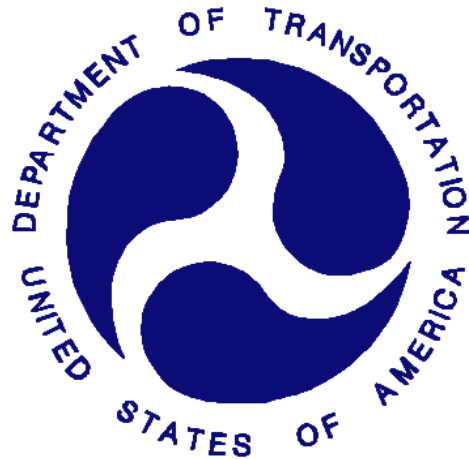


REPORT NUMBER: SINCAP-MGA-2012-043

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

**GENERAL MOTORS LLC
2012 Chevrolet Silverado 2500 2WD Crew Cab
NHTSA No.: MC0113**

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



Test Date: December 21, 2011

Final Report Date: February 10, 2012

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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Prepared by: 
Donna Janovicz, Project Manager

Approved by: 
Ben Fischer, Project Engineer

Approval Date: February 10, 2012

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: _____

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

Date: _____

Technical Report Documentation Page

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7. Author(s) Donna Janovicz, Project Manager Ben Fischer, Project Engineer		8. Performing Organization Report No. SINCAP-MGA-2012-043																																																					
9. Performing Organization Name and Address MGA Research Corporation 5000 Warren Road Burlington, WI 53105		10. Work Unit No.																																																					
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12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Office of Crashworthiness Standards (NVS-111) 1200 New Jersey Ave, SE, Room W43-410 Washington, D.C. 20590		13. Type of Report and Period Covered: Final Test Report December 21, 2011 to February 10, 2012																																																					
		14. Sponsoring Agency Code NVS-111																																																					
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 Silverado 2500 2WD Crew Cab 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 December 21, 2011. The impact velocity of the Moving Deformable Barrier (MDB) was 62.4 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 318 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>46</td> </tr> <tr> <td>Maximum Thorax Rib Deflection</td> <td>mm</td> <td>44</td> <td>9</td> </tr> <tr> <td>Total Abdominal Force</td> <td>N</td> <td>2500</td> <td>296</td> </tr> <tr> <td>Pubic Symphysis Force</td> <td>N</td> <td>6000</td> <td>1933</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>32</td> </tr> <tr> <td>Resultant Lower Spine Acceleration</td> <td>Gs</td> <td>82</td> <td>26</td> </tr> <tr> <td>Total Pelvic Force (sum of acetabular and iliac forces)</td> <td>N</td> <td>5525</td> <td>826</td> </tr> <tr> <td>Maximum Thoracic Rib Deflection</td> <td>mm</td> <td>38*</td> <td>14</td> </tr> <tr> <td>Maximum Abdomen Rib Deflection</td> <td>mm</td> <td>45*</td> <td>3</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	46	Maximum Thorax Rib Deflection	mm	44	9	Total Abdominal Force	N	2500	296	Pubic Symphysis Force	N	6000	1933		Passenger ATD (SID-IIs)			Measurement Description	Units	Threshold	Result	Head Injury Criteria (HIC ₃₆)	N/A	1000	32	Resultant Lower Spine Acceleration	Gs	82	26	Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	826	Maximum Thoracic Rib Deflection	mm	38*	14	Maximum Abdomen Rib Deflection	mm	45*	3
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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 Silverado 2500 2WD Crew Cab. 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 Silverado 2500 2WD Crew Cab was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 62.4 km/h (38.8 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 December 21, 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	46
Maximum Thorax Rib Deflection	mm	44	9
Total Abdominal Force	N	2500	296
Pubic Symphysis Force	N	6000	1933

Passenger ATD (SID-IIs)			
Measurement Description	Units	Threshold	Result
Head Injury Criteria (HIC ₃₆)	N/A	1000	32
Resultant Lower Spine Acceleration	Gs	82	26
Total Pelvic Force	N	5525	826
Maximum Thoracic Rib Deflection	mm	38*	14
Maximum Abdomen Rib Deflection	mm	45*	3

*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	No		No	
Side Torso Airbag	No		No	
Seat Belt Pretensioner	Yes	No	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 Front Sill Y after 6 msec.

Left Rear Sill Y after 2 msec.

Left Lower A-Post Y

Left Lower B-Post Y after 2 msec.

Left Mid A-Post Y is questionable.

Floorpan @ Rear Axle Y is questionable from 23-26 and 34-38 msec.

Driver Seat Track Y is questionable from 8-12 msec.

Left Rear Seat Y is questionable from 21-24 msec.

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 Silverado 2500 2WD Crew Cab NHTSA No. MC0113
 Test Program: NCAP Side MDB Impact Test Test Date: 12/21/2011

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	MC0113	Traction Control System (TCS)	Yes
Model Year	2012	Auto-Leveling System	No
Make	Chevrolet	Automatic Door Locks (ADL)	Yes
Model	Silverado 2500	Power Window Auto-Reverse	No
Body Style	Crew Cab	Other Optional Feature	N/A
VIN	1GC1CXCG8CF109269	Driver Front Airbag	Yes
Body Color	Blue Granite Metallic	Driver Curtain Airbag	No
Odometer Reading (km/mi)	45 / 28	Driver Head/Torso Airbag	No
Engine Displacement (L)	6.0	Driver Torso Airbag	No
Type/No. Cylinders	8	Driver Torso/Pelvis Airbag	No
Engine Placement	Longitudinal	Driver Pelvis Airbag	No
Transmission Type	Automatic	Driver Knee Airbag	No
Transmission Speeds	6	Rear Pass. Curtain Airbag	No
Overdrive	Yes	Rear Pass. Head/Torso Airbag	No
Final Drive	Rear	Rear Pass. Torso Airbag	No
Roof Rack	No	Rear Pass. Torso/Pelvis Airbag	No
Sunroof/T-Top	No	Rear Pass. Pelvis Airbag	No
Running Boards	No	Driver Seat Belt Pretensioner	Yes
Tilt Steering Wheel	Yes	Rear Pass. Seat Belt Pretensioner	No
Power Seats	Yes, driver's only	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)	4309
Date of Manufacture	09/11	GAWR Front (kg)	1996
Vehicle Type	Truck	GAWR Rear (kg)	2812

VEHICLE SEATING AND WEIGHT CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity (DSC)	3	3		6	
Capacity Weight (VCW) (kg)				1441	(A)
DSC x 68.04 kg				408	(B)
Rated Cargo and Luggage Weight (RCLW)				1033	(A-B)

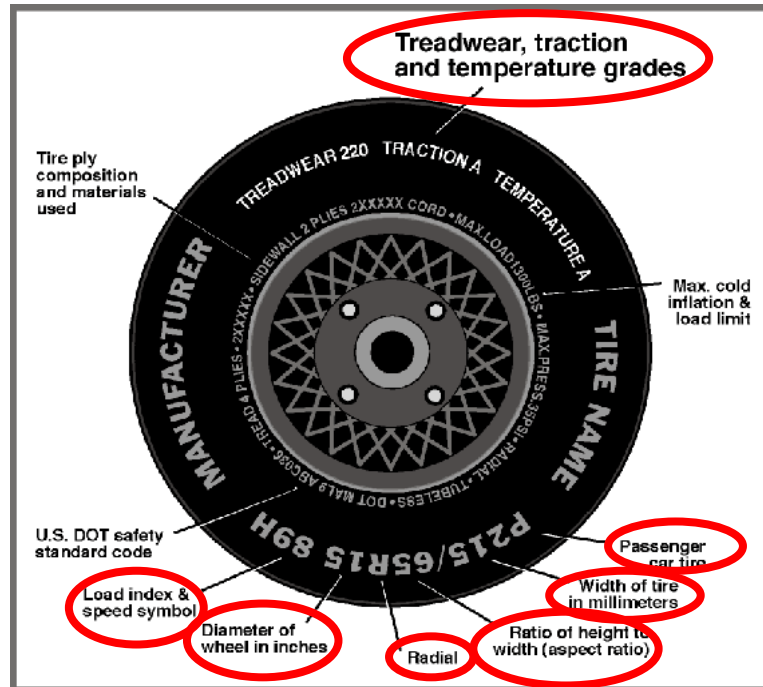
VEHICLE SEAT TYPE

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							

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

Test Vehicle: 2012 Chevrolet Silverado 2500 2WD Crew Cab NHTSA No. MC0113
Test Program: NCAP Side MDB Impact Test Test Date: 12/21/2011

VEHICLE TIRE INFORMATION



TIRE PLACARD INFORMATION

Measured Parameter	Front	Rear
Recommended Cold Tire Pressure (kPa)	420	550
Recommended Tire Size	LT245/75R17	LT245/75R17

TIRE SIDEWALL INFORMATION

Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	550	550
Tire Size on Vehicle	LT245/75R17	LT245/75R17
Tire Manufacturer	Firestone	Firestone
Tire Name	Transforce HT	Transforce HT
Tire Type	Light Truck	Light Truck
Tire Width	245	245
Aspect Ratio	75	75
Radial	Yes	Yes
Wheel Diameter	17	17
Load Index/Speed Symbol	121/118R	121/118R
Treadwear		
Traction Grade		
Temperature Grade		
Tire Material	Rubber	Rubber

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

Test Vehicle: 2012 Chevrolet Silverado 2500 2WD Crew Cab NHTSA No. MC0113
 Test Program: NCAP Side MDB Impact Test Test Date: 12/21/2011

TEST PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kpa	420	420	550	550
Tire Placard	kpa	420	420	550	550
Owner's Manual	kpa				
As Tested	kpa	420	420	550	550

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	807.0	634.6		867.7	741.2		863.2	756.2	
Right	kg	765.7	621.4		781.6	697.2		762.0	711.2	
Ratio	%	55.6	44.4		53.4	46.6		52.6	47.4	
Totals	kg	1572.7	1256.0	2828.7	1649.3	1438.4	3087.7	1625.2	1467.4	3092.6

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	2828.7	(A)
Sum of Actual Weight of 2 P572 ATDs Used	kg	129.3	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	136	(C)
Calculated Vehicle Target Weight (TVTW)	kg	3094.0	(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	88.5
None	0.0

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

Test Vehicle: 2012 Chevrolet Silverado 2500 2WD Crew Cab NHTSA No. MC0113
 Test Program: NCAP Side MDB Impact Test Test Date: 12/21/2011

TEST VEHICLE ATTITUDES AND CG

	Units	Fully Loaded	As Tested	Meets Requirement***
Left Front	mm	993	991	Yes
Right Front	mm	1008	1009	Yes
Right Rear	mm	1082	1088	Yes
Left Rear	mm	1065	1067	Yes
Vehicle CG (Aft of Front Axle)	mm	1858	1824	
Vehicle CG (Left (+) / Right (-) from Longitudinal Centerline)	mm	40	35	

*** 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 Silverado 2500 2WD Crew Cab NHTSA No. MC0113
 Test Program: NCAP Side MDB Impact Test Test Date: 12/21/2011

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	16.2	4.2	10.2
Front Passenger Seat	Fixed	Fixed	Fixed
Front Center Seat	Fixed	Fixed	Fixed
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	10.2	0	Max	43	43	43
	10.2	0	Mid	22	22	22
	10.2	0	Min	0	0	0
Front Passenger Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
	Fixed	Fixed	Mid	Fixed	Fixed	Fixed
	Fixed	Fixed	Min	Fixed	Fixed	Fixed
Front Center Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
	Fixed	Fixed	Mid	Fixed	Fixed	Fixed
	Fixed	Fixed	Min	Fixed	Fixed	Fixed
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 Silverado 2500 2WD Crew Cab
 Test Program: NCAP Side MDB Impact Test

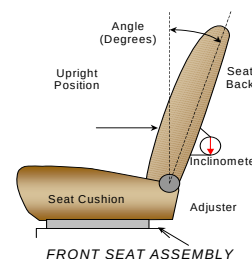
NHTSA No. MC0113
 Test Date: 12/21/2011

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	210	22 (1 st as 1)	110	11 th (1 st as 0)
Front Center Seat	Fixed	Fixed	Fixed	Fixed
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		8.5	8 th (1 st as 0)
Front Passenger Seat	49.4		7.5	
Front Center Seat	Fixed		Fixed	Fixed
Struck Side Rear Seat	Fixed		25.1*	Fixed
Non-Struck Side Rear Seat	Fixed		25.1*	Fixed
Rear Center Seat	Fixed		25.1*	Fixed

*Seat back was fixed, angle measured on seatback.

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

Test Vehicle: 2012 Chevrolet Silverado 2500 2WD Crew Cab NHTSA No. MC0113
 Test Program: NCAP Side MDB Impact Test Test Date: 12/21/2011

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 (1 st as 1)	0 (uppermost as 0)
Rear Seat	Fixed	Not Applicable

HEAD RESTRAINT ADJUSTMENT

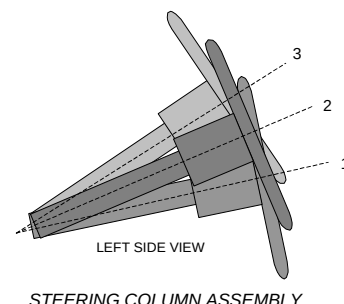
The driver's head restraint is adjusted to the highest and most full forward in-use position. The struck-side rear passenger's head restraint is adjusted to the lowest and most full forward in-use position.

	Total # of Positions	Placed in Position #
Driver Seat	4	Highest
Rear Seat	3	Lowest

STEERING COLUMN ADJUSTMENT

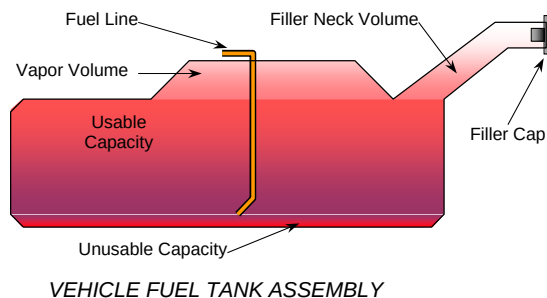
Steering wheel and column adjustments are made so that the steering wheel geometric locus is described when it moves through its full range of motion.

	Degrees	Fore/Aft Position (mm)
Lowermost, Position 1	78.7	
Geometric Center, Position 2	68.7	
Uppermost, Position 3	58.7	
Telescoping Steering Wheel Travel		
Test Position	68.7	



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 Silverado 2500 2WD Crew Cab NHTSA No. MC0113
 Test Program: NCAP Side MDB Impact Test Test Date: 12/21/2011

FUEL TANK CAPACITY DATA

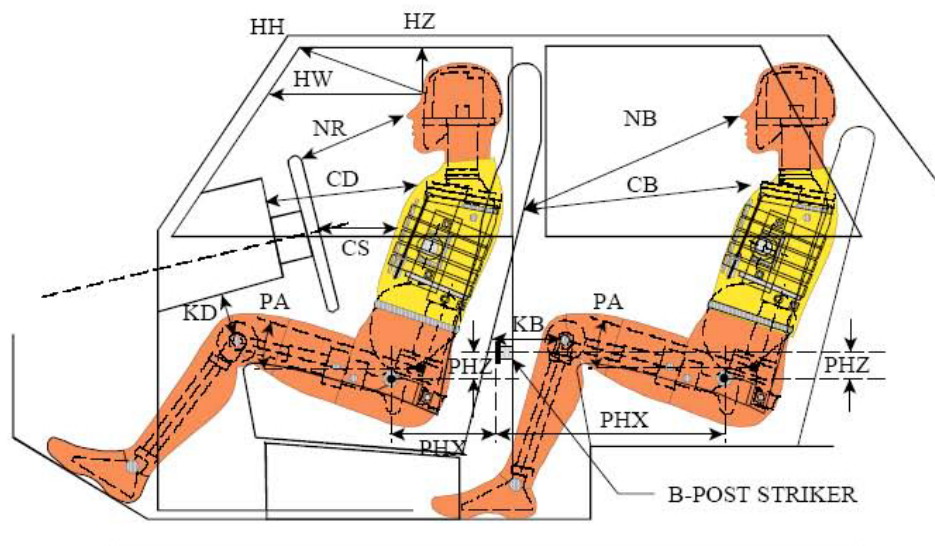
	Liters
Usable Capacity of "Standard" Tank (see Form No. 1)	135.1
Usable Capacity of "Optional" Tank (see Form No. 1)	
Usable Capacity of Standard Tank as Specified in Owner's Manual	136.3
Usable Capacity of Optional Tank as Specified in Owner's Manual	
93% of Usable Capacity	125.6
Actual Amount of Solvent Used	125.7
1/3 of Usable Capacity	45.0

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 Silverado 2500 2WD Crew Cab
Test Program: NCAP Side MDB Impact Test

NHTSA No. MC0113
Test Date: 12/21/2011



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

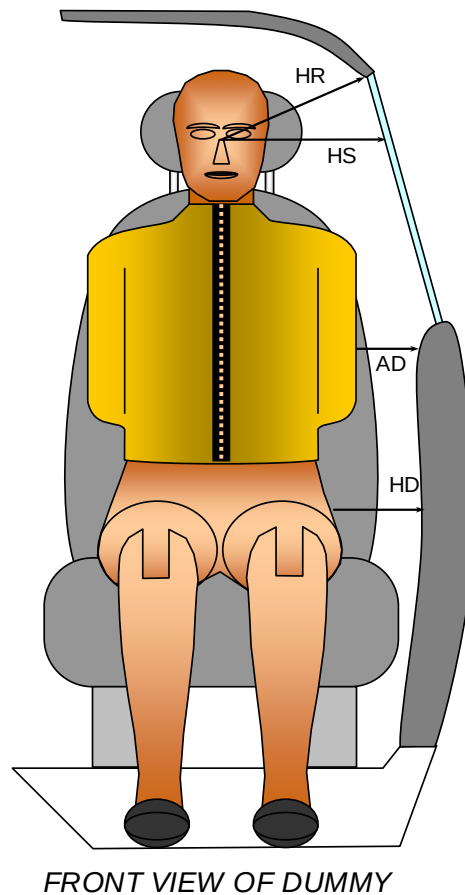
DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Pass. Code	Measurement Description	Driver S/N 032		Passenger S/N 306	
			Length (mm)	Angle(°)	Length (mm)	Angle(°)
HH		Head to Header	439	15.4		
HW		Head to Windshield	648			
HZ	HZ	Head to Roof Liner	216		319	
NR	NB	Nose to Rim/Seat Back	428	15.7	527	12.7
CD	CB	Chest to Dashboard/Seat Back	527	11.2	546	7.6
CS		Chest to Steering Wheel	345	12.7		
KDL	KBL	Left Knee to Dash/Seat Back	159	33.4	307	26.3
KDR	KBR	Right Knee to Dash/Seat Back	142	30.8	310	26.2
PAX	PAX	Pelvic Tilt Angle X		20.4		15.8
	PAY	Pelvic Tilt Angle Y		-1.4		-1.1
PHX	PHX	Hip Point to Striker (X-Axis)	319		309	
PHZ	PHZ	Hip Point to Striker (Z-Axis)	25		-13	

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2012 Chevrolet Silverado 2500 2WD Crew Cab
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MC0113
 Test Date: 12/21/2011



FRONT VIEW OF DUMMY

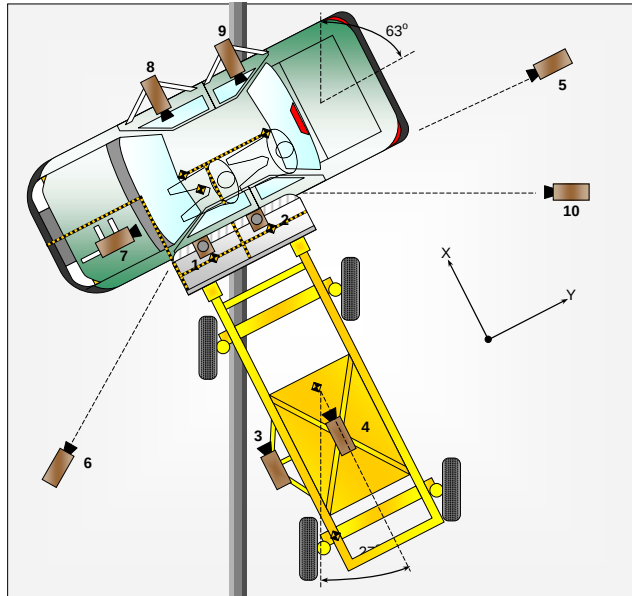
DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

Code	Measurement Description	Units	Driver S/N 032	Passenger S/N 306
HR	Head to Side Header	mm	179	260
HS	Head to Side Window	mm	308	358
AD	Arm to Door	mm	117	175
HD	Hip Point to Door	mm	151	232

DATA SHEET NO. 5 CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2012 Chevrolet Silverado 2500 2WD Crew Cab
Test Program: NCAP Side MDB Impact Test

NHTSA No. MC0113
Test Date: 12/21/2011



CAMERA LOCATIONS AND DATA

No.	Camera View	Coordinates (mm)			Lens Length (mm)	Operating Frame Rate (fps)
		X*	Y*	Z*		
1	Overhead Overall	110	160	-5050	14	1000
2	Overhead Close-Up	70	110	-5050	20	1000
3	Left Impact Point (MDB)				50	1000
4	Side Overall (MDB)				16	1000
5	Rear	90	4920	-1220	20	1000
6	Left Front	4360	-4860	-1280	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

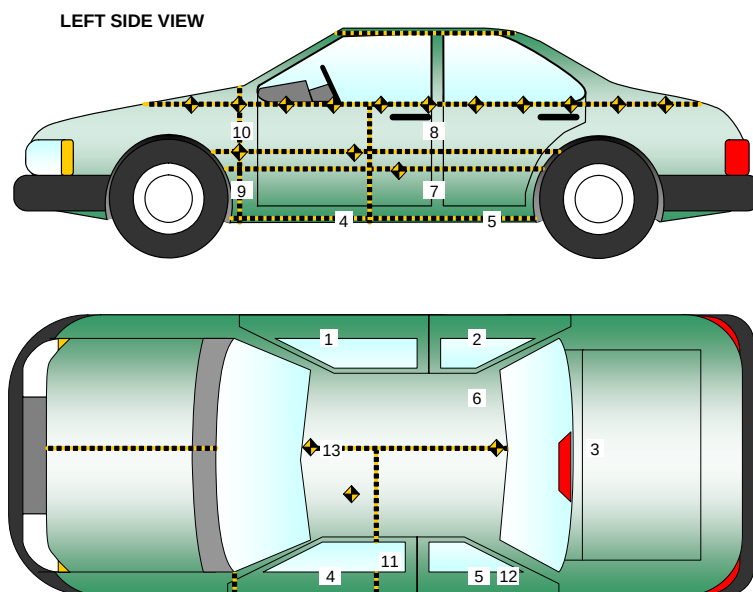
INSTRUMENTATION

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 Silverado 2500 2WD Crew Cab
Test Program: NCAP Side MDB Impact Test

NHTSA No. MC0113
Test Date: 12/21/2011



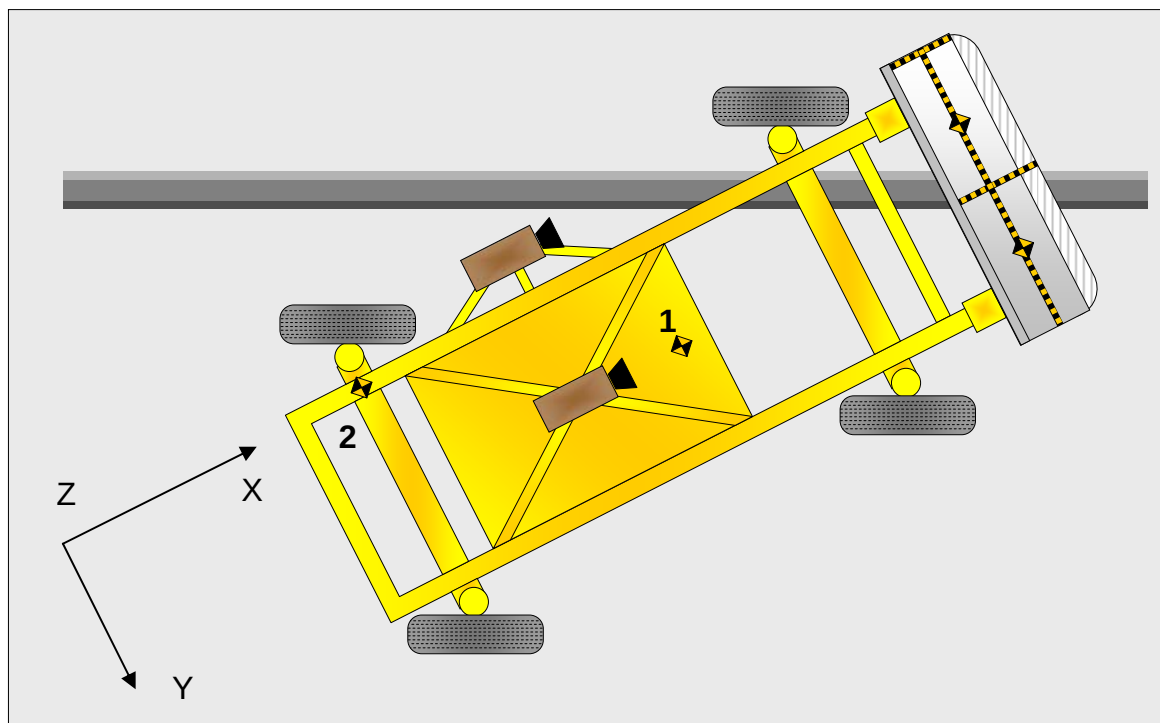
TEST VEHICLE ACCELEROMETER LOCATIONS

Accelerometer Location				
No.	ID	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	3435	-179	-624
2	Right Sill at Front Seat	3848	805	-525
3	Right Sill at Rear Seat	2780	805	-530
4	Left Sill at Front Door	3896	-805	-531
5	Left Sill at Rear Door	2890	-805	-520
6	Left Lower A-Post	4451	-770	-884
7	Left Middle A-Post	4515	-874	-1100
8	Left Lower B-Post	3360	-822	-855
9	Left Middle B-Post	3325	-819	-1146
10	Front Seat Track	3547	-521	-788
11	Rear Seat Structure	2520	-696	-790
12	Rt. Rear Occ. Compartment	3241	374	-654
13	Engine Block	5165	0	-1165
14	Rear Above Axle	1202	0	-920

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 Silverado 2500 2WD Crew Cab NHTSA No. MC0113
Test Program: NCAP Side MDB Impact Test Test Date: 12/21/2011



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 Silverado 2500 2WD Crew Cab NHTSA No. MC0113
Test Program: NCAP Side MDB Impact Test Test Date: 12/21/2011

TEST DUMMY INFORMATION AND CONTACT POINTS

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

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

Test Vehicle: 2012 Chevrolet Silverado 2500 2WD Crew Cab NHTSA No. MC0113
 Test Program: NCAP Side MDB Impact Test Test Date: 12/21/2011

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	No		No	
Side Torso Airbag	No		No	
Seat Belt Pretensioner	Yes	No	No	
Seat Belt Load Limiter	Yes		No	
Other				

IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vehicle Wheel Base	mm		3915
Vertical Impact Reference Line (Aft of Front Axle) (Intended Impact Point)	mm		508
Actual Impact Point (Aft of Front Axle)	mm		512
Horizontal Offset (+forward / -rearward)	mm	+/- 50 of intended impact point	-4
Vertical Offset (+down / -up)	mm	+/- 20 of intended impact point	+1

DATA SHEET NO. 9
MDB SUMMARY OF RESULTS

Test Vehicle: 2012 Chevrolet Silverado 2500 2WD Crew Cab NHTSA No. MC0113
 Test Program: NCAP Side MDB Impact Test Test Date: 12/21/2011

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	62.4
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	90.1
MDB Forward Line of Motion to Target Vehicle CL	degrees	62.5 to 63.5	63.2
MDB Crabbed Angle to MDB Forward Line of Motion	degrees	26 to 28	26.8

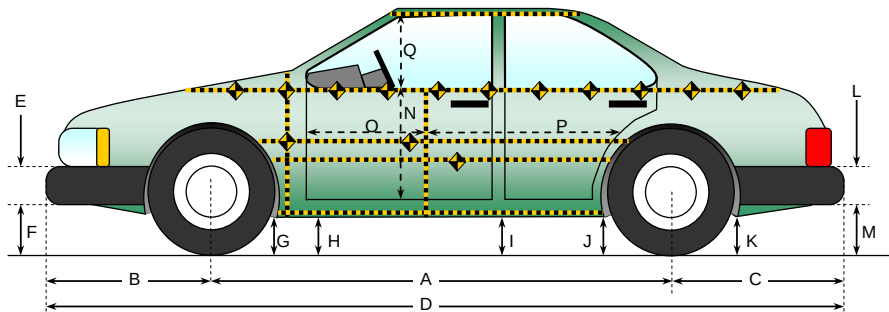
MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE

Vertical Location			From Centerline		Maximum Crush
Row	Description	Height	Distance	Direction	
A	Center of Bumper	432	300	Right	92
B	Top of Bumper	533	100	Right	80
C	Mid-Level	686	800	Right	153
D	Top of Stack	813	800	Right	223

DATA SHEET NO. 10
TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2012 Chevrolet Silverado 2500 2WD Crew Cab
Test Program: NCAP Side MDB Impact Test

NHTSA No. MC0113
Test Date: 12/21/2011



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

LEFT SIDE VIEW

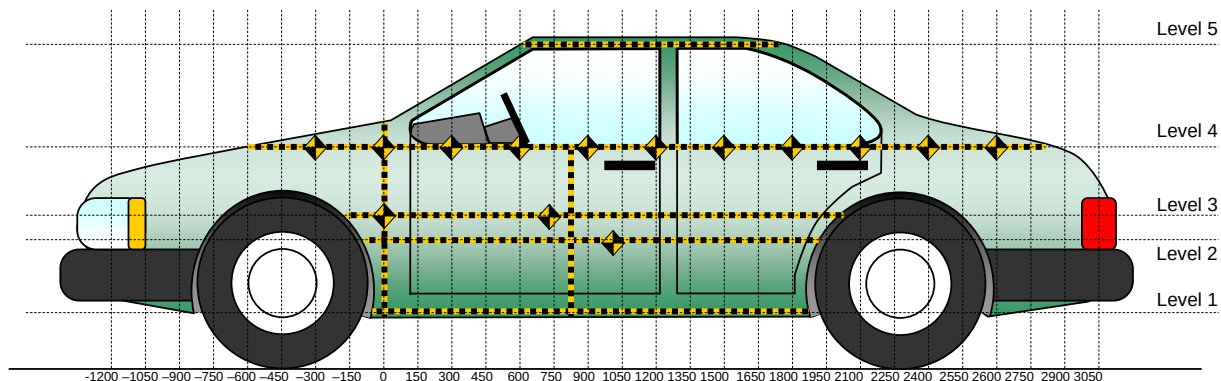
VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	3915	3875	40
B	Front Axle to FSOV	995	995	0
C	Rear Axle to RSOV	1195	1195	0
D	Total Length at Centerline	6105	6065	40
E	Front Bumper Thickness	195	195	0
F	Front Bumper Bottom to Ground	325	330	-5
G	Sill Height at Front Wheel Well	350	360	-10
H	Sill Height at Front Door Leading Edge	315	320	-5
I	Sill Height at B Pillar	330	331	-1
J1	Sill Height at Rear Wheel Well	330	334	-4
J2	Pinch Weld Height at Rear Wheel Well	315	322	-7
K	Sill Height Aft of Rear Wheel Well	530	535	-5
L	Rear Bumper Thickness	200	200	0
M	Rear Bumper Bottom to Ground	448	437	11
N	Sill Height to Window Bottom Sill	836	785	51
O	Front Door Leading Edge to Impact CL	791	782	9
P	Rear Door Trailing Edge to Impact CL	1364	1343	21
Q	Front Window Opening	534	533	1
R	Right Side Length	5260	5283	-23
S	Left Side Length	5260	5190	70
T	Vehicle Width at B Post	2004	1779	225

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

Test Vehicle: 2012 Chevrolet Silverado 2500 2WD Crew Cab
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MC0113
 Test Date: 12/21/2011



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	570	318	1650
2	Mid Door	895	272	1200
3	Occupant Hip Point	971	233	1200
4	Window Sill	1248	168	1350
5	Window Top	1865	71	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 Silverado 2500 2WD Crew Cab
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MC0113
 Test Date: 12/21/2011

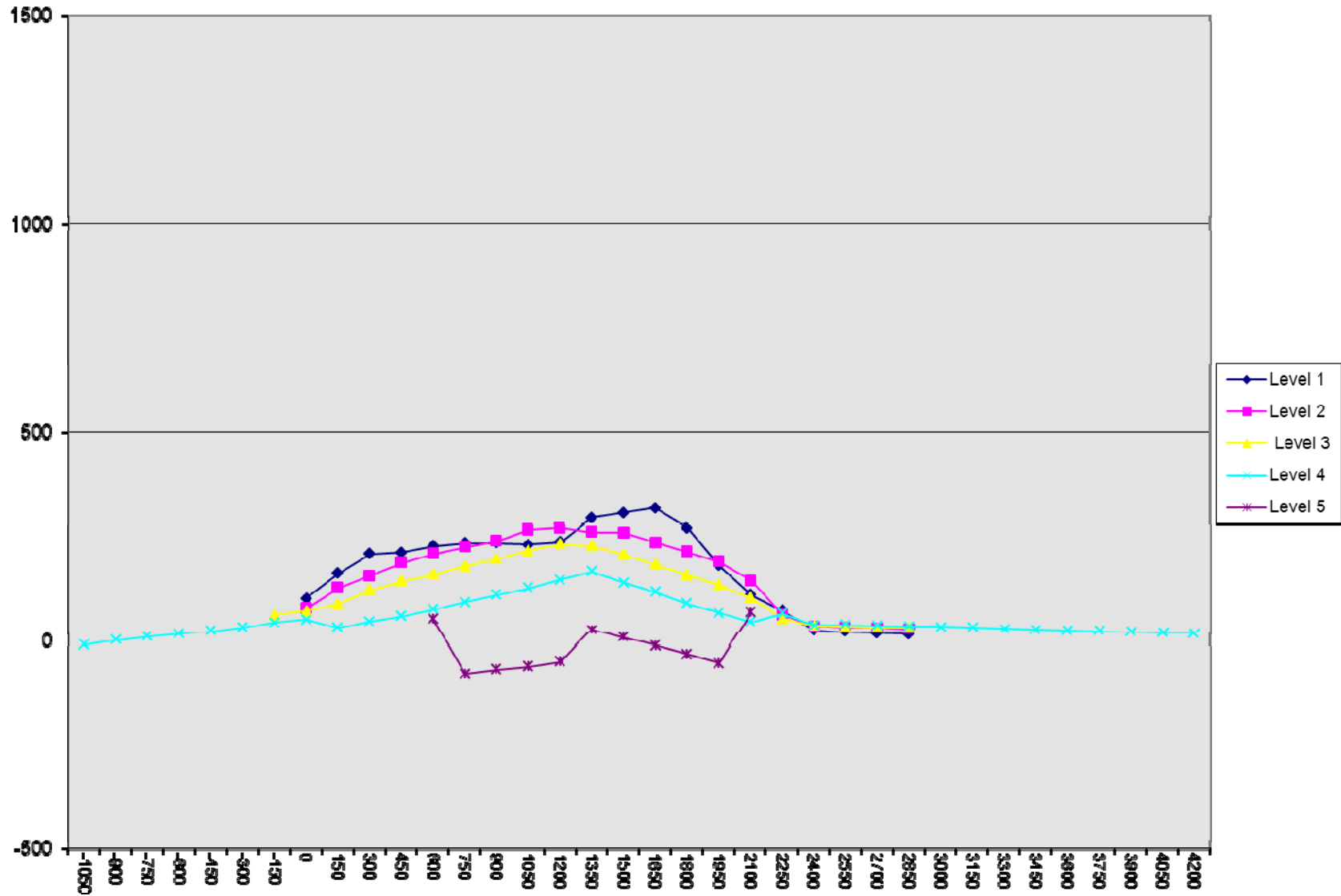
	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-1050				222					212					-10	
-900				191					192					1	
-750				176					186					10	
-600				167					184					17	
-450				160					184					24	
-300				156					189					33	
-150			90	157				155	203				65	46	
0	144	102	114	164		248	182	188	217		104	80	74	53	
150	162	119	122	161		326	248	212	195		164	129	90	34	
300	162	118	120	159		372	276	244	208		210	158	124	49	
450	164	115	117	156		378	304	262	218		214	189	145	62	
600	165	113	115	152	428	394	323	276	230	482	229	210	161	78	54
750	165	111	113	149	397	400	337	294	244	318	235	226	181	95	-79
900	166	110	112	145	386	402	350	310	257	317	236	240	198	112	-69
1050	168	110	110	143	384	400	377	328	272	323	232	267	218	129	-61
1200	169	110	110	141	378	407	382	343	290	328	238	272	233	149	-50
1350	171	110	110	140	378	466	371	338	308	406	295	261	228	168	28
1500	173	110	111	140	374	479	370	320	282	382	306	260	209	142	8
1650	175	111	111	139	372	493	348	295	258	360	318	237	184	119	-12
1800	178	113	112	138	373	450	328	272	230	340	272	215	160	92	-33
1950	182	114	114	138	373	364	305	250	207	320	182	191	136	69	-53
2100	184	115	115	137	372	296	261	220	184	443	112	146	105	47	71
2250	196	123	124	141		271	188	180	209		75	65	56	68	
2400	190	120	120	143		215	157	158	182		25	37	38	39	
2550	190	119	118	139		212	153	153	179		22	34	35	40	
2700	181	108	108	135		200	140	140	173		19	32	32	38	
2850	173	96	94	117		189	125	127	153		16	29	33	36	
3000				108					143					35	
3150				106					139					33	
3300				103					133					30	
3450				102					130					28	
3600				102					128					26	
3750				104					128					24	
3900				107					129					22	
4050				113					133					20	
4200				132					150					18	

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 Silverado 2500 2WD Crew Cab
Test Program: NCAP Side MDB Impact Test

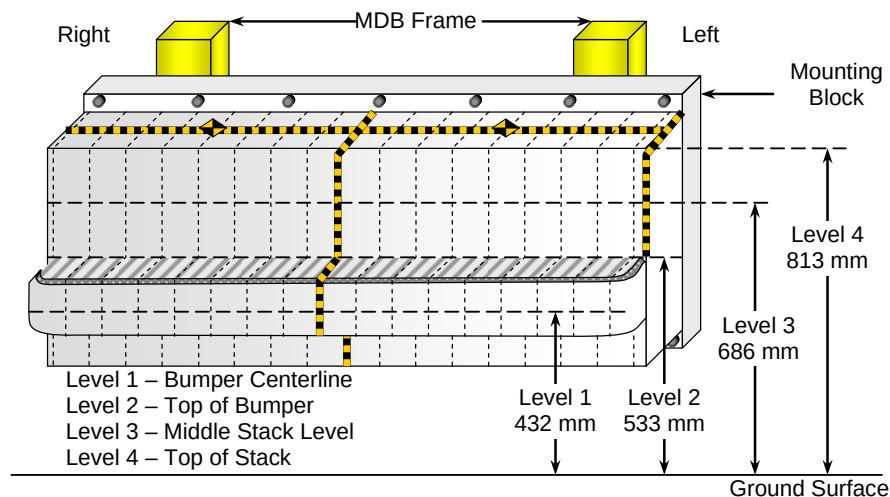
NHTSA No. MC0113
Test Date: 12/13/2011



DATA SHEET NO. 12
MDB EXTERIOR STATIC CRUSH MEASUREMENTS

Test Vehicle: 2012 Chevrolet Silverado 2500 2WD Crew Cab
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MC0113
 Test Date: 12/21/2011



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	223	160	120	98	98	109	129	126	113	97	94	86	89	102	117	138	167
3	153	92	46	45	59	69	82	101	105	108	96	101	108	110	125	134	149
2	75	73	73	73	73	73	76	80	73	56	56	57	55	55	55	55	57
1	77	75	72	70	68	92	79	78	73	57	53	48	48	48	52	49	35

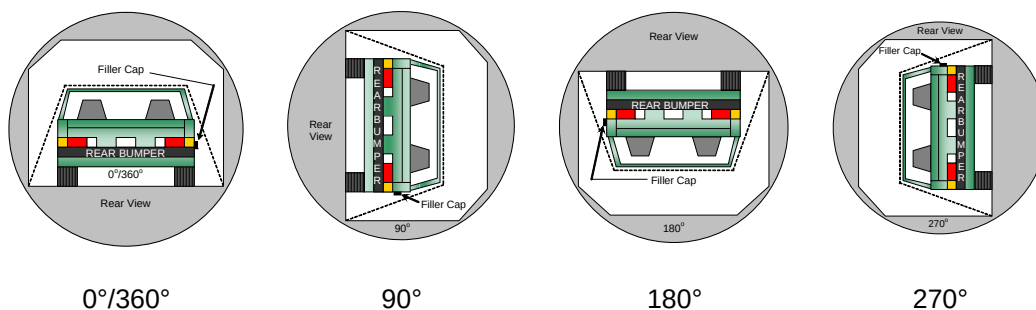
DATA SHEET NO. 13
FMVSS 301 FUEL SYSTEM INTEGRITY POST-IMPACT DATA

Test Vehicle: 2012 Chevrolet Silverado 2500 2WD Crew Cab NHTSA No. MC0113
 Test Program: NCAP Side MDB Impact Test Test Date: 12/21/2011

Test Time: 10:20 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°	170	300	470
90° to 180°	150	300	450
180° to 270°	131	300	431
270° to 360°	149	300	449

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

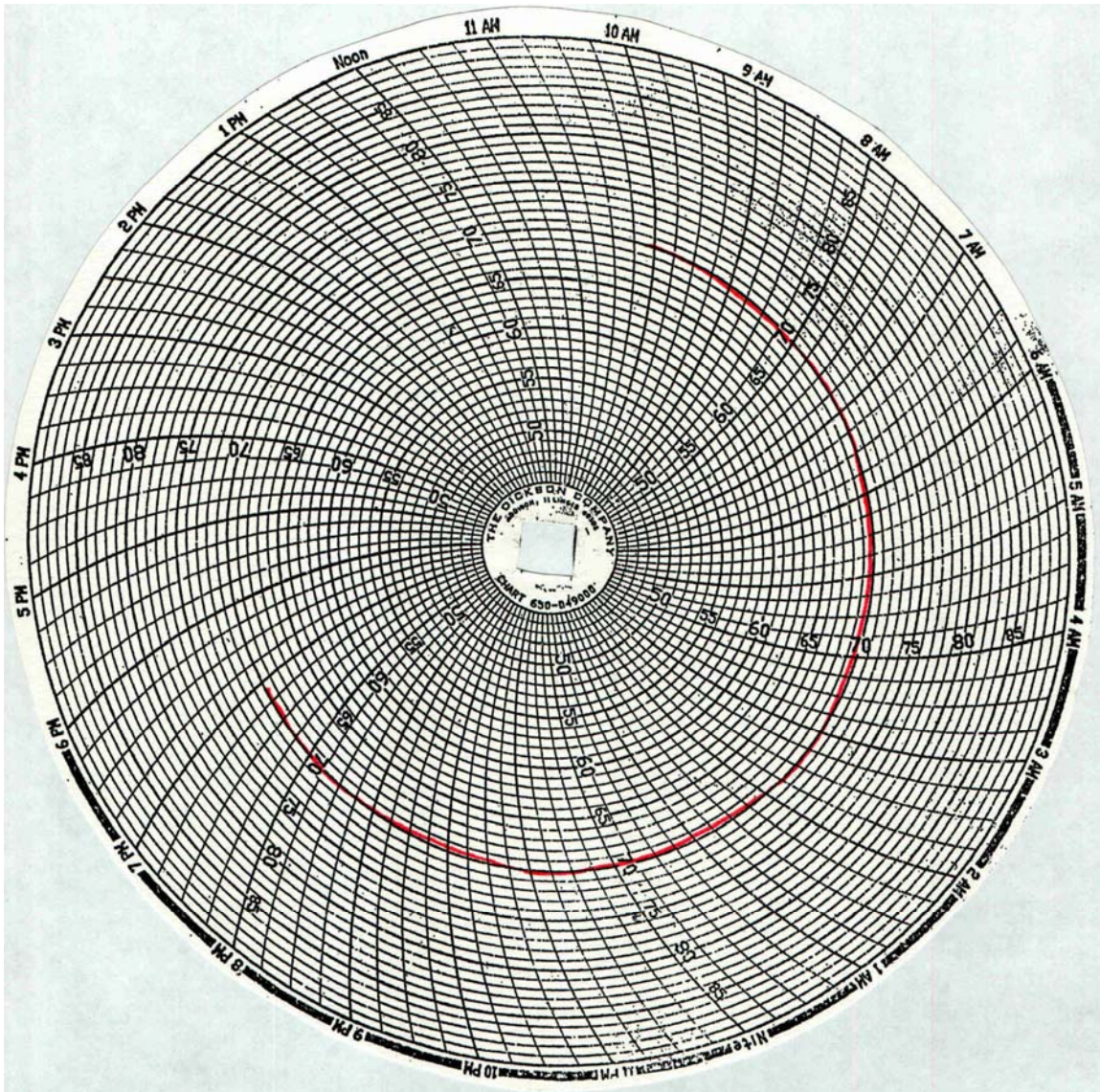
ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

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 Silverado 2500 2WD Crew Cab
Test Program: NCAP Side MDB Impact Test

NHTSA No. MC0113
Test Date: 12/21/2011



APPENDIX A
PHOTOGRAPHS

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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



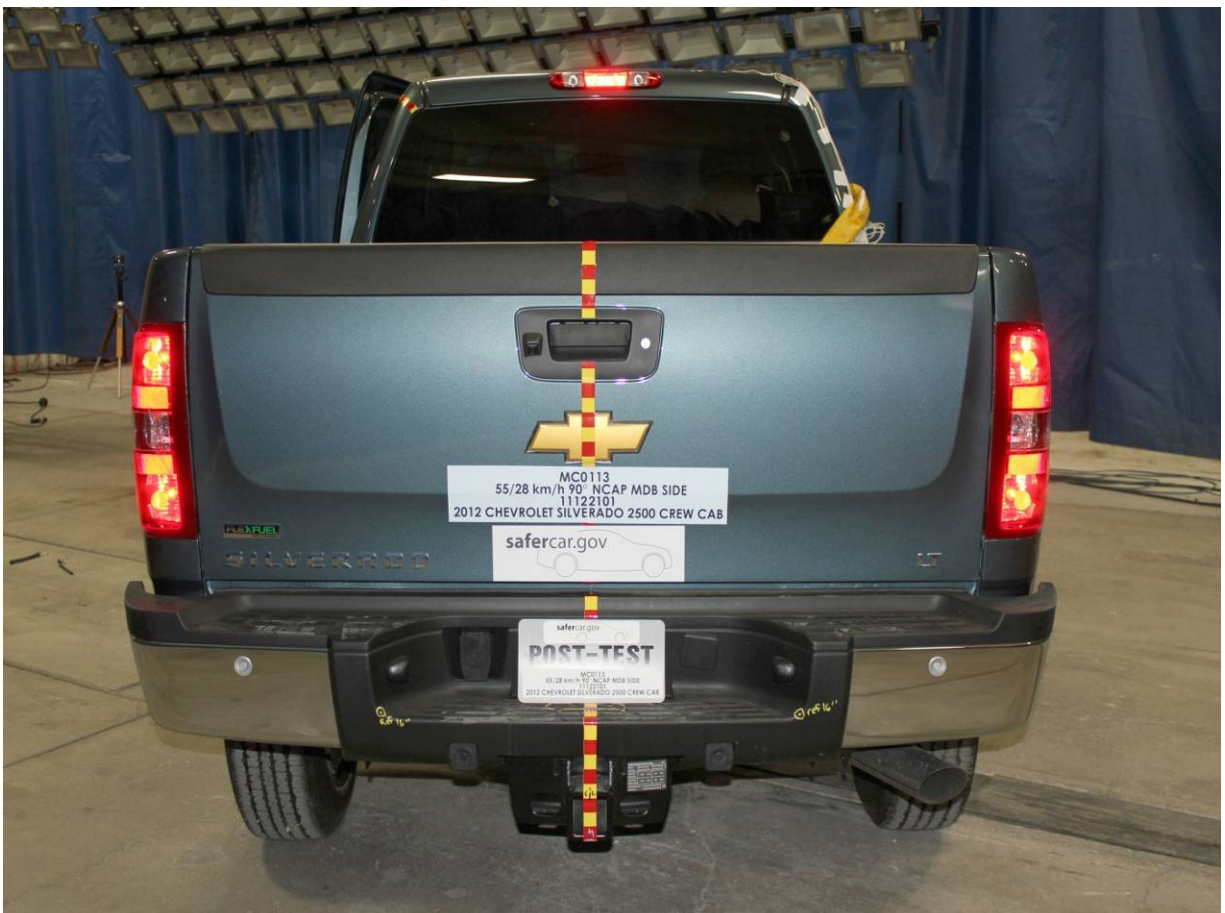
Pre-Test Left Three-Quarter Rear View of Test Vehicle



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



Pre-Test Rear View of Test Vehicle



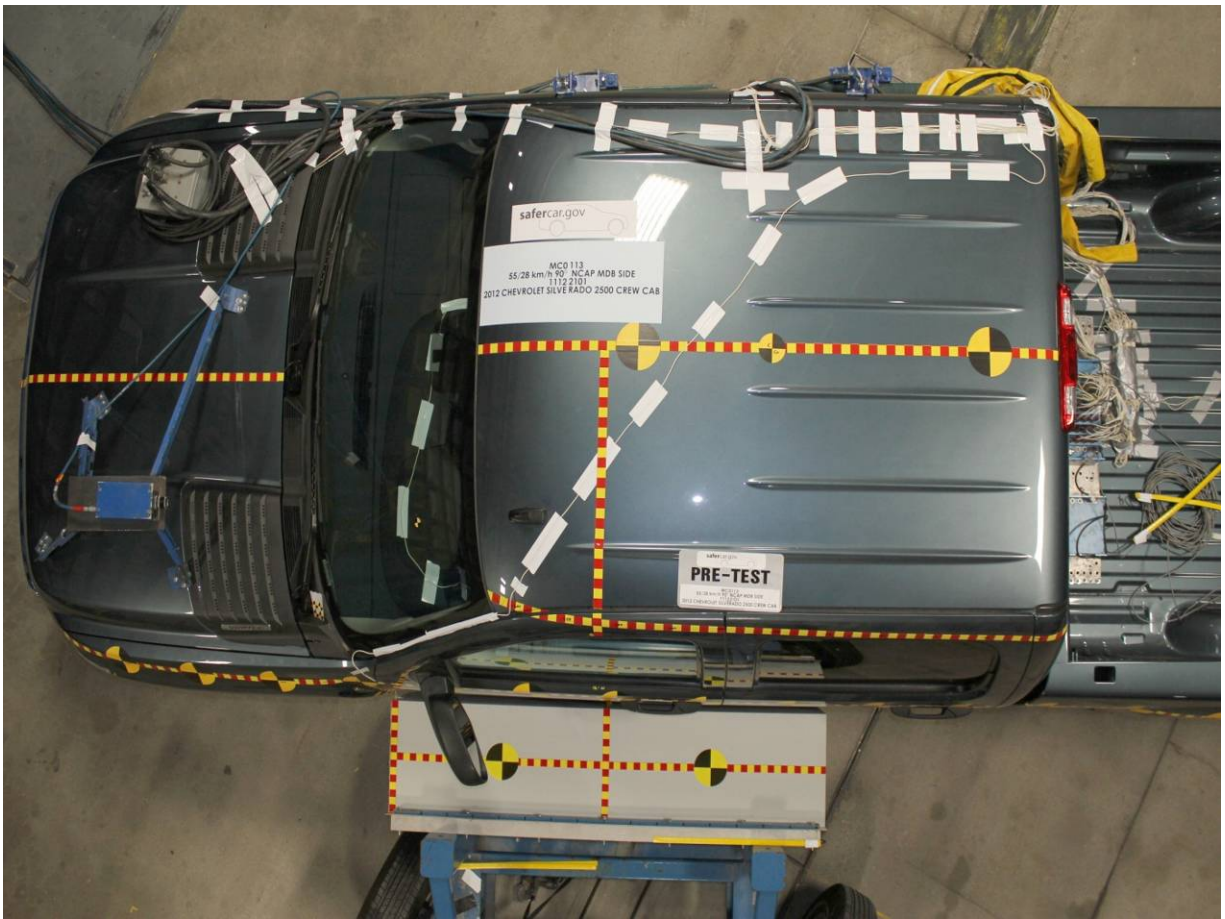
Post-Test Rear View of Test Vehicle



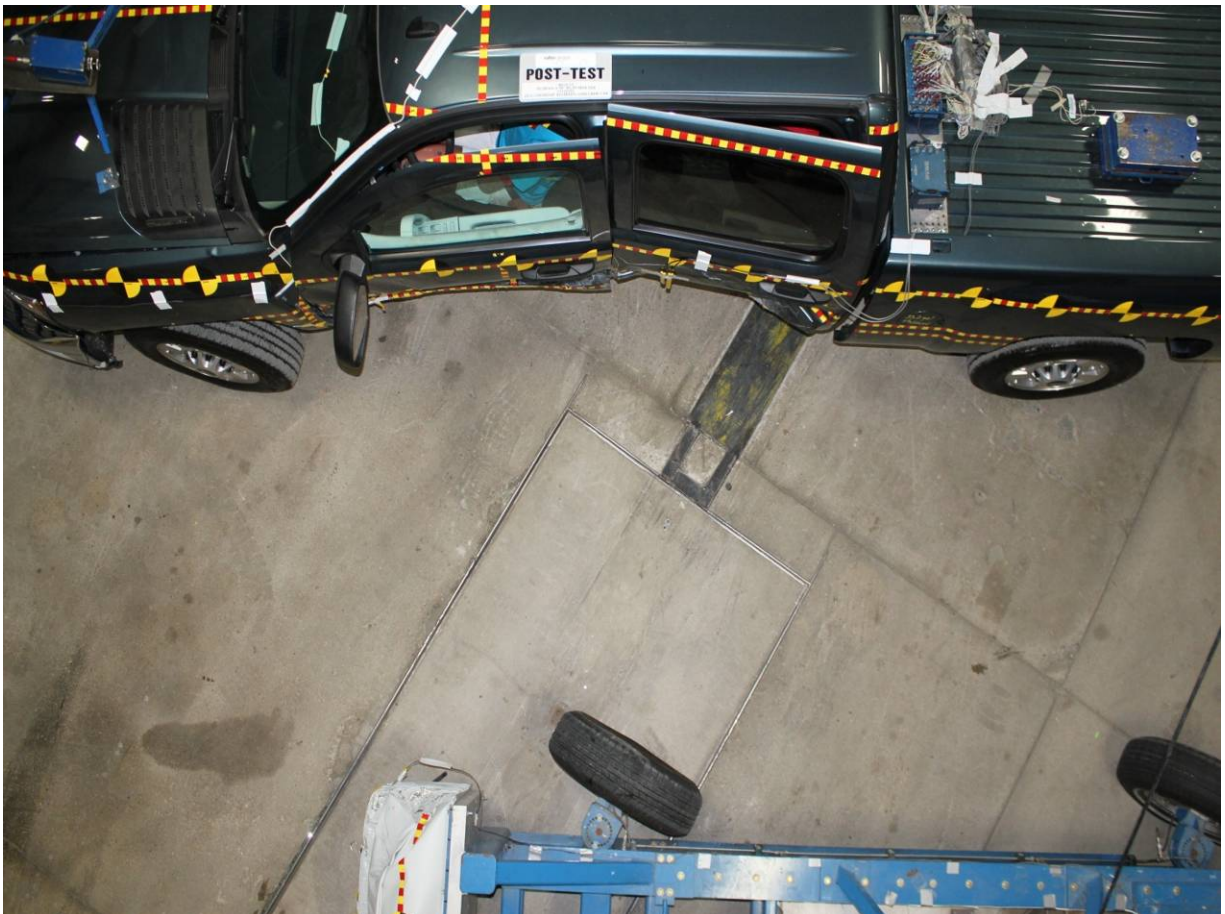
Pre-Test Right Side View of Test Vehicle



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



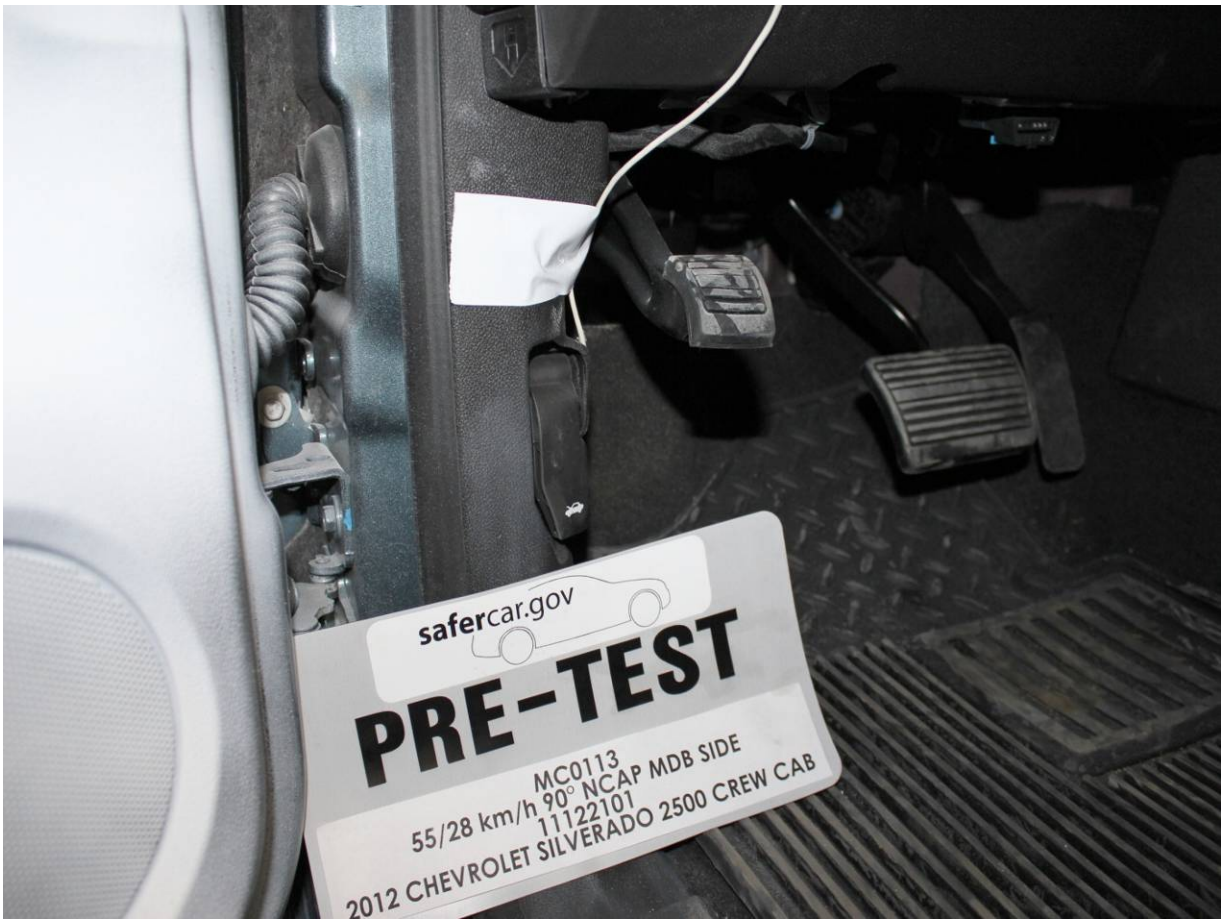
Pre-Test Placement of Driver Dummy's Feet



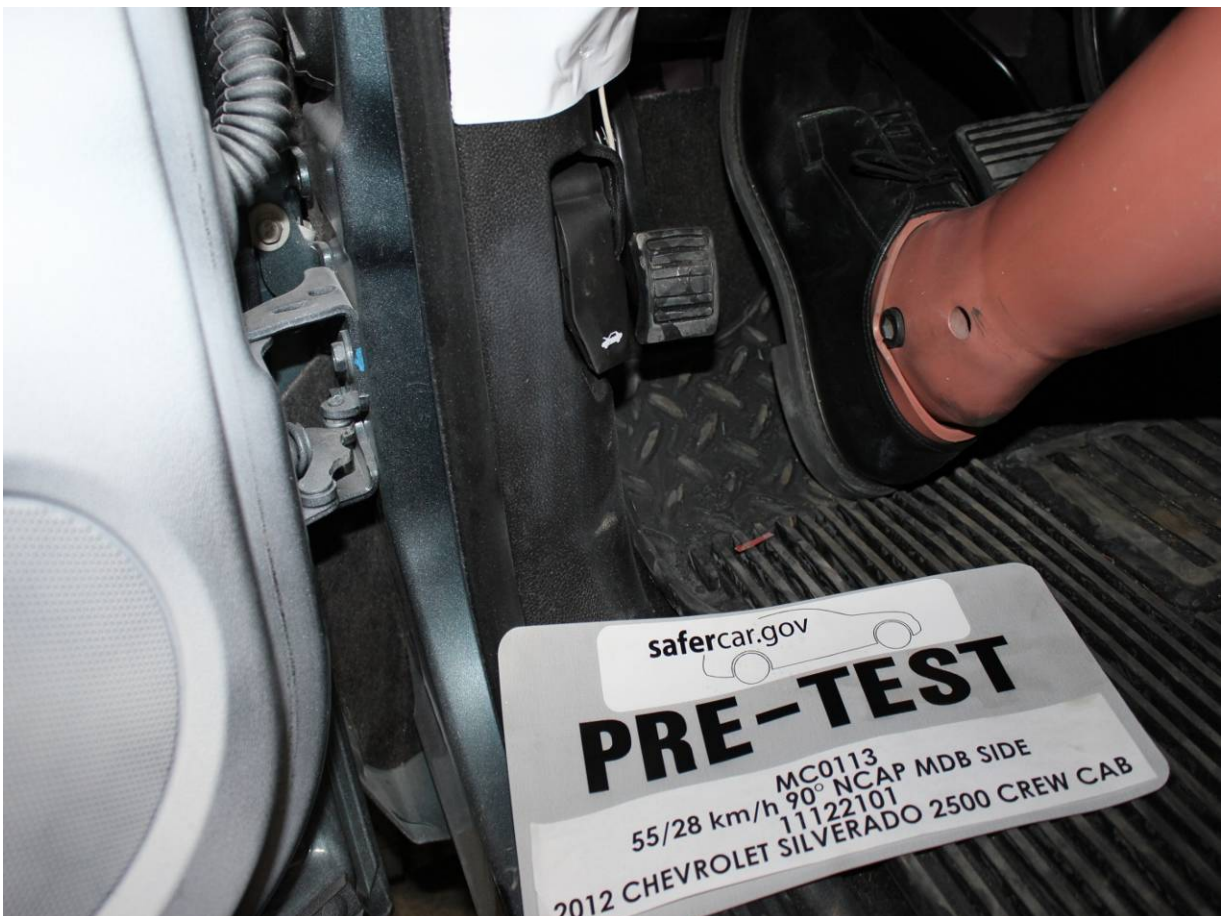
Pre-Test View of Belt Anchorage for Driver Dummy



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



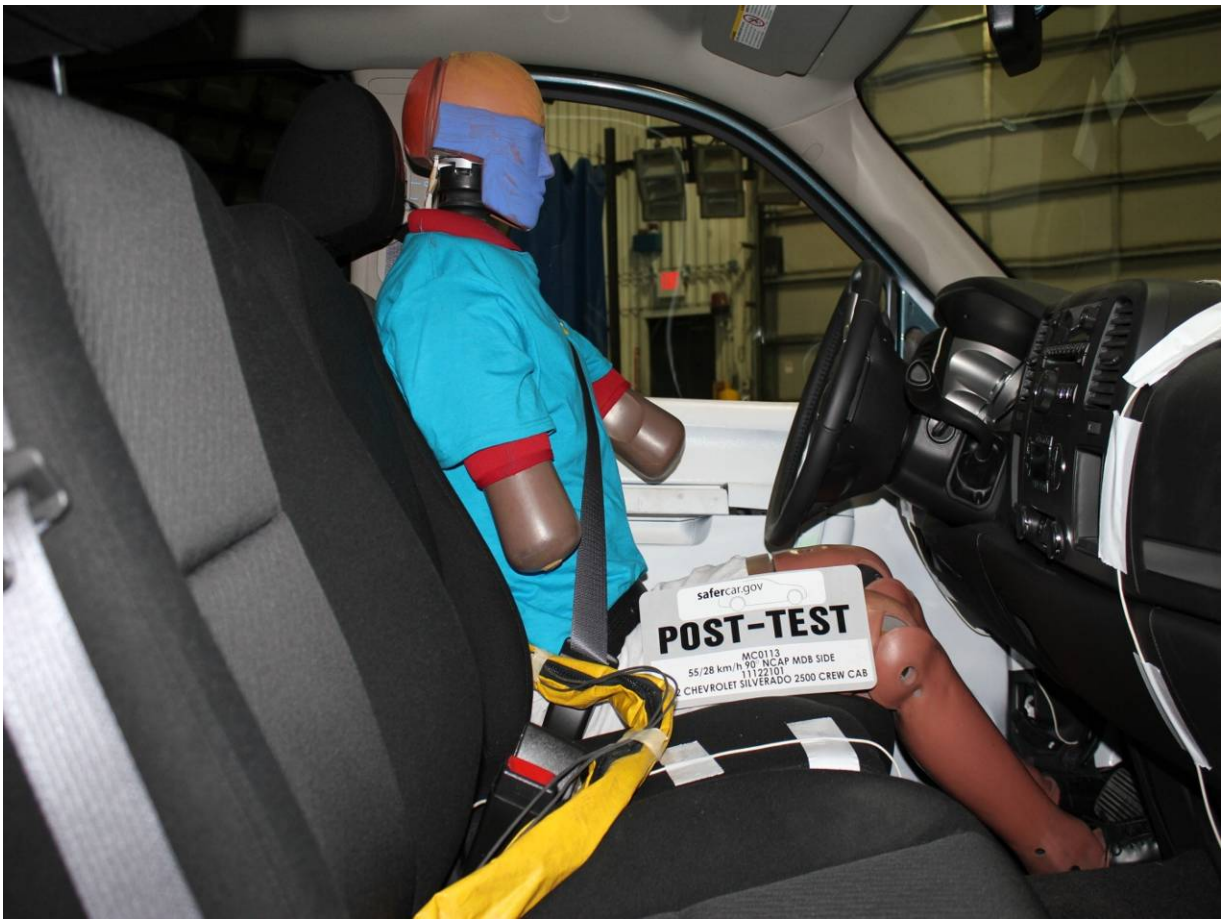
Pre-Test Driver Dummy and Door Clearance View



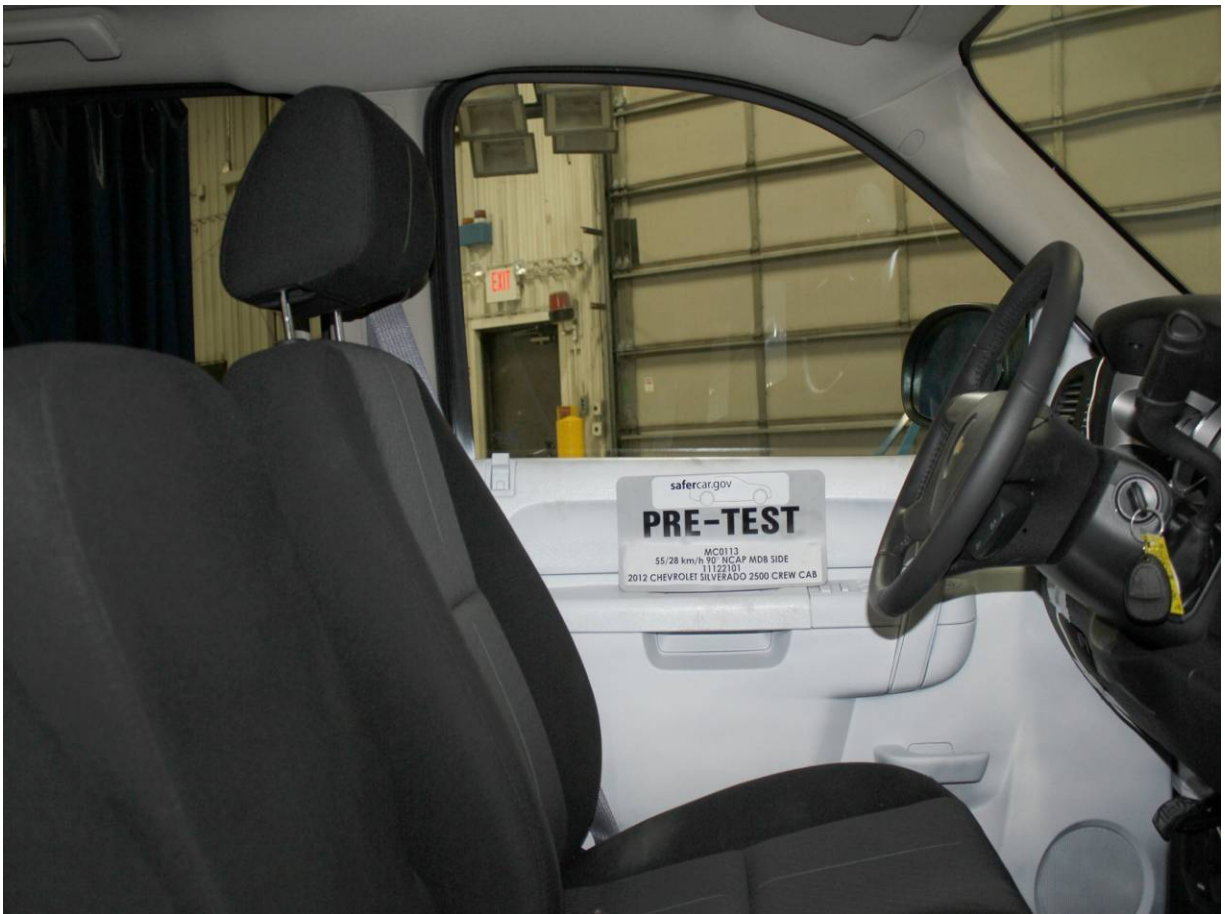
Post-Test Driver Dummy and Door Clearance View



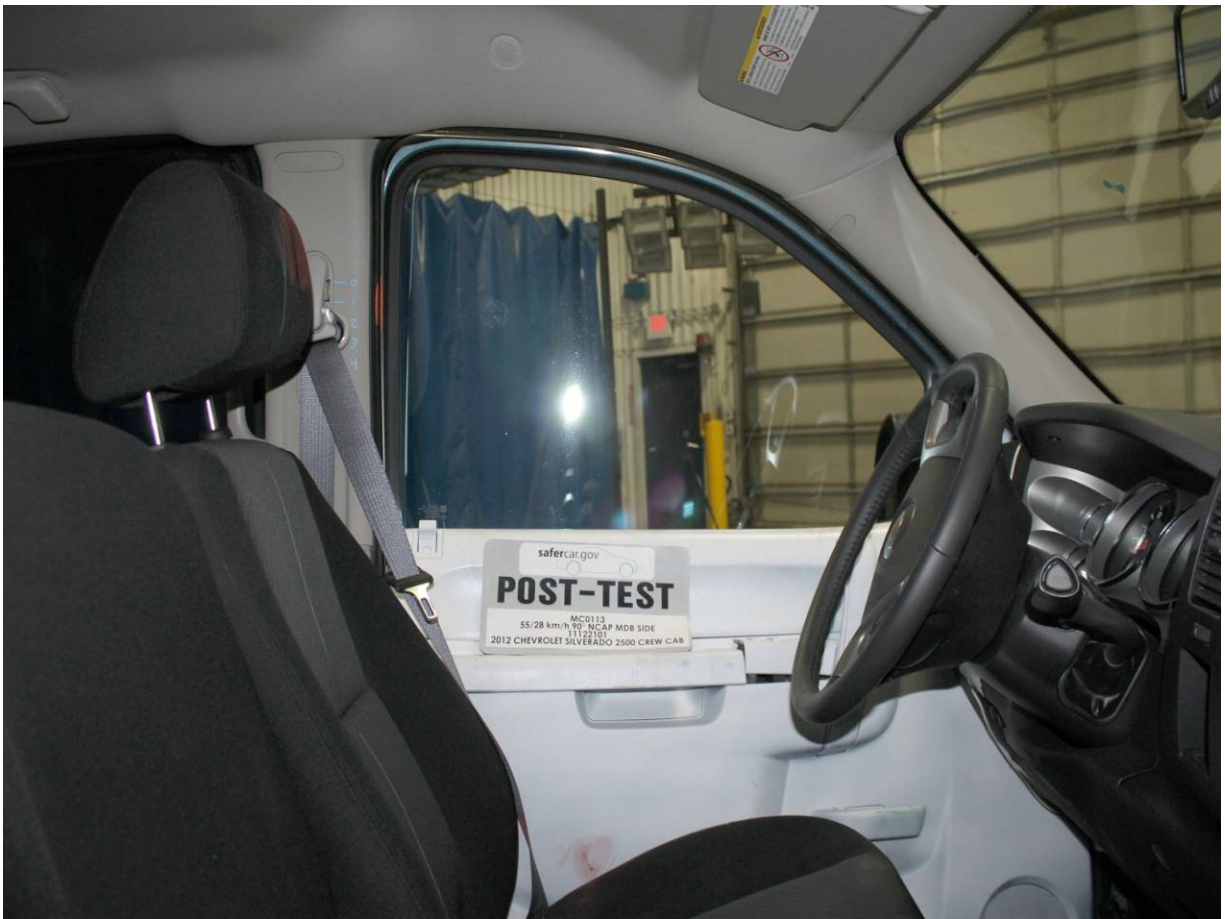
Pre-Test Right Side View of Driver Dummy and Front Seat of Occupant Compartment



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



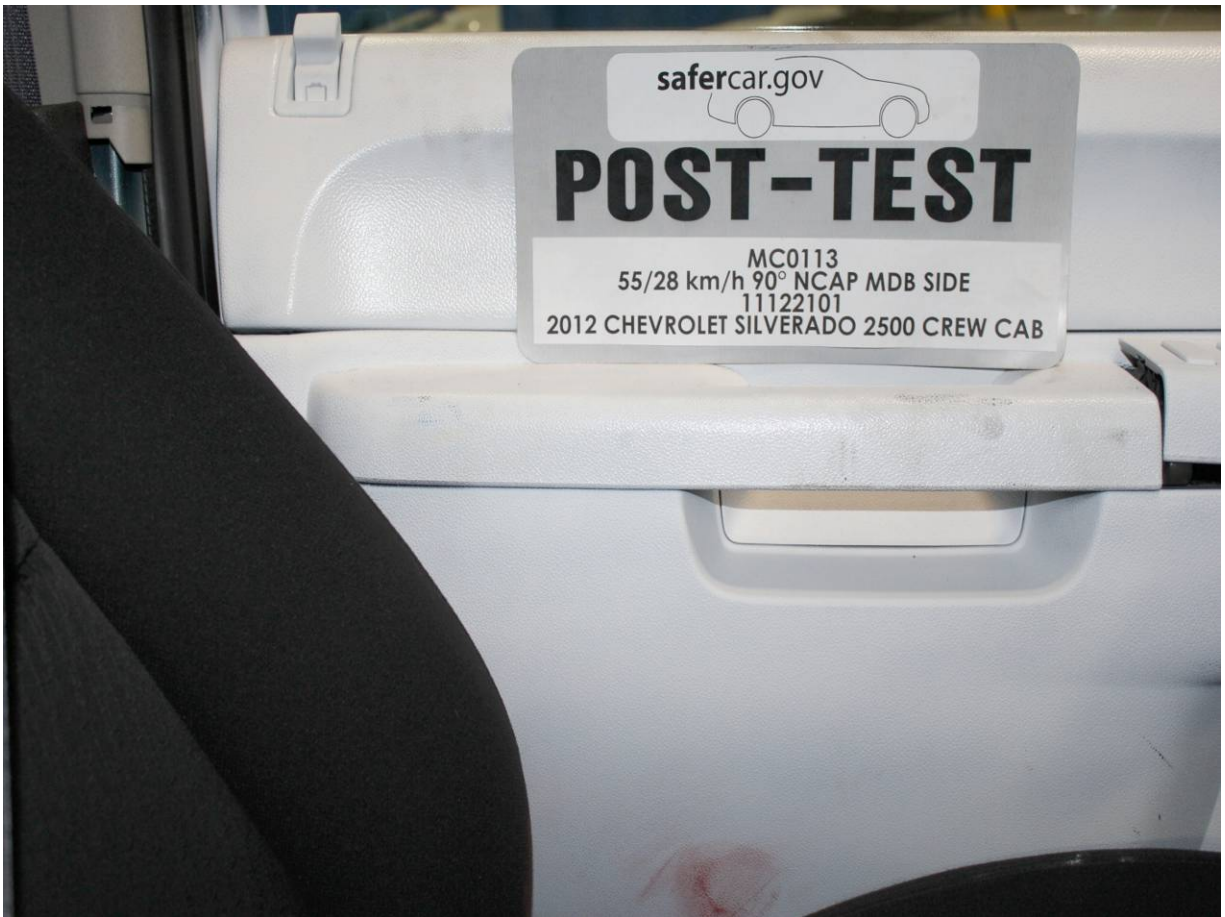
Post-Test Driver Dummy Close-up Head Contact with Vehicle Interior View



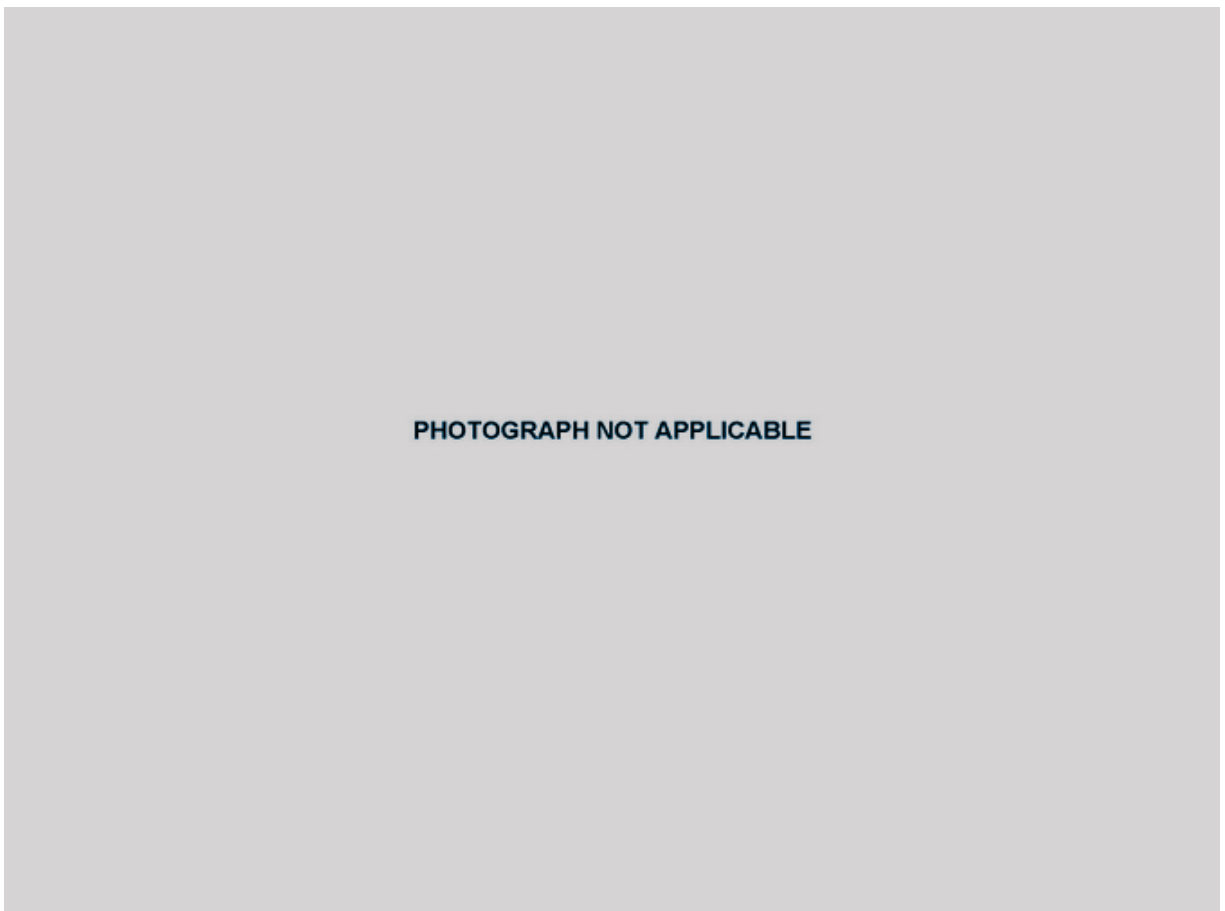
Post-Test Driver Dummy Close-up Head Contact with Vehicle Interior View

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



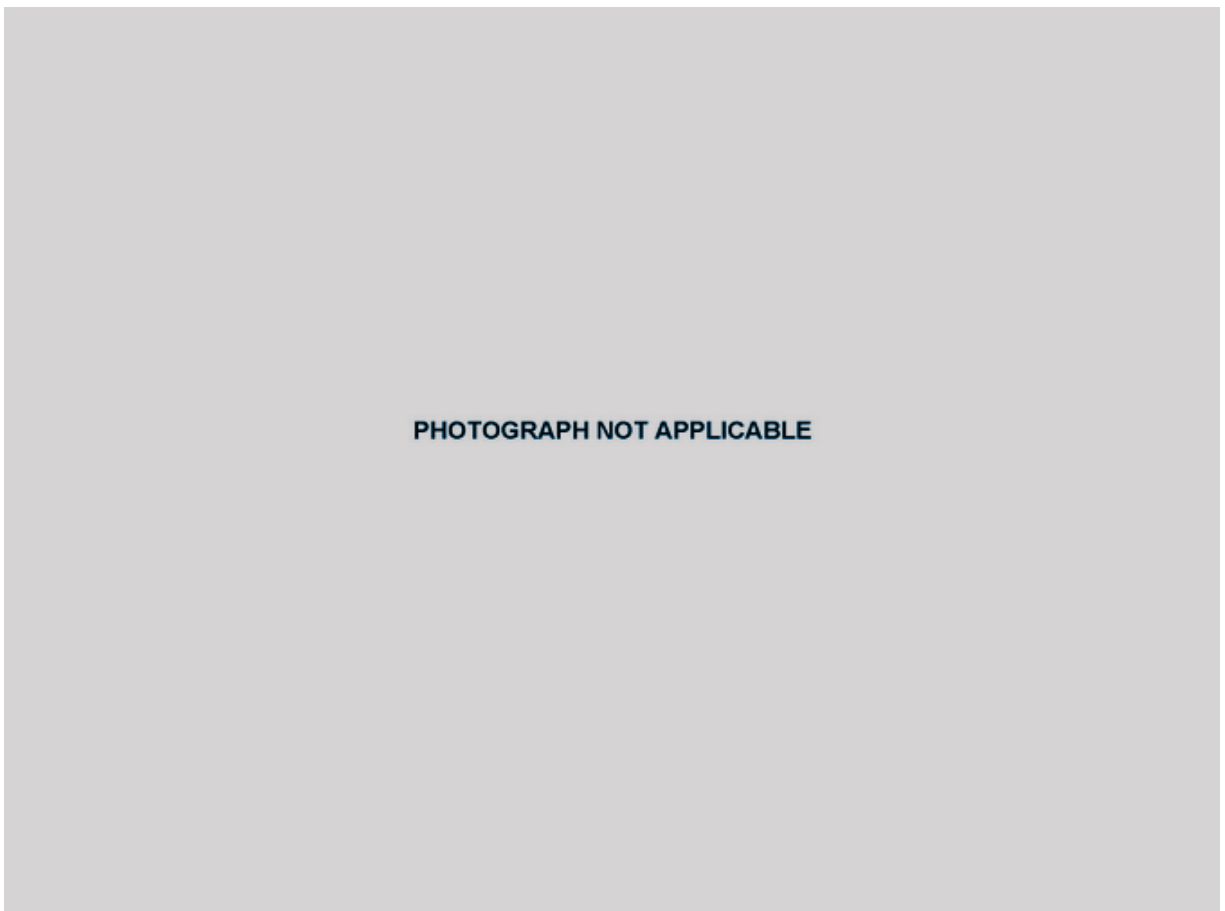
Post-Test Driver Dummy Close-up Torso Contact with Vehicle Interior View



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



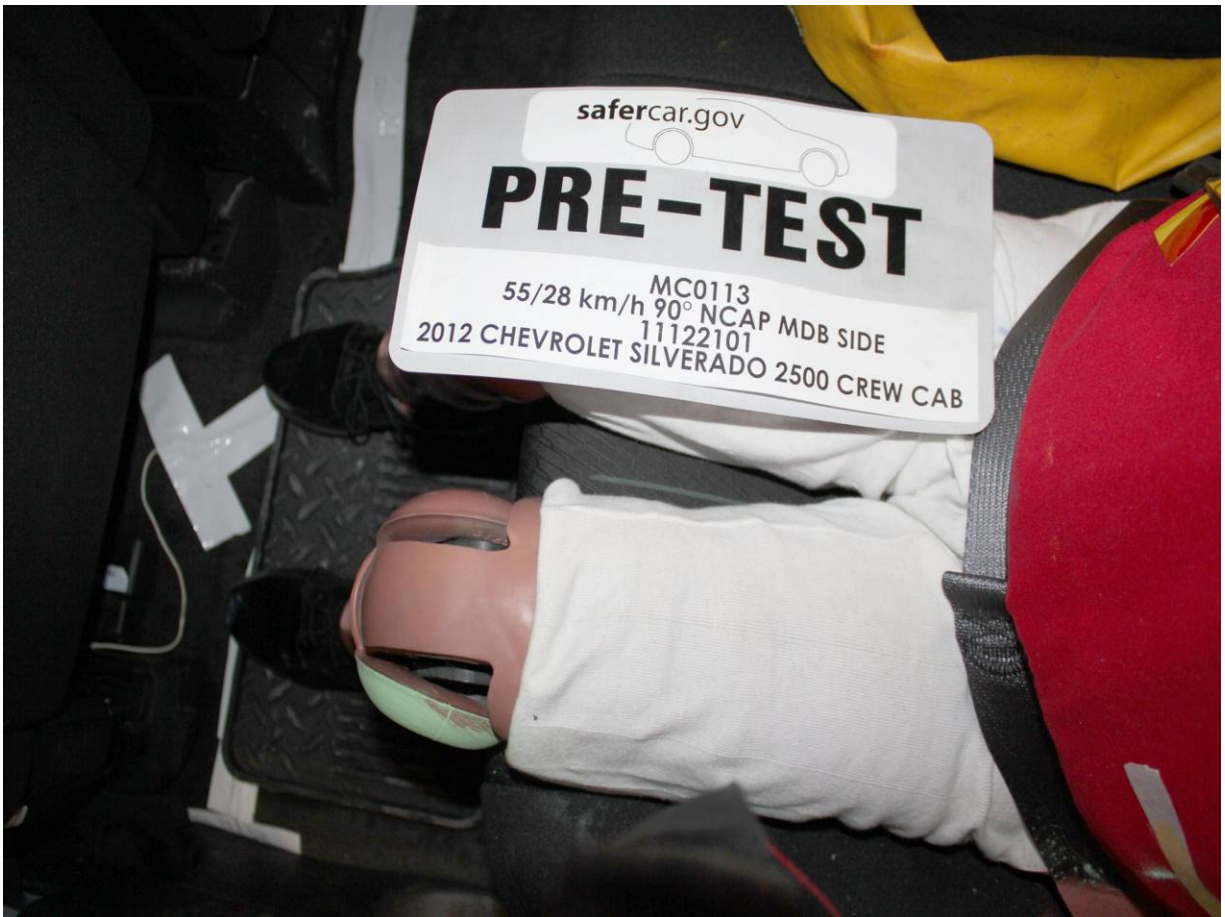
Pre-Test Frontal View of Rear Passenger Seat Back Prior to Dummy Positioning



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



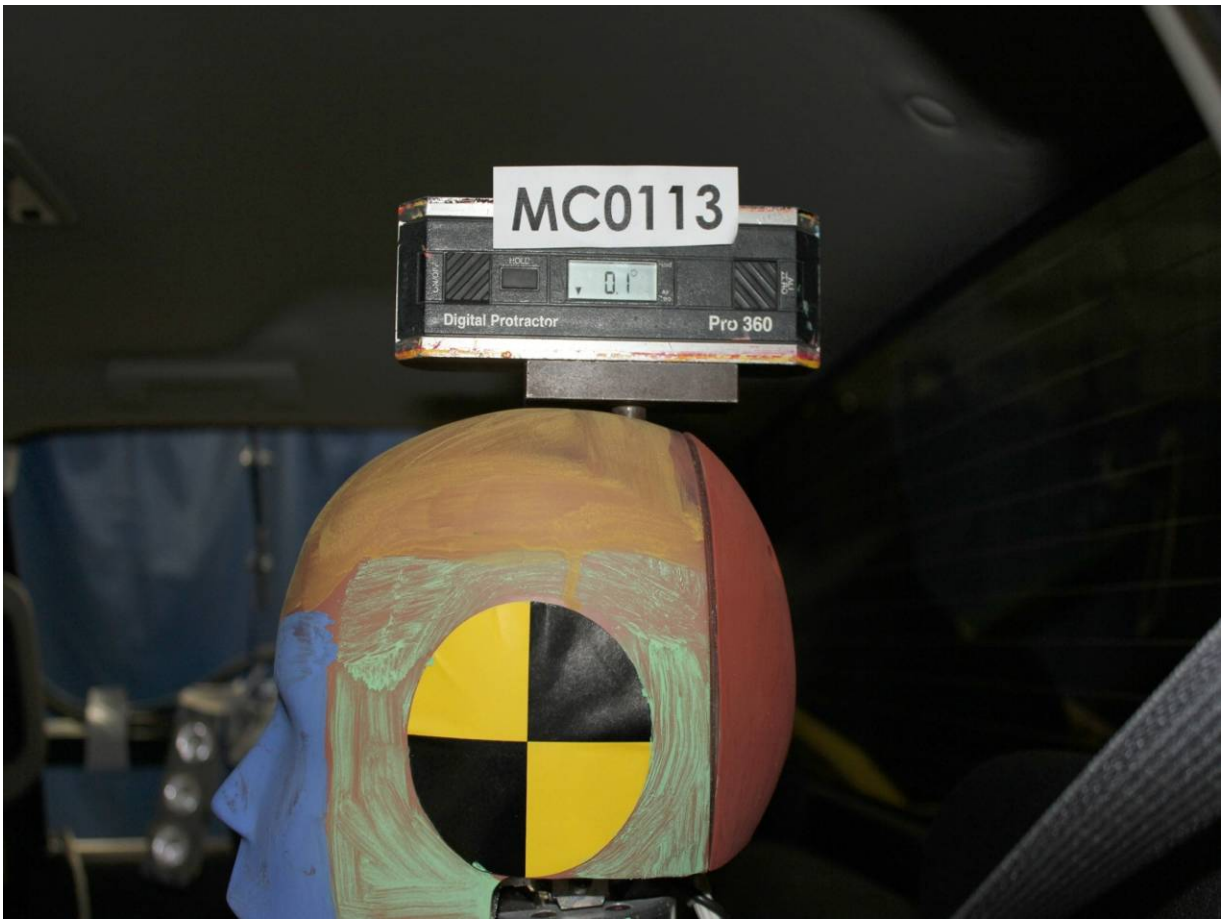
Pre-Test Overhead View of Rear Passenger Seat Pan Prior to Dummy Positioning



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



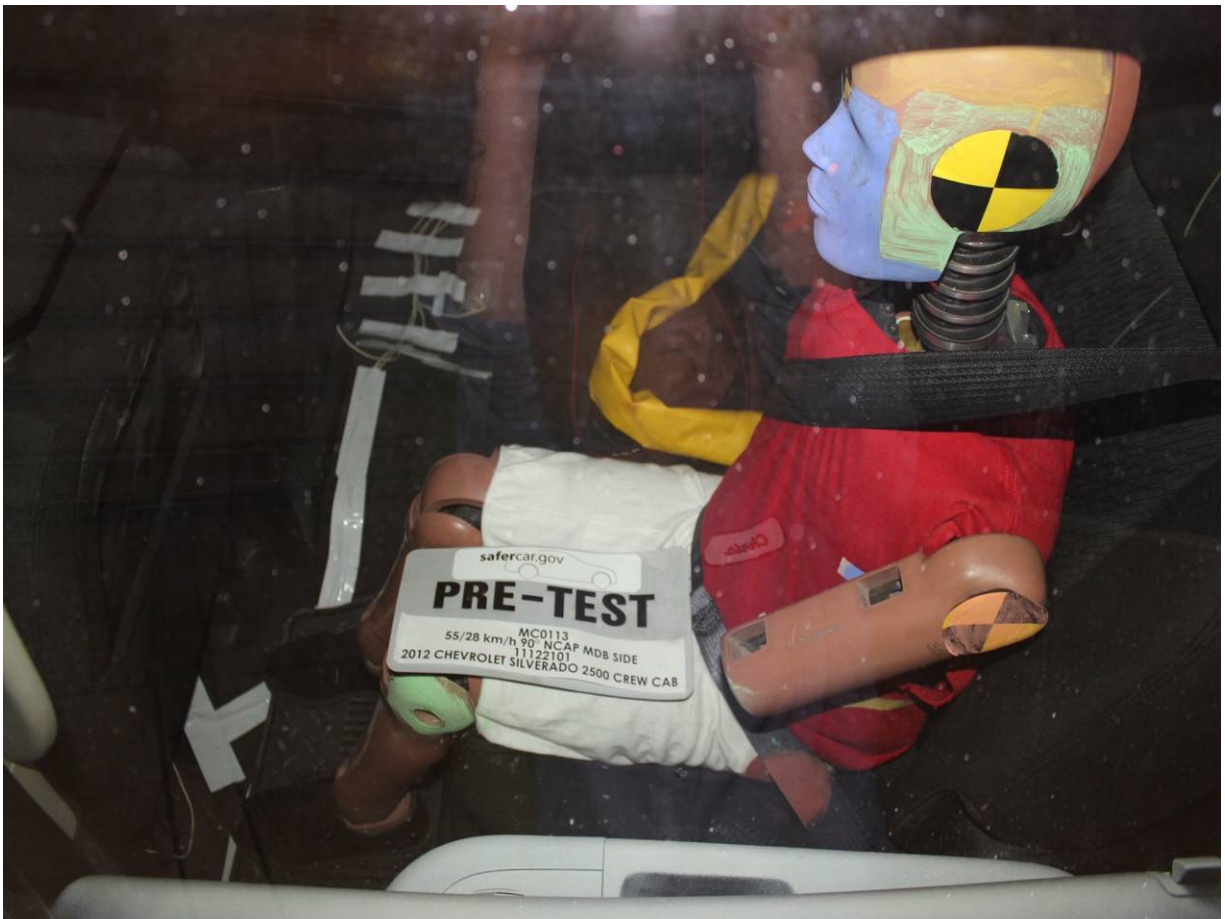
Pre-Test Close-Up Left Side View of Rear Passenger Seat Track



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



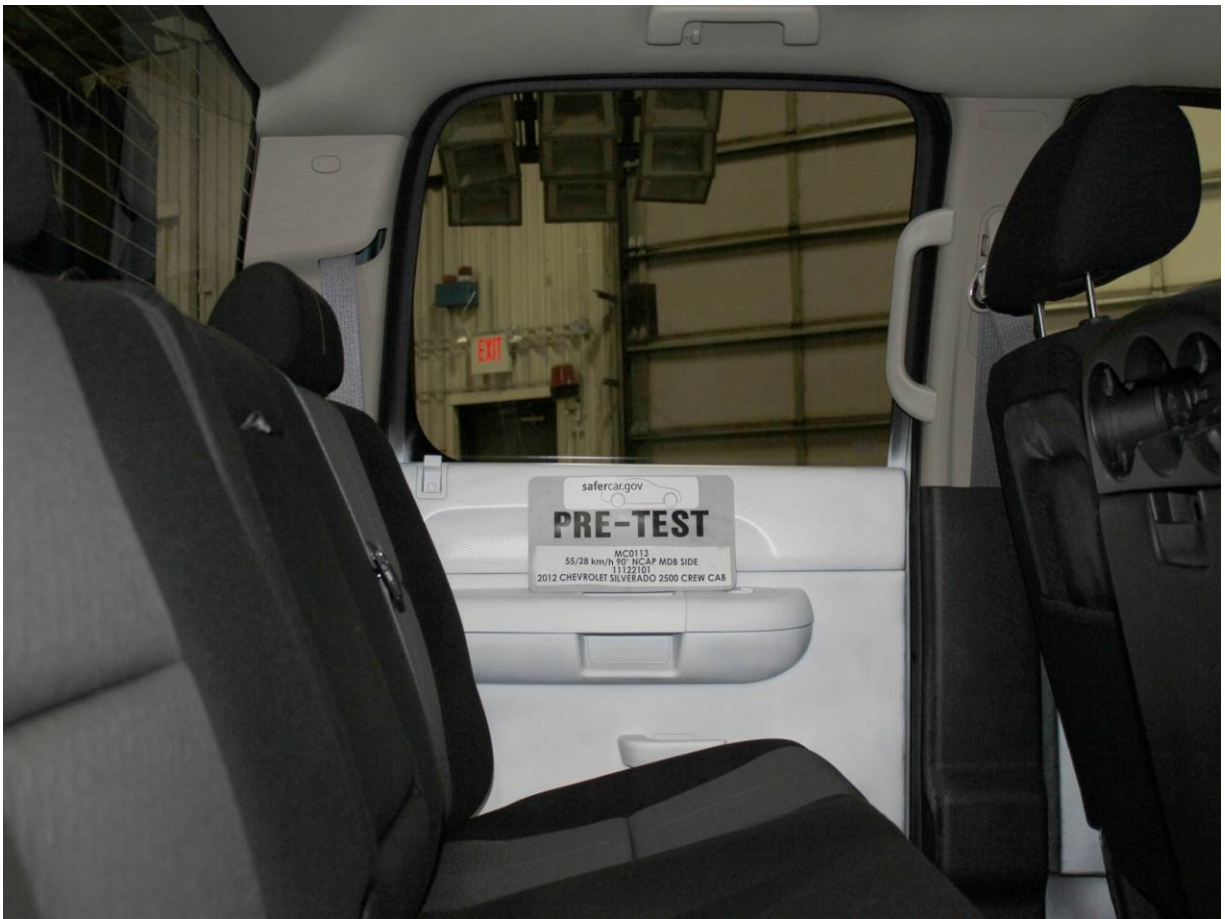
Post-Test Rear Passenger Dummy and Door Clearance View



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 Vehicle Interior View

PHOTOGRAPH NOT APPLICABLE

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



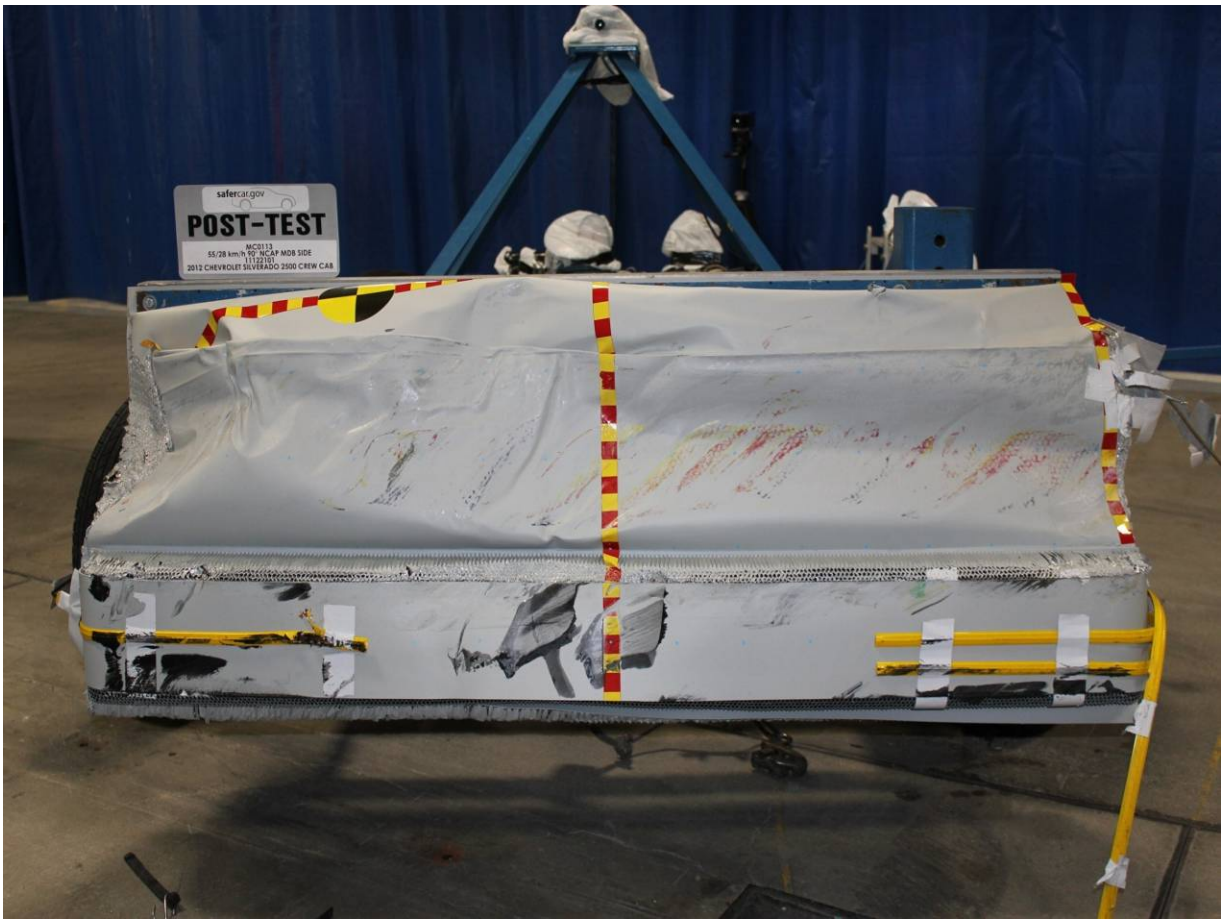
Pre-Test View of Fuel Filler Cap or Fuel Filler Neck



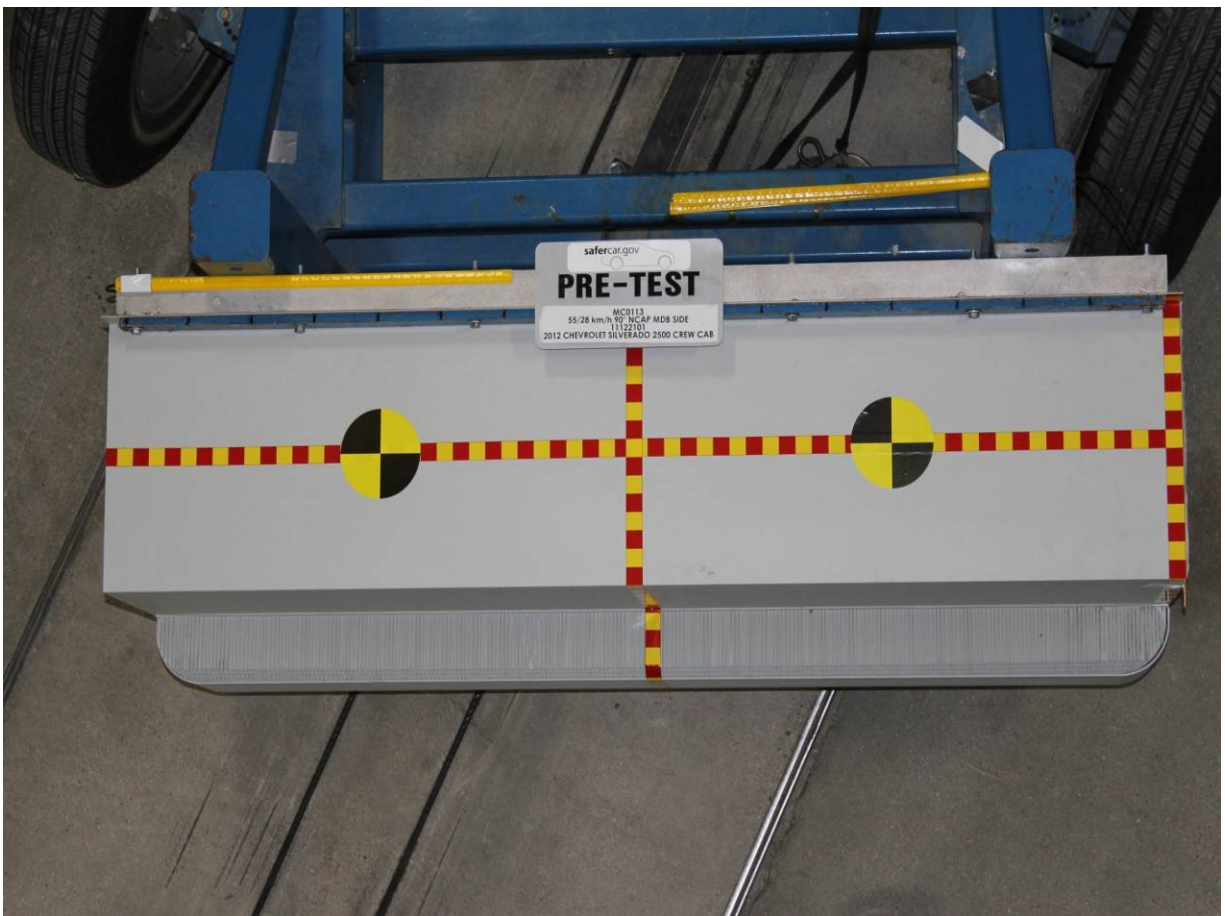
Post-Test View of Fuel Filler Cap or Fuel Filler Neck



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



2012 SILVERADO 2500 2WD LT CREW CAB

EXTERIOR: BLUE GRANITE METALLIC
INTERIOR: EBONY

VORTEC 6.0L V8 SFI GAS ENGINE
6-SPEED AUTOMATIC TRANSMISSION

STANDARD EQUIPMENT		OTHER		visit us at www.liverty.com	
TRUCKS FEATURED BELOW ARE MODELED AT NO EXTRA CHARGE IN THE STANDARD EQUIPMENT PRICE SHOWN.		• BATTERY RUN DOWN PROTECTION		• LOCKING REAR DIFFERENTIAL	
• 5 YEAR / 100,000 MILE POWERTRAIN LIMITED WARRANTY SEE DEALER FOR DETAILS		• OIL LIFE MONITOR SYSTEM		• INTEGRATED TRAILER BRAKE CONTROLLER	
MECHANICAL		• 24-HOUR ROADSIDE ASSISTANCE		CONVENIENCE PACKAGE: 860.00	
• VORTEC 6.0L V8 ENGINE		OPTIONS & PRICING		• ADJUSTABLE PEDALS	
• 6-SPEED H.O. AUTO TRANSMISSION		MANUFACTURER'S SUGGESTED RETAIL PRICE		• REAR PARKING ASSIST	
• TORSION BAR FRONT SUSPENSION		STANDARD VEHICLE PRICE \$36,155.00		• ELECTRIC REAR WINDOW DEFROGGER	
• MULTI-LEAF REAR SPRING SUSP.		OPTIONAL EQUIPMENT BY THE MANUFACTURER, NOT REPLACES STANDARD EQUIPMENT PRICING		• REMOTE VEHICLE STARTER SYSTEM	
• 285 HANDLING TRAILERING SUSP.		INTERIOR PLUS PACKAGE: 1,015.00		• UNIVERSAL HOME REMOTE	
• FULLY BOXED FRAME DESIGN		• PWR SEAT ADJUST, DRIVER 6-WAY		REAR VISION CAMERA 450.00	
• 125 AMP ALTERNATOR		• AUTO DUAL ZONE A/C		CAMPER/STH WHEEL TRAILER WIRING 35.00	
• RE-CIRCULATING BALL STEERING		• STEERING WHEEL RADIO CONTROL		PROVISIONS	
SAFETY & SECURITY		• CD PLAYER W/ USB PORT		G.W. RATING - 9,500 LBS INC.	
• 4-WHEEL ABS BRAKES		• BLUETOOTH FOR PHONE		REAR AXLE - 3.73 RATIO INC.	
• DRIVER AND FRONT PASSENGER AIR BAGS		• FOG LAMPS		VORTEC 6.0L V8 SFI GAS ENGINE INC.	
• THEFT DETECTION SYSTEM		• LOCKING TAILGATE		TOTAL OPTIONS \$3,140.00	
• REMOTE KEYLESS ENTRY		• EZ LIFT TAILGATE		TOTAL VEHICLE & OPTIONS \$39,295.00	
• DAYTIME RUNNING LAMPS		HO TRAILERING EQUIPMENT PKG: 786.00		DESTINATION CHARGE 995.00	
• STABILITRAK-STABILITY CONTROL WITH TRAILER SWAY CONTROL AND HILL START ASSIST				TOTAL VEHICLE PRICE* \$40,290.00	
• AUTO HEADLAMPS W/FLASH-TO-PASS					
• 6 MPH ONSTAR DIRECTIONS & CONNECTIONS WITH AUTOMATIC CRASH RESPONSE AND TURN-BY-TURN NAVIGATION (ASK DEALER ABOUT GEOGRAPHIC COVERAGE)					
• SPARE TIRE LOCK					
• TIRE PRESSURE MONITOR SYSTEM (DOES NOT APPLY TO SPARE TIRE)					
EXTERIOR					
• CHROME REAR BUMPER					
• 17" ALUMINUM WHEELS					
• 17" ALL-SEASON TIRES					
• FRONT RECOVERY HOOKS					
• DUAL PWR HEATED CSVR MIRRORS					
• BOODSIDE MOLDINGS					
• CHROME SURROUND GRILLE					
• CARGO BOX ILLUMINATION					
• SOLAR RAY DEEP TINTED GLASS					
INTERIOR					
• AIR CONDITIONING					
• POWER LOCKS					
• POWER WINDOW					
• LEATHER W/POWER STEERING WHEEL					
• ILLUMINATED VANITY MIRRORS					
• 60/40 SPLIT REAR SEATING					
• DUAL GLOVE BOX STORAGE					
• AM/FM STEREO WITH CD PLAYER					
• XM RADIO + SERVICE SUBSCRIPTION SOLD SEPARATELY BY SIRIUSXM AFTER 3 MONTHS					
• DRIVER INFO CENTER DISPLAY					
• INTERMITTENT WIPERS					
• 6 GAUGE CLUSTER W/ tachometer					
• 12-VOLT ASH PWR OUTLET					
• TILT STEERING WHEEL					
• CRUISE CONTROL					
• CARPETED FLOOR COVERING WITH VINYL MATS					

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EPA Fuel Economy Estimates		GOVERNMENT SAFETY RATINGS	
CITY MPG Expected range for most drivers XX to XX MPG NOT APPLICABLE TO THIS VEHICLE HIGHWAY MPG Expected range for most drivers XX to XX MPG Your actual mileage will vary depending on how you drive and maintain your vehicle.		Frontal Crash Driver Passenger Not Rated 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. Side Crash Front seat Rear seat Not Rated Not Rated Star ratings based on the risk of injury in a side impact. 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).	
277 See the FREE Fuel Economy Guide at dealers or www.fueleconomy.gov		www.safercar.gov or 1-888-327-4236 ORDER NO. P00101 SALES CODE E SALES MODEL CODE C00013 VIN 1G11CXXC8C6F199269 FRONT ASSEMBLY PLANT, IN, U.S.A. VIN 1G11CXXC8C6F199269 DEALER TO WHOM ORDERED TOM BANNEN CHEVROLET, INC. PO BOX 1307 MADISON, TN 37116-1307 NZ 2GA1557243	

Monroney Label

Head Restraints

Front Seats

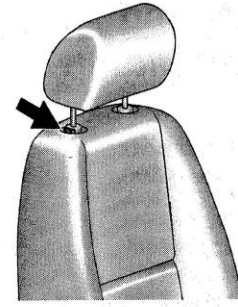
The front seats have adjustable head restraints in the outboard seating positions.

WARNING

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



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



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

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

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

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

Rear Seats

The rear seat has 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.

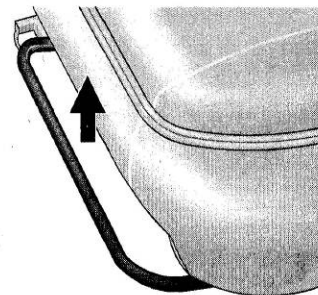
Rear outboard headrests are not designed to be removed.

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.



Split Bench or Bucket Seat

To adjust the seat:

1. Lift the bar 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 Driver Dummy Knee Contact with Vehicle Interior View



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

APPENDIX B

DUMMY RESPONSE DATA PLOTS

TABLE OF DATA PLOTS
Driver Dummy Instrumentation Plots

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Figure No. 3.	Driver Head Acceleration (Z) Primary vs. Time	B-1
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Figure No. 20.	Passenger Lower Spine T12 Acceleration (Z) vs. Time	B-6
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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)

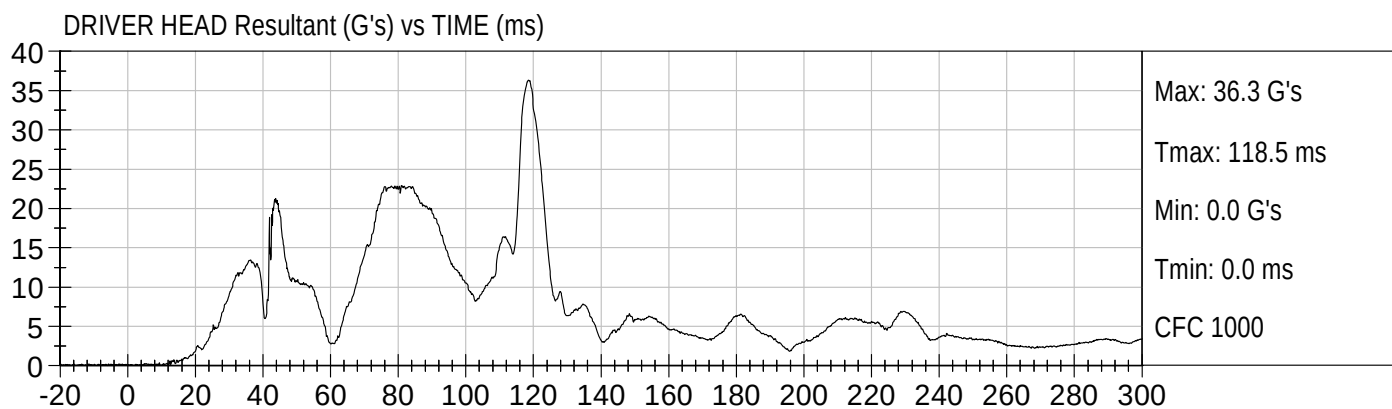
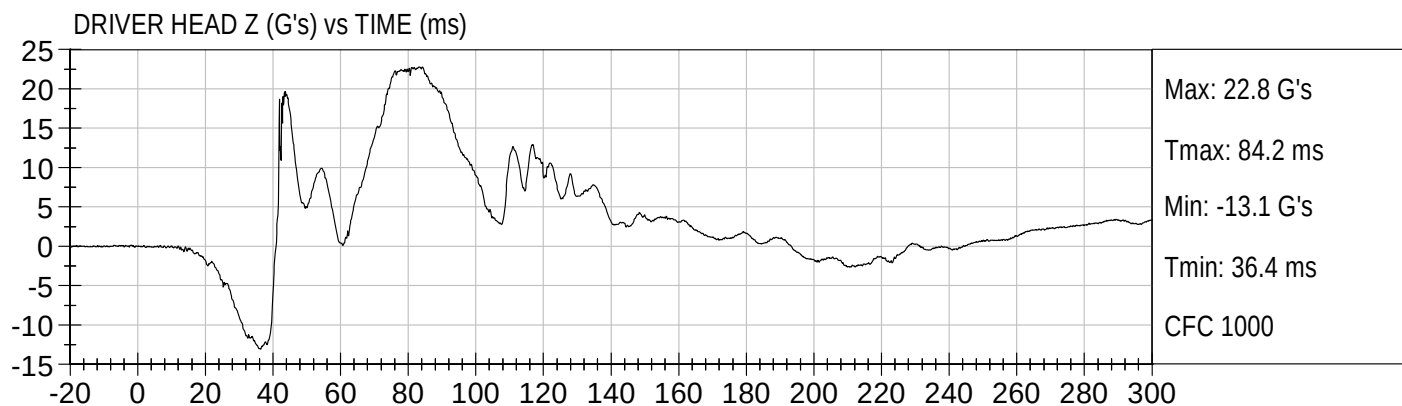
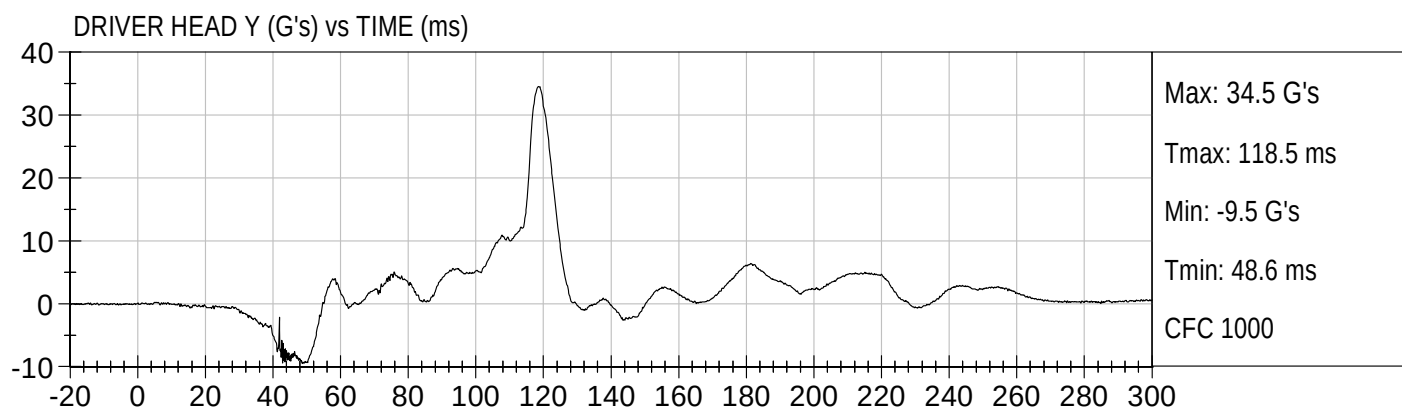
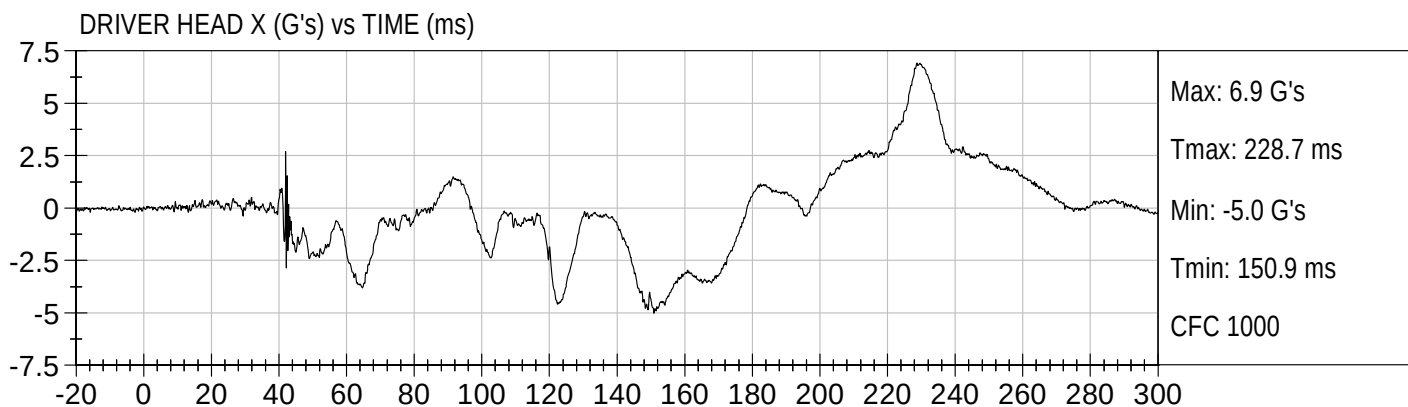
MDB Instrumentation Data

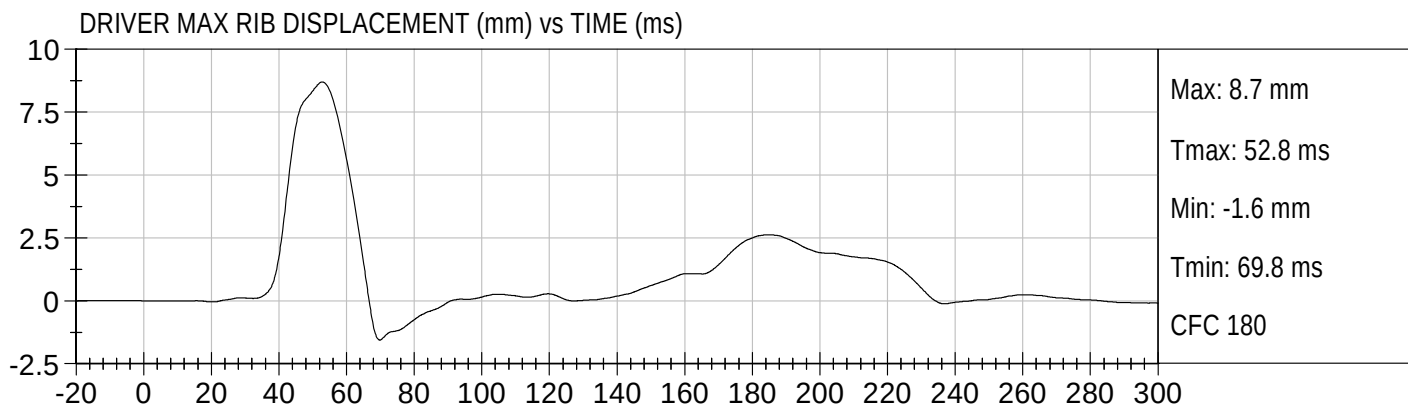
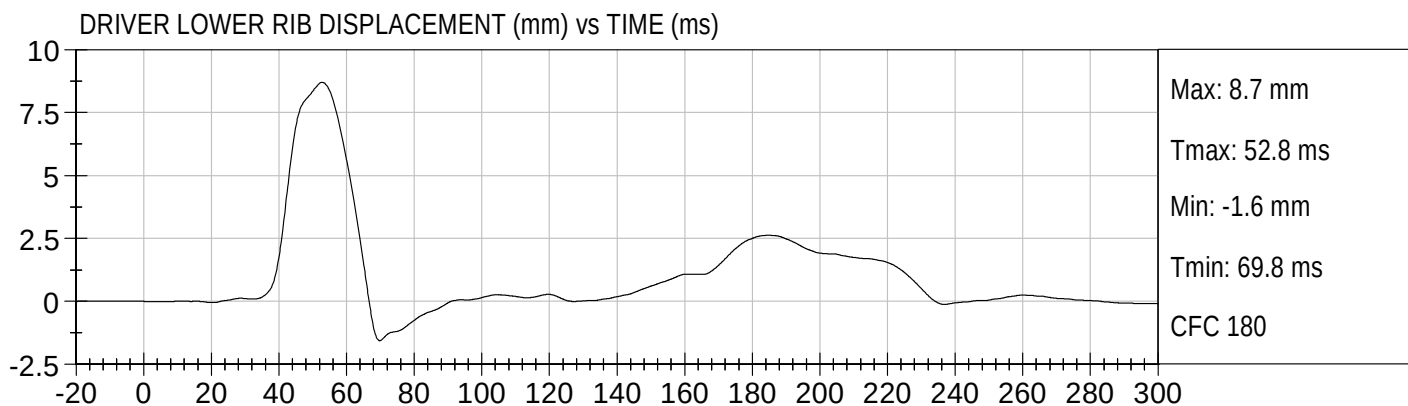
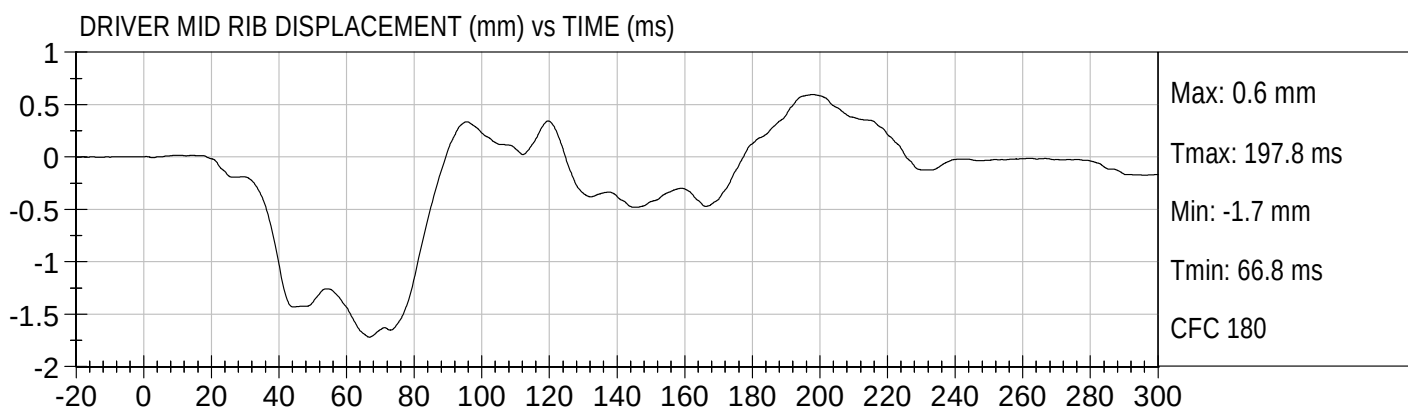
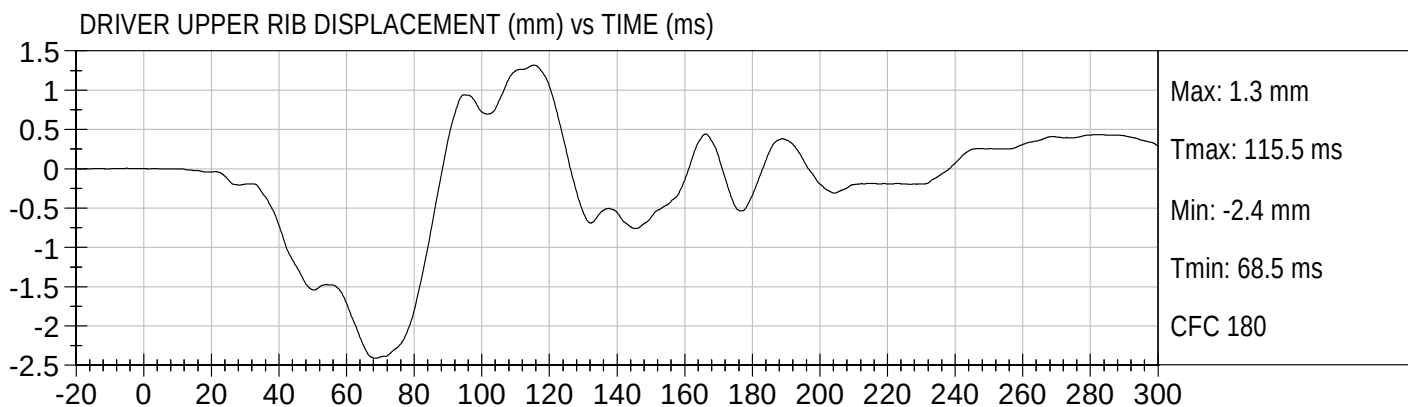
MDB Center of Gravity Acceleration (X)
MDB Center of Gravity Acceleration (Y)
MDB Center of Gravity Acceleration (Z)
MDB Rear Acceleration (X)
MDB Rear Acceleration (Y)
Left MDB Contact Switch
Right MDB Contact Switch

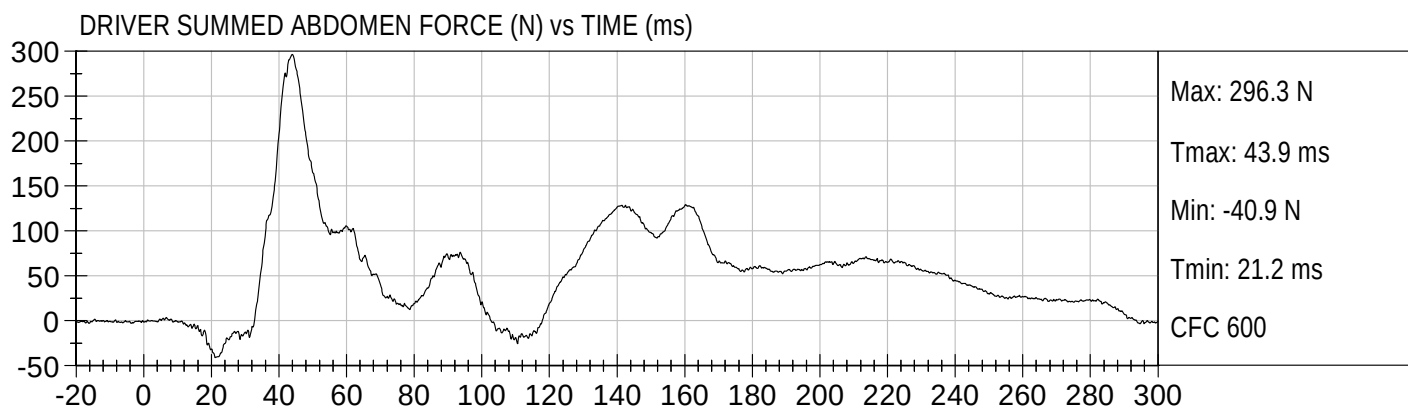
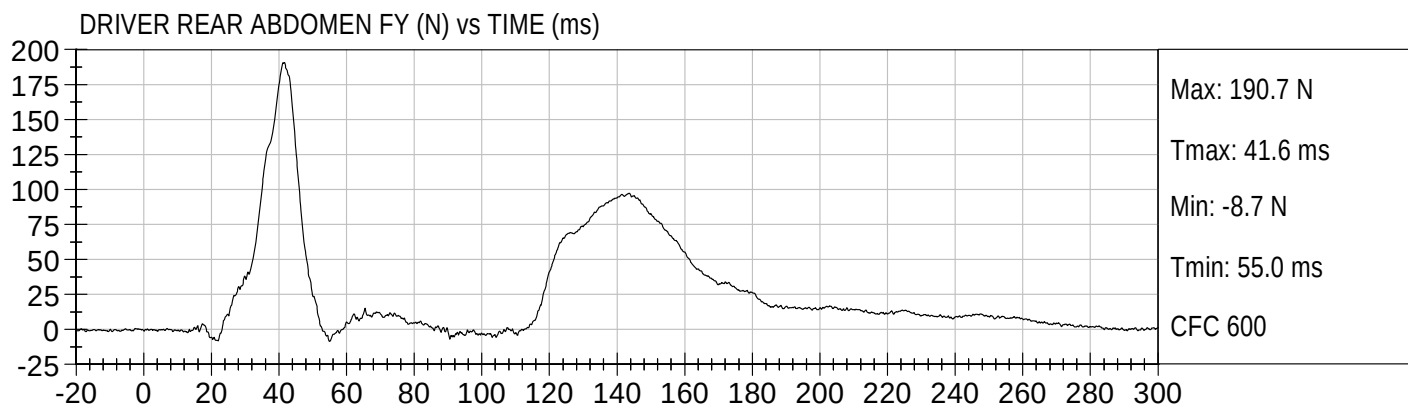
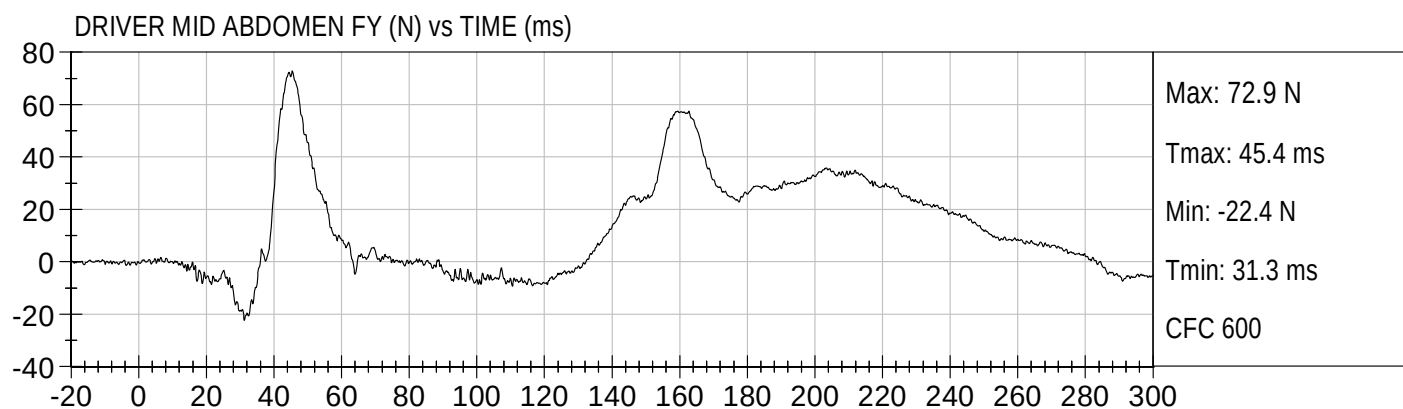
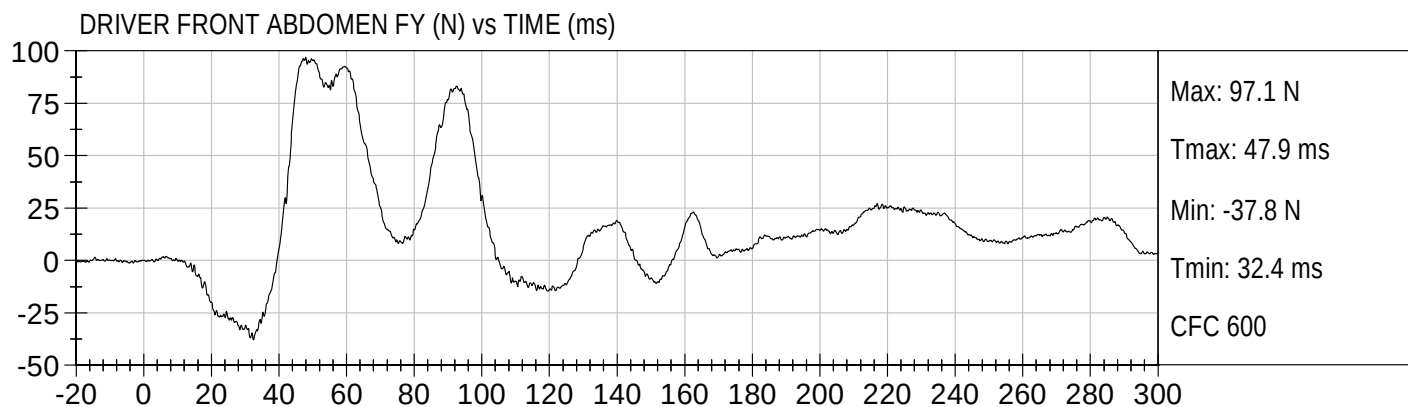


55/28 km/h 90° MDB Side Impact
2012 Chevrolet Silverado 2500 Crew Cab - MC0113

Test Date: 12/21/2011
Speed: 38.8 mph (62.4 km/h)



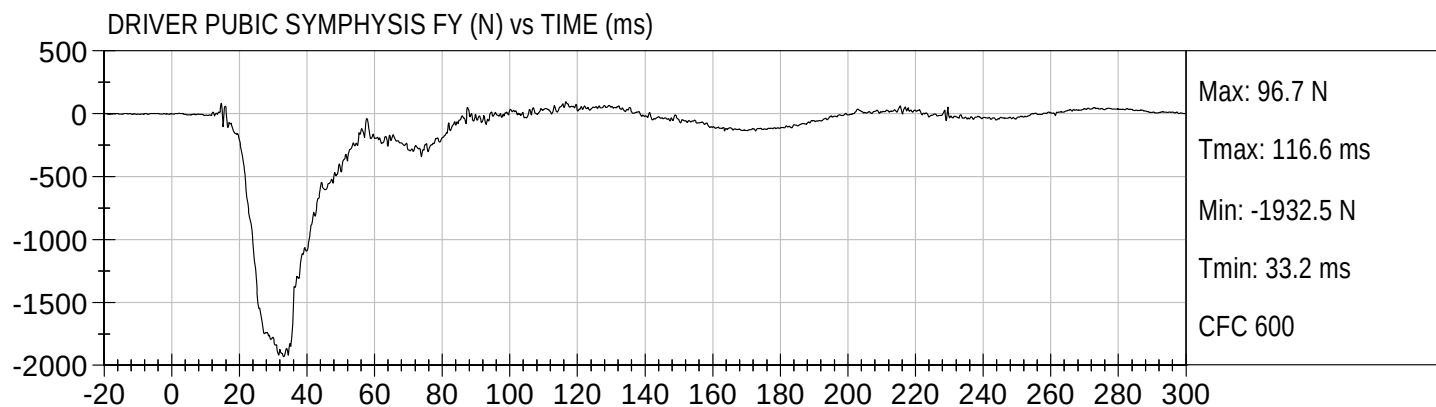






55/28 km/h 90° MDB Side Impact
2012 Chevrolet Silverado 2500 Crew Cab - MC0113

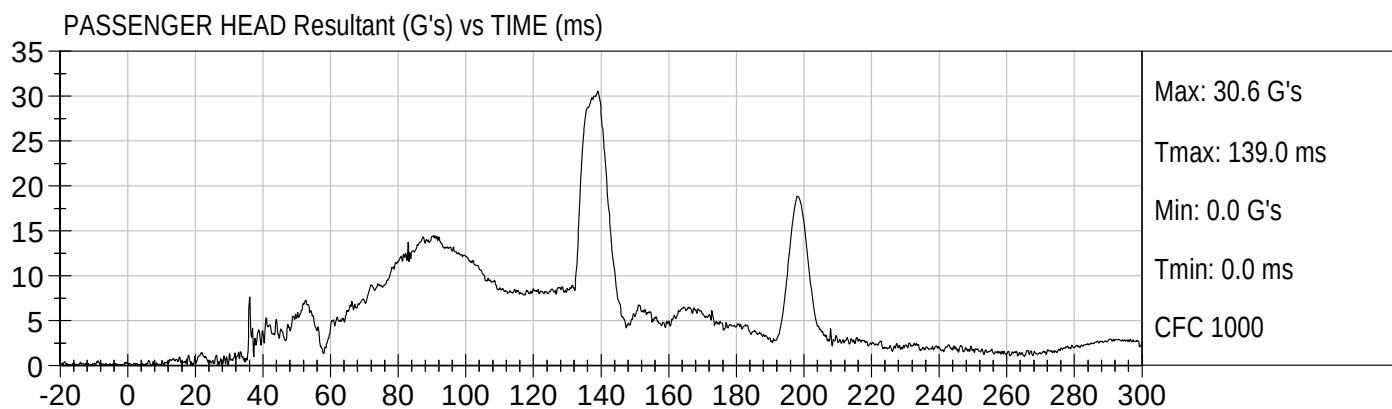
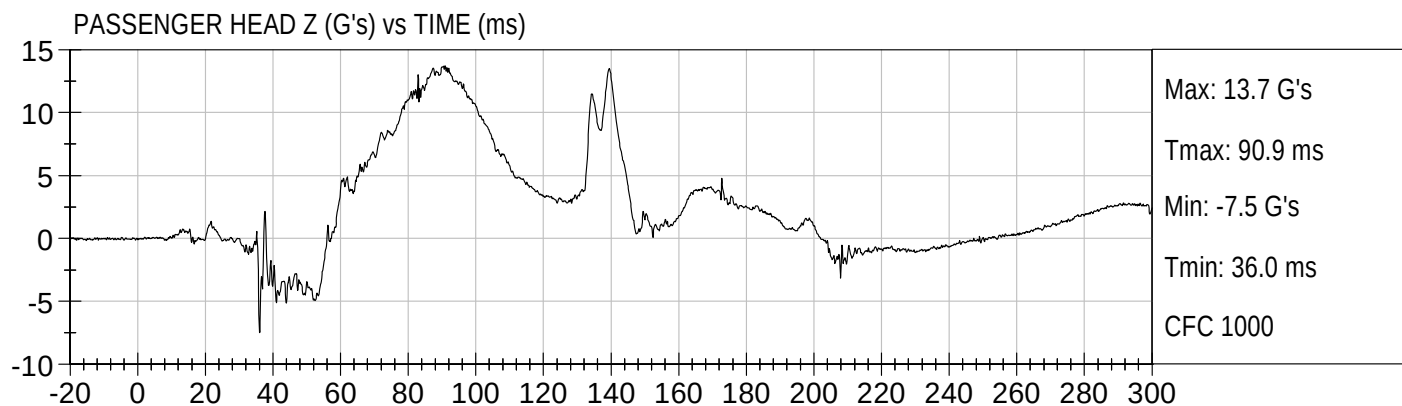
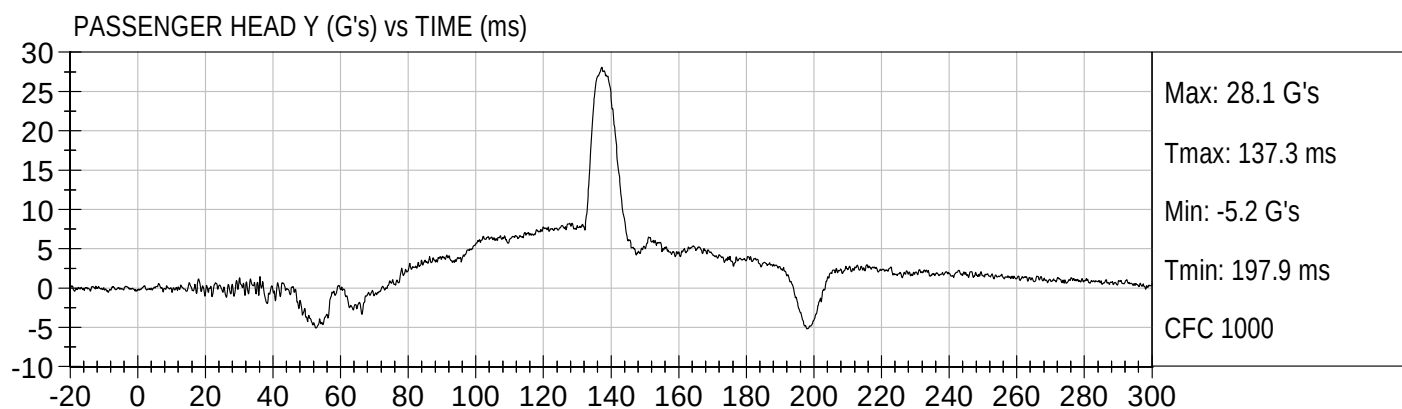
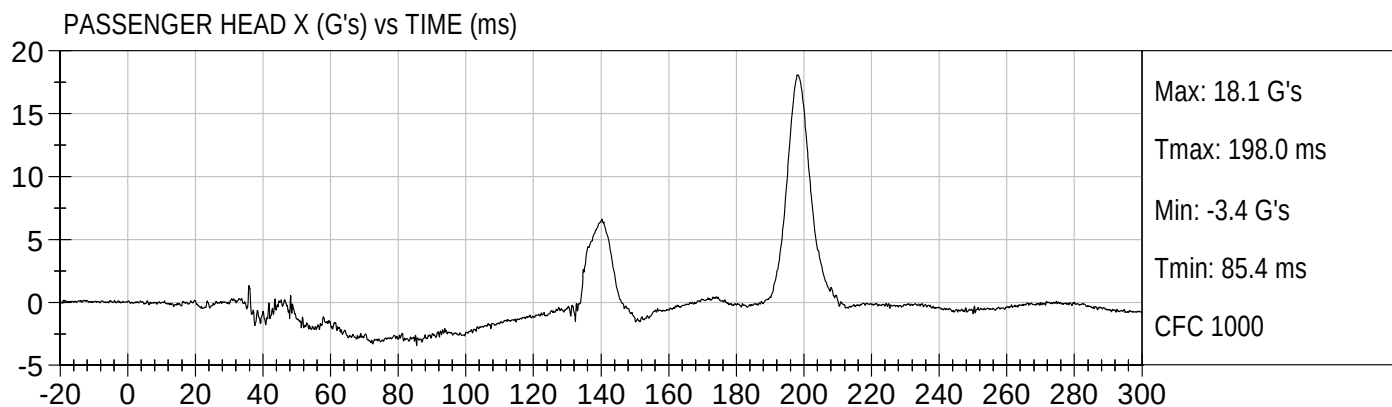
Test Date: 12/21/2011
Speed: 38.8 mph (62.4 km/h)





55/28 km/h 90° MDB Side Impact
2012 Chevrolet Silverado 2500 Crew Cab - MC0113

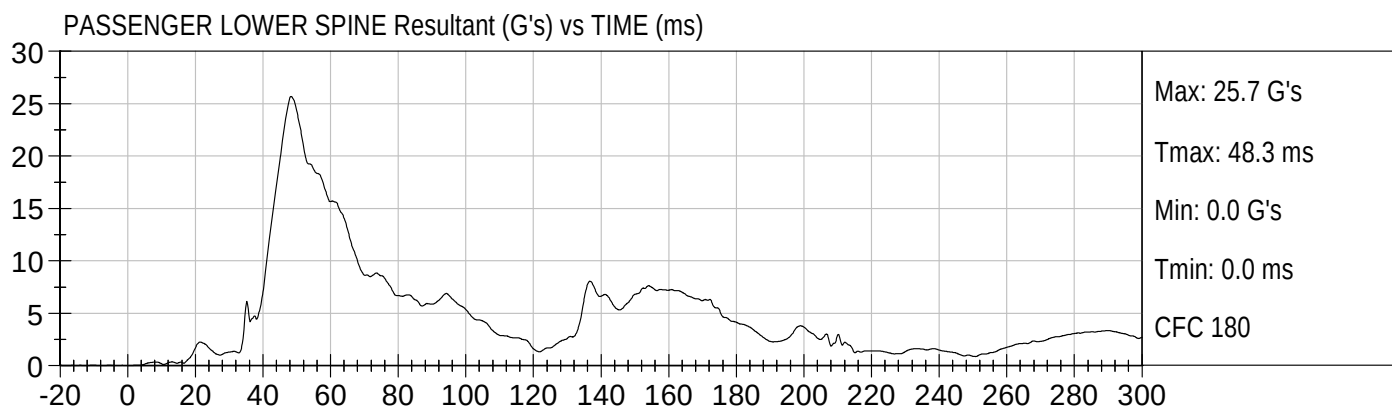
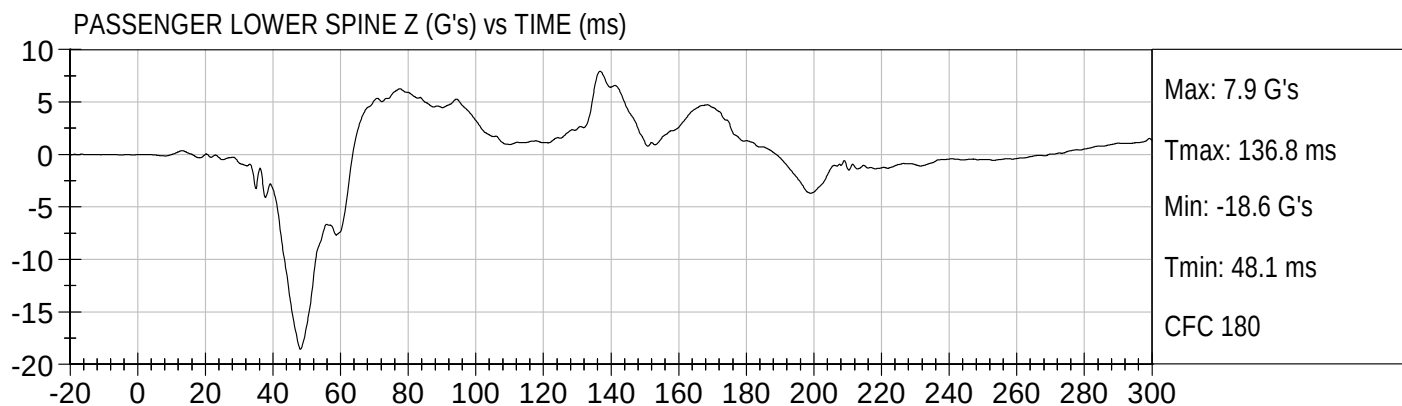
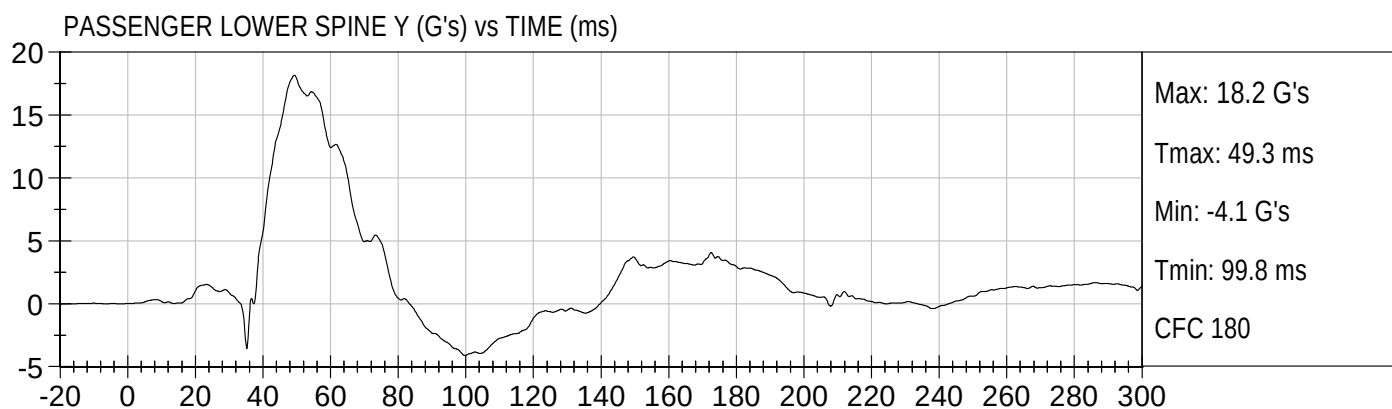
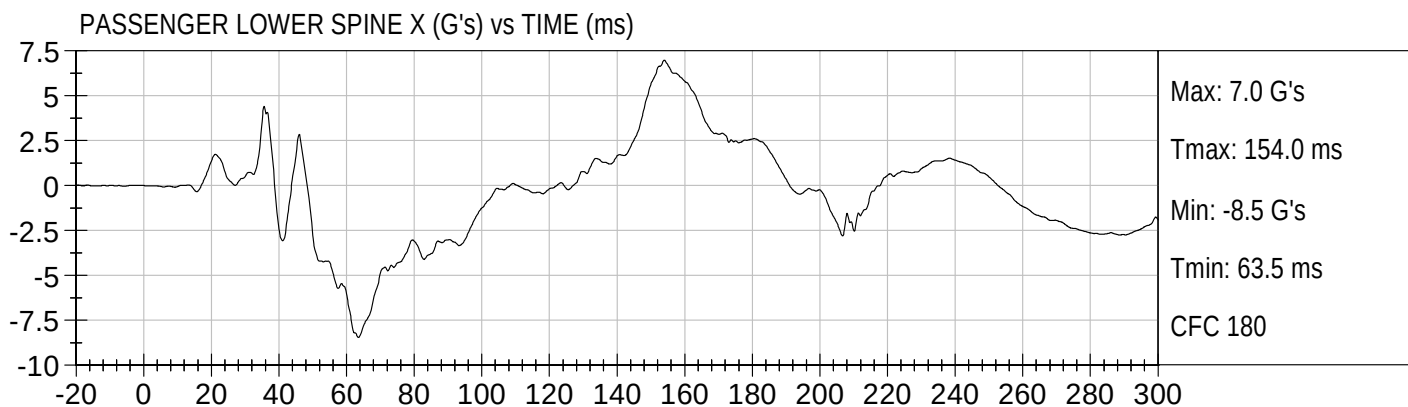
Test Date: 12/21/2011
Speed: 38.8 mph (62.4 km/h)





55/28 km/h 90° MDB Side Impact
2012 Chevrolet Silverado 2500 Crew Cab - MC0113

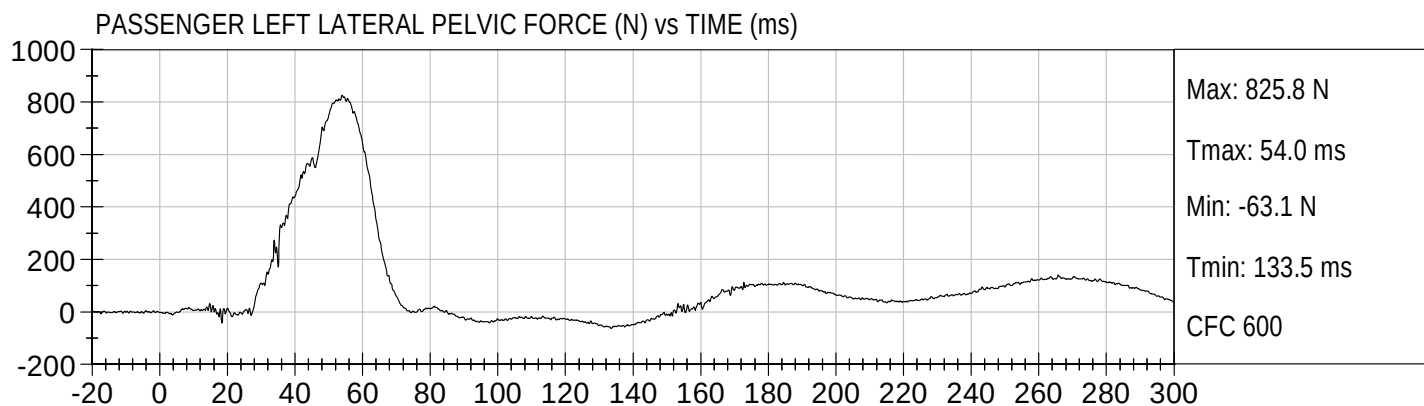
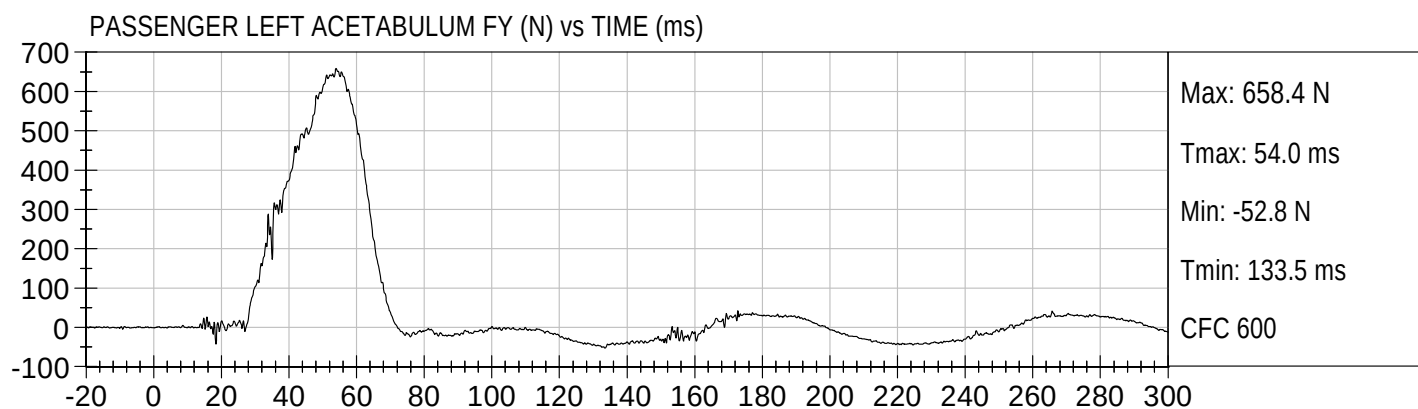
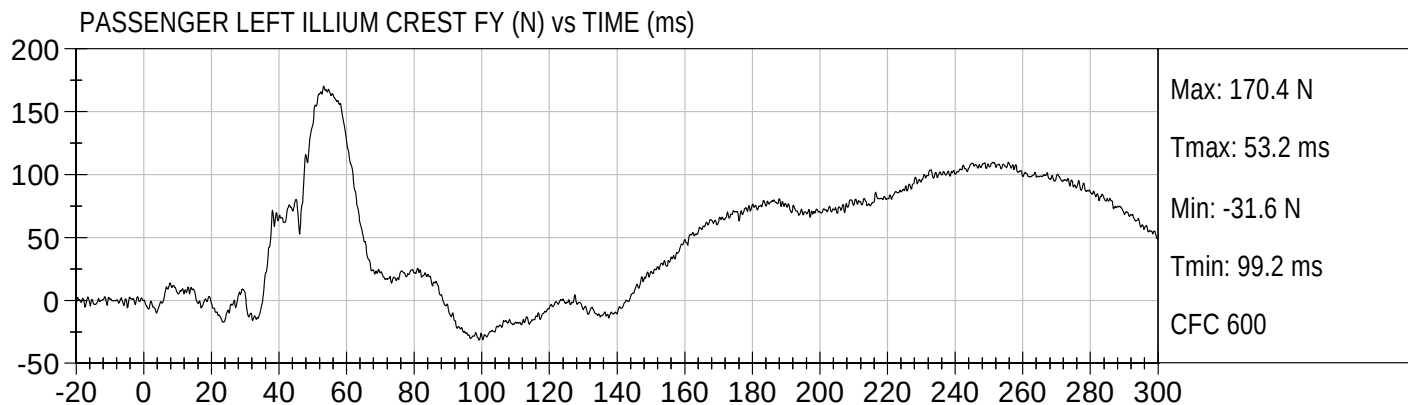
Test Date: 12/21/2011
Speed: 38.8 mph (62.4 km/h)





55/28 km/h 90° MDB Side Impact
2012 Chevrolet Silverado 2500 Crew Cab - MC0113

Test Date: 12/21/2011
Speed: 38.8 mph (62.4 km/h)



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: D114171

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	23	Pass
Peak Resultant Acceleration	G's	125 to 155	146	Pass
Peak Longitudinal Acceleration	G's	+/- 15	-13.5	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 15% of peak	Yes	Pass
Overall Test Results				Pass

Jessica Galt
Laboratory Technician

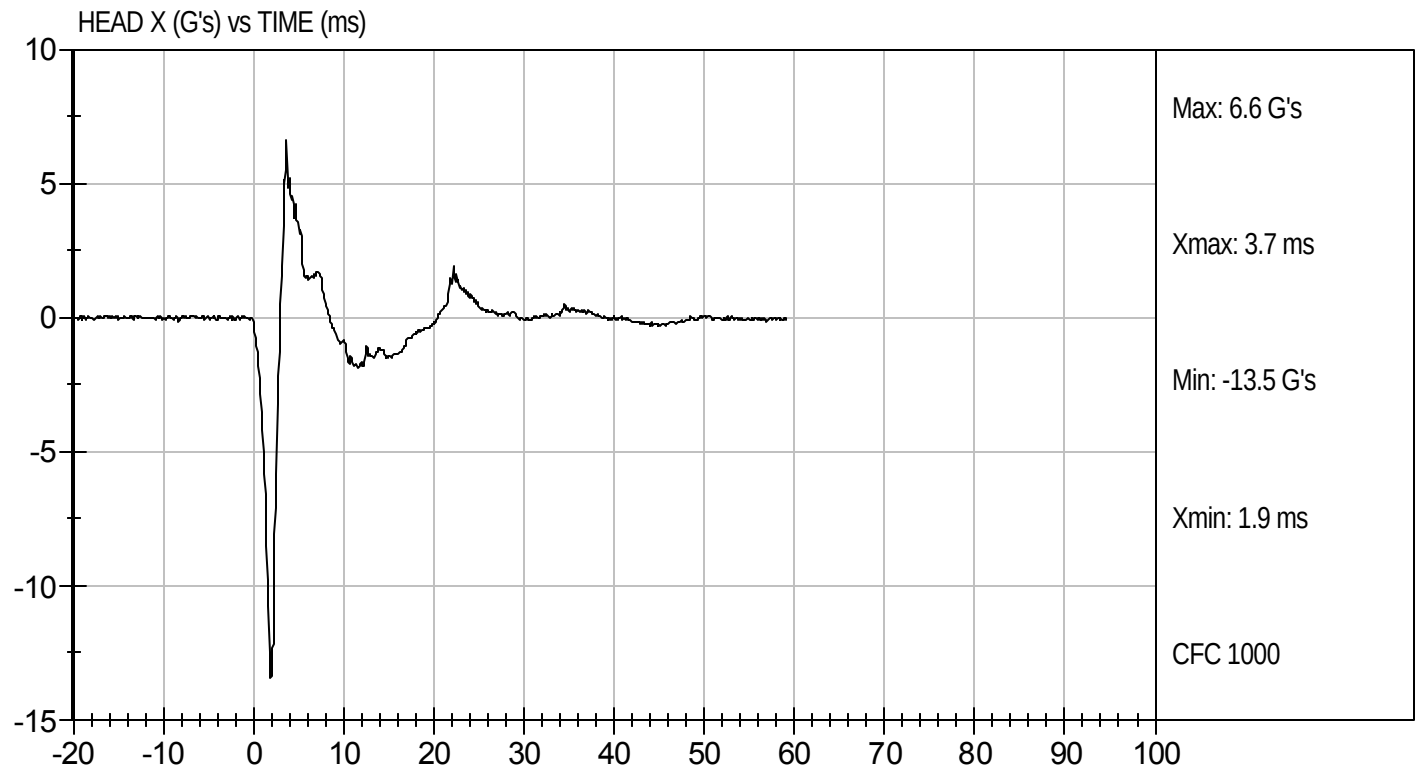
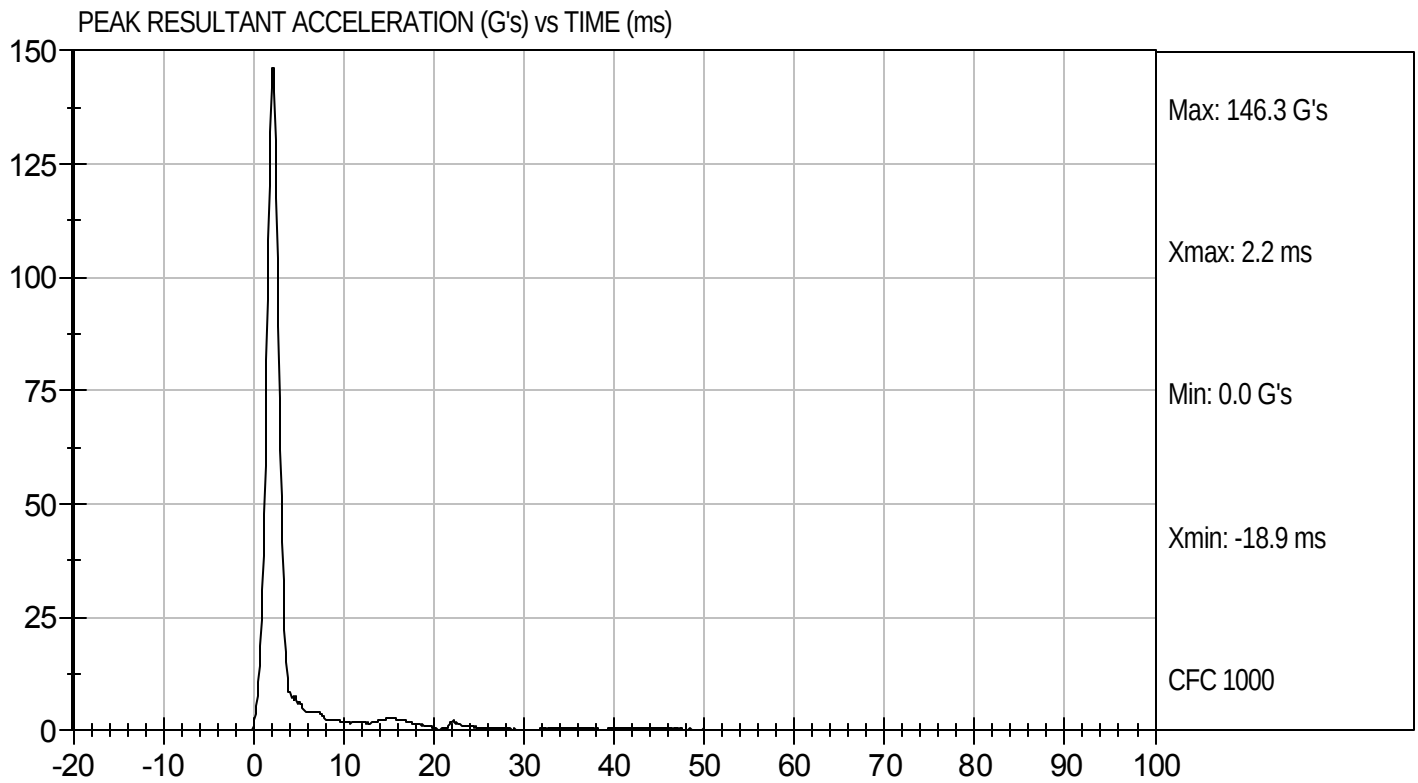
12/13/11
Test Date

David Winkelbauer
Approved By



Test Desc: Head Drop
Component ID: D114171

Test Date: 12/13/11
Velocity: 0 ft/s, 0 m/s



MGA RESEARCH CORPORATION
NECK PENDULUM TEST
ES-2re DUMMY

ATD Serial No: 032

Test I.D: D114172

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	18.0 to 22.0	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	23	Pass
Pendulum Speed		m/s	3.3 to 3.5	3.4	Pass
Pendulum Deceleration	1 ms	m/s	0.00 to -0.05	-0.03	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	61.3	Pass
Head Rotation Decay Time to 0 degree		ms	53.0 to 88.0	60.1	Pass
Overall Test Results					Pass


 Laboratory Technician

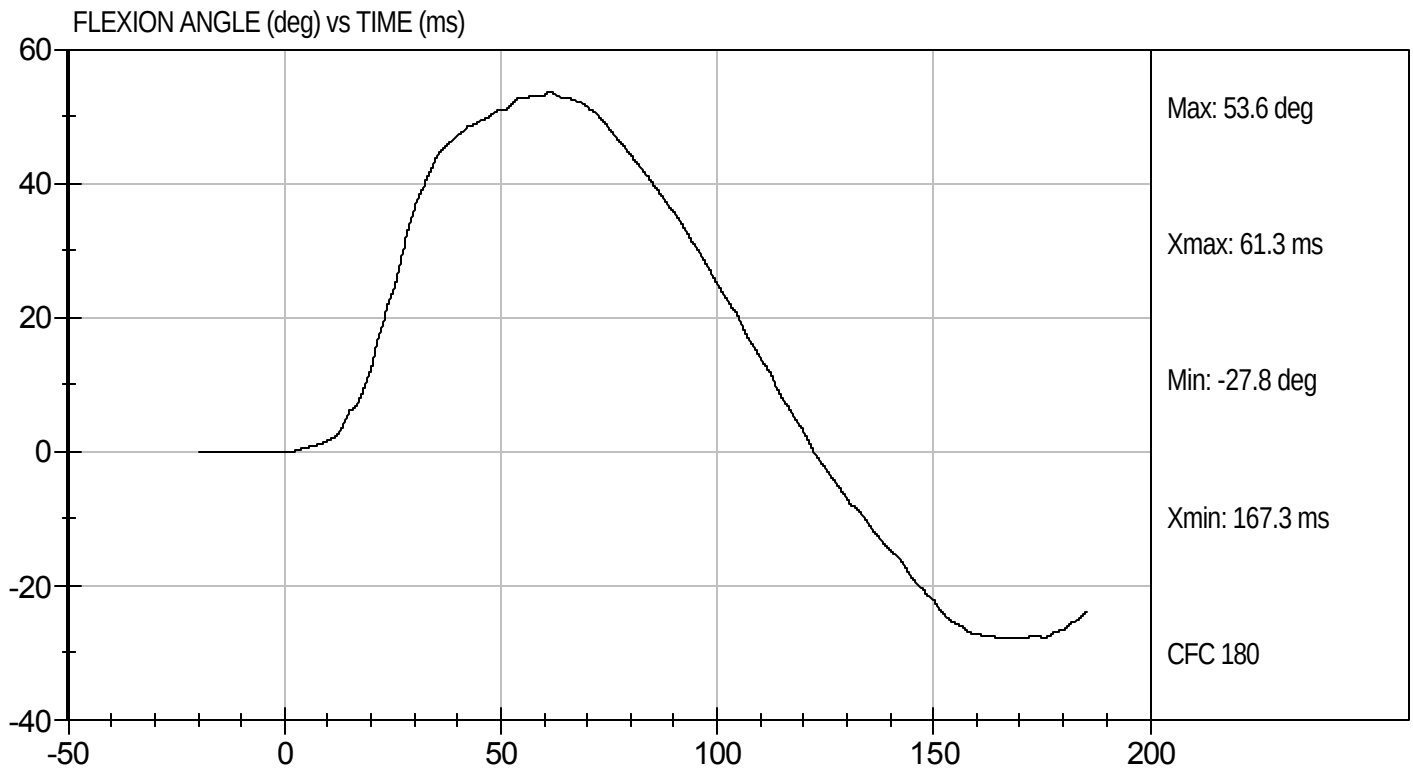
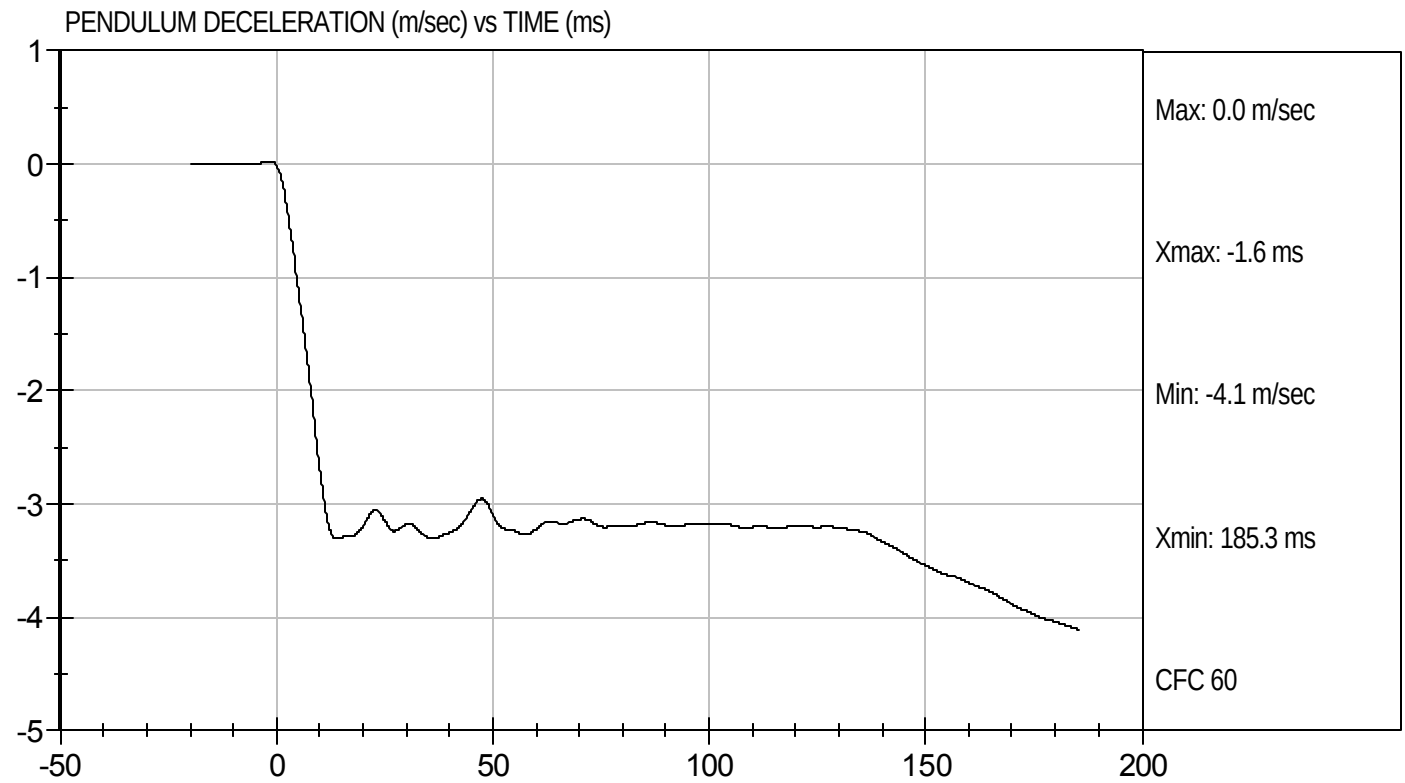
12/13/11
 Test Date


 Approved By



Test Desc: Neck Bending
Component ID: D114172

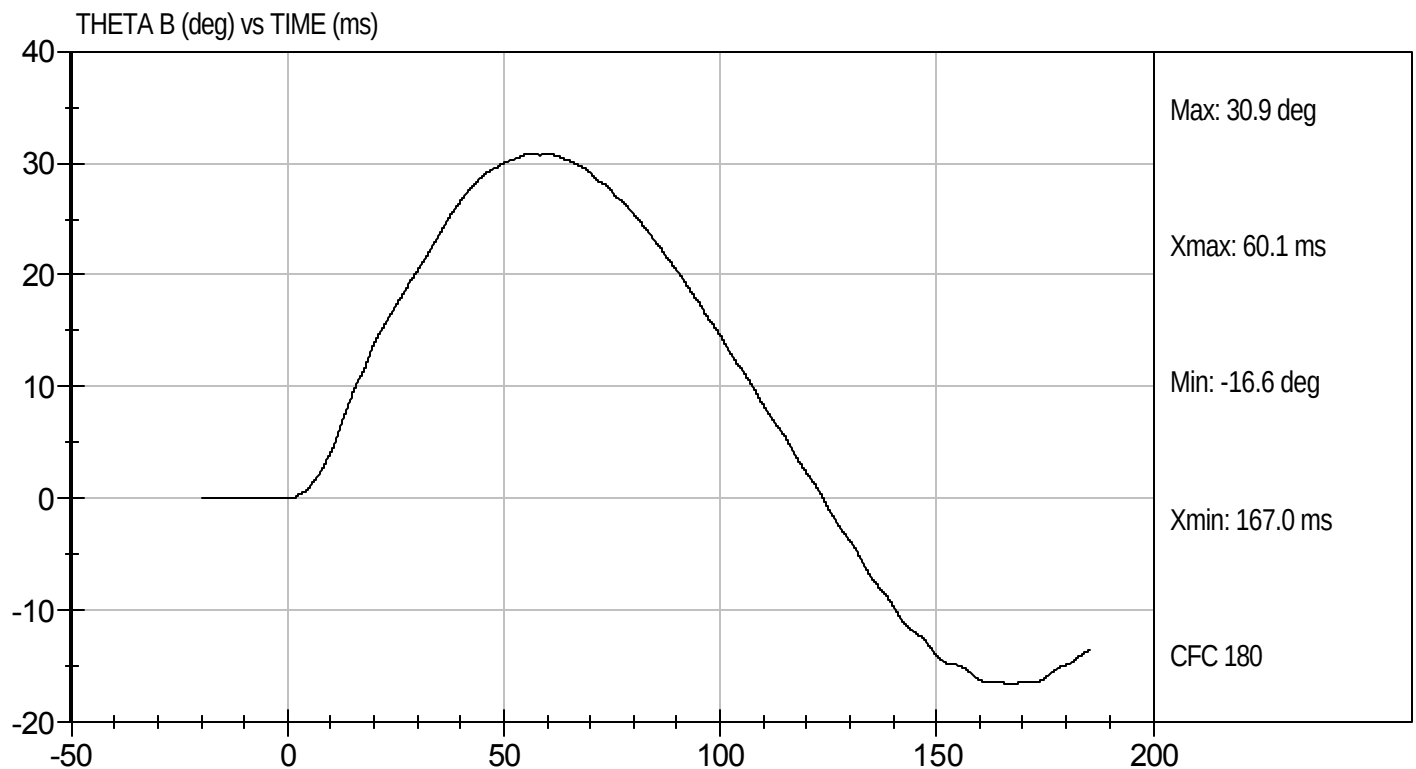
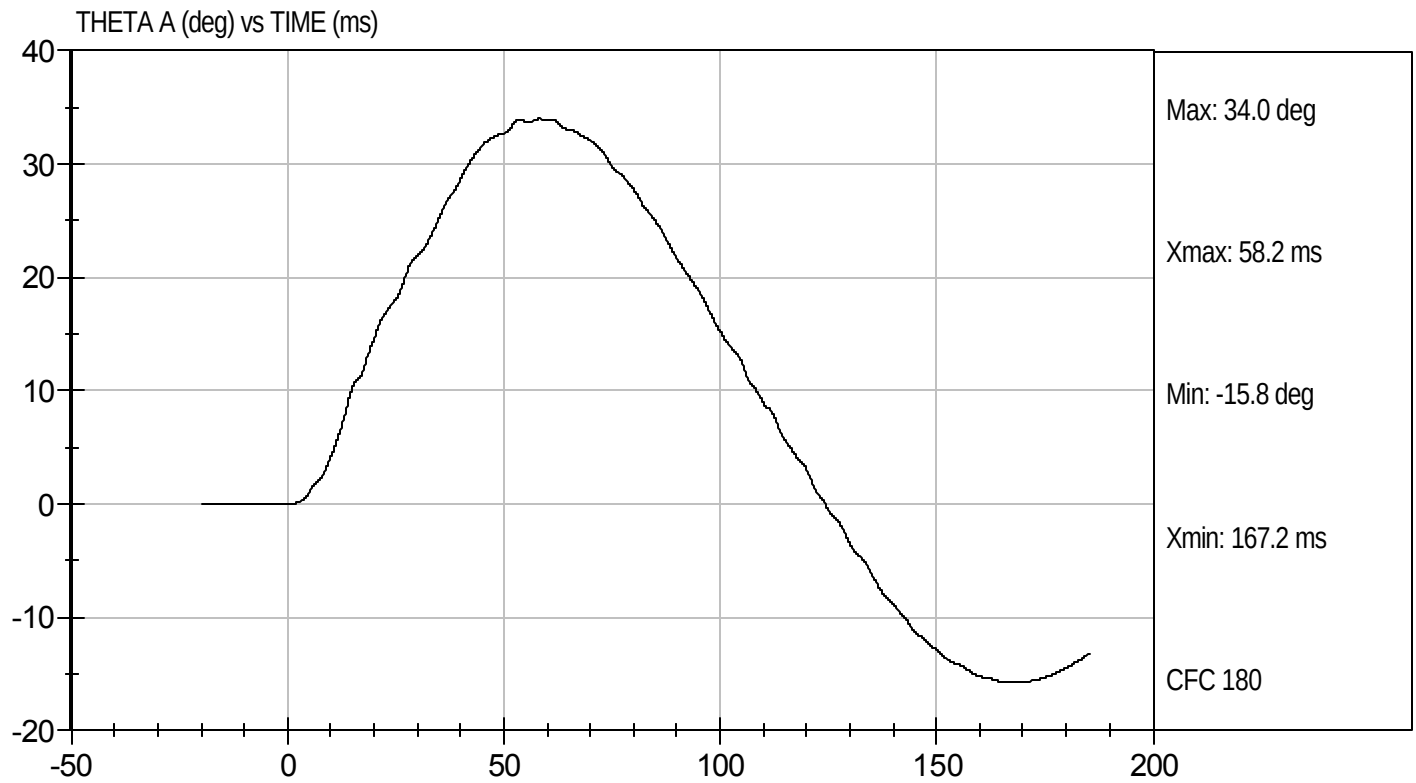
Test Date: 12/13/11
Velocity: 11.16 ft/s, 3.4 m/s





Test Desc: Neck Bending
Component ID: D114172

Test Date: 12/13/11
Velocity: 11.16 ft/s, 3.4 m/s

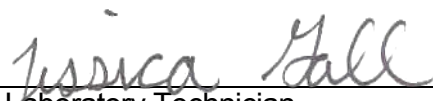


MGA RESEARCH CORPORATION
SHOULDER IMPACT TEST
ES-2re DUMMY

ATD Serial No: 032

Test I.D: D114173

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	33	Pass
Pendulum Speed	m/s	4.2 to 4.4	4.3	Pass
Peak Shoulder Acceleration	G's	7.5 to 10.5	9.6	Pass
Time of Peak Shoulder Acceleration	ms	NA	13.0	Pass
Overall Test Results			Pass	


Laboratory Technician

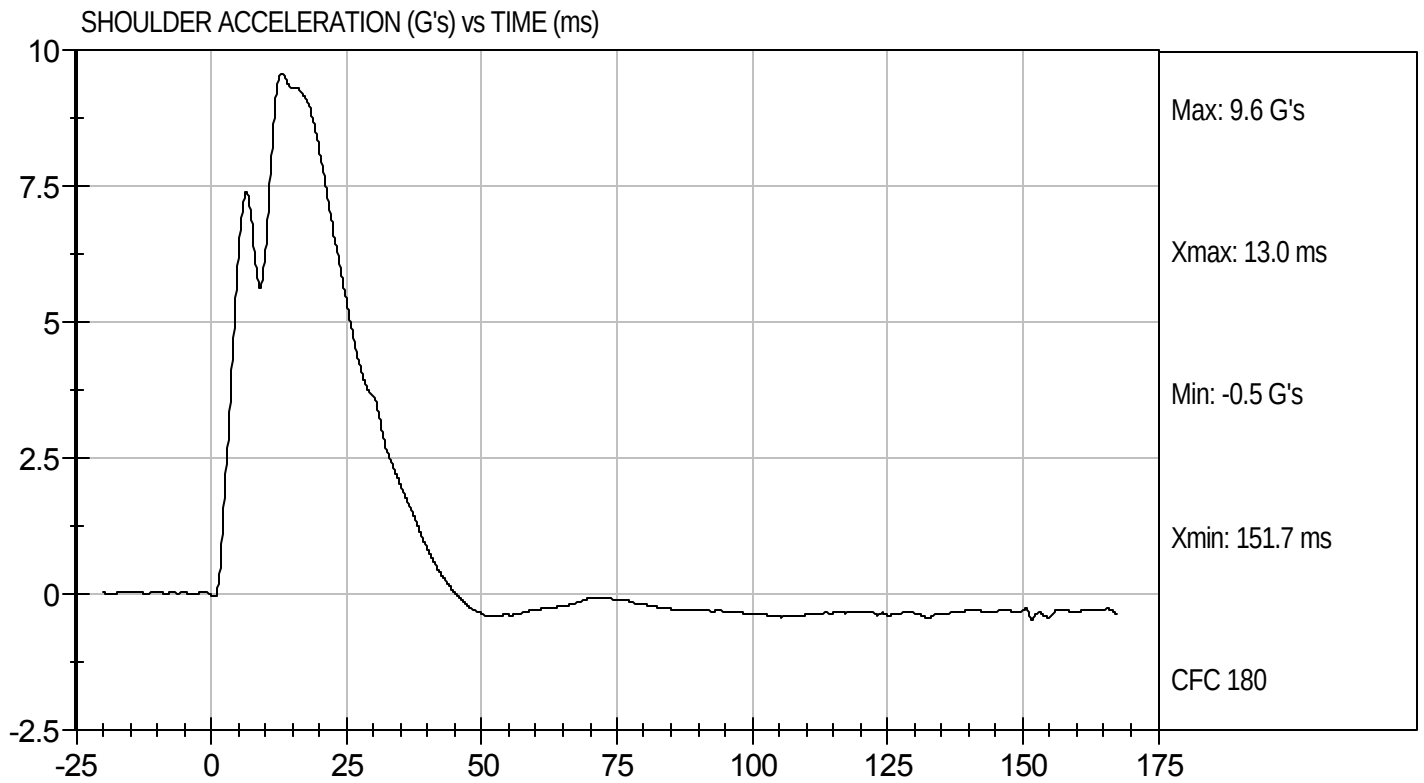
12/14/11
Test Date


Approved By



Test Desc: Shoulder Impact
Component ID: D114173

Test Date: 12/14/11
Velocity: 14.25 ft/s, 4.3 m/s



MGA RESEARCH CORPORATION

**UPPER RIB TEST
EUROSID 2 DUMMY**

ATD Serial No: 032

Test I.D: D114174

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	22	Pass
Displacement at 3 m/s	mm	36.0 to 40.0	37.9	Pass
Displacement at 4 m/s	mm	46.0 to 51.0	47.4	Pass
Overall Test Results			Pass	


Laboratory Technician

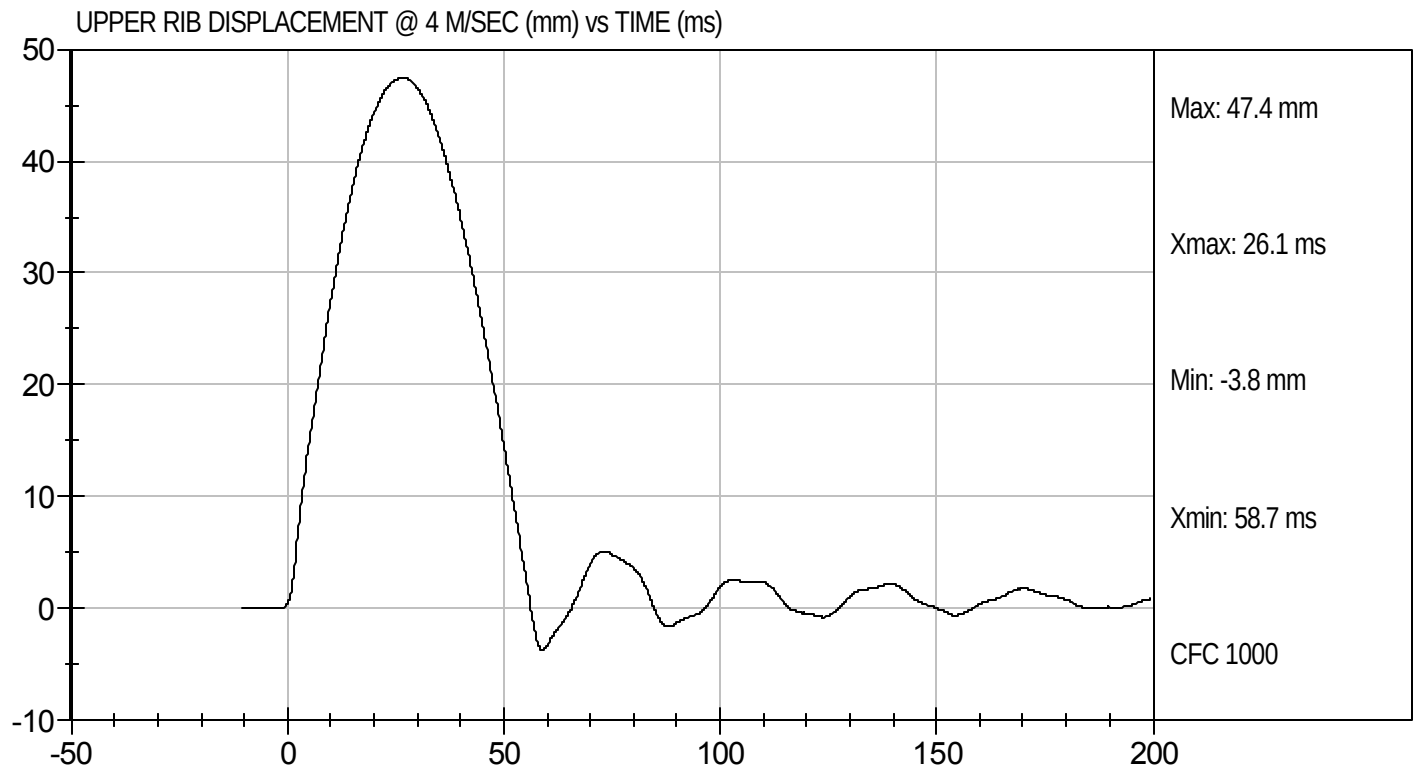
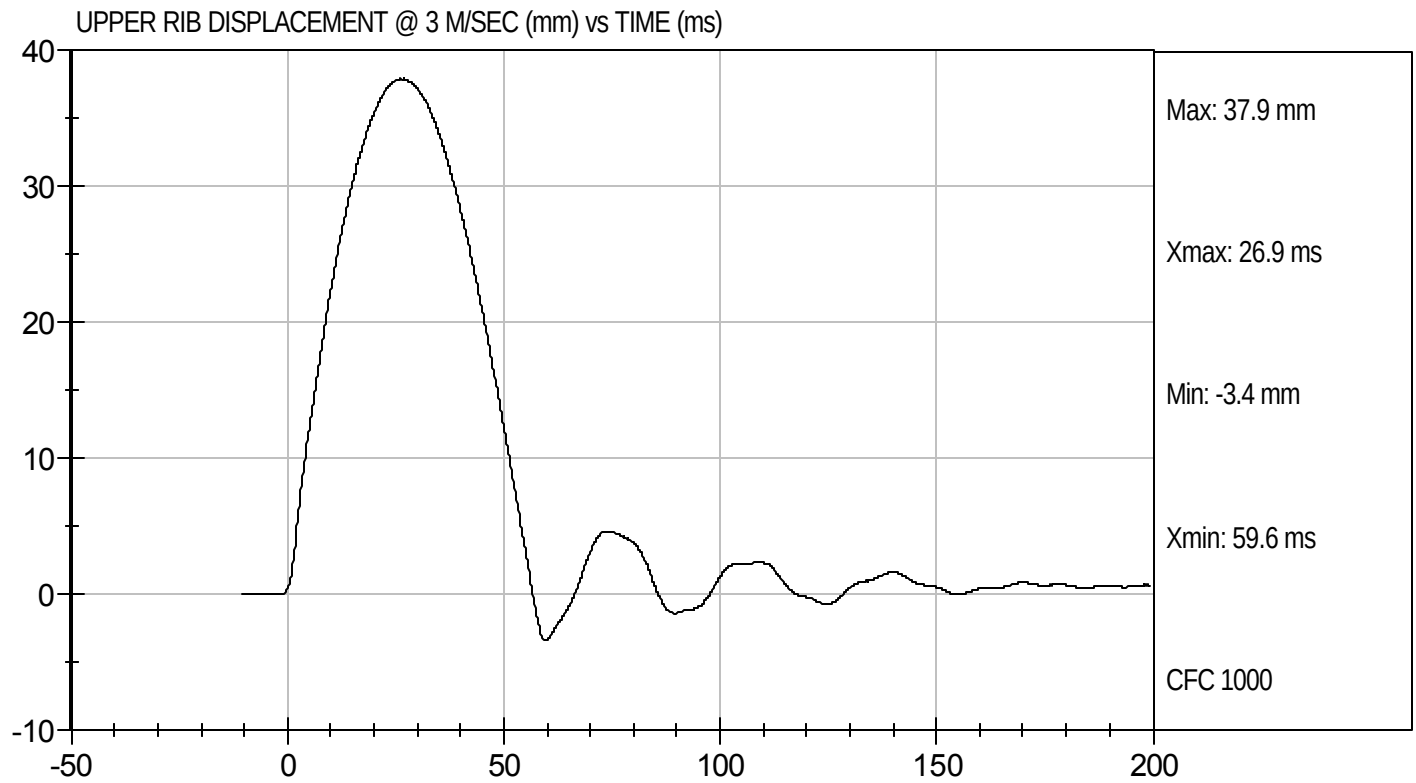
12/13/11
Test Date


Approved By



Test Desc: Rib Impact - Upper
Component ID: D114174

Test Date: 12/13/11



MGA RESEARCH CORPORATION

MID RIB TEST
EUROSID 2 DUMMY

ATD Serial No: 032

Test I.D: D114175

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	21	Pass
Displacement at 3 m/s	mm	36.0 to 40.0	37.6	Pass
Displacement at 4 m/s	mm	46.0 to 51.0	47.8	Pass
			Overall Test Results	Pass


Laboratory Technician

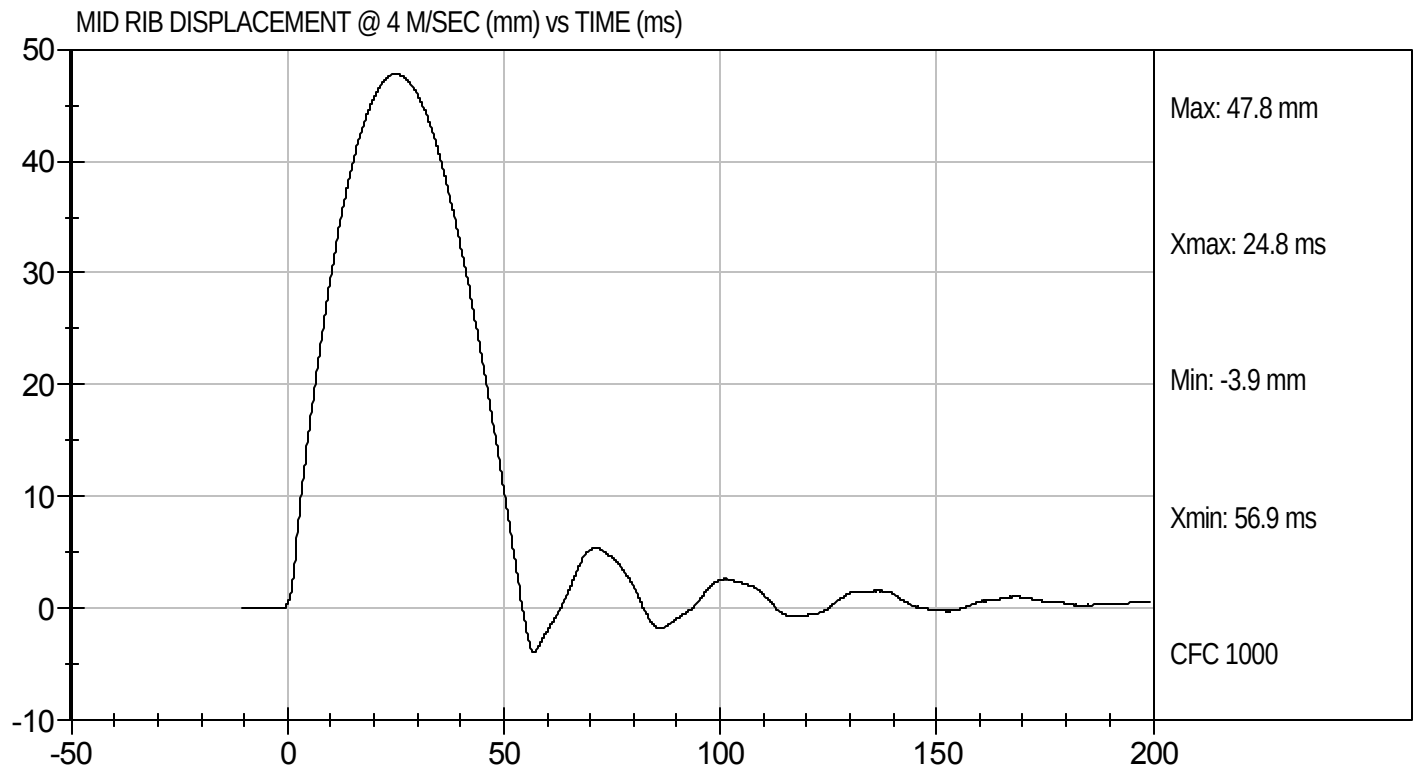
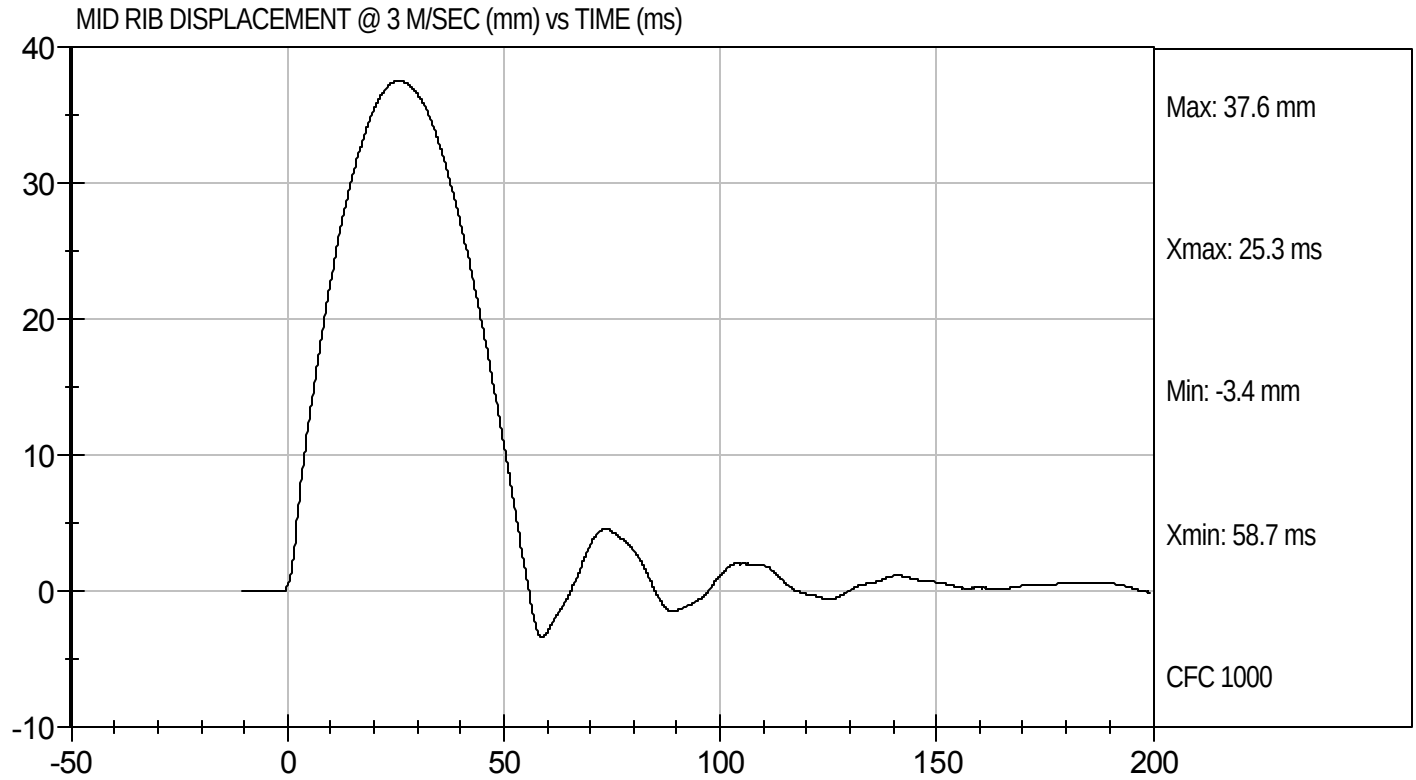
12/14/11
Test Date


Approved By



Test Desc: Rib Impact - Mid
Component ID: D114175

Test Date: 12/14/11



MGA RESEARCH CORPORATION

LOWER RIB TEST
EUROSID 2 DUMMY

ATD Serial No: 032

Test I.D: D114176

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	21	Pass
Displacement at 3 m/s	mm	36.0 to 40.0	37.9	Pass
Displacement at 4 m/s	mm	46.0 to 51.0	48.2	Pass
Overall Test Results			Pass	

Jessica Hall
Laboratory Technician

12/14/11
Test Date

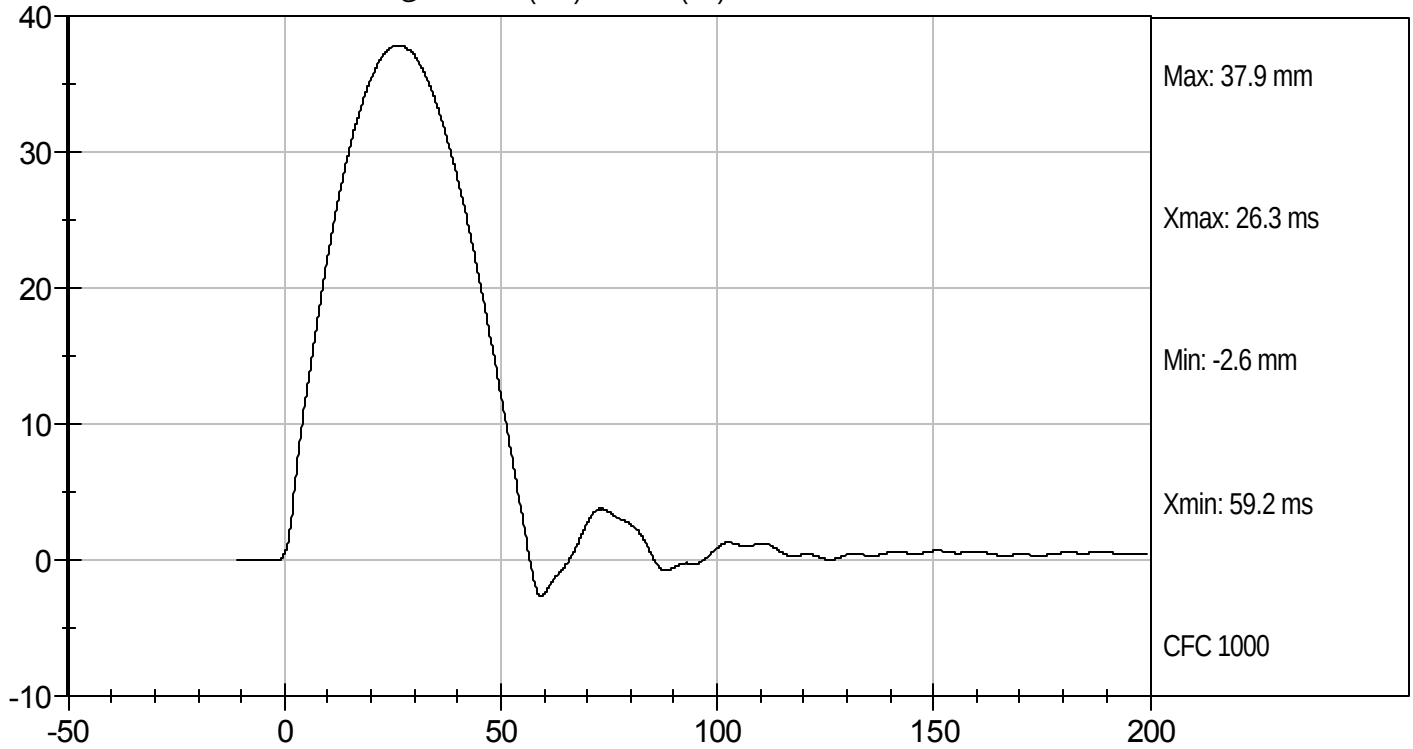
David Winkelbauer
Approved By



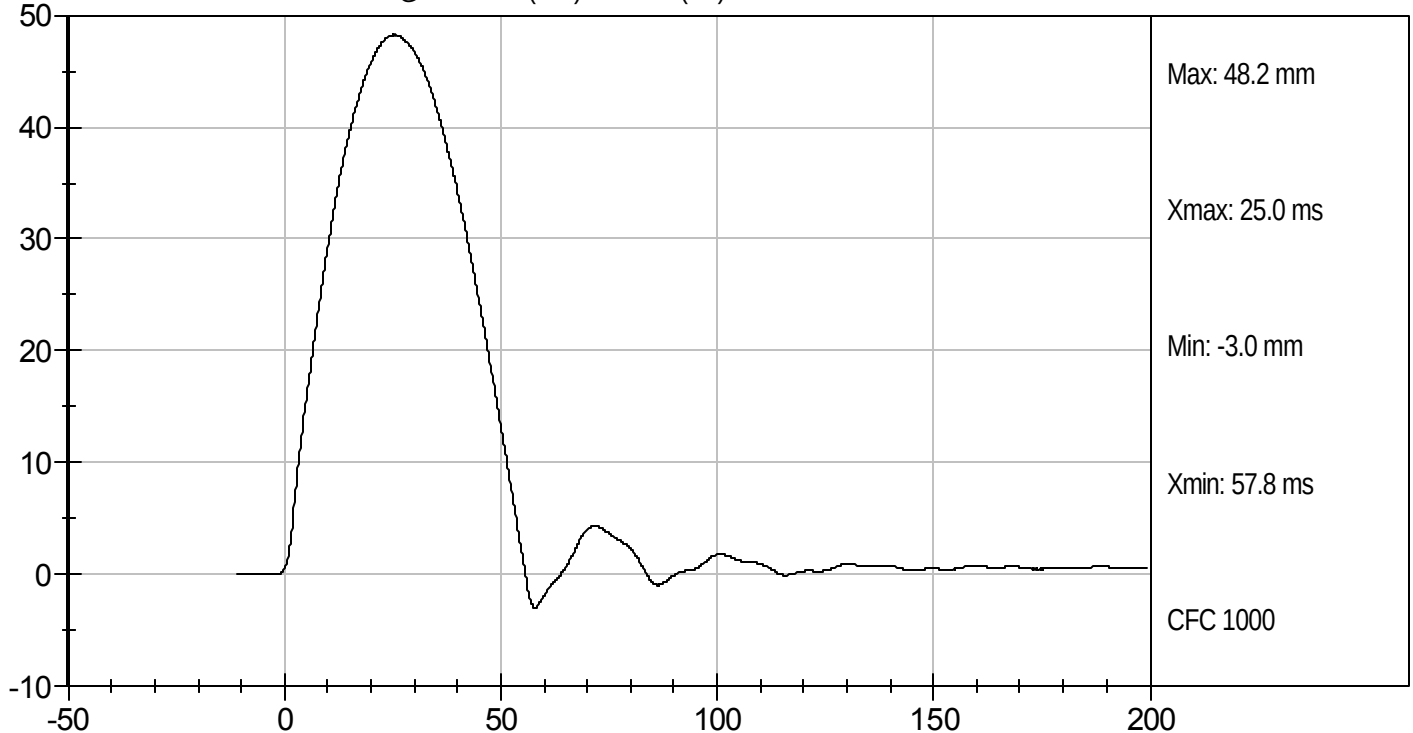
Test Desc: Rib Impact - Lower
Component ID: D114176

Test Date: 12/14/11

LOWER RIB DISPLACEMENT @ 3 M/SEC (mm) vs TIME (ms)



LOWER RIB DISPLACEMENT @ 4 M/SEC (mm) vs TIME (ms)



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

ATD Serial No: 032

Test I.D: D114170

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.6	Pass
Humidity	%	10 to 70	32	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	5.20	Pass
Upper Rib Displacement	mm	34.0 to 41.0	36.8	Pass
Middle Rib Displacement	mm	37.0 to 45.0	39.6	Pass
Lower Rib Displacement	mm	37.0 to 44.0	38.8	Pass
			Overall Test Results	Pass


Laboratory Technician

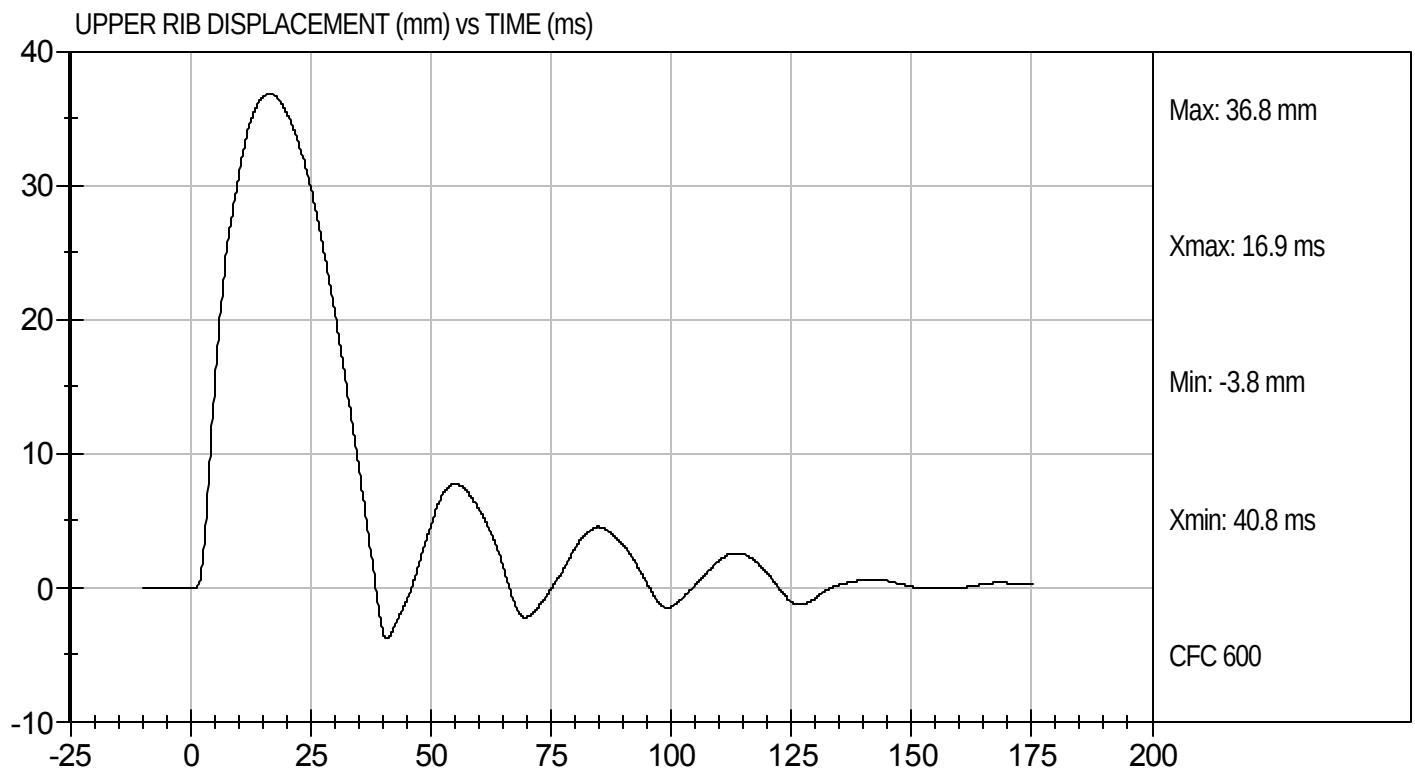
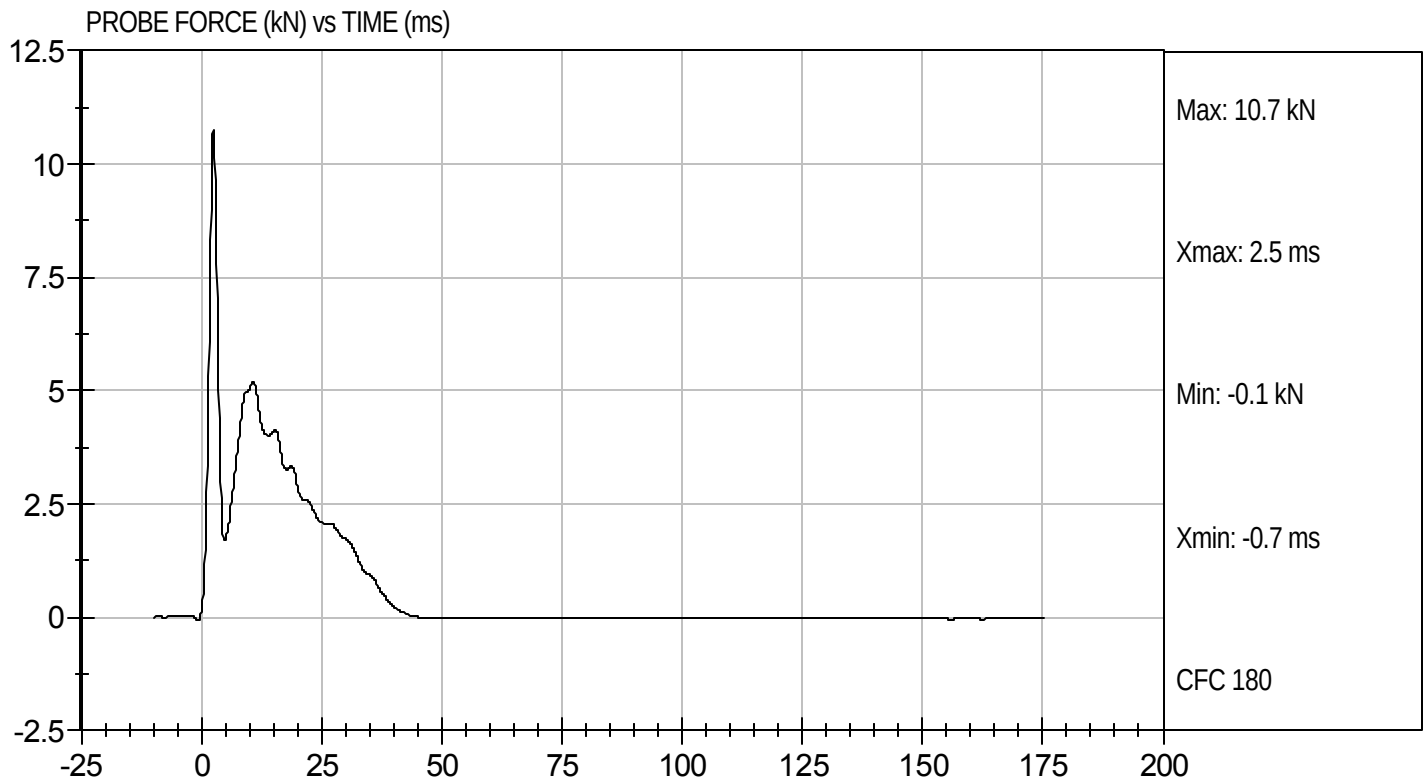
12/14/11
Test Date


Approved By



Test Desc: Thorax Impact
Component ID: D114170

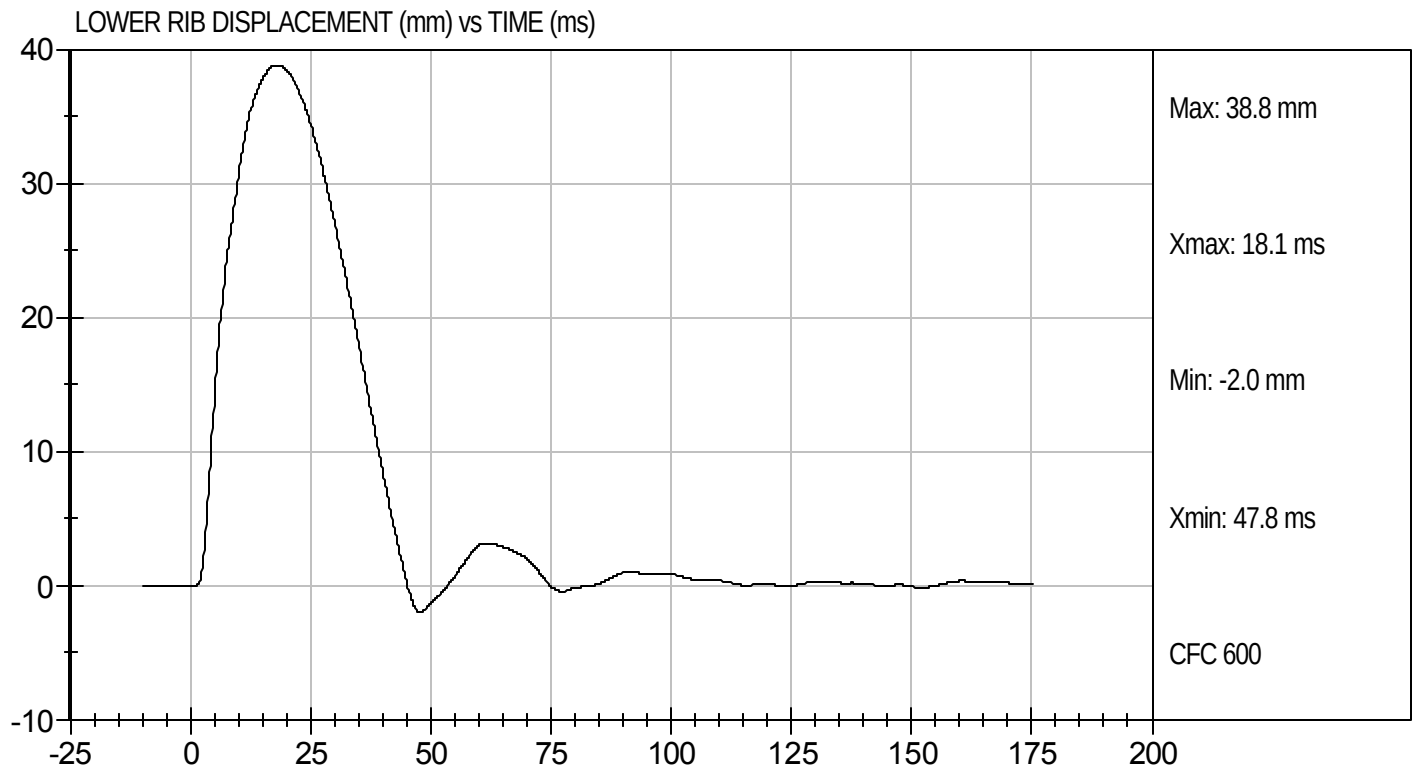
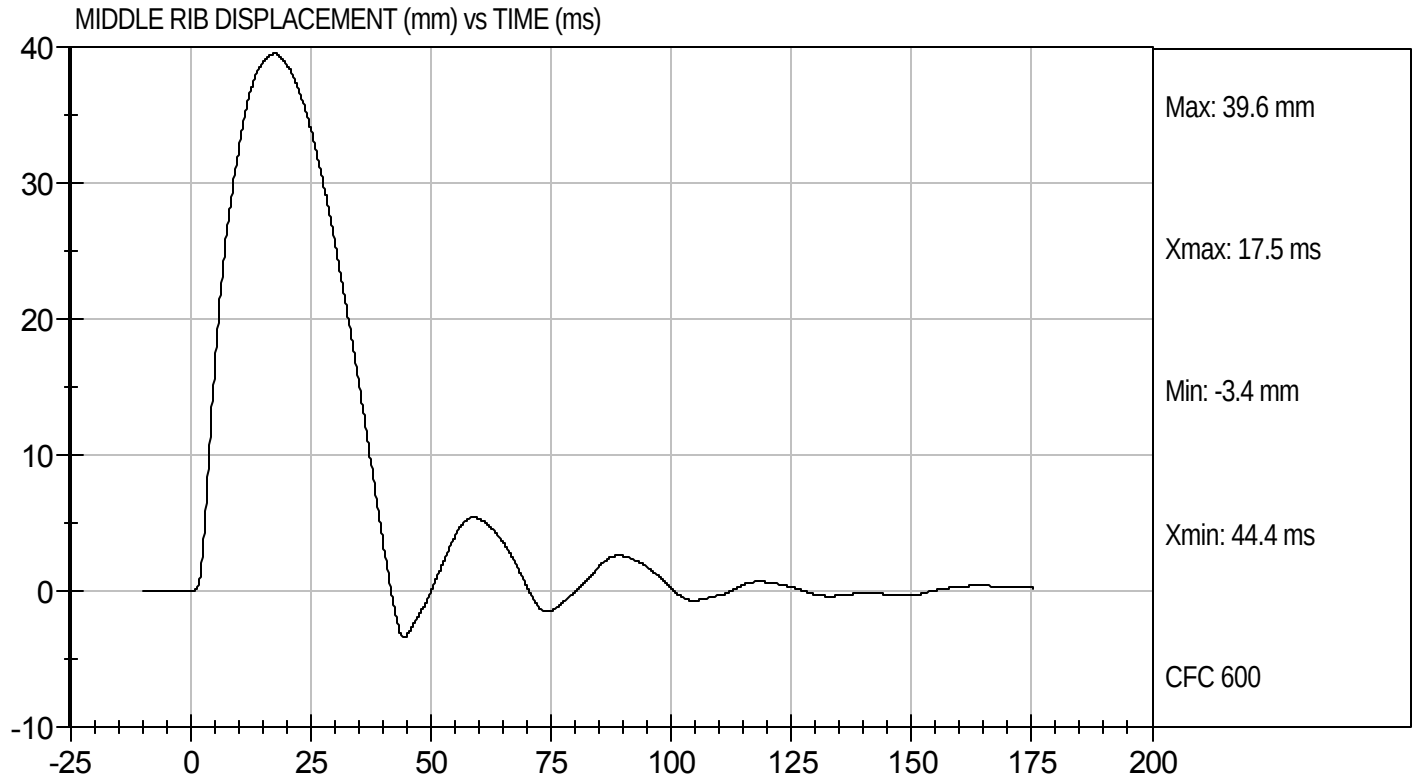
Test Date: 12/14/11
Velocity: 18.32 ft/s, 5.58 m/s





Test Desc: Thorax Impact
Component ID: D114170

Test Date: 12/14/11
Velocity: 18.32 ft/s, 5.58 m/s



MGA RESEARCH CORPORATION

ABDOMEN TEST

ES-2re DUMMY

ATD Serial No: 032

Test I.D: D114177

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	33	Pass
Probe Speed	m/s	3.90 to 4.10	4.06	Pass
Maximum Impact Force	kN	4.00 to 4.80	4.22	Pass
Time of Maximum Impactor Force	ms	10.60 to 13.00	10.80	Pass
Maximum Total Abdomen Force	kN	2.20 to 2.70	2.52	Pass
Time of Maximum Abdomen Force	ms	10.00 to 12.30	10.20	Pass
Overall Test Results			Pass	

Jessica Hall
Laboratory Technician

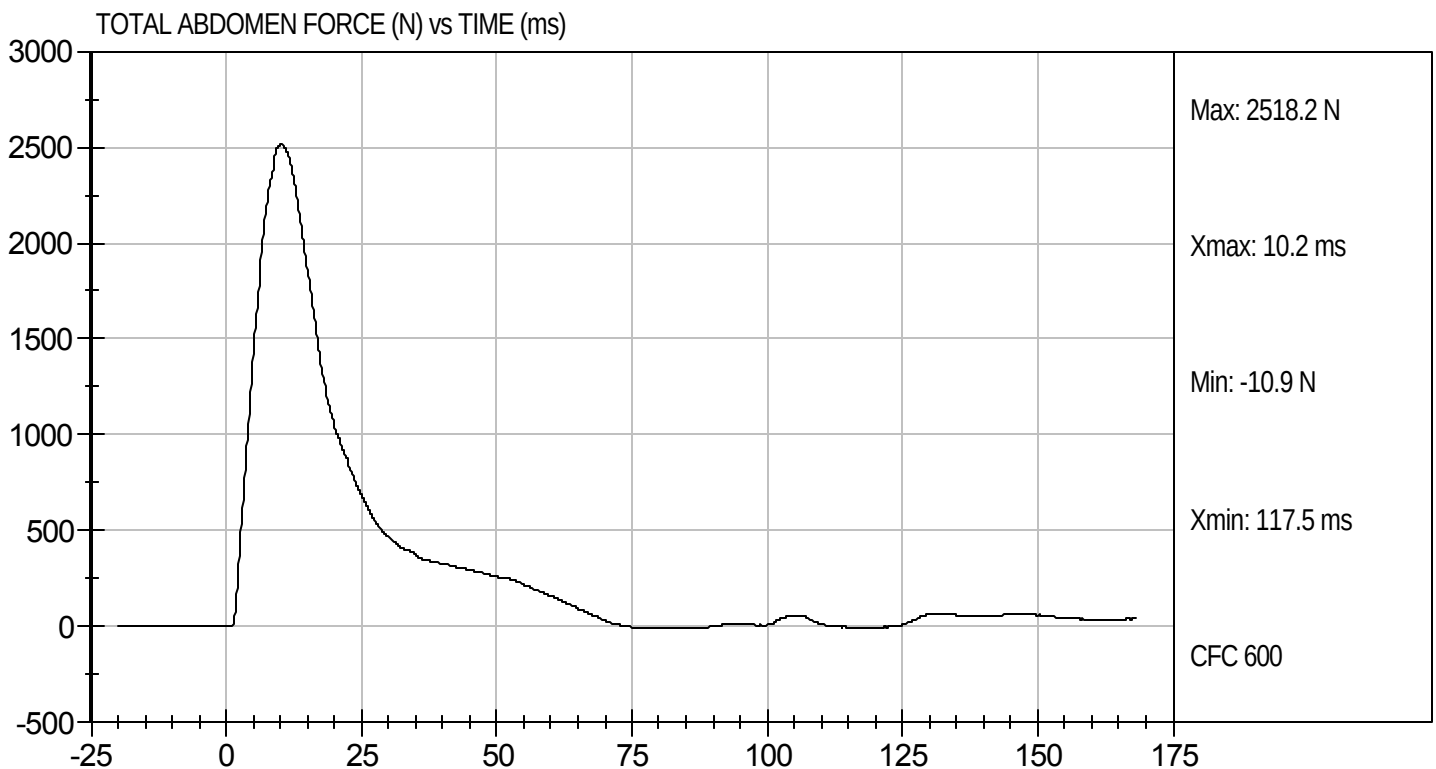
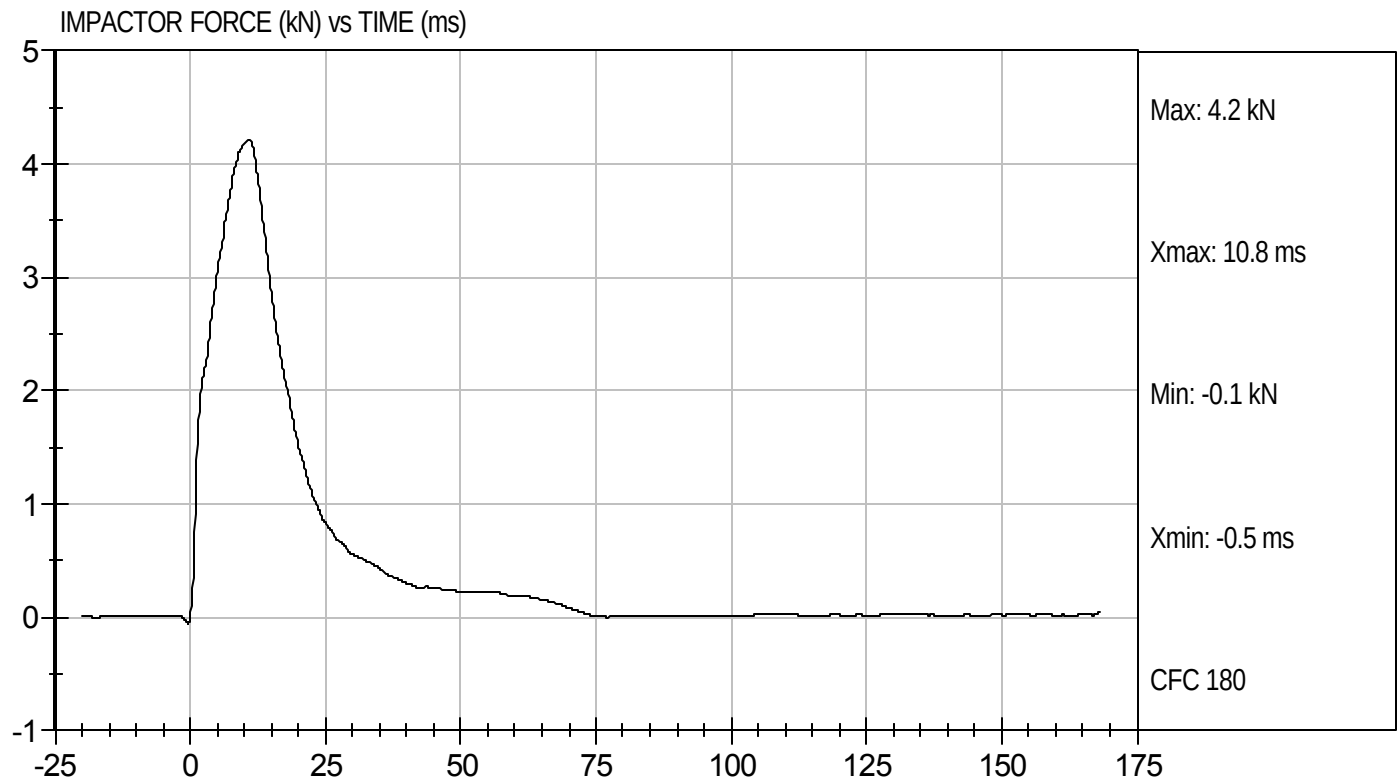
12/14/11
Test Date

David Winkelbauer
Approved By



Test Desc: Abdomen Impact
Component ID: D114177

Test Date: 12/14/11
Velocity: 13.33 ft/s, 4.06 m/s

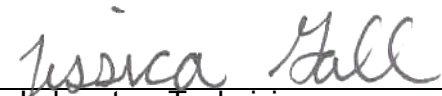


MGA RESEARCH CORPORATION
LUMBAR SPINE TEST
ES-2re DUMMY

ATD Serial No: 032

Test I.D: D114178

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	23	Pass
Pendulum Speed		m/s	5.95 to 6.15	6.13	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	-0.42	Pass
	27 ms	m/s	-6.50 to -5.80	-5.91	Pass
	30 ms	m/s	>= -6.5	-5.85	Pass
Maximum Flexion Angle		deg	45.0 to 55.0	46.9	Pass
Time of Maximum Flexion Angle		ms	39.0 to 53.0	43.6	Pass
Headform Rotation Decay to Initial Position		ms	37 to 57	44	Pass
Overall Results					Pass


 Laboratory Technician

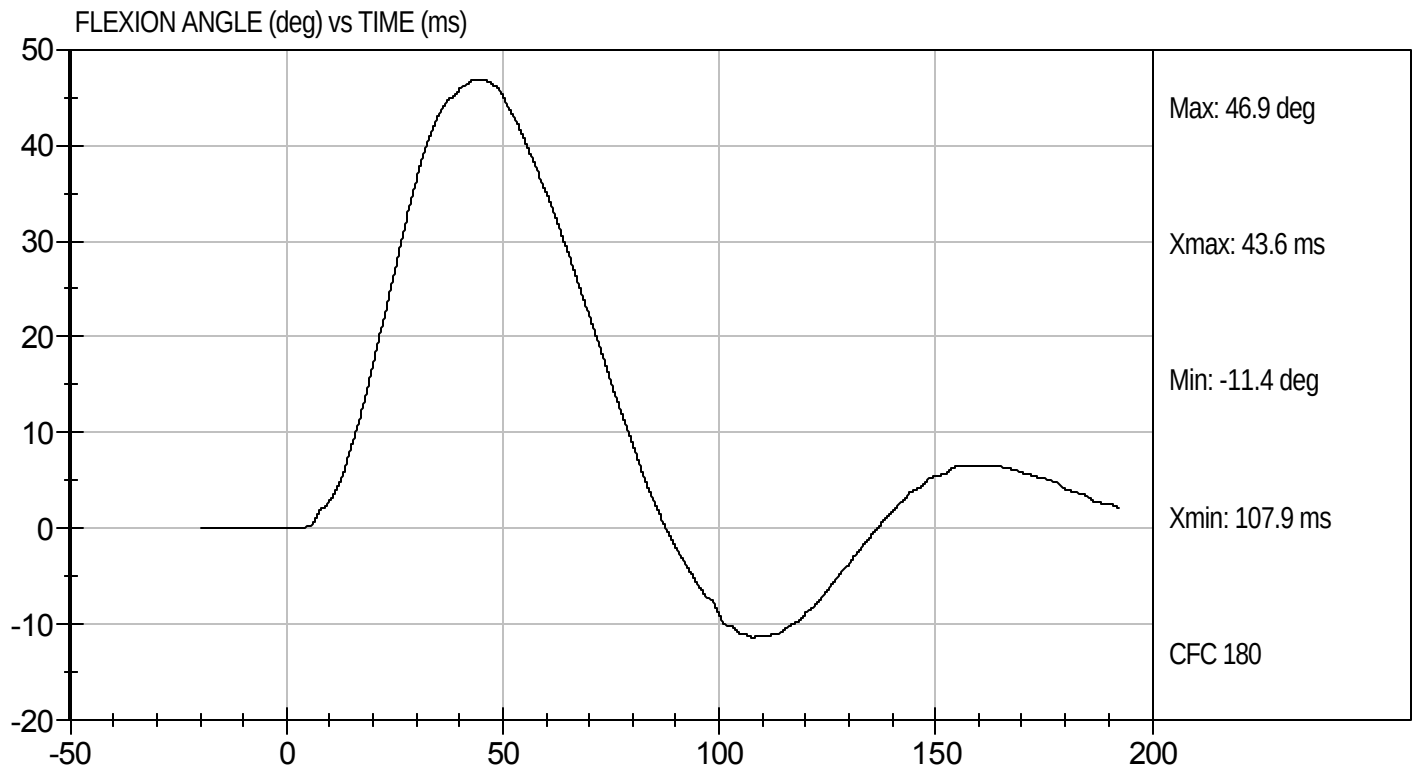
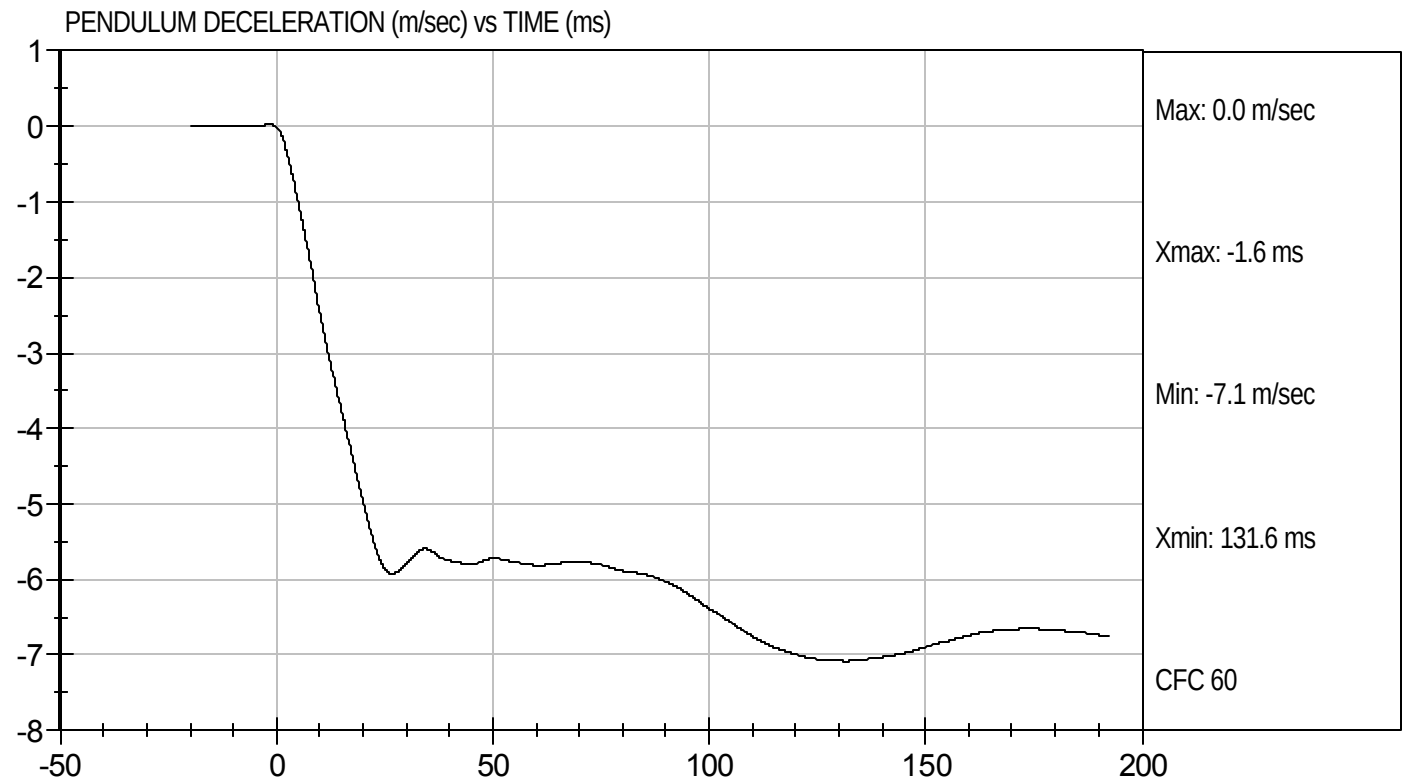
12/13/11
 Test Date


 Approved By



Test Desc: Lumbar Bending
Component ID: D114178

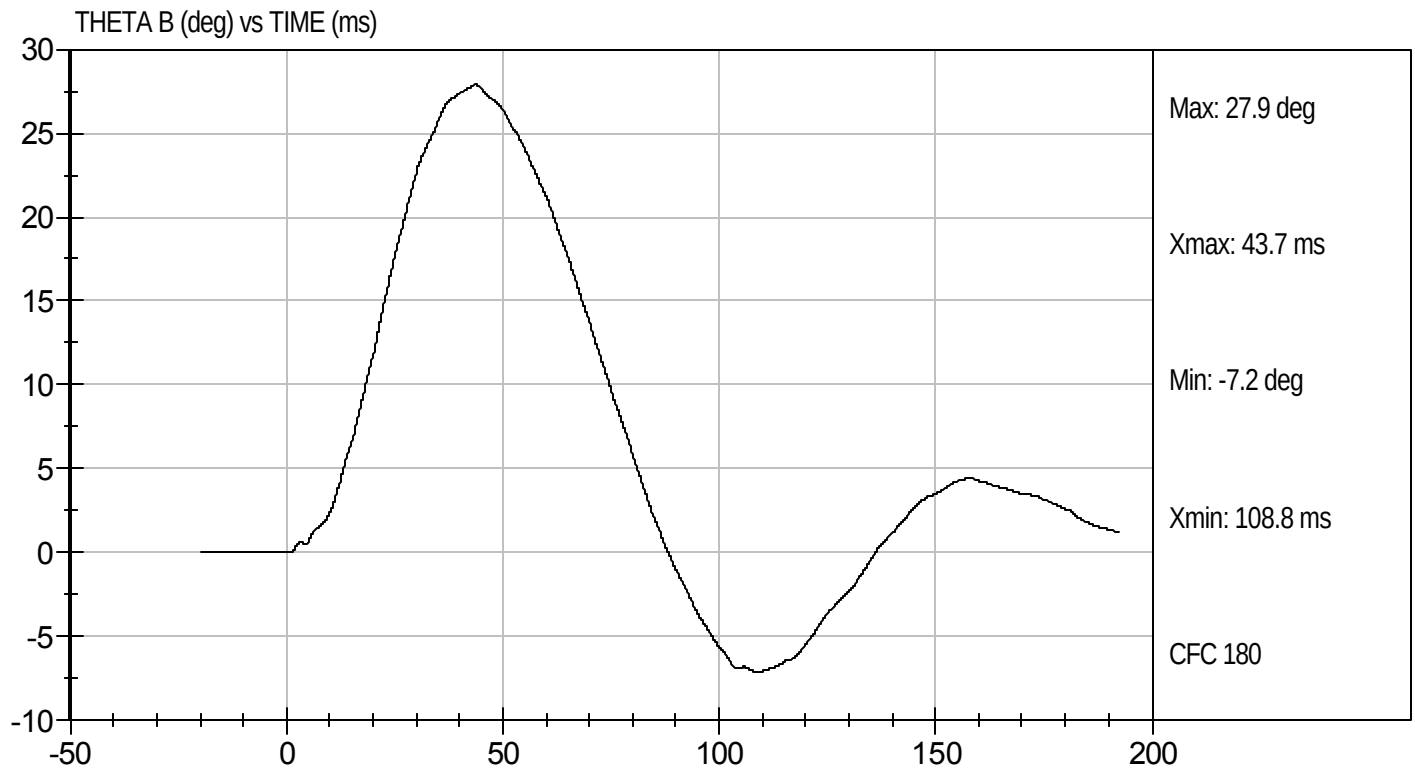
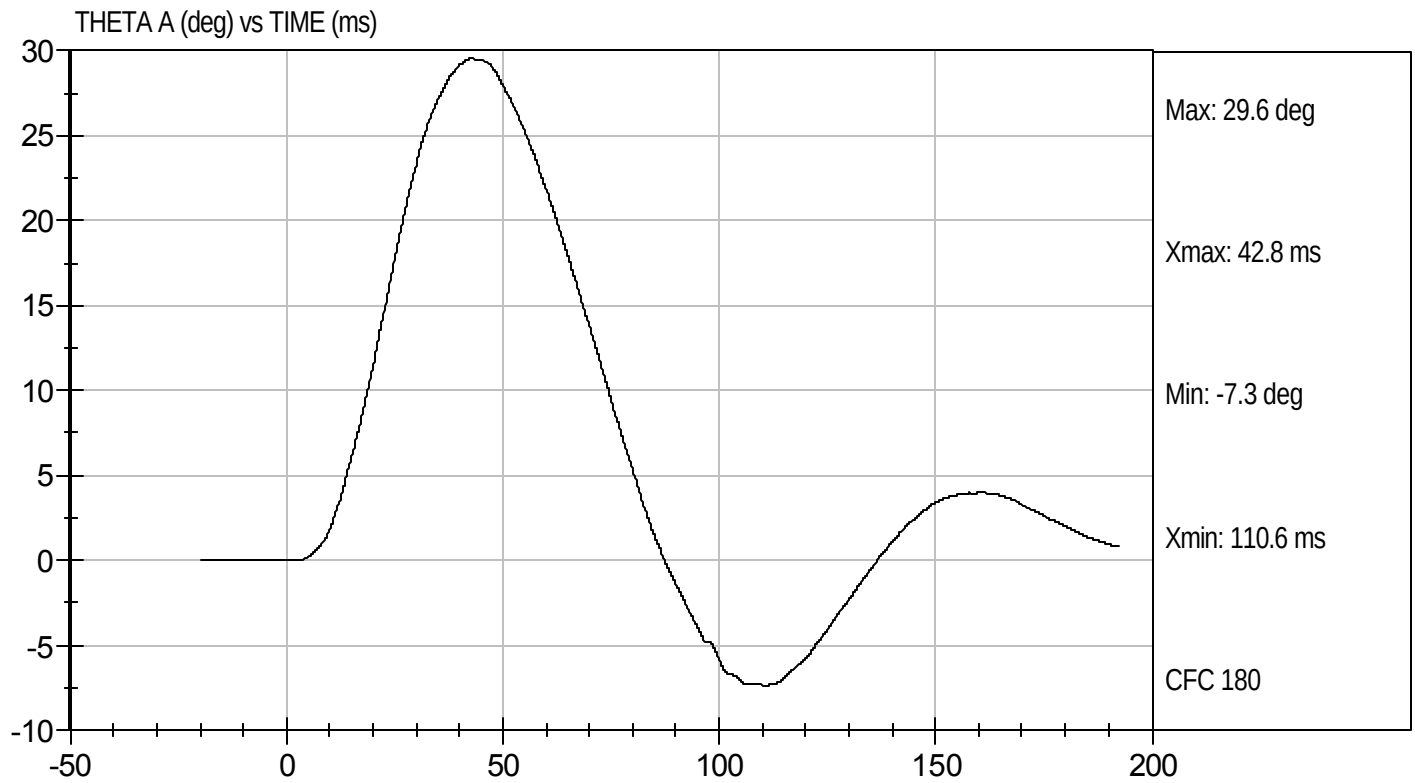
Test Date: 12/13/11
Velocity: 20.10 ft/s, 6.13 m/s





Test Desc: Lumbar Bending
Component ID: D114178

Test Date: 12/13/11
Velocity: 20.10 ft/s, 6.13 m/s



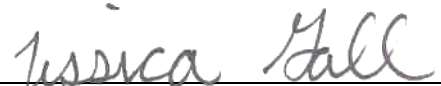
MGA RESEARCH CORPORATION

**PELVIS TEST
ES-2re DUMMY**

ATD Serial No: 032

Test I.D: D114179

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	33	Pass
Probe Speed	m/s	4.20 to 4.40	4.34	Pass
Maximum Impactor Force	kN	4.70 to 5.40	5.06	Pass
Time of Maximum Impactor Force	ms	11.80 to 16.10	13.10	Pass
Maximum Pubic Force	kN	1.23 to 1.59	1.43	Pass
Time of Maximum Pubic Force	ms	12.20 to 17.00	13.70	Pass
Overall Test Results				Pass


Laboratory Technician

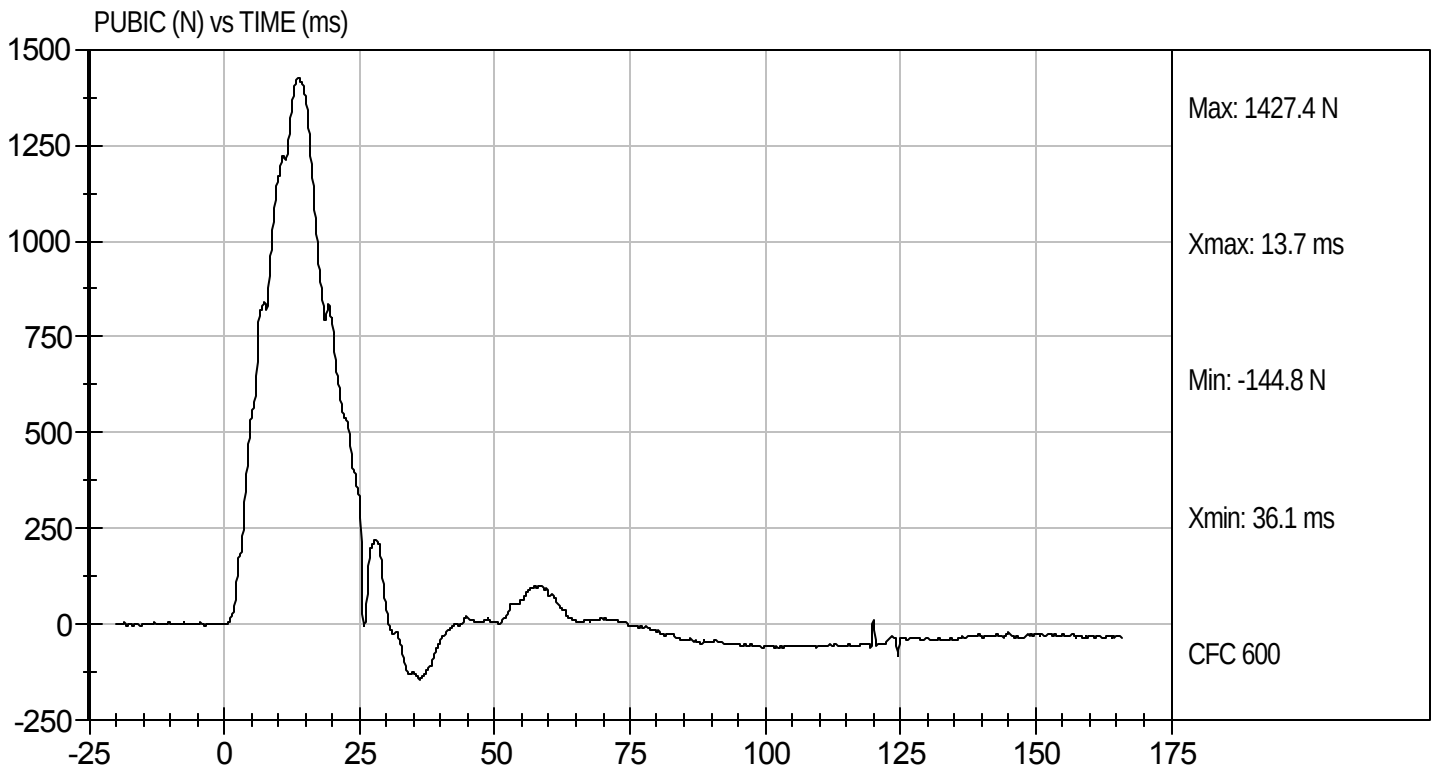
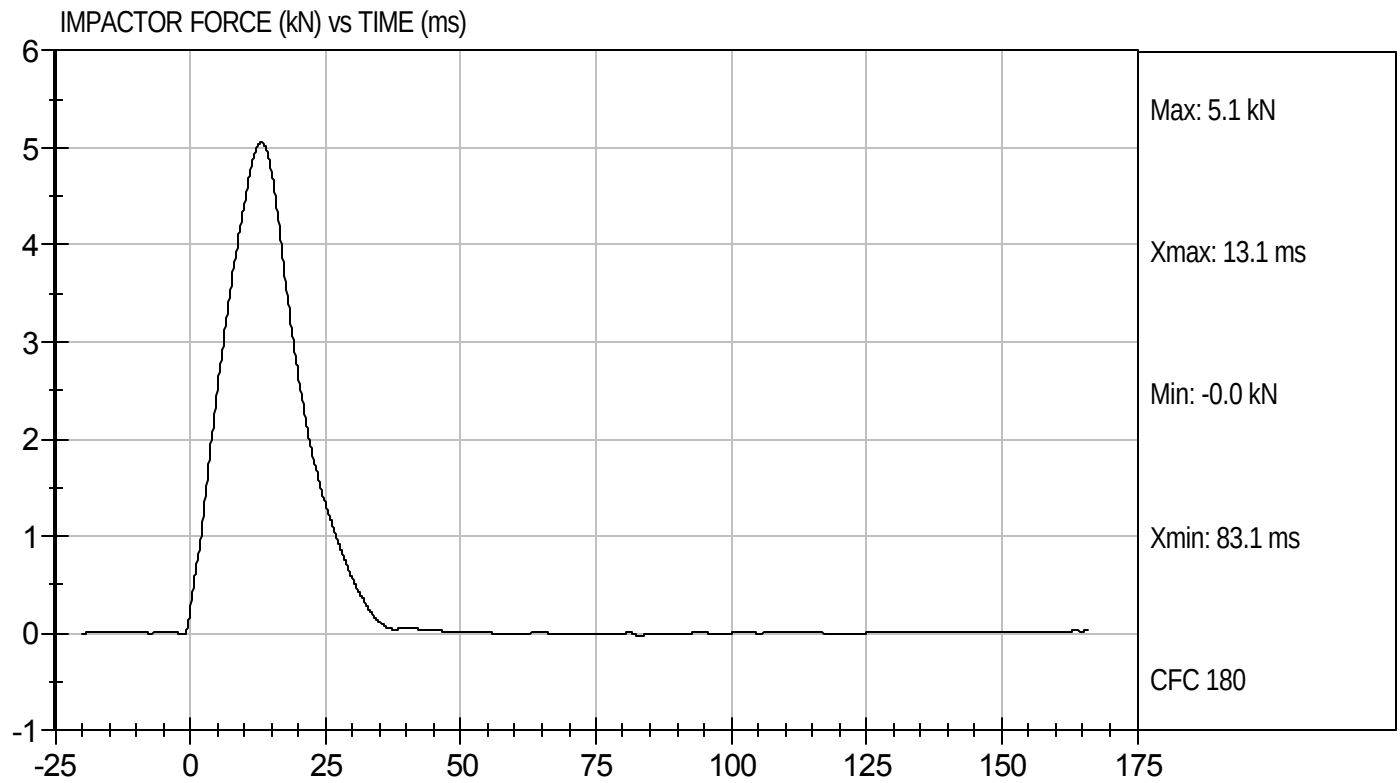
12/14/11
Test Date


Approved By



Test Desc: Pelvis Impact
Component ID: D114179

Test Date: 12/14/11
Velocity: 14.25 ft/s, 4.34 m/s



MGA RESEARCH CORPORATION

HEAD DROP TEST

ES-2re DUMMY

ATD Serial No: 032Test ID: D114331

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	22.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	125 to 155	148	Pass
Peak Longitudinal Acceleration	G's	+/- 15	-8.6	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 15% of peak	Yes	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

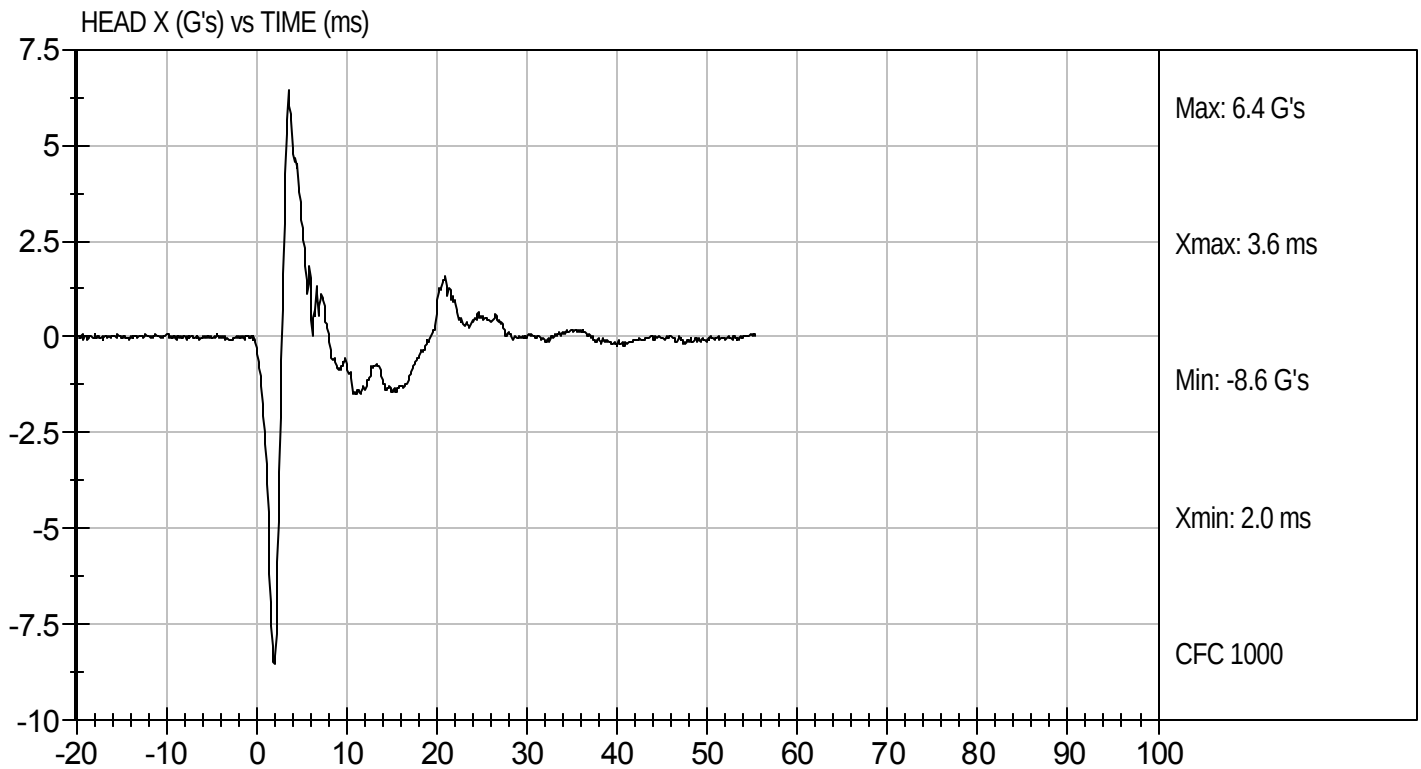
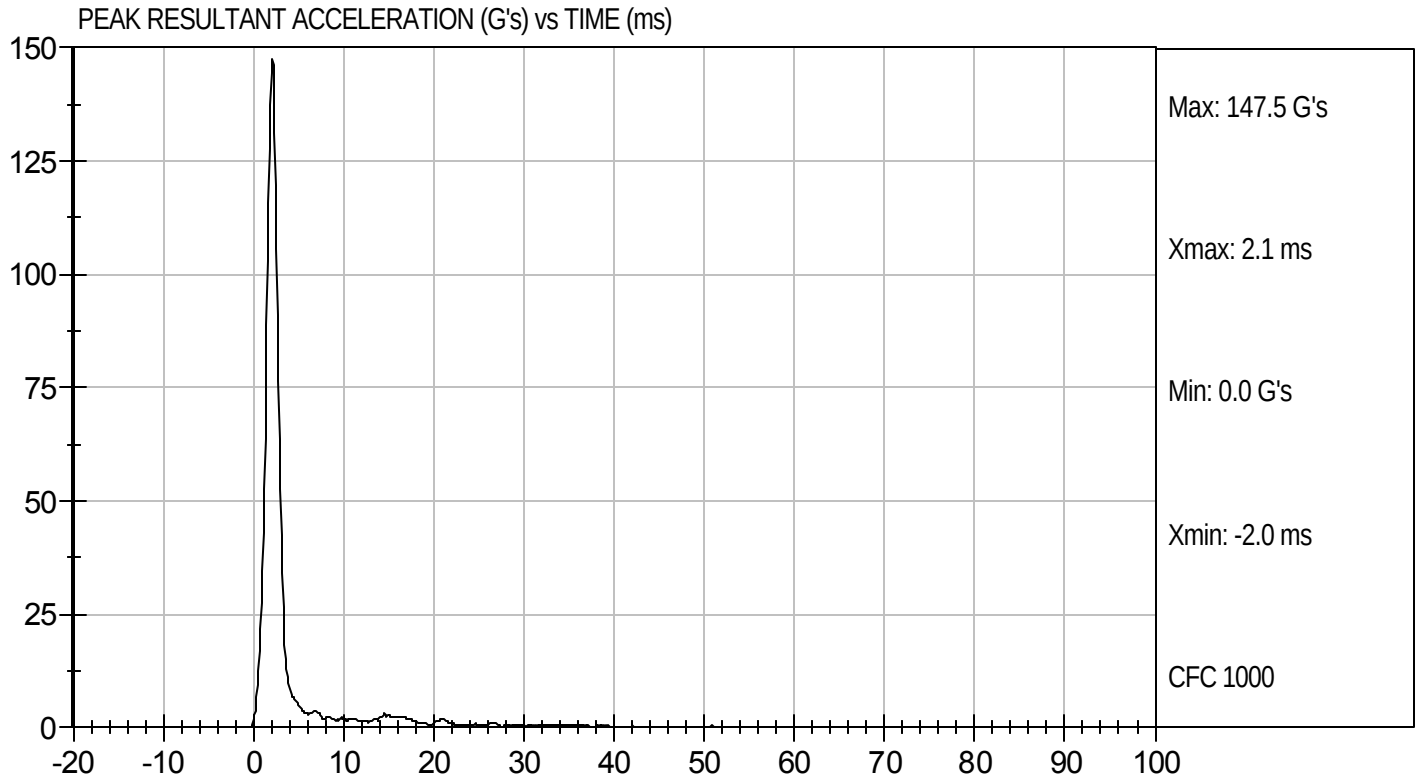
12/21/11
Test Date

David Winkelbauer
Approved By



Test Desc: Head Drop
Component ID: D114331

Test Date: 12/21/11
Velocity: 0 ft/s, 0 m/s

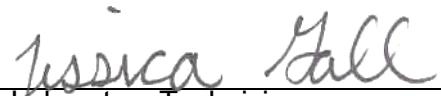


MGA RESEARCH CORPORATION
NECK PENDULUM TEST
ES-2re DUMMY

ATD Serial No: 032

Test I.D: D114332

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	18.0 to 22.0	22.0	Pass
Laboratory Relative Humidity		%	10 to 70	31	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	-3.27	Pass
Maximum Flexion Angle		deg	49.0 to 59.0	52.6	Pass
Time of Maximum Flexion Angle		ms	54.0 to 66.0	61.5	Pass
Head Rotation Decay Time to 0 degree		ms	53.0 to 88.0	60.9	Pass
Overall Test Results					Pass


 Laboratory Technician

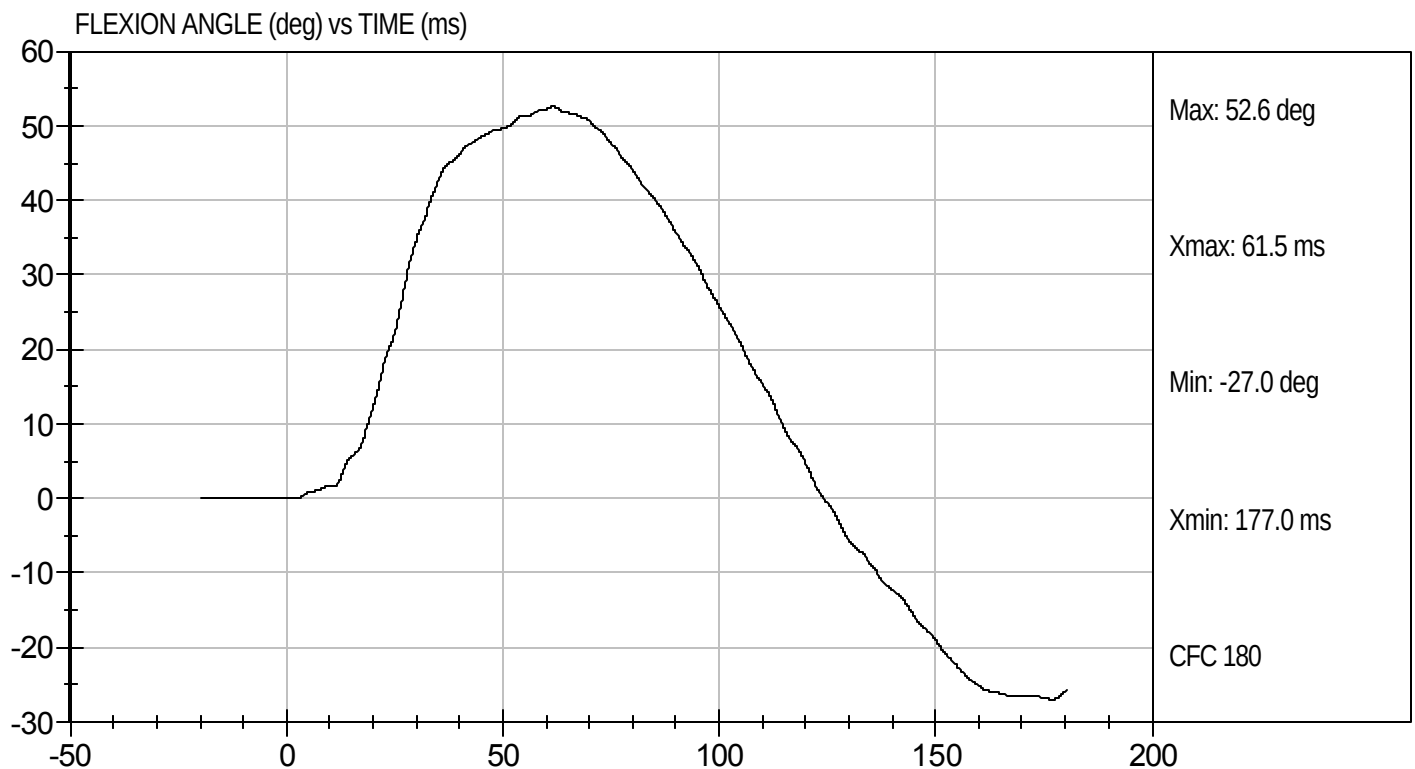
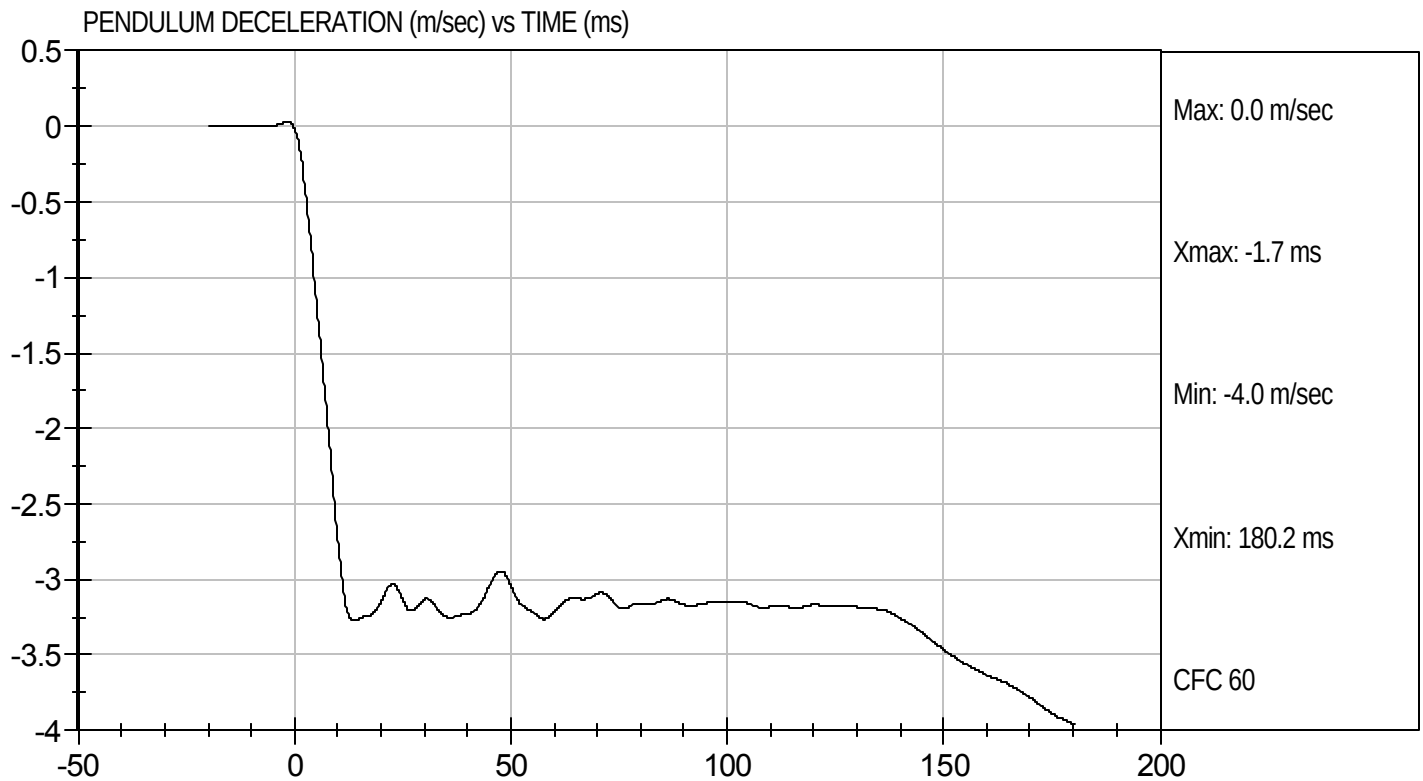
12/21/11
 Test Date


 Approved By



Test Desc: Neck Bending
Component ID: D114332

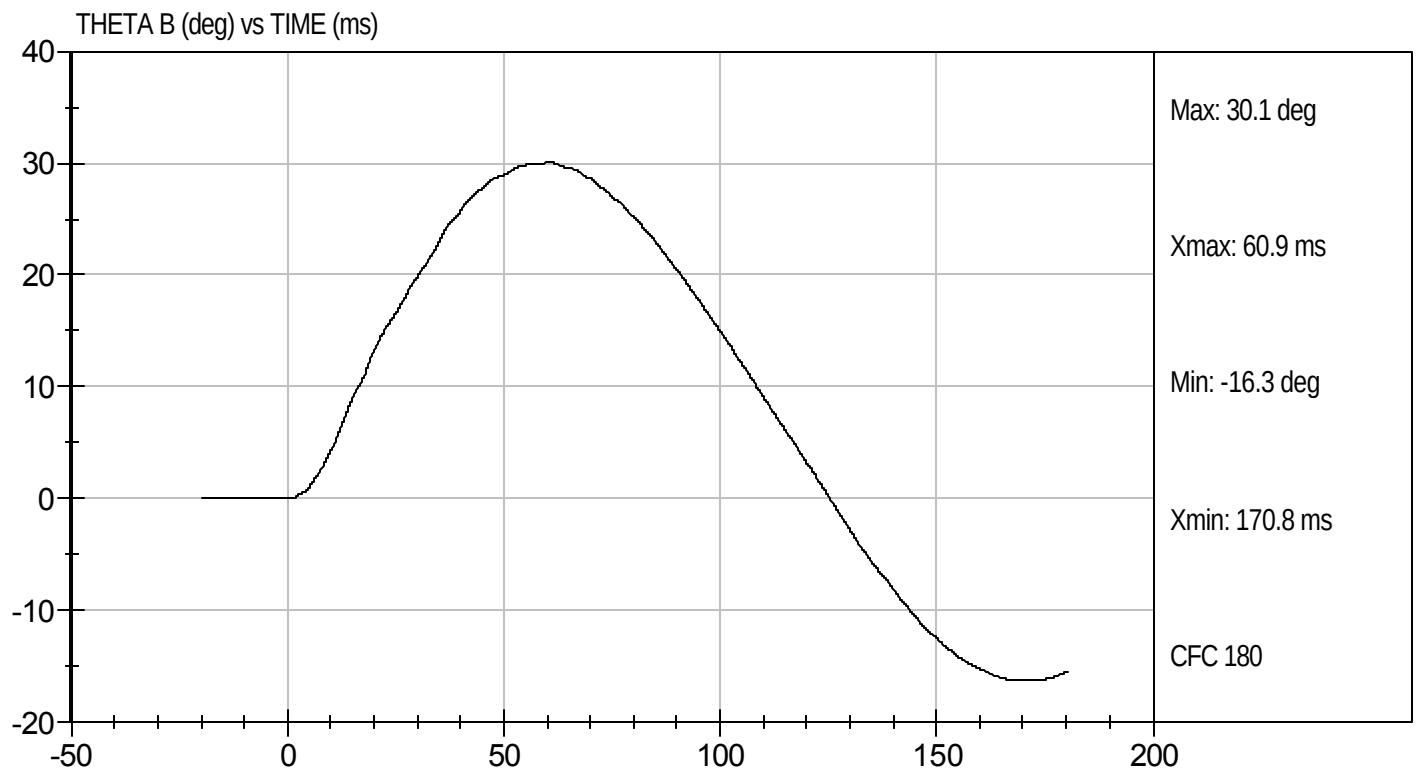
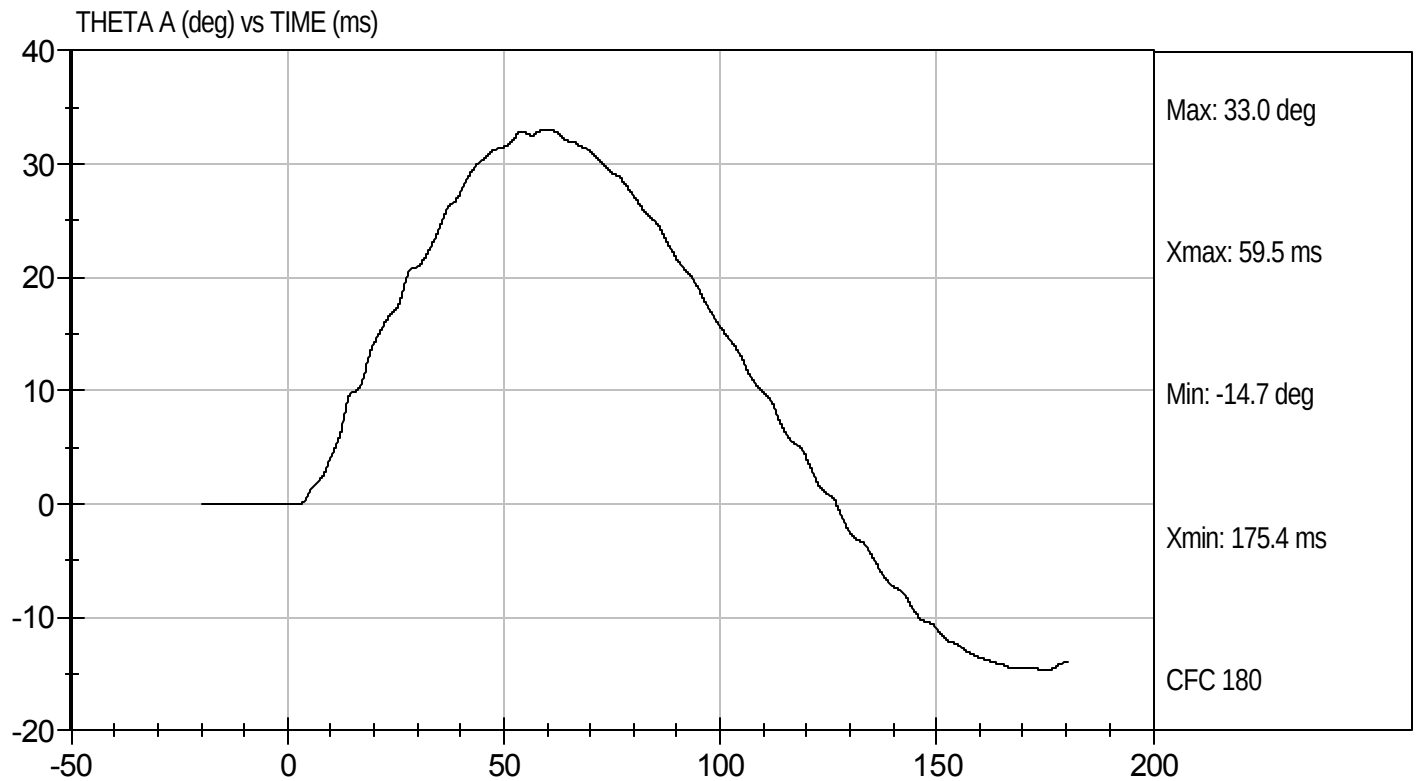
Test Date: 12/21/11
Velocity: 11.11 ft/s, 3.4 m/s





Test Desc: Neck Bending
Component ID: D114332

Test Date: 12/21/11
Velocity: 11.11 ft/s, 3.4 m/s



MGA RESEARCH CORPORATION
SHOULDER IMPACT TEST
ES-2re DUMMY

ATD Serial No: 032

Test I.D: D114333

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Speed	m/s	4.2 to 4.4	4.3	Pass
Peak Shoulder Acceleration	G's	7.5 to 10.5	9.0	Pass
Time of Peak Shoulder Acceleration	ms	NA	13.2	Pass
Overall Test Results			Pass	


Laboratory Technician

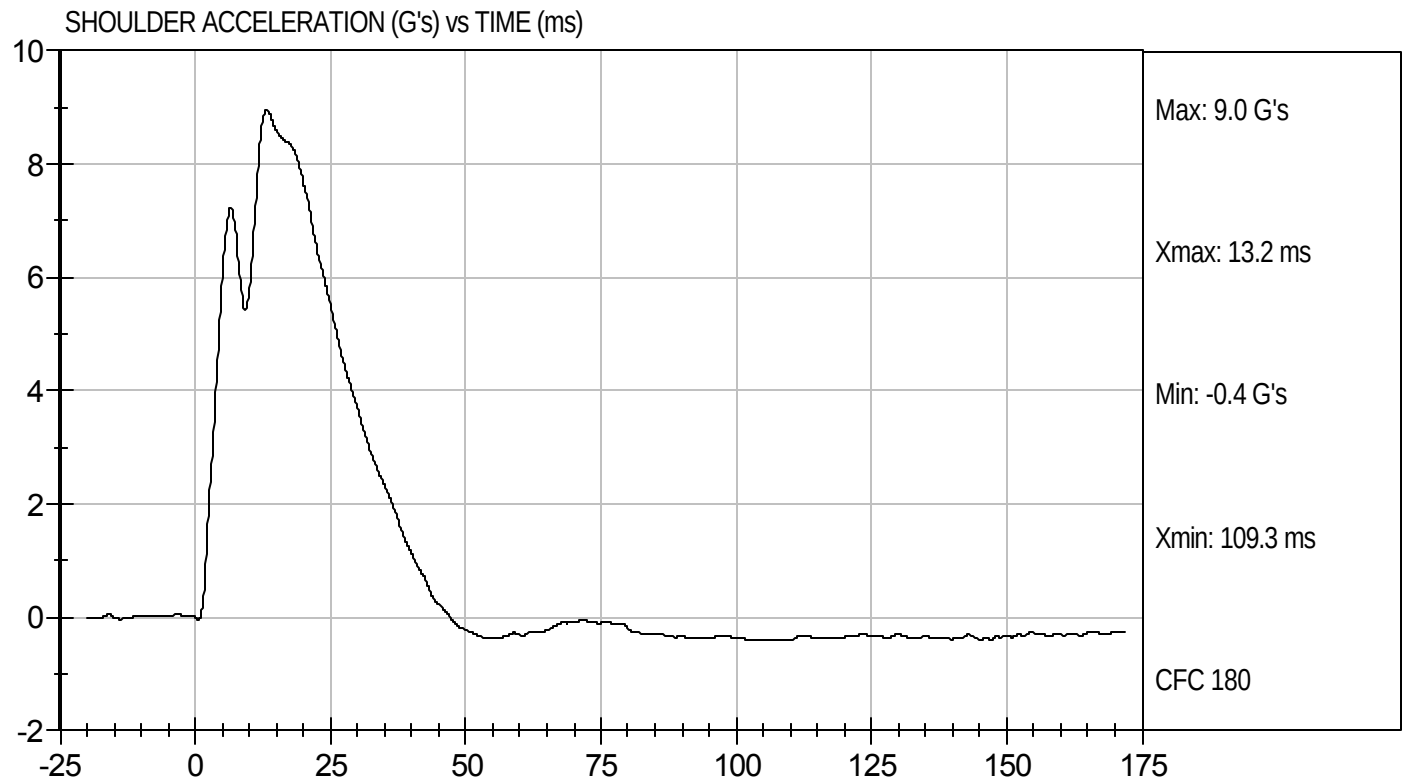
12/21/11
Test Date


Approved By



Test Desc: Shoulder Impact
Component ID: D114333

Test Date: 12/21/11
Velocity: 14.12 ft/s, 4.3 m/s



MGA RESEARCH CORPORATION

UPPER RIB TEST
EUROSID 2 DUMMY

ATD Serial No: 032

Test I.D: D114334

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	30	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

Jessica Hall
Laboratory Technician

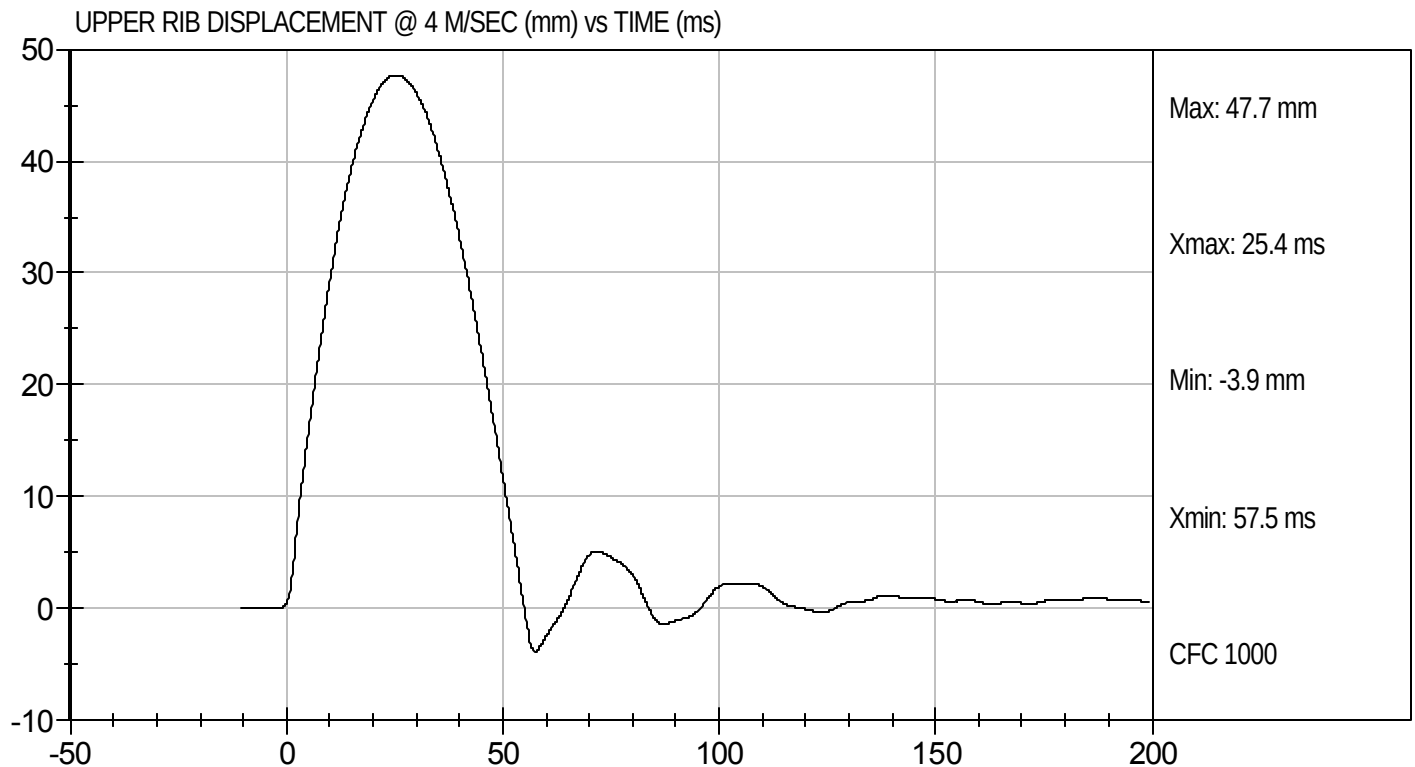
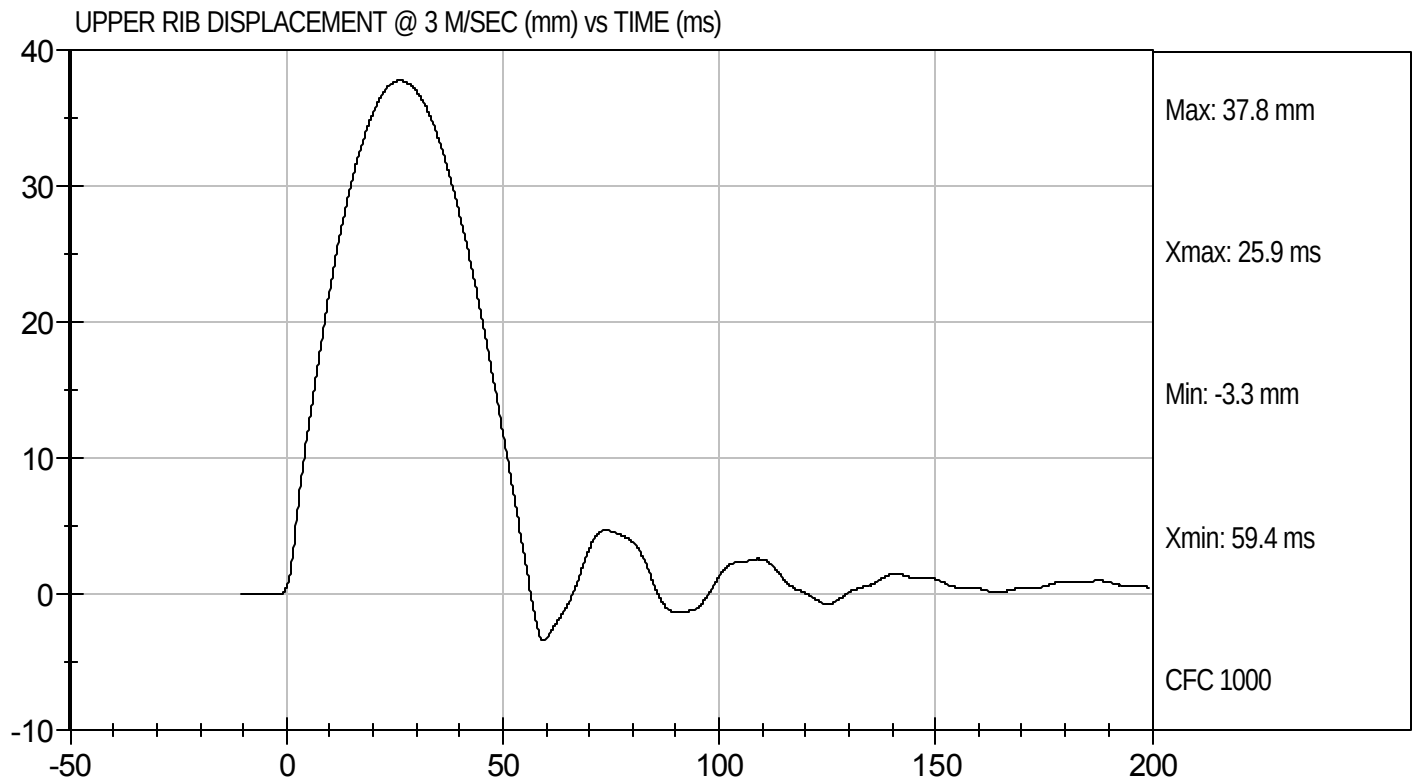
12/21/11
Test Date

David Winkelbauer
Approved By



Test Desc: Rib Impact - Upper
Component ID: D114334

Test Date: 12/21/11



MGA RESEARCH CORPORATION

MID RIB TEST
EUROSID 2 DUMMY

ATD Serial No: 032

Test I.D: D114335

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Displacement at 3 m/s	mm	36.0 to 40.0	37.2	Pass
Displacement at 4 m/s	mm	46.0 to 51.0	47.7	Pass
			Overall Test Results	Pass


Laboratory Technician

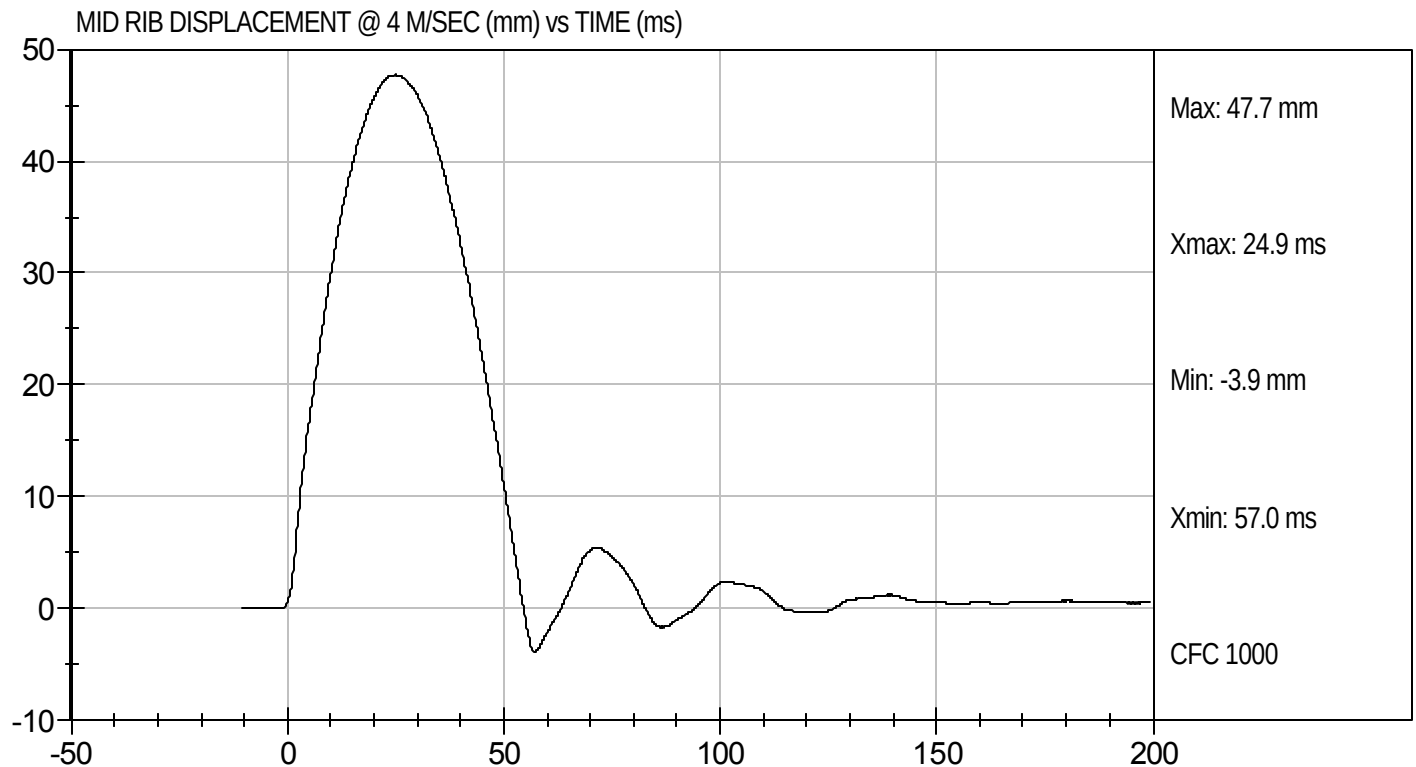
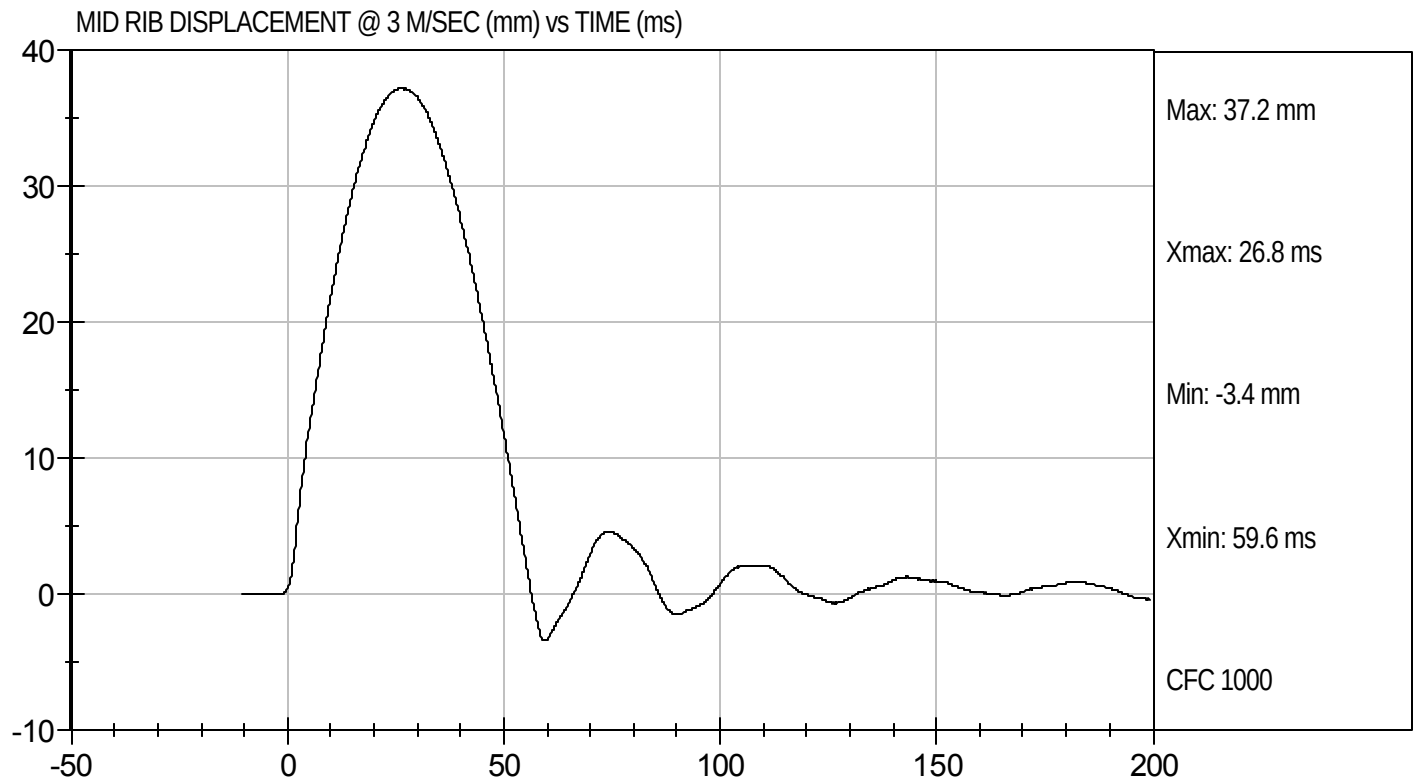
12/21/11
Test Date


Approved By



Test Desc: Rib Impact - Mid
Component ID: D114335

Test Date: 12/21/11



MGA RESEARCH CORPORATION

**LOWER RIB TEST
EUROSID 2 DUMMY**

ATD Serial No: 032

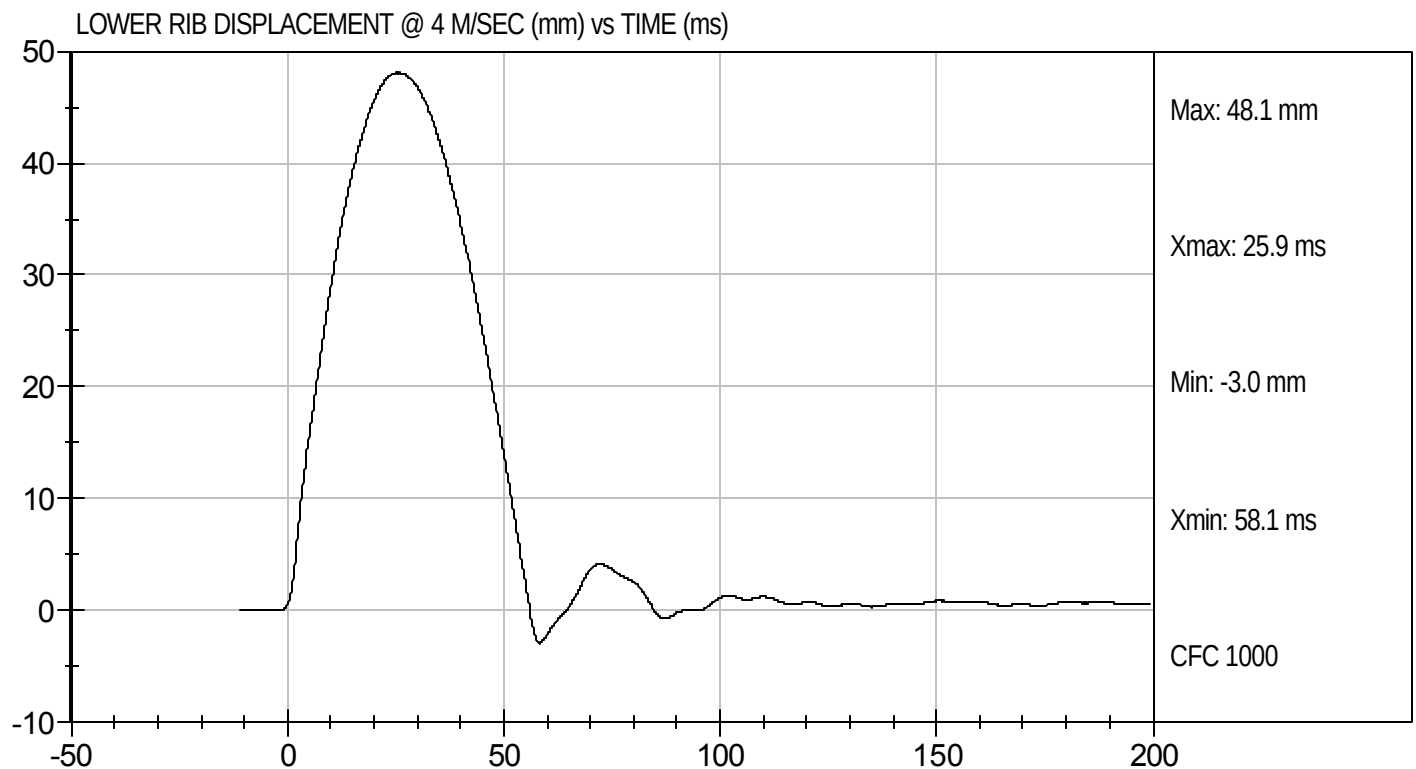
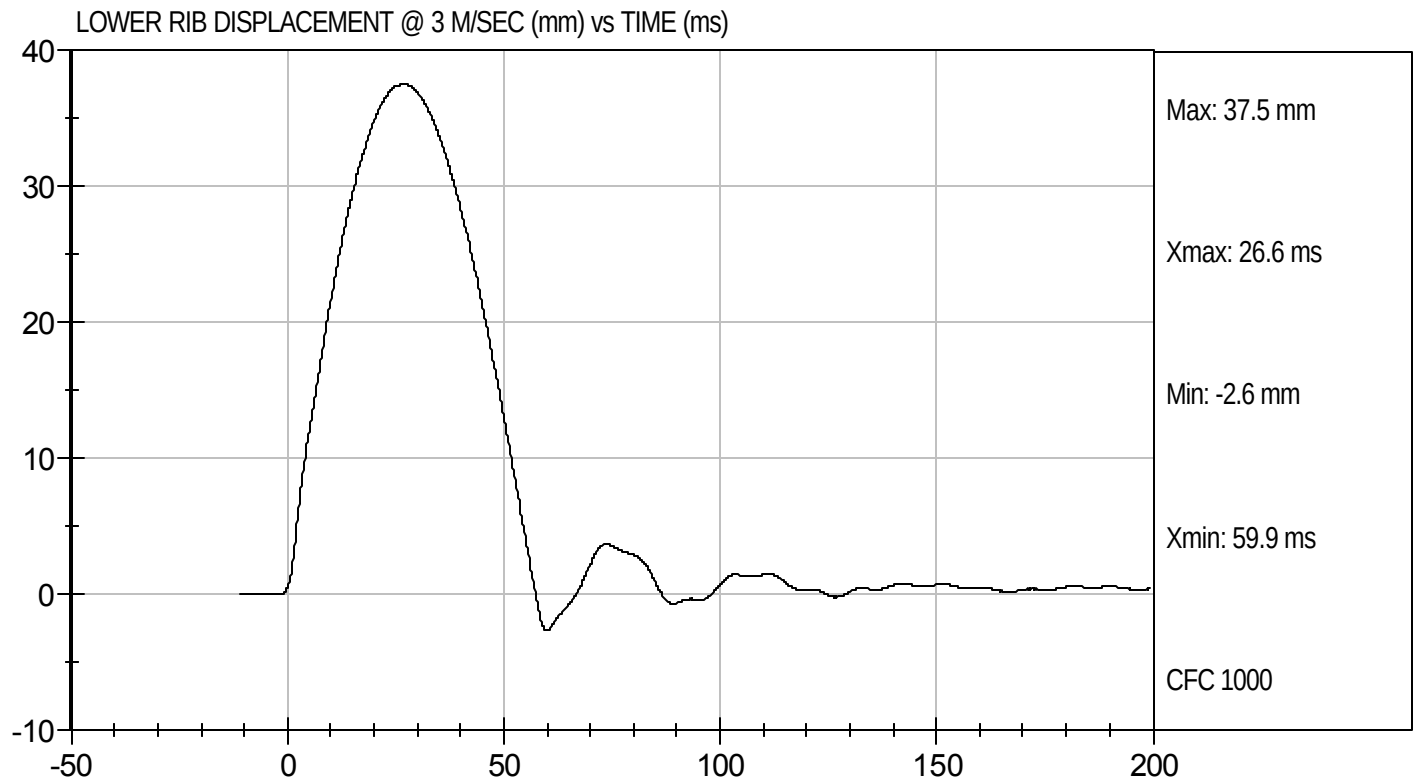
Test I.D: D114336

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	30	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	48.1	Pass
			Overall Test Results	Pass


Laboratory Technician

12/21/11
Test Date


Approved By



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

ATD Serial No: 032

Test I.D: D114330

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	22.0	Pass
Humidity	%	10 to 70	30	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	5.33	Pass
Upper Rib Displacement	mm	34.0 to 41.0	37.0	Pass
Middle Rib Displacement	mm	37.0 to 45.0	40.0	Pass
Lower Rib Displacement	mm	37.0 to 44.0	39.5	Pass
Overall Test Results			Pass	


Laboratory Technician

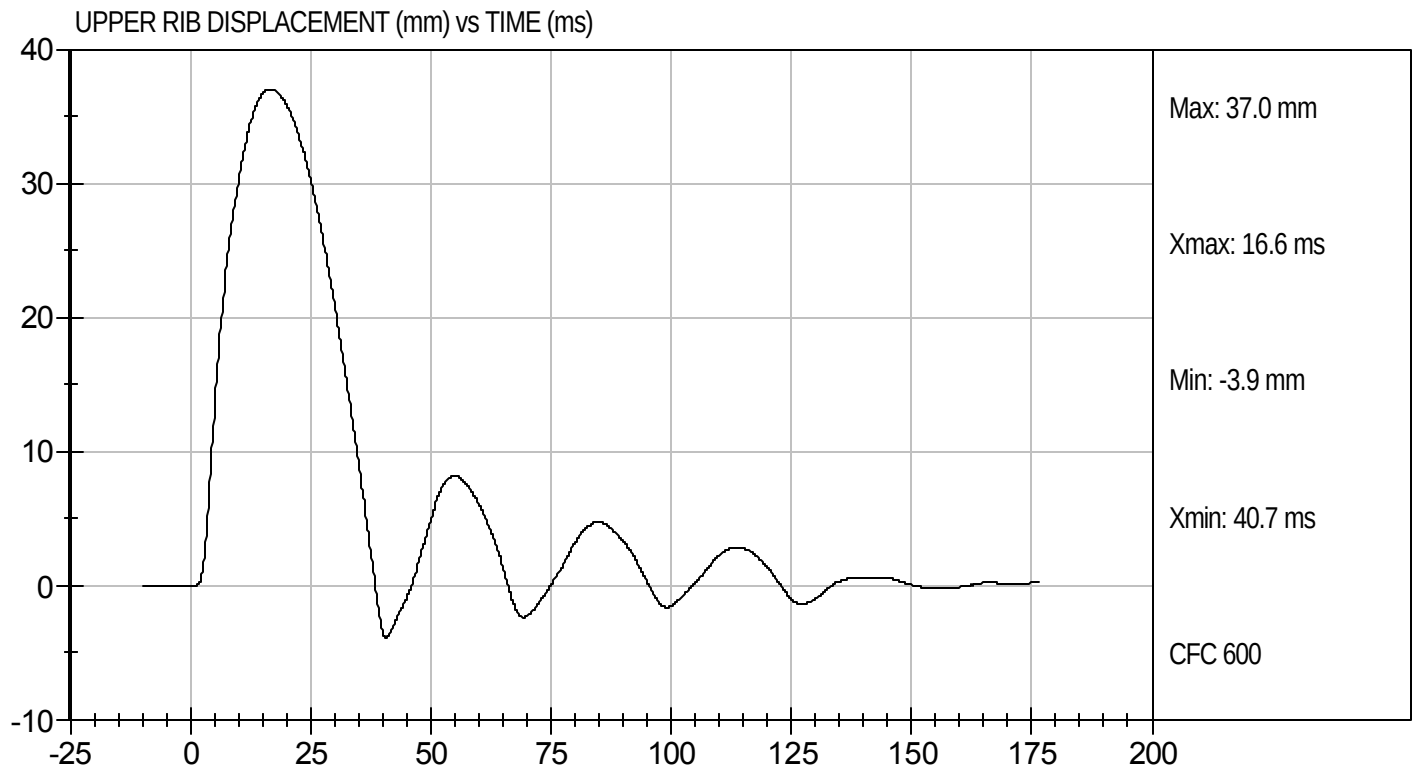
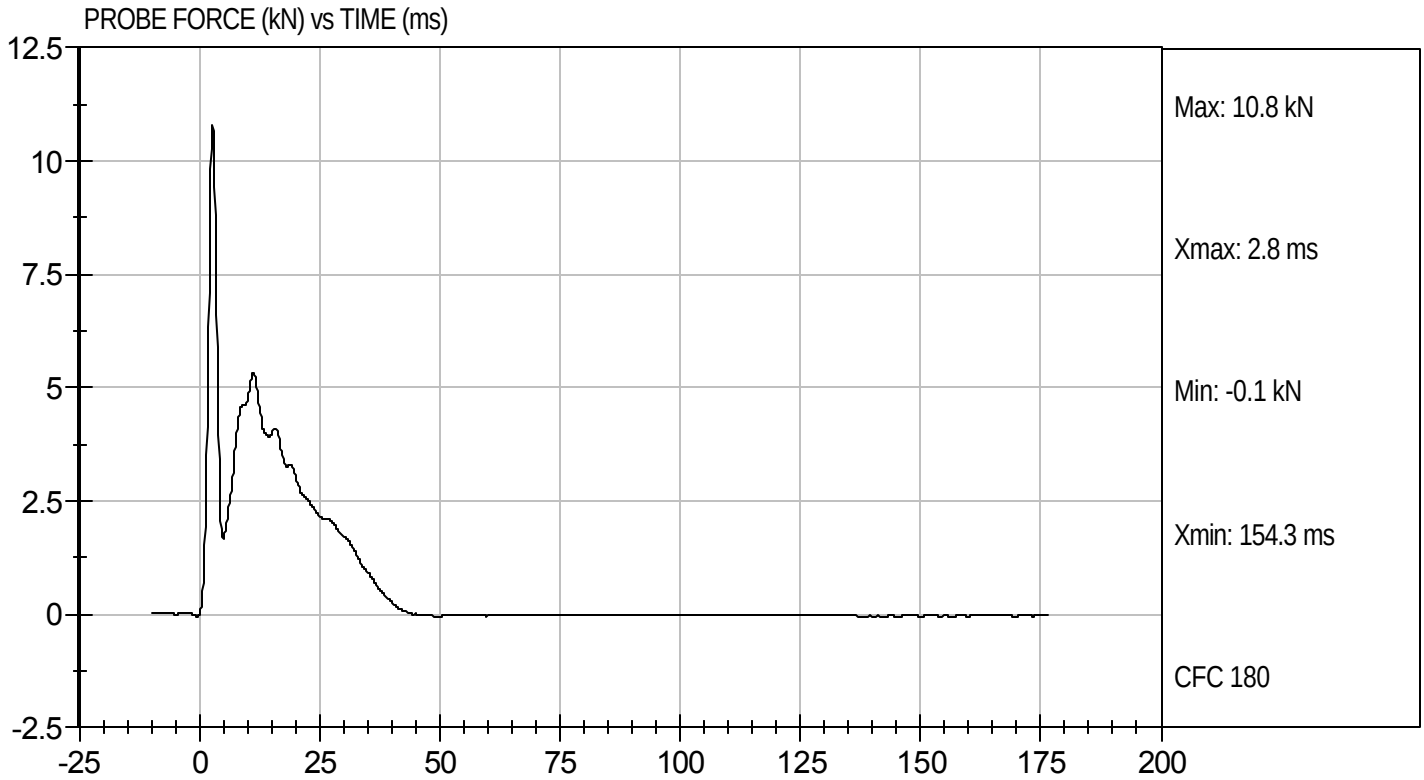
12/21/11
Test Date


Approved By



Test Desc: Thorax Impact
Component ID: D114330

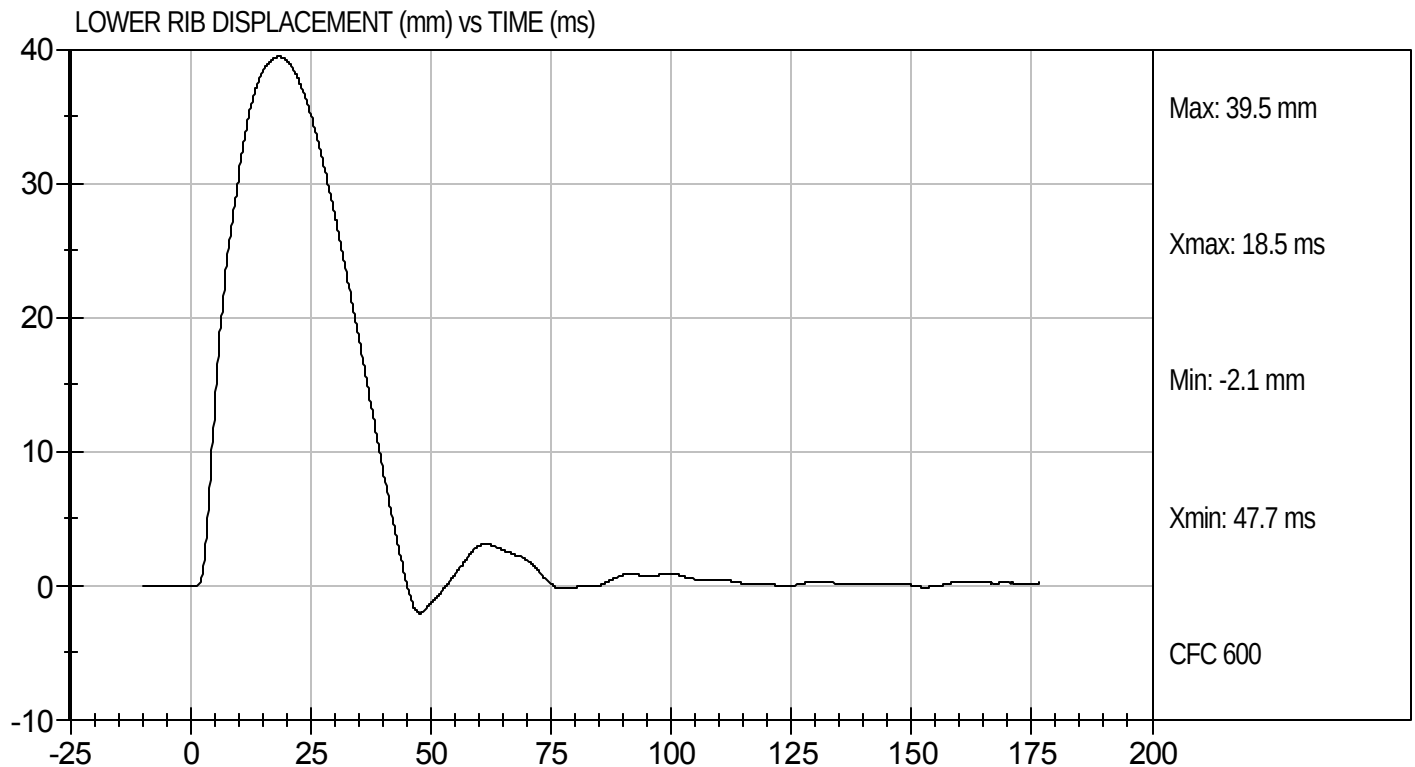
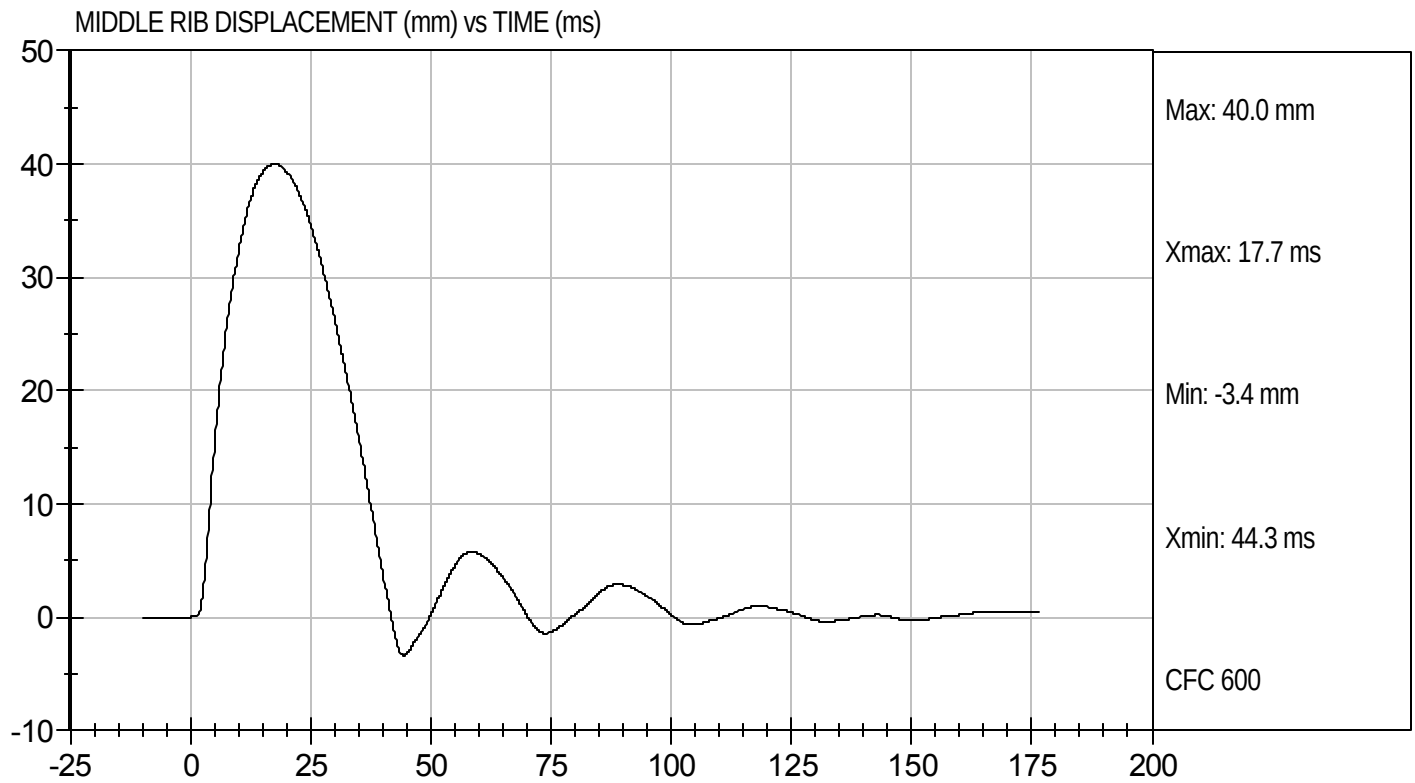
Test Date: 12/21/11
Velocity: 18.31 ft/s, 5.58 m/s





Test Desc: Thorax Impact
Component ID: D114330

Test Date: 12/21/11
Velocity: 18.31 ft/s, 5.58 m/s



MGA RESEARCH CORPORATION

ABDOMEN TEST

ES-2re DUMMY

ATD Serial No: 032

Test I.D: D114337

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Speed	m/s	3.90 to 4.10	4.10	Pass
Maximum Impact Force	kN	4.00 to 4.80	4.25	Pass
Time of Maximum Impact Force	ms	10.60 to 13.00	10.70	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	10.20	Pass
Overall Test Results				Pass


Laboratory Technician

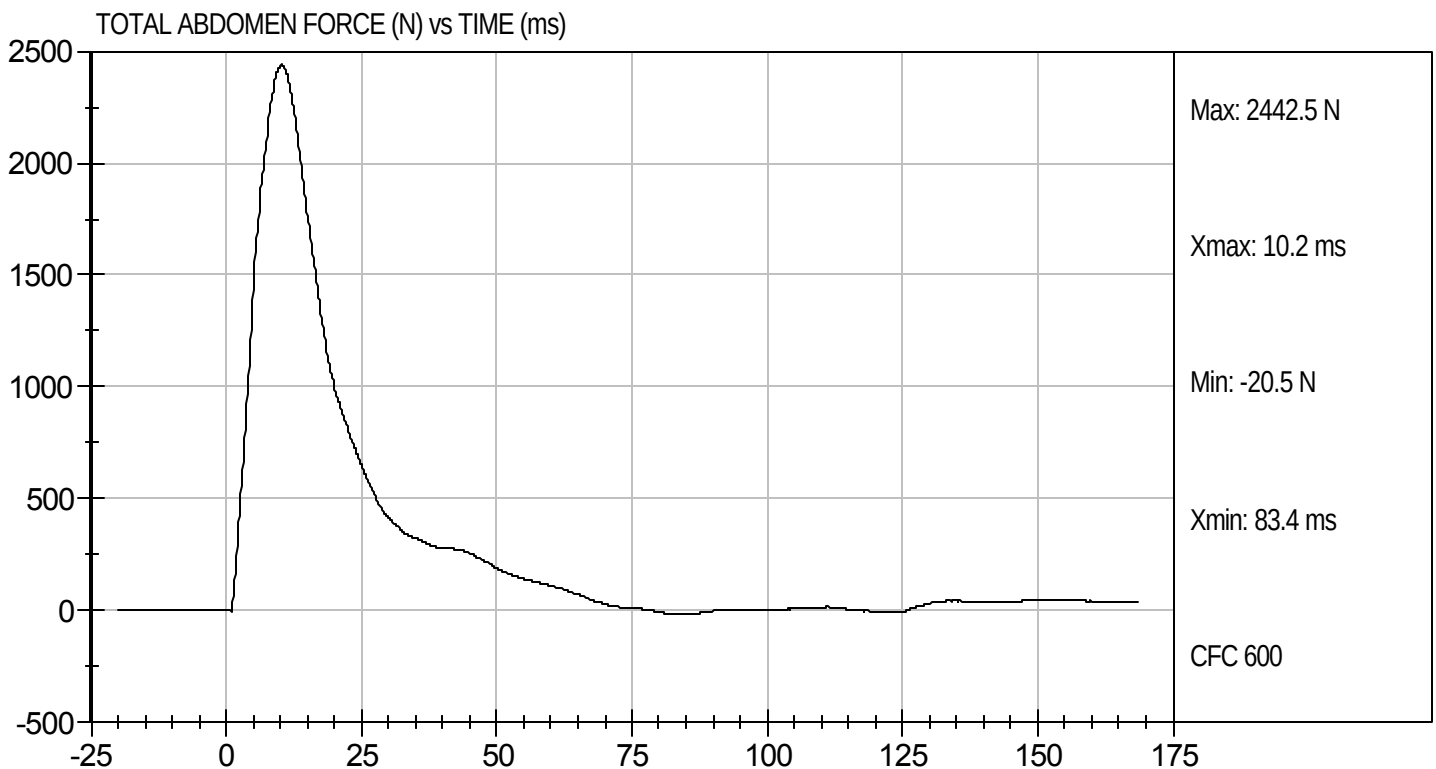
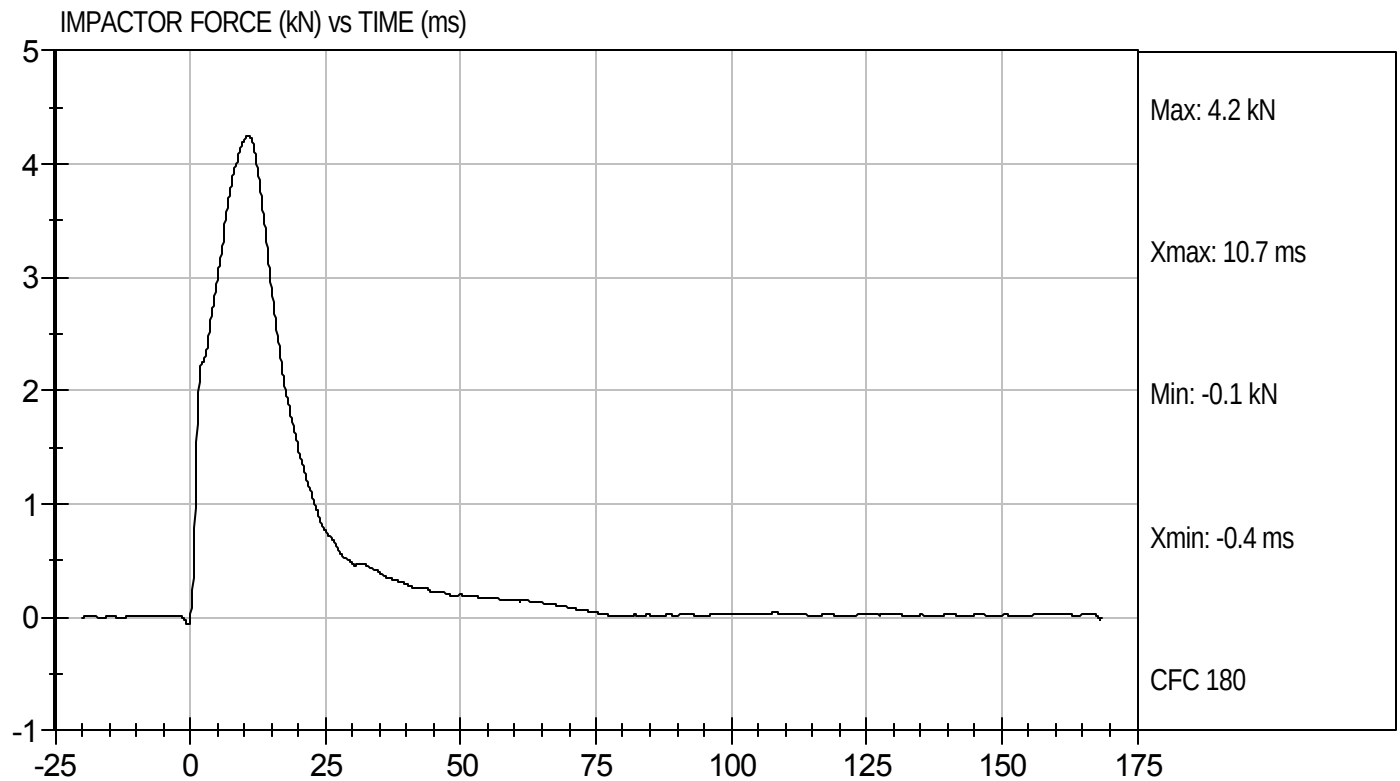
12/21/11
Test Date


Approved By



Test Desc: Abdomen Impact
Component ID: D114337

Test Date: 12/21/11
Velocity: 13.44 ft/s, 4.1 m/s

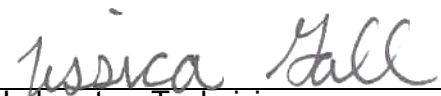


MGA RESEARCH CORPORATION
LUMBAR SPINE TEST
ES-2re DUMMY

ATD Serial No: 032

Test I.D: D114338

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	22.1	Pass
Laboratory Relative Humidity		%	10 to 70	31	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	-0.42	Pass
	27 ms	m/s	-6.50 to -5.80	-5.84	Pass
	30 ms	m/s	>= -6.5	-6.35	Pass
Maximum Flexion Angle		deg	45.0 to 55.0	45.2	Pass
Time of Maximum Flexion Angle		ms	39.0 to 53.0	43.5	Pass
Headform Rotation Decay to Initial Position		ms	37 to 57	43	Pass
Overall Results					Pass


 Laboratory Technician

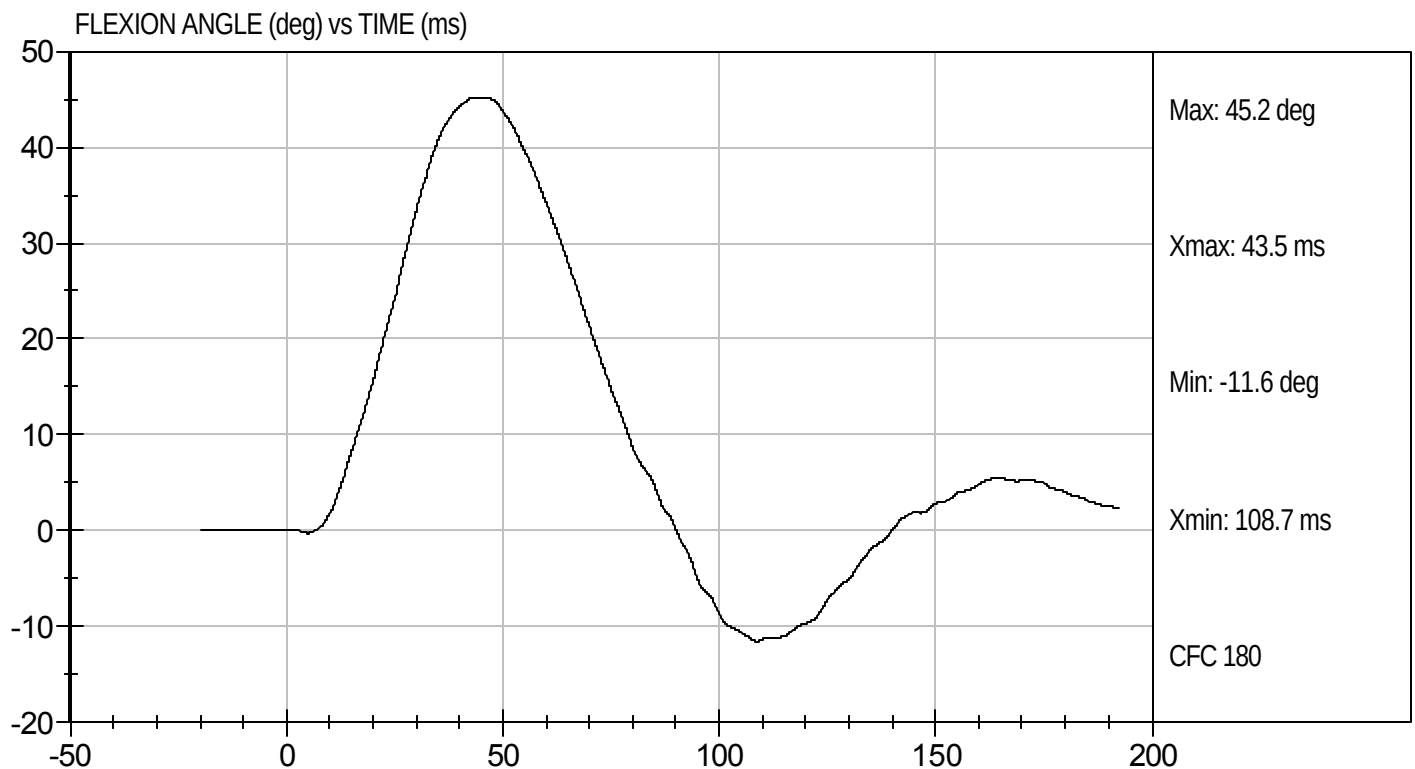
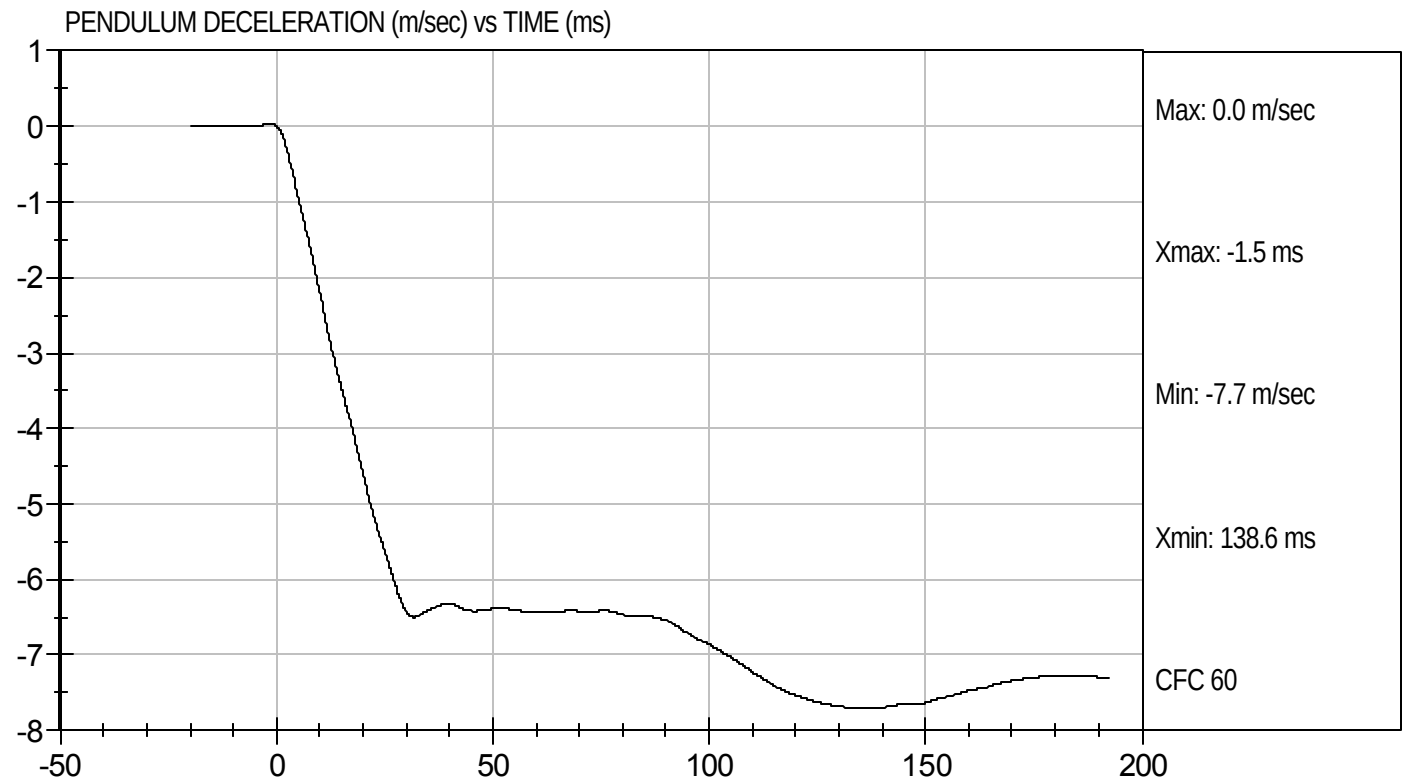
12/21/11
 Test Date


 Approved By



Test Desc: Lumbar Bending
Component ID: D114338

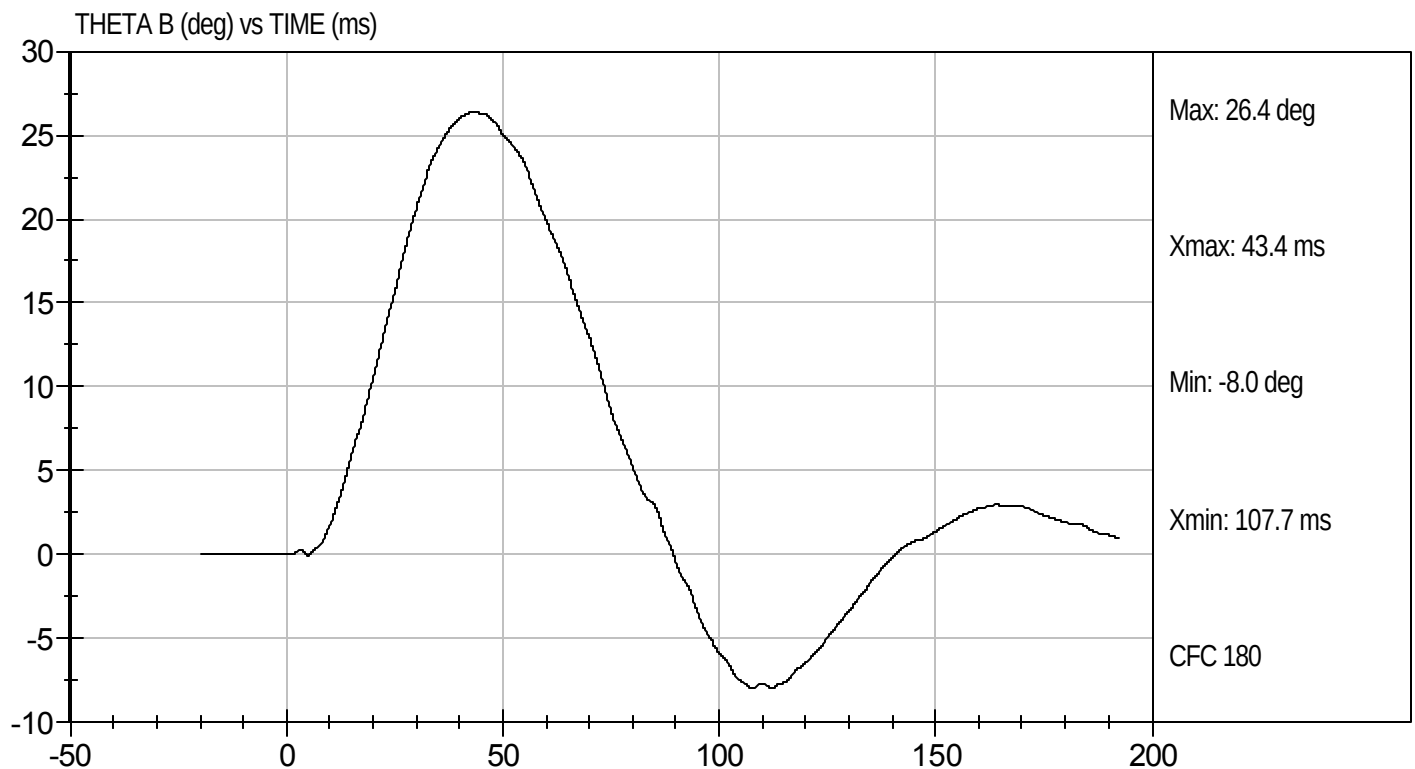
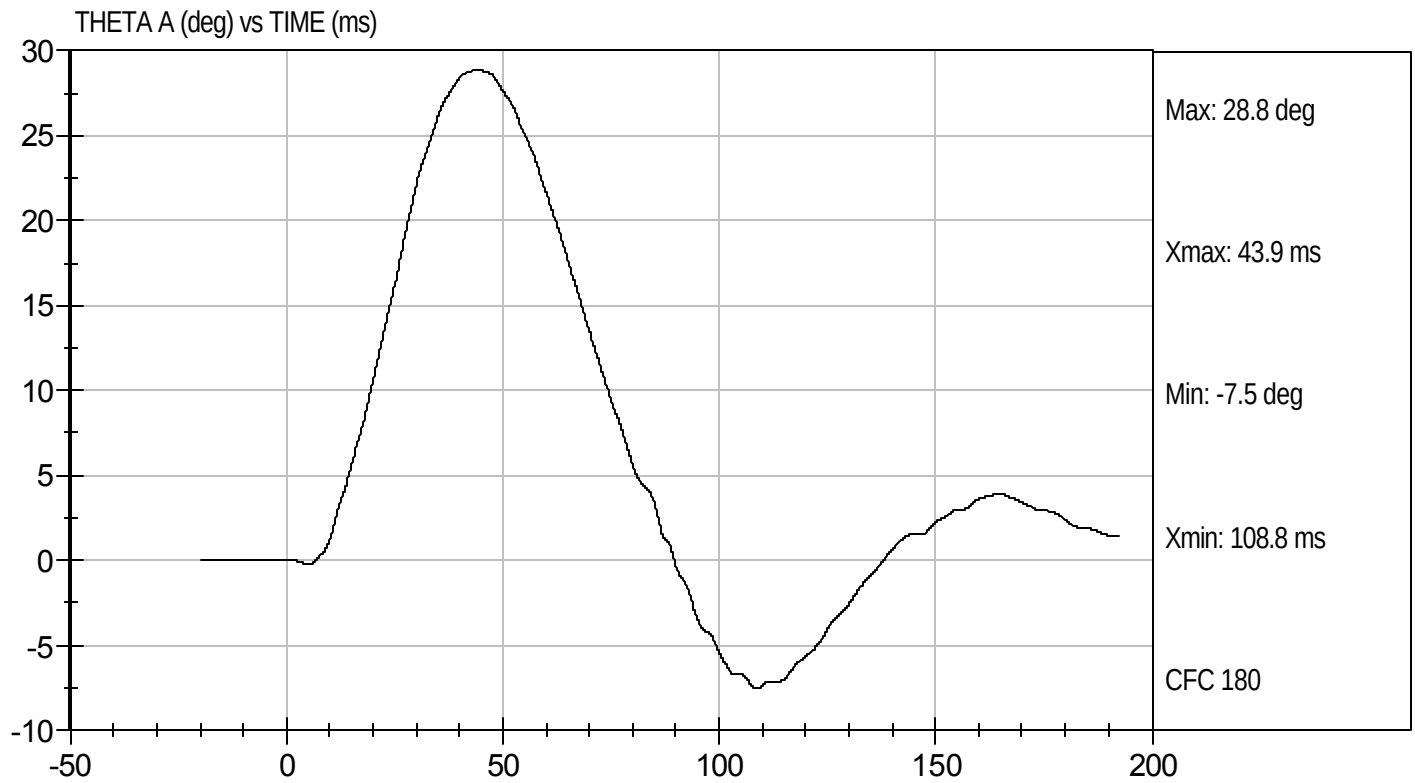
Test Date: 12/21/11
Velocity: 20.08 ft/s, 6.12 m/s





Test Desc: Lumbar Bending
Component ID: D114338

Test Date: 12/21/11
Velocity: 20.08 ft/s, 6.12 m/s



MGA RESEARCH CORPORATION

**PELVIS TEST
ES-2re DUMMY**

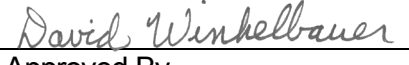
ATD Serial No: 032

Test I.D: D114339

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	22.0	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	4.91	Pass
Time of Maximum Impactor Force	ms	11.80 to 16.10	13.10	Pass
Maximum Pubic Force	kN	1.23 to 1.59	1.40	Pass
Time of Maximum Pubic Force	ms	12.20 to 17.00	13.40	Pass
Overall Test Results				Pass


Laboratory Technician

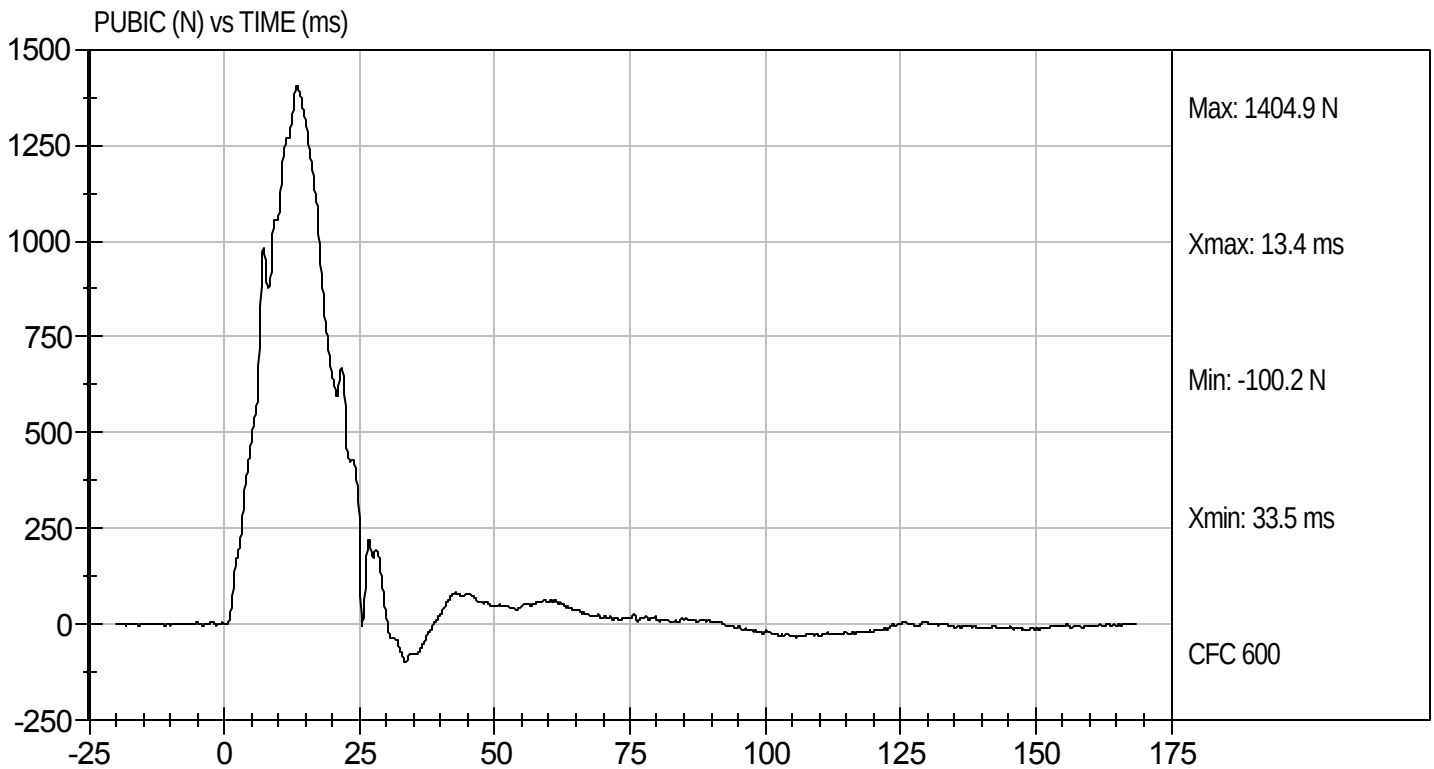
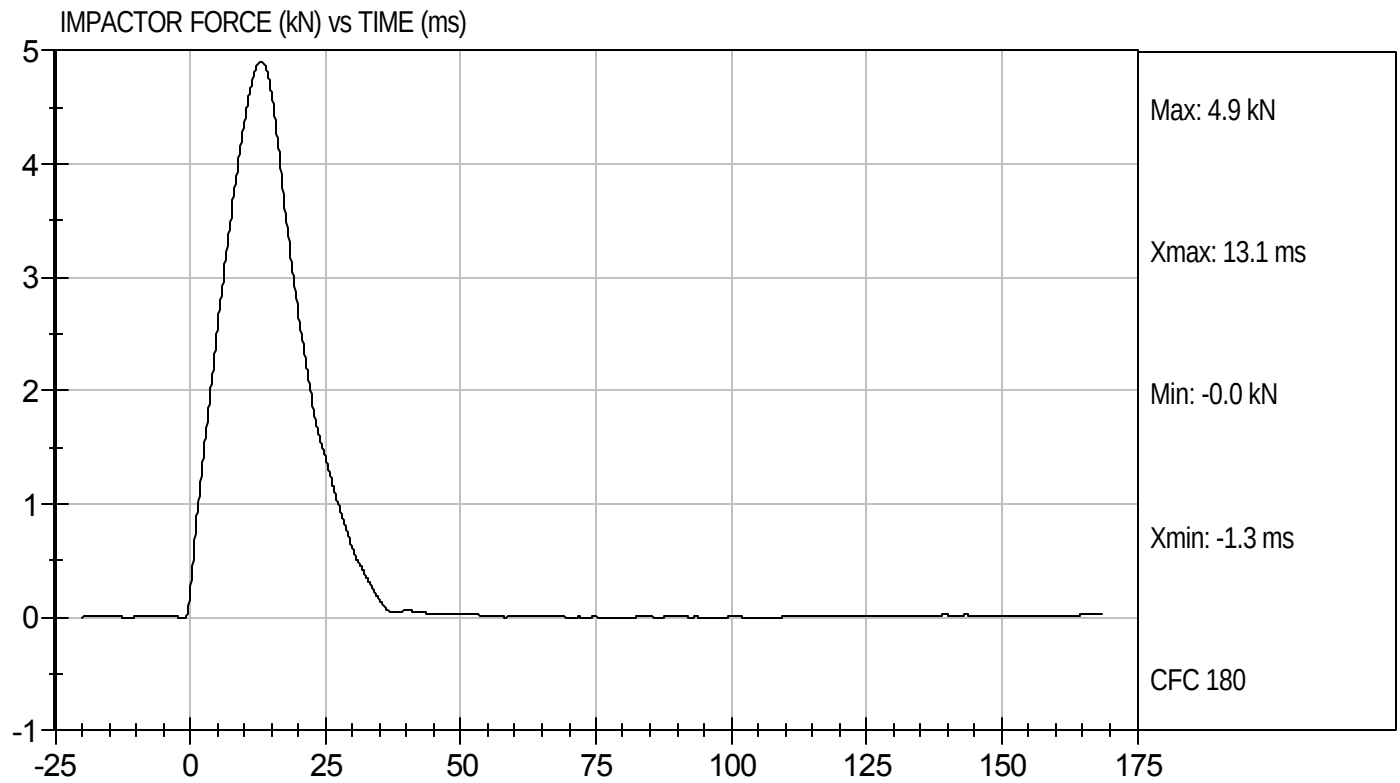
12/21/11
Test Date


Approved By



Test Desc: Pelvis Impact
Component ID: D114339

Test Date: 12/21/11
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: D114181

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	31	Pass
Peak Resultant Acceleration	G's	115 to 137	119	Pass
Peak Longitudinal Acceleration	G's	+/- 15	-3.9	Pass
Unimodal	N/A	<15%	Yes	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

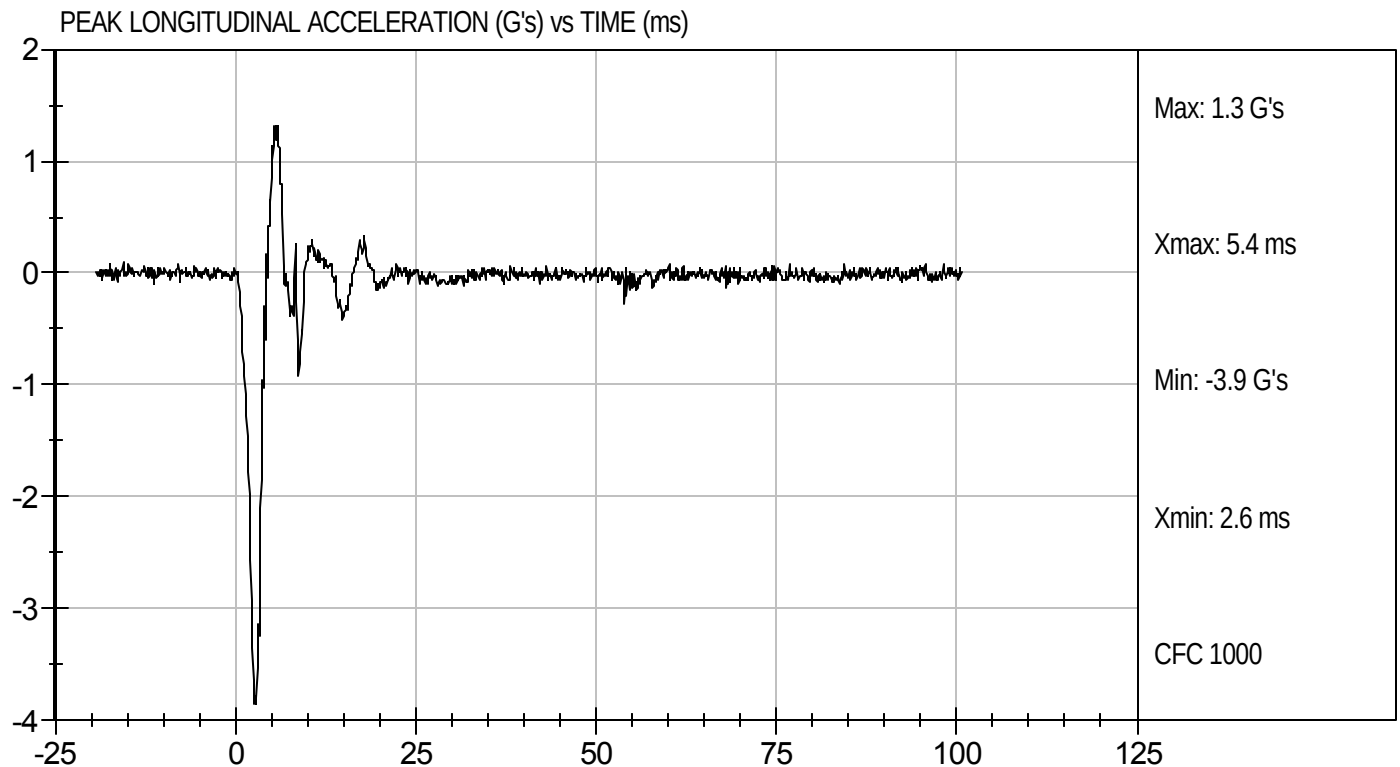
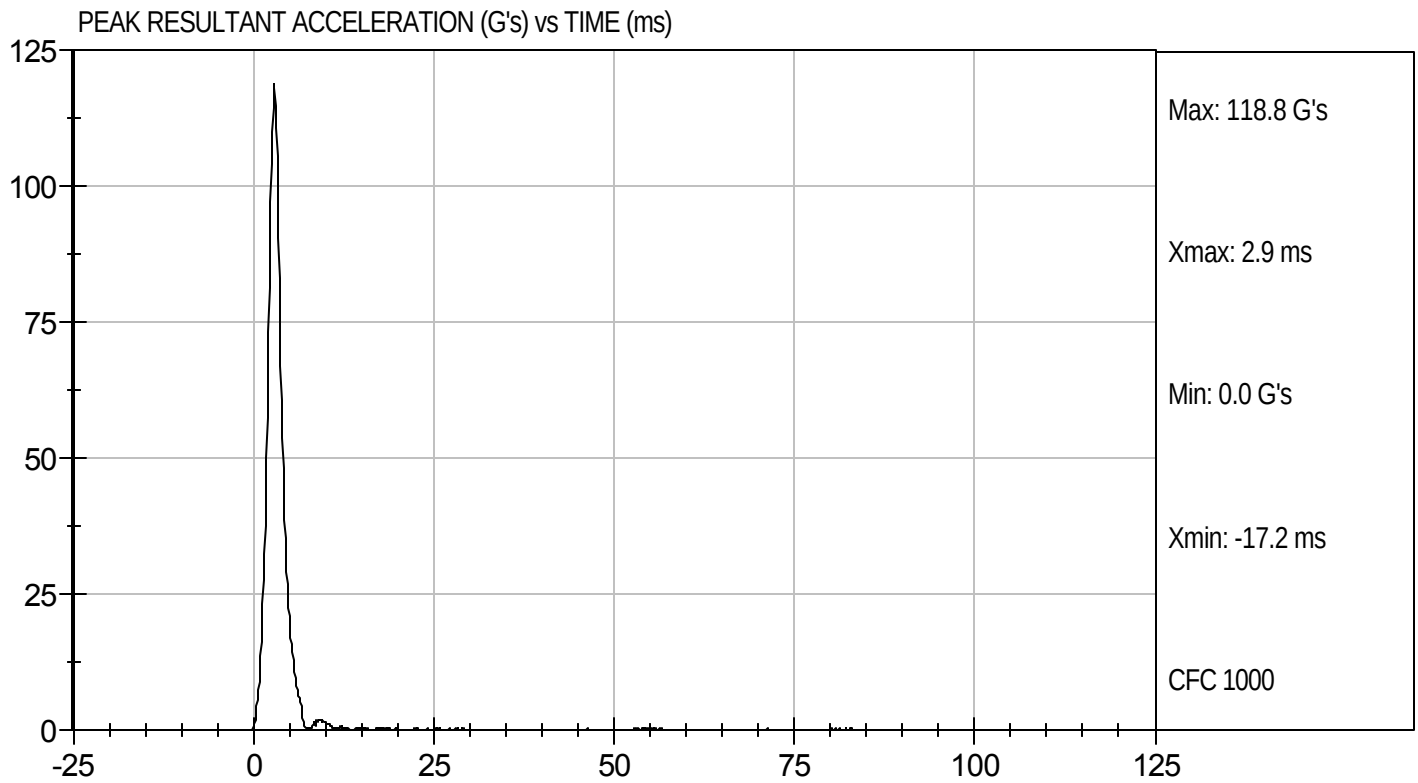
12/14/11
Test Date

David Winkelbauer
Approved By



Test Desc: Head Drop
Component ID: D114181

Test Date: 12/14/11
Velocity: 0 ft/s, 0 m/s

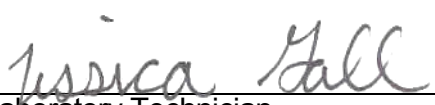


MGA RESEARCH CORPORATION
LATERAL NECK PENDULUM TEST
SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

Test I.D: D114182

Tested Parameter		Units	Specification	Result	Pass/Fail
Temperature		deg C	20.6 to 22.2	21.4	Pass
Humidity		%	10 to 70	32	Pass
Impact Velocity		m/s	5.51 to 5.63	5.58	Pass
Delta Velocity	10 ms	m/s	2.20 to 2.80	2.57	Pass
	15 ms	m/s	3.30 to 4.10	3.64	Pass
	20 ms	m/s	4.40 to 5.40	4.81	Pass
	25 ms	m/s	5.40 to 6.10	5.44	Pass
	25-100 ms	m/s	5.50 to 6.20	5.57	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	-42	Pass
Time of Moment Decay to 0 Nm		ms	102 to 126	116	Pass
Overall Test Results				Pass	


 Laboratory Technician

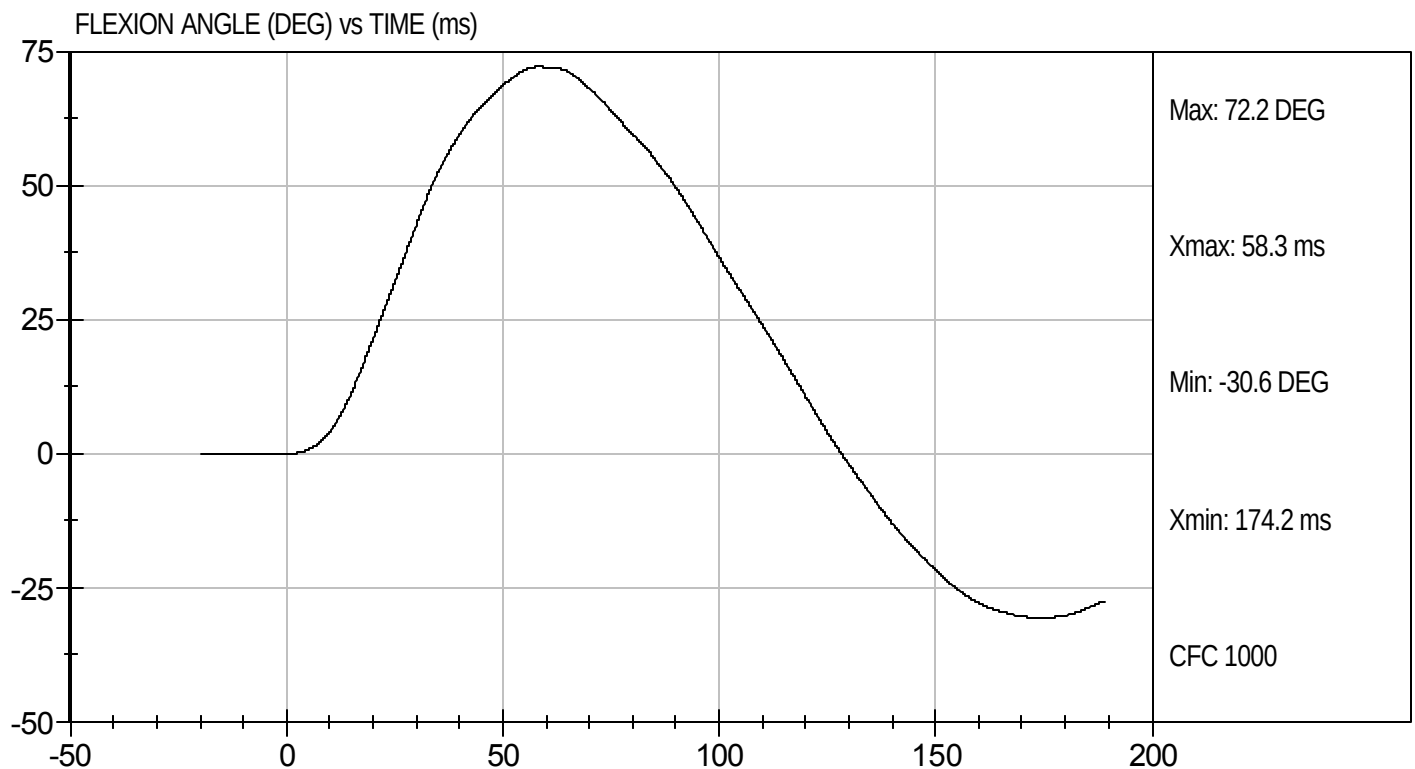
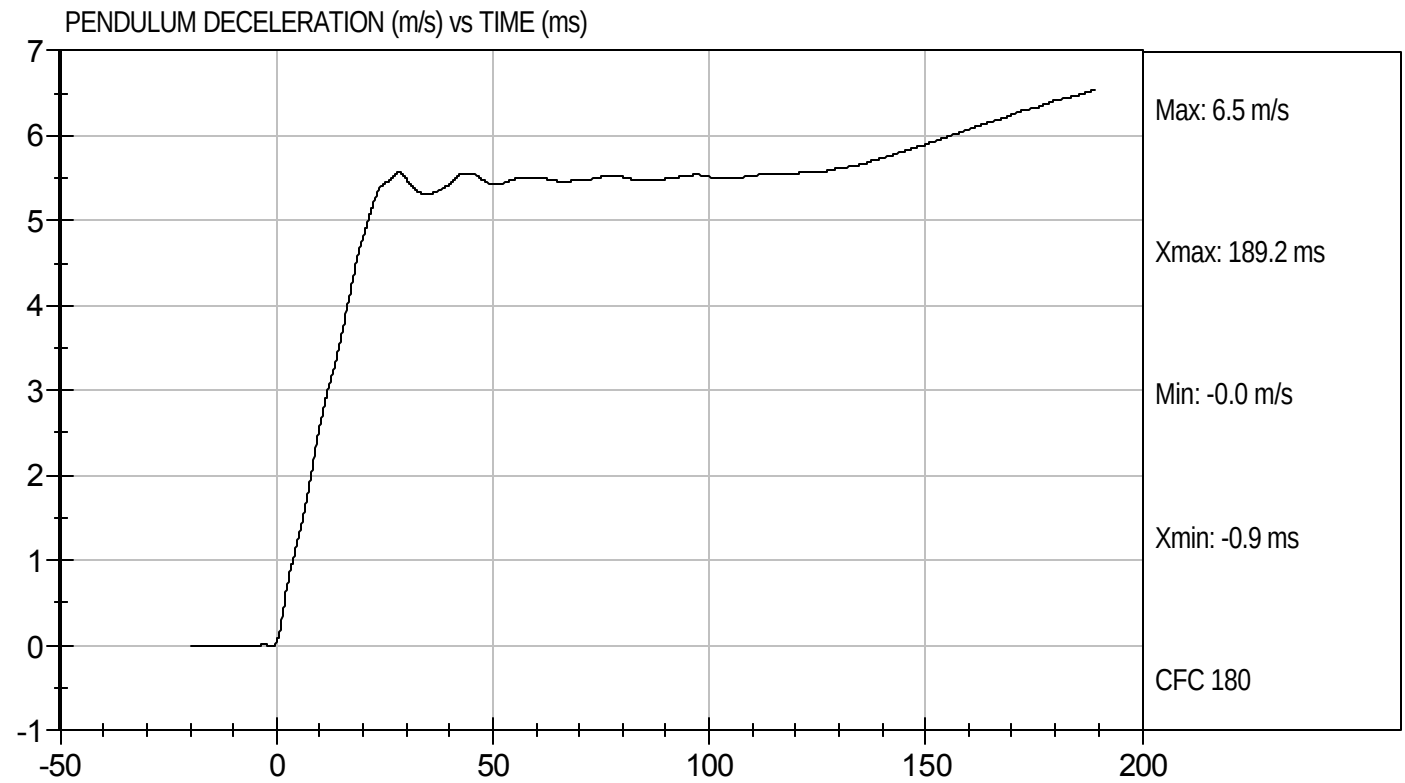
12/14/11
 Test Date


 Approved By



Test Desc: Neck Bending
Component ID: D114182

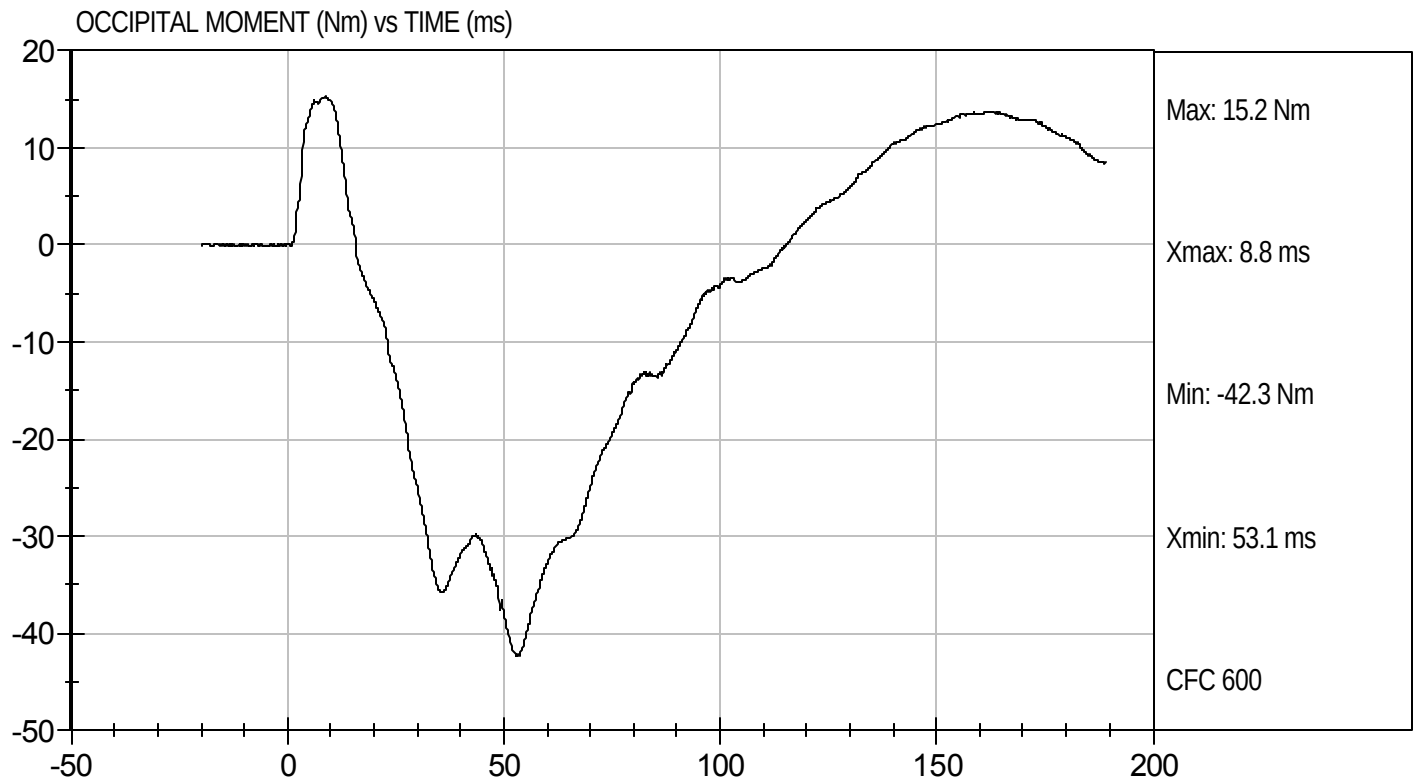
Test Date: 12/14/11
Velocity: 18.31 ft/s, 5.58 m/s





Test Desc: Neck Bending
Component ID: D114182

Test Date: 12/14/11
Velocity: 18.31 ft/s, 5.58 m/s

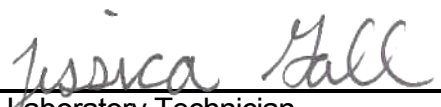


MGA RESEARCH CORPORATION
SHOULDER IMPACT TEST
SID-Its BUILD LEVEL D DUMMY

ATD Serial No: 306

Test ID: D114183

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	20.7	Pass
Laboratory Relative Humidity	%	10 to 70	23	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

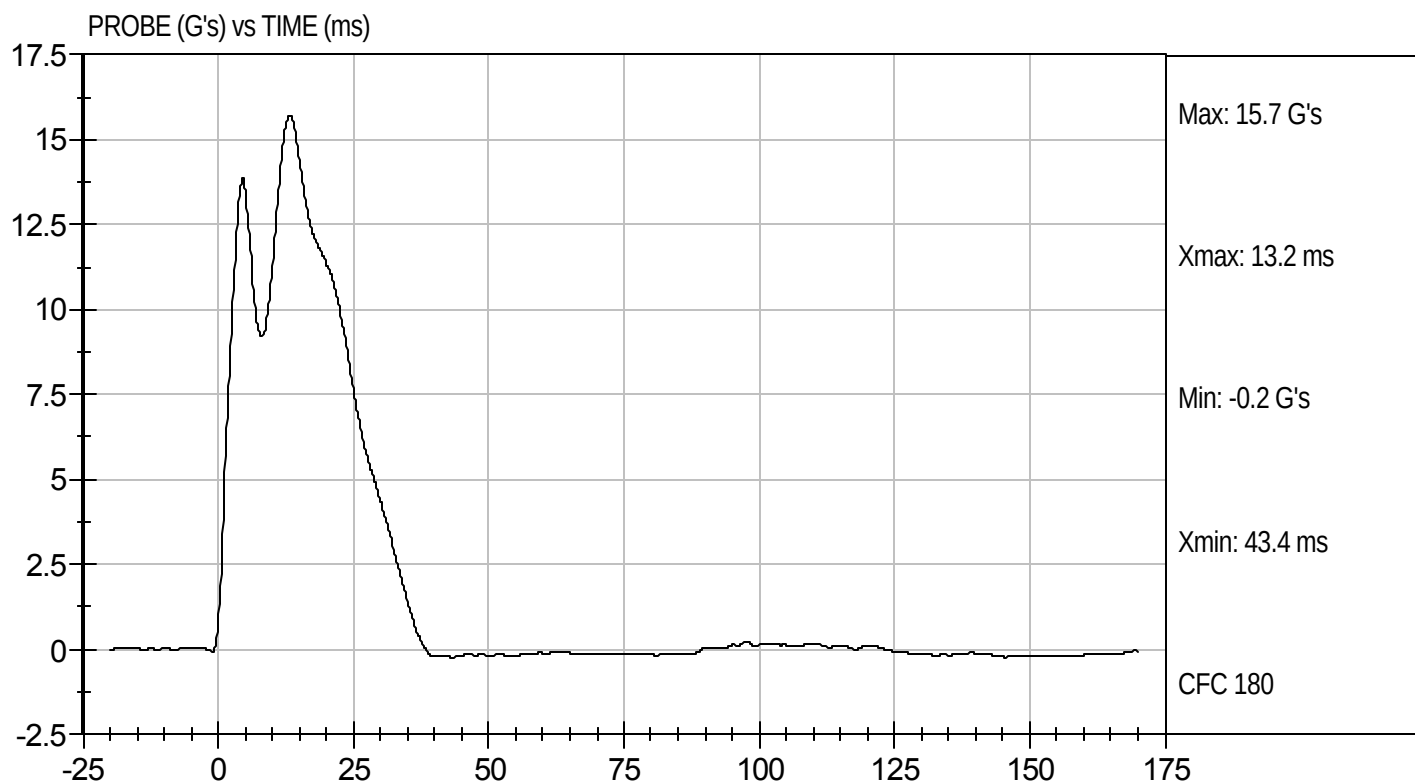
12/13/11
Test Date


Approved By



Test Desc: Shoulder Impact
Component ID: D114183

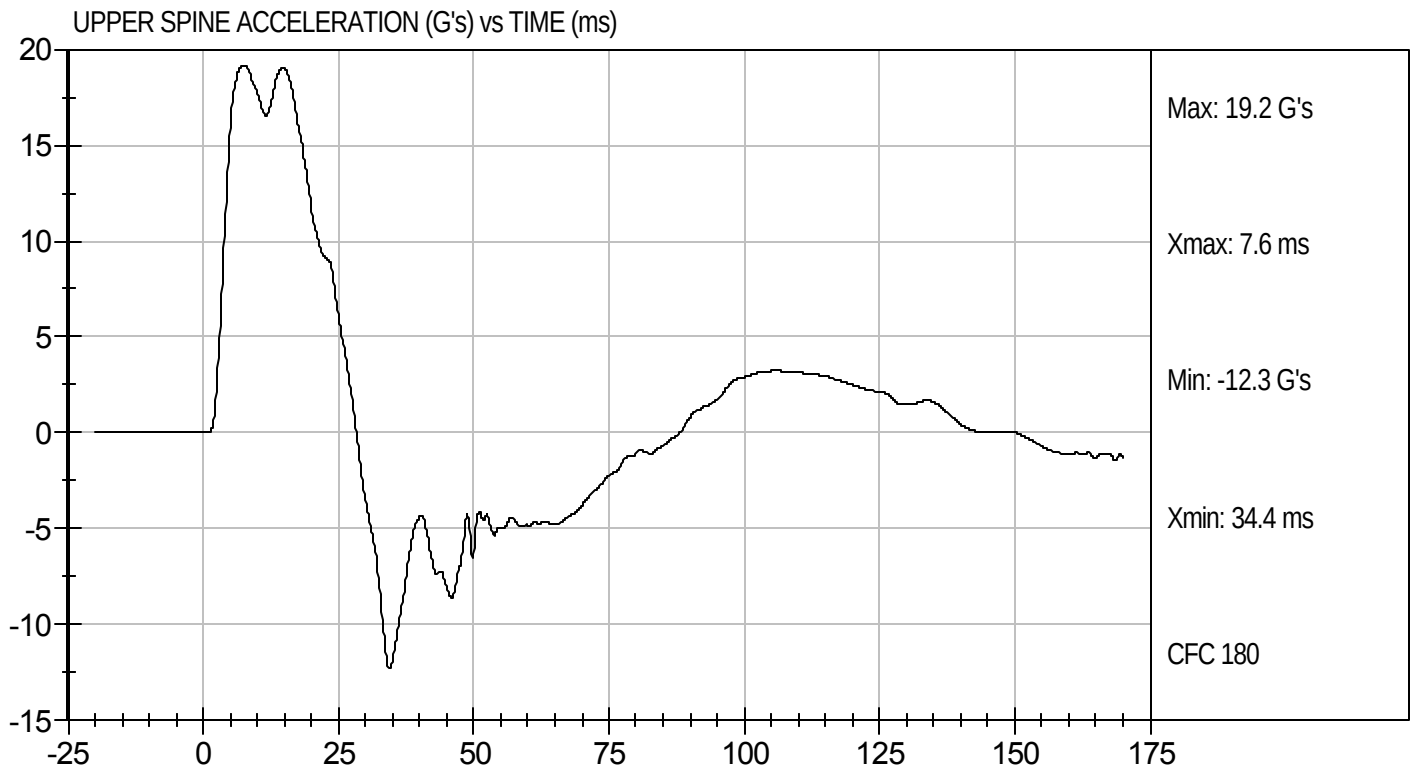
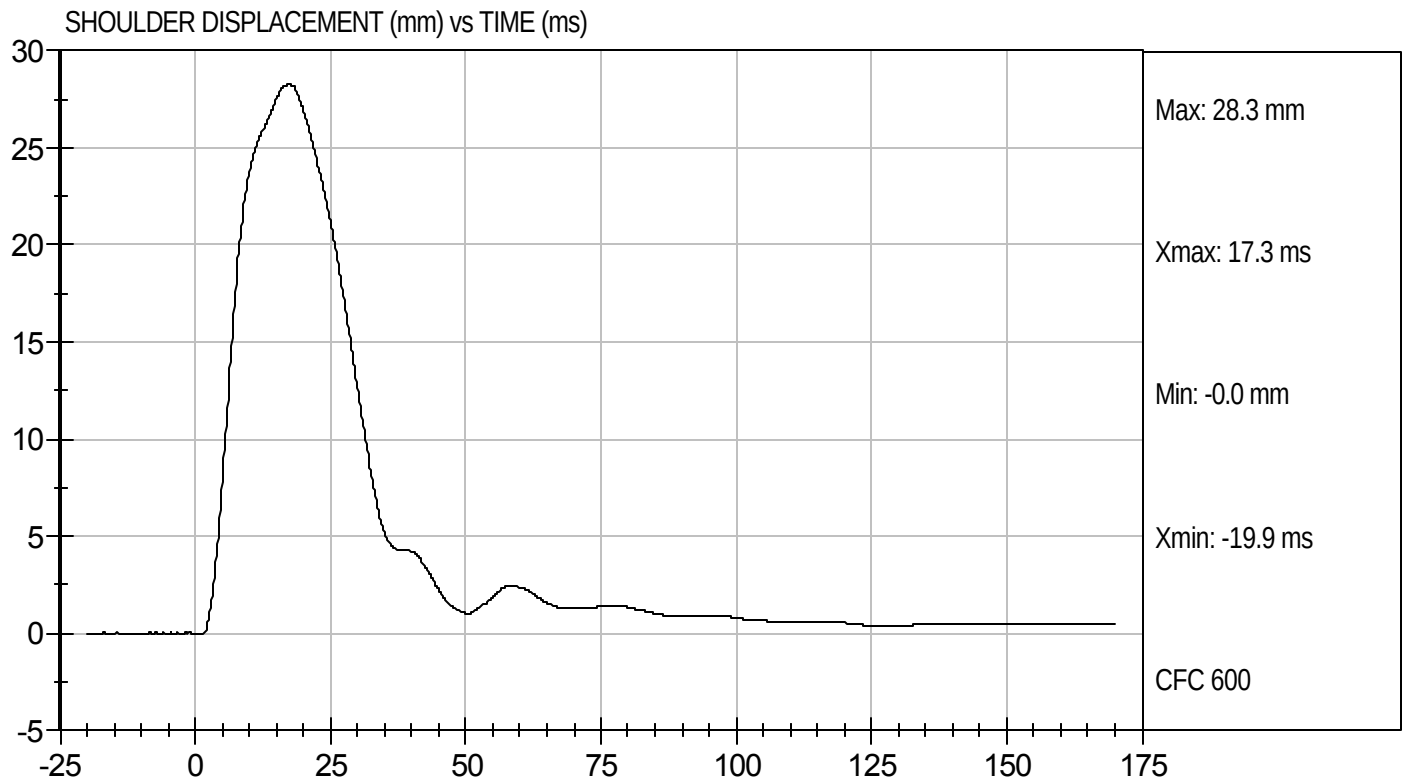
Test Date: 12/13/11
Velocity: 14.36 ft/s, 4.38 m/s





Test Desc: Shoulder Impact
Component ID: D114183

Test Date: 12/13/11
Velocity: 14.36 ft/s, 4.38 m/s



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

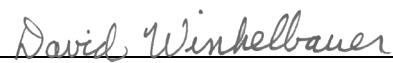
ATD Serial No: 306

Test I.D: D114184

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	20.7	Pass
Humidity	%	10 to 70	23	Pass
Impact Velocity	m/s	6.60 to 6.80	6.68	Pass
Peak Impactor Acceleration	G's	30 to 36	34	Pass
Shoulder Displacement	mm	31 to 40	33	Pass
Upper Rib Displacement	mm	25 to 32	26	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	41	Pass
Lower Spine (T12) Y Acceleration	G's	29 to 37	34	Pass
Overall Test Results				Pass


Laboratory Technician

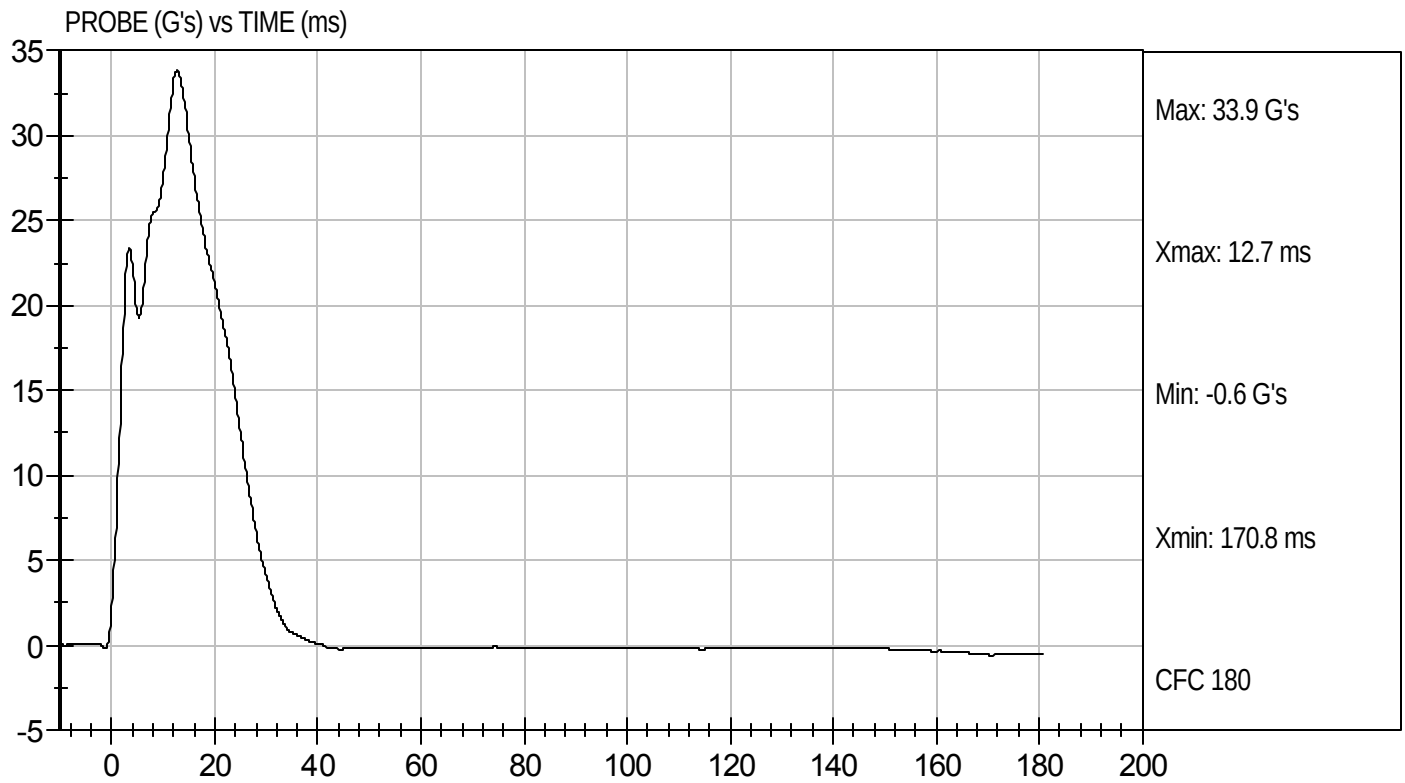
12/13/11
Test Date


Approved By



Test Desc: Thorax With Arm
Component ID: D114184

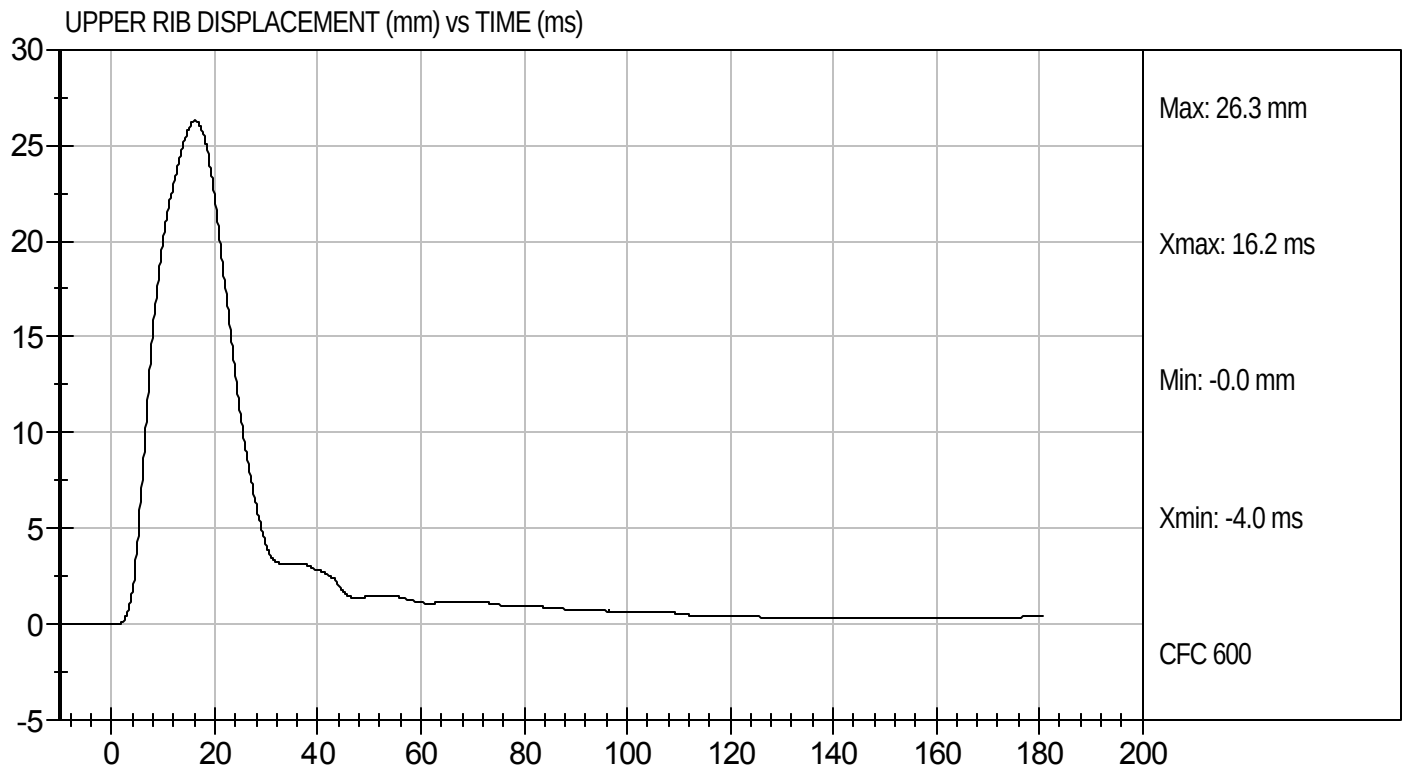
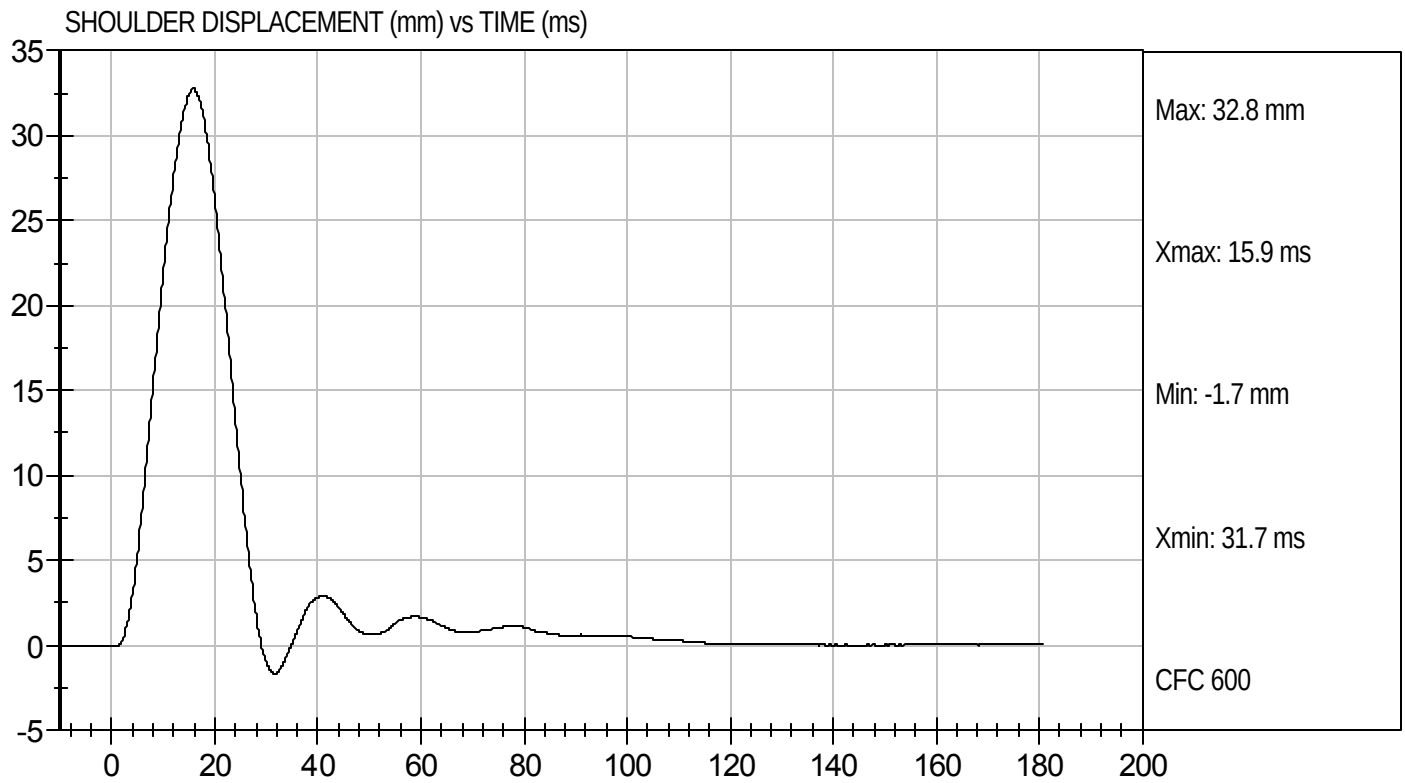
Test Date: 12/13/11
Velocity: 21.9 ft/s, 6.68 m/s





Test Desc: Thorax With Arm
Component ID: D114184

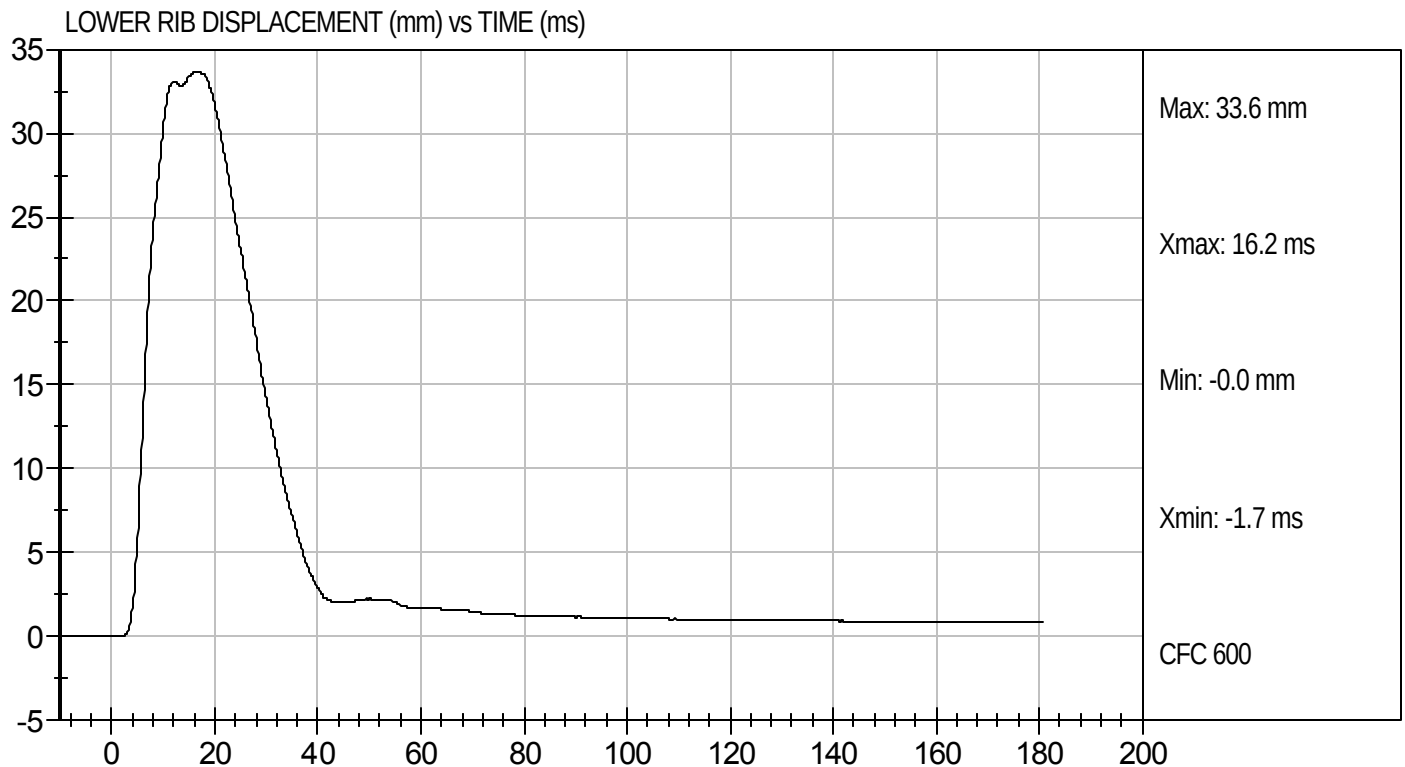
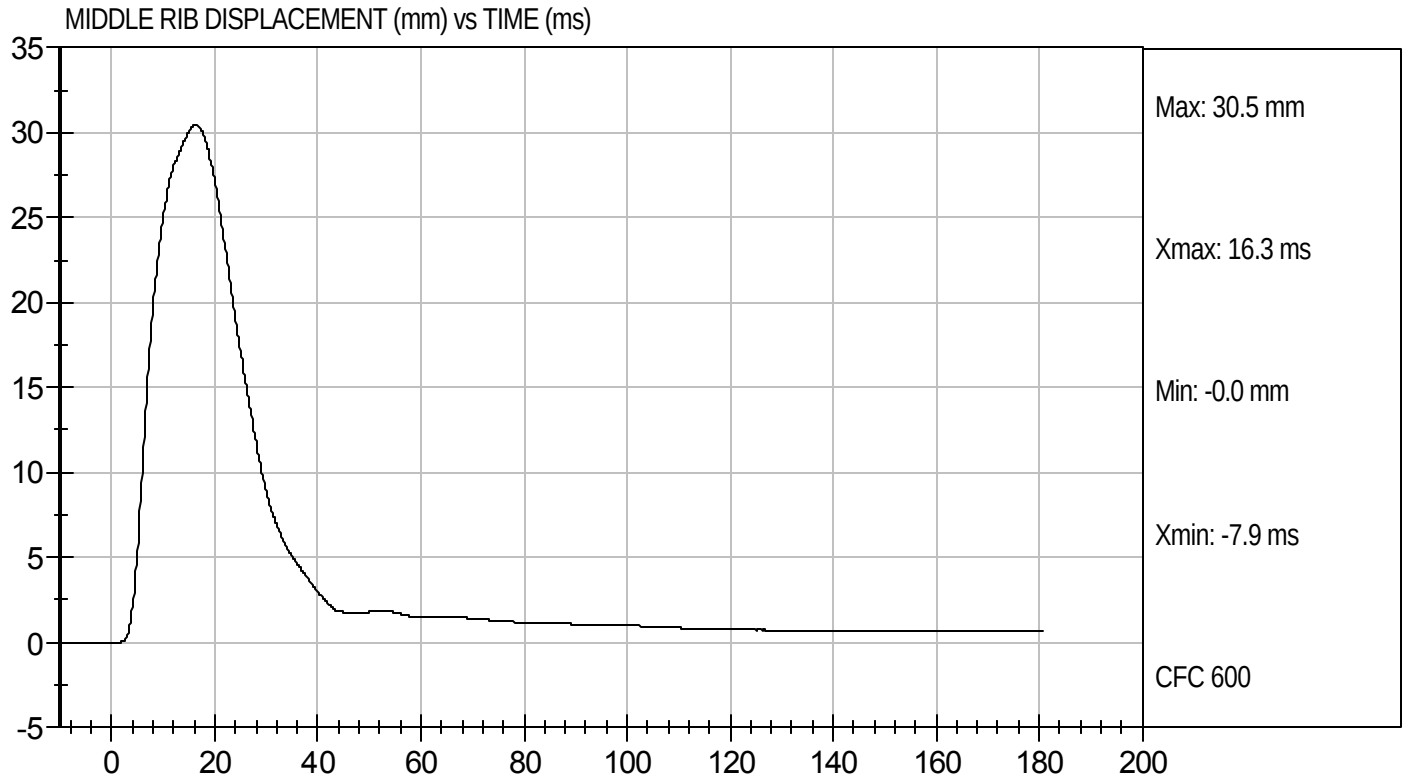
Test Date: 12/13/11
Velocity: 21.9 ft/s, 6.68 m/s





Test Desc: Thorax With Arm
Component ID: D114184

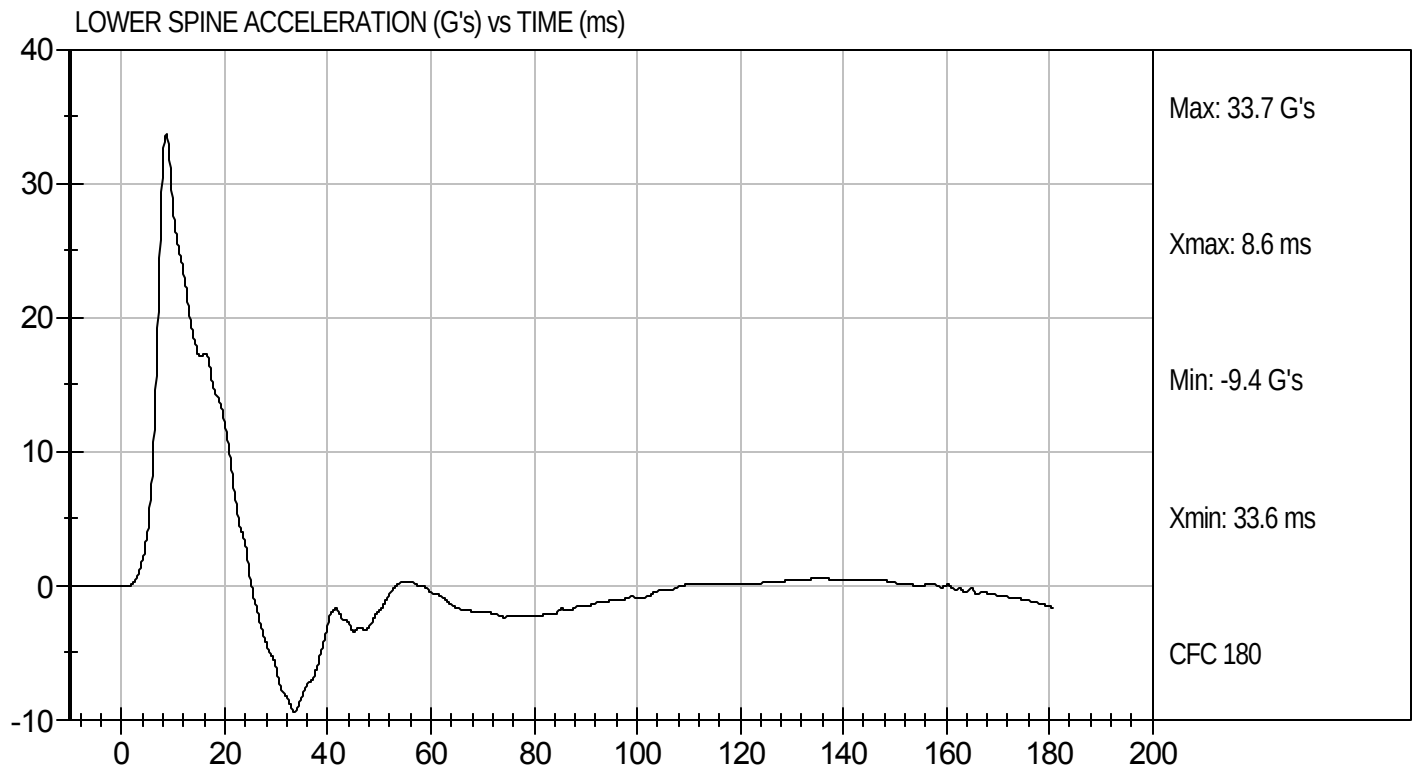
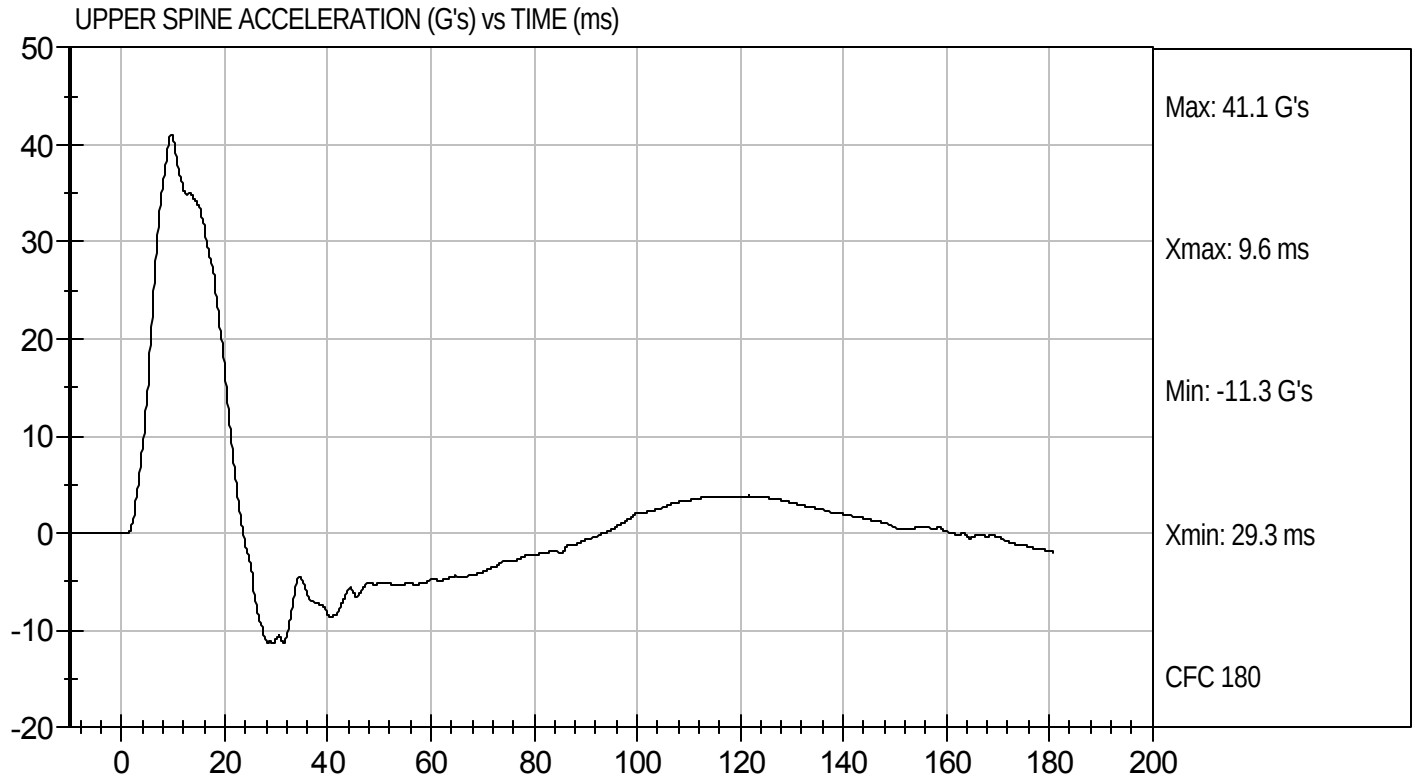
Test Date: 12/13/11
Velocity: 21.9 ft/s, 6.68 m/s





Test Desc: Thorax With Arm
Component ID: D114184

Test Date: 12/13/11
Velocity: 21.9 ft/s, 6.68 m/s



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

ATD Serial No: 306

Test I.D: D114185

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	20.7	Pass
Humidity	%	10 to 70	23	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	36	Pass
Middle Rib Displacement	mm	39 to 45	41	Pass
Lower Rib Displacement	mm	35 to 43	39	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

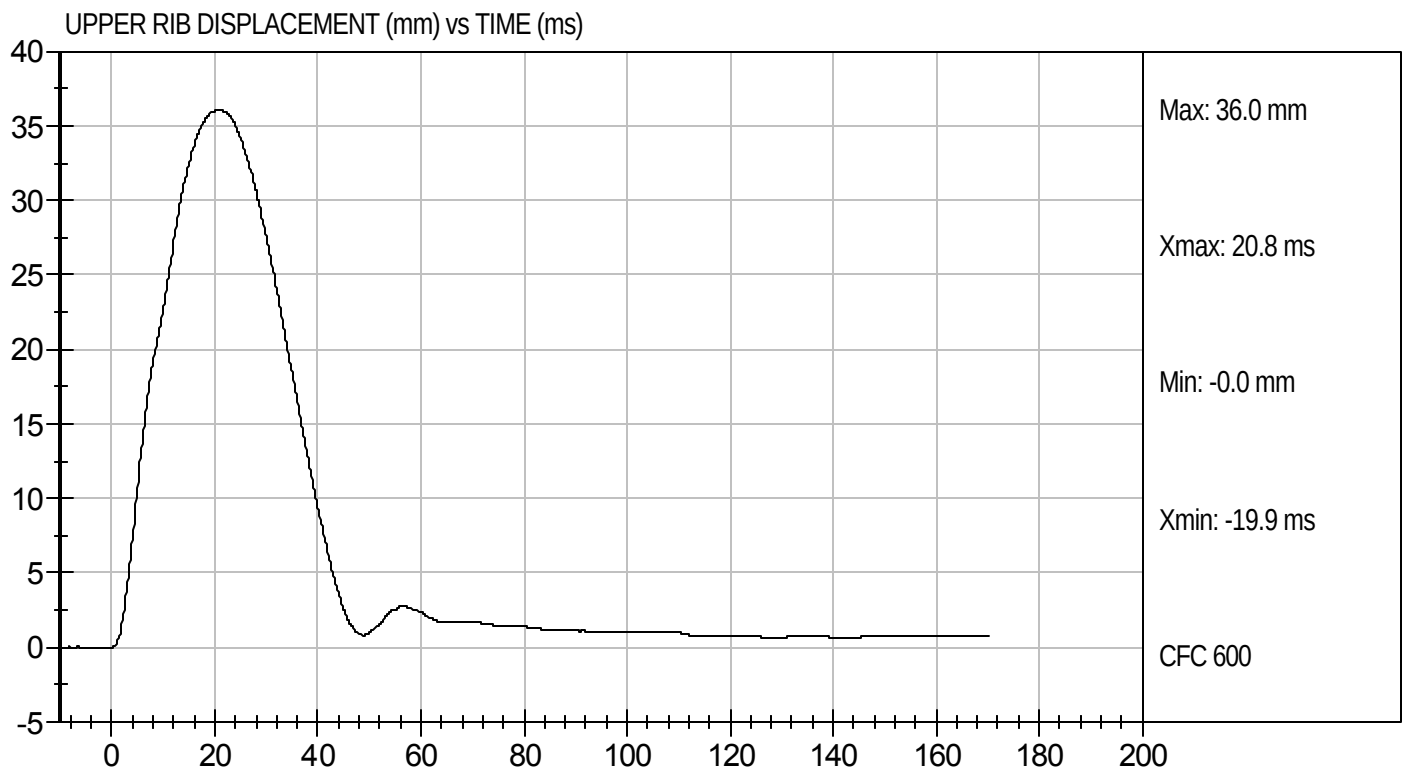
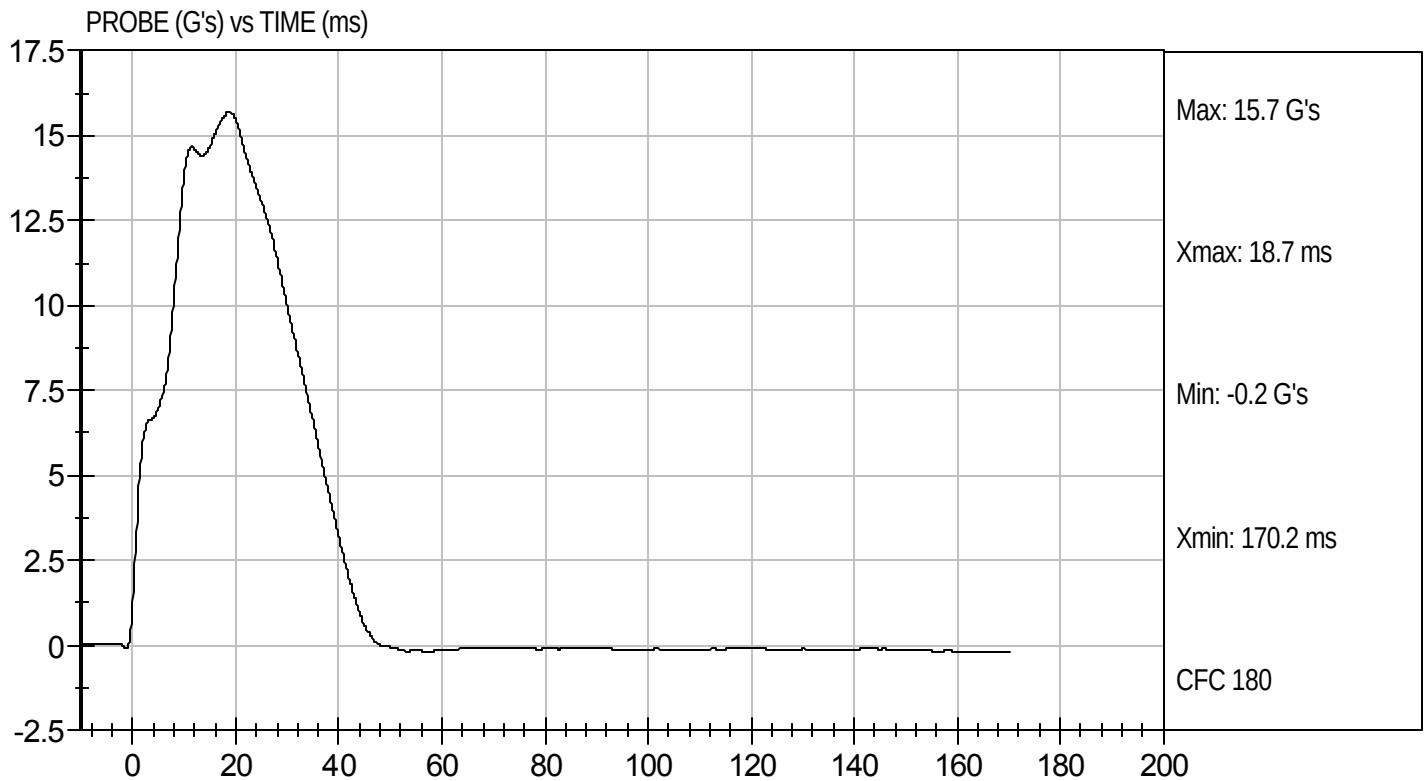
12/13/11
Test Date


Approved By



Test Desc: Thorax Without Arm
Component ID: D114185

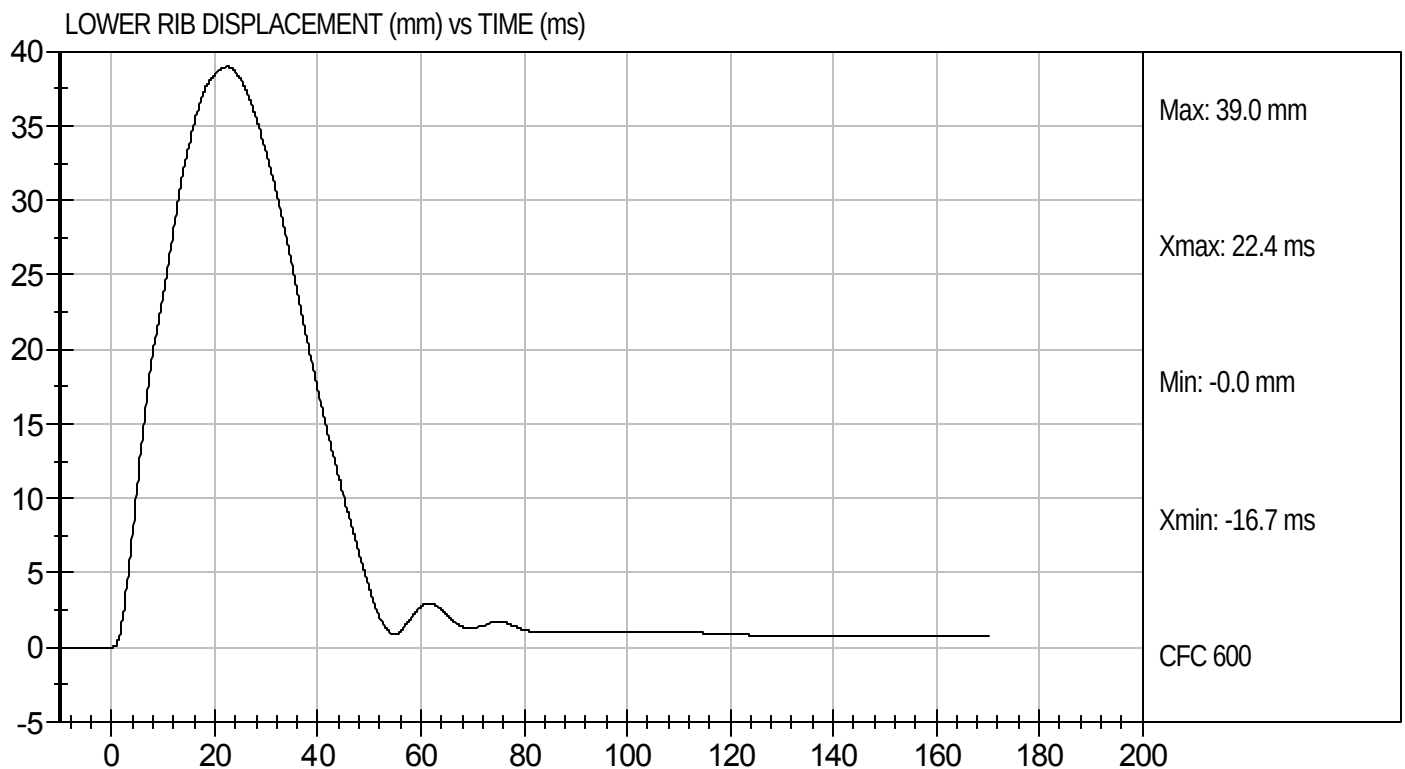
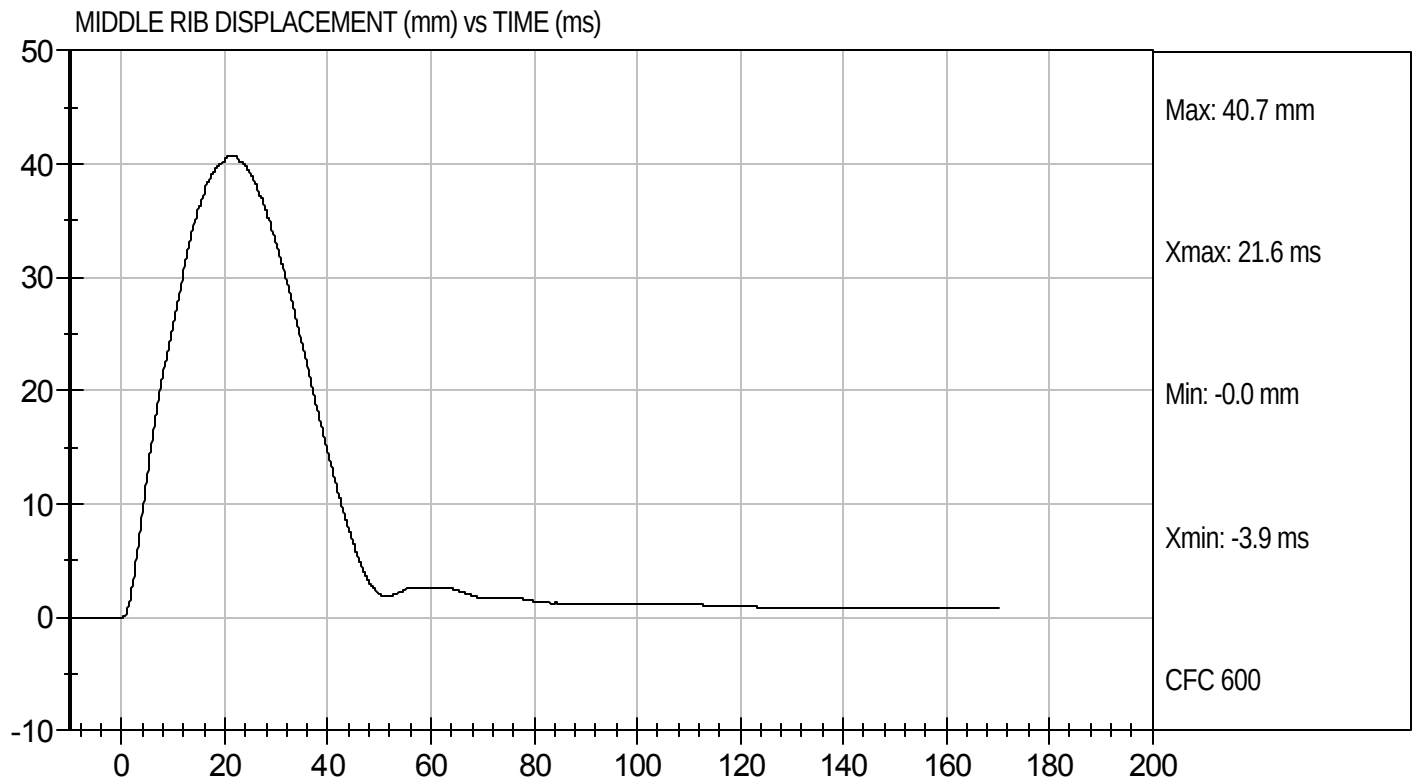
Test Date: 12/13/11
Velocity: 14.24 ft/s, 4.34 m/s





Test Desc: Thorax Without Arm
Component ID: D114185

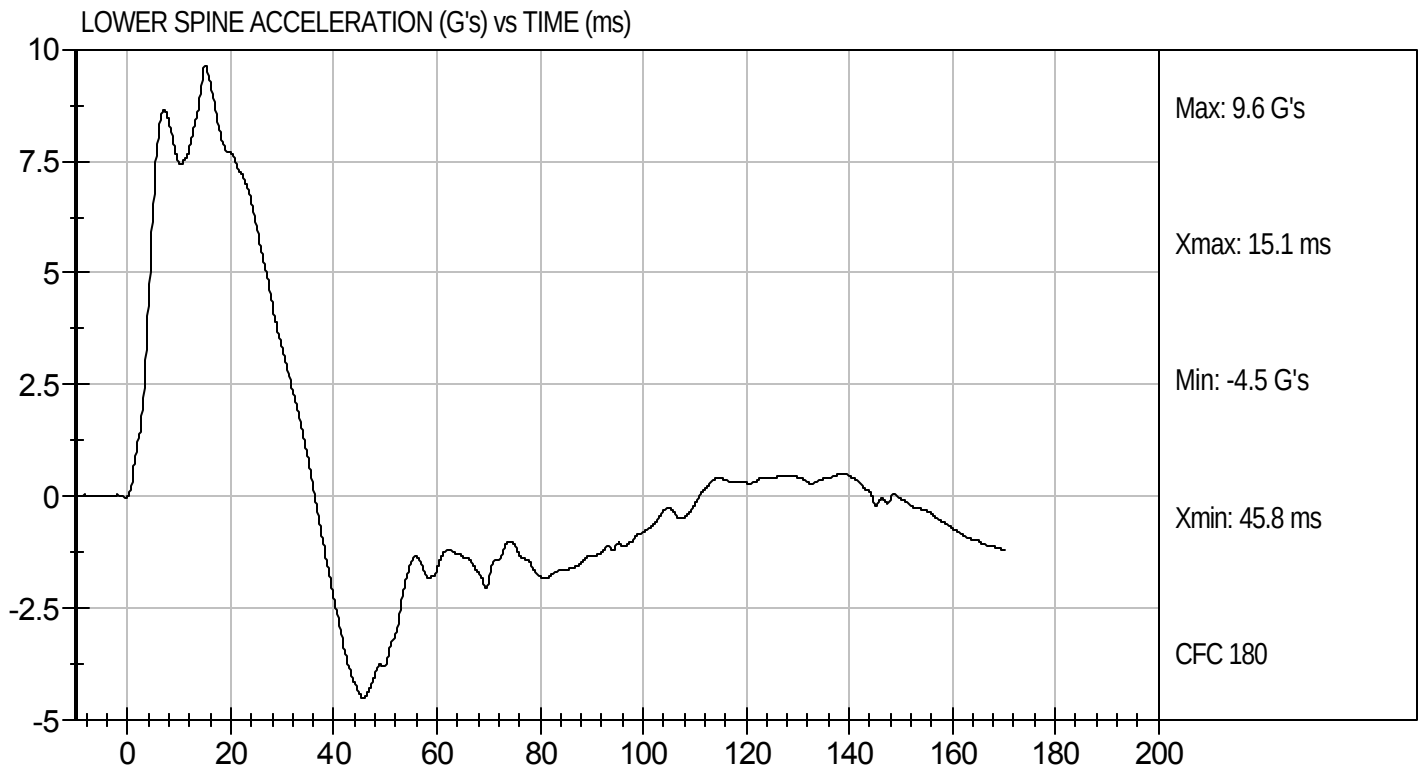
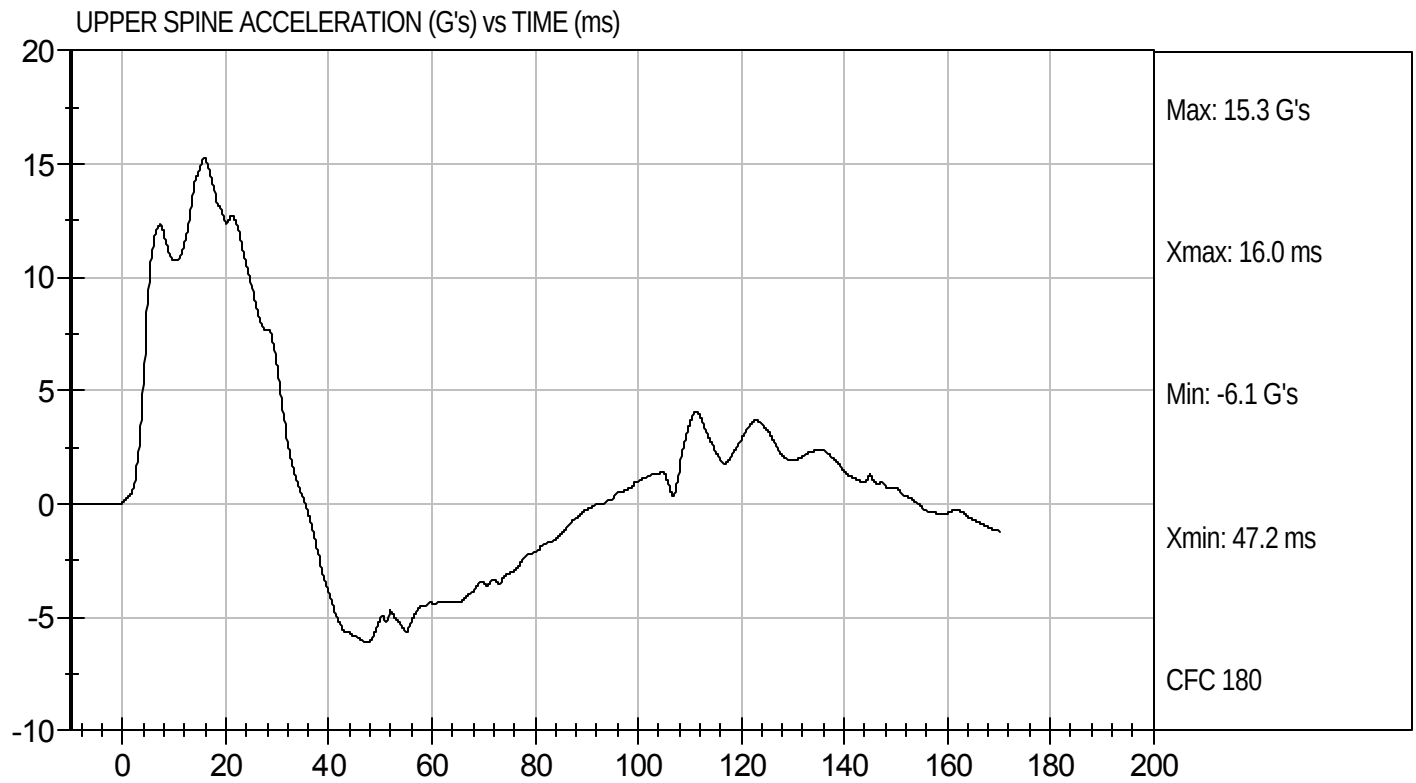
Test Date: 12/13/11
Velocity: 14.24 ft/s, 4.34 m/s





Test Desc: Thorax Without Arm
Component ID: D114185

Test Date: 12/13/11
Velocity: 14.24 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: D114186

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	20.7	Pass
Humidity	%	10 to 70	23	Pass
Impact Velocity	m/s	4.20 to 4.40	4.34	Pass
Peak Impactor Acceleration	G's	12 to 16	14	Pass
Upper Rib Displacement	mm	36 to 47	39	Pass
Lower Rib Displacement	mm	33 to 44	35	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	11	Pass
			Overall Test Results	Pass



Laboratory Technician

12/13/11

Test Date

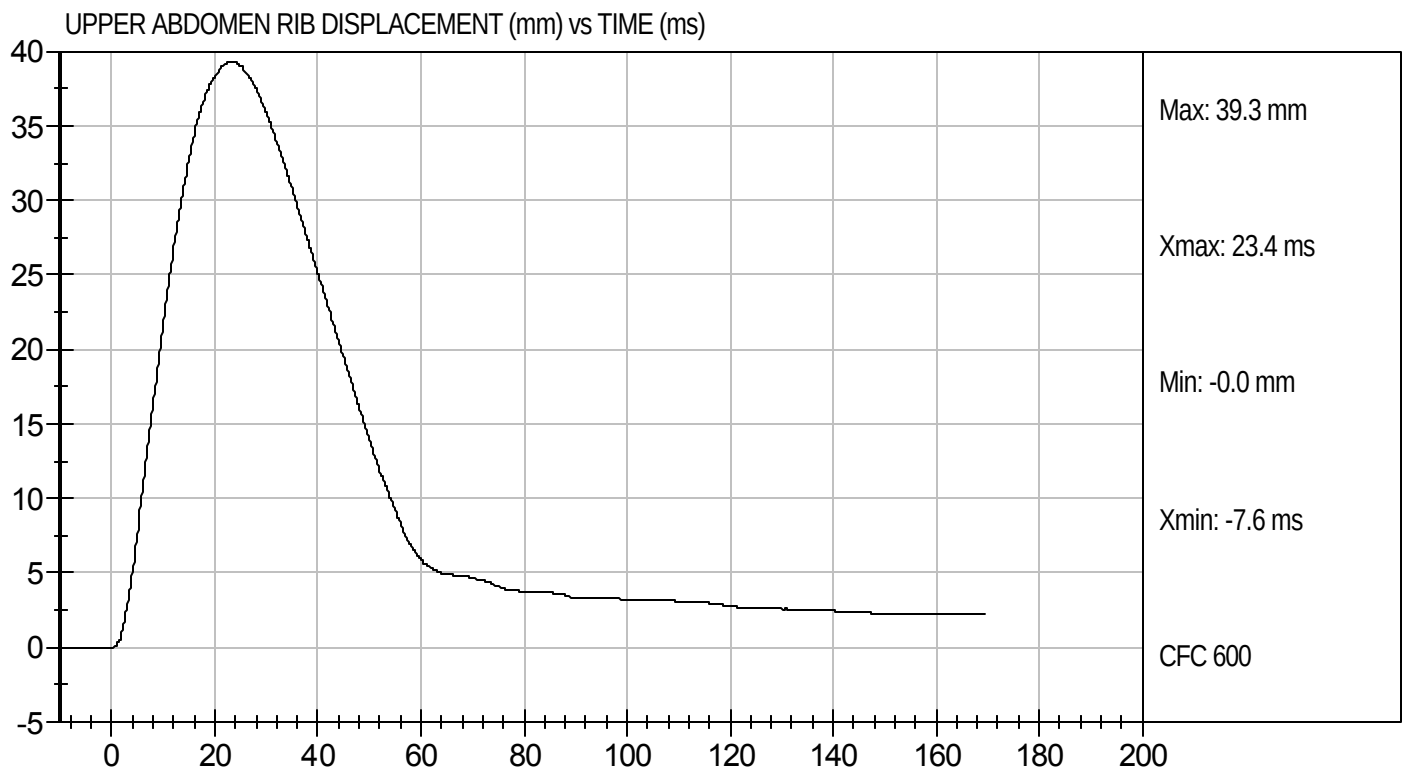
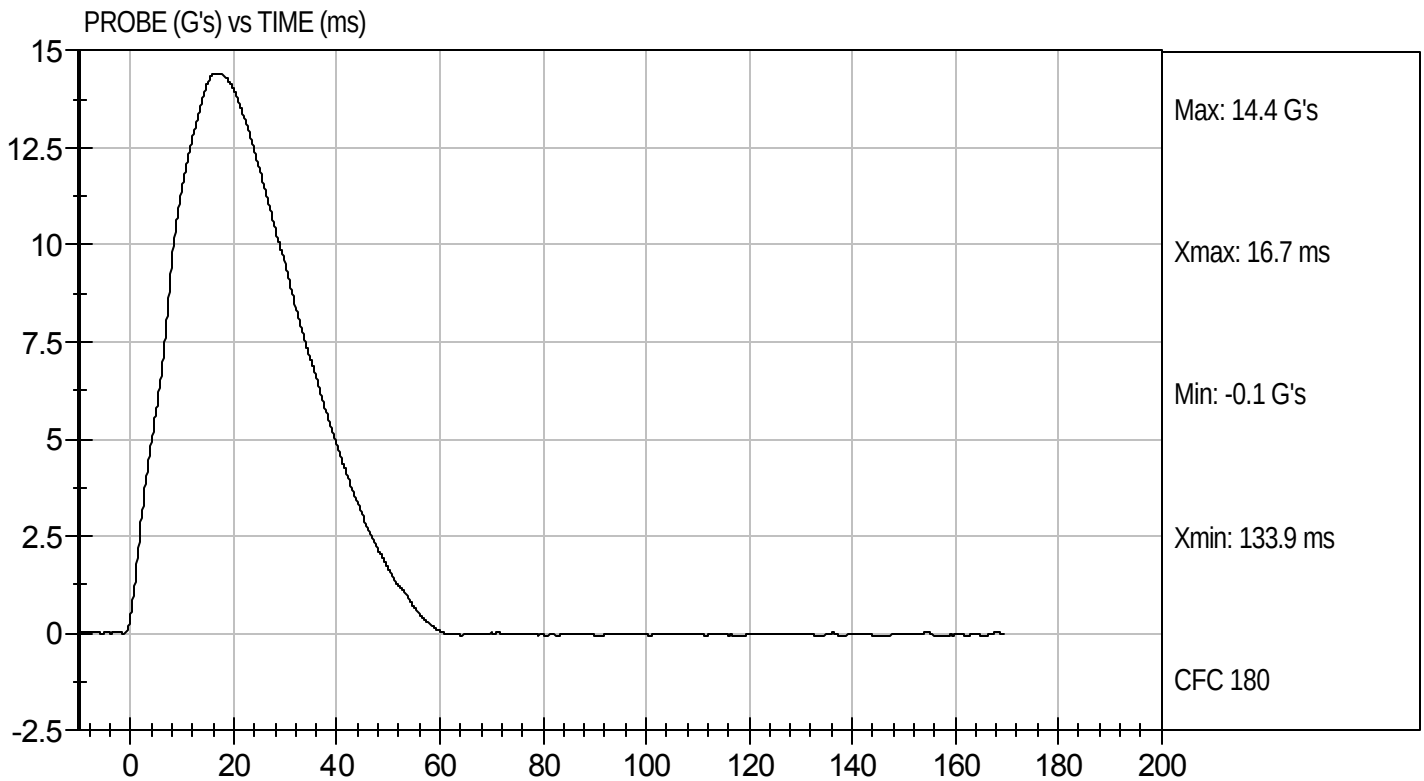


Approved By



Test Desc: Abdomen Impact
Component ID: D114186

Test Date: 12/13/11
Velocity: 14.24 ft/s, 4.34 m/s

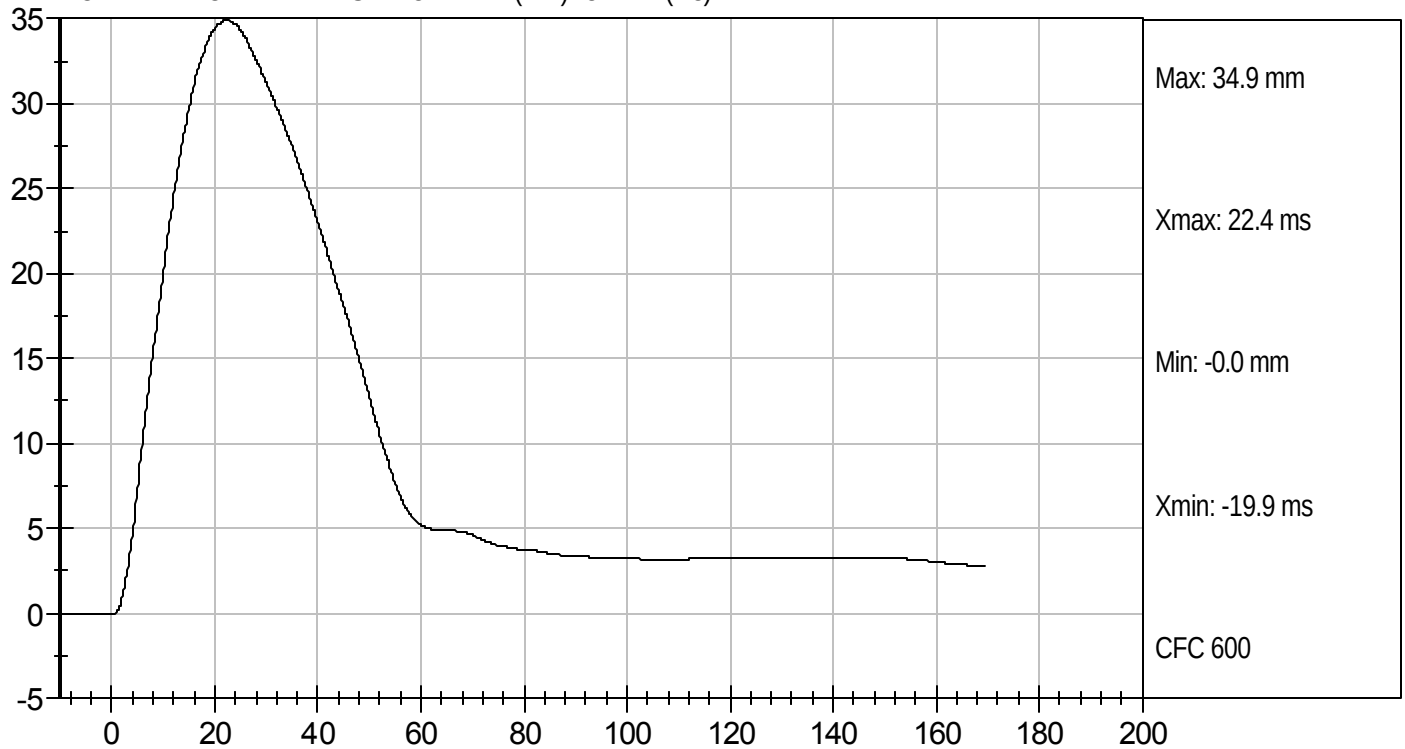




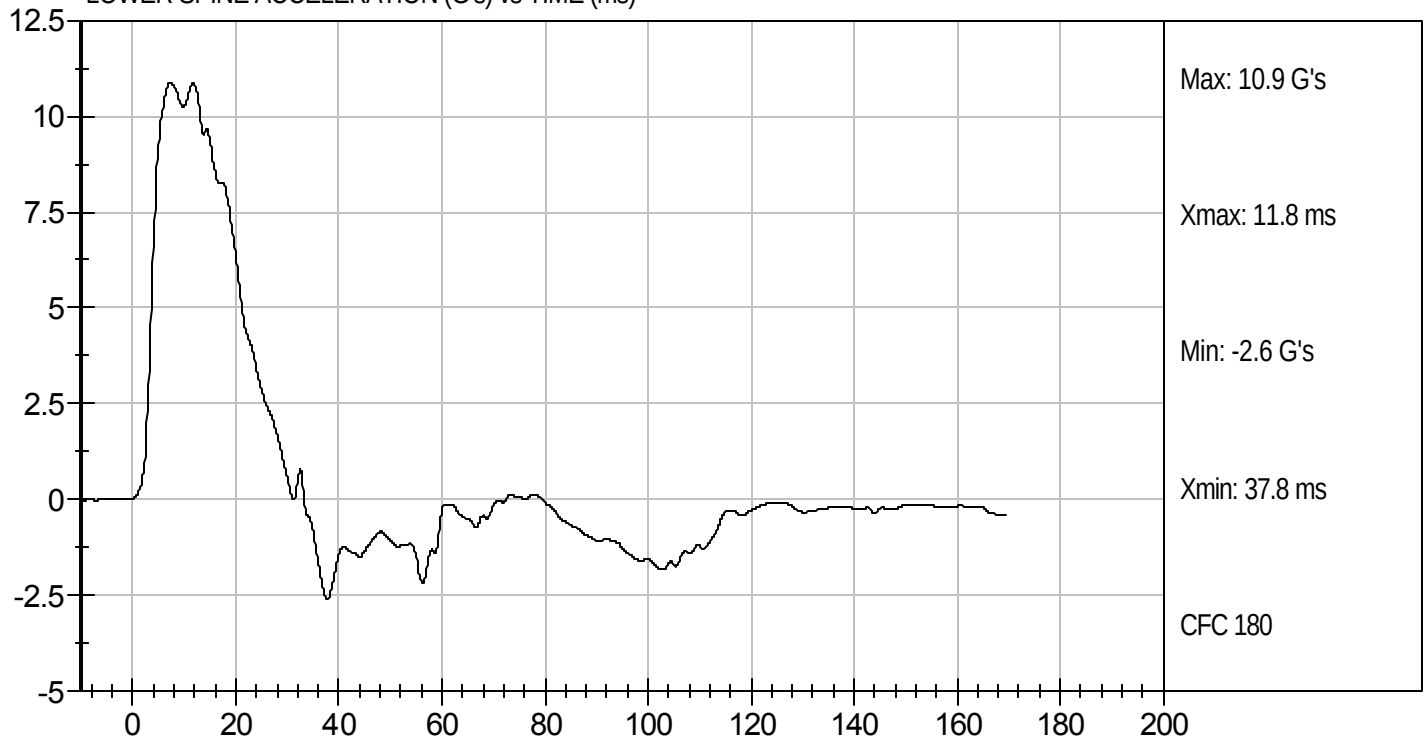
Test Desc: Abdomen Impact
Component ID: D114186

Test Date: 12/13/11
Velocity: 14.24 ft/s, 4.34 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: D114187

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	20.7	Pass
Humidity	%	10 to 70	23	Pass
Impact Velocity	m/s	6.60 to 6.80	6.68	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	3903	Pass
Overall Test Results				Pass


Laboratory Technician

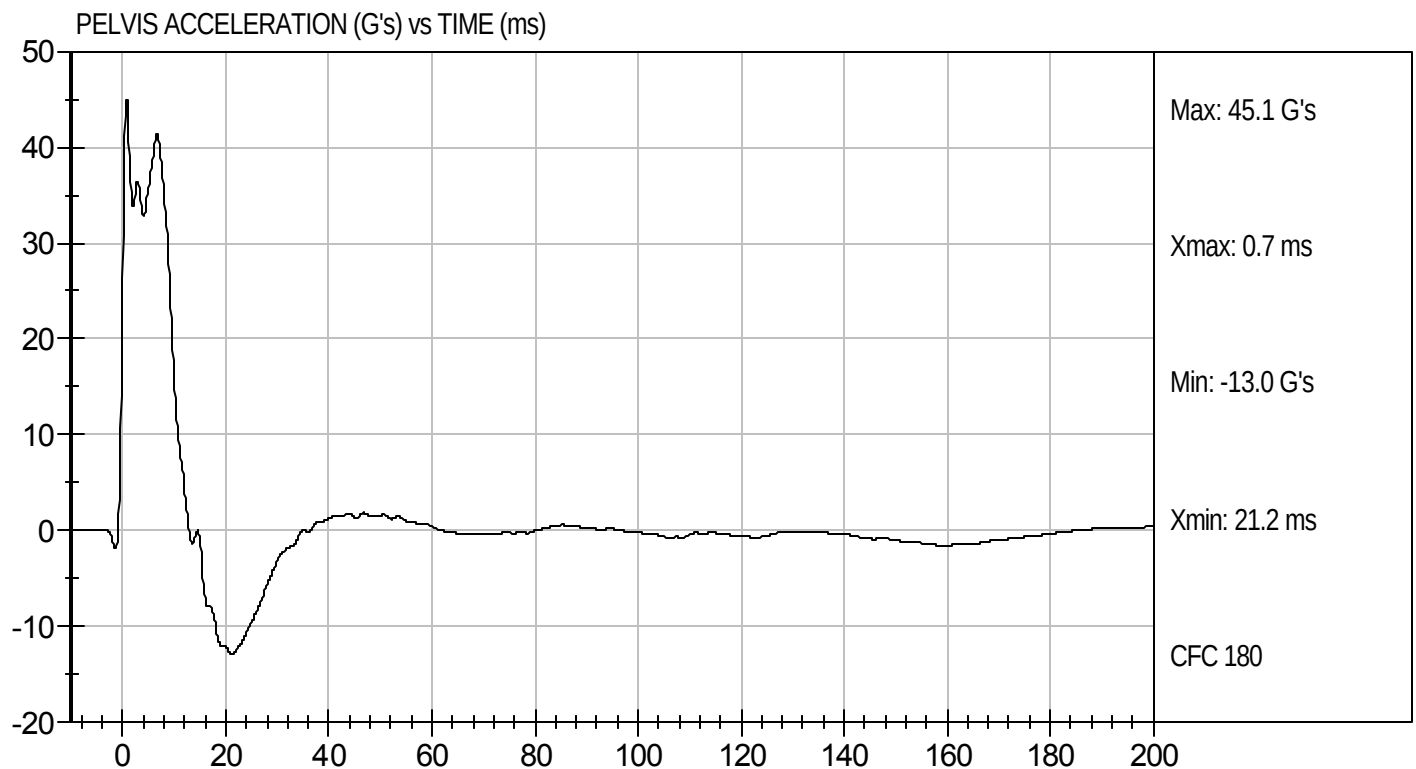
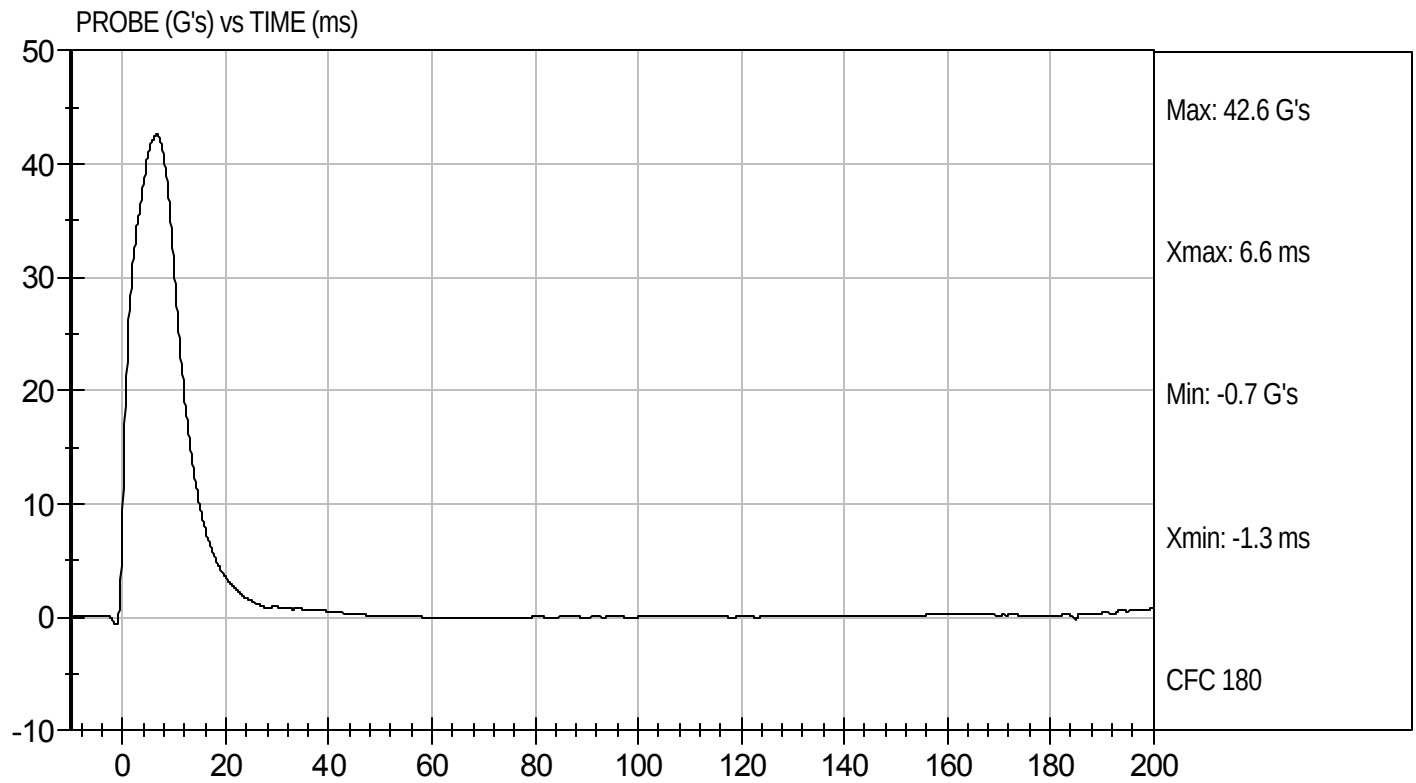
12/13/11
Test Date


Approved By



Test Desc: Pelvis Impact
Component ID: D114187

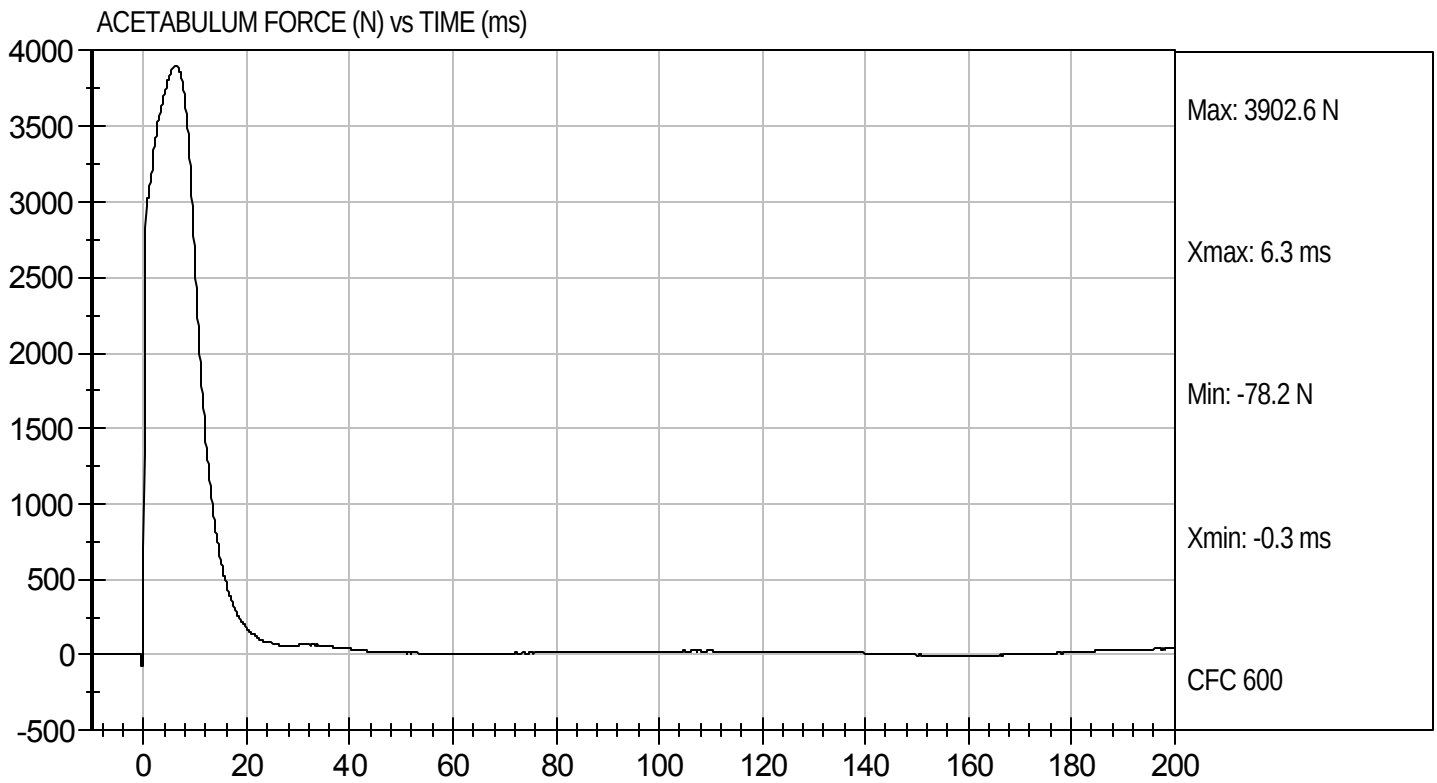
Test Date: 12/13/11
Velocity: 21.9 ft/s, 6.68 m/s





Test Desc: Pelvis Impact
Component ID: D114187

Test Date: 12/13/11
Velocity: 21.9 ft/s, 6.68 m/s



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

ATD Serial No: 306

Test I.D: D114188

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	20.7	Pass
Humidity	%	10 to 70	23	Pass
Impact Velocity	m/s	4.20 to 4.40	4.30	Pass
Peak Impactor Acceleration	G's	36 to 45	40	Pass
Pelvis Y Acceleration	G's	28 to 39	33	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	4808	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

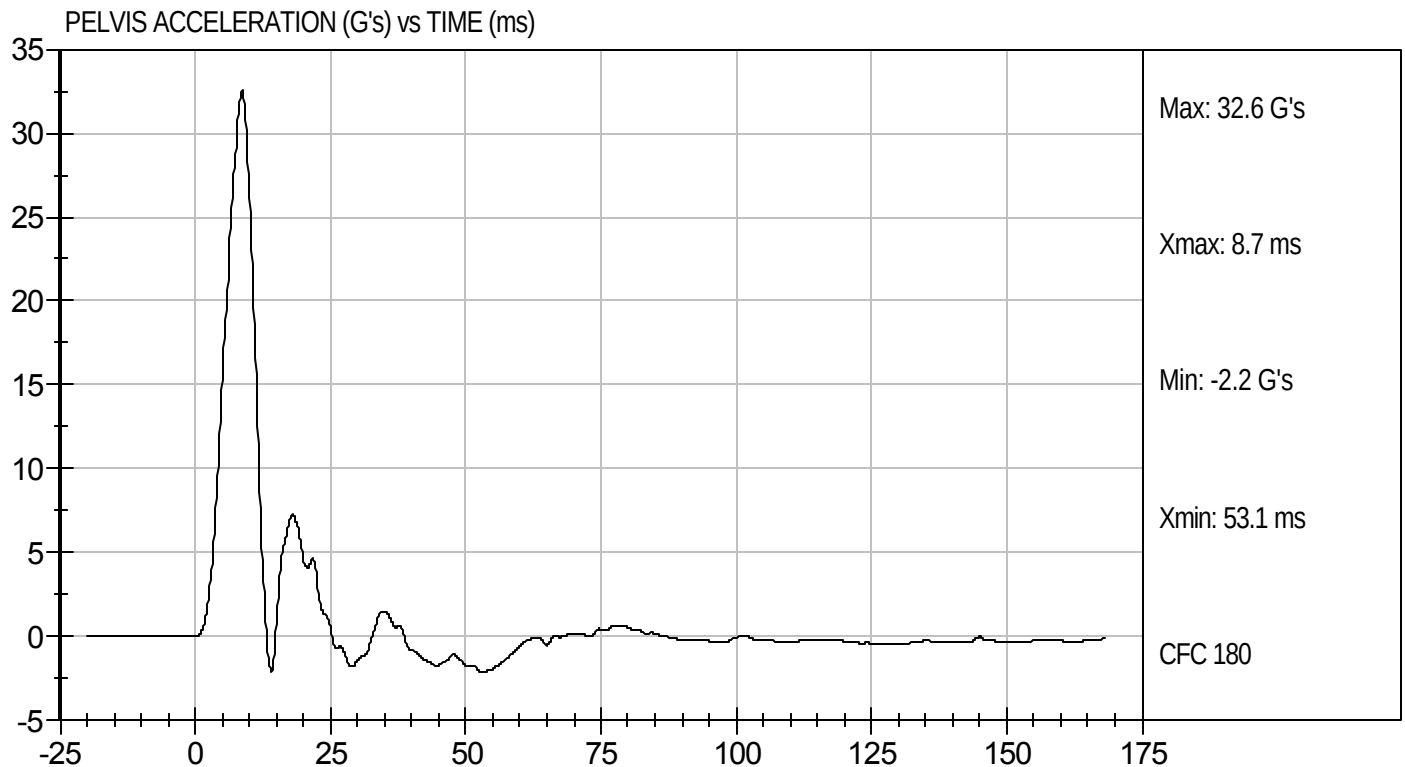
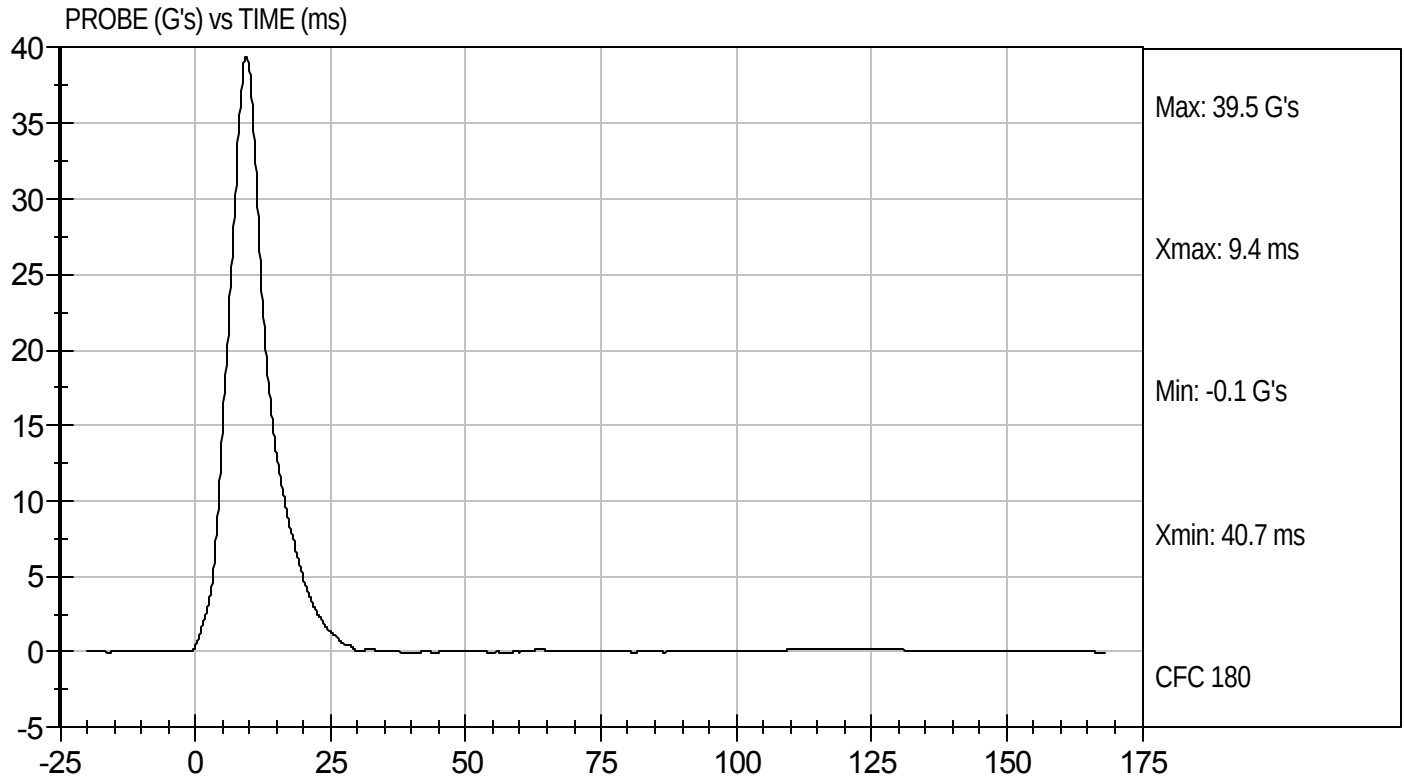
12/13/11
Test Date

David Winkelbauer
Approved By



Test Desc: Iliac Impact
Component ID: D114188

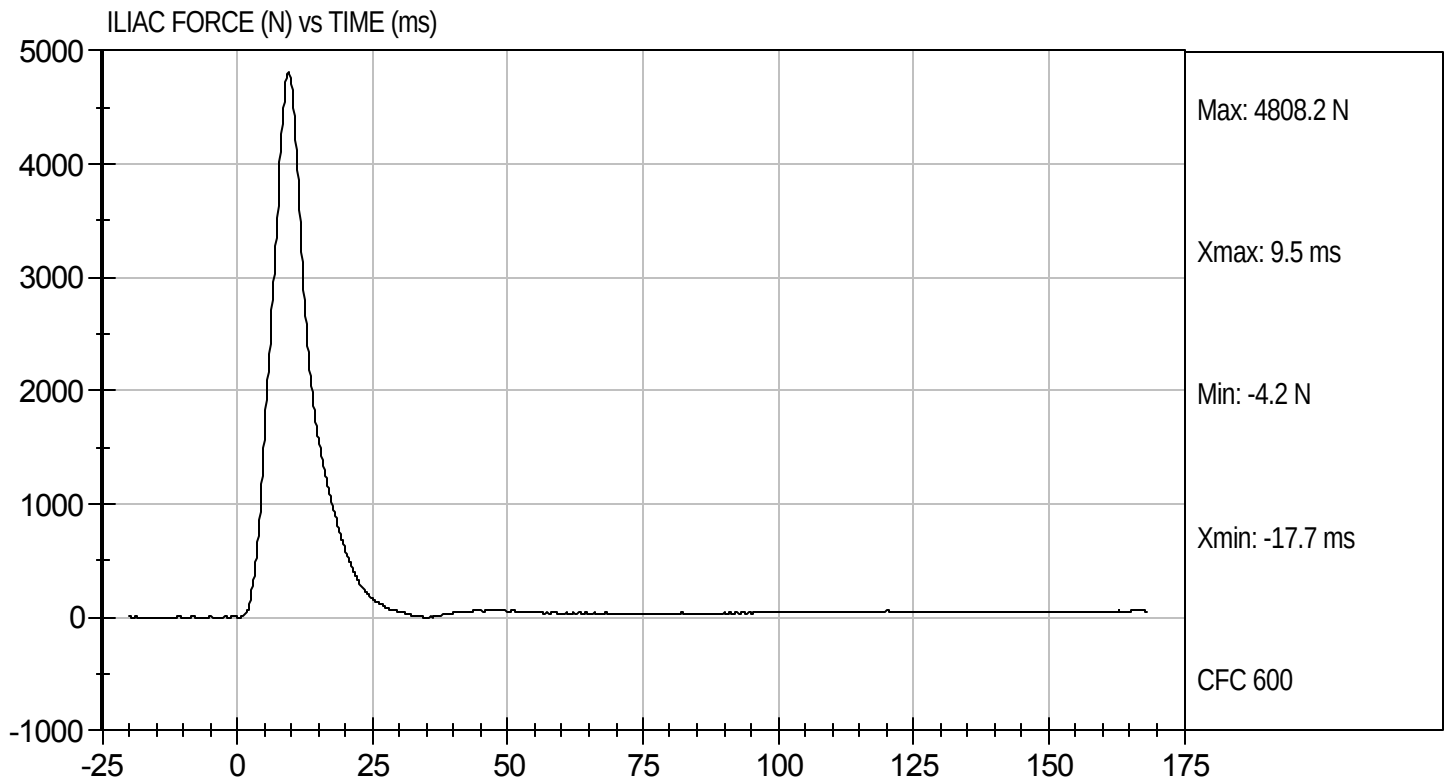
Test Date: 12/13/11
Velocity: 14.12 ft/s, 4.30 m/s





Test Desc: Iliac Impact
Component ID: D114188

Test Date: 12/13/11
Velocity: 14.12 ft/s, 4.30 m/s



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

ATD Serial No: 306

Test ID: D114341

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	115 to 137	121	Pass
Peak Longitudinal Acceleration	G's	+/- 15	-2.4	Pass
Unimodal	N/A	<15%	Yes	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

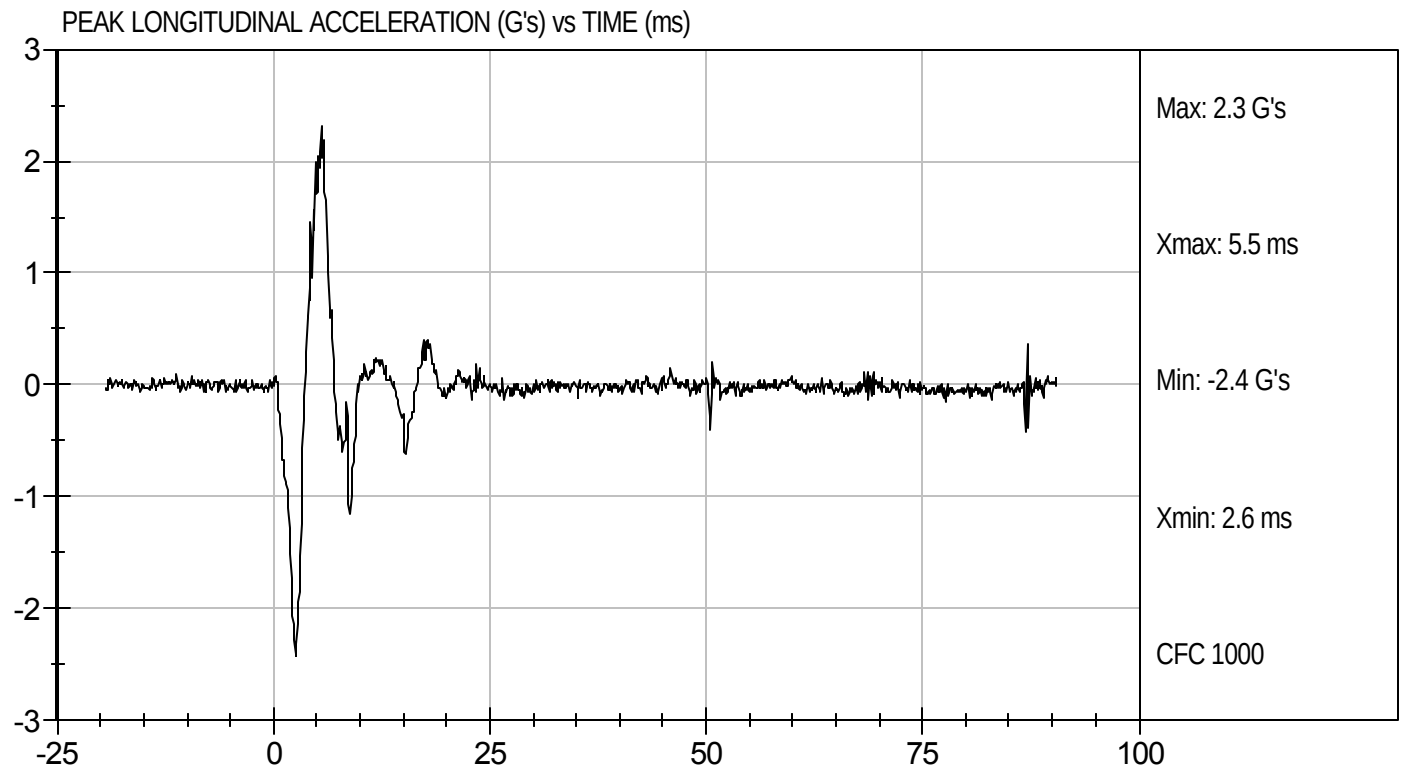
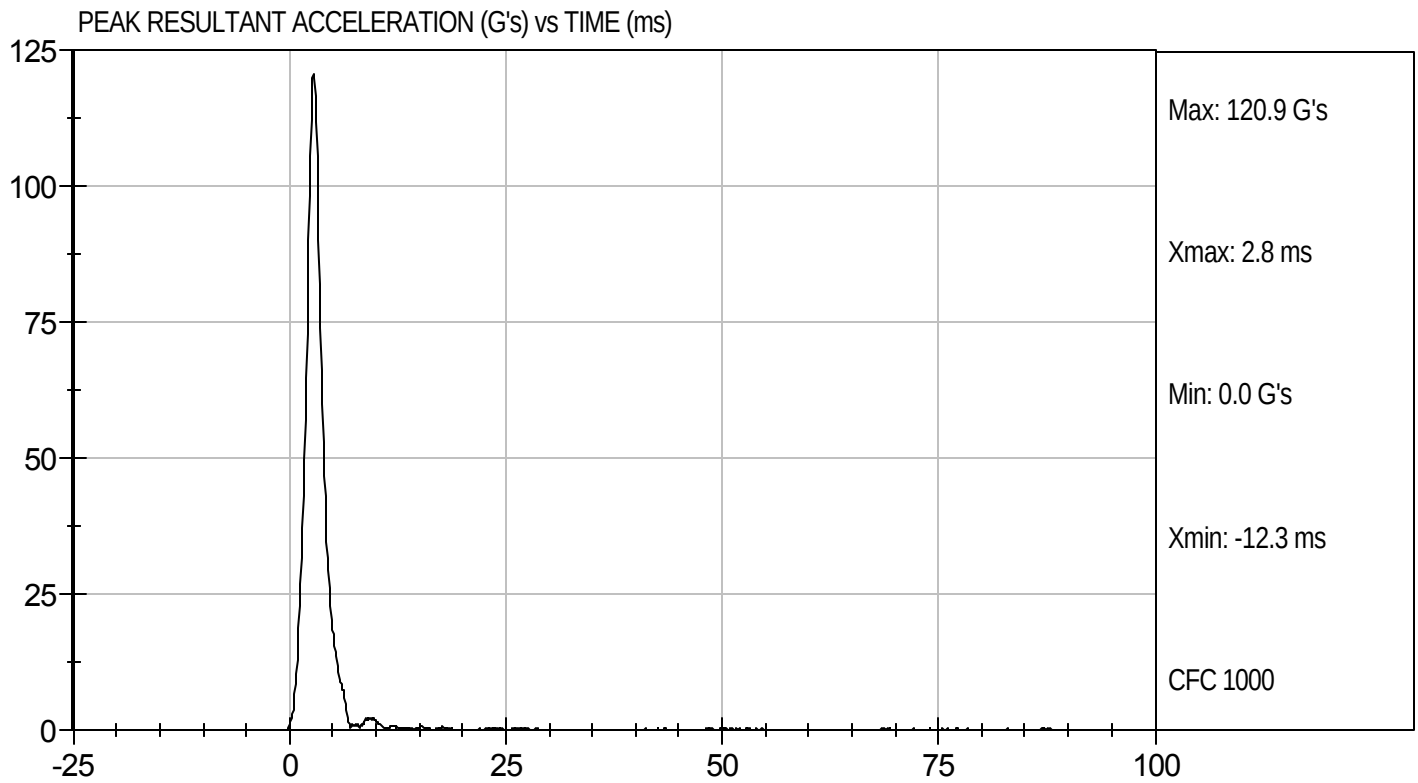
12/21/11
Test Date

David Winkelbauer
Approved By



Test Desc: Head Drop
Component ID: D114341

Test Date: 12/21/11
Velocity: 0 ft/s, 0 m/s

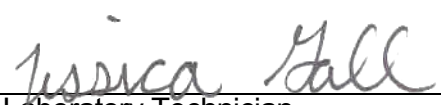


MGA RESEARCH CORPORATION
LATERAL NECK PENDULUM TEST
SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

Test I.D: D114342

Tested Parameter		Units	Specification	Result	Pass/Fail
Temperature		deg C	20.6 to 22.2	21.9	Pass
Humidity		%	10 to 70	31	Pass
Impact Velocity		m/s	5.51 to 5.63	5.58	Pass
Delta Velocity	10 ms	m/s	2.20 to 2.80	2.65	Pass
	15 ms	m/s	3.30 to 4.10	3.71	Pass
	20 ms	m/s	4.40 to 5.40	4.87	Pass
	25 ms	m/s	5.40 to 6.10	5.55	Pass
	25-100 ms	m/s	5.50 to 6.20	5.58	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	-43	Pass
Time of Moment Decay to 0 Nm		ms	102 to 126	114	Pass
Overall Test Results				Pass	


 Laboratory Technician

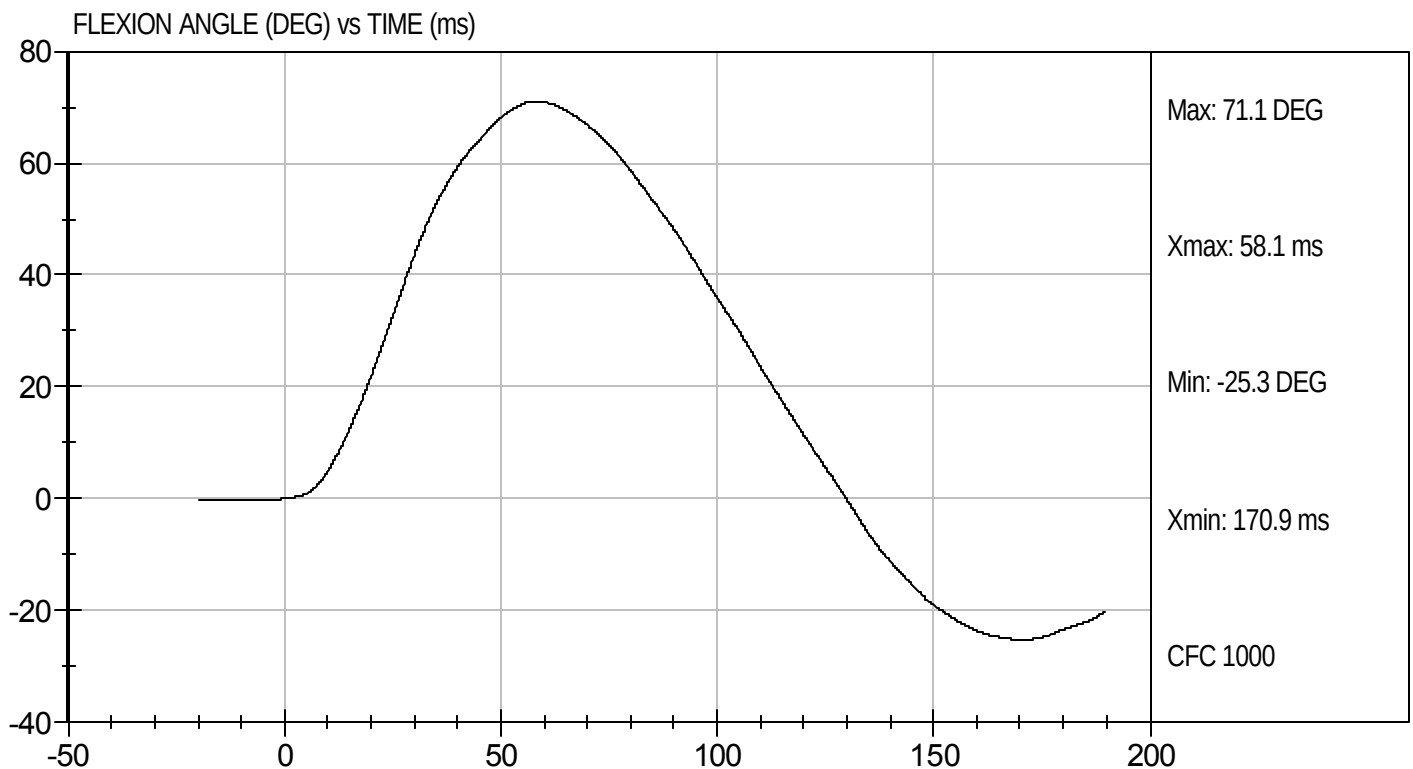
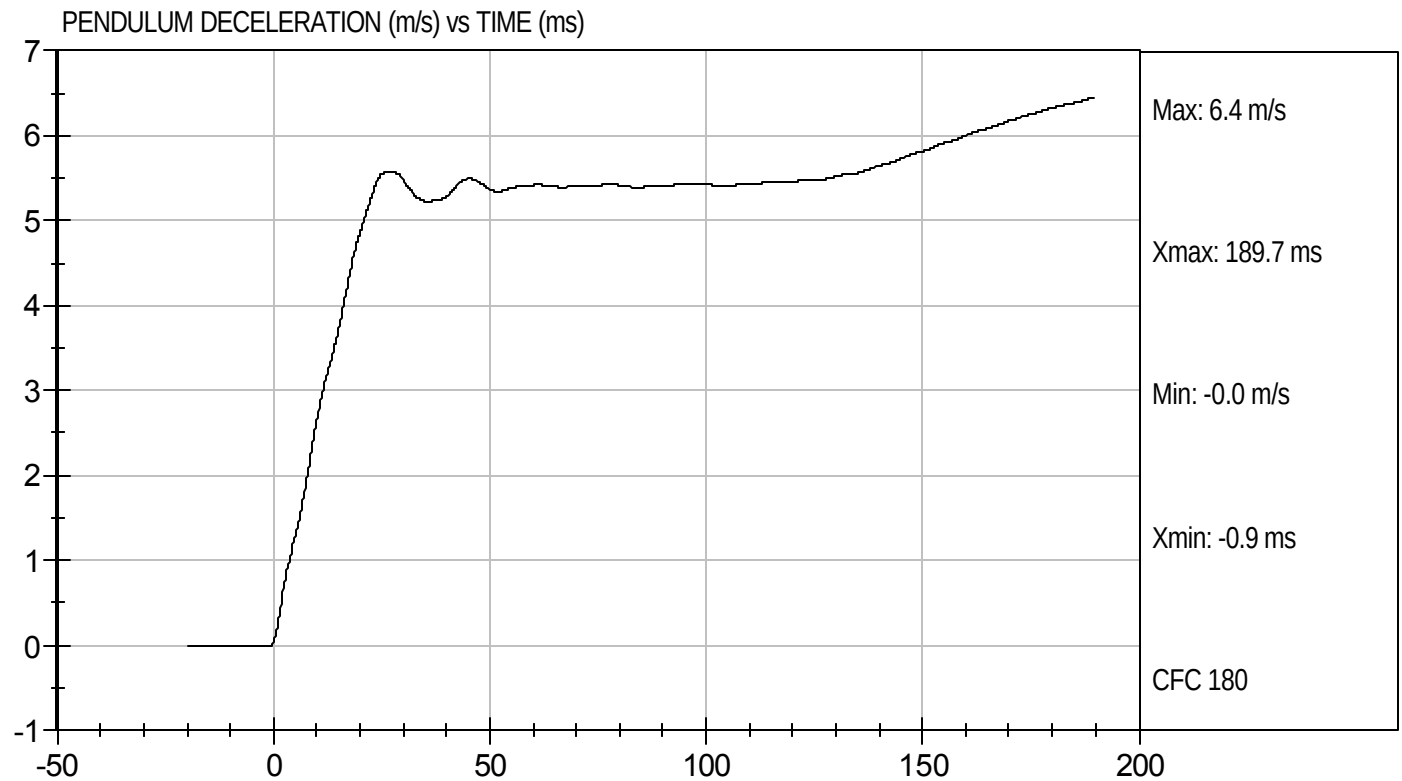
12/21/11
 Test Date


 Approved By



Test Desc: Neck Bending
Component ID: D114342

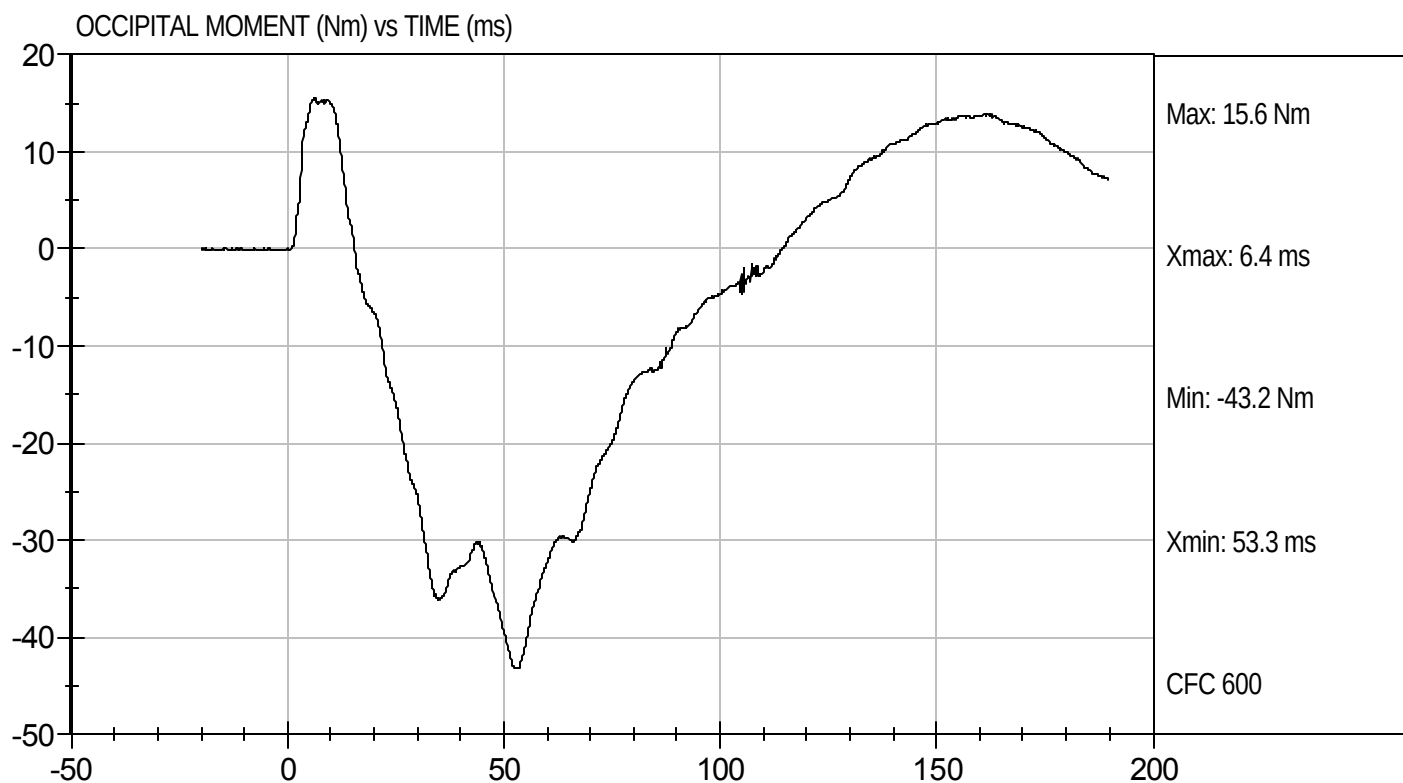
Test Date: 12/21/11
Velocity: 18.32 ft/s, 5.58 m/s





Test Desc: Neck Bending
Component ID: D114342

Test Date: 12/21/11
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: D114343

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	31	Pass
Impact Velocity	m/s	4.20 to 4.40	4.38	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

Jessica Gall
Laboratory Technician

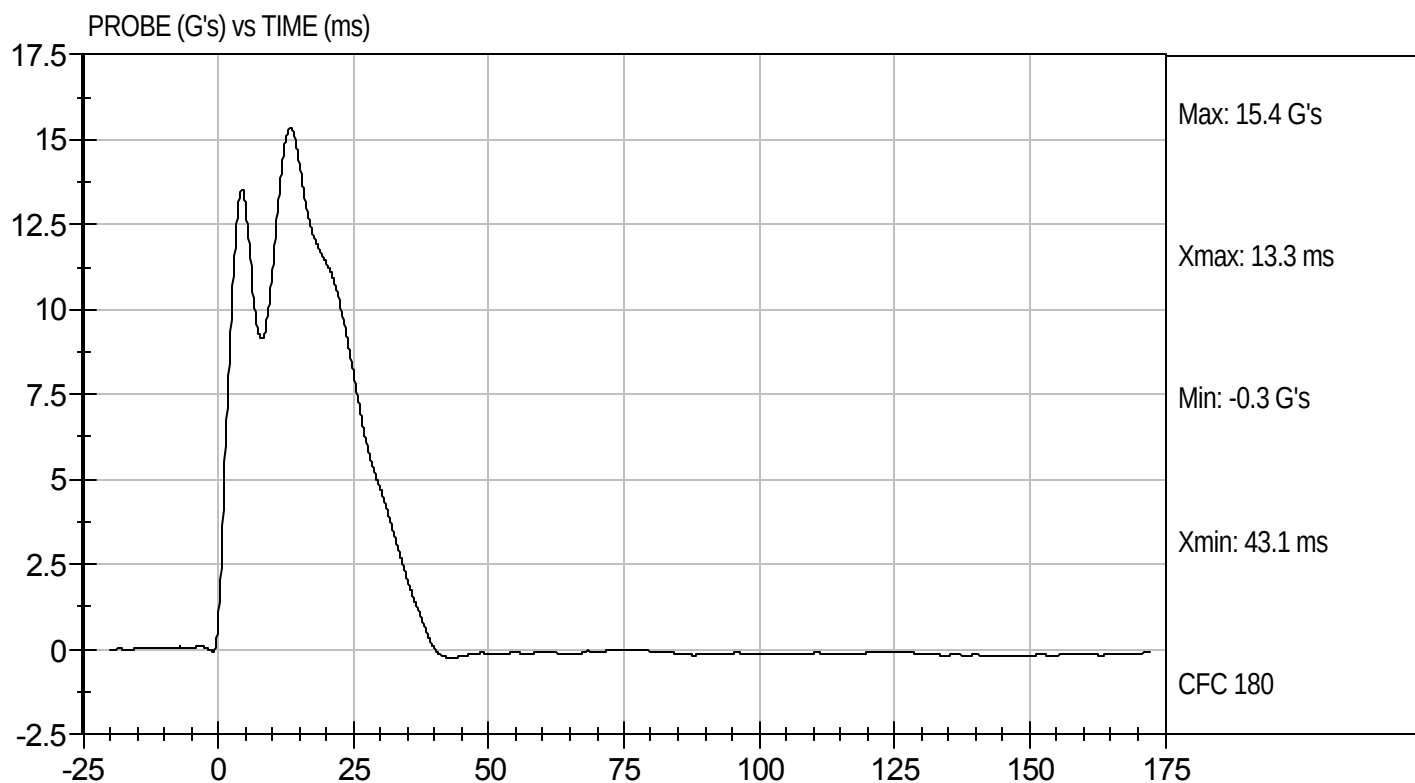
12/21/11
Test Date

David Winkelbauer
Approved By



Test Desc: Shoulder Impact
Component ID: D114343

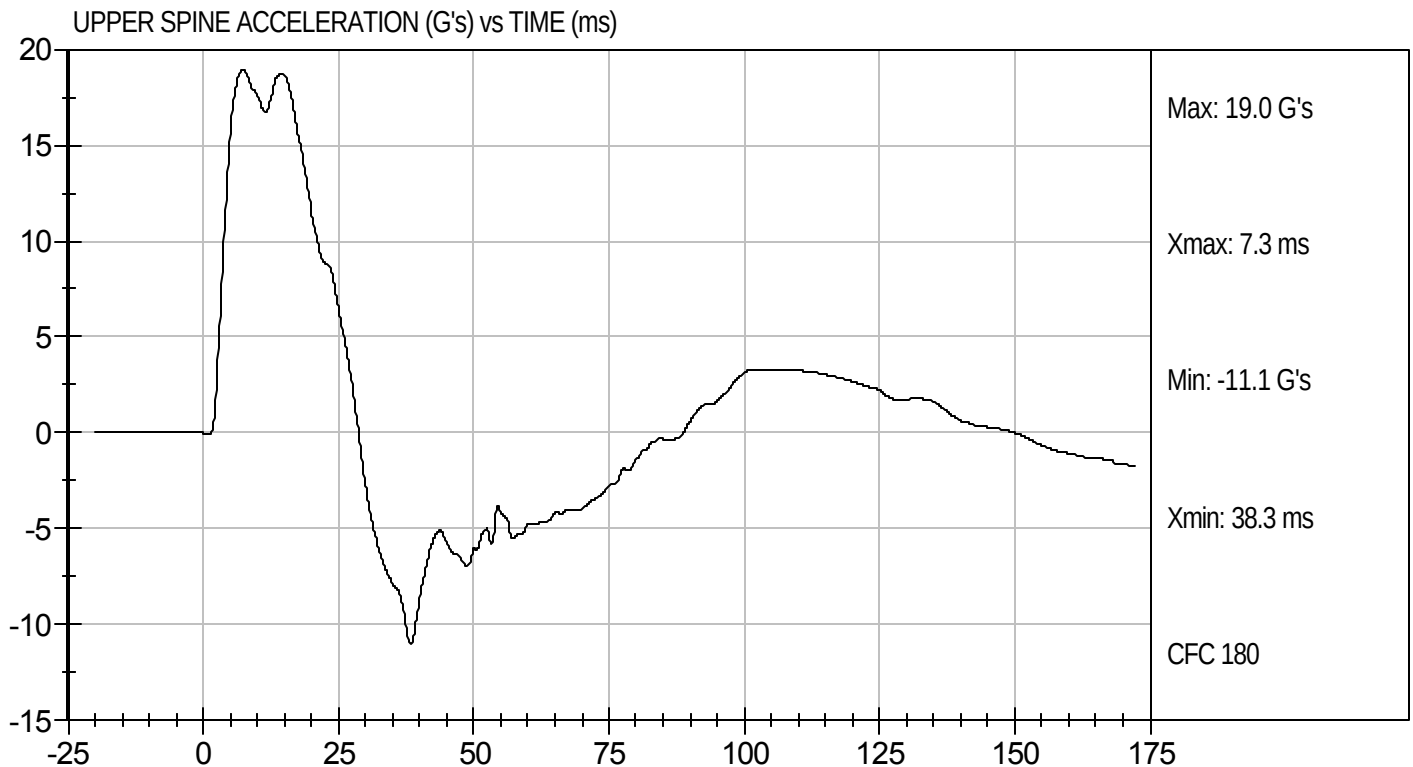
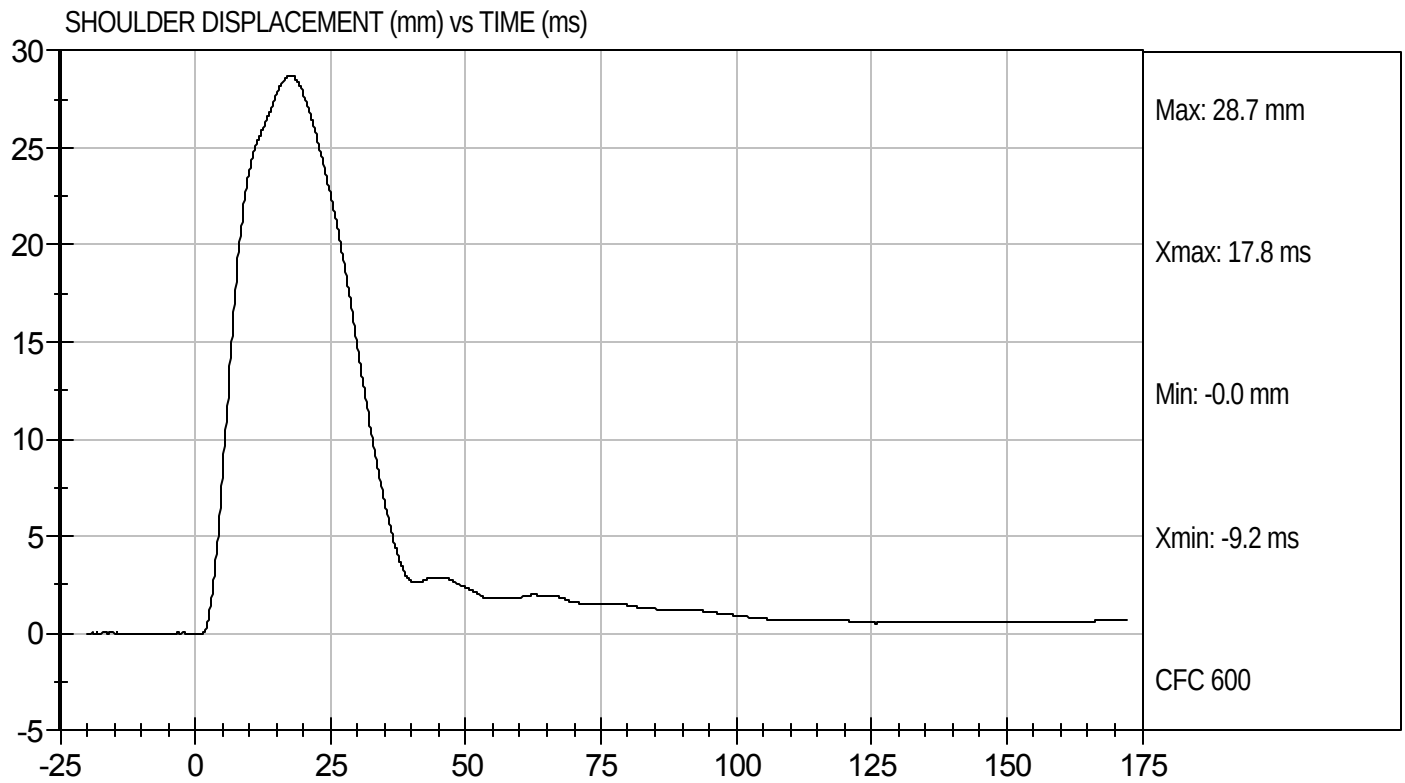
Test Date: 12/21/11
Velocity: 14.37 ft/s, 4.38 m/s





Test Desc: Shoulder Impact
Component ID: D114343

Test Date: 12/21/11
Velocity: 14.37 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: D114344

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.9	Pass
Humidity	%	10 to 70	31	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	33	Pass
Upper Rib Displacement	mm	25 to 32	26	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	33	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

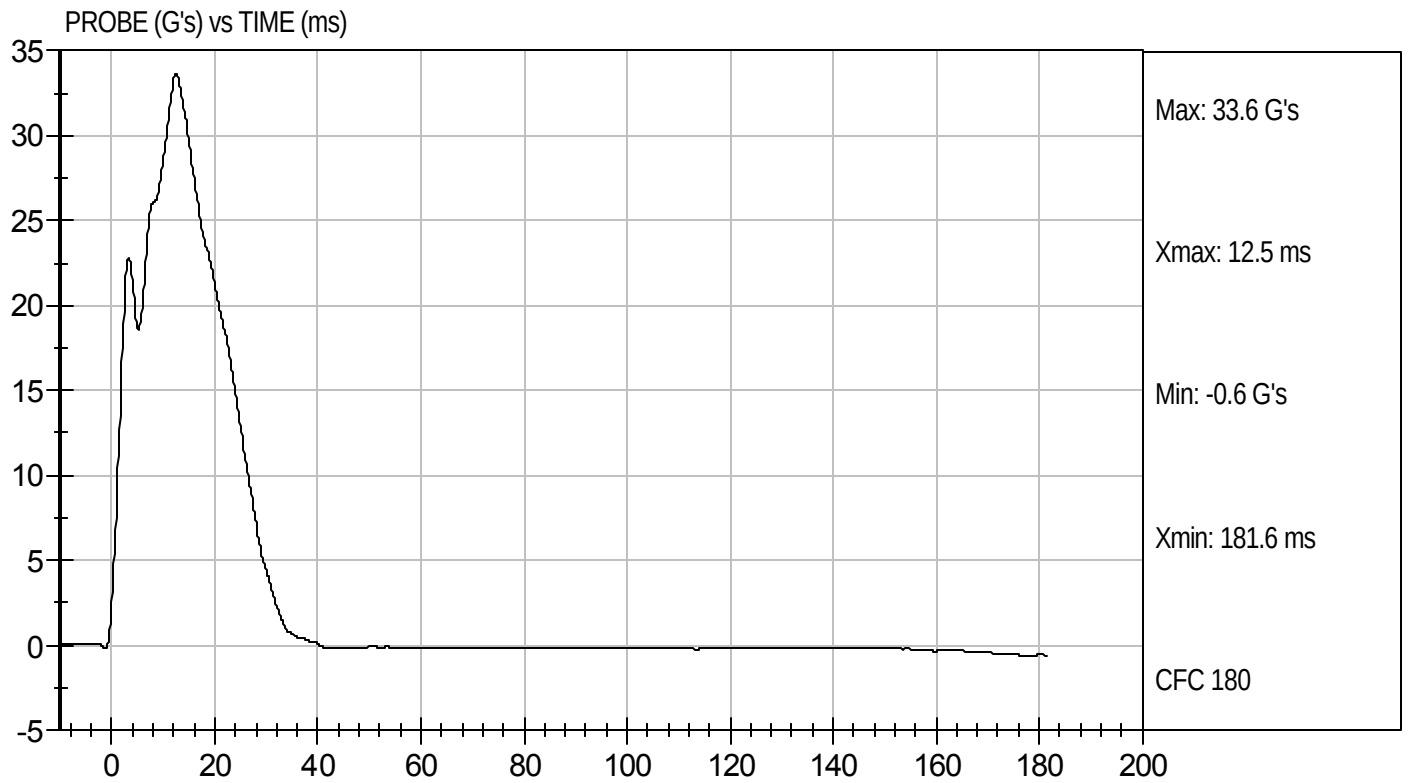
12/21/11
Test Date

David Winkelbauer
Approved By



Test Desc: Thorax With Arm
Component ID: D114344

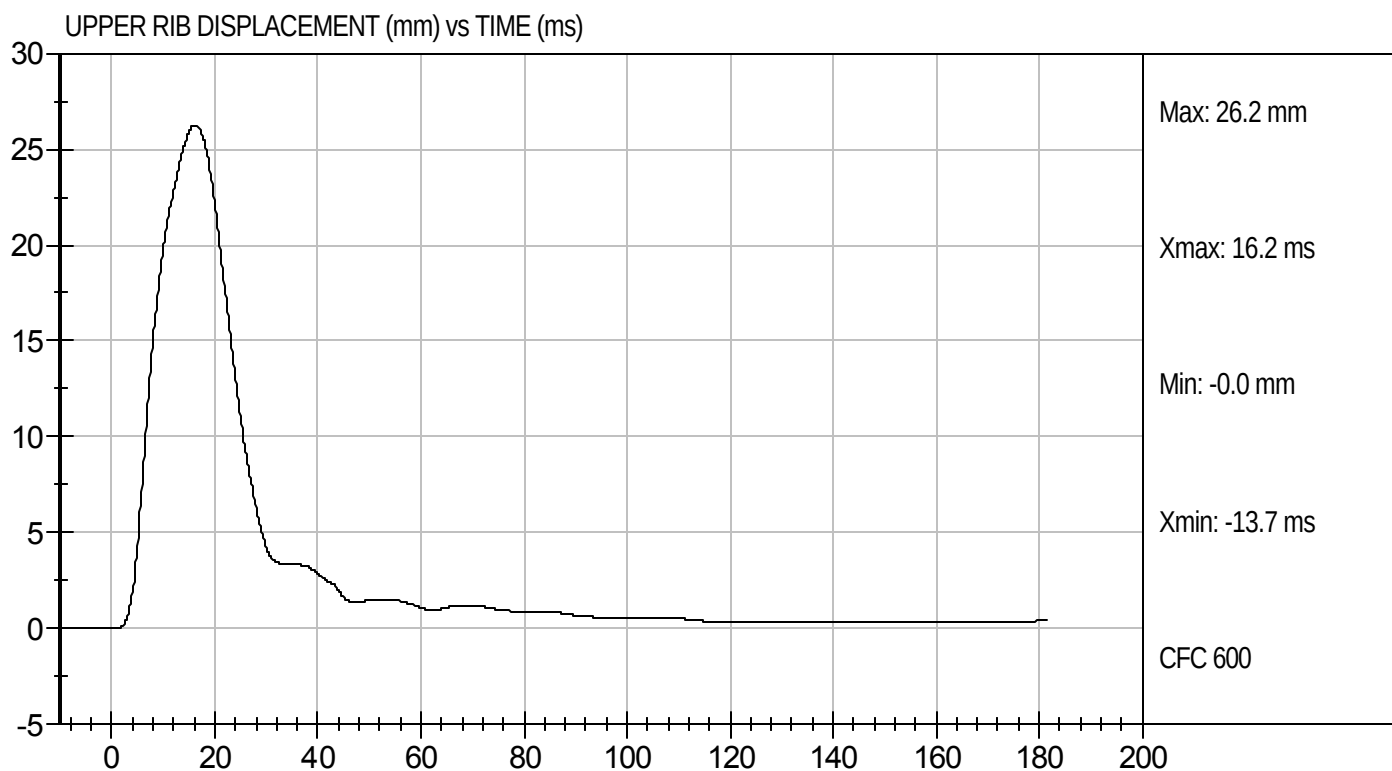
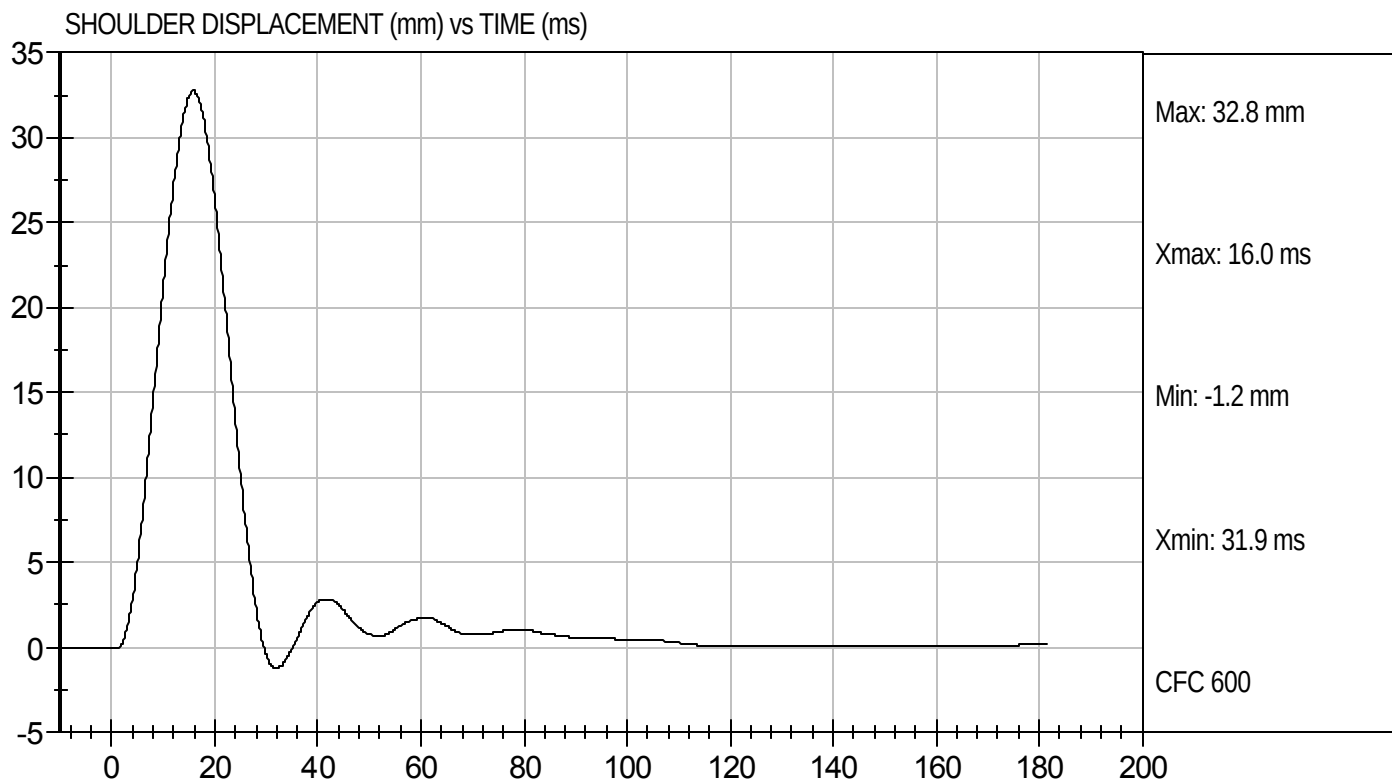
Test Date: 12/21/11
Velocity: 22.22 ft/s, 6.77 m/s





Test Desc: Thorax With Arm
Component ID: D114344

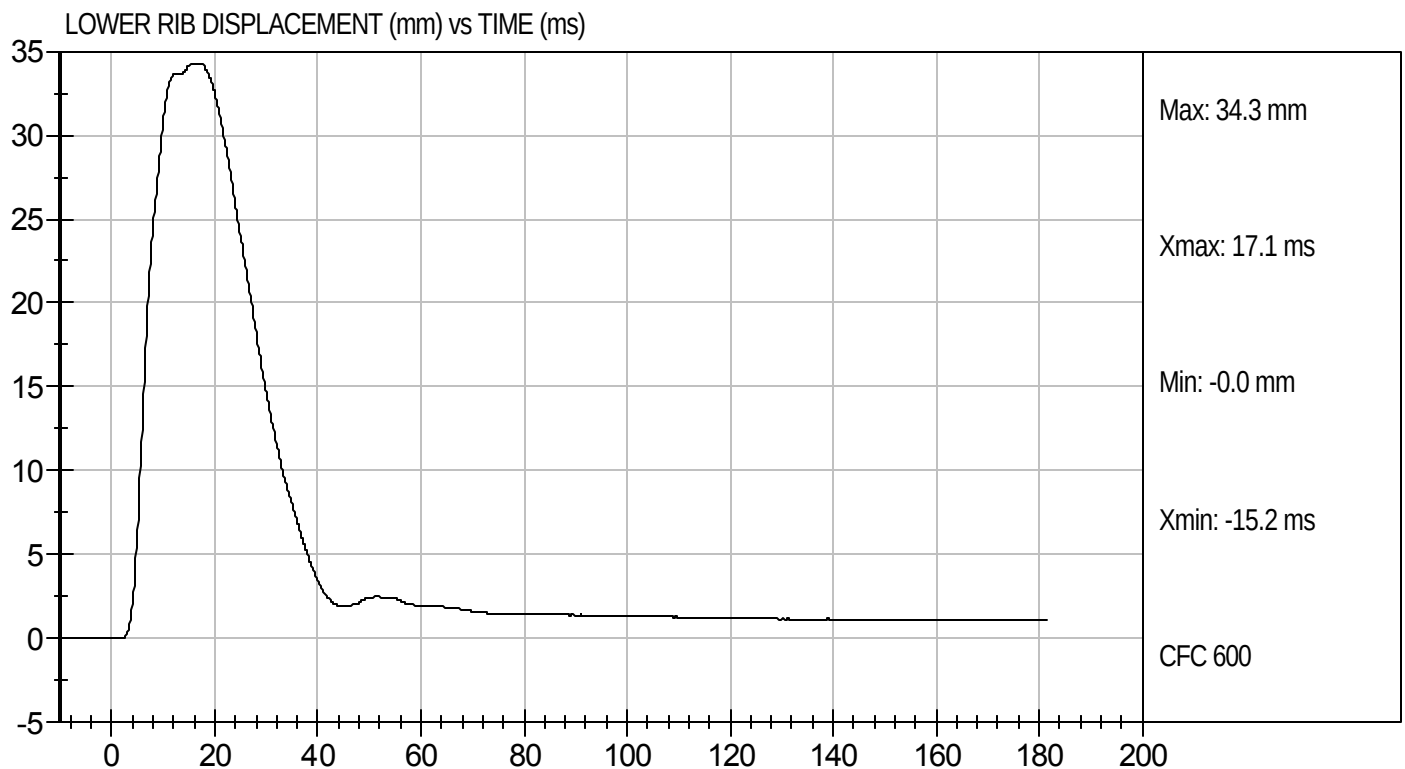
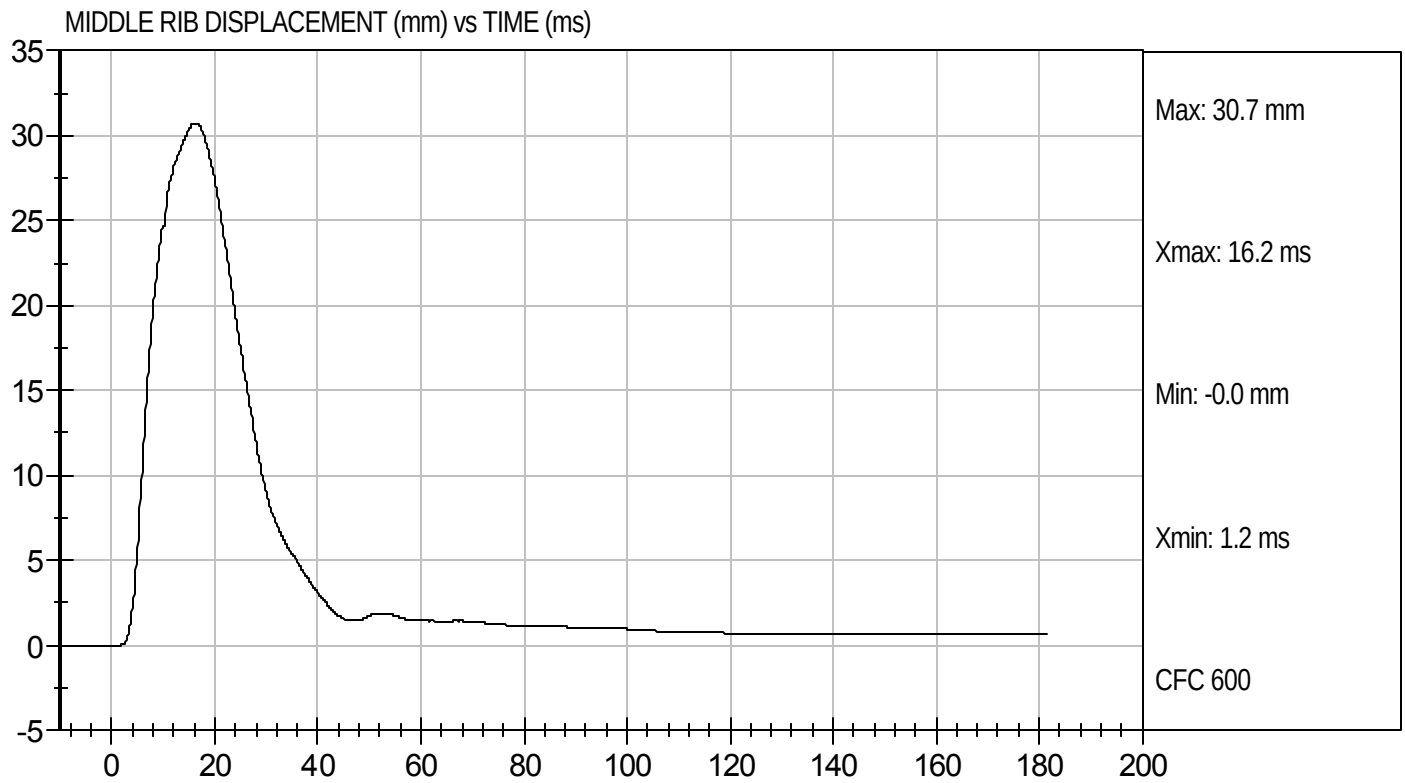
Test Date: 12/21/11
Velocity: 22.22 ft/s, 6.77 m/s





Test Desc: Thorax With Arm
Component ID: D114344

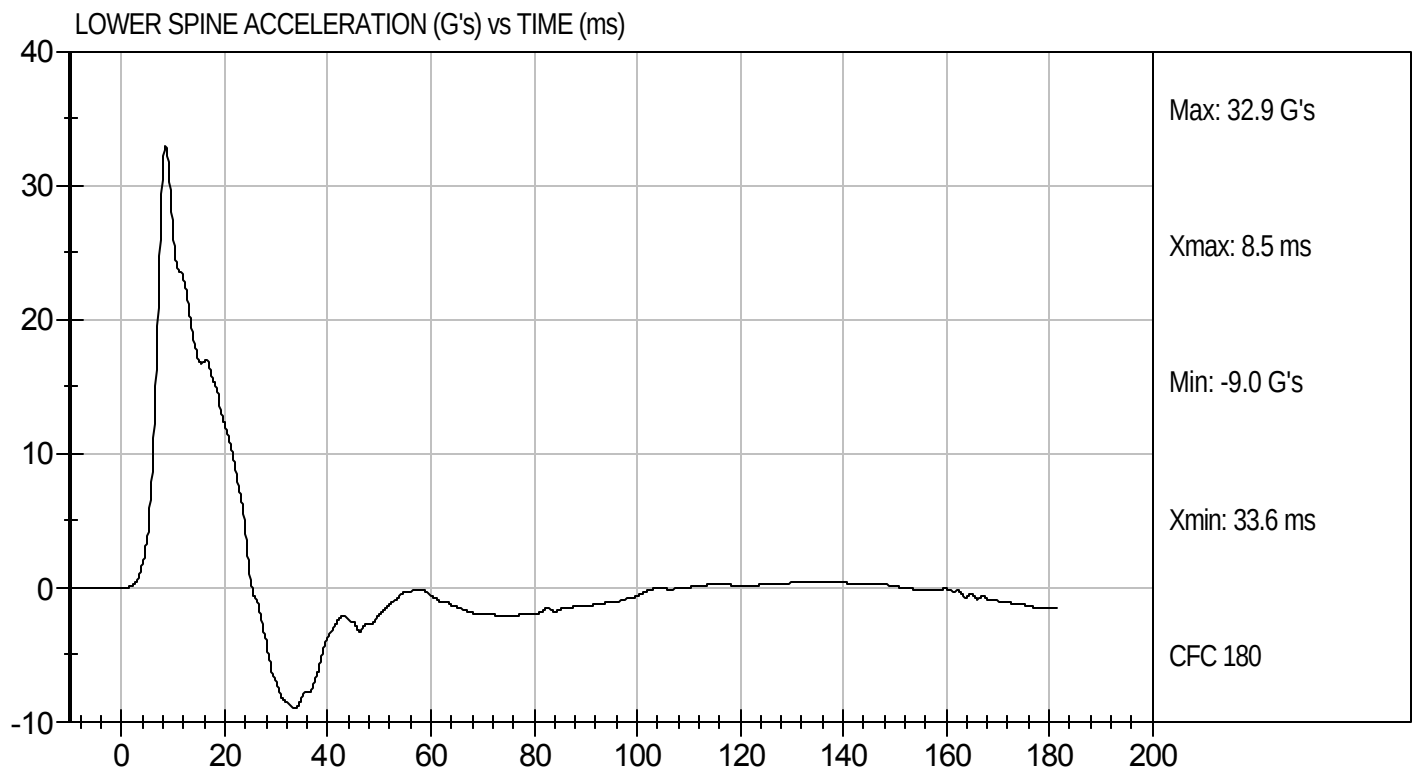
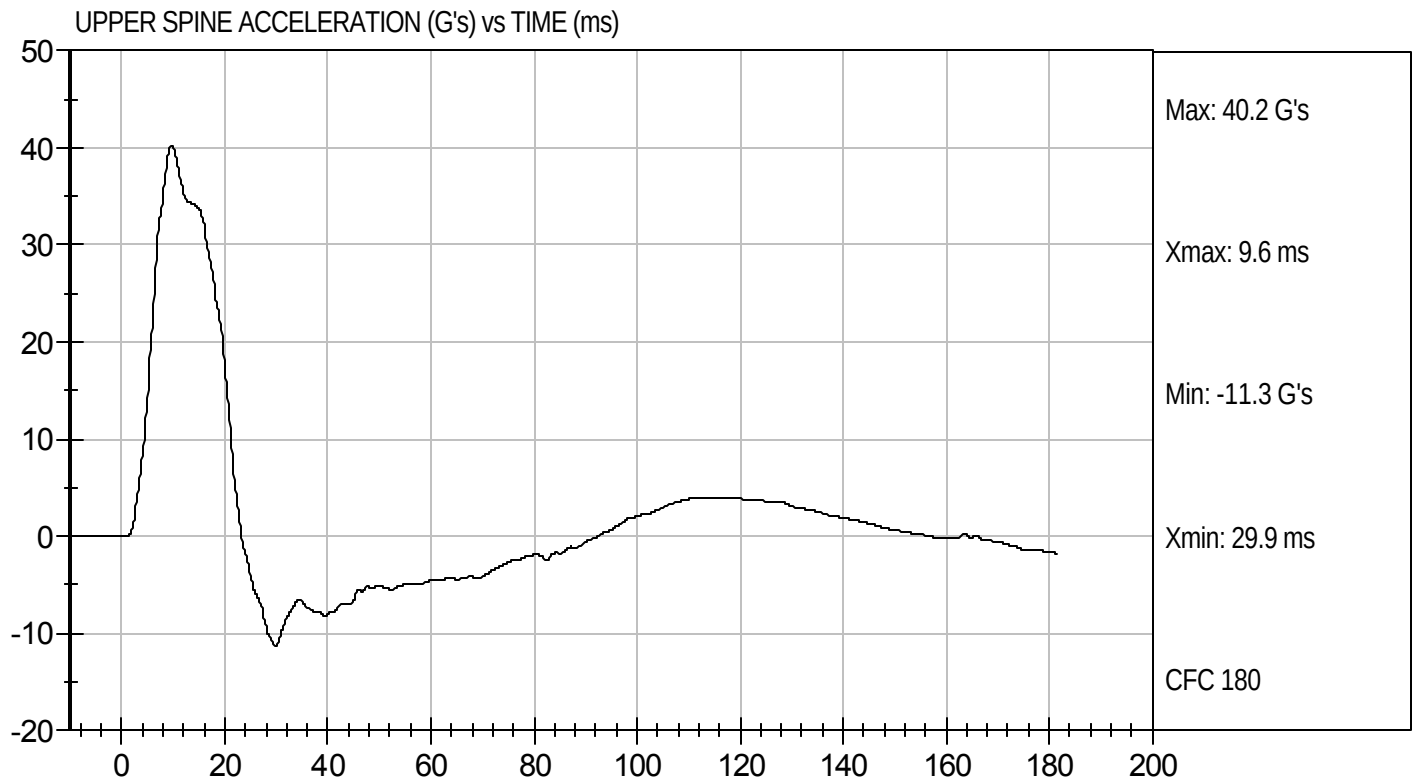
Test Date: 12/21/11
Velocity: 22.22 ft/s, 6.77 m/s





Test Desc: Thorax With Arm
Component ID: D114344

Test Date: 12/21/11
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: D114345

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.9	Pass
Humidity	%	10 to 70	31	Pass
Impact Velocity	m/s	4.20 to 4.40	4.38	Pass
Peak Impactor Force	G's	14 to 18	16	Pass
Upper Rib Displacement	mm	32 to 40	34	Pass
Middle Rib Displacement	mm	39 to 45	40	Pass
Lower Rib Displacement	mm	35 to 43	39	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

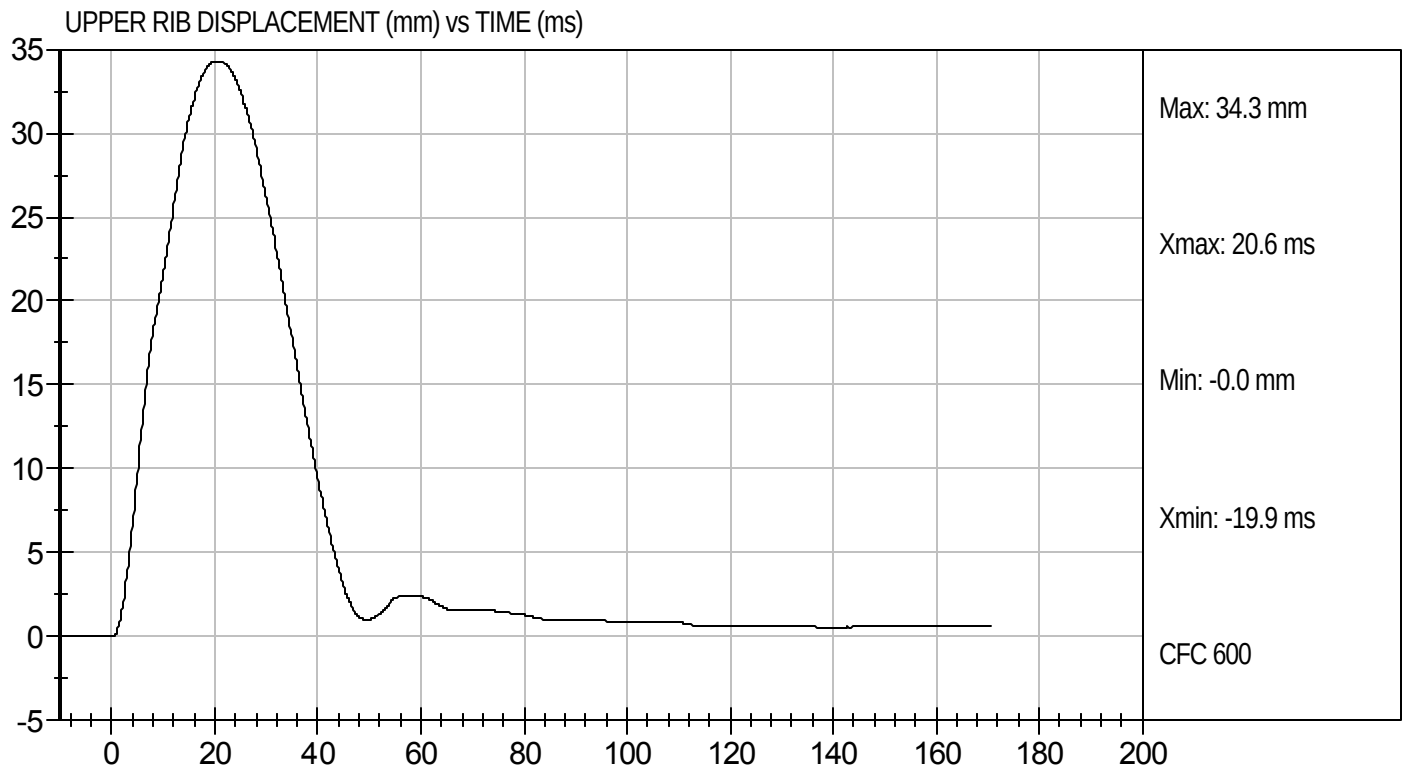
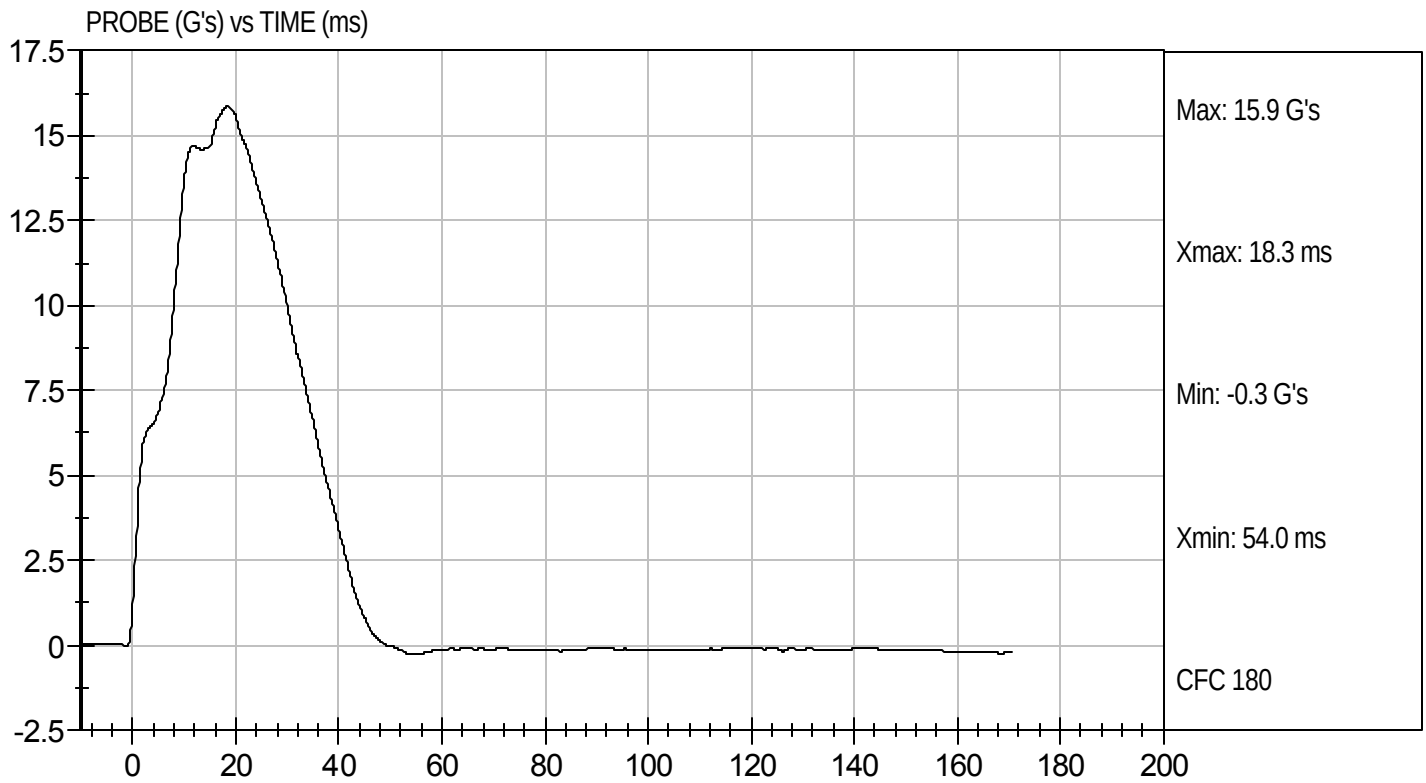
12/21/11
Test Date


Approved By



Test Desc: Thorax Without Arm
Component ID: D114345

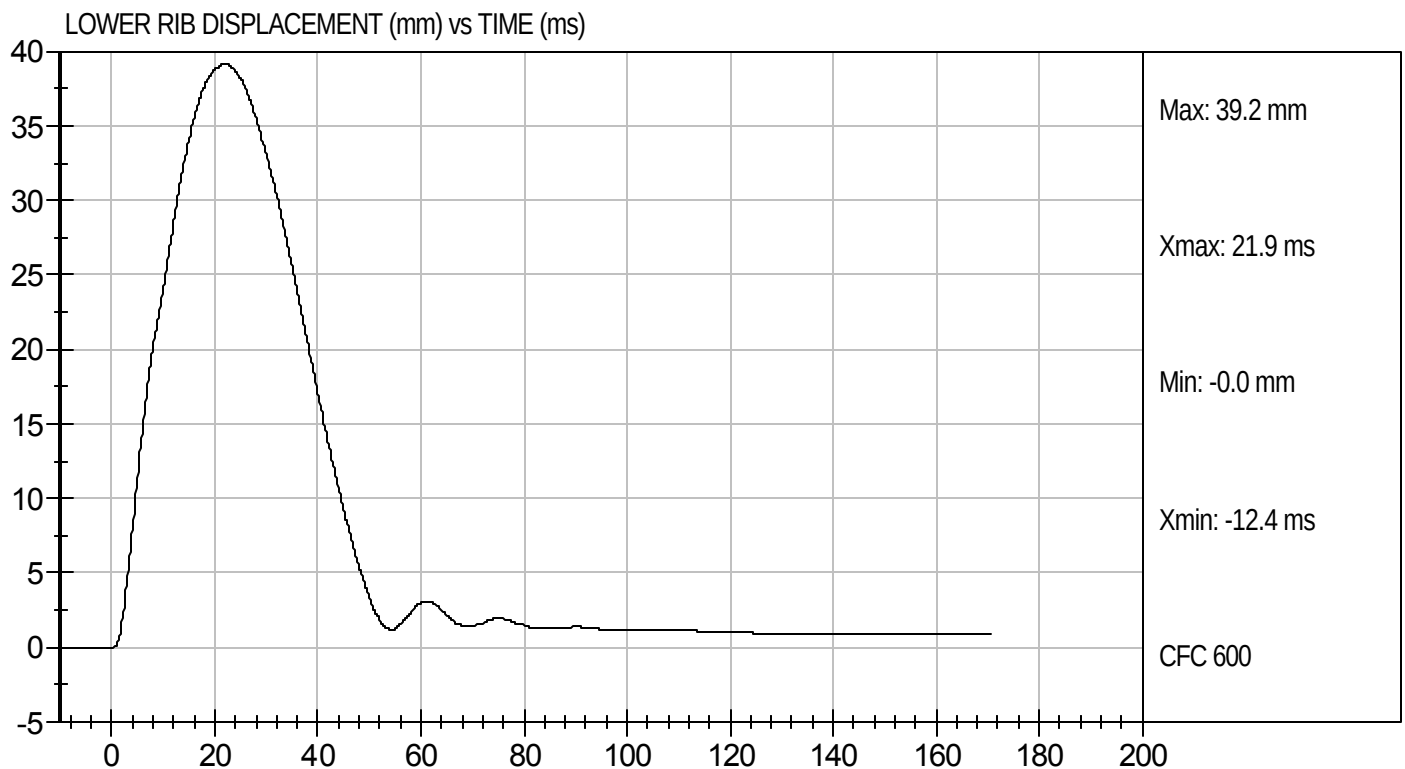
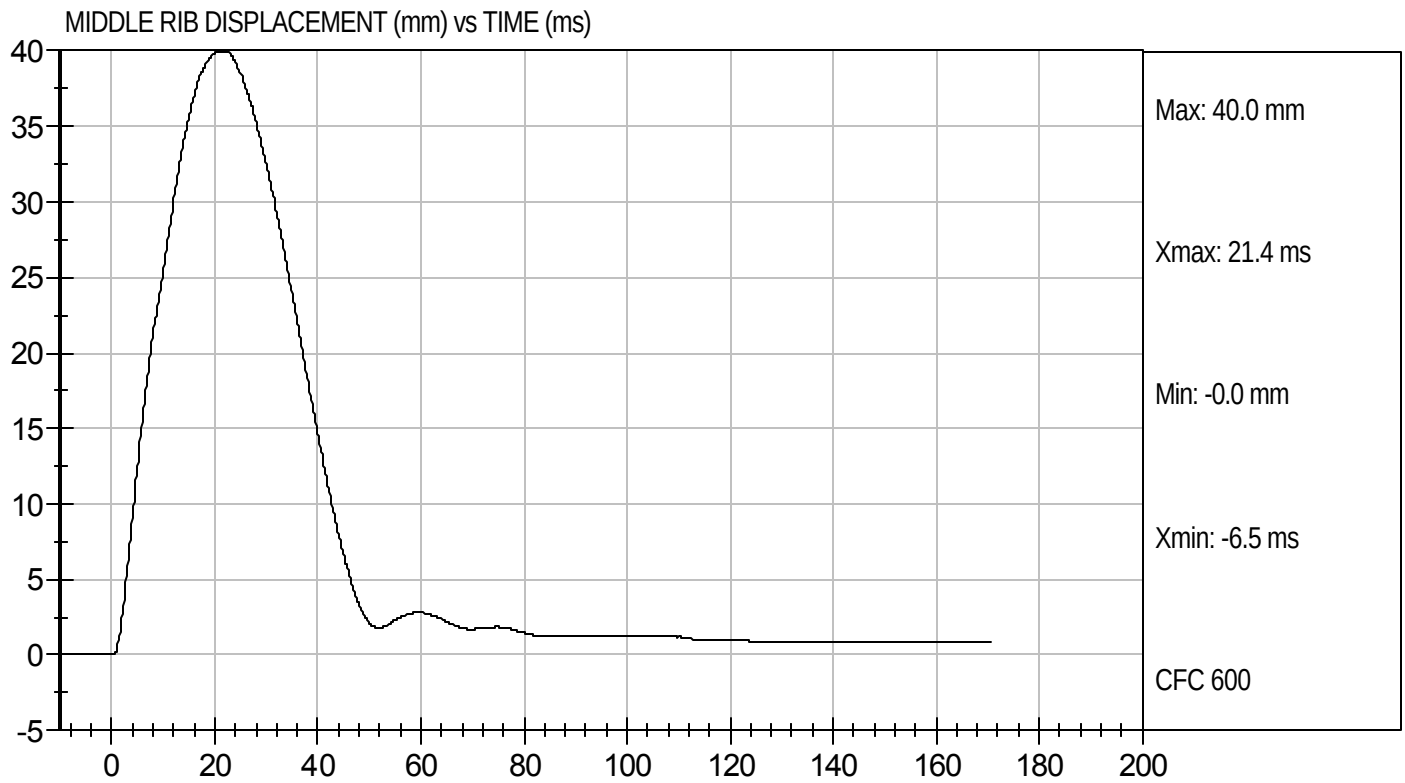
Test Date: 12/21/11
Velocity: 14.37 ft/s, 4.38 m/s





Test Desc: Thorax Without Arm
Component ID: D114345

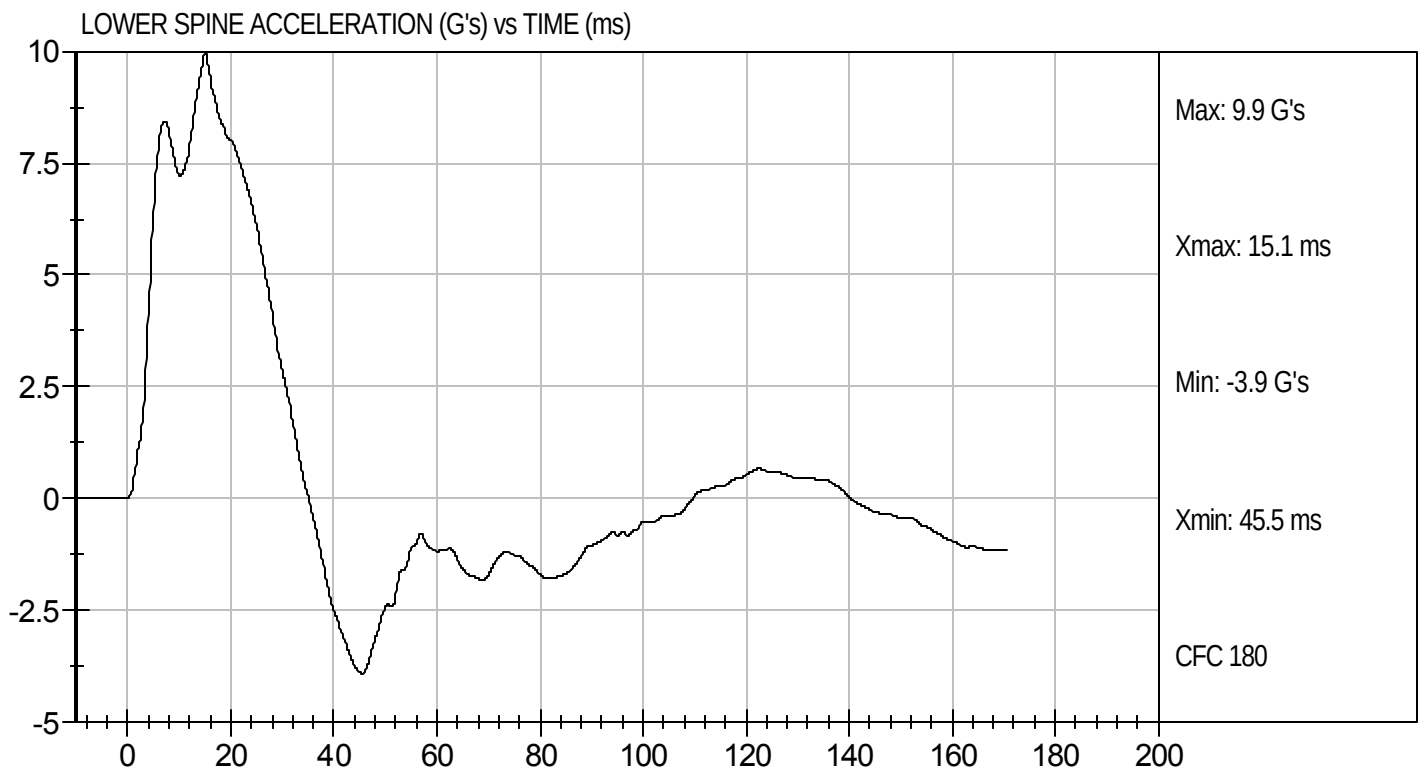
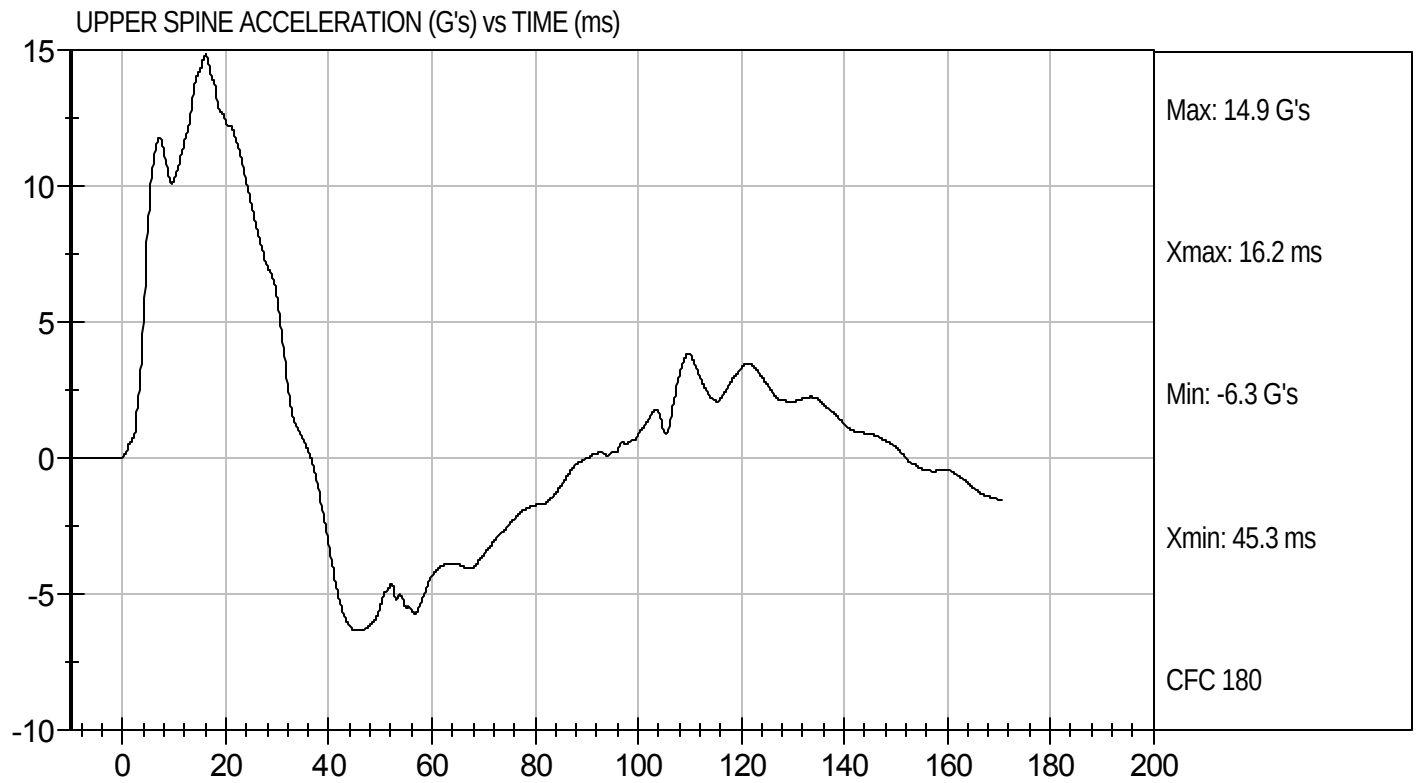
Test Date: 12/21/11
Velocity: 14.37 ft/s, 4.38 m/s





Test Desc: Thorax Without Arm
Component ID: D114345

Test Date: 12/21/11
Velocity: 14.37 ft/s, 4.38 m/s



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

ATD Serial No: 306

Test I.D: D114346

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	22.0	Pass
Humidity	%	10 to 70	31	Pass
Impact Velocity	m/s	4.20 to 4.40	4.34	Pass
Peak Impactor Acceleration	G's	12 to 16	14	Pass
Upper Rib Displacement	mm	36 to 47	36	Pass
Lower Rib Displacement	mm	33 to 44	35	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	11	Pass
			Overall Test Results	Pass

Jessica Hall
Laboratory Technician

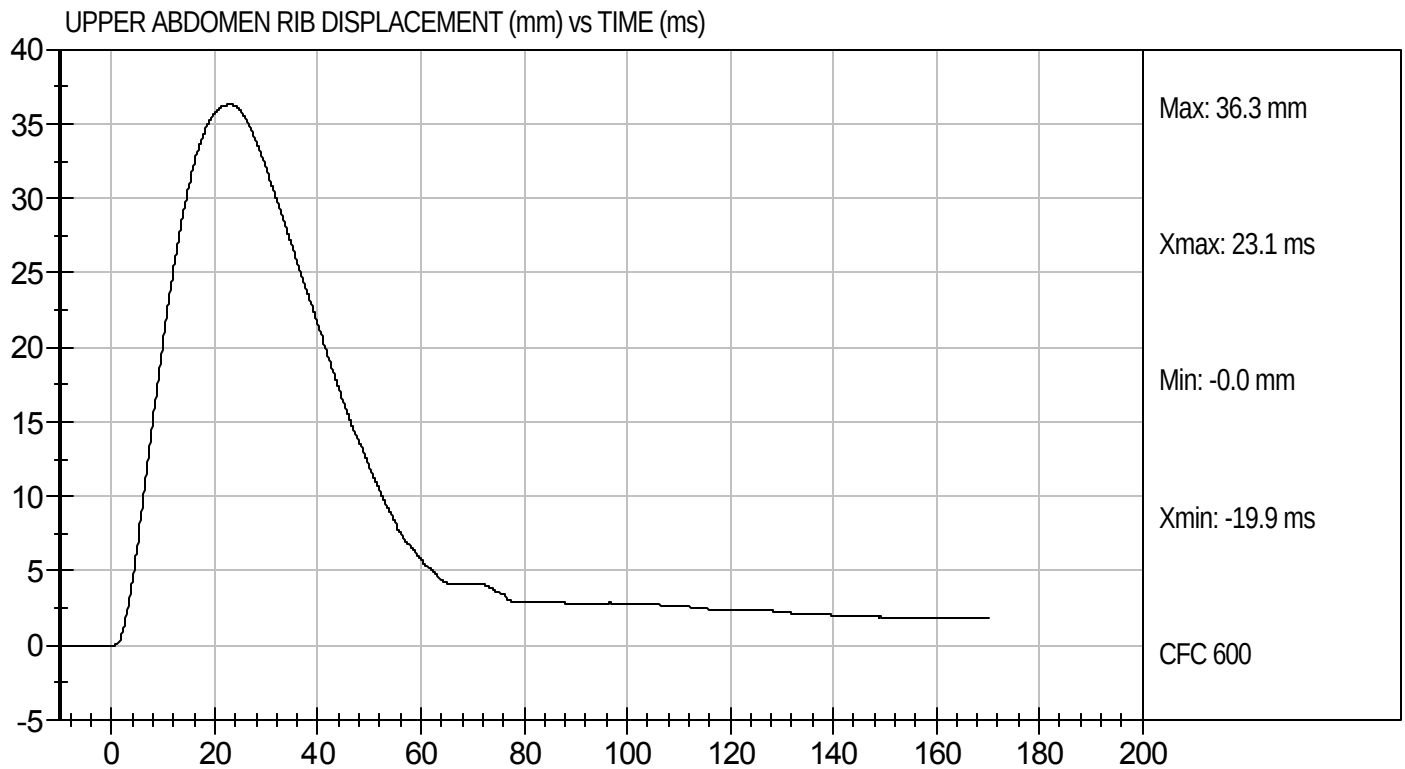
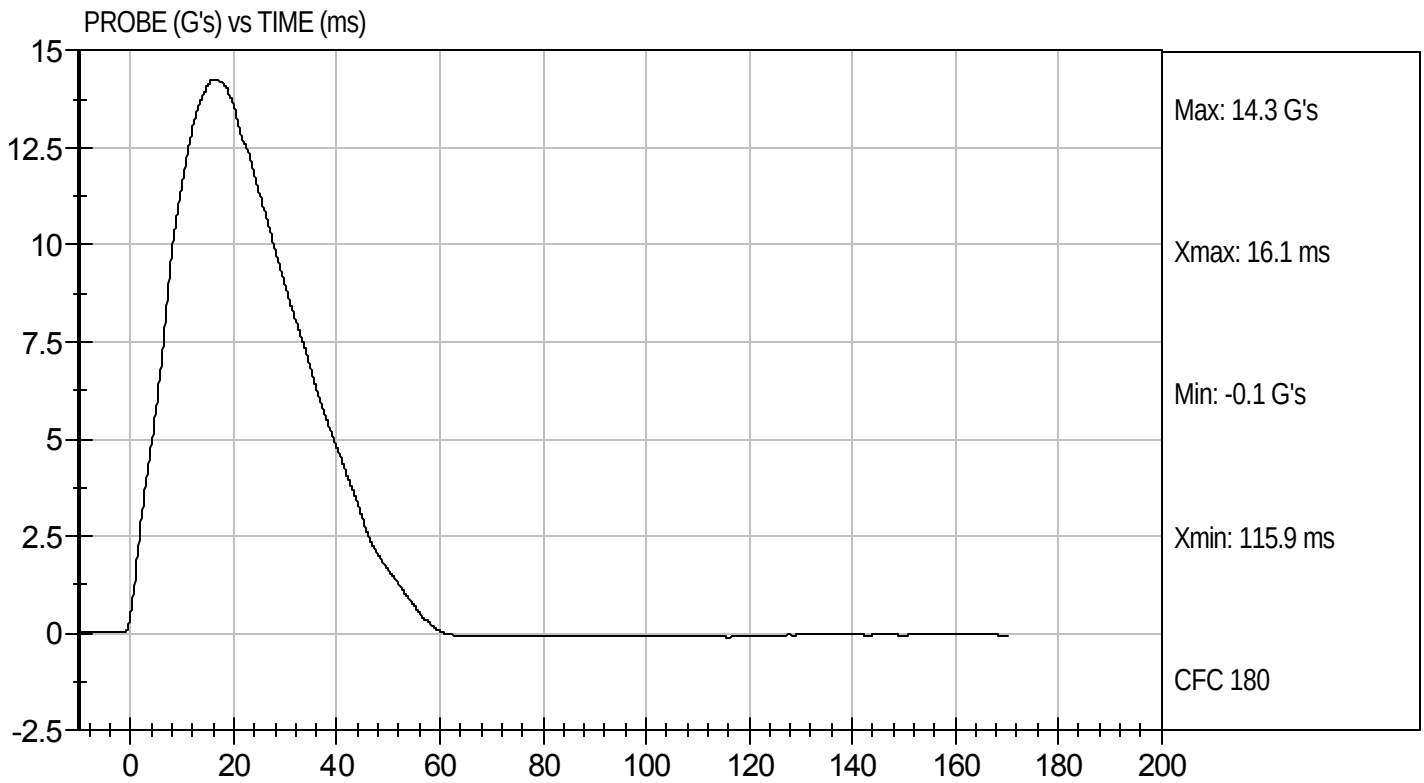
12/21/11
Test Date

David Winkelbauer
Approved By



Test Desc: Abdomen Impact
Component ID: D114346

Test Date: 12/21/11
Velocity: 14.25 ft/s, 4.34 m/s

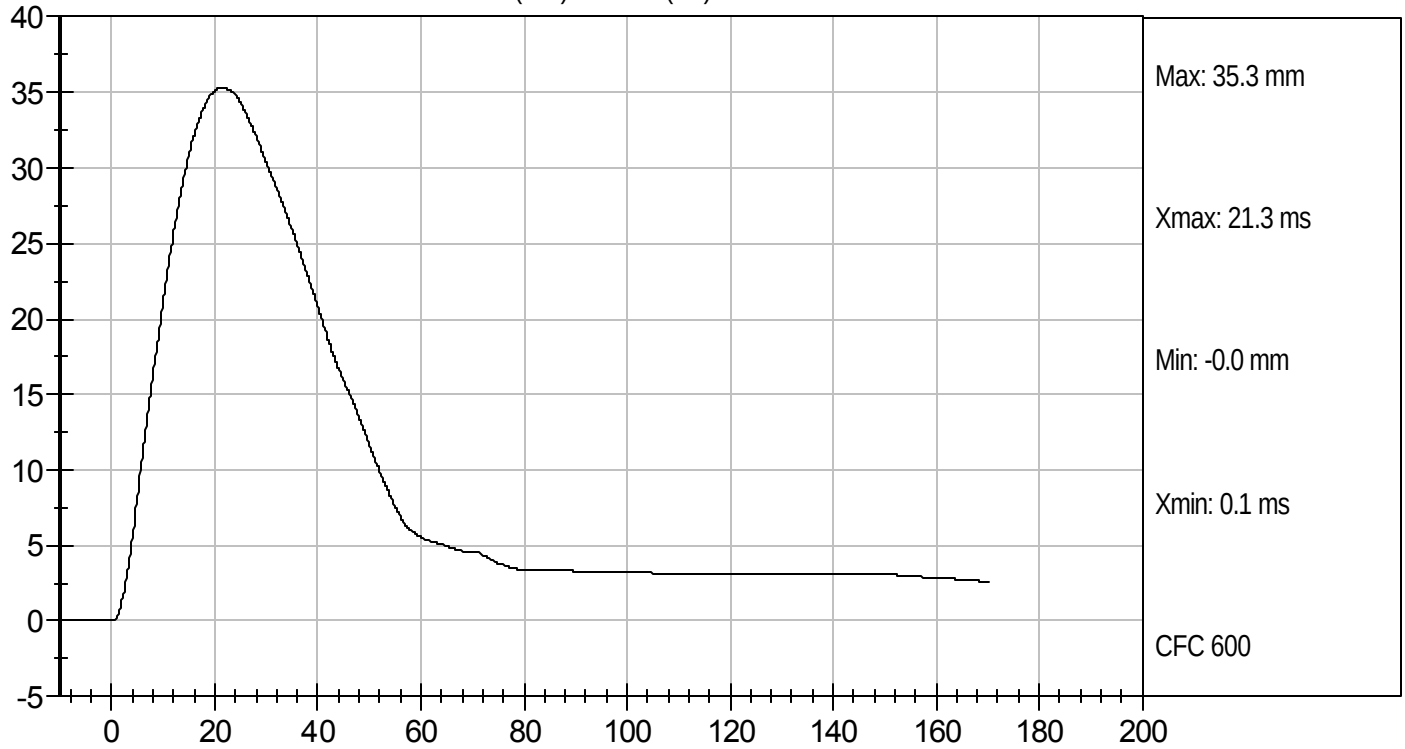




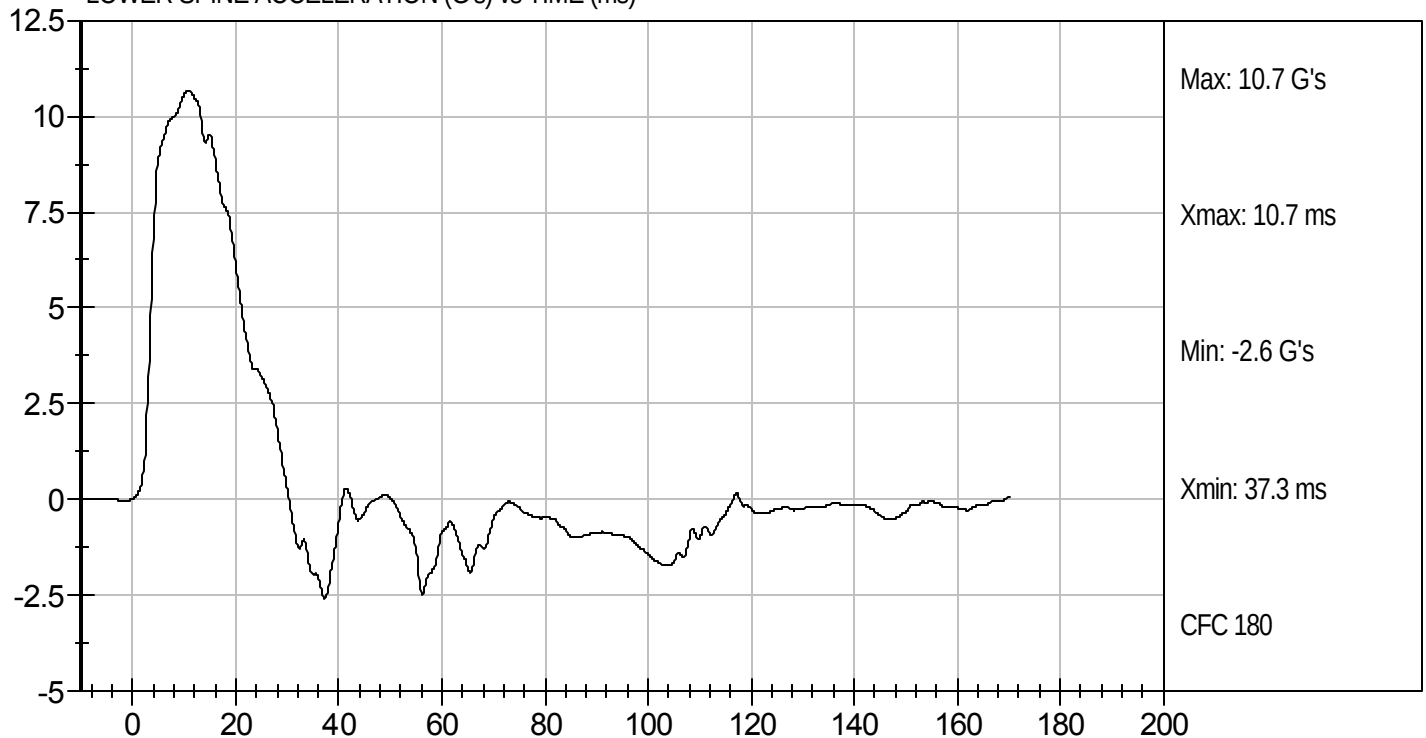
Test Desc: Abdomen Impact
Component ID: D114346

Test Date: 12/21/11
Velocity: 14.25 ft/s, 4.34 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: D114347

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.8	Pass
Humidity	%	10 to 70	31	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	3814	Pass
Overall Test Results				Pass


Laboratory Technician

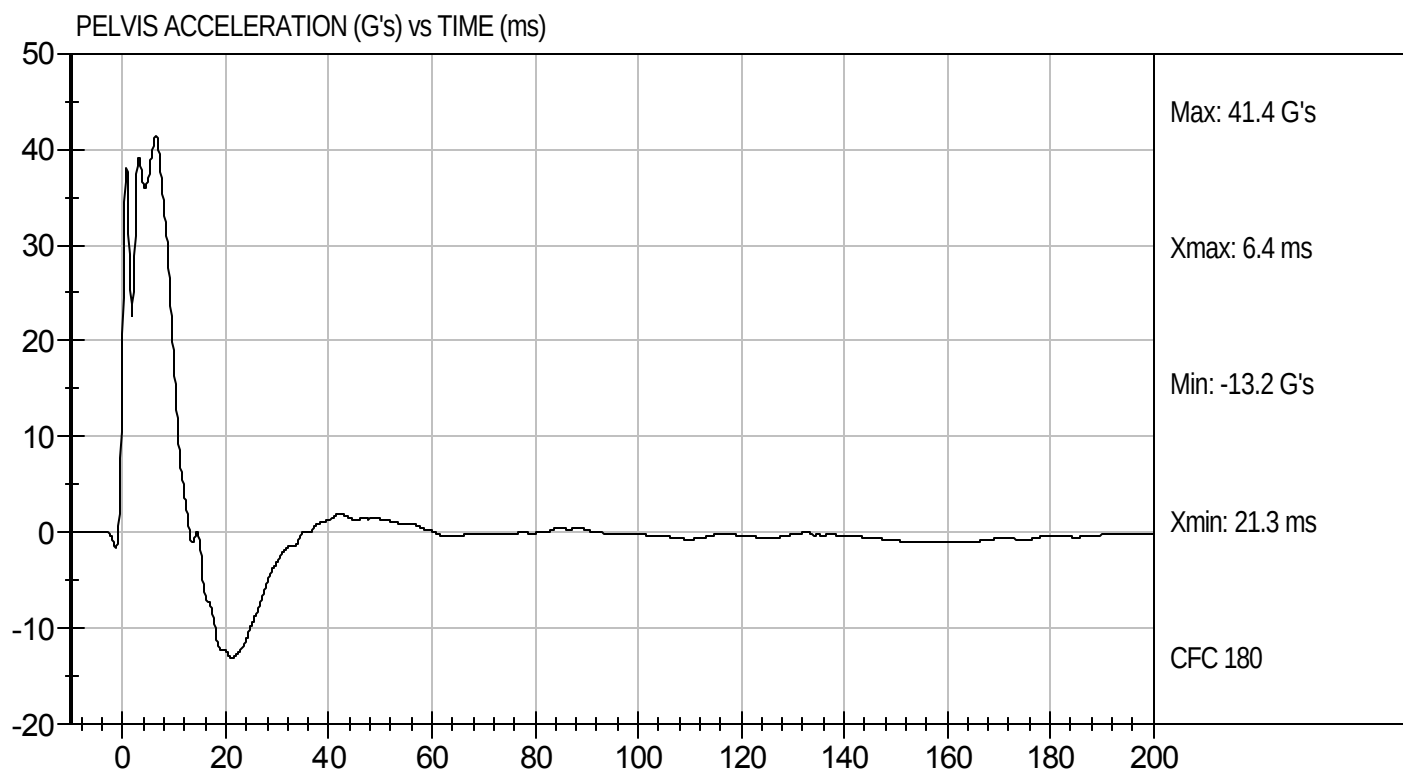
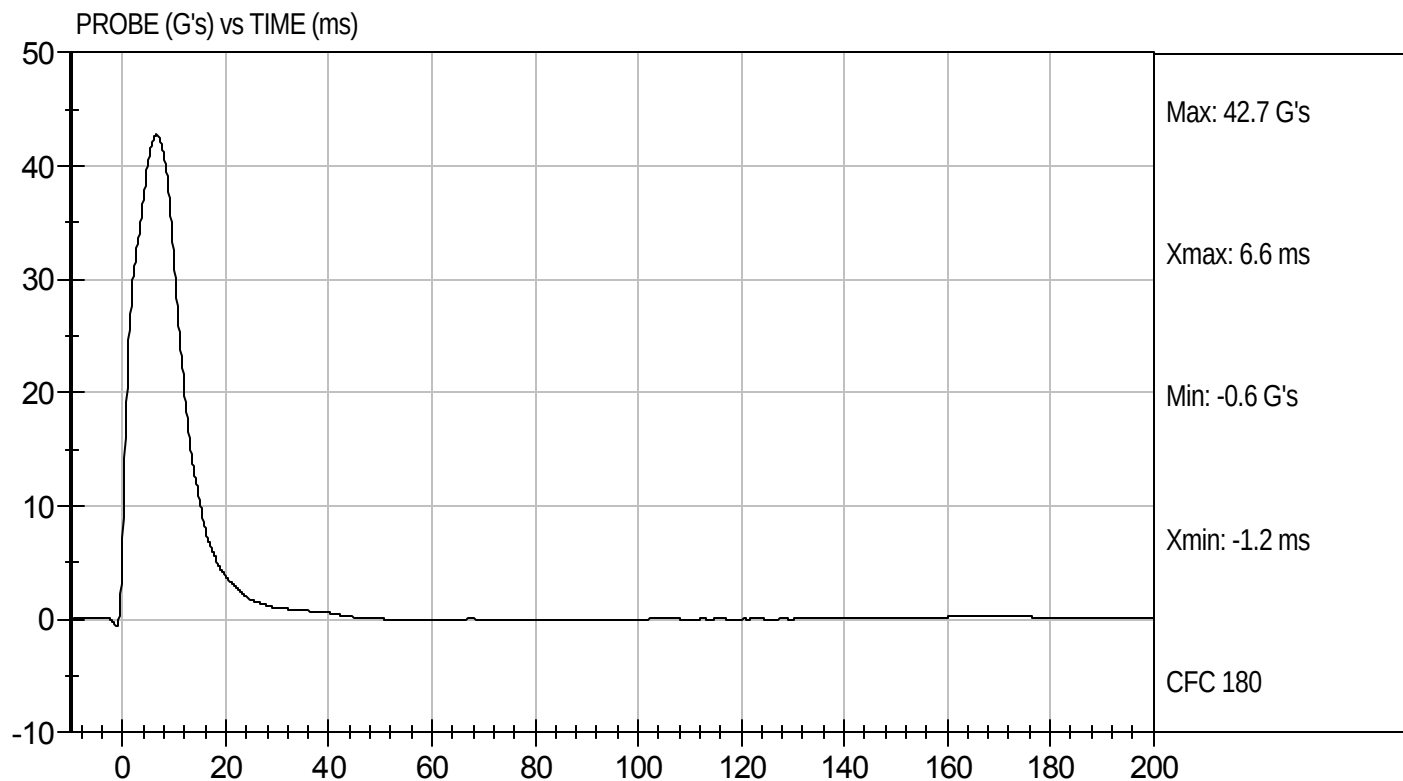
12/21/11
Test Date


Approved By



Test Desc: Pelvis Impact
Component ID: D114347

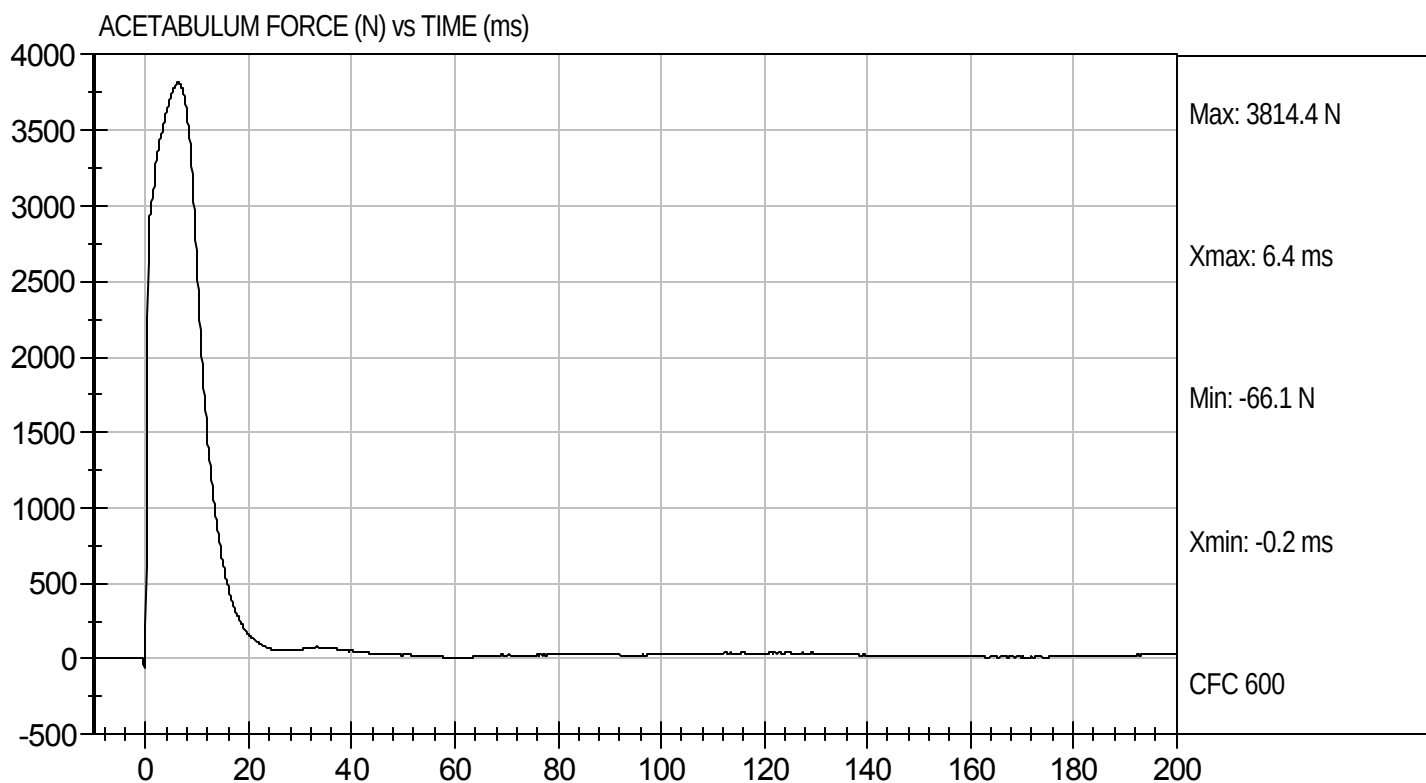
Test Date: 12/21/11
Velocity: 22.01 ft/s, 6.71 m/s





Test Desc: Pelvis Impact
Component ID: D114347

Test Date: 12/21/11
Velocity: 22.01 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: D114348

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.9	Pass
Humidity	%	10 to 70	31	Pass
Impact Velocity	m/s	4.20 to 4.40	4.38	Pass
Peak Impactor Acceleration	G's	36 to 45	40	Pass
Pelvis Y Acceleration	G's	28 to 39	34	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	4860	Pass
Overall Test Results			Pass	


Laboratory Technician

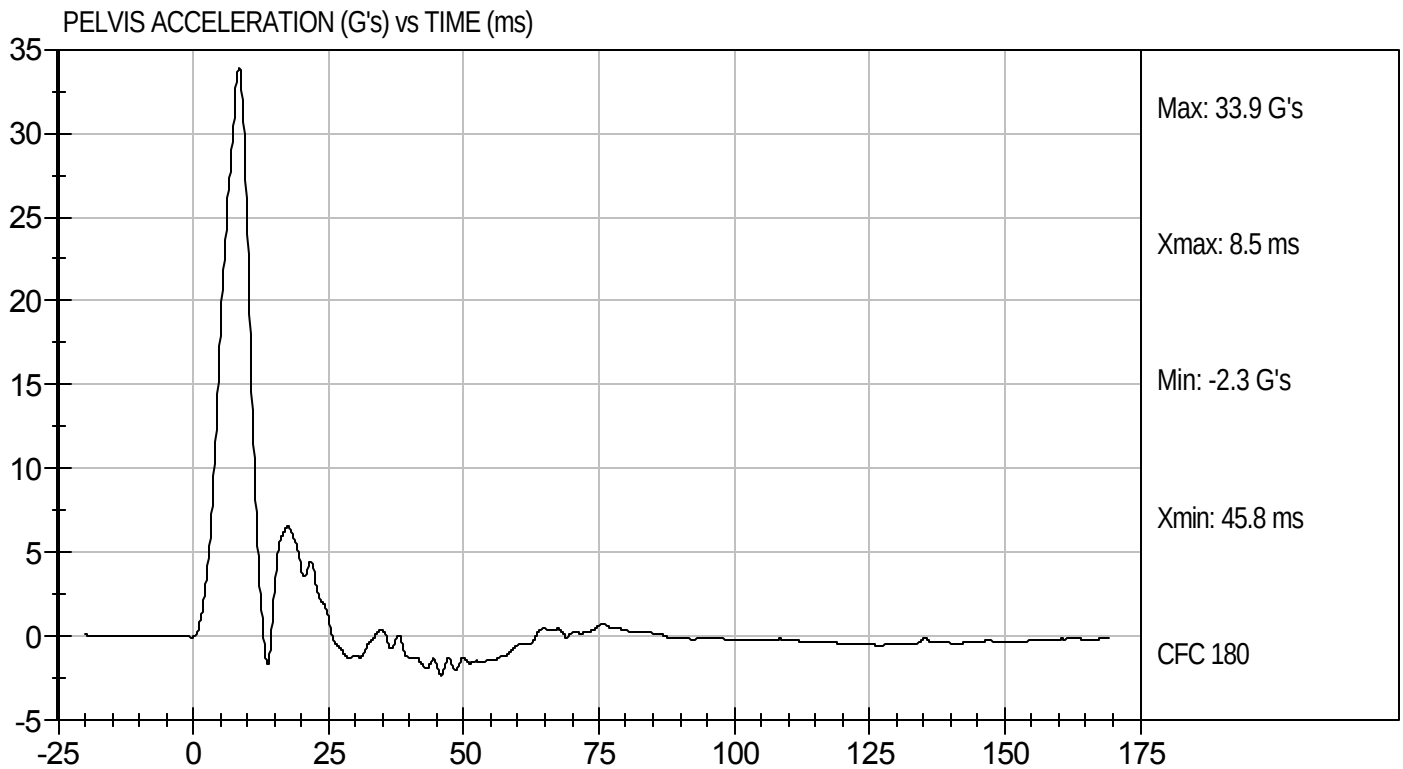
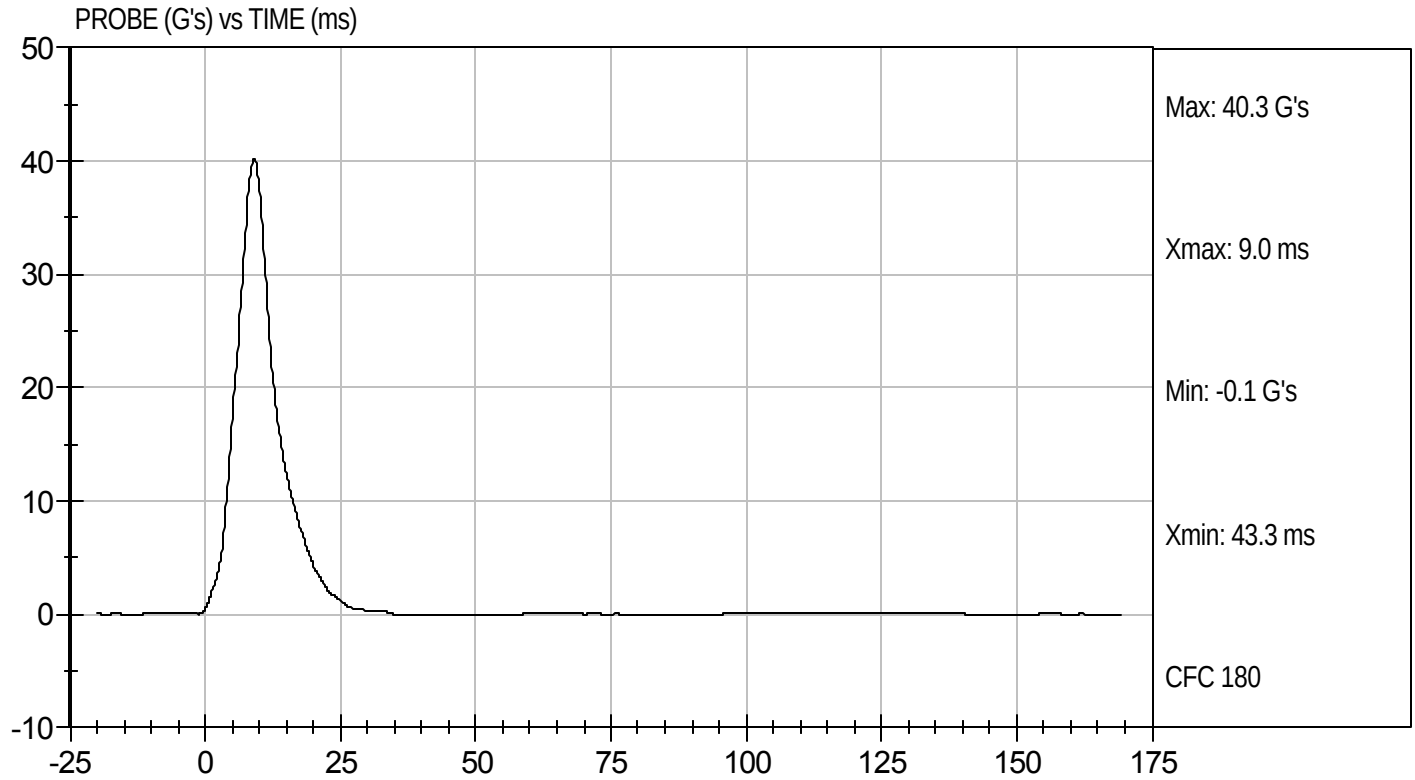
12/21/11
Test Date


Approved By



Test Desc: Iliac Impact
Component ID: D114348

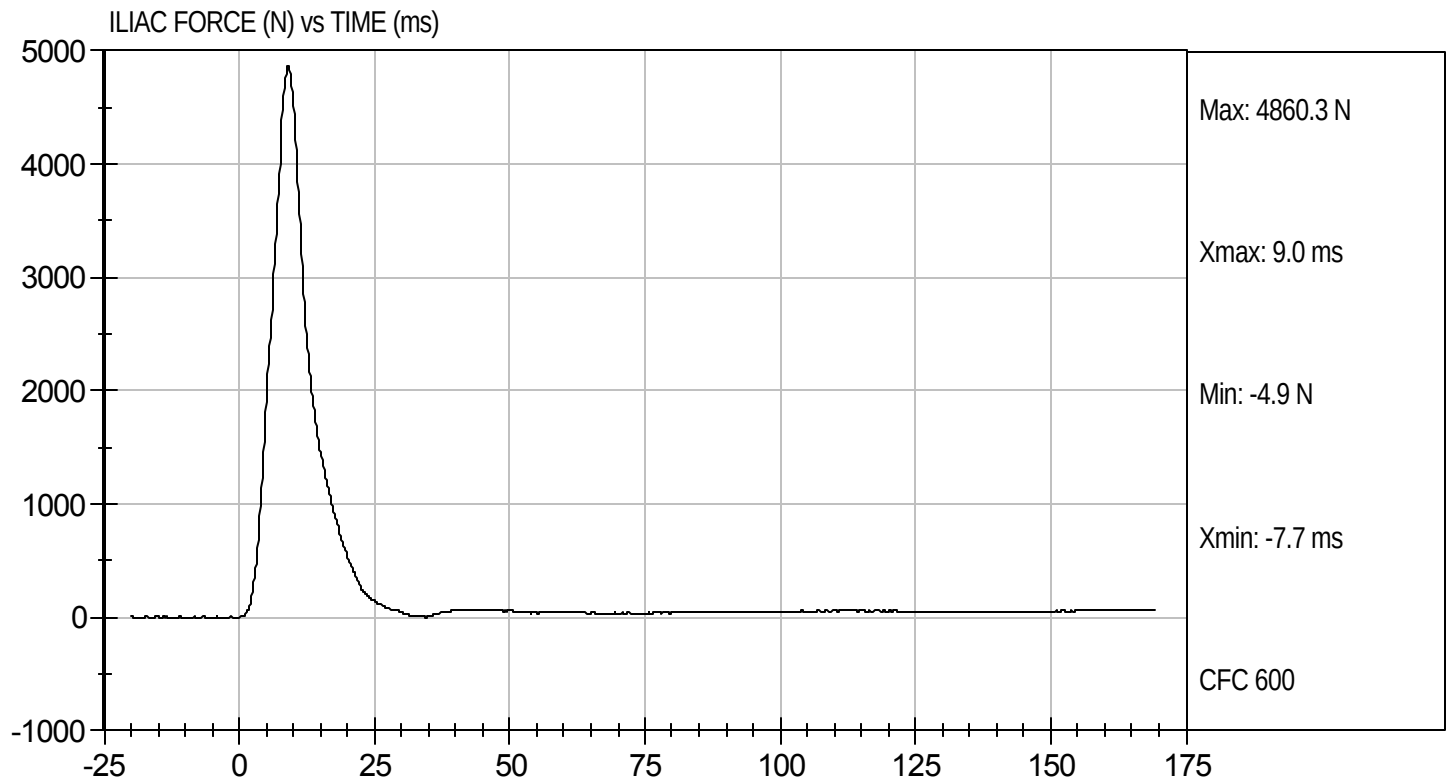
Test Date: 12/21/11
Velocity: 14.37 ft/s, 4.38 m/s





Test Desc: Iliac Impact
Component ID: D114348

Test Date: 12/21/11
Velocity: 14.37 ft/s, 4.38 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	12/06/11
				Y	P67886	Endevco	12/06/11
				Z	P67887	Endevco	12/06/11
Head Accelerometers				X	P67888	Endevco	12/06/11
				Y	P67889	Endevco	12/06/11
				Z	P67890	Endevco	12/06/11
Displacement Potentiometers	Thoracic Rib	Upper	Y	G1187	FTSS	12/06/11	
		Middle	Y	G1261	FTSS	12/06/11	
		Lower	Y	G1270	FTSS	12/06/11	
	Abdominal Rib	Upper	Y	G1287	FTSS	12/06/11	
		Lower	Y	G1304	FTSS	12/06/11	
Lower Spine Accelerometers (T12)				X	P67893	Endevco	12/06/11
				Y	P67894	Endevco	12/06/11
				Z	P67895	Endevco	12/06/11
Acetabulum Load Cell				Y	ACG111	FTSS	05/20/11
Iliac Wing Load Cell				Y	IWG226	FTSS	05/20/11
Pelvis Plug (struck side)					47407	FTSS	10/18/11
Pelvis Plug (non-struck side)					46406	FTSS	09/22/11

Table 3 – Vehicle Instrumentation

		Serial Number	Manufacturer	Calibration Date
Vehicle Center of Gravity	X	P59624	Endevco	09/13/11
Vehicle Center of Gravity	Y	P59623	Endevco	09/13/11
Vehicle Center of Gravity	Z	P59625	Endevco	09/13/11
Right Sill at Front Seat	X	P63503	Endevco	10/25/11
Right Sill at Front Seat	Y	P63505	Endevco	10/25/11
Right Sill at Front Seat	Z	P63504	Endevco	10/25/11
Right Sill at Rear Seat	X	P63536	Endevco	08/01/11
Right Sill at Rear Seat	Y	P63535	Endevco	08/01/11
Right Sill at Rear Seat	Z	P63534	Endevco	08/01/11
Left Sill at Front Door	Y	P59365	Endevco	07/01/11
Left Sill at Rear Door	Y	P47881	Endevco	11/04/11
Left A-Post Lower	Y	P59634	Endevco	11/04/11
Left A-Post Middle	Y	P52186	Endevco	08/22/11
Left B-Post Lower	Y	P47111	Endevco	09/12/11
Left B-Post Middle	Y	P59376	Endevco	10/20/11
Front Seat Track	Y	P59352	Endevco	07/07/11
Rear Seat Track or Structure	Y	P55674	Endevco	07/07/11
Right Rear Occ. Compartment	Y	P45392	Endevco	09/12/11
Engine Block	X	P59653	Endevco	10/20/11
Engine Block	Y	P59652	Endevco	10/20/11
Rear Floorpan Above Axle	X	P59265	Endevco	08/22/11
Rear Floorpan Above Axle	Y	P59264	Endevco	08/22/11
Rear Floorpan Above Axle	Z	P59266	Endevco	08/22/11

Table 4 – MDB Instrumentation

		Serial Number	Manufacturer	Calibration Date
MDB Center of Gravity	X	P63411	Endevco	07/08/11
MDB Center of Gravity	Y	P63412	Endevco	07/08/11
MDB Center of Gravity	Z	P63413	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