

**REPORT NUMBER: SINCAP-MGA-2013-032**

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

**CHRYSLER GROUP LLC  
2013 Dodge Challenger SXT 2-Dr Coupe  
NHTSA No.: MD0302**

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



**Test Date: November 9, 2012**

**Final Report Date: December 19, 2012**

**FINAL REPORT**

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

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Approved by:   
Ben Fischer, Project Engineer

Approval Date: December 19, 2012

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: \_\_\_\_\_

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

Date: \_\_\_\_\_

### Technical Report Documentation Page

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		6. Performing Organization Code MGA																												
7. Author(s) Donna Janovicz, Project Manager Ben Fischer, Project Engineer		8. Performing Organization Report No. SINCAP-MGA-2013-032																												
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15. Supplementary Notes																														
16. Abstract A 55/28 km/h 90° Moving Deformable Barrier NCAP Side Impact Test was conducted on the subject 2013 Dodge Challenger SXT 2-Dr Coupe in accordance with the specifications of the Office of Crashworthiness Standards NCAP Side Laboratory Test Procedure for the generation of consumer information on vehicle side crash protection. The test was conducted at MGA Research Corporation, in Burlington, Wisconsin, on November 9, 2012.  The impact velocity of the Moving Deformable Barrier (MDB) was 62.6 km/h, and the ambient temperature at the struck (driver's) side of the target vehicle at the time of impact was 20.7° C. The target vehicle post-test maximum crush was 154 mm at level 2. The test vehicle's performance was as follows:																														
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The door on the struck side of the vehicle did not separate from the body at the hinges, but the left door did separate at the latch. The opposite door did not open during the side impact event.																														
17. Key Words New Car Assessment Program (NCAP) Side Impact MDB ES-2re SID-IIs		18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Administration Technical Information Services Division, NPO-411 1200 New Jersey Ave, SE Washington, DC 20590 e-mail: <a href="mailto:tis@nhtsa.dot.gov">tis@nhtsa.dot.gov</a> FAX: 202-493-2833																												
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**SECTION 1**  
**TEST PURPOSE AND PROCEDURE**

This moving deformable barrier side impact test is part of the MY 2013 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 2013 Dodge Challenger SXT 2-Dr Coupe. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Side NCAP Laboratory Test Procedure dated September 2012.

## SECTION 2 SUMMARY OF TEST RESULTS

A 2013 Dodge Challenger SXT 2-Dr Coupe 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 62.6 km/h. The target vehicle was stationary and was positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by MGA Research Corporation in Burlington, Wisconsin, on November 9, 2012. 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 September 2012. The side impact event was documented by eleven (11) cameras. Camera locations are included in this report.

The dummies were instrumented in the following manner:

### DRIVER ATD (ES-2re)

- Primary and Redundant Head CG Triaxial Accelerometers
- Head 9-Axis Accelerometers
- Chest Upper Rib, Middle Rib, and Lower Rib Y-Axis Displacement Potentiometers
- Abdomen Forward, Middle, and Rear Y-Axis Load Cells
- Lower Spine (T12) Triaxial Accelerometers
- Pubic Symphysis Y-Axis Load Cell

### PASSENGER ATD (SID-IIs)

- Primary and Redundant Head CG Triaxial Accelerometers
- Chest Upper Rib, Middle Rib, and Lower Rib Y-Axis Displacement Potentiometers
- Abdomen Upper Rib and Lower Rib Y-Axis Displacement Potentiometers
- Lower Spine (T12) Triaxial Accelerometers
- Acetabulum and Iliac Wing Y-Axis Load Cells

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

Dummy Injury readings were recorded as follows:

### DUMMY INJURY VALUES

Measurement Description	Driver ATD (ES-2re)		
	Units	Threshold	Result
Head Injury Criteria (HIC <sub>36</sub> )	N/A	1000	125
Maximum Thorax Rib Deflection	mm	44	17
Total Abdominal Force	N	2500	1780
Pubic Symphysis Force	N	6000	2061

Measurement Description	Passenger ATD (SID-IIs)		
	Units	Threshold	Result
Head Injury Criteria (HIC <sub>36</sub> )	N/A	1000	156
Resultant Lower Spine Acceleration	Gs	82	46
Total Pelvic Force	N	5525	1367
Maximum Thoracic Rib Deflection	mm	38*	26
Maximum Abdomen Rib Deflection	mm	45*	33

\*Proposed IARV

Supplemental restraint information is given below:

**SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION**

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

The test data can be found on the NHTSA website at [www.nhtsa.dot.gov](http://www.nhtsa.dot.gov)

**GENERAL COMMENTS**

There was no valid data collected for:

- Left Lower A-Post Y
- Left Mid A-Post Y
- Left Mid B-Post Y

- Right Rear Sill X is questionable from 19-23ms and 36-43ms
- Right Rear Sill Y is questionable from 19-26ms and 36-43ms
- Right Rear Sill Z is questionable from 36-43ms
- Left Lower B-Post Y is questionable from 1-10ms

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

**SECTION 3  
OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS**

**DATA SHEET NO. 1  
GENERAL TEST AND VEHICLE PARAMETER DATA**

Test Vehicle: 2013 Dodge Challenger SXT 2-Dr Coupe  
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MD0302  
 Test Date: 11/09/2012

**TEST VEHICLE INFORMATION AND OPTIONS**

NHTSA No.	MD0302	Traction Control System (TCS)	Yes
Model Year	2013	Auto-Leveling System	No
Make	Dodge	Automatic Door Locks (ADL)	Yes
Model	Challenger	Power Window Auto-Reverse	No
Body Style	Coupe	Other Optional Feature	N/A
VIN	2C3CDYAG1DH530656	Driver Front Airbag	Yes
Body Color	Redline Pearl	Driver Curtain Airbag	Yes
Odometer Reading (km/mi)	156 / 97	Driver Head/Torso Airbag	No
Engine Displacement (L)	3.6	Driver Torso Airbag	No
Type/No. Cylinders	6	Driver Torso/Pelvis Airbag	Yes
Engine Placement	Longitudinal	Driver Pelvis Airbag	No
Transmission Type	Automatic	Driver Knee Airbag	No
Transmission Speeds	5	Rear Pass. Curtain Airbag	Yes
Overdrive	Yes	Rear Pass. Head/Torso Airbag	No
Final Drive	Rear	Rear Pass. Torso Airbag	No
Roof Rack	No	Rear Pass. Torso/Pelvis Airbag	No
Sunroof/T-Top	No	Rear Pass. Pelvis Airbag	No
Running Boards	No	Driver Seat Belt Pretensioner	Yes
Tilt Steering Wheel	Yes	Rear Pass. Seat Belt Pretensioner	No
Power Seats	Yes, driver only	Driver Load Limiter	Yes
Anti-Lock Brakes (ABS)	Yes	Rear Pass. Load Limiter	No
		Other Safety Restraint	N/A

Does owner's manual provide instruction to turn off automatic door locks?	Yes
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**DATA FROM CERTIFICATION LABEL**

Manufactured By	Chrysler Group LLC	GVWR (kg)	2246
Date of Manufacture	AUG 12	GAWR Front (kg)	1275
Vehicle Type	Passenger Car	GAWR Rear (kg)	1275

**VEHICLE SEATING AND WEIGHT CAPACITY DATA**

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

**VEHICLE SEAT TYPE**

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

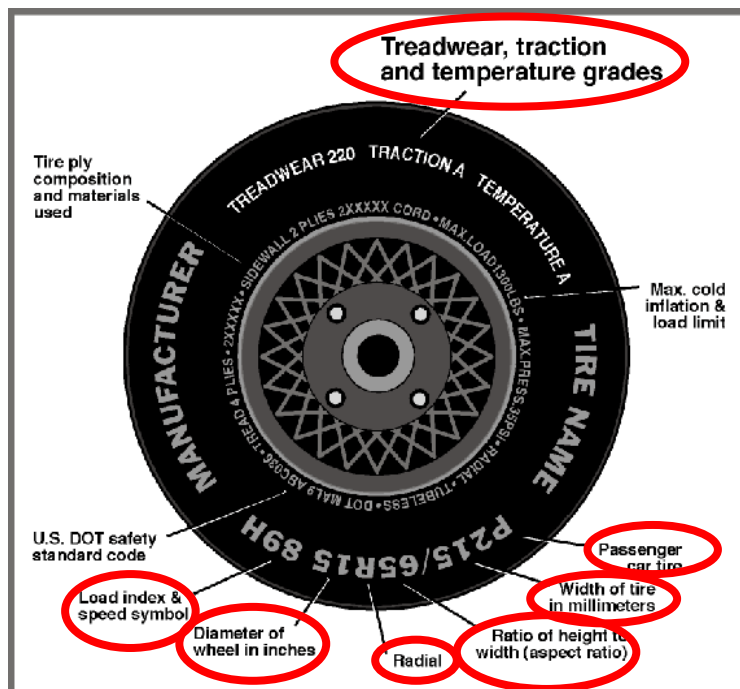
## DATA SHEET NO. 1 (CONTINUED)

### GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2013 Dodge Challenger SXT 2-Dr Coupe  
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MD0302  
 Test Date: 11/09/2012

#### VEHICLE TIRE INFORMATION



Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	220	220
Recommended Tire Size	P235/55R18	P235/55R18
Tire Size on Vehicle	P235/55R18	P235/55R18
Tire Manufacturer	Michelin	Michelin
Tire Model	Pilot HX MXM4	Pilot HX MXM4
Treadwear	300	300
Traction	A	A
Temperature Grade	A	A
Tire Plies Sidewall	2	2
Tire Plies Body	5	5
Load Index/Speed Symbol	99V	99V
Tire Material	Rubber	Rubber
DOT Safety Code Left	B93J PN2X	B93J PN2X
DOT Safety Code Right	B93J PN2X	B93J PN2X

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

Test Vehicle: 2013 Dodge Challenger SXT 2-Dr Coupe  
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MD0302  
 Test Date: 11/09/2012

**TEST PRESSURES**

	Units	LF	RF	LR	RR
As Delivered	kpa	220	220	220	220
Tire Placard	kpa	220	220	220	220
Owner's Manual	kpa				
As Tested	kpa	220	220	220	220

**MDB TIRE SPECIFICATIONS**

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

**TEST VEHICLE AXLE WEIGHTS**

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	463.6	417.3		503.1	485.4		508.0	500.8	
Right	kg	465.8	422.3		478.1	476.2		459.5	481.3	
Ratio	%	52.5	47.5		50.5	49.5		49.6	50.4	
Totals	kg	929.4	839.6	1769.0	981.2	961.6	1942.8	967.5	982.1	1949.6

**TARGET TEST WEIGHT CALCULATION**

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1769.0	(A)
Sum of Actual Weight of 2 P572 ATDs Used	kg	129.3	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	52	(C)
Calculated Vehicle Target Weight (TVT <sub>W</sub> )	kg	1950.3	(A+B+C)

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

**TEST VEHICLE ATTITUDES AND CG**

	Units	Fully Loaded	As Tested	Meets Requirement***
Left Front	mm	755	757	Yes
Right Front	mm	765	757	Yes
Right Rear	mm	760	764	Yes
Left Rear	mm	756	766	Yes
Vehicle CG (Aft of Front Axle)	mm	1489	1463	
Vehicle CG (Left (+) / Right (-) from Longitudinal Centerline)	mm	28	14	

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

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

Test Vehicle: 2013 Dodge Challenger SXT 2-Dr Coupe  
Test Program: NCAP Side MDB Impact Test

NHTSA No. MD0302  
Test Date: 11/09/2012

**WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW**

Component Description	Weight (kg)
Weight of Ballast, if any	25.4
Right taillight, jack & tools, spare tire, trunk carpet/floor.	27.7

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

Test Vehicle: 2013 Dodge Challenger SXT 2-Dr Coupe  
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MD0302  
 Test Date: 11/09/2012

**SEAT POSITIONING**

The driver's seat, front center seat (if applicable), and right front passenger's seat should be set to the mid-track, lowest, mid-angle position. The struck-side rear passenger's seat, rear center seat, and non-struck side rear passenger's seats should be set to the rear-most, lowest, mid-angle position.

**SCRL ANGLE RANGE**

Seat	SCRL (°)		
	Max	Min	Mid
Driver Seat	18.6	11.9	15.3
Front Passenger Seat	Fixed	Fixed	Fixed
Front Center Seat			
Struck Side Rear Seat	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed

**SEAT HEIGHT AND ANGLE**

Seat	As Tested SCRL Angle (Mid) (°)	As Tested SCRP Height (mm)	SCRP Height Position	SCRP Height (mm)		
				Rear-most	Mid-Fore/Aft	Forward-Most
Driver Seat	15.3	0	Max	54	54	54
	15.3	0	Mid	27	27	27
	15.3	0	Min	0	0	0
Front Passenger Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
	Fixed	Fixed	Mid	Fixed	Fixed	Fixed
	Fixed	Fixed	Min	Fixed	Fixed	Fixed
Front Center Seat			Max			
			Mid			
			Min			
Struck Side Rear Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
	Fixed	Fixed	Mid	Fixed	Fixed	Fixed
	Fixed	Fixed	Min	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
	Fixed	Fixed	Mid	Fixed	Fixed	Fixed
	Fixed	Fixed	Min	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
	Fixed	Fixed	Mid	Fixed	Fixed	Fixed
	Fixed	Fixed	Min	Fixed	Fixed	Fixed

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

Test Vehicle: 2013 Dodge Challenger SXT 2-Dr Coupe  
 Test Program: NCAP Side MDB Impact Test

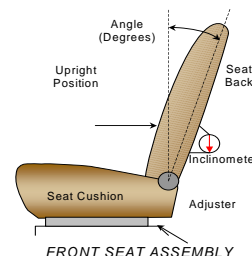
NHTSA No. MD0302  
 Test Date: 11/09/2012

**SEAT FORE/AFT POSITIONS**

Seat	Total Fore/Aft Travel		Test Position from Forward-most Position	
	mm	Detents	mm	Detent
Driver Seat	272		136	
Front Passenger Seat	220	22 (1 <sup>st</sup> as 0)	110	11 (1 <sup>st</sup> as 0)
Front Center Seat				
Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Non-Struck Side	Fixed	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed	Fixed

**SEAT BACK ANGLE ADJUSTMENT**

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



Seat	Total Seat Back Angle Range		Test Position from Vertical	
	Degrees	Detents	Degrees	Detent
Driver Seat w/Seated Dummy	51.2		14.8	7 (1 <sup>st</sup> as 0)
Front Passenger Seat	50.7		15.7	7 (1 <sup>st</sup> as 0)
Front Center Seat				
Struck Side Rear Seat	Fixed		22.4*	Fixed
Non-Struck Side Rear Seat	Fixed		22.4*	Fixed
Rear Center Seat	Fixed		22.4*	Fixed

\*Seat back was fixed, angle measured on seatback.

## DATA SHEET NO. 2 (CONTINUED)

### SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND FUEL SYSTEM DATA

Test Vehicle: 2013 Dodge Challenger SXT 2-Dr Coupe  
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#### SEAT BELT ANCHORAGE ADJUSTMENT

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

	Total # of Positions	Placed in Position #
Driver Seat	Fixed	Not Applicable
Rear Seat	Fixed	Not Applicable

#### HEAD RESTRAINT ADJUSTMENT

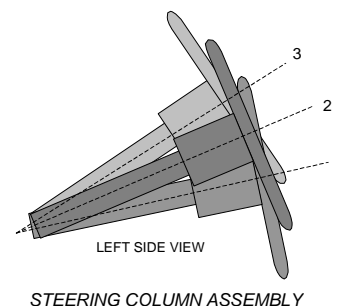
The driver's head restraint is adjusted to the highest and most full forward in-use position. The struck-side rear passenger's head restraint is adjusted to the lowest and most full forward in-use position.

	Total # of Positions	Placed in Position #
Driver Seat	4	Highest
Rear Seat	Fixed	Not Applicable

#### STEERING COLUMN ADJUSTMENT

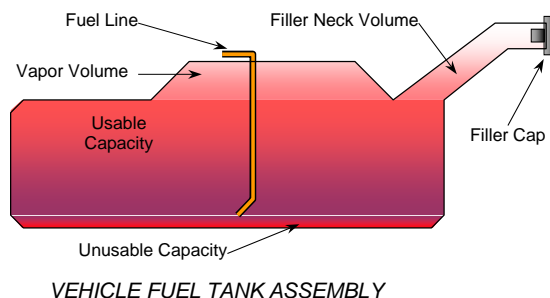
Steering wheel and column adjustments are made so that the steering wheel Ogeometric locus is described when it moves through its full range of motion.

	Degrees	Fore/Aft Position (mm)
Lowermost, Position 1	65.0	215
Geometric Center, Position 2	67.5	185
Uppermost, Position 3	65.0	155
Telescoping Steering Wheel Travel		60
Test Position	67.5	185



#### FUEL PUMP

Describe the fuel pump type, details about how it operates and the location of the fuel filler pipe. The vehicle is equipped with an electric fuel pump. The fuel pump starts pumping fuel when the key is in the "ON" position. The fuel pipe is on the left side.



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

Test Vehicle: 2013 Dodge Challenger SXT 2-Dr Coupe  
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MD0302  
 Test Date: 11/09/2012

**FUEL TANK CAPACITY DATA**

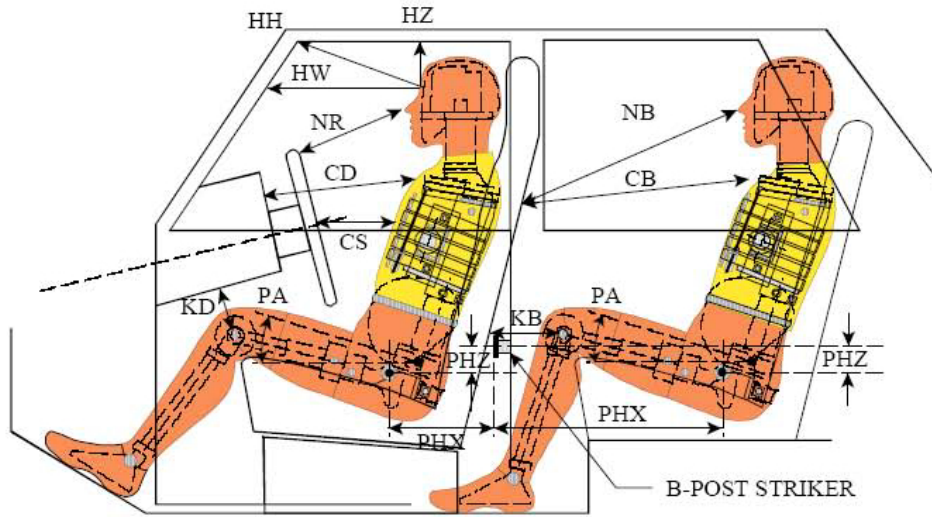
	Liters
Usable Capacity of "Standard" Tank (see Form No. 1)	72.3
Usable Capacity of "Optional" Tank (see Form No. 1)	
Usable Capacity of Standard Tank as Specified in Owner's Manual	72.0
Usable Capacity of Optional Tank as Specified in Owner's Manual	
93% of Usable Capacity	67.2
Actual Amount of Solvent Used	67.2
1/3 of Usable Capacity	24.1

Is the actual amount of solvent used in the test equal to 93% ± 1%  
 of the Usable Capacity stated in Form No. 1? **YES**

**DATA SHEET NO. 3  
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS**

Test Vehicle: 2013 Dodge Challenger SXT 2-Dr Coupe  
Test Program: NCAP Side MDB Impact Test

NHTSA No. MD0302  
Test Date: 11/09/2012



**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

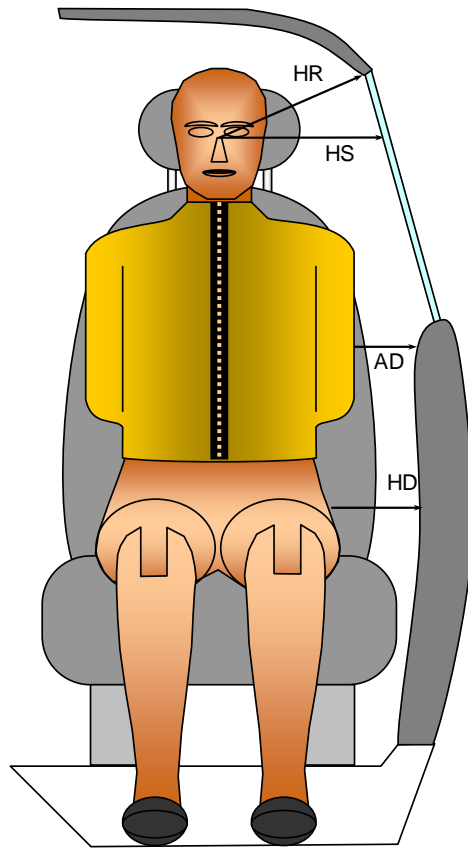
**DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION**

Driver Code	Pass. Code	Measurement Description	Driver S/N 032		Passenger S/N 296	
			Length (mm)	Angle(°)	Length (mm)	Angle(°)
HH		Head to Header	452	15.7		
HW		Head to Windshield	672			
HZ	HZ	Head to Roof Liner	184		245	
NR	NB	Nose to Rim/Seat Back	450	12.7	460	15.4
CD	CB	Chest to Dashboard/Seat Back	578	8.1	433	6.5
CS		Chest to Steering Wheel	350	9.5		
KDL	KBL	Left Knee to Dash/Seat Back	219	27.5	170	26.2
KDR	KBR	Right Knee to Dash/Seat Back	216	28.3	162	20.8
PAX	PAX	Pelvic Tilt Angle X		20.6		25.5
	PAY	Pelvic Tilt Angle Y		-0.9		0.2
PHX	PHX	Hip Point to Striker (X-Axis)	439		395	
PHZ	PHZ	Hip Point to Striker (Z-Axis)	155		110	

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

Test Vehicle: 2013 Dodge Challenger SXT 2-Dr Coupe  
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MD0302  
 Test Date: 11/09/2012



*FRONT VIEW OF DUMMY*

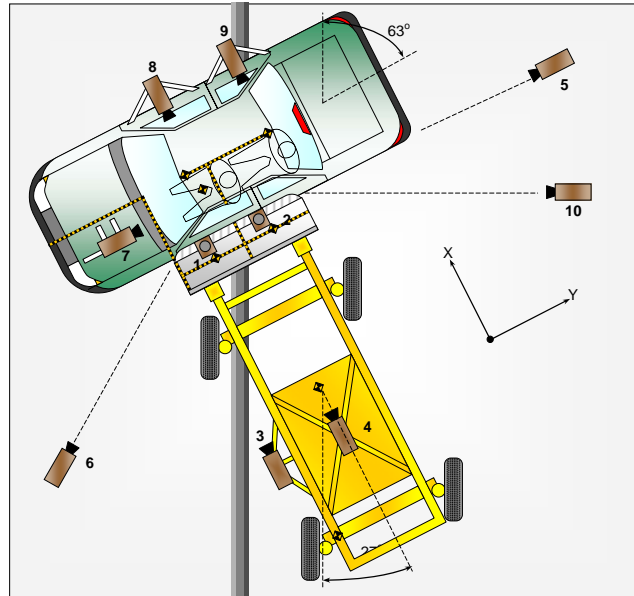
**DUMMY LATERAL CLEARANCE DIMENSION INFORMATION**

Code	Measurement Description	Units	Driver S/N 032	Passenger S/N 296
HR	Head to Side Header	mm	219	243
HS	Head to Side Window	mm	355	311
AD	Arm to Door	mm	127	132
HD	Hip Point to Door	mm	165	145

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

Test Vehicle: 2013 Dodge Challenger SXT 2-Dr Coupe  
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MD0302  
 Test Date: 11/09/2012



**CAMERA LOCATIONS AND DATA**

No.	Camera View	Coordinates (mm)			Lens Length (mm)	Operating Frame Rate (fps)
		X*	Y*	Z*		
1	Overhead Overall	170	210	-5070	14	1000
2	Overhead Close-Up	100	70	-5070	20	1000
3	Left Impact Point (MDB)				50	1000
4	Side Overall (MDB)				16	1000
5	Rear	80	4850	-1210	24	1000
6	Left Front	4200	-4230	-1230	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  $\pm 6$  mm

Explain why camera(s) did not operate as intended: None

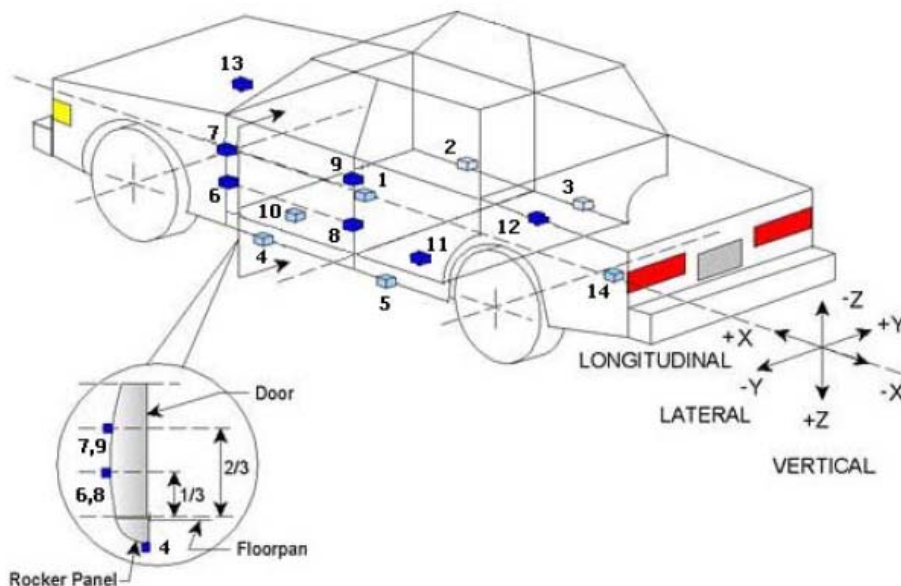
**INSTRUMENTATION**

Driver Dummy Channels	22
Passenger Dummy Channels	16
Vehicle Structure Accelerometers	23
MDB Accelerometers	5
MDB Contacts	2
Total	68

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

Test Vehicle: 2013 Dodge Challenger SXT 2-Dr Coupe  
Test Program: NCAP Side MDB Impact Test

NHTSA No. MD0302  
Test Date: 11/09/2012



**TEST VEHICLE ACCELEROMETER LOCATIONS**

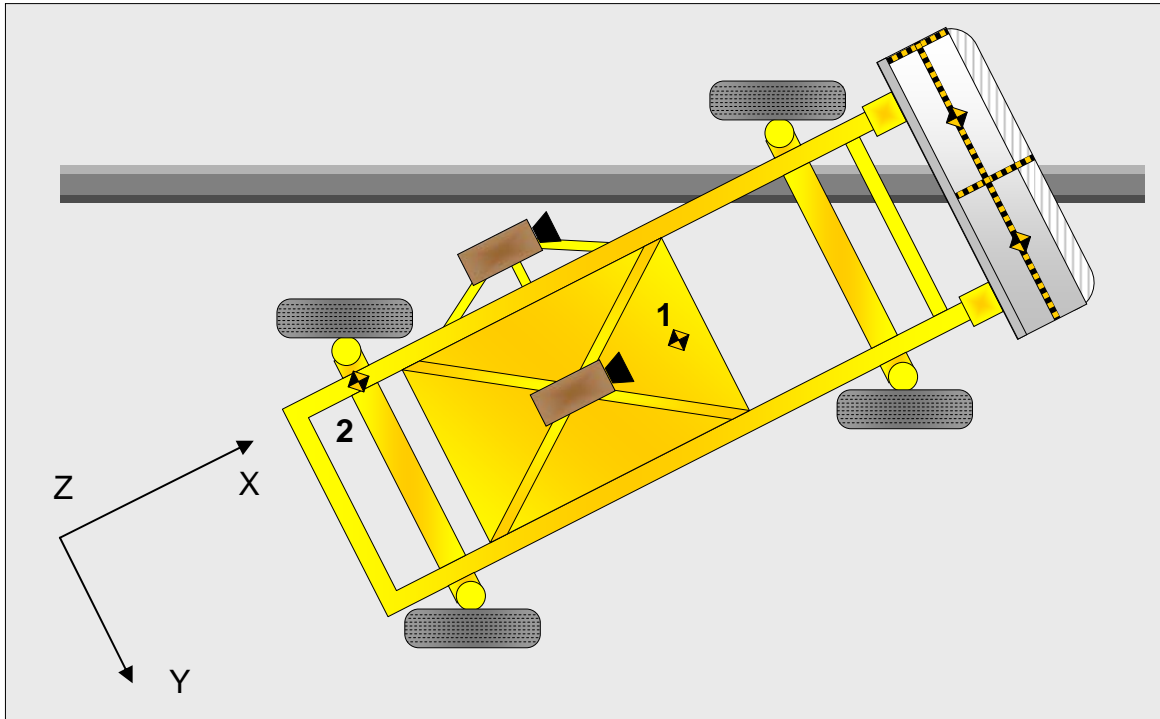
Accelerometer Location				
No.	ID	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2529	-160	-194
2	Right Sill at Front Seat	2832	770	-191
3	Right Sill at Rear Seat	1636	772	-190
4	Left Sill at Front Door	2750	-770	-185
5	Left Sill at Rear Door	1650	-772	-184
6	Left Lower A-Post	3343	-792	-570
7	Left Middle A-Post	3311	-792	-783
8	Left Lower B-Post	2068	-766	-584
9	Left Middle B-Post	2030	-759	-758
10	Front Seat Track	2414	-571	-301
11	Rear Seat Structure	2012	-413	-347
12	Rt. Rear Occ. Compartment	2064	310	-258
13	Engine Block	3986	-5	-957
14	Rear Above Axle	1085	32	-524

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

**DATA SHEET NO. 7  
MDB ACCELEROMETER LOCATIONS**

Test Vehicle: 2013 Dodge Challenger SXT 2-Dr Coupe  
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MD0302  
 Test Date: 11/09/2012



**MDB ACCELEROMETER LOCATIONS**

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

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

**DATA SHEET NO. 8  
POST-TEST OBSERVATIONS**

Test Vehicle: 2013 Dodge Challenger SXT 2-Dr Coupe  
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MD0302  
 Test Date: 11/09/2012

**TEST DUMMY INFORMATION AND CONTACT POINTS**

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

**POST-TEST DOOR PERFORMANCE**

Description	Struck Side		Non-Struck Side		Rear Hatch/ Other Door
	Front	Rear	Front	Rear	
Remained Closed and Operational	No		Yes		Yes
Total Separation from Vehicle at Hinges or Latches	Yes		No		No
Latch or Hinge Systems Pulled Out of Their Anchorages	No		No		No
Disengaged from Latched Position	Yes		No		No
Latch Separated from Striker	Yes		No		No
Jammed Shut	No		No		No
If Door Opened at Striker, Record Width of Opening at Striker (mm)	100		N/A		N/A

**POST-TEST SEAT PERFORMANCE**

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

**POST-TEST STRUCTURAL OBSERVATIONS**

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

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

Test Vehicle: 2013 Dodge Challenger SXT 2-Dr Coupe  
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MD0302  
 Test Date: 11/09/2012

**SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION**

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

**IMPACT POINT LOCATION DATA**

Measured Parameter	Units	Tolerance	Value
Vehicle Wheel Base	mm		2955
Vertical Impact Reference Line (Aft of Front Axle) (Intended Impact Point)	mm		538
Actual Impact Point (Aft of Front Axle)	mm		532
Horizontal Offset (+forward / -rearward)	mm	+/- 50 of intended impact point	+6
Vertical Offset (+down / -up)	mm	+/- 20 of intended impact point	+4

**DATA SHEET NO. 9**  
**MDB SUMMARY OF RESULTS**

Test Vehicle: 2013 Dodge Challenger SXT 2-Dr Coupe  
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MD0302  
 Test Date: 11/09/2012

**MDB SPECIFICATIONS**

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

**MDB WEIGHTS**

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

**SPEED AND ANGLE AT IMPACT DATA**

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	62.6
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	62.5
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	89.9
MDB Forward Line of Motion to Target Vehicle CL	degrees	62.5 to 63.5	63.4
MDB Crabbed Angle to MDB Forward Line of Motion	degrees	26 to 28	26.6

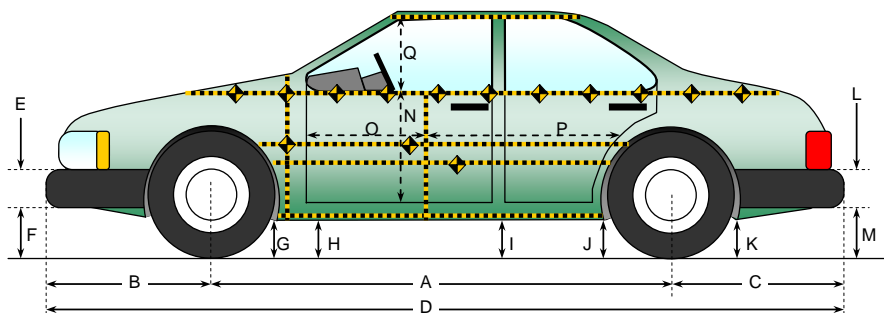
**MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE**

Row	Vertical Location		From Centerline		Maximum Crush
	Description	Height	Distance	Direction	
A	Center of Bumper	432	700	Right	340
B	Top of Bumper	533	700	Right	255
C	Mid-Level	686	600	Right	189
D	Top of Stack	813	700	Left	216

**DATA SHEET NO. 10  
TEST VEHICLE PROFILE MEASUREMENTS**

Test Vehicle: 2013 Dodge Challenger SXT 2-Dr Coupe  
Test Program: NCAP Side MDB Impact Test

NHTSA No. MD0302  
Test Date: 11/09/2012



All measurements in (mm) with tolerance of  $\pm 3$  mm

**LEFT SIDE VIEW**

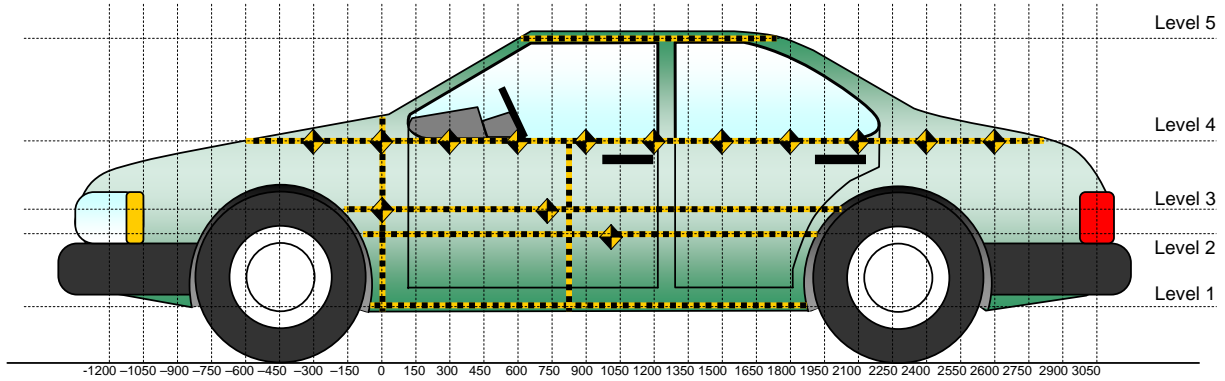
**VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION**

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2955	2947	8
B	Front Axle to FSOV	951	954	-3
C	Rear Axle to RSOV	1118	1105	13
D	Total Length at Centerline	5024	5006	18
E	Front Bumper Thickness	110	110	0
F	Front Bumper Bottom to Ground	189	198	-9
G	Sill Height at Front Wheel Well	153	134	19
H	Sill Height at Front Door Leading Edge	153	135	18
I	Sill Height at B Pillar	167	143	24
J1	Sill Height at Rear Wheel Well	167	158	9
J2	Pinch Weld Height at Rear Wheel Well	167	156	11
K	Sill Height Aft of Rear Wheel Well	219	198	21
L	Rear Bumper Thickness	198	198	0
M	Rear Bumper Bottom to Ground	374	378	-4
N	Sill Height to Window Bottom Sill	778	734	44
O	Front Door Leading Edge to Impact CL	652	646	6
P	Rear Door Trailing Edge to Impact CL	748	725	23
Q	Front Window Opening	355	388	-33
R	Right Side Length	4594	4589	5
S	Left Side Length	4594	4564	30
T	Vehicle Width at B Post	1918	1804	114

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

Test Vehicle: 2013 Dodge Challenger SXT 2-Dr Coupe  
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MD0302  
 Test Date: 11/09/2012



All Measurements Shown in mm

**LEFT SIDE VIEW**

**MAXIMUM EXTERIOR CRUSH MEASUREMENTS**

Level	Measurement Description	Height Above Ground (mm)	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	283	50	300
2	Occupant Hip Point	508	154	450
3	Mid Door	627	146	750
4	Window Sill	975	78	1650
5	Window Top	1336	19	1800

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

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

Test Vehicle: 2013 Dodge Challenger SXT 2-Dr Coupe  
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MD0302  
 Test Date: 11/09/2012

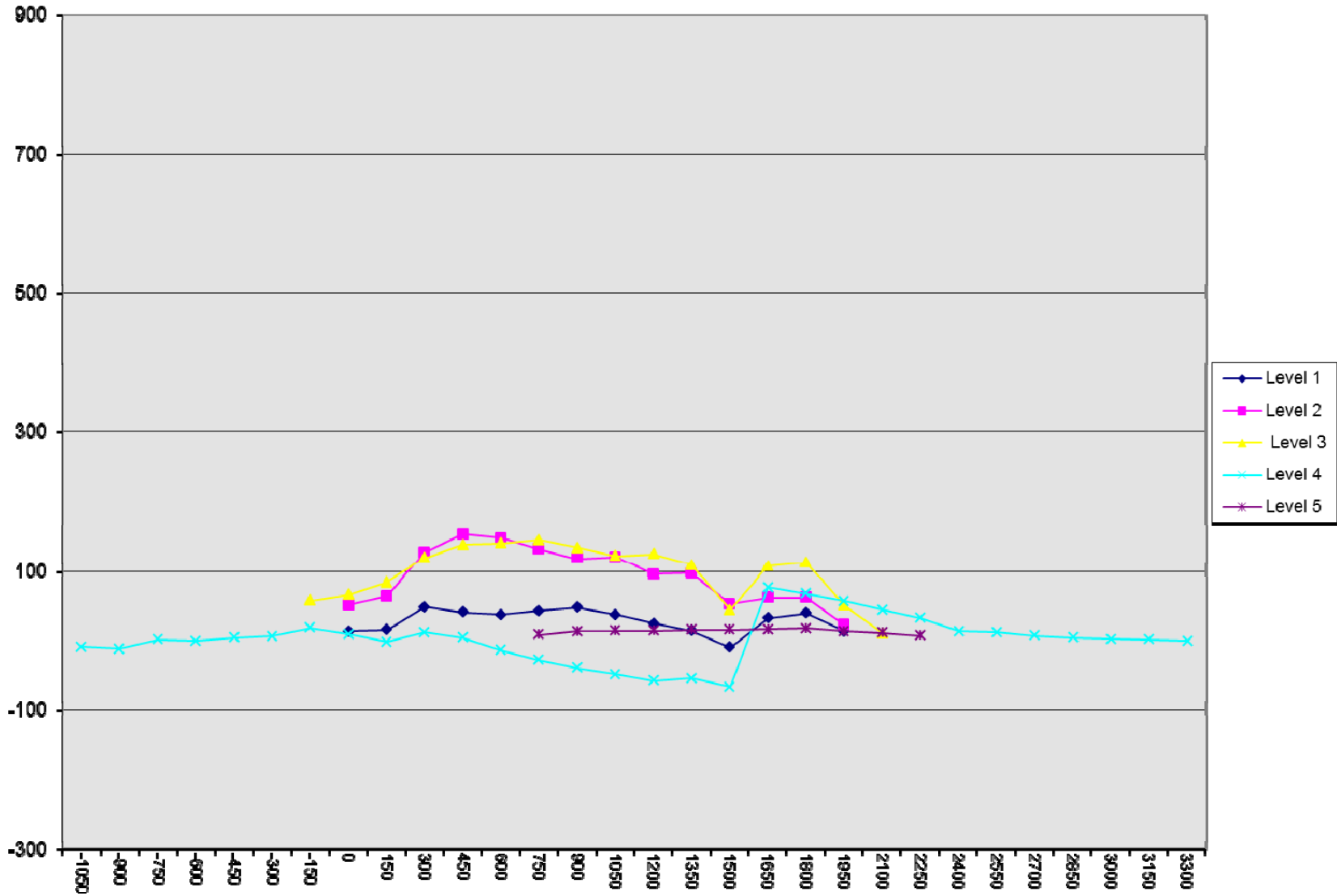
	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-1050				283					276					-7	
-900				275					268					-10	
-750				265					268					3	
-600				264					265					1	
-450				257					263					6	
-300				254					262					8	
-150			161	256				220	276				59	20	
0	224	174	159	250		239	227	226	261		15	53	67	11	
150	225	171	156	249		242	236	241	249		17	65	85	0	
300	225	168	154	248		275	296	274	262		50	128	120	14	
450	222	165	153	245		264	319	292	251		42	154	139	6	
600	219	164	152	241		258	313	293	229		39	149	141	-12	
750	216	163	151	240	450	260	296	297	214	460	44	133	146	-26	10
900	217	162	151	238	430	266	281	286	201	445	49	119	135	-37	15
1050	216	162	151	237	429	255	283	274	191	445	39	121	123	-46	16
1200	216	162	152	239	429	242	258	278	184	445	26	96	126	-55	16
1350	217	163	152	238	430	233	260	262	186	447	16	97	110	-52	17
1500	218	164	151	238	430	210	218	197	174	447	-8	54	46	-64	17
1650	221	165	154	232	430	255	228	262	310	448	34	63	108	78	18
1800	224	166	155	215	435	265	229	268	284	454	41	63	113	69	19
1950	226	168	156	201	442	241	192	208	259	457	15	24	52	58	15
2100			160	196	455			172	242	468			12	46	13
2250				193	475				227	484				34	9
2400				192					207					15	
2550				193					207					14	
2700				202					211					9	
2850				211					217					6	
3000				223					227					4	
3150				236					239					3	
3300				256					257					1	

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

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

Test Vehicle: 2013 Dodge Challenger SXT 2-Dr Coupe  
 Test Program: NCAP Side MDB Impact Test

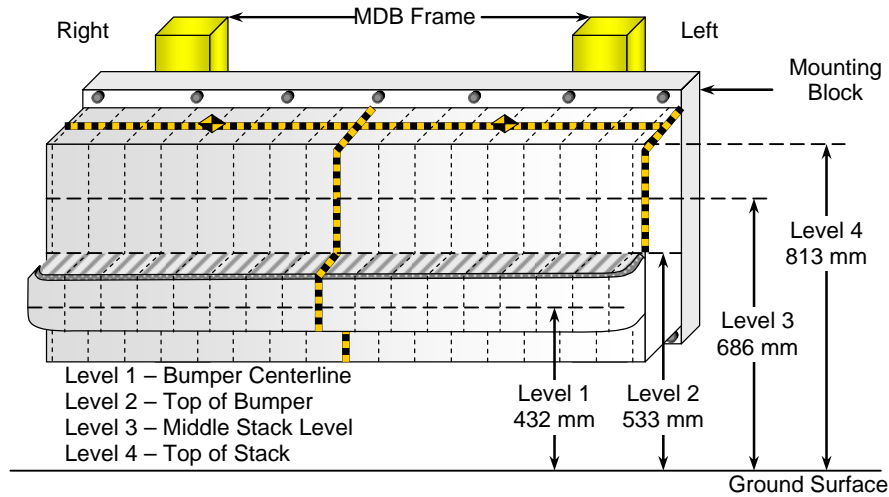
NHTSA No. MD0302  
 Test Date: 11/09/2012



**DATA SHEET NO. 12**  
**MDB EXTERIOR STATIC CRUSH MEASUREMENTS**

Test Vehicle: 2013 Dodge Challenger SXT 2-Dr Coupe  
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MD0302  
 Test Date: 11/09/2012



**FRONT VIEW**

**DEFORMABLE BARRIER STATIC CRUSH**

Stack Level	Distance Right of Center (mm)								C <sub>L</sub>	Distance Left of Center (mm)							
	800	700	600	500	400	300	200	100		0	100	200	300	400	500	600	700
4	144	158	154	93	58	41	37	47	52	60	73	83	97	113	155	216	186
3	166	180	189	119	71	48	40	38	35	35	40	49	63	80	125	175	145
2	240	255	225	159	130	130	127	132	132	135	128	133	135	140	165	155	185
1	313	340	335	269	229	189	169	147	141	142	143	147	151	169	192	225	202

**DATA SHEET NO. 13**  
**FMVSS NO. 301 STATIC ROLLOVER RESULTS**

Test Vehicle: 2013 Dodge Challenger SXT 2-Dr Coupe  
 Test Program: NCAP Side MDB Impact Test

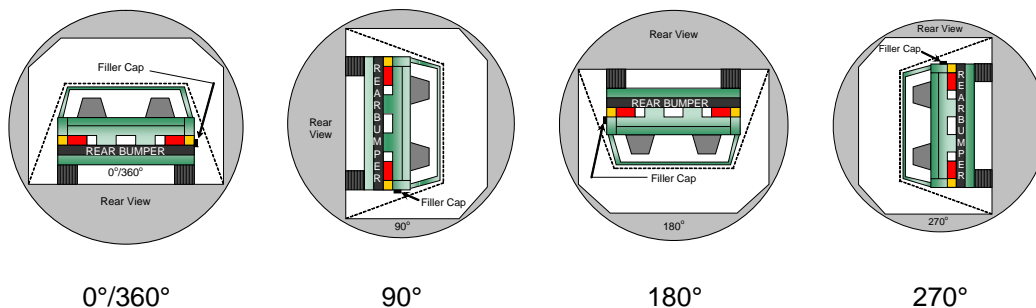
NHTSA No. MD0302  
 Test Date: 11/09/2012

Test Time: 1:48 pm

Temperature: 20.7° 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°	113	300	413
90° to 180°	112	300	412
180° to 270°	108	300	408
270° to 360°	112	300	412

**FMVSS 301 ROLLOVER SPILLAGE TABLE (units in ounces)**

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

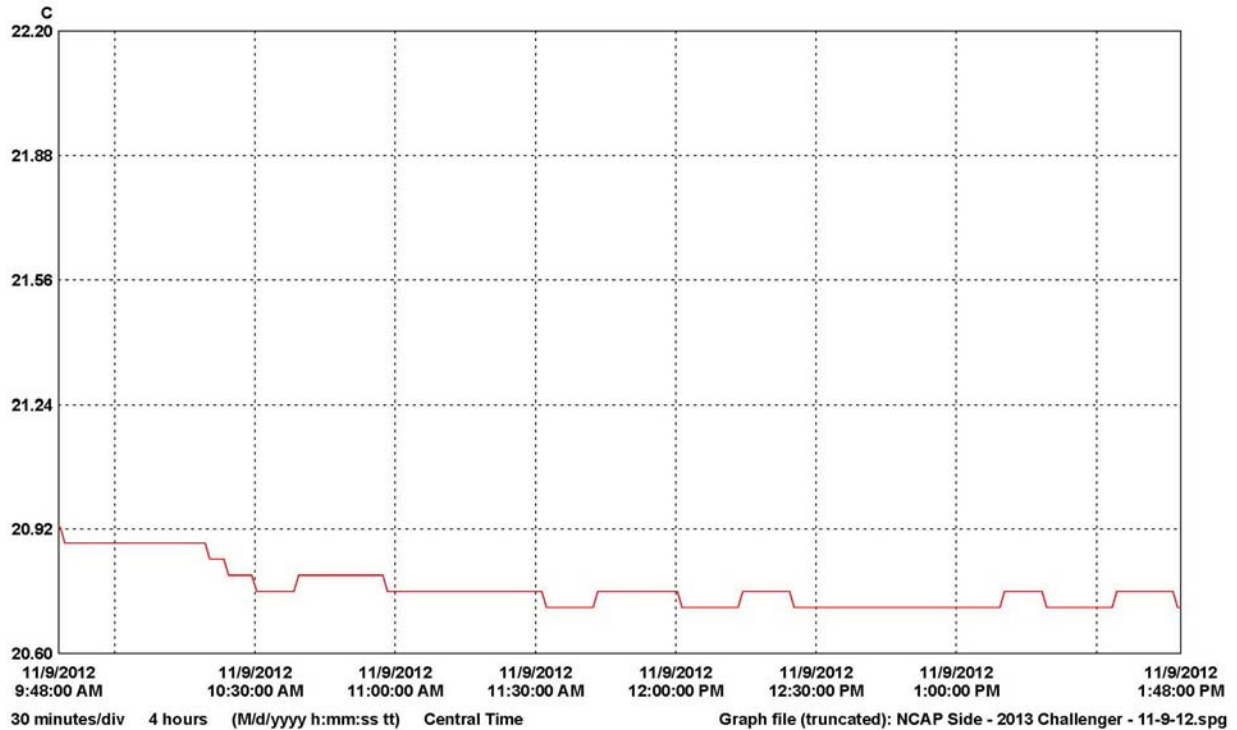
**ROLLOVER SOLVENT SPILLAGE LOCATION TABLE**

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

**DATA SHEET NO. 14**  
**DUMMY/VEHICLE TEMPERATURE STABILIZATION DATA**

Test Vehicle: 2013 Dodge Challenger SXT 2-Dr Coupe  
 Test Program: NCAP Side MDB Impact Test

NHTSA No. MD0302  
 Test Date: 11/09/2012



LN	Serial #	Description	CH	Value	Maximum	Average	Minimum	Units	CH description	Logger file
1	10102056	Crash	1		20.93	20.77	20.72	C	Temperature	10102056_Crash.spl

**APPENDIX A**  
**PHOTOGRAPHS**

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As Delivered Right Front Three-Quarter View of Test Vehicle



As Delivered Left Rear Three-Quarter View of Test Vehicle



Pre-Test Frontal View of Test Vehicle



Post-Test Frontal View of Test Vehicle



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



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



Pre-Test Left Side View of Test Vehicle



Post-Test Left Side View of Test Vehicle



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



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



Pre-Test Rear View of Test Vehicle



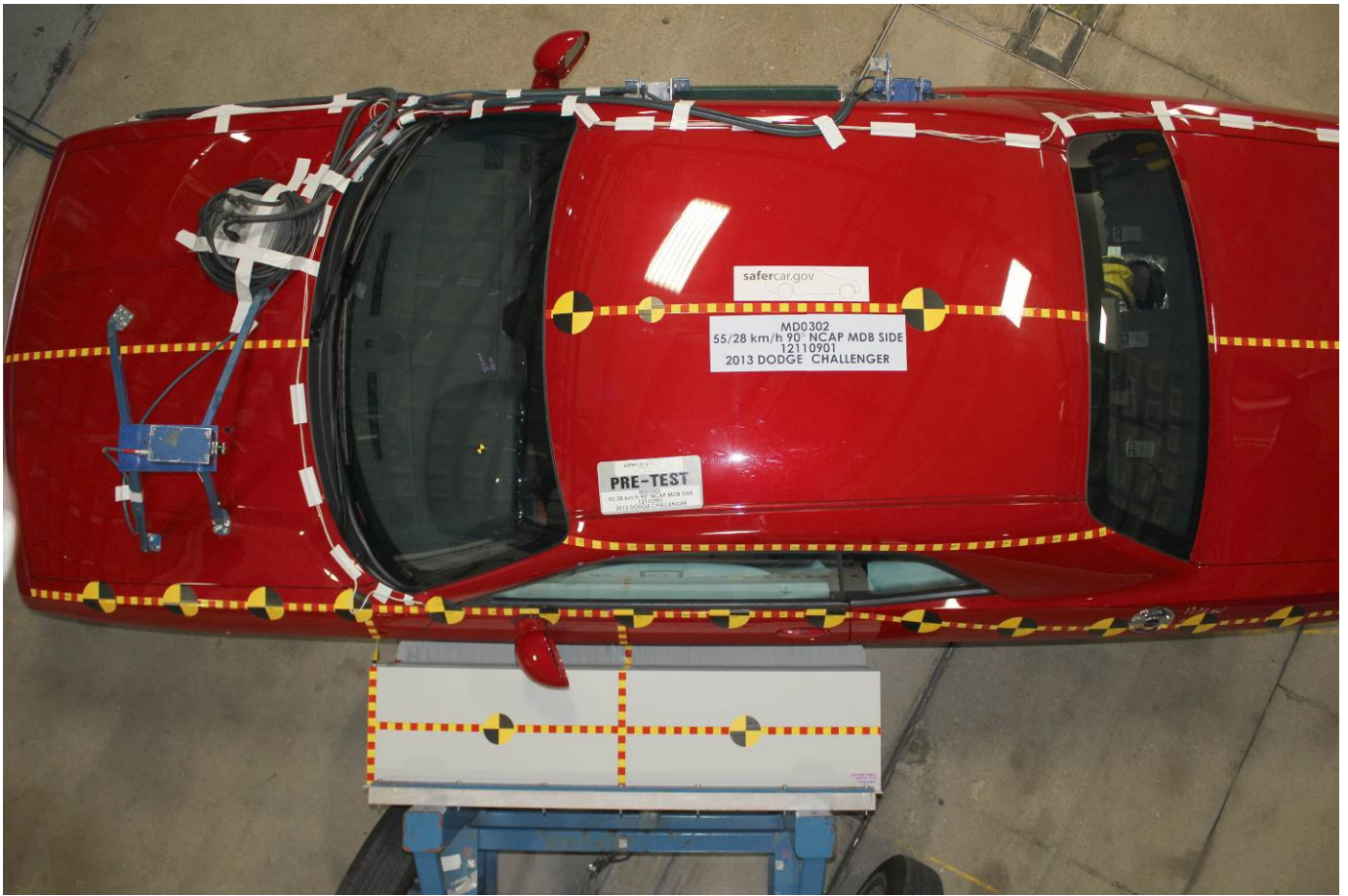
Post-Test Rear View of Test Vehicle



Pre-Test Right Side View of Test Vehicle



Post-Test Right Side View of Test Vehicle



Pre-Test Overhead View of Test Area



Post-Test Overhead View of Test Area



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



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



Pre-Test Close-Up View of Impact Point Target



Post-Test Close-Up View of Impact Point Target



Pre-Test Left Front Door Latch Close-Up



Post-Test Left Front Door Latch Close-Up

**PHOTOGRAPH NOT APPLICABLE**

Pre-Test Left Rear Door Latch Close-Up

**PHOTOGRAPH NOT APPLICABLE**

Post-Test Left Rear Door Latch Close-Up



Pre-Test Front Close-Up View of Driver Dummy



Post-Test Front Close-Up View of Driver Dummy



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



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



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



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



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



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



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



Pre-Test Placement of Driver Dummy's Feet



Pre-Test View of Belt Anchorage for Driver Dummy



Pre-Test View of Belt Anchorage for Driver Dummy



Pre-Test Left Side View of Steering Wheel



Pre-Test View of Disengaged Parking Brake



Pre-Test View of Parking Brake



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



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



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



Pre-Test Driver Dummy and Door Clearance View



Post-Test Driver Dummy and Door Clearance View



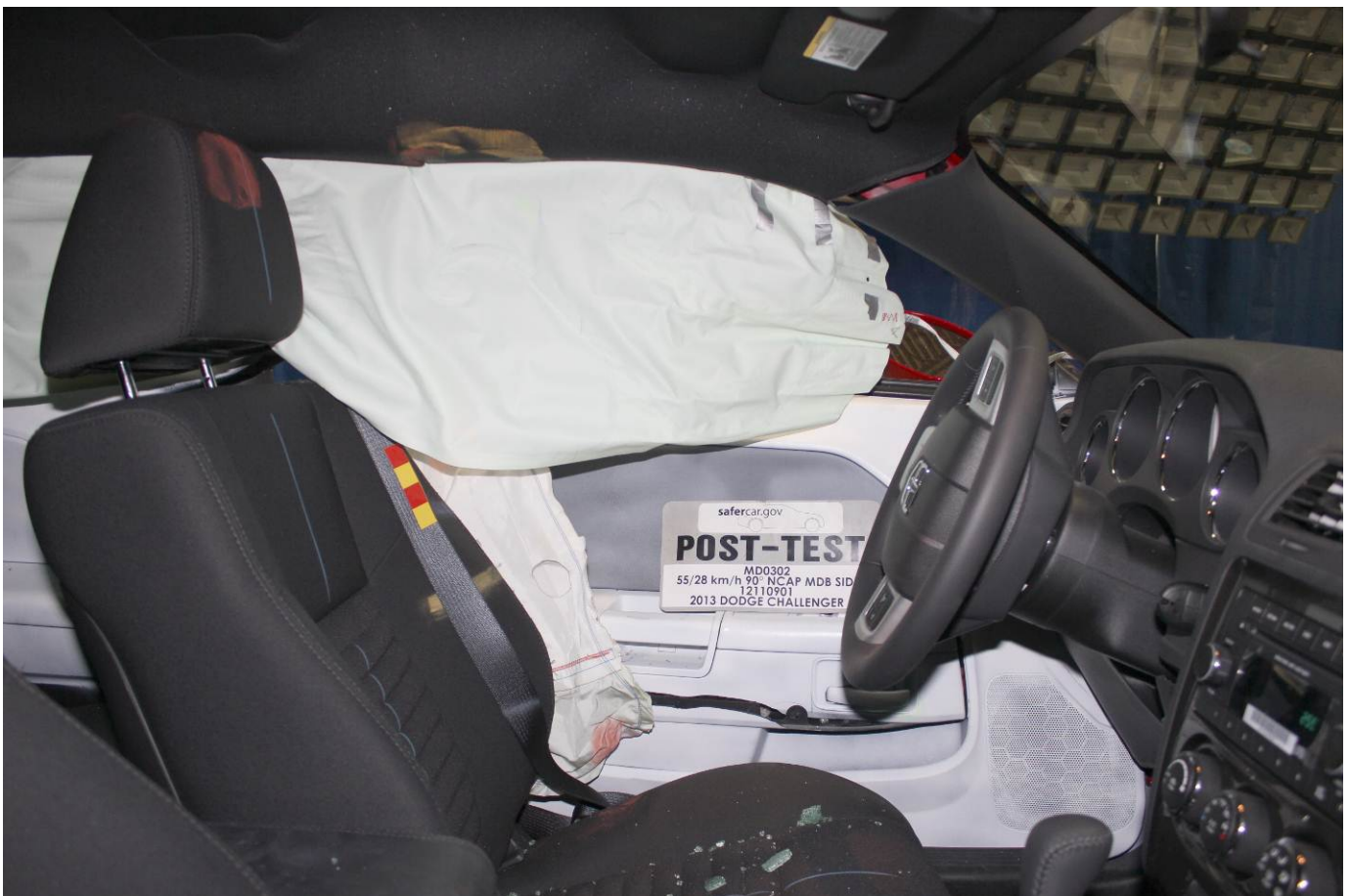
Pre-Test Right Side View of Driver Dummy and Front Seat of Occupant Compartment



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



Pre-Test Driver Inner Door Panel View



Post-Test Driver Inner Door Panel View



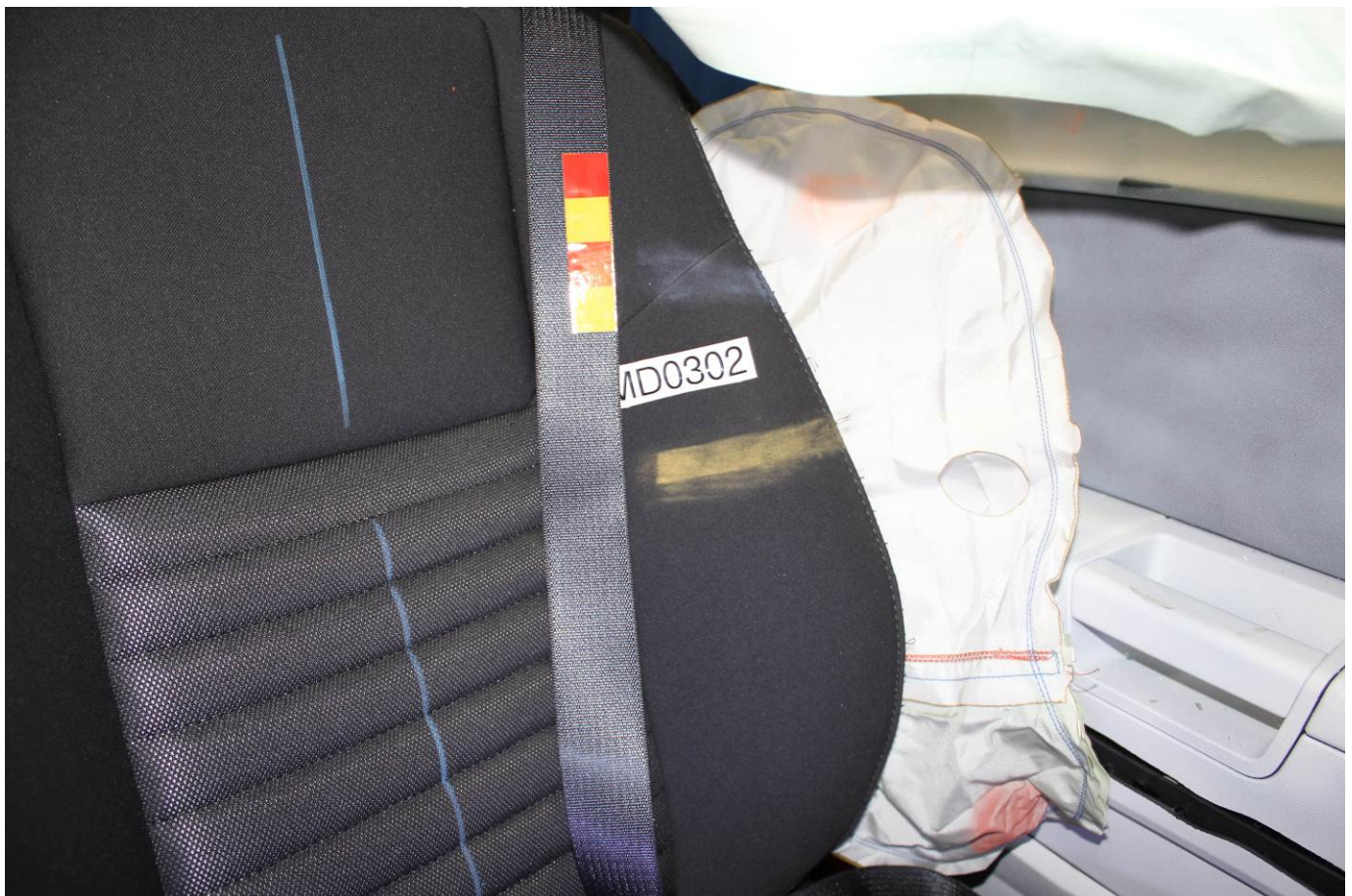
Post-Test Driver Dummy Close-up Head Contact with Vehicle Interior View



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



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



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



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



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



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



Post-Test Driver Dummy Close-up Knee Contact View



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



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



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



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



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



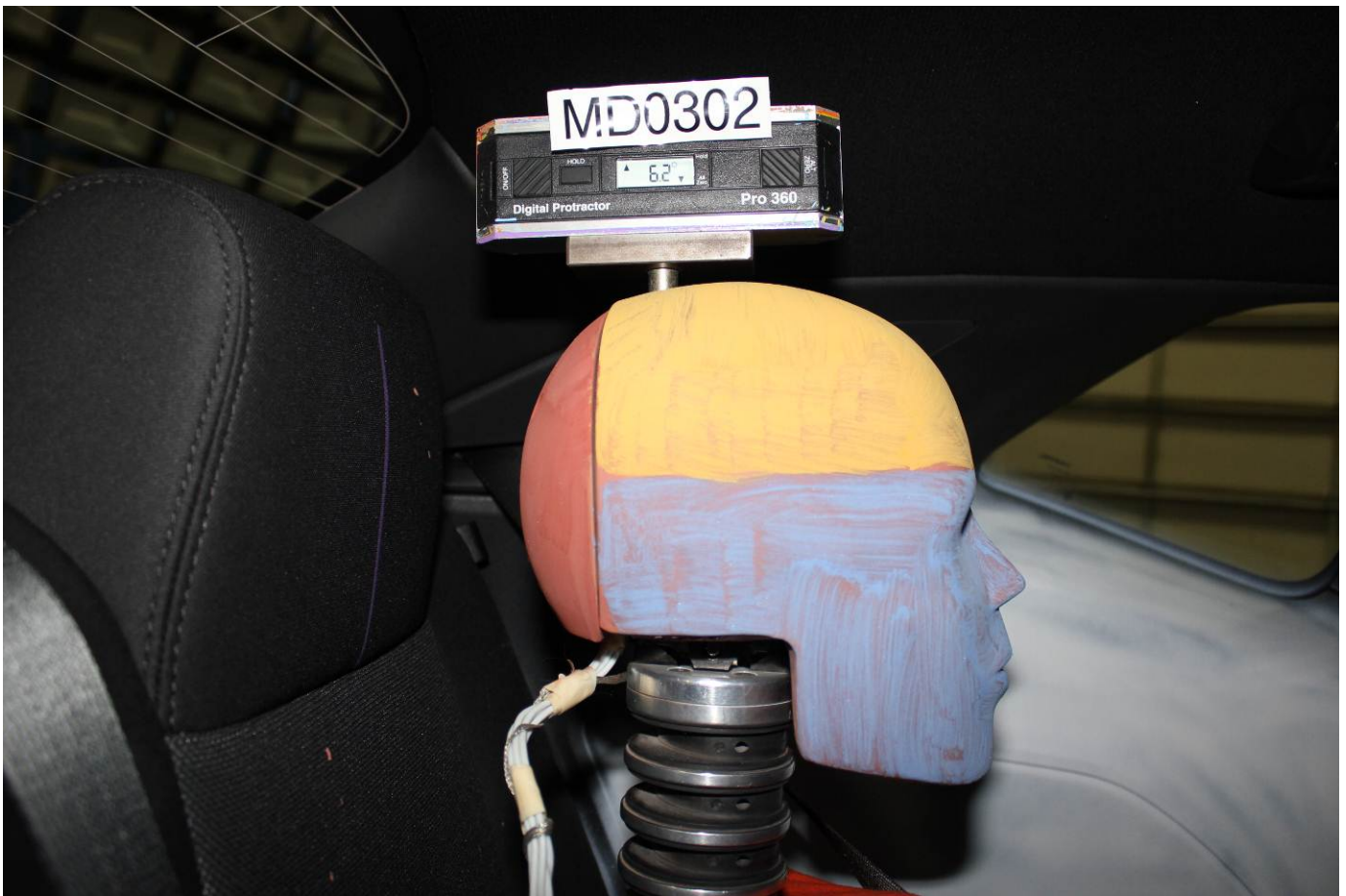
Pre-Test Overhead View of Rear Passenger Seat Pan Prior to Dummy Positioning

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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



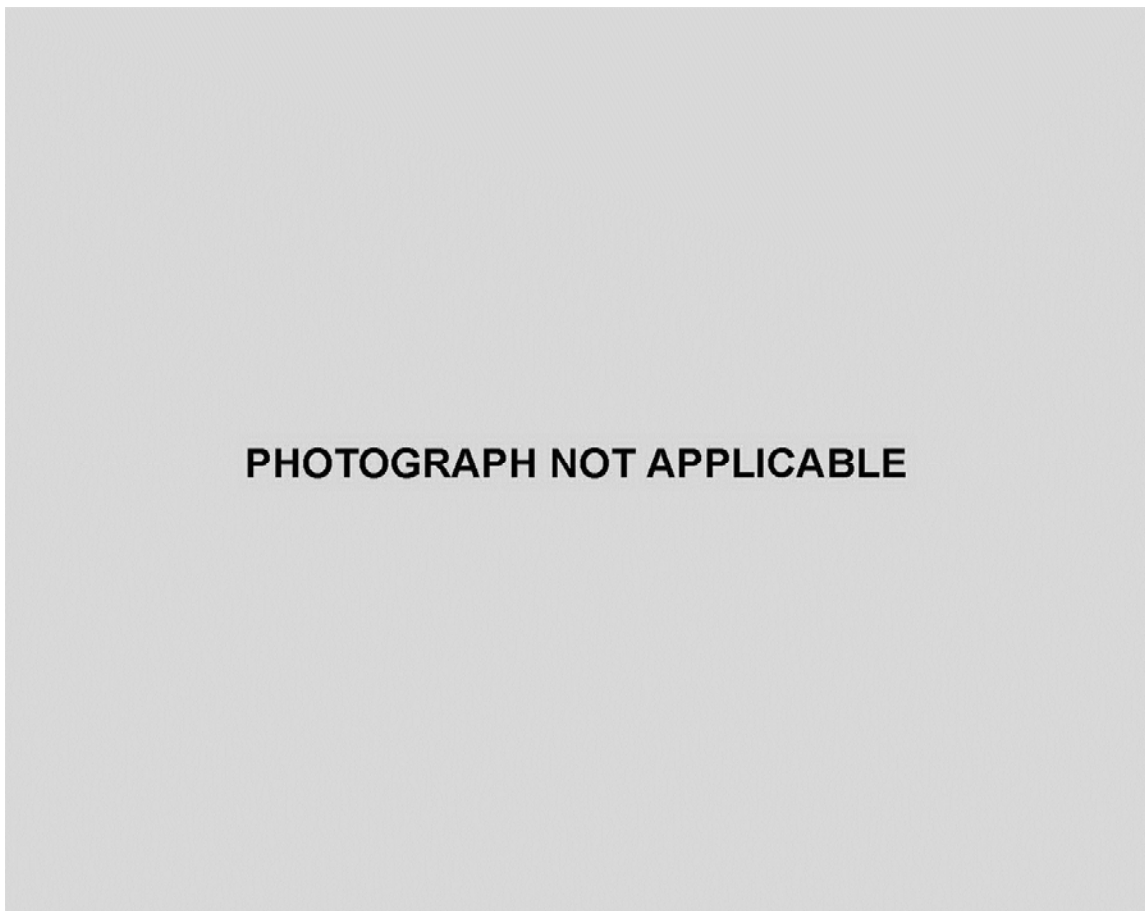
Pre-Test View of Rear Passenger Dummy's Head Showing Dummy's Head is Level



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

**PHOTOGRAPH NOT APPLICABLE**

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



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



Pre-Test Rear Passenger Dummy and Door Clearance View



Post-Test Rear Passenger Dummy and Door Clearance View



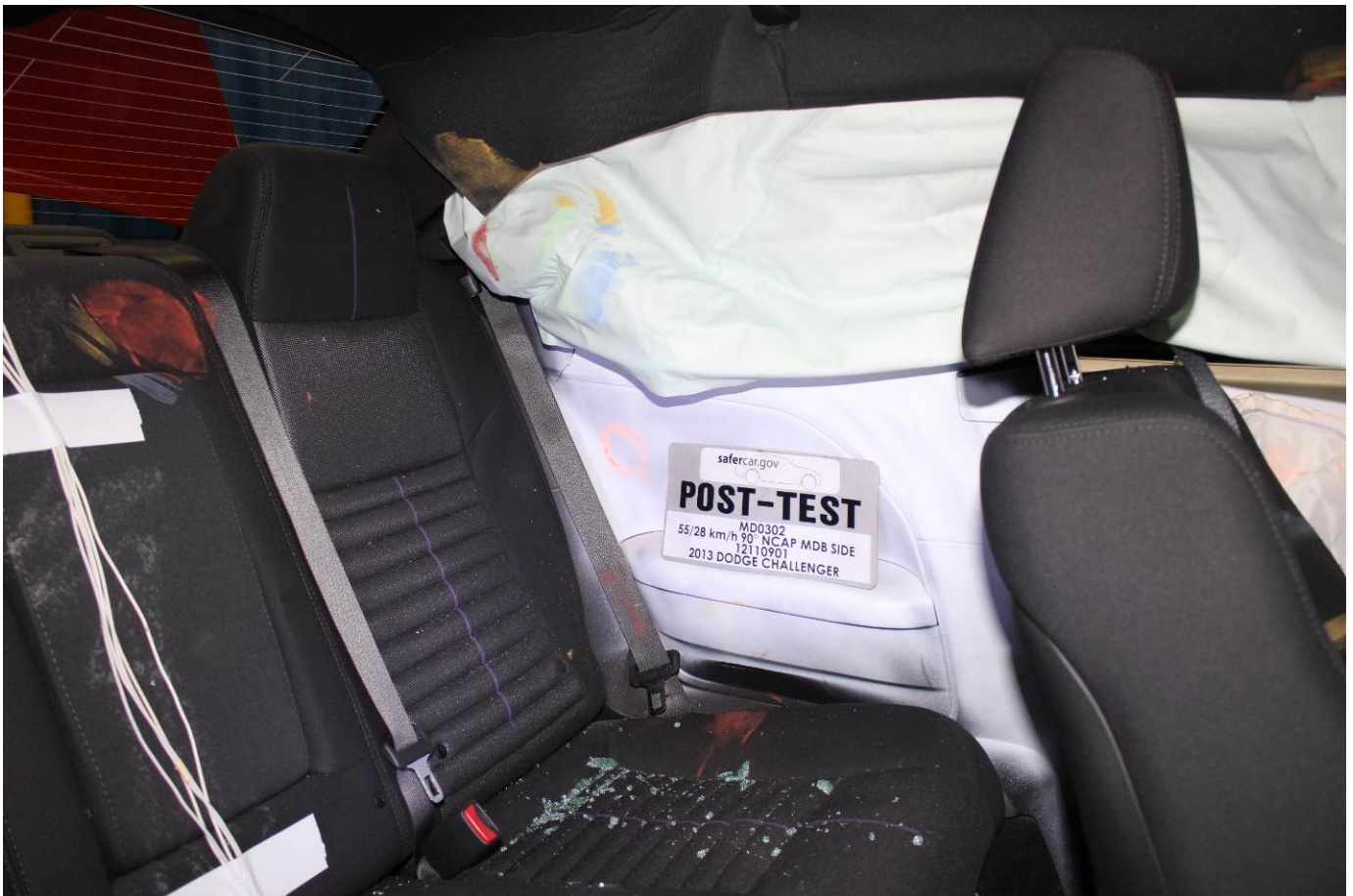
Pre-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment



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



Pre-Test Rear Passenger Inner Door Panel View



Post-Test Rear Passenger Inner Door Panel View



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



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



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



Post-Test Rear Passenger Dummy Close-up Knee Contact View



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



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



Pre-Test Front View of MDB Impactor Face



Post-Test Front View of MDB Impactor Face



Pre-Test Top View of MDB Impactor Face



Post-Test Top View of MDB Impactor Face



Pre-Test Left Side View of MDB Impactor Face



Post-Test Left Side View of MDB Impactor Face



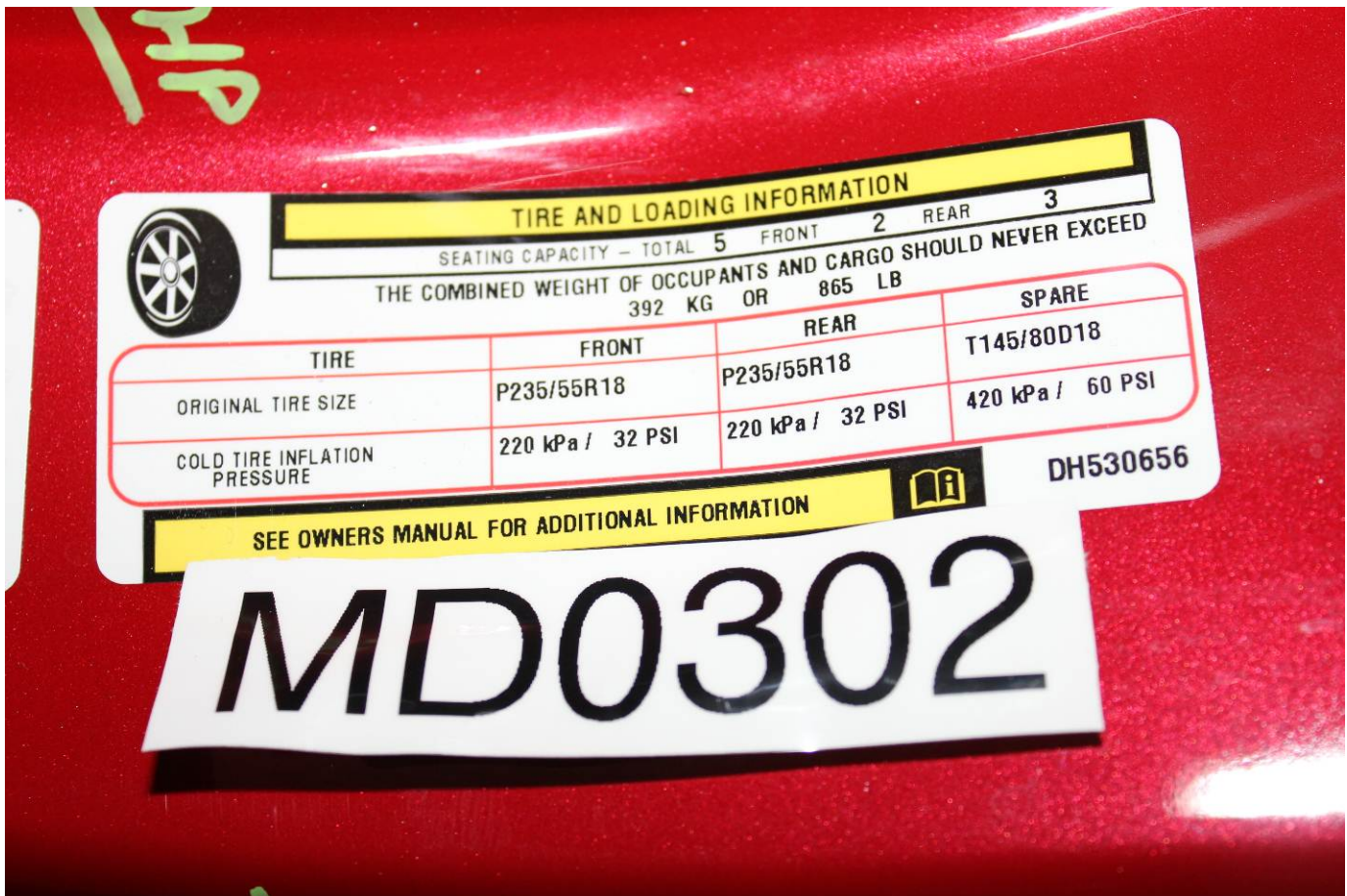
Pre-Test Right Side View of MDB Impactor Face



Post-Test Right Side View of MDB Impactor Face



Close-Up View of Vehicle's Certification Label



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



Pre-Test Ballast View

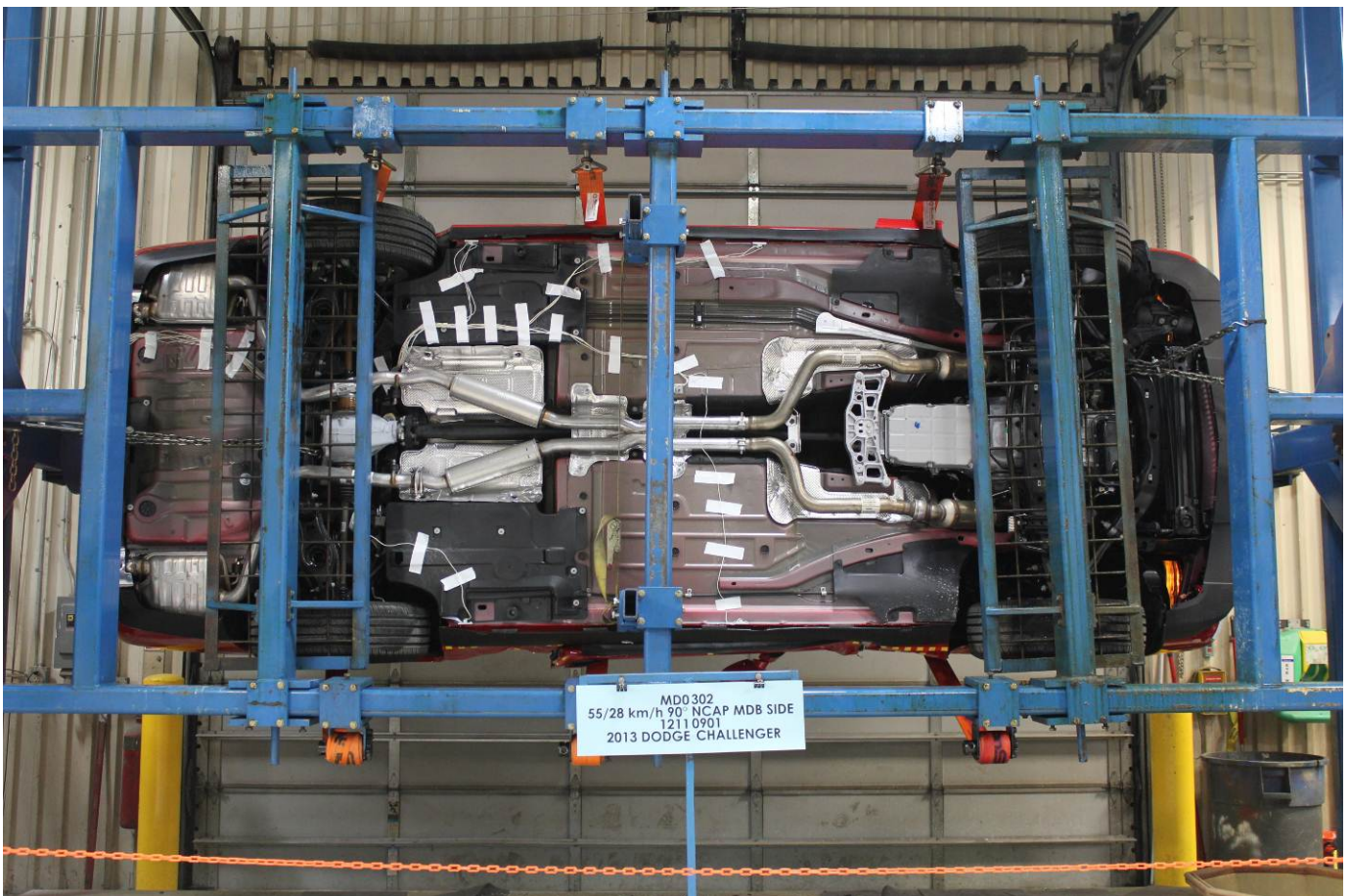


Post-Test Primary and Redundant Speed Trap Read-Out



MD0302  
55/28 km/h 90° NCAP MDB SIDE  
1211 0901  
2013 DODGE CHALLENGER

FMVSS No. 301 Static Rollover 0 Degrees



MD0302  
55/28 km/h 90° NCAP MDB SIDE  
1211 0901  
2013 DODGE CHALLENGER

FMVSS No. 301 Static Rollover 90 Degrees



FMVSS No. 301 Static Rollover 180 Degrees



FMVSS No. 301 Static Rollover 270 Degrees



FMVSS No. 301 Static Rollover 360 Degrees



Impact Event

**2013 DODGE CHALLENGER SXT**

For more information visit: [www.dodge.com](http://www.dodge.com) Chrysler Group LLC  
or call 1-800-4ADODGE

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

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

**Base Price: \$25,495**

**DODGE CHALLENGER**  
Exterior Color: Redline 3-Coat Pearl Exterior Paint  
Interior Color: Dark Slate Gray Interior Color  
Interior: Cloth Low-Back Bucket Seats  
Engine: 3.6-Liter V6 24-Valve VVT Engine  
Transmission: 5-Speed Automatic Transmission

**STANDARD EQUIPMENT (UNLESS REPLACED BY OPTIONAL EQUIPMENT)**

**FUNCTIONAL/SAFETY FEATURES**  
Advanced Multistage Front Airbags  
Supplemental Side-Curtain Front and Rear Airbags  
Supplemental Front Seat-Mounted Side Airbags  
Electronic Stability Control  
All Speed Traction Control  
Hill Start Assist

Anti-Lock 4-Wheel Disc Brakes  
Rain Brake Support  
Ready Alert Braking  
Electro-Hydraulic Power Steering  
Touring Suspension  
Sentry Key® Theft Deterrent System  
Keyless Go

Speed Control  
Power Trunk Lid Release  
Illuminated Entry  
140-MPH Primary Speedometer  
Speed Sensitive Power Locks  
Tire Pressure Monitor with Warning Lamp  
19.1-Gallon Fuel Tank

**INTERIOR FEATURES**  
Air Conditioning with Automatic Temperature Control  
Power 6-Way Driver Seat  
Power 4-Way Driver Lumbar Adjust  
Rear 60 / 40 Folding Seat  
Rear Armrest with Cup Holder Seat  
Power Windows with Front One-Touch-Down Feature  
Leather-Wrapped Shift Knob  
Leather-Wrapped Steering Wheel  
Tilt / Telescoping Steering Column  
Steering Wheel Mounted Audio Controls

Uconnect® 130 AM/FM/CD/MP3  
Audio Jack Input for Mobile Devices  
6 Speakers  
Electronic Vehicle Information Center  
Floor Console with Armrest  
12-Volt Center Console Power Outlet  
Illuminated Cup Holders  
LED Illuminated Interior Door Handles  
Luxury Front and Rear Floor Mats  
Bright Fuel Filler Door

**EXTERIOR FEATURES**  
P235/55R18 BSW All Season Performance Tires  
18-Inch x 7.5-Inch Aluminum Wheels  
Power Mirrors with Manual Fold-Away  
Dual Rear Exhaust with Bright Tips  
Bright Fuel Filler Door

**OPTIONAL EQUIPMENT**  
Redline 3-Coat Pearl Exterior Paint \$500  
Customer Preferred Package ZSE

**DESTINATION CHARGE \$995**

**TOTAL PRICE: \* \$26,990**

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

**5 YEAR / 100,000 MILE POWERTRAIN WARRANTY**

**EPA DOT Fuel Economy and Environment Gasoline Vehicle**

**Fuel Economy**  
21 MPG combined city/hwy  
18 city 27 highway  
4.8 gallons per 100 miles  
Midsize cars range from 13 to 99 MPG. The best vehicle rates 112 MPG.

**You spend \$1,150 more in fuel costs over 5 years** compared to the average new vehicle.

**Annual fuel cost \$2,550**

**Fuel Economy & Greenhouse Gas Rating (tailpipe only)** 5 (Best)

**Smog Rating (tailpipe only)** 6 (Best)

This vehicle emits 423 grams CO2 per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also creates emissions. Learn more at [fuelconomy.gov](http://fuelconomy.gov)

Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 23 MPG and cost \$11,600 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at \$3.50 per gallon. MPG is miles per gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.

**fuelconomy.gov**  
Calculate personalized estimates and compare vehicles

**GOVERNMENT 5-STAR SAFETY RATINGS**

**Overall Vehicle Score Not Rated**  
Based on the combined ratings of frontal, side, and rollover. Should ONLY be compared to other vehicles of similar size and weight. ▲ Safety concern: visit [www.safercar.gov](http://www.safercar.gov) or call 1-888-327-4236 for more details.

<b>Frontal Crash</b>	Driver Passenger	Not Rated
Based on the risk of injury in a frontal impact. Should ONLY be compared to other vehicles of similar size and weight.		
<b>Side Crash</b>	Front seat Rear seat	Not Rated
Based on the risk of injury in a side impact.		
<b>Rollover</b>		★★★★
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](http://www.safercar.gov) or 1-888-327-4236

**PARTS CONTENT INFORMATION FOR VEHICLES IN THIS CARLINE:**  
U.S./CANADIAN PARTS CONTENT: 67 %  
MAJOR SOURCES OF FOREIGN PARTS CONTENT: 15 %  
NOTE: PARTS CONTENT DOES NOT INCLUDE FINAL ASSEMBLY, DISTRIBUTION, OR OTHER NON-PARTS COSTS.

**FOR THIS VEHICLE:**  
FINAL ASSEMBLY POINT: BRAMPTON, ONTARIO, CANADA  
COUNTRY OF ORIGIN: MEXICO  
ENGINE: MEXICO  
TRANSMISSION: UNITED STATES

Assembly Point/Port of Entry: BRAMPTON, ONTARIO, CANADA  
VIN: 2C3CDYAG1DH-530656 LA-10N 7811

SHIP TO: 45449 14 JACK PHELAN DODGE OF COUNTRYSIDE 5859 S LA GRANGE RD COUNTRYSIDE IL 60525-4065  
SHIP TO: 51 45449 JACK PHELAN DODGE OF COUNTRYSIDE 5859 S LA GRANGE RD COUNTRYSIDE IL 60525-4065

THIS LABEL IS ADDED TO THIS VEHICLE TO COMPLY WITH FEDERAL LAW. THIS LABEL CANNOT BE REMOVED OR ALTERED PRIOR TO DELIVERY TO THE ULTIMATE PURCHASER.  
\* EXCEPT WHERE LOCAL LAWS, FEES AND TITLES AND LICENSES AND DEALER SUPPLIES AND INSTALLED OPTIONS AND ACCESSORIES ARE NOT INCLUDED IN THIS PRICE. DISCOUNT, IF ANY, IS BASED ON PRICE OF OPTIONS IF PURCHASED SEPARATELY.

The safety ratings above are based on Federal Government tests of particular vehicles equipped with certain features and options. The performance of this vehicle may differ. Bumper Performance  
This vehicle is equipped with bumper systems that can withstand a frontal barrier impact speed of 2.5 miles per hour and a rear barrier impact speed of 2.5 miles per hour with no more damage than allowed by the Federal bumper standard. The Federal bumper standard allows damage to the bumpers and attaching hardware and specifies barrier tests to be conducted at 2.5 miles per hour.

**Monroney Label**

**Head Restraints**

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

**WARNING!**

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

**Active Head Restraints — Front Seats**

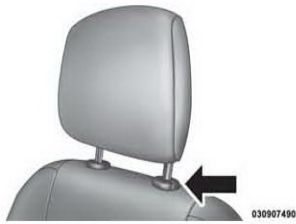
Driver Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

## Active Head Restraints — Front Seats

The front driver and passenger seats are equipped with Active Head Restraints (AHR). In the event of a rear impact, the AHRs will automatically extend forward minimizing the gap between the back of the occupants head and the AHR.

The AHRs will automatically return to their normal position following a rear impact. If the AHRs do not return to their normal position see your authorized dealer immediately.

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



Push Button

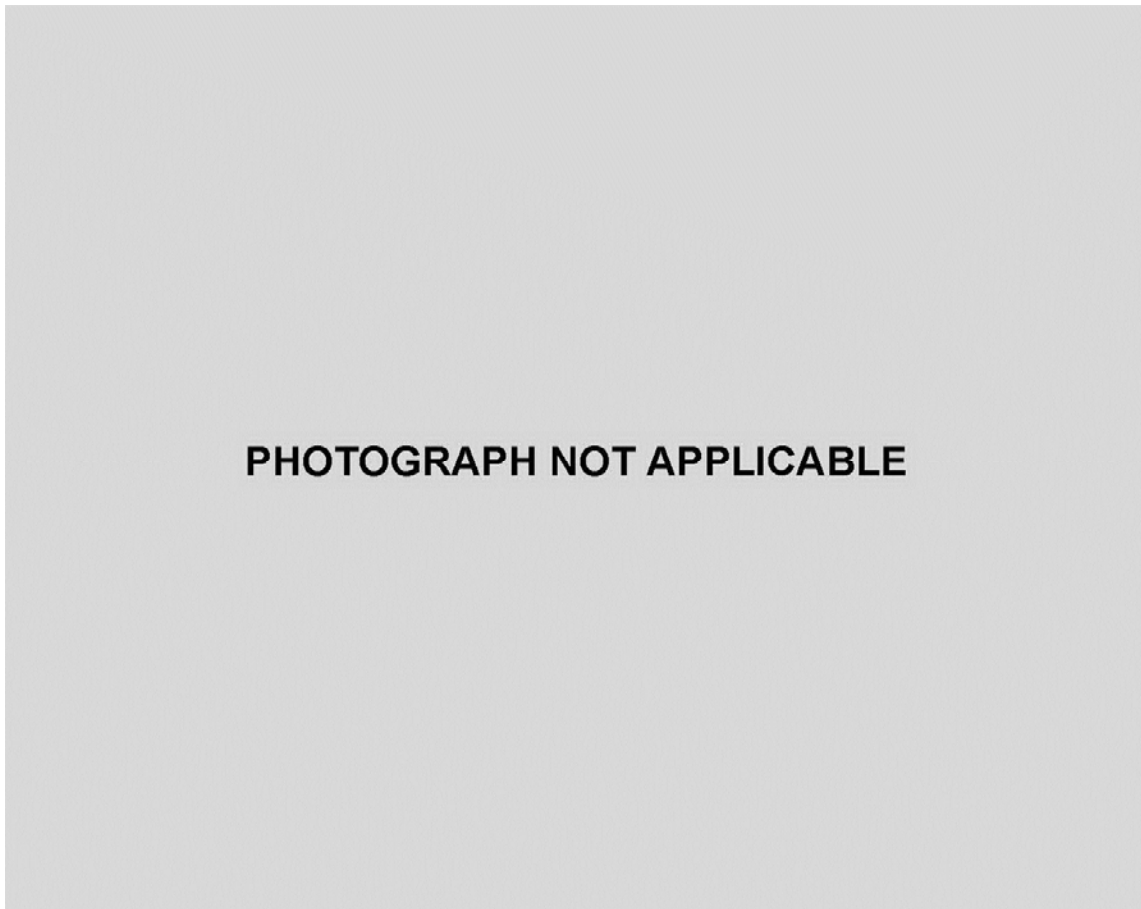
**NOTE:** The head restraints should only be removed by qualified technicians, for service purposes only. If either of the head restraints require removal, see your authorized dealer.

**WARNING!**

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

**Parent topic:** [Head Restraints](#)

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



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



Post-Test Left Door Opening View

**APPENDIX B**  
**DUMMY RESPONSE DATA PLOTS**

**TABLE OF DATA PLOTS**  
**Driver Dummy Instrumentation Plots**

<b><u>No.</u></b>	<b><u>Description</u></b>	<b><u>Page No.</u></b>
Figure No. 1.	Driver 9 Axis Head CG Acceleration (X) vs. Time	B-1
Figure No. 2.	Driver 9 Axis Head CG Acceleration (Y) vs. Time	B-1
Figure No. 3.	Driver 9 Axis Head CG Acceleration (Z) vs. Time	B-1
Figure No. 4.	Driver 9 Axis Head CG Resultant Acceleration (X) 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
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Figure No. 16.	Passenger Head Acceleration (Z) Primary vs. Time	B-5
Figure No. 17.	Passenger Head Resultant Acceleration Primary vs. Time	B-5
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](http://www.NHTSA.dot.gov)

**Additional Driver & Passenger Dummy Instrumentation Data**

Driver Head CG Redundant Acceleration (X) vs. Time

Driver Head CG Redundant Acceleration (Y) vs. Time

Driver Head CG Redundant Acceleration (Z) vs. Time

Driver 9 Axis Head X Arm Y

Driver 9 Axis Head X Arm Z

Driver 9 Axis Head Y Arm X

Driver 9 Axis Head Y Arm Z

Driver 9 Axis Head Z Arm X

Driver 9 Axis Head Z Arm Y

Driver Lower Spine T12 Acceleration (X)

Driver Lower Spine T12 Acceleration (Y)

Driver Lower Spine T12 Acceleration (Z)

Passenger Head Acceleration Redundant (X)

Passenger Head Acceleration Redundant (Y)

Passenger Head Acceleration Redundant (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)

### **Vehicle Instrumentation Data**

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

### **MDB Instrumentation Data**

MDB Center of Gravity Acceleration (X)

MDB Center of Gravity Acceleration (Y)

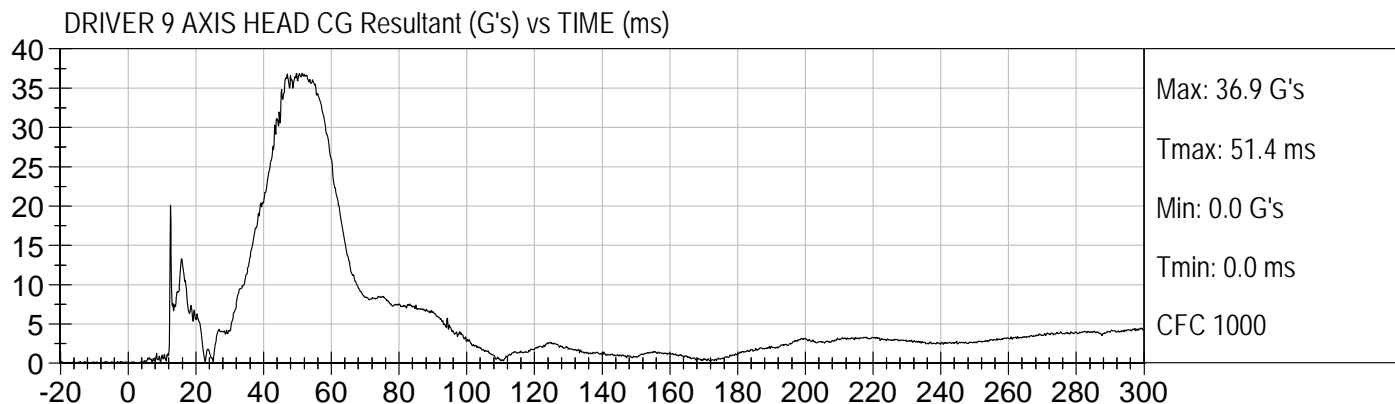
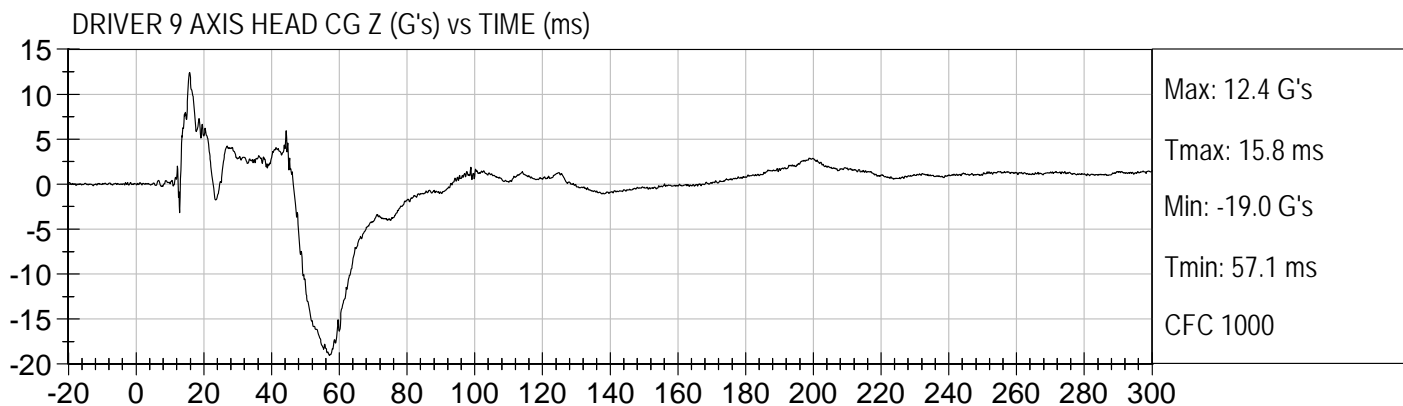
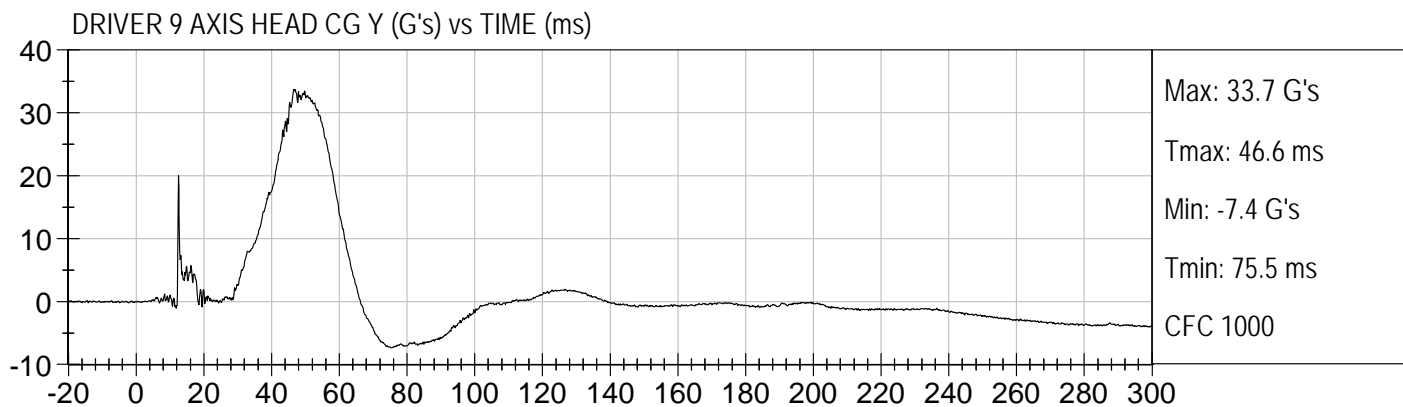
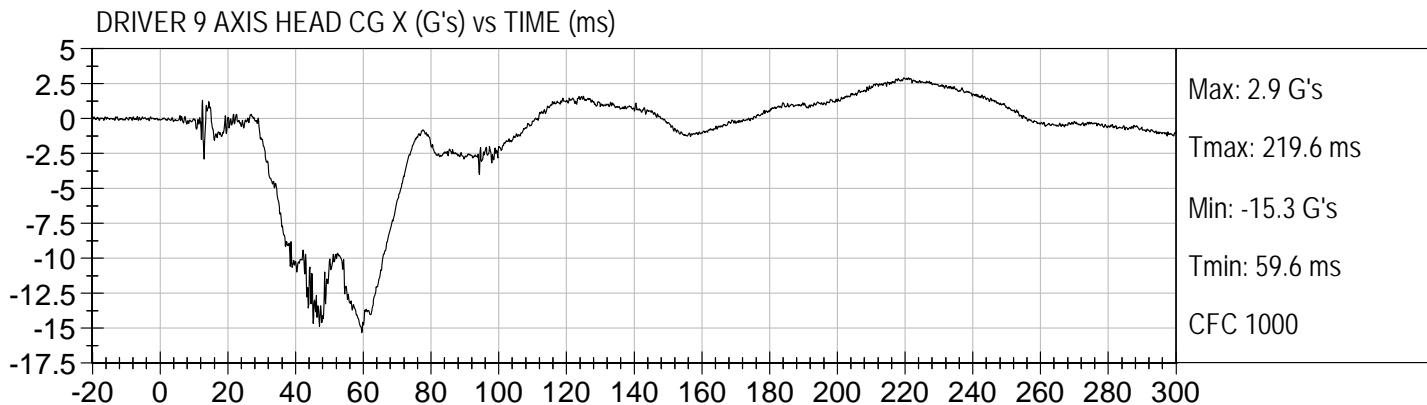
MDB Center of Gravity Acceleration (Z)

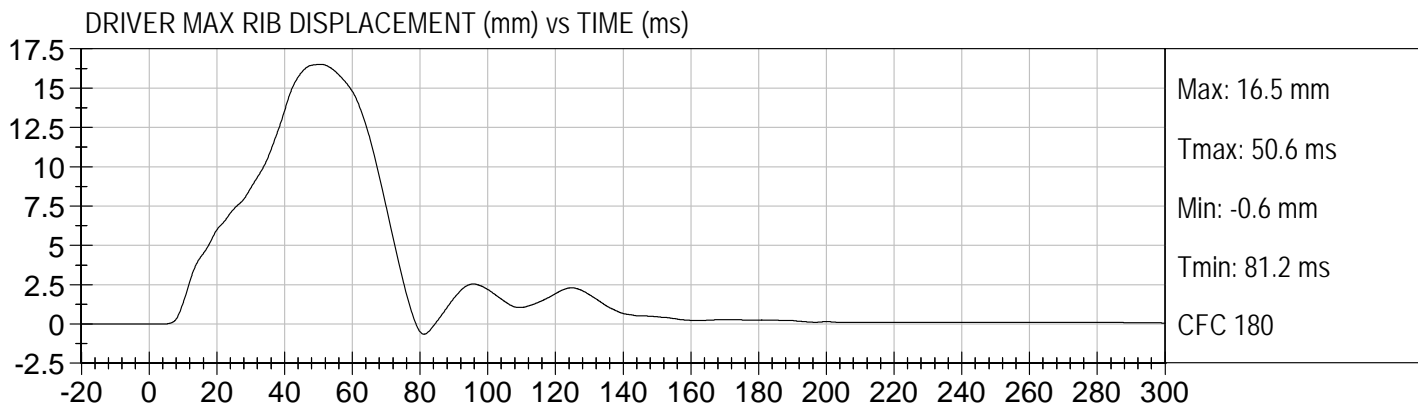
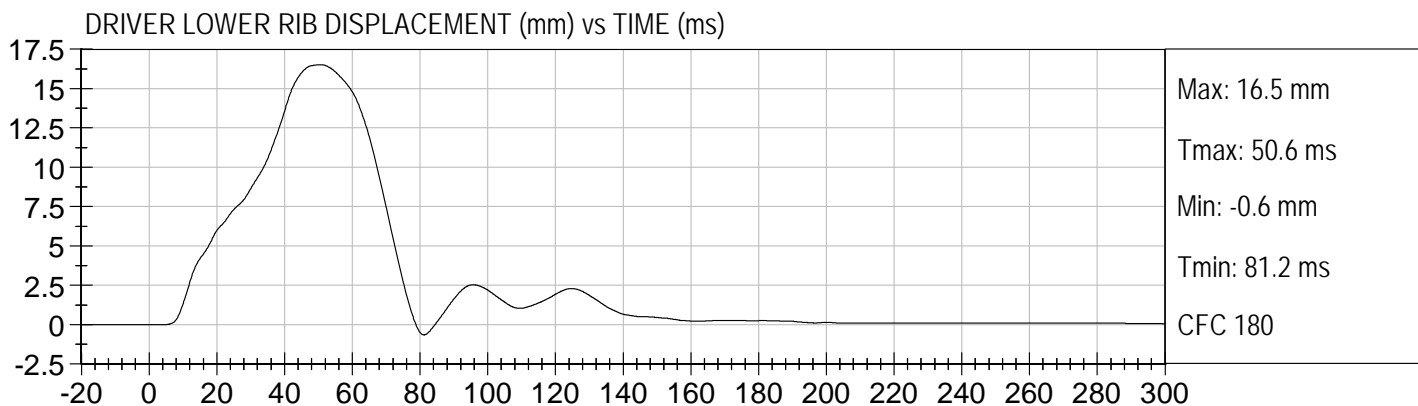
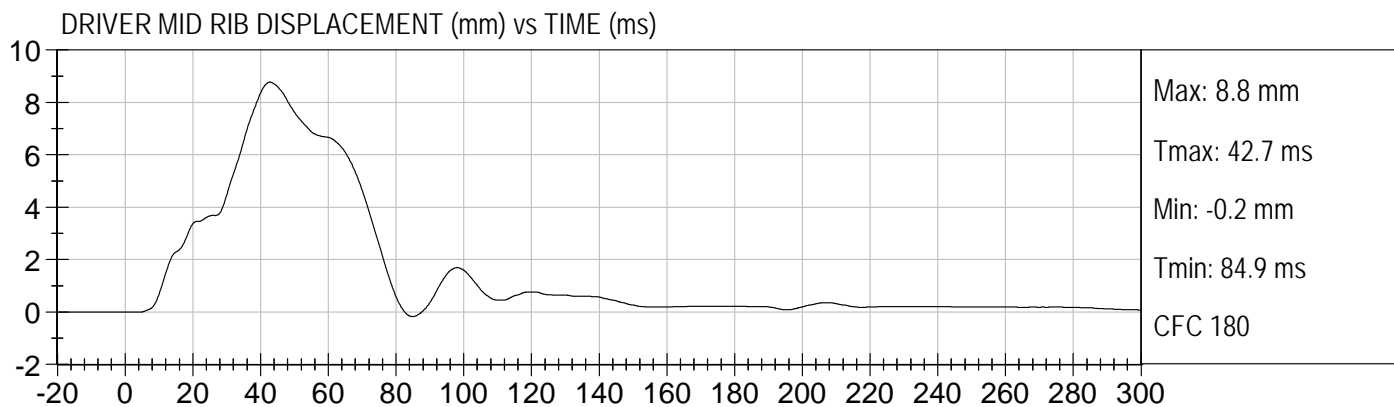
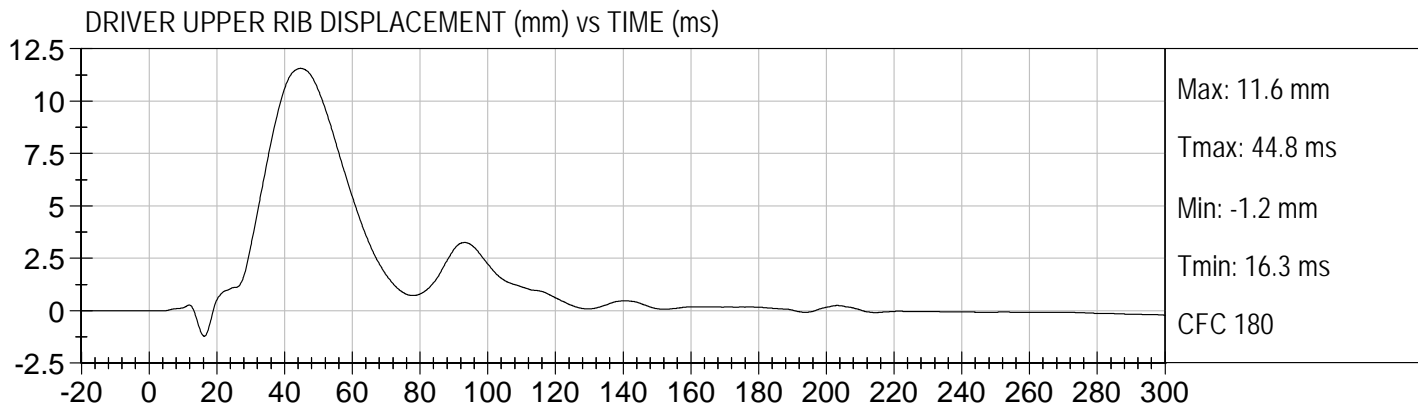
MDB Rear Acceleration (X)

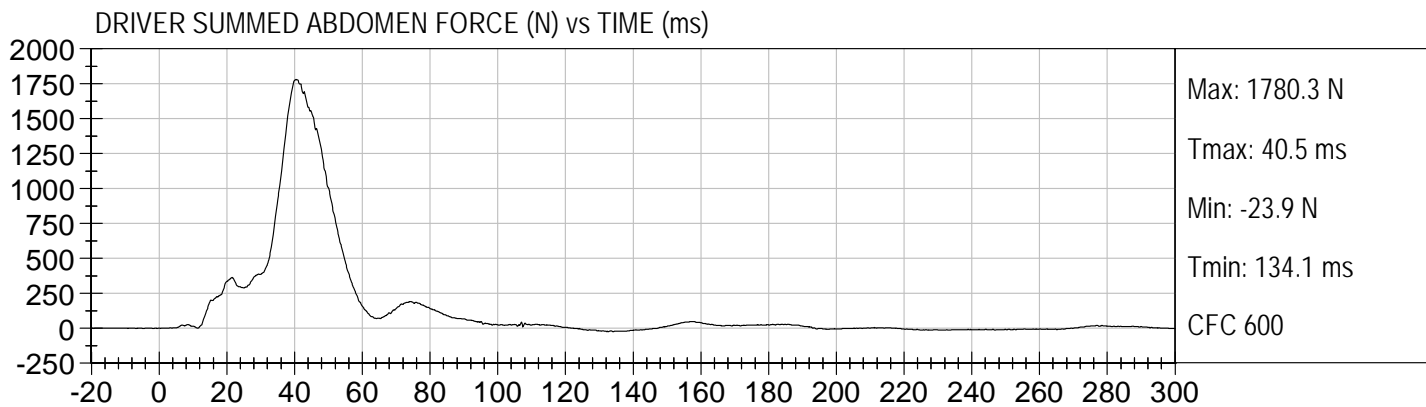
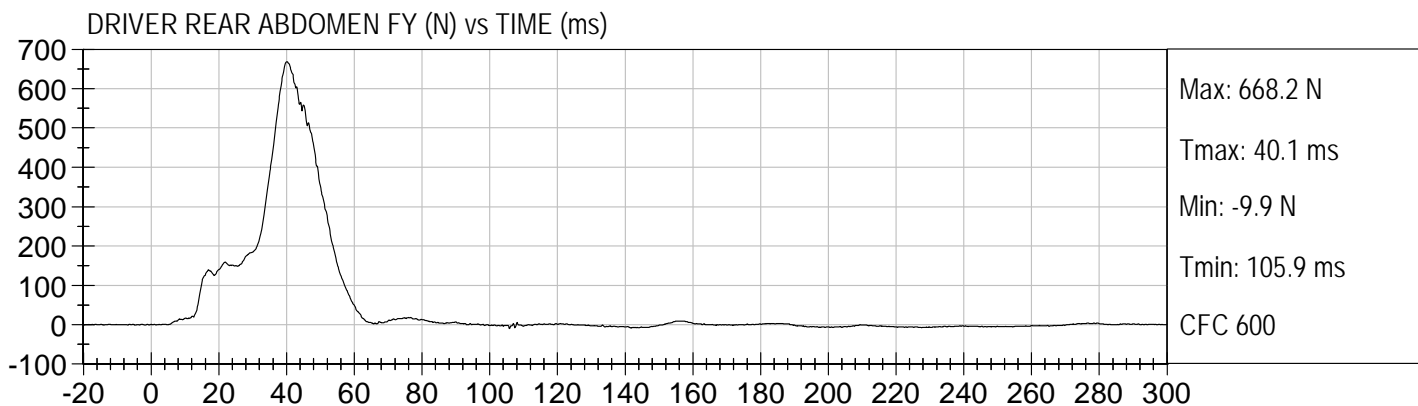
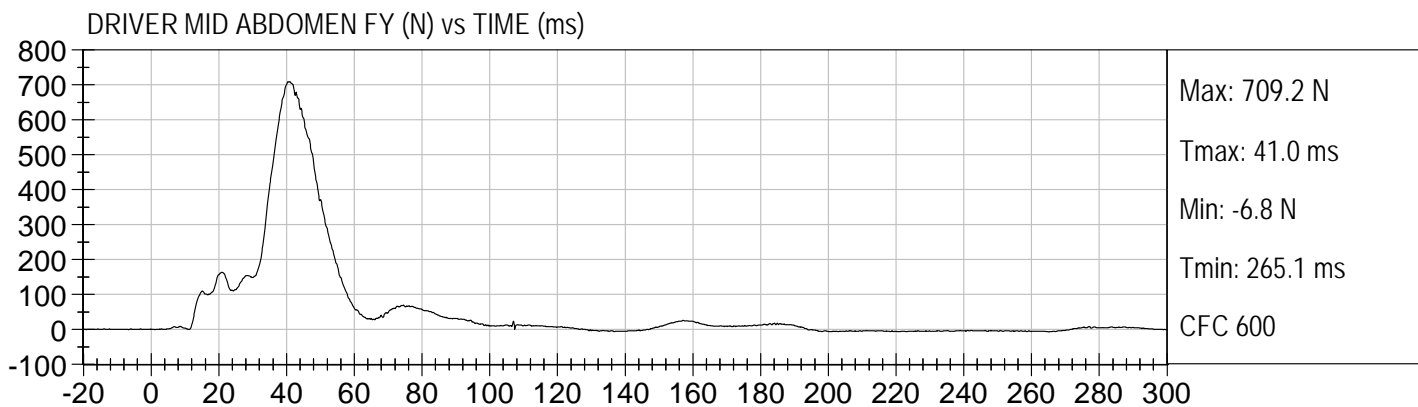
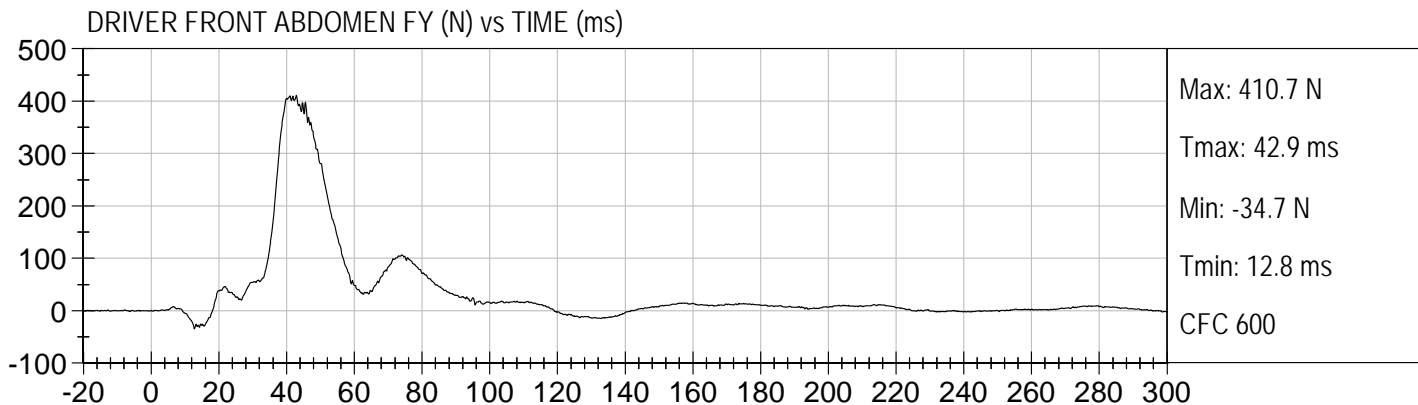
MDB Rear Acceleration (Y)

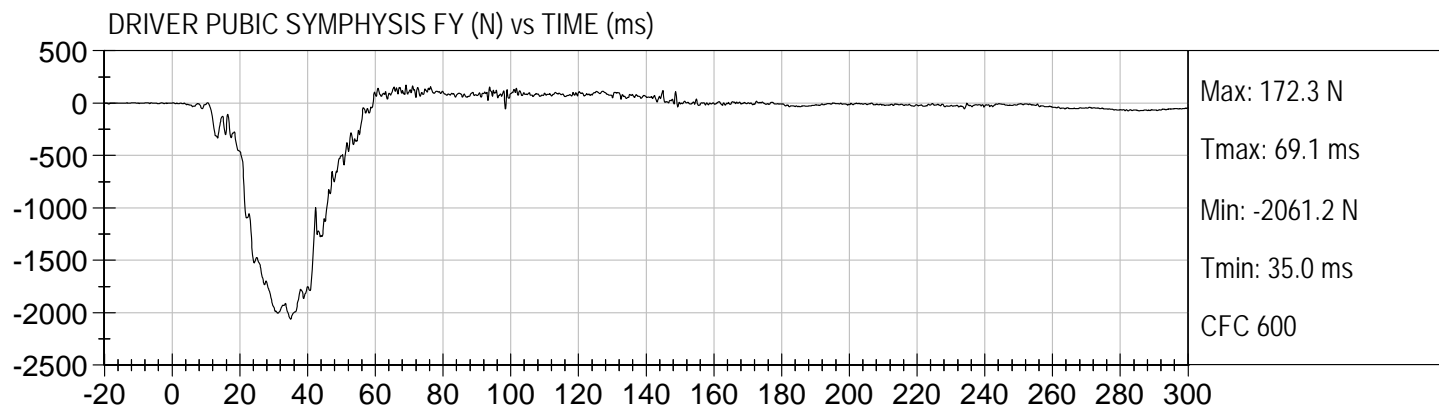
Left MDB Contact Switch

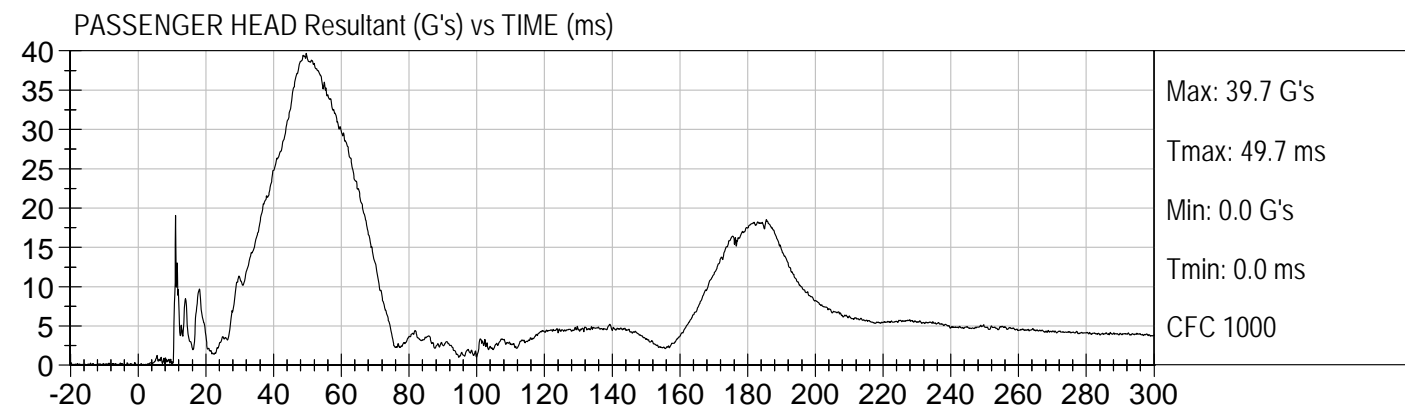
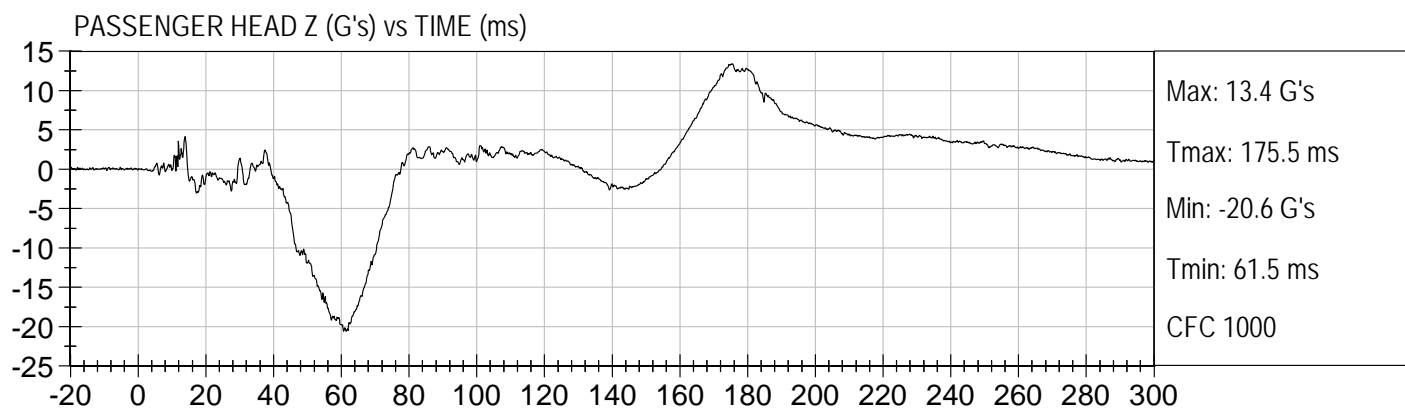
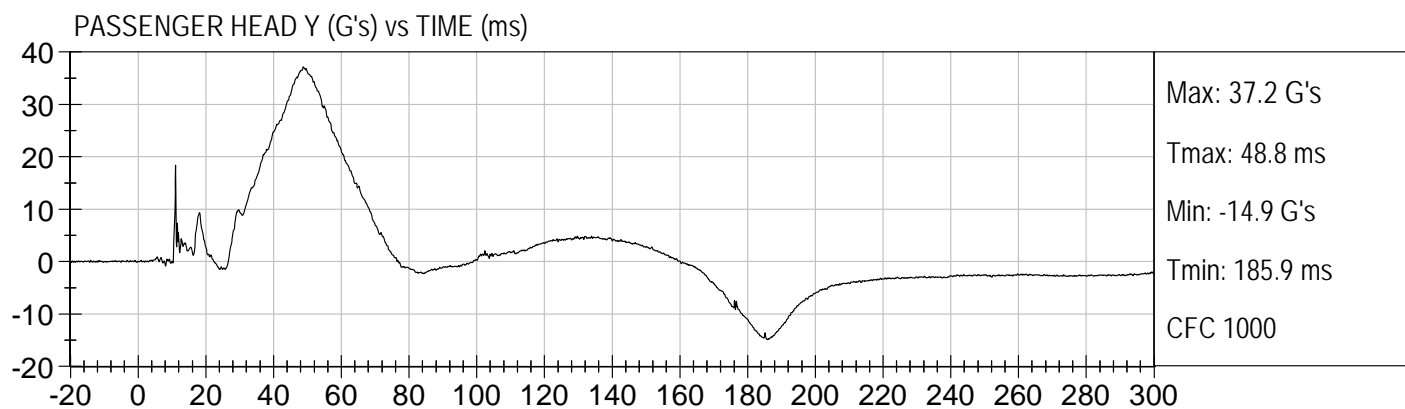
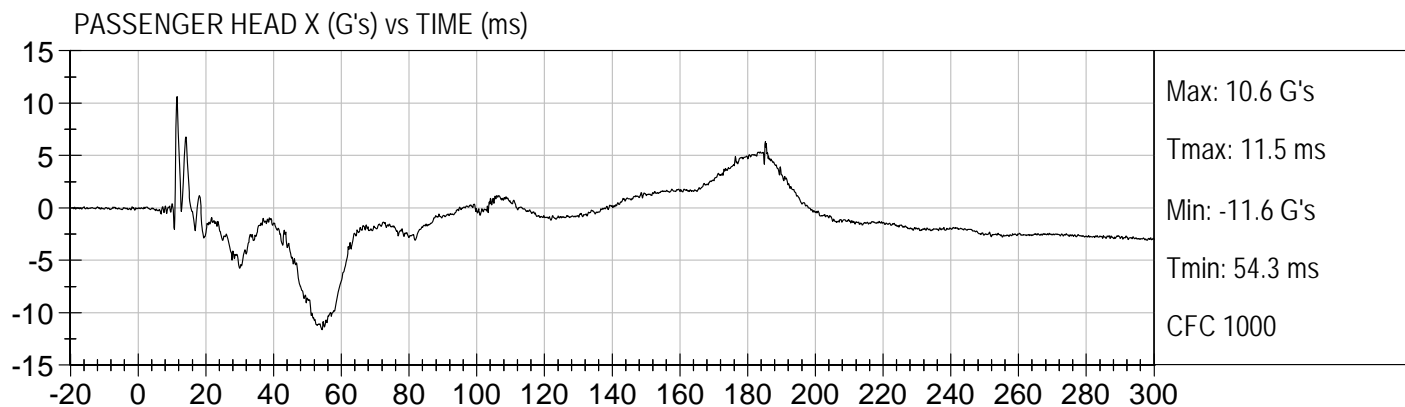
Right MDB Contact Switch

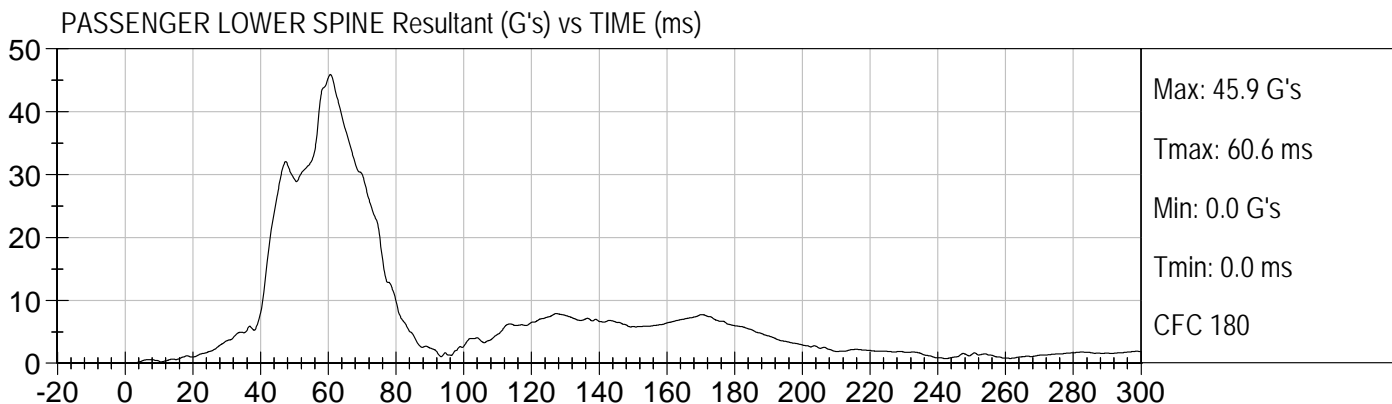
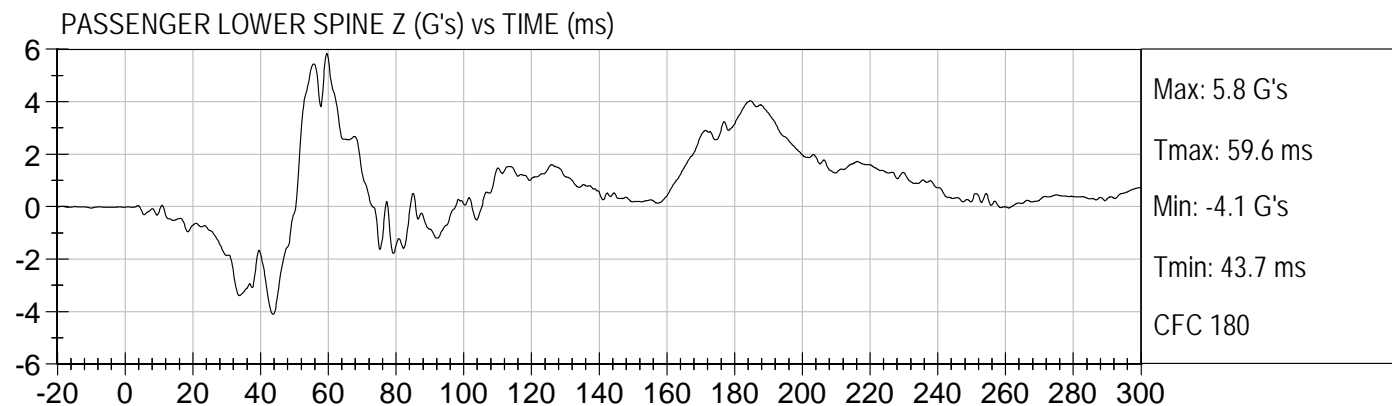
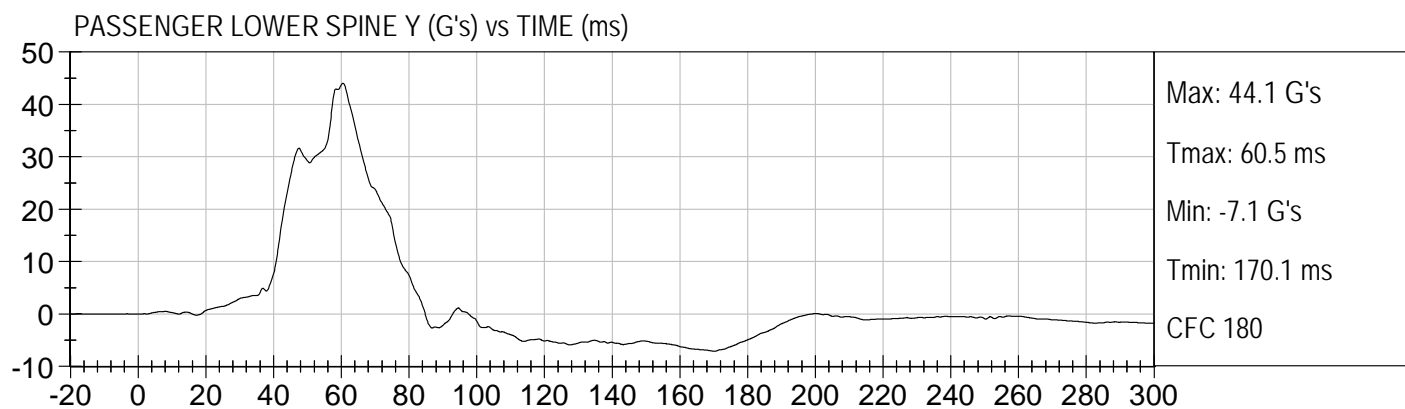
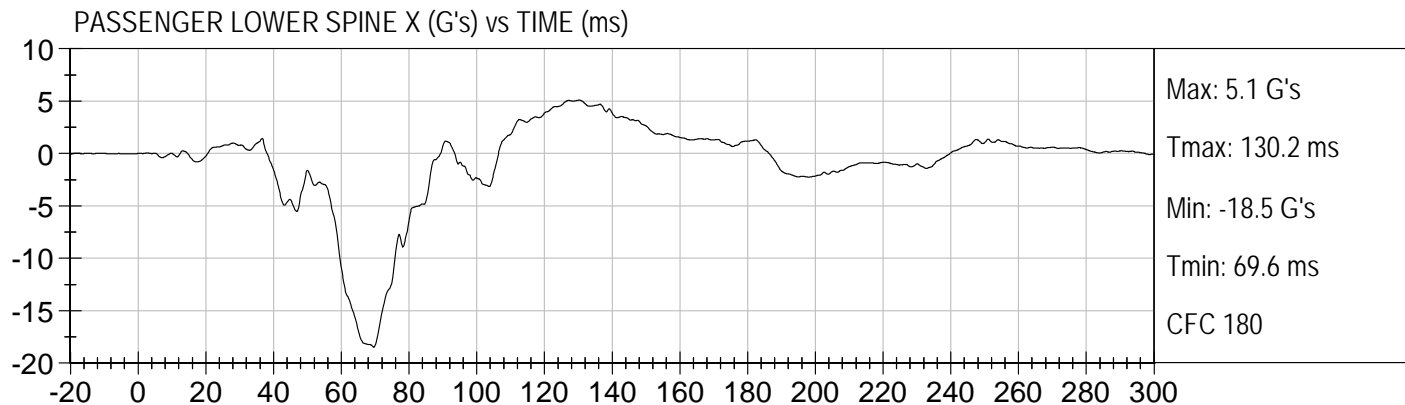


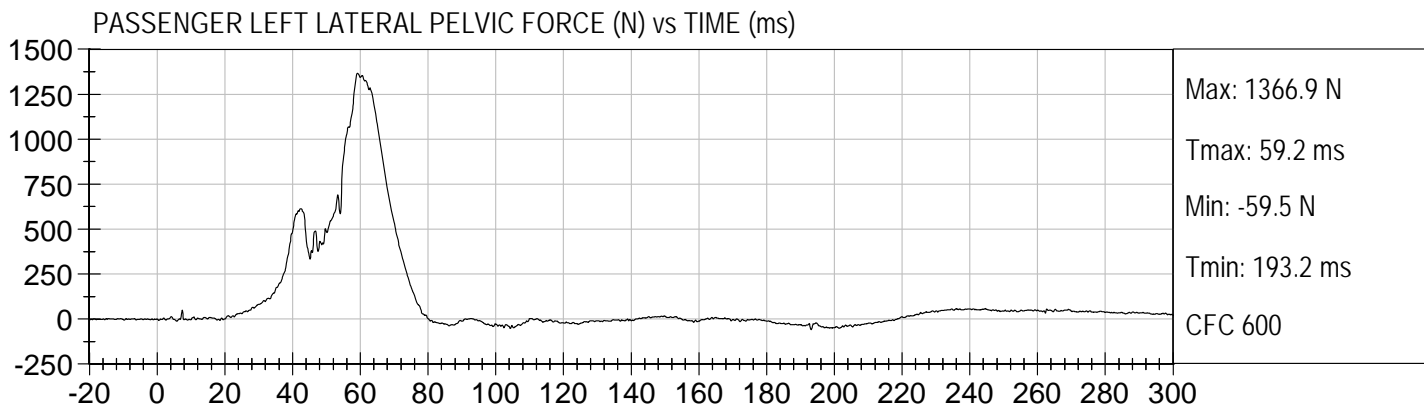
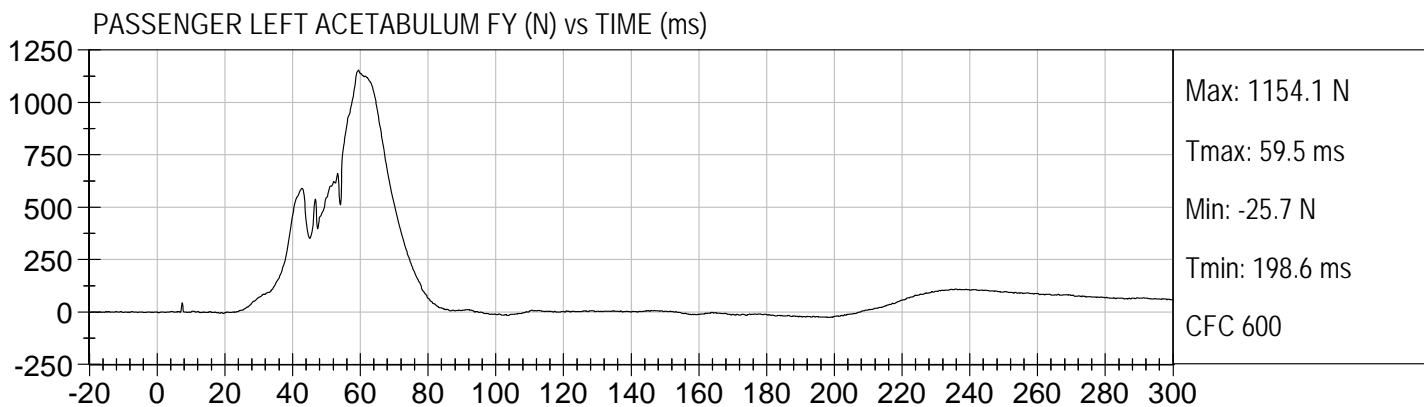












## **APPENDIX C**

### **DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA**

**ES-2re External Measurements**  
**SN: 032**

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

**MGA RESEARCH CORPORATION**  
**HEAD DROP TEST**  
**ES-2re DUMMY**

**ATD Serial No:** 032

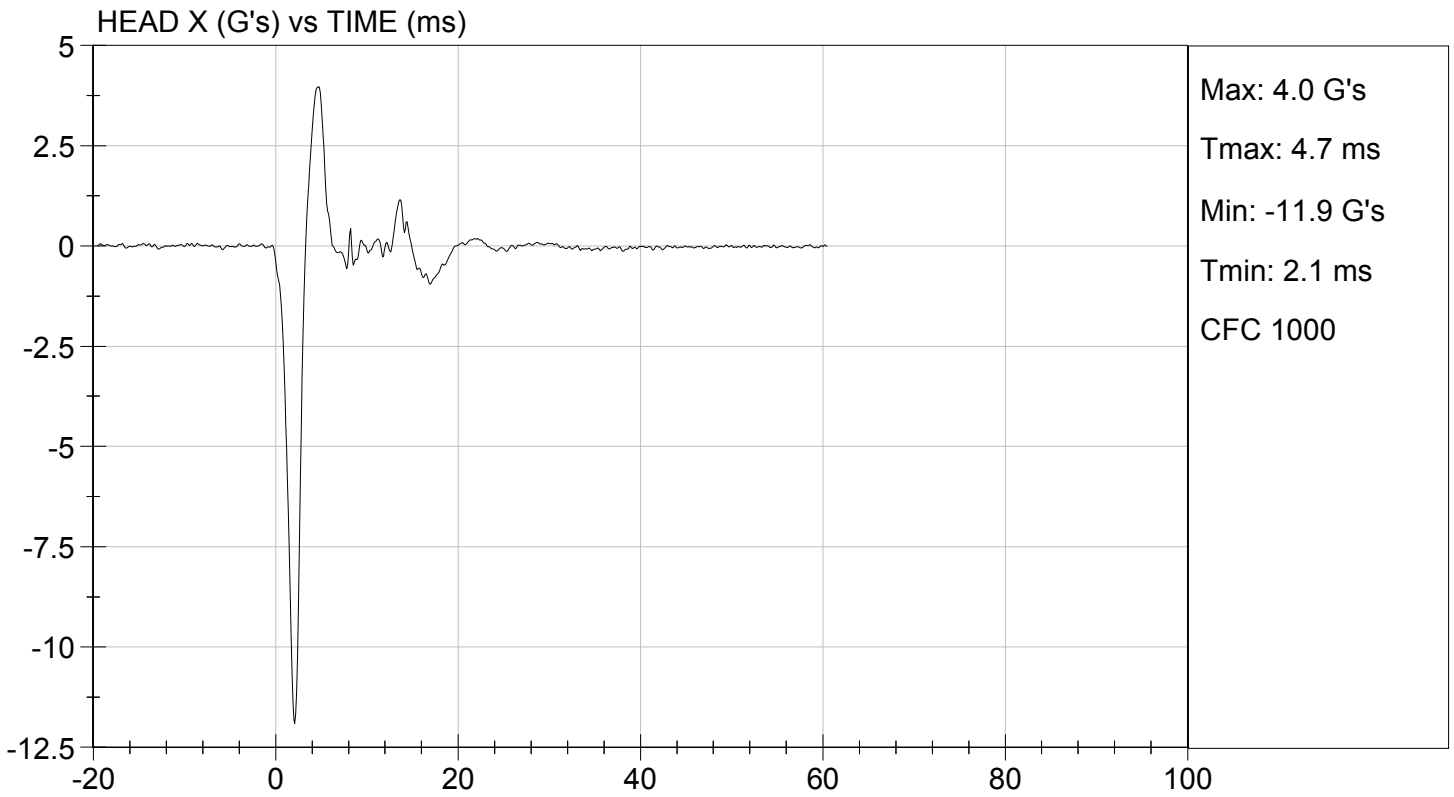
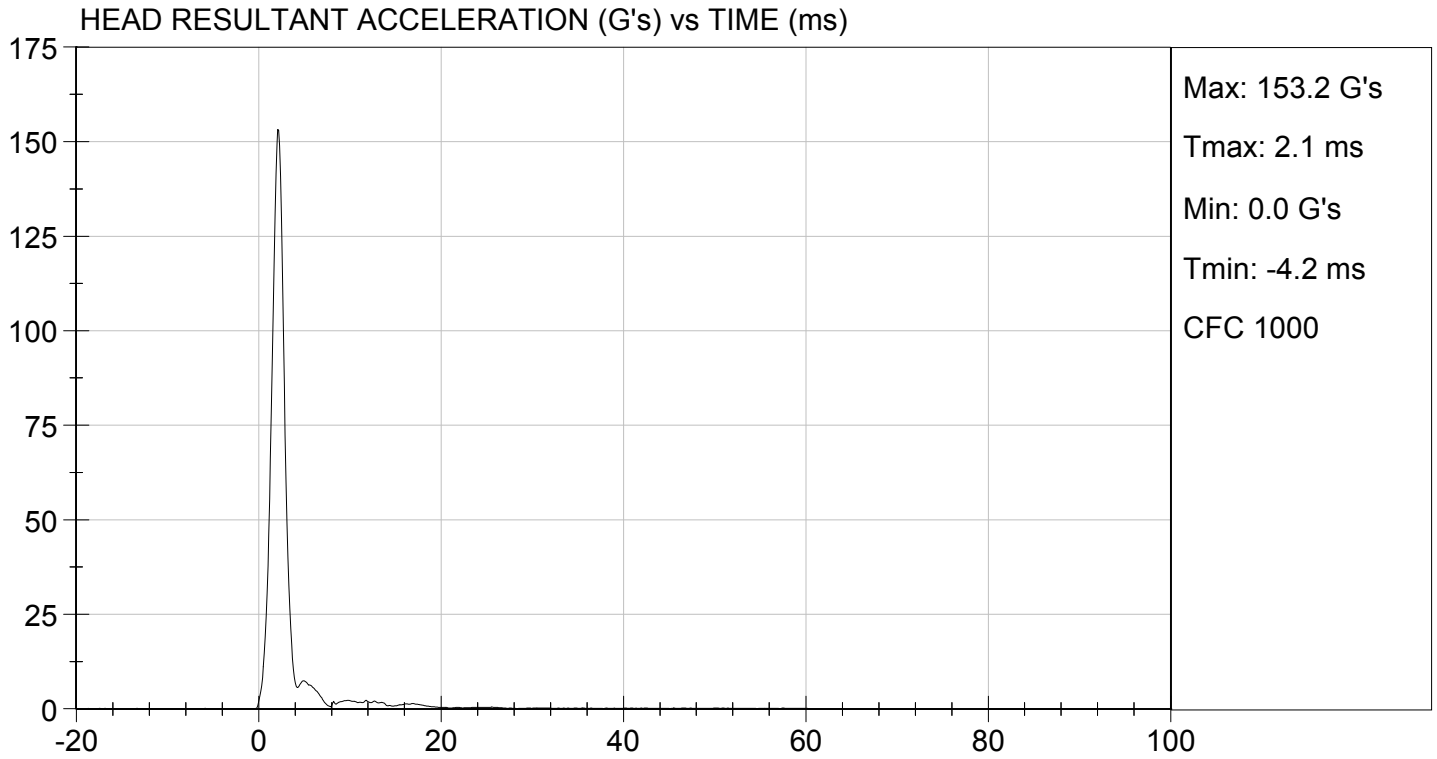
**Test ID:** D124081

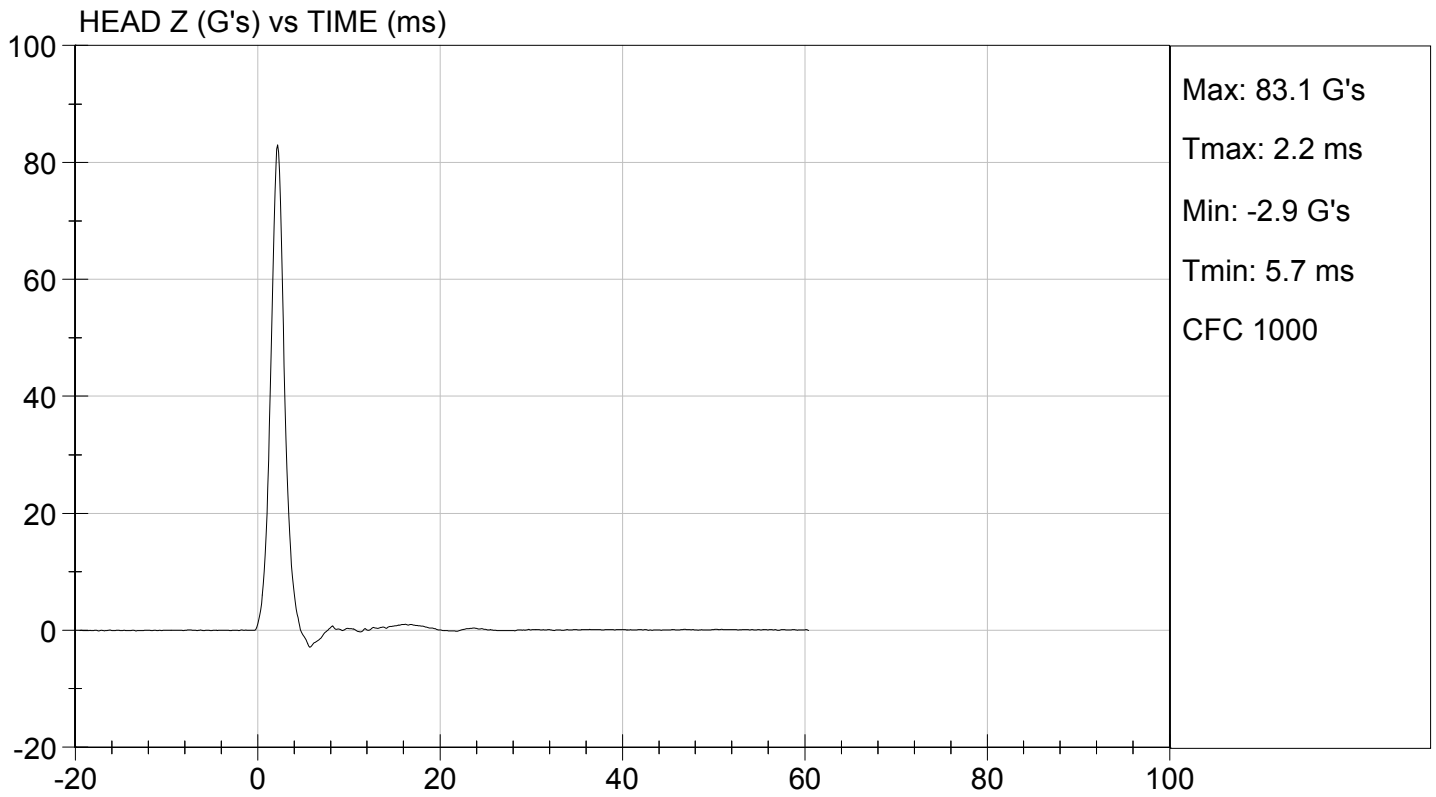
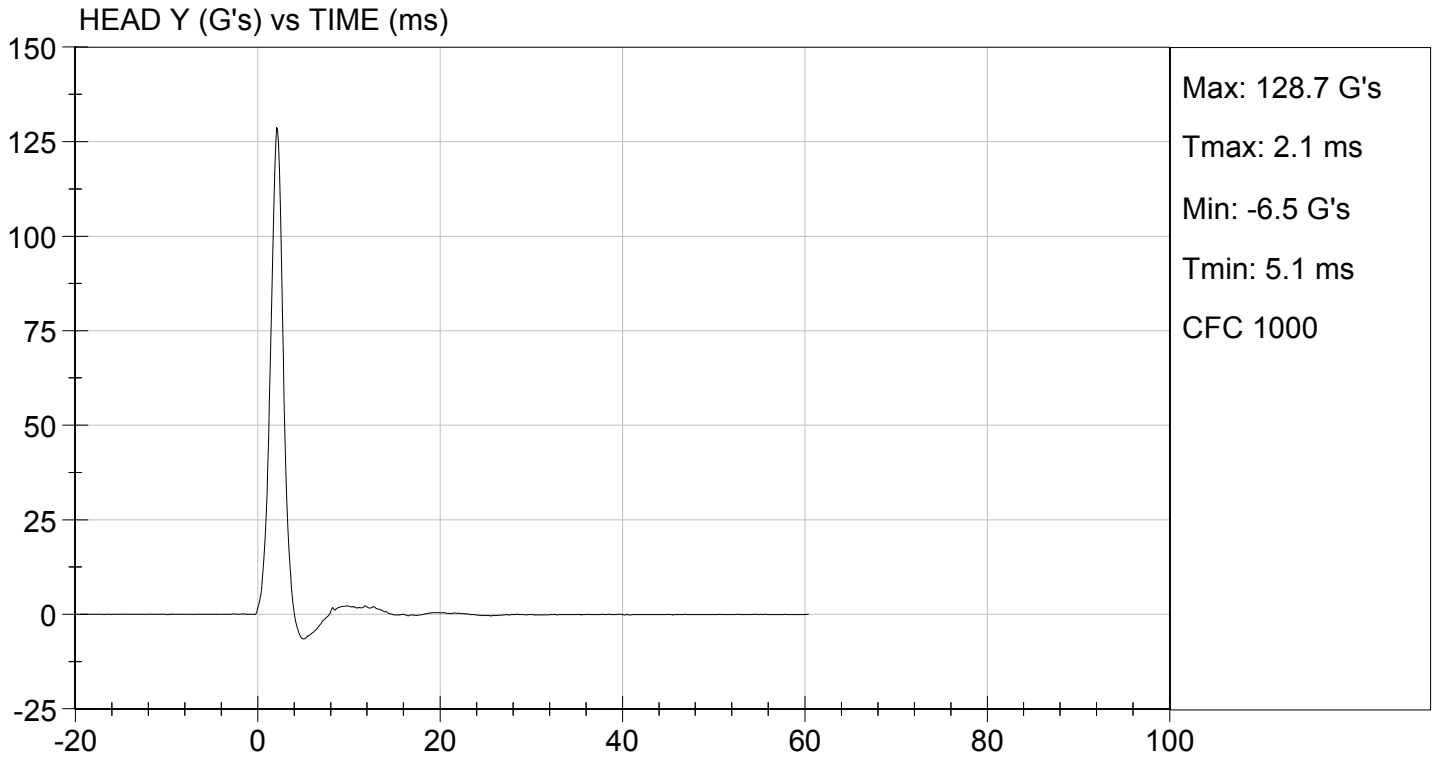
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	28	Pass
Peak Resultant Acceleration	G's	125 to 155	153	Pass
Peak Longitudinal Acceleration	G's	<= +/- 15.0	-11.9	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 15% of peak	Yes	Pass
<b>Overall Test Results</b>				<b>Pass</b>

*Jessica Hall*  
 Laboratory Technician

10/26/2012  
 Test Date

*David Winkelbauer*  
 Approved By





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

**ATD Serial No:** 032

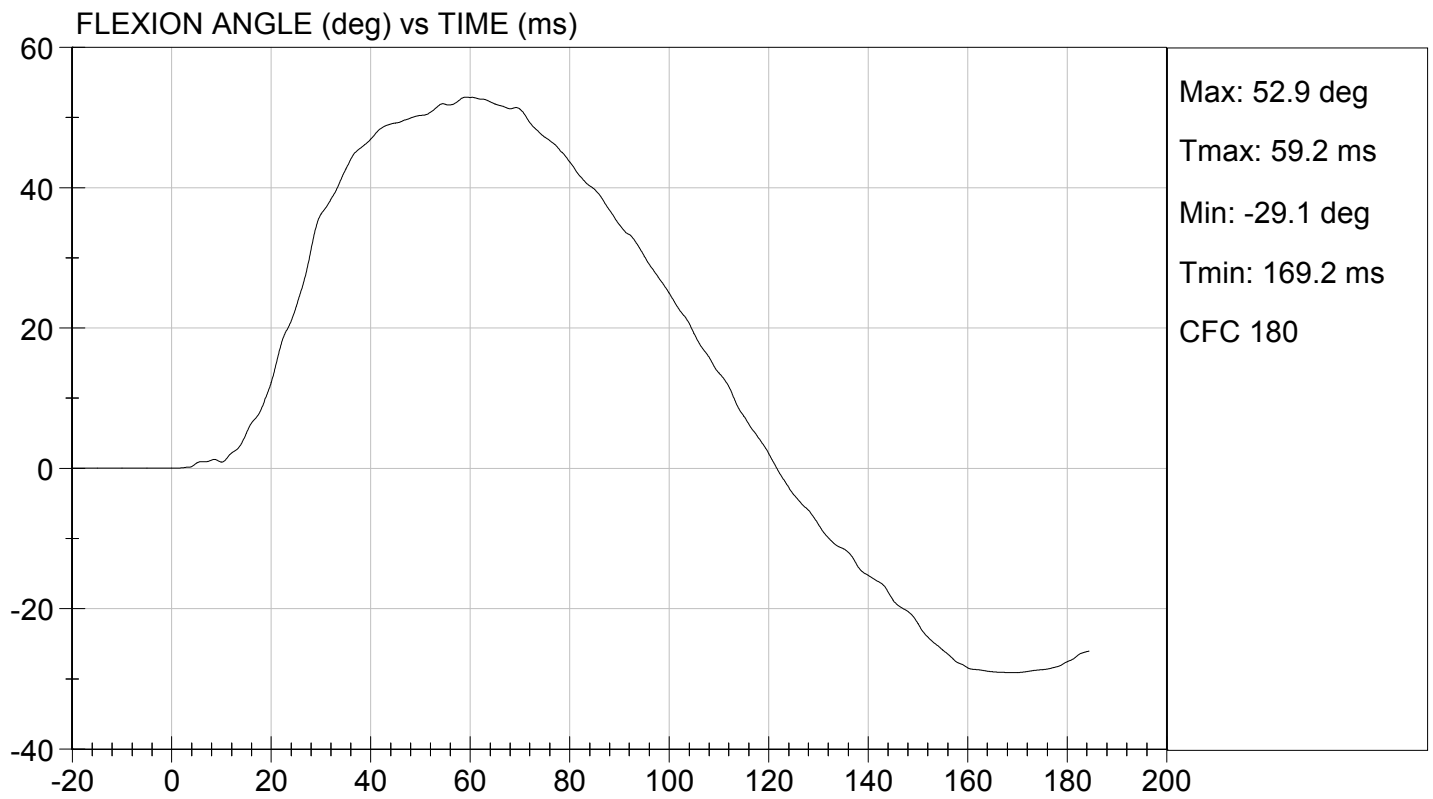
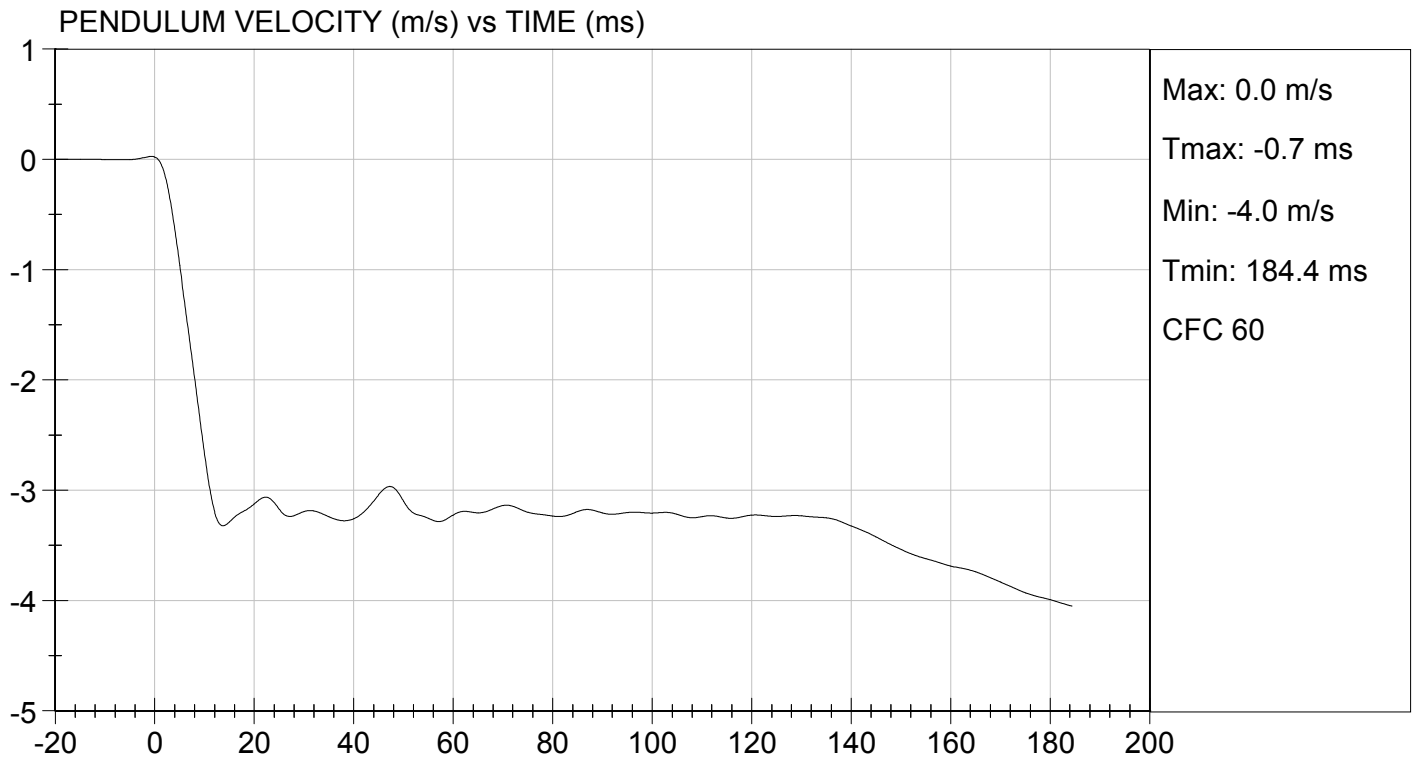
**Test I.D.:** D124082

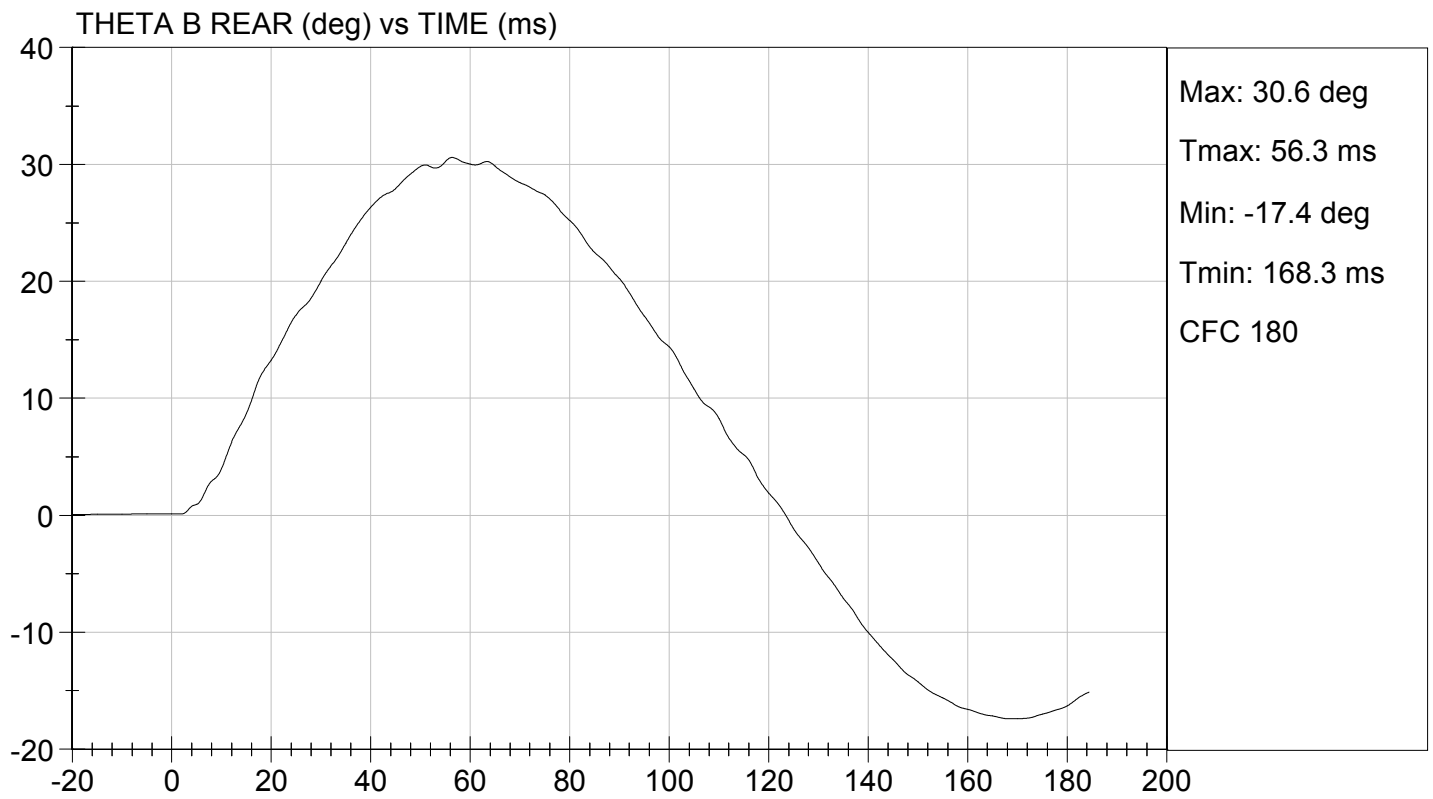
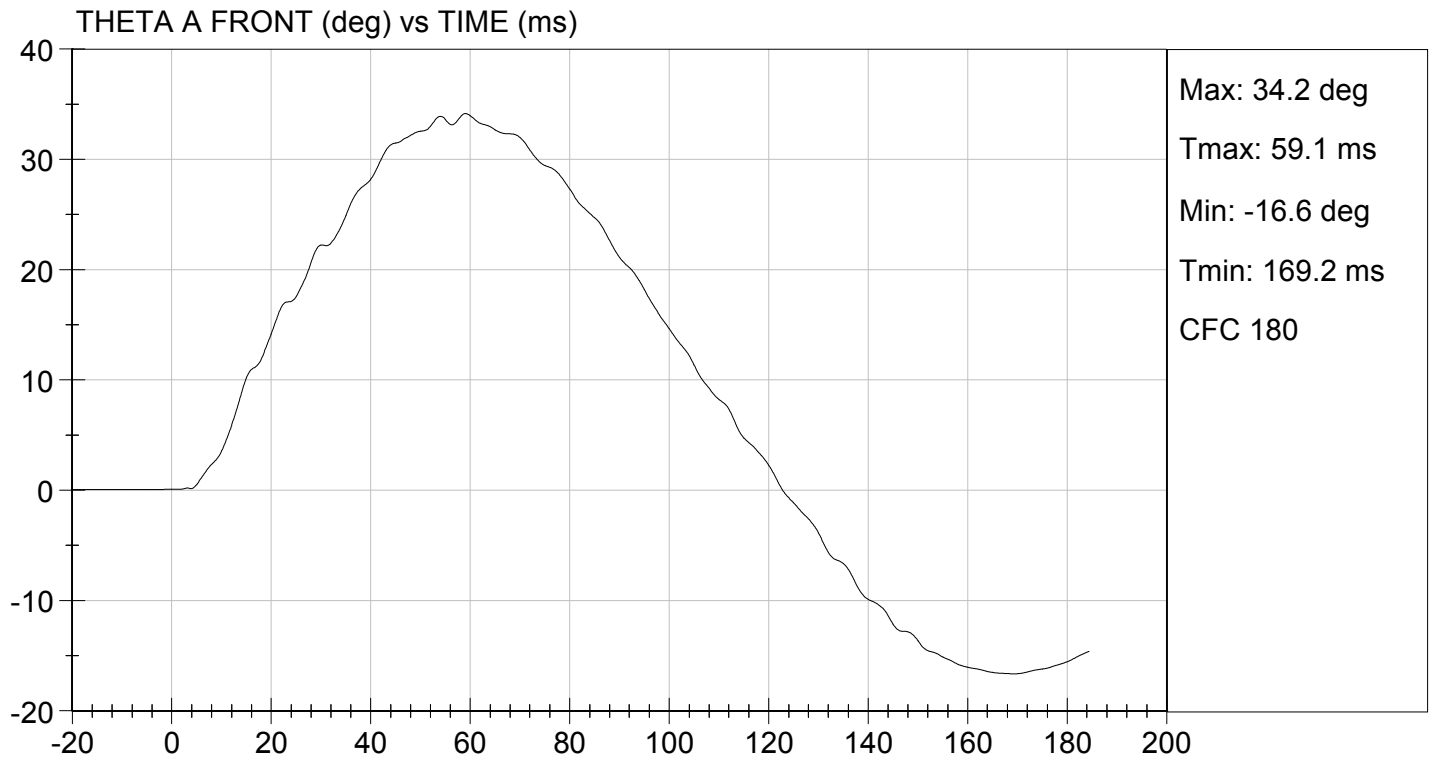
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	22.0	Pass
Laboratory Relative Humidity		%	10 to 70	29	Pass
Pendulum Speed		m/s	3.30 to 3.50	3.41	Pass
Pendulum Velocity	1 ms	m/s	-0.05 to 0.00	-0.02	Pass
	3 ms	m/s	-0.25 to -0.375	-0.35	Pass
	14 ms	m/s	-3.20 to -3.70	-3.32	Pass
	17 ms	m/s	>= -3.70	-3.21	Pass
Maximum Flexion Angle		deg	49.0 to 59.0	52.9	Pass
Time of Maximum Flexion Angle		ms	54.0 to 66.0	59.2	Pass
Head Rotation Decay Time to 0 Degree		ms	53.0 to 88.0	56.3	Pass
<b>Overall Results</b>					<b>Pass</b>

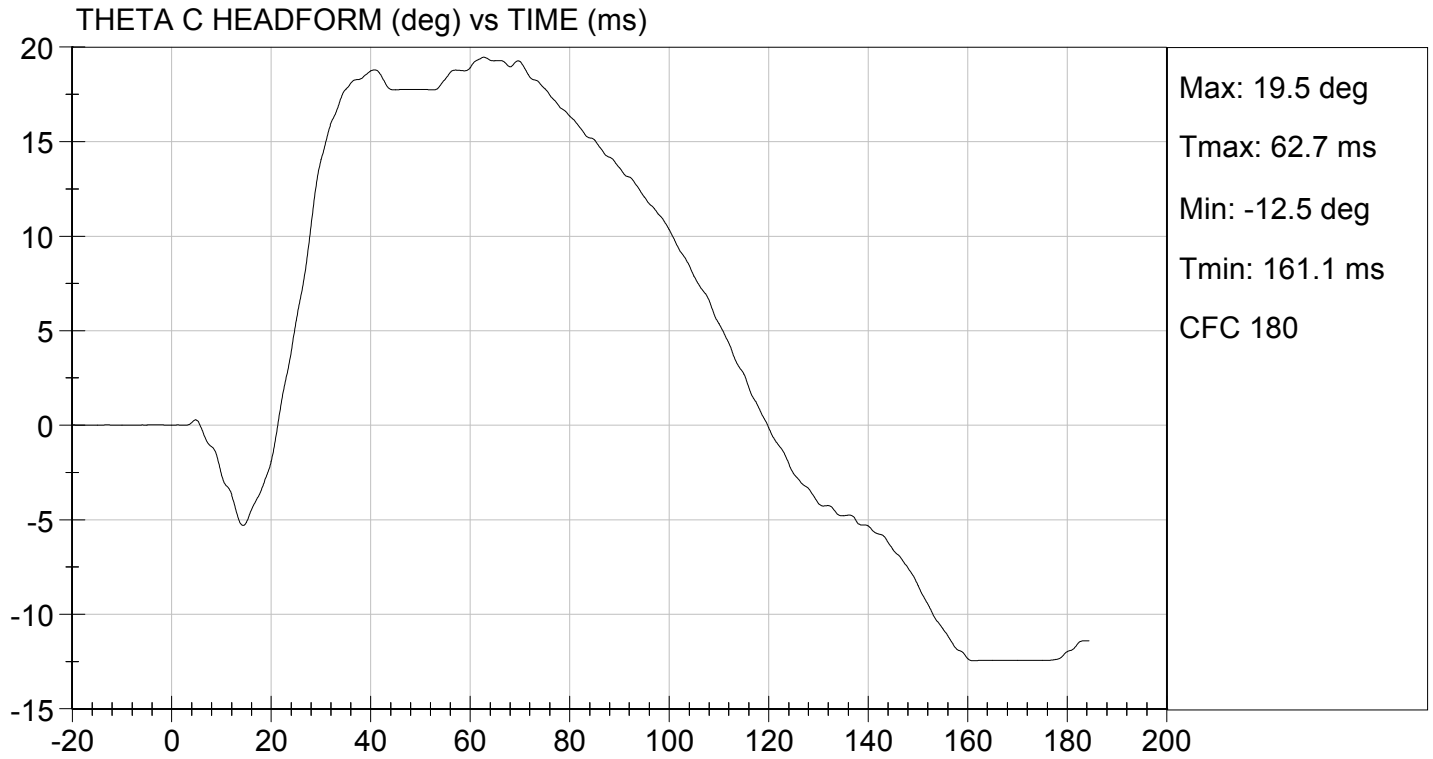
Jessica Hall  
 Laboratory Technician

10/26/2012  
 Test Date

David Winkelbauer  
 Approved By







**MGA RESEARCH CORPORATION**  
**SHOULDER IMPACT TEST**  
**ES-2re DUMMY**

**ATD Serial No:** 032

**Test I.D:** D124083

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	29	Pass
Pendulum Speed	m/s	4.20 to 4.40	4.34	Pass
Peak Impactor Acceleration	G's	7.5 to 10.5	10.2	Pass
Overall Test Results				Pass

*Jessica Hall*  
 Laboratory Technician

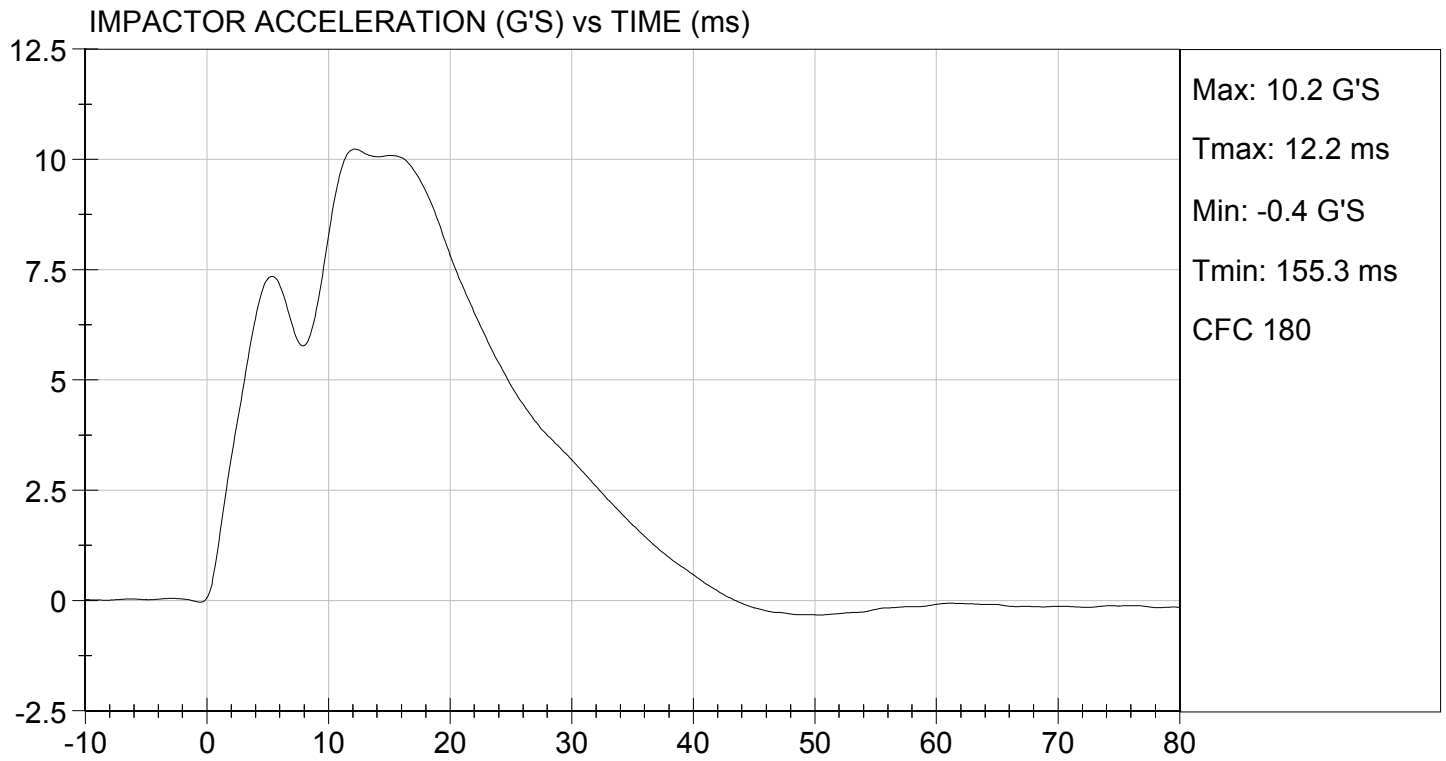
10/29/2012  
 Test Date

*David Winkelbauer*  
 Approved By



TEST DESC: SHOULDER IMPACT  
VELOCITY: 14.25 ft/s, 4.34 m/s

TEST DATE: 10/29/2012  
TEST #: D124083



MGA RESEARCH CORPORATION

UPPER RIB TEST

ES-2re DUMMY

ATD Serial No: 032

Test I.D: D124084

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	28	Pass
Displacement at 459 mm	mm	36.0 to 40.0	37.8	Pass
Displacement at 815 mm	mm	46.0 to 51.0	48.5	Pass
Overall Test Results				Pass

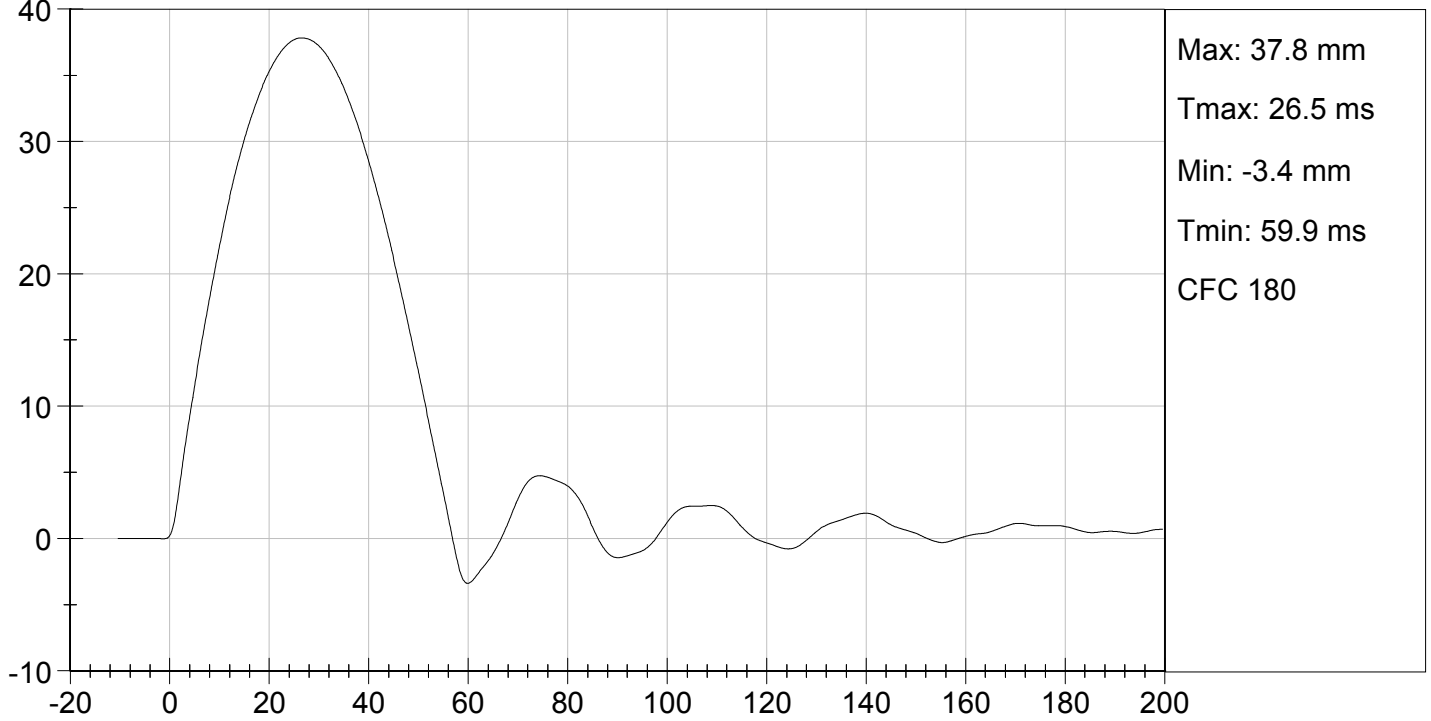
Jessica Hall  
Laboratory Technician

10/26/2012  
Test Date

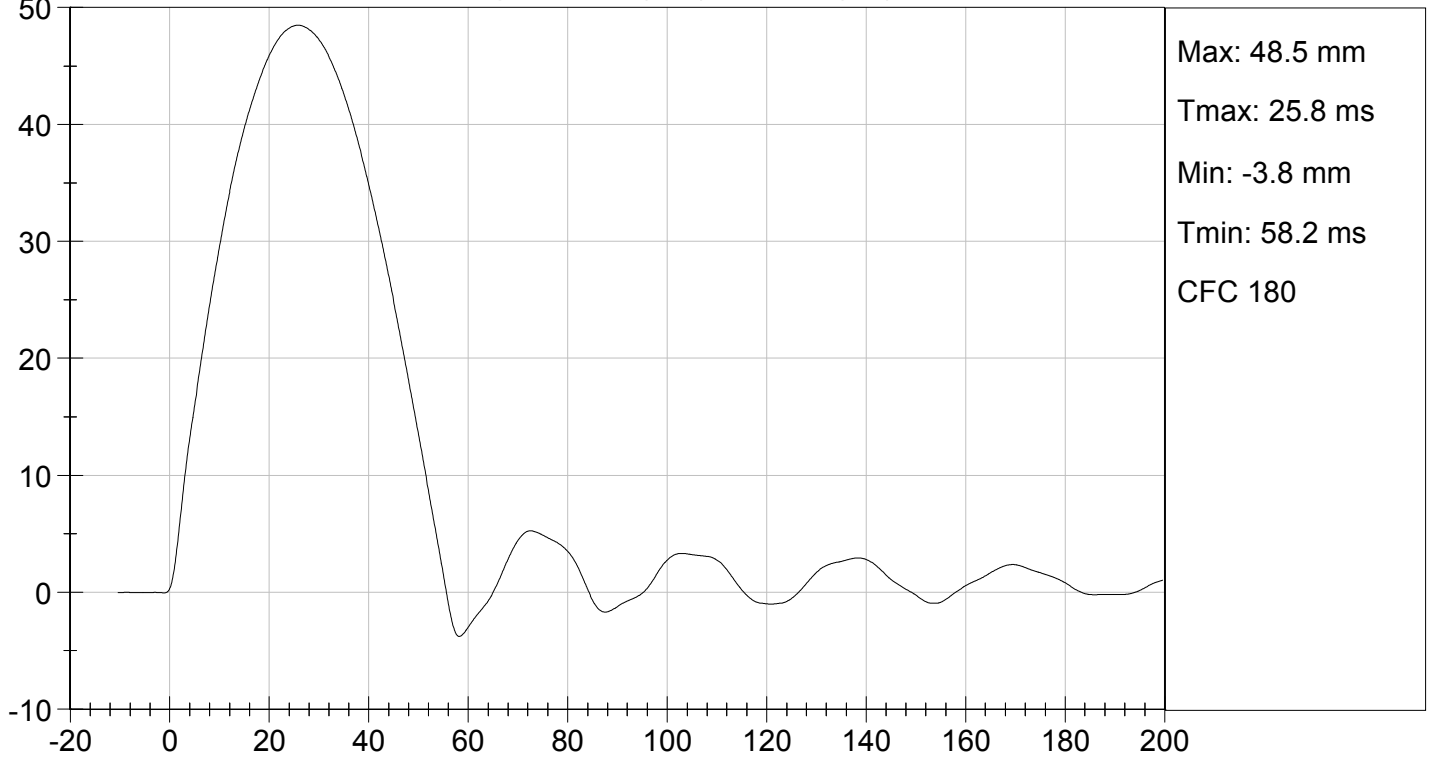
David Winkelbauer  
Approved By



UPPER RIB DISPLACEMENT @ 459 mm (mm) vs TIME (ms)



UPPER RIB DISPLACEMENT @ 815 mm (mm) vs TIME (ms)



MGA RESEARCH CORPORATION

MID RIB TEST

ES-2re DUMMY

ATD Serial No: 032

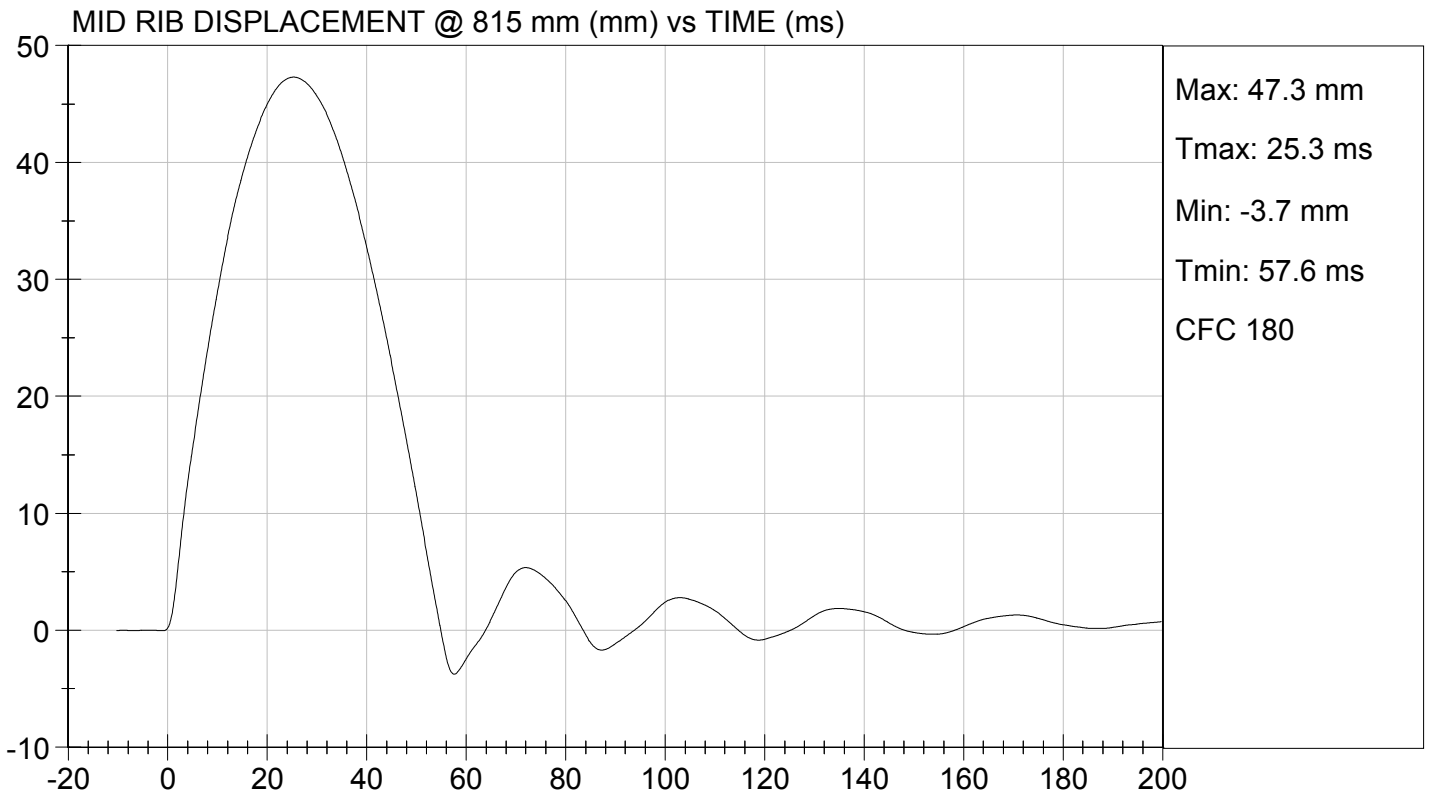
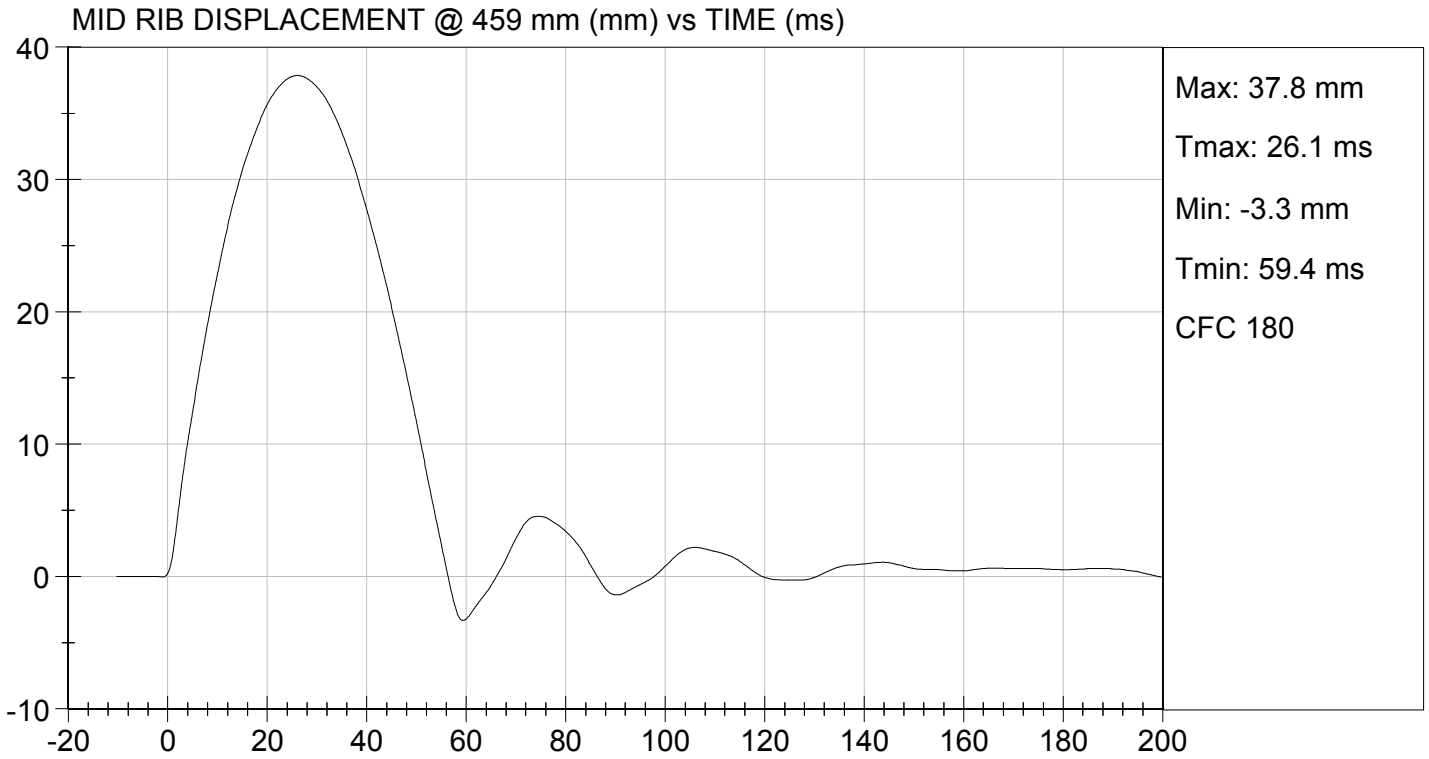
Test I.D: D124085

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	28	Pass
Displacement at 459 mm	mm	36.0 to 40.0	37.8	Pass
Displacement at 815 mm	mm	46.0 to 51.0	47.3	Pass
Overall Test Results				Pass

  
Laboratory Technician

10/26/2012  
Test Date

  
Approved By



**MGA RESEARCH CORPORATION**

**LOWER RIB TEST**

**ES-2re DUMMY**

**ATD Serial No:** 032

**Test I.D.:** D124086

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	28	Pass
Displacement at 459 mm	mm	36.0 to 40.0	38.4	Pass
Displacement at 815 mm	mm	46.0 to 51.0	47.9	Pass
Overall Test Results				Pass

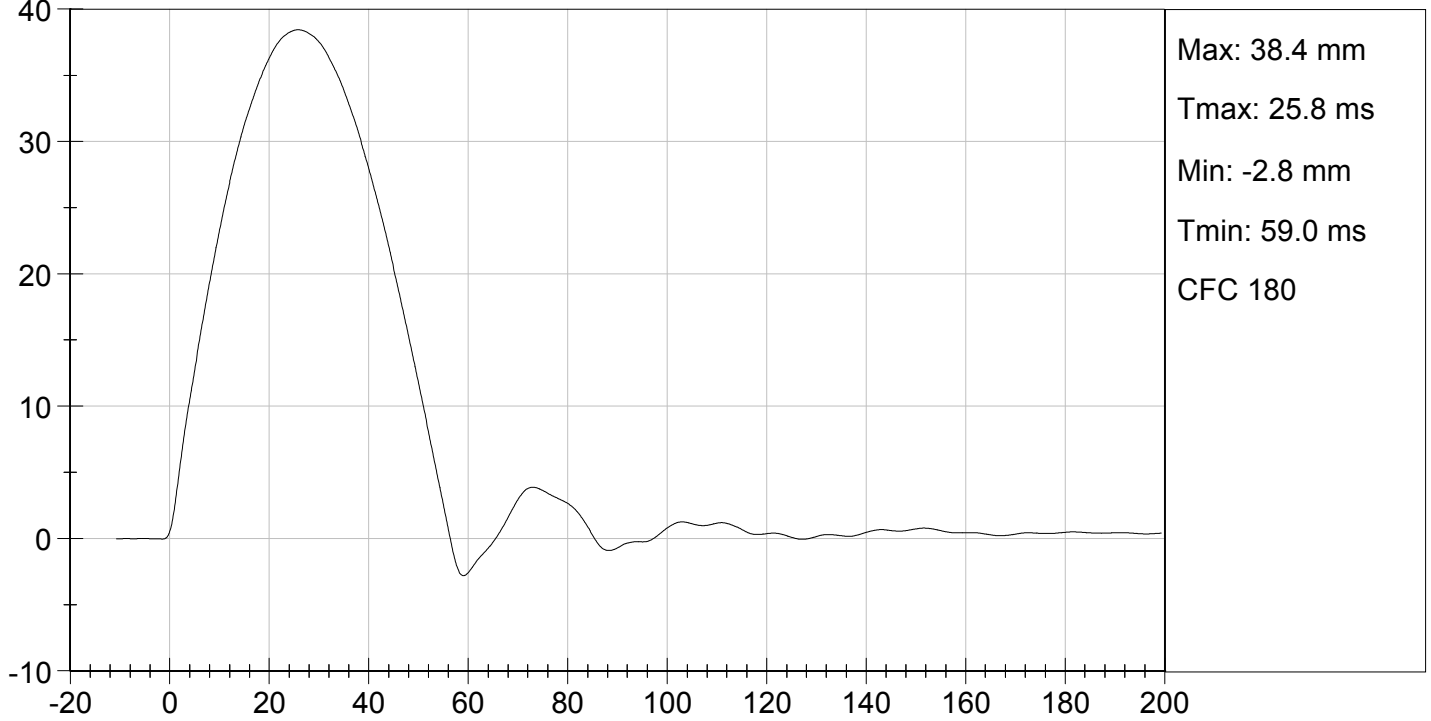
  
Laboratory Technician

10/26/2012  
Test Date

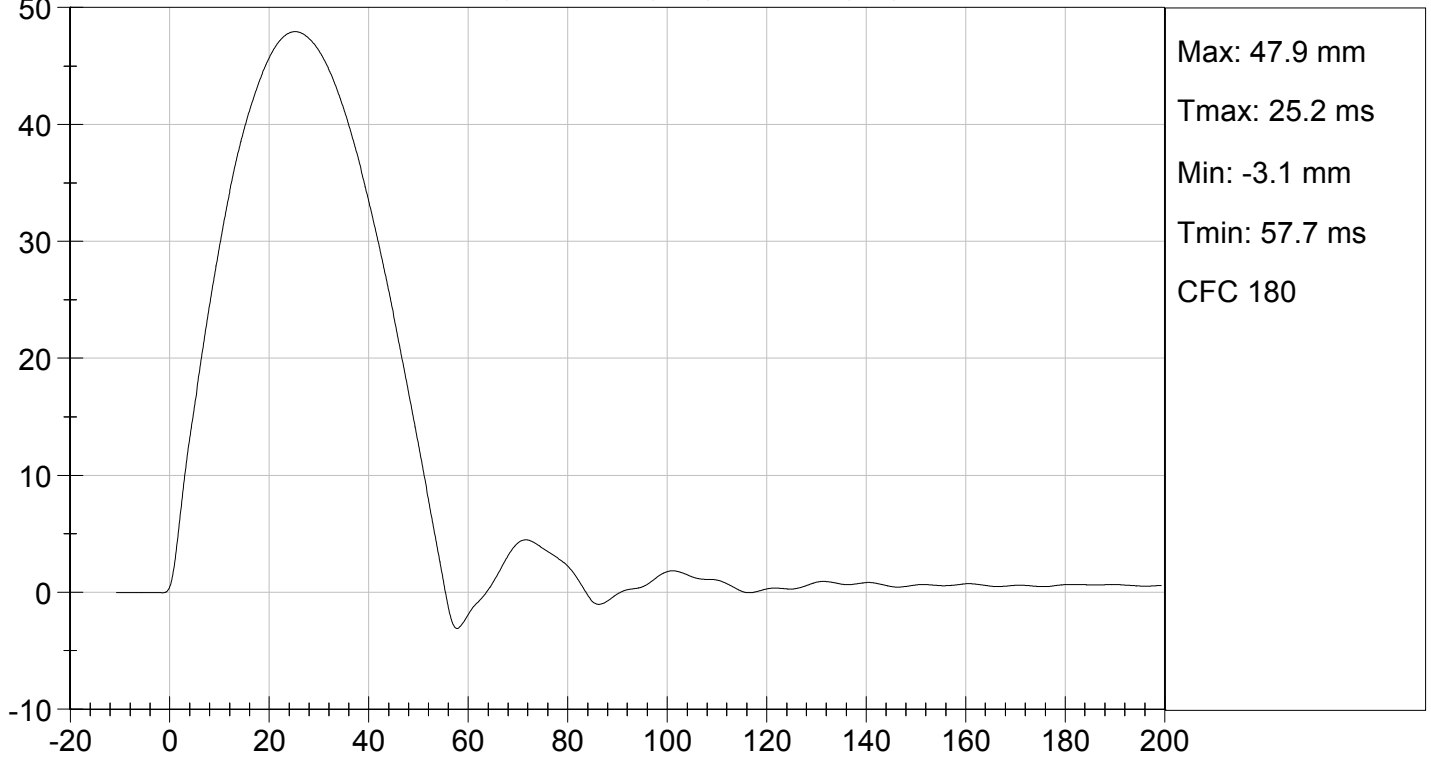
  
Approved By



LOWER RIB DISPLACEMENT @ 459 mm (mm) vs TIME (ms)



LOWER RIB DISPLACEMENT @ 815 mm (mm) vs TIME (ms)



**MGA RESEARCH CORPORATION**  
**THORAX IMPACT TEST**  
**ES-2re DUMMY**

**ATD Serial No:** 032

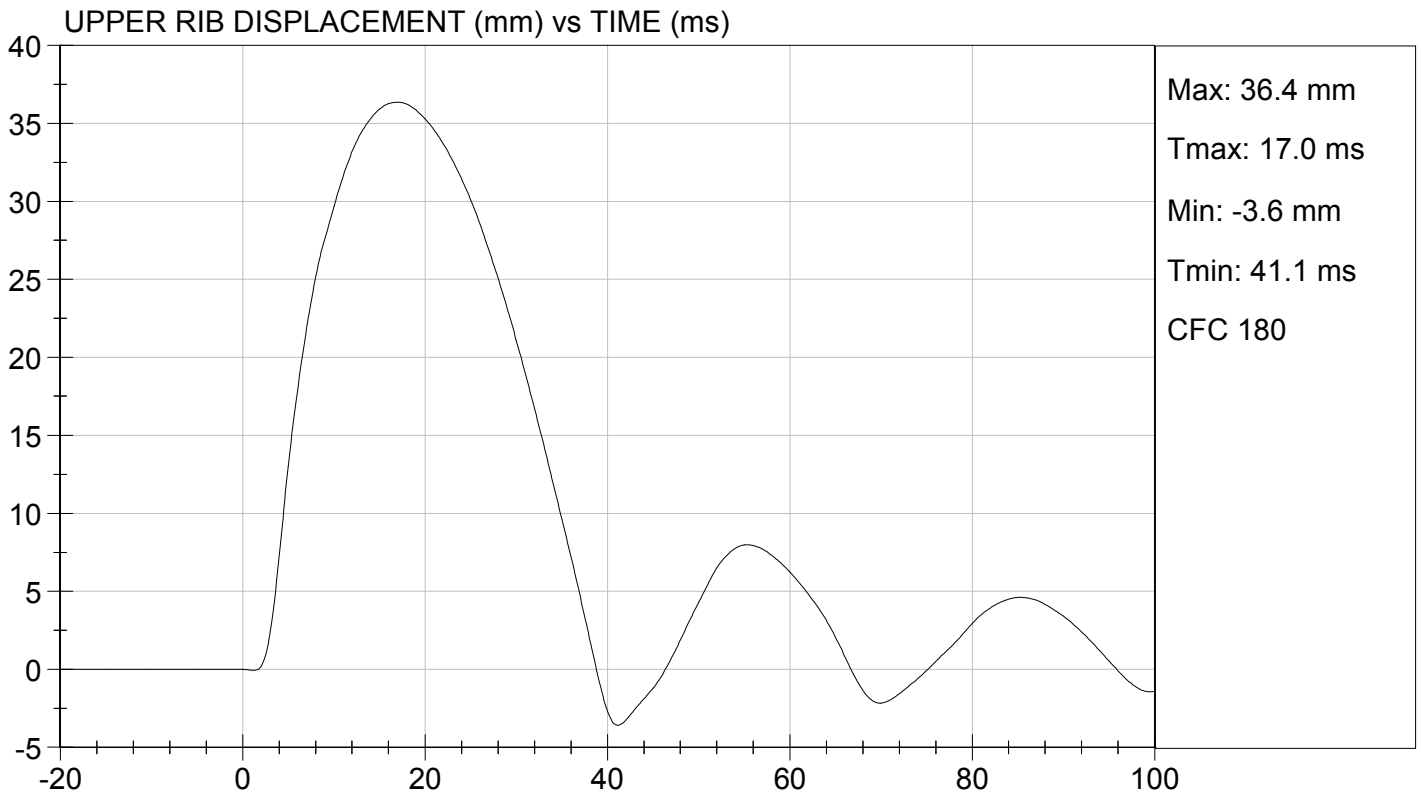
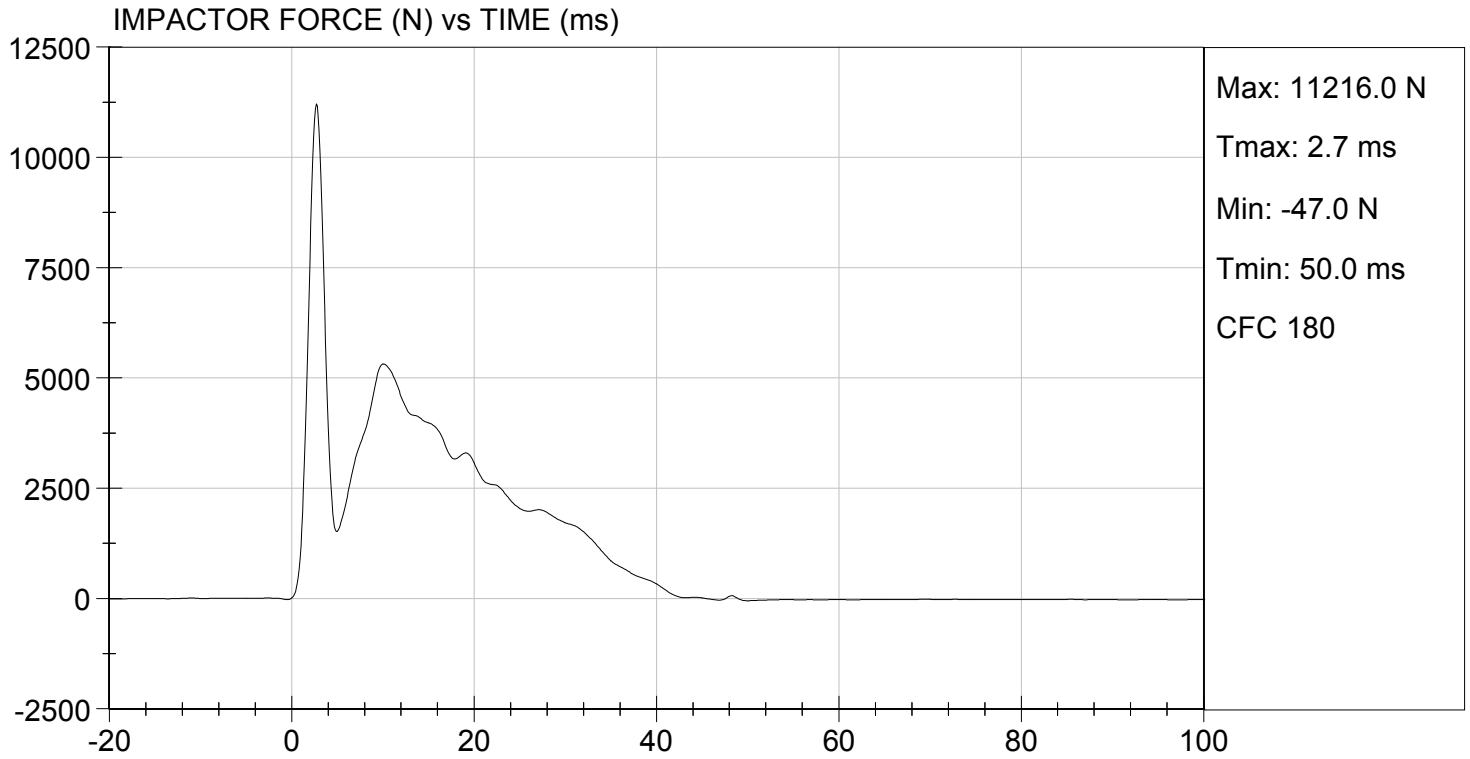
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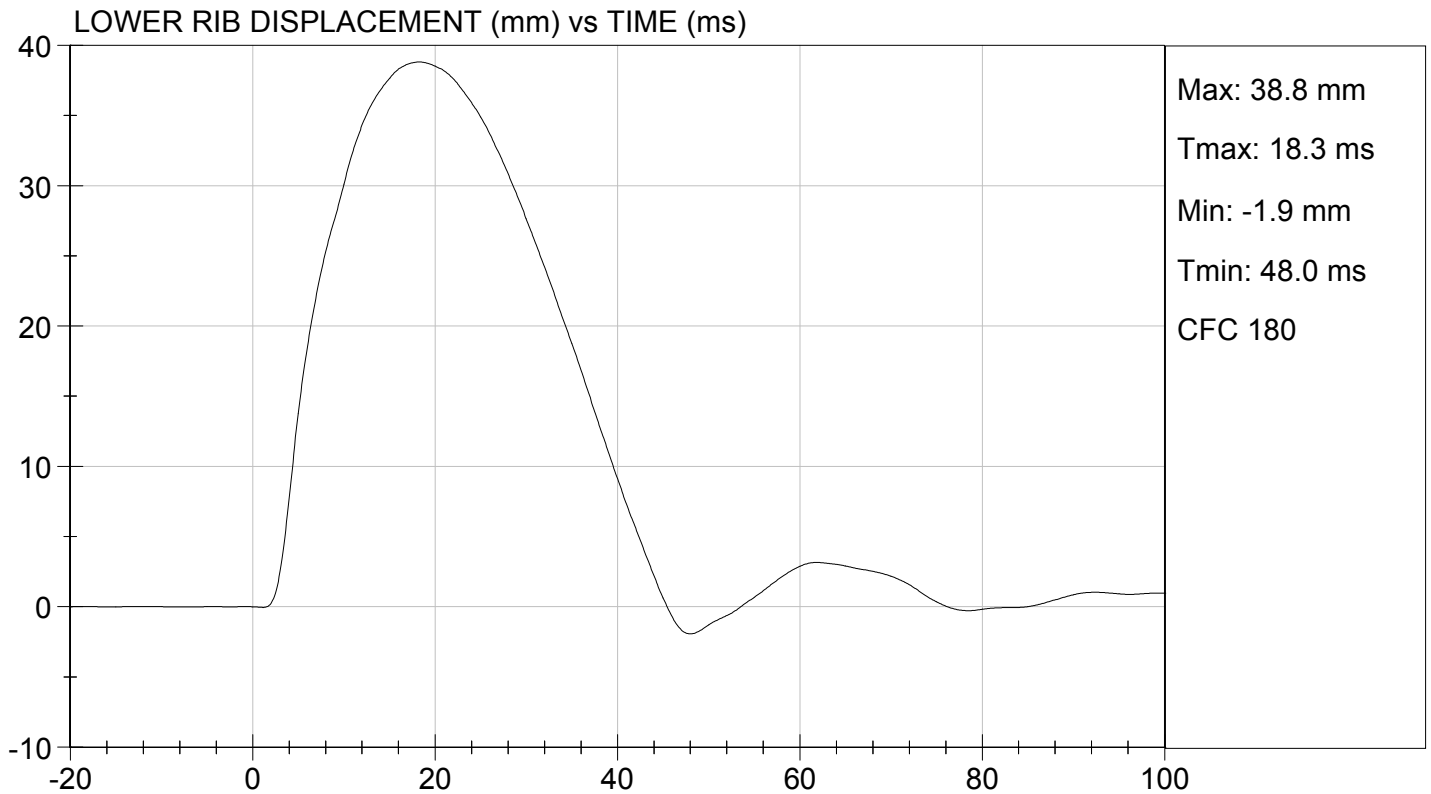
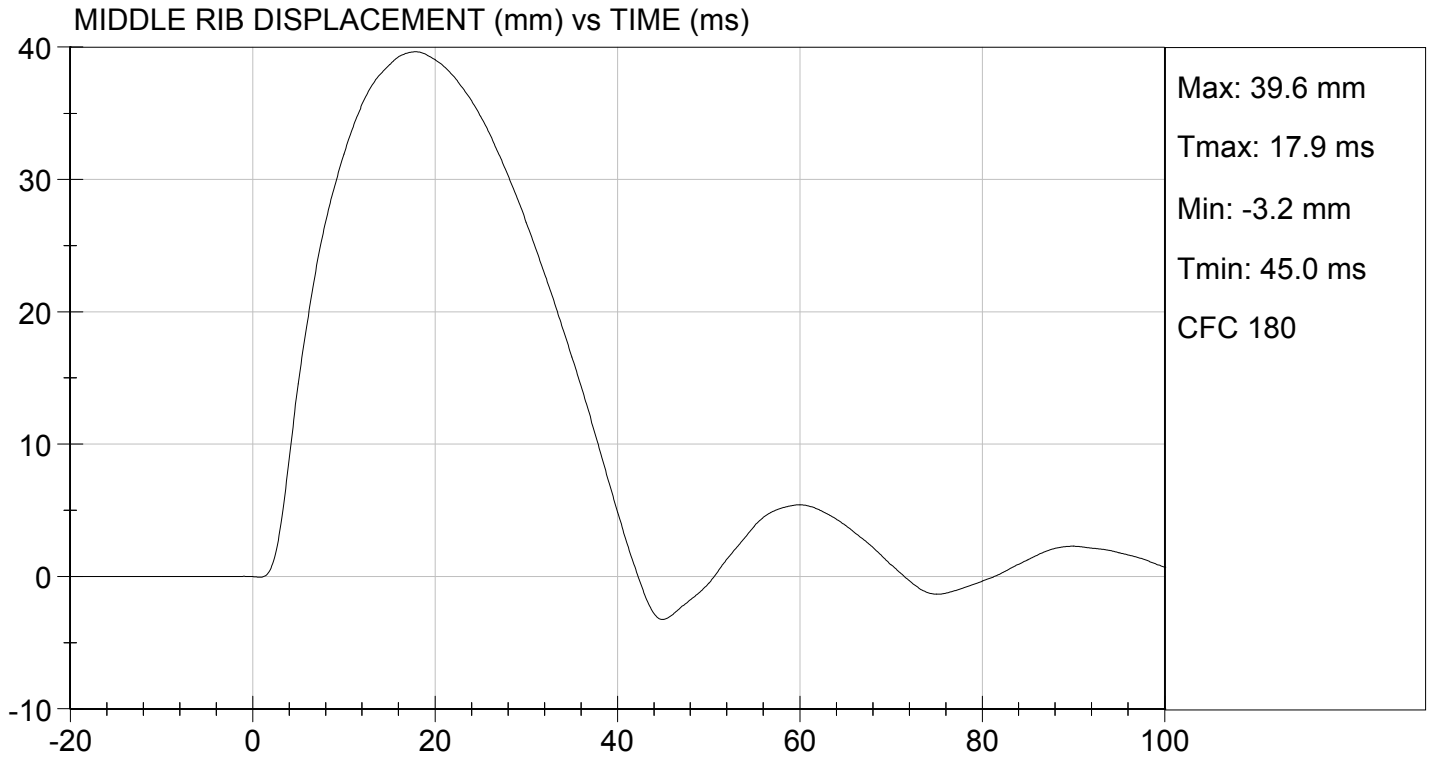
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	20.8	Pass
Humidity	%	10 to 70	29	Pass
Probe Speed	m/s	5.40 to 5.60	5.58	Pass
Maximum Impactor Force (after 6 ms)	N	5100 to 6200	5316	Pass
Upper Rib Displacement	mm	34.0 to 41.0	36.4	Pass
Middle Rib Displacement	mm	37.0 to 45.0	39.6	Pass
Lower Rib Displacement	mm	37.0 to 44.0	38.8	Pass
<b>Overall Test Results</b>				<b>Pass</b>

  
 Laboratory Technician

10/29/2012  
 Test Date

  
 Approved By





**MGA RESEARCH CORPORATION**

**ABDOMEN TEST**

**ES-2re DUMMY**

**ATD Serial No:** 032

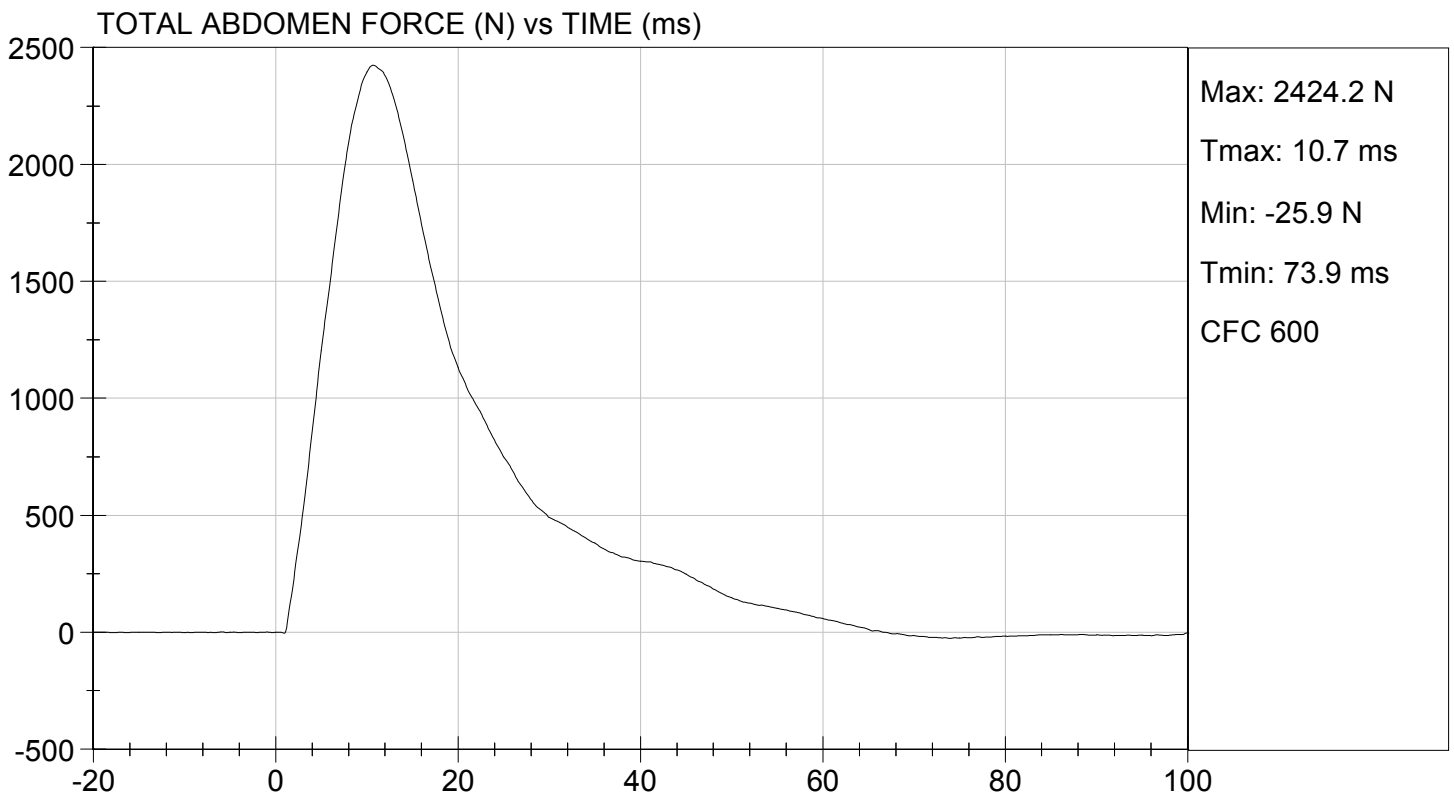
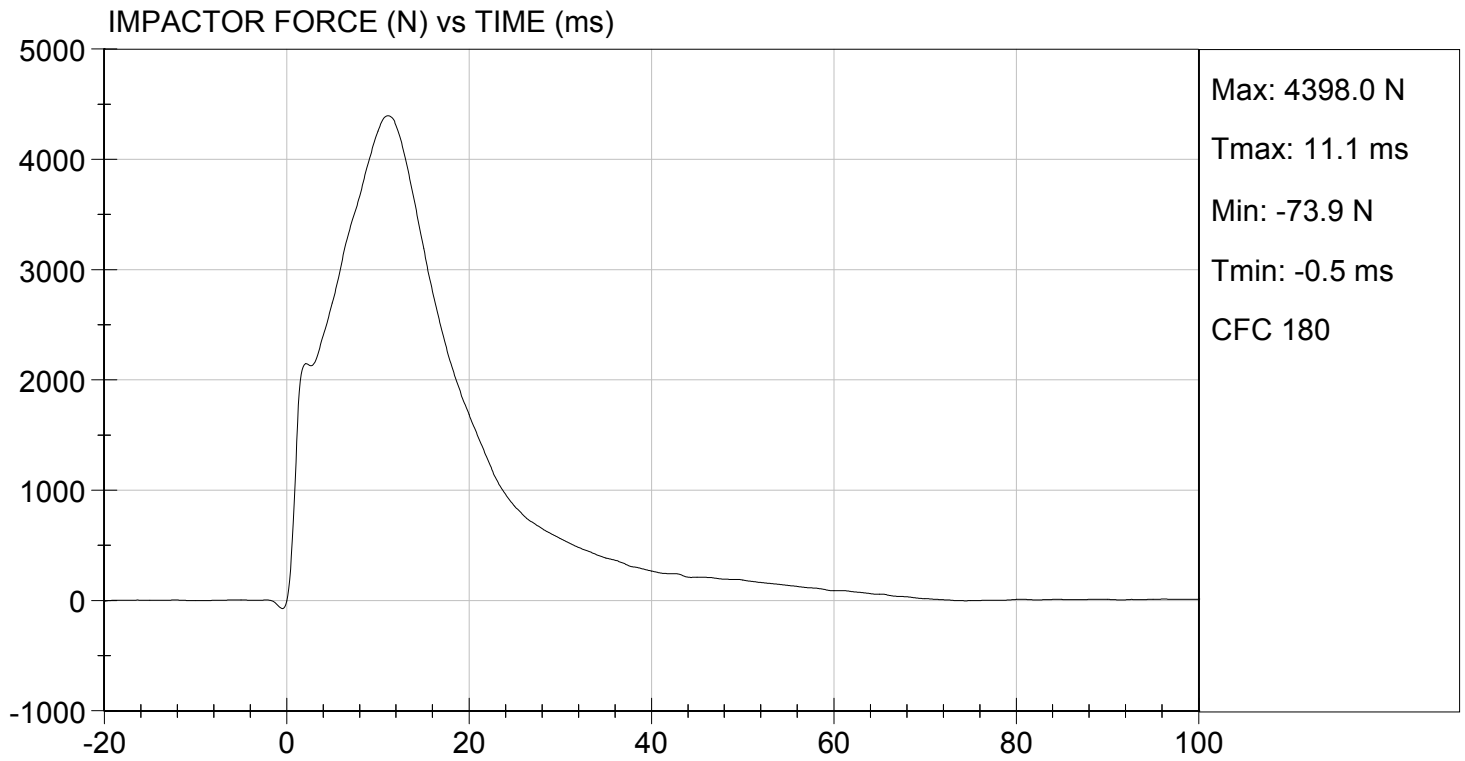
**Test I.D:** D124087

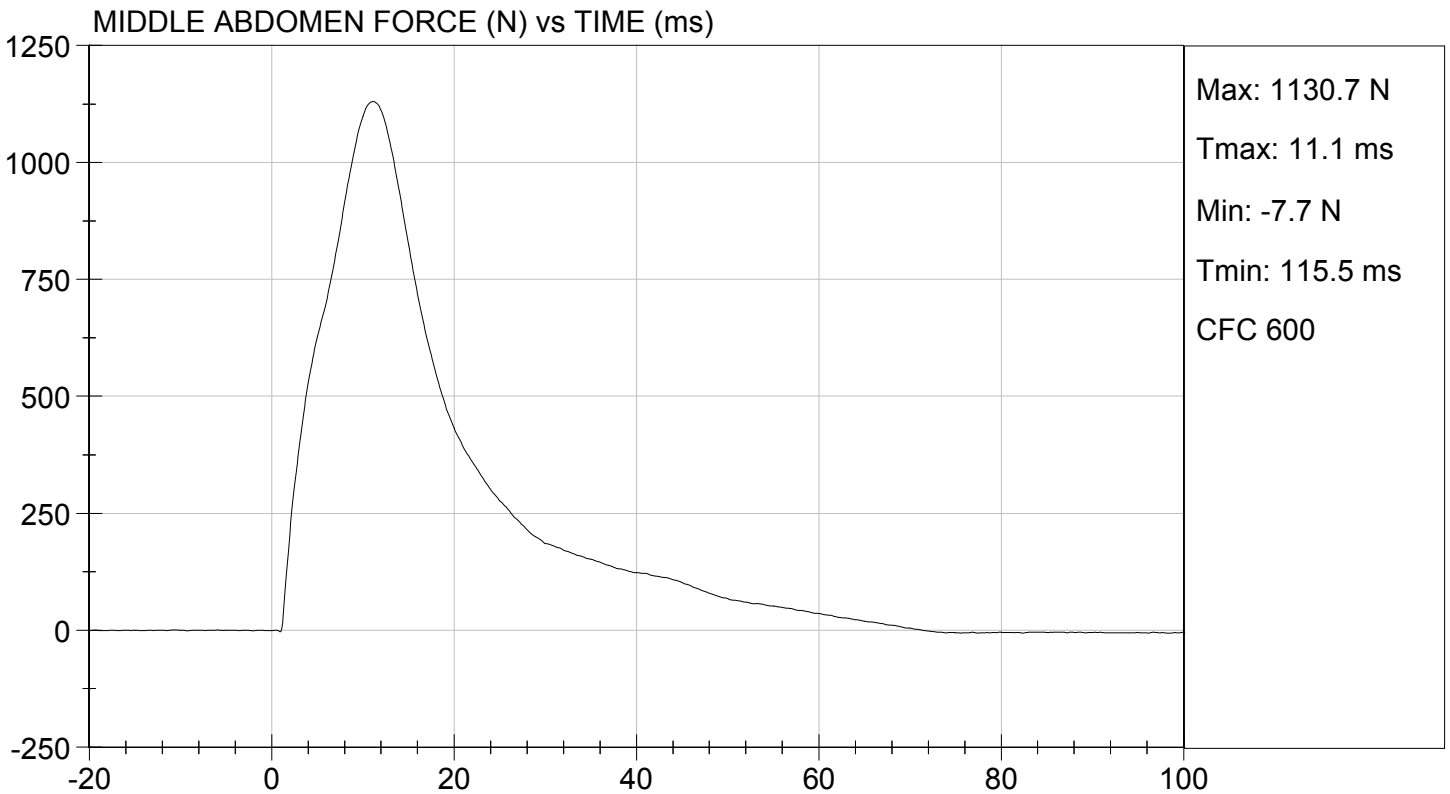
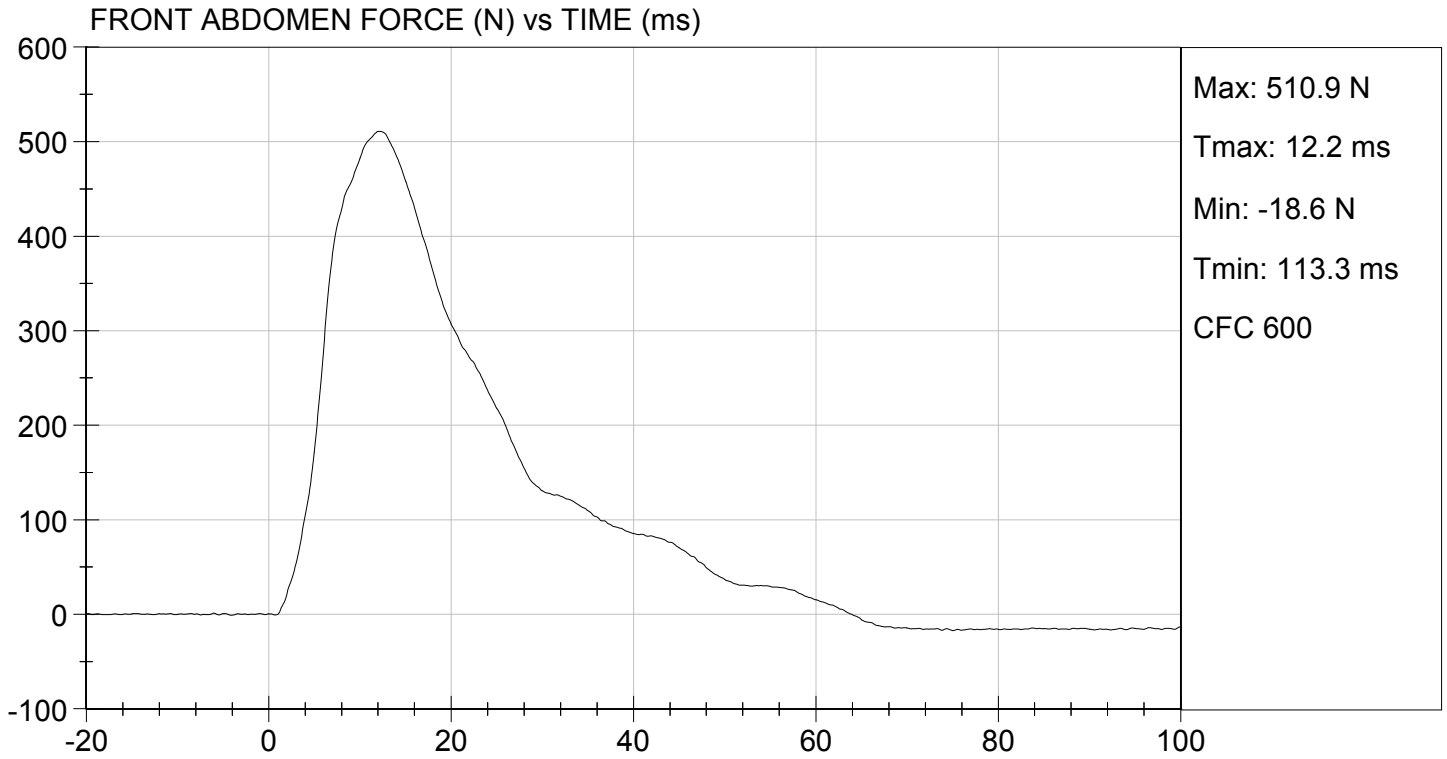
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	20.8	Pass
Laboratory Relative Humidity	%	10 to 70	29	Pass
Probe Speed	m/s	3.90 to 4.10	4.10	Pass
Maximum Impactor Force	N	4000 to 4800	4398	Pass
Time of Maximum Impactor Force	ms	10.6 to 13.0	11.1	Pass
Maximum Total Abdomen Force	N	2200 to 2700	2424	Pass
Time of Maximum Abdomen Force	ms	10.0 to 12.3	10.7	Pass
Overall Test Results				Pass

  
Laboratory Technician

10/29/2012  
Test Date

  
Approved By

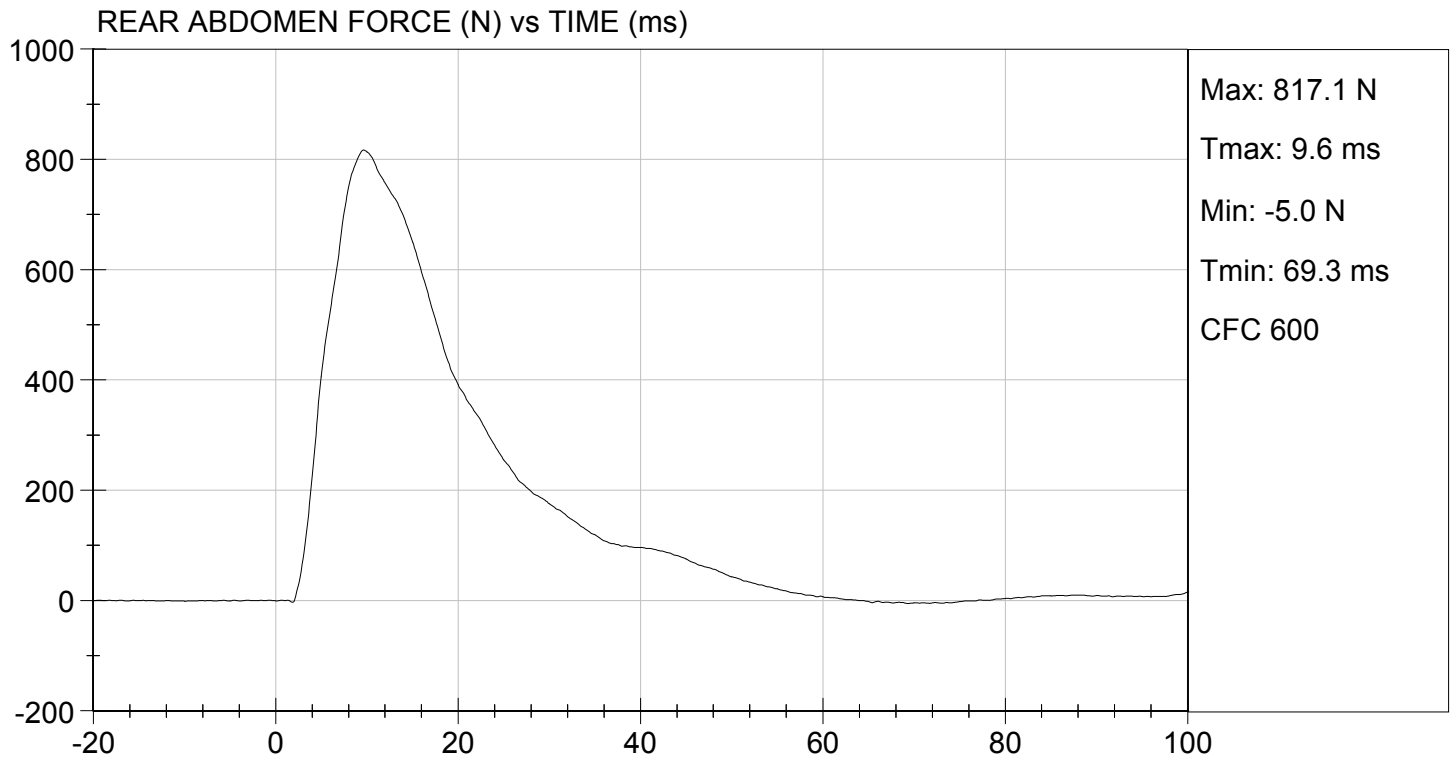






TEST DESC: ABDOMEN IMPACT  
VELOCITY: 13.44 ft/s, 4.10 m/s

TEST DATE: 10/29/2012  
TEST #: D124087



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

**ATD Serial No:** 032

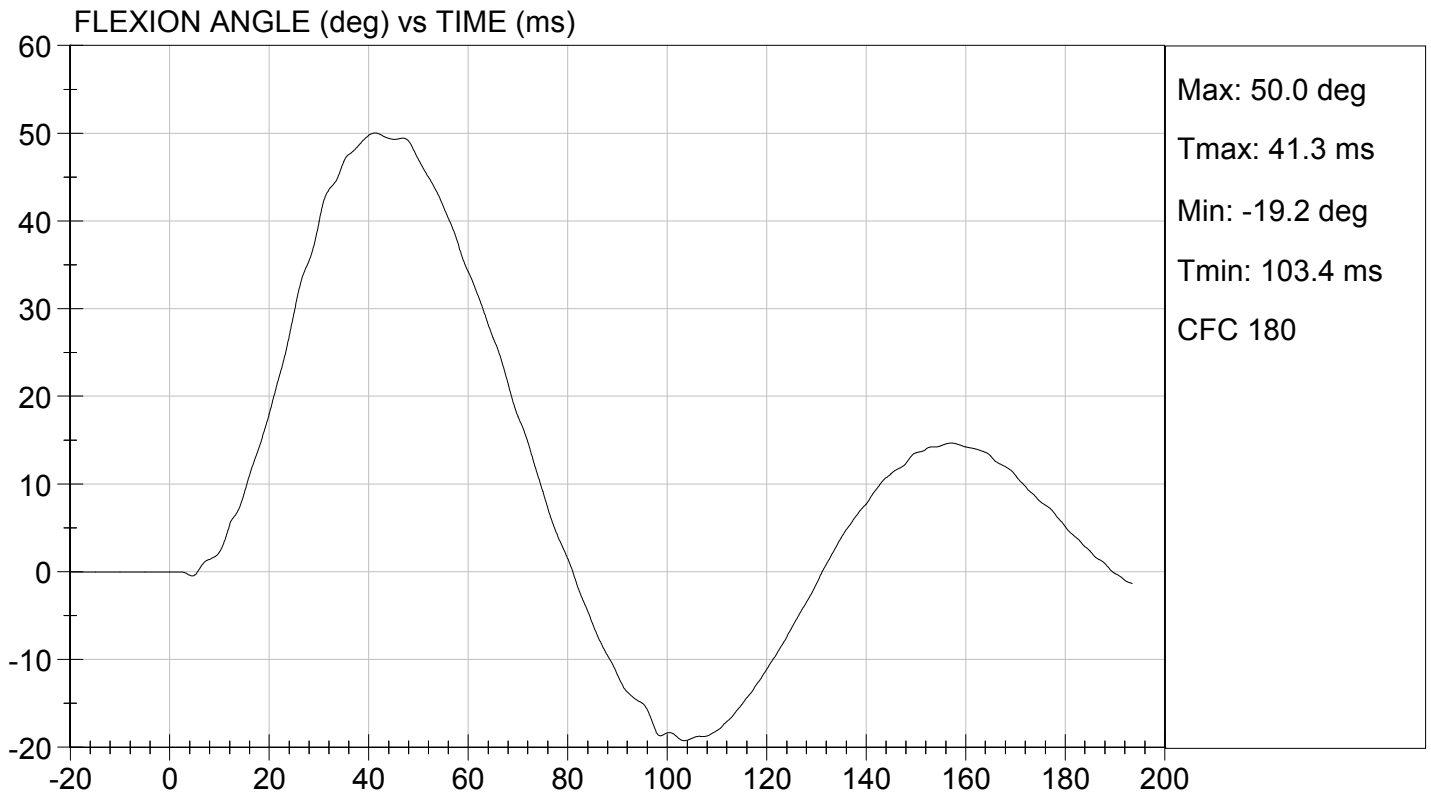
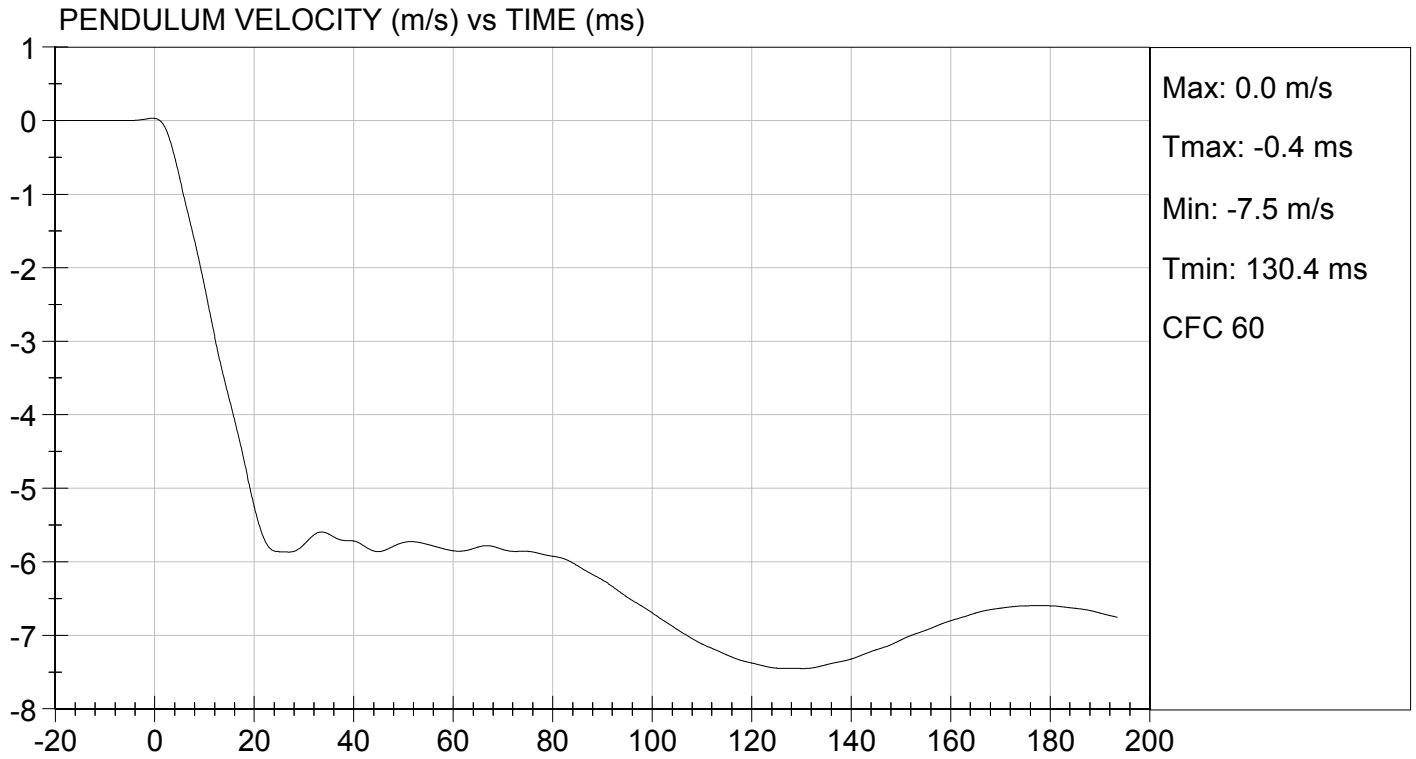
**Test I.D.:** D124088

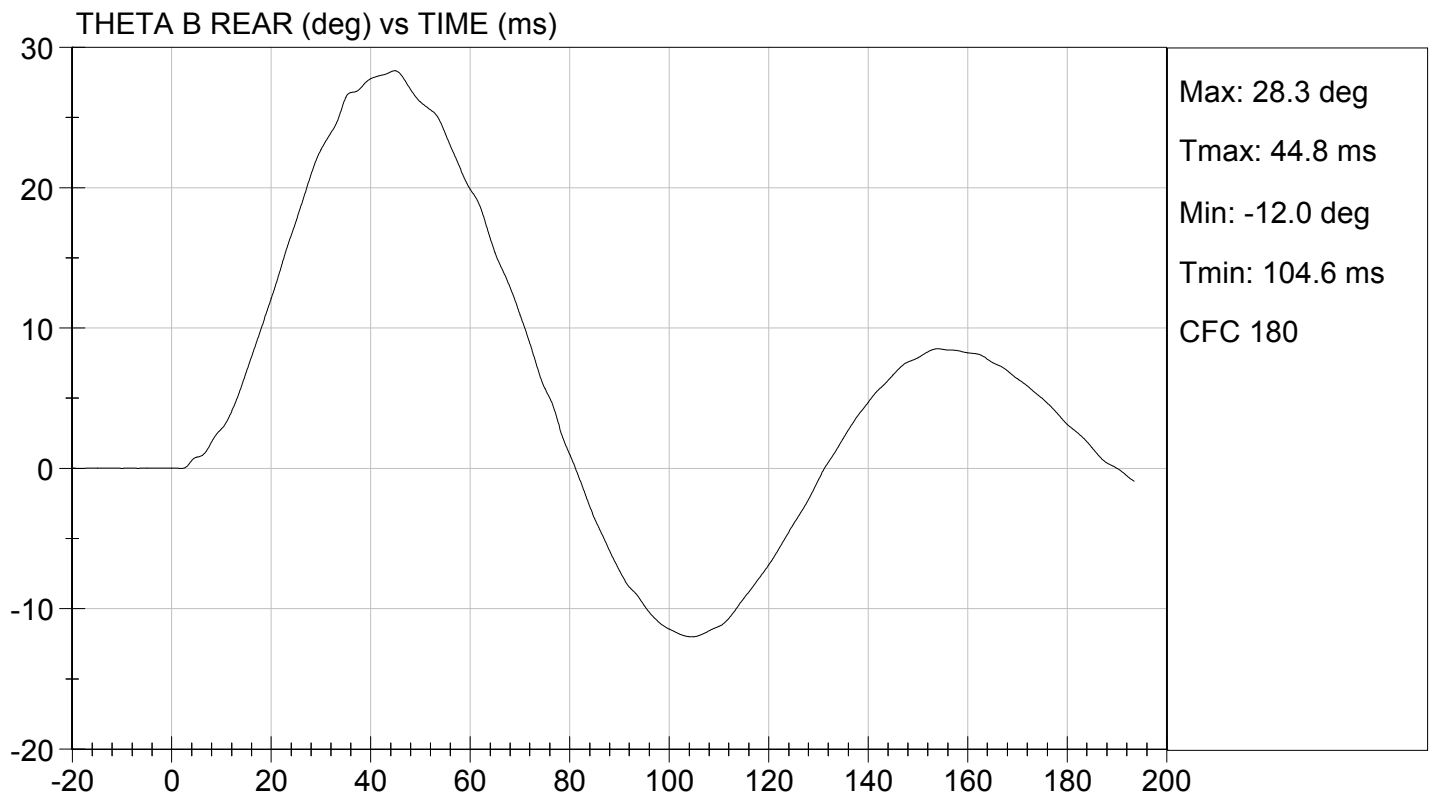
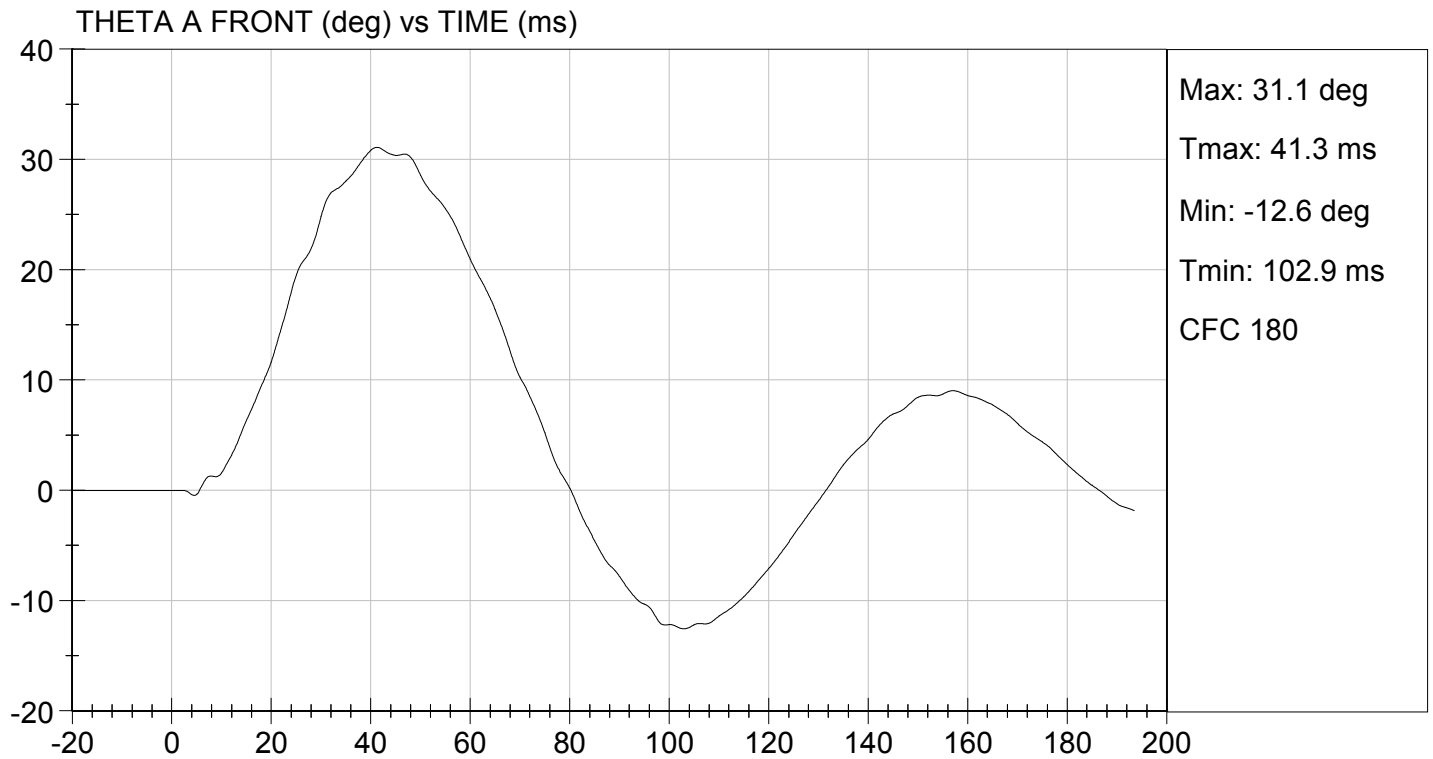
Tested Parameter	Units	Specification	Result	Pass/Fail	
Laboratory Temperature	deg C	20.6 to 22.2	22.0	Pass	
Laboratory Relative Humidity	%	10 to 70	29	Pass	
Pendulum Speed	m/s	5.95 to 6.15	6.12	Pass	
Pendulum Velocity	1 ms	m/s	-0.05 to 0.00	-0.00	Pass
	3.7 ms	m/s	-0.425 to -0.24	-0.424	Pass
	27 ms	m/s	-6.50 to -5.80	-5.87	Pass
	30 ms	m/s	>= -6.50	-5.76	Pass
Maximum Flexion Angle	deg	45.0 to 55.0	50.0	Pass	
Time of Maximum Flexion Angle	ms	39.0 to 53.0	41.3	Pass	
Headform Rotation Decay to Initial Position	ms	37 to 57	45	Pass	
<b>Overall Results</b>				<b>Pass</b>	

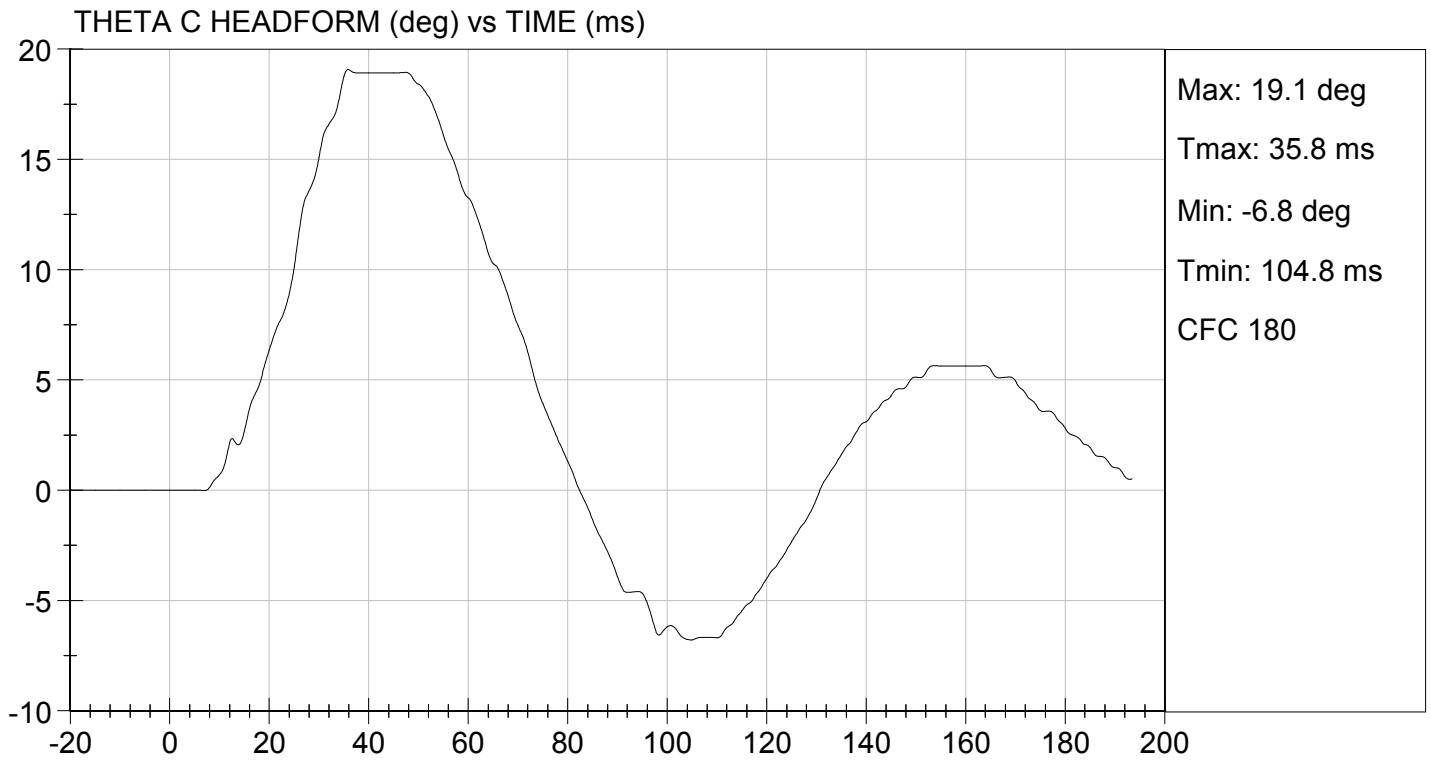
  
 Laboratory Technician

10/26/2012  
 Test Date

  
 Approved By







**MGA RESEARCH CORPORATION**

**PELVIS TEST**

**ES-2re DUMMY**

**ATD Serial No:** 032

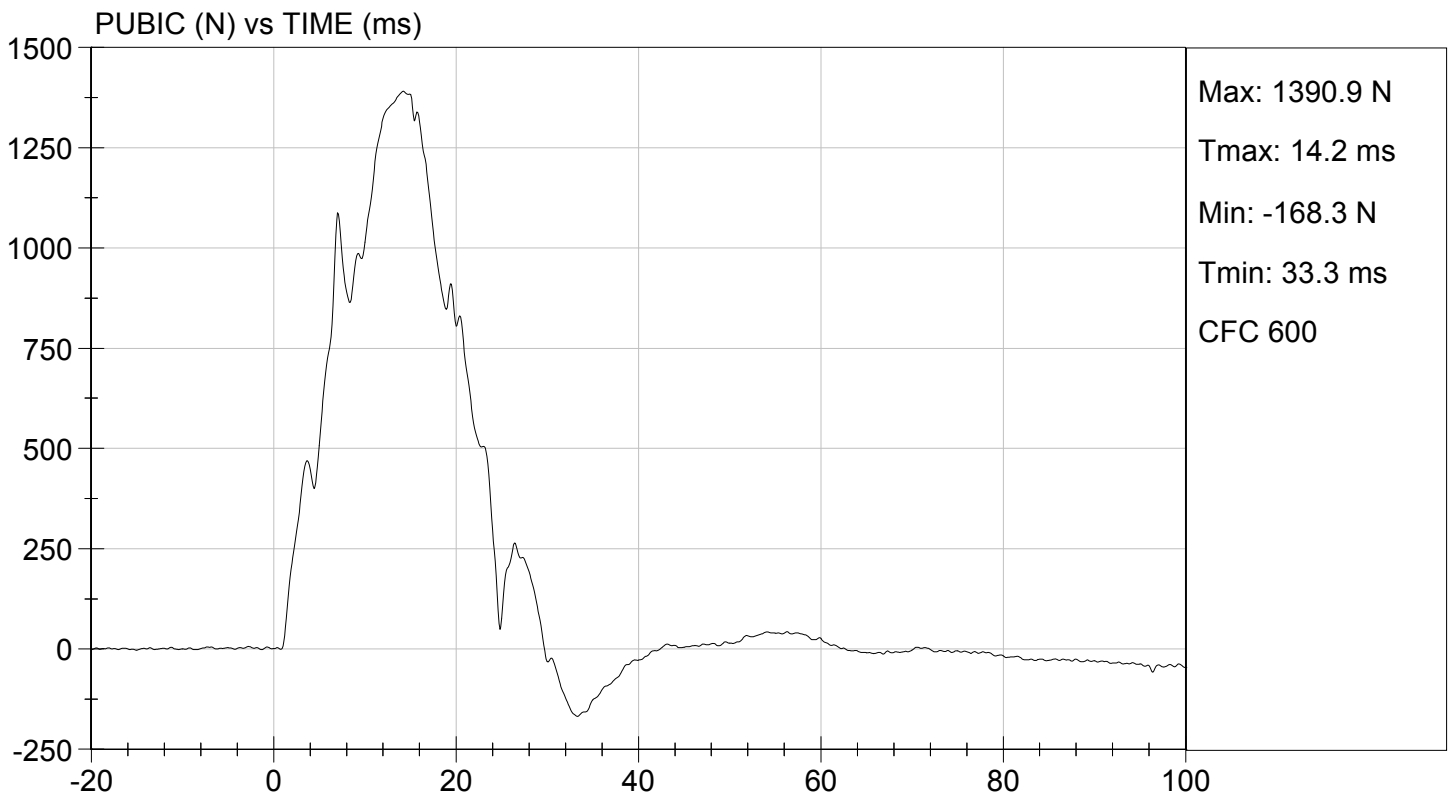
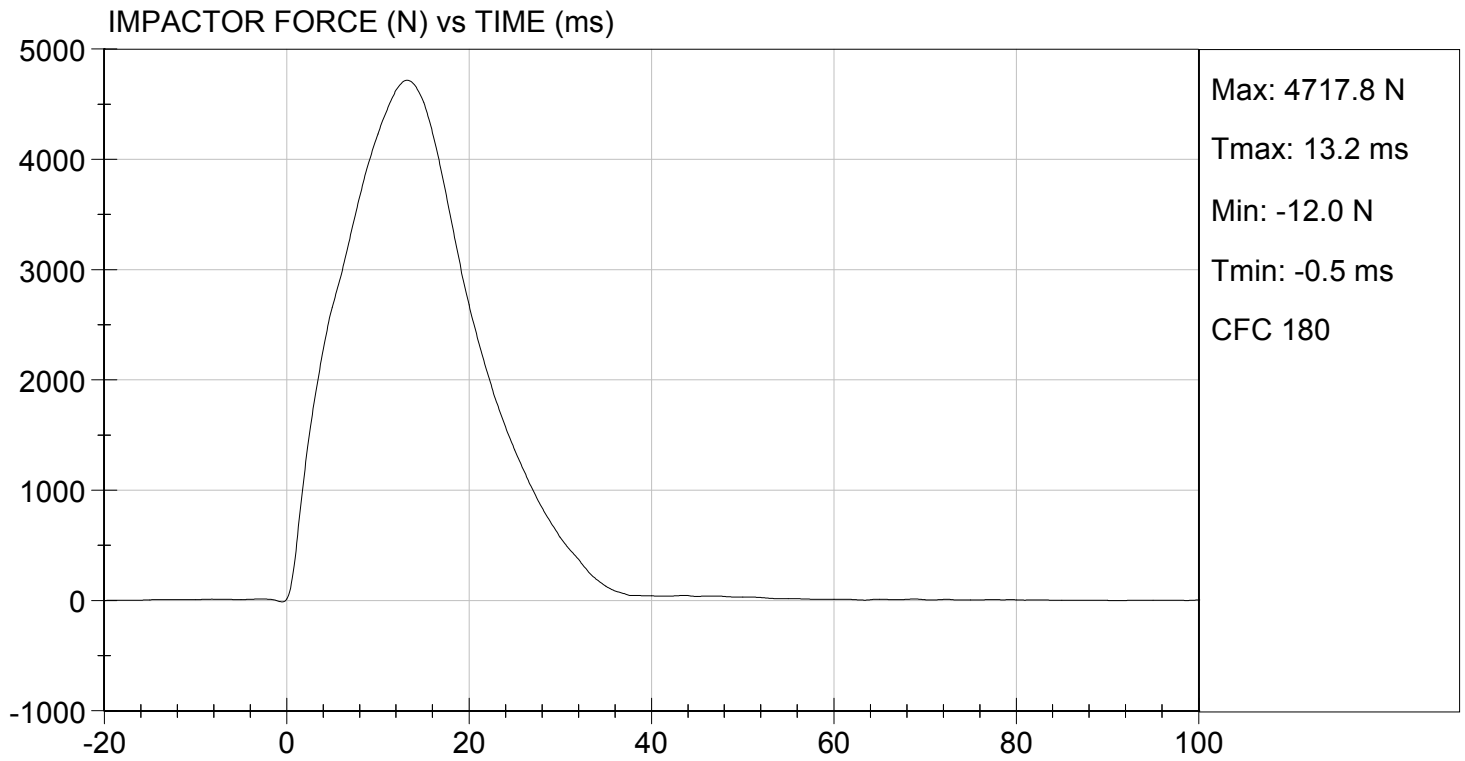
**Test I.D:** D124089

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	29	Pass
Probe Speed	m/s	4.20 to 4.40	4.30	Pass
Maximum Impactor Force	N	4700 to 5400	4718	Pass
Time of Maximum Impactor Force	ms	11.8 to 16.1	13.2	Pass
Maximum Pubic Force	N	1230 to 1590	1391	Pass
Time of Maximum Pubic Force	ms	12.2 to 17.0	14.2	Pass
Overall Test Results				Pass

  
Laboratory Technician

10/29/2012  
Test Date

  
Approved By



**MGA RESEARCH CORPORATION**  
**HEAD DROP TEST**  
**ES-2re DUMMY**

ATD Serial No: 032

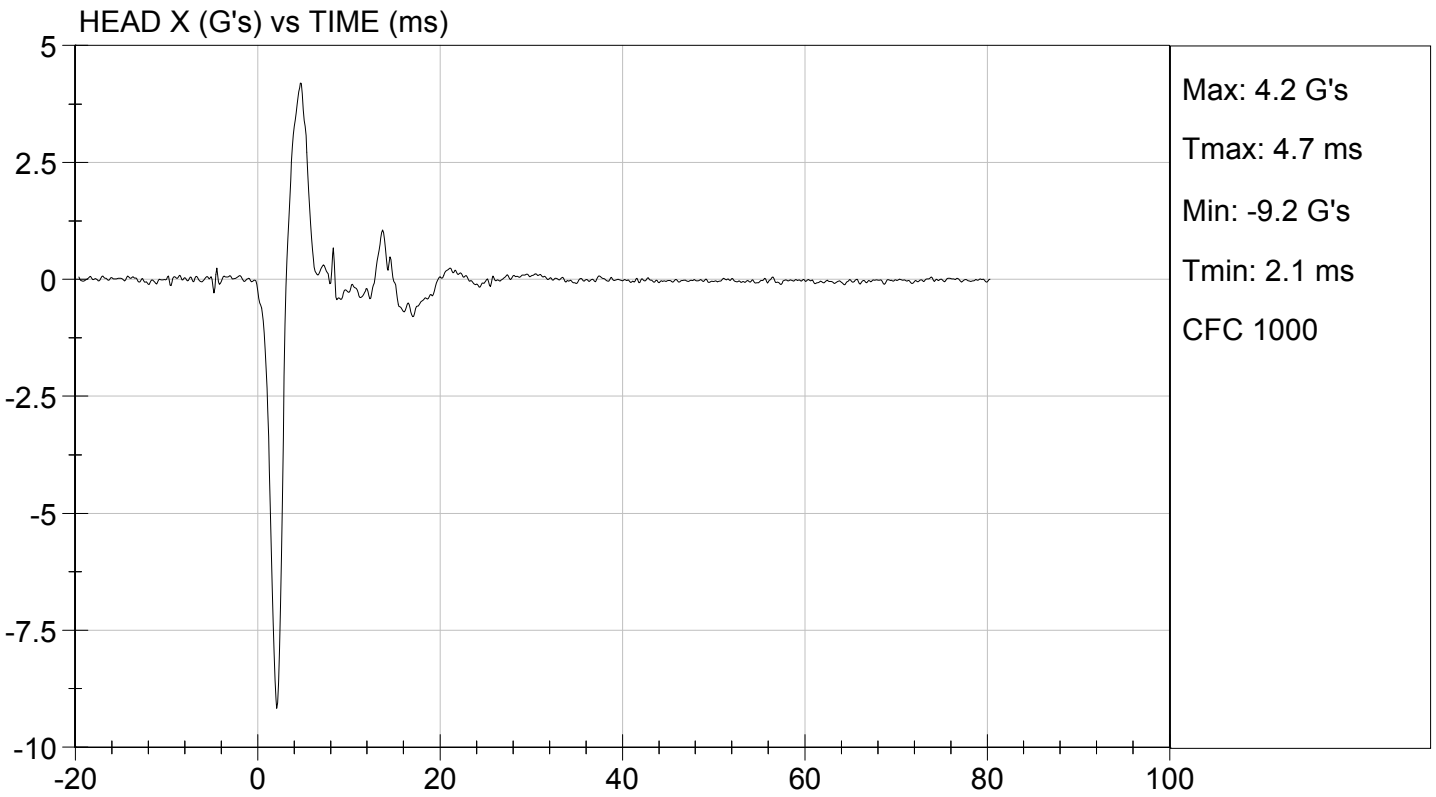
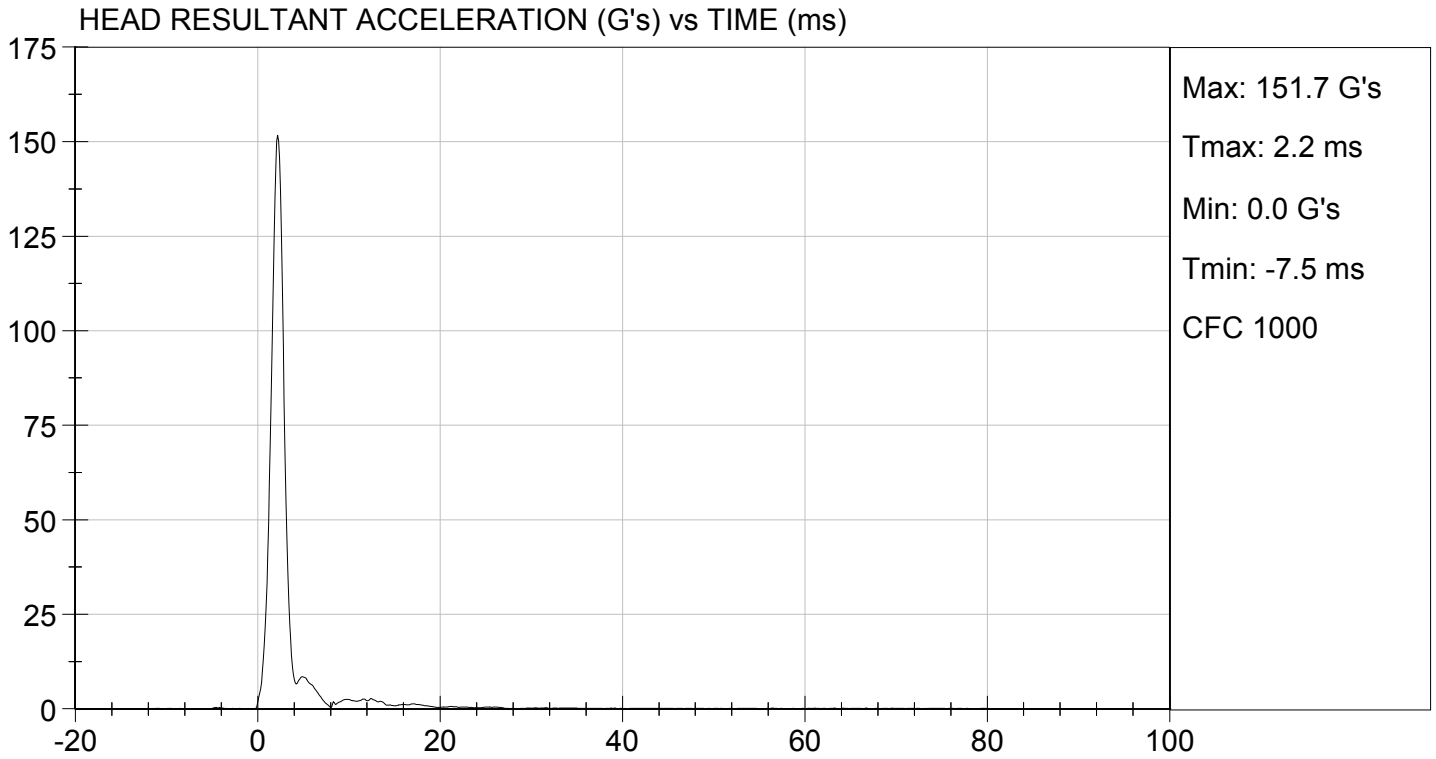
Test ID: D124331

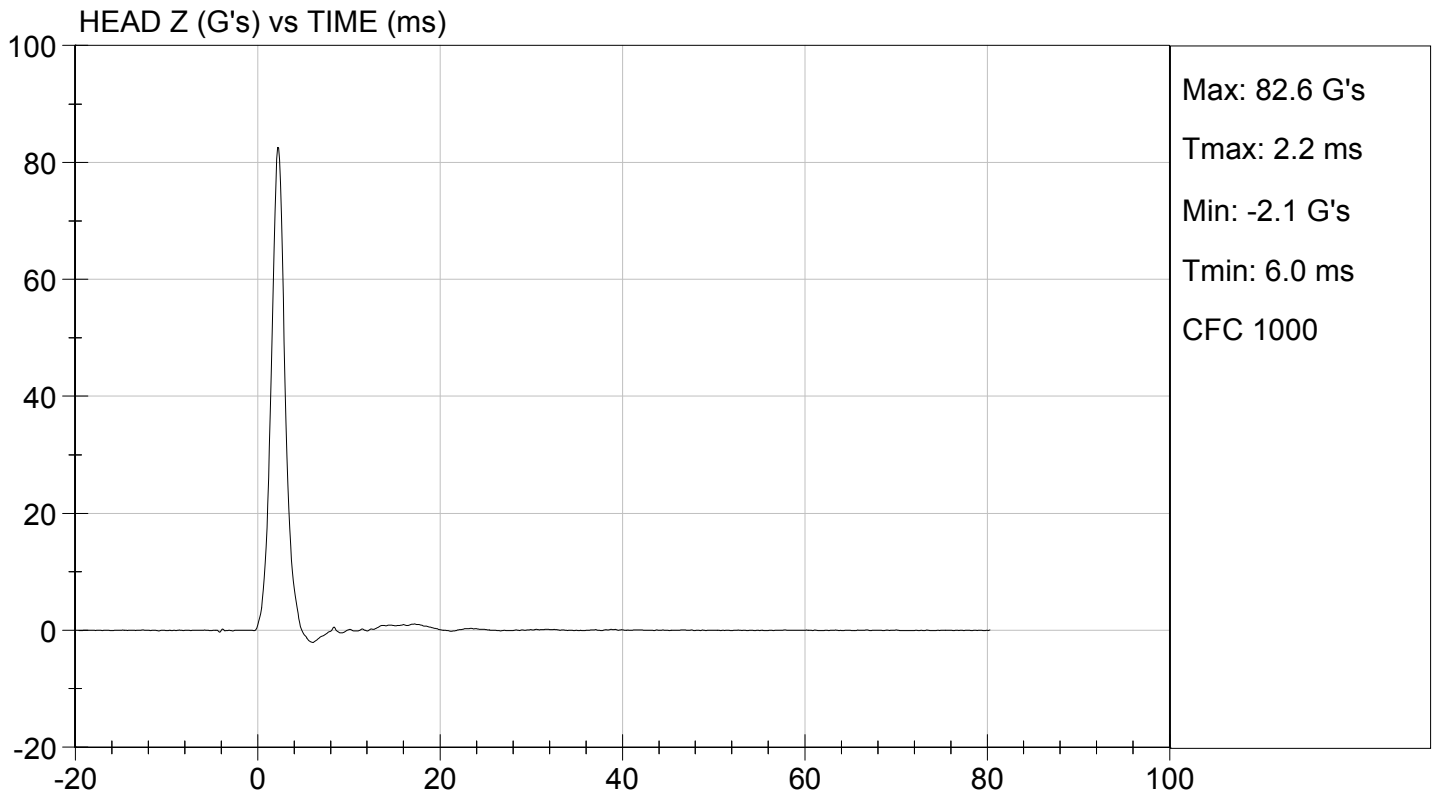
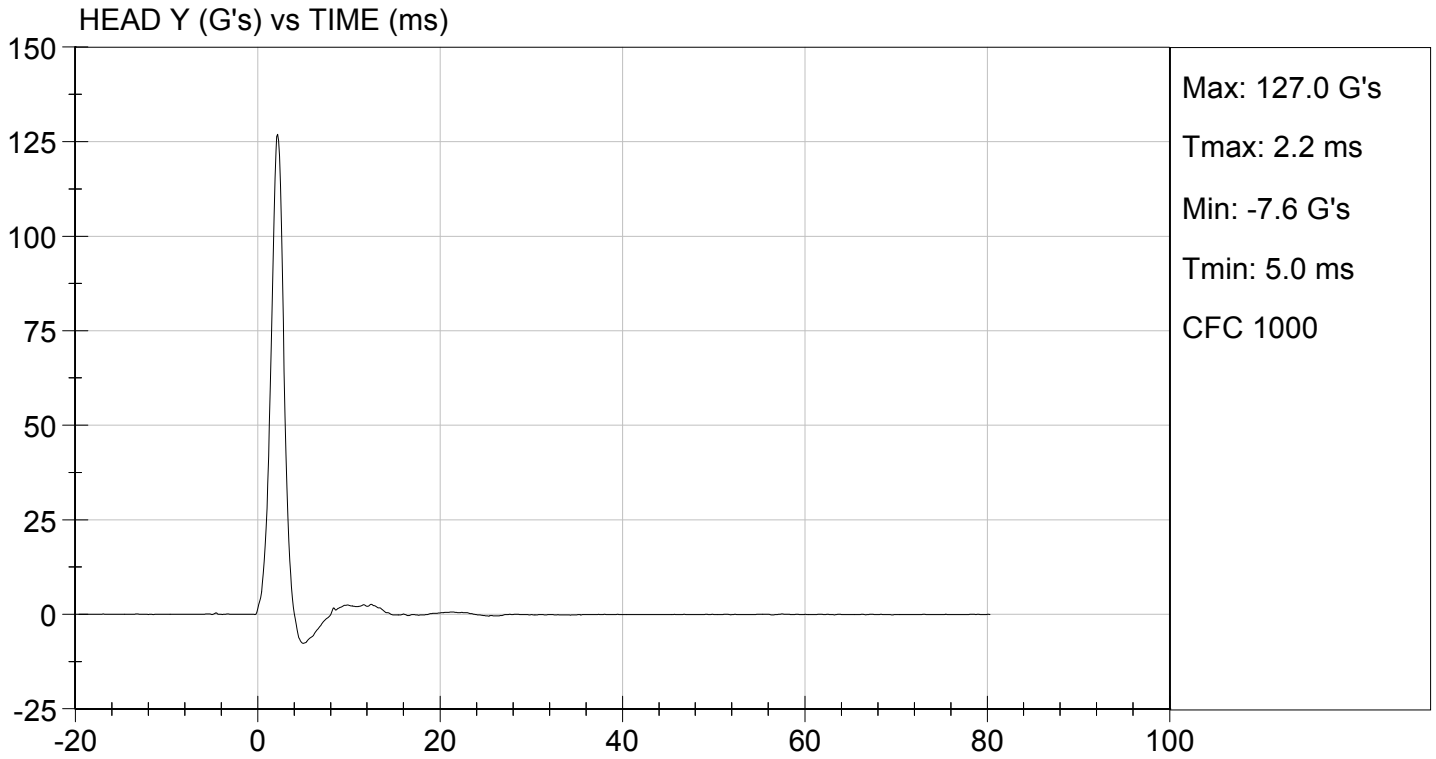
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	125 to 155	152	Pass
Peak Longitudinal Acceleration	G's	<= +/- 15.0	-9.2	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	within 15% of peak	Yes	Pass
<b>Overall Test Results</b>				<b>Pass</b>

*Jessica Gall*  
 Laboratory Technician

11/12/2012  
 Test Date

*David Winkelbauer*  
 Approved By





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

**ATD Serial No:** 032

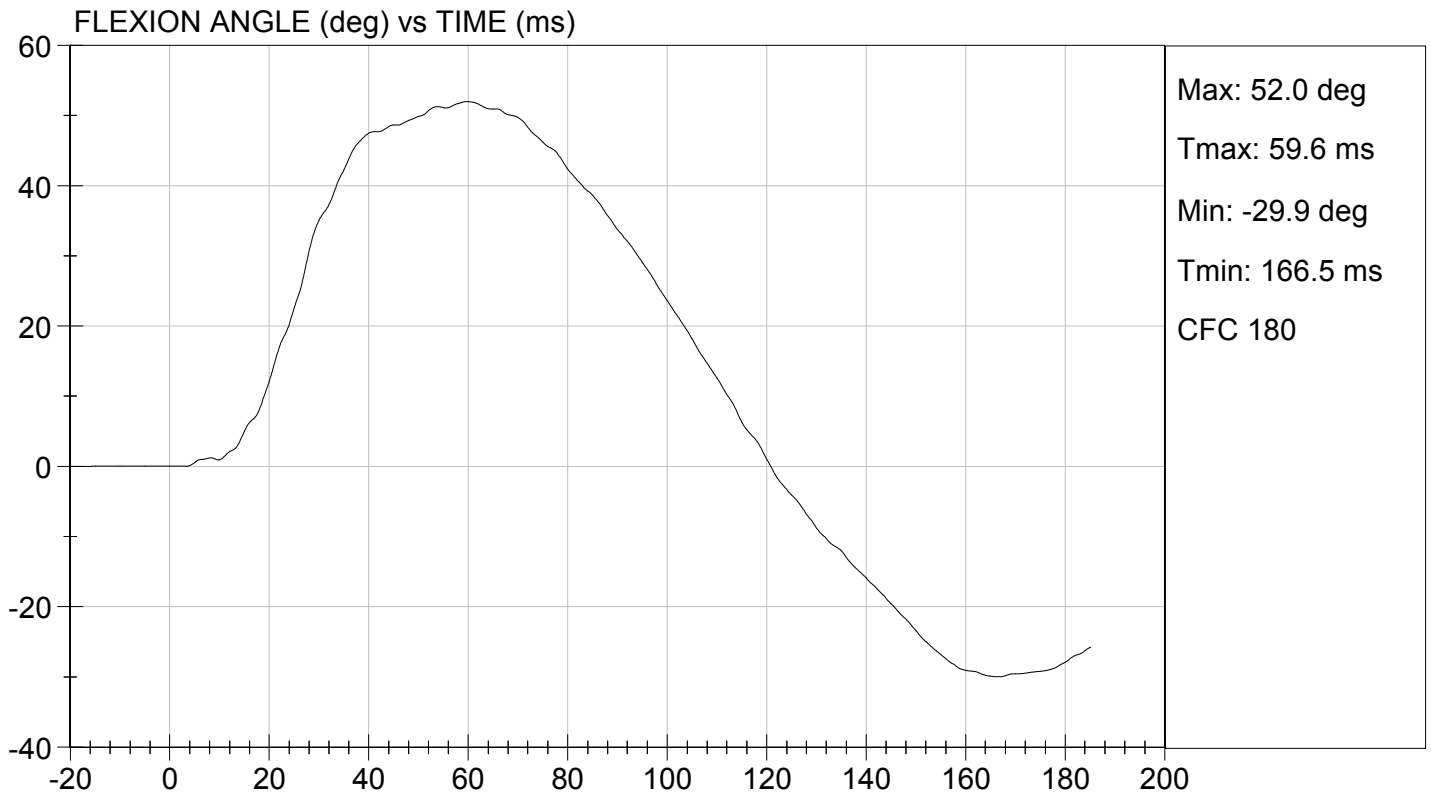
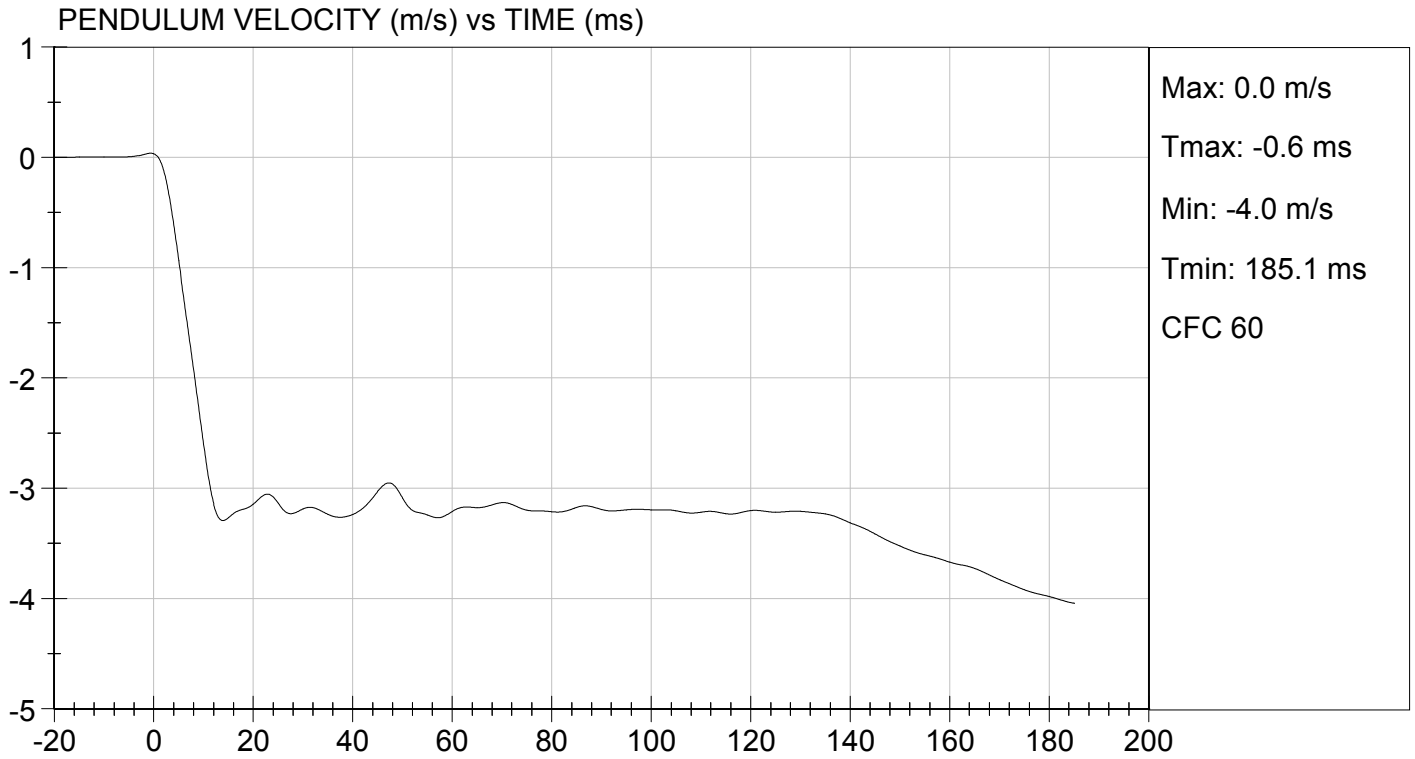
**Test I.D.:** D124332

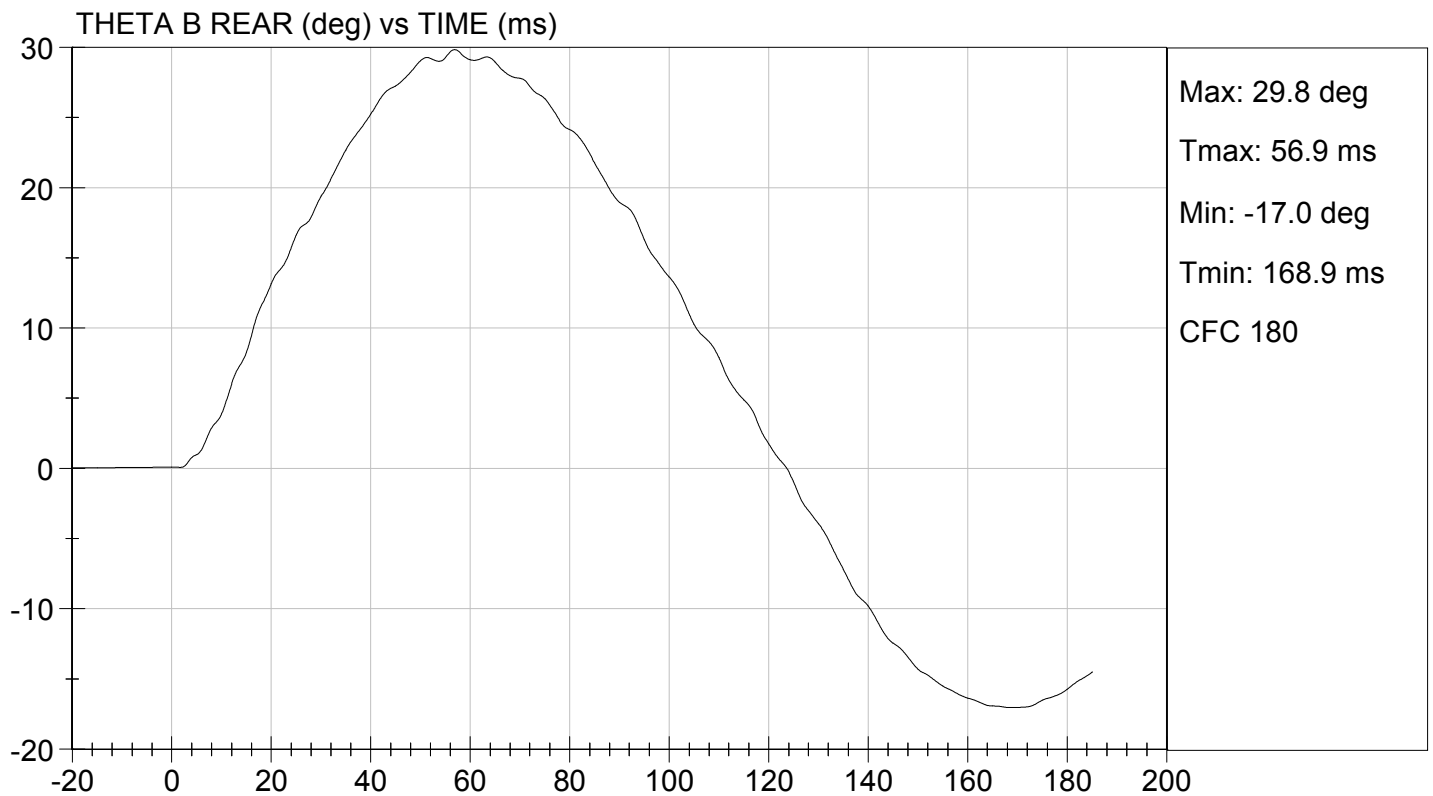
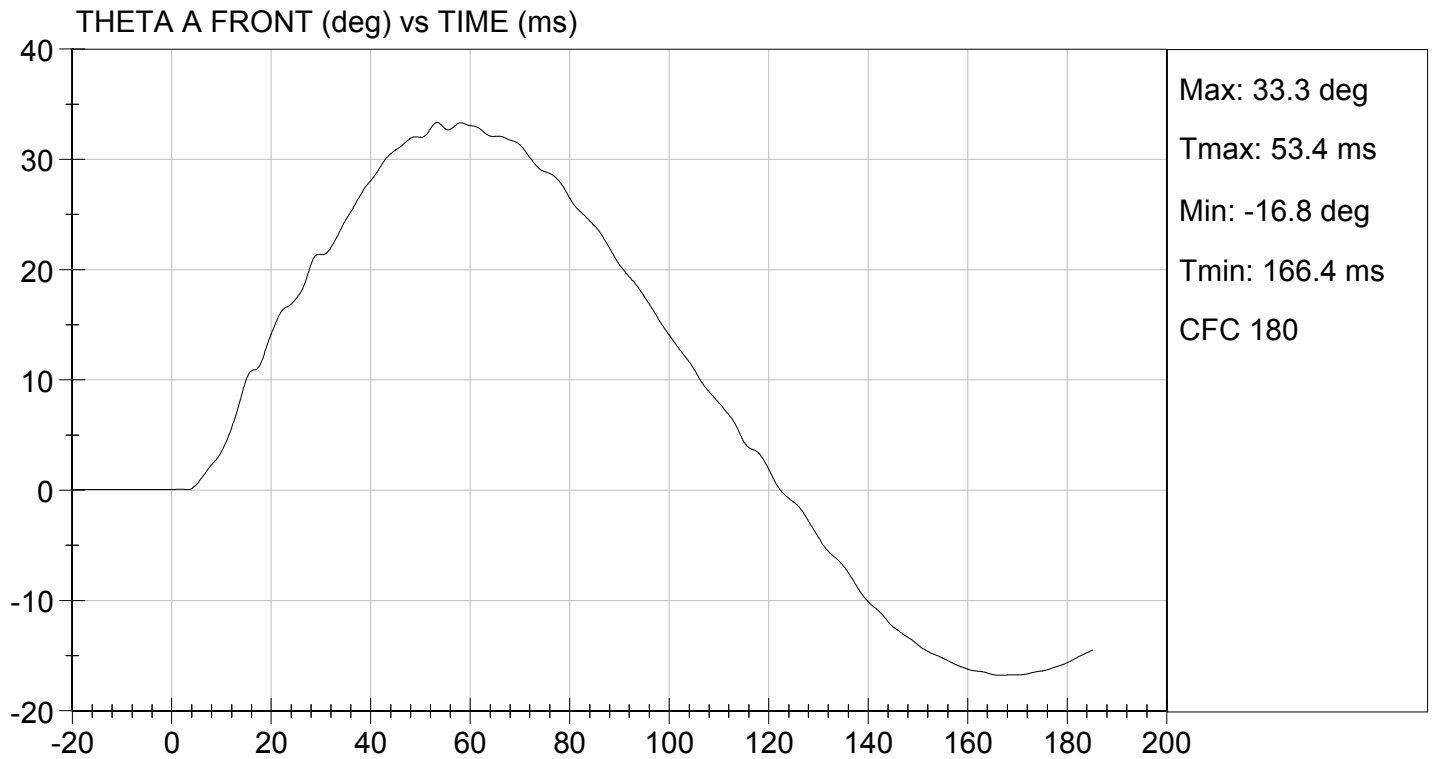
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	22.0	Pass
Laboratory Relative Humidity		%	10 to 70	28	Pass
Pendulum Speed		m/s	3.30 to 3.50	3.41	Pass
Pendulum Velocity	1 ms	m/s	-0.05 to 0.00	-0.01	Pass
	3 ms	m/s	-0.25 to -0.375	-0.33	Pass
	14 ms	m/s	-3.20 to -3.70	-3.29	Pass
	17 ms	m/s	>= -3.70	-3.20	Pass
Maximum Flexion Angle		deg	49.0 to 59.0	52.0	Pass
Time of Maximum Flexion Angle		ms	54.0 to 66.0	59.6	Pass
Head Rotation Decay Time to 0 Degree		ms	53.0 to 88.0	56.9	Pass
<b>Overall Results</b>					<b>Pass</b>

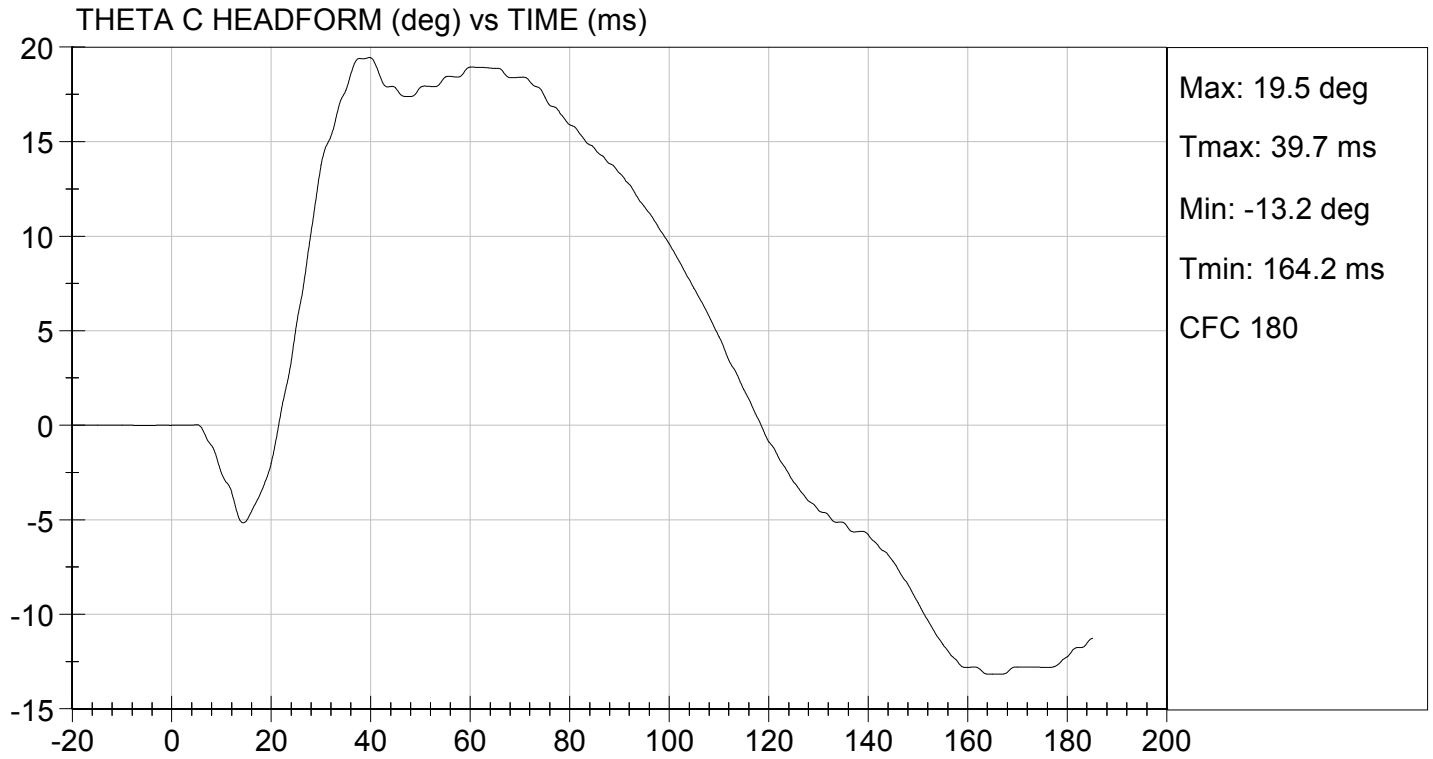
Jessica Hall  
 Laboratory Technician

11/12/2012  
 Test Date

David Winkelbauer  
 Approved By







**MGA RESEARCH CORPORATION**  
**SHOULDER IMPACT TEST**  
**ES-2re DUMMY**

**ATD Serial No:** 032

**Test I.D:** D124333

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	25	Pass
Pendulum Speed	m/s	4.20 to 4.40	4.3	Pass
Peak Impactor Acceleration	G's	7.5 to 10.5	9.3	Pass
Overall Test Results				Pass

  
 Laboratory Technician

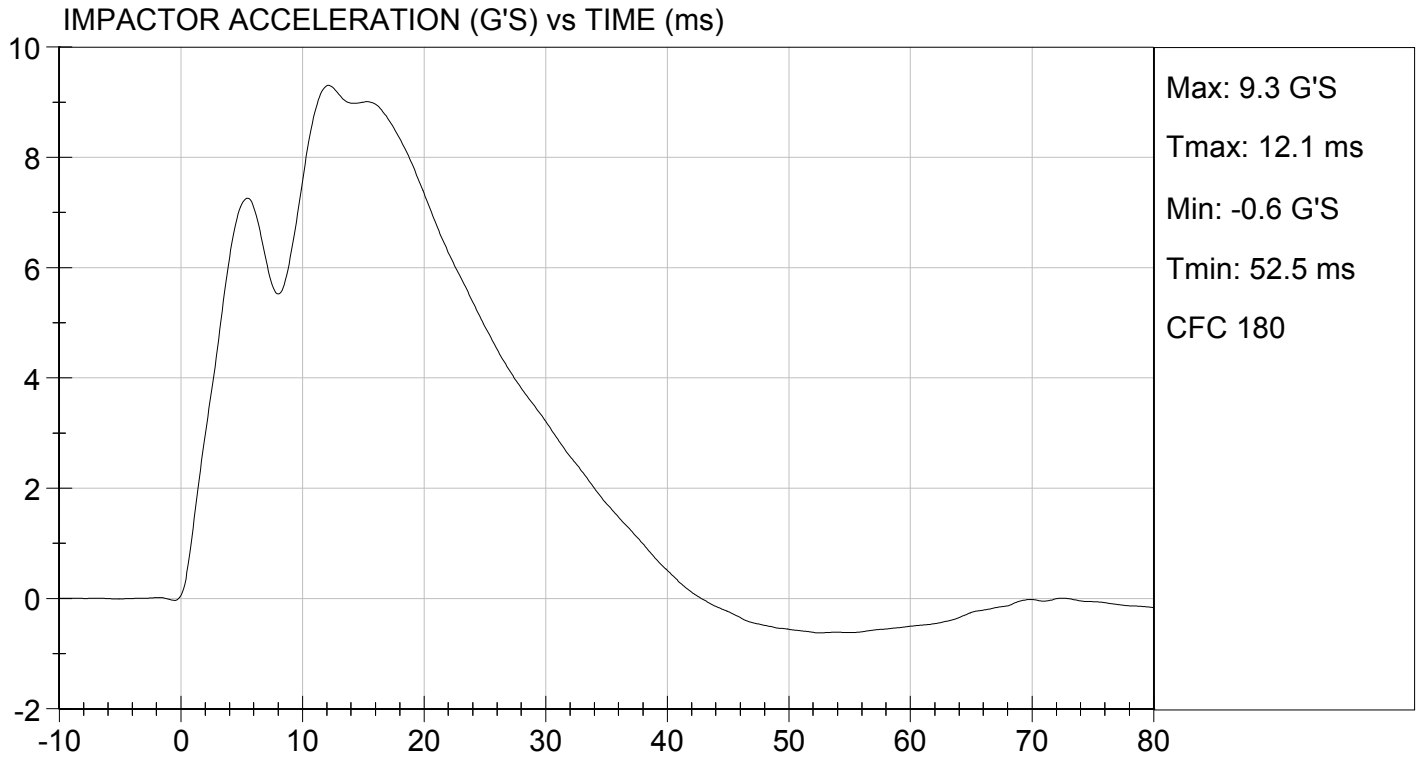
11/12/2012  
 Test Date

  
 Approved By



TEST DESC: SHOULDER IMPACT  
VELOCITY: 14.12 ft/s, 4.3 m/s

TEST DATE: 11/12/2012  
TEST #: D124333



**MGA RESEARCH CORPORATION**

**UPPER RIB TEST**

**ES-2re DUMMY**

**ATD Serial No:** 032

**Test I.D.:** D124334

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	25	Pass
Displacement at 459 mm	mm	36.0 to 40.0	37.2	Pass
Displacement at 815 mm	mm	46.0 to 51.0	48.6	Pass
Overall Test Results				Pass

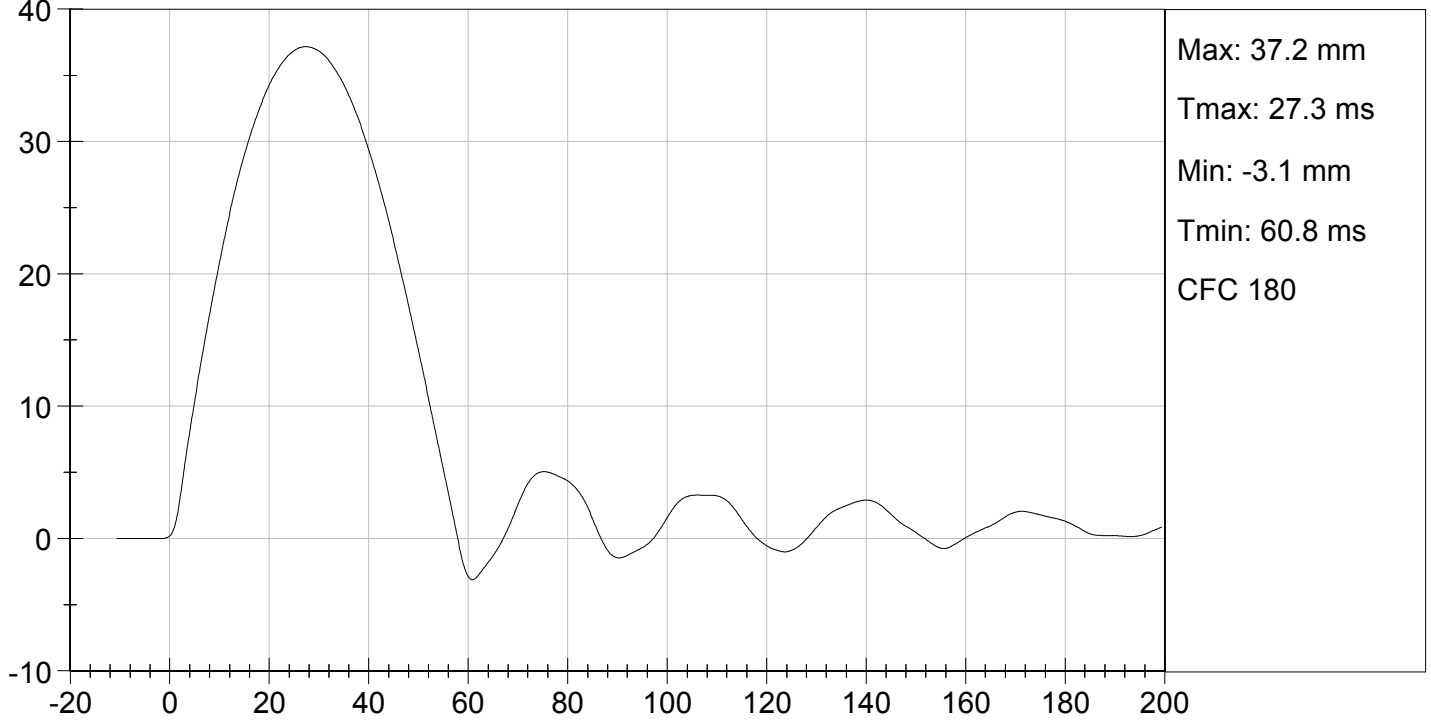
Jessica Hall  
Laboratory Technician

11/12/2012  
Test Date

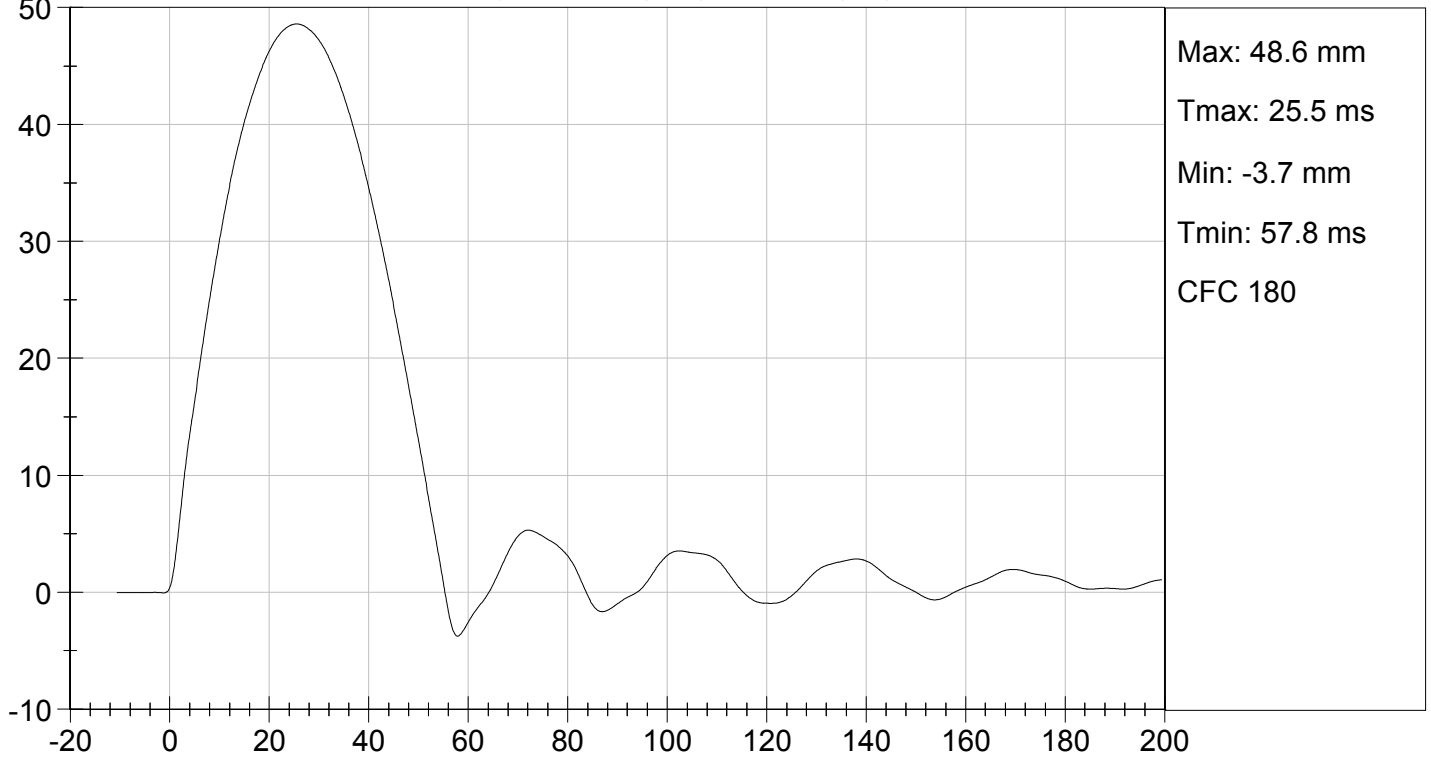
David Winkelbauer  
Approved By



UPPER RIB DISPLACEMENT @ 459 mm (mm) vs TIME (ms)



UPPER RIB DISPLACEMENT @ 815 mm (mm) vs TIME (ms)



MGA RESEARCH CORPORATION

MID RIB TEST

ES-2re DUMMY

ATD Serial No: 032

Test I.D: D124335

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	25	Pass
Displacement at 459 mm	mm	36.0 to 40.0	37.1	Pass
Displacement at 815 mm	mm	46.0 to 51.0	47.9	Pass
Overall Test Results				Pass

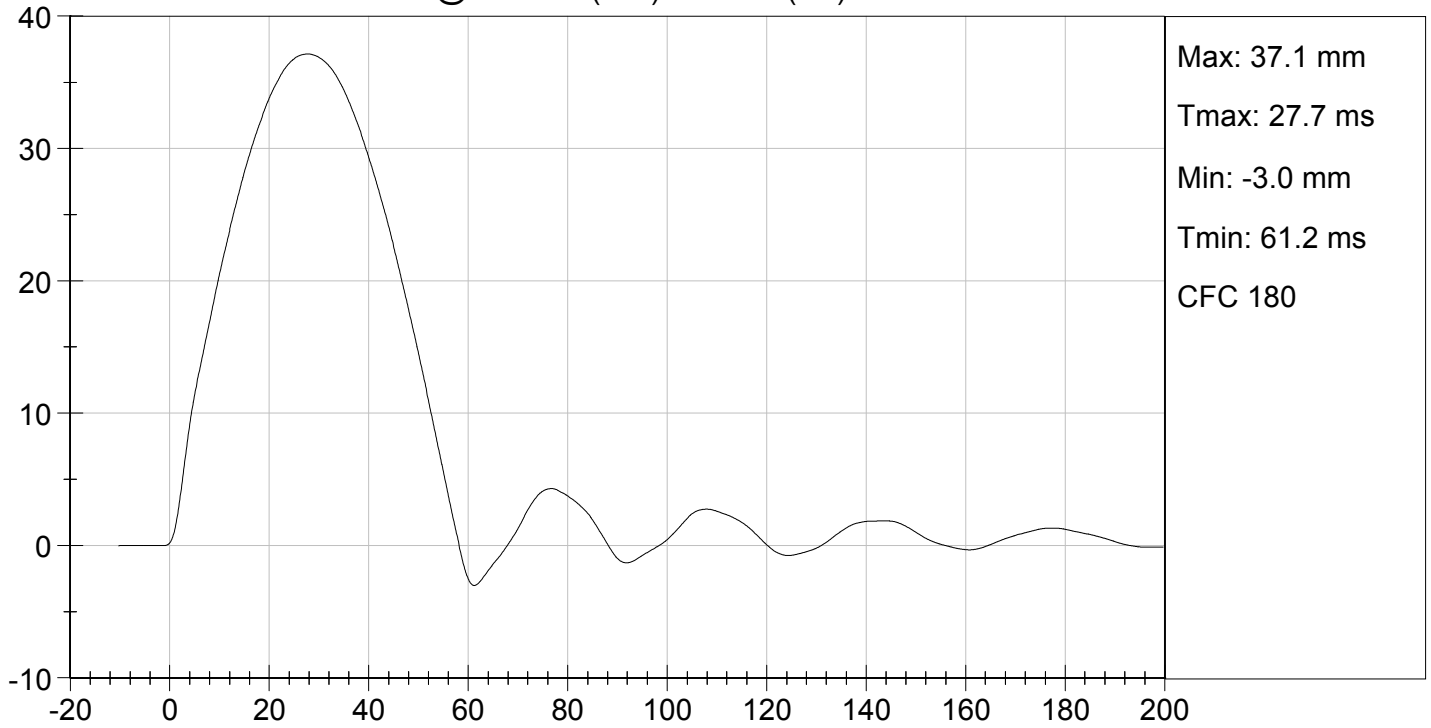
Jessica Hall  
Laboratory Technician

11/12/2012  
Test Date

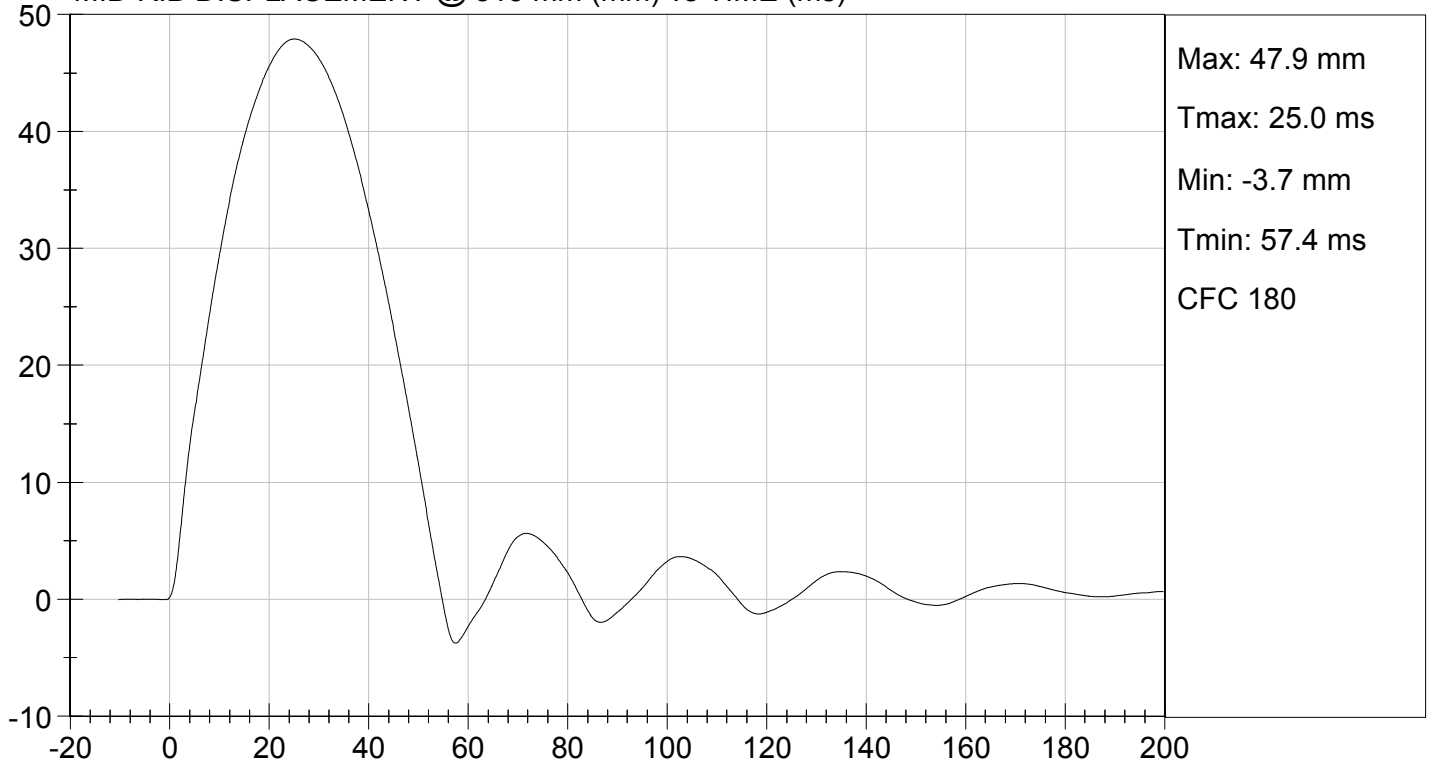
David Winkelbauer  
Approved By



MID RIB DISPLACEMENT @ 459 mm (mm) vs TIME (ms)



MID RIB DISPLACEMENT @ 815 mm (mm) vs TIME (ms)



MGA RESEARCH CORPORATION

LOWER RIB TEST

ES-2re DUMMY

ATD Serial No: 032

Test I.D: D124336

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	25	Pass
Displacement at 459 mm	mm	36.0 to 40.0	37.6	Pass
Displacement at 815 mm	mm	46.0 to 51.0	47.8	Pass
Overall Test Results				Pass

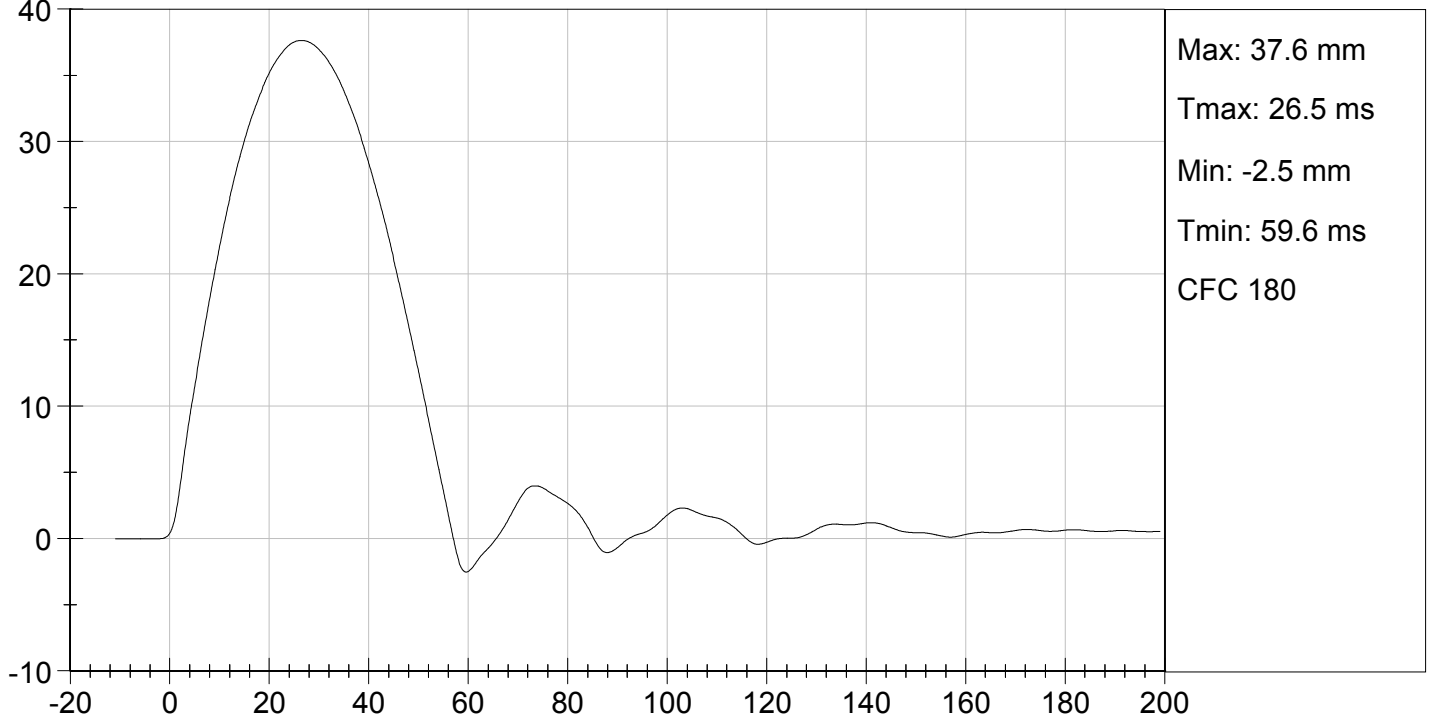
  
Laboratory Technician

11/12/2012  
Test Date

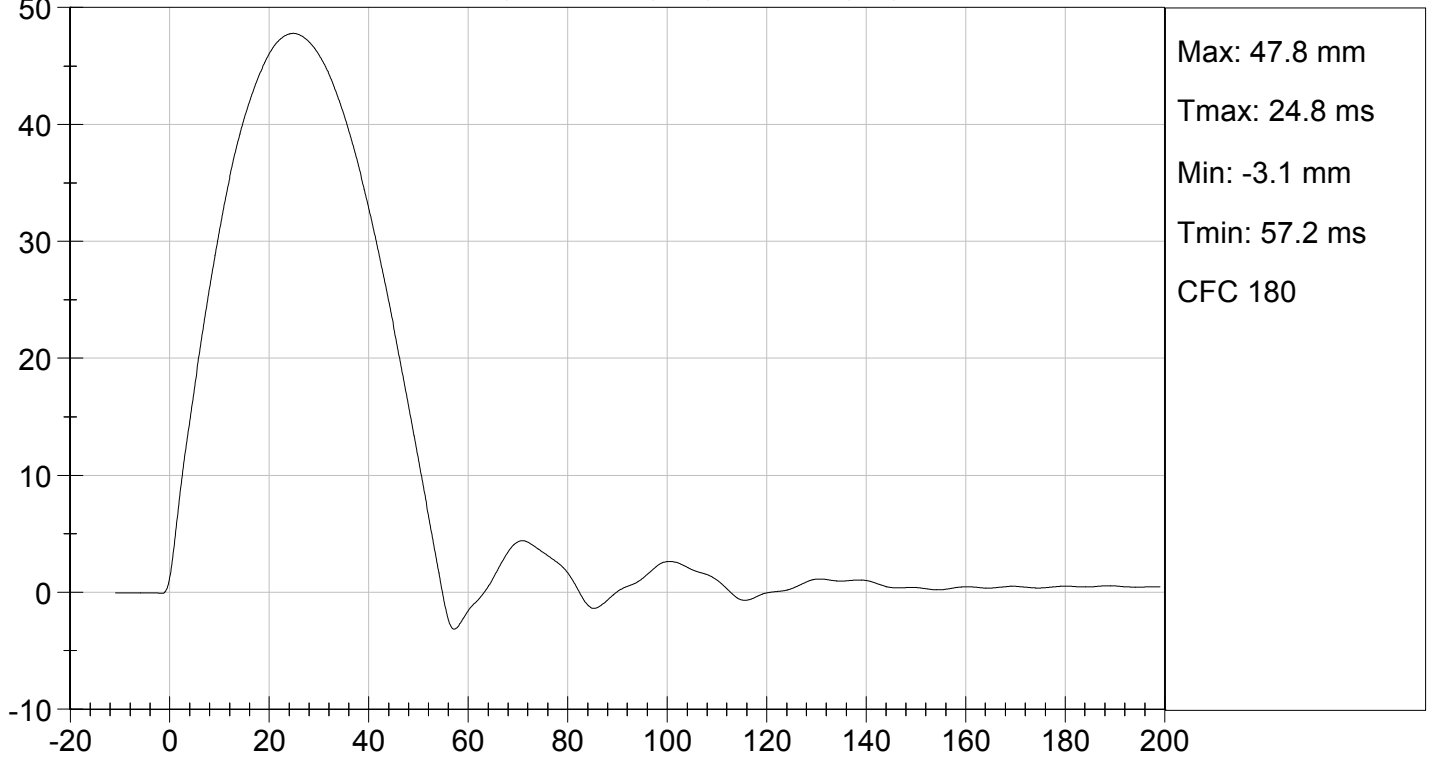
  
Approved By



LOWER RIB DISPLACEMENT @ 459 mm (mm) vs TIME (ms)



LOWER RIB DISPLACEMENT @ 815 mm (mm) vs TIME (ms)



**MGA RESEARCH CORPORATION**  
**THORAX IMPACT TEST**  
**ES-2re DUMMY**

**ATD Serial No:** 032

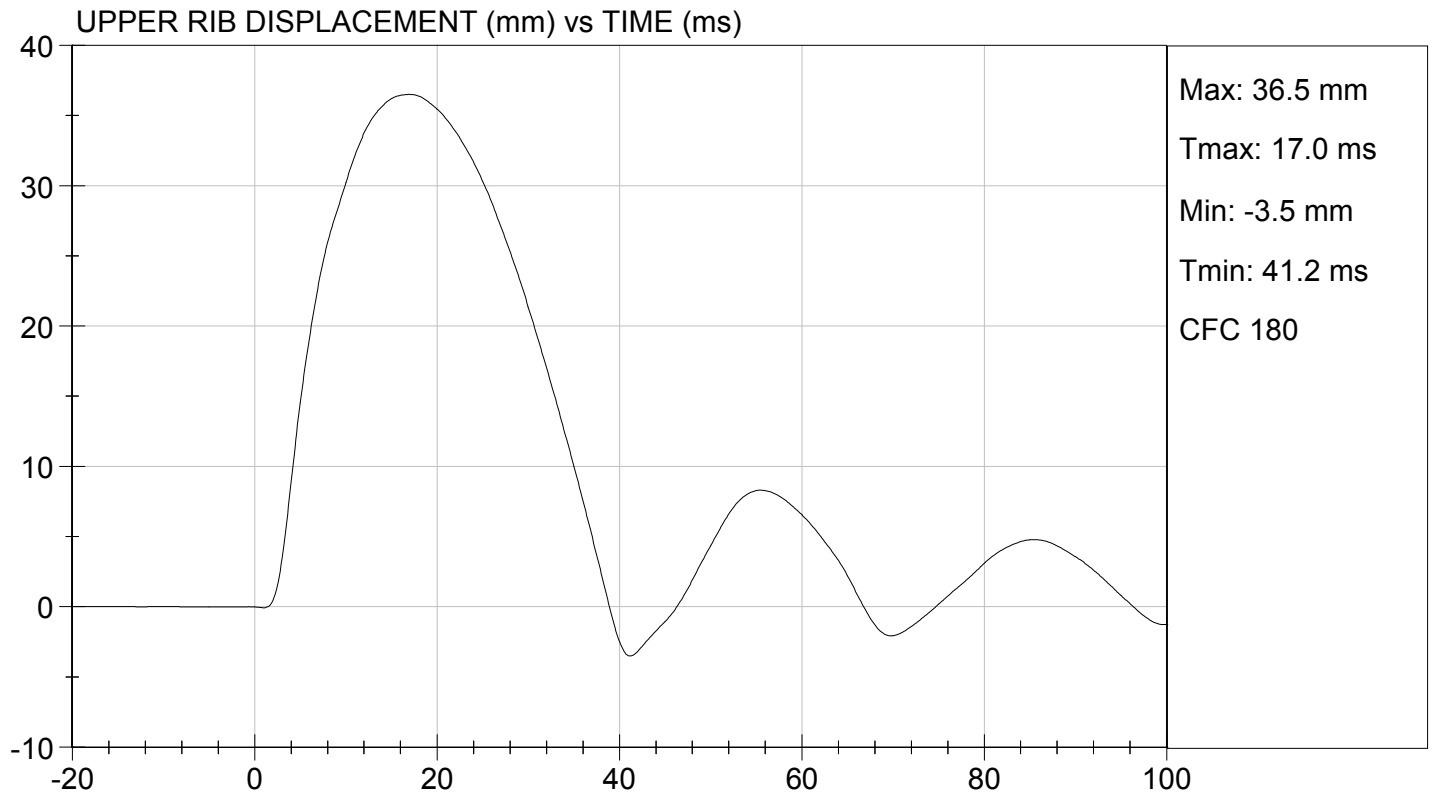
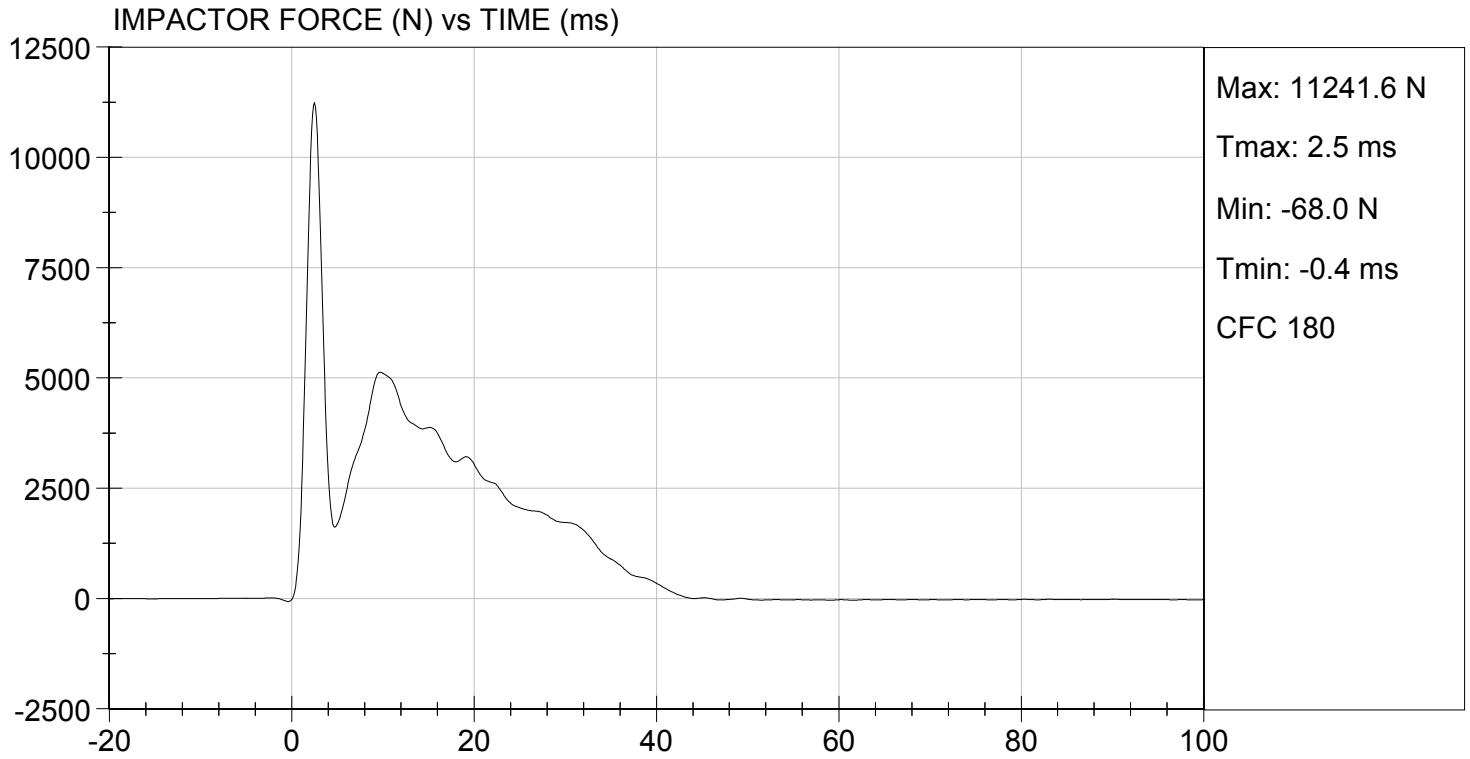
**Test I.D.:** D124330

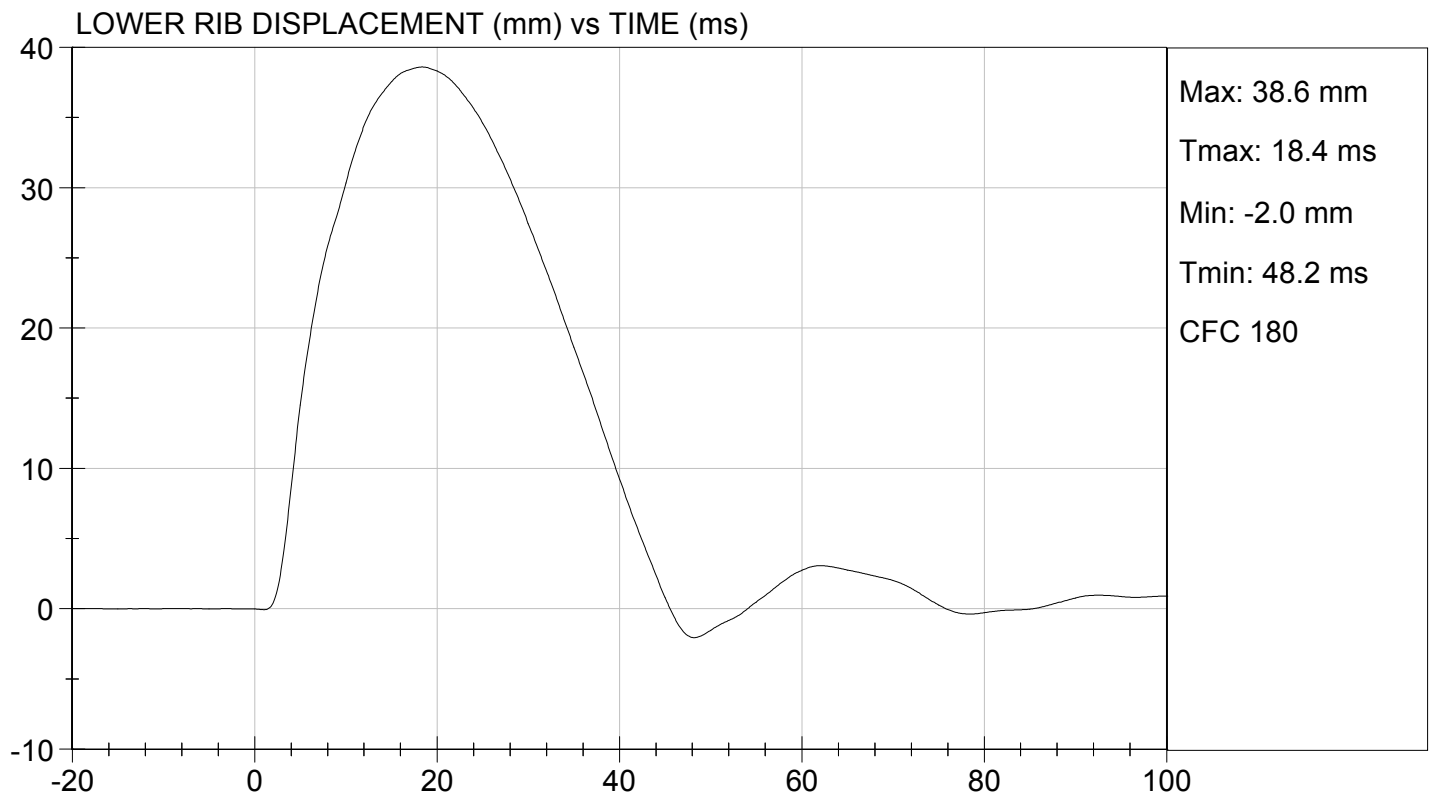
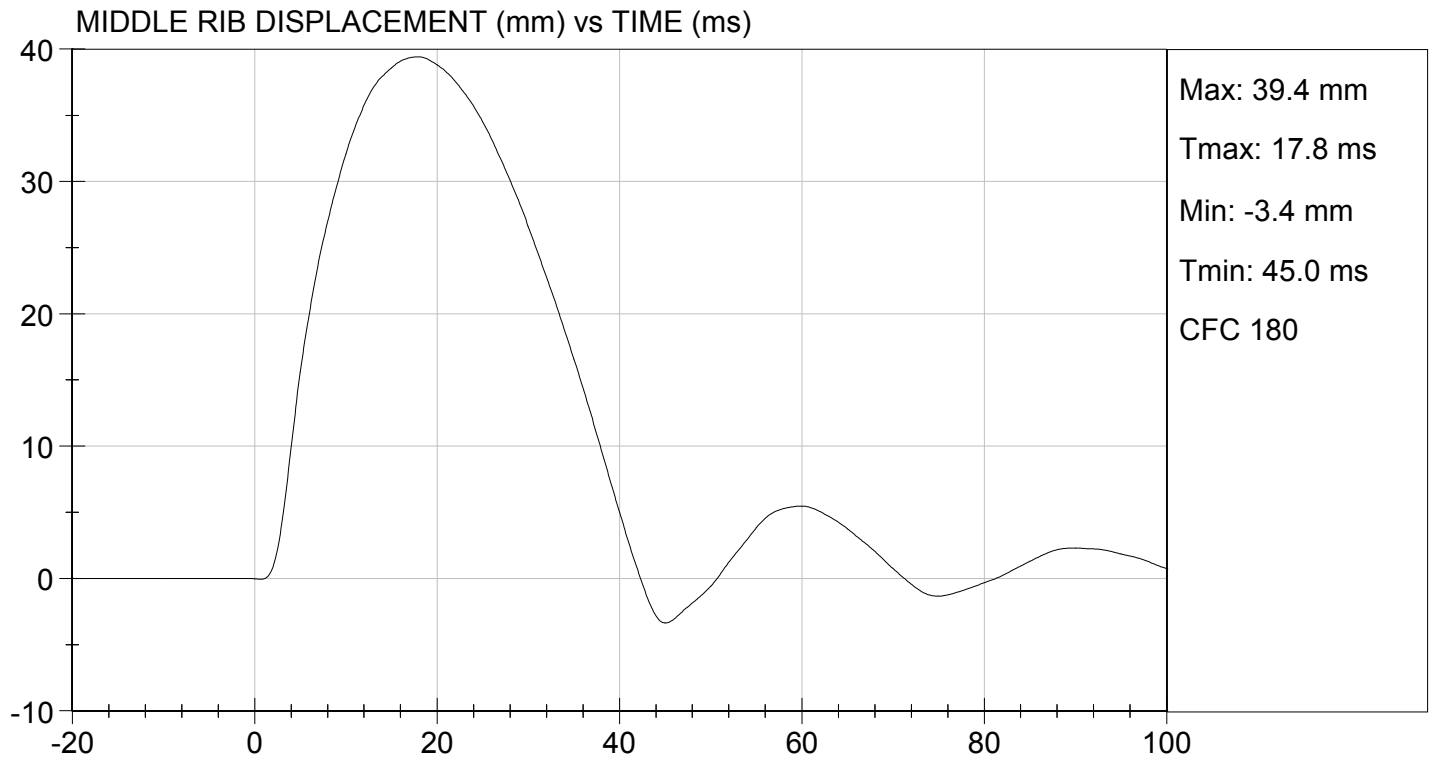
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.9	Pass
Humidity	%	10 to 70	25	Pass
Probe Speed	m/s	5.40 to 5.60	5.58	Pass
Maximum Impactor Force (after 6 ms)	N	5100 to 6200	5128	Pass
Upper Rib Displacement	mm	34.0 to 41.0	36.5	Pass
Middle Rib Displacement	mm	37.0 to 45.0	39.4	Pass
Lower Rib Displacement	mm	37.0 to 44.0	38.6	Pass
<b>Overall Test Results</b>				<b>Pass</b>

  
 Laboratory Technician

11/12/2012  
 Test Date

  
 Approved By





**MGA RESEARCH CORPORATION**

**ABDOMEN TEST**

**ES-2re DUMMY**

**ATD Serial No:** 032

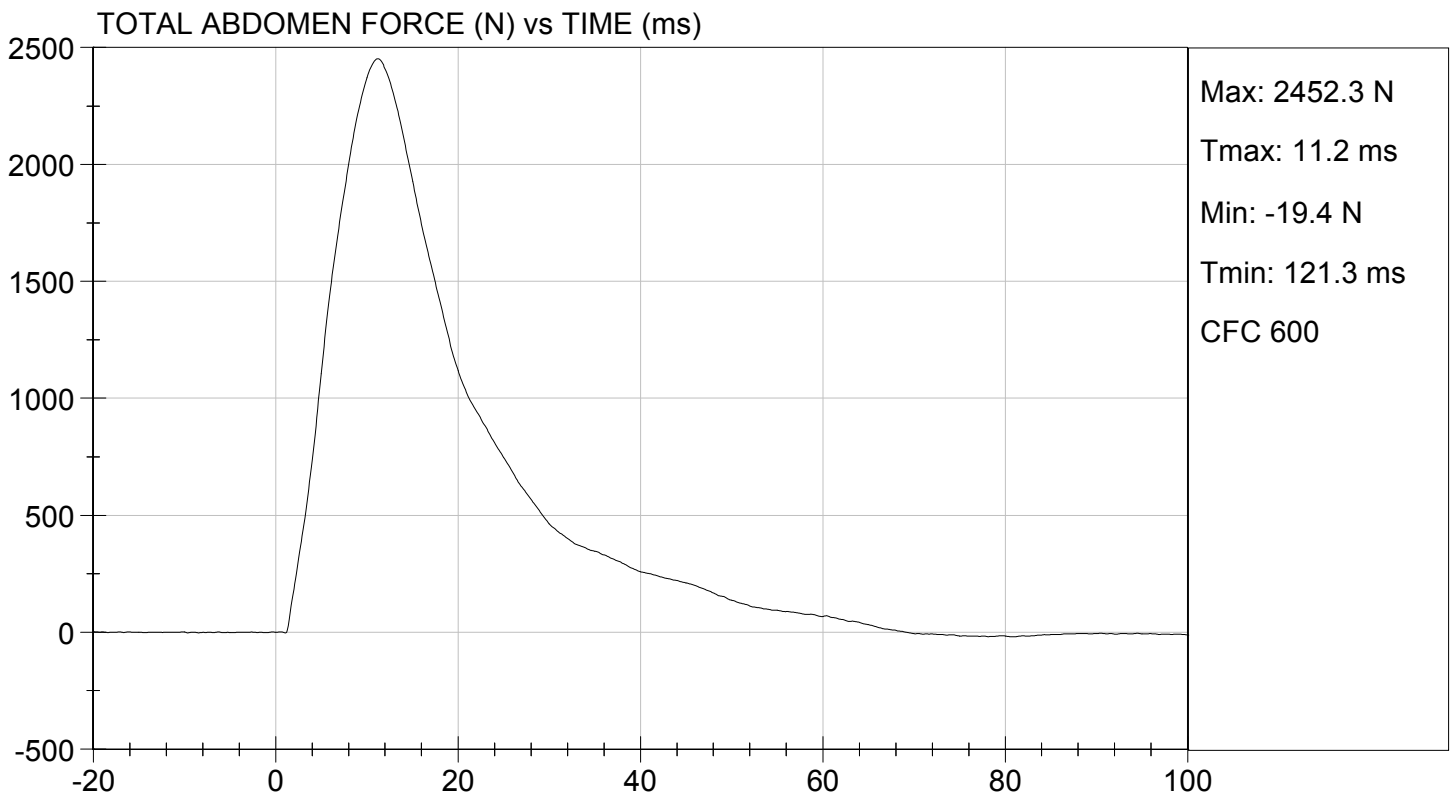
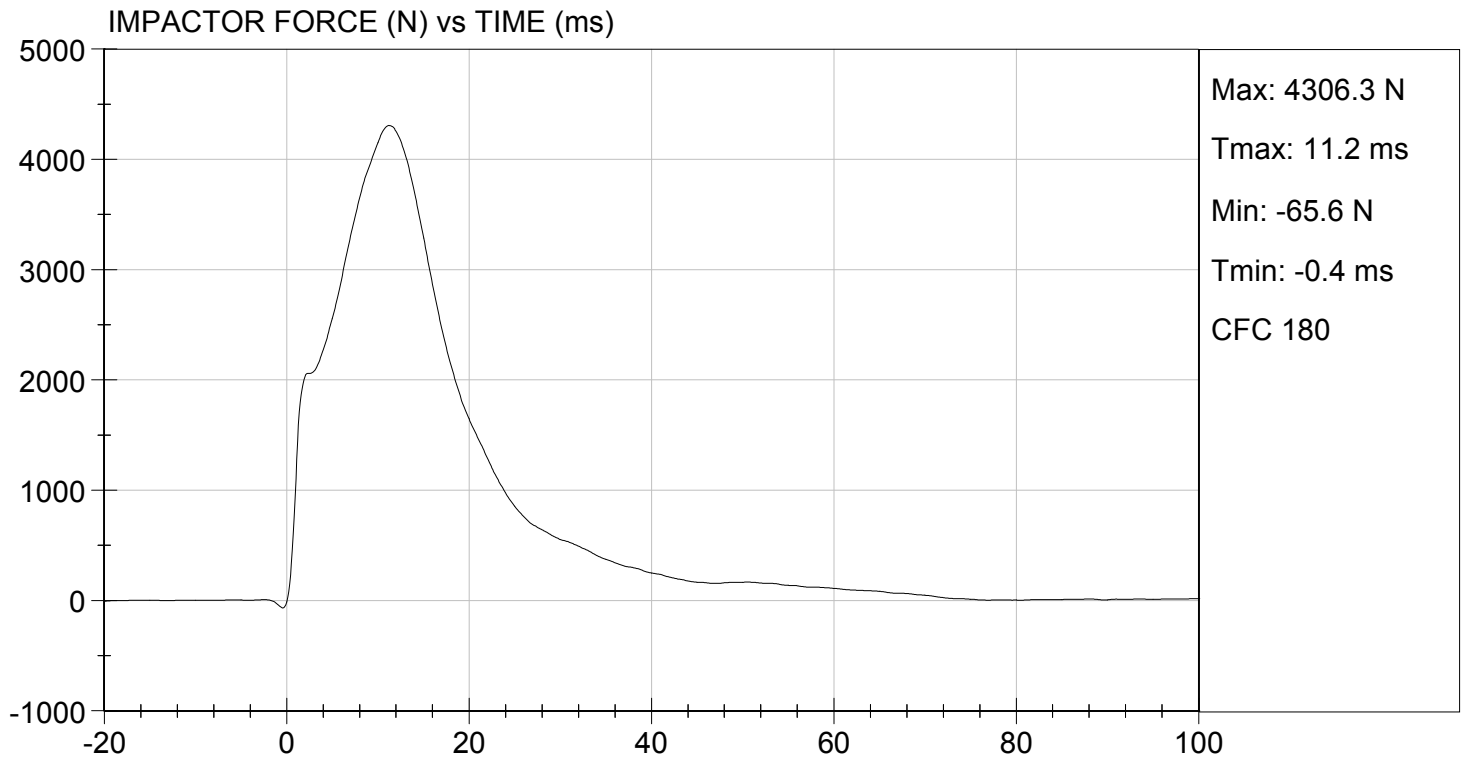
**Test I.D:** D124337

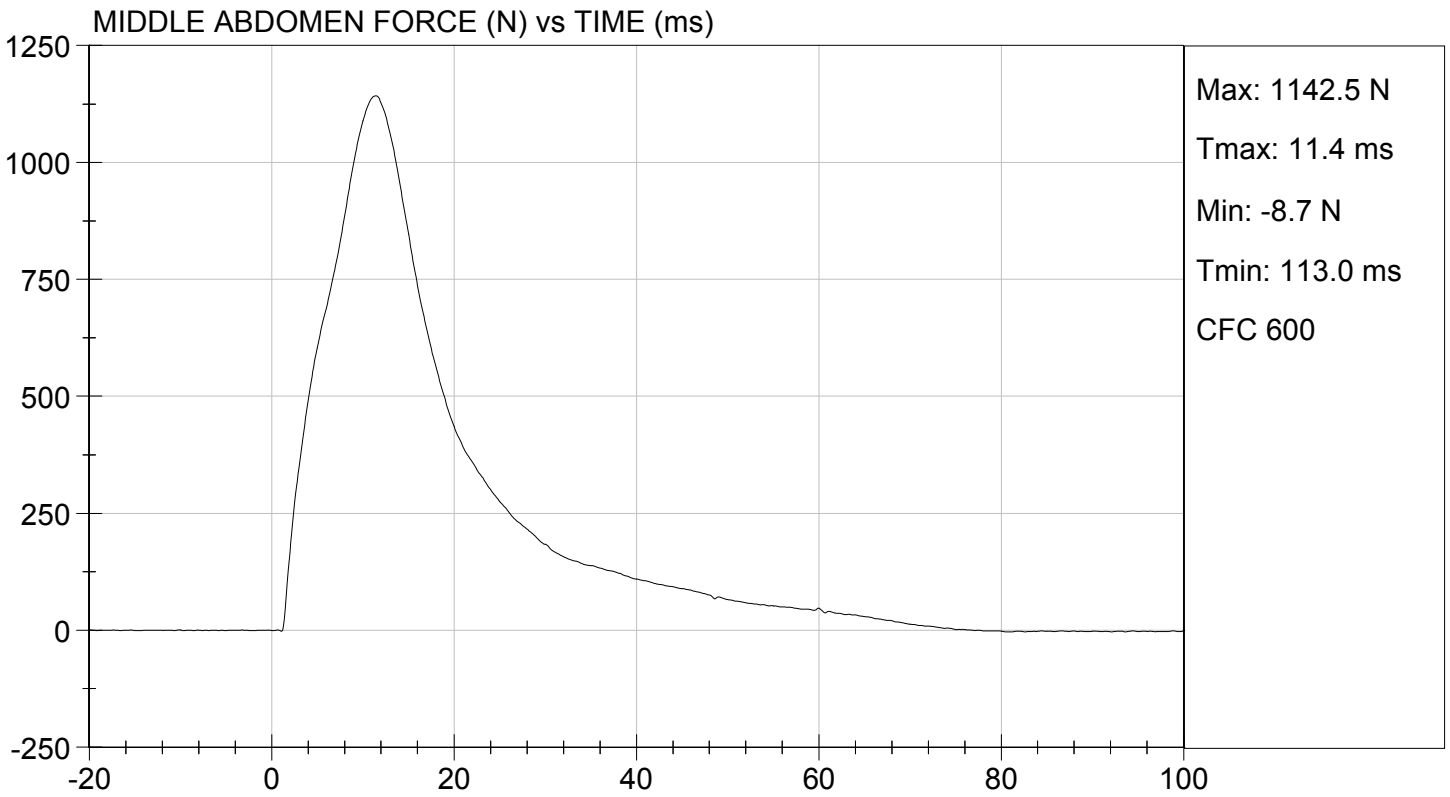
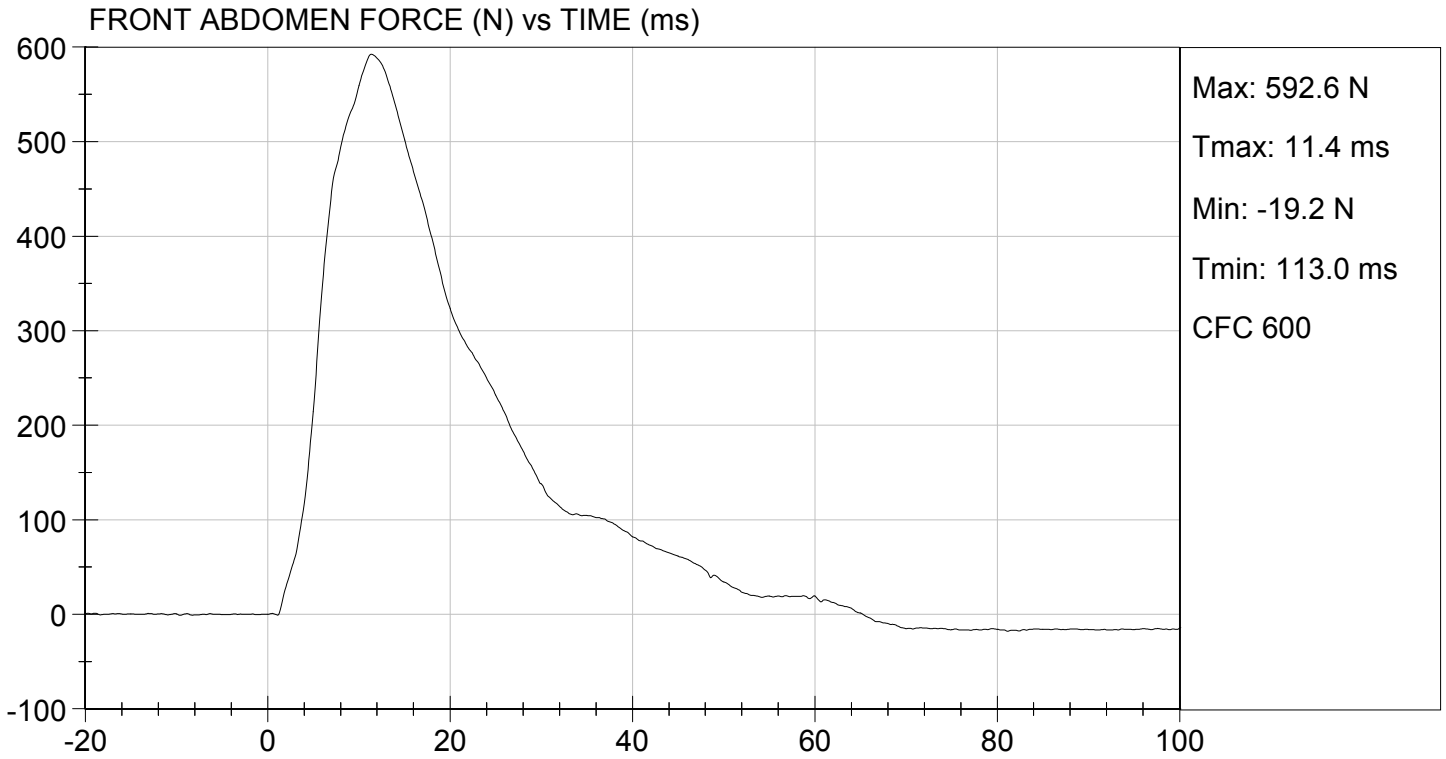
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	25	Pass
Probe Speed	m/s	3.90 to 4.10	4.06	Pass
Maximum Impactor Force	N	4000 to 4800	4306	Pass
Time of Maximum Impactor Force	ms	10.6 to 13.0	11.2	Pass
Maximum Total Abdomen Force	N	2200 to 2700	2452	Pass
Time of Maximum Abdomen Force	ms	10.0 to 12.3	11.2	Pass
Overall Test Results				Pass

  
Laboratory Technician

11/12/2012  
Test Date

  
Approved By

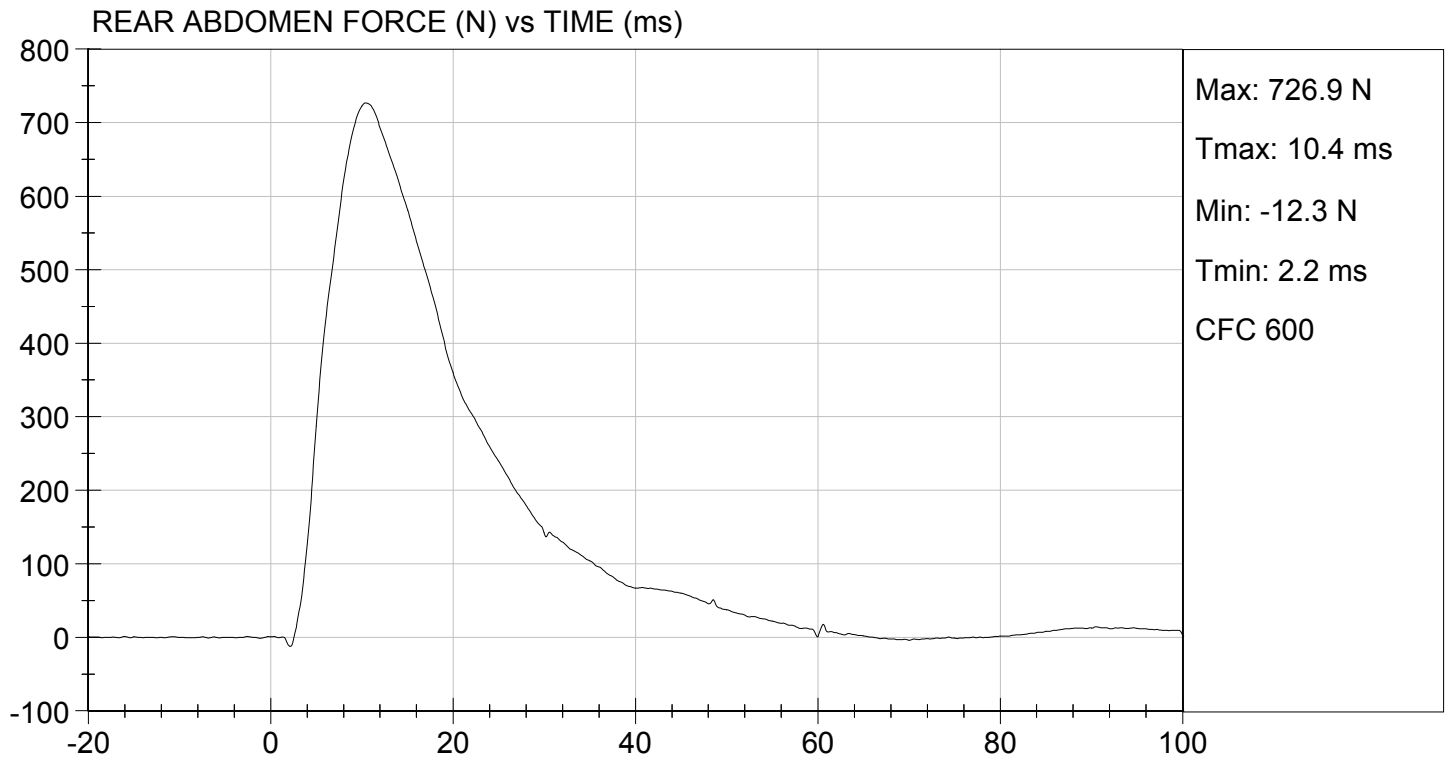






TEST DESC: ABDOMEN IMPACT  
VELOCITY: 13.33 ft/s, 4.06 m/s

TEST DATE: 11/12/2012  
TEST #: D124337



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

**ATD Serial No:** 032

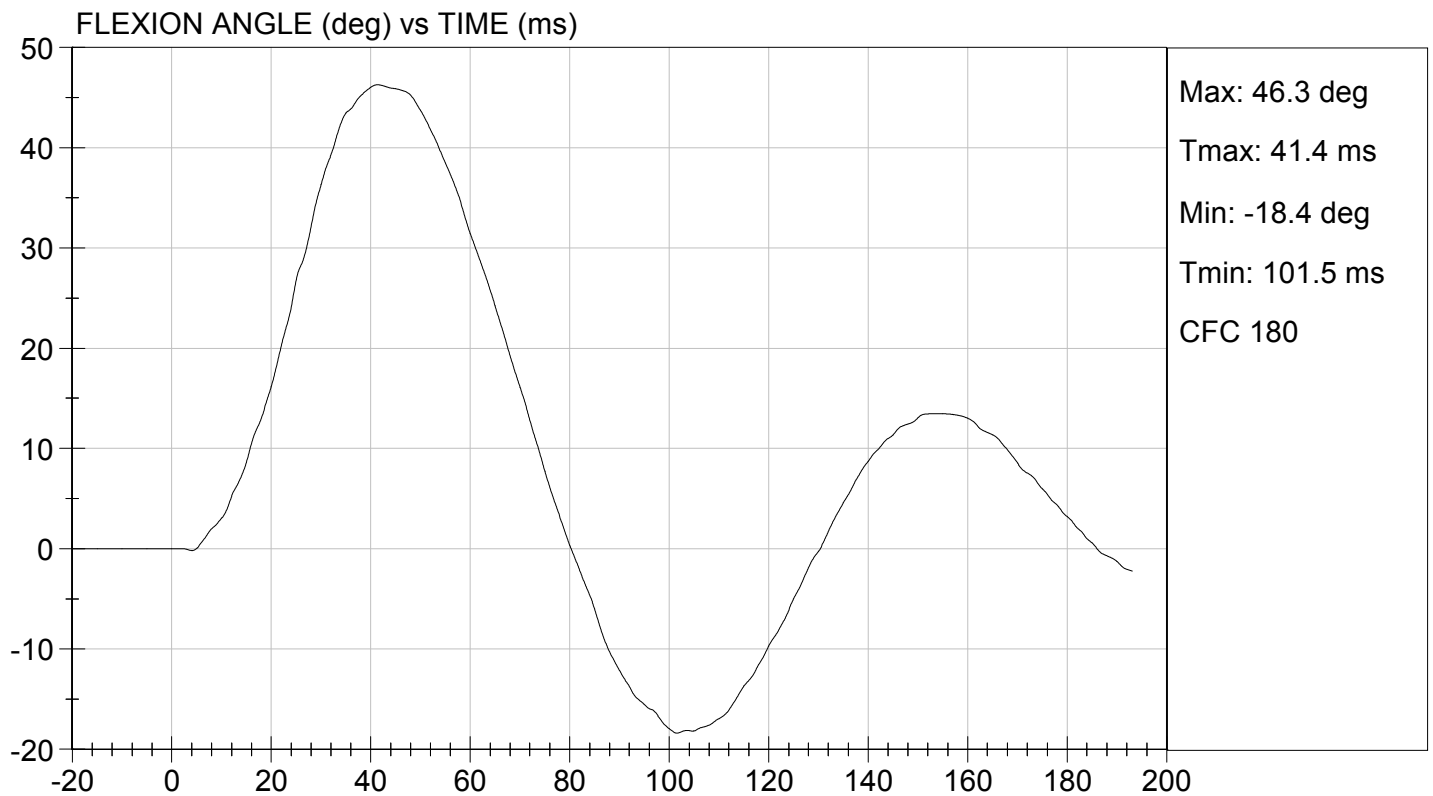
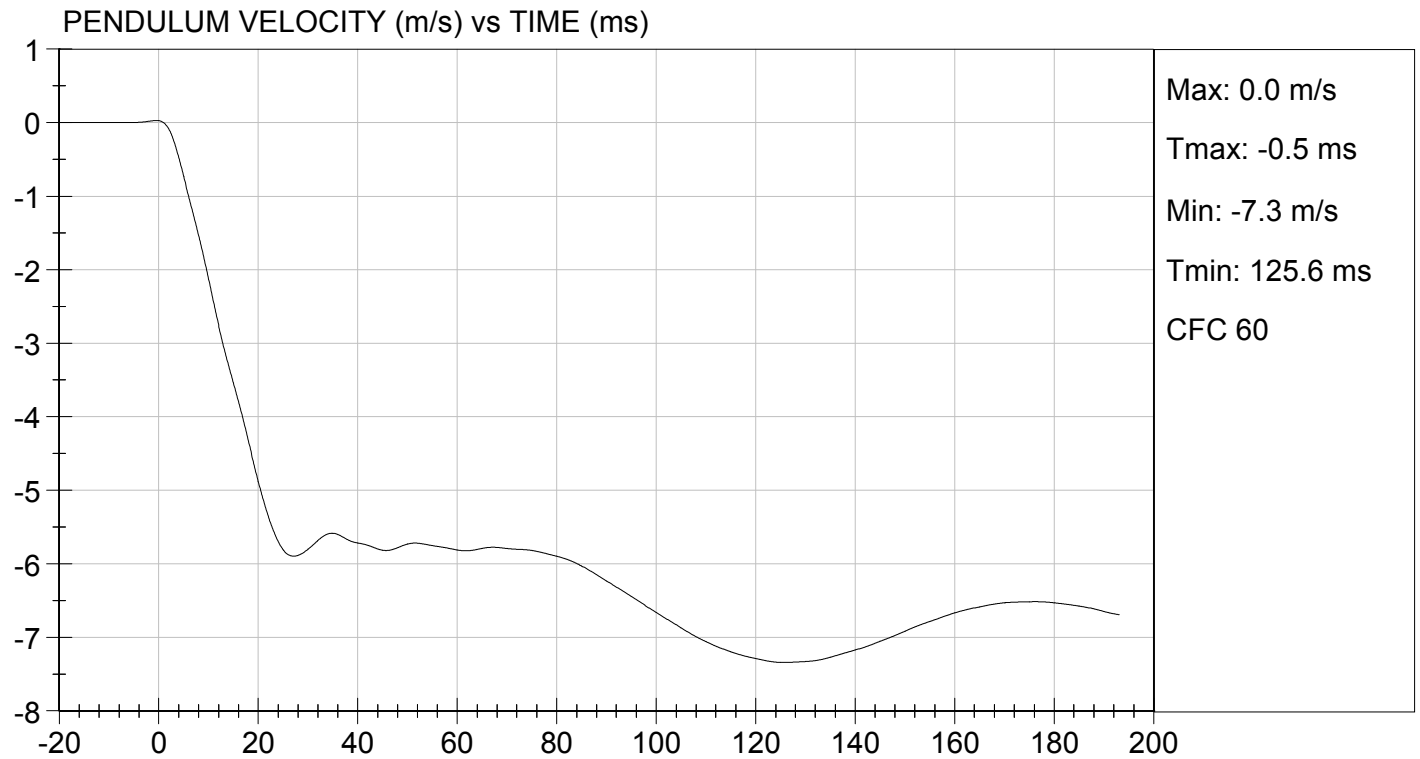
**Test I.D.:** D124338

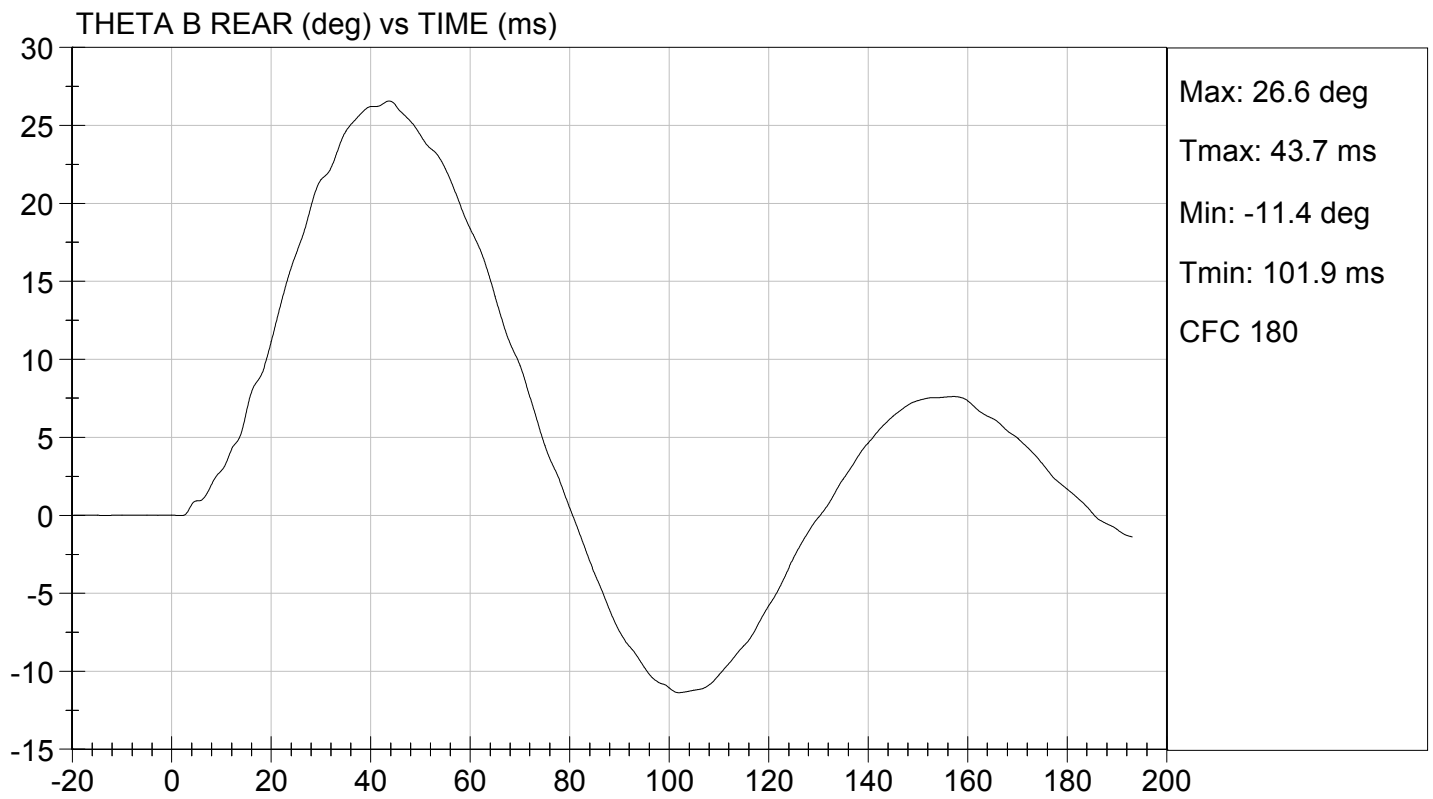
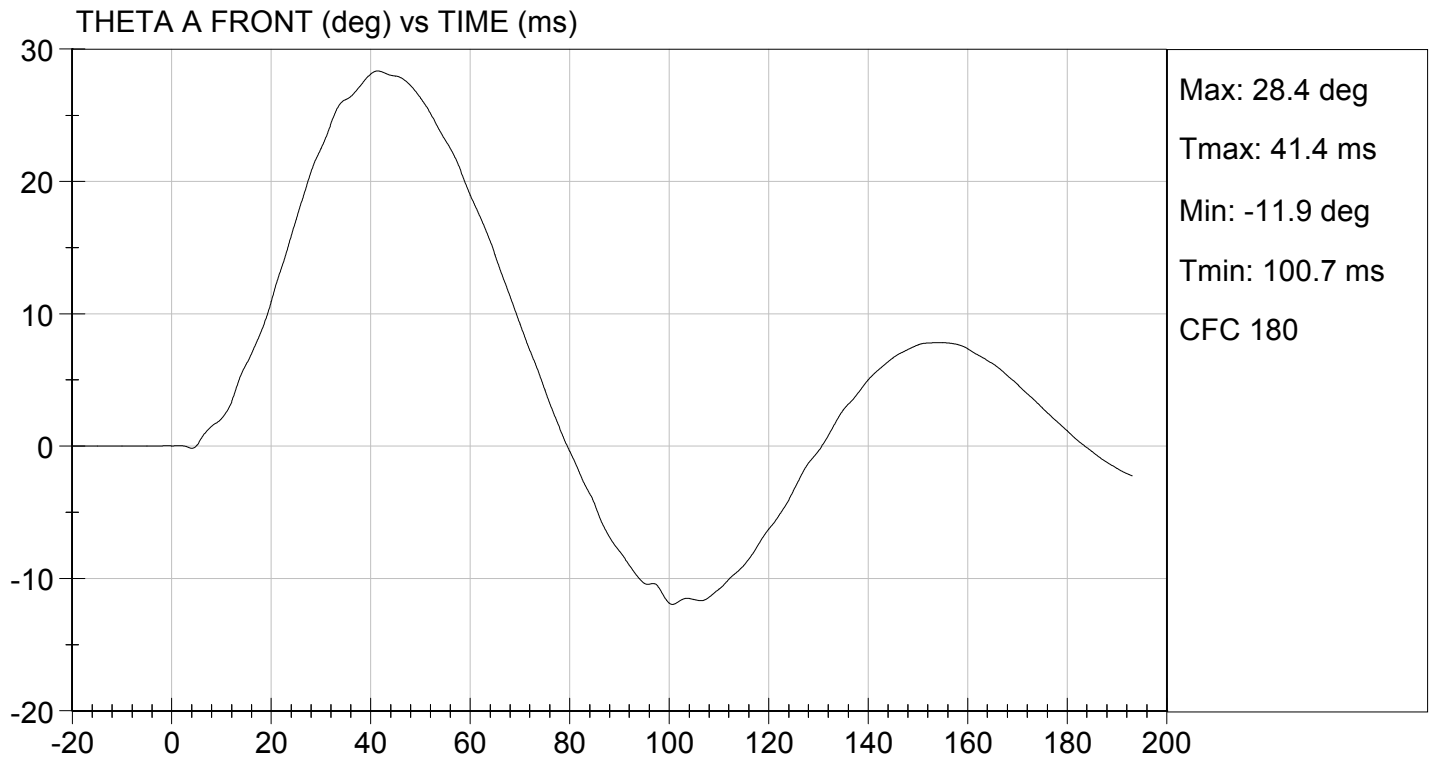
Tested Parameter	Units	Specification	Result	Pass/Fail	
Laboratory Temperature	deg C	20.6 to 22.2	22.0	Pass	
Laboratory Relative Humidity	%	10 to 70	28	Pass	
Pendulum Speed	m/s	5.95 to 6.15	6.12	Pass	
Pendulum Velocity	1 ms	m/s	-0.05 to 0.00	-0.00	Pass
	3.7 ms	m/s	-0.425 to -0.24	-0.401	Pass
	27 ms	m/s	-6.50 to -5.80	-5.89	Pass
	30 ms	m/s	>= -6.50	-5.80	Pass
Maximum Flexion Angle	deg	45.0 to 55.0	46.3	Pass	
Time of Maximum Flexion Angle	ms	39.0 to 53.0	41.4	Pass	
Headform Rotation Decay to Initial Position	ms	37 to 57	44	Pass	
<b>Overall Results</b>				<b>Pass</b>	

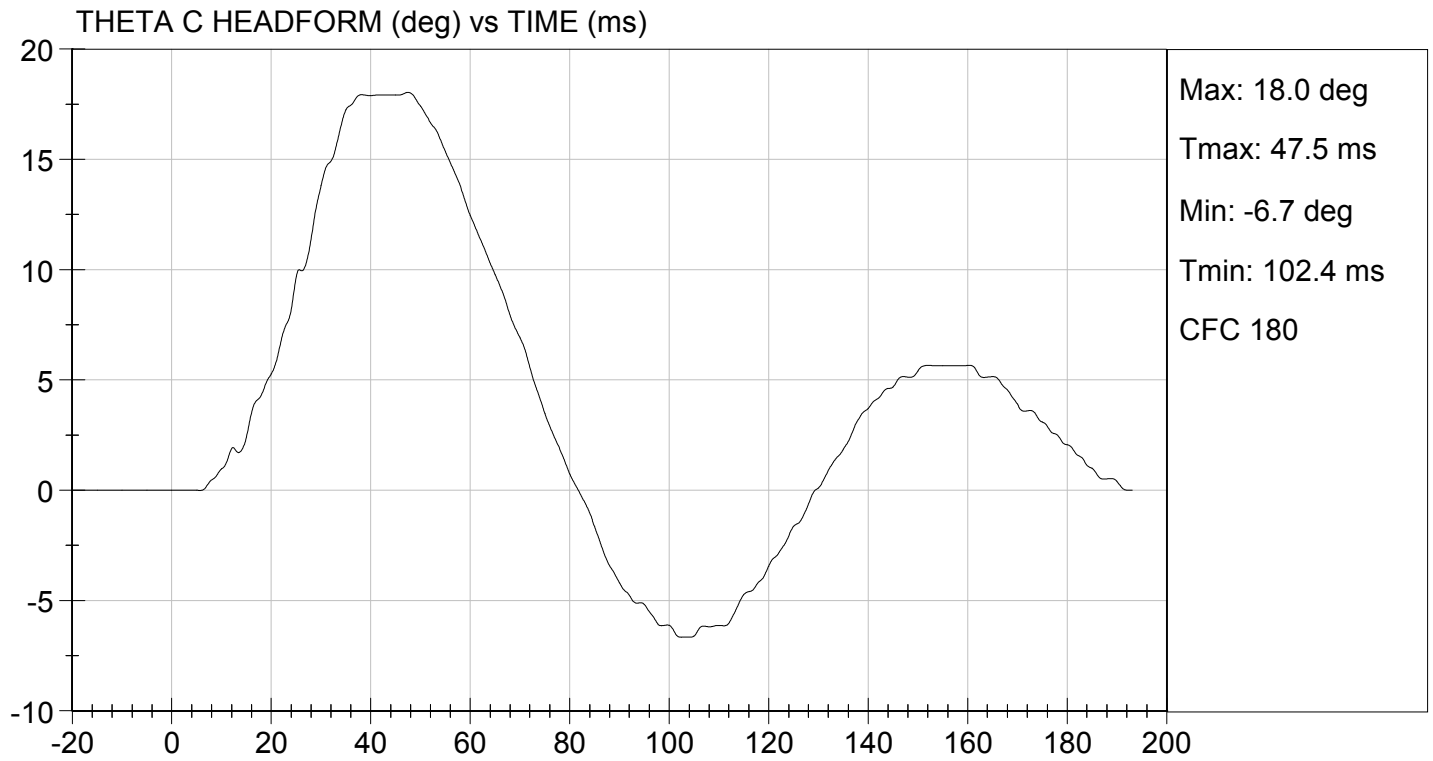
  
 Laboratory Technician

11/12/2012  
 Test Date

  
 Approved By







MGA RESEARCH CORPORATION

PELVIS TEST  
ES-2re DUMMY

ATD Serial No: 032

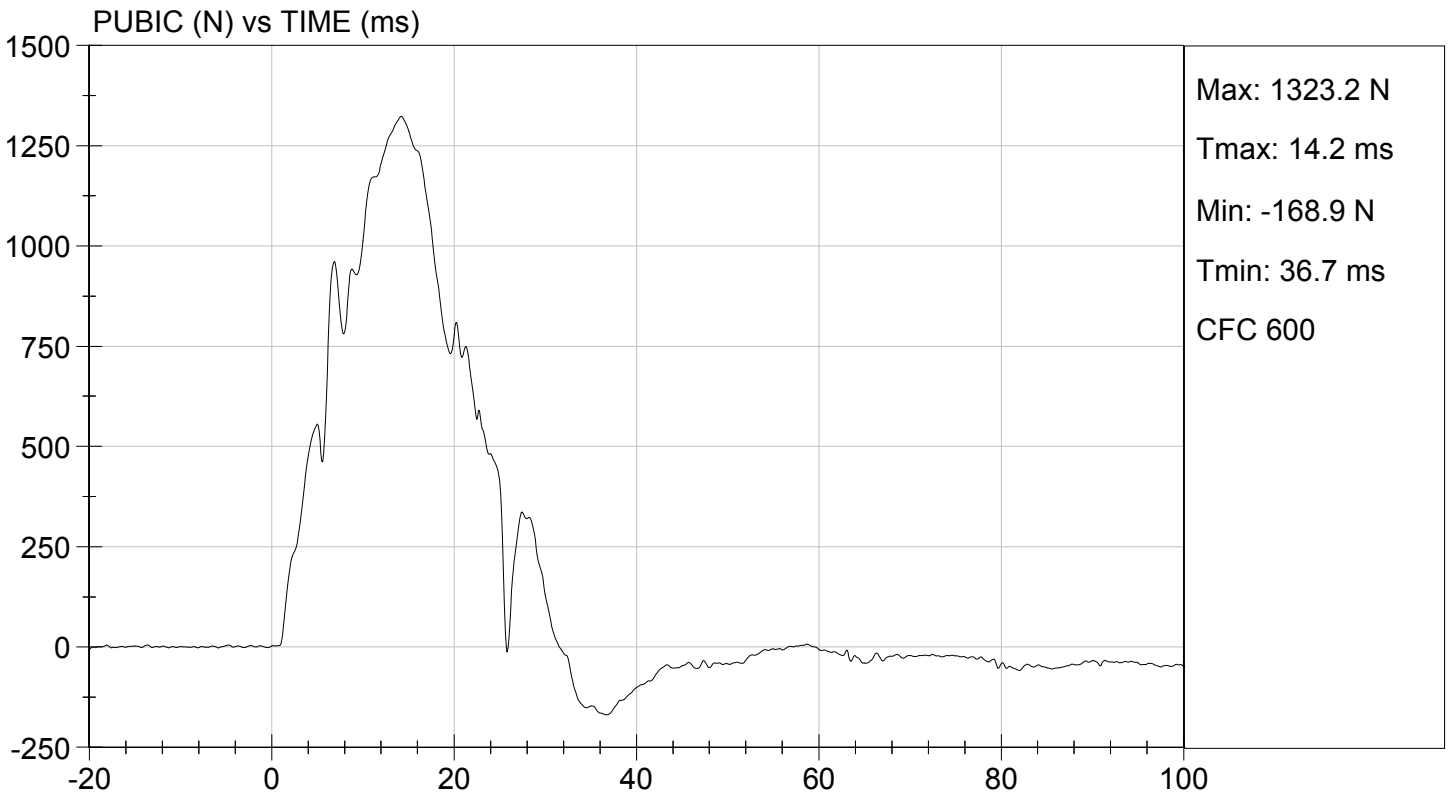
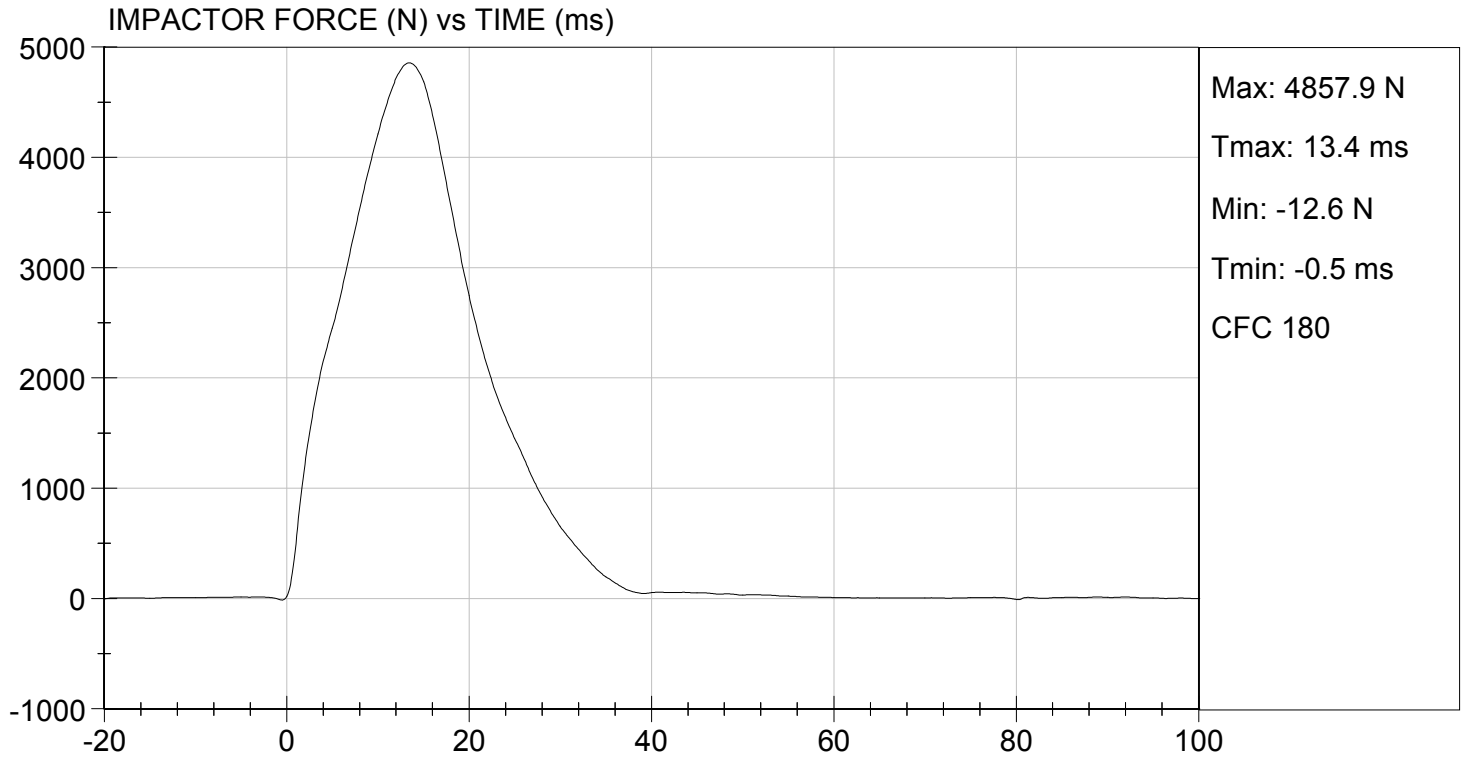
Test I.D: D124339

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	25	Pass
Probe Speed	m/s	4.20 to 4.40	4.30	Pass
Maximum Impactor Force	N	4700 to 5400	4858	Pass
Time of Maximum Impactor Force	ms	11.8 to 16.1	13.4	Pass
Maximum Pubic Force	N	1230 to 1590	1323	Pass
Time of Maximum Pubic Force	ms	12.2 to 17.0	14.2	Pass
Overall Test Results				Pass

  
Laboratory Technician

11/12/2012  
Test Date

  
Approved By



**SID-IIsD External Measurements**  
**SN: 296**

<b>No.</b>	<b>Name</b>	<b>Spec. (mm)</b>	<b>Result</b>	<b>Pass/Fail</b>
<b>A</b>	Sitting Height	772 - 788	784	Pass
<b>B</b>	Shoulder Pivot Height	437 - 453	442	Pass
<b>C</b>	H-point Height	79 - 89	83	Pass
<b>D</b>	H-point from Seatback	141 - 151	145	Pass
<b>E</b>	Shoulder Pivot from Backline	97 - 107	99	Pass
<b>F</b>	Thigh Clearance	119 - 135	121	Pass
<b>G</b>	Head Breadth	140 - 148	142	Pass
<b>H</b>	Head Back from Backline	40 - 46	45	Pass
<b>I</b>	Head Depth	178 - 188	180	Pass
<b>J</b>	Head Circumference	541 - 551	548	Pass
<b>K</b>	Buttock to Knee Length	514 - 540	535	Pass
<b>L</b>	Popliteal Height	343 - 369	358	Pass
<b>M</b>	Knee Pivot to Floor Height	392 - 409	404	Pass
<b>N</b>	Buttock Popliteal Length	416 - 442	435	Pass
<b>O</b>	Chest Depth w/o Jacket	195 - 211	206	Pass
<b>P</b>	Foot Length	216 - 232	219	Pass
<b>Q</b>	Hip Breadth (w/ pelvic plugs)	313 - 323	316	Pass
<b>R</b>	Arm Length	249 - 259	250	Pass
<b>S</b>	Knee Joint to Seatback	477 - 493	481	Pass
<b>V</b>	Shoulder Width	341 - 357	346	Pass
<b>W</b>	Foot Width	78 - 94	85	Pass
<b>Y</b>	Chest Circumference w/ jacket	851 - 881	870	Pass
<b>Z</b>	Waist Circumference	761 - 791	772	Pass

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

ATD Serial No: 296

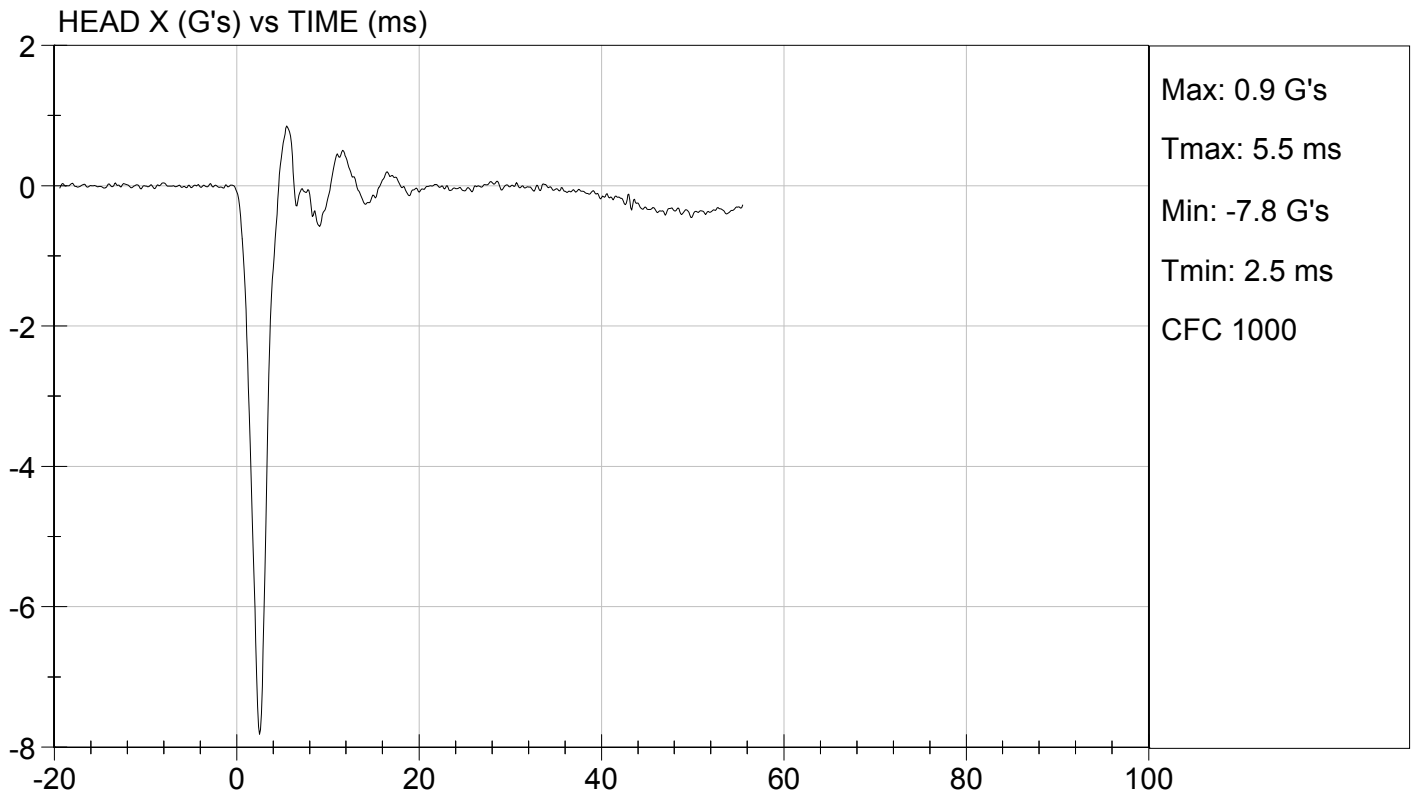
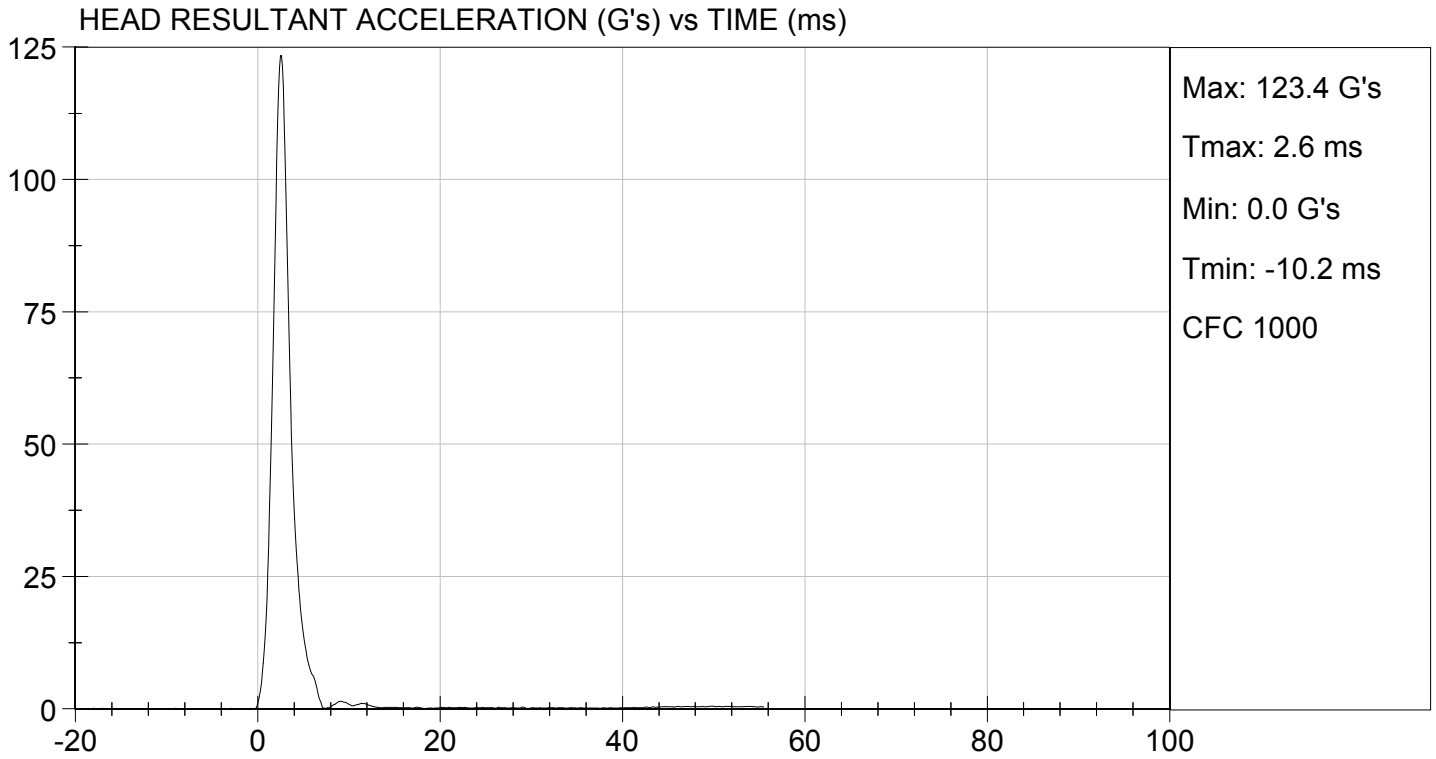
Test ID: D124091

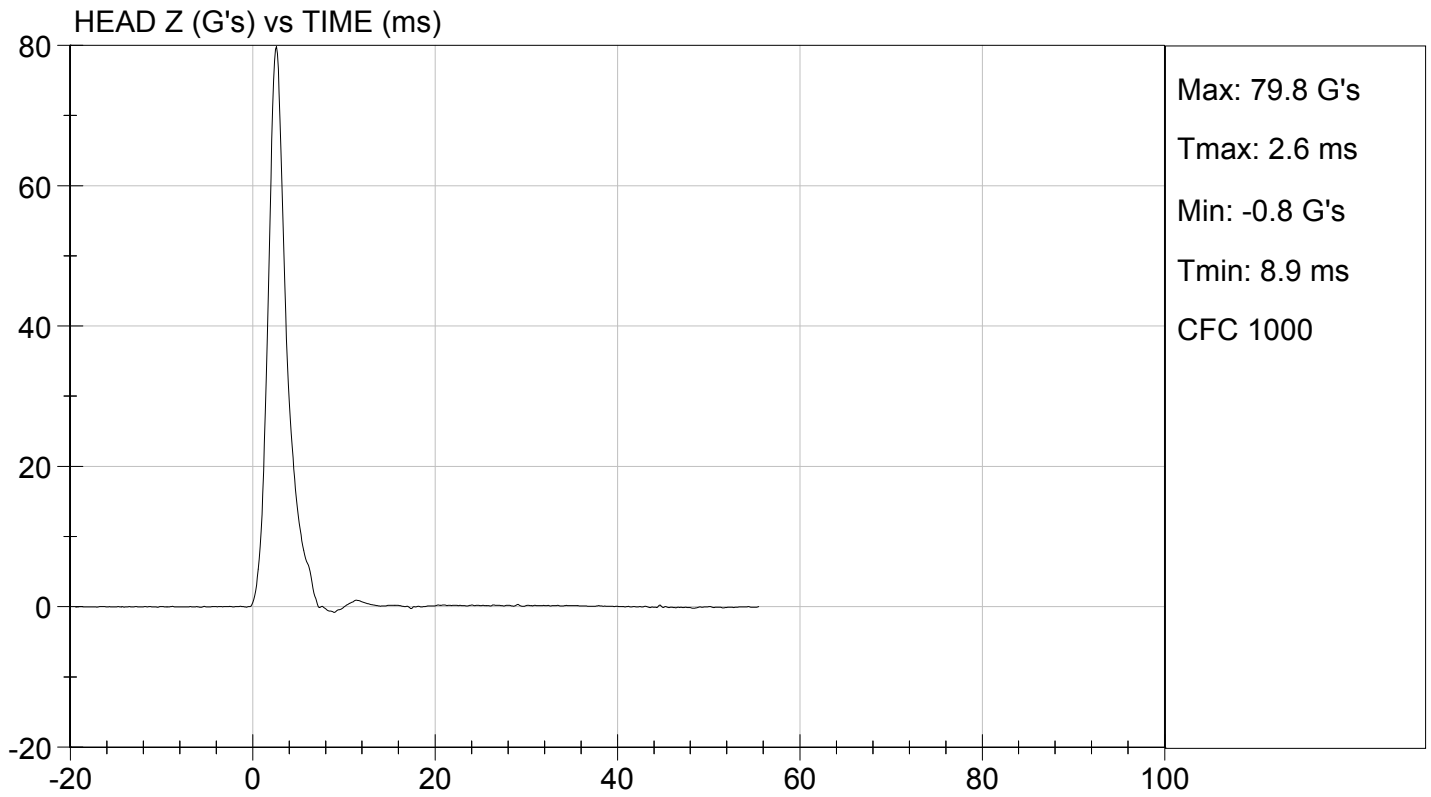
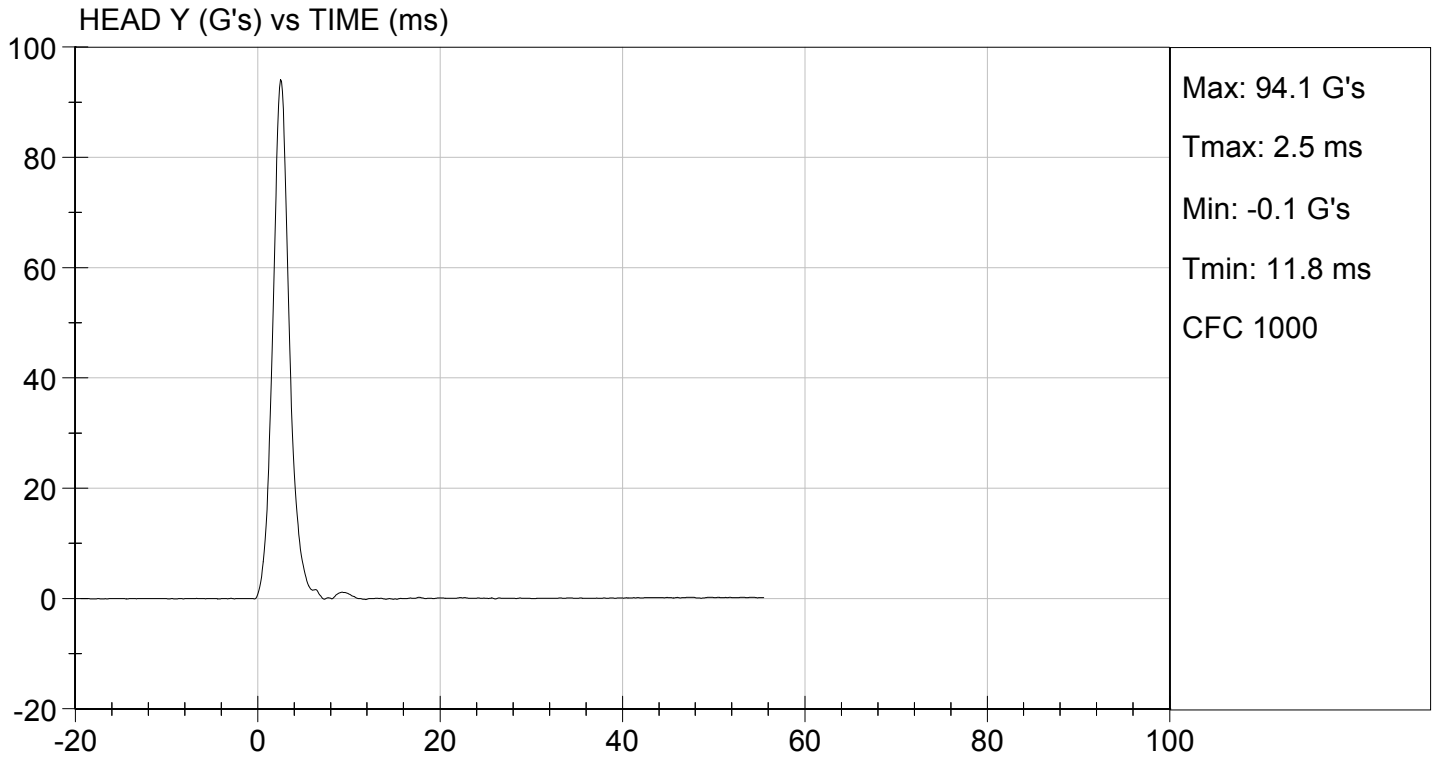
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	28	Pass
Peak Resultant Acceleration	G's	115 to 137	123	Pass
Peak Longitudinal Acceleration	G's	+/- 15	-7.8	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	<15%	Yes	Pass
Overall Test Results				Pass

Jessica Hall  
Laboratory Technician

10/26/2012  
Test Date

David Winkelbauer  
Approved By





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

**ATD Serial No:** 296

**Test I.D.:** D124092

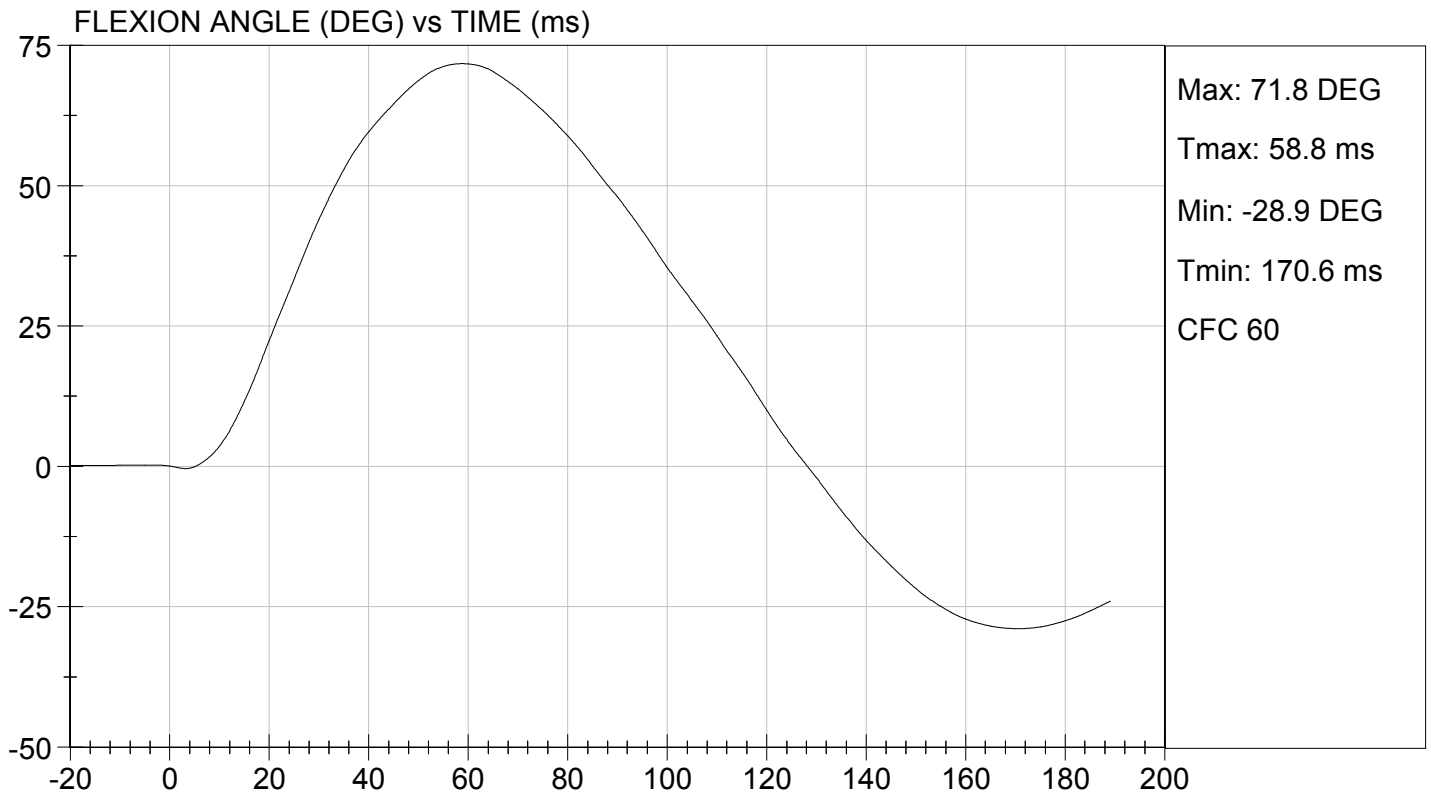
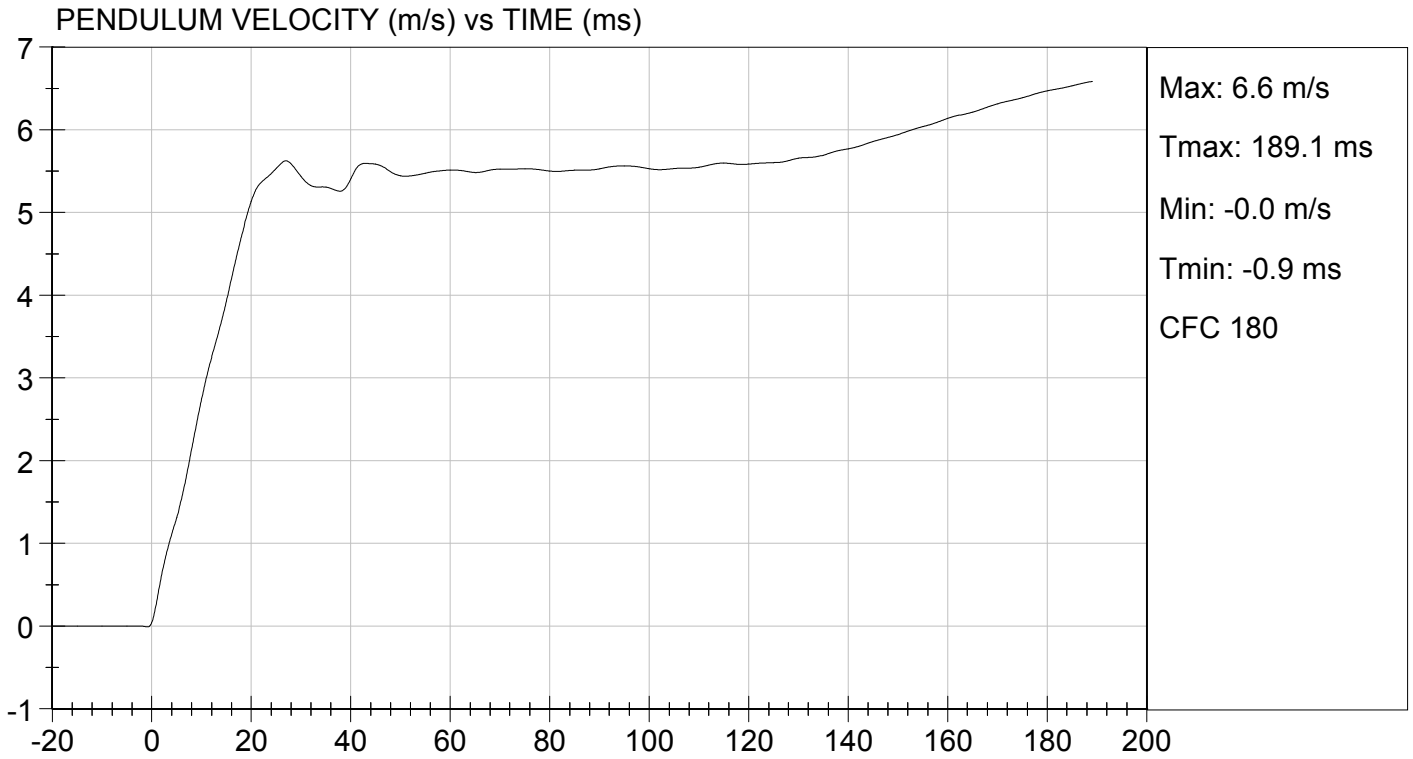
Tested Parameter	Units	Specification	Result	Pass/Fail	
Temperature	deg C	20.6 to 22.2	22.0	Pass	
Humidity	%	10 to 70	29	Pass	
Impact Velocity	m/s	5.51 to 5.63	5.58	Pass	
Pendulum Velocity	10 ms	m/s	2.20 to 2.80	2.75	Pass
	15 ms	m/s	3.30 to 4.10	3.93	Pass
	20 ms	m/s	4.40 to 5.40	5.13	Pass
	25 ms	m/s	5.40 to 6.10	5.53	Pass
	25-100 ms	m/s	5.50 to 6.20	5.62	Pass
Maximum D-Plane Rotation	deg	71 to 81	72	Pass	
Time of Maximum D-Plane Rotation	ms	50 to 70	59	Pass	
Maximum Occipital Condyle Moment	Nm	-44 to -36	-42	Pass	
Time of Moment Decay to 0 Nm	ms	102 to 126	113	Pass	
<b>Overall Test Results</b>				<b>Pass</b>	

Jessica Gall  
Laboratory Technician

10/26/2012

Test Date

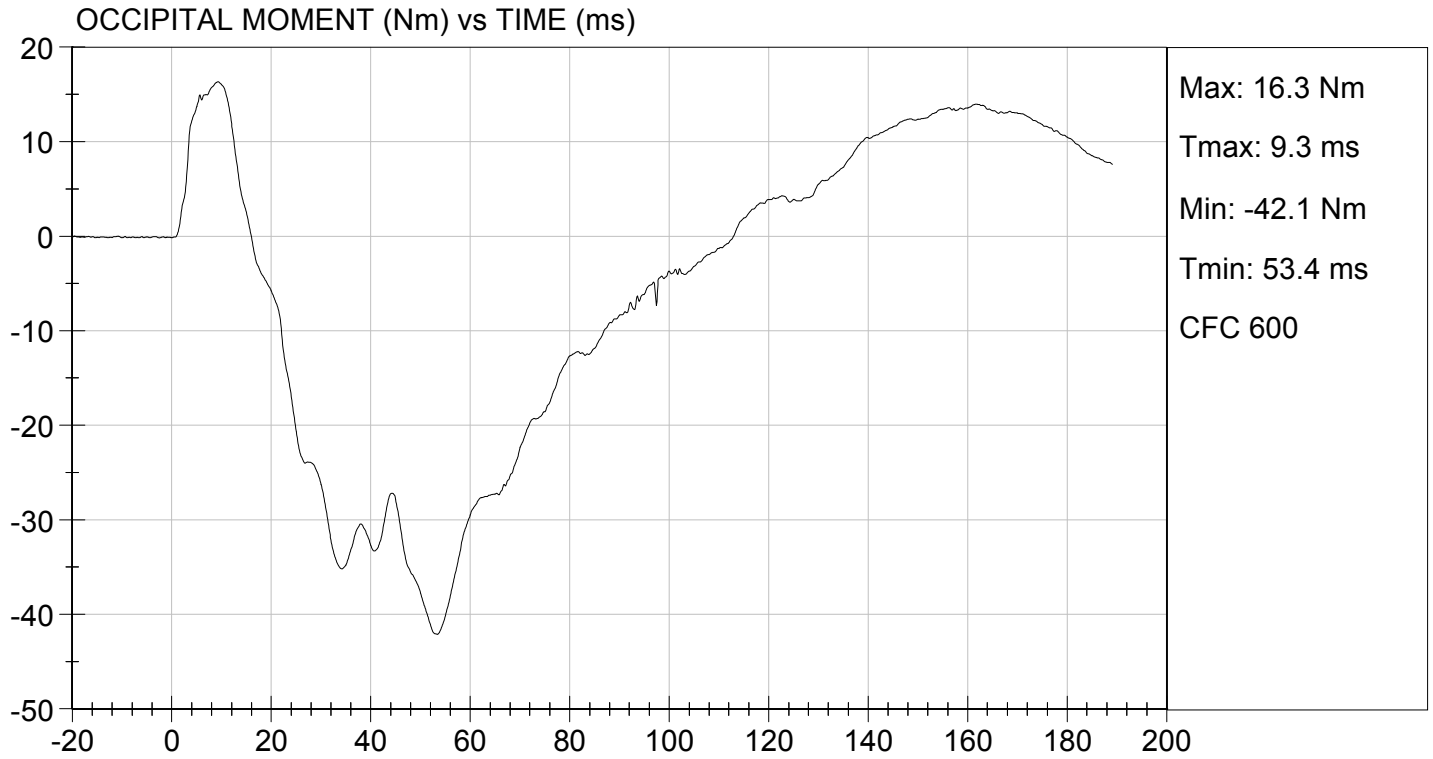
David Winkelbauer  
Approved By





TEST DESC: NECK BENDING  
VELOCITY: 18.31 ft/s, 5.58 m/s

TEST DATE: 10/26/2012  
TEST #: D124092



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

ATD Serial No: 296

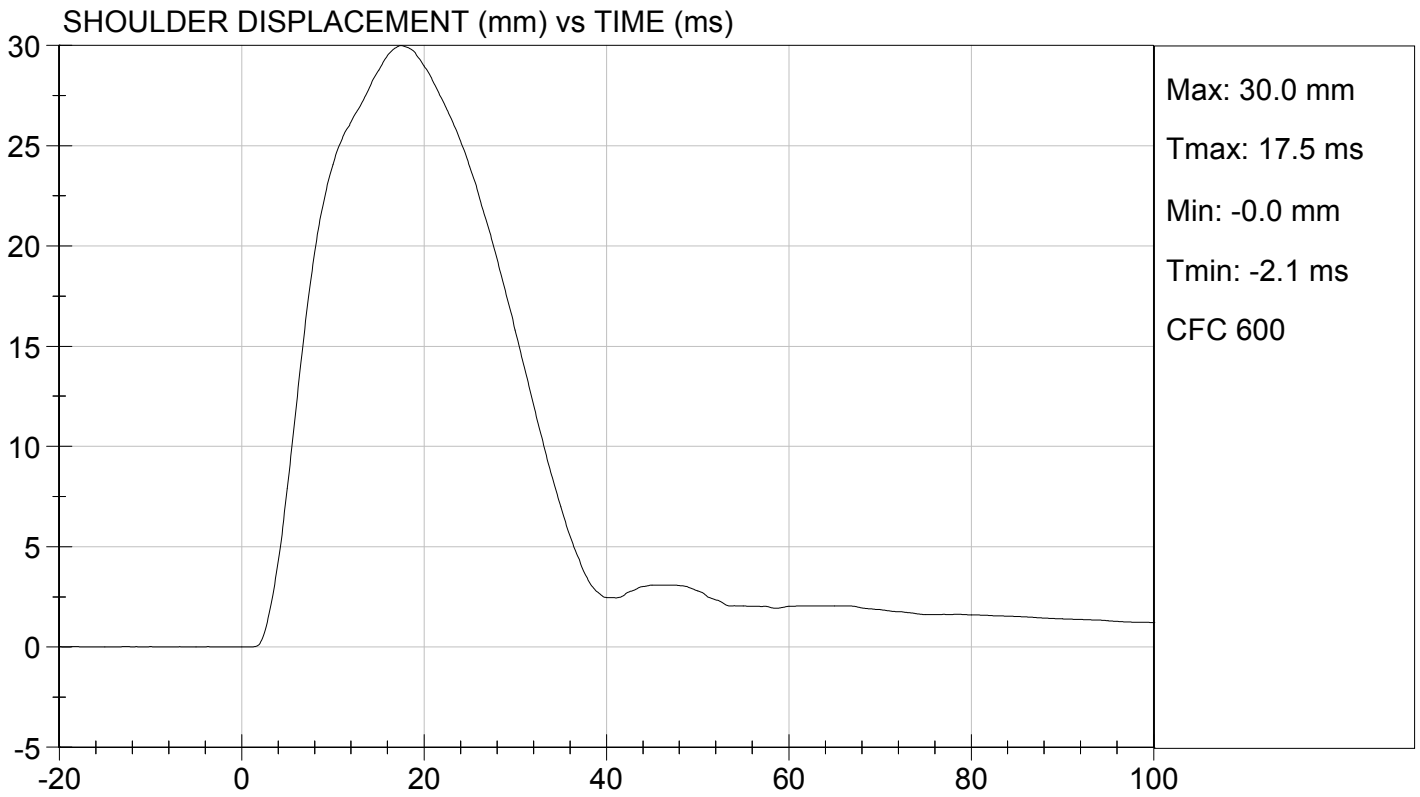
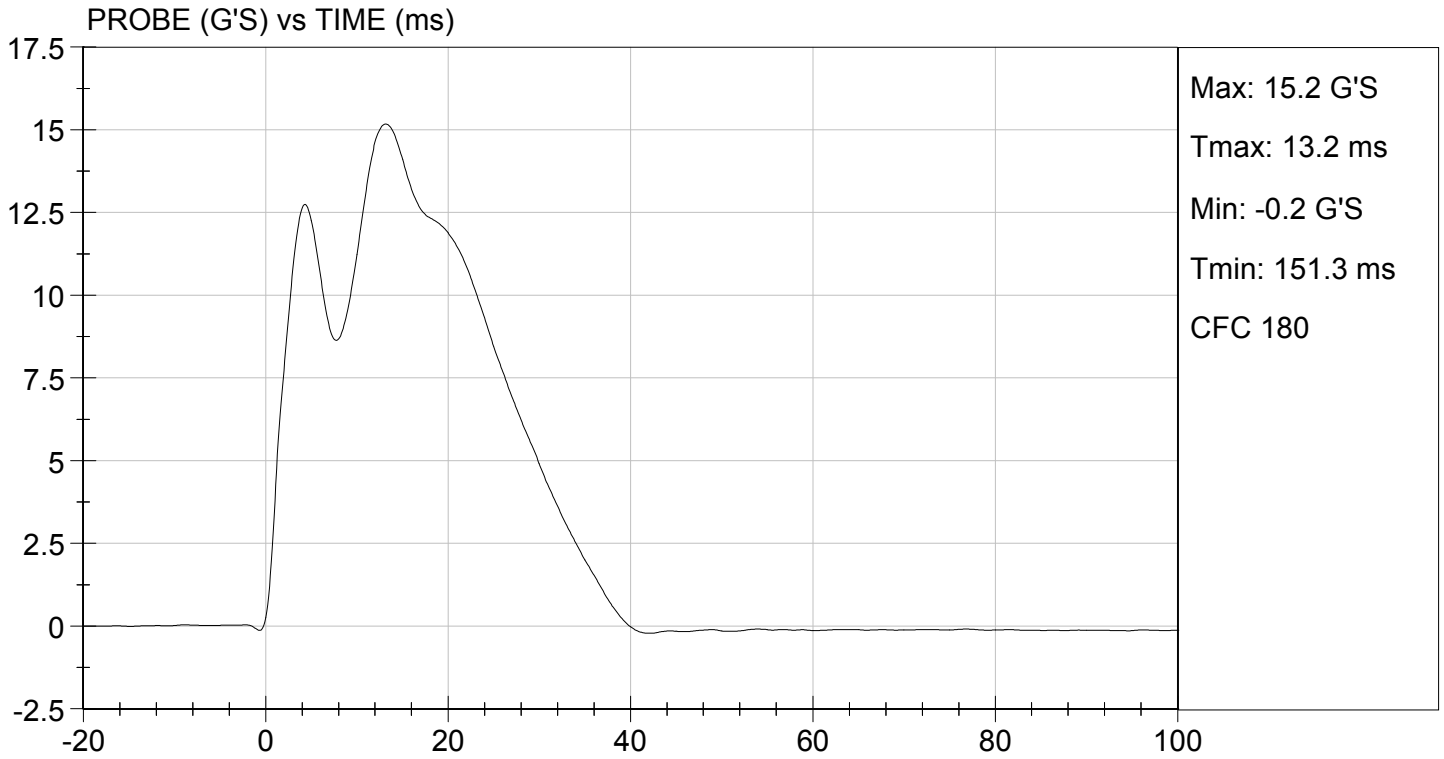
Test ID: D124093

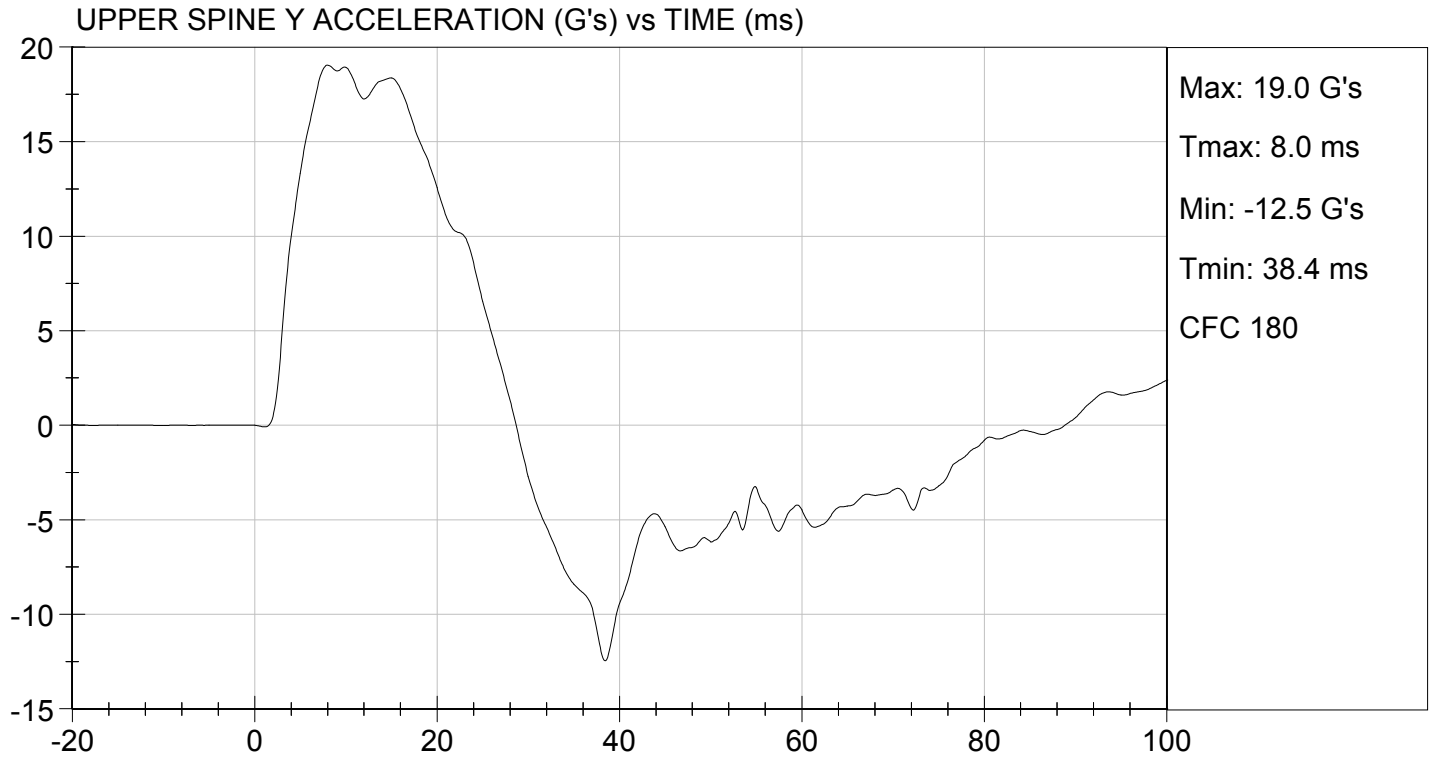
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	20.8	Pass
Laboratory Relative Humidity	%	10 to 70	28	Pass
Impact Velocity	m/s	4.20 to 4.40	4.34	Pass
Maximum Probe Acceleration	G's	13 to 18	15	Pass
Shoulder Displacement	mm	28 to 37	30	Pass
Upper Spine (T1) Y Acceleration	G's	17 to 22	19	Pass
Overall Test Results				Pass

Jessica Gall  
Laboratory Technician

10/29/2012  
Test Date

David Winkelbauer  
Approved By





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

ATD Serial No: 296

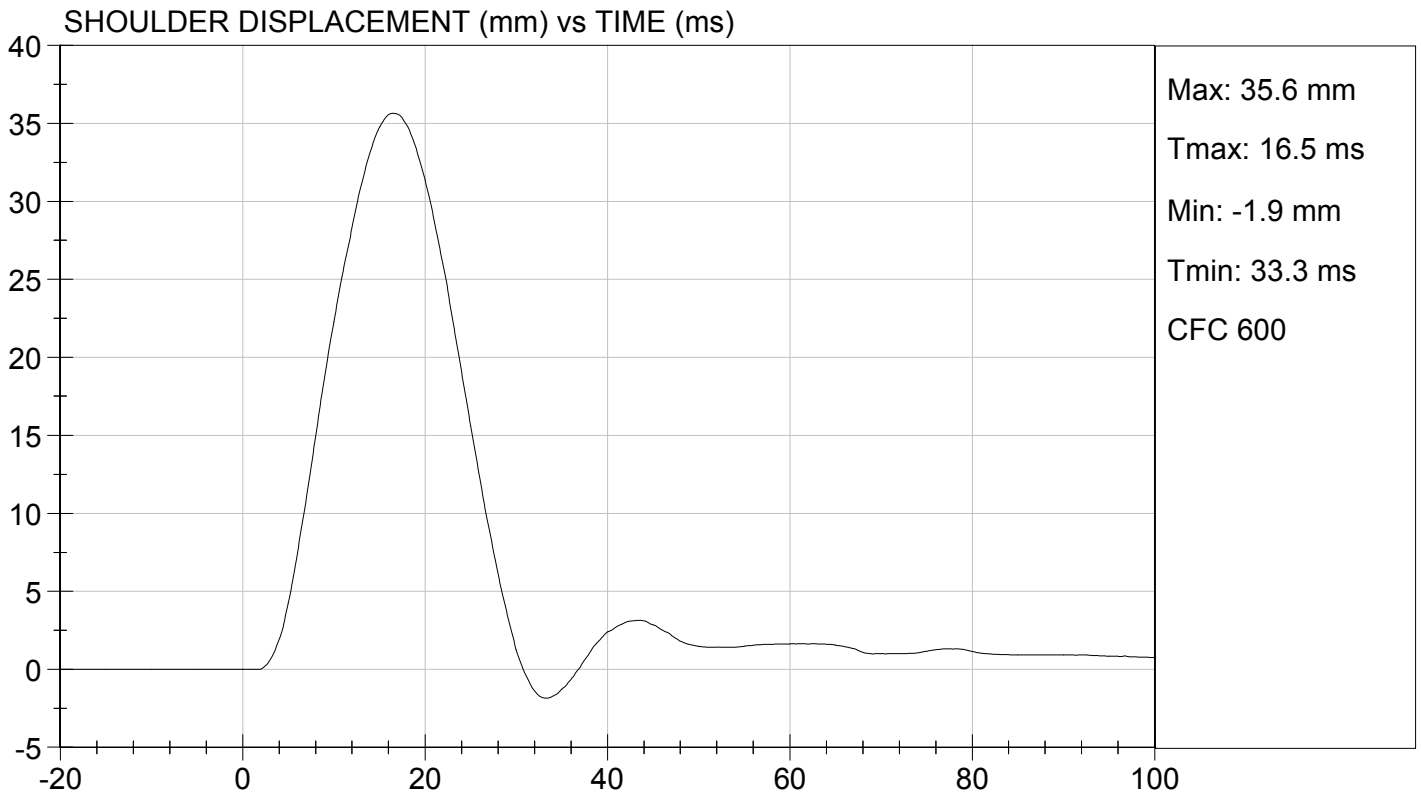
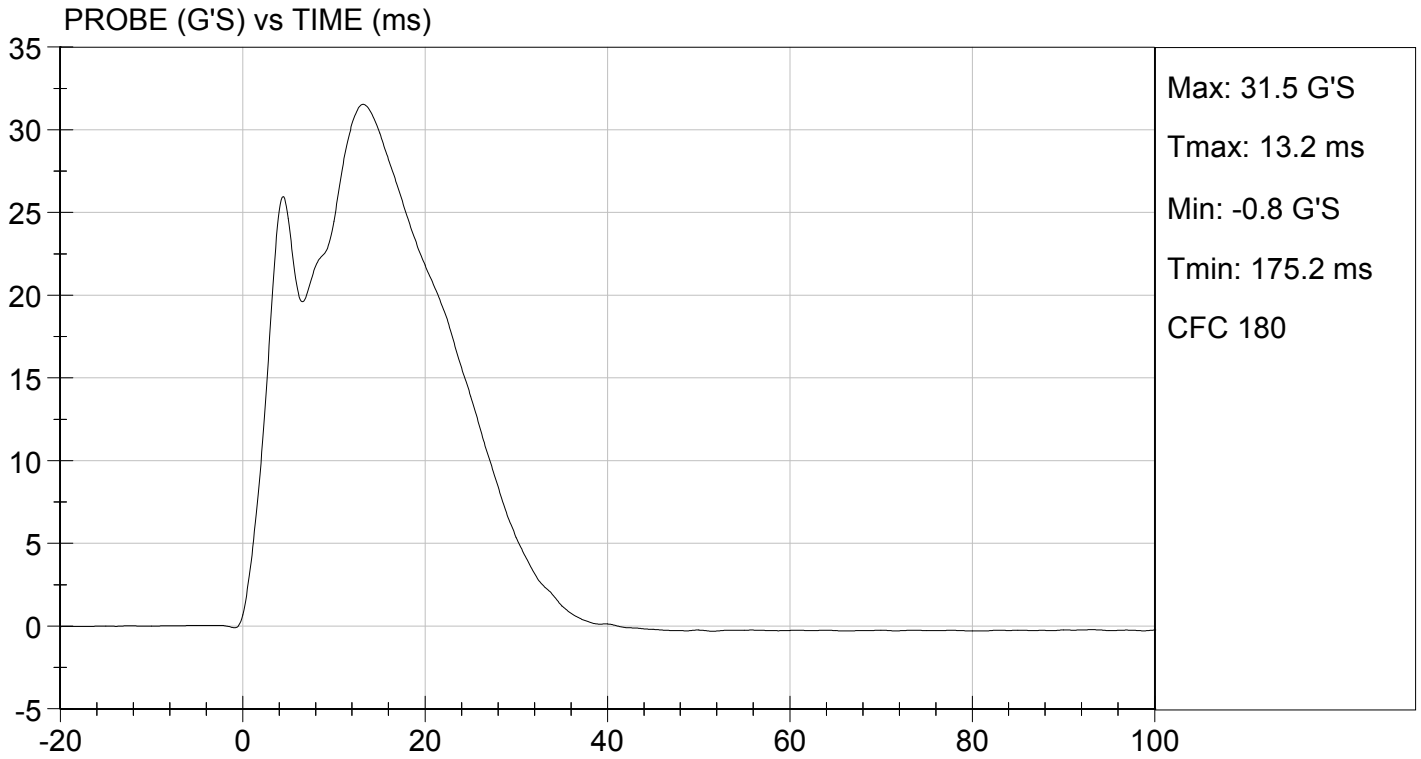
Test I.D: D124094

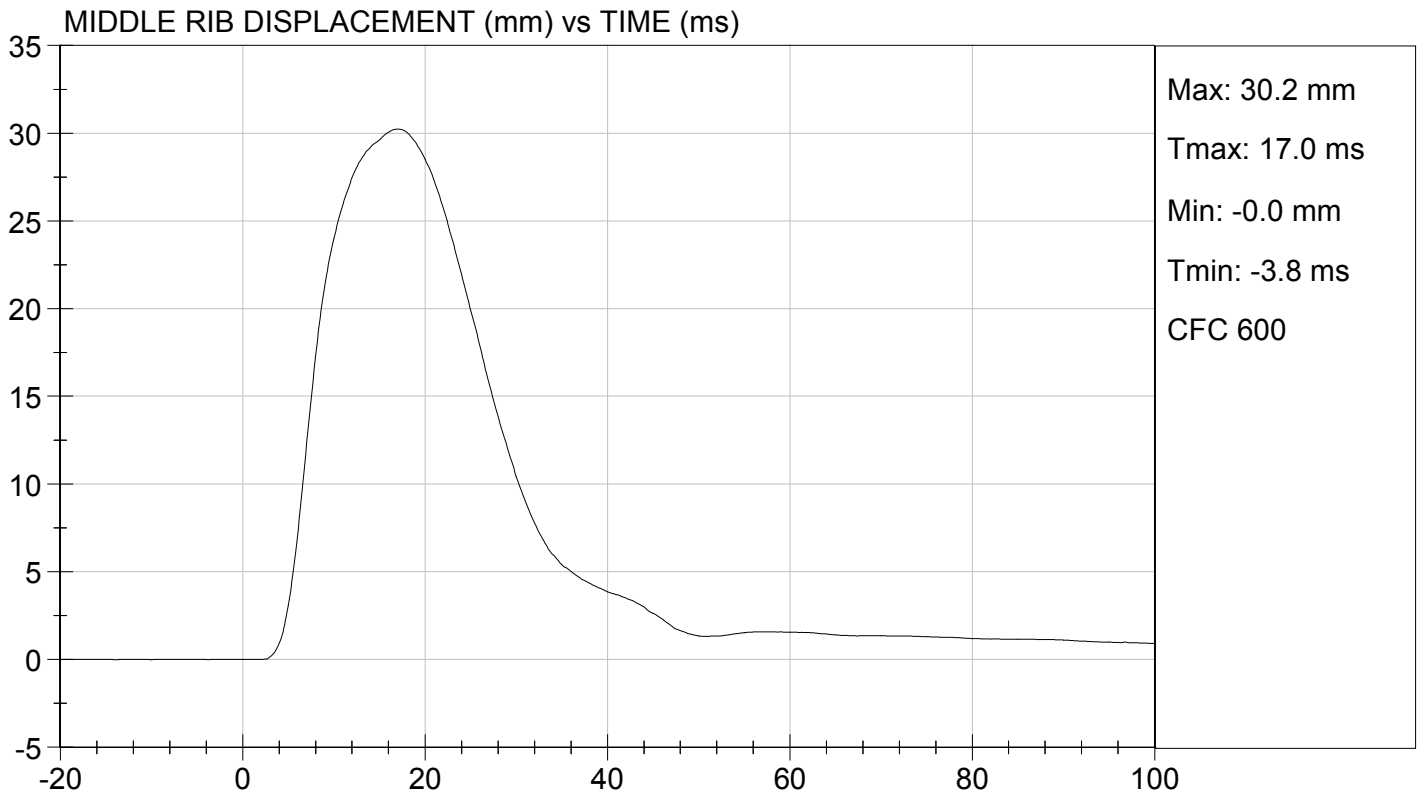
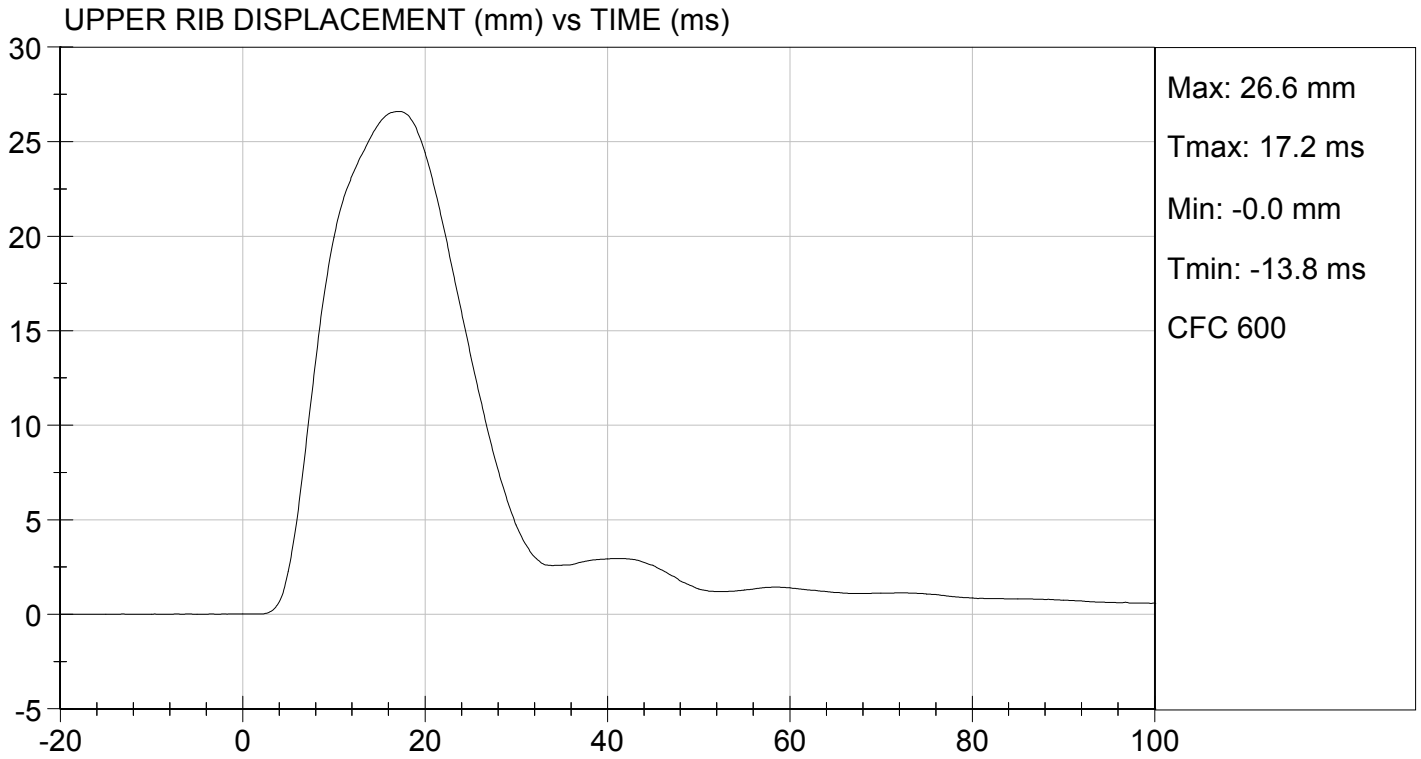
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	20.8	Pass
Humidity	%	10 to 70	28	Pass
Impact Velocity	m/s	6.60 to 6.80	6.77	Pass
Maximum Probe Acceleration	G's	30 to 36	32	Pass
Shoulder Displacement	mm	31 to 40	36	Pass
Upper Rib Displacement	mm	25 to 32	27	Pass
Middle Rib Displacement	mm	30 to 36	30	Pass
Lower Rib Displacement	mm	32 to 38	32	Pass
Upper Spine (T1) Y Acceleration	G's	34 to 43	38	Pass
Lower Spine (T12) Y Acceleration	G's	29 to 37	33	Pass
Overall Test Results				Pass

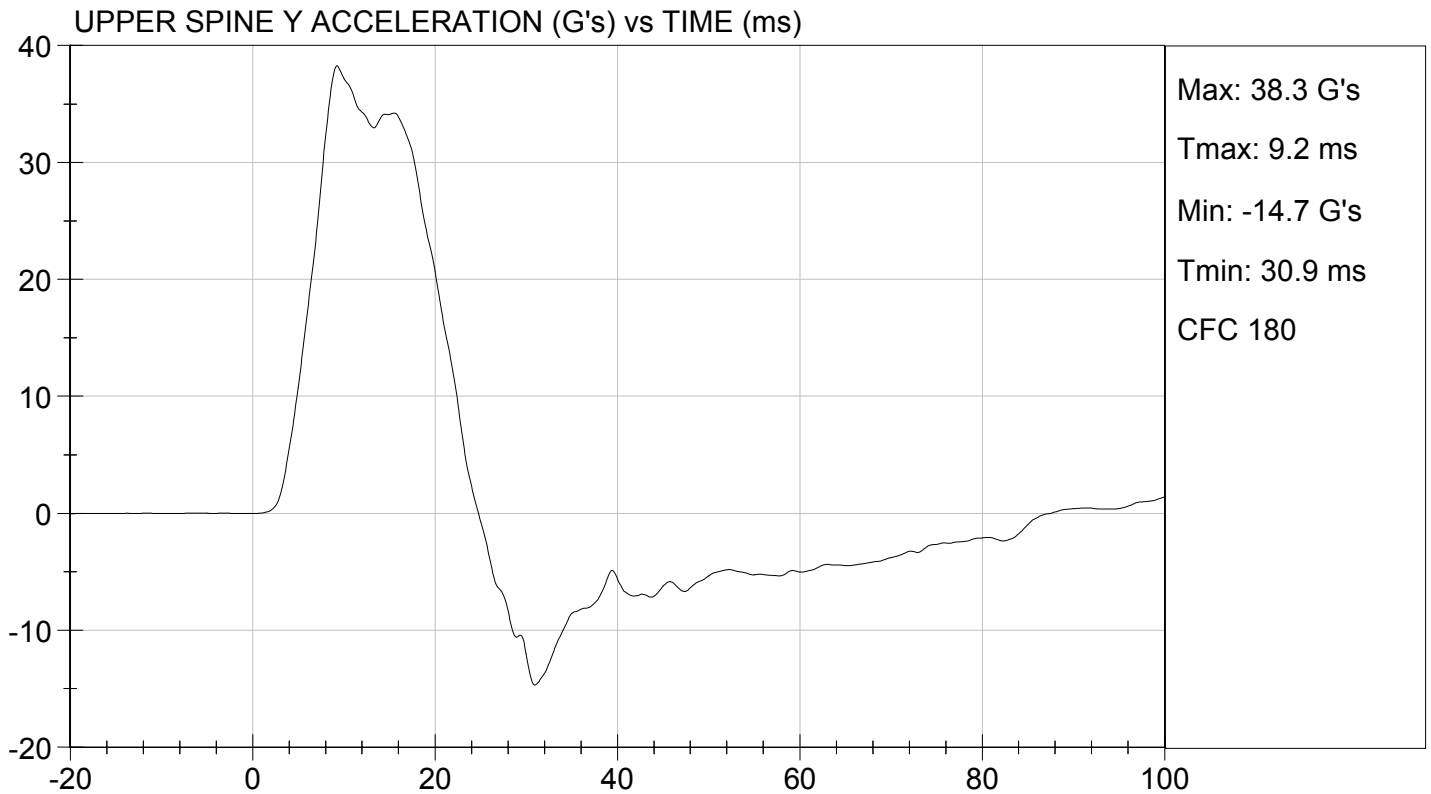
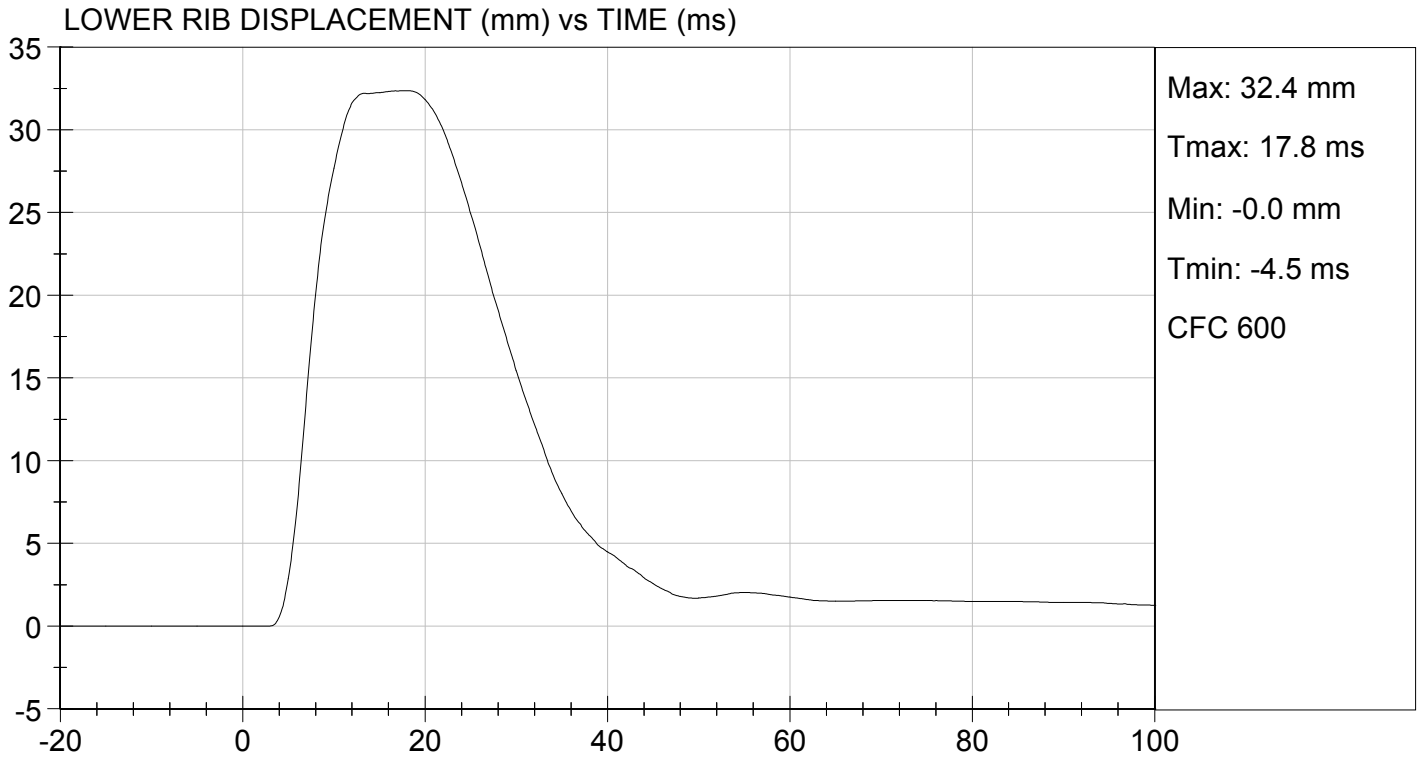
Jessica Hall  
Laboratory Technician

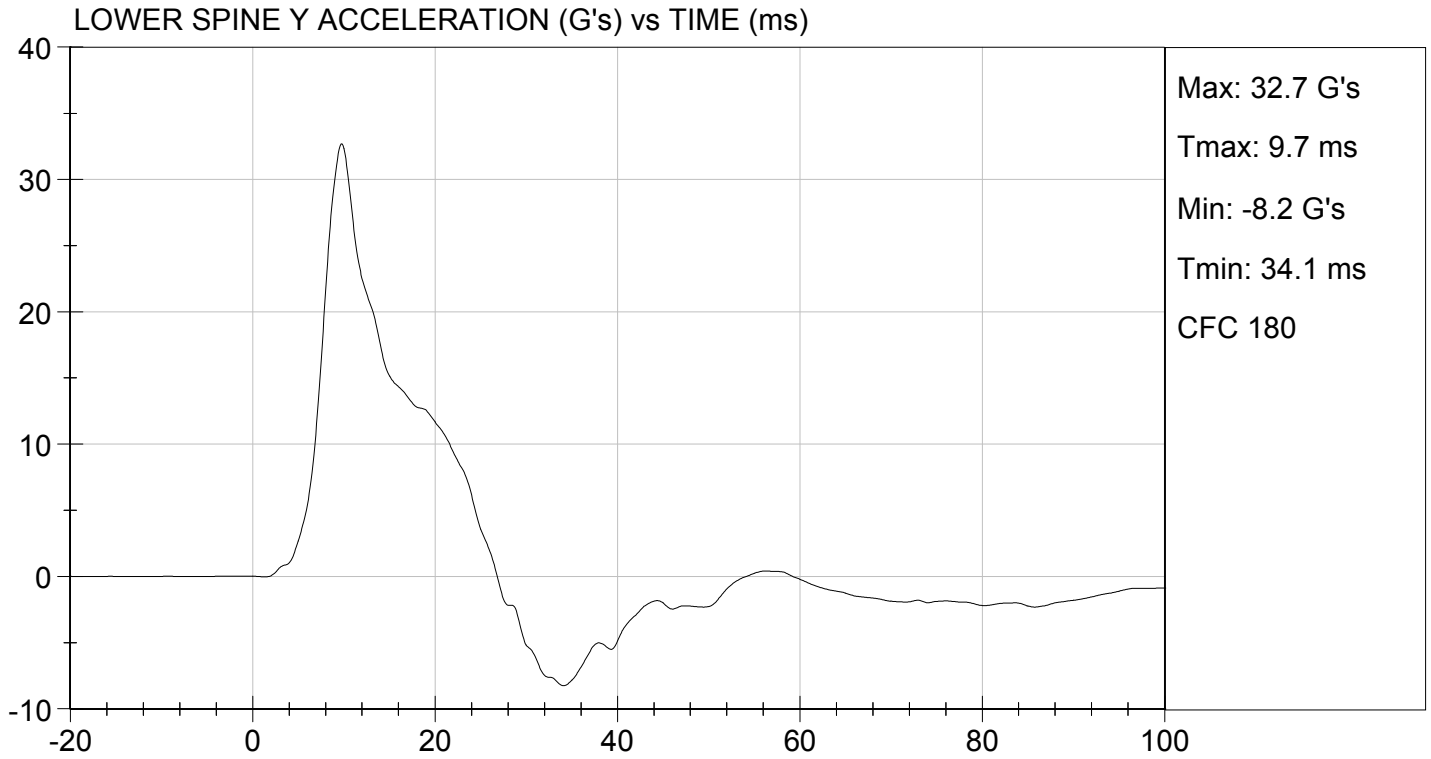
10/29/2012  
Test Date

David Winkelbauer  
Approved By









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


ATD Serial No: 296

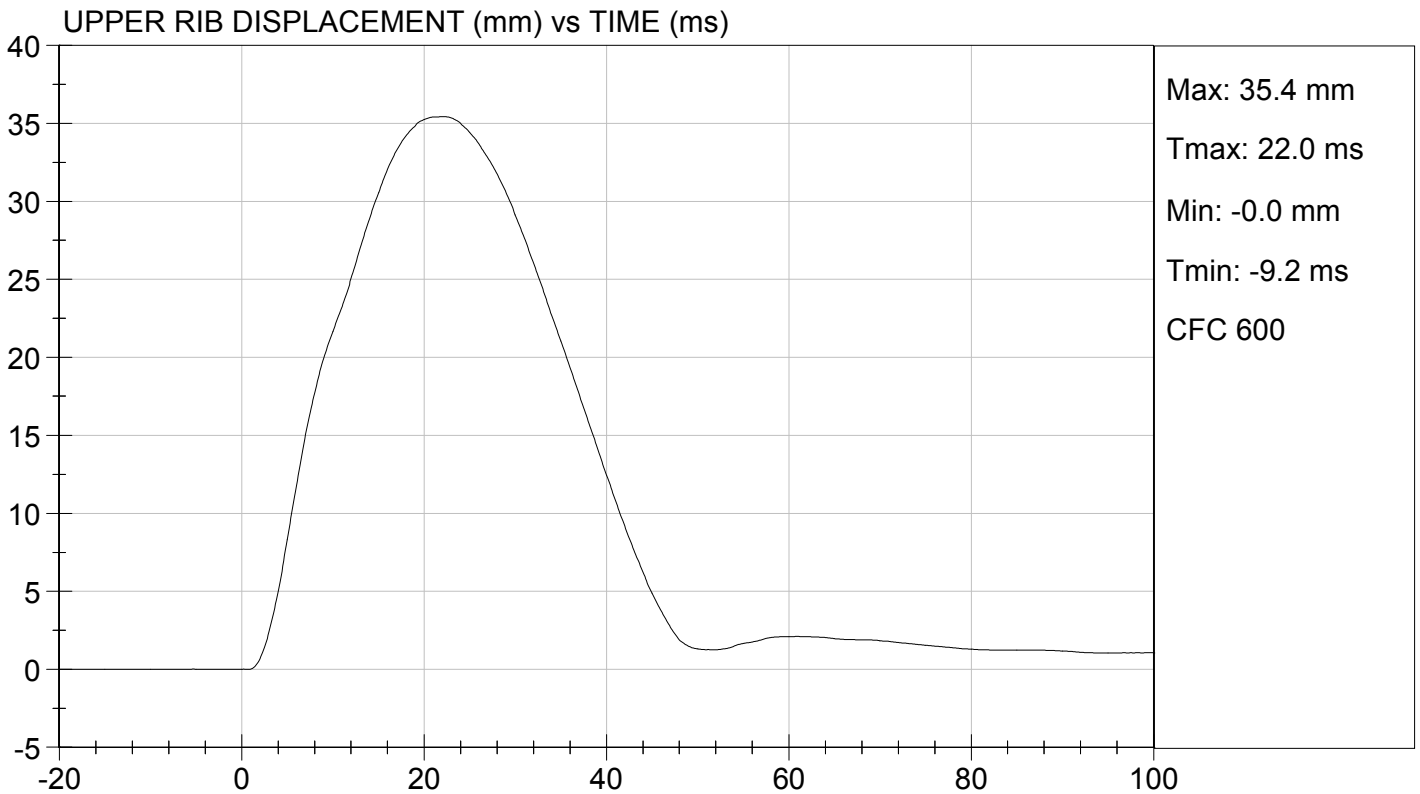
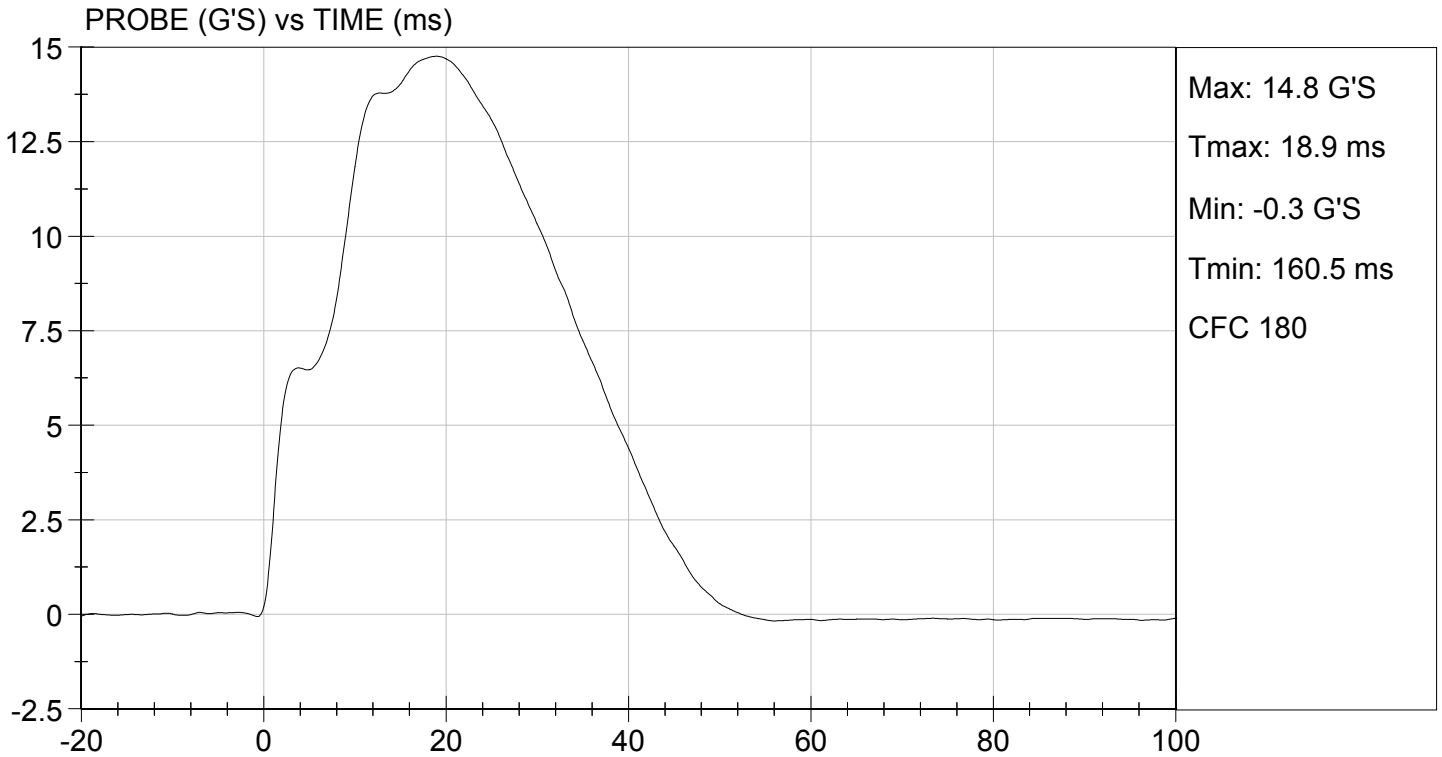
Test I.D: D124095

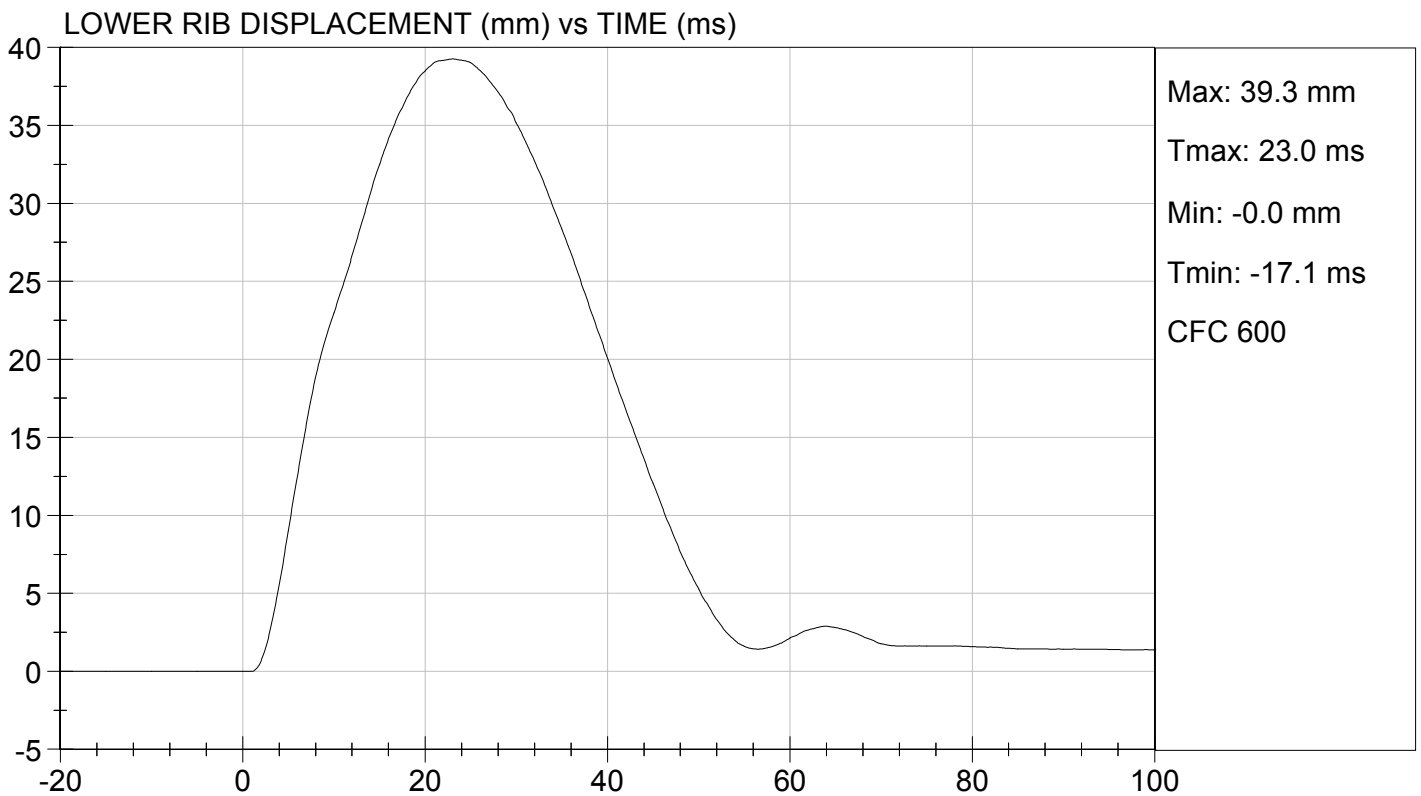
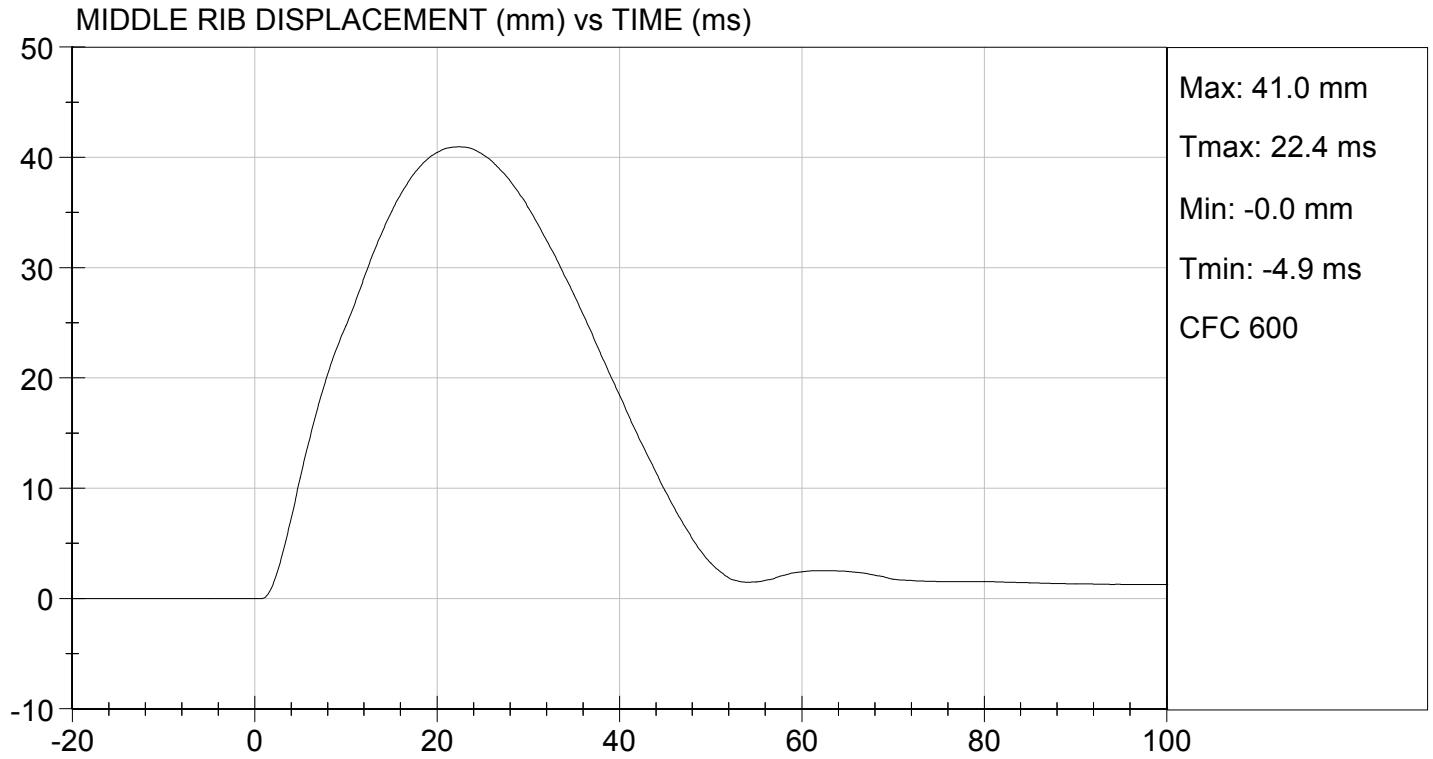
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	20.8	Pass
Humidity	%	10 to 70	28	Pass
Impact Velocity	m/s	4.20 to 4.40	4.38	Pass
Maximum Probe Acceleration	G's	14 to 18	15	Pass
Upper Rib Displacement	mm	32 to 40	35	Pass
Middle Rib Displacement	mm	39 to 45	41	Pass
Lower Rib Displacement	mm	35 to 43	39	Pass
Upper Spine (T1) Y Acceleration	G's	13 to 17	14	Pass
Lower Spine (T12) Y Acceleration	G's	7 to 11	8	Pass
<b>Overall Test Results</b>				<b>Pass</b>

  
 Laboratory Technician

10/29/2012  
 Test Date

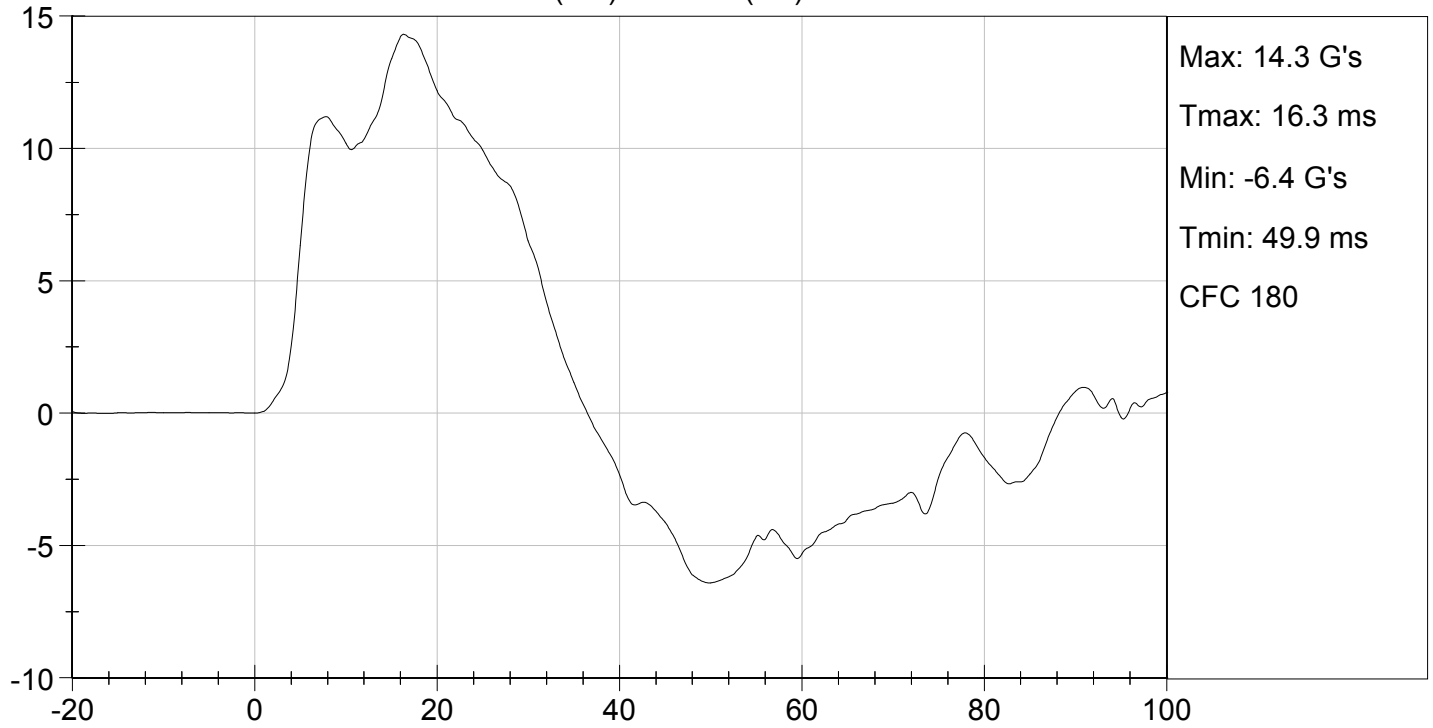
  
 Approved By



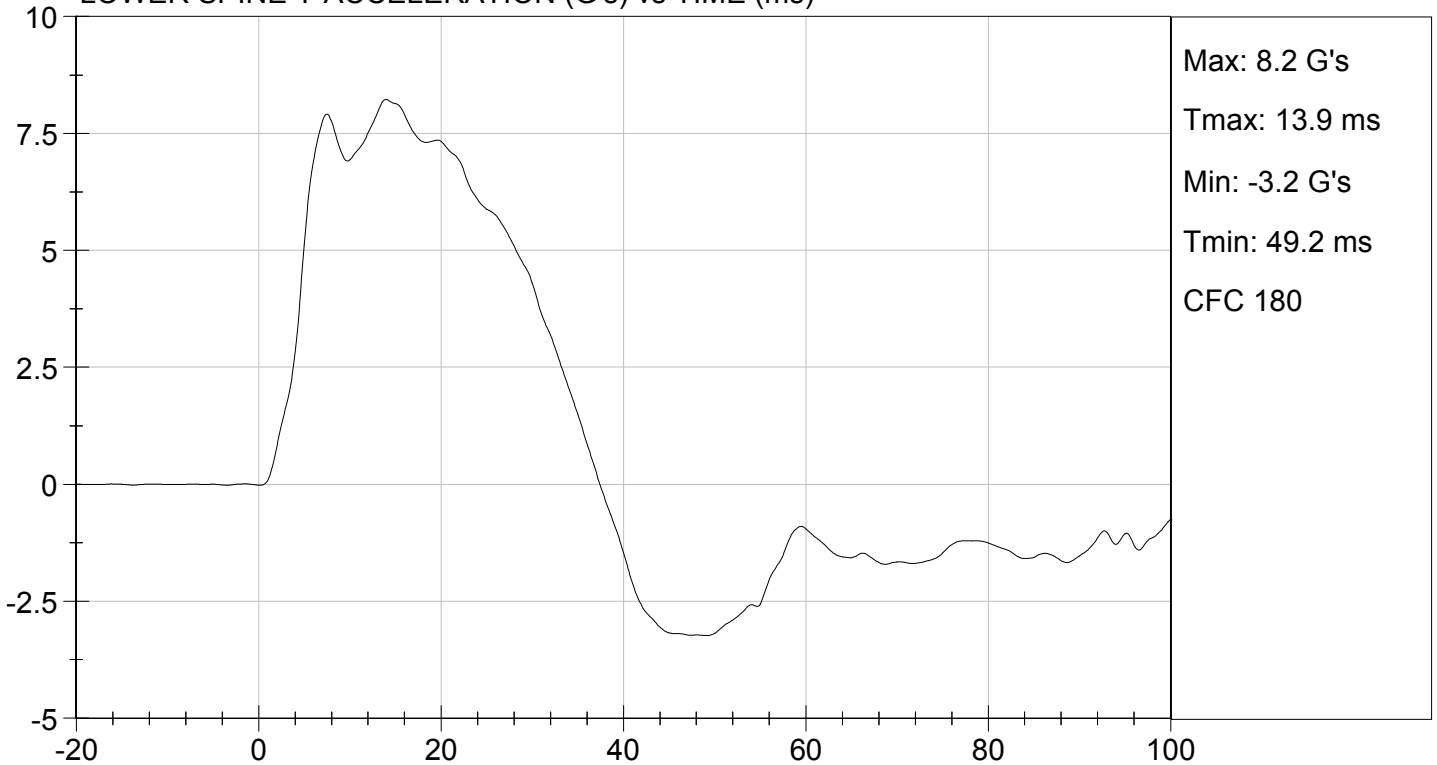




UPPER SPINE Y ACCELERATION (G's) vs TIME (ms)



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



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

ATD Serial No: 296

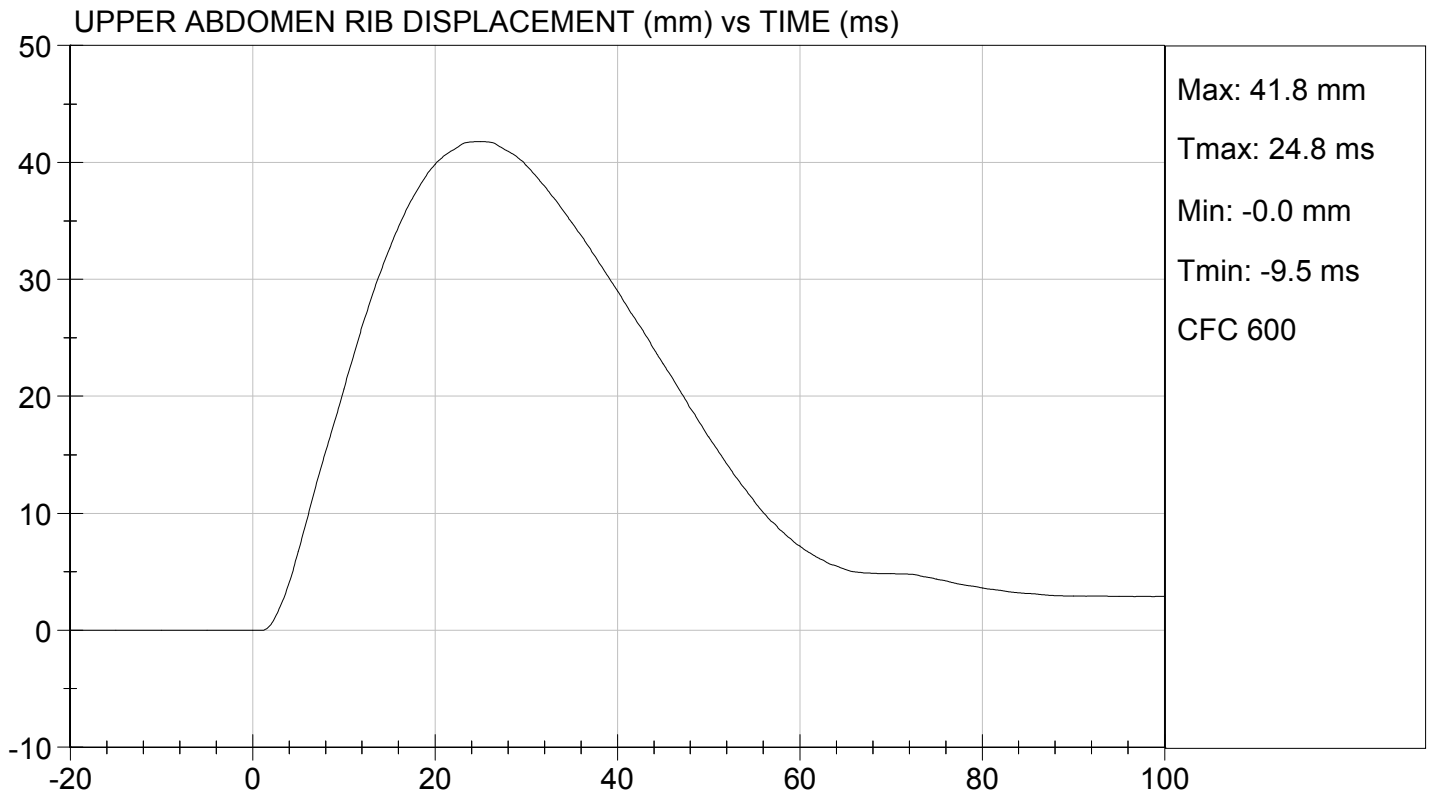
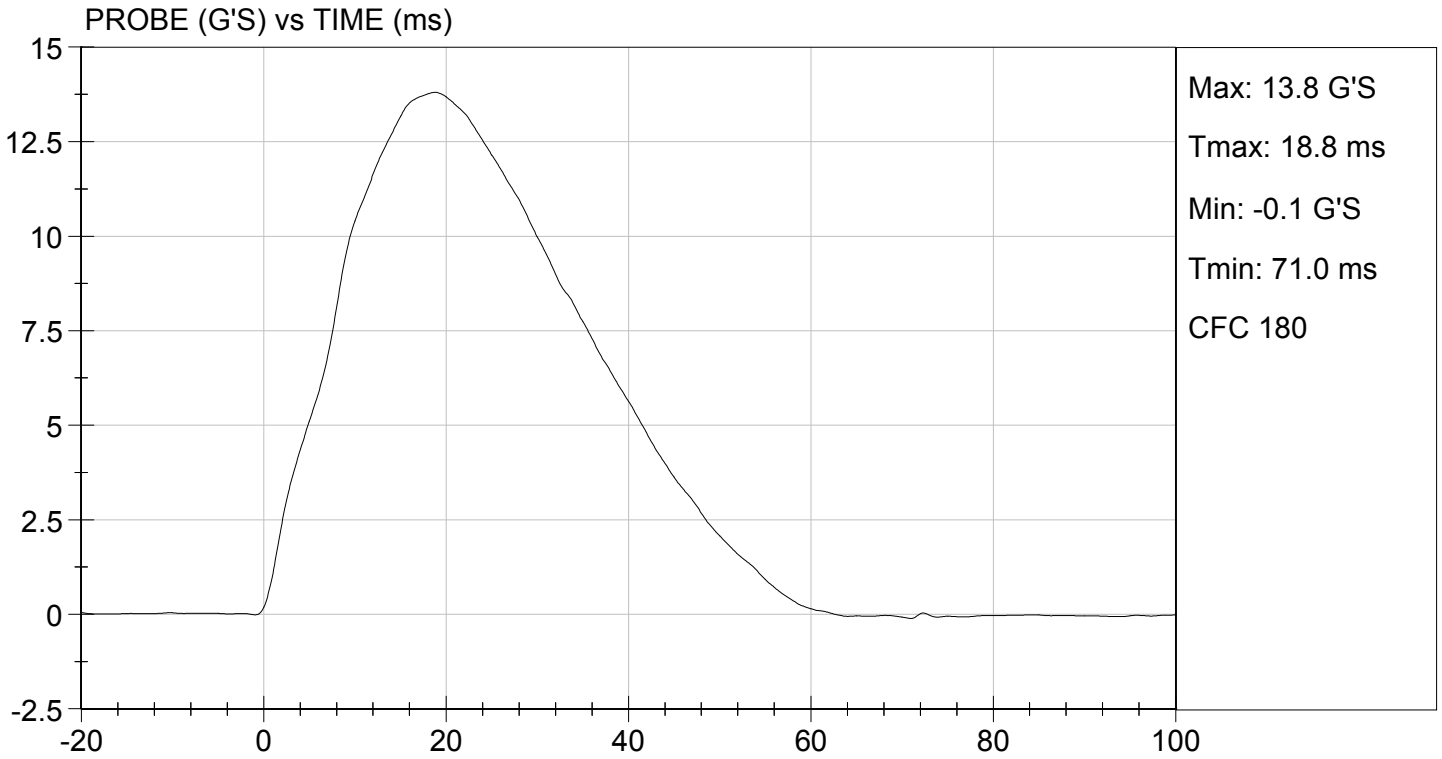
Test I.D: D124096

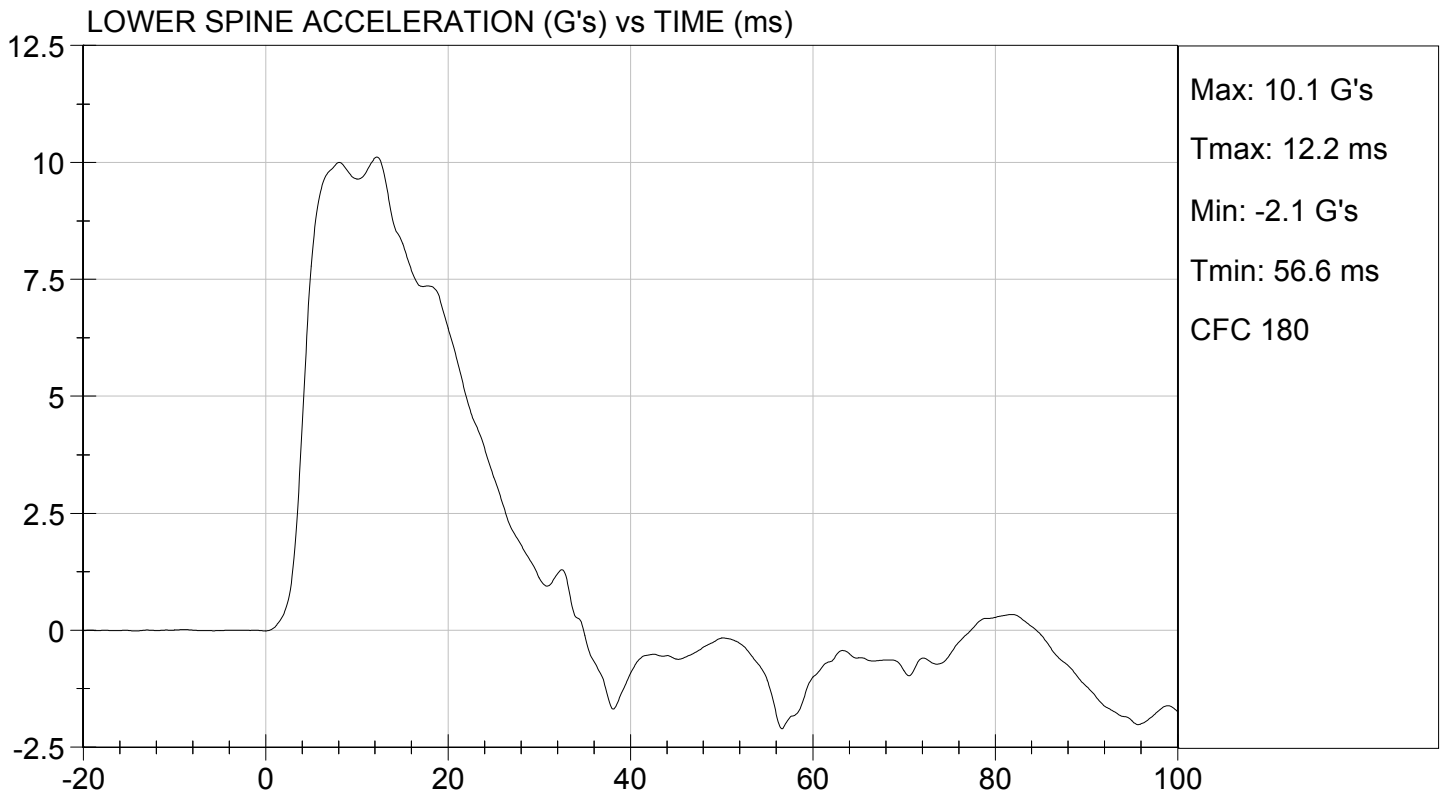
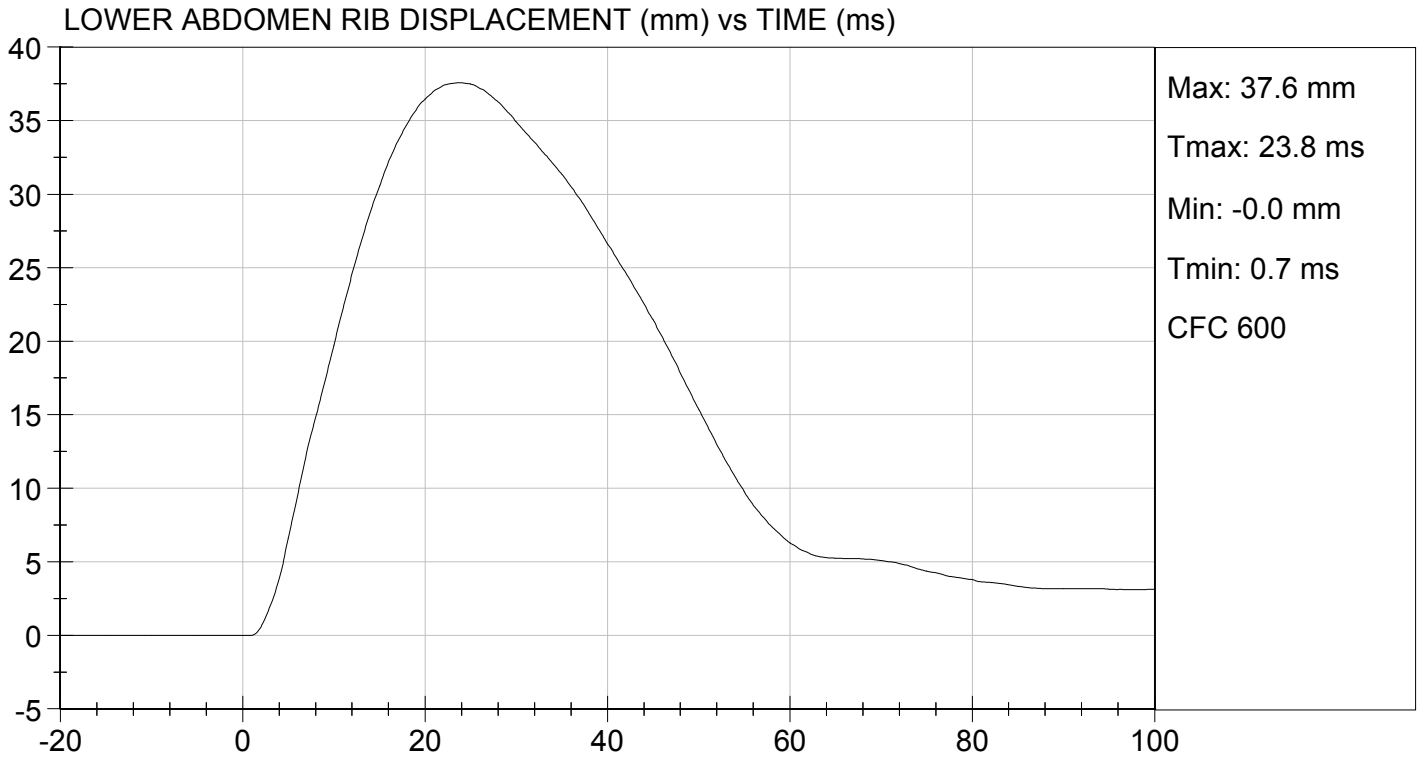
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	20.8	Pass
Humidity	%	10 to 70	28	Pass
Impact Velocity	m/s	4.20 to 4.40	4.34	Pass
Maximum Probe Acceleration	G's	12 to 16	14	Pass
Upper Abdomen Rib Displacement	mm	36 to 47	42	Pass
Lower Abdomen Rib Displacement	mm	33 to 44	38	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	10	Pass
Overall Test Results				Pass

Jessica Hall  
Laboratory Technician

10/29/2012  
Test Date

David Winkelbauer  
Approved By





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

**ATD Serial No:** 296

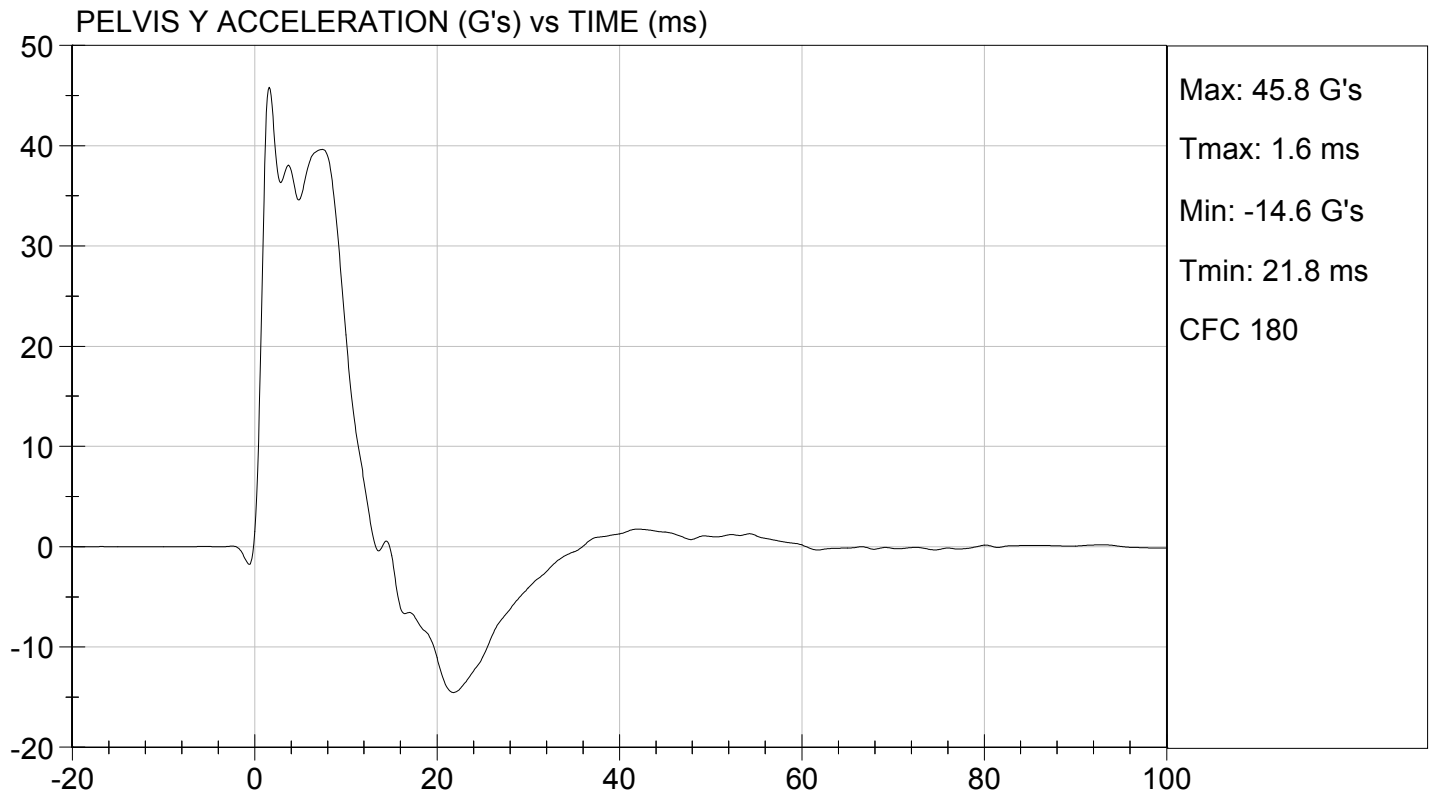
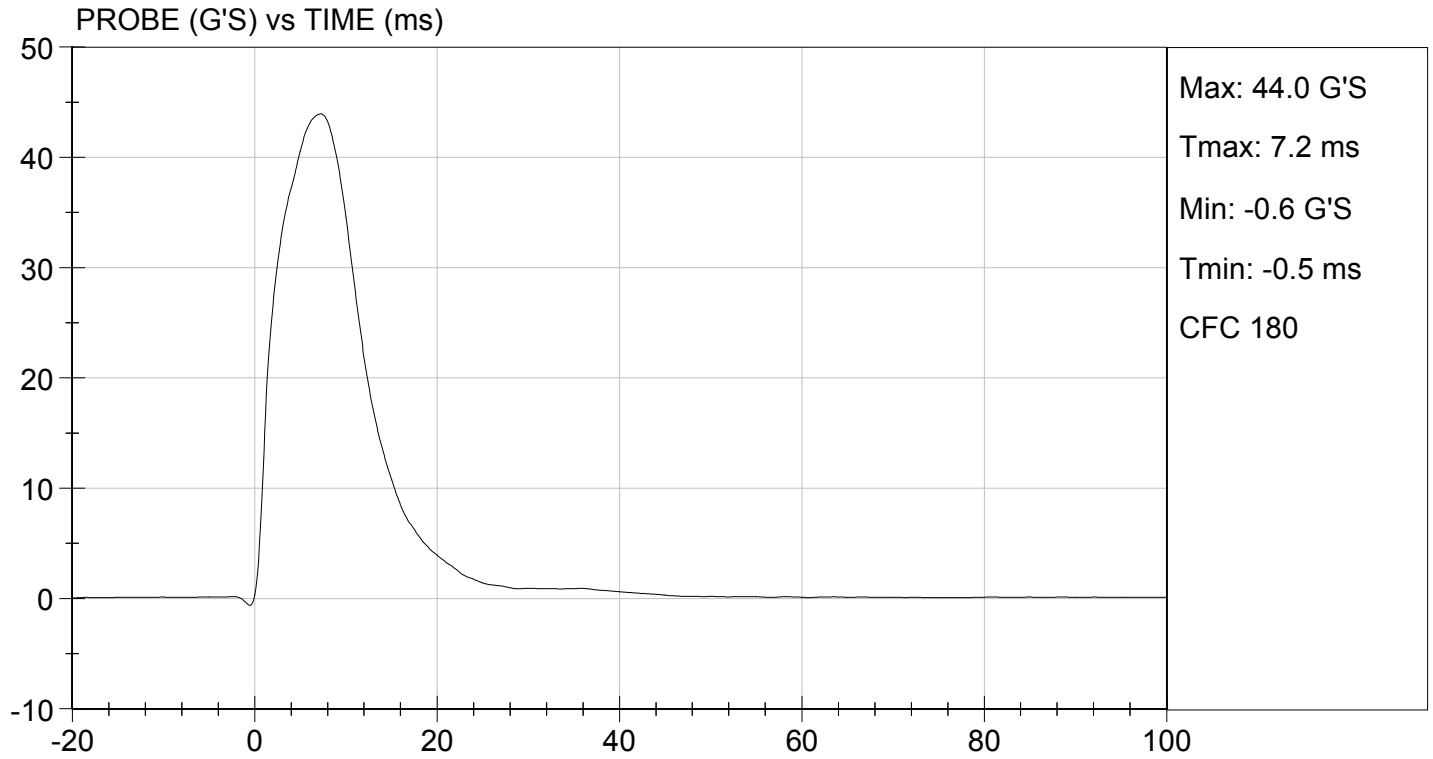
**Test I.D:** D124097

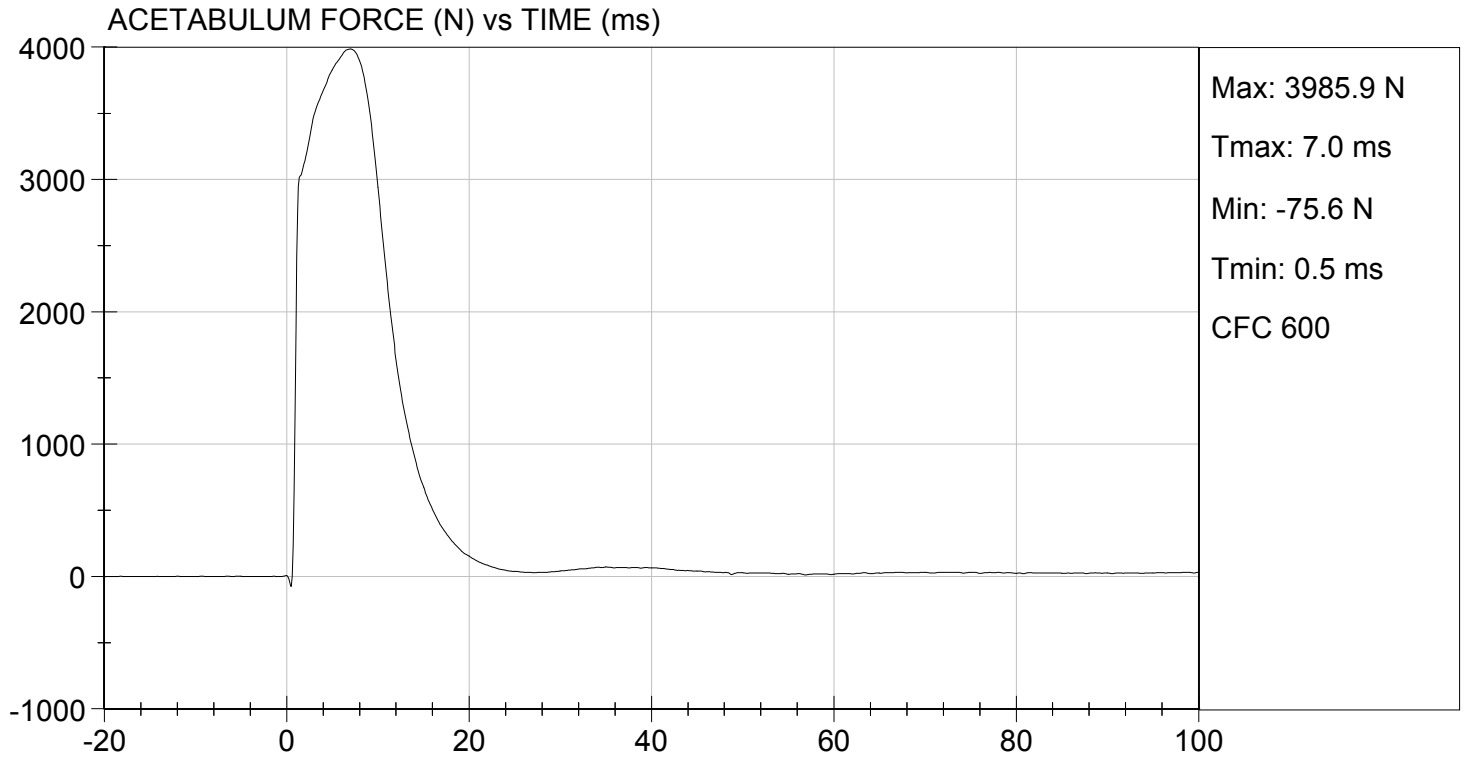
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	20.8	Pass
Humidity	%	10 to 70	28	Pass
Impact Velocity	m/s	6.60 to 6.80	6.68	Pass
Maximum Probe Acceleration	G's	38 to 47	44	Pass
Pelvis Y Acceleration After 6 ms	G's	34 to 42	40	Pass
Peak Acetabulum Force	N	3600 to 4300	3,986	Pass
<b>Overall Test Results</b>				<b>Pass</b>

Jessica Gall  
 Laboratory Technician

10/29/2012  
 Test Date

David Winkelbauer  
 Approved By





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

ATD Serial No: 296

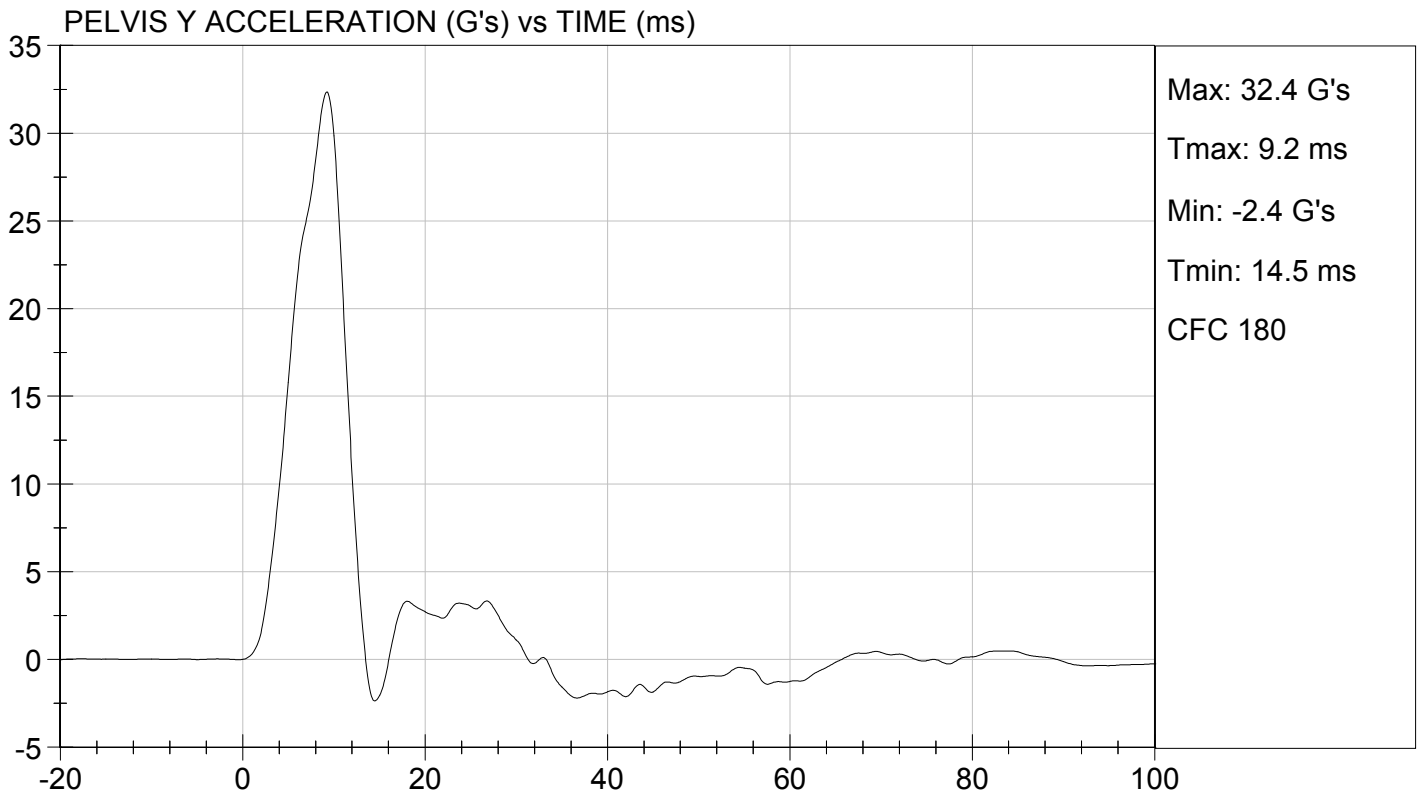
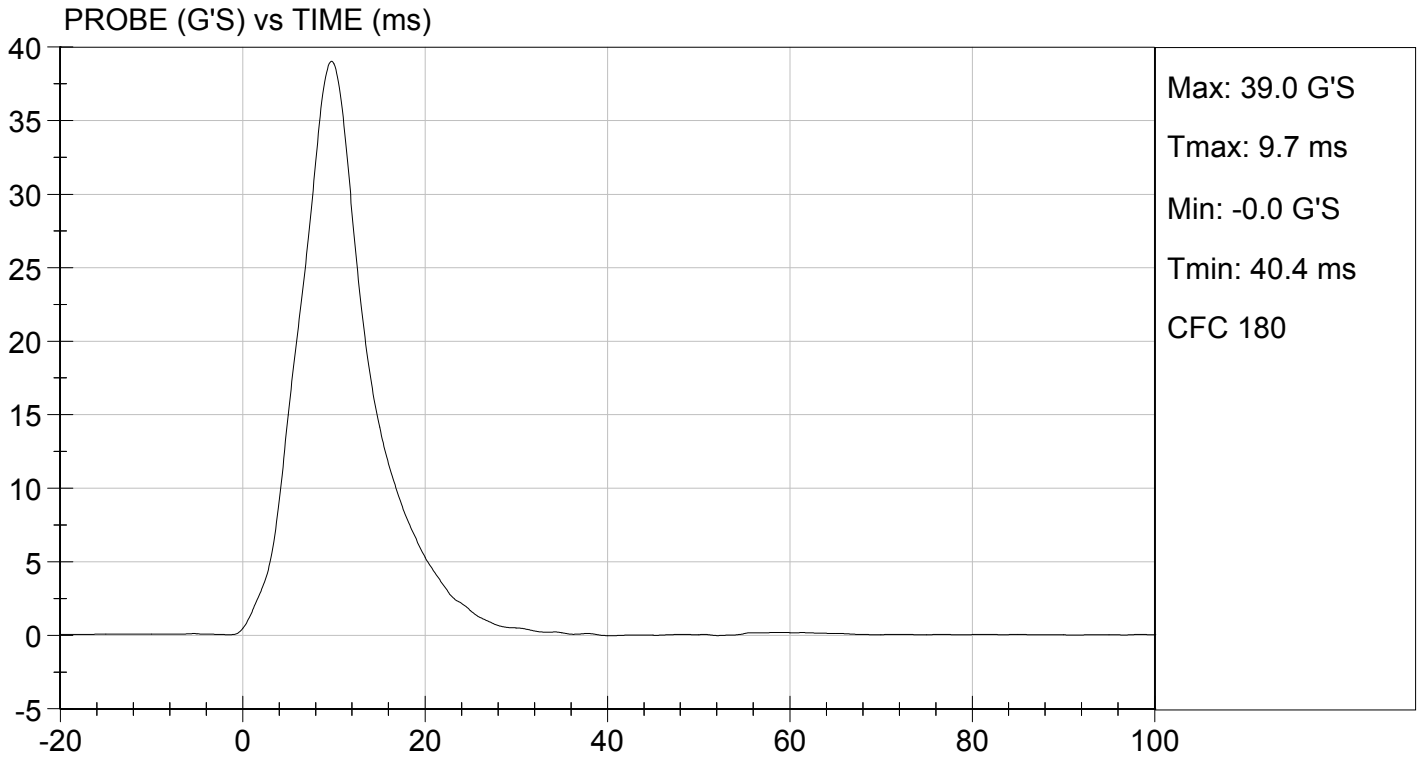
Test I.D: D124098

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	20.8	Pass
Humidity	%	10 to 70	28	Pass
Impact Velocity	m/s	4.20 to 4.40	4.30	Pass
Maximum Probe Acceleration	G's	36 to 45	39	Pass
Pelvis Y Acceleration	G's	28 to 39	32	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	4,663	Pass
Overall Test Results				Pass

Jessica Gall  
 Laboratory Technician

10/29/2012  
 Test Date

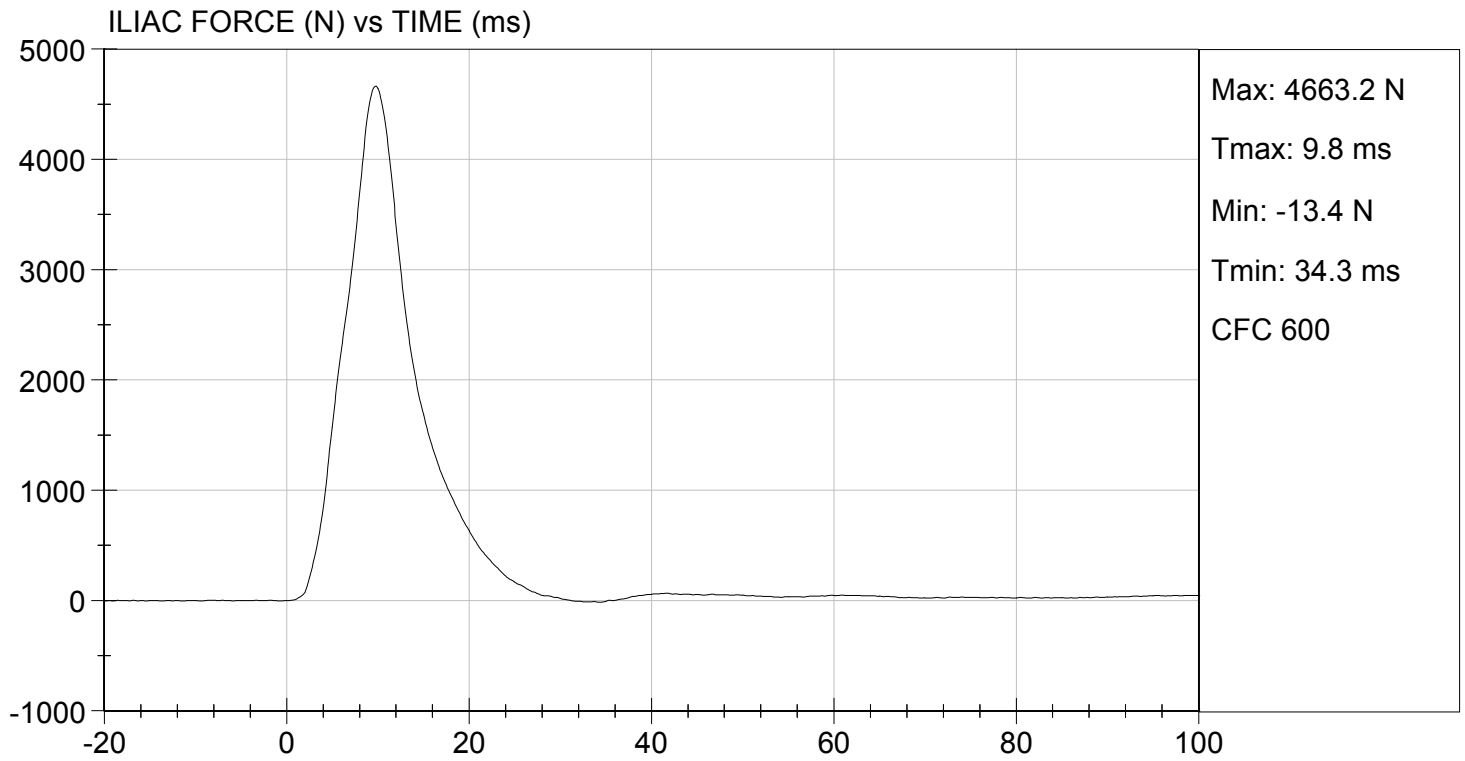
David Winkelbauer  
 Approved By





TEST DESC: ILLIAC  
VELOCITY: 14.12 ft/s, 4.30 m/s

TEST DATE: 10/29/2012  
TEST #: D124098



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

ATD Serial No: 296

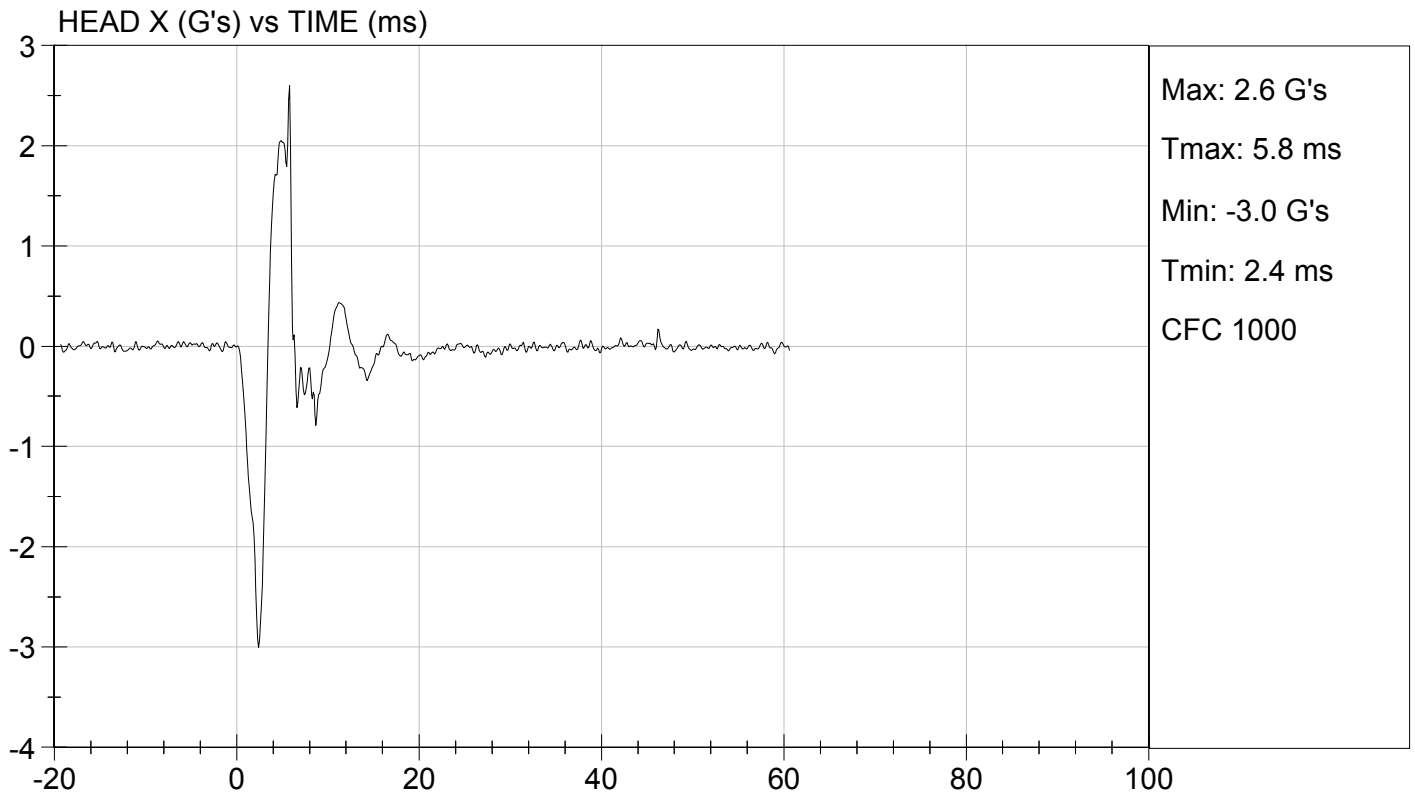
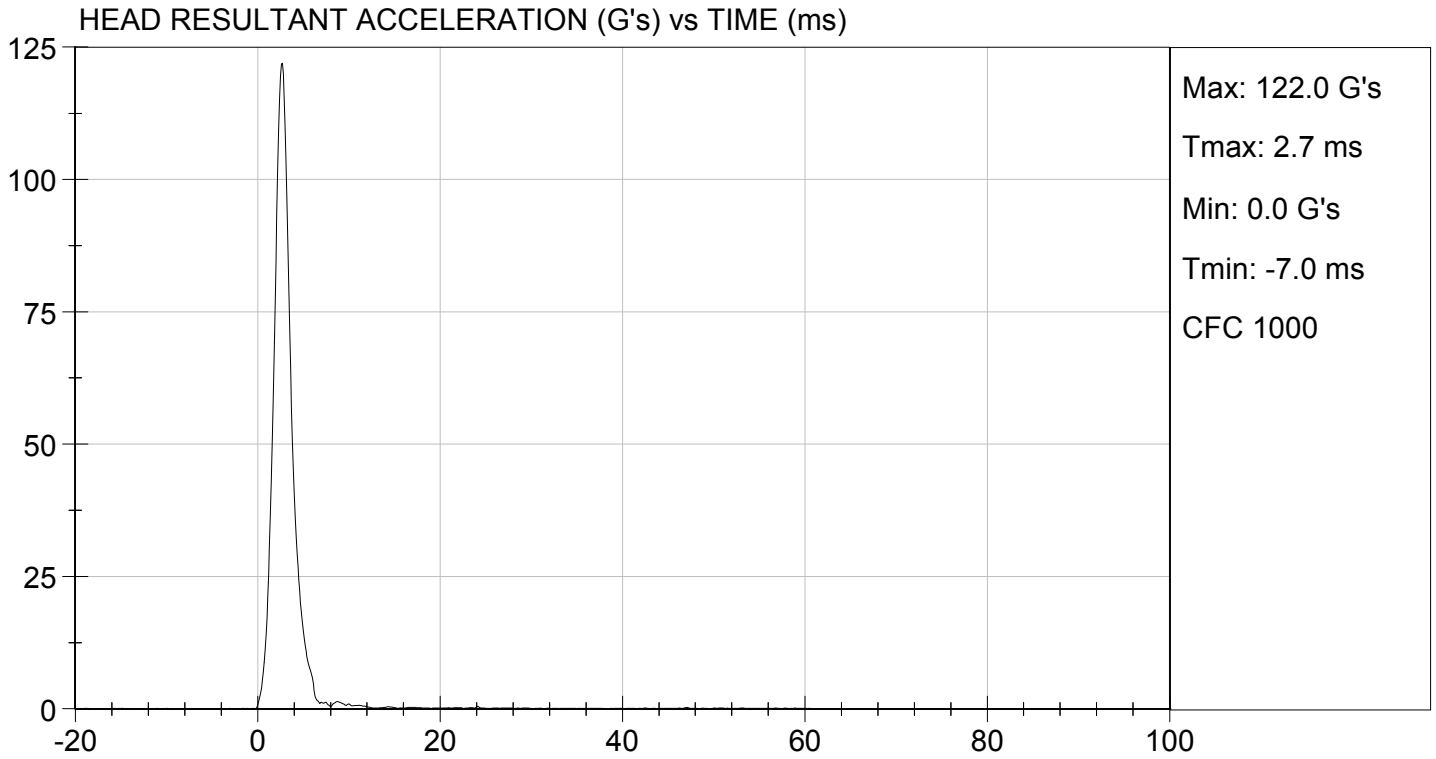
Test ID: D124321

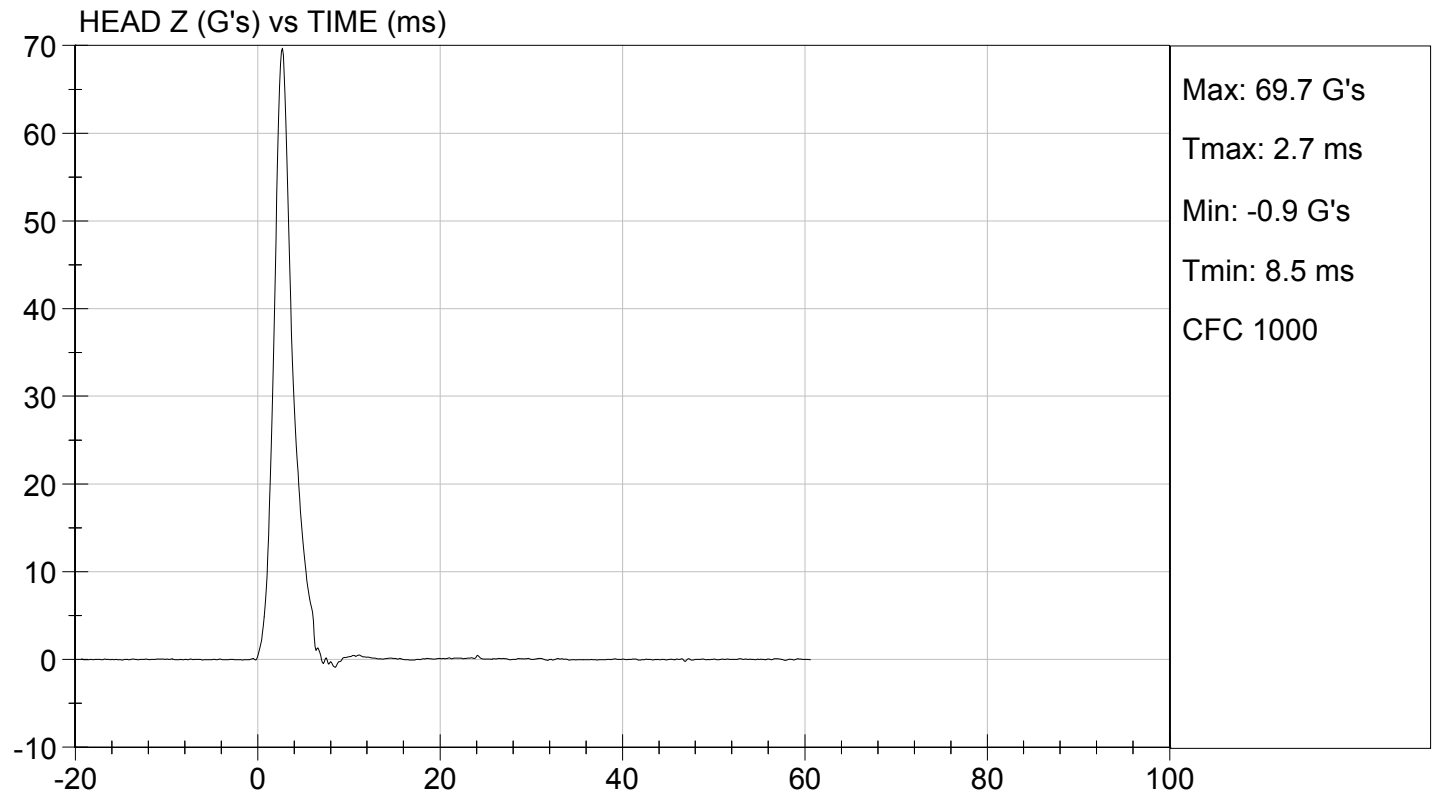
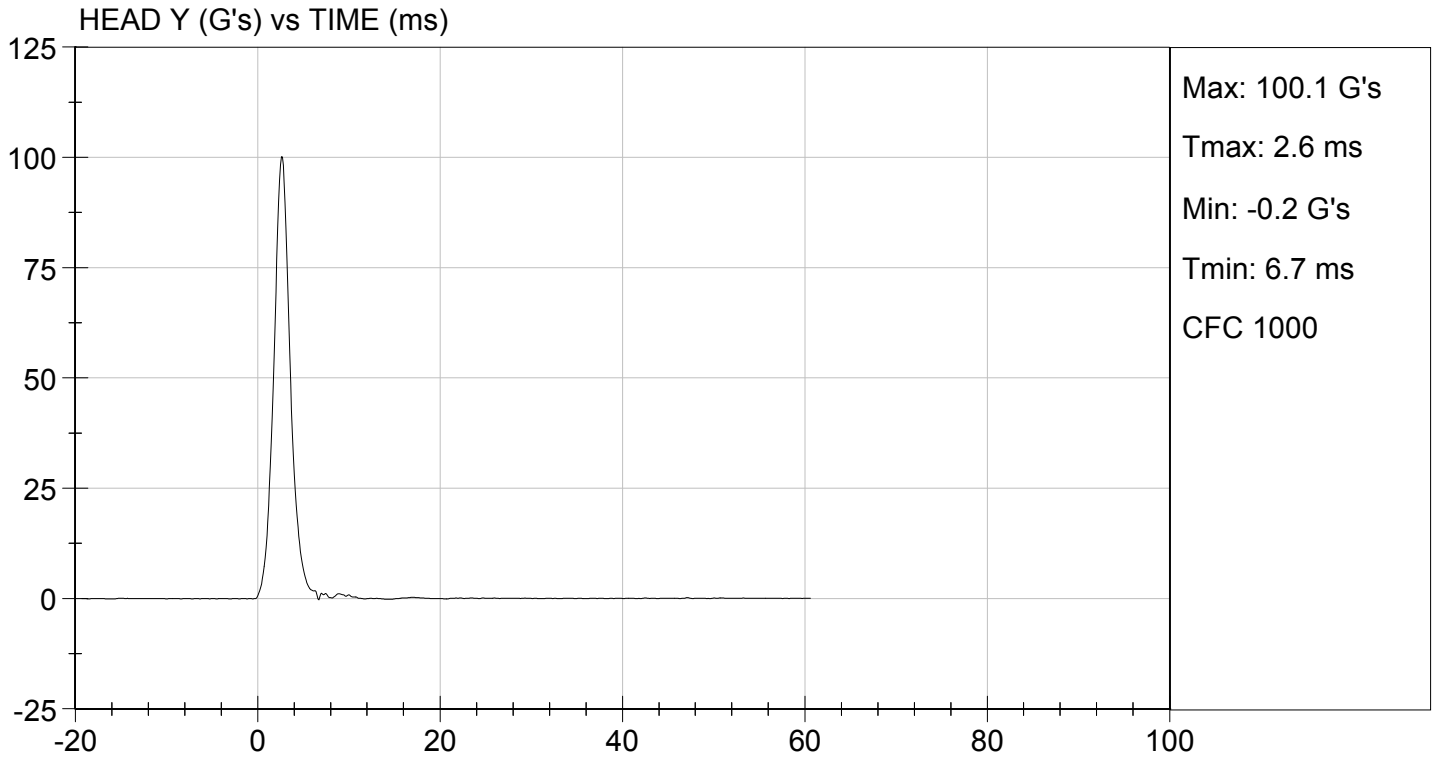
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	115 to 137	122	Pass
Peak Longitudinal Acceleration	G's	+/- 15	-3.0	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	<15%	Yes	Pass
Overall Test Results				Pass

*Jessica Gall*  
 \_\_\_\_\_  
 Laboratory Technician

11/12/2012  
 \_\_\_\_\_  
 Test Date

*David Winkelbauer*  
 \_\_\_\_\_  
 Approved By





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

**ATD Serial No:** 296

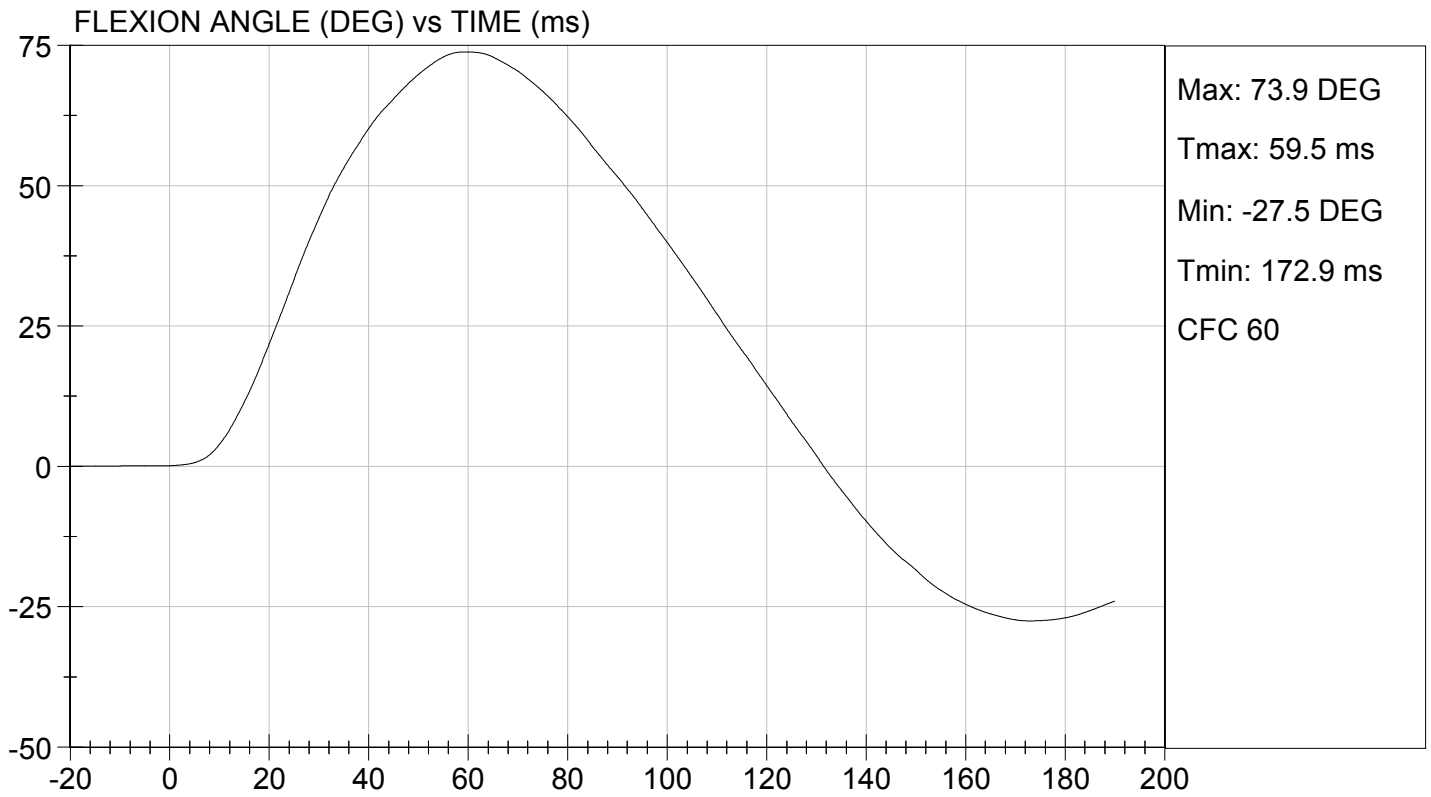
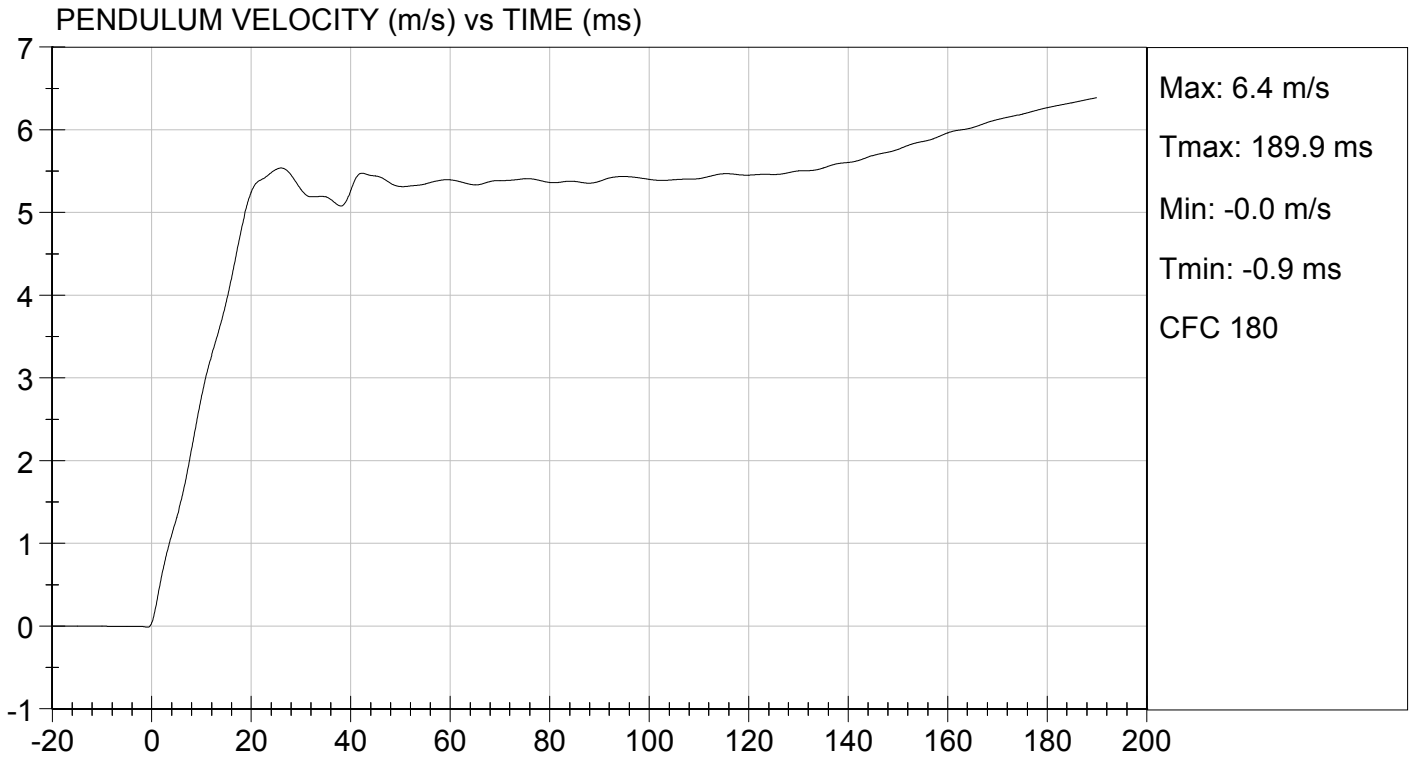
**Test I.D.:** D124322

Tested Parameter	Units	Specification	Result	Pass/Fail	
Temperature	deg C	20.6 to 22.2	22.0	Pass	
Humidity	%	10 to 70	29	Pass	
Impact Velocity	m/s	5.51 to 5.63	5.58	Pass	
Pendulum Velocity	10 ms	m/s	2.20 to 2.80	2.78	Pass
	15 ms	m/s	3.30 to 4.10	3.93	Pass
	20 ms	m/s	4.40 to 5.40	5.25	Pass
	25 ms	m/s	5.40 to 6.10	5.52	Pass
	25-100 ms	m/s	5.50 to 6.20	5.54	Pass
Maximum D-Plane Rotation	deg	71 to 81	74	Pass	
Time of Maximum D-Plane Rotation	ms	50 to 70	60	Pass	
Maximum Occipital Condyle Moment	Nm	-44 to -36	-42	Pass	
Time of Moment Decay to 0 Nm	ms	102 to 126	114	Pass	
<b>Overall Test Results</b>				<b>Pass</b>	

Jessica Gall  
Laboratory Technician

11/12/2012  
Test Date

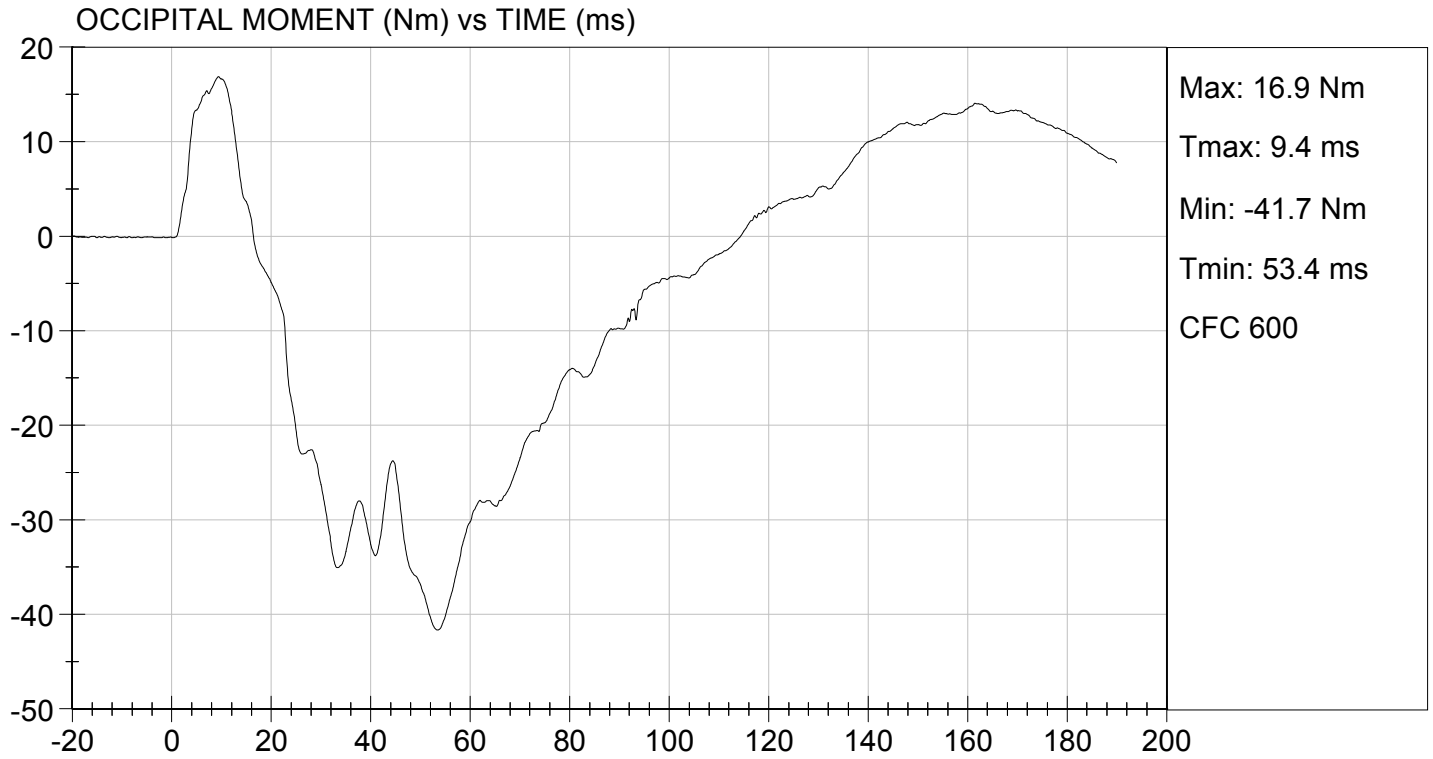
David Winkelbauer  
Approved By





TEST DESC: NECK BENDING  
VELOCITY: 18.31 ft/s, 5.58 m/s

TEST DATE: 11/12/2012  
TEST #: D124322



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

ATD Serial No: 296

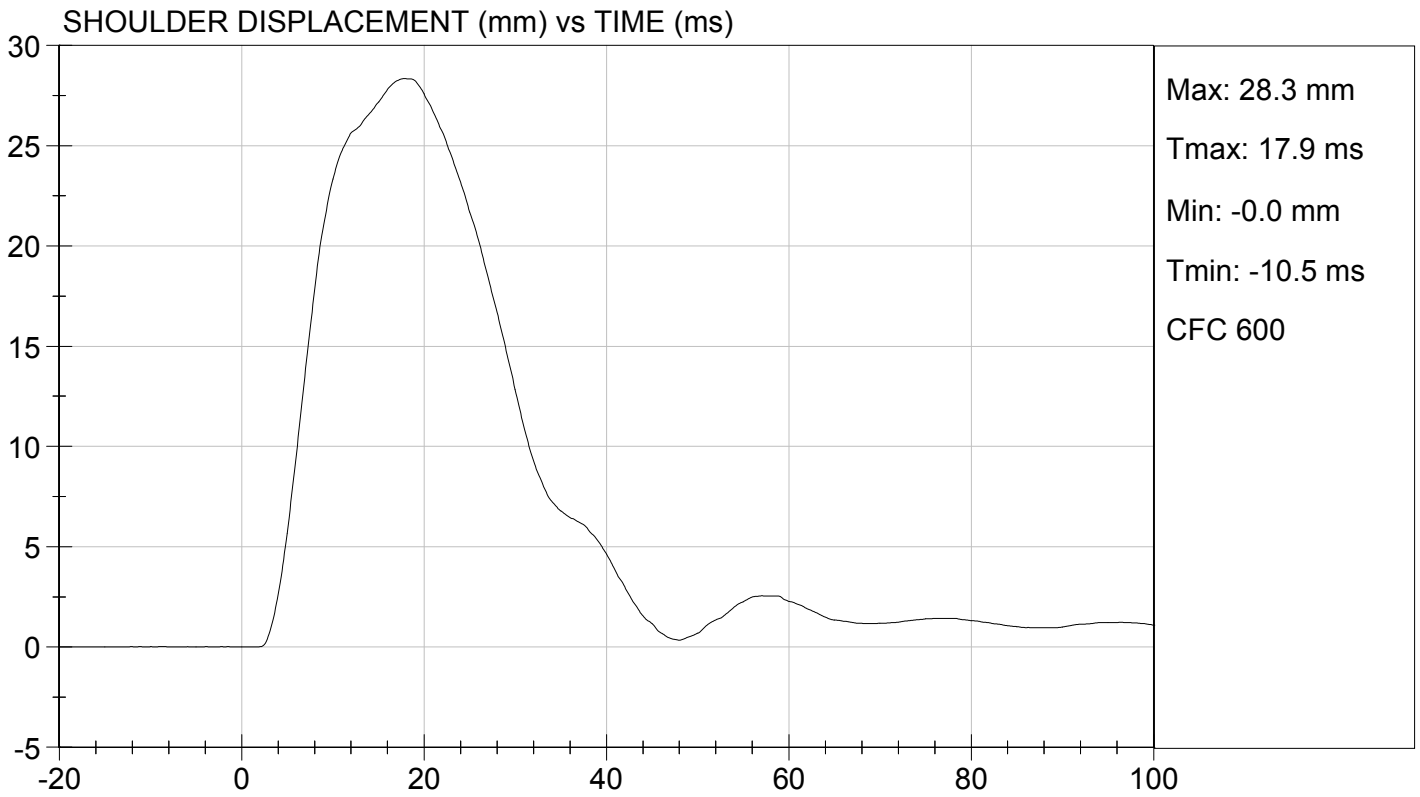
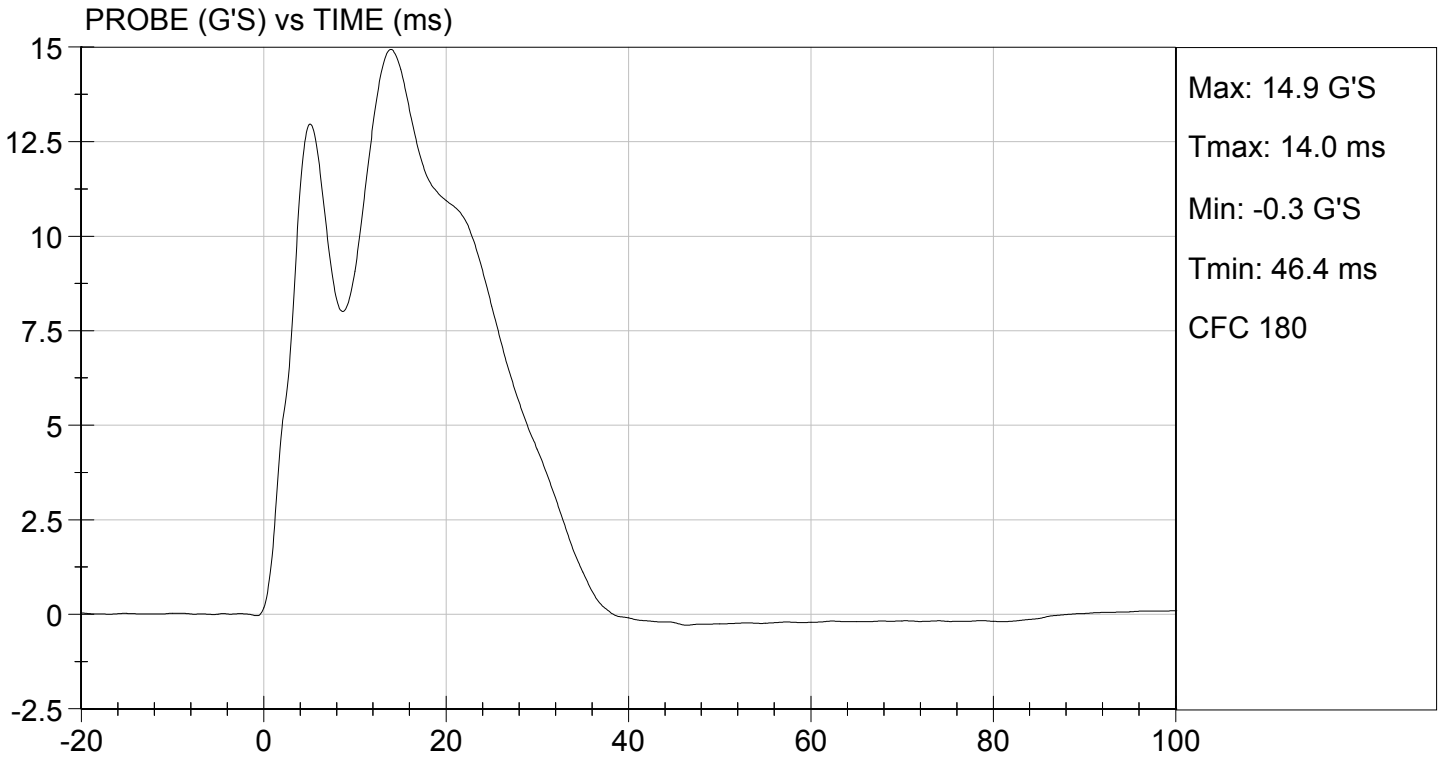
Test ID: D124323

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	36	Pass
Impact Velocity	m/s	4.20 to 4.40	4.30	Pass
Maximum Probe Acceleration	G's	13 to 18	15	Pass
Shoulder Displacement	mm	28 to 37	28	Pass
Upper Spine (T1) Y Acceleration	G's	17 to 22	18	Pass
Overall Test Results				Pass

Jessica Hall  
 Laboratory Technician

11/09/2012  
 Test Date

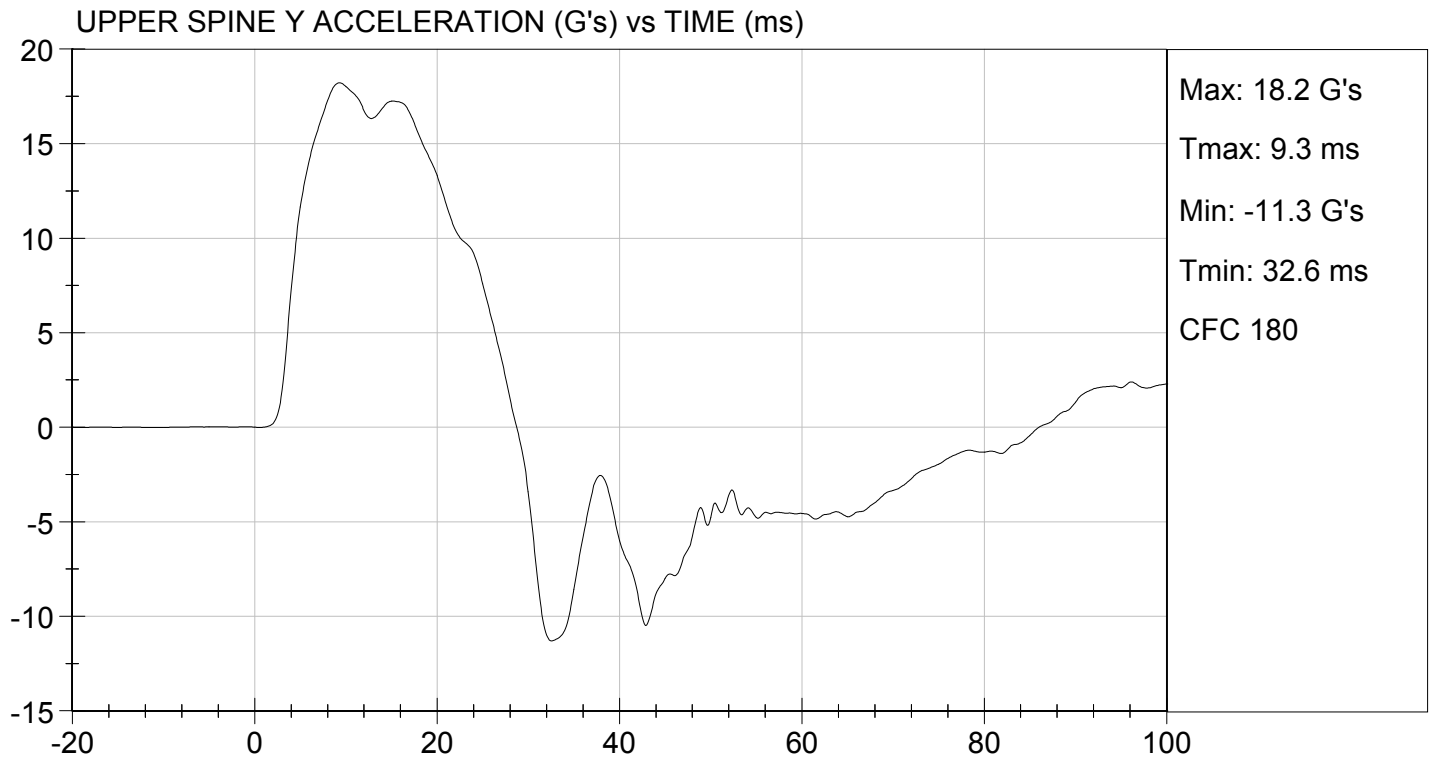
David Winkelbauer  
 Approved By





TEST DESC: SHOULDER IMPACT  
VELOCITY: 14.12 ft/s, 4.30 m/s

TEST DATE: 11/09/2012  
TEST #: D124323



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

**ATD Serial No:** 296

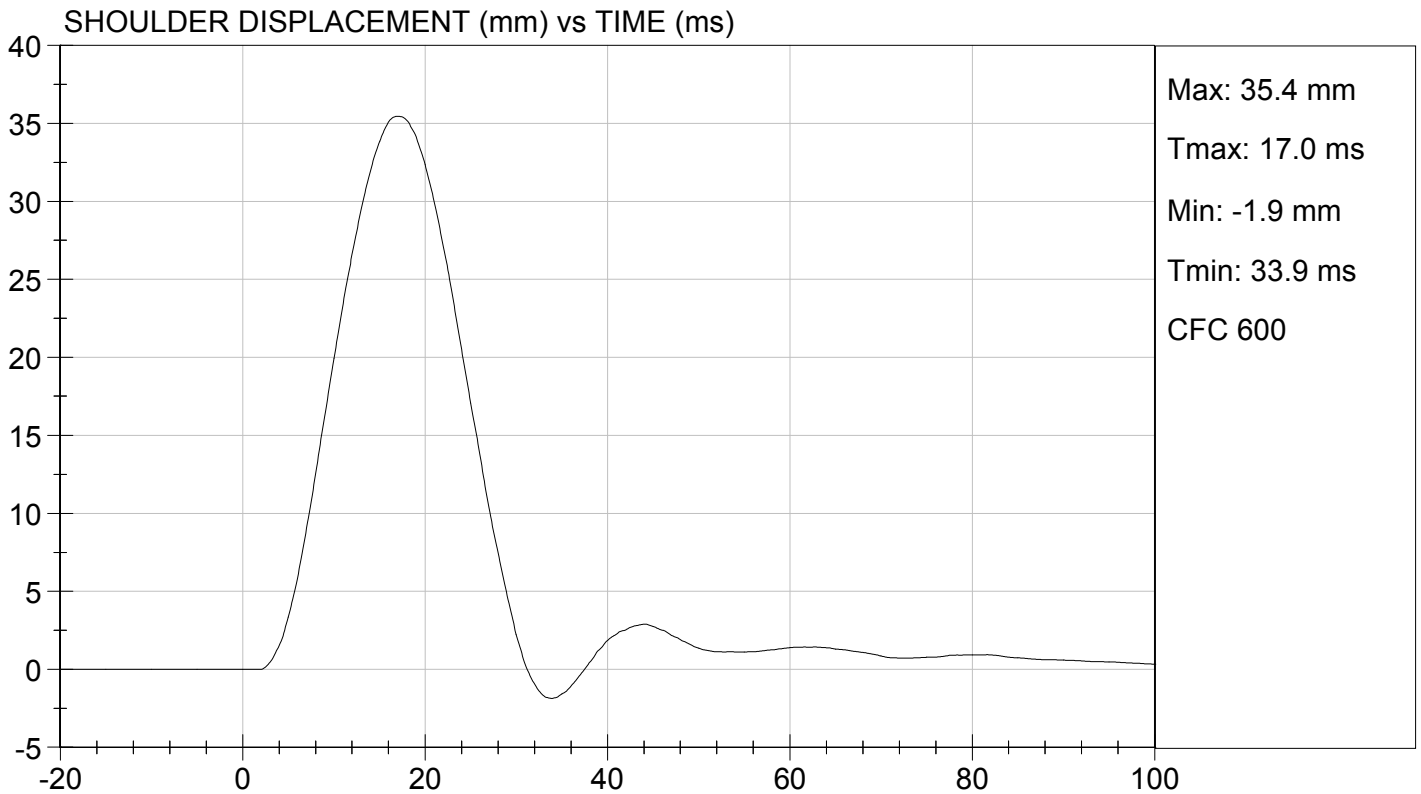
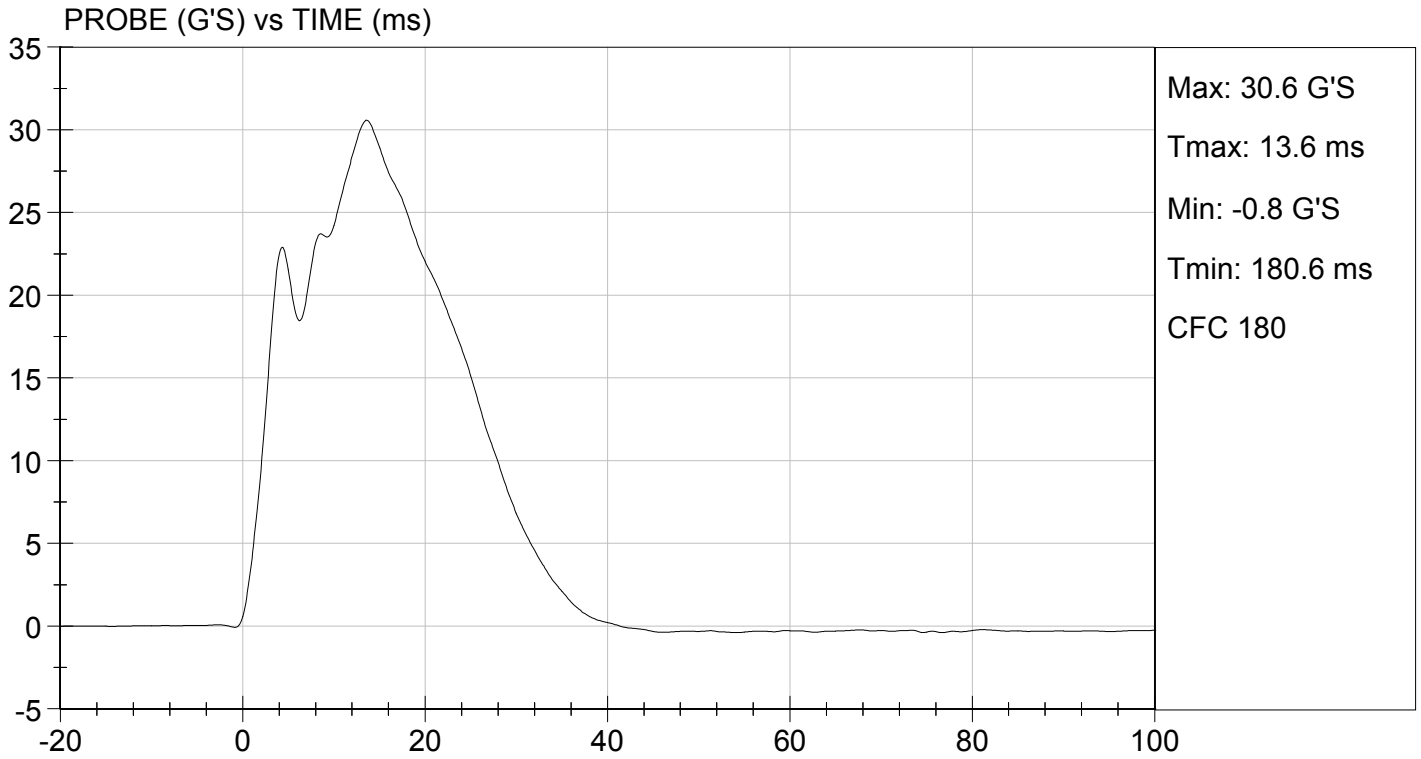
**Test I.D:** D124324

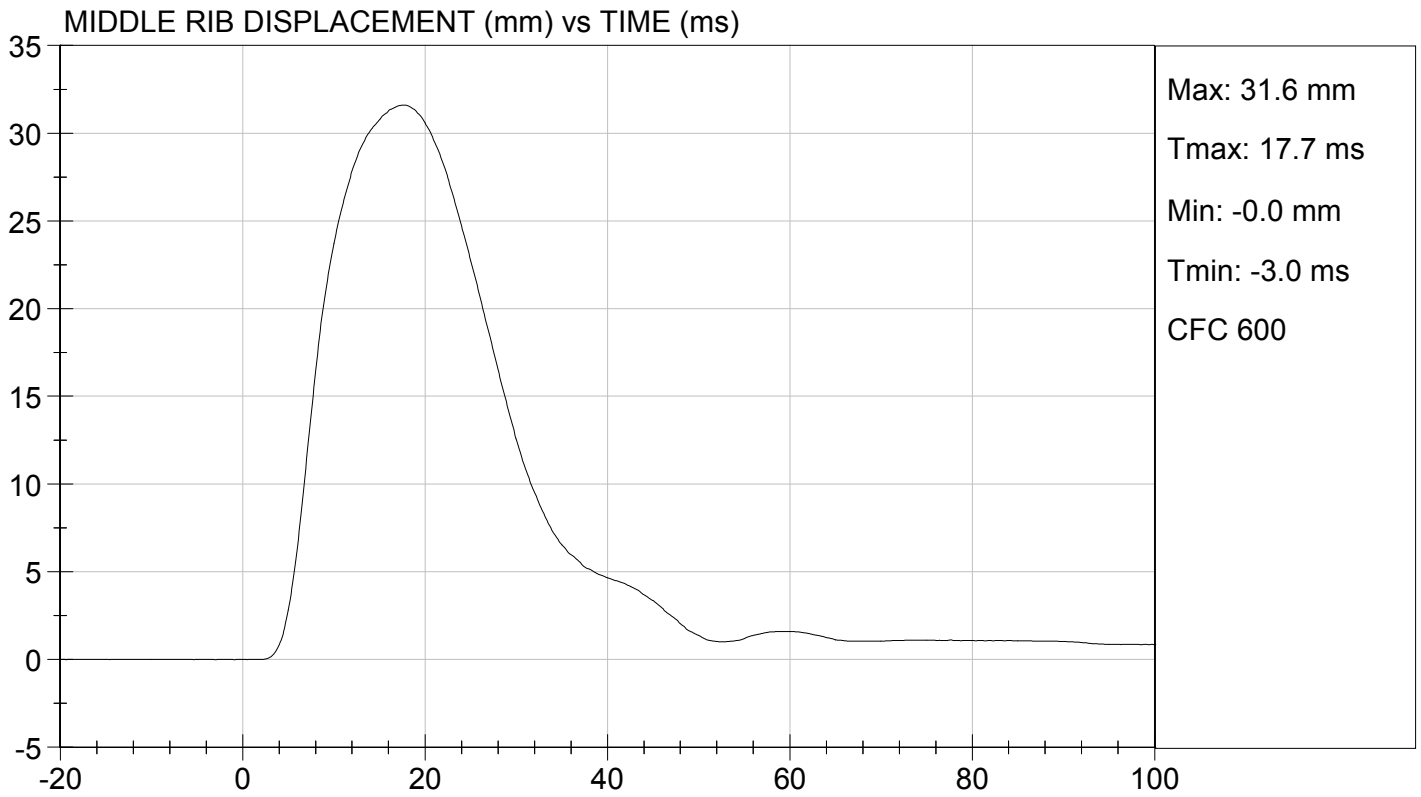
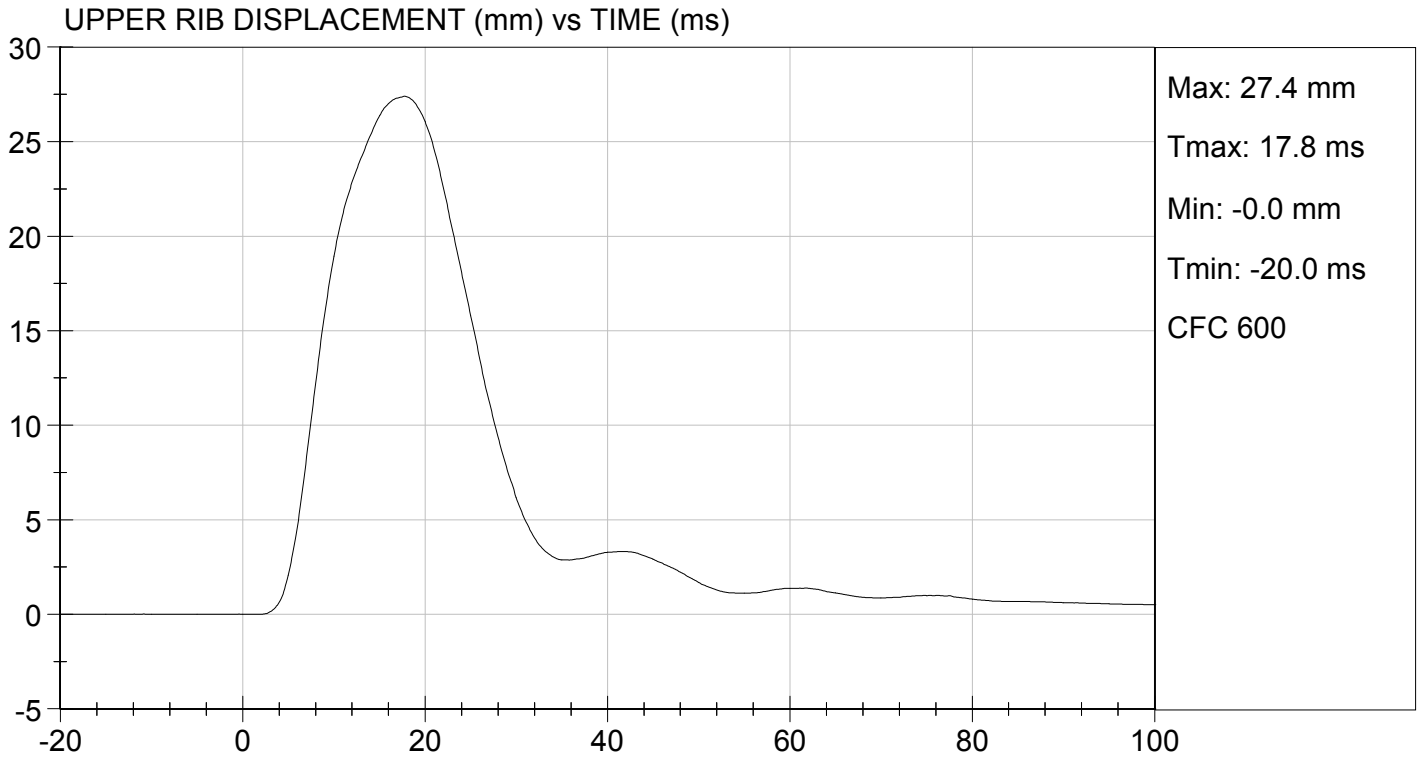
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.6	Pass
Humidity	%	10 to 70	32	Pass
Impact Velocity	m/s	6.60 to 6.80	6.77	Pass
Maximum Probe Acceleration	G's	30 to 36	31	Pass
Shoulder Displacement	mm	31 to 40	35	Pass
Upper Rib Displacement	mm	25 to 32	27	Pass
Middle Rib Displacement	mm	30 to 36	32	Pass
Lower Rib Displacement	mm	32 to 38	34	Pass
Upper Spine (T1) Y Acceleration	G's	34 to 43	37	Pass
Lower Spine (T12) Y Acceleration	G's	29 to 37	29	Pass
			<b>Overall Test Results</b>	<b>Pass</b>

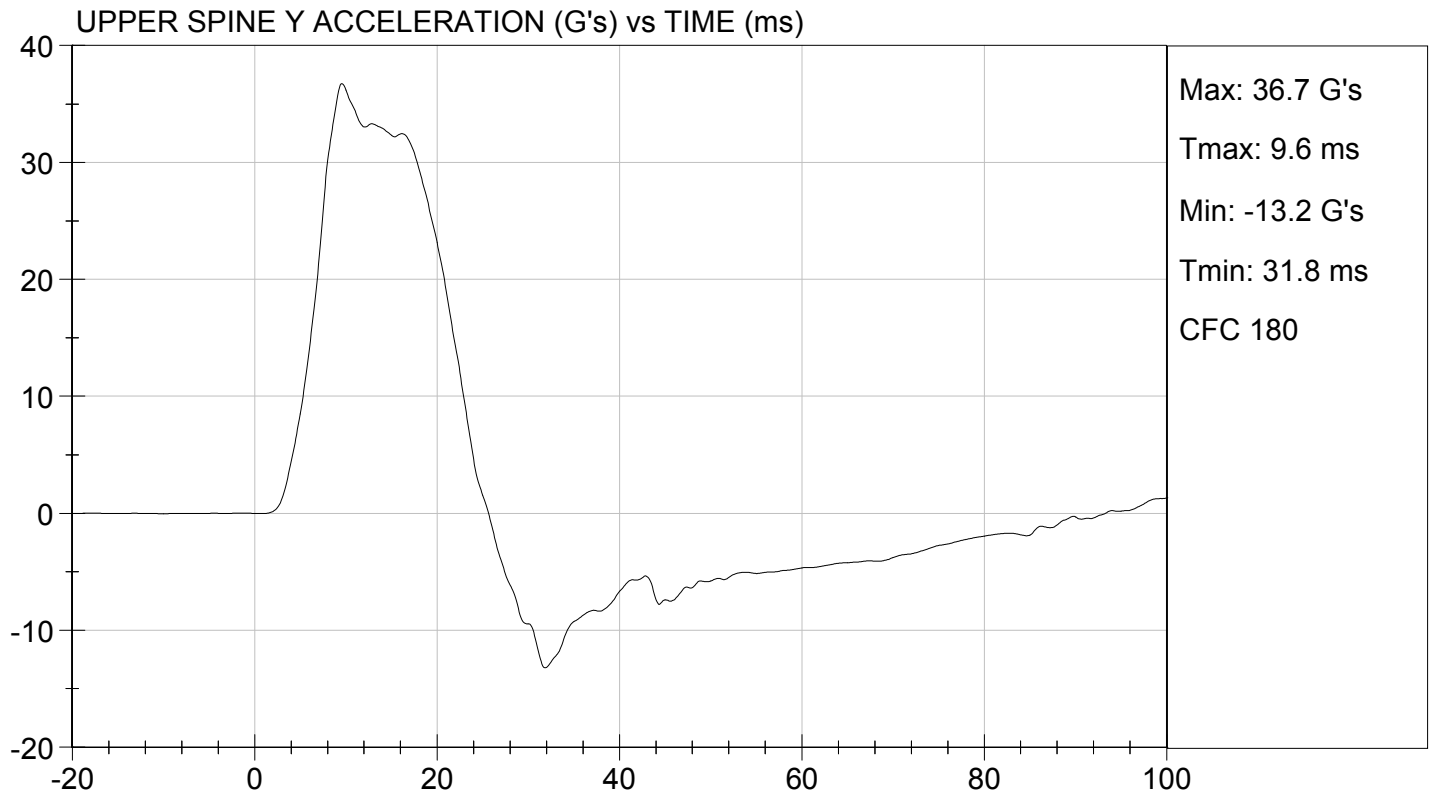
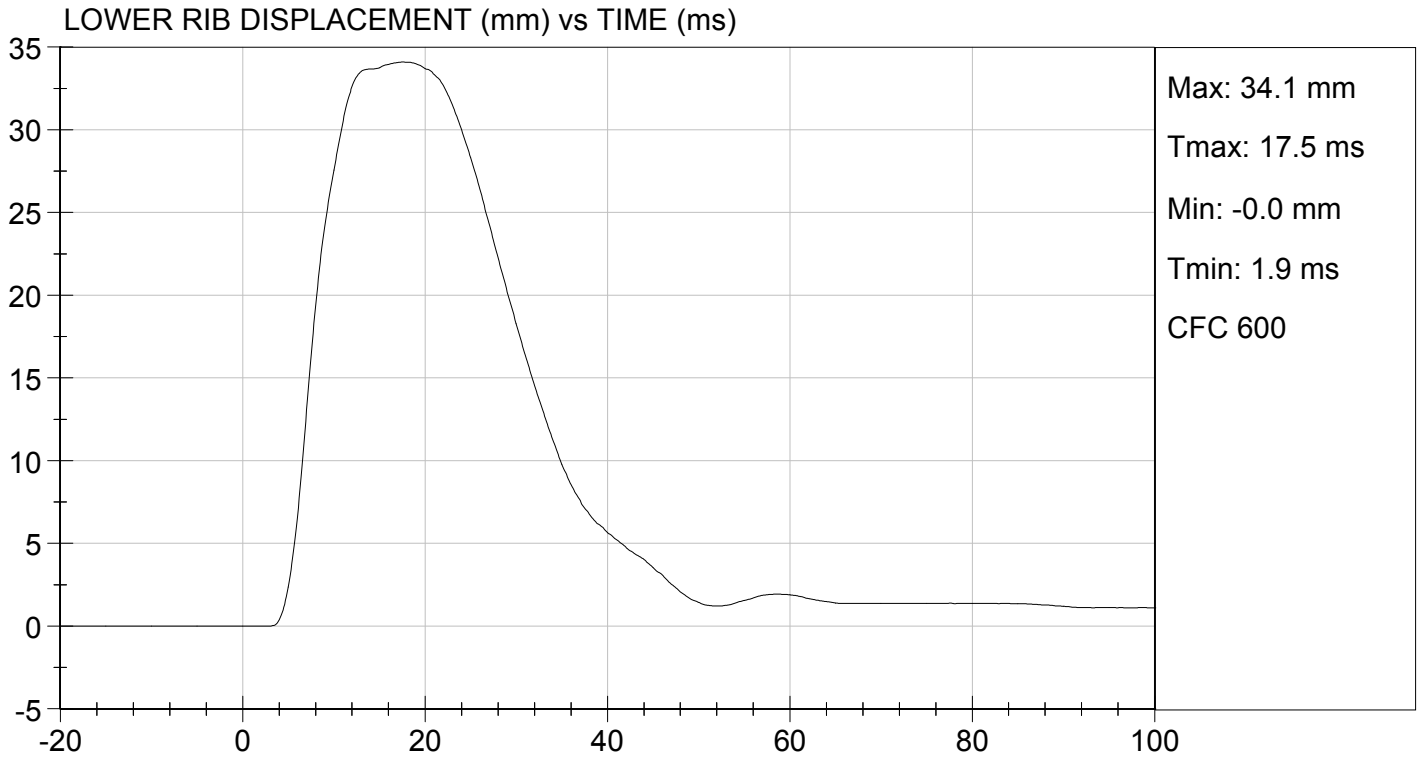
Jessica Hall  
Laboratory Technician

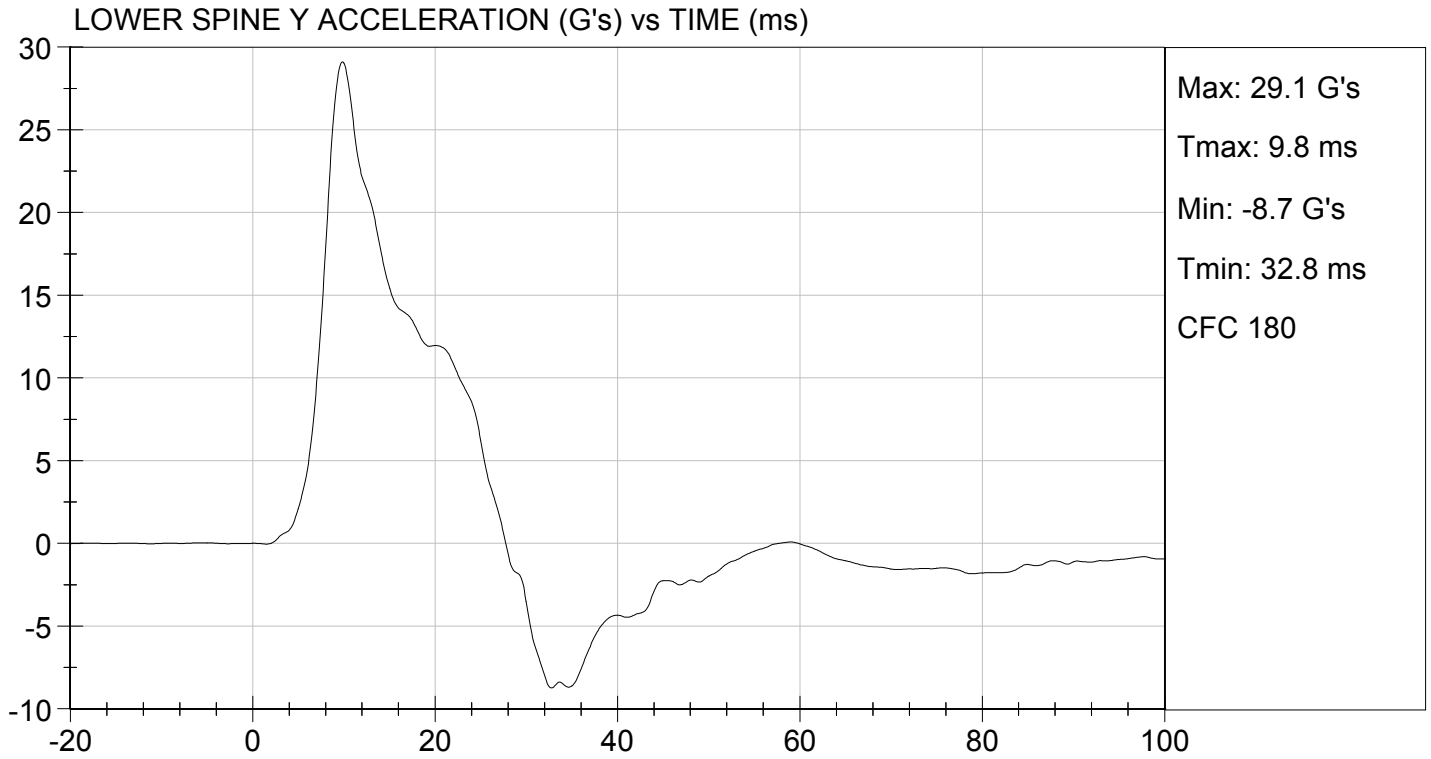
11/12/2012  
Test Date

David Winkelbauer  
Approved By









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

**ATD Serial No:** 296

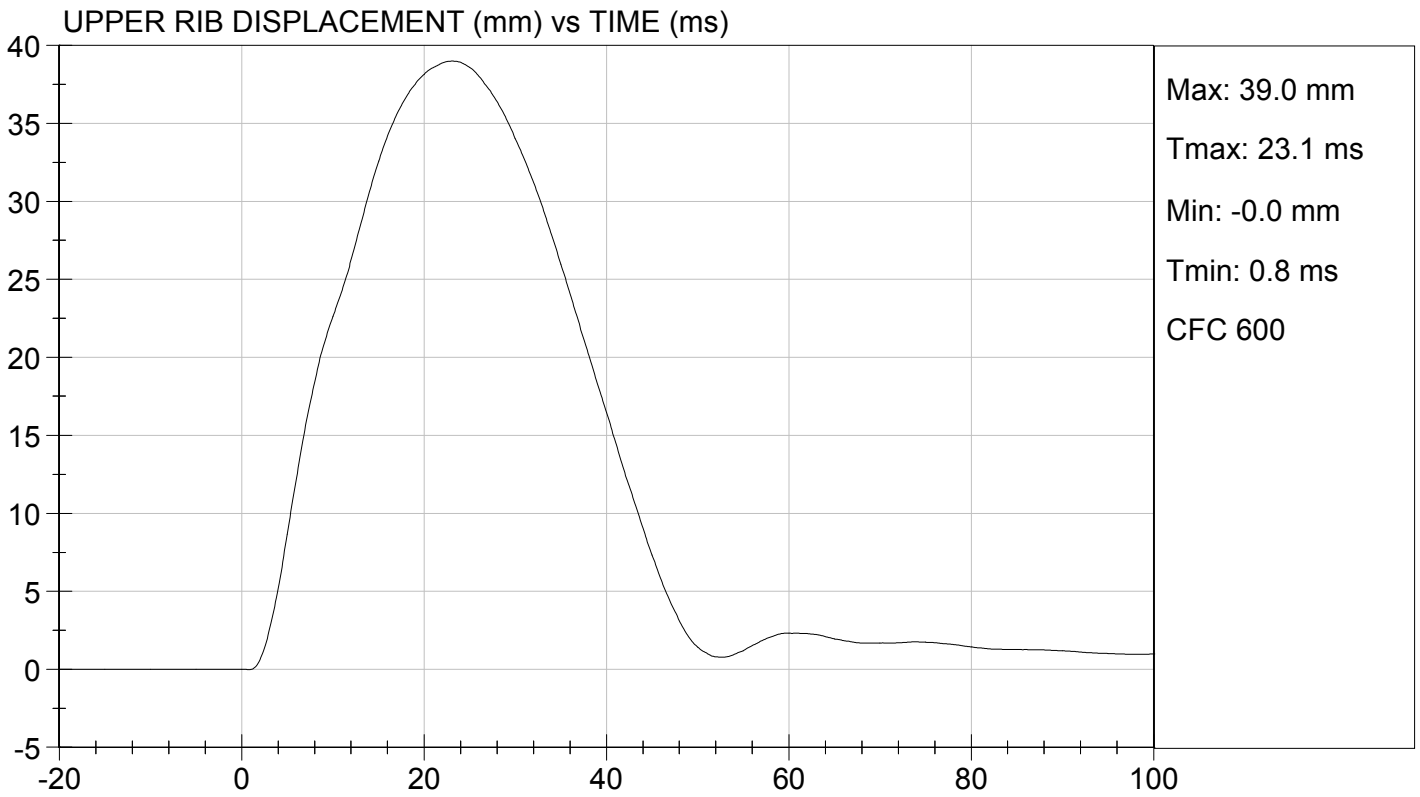
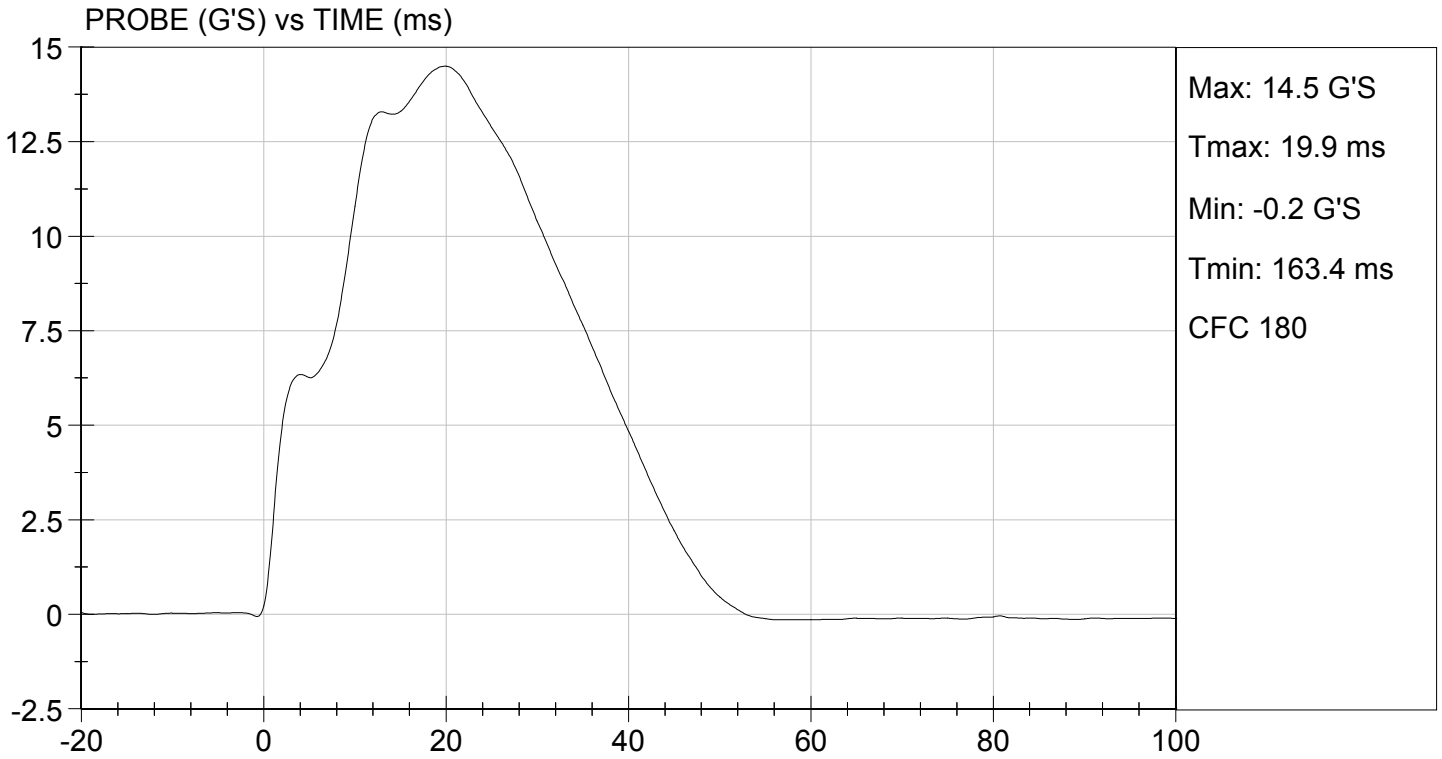
**Test I.D:** D124325

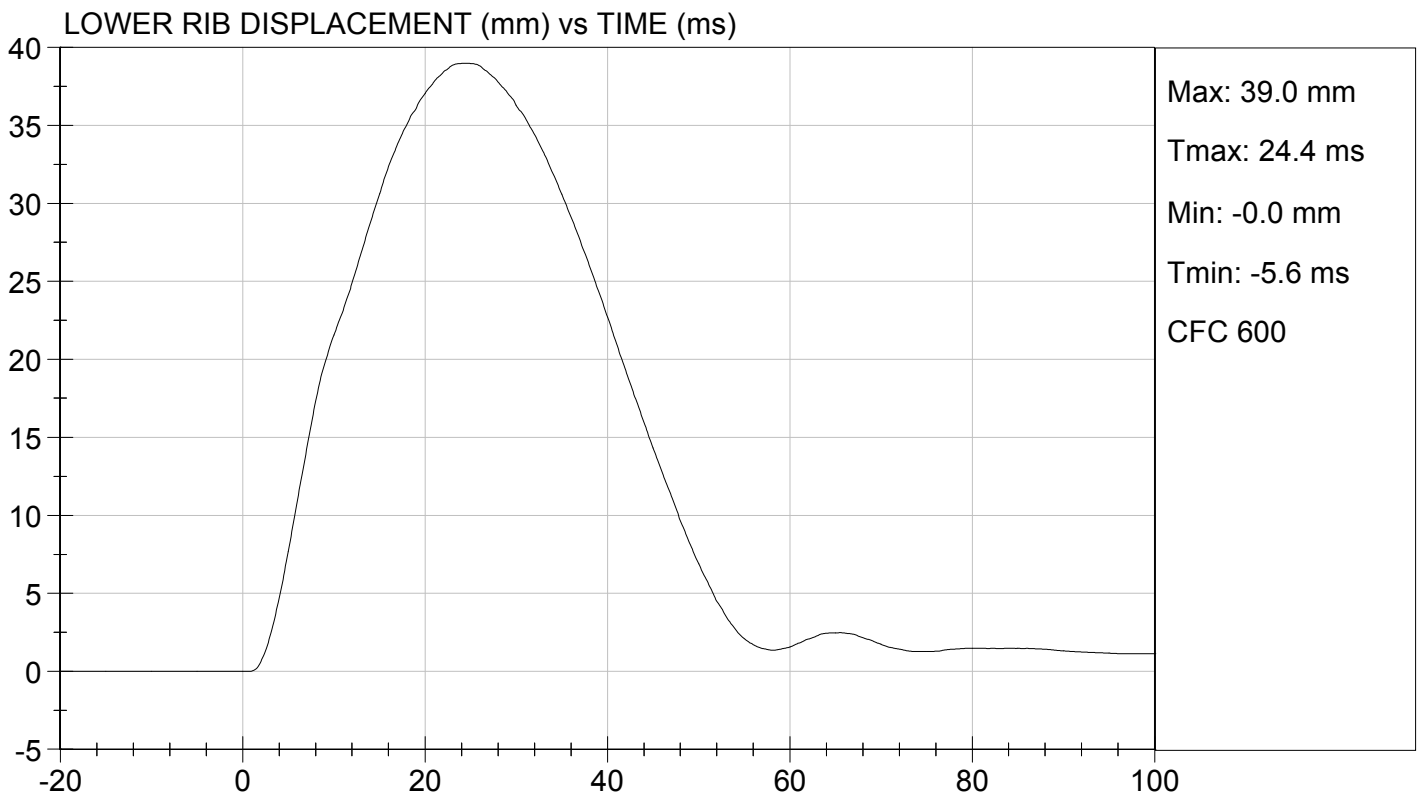
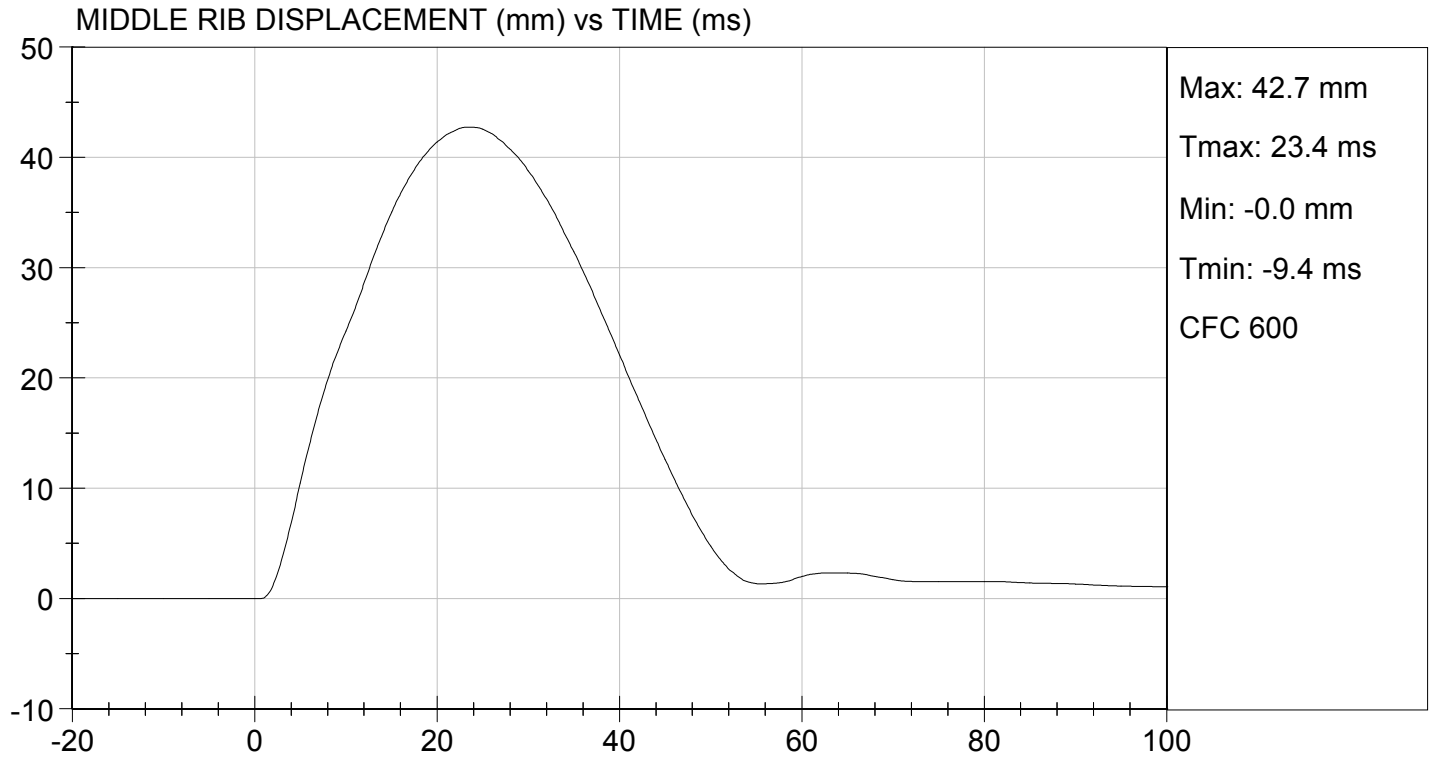
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.4	Pass
Humidity	%	10 to 70	36	Pass
Impact Velocity	m/s	4.20 to 4.40	4.23	Pass
Maximum Probe Acceleration	G's	14 to 18	14	Pass
Upper Rib Displacement	mm	32 to 40	39	Pass
Middle Rib Displacement	mm	39 to 45	43	Pass
Lower Rib Displacement	mm	35 to 43	39	Pass
Upper Spine (T1) Y Acceleration	G's	13 to 17	14	Pass
Lower Spine (T12) Y Acceleration	G's	7 to 11	8	Pass
<b>Overall Test Results</b>				<b>Pass</b>

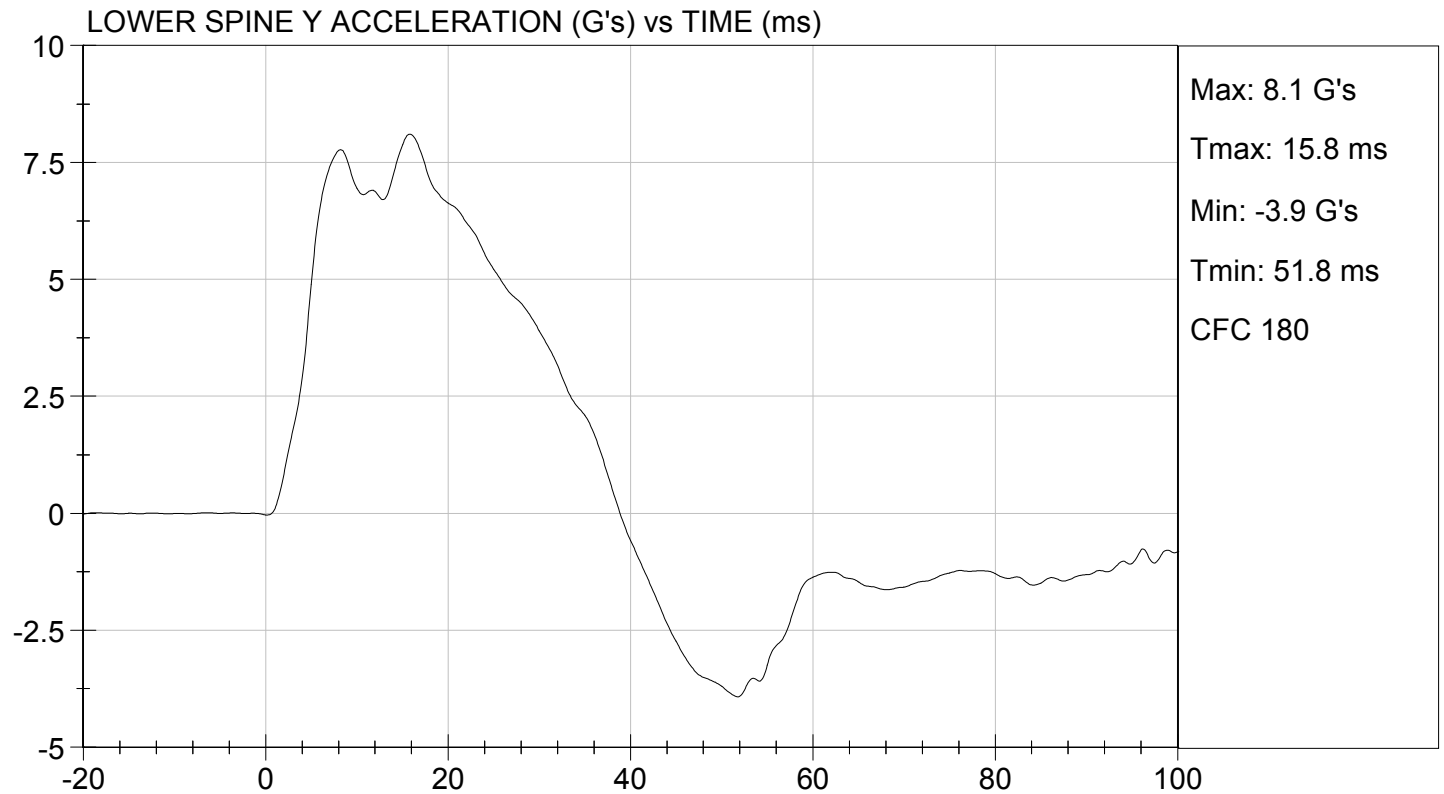
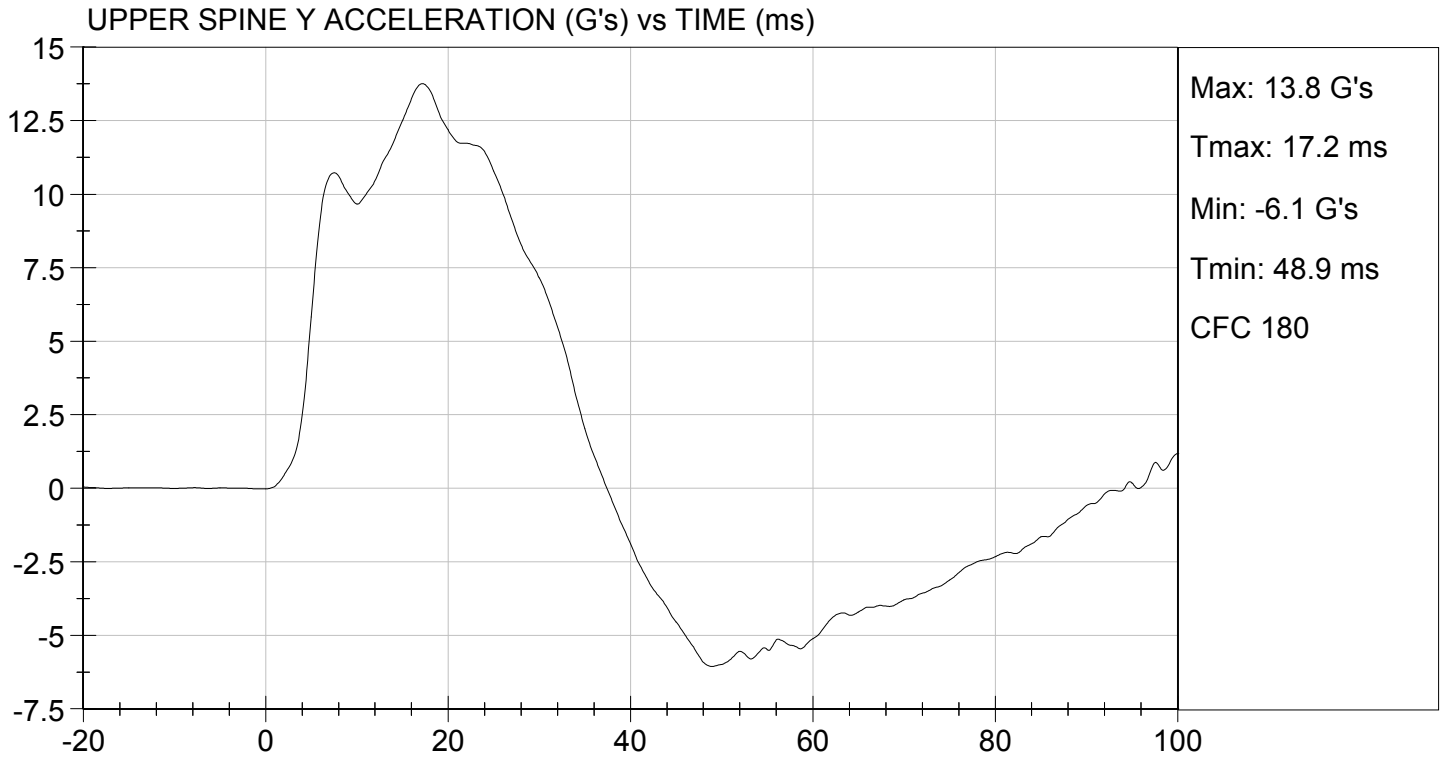
*Jessica Hall*  
 Laboratory Technician

11/09/2012  
 Test Date

*David Winkelbauer*  
 Approved By







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

ATD Serial No: 296

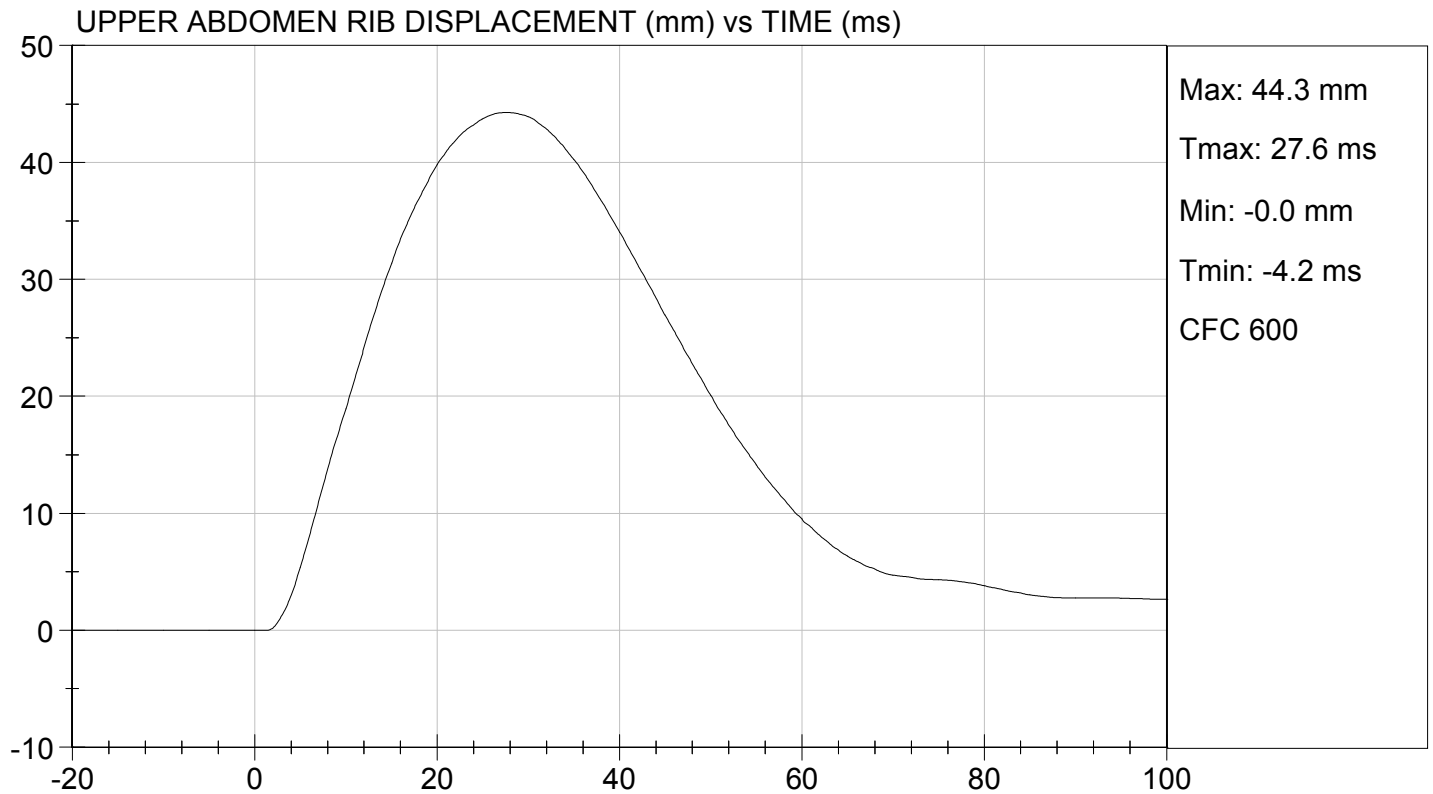
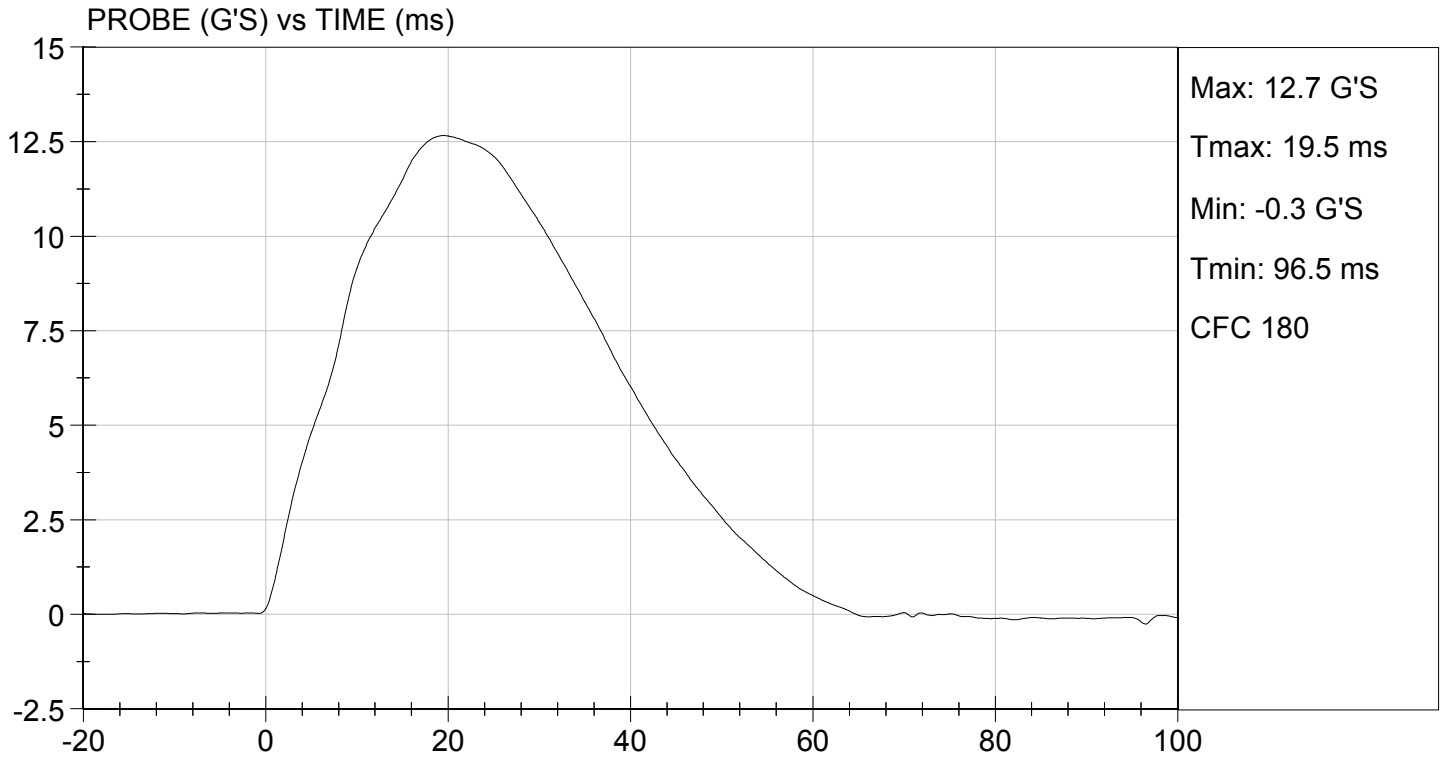
Test I.D: D124326

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.4	Pass
Humidity	%	10 to 70	36	Pass
Impact Velocity	m/s	4.20 to 4.40	4.30	Pass
Maximum Probe Acceleration	G's	12 to 16	13	Pass
Upper Abdomen Rib Displacement	mm	36 to 47	44	Pass
Lower Abdomen Rib Displacement	mm	33 to 44	43	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	9	Pass
Overall Test Results				Pass

Jessica Hall  
 Laboratory Technician

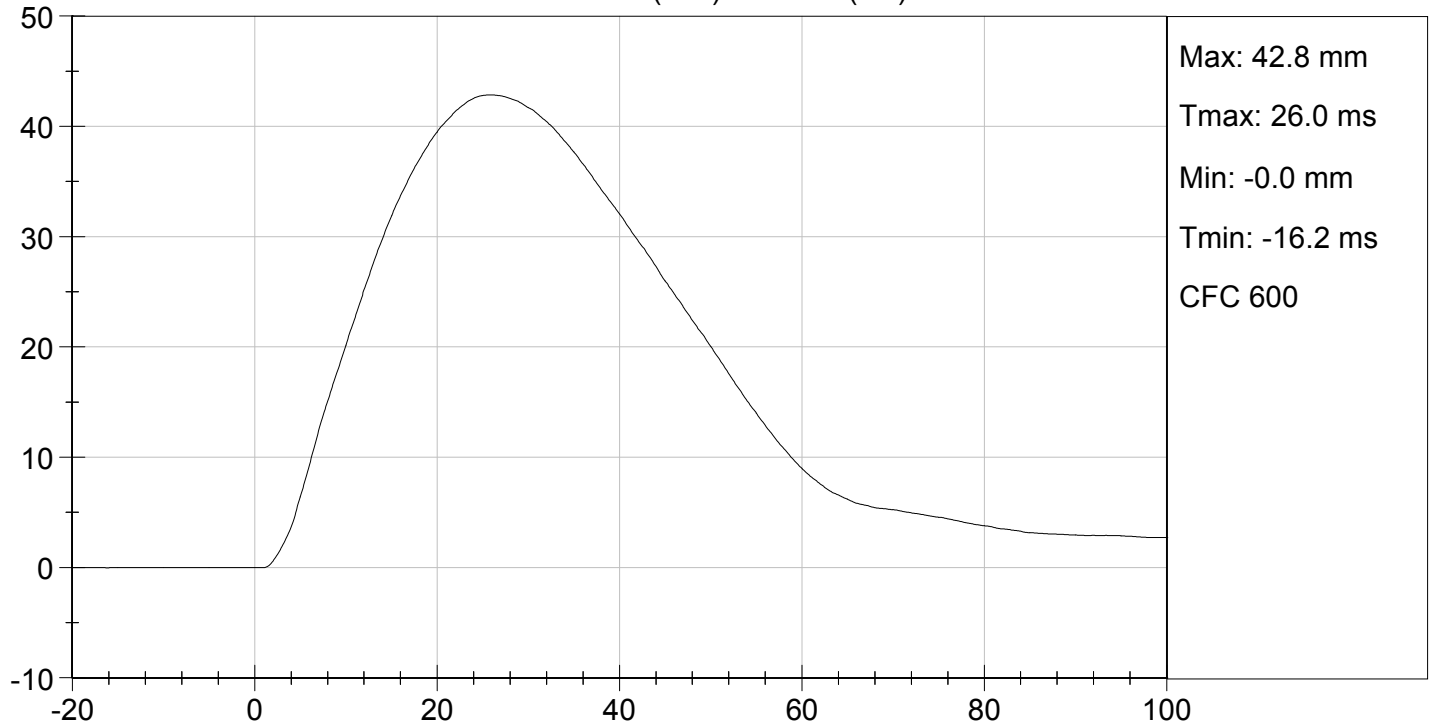
11/09/2012  
 Test Date

David Winkelbauer  
 Approved By

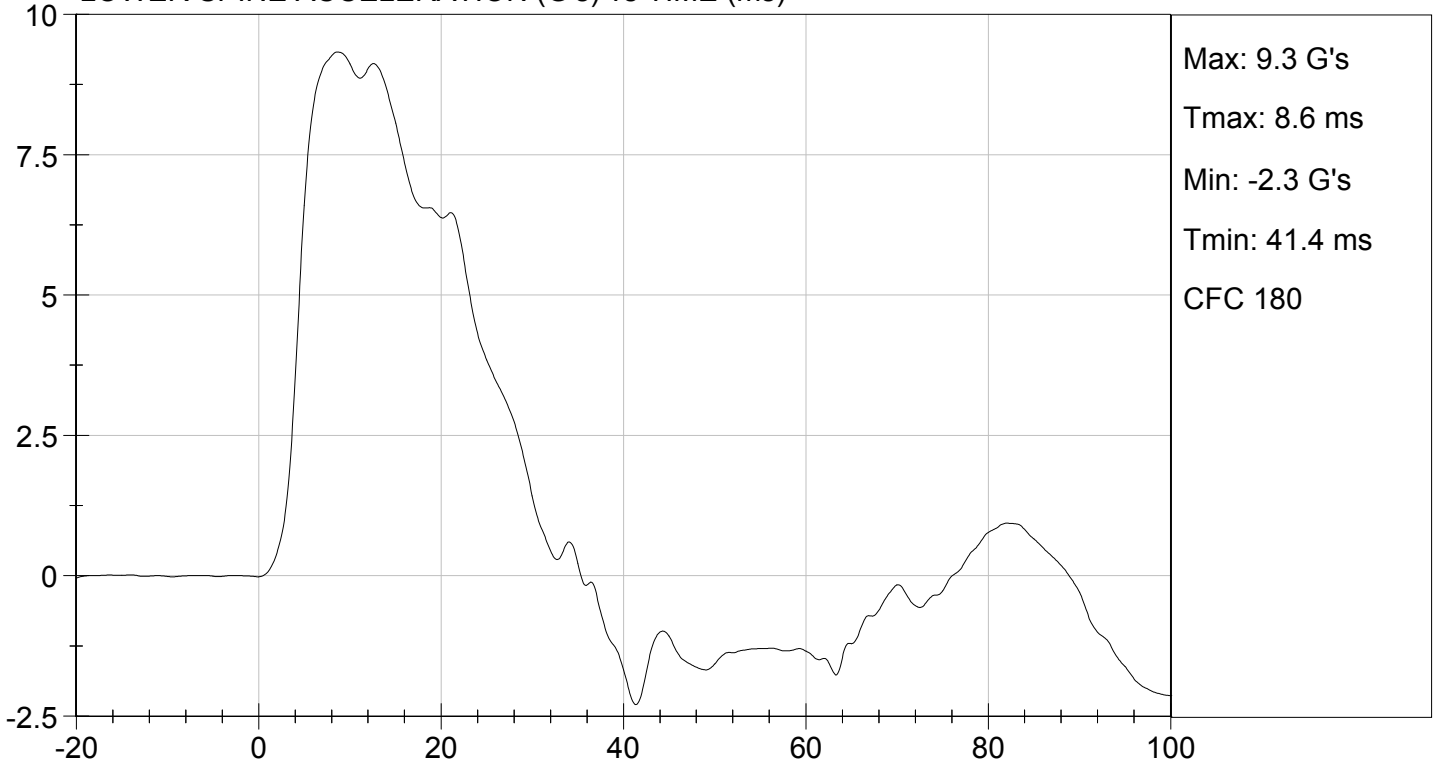




LOWER ABDOMEN RIB DISPLACEMENT (mm) vs TIME (ms)



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



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

**ATD Serial No:** 296

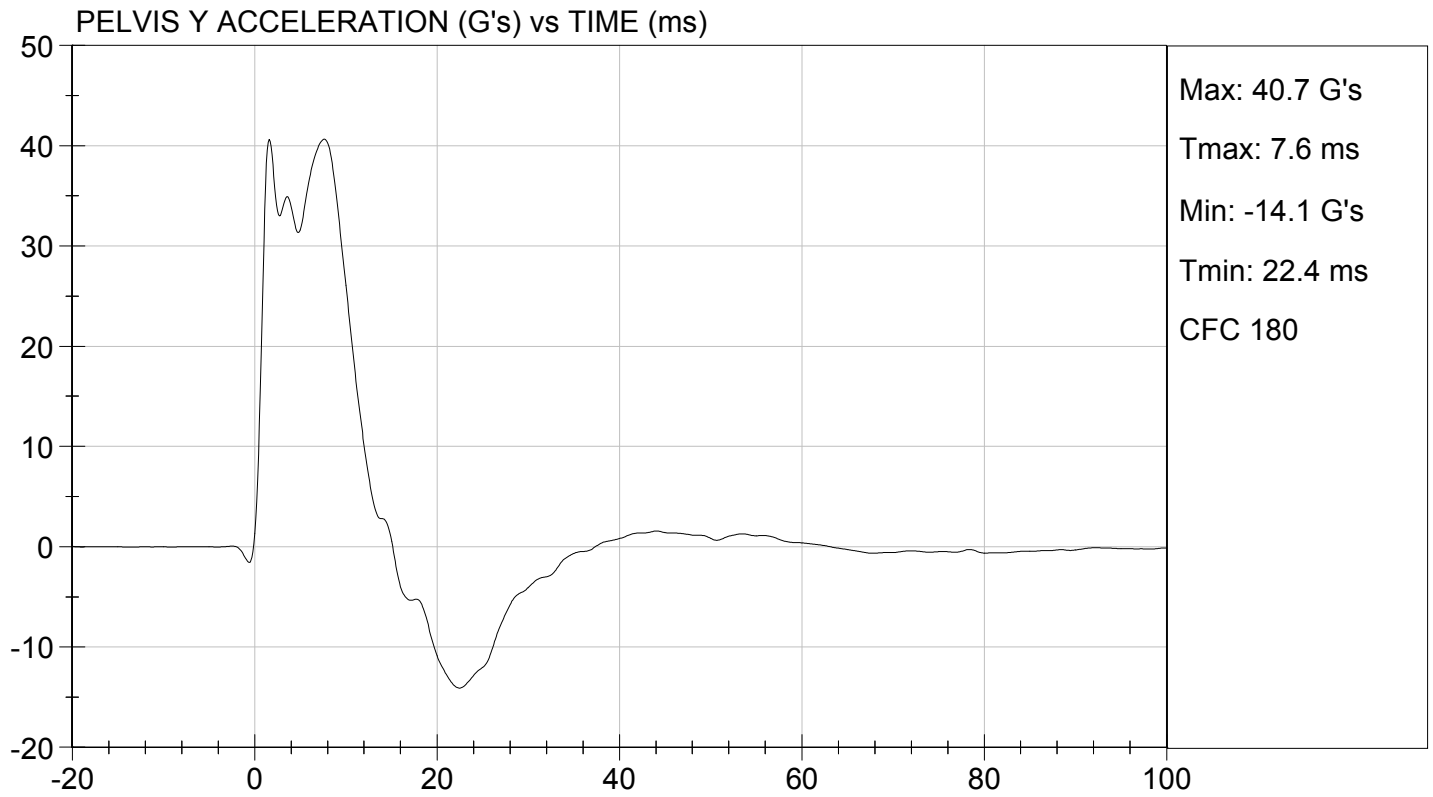
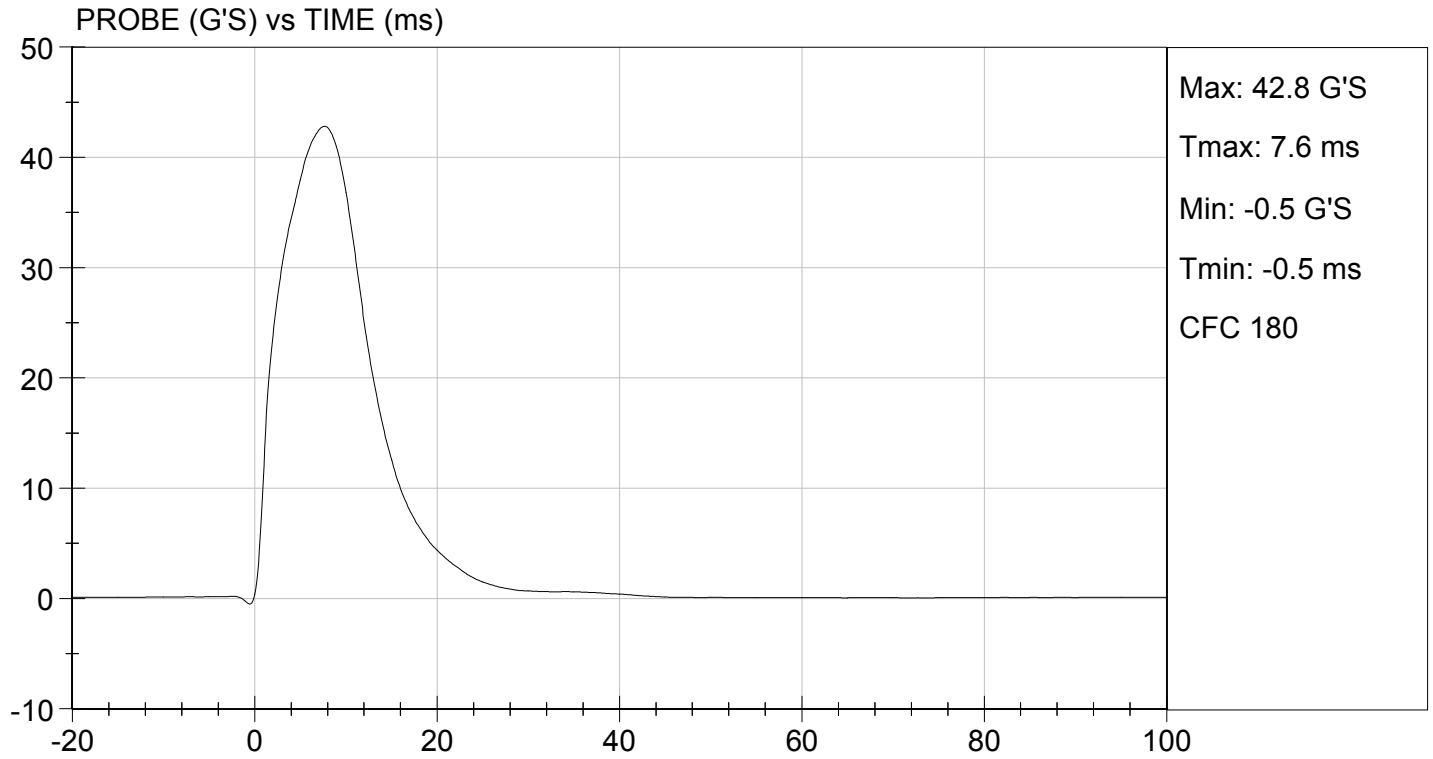
**Test I.D:** D124327

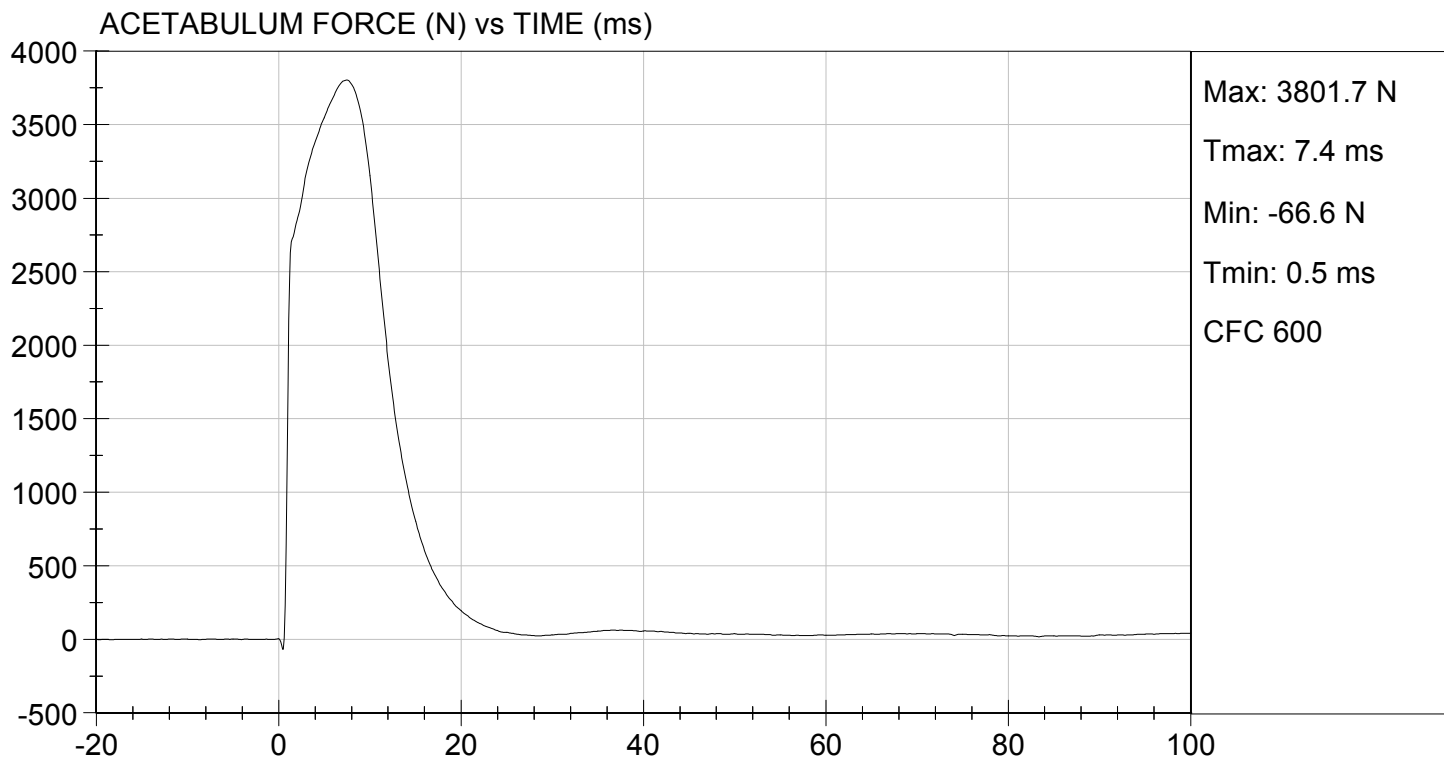
Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.6	Pass
Humidity	%	10 to 70	32	Pass
Impact Velocity	m/s	6.60 to 6.80	6.68	Pass
Maximum Probe Acceleration	G's	38 to 47	43	Pass
Pelvis Y Acceleration After 6 ms	G's	34 to 42	41	Pass
Peak Acetabulum Force	N	3600 to 4300	3,802	Pass
<b>Overall Test Results</b>				<b>Pass</b>

*Jessica Hall*  
 Laboratory Technician

11/12/2012  
 Test Date

*David Winkelbauer*  
 Approved By





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

ATD Serial No: 296

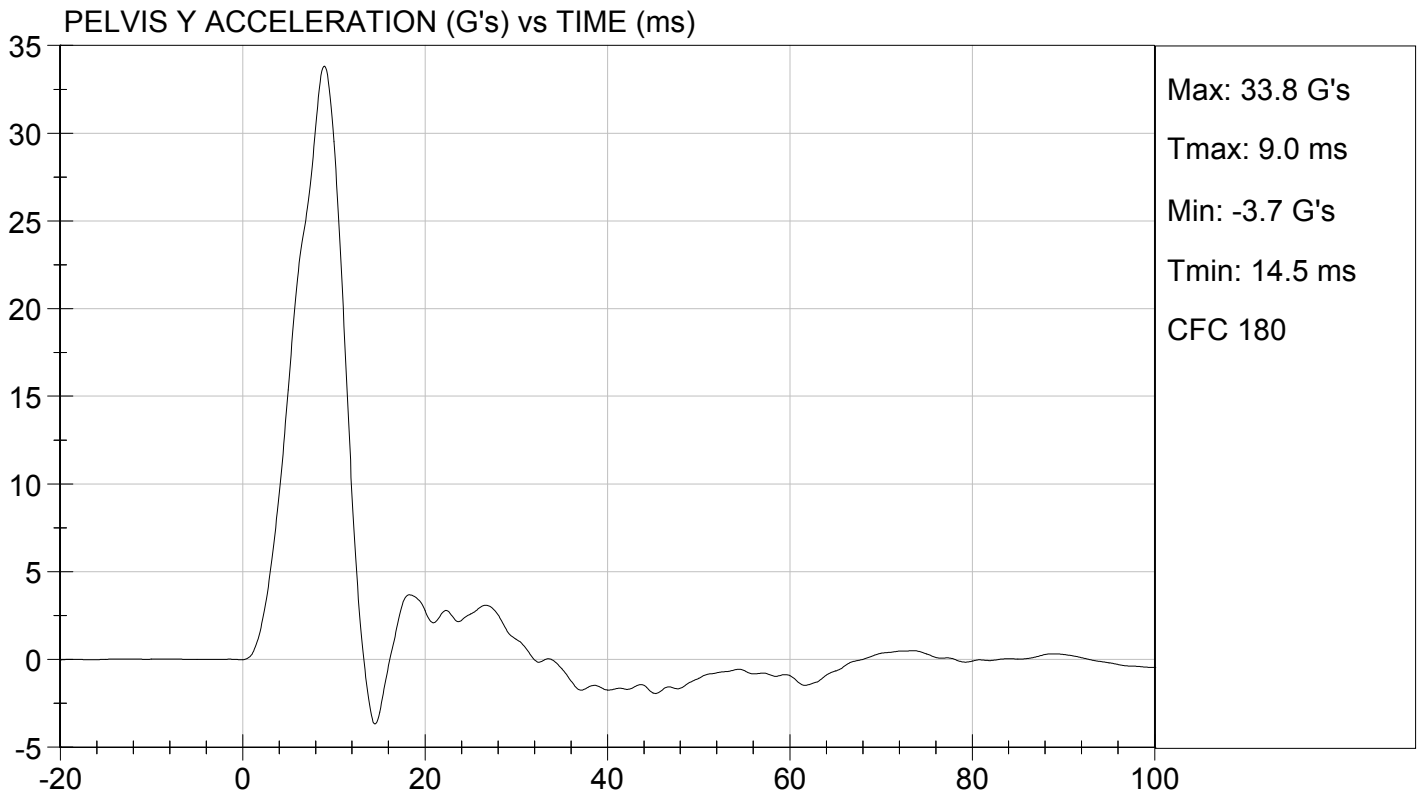
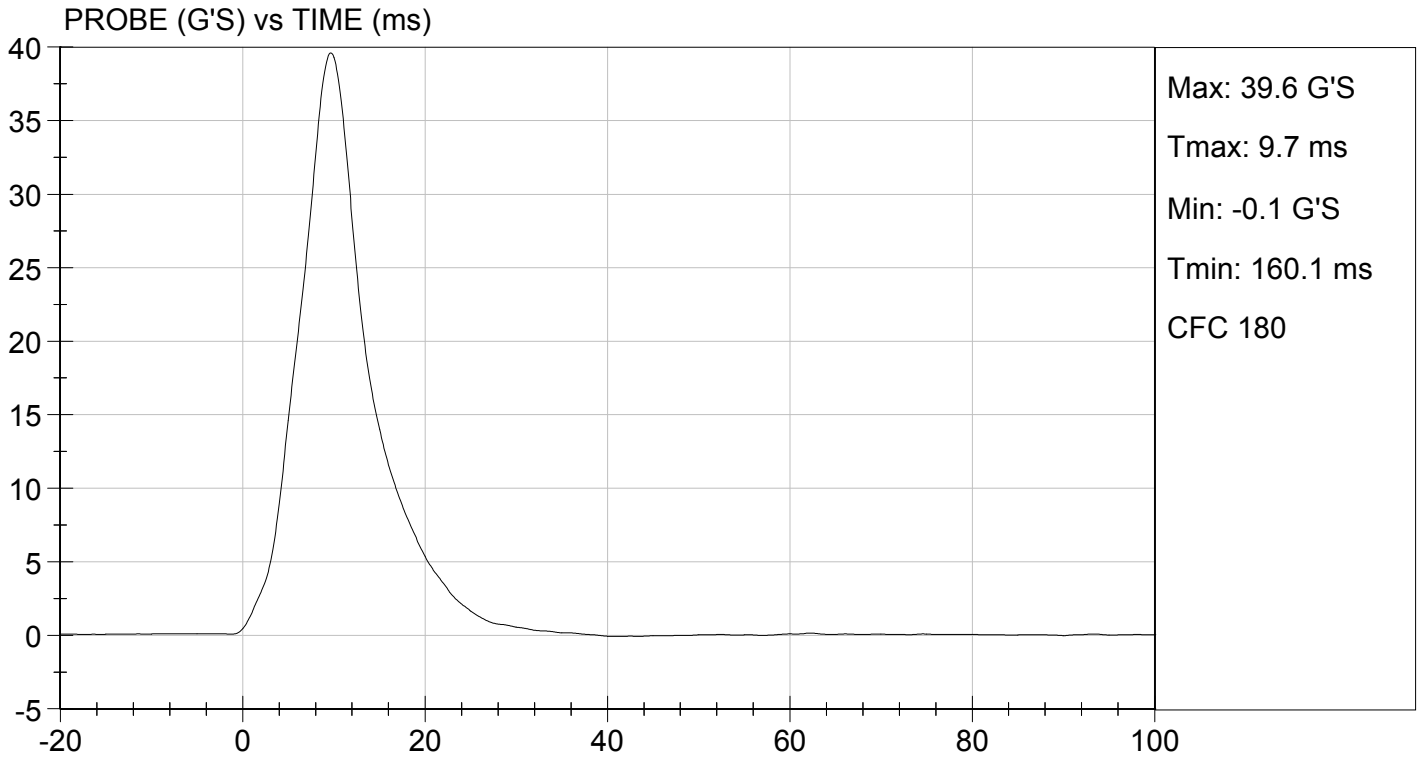
Test I.D: D124328

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.6	Pass
Humidity	%	10 to 70	32	Pass
Impact Velocity	m/s	4.20 to 4.40	4.27	Pass
Maximum Probe Acceleration	G's	36 to 45	40	Pass
Pelvis Y Acceleration	G's	28 to 39	34	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	4,790	Pass
Overall Test Results				Pass

Jessica Hall  
 Laboratory Technician

11/12/2012  
 Test Date

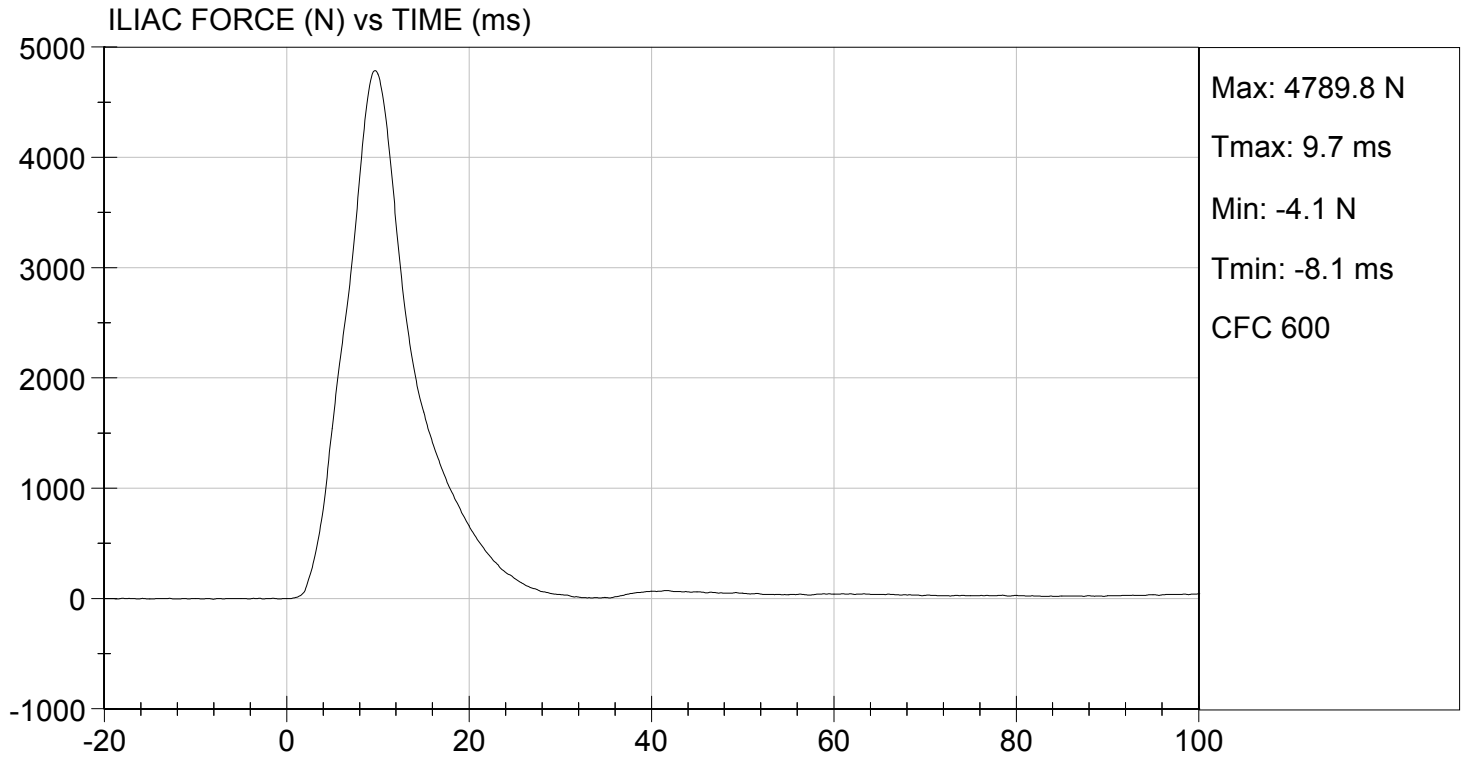
David Winkelbauer  
 Approved By



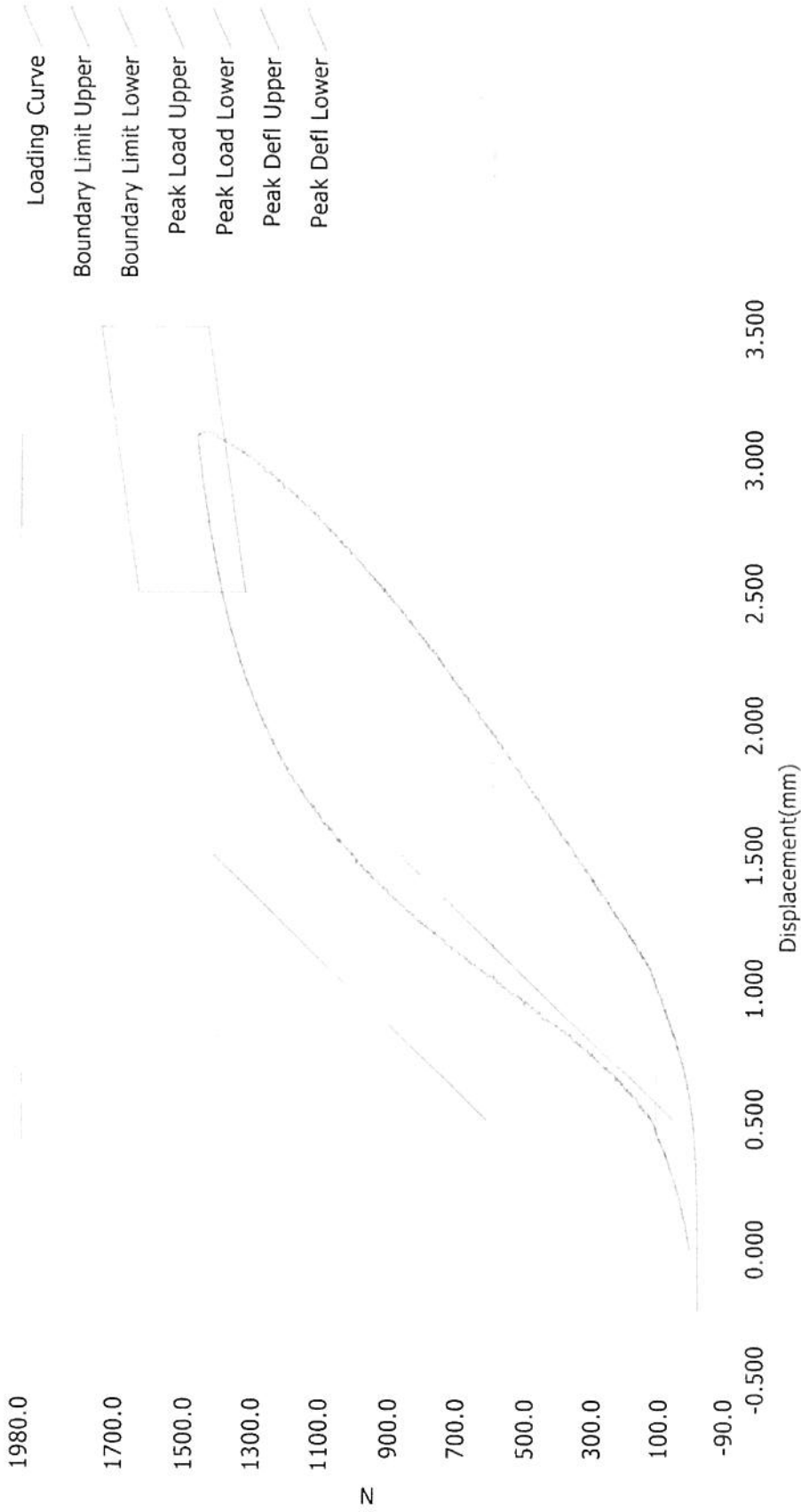


TEST DESC: ILLIAC  
VELOCITY: 14.01 ft/s, 4.27 m/s

TEST DATE: 11/12/2012  
TEST #: D124328



# Resultant Data - SIDIIs Plug Compression



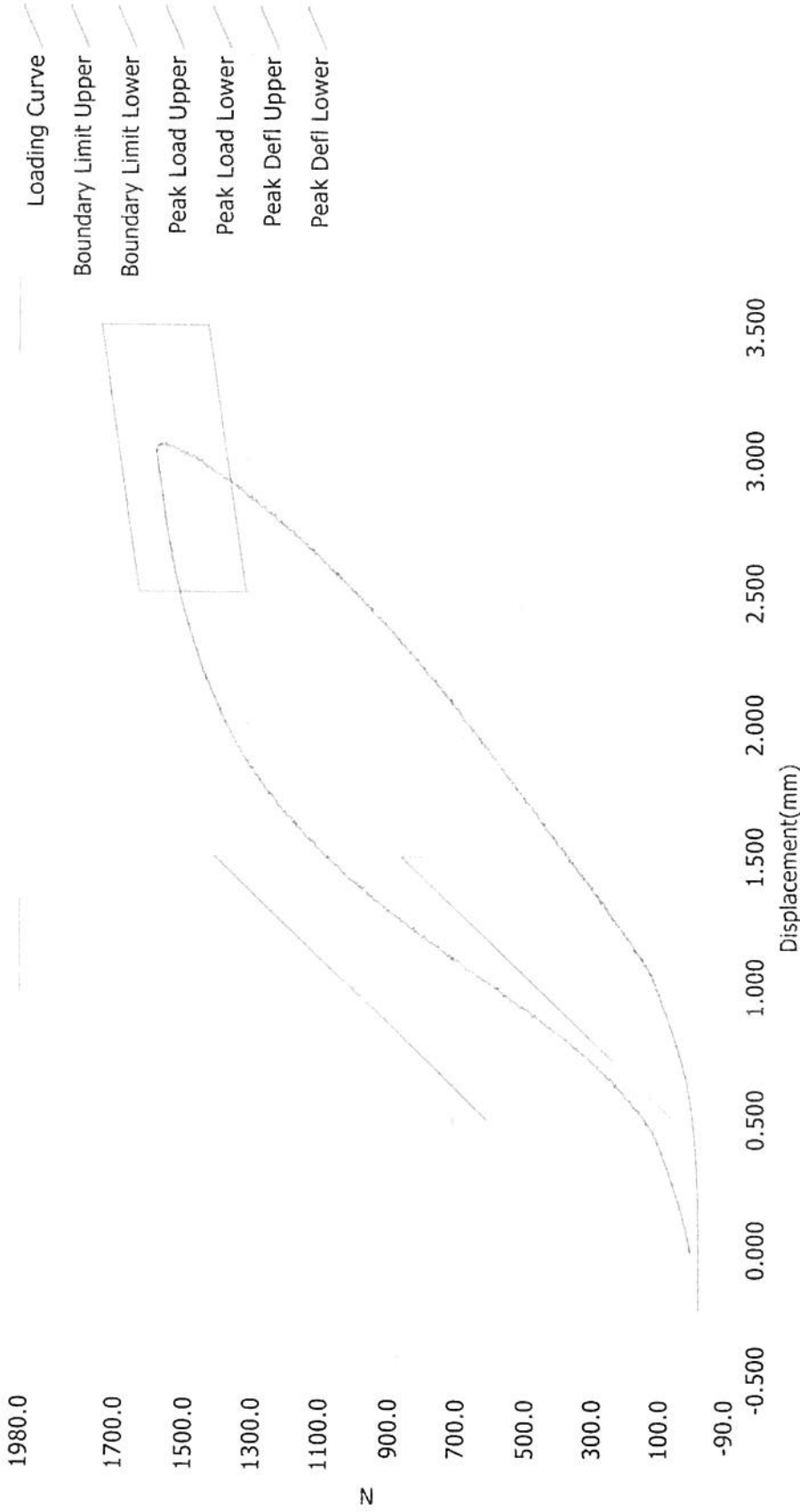
ATD Calibration Lab

Test ID	Part Serial Number	Test Date	Test Time
	47681	10/27/2011	11:20 PM
Cert ID	ATD Serial Number	ATD Type	
	N/A	SIDIIs	

Current Date : 10/27/2011

Current Time : 23:21:36

# Resultant Data - SIDIIs Plug Compression



ATD Calibration Lab

Test ID	Part Serial Number	Test Date	Test Time
	46652	9/28/2011	9:11 PM
Cert ID	ATD Serial Number	ATD Type	
	N/A	SIDIIs	

Current Date : 9/28/2011

Current Time : 21:12:27

**APPENDIX D**

**TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA**

**Table 1 – Dummy Instrumentation (ES-2re)**

			ES-2re S/N 032		
			Serial Number	Manufacturer	Calibration Date
9 Axis Head CG Accelerometers	Primary	X	P72799	Endevco	09/28/12
		Y	P72800	Endevco	09/28/12
		Z	P72801	Endevco	09/28/12
Head CG Accelerometers	Redundant	X	P72802	Endevco	09/28/12
		Y	P72803	Endevco	09/28/12
		Z	P72804	Endevco	09/28/12
9 Axis Head X		Y	P73988	Endevco	08/08/12
		Z	P73989	Endevco	08/08/12
9 Axis Head Y		X	P73990	Endevco	08/08/12
		Z	P73984	Endevco	08/08/12
9 Axis Head Z		X	P73986	Endevco	08/08/12
		Y	P73987	Endevco	08/08/12
Thorax Rib Displacement Potentiometers	Upper	Y	G176	Honeywell	10/19/12
	Middle	Y	G169	Honeywell	10/19/12
	Lower	Y	G164	Honeywell	10/19/12
Abdomen Load Cells	Forward	Y	ABG1532	Denton	01/03/12
	Middle	Y	ABG1534	Denton	01/03/12
	Rear	Y	ABG1535	Denton	01/03/12
Lower Spine Accelerometers (T12)		X	P77693	Endevco	10/12/12
		Y	P77714	Endevco	10/12/12
		Z	P77736	Endevco	10/12/12
Public Symphysis Load Cell		Y	PG461	Denton	01/03/12

**Table 2 – Dummy Instrumentation (SID-IIs)**

				SID-IIs S/N 296		
				Serial Number	Manufacturer	Calibration Date
Head Accelerometers		Primary	X	P78696	Endevco	10/12/12
			Y	P78698	Endevco	10/12/12
			Z	P78699	Endevco	10/12/12
		Redundant	X	P78700	Endevco	10/12/12
			Y	P78701	Endevco	10/12/12
			Z	P78708	Endevco	10/12/12
Displacement Potentiometers	Thoracic Rib	Upper	Y	G012	Servo	10/15/12
		Middle	Y	G1163	FTSS	10/15/12
		Lower	Y	G1158	FTSS	10/15/12
	Abdominal Rib	Upper	Y	G1146	FTSS	10/15/12
		Lower	Y	G1126	FTSS	10/15/12
Lower Spine Accelerometers (T12)			X	P78690	Endevco	10/12/12
			Y	P78693	Endevco	10/12/12
			Z	P78694	Endevco	10/12/12
Acetabulum Load Cell			Y	ACG268	Denton	01/11/12
Iliac Wing Load Cell			Y	IWG282	Denton	12/23/11
Pelvis Plug (struck side)				47681	FTSS	10/27/11
Pelvis Plug (non-struck side)				46652	FTSS	09/28/11

**Table 3 – Vehicle Instrumentation**

			Serial Number	Manufacturer	Calibration Date
1	Vehicle Center of Gravity	X	P66527	Endevco	07/18/12
	Vehicle Center of Gravity	Y	P66528	Endevco	07/18/12
	Vehicle Center of Gravity	Z	P66529	Endevco	07/18/12
2	Right Sill at Front Seat	X	P63898	Endevco	10/08/12
	Right Sill at Front Seat	Y	P63897	Endevco	10/08/12
	Right Sill at Front Seat	Z	P63899	Endevco	10/08/12
3	Right Sill at Rear Seat	X	P77670	Endevco	07/30/12
	Right Sill at Rear Seat	Y	P77671	Endevco	07/30/12
	Right Sill at Rear Seat	Z	P77669	Endevco	07/30/12
4	Left Sill at Front Door	Y	P66759	Endevco	07/18/12
5	Left Sill at Rear Door	Y	P64534	Endevco	06/14/12
6	Left A-Post Lower	Y	P73883	Endevco	07/12/12
7	Left A-Post Middle	Y	P73882	Endevco	07/12/12
8	Left B-Post Lower	Y	P66817	Endevco	08/02/12
9	Left B-Post Middle	Y	P66816	Endevco	10/09/12
10	Front Seat Track	Y	P59290	Endevco	10/08/12
11	Rear Seat Track or Structure	Y	P77710	Endevco	07/23/12
12	Right Rear Occ. Compartment	Y	P66521	Endevco	08/02/12
13	Engine Block	X	P68846	Endevco	07/21/12
	Engine Block	Y	P68845	Endevco	07/21/12
14	Rear Floorpan Above Axle	X	P66523	Endevco	08/02/12
	Rear Floorpan Above Axle	Y	P66522	Endevco	08/02/12
	Rear Floorpan Above Axle	Z	P66775	Endevco	07/31/12

**Table 4 – MDB Instrumentation**

		Serial Number	Manufacturer	Calibration Date
MDB Center of Gravity	X	P59379	Endevco	06/12/12
MDB Center of Gravity	Y	P59380	Endevco	06/12/12
MDB Center of Gravity	Z	P59381	Endevco	06/12/12
Left Frame at Rear Axle Centerline	X	P59279	Endevco	06/12/12
Left Frame at Rear Axle Centerline	Y	P59280	Endevco	06/12/12