

REPORT NUMBER: SINCAP-MGA-2011-022

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

**CAMI AUTOMOTIVE INC.
2011 Chevrolet Equinox 1LT FWD
NHTSA No.: MB0104**

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



Test Date: September 17, 2010


Final Report Date: December 13, 2010

FINAL REPORT

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

This final test report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, in response to Contract Number DTNH22-09-D-00124.

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Approval Date: December 13, 2010

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: _____

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

Date: _____

Technical Report Documentation Page

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15. Supplementary Notes																																															
16. Abstract A 55/28 km/h 90° Moving Deformable Barrier NCAP Side Impact Test was conducted on the subject 2011 Chevrolet Equinox 1LT FWD 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 September 17, 2010. 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 262 mm at level 3. The test vehicle's performance was as follows: <table border="1" style="margin: 10px auto; border-collapse: collapse; text-align: center;"> <thead> <tr> <th colspan="4" style="text-align: left;">Driver ATD (ES-2re)</th> </tr> <tr> <th style="text-align: left;">Measurement Description</th> <th>Units</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td style="text-align: left;">Head Injury Criteria (HIC₃₆)</td> <td>N/A</td> <td>1000</td> <td>79</td> </tr> <tr> <td style="text-align: left;">Maximum Thorax Rib Deflection</td> <td>mm</td> <td>44</td> <td>35</td> </tr> <tr> <td style="text-align: left;">Combined Abdominal Force</td> <td>N</td> <td>2500</td> <td>801</td> </tr> <tr> <td style="text-align: left;">Pubic Symphysis Force</td> <td>N</td> <td>6000</td> <td>2431</td> </tr> </tbody> </table> <table border="1" style="margin: 10px auto; border-collapse: collapse; text-align: center;"> <thead> <tr> <th colspan="4" style="text-align: left;">Passenger ATD (SID-IIs)</th> </tr> <tr> <th style="text-align: left;">Measurement Description</th> <th>Units</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td style="text-align: left;">Head Injury Criteria (HIC₃₆)</td> <td>N/A</td> <td>1000</td> <td>256</td> </tr> <tr> <td style="text-align: left;">Lower Spine (T12) Resultant Acceleration</td> <td>G</td> <td>82</td> <td>48</td> </tr> <tr> <td style="text-align: left;">Total Pelvic Force (sum of acetabular and iliac forces)</td> <td>N</td> <td>5525</td> <td>2229</td> </tr> </tbody> </table>				Driver ATD (ES-2re)				Measurement Description	Units	Threshold	Result	Head Injury Criteria (HIC ₃₆)	N/A	1000	79	Maximum Thorax Rib Deflection	mm	44	35	Combined Abdominal Force	N	2500	801	Pubic Symphysis Force	N	6000	2431	Passenger ATD (SID-IIs)				Measurement Description	Units	Threshold	Result	Head Injury Criteria (HIC ₃₆)	N/A	1000	256	Lower Spine (T12) Resultant Acceleration	G	82	48	Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2229
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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 Adm. Technical Reference Division 1200 New Jersey Ave, SE Washington, D.C. 20590																																													
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SECTION 1
PURPOSE AND SUMMARY OF TEST

PURPOSE

This moving deformable barrier side impact test is part of the MY 2011 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 2011 Chevrolet Equinox 1LT FWD. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Side NCAP Laboratory Test Procedure dated January 2010.

SUMMARY

A 2011 Chevrolet Equinox 1LT FWD 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 September 17, 2010. 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 January 2010. 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)
- Head CG Triaxial Accelerometers
- Thorax Rib 1 to Rib 3 Displacement Potentiometers
- Abdomen Forward, Middle, and Rear Load Cells
- Lower Spine Triaxial Accelerometers
- Pubic Load Cell

- PASSENGER ATD (SID-IIs)
- Head CG Triaxial Accelerometers
- Thorax Upper, Middle, and Lower Rib Displacement Potentiometers
- Abdomen Upper and Lower Rib Displacement Potentiometers
- Lower Spine Triaxial Accelerometers
- Iliac Load Cell
- Acetabulum Load Cell

DUMMY INJURY VALUES

Measurement Description	Driver ATD (ES-2re)		
	Units	Threshold	Result
Head Injury Criteria (HIC ₃₆)	N/A	1000	79
Maximum Thorax Rib Deflection	mm	44	35
Combined Abdominal Force	N	2500	801
Pubic Symphysis Force	N	6000	2431

Measurement Description	Passenger ATD (SID-IIs)		
	Units	Threshold	Result
Head Injury Criteria (HIC ₃₆)	N/A	1000	256
Lower Spine (T12) Resultant Acceleration	G	82	48
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2229

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Left Front (Driver) P1		Left Rear (Passenger) P4	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	No	No	
Knee Airbag	No		No	
Side Curtain Airbag	Yes	Yes	Yes	Yes
Side Torso Airbag	Yes	Yes	No	
Side Pelvis Airbag	Yes	Yes	No	
Seat Belt Pretensioner	Yes	Yes	No	
Seat Belt Load Limiter	Yes		No	

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

GENERAL COMMENTS

There was no valid data collected for:
 Right Front Sill Y
 Driver Seat Track Y after 10 msec.
 Driver Shoulder Contact

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

SECTION 2
OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS

DATA SHEET NO. 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2011 Chevrolet Equinox 1LT FWD
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MB0104
 Test Date: 9/17/2010

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	MB0104	Anti-Lock Brakes	Yes
Model Year	2011	All Wheel Drive	No
Make	Chevrolet	Power Steering	Yes
Model	Equinox	Driver Front Airbag	Yes
Body Style	MPV	Driver Curtain Airbag	Yes
VIN	2CNALDEC0B6213512	Driver Head/Torso Airbag	No
Body Color	Cardinal Red Metallic	Driver Torso Airbag	Yes
Delivery Date	9/08/2010	Driver Torso/Pelvis Airbag	No
Odometer (mi)	107	Driver Pelvis Airbag	Yes
Odometer (km)	172	Driver Knee Airbag	No
Dealer	Burtness Chevrolet	Rear Pass. Front Airbag	No
Transmission	Automatic	Rear Pass. Curtain Airbag	Yes
Final Drive	Front	Rear Pass. Head/Torso Airbag	No
Type/No. Cylinders	4	Rear Pass. Torso Airbag	No
Engine Displacement (L)	2.4	Rear Pass. Torso/Pelvis Airbag	No
Engine Placement	Lateral	Rear Pass. Pelvis Airbag	No
Roof Rack	Yes	Rear Pass. Knee Airbag	No
Sunroof/T-Top	No	Pretensioners	Yes
Tinted Glass	Yes	Load Limiters	Yes
Traction Control	Yes	Automatic Door Locks	Yes
Power Brakes	Yes	Bucket Seats	Yes
Front Disc	Yes	Tilt Steering	Yes
Rear Disc	Yes	Power Seats	Yes
Does owner's manual provide instruction to turn off automatic door locks?			No

DATA FROM CERTIFICATION LABEL

Manufactured By	CAMI Automotive Inc.	GVWR (kg)	2250
Date of Manufacture	08/10	GAWR Front (kg)	1175
		GAWR Rear (kg)	1240

VEHICLE SEATING AND WEIGHT CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity (DSC)	2	3		5	
Capacity Weight (VCW) (kg)				525	(A)
DSC x 68.04 (kg)				340	(B)
Cargo Weight (RCLW) (kg)				185	(A-B)

VEHICLE SEAT TYPE

Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	60/40 Split	Contoured	Fixed	Adjustable	
						Manual	Power
Front Seat	X						X
Rear or Second Row			X		X		
Third Row Seat							

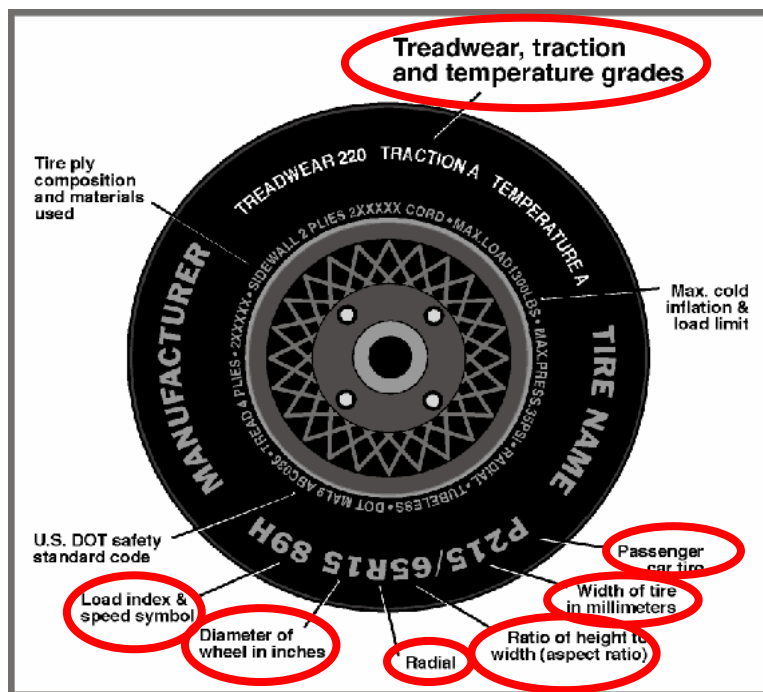
DATA SHEET NO. 1 (continued)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2011 Chevrolet Equinox 1LT FWD
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MB0104
 Test Date: 9/17/2010

VEHICLE TIRE INFORMATION



DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	240	240
Recommended Tire Size	P225/65R17	P225/65R17
Tire Size on Vehicle	P225/65R17	P225/65R17
Tire Manufacturer	Michelin	Michelin
Tire Model	Latitude Tour	Latitude Tour
Treadwear	720	720
Traction	A	A
Temperature Grades	B	B
Tire Plies Sidewall	1	1
Tire Plies Body	4	4
Load Index & Speed Symbol	100T	100T
Tire Material	Rubber	Rubber
DOT Safety Code Right	M33T 006X	M33T 006X
DOT Safety Code Left	M33T 006X	M33T 006X

DATA SHEET NO. 1 (continued)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2011 Chevrolet Equinox 1LT FWD
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MB0104
 Test Date: 9/17/2010

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	489.0	379.6		514.4	499.9		529.3	499.0	
Right	kg	480.4	366.1		482.6	476.7		484.9	467.2	
Ratio	%	56.5	53.5		50.5	49.5		51.2	48.8	
Totals	kg	969.4	745.7	1715.1	997.0	976.6	1973.6	1014.2	966.2	1980.4

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1715.1	(A)
Sum of Actual Weight of 2 P572 ATDs Used	kg	129.3	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	136	(C)
Calculated Target Vehicle Test Weight (TVT _W)	kg	1980.4	(A+B+C)

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
Fully Loaded	mm	806	818	807	819	
As Tested (Fully Loaded \pm 10mm at each wheel well)	mm	810	821	808	812	1414

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	2858
Total Vehicle Length at Left Side	mm	3660
Total Vehicle Length at Centerline	mm	4792
Total Vehicle Length at Right Side	mm	3660
Weight of Ballast in Cargo Area	kg	117.5
Weight of Vehicle Components Removed	kg	10.0
Amount of Stoddard Solvent in Fuel Tank	L	66.2

Vehicle components removed to meet target vehicle test weight: Trunk tools and carpet, right tail light.

TEST VEHICLE VERTICAL IMPACT POINT DATA

Measurement Description	Units	Value
Target Impact Point Aft of Front Axle	mm	489
Actual Impact Point Aft of Front Axle	mm	494

DATA SHEET NO. 2

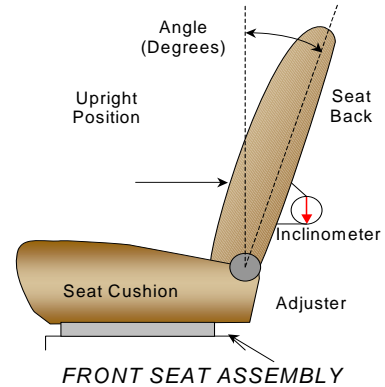
SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

Test Vehicle: 2011 Chevrolet Equinox 1LT FWD
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MB0104
 Test Date: 9/17/2010

NOMINAL DESIGN RIDING POSITION

The driver and passenger seat backs are positioned to the manufacturer's designated angle. The procedure is as follows:
 For the driver, set seat back at 2.8° measured at the outboard headrest post. For the left rear passenger, set seat back at 18° measured at rear outboard seat back panel.



SEAT BACK ANGLES

	Degrees
Driver with Seated Dummy	2.8° at headrest post
Passenger with Seated Dummy	17.5° (forwardmost locking detent)

SEAT FORE/AFT POSITIONS

	Total Fore/Aft Travel	Placed in Position #
Driver Seat	244 mm	122 mm (forwardmost as 0)
Rear Seat	21 detents	20 th detent (forwardmost as 0)

Describe method: For the driver seat track, using only the controls that primarily move the seat in the fore-aft direction, the seat was moved to the full rear position and marked. The seat was then moved to the foremost position and marked. The seat was then placed in the mid point of travel and marked. For the left rear passenger seat track, using only the controls that primarily move the seat in the fore-aft direction, the seat was moved to the full rear position and marked. The seat was then moved to the foremost position and marked.

SEAT BELT UPPER ANCHORAGES

	Total # of Positions	Placed in Position #
Driver Seat	5 detents	0 (uppermost as 0)
Rear Seat	Fixed	Fixed

Describe method: The driver seat anchorage was set in the uppermost position. The left rear passenger seat anchorage was fixed.

DATA SHEET NO. 2 (CONTINUED)

SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

Test Vehicle: 2011 Chevrolet Equinox 1LT FWD
 Test Program: NCAP Side MDB Impact Test

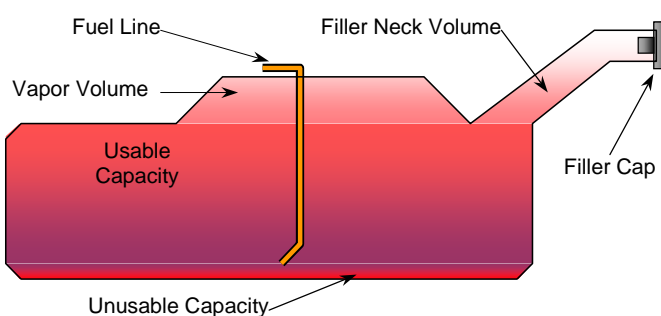
NHTSA No. MB0104
 Test Date: 9/17/2010

FUEL TANK CAPACITY DATA

	Liters
Usable Capacity of "Standard Tank"	71.1
Usable Capacity of "Optional" Tank	
Usable Capacity Used for FMVSS 301	65.4 to 66.8
Actual Amount of Solvent used	66.2

Describe the fuel pump type, its behavior, and the location of the fuel filler pipe.

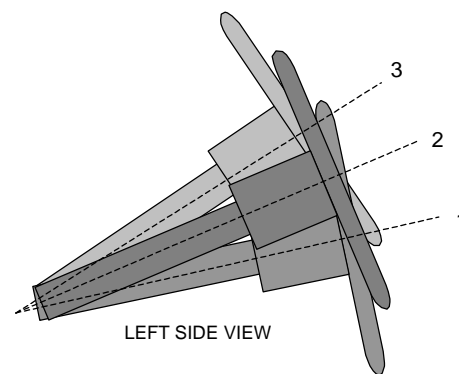
The test vehicle is equipped with an electric fuel pump. The fuel pump is activated during "crank/run" for 2 seconds. If "crank/run" goes off before the 2 seconds is up, the fuel pump will turn off. At the end of 2 seconds, the fuel pump will be "on" whenever the engine is running. The fuel filler pipe is on the right side.



VEHICLE FUEL TANK ASSEMBLY

STEERING COLUMN ADJUSTMENT

Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes when moved through its full range of motion. An aluminum plate is placed across the rim of the steering wheel, an inclinometer is placed on the plate and the angle is measured.



LEFT SIDE VIEW

STEERING COLUMN ASSEMBLY

STEERING COLUMN POSITION

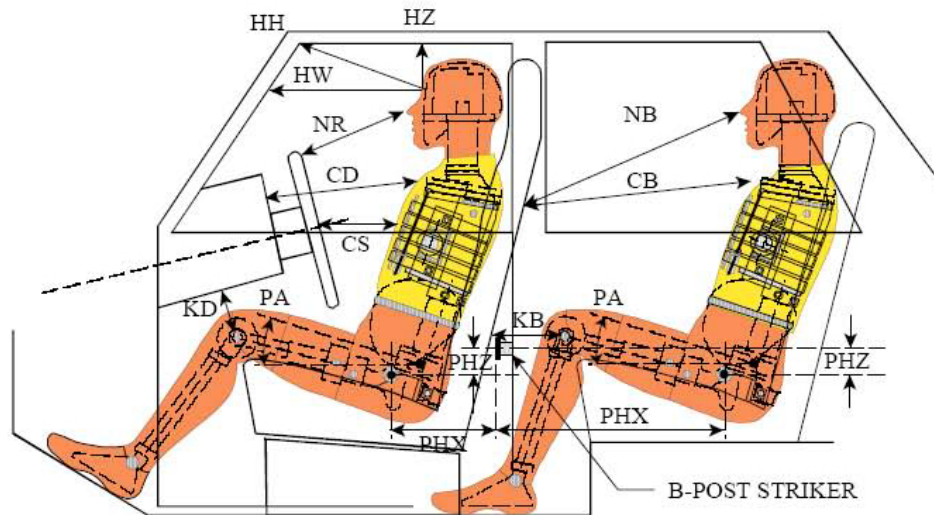
	Degrees	Fore/Aft Position (mm)
Lowermost - Position 1	68.4	230
Geometric Center – Position 2	66.8	205
Uppermost – Position 3	65.2	180
Telescoping Steering Wheel Travel		50
Test Position	66.8	205

DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2011 Chevrolet Equinox 1LT FWD
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MB0104
 Test Date: 9/17/2010



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

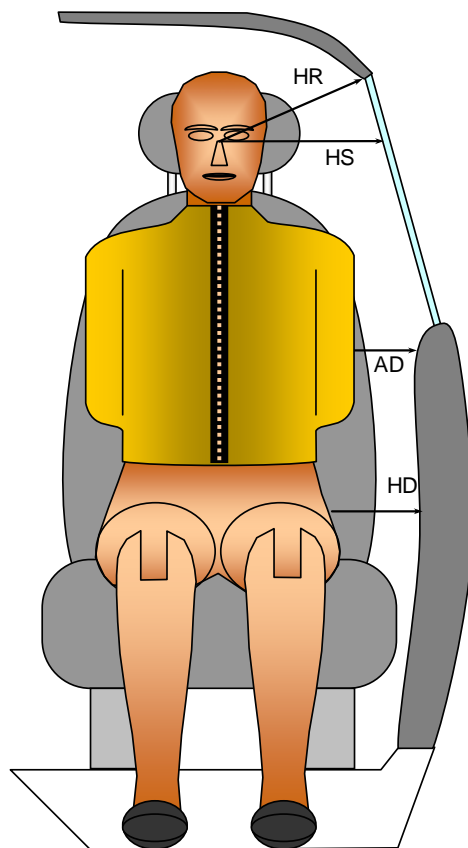
DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Pass. Code	Measurement Description	Driver S/N 032		Passenger S/N 306	
			Length (mm)	Angle(°)	Length (mm)	Angle(°)
HH		Head to Header	412	17.3		
HW		Head to Windshield	694	0		
HZ	HZ	Head to Roof	189	90	281	90
NR	NB	Nose to Rim/Seat Back	443	17.0	615	14.4
CD	CB	Chest to Dash/Seat Back	558	9.3	615	9.3
CS		Chest to Steering Wheel	360	5.1		
KDL	KBL	Left Knee to Dash/Seat Back	209	36.4	334	23.5
KDR	KBR	Right Knee to Dash/Seat Back	194	38.2	329	25.2
PA	PA	Pelvic Angle		22.2		19.6
PHX	PHX	H-Point to Striker (X-Axis)	173	0	152	0
PHZ	PHZ	H-Point to Striker (Z-Axis)	88	90	194	90
SA	SA	Seat Back Angle		2.8		17.5

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2011 Chevrolet Equinox 1LT FWD
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NHTSA No. MB0104
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FRONT VIEW OF DUMMY

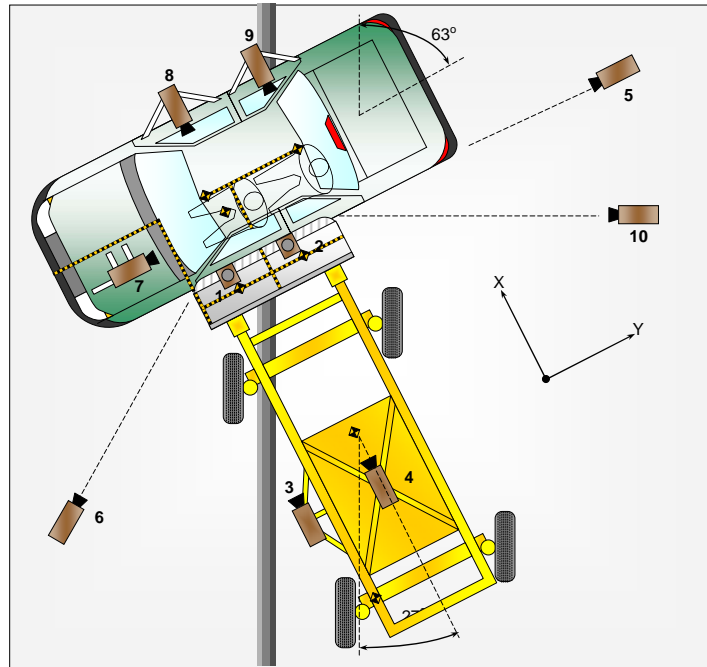
DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

Code	Measurement Description	Units	Driver S/N 032	Passenger S/N 306
HR	Head to Side Header	mm	190	254
HS	Head to Side Window	mm	310	373
AD	Arm to Door	mm	92	152
HD	H-Point to Door	mm	150	221

DATA SHEET NO. 5
CAMERA LOCATIONS AND DATA

Test Vehicle: 2011 Chevrolet Equinox 1LT FWD
Test Program: NCAP Side MDB Impact Test

NHTSA No. MB0104
Test Date: 9/17/2010



CAMERA LOCATIONS AND DATA

No.	Camera View	Coordinates (mm)			Angle	Lens (mm)	Film Speed (fps)
		X*	Y*	Z*			
1	Overhead Overall	-860	0	-5050	86.4	14	1000
2	Overhead Close-up	650	1110	-5050	80.2	50	1000
3	Left Impact Point (MDB)					50	1000
4	Side Overall (MDB)					16	1000
5	Rear	-3290	5230	-1290	4.2	24	1000
6	Left Front	3430	-4290	-1230	6.1	24	1000
7	Driver Front (OB)					12.5	1000
8	Driver Side (OB)					8	1000
9	Passenger Side (OB)					8	1000
10	Real Time Left Rear						30
11	Real Time Inrun						30

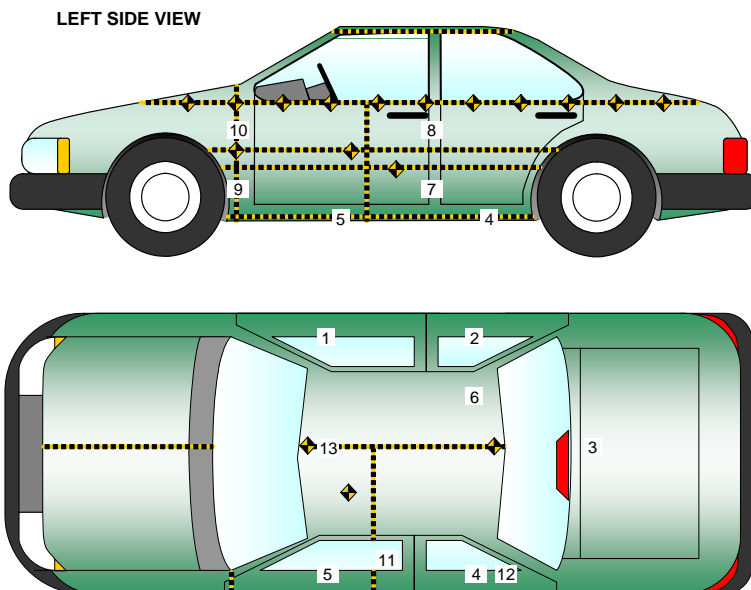
Reference: Impact Point projected to Ground
+X = To Front of MDB, +Y = To Right of MDB, +Z = Down

* All measurements accurate to ± 6 mm

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

Test Vehicle: 2011 Chevrolet Equinox 1LT FWD
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MB0104
 Test Date: 9/17/2010



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

Accelerometer Location				
No.	ID	Coordinates (mm)		
		X	Y	Z
1	Right Sill at Front Seat	2408	720	305
2	Right Sill at Rear Seat	1420	720	305
3	Rear Floorpan Above Axle	1028	0	593
4	Left Sill at Rear Door	1401	-720	305
5	Left Sill at Front Door	2452	-720	290
6	Rt. Rear Occ. Compartment	1825	395	408
7	Left Lower B-Post	2120	-695	690
8	Left Middle B-Post	2120	-689	945
9	Left Lower A-Post	3200	-685	650
10	Left Middle A-Post	3220	-835	875
11	Front Seat Track	1320	-580	454
12	Rear Seat Track or Structure	2075	-420	476
13	Vehicle CG	2400	-90	305

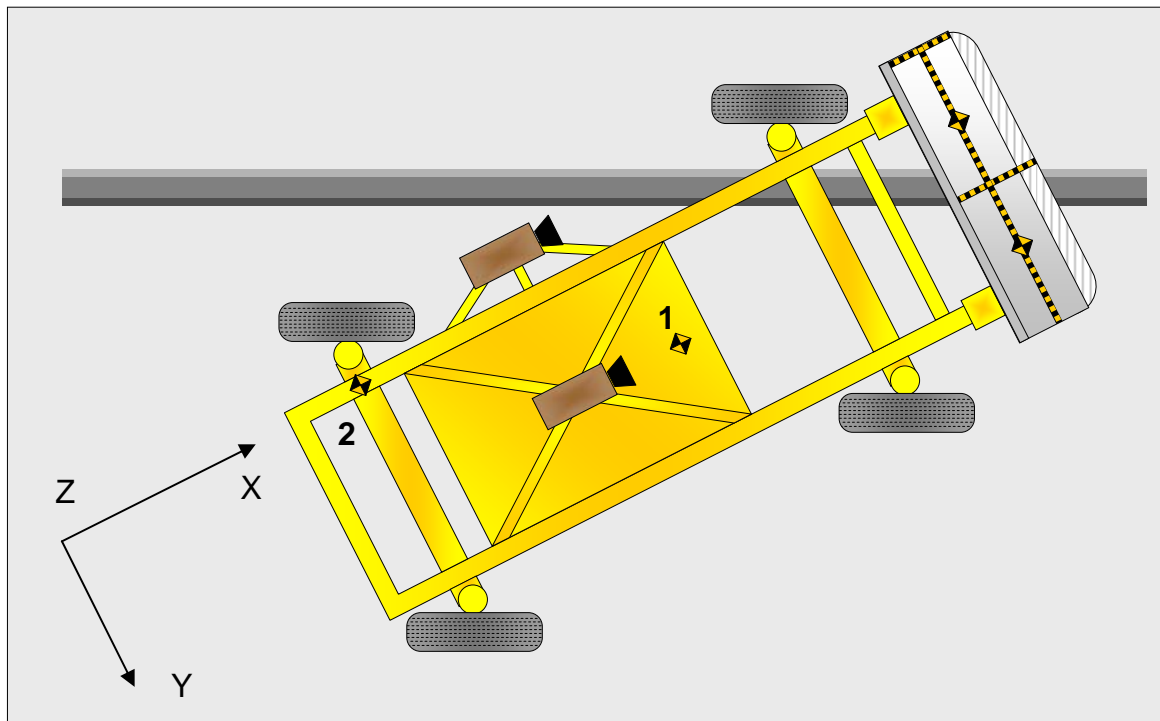
Reference: X – Rear Surface of Vehicle (+ forward)
 Y - Vehicle Centerline (+ to right)
 Z - Ground Plane (+ up)

DATA SHEET NO. 7

MOVING DEFORMABLE BARRIER (MDB) ACCELEROMETER LOCATIONS

Test Vehicle: 2011 Chevrolet Equinox 1LT FWD
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MB0104
 Test Date: 9/17/2010



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

TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2011 Chevrolet Equinox 1LT FWD
Test Program: NCAP Side MDB Impact Test

NHTSA No. MB0104
Test Date: 9/17/2010

MAXIMUM EXTERIOR STATIC CRUSH

Level	Measurement Description	Units	Maximum Crush	Above Ground
1	Sill Top Height	mm	135	400
2	Occupant H-Point	mm	243	650
3	Mid Door	mm	262	772
4	Window Sill	mm	113	1115
5	Window Top	mm	11	1580
	Maximum Penetration	mm	262	

INSTRUMENTATION

Driver Dummy Channels	16
Passenger Dummy Channels	16
Vehicle Structure Accelerometers	21
MDB Accelerometers	5
Total No. of Contact Switches	8
Monitoring Channels	4
Total	70

CAMERA COVERAGE

High-Speed Vehicle Onboard	3
High-Speed Offboard	4
High-Speed MDB Onboard	2
Real-Time Stationary	1
Real-Time Panning	1
Total	11

DATA SHEET NO. 9

MOVING DEFORMABLE BARRIER (MDB) SUMMARY OF RESULTS

Test Vehicle: 2011 Chevrolet Equinox 1LT FWD
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MB0104
 Test Date: 9/17/2010

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 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	62.4
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	89.7

MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE

Row	Vertical Location		From Centerline		Maximum Crush
	Description	Height	Distance	Direction	
A	Center of Bumper	432	800	Right	249
B	Top of Bumper	533	800	Right	141
C	Mid-Level	686	800	Left	113
D	Top of Stack	813	800	Left	158

MDB INSTRUMENTATION AND CAMERAS

Accelerometers	5
Contact Switches	2
High-Speed Cameras	2

DATA SHEET NO. 10

POST-TEST OBSERVATIONS

Test Vehicle: 2011 Chevrolet Equinox 1LT FWD
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MB0104
 Test Date: 9/17/2010

TEST DUMMY INFORMATION AND CONTACT

Description	Driver (ES-2re)	Passenger (SID-IIs)
Dummy Type / Serial No.	ES-2re / 032	SID-IIs / 306
Head Contact	Curtain Airbag, Side Header, Headrest	Curtain Airbag
Upper Torso Contact	Torso Airbag	Door Panel
Lower Torso Contact	Pelvis Airbag	Door Panel
Left Knee Contact	Door Panel	Door Panel
Right Knee Contact	Left Knee	Left Knee

POST TEST DOOR OPENING AND SEAT TRACK INFORMATION

Description	Front	Rear
Left Side Doors	Remained closed and jammed shut	Remained closed and jammed shut
Right Side Doors	Remained closed and operational	Remained closed and operational
Hatch and Other Doors	Remained closed and operational	Remained closed and operational
Seat Movement	0	0
Seat Back Failure	None	None

POST TEST STRUCTURAL OBSERVATIONS

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

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Left Front (Driver) P1		Left Rear (Passenger) P4	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	No	No	
Knee Airbag	No		No	
Side Curtain Airbag	Yes	Yes	Yes	Yes
Side Torso Airbag	Yes	Yes	No	
Side Pelvis Airbag	Yes	Yes	No	
Seat Belt Pretensioner	Yes	Yes	No	
Seat Belt Load Limiter	Yes		No	

MDB LEFT EDGE IMPACT POINT DATA

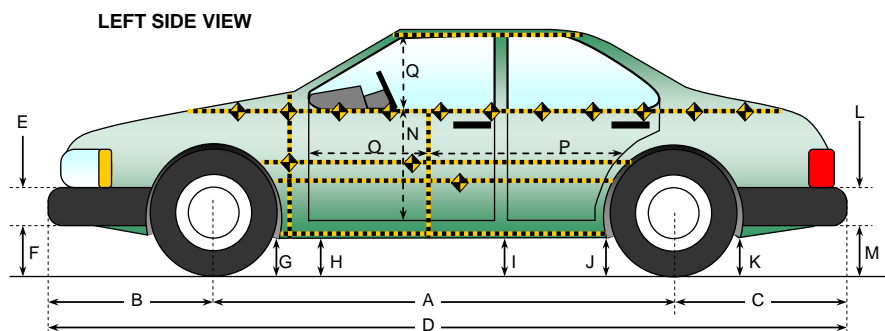
Measured Parameter	Units	Requirement	Value
Horizontal Offset	mm	+/- 50	5 rear
Vertical Offset	mm	+/-20	4 up

DATA SHEET NO. 11

VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2011 Chevrolet Equinox 1LT FWD
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MB0104
 Test Date: 9/17/2010



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

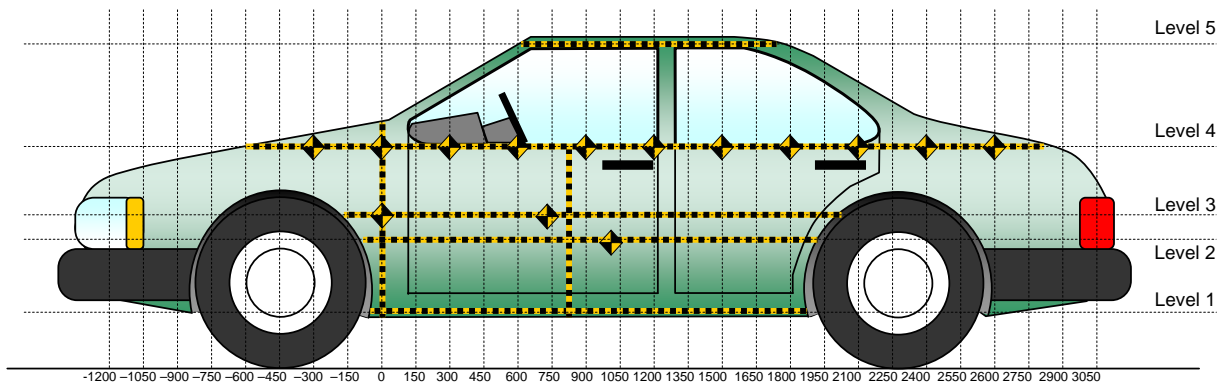
VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2858	2853	5
B	Front Axle to FSOV	952	956	-4
C	Rear Axle to RSOV	980	969	11
D	Total Length at Centerline	4792	4780	12
E	Front Bumper Thickness	145	145	0
F	Front Bumper Bottom to Ground	380	348	32
G	Sill Height at Front Wheel Well	258	215	43
H	Sill Height at Front Door Leading Edge	255	213	42
I	Sill Height at B Pillar	257	223	34
J1	Sill Height at Rear Wheel Well	250	235	15
J2	Pinch Weld Height at Rear Wheel Well	247	237	10
K	Sill Height Aft of Rear Wheel Well	260	249	11
L	Rear Bumper Thickness	117	117	0
M	Rear Bumper Bottom to Ground	292	300	-8
N	Sill Height to Window Bottom Sill	776	690	86
O	Front Door Leading Edge to Impact CL	781	765	16
P	Rear Door Trailing Edge to Impact CL	1366	1309	57
Q	Front Window Opening	455	562	-107
R	Right Side Length	3660	3662	-2
S	Left Side Length	3660	3641	19
T	Vehicle Width at B Post	1793	1587	206

DATA SHEET NO. 12
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2011 Chevrolet Equinox 1LT FWD
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MB0104
 Test Date: 9/17/2010



All Measurements Shown in mm

LEFT SIDE VIEW

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

Level	Measurement Description	Height Above Ground (mm)
1	Sill Top	400
2	Occupant H-Point	650
3	Mid-Door	772
4	Window Sill	1115
5	Window Top	1580

DATA SHEET NO. 12 (CONTINUED)
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2011 Chevrolet Equinox 1LT FWD
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MB0104
 Test Date: 9/17/2010

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-750				377					378					1	
-600				356					360					4	
-450				243					348					105	
-300			177	225				158	338				-19	113	
-150		181	181	216			161	157	329			-20	-24	113	
0	210	191	206	205		238	183	185	317		28	-8	-21	112	
150	237	208	212	298		302	339	333	278		65	131	121	-20	
300	243	206	207	294		334	391	381	284		91	185	174	-10	
450	241	203	204	287		345	376	406	282		104	173	202	-5	
600	241	202	203	283	507	350	397	424	285	513	109	195	221	2	6
750	239	201	202	281	493	353	415	435	292	494	114	214	233	11	1
900	238	201	201	277	490	353	426	436	302	495	115	225	235	25	5
1050	238	200	201	273	489	353	411	404	316	495	115	211	203	43	6
1200	240	201	201	270	487	372	430	448	371	498	132	229	247	101	11
1350	240	201	200	269	487	375	427	462	358	495	135	226	262	89	8
1500	242	202	201	268	487	375	430	462	347	494	133	228	261	79	7
1650	245	203	202	267	487	379	446	445	343	493	134	243	243	76	6
1800	224	201	204	267	487	355	422	433	327	492	131	221	229	60	5
1950		176	186	269	488		285	309	337	493		109	123	68	5
2100			171	270	491			233	287	495			62	17	4
2250			172	273	493			220	310	495			48	37	2
2400				278	501				306	501				28	0
2550				283	503				304	507				21	4
2700				291					304					13	
2850				304					308					4	

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

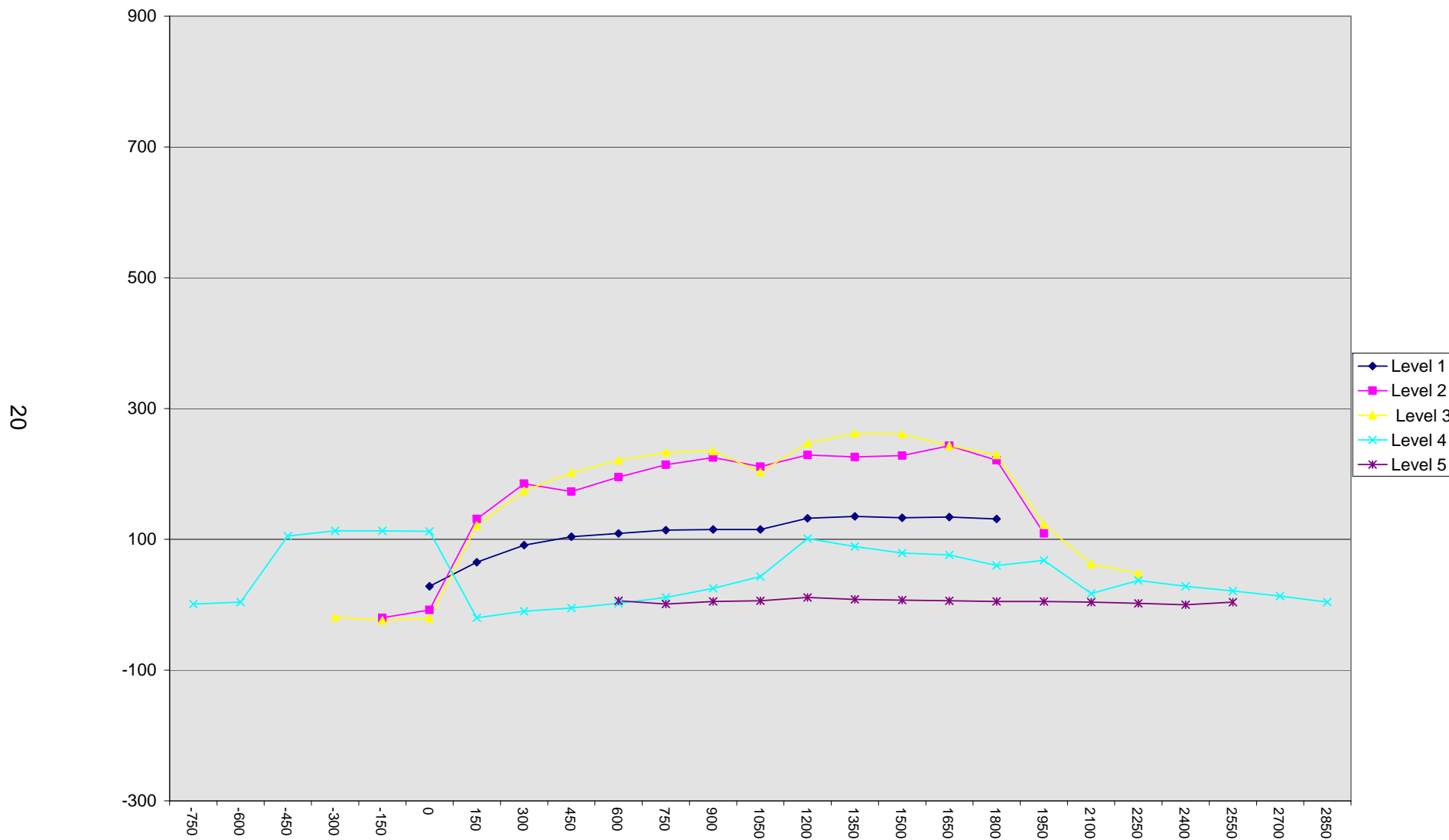
MAXIMUM CRUSH DATA

	Level 1	Level 2	Level 3	Level 4	Level 5
Maximum Crush (mm)	135	243	262	113	11
Distance From Impact (mm)	1350	1650	1350	-150	1200

DATA SHEET NO. 12 (continued)
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2011 Chevrolet Equinox 1LT FWD
Test Program: NCAP Side MDB Impact Test

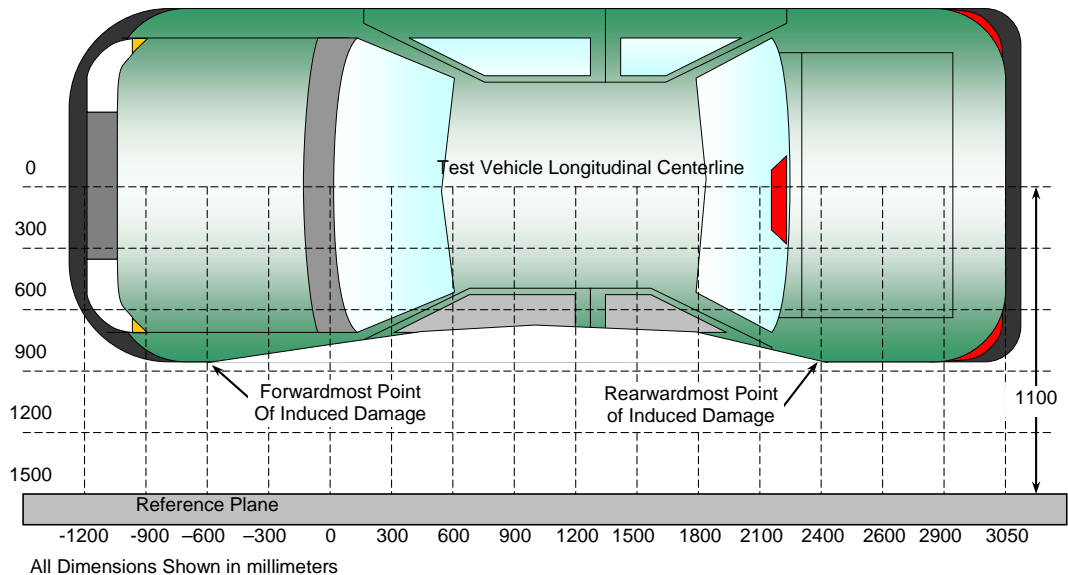
NHTSA No. MB0104
Test Date: 9/17/2010



DATA SHEET NO. 13
VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2011 Chevrolet Equinox 1LT FWD
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MB0104
 Test Date: 9/17/2010



TOP VIEW

DAMAGE PROFILE DISTANCES

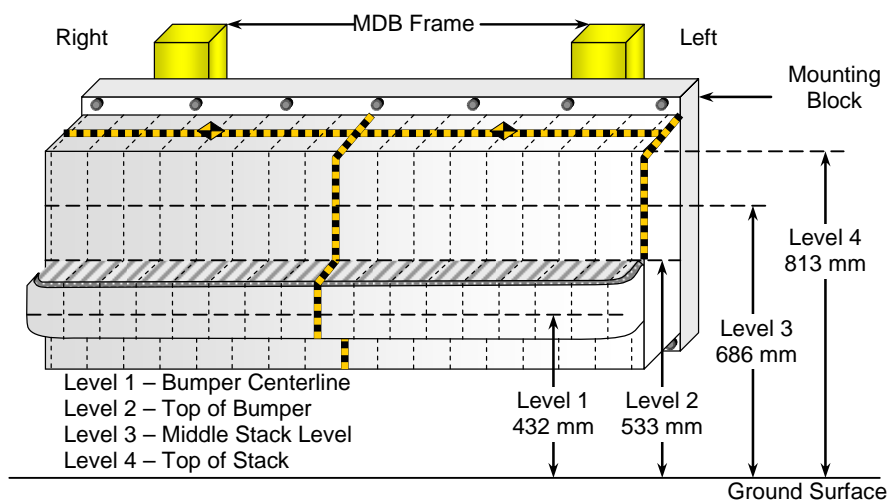
DPD	Distance from Impact Point (mm)	Level	Pre-Test (mm)	Post-Test (mm)	Max. Static Crush (mm)
1	2850	4	304	308	4
2	2118	4	271	282	11
3	1392	3	200	462	262
4	662	3	203	429	226
5	-34	4	206	318	112
6	-750	4	377	378	1

DATA SHEET NO. 14

EXTERIOR STATIC CRUSH FOR IMPACTOR FACE

Test Vehicle: 2011 Chevrolet Equinox 1LT FWD
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MB0104
 Test Date: 9/17/2010



FRONT VIEW

DEFORMABLE BARRIER STATIC CRUSH

Stack Level	Distance Right of Center (mm)								C _L	Distance Left of Center (mm)							
	800	700	600	500	400	300	200	100		100	200	300	400	500	600	700	800
4	50	47	43	39	38	48	75	75	62	37	47	55	63	72	83	107	158
3	67	49	57	65	60	55	61	63	68	43	40	42	47	54	66	86	113
2	141	138	136	135	131	130	122	120	120	120	118	115	113	110	109	109	117
1	249	240	235	232	235	233	232	230	225	222	220	219	215	209	214	220	222

DATA SHEET NO. 15

FMVSS 301 FUEL SYSTEM INTEGRITY POST-IMPACT DATA

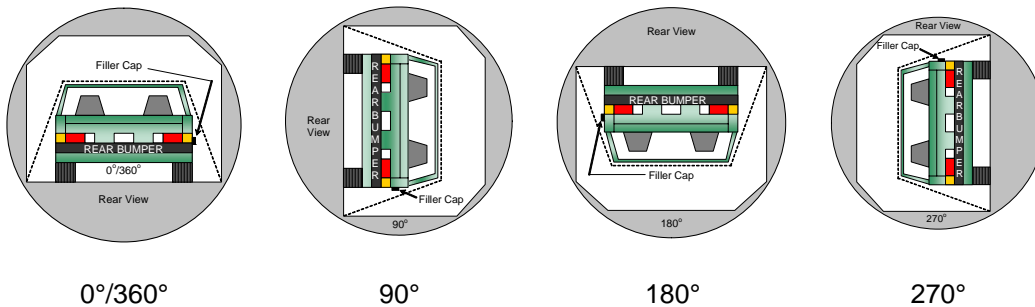
Test Vehicle: 2011 Chevrolet Equinox 1LT FWD
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MB0104
 Test Date: 9/17/2010

Test Time: 11:09 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°	122	300	422
90° to 180°	104	300	404
180° to 270°	115	300	415
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

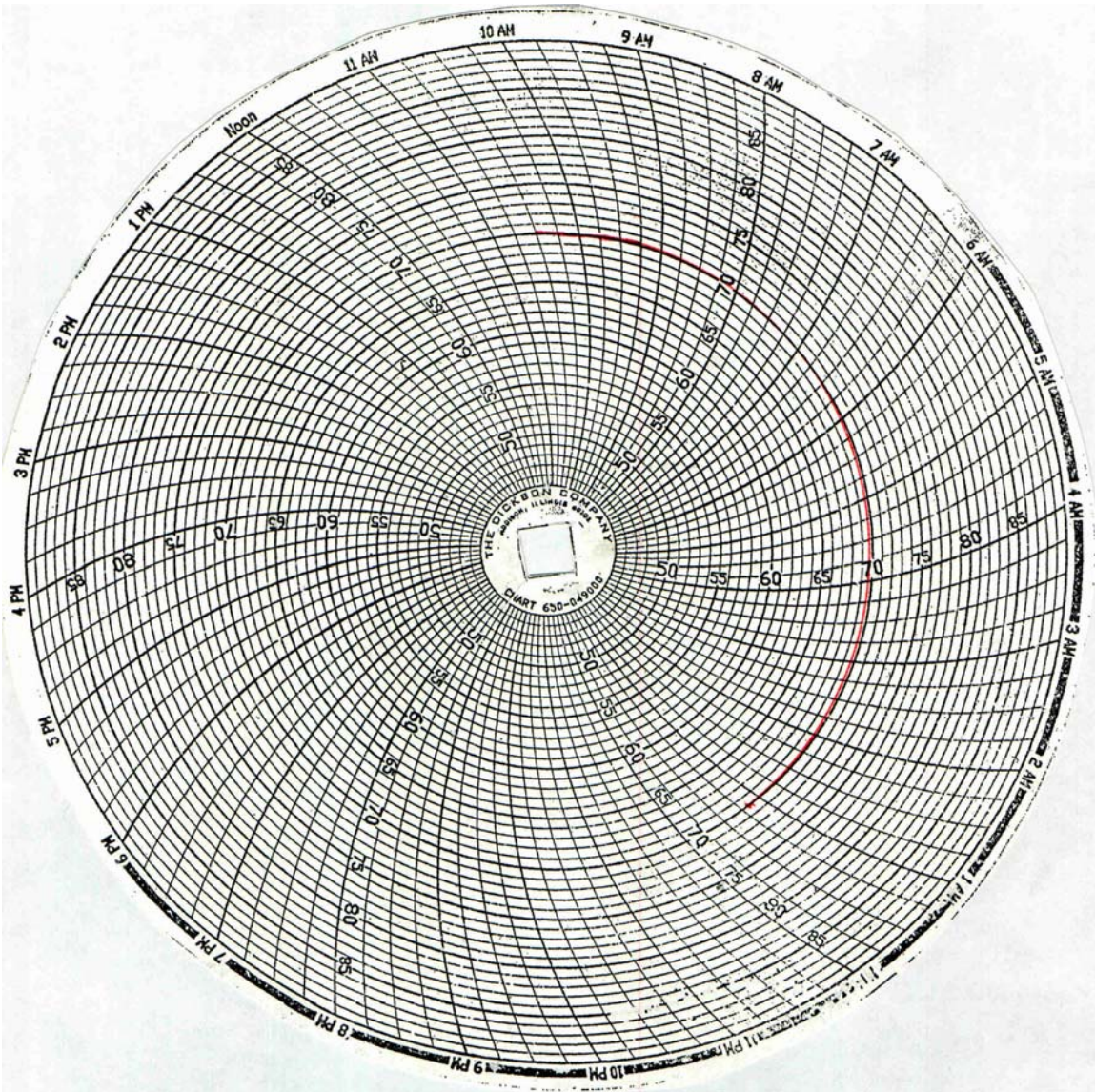
Test Phase	Spillage Location
0° to 90°	
90° to 180°	
180° to 270°	
270° to 360°	

DATA SHEET NO. 16

DUMMY/VEHICLE TEMPERATURE STABILIZATION DATA

Test Vehicle: 2011 Chevrolet Equinox 1LT FWD
Test Program: NCAP Side MDB Impact Test

NHTSA No. MB0104
Test Date: 9/17/2010



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



As Delivered Left Rear Three-Quarter View of Test Vehicle



Pre-Test Frontal View of Test Vehicle



Post-Test Frontal View of Test Vehicle



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



Post-Test Left Three-Quarter Front 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



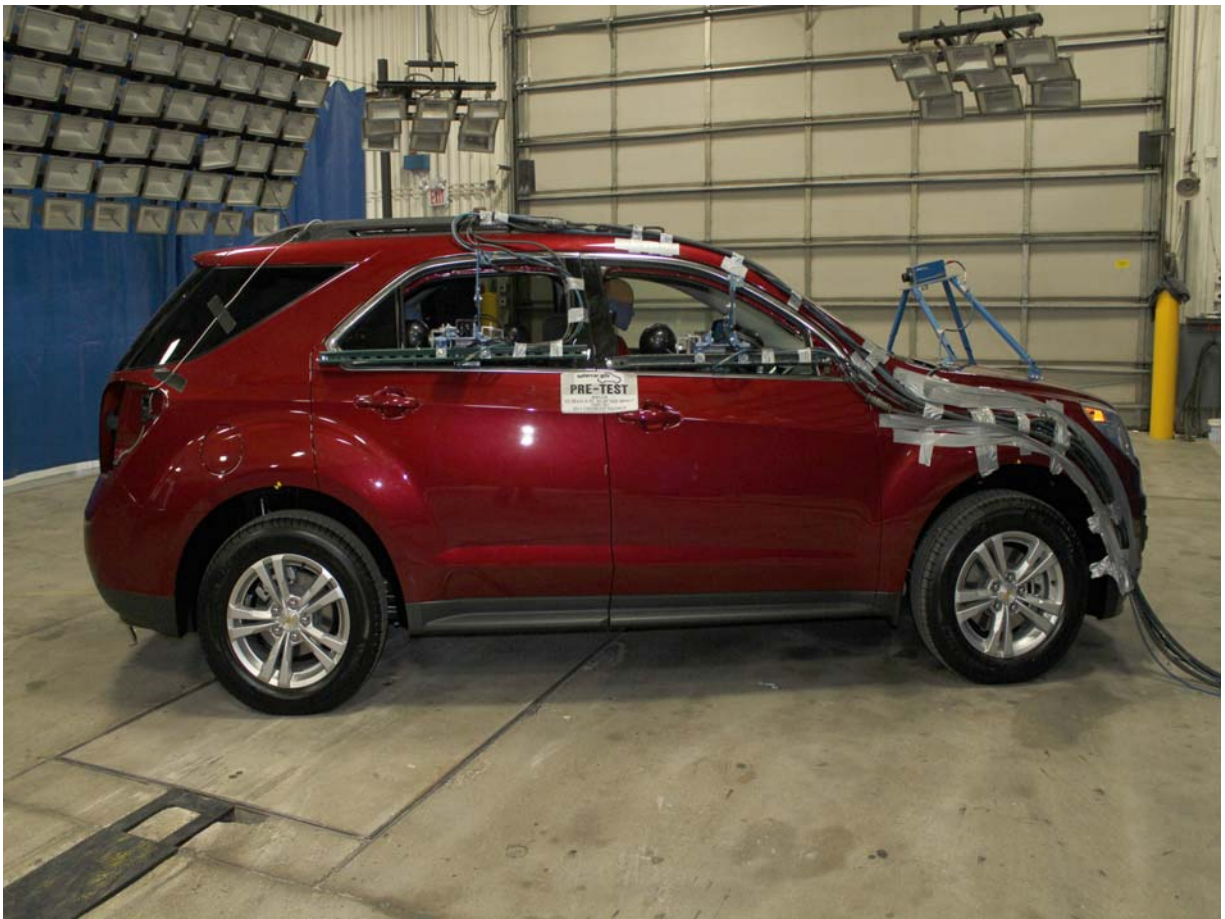
Post-Test Left Three-Quarter Rear View of Test Vehicle



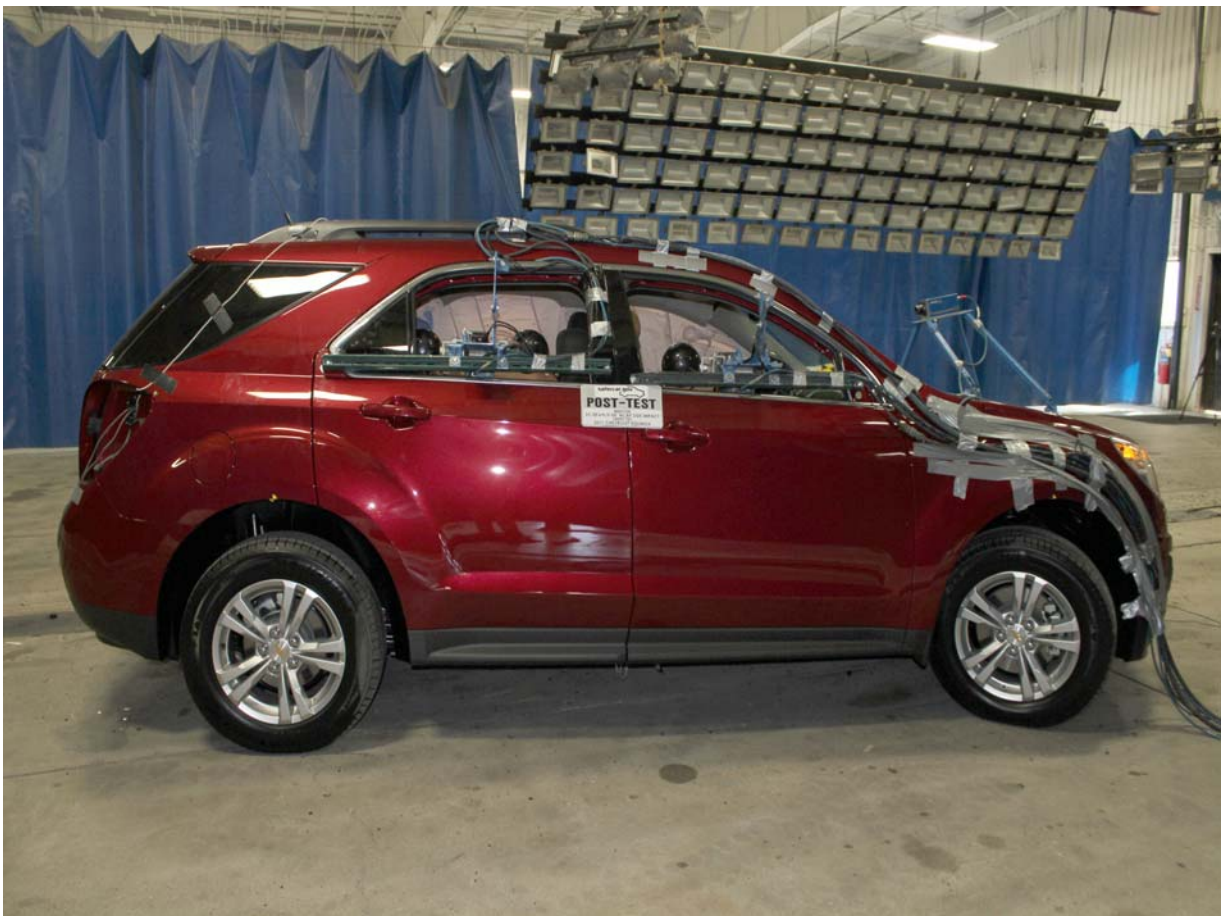
Pre-Test Rear View of Test Vehicle



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 Vehicle with MDB Positioned Against Side of Test Vehicle



Post-Test Overhead View of Test Vehicle and MDB



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, Chalking, and Contact Switches



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



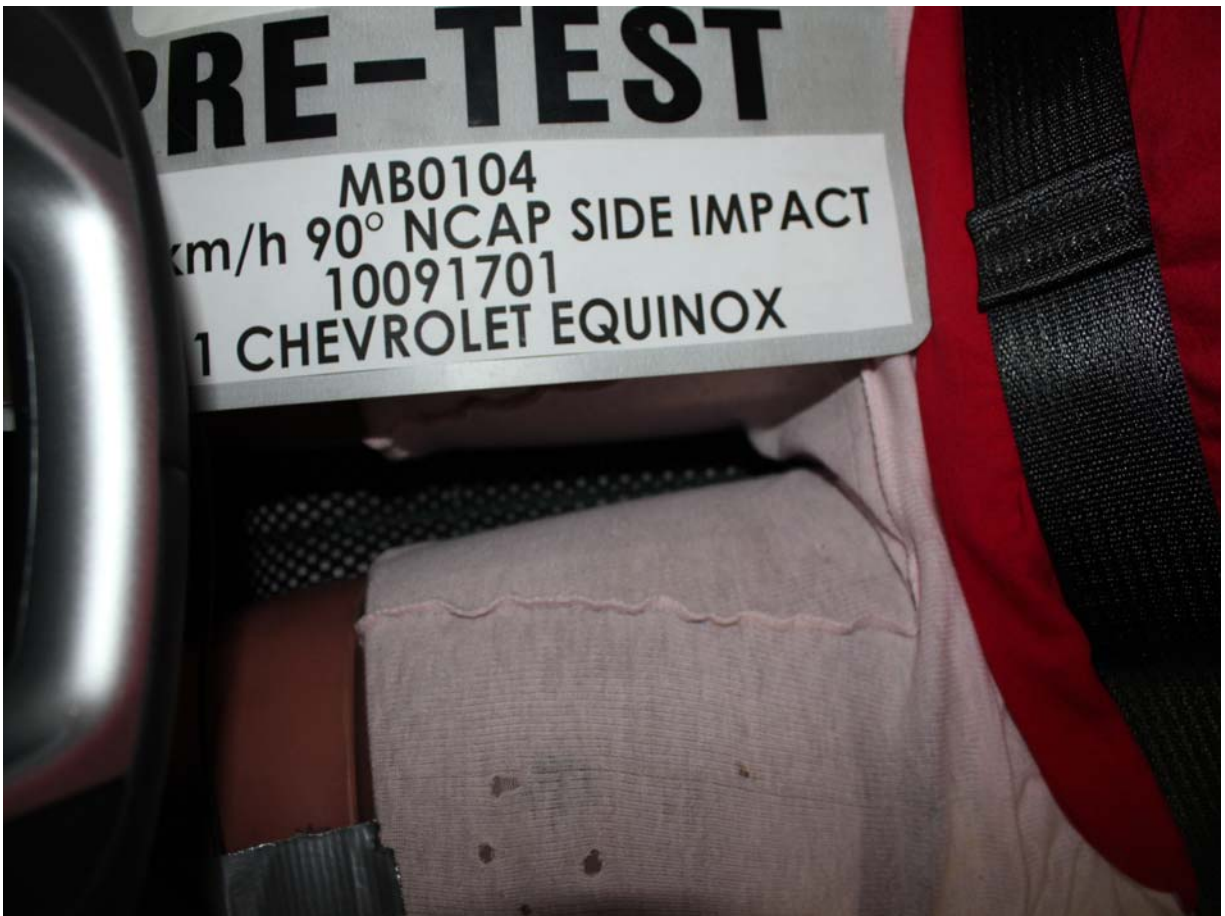
Pre-Test Frontal View of Driver Seat Back Prior to Dummy Positioning



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



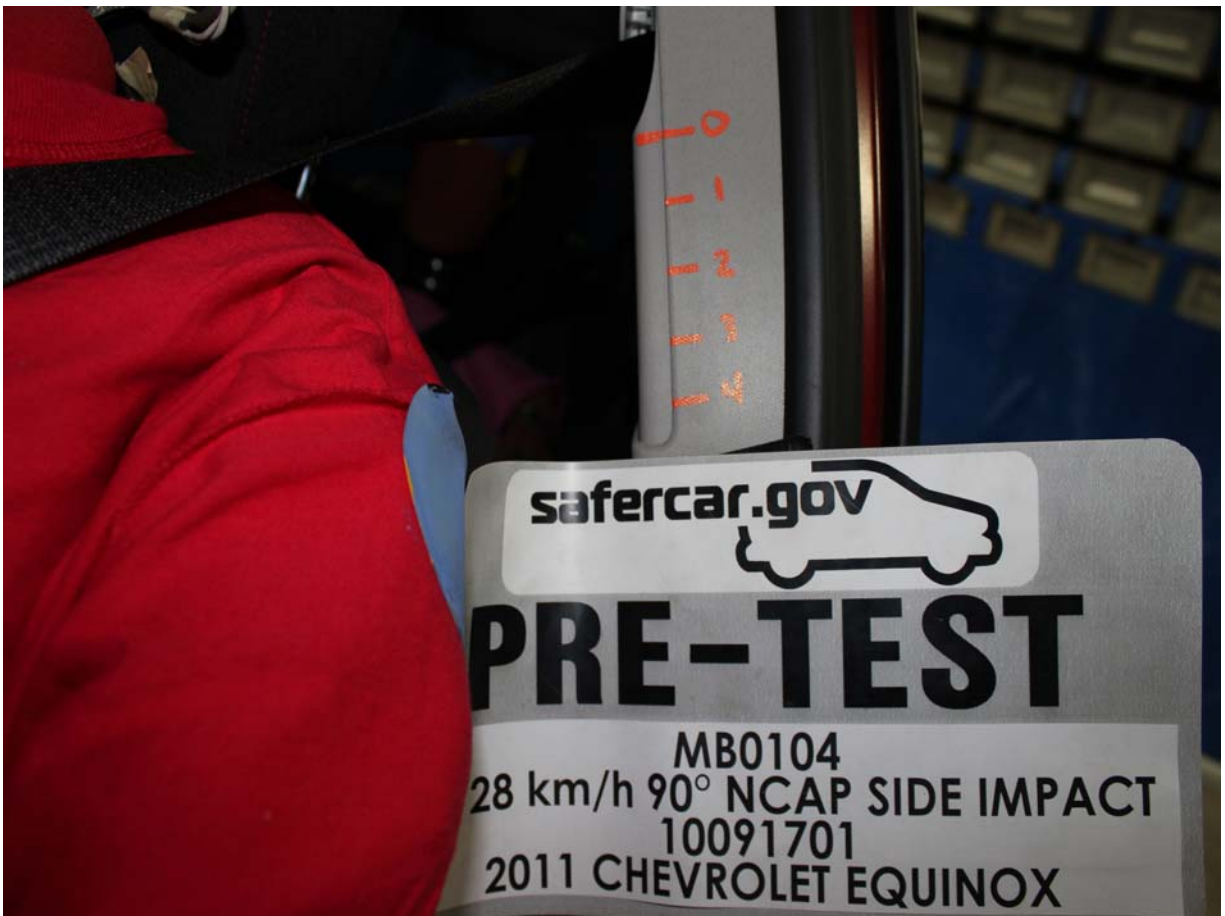
Pre-Test Frontal View of Driver Seat Pan Prior to Dummy Positioning



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



Pre-Test Placement of Driver Dummy's Feet



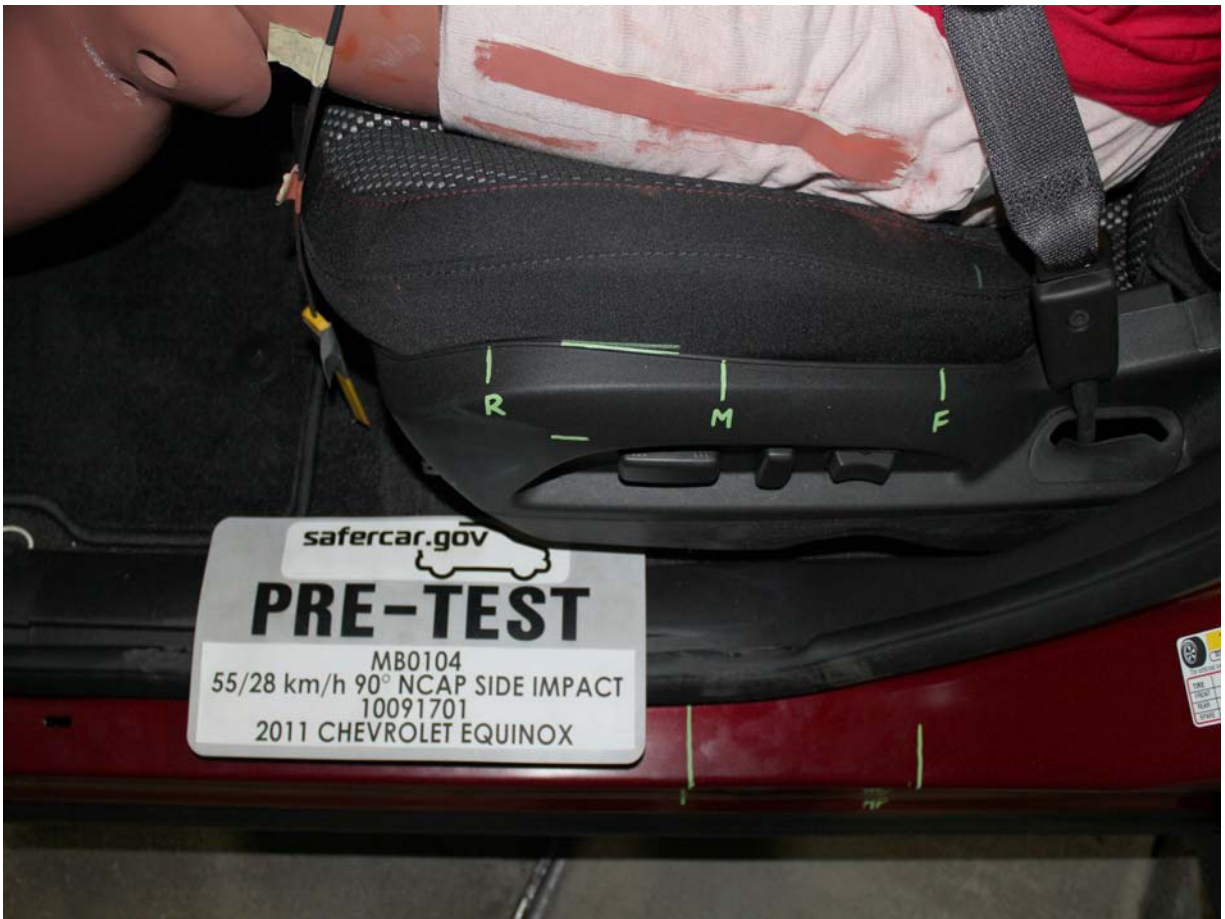
Pre-Test View of Belt Anchorage for Driver Dummy



Pre-Test Left Side View of Steering Wheel



Pre-Test View of 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 Front Seat of Occupant Compartment



Post-Test Right Side View of Front Seat of Occupant Compartment



Pre-Test Driver Inner Door Panel View



Post-Test Driver Inner Door Panel View Showing Driver Dummy Contact Locations



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



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

PHOTOGRAPH NOT APPLICABLE

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 Passenger Dummy Showing Belt, Chalking, and Contact Switches



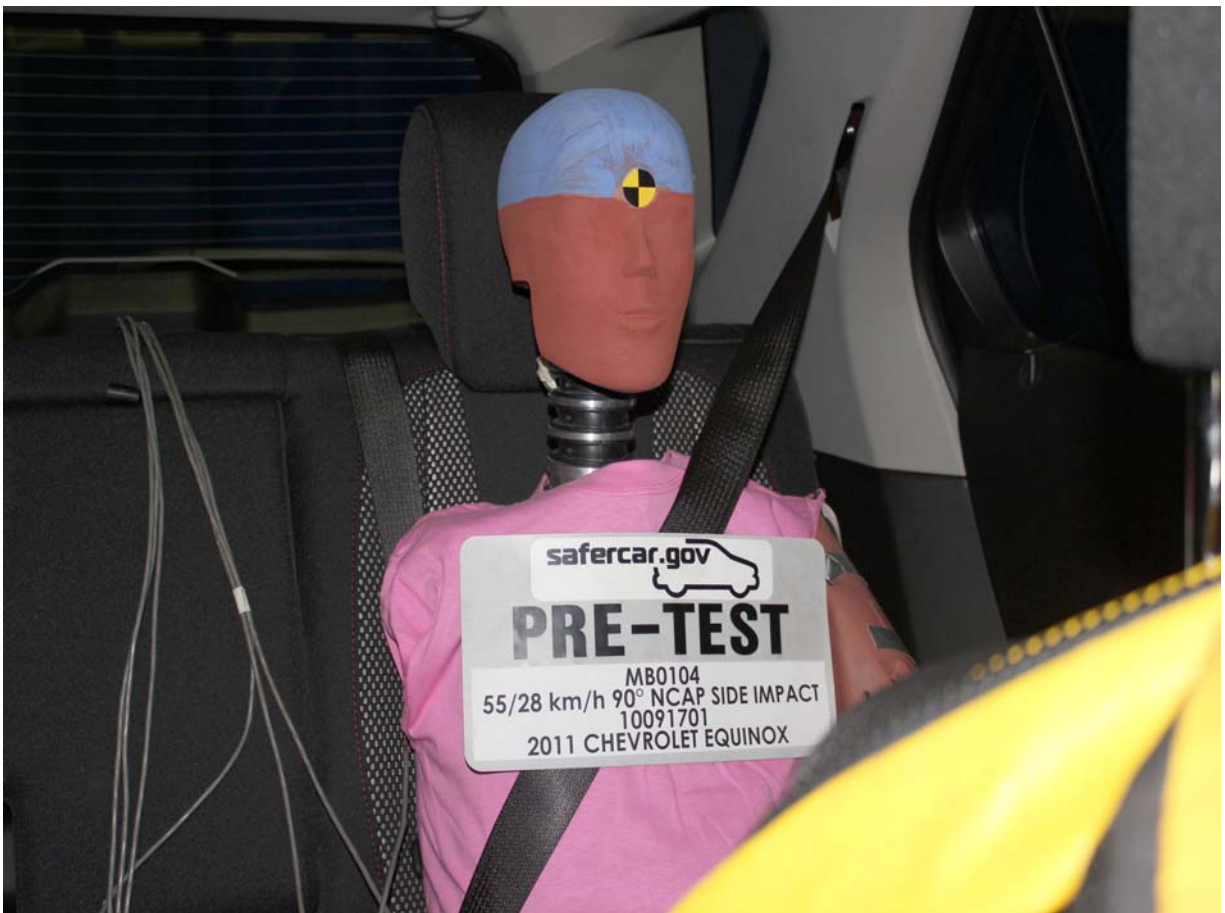
Pre-Test Left Side View of Rear Passenger Dummy Shoulder and Door Top View



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

PHOTOGRAPH NOT APPLICABLE

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



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

PHOTOGRAPH NOT APPLICABLE

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 Seat and Rear Seat Occupant Compartment



Pre-Test Passenger Inner Door Panel View



Post-Test Rear Passenger Inner Door Panel View Showing Dummy Contact Locations

PHOTOGRAPH NOT APPLICABLE

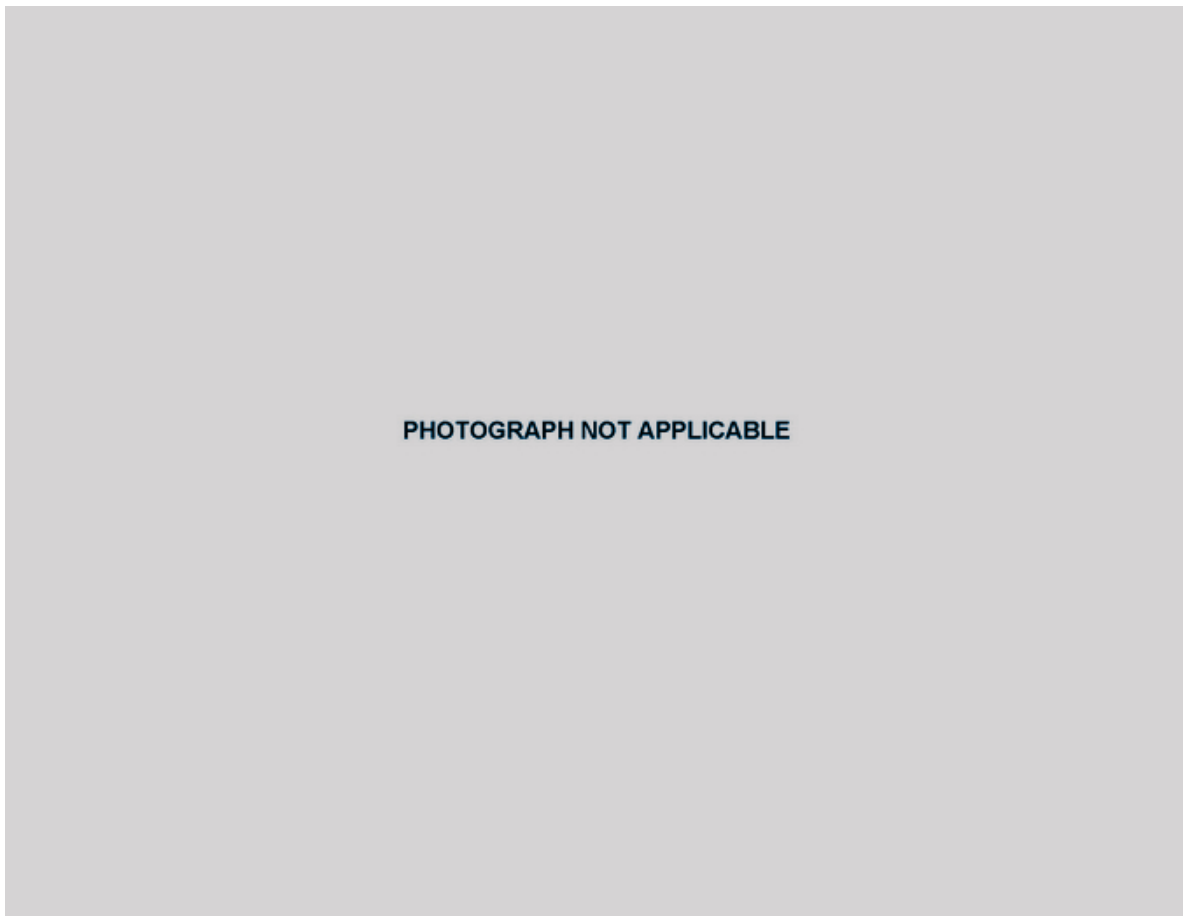
Post-Test Rear Passenger Dummy Close-up Head Contact with Vehicle View



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



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

PHOTOGRAPH NOT APPLICABLE

Post-Test Rear Passenger Dummy Close-up Pelvis Contact 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



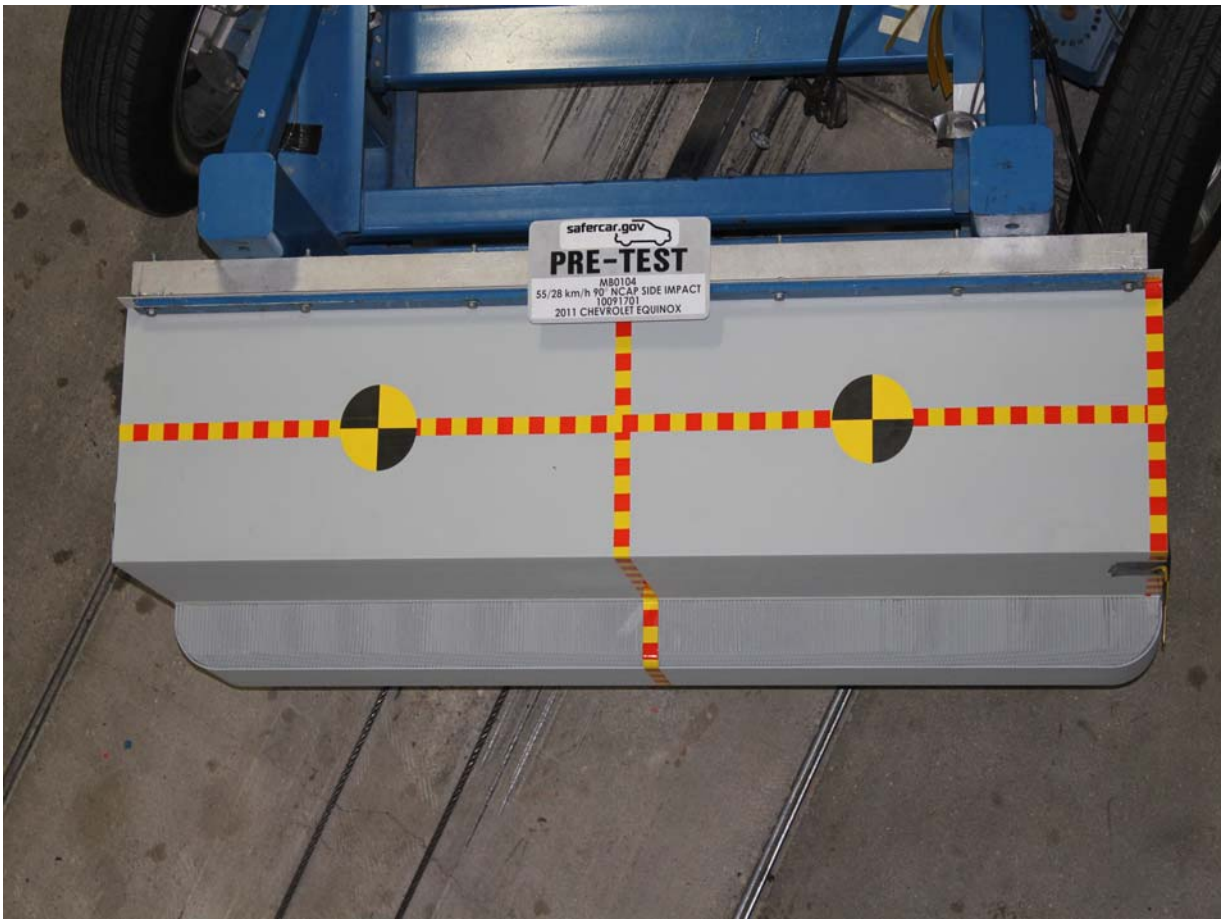
Post-Test View of Fuel Filler Cap or Fuel Filler Neck



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



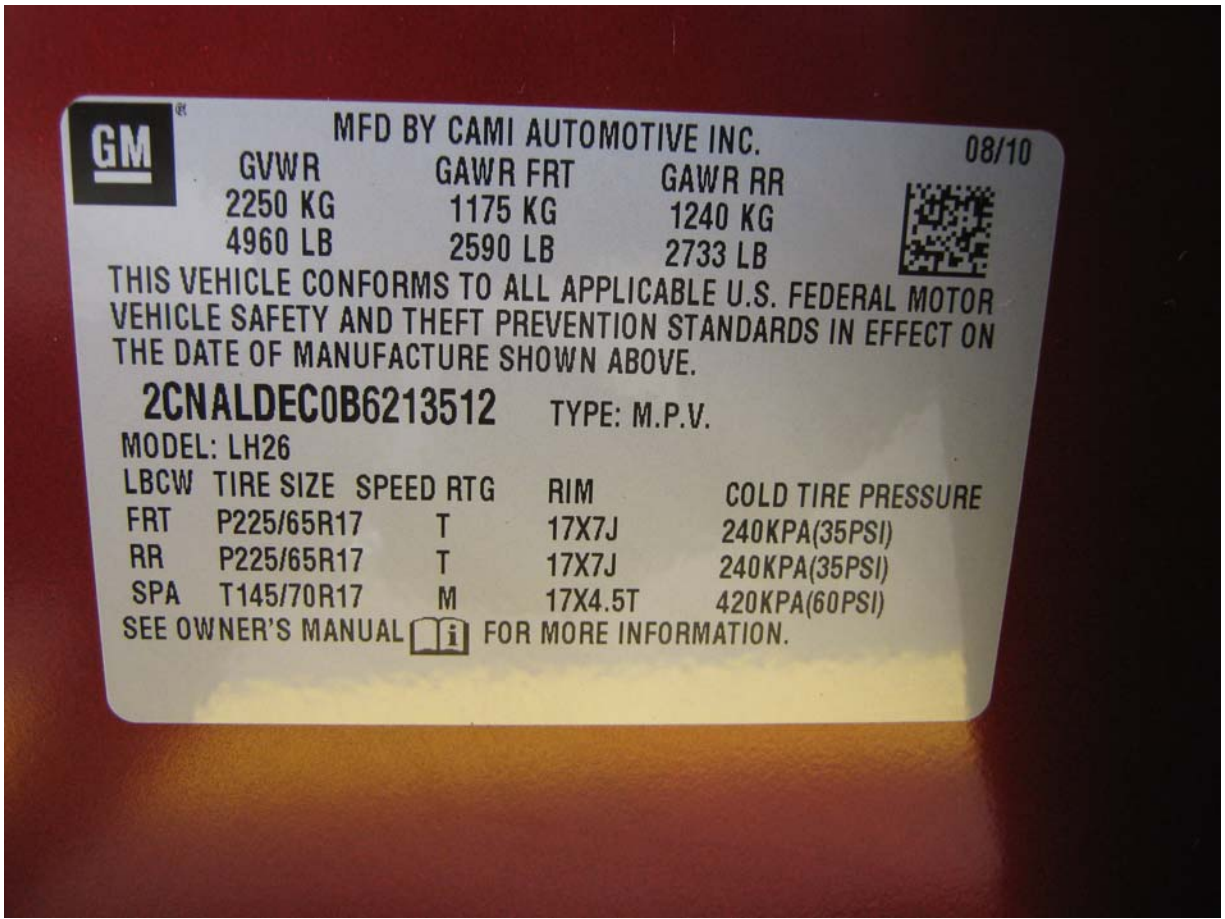
Post-Test Left Side View of MDB Impactor Face



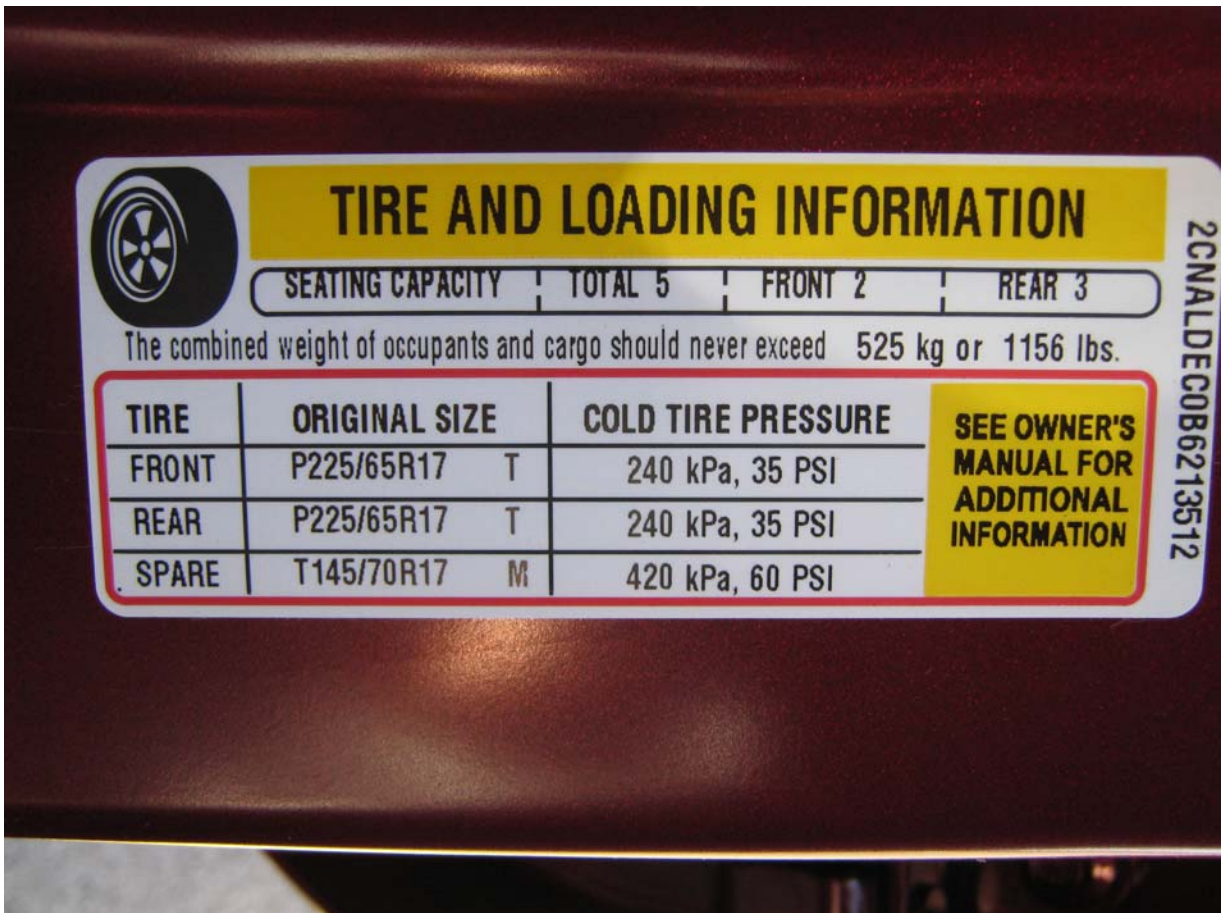
Pre-Test Right Side View of MDB Impactor Face



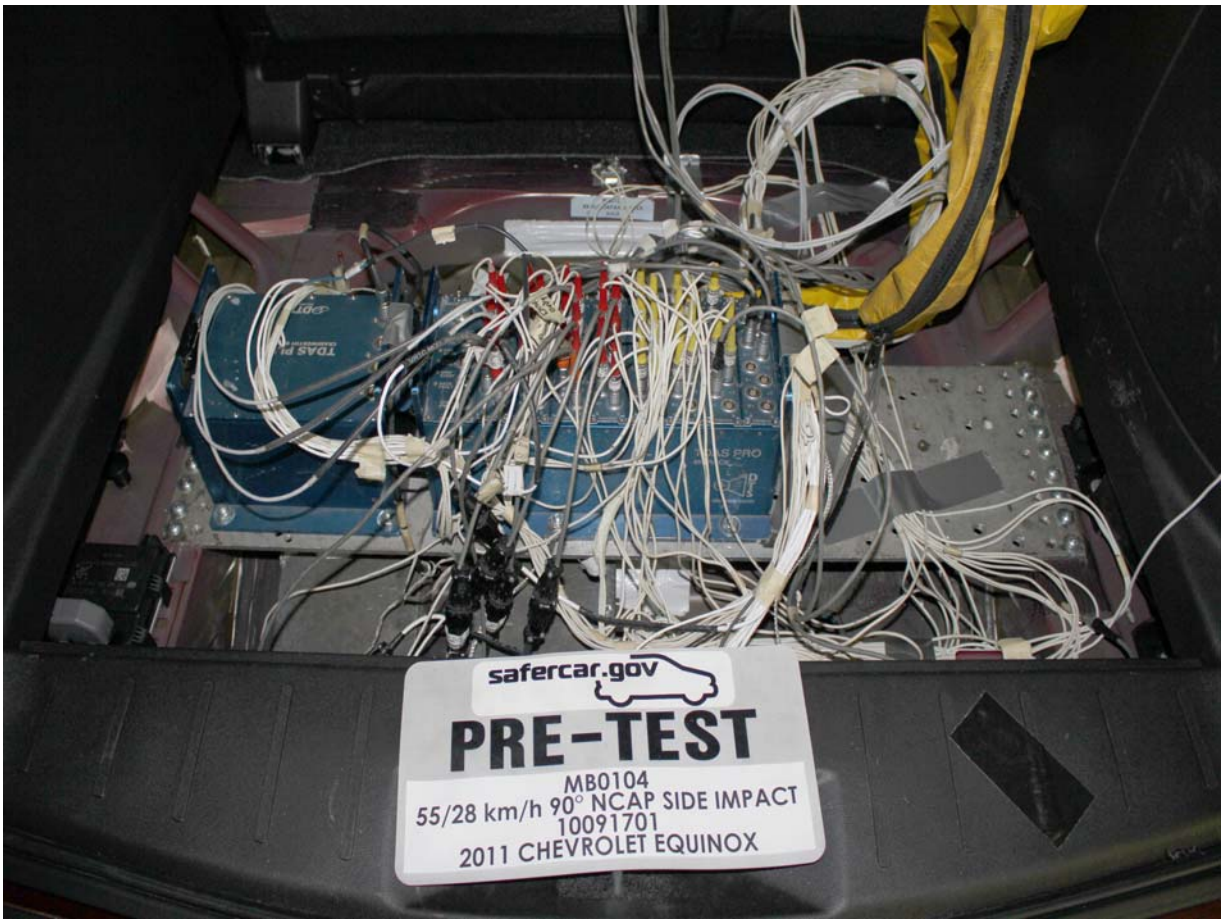
Post-Test Right Side View of MDB Impactor Face



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



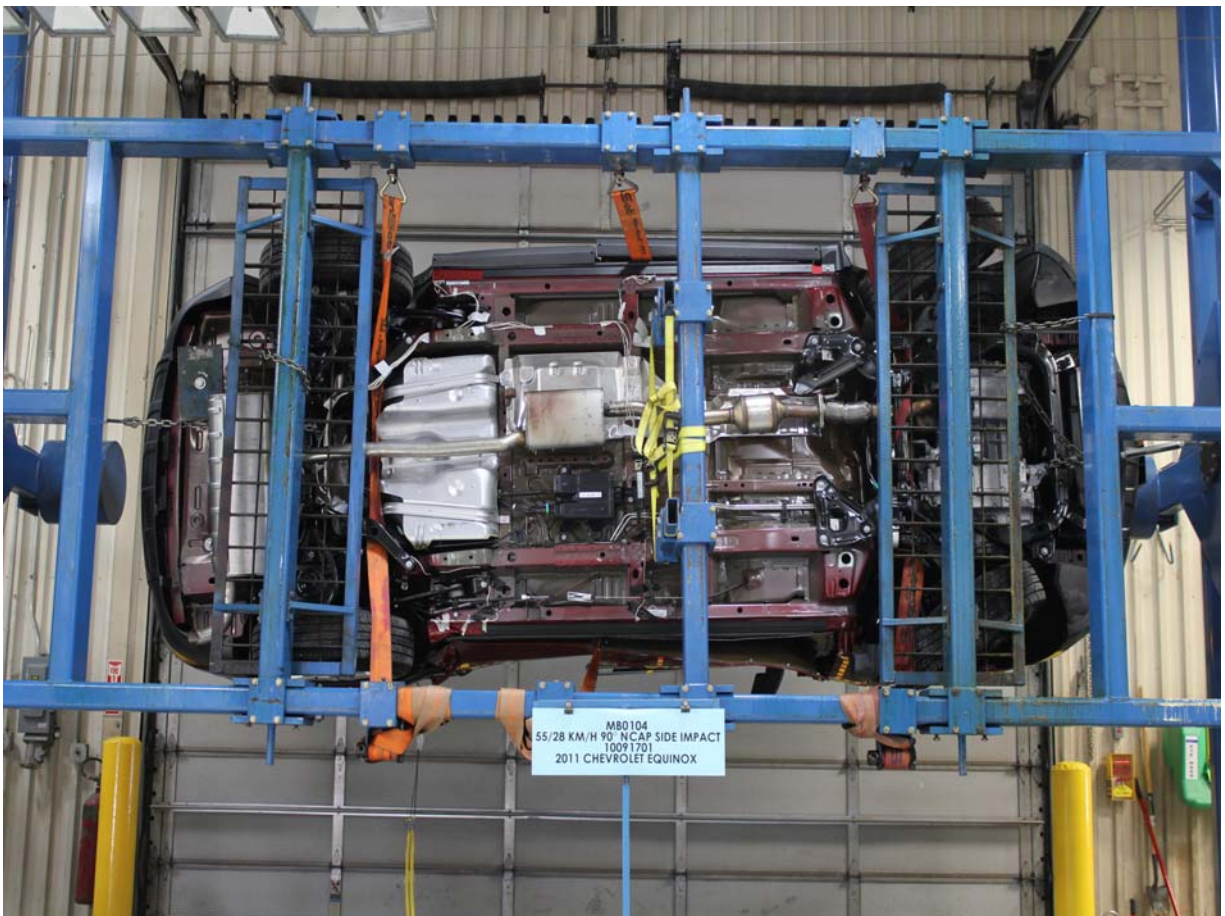
FMVSS No. 301/305 Rollover 0 Degrees



FMVSS No. 301/305 Rollover 90 Degrees



FMVSS No. 301/305 Rollover 180 Degrees



FMVSS No. 301/305 Rollover 270 Degrees



FMVSS No. 301/305 Rollover 360 Degrees



Impact Event



2011 EQUINOX FWD 1LT

**EXTERIOR: CARDINAL RED METALLIC
INTERIOR: JET BLACK**

**ENGINE: 2.4L DOHC, 4-CYL 182HP
TRANSMISSION, 6 SPD AUTOMATIC**

Visit us at www.chevy.com

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

- 5 YEAR/100,000 MILE POWERTRAIN LIMITED WARRANTY SEE DEALER FOR DETAILS
- MECHANICAL**
 - ENGINE, 2.4L, 4-CYL, DOHC SIDI
 - TRANSMISSION 6-SPEED AUTOMATIC
 - OIL LIFE MONITORING SYSTEM
 - COMPACT SPARE, STEEL
- SAFETY/SECURITY**
 - ANTILOCK BRAKE SYSTEM, 4 WHEEL DISC
 - STABILITRAK-STABILITY CONTROL SYSTEM WITH TRACTION CONTROL
 - TIRE PRESSURE MONITOR SYSTEM
 - AIR BAGS, DUAL FRONTAL
 - SIDE IMPACT AIRBAGS, DRIVER AND FRONT PASSENGER
 - HEAD CURTAIN SIDE AIRBAGS WITH ROLLOVER PROTECTION, ALL ROWS

- CHILD SAFETY LATCH SYSTEM
- AUTOMATIC HEADLAMP CONTROL
- REMOTE KEYLESS ENTRY
- THEFT DETERRENT SYSTEM
- 6 MTHS ONSTAR DIRECTIONS AND CONNECTIONS WITH AUTOMATIC CRASH RESPONSE AND TURN-BY-TURN NAVIGATION (ASK DEALER ABOUT GEOGRAPHIC COVERAGE)
- EXTERIOR FEATURES**
 - POWER OUTSIDE MIRRORS, BODY COLOR, HEATED
 - 17" ALUMINUM WHEELS
 - GLASS DEEP TINTED
 - ROOF RACK SIDE RAILS
- INTERIOR FEATURES**
 - PREMIUM CLOTH SEATS
 - DRIVER SEAT WITH POWER HEIGHT AND LUMBAR ADJUSTMENT
 - MULTI-FLEX (TM) SLIDING REAR SEAT WITH 60/40 SPLIT

- SEATBACK & 3-POSITION RECLINE
- AIR CONDITIONING
- STEERING, TILT AND TELESCOPING
- CRUISE CONTROL
- POWER WINDOWS, EXPRESS DOWN
- AM/FM STEREO CD WITH AUX INPUT
- XM SATELLITE RADIO - SERVICE SUBSCRIPTION SOLD SEPARATELY BY SIRIUS/XM AFTER 3 MONTHS
- OUTSIDE TEMPERATURE & COMPASS
- FLOOR MATS
- BLUE TOOTH FOR PHONE
- LEATHER WRAPPED STEERING WHEEL WITH AUDIO CONTROLS
- USB PORT

OPTIONS & PRICING
MANUFACTURER'S SUGGESTED RETAIL PRICE

STANDARD VEHICLE PRICE \$23,910.00
OPTIONS INSTALLED BY THE MANUFACTURER (MAY REPLACE STANDARD EQUIPMENT SHOWN)

DRIVER CONVENIENCE PACKAGE: 845.00

- REMOTE VEHICLE STARTER SYSTEM ADJUSTER
- REARVIEW CAMERA SYSTEM INCLUDES AUTO DIMMING INSIDE REAR VIEW MIRROR
- REAR AXLE, 3.23 RATIO INC.
- 4,960 LBS GVWR INC.

TOTAL OPTIONS \$845.00
TOTAL VEHICLE & OPTIONS \$24,755.00
DESTINATION CHARGE 745.00

TOTAL VEHICLE PRICE* \$25,500.00

EPA Fuel Economy Estimates



GOVERNMENT SAFETY RATINGS

This vehicle has not been rated by the government for frontal crash, side crash or rollover risk.

Source: National Highway Traffic Safety Administration (NHTSA).

PARTS CONTENT INFORMATION

FOR VEHICLES IN THIS CARLINE:
U.S./CANADIAN PARTS CONTENT: 66%

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

FOR THIS VEHICLE:
FINAL ASSEMBLY POINT:
INGERSOLL, ON CANADA
COUNTRY OF ORIGIN:
ENGINE: UNITED STATES
TRANSMISSION: KOREA

ORDER NO. P4528H SALES CODE C
DEALER NO. 4272 SALES MODEL CODE 1U28
MANUFACTURER'S PART NO.: CANADA
INGERSOLL ON
VIN 2CNALDEC0B8213512

DEALER TO WHOM DELIVERED
BURTNESS CHEVROLET OF WHITEWATER
563 S JANEVILLE ST
WHITEWATER, WI 53190-1719

2MM1063472

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

3-2 Seats and Restraints

Head Restraints

The vehicle's front and rear seats have head restraints in all outboard seating positions.

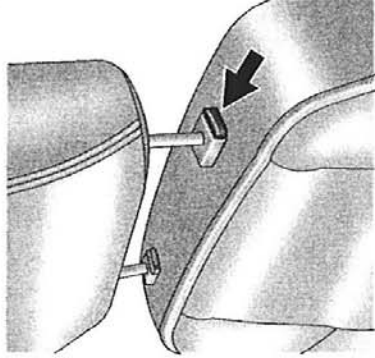


WARNING

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



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



1. Pull the head restraint up to raise it. To lower the head restraint, press the release button, located on the head restraint post on the top of the seatback, while you push the head restraint down.
2. Push down on the head restraint after the button is released to make sure that it is locked in place.

The vehicle's rear seat head restraints are not adjustable.

The head restraints not designed to be removed.

3-2 Seats and Restraints

Head Restraints

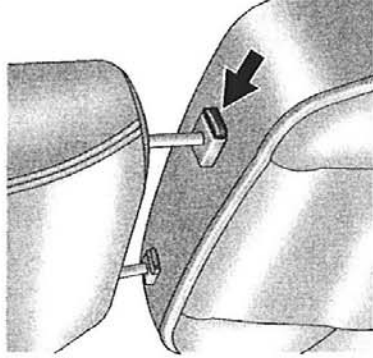
The vehicle's front and rear seats have head restraints in all outboard seating positions.

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APPENDIX B
DUMMY RESPONSE DATA

TABLE OF DATA PLOTS
Driver & Passenger Dummy Instrumentation Plots
FILTERED DATA

<u>No.</u>	<u>Description</u>	<u>Page No.</u>
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

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)

Driver Shoulder Contact Switch

Driver Torso Contact Switch

Driver Pelvis Contact Switch

Passenger Head Acceleration Redundant (X)

Passenger Head Acceleration Redundant (Y)

Passenger Head Acceleration Redundant (Z)

Passenger Shoulder Contact Switch

Passenger Torso Contact Switch

Passenger Pelvis Contact Switch

Vehicle Instrumentation Data

Driver Side Airbag Timing

Driver Side Curtain Airbag Timing (not installed)

Passenger Side Airbag Timing (not installed)

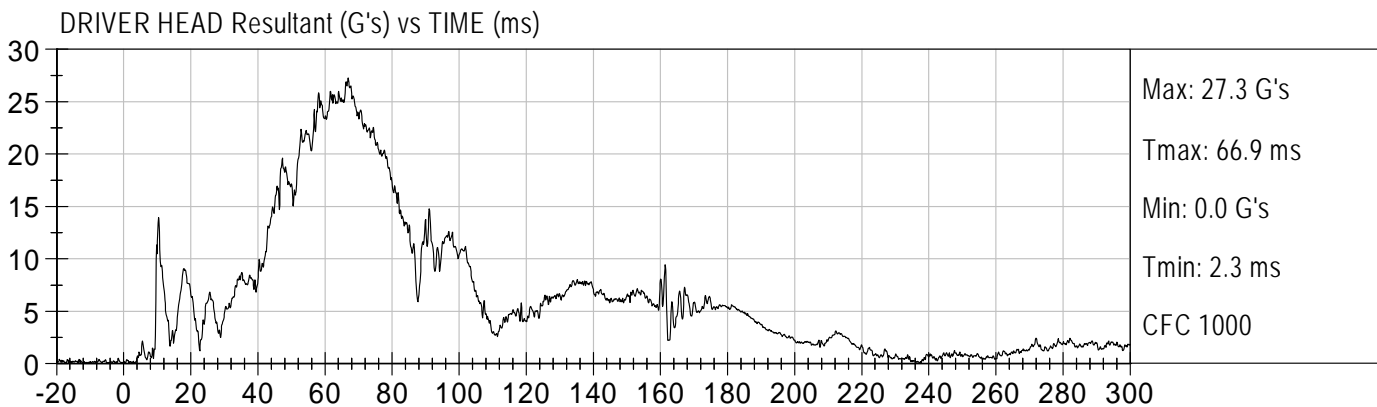
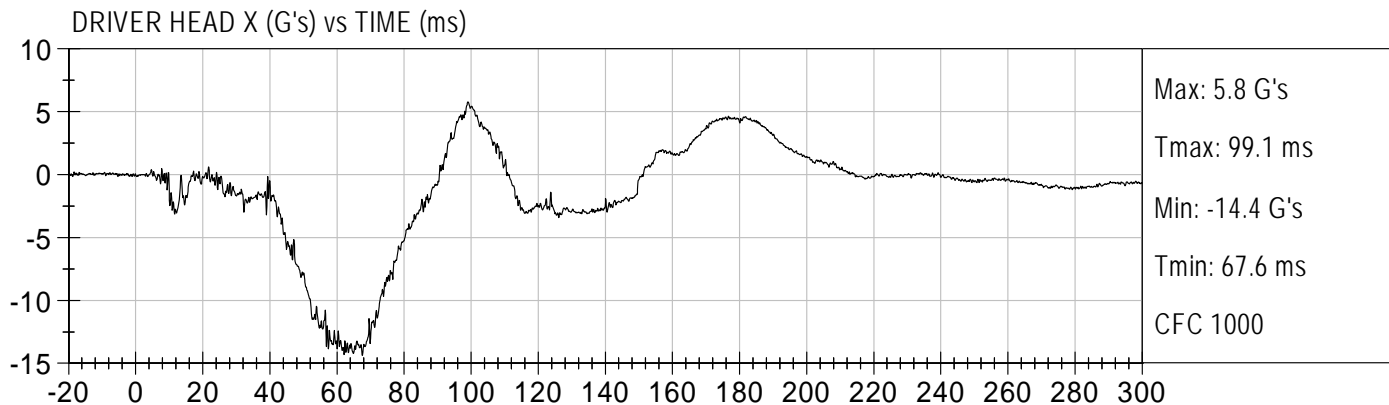
Passenger Side Curtain Airbag Timing (not installed)

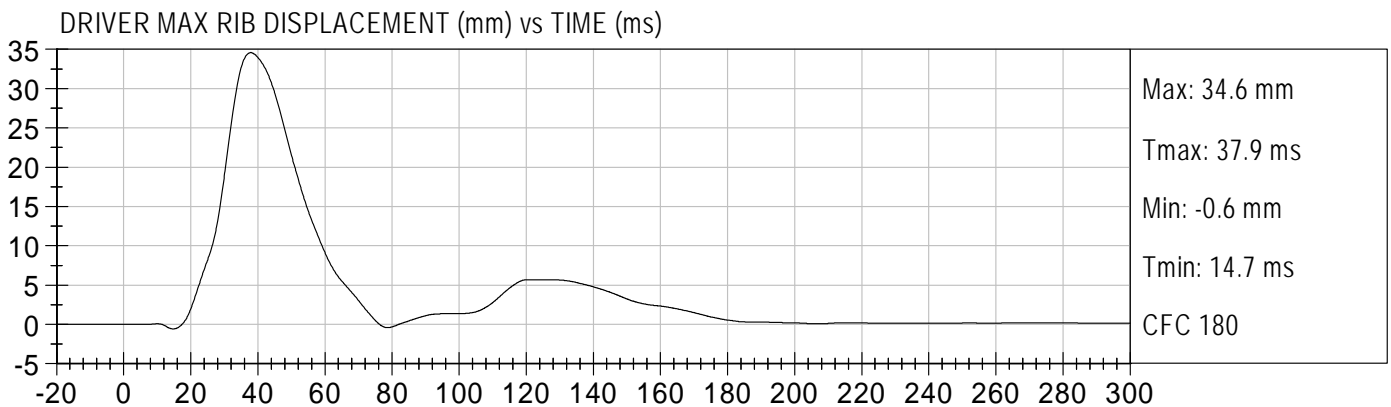
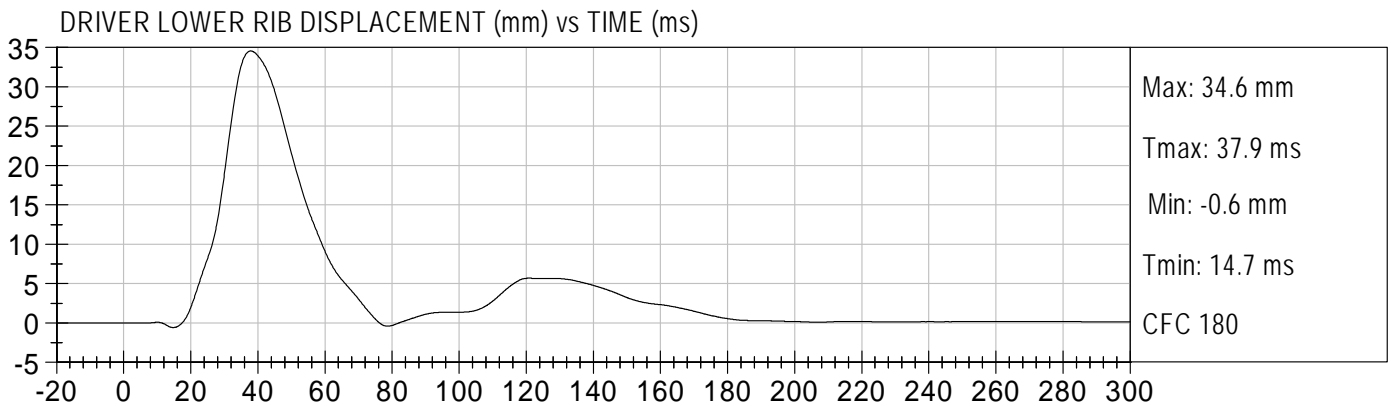
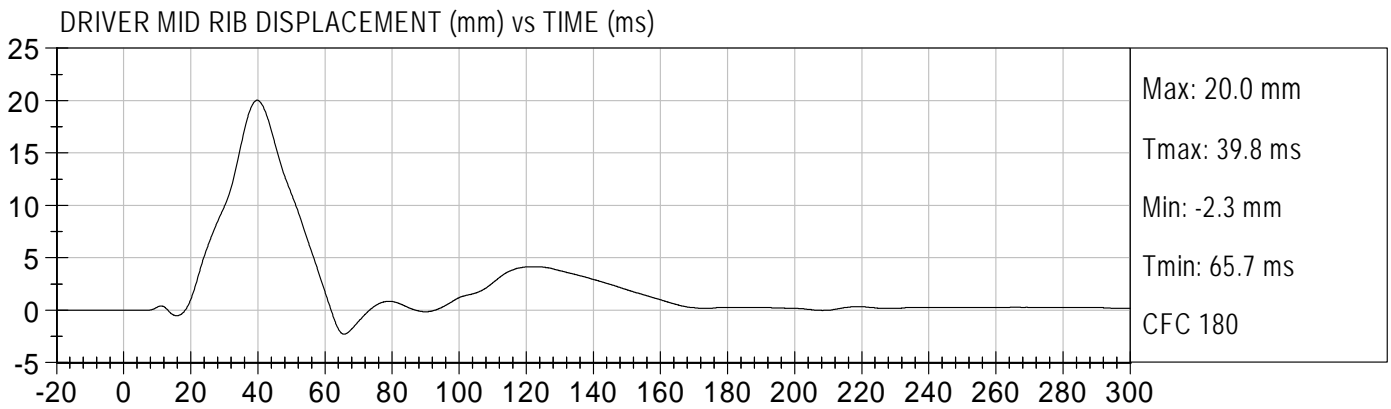
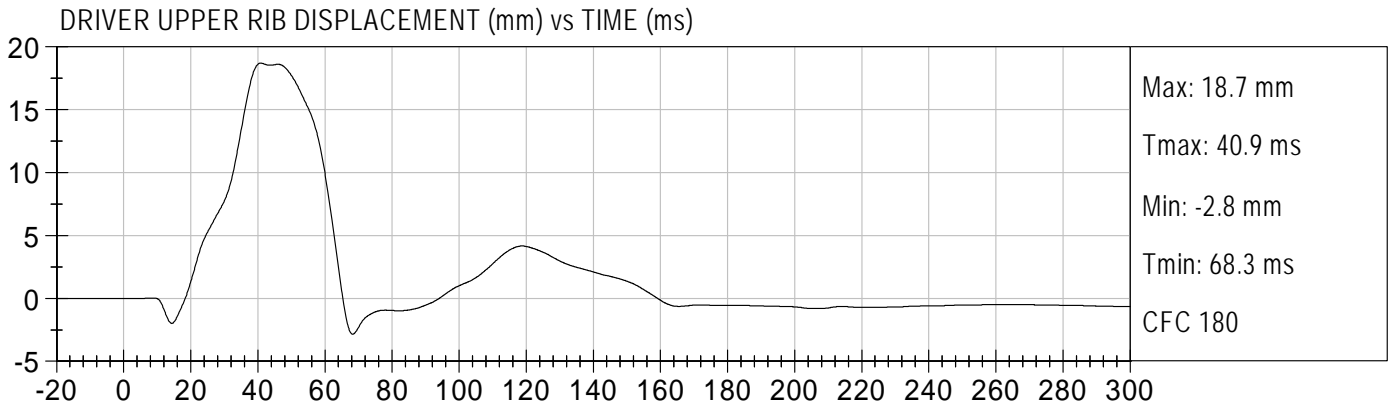
Right Side Sill at Front Seat Acceleration (X)

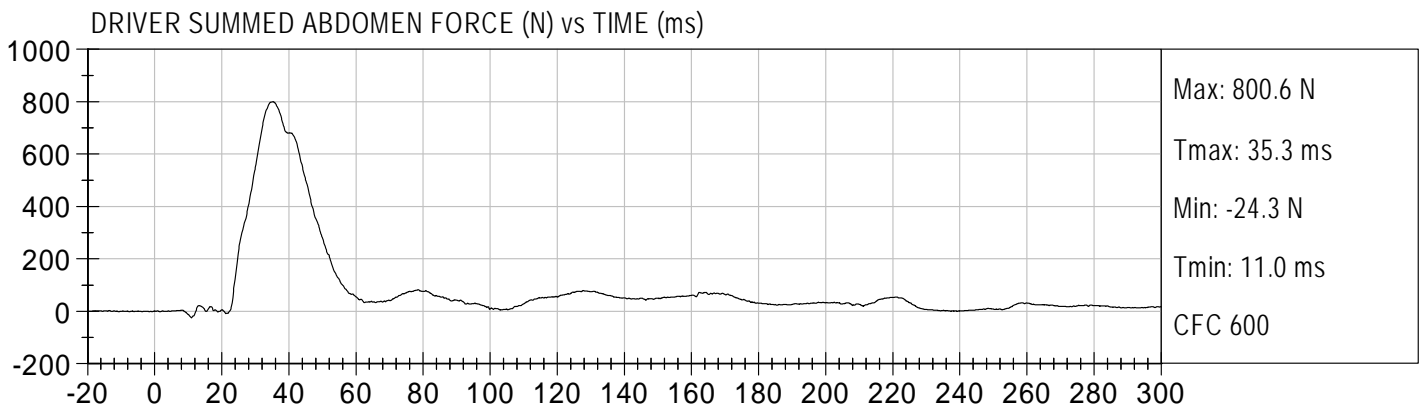
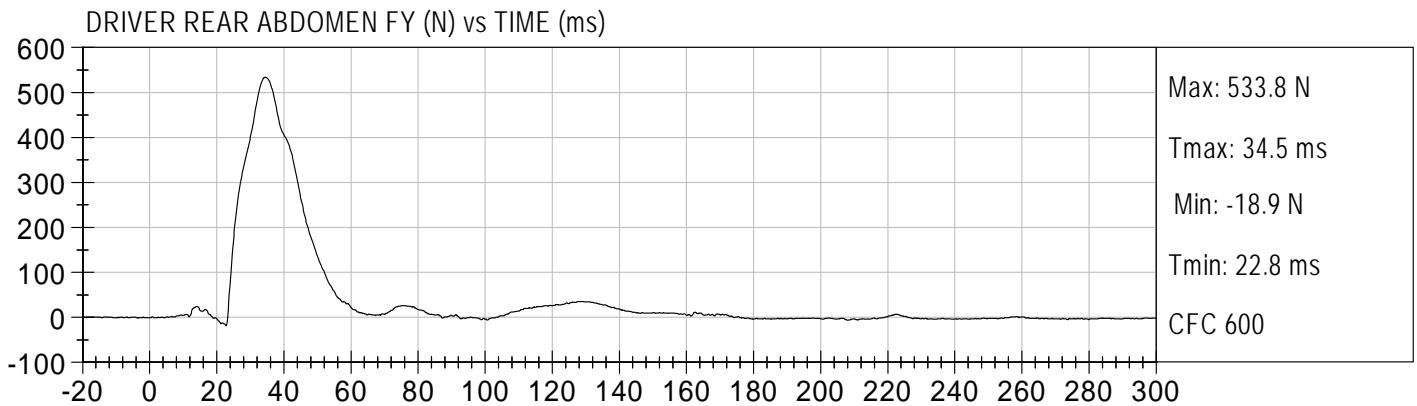
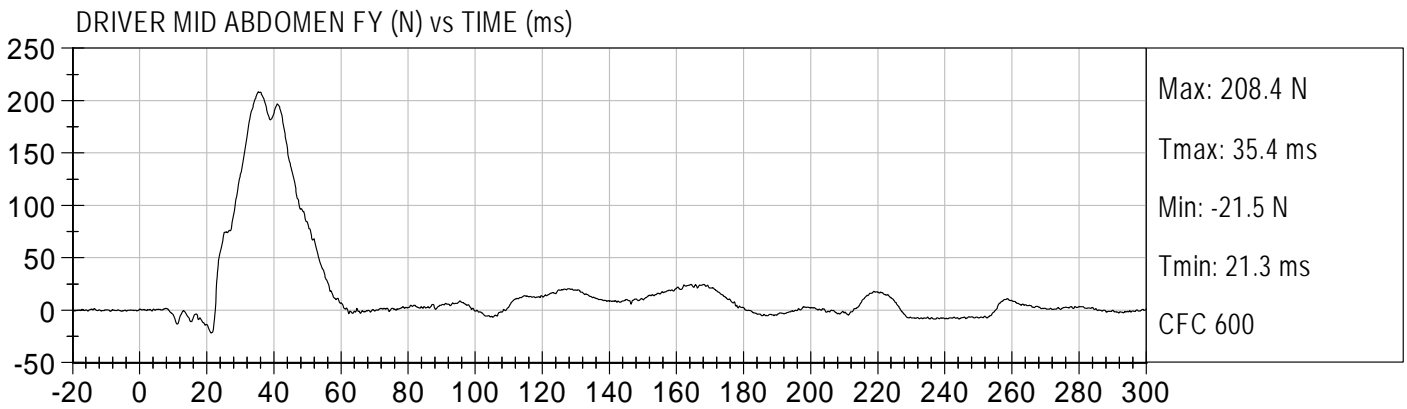
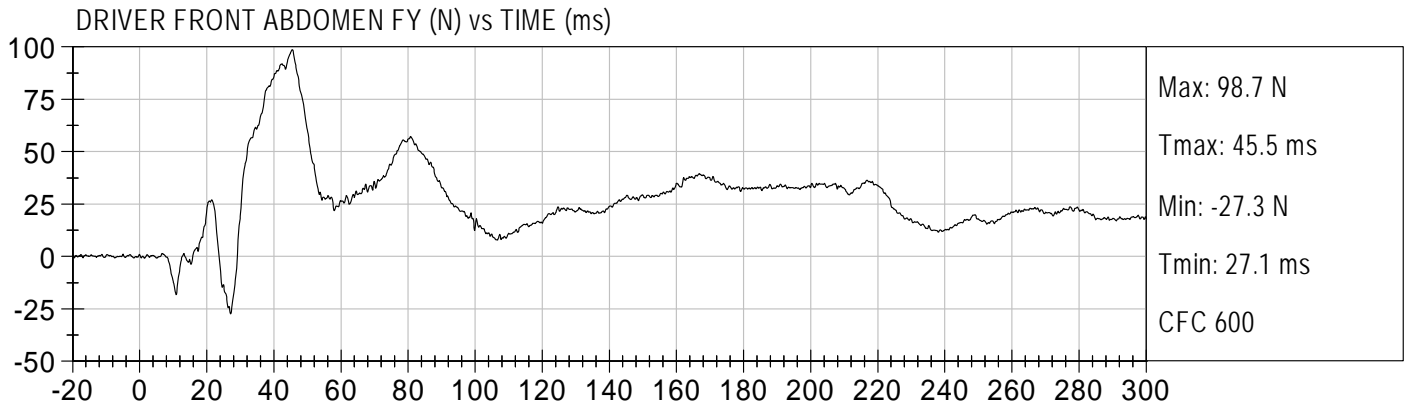
Right Side Sill at Front Seat Acceleration (Y)
Right Side Sill at Front Seat Acceleration (Z)
Right Side Sill at Rear Seat Acceleration (X)
Right Side Sill at Rear Seat Acceleration (Y)
Right Side Sill at Rear Seat Acceleration (Z)
Rear Floorpan Above Axle Acceleration (X)
Rear Floorpan Above Axle Acceleration (Y)
Rear Floorpan Above Axle Acceleration (Z)
Left Side Sill at Front Seat Acceleration (Y)
Left Side Sill at Rear Seat Acceleration (Y)
Right Rear Occupant Compartment 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)
Vehicle Center of Gravity Acceleration (X)
Vehicle Center of Gravity Acceleration (Y)
Vehicle Center of Gravity Acceleration (Z)

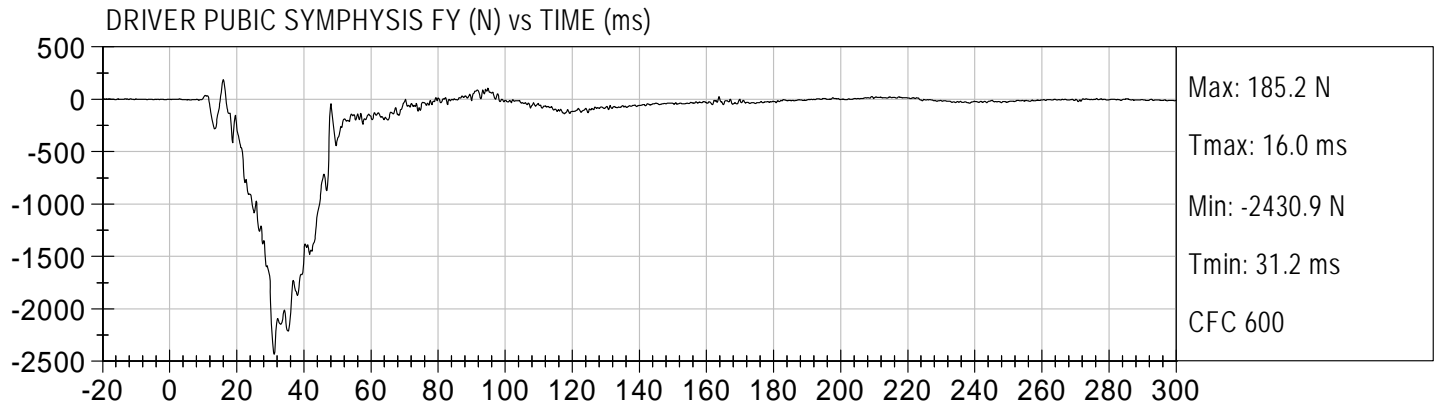
MDB Instrumentation Data

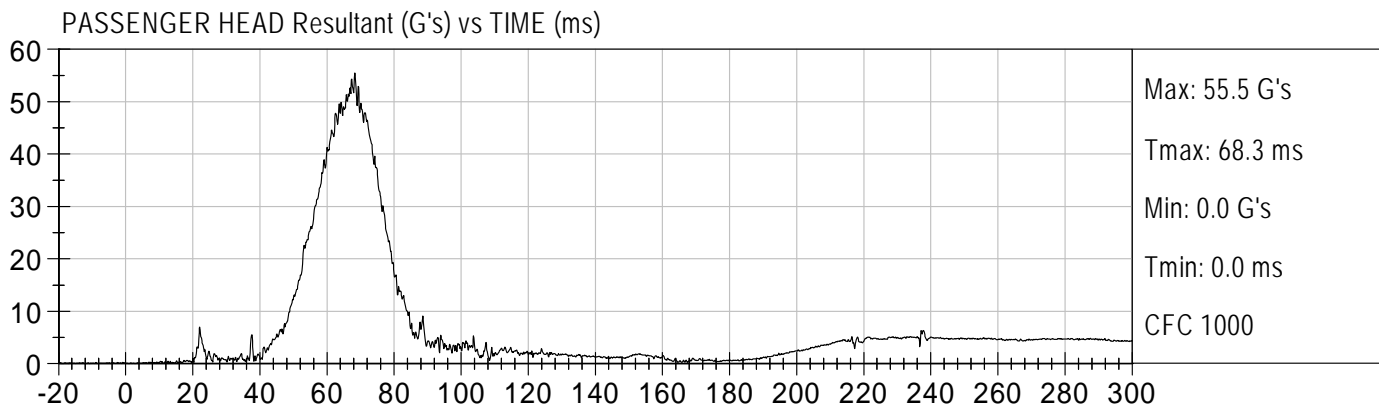
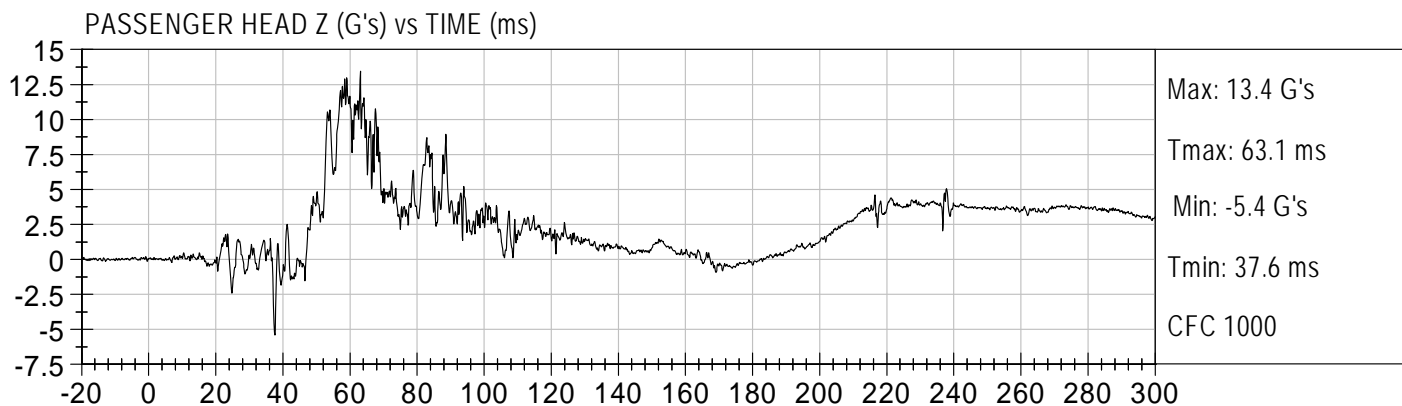
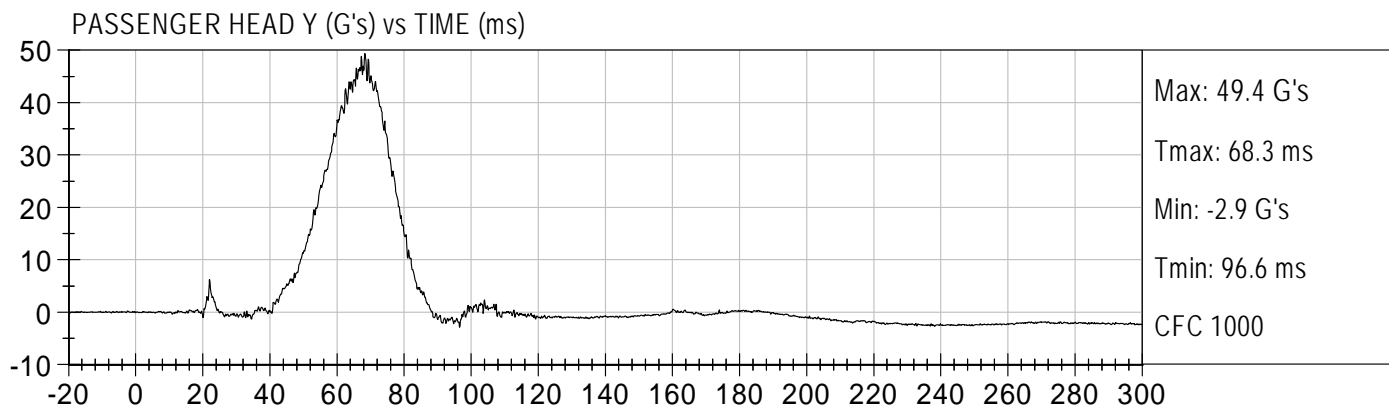
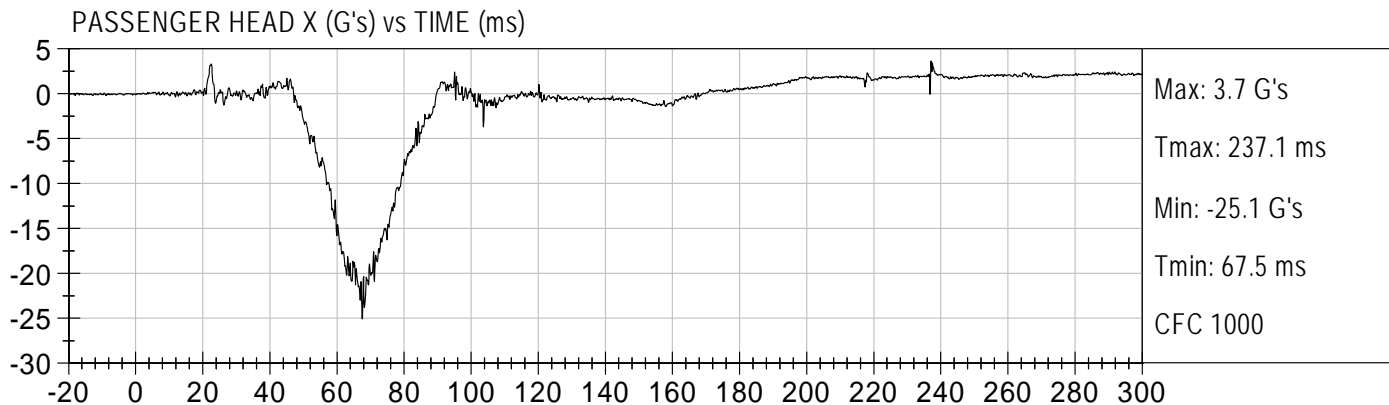
MDB Center of Gravity Acceleration (X)
MDB Center of Gravity Acceleration (Y)
MDB Center of Gravity Acceleration (Z)
MDB Rear Acceleration (X)
MDB Rear Acceleration (Y)
Left MDB Contact Switch
Right MDB Contact Switch

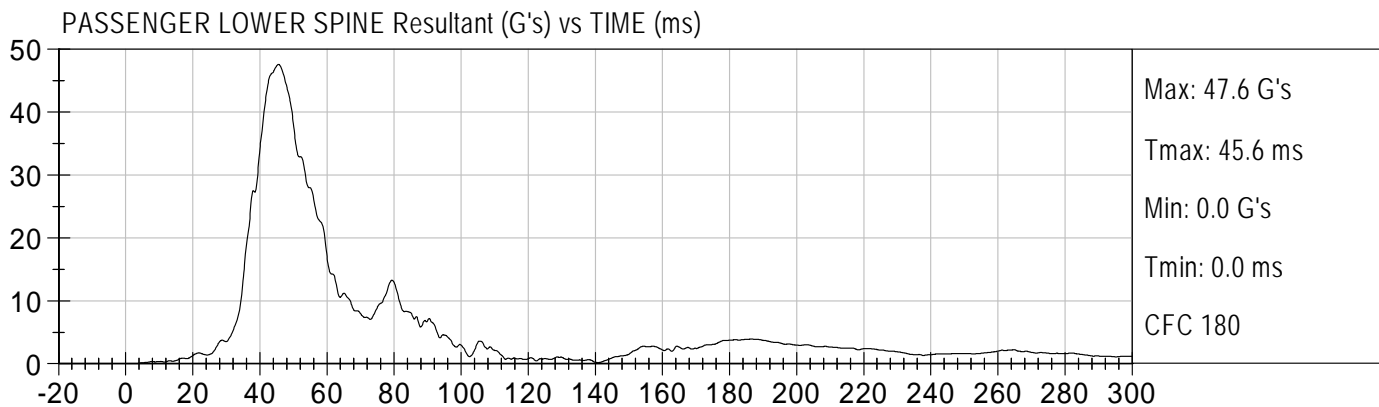
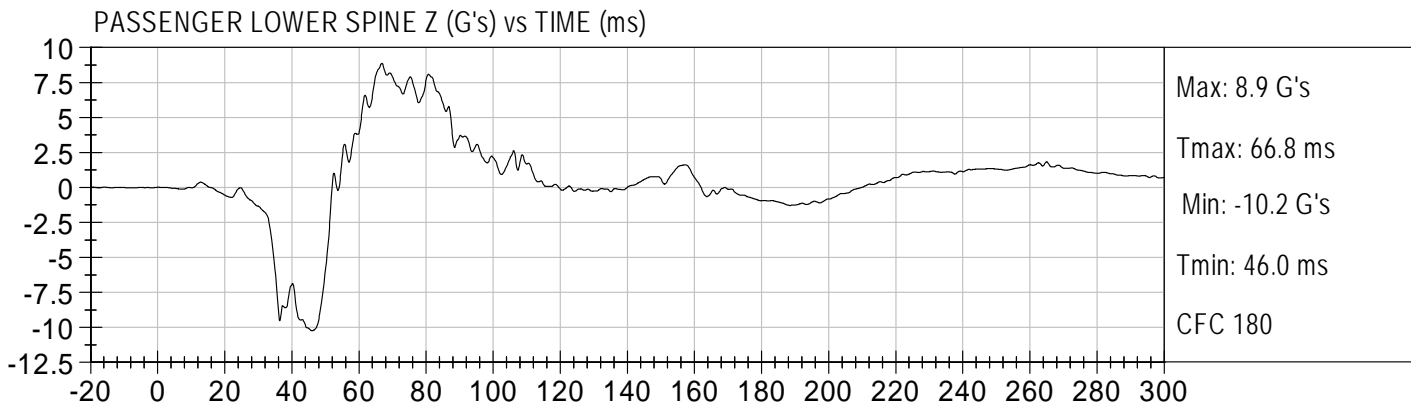
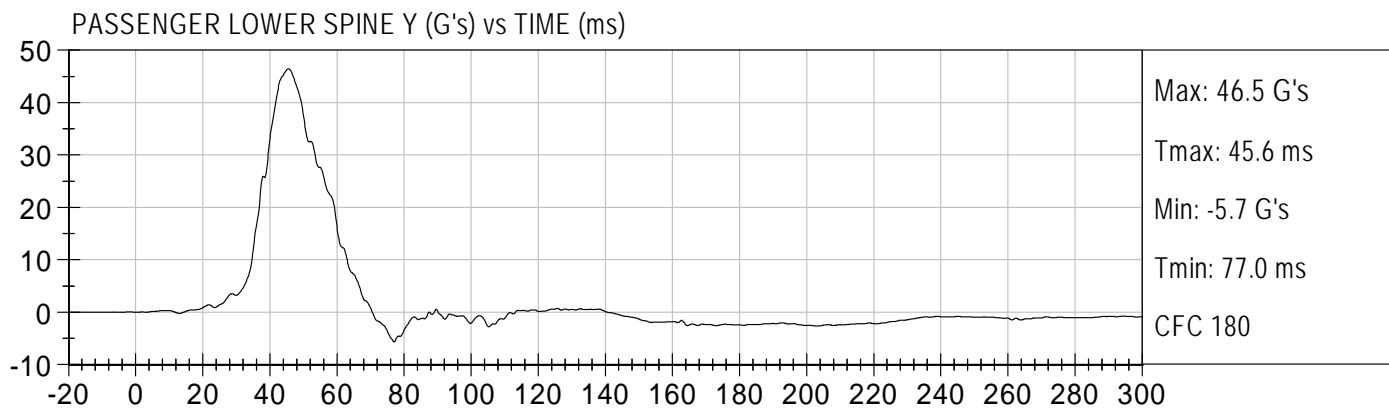
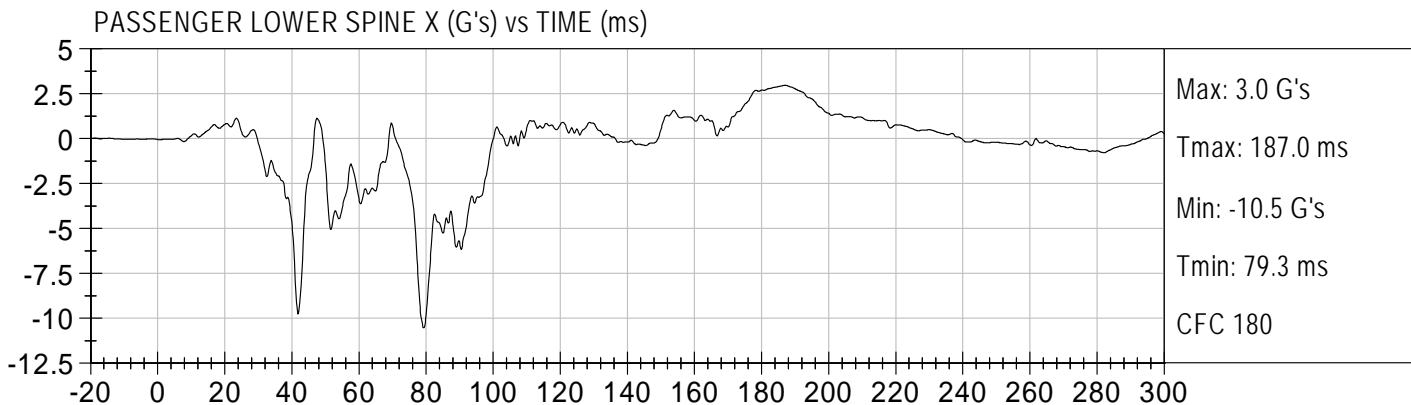


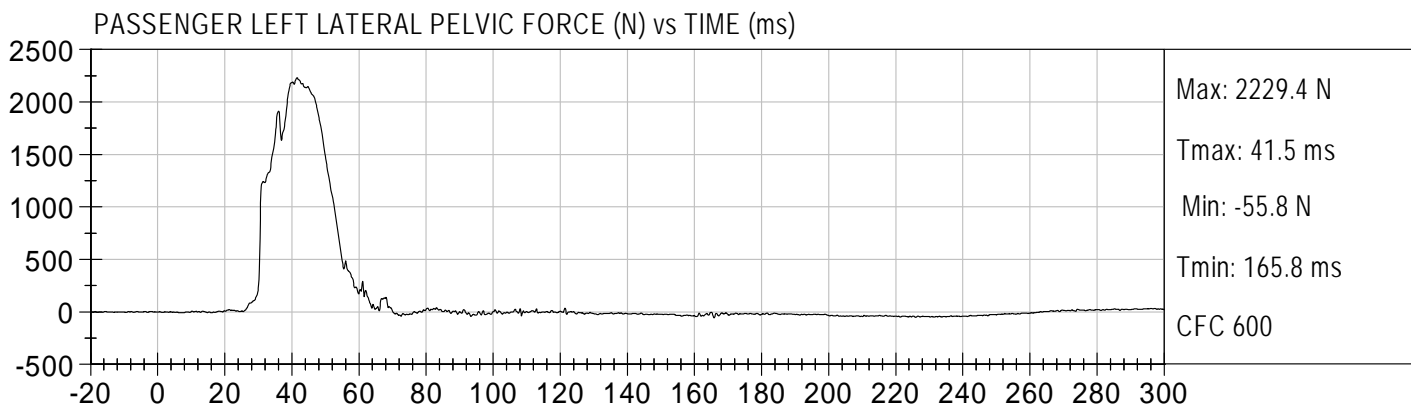
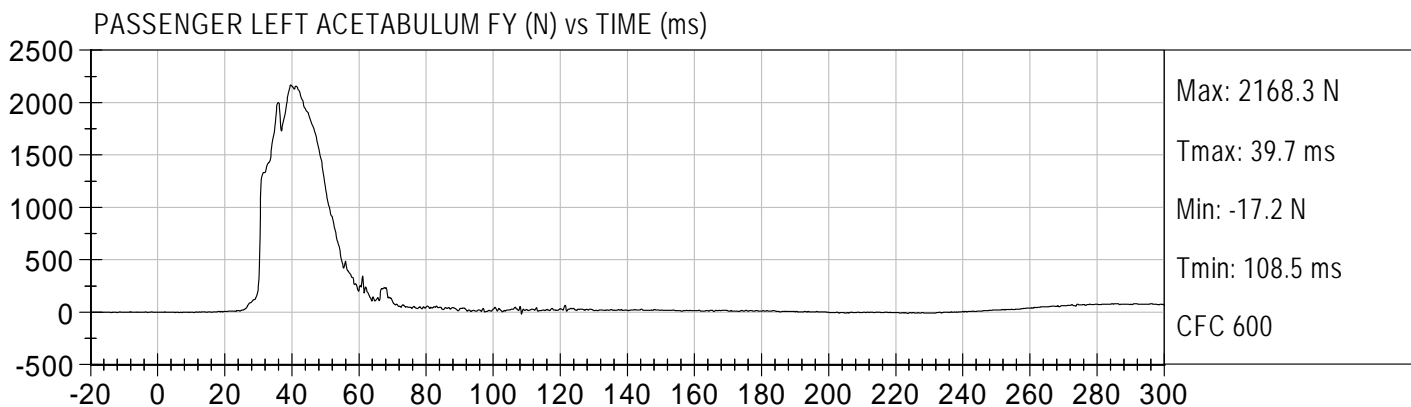
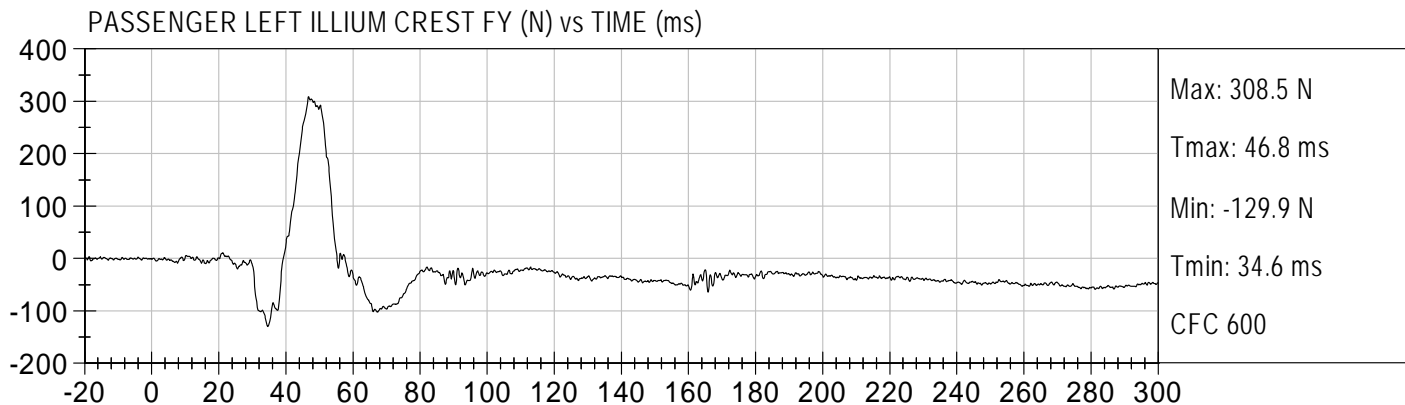












APPENDIX C

DUMMY CALIBRATION AND PERFORMANCE VERIFICATION DATA

MGA RESEARCH CORPORATION
HEAD DROP TEST
ES-2re DUMMY

ATD Serial No: 032

Test ID: D102931

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	44	Pass
Peak Resultant Acceleration	G's	125 to 155	153	Pass
Peak Lateral Acceleration	G's	+/- 15	5.8	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 15% of peak	Yes	Pass
Overall Test Results				Pass

Jessica Hall
 Laboratory Technician

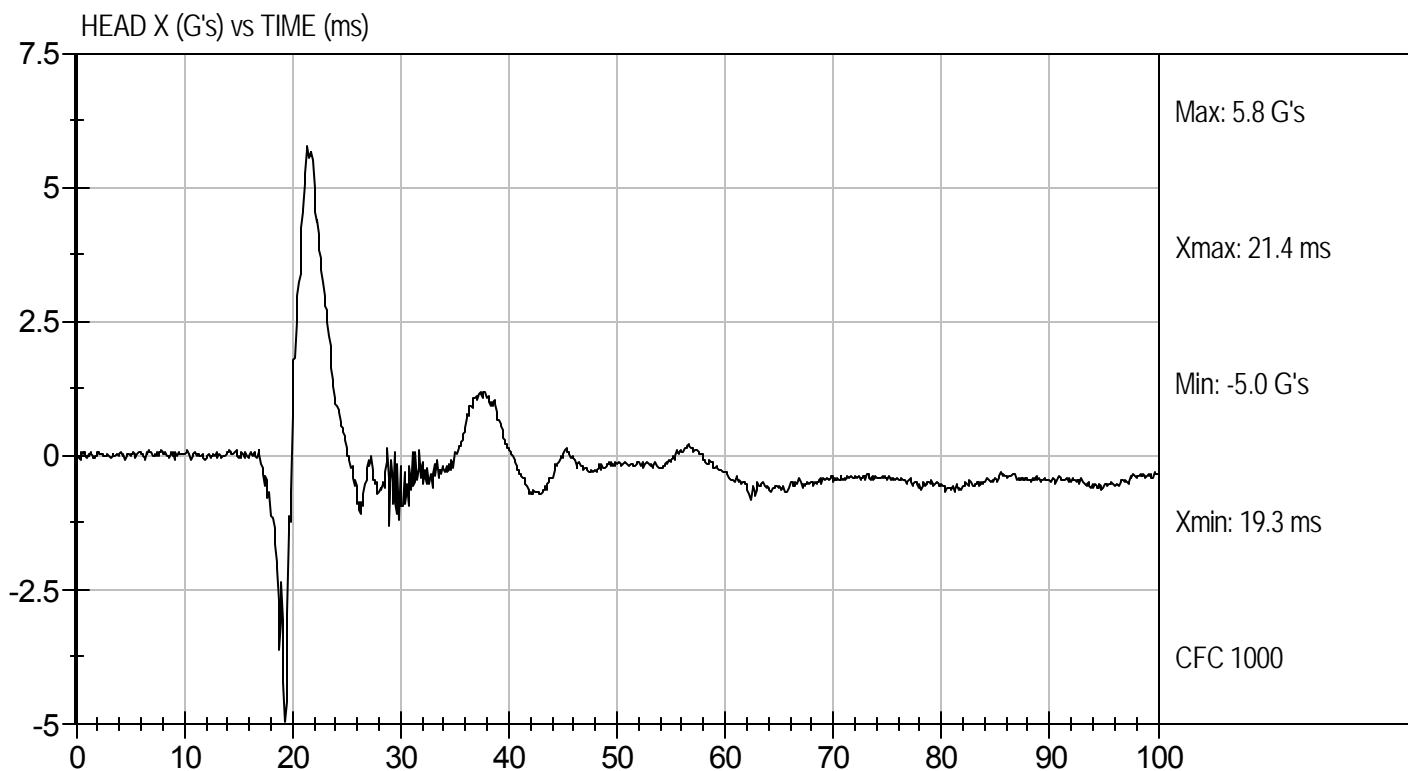
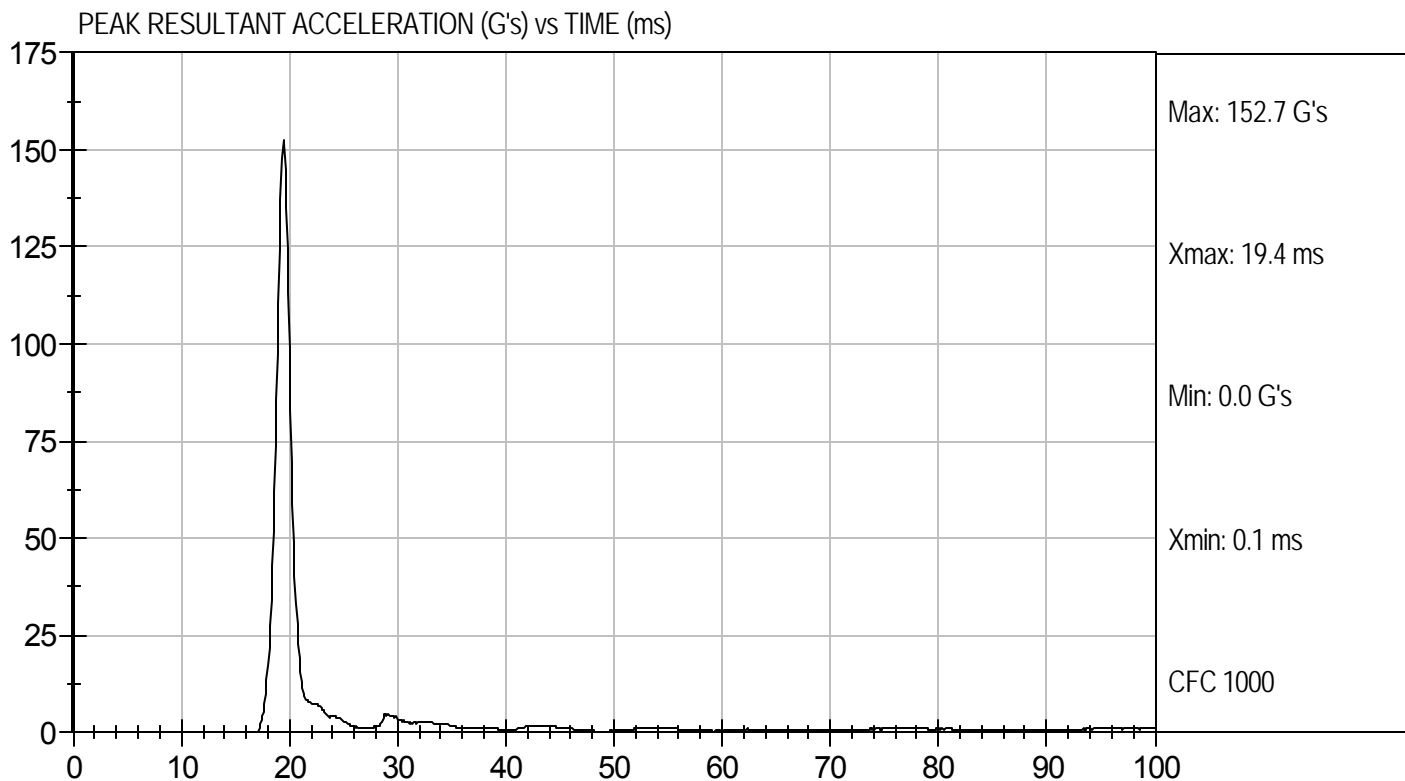
9/9/10
 Test Date

David Winkelbauer
 Approved By



Test Desc: Head Drop
Component ID: D102931

Test Date: 9/9/10
Velocity: 0 ft/s, 0 m/s



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

ATD Serial No: 032

Test I.D.: D102932

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	18.0 to 22.0	21.9	Pass
Laboratory Relative Humidity		%	10 to 70	43	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	-0.32	Pass
	14 ms	m/s	-3.20 to -3.70	-3.38	Pass
Maximum Flexion Angle		deg	49.0 to 59.0	53.9	Pass
Time of Maximum Flexion Angle		ms	54.0 to 66.0	58.7	Pass
Head Rotation Decay Time to 0 degree		ms	53.0 to 88.0	57.7	Pass
Overall Test Results					Pass

Jessica Hall
Laboratory Technician

9/9/10
Test Date

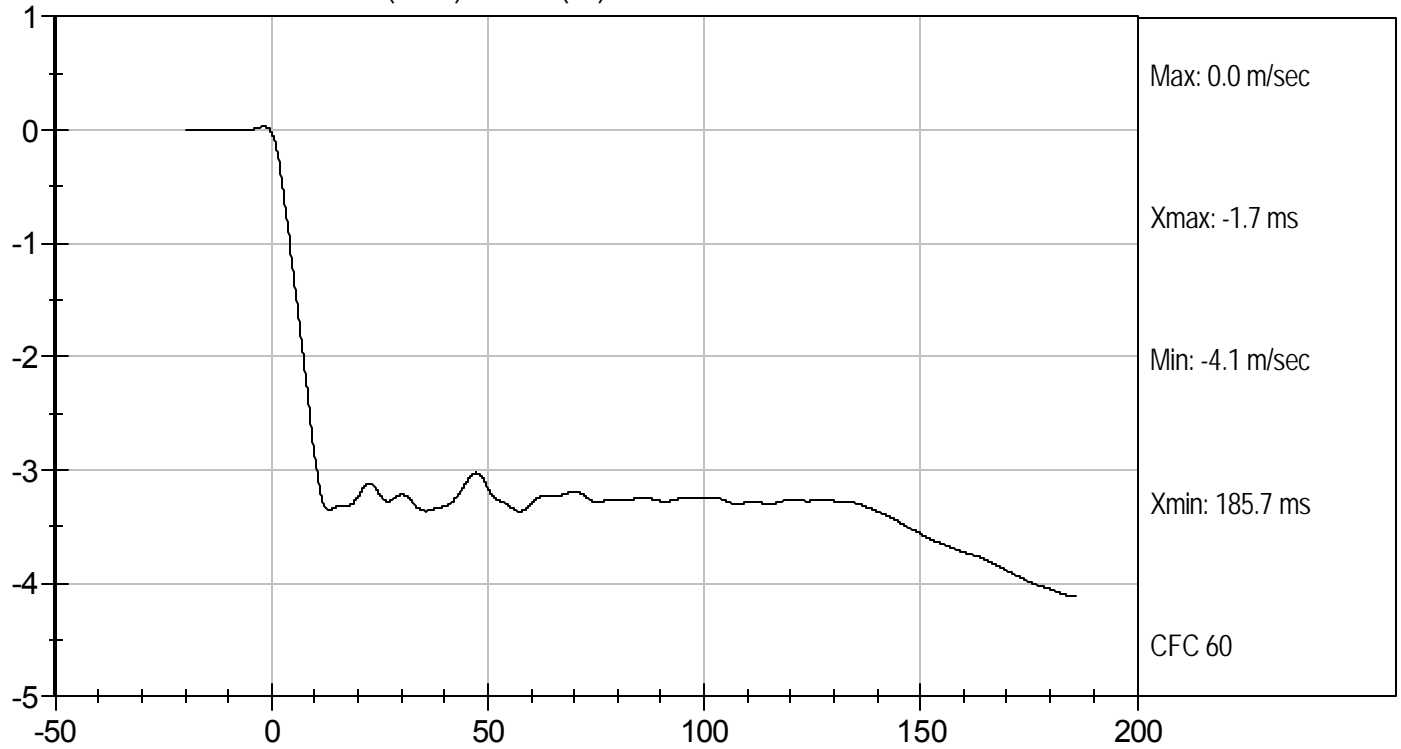
David Winkelbauer
Approved By



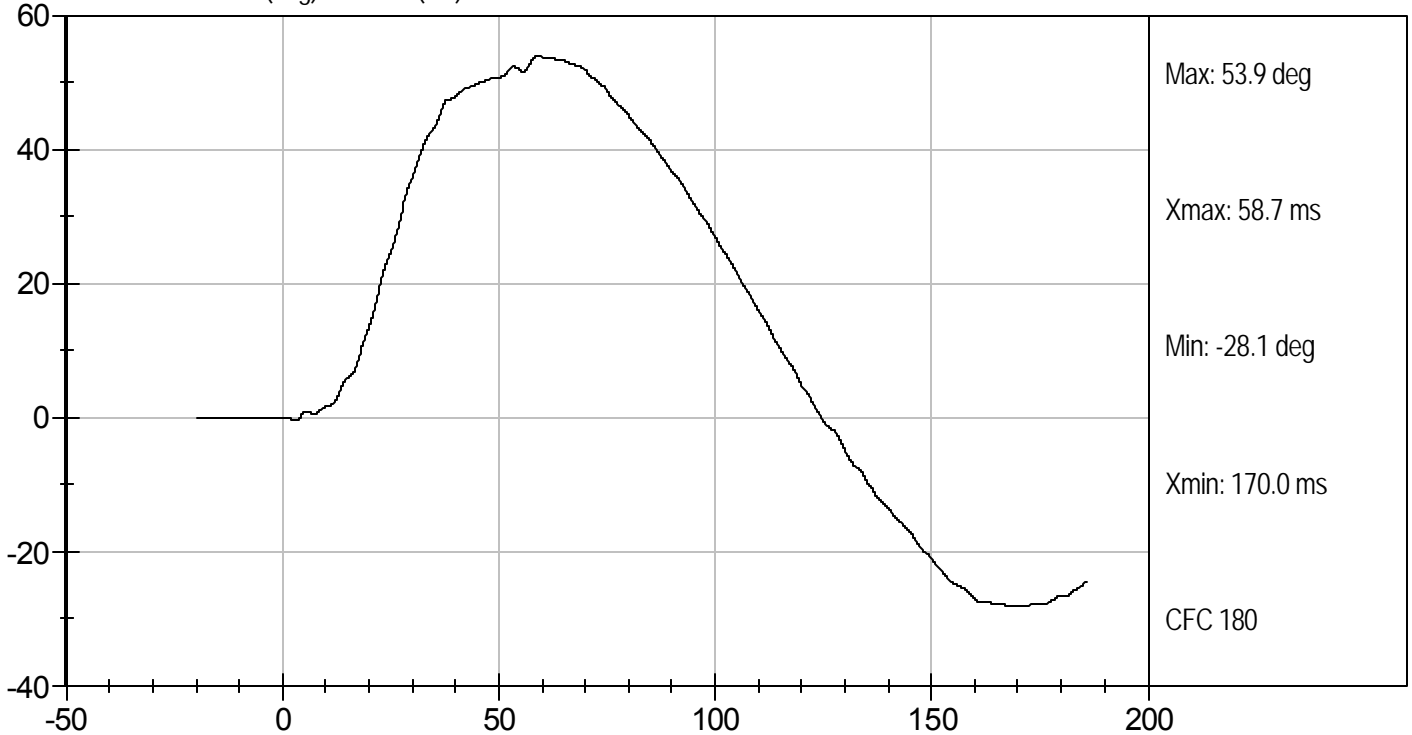
Test Desc: Neck Bending
Component ID: D102932

Test Date: 9/9/10
Velocity: 11.41 ft/s, 3.48 m/s

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



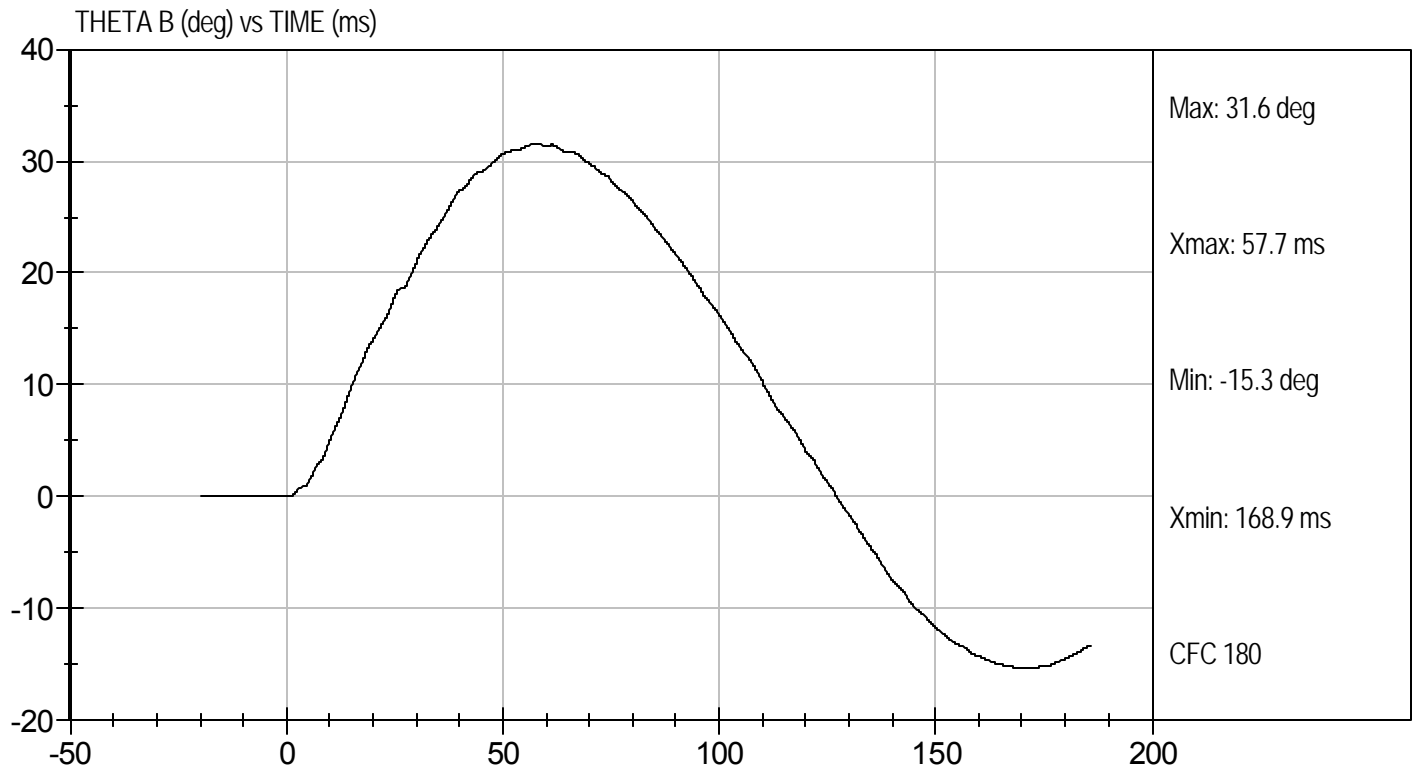
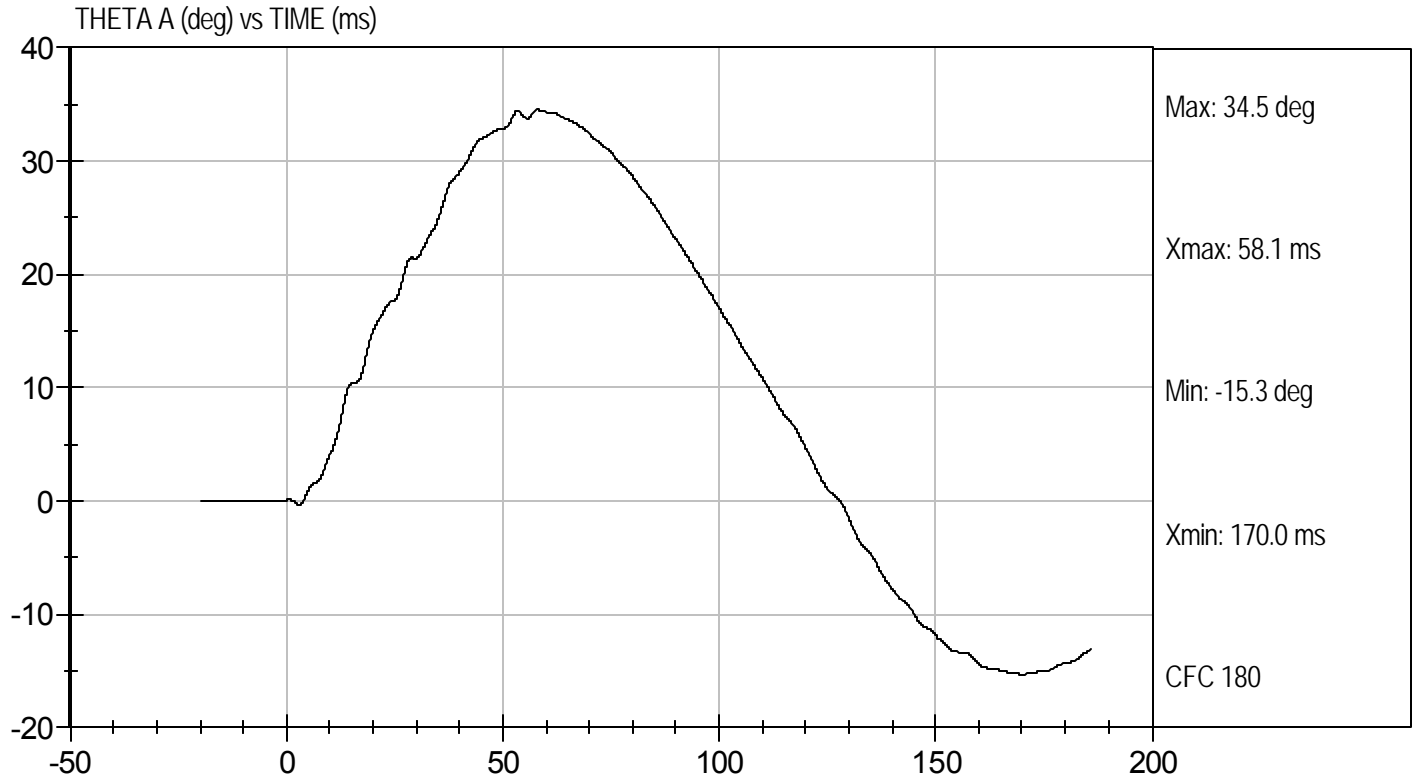
FLEXION ANGLE (deg) vs TIME (ms)





Test Desc: Neck Bending
Component ID: D102932

Test Date: 9/9/10
Velocity: 11.41 ft/s, 3.48 m/s



MGA RESEARCH CORPORATION
SHOULDER IMPACT TEST
ES-2re DUMMY


ATD Serial No: 032

Test I.D: D102933

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	45	Pass
Pendulum Speed	m/s	4.2 to 4.4	4.3	Pass
Peak Shoulder Acceleration	G's	7.5 to 10.5	9.7	Pass
Time of Peak Shoulder Acceleration	ms	NA	13.3	Pass
Overall Test Results				Pass


 Laboratory Technician

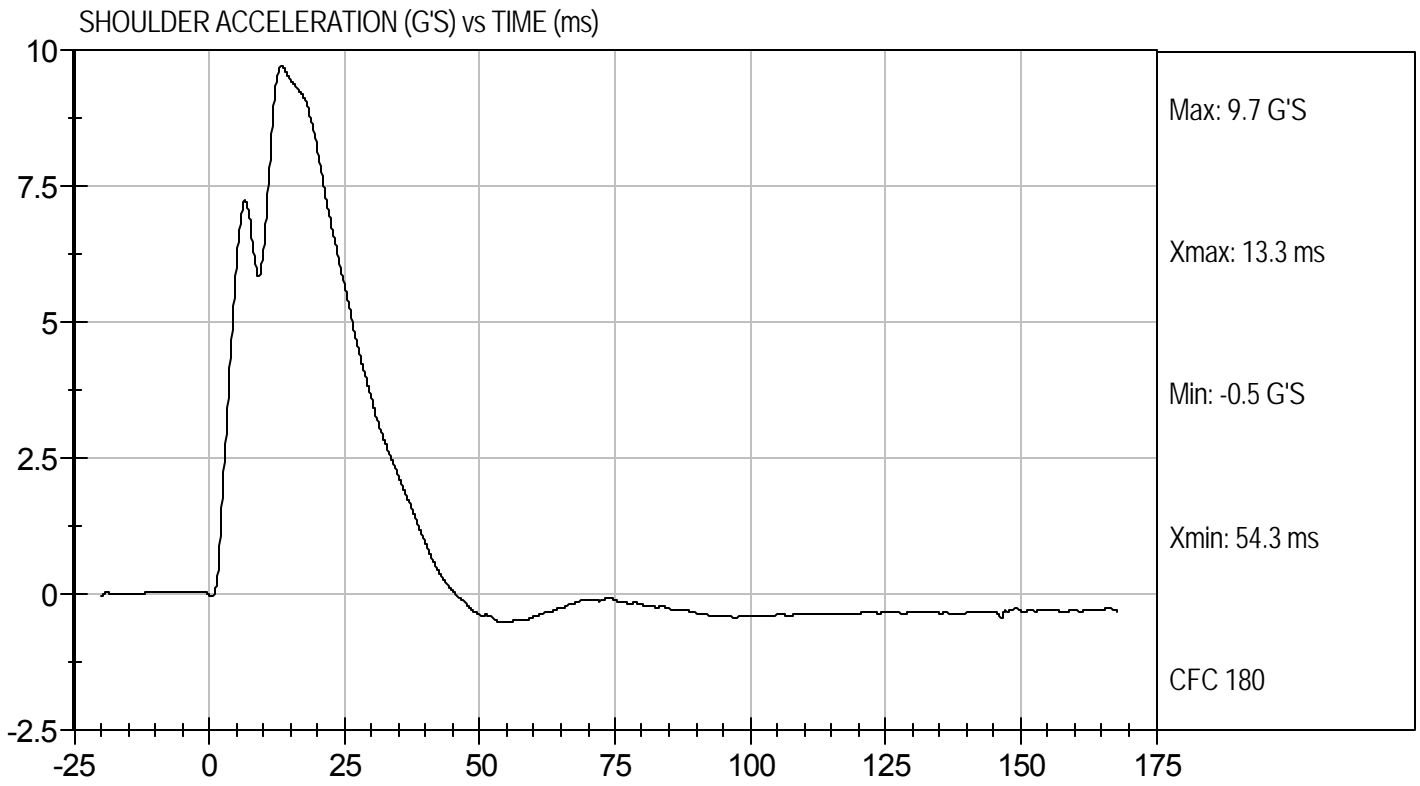
9/8/10
 Test Date


 Approved By



Test Desc: Shoulder Impact
Component ID: D102933

Test Date: 9/8/10
Velocity: 14.00 ft/s, 4.3 m/s



MGA RESEARCH CORPORATION

UPPER RIB TEST

ES-2re DUMMY

ATD Serial No: 032

Test I.D: D102934

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	44	Pass
Displacement at 3 m/s	mm	36.0 to 40.0	37.1	Pass
Displacement at 4 m/s	mm	46.0 to 51.0	48.0	Pass
Overall Test Results				Pass

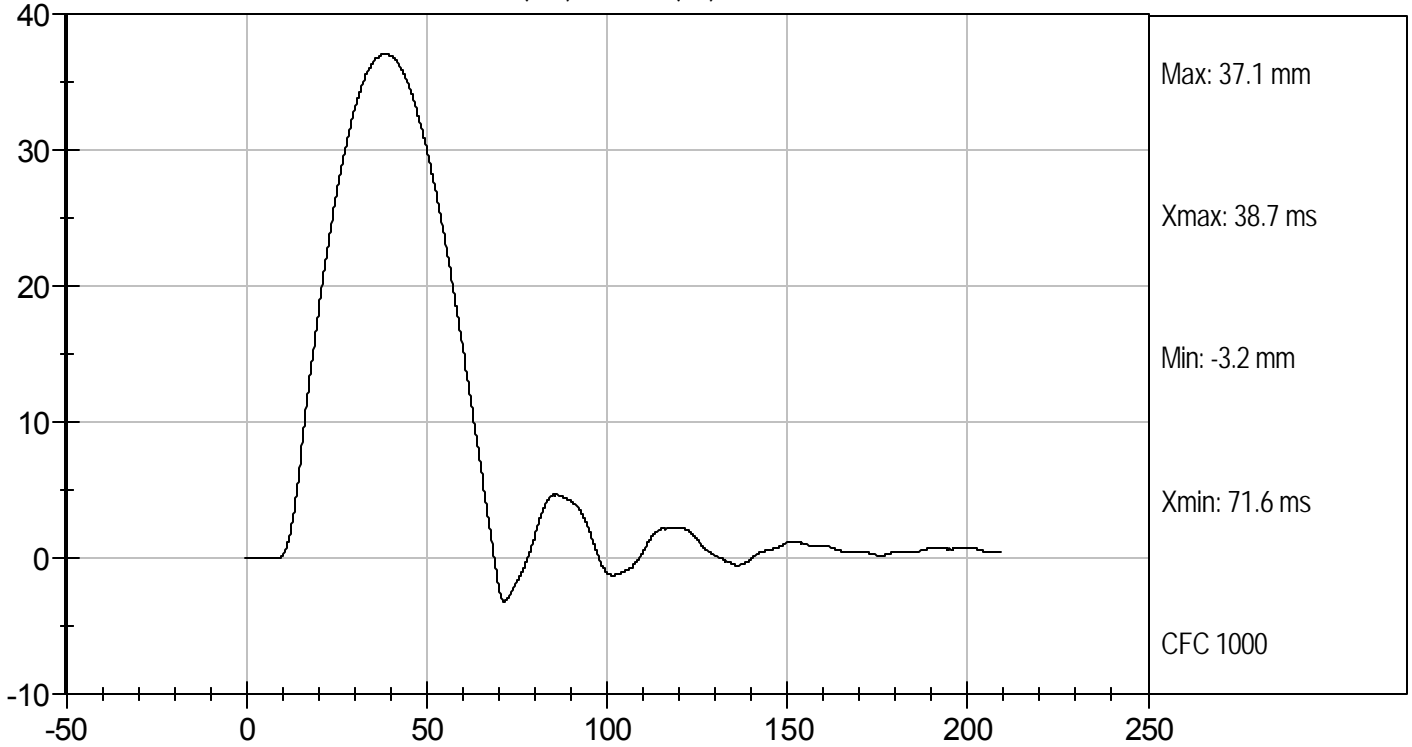
Jessica Gall
Laboratory Technician

9/9/10
Test Date

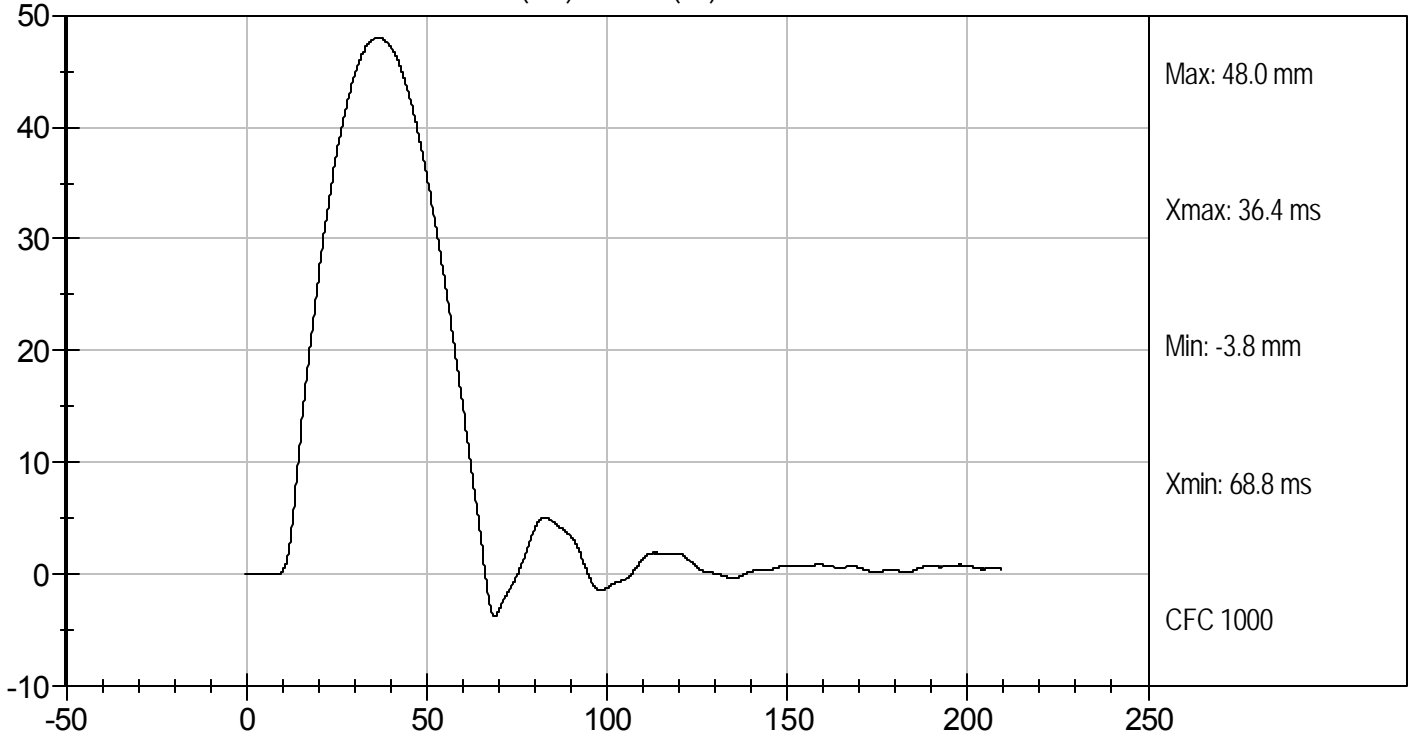
David Winkelbauer
Approved By



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: D102935

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	44	Pass
Displacement at 3 m/s	mm	36.0 to 40.0	37.8	Pass
Displacement at 4 m/s	mm	46.0 to 51.0	47.9	Pass
Overall Test Results				Pass

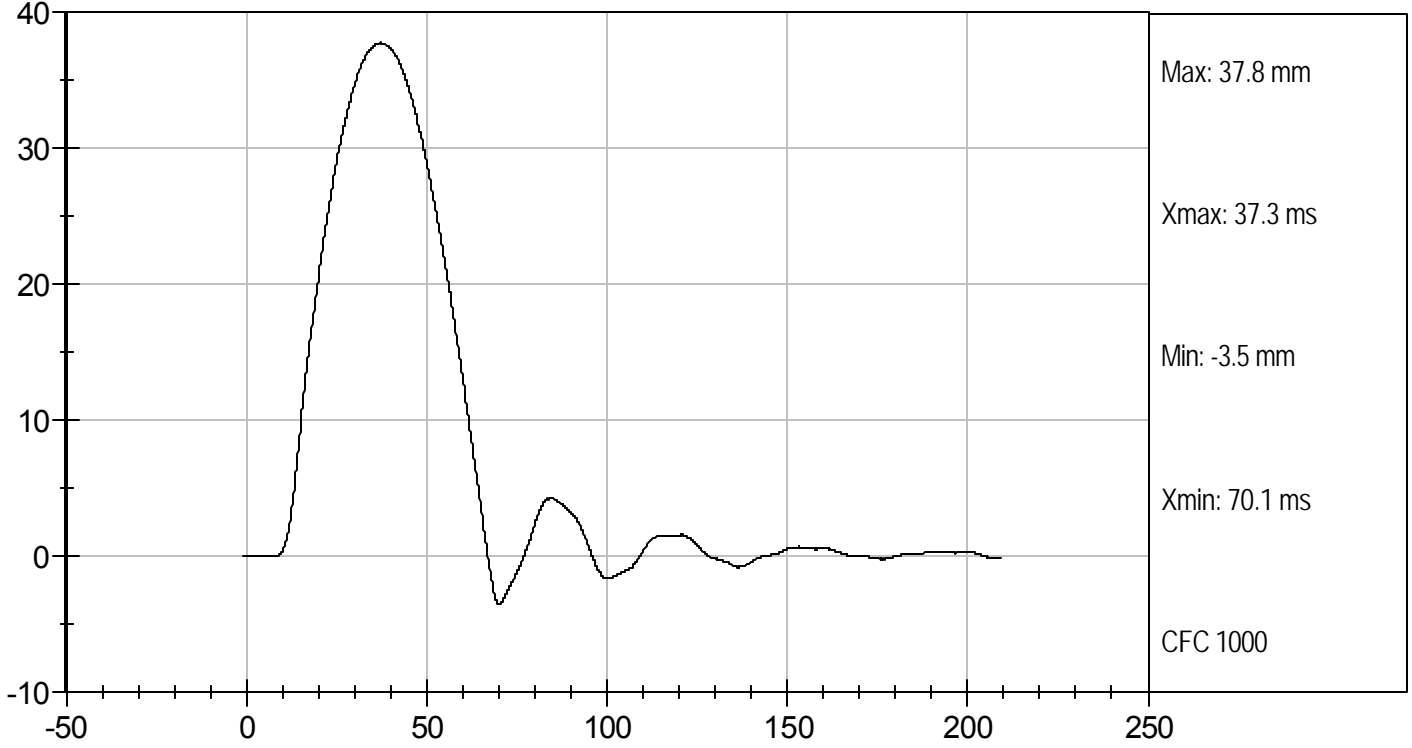
Jessica Hall
Laboratory Technician

9/9/10
Test Date

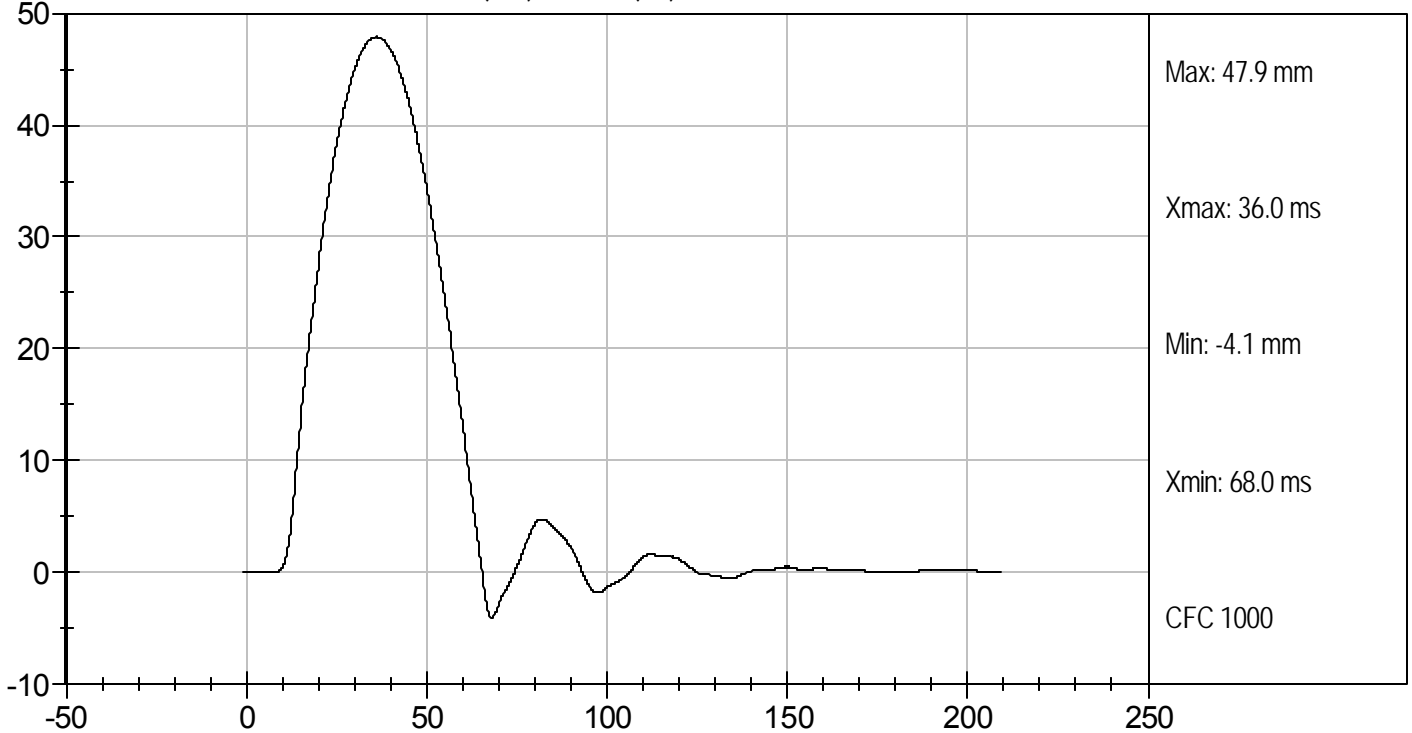
David Winkelbauer
Approved By



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: D102936

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	46	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	48.3	Pass
Overall Test Results				Pass

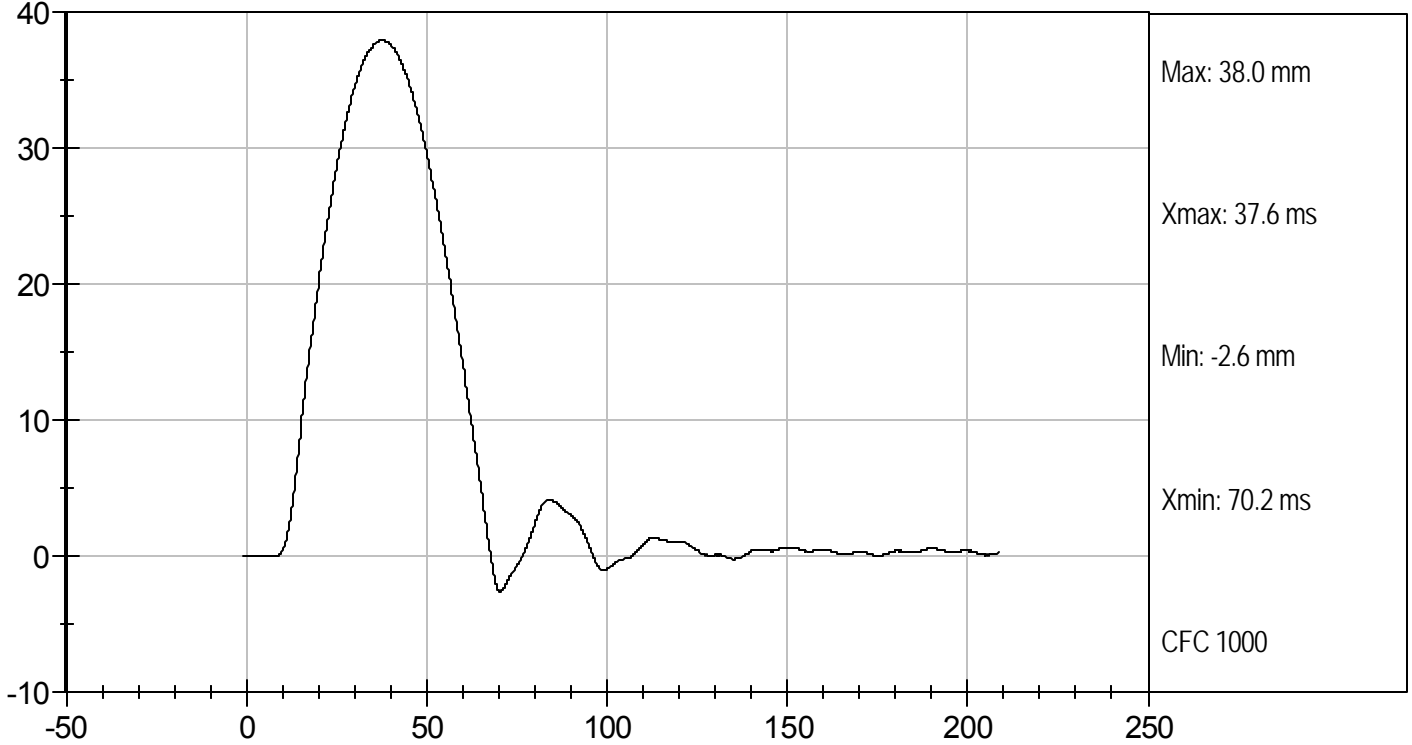

Laboratory Technician

9/9/10
Test Date

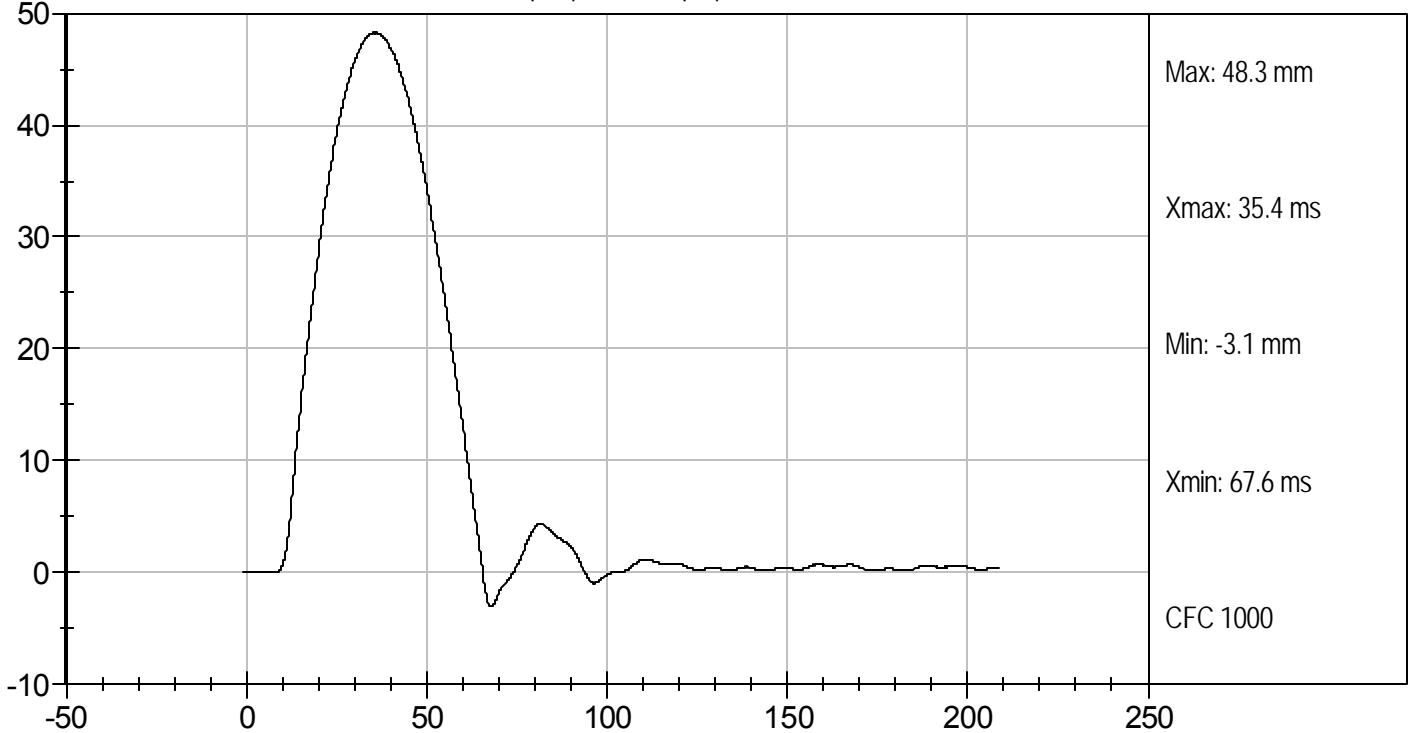

Approved By



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



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



MGA RESEARCH CORPORATION

ABDOMEN TEST

ES-2re DUMMY

ATD Serial No: 032

Test I.D: D102937

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	45	Pass
Probe Speed	m/s	3.90 to 4.10	4.10	Pass
Maximum Impact Force	kN	4.00 to 4.80	4.31	Pass
Time of Maximum Impact Force	ms	10.60 to 13.00	11.60	Pass
Maximum Total Abdomen Force	kN	2.20 to 2.70	2.44	Pass
Time of Maximum Abdomen Force	ms	10.00 to 12.30	11.20	Pass
Overall Test Results				Pass

Jessica Gall
Laboratory Technician

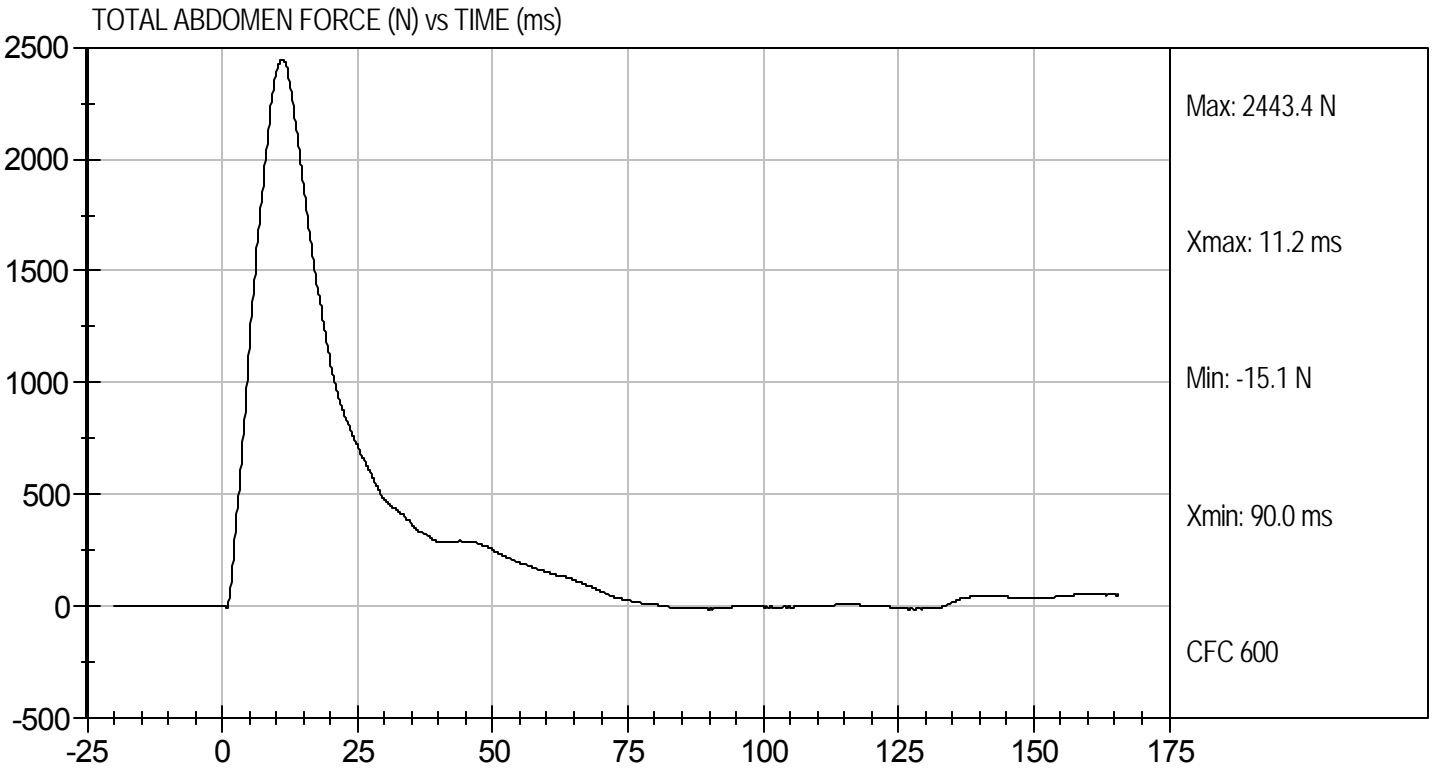
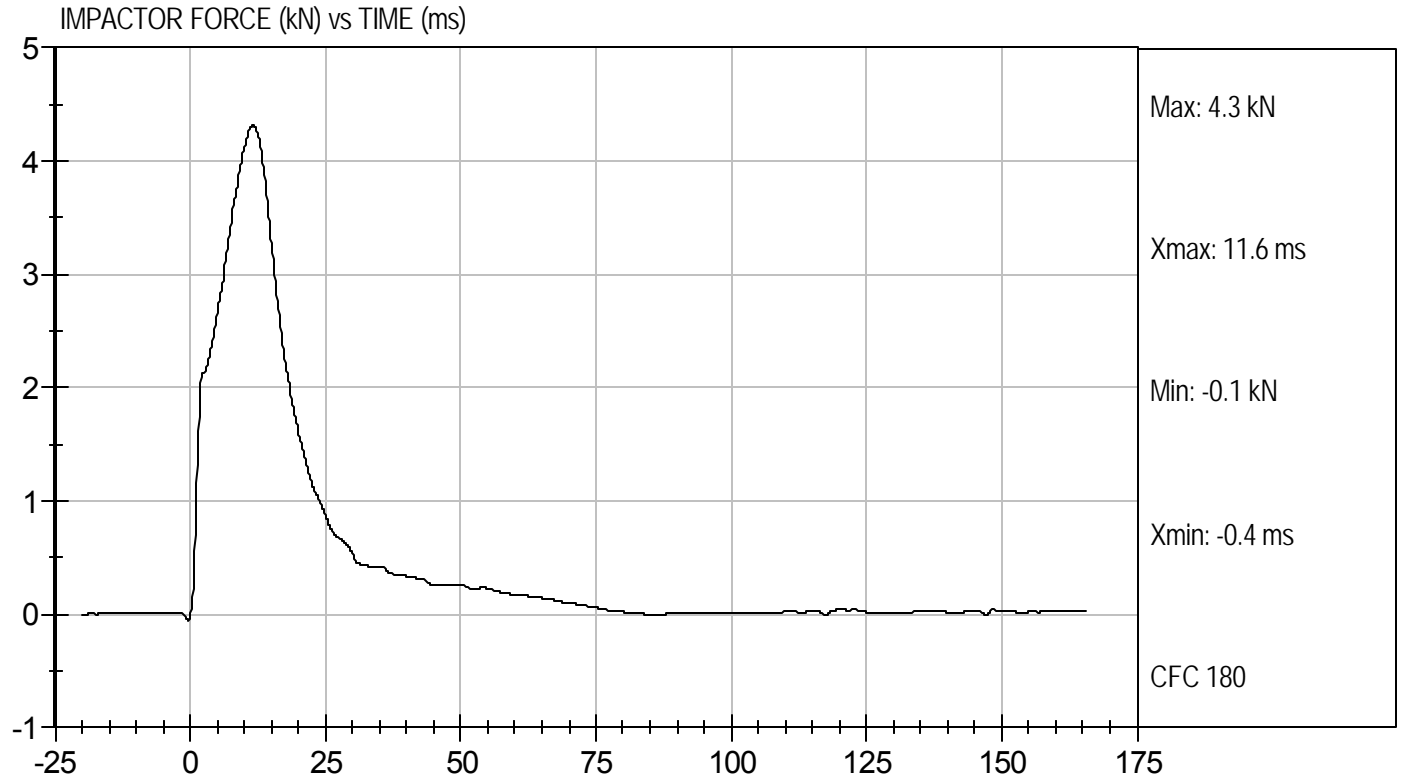
9/8/10
Test Date

David Winkelbauer
Approved By



Test Desc: Abdomen Impact
Component ID: D102937

Test Date: 9/8/10
Velocity: 13.44 ft/s, 4.1 m/s



**MGA RESEARCH CORPORATION
LUMBAR SPINE TEST
ES-2re DUMMY**

ATD Serial No: 032

Test I.D.: D102938

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	6.05	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	-0.42	Pass
	27 ms	m/s	-6.50 to -5.80	-5.97	Pass
	30 ms	m/s	>= -6.5	-5.91	Pass
Maximum Flexion Angle		deg	45.0 to 55.0	47.6	Pass
Time of Maximum Flexion Angle		ms	39.0 to 53.0	39.8	Pass
Headform Rotation Decay to Initial Position		ms	37 to 57	40	Pass
Overall Results					Pass

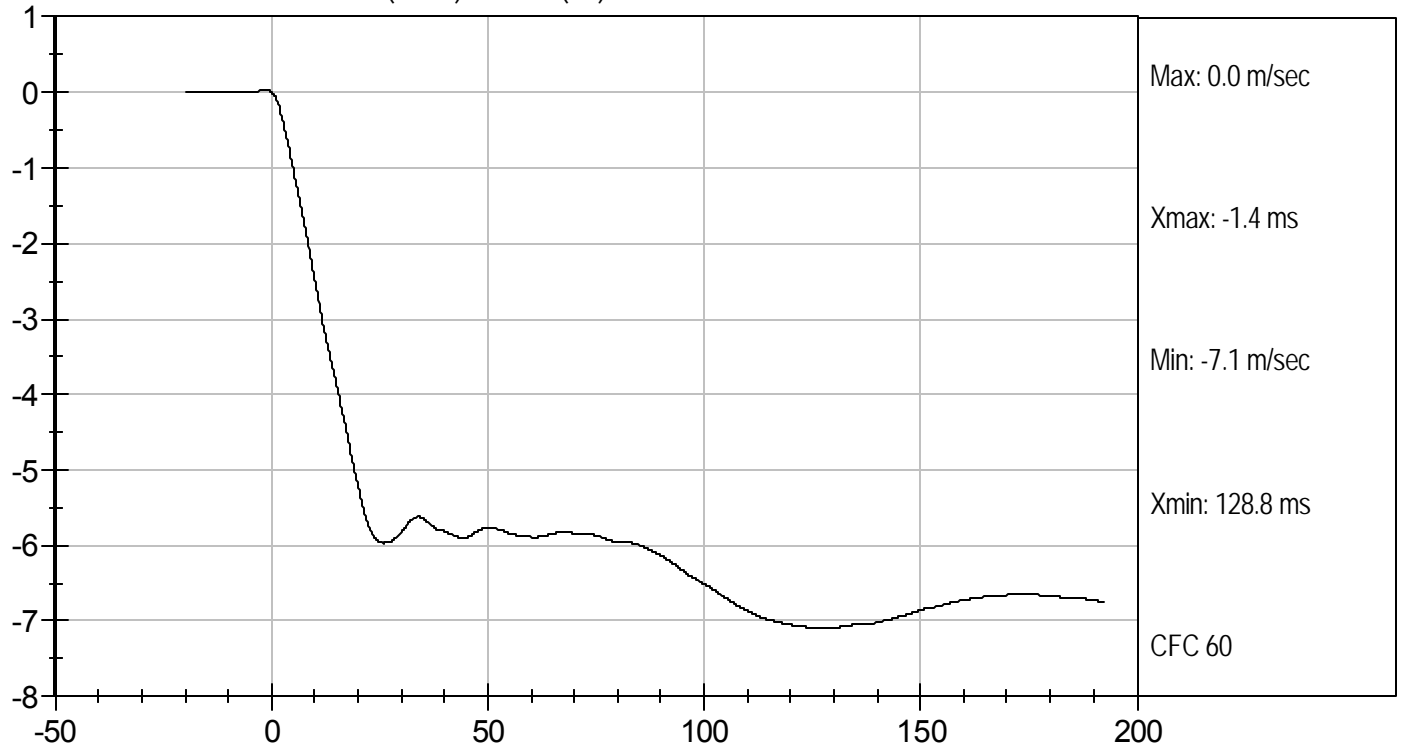
Jessica Hall
Laboratory Technician

9/9/10
Test Date

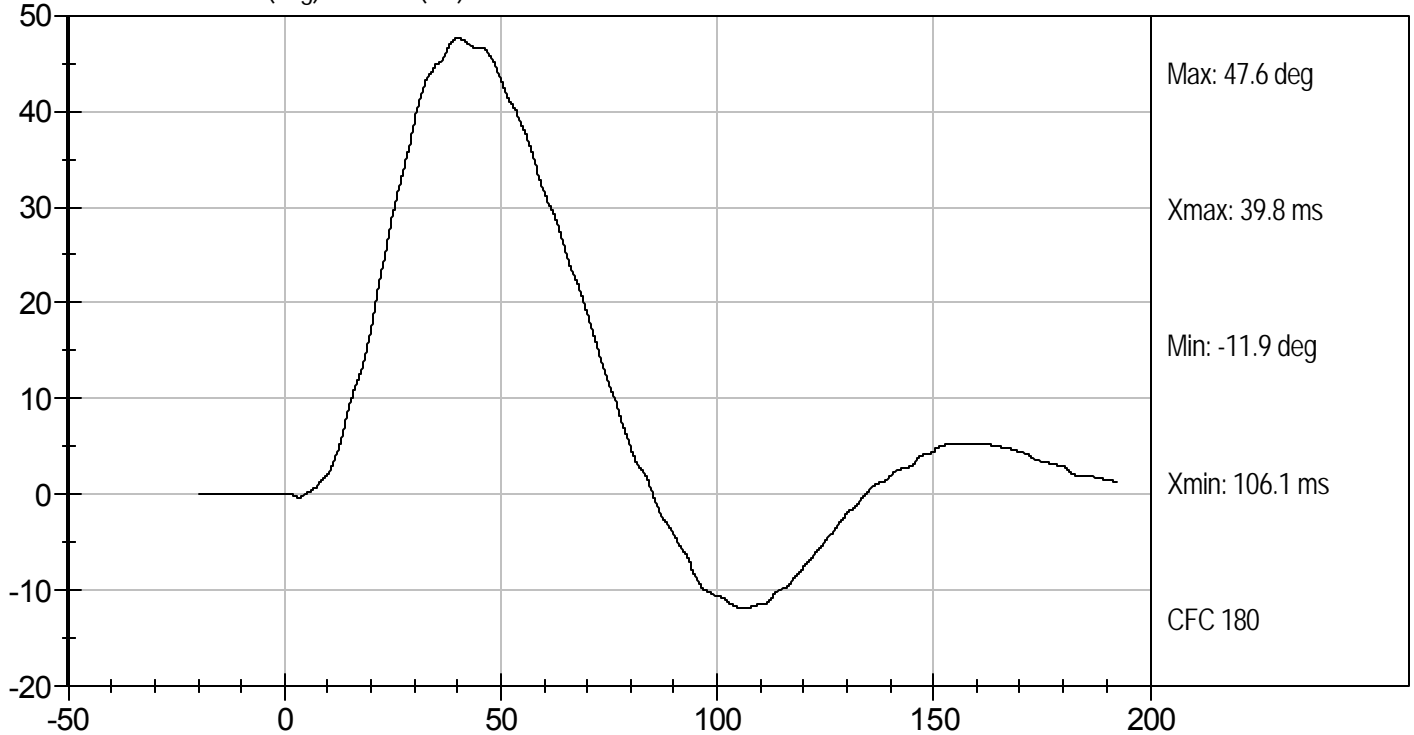
David Winkelbauer
Approved By



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



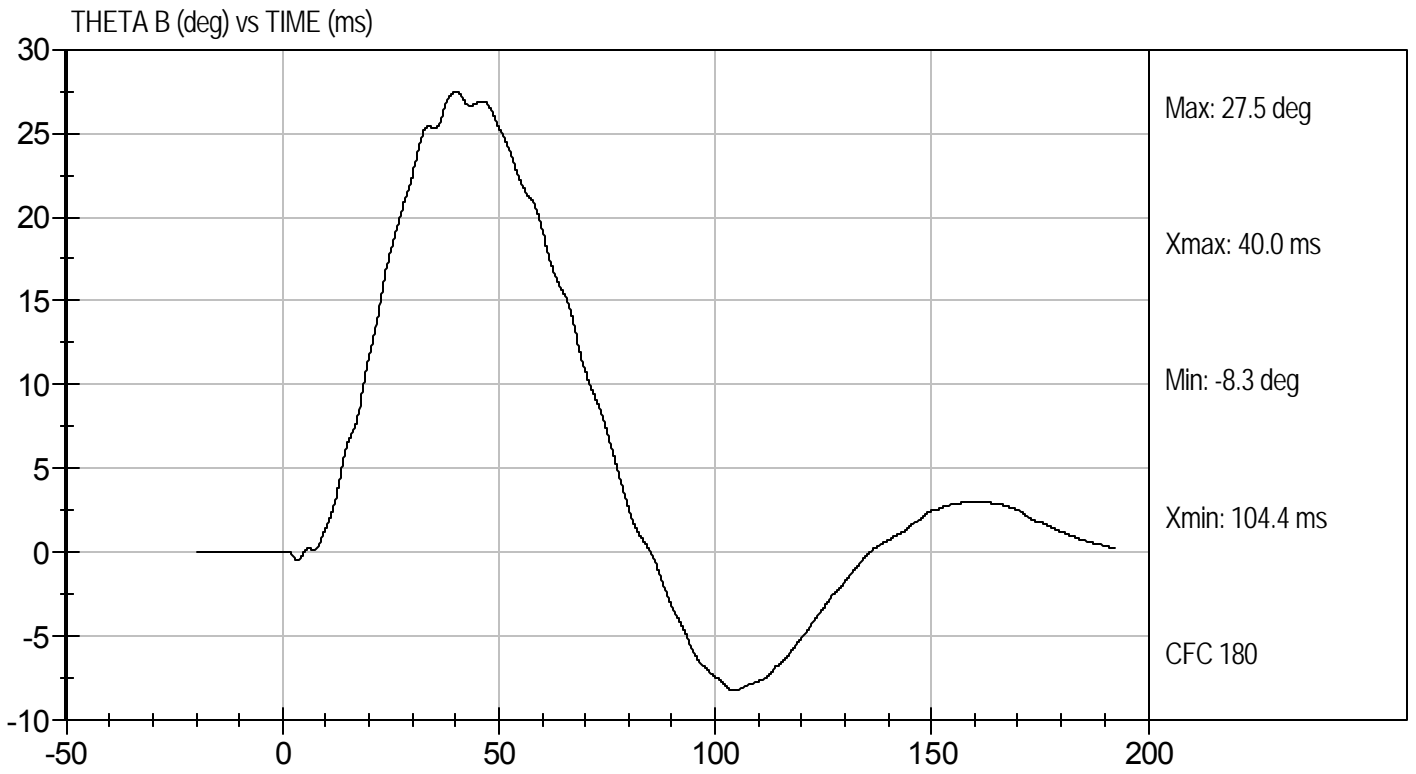
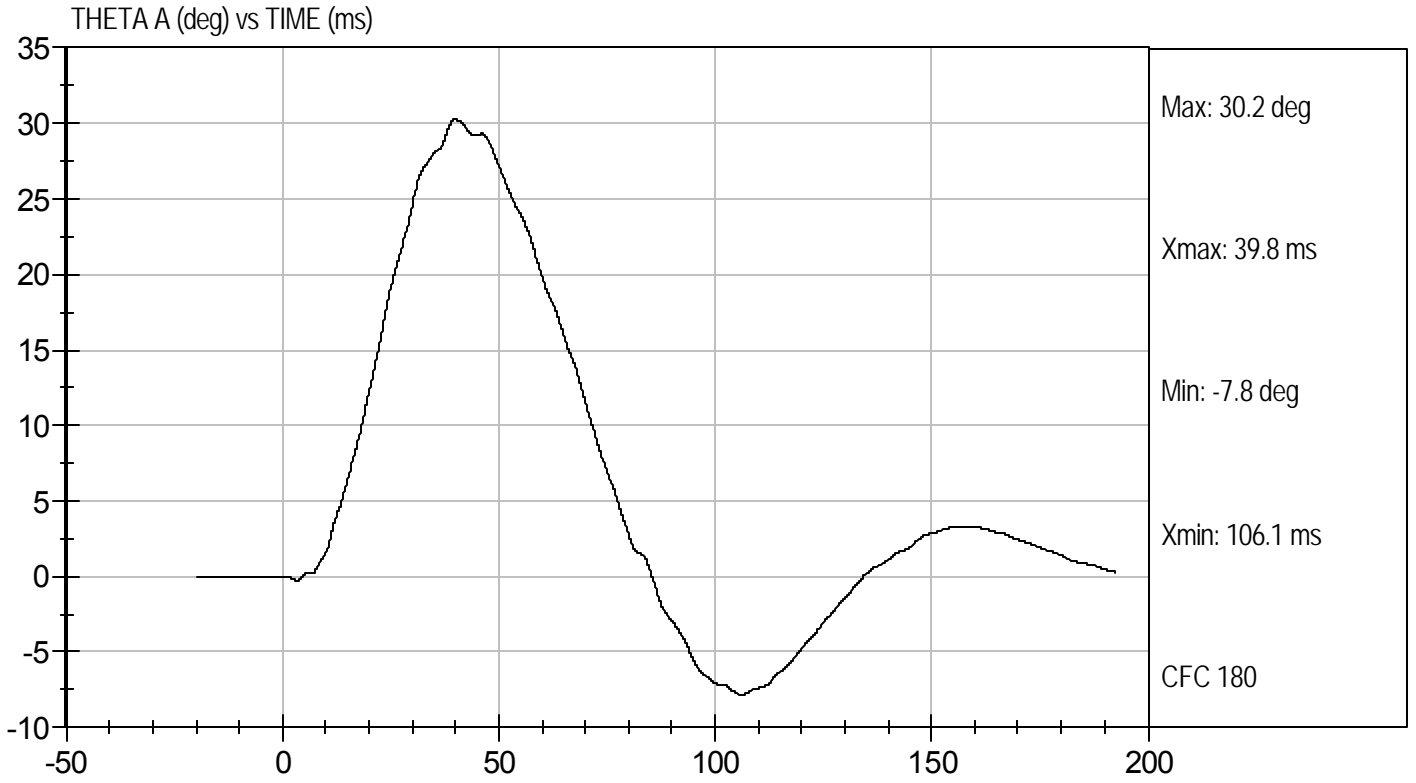
FLEXION ANGLE (deg) vs TIME (ms)





Test Desc: Lumbar Bending
Component ID: D102938

Test Date: 9/9/10
Velocity: 19.84 ft/s, 6.05 m/s



MGA RESEARCH CORPORATION

PELVIS TEST

ES-2re DUMMY

ATD Serial No: 032

Test I.D: D102939

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	45	Pass
Probe Speed	m/s	4.20 to 4.40	4.38	Pass
Maximum Impactor Force	kN	4.70 to 5.40	4.88	Pass
Time of Maximum Impactor Force	ms	11.80 to 16.10	13.70	Pass
Maximum Pubic Force	kN	1.23 to 1.59	1.41	Pass
Time of Maximum Pubic Force	ms	12.20 to 17.00	14.00	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

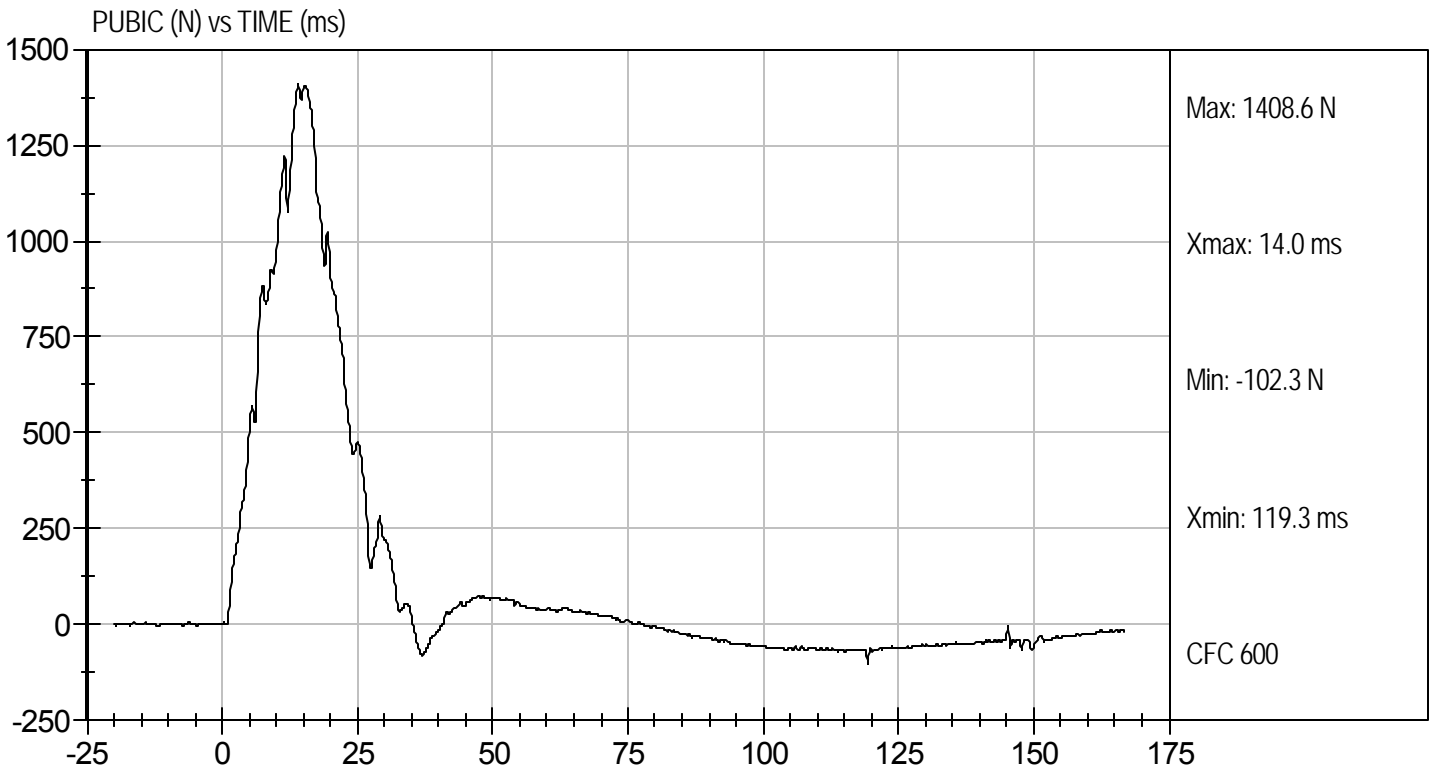
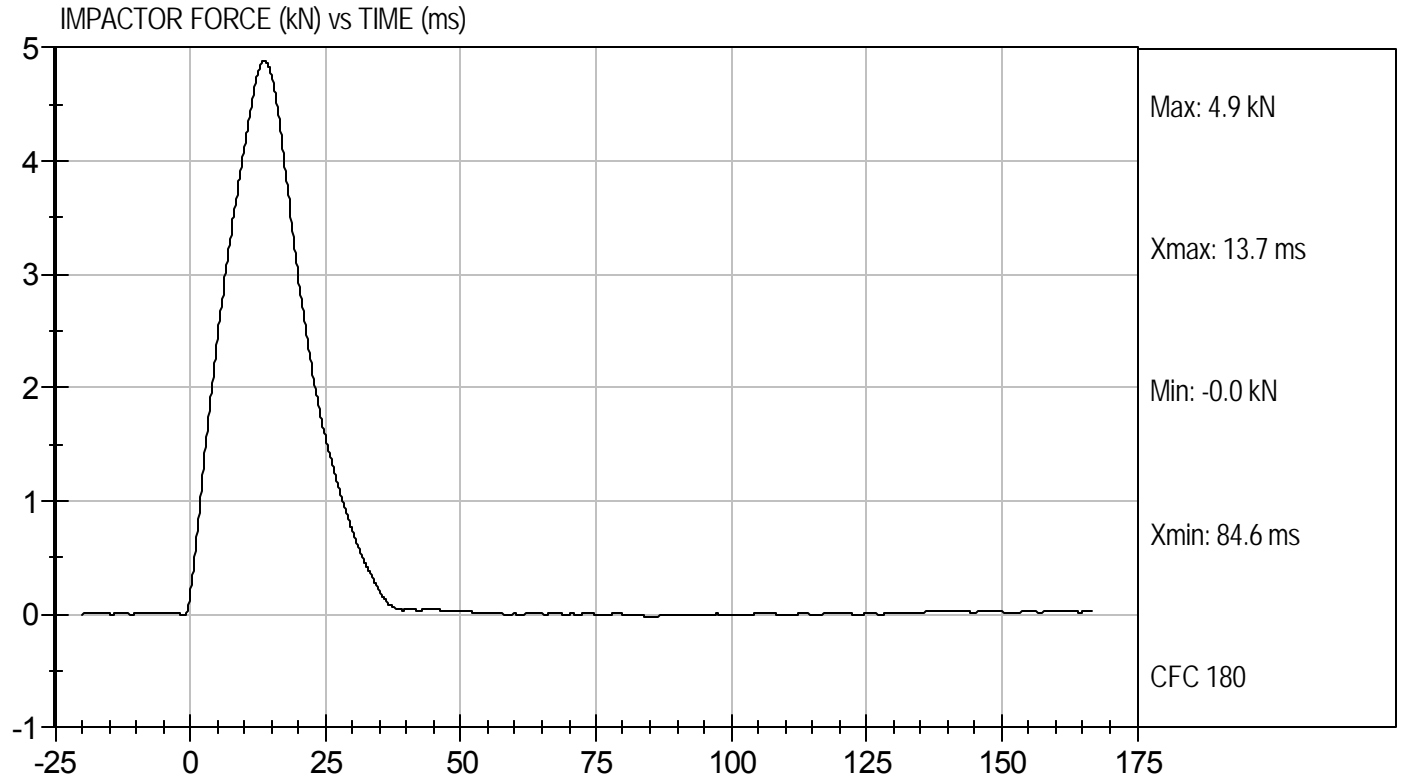
9/8/10
Test Date

David Winkelbauer
Approved By



Test Desc: Pelvis Impact
Component ID: D102939

Test Date: 9/8/10
Velocity: 14.36 ft/s, 4.38 m/s



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

ATD Serial No: 032

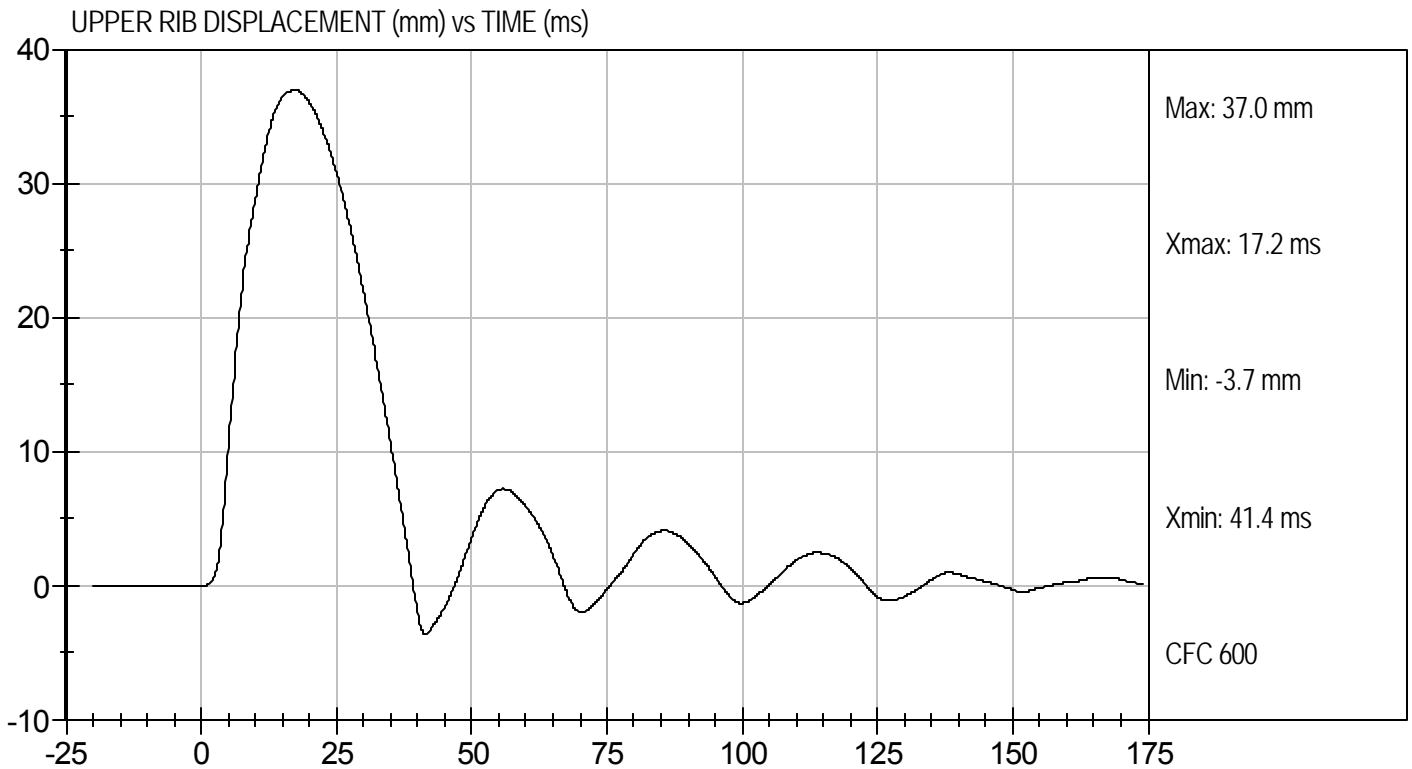
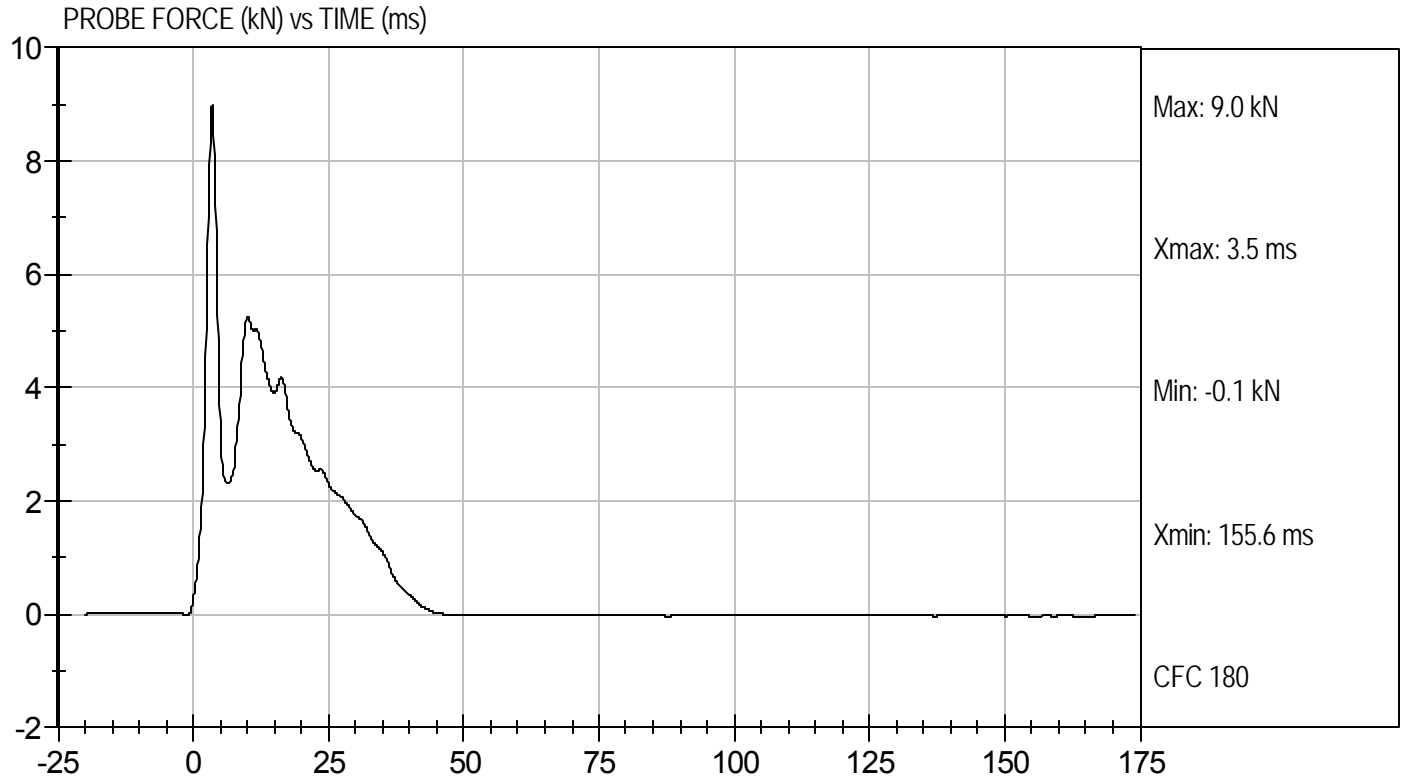
Test I.D: D102930

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.2	Pass
Humidity	%	10 to 70	45	Pass
Probe Speed	m/s	5.40 to 5.60	5.52	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	37.0	Pass
Middle Rib Displacement	mm	37.0 to 45.0	39.3	Pass
Lower Rib Displacement	mm	37.0 to 44.0	39.0	Pass
Overall Test Results				Pass

Jessica Gall
 Laboratory Technician

9/8/10
 Test Date

David Winkelbauer
 Approved By

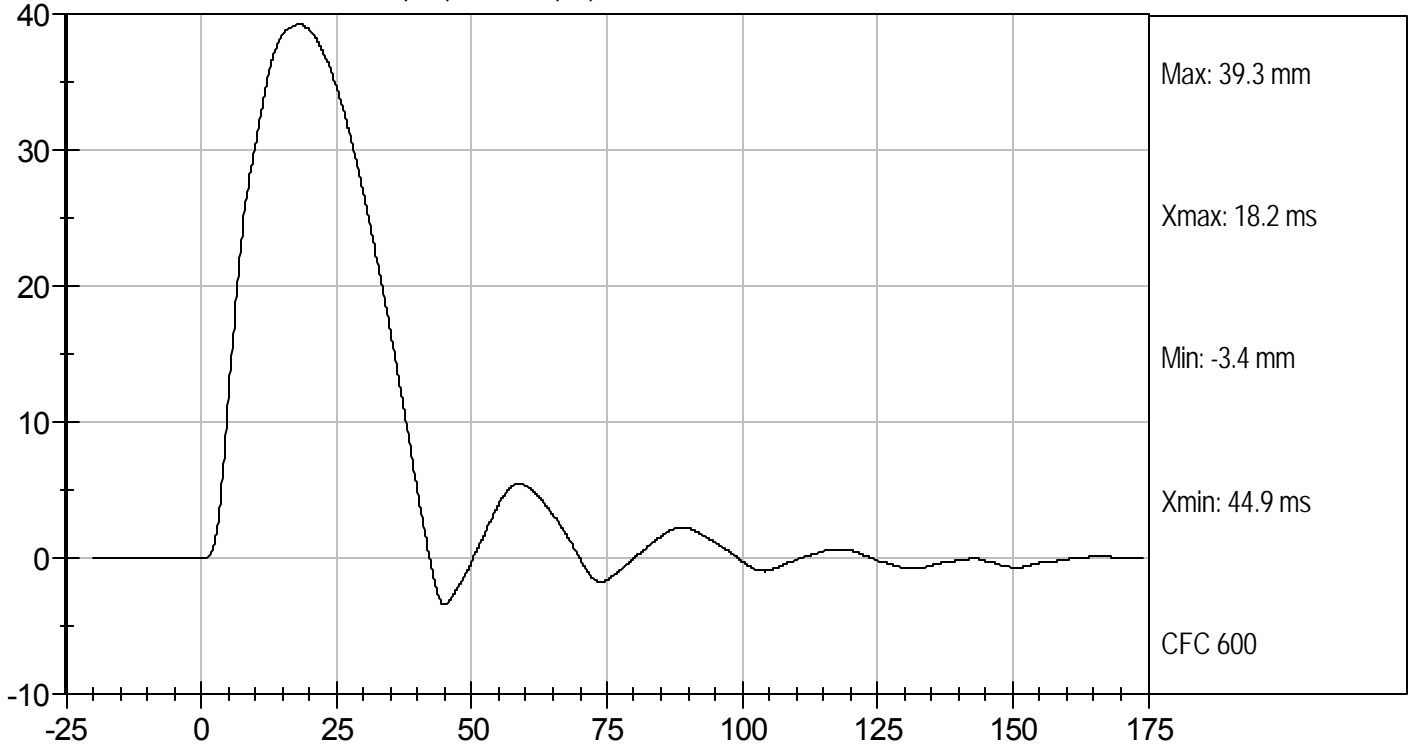




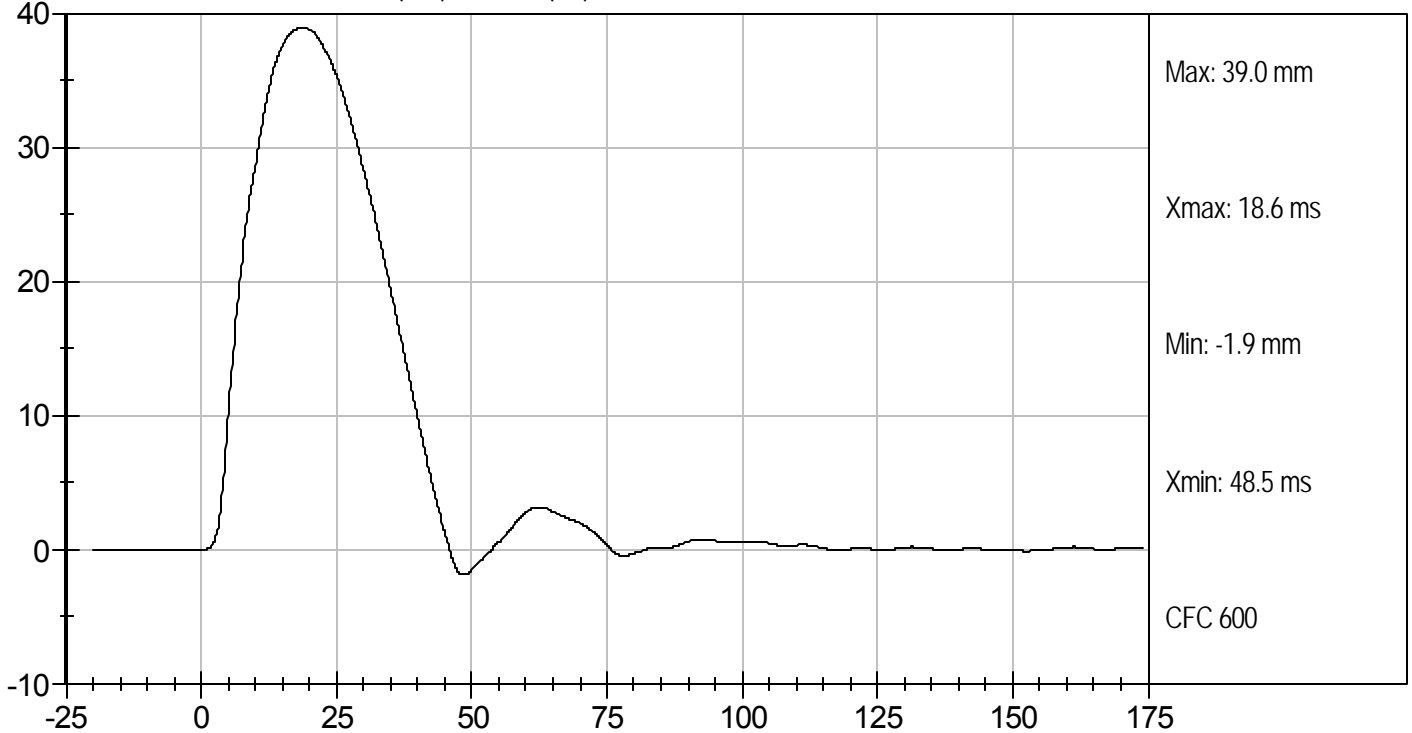
Test Desc: Thorax Impact
Component ID: D102930

Test Date: 9/8/10
Velocity: 18.1 ft/s, 5.52 m/s

MIDDLE RIB DISPLACEMENT (mm) vs TIME (ms)



LOWER RIB DISPLACEMENT (mm) vs TIME (ms)



MGA RESEARCH CORPORATION
HEAD DROP TEST
ES-2re DUMMY

ATD Serial No: 032

Test ID: D103121

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	20.9	Pass
Laboratory Relative Humidity	%	10 to 70	54	Pass
Peak Resultant Acceleration	G's	125 to 155	140	Pass
Peak Lateral Acceleration	G's	+/- 15	6.5	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 15% of peak	Yes	Pass
Overall Test Results				Pass

Jessica Gall
 Laboratory Technician

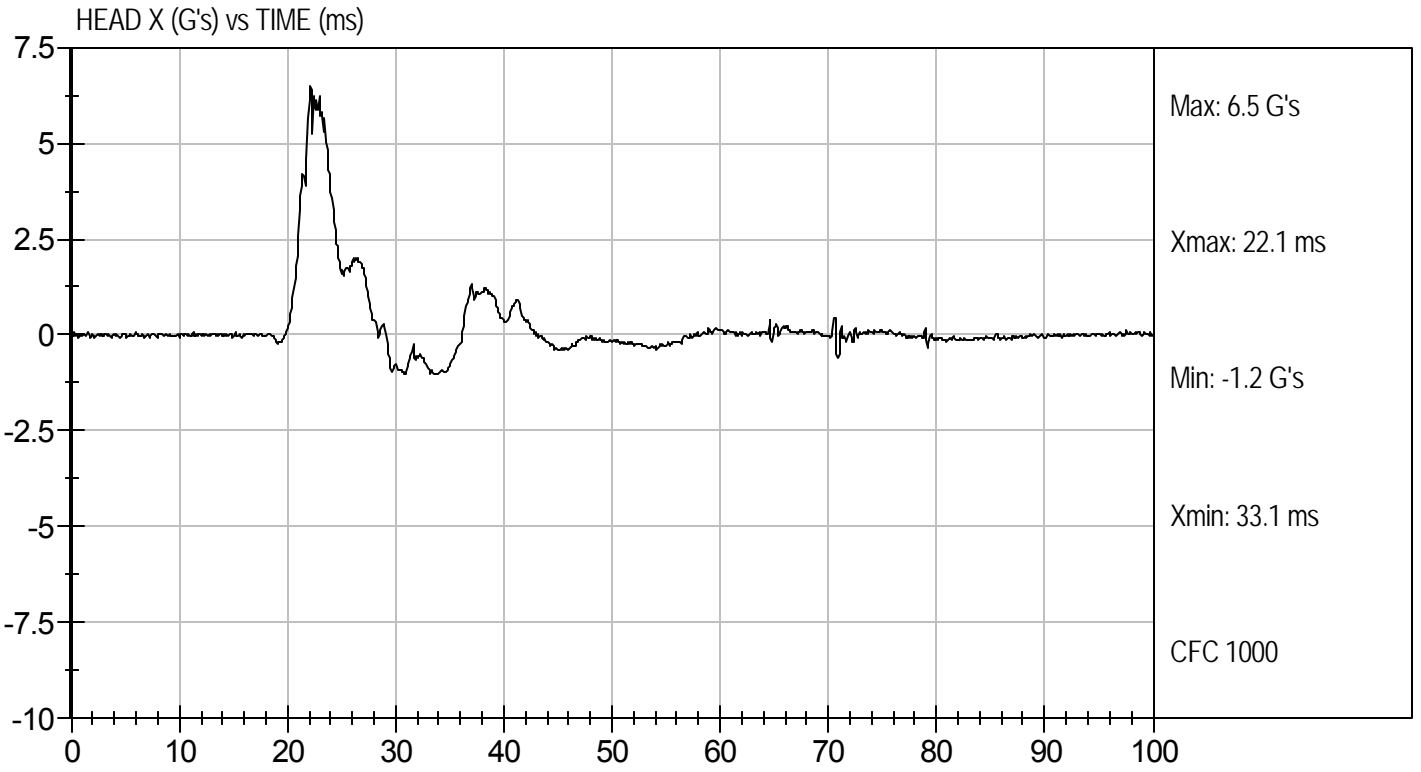
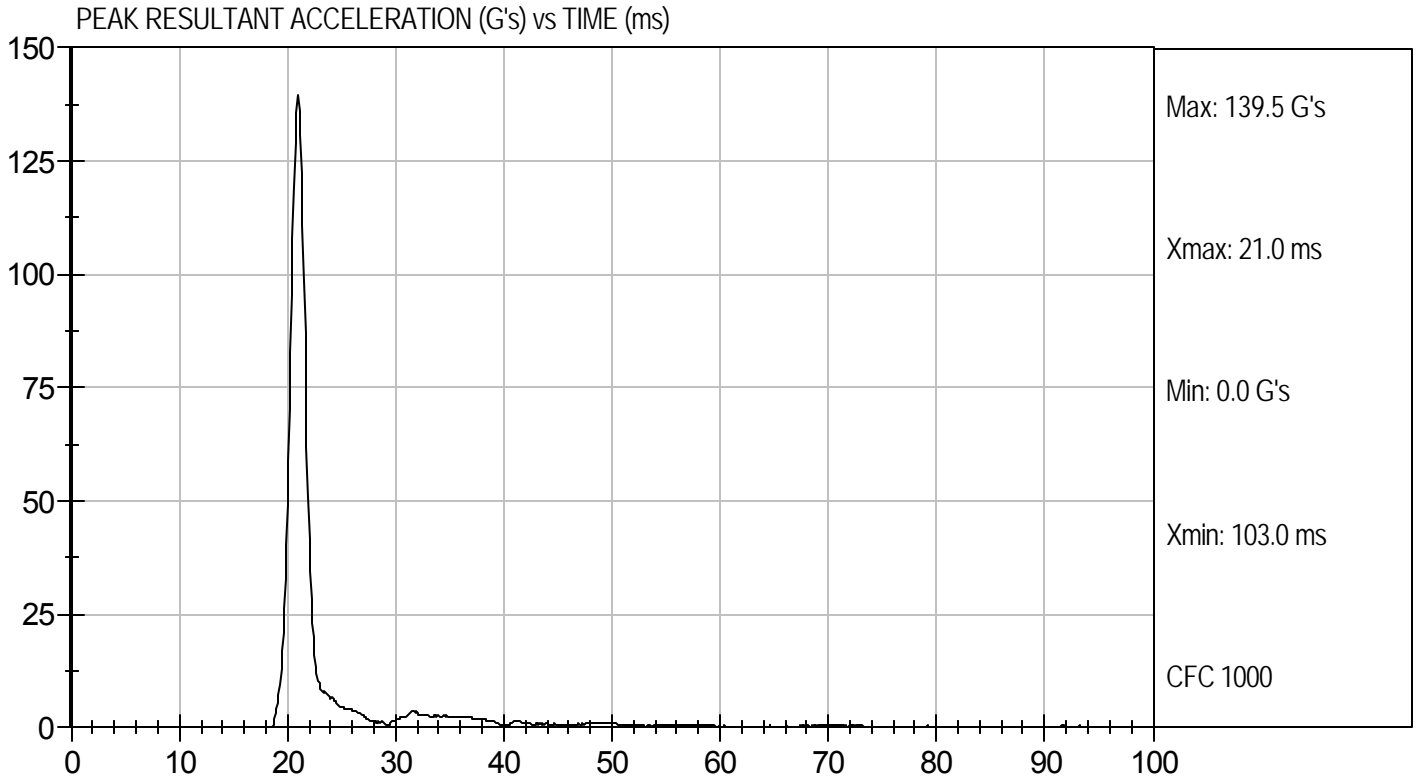
9/20/10
 Test Date

David Winkelbauer
 Approved By



Test Desc: Head Drop
Component ID: D103121

Test Date: 9/20/10
Velocity: 0 ft/s, 0 m/s



MGA RESEARCH CORPORATION
NECK PENDULUM TEST
ES-2re DUMMY

ATD Serial No: 032

Test I.D.: D103122

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	18.0 to 22.0	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	53	Pass
Pendulum Speed		m/s	3.3 to 3.5	3.4	Pass
Pendulum Deceleration	1 ms	m/s	0.00 to -0.05	-0.02	Pass
	3 ms	m/s	-0.25 to -0.375	-0.32	Pass
	14 ms	m/s	-3.20 to -3.70	-3.21	Pass
Maximum Flexion Angle		deg	49.0 to 59.0	50.1	Pass
Time of Maximum Flexion Angle		ms	54.0 to 66.0	63.5	Pass
Head Rotation Decay Time to 0 degree		ms	53.0 to 88.0	54.8	Pass
Overall Test Results					Pass

Jessica Gall
 Laboratory Technician

9/20/10
 Test Date

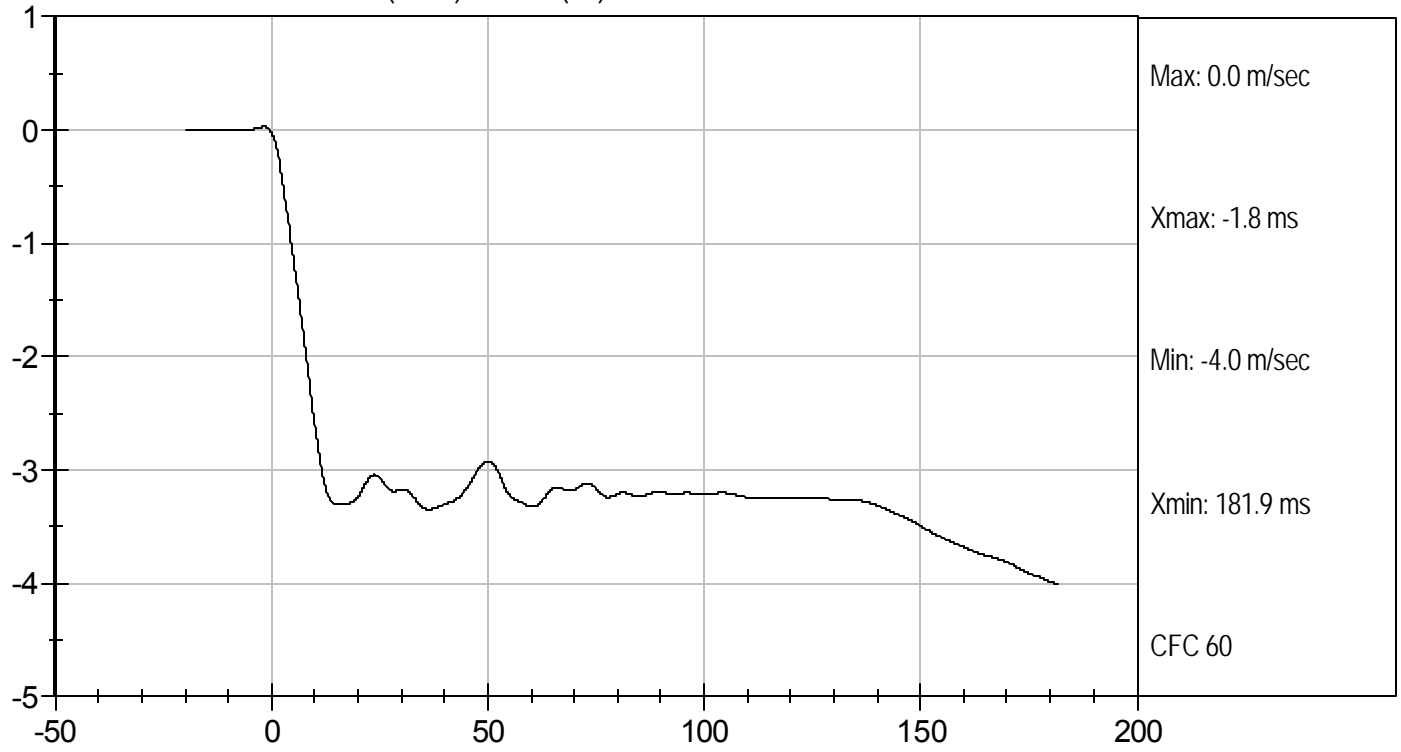
David Winkelbauer
 Approved By



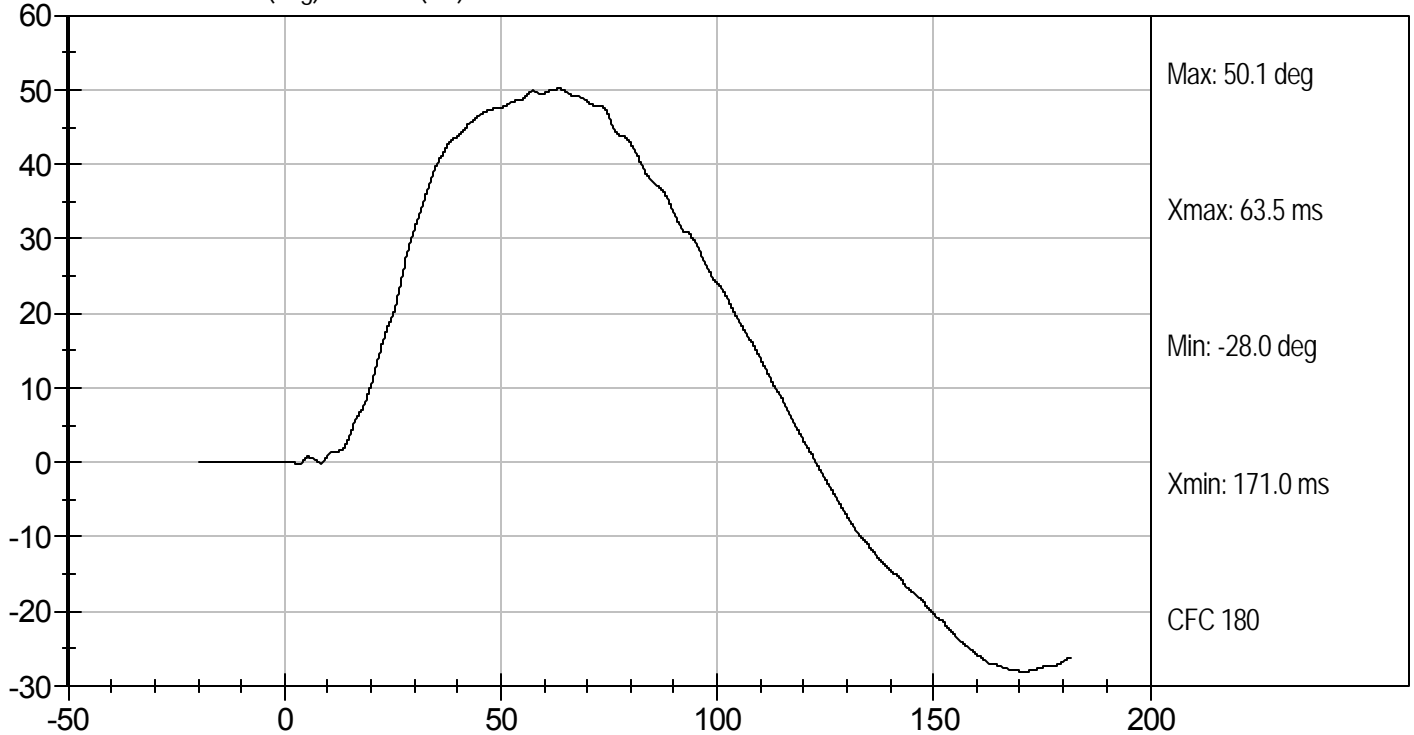
Test Desc: Neck Bending
Component ID: D103122

Test Date: 9/20/10
Velocity: 11.11 ft/s, 3.4 m/s

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



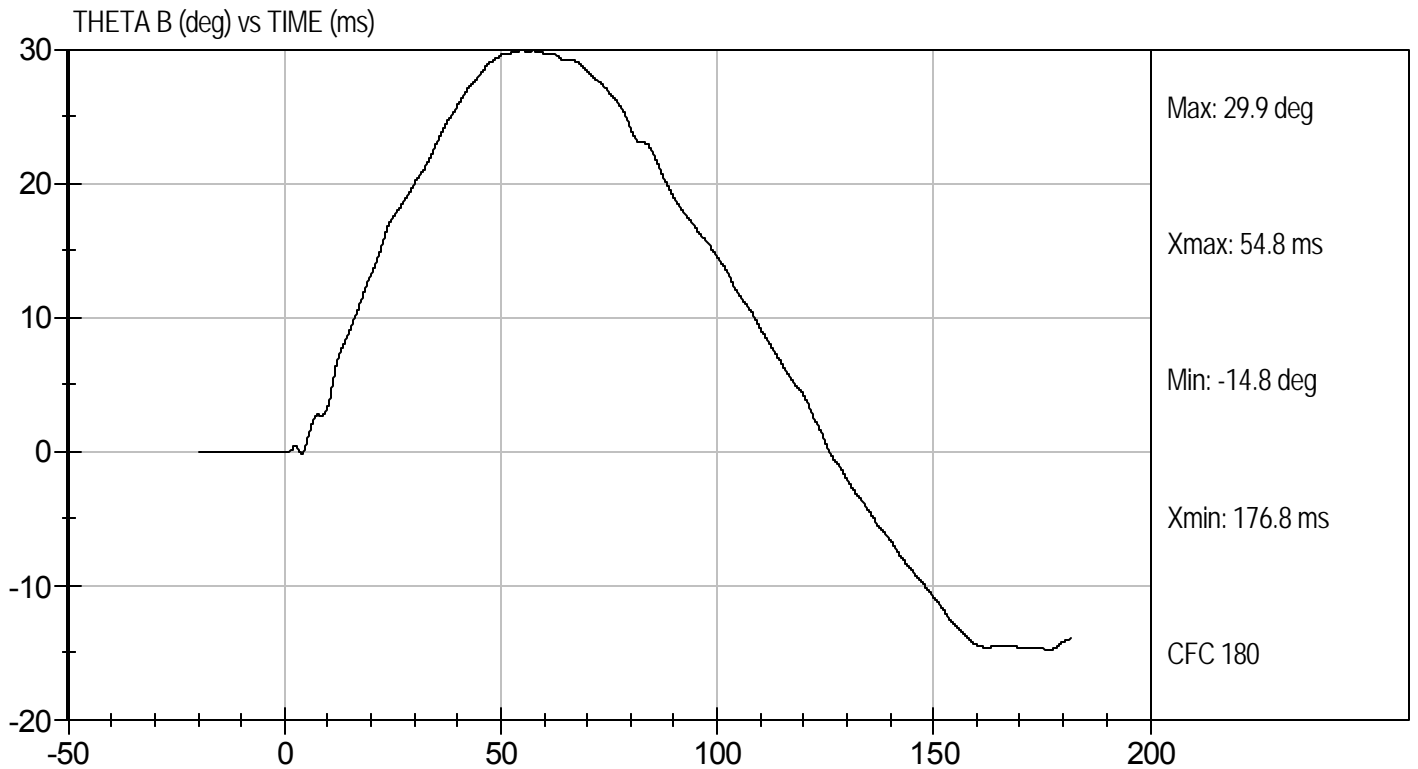
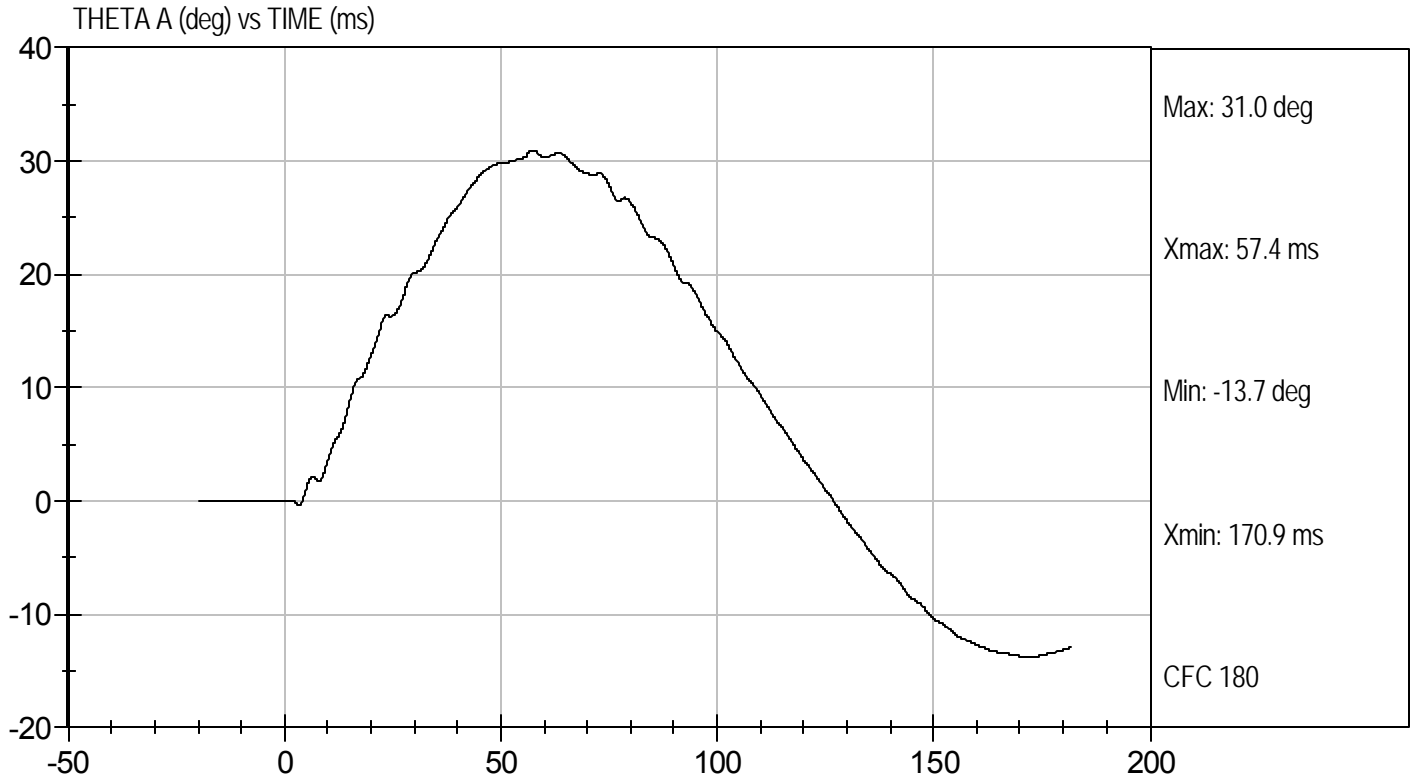
FLEXION ANGLE (deg) vs TIME (ms)





Test Desc: Neck Bending
Component ID: D103122

Test Date: 9/20/10
Velocity: 11.11 ft/s, 3.4 m/s



MGA RESEARCH CORPORATION
SHOULDER IMPACT TEST
ES-2re DUMMY

ATD Serial No: 032

Test I.D: D103123

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	56	Pass
Pendulum Speed	m/s	4.2 to 4.4	4.3	Pass
Peak Shoulder Acceleration	G's	7.5 to 10.5	9.7	Pass
Time of Peak Shoulder Acceleration	ms	NA	13.4	Pass
Overall Test Results				Pass

Jessica Gall
 Laboratory Technician

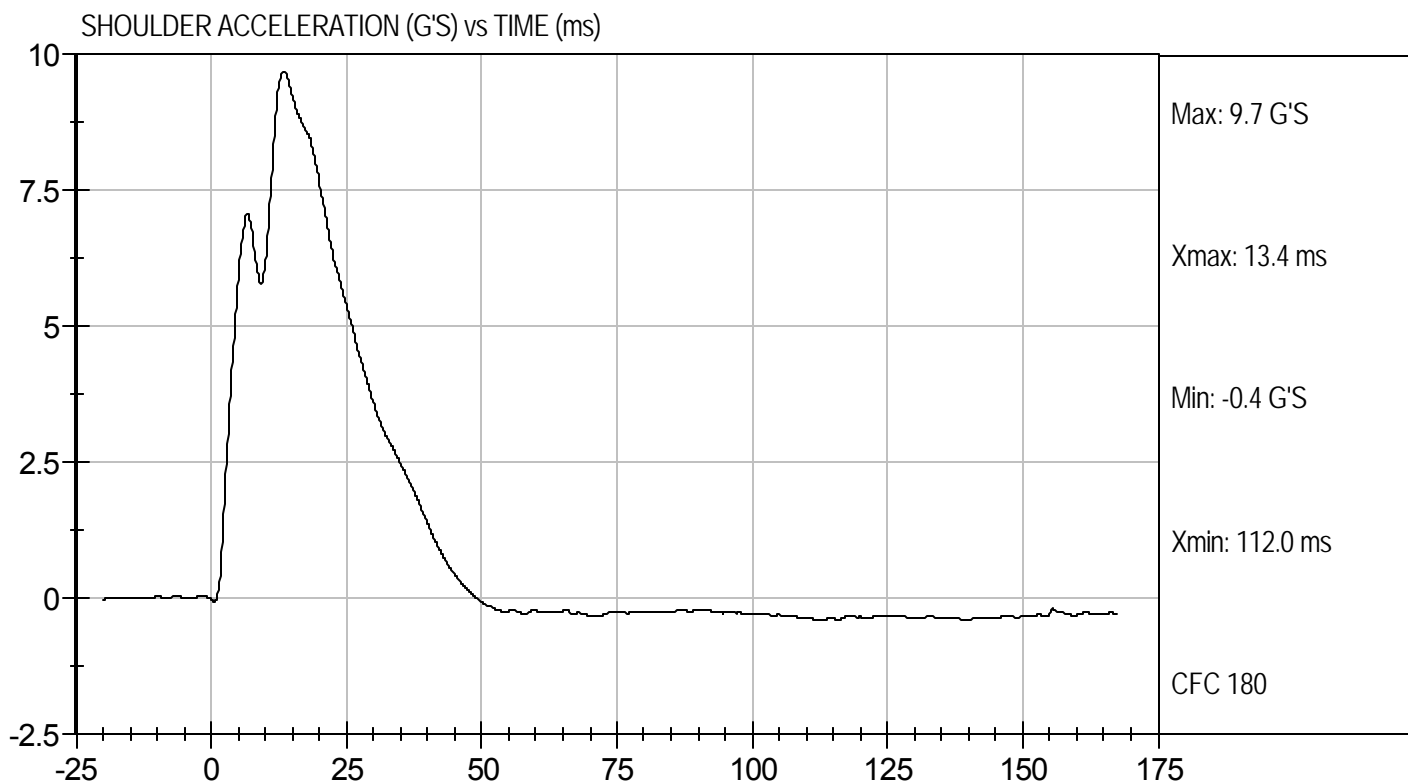
9/21/10
 Test Date

David Winkelbauer
 Approved By



Test Desc: Shoulder Impact
Component ID: D103123

Test Date: 9/21/10
Velocity: 14.01 ft/s, 4.3 m/s



MGA RESEARCH CORPORATION

UPPER RIB TEST

ES-2re DUMMY

ATD Serial No: 032

Test I.D: D103124

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	55	Pass
Displacement at 3 m/s	mm	36.0 to 40.0	38.3	Pass
Displacement at 4 m/s	mm	46.0 to 51.0	48.2	Pass
Overall Test Results				Pass

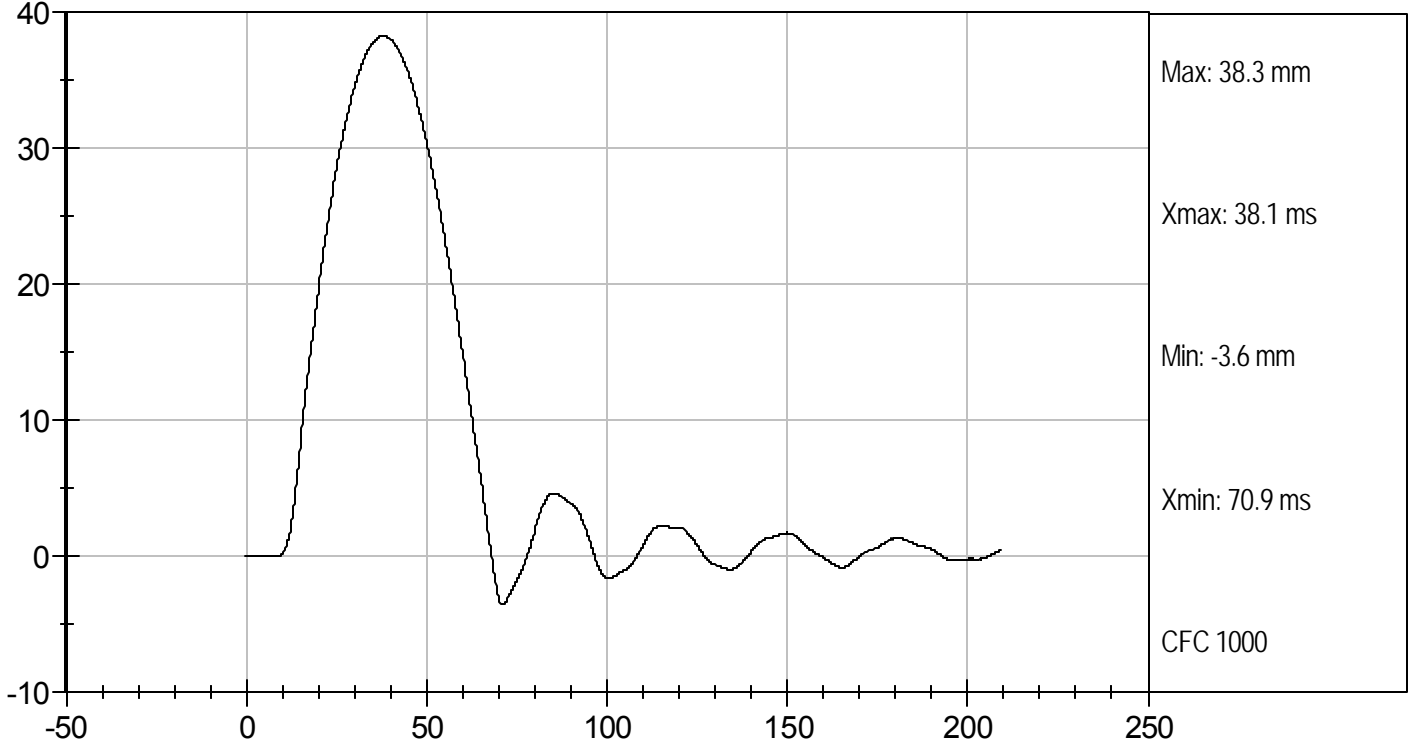
Jessica Gall
Laboratory Technician

9/20/10
Test Date

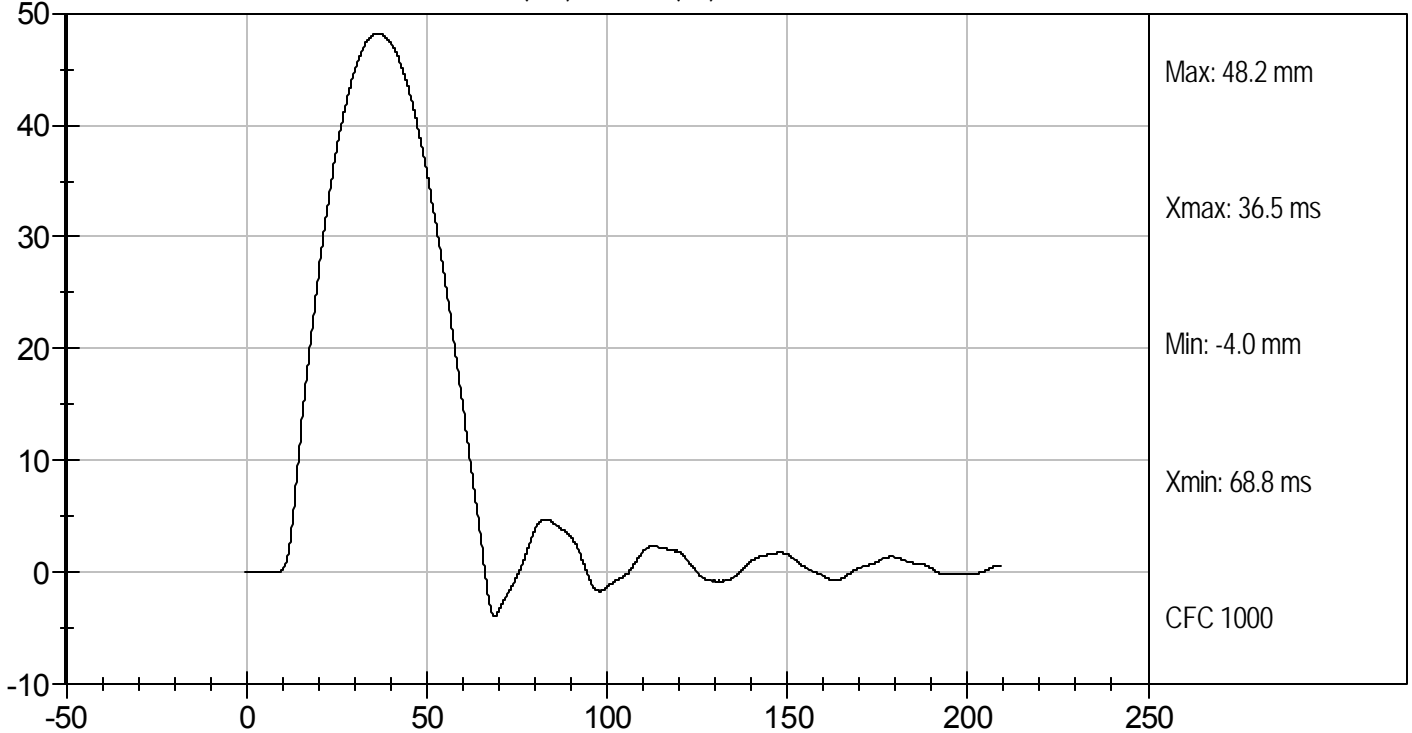
David Winkelbauer
Approved By



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: D103125

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	55	Pass
Displacement at 3 m/s	mm	36.0 to 40.0	38.3	Pass
Displacement at 4 m/s	mm	46.0 to 51.0	48.3	Pass
Overall Test Results				Pass

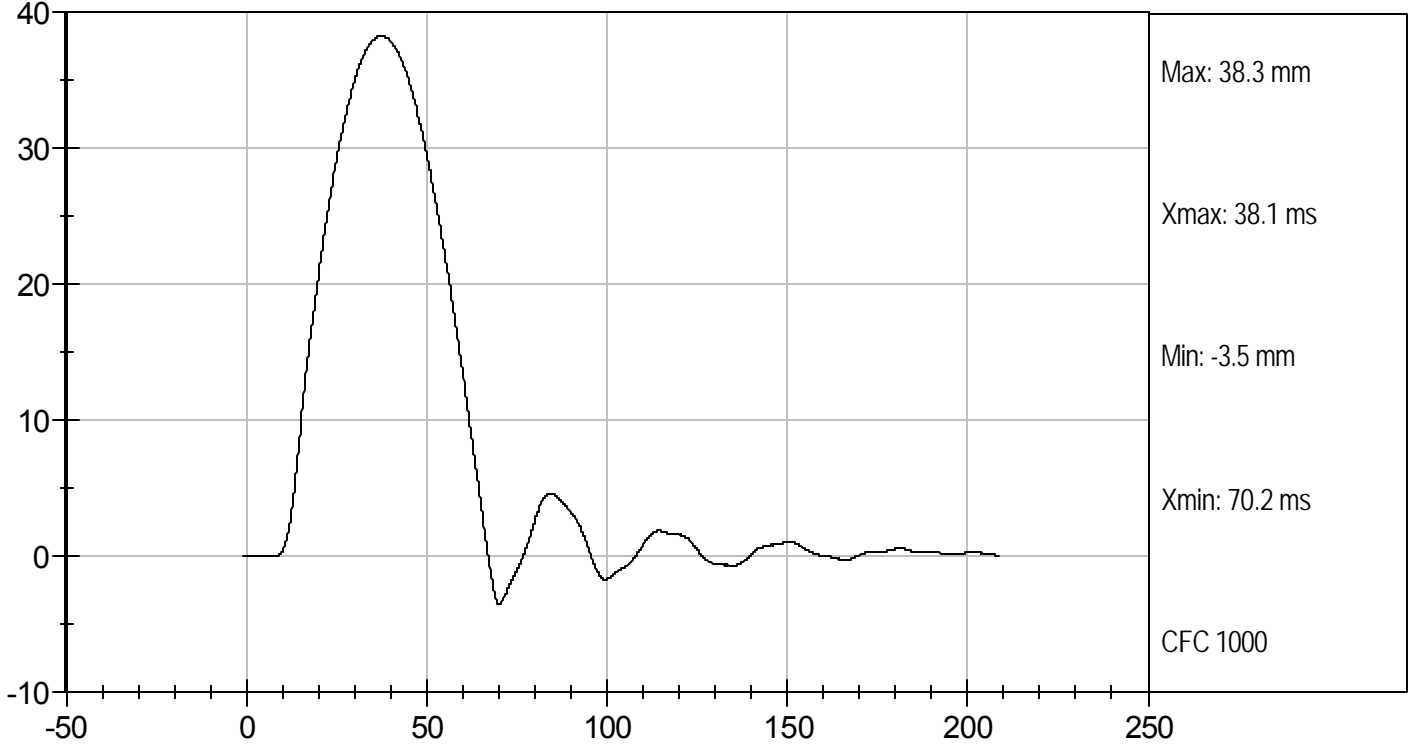
Jessica Hall
Laboratory Technician

9/20/10
Test Date

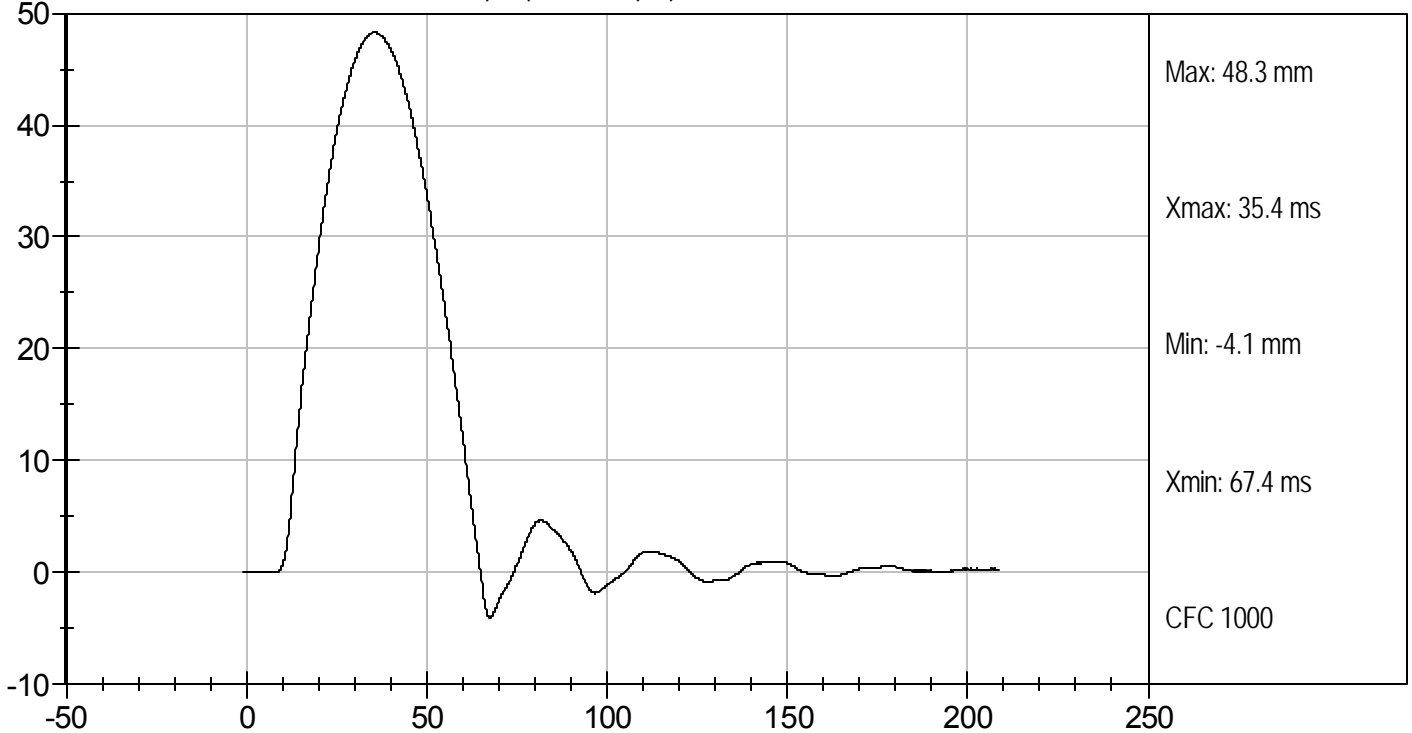
David Winkelbauer
Approved By



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: D103126

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	55	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	48.0	Pass
Overall Test Results				Pass

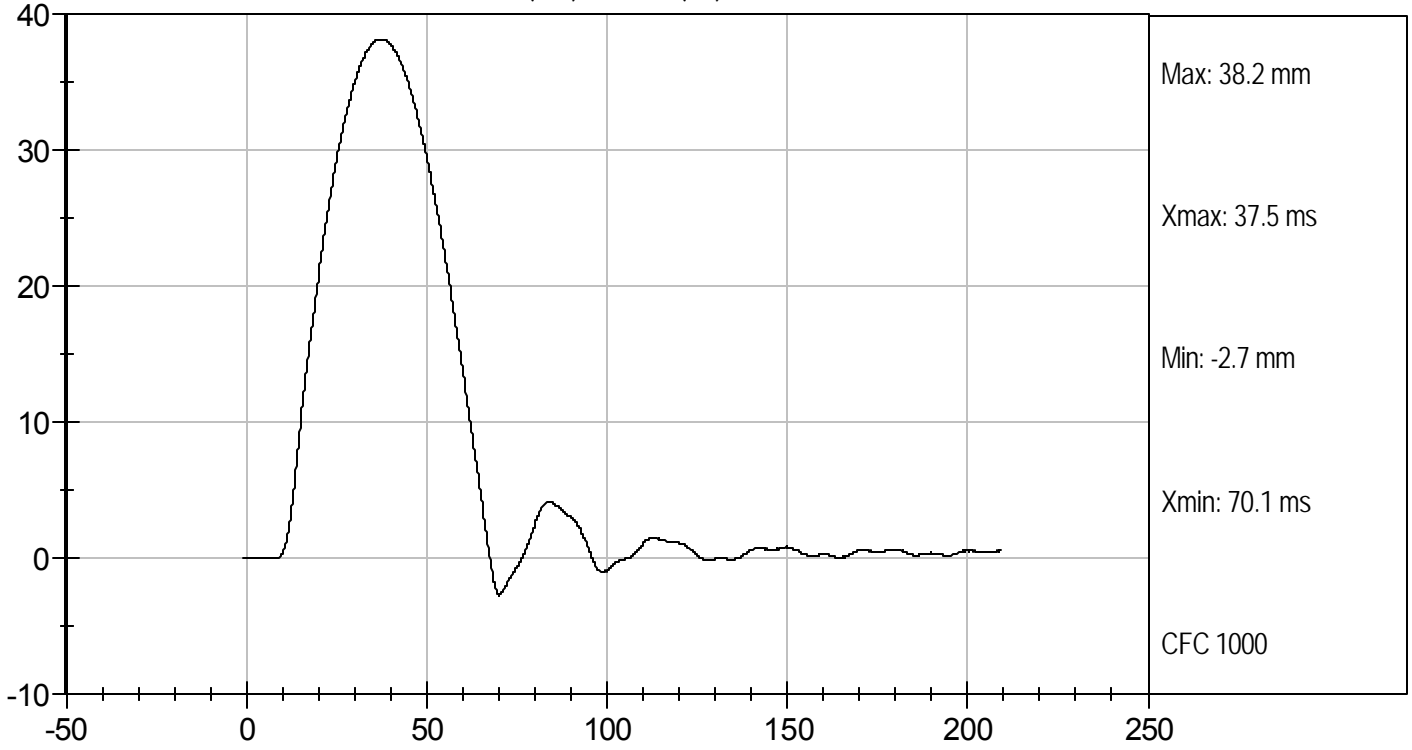
Jessica Hall
Laboratory Technician

9/20/10
Test Date

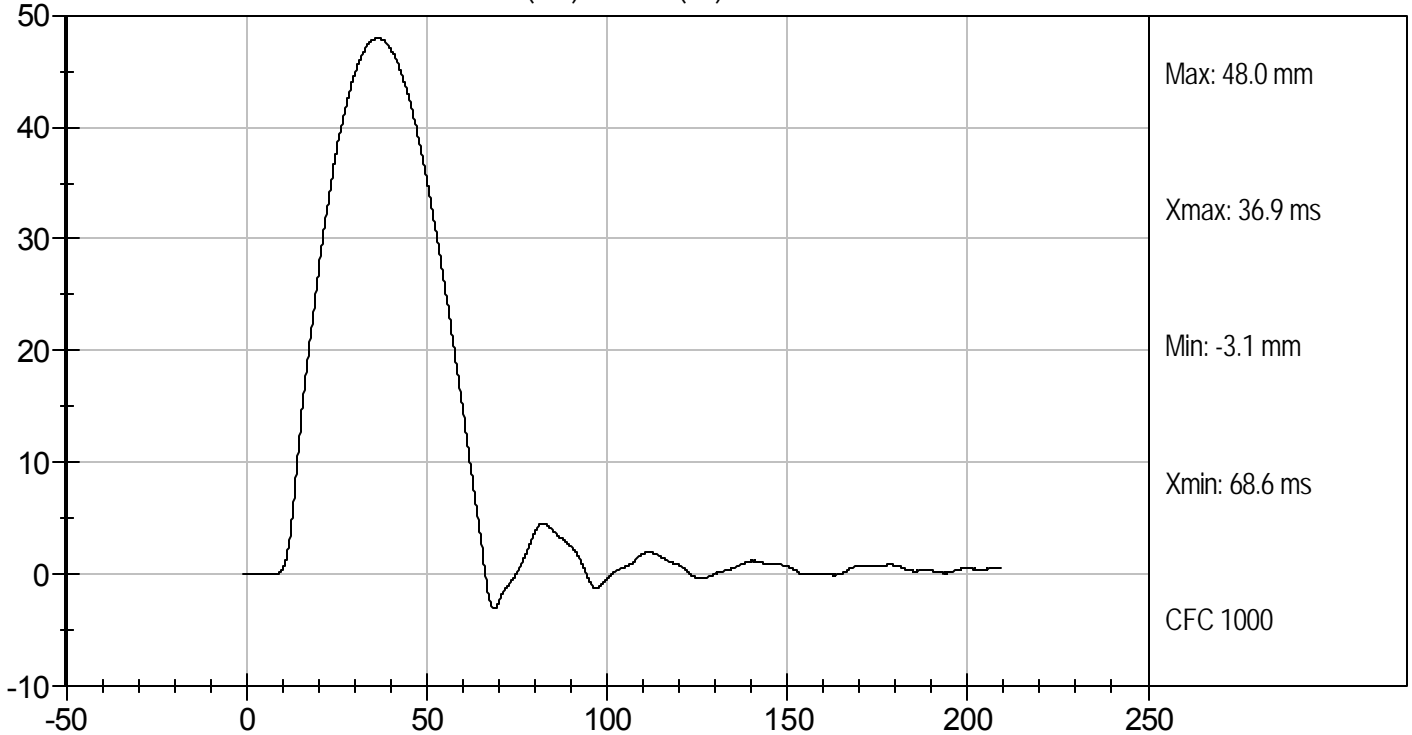
David Winkelbauer
Approved By



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



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



MGA RESEARCH CORPORATION

ABDOMEN TEST

ES-2re DUMMY

ATD Serial No: 032

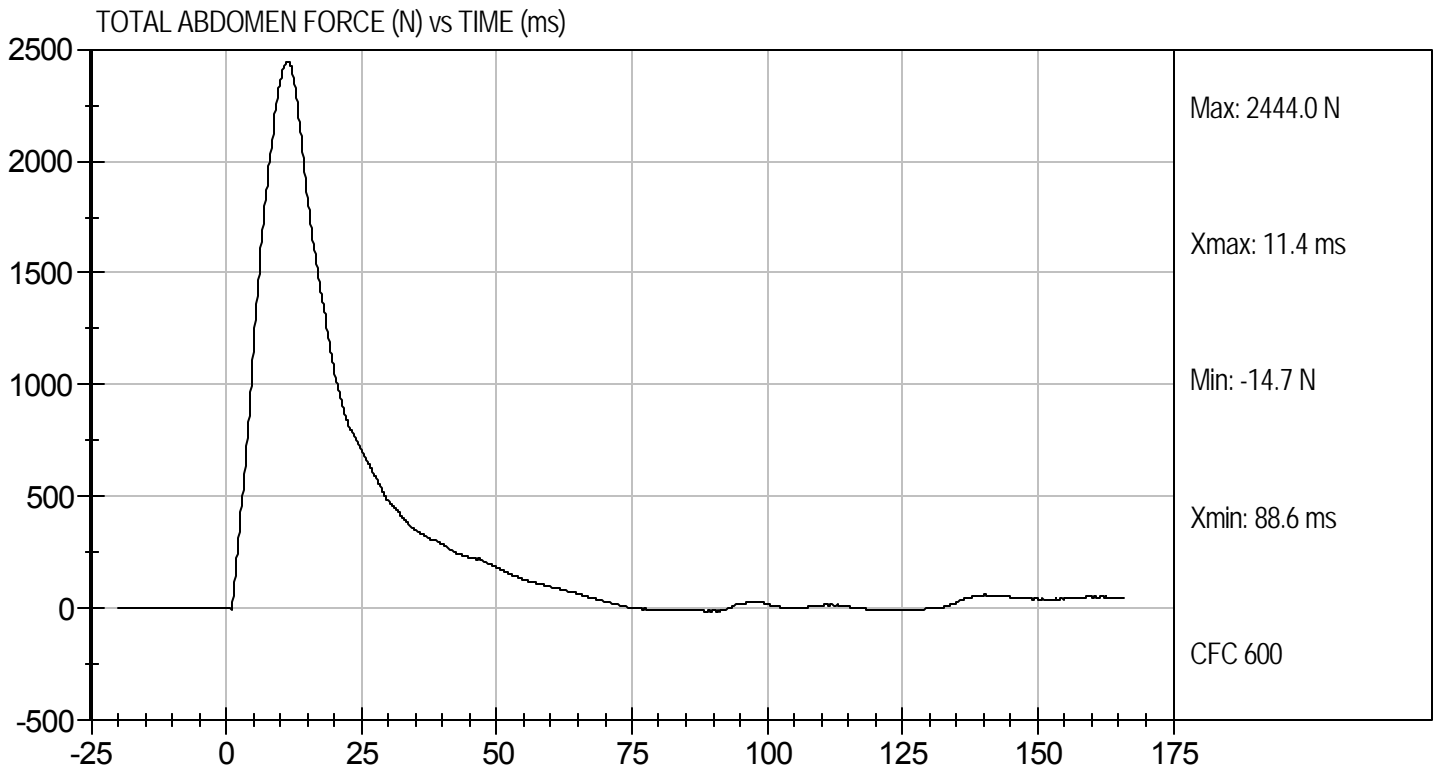
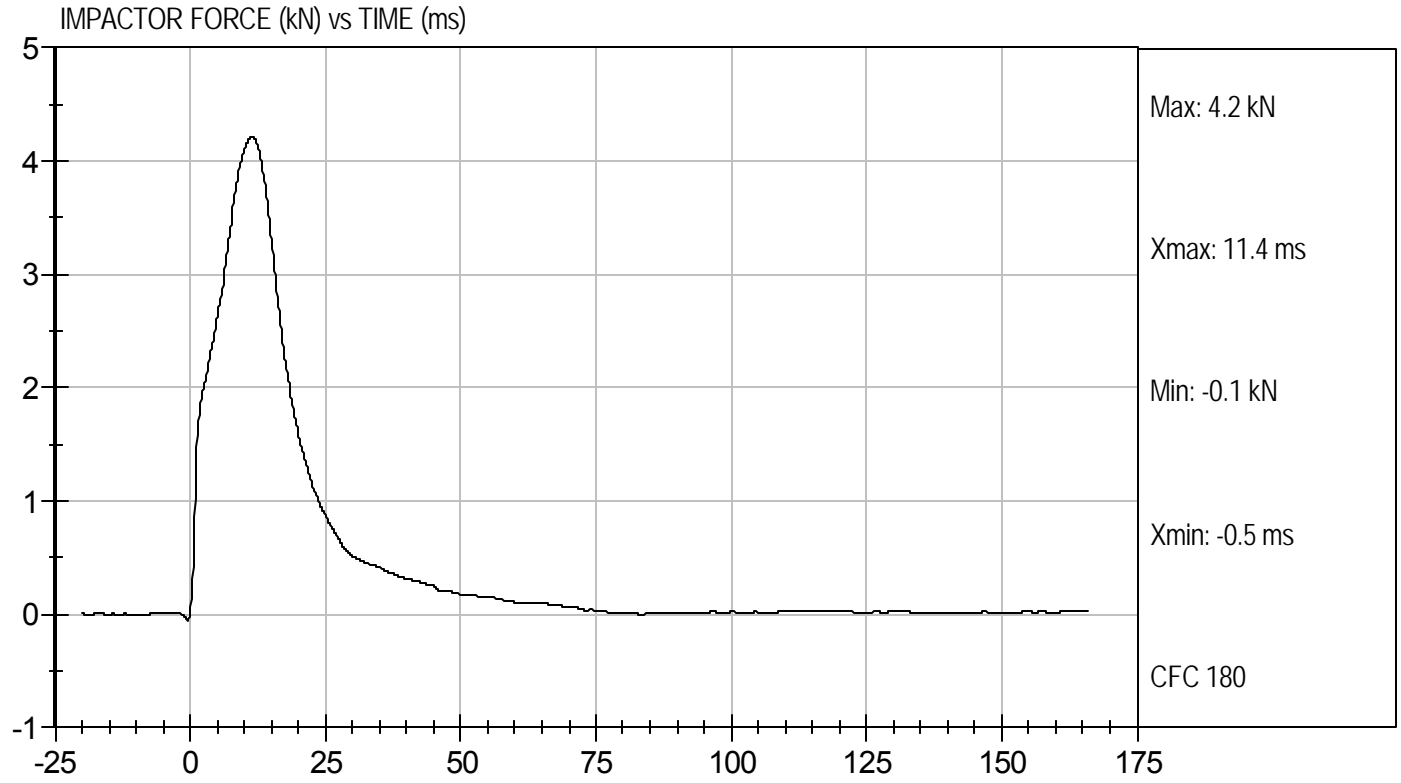
Test I.D: D103127

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	55	Pass
Probe Speed	m/s	3.90 to 4.10	4.03	Pass
Maximum Impact Force	kN	4.00 to 4.80	4.22	Pass
Time of Maximum Impact Force	ms	10.60 to 13.00	11.40	Pass
Maximum Total Abdomen Force	kN	2.20 to 2.70	2.44	Pass
Time of Maximum Abdomen Force	ms	10.00 to 12.30	11.40	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

9/21/10
Test Date

David Winkelbauer
Approved By



MGA RESEARCH CORPORATION
LUMBAR SPINE TEST
ES-2re DUMMY

ATD Serial No: 032

Test I.D.: D103128

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	54	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	-0.40	Pass
	27 ms	m/s	-6.50 to -5.80	-5.99	Pass
	30 ms	m/s	>= -6.5	-5.93	Pass
Maximum Flexion Angle		deg	45.0 to 55.0	45.5	Pass
Time of Maximum Flexion Angle		ms	39.0 to 53.0	42.5	Pass
Headform Rotation Decay to Initial Position		ms	37 to 57	42	Pass
Overall Results					Pass

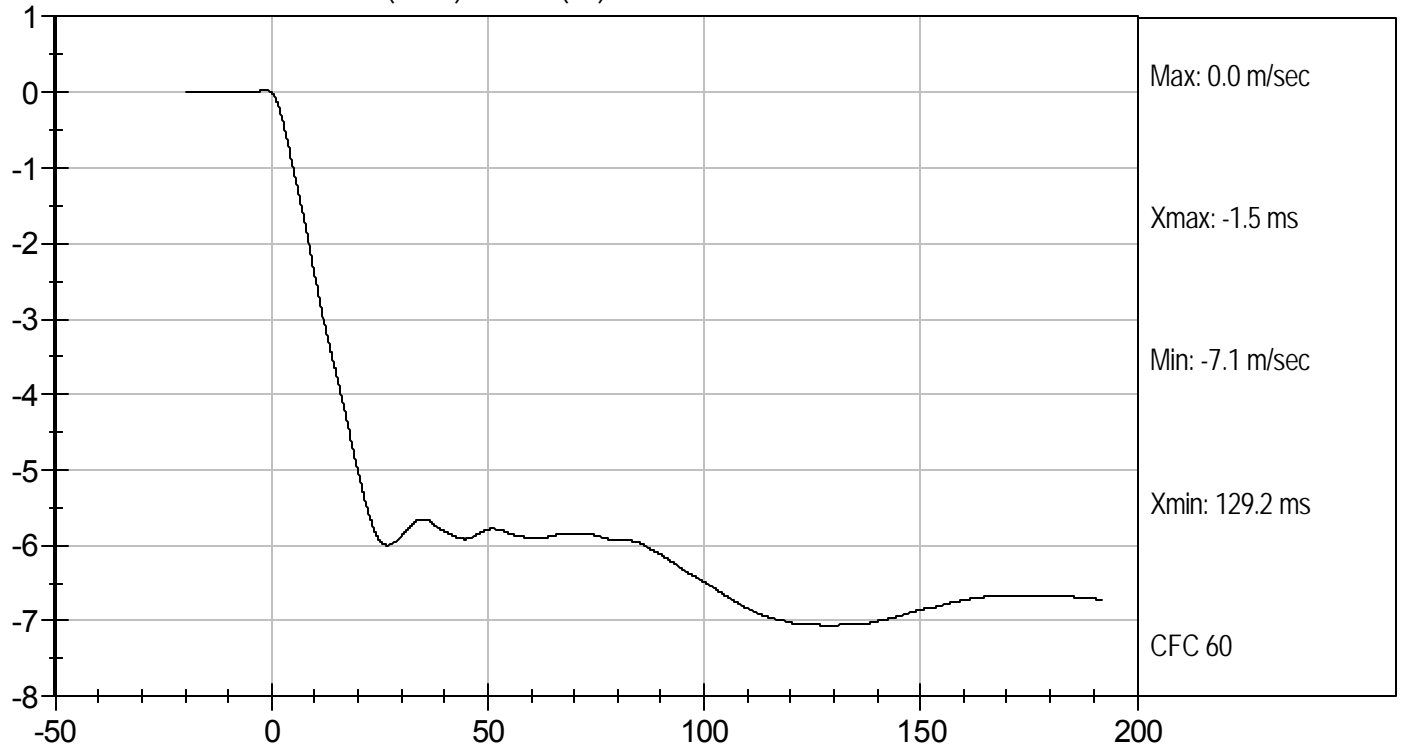

 Laboratory Technician

9/20/10
 Test Date

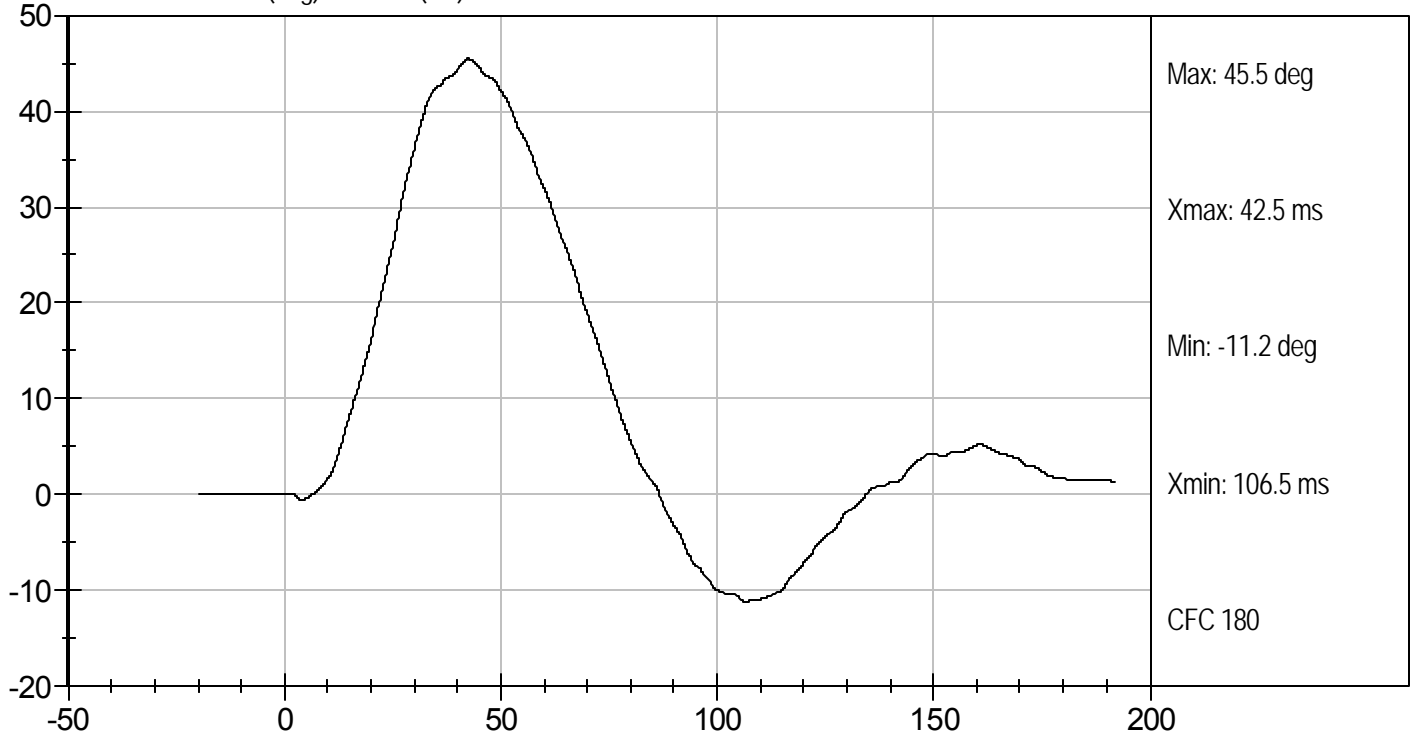

 Approved By

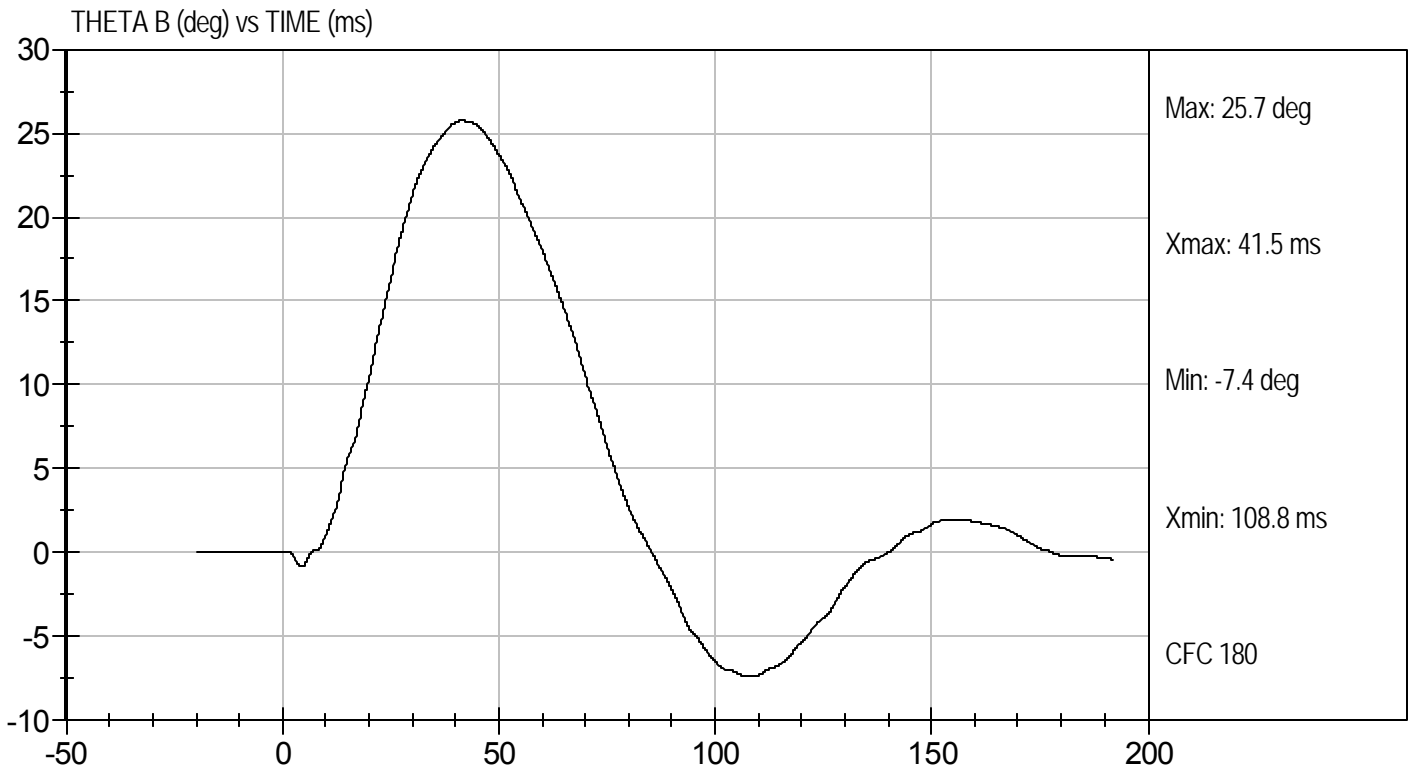
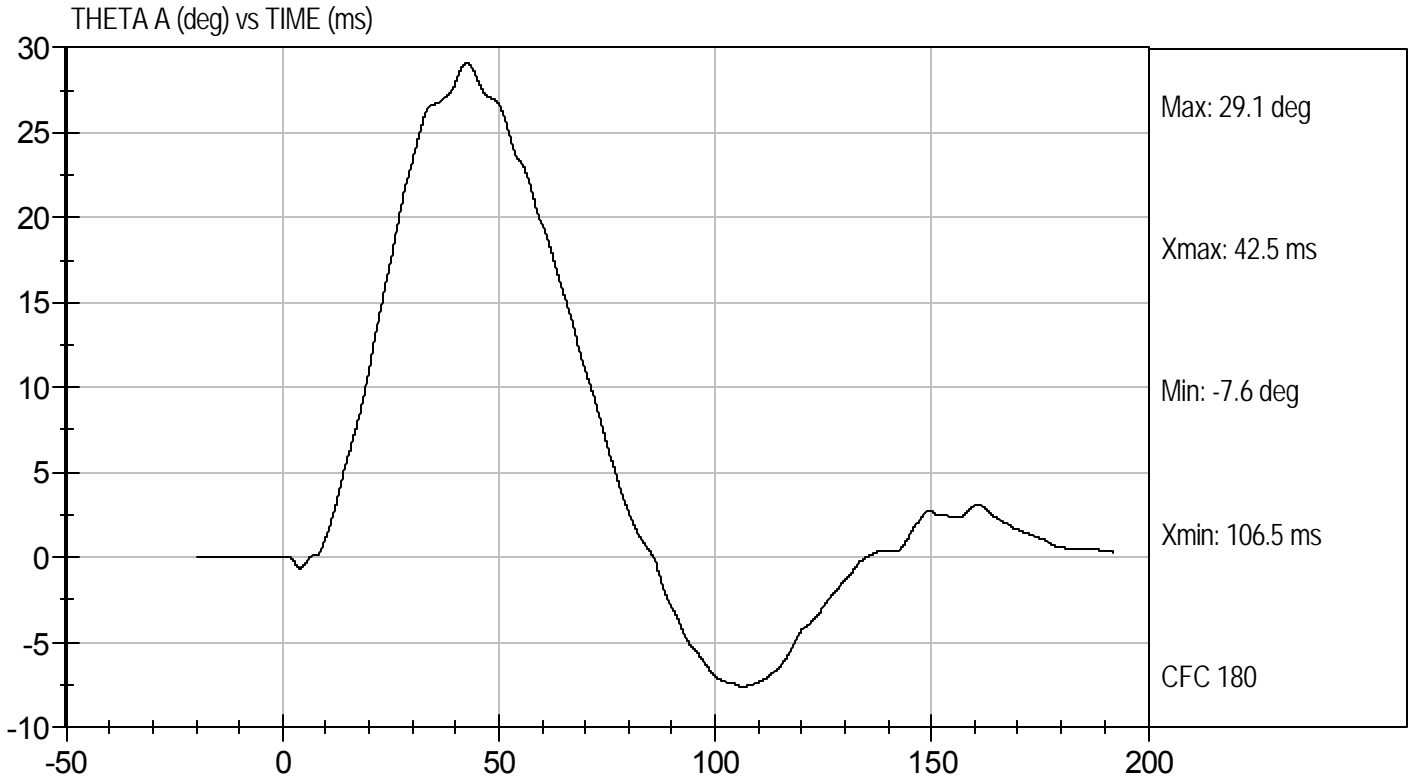


PENDULUM DECELERATION (m/sec) vs TIME (ms)



FLEXION ANGLE (deg) vs TIME (ms)





MGA RESEARCH CORPORATION

PELVIS TEST

ES-2re DUMMY

ATD Serial No: 032

Test I.D: D103129

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	55	Pass
Probe Speed	m/s	4.20 to 4.40	4.34	Pass
Maximum Impactor Force	kN	4.70 to 5.40	4.79	Pass
Time of Maximum Impactor Force	ms	11.80 to 16.10	14.60	Pass
Maximum Pubic Force	kN	1.23 to 1.59	1.40	Pass
Time of Maximum Pubic Force	ms	12.20 to 17.00	16.20	Pass
Overall Test Results				Pass

Jessica Gall
Laboratory Technician

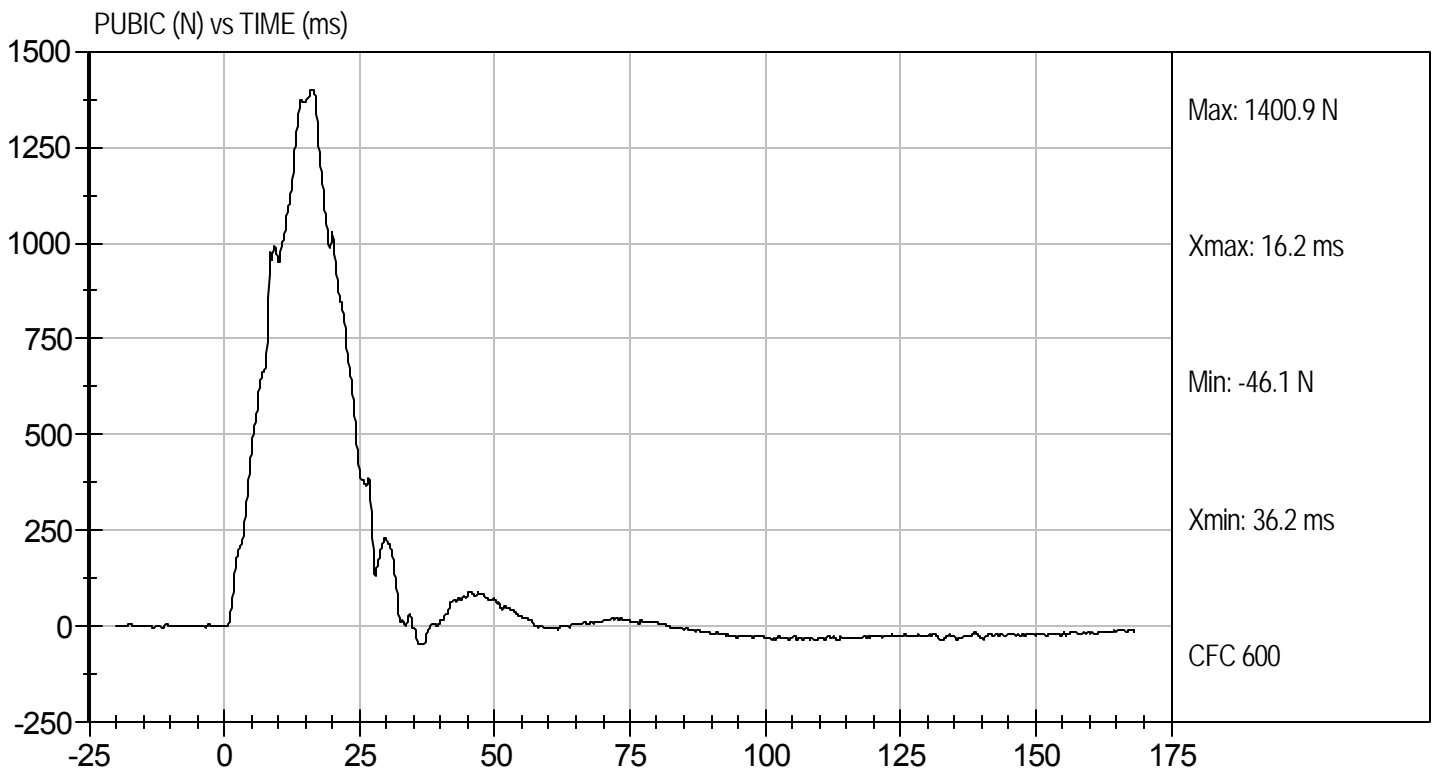
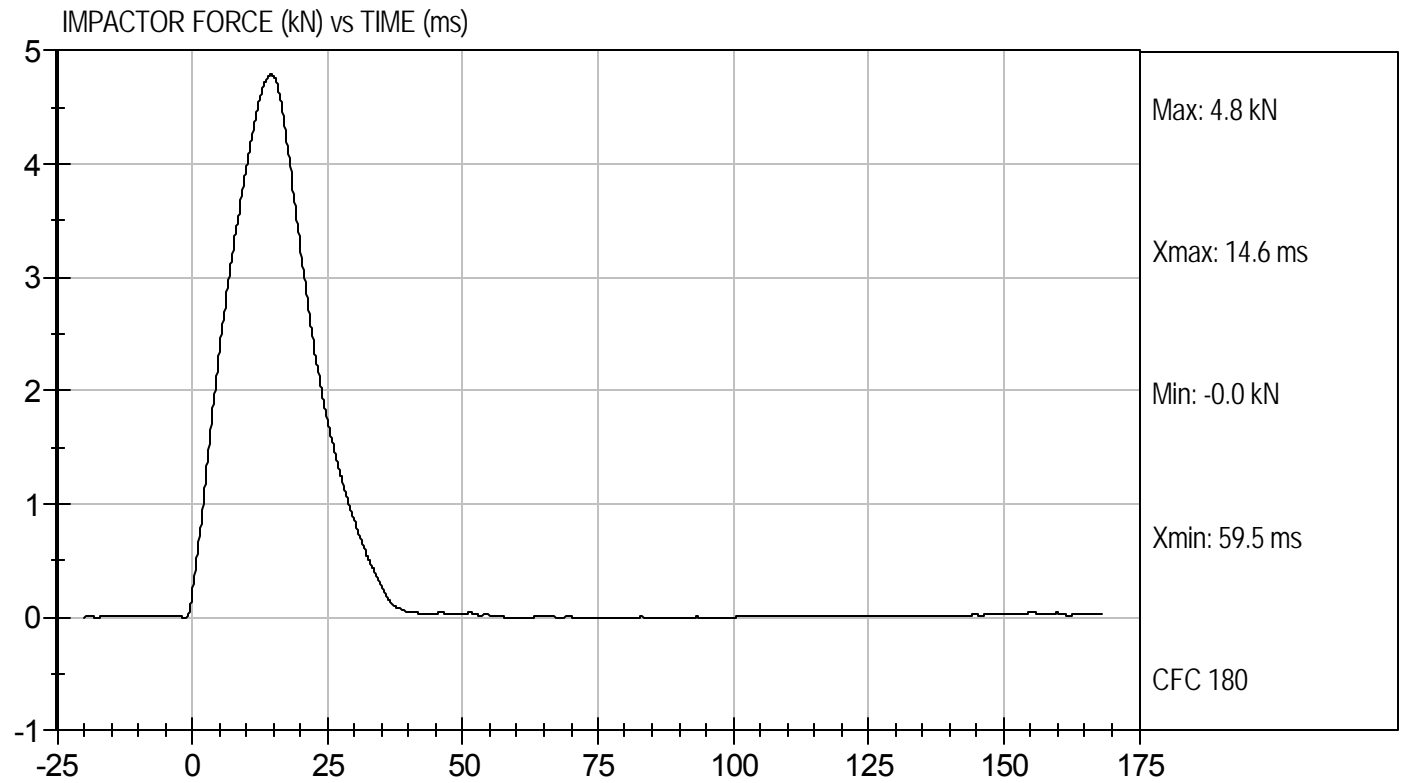
9/21/10
Test Date

David Winkelbauer
Approved By



Test Desc: Pelvis Impact
Component ID: D103129

Test Date: 9/21/10
Velocity: 14.25 ft/s, 4.03 m/s



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

ATD Serial No: 032

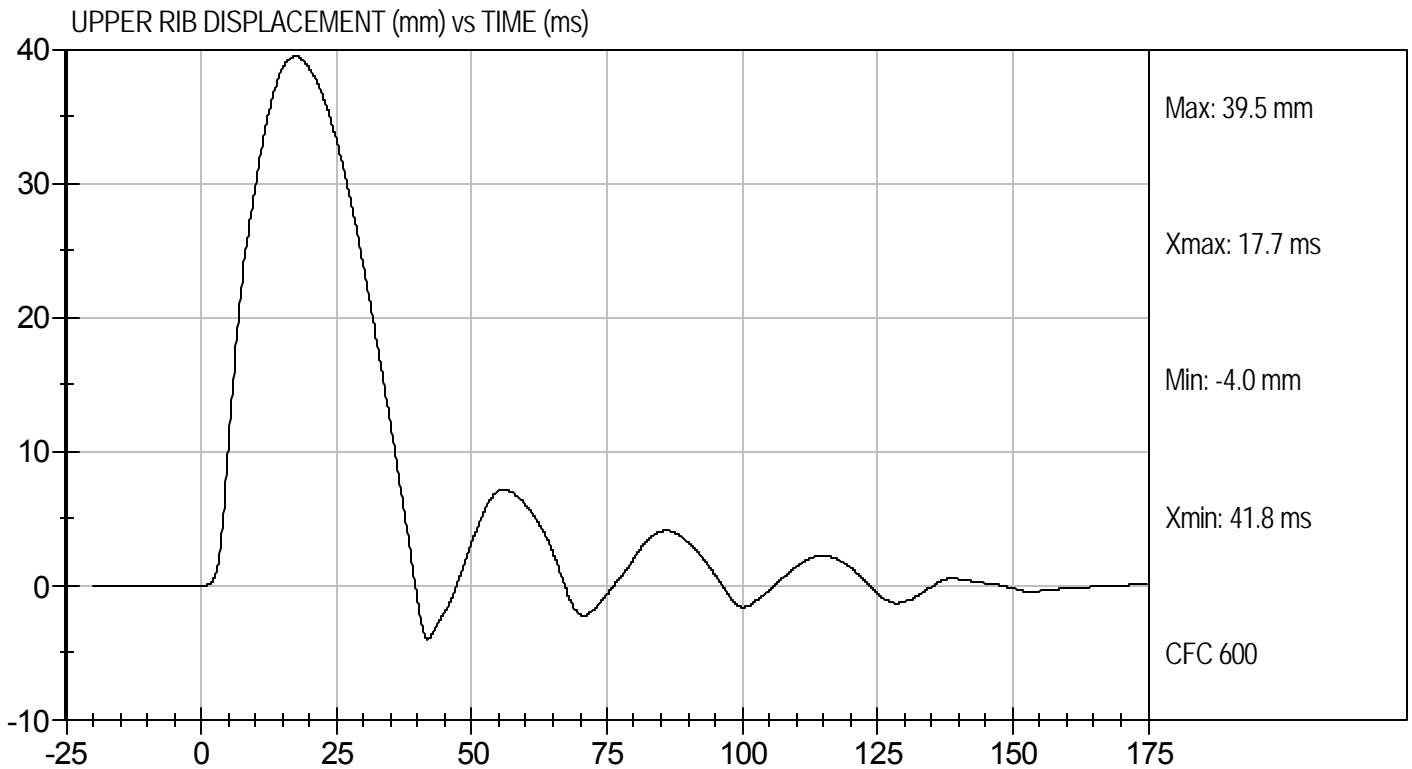
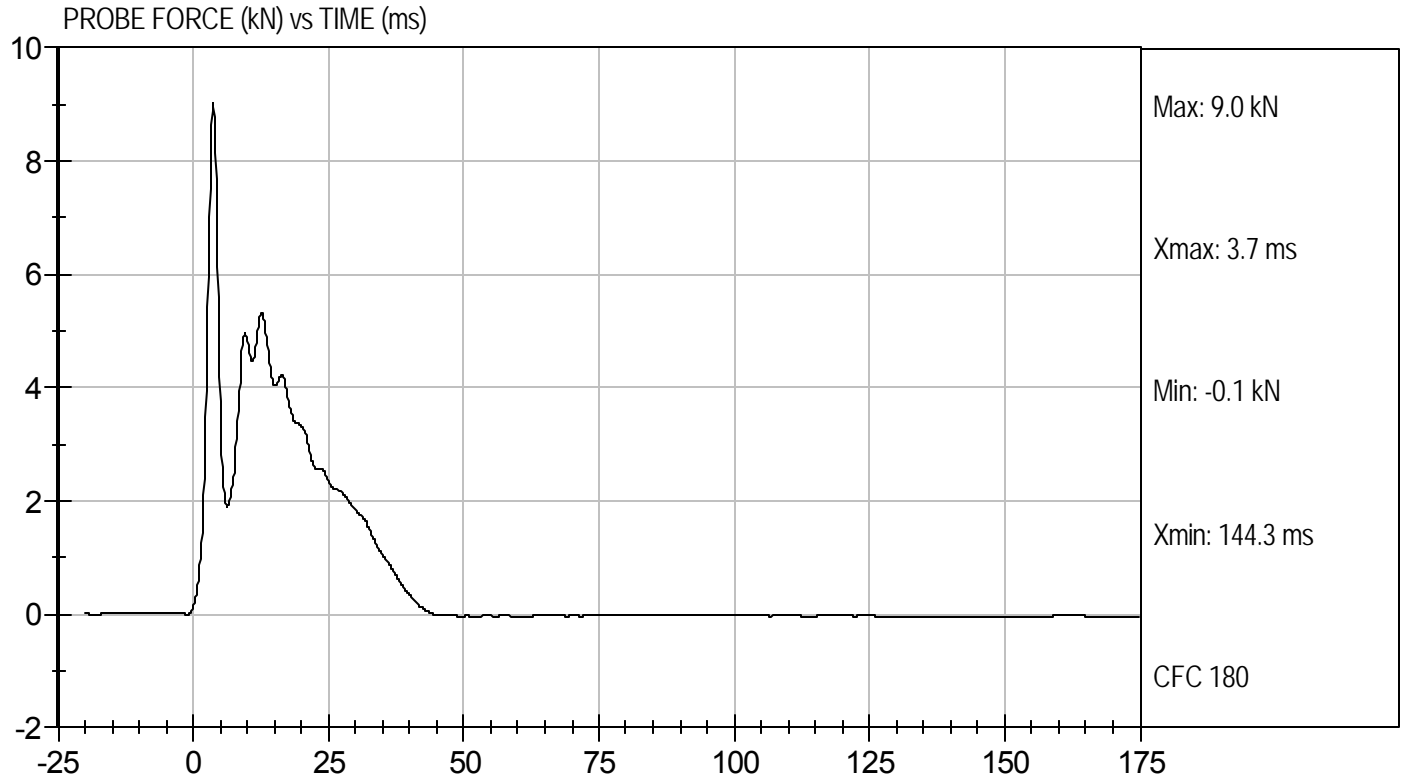
Test I.D: D103120

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.6	Pass
Humidity	%	10 to 70	56	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	5.31	Pass
Upper Rib Displacement	mm	34.0 to 41.0	39.5	Pass
Middle Rib Displacement	mm	37.0 to 45.0	41.0	Pass
Lower Rib Displacement	mm	37.0 to 44.0	39.4	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

9/21/10
Test Date

David Winkelbauer
Approved By

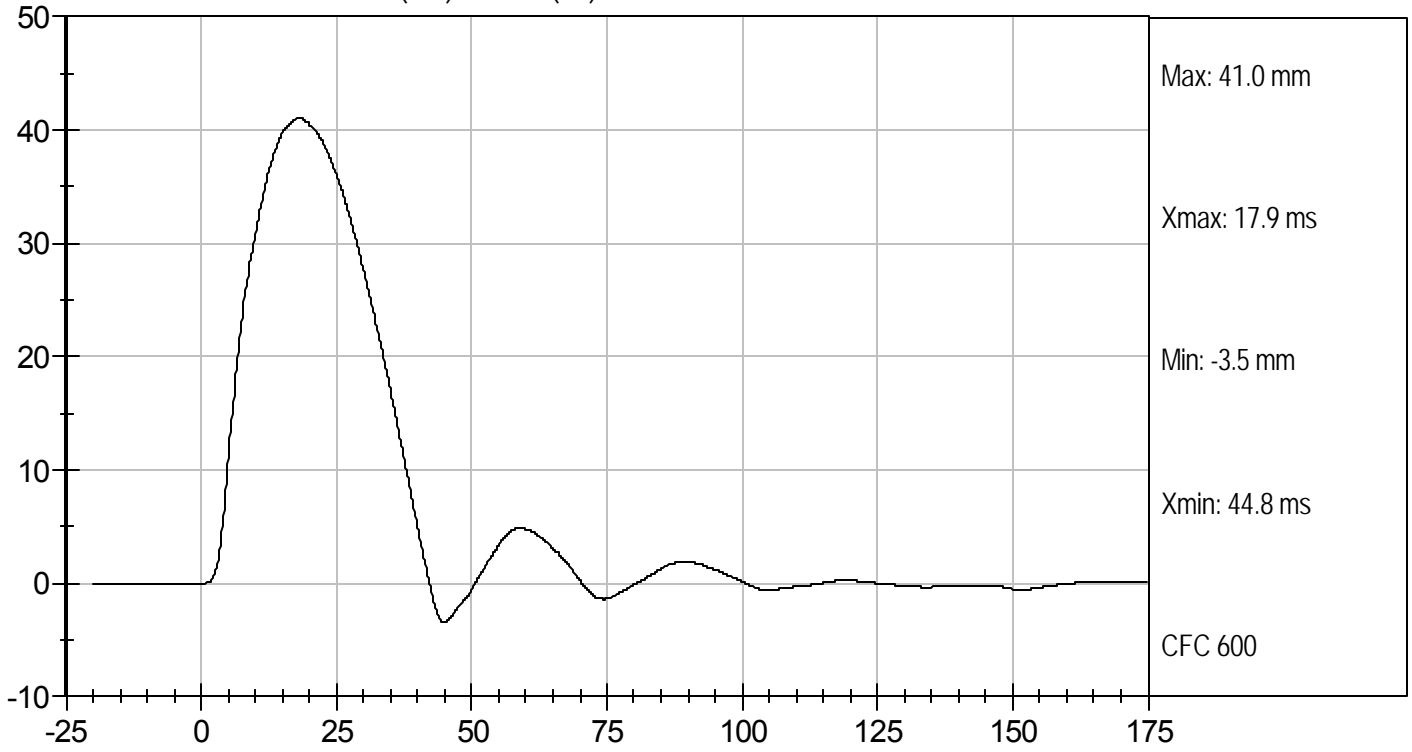




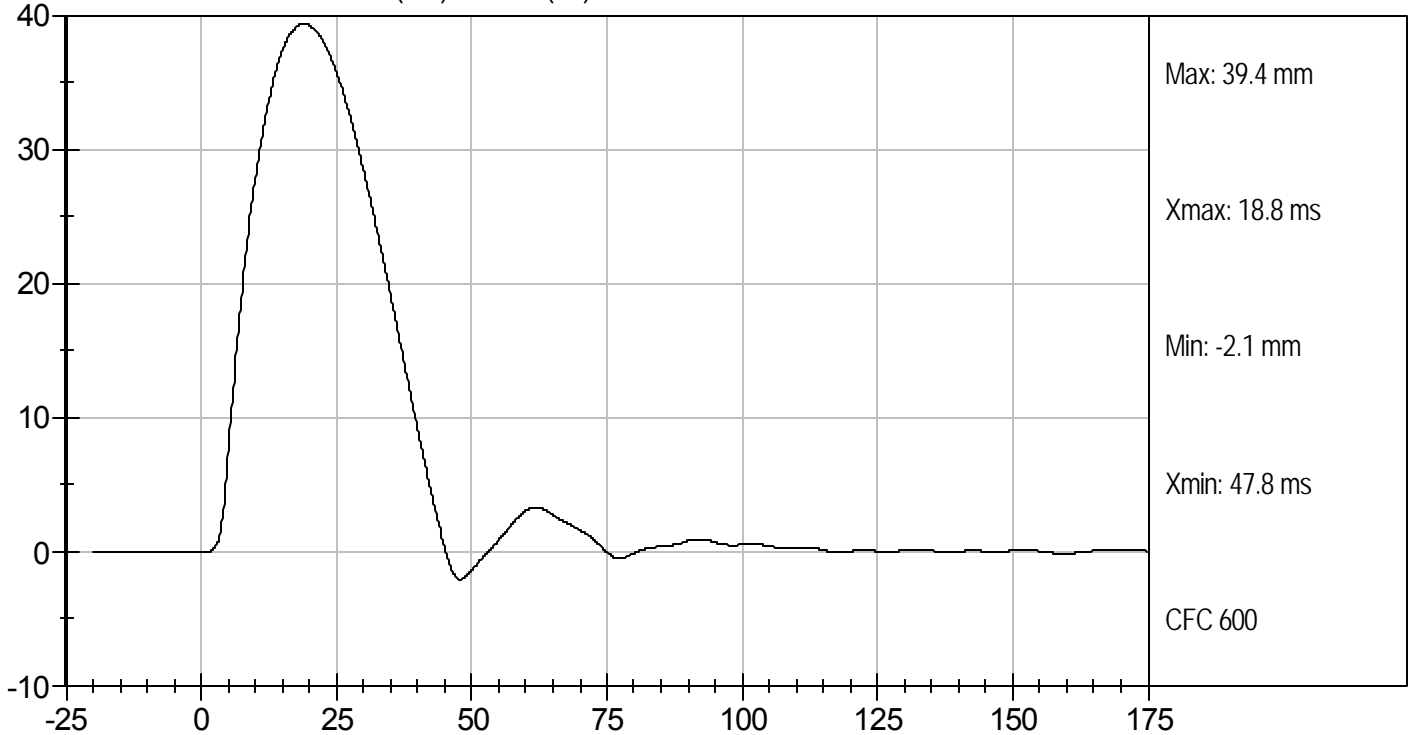
Test Desc: Thorax Impact
Component ID: D103120

Test Date: 9/21/10
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
HEAD DROP TEST
SID-Its BUILD LEVEL D DUMMY

ATD Serial No: 306

Test ID: D102991

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	22.1	Pass
Laboratory Relative Humidity	%	10 to 70	43	Pass
Peak Resultant Acceleration	G's	115 to 137	117	Pass
Peak Lateral Acceleration	G's	+/- 15	7.7	Pass
Unimodal	N/A	<15%	Yes	Pass
Overall Test Results				Pass

Jessica Gall
 Laboratory Technician

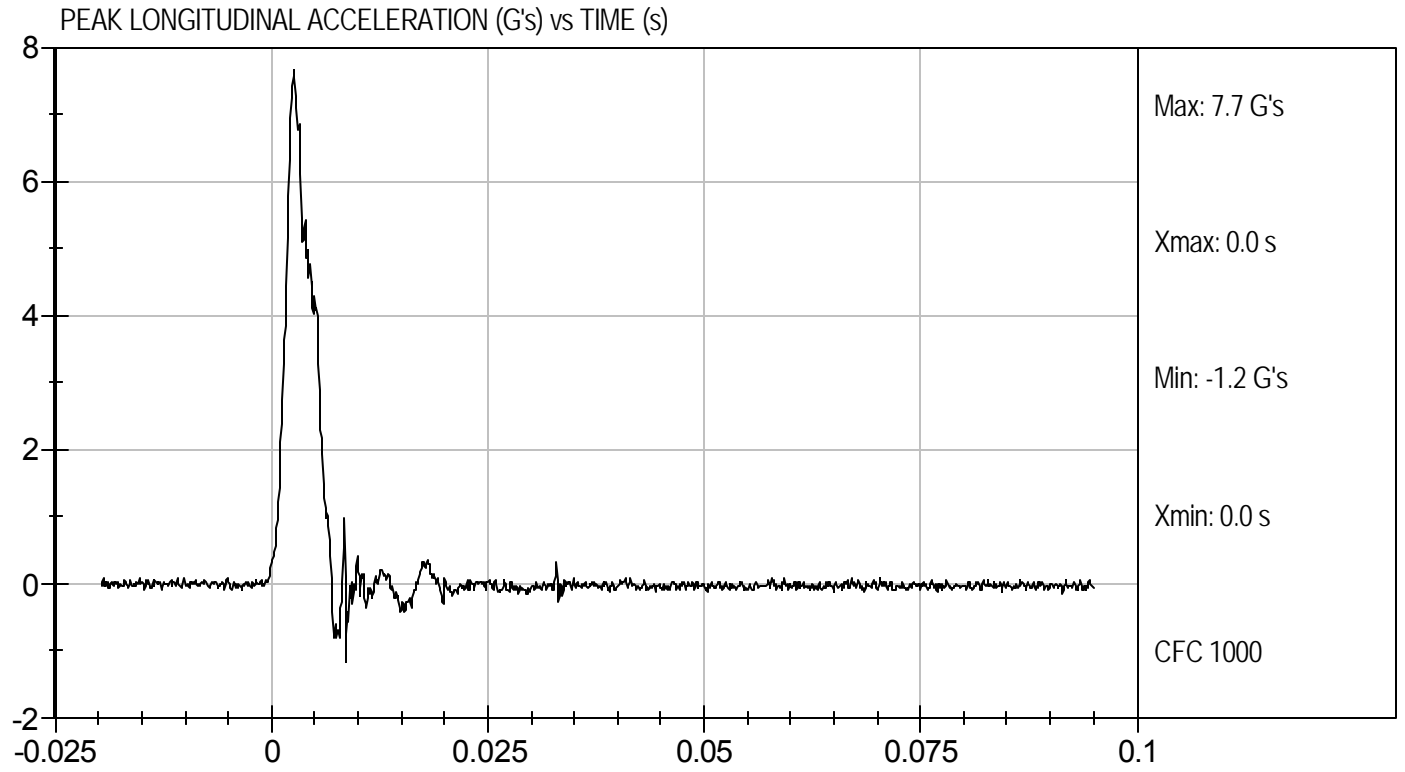
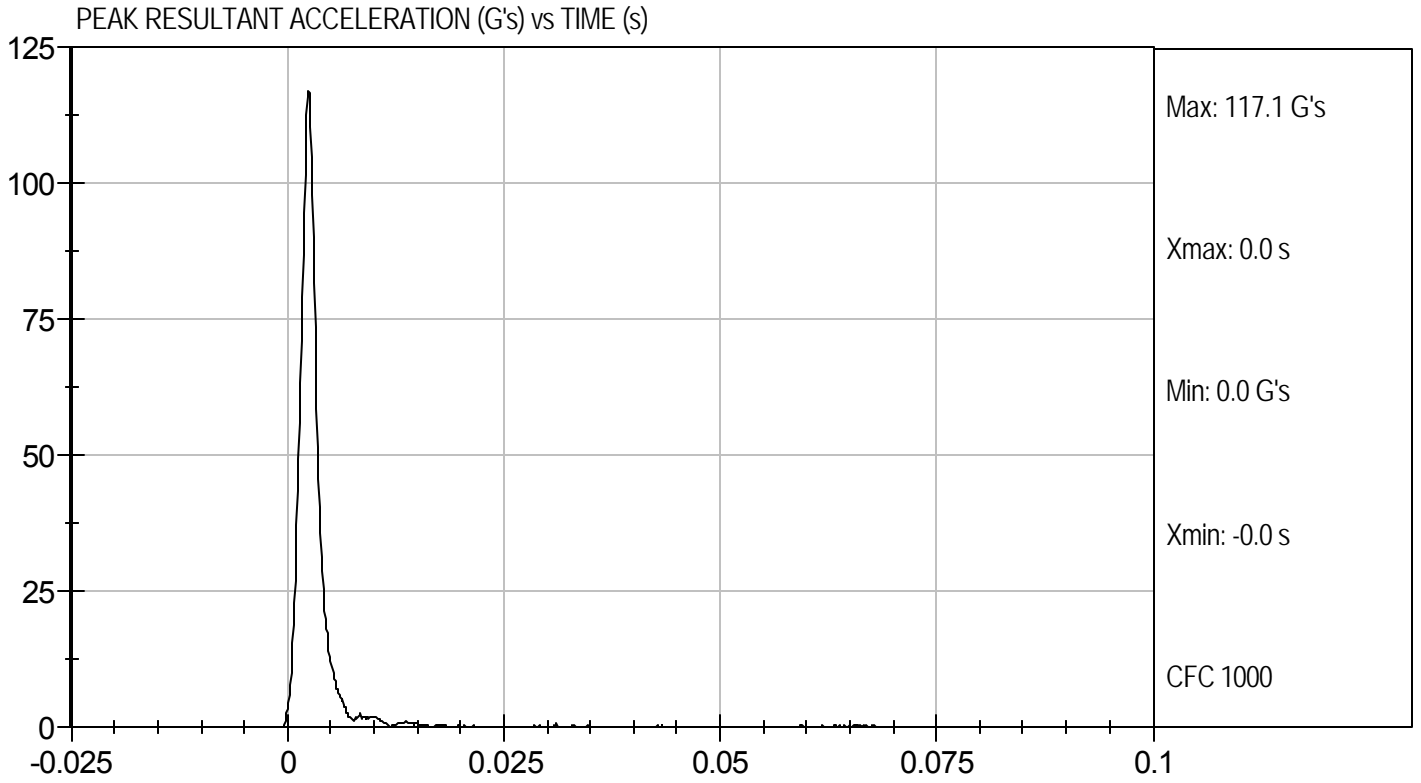
9/14/10
 Test Date

David Winkelbauer
 Approved By



Test Desc: Head Drop
Component ID: D102991

Test Date: 9/14/10
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.: D102992

Tested Parameter		Units	Specification	Result	Pass/Fail
Temperature		deg C	20.6 to 22.2	21.1	Pass
Humidity		%	10 to 70	50	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	3.42	Pass
	20 ms	m/s	4.40 to 5.40	4.60	Pass
	25 ms	m/s	5.40 to 6.10	5.49	Pass
	25-100 ms	m/s	5.50 to 6.20	5.57	Pass
Maximum D-Plane Rotation		deg	71 to 81	72	Pass
Time of Maximum D-Plane Rotation		ms	50 to 70	60	Pass
Maximum Occipital Condyle Moment during Rotation Interval Nm			-44 to -36	-43	Pass
Time of Moment Decay to 0 Nm		ms	102 to 126	113	Pass
Overall Test Results					Pass

Jessica Hall
Laboratory Technician

9/13/10
Test Date

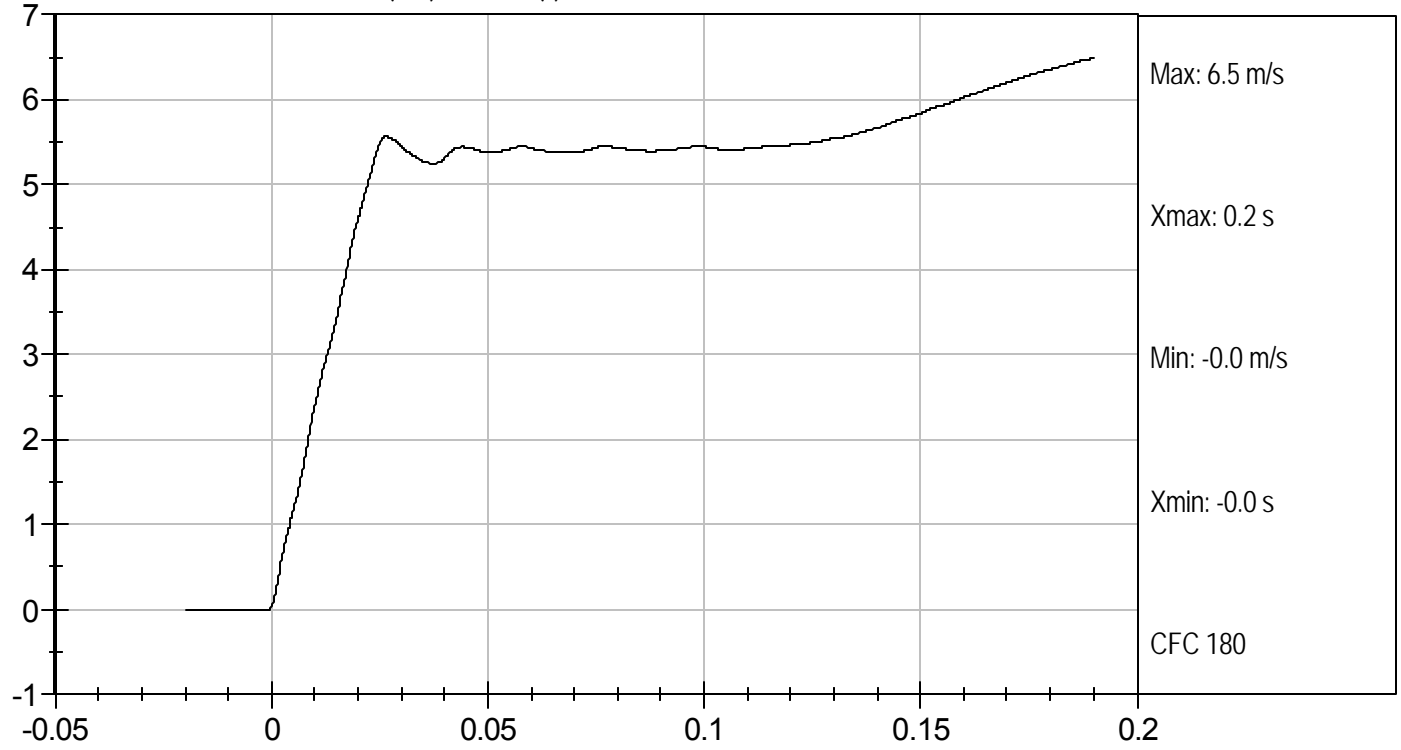
David Winkelbauer
Approved By



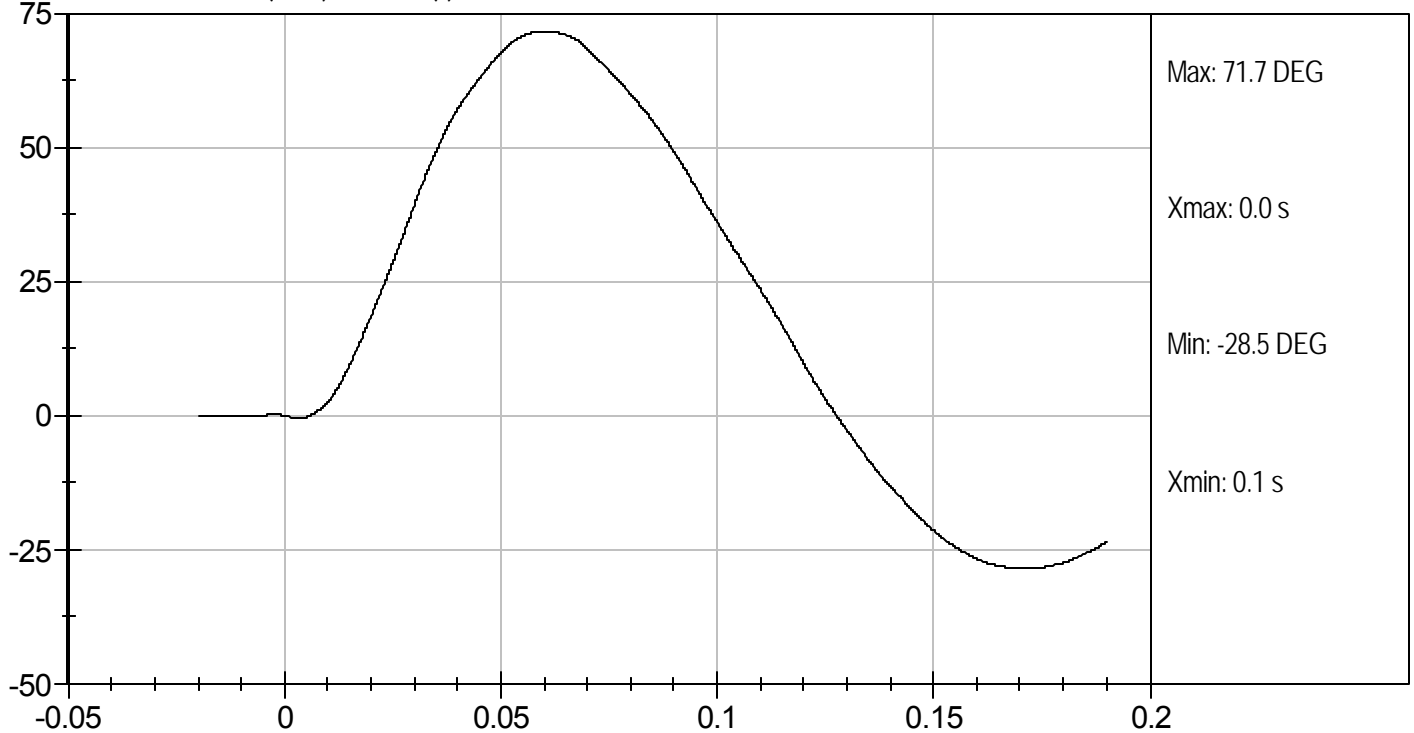
Test Desc: Neck Bending
Component ID: D102992

Test Date: 9/13/10
Velocity: 18.31 ft/s, 5.58 m/s

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



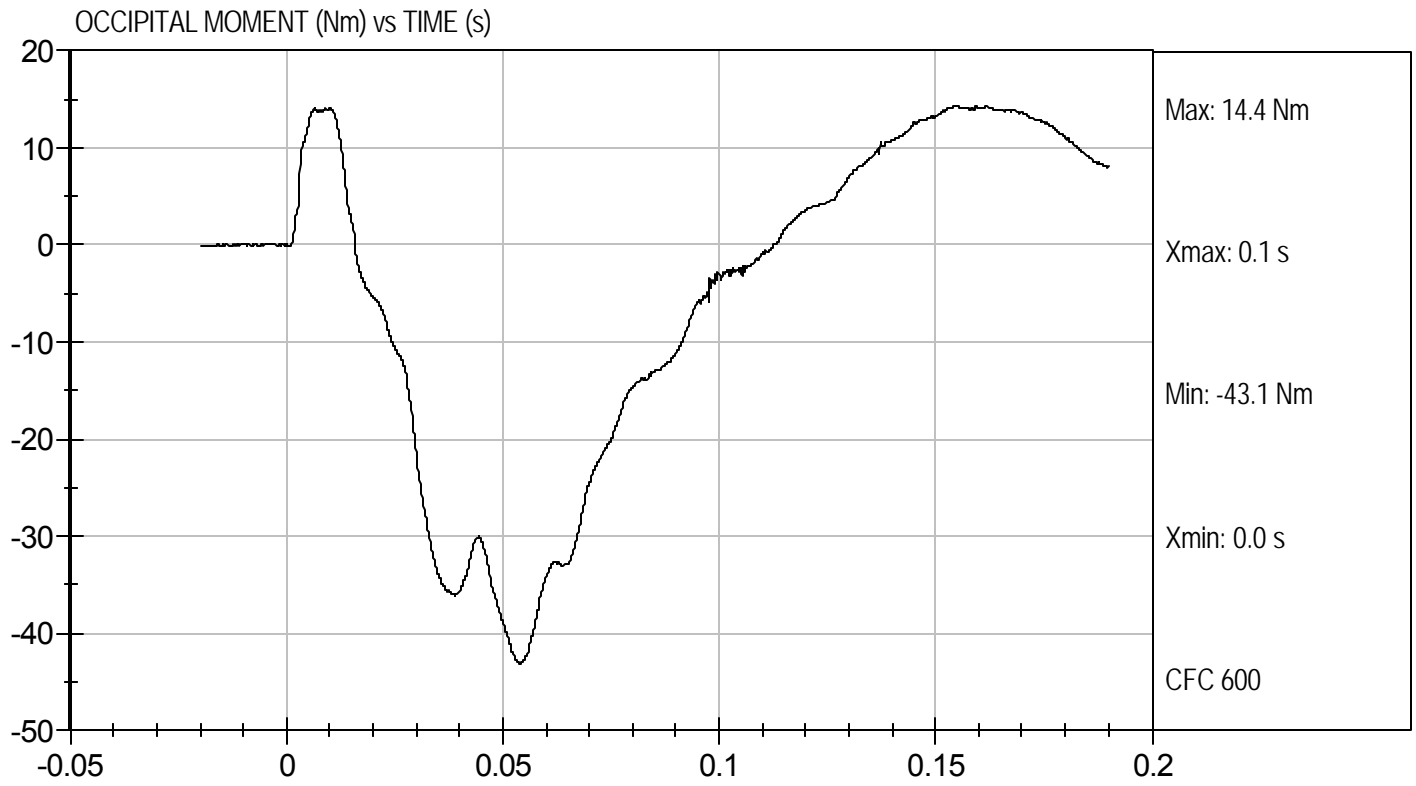
FLEXION ANGLE (DEG) vs TIME (s)





Test Desc: Neck Bending
Component ID: D102992

Test Date: 9/13/10
Velocity: 18.31 ft/s, 5.58 m/s



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

ATD Serial No: 306

Test ID: D102993

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	52	Pass
Impact Velocity	m/s	4.20 to 4.40	4.34	Pass
Maximum Probe Acceleration	G's	13 to 18	16	Pass
Shoulder Displacement	mm	28 to 37	28	Pass
Upper Spine (T1) Y Acceleration	G's	17 to 22	20	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

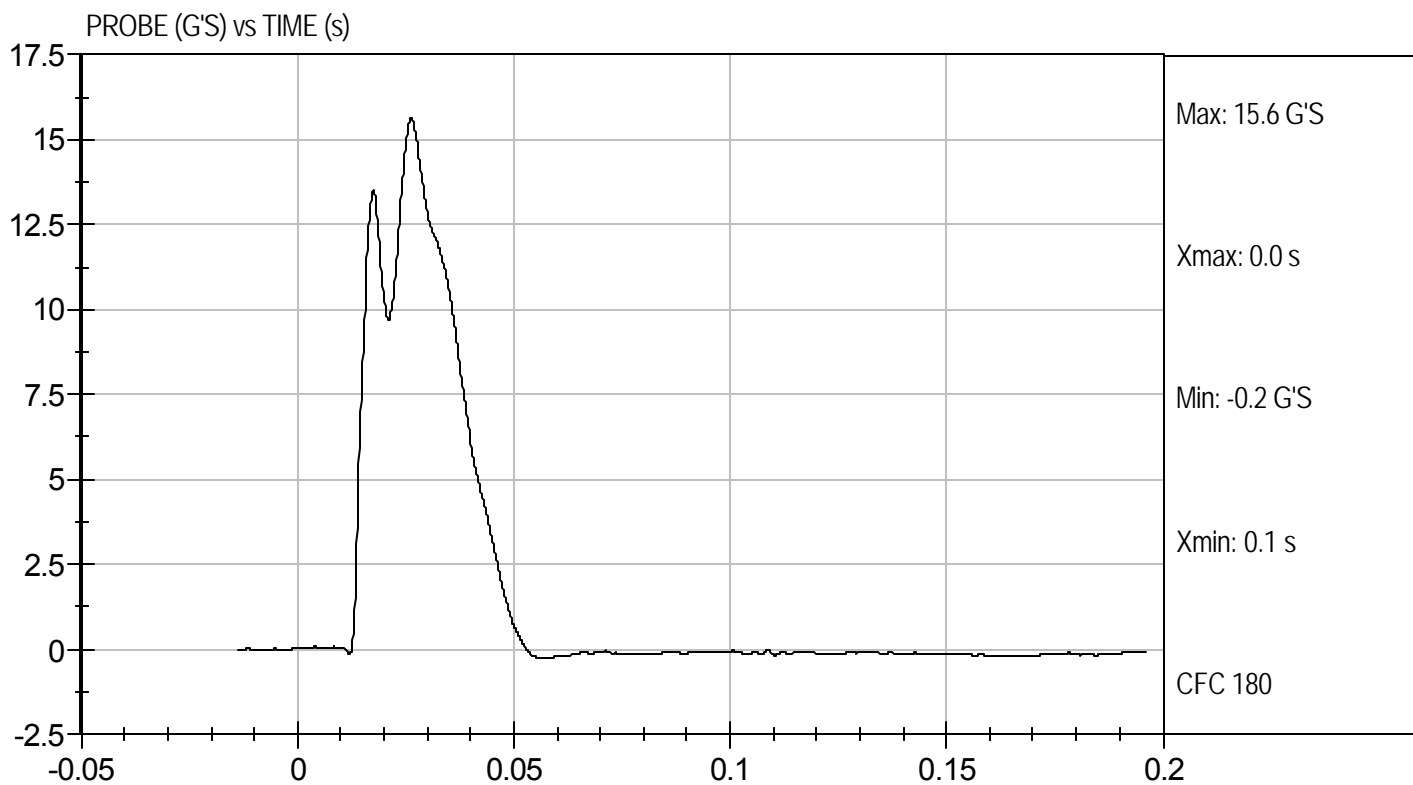
9/14/10
Test Date

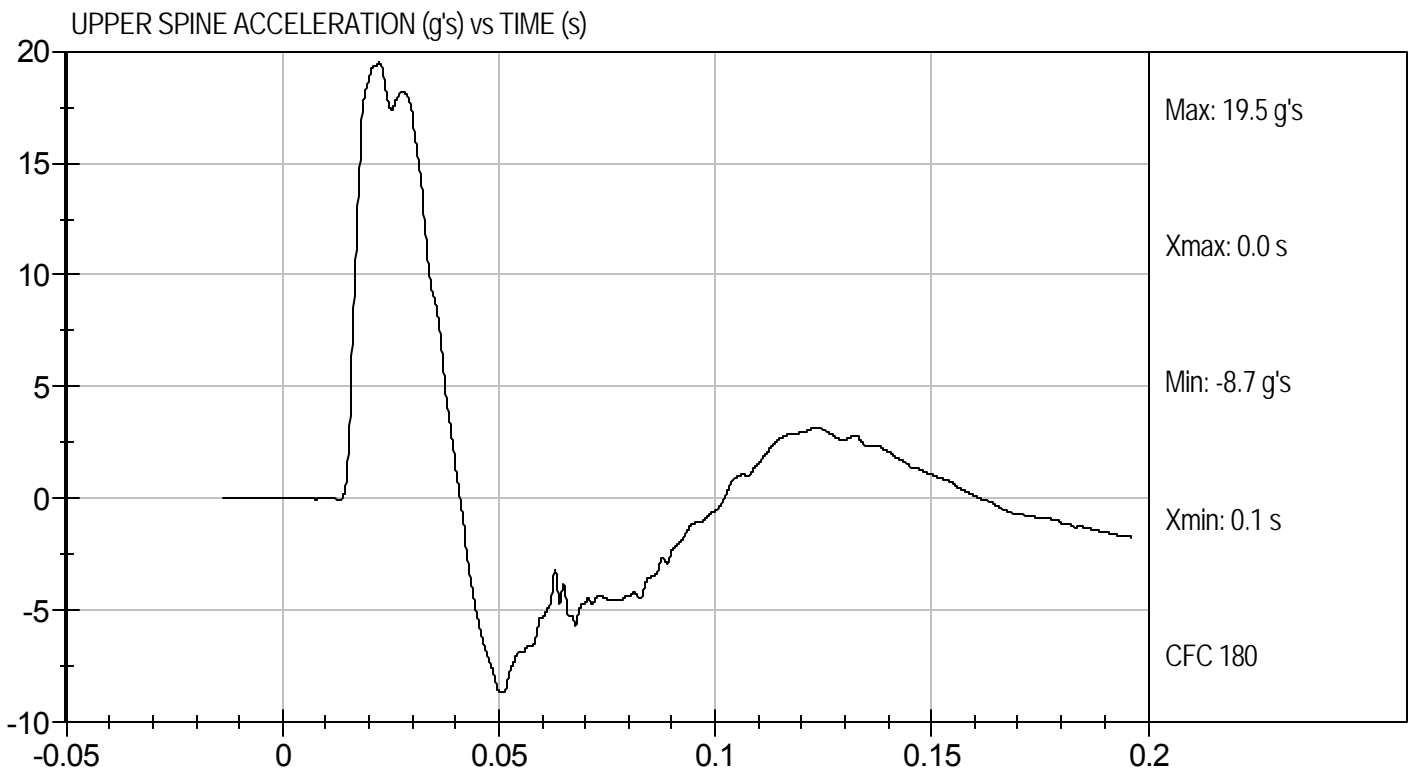
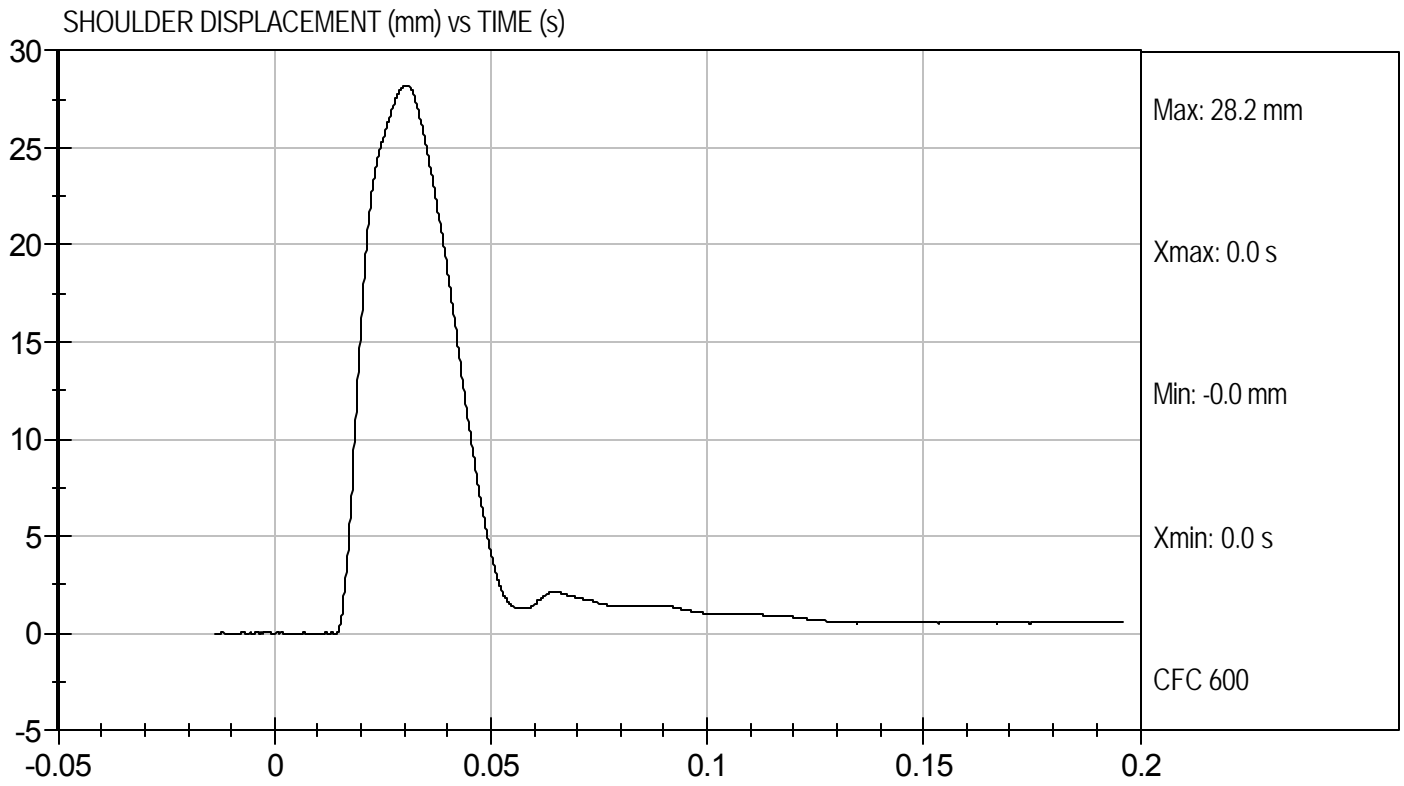
David Winkelbauer
Approved By



Test Desc: Shoulder Impact
Component ID: D102993

Test Date: 9/14/10
Velocity: 14.25 ft/s, 4.34 m/s





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

ATD Serial No: 306

Test I.D: D102994

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.9	Pass
Humidity	%	10 to 70	53	Pass
Impact Velocity	m/s	6.60 to 6.80	6.77	Pass
Peak Impactor Acceleration	G's	30 to 36	33	Pass
Shoulder Displacement	mm	31 to 40	36	Pass
Upper Rib Displacement	mm	25 to 32	28	Pass
Middle Rib Displacement	mm	30 to 36	31	Pass
Lower Rib Displacement	mm	32 to 38	33	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

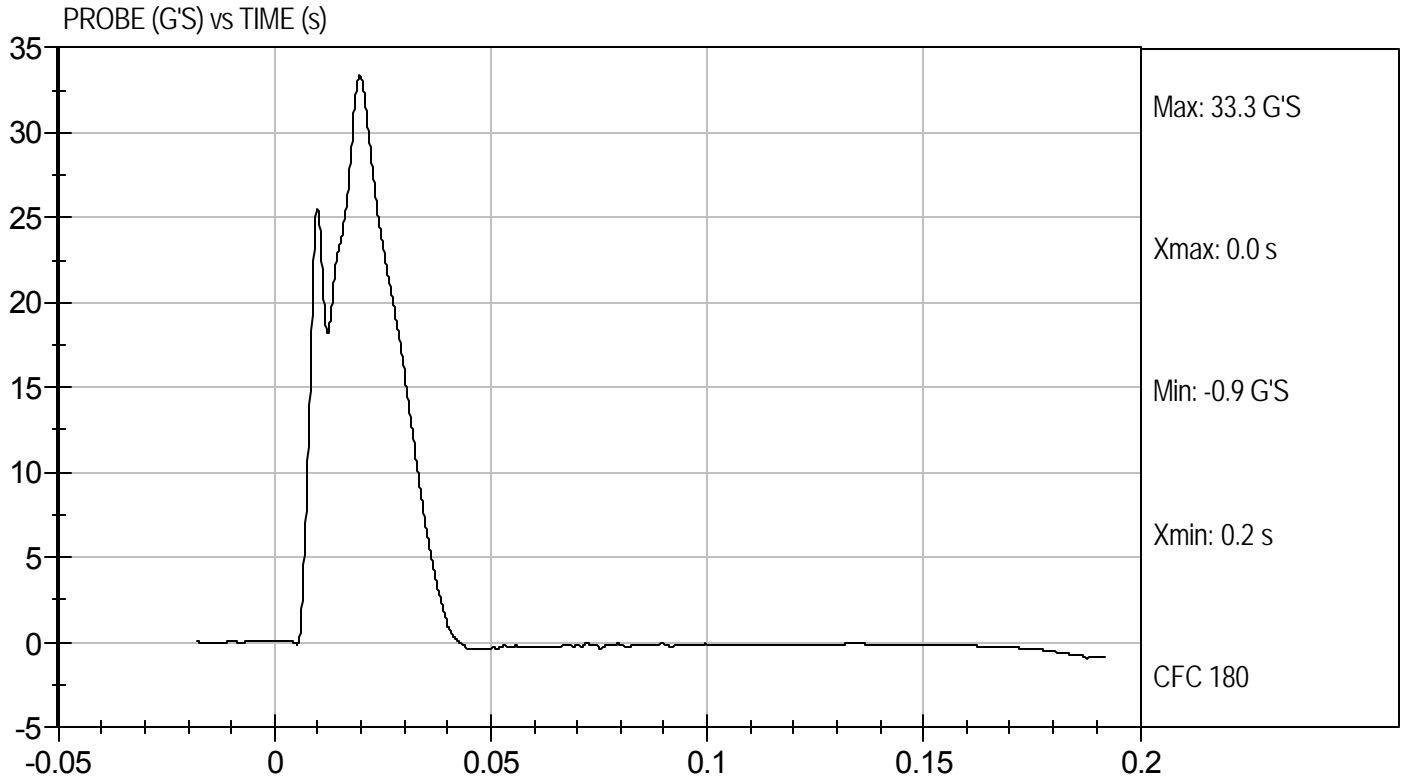
9/14/10
Test Date

David Winkelbauer
Approved By



Test Desc: Thorax With Arm
Component ID: D102994

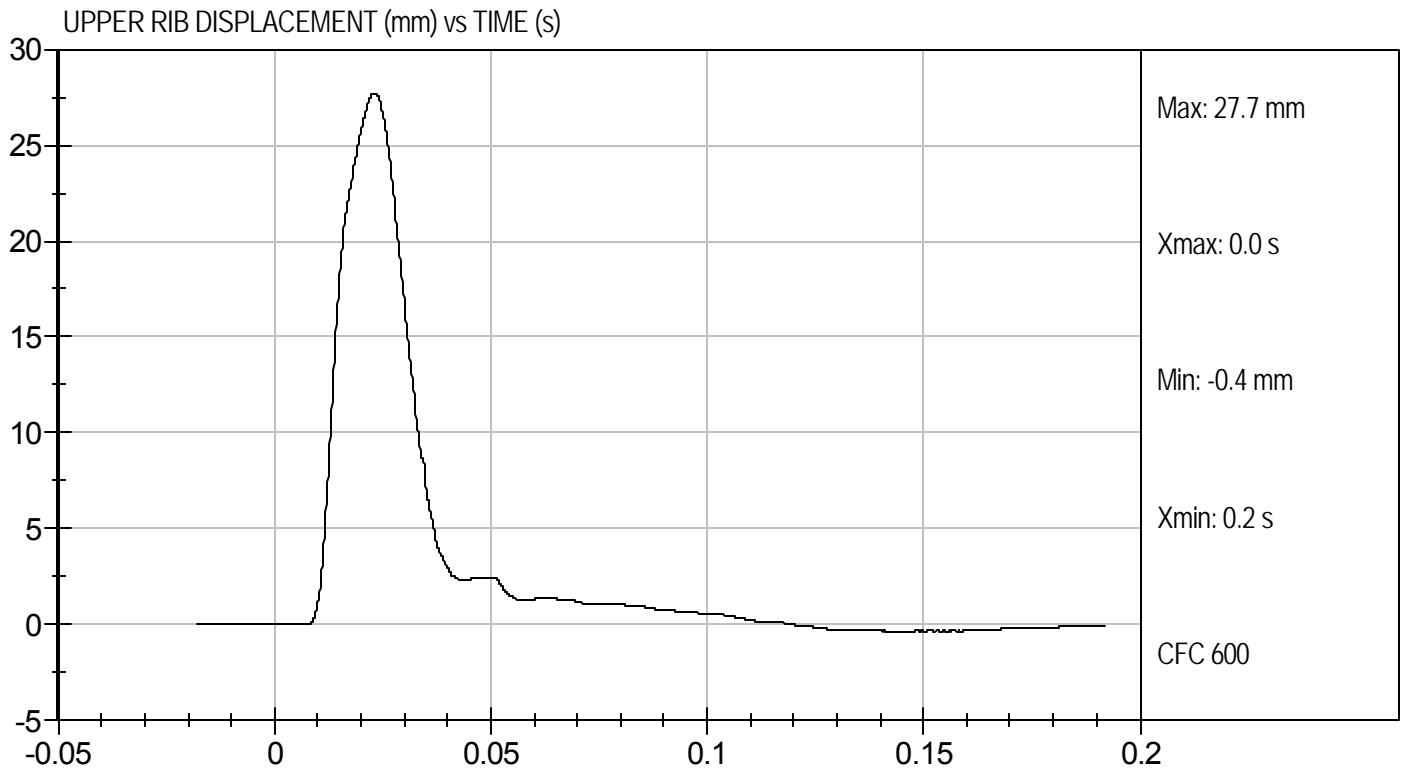
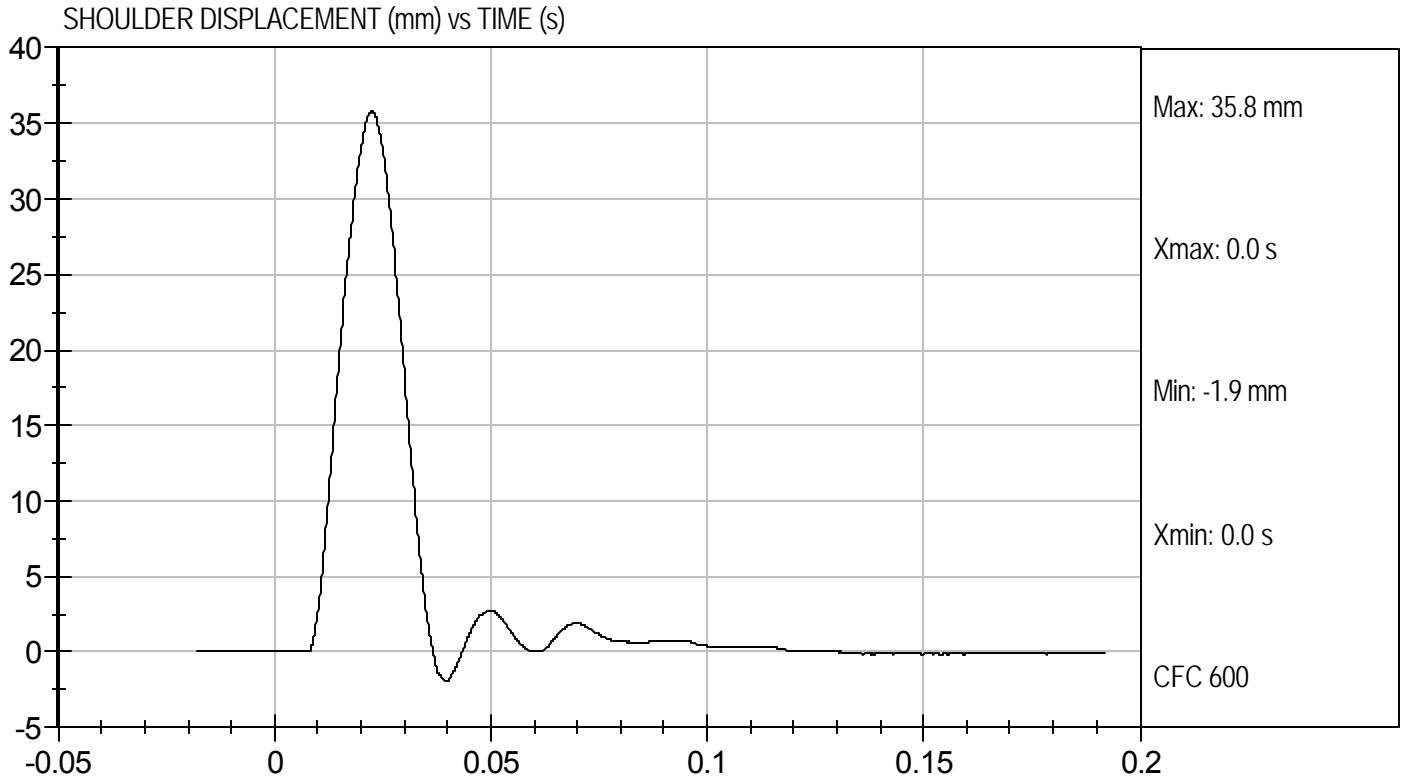
Test Date: 9/14/10
Velocity: 22.22 ft/s, 6.77 m/s

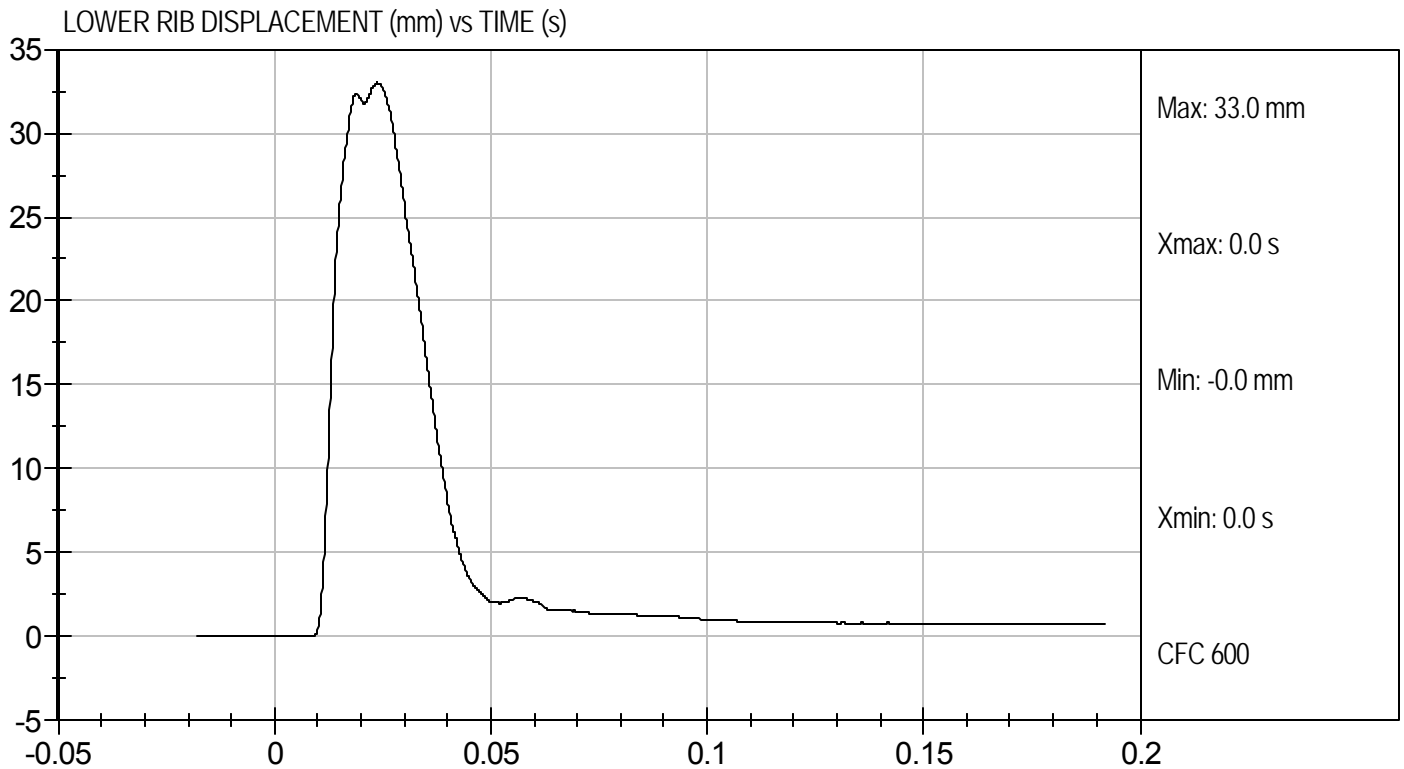
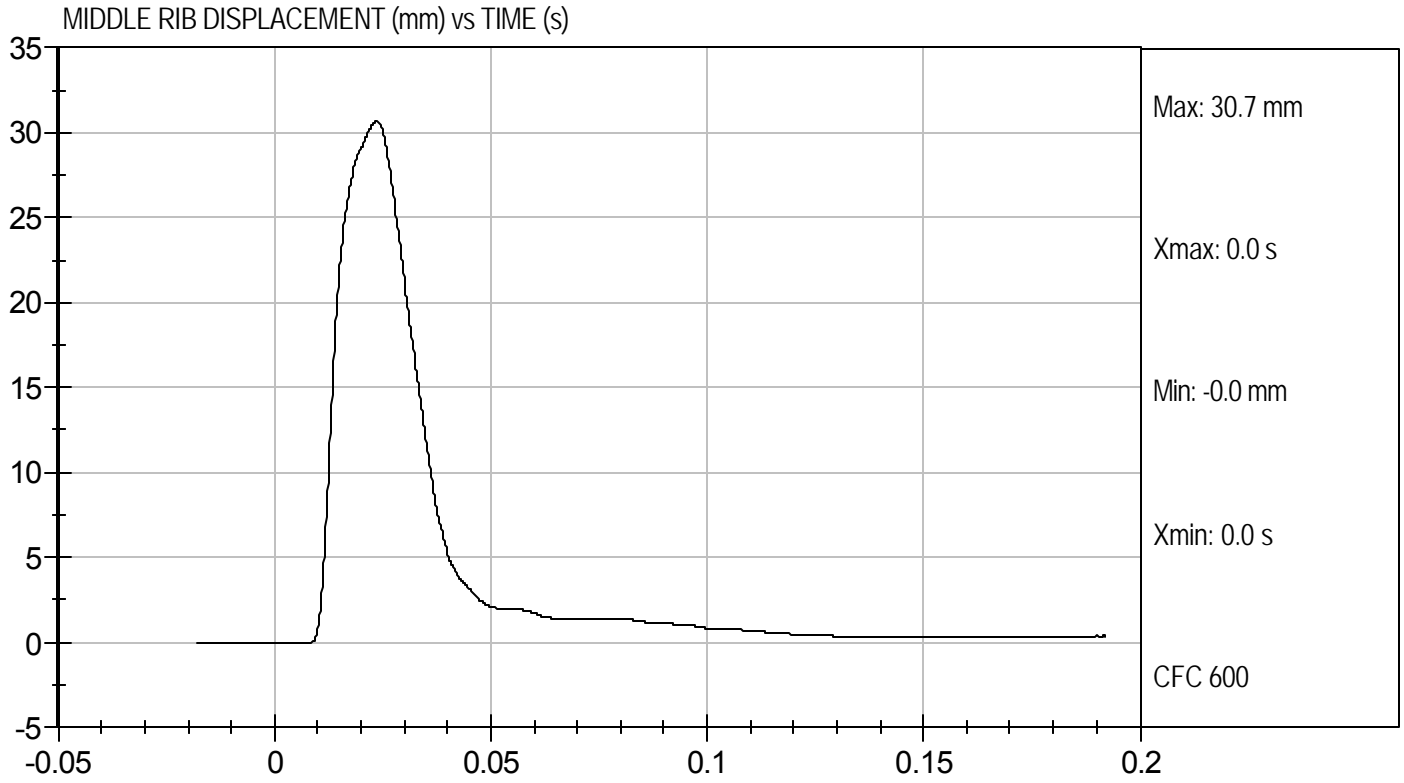


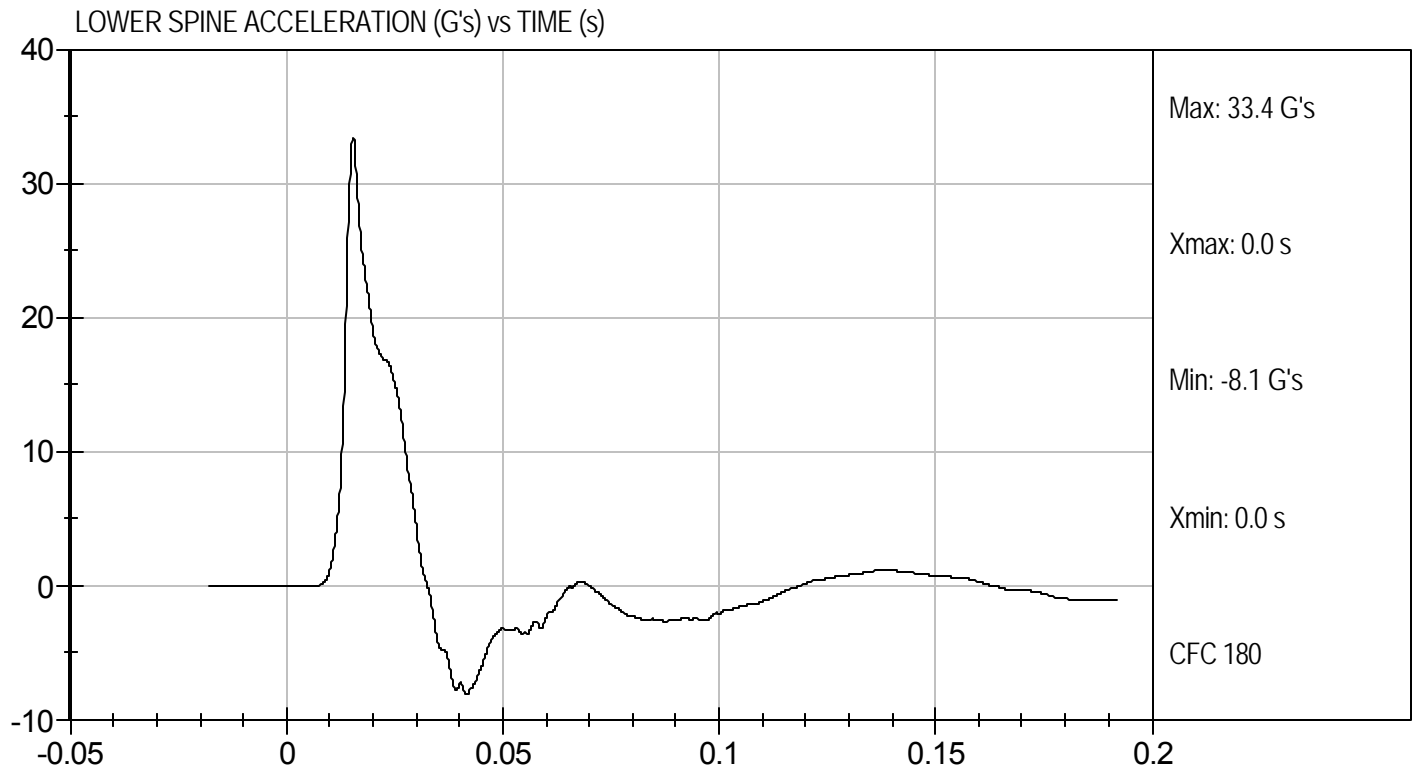
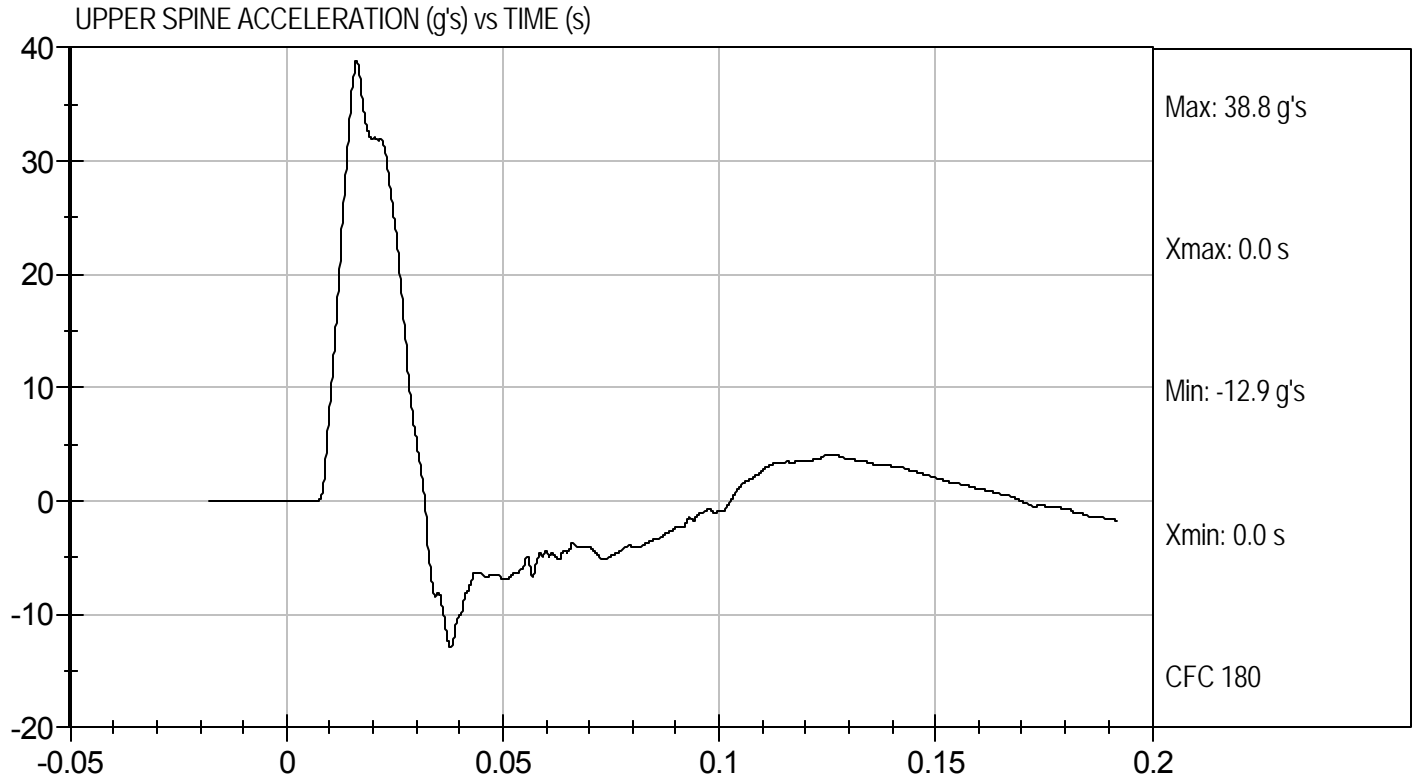


Test Desc: Thorax With Arm
Component ID: D102994

Test Date: 9/14/10
Velocity: 22.22 ft/s, 6.77 m/s







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


ATD Serial No: 306

Test I.D: D102995

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.6	Pass
Humidity	%	10 to 70	49	Pass
Impact Velocity	m/s	4.20 to 4.40	4.38	Pass
Peak Impactor Force	G's	14 to 18	15	Pass
Upper Rib Displacement	mm	32 to 40	38	Pass
Middle Rib Displacement	mm	39 to 45	41	Pass
Lower Rib Displacement	mm	35 to 43	38	Pass
Upper Spine (T1) Y Acceleration	G's	13 to 17	15	Pass
Lower Spine (T12) Y Acceleration	G's	7 to 11	8	Pass
Overall Test Results				Pass


 Laboratory Technician

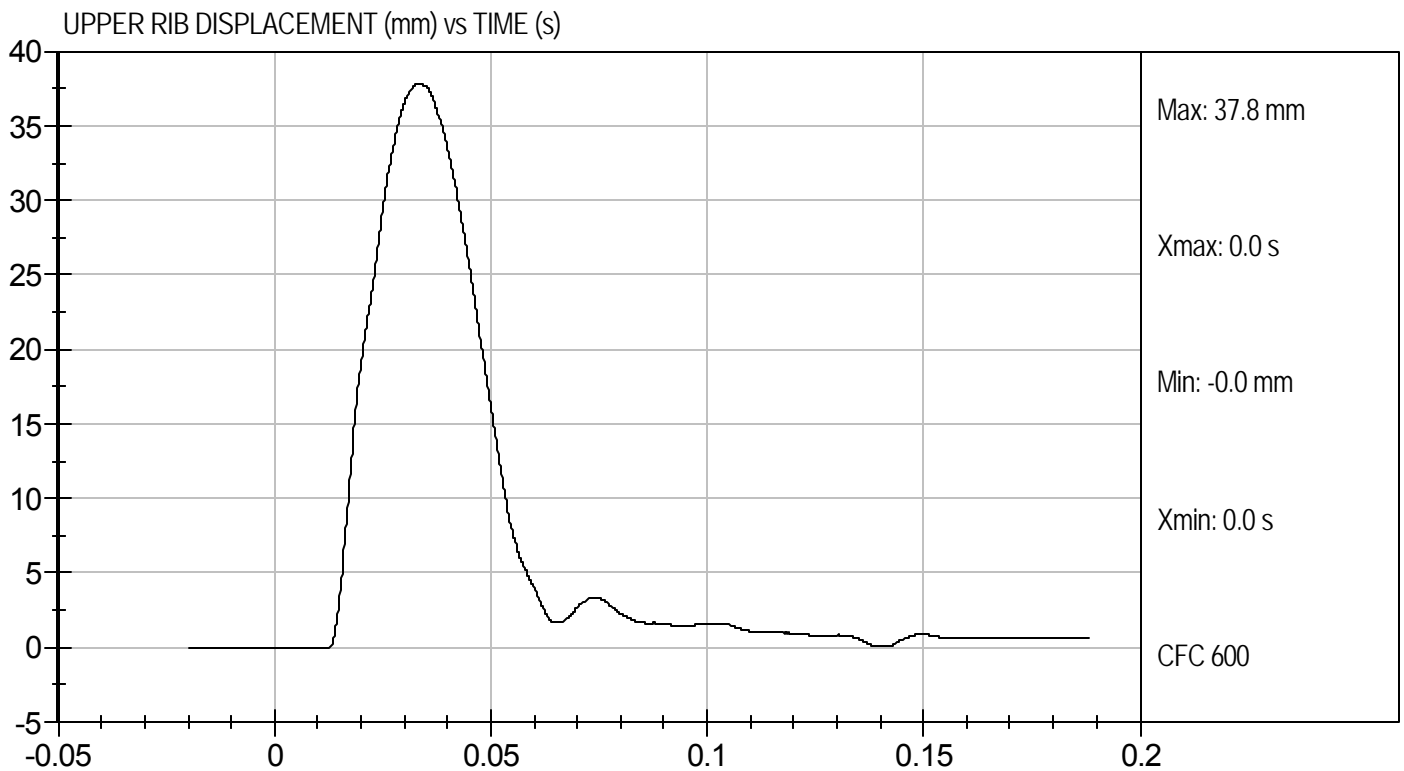
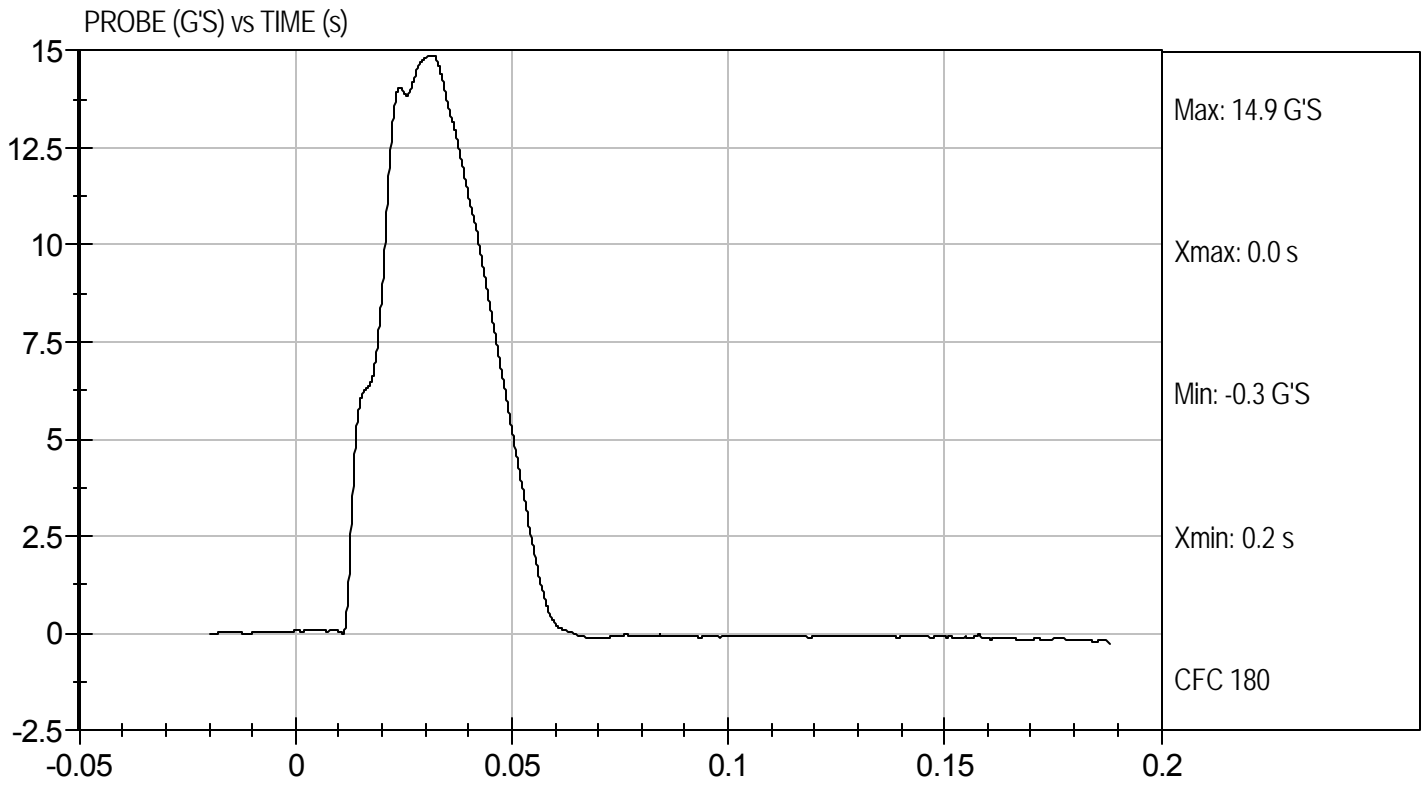
9/14/10
 Test Date


 Approved By



Test Desc: Thorax Without Arm
Component ID: D102995

Test Date: 9/14/10
Velocity: 14.37 ft/s, 4.38 m/s

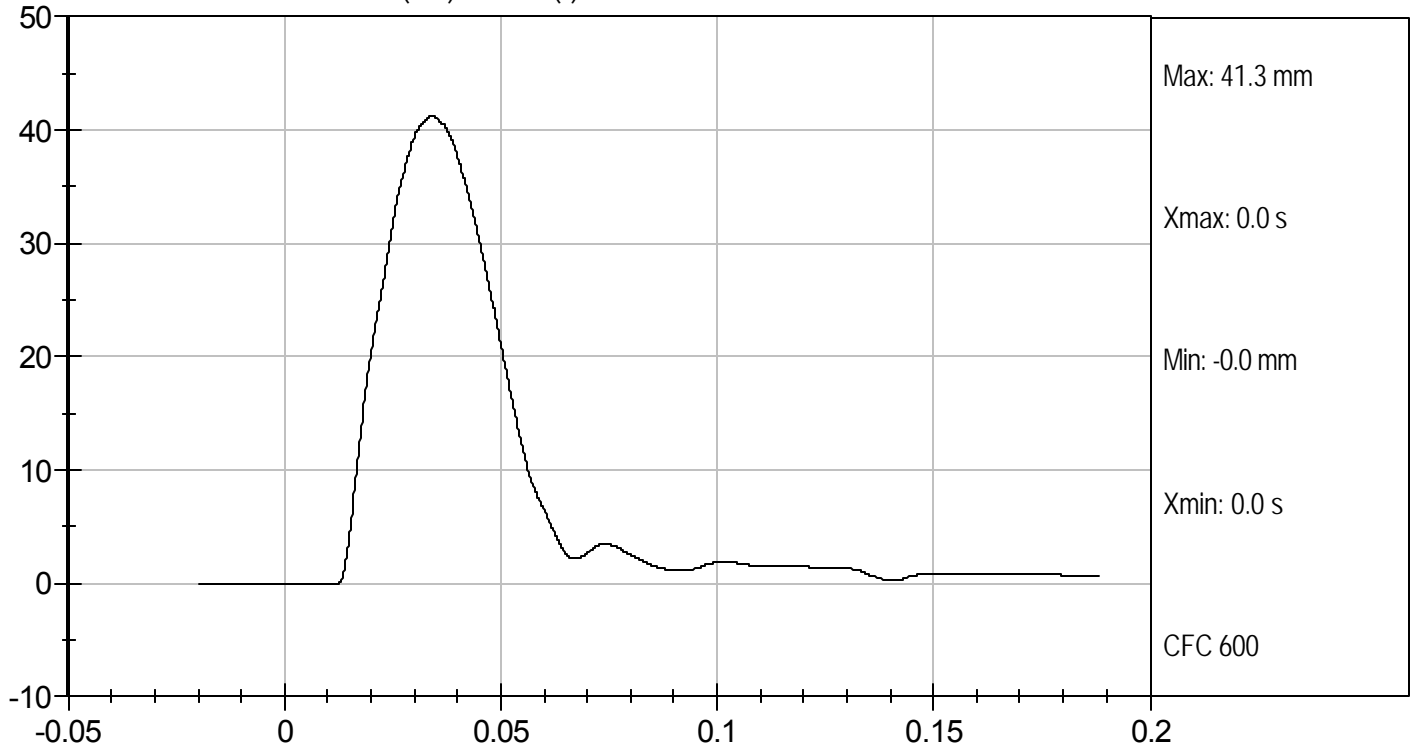




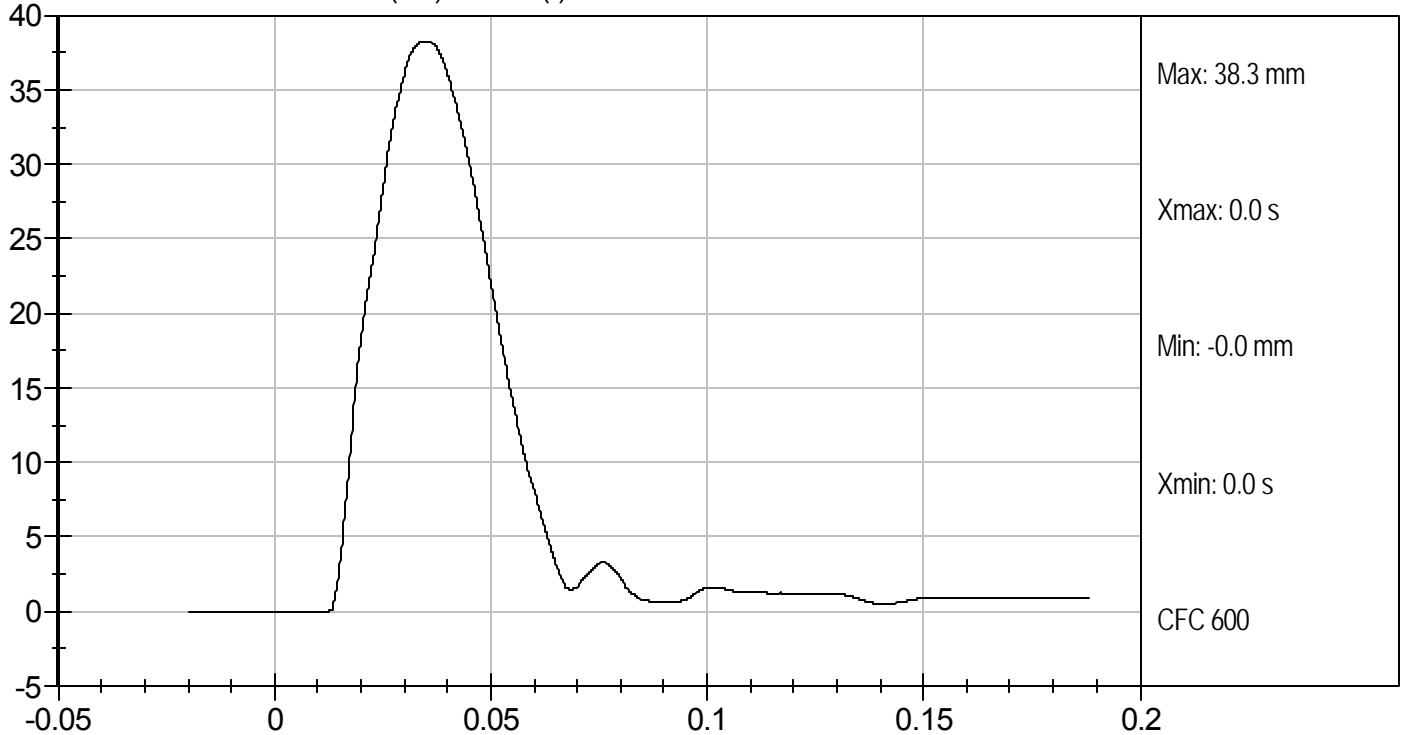
Test Desc: Thorax Without Arm
Component ID: D102995

Test Date: 9/14/10
Velocity: 14.37 ft/s, 4.38 m/s

MIDDLE RIB DISPLACEMENT (mm) vs TIME (s)

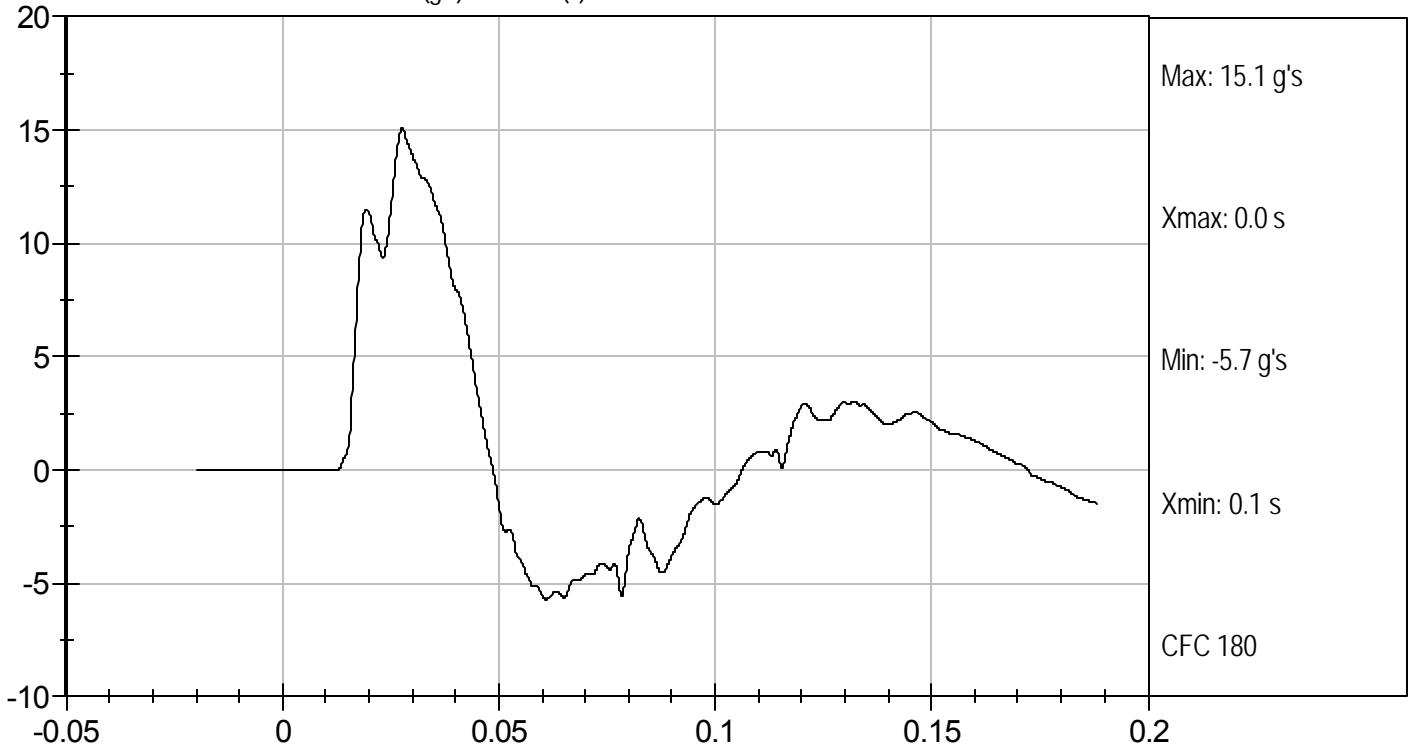


LOWER RIB DISPLACEMENT (mm) vs TIME (s)

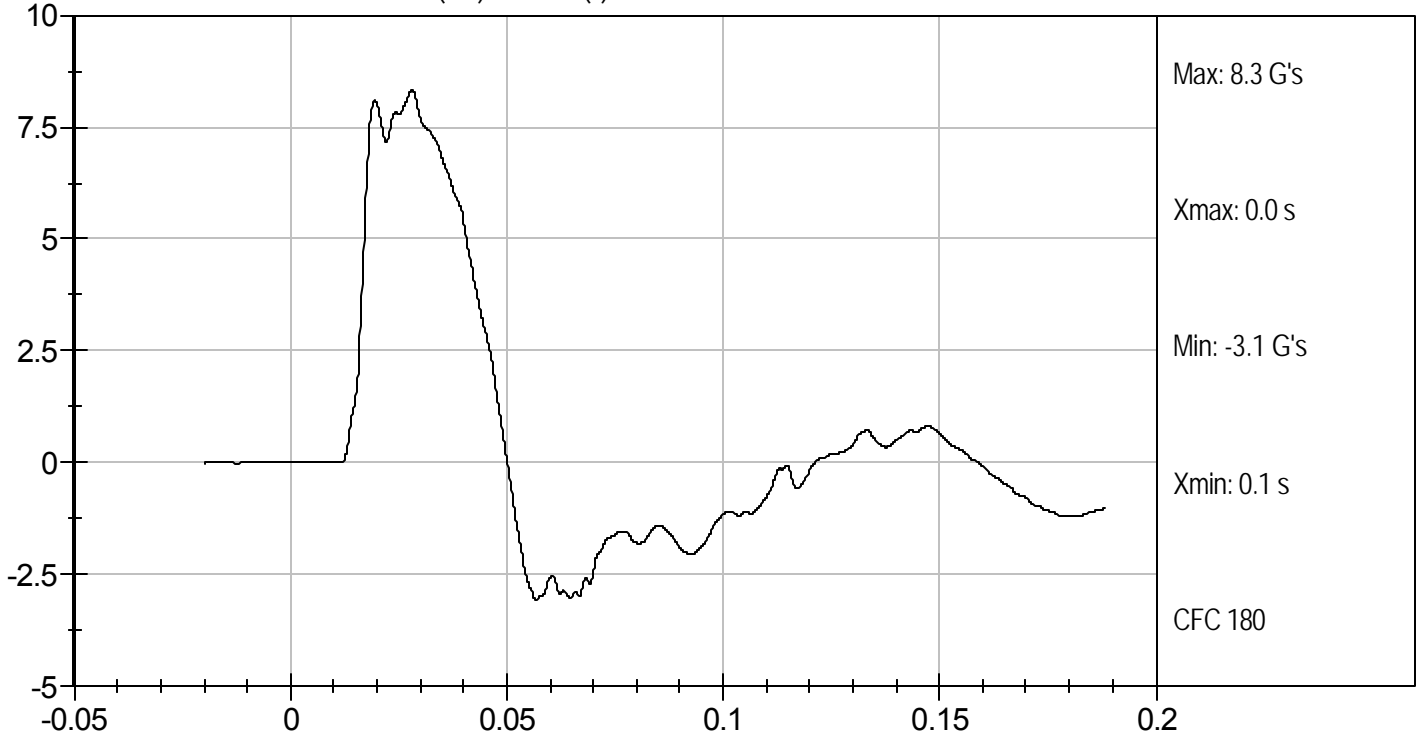




UPPER SPINE ACCELERATION (g's) vs TIME (s)



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



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

ATD Serial No: 306

Test I.D: D102996

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.7	Pass
Humidity	%	10 to 70	49	Pass
Impact Velocity	m/s	4.20 to 4.40	4.27	Pass
Peak Impactor Acceleration	G's	12 to 16	14	Pass
Upper Rib Displacement	mm	36 to 47	42	Pass
Lower Rib Displacement	mm	33 to 44	36	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	11	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

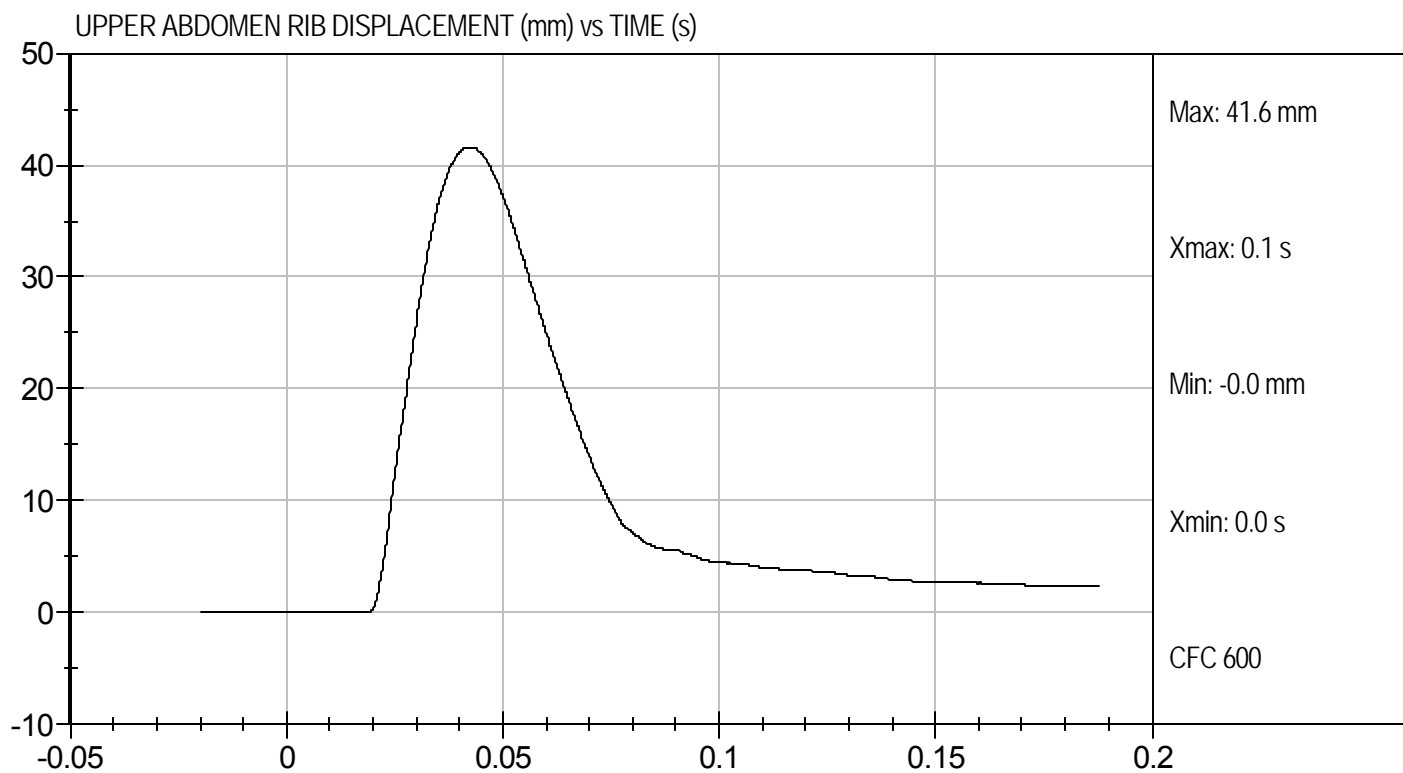
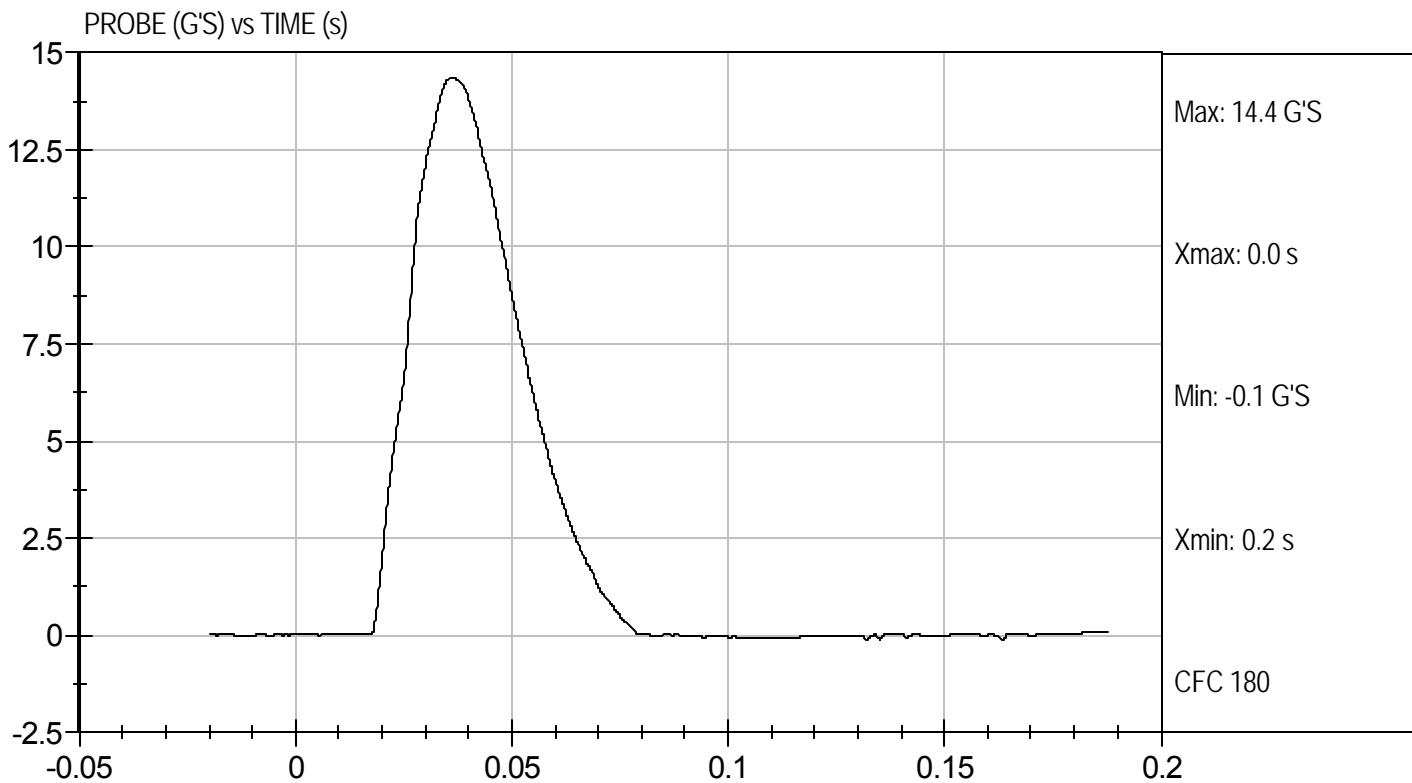
9/14/10
Test Date

David Winkelbauer
Approved By



Test Desc: Abdomen Impact
Component ID: D102996

Test Date: 9/14/10
Velocity: 14.01 ft/s, 4.27 m/s

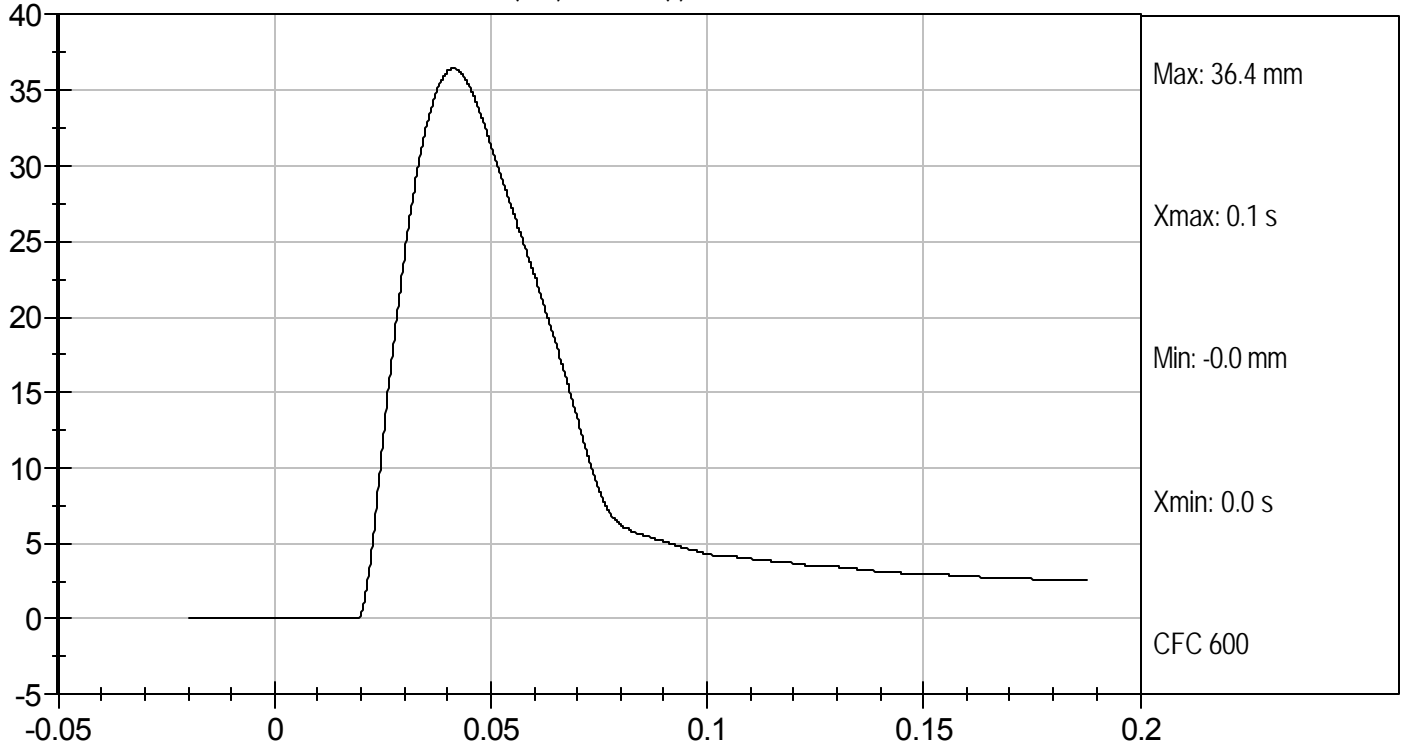




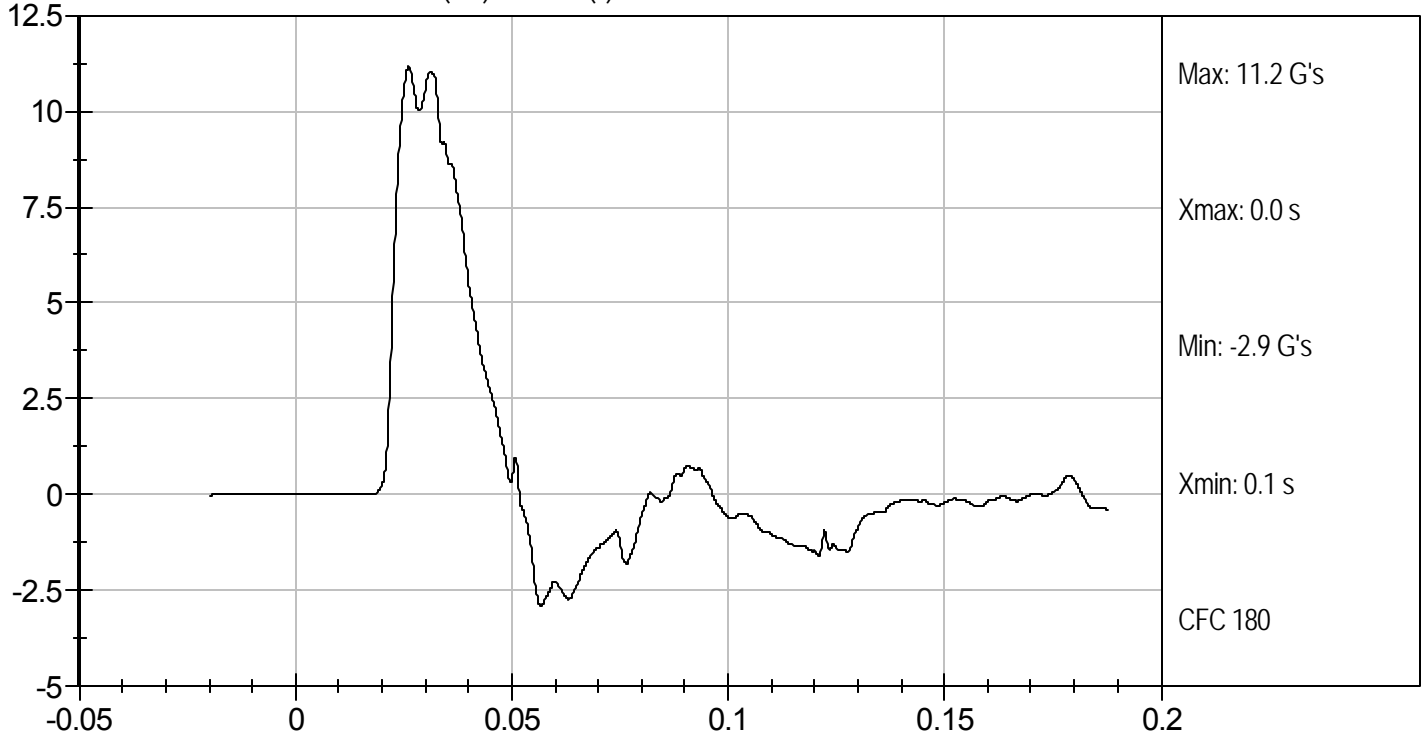
Test Desc: Abdomen Impact
Component ID: D102996

Test Date: 9/14/10
Velocity: 14.01 ft/s, 4.27 m/s

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



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



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

ATD Serial No: 306

Test I.D: D102997

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.8	Pass
Humidity	%	10 to 70	52	Pass
Impact Velocity	m/s	6.60 to 6.80	6.71	Pass
Peak Impactor Acceleration	G's	38 to 47	41	Pass
Pelvis Y Acceleration after 6 ms	G's	34 to 42	37	Pass
Peak Acetabulum Force	N	3600 to 4300	4059	Pass
Overall Test Results				Pass


 Laboratory Technician

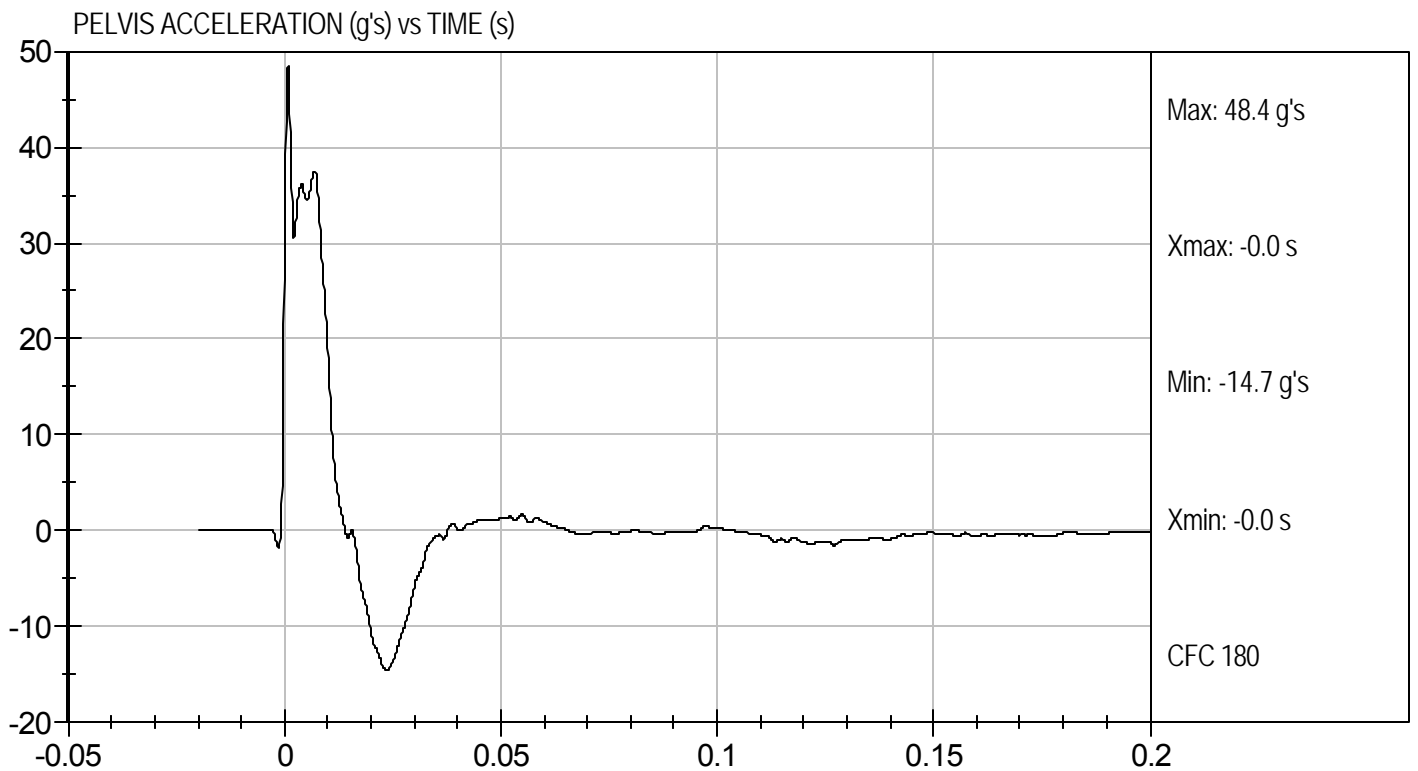
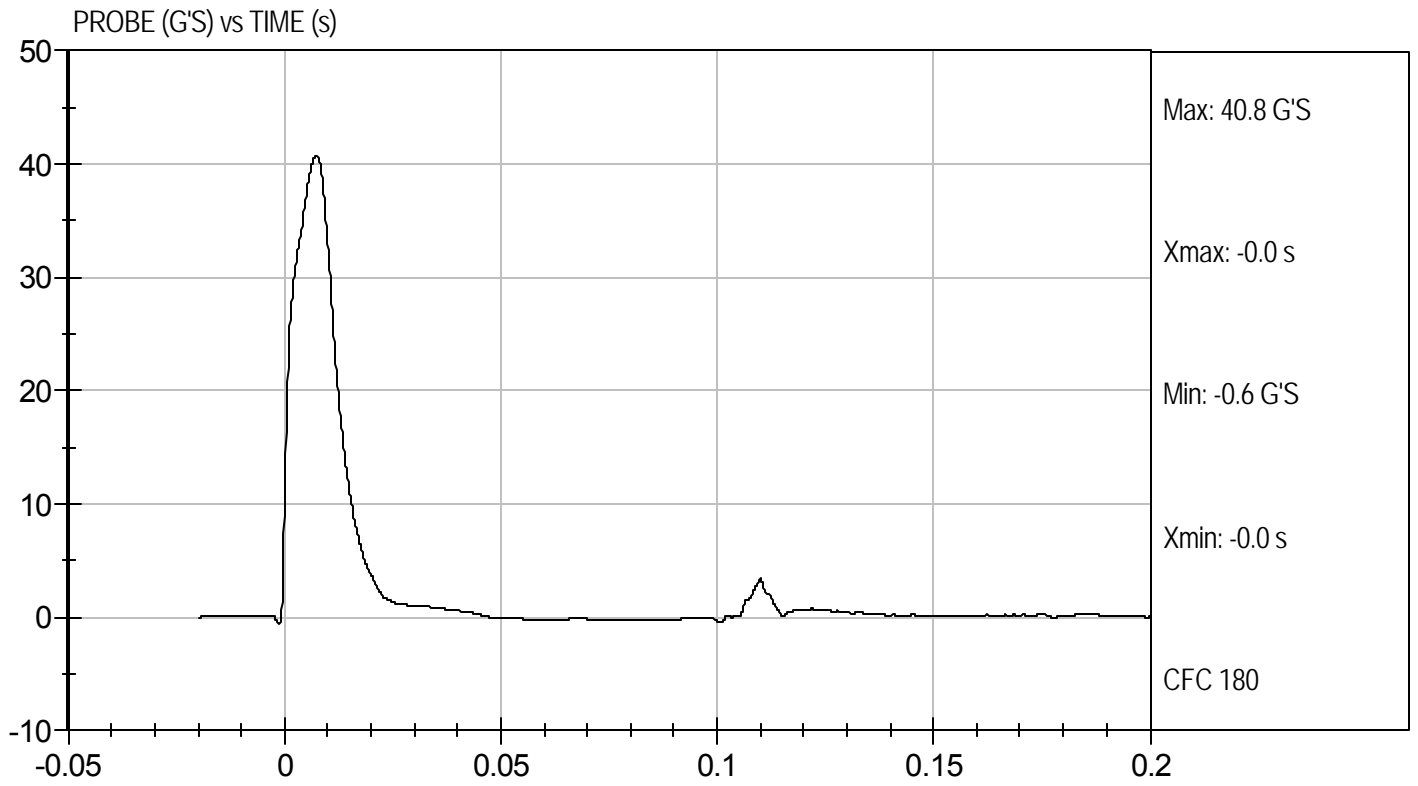
9/14/10
 Test Date


 Approved By



Test Desc: Pelvis Impact
Component ID: D102997

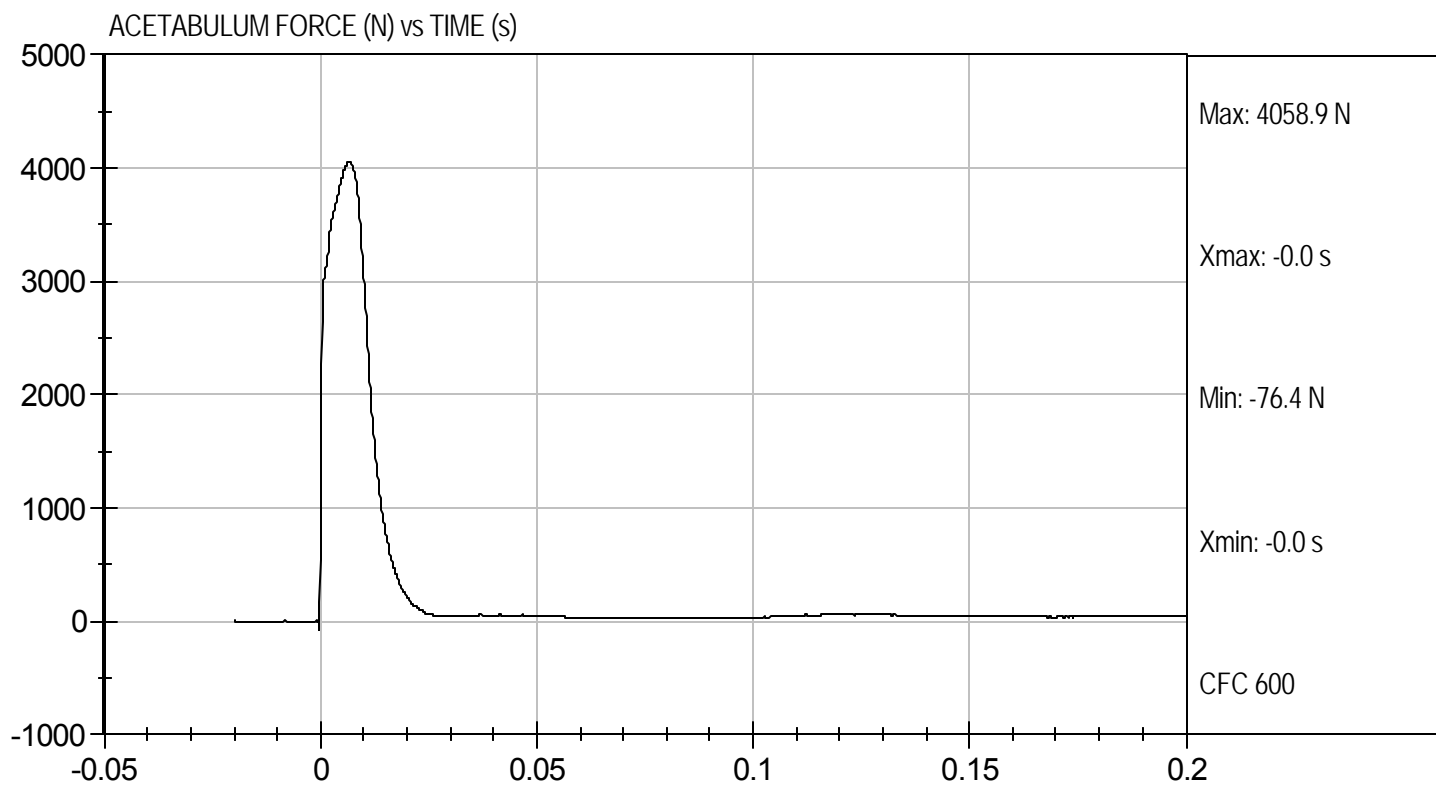
Test Date: 9/14/10
Velocity: 22.01 ft/s, 6.71 m/s





Test Desc: Pelvis Impact
Component ID: D102997

Test Date: 9/14/10
Velocity: 22.01 ft/s, 6.71 m/s



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

ATD Serial No: 306

Test I.D: D102998

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.9	Pass
Humidity	%	10 to 70	54	Pass
Impact Velocity	m/s	4.20 to 4.40	4.38	Pass
Peak Impactor Acceleration	G's	36 to 45	39	Pass
Pelvis Y Acceleration	G's	28 to 39	29	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	4913	Pass
Overall Test Results				Pass

Jessica Gall
Laboratory Technician

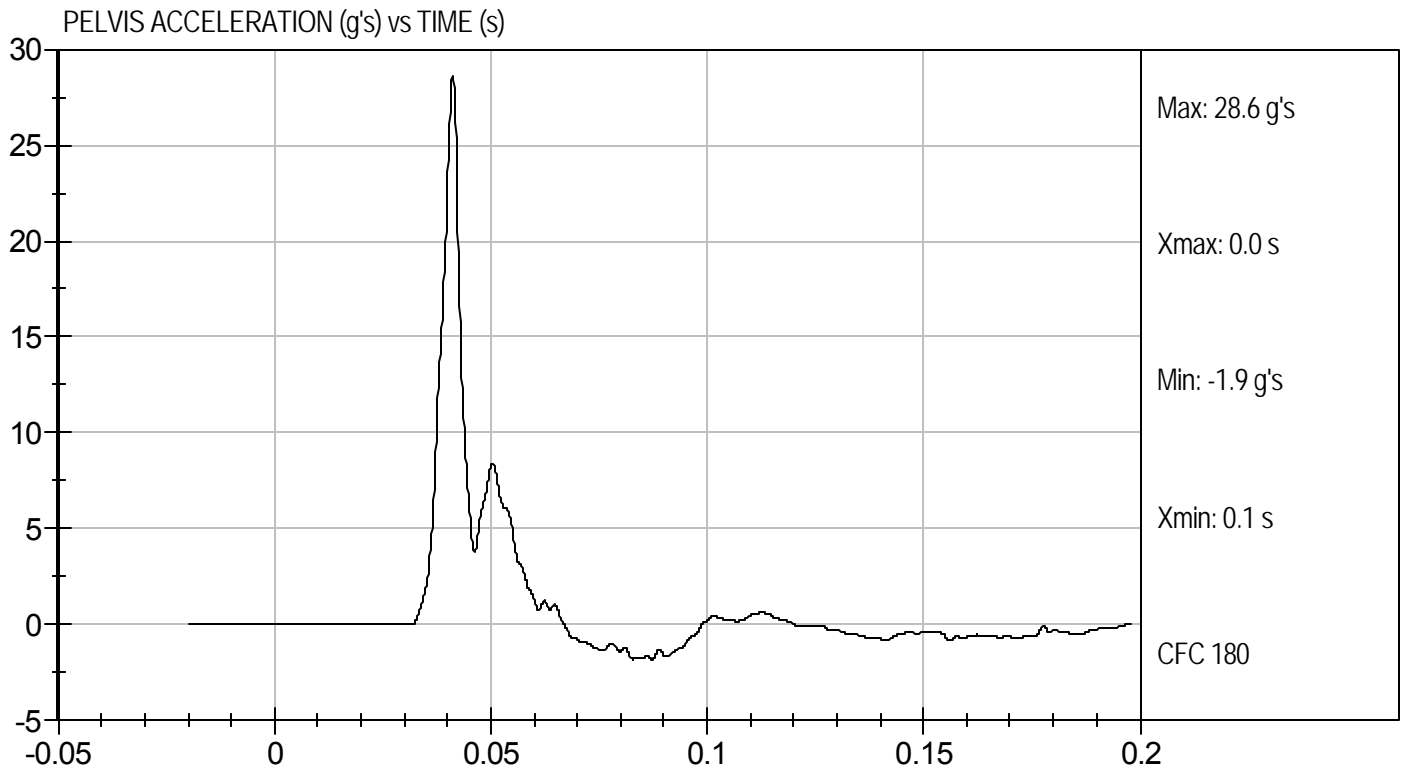
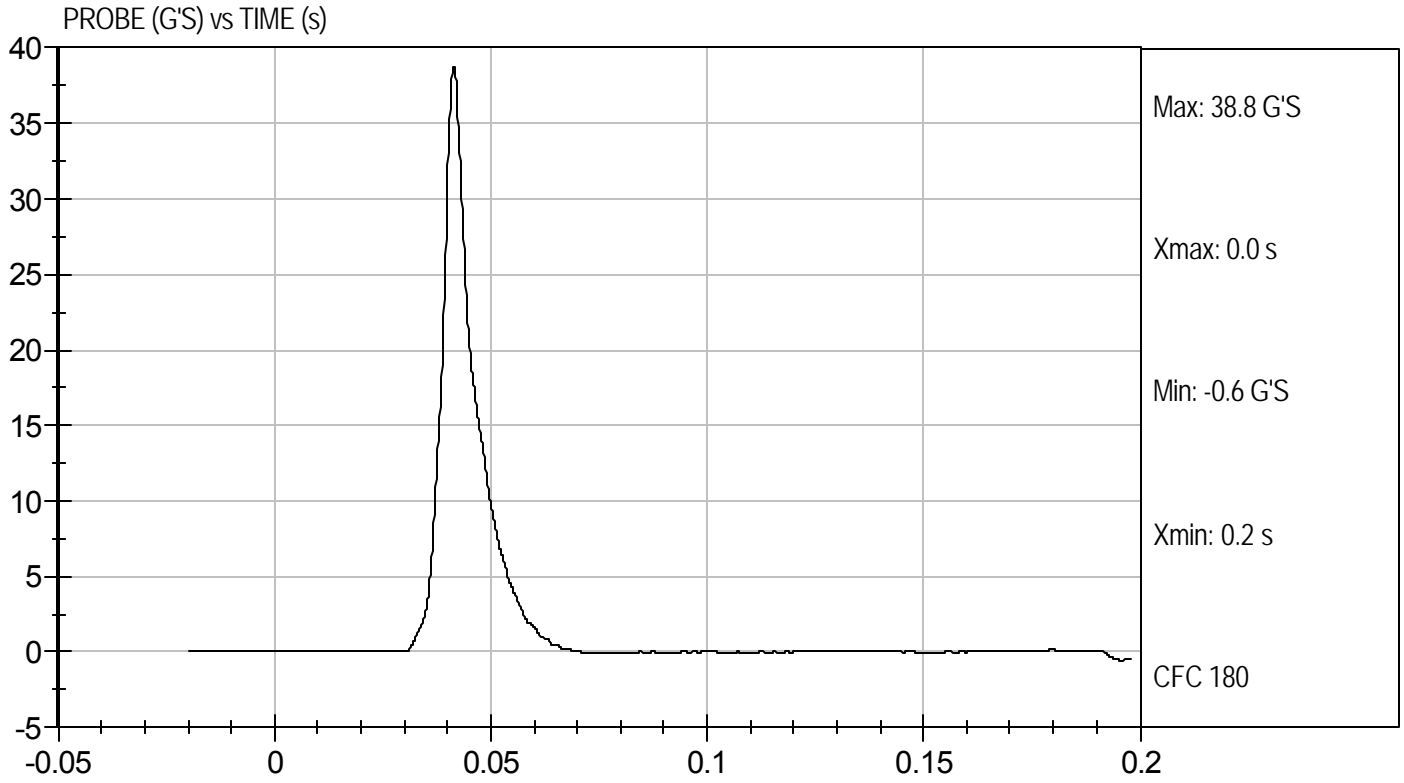
9/14/10
Test Date

David Winkelbauer
Approved By



Test Desc: Iliac Impact
Component ID: D102998

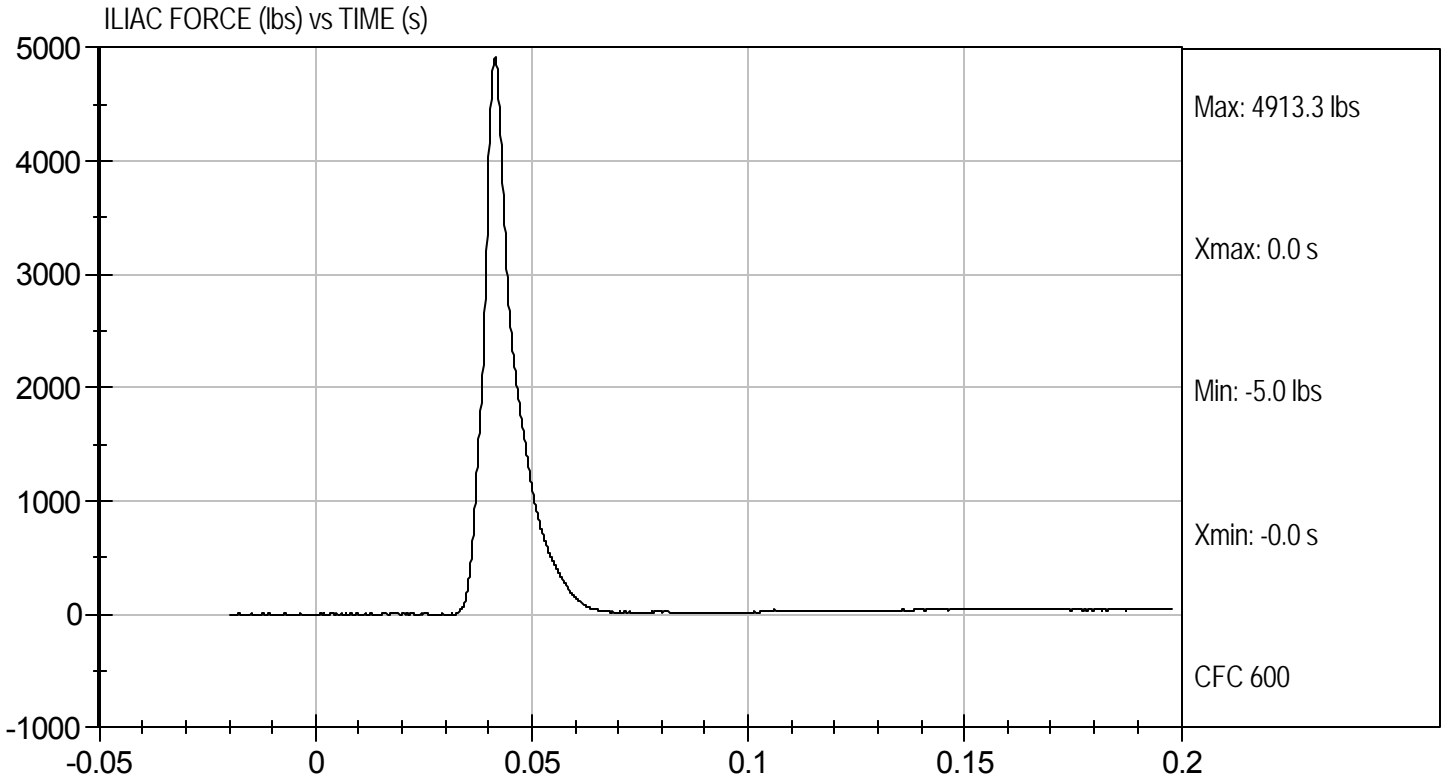
Test Date: 9/14/10
Velocity: 14.37 ft/s, 4.38 m/s





Test Desc: Iliac Impact
Component ID: D102998

Test Date: 9/14/10
Velocity: 14.37 ft/s, 4.38 m/s



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

ATD Serial No: 306

Test ID: D103111

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.0	Pass
Laboratory Relative Humidity	%	10 to 70	52	Pass
Peak Resultant Acceleration	G's	115 to 137	122	Pass
Peak Lateral Acceleration	G's	+/- 15	5.1	Pass
Unimodal	N/A	<15%	Yes	Pass
Overall Test Results				Pass

Jessica Hall
 Laboratory Technician

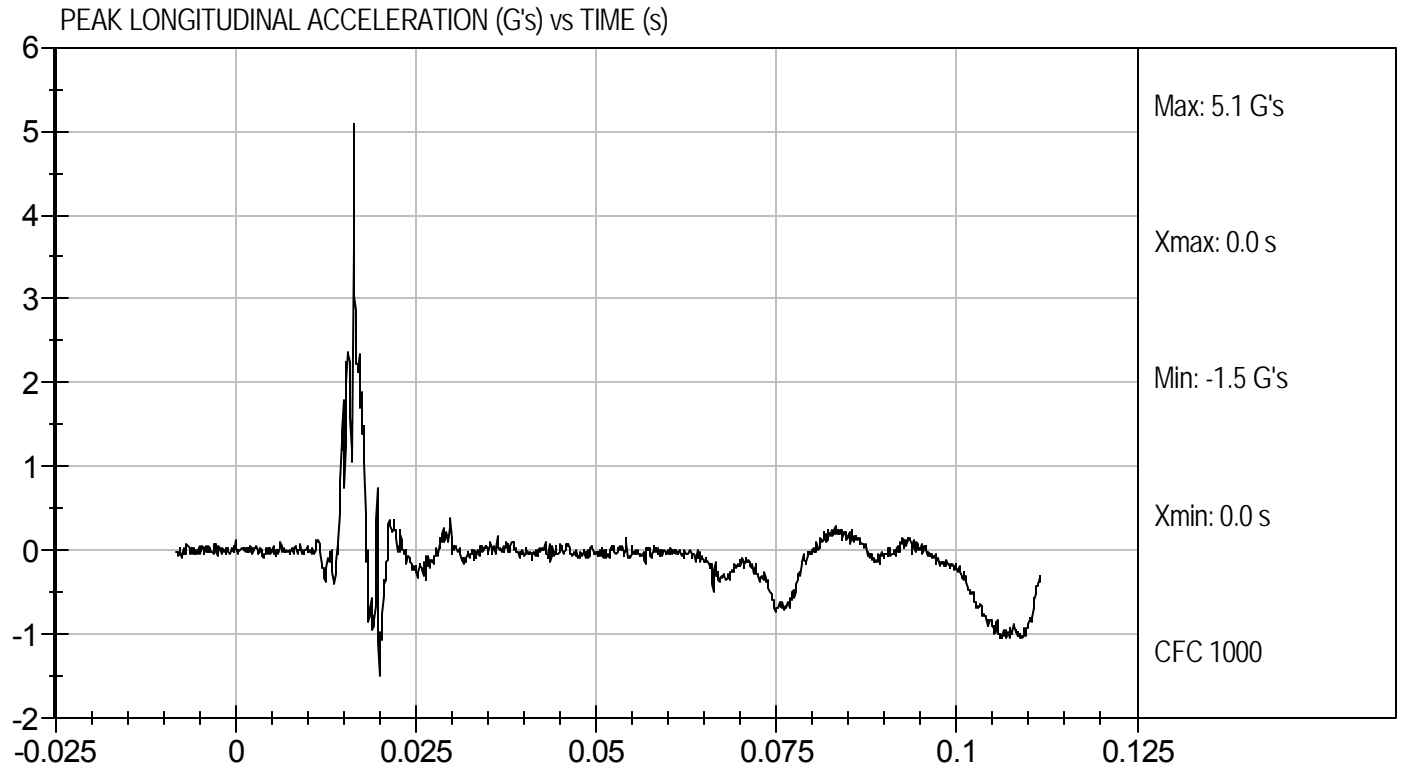
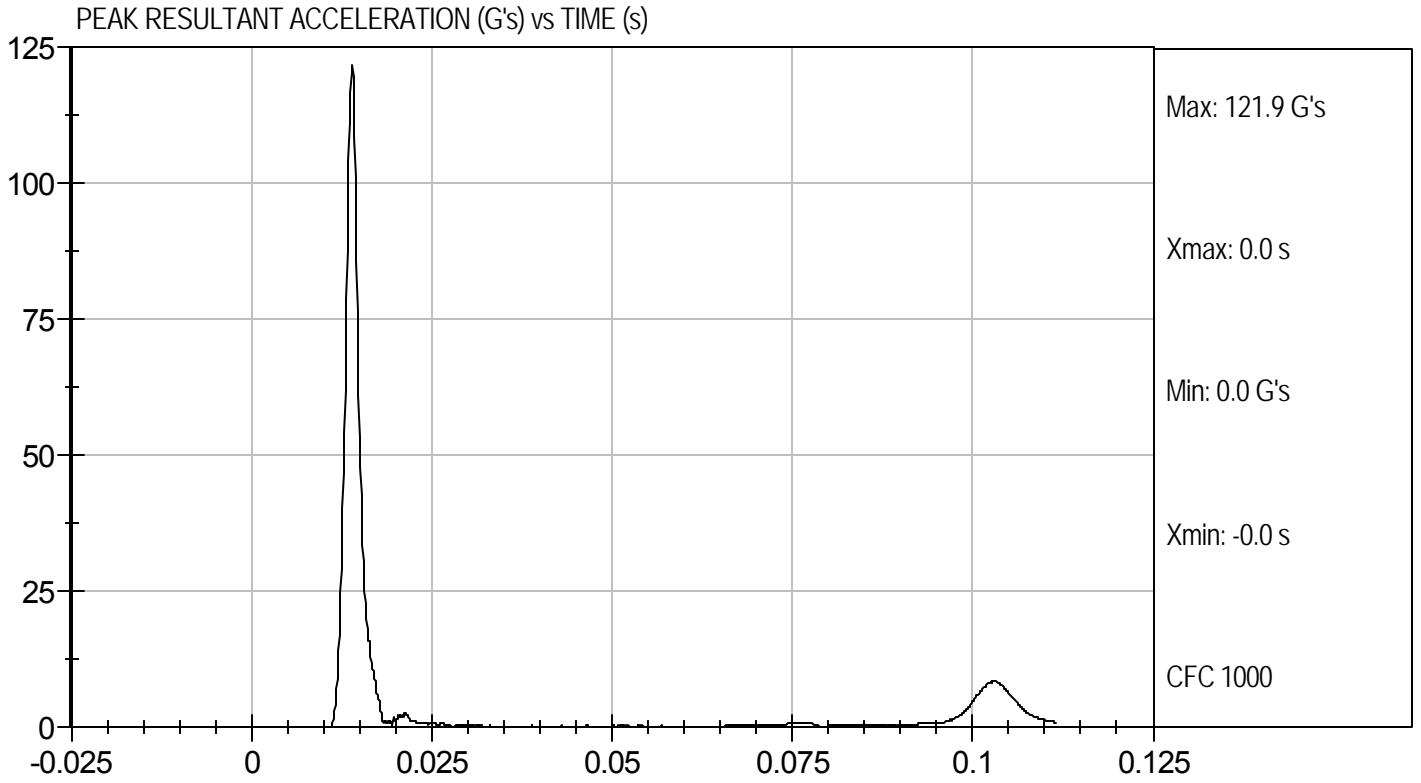
9/20/10
 Test Date

David Winkelbauer
 Approved By



Test Desc: Head Drop
Component ID: D103111

Test Date: 9/20/10
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.: D103112

Tested Parameter		Units	Specification	Result	Pass/Fail
Temperature		deg C	20.6 to 22.2	21.1	Pass
Humidity		%	10 to 70	53	Pass
Impact Velocity		m/s	5.51 to 5.63	5.58	Pass
Delta Velocity	10 ms	m/s	2.20 to 2.80	2.57	Pass
	15 ms	m/s	3.30 to 4.10	3.68	Pass
	20 ms	m/s	4.40 to 5.40	4.93	Pass
	25 ms	m/s	5.40 to 6.10	5.56	Pass
	25-100 ms	m/s	5.50 to 6.20	5.57	Pass
Maximum D-Plane Rotation		deg	71 to 81	71	Pass
Time of Maximum D-Plane Rotation		ms	50 to 70	60	Pass
Maximum Occipital Condyle Moment during Rotation Interval Nm			-44 to -36	-43	Pass
Time of Moment Decay to 0 Nm		ms	102 to 126	113	Pass
Overall Test Results					Pass

Jessica Hall
Laboratory Technician

9/20/10
Test Date

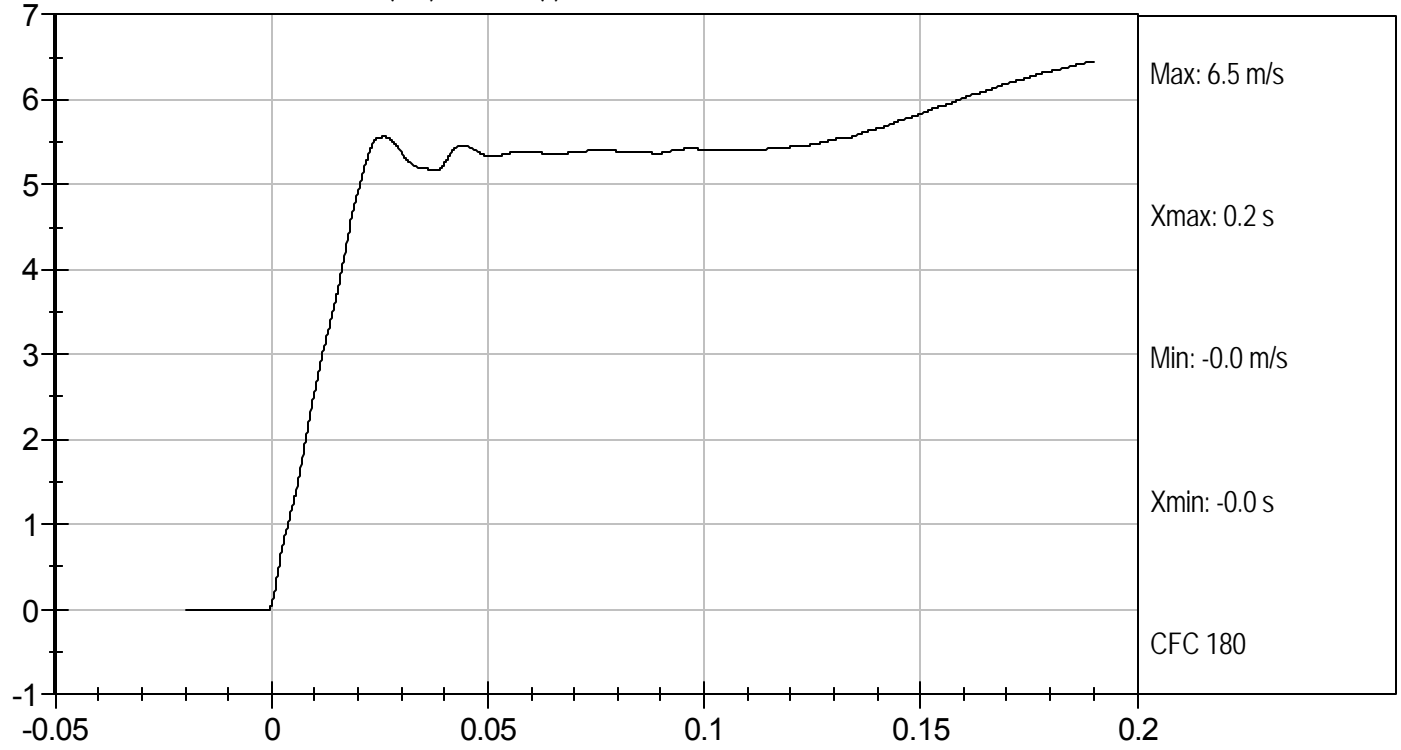
David Winkelbauer
Approved By



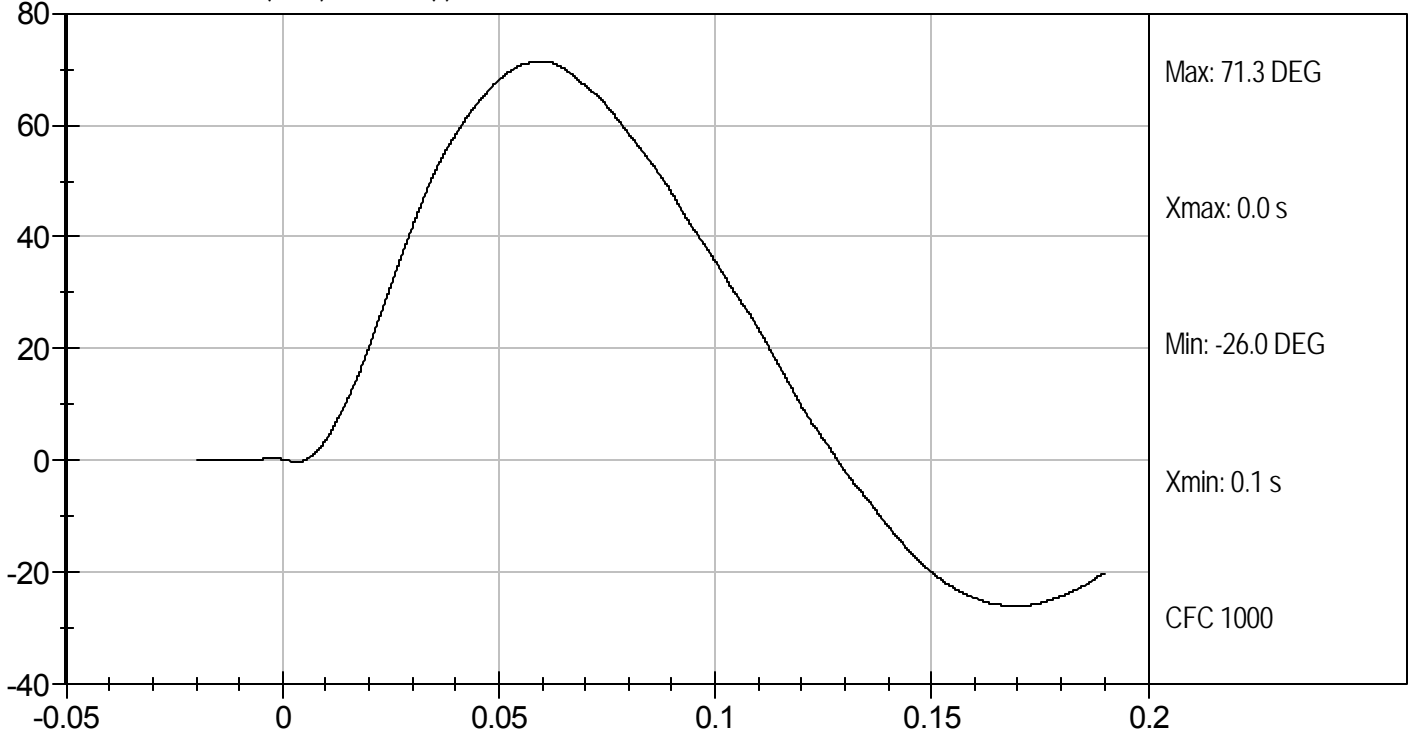
Test Desc: Neck Bending
Component ID: D103112

Test Date: 9/20/10
Velocity: 18.31 ft/s, 5.58 m/s

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



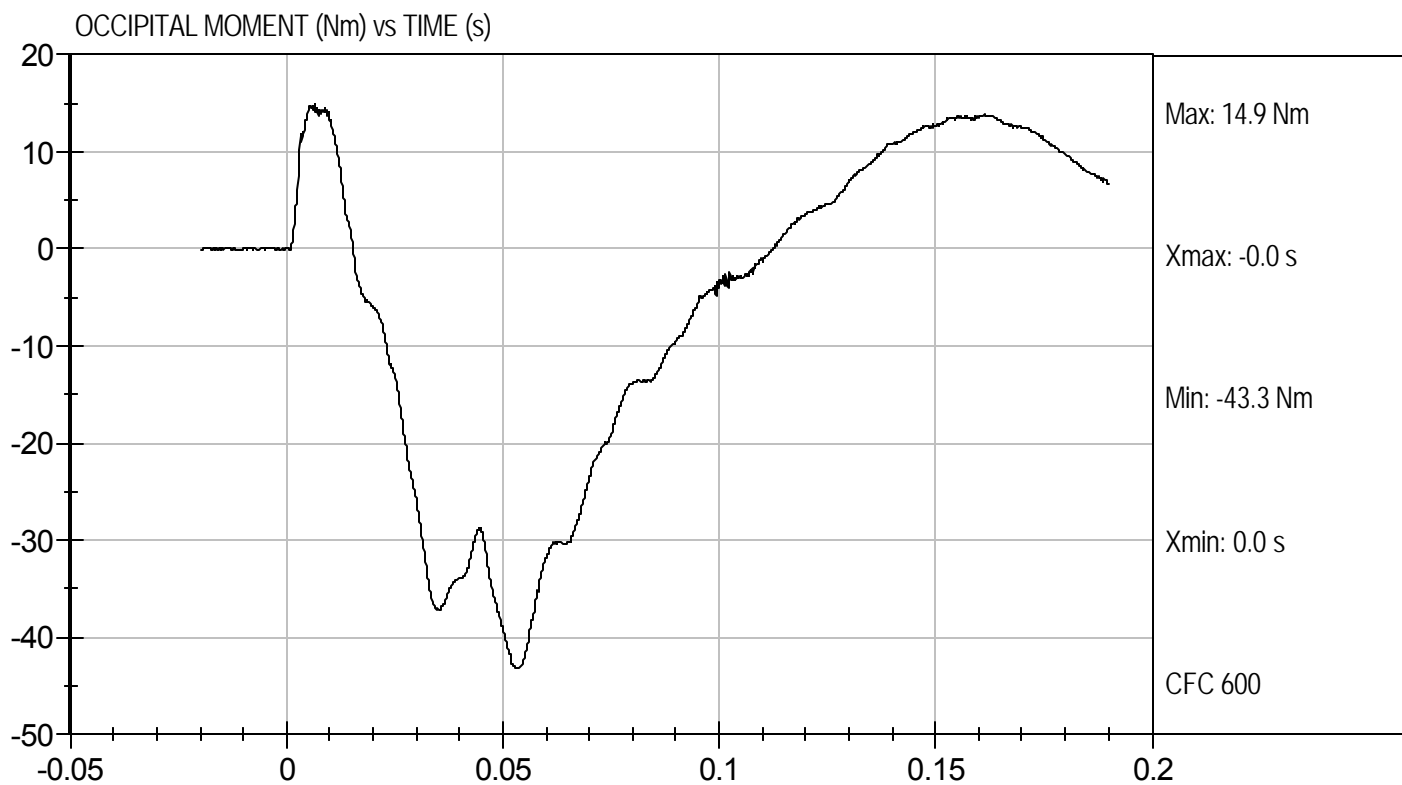
FLEXION ANGLE (DEG) vs TIME (s)





Test Desc: Neck Bending
Component ID: D103112

Test Date: 9/20/10
Velocity: 18.31 ft/s, 5.58 m/s



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

ATD Serial No: 306

Test ID: D103113

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	55	Pass
Impact Velocity	m/s	4.20 to 4.40	4.34	Pass
Maximum Probe Acceleration	G's	13 to 18	16	Pass
Shoulder Displacement	mm	28 to 37	29	Pass
Upper Spine (T1) Y Acceleration	G's	17 to 22	20	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

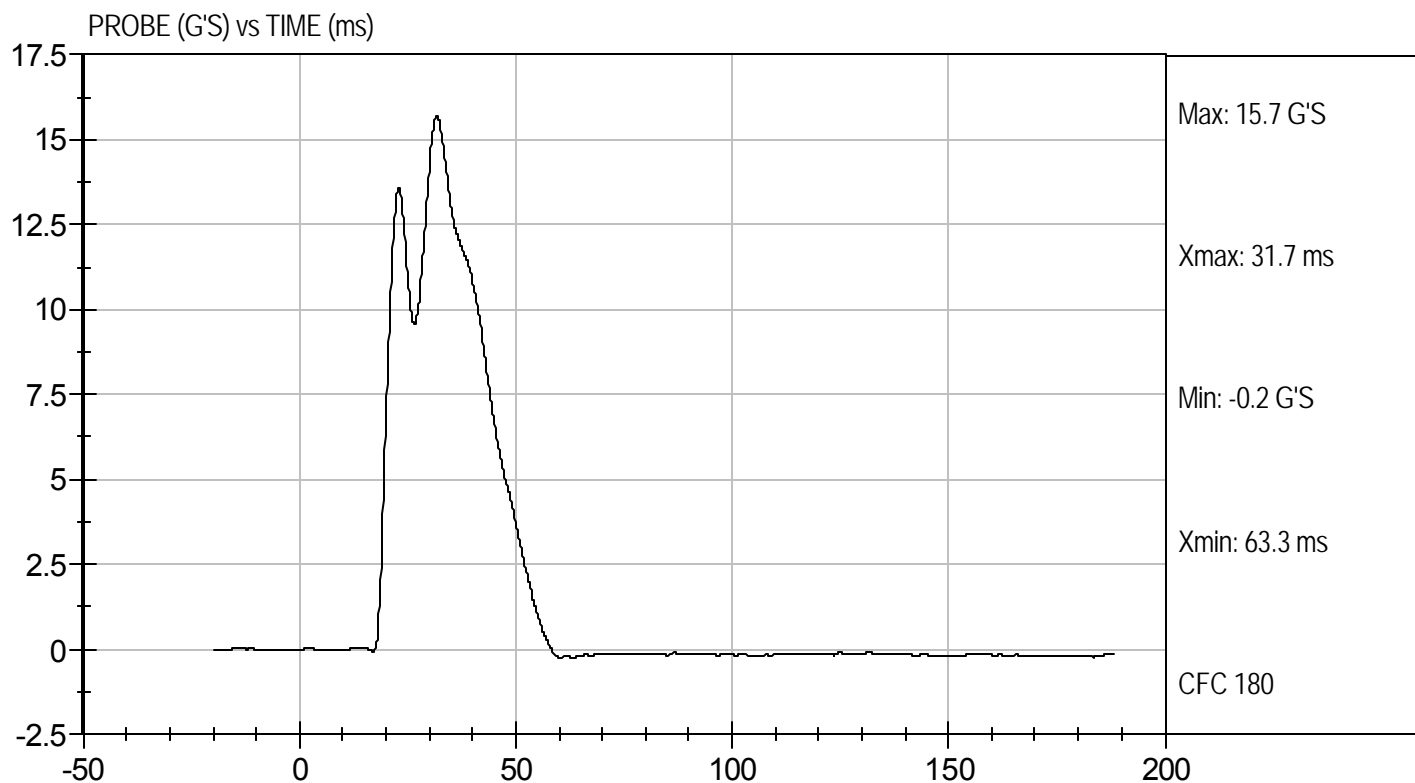
9/20/10
Test Date

David Winkelbauer
Approved By



Test Desc: Shoulder Impact
Component ID: D103113

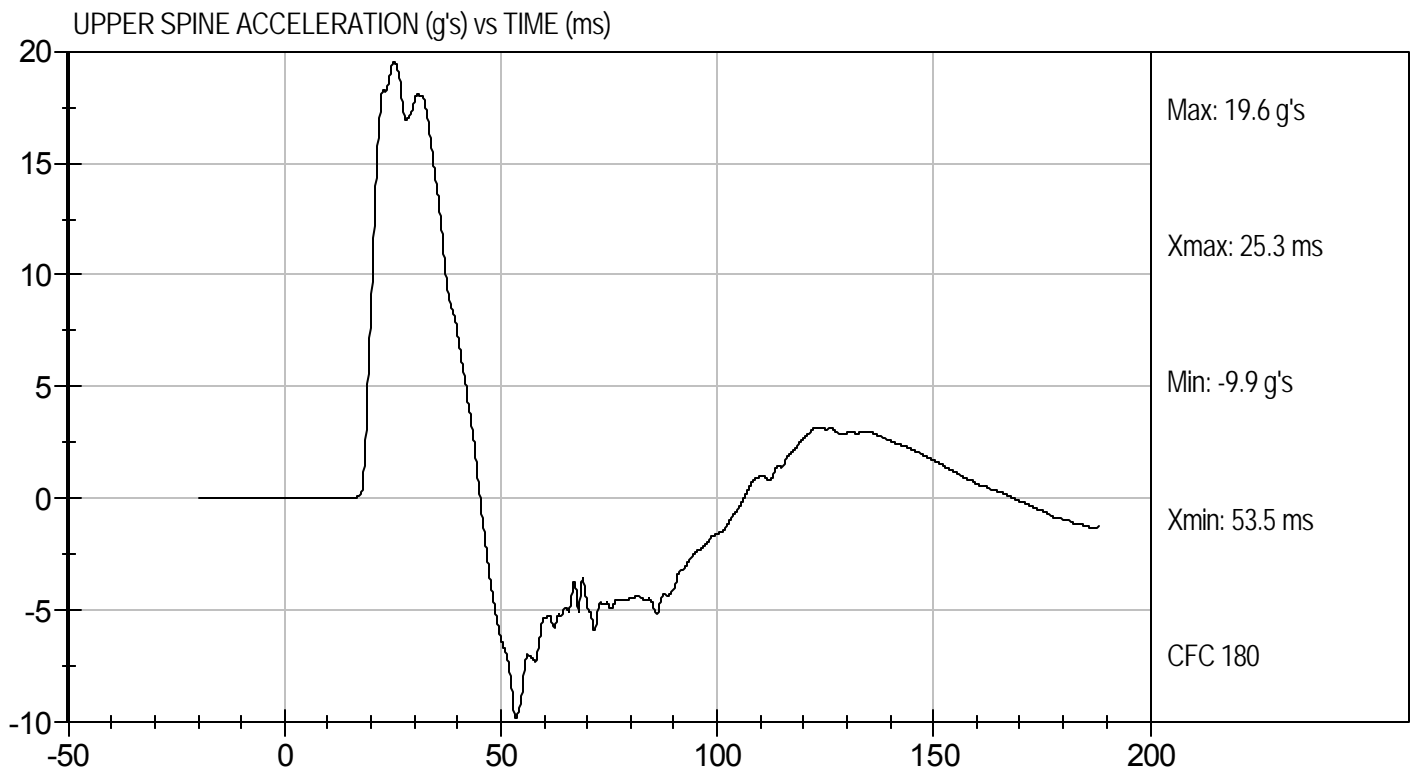
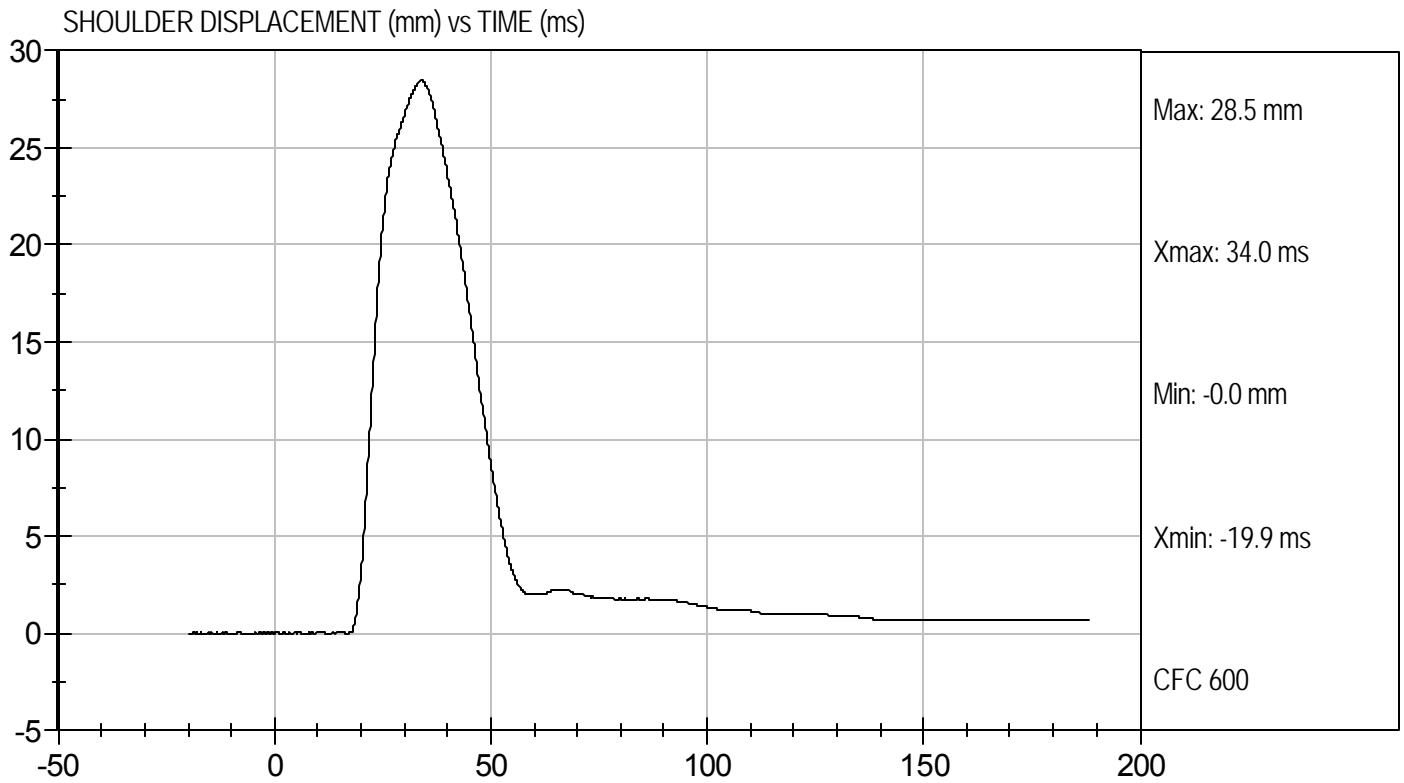
Test Date: 9/20/10
Velocity: 14.25 ft/s, 4.34 m/s





Test Desc: Shoulder Impact
Component ID: D103113

Test Date: 9/20/10
Velocity: 14.25 ft/s, 4.34 m/s



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


ATD Serial No: 306

Test I.D: D103114

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.5	Pass
Humidity	%	10 to 70	54	Pass
Impact Velocity	m/s	6.60 to 6.80	6.77	Pass
Peak Impactor Acceleration	G's	30 to 36	33	Pass
Shoulder Displacement	mm	31 to 40	33	Pass
Upper Rib Displacement	mm	25 to 32	27	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	38	Pass
Lower Spine (T12) Y Acceleration	G's	29 to 37	32	Pass
Overall Test Results				Pass


Laboratory Technician

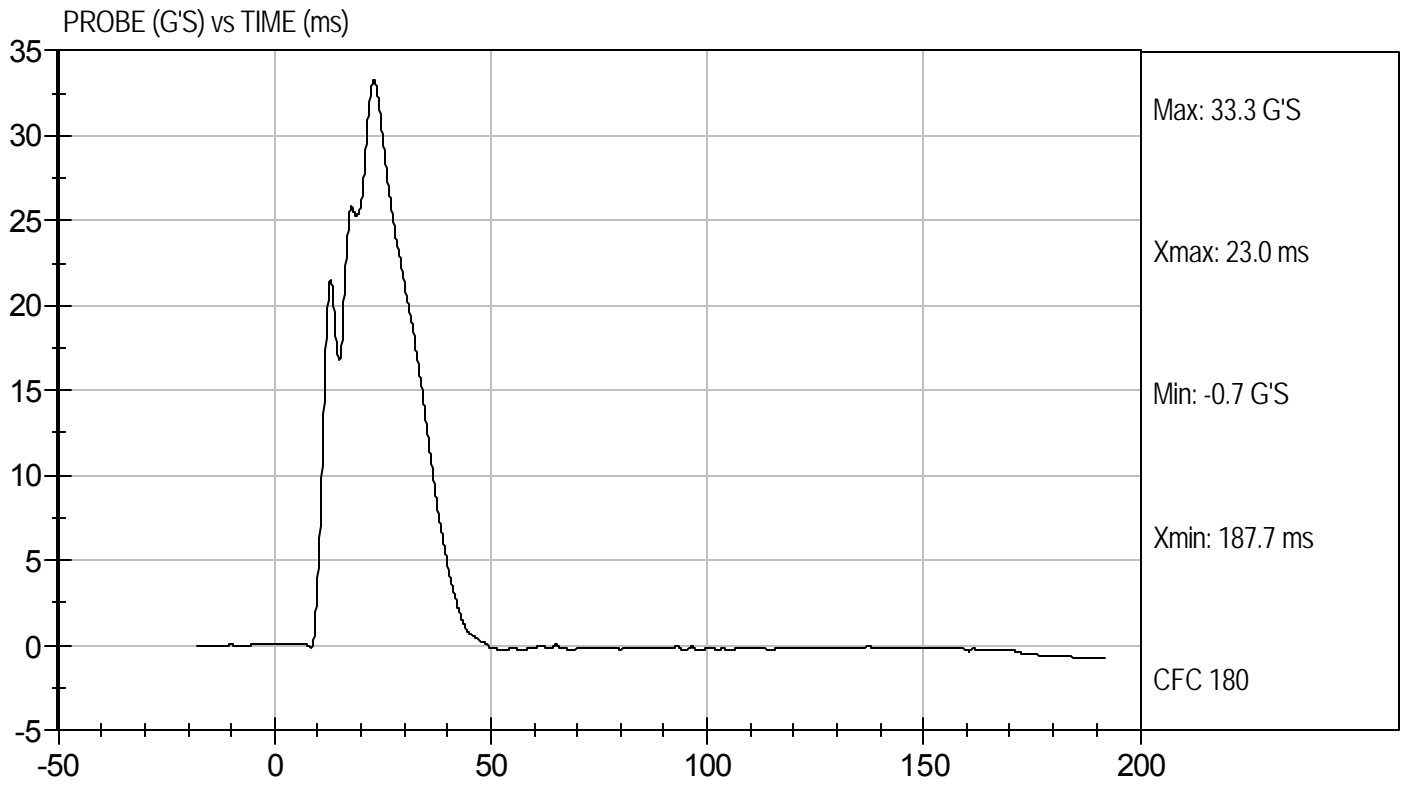
9/20/10
Test Date

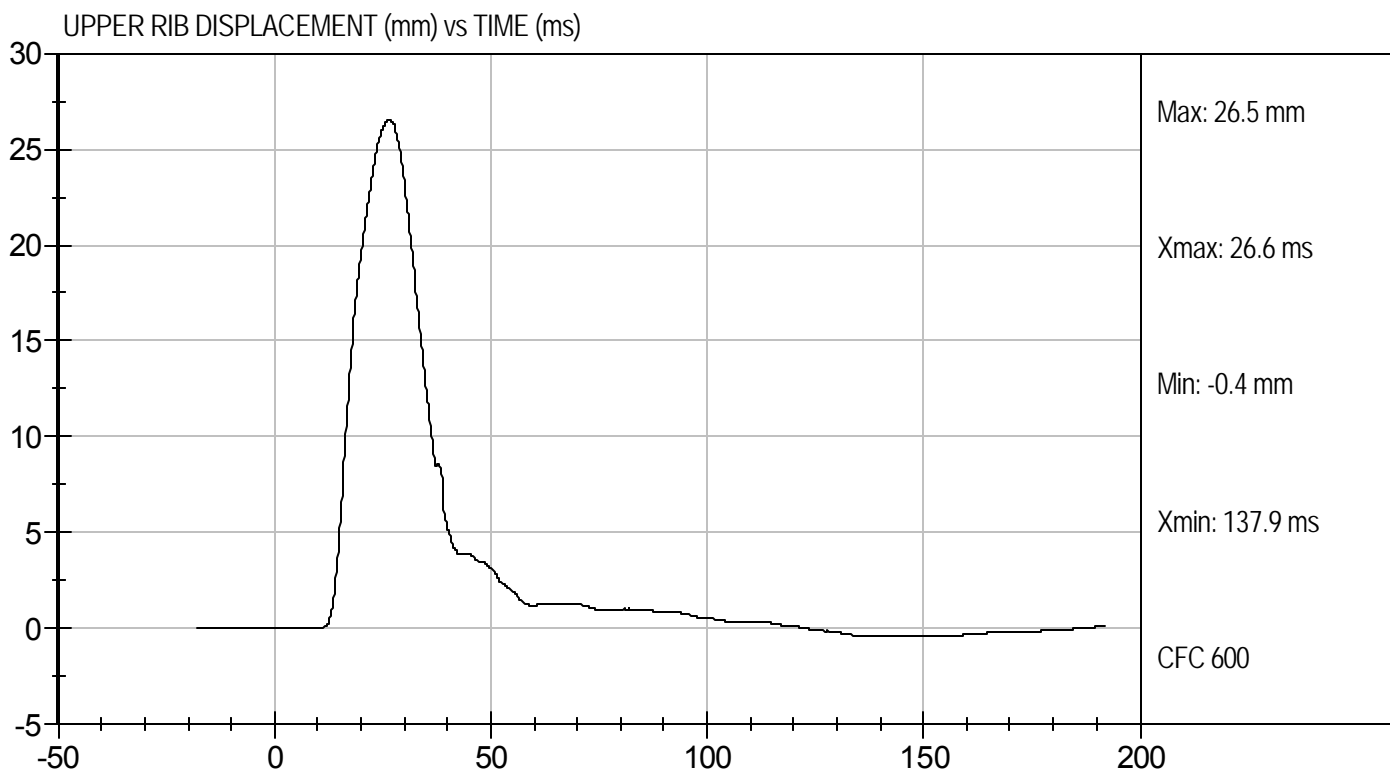
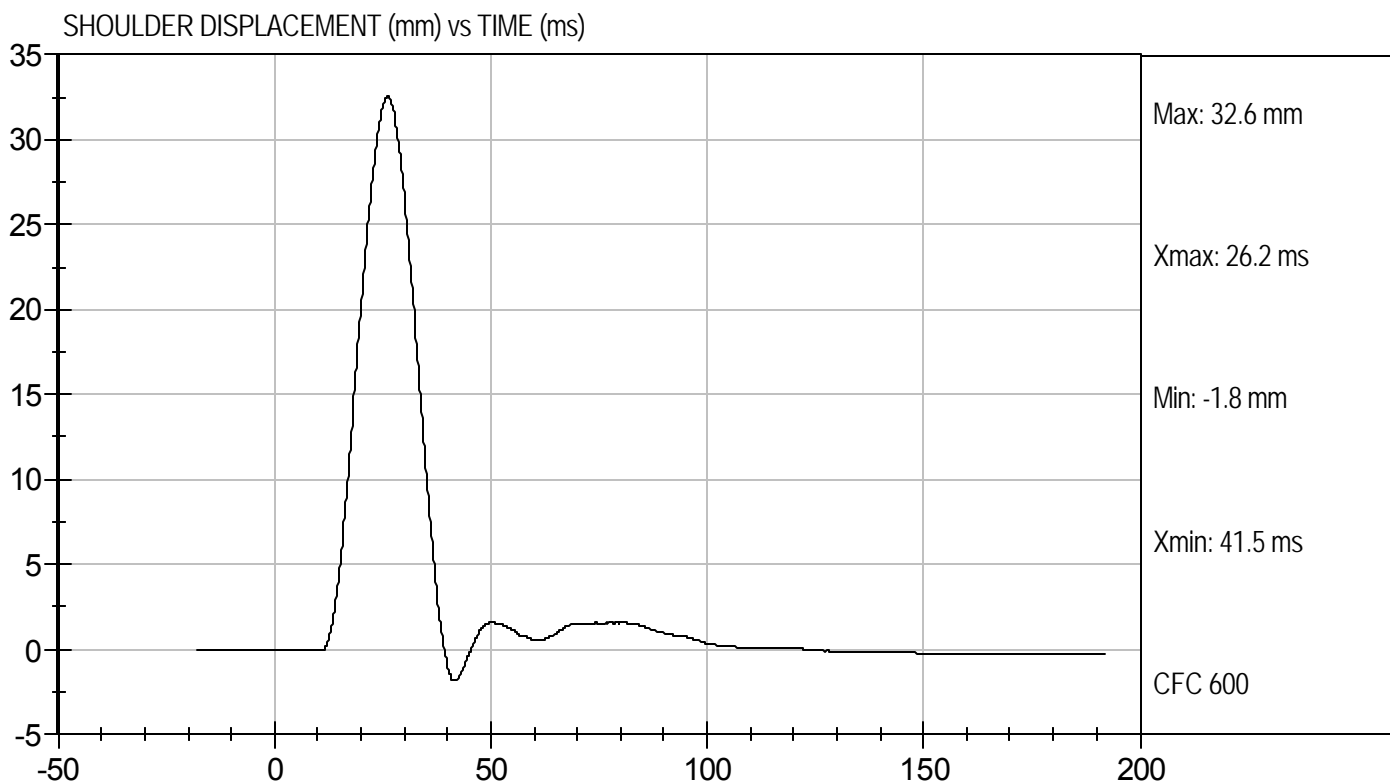

Approved By

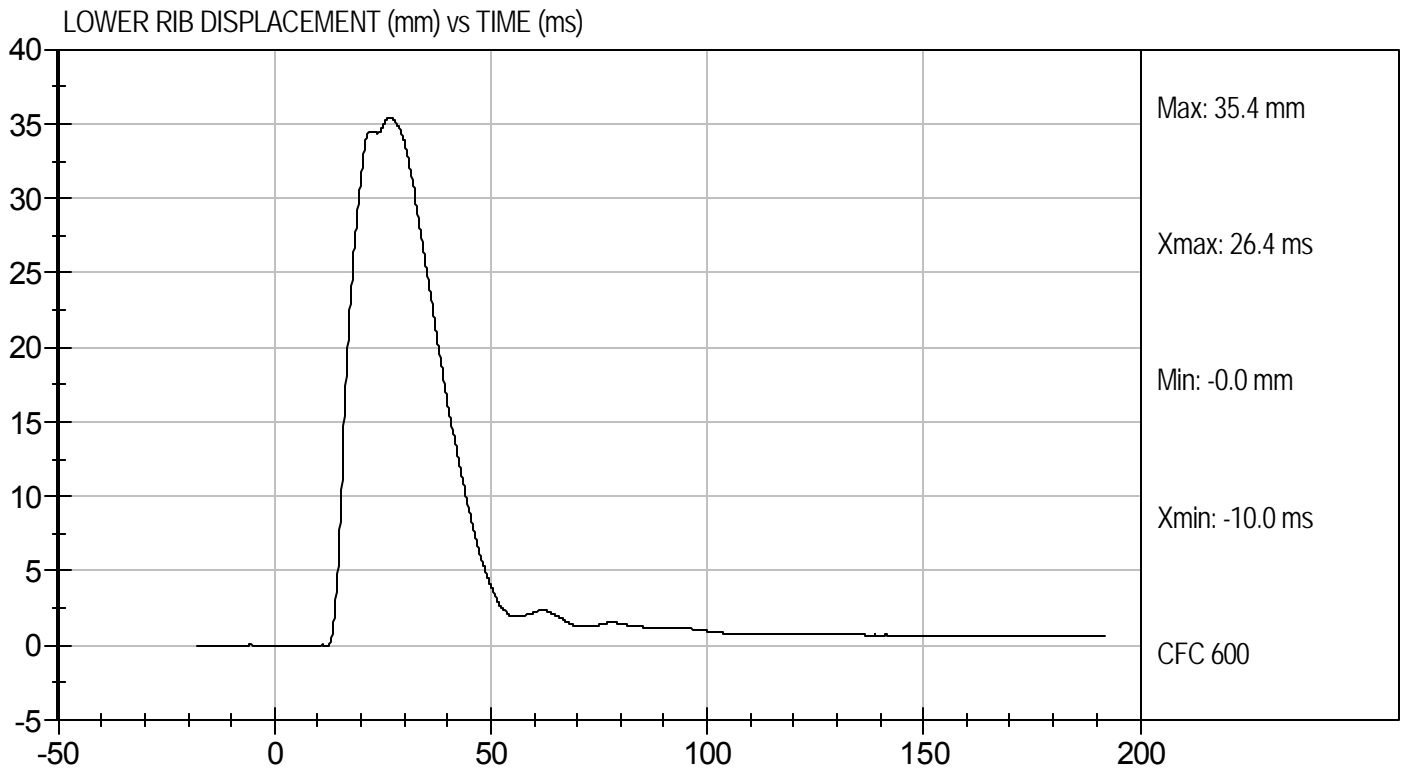
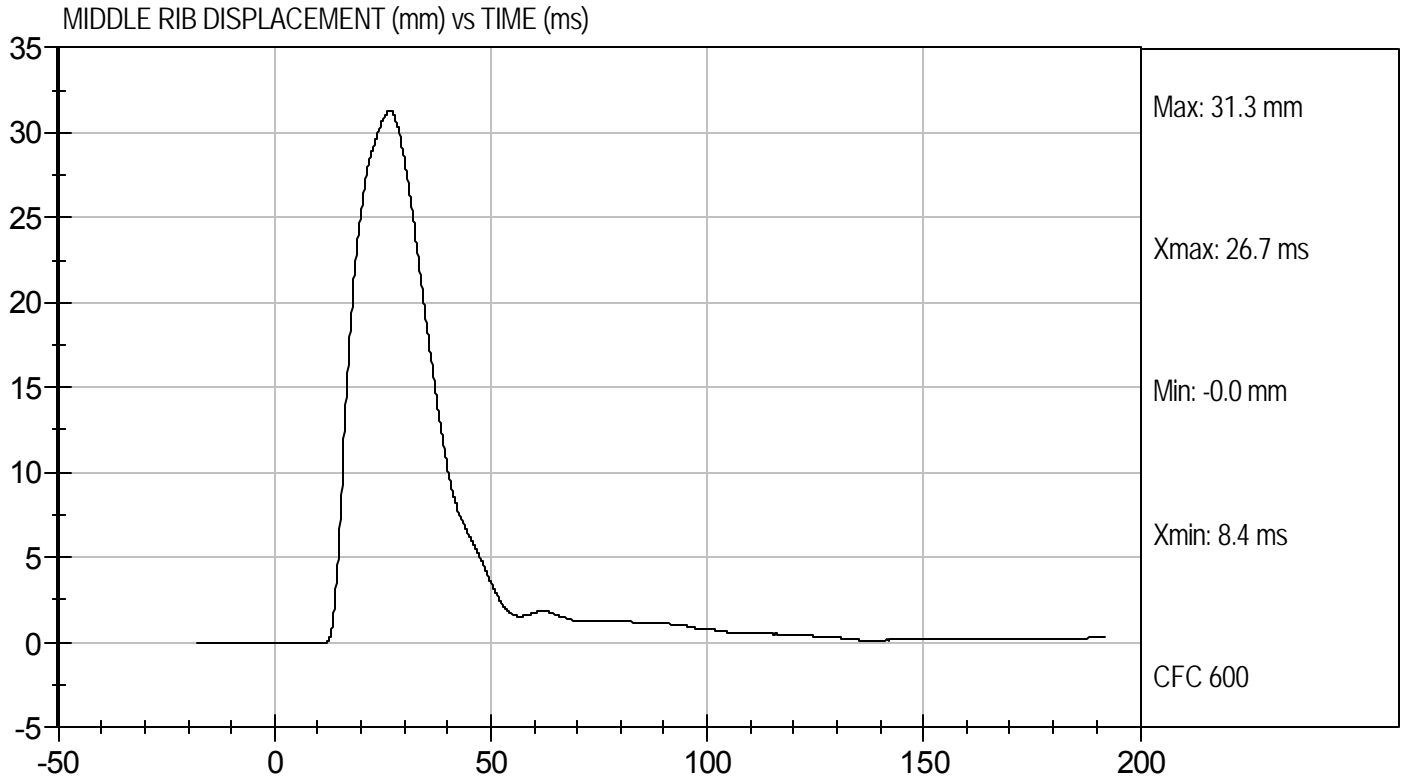


Test Desc: Thorax With Arm
Component ID: D103114

Test Date: 9/20/10
Velocity: 22.22 ft/s, 6.77 m/s





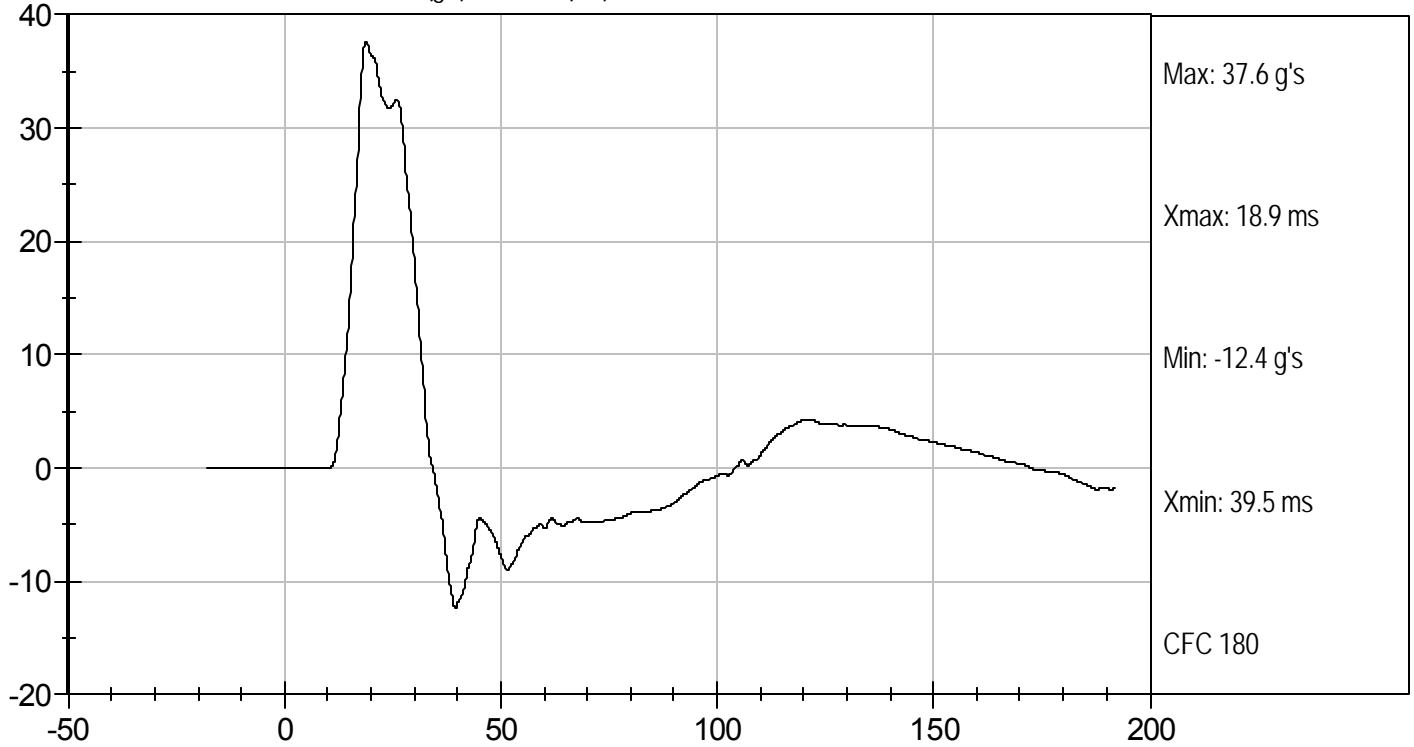




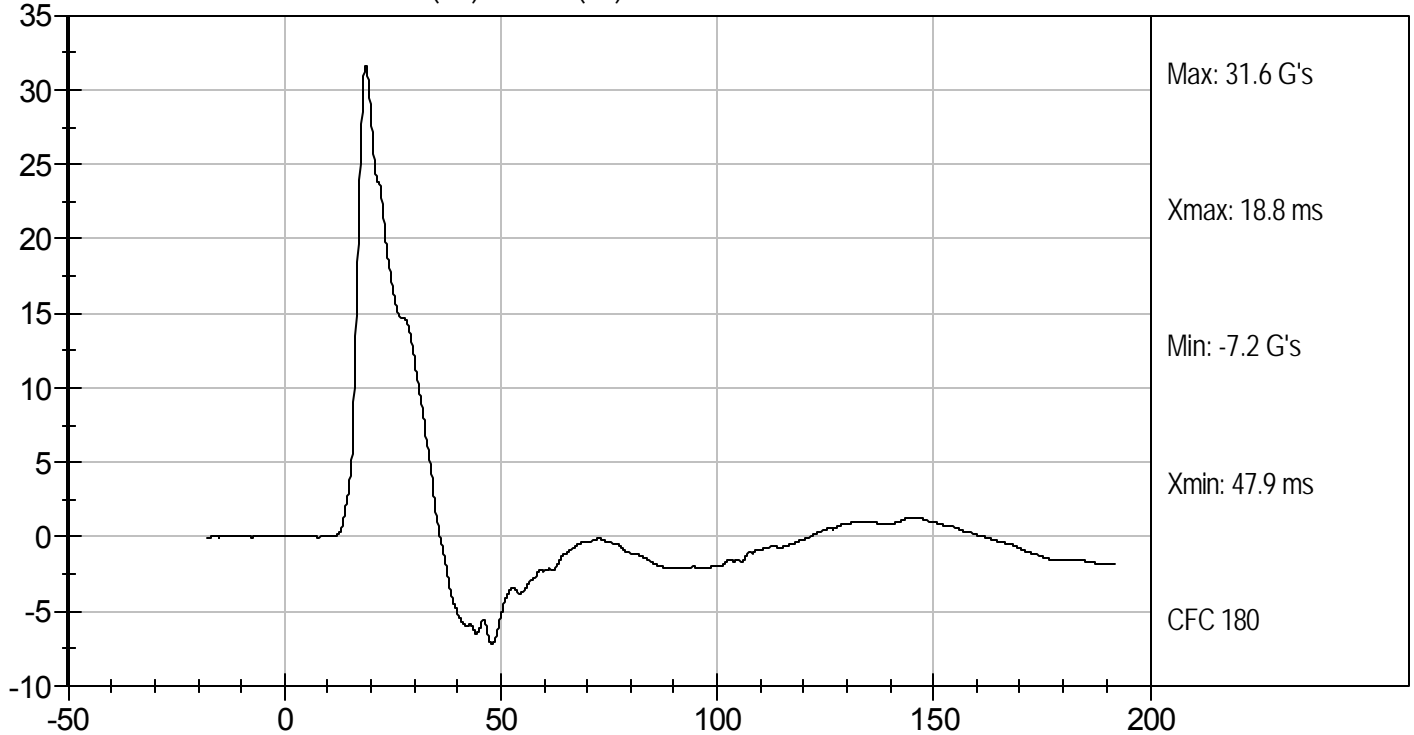
Test Desc: Thorax With Arm
Component ID: D103114

Test Date: 9/20/10
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: D103115

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.4	Pass
Humidity	%	10 to 70	55	Pass
Impact Velocity	m/s	4.20 to 4.40	4.34	Pass
Peak Impactor Force	G's	14 to 18	16	Pass
Upper Rib Displacement	mm	32 to 40	34	Pass
Middle Rib Displacement	mm	39 to 45	42	Pass
Lower Rib Displacement	mm	35 to 43	42	Pass
Upper Spine (T1) Y Acceleration	G's	13 to 17	14	Pass
Lower Spine (T12) Y Acceleration	G's	7 to 11	11	Pass
Overall Test Results				Pass


 Laboratory Technician

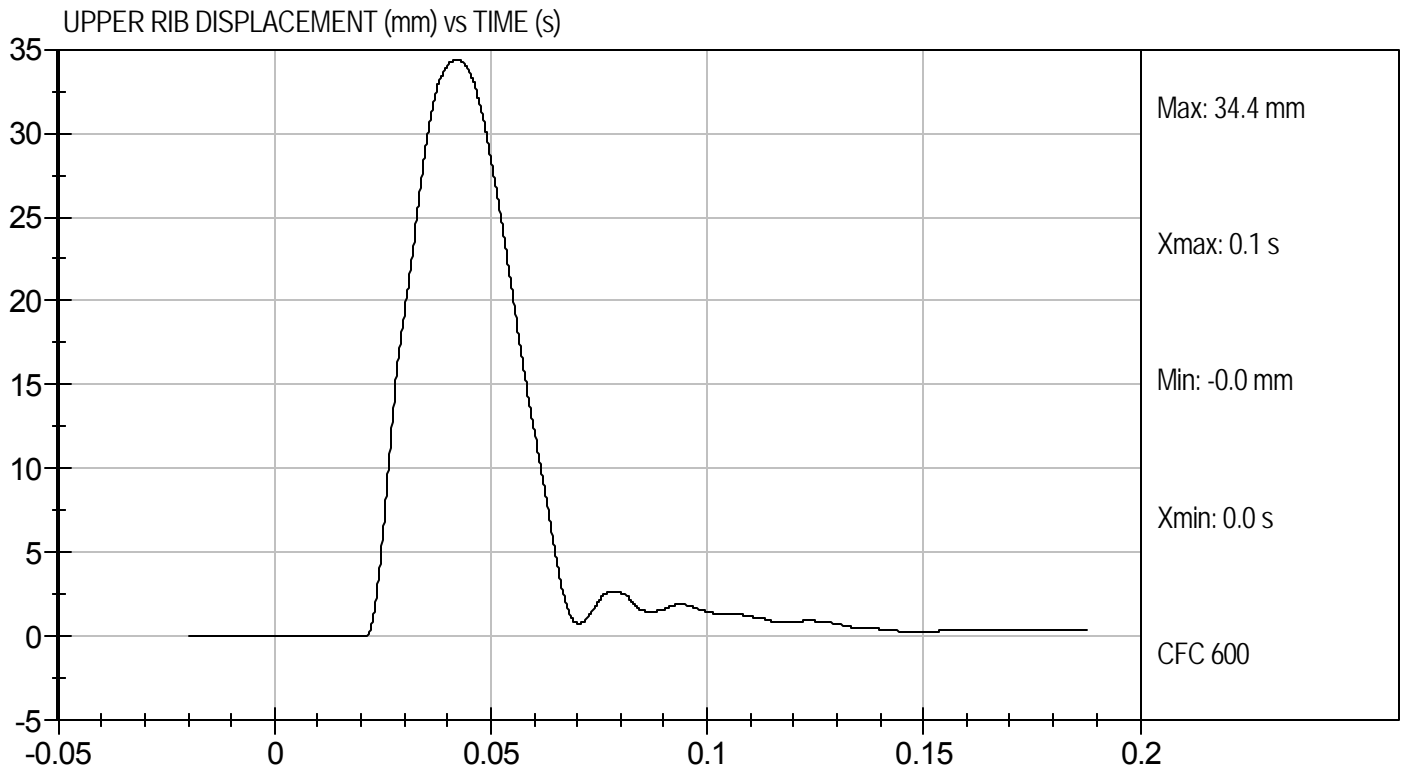
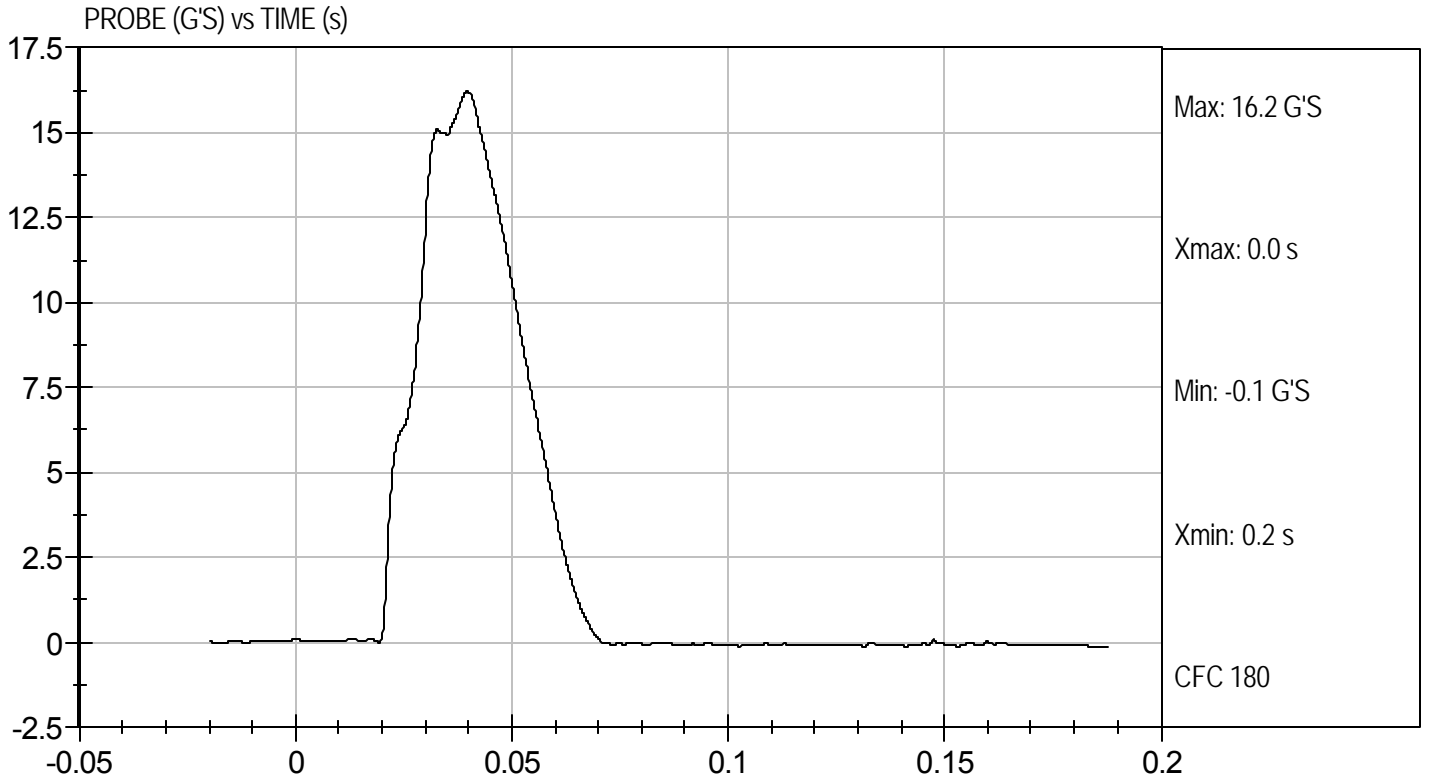
9/20/10
 Test Date


 Approved By



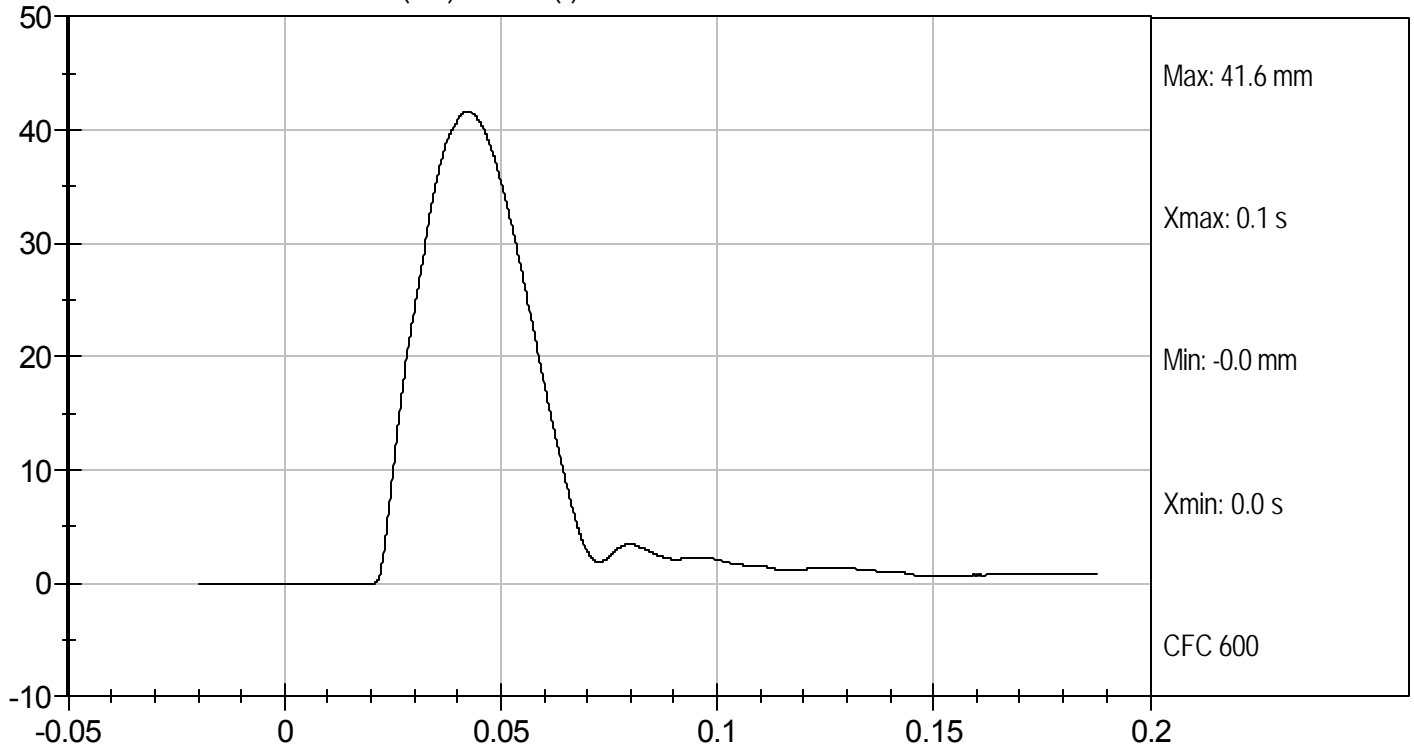
Test Desc: Thorax Without Arm
Component ID: D103115

Test Date: 9/20/10
Velocity: 14.25 ft/s, 4.34 m/s

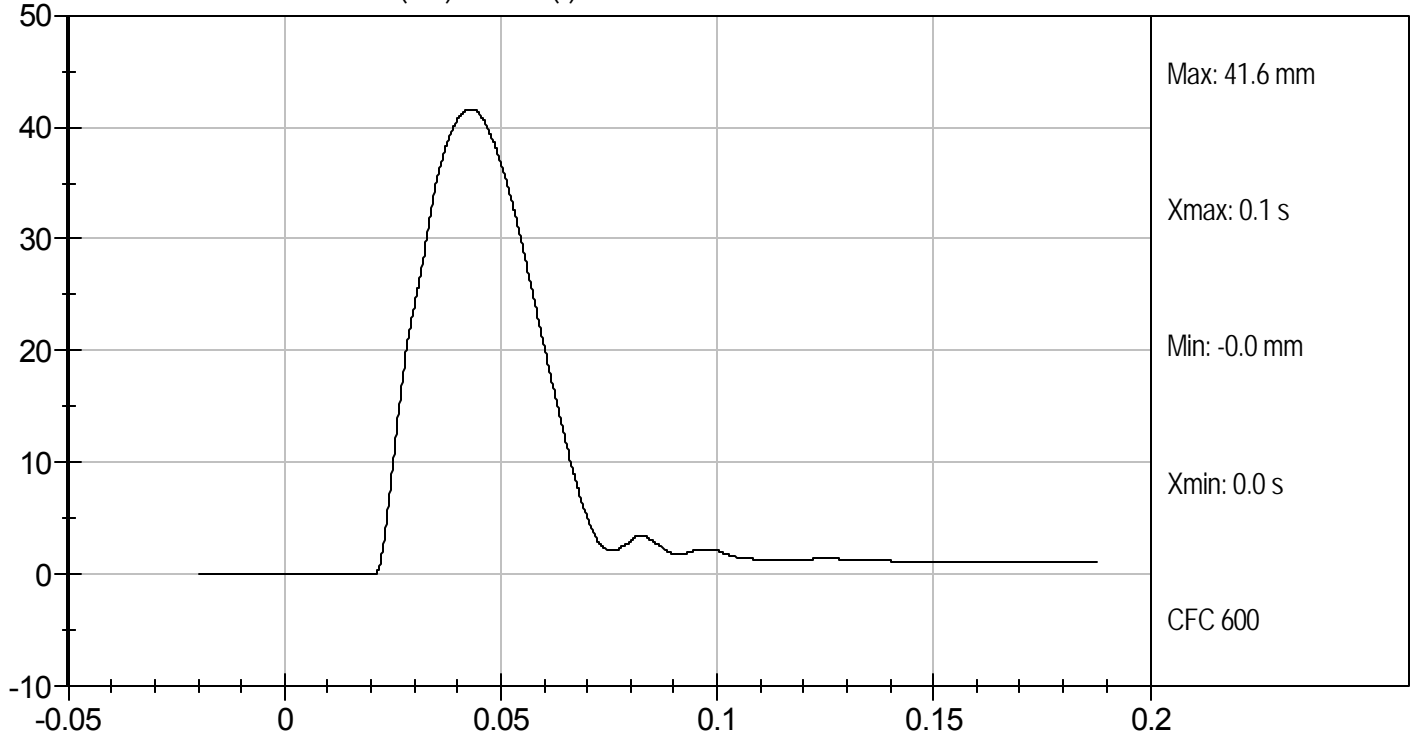




MIDDLE RIB DISPLACEMENT (mm) vs TIME (s)



LOWER RIB DISPLACEMENT (mm) vs TIME (s)

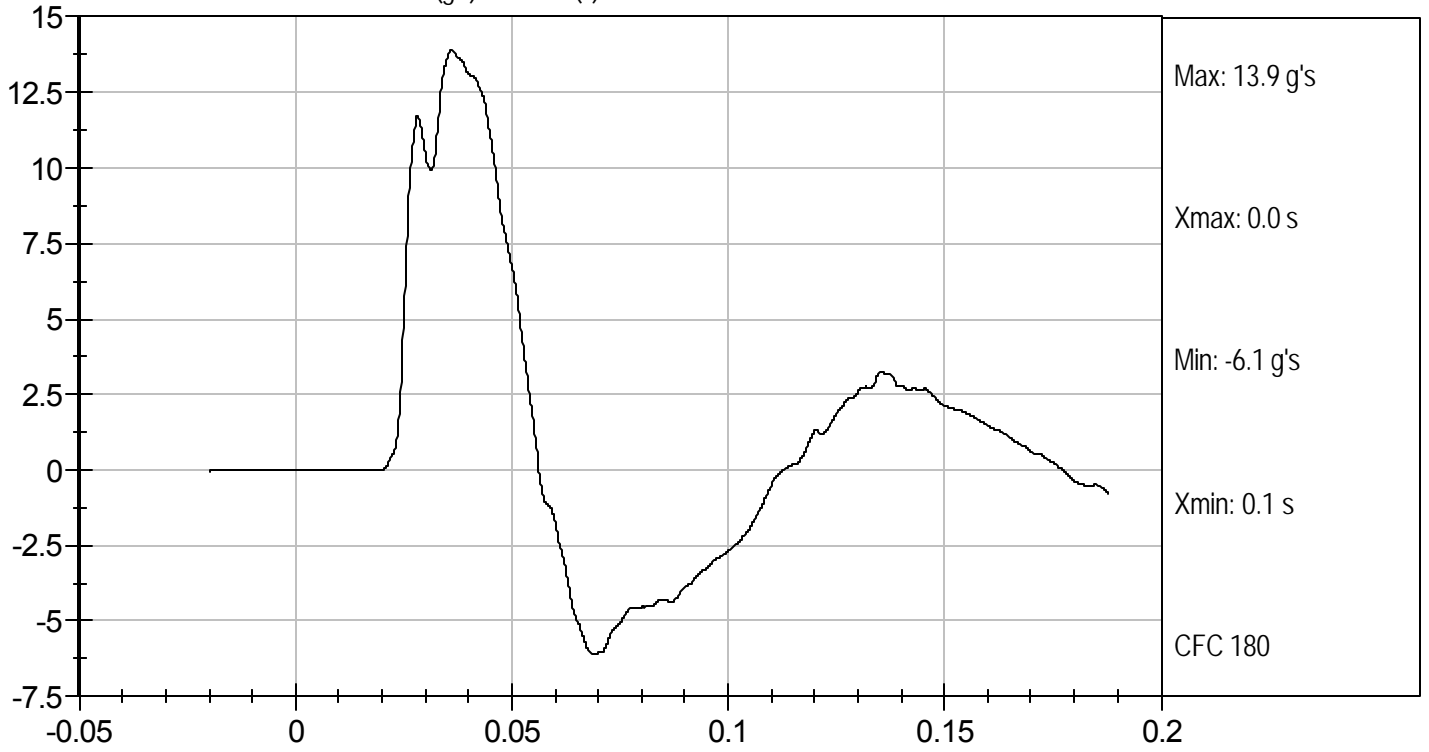




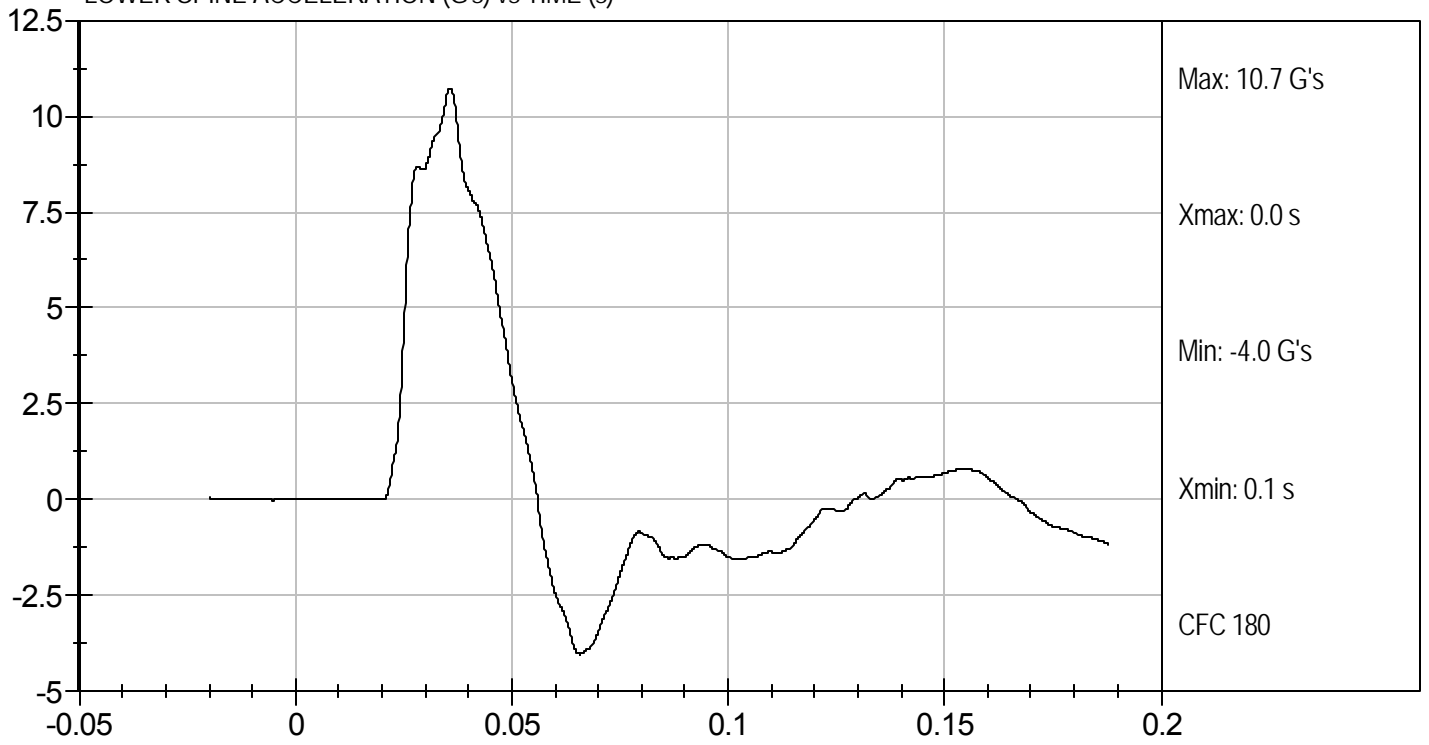
Test Desc: Thorax Without Arm
Component ID: D103115

Test Date: 9/20/10
Velocity: 14.25 ft/s, 4.34 m/s

UPPER SPINE ACCELERATION (g's) vs TIME (s)



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



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

ATD Serial No: 306

Test I.D: D103116

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.5	Pass
Humidity	%	10 to 70	56	Pass
Impact Velocity	m/s	4.20 to 4.40	4.38	Pass
Peak Impactor Acceleration	G's	12 to 16	15	Pass
Upper Rib Displacement	mm	36 to 47	43	Pass
Lower Rib Displacement	mm	33 to 44	34	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	11	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

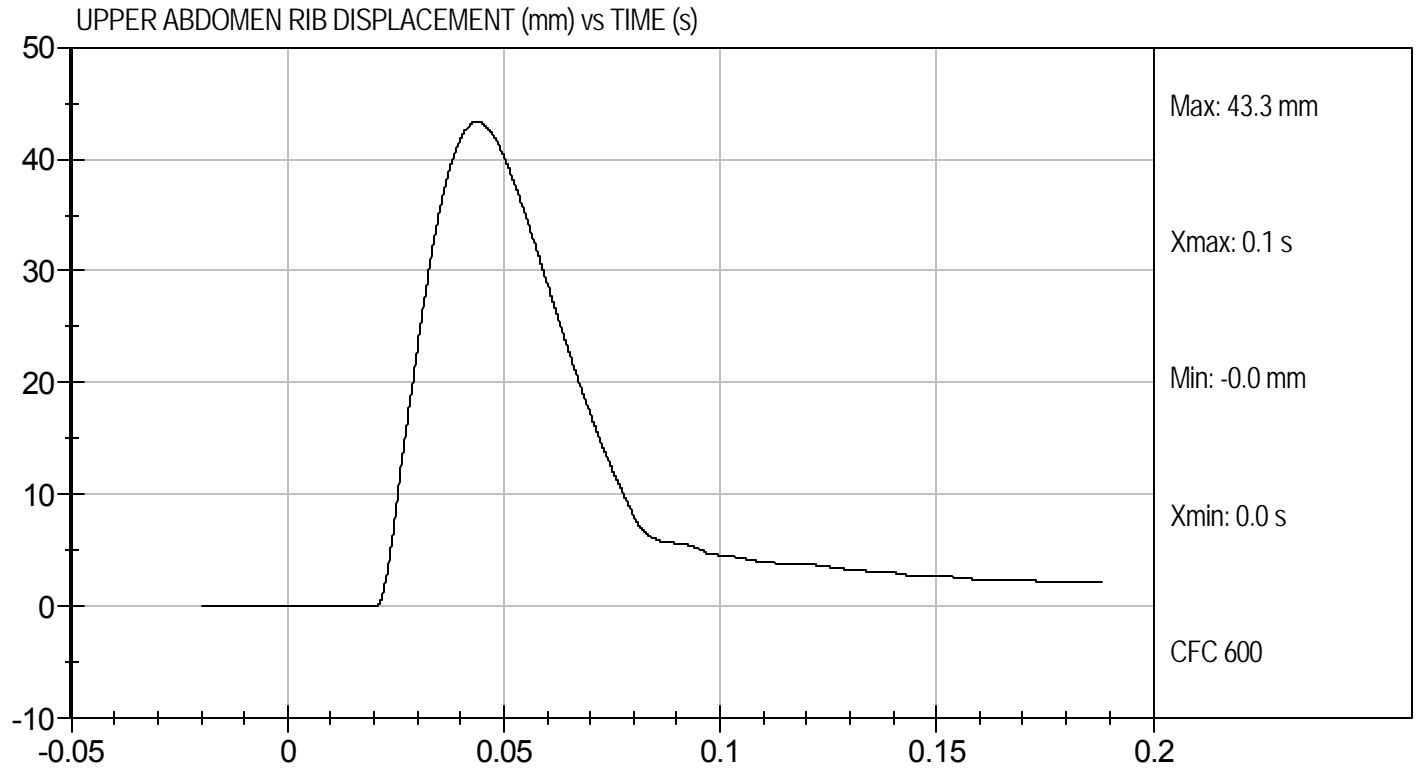
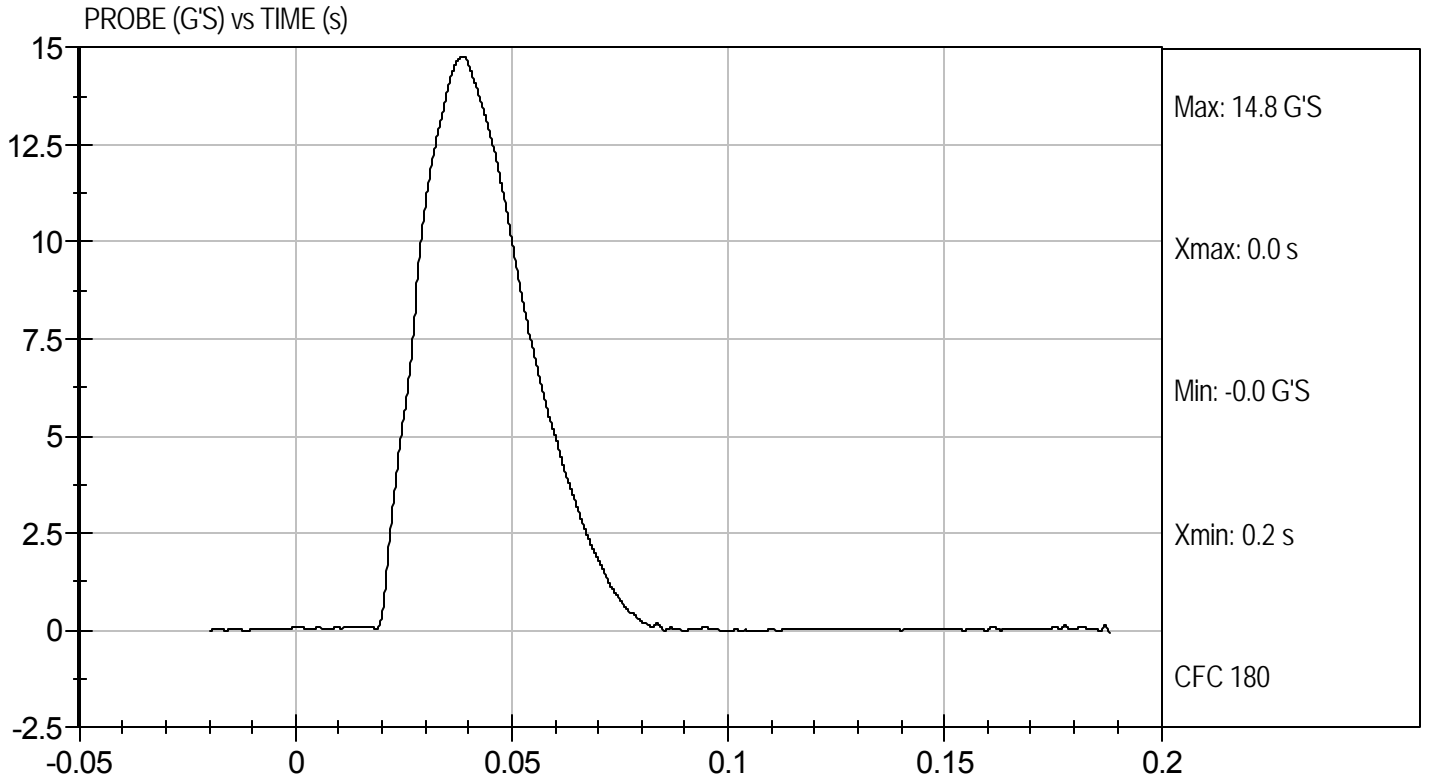
9/20/10
Test Date

David Winkelbauer
Approved By



Test Desc: Abdomen Impact
Component ID: D103116

Test Date: 9/20/10
Velocity: 14.36 ft/s, 4.38 m/s

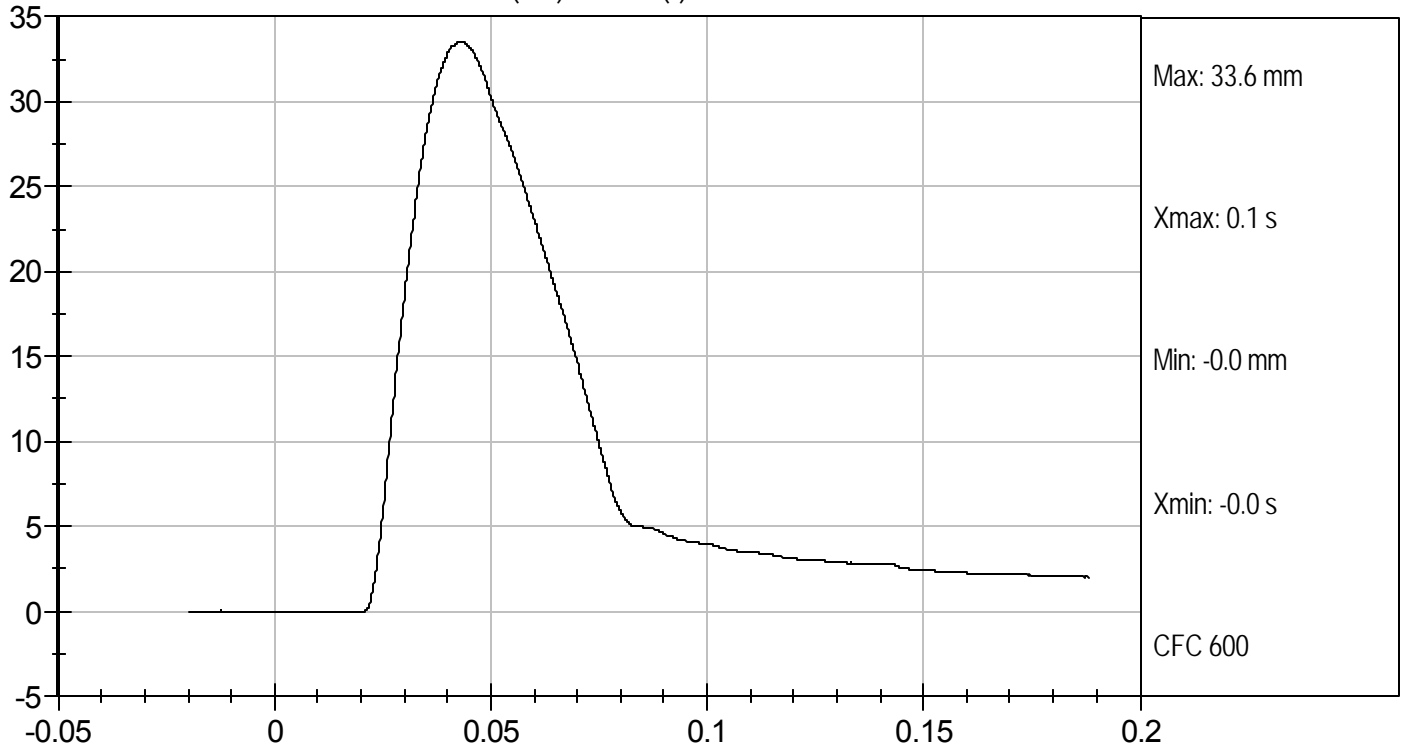




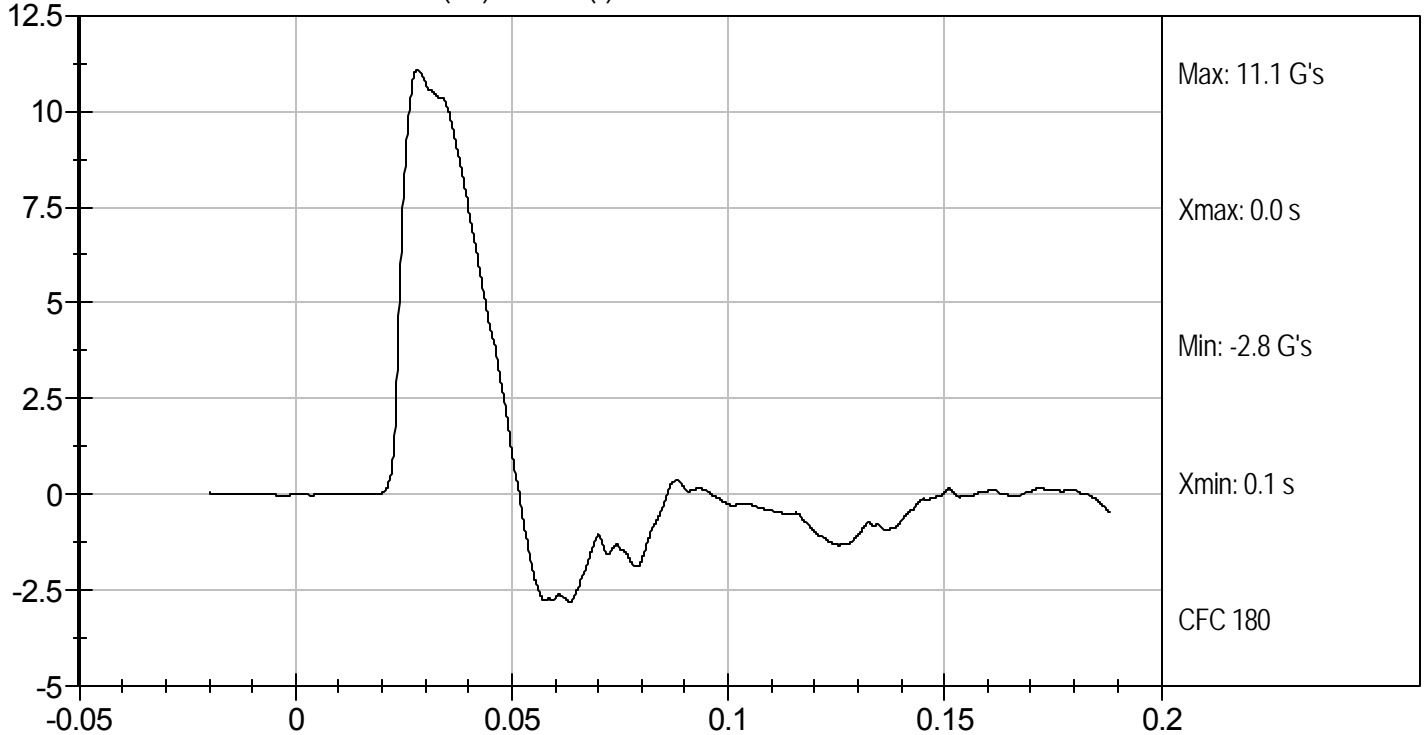
Test Desc: Abdomen Impact
Component ID: D103116

Test Date: 9/20/10
Velocity: 14.36 ft/s, 4.38 m/s

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



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



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

ATD Serial No: 306

Test I.D: D103117

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.9	Pass
Humidity	%	10 to 70	58	Pass
Impact Velocity	m/s	6.60 to 6.80	6.71	Pass
Peak Impactor Acceleration	G's	38 to 47	41	Pass
Pelvis Y Acceleration after 6 ms	G's	34 to 42	35	Pass
Peak Acetabulum Force	N	3600 to 4300	4136	Pass
Overall Test Results				Pass

Jessica Gall

 Laboratory Technician

9/21/10

 Test Date

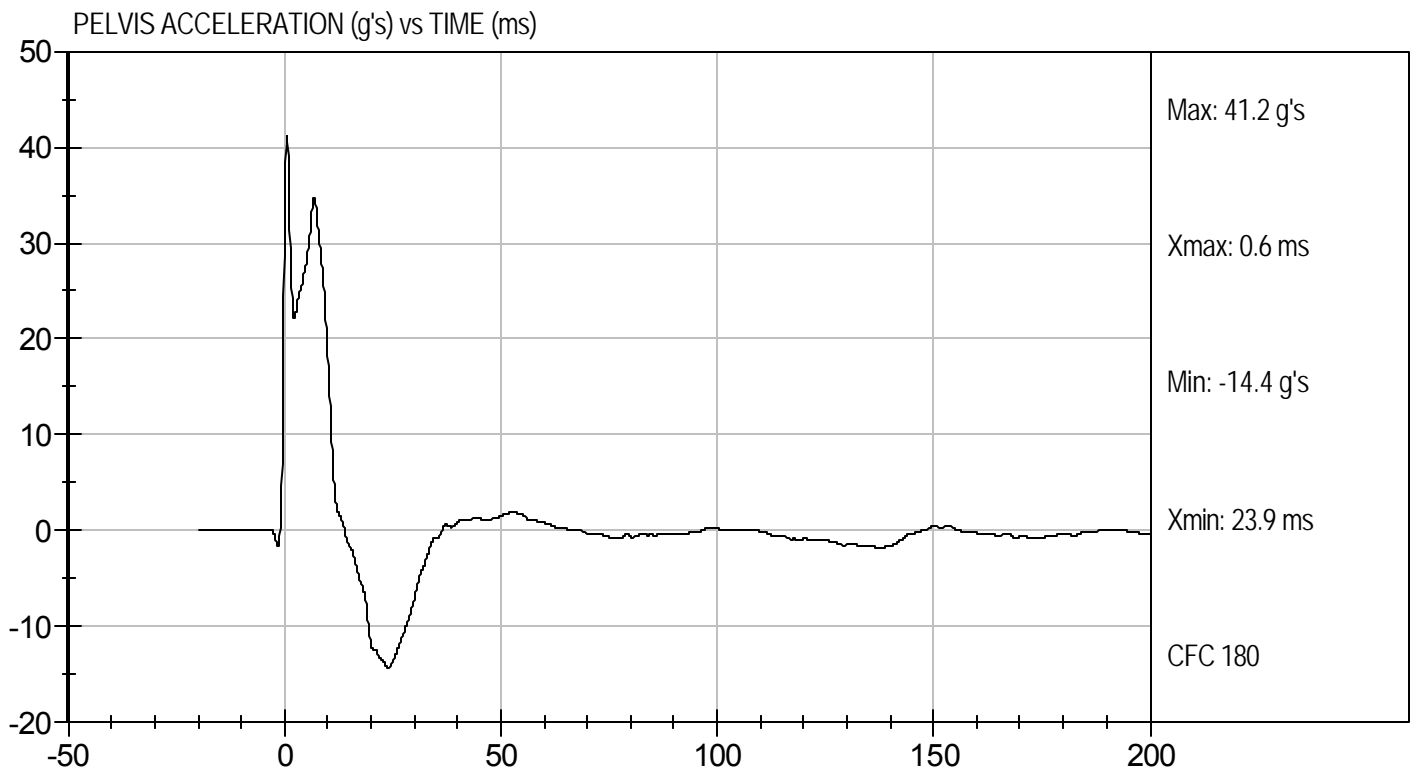
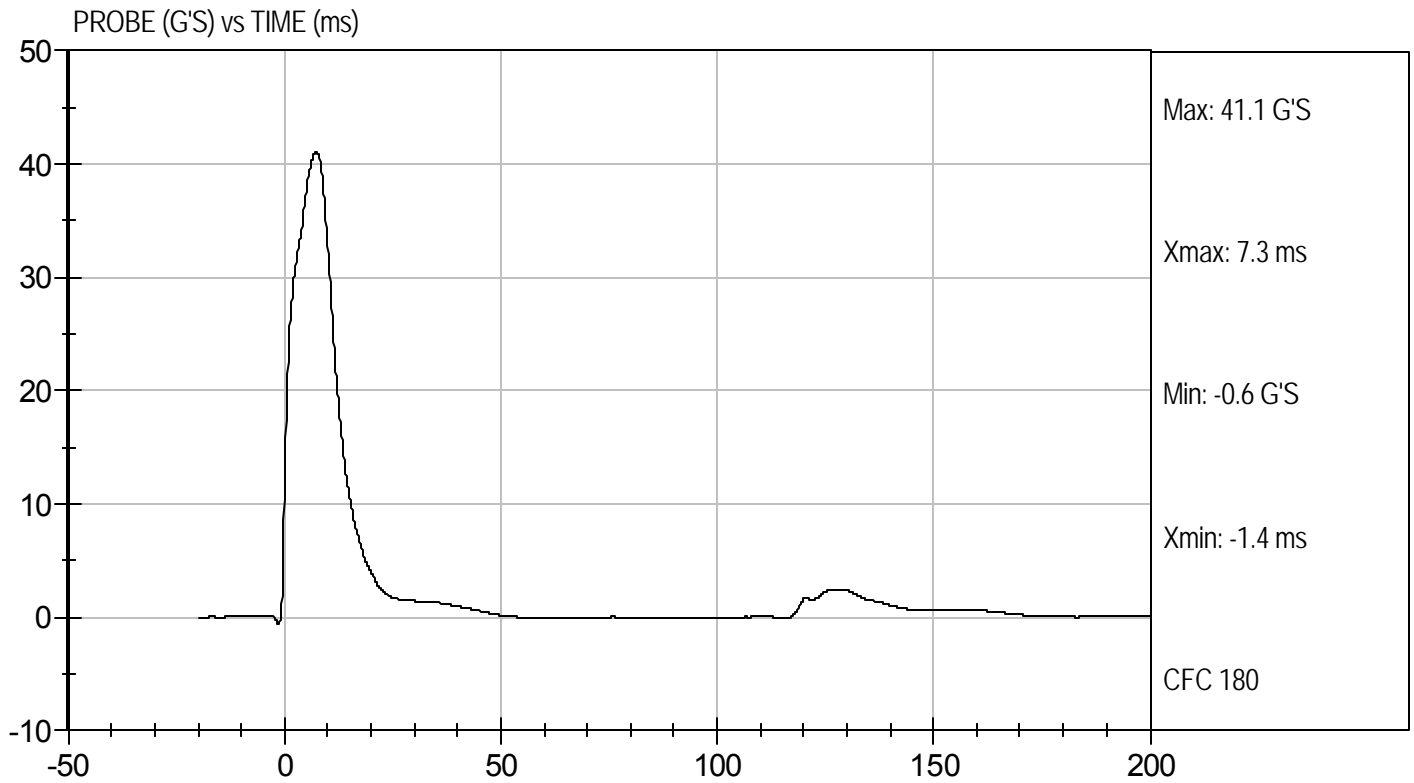
David Winkelbauer

 Approved By



Test Desc: Pelvis Impact
Component ID: D103117

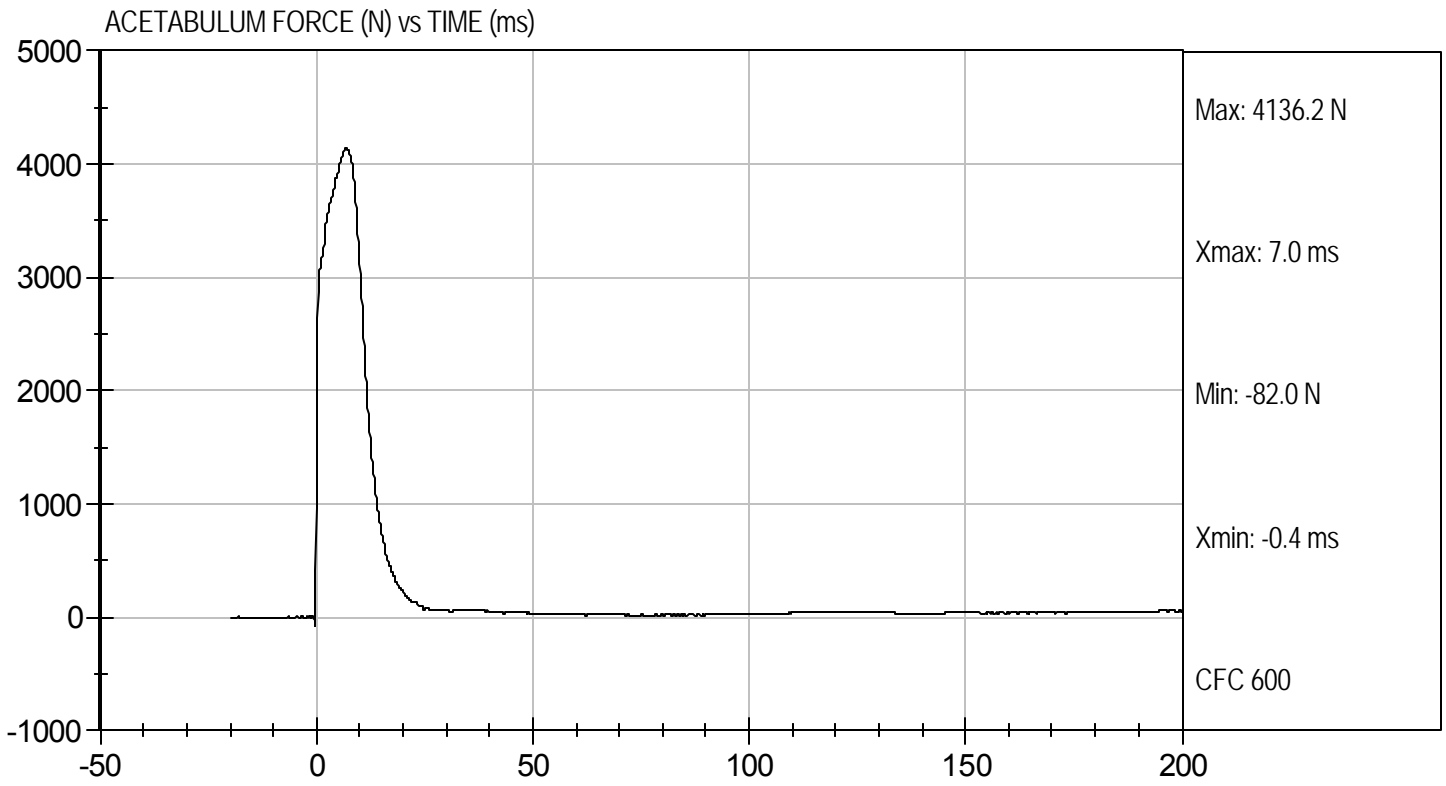
Test Date: 9/21/10
Velocity: 22.00 ft/s, 6.71 m/s





Test Desc: Pelvis Impact
Component ID: D103117

Test Date: 9/21/10
Velocity: 22.00 ft/s, 6.71 m/s



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

ATD Serial No: 306

Test I.D: D103118

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.8	Pass
Humidity	%	10 to 70	56	Pass
Impact Velocity	m/s	4.20 to 4.40	4.38	Pass
Peak Impactor Acceleration	G's	36 to 45	39	Pass
Pelvis Y Acceleration	G's	28 to 39	30	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	4924	Pass
Overall Test Results				Pass

Jessica Gall
 Laboratory Technician

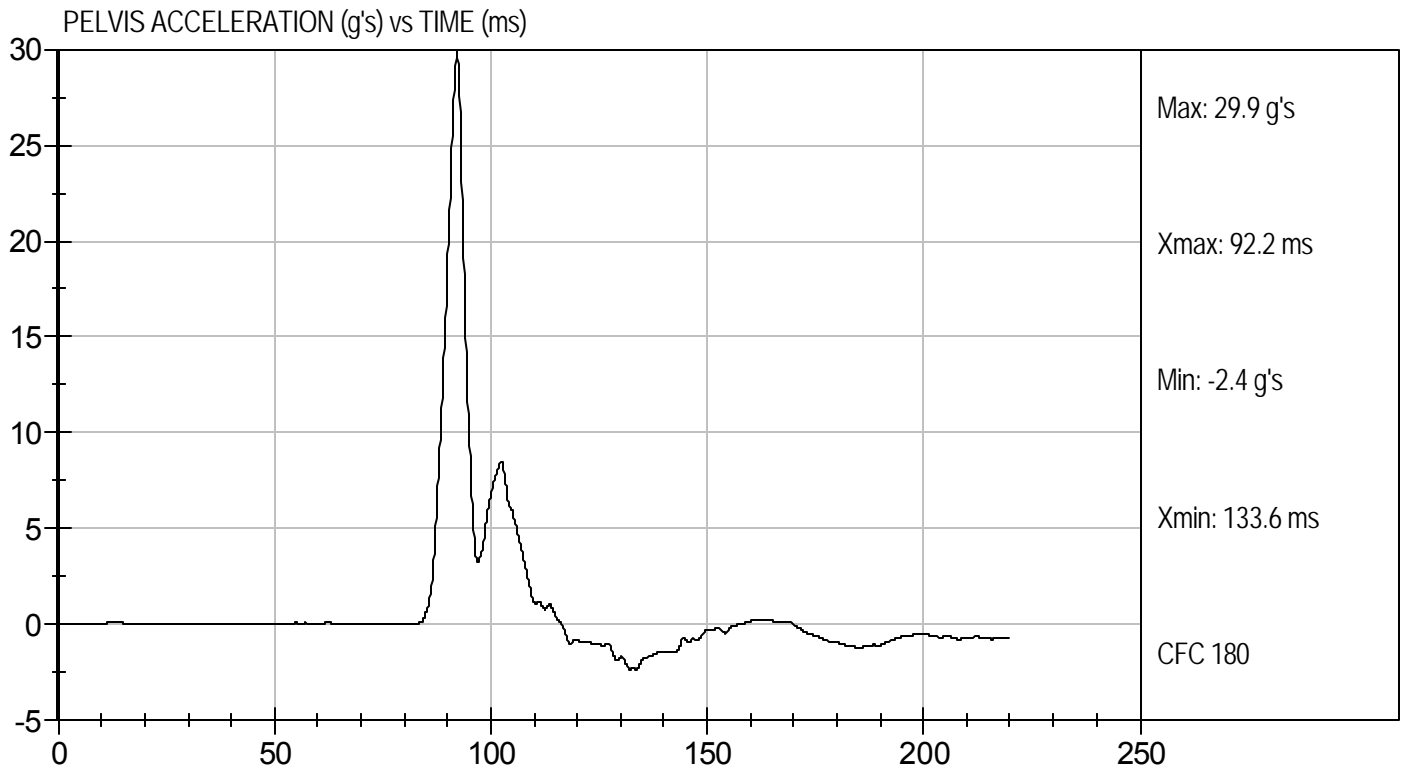
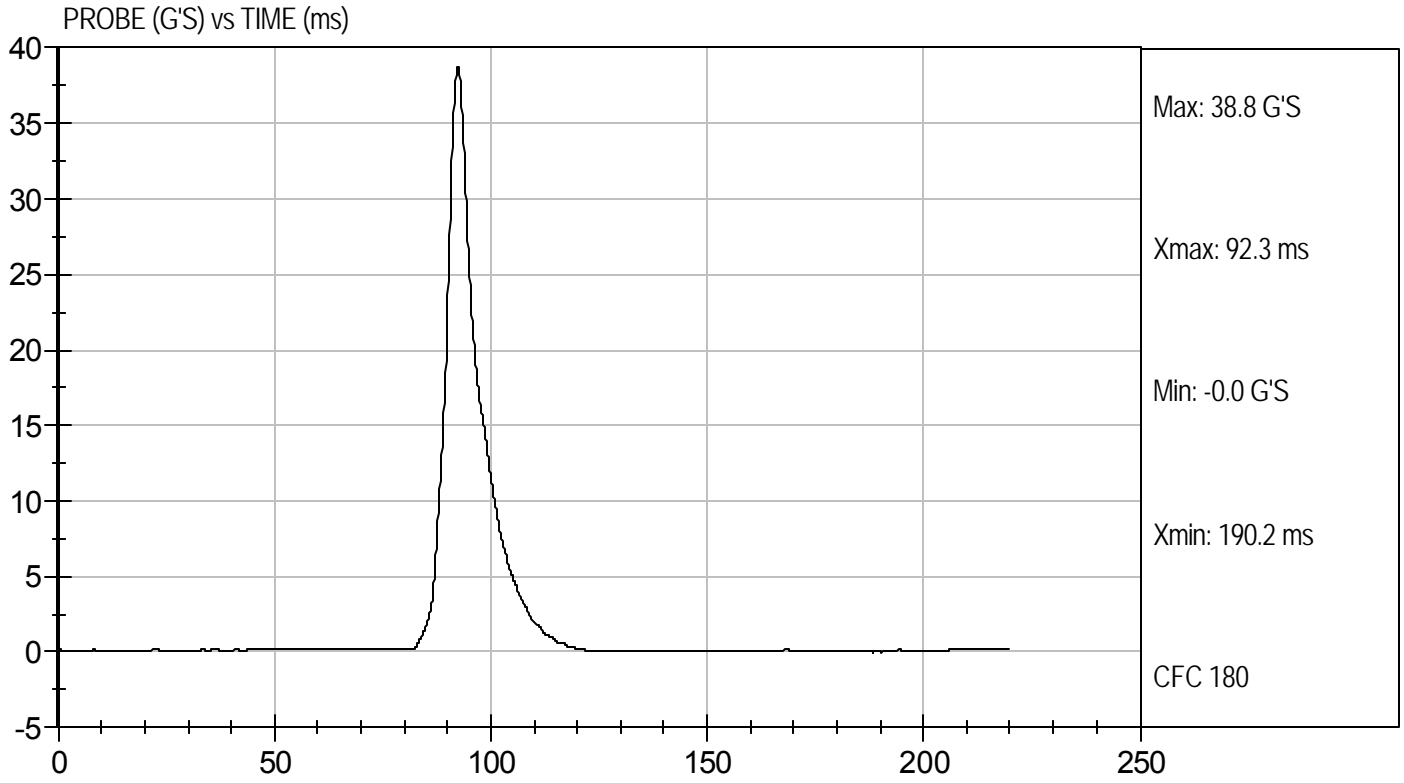
9/21/10
 Test Date

David Winkelbauer
 Approved By



Test Desc: Iliac Impact
Component ID: D103118

Test Date: 9/21/10
Velocity: 14.36 ft/s, 4.38 m/s





Test Desc: Iliac Impact
Component ID: D103118

Test Date: 9/21/10
Velocity: 14.36 ft/s, 4.38 m/s

