

REPORT NUMBER: SINCAP-MGA-2012-012

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

**CHRYSLER GROUP LLC
2012 Dodge Journey SXT FWD SUV
NHTSA No.: MC0320**

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



Test Date: October 7, 2011


Final Report Date: November 4, 2011

FINAL REPORT

**U.S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Office of Crashworthiness Standards
Mail Code: NVS-111
1200 New Jersey Ave, SE
Room W43-410
Washington, DC 20590**

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Approved by: 
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Approval Date: November 4, 2011

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: _____

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

Date: _____

Technical Report Documentation Page

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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 October 7 to November 4, 2011																												
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15. Supplementary Notes																														
16. Abstract A 55/28 km/h 90° Moving Deformable Barrier NCAP Side Impact Test was conducted on the subject 2012 Dodge Journey SXT FWD SUV in accordance with the specifications of the Office of Crashworthiness Standards NCAP Side Laboratory Test Procedure for the generation of consumer information on vehicle side crash protection. The test was conducted at MGA Research Corporation, in Burlington, Wisconsin, on October 7, 2011. The impact velocity of the Moving Deformable Barrier (MDB) was 62.1 km/h, and the ambient temperature at the struck (driver's) side of the target vehicle at the time of impact was 21°C. The target vehicle post-test maximum crush was 183 mm at level 3. The test vehicle's performance was as follows:																														
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The two doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite doors did not open during the side impact event.																														
17. Key Words New Car Assessment Program (NCAP) Side Impact MDB ES-2re SID-IIs		18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Administration Technical Information Services Division, NPO-411 1200 New Jersey Ave, SE, Room E12-100 Washington, DC 20590 Email: tis@nhtsa.dot.gov FAX: 202-493-2833																												
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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 Dodge Journey SXT FWD SUV. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Side NCAP Laboratory Test Procedure dated August 2011.

SECTION 2 SUMMARY OF TEST RESULTS

A 2012 Dodge Journey SXT FWD SUV was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 62.1 km/h (38.6 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 October 7, 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

Measurement Description	Driver ATD (ES-2re)		
	Units	Threshold	Result
Head Injury Criteria (HIC ₃₆)	N/A	1000	68
Maximum Thorax Rib Deflection	mm	44	19
Combined Abdominal Force	N	2500	570
Pubic Symphysis Force	N	6000	1491

Measurement Description	Passenger ATD (SID-IIs)		
	Units	Threshold	Result
Head Injury Criteria (HIC ₃₆)	N/A	1000	133
Resultant Lower Spine Acceleration	Gs	82	46
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	4571
Maximum Thoracic Rib Deflection	mm	38*	30
Maximum Abdomen Rib Deflection	mm	45*	34

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

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

GENERAL COMMENTS

There was no valid data collected for:
Left Lower A-Post Y
Left Mid B-Post Y after 13 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 Dodge Journey SXT FWD SUV
Test Program: NCAP Side MDB Impact Test

NHTSA No. MC0320
Test Date: 10/07/2011

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	MC0320	Traction Control System (TCS)	Yes
Model Year	2012	Auto-Leveling System	No
Make	Dodge	Automatic Door Locks (ADL)	Yes
Model	Journey	Power Window Auto-Reverse	No
Body Style	SUV	Other Optional Feature	N/A
VIN	3C4PDCBG7CT142741	Driver Front Airbag	Yes
Body Color	Bright Silver Metallic	Driver Curtain Airbag	Yes
Odometer Reading (km/mi)	291 / 181	Driver Head/Torso Airbag	No
Engine Displacement (L)	3.6	Driver Torso Airbag	Yes
Type/No. Cylinders	6	Driver Torso/Pelvis Airbag	No
Engine Placement	Lateral	Driver Pelvis Airbag	No
Transmission Type	Automatic	Driver Knee Airbag	Yes
Transmission Speeds	6	Rear Pass. Curtain Airbag	Yes
Overdrive	Yes	Rear Pass. Head/Torso Airbag	No
Final Drive	Front	Rear Pass. Torso Airbag	No
Roof Rack	Yes	Rear Pass. Torso/Pelvis Airbag	No
Sunroof/T-Top	No	Rear Pass. Pelvis Airbag	No
Running Boards	No	Driver Seat Belt Pretensioner	Yes
Tilt Steering Wheel	Yes	Rear Pass. Seat Belt Pretensioner	No
Power Seats	No	Driver Load Limiter	Yes
Anti-Lock Brakes (ABS)	Yes	Rear Pass. Load Limiter	No
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	Chrysler Group LLC	GVWR (kg)	2314
Date of Manufacture	7-11	GAWR Front (kg)	1248
Vehicle Type	MPV	GAWR Rear (kg)	1316

VEHICLE SEATING AND WEIGHT CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity (DSC)	2	3		5	
Capacity Weight (VCW) (kg)				392	(A)
DSC x 68.04 kg				340	(B)
Rated Cargo and Luggage Weight (RCLW)				52	(A-B)

VEHICLE SEAT TYPE

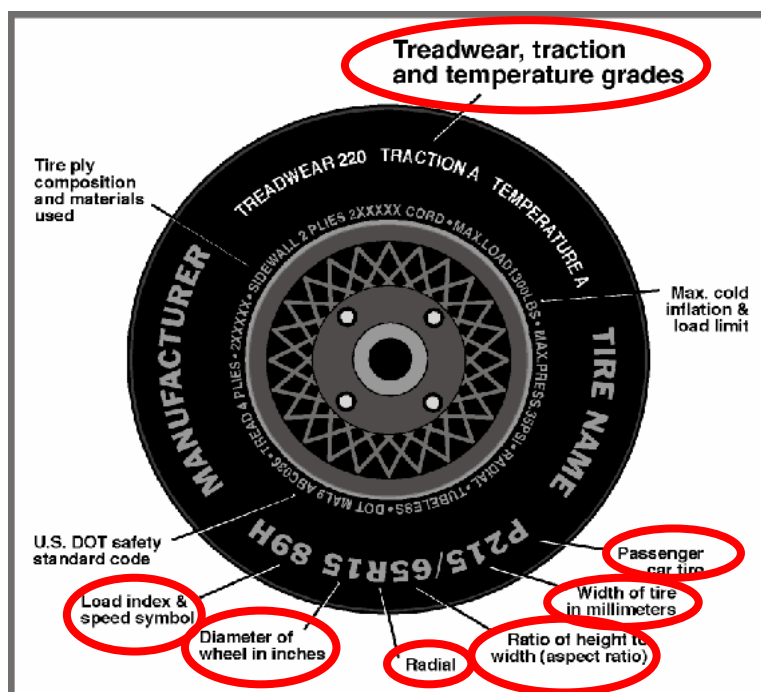
Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable	
						Manual	Power
Front Seat	X					w/lever	
Rear or Second Row			X			w/lever	
Third Row Seat							

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

Test Vehicle: 2012 Dodge Journey SXT FWD SUV
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NHTSA No. MC0320
 Test Date: 10/07/2011

VEHICLE TIRE INFORMATION



TIRE PLACARD INFORMATION

Measured Parameter	Front	Rear
Recommended Cold Tire Pressure (kPa)	250	250
Recommended Tire Size	P225/65R17	P225/65R17

TIRE SIDEWALL INFORMATION

Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	300	300
Tire Size on Vehicle	P225/65R17	P225/65R17
Tire Manufacturer	Kumho	Kumho
Tire Name	Solus	Solus
Tire Type	Passenger	Passenger
Tire Width	225	225
Aspect Ratio	65	65
Radial	Yes	Yes
Wheel Diameter	17	17
Load Index/Speed Symbol	100T	100T
Treadwear	440	440
Traction Grade	A	A
Temperature Grade	A	A
Tire Material	Rubber	Rubber

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

Test Vehicle: 2012 Dodge Journey SXT FWD SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MC0320
 Test Date: 10/07/2011

TEST PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kpa	250	250	250	250
Tire Placard	kpa	250	250	250	250
Owner's Manual	kpa				
As Tested	kpa	250	250	250	250

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	551.6	385.6		589.2	460.4		595.1	463.1	
Right	kg	509.8	391.0		521.2	441.8		516.7	444.1	
Ratio	%	57.7	42.3		55.2	44.8		55.1	44.9	
Totals	kg	1061.4	776.6	1838.0	1110.4	902.2	2012.6	1111.8	907.2	2019.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1838.0	(A)
Sum of Actual Weight of 2 P572 ATDs Used	kg	129.3	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	52	(C)
Calculated Vehicle Target Weight (TVTW)	kg	2019.3	(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	32.2
Right tail light, right side mirror, jack & tools	19.5

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

Test Vehicle: 2012 Dodge Journey SXT FWD SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MC0320
 Test Date: 10/07/2011

TEST VEHICLE ATTITUDES AND CG

	Units	Fully Loaded	As Tested	Meets Requirement***
Left Front	mm	795	796	Yes
Right Front	mm	798	798	Yes
Right Rear	mm	796	796	Yes
Left Rear	mm	788	795	Yes
Vehicle CG (Aft of Front Axle)	mm	1303	1300	
Vehicle CG (Left (+) / Right (-) from Longitudinal Centerline)	mm	38	34	

*** 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 Dodge Journey SXT FWD SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MC0320
 Test Date: 10/07/2011

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	19.8	16.2	18.0
Front Passenger Seat	Fixed	Fixed	Fixed
Front Center Seat			
Struck Side Rear Seat	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed
Rear Center Seat			

SEAT HEIGHT AND ANGLE

Seat	As Tested SCRL Angle (Mid) (°)	As Tested SCRP Height (mm)	SCRP Height Position	SCRP Height (mm)		
				Rear-most	Mid-Fore/Aft	Forward-Most
Driver Seat	18.0	N/A	Max	N/A	N/A	N/A
	18.0	N/A	Mid	N/A	N/A	N/A
	18.0	N/A	Min	N/A	N/A	N/A
Front Passenger Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
	Fixed	Fixed	Mid	Fixed	Fixed	Fixed
	Fixed	Fixed	Min	Fixed	Fixed	Fixed
Front Center Seat			Max			
			Mid			
			Min			
Struck Side Rear Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
	Fixed	Fixed	Mid	Fixed	Fixed	Fixed
	Fixed	Fixed	Min	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
	Fixed	Fixed	Mid	Fixed	Fixed	Fixed
	Fixed	Fixed	Min	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
	Fixed	Fixed	Mid	Fixed	Fixed	Fixed
	Fixed	Fixed	Min	Fixed	Fixed	Fixed

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

Test Vehicle: 2012 Dodge Journey SXT FWD SUV
 Test Program: NCAP Side MDB Impact Test

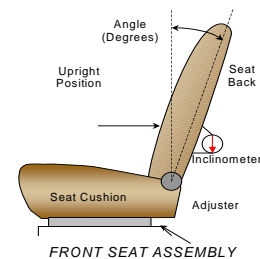
NHTSA No. MC0320
 Test Date: 10/07/2011

SEAT FORE/AFT POSITIONS

Seat	Total Fore/Aft Travel		Test Position from Forward-most Position	
	mm	Detents	mm	Detent
Driver Seat	232	35 (1 st as 1)	116	17 th (1 st as 0)
Front Passenger Seat	232	35 (1 st as 1)	116	17 th (1 st as 0)
Front Center Seat				
Struck Side Rear Seat	120	13 (1 st as 1)	120	12 th (1 st as 0)
Non-Struck Side	120	13 (1 st as 1)	120	12 th (1 st as 0)
Rear Center Seat	120	13 (1 st as 1)	120	12 th (1 st as 0)

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 positioned such that the dummy's head is level. The rear center and non-struck side rear outboard seat backs are positioned in a similar manner as the struck-side rear seat back.



Seat	Total Seat Back Angle Range		Test Position from Vertical	
	Degrees	Detents	Degrees	Detent
Driver Seat w/Seated Dummy	NA		13.6	
Front Passenger Seat	73.6		13.4	9 th (1 st as 0)
Front Center Seat				
Struck Side Rear Seat	20.0		1.9	0 (1 st as 0)
Non-Struck Side Rear Seat	20.0		1.9	0 (1 st as 0)
Rear Center Seat				

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

Test Vehicle: 2012 Dodge Journey SXT FWD SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MC0320
 Test Date: 10/07/2011

SEAT BELT ANCHORAGE ADJUSTMENT

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

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

HEAD RESTRAINT ADJUSTMENT

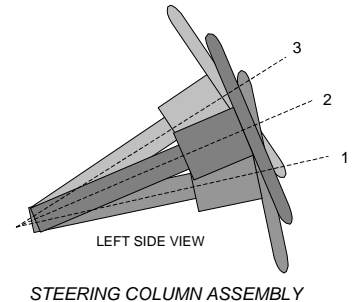
The driver's head restraint is adjusted to the highest and most full forward in-use position. The struck-side rear passenger's head restraint is adjusted to the lowest and most full forward in-use position.

	Total # of Positions	Placed in Position #
Driver Seat	5	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.

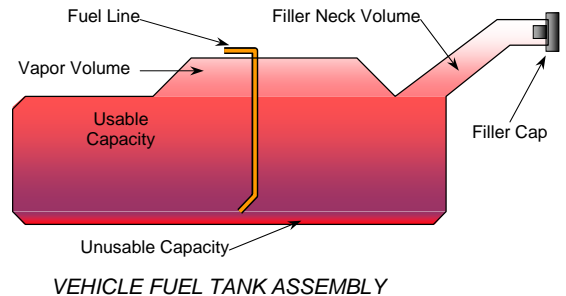
	Degrees	Fore/Aft Position (mm)
Lowermost, Position 1	70.0	233
Geometric Center, Position 2	67.0	209
Uppermost, Position 3	64.0	185
Telescoping Steering Wheel Travel		48
Test Position	67.0	209



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. The pump starts pumping fuel when the key is in the 'run' position. (Push the button twice to set the engine in the run position.) 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 Dodge Journey SXT FWD SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MC0320
 Test Date: 10/07/2011

FUEL TANK CAPACITY DATA

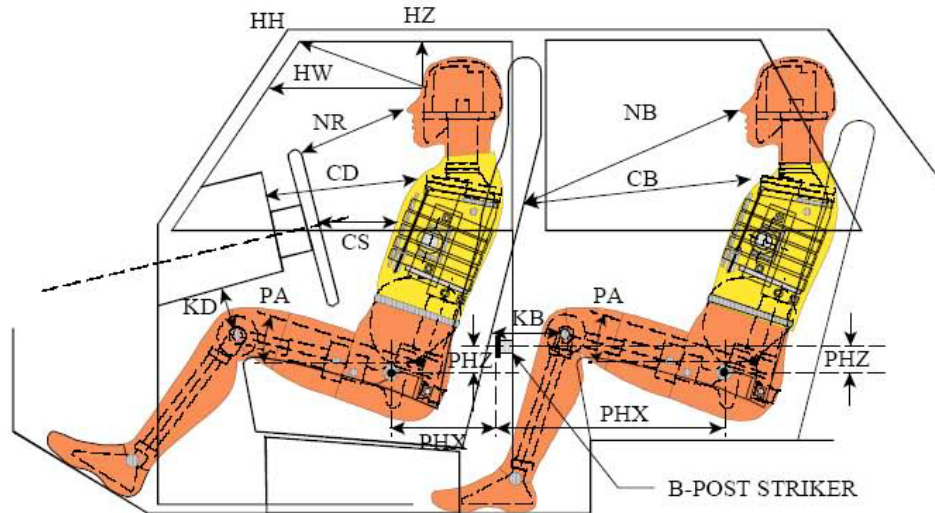
	Liters
Usable Capacity of "Standard" Tank (see Form No. 1)	77.6
Usable Capacity of "Optional" Tank (see Form No. 1)	
Usable Capacity of Standard Tank as Specified in Owner's Manual	77.6
Usable Capacity of Optional Tank as Specified in Owner's Manual	
93% of Usable Capacity	72.1
Actual Amount of Solvent Used	72.1
1/3 of Usable Capacity	25.9

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 Dodge Journey SXT FWD SUV
Test Program: NCAP Side MDB Impact Test

NHTSA No. MC0320
Test Date: 10/07/2011



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

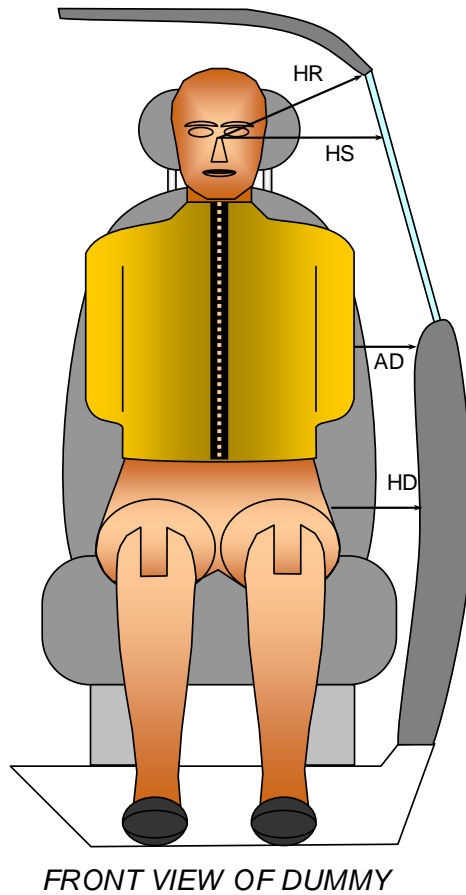
DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Pass. Code	Measurement Description	Driver S/N 032		Passenger S/N 306	
			Length (mm)	Angle(°)	Length (mm)	Angle(°)
HH		Head to Header	449	14.7		
HW		Head to Windshield	797			
HZ	HZ	Head to Roof Liner	221		308	
NR	NB	Nose to Rim/Seat Back	473	22.3	486	16.3
CD	CB	Chest to Dashboard/Seat Back	576	3.4	489	12.1
CS		Chest to Steering Wheel	355	11.9		
KDL	KBL	Left Knee to Dash/Seat Back	182	21.2	247	21.6
KDR	KBR	Right Knee to Dash/Seat Back	150	23.0	253	24.8
PAX	PAX	Pelvic Tilt Angle X		24.4		18.8
	PAY	Pelvic Tilt Angle Y		1.4		
PHX	PHX	Hip Point to Striker (X-Axis)	179		311	
PHZ	PHZ	Hip Point to Striker (Z-Axis)	128		211	

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

Test Vehicle: 2012 Dodge Journey SXT FWD SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MC0320
 Test Date: 10/07/2011



FRONT VIEW OF DUMMY

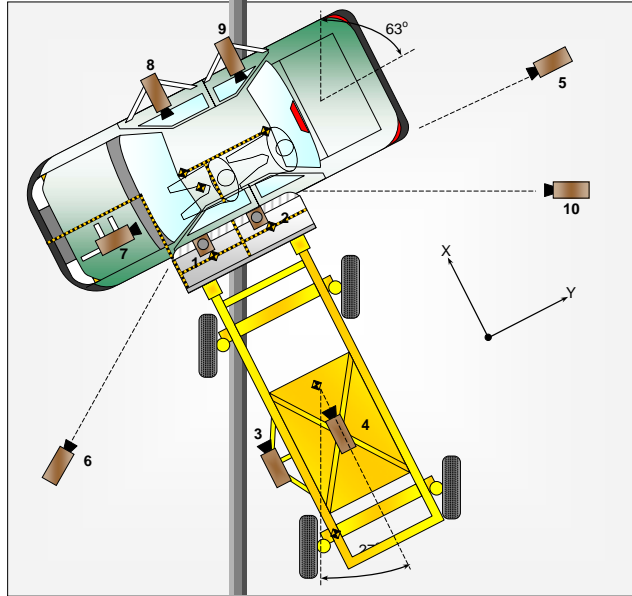
DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

Code	Measurement Description	Units	Driver S/N 032	Passenger S/N 306
HR	Head to Side Header	mm	212	258
HS	Head to Side Window	mm	351	359
AD	Arm to Door	mm	78	140
HD	Hip Point to Door	mm	149	154

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

Test Vehicle: 2012 Dodge Journey SXT FWD SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MC0320
 Test Date: 10/07/2011



CAMERA LOCATIONS AND DATA

No.	Camera View	Coordinates (mm)			Lens Length (mm)	Operating Frame Rate (fps)
		X*	Y*	Z*		
1	Overhead Overall	-120	190	-5050	14	1000
2	Overhead Close-Up	40	20	-5050	20	1000
3	Left Impact Point (MDB)				50	1000
4	Side Overall (MDB)				16	1000
5	Rear	30	5090	-1090	24	1000
6	Left Front	4220	-4390	-1080	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

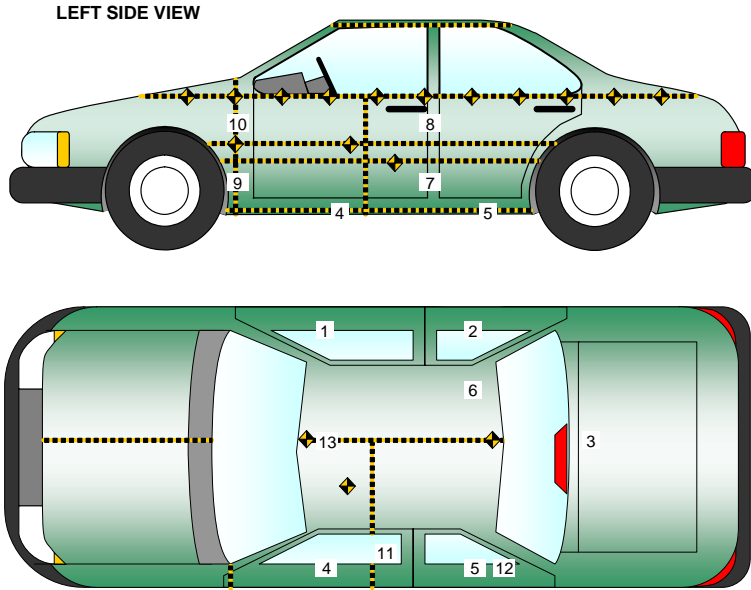
INSTRUMENTATION

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 Dodge Journey SXT FWD SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MC0320
 Test Date: 10/07/2011



TEST VEHICLE ACCELEROMETER LOCATIONS

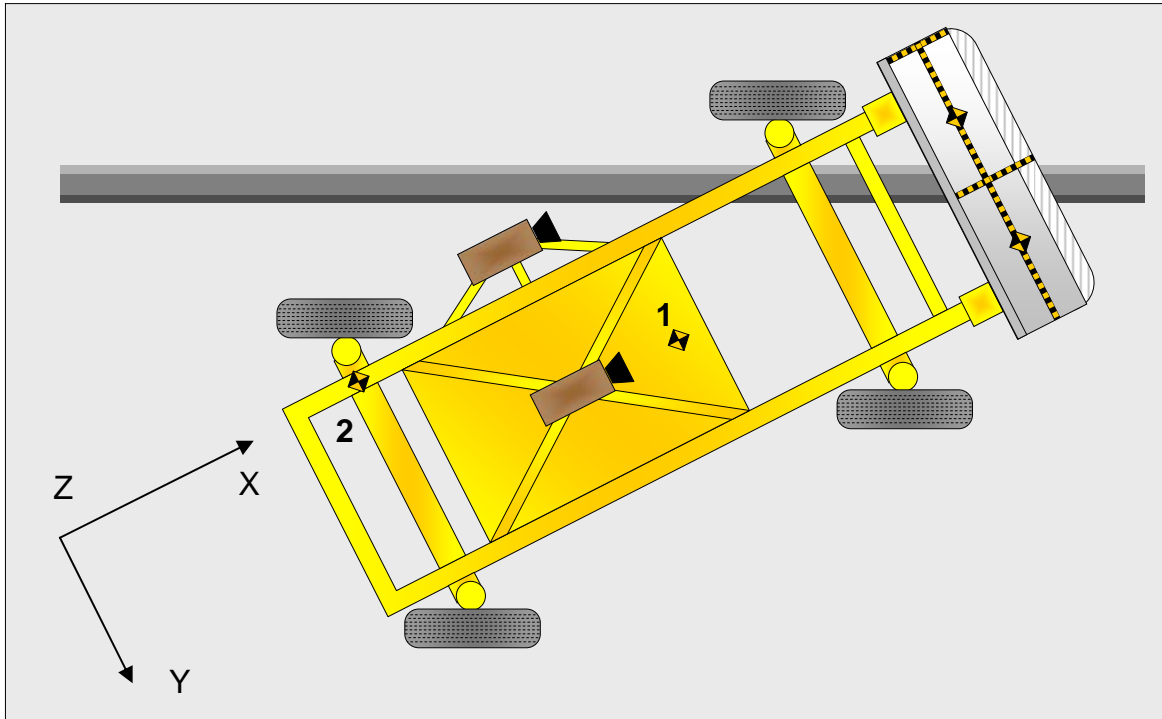
Accelerometer Location				
No.	ID	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2766	-58	-460
2	Right Sill at Front Seat	2538	720	-275
3	Right Sill at Rear Seat	1664	715	-290
4	Left Sill at Front Door	2828	-720	-260
5	Left Sill at Rear Door	1770	-715	-285
6	Left Lower A-Post	3288	-696	-646
7	Left Middle A-Post	3304	-827	-885
8	Left Lower B-Post	2203	-735	-614
9	Left Middle B-Post	2203	-728	-905
10	Front Seat Track	2371	-540	-445
11	Rear Seat Structure	1872	-561	-510
12	Rt. Rear Occ. Compartment	2045	404	-228
13	Engine Block	4148	0	-963
14	Rear Above Axle	876	0	-607

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 Dodge Journey SXT FWD SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MC0320
 Test Date: 10/07/2011



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 Dodge Journey SXT FWD SUV
Test Program: NCAP Side MDB Impact Test

NHTSA No. MC0320
Test Date: 10/07/2011

TEST DUMMY INFORMATION AND CONTACT POINTS

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

POST-TEST DOOR PERFORMANCE

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

POST-TEST SEAT PERFORMANCE

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

POST-TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	No Separation
Sill Separation	None
Windshield Damage	None
Side Window Damage	Left Front and Left Rear Window Broke
Other Notable Effects	None

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

Test Vehicle: 2012 Dodge Journey SXT FWD SUV
Test Program: NCAP Side MDB Impact Test

NHTSA No. MC0320
Test Date: 10/07/2011

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Struck Side Driver		Struck Side Rear Passenger	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	No		
Knee Airbag	Yes	No		
Side Curtain Airbag	Yes	Yes	Yes	Yes
Side Torso Airbag	Yes	Yes	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		2900
Vertical Impact Reference Line (Aft of Front Axle) (Intended Impact Point)	mm		508
Actual Impact Point (Aft of Front Axle)	mm		527
Horizontal Offset (+forward / -rearward)	mm	+/- 50 of intended impact point	-19
Vertical Offset (+down / -up)	mm	+/- 20 of intended impact point	8

DATA SHEET NO. 9
MDB SUMMARY OF RESULTS

Test Vehicle: 2012 Dodge Journey SXT FWD SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MC0320
 Test Date: 10/07/2011

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	62.1
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	62.2
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	91.1
MDB Forward Line of Motion to Target Vehicle CL	degrees	62.5 to 63.5	63.0
MDB Crabbed Angle to MDB Forward Line of Motion	degrees	26 to 28	26.9

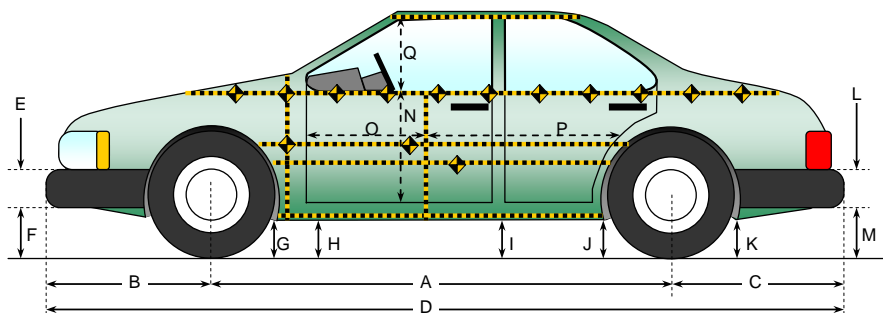
MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE

Row	Vertical Location		From Centerline		Maximum Crush
	Description	Height	Distance	Direction	
A	Center of Bumper	432	400	Right	225
B	Top of Bumper	533	800	Right	138
C	Mid-Level	686	600	Right	135
D	Top of Stack	813	100	Right	157

DATA SHEET NO. 10
TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2012 Dodge Journey SXT FWD SUV
Test Program: NCAP Side MDB Impact Test

NHTSA No. MC0320
Test Date: 10/07/2011



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

LEFT SIDE VIEW

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

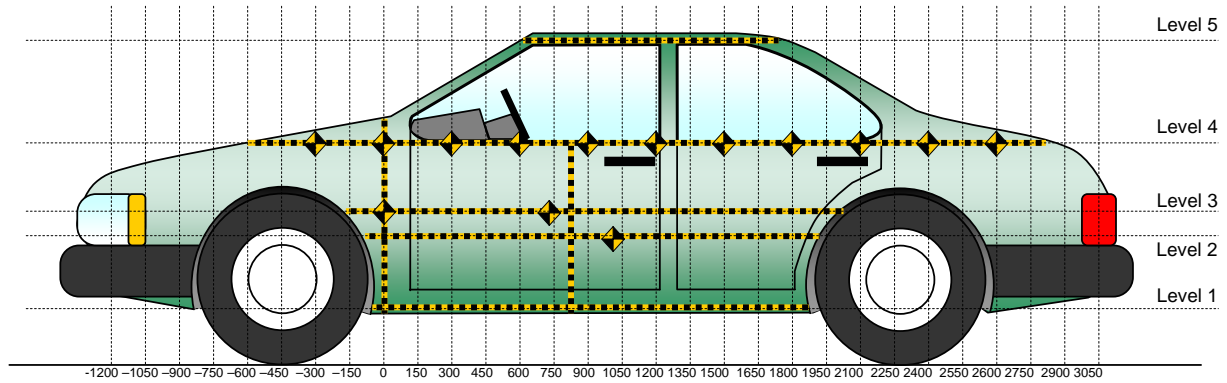
Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2900	2910	-10
B	Front Axle to FSOV	998	1024	-26
C	Rear Axle to RSOV	997	998	-1
D	Total Length at Centerline	4895	4932	-37
E	Front Bumper Thickness	100	100	0
F	Front Bumper Bottom to Ground	244	*	*
G	Sill Height at Front Wheel Well	232	227	5
H	Sill Height at Front Door Leading Edge	239	230	9
I	Sill Height at B Pillar	248	258	-10
J1	Sill Height at Rear Wheel Well	256	263	-7
J2	Pinch Weld Height at Rear Wheel Well	254	255	-1
K	Sill Height Aft of Rear Wheel Well	272	269	3
L	Rear Bumper Thickness	120	120	0
M	Rear Bumper Bottom to Ground	435	435	0
N	Sill Height to Window Bottom Sill	777	734	43
O	Front Door Leading Edge to Impact CL	839	787	52
P	Rear Door Trailing Edge to Impact CL	1305	1256	49
Q	Front Window Opening	500	497	3
R	Right Side Length	3860	3860	0
S	Left Side Length	3860	3855	5
T	Vehicle Width at B Post	1830	1722	108

*Bumper fell off during impact.

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

Test Vehicle: 2012 Dodge Journey SXT FWD SUV
Test Program: NCAP Side MDB Impact Test

NHTSA No. MC0320
Test Date: 10/07/2011



All Measurements Shown in mm

LEFT SIDE VIEW

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Measurement Description	Height Above Ground (mm)	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	312	57	1200
2	Occupant Hip Point	679	181	750
3	Mid Door	730	183	600
4	Window Sill	1051	105	1650
5	Window Top	1598	16	1350

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 Dodge Journey SXT FWD SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MC0320
 Test Date: 10/07/2011

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900				338					340					2	
-750				316					318					2	
-600				295					300					5	
-450				279					288					9	
-300				266					278					12	
-150		170	175	254			185	192	270			15	17	16	
0	221	195	192	246		235	195	202	264		14	0	10	18	
150	222	193	190	240		245	340	332	262		23	147	142	22	
300	221	192	188	233		251	343	338	265		30	151	150	32	
450	220	192	187	228		257	342	357	267		37	150	170	39	
600	219	192	187	222		262	363	370	270		43	171	183	48	
750	219	192	187	216	454	268	373	369	271	462	49	181	182	55	8
900	220	193	189	212	455	272	366	357	275	461	52	173	168	63	6
1050	222	196	191	210	454	277	326	315	268	465	55	130	124	58	11
1200	224	198	194	210	454	281	348	341	293	469	57	150	147	83	15
1350	226	202	197	211	456	282	364	370	300	472	56	162	173	89	16
1500	230	206	201	213	458	284	355	370	317	473	54	149	169	104	15
1650	235	211	205	216	462	285	348	367	321	474	50	137	162	105	12
1800	240	215	210	220	465	288	353	354	290	477	48	138	144	70	12
1950		190	205	225	469		321	340	268	477		131	135	43	8
2100			171	229	475			217	245	485			46	16	10
2250				236	479				250	489				14	10
2400				243	490				257	497				14	7
2550				251	501				262	508				11	7
2700				259	512				268	519				9	7
2850				267					274					7	

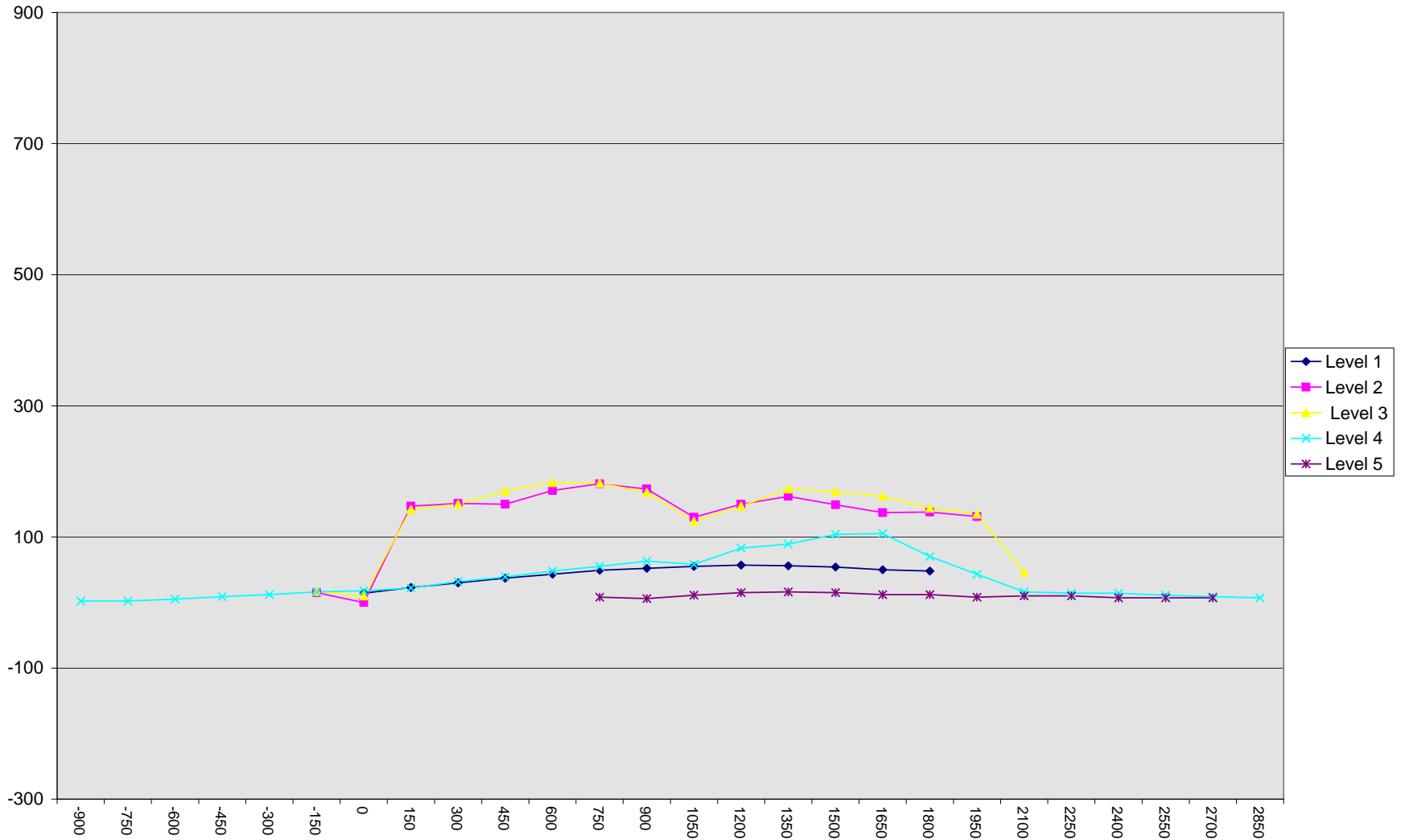
NOTE: Pre-test measurements are taken when the vehicle is in the "As Tested" weight condition. Vehicle measurements forward of the vertical impact reference line are negative. The crush profile grid is established prior to the test based on an estimated impact point.

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

Test Vehicle: 2012 Dodge Journey SXT FWD SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MC0320
 Test Date: 10/07/2011

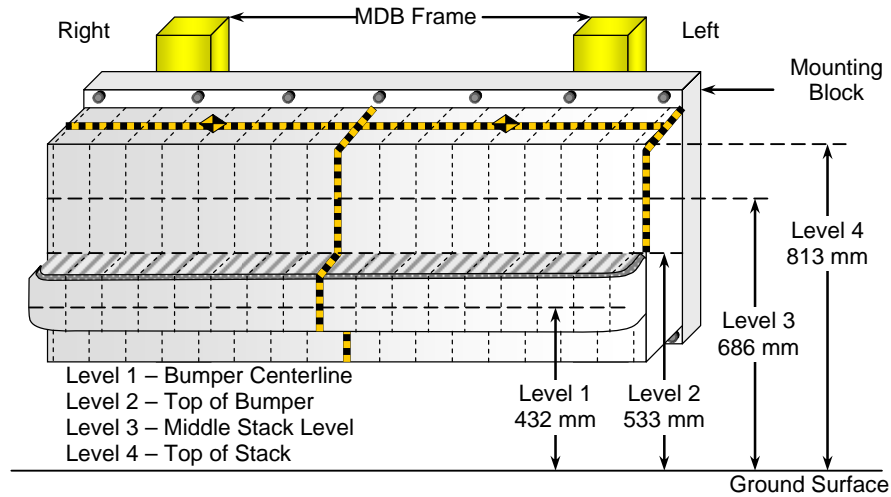
24



DATA SHEET NO. 12
MDB EXTERIOR STATIC CRUSH MEASUREMENTS

Test Vehicle: 2012 Dodge Journey SXT FWD SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MC0320
 Test Date: 10/07/2011



FRONT VIEW

DEFORMABLE BARRIER STATIC CRUSH

Stack Level	Distance Right of Center (mm)								C _L	Distance Left of Center (mm)							
	800	700	600	500	400	300	200	100		0	100	200	300	400	500	600	700
4	147	145	120	86	88	107	138	157	144	110	99	96	96	106	115	132	153
3	120	120	135	107	93	92	111	128	111	84	75	75	82	88	95	105	113
2	138	135	122	119	115	120	118	121	109	117	118	125	134	133	133	135	135
1	217	224	221	220	225	222	224	224	217	222	221	221	219	222	219	222	212

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

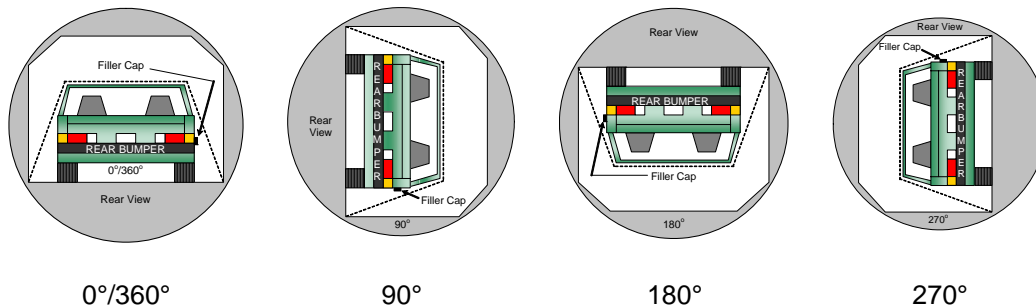
Test Vehicle: 2012 Dodge Journey SXT FWD SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MC0320
 Test Date: 10/07/2011

Test Time: 10:02 am Temperature: 21° 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°	117	300	417
90° to 180°	113	300	413
180° to 270°	109	300	409
270° to 360°	118	300	418

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

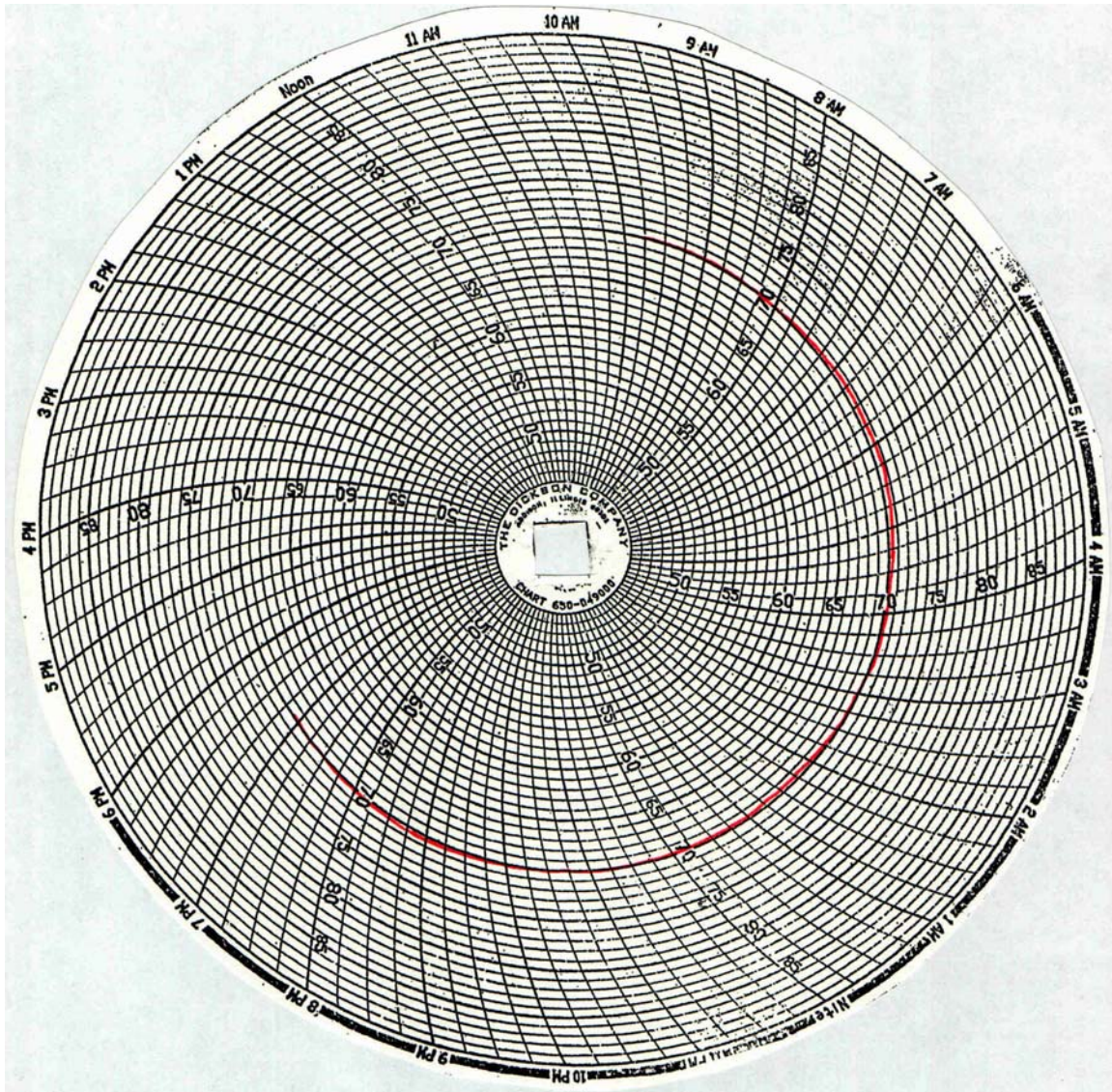
ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

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 Dodge Journey SXT FWD SUV
Test Program: NCAP Side MDB Impact Test

NHTSA No. MC0320
Test Date: 10/07/2011



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



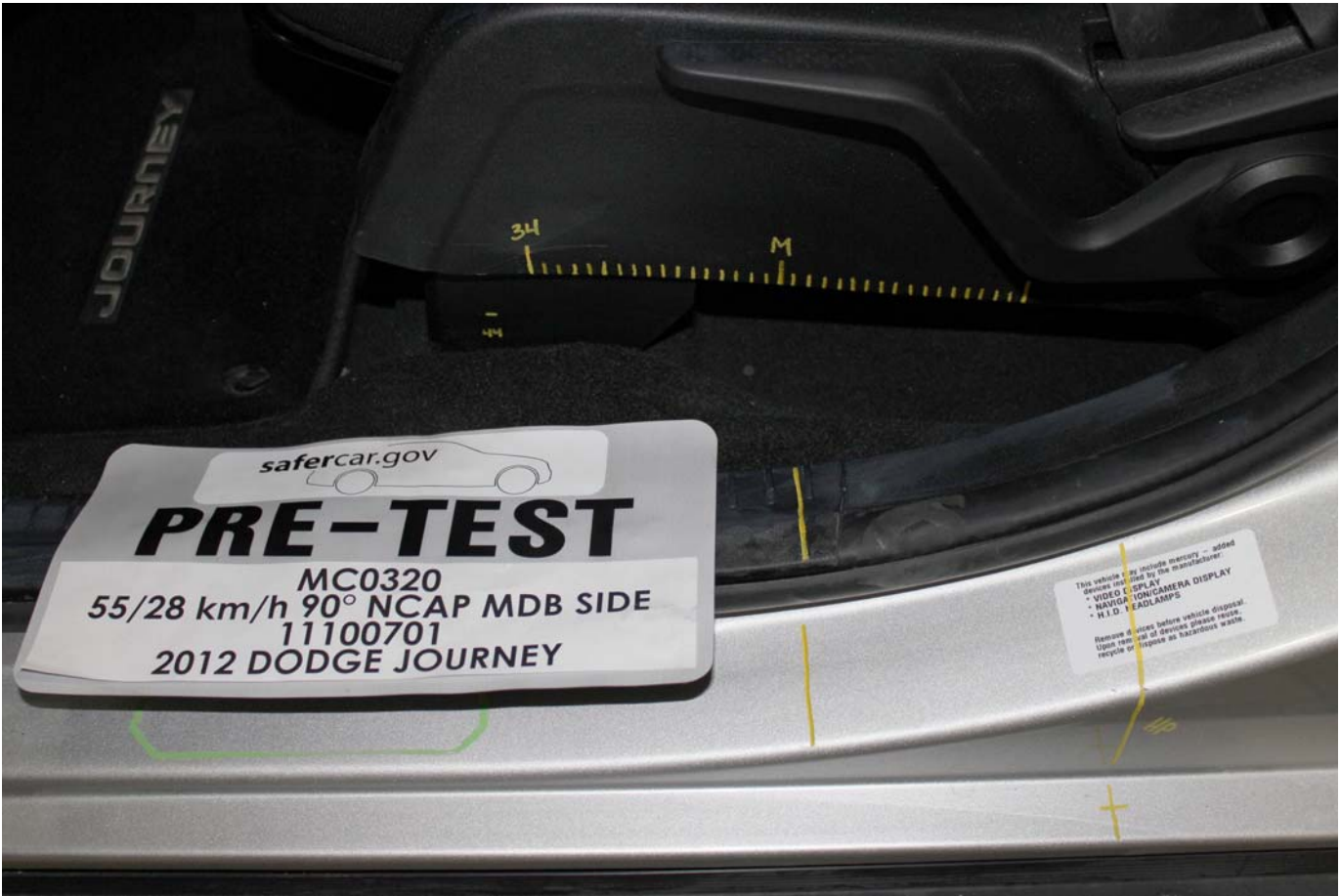
Pre-Test Left Side View of Steering Wheel



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 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

PHOTOGRAPH NOT APPLICABLE

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



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



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



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



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



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



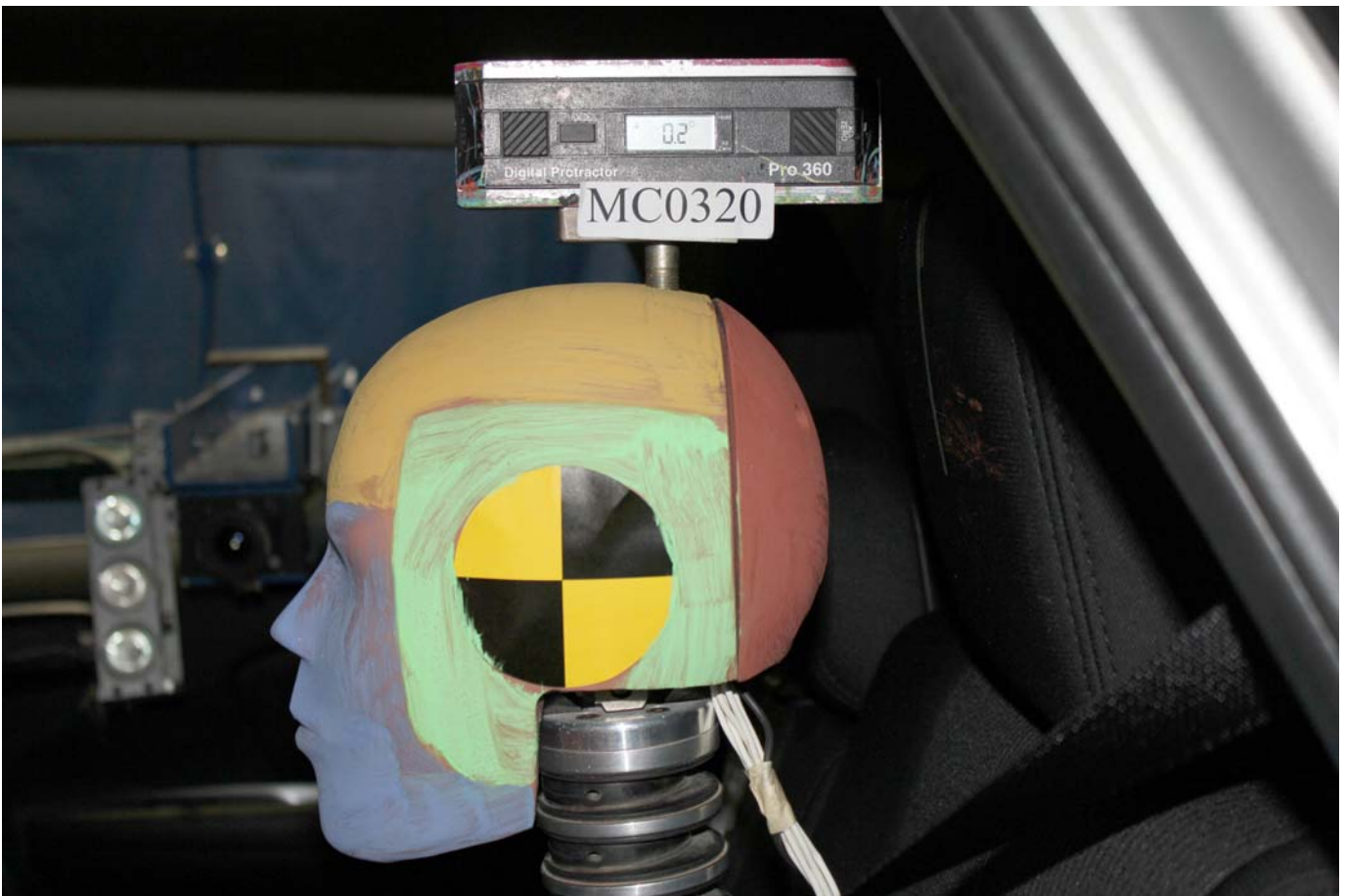
Pre-Test Overhead View of Rear Passenger Seat Pan Prior to Dummy Positioning



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



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



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



Pre-Test Placement of Rear Passenger Dummy's Feet



Pre-Test View of Belt Anchorage for Rear Passenger Dummy



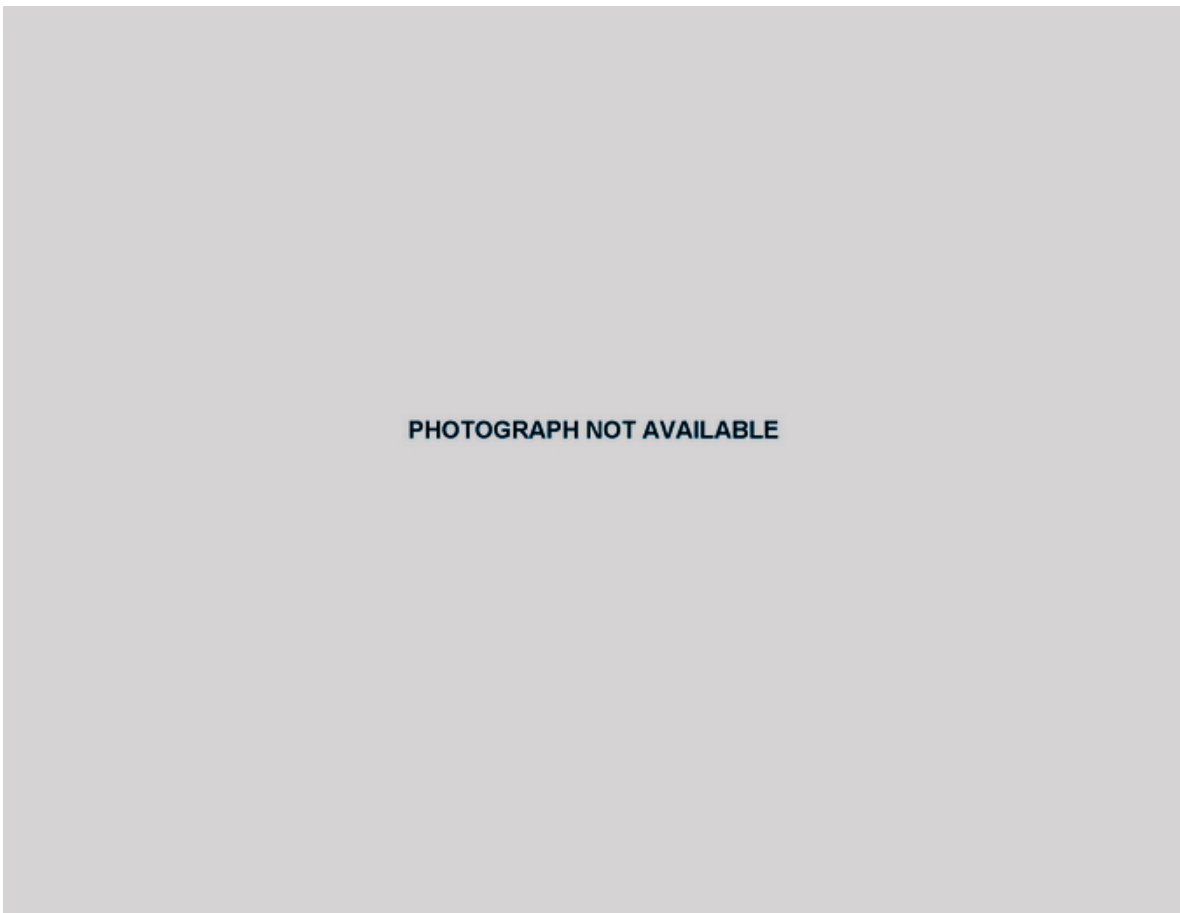
Pre-Test Close-Up Left Side View of Rear Passenger Seat Track



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



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



Pre-Test Rear Passenger Dummy and Door Clearance View



Post-Test Rear Passenger Dummy and Door Clearance View



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



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



Pre-Test Rear Passenger Inner Door Panel View



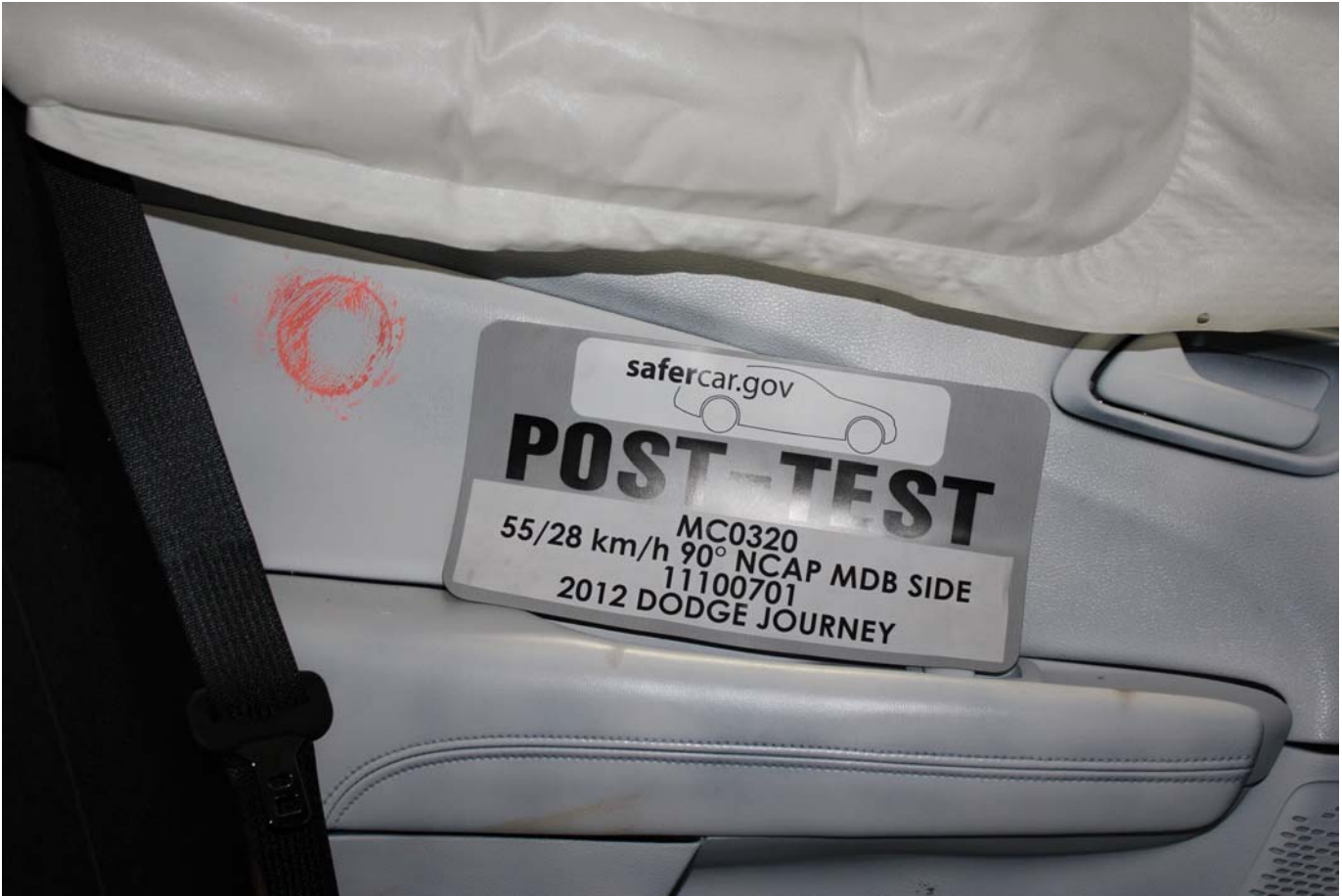
Post-Test Rear Passenger Inner Door Panel View



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



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



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

PHOTOGRAPH NOT APPLICABLE

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



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

PHOTOGRAPH NOT APPLICABLE

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



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



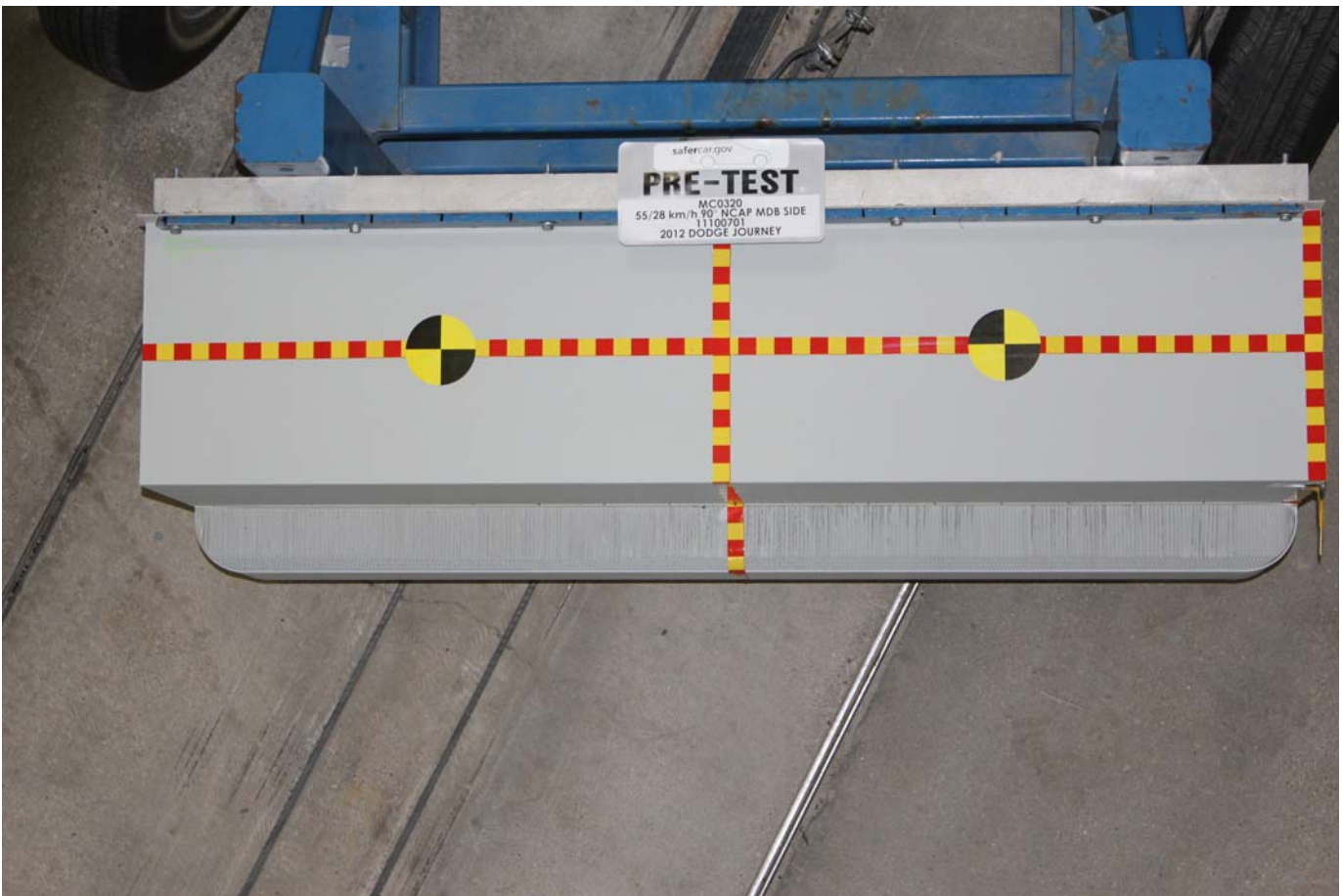
Post-Test View of Fuel Filler Cap or Fuel Filler Neck



Pre-Test Front View of MDB Impactor Face



Post-Test Front View of MDB Impactor Face



Pre-Test Top View of MDB Impactor Face



Post-Test Top View of MDB Impactor Face



Pre-Test Left Side View of MDB Impactor Face



Post-Test Left Side View of MDB Impactor Face



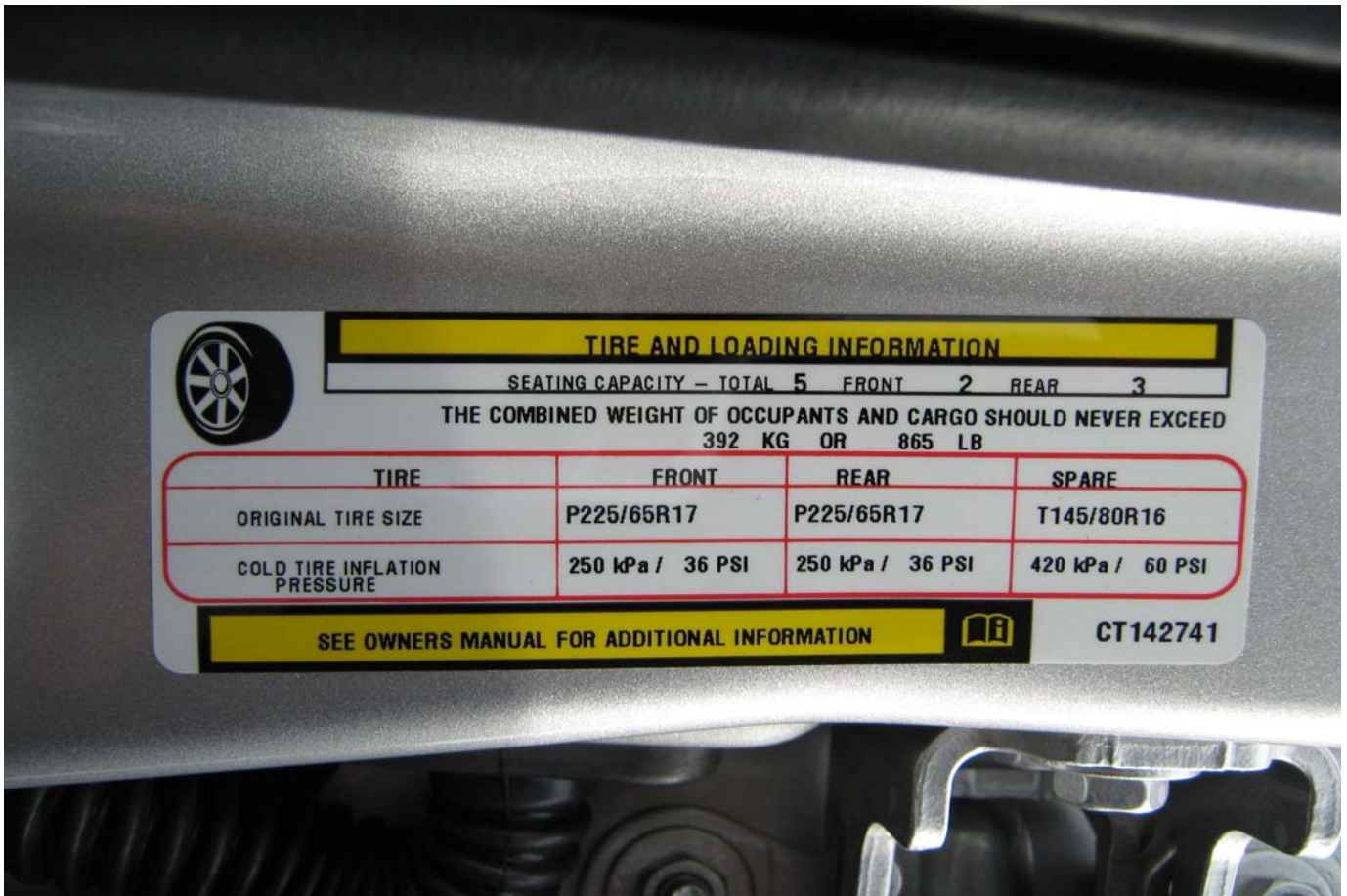
Pre-Test Right Side View of MDB Impactor Face



Post-Test Right Side View of MDB Impactor Face



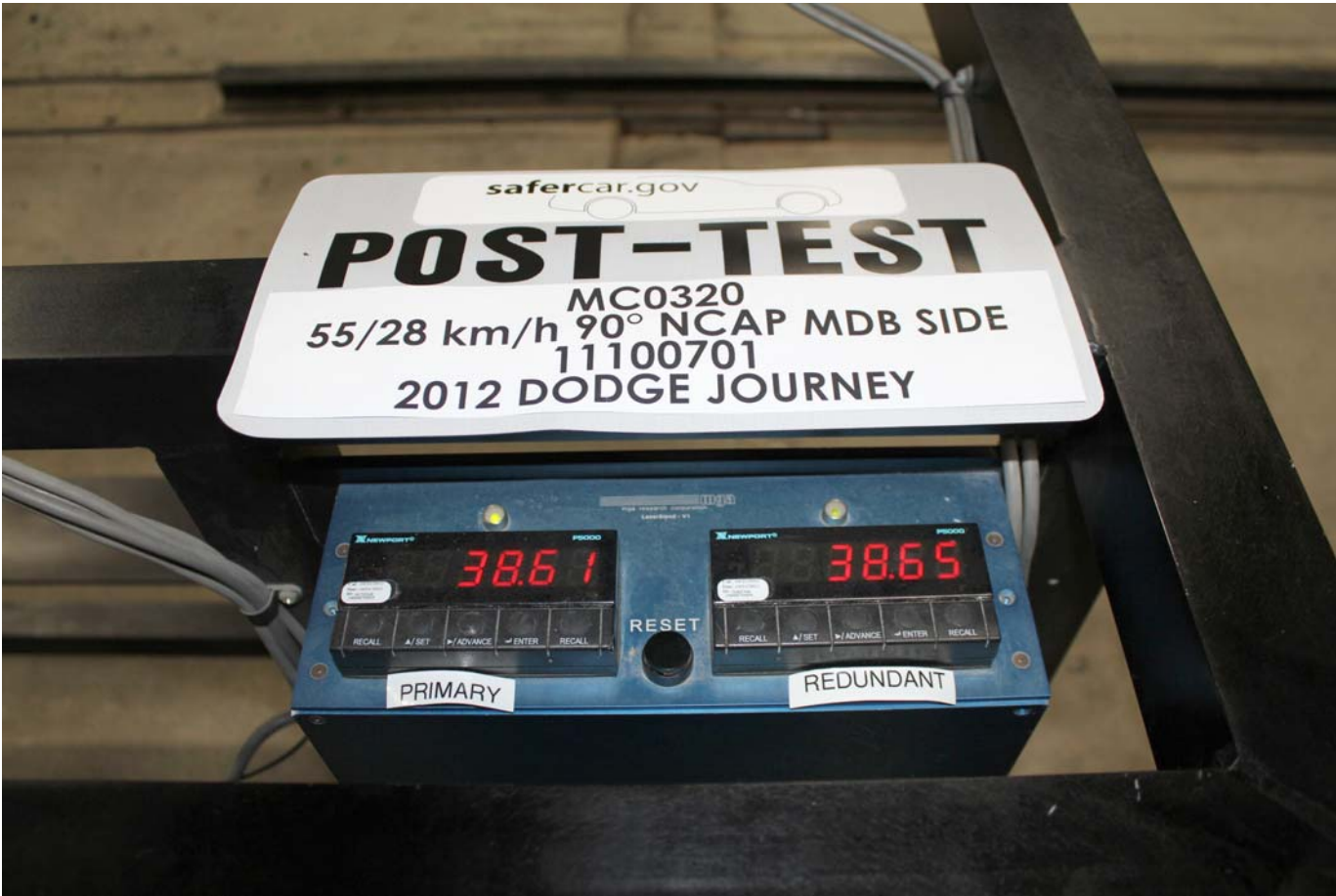
Close-Up View of Vehicle's Certification Label



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



Pre-Test Ballast View



Post-Test Primary and Redundant Speed Trap Read-Out



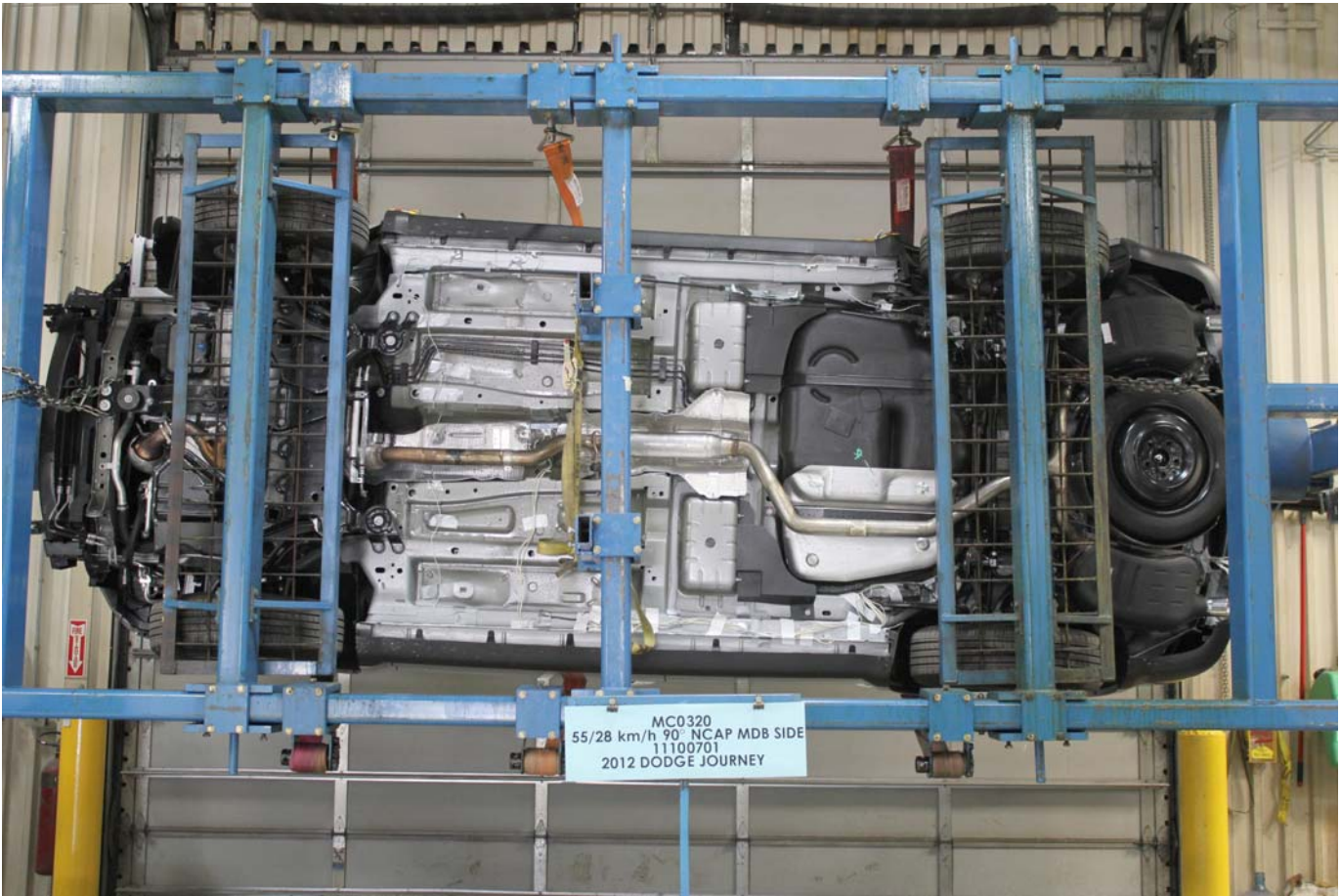
FMVSS No. 301 Static Rollover 0 Degrees



FMVSS No. 301 Static Rollover 90 Degrees



FMVSS No. 301 Static Rollover 180 Degrees



FMVSS No. 301 Static Rollover 270 Degrees



FMVSS No. 301 Static Rollover 360 Degrees



Impact Event

2012 DODGE JOURNEY SXT

THIS VEHICLE IS MANUFACTURED TO MEET SPECIFIC UNITED STATES REQUIREMENTS. THIS VEHICLE IS NOT MANUFACTURED FOR SALE OR REGISTRATION OUTSIDE OF THE UNITED STATES.

MANUFACTURER'S SUGGESTED RETAIL PRICE OF THIS MODEL INCLUDING DEALER PREPARATION

Base Price: \$24,495

DODGE JOURNEY MAINSTREET (FWD)
 Exterior Color: Bright Silver Metallic, Clear Coat Exterior Paint
 Interior Color: Black, Interior Color
 Interior: Premium Cloth, Low-Back Bucket Seats
 Engine: 2.6-Liter 185 24-Valve VPT Engine
 Transmission: 6-Speed Automatic 62TE Transmission

STANDARD EQUIPMENT (UNLESS REPLACED BY OPTIONAL EQUIPMENT)

FUNCTIONAL/SAFETY FEATURES

- Advanced Multistage Front Airbags
- Supplemental Side Curtain All Rows Airbags
- Supplemental Front Side Seat Airbags
- Active Head Restraints
- Child Seat Anchor System-LATCH Ready
- Anti-Lock 4-Wheel-Disc Brakes
- Height-Adjustable Front Shoulder Bolts
- Electronic Stability Program (ESP)
- Electronic Roll Mitigation
- Brake Assist
- Traction Control
- Speed Control
- Keyless Go
- Panama Proximity Keyless Entry
- Power Locks
- Sentry Key Throttle Return System
- Tire Pressure Monitoring Display
- Variable Intermittent Windshield Wipers
- Rear Window Defroster
- Audio Jack Input for Mobile Devices
- 20.5-Gallon Fuel Tank
- Front and Rear Floor Mats

INTERIOR FEATURES

- Air Conditioning with Dual Zone Temperature Control
- Second-Row In-Floor Storage Bins
- Rear Reclining / Fold-Flat Seat
- Full Length Floor Console Prem Arm Rest
- Driver Height Adjuster Seat
- Uconnect Touch 4.3S CD/MP3/SAT
- 4.3-Inch Touch-Screen Display

For more information visit: www.dodge.com Chrysler Group LLC
 or call 1-800-4ADODGE

EPA Fuel Economy Estimates

These estimates reflect new EPA methods beginning with 2008 models.

GASOLINE CITY MPG 17	Dual Fuel Vehicle* Gasoline-Ethanol (E85) Estimated Annual Fuel Cost \$2,250	GASOLINE HIGHWAY MPG 25
---------------------------------------	--	--

Expected range for most drivers 14 to 20 MPG

based on 15,000 miles at \$3.00 per gallon of gasoline

Expected range for most drivers 20 to 30 MPG

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

Combined Gasoline Fuel Economy
This vehicle **20**

10 20 30
AT SUVs

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

EXTERIOR FEATURES

- P225SR17 85W All Season Tearing Tires
- 17-Inch x 6.5-Inch Aluminum Wheels
- Power Heated Exterior Mirrors w/ Manual Fold-Away
- Fog Lamps
- Sunscreen Deep Tint Glass
- Bright Grille
- Dual Bright Exhaust Tips

OPTIONAL EQUIPMENT

Customer Preferred Package 288

DESTINATION CHARGE \$800

TOTAL PRICE: * \$25,295

WARRANTY COVERAGE

- 5-year or 100,000-mile Powertrain Limited Warranty.
- 3-year or 36,000-mile Basic Limited Warranty.
- 24-hour towing assistance; certain restrictions apply.
- Ask Dealer for a copy of the limited warranties or see your owner's manual for details.

5 YEAR/100,000 MILE POWERTRAIN WARRANTY

GOVERNMENT SAFETY RATINGS

Frontal Crash	Driver Passenger	Not Rated
Side Crash	Front seat Rear seat	Not Rated
Rollover	★★★★	

Star ratings based on the risk of injury in a frontal impact.

Star ratings should ONLY be compared to other vehicles of similar size and weight.

Star ratings based on the risk of rollover in a single vehicle crash.

Star ratings range from 1 to 5 stars (★★★★) with 5 being the highest. Source: National Highway Traffic Safety Administration (NHTSA).

www.safercar.gov or 1-888-327-4236

The safety ratings above are based on Federal Government tests of particular vehicles equipped with certain features and options. The performance of this vehicle may differ.

PARTS CONTENT INFORMATION

FOR VEHICLES IN THIS COUNTRY:
 U.S./CANADIAN PARTS CONTENT: 36 %
 MAJOR SOURCES OF FOREIGN PARTS CONTENT:

MEXICO: 55 %
 NOTE: PARTS CONTENT DOES NOT INCLUDE FINAL ASSEMBLY, DISTRIBUTION, OR OTHER NON-PARTS COSTS.

FOR THIS VEHICLE:
 FINAL ASSEMBLY POINT:
 TOLUCA, MEXICO
 COUNTRY OF ORIGIN:
 ENGINE: MEXICO
 TRANSMISSION: UNITED STATES

hardback surface that you can use as a work surface when the seat is folded flat and the vehicle is not in motion.



Fold-Flat Seat

Pull upward on the recline lever to fold or unfold the seat.

WARNING!

Adjusting a seat while the vehicle is moving is dangerous. The sudden movement of the seat could cause you to lose control. Adjust any seat only while the vehicle is parked.

Head Restraints

Head restraints are designed to reduce the risk of injury by restricting head movement in the event of a rear impact. Head restraints should be adjusted so that the top of the head restraint is located above the top of your ear.

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

WARNING!

The head restraints for all occupants must be properly adjusted prior to operating the vehicle or occupying a seat. Head restraints should never be adjusted while the vehicle is in motion. Driving a vehicle with the head restraints improperly adjusted or removed could cause serious injury or death in the event of a collision.

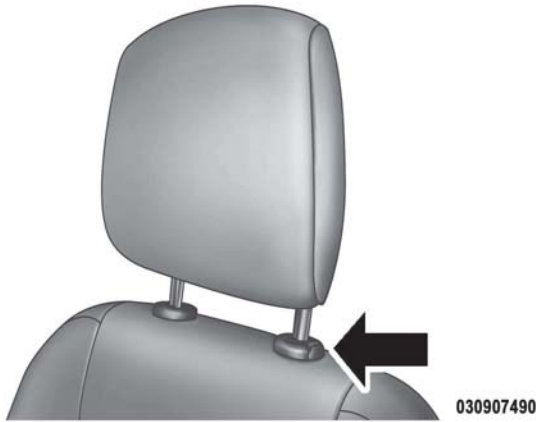
Active Head Restraints (AHR) — Front Seats

Active Head Restraints are passive, deployable components, and vehicles with this equipment can not be readily identified by any markings, only through visual inspection of the head restraint. The head restraint will be split in two halves, with the front half being soft foam and trim, the back half being decorative plastic.

When AHRs deploy during a rear impact, the front half of the head restraint extends forward to minimize the gap between the back of the occupant's head and the AHR. This system is designed to help prevent or reduce the extent of injuries to the driver and front passenger in certain types of rear impacts. Refer to "Occupant Restraints" in "Things To Know Before Starting Your Vehicle" for further information.

To raise the head restraint, pull upward on the head restraint. To lower the head restraint, press the push button, located at the base of the head restraint, and push downward on the head restraint.

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



Push Button



Active Head Restraint (Normal Position)

For comfort, the Active Head Restraints can be tilted forward and backward. To tilt the head restraint closer to the back of your head, pull forward on the bottom of the head restraint. Push rearward on the bottom of the head restraint to move the head restraint away from your head.

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



Active Head Restraint (Tilted)

- In the event of deployment of an Active Head Restraint, refer to "Occupant Restraints/Supplemental Active Head Restraints (AHR)/Resetting Active Head Restraints (AHR)" in "Things To Know Before Starting Your Vehicle" for further information.

WARNING!

- Do not place items over the top of the Active Head Restraint, such as coats, seat covers or portable DVD players. These items may interfere with the operation of the Active Head Restraint in the event of a collision and could result in serious injury or death.

(Continued)

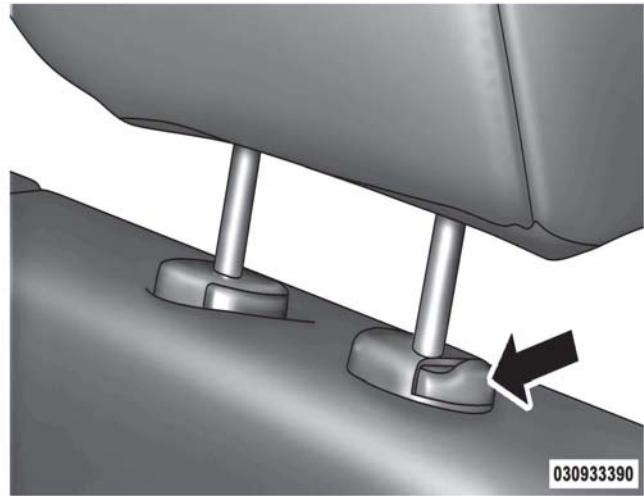
NOTE:

- The head restraints should only be removed by qualified technicians, for service purposes only. If either of the head restraints require removal, see your authorized dealer.

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

WARNING! (Continued)

- Active Head Restraints may be deployed if they are struck by an object such as a hand, foot or loose cargo. To avoid accidental deployment of the Active Head Restraint ensure that all cargo is secured, as loose cargo could contact the Active Head Restraint during sudden stops. Failure to follow this warning could cause personal injury if the Active Head Restraint is deployed.



Adjustment Button

Head Restraints — Second Row Seats

The rear seats are equipped with adjustable head restraints. To raise the head restraint, pull upward on the head restraint. To lower the head restraint, press the adjustment button, located on the base of the head restraint, and push downward on the head restraint.

NOTE:

- The head restraints should only be removed by qualified technicians, for service purposes only. If any of the head restraints require removal, see your authorized dealer.

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

- For proper routing of a Child Seat Tether, refer to "Occupant Restraints" in "Things To Know Before Starting Your Vehicle".

WARNING!

Driving a vehicle with the head restraints removed or improperly adjusted could cause serious injury or death in the event of a collision. The head restraints should be checked prior to operating the vehicle and never adjusted while the vehicle is in motion.

WARNING!

Do not allow a passenger to sit in a third row seat without having the head restraint unfolded and locked in place. Failure to follow this warning may result in personal injury to the passenger in the event of a collision.

Third Row Passenger Seats — Seven Passenger Models

These head restraints are non-adjustable and non-removable. However, you can fold them forward when they are not in use by passengers. Refer to "50/50 Split Third-Row Passenger Seats With Fold-Flat Feature — Seven Passenger Models" for further information.

60/40 Split Second-Row Passenger Seats

To provide additional storage area, each second-row passenger seat can be folded flat. This allows for extended cargo space and still maintains some seating room if needed.

NOTE: Prior to folding the second-row passenger seat, make sure the front seatback is not in a reclined position. This will allow the second-row seat to fold easily.

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



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. 1.	Driver Head Acceleration (X) Primary vs. Time	B-1
Figure No. 2.	Driver Head Acceleration (Y) Primary vs. Time	B-1
Figure No. 3.	Driver Head Acceleration (Z) Primary vs. Time	B-1
Figure No. 4.	Driver Head Resultant Acceleration Primary vs. Time	B-1
Figure No. 5.	Driver Upper Thorax Rib Deflection (Y) vs. Time	B-2
Figure No. 6.	Driver Middle Thorax Rib Deflection (Y) vs. Time	B-2
Figure No. 7.	Driver Lower Thorax Rib Deflection (Y) vs. Time	B-2
Figure No. 8.	Driver Thorax Rib Deflection Maximum vs. Time	B-2
Figure No. 9.	Driver Anterior Abdomen Force (Y) vs. Time	B-3
Figure No. 10.	Driver Middle Abdomen Force (Y) vs. Time	B-3
Figure No. 11.	Driver Posterior Abdomen Force (Y) vs. Time	B-3
Figure No. 12.	Driver Total Abdominal Force (Y) vs. Time	B-3
Figure No. 13.	Driver Pubic Symphysis Force (Y) vs. Time	B-4
Figure No. 14.	Passenger Head Acceleration (X) Primary vs. Time	B-5
Figure No. 15.	Passenger Head Acceleration (Y) Primary vs. Time	B-5
Figure No. 16.	Passenger Head Acceleration (Z) Primary vs. Time	B-5
Figure No. 17.	Passenger Head Resultant Acceleration Primary vs. Time	B-5
Figure No. 18.	Passenger Lower Spine T12 Acceleration (X) vs. Time	B-6
Figure No. 19.	Passenger Lower Spine T12 Acceleration (Y) vs. Time	B-6
Figure No. 20.	Passenger Lower Spine T12 Acceleration (Z) vs. Time	B-6
Figure No. 21.	Passenger Lower Spine T12 Resultant Acceleration vs. Time	B-6
Figure No. 22.	Passenger Iliac Force on Impact Side (Y) vs. Time	B-7
Figure No. 23.	Passenger Acetabulum Force on Impact Side (Y) vs. Time	B-7
Figure No. 24.	Passenger Total Pelvic Force on Impact Side (Y) vs. Time	B-7

The following additional data for this test can be obtained from the Research and Development section of the NHTSA website. The website can be found at www.NHTSA.dot.gov

Additional Driver & Passenger Dummy Instrumentation Data

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

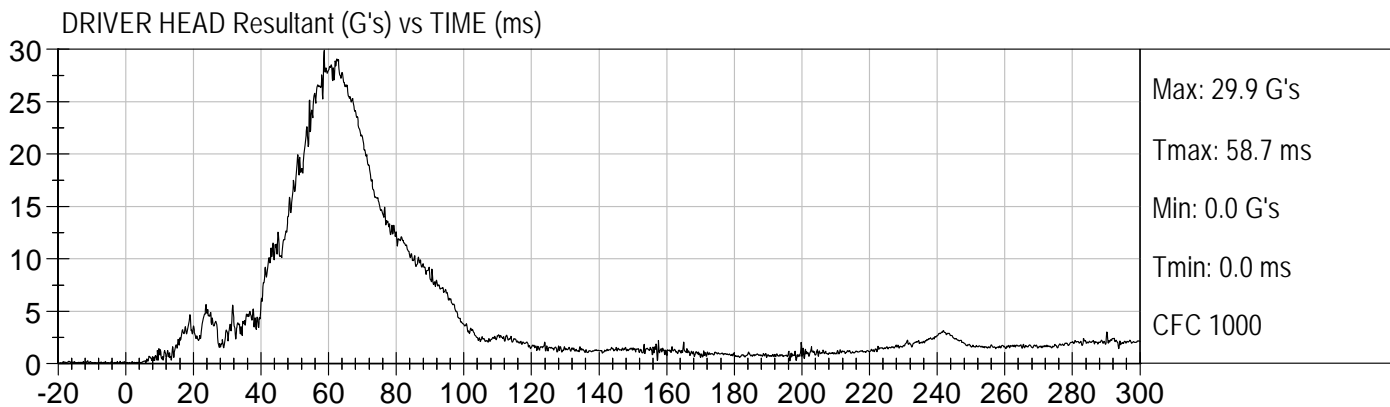
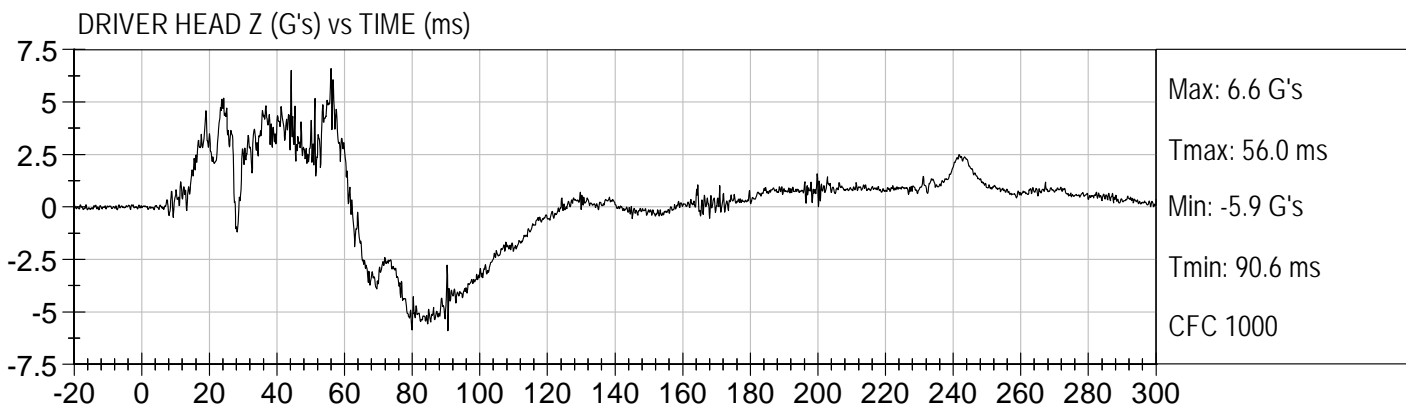
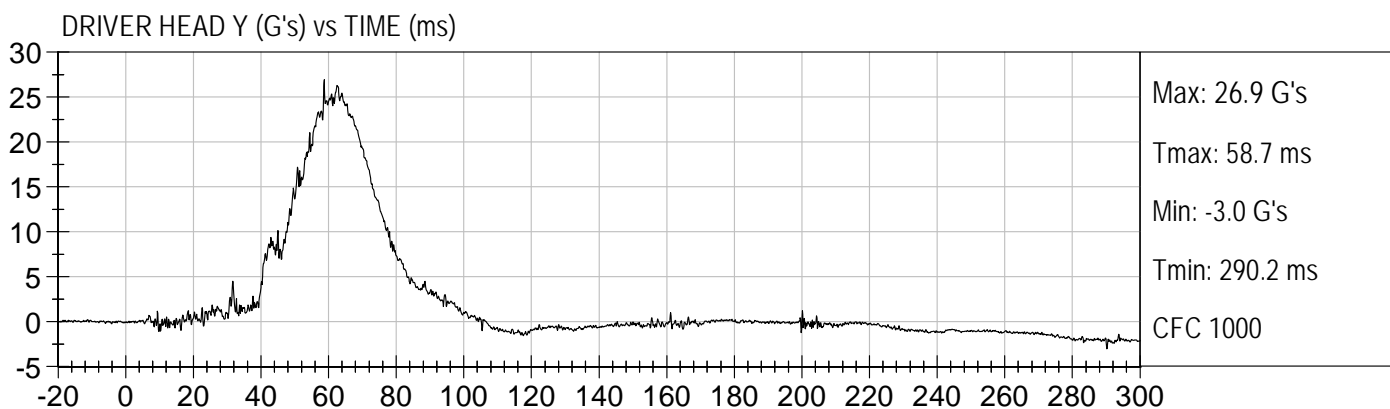
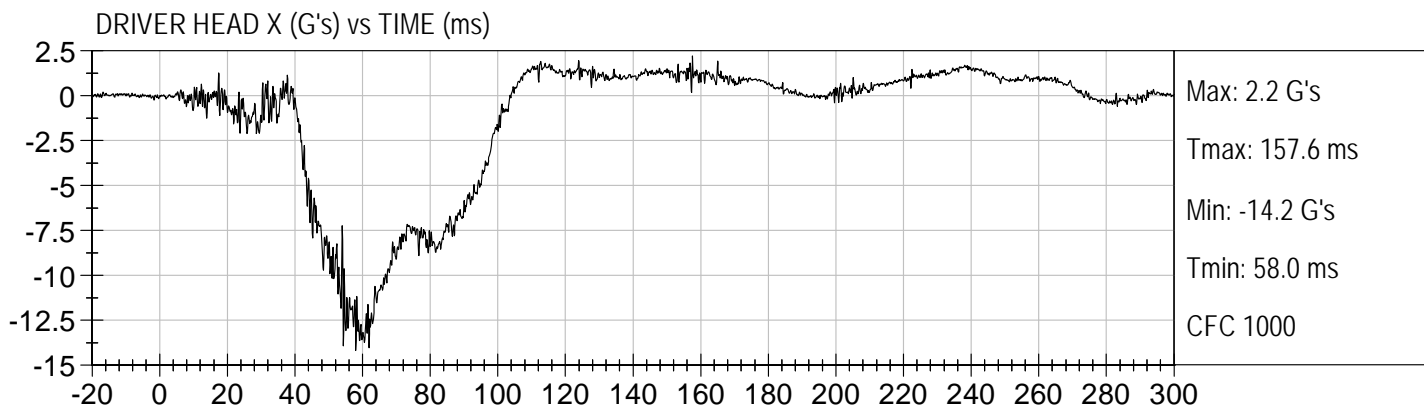
Vehicle Instrumentation Data

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

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

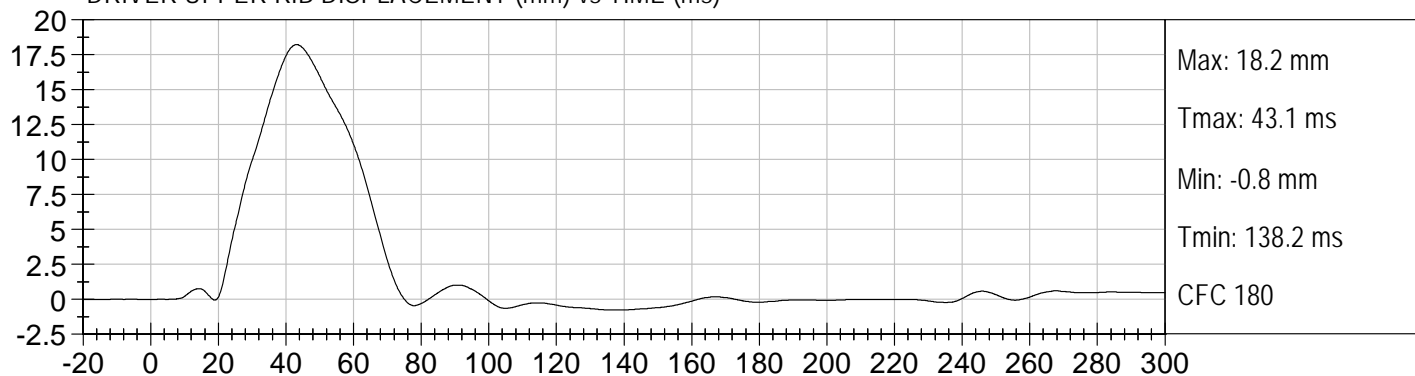
MDB Instrumentation Data

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

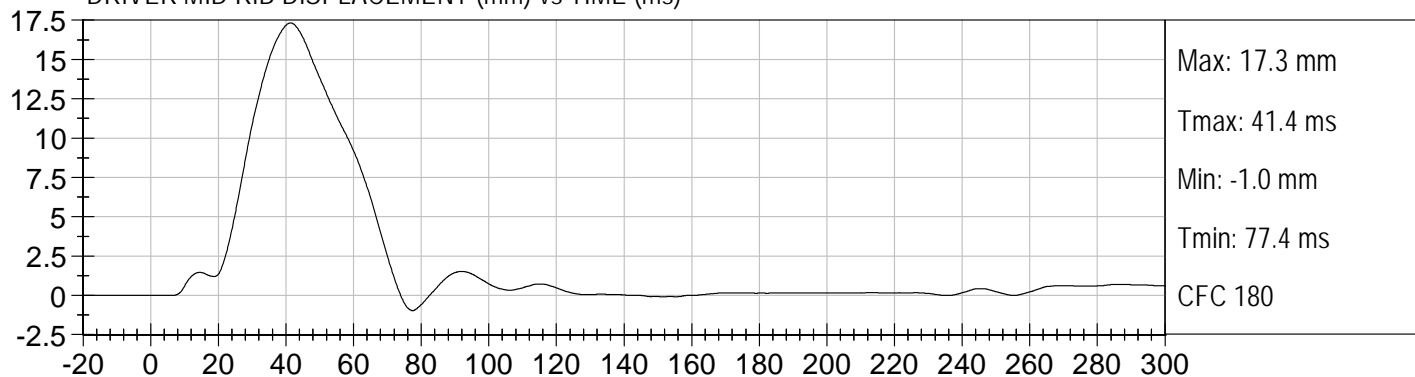




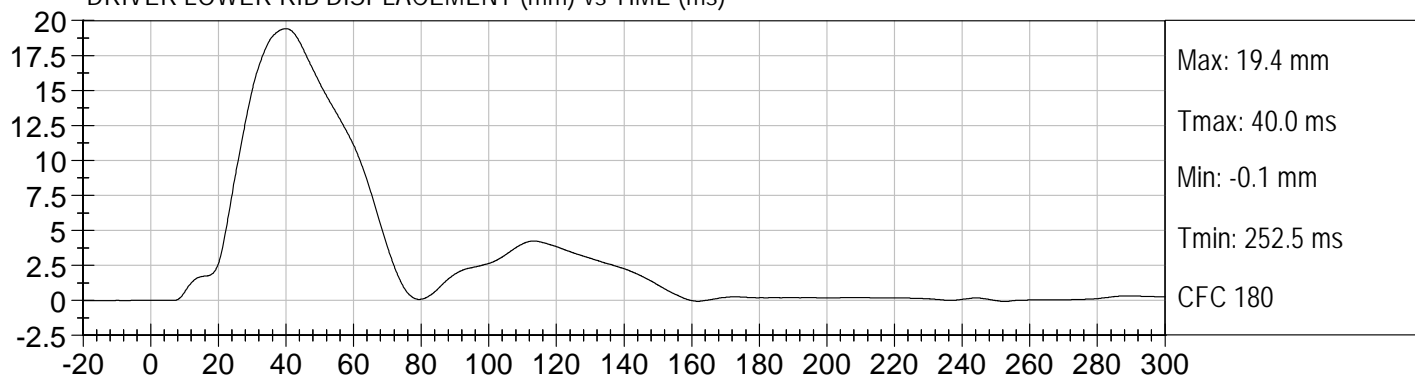
DRIVER UPPER RIB DISPLACEMENT (mm) vs TIME (ms)



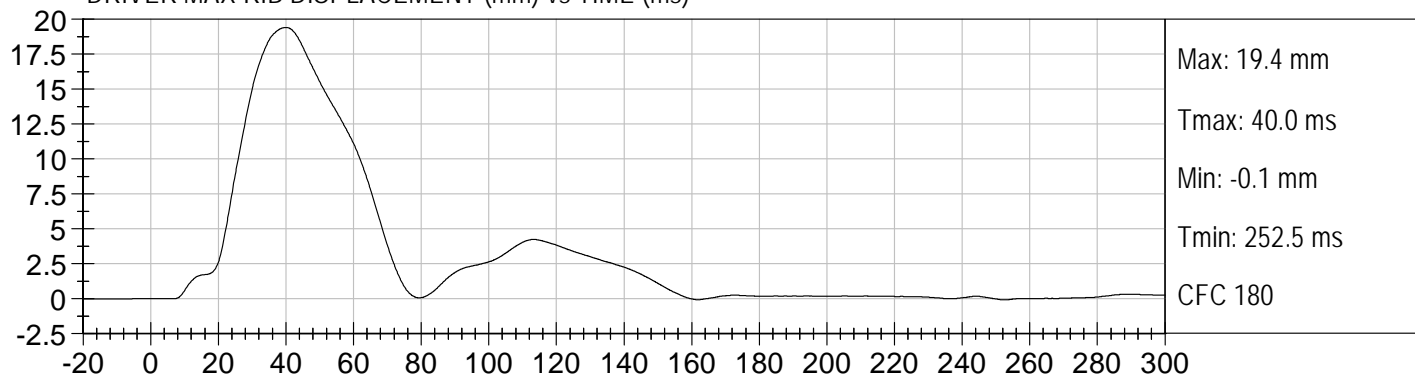
DRIVER MID RIB DISPLACEMENT (mm) vs TIME (ms)

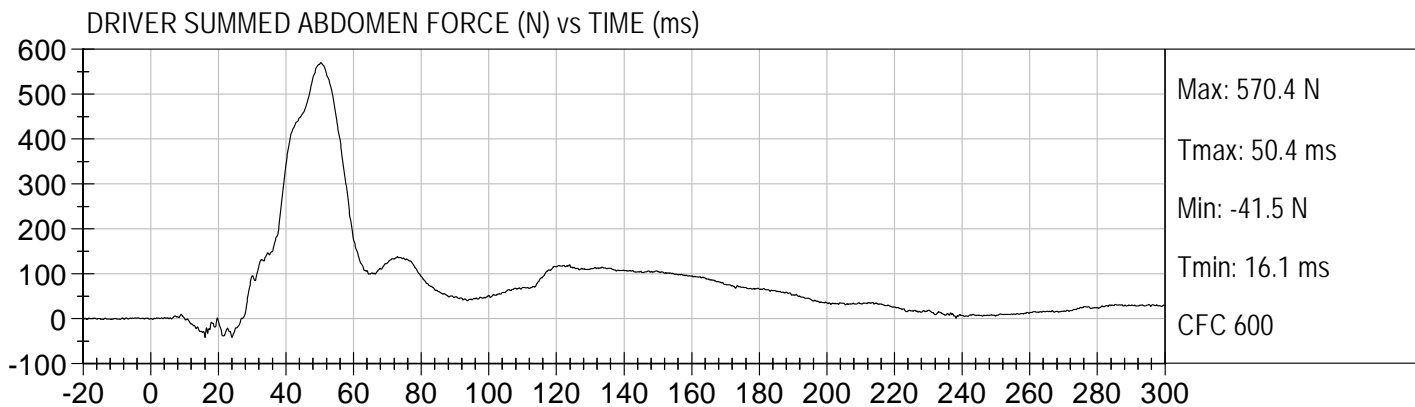
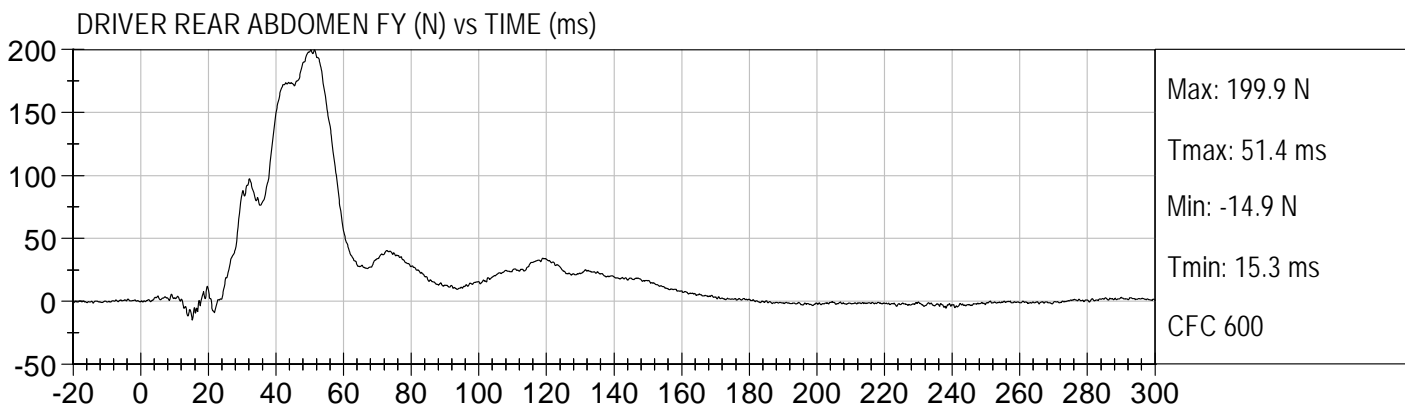
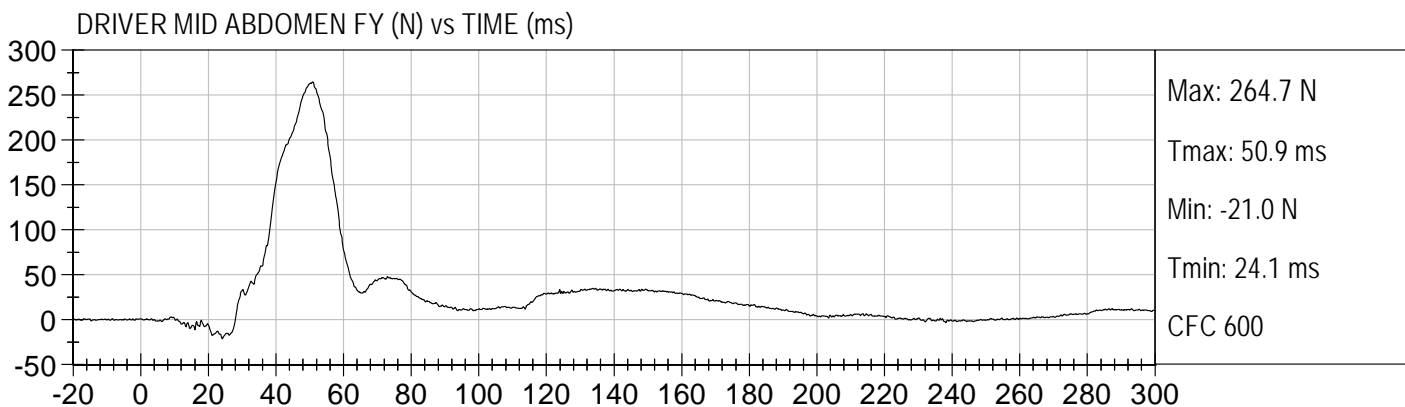
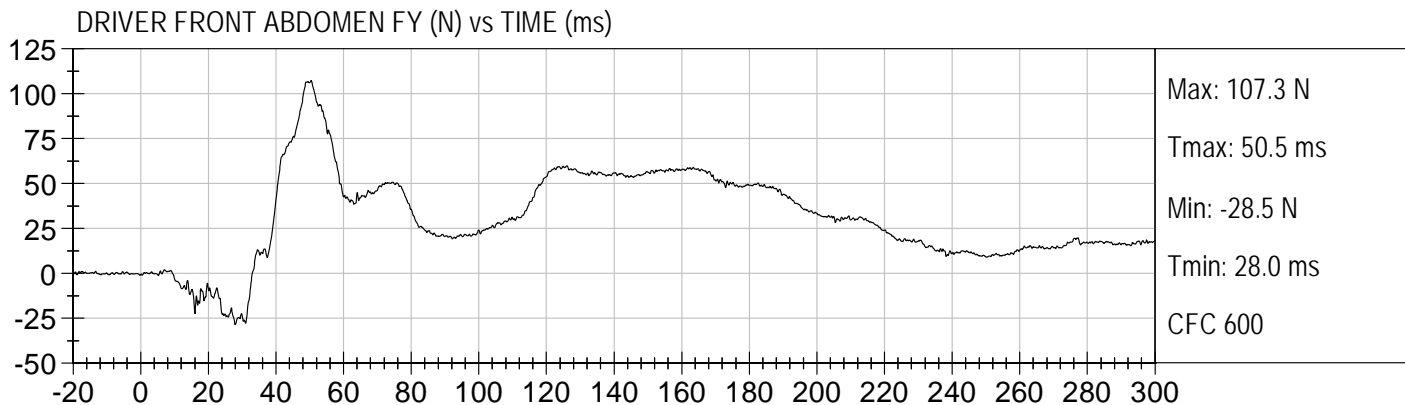


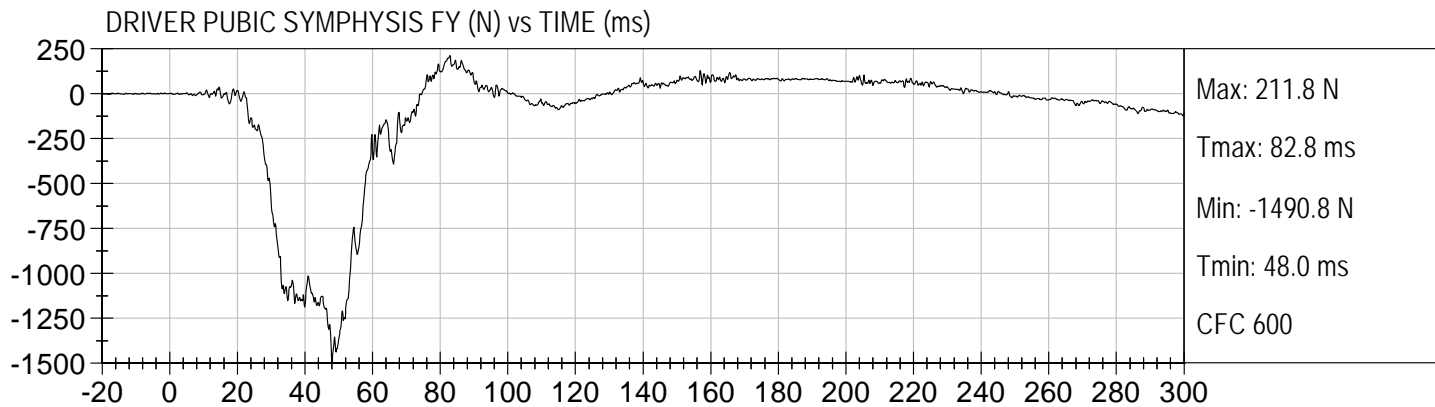
DRIVER LOWER RIB DISPLACEMENT (mm) vs TIME (ms)

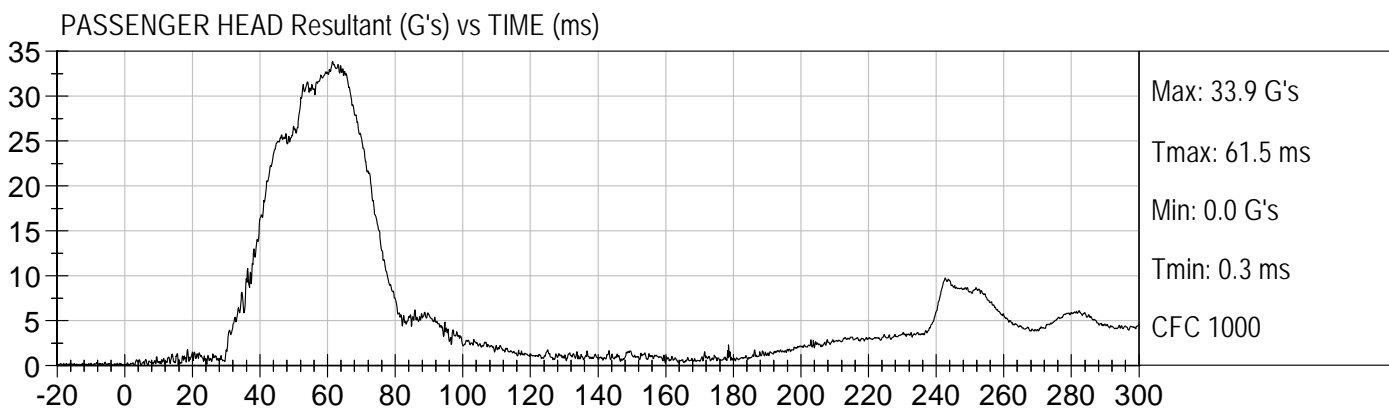
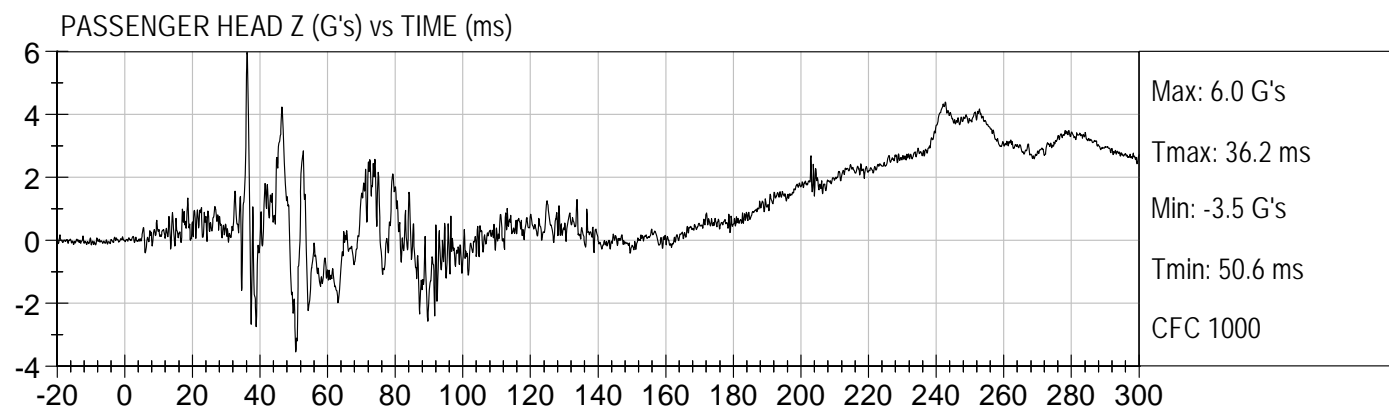
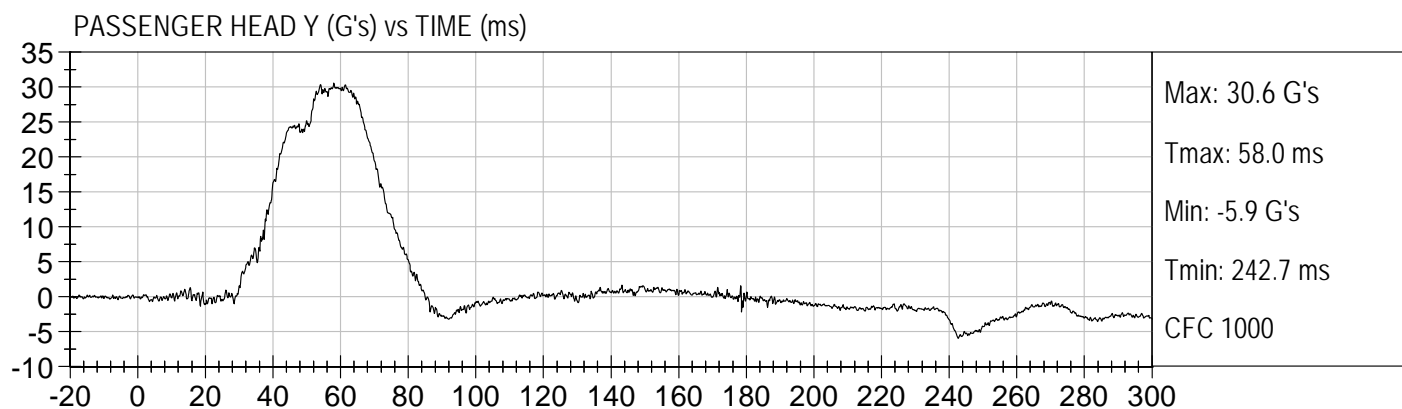
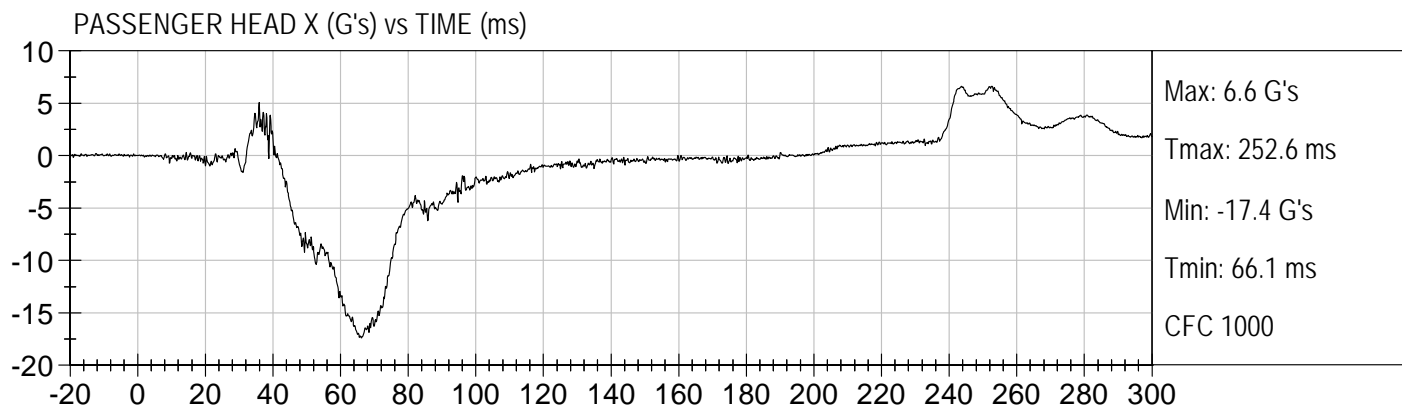


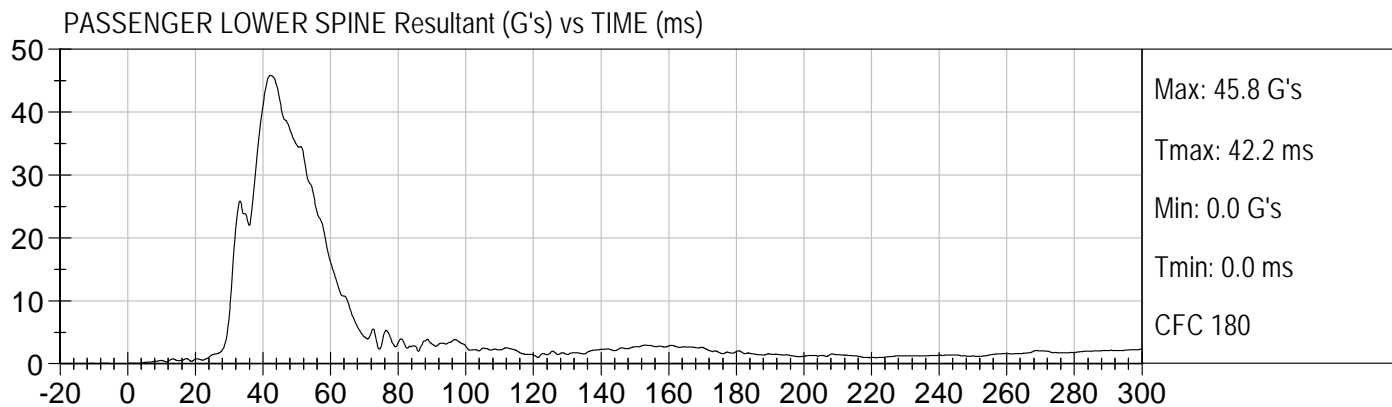
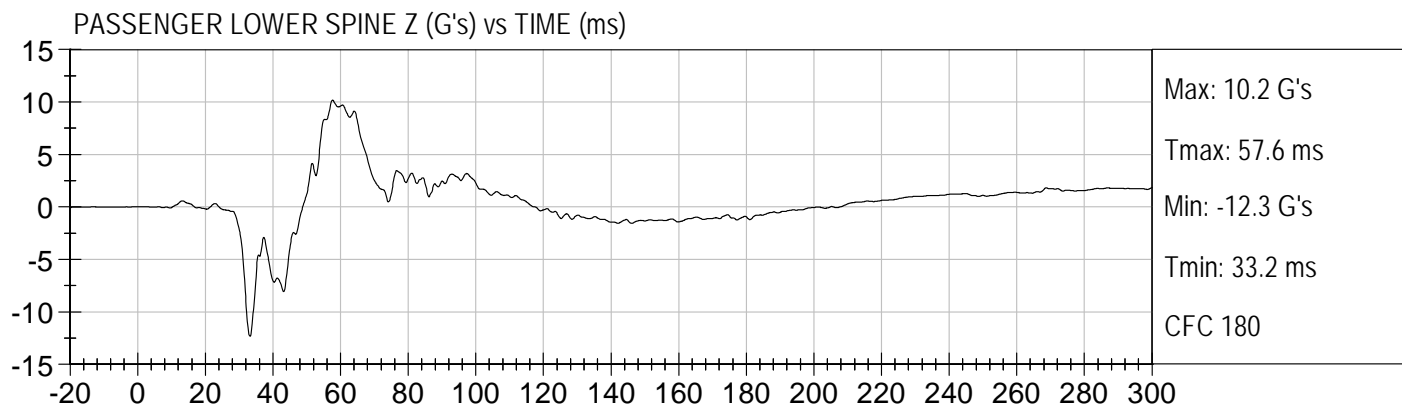
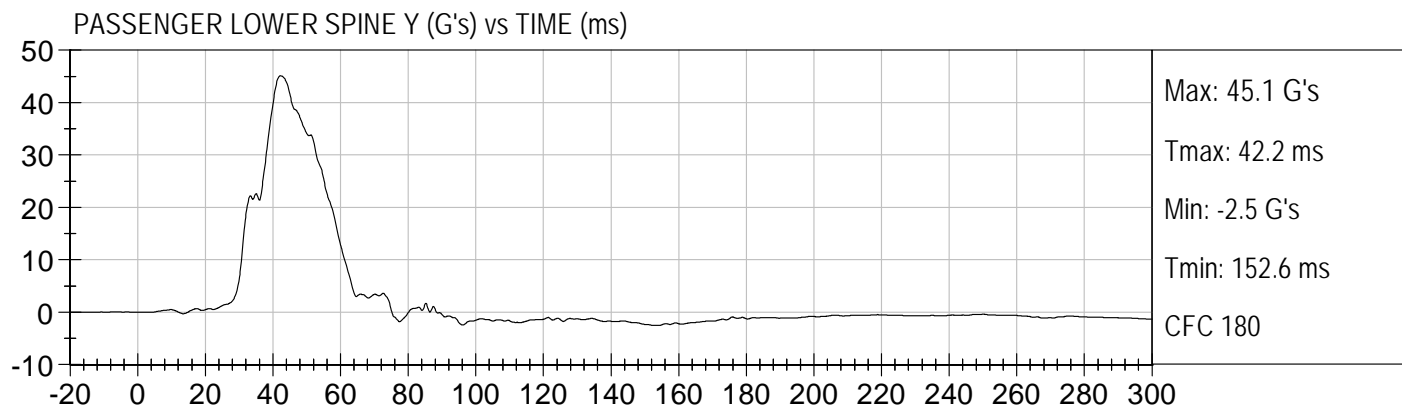
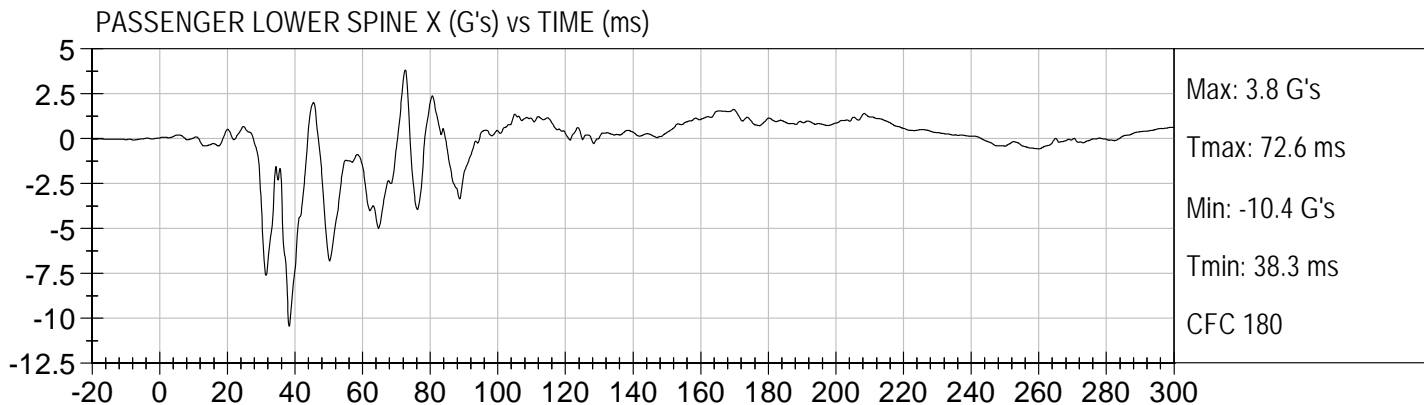
DRIVER MAX RIB DISPLACEMENT (mm) vs TIME (ms)

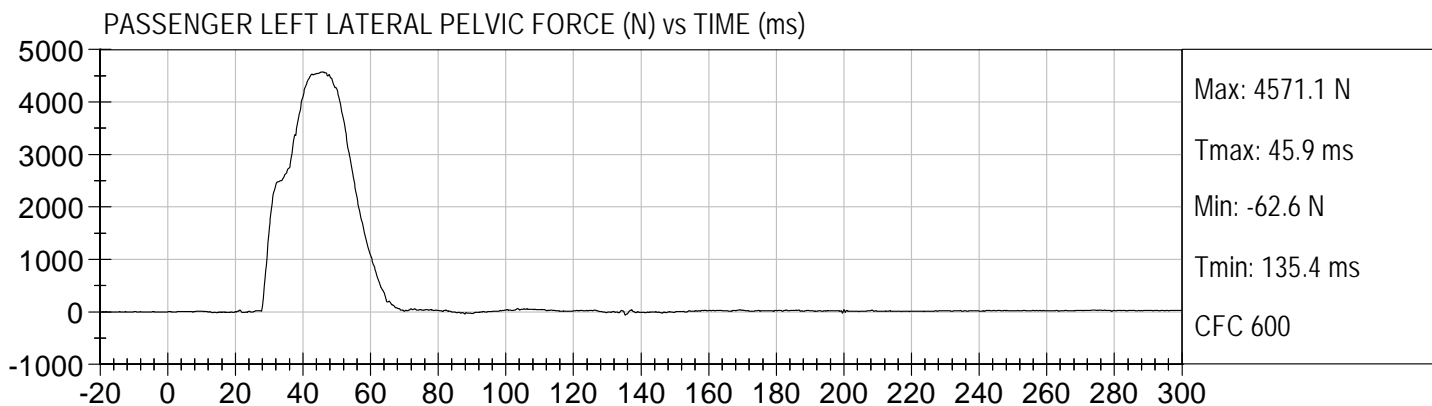
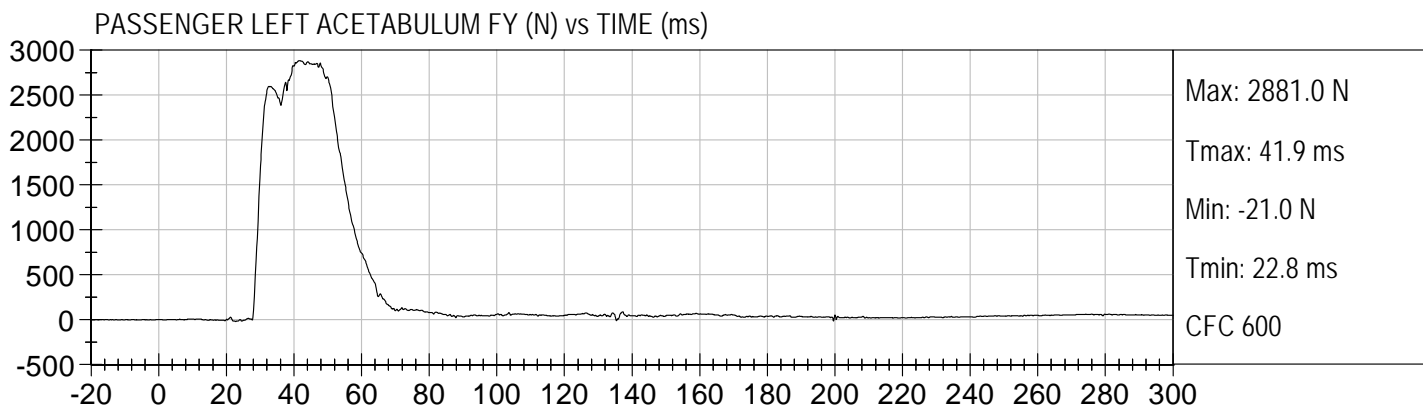
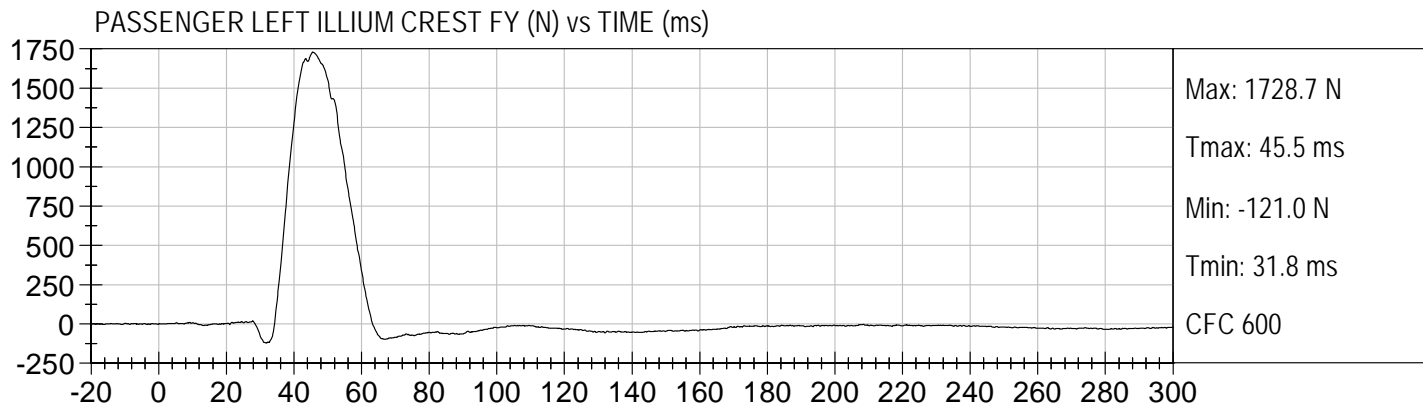












APPENDIX C

DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

ES-2re External Measurements
SN: 032

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

MGA RESEARCH CORPORATION
HEAD DROP TEST
ES-2re DUMMY

ATD Serial No: 032

Test ID: D113321

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.0	Pass
Laboratory Relative Humidity	%	10 to 70	40	Pass
Peak Resultant Acceleration	G's	125 to 155	148	Pass
Peak Lateral Acceleration	G's	+/- 15	-11.5	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 15% of peak	Yes	Pass
Overall Test Results				Pass

Jessica Gall
Laboratory Technician

10/5/11
Test Date

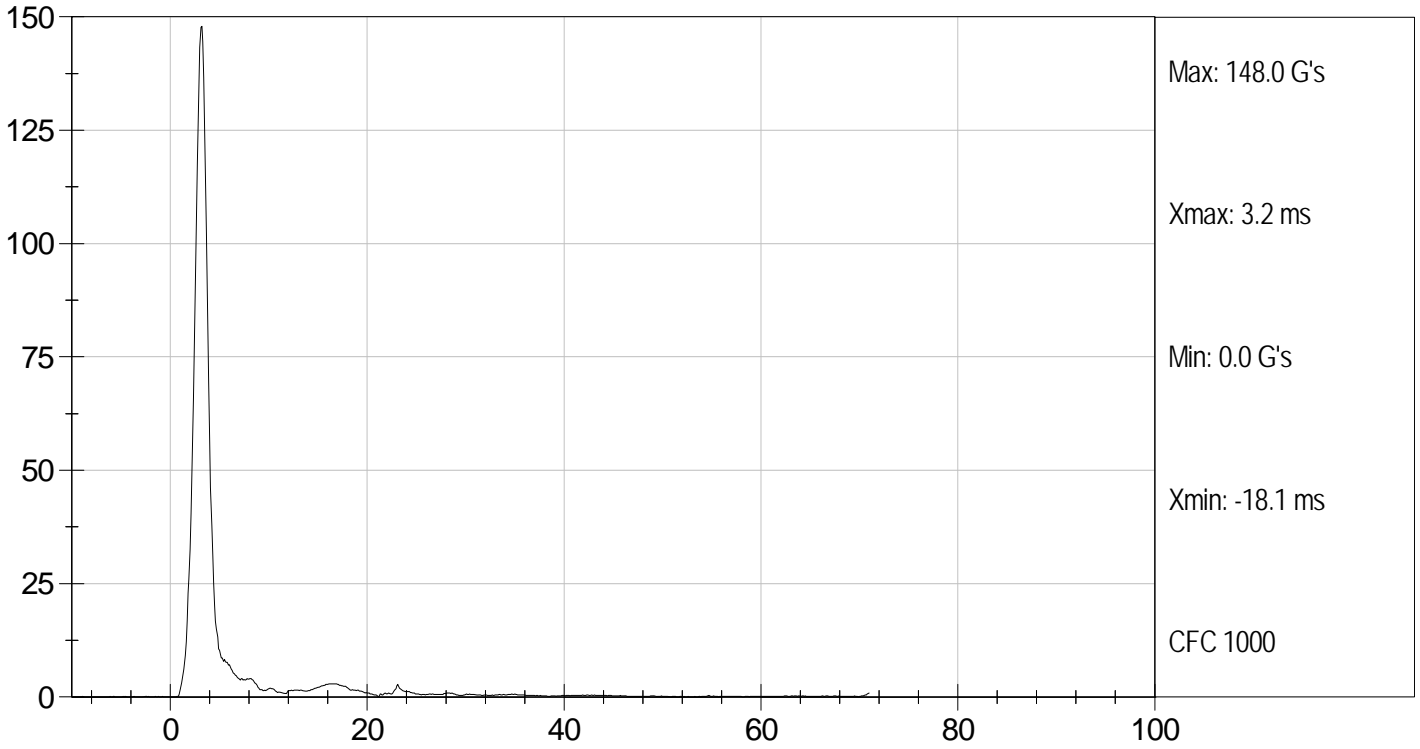
David Winkelbauer
Approved By



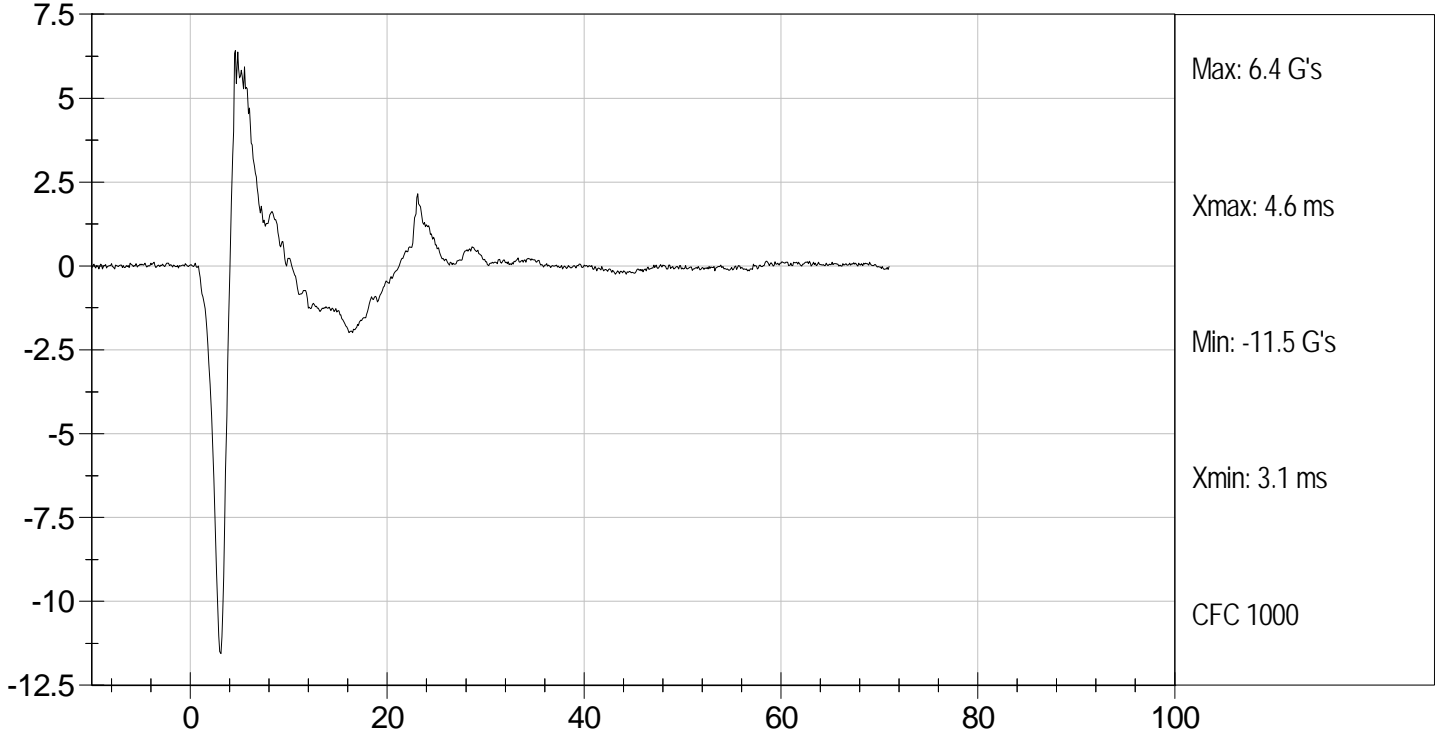
Test Desc: Head Drop
Component ID: D113321

Test Date: 10/5/11
Velocity: 0 ft/s, 0 m/s

PEAK RESULTANT ACCELERATION (G's) vs TIME (ms)



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



**MGA RESEARCH CORPORATION
NECK PENDULUM TEST
ES-2re DUMMY**

ATD Serial No: 032

Test I.D.: D113322

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	18.0 to 22.0	21.4	Pass
Laboratory Relative Humidity		%	10 to 70	40	Pass
Pendulum Speed		m/s	3.3 to 3.5	3.4	Pass
Pendulum Deceleration	1 ms	m/s	0.00 to -0.05	-0.01	Pass
	3 ms	m/s	-0.25 to -0.375	-0.34	Pass
	14 ms	m/s	-3.20 to -3.70	-3.28	Pass
Maximum Flexion Angle		deg	49.0 to 59.0	53.3	Pass
Time of Maximum Flexion Angle		ms	54.0 to 66.0	62.1	Pass
Head Rotation Decay Time to 0 degree		ms	53.0 to 88.0	55.4	Pass
Overall Test Results					Pass

Jessica Hall
Laboratory Technician

10/5/11
Test Date

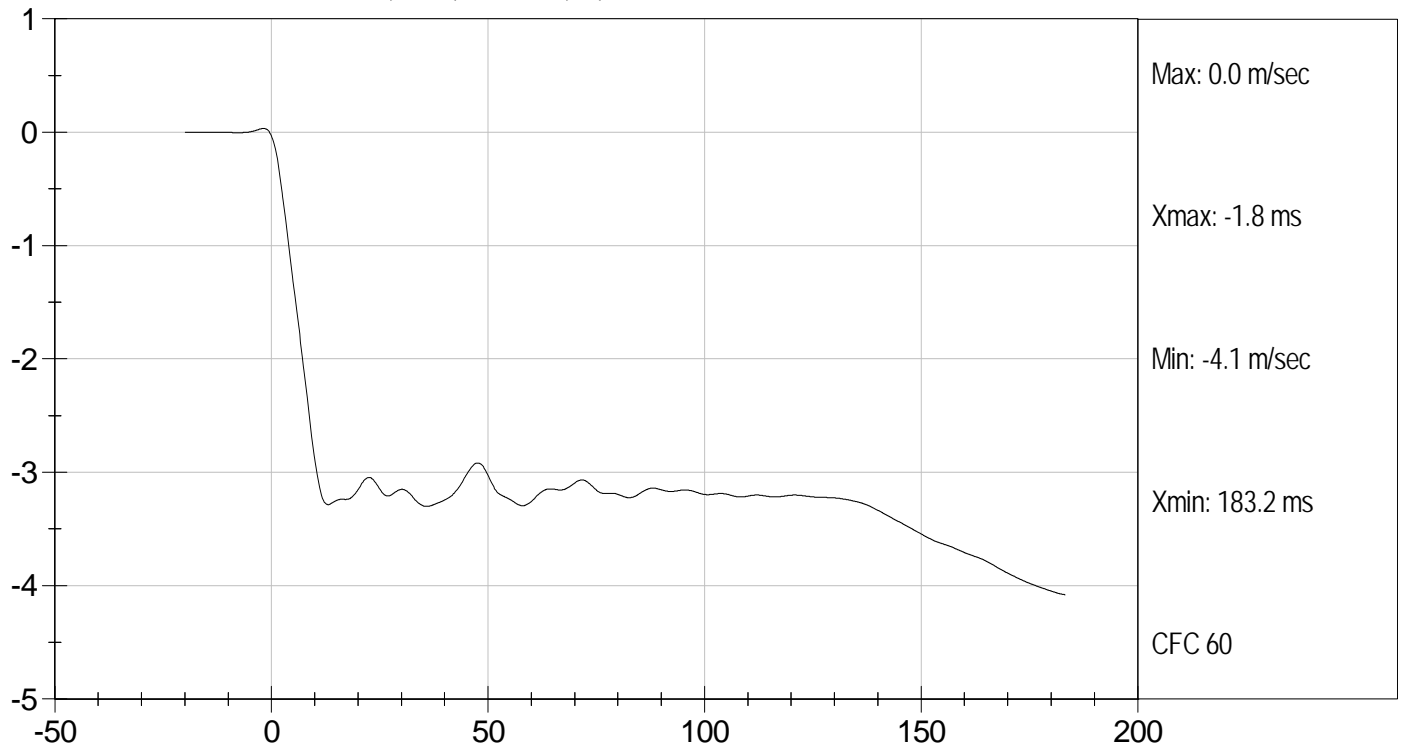
David Winkelbauer
Approved By



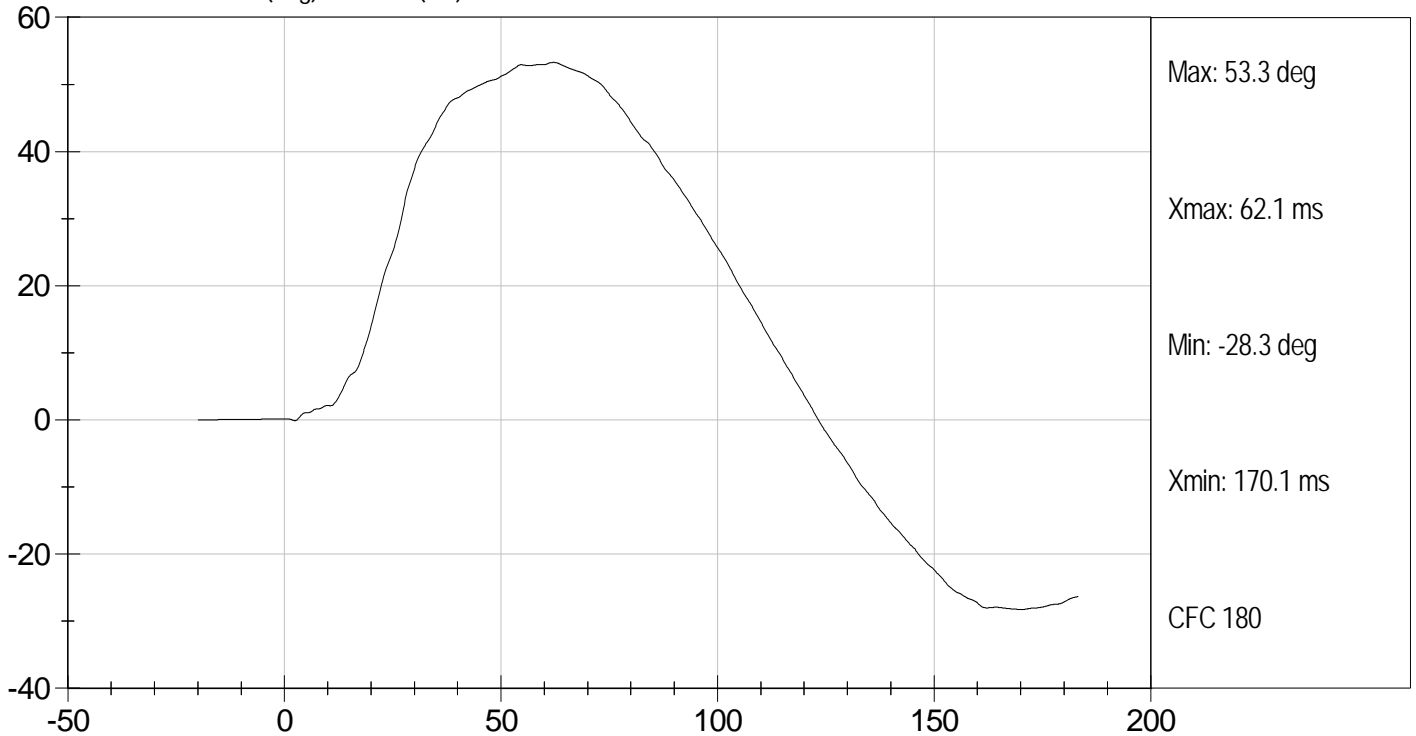
Test Desc: Neck Bending
Component ID: D113322

Test Date: 10/5/11
Velocity: 11.2 ft/s, 3.4 m/s

PENDULUM DECELERATION (m/sec) vs TIME (ms)



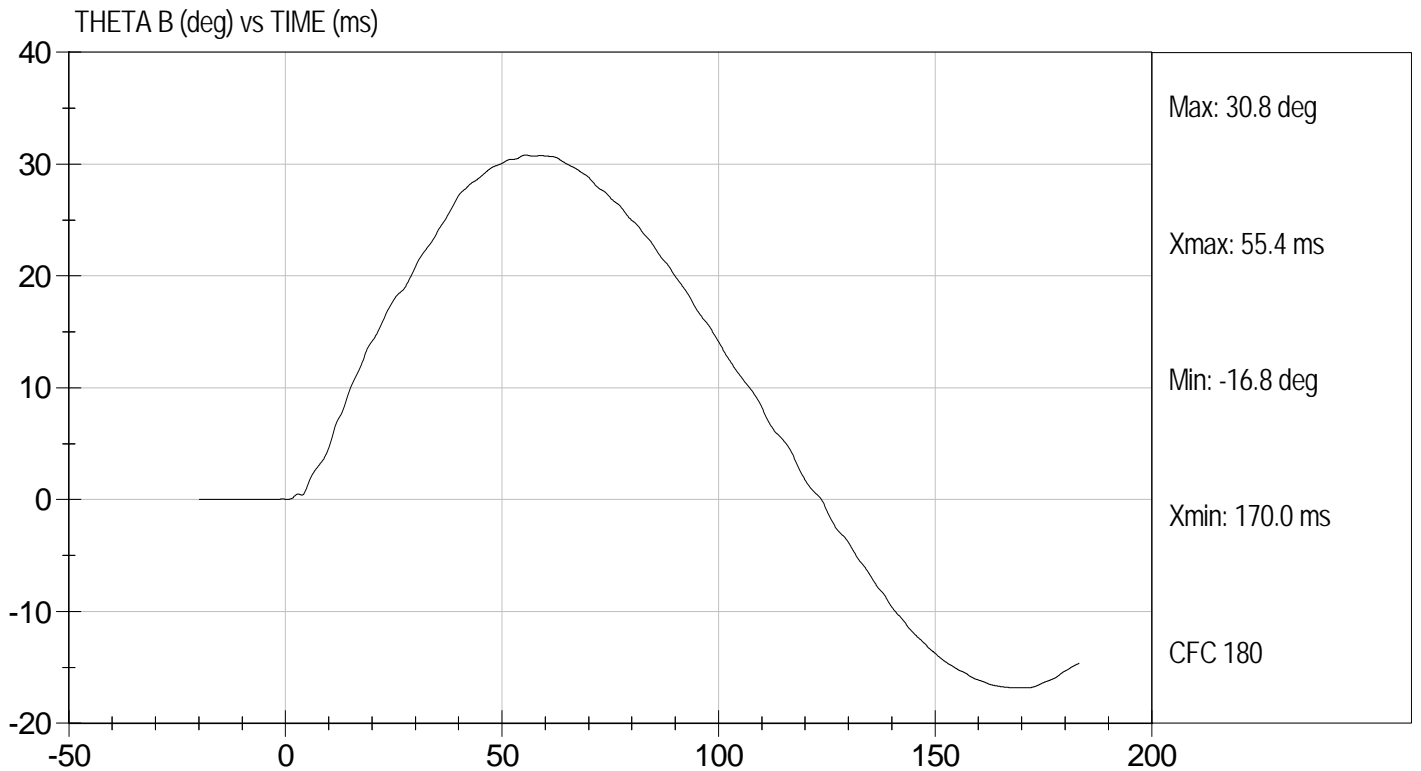
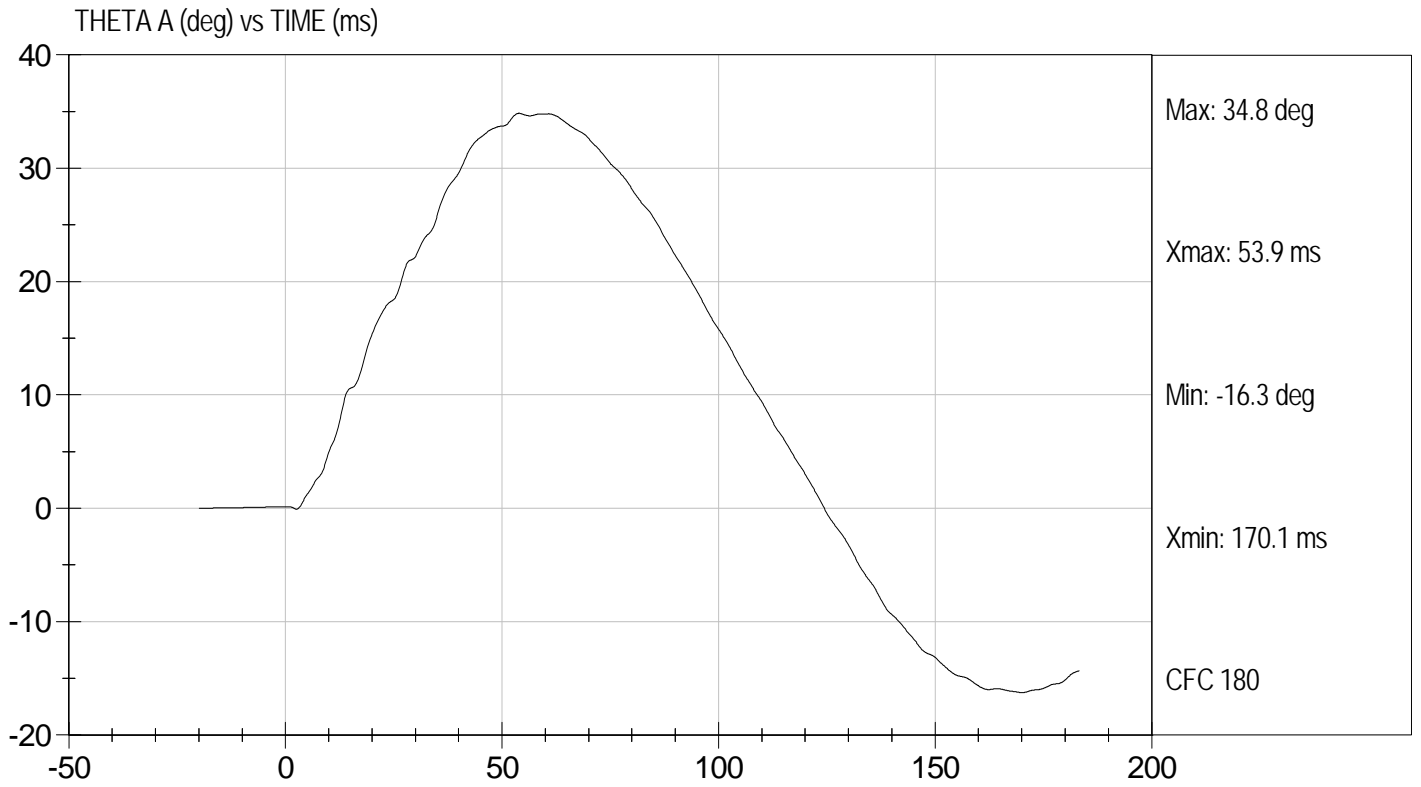
FLEXION ANGLE (deg) vs TIME (ms)





Test Desc: Neck Bending
Component ID: D113322

Test Date: 10/5/11
Velocity: 11.2 ft/s, 3.4 m/s



MGA RESEARCH CORPORATION
SHOULDER IMPACT TEST
ES-2re DUMMY

ATD Serial No: 032

Test I.D.: D113323

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	42	Pass
Pendulum Speed	m/s	4.2 to 4.4	4.3	Pass
Peak Shoulder Acceleration	G's	7.5 to 10.5	9.2	Pass
Time of Peak Shoulder Acceleration	ms	NA	13.2	Pass
Overall Test Results				Pass

Jessica Hall
 Laboratory Technician

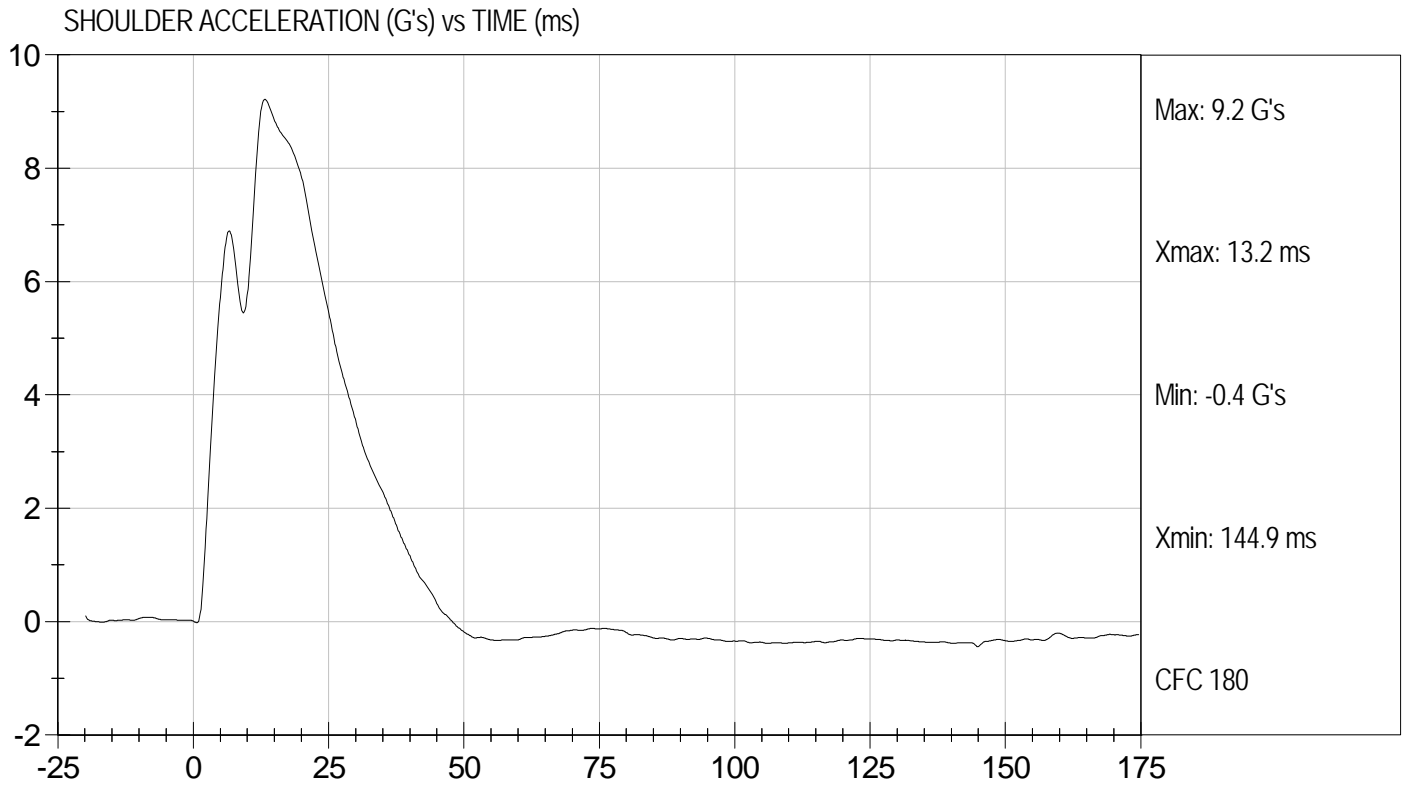
10/5/11
 Test Date

David Winkelbauer
 Approved By



Test Desc: Shoulder Impact
Component ID: D113323

Test Date: 10/5/11
Velocity: 14.24 ft/s, 4.3 m/s



MGA RESEARCH CORPORATION
UPPER RIB TEST
ES-2re DUMMY

ATD Serial No: 032

Test I.D: D113324

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	41	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	48.3	Pass
Overall Test Results				Pass

Jessica Hall

 Laboratory Technician

10/5/11

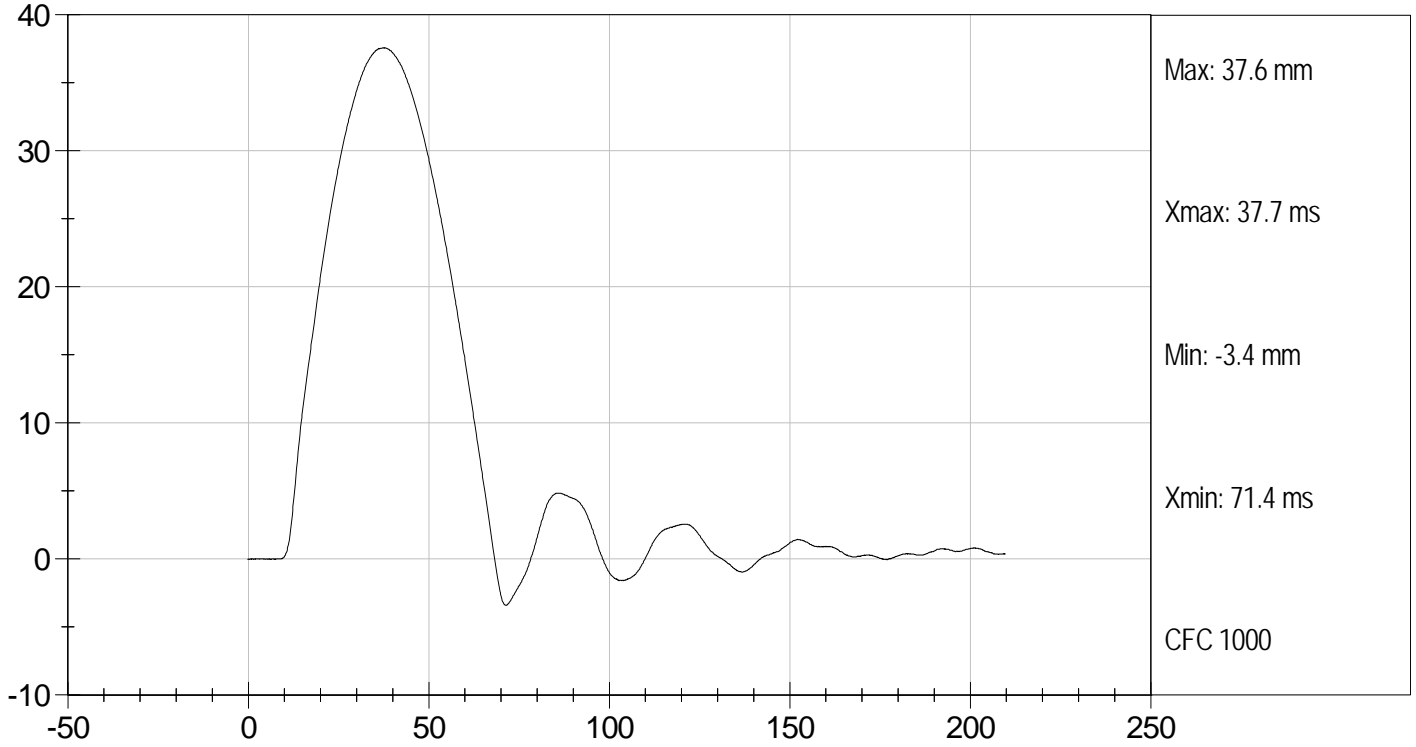
 Test Date

David Winkelbauer

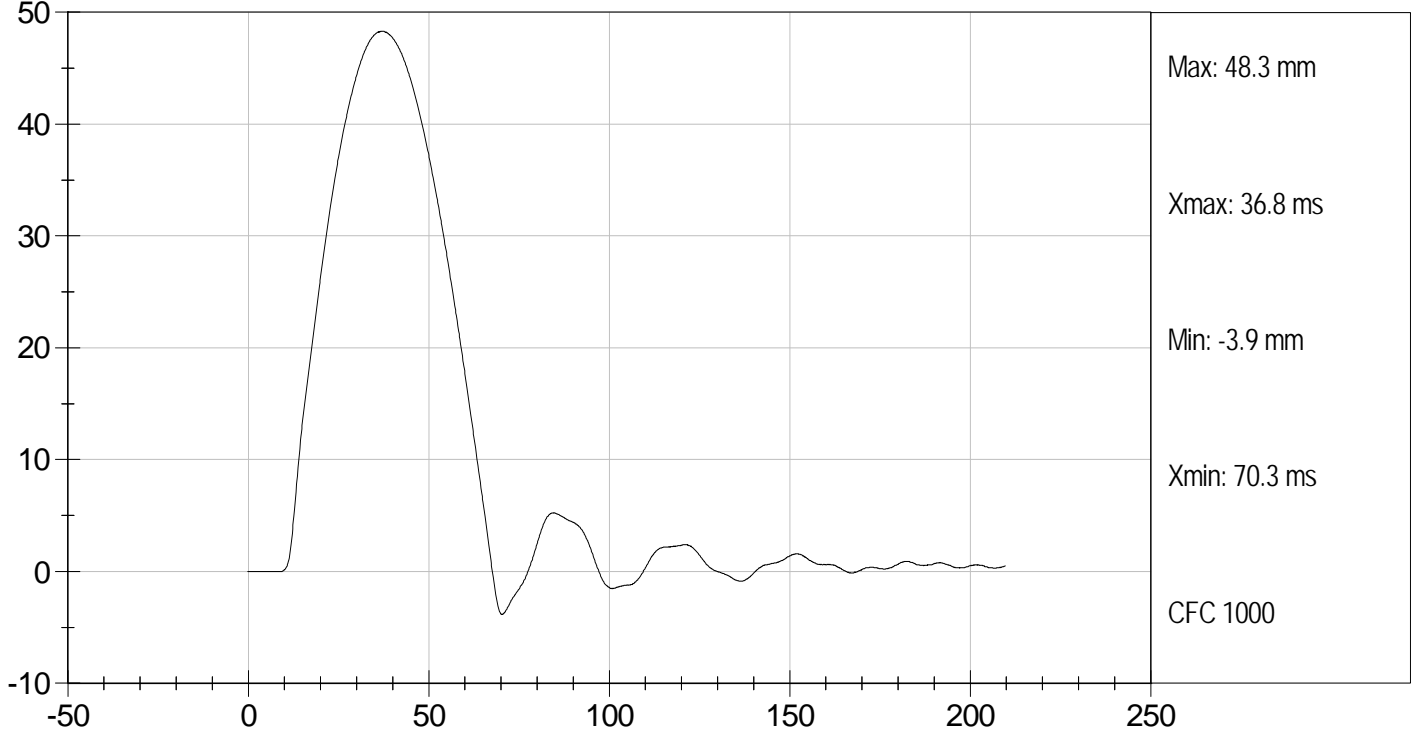
 Approved By



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



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



MGA RESEARCH CORPORATION

MID RIB TEST
ES-2re DUMMY

ATD Serial No: 032

Test I.D.: D113325

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	41	Pass
Displacement at 3 m/s	mm	36.0 to 40.0	37.4	Pass
Displacement at 4 m/s	mm	46.0 to 51.0	47.7	Pass
Overall Test Results				Pass

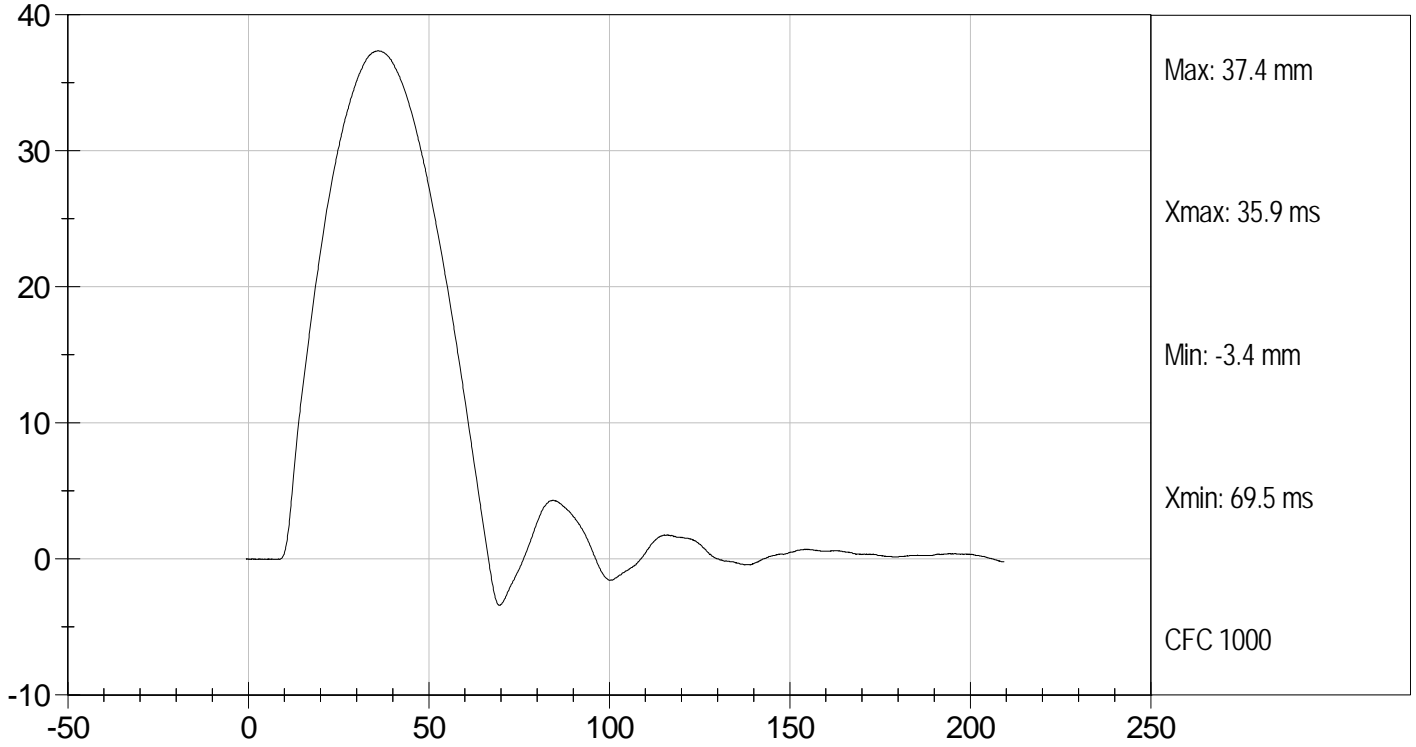

Laboratory Technician

10/5/11
Test Date

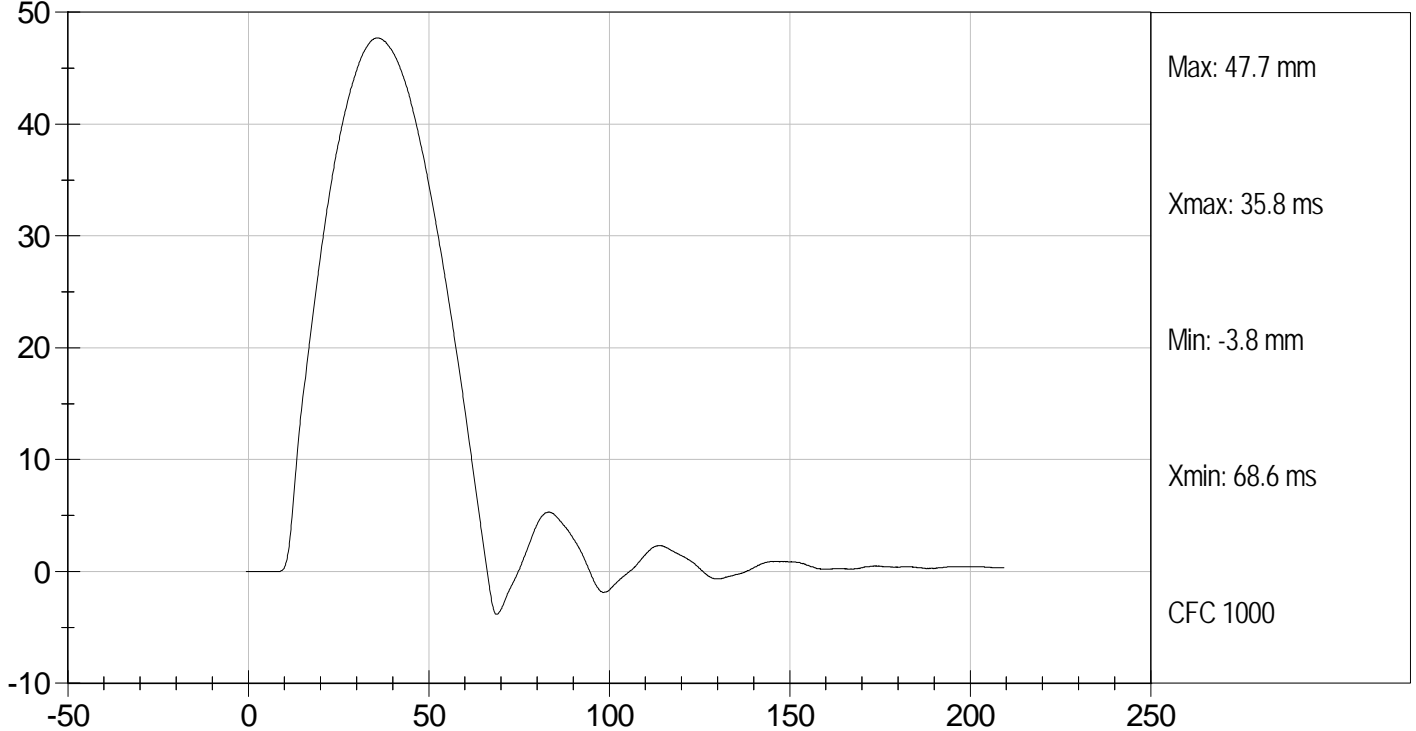

Approved By



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



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



MGA RESEARCH CORPORATION

LOWER RIB TEST

ES-2re DUMMY

ATD Serial No: 032

Test I.D: D113326

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	41	Pass
Displacement at 3 m/s	mm	36.0 to 40.0	38.0	Pass
Displacement at 4 m/s	mm	46.0 to 51.0	48.7	Pass
Overall Test Results				Pass

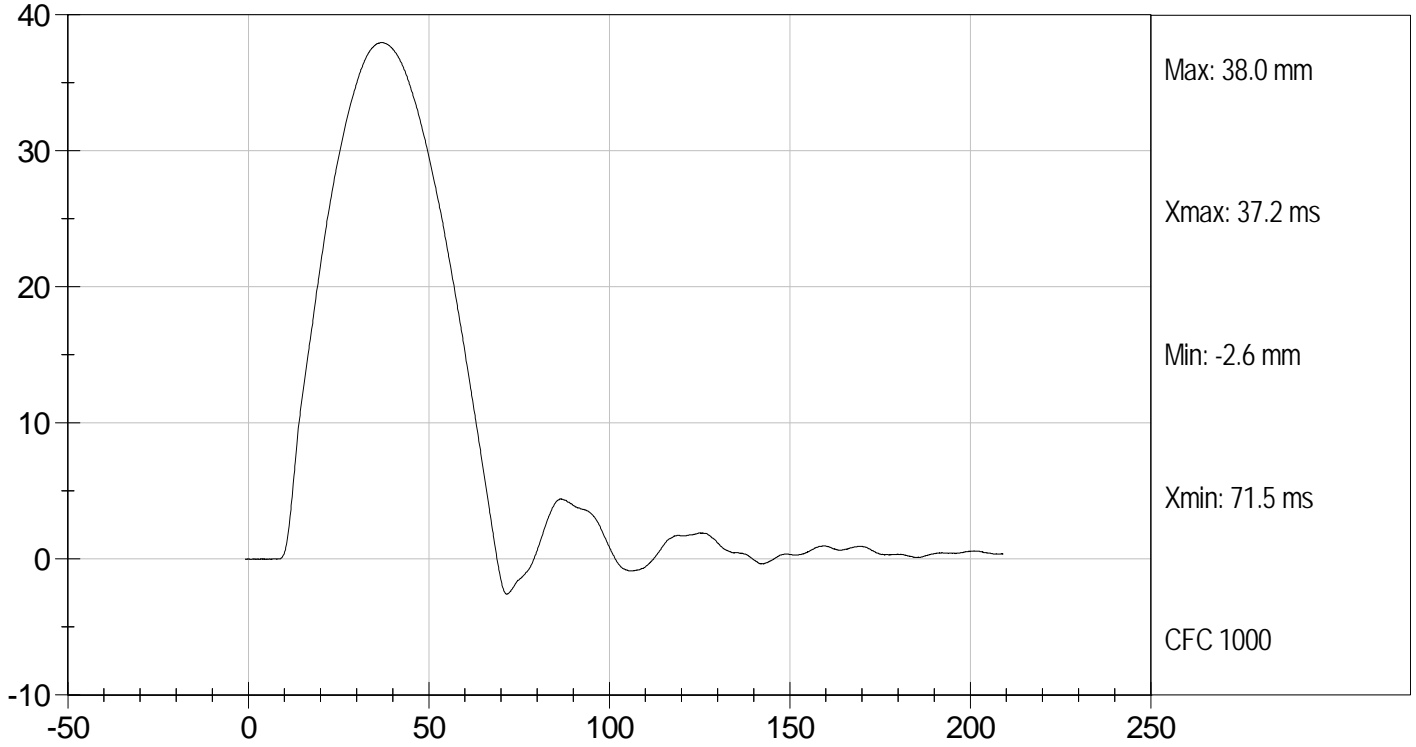
Jessica Hall
Laboratory Technician

10/5/11
Test Date

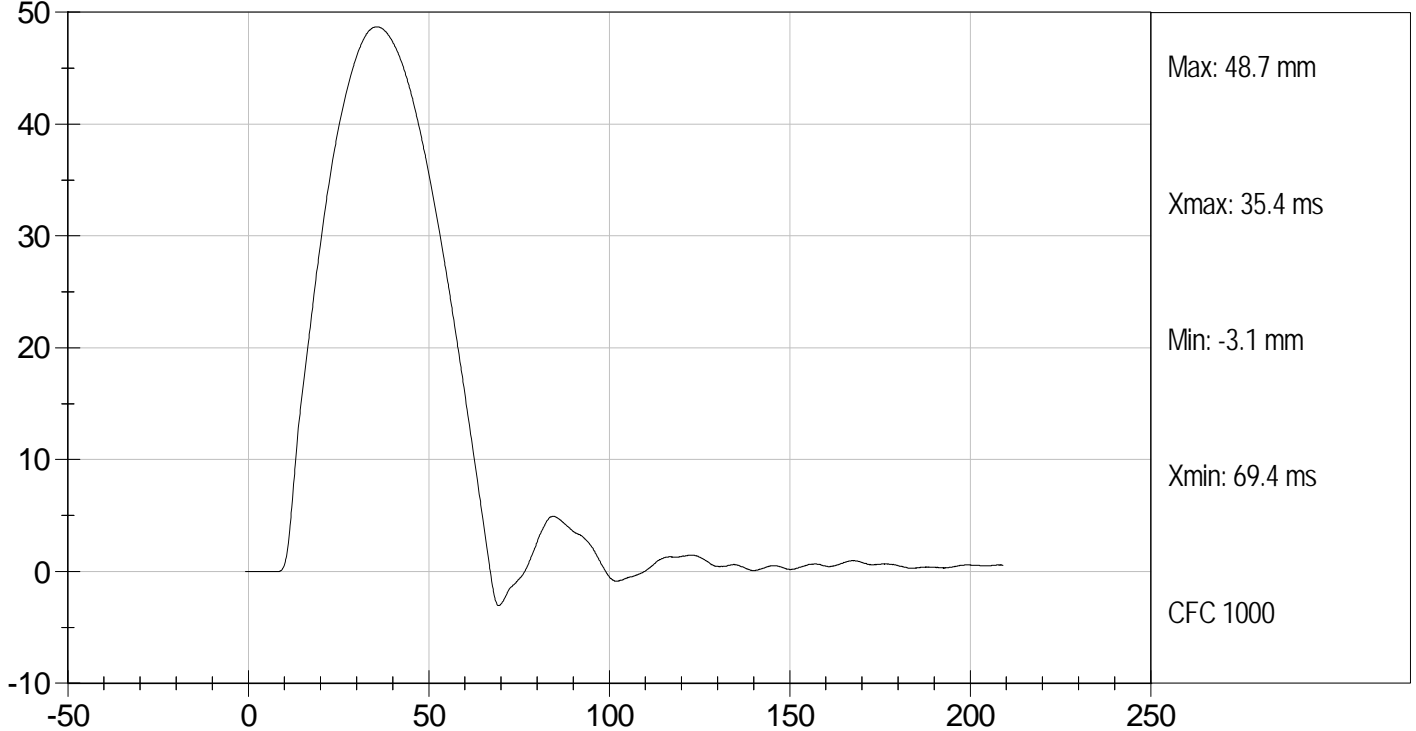
David Winkelbauer
Approved By



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.: D113320

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.5	Pass
Humidity	%	10 to 70	42	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	37.9	Pass
Middle Rib Displacement	mm	37.0 to 45.0	40.5	Pass
Lower Rib Displacement	mm	37.0 to 44.0	40.1	Pass
Overall Test Results				Pass


 Laboratory Technician

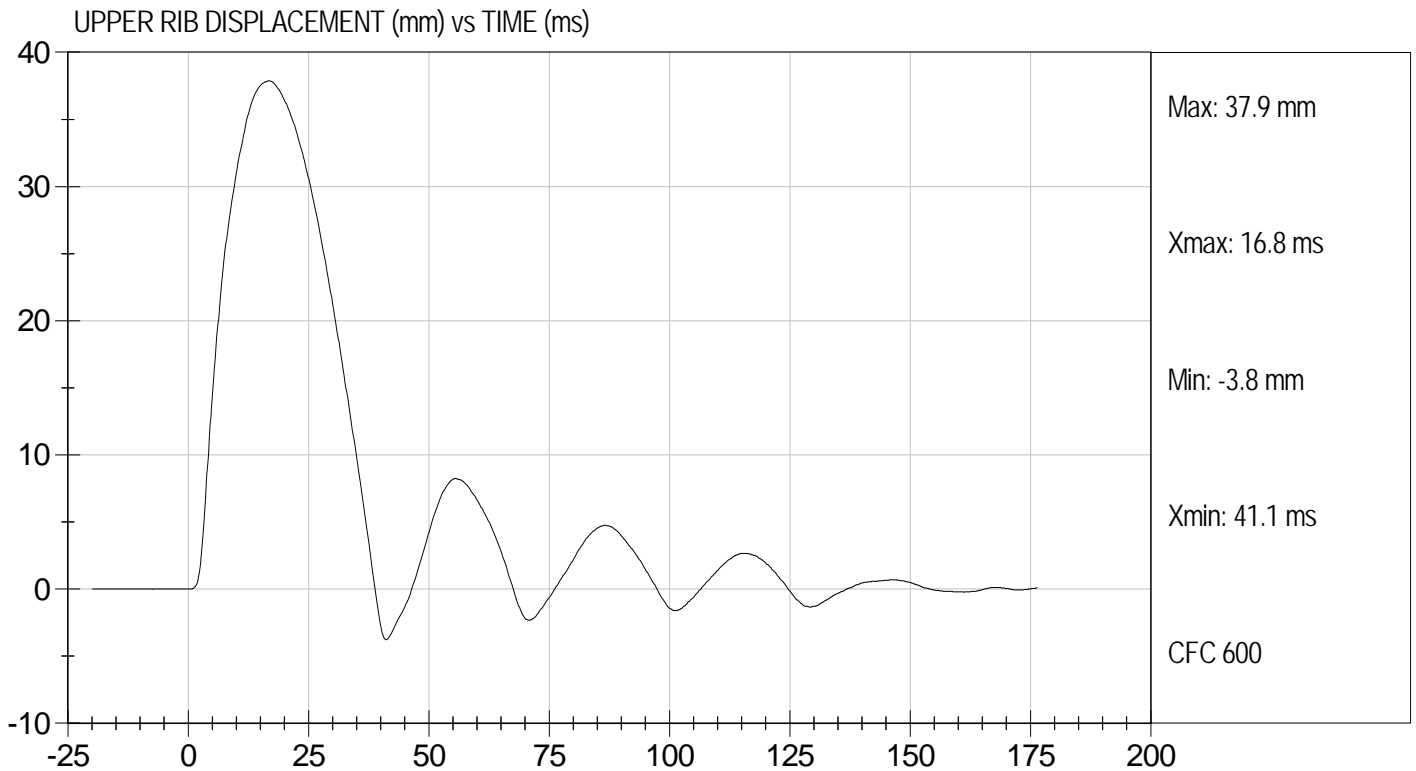
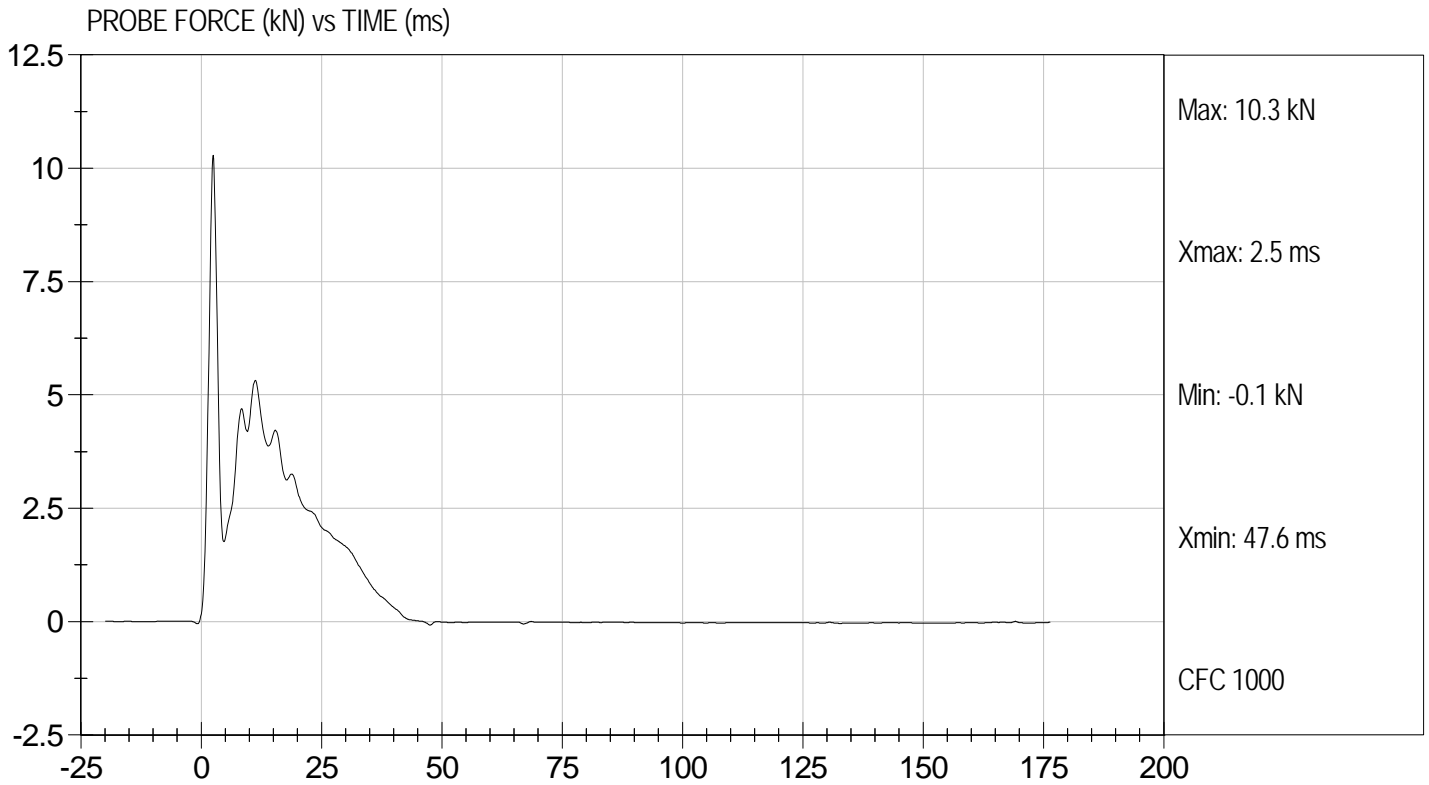
10/5/11
 Test Date


 Approved By



Test Desc: Thorax Impact
Component ID: D113320

Test Date: 10/5/11
Velocity: 18.32 ft/s, 5.58 m/s

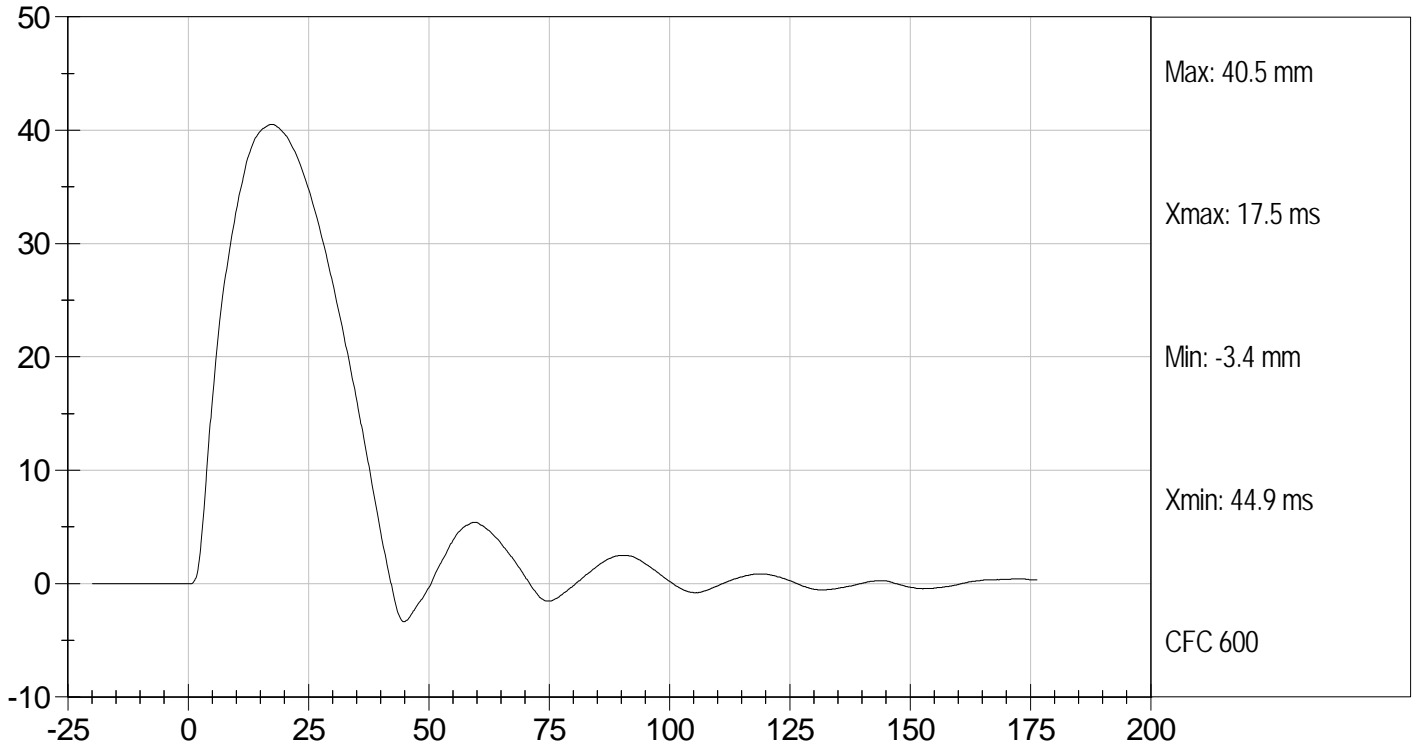




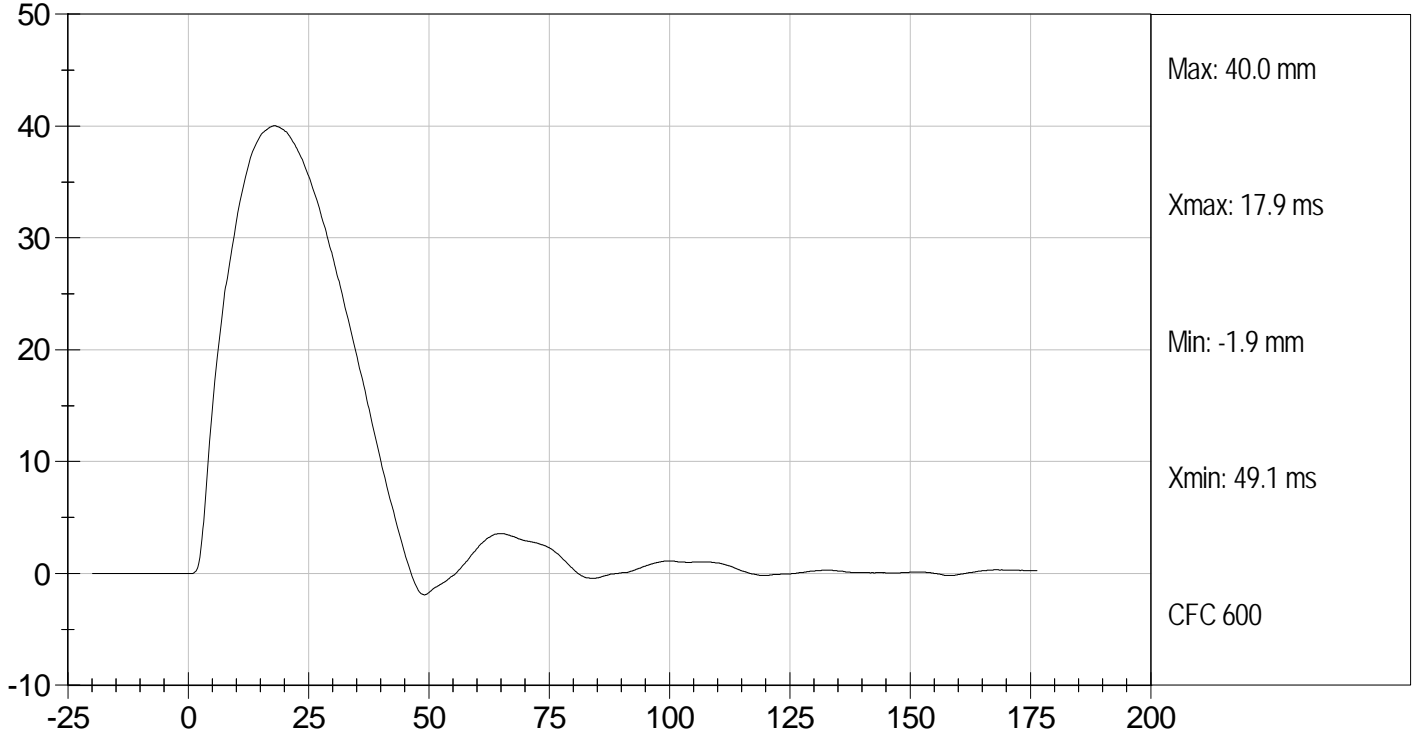
Test Desc: Thorax Impact
Component ID: D113320

Test Date: 10/5/11
Velocity: 18.32 ft/s, 5.58 m/s

MIDDLE RIB DISPLACEMENT (mm) vs TIME (ms)



LOWER RIB DISPLACEMENT (mm) vs TIME (ms)



MGA RESEARCH CORPORATION

ABDOMEN TEST

ES-2re DUMMY


ATD Serial No: 032

Test I.D: D113327

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	42	Pass
Probe Speed	m/s	3.90 to 4.10	4.06	Pass
Maximum Impact Force	kN	4.00 to 4.80	4.07	Pass
Time of Maximum Impactor Force	ms	10.60 to 13.00	11.00	Pass
Maximum Total Abdomen Force	kN	2.20 to 2.70	2.41	Pass
Time of Maximum Abdomen Force	ms	10.00 to 12.30	10.80	Pass
Overall Test Results				Pass


Laboratory Technician

10/5/11
Test Date

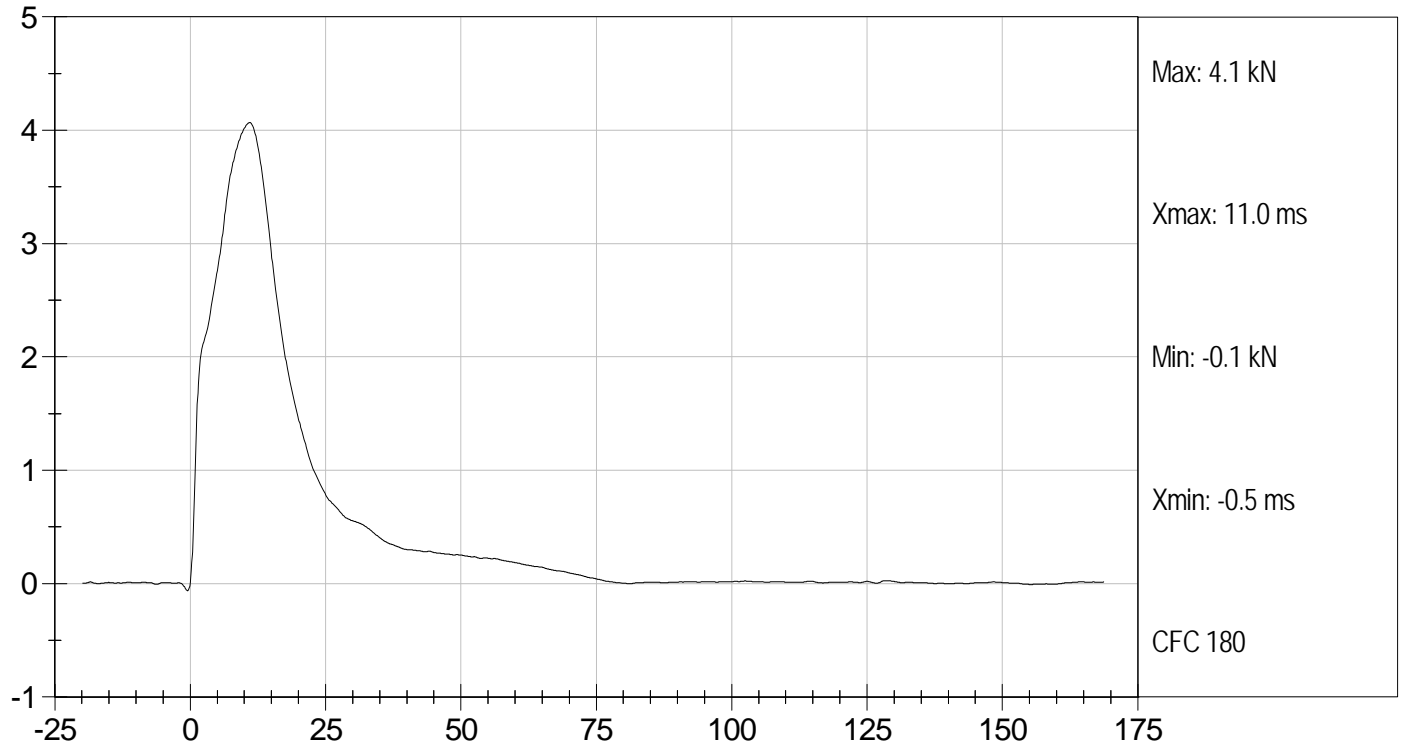

Approved By



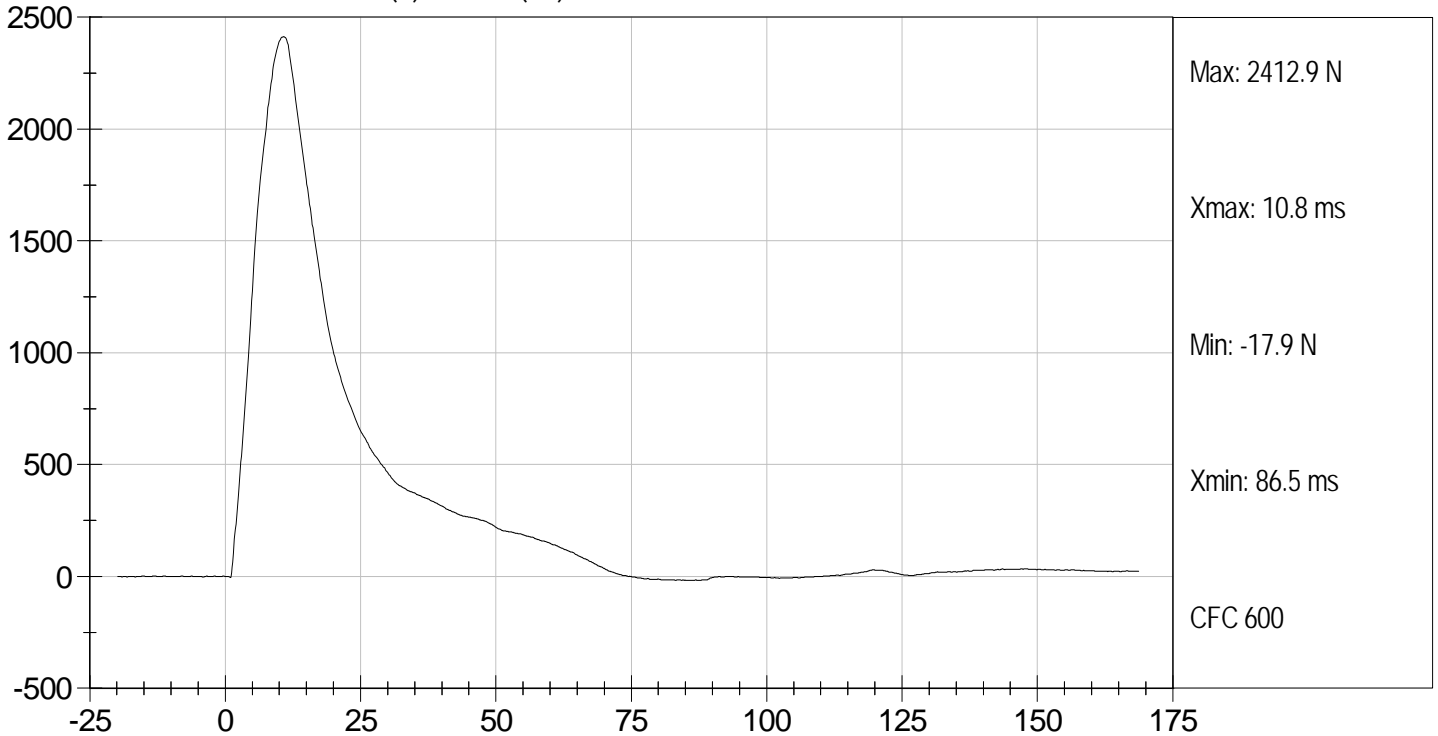
Test Desc: Abdomen Impact
Component ID: D113327

Test Date: 10/5/11
Velocity: 13.33 ft/s, 4.06 m/s

IMPACTOR FORCE (kN) vs TIME (ms)



TOTAL ABDOMEN FORCE (N) vs TIME (ms)



MGA RESEARCH CORPORATION
LUMBAR SPINE TEST
ES-2re DUMMY

ATD Serial No: 032

Test I.D.: D113328

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	40	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	-0.41	Pass
	27 ms	m/s	-6.50 to -5.80	-6.01	Pass
	30 ms	m/s	>= -6.5	-6.00	Pass
Maximum Flexion Angle	deg	45.0 to 55.0	50.7	Pass	
Time of Maximum Flexion Angle	ms	39.0 to 53.0	45.3	Pass	
Headform Rotation Decay to Initial Position	ms	37 to 57	44	Pass	
Overall Results				Pass	

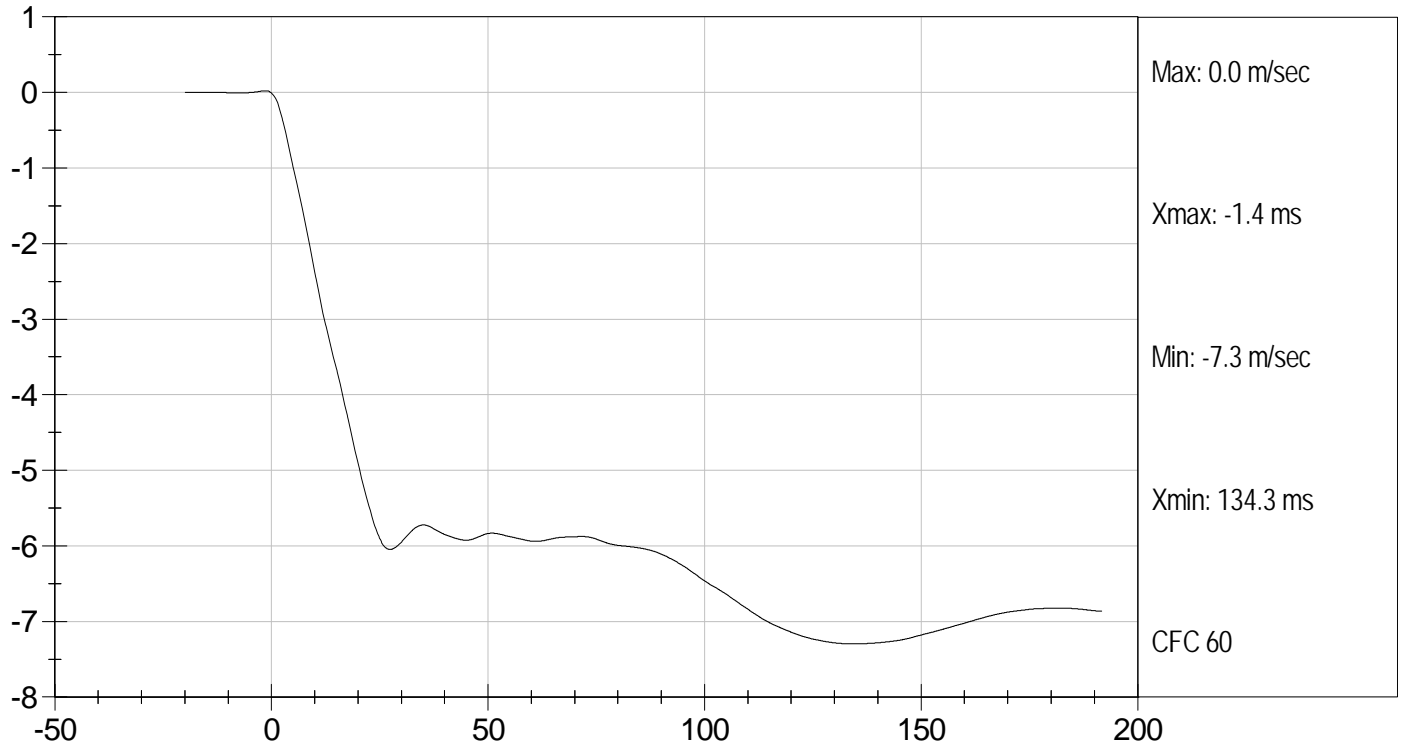
Jessica Gall
 Laboratory Technician

10/5/11
 Test Date

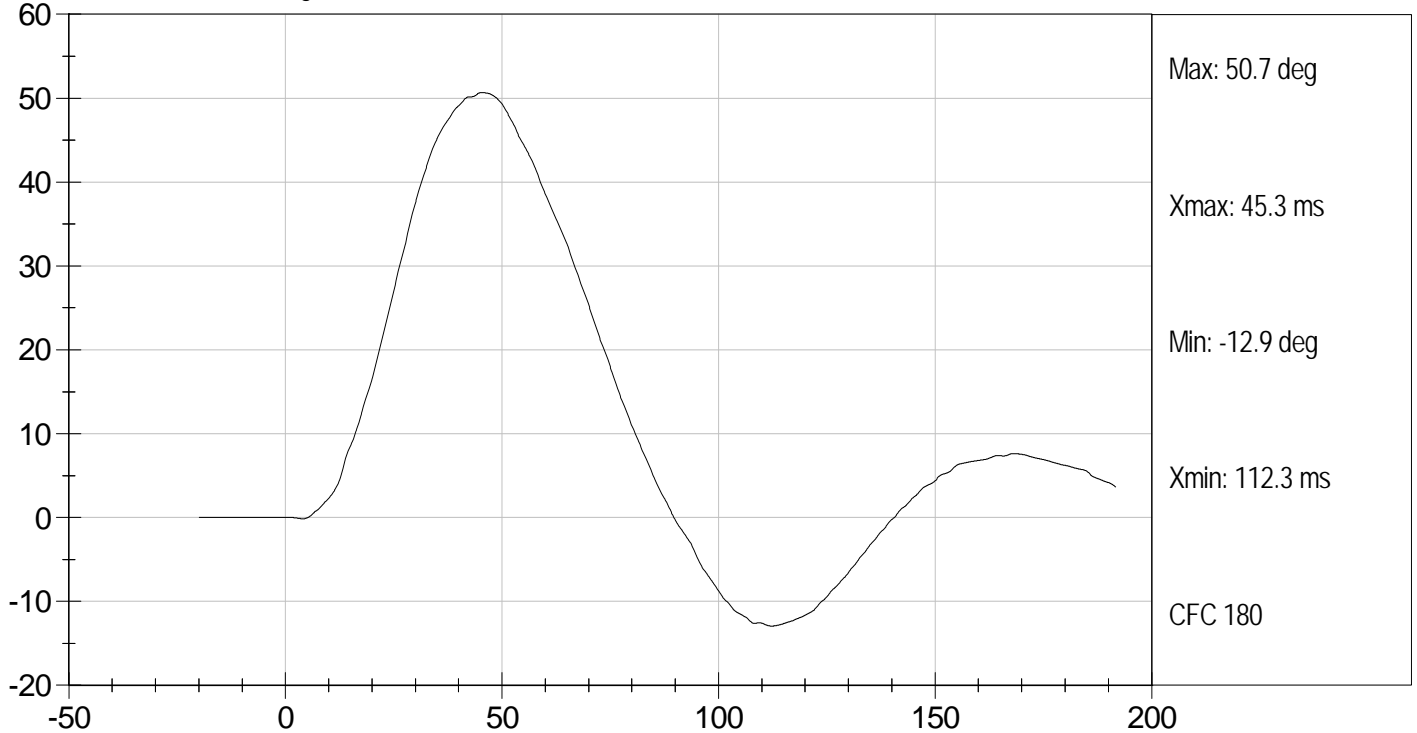
David Winkelbauer
 Approved By



PENDULUM DECELERATION (m/sec) vs TIME (ms)



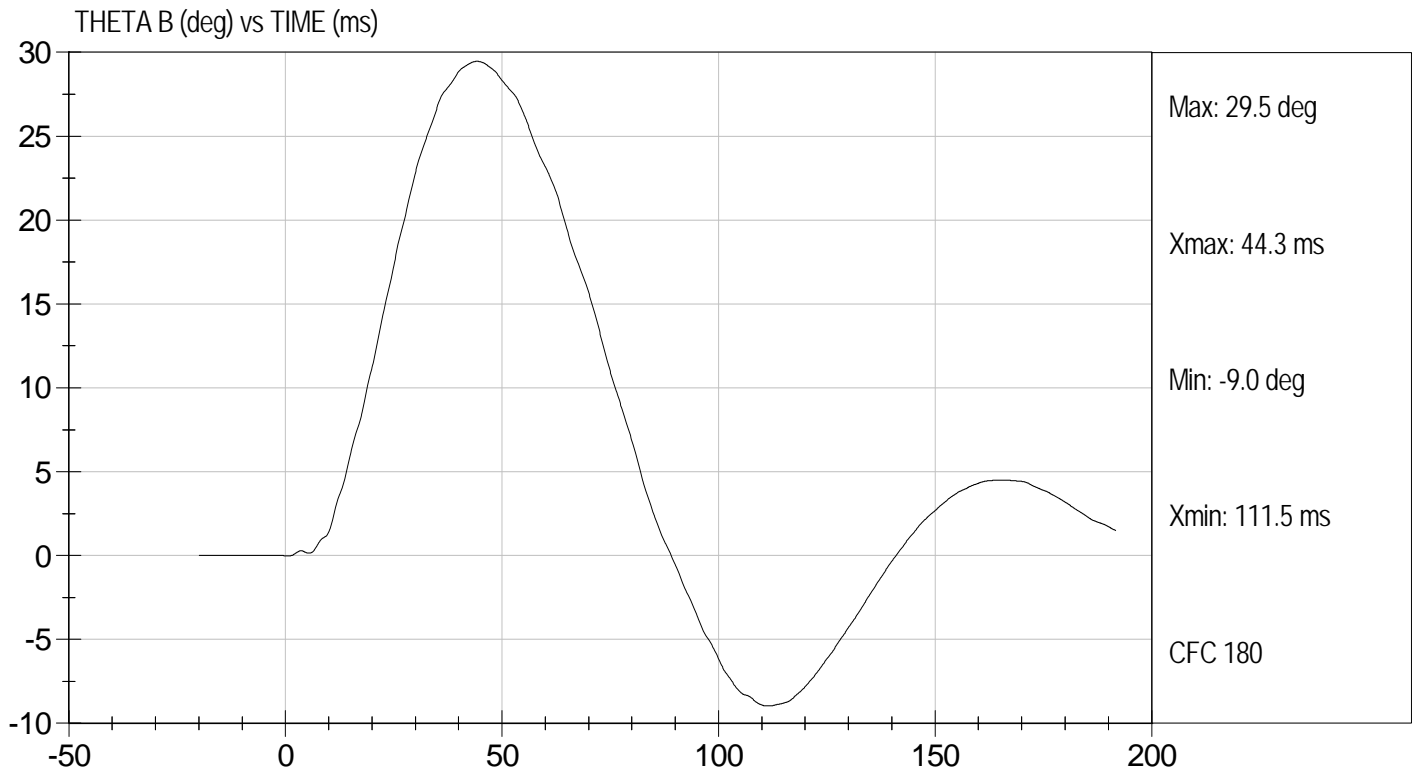
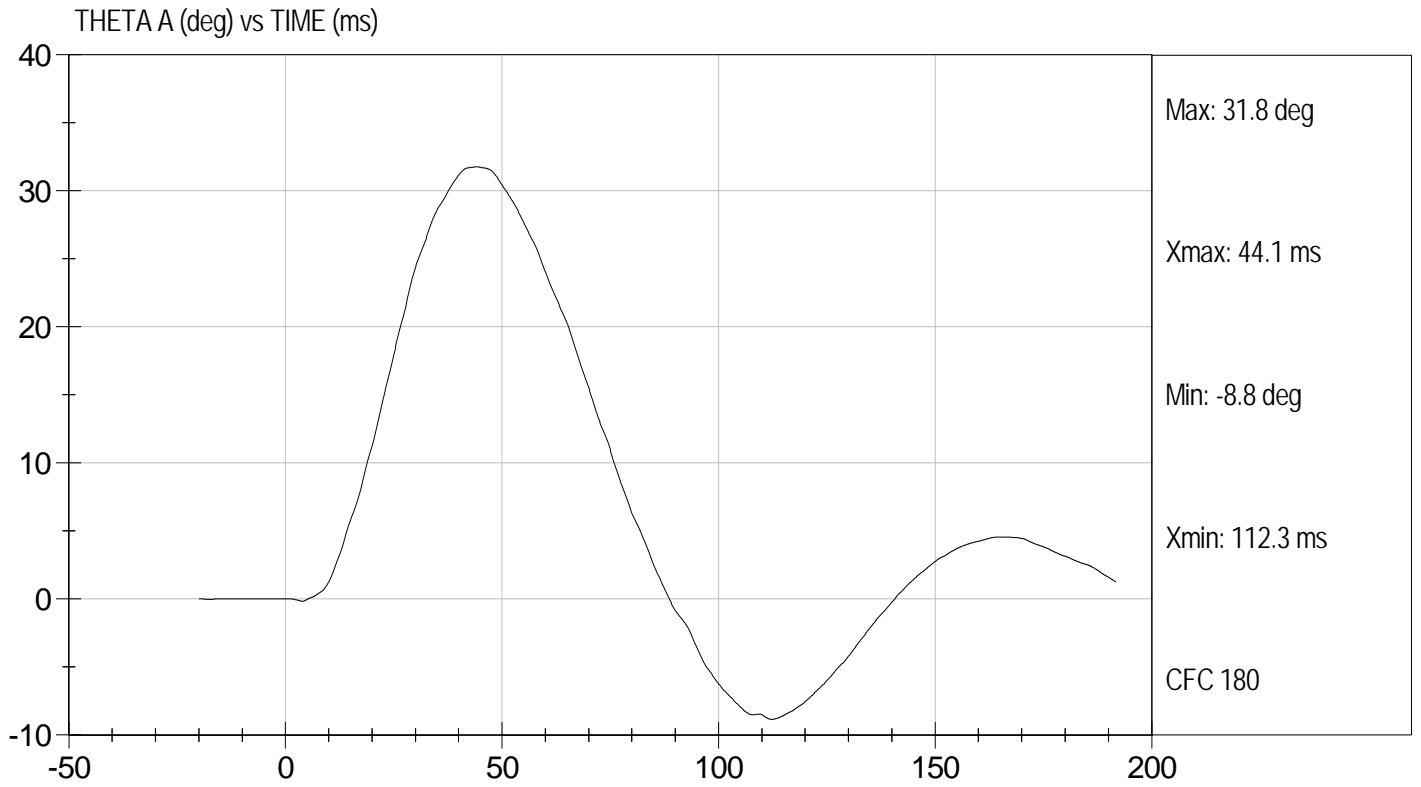
FLEXION ANGLE (deg) vs TIME (ms)





Test Desc: Lumbar Bending
Component ID: D113328

Test Date: 10/5/11
Velocity: 20.08 ft/s, 6.12 m/s



MGA RESEARCH CORPORATION

**PELVIS TEST
ES-2re DUMMY**

ATD Serial No: 032

Test I.D: D113329

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	42	Pass
Probe Speed	m/s	4.20 to 4.40	4.27	Pass
Maximum Impactor Force	kN	4.70 to 5.40	4.76	Pass
Time of Maximum Impactor Force	ms	11.80 to 16.10	13.70	Pass
Maximum Pubic Force	kN	1.23 to 1.59	1.47	Pass
Time of Maximum Pubic Force	ms	12.20 to 17.00	14.50	Pass
Overall Test Results				Pass

Jessica Gall

 Laboratory Technician

10/5/11
 Test Date

David Winkelbauer

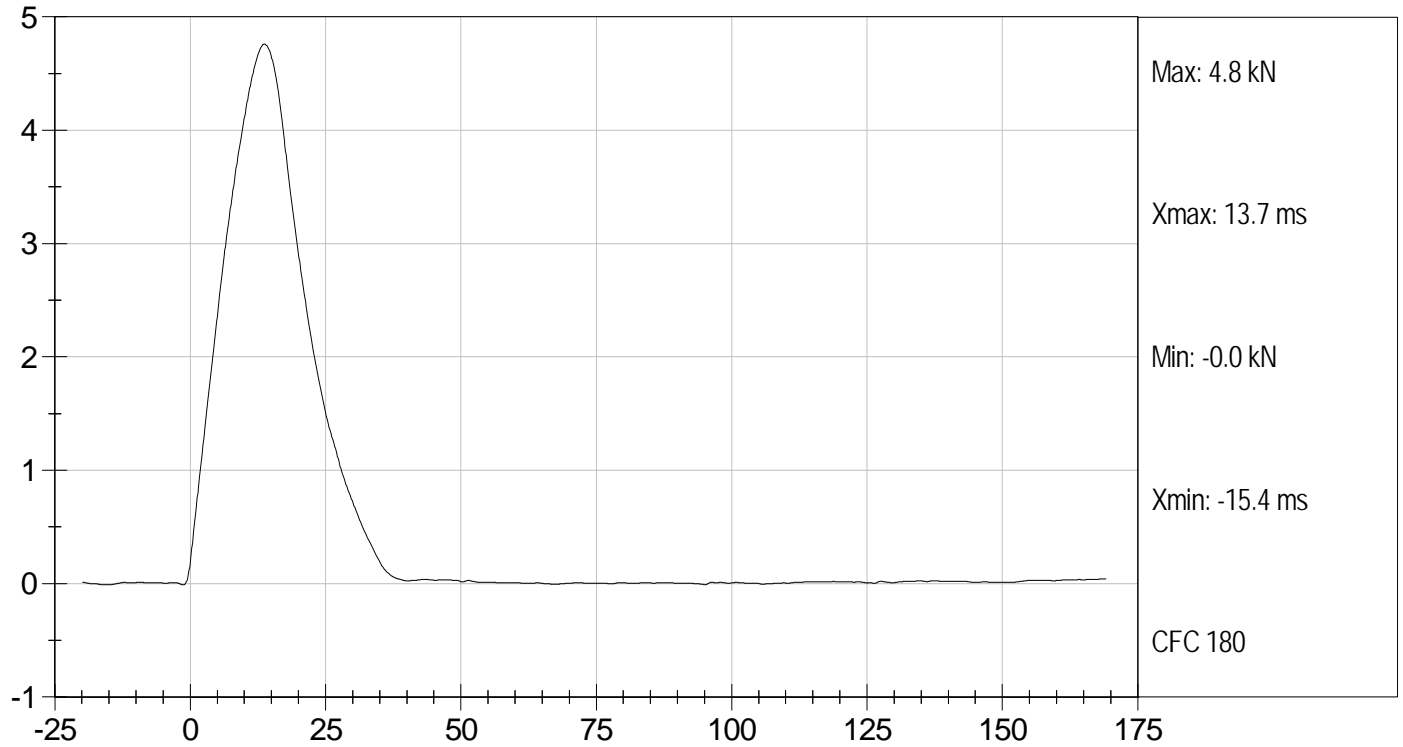
 Approved By



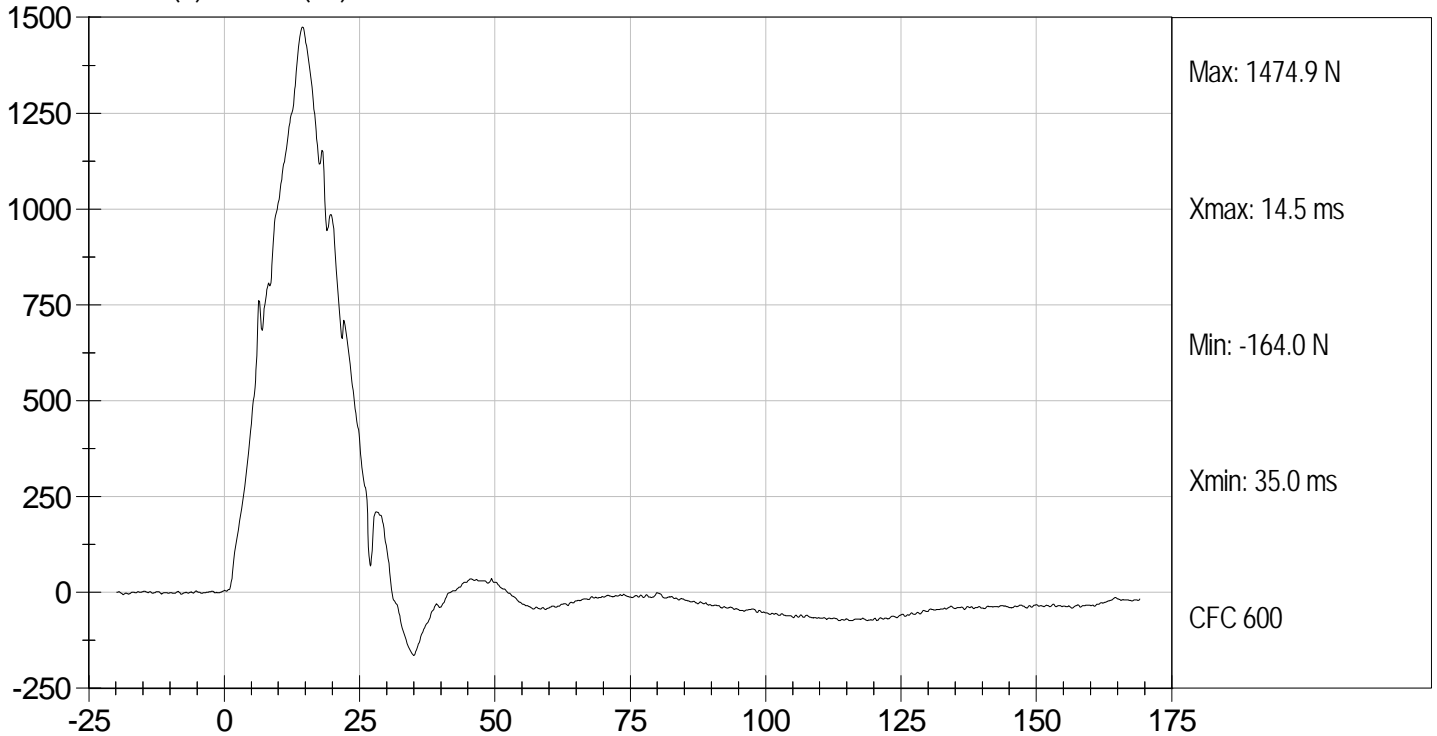
Test Desc: Pelvis Impact
Component ID: D113329

Test Date: 10/5/11
Velocity: 14.00 ft/s, 4.27 m/s

IMPACTOR FORCE (kN) vs TIME (ms)



PUBIC (N) vs TIME (ms)



MGA RESEARCH CORPORATION
HEAD DROP TEST
ES-2re DUMMY

ATD Serial No: 032

Test ID: D113381

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	44	Pass
Peak Resultant Acceleration	G's	125 to 155	148	Pass
Peak Lateral 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 Gall
 Laboratory Technician

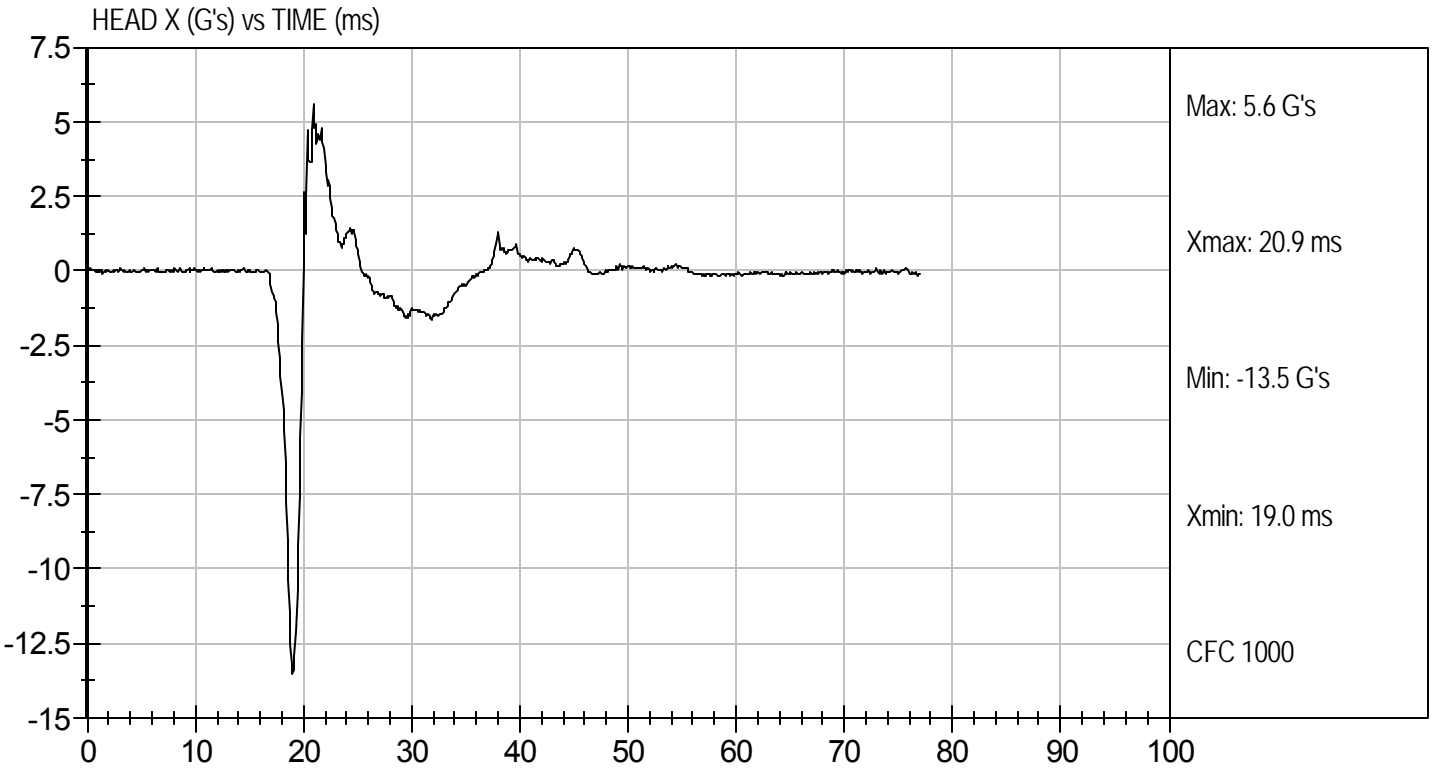
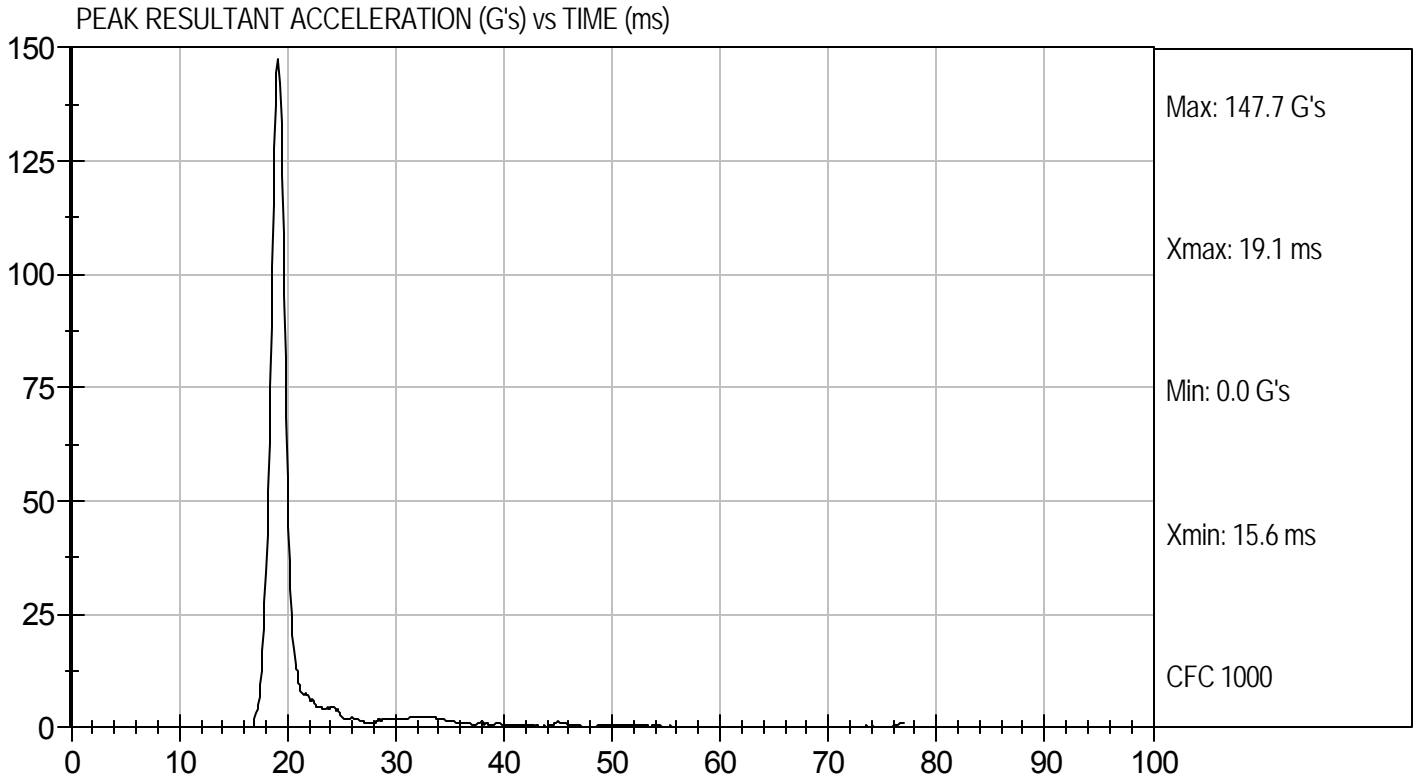
10/7/11
 Test Date

David Winkelbauer
 Approved By



Test Desc: Head Drop
Component ID: D113381

Test Date: 10/7/11
Velocity: 0 ft/s, 0 m/s



**MGA RESEARCH CORPORATION
NECK PENDULUM TEST
ES-2re DUMMY**

ATD Serial No: 032

Test I.D.: D113382

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	18.0 to 22.0	21.8	Pass
Laboratory Relative Humidity		%	10 to 70	46	Pass
Pendulum Speed		m/s	3.3 to 3.5	3.5	Pass
Pendulum Deceleration	1 ms	m/s	0.00 to -0.05	-0.02	Pass
	3 ms	m/s	-0.25 to -0.375	-0.33	Pass
	14 ms	m/s	-3.20 to -3.70	-3.32	Pass
Maximum Flexion Angle		deg	49.0 to 59.0	54.0	Pass
Time of Maximum Flexion Angle		ms	54.0 to 66.0	64.1	Pass
Head Rotation Decay Time to 0 degree		ms	53.0 to 88.0	58.2	Pass
Overall Test Results					Pass

Jessica Hall
Laboratory Technician

10/7/11
Test Date

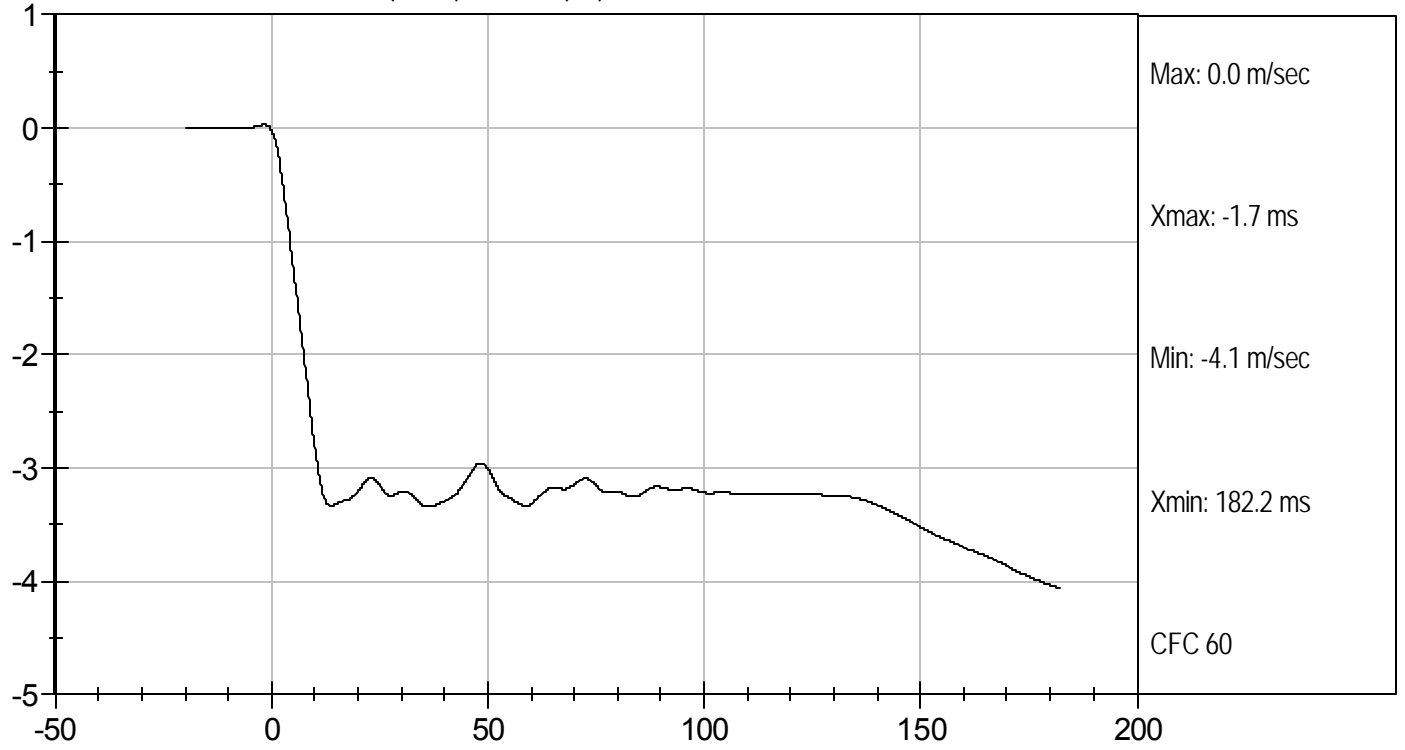
David Winkelbauer
Approved By



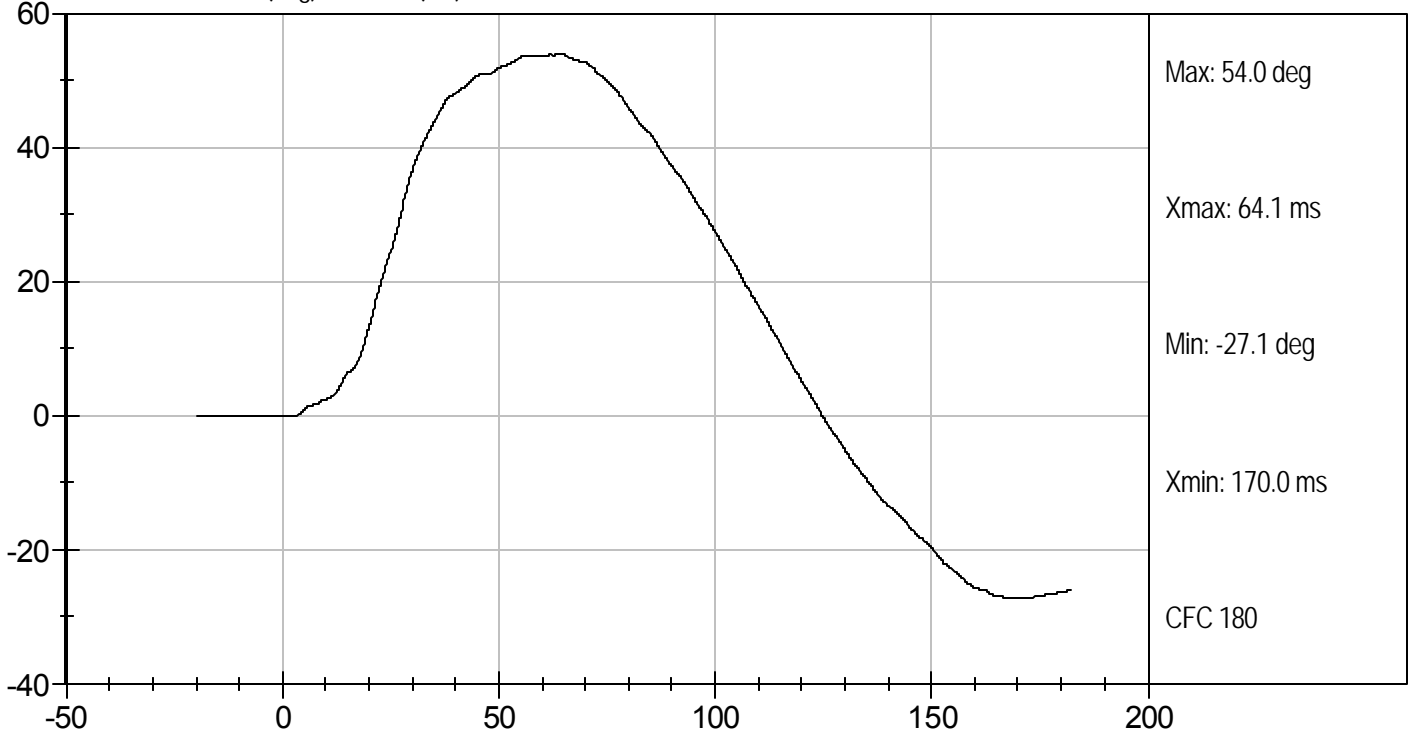
Test Desc: Neck Bending
Component ID: D113382

Test Date: 10/7/11
Velocity: 11.42 ft/s, 3.48 m/s

PENDULUM DECELERATION (m/sec) vs TIME (ms)



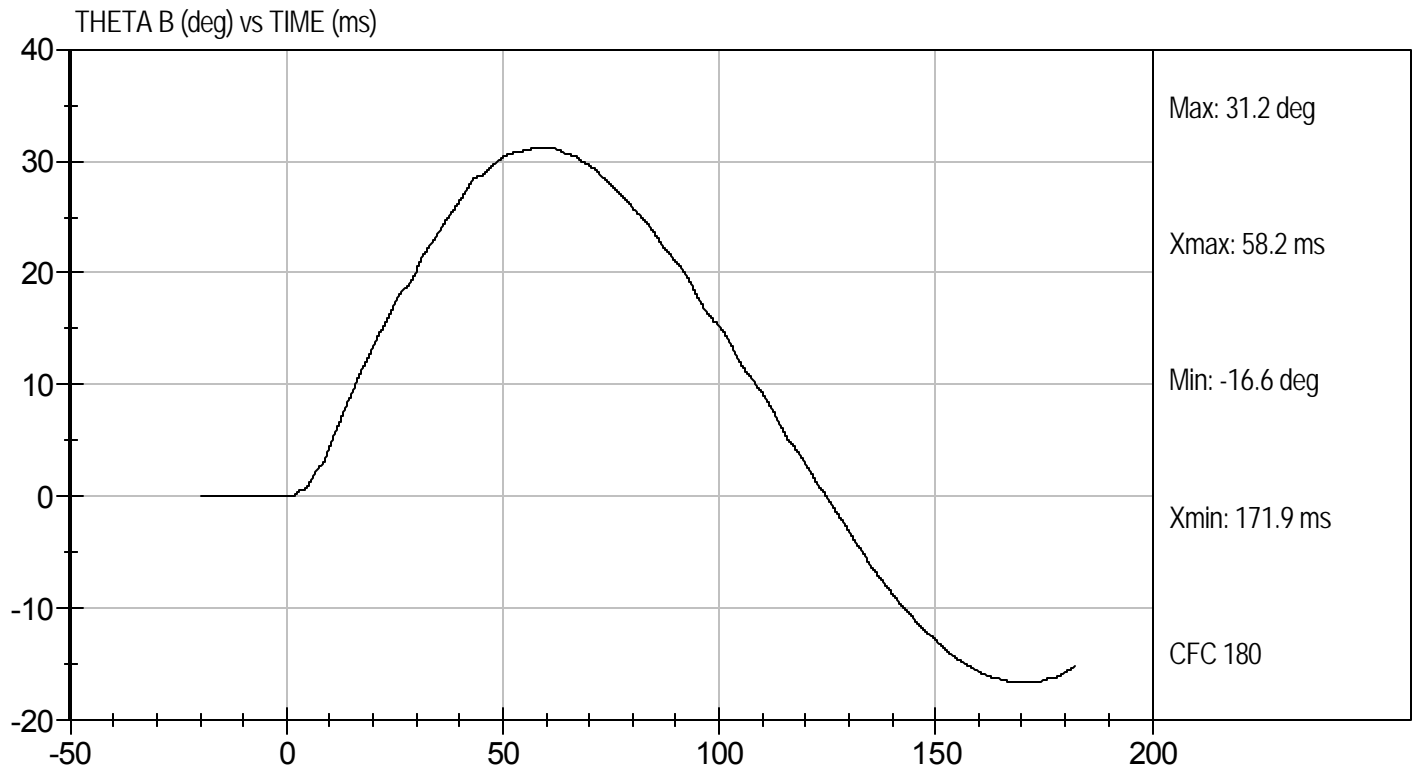
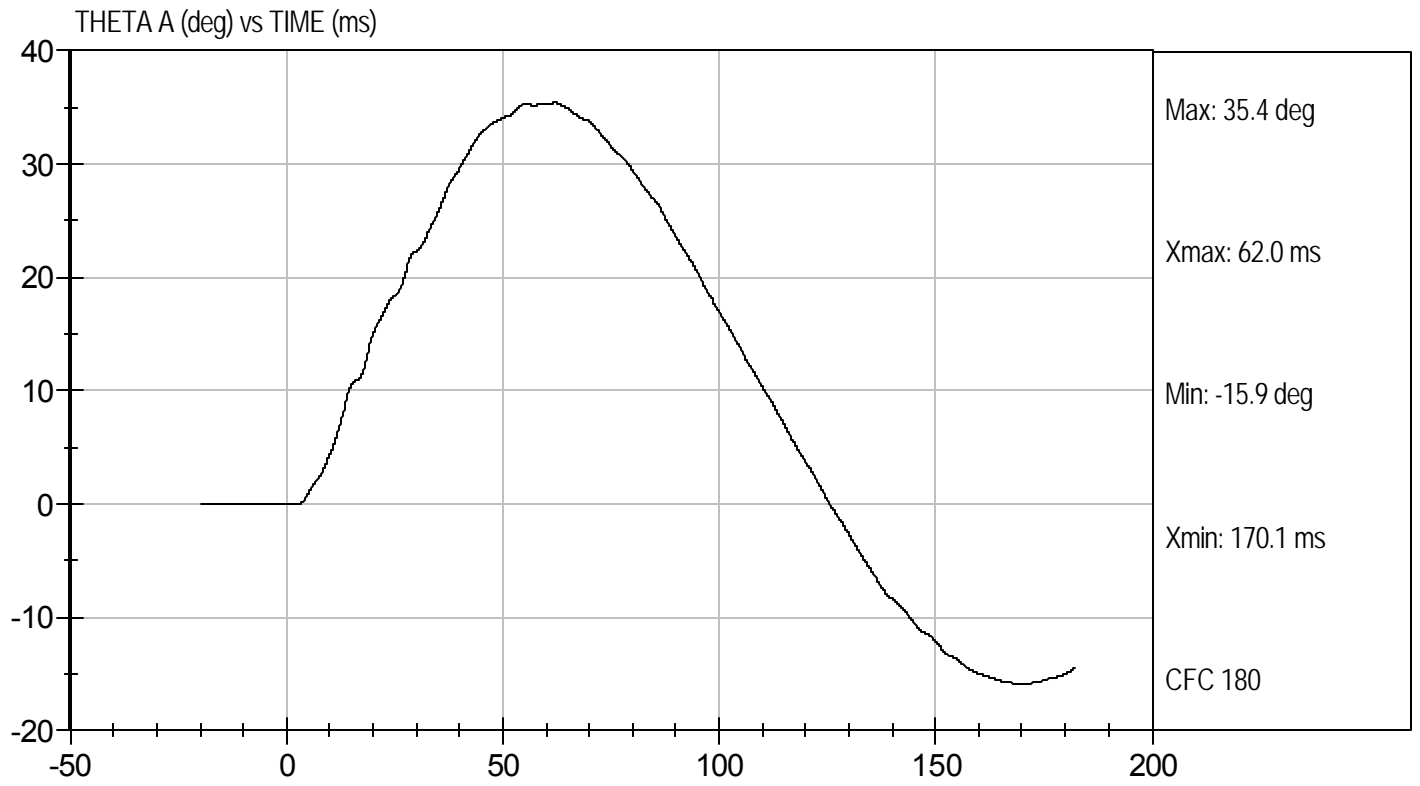
FLEXION ANGLE (deg) vs TIME (ms)





Test Desc: Neck Bending
Component ID: D113382

Test Date: 10/7/11
Velocity: 11.42 ft/s, 3.48 m/s



MGA RESEARCH CORPORATION
SHOULDER IMPACT TEST
ES-2re DUMMY

ATD Serial No: 032

Test I.D: D113383

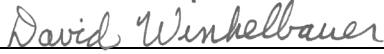
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	45	Pass
Pendulum Speed	m/s	4.2 to 4.4	4.3	Pass
Peak Shoulder Acceleration	G's	7.5 to 10.5	9.3	Pass
Time of Peak Shoulder Acceleration	ms	NA	13.6	Pass
Overall Test Results				Pass



 Laboratory Technician

10/7/11

 Test Date

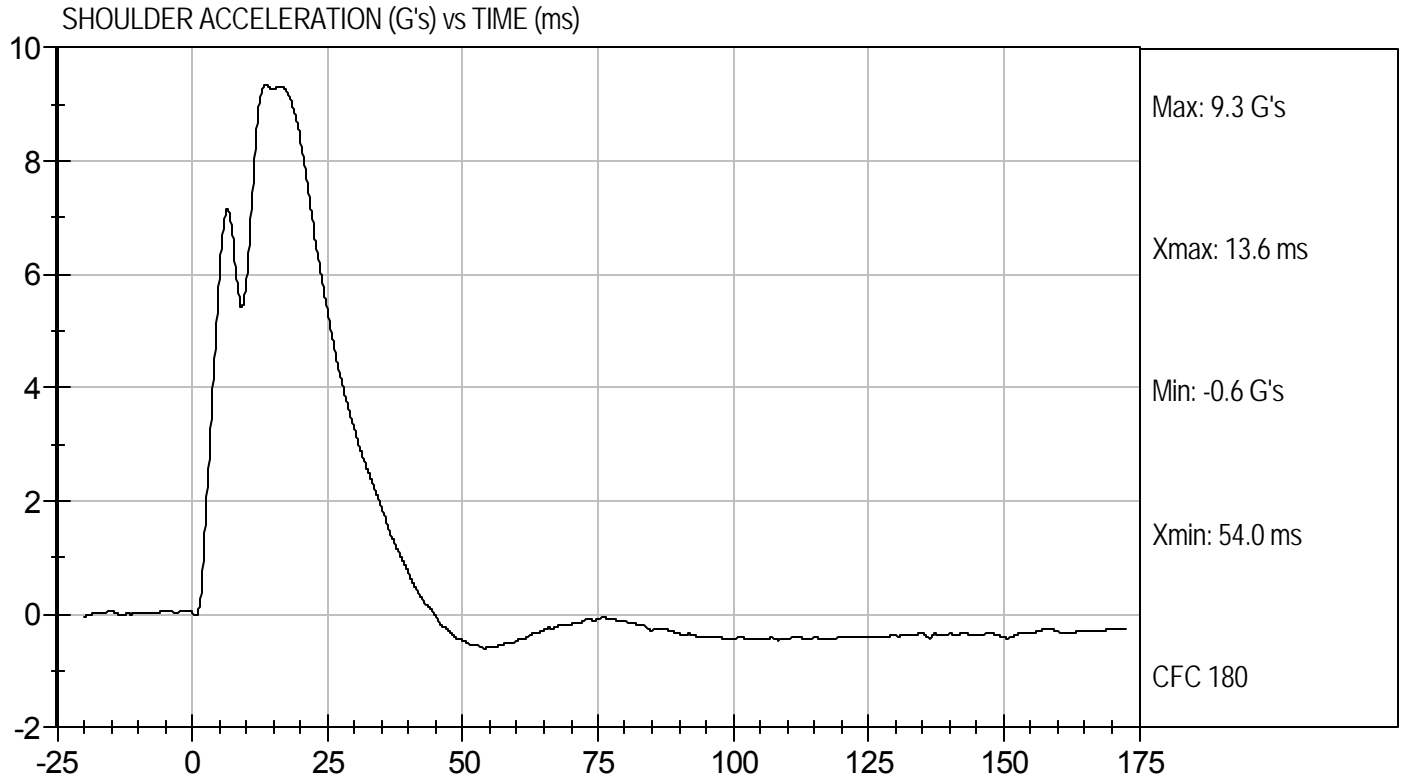


 Approved By



Test Desc: Shoulder Impact
Component ID: D113383

Test Date: 10/7/11
Velocity: 14.25 ft/s, 4.3 m/s



MGA RESEARCH CORPORATION

UPPER RIB TEST

ES-2re DUMMY

ATD Serial No: 032

Test I.D: D113384

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	44	Pass
Displacement at 3 m/s	mm	36.0 to 40.0	37.4	Pass
Displacement at 4 m/s	mm	46.0 to 51.0	48.3	Pass
Overall Test Results				Pass

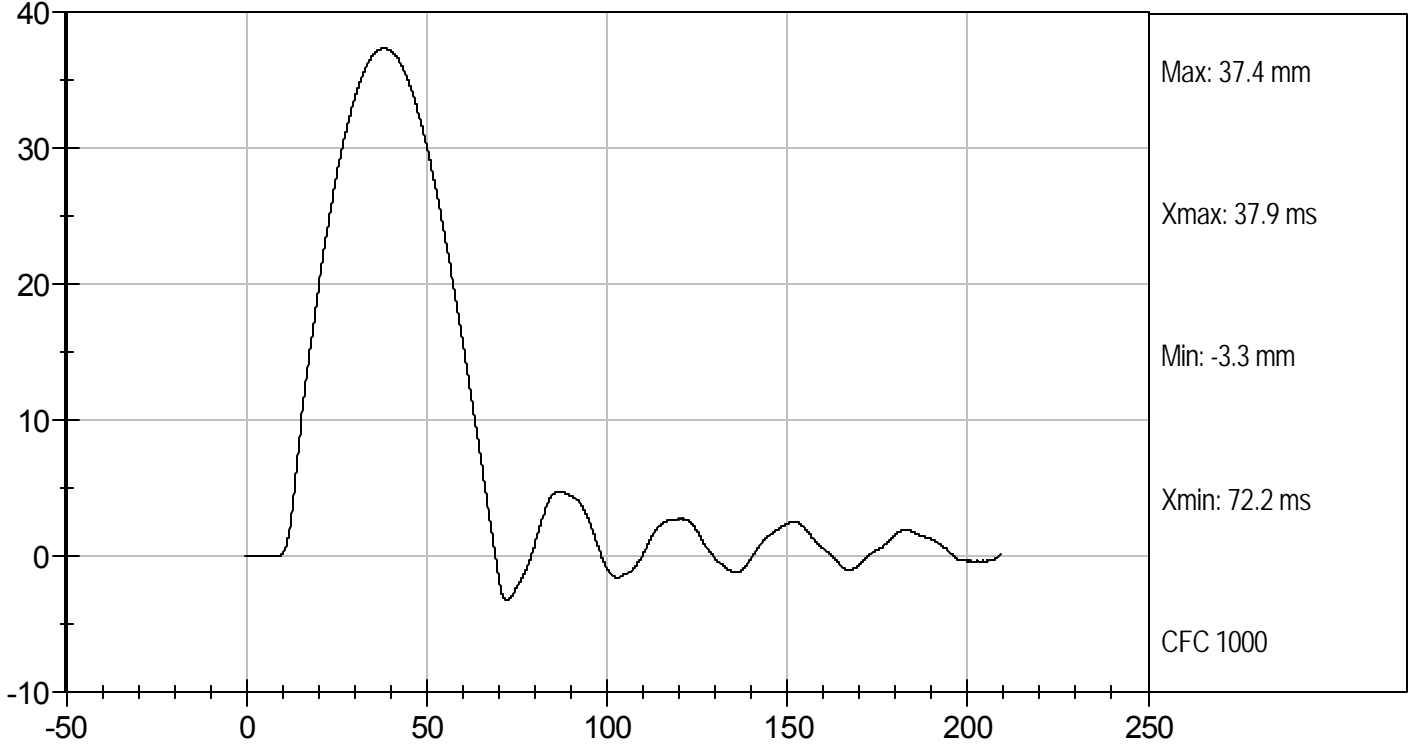
Jessica Hall
Laboratory Technician

10/7/11
Test Date

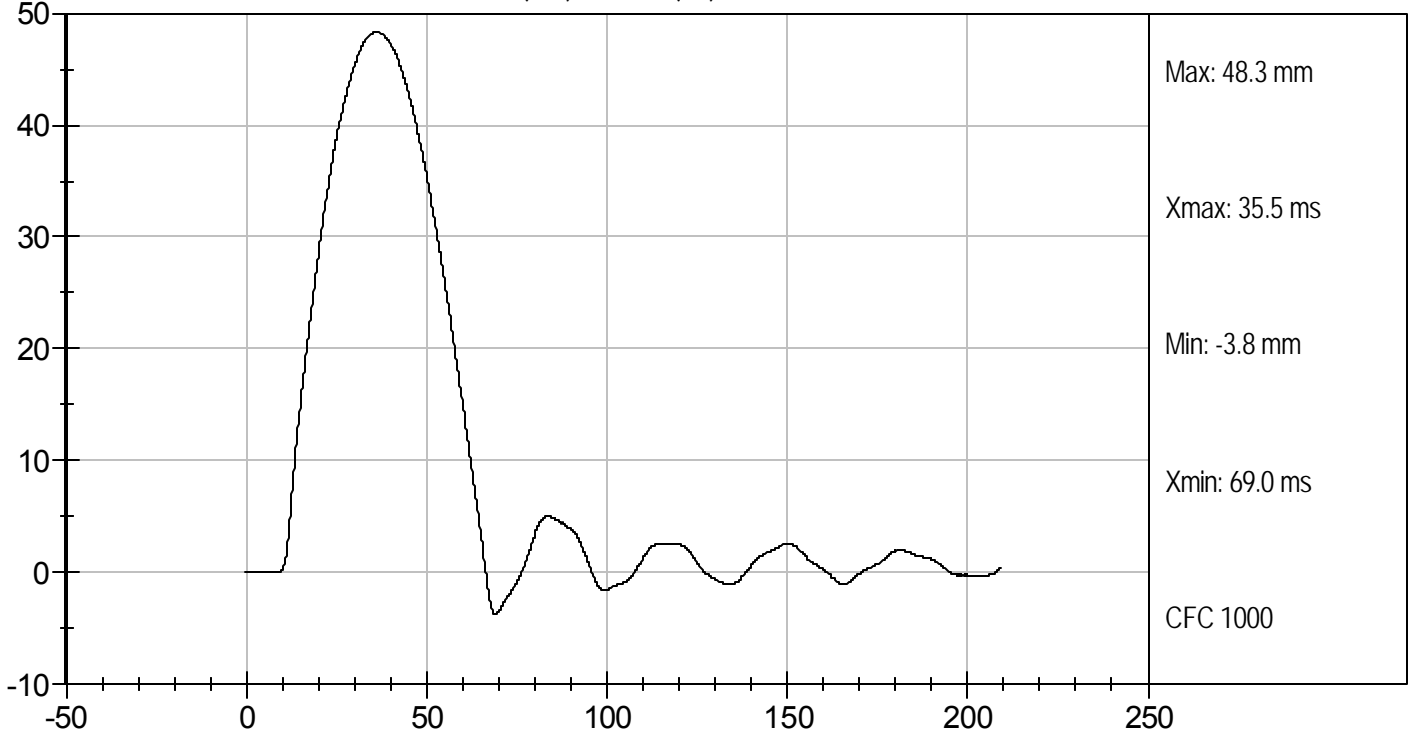
David Winkelbauer
Approved By



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



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



MGA RESEARCH CORPORATION

MID RIB TEST

ES-2re DUMMY

ATD Serial No: 032

Test I.D: D113385

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	44	Pass
Displacement at 3 m/s	mm	36.0 to 40.0	38.2	Pass
Displacement at 4 m/s	mm	46.0 to 51.0	48.5	Pass
Overall Test Results				Pass

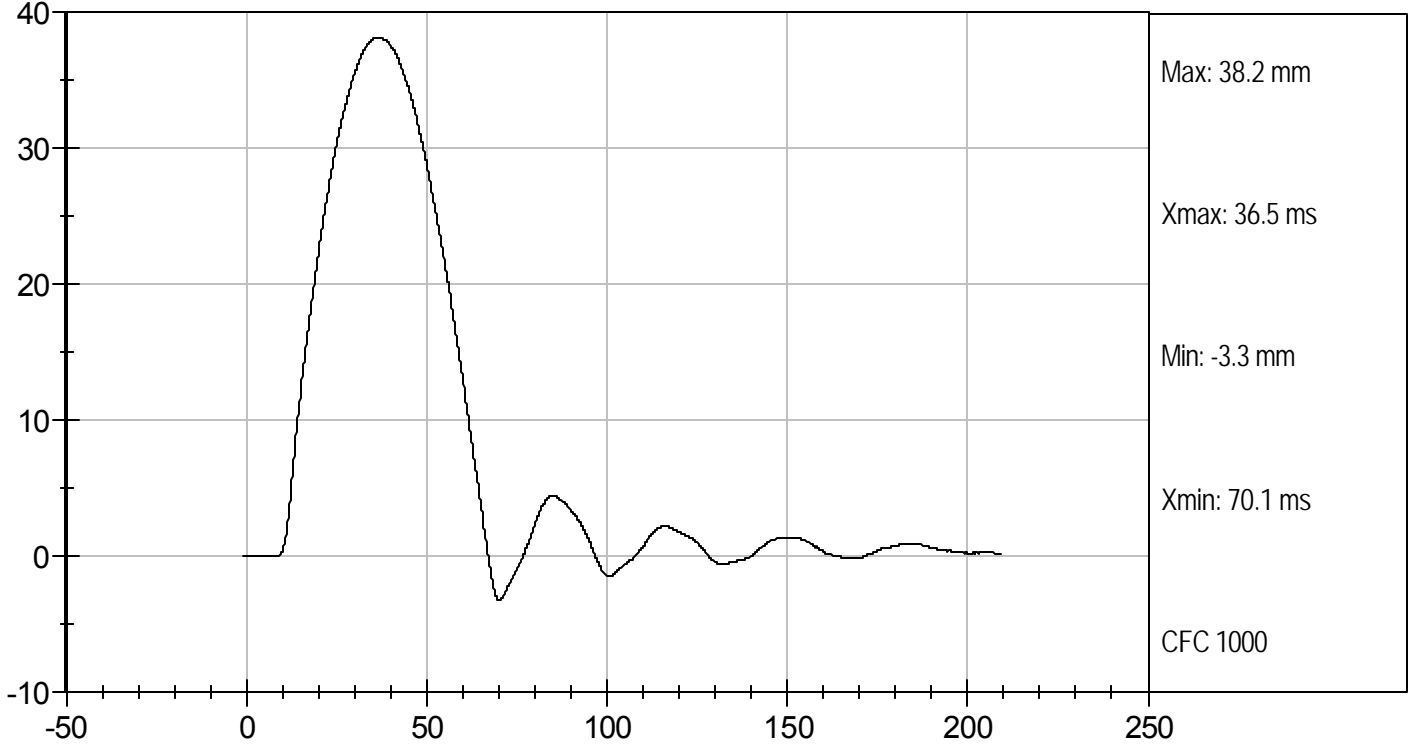
Jessica Gall
Laboratory Technician

10/7/11
Test Date

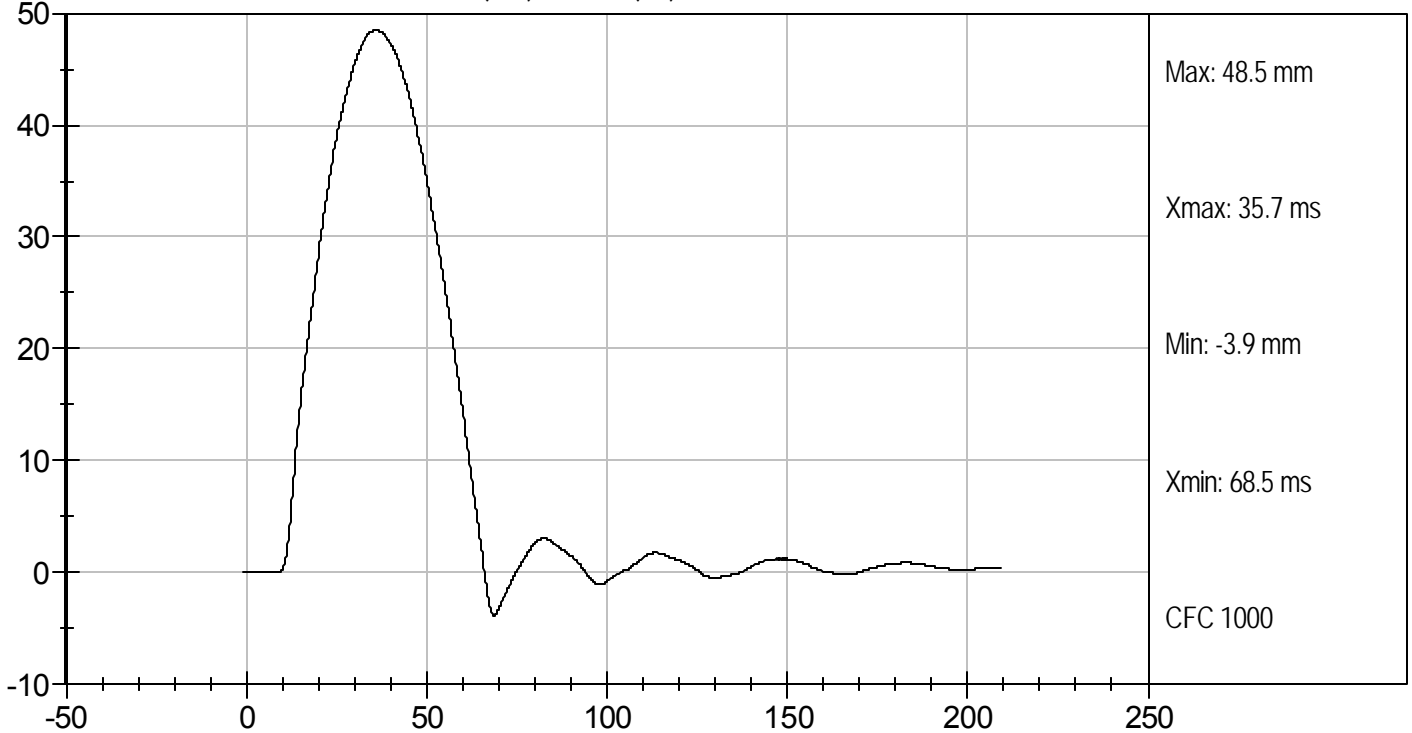
David Winkelbauer
Approved By



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



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



MGA RESEARCH CORPORATION

LOWER RIB TEST

ES-2re DUMMY

ATD Serial No: 032

Test I.D: D113386

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	44	Pass
Displacement at 3 m/s	mm	36.0 to 40.0	38.9	Pass
Displacement at 4 m/s	mm	46.0 to 51.0	49.0	Pass
Overall Test Results				Pass

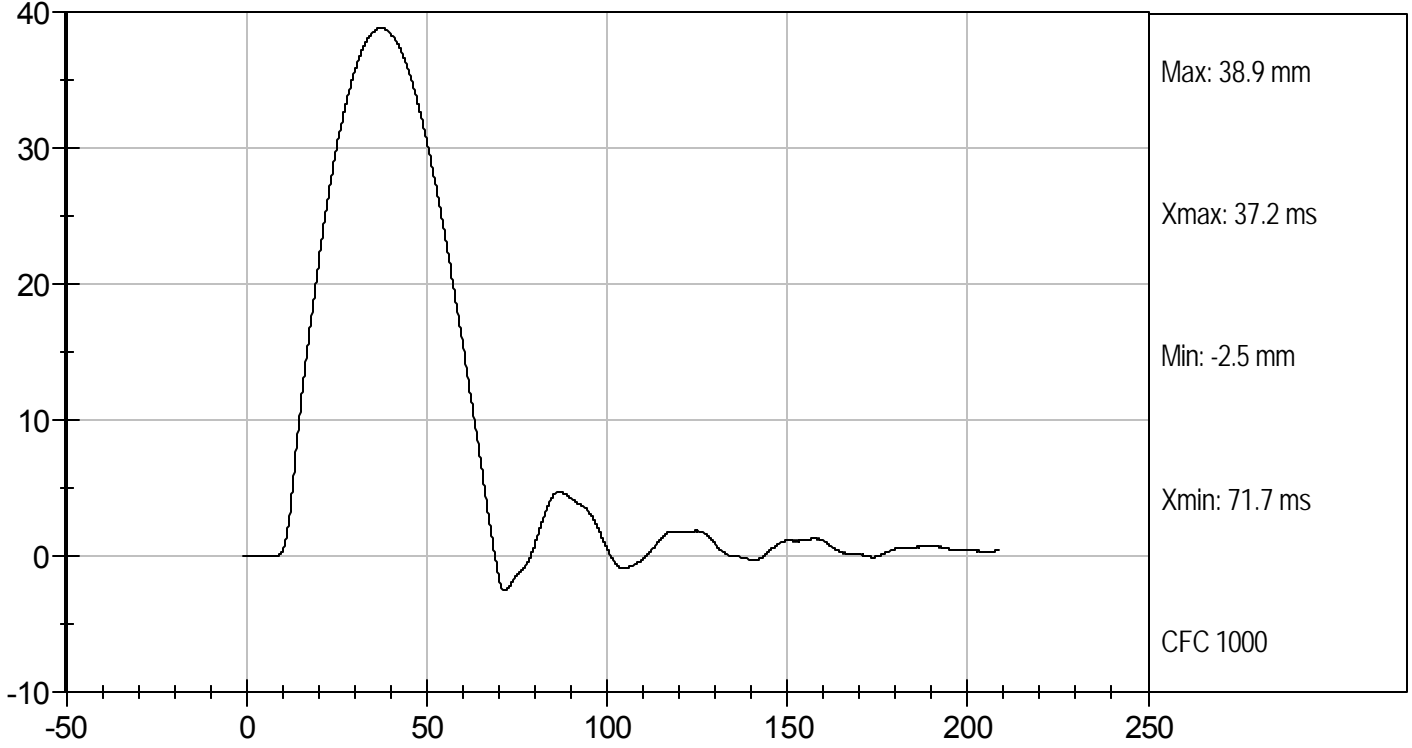
Jessica Gall
Laboratory Technician

10/7/11
Test Date

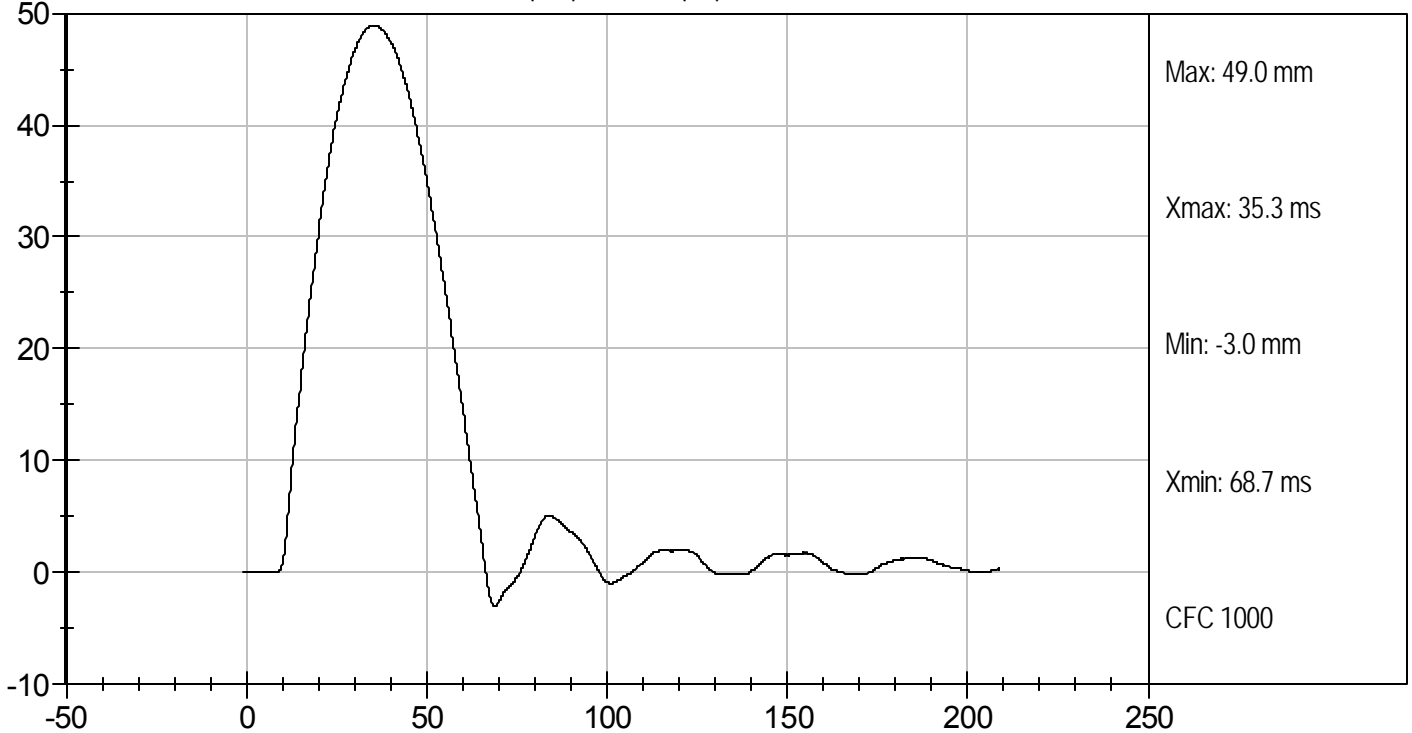
David Winkelbauer
Approved By



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: D113380

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.5	Pass
Humidity	%	10 to 70	45	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	5.23	Pass
Upper Rib Displacement	mm	34.0 to 41.0	37.4	Pass
Middle Rib Displacement	mm	37.0 to 45.0	40.4	Pass
Lower Rib Displacement	mm	37.0 to 44.0	40.2	Pass
Overall Test Results				Pass

Jessica Hall
 Laboratory Technician

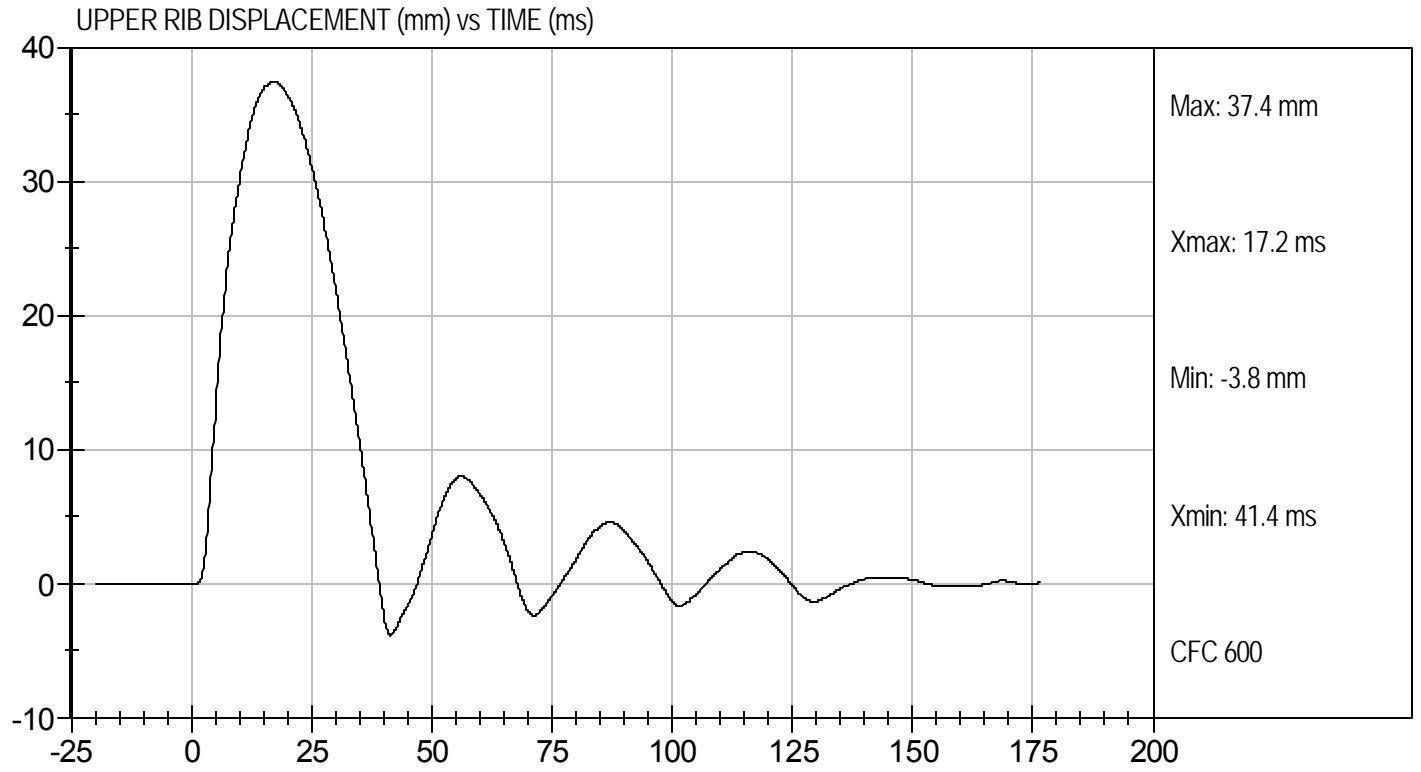
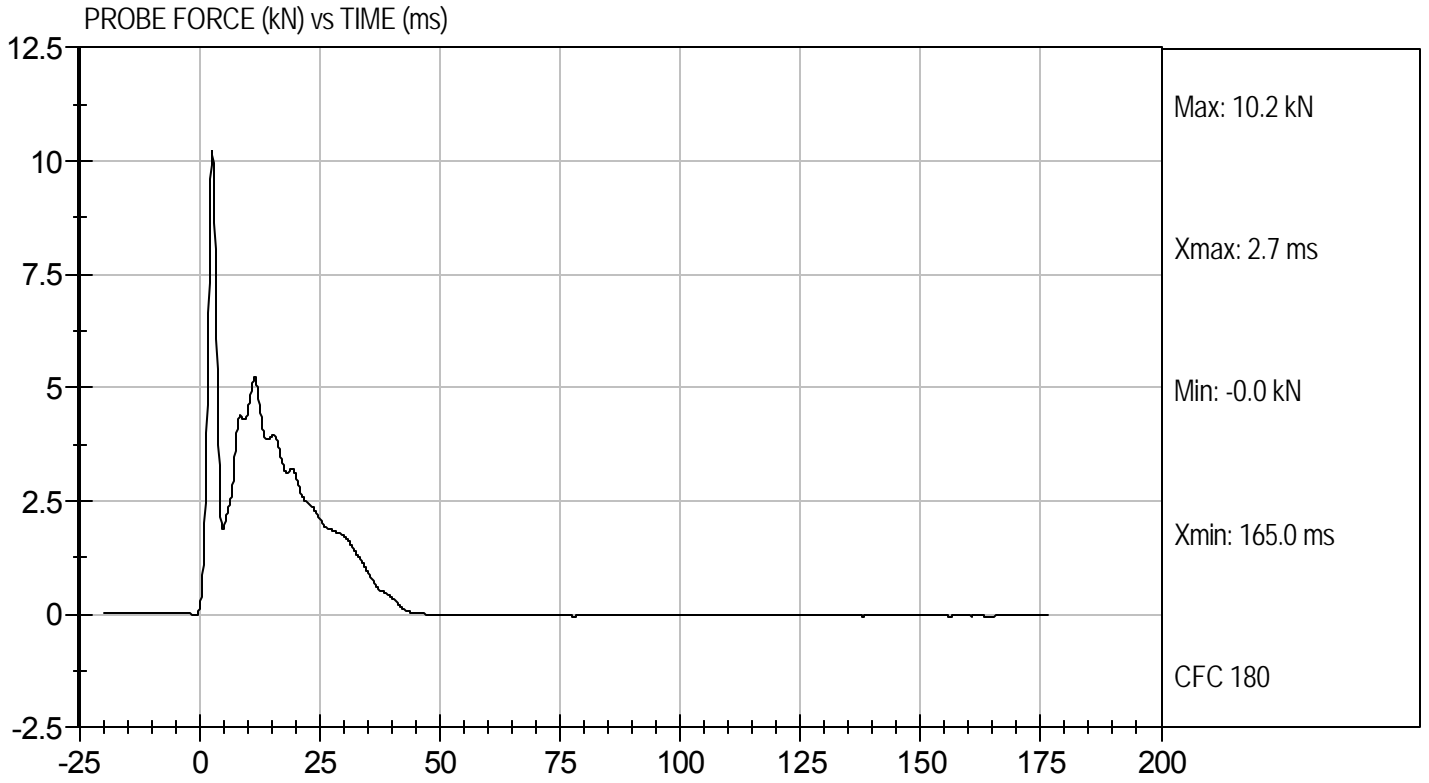
10/7/11
 Test Date

David Winkelbauer
 Approved By



Test Desc: Thorax Impact
Component ID: D113380

Test Date: 10/7/11
Velocity: 18.31 ft/s, 5.58 m/s

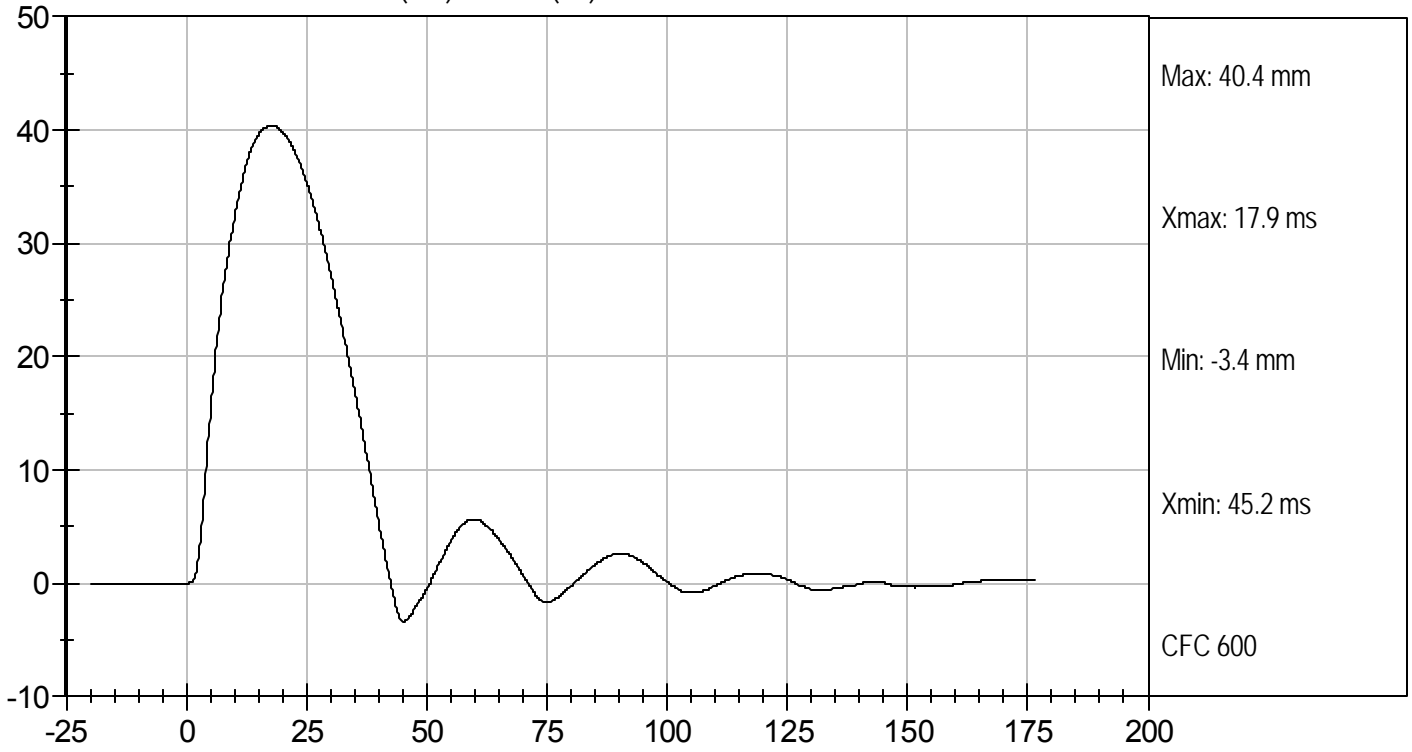




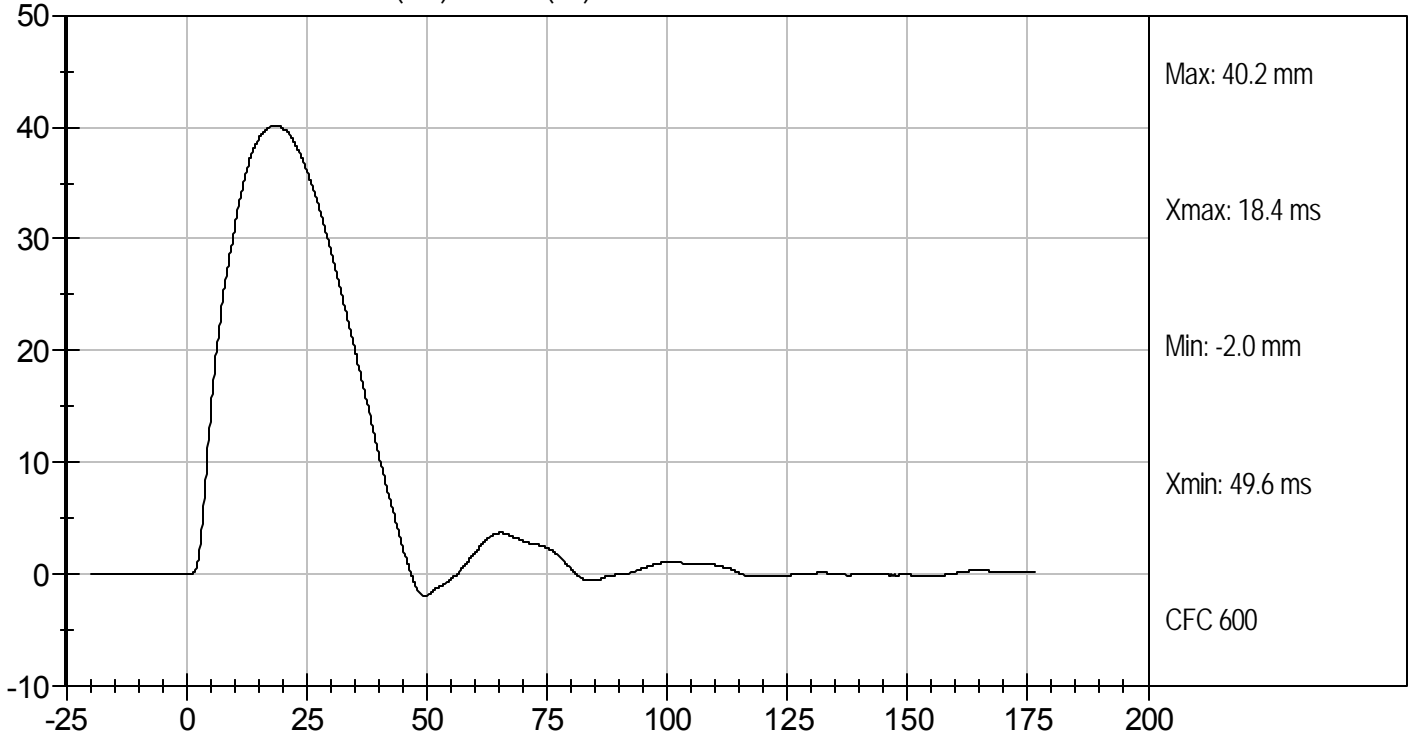
Test Desc: Thorax Impact
Component ID: D113380

Test Date: 10/7/11
Velocity: 18.31 ft/s, 5.58 m/s

MIDDLE RIB DISPLACEMENT (mm) vs TIME (ms)



LOWER RIB DISPLACEMENT (mm) vs TIME (ms)



MGA RESEARCH CORPORATION

ABDOMEN TEST

ES-2re DUMMY

ATD Serial No: 032

Test I.D: D113387

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	45	Pass
Probe Speed	m/s	3.90 to 4.10	4.06	Pass
Maximum Impact Force	kN	4.00 to 4.80	4.14	Pass
Time of Maximum Impact Force	ms	10.60 to 13.00	11.20	Pass
Maximum Total Abdomen Force	kN	2.20 to 2.70	2.38	Pass
Time of Maximum Abdomen Force	ms	10.00 to 12.30	10.80	Pass
Overall Test Results				Pass

Jessica Gall
Laboratory Technician

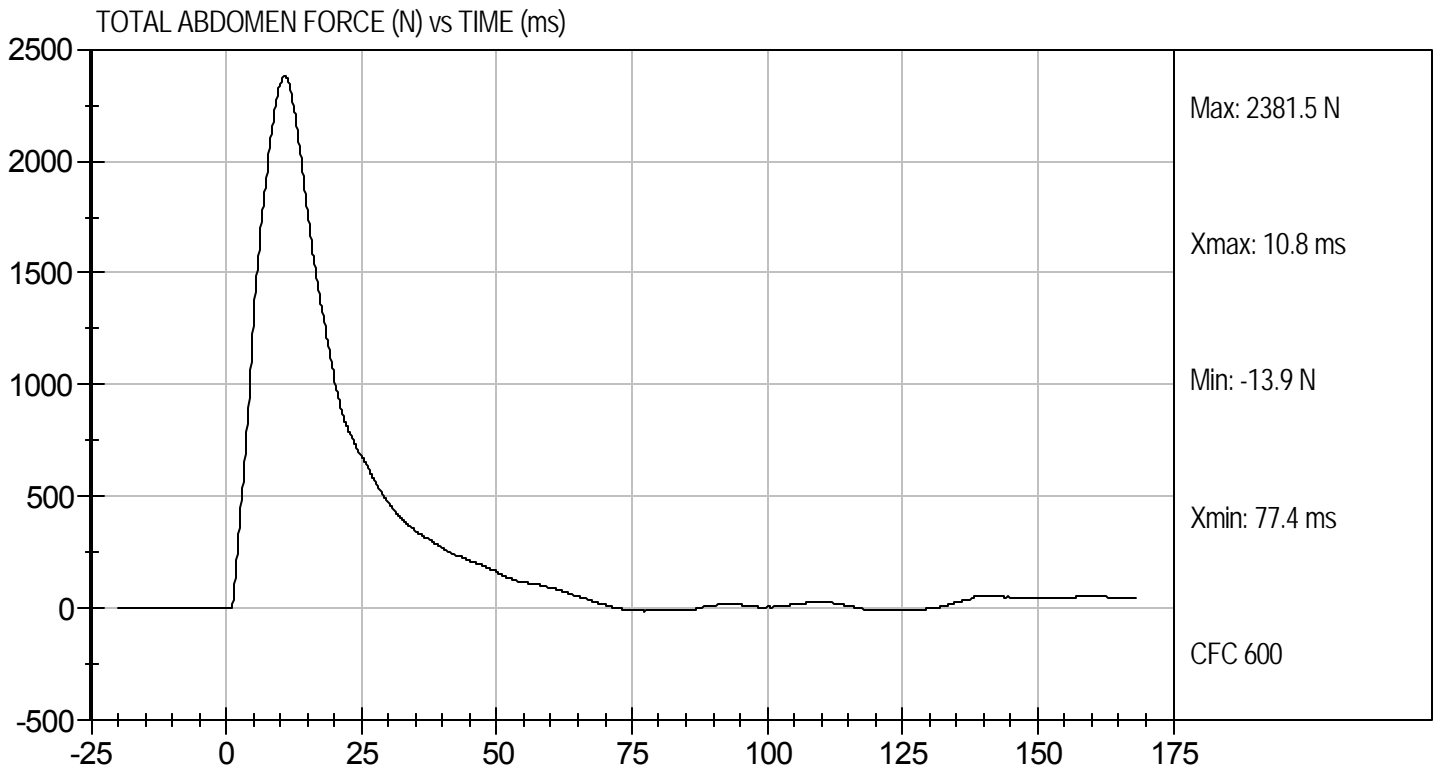
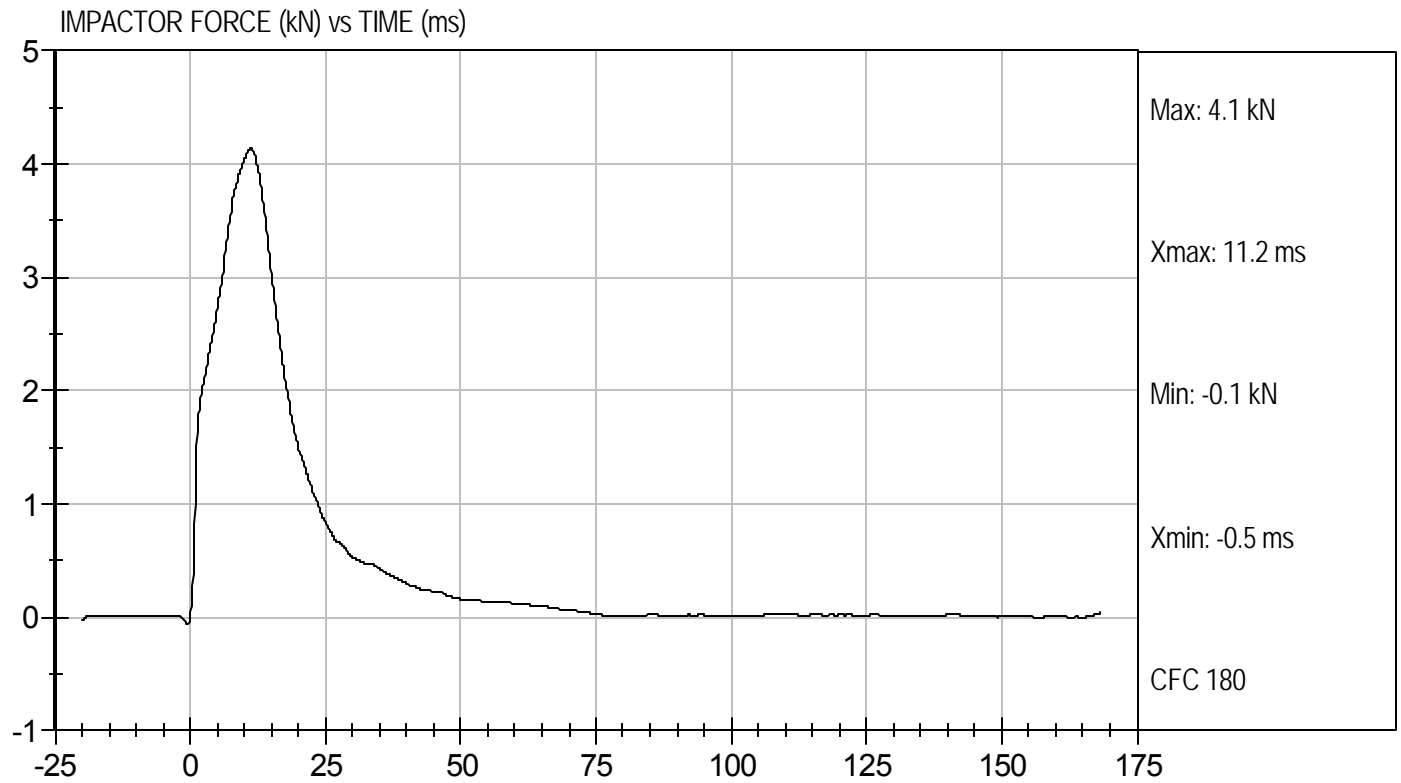
10/7/11
Test Date

David Winkelbauer
Approved By



Test Desc: Abdomen Impact
Component ID: D113387

Test Date: 10/7/11
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.: D113388

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	44	Pass
Pendulum Speed		m/s	5.95 to 6.15	6.12	Pass
Pendulum Deceleration	1 ms	m/s	-0.05 to 0.00	-0.02	Pass
	3.7 ms	m/s	-0.425 to -0.24	-0.41	Pass
	27 ms	m/s	-6.50 to -5.80	-5.88	Pass
	30 ms	m/s	>= -6.5	-6.02	Pass
Maximum Flexion Angle		deg	45.0 to 55.0	45.0	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

Jessica Hall

 Laboratory Technician

10/7/11

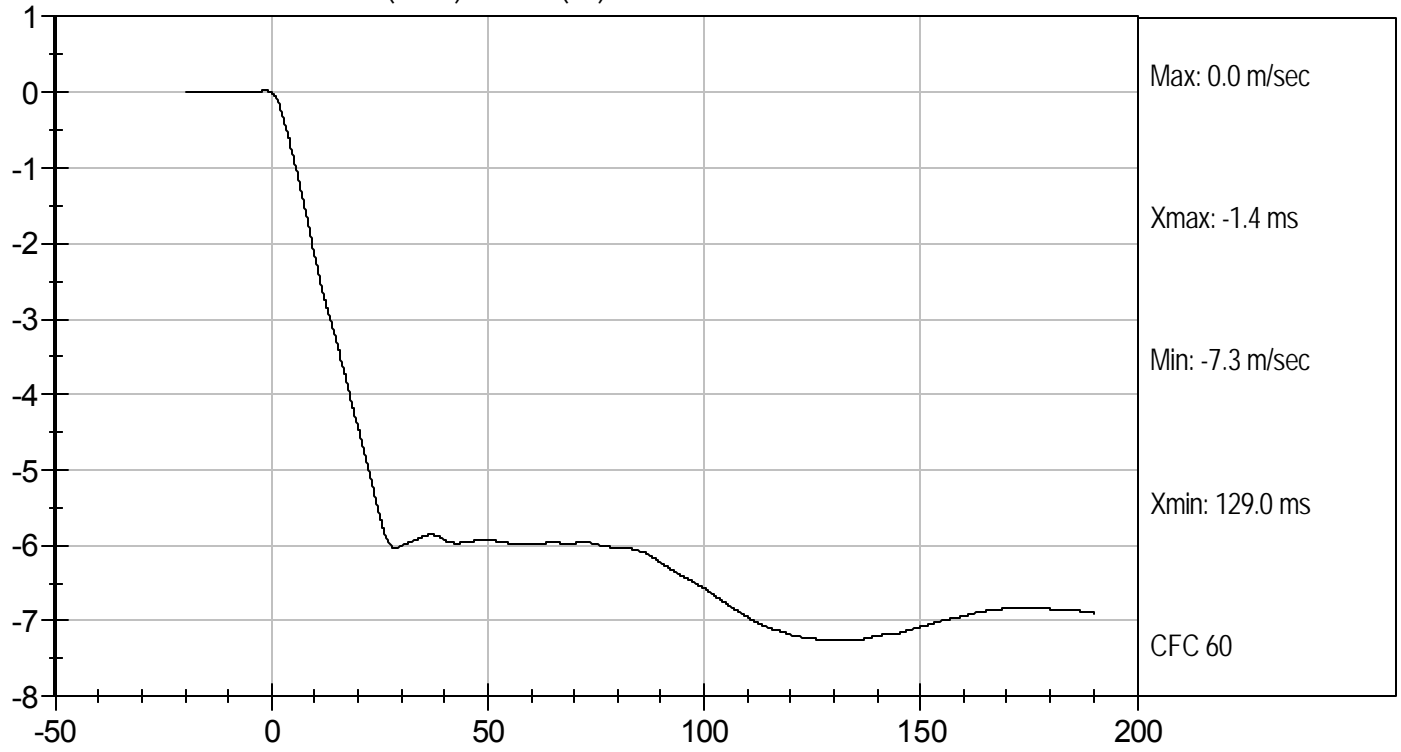
 Test Date

David Winkelbauer

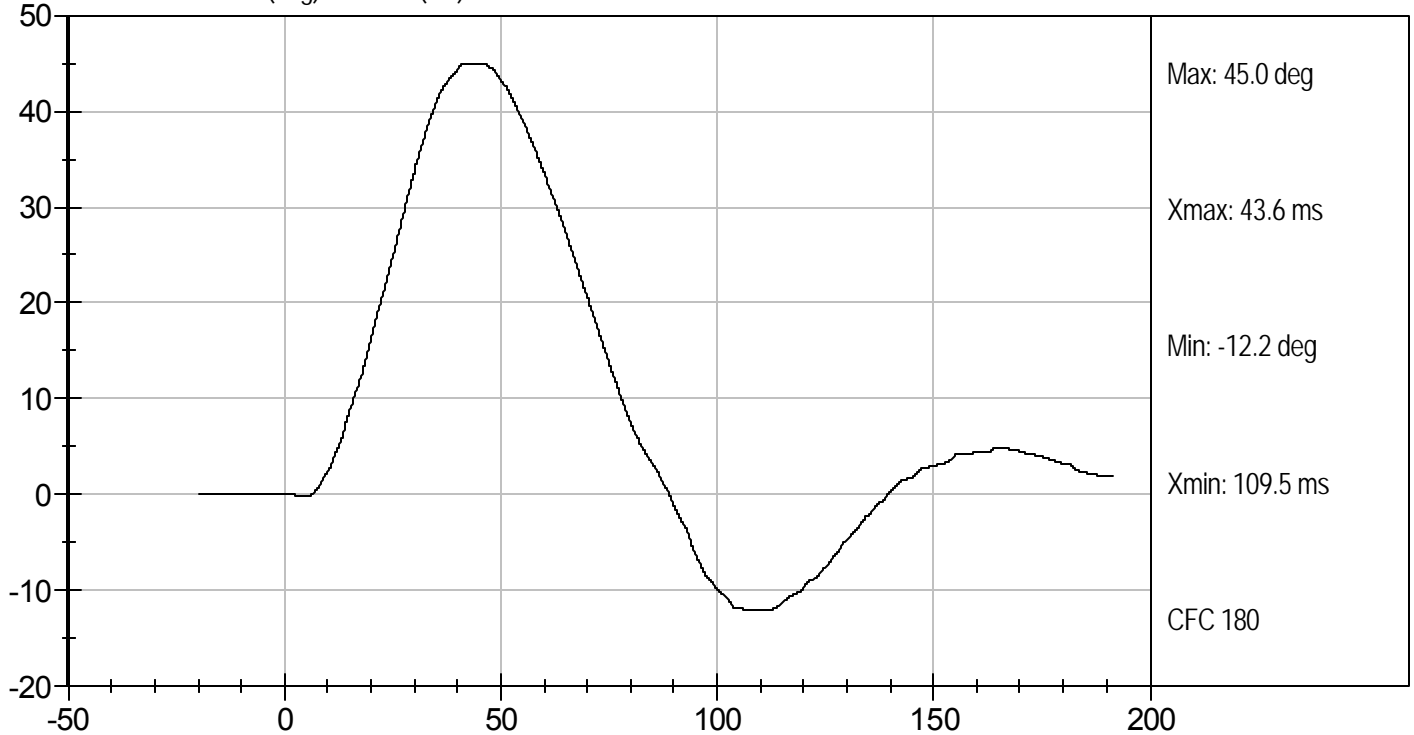
 Approved By



PENDULUM DECELERATION (m/sec) vs TIME (ms)



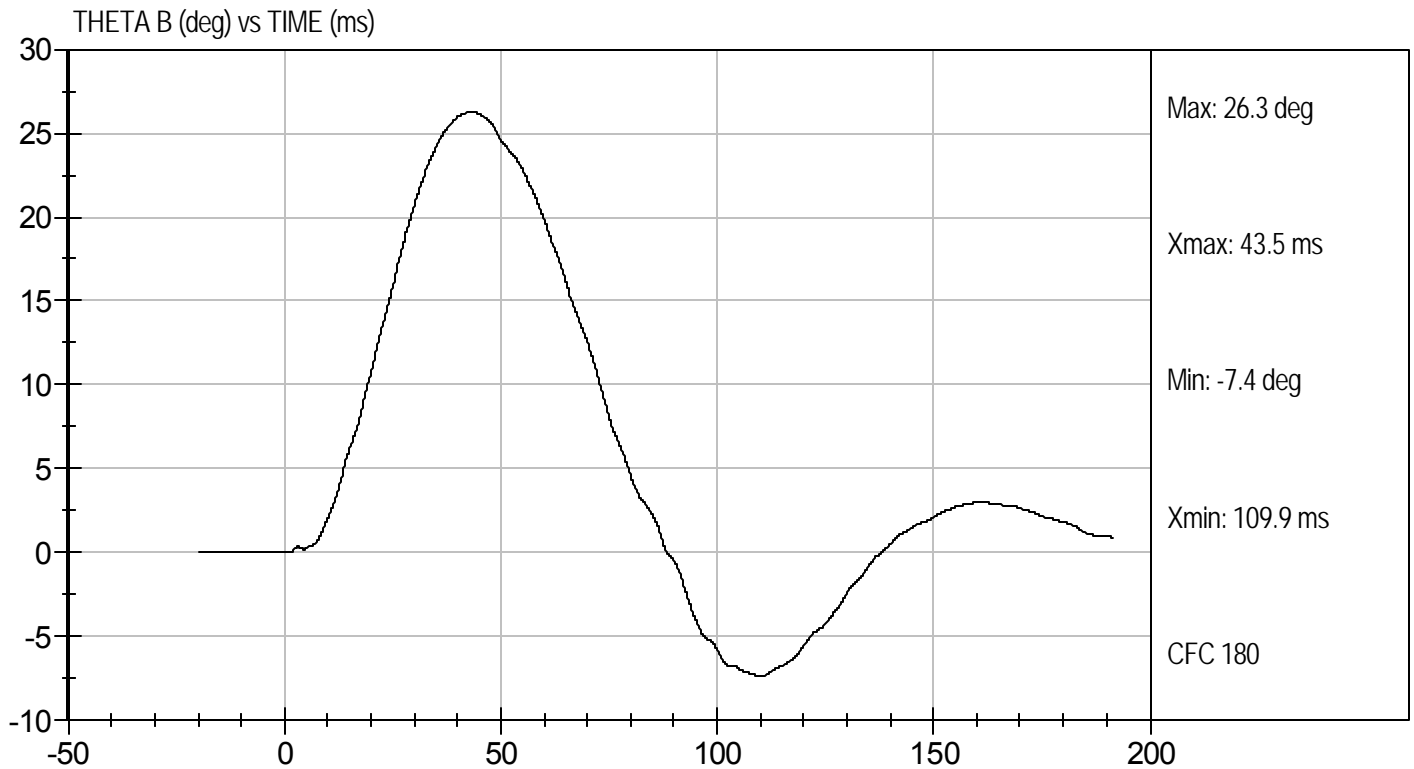
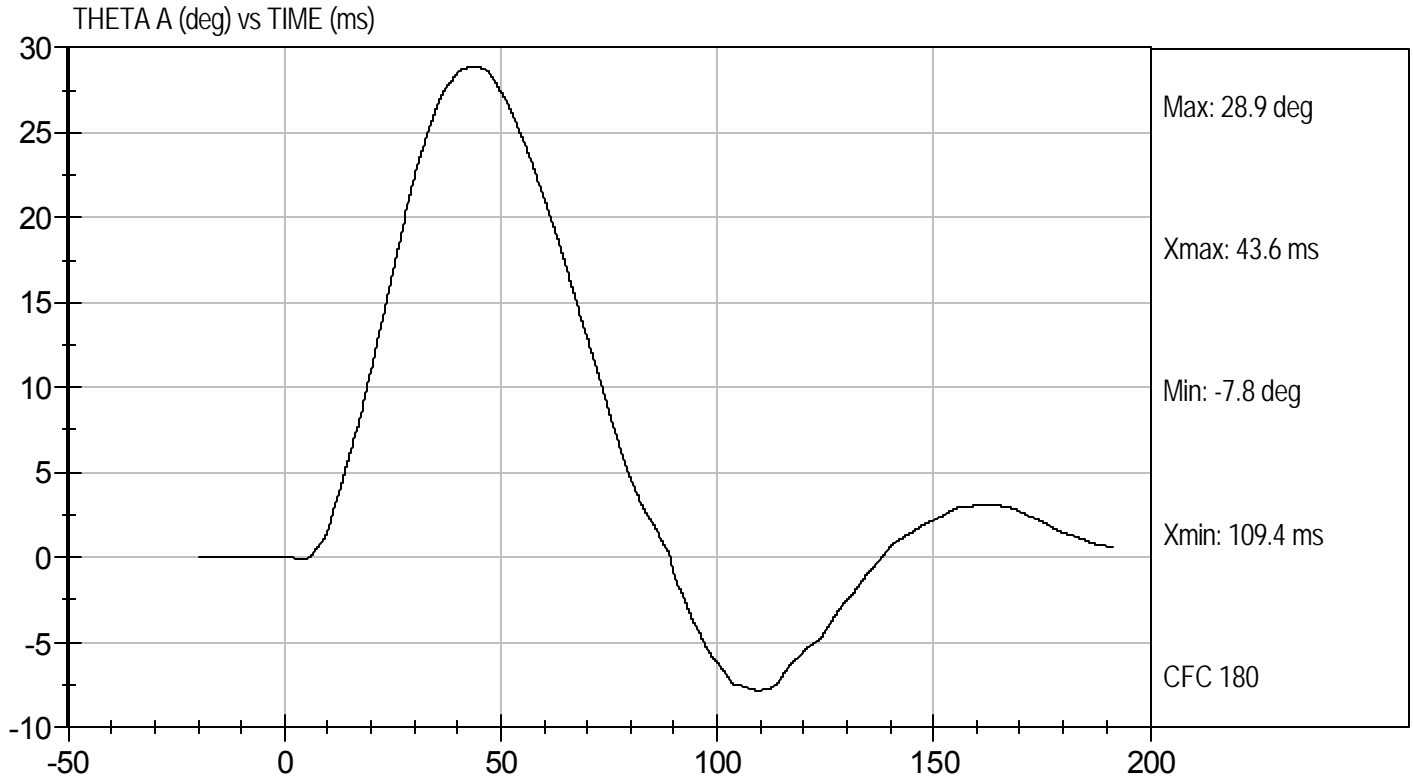
FLEXION ANGLE (deg) vs TIME (ms)





Test Desc: Lumbar Bending
Component ID: D113388

Test Date: 10/7/11
Velocity: 20.08 ft/s, 6.12 m/s



MGA RESEARCH CORPORATION

**PELVIS TEST
ES-2re DUMMY**

ATD Serial No: 032

Test I.D: D113389

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	45	Pass
Probe Speed	m/s	4.20 to 4.40	4.27	Pass
Maximum Impactor Force	kN	4.70 to 5.40	4.79	Pass
Time of Maximum Impactor Force	ms	11.80 to 16.10	13.70	Pass
Maximum Pubic Force	kN	1.23 to 1.59	1.48	Pass
Time of Maximum Pubic Force	ms	12.20 to 17.00	15.30	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

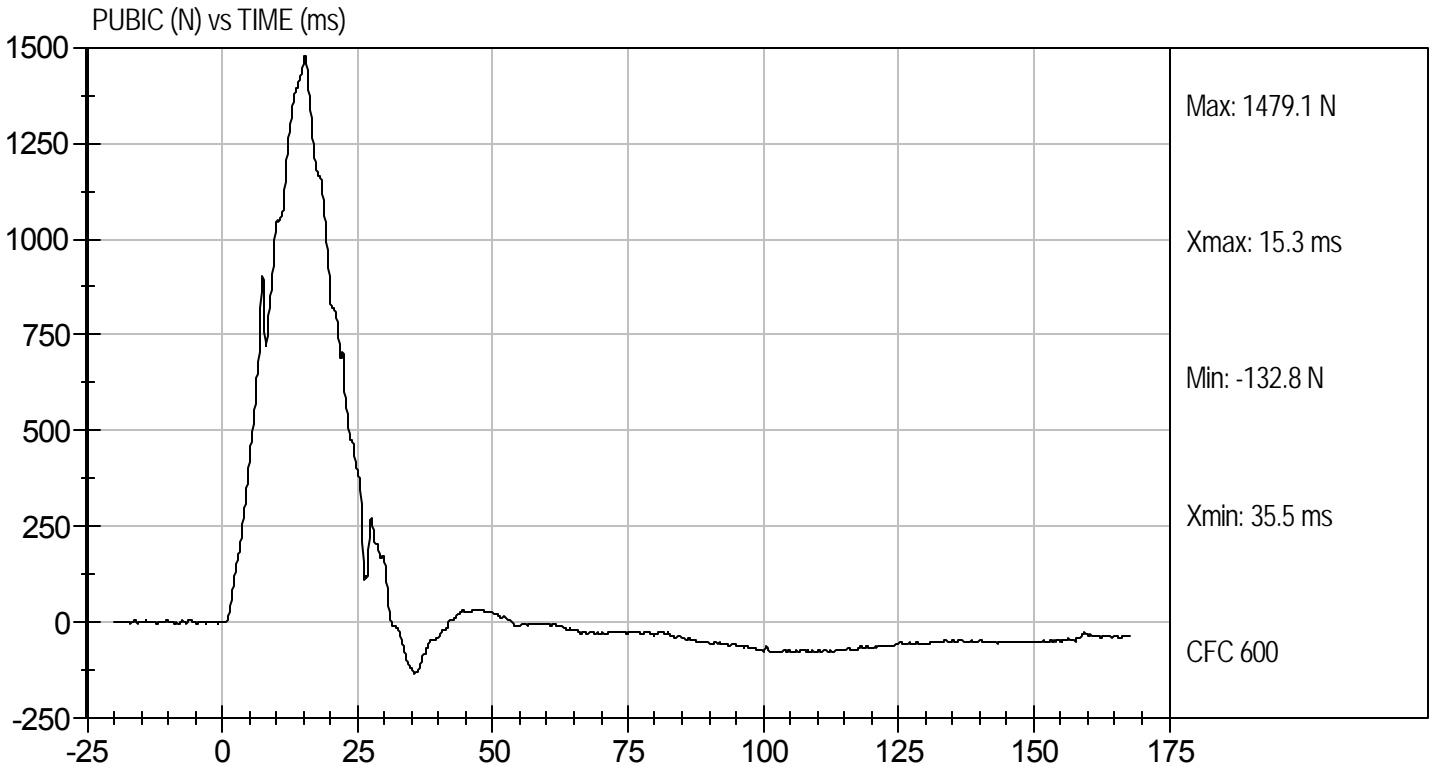
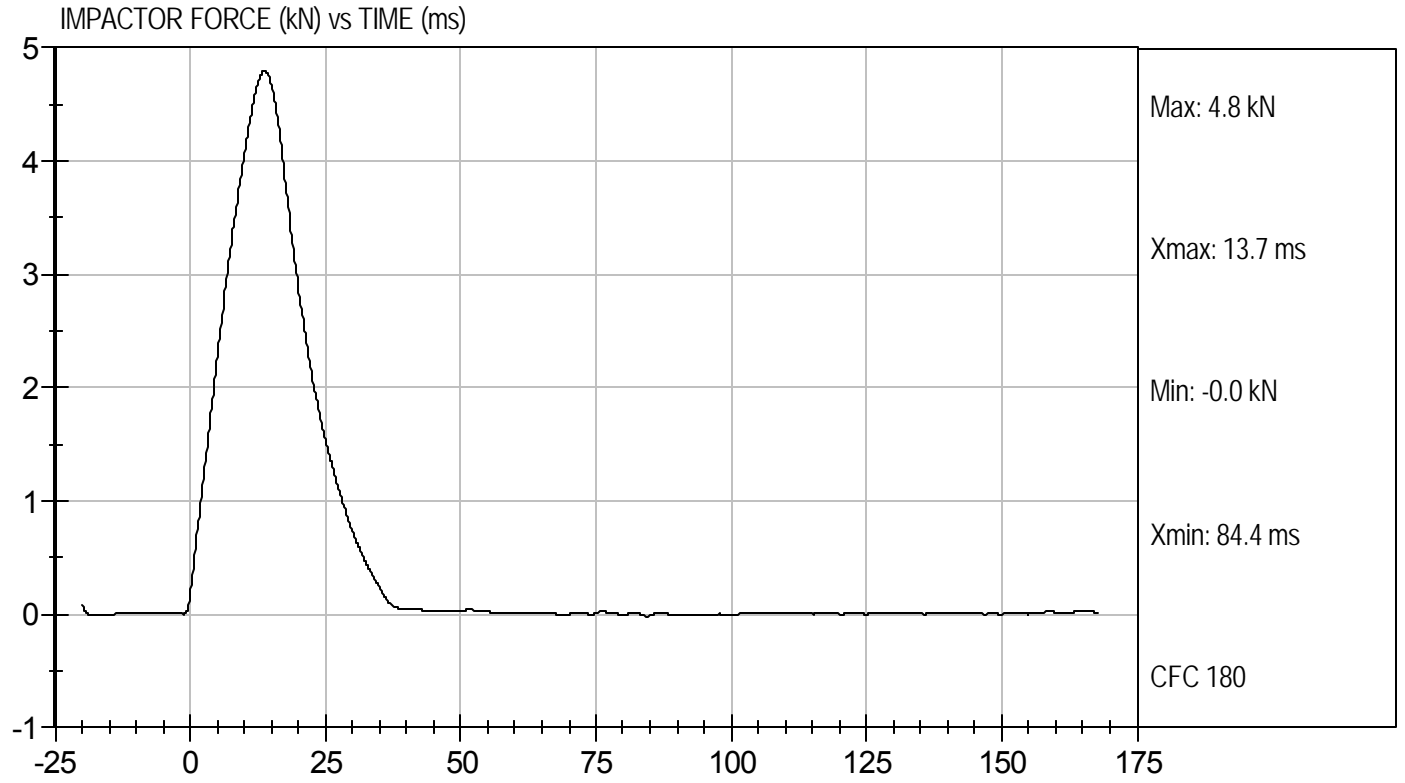
10/7/11
Test Date

David Winkelbauer
Approved By



Test Desc: Pelvis Impact
Component ID: D113389

Test Date: 10/7/11
Velocity: 14.0 ft/s, 4.27 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: D113331

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	20.9	Pass
Laboratory Relative Humidity	%	10 to 70	40	Pass
Peak Resultant Acceleration	G's	115 to 137	120	Pass
Peak Lateral Acceleration	G's	+/- 15	-3.3	Pass
Unimodal	N/A	<15%	Yes	Pass
Overall Test Results				Pass

Jessica Gall
 Laboratory Technician

10/5/11
 Test Date

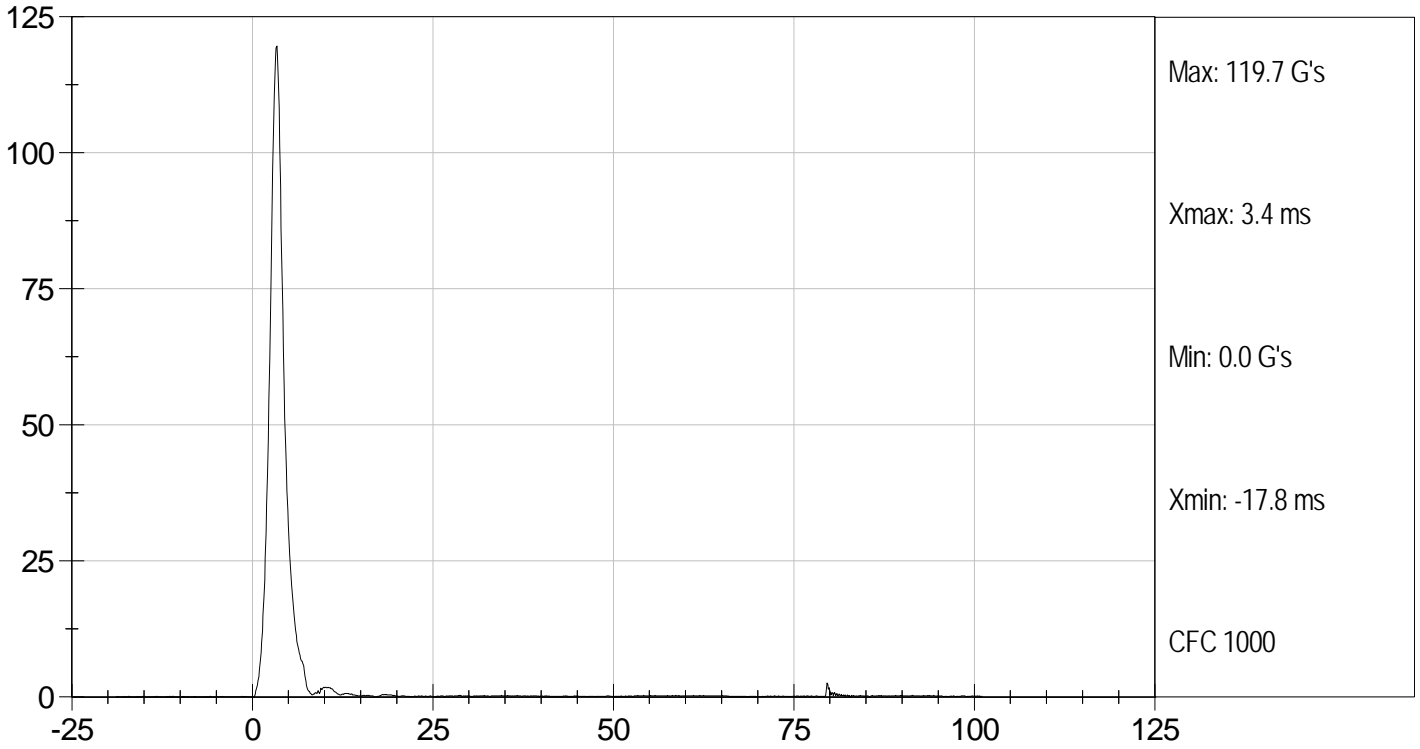
David Winkelbauer
 Approved By



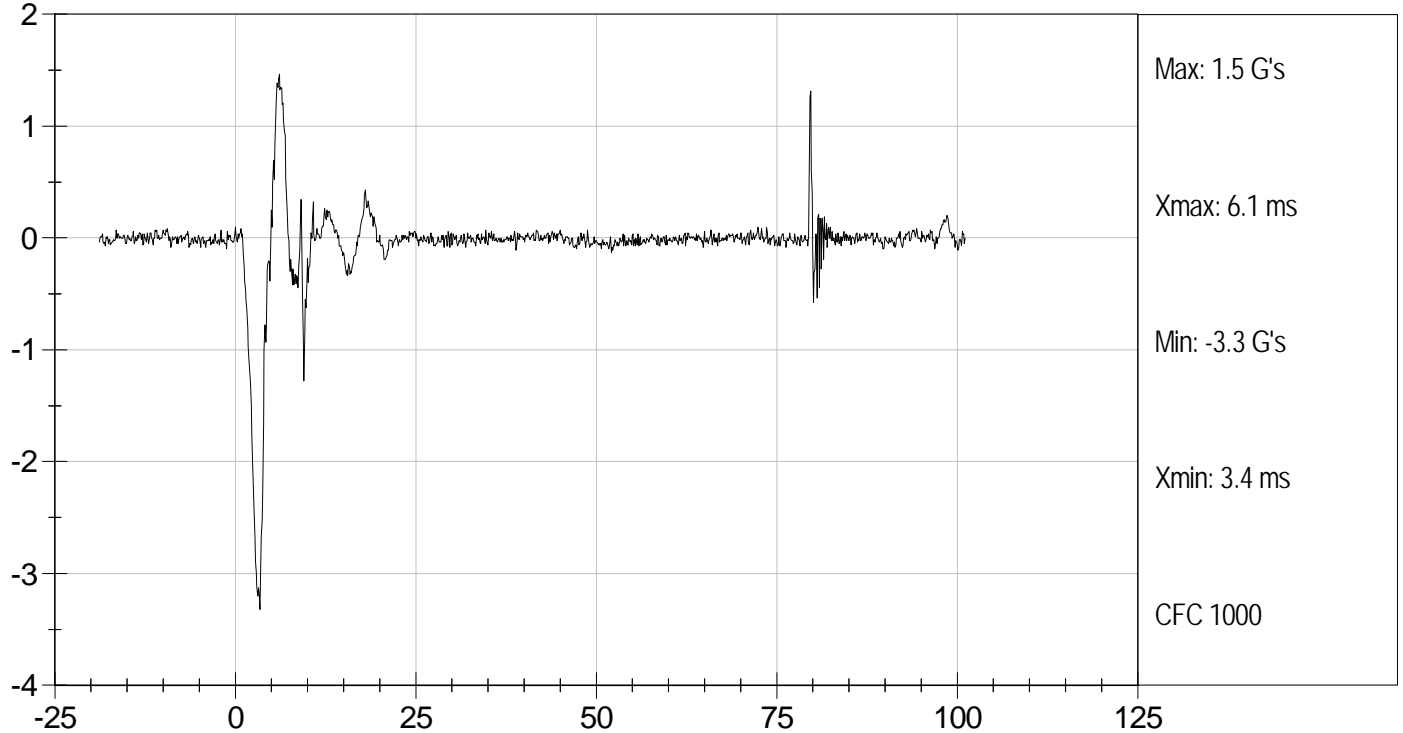
Test Desc: Head Drop
Component ID: D113331

Test Date: 10/5/11
Velocity: 0 ft/s, 0 m/s

PEAK RESULTANT ACCELERATION (G's) vs TIME (ms)



PEAK LONGITUDINAL ACCELERATION (G's) vs TIME (ms)



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

ATD Serial No: 306

Test I.D: D113332

Tested Parameter		Units	Specification	Result	Pass/Fail
Temperature		deg C	20.6 to 22.2	20.9	Pass
Humidity		%	10 to 70	41	Pass
Impact Velocity		m/s	5.51 to 5.63	5.58	Pass
Delta Velocity	10 ms	m/s	2.20 to 2.80	2.40	Pass
	15 ms	m/s	3.30 to 4.10	3.40	Pass
	20 ms	m/s	4.40 to 5.40	4.50	Pass
	25 ms	m/s	5.40 to 6.10	5.47	Pass
	25-100 ms	m/s	5.50 to 6.20	5.62	Pass
Maximum D-Plane Rotation		deg	71 to 81	71	Pass
Time of Maximum D-Plane Rotation		ms	50 to 70	59	Pass
Maximum Occipital Condyle Moment during Rotation Interval Nm			-44 to -36	-40	Pass
Time of Moment Decay to 0 Nm		ms	102 to 126	113	Pass
Overall Test Results					Pass


Laboratory Technician

10/5/11
Test Date

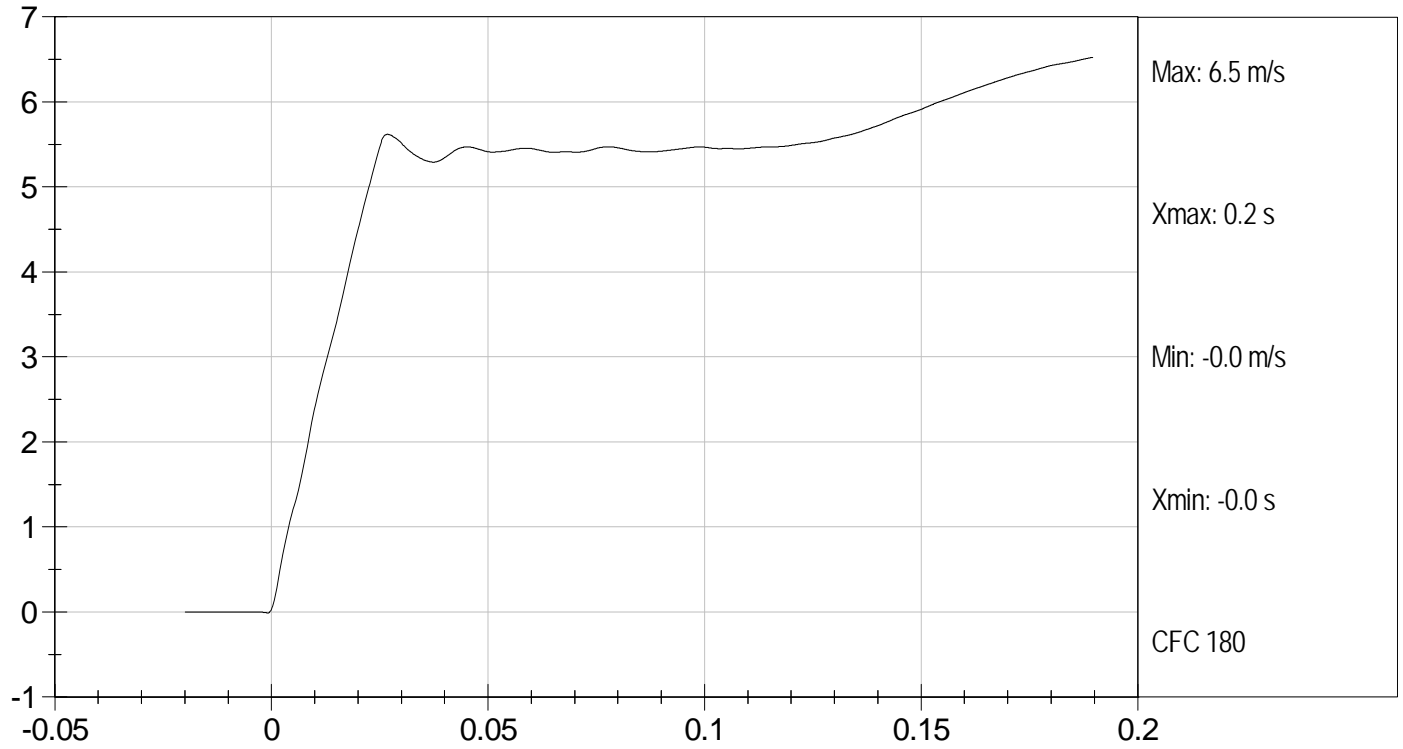

Approved By



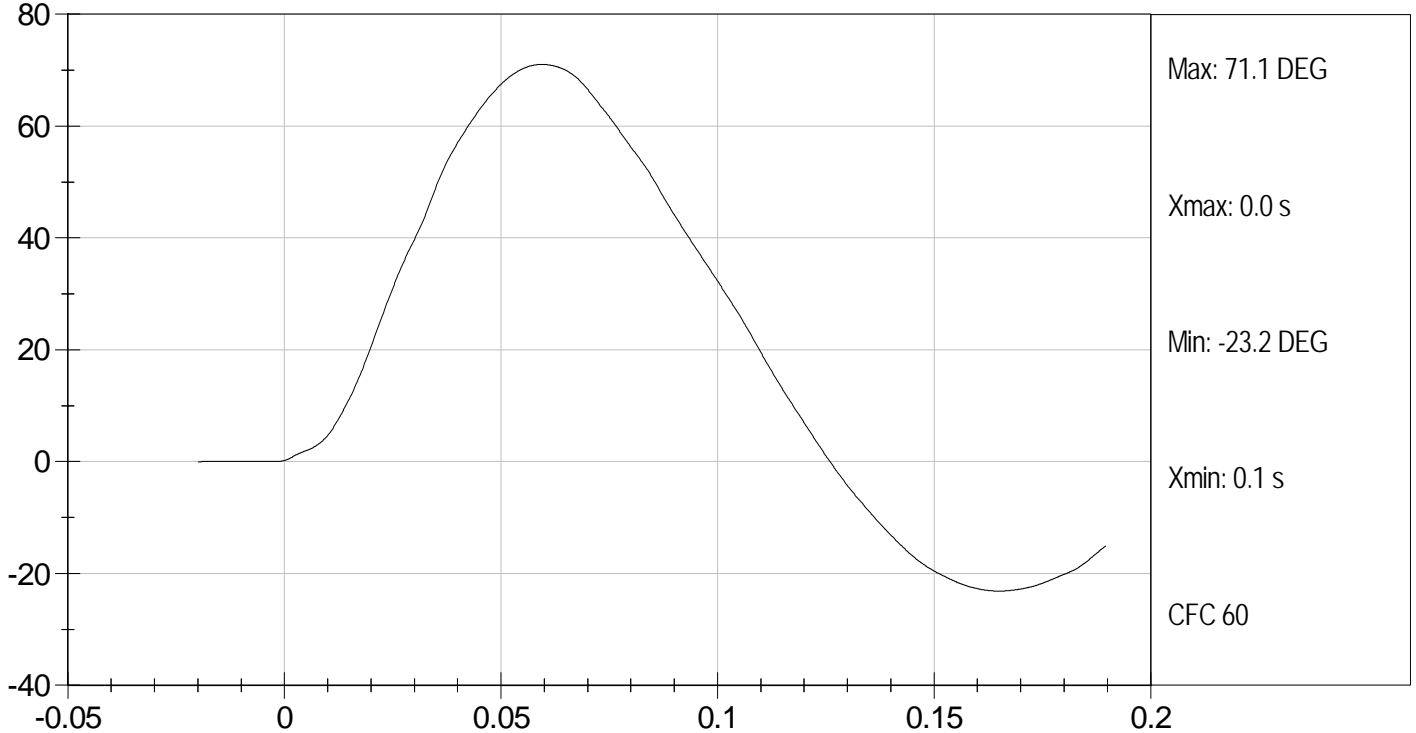
Test Desc: Neck Bending
Component ID: D113332

Test Date: 10/5/11
Velocity: 18.32 ft/s, 5.58 m/s

PENDULUM DECELERATION (m/s) vs TIME (s)



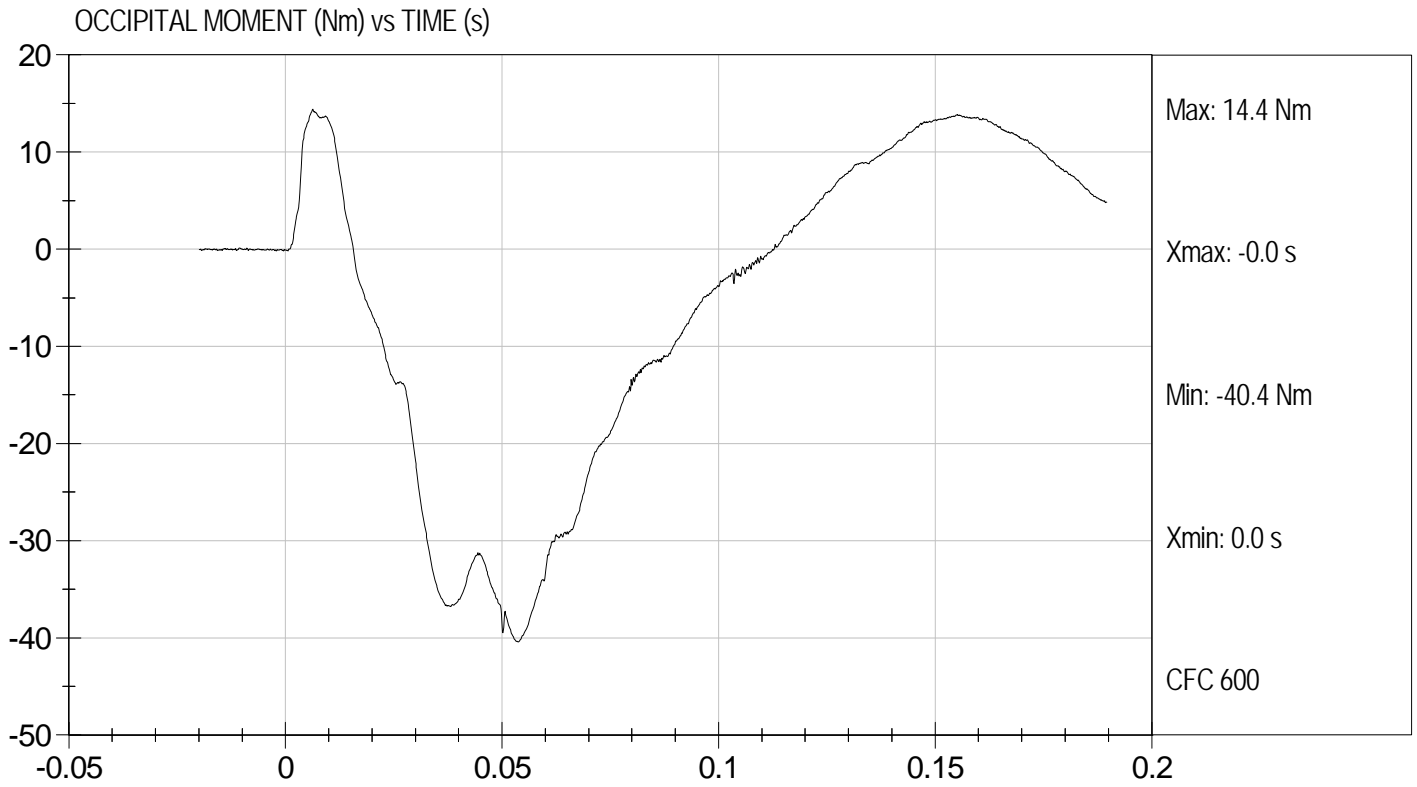
FLEXION ANGLE (DEG) vs TIME (s)





Test Desc: Neck Bending
Component ID: D113332

Test Date: 10/5/11
Velocity: 18.32 ft/s, 5.58 m/s



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

ATD Serial No: 306

Test ID: D113333

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	42	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	30	Pass
Upper Spine (T1) Y Acceleration	G's	17 to 22	19	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

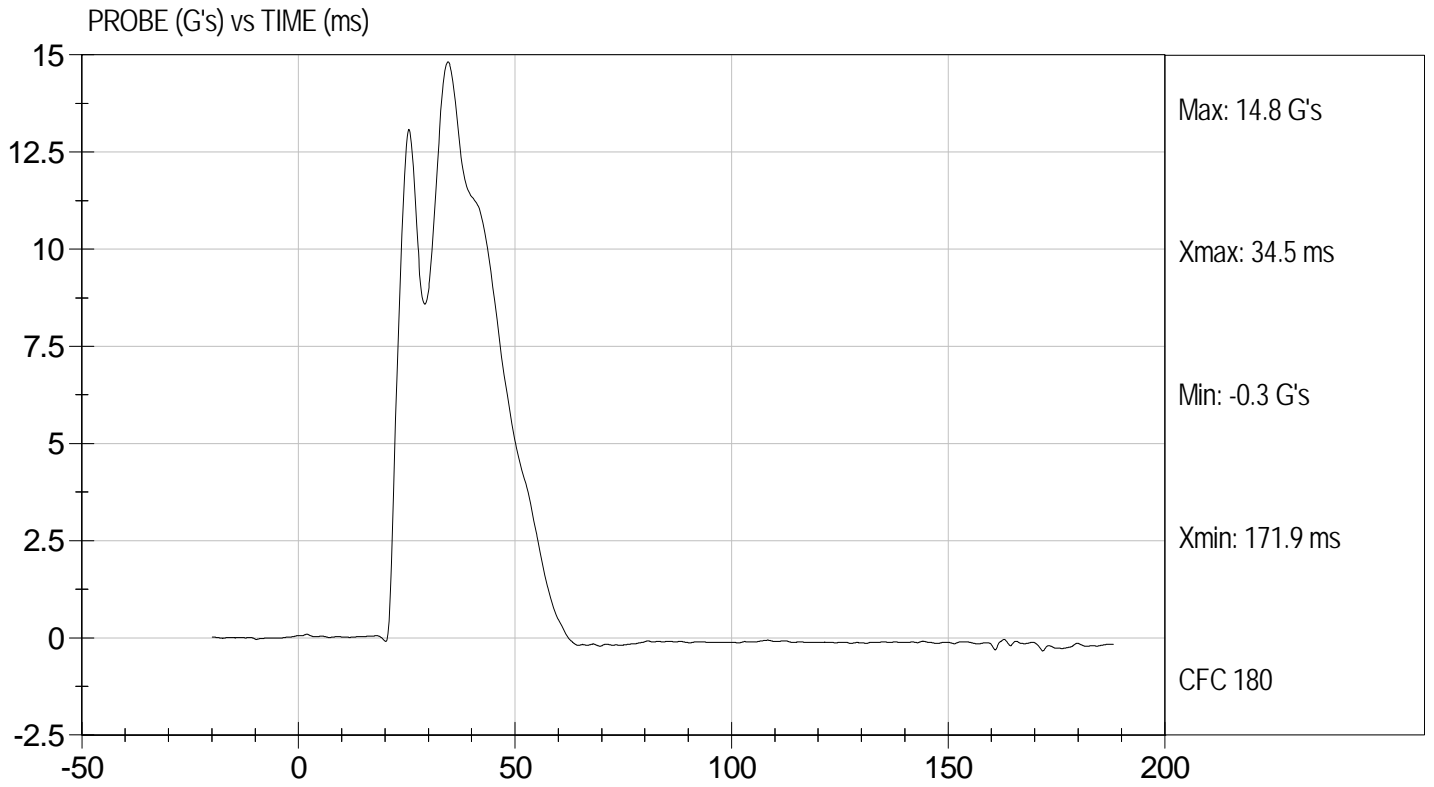
10/5/11
Test Date

David Winkelbauer
Approved By



Test Desc: Shoulder Impact
Component ID: D113333

Test Date: 10/5/11
Velocity: 14.36 ft/s, 4.38 m/s

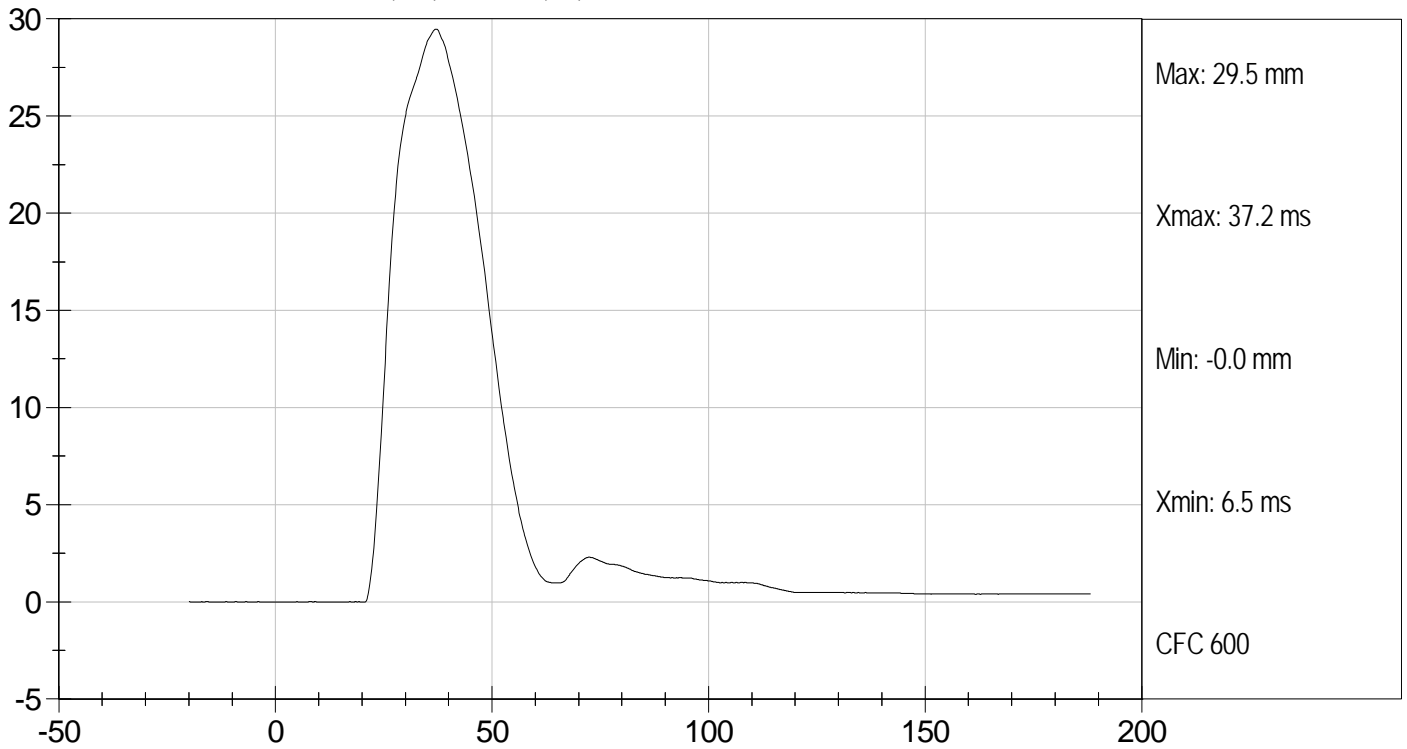




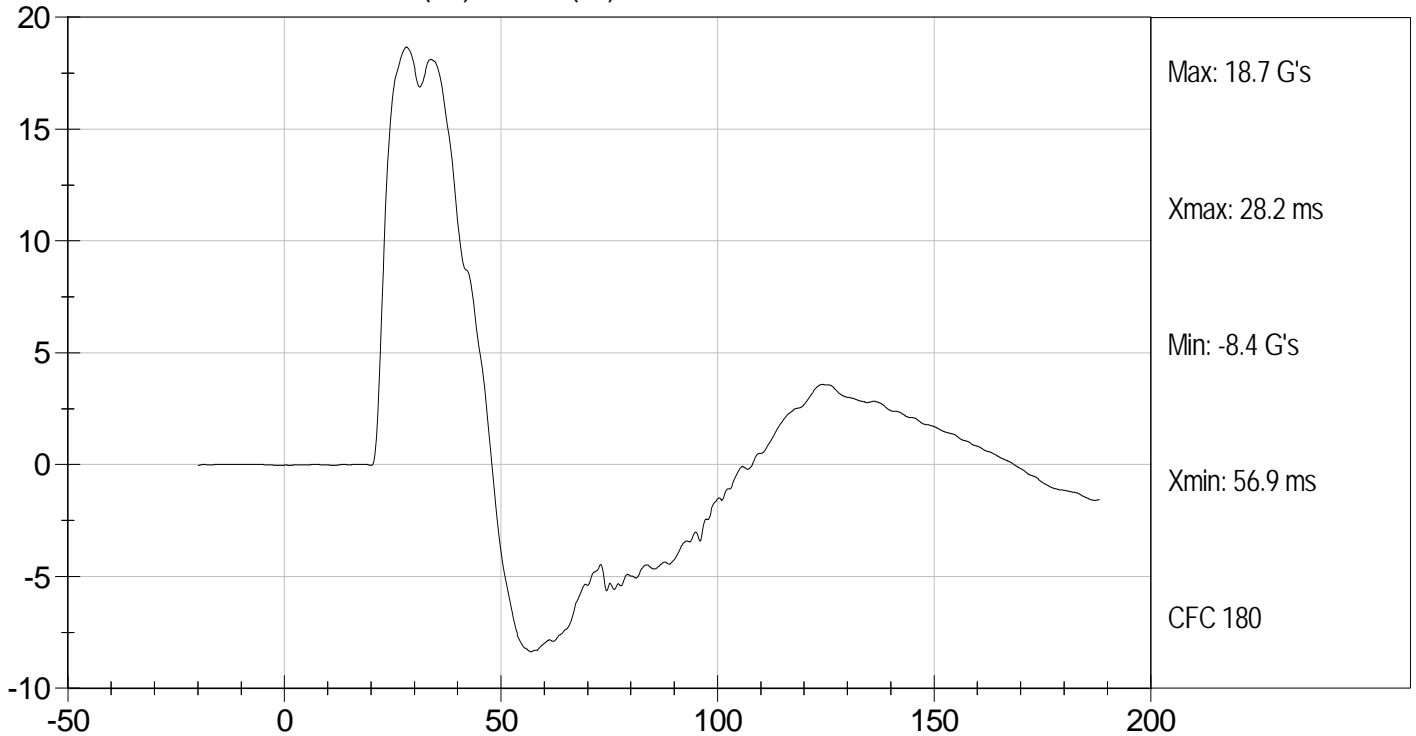
Test Desc: Shoulder Impact
Component ID: D113333

Test Date: 10/5/11
Velocity: 14.36 ft/s, 4.38 m/s

SHOULDER DISPLACEMENT (mm) vs TIME (ms)



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



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

ATD Serial No: 306

Test I.D: D113334

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.7	Pass
Humidity	%	10 to 70	42	Pass
Impact Velocity	m/s	6.60 to 6.80	6.77	Pass
Peak Impactor Acceleration	G's	30 to 36	32	Pass
Shoulder Displacement	mm	31 to 40	33	Pass
Upper Rib Displacement	mm	25 to 32	29	Pass
Middle Rib Displacement	mm	30 to 36	32	Pass
Lower Rib Displacement	mm	32 to 38	35	Pass
Upper Spine (T1) Y Acceleration	G's	34 to 43	39	Pass
Lower Spine (T12) Y Acceleration	G's	29 to 37	33	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

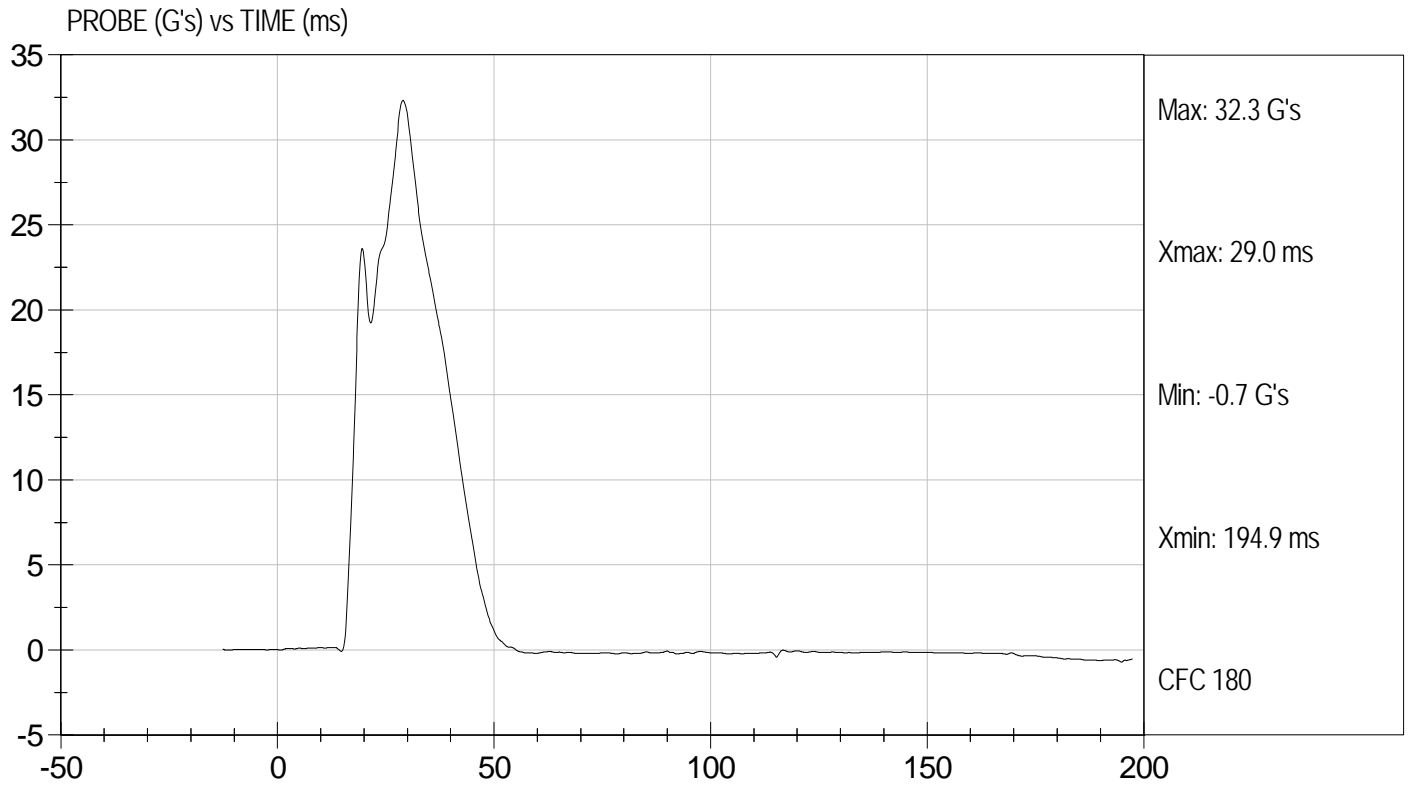
10/5/11
Test Date

David Winkelbauer
Approved By



Test Desc: Thorax With Arm
Component ID: D113334

Test Date: 10/5/11
Velocity: 22.22 ft/s, 6.77 m/s

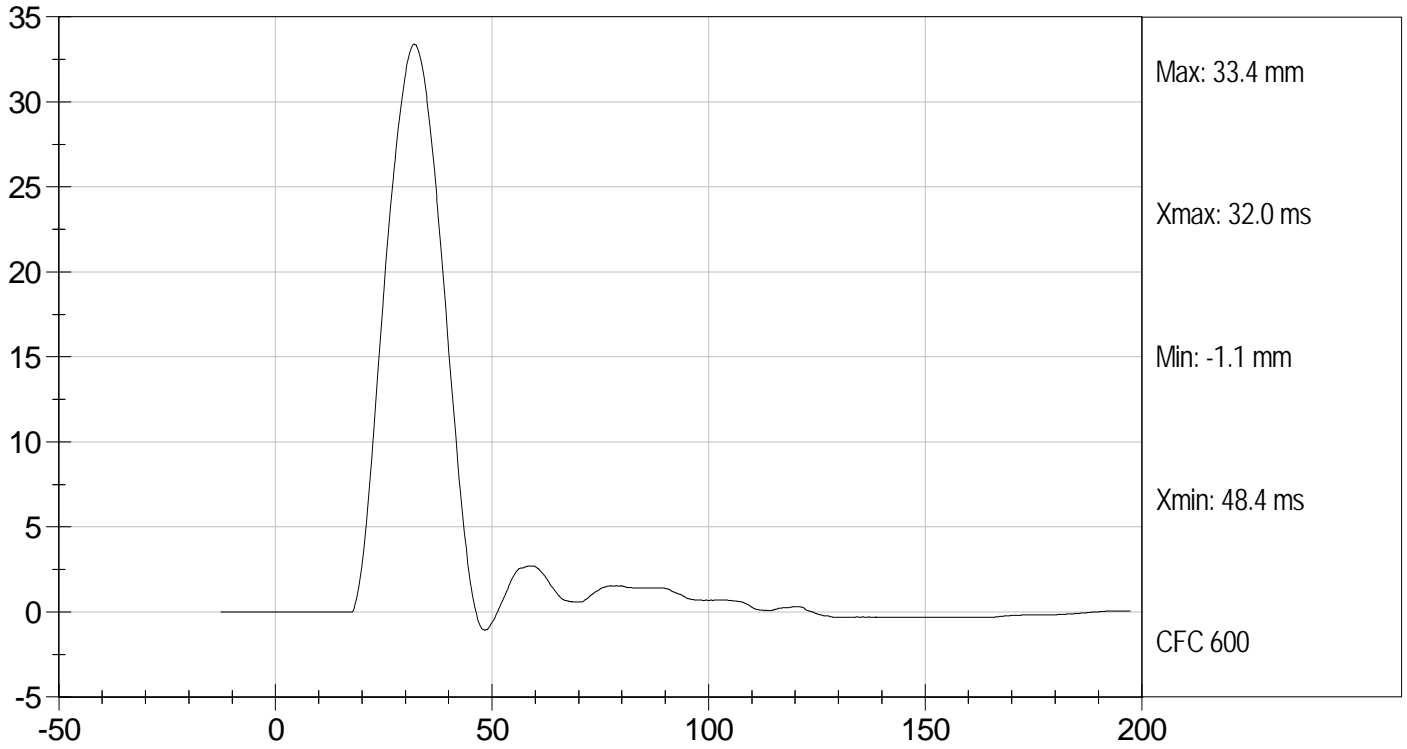




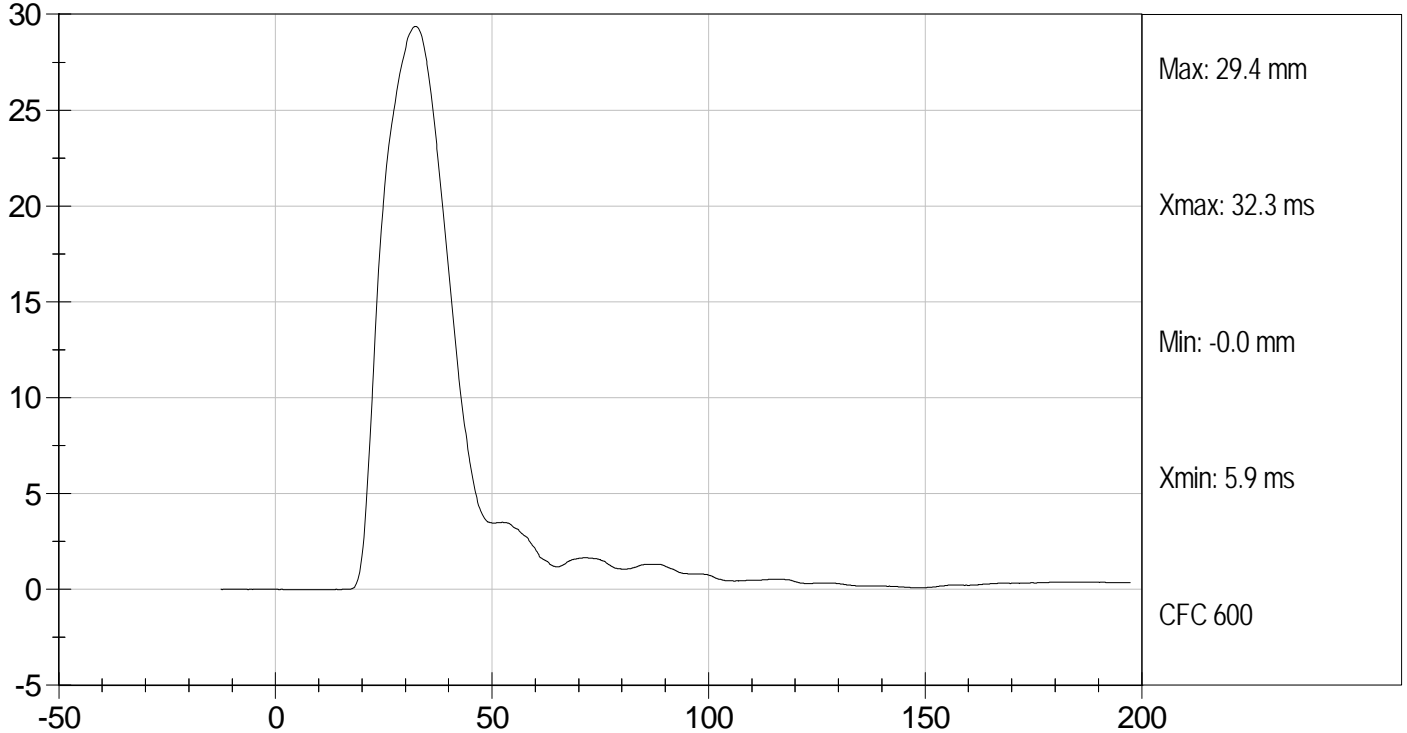
Test Desc: Thorax With Arm
Component ID: D113334

Test Date: 10/5/11
Velocity: 22.22 ft/s, 6.77 m/s

SHOULDER DISPLACEMENT (mm) vs TIME (ms)



UPPER RIB DISPLACEMENT (mm) vs TIME (ms)

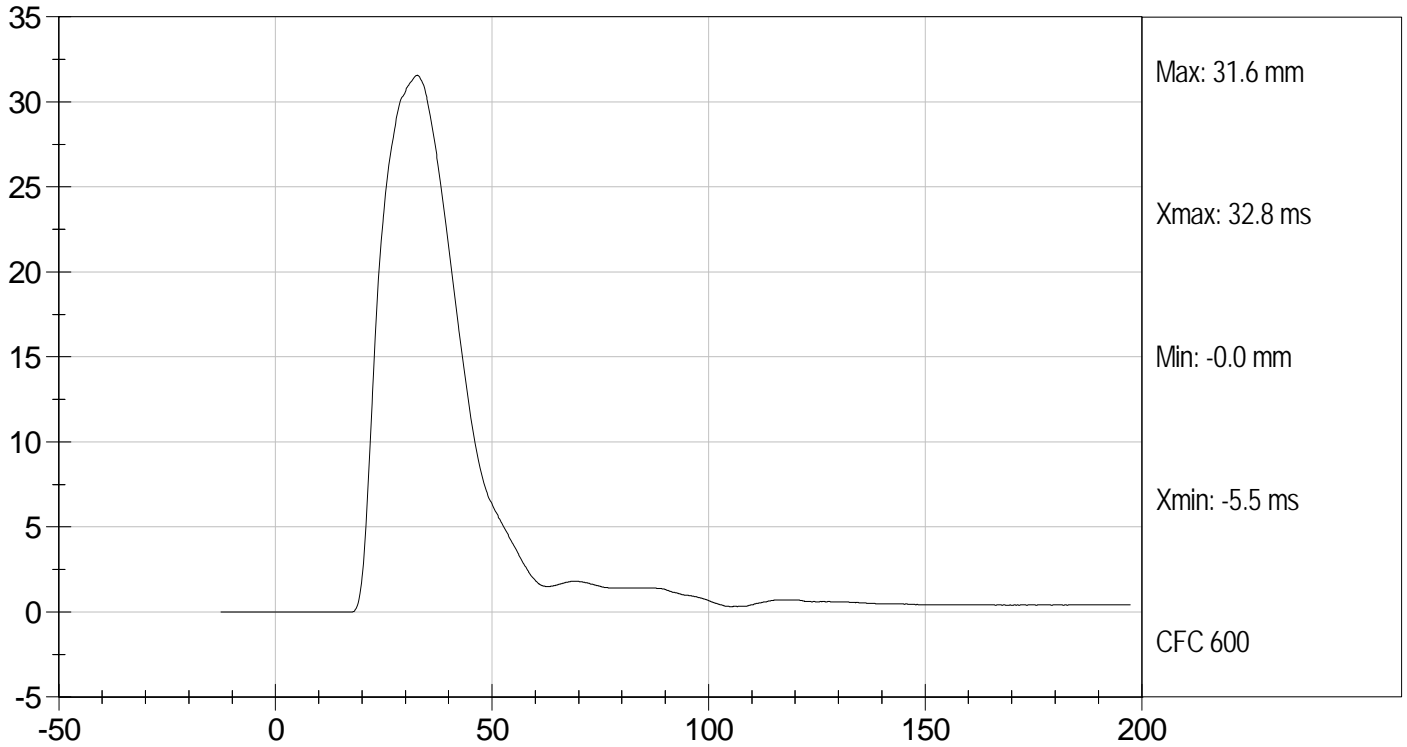




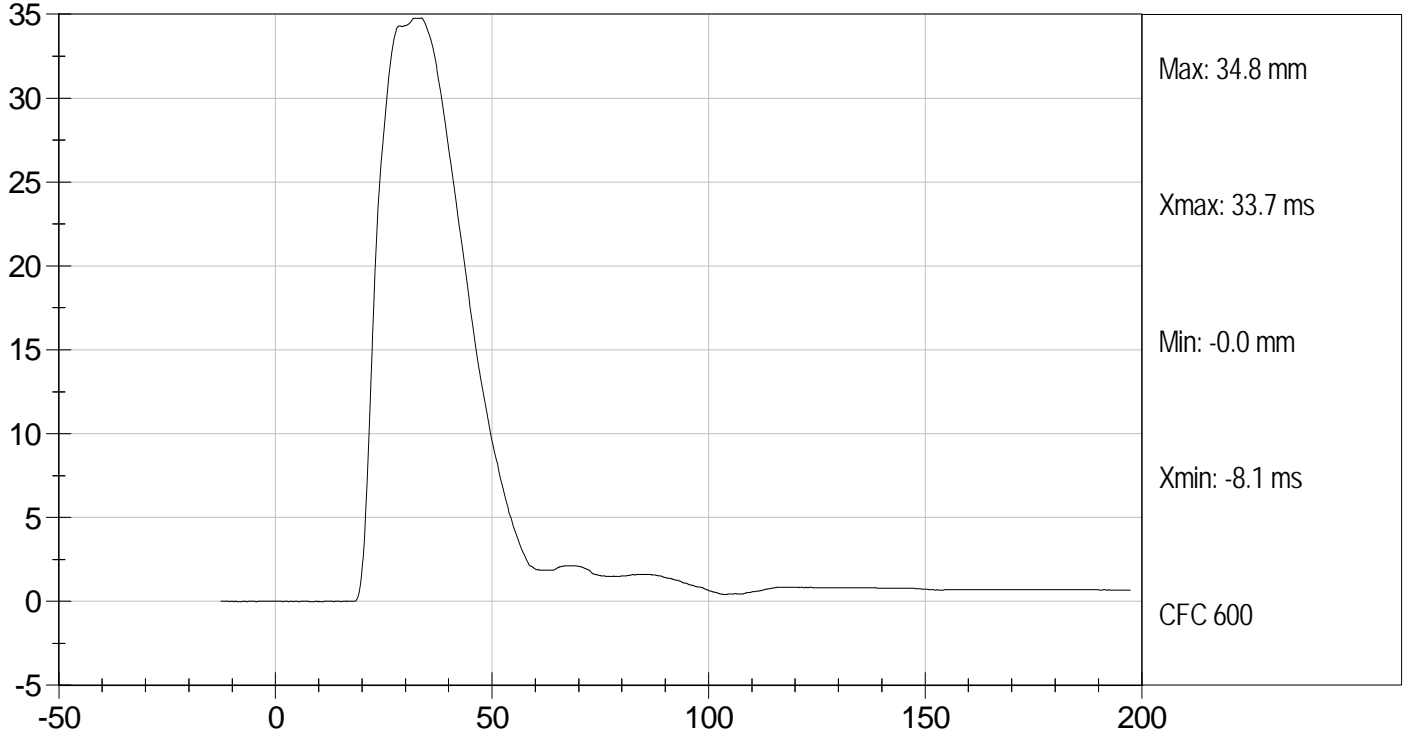
Test Desc: Thorax With Arm
Component ID: D113334

Test Date: 10/5/11
Velocity: 22.22 ft/s, 6.77 m/s

MIDDLE RIB DISPLACEMENT (mm) vs TIME (ms)



LOWER RIB DISPLACEMENT (mm) vs TIME (ms)

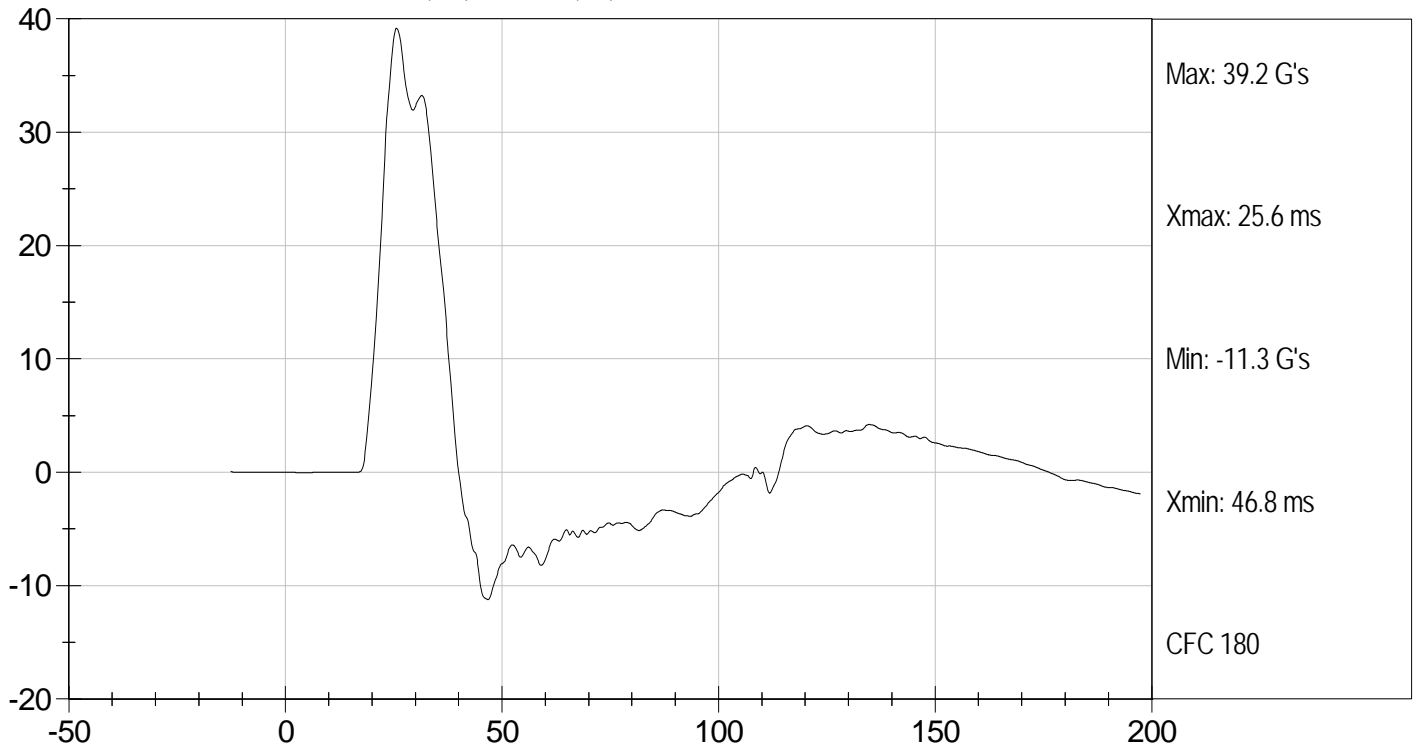




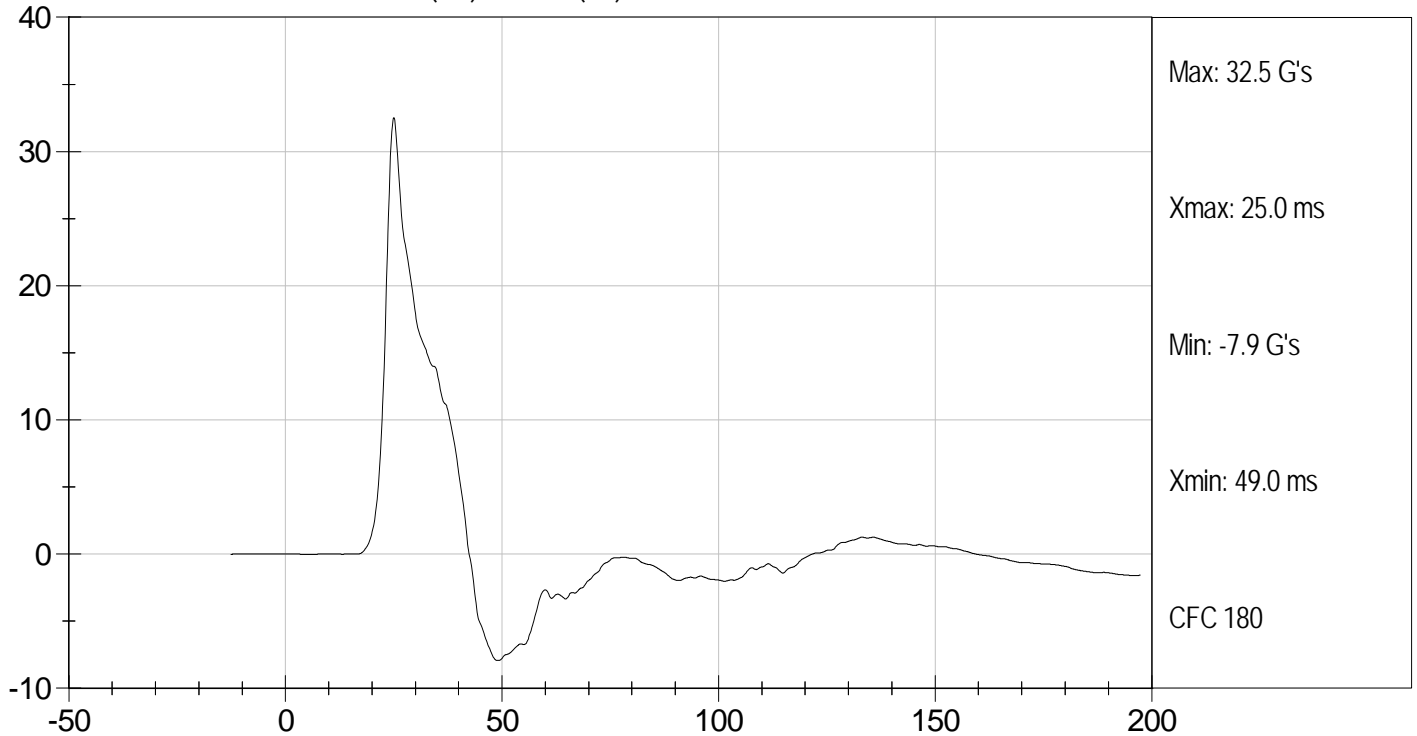
Test Desc: Thorax With Arm
Component ID: D113334

Test Date: 10/5/11
Velocity: 22.22 ft/s, 6.77 m/s

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



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



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

ATD Serial No: 306

Test I.D: D113335

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.5	Pass
Humidity	%	10 to 70	42	Pass
Impact Velocity	m/s	4.20 to 4.40	4.34	Pass
Peak Impactor Force	G's	14 to 18	15	Pass
Upper Rib Displacement	mm	32 to 40	39	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	14	Pass
Lower Spine (T12) Y Acceleration	G's	7 to 11	8	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

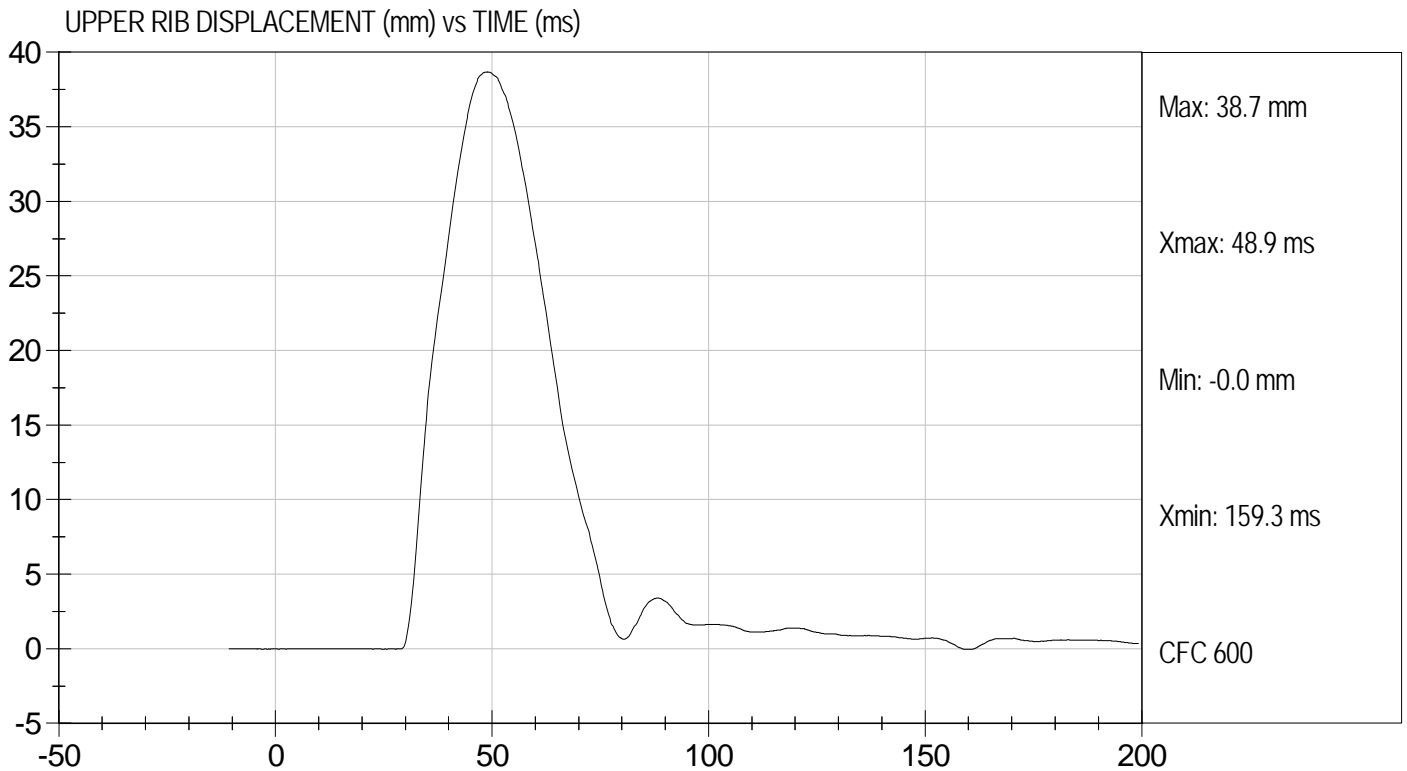
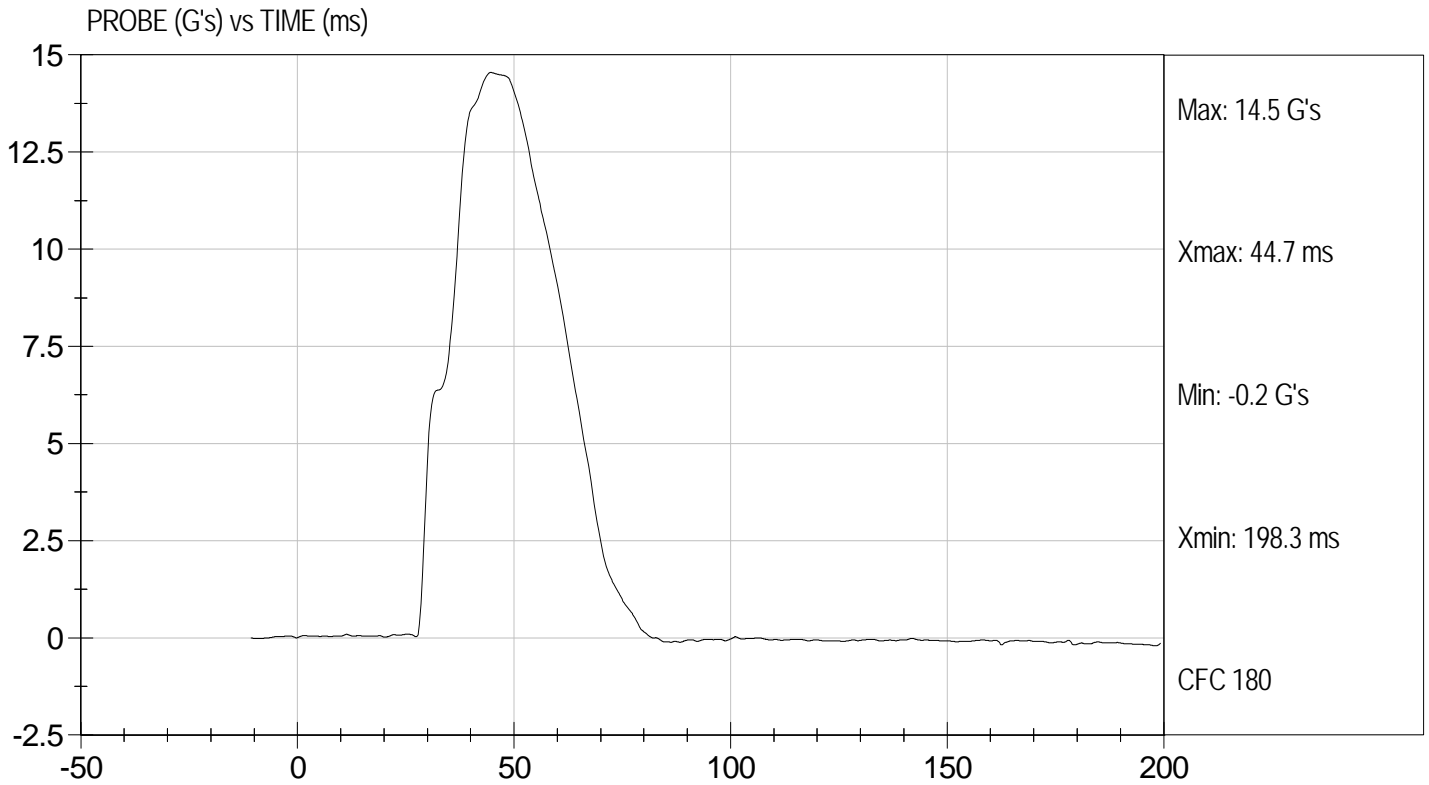
10/5/11
Test Date

David Winkelbauer
Approved By



Test Desc: Thorax Without Arm
Component ID: D113335

Test Date: 10/5/11
Velocity: 14.25 ft/s, 4.34 m/s

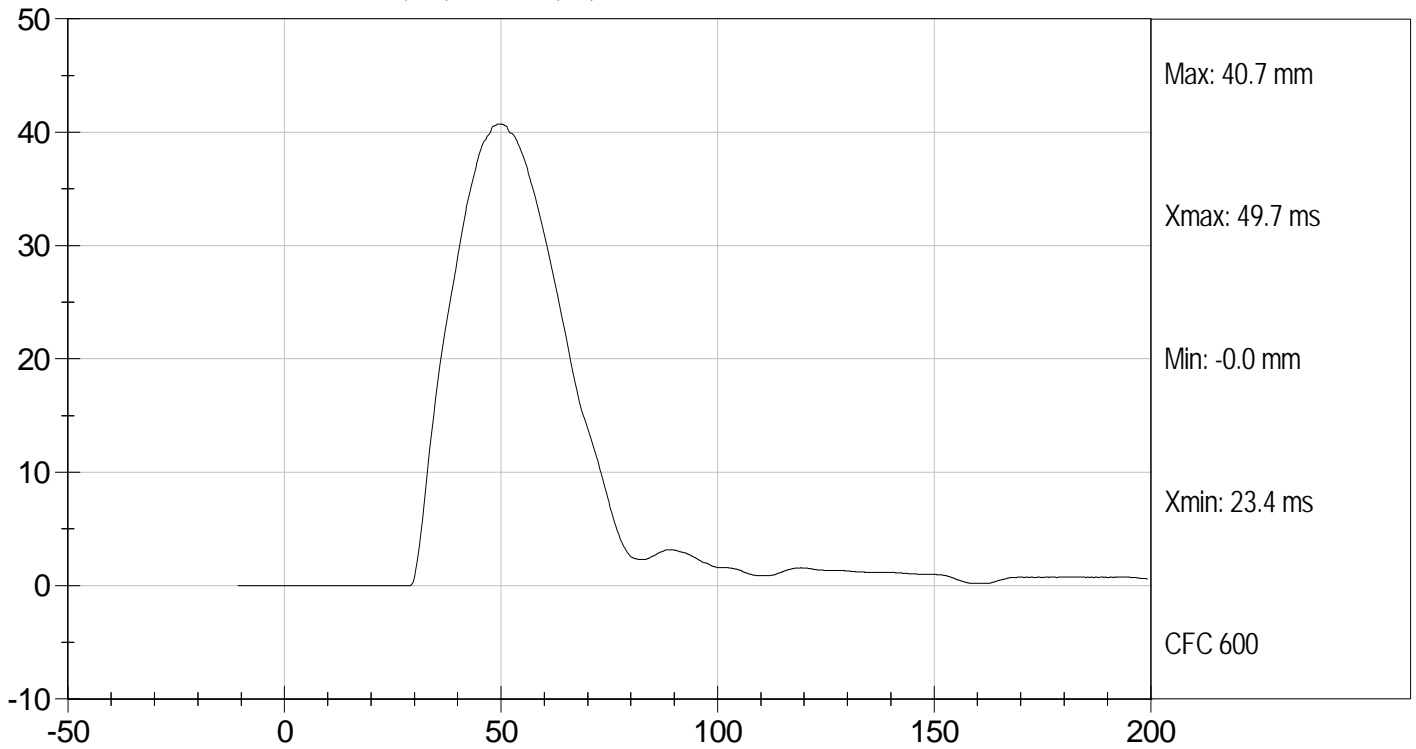




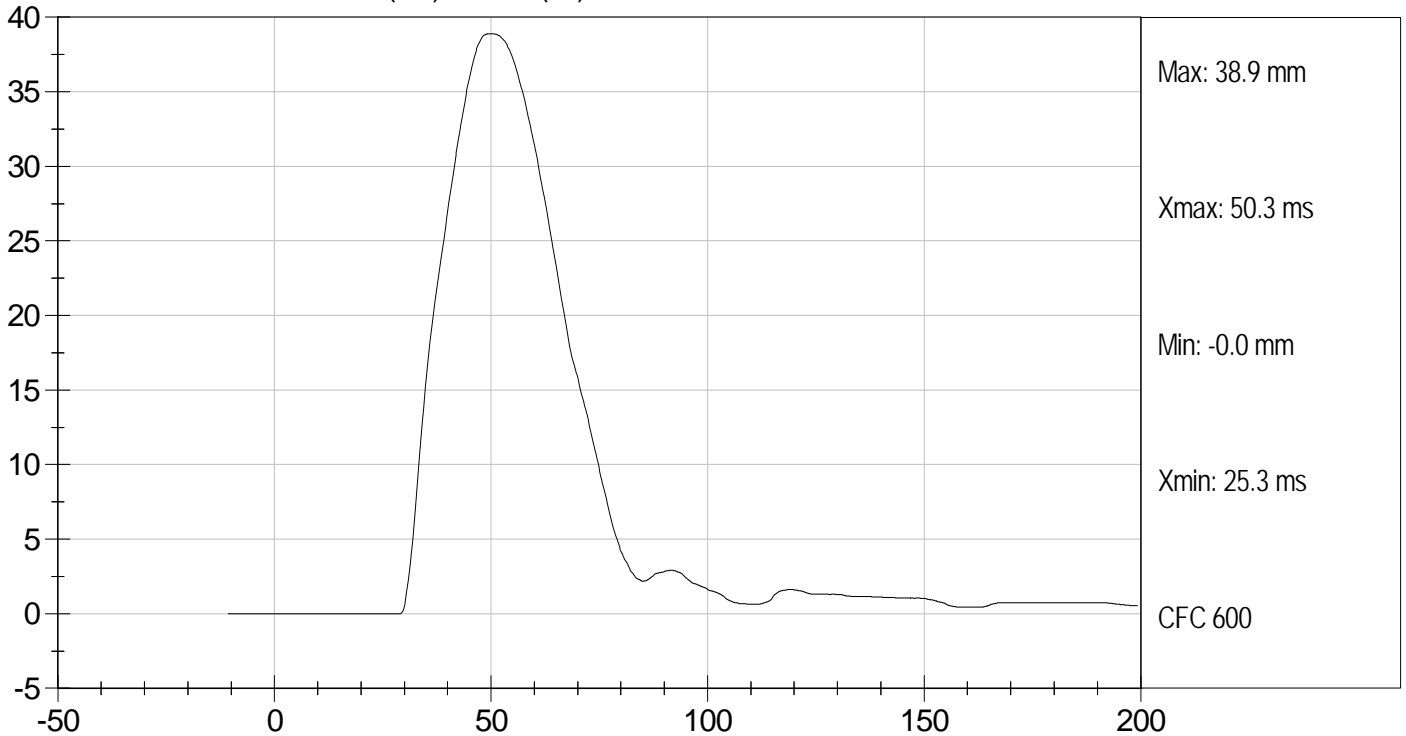
Test Desc: Thorax Without Arm
Component ID: D113335

Test Date: 10/5/11
Velocity: 14.25 ft/s, 4.34 m/s

MIDDLE RIB DISPLACEMENT (mm) vs TIME (ms)



LOWER RIB DISPLACEMENT (mm) vs TIME (ms)

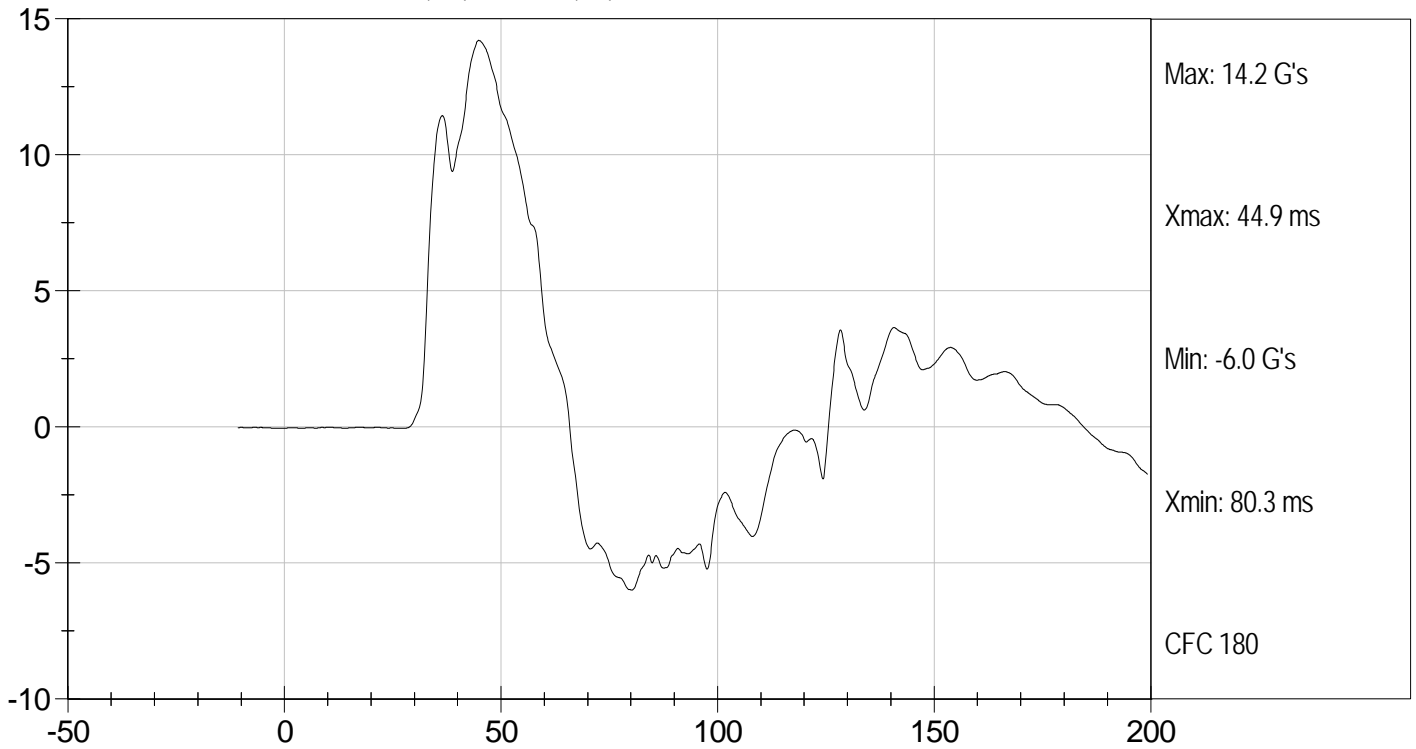




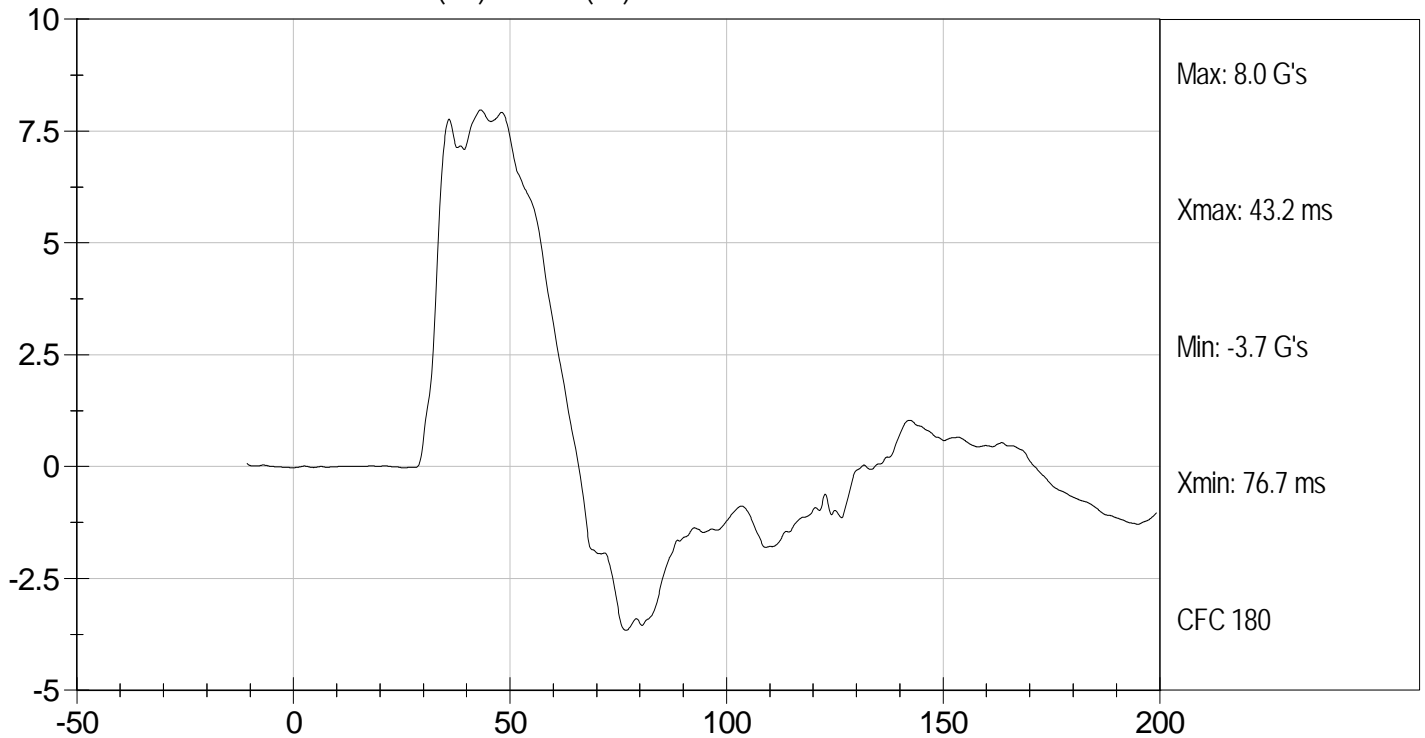
Test Desc: Thorax Without Arm
Component ID: D113335

Test Date: 10/5/11
Velocity: 14.25 ft/s, 4.34 m/s

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



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



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

ATD Serial No: 306

Test I.D: D113336

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.6	Pass
Humidity	%	10 to 70	41	Pass
Impact Velocity	m/s	4.20 to 4.40	4.34	Pass
Peak Impactor Acceleration	G's	12 to 16	13	Pass
Upper Rib Displacement	mm	36 to 47	43	Pass
Lower Rib Displacement	mm	33 to 44	41	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	10	Pass
Overall Test Results				Pass

Jessica Gall
 Laboratory Technician

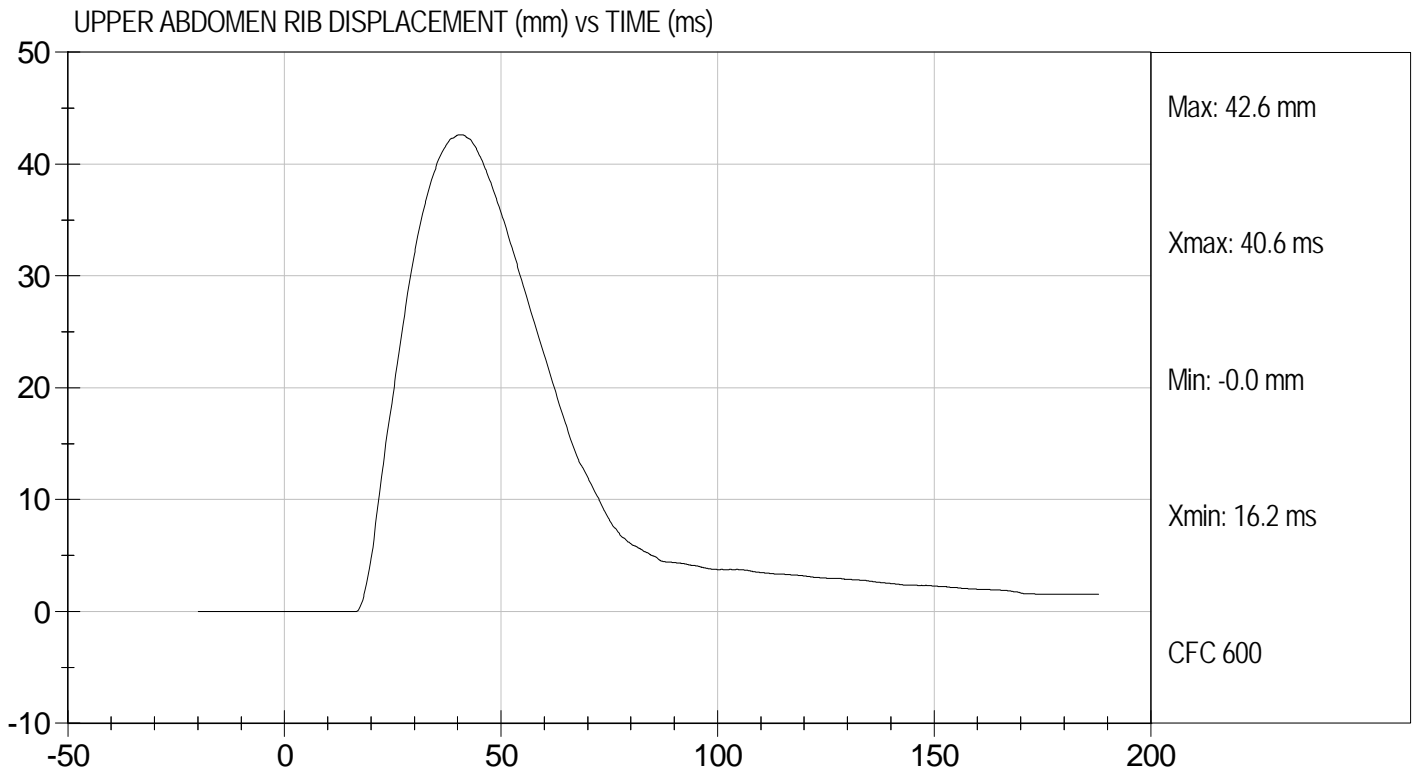
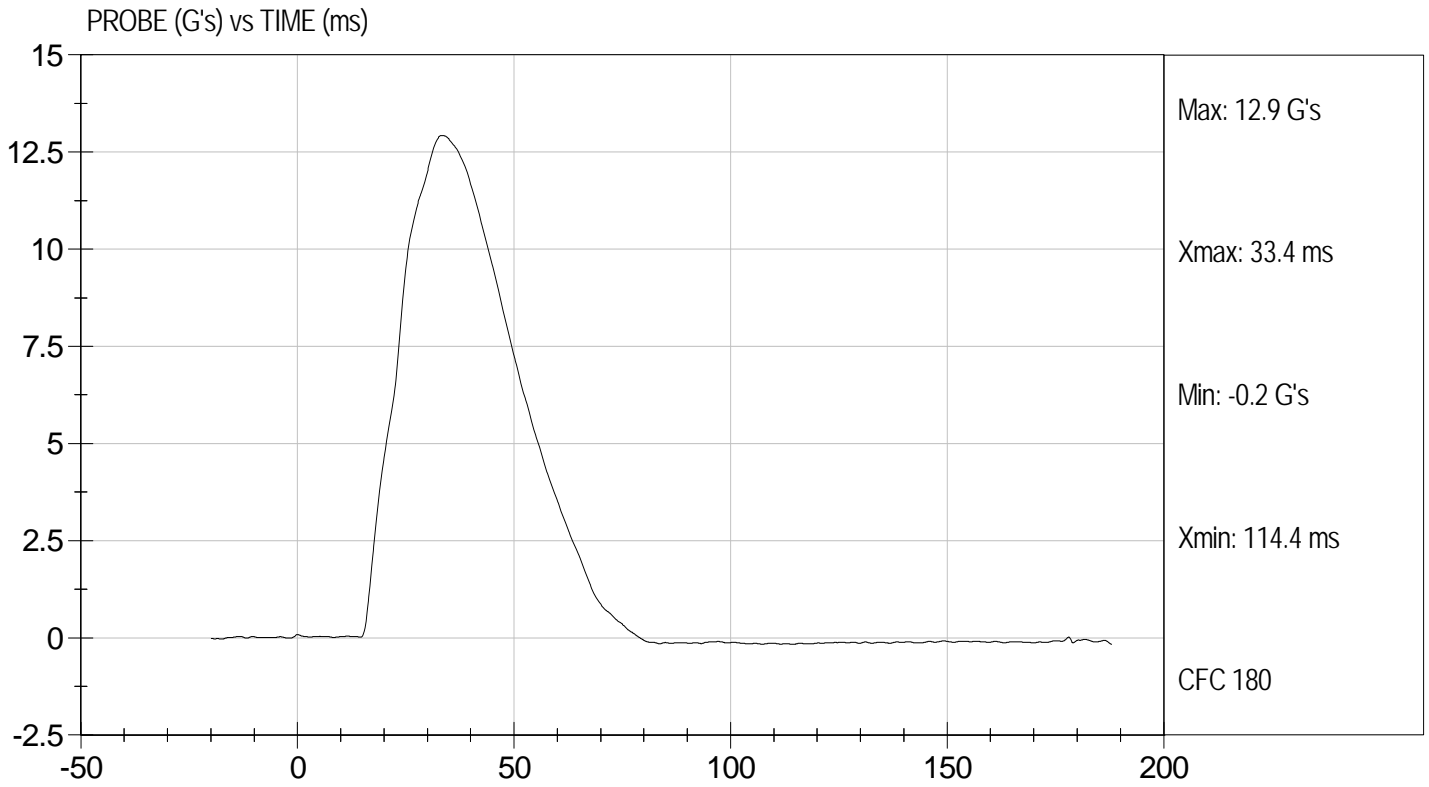
10/5/11
 Test Date

David Winkelbauer
 Approved By



Test Desc: Abdomen Impact
Component ID: D113336

Test Date: 10/5/11
Velocity: 14.25 ft/s, 4.34 m/s

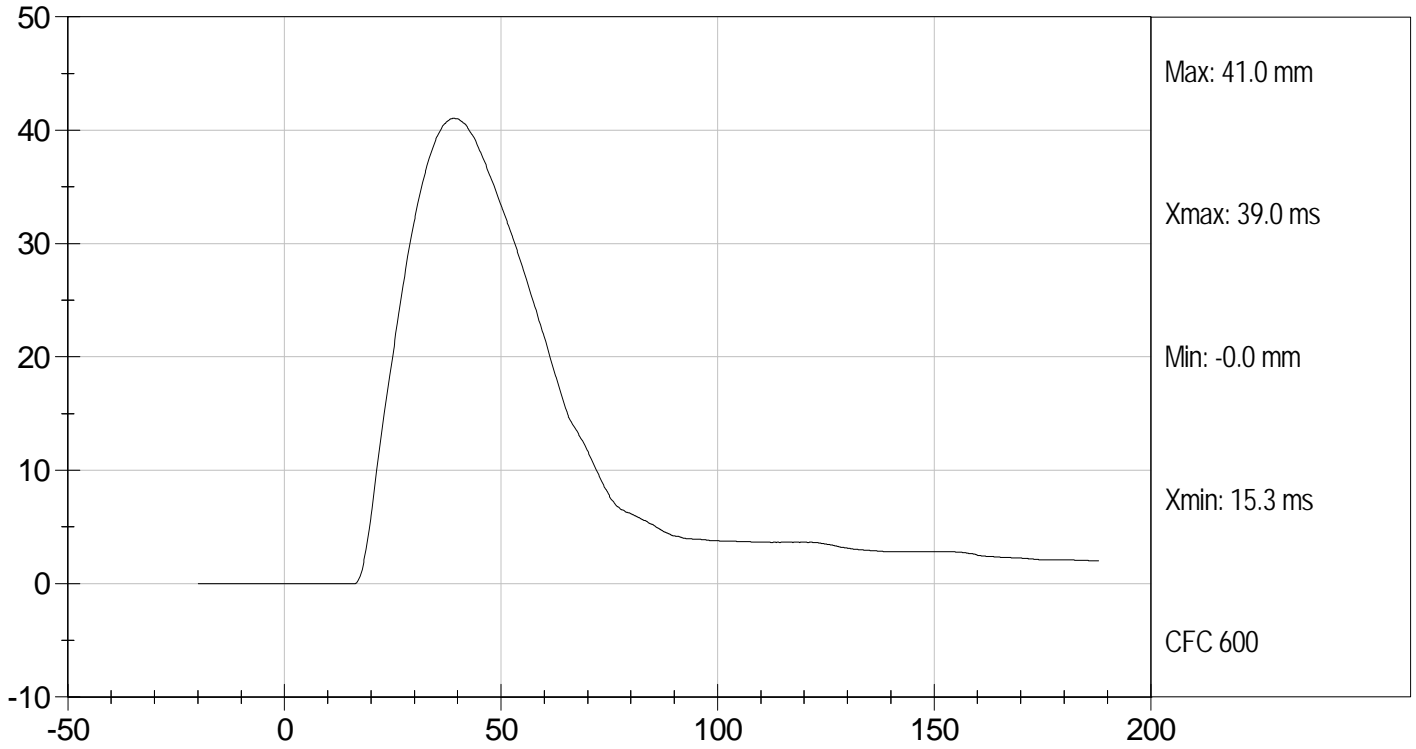




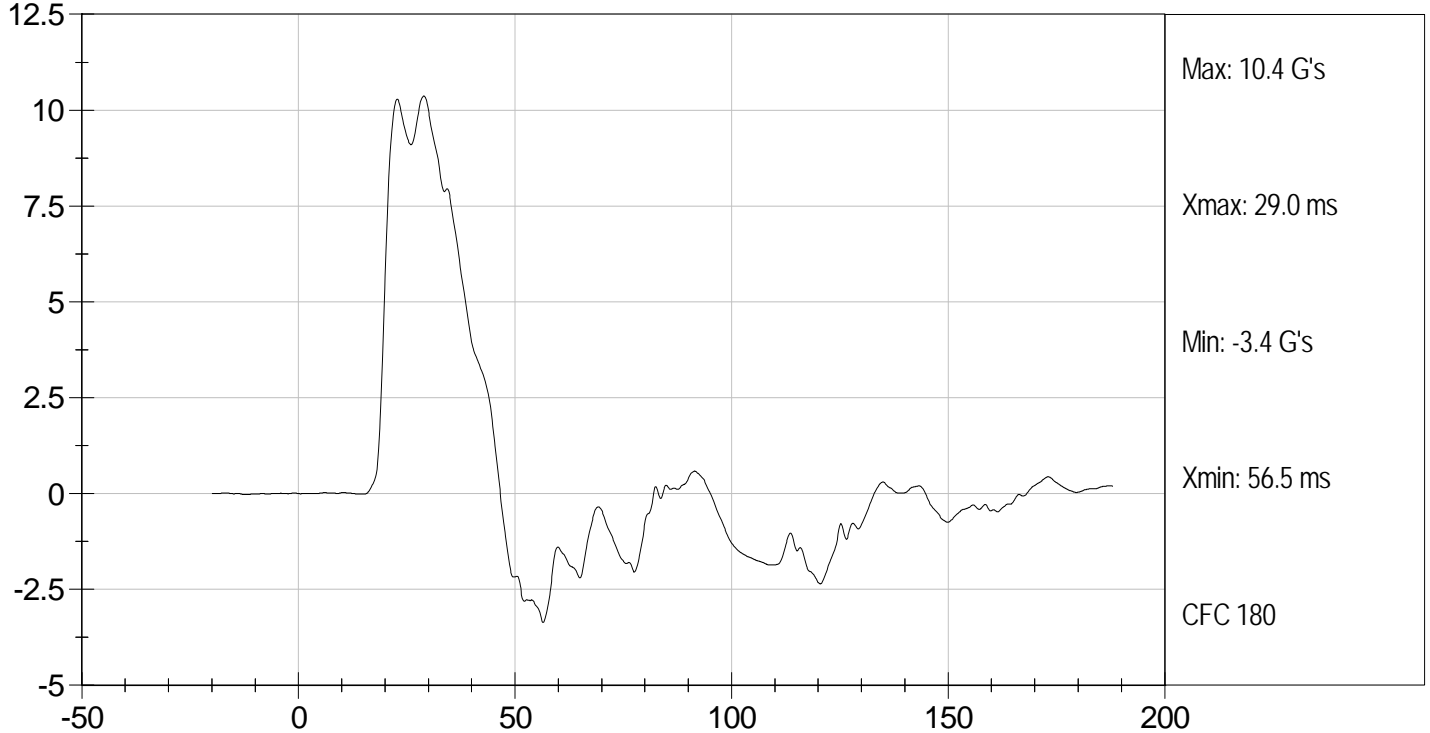
Test Desc: Abdomen Impact
Component ID: D113336

Test Date: 10/5/11
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: D113337

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.4	Pass
Humidity	%	10 to 70	40	Pass
Impact Velocity	m/s	6.60 to 6.80	6.67	Pass
Peak Impactor Acceleration	G's	38 to 47	41	Pass
Pelvis Y Acceleration after 6 ms	G's	34 to 42	41	Pass
Peak Acetabulum Force	N	3600 to 4300	3675	Pass
			Overall Test Results	Pass

Jessica Hall
 Laboratory Technician

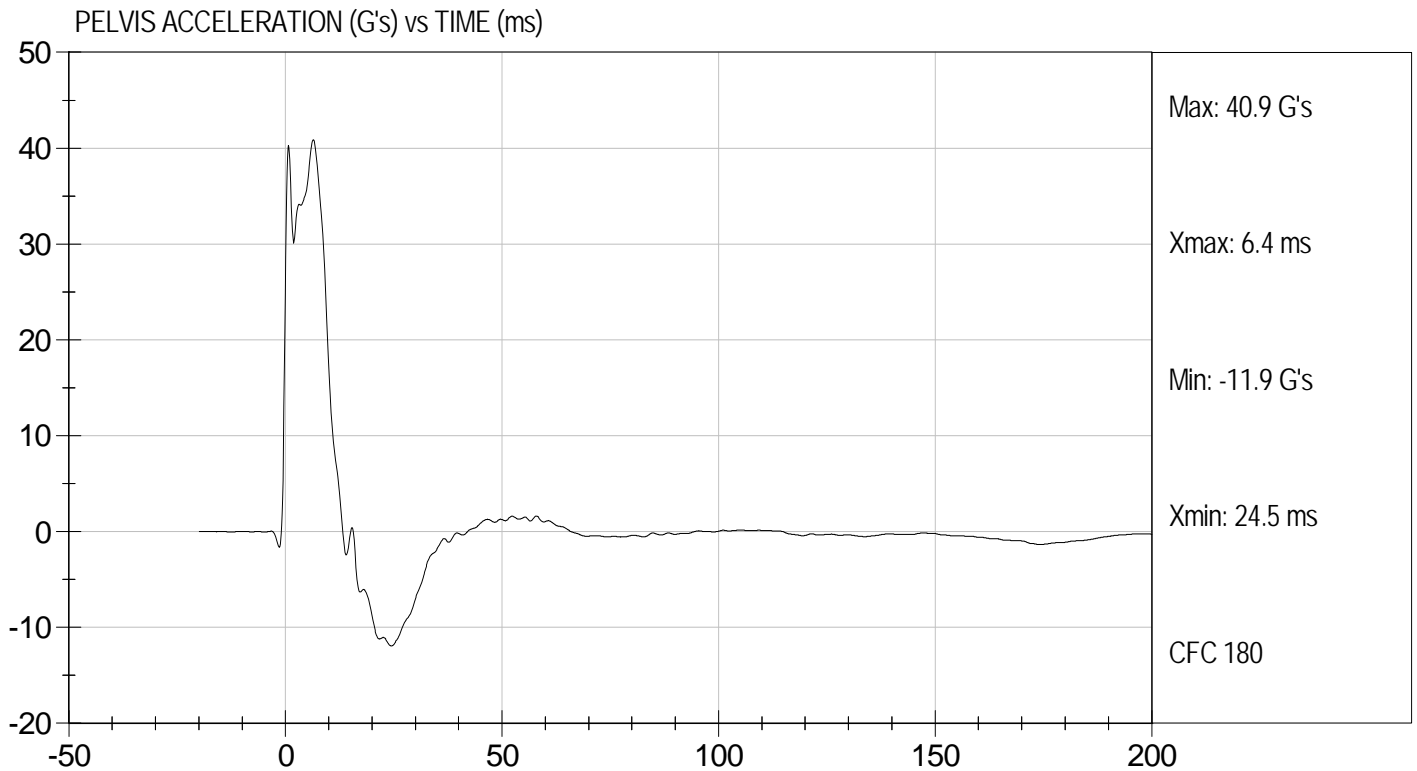
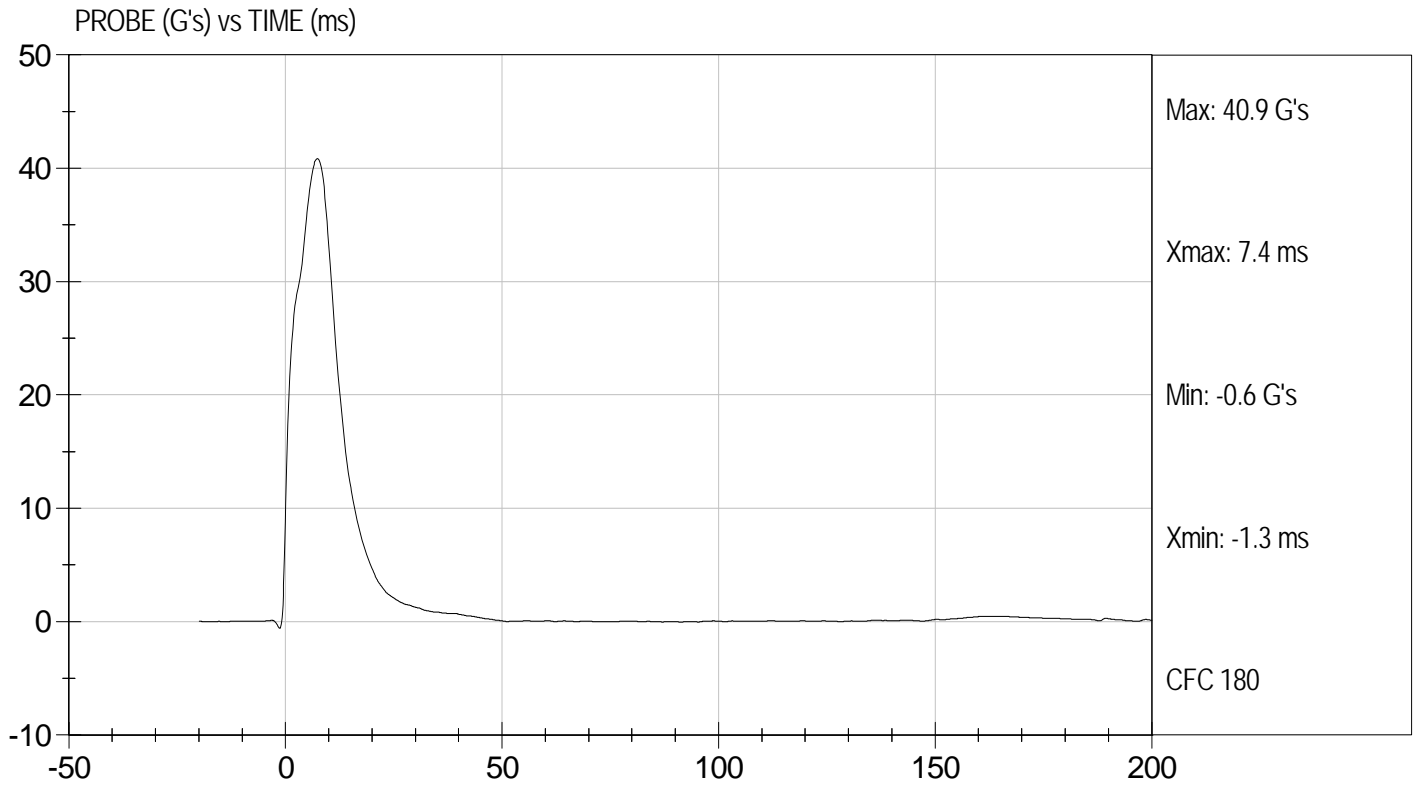
10/5/11
 Test Date

David Winkelbauer
 Approved By



Test Desc: Pelvis Impact
Component ID: D113337

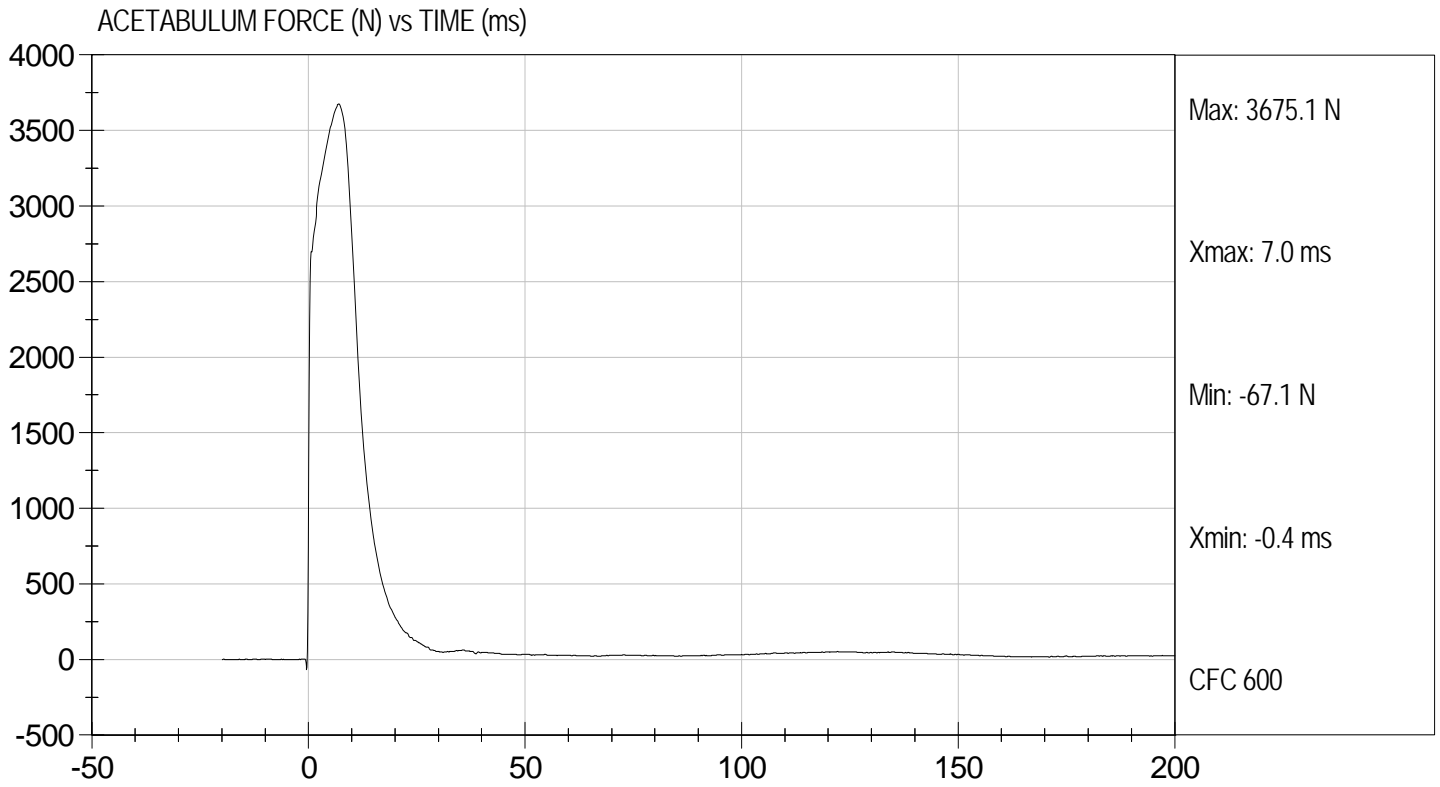
Test Date: 10/5/11
Velocity: 21.88 ft/s, 6.67 m/s





Test Desc: Pelvis Impact
Component ID: D113337

Test Date: 10/5/11
Velocity: 21.88 ft/s, 6.67 m/s



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

ATD Serial No: 306

Test I.D: D113338

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.4	Pass
Humidity	%	10 to 70	40	Pass
Impact Velocity	m/s	4.20 to 4.40	4.27	Pass
Peak Impactor Acceleration	G's	36 to 45	40	Pass
Pelvis Y Acceleration	G's	28 to 39	32	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	5097	Pass
			Overall Test Results	Pass

Jessica Hall
 Laboratory Technician

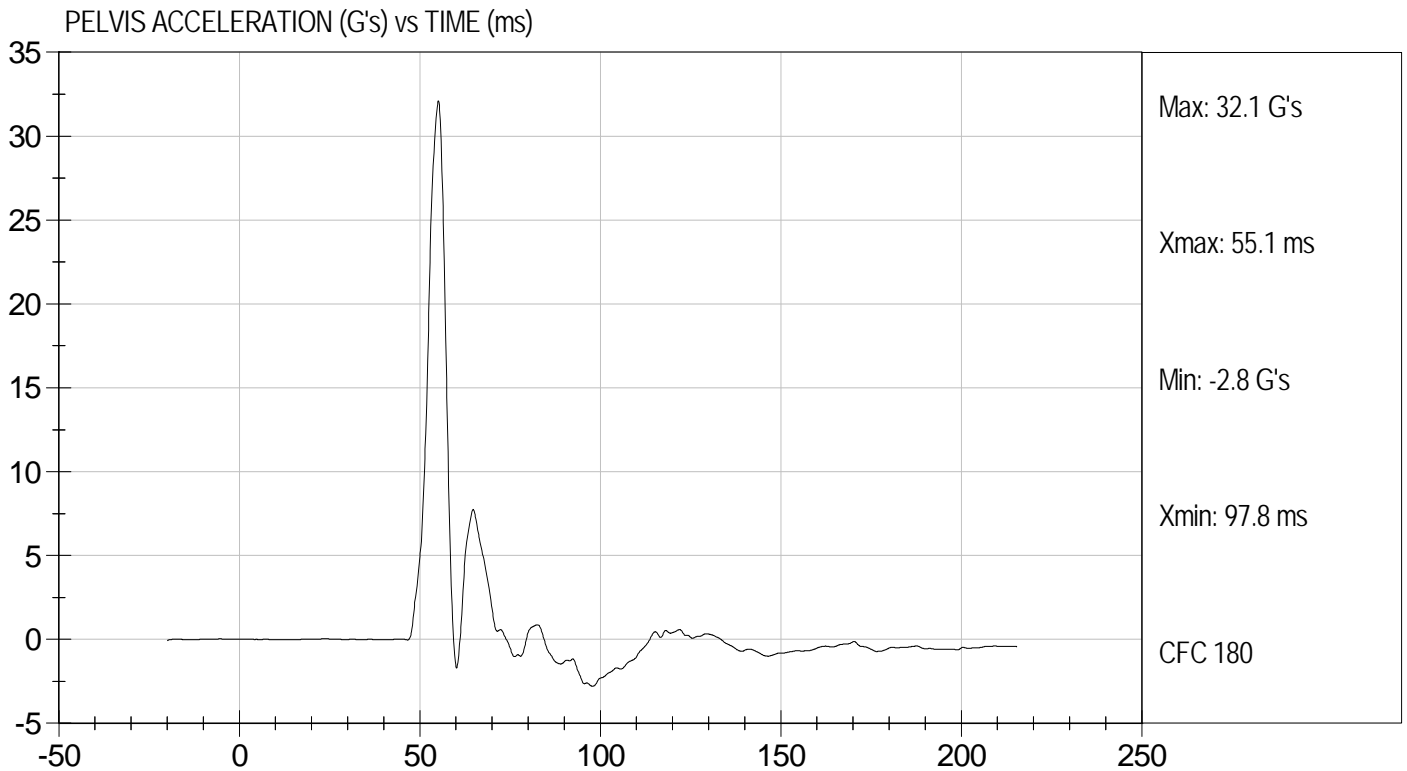
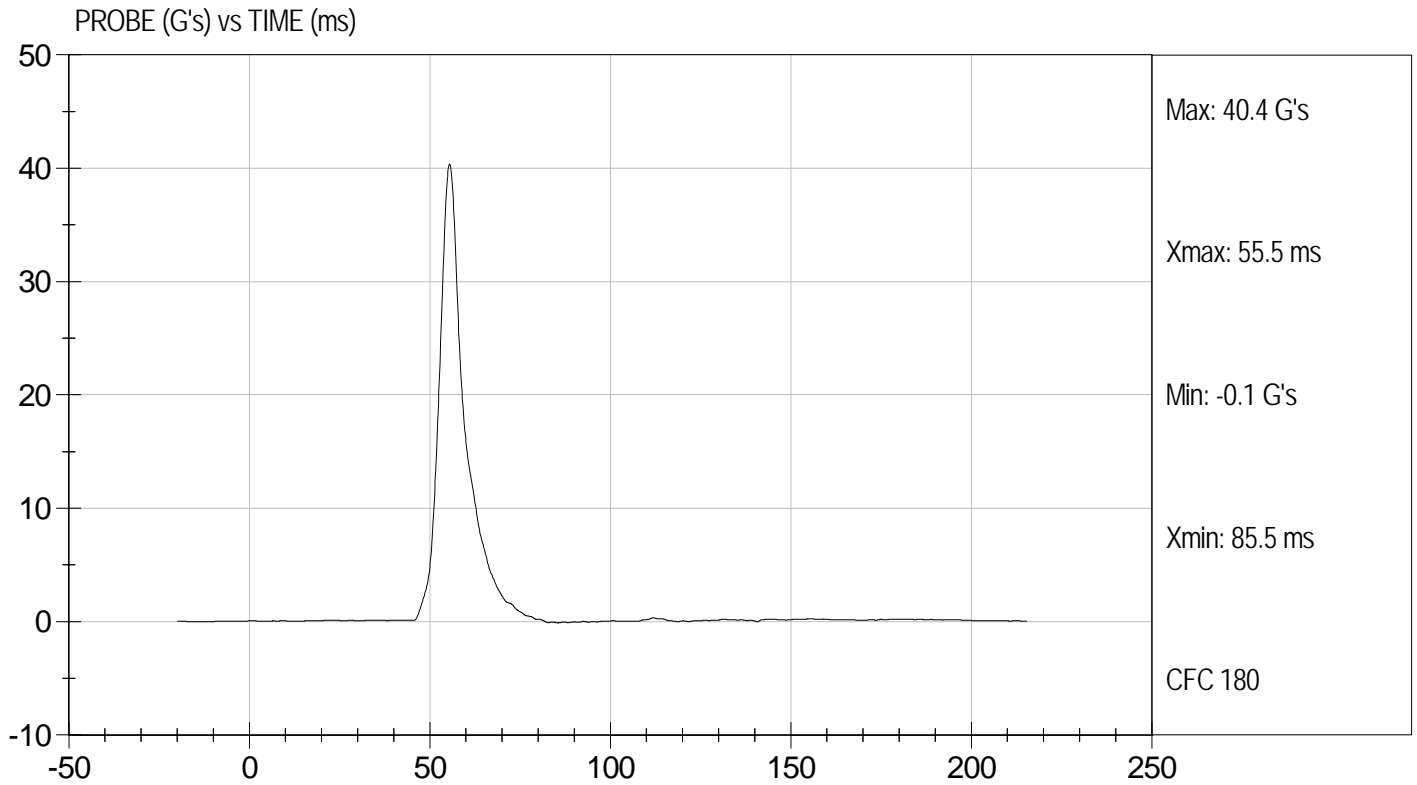
10/5/11
 Test Date

David Winkelbauer
 Approved By



Test Desc: Iliac Impact
Component ID: D113338

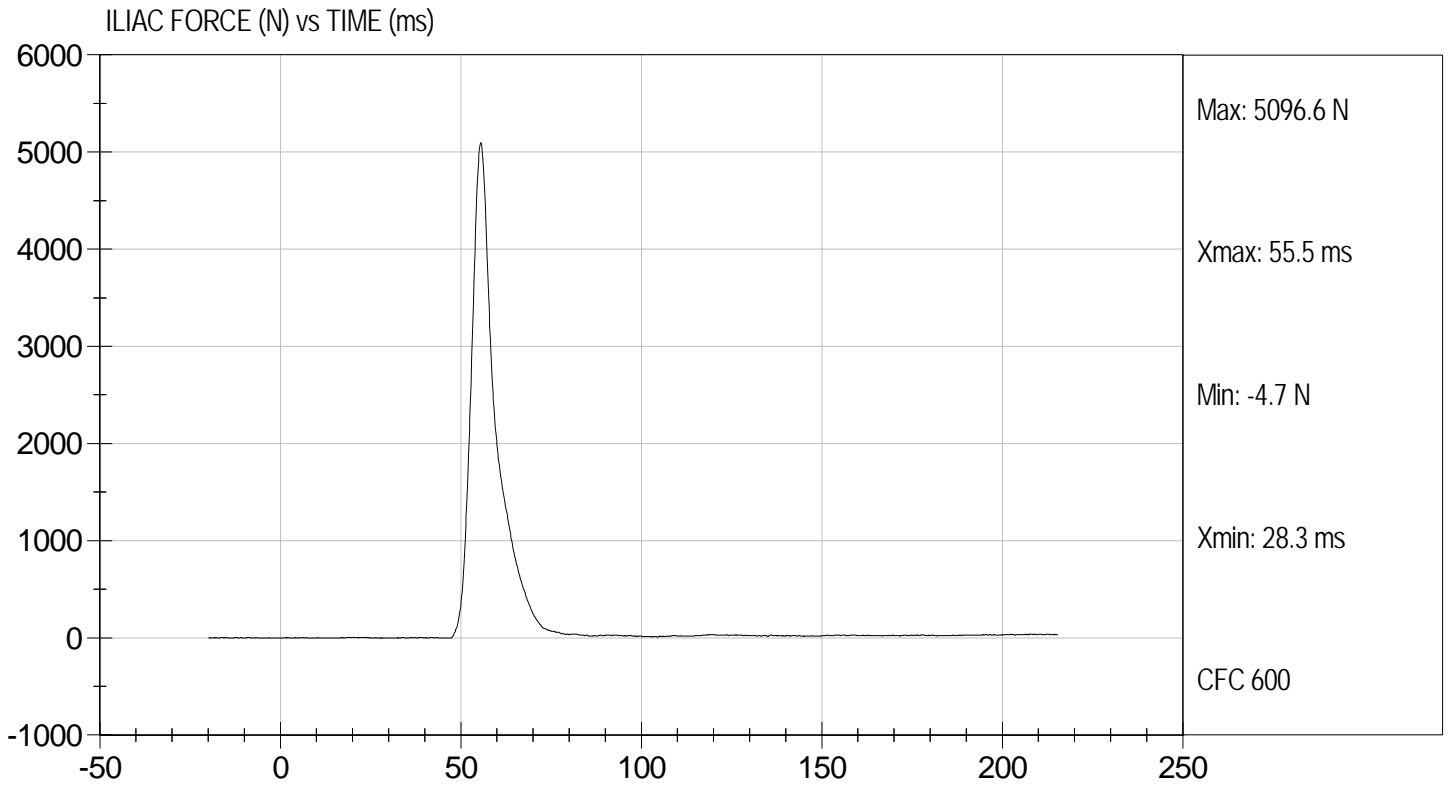
Test Date: 10/5/11
Velocity: 14.00 ft/s, 4.27 m/s





Test Desc: Iliac Impact
Component ID: D113338

Test Date: 10/5/11
Velocity: 14.00 ft/s, 4.27 m/s



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

ATD Serial No: 306

Test ID: D113391

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	46	Pass
Peak Resultant Acceleration	G's	115 to 137	121	Pass
Peak Lateral Acceleration	G's	+/- 15	-2.6	Pass
Unimodal	N/A	<15%	Yes	Pass
Overall Test Results				Pass

Jessica Gall
Laboratory Technician

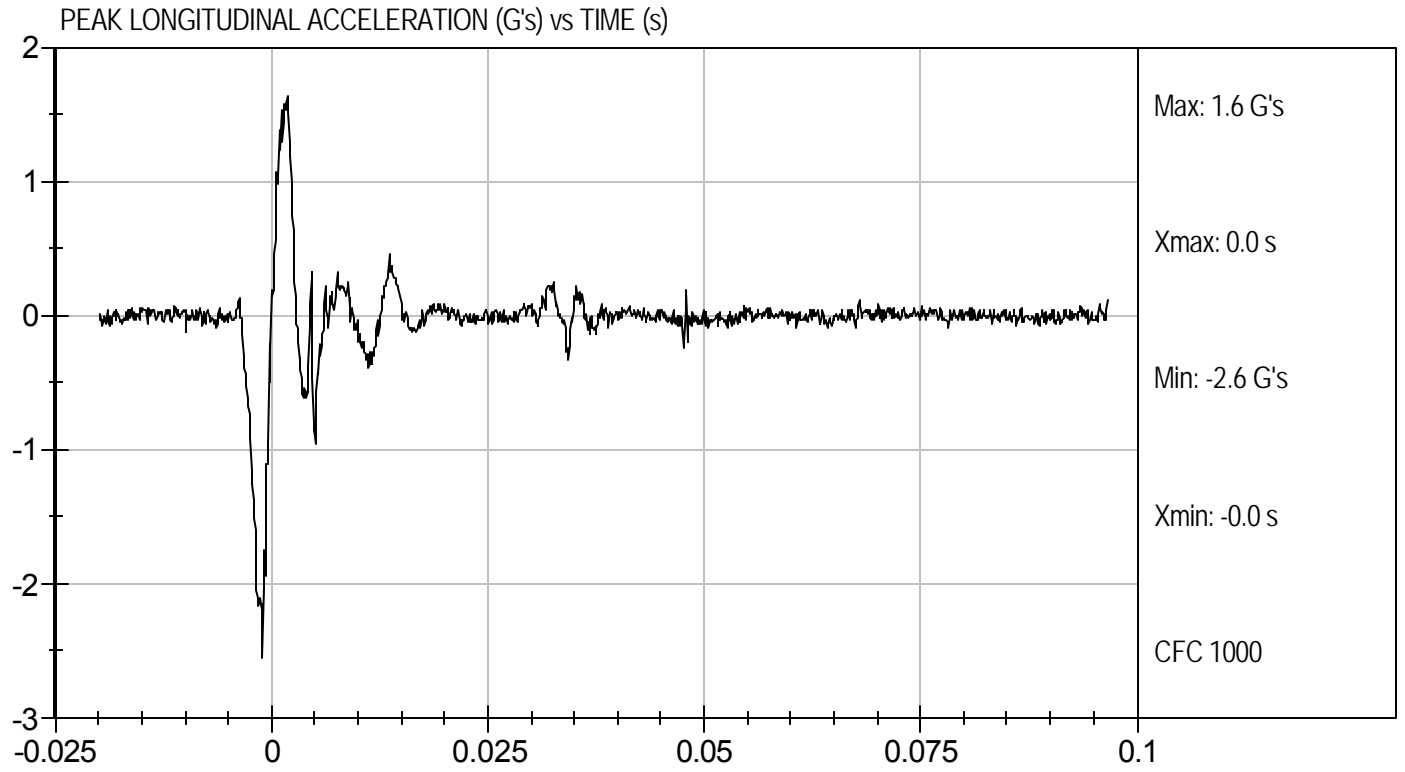
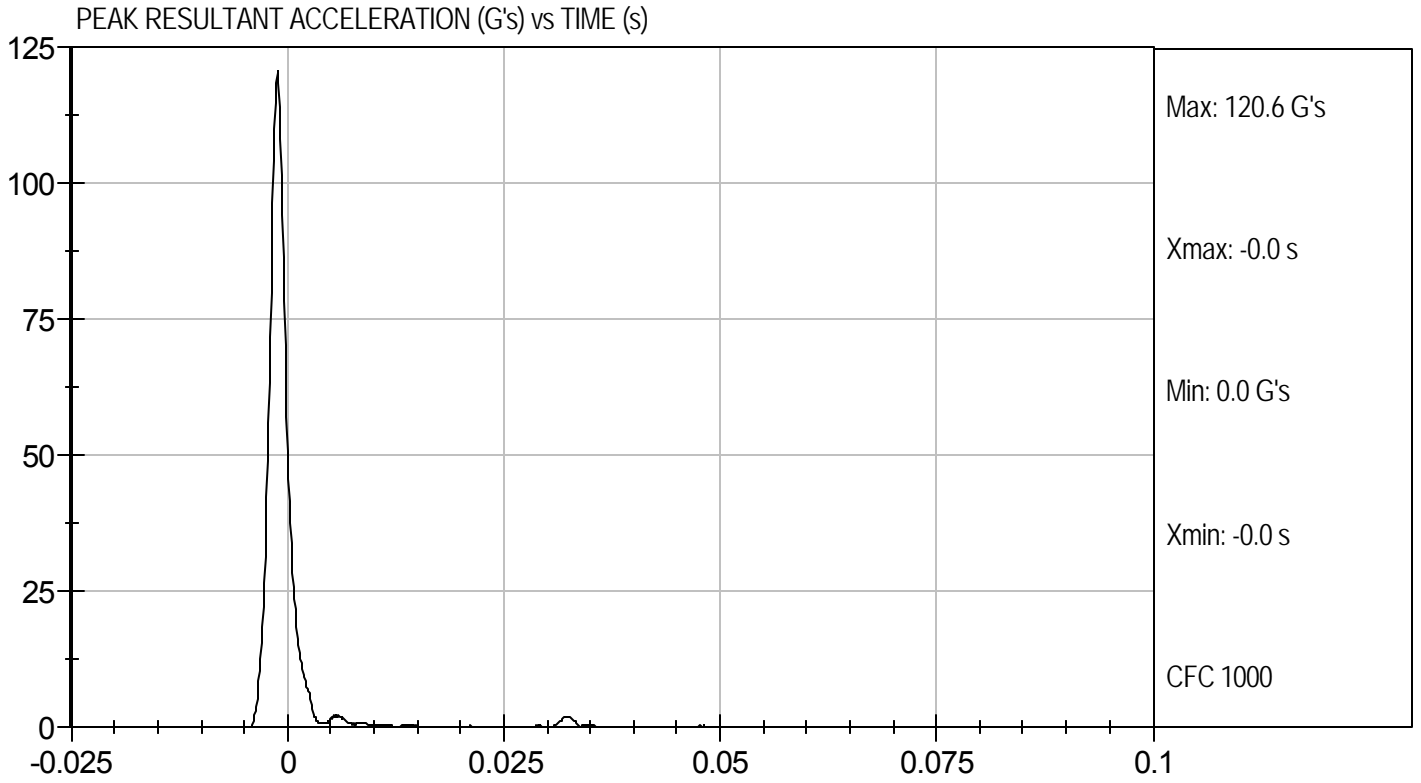
10/7/11
Test Date

David Winkelbauer
Approved By



Test Desc: Head Drop
Component ID: D113391

Test Date: 10/7/11
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.: D113392

Tested Parameter		Units	Specification	Result	Pass/Fail
Temperature		deg C	20.6 to 22.2	21.8	Pass
Humidity		%	10 to 70	46	Pass
Impact Velocity		m/s	5.51 to 5.63	5.58	Pass
Delta Velocity	10 ms	m/s	2.20 to 2.80	2.44	Pass
	15 ms	m/s	3.30 to 4.10	3.54	Pass
	20 ms	m/s	4.40 to 5.40	4.71	Pass
	25 ms	m/s	5.40 to 6.10	5.43	Pass
	25-100 ms	m/s	5.50 to 6.20	5.52	Pass
Maximum D-Plane Rotation		deg	71 to 81	73	Pass
Time of Maximum D-Plane Rotation		ms	50 to 70	58	Pass
Maximum Occipital Condyle Moment during Rotation Interval Nm			-44 to -36	-44	Pass
Time of Moment Decay to 0 Nm		ms	102 to 126	113	Pass
				Overall Test Results	Pass

Jessica Hall
Laboratory Technician

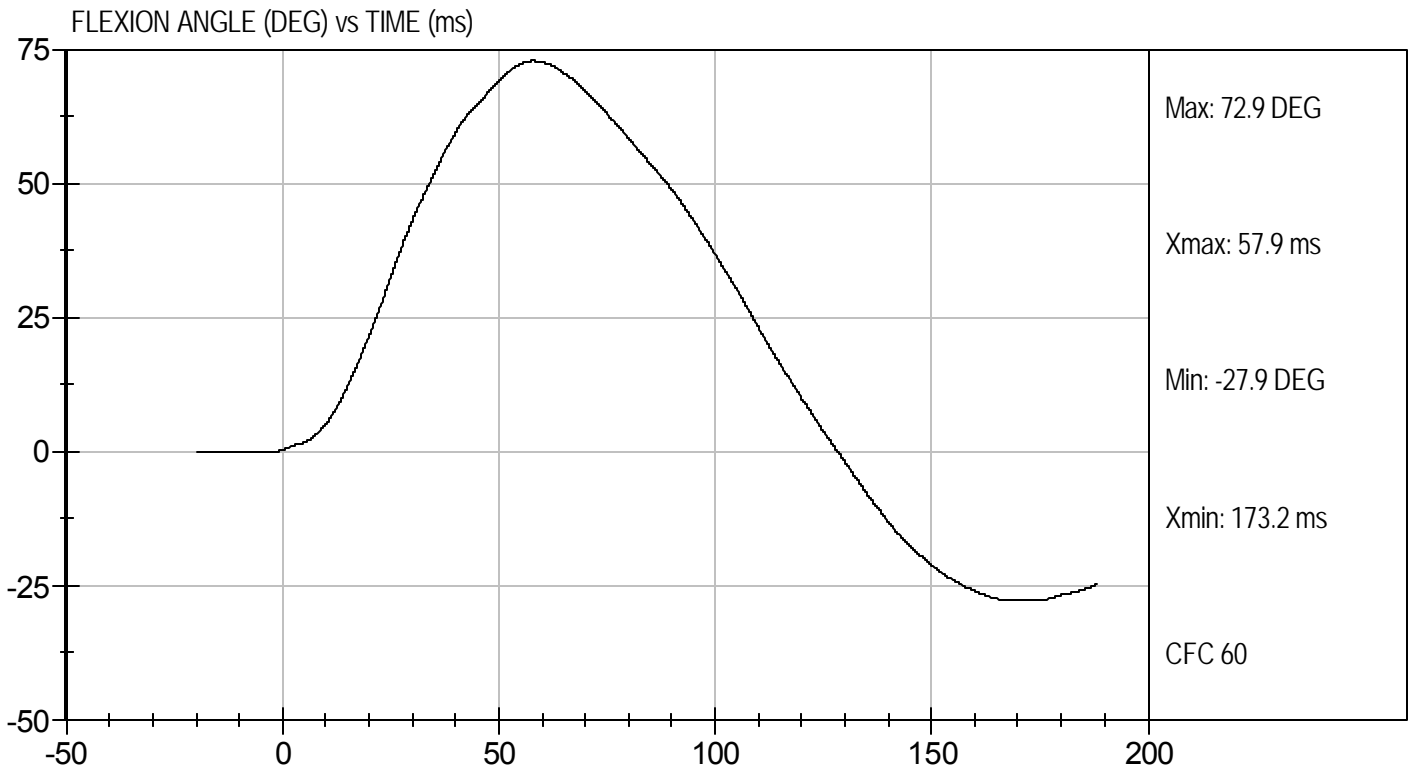
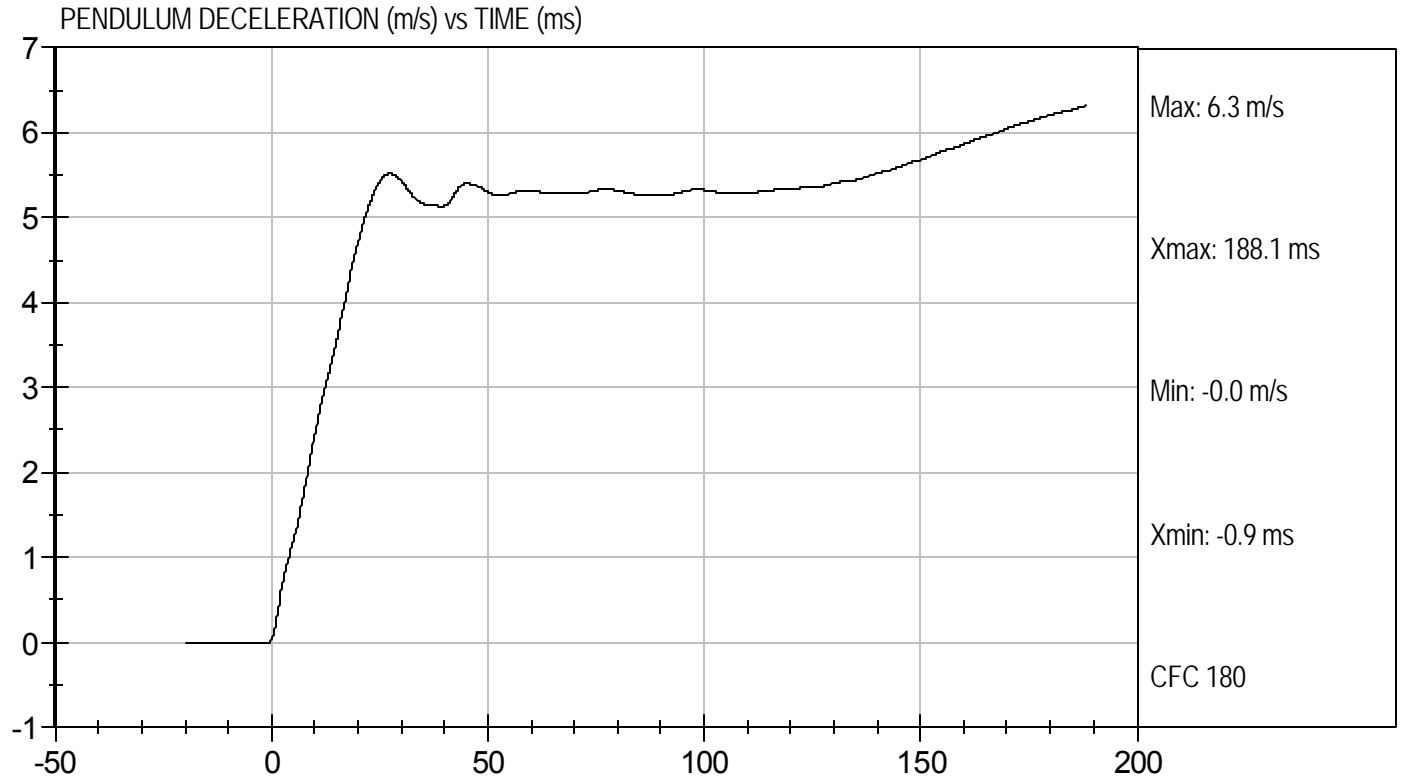
10/7/11
Test Date

David Winkelbauer
Approved By



Test Desc: Neck Bending
Component ID: D113392

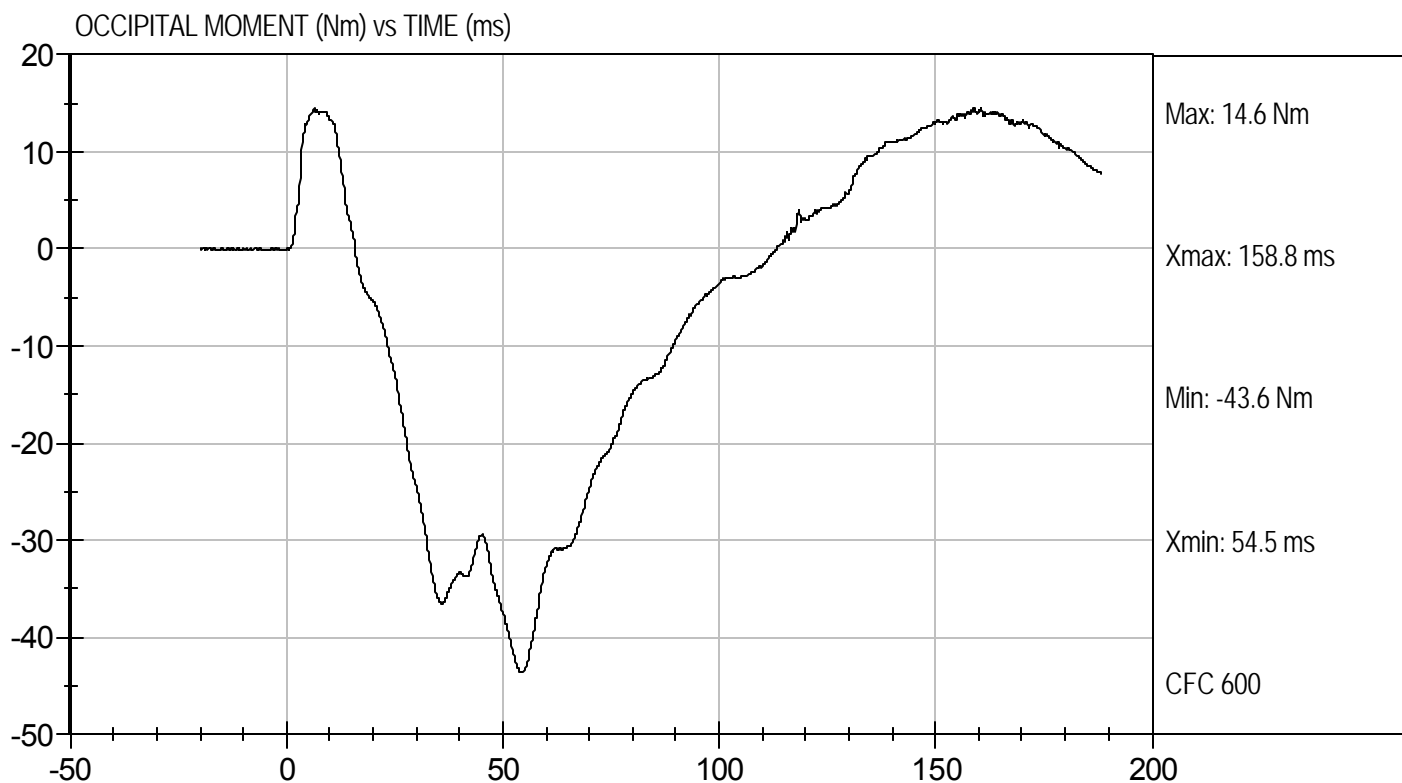
Test Date: 10/7/11
Velocity: 18.32 ft/s, 5.58 m/s





Test Desc: Neck Bending
Component ID: D113392

Test Date: 10/7/11
Velocity: 18.32 ft/s, 5.58 m/s



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

ATD Serial No: 306

Test ID: D113393

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	44	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	30	Pass
Upper Spine (T1) Y Acceleration	G's	17 to 22	19	Pass
Overall Test Results				Pass

Jessica Gall
Laboratory Technician

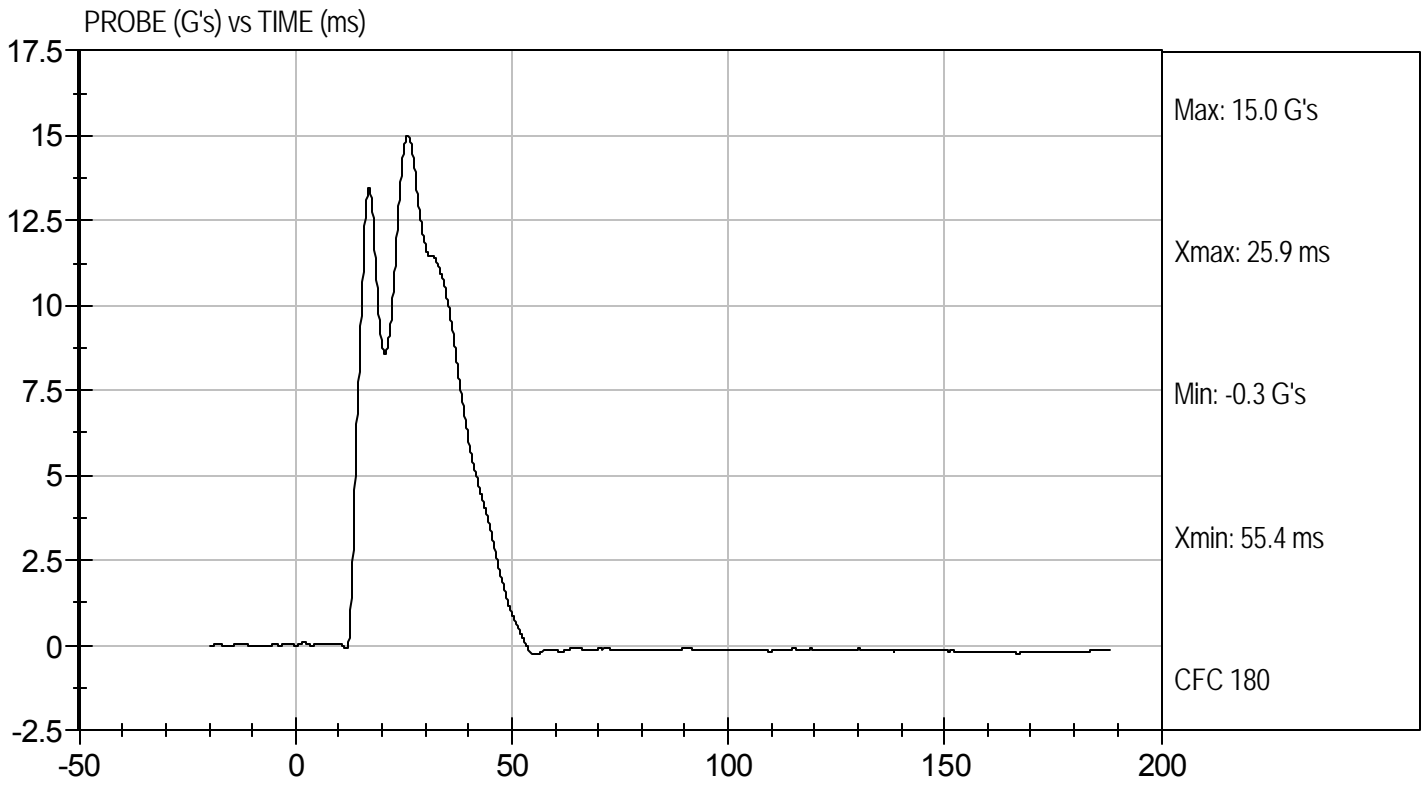
10/7/11
Test Date

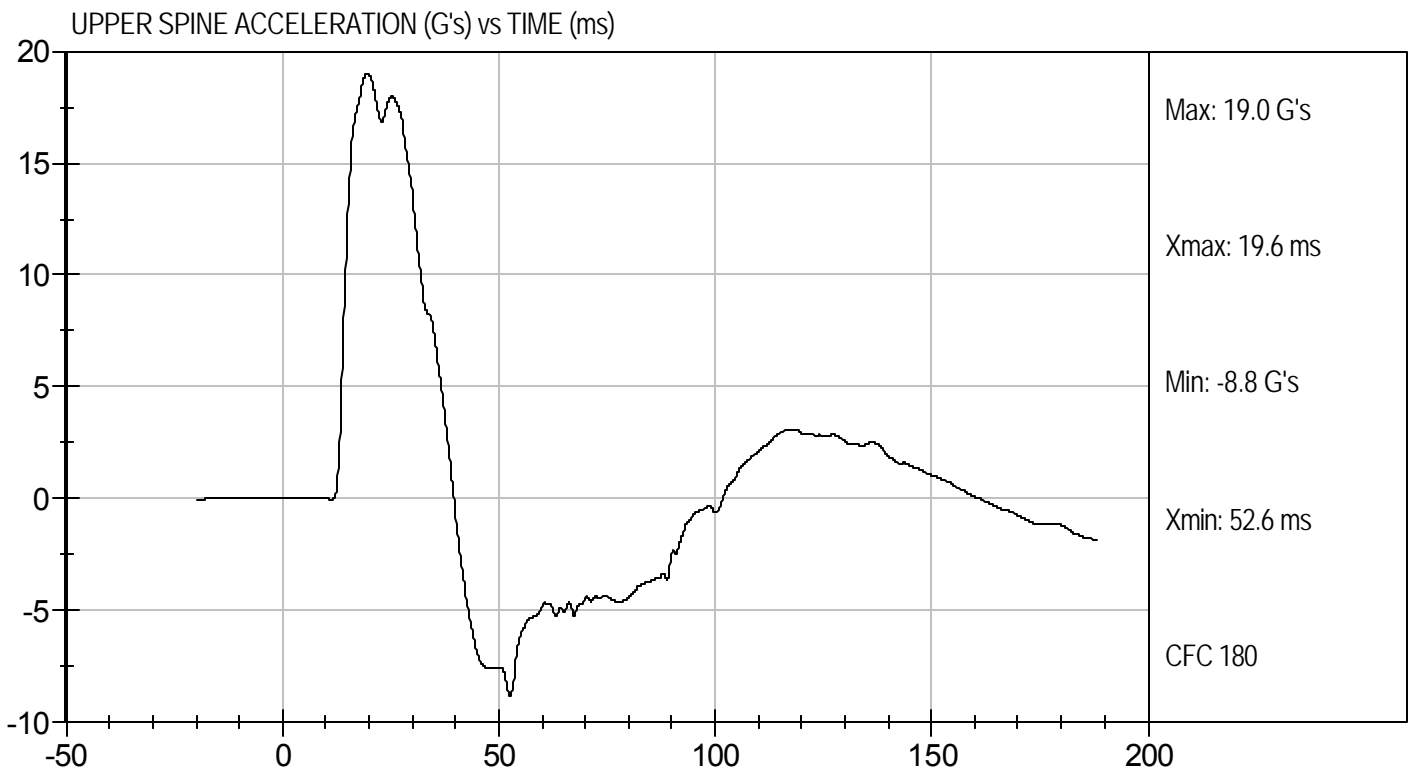
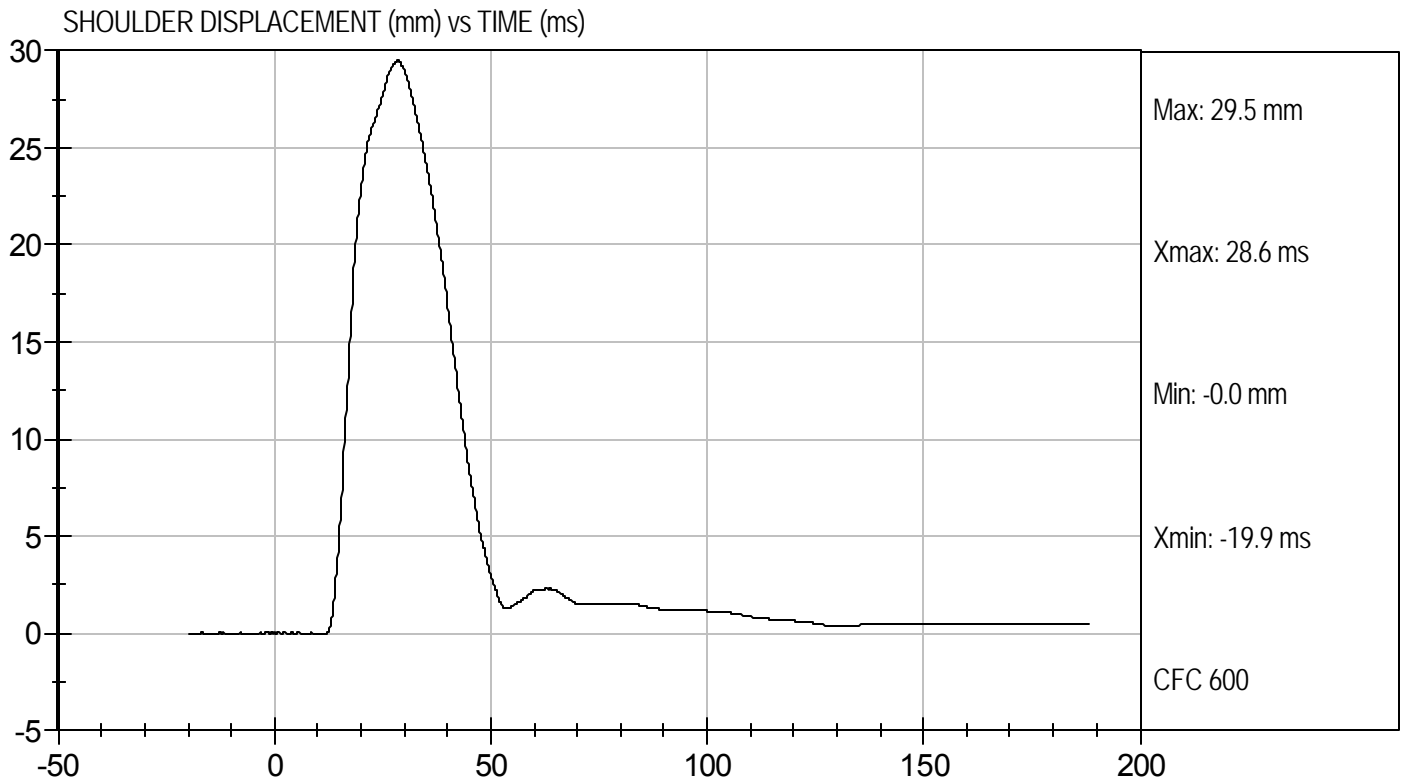
David Winkelbauer
Approved By



Test Desc: Shoulder Impact
Component ID: D113393

Test Date: 10/7/11
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: D113394

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.5	Pass
Humidity	%	10 to 70	45	Pass
Impact Velocity	m/s	6.60 to 6.80	6.77	Pass
Peak Impactor Acceleration	G's	30 to 36	32	Pass
Shoulder Displacement	mm	31 to 40	33	Pass
Upper Rib Displacement	mm	25 to 32	29	Pass
Middle Rib Displacement	mm	30 to 36	31	Pass
Lower Rib Displacement	mm	32 to 38	35	Pass
Upper Spine (T1) Y Acceleration	G's	34 to 43	40	Pass
Lower Spine (T12) Y Acceleration	G's	29 to 37	31	Pass
Overall Test Results				Pass


Laboratory Technician

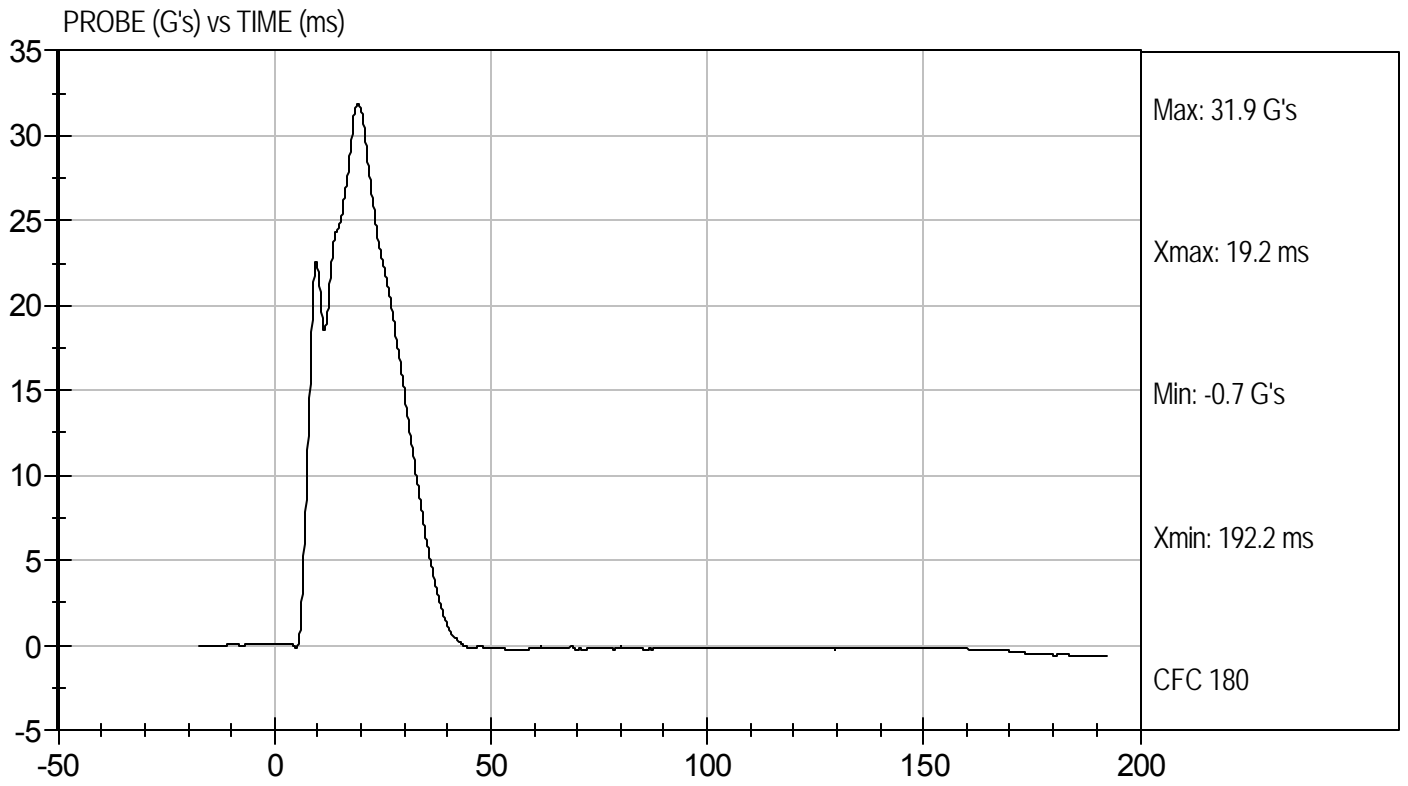
10/7/11
Test Date

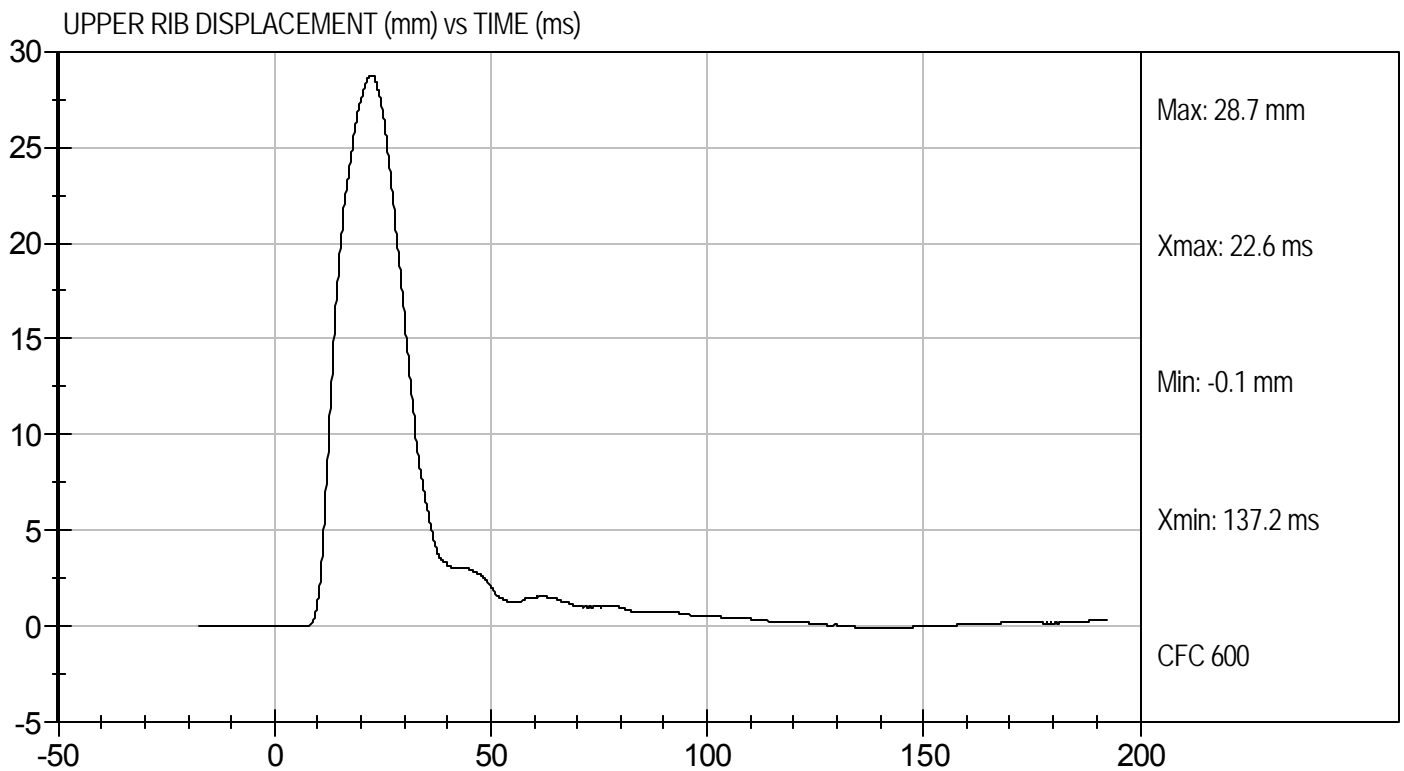
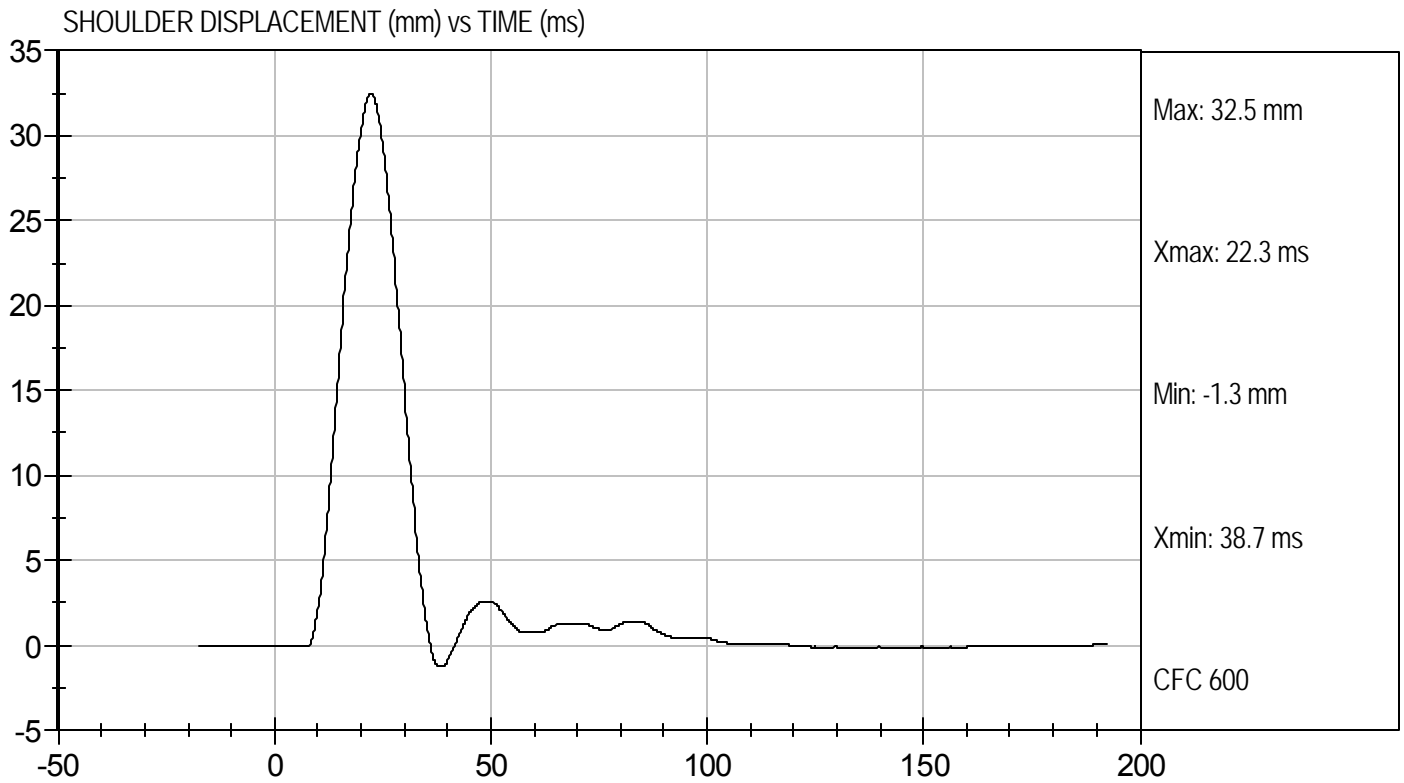

Approved By



Test Desc: Thorax With Arm
Component ID: D113394

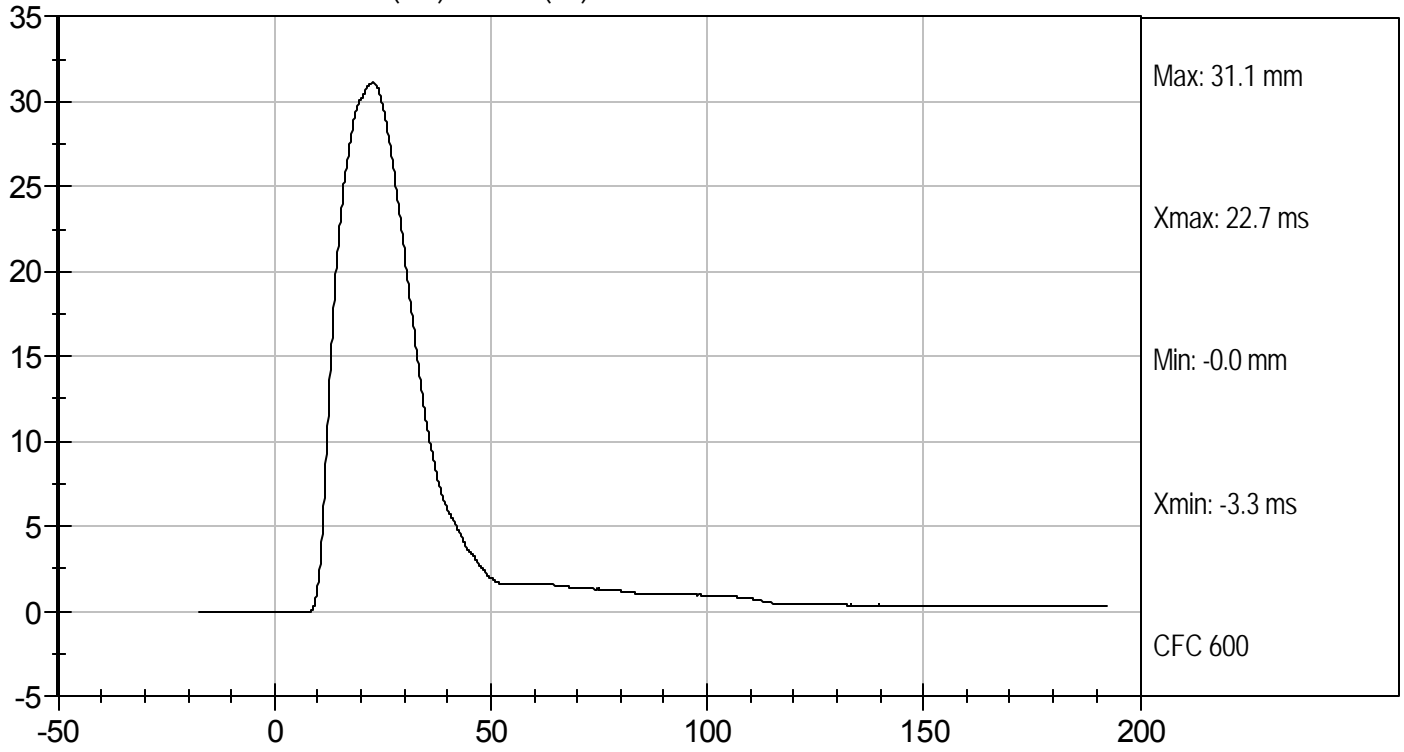
Test Date: 10/7/11
Velocity: 22.22 ft/s, 6.77 m/s



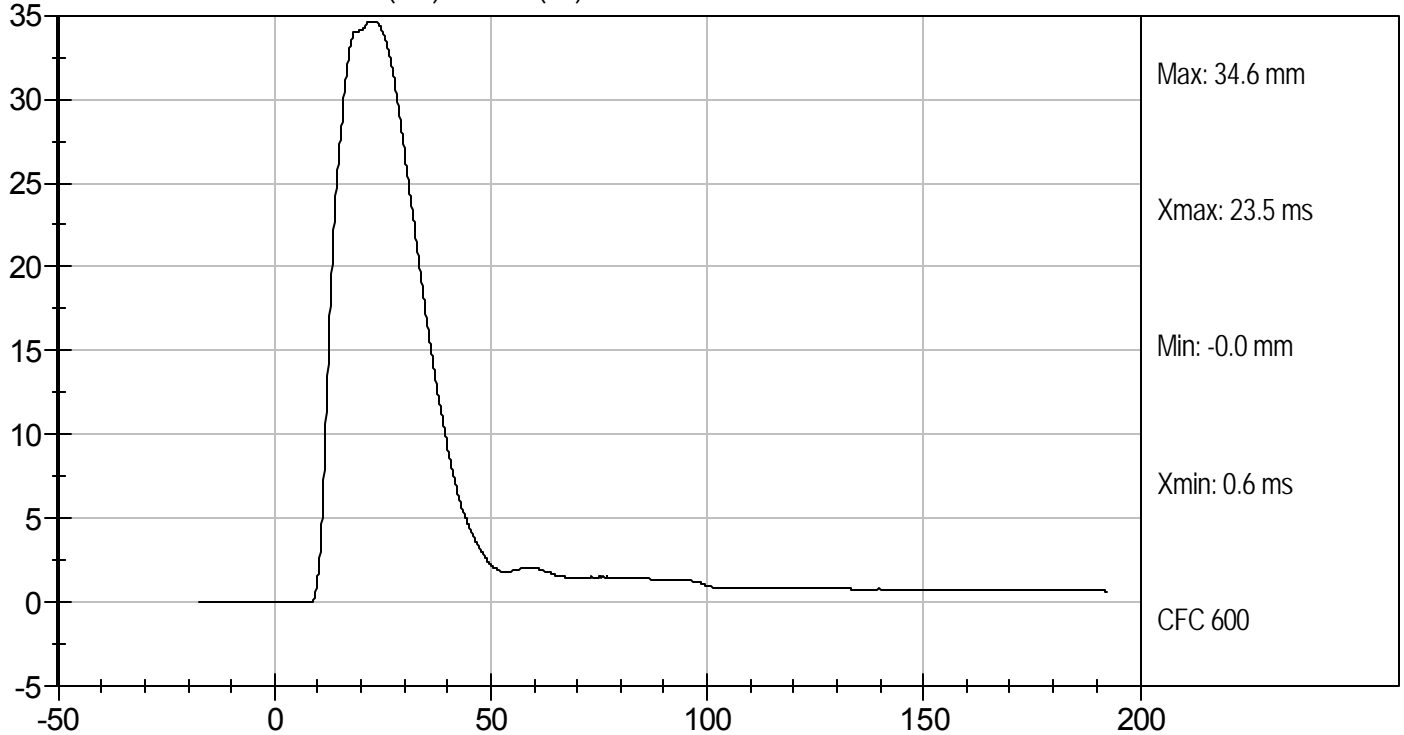




MIDDLE RIB DISPLACEMENT (mm) vs TIME (ms)



LOWER RIB DISPLACEMENT (mm) vs TIME (ms)

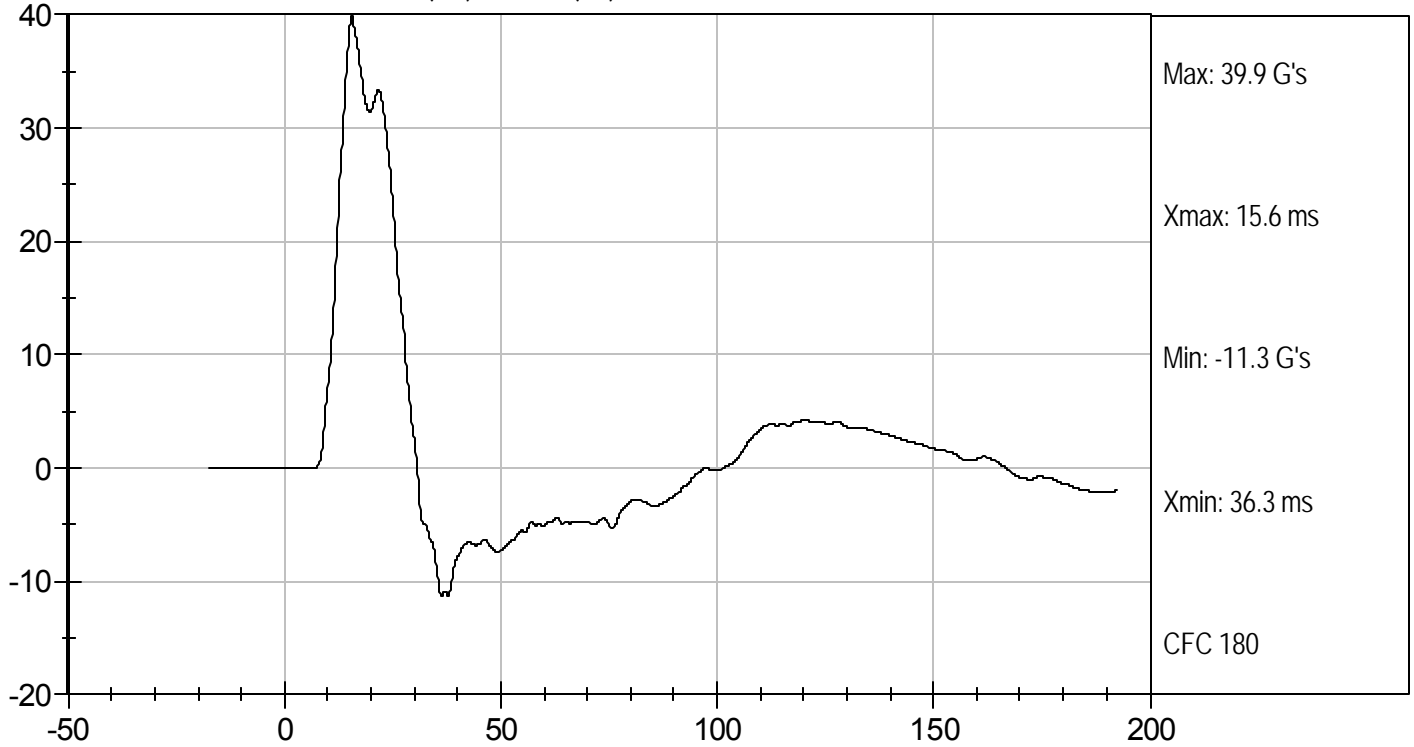




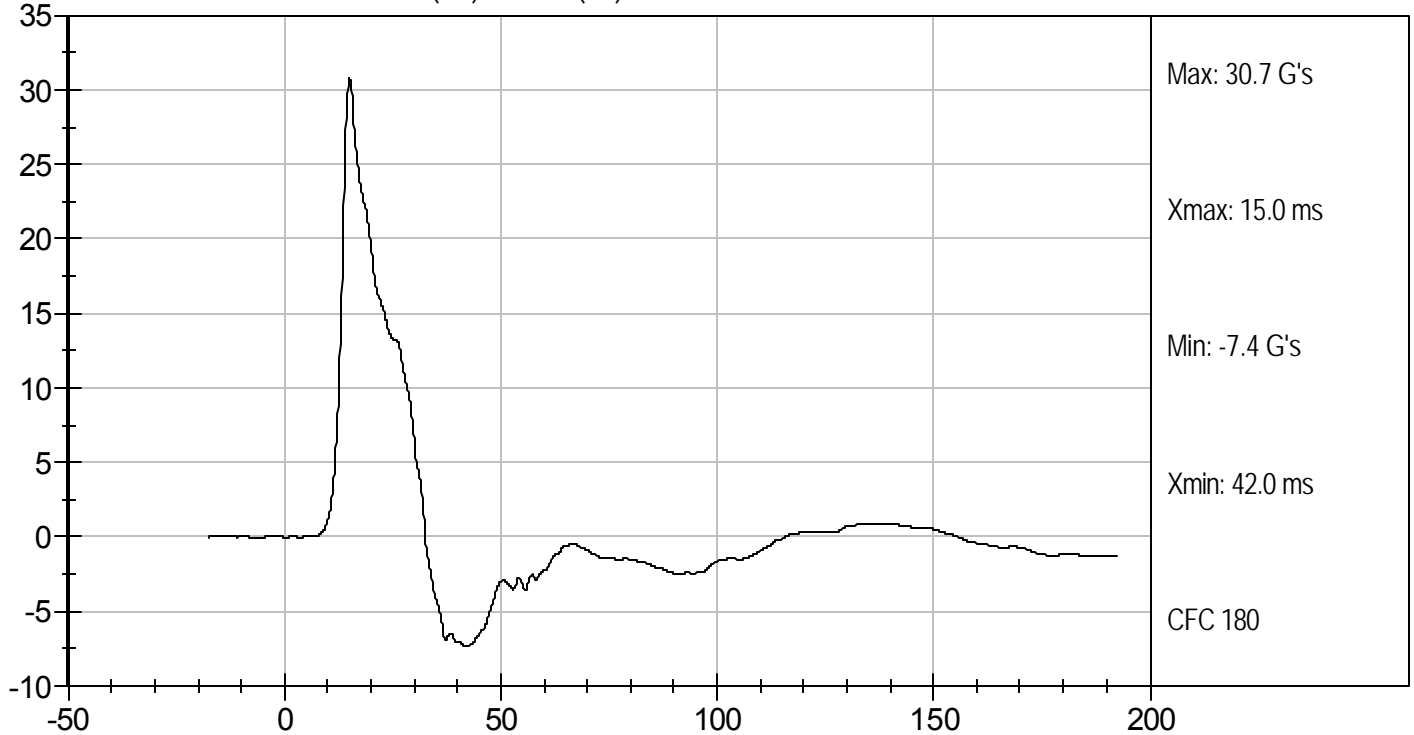
Test Desc: Thorax With Arm
Component ID: D113394

Test Date: 10/7/11
Velocity: 22.22 ft/s, 6.77 m/s

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



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



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


ATD Serial No: 306

Test I.D: D113395

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.4	Pass
Humidity	%	10 to 70	45	Pass
Impact Velocity	m/s	4.20 to 4.40	4.34	Pass
Peak Impactor Force	G's	14 to 18	15	Pass
Upper Rib Displacement	mm	32 to 40	38	Pass
Middle Rib Displacement	mm	39 to 45	40	Pass
Lower Rib Displacement	mm	35 to 43	40	Pass
Upper Spine (T1) Y Acceleration	G's	13 to 17	14	Pass
Lower Spine (T12) Y Acceleration	G's	7 to 11	8	Pass
Overall Test Results				Pass


 Laboratory Technician

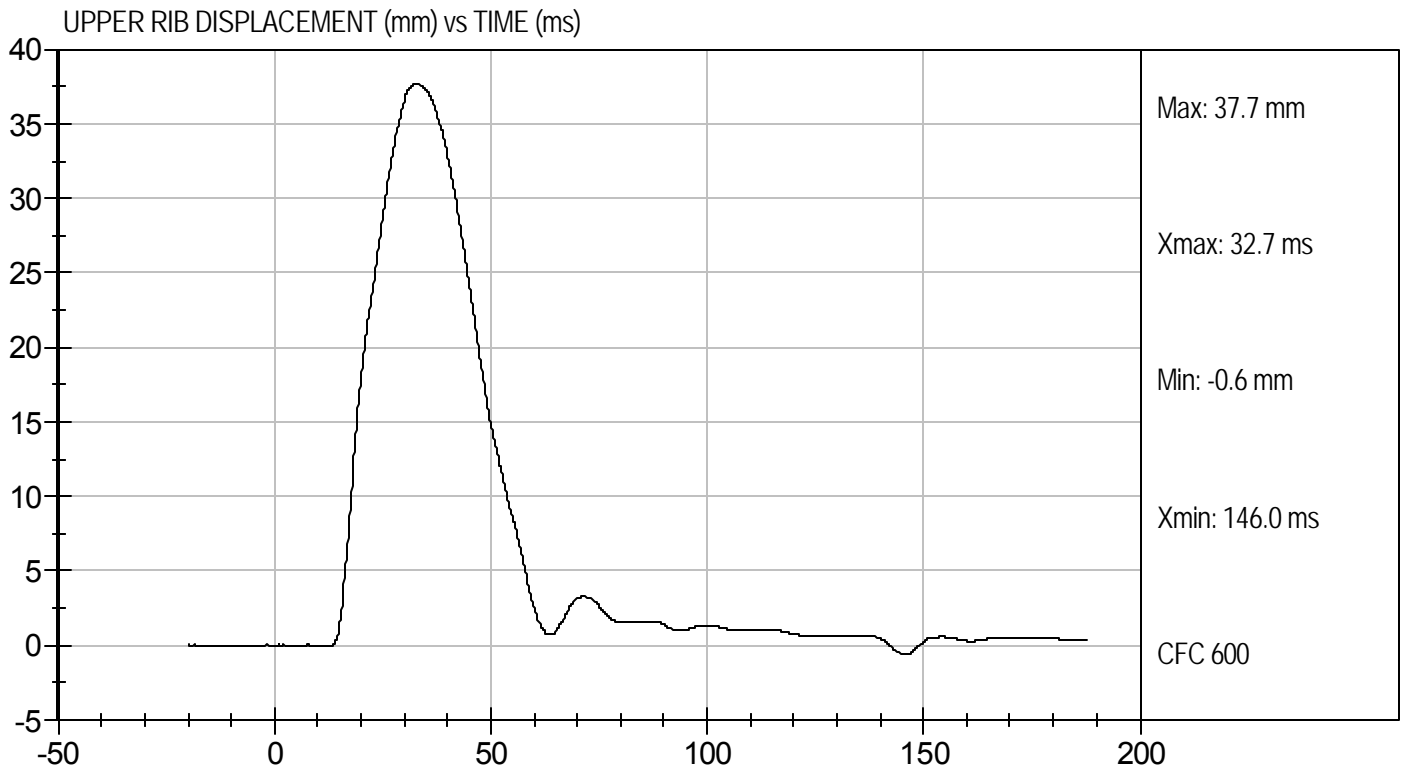
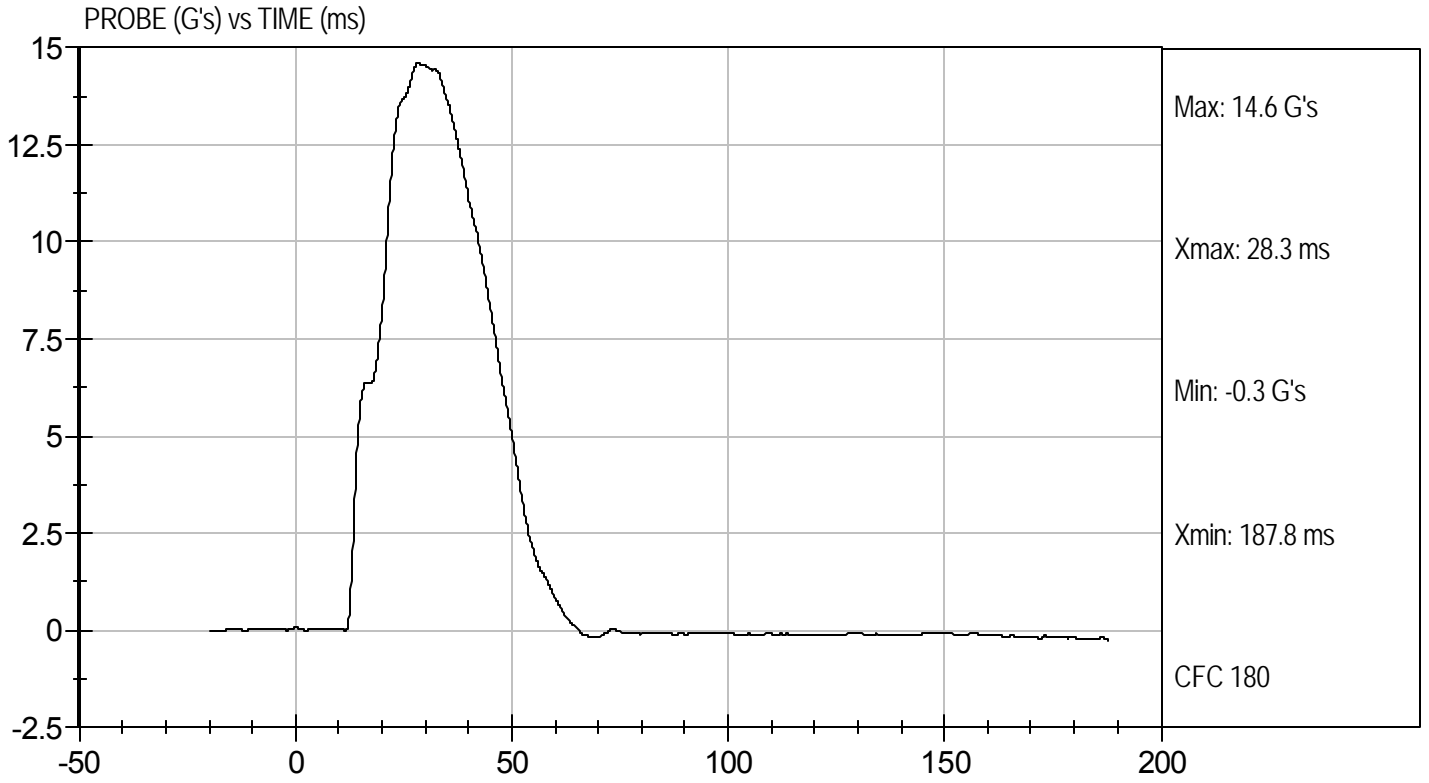
10/7/11
 Test Date


 Approved By



Test Desc: Thorax Without Arm
Component ID: D113395

Test Date: 10/7/11
Velocity: 14.25 ft/s, 4.34 m/s

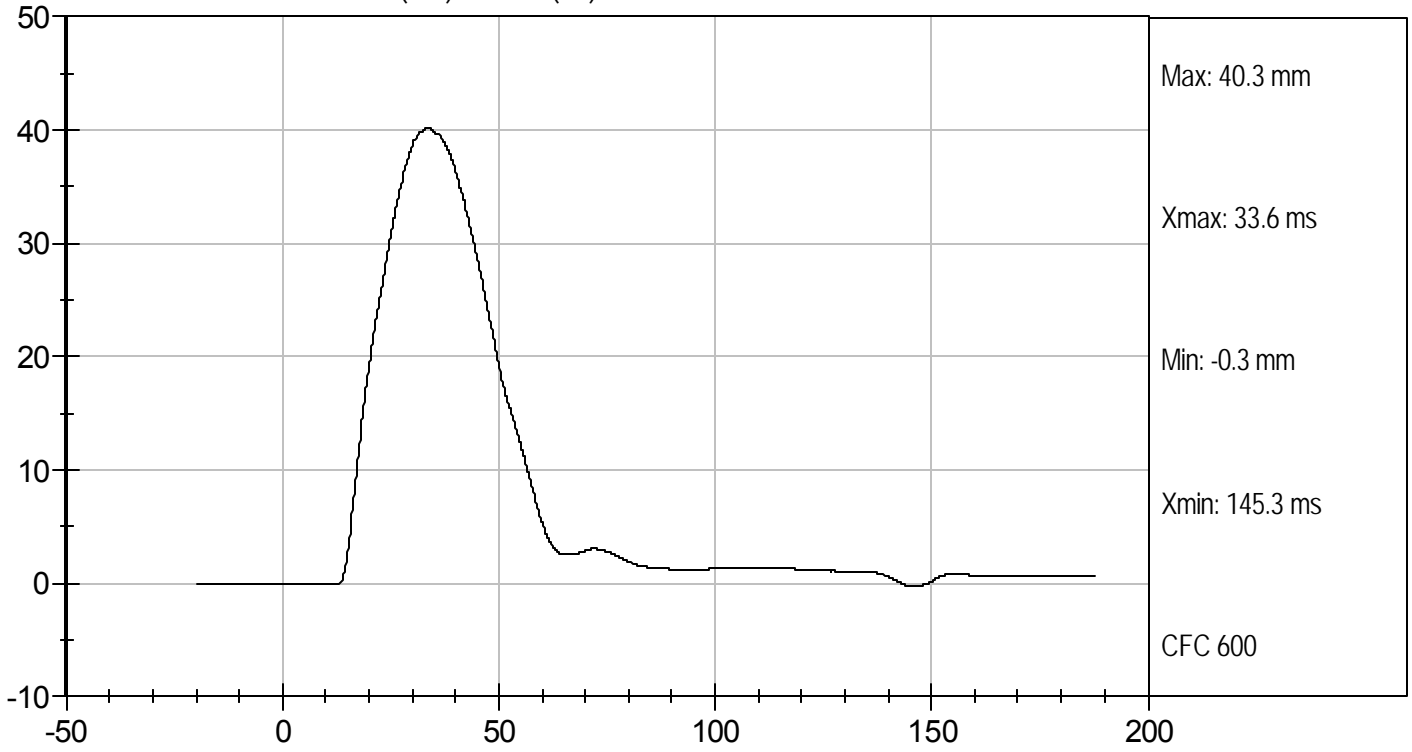




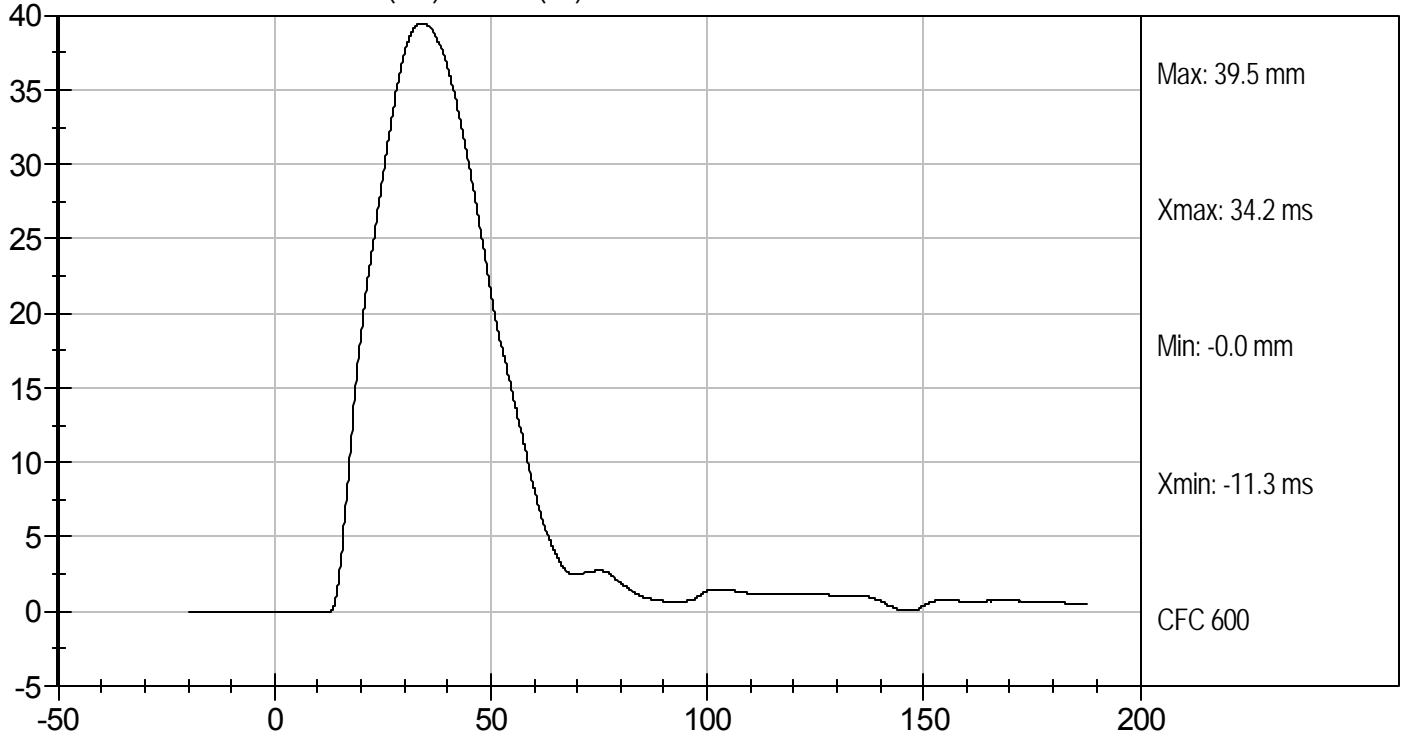
Test Desc: Thorax Without Arm
Component ID: D113395

Test Date: 10/7/11
Velocity: 14.25 ft/s, 4.34 m/s

MIDDLE RIB DISPLACEMENT (mm) vs TIME (ms)



LOWER RIB DISPLACEMENT (mm) vs TIME (ms)

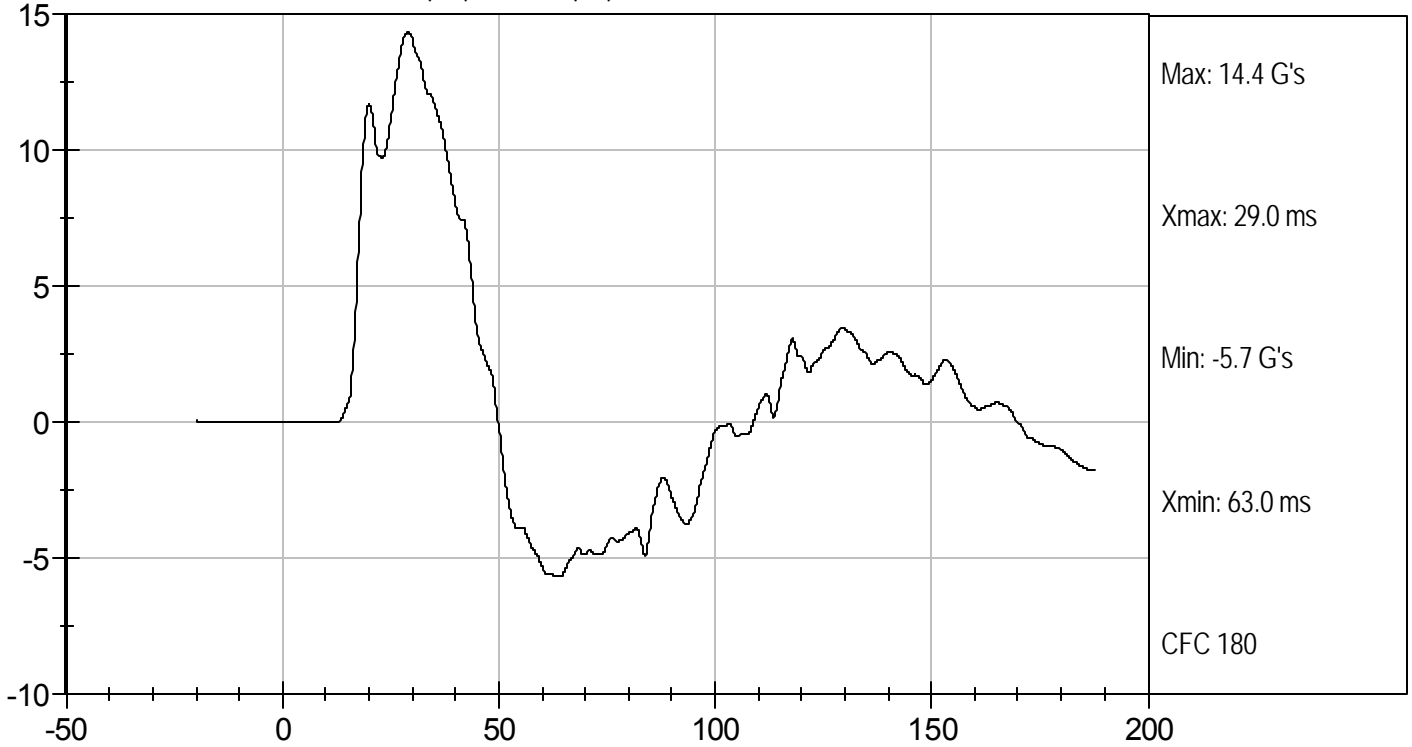




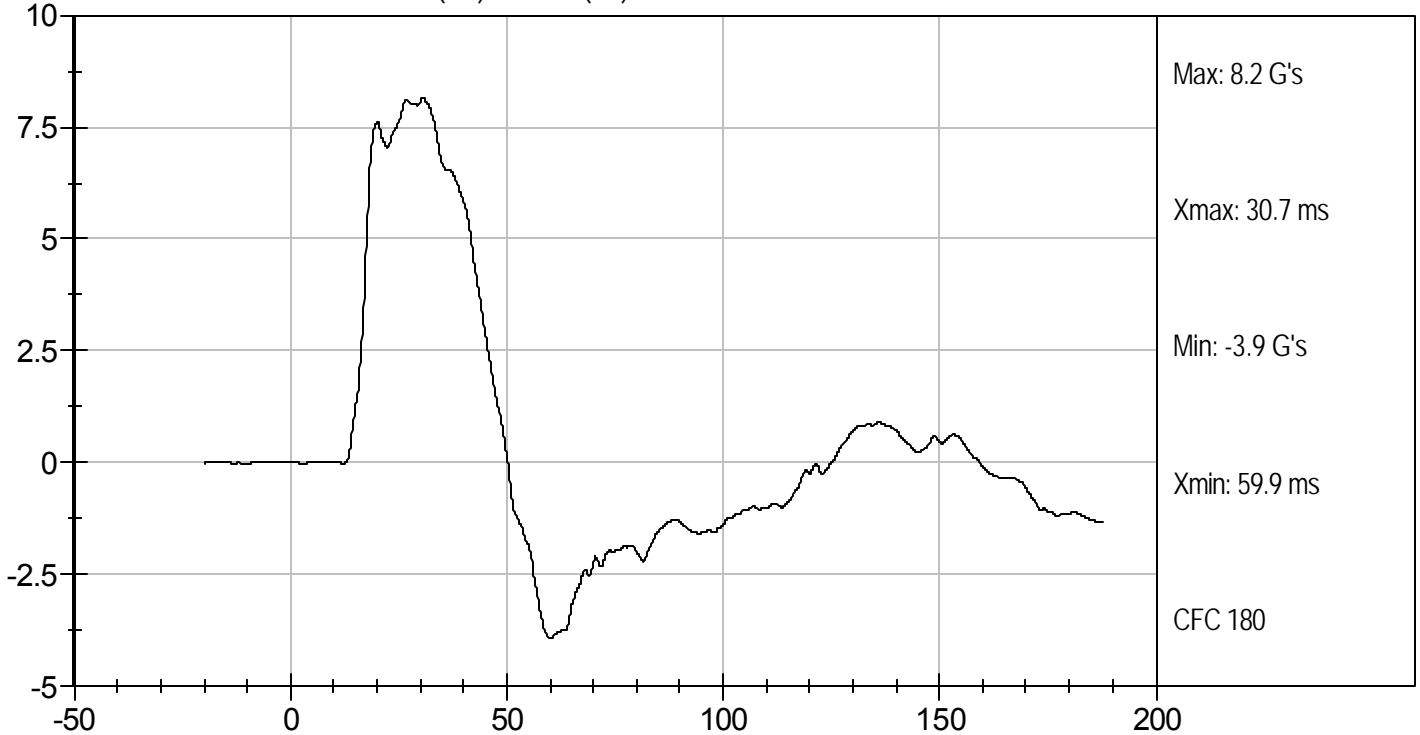
Test Desc: Thorax Without Arm
Component ID: D113395

Test Date: 10/7/11
Velocity: 14.25 ft/s, 4.34 m/s

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



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



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

ATD Serial No: 306

Test I.D: D113396

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.5	Pass
Humidity	%	10 to 70	43	Pass
Impact Velocity	m/s	4.20 to 4.40	4.30	Pass
Peak Impactor Acceleration	G's	12 to 16	14	Pass
Upper Rib Displacement	mm	36 to 47	41	Pass
Lower Rib Displacement	mm	33 to 44	41	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	10	Pass
Overall Test Results				Pass

Jessica Gall
Laboratory Technician

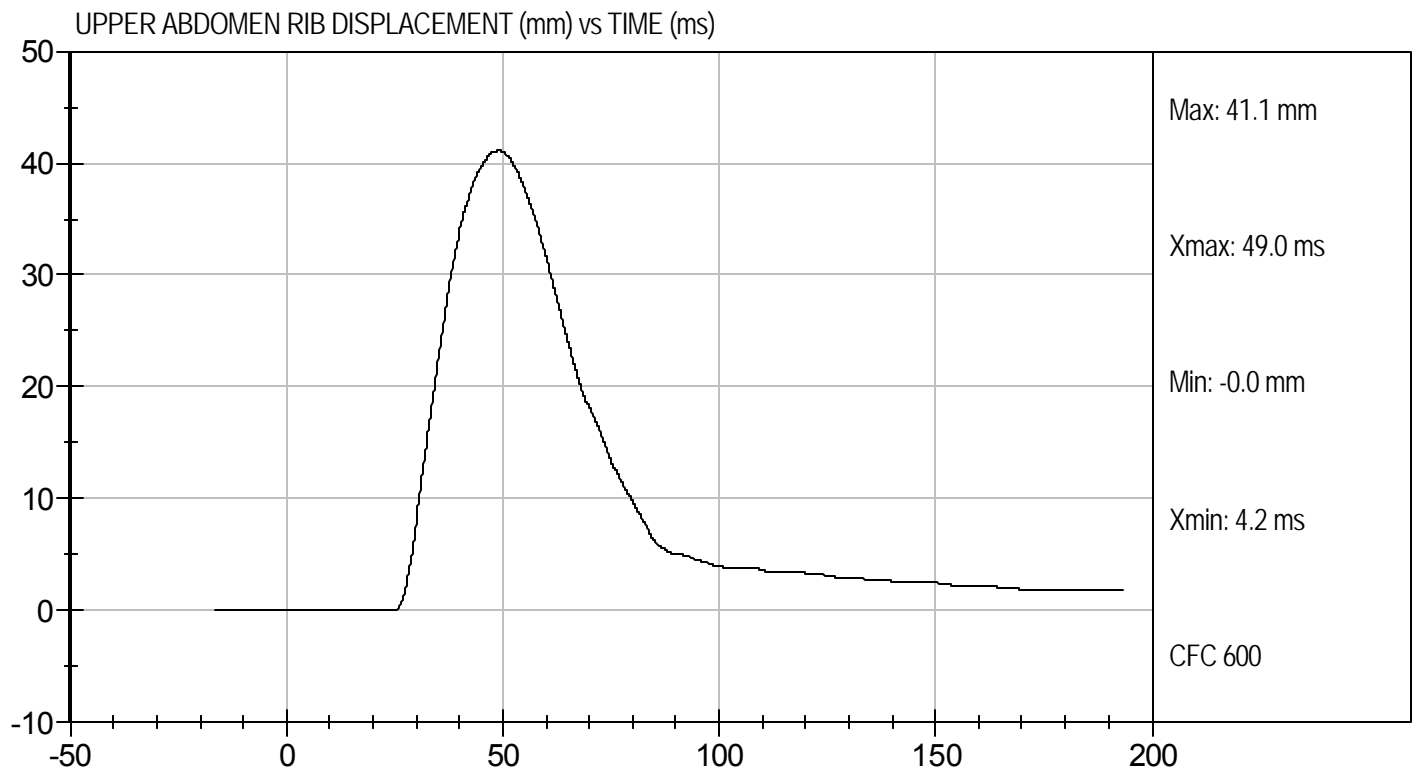
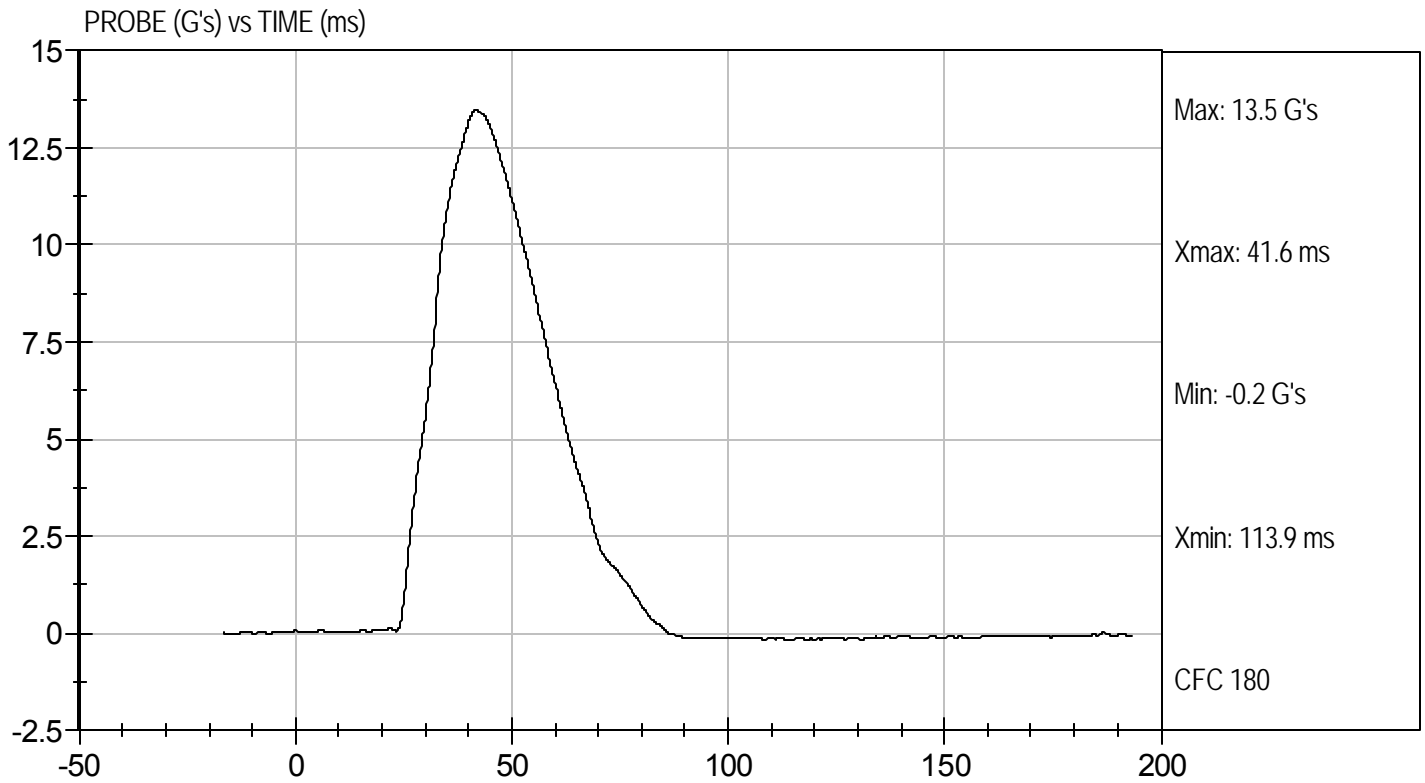
10/7/11
Test Date

David Winkelbauer
Approved By



Test Desc: Abdomen Impact
Component ID: D113396

Test Date: 10/7/11
Velocity: 14.12 ft/s, 4.30 m/s

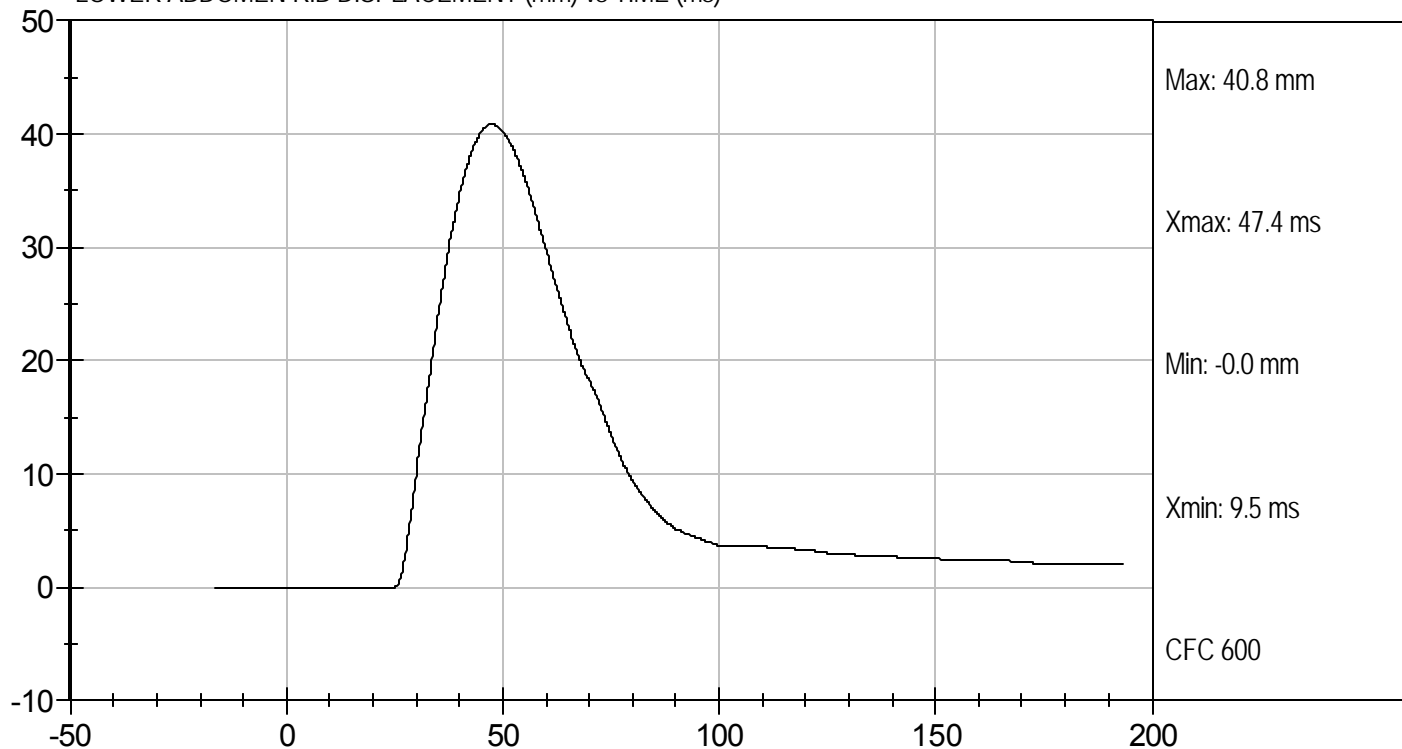




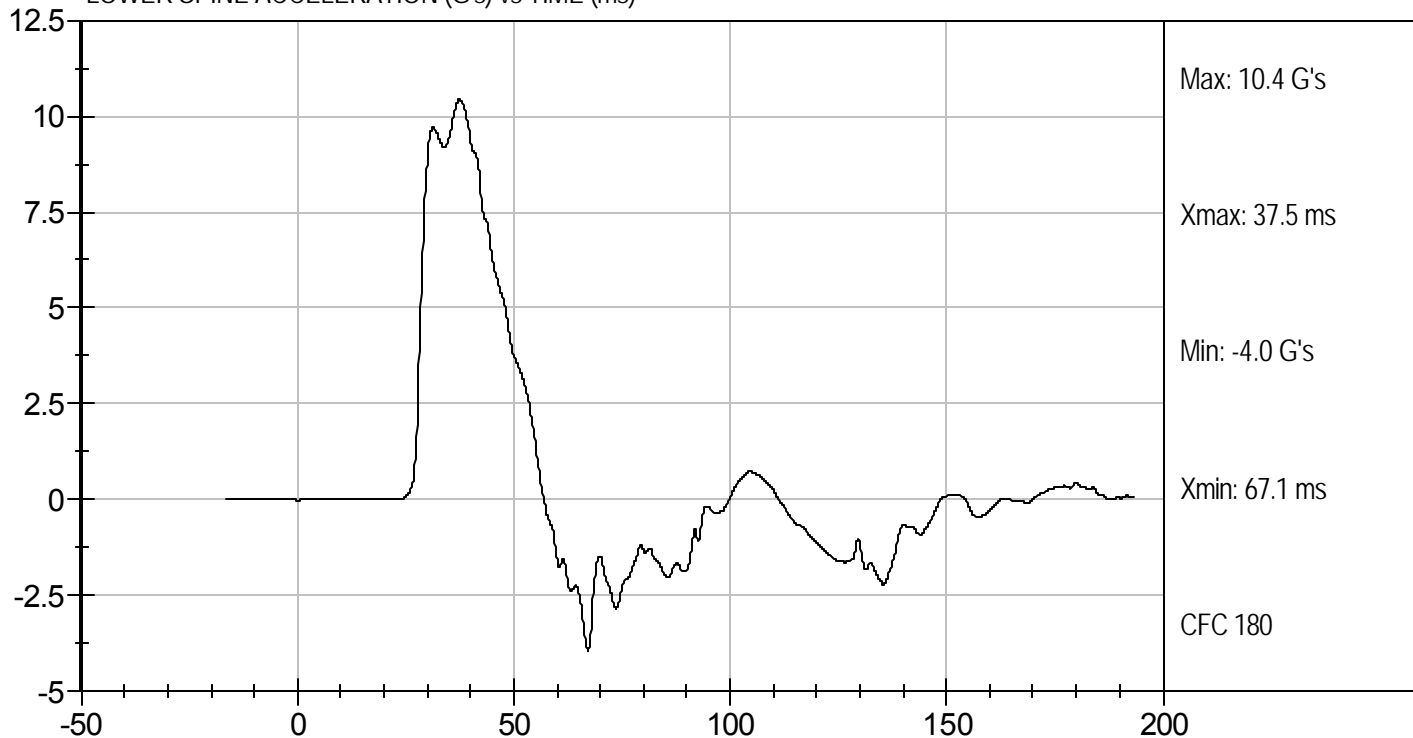
Test Desc: Abdomen Impact
Component ID: D113396

Test Date: 10/7/11
Velocity: 14.12 ft/s, 4.30 m/s

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



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



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

ATD Serial No: 306

Test I.D: D113397

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.6	Pass
Humidity	%	10 to 70	45	Pass
Impact Velocity	m/s	6.60 to 6.80	6.74	Pass
Peak Impactor Acceleration	G's	38 to 47	41	Pass
Pelvis Y Acceleration after 6 ms	G's	34 to 42	40	Pass
Peak Acetabulum Force	N	3600 to 4300	3727	Pass
Overall Test Results				Pass

Jessica Gall
Laboratory Technician

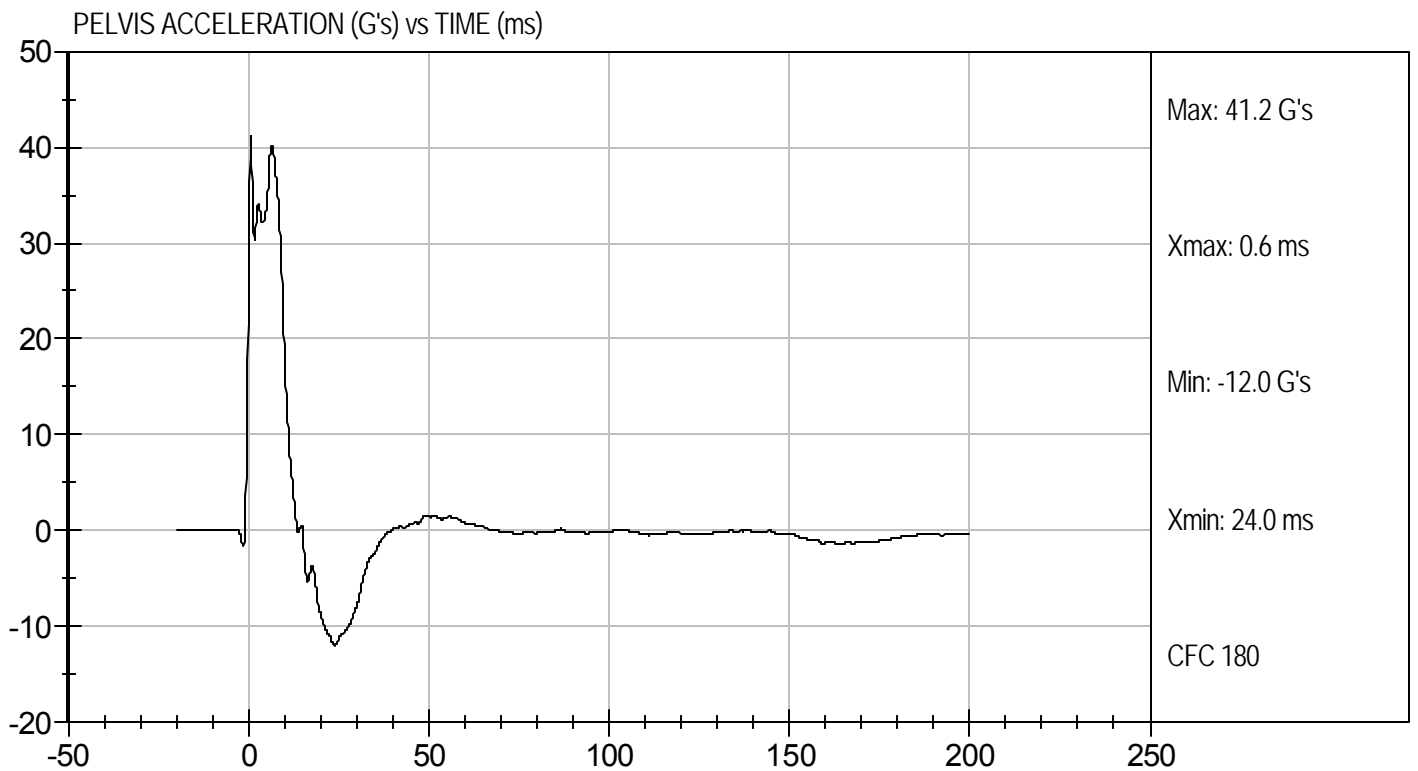
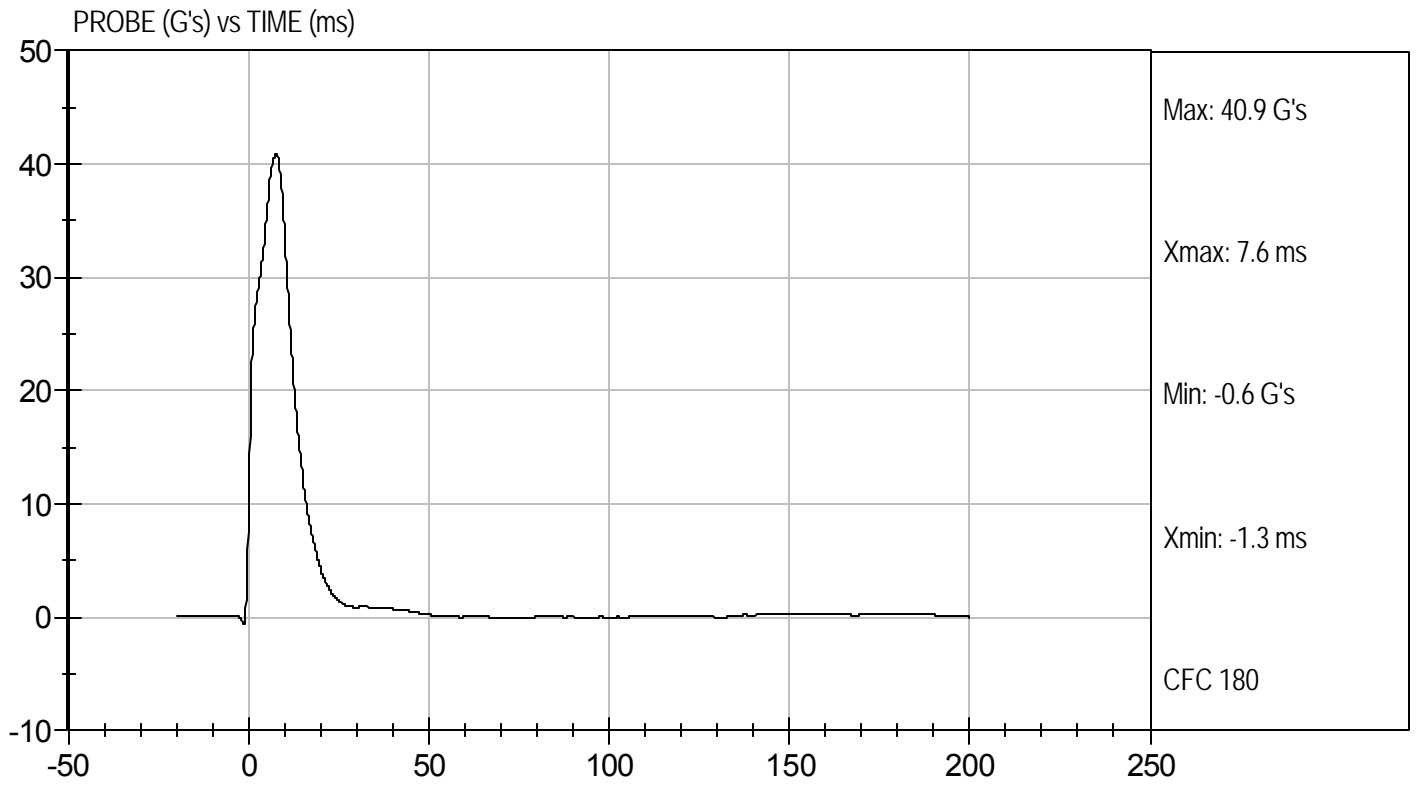
10/7/11
Test Date

David Winkelbauer
Approved By



Test Desc: Pelvis Impact
Component ID: D113397

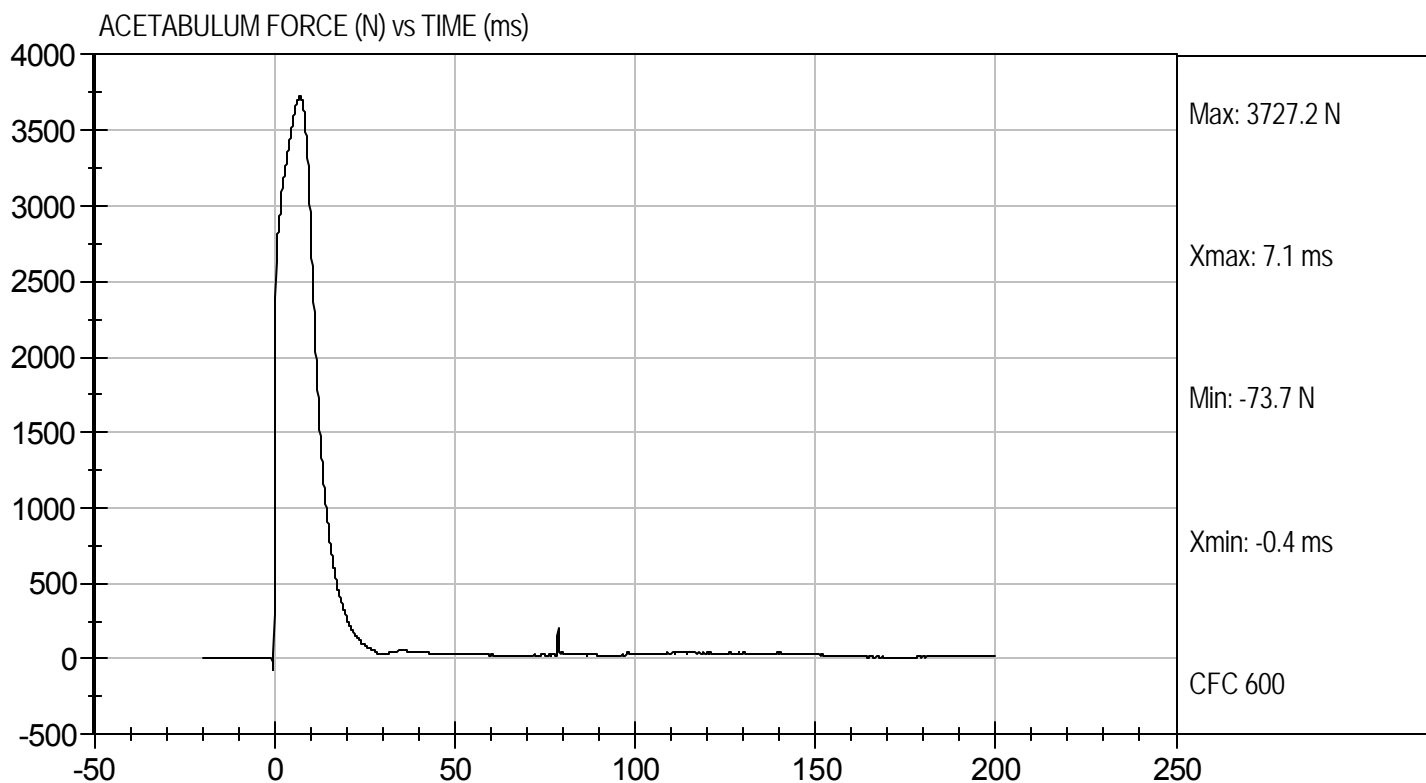
Test Date: 10/7/11
Velocity: 22.11 ft/s, 6.74 m/s





Test Desc: Pelvis Impact
Component ID: D113397

Test Date: 10/7/11
Velocity: 22.11 ft/s, 6.74 m/s



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

ATD Serial No: 306

Test I.D: D113398

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.7	Pass
Humidity	%	10 to 70	45	Pass
Impact Velocity	m/s	4.20 to 4.40	4.30	Pass
Peak Impactor Acceleration	G's	36 to 45	38	Pass
Pelvis Y Acceleration	G's	28 to 39	29	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	4707	Pass
Overall Test Results				Pass

Jessica Hall
 Laboratory Technician

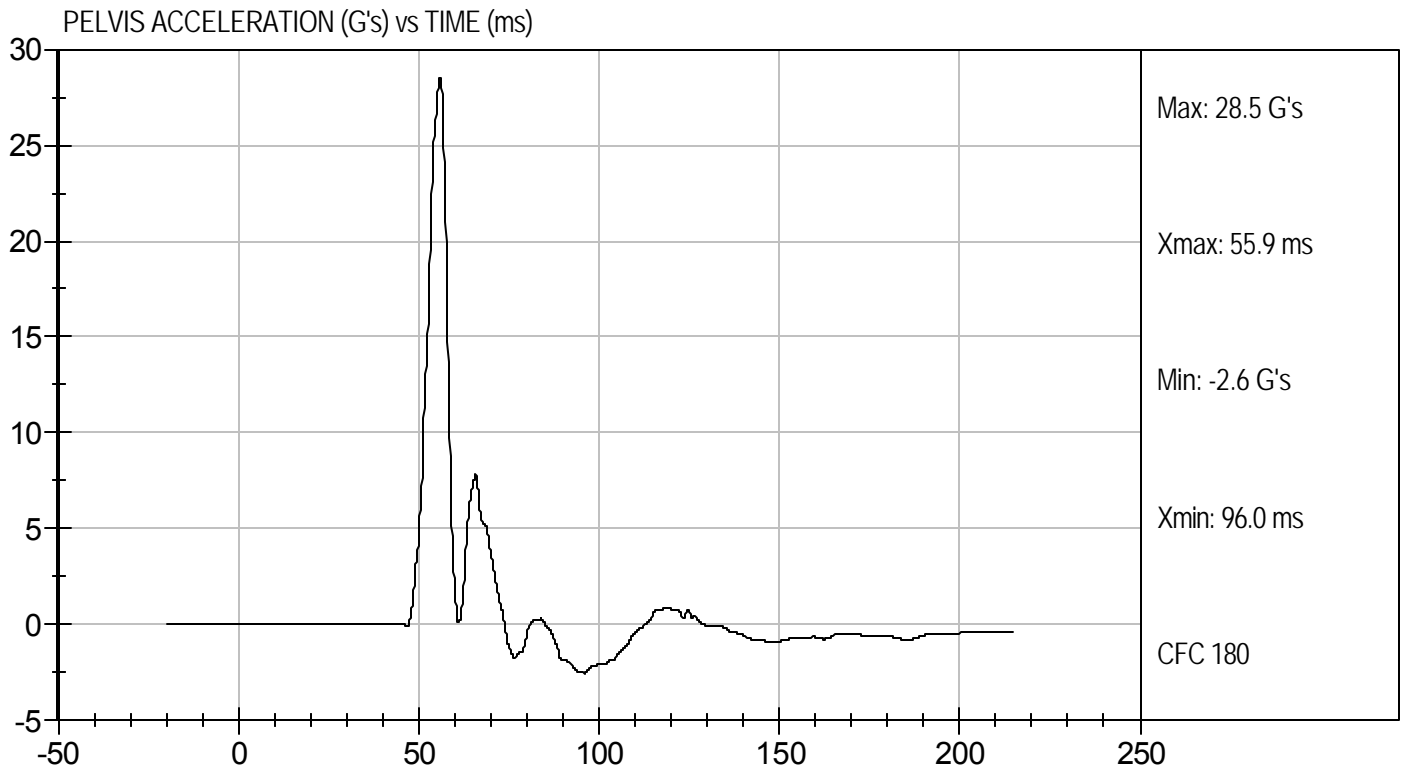
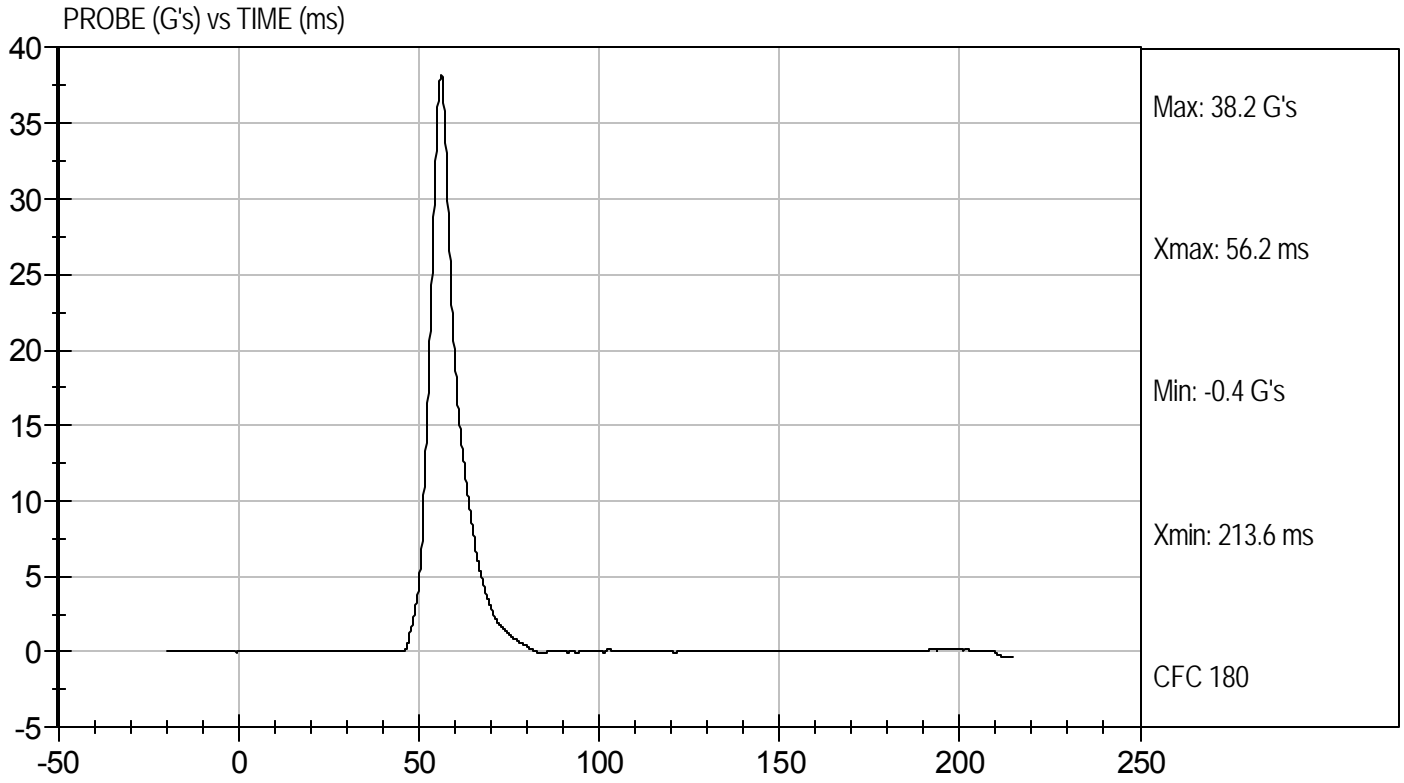
10/7/11
 Test Date

David Winkelbauer
 Approved By



Test Desc: Iliac Impact
Component ID: D113398

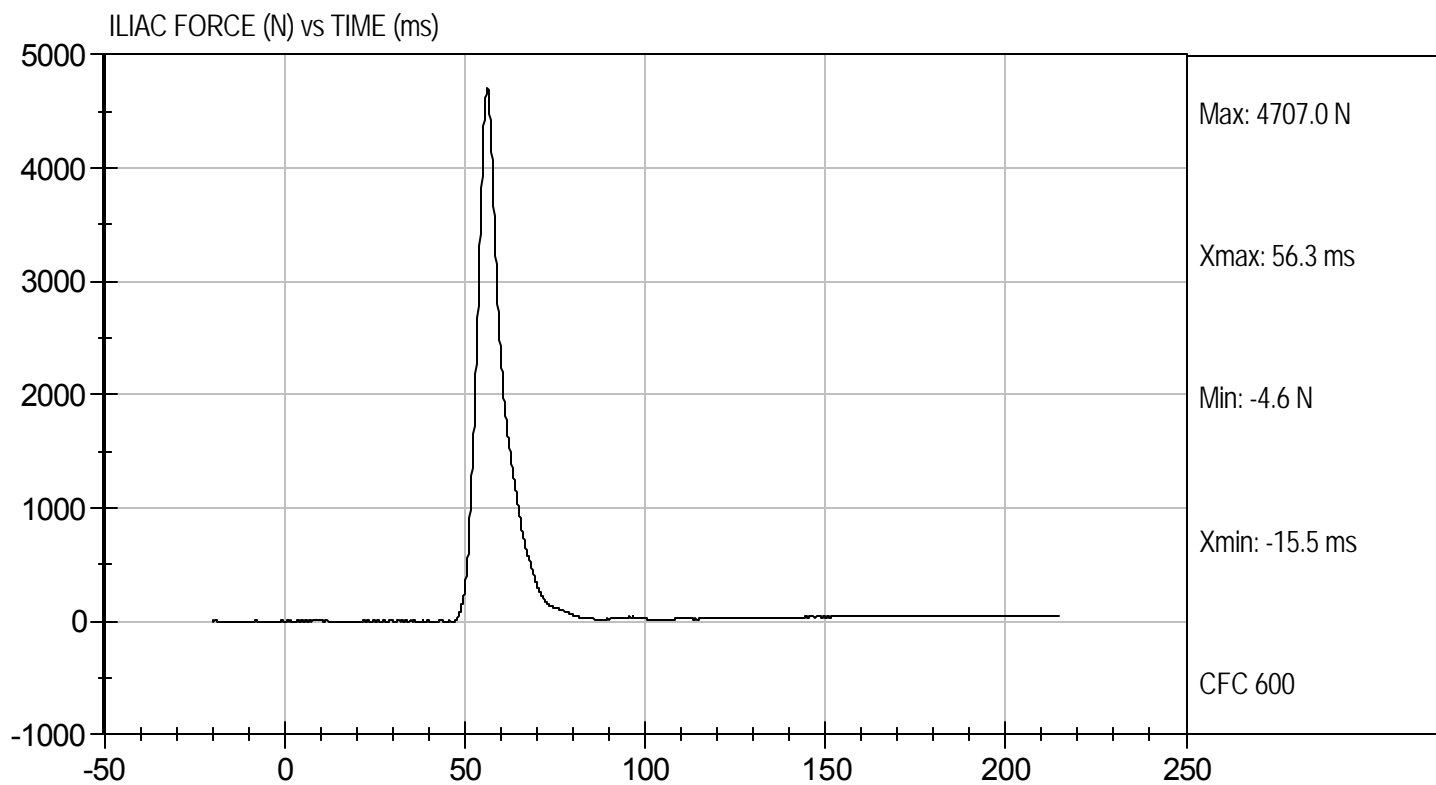
Test Date: 10/7/11
Velocity: 14.12 ft/s, 4.30 m/s





Test Desc: Iliac Impact
Component ID: D113398

Test Date: 10/7/11
Velocity: 14.12 ft/s, 4.30 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	P63414	Endevco	05/03/11
		Y	P63490	Endevco	05/03/11
		Z	P63491	Endevco	05/03/11
Head Accelerometers		Xr	P63492	Endevco	05/03/11
		Yr	P63494	Endevco	05/03/11
		Zr	P63498	Endevco	05/03/11
Thorax Rib Displacement Potentiometers	Upper	Y	G176	Honeywell	06/10/11
	Middle	Y	G169	Honeywell	06/10/11
	Lower	Y	G164	Honeywell	06/10/11
Abdomen Load Cells	Forward	Y	ABG1532	Denton	01/06/11
	Middle	Y	ABG1534	Denton	01/06/11
	Rear	Y	ABG1535	Denton	01/06/11
Lower Spine Accelerometers (T12)		X	P73742	Endevco	10/04/11
		Y	P73743	Endevco	10/04/11
		Z	P73749	Endevco	10/04/11
Pubic Symphysis Load Cell		Y	PG461	Denton	01/06/11

Table 2 – Dummy Instrumentation (SID-IIs)

				SID-IIs S/N 306		
				Serial Number	Manufacturer	Calibration Date
Head Accelerometers			X	P67884	Endevco	06/08/11
			Y	P67886	Endevco	06/08/11
			Z	P67887	Endevco	06/08/11
Head Accelerometers			X	P67888	Endevco	06/08/11
			Y	P67889	Endevco	06/08/11
			Z	P67890	Endevco	06/08/11
Displacement Potentiometers	Thoracic Rib	Upper	Y	G1187	FTSS	06/09/11
		Middle	Y	G1261	FTSS	06/09/11
		Lower	Y	G1270	FTSS	06/09/11
	Abdominal Rib	Upper	Y	G1287	FTSS	06/09/11
		Lower	Y	G1304	FTSS	06/09/11
Lower Spine Accelerometers (T12)			X	P67893	Endevco	06/08/11
			Y	P67894	Endevco	06/08/11
			Z	P67895	Endevco	06/08/11
Acetabulum Load Cell			Y	ACG111	FTSS	05/20/11
Iliac Wing Load Cell			Y	IWG226	FTSS	05/20/11
Pelvis Plug (struck side)				37160	FTSS	10/08/10
Pelvis Plug (non-struck side)				37162	FTSS	10/08/10

Table 3 – Vehicle Instrumentation

		Serial Number	Manufacturer	Calibration Date
Vehicle Center of Gravity	X	P59315	Endevco	04/28/11
Vehicle Center of Gravity	Y	P59316	Endevco	04/28/11
Vehicle Center of Gravity	Z	P59317	Endevco	04/28/11
Right Sill at Front Seat	X	P63283	Endevco	08/22/11
Right Sill at Front Seat	Y	P59376	Endevco	04/27/11
Right Sill at Front Seat	Z	P63284	Endevco	08/22/11
Right Sill at Rear Seat	X	P59260	Endevco	09/13/11
Right Sill at Rear Seat	Y	P59258	Endevco	09/13/11
Right Sill at Rear Seat	Z	P59259	Endevco	09/13/11
Left Sill at Front Door	Y	P59247	Endevco	05/20/11
Left Sill at Rear Door	Y	P49475	Endevco	07/08/11
Left A-Post Lower	Y	P52209	Endevco	08/22/11
Left A-Post Middle	Y	P59251	Endevco	06/10/11
Left B-Post Lower	Y	P52215	Endevco	06/10/11
Left B-Post Middle	Y	P59352	Endevco	07/07/11
Front Seat Track	Y	P63206	Endevco	04/04/11
Rear Seat Track or Structure	Y	P63548	Endevco	07/14/11
Right Rear Occ. Compartment	Y	P50050	Endevco	06/10/11
Engine Block	X	P63255	Endevco	09/13/11
Engine Block	Y	P63254	Endevco	09/13/11
Rear Floorpan Above Axle	X	P63265	Endevco	09/13/11
Rear Floorpan Above Axle	Y	P63267	Endevco	09/13/11
Rear Floorpan Above Axle	Z	P63266	Endevco	09/13/11

Table 4 – MDB Instrumentation

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