

REPORT NUMBER: SINCAP-MGA-2011-083

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

**HONDA OF CANADA MFG.
2011 Acura ZDX SUV
NHTSA No.: HB5304**

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



Test Date: June 16, 2011

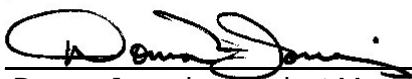
Final Report Date: July 25, 2011

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: July 25, 2011

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: _____

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

Date: _____

Technical Report Documentation Page

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16. Abstract A 55/28 km/h 90° Moving Deformable Barrier NCAP Side Impact Test was conducted on the subject 2011 Acura ZDX SUV in accordance with the specifications of the Office of Crashworthiness Standards NCAP Side Laboratory Test Procedure for the generation of consumer information on vehicle side crash protection. The test was conducted at MGA Research Corporation, in Burlington, Wisconsin, on June 16, 2011. The impact velocity of the Moving Deformable Barrier (MDB) was 62.1 km/h, and the ambient temperature at the struck (driver's) side of the target vehicle at the time of impact was 21°C. The target vehicle post-test maximum crush was 263 mm at level 3. The test vehicle's performance was as follows: <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th></th> <th colspan="3">Driver ATD (ES-2re)</th> </tr> <tr> <th>Measurement Description</th> <th>Units</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td> <td>N/A</td> <td>1000</td> <td>79</td> </tr> <tr> <td>Maximum Thorax Rib Deflection</td> <td>mm</td> <td>44</td> <td>29</td> </tr> <tr> <td>Combined Abdominal Force</td> <td>N</td> <td>2500</td> <td>459</td> </tr> <tr> <td>Pubic Symphysis Force</td> <td>N</td> <td>6000</td> <td>1210</td> </tr> </tbody> </table> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th></th> <th colspan="3">Passenger ATD (SID-IIs)</th> </tr> <tr> <th>Measurement Description</th> <th>Units</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td> <td>N/A</td> <td>1000</td> <td>152</td> </tr> <tr> <td>Lower Spine (T12) Resultant Acceleration</td> <td>G</td> <td>82</td> <td>41</td> </tr> <tr> <td>Total Pelvic Force (sum of acetabular and iliac forces)</td> <td>N</td> <td>5525</td> <td>2917</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	29	Combined Abdominal Force	N	2500	459	Pubic Symphysis Force	N	6000	1210		Passenger ATD (SID-IIs)			Measurement Description	Units	Threshold	Result	Head Injury Criteria (HIC ₃₆)	N/A	1000	152	Lower Spine (T12) Resultant Acceleration	G	82	41	Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2917
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TABLE OF CONTENTS

<u>Section</u>		<u>Page No.</u>
1	Purpose and Summary of Test	1
2	Occupant and Vehicle Information / Data Sheets	3
<u>Data Sheet No.</u>		<u>Page No.</u>
1	General Test and Vehicle Parameter Data	4
2	Seat Adjustment, Fuel System, and Steering Wheel Data	7
3	Dummy Longitudinal Clearance Dimensions	9
4	Dummy Lateral Clearance Dimensions	10
5	Camera Locations and Data	11
6	Vehicle Accelerometer Locations	12
7	Moving Deformable Barrier Accelerometer Locations	13
8	Test Vehicle Summary of Results	14
9	Moving Deformable Barrier Summary of Results	15
10	Post-Test Observations	16
11	Vehicle Profile Measurements	17
12	Vehicle Exterior Crush Measurements	18
13	Vehicle Damage Profile Distances	21
14	Exterior Static Crush for Impactor Face	22
15	FMVSS 301 Fuel System Integrity Post-Impact Data	23
16	Dummy/Vehicle Temperature Stabilization Data	24
<u>Appendix</u>		
A	Photographs	A
B	Dummy Response Data	B
C	Dummy Calibration and Performance Verification Data	C

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 Acura ZDX SUV. 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 Acura ZDX SUV was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 62.1 km/h (38.6 mph). The target vehicle was stationary and was positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by MGA Research Corporation in Burlington, Wisconsin, on June 16, 2011. Pretest and post test photographs of the test vehicle, the MDB, and the dummies (ES-2re and SID-IIs) are included in this report.

Dummies were placed in the driver and left rear designated seating positions according to instructions specified in the OCWS NCAP Side Laboratory Test Procedure dated 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	29
Combined Abdominal Force	N	2500	459
Pubic Symphysis Force	N	6000	1210

Measurement Description	Passenger ATD (SID-IIs)		
	Units	Threshold	Result
Head Injury Criteria (HIC ₃₆)	N/A	1000	152
Lower Spine (T12) Resultant Acceleration	G	82	41
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2917

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/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:
 Left Front Sill Y after 7 msec.
 Left Lower B-Post Y after 5 msec.
 Left Lower A-Post Y after 5 msec.
 Left Mid A-Post Y after 20 msec.
 Right MDB 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 Acura ZDX SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No. HB5304
 Test Date: 6/16/2011

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	HB5304	Anti-Lock Brakes	Yes
Model Year	2011	All Wheel Drive	Yes
Make	Acura	Power Steering	Yes
Model	ZDX	Driver Front Airbag	Yes
Body Style	MPV	Driver Curtain Airbag	Yes
VIN	2HNYB1H68BH500654	Driver Head/Torso Airbag	No
Body Color	Grigio M.	Driver Torso Airbag	No
Delivery Date	6/08/2011	Driver Torso/Pelvis Airbag	Yes
Odometer (mi)	133	Driver Pelvis Airbag	No
Odometer (km)	214	Driver Knee Airbag	No
Dealer	Joe Rizza Acura	Rear Pass. Front Airbag	No
Transmission	Automatic	Rear Pass. Curtain Airbag	Yes
Final Drive	AWD	Rear Pass. Head/Torso Airbag	No
Type/No. Cylinders	6	Rear Pass. Torso Airbag	No
Engine Displacement (L)	3.7	Rear Pass. Torso/Pelvis Airbag	No
Engine Placement	Lateral	Rear Pass. Pelvis Airbag	No
Roof Rack	No	Rear Pass. Knee Airbag	No
Sunroof/T-Top	Yes	Pretensioners	Yes
Tinted Glass	No	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?			Yes

DATA FROM CERTIFICATION LABEL

Manufactured By	Honda of Canada Mfg.	GVWR (kg)	2510
Date of Manufacture	02/11	GAWR Front (kg)	1325
		GAWR Rear (kg)	1215

VEHICLE SEATING AND WEIGHT CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity (DSC)	2	3		5	
Capacity Weight (VCW) (kg)				380	(A)
DSC x 68.04 (kg)				340	(B)
Cargo Weight (RCLW) (kg)				40	(A-B)

VEHICLE SEAT TYPE

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

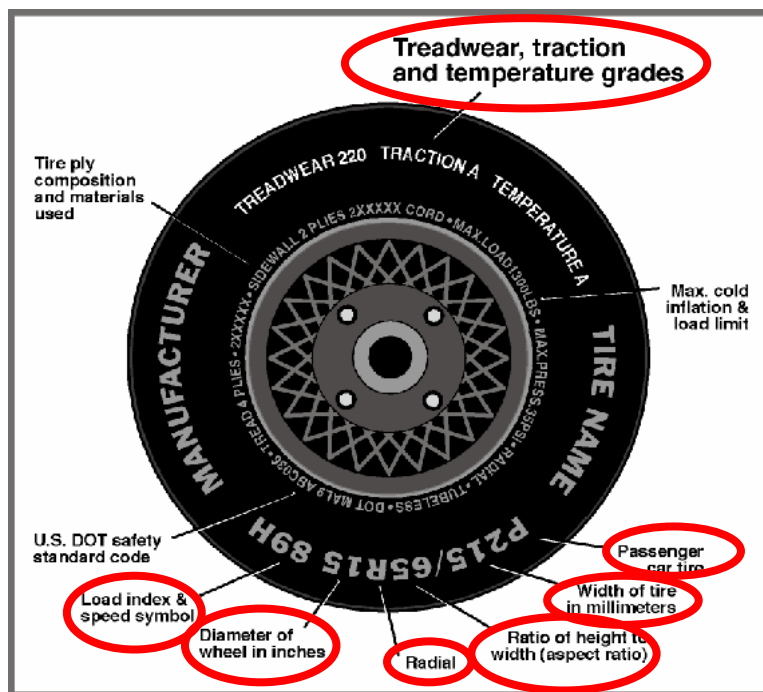
DATA SHEET NO. 1 (continued)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2011 Acura ZDX SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No. HB5304
 Test Date: 6/16/2011

VEHICLE TIRE INFORMATION



DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	350	350
Cold Pressure (kPa)	220	220
Recommended Tire Size	P255/50R19	P255/50R19
Tire Size on Vehicle	P255/50R19	P255/50R19
Tire Manufacturer	Michelin	Michelin
Tire Model	Latitude	Latitude
Treadwear	440	440
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	2	2
Tire Plies Body	5	5
Load Index & Speed Symbol	103H	103H
Tire Material	Rubber	Rubber
DOT Safety Code Right	B3XX 001X 0111	B3XX 001X 0111
DOT Safety Code Left	B3XX 001X 0111	B3XX 001X 0111

DATA SHEET NO. 1 (continued)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2011 Acura ZDX SUV
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NHTSA No. HB5304
 Test Date: 6/16/2011

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	587.8	438.2		633.4	495.5		629.1	511.7	
Right	kg	572.0	420.5		588.1	462.0		580.2	465.4	
Ratio	%	57.5	42.5		56.1	43.9		55.3	44.7	
Totals	kg	1159.8	858.7	2018.5	1221.5	957.5	2179.0	1209.3	977.1	2186.4

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	2018.5	(A)
Sum of Actual Weight of 2 P572 ATDs Used	kg	129.3	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	40	(C)
Calculated Target Vehicle Test Weight (TVTW)	kg	2187.8	(A+B+C)

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
Fully Loaded	mm	783	787	783	790	
As Tested (Fully Loaded $\pm$ 10mm at each wheel well)	mm	788	788	791	790	1211

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	2755
Total Vehicle Length at Left Side	mm	3363
Total Vehicle Length at Centerline	mm	4895
Total Vehicle Length at Right Side	mm	3363
Weight of Ballast in Cargo Area	kg	0.0
Weight of Vehicle Components Removed	kg	20.9
Amount of Stoddard Solvent in Fuel Tank	L	73.2

Vehicle components removed to meet target vehicle test weight: Right tail light, right side mirror, trunk carpet, jack & tools.

TEST VEHICLE VERTICAL IMPACT POINT DATA

Measurement Description	Units	Value
Target Impact Point Aft of Front Axle	mm	438
Actual Impact Point Aft of Front Axle	mm	434

DATA SHEET NO. 2

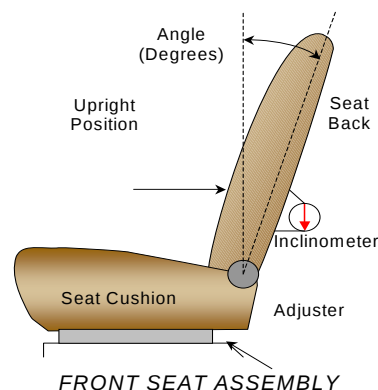
SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

Test Vehicle: 2011 Acura ZDX SUV
Test Program: NCAP Side MDB Impact Test

NHTSA No. HB5304
Test Date: 6/16/2011

NOMINAL DESIGN RIDING POSITION

The driver seatback is positioned to the manufacturer's designated angle. The procedure is as follows: Set seat back angle at 12.7° on top of headrest post guide relative to the door sill. The right front passenger seatback is set to match the driver seatback. The left rear passenger seat back is fixed.



SEAT BACK ANGLES

	Degrees
Driver with Seated Dummy	12.8° on headrest post
Passenger with Seated Dummy	30.0° on seat back

SEAT FORE/AFT POSITIONS

	Total Fore/Aft Travel	Placed in Position #
Driver Seat	235 mm	118 mm (forward-most as 0)
Rear Seat	Fixed	Fixed

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. The left rear passenger seat track was fixed.

SEAT BELT UPPER ANCHORAGES

	Total # of Positions	Placed in Position #
Driver Seat	4 detents (1 st as 1)	0 detent (uppermost as 0)
Rear Seat	Fixed	Fixed

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

DATA SHEET NO. 2 (CONTINUED)

SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

Test Vehicle: 2011 Acura ZDX SUV
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NHTSA No. HB5304
 Test Date: 6/16/2011

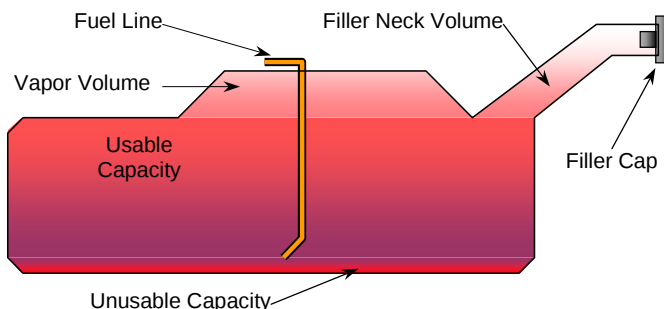
FUEL TANK CAPACITY DATA

	Liters
Usable Capacity of "Standard Tank"	78.7
Usable Capacity of "Optional" Tank	
Usable Capacity Used for FMVSS 301	72.4 to 74.0
Actual Amount of Solvent used	73.2

FUEL PUMP

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

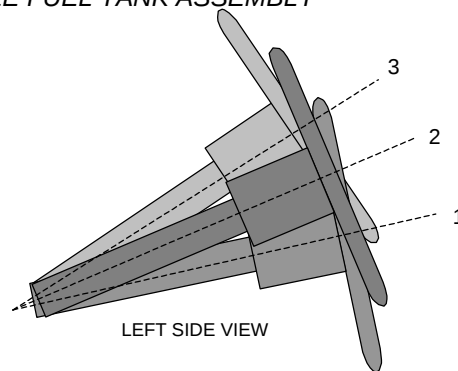
The test vehicle is equipped with an electric fuel pump. After the engine start/stop switch is turned from OFF to ON mode, the pump will be filled up for two seconds, and then the pressure is maintained. The fuel pipe is on the left side.



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.



STEERING COLUMN ASSEMBLY

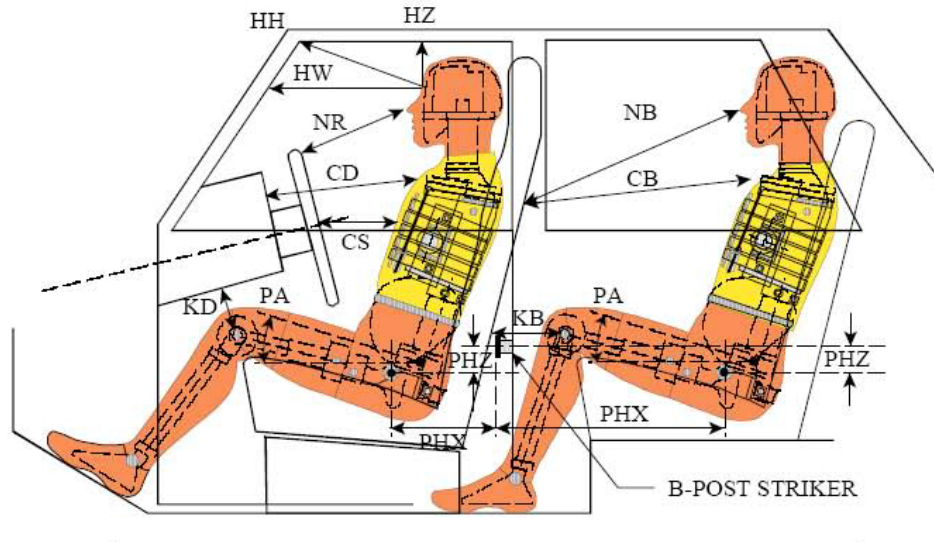
STEERING COLUMN POSITION

	Detent	Fore/Aft Position (mm)
Lowermost - Position 1	71.1	163
Geometric Center – Position 2	68.7	148
Uppermost – Position 3	66.3	133
Telescoping Steering Wheel Travel		30
Test Position	68.7	148

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2011 Acura ZDX SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No. HB5304
 Test Date: 6/16/2011



LEFT SIDE VIEW

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

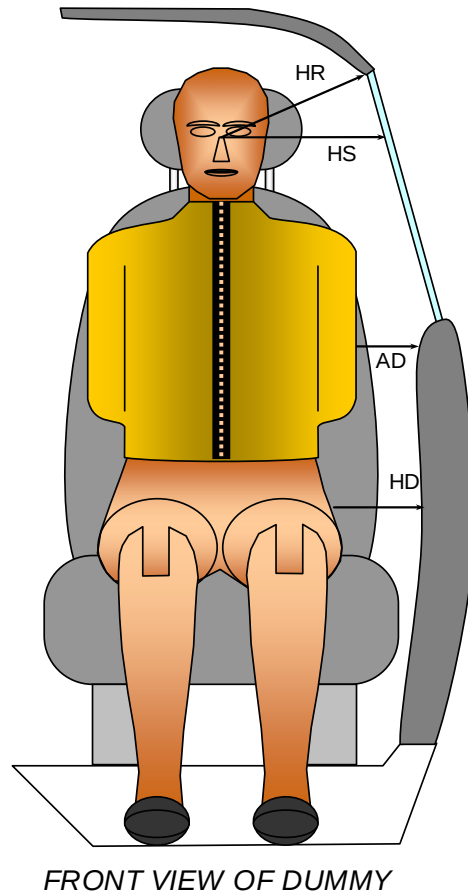
DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Pass. Code	Measurement Description	Driver S/N 032		Passenger S/N 306	
			Length (mm)	Angle(°)	Length (mm)	Angle(°)
HH		Head to Header	387	13.9		
HW		Head to Windshield	687	0		
HZ	HZ	Head to Roof	124	90	206	90
NR	NB	Nose to Rim/Seat Back	445	12.0	602	15.7
CD	CB	Chest to Dash/Seat Back	576	11.8	559	4.0
CS		Chest to Steering Wheel	374	9.4		
KDL	KBL	Left Knee to Dash/Seat Back	137	29.2	271	26.9
KDR	KBR	Right Knee to Dash/Seat Back	128	38.5	282	28.4
PA	PA	Pelvic Angle		22.8		23.8
PHX	PHX	H-Point to Striker (X-Axis)	283	0	194	0
PHZ	PHZ	H-Point to Striker (Z-Axis)	138	90	263	90
SA	SA	Seat Back Angle		12.8		Fixed

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2011 Acura ZDX SUV
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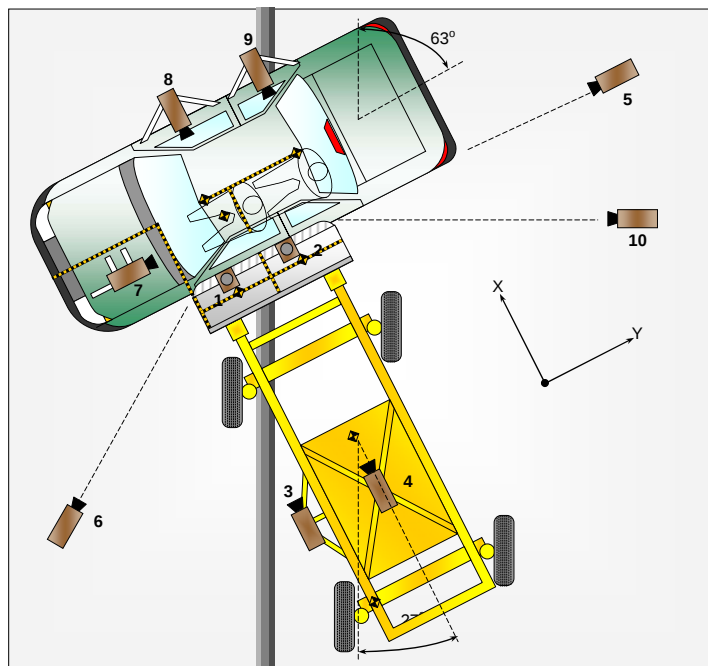
DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

Code	Measurement Description	Units	Driver S/N 032	Passenger S/N 306
HR	Head to Side Header	mm	179	189
HS	Head to Side Window	mm	331	355
AD	Arm to Door	mm	120	176
HD	H-Point to Door	mm	173	240

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

Test Vehicle: 2011 Acura ZDX SUV
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 Test Date: 6/16/2011



CAMERA LOCATIONS AND DATA

No.	Camera View	Coordinates (mm)			Angle	Lens (mm)	Film Speed (fps)
		X*	Y*	Z*			
1	Overhead Overall	-170	0	-5050	88.1	14	1000
2	Overhead Close-up	280	-1170	-5050	82.8	50	1000
3	Left Impact Point (MDB)					50	1000
4	Side Overall (MDB)					16	1000
5	Rear	50	4750	-1120	6.3	24	1000
6	Left Front	3090	-4070	-1100	5.7	24	1000
7	Driver Front (OB)					16	1000
8	Driver Side (OB)					8	1000
9	Passenger Side (OB)					8	1000
10	Real Time Left Rear						30
11	Real Time Inrun						30

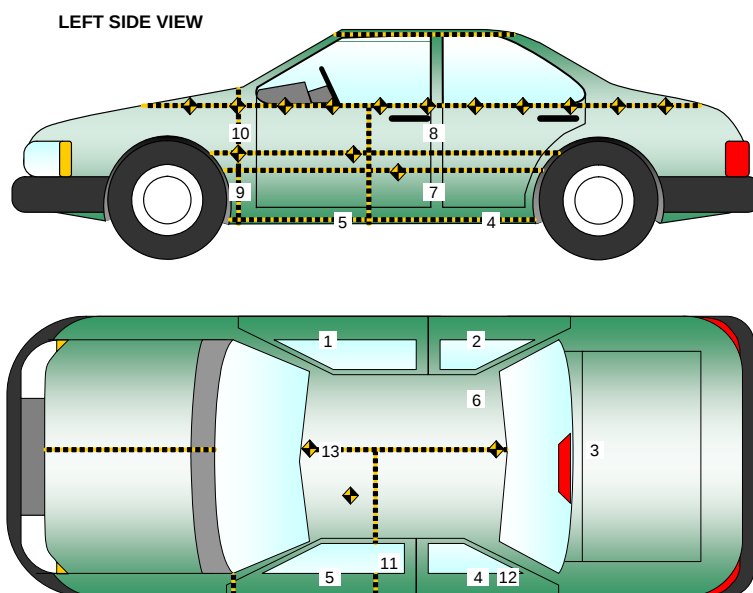
Reference: Impact Point projected to Ground
 +X = To Front of MDB, +Y = To Right of MDB, +Z = Down

* All measurements accurate to ± 6 mm

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

Test Vehicle: 2011 Acura ZDX SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No. HB5304
 Test Date: 6/16/2011



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

Accelerometer Location				
No.	ID	Coordinates (mm)		
		X	Y	Z
1	Right Sill at Front Seat	2630	785	-348
2	Right Sill at Rear Seat	1761	785	-350
3	Rear Floorpan Above Axle	684	0	-600
4	Left Sill at Rear Door	1761	-785	-351
5	Left Sill at Front Door	2630	-785	-347
6	Rt. Rear Occ. Compartment	1895	320	-470
7	Left Lower B-Post	2000	-780	-745
8	Left Middle B-Post	2000	-720	-952
9	Left Lower A-Post	3130	-779	-715
10	Left Middle A-Post	3184	-860	-910
11	Front Seat Track	2225	-600	-450
12	Rear Seat Track or Structure			
13	Vehicle CG	2490	-40	-382

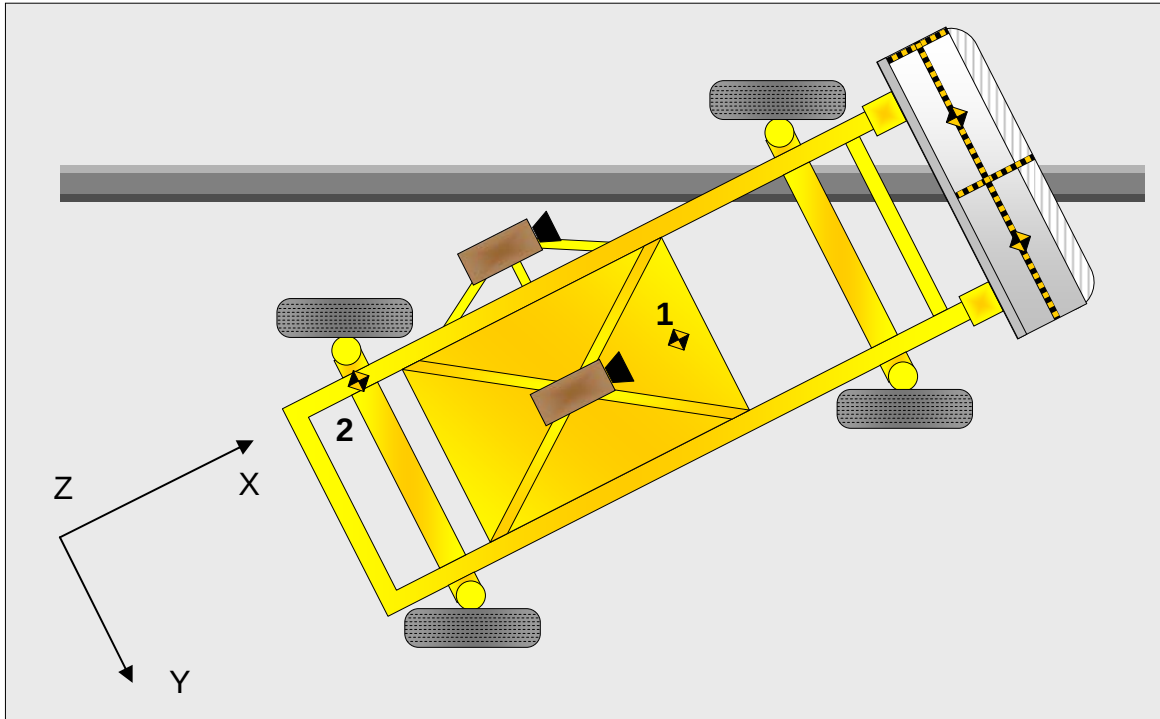
Reference: X – Rear Surface of Vehicle (+ forward)
 Y - Vehicle Centerline (+ to right)
 Z - Ground Plane (+ down)

DATA SHEET NO. 7

MOVING DEFORMABLE BARRIER (MDB) ACCELEROMETER LOCATIONS

Test Vehicle: 2011 Acura ZDX SUV
Test Program: NCAP Side MDB Impact Test

NHTSA No. HB5304
Test Date: 6/16/2011



MDB ACCELEROMETER LOCATIONS

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

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

DATA SHEET NO. 8
TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2011 Acura ZDX SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No. HB5304
 Test Date: 6/16/2011

MAXIMUM EXTERIOR STATIC CRUSH

Level	Measurement Description	Units	Maximum Crush	Above Ground
1	Sill Top Height	mm	166	323
2	Occupant H-Point	mm	255	678
3	Mid Door	mm	263	720
4	Window Sill	mm	129	1058
5	Window Top	mm	14	1510
	Maximum Penetration	mm	263	

INSTRUMENTATION

Driver Dummy Channels	16
Passenger Dummy Channels	16
Vehicle Structure Accelerometers	21
MDB Accelerometers	5
Total No. of Contact Switches – not installed	8
Monitoring Channels – not installed	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 Acura ZDX SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No. HB5304
 Test Date: 6/16/2011

MDB SPECIFICATIONS

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

MDB WEIGHTS

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

SPEED AND 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	61.9
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	89.8

MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE

Vertical Location			From Centerline		Maximum Crush
Row	Description	Height	Distance	Direction	
A	Center of Bumper	432	800	Left	219
B	Top of Bumper	533	800	Left	139
C	Mid-Level	686	800	Left	142
D	Top of Stack	813	800	Left	176

MDB INSTRUMENTATION AND CAMERAS

Accelerometers	5
Contact Switches	2
High-Speed Cameras	2

DATA SHEET NO. 10

POST-TEST OBSERVATIONS

Test Vehicle: 2011 Acura ZDX SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No. HB5304
 Test Date: 6/16/2011

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, Headrest, Headliner	Curtain Airbag, Headrest, Headliner
Upper Torso Contact	Side Airbag, Seat Back	Seat Back, Door Panel
Lower Torso Contact	Side Airbag, Seat Back	Seat Back
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 Rear Window 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/Pelvis Airbag	Yes	Yes	No	
Seat Belt Pretensioner	Yes	Yes	No	
Seat Belt Load Limiter	Yes		No	

MDB LEFT EDGE IMPACT POINT DATA

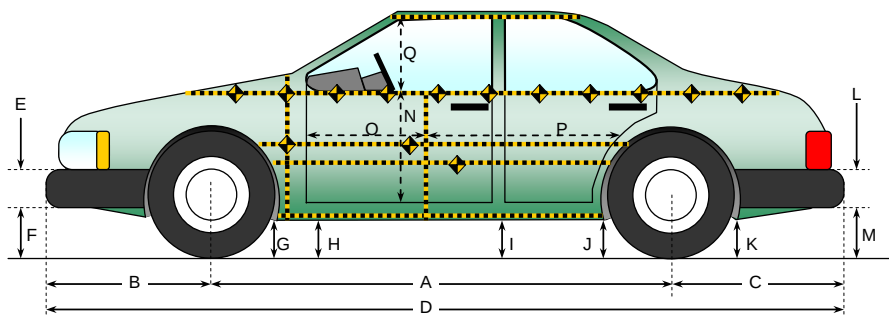
Measured Parameter	Units	Requirement	Value
Horizontal Offset	mm	+/- 50	4 forward
Vertical Offset	mm	+/-20	4 up

DATA SHEET NO. 11

VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2011 Acura ZDX SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No. HB5304
 Test Date: 6/16/2011



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

LEFT SIDE VIEW

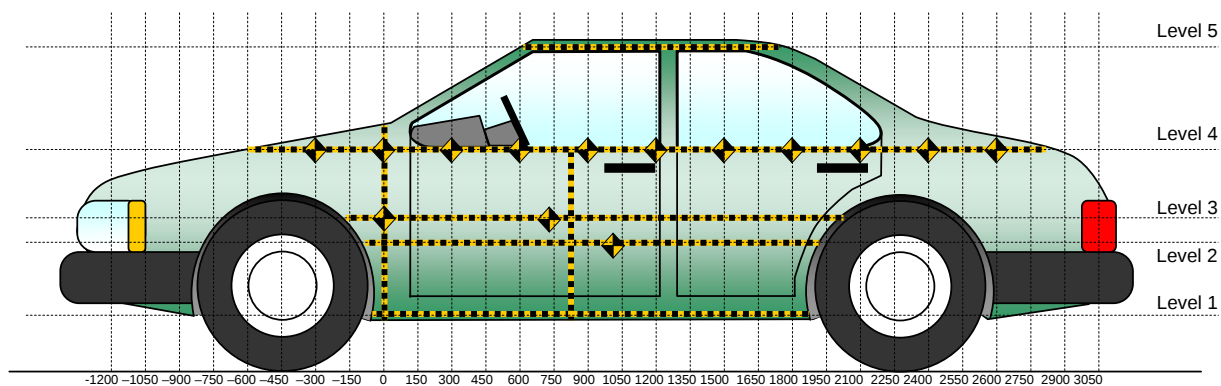
VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2755	2670	85
B	Front Axle to FSOV	1075	1075	0
C	Rear Axle to RSOV	1065	1065	0
D	Total Length at Centerline	4895	4810	85
E	Front Bumper Thickness	95	95	0
F	Front Bumper Bottom to Ground	257	218	39
G	Sill Height at Front Wheel Well	253	207	46
H	Sill Height at Front Door Leading Edge	253	204	49
I	Sill Height at B Pillar	256	165	91
J1	Sill Height at Rear Wheel Well	245	254	-9
J2	Pinch Weld Height at Rear Wheel Well	246	248	-2
K	Sill Height Aft of Rear Wheel Well	306	315	-9
L	Rear Bumper Thickness	100	100	0
M	Rear Bumper Bottom to Ground	383	384	-1
N	Sill Height to Window Bottom Sill	834	805	29
O	Front Door Leading Edge to Impact CL	880	875	5
P	Rear Door Trailing Edge to Impact CL	1015	1000	15
Q	Front Window Opening	370	360	10
R	Right Side Length	3363	3365	-2
S	Left Side Length	3363	3325	38
T	Vehicle Width at B Post	1981	1790	191

DATA SHEET NO. 12 **VEHICLE EXTERIOR CRUSH MEASUREMENTS**

Test Vehicle: 2011 Acura ZDX SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No. HB5304
 Test Date: 6/16/2011



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	323
2	Mid Door	678
3	Occupant H-Point	720
4	Window Sill	1058
5	Window Top	1510

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

Test Vehicle: 2011 Acura ZDX SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No. HB5304
 Test Date: 6/16/2011

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900				320					320					0	
-750				297					297					0	
-600				276					276					0	
-450				257					264					7	
-300				248					262					14	
-150			101	234				115	248				14	14	
0		111	114	227			139	139	243			28	25	16	
150	162	120	121	225		203	266	256	233		41	146	135	8	
300	162	121	120	220		225	341	345	253		63	220	225	33	
450	162	120	119	215		240	355	363	258		78	235	244	43	
600	162	119	118	210	427	245	365	375	268	432	83	246	257	58	5
750	161	118	117	208	427	252	373	380	255	425	91	255	263	47	-2
900	161	119	117	209	426	266	373	378	250	435	105	254	261	41	9
1050	160	120	118	208	434	271	356	352	257	440	111	236	234	49	6
1200	160	121	119	207	438	280	330	338	278	447	120	209	219	71	9
1350	160	124	122	207	445	310	370	375	300	455	150	246	253	93	10
1500	164	126	126	210	454	316	370	383	308	464	152	244	257	98	10
1650	164	128	129	211	465	330	358	378	340	475	166	230	249	129	10
1800	153	122	125	214	476	312	352	348	335	490	159	230	223	121	14
1950		106	109	213	496		239	250	265	507		133	141	52	11
2100				200	516				236	524				36	8
2250				190	538				227	542				37	4
2400				198					223					25	
2550				215					233					18	

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

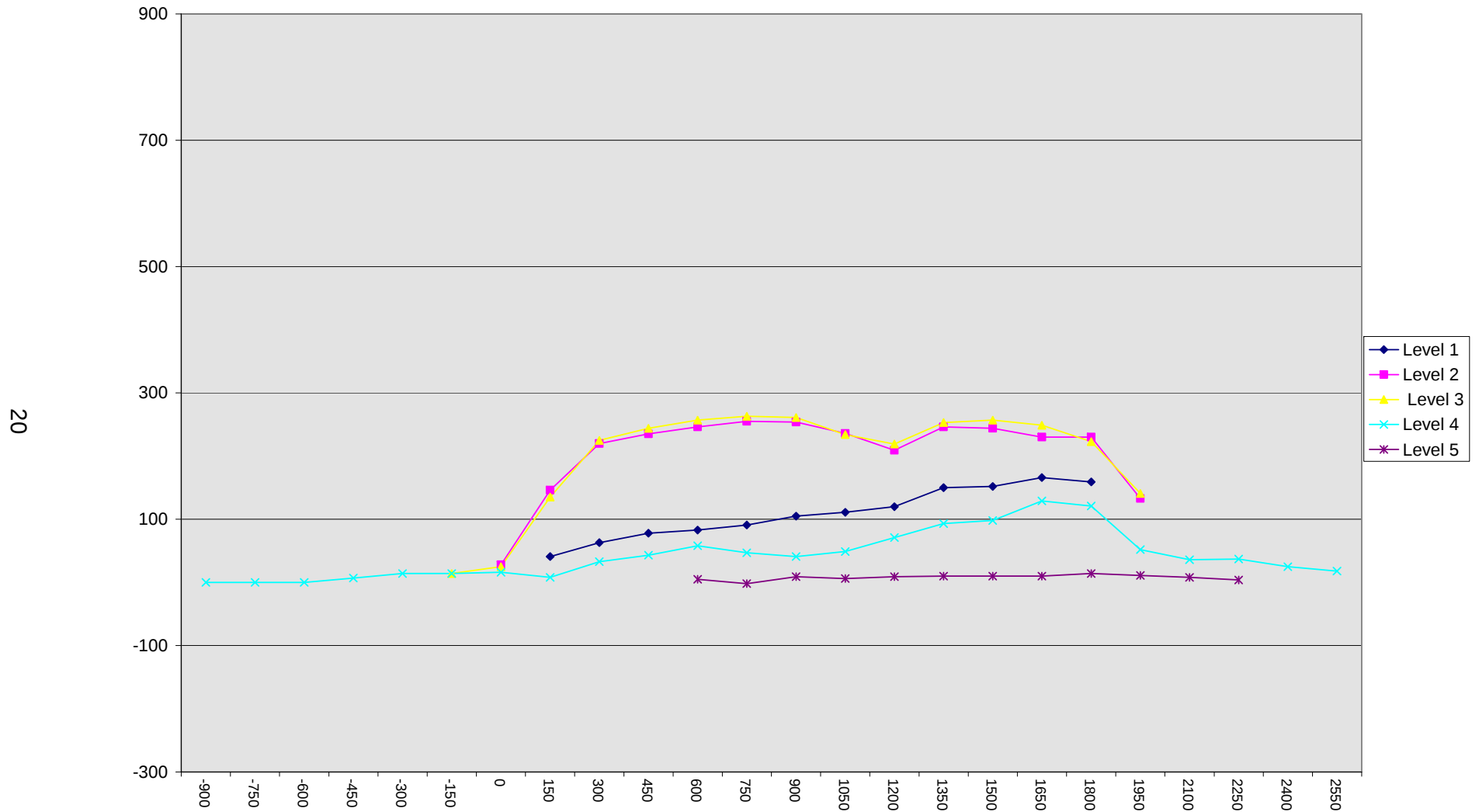
	Level 1	Level 2	Level 3	Level 4	Level 5
Maximum Crush (mm)	166	255	263	129	14
Distance From Impact (mm)	1650	750	750	1650	1800

DATA SHEET NO. 12 (continued)

VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2011 Acura ZDX SUV
Test Program: NCAP Side MDB Impact Test

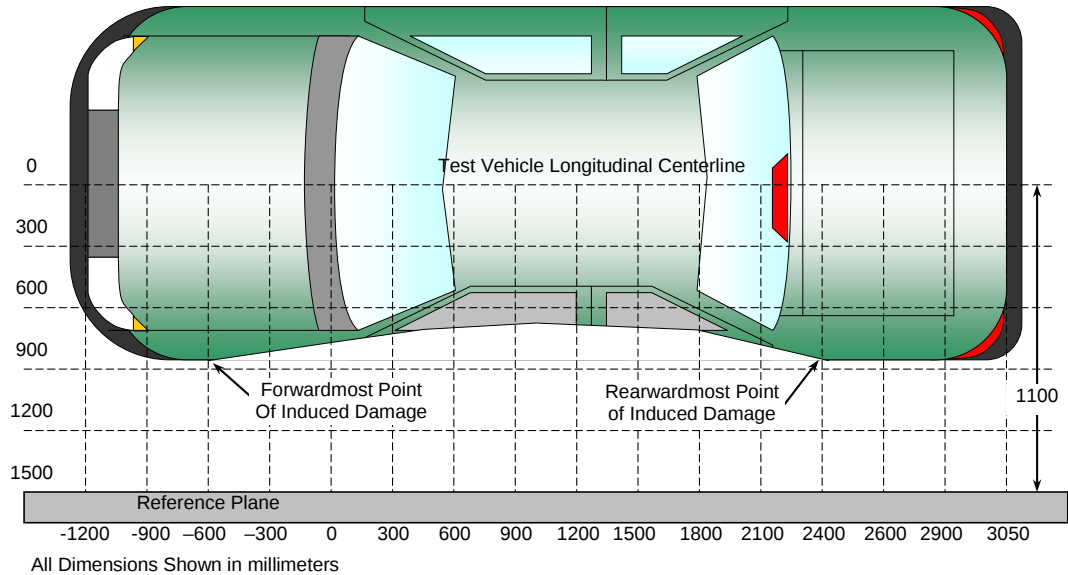
NHTSA No. HB5304
Test Date: 6/16/2011



DATA SHEET NO. 13
VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2011 Acura ZDX SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No. HB5304
 Test Date: 6/16/2011



TOP VIEW

DAMAGE PROFILE DISTANCES

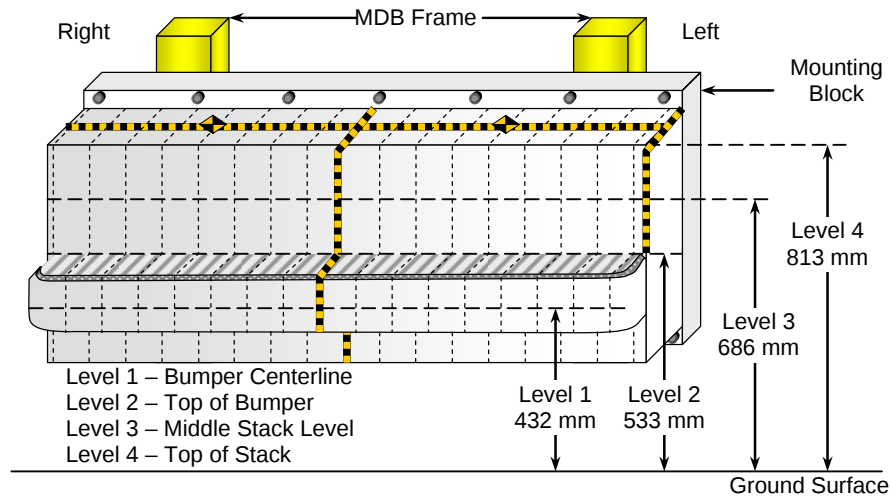
DPD	Distance from Impact Point (mm)	Level	Pre-Test (mm)	Post-Test (mm)	Max. Static Crush (mm)
1	2550	4	215	233	18
2	1855	4	214	318	104
3	1125	2	120	365	245
4	440	3	119	370	251
5	-325	4	251	255	4
6	-900	4	320	320	0

DATA SHEET NO. 14

EXTERIOR STATIC CRUSH FOR IMPACTOR FACE

Test Vehicle: 2011 Acura ZDX SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No. HB5304
 Test Date: 6/16/2011



FRONT VIEW

DEFORMABLE BARRIER STATIC CRUSH

Stack Level	Distance Right of Center (mm)								C _L	Distance Left of Center (mm)							
	800	700	600	500	400	300	200	100		100	200	300	400	500	600	700	800
4	66	45	38	39	60	95	88	81	53	63	54	60	65	72	83	101	176
3	70	55	53	50	78	86	68	45	46	38	37	36	42	48	60	78	142
2	105	105	105	103	94	98	96	98	105	110	114	117	122	124	128	132	139
1	165	168	169	171	175	175	180	181	184	188	190	194	197	200	208	216	219

DATA SHEET NO. 15

FMVSS 301 FUEL SYSTEM INTEGRITY POST-IMPACT DATA

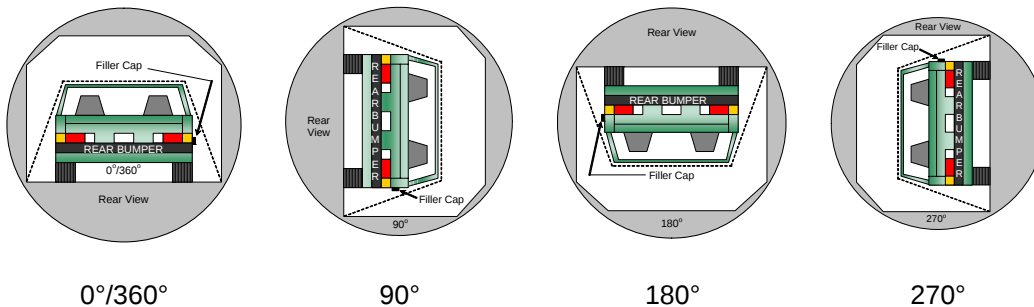
Test Vehicle: 2011 Acura ZDX SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No. HB5304
 Test Date: 6/16/2011

Test Time: 11:05 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°	118	300	418
90° to 180°	111	300	411
180° to 270°	105	300	405
270° to 360°	110	300	410

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

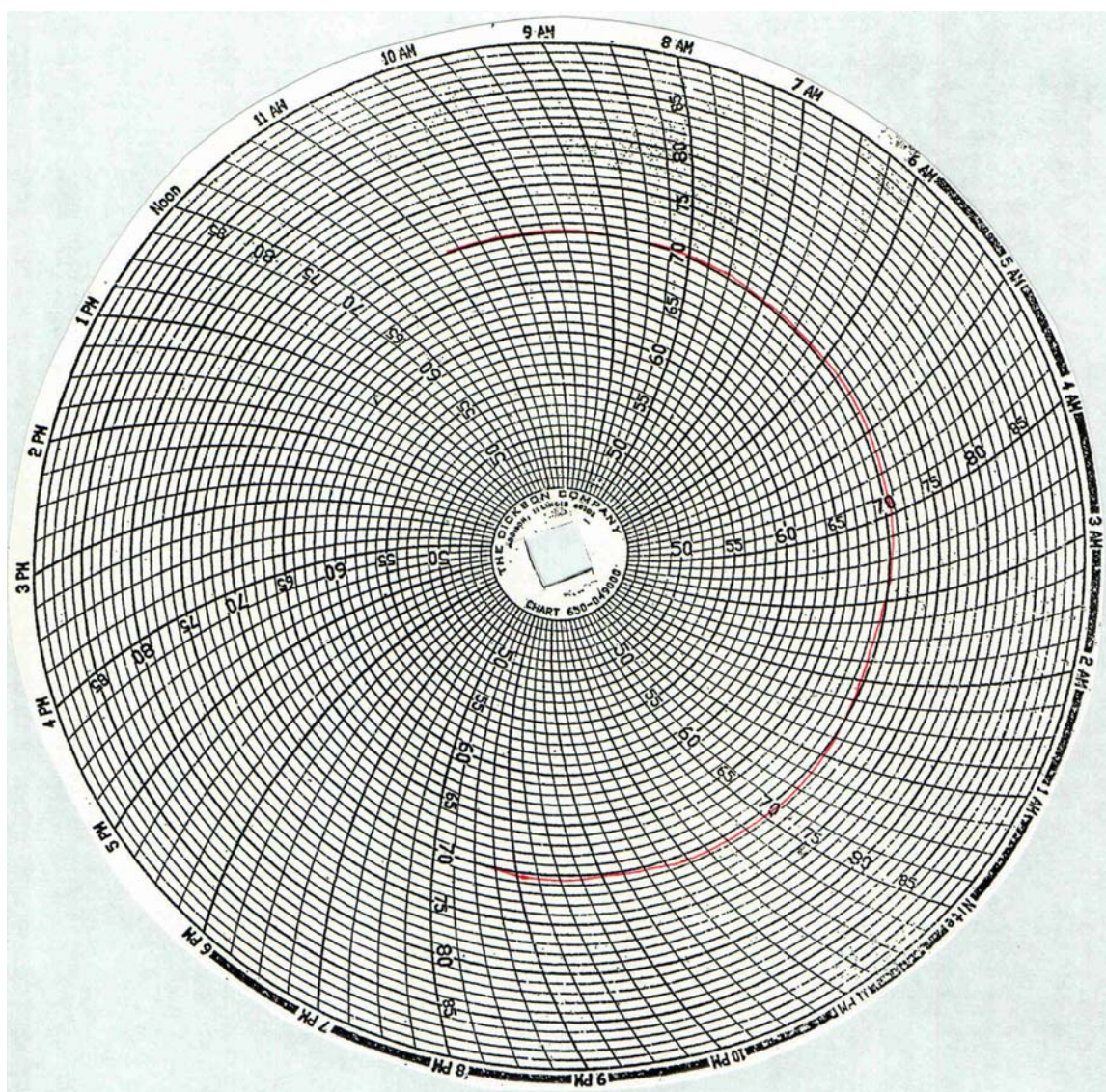
Test Phase	Spillage Location
0° to 90°	
90° to 180°	
180° to 270°	
270° to 360°	

DATA SHEET NO. 16

DUMMY/VEHICLE TEMPERATURE STABILIZATION DATA

Test Vehicle: 2011 Acura ZDX SUV
Test Program: NCAP Side MDB Impact Test

NHTSA No. HB5304
Test Date: 6/16/2011



APPENDIX A
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

		<u>Page No.</u>
Photo No. 1.	As Delivered Right Front Three-Quarter View of Test Vehicle	A-1
Photo No. 2.	As Delivered Left Rear Three-Quarter View of Test Vehicle	A-1
Photo No. 3.	Pre-Test Frontal View of Test Vehicle	A-2
Photo No. 4.	Post-Test Frontal View of Test Vehicle	A-2
Photo No. 5.	Pre-Test Left Three-Quarter Front View of Test Vehicle	A-3
Photo No. 6.	Post-Test Left Three-Quarter Front View of Test Vehicle	A-3
Photo No. 7.	Pre-Test Left Side View of Test Vehicle	A-4
Photo No. 8.	Post-Test Left Side View of Test Vehicle	A-4
Photo No. 9.	Pre-Test Left Three-Quarter Rear View of Test Vehicle	A-5
Photo No. 10.	Post-Test Left Three-Quarter Rear View of Test Vehicle	A-5
Photo No. 11.	Pre-Test Rear View of Test Vehicle	A-6
Photo No. 12.	Post-Test Rear View of Test Vehicle	A-6
Photo No. 13.	Pre-Test Right Side View of Test Vehicle	A-7
Photo No. 14.	Post-Test Right Side View of Test Vehicle	A-7
Photo No. 15.	Pre-Test Overhead View of Test Vehicle with MDB Positioned Against Side of Test Vehicle	A-8
Photo No. 16.	Post-Test Overhead View of Test Vehicle and MDB	A-8
Photo No. 17.	Pre-Test Left Side View of MDB Positioned Against Side of Test Vehicle	A-9
Photo No. 18.	Pre-Test Right Side View of MDB Positioned Against Side of Test Vehicle	A-9
Photo No. 19.	Pre-Test Close-Up View of Impact Point Target	A-10
Photo No. 20.	Post-Test Close-Up View of Impact Point Target	A-10
Photo No. 21.	Pre-Test Left Front Door Latch Close-Up	A-11
Photo No. 22.	Post-Test Left Front Door Latch Close-Up	A-11
Photo No. 23.	Pre-Test Left Rear Door Latch Close-Up	A-12

		<u>Page No.</u>
Photo No. 24.	Post-Test Left Rear Door Latch Close-Up	A-12
Photo No. 25.	Pre-Test Front Close-Up View of Driver Dummy	A-13
Photo No. 26.	Post-Test Front Close-Up View of Driver Dummy	A-13
Photo No. 27.	Pre-Test Left Side View of Driver Dummy Showing Belt, Chalking, and Contact Switches	A-14
Photo No. 28.	Pre-Test Left Side View of Driver Dummy Shoulder and Door Top View	A-15
Photo No. 29.	Post-Test Left Side View of Driver Dummy Shoulder and Door Top View	A-15
Photo No. 30.	Pre-Test Frontal View of Driver Seat Back Prior to Dummy Positioning	A-16
Photo No. 31.	Pre-Test Frontal View of Driver Dummy Head and Shoulders in Relation to Head Restraint	A-16
Photo No. 32.	Pre-Test Frontal View of Driver Seat Pan Prior to Dummy Positioning	A-17
Photo No. 33.	Pre-Test Overhead View of Driver Dummy Thighs on Seat Pan	A-17
Photo No. 34.	Pre-Test Placement of Driver Dummy's Feet	A-18
Photo No. 35.	Pre-Test View of Belt Anchorage for Driver Dummy	A-18
Photo No. 36.	Pre-Test Left Side View of Steering Wheel	A-19
Photo No. 37.	Pre-Test View of Parking Brake	A-19
Photo No. 38.	Pre-Test Close-Up Left Side View of Driver Seat Track	A-20
Photo No. 39.	Pre-Test Close-Up Left Side View of Driver Seat Back	A-20
Photo No. 40.	Pre-Test Close-Up View of Driver Seat Back or Head Restraint	A-21
Photo No. 41.	Pre-Test Driver Dummy and Door Clearance View	A-22
Photo No. 42.	Post-Test Driver Dummy and Door Clearance View	A-22
Photo No. 43.	Pre-Test Right Side View of Front Seat of Occupant Compartment	A-23
Photo No. 44.	Post-Test Right Side View of Front Seat of Occupant Compartment	A-23
Photo No. 45.	Pre-Test Driver Inner Door Panel View	A-24
Photo No. 46.	Post-Test Driver Inner Door Panel View Showing Driver Dummy Contact Locations	A-24
Photo No. 47.	Post-Test Driver Dummy Close-up Head Contact with Vehicle Interior View	A-25

		<u>Page No.</u>
Photo No. 48.	Post-Test Driver Dummy Close-up Head Contact with Side Airbag View	A-25
Photo No. 49.	Post-Test Driver Dummy Close-up Torso Contact with Vehicle Interior View	A-26
Photo No. 50.	Post-Test Driver Dummy Close-up Torso Contact with Side Airbag View	A-26
Photo No. 51.	Post-Test Driver Dummy Close-up Pelvis Contact with Vehicle Interior View	A-27
Photo No. 52.	Post-Test Driver Dummy Close-up Pelvis Contact with Side Airbag View	A-27
Photo No. 53.	Pre-Test Left Side View of Passenger Dummy Showing Belt, Chalking, and Contact Switches	A-28
Photo No. 54.	Pre-Test Left Side View of Rear Passenger Dummy Shoulder and Door Top View	A-29
Photo No. 55.	Post-Test Left Side View of Rear Passenger Dummy Shoulder and Door Top View	A-29
Photo No. 56.	Pre-Test Frontal View of Rear Passenger Seat Back Prior to Dummy Positioning	A-30
Photo No. 57.	Pre-Test Frontal View of Rear Passenger Dummy Head and Shoulders in Relation to Head Restraint	A-30
Photo No. 58.	Pre-Test Overhead View of Rear Passenger Seat Pan Prior to Dummy Positioning	A-31
Photo No. 59.	Pre-Test Overhead View of Rear Passenger Dummy Thighs on Seat Pan	A-31
Photo No. 60.	Pre-Test View of Rear Passenger Dummy's Neck Showing Position of Adjustable Neck Bracket	A-32
Photo No. 61.	Pre-Test View of Rear Passenger Dummy's Head Showing Dummy's Head is Level	A-32
Photo No. 62.	Pre-Test Placement of Rear Passenger Dummy's Feet	A-33
Photo No. 63.	Pre-Test View of Belt Anchorage for Rear Passenger Dummy	A-33
Photo No. 64.	Pre-Test Close-Up Left Side View of Rear Passenger Seat Track	A-34
Photo No. 65.	Pre-Test Close-Up Left Side View of Rear Passenger Seat Back	A-34
Photo No. 66.	Pre-Test Close-up View of Rear Passenger Seat Back or Head Restraint	A-35
Photo No. 67.	Pre-Test Rear Passenger Dummy and Door Clearance View	A-36
Photo No. 68.	Post-Test Rear Passenger Dummy and Door Clearance View	A-36
Photo No. 69.	Pre-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment	A-37
Photo No. 70.	Post-Test Right Side View of Rear Passenger Dummy Seat and Rear Seat Occupant Compartment	A-37
Photo No. 71.	Pre-Test Passenger Inner Door Panel View	A-38

		<u>Page No.</u>
Photo No. 72.	Post-Test Rear Passenger Inner Door Panel View Showing Dummy Contact Locations	A-38
Photo No. 73.	Post-Test Rear Passenger Dummy Close-up Head Contact with Vehicle Interior View	A-39
Photo No. 74.	Post-Test Rear Passenger Dummy Close-up Head Contact with Side Airbag View	A-39
Photo No. 75.	Post-Test Rear Passenger Dummy Close-up Torso Contact with Vehicle Interior View	A-40
Photo No. 76.	Post-Test Rear Passenger Dummy Close-up Torso Contact with Side Airbag View	A-40
Photo No. 77.	Post-Test Rear Passenger Dummy Close-up Pelvis Contact with Vehicle Interior View	A-41
Photo No. 78.	Post-Test Rear Passenger Dummy Close-up Pelvis Contact with Side Airbag View	A-41
Photo No. 79.	Pre-Test View of Fuel Filler Cap or Fuel Filler Neck	A-42
Photo No. 80.	Post-Test View of Fuel Filler Cap or Fuel Filler Neck	A-42
Photo No. 81.	Pre-Test Front View of MDB Impactor Face	A-43
Photo No. 82.	Post-Test Front View of MDB Impactor Face	A-43
Photo No. 83.	Pre-Test Top View of MDB Impactor Face	A-44
Photo No. 84.	Post-Test Top View of MDB Impactor Face	A-44
Photo No. 85.	Pre-Test Left Side View of MDB Impactor Face	A-45
Photo No. 86.	Post-Test Left Side View of MDB Impactor Face	A-45
Photo No. 87.	Pre-Test Right Side View of MDB Impactor Face	A-46
Photo No. 88.	Post-Test Right Side View of MDB Impactor Face	A-46
Photo No. 89.	Close-Up View of Vehicle's Certification Label	A-47
Photo No. 90.	Close-Up View of Vehicle's Tire Information Placard or Label	A-47
Photo No. 91.	Pre-Test Ballast View	A-48
Photo No. 92.	Post-Test Primary and Redundant Speed Trap Read-Out	A-48
Photo No. 93.	FMVSS No. 301/305 Rollover 0 Degrees	A-49
Photo No. 94.	FMVSS No. 301/305 Rollover 90 Degrees	A-49
Photo No. 95.	FMVSS No. 301/305 Rollover 180 Degrees	A-50

		<u>Page No.</u>
Photo No. 96.	FMVSS No. 301/305 Rollover 270 Degrees	A-50
Photo No. 97.	FMVSS No. 301/305 Rollover 360 Degrees	A-51
Photo No. 98.	Impact Event	A-51
Photo No. 99.	Monroney Label	A-52
Photo No. 100.	Head Restraint Use and Adjustment Information from Vehicle Manual	A-53
Photo No. 101.	Head Restraint Use and Adjustment Information from Vehicle Manual	A-54
Photo No. 102.	Head Restraint Use and Adjustment Information from Vehicle Manual	A-55
Photo No. 103.	Head Restraint Use and Adjustment Information from Vehicle Manual	A-56



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



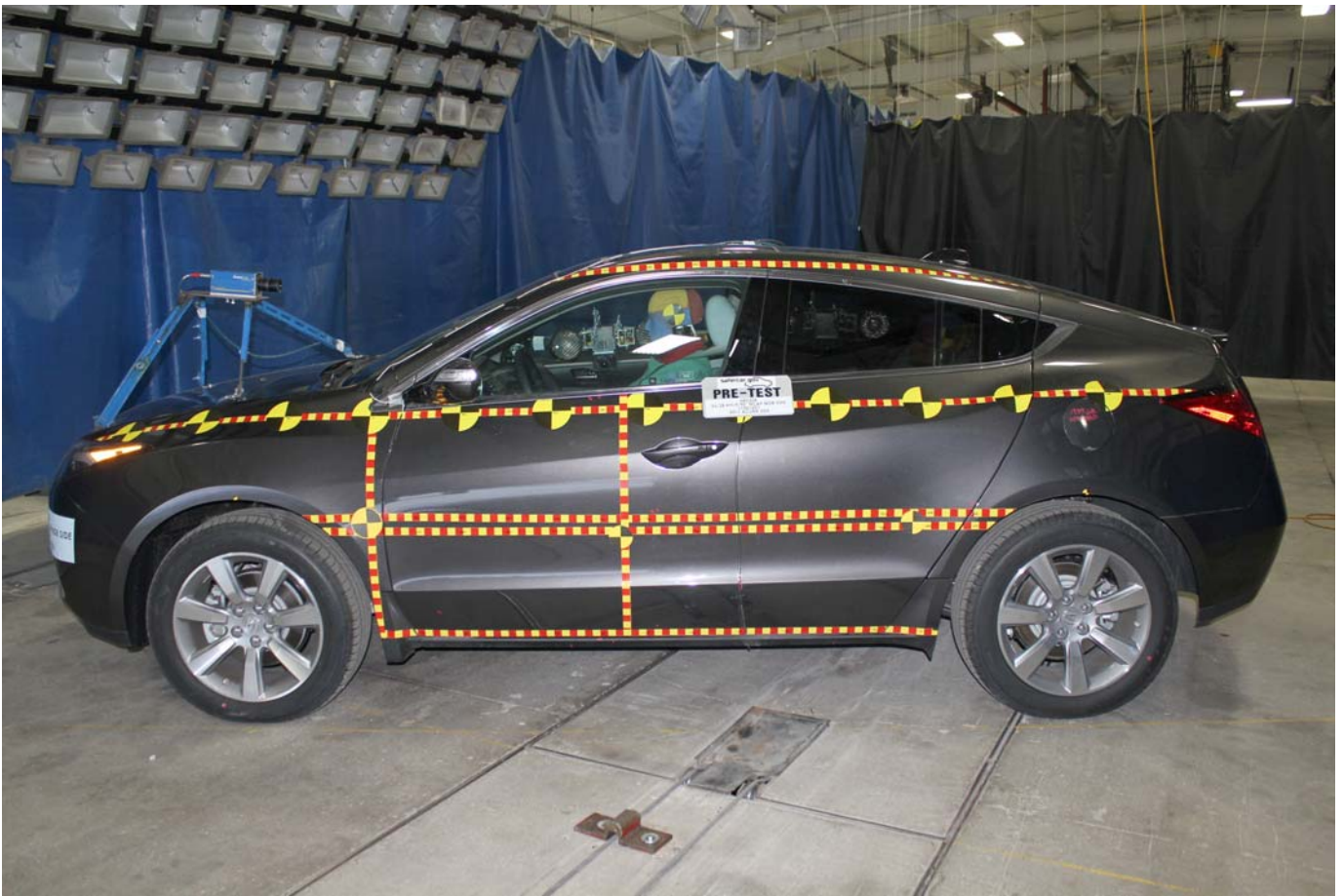
Post-Test Frontal View of Test Vehicle



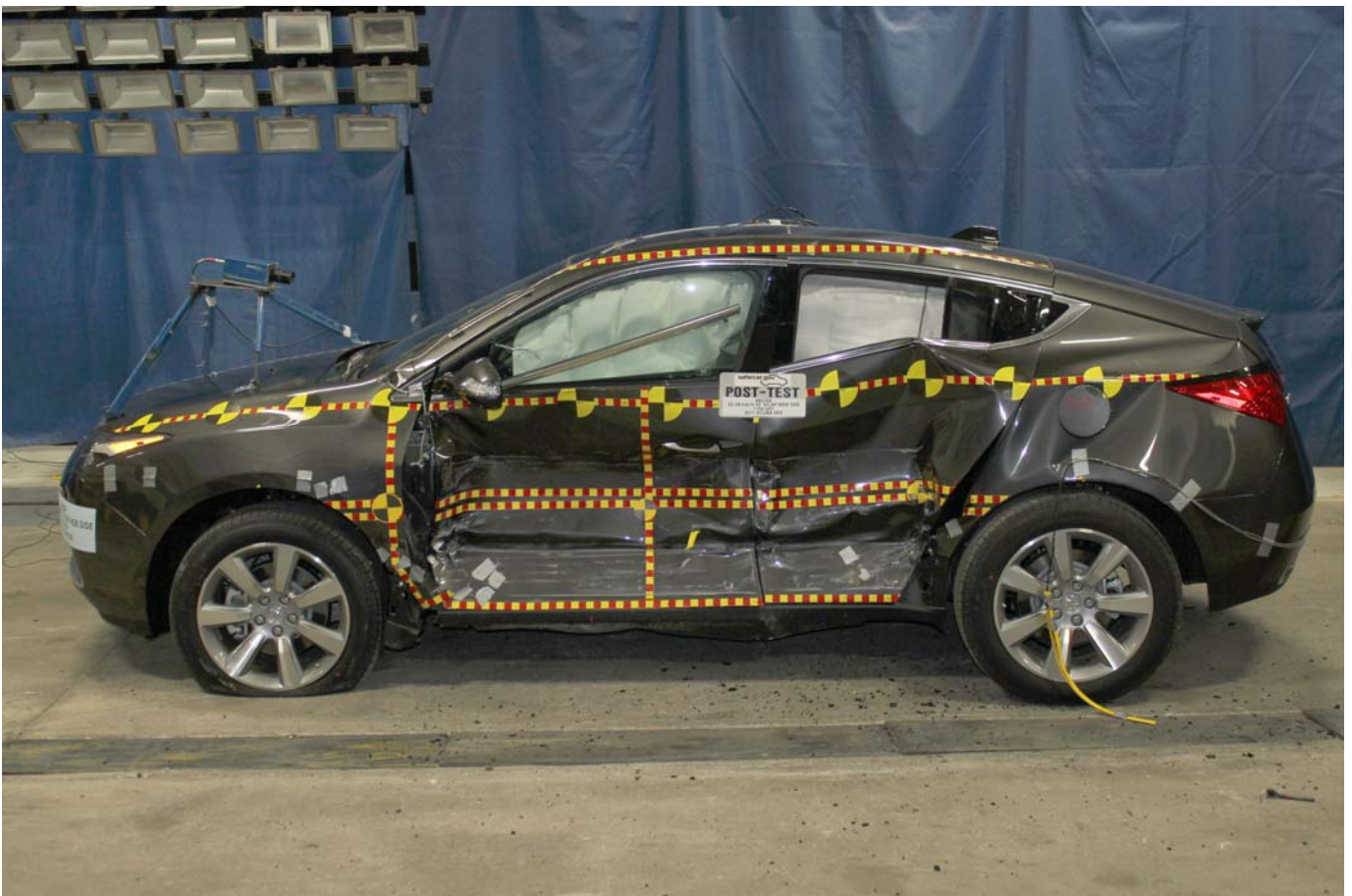
Pre-Test Left Three-Quarter Front View of Test Vehicle



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



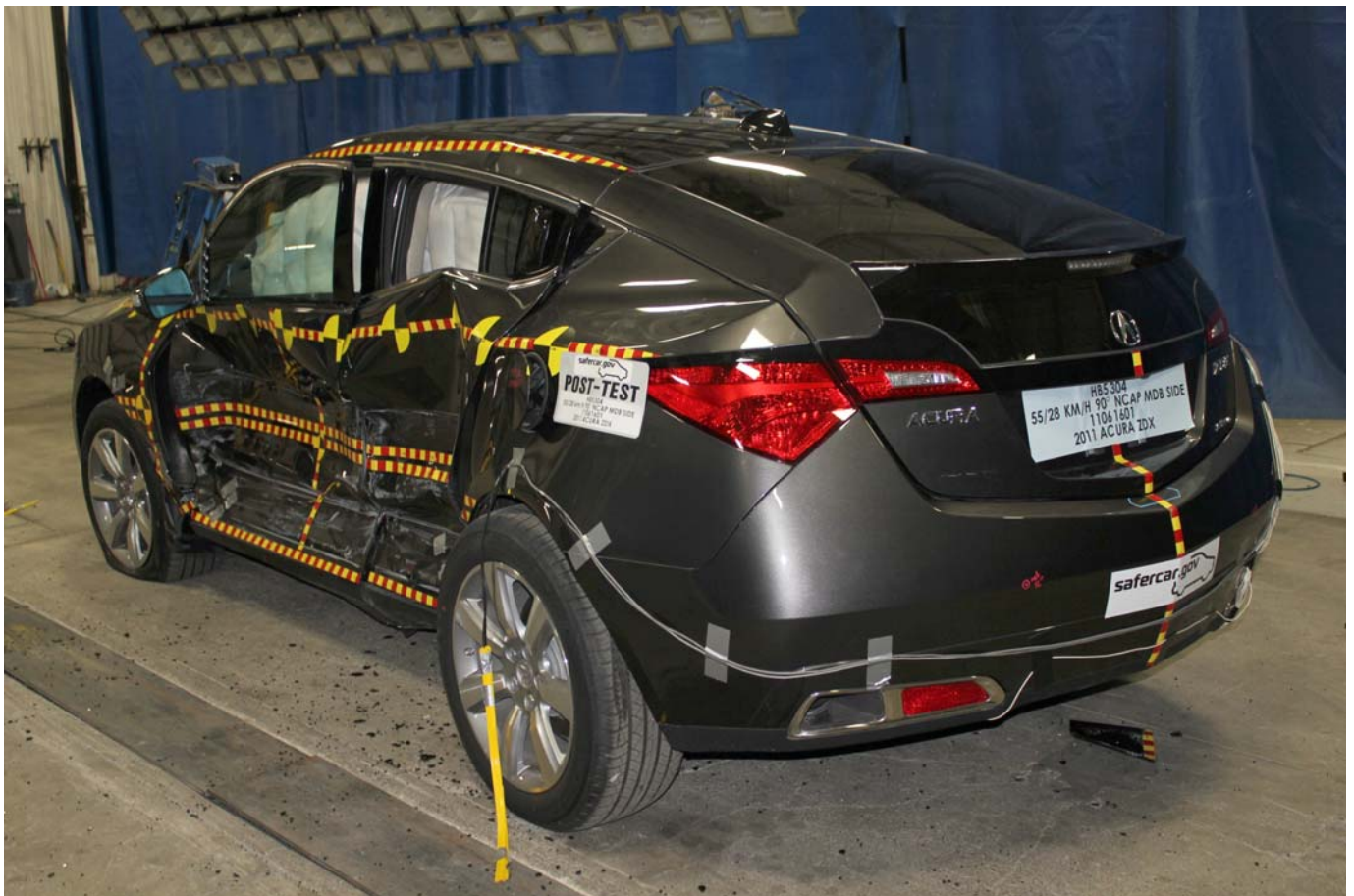
Pre-Test Left Side View of Test Vehicle



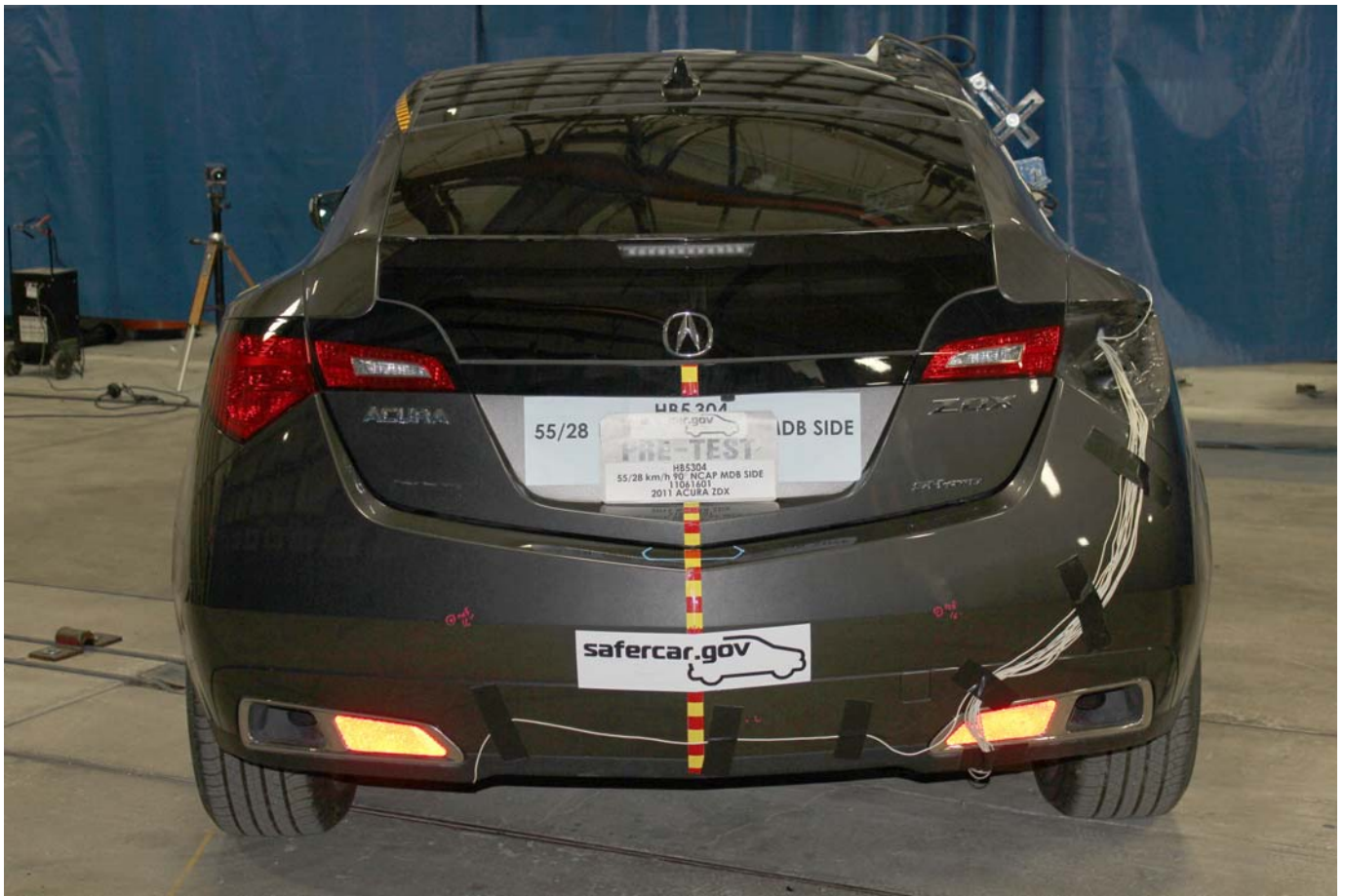
Post-Test Left Side View of Test Vehicle



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



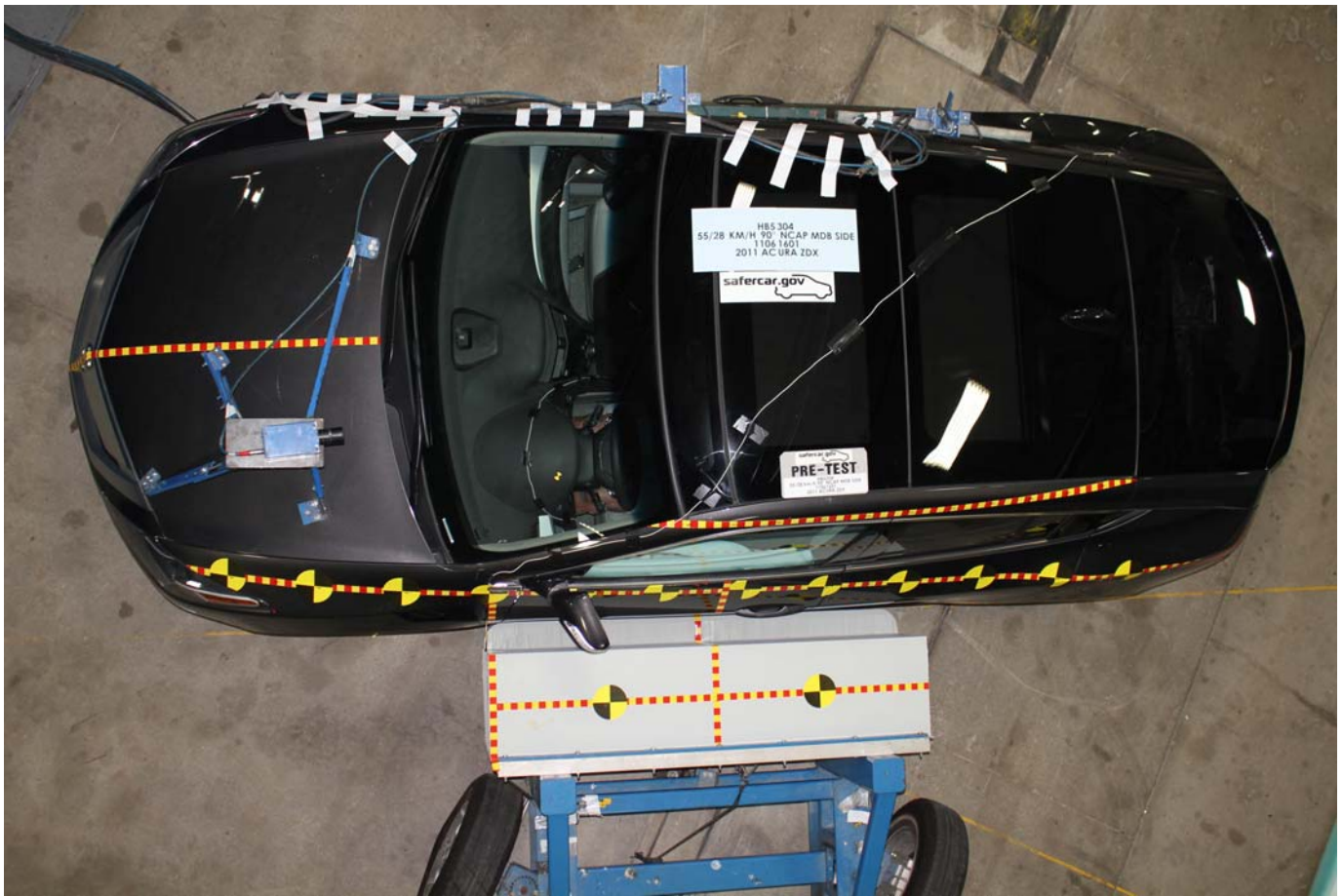
Post-Test Rear View of Test Vehicle



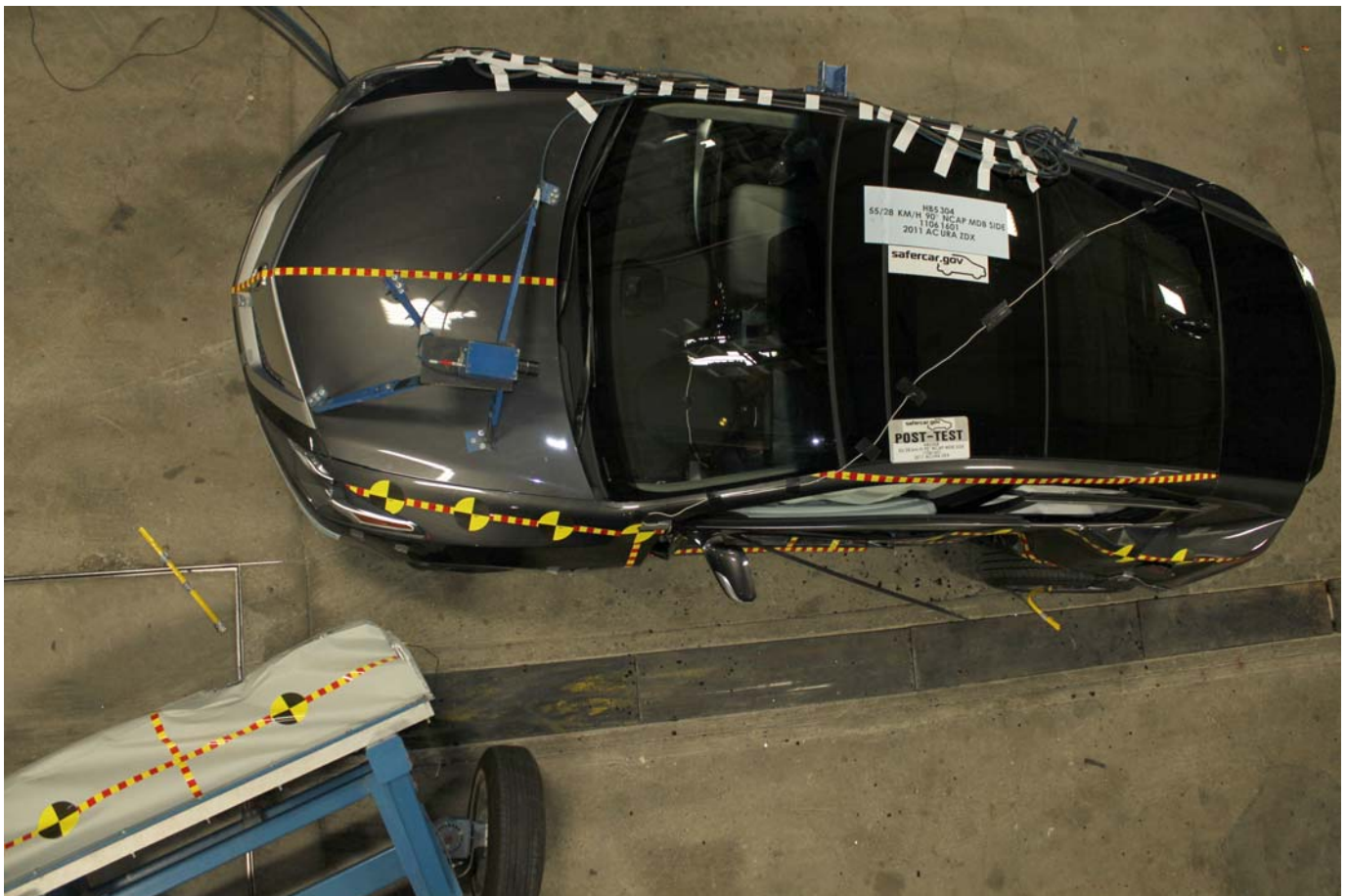
Pre-Test Right Side View of Test Vehicle



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



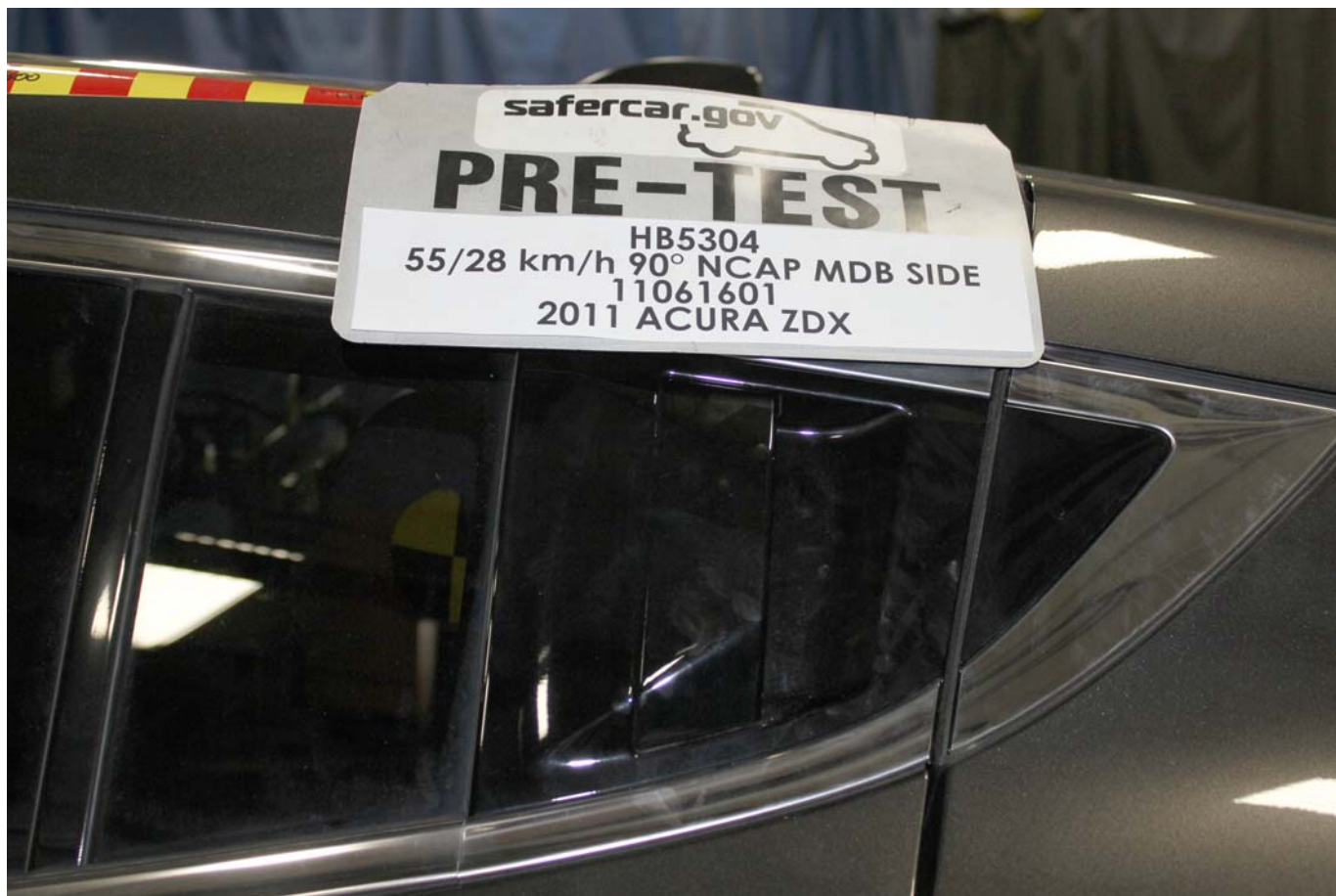
Post-Test Close-Up View of Impact Point Target



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 Interior View



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



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

PHOTOGRAPH NOT APPLICABLE

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



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



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



Pre-Test Left Side View of 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



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



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



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

PHOTOGRAPH NOT AVAILABLE

Pre-Test Rear Passenger Dummy and Door Clearance View

PHOTOGRAPH NOT AVAILABLE

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



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



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



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

PHOTOGRAPH NOT APPLICABLE

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



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

PHOTOGRAPH NOT APPLICABLE

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



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



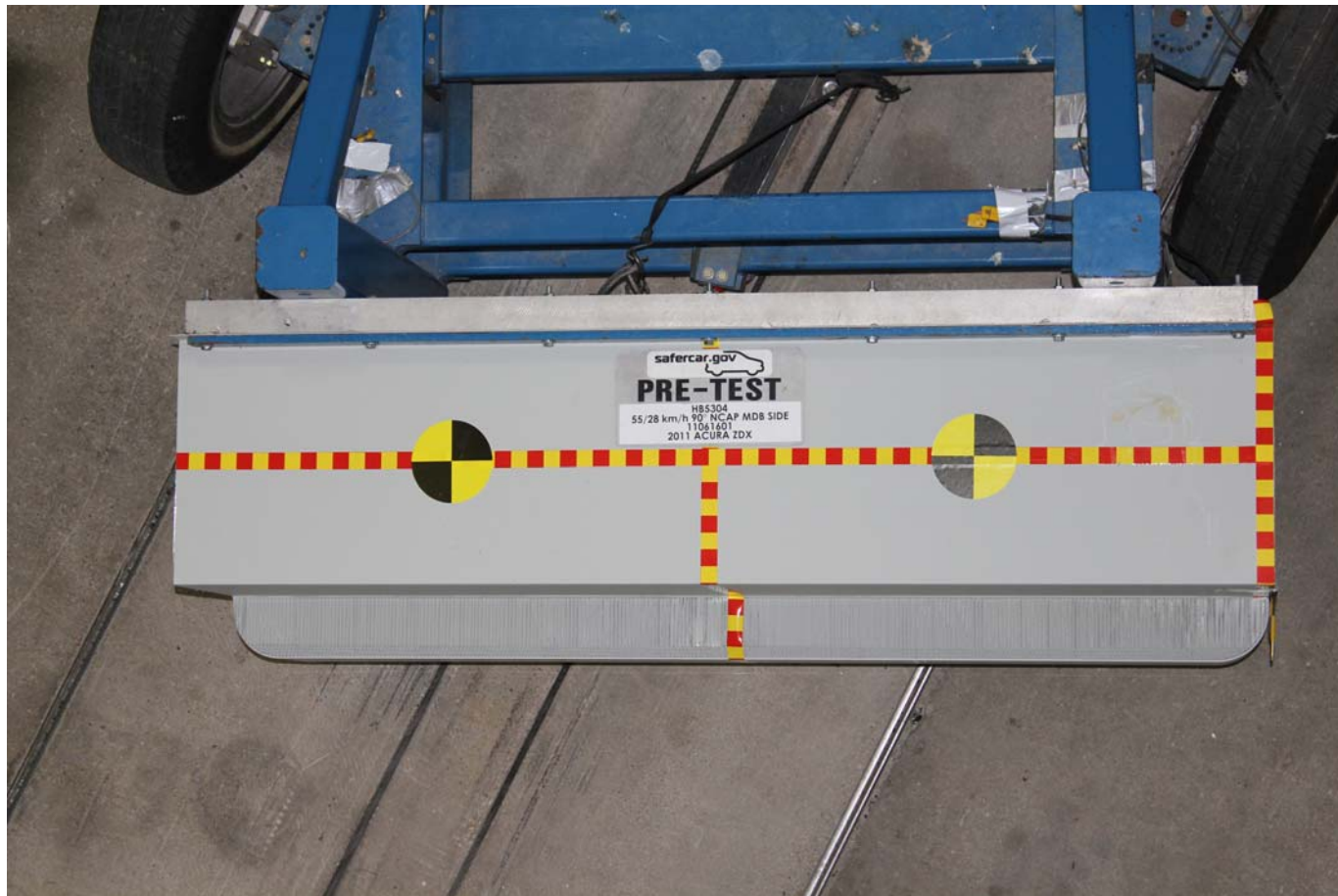
Post-Test View of Fuel Filler Cap or Fuel Filler Neck



Pre-Test Front View of MDB Impactor Face



Post-Test Front View of MDB Impactor Face



Pre-Test Top View of MDB Impactor Face



Post-Test Top View of MDB Impactor Face



Pre-Test Left Side View of MDB Impactor Face



Post-Test Left Side View of MDB Impactor Face



Pre-Test Right Side View of MDB Impactor Face



Post-Test Right Side View of MDB Impactor Face

MFD. IN CANADA BY HONDA OF CANADA MFG.,
- A DIVISION OF HONDA CANADA INC. 02/'11
GVWR 2510KG (5534LBS) TIRE SIZE RIM SIZE
GAWR F 1325KG (2921LBS) P255/50R19 103H 19X8.5J
GAWR R 1215KG (2679LBS) P255/50R19 103H 19X8.5J
THIS VEHICLE CONFORMS TO ALL APPLICABLE
FEDERAL MOTOR VEHICLE SAFETY
AND THEFT PREVENTION STANDARDS IN EFFECT
ON THE DATE OF MANUFACTURE SHOWN ABOVE.
V.I.N.: 2HNYB1H68BH500654 TYPE: MPV



SZN B AC6 -NH736MX -B -00

Close-Up View of Vehicle's Certification Label



TIRE AND LOADING INFORMATION

SEATING CAPACITY TOTAL 5 FRONT 2 REAR 3

The combined weight of occupants and cargo should never exceed 380kg or 830lbs.

TIRE	SIZE	COLD TIRE PRESSURE	SEE OWNER'S MANUAL FOR ADDITIONAL INFORMATION
FRONT	P255/50R19 103H	220KPA, 32PSI	
REAR		220KPA, 32PSI	
SPARE	T165/80D17 104M	420KPA, 60PSI	

SZNA

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

PHOTOGRAPH NOT APPLICABLE

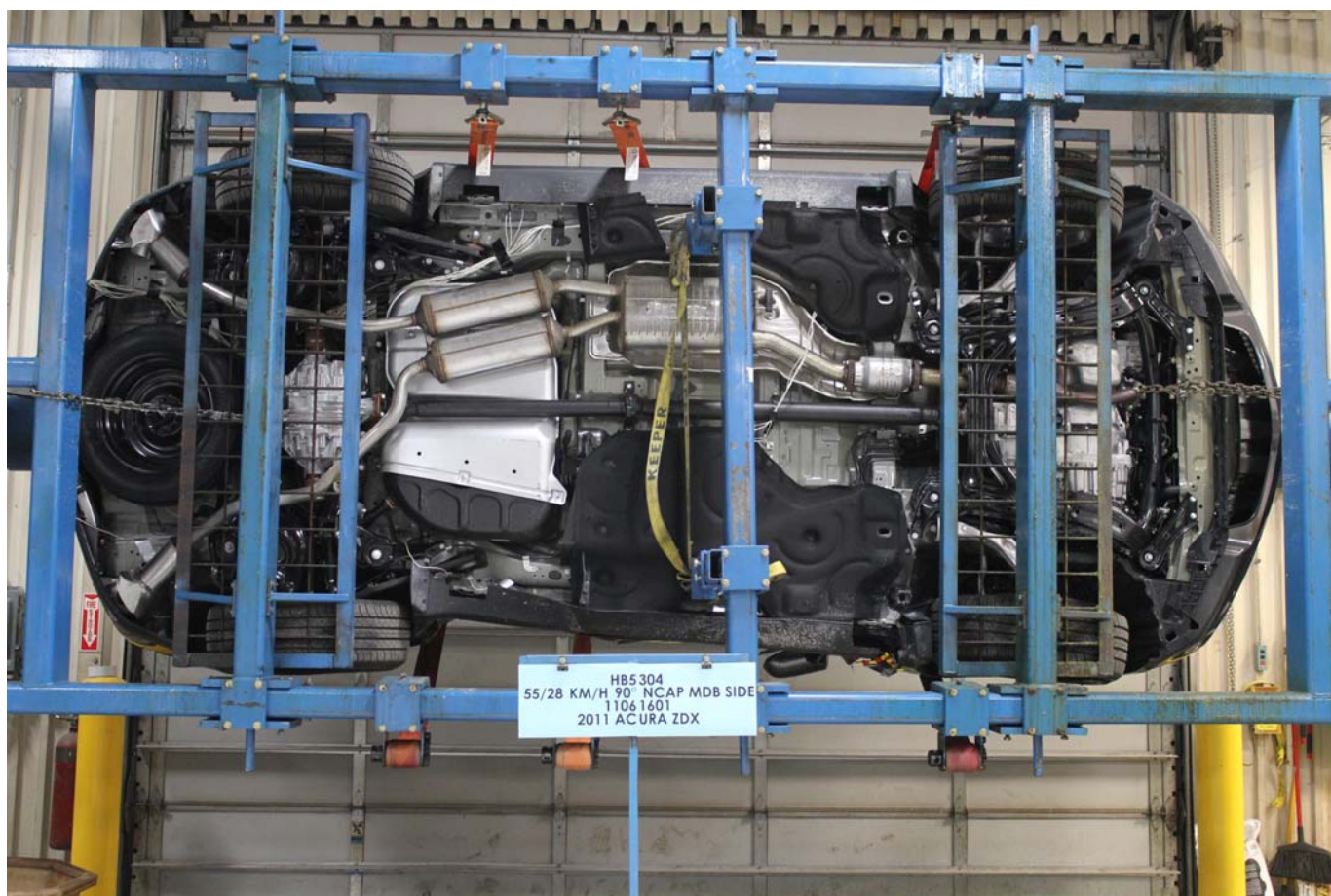
Pre-Test Ballast View



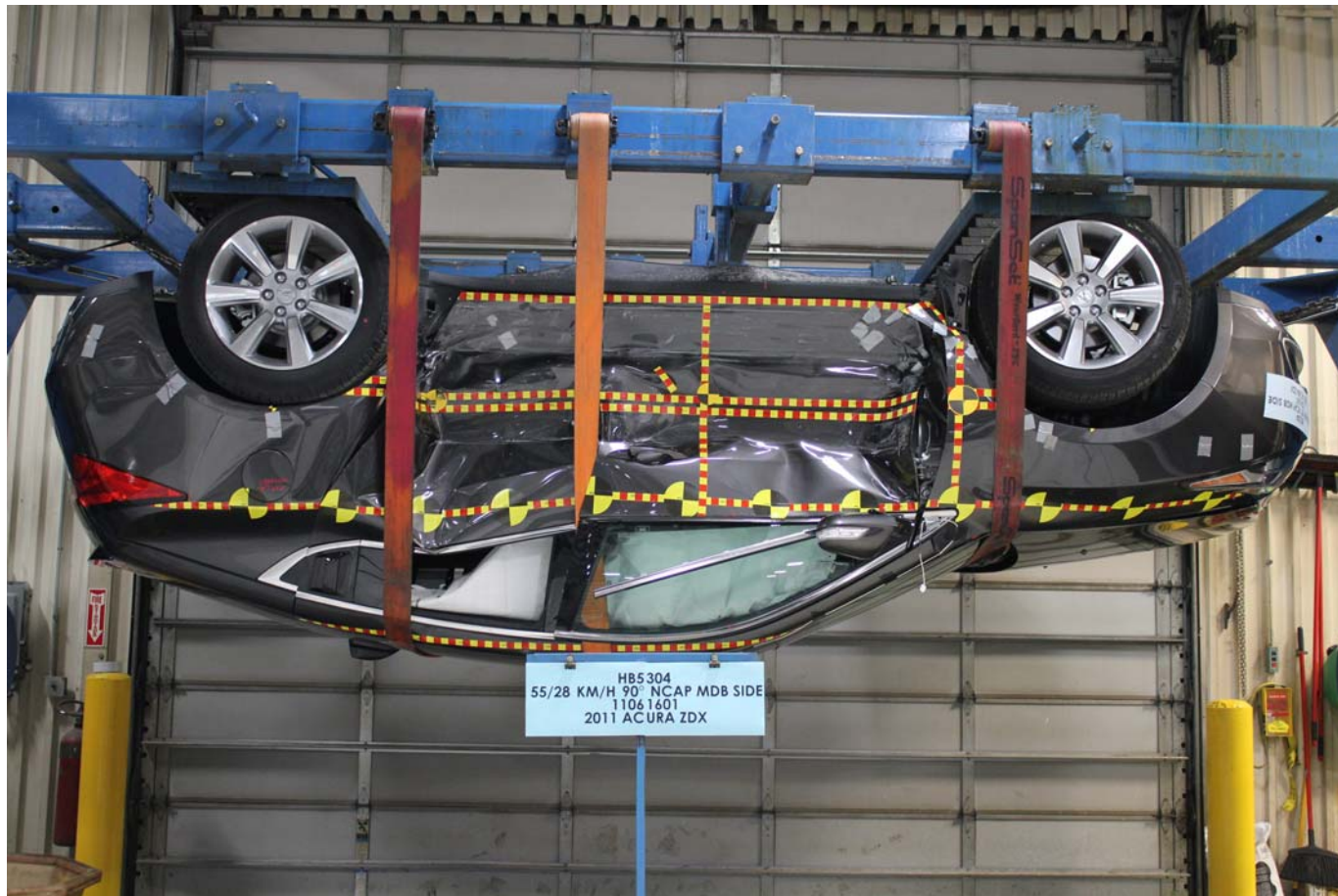
Post-Test Primary and Redundant Speed Trap Read-Out



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 ZDX ADVANCE

VEHICLE NUMBER: 2HNYBH68BH500654
ENGINE NUMBER: 2HNS-2000693 EXT: GUNDO M.
CONTROL NUMBER: 776887 INT: TAUPE

STANDARD EQUIPMENT AT NO EXTRA COST

- **TECHNICAL FEATURES***
 - 3.0L VTEC 24-Valve SOHC i-VTEC
 - 6-Speed Automatic Transmission with Sequential SportShift
 - Paddle Shifters
 - SH-AWD System
 - 4-Wheel Disc Brakes
 - MacPherson Strut Front Suspension
 - Rear Multi-Link Suspension
 - Variable-Assist Rack-and-Pinion Power Steering
 - Drive-by-Wire Throttle System
 - Active Noise Control System
- **SAFETY FEATURES***
 - Driver's and Front Passenger's Dual-Stage Airbags (SRS)
 - Driver's and Front Passenger's Side Airbags
 - Side Curtain Airbags with Rollover Sensor
 - Vehicle Stability Assist (VSA)
 - Anti-Lock Braking System (ABS)
 - Electronic Brake Distribution (EBD)
 - Brake Assist
 - Active Front Head Restraints
 - Tire Pressure Monitoring System
 - Side-Impact Door Beams
 - Day Time Running Lights (DRL)
 - LATCH System for Child Seats
- **INTERIOR FEATURES***
 - XM Satellite Radio
 - MP3/Auxiliary Input Jack
 - RS-485 Audio Interface
 - Radio Data System (RDS)
 - Bluetooth Audio System
 - Driver Recognition Memory System
 - Driver's 10-Way Power Seat
 - Front Passenger's 8-Way Power Seat
 - Heated Front Seats
- **TECH PACKAGE***
 - Acura Navigation System with Voice Recognition and Multi-View Rear Camera
 - Real-Time Traffic and Weather (available in select markets)
 - Sport Seats with Perforated Premium Leather Trim
 - Premium 12-Speaker and Sound System with 10 Speakers and AM/FM/DVD-A, CD, DTS, Dolby Pro Logic II
 - Hard Disk Drive (HDD)
 - Push-Button Ignition
 - GPS-Linked, Dual-Zone Auto Climate Control with Air Filtration System
 - Keyless Access System with Security System
- **ADVANCE PACKAGE***
 - Intelligent Drive System
 - Collision Mitigation Braking System
 - Blind Spot Information System
 - Front Seat Belts with E-PreTensioning System
 - Ventilated Front Seats
 - Adaptive Cruise Control (ACC)

Manufacturer's Suggested Retail Price **\$56,195.00**

MSRP Includes:
• 6YR/70K Mile Powertrain Warranty
• 4YR/50K Mile Ltd Vehicle Warranty
• 3-Month Full XM Radio
• Real-Time Traffic & Weather Service

*XM Radio is available in the 48 contiguous states

Destination and Handling **860.00**

TOTAL VEHICLE PRICE
(Includes Pre-Delivery Service)

\$57,055.00

Licenses and title fees, state and local taxes and dealer options and accessories are not included in the manufacturer's suggested retail price.

JOE RIZZA ACURA
8150 WEST 159TH STREET
ORLAND PARK, IL 60462

PORT OF ENTRY: BUFFALO
DELIVERY POINT: CHICAGO

SHIP#:

ROW/SPACE: 105-058 208-006

TRANS.METHOD: NS0 ELWOOD

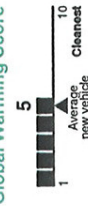
VIN: 2HNYBH68BH500654

ORIG. DLR: 251482
REF.NO: 40298
HN CODE: AL-3712
EMISSION: 50 STATE
DEALER: 251482

Environmental Performance

Protect the environment, choose vehicles with higher scores:

Global Warming Score



Smog Score



Vehicle emissions are a primary contributor to global warming and smog. Scores are determined by the California Air Resources Board based on the vehicle's emissions. Please visit www.DriveCleanCA.gov for more information. AIR RESOURCES BOARD

EPA Fuel Economy Estimates

CITY MPG

16

Expected range for most drivers 13 to 19 MPG

HIGHWAY MPG

23

Expected range for most drivers 19 to 27 MPG

Estimated Annual Fuel Cost

\$2,525

based on 15,000 miles at \$3.20 per gallon

Combined Fuel Economy

This Vehicle

19

10 32

All SUVs

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

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

PARTS CONTENT INFORMATION

FOR VEHICLES IN THIS CARLINE

U.S./Canadian Parts Content: **65 %**

Major Sources of Foreign Parts Content:

JAPAN 25 %

NOTE: Parts content does not include final assembly, distribution or other non-parts costs.

GOVERNMENT SAFETY RATINGS

Frontal Crash Driver Not Rated Passenger Not Rated

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

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

Side Crash Front seat Not Rated Rear seat Not Rated

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

Rollover ★★★★★

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

Star ratings range from 1 to 5 stars (★★★★★) with 5 being the highest.

Source: National Highway Traffic Safety Administration (NHTSA).

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

FOR THIS VEHICLE

Final Assembly Point:

ALLISTON, ONTARIO

CANADA

Country of Origin: Engine:

U.S.A.

Transmission:

JAPAN

Seats

Moves the whole seat up and forward, or down and backward. The front of the seat also tilts up or down at the same time.



Adjusts the seat-back angle forward or backward.



Increases or decreases the lumbar support. (Driver's seat only)

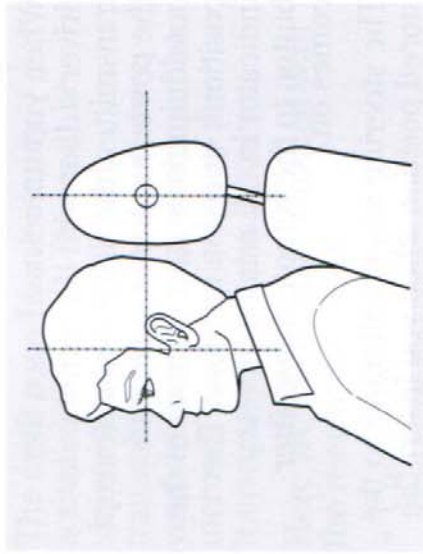


The driver's seat includes a memory feature. Two seat positions can be stored in separate memories. You can then select a memorized position by pushing the appropriate memory button. Refer to page 180 for how to memorize and select the seat positions.

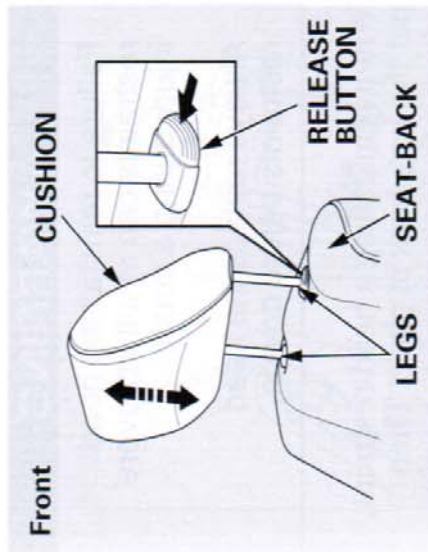
Head Restraints

See page 15 for important safety information and a warning about improperly positioning head restraints.

Your vehicle is equipped with head restraints in all seating positions to help protect you and your passengers from the likelihood of whiplash and other injuries.

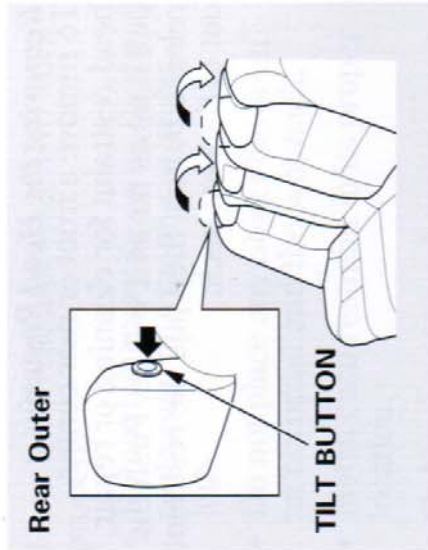
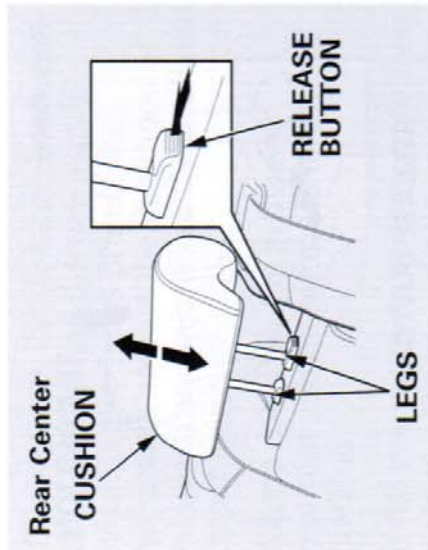


They are most effective when you adjust them so the center of the back of the occupant's head rests against the center of the restraint.



Adjusting the Head Restraint

The head restraints adjust for height. You need both hands to adjust the restraint. Do not attempt to adjust it while driving. To raise it, pull upward. To lower the restraint, push the release button sideways, and push the restraint down.



To lower either rear outer head restraint for better visibility, press the tilt button on the side of the head restraint. It folds down backward. To raise the rear outer head restraint, pull it up from the rear by hand. Make sure the head restraint locks in position when you lower or raise it.

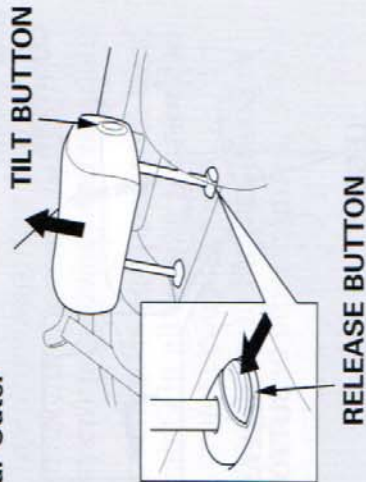
CONTINUED

Seats

Removing the Head Restraint

To remove a front or rear center head restraint for cleaning or repair, pull it up as far as it will go. Push the release button, then pull the restraint out of the seat-back.

Rear Outer



If for some reason you need to remove the rear outer head restraint, push the tilt button, then fold the head restraint backward. Push the release button, then pull the restraint out of the seat-back.

⚠ WARNING

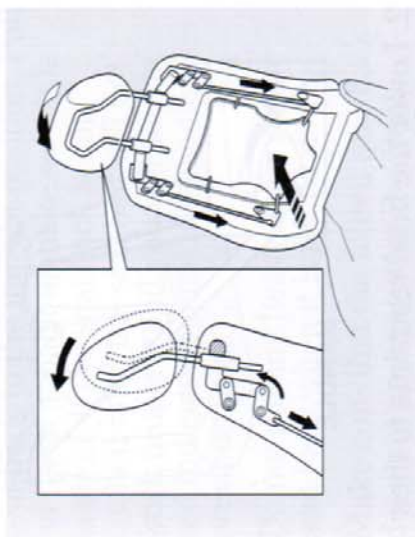
Failure to reinstall the head restraints can result in severe injury during a crash.

Always replace the head restraints before driving.

When reinstalling a head restraint, put the legs back in place. Then adjust it to the appropriate height while pressing the release button.

Make sure the head restraint locks in position when you reinstall it.

Active Head Restraints



The driver's and front passenger's seats have active head restraints. If the vehicle is struck severely from the rear, the occupant properly secured with the seat belt will be pushed against the seat-back and the head restraint will automatically move forward.

This reduces the distance between the restraint and the occupant's head. It also helps protect the occupants against the likelihood of whiplash and injuries to the neck and upper spine.

After a collision, the activated restraint should return to its normal position.

If the restraints do not return to their normal position, or in the event of a severe collision, have the vehicle inspected by an Acura dealer.

For a head restraint system to work properly:

- Do not hang any items on the head restraints, or from the restraint legs.
- Do not place any object between an occupant and the seat-back.
- Install each restraint in its proper location.
- Only use genuine Acura replacement head restraints.

CONTINUED

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 – not installed
Driver Torso Contact Switch – not installed
Driver Pelvis Contact Switch – not installed
Passenger Head Acceleration Redundant (X)
Passenger Head Acceleration Redundant (Y)
Passenger Head Acceleration Redundant (Z)
Passenger Shoulder Contact Switch – not installed
Passenger Torso Contact Switch – not installed
Passenger Pelvis Contact Switch – not installed

Vehicle Instrumentation Data

Driver Side Airbag Timing – not installed
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) – not installed
Vehicle Center of Gravity Acceleration (X)
Vehicle Center of Gravity Acceleration (Y)
Vehicle Center of Gravity Acceleration (Z)

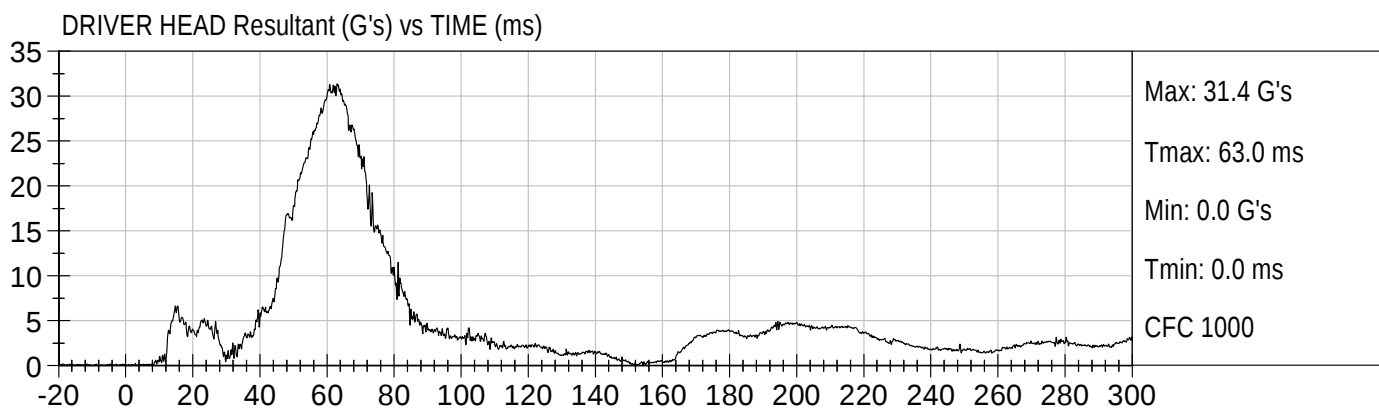
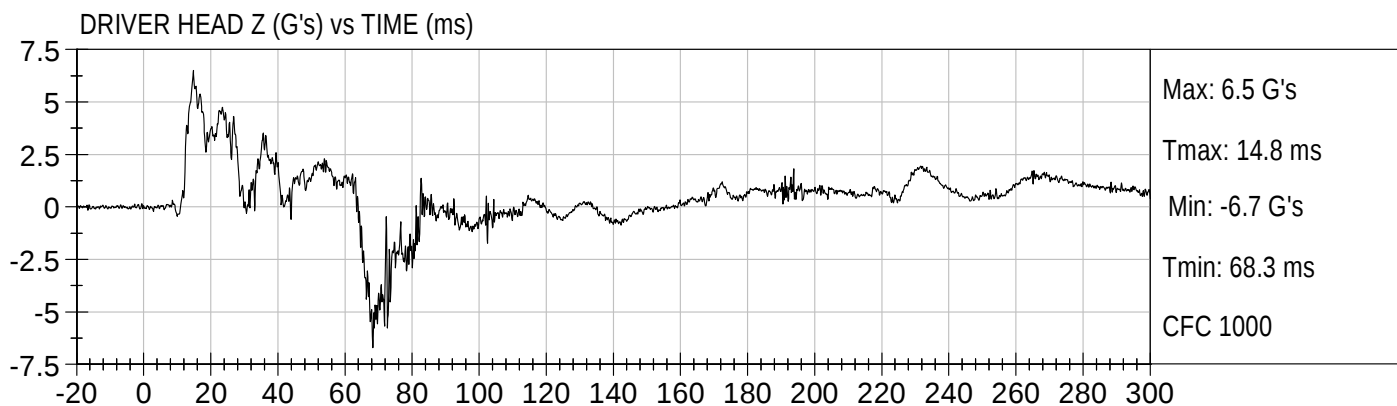
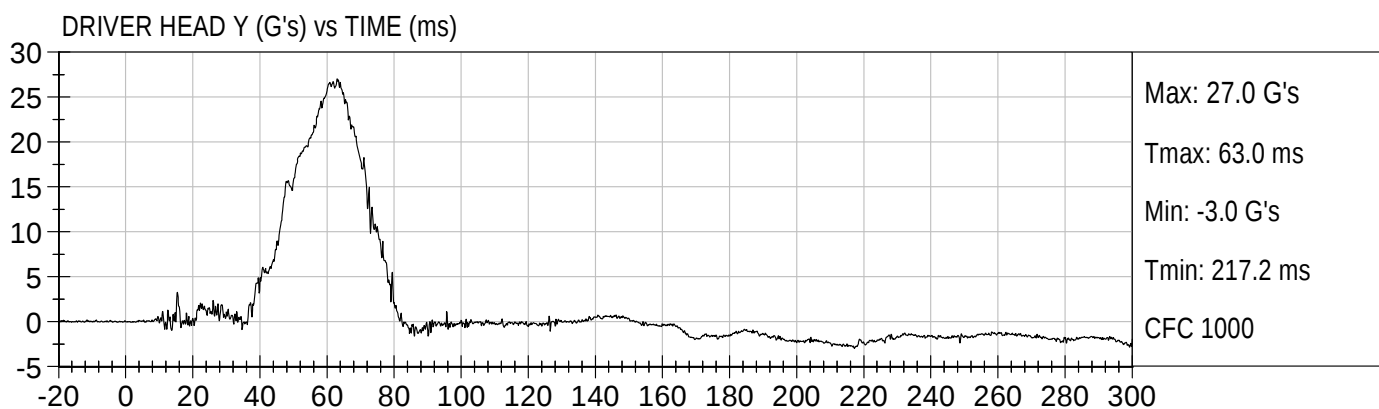
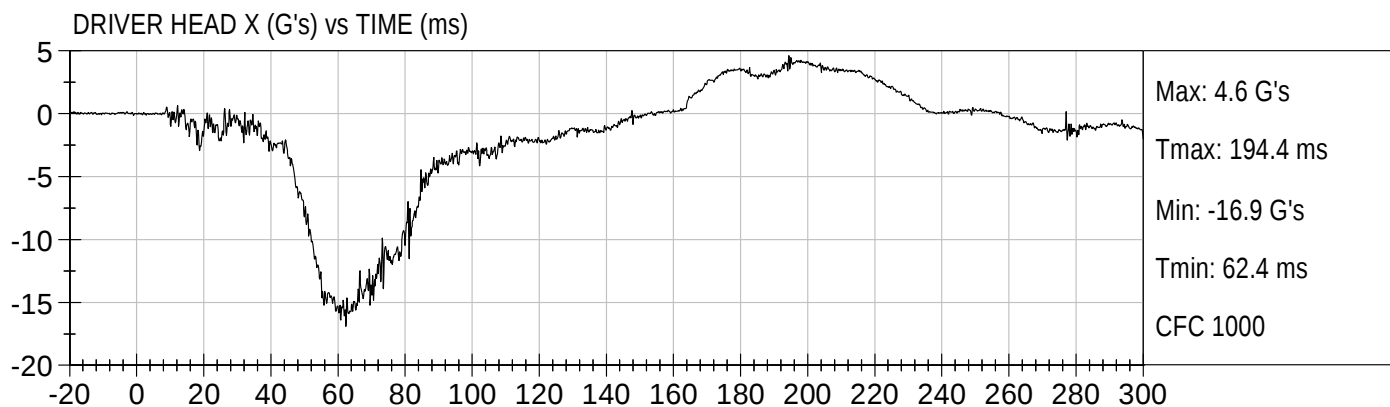
MDB Instrumentation Data

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



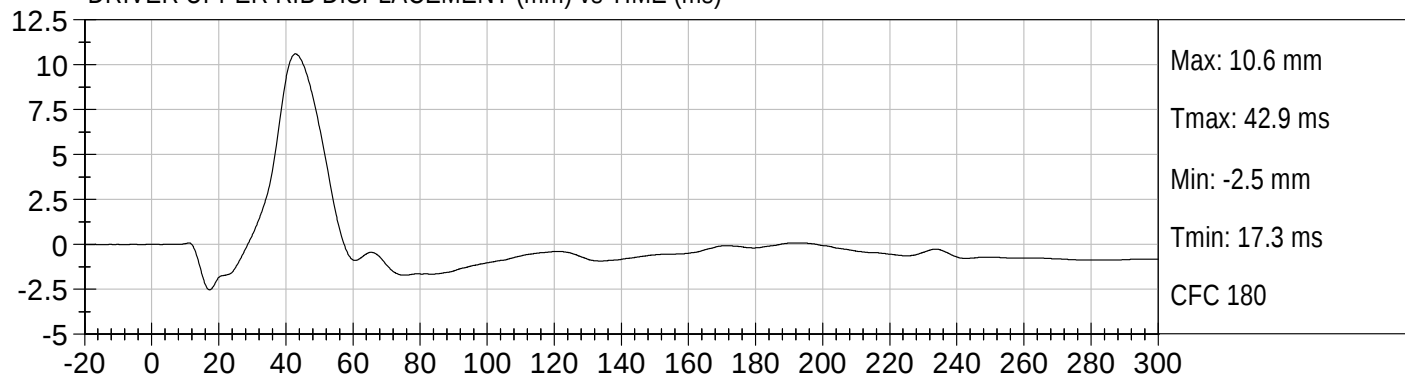
55/28 km/h 90° NCAP MDB Side Impact
2011 Acura ZDX - HB5304

Test Date: 06/16/2011
Speed: 38.6 mph (62.1 km/h)

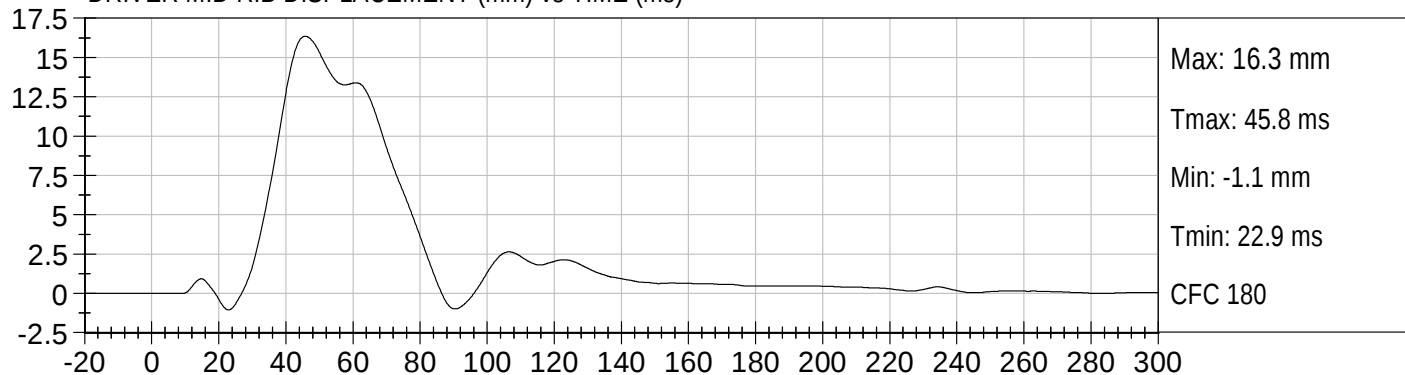




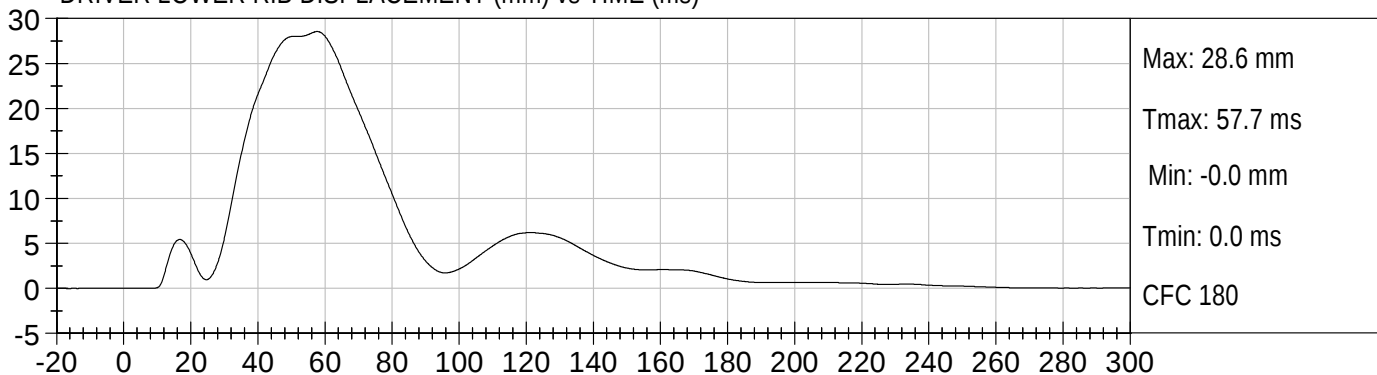
DRIVER UPPER RIB DISPLACEMENT (mm) vs TIME (ms)



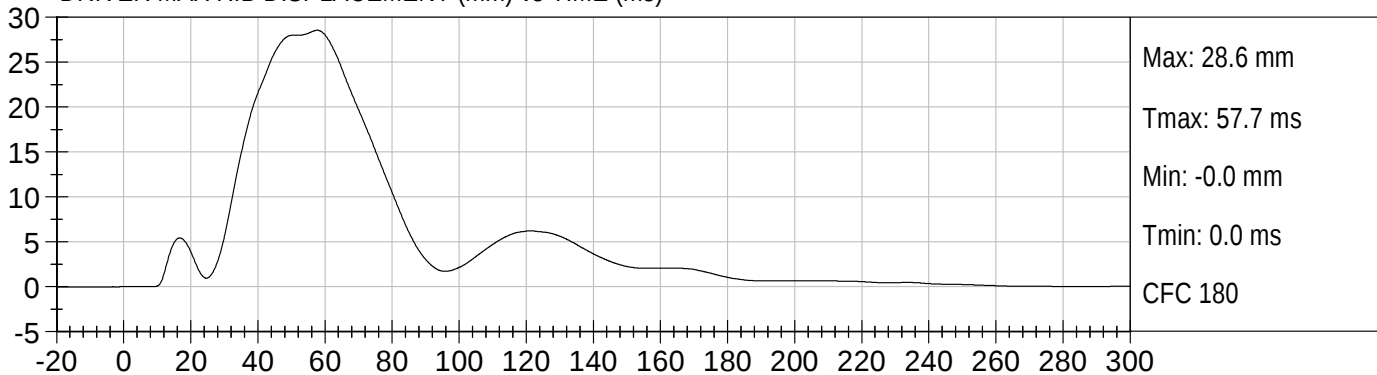
DRIVER MID RIB DISPLACEMENT (mm) vs TIME (ms)



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



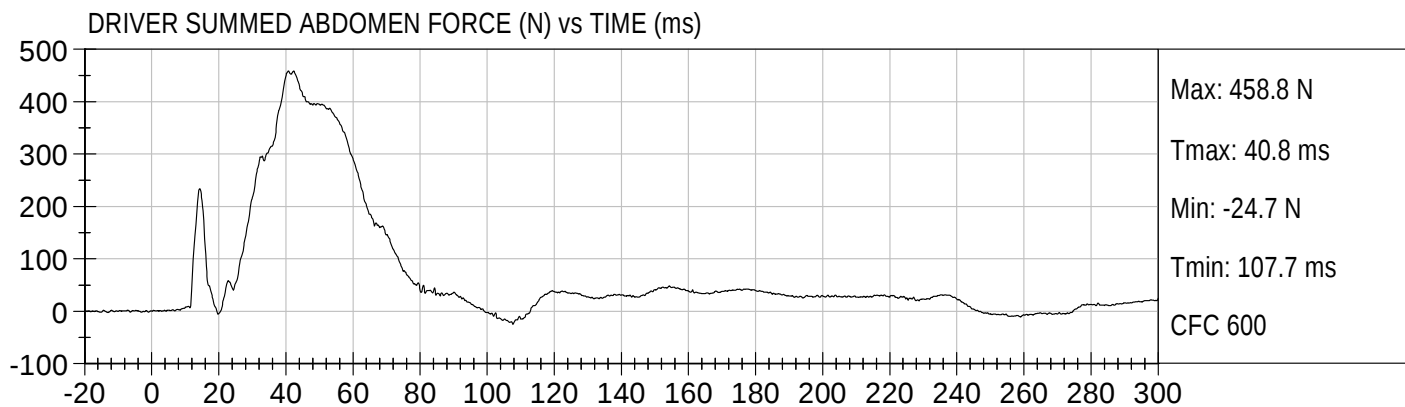
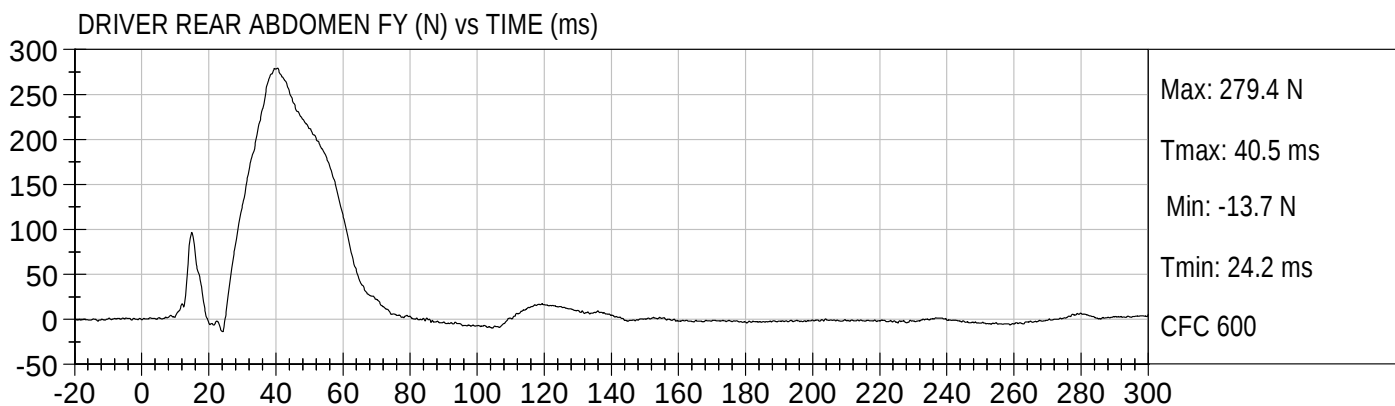
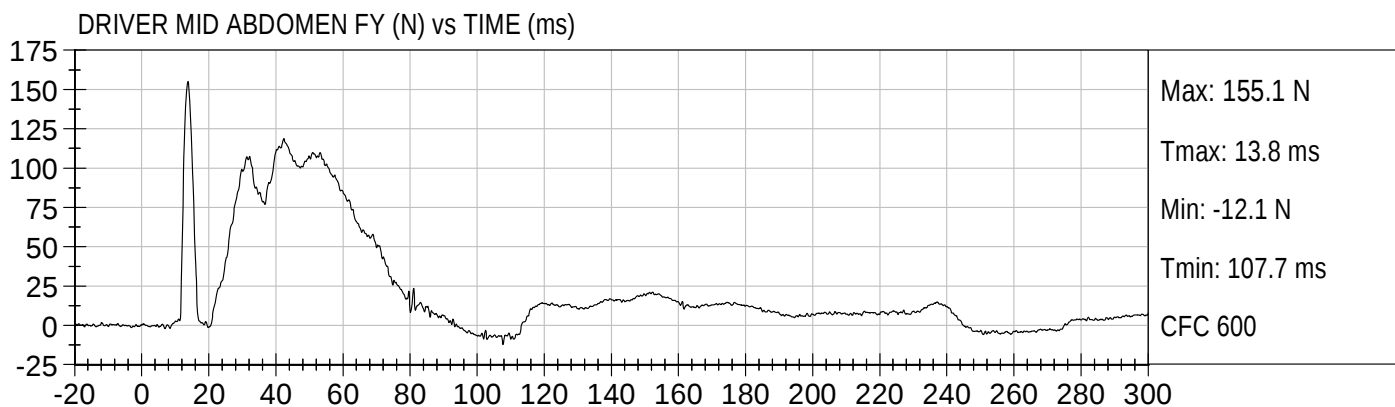
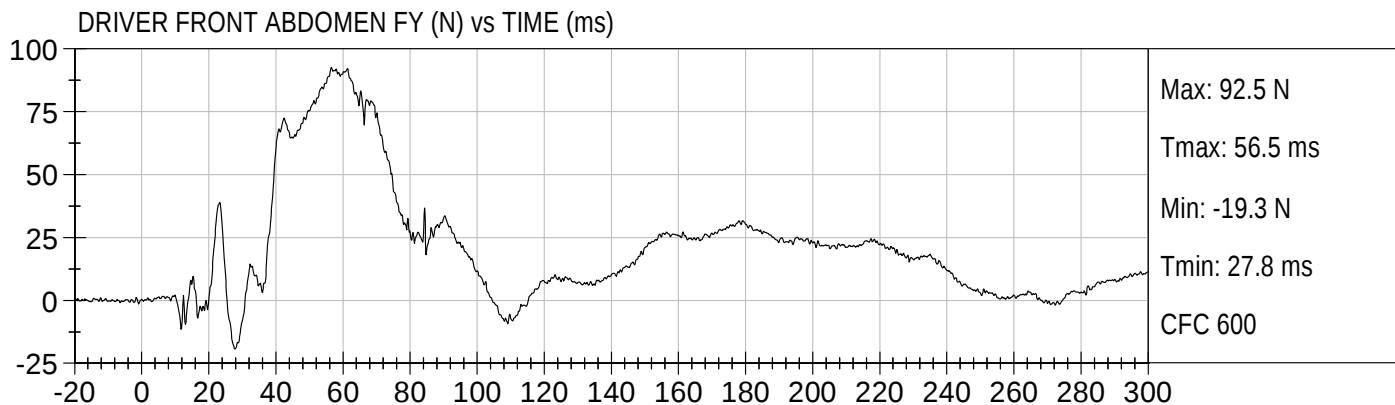
DRIVER MAX RIB DISPLACEMENT (mm) vs TIME (ms)





55/28 km/h 90° NCAP MDB Side Impact
2011 Acura ZDX - HB5304

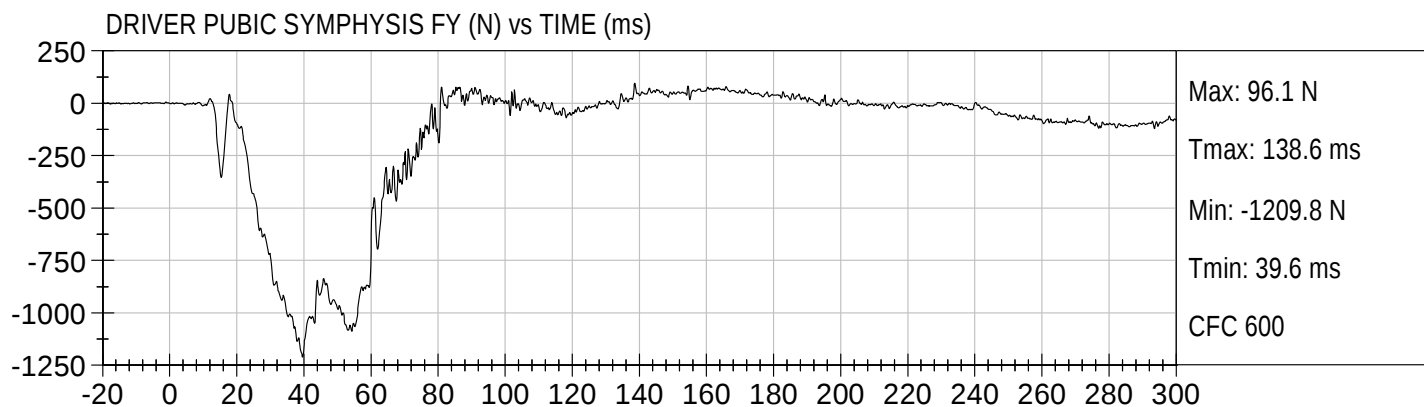
Test Date: 06/16/2011
Speed: 38.6 mph (62.1 km/h)





55/28 km/h 90° NCAP MDB Side Impact
2011 Acura ZDX - HB5304

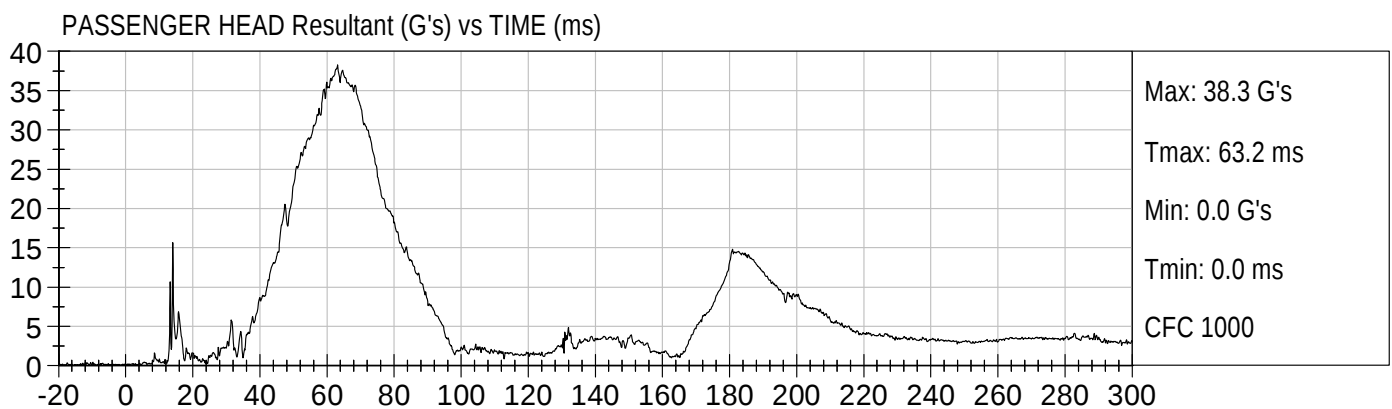
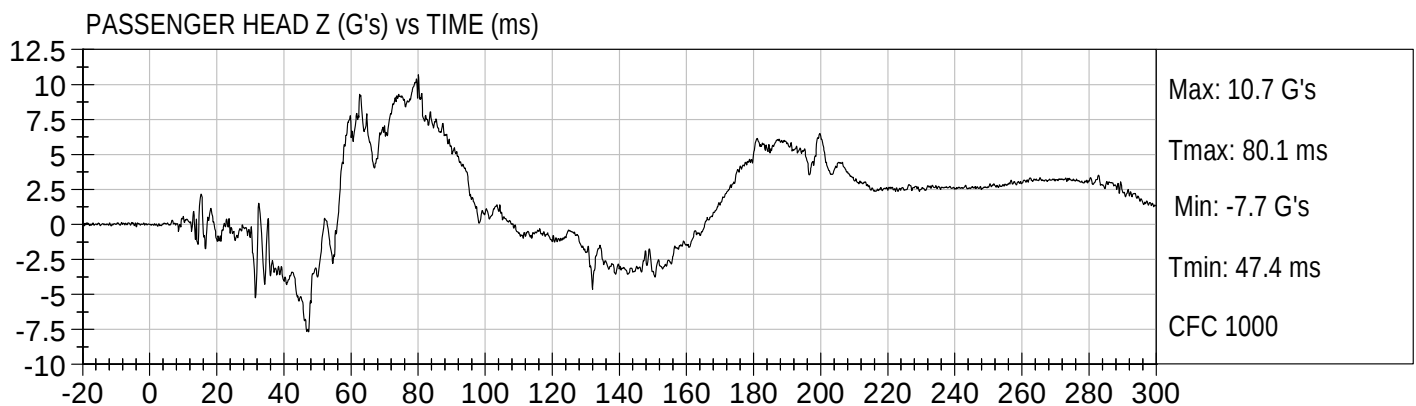
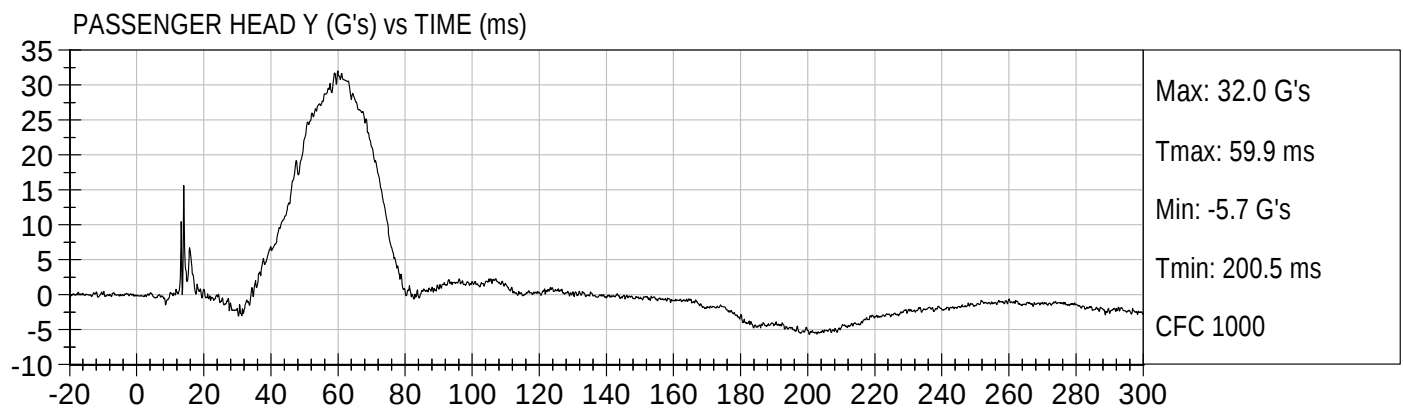
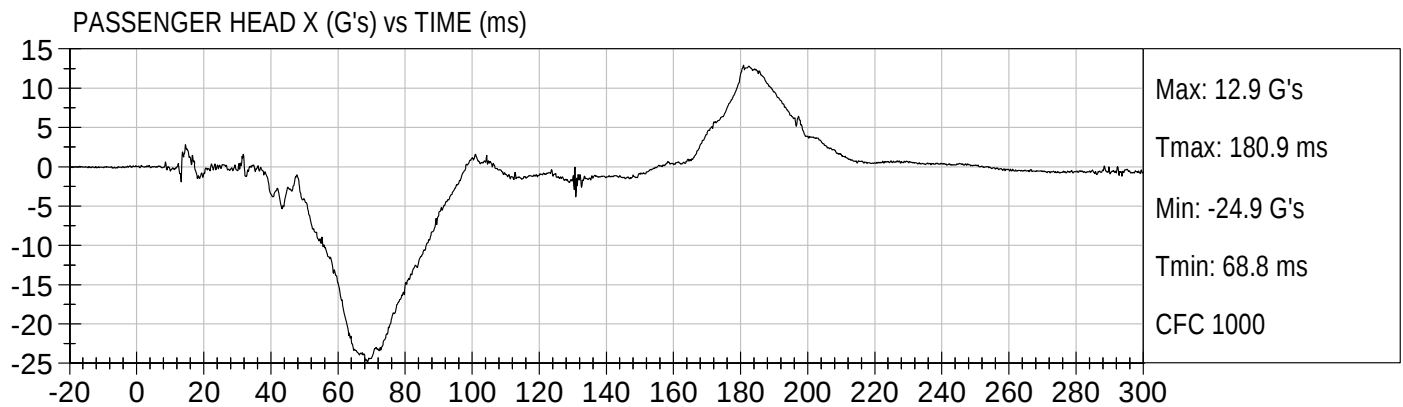
Test Date: 06/16/2011
Speed: 38.6 mph (62.1 km/h)





55/28 km/h 90° NCAP MDB Side Impact
2011 Acura ZDX - HB5304

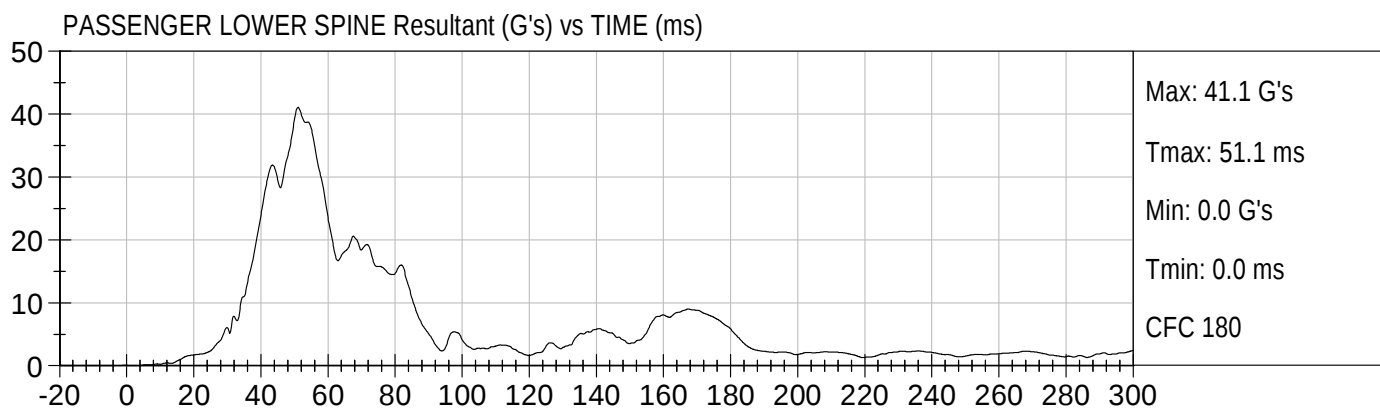
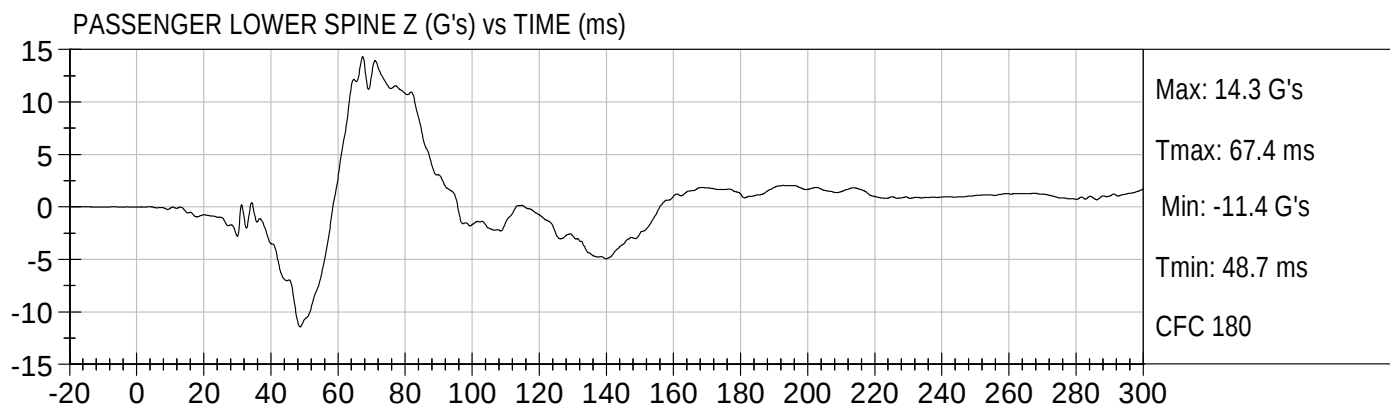
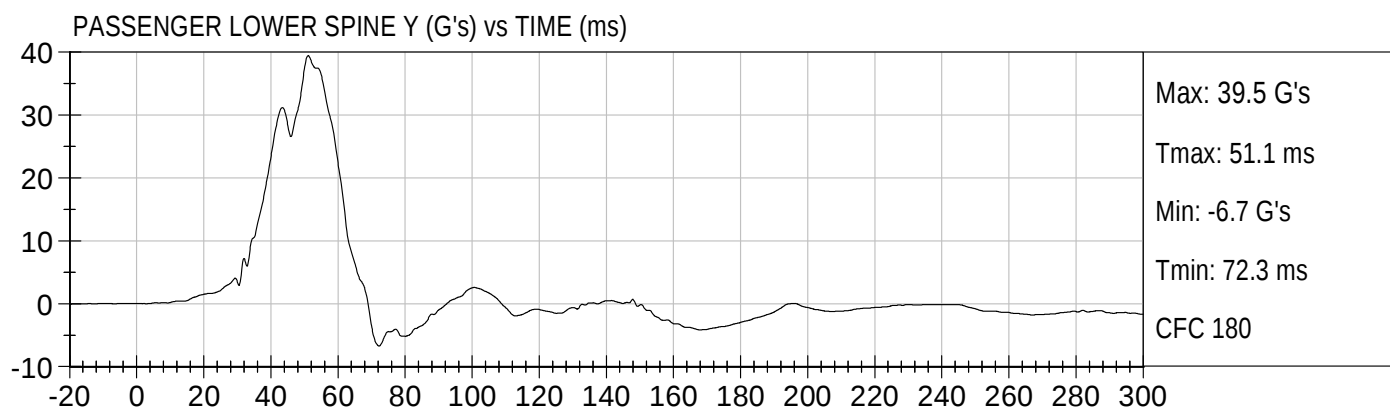
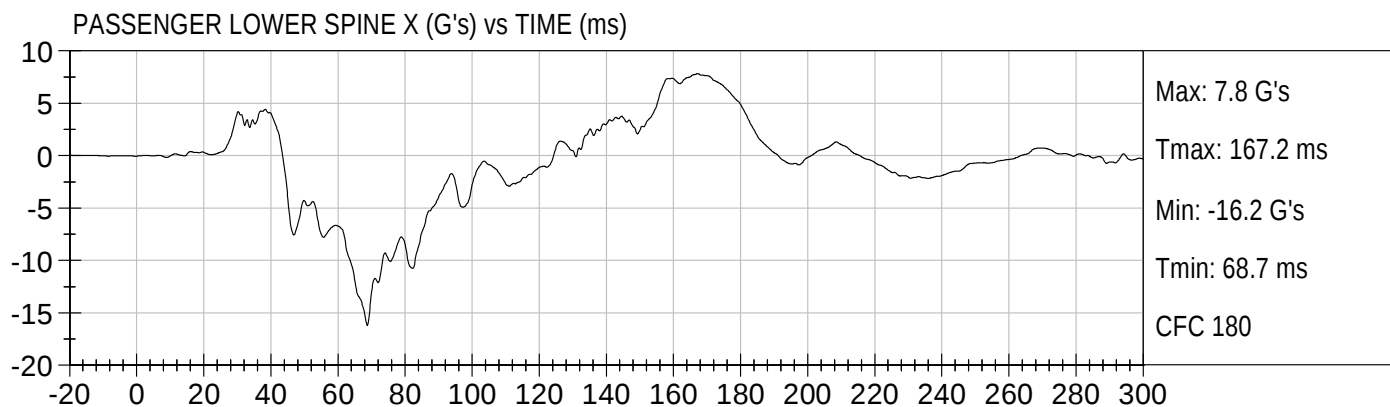
Test Date: 06/16/2011
Speed: 38.6 mph (62.1 km/h)





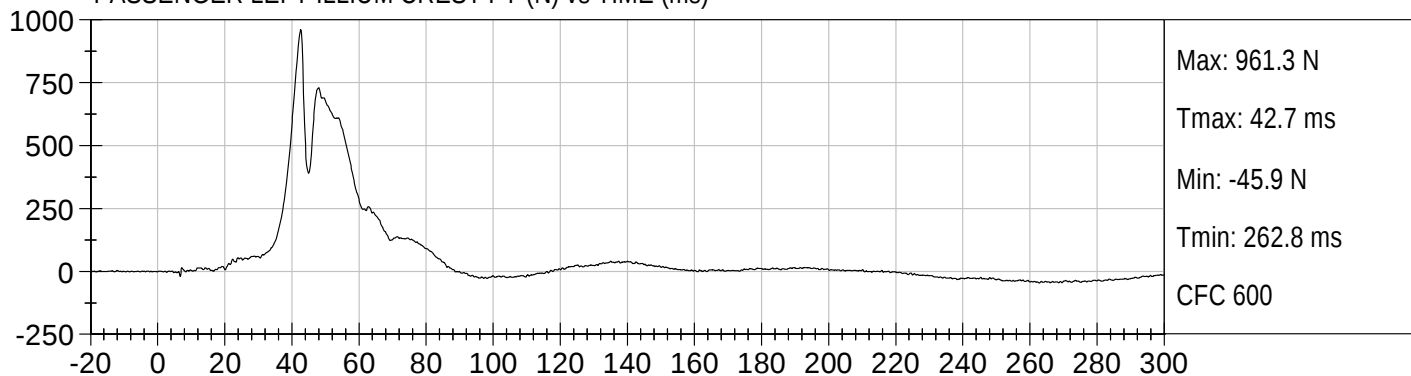
55/28 km/h 90° NCAP MDB Side Impact
2011 Acura ZDX - HB5304

Test Date: 06/16/2011
Speed: 38.6 mph (62.1 km/h)

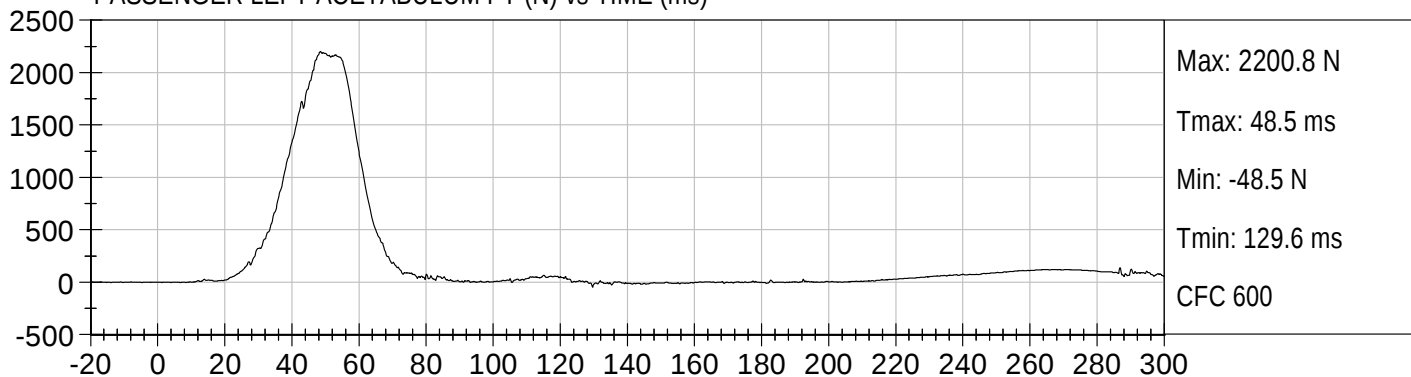




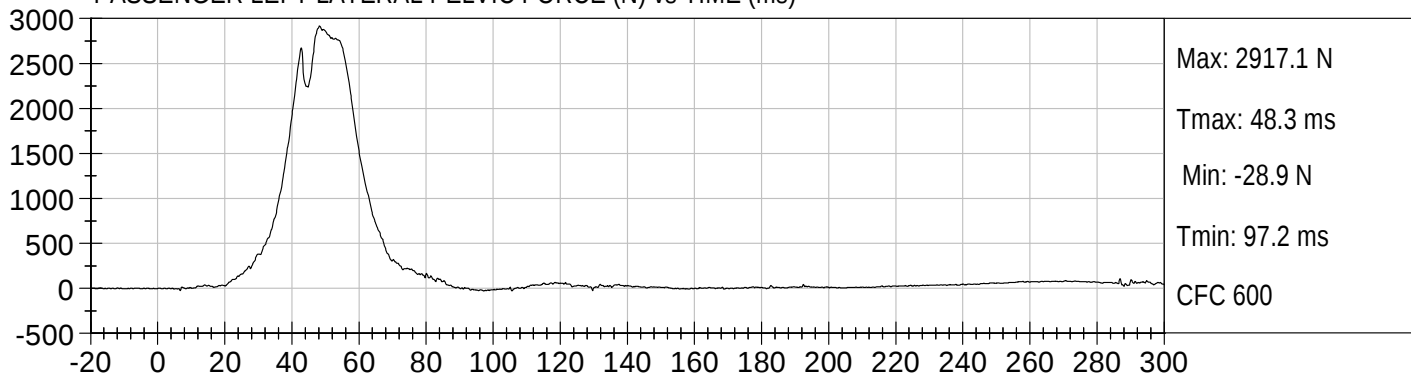
PASSENGER LEFT ILLIUM CREST FY (N) vs TIME (ms)



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



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



APPENDIX C

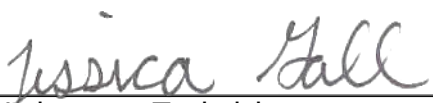
DUMMY CALIBRATION AND PERFORMANCE VERIFICATION DATA

MGA RESEARCH CORPORATION
HEAD DROP TEST
ES-2re DUMMY

ATD Serial No: 032

Test ID: D111691

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	35	Pass
Peak Resultant Acceleration	G's	125 to 155	142	Pass
Peak Lateral Acceleration	G's	+/- 15	5.4	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 15% of peak	Yes	Pass
Overall Test Results				Pass


Laboratory Technician

5/9/11
Test Date

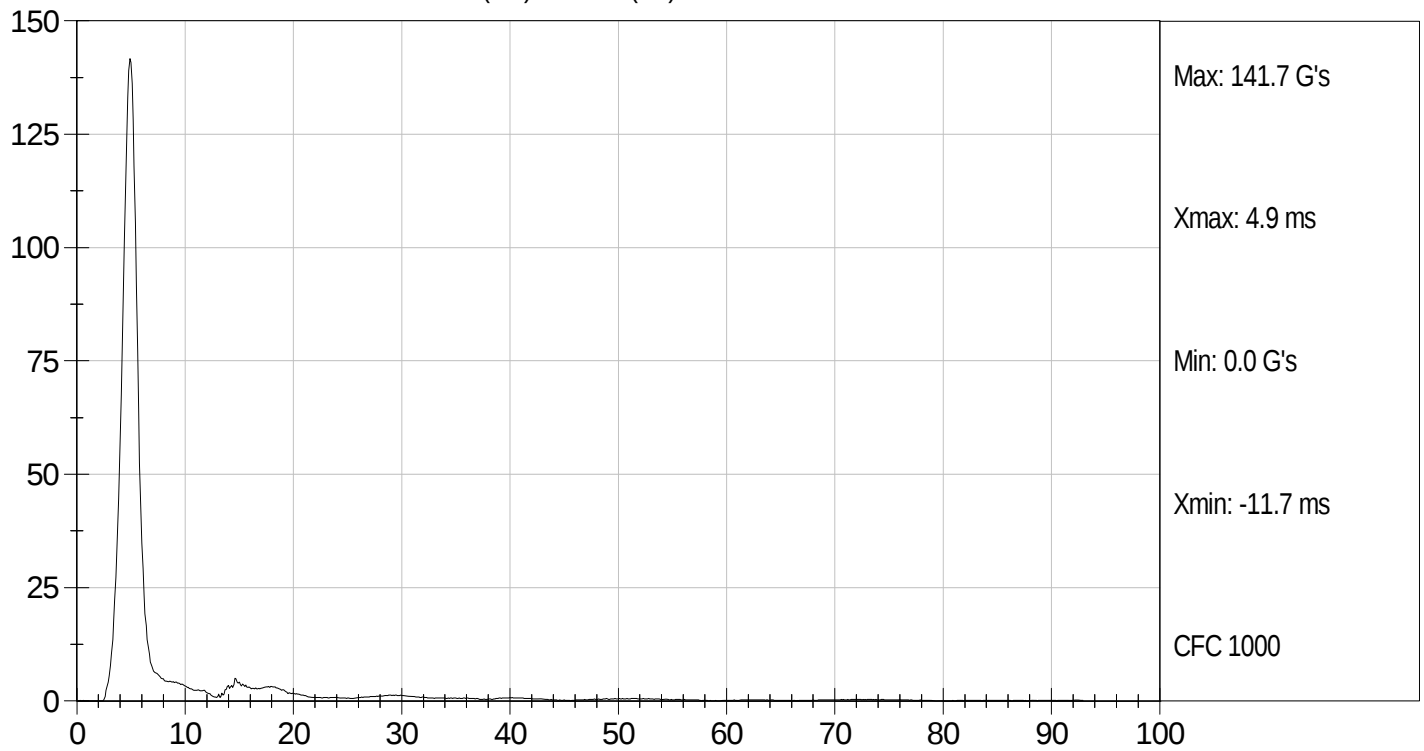

Approved By



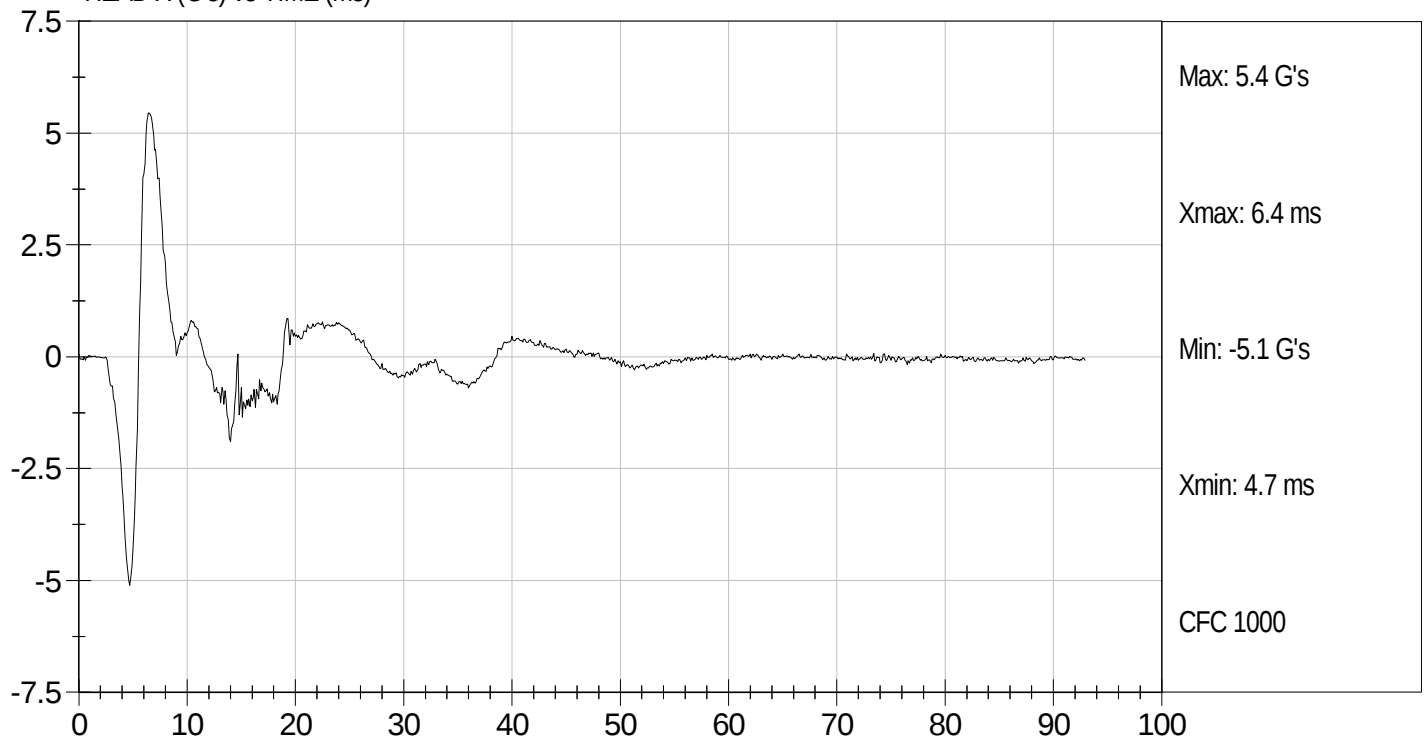
Test Desc: Head Drop
Component ID: D111691

Test Date: 5/9/11
Velocity: 0 ft/s, 0 m/s

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



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



MGA RESEARCH CORPORATION
NECK PENDULUM TEST
ES-2re DUMMY

ATD Serial No: 032

Test I.D: D111692

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	18.0 to 22.0	21.5	Pass
Laboratory Relative Humidity		%	10 to 70	36	Pass
Pendulum Speed		m/s	3.3 to 3.5	3.5	Pass
Pendulum Deceleration	1 ms	m/s	0.00 to -0.05	-0.01	Pass
	3 ms	m/s	-0.25 to -0.375	-0.32	Pass
	14 ms	m/s	-3.20 to -3.70	-3.34	Pass
Maximum Flexion Angle		deg	49.0 to 59.0	53.7	Pass
Time of Maximum Flexion Angle		ms	54.0 to 66.0	58.8	Pass
Head Rotation Decay Time to 0 degree		ms	53.0 to 88.0	58.7	Pass
Overall Test Results					Pass


 Laboratory Technician

5/9/11
 Test Date

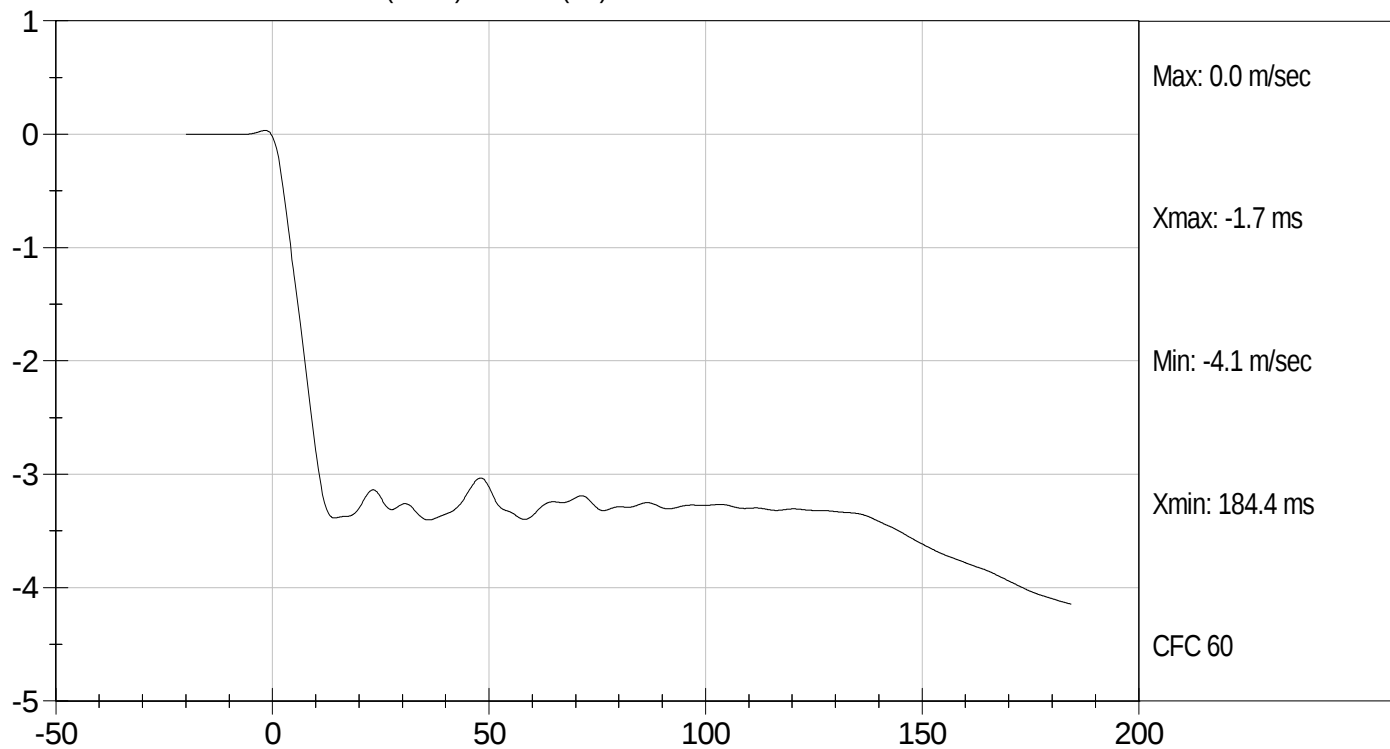

 Approved By



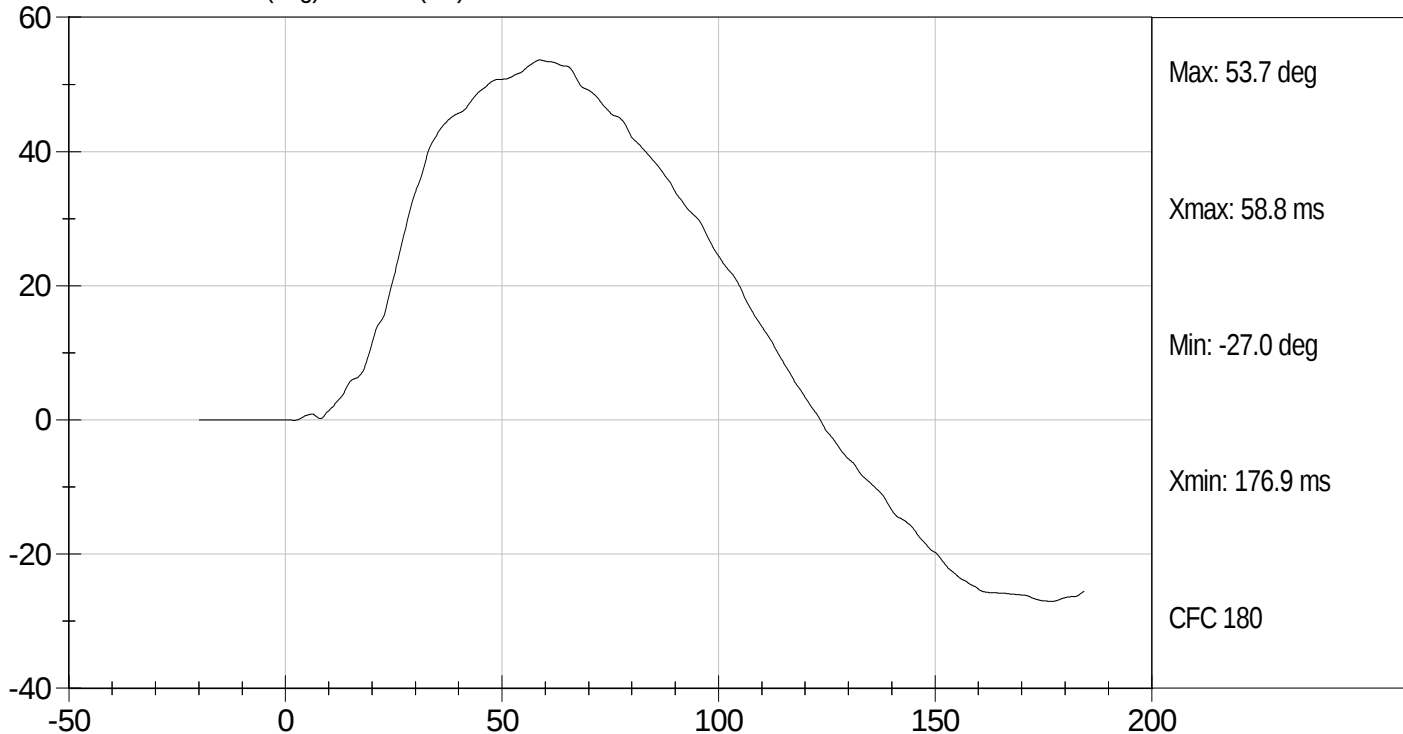
Test Desc: Neck Bending
Component ID: D111692

Test Date: 5/9/11
Velocity: 11.42 ft/s, 3.48 m/s

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



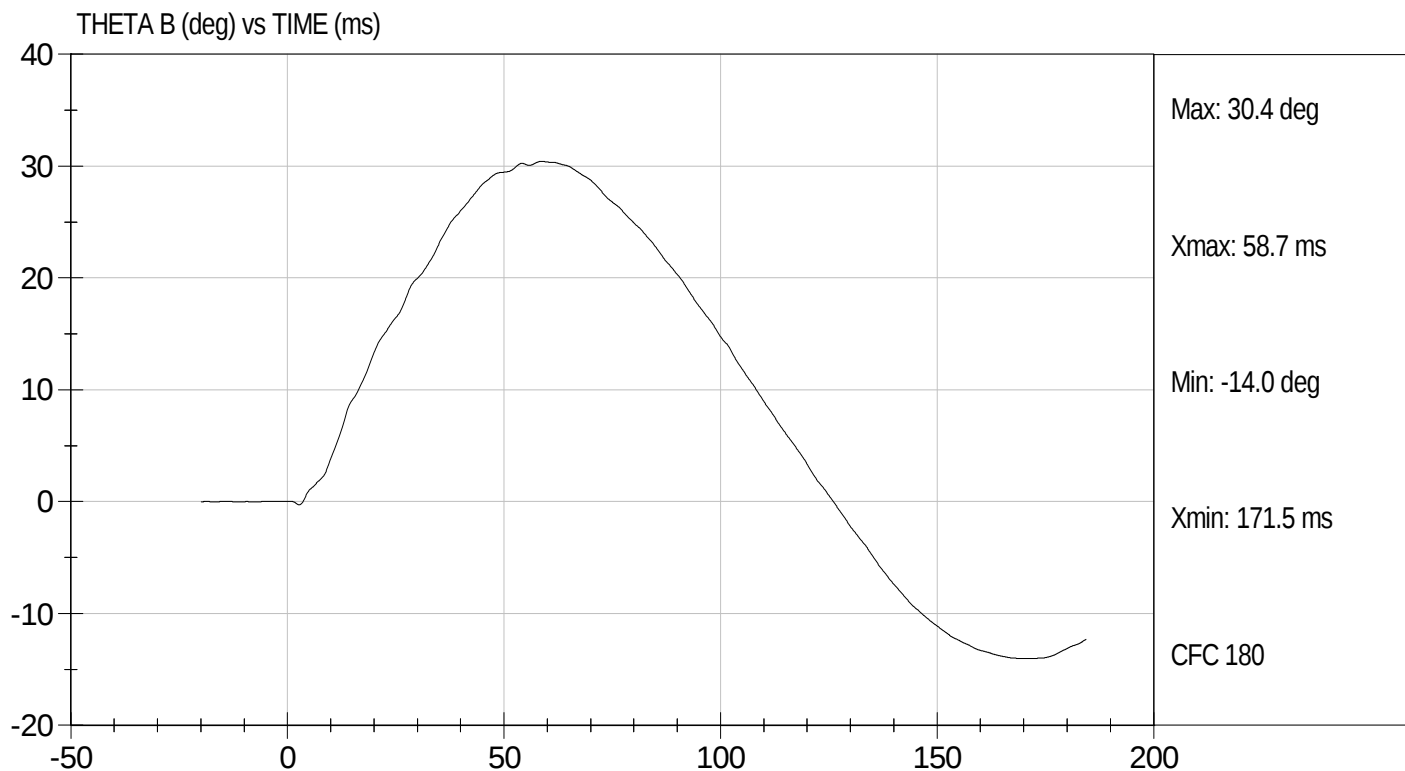
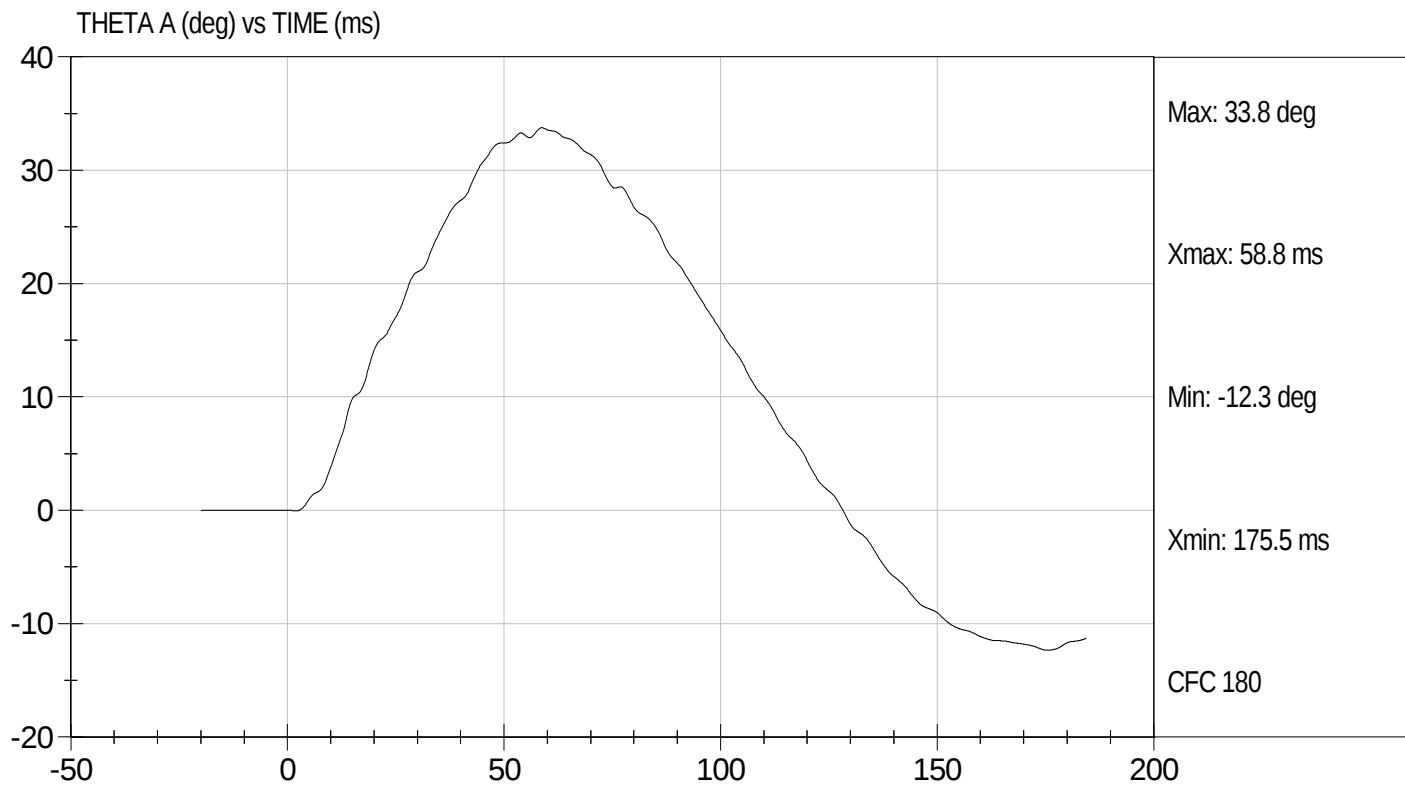
FLEXION ANGLE (deg) vs TIME (ms)





Test Desc: Neck Bending
Component ID: D111692

Test Date: 5/9/11
Velocity: 11.42 ft/s, 3.48 m/s

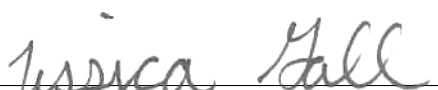


MGA RESEARCH CORPORATION
SHOULDER IMPACT TEST
ES-2re DUMMY

ATD Serial No: 032

Test I.D: D111693

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	32	Pass
Pendulum Speed	m/s	4.2 to 4.4	4.4	Pass
Peak Shoulder Acceleration	G's	7.5 to 10.5	9.5	Pass
Time of Peak Shoulder Acceleration	ms	NA	13.5	Pass
Overall Test Results			Pass	


Laboratory Technician

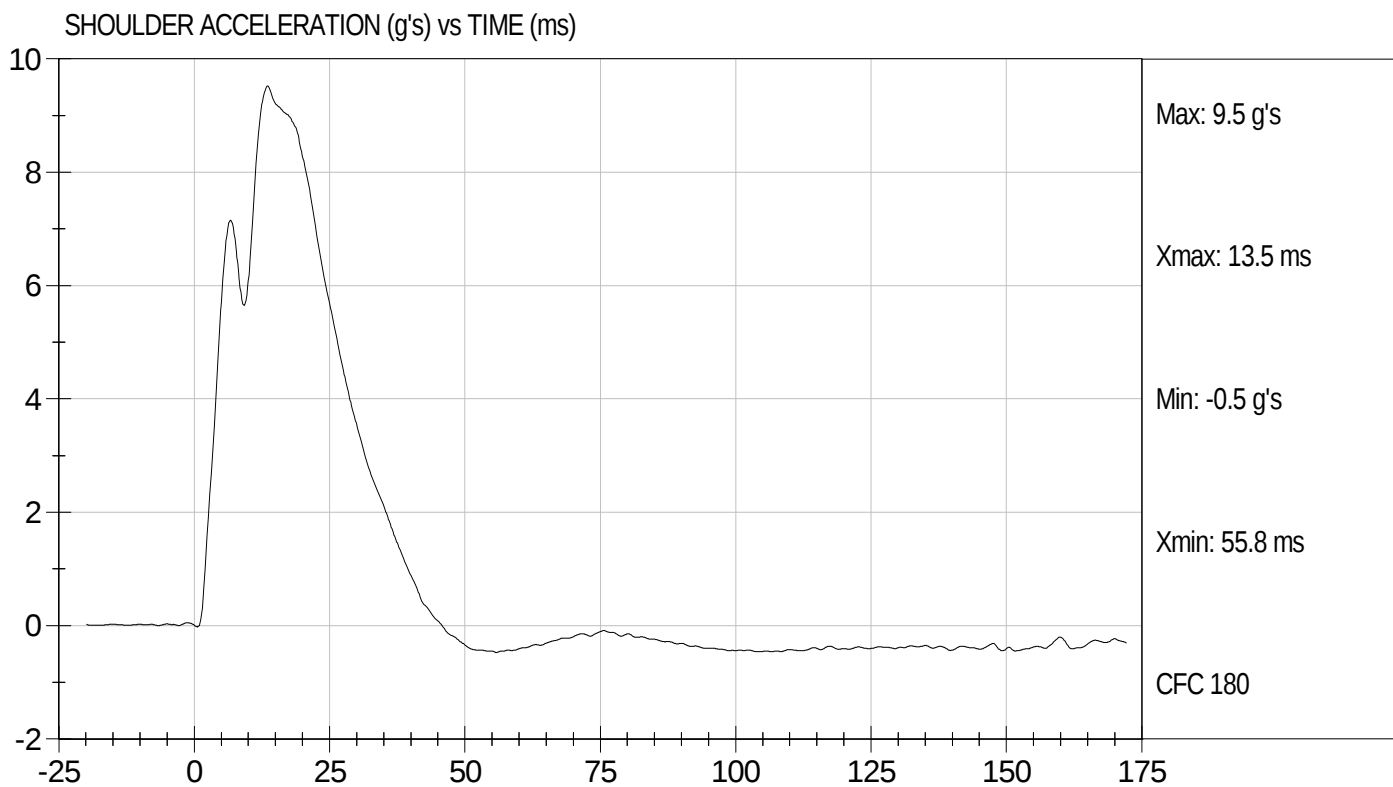
5/9/11
Test Date


Approved By



Test Desc: Shoulder Impact
Component ID: D111693

Test Date: 5/9/11
Velocity: 14.36 ft/s, 4.4 m/s



MGA RESEARCH CORPORATION

UPPER RIB TEST

ES-2re DUMMY

ATD Serial No: 032

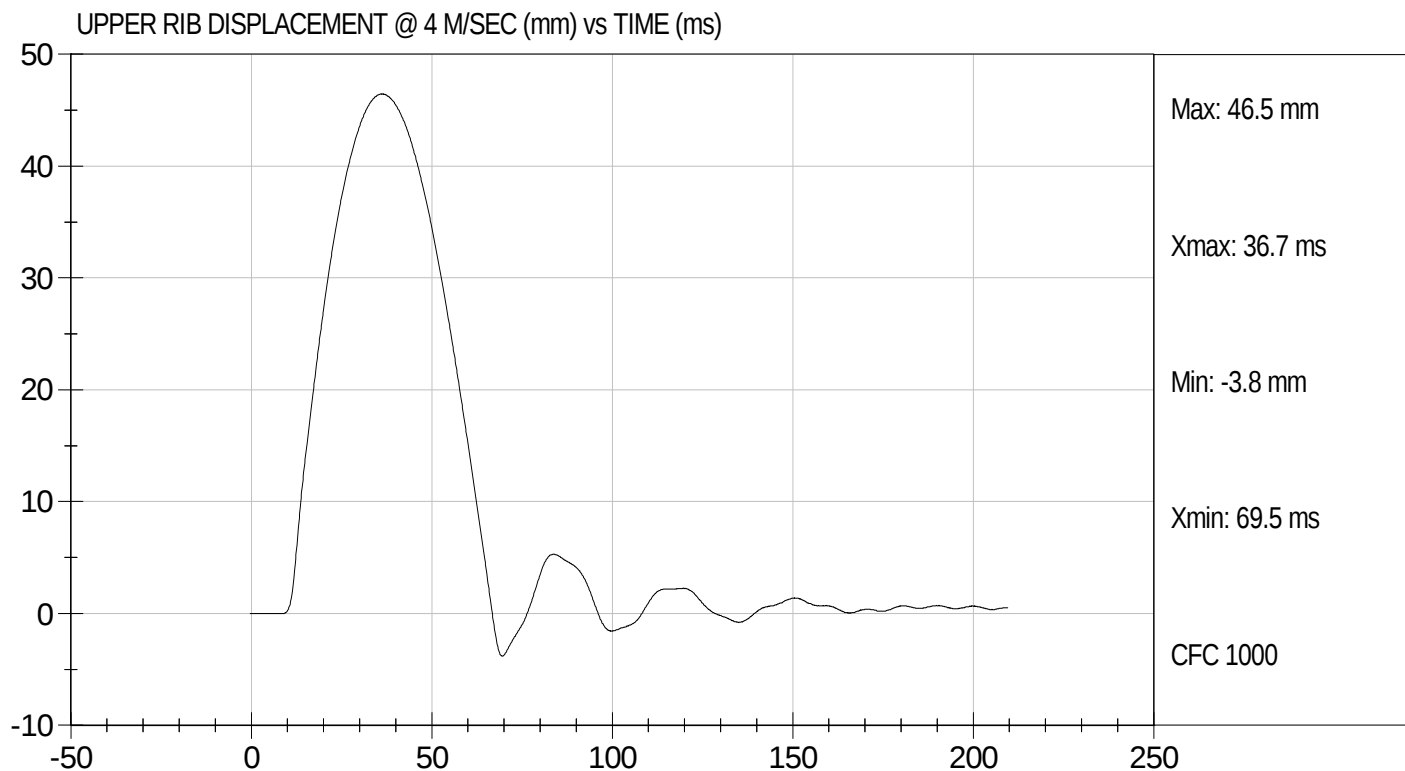
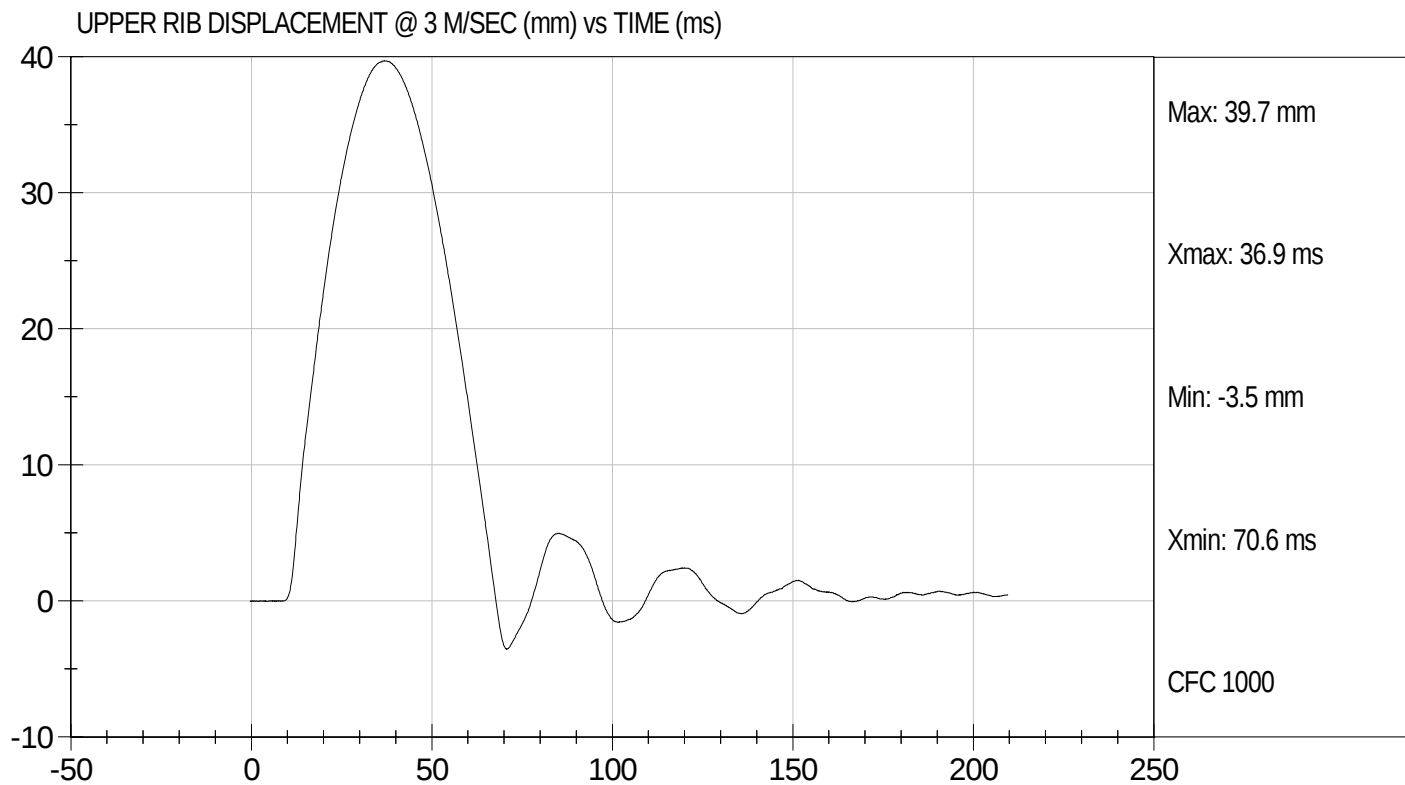
Test I.D: D111694

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	31	Pass
Displacement at 3 m/s	mm	36.0 to 40.0	39.7	Pass
Displacement at 4 m/s	mm	46.0 to 51.0	46.5	Pass
			Overall Test Results	Pass


Laboratory Technician

5/6/11
Test Date


Approved By



MGA RESEARCH CORPORATION

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

ATD Serial No: 032

Test I.D: D111695

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	31	Pass
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	48.4	Pass
Overall Test Results				Pass


Laboratory Technician

5/6/11
Test Date

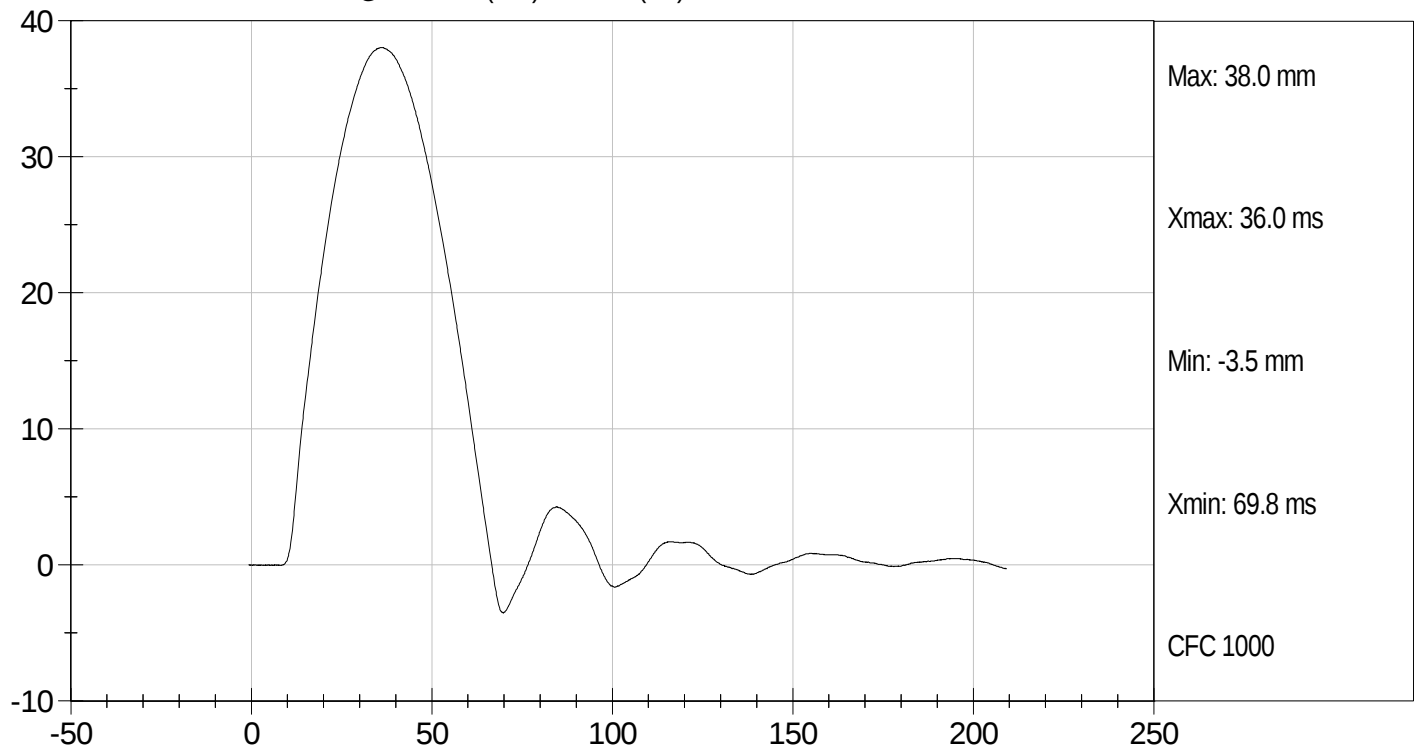

Approved By



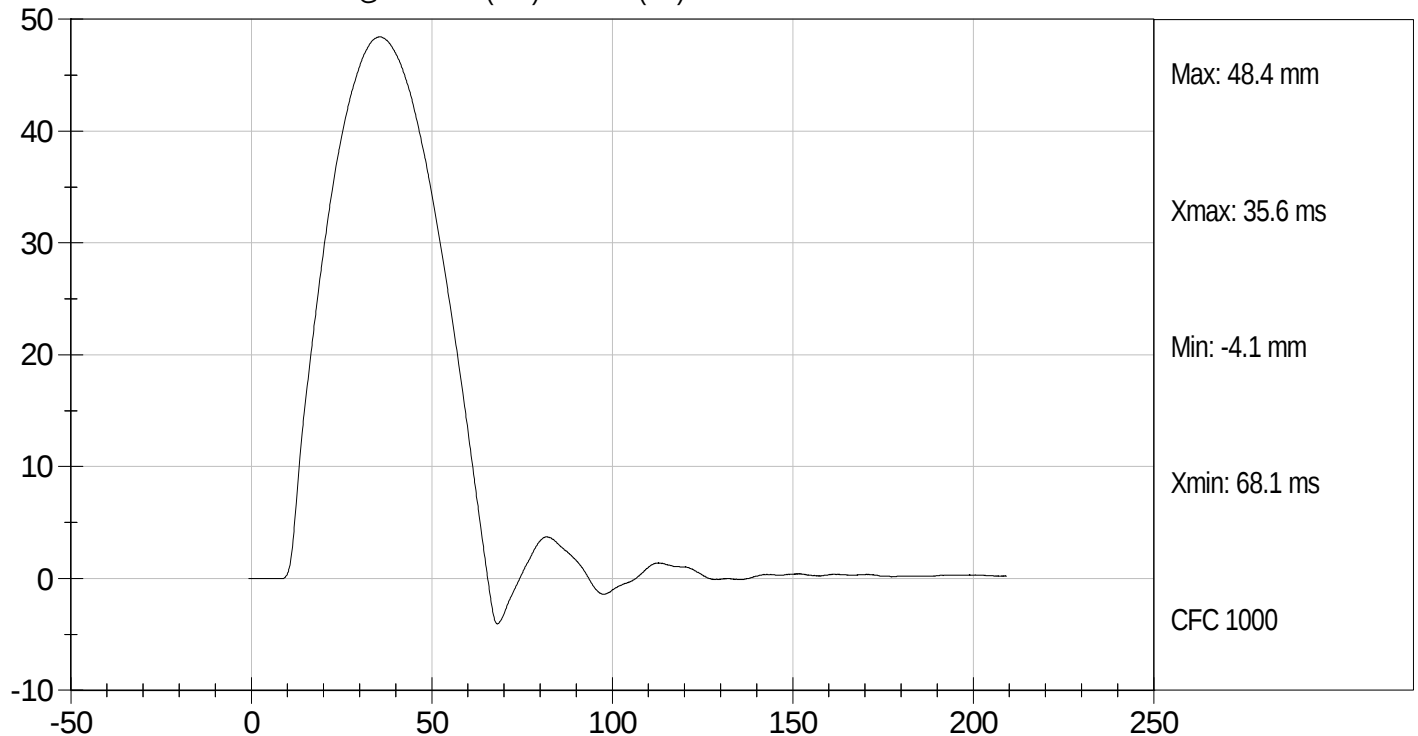
Test Desc: Rib Impact - Mid
Component ID: D111695

Test Date: 5/6/11

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

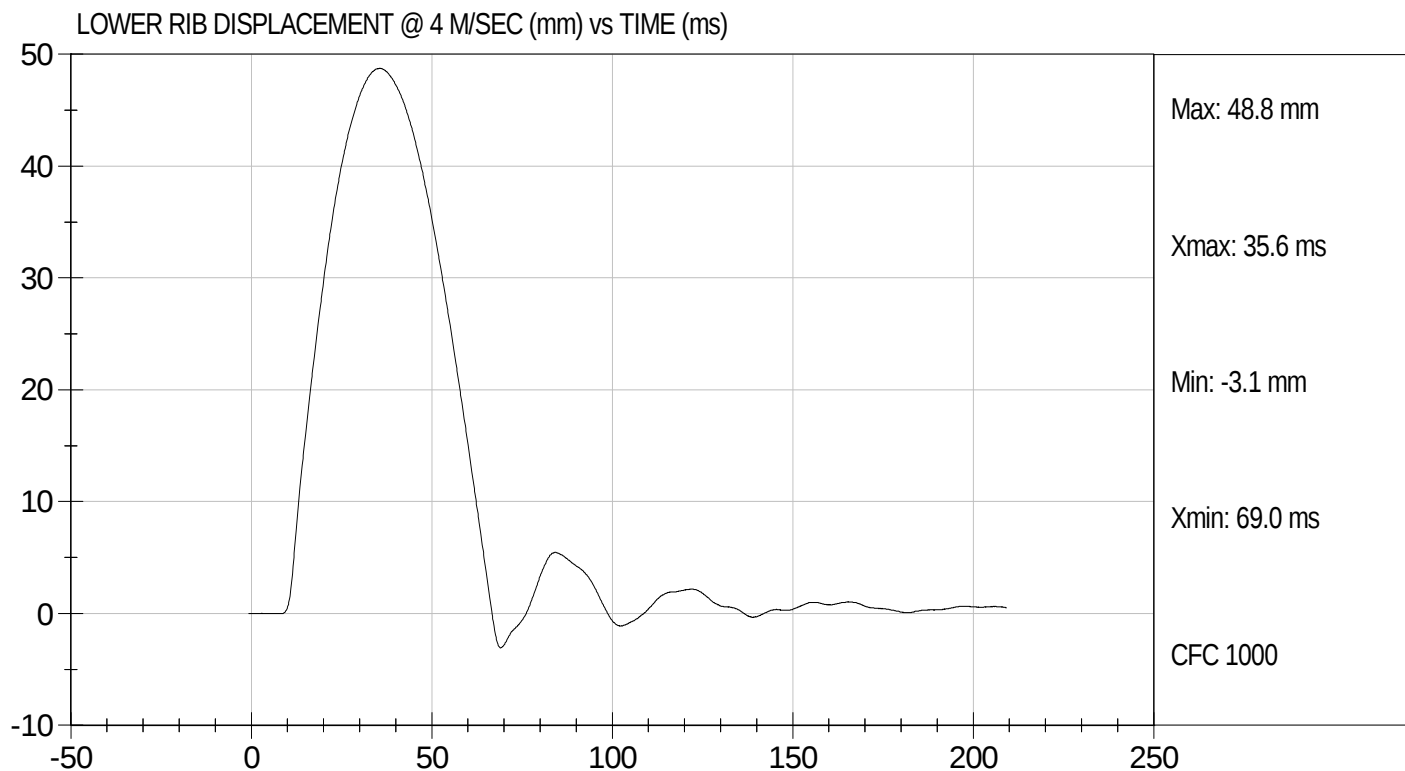
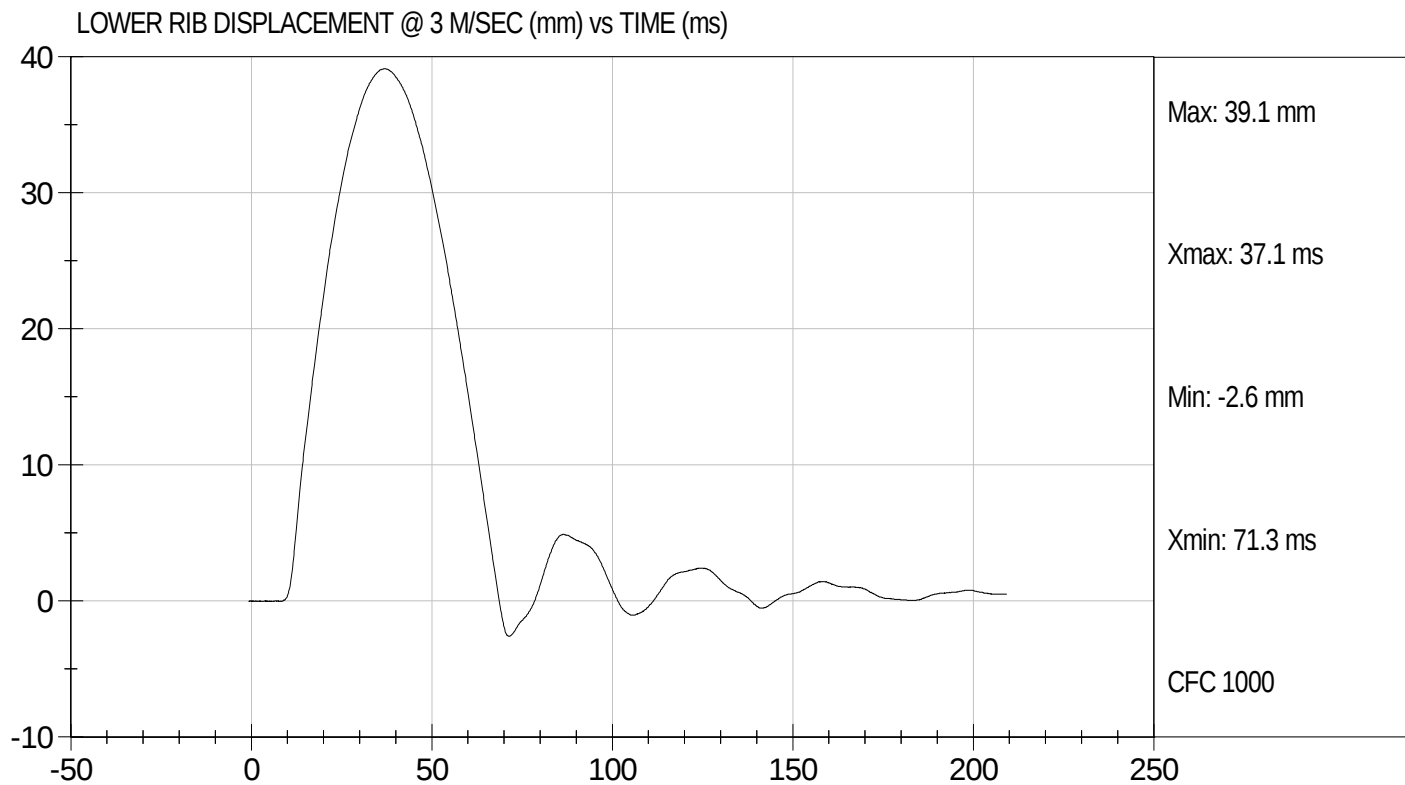
Test I.D: D111696

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	31	Pass
Displacement at 3 m/s	mm	36.0 to 40.0	39.1	Pass
Displacement at 4 m/s	mm	46.0 to 51.0	48.8	Pass
			Overall Test Results	Pass


Laboratory Technician

5/6/11
Test Date


Approved By



MGA RESEARCH CORPORATION

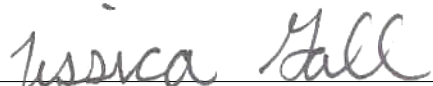
ABDOMEN TEST

ES-2re DUMMY

ATD Serial No: 032

Test I.D: D111697

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	32	Pass
Probe Speed	m/s	3.90 to 4.10	4.10	Pass
Maximum Impact Force	kN	4.00 to 4.80	4.13	Pass
Time of Maximum Impactor Force	ms	10.60 to 13.00	10.90	Pass
Maximum Total Abdomen Force	kN	2.20 to 2.70	2.41	Pass
Time of Maximum Abdomen Force	ms	10.00 to 12.30	10.80	Pass
Overall Test Results				Pass


Laboratory Technician

5/9/11
Test Date

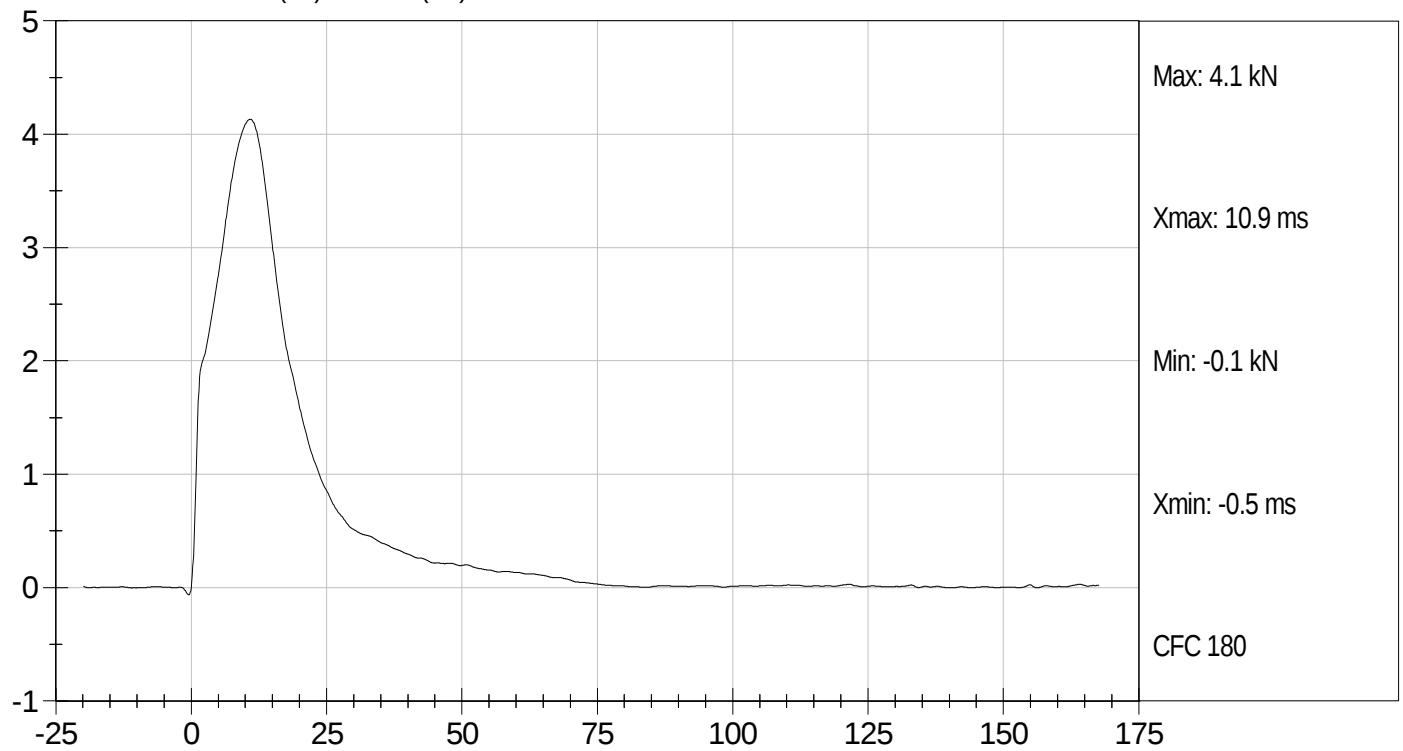

Approved By



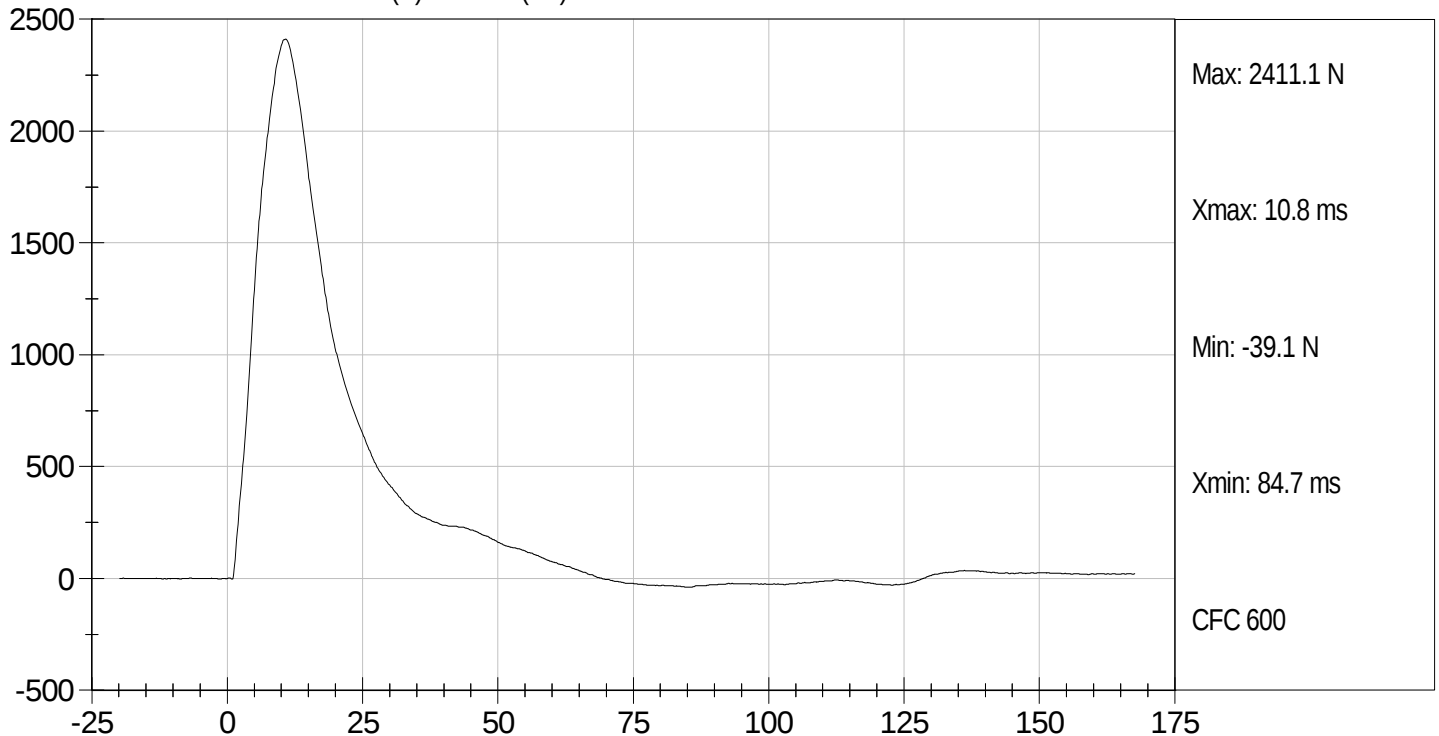
Test Desc: Abdomen Impact
Component ID: D111697

Test Date: 5/9/11
Velocity: 13.44 ft/s, 4.1 m/s

IMPACTOR FORCE (kN) vs TIME (ms)



TOTAL ABDOMEN FORCE (N) vs TIME (ms)

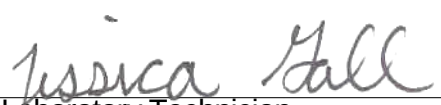


MGA RESEARCH CORPORATION
LUMBAR SPINE TEST
ES-2re DUMMY

ATD Serial No: 032

Test I.D: D111698

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	36	Pass
Pendulum Speed		m/s	5.95 to 6.15	6.12	Pass
Pendulum Deceleration	1 ms	m/s	-0.05 to 0.00	-0.01	Pass
	3.7 ms	m/s	-0.425 to -0.24	-0.42	Pass
	27 ms	m/s	-6.50 to -5.80	-6.09	Pass
	30 ms	m/s	>= -6.5	-5.98	Pass
Maximum Flexion Angle		deg	45.0 to 55.0	51.7	Pass
Time of Maximum Flexion Angle		ms	39.0 to 53.0	44.7	Pass
Headform Rotation Decay to Initial Position		ms	37 to 57	47	Pass
Overall Results					Pass


 Laboratory Technician

5/9/11
 Test Date

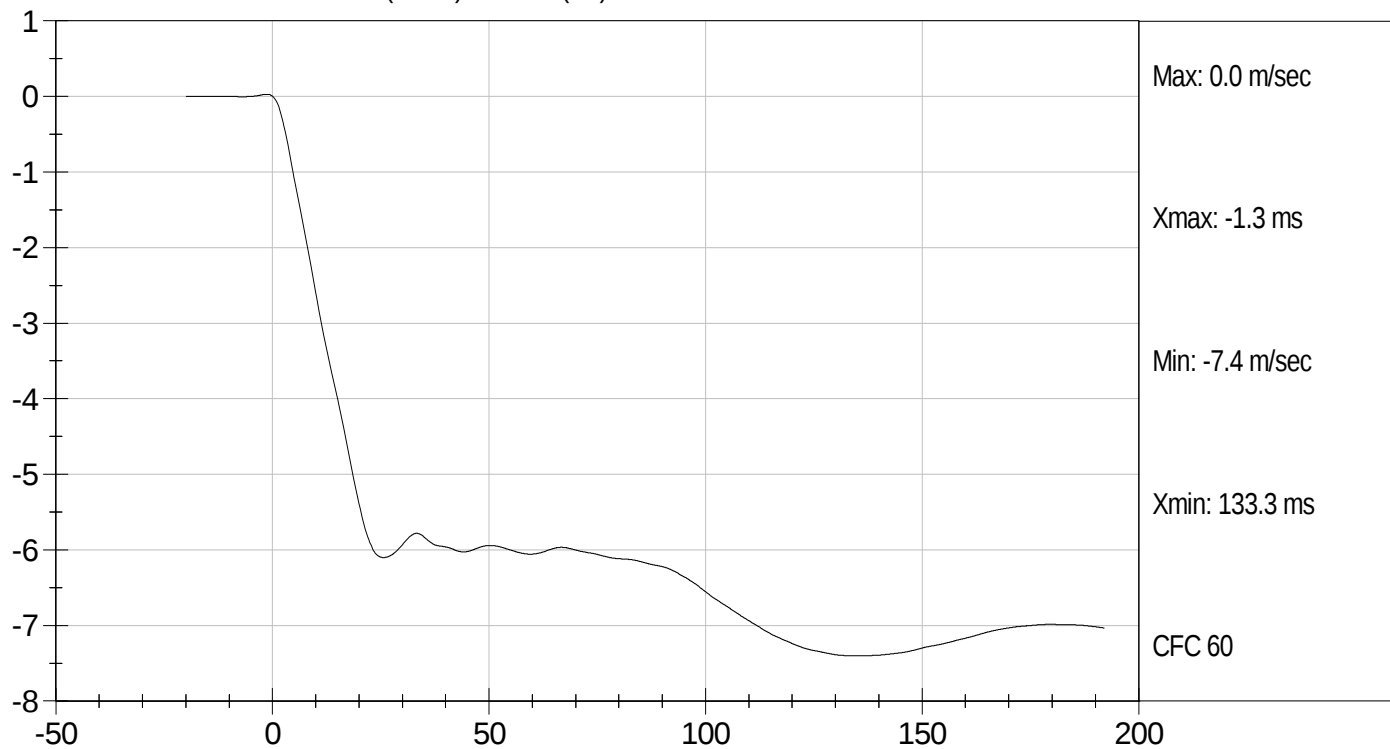

 Approved By



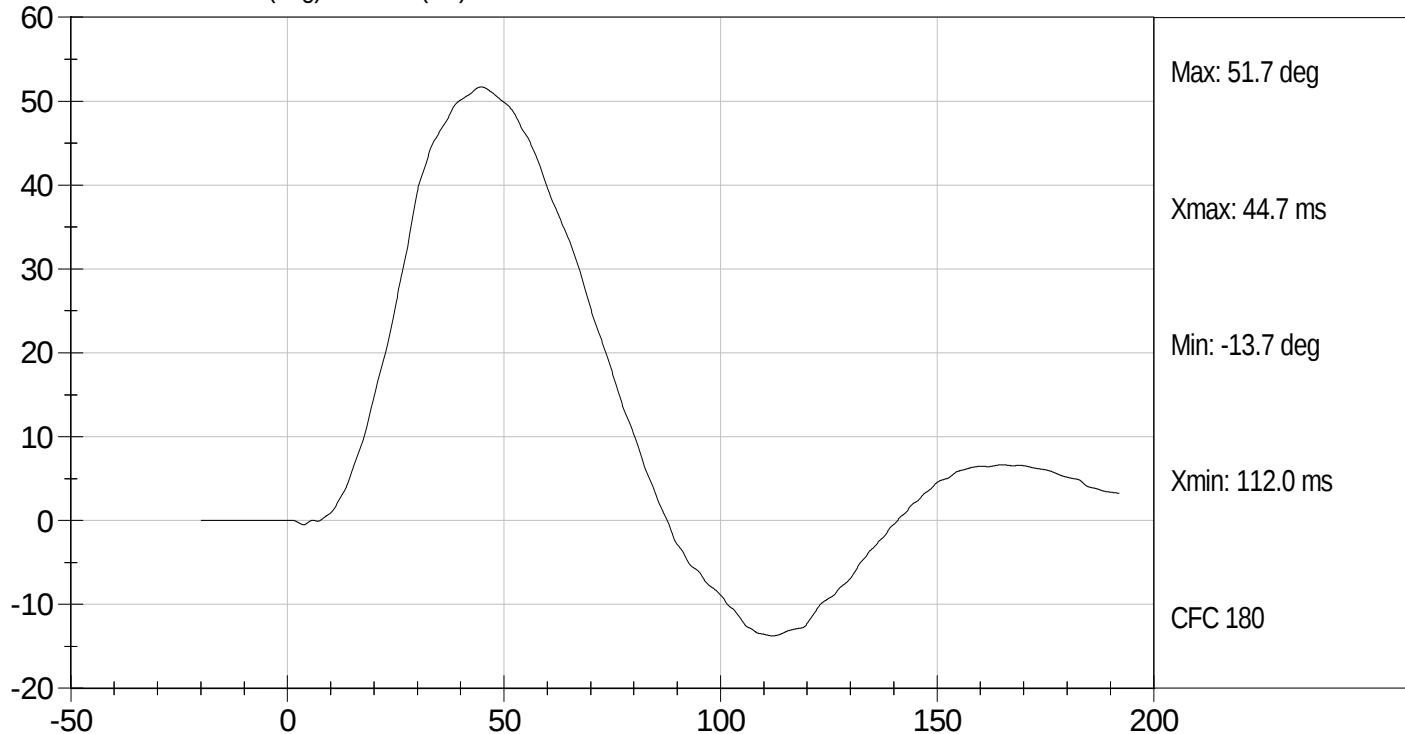
Test Desc: Lumbar Flexion
Component ID: D111698

Test Date: 5/9/11
Velocity: 20.08 ft/s, 6.12 m/s

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



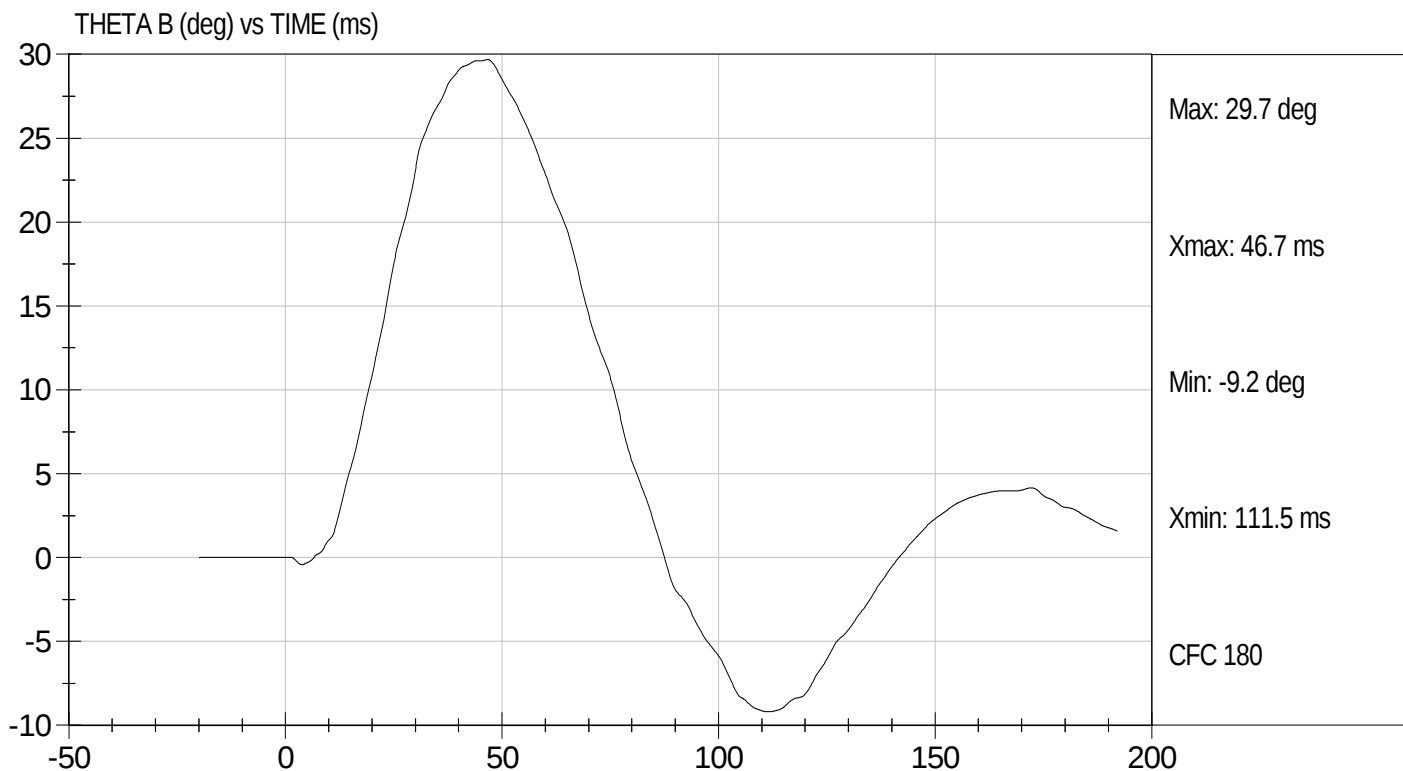
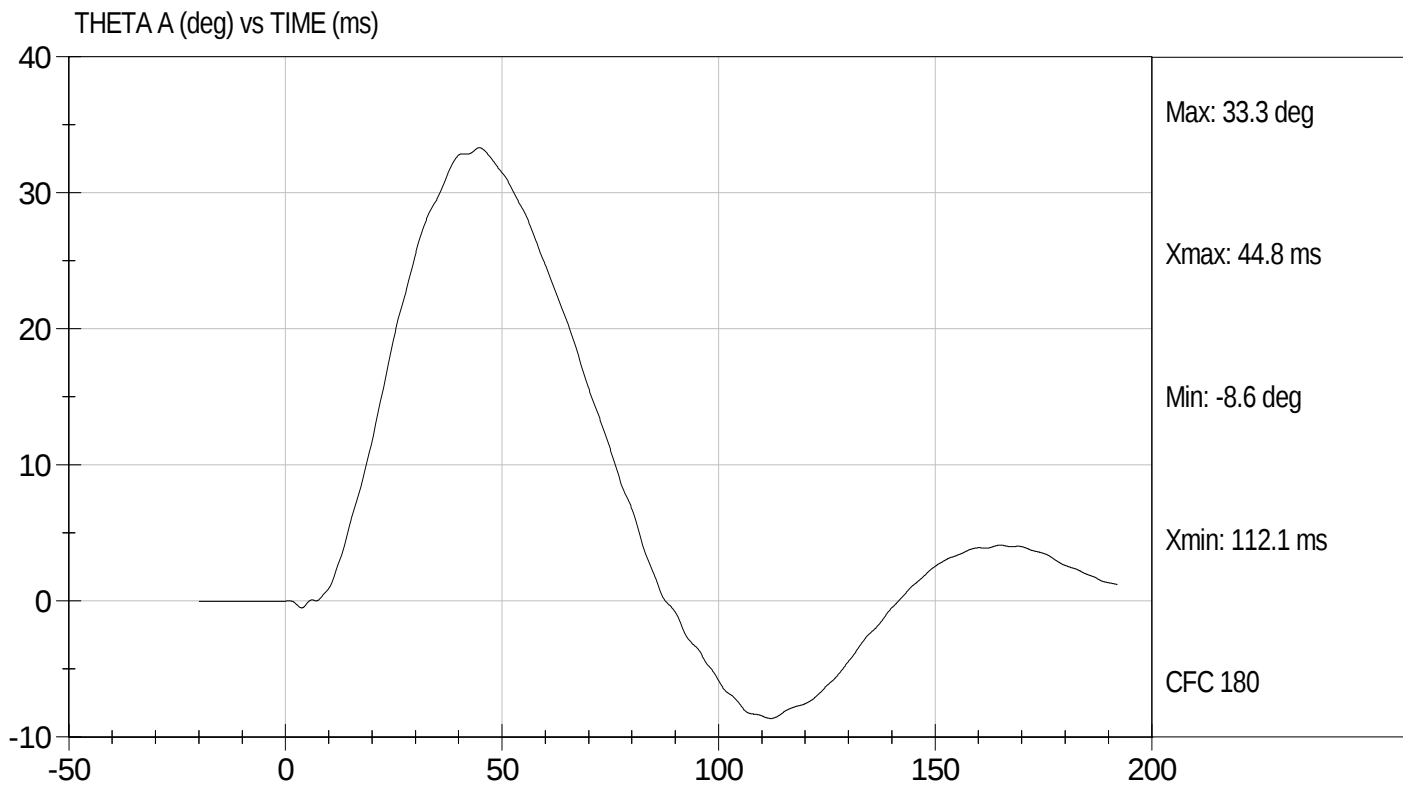
FLEXION ANGLE (deg) vs TIME (ms)





Test Desc: Lumbar Flexion
Component ID: D111698

Test Date: 5/9/11
Velocity: 20.08 ft/s, 6.12 m/s



MGA RESEARCH CORPORATION

**PELVIS TEST
ES-2re DUMMY**

ATD Serial No: 032

Test I.D: D111699

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	32	Pass
Probe Speed	m/s	4.20 to 4.40	4.34	Pass
Maximum Impactor Force	kN	4.70 to 5.40	4.72	Pass
Time of Maximum Impactor Force	ms	11.80 to 16.10	13.10	Pass
Maximum Pubic Force	kN	1.23 to 1.59	1.36	Pass
Time of Maximum Pubic Force	ms	12.20 to 17.00	14.50	Pass
Overall Test Results				Pass


Laboratory Technician

5/9/11
Test Date

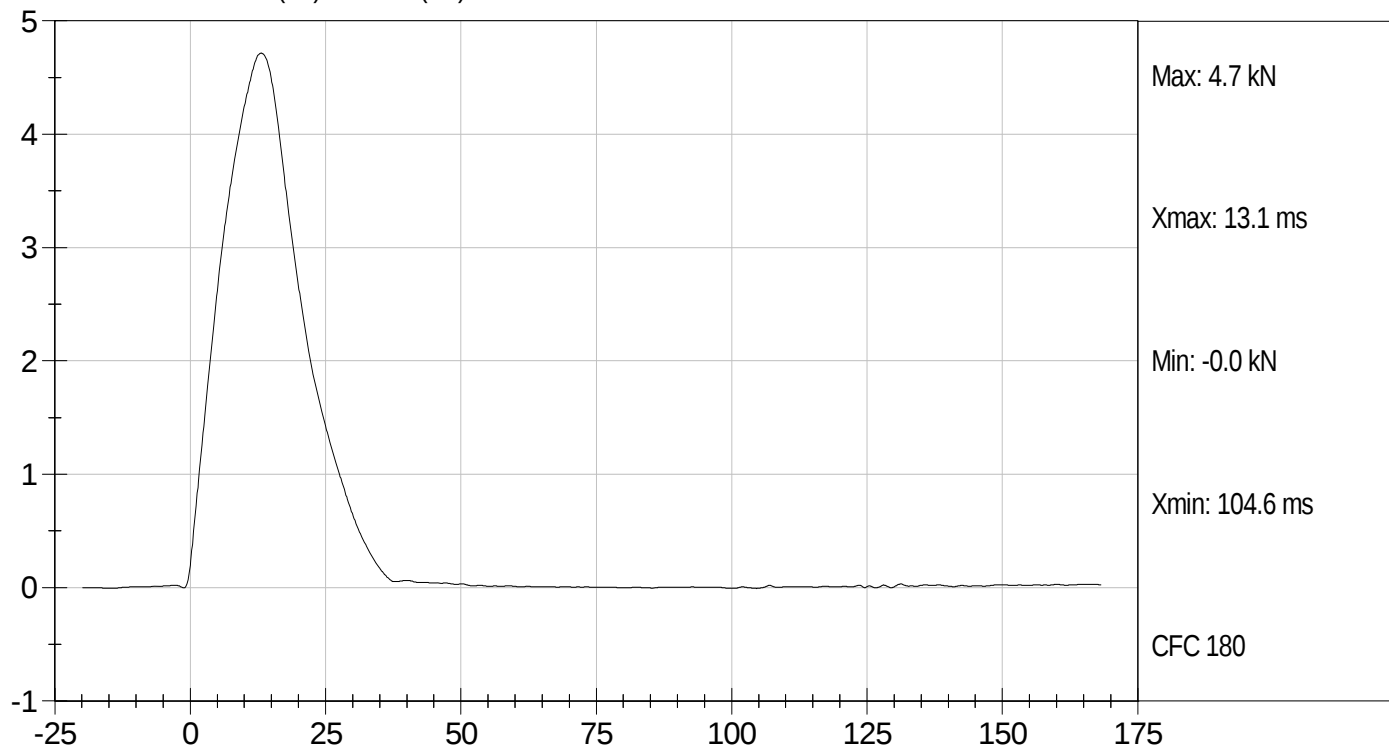

Approved By



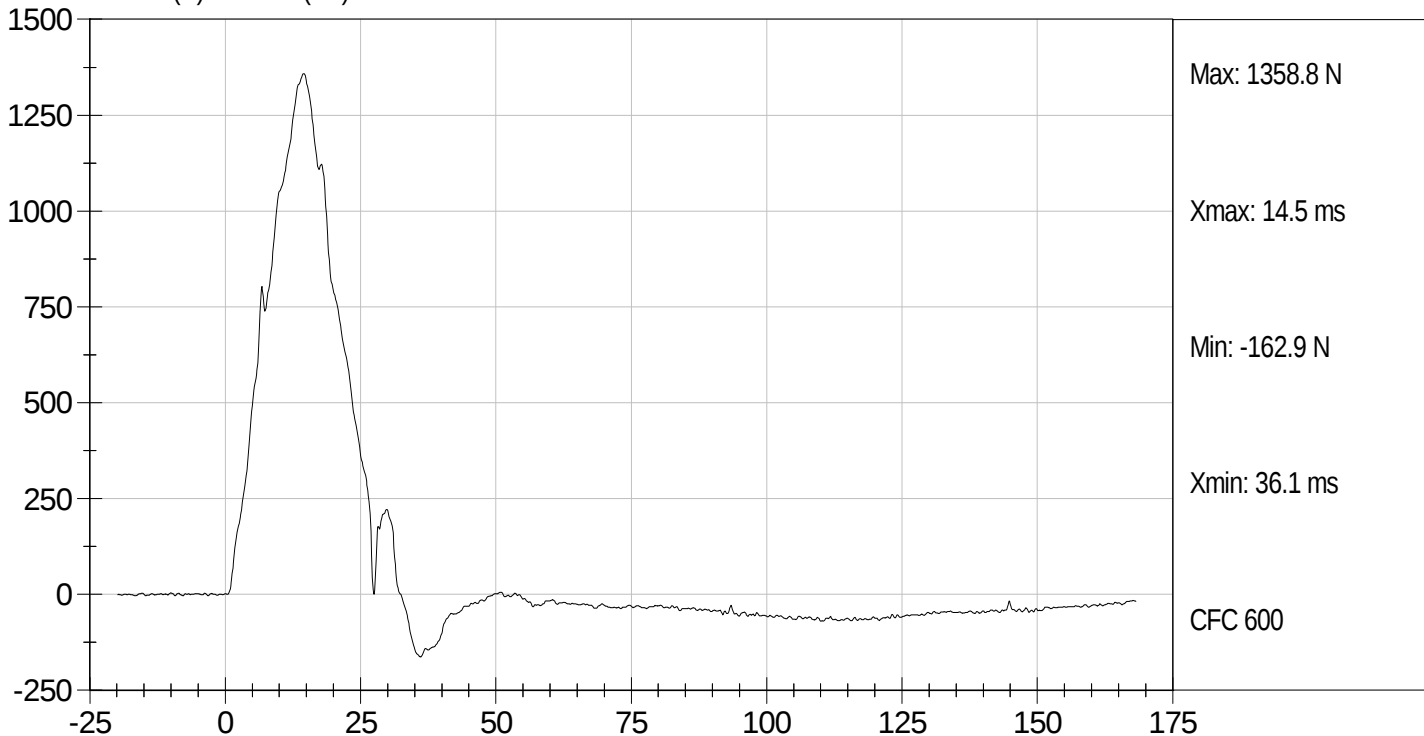
Test Desc: Pelvis Impact
Component ID: D111699

Test Date: 5/9/11
Velocity: 14.24 ft/s, 4.34 m/s

IMPACTOR FORCE (kN) vs TIME (ms)



PUBIC (N) vs TIME (ms)

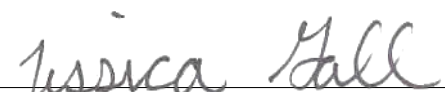


MGA RESEARCH CORPORATION
FULL BODY THORAX IMPACT TEST
ES-2re DUMMY

ATD Serial No: 032

Test I.D: D111690

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.7	Pass
Humidity	%	10 to 70	32	Pass
Probe Speed	m/s	5.40 to 5.60	5.58	Pass
Maximum Impactor Force (after 6 ms)	kN	5.10 to 6.20	5.25	Pass
Upper Rib Displacement	mm	34.0 to 41.0	38.0	Pass
Middle Rib Displacement	mm	37.0 to 45.0	40.4	Pass
Lower Rib Displacement	mm	37.0 to 44.0	40.3	Pass
			Overall Test Results	Pass


Laboratory Technician

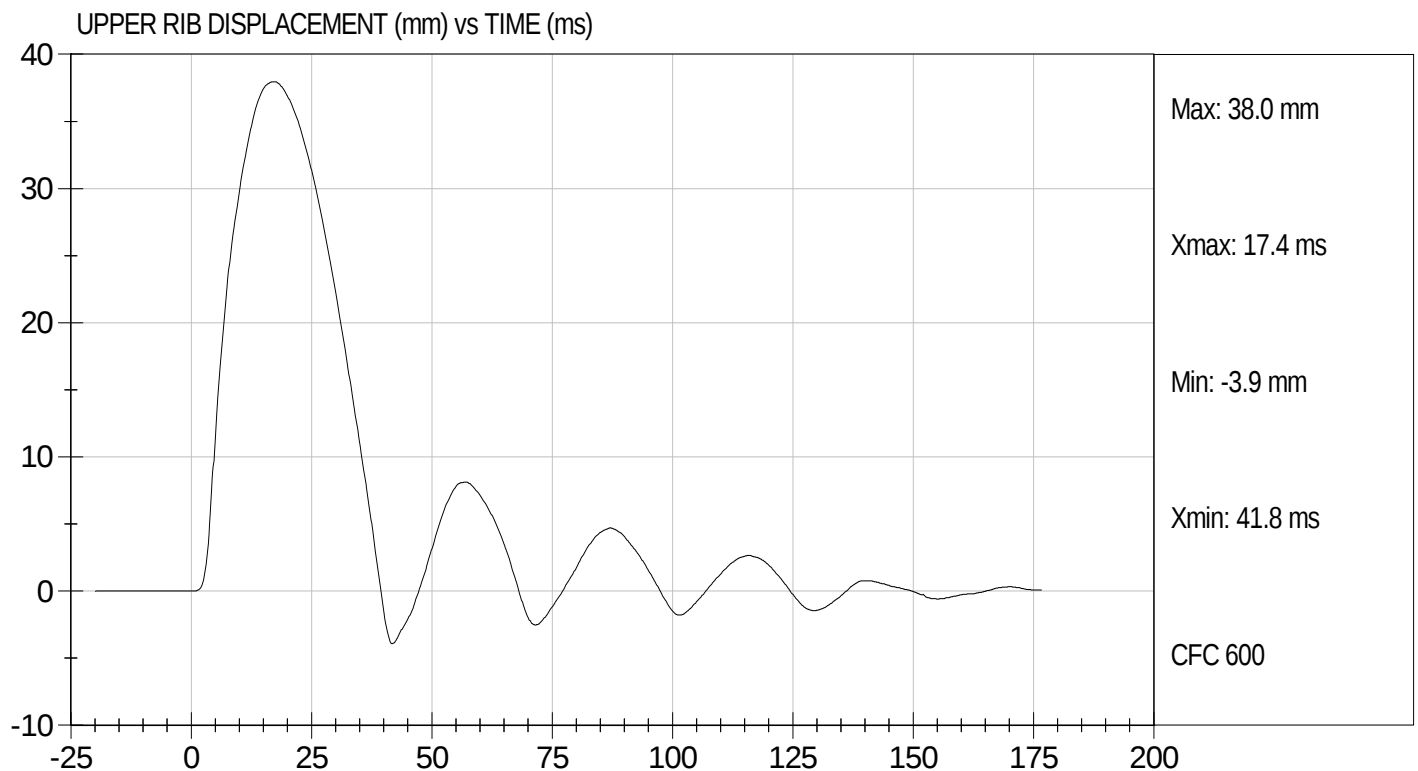
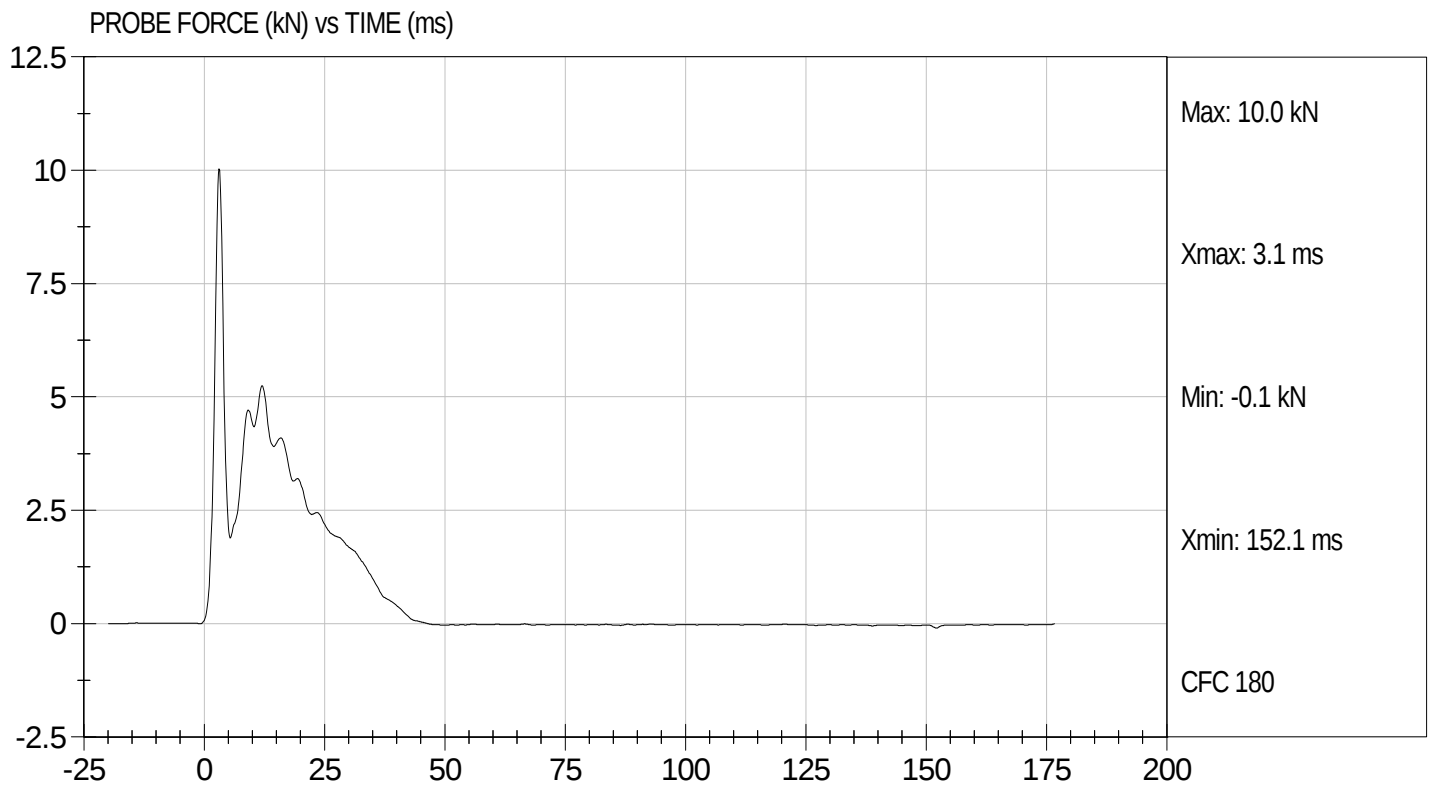
5/9/11
Test Date


Approved By



Test Desc: Thorax Impact
Component ID: D111690

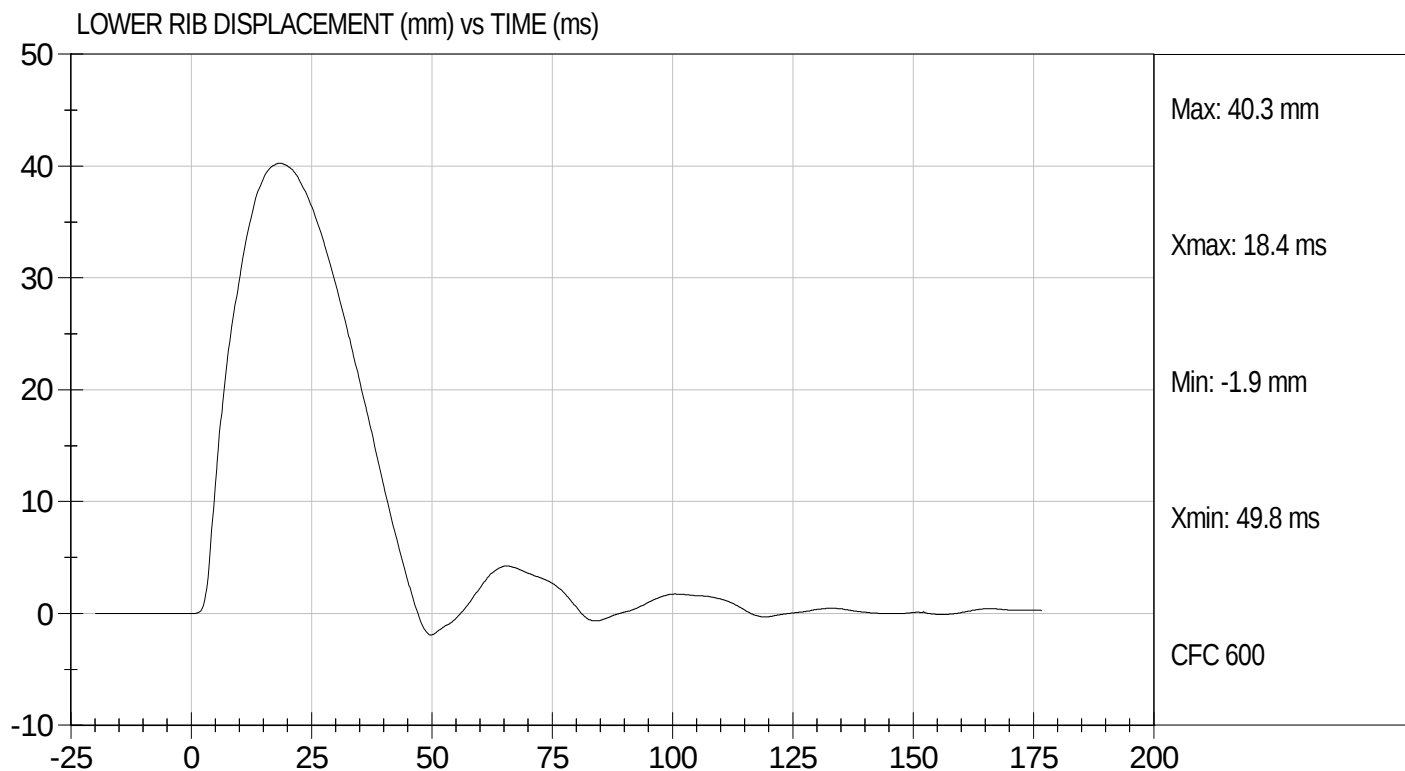
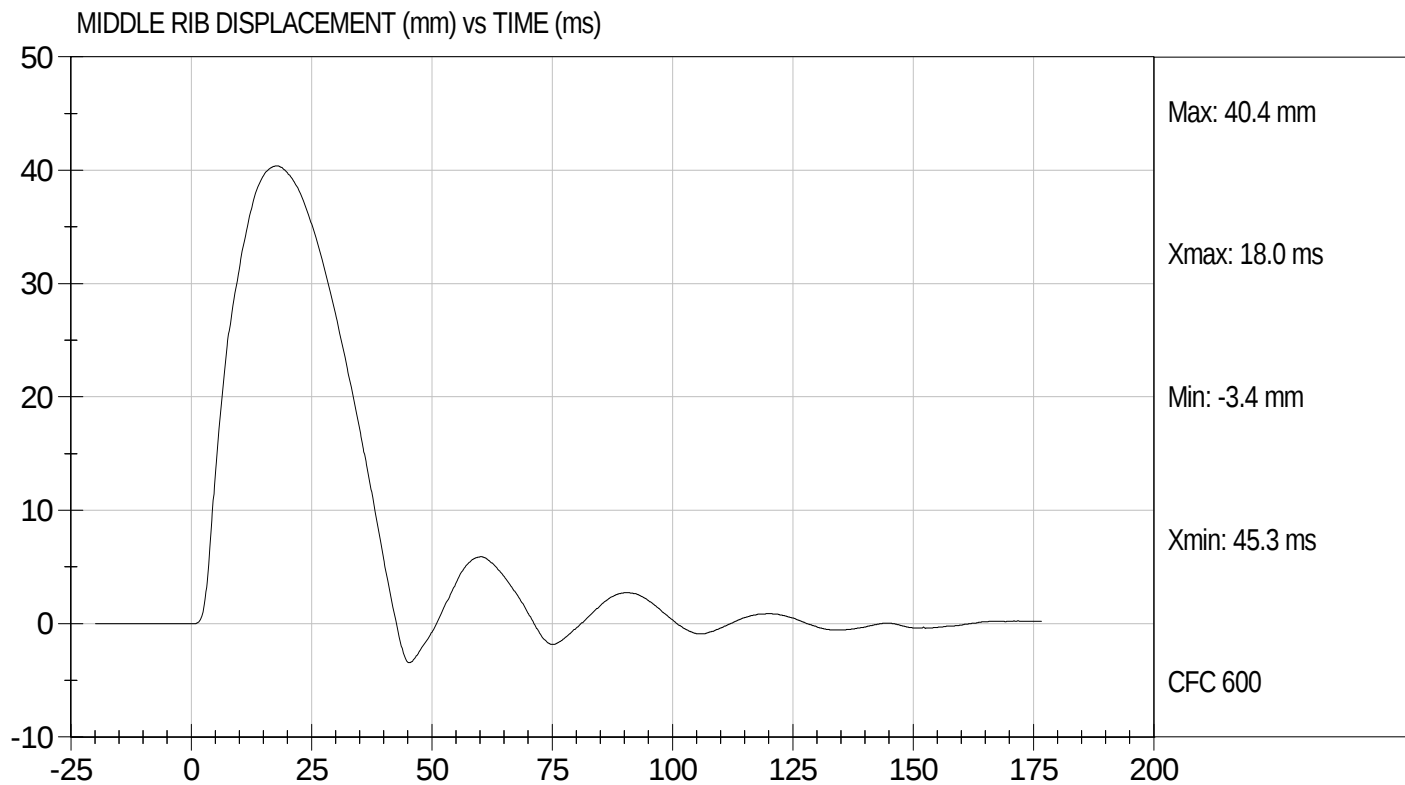
Test Date: 5/9/11
Velocity: 18.31 ft/s, 5.58 m/s





Test Desc: Thorax Impact
Component ID: D111690

Test Date: 5/9/11
Velocity: 18.31 ft/s, 5.58 m/s



MGA RESEARCH CORPORATION

HEAD DROP TEST

ES-2re DUMMY

ATD Serial No: 032Test ID: D112131

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	20.8	Pass
Laboratory Relative Humidity	%	10 to 70	49	Pass
Peak Resultant Acceleration	G's	125 to 155	145	Pass
Peak Lateral Acceleration	G's	+/- 15	-12.3	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 15% of peak	Yes	Pass
Overall Test Results				Pass


Laboratory Technician

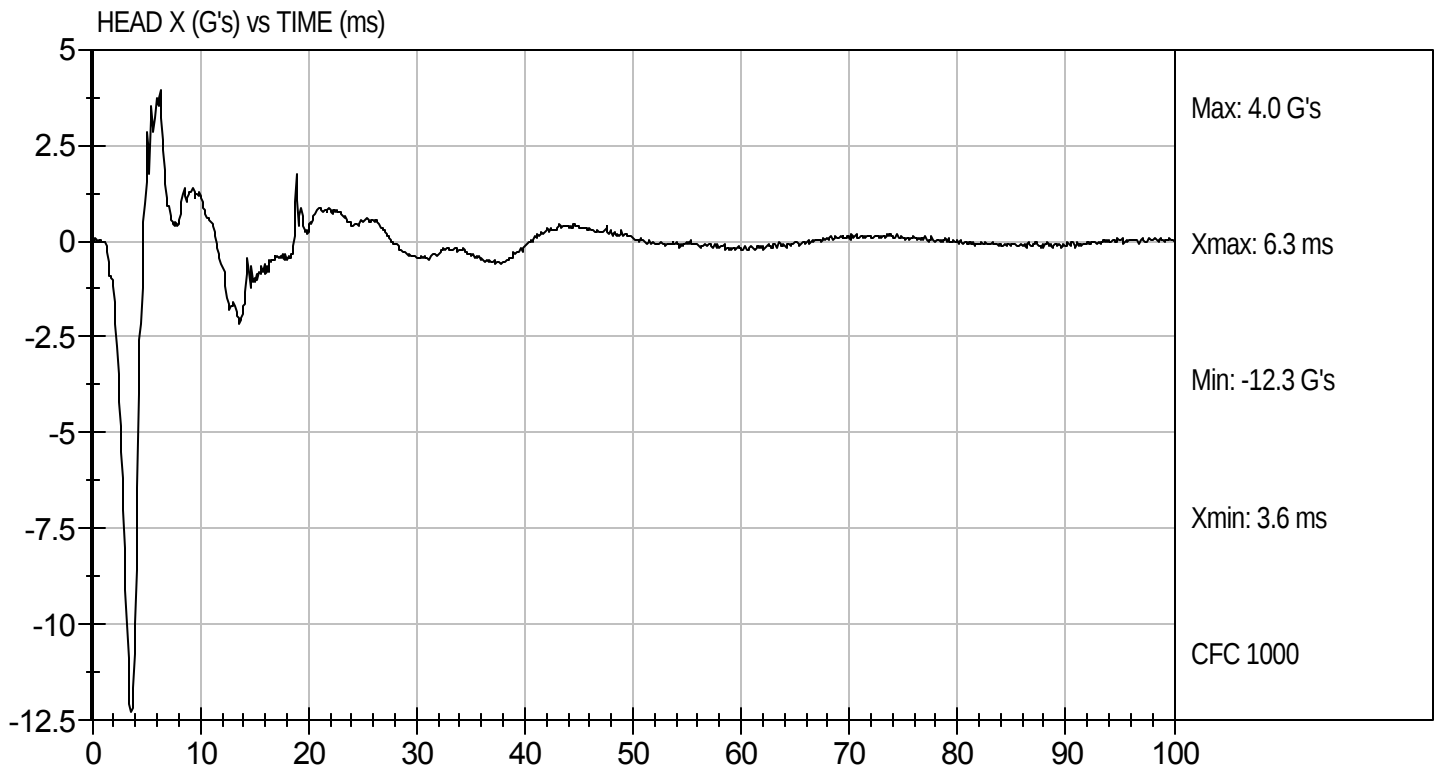
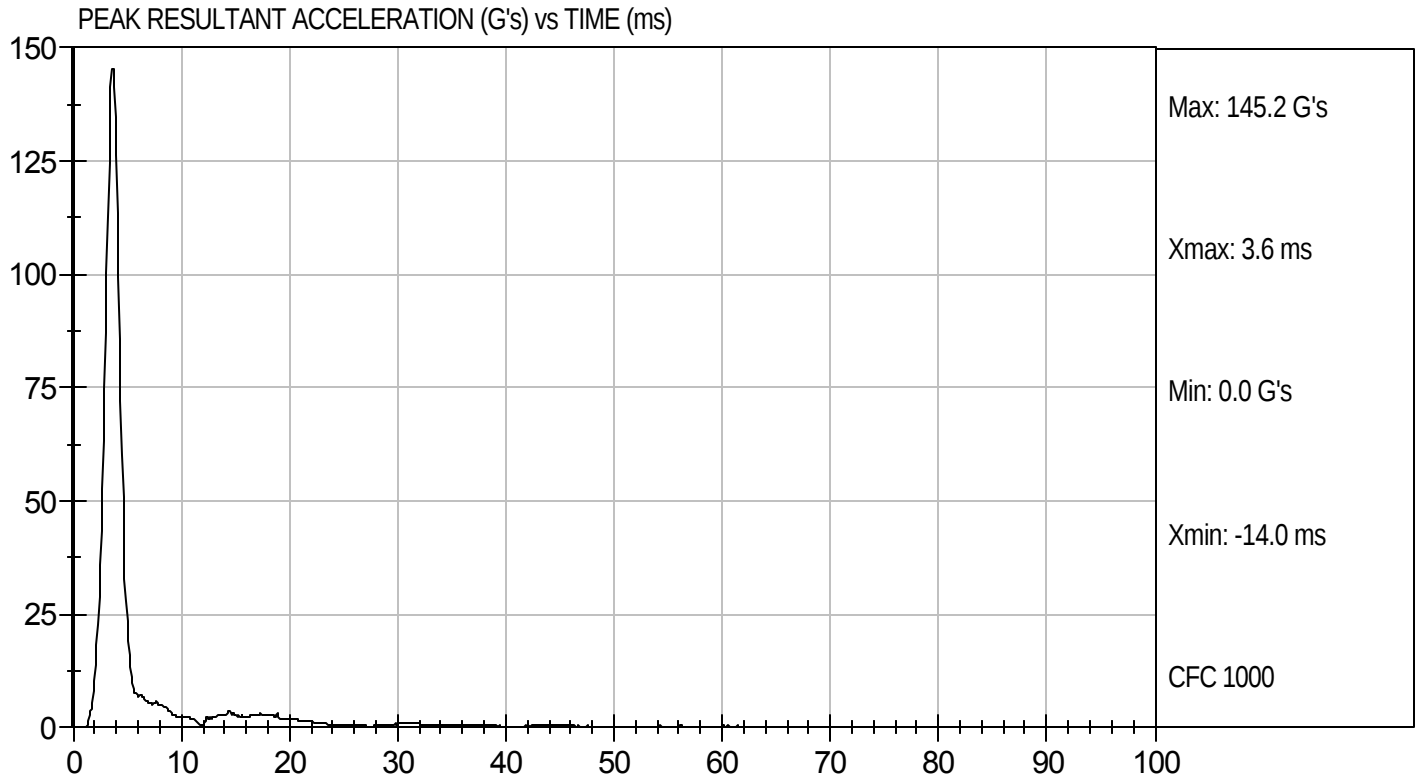
6/17/11
Test Date


Approved By



Test Desc: Head Drop
Component ID: D112131

Test Date: 6/17/11
Velocity: 0 ft/s, 0 m/s

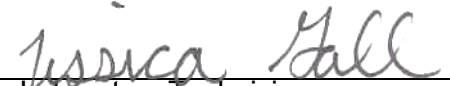


MGA RESEARCH CORPORATION
NECK PENDULUM TEST
ES-2re DUMMY

ATD Serial No: 032

Test I.D: D112132

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	18.0 to 22.0	21.5	Pass
Laboratory Relative Humidity		%	10 to 70	54	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	-3.26	Pass
Maximum Flexion Angle		deg	49.0 to 59.0	53.6	Pass
Time of Maximum Flexion Angle		ms	54.0 to 66.0	56.1	Pass
Head Rotation Decay Time to 0 degree		ms	53.0 to 88.0	56.5	Pass
Overall Test Results					Pass


 Laboratory Technician

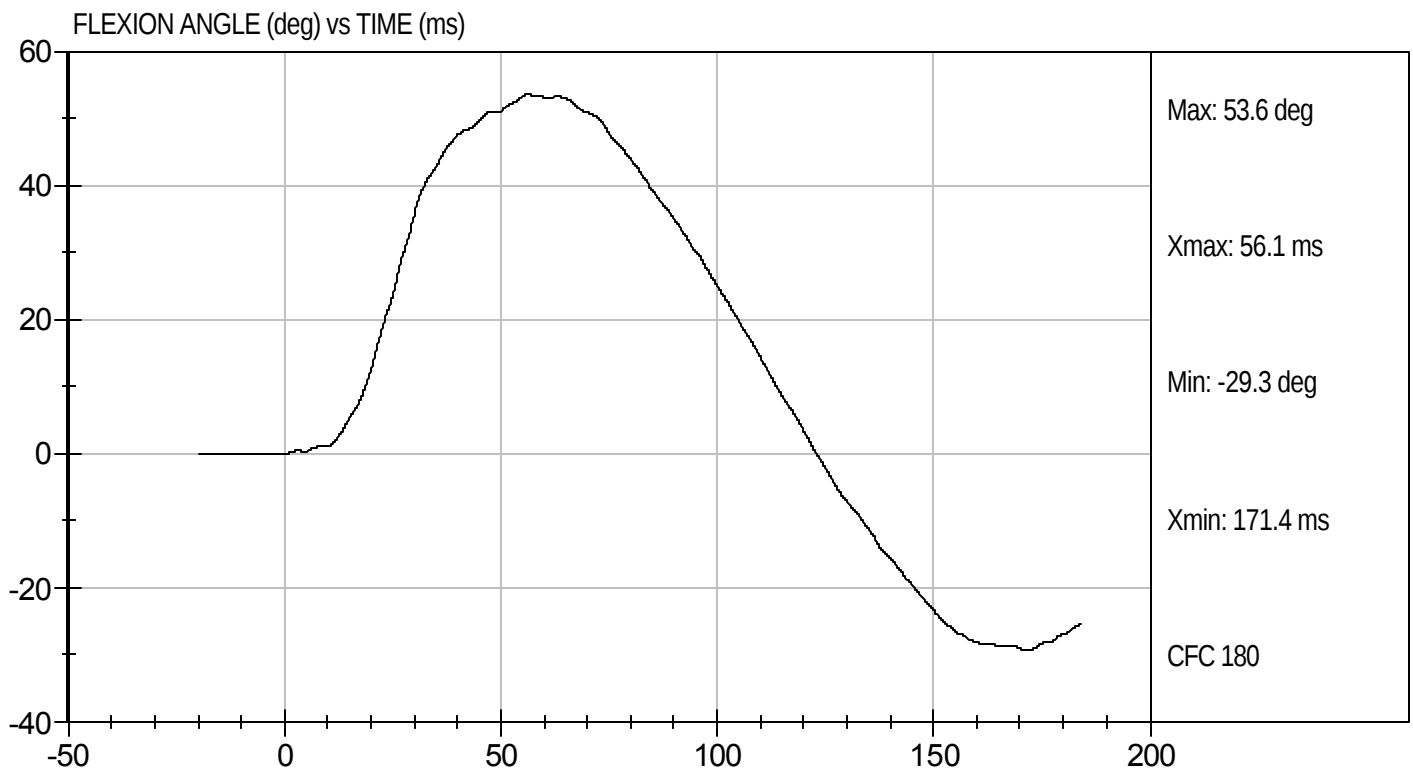
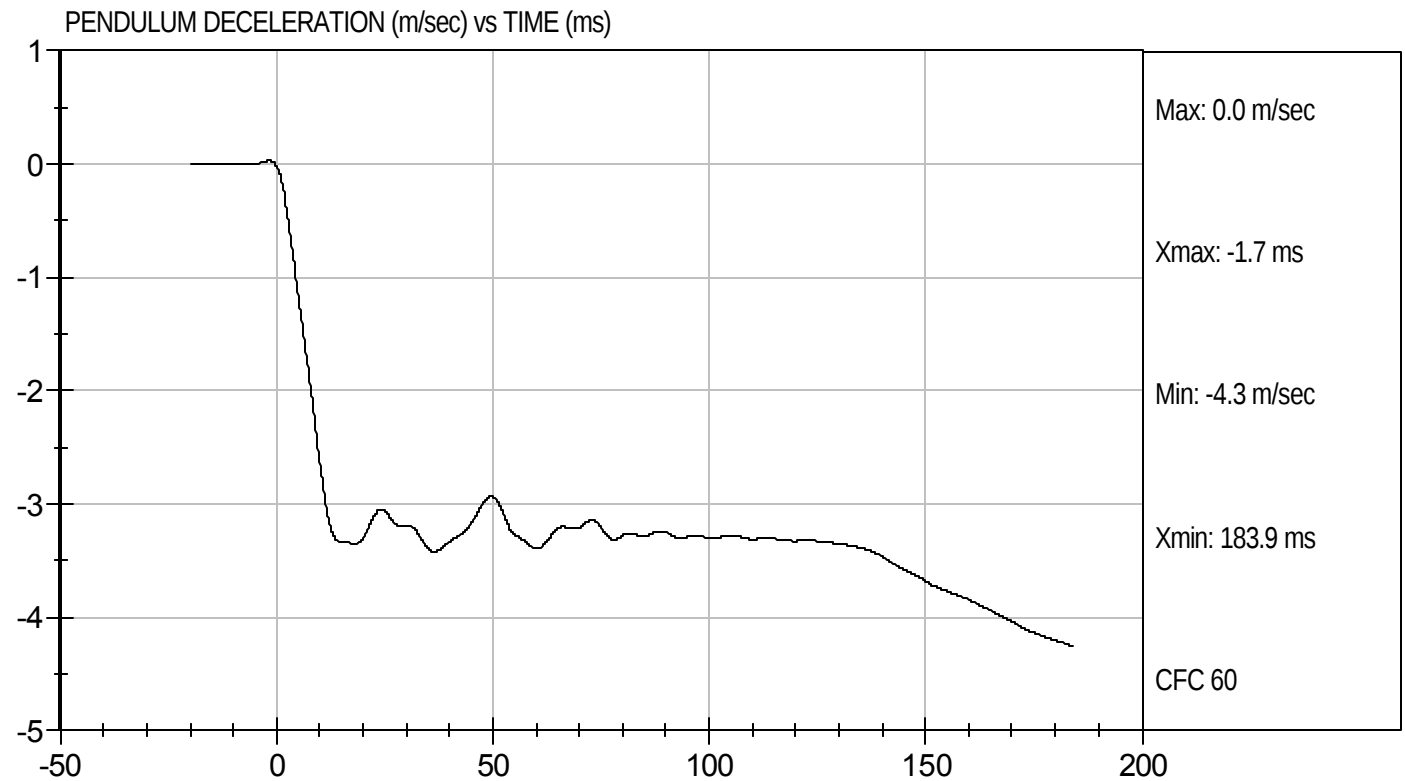
6/20/11
 Test Date


 Approved By



Test Desc: Neck Bending
Component ID: D112132

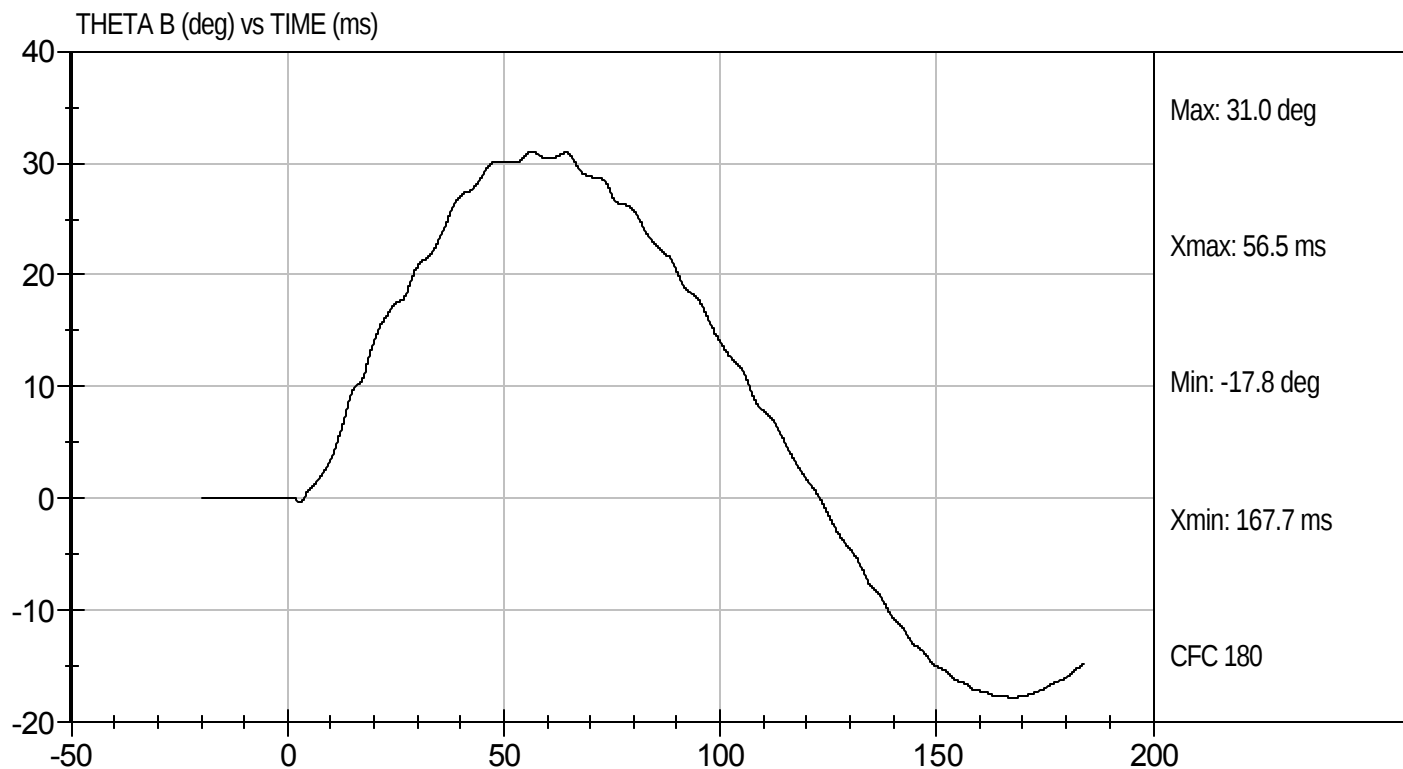
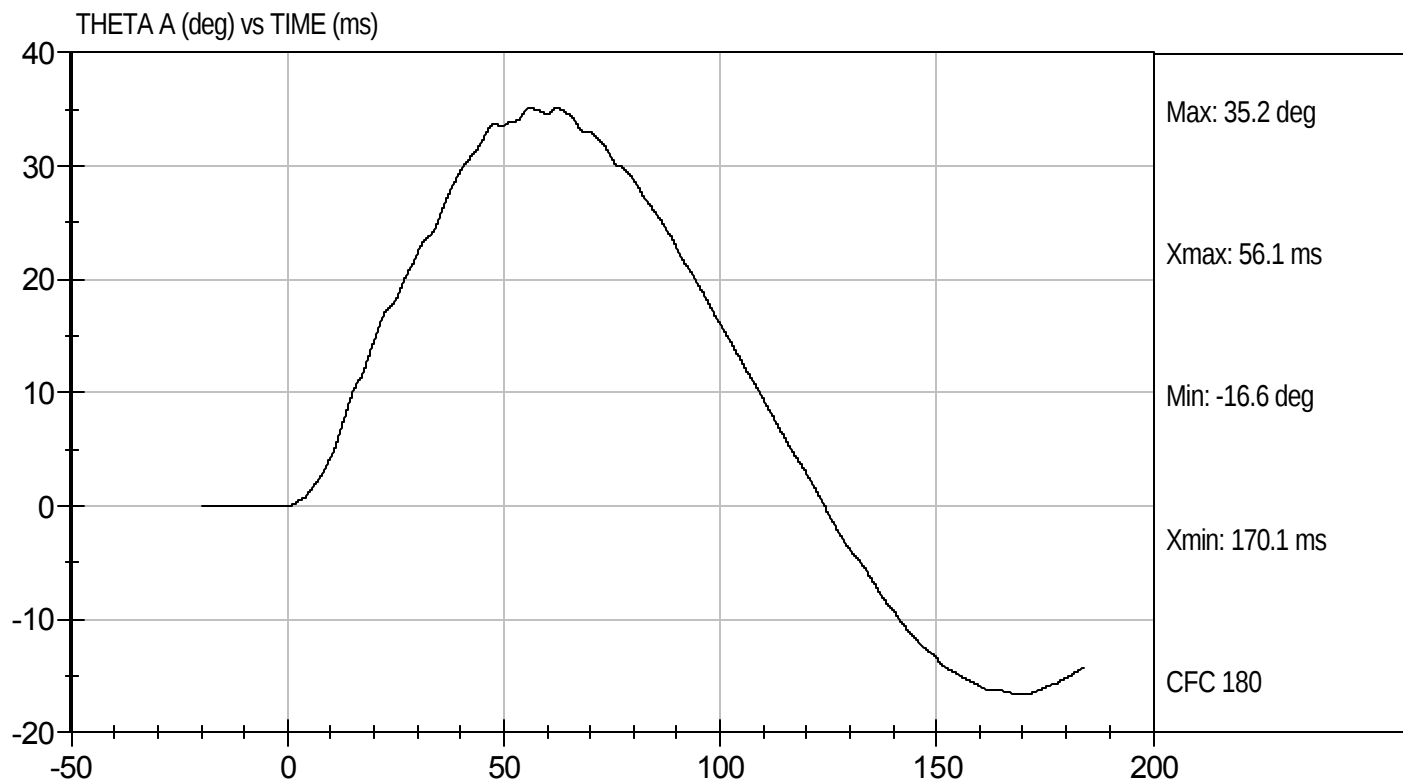
Test Date: 6/20/11
Velocity: 11.42 ft/s, 3.5 m/s





Test Desc: Neck Bending
Component ID: D112132

Test Date: 6/20/11
Velocity: 11.42 ft/s, 3.5 m/s



MGA RESEARCH CORPORATION
SHOULDER IMPACT TEST
ES-2re DUMMY

ATD Serial No: 032

Test I.D: D112133

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	50	Pass
Pendulum Speed	m/s	4.2 to 4.4	4.4	Pass
Peak Shoulder Acceleration	G's	7.5 to 10.5	9.3	Pass
Time of Peak Shoulder Acceleration	ms	NA	13.6	Pass
Overall Test Results			Pass	


Laboratory Technician

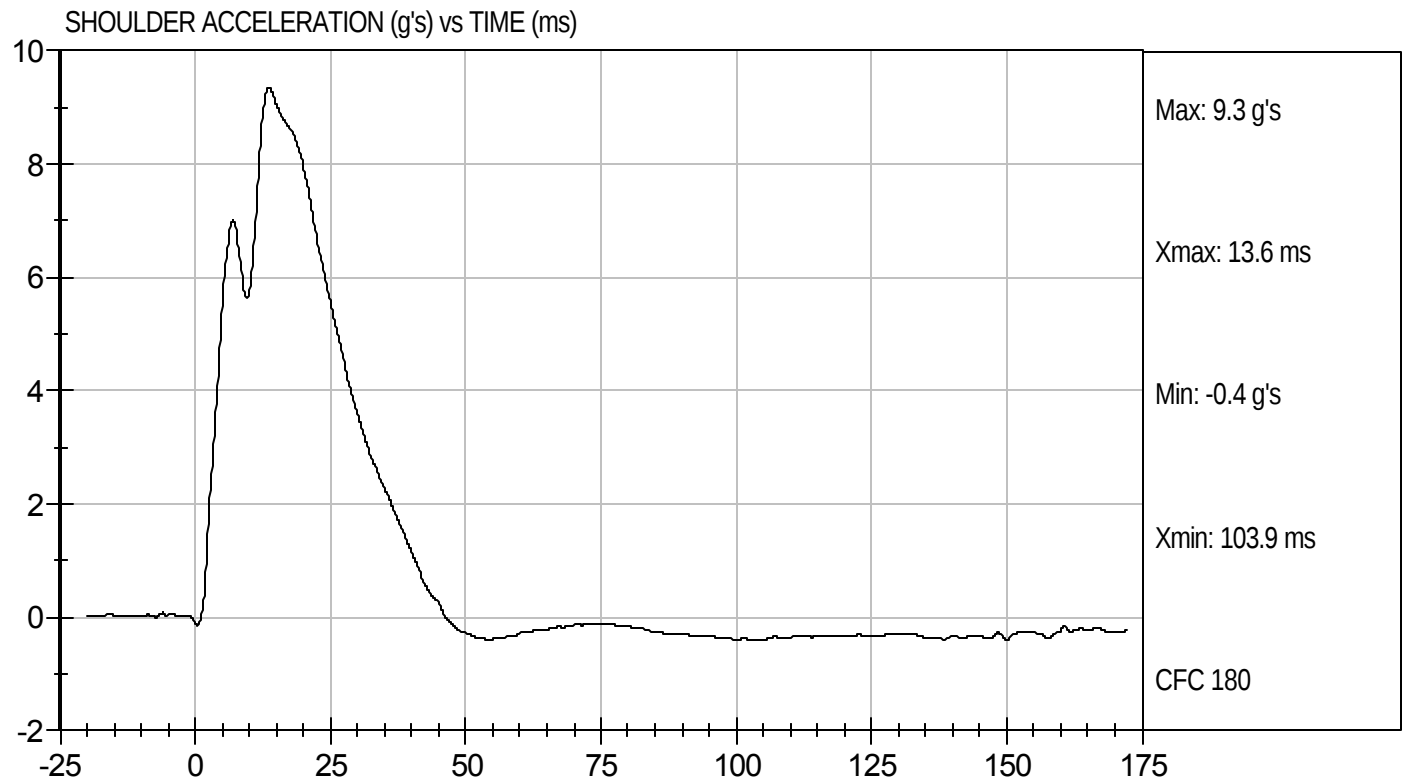
6/20/11
Test Date


Approved By



Test Desc: Shoulder Impact
Component ID: D112133

Test Date: 6/20/11
Velocity: 14.36 ft/s, 4.4 m/s



MGA RESEARCH CORPORATION

UPPER RIB TEST

ES-2re DUMMY

ATD Serial No: 032

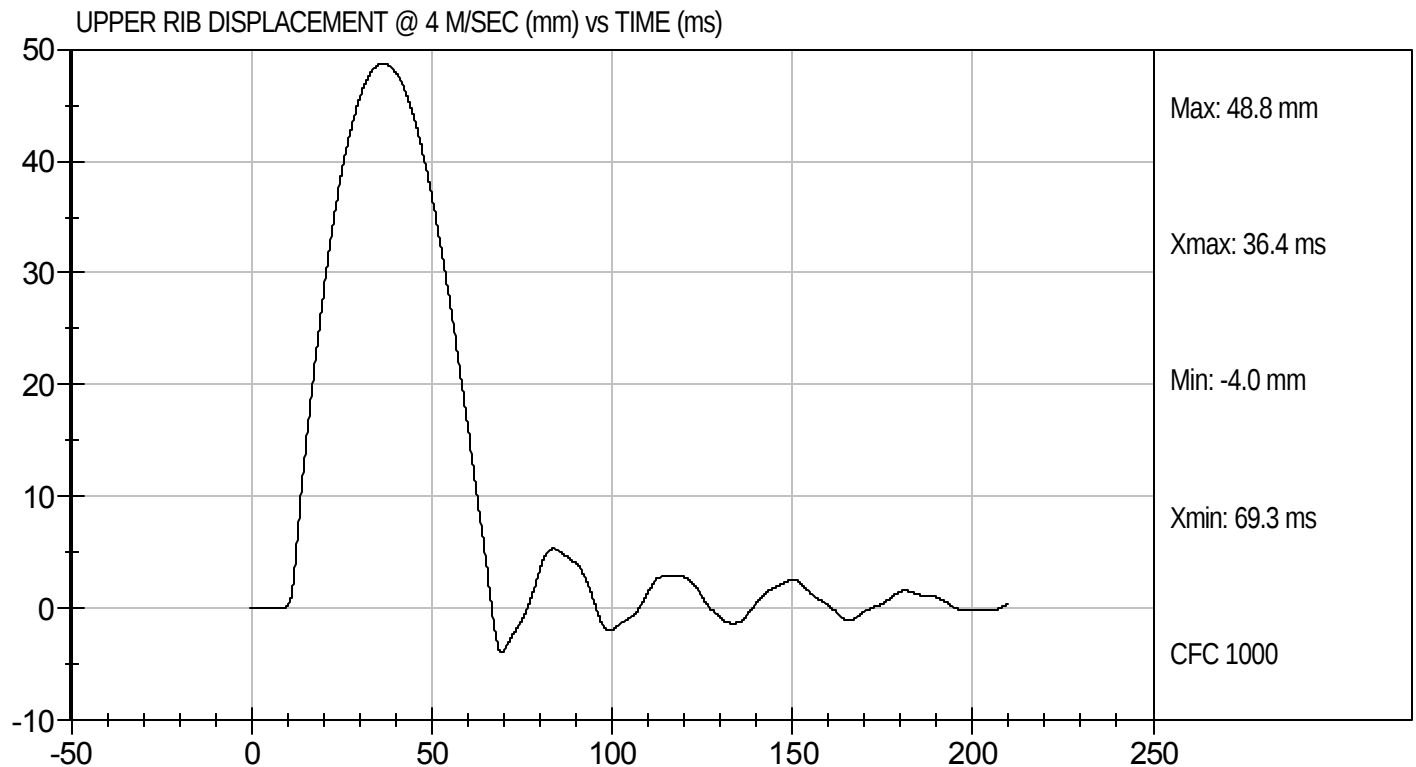
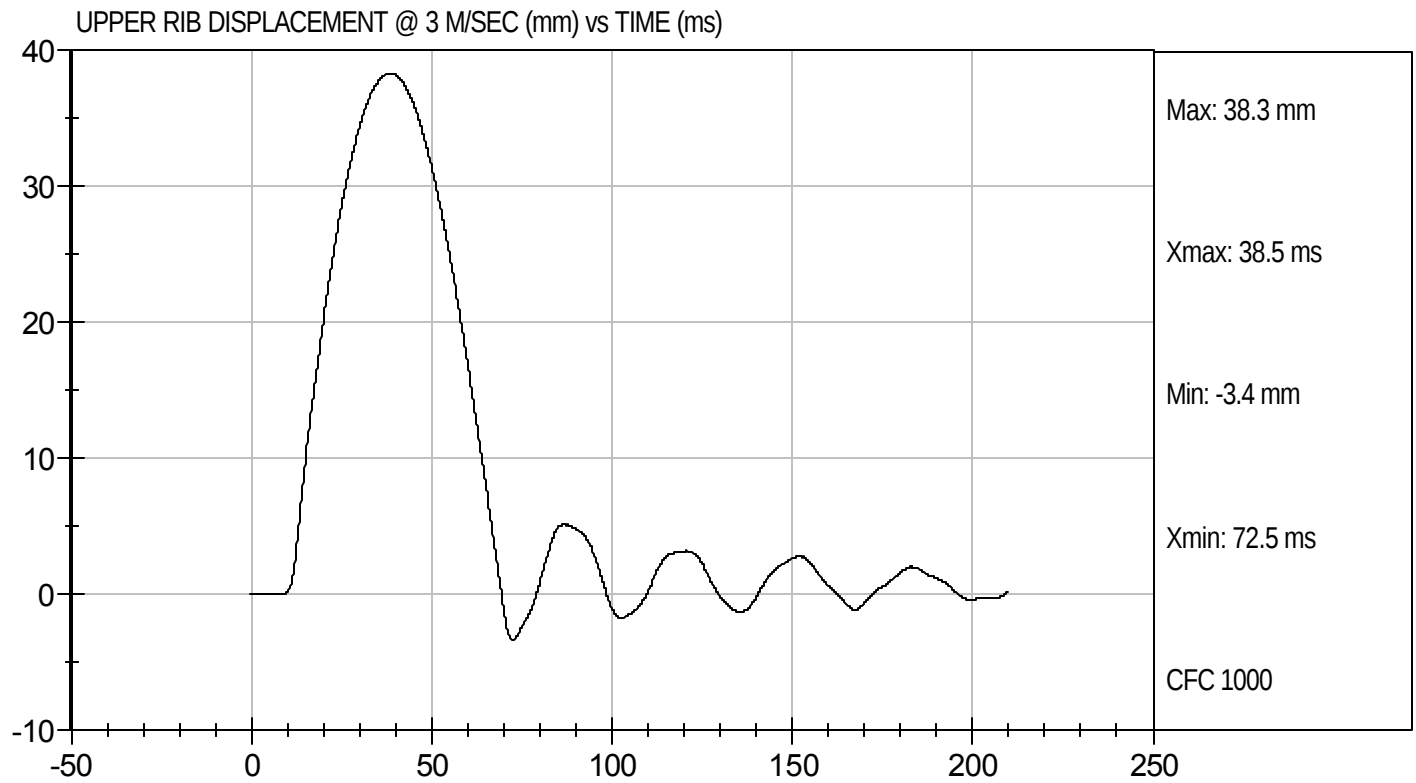
Test I.D: D112134

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	54	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	48.8	Pass
Overall Test Results			Pass	

Jessica Gall
Laboratory Technician

6/20/11
Test Date

David Winkelbauer
Approved By



MGA RESEARCH CORPORATION

MID RIB TEST
ES-2re DUMMY

ATD Serial No: 032

Test I.D: D112135

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	54	Pass
Displacement at 3 m/s	mm	36.0 to 40.0	37.7	Pass
Displacement at 4 m/s	mm	46.0 to 51.0	48.5	Pass
			Overall Test Results	Pass

Jessica Gall
Laboratory Technician

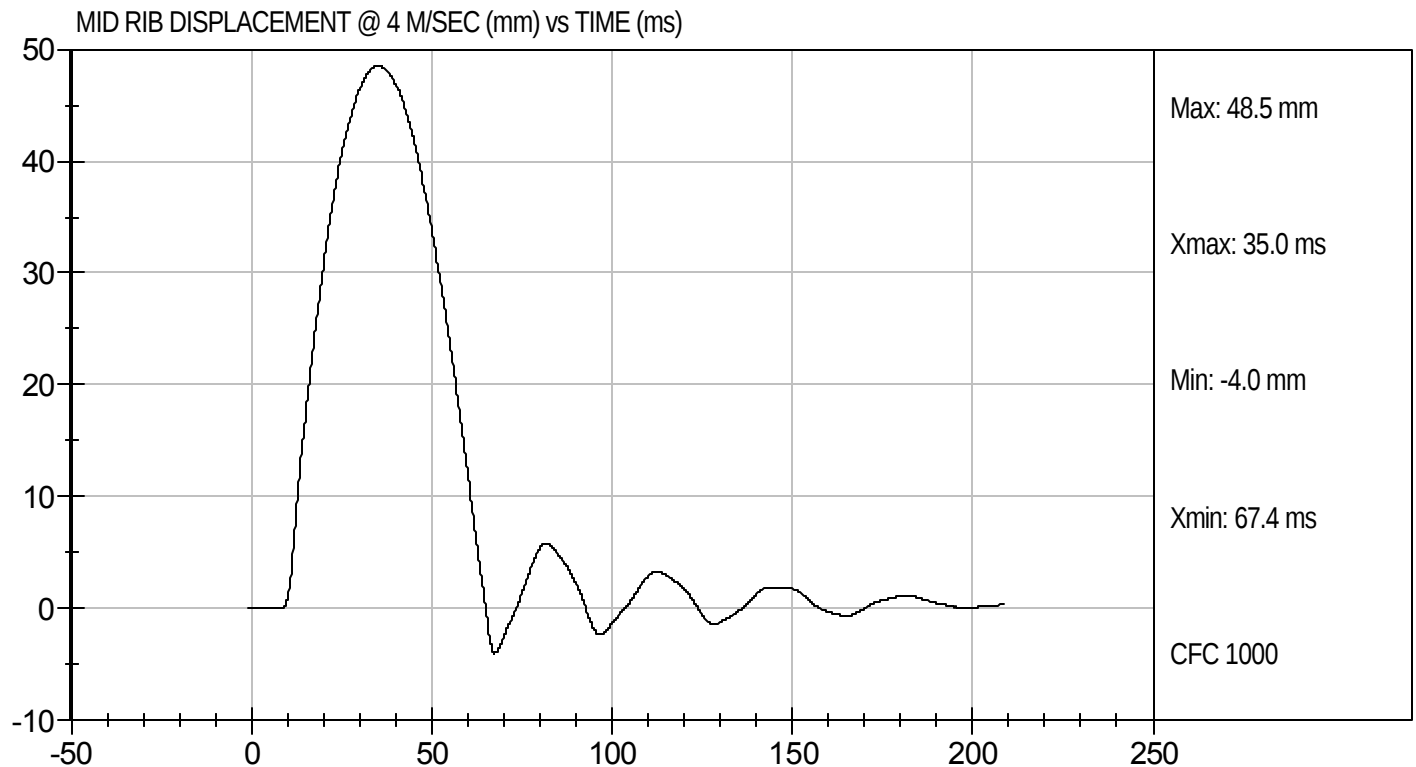
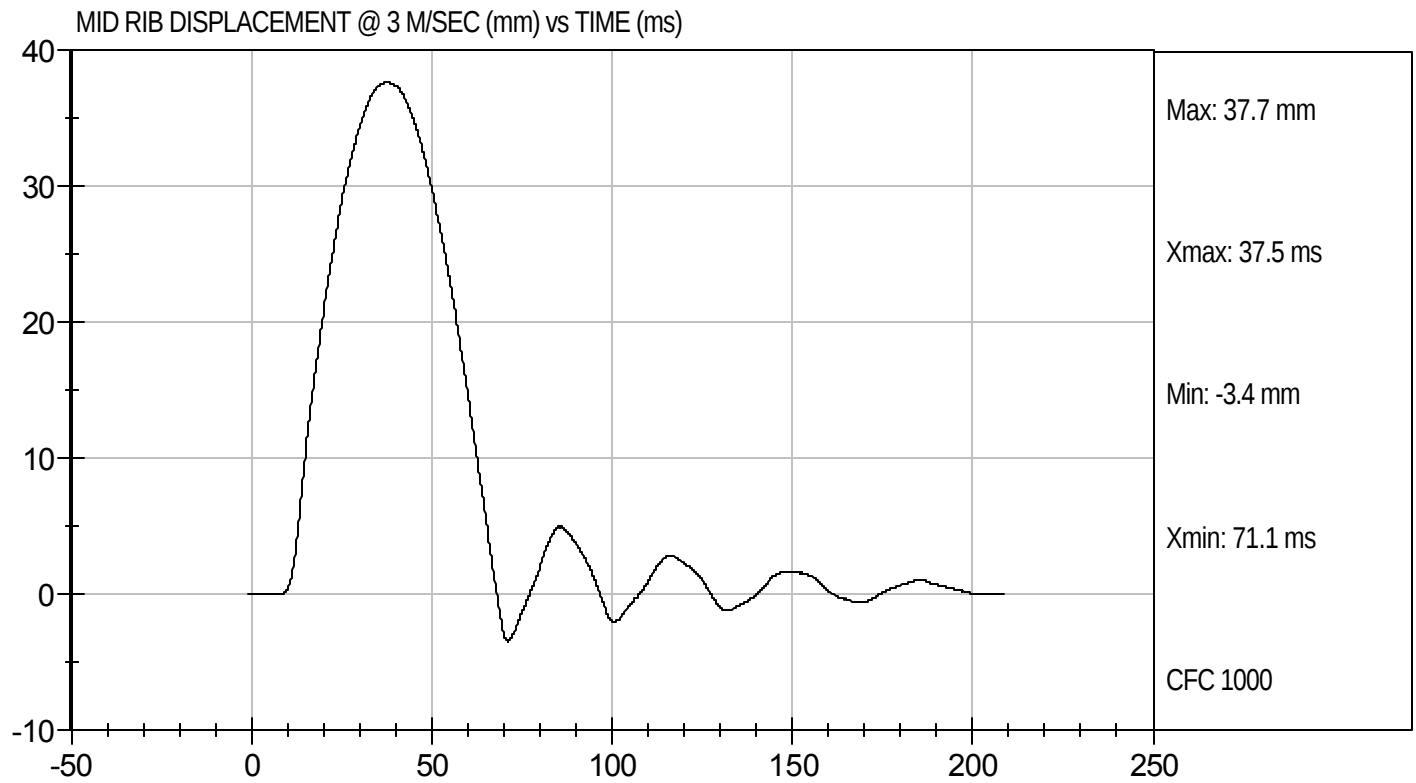
6/20/11
Test Date

David Winkelbauer
Approved By



Test Desc: Rib Impact - Mid
Component ID: D112135

Test Date: 6/20/11



MGA RESEARCH CORPORATION

LOWER RIB TEST

ES-2re DUMMY

ATD Serial No: 032

Test I.D: D112136

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	54	Pass
Displacement at 3 m/s	mm	36.0 to 40.0	38.9	Pass
Displacement at 4 m/s	mm	46.0 to 51.0	48.5	Pass
			Overall Test Results	Pass

Jessica Hall
Laboratory Technician

6/20/11
Test Date

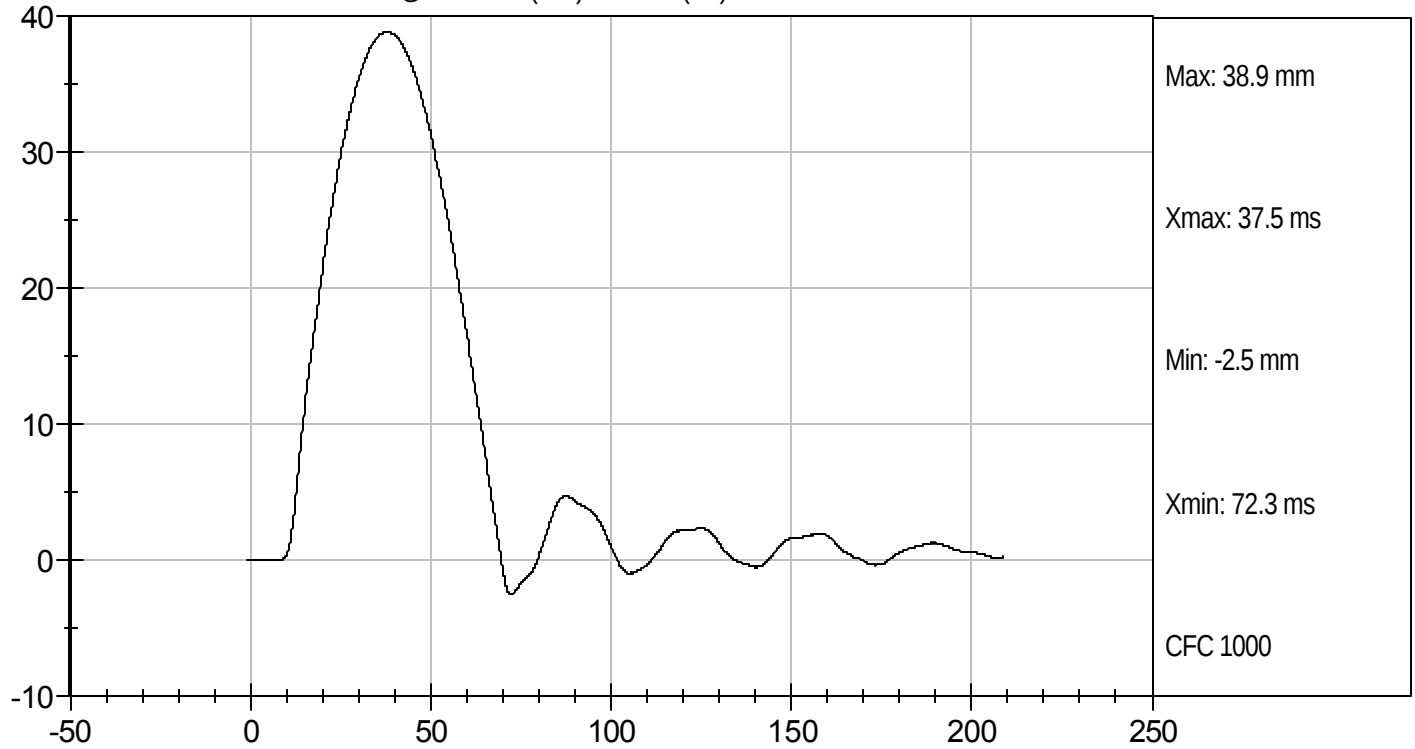
David Winkelbauer
Approved By



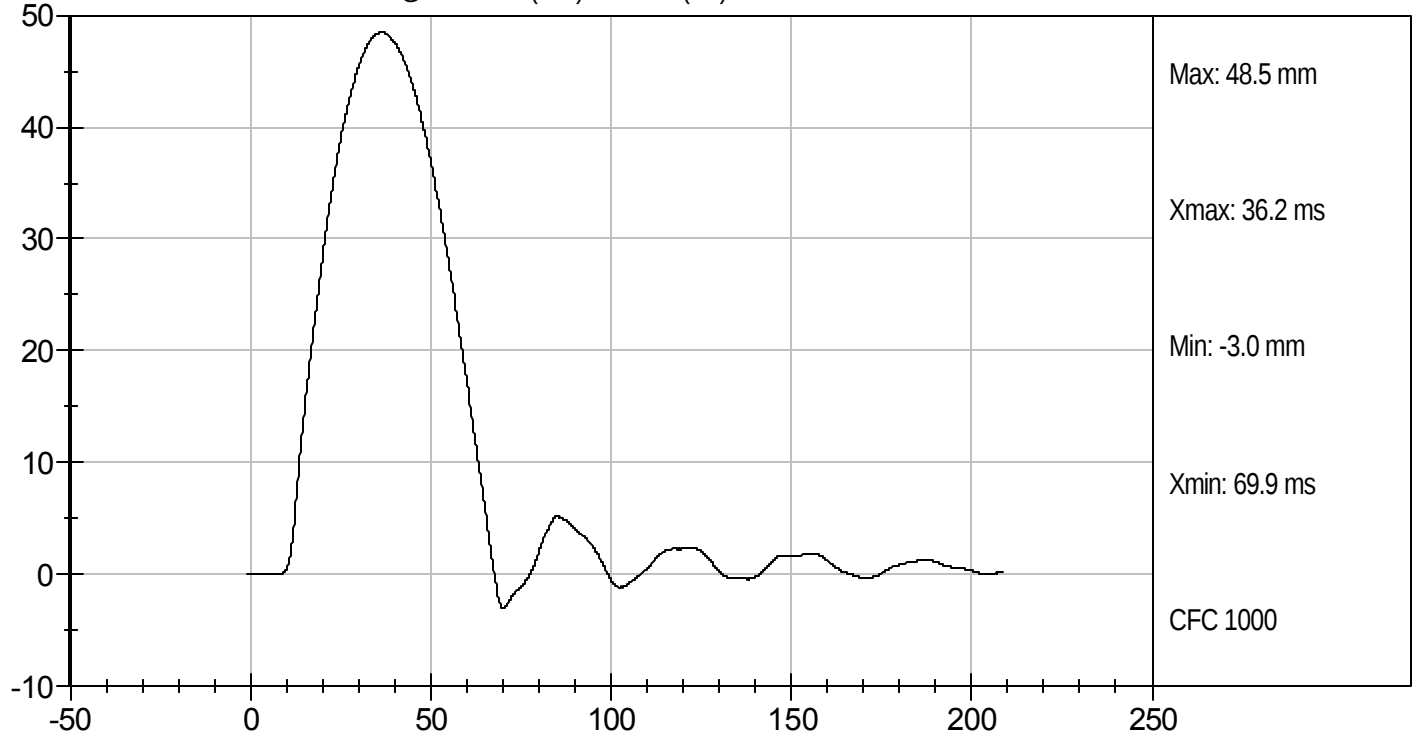
Test Desc: Rib Impact - Lower
Component ID: D112136

Test Date: 6/20/11

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: 032Test I.D: D112137

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	50	Pass
Probe Speed	m/s	3.90 to 4.10	4.10	Pass
Maximum Impact Force	kN	4.00 to 4.80	4.18	Pass
Time of Maximum Impactor Force	ms	10.60 to 13.00	11.80	Pass
Maximum Total Abdomen Force	kN	2.20 to 2.70	2.33	Pass
Time of Maximum Abdomen Force	ms	10.00 to 12.30	11.30	Pass
Overall Test Results				Pass

Jessica Gall
Laboratory Technician

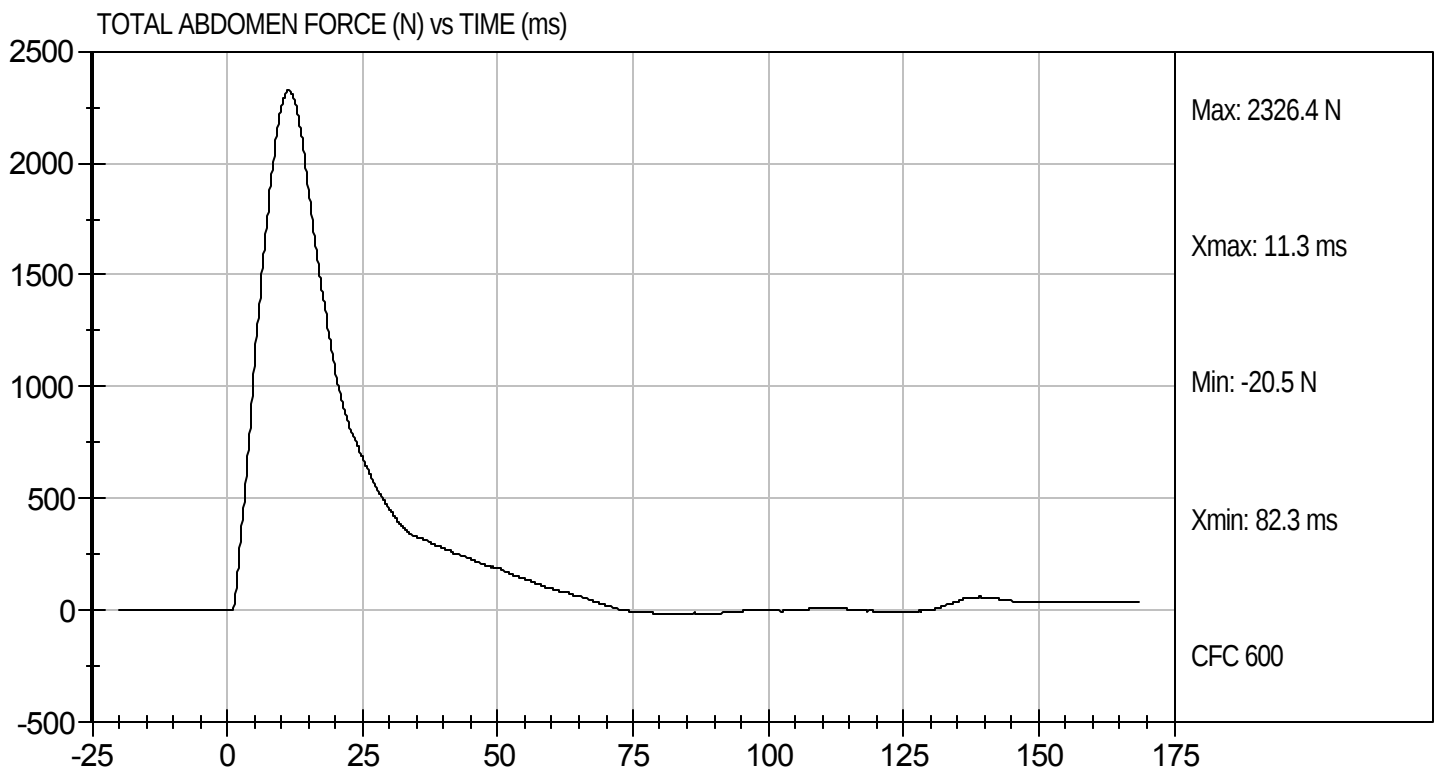
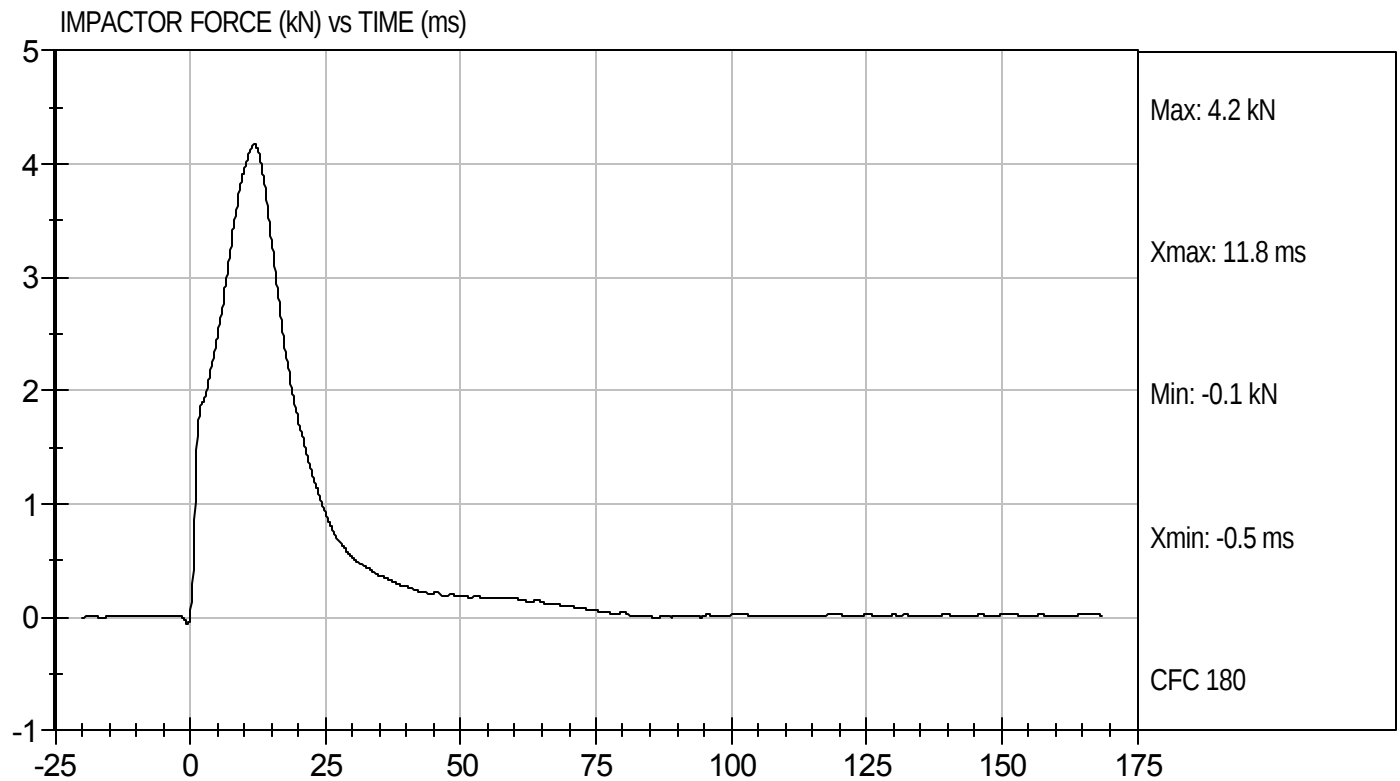
6/20/11
Test Date

David Winkelbauer
Approved By



Test Desc: Abdomen Impact
Component ID: D112137

Test Date: 6/20/11
Velocity: 13.44 ft/s, 4.1 m/s

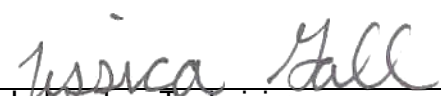


MGA RESEARCH CORPORATION
LUMBAR SPINE TEST
ES-2re DUMMY

ATD Serial No: 032

Test I.D: D112138

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	50	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	-0.42	Pass
	27 ms	m/s	-6.50 to -5.80	-5.91	Pass
	30 ms	m/s	>= -6.5	-6.05	Pass
Maximum Flexion Angle		deg	45.0 to 55.0	52.0	Pass
Time of Maximum Flexion Angle		ms	39.0 to 53.0	45.6	Pass
Headform Rotation Decay to Initial Position		ms	37 to 57	47	Pass
Overall Results					Pass


 Laboratory Technician

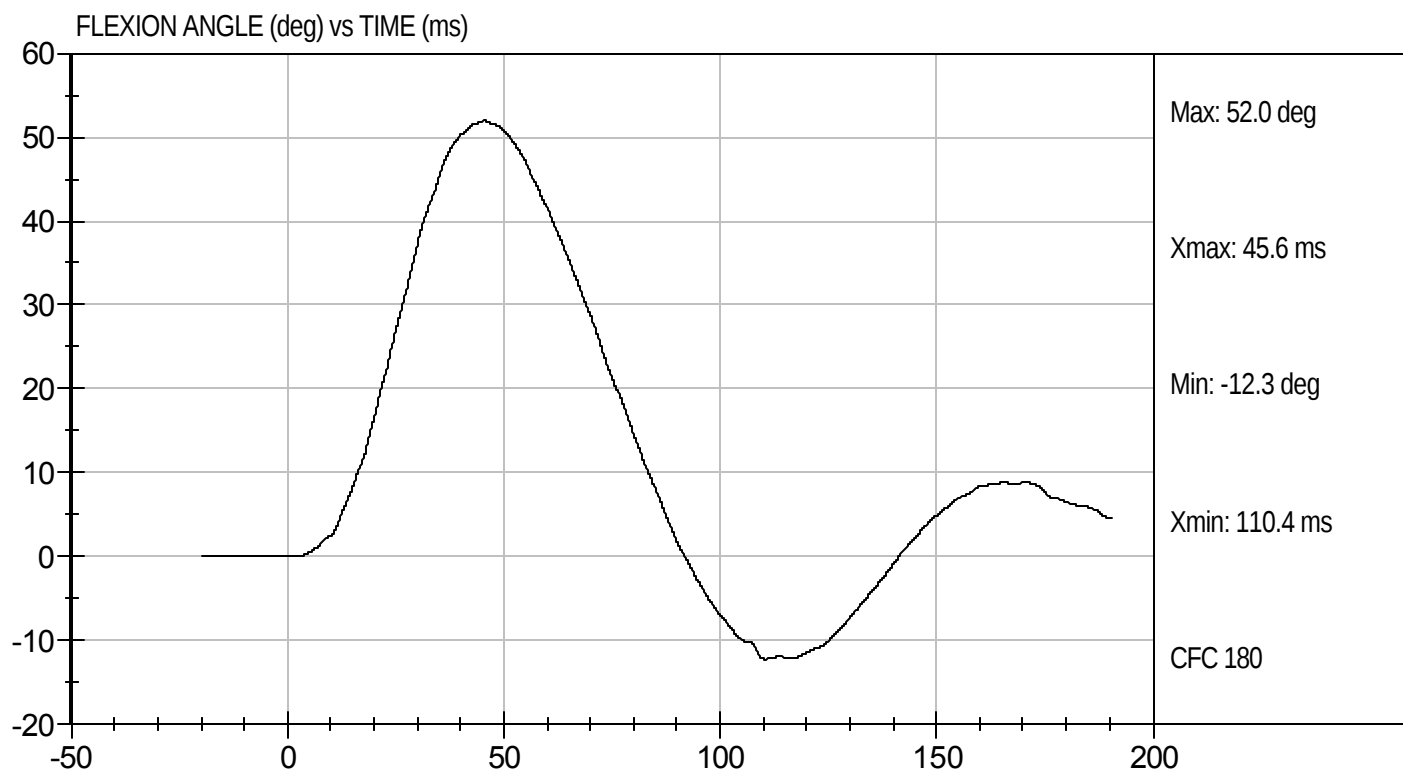
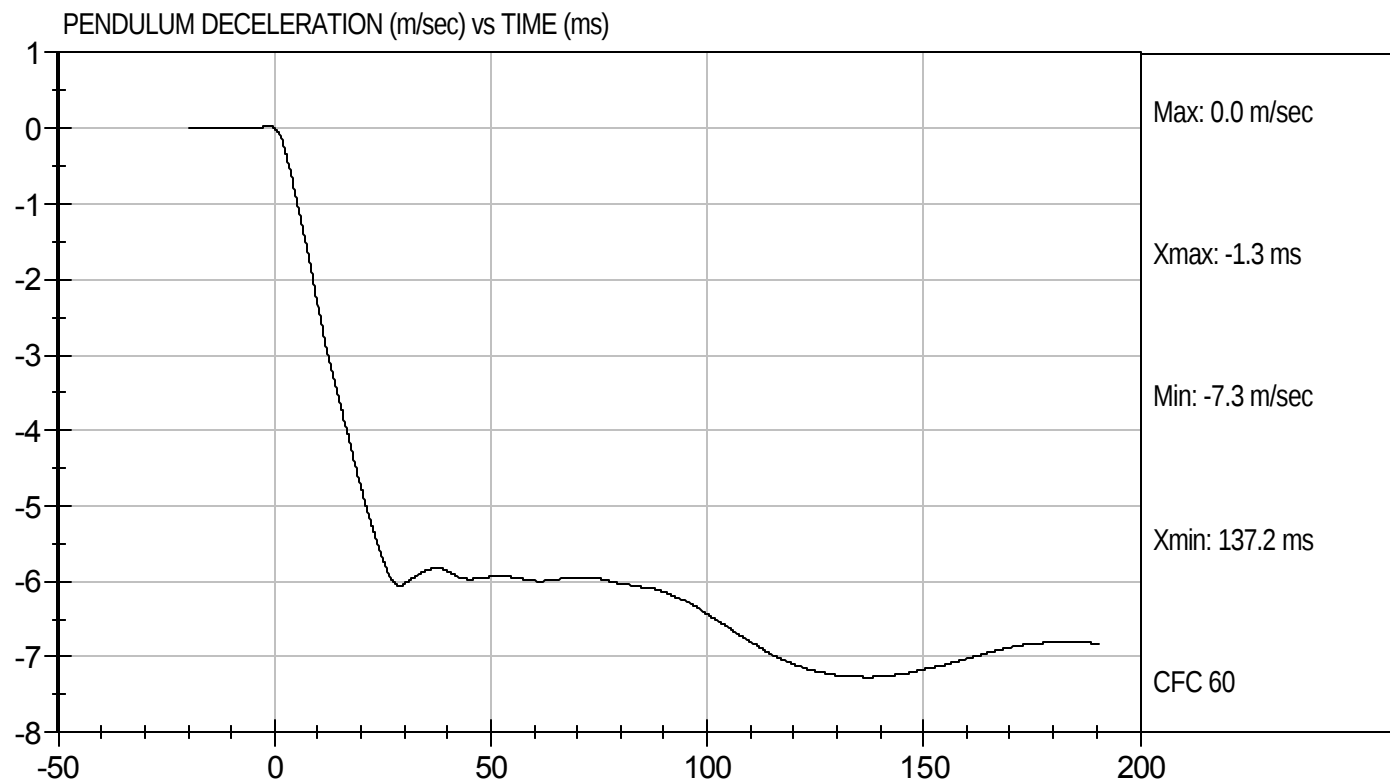
6/17/11
 Test Date


 Approved By



Test Desc: Lumbar Flexion
Component ID: D112138

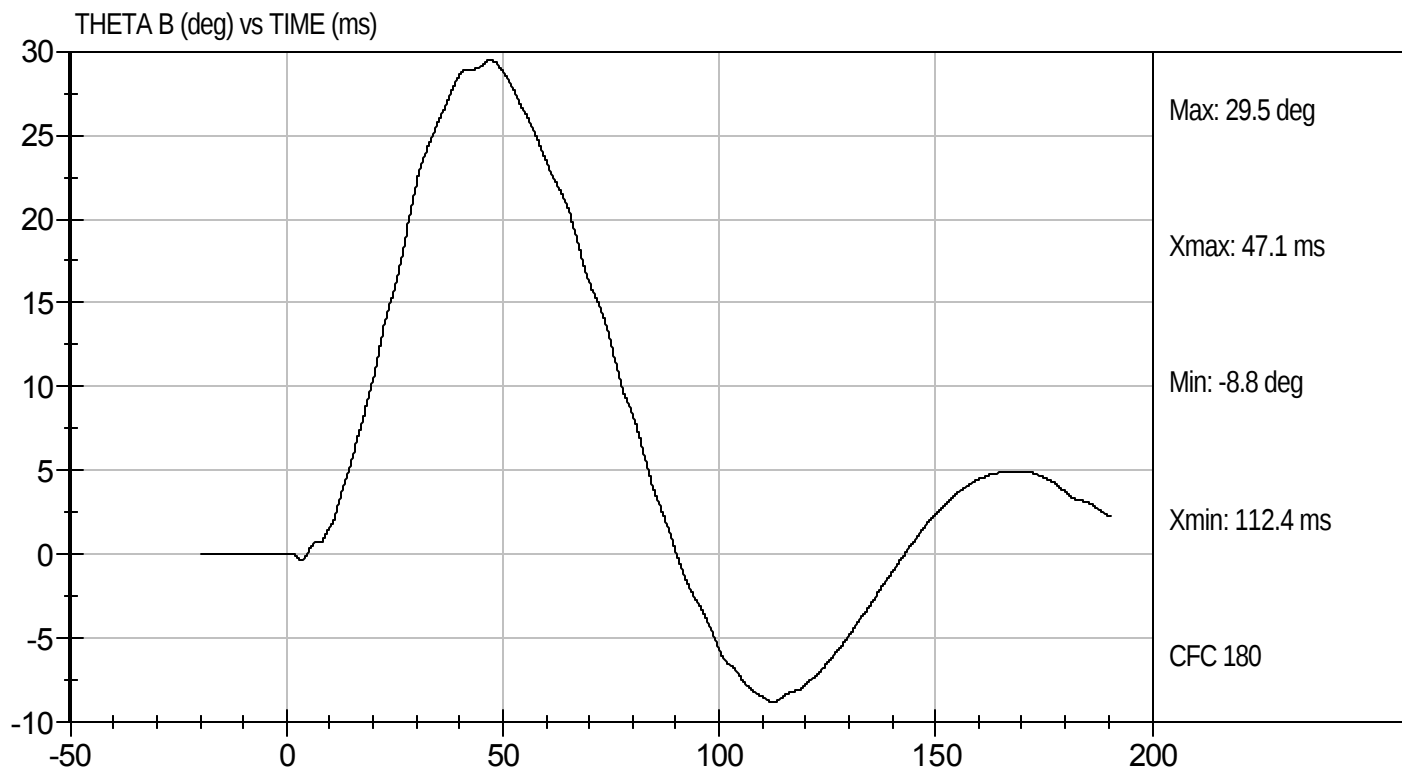
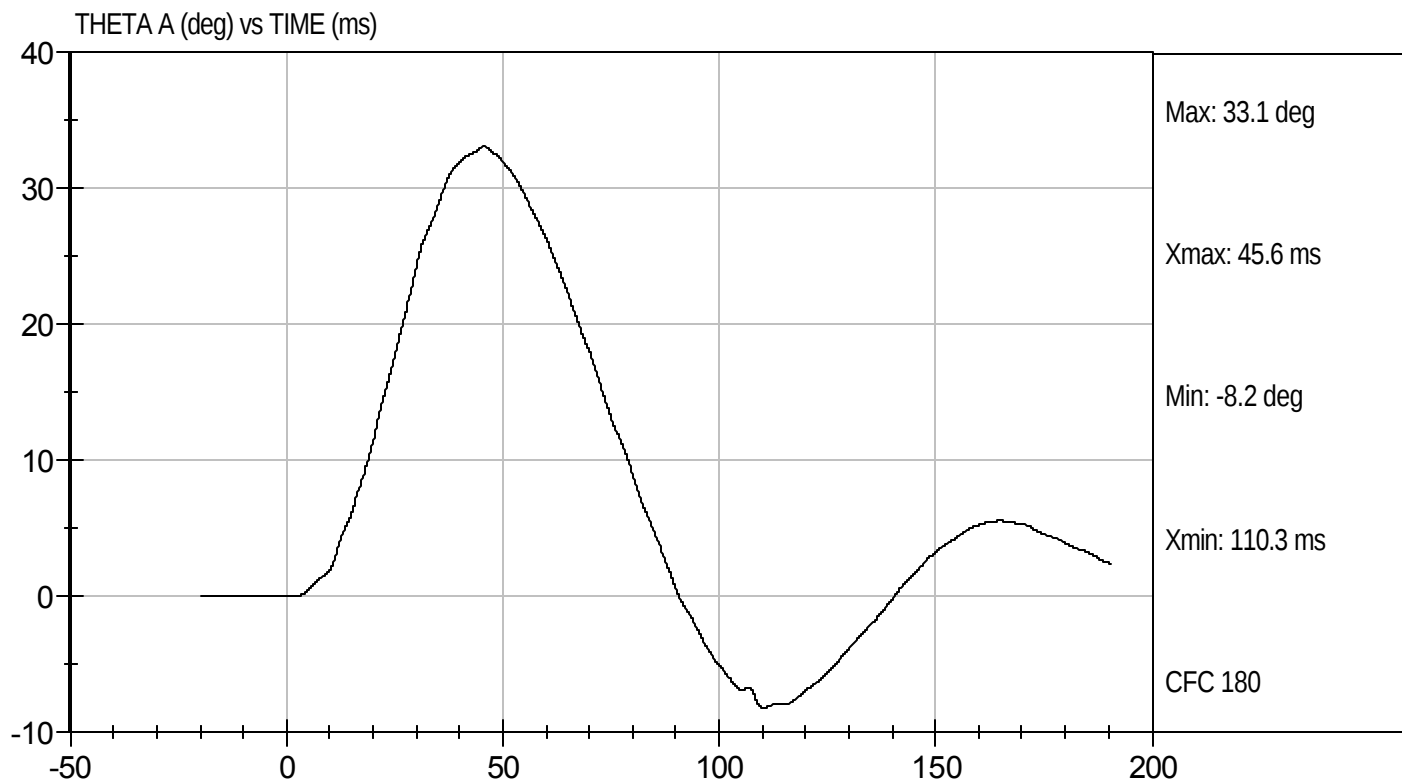
Test Date: 6/17/11
Velocity: 20.08 ft/s, 6.12 m/s





Test Desc: Lumbar Flexion
Component ID: D112138

Test Date: 6/17/11
Velocity: 20.08 ft/s, 6.12 m/s



MGA RESEARCH CORPORATION

PELVIS TEST
ES-2re DUMMY

ATD Serial No: 032

Test I.D: D112139

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	50	Pass
Probe Speed	m/s	4.20 to 4.40	4.27	Pass
Maximum Impactor Force	kN	4.70 to 5.40	4.94	Pass
Time of Maximum Impactor Force	ms	11.80 to 16.10	13.60	Pass
Maximum Pubic Force	kN	1.23 to 1.59	1.52	Pass
Time of Maximum Pubic Force	ms	12.20 to 17.00	15.30	Pass
Overall Test Results				Pass


Laboratory Technician

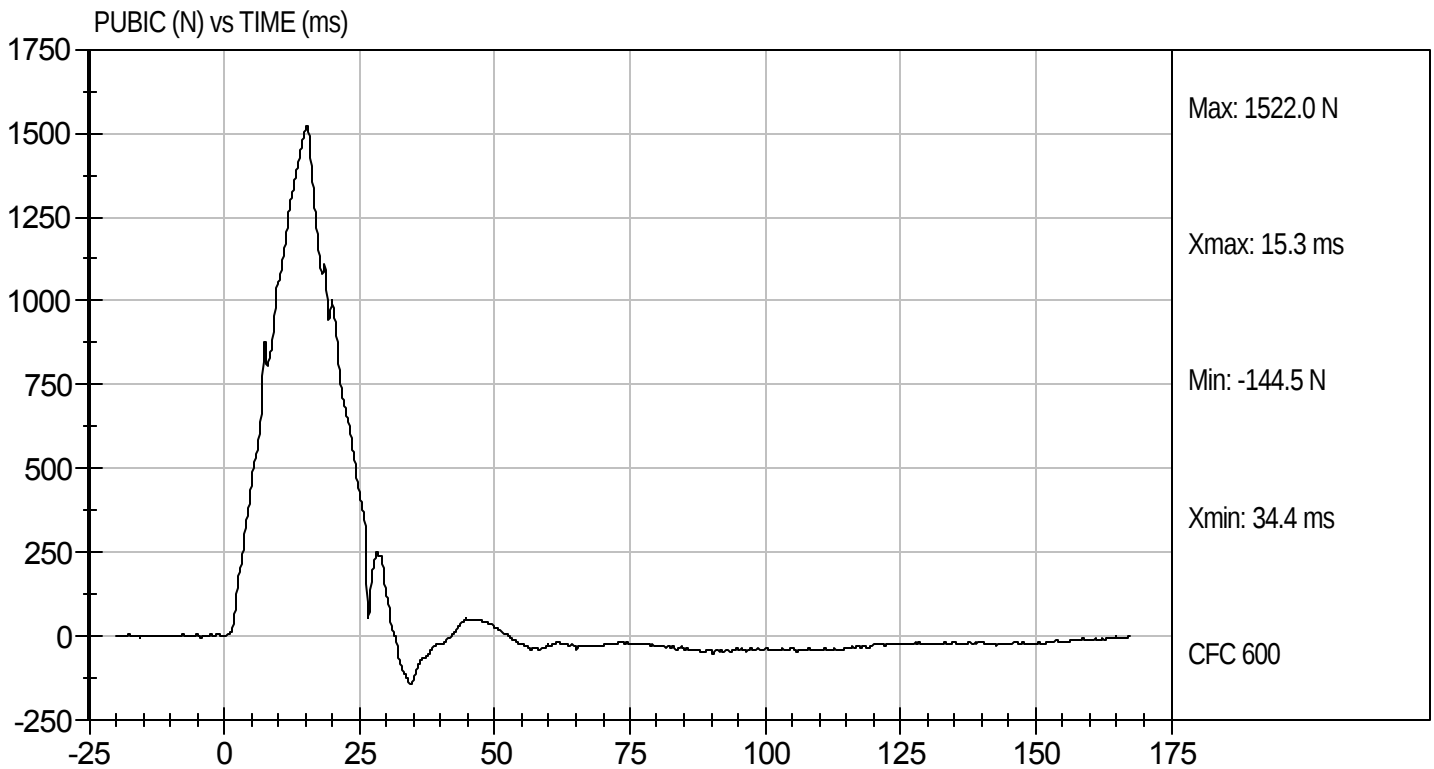
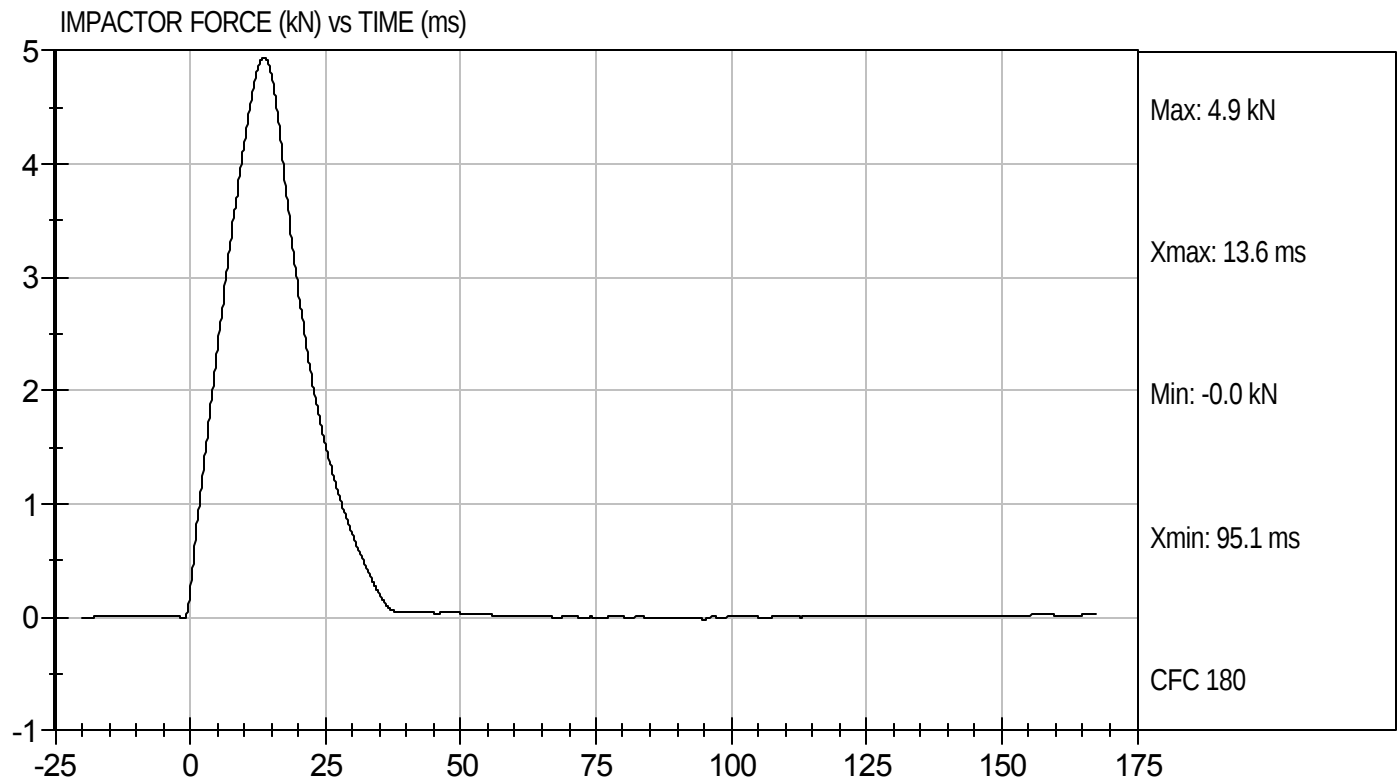
6/20/11
Test Date


Approved By



Test Desc: Pelvis Impact
Component ID: D112139

Test Date: 6/20/11
Velocity: 14.00 ft/s, 4.27 m/s



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

ATD Serial No: 032

Test I.D: D112130

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.4	Pass
Humidity	%	10 to 70	50	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	5.38	Pass
Upper Rib Displacement	mm	34.0 to 41.0	37.8	Pass
Middle Rib Displacement	mm	37.0 to 45.0	41.0	Pass
Lower Rib Displacement	mm	37.0 to 44.0	41.5	Pass
			Overall Test Results	Pass

Jessica Hall
Laboratory Technician

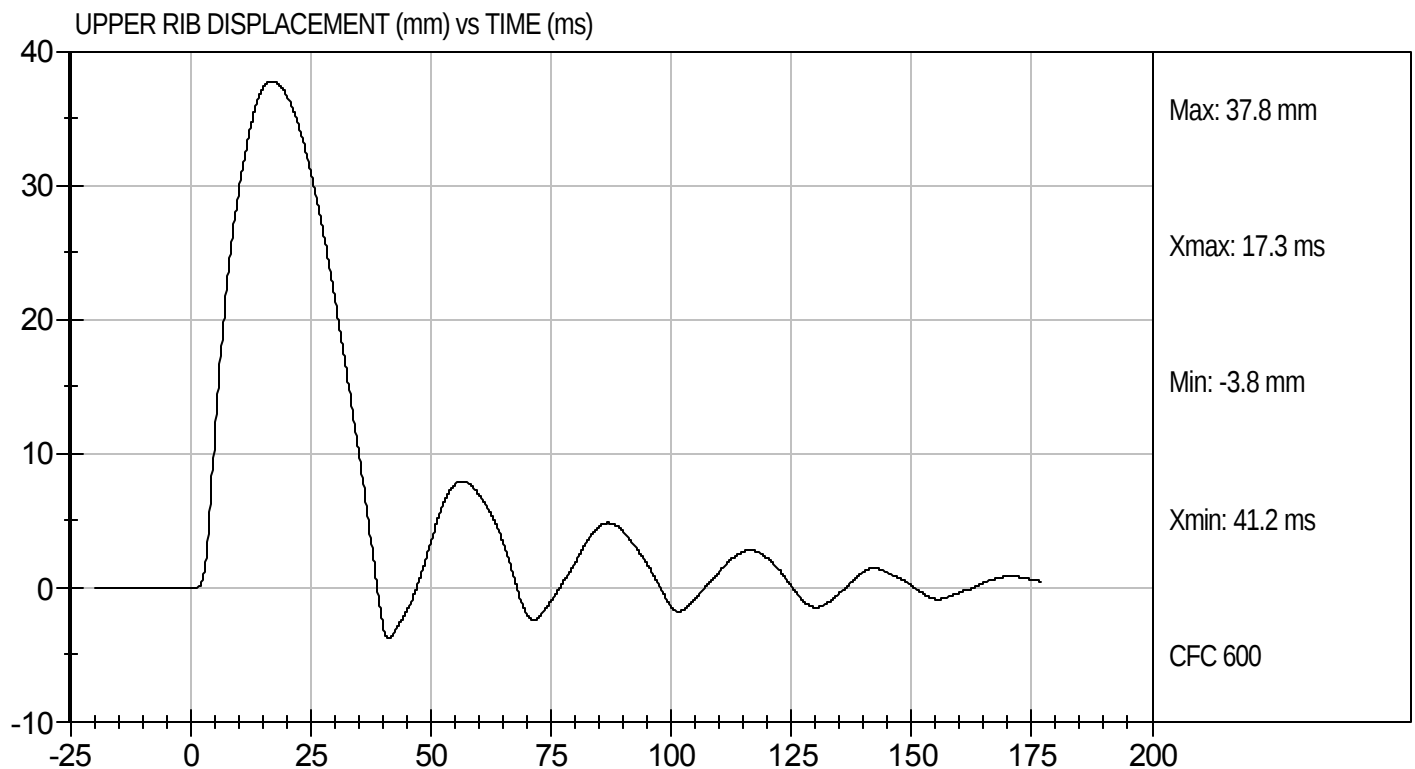
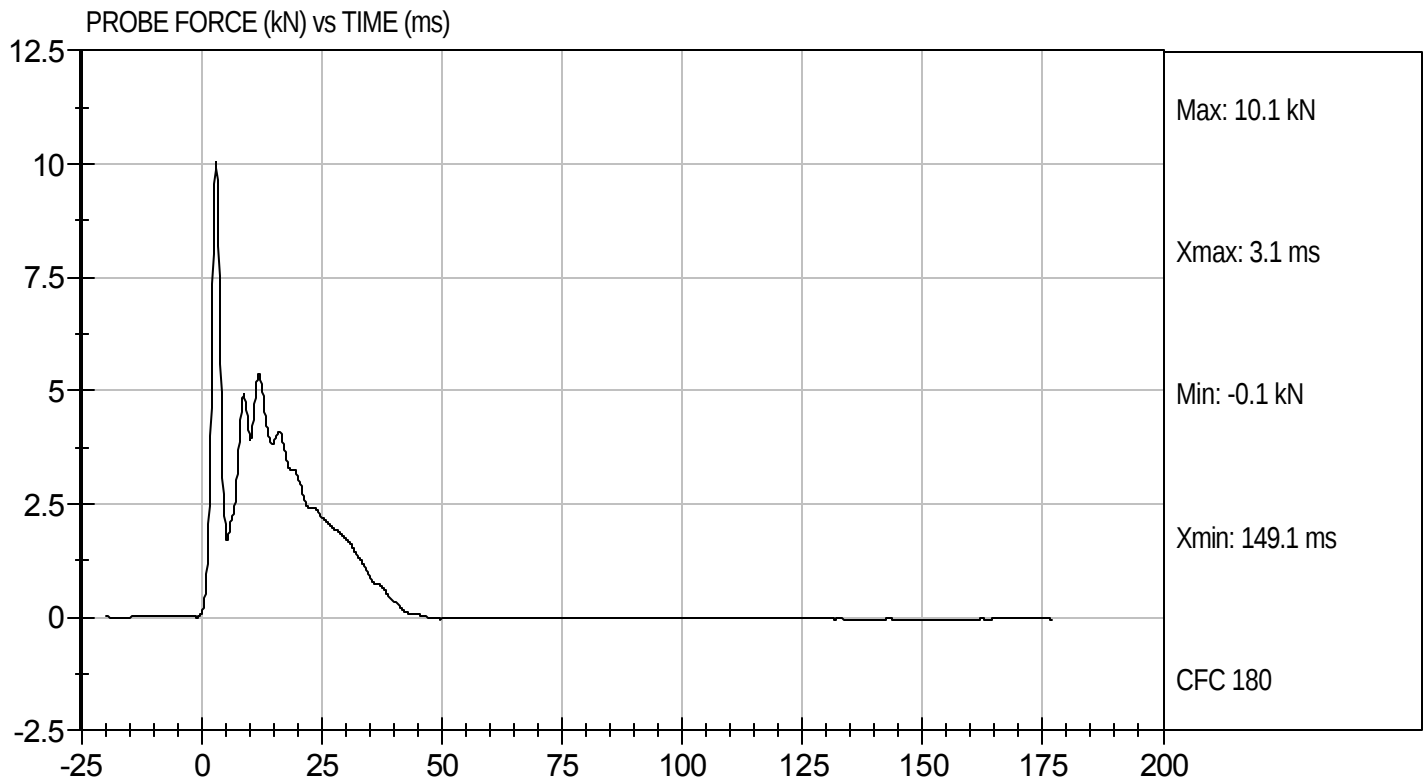
6/20/11
Test Date

David Winkelbauer
Approved By



Test Desc: Thorax Impact
Component ID: D112130

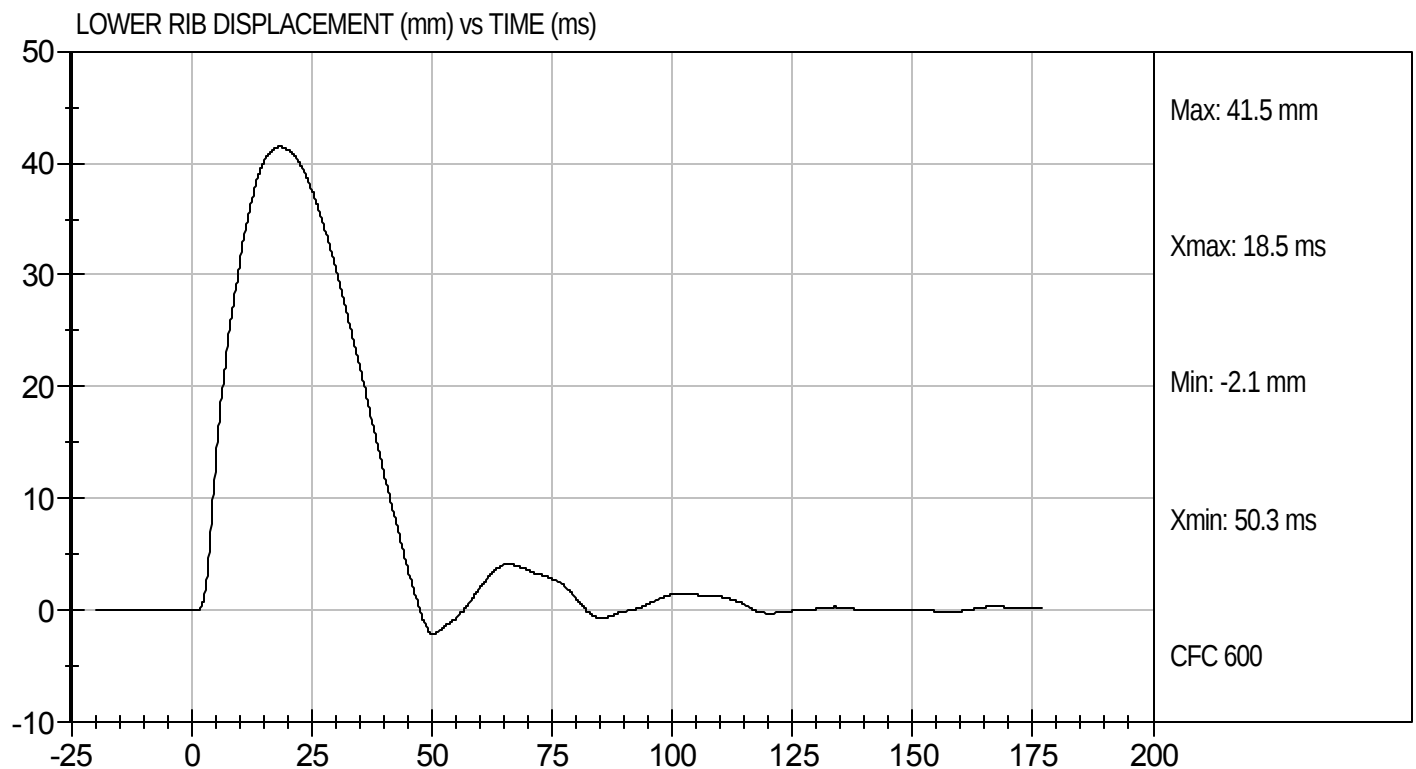
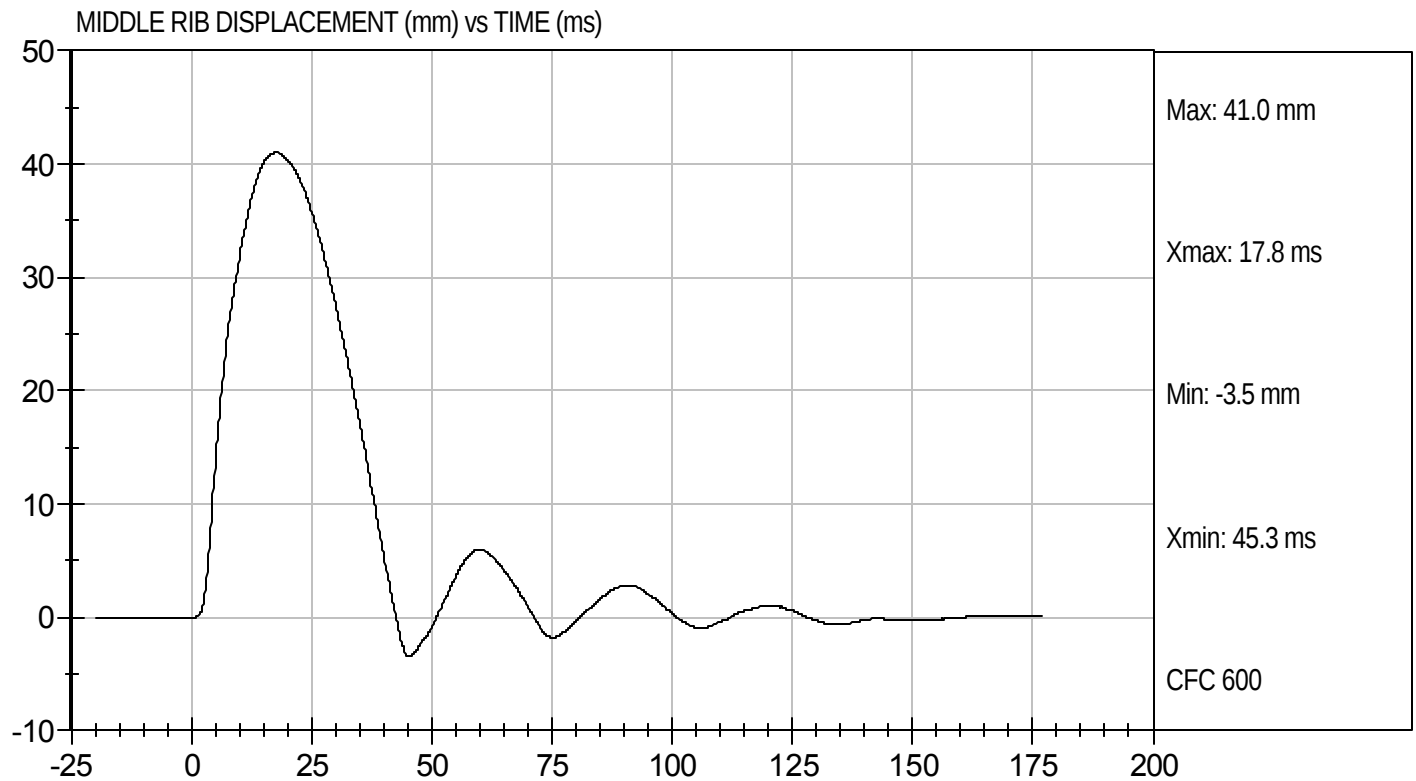
Test Date: 6/20/11
Velocity: 18.31 ft/s, 5.58 m/s





Test Desc: Thorax Impact
Component ID: D112130

Test Date: 6/20/11
Velocity: 18.31 ft/s, 5.58 m/s



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

ATD Serial No: 306

Test ID: D112031

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	49	Pass
Peak Resultant Acceleration	G's	115 to 137	122	Pass
Peak Lateral Acceleration	G's	+/- 15	2.8	Pass
Unimodal	N/A	<15%	Yes	Pass
Overall Test Results				Pass



Laboratory Technician

6/9/11

Test Date

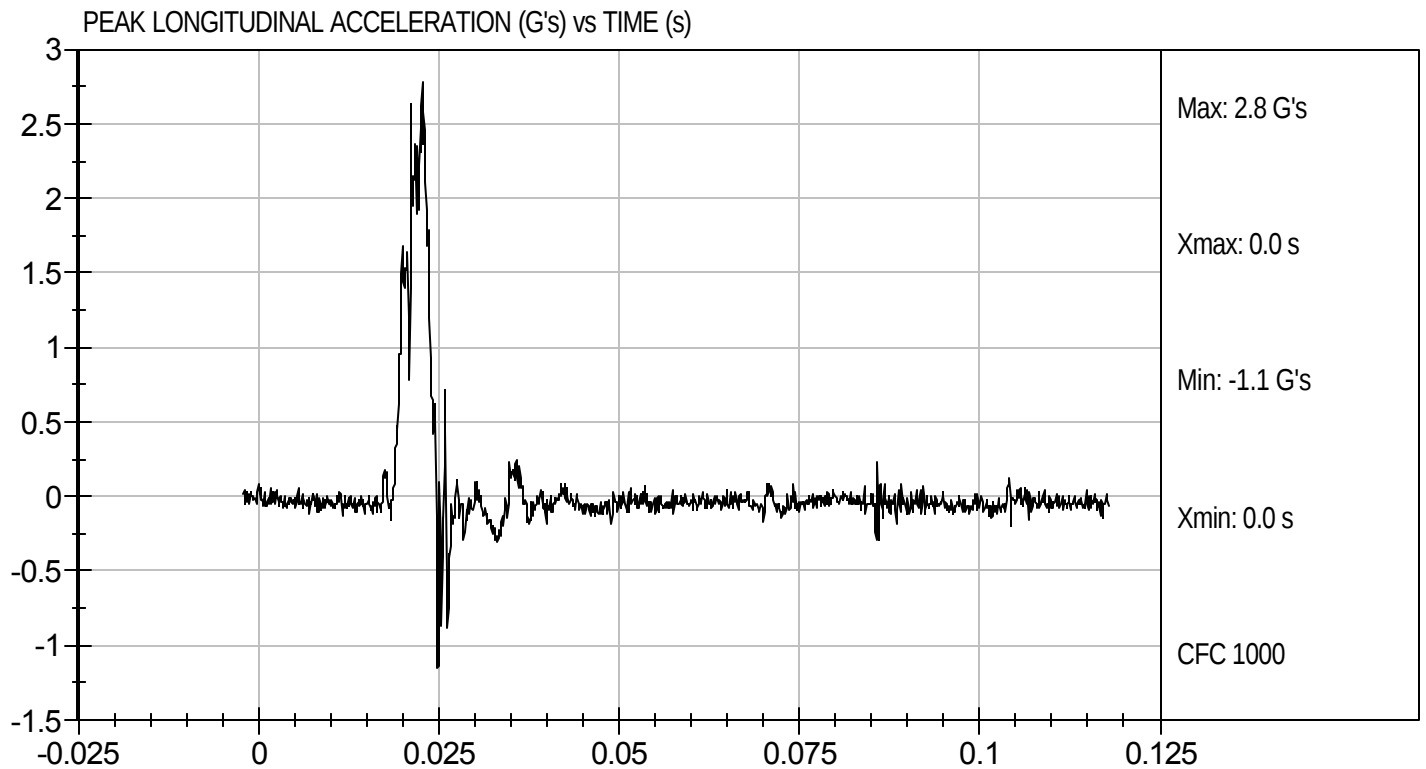
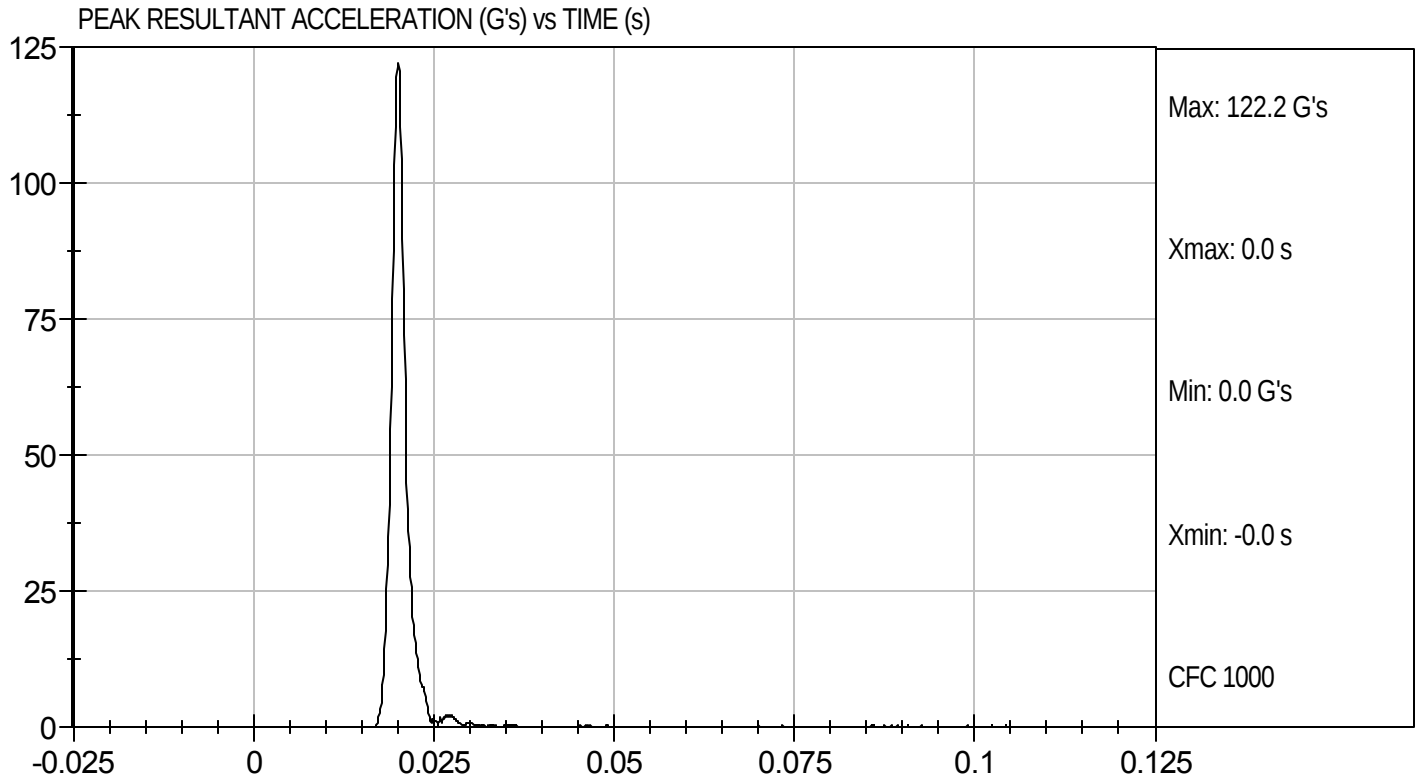


Approved By



Test Desc: Neck Bending
Component ID: D112031

Test Date: 6/9/11
Velocity: 0 ft/s, 0 m/s



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

ATD Serial No: 306

Test I.D: D112032

Tested Parameter		Units	Specification	Result	Pass/Fail
Temperature		deg C	20.6 to 22.2	21.7	Pass
Humidity		%	10 to 70	47	Pass
Impact Velocity		m/s	5.51 to 5.63	5.58	Pass
Delta Velocity	10 ms	m/s	2.20 to 2.80	2.75	Pass
	15 ms	m/s	3.30 to 4.10	3.96	Pass
	20 ms	m/s	4.40 to 5.40	5.29	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	73	Pass
Time of Maximum D-Plane Rotation		ms	50 to 70	57	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	112	Pass
Overall Test Results				Pass	

Jessica Hall
Laboratory Technician

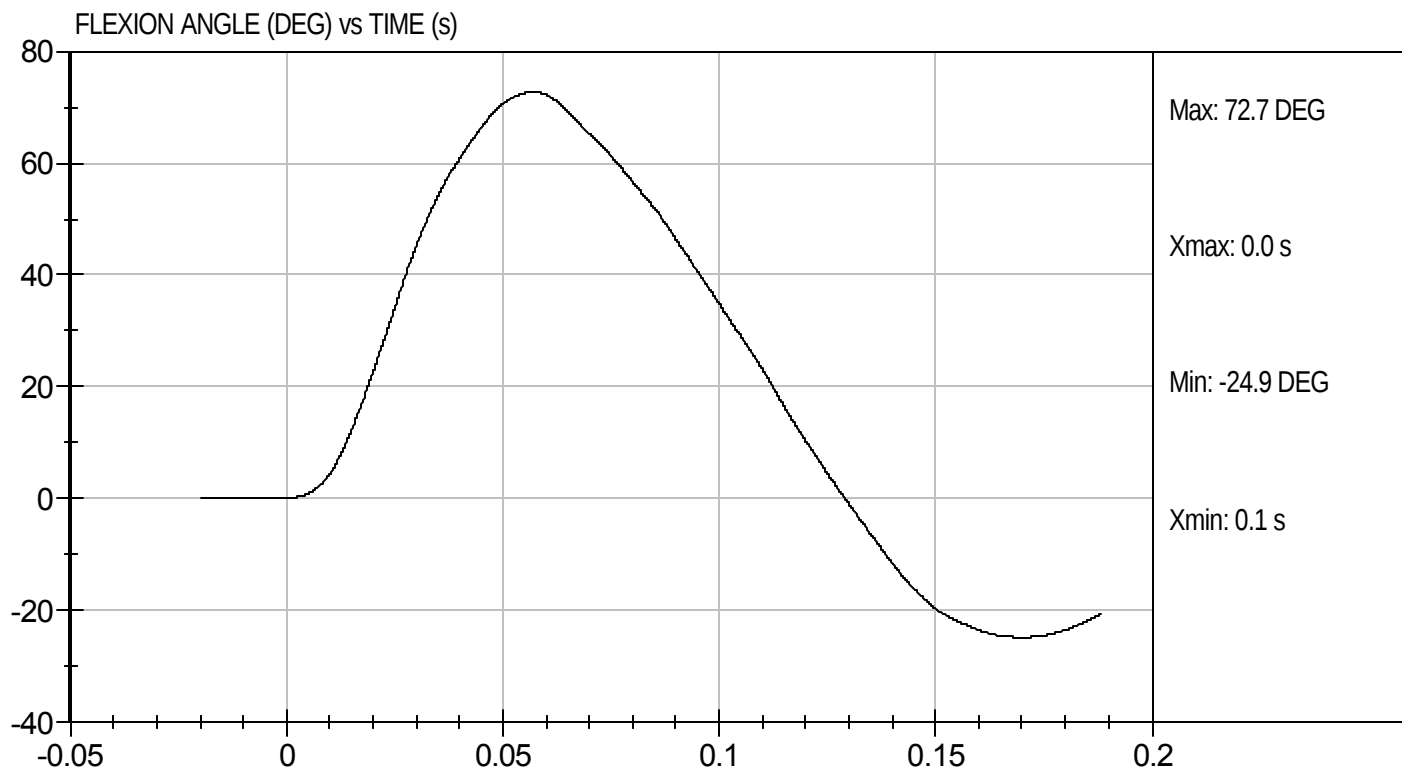
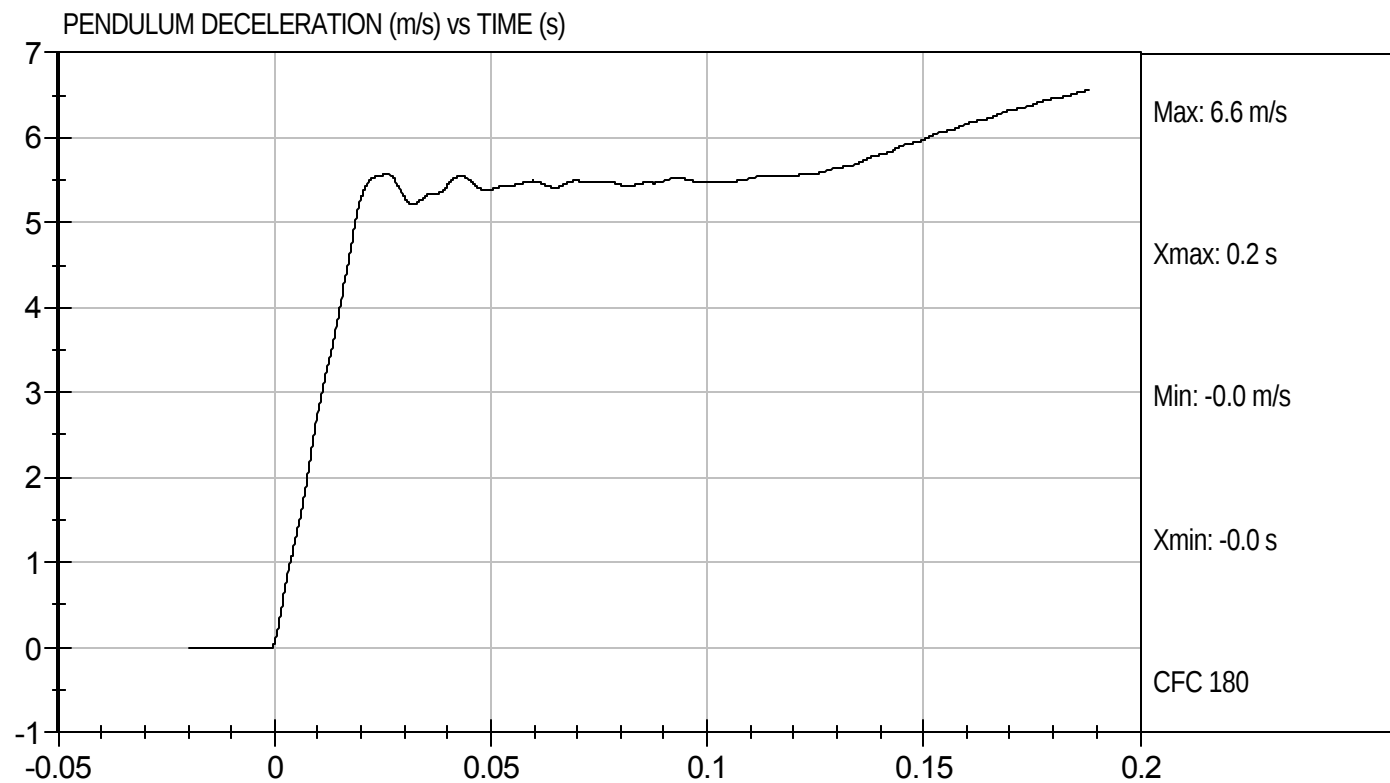
6/9/11
Test Date

David Winkelbauer
Approved By



Test Desc: Neck Bending
Component ID: D112032

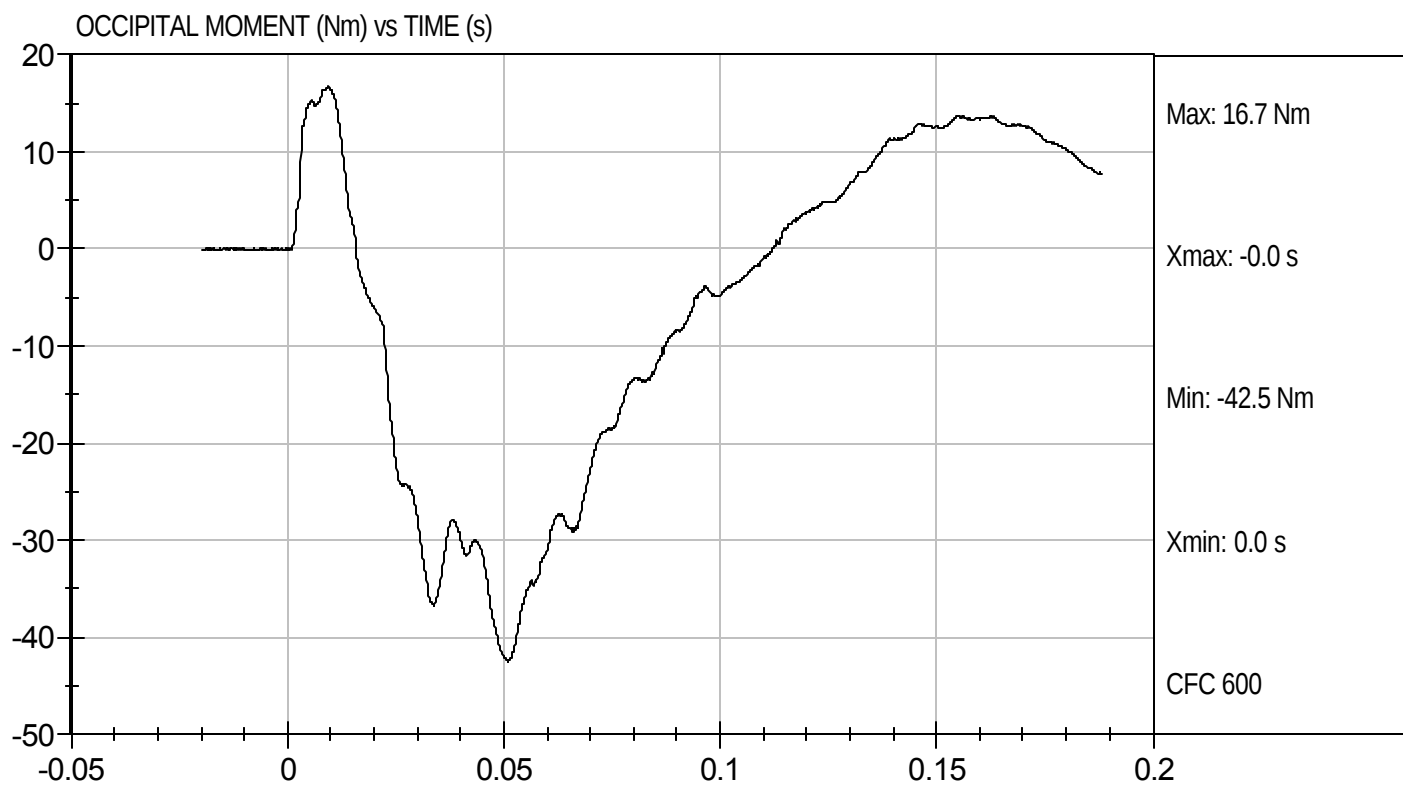
Test Date: 6/9/11
Velocity: 18.32 ft/s, 5.58 m/s





Test Desc: Neck Bending
Component ID: D112032

Test Date: 6/9/11
Velocity: 18.32 ft/s, 5.58 m/s



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

ATD Serial No: 306

Test ID: D112033

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	49	Pass
Impact Velocity	m/s	4.20 to 4.40	4.34	Pass
Maximum Probe Acceleration	G's	13 to 18	15	Pass
Shoulder Displacement	mm	28 to 37	30	Pass
Upper Spine (T1) Y Acceleration	G's	17 to 22	19	Pass
			Overall Test Results	Pass


Laboratory Technician

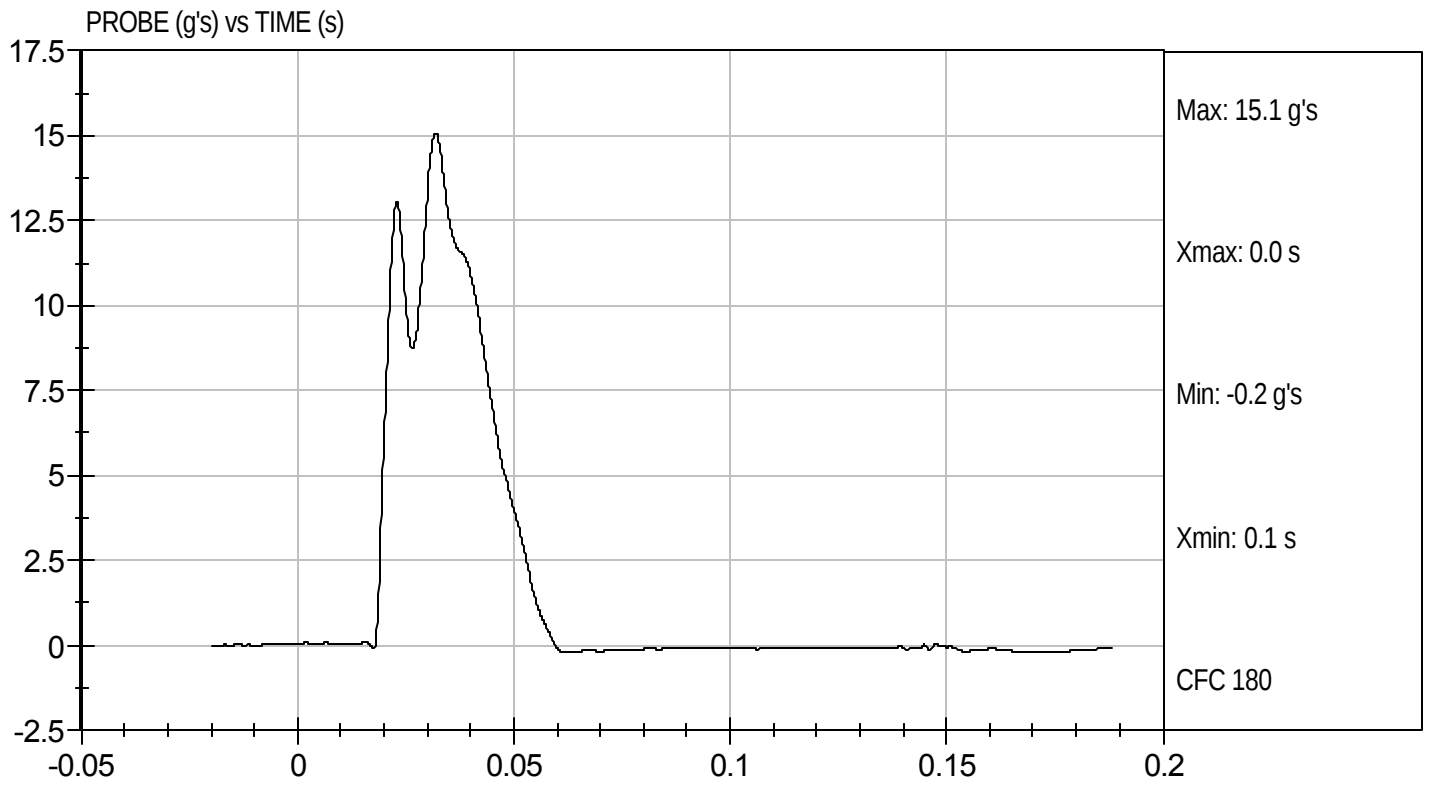
6/9/11
Test Date


Approved By



Test Desc: Shoulder Impact
Component ID: D112033

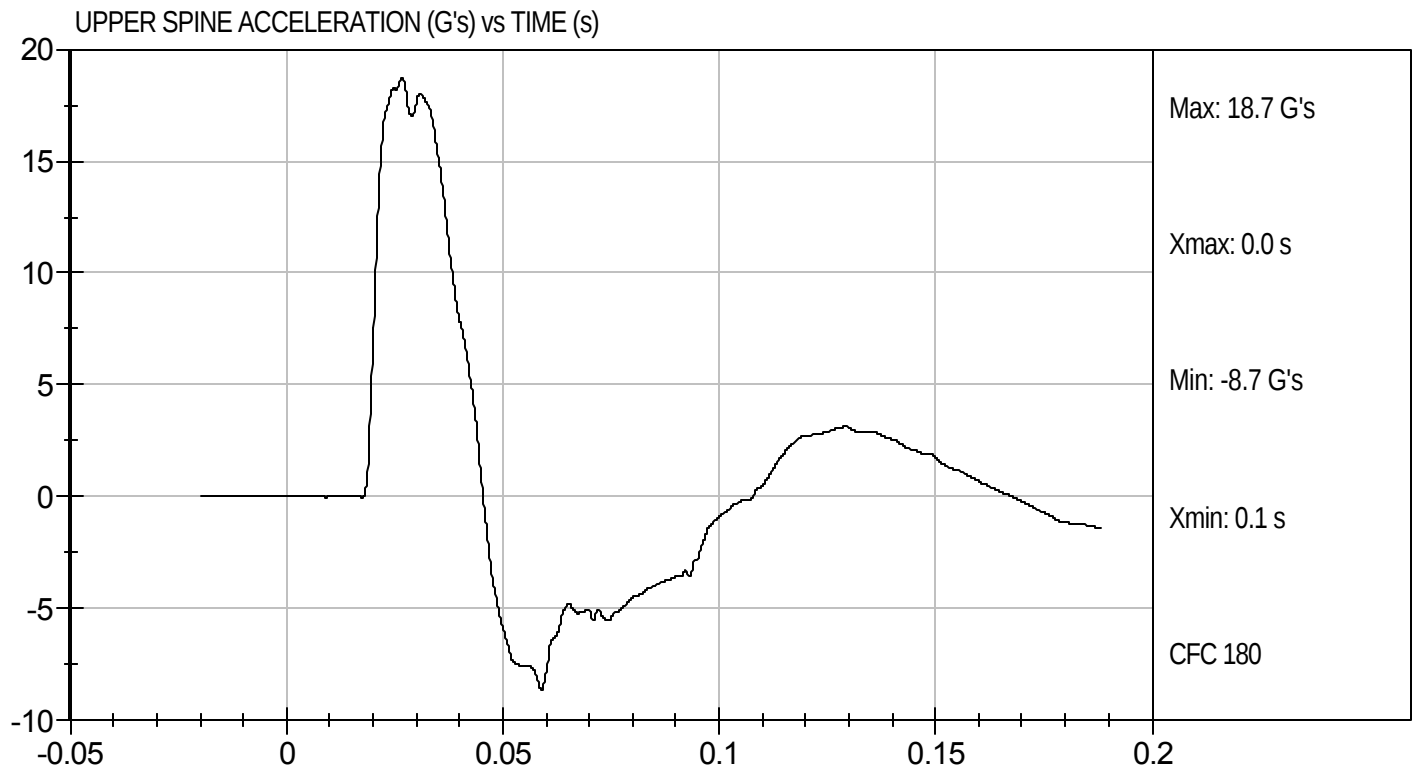
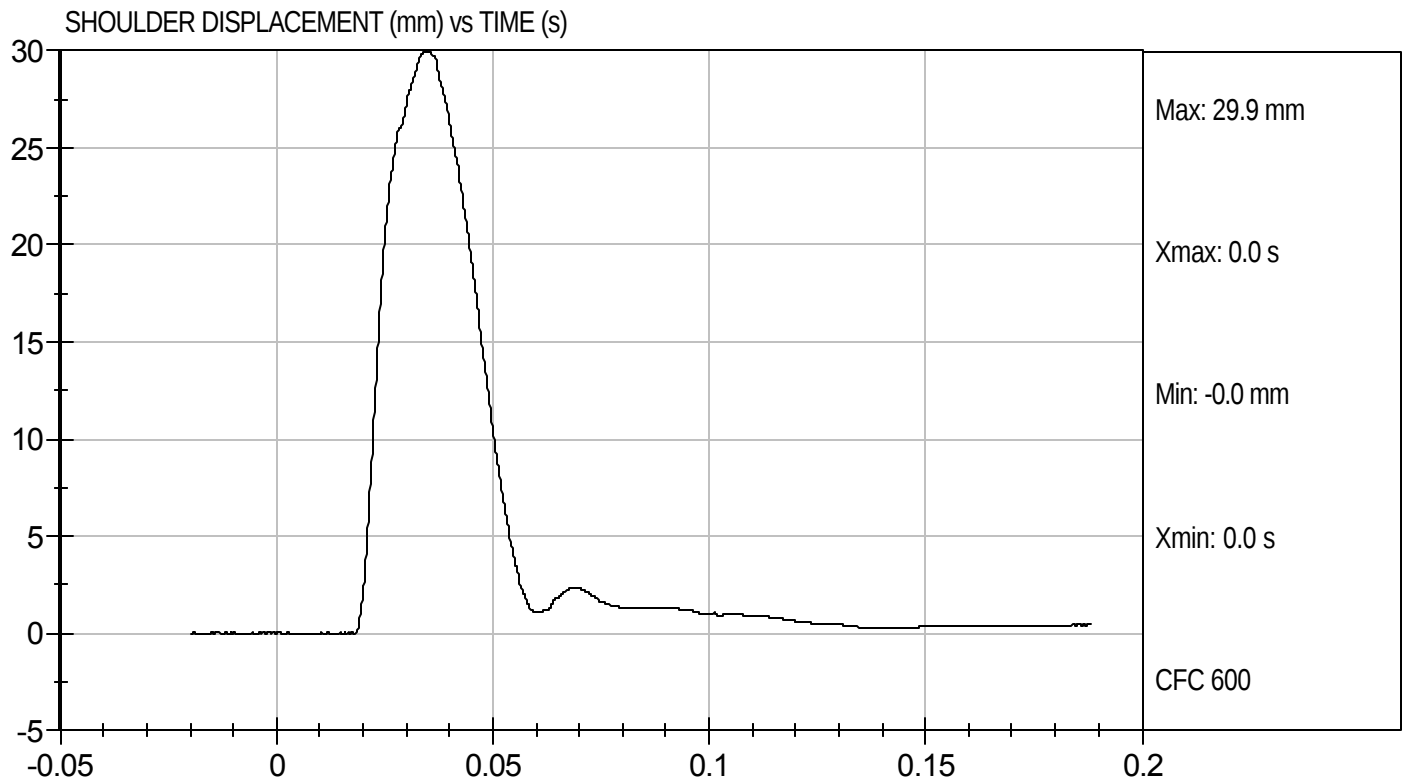
Test Date: 6/9/11
Velocity: 14.24 ft/s, 4.34 m/s





Test Desc: Shoulder Impact
Component ID: D112033

Test Date: 6/9/11
Velocity: 14.24 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: D112034

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.2	Pass
Humidity	%	10 to 70	49	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	32	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	33	Pass
Upper Spine (T1) Y Acceleration	G's	34 to 43	40	Pass
Lower Spine (T12) Y Acceleration	G's	29 to 37	34	Pass
Overall Test Results			Pass	

Jessica Hall
Laboratory Technician

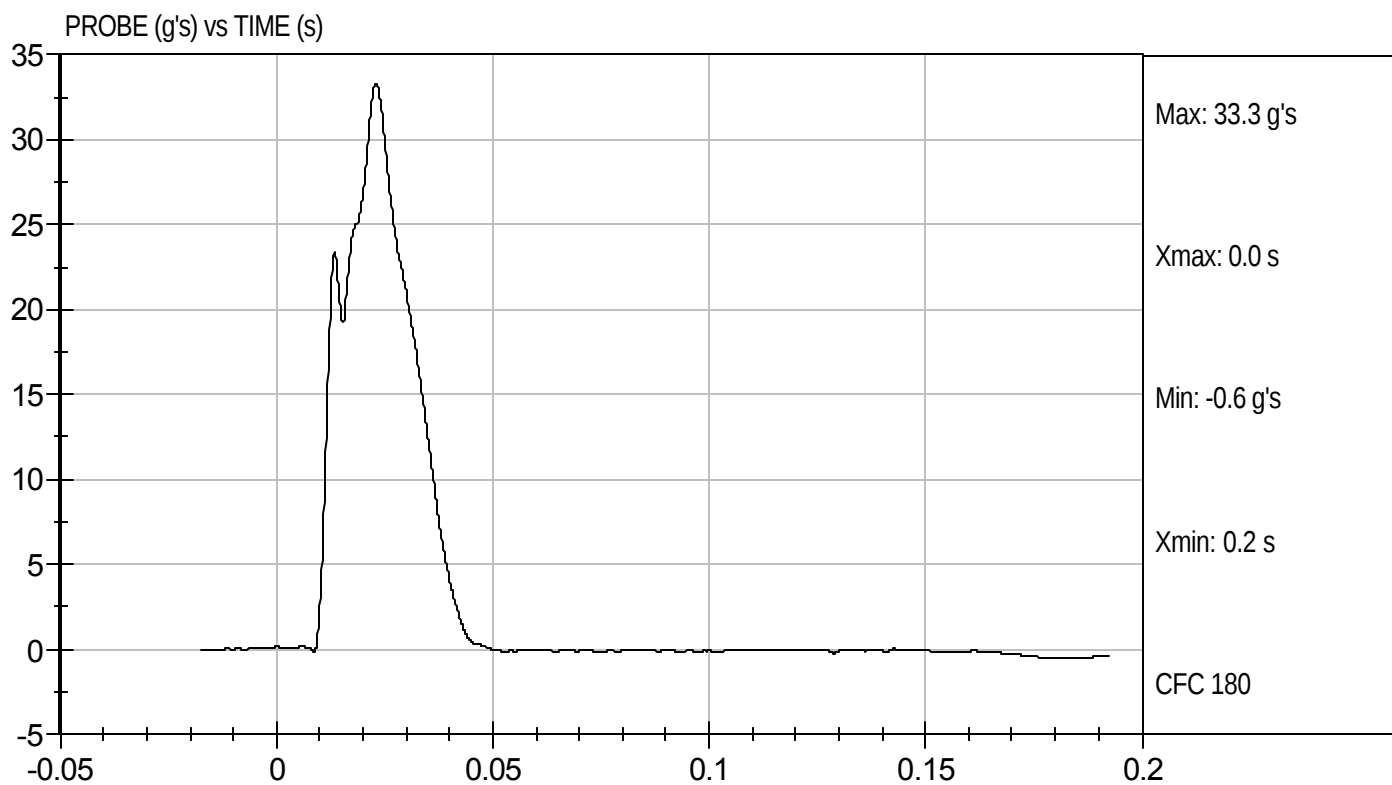
6/10/11
Test Date

David Winkelbauer
Approved By



Test Desc: Thorax With Arm
Component ID: D112034

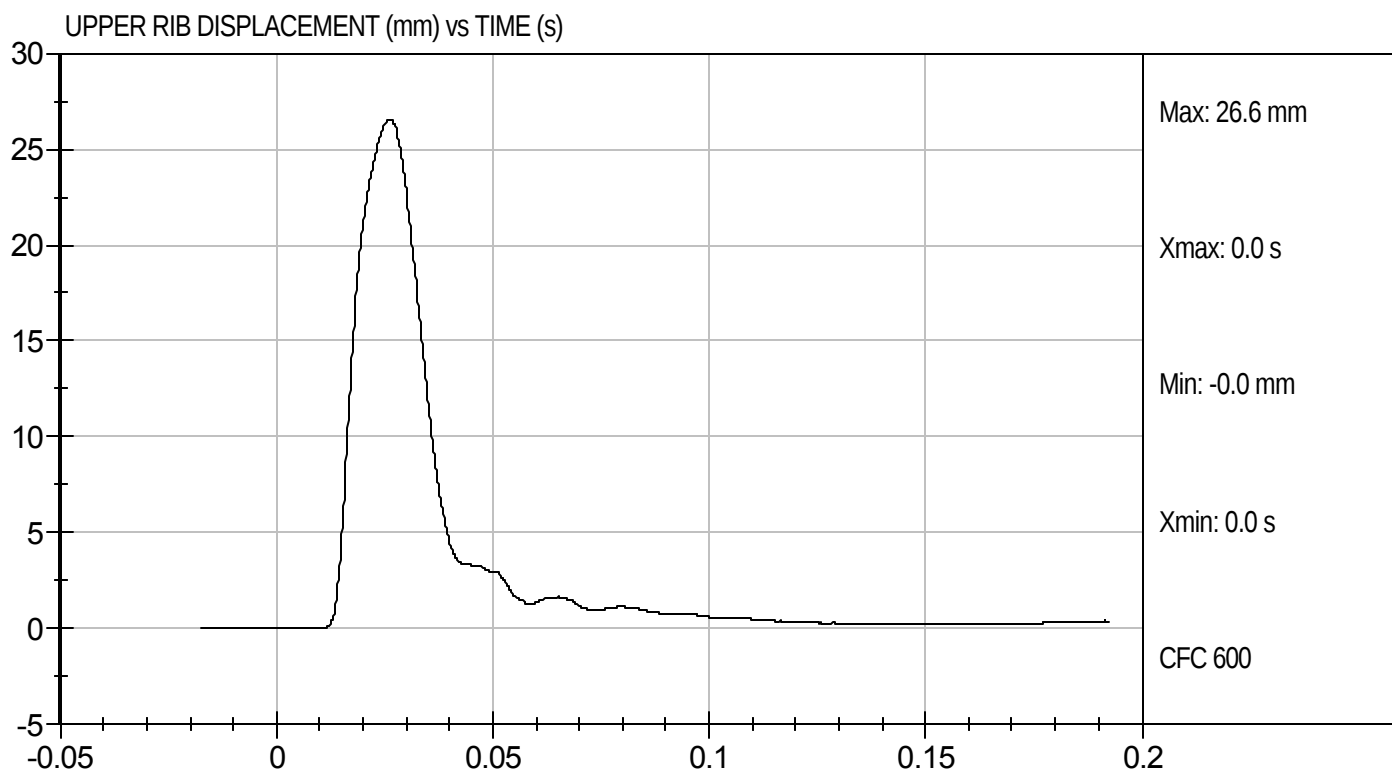
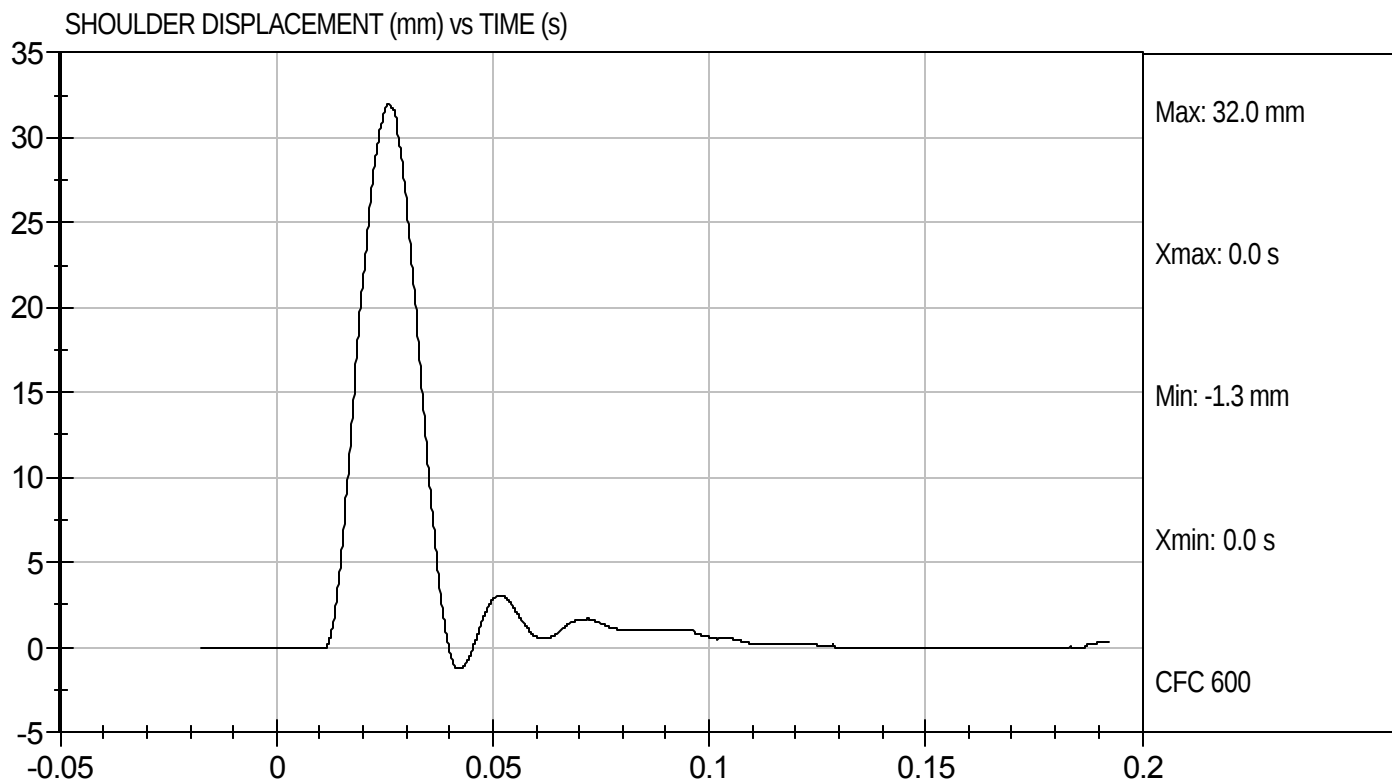
Test Date: 6/10/11
Velocity: 22.22 ft/s, 6.77 m/s





Test Desc: Thorax With Arm
Component ID: D112034

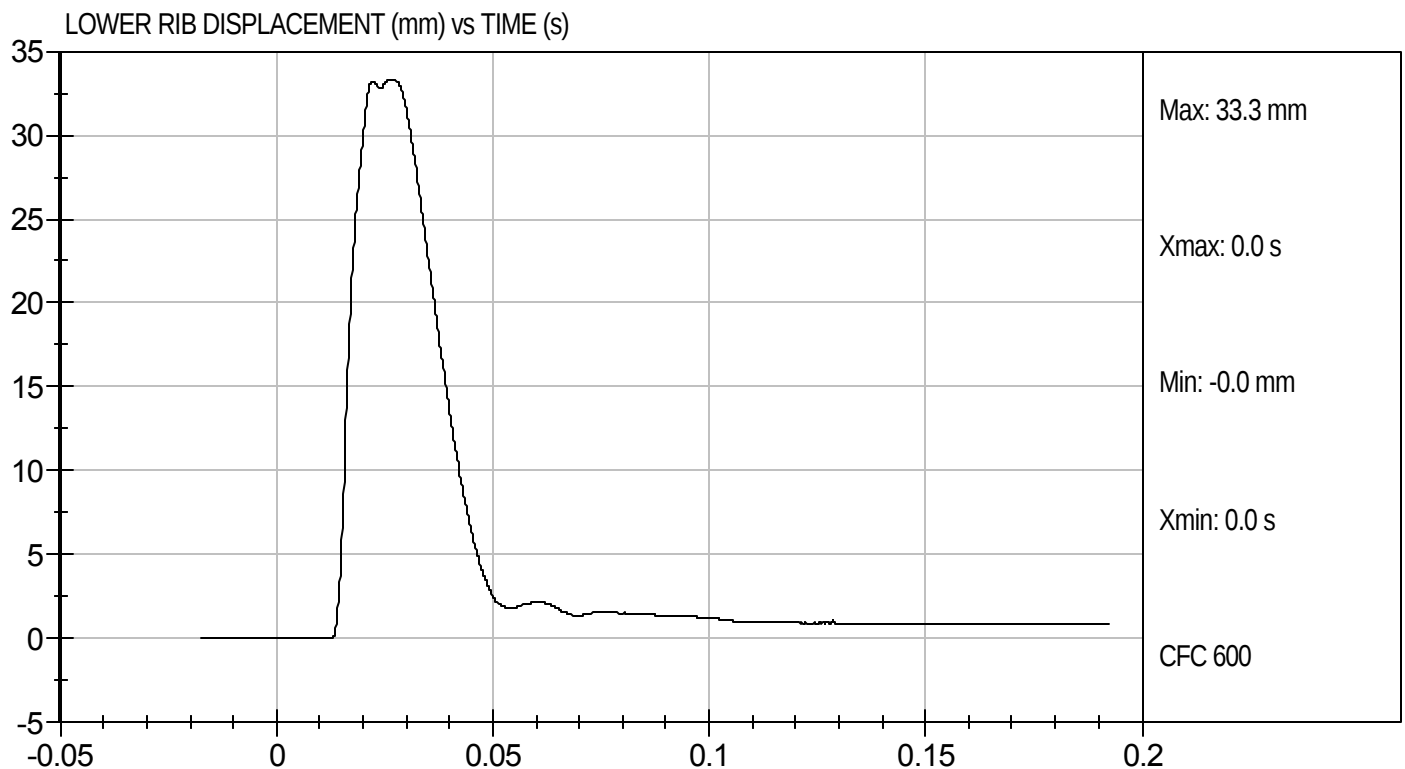
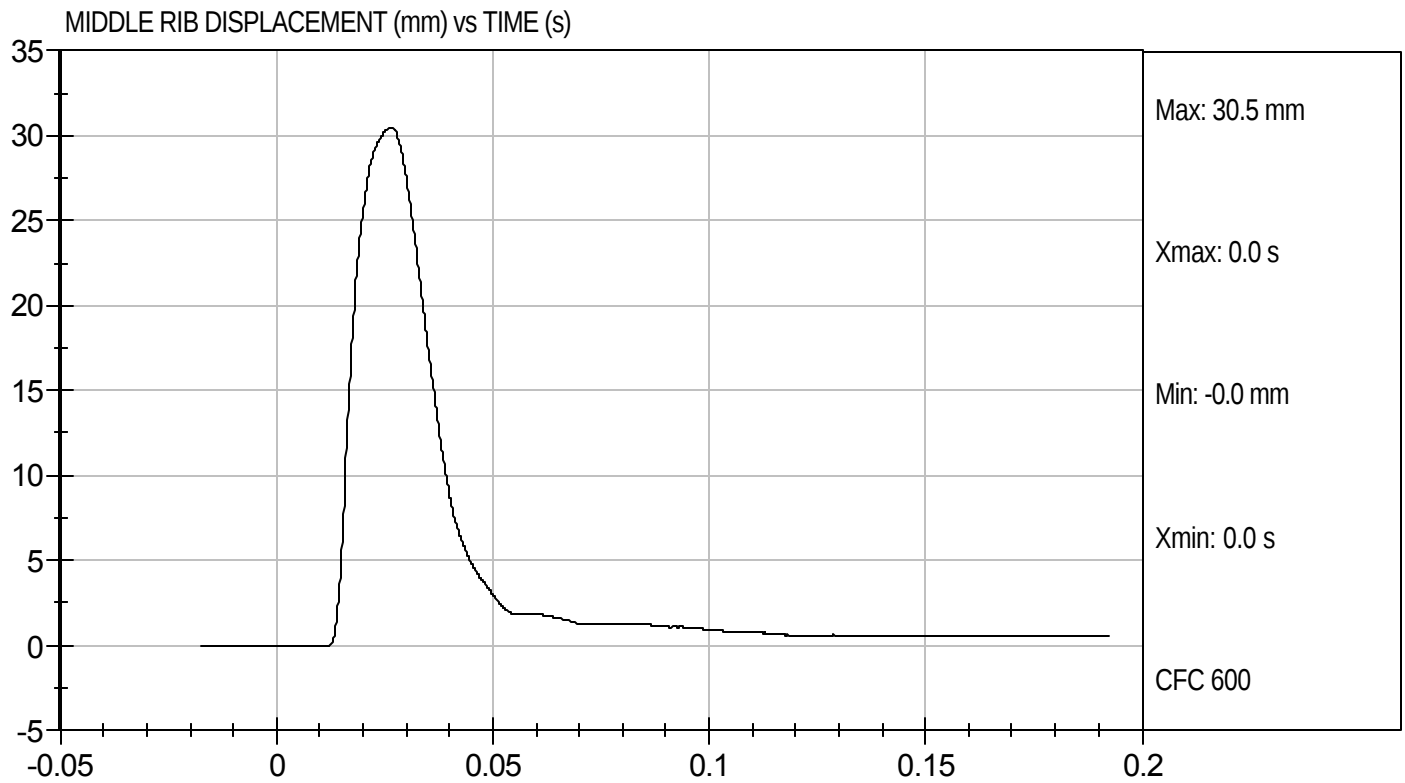
Test Date: 6/10/11
Velocity: 22.22 ft/s, 6.77 m/s





Test Desc: Thorax With Arm
Component ID: D112034

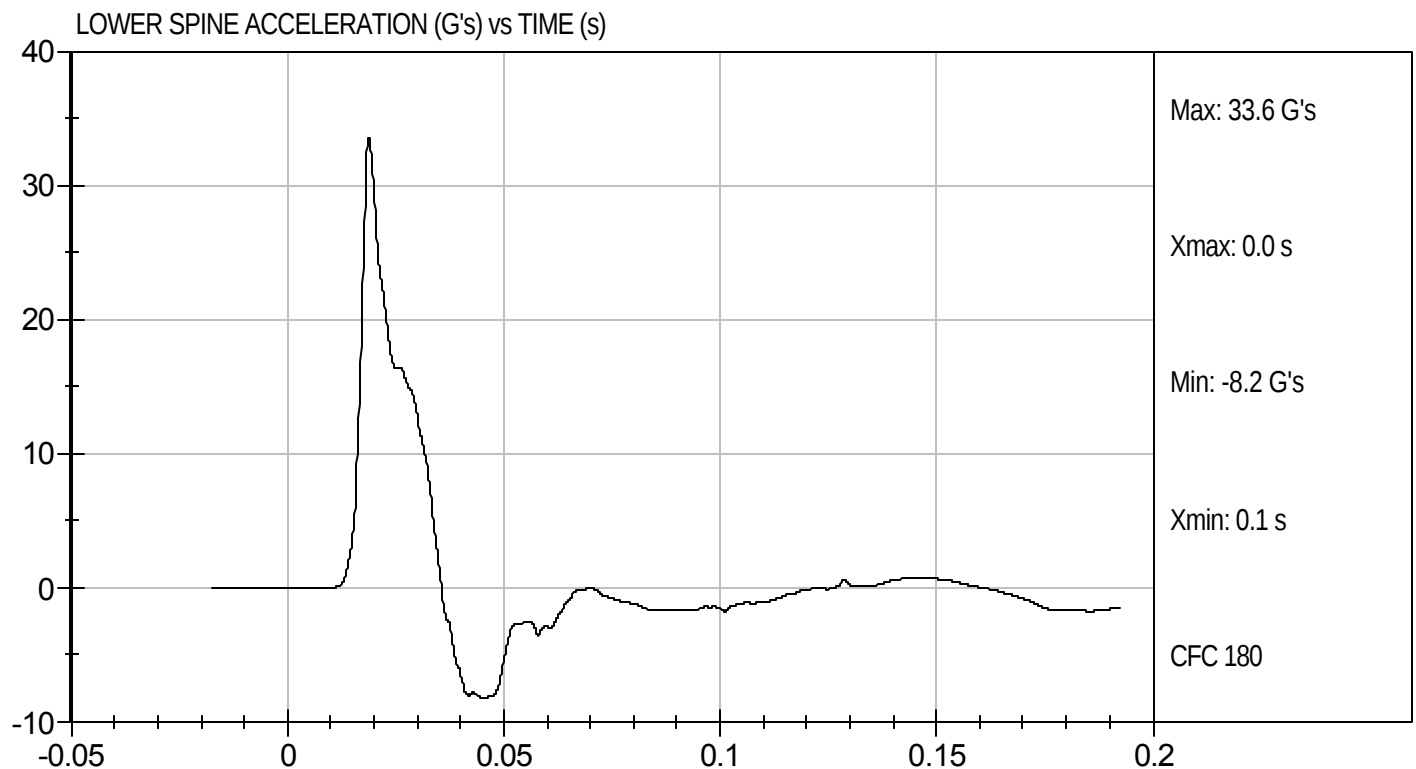
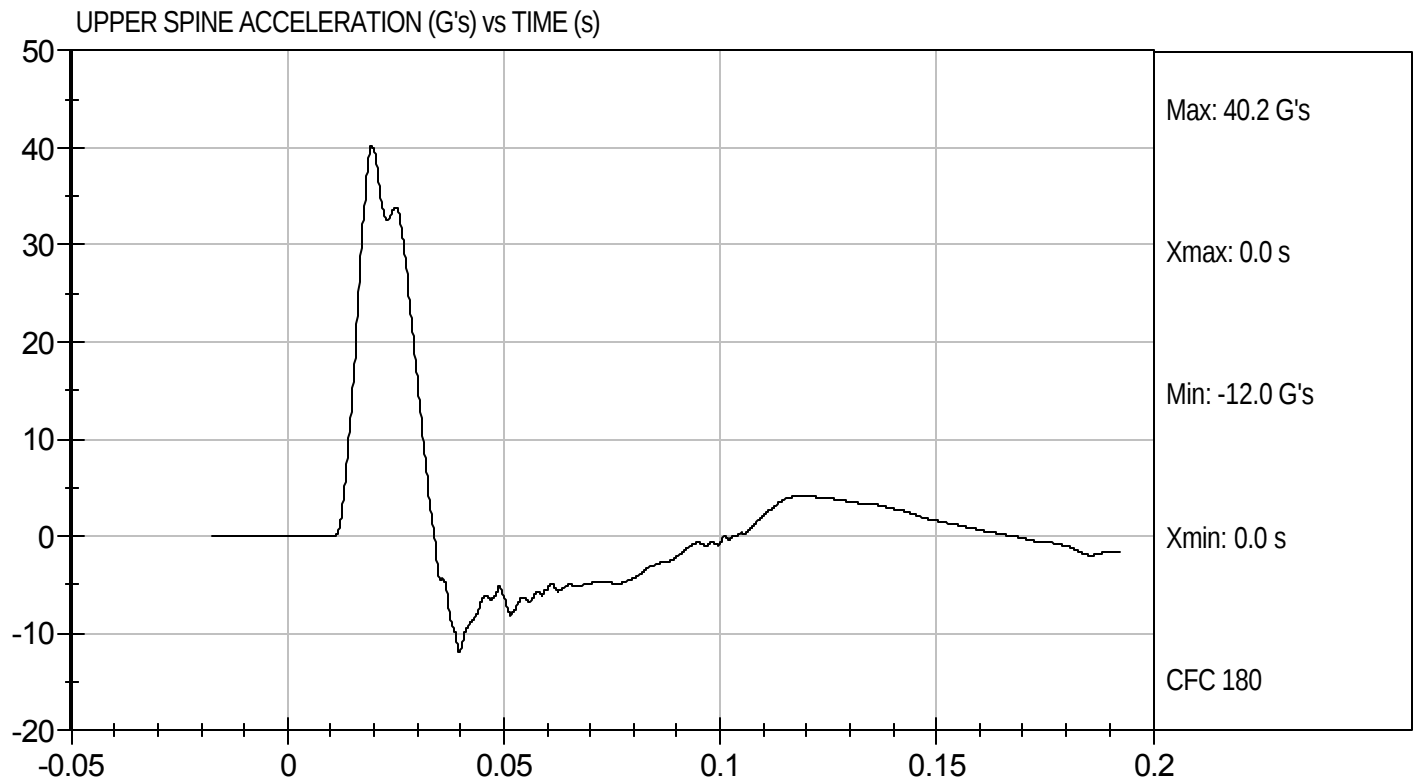
Test Date: 6/10/11
Velocity: 22.22 ft/s, 6.77 m/s





Test Desc: Thorax With Arm
Component ID: D112034

Test Date: 6/10/11
Velocity: 22.22 ft/s, 6.77 m/s



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

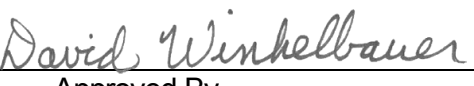
ATD Serial No: 306

Test I.D: D112035

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.2	Pass
Humidity	%	10 to 70	49	Pass
Impact Velocity	m/s	4.20 to 4.40	4.30	Pass
Peak Impactor Force	G's	14 to 18	15	Pass
Upper Rib Displacement	mm	32 to 40	39	Pass
Middle Rib Displacement	mm	39 to 45	41	Pass
Lower Rib Displacement	mm	35 to 43	39	Pass
Upper Spine (T1) Y Acceleration	G's	13 to 17	15	Pass
Lower Spine (T12) Y Acceleration	G's	7 to 11	9	Pass
Overall Test Results			Pass	


Laboratory Technician

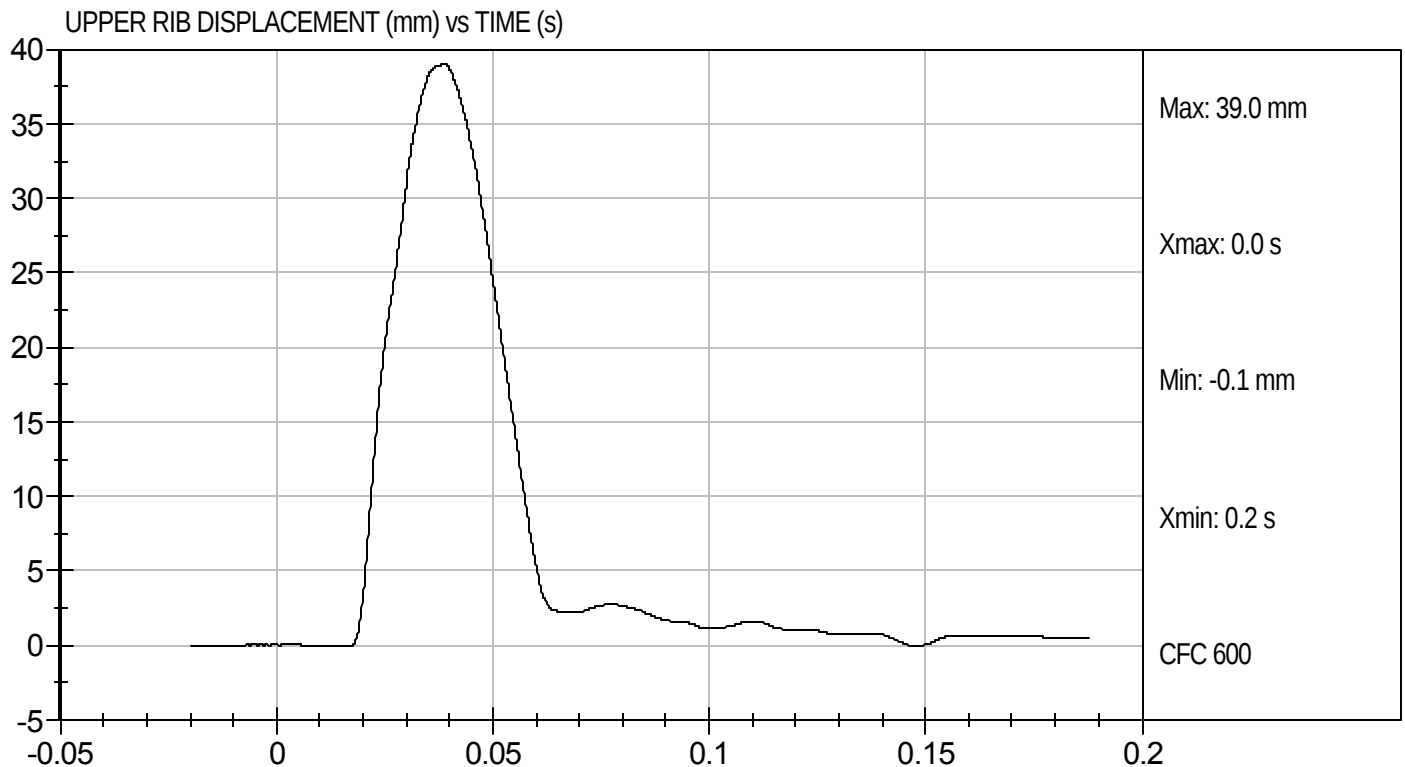
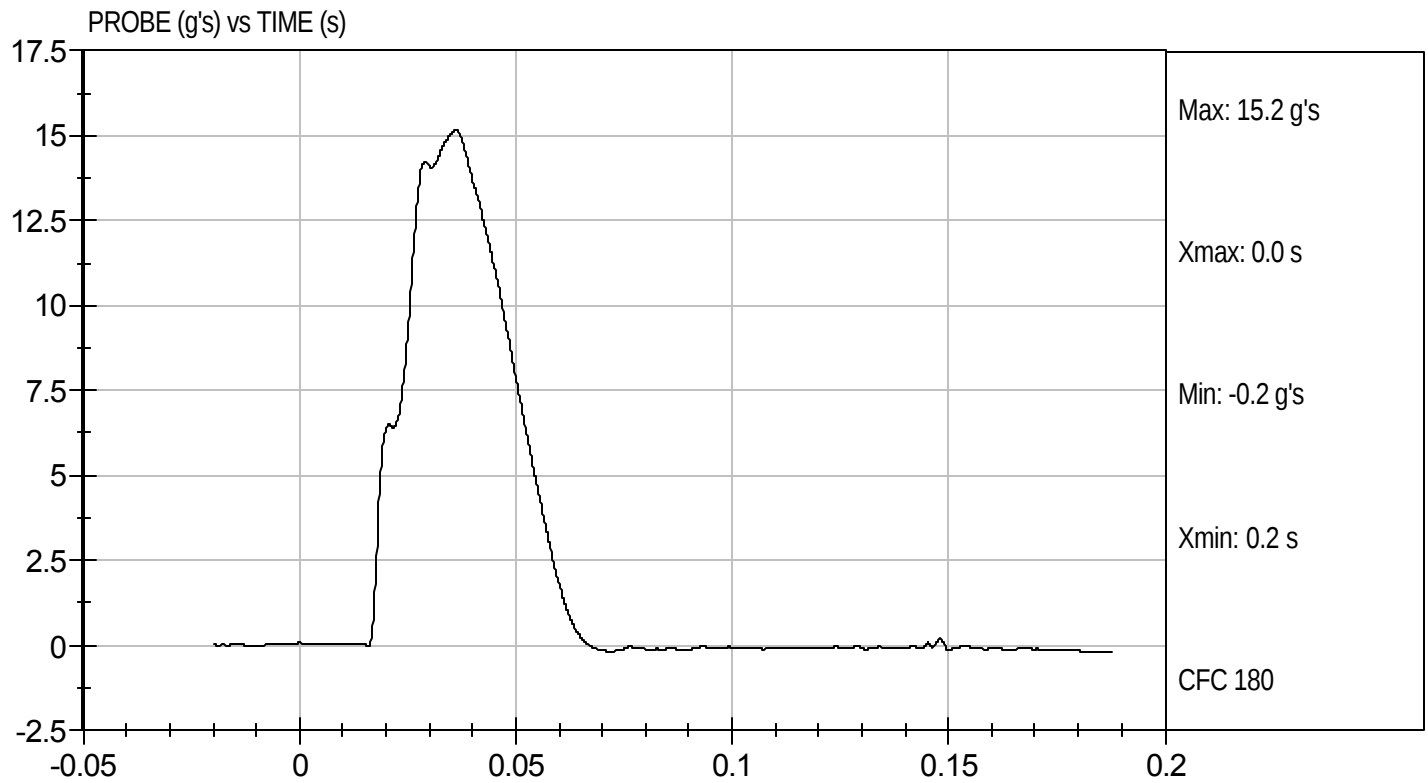
6/10/11
Test Date


Approved By



Test Desc: Thorax With Arm
Component ID: D112035

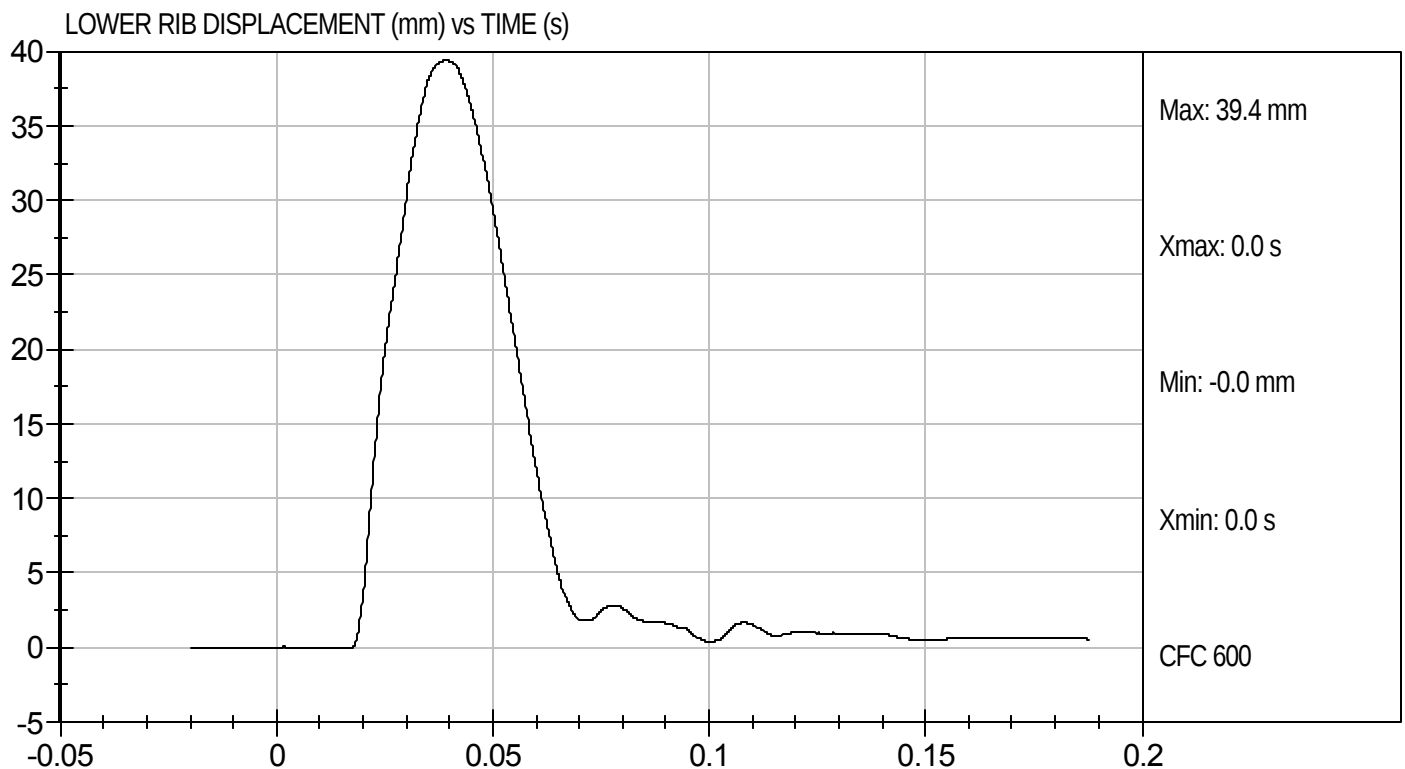
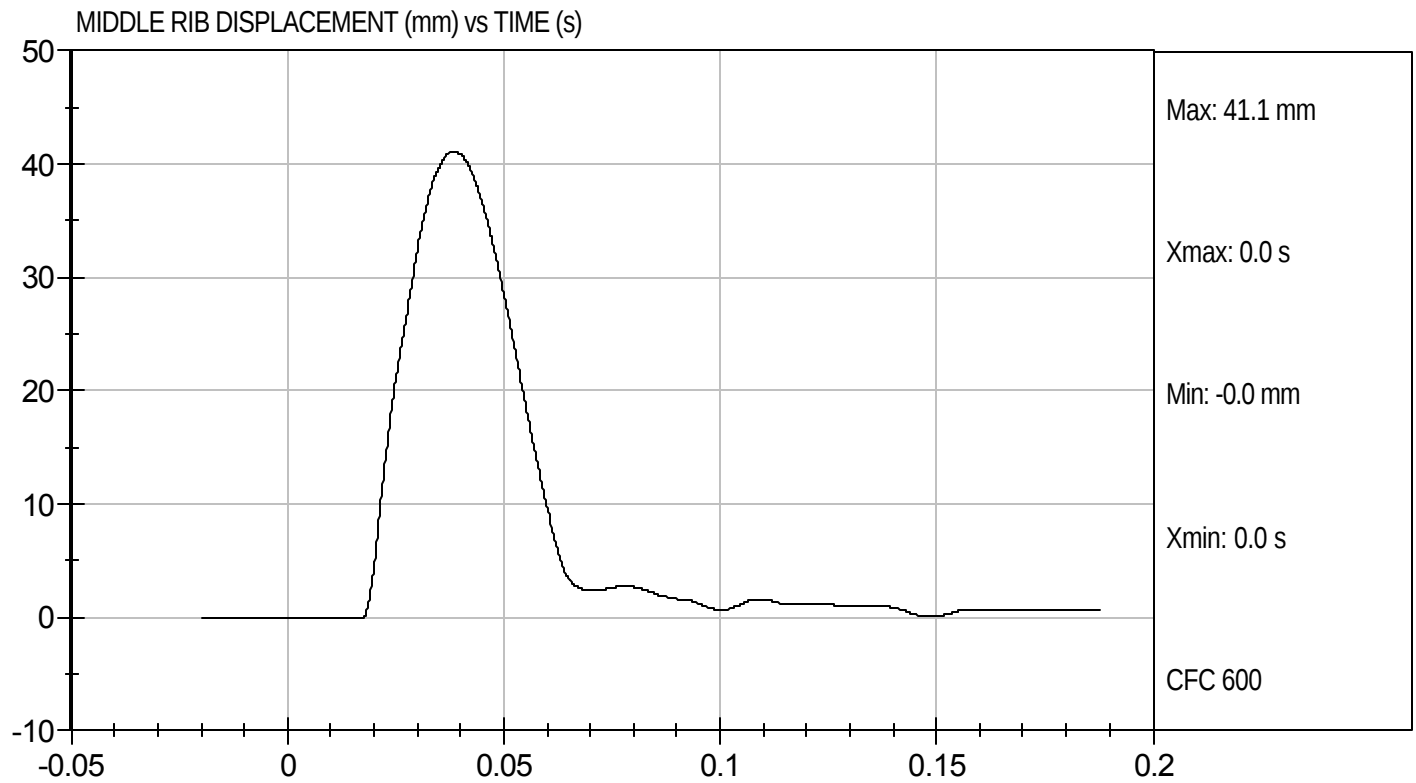
Test Date: 6/10/11
Velocity: 14.12 ft/s, 4.30 m/s





Test Desc: Thorax With Arm
Component ID: D112035

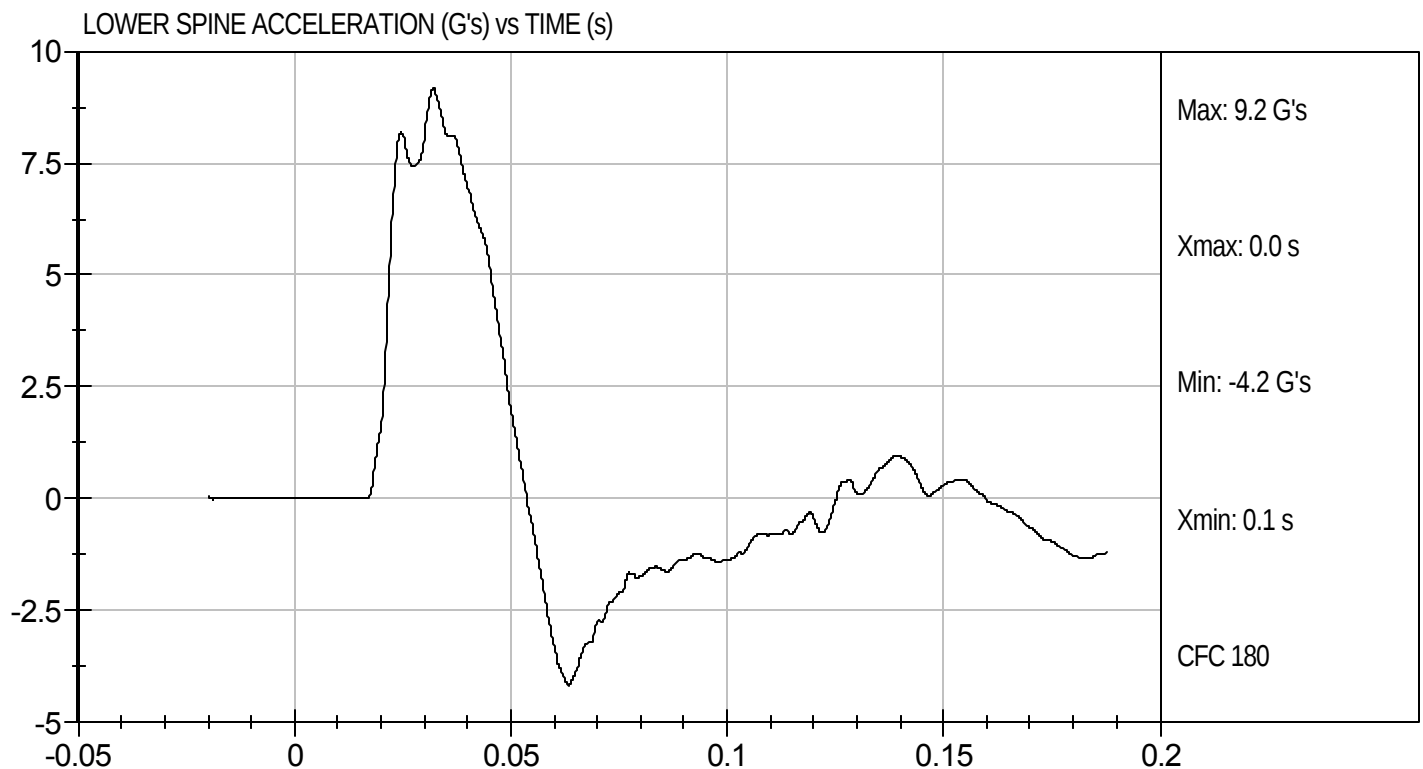
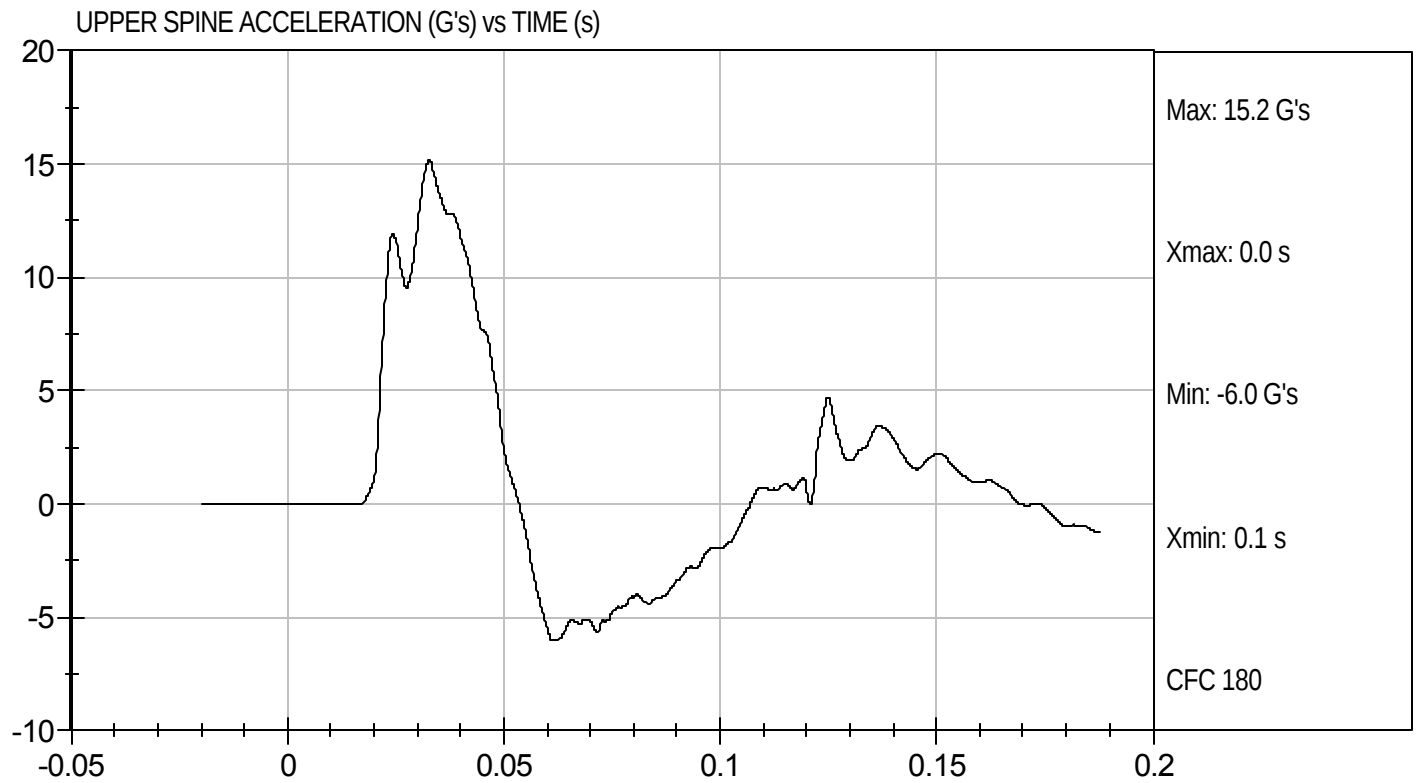
Test Date: 6/10/11
Velocity: 14.12 ft/s, 4.30 m/s





Test Desc: Thorax With Arm
Component ID: D112035

Test Date: 6/10/11
Velocity: 14.12 ft/s, 4.30 m/s



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

ATD Serial No: 306

Test I.D: D112036

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.4	Pass
Humidity	%	10 to 70	49	Pass
Impact Velocity	m/s	4.20 to 4.40	4.34	Pass
Peak Impactor Acceleration	G's	12 to 16	14	Pass
Upper Rib Displacement	mm	36 to 47	38	Pass
Lower Rib Displacement	mm	33 to 44	41	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	11	Pass
			Overall Test Results	Pass

Jessica Hall
Laboratory Technician

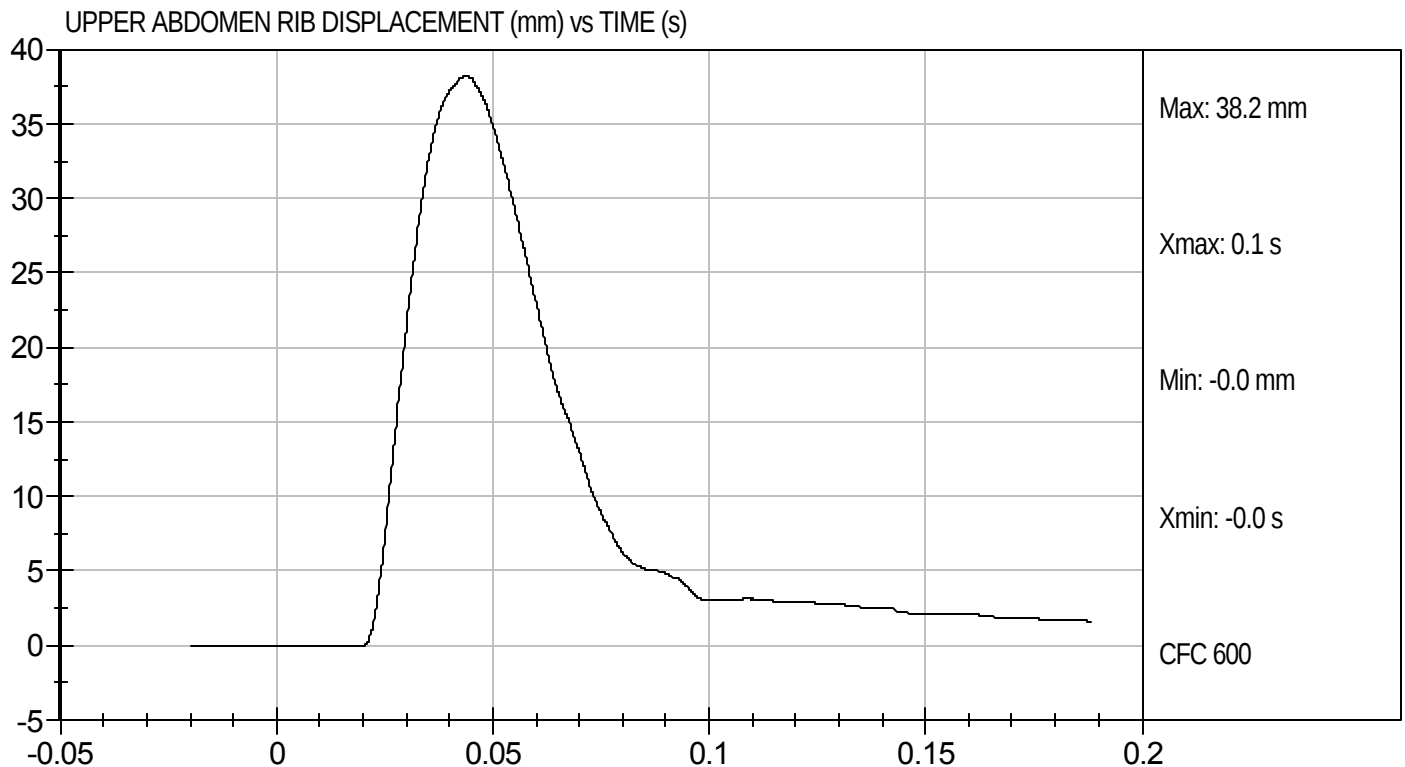
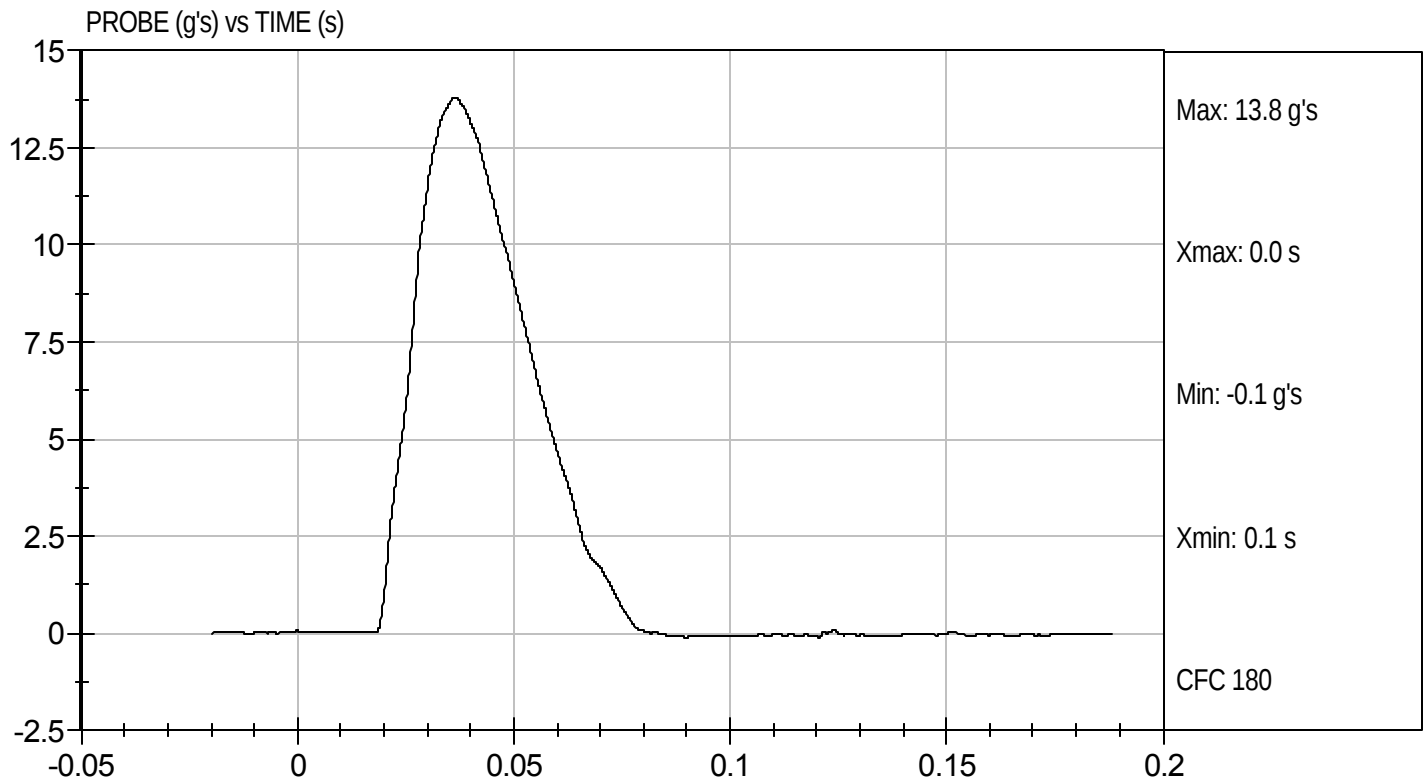
6/10/11
Test Date

David Winkelbauer
Approved By



Test Desc: Abdomen Impact
Component ID: D112036

Test Date: 6/10/11
Velocity: 14.24 ft/s, 4.34 m/s

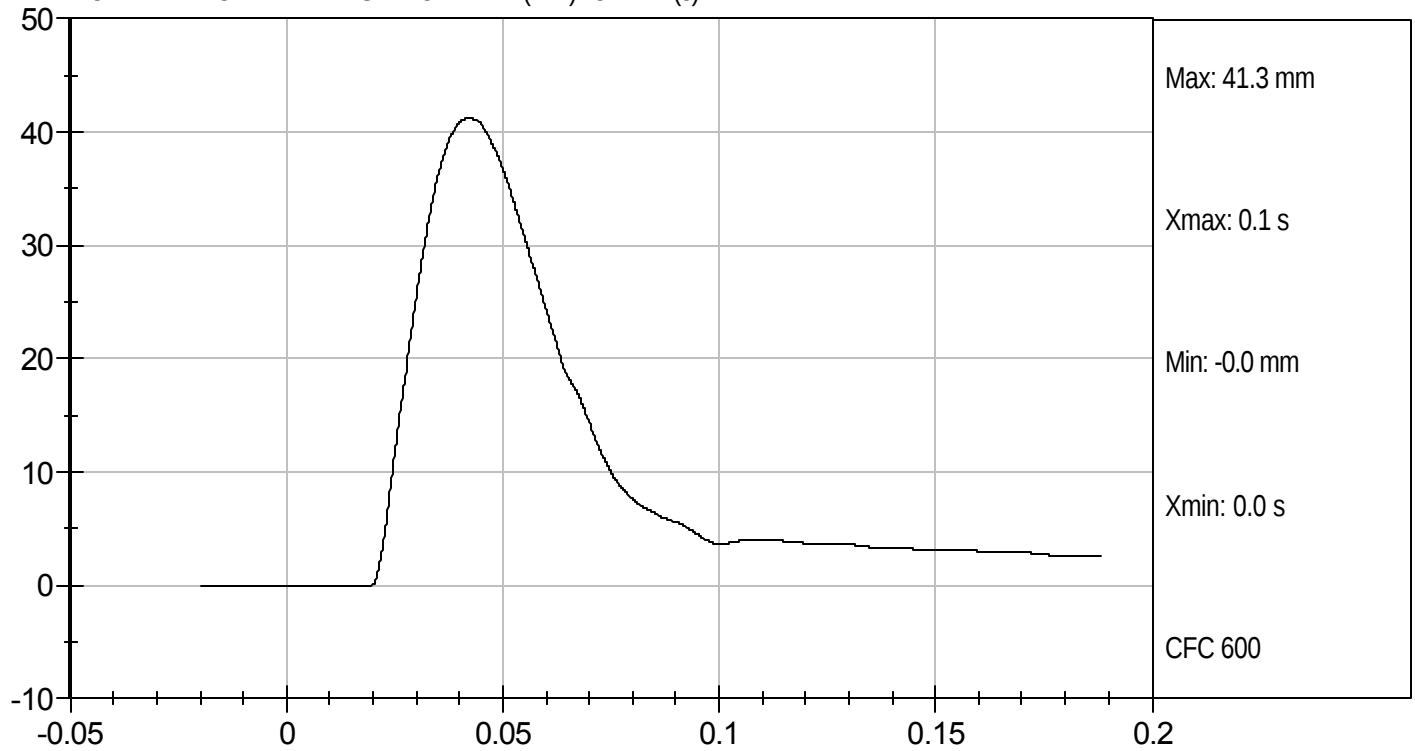




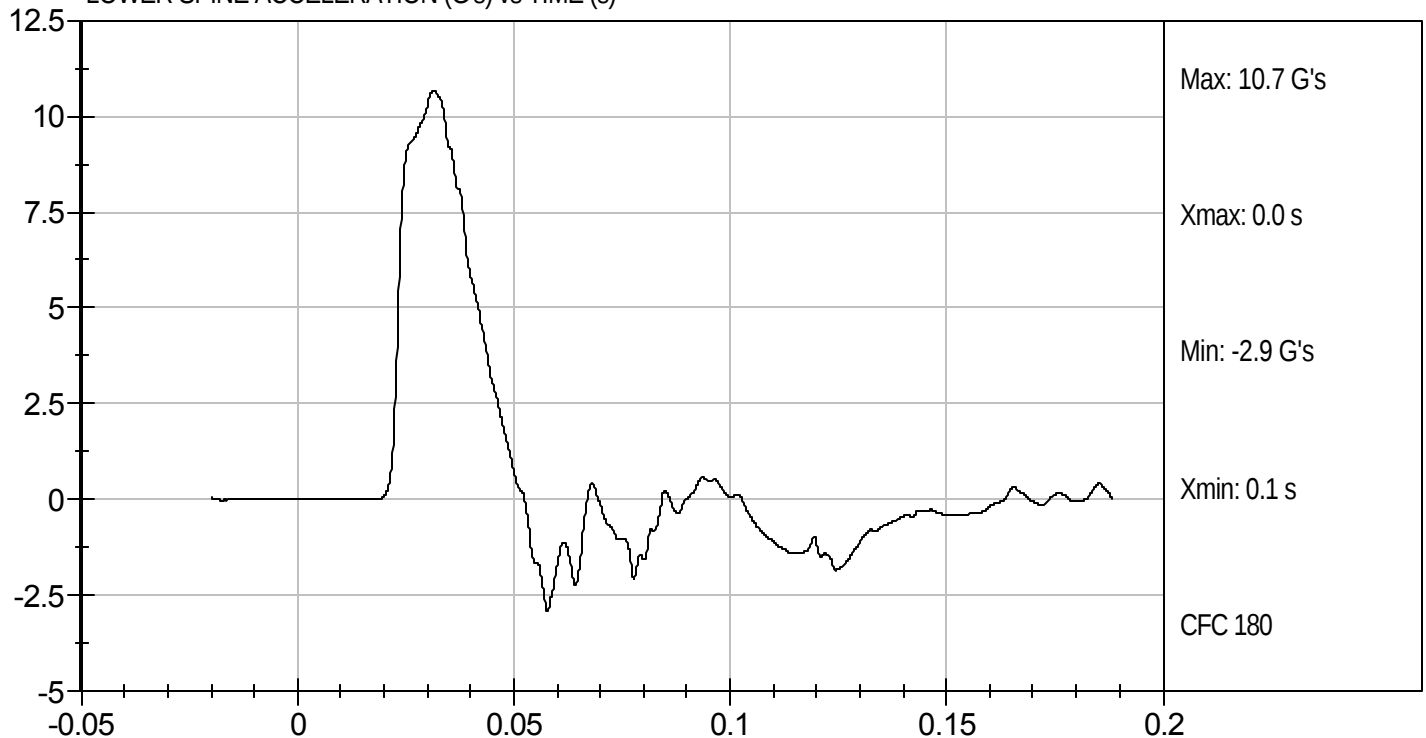
Test Desc: Abdomen Impact
Component ID: D112036

Test Date: 6/10/11
Velocity: 14.24 ft/s, 4.34 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: D112037

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.4	Pass
Humidity	%	10 to 70	49	Pass
Impact Velocity	m/s	6.60 to 6.80	6.77	Pass
Peak Impactor Acceleration	G's	38 to 47	41	Pass
Pelvis Y Acceleration after 6 ms	G's	34 to 42	39	Pass
Peak Acetabulum Force	N	3600 to 4300	3803	Pass
Overall Test Results				Pass


Laboratory Technician

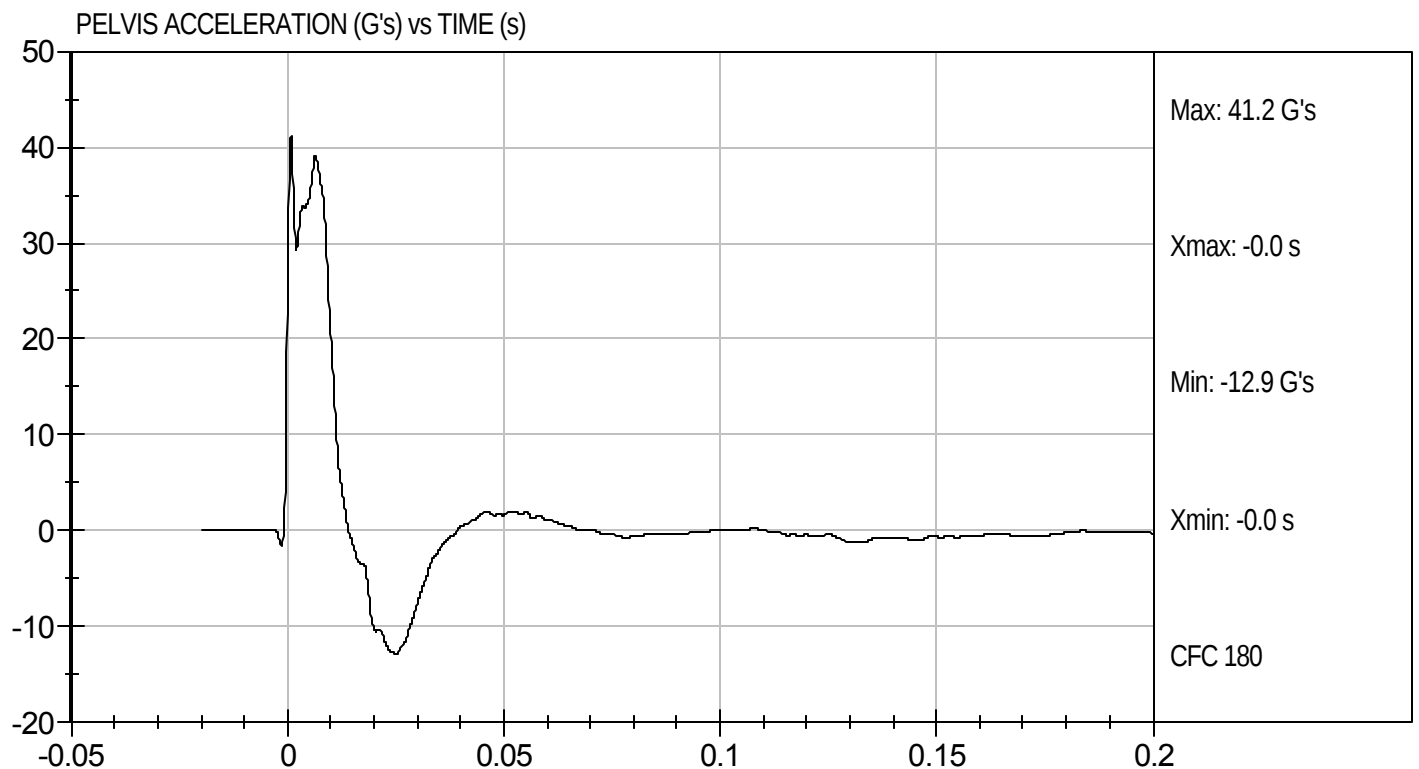
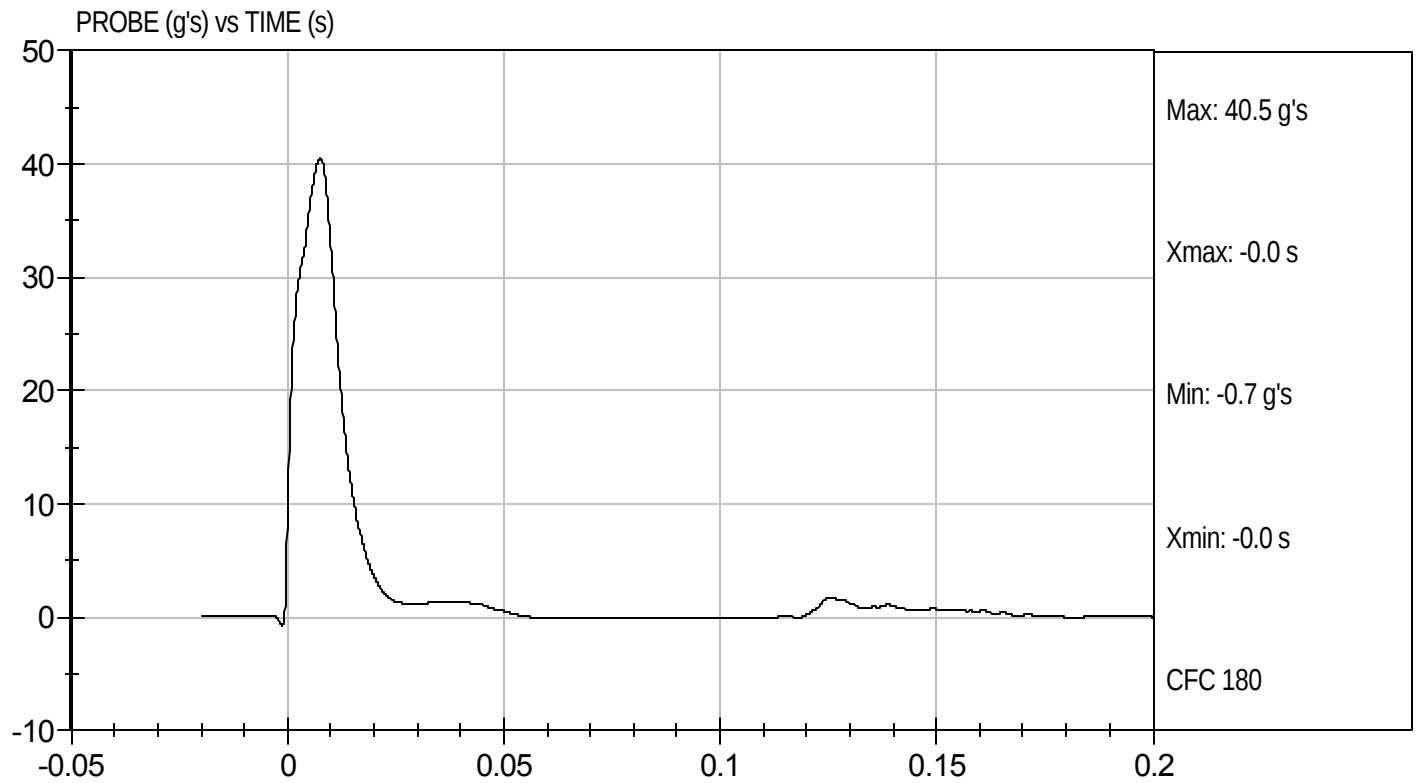
6/10/11
Test Date


Approved By



Test Desc: Pelvis Impact
Component ID: D112037

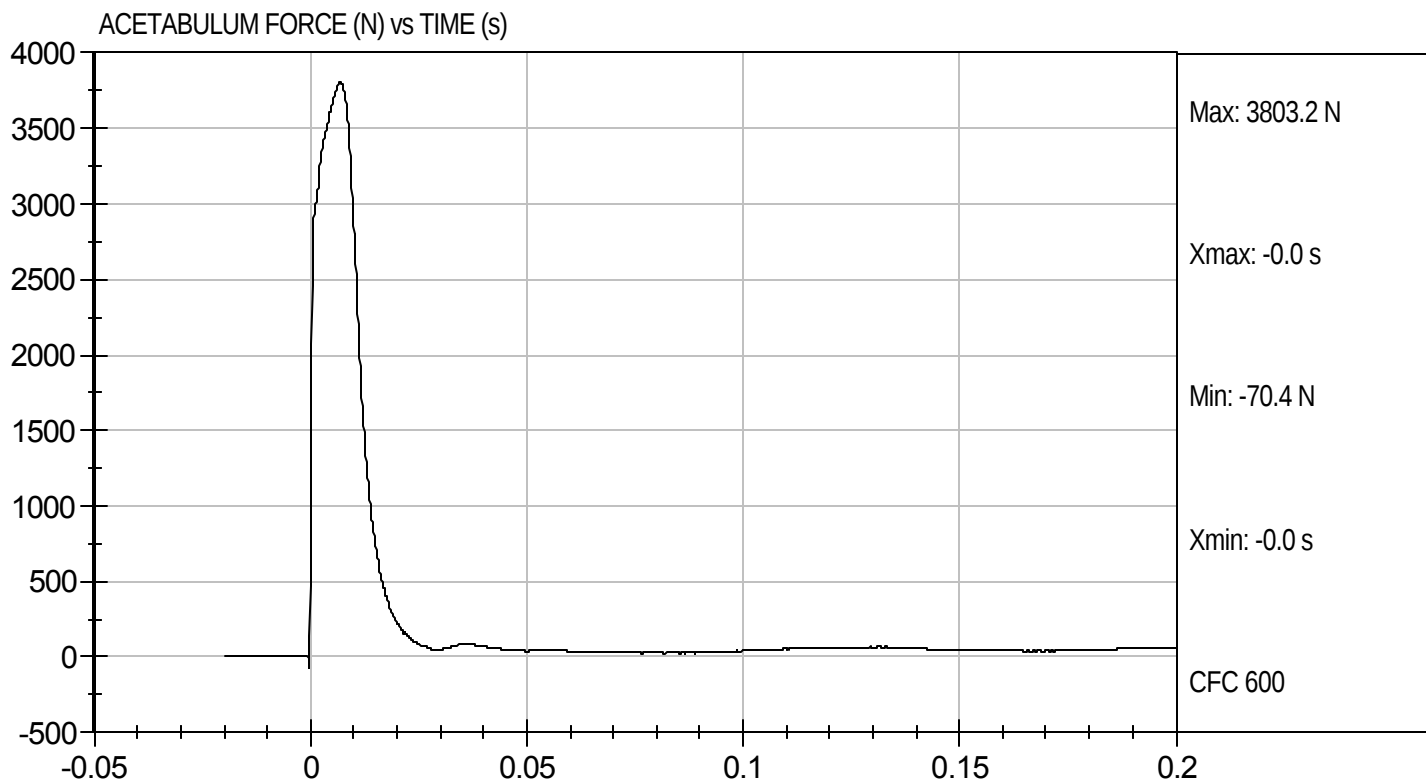
Test Date: 6/10/11
Velocity: 22.22 ft/s, 6.77 m/s





Test Desc: Pelvis Impact
Component ID: D112037

Test Date: 6/10/11
Velocity: 22.22 ft/s, 6.77 m/s



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

ATD Serial No: 306

Test I.D: D112038

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.4	Pass
Humidity	%	10 to 70	49	Pass
Impact Velocity	m/s	4.20 to 4.40	4.34	Pass
Peak Impactor Acceleration	G's	36 to 45	40	Pass
Pelvis Y Acceleration	G's	28 to 39	33	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	5061	Pass
Overall Test Results			Pass	


Laboratory Technician

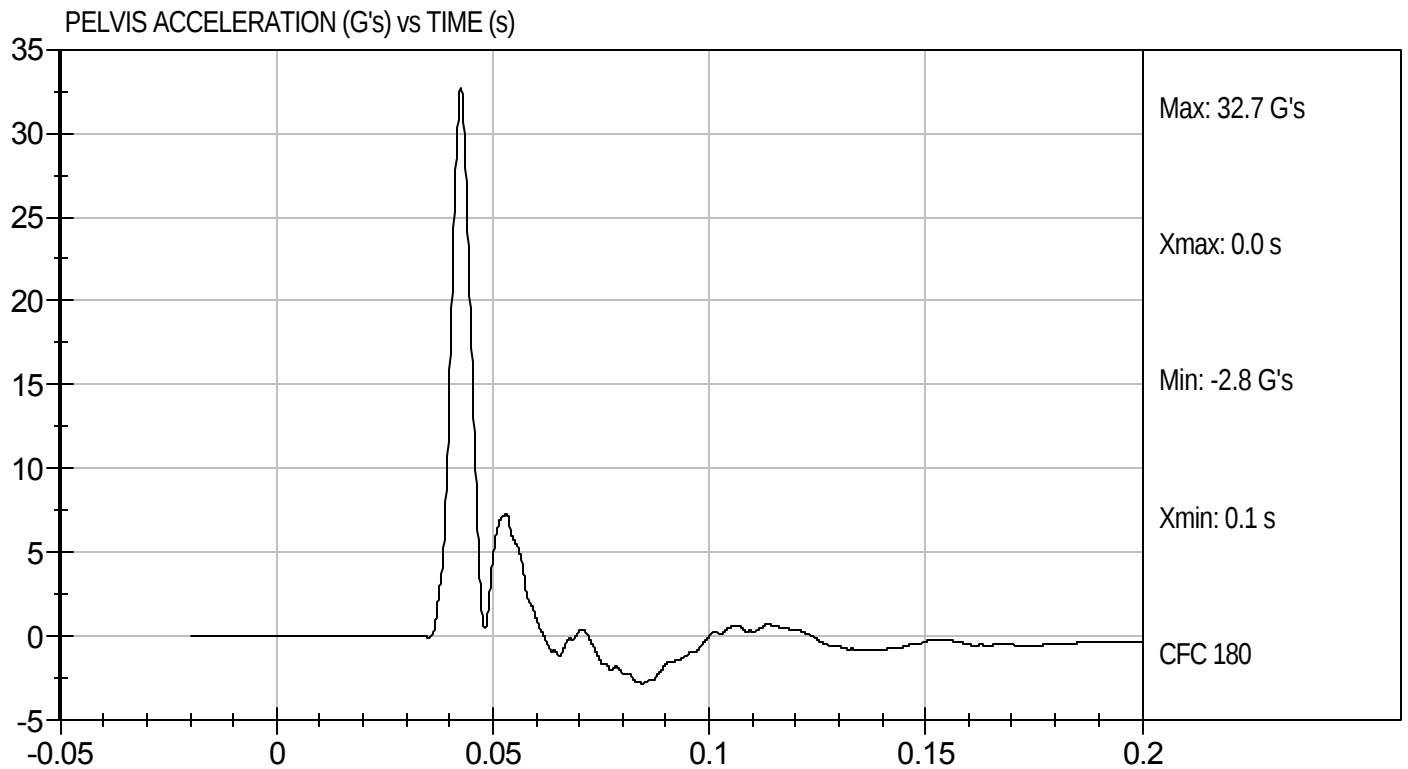
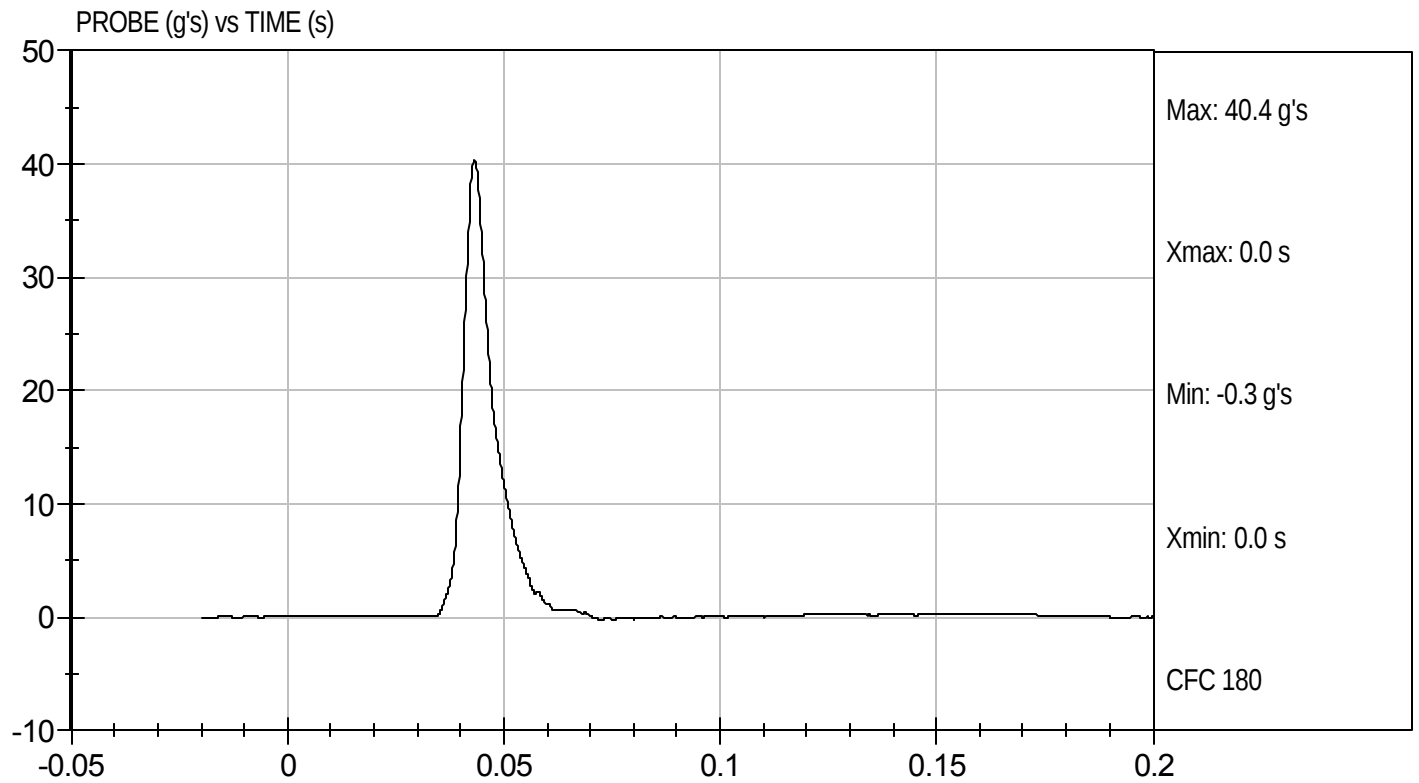
6/10/11
Test Date


Approved By



Test Desc: Iliac Impact
Component ID: D112038

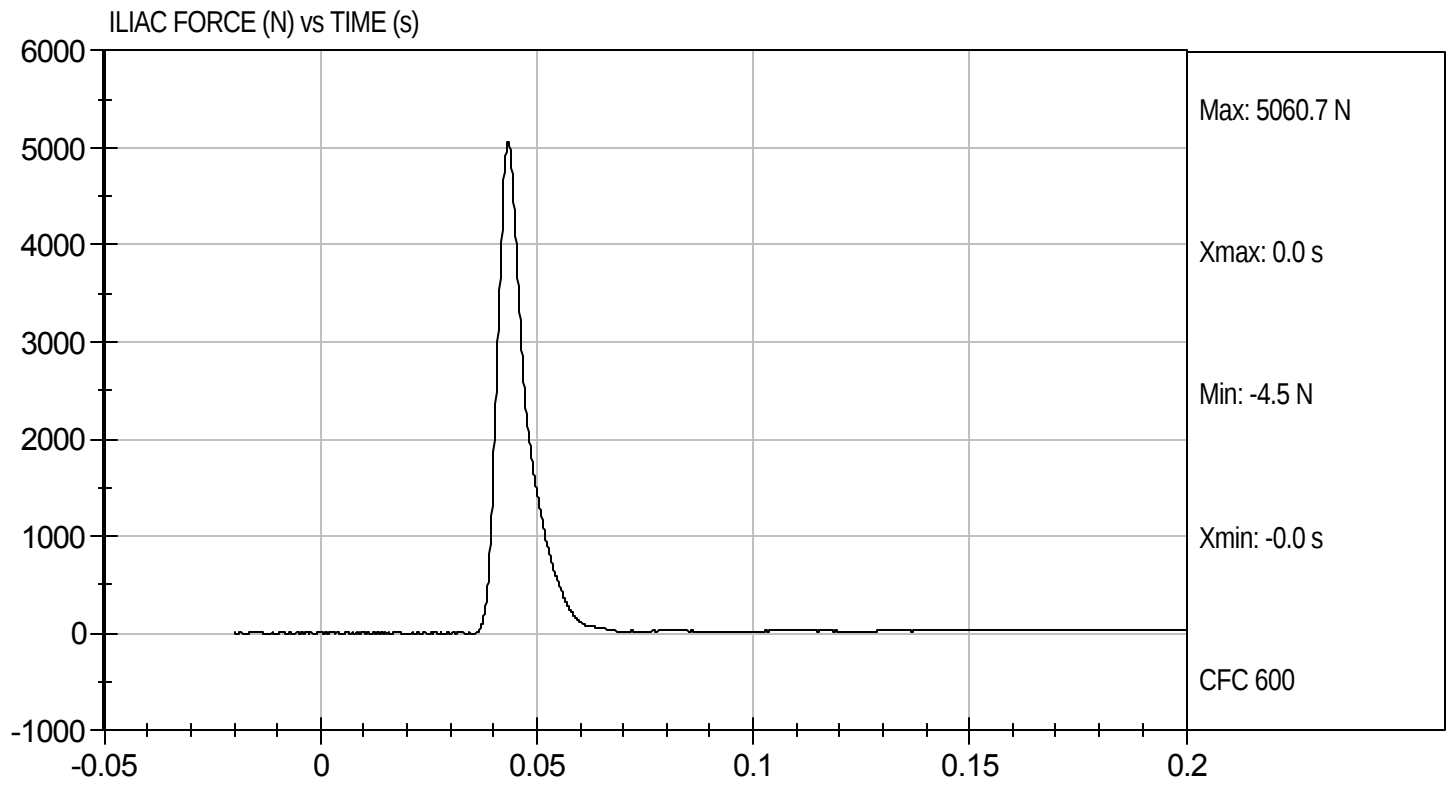
Test Date: 6/10/11
Velocity: 14.24 ft/s, 4.34 m/s





Test Desc: Iliac Impact
Component ID: D112038

Test Date: 6/10/11
Velocity: 14.24 ft/s, 4.34 m/s



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

ATD Serial No: 306

Test ID: D112141

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	20.8	Pass
Laboratory Relative Humidity	%	10 to 70	49	Pass
Peak Resultant Acceleration	G's	115 to 137	119	Pass
Peak Lateral Acceleration	G's	+/- 15	-1.9	Pass
Unimodal	N/A	<15%	Yes	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

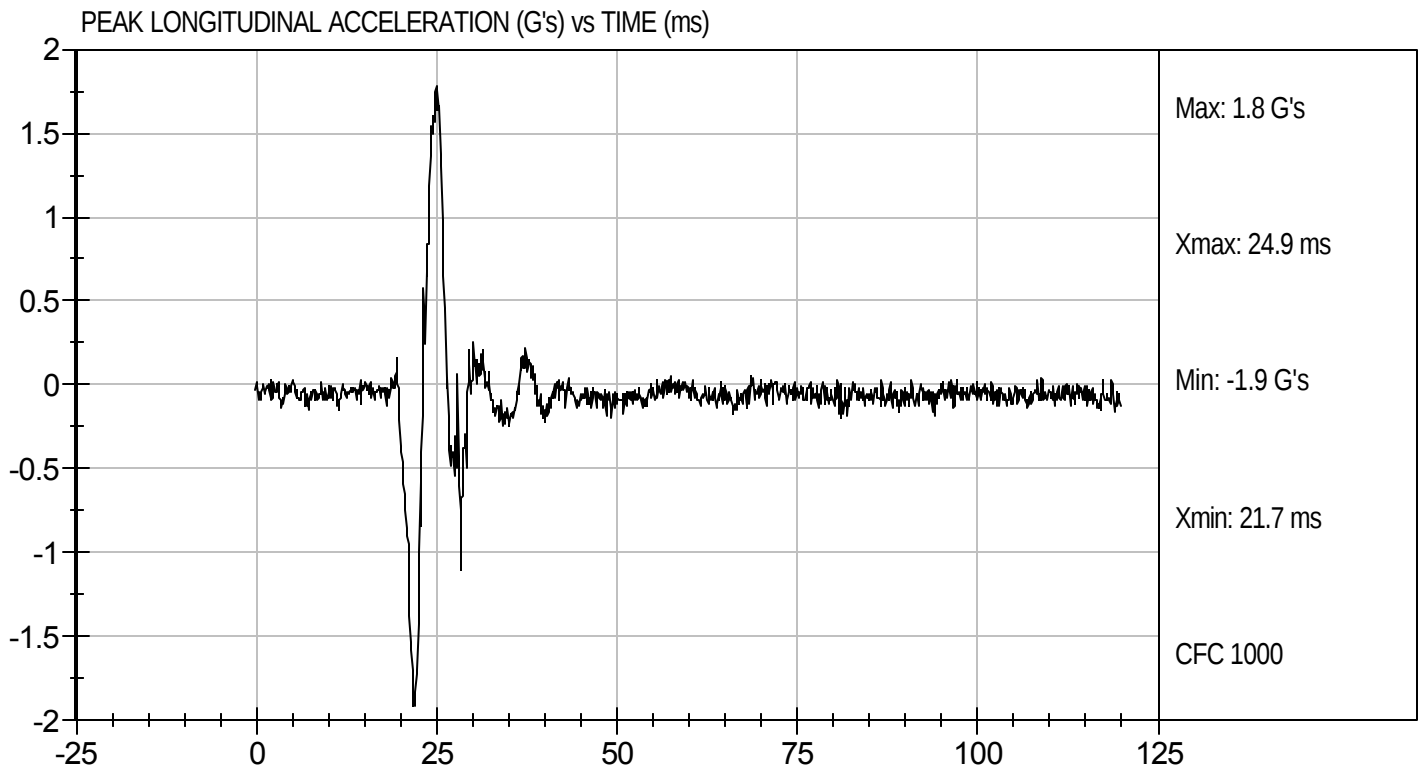
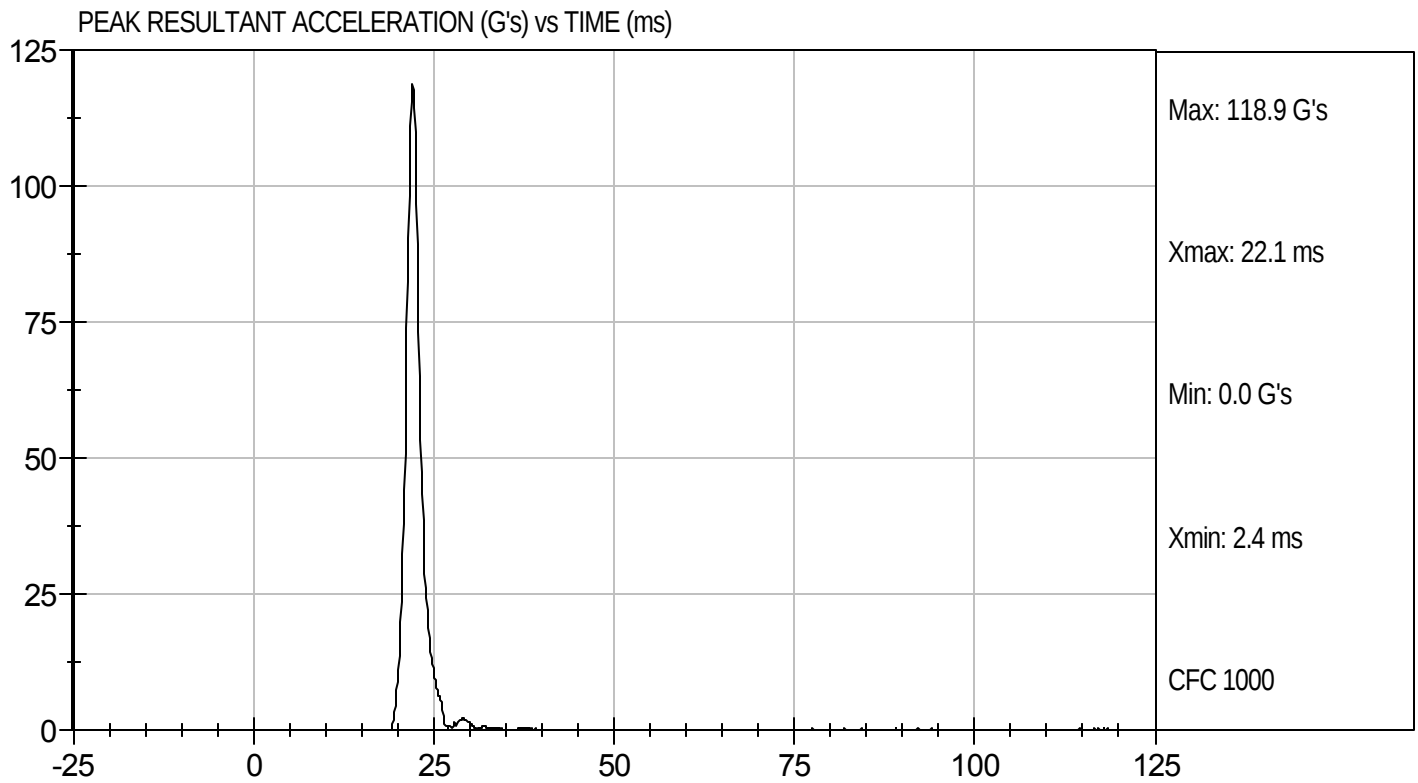
6/17/11
Test Date

David Winkelbauer
Approved By



Test Desc: Head Drop
Component ID: D112141

Test Date: 6/17/11
Velocity: 0 ft/s, 0 m/s

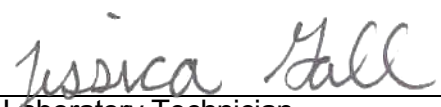


MGA RESEARCH CORPORATION
LATERAL NECK PENDULUM TEST
SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

Test I.D.: D112142

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	5.51 to 5.63	5.52	Pass
Delta Velocity	10 ms	m/s	2.20 to 2.80	2.39	Pass
	15 ms	m/s	3.30 to 4.10	3.37	Pass
	20 ms	m/s	4.40 to 5.40	4.51	Pass
	25 ms	m/s	5.40 to 6.10	5.41	Pass
	25-100 ms	m/s	5.50 to 6.20	5.54	Pass
Maximum D-Plane Rotation		deg	71 to 81	72	Pass
Time of Maximum D-Plane Rotation		ms	50 to 70	58	Pass
Maximum Occipital Condyle Moment during Rotation Interval Nm			-44 to -36	-39	Pass
Time of Moment Decay to 0 Nm		ms	102 to 126	116	Pass
Overall Test Results				Pass	


 Laboratory Technician

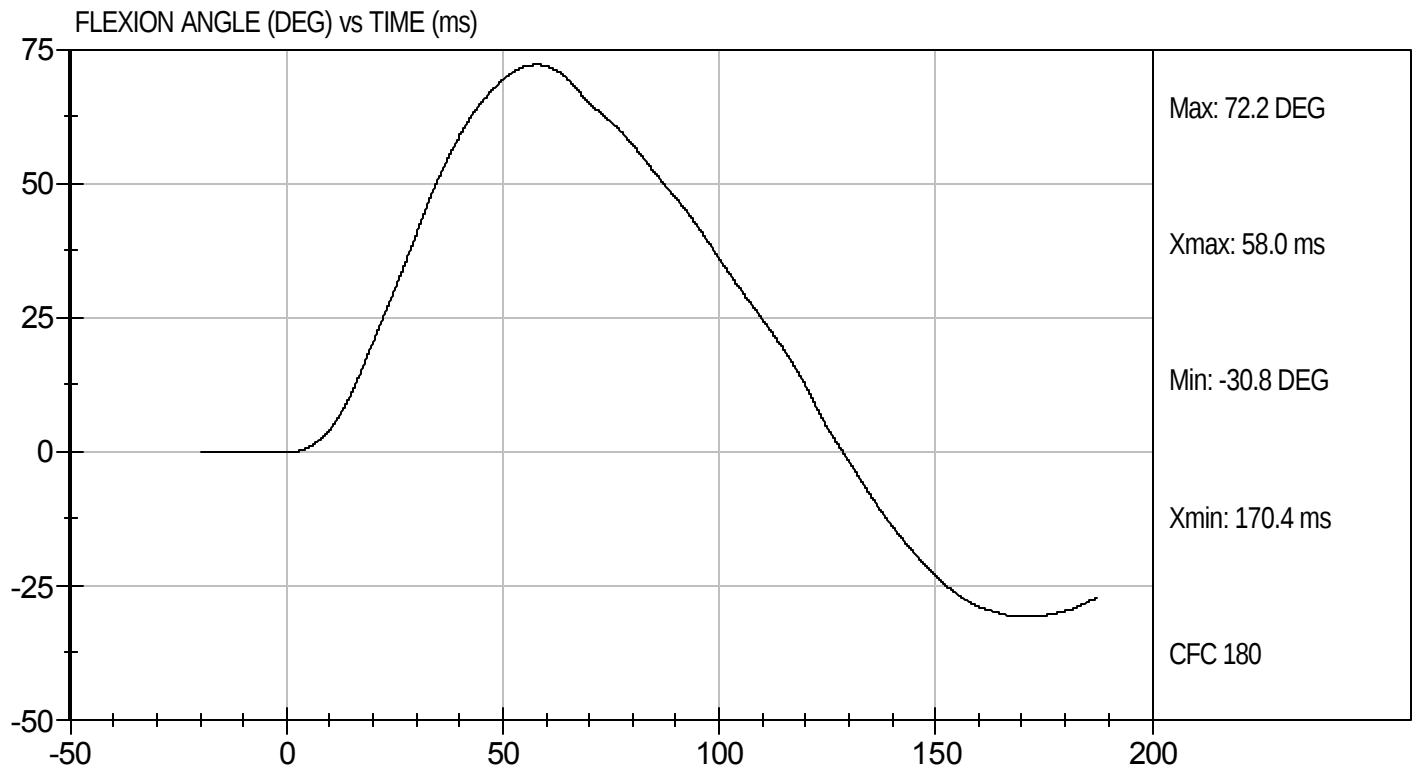
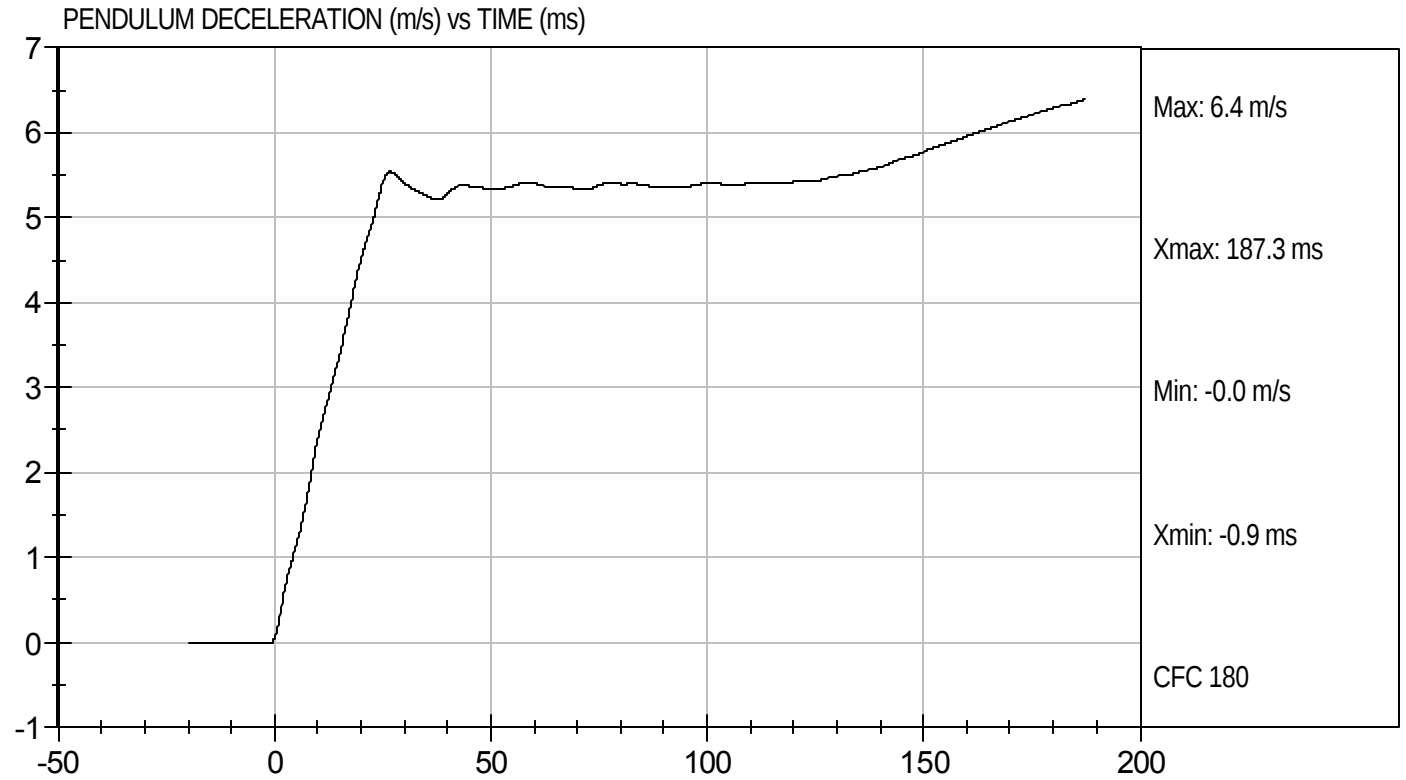
6/20/11
 Test Date


 Approved By



Test Desc: Neck Bending
Component ID: D112142

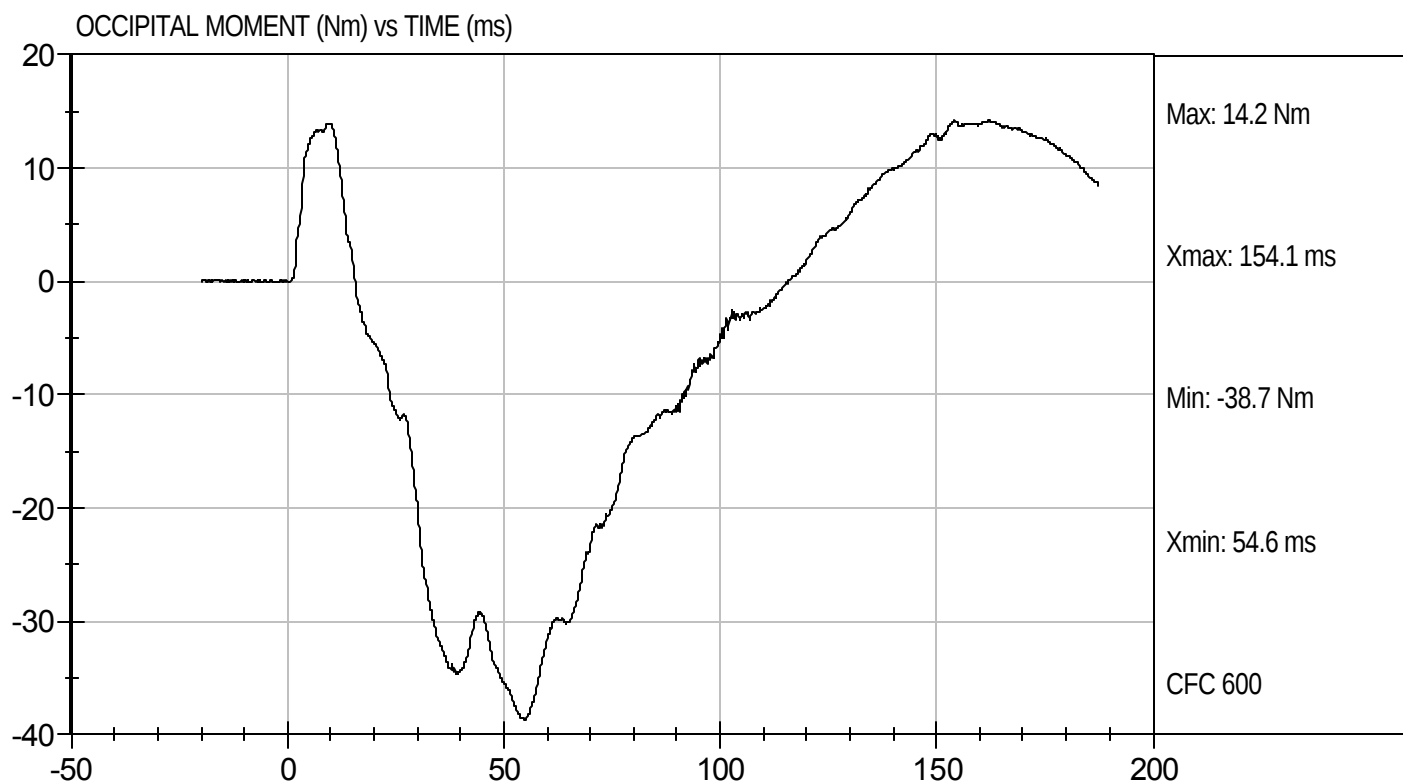
Test Date: 6/20/11
Velocity: 18.11 ft/s, 5.52 m/s





Test Desc: Neck Bending
Component ID: D112142

Test Date: 6/20/11
Velocity: 18.11 ft/s, 5.52 m/s

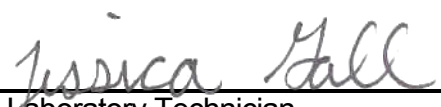


MGA RESEARCH CORPORATION
SHOULDER IMPACT TEST
SID-11s BUILD LEVEL D DUMMY

ATD Serial No: 306

Test ID: D112143

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	53	Pass
Impact Velocity	m/s	4.20 to 4.40	4.38	Pass
Maximum Probe Acceleration	G's	13 to 18	15	Pass
Shoulder Displacement	mm	28 to 37	30	Pass
Upper Spine (T1) Y Acceleration	G's	17 to 22	19	Pass
Overall Test Results			Pass	


Laboratory Technician

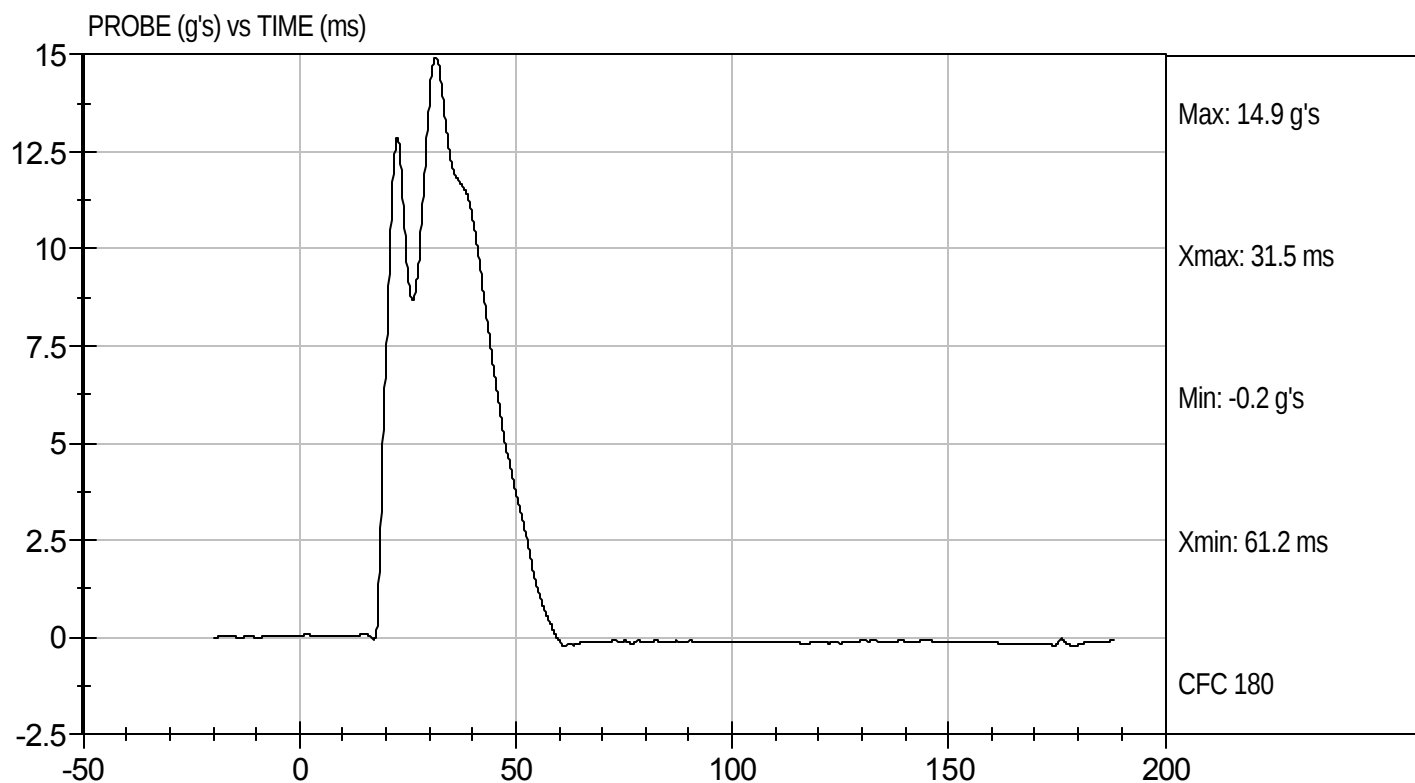
6/21/11
Test Date


Approved By



Test Desc: Shoulder Impact
Component ID: D112143

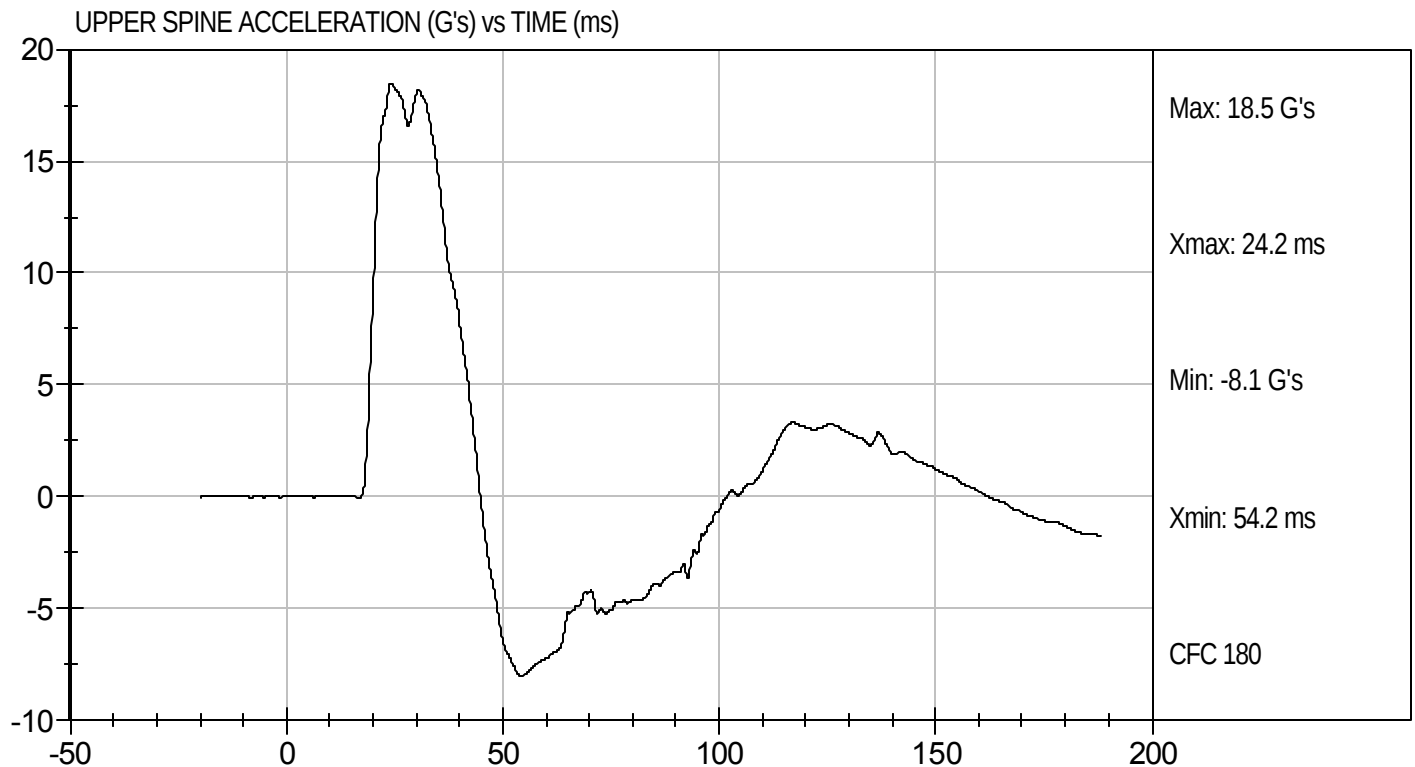
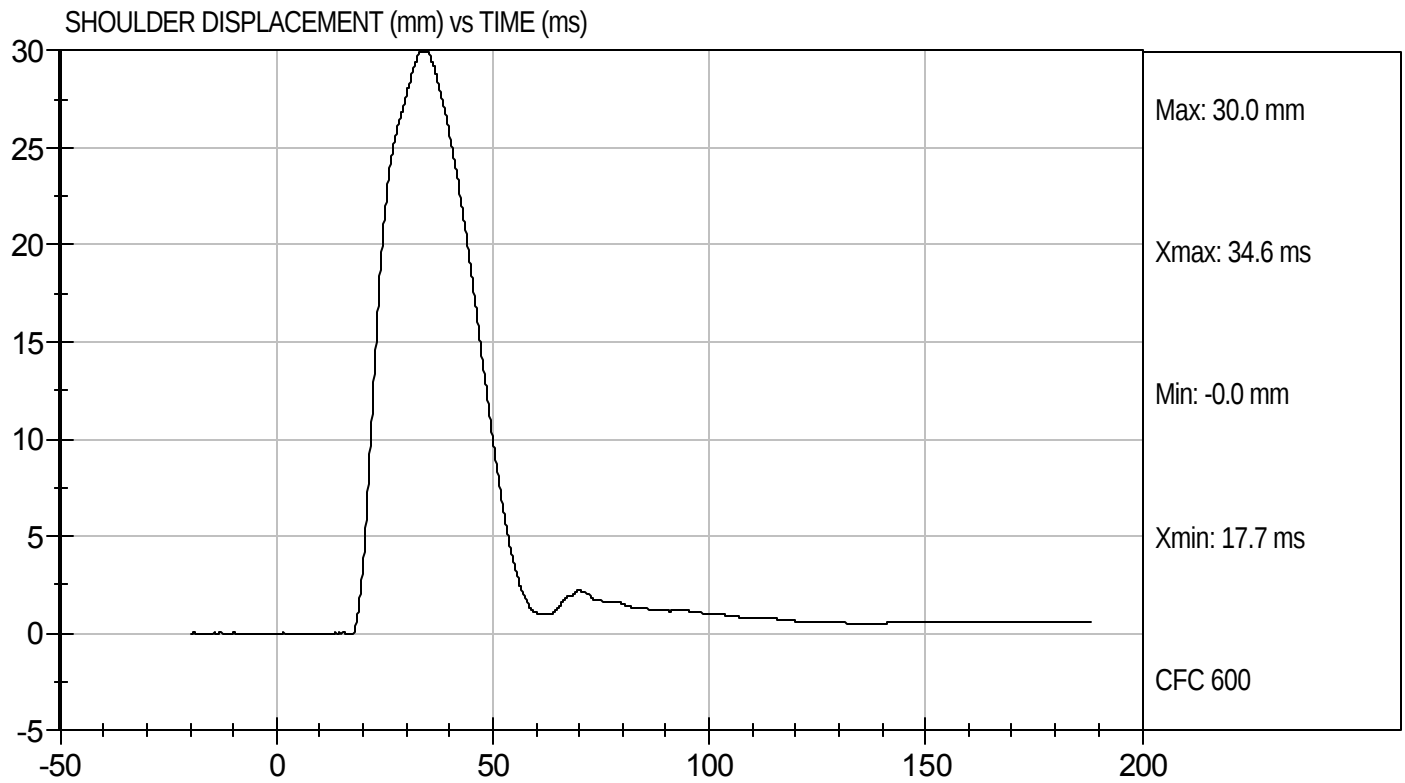
Test Date: 6/21/11
Velocity: 14.37 ft/s, 4.38 m/s





Test Desc: Shoulder Impact
Component ID: D112143

Test Date: 6/21/11
Velocity: 14.37 ft/s, 4.38 m/s



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

ATD Serial No: 306

Test I.D: D112144

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.7	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	32	Pass
Shoulder Displacement	mm	31 to 40	33	Pass
Upper Rib Displacement	mm	25 to 32	29	Pass
Middle Rib Displacement	mm	30 to 36	31	Pass
Lower Rib Displacement	mm	32 to 38	34	Pass
Upper Spine (T1) Y Acceleration	G's	34 to 43	40	Pass
Lower Spine (T12) Y Acceleration	G's	29 to 37	32	Pass
Overall Test Results				Pass


Laboratory Technician

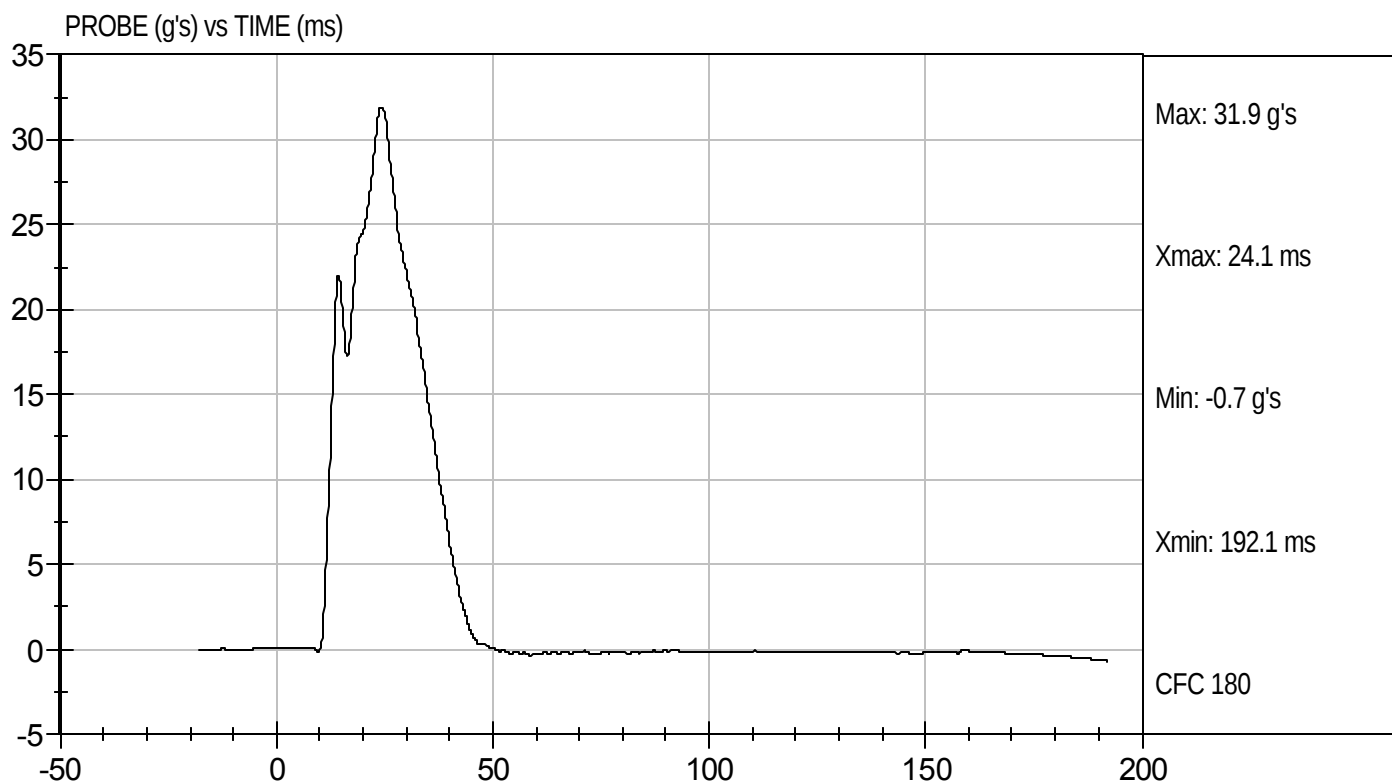
6/21/11
Test Date


Approved By



Test Desc: Thorax With Arm
Component ID: D112144

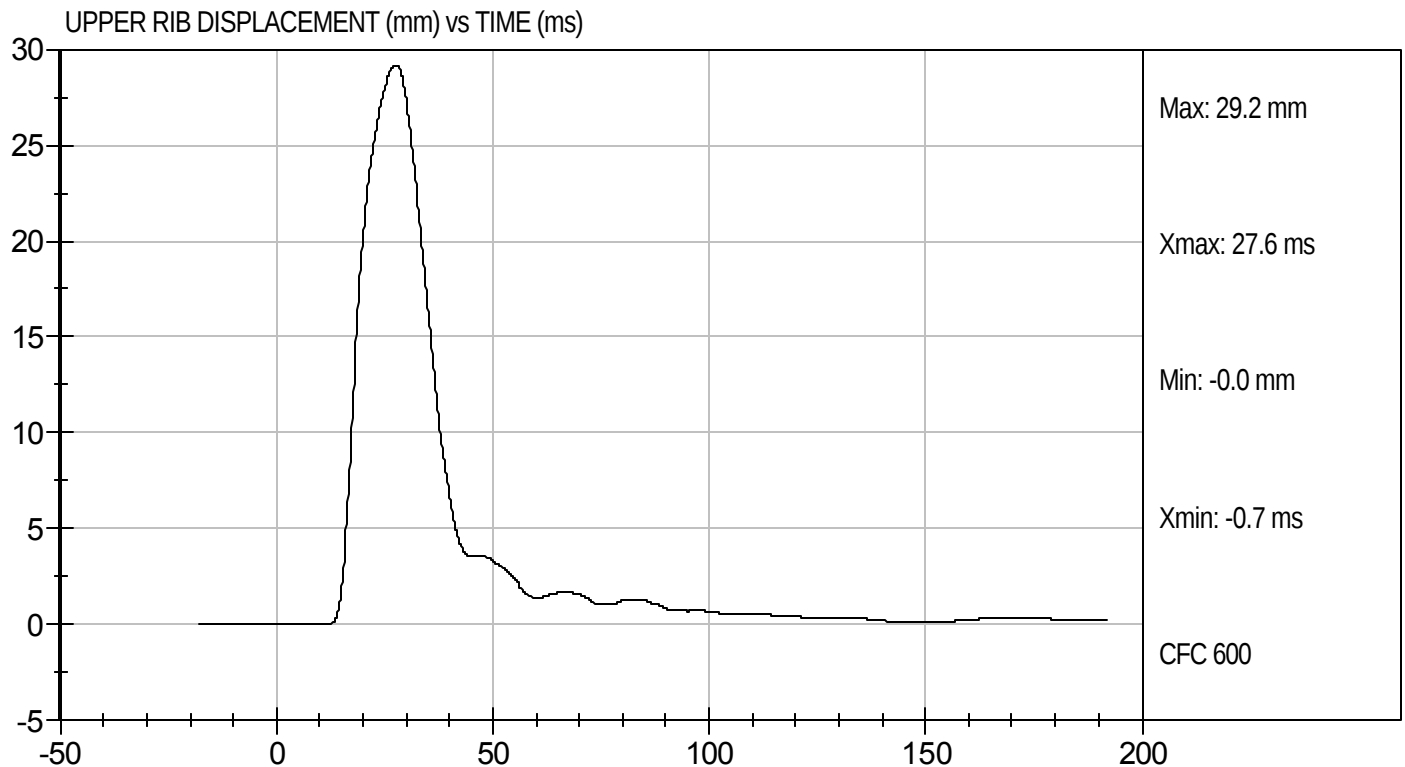
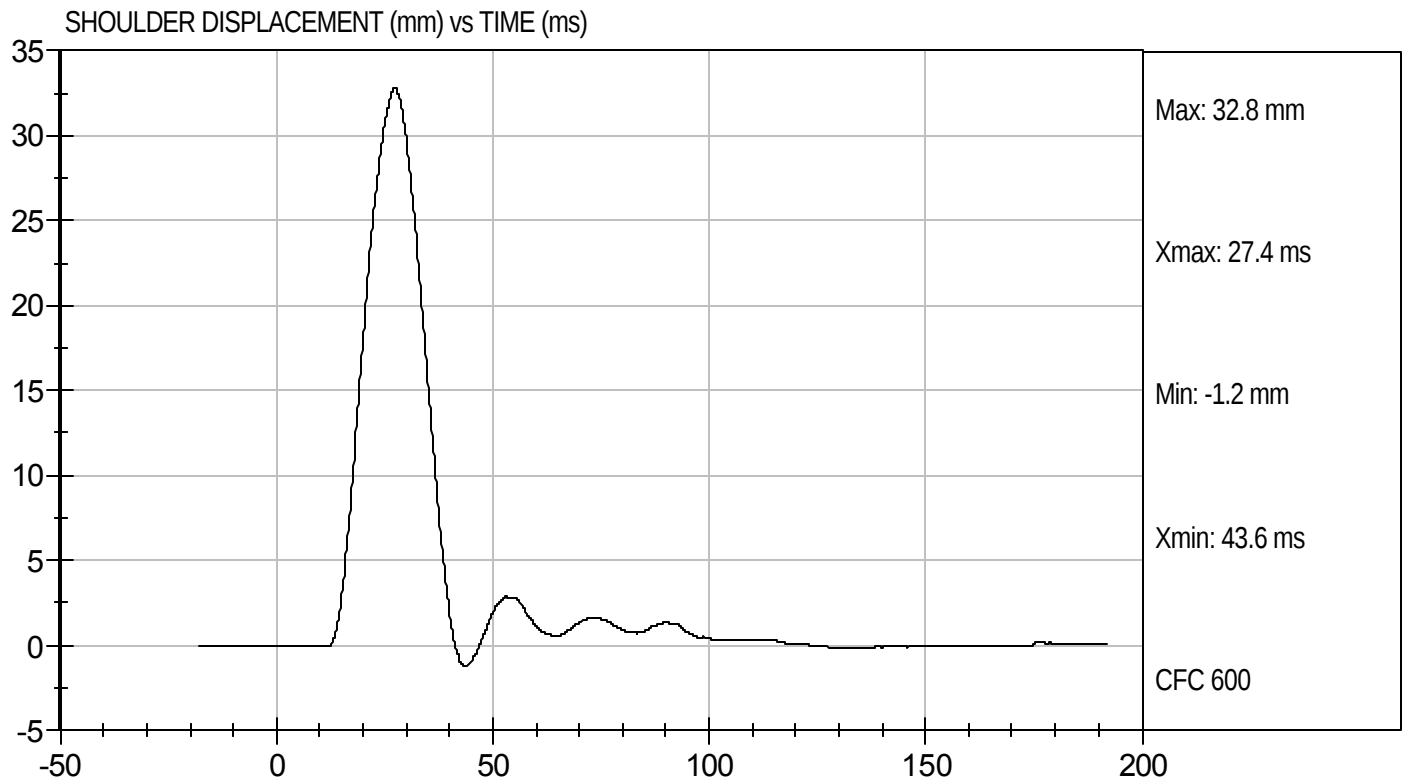
Test Date: 6/21/11
Velocity: 22.2 ft/s, 6.77 m/s





Test Desc: Thorax With Arm
Component ID: D112144

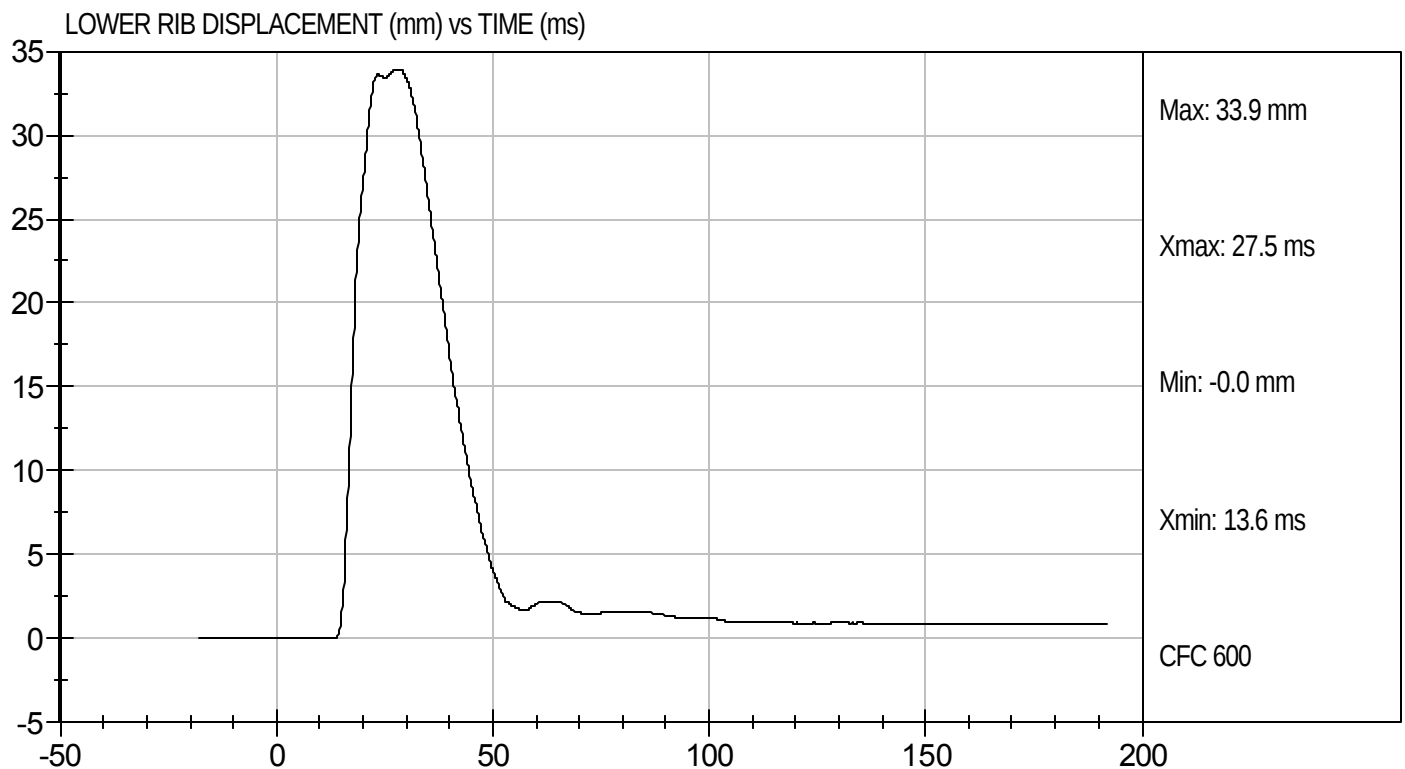
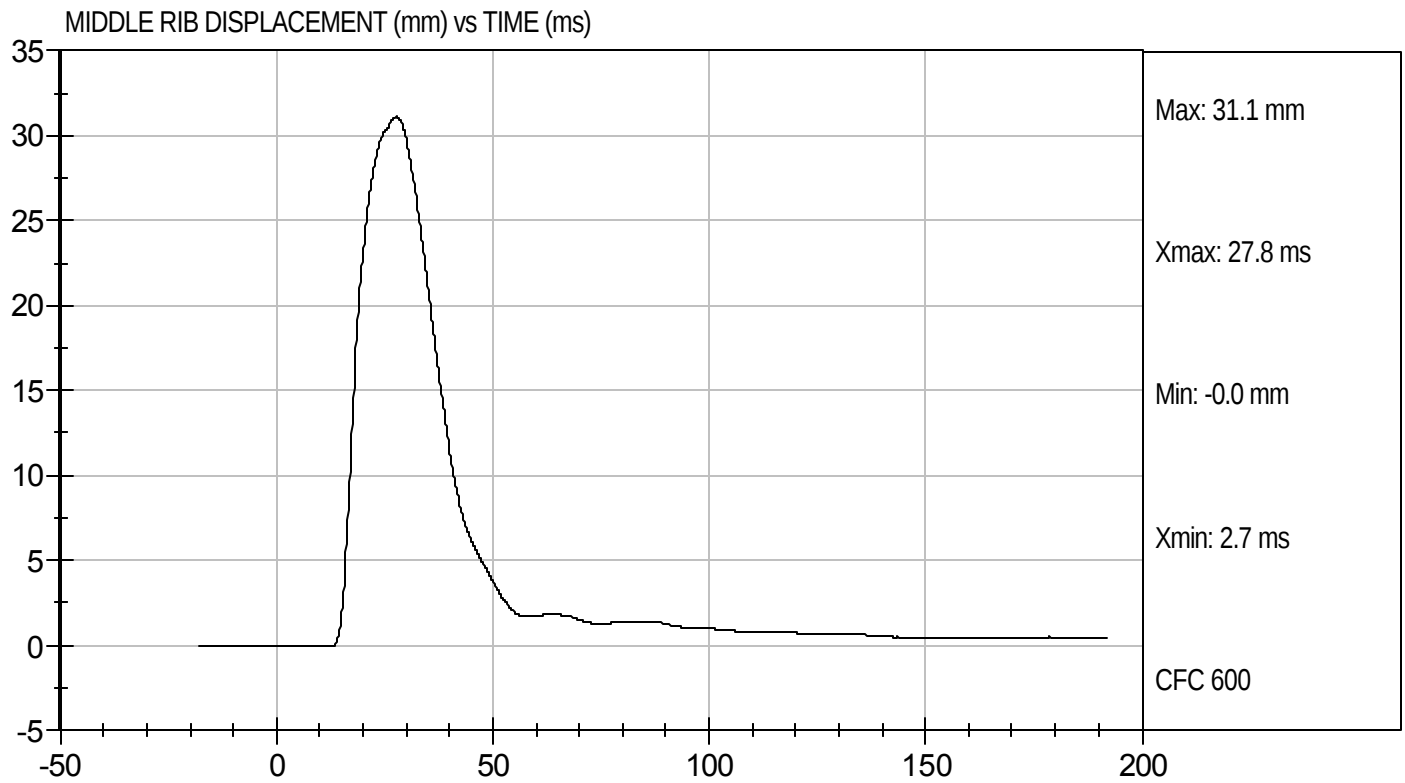
Test Date: 6/21/11
Velocity: 22.2 ft/s, 6.77 m/s





Test Desc: Thorax With Arm
Component ID: D112144

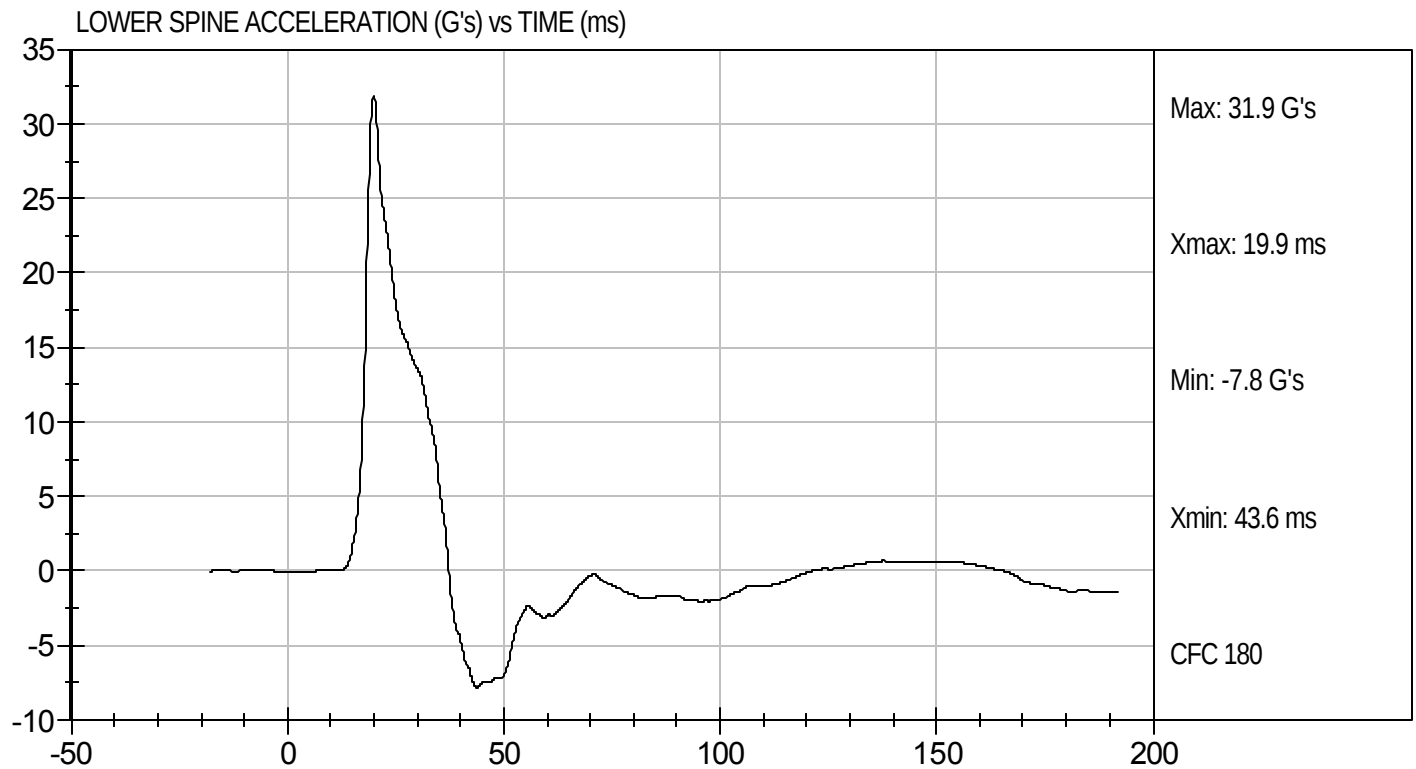
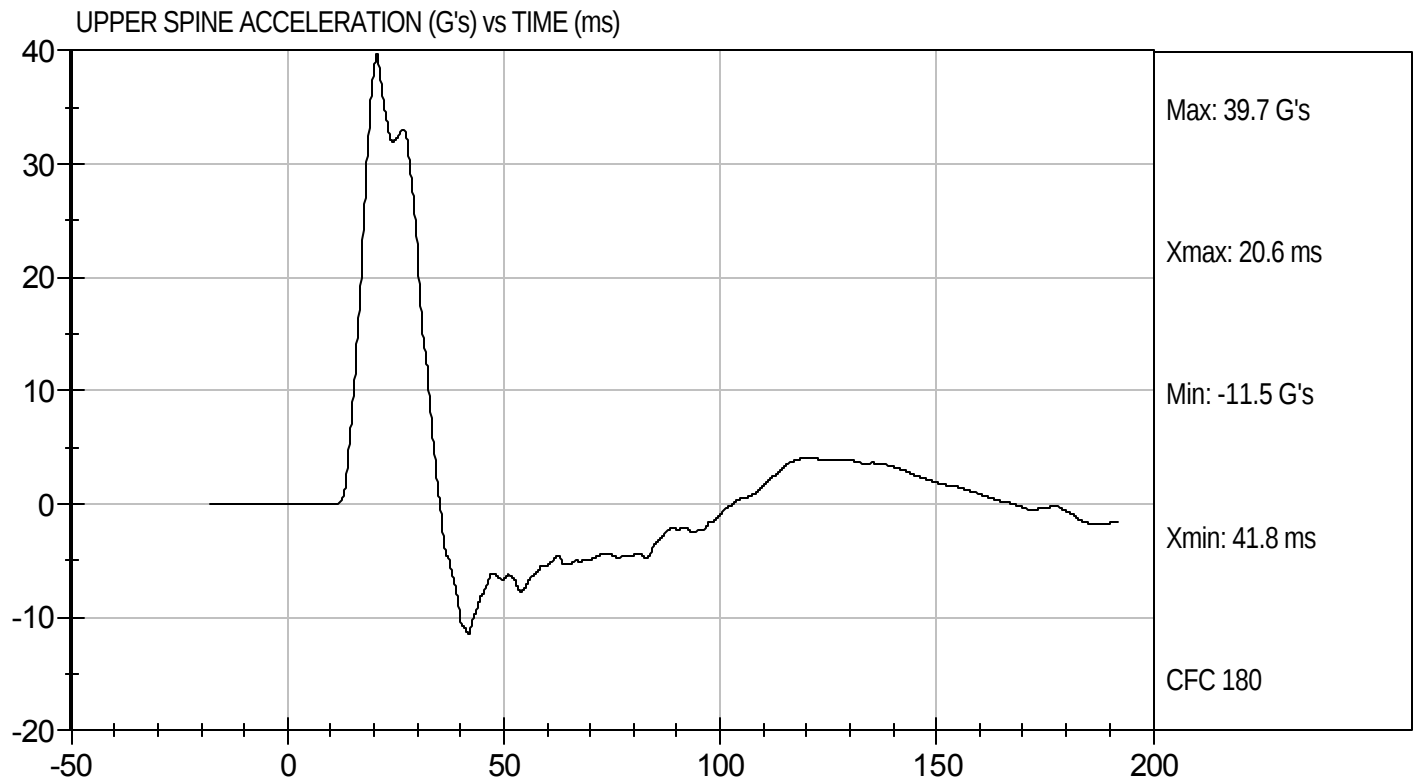
Test Date: 6/21/11
Velocity: 22.2 ft/s, 6.77 m/s





Test Desc: Thorax With Arm
Component ID: D112144

Test Date: 6/21/11
Velocity: 22.2 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: D112145

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.7	Pass
Humidity	%	10 to 70	53	Pass
Impact Velocity	m/s	4.20 to 4.40	4.30	Pass
Peak Impactor Force	G's	14 to 18	15	Pass
Upper Rib Displacement	mm	32 to 40	40	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

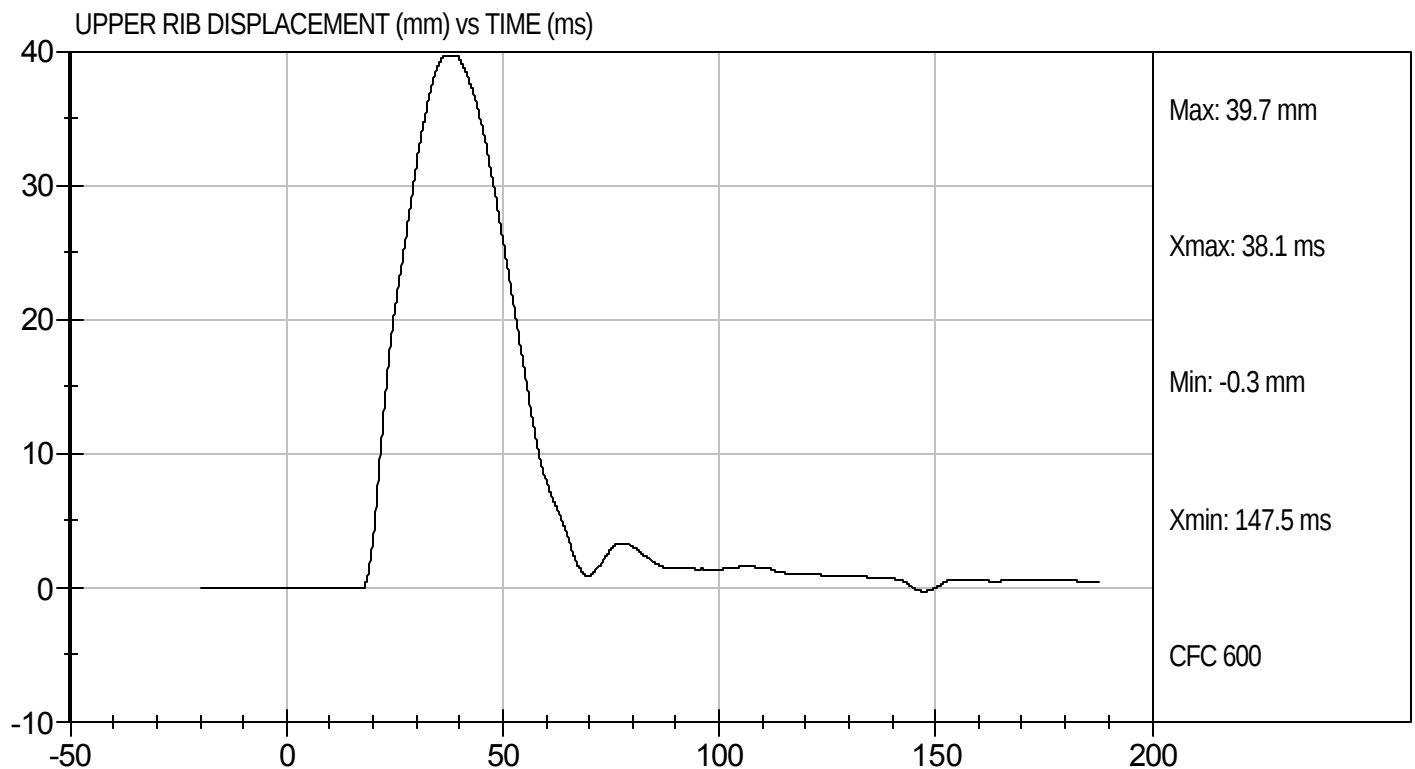
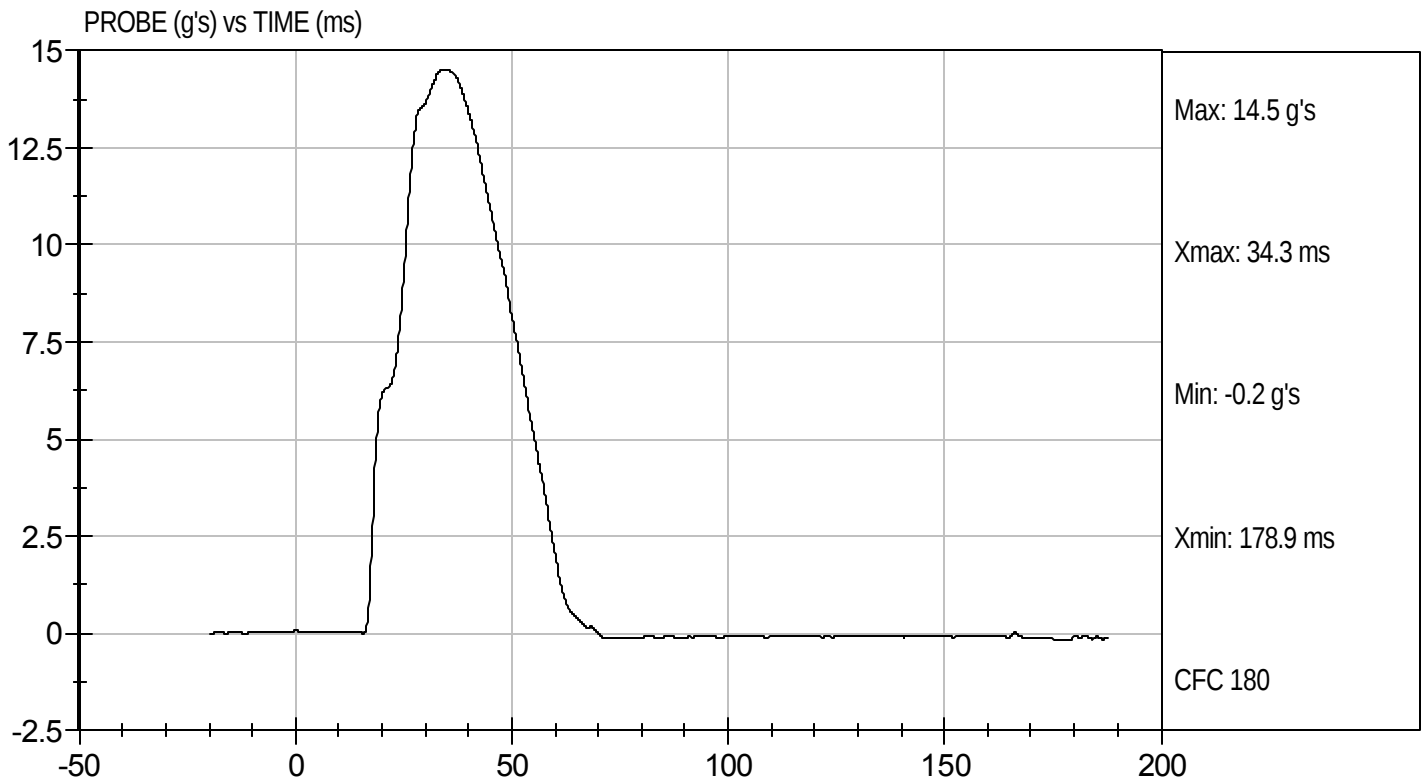
6/21/11
Test Date


Approved By



Test Desc: Thorax Without Arm
Component ID: D112145

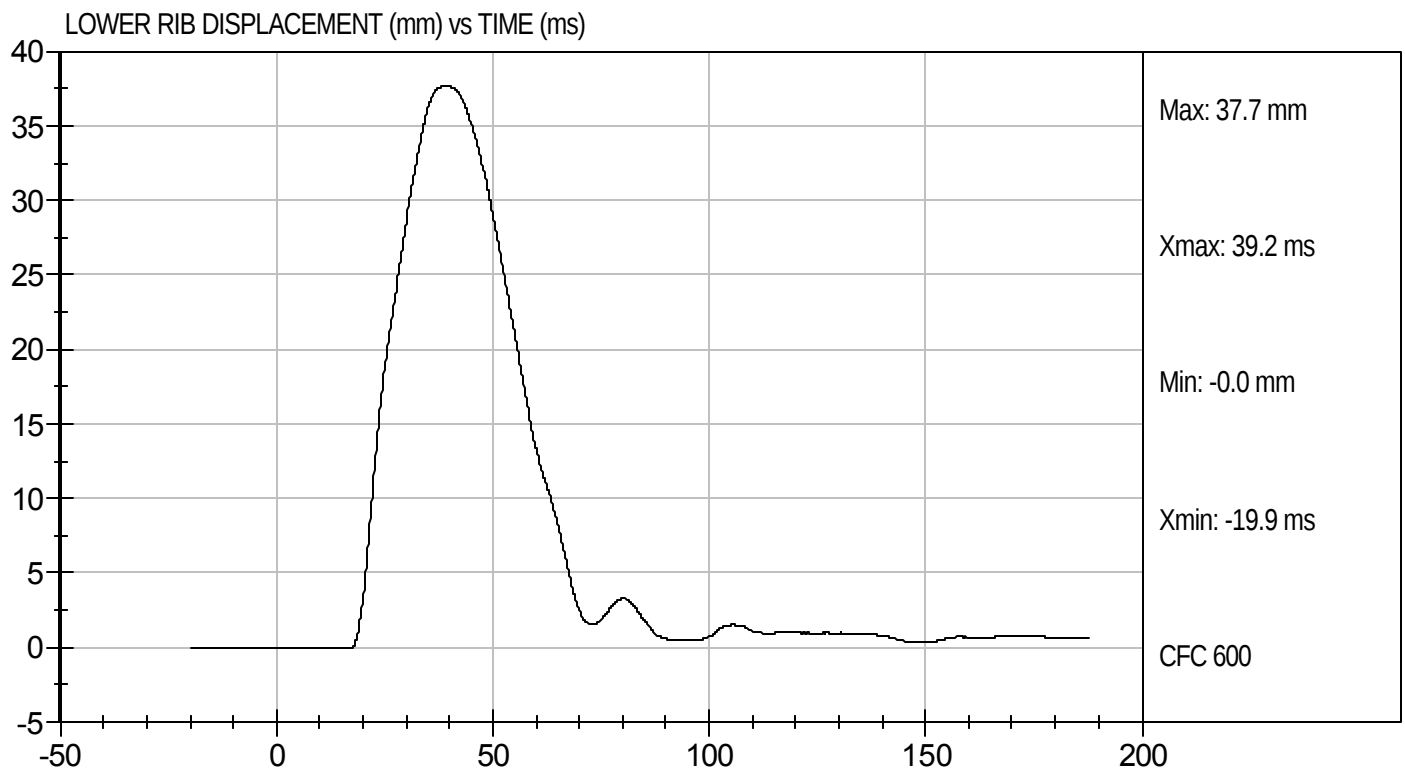
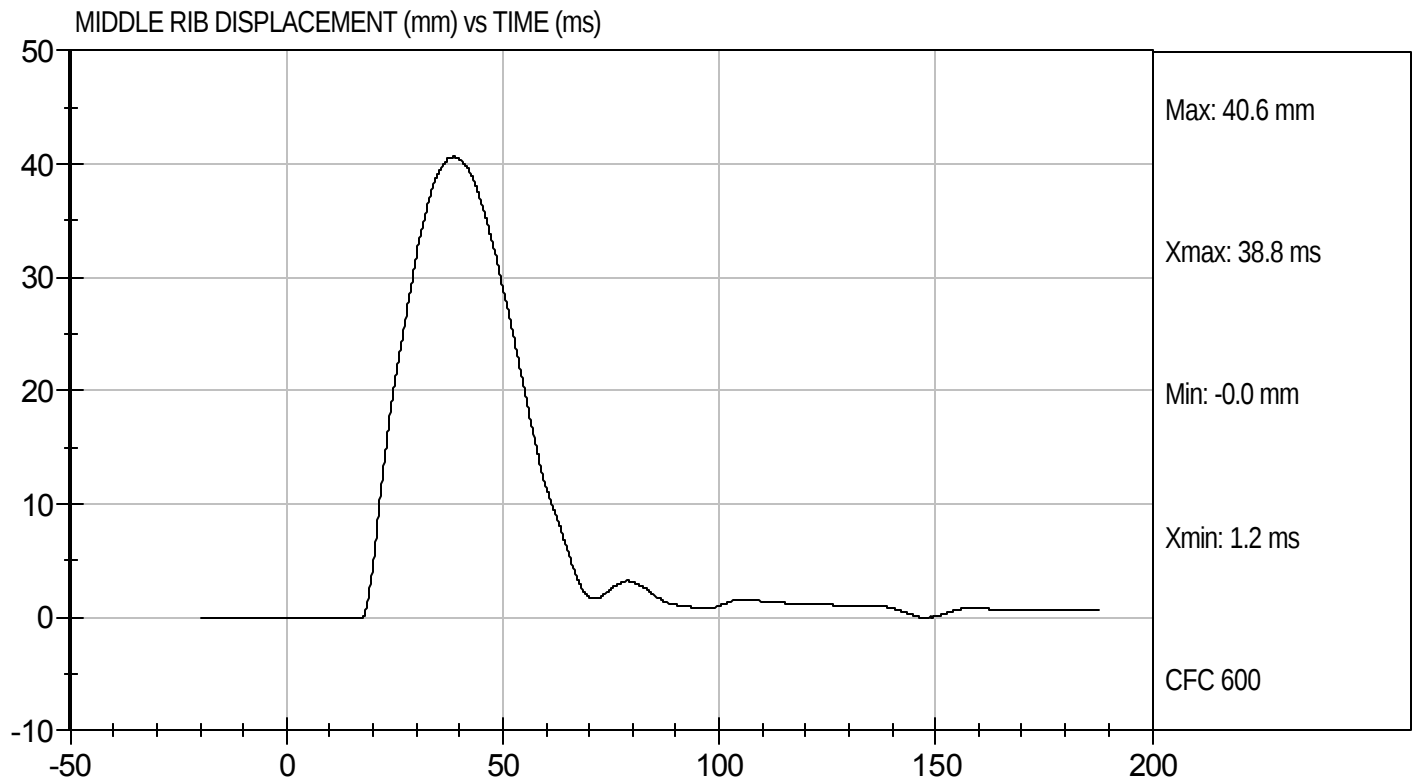
Test Date: 6/21/11
Velocity: 14.12 ft/s, 4.30 m/s





Test Desc: Thorax Without Arm
Component ID: D112145

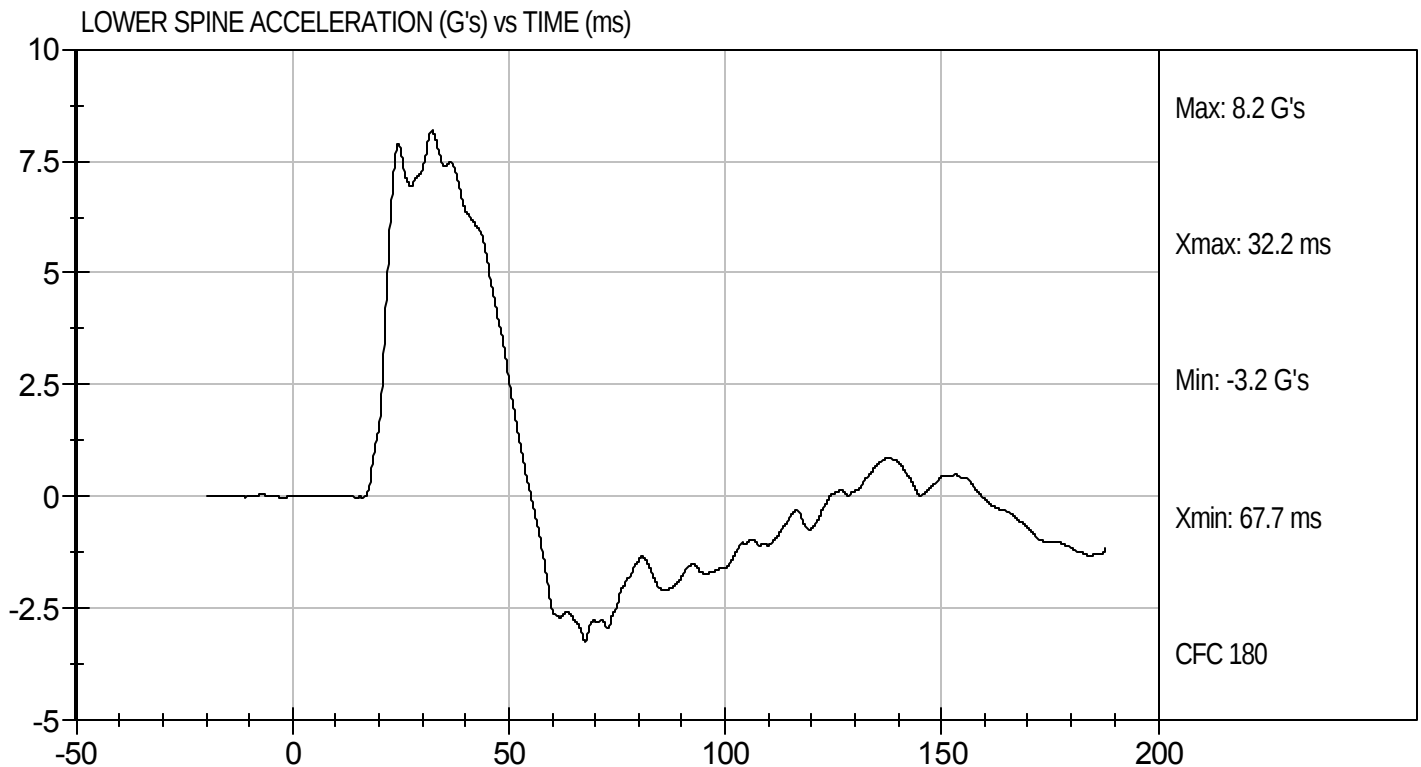
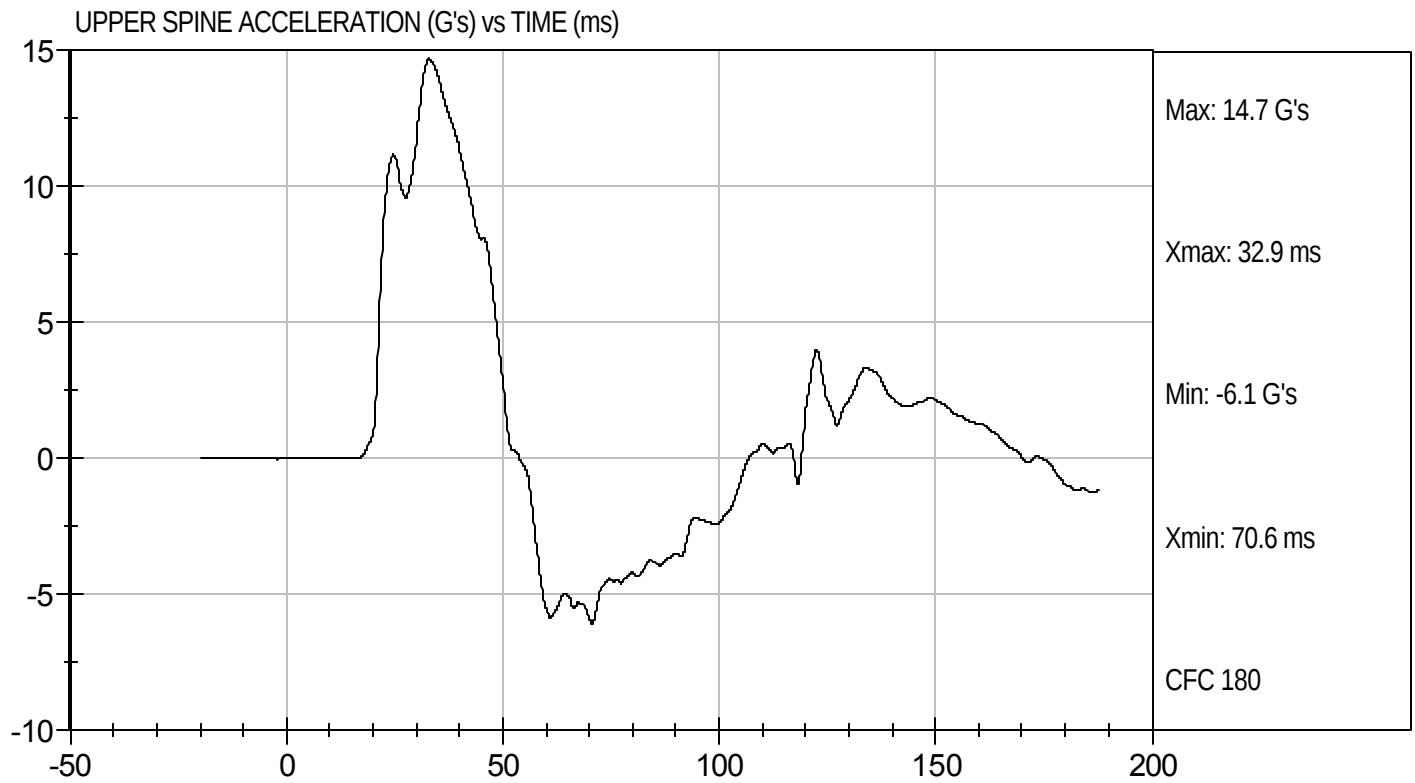
Test Date: 6/21/11
Velocity: 14.12 ft/s, 4.30 m/s





Test Desc: Thorax Without Arm
Component ID: D112145

Test Date: 6/21/11
Velocity: 14.12 ft/s, 4.30 m/s

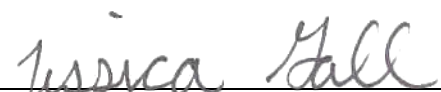


MGA RESEARCH CORPORATION
ABDOMINAL IMPACT TEST
SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

Test I.D: D112146

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.7	Pass
Humidity	%	10 to 70	53	Pass
Impact Velocity	m/s	4.20 to 4.40	4.30	Pass
Peak Impactor Acceleration	G's	12 to 16	14	Pass
Upper Rib Displacement	mm	36 to 47	39	Pass
Lower Rib Displacement	mm	33 to 44	39	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	10	Pass
			Overall Test Results	Pass



Laboratory Technician

6/21/11
Test Date

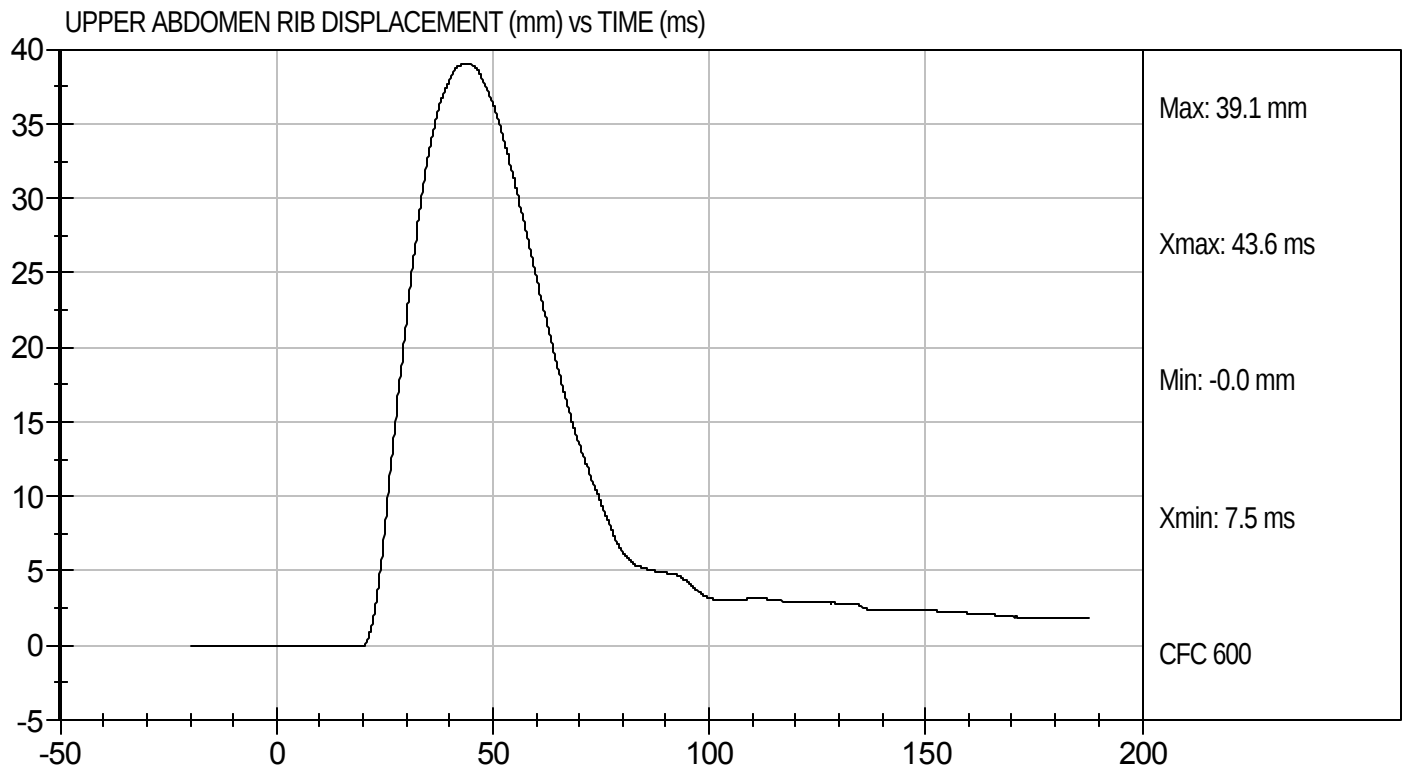
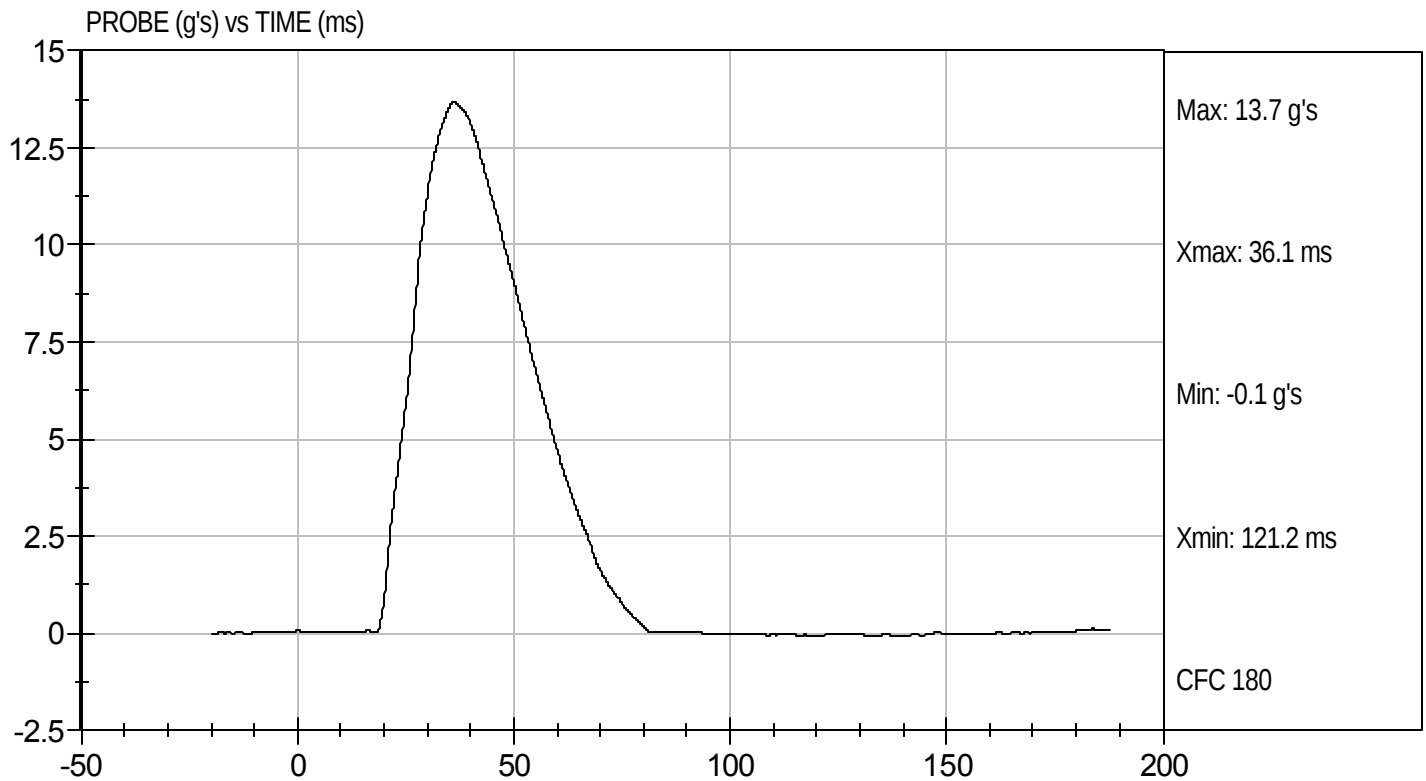


Approved By



Test Desc: Abdomen Impact
Component ID: D112146

Test Date: 6/21/11
Velocity: 14.12 ft/s, 4.30 m/s

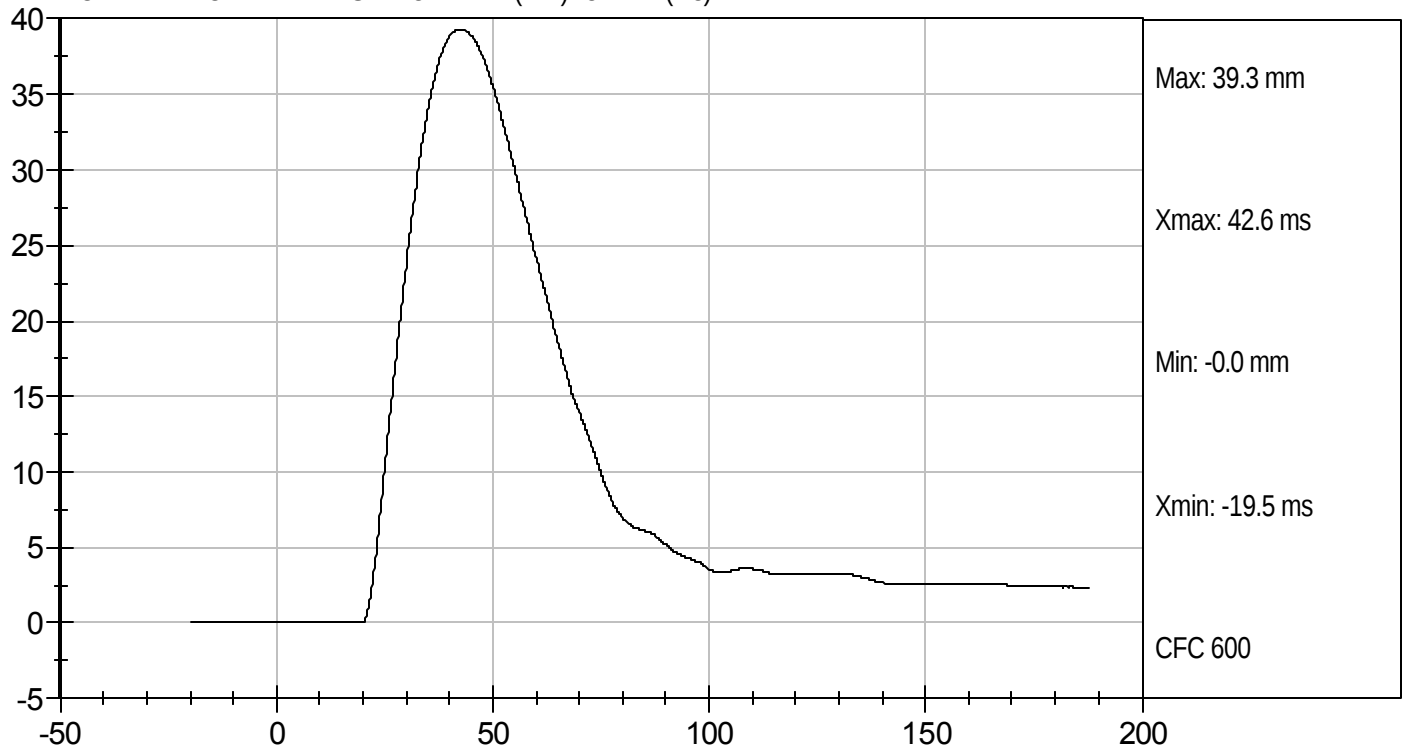




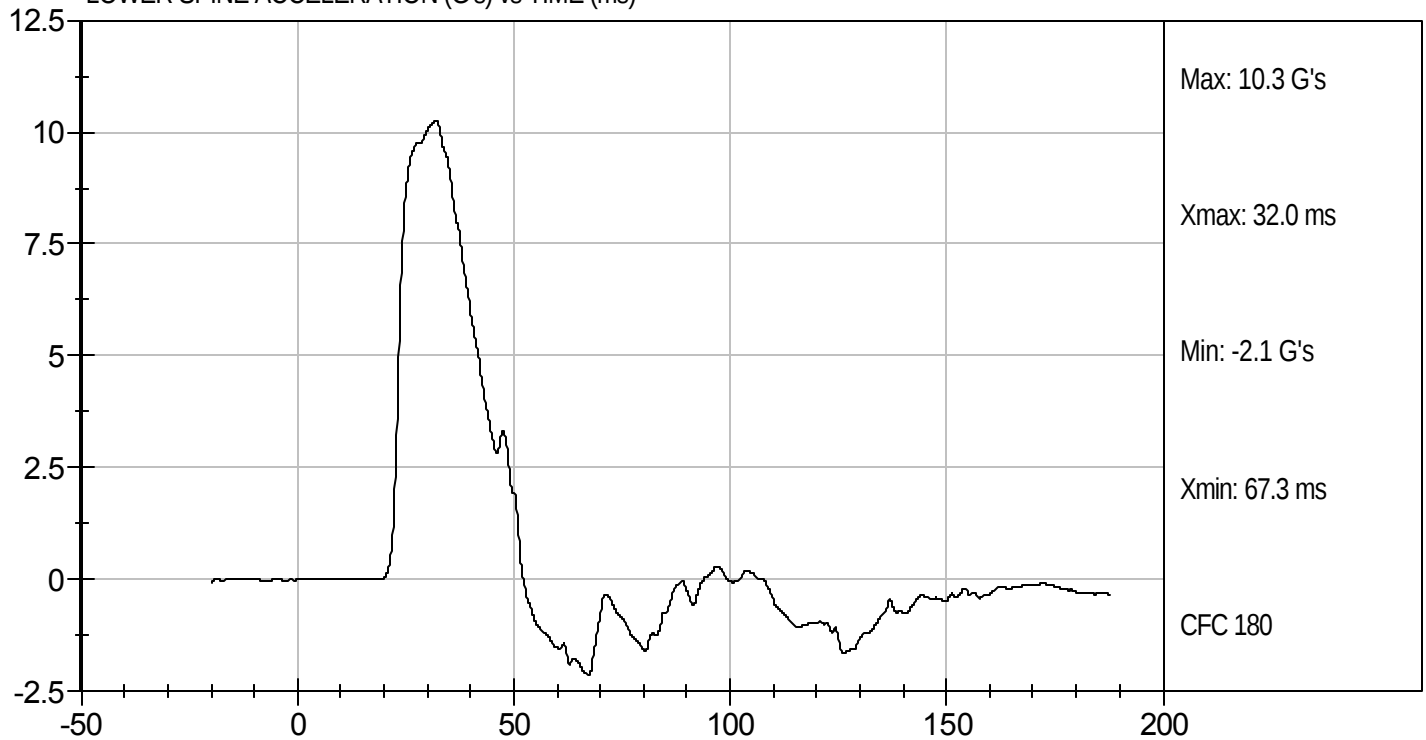
Test Desc: Abdomen Impact
Component ID: D112146

Test Date: 6/21/11
Velocity: 14.12 ft/s, 4.30 m/s

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



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



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

ATD Serial No: 306

Test I.D: D112147

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.7	Pass
Humidity	%	10 to 70	53	Pass
Impact Velocity	m/s	6.60 to 6.80	6.77	Pass
Peak Impactor Acceleration	G's	38 to 47	41	Pass
Pelvis Y Acceleration after 6 ms	G's	34 to 42	40	Pass
Peak Acetabulum Force	N	3600 to 4300	3809	Pass
Overall Test Results				Pass


Laboratory Technician

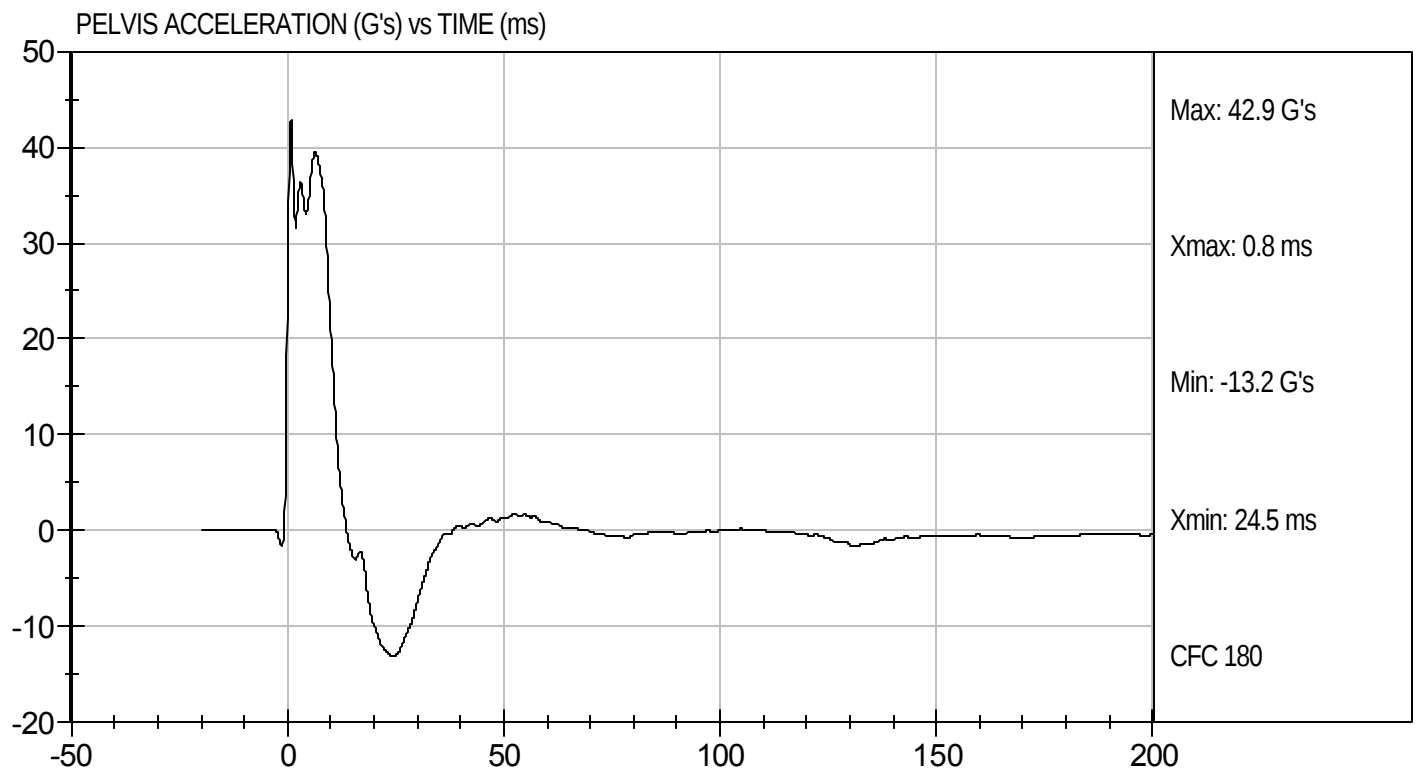
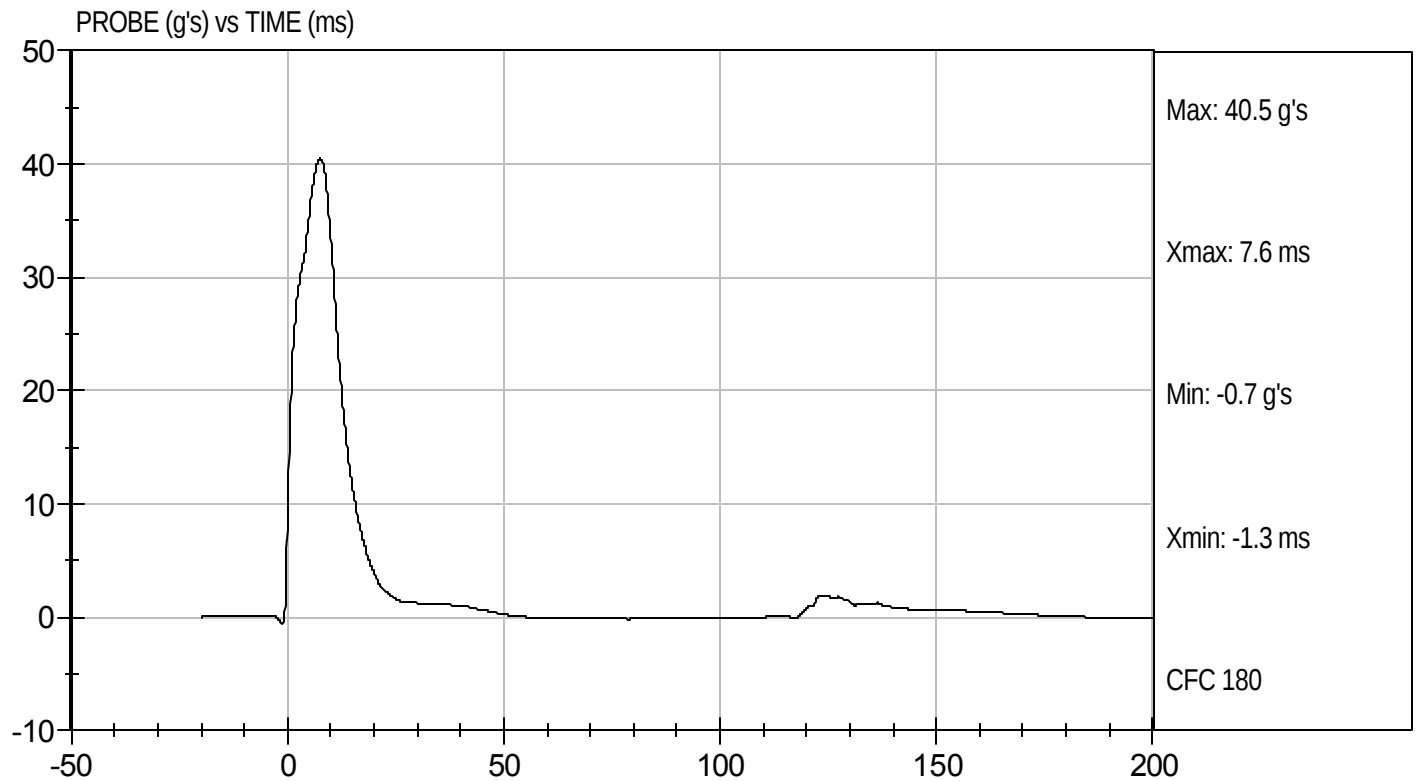
6/21/11
Test Date


Approved By



Test Desc: Pelvis Impact
Component ID: D112147

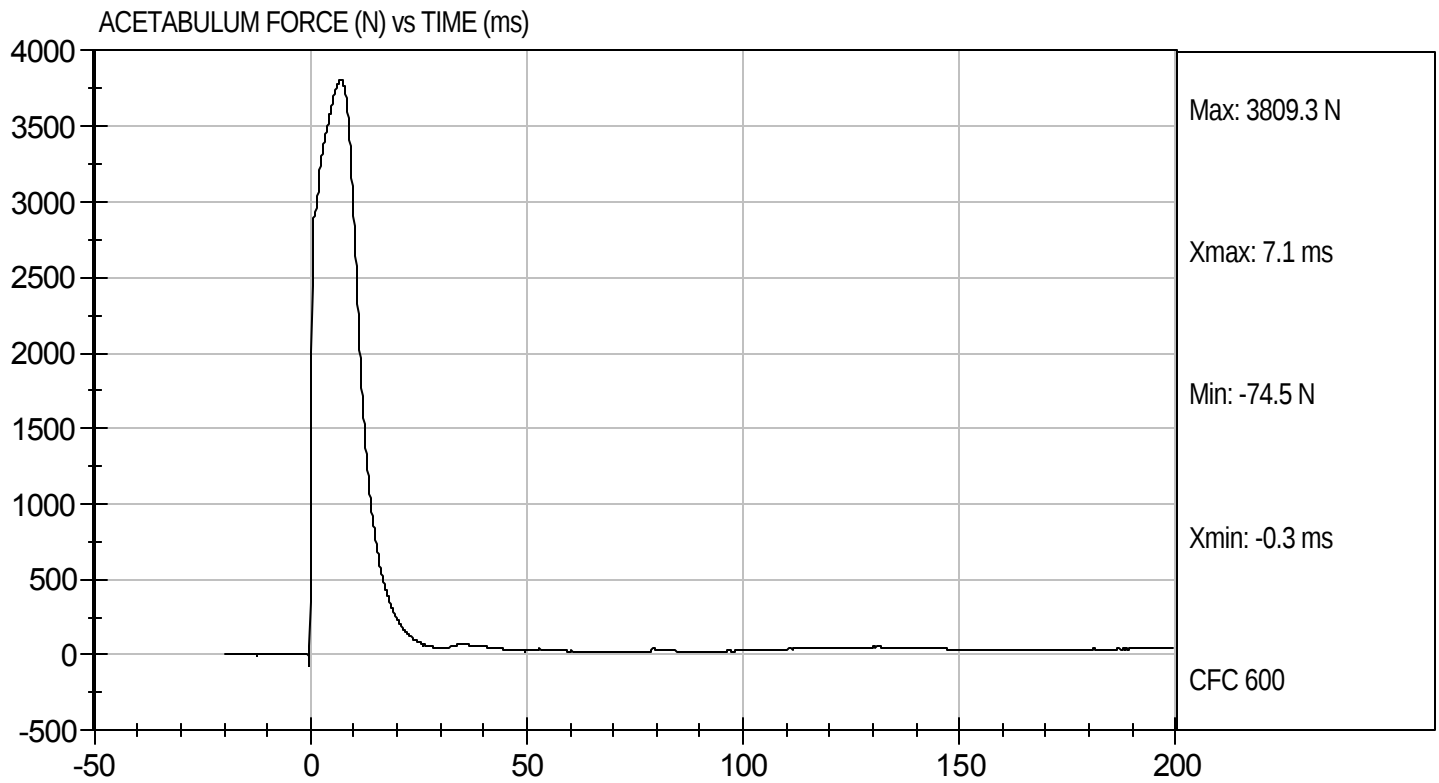
Test Date: 6/21/11
Velocity: 22.22 ft/s, 6.77 m/s





Test Desc: Pelvis Impact
Component ID: D112147

Test Date: 6/21/11
Velocity: 22.22 ft/s, 6.77 m/s



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

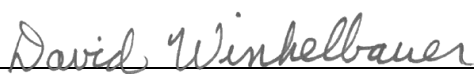
ATD Serial No: 306

Test I.D: D112148

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.7	Pass
Humidity	%	10 to 70	53	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	4930	Pass
Overall Test Results				Pass


Laboratory Technician

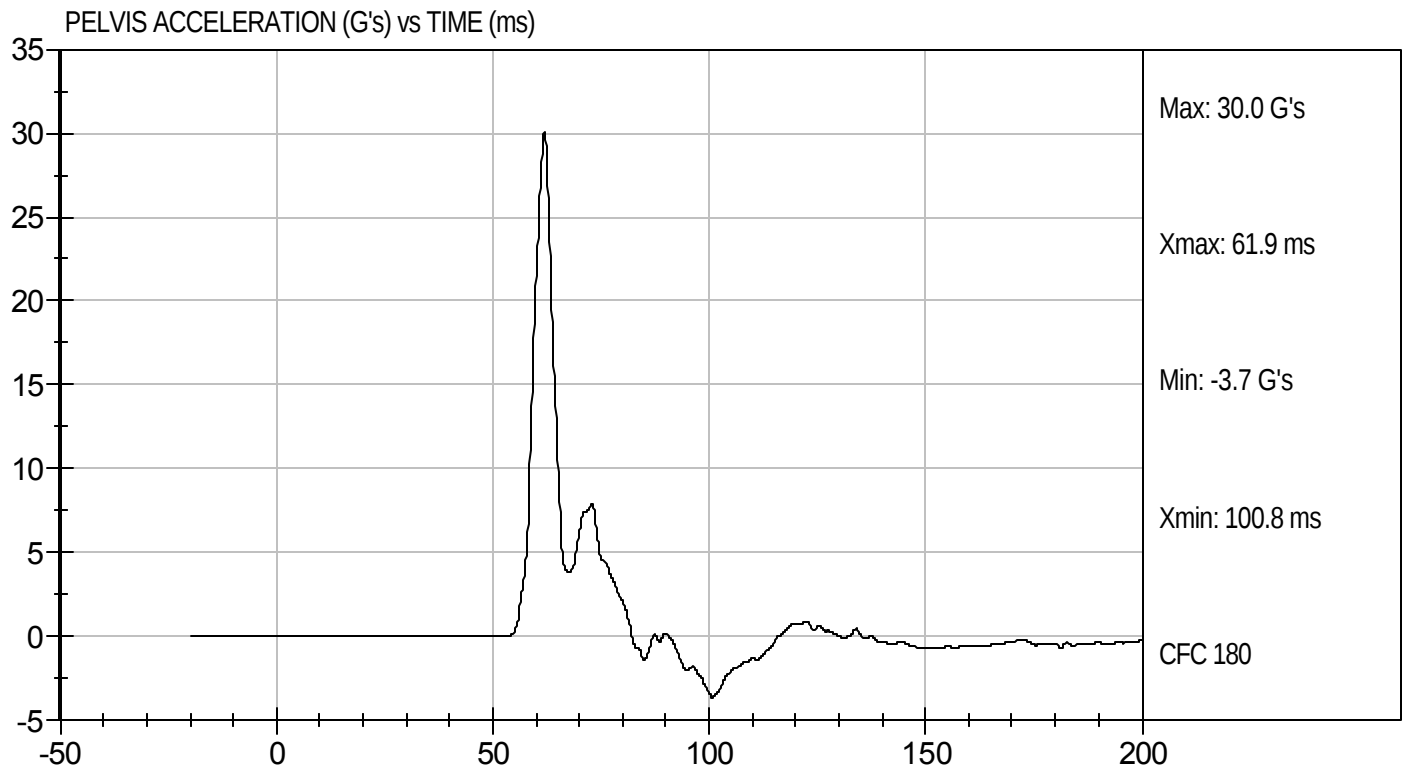
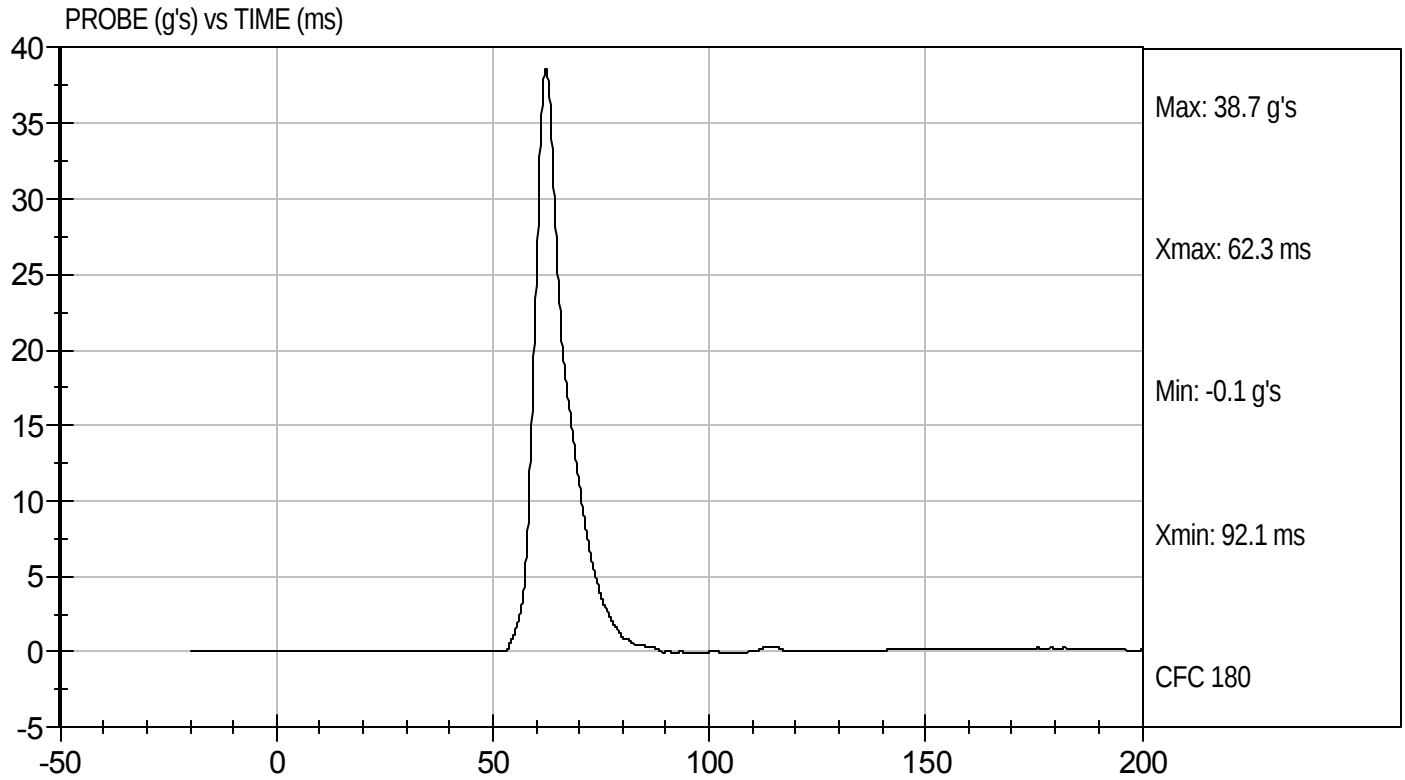
6/21/11
Test Date


Approved By



Test Desc: Iliac Impact
Component ID: D112148

Test Date: 6/21/11
Velocity: 14.37 ft/s, 4.38 m/s





Test Desc: Iliac Impact
Component ID: D112148

Test Date: 6/21/11
Velocity: 14.37 ft/s, 4.38 m/s

