9/11
Velocity: 22.22 ft/s, 6.77 m/s





Test Desc: Thorax With Arm
Component ID: D113734

Test Date: 11/9/11
Velocity: 22.22 ft/s, 6.77 m/s



MGA RESEARCH CORPORATION
THORAX (WITHOUT ARM) IMPACT TEST
SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

Test I.D: D113735

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.3	Pass
Humidity	%	10 to 70	38	Pass
Impact Velocity	m/s	4.20 to 4.40	4.30	Pass
Peak Impactor Force	G's	14 to 18	15	Pass
Upper Rib Displacement	mm	32 to 40	38	Pass
Middle Rib Displacement	mm	39 to 45	41	Pass
Lower Rib Displacement	mm	35 to 43	40	Pass
Upper Spine (T1) Y Acceleration	G's	13 to 17	15	Pass
Lower Spine (T12) Y Acceleration	G's	7 to 11	9	Pass
Overall Test Results			Pass	


Laboratory Technician

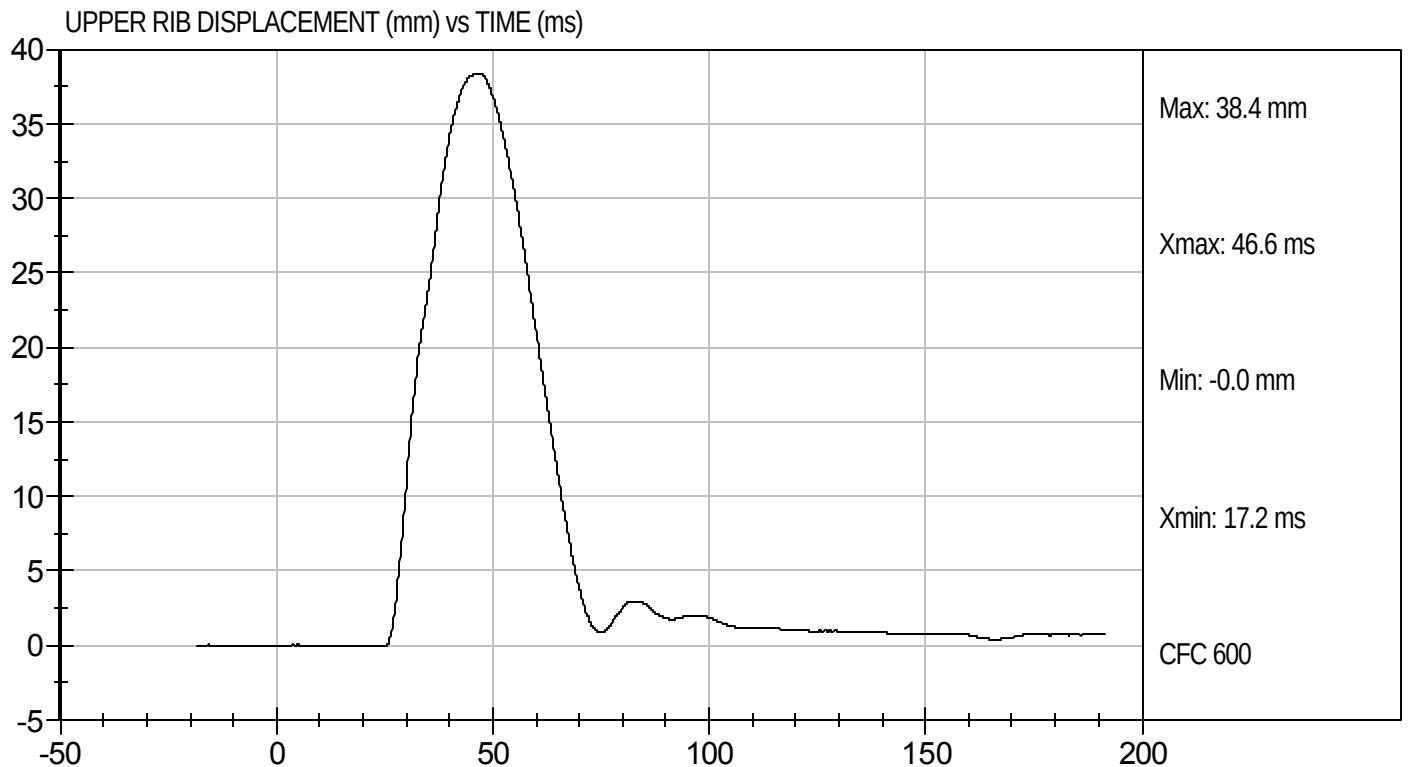
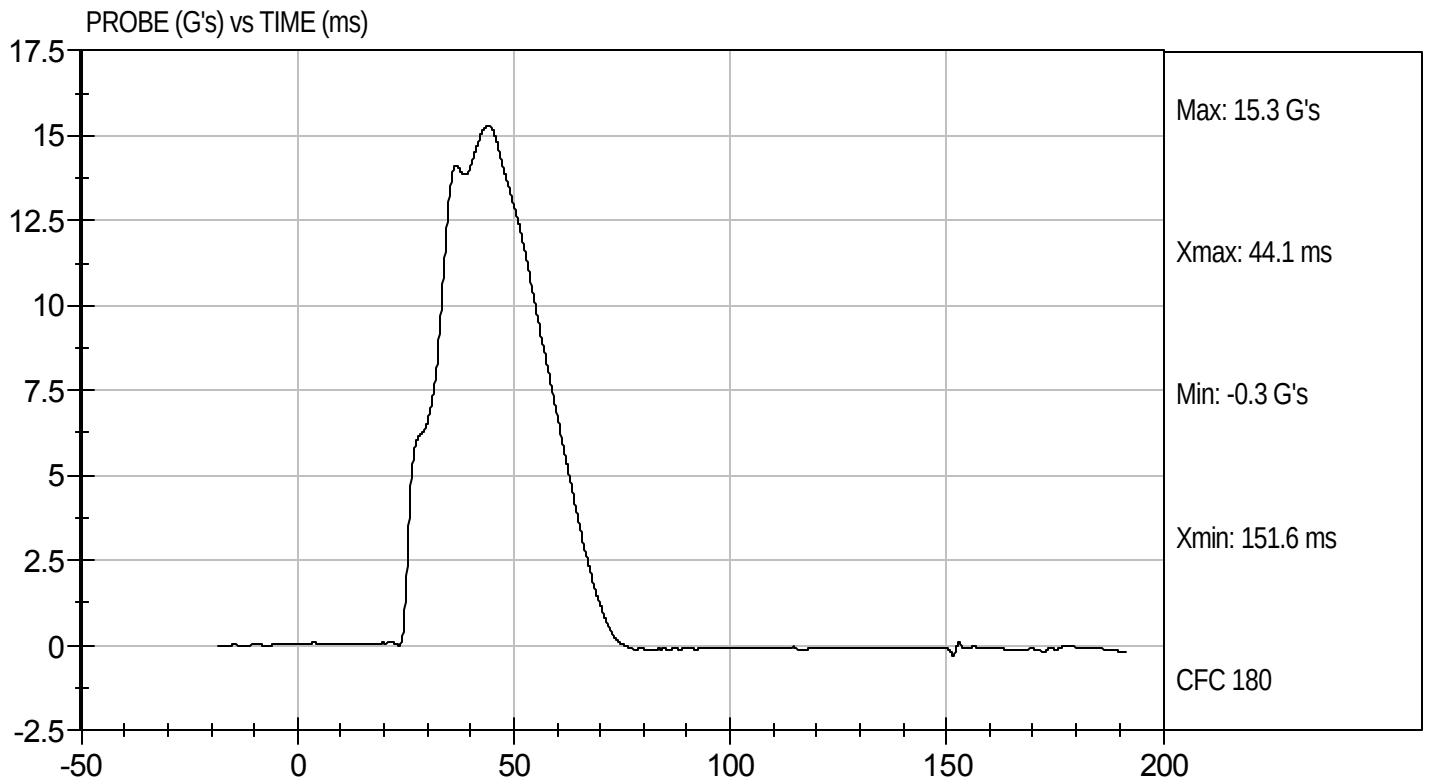
11/9/11
Test Date


Approved By



Test Desc: Thorax Without Arm
Component ID: D113735

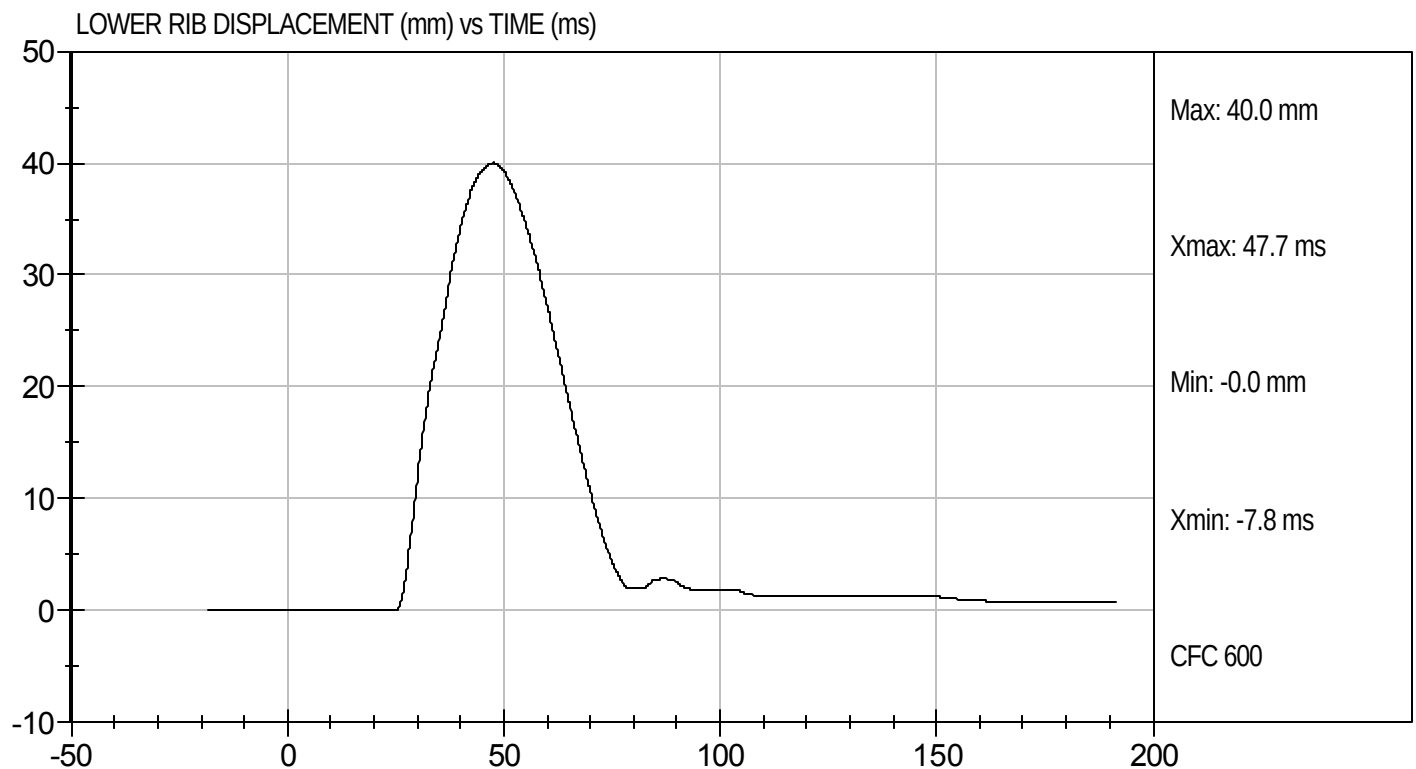
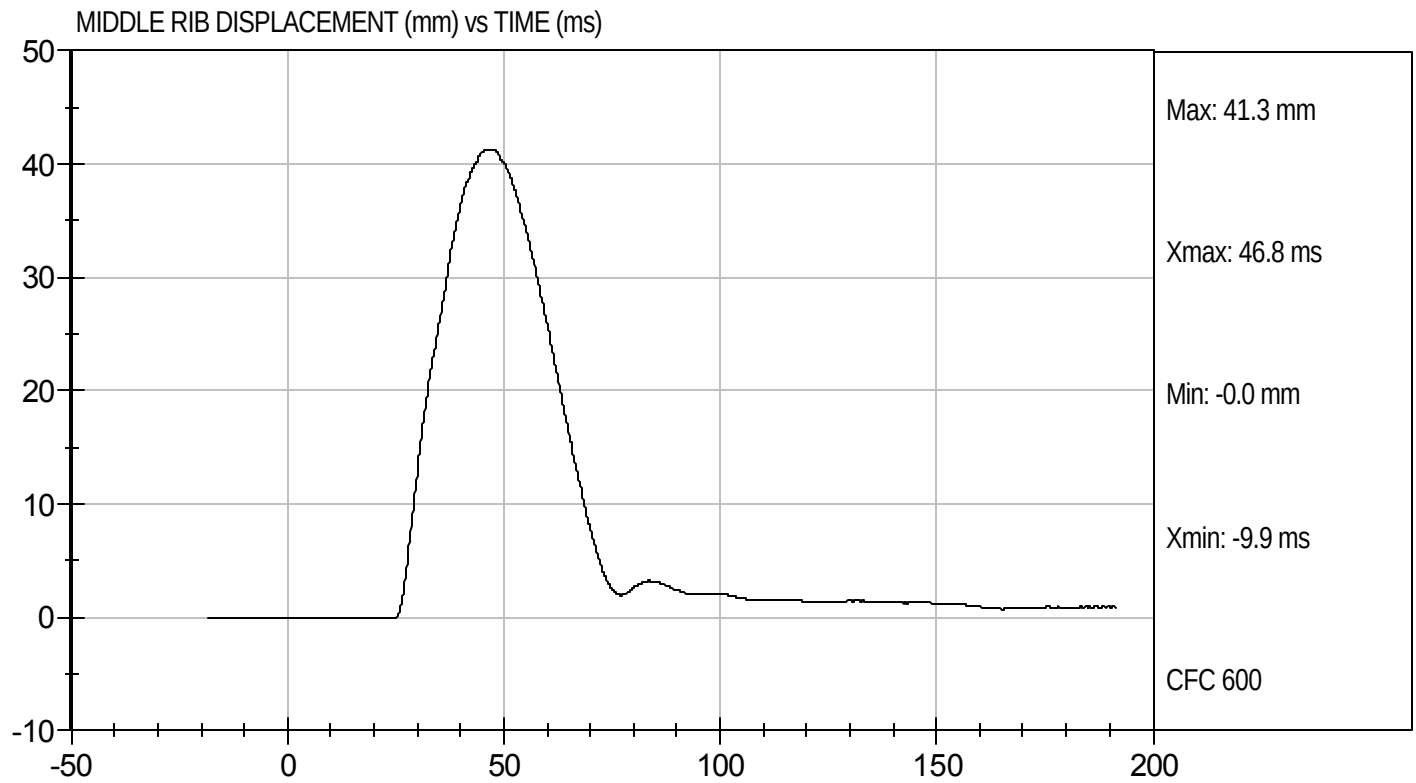
Test Date: 11/9/11
Velocity: 14.12 ft/s, 4.30 m/s





Test Desc: Thorax Without Arm
Component ID: D113735

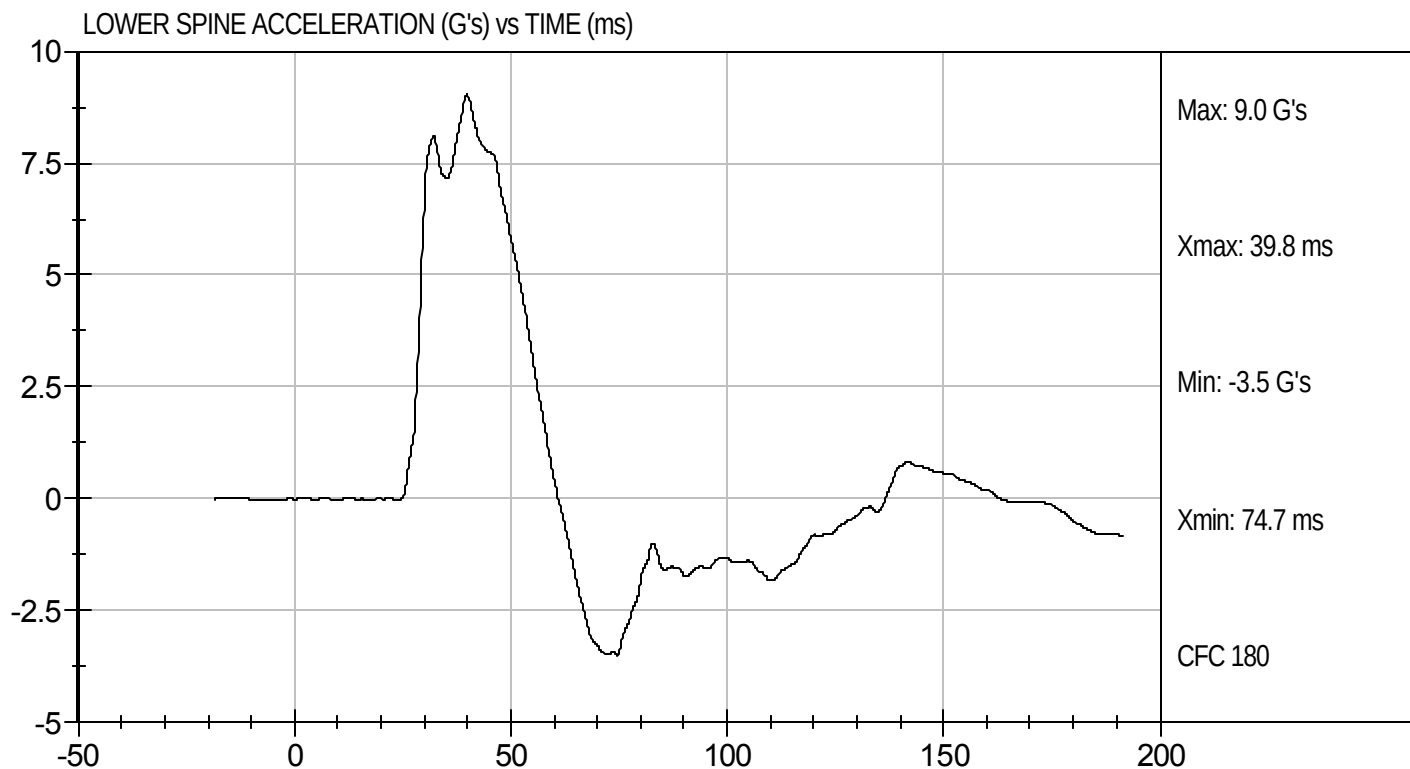
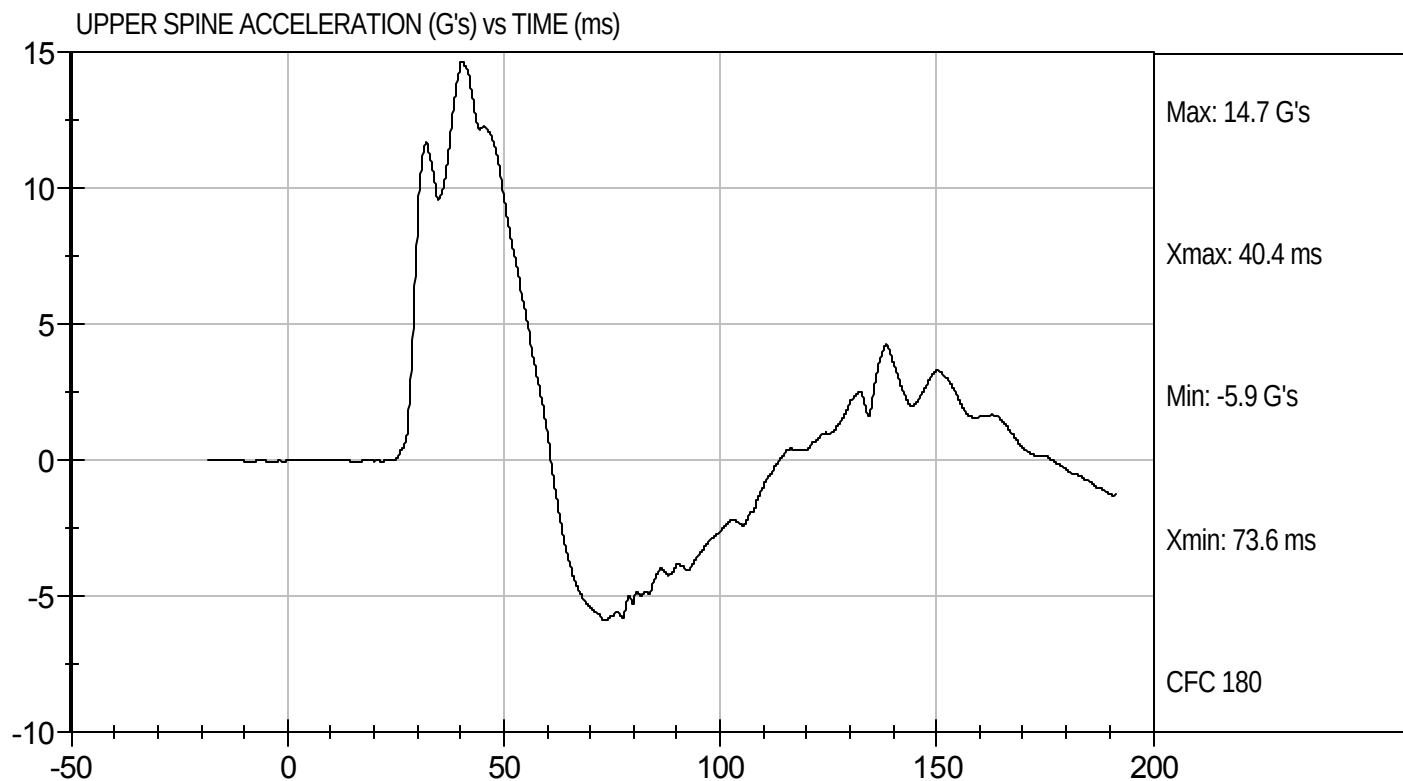
Test Date: 11/9/11
Velocity: 14.12 ft/s, 4.30 m/s





Test Desc: Thorax Without Arm
Component ID: D113735

Test Date: 11/9/11
Velocity: 14.12 ft/s, 4.30 m/s



MGA RESEARCH CORPORATION
ABDOMINAL IMPACT TEST
SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

Test I.D: D113736

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.4	Pass
Humidity	%	10 to 70	38	Pass
Impact Velocity	m/s	4.20 to 4.40	4.38	Pass
Peak Impactor Acceleration	G's	12 to 16	14	Pass
Upper Rib Displacement	mm	36 to 47	40	Pass
Lower Rib Displacement	mm	33 to 44	37	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	11	Pass
Overall Test Results			Pass	

Jessica Hall
Laboratory Technician

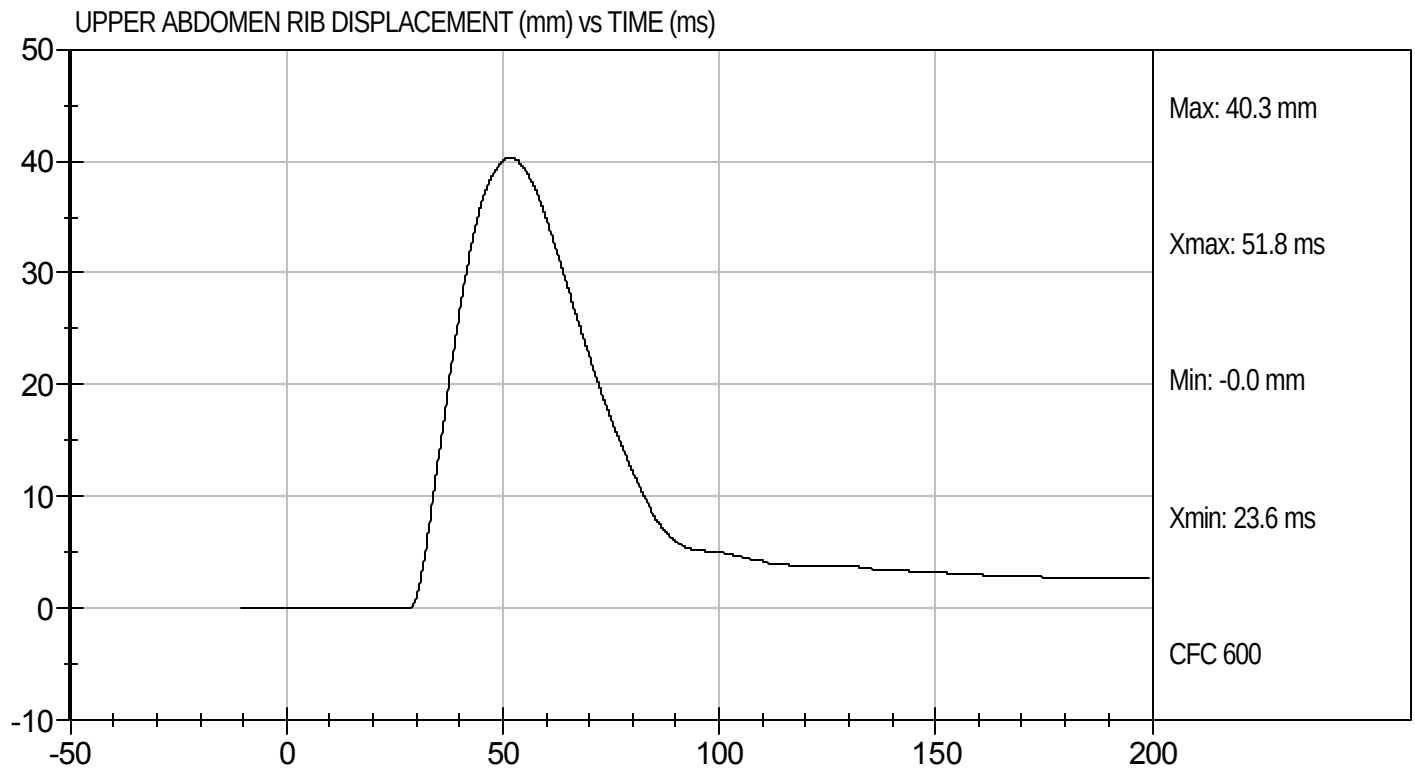
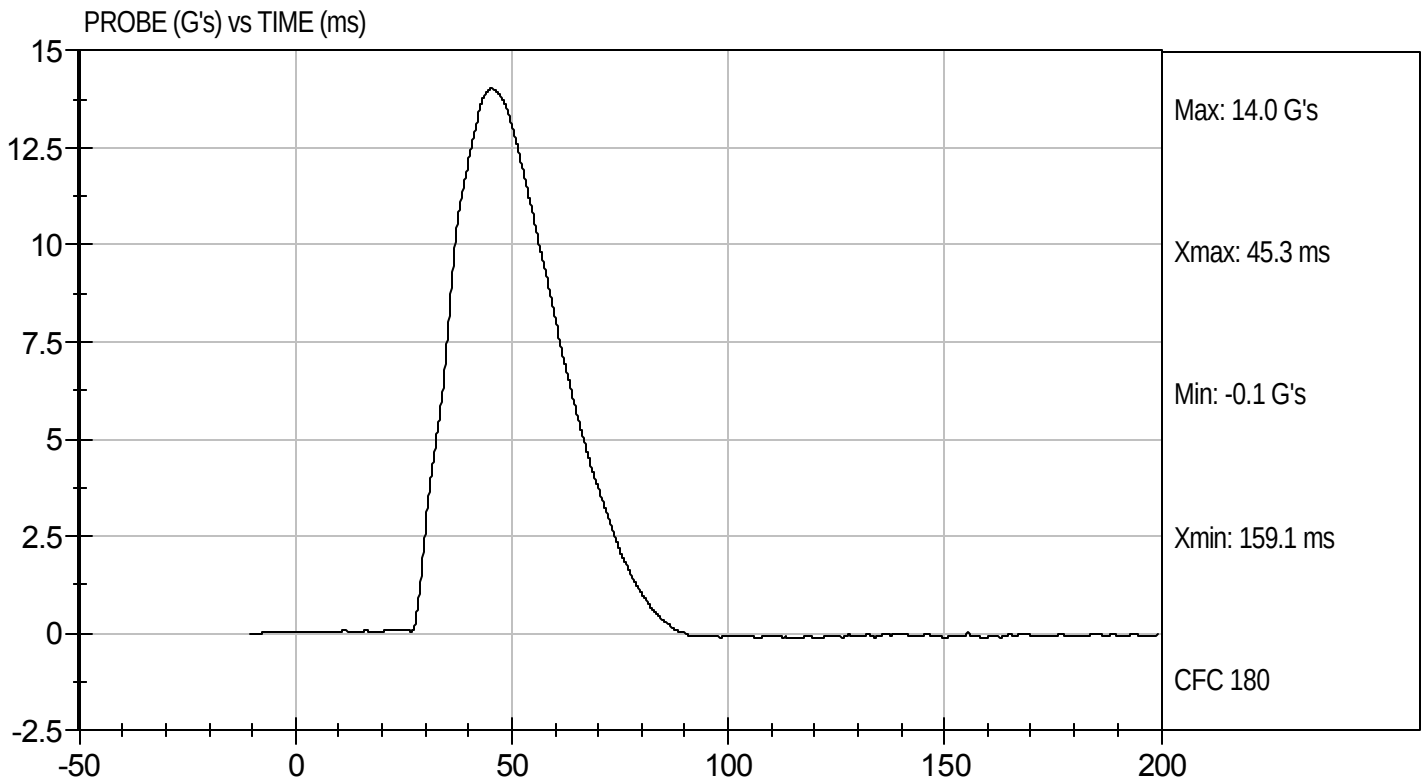
11/9/11
Test Date

David Winkelbauer
Approved By



Test Desc: Abdomen Impact
Component ID: D113736

Test Date: 11/9/11
Velocity: 14.36 ft/s, 4.38 m/s

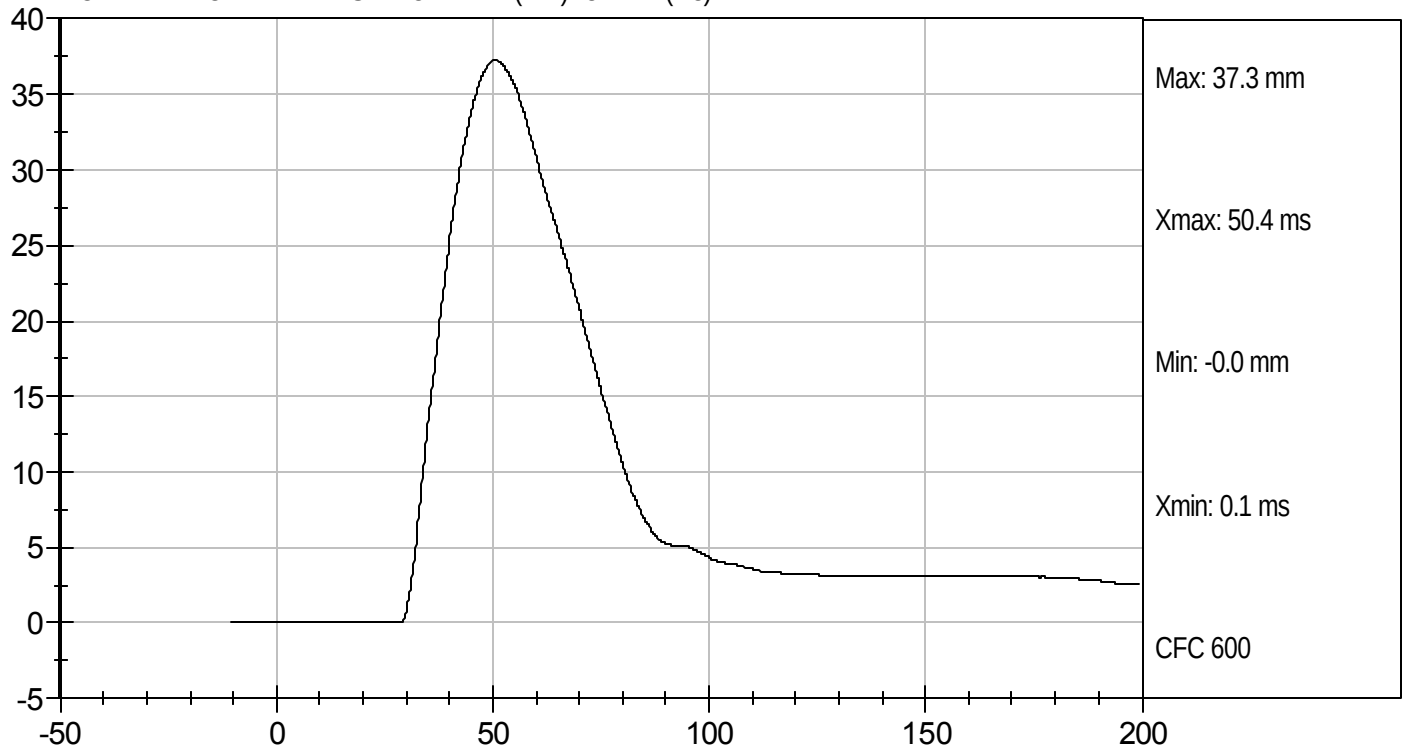




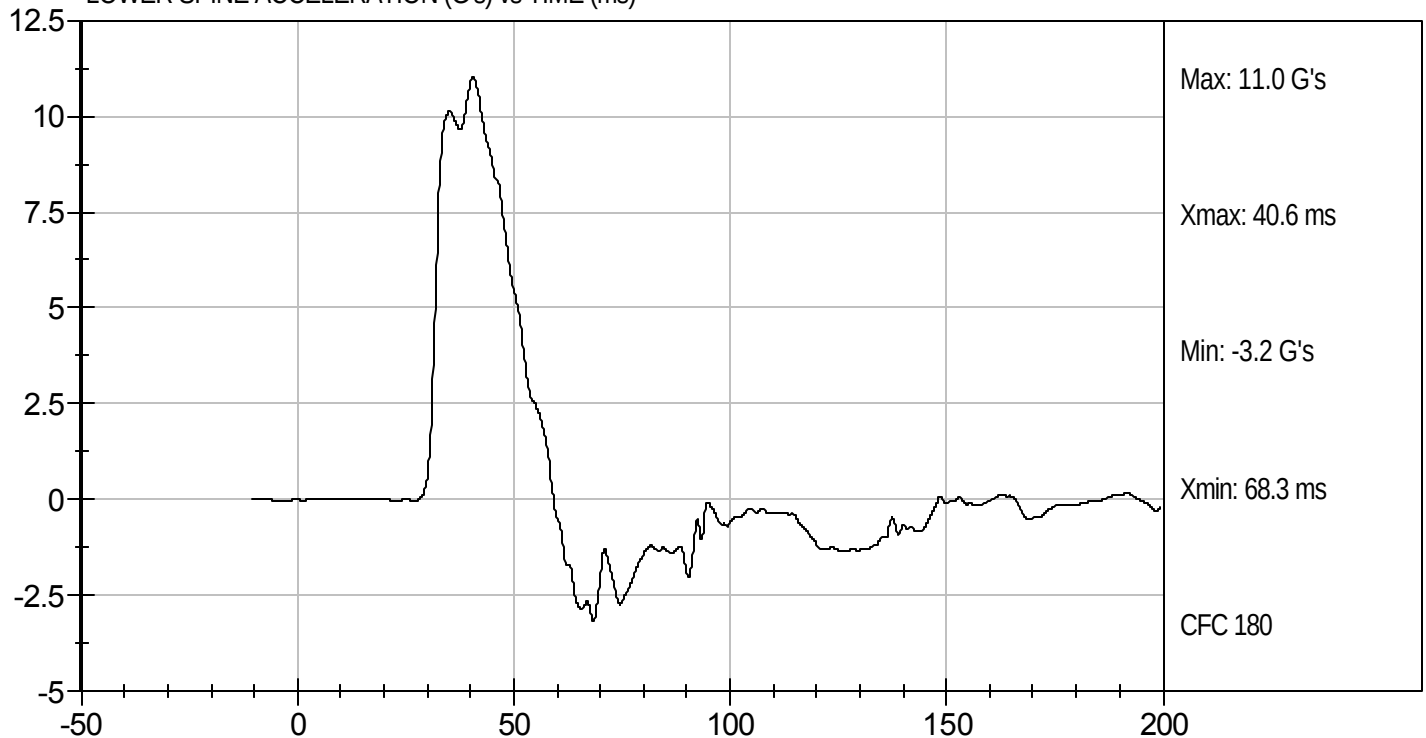
Test Desc: Abdomen Impact
Component ID: D113736

Test Date: 11/9/11
Velocity: 14.36 ft/s, 4.38 m/s

LOWER ABDOMEN RIB DISPLACEMENT (mm) vs TIME (ms)



LOWER SPINE ACCELERATION (G's) vs TIME (ms)

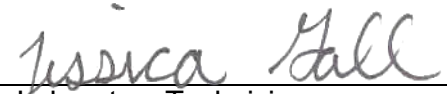


MGA RESEARCH CORPORATION
PELVIS IMPACT TEST
SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

Test I.D: D113737

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.3	Pass
Humidity	%	10 to 70	38	Pass
Impact Velocity	m/s	6.60 to 6.80	6.71	Pass
Peak Impactor Acceleration	G's	38 to 47	43	Pass
Pelvis Y Acceleration after 6 ms	G's	34 to 42	41	Pass
Peak Acetabulum Force	N	3600 to 4300	3952	Pass
Overall Test Results				Pass


Laboratory Technician

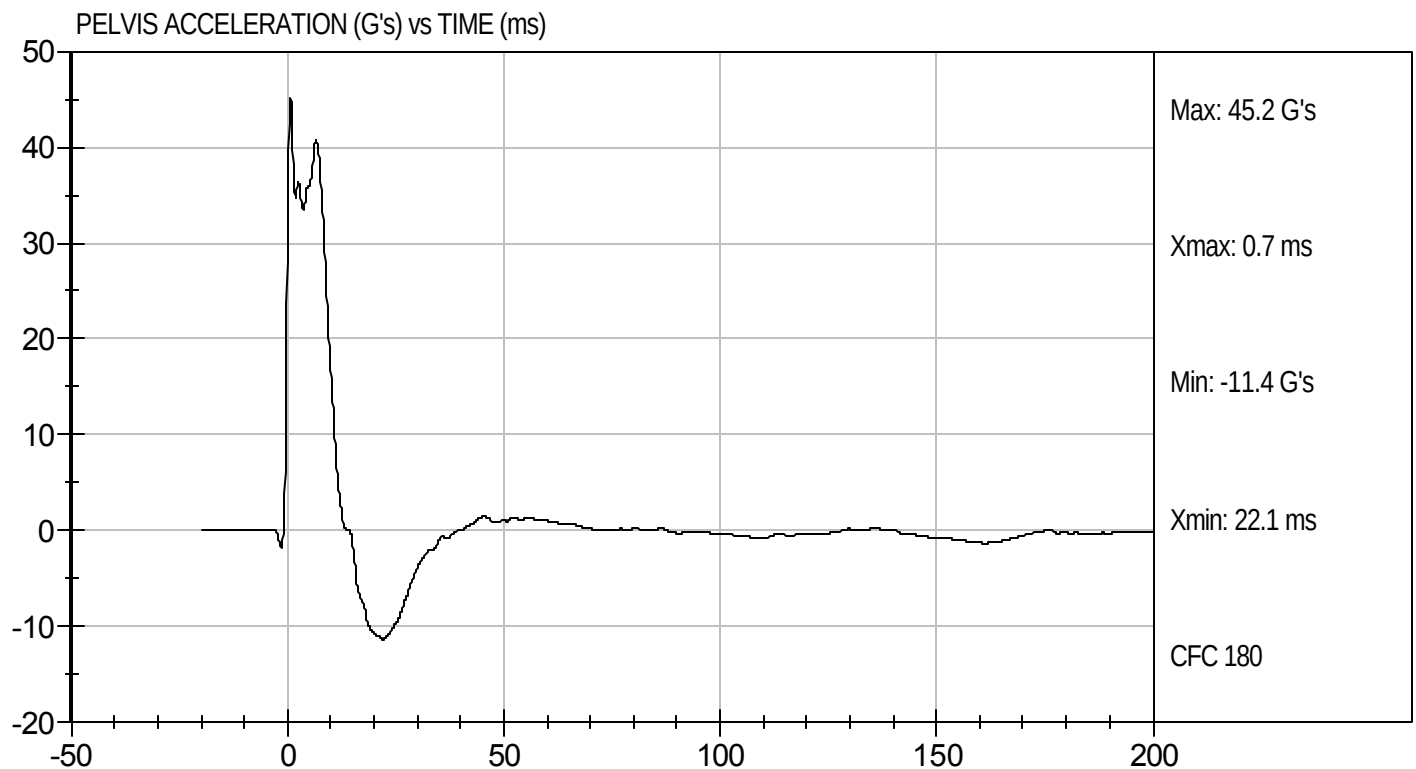
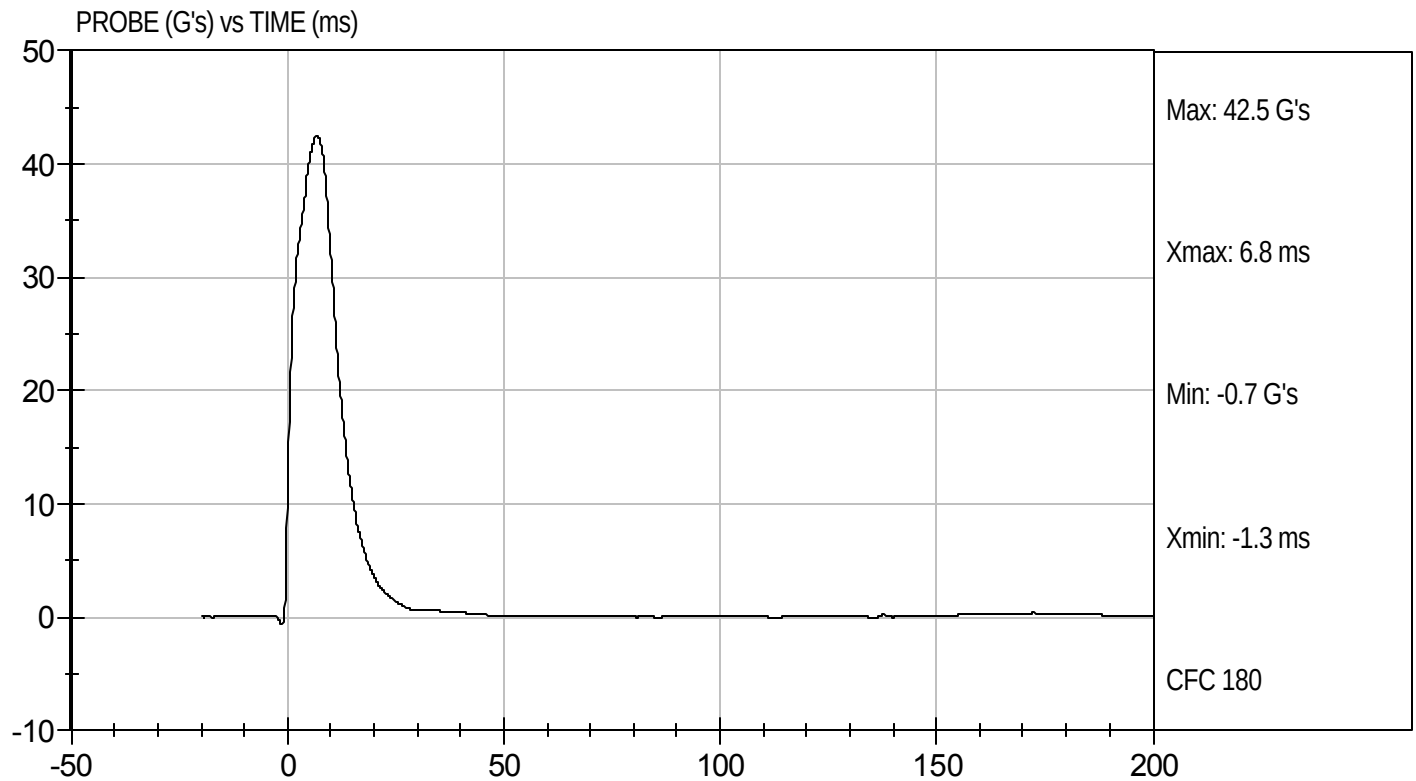
11/9/11
Test Date


Approved By



Test Desc: Pelvis Impact
Component ID: D113737

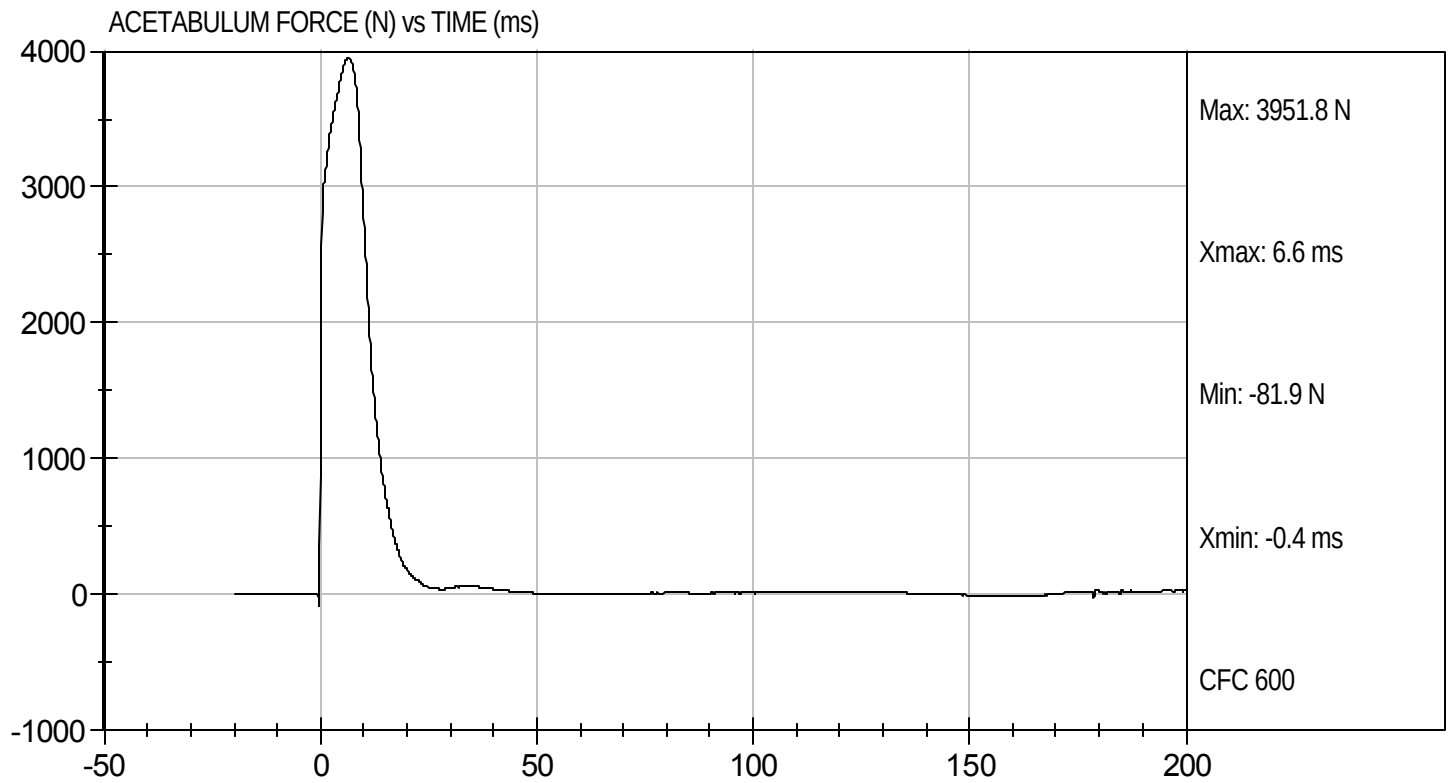
Test Date: 11/9/11
Velocity: 22.00 ft/s, 6.71 m/s





Test Desc: Pelvis Impact
Component ID: D113737

Test Date: 11/9/11
Velocity: 22.00 ft/s, 6.71 m/s



MGA RESEARCH CORPORATION
ILIAC IMPACT TEST
SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

Test I.D: D113738

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.4	Pass
Humidity	%	10 to 70	37	Pass
Impact Velocity	m/s	4.20 to 4.40	4.34	Pass
Peak Impactor Acceleration	G's	36 to 45	38	Pass
Pelvis Y Acceleration	G's	28 to 39	32	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	4621	Pass
Overall Test Results			Pass	


Laboratory Technician

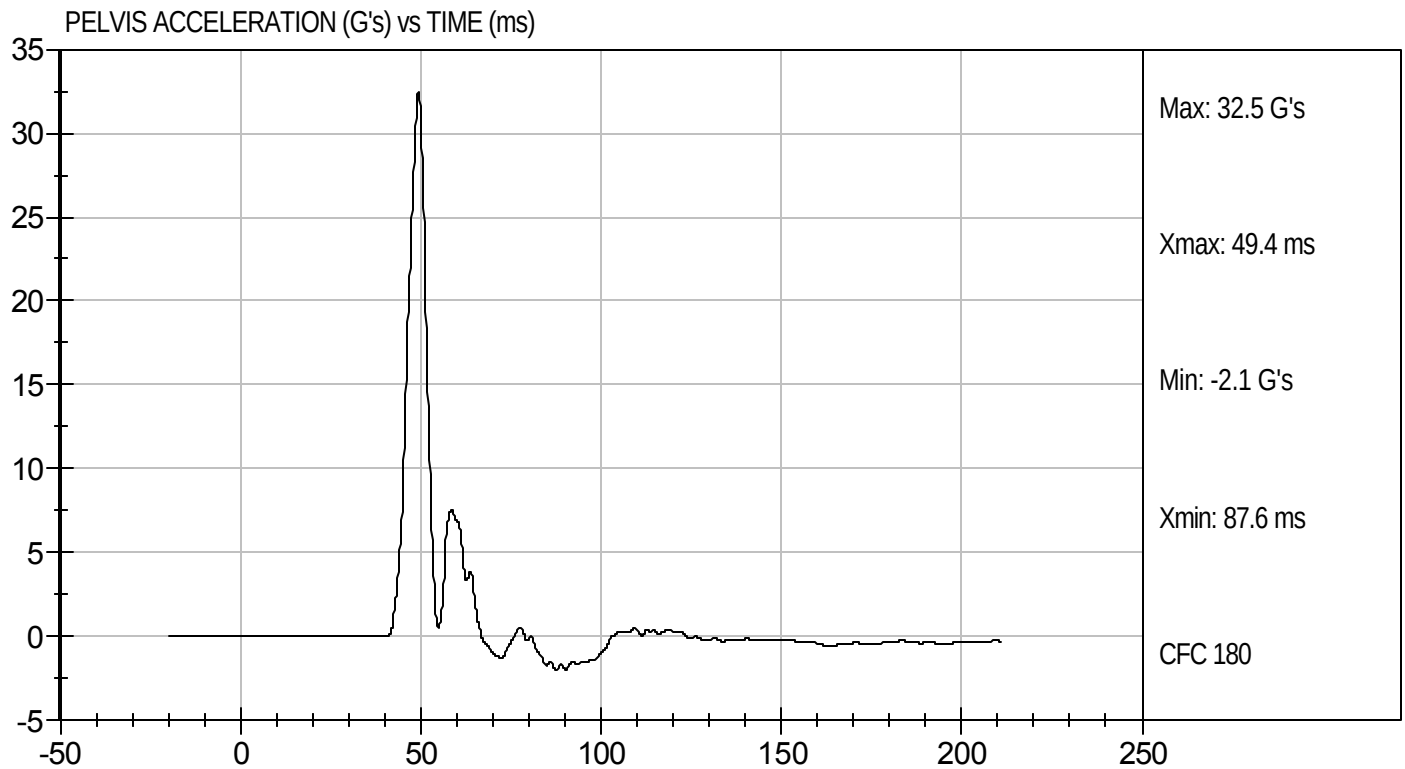
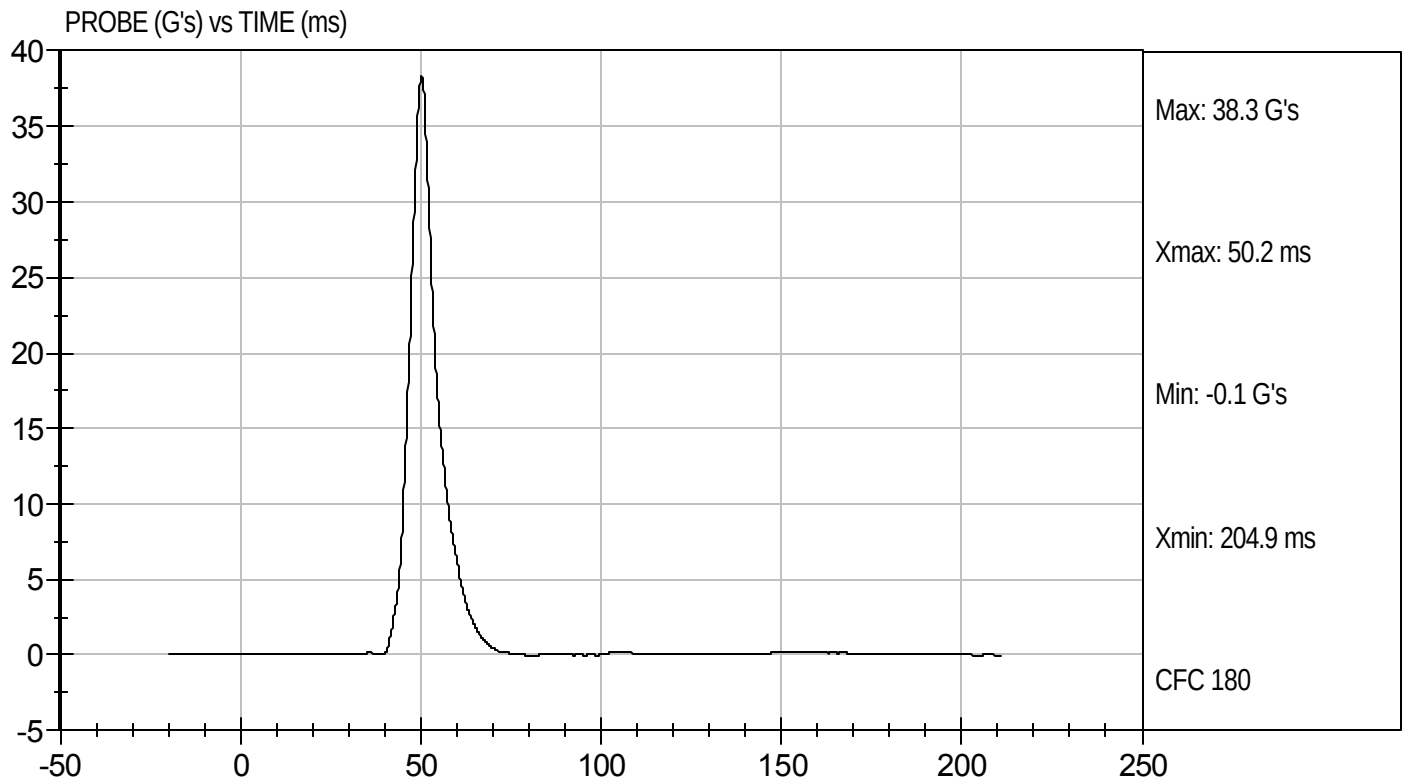
11/9/11
Test Date


Approved By



Test Desc: Iliac Impact
Component ID: D113738

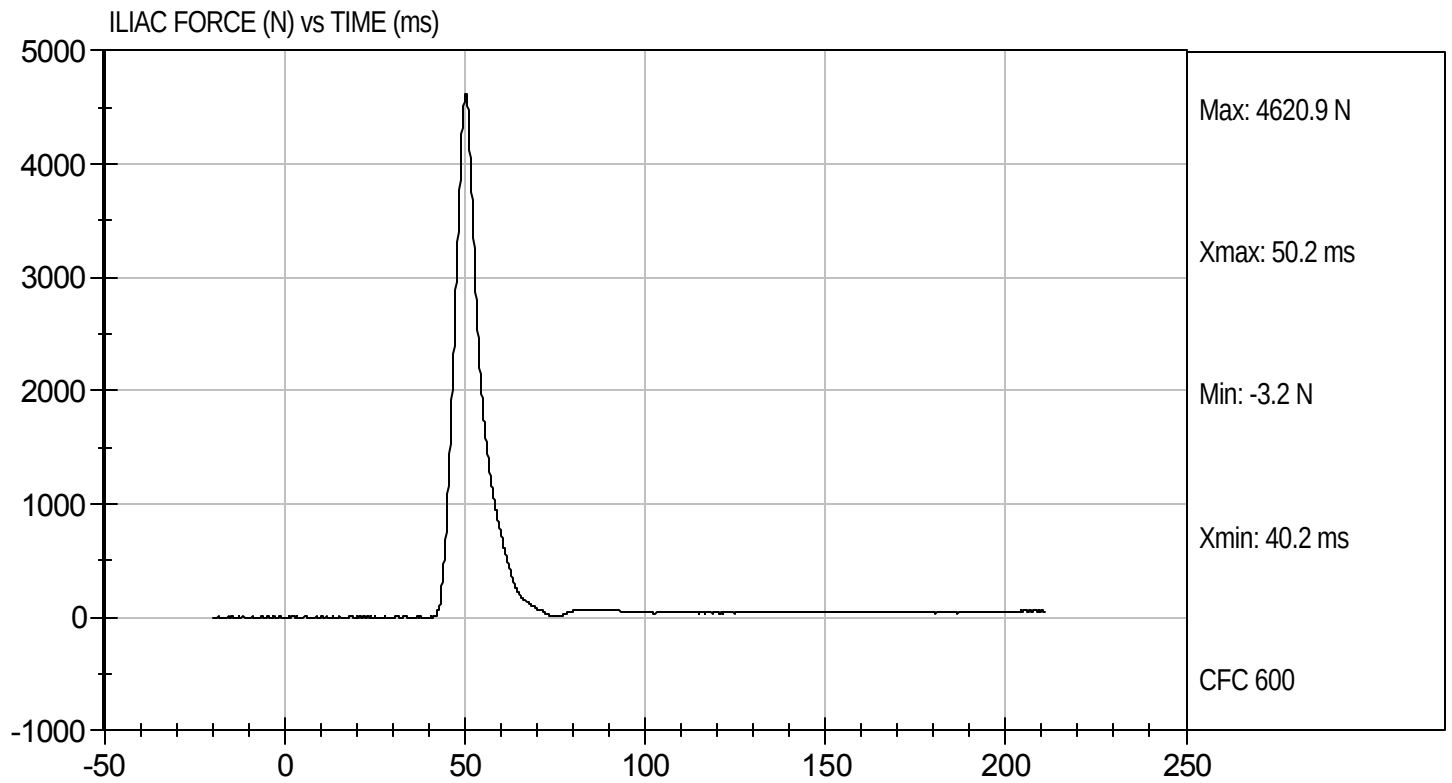
Test Date: 11/9/11
Velocity: 14.25 ft/s, 4.34 m/s





Test Desc: Iliac Impact
Component ID: D113738

Test Date: 11/9/11
Velocity: 14.25 ft/s, 4.34 m/s



APPENDIX D

TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

Table 1 – Dummy Instrumentation (ES-2re)

			ES-2re S/N 032		
			Serial Number	Manufacturer	Calibration Date
Head Accelerometers		X	P73737	Endevco	10/04/11
		Y	P73738	Endevco	10/04/11
		Z	P73740	Endevco	10/04/11
Head Accelerometers		Xr	P66627	Endevco	10/10/11
		Yr	P73753	Endevco	10/04/11
		Zr	P73754	Endevco	10/04/11
Thorax Rib Displacement Potentiometers	Upper	Y	G176	Honeywell	10/12/11
	Middle	Y	G169	Honeywell	10/12/11
	Lower	Y	G164	Honeywell	10/12/11
Abdomen Load Cells	Forward	Y	ABG1532	Denton	01/06/11
	Middle	Y	ABG1534	Denton	01/06/11
	Rear	Y	ABG1535	Denton	01/06/11
Lower Spine Accelerometers (T12)		X	P73742	Endevco	10/04/11
		Y	P73743	Endevco	10/04/11
		Z	P73749	Endevco	10/04/11
Pubic Symphysis Load Cell		Y	PG461	Denton	01/06/11

Table 2 – Dummy Instrumentation (SID-IIs)

			SID-IIs S/N 306			
			Serial Number	Manufacturer	Calibration Date	
Head Accelerometers			X	P67884	Endevco	06/08/11
			Y	P67886	Endevco	06/08/11
			Z	P67887	Endevco	06/08/11
Head Accelerometers			X	P67888	Endevco	06/08/11
			Y	P67889	Endevco	06/08/11
			Z	P67890	Endevco	06/08/11
Displacement Potentiometers	Thoracic Rib	Upper	Y	G1187	FTSS	06/09/11
		Middle	Y	G1261	FTSS	06/09/11
		Lower	Y	G1270	FTSS	06/09/11
	Abdominal Rib	Upper	Y	G1287	FTSS	06/09/11
		Lower	Y	G1304	FTSS	06/09/11
Lower Spine Accelerometers (T12)			X	P67893	Endevco	06/08/11
			Y	P67894	Endevco	06/08/11
			Z	P67895	Endevco	06/08/11
Acetabulum Load Cell			Y	ACG111	FTSS	05/20/11
Iliac Wing Load Cell			Y	IWG226	FTSS	05/20/11
Pelvis Plug (struck side)				37124	FTSS	10/08/10
Pelvis Plug (non-struck side)				37149	FTSS	10/08/10

Table 3 – Vehicle Instrumentation

		Serial Number	Manufacturer	Calibration Date
Vehicle Center of Gravity	X	P59663	Endevco	05/20/11
Vehicle Center of Gravity	Y	P59665	Endevco	05/20/11
Vehicle Center of Gravity	Z	P59664	Endevco	05/20/11
Right Sill at Front Seat	X	P59373	Endevco	09/13/11
Right Sill at Front Seat	Y	P59374	Endevco	09/13/11
Right Sill at Front Seat	Z	P59372	Endevco	09/13/11
Right Sill at Rear Seat	X	P59260	Endevco	09/13/11
Right Sill at Rear Seat	Y	P59258	Endevco	09/13/11
Right Sill at Rear Seat	Z	P59259	Endevco	09/13/11
Left Sill at Front Door	Y	P59360	Endevco	08/22/11
Left Sill at Rear Door	Y	L02-Z18	Entran	07/01/11
Left A-Post Lower	Y	P47079	Endevco	10/20/11
Left A-Post Middle	Y	P59639	Endevco	05/20/11
Left B-Post Lower	Y	P59376	Endevco	10/20/11
Left B-Post Middle	Y	P63226	Endevco	10/20/11
Front Seat Track	Y	P52278	Endevco	07/07/11
Rear Seat Track or Structure	Y	P55699	Endevco	09/12/11
Right Rear Occ. Compartment	Y	P49455	Endevco	07/01/11
Engine Block	X	P59280	Endevco	05/20/11
Engine Block	Y	P59279	Endevco	05/20/11
Rear Floorpan Above Axle	X	P59645	Endevco	07/01/11
Rear Floorpan Above Axle	Y	P59643	Endevco	07/01/11
Rear Floorpan Above Axle	Z	P59644	Endevco	07/01/11

Table 4 – MDB Instrumentation

		Serial Number	Manufacturer	Calibration Date
MDB Center of Gravity	X	P63531	Endevco	07/08/11
MDB Center of Gravity	Y	P63532	Endevco	07/08/11
MDB Center of Gravity	Z	P63533	Endevco	07/08/11
Left Frame at Rear Axle Centerline	X	P59322	Endevco	07/07/11
Left Frame at Rear Axle Centerline	Y	P59323	Endevco	07/07/11