

REPORT NUMBER: SPNCAP-MGA-2013-016

**NEW CAR ASSESSMENT PROGRAM (NCAP)
Side Impact Pole Test**

**GENERAL MOTORS OF CANADA LTD.
2013 Cadillac XTS 4-Dr Sedan
NHTSA No.: MD0112**

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



Test Date: October 1, 2012

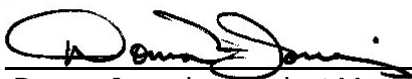
Final Report Date: October 30, 2012

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: October 30, 2012

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: _____

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

Date: _____

Technical Report Documentation Page

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7. Author(s) Donna Janovicz, Project Manager Ben Fischer, Project Engineer				8. Performing Organization Report No. SPNCAP-MGA-2013-016																												
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				14. Sponsoring Agency Code NVS-111																												
15. Supplementary Notes																																
16. Abstract A 32.20 km/h, 75° oblique impact Side NCAP Test was conducted on the subject 2013 Cadillac XTS 4-Dr Sedan in accordance with the specifications of the Office of Crashworthiness Standards Side NCAP Pole Laboratory Test Procedure for the generation of consumer information on vehicle side pole crash protection. The test was conducted at MGA Research Corporation, in Burlington, Wisconsin, on October 1, 2012. The impact velocity was 32.2 km/h, and the ambient temperature at the struck (driver's) side of the target vehicle at the time of impact was 20.9°C. The test vehicle post-test maximum crush was 390 mm at level 3. The test vehicle's performance was as follows: <table border="1" style="margin: 10px auto; border-collapse: collapse; text-align: center;"> <thead> <tr> <th rowspan="2" style="text-align: left;">Measurement Description</th> <th colspan="3">Driver ATD (SID-IIs)</th> </tr> <tr> <th>Units</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td style="text-align: left;">Head Injury Criteria (HIC₃₆)</td> <td>N/A</td> <td>1000</td> <td>393</td> </tr> <tr> <td style="text-align: left;">Resultant Lower Spine Acceleration</td> <td>Gs</td> <td>82</td> <td>51</td> </tr> <tr> <td style="text-align: left;">Total Pelvic Force (sum of acetabular and iliac forces)</td> <td>N</td> <td>5525</td> <td>3465</td> </tr> <tr> <td style="text-align: left;">Maximum Thoracic Rib Deflection</td> <td>mm</td> <td>38*</td> <td>17</td> </tr> <tr> <td style="text-align: left;">Maximum Abdomen Rib Deflection</td> <td>mm</td> <td>45*</td> <td>16</td> </tr> </tbody> </table> *Proposed IARV The two doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite doors did not open during the side impact event.						Measurement Description	Driver ATD (SID-IIs)			Units	Threshold	Result	Head Injury Criteria (HIC ₃₆)	N/A	1000	393	Resultant Lower Spine Acceleration	Gs	82	51	Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	3465	Maximum Thoracic Rib Deflection	mm	38*	17	Maximum Abdomen Rib Deflection	mm	45*	16
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17. Key Words New Car Assessment Program (NCAP) Side Impact Pole Part 572V 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: tis@nhtsa.dot.gov FAX: 202-493-2833																													
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SECTION 1

TEST PURPOSE AND PROCEDURE

This 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 Cadillac XTS 4-Dr Sedan. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Side NCAP Pole Laboratory Test Procedure, dated September 2012.

SECTION 2 SUMMARY OF TEST RESULTS

A rigid pole side impact test was conducted on a 2013 Cadillac XTS 4-Dr Sedan. The subject vehicle was towed into the rigid pole at an angle of 75° and a velocity of 32.2 km/h. The test was conducted by MGA Research Corporation in Burlington, Wisconsin, on October 1, 2012. Pre-test and post-test photographs of the test vehicle and side impact dummy (SID-IIs) are included in Appendix A of this report.

One Part 572V (SID-IIs) dummy was placed in the driver designated seating position according to instructions specified in the OCWS Side NCAP Pole Laboratory Test Procedure dated September 2012. Camera locations and other pertinent camera information are included in this report.

The Part 572V (SID-IIs) dummy was instrumented accordingly:

- Head CG Triaxial Accelerometers (Primary and Redundant)
- Head 9-Axis Accelerometers
- Thorax Upper, Middle, and Lower Rib Displacement Potentiometers
- Abdomen Upper Rib and Lower Rib Displacement Potentiometers
- Lower Spine (T12) Triaxial Accelerometers
- Iliac Load Cell
- Acetabulum Load Cell

Appendix B contains the vehicle and 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.

Injury readings for the SID-IIs dummy were recorded as follows:

Measurement Description	Driver ATD (SID-IIs)		
	Units	Threshold	Result
Head Injury Criteria (HIC ₃₆)	N/A	1000	393
Resultant Lower Spine Acceleration	Gs	82	51
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	3465
Maximum Thoracic Rib Deflection	mm	38*	17
Maximum Abdominal Rib Deflection	mm	45*	16

*Proposed IARV

Supplemental restraint information is given below:

Restraint Type	Left Front (Driver) Occupant Location 1		Left Rear (Passenger) Occupant Location 4	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	No		
Knee Airbag	Yes	No		
Side Curtain Airbag	Yes	Yes	Yes	Yes
Side Torso/Abdomen/Pelvis Airbag	Yes	Yes	No	
Torso Airbag	No		Yes	Yes
Seat Belt Pretensioner	Yes	Yes	No	
Seat Belt Load Limiter	Yes		No	
Other				

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

GENERAL COMMENTS

There was no valid data collected for:

- Left Floor Sill Y after 8ms
- Left Lower A-Post Y after 33ms
- Left Mid A-Post Y after 31ms
- Left Mid B-Post Y after 8ms
- Driver Seat Track Y after 9ms
- Top of Engine Y

Load Cell Pole #1 FY is questionable from 89-95ms

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

SECTION 3
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2013 Cadillac XTS 4-Dr Sedan
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MD0112
 Test Date: 10/01/2012

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	MD0112	Traction Control System (TCS)	Yes
Model Year	2013	Auto-Leveling System	Yes
Make	Cadillac	Automatic Door Locks (ADL)	Yes
Model	XTS	Power Window Auto-Reverse	Yes
Body Style	Sedan	Other Optional Feature	N/A
VIN	2G61P5S31D9121056	Driver Front Airbag	Yes
Body Color	Radiant Silver Metallic	Driver Curtain Airbag	Yes
Odometer Reading (km/mi)	95 / 59	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	Lateral	Driver Pelvis Airbag	No
Transmission Type	Automatic	Driver Knee Airbag	Yes
Transmission Speeds	6	Rear Pass. Curtain Airbag	Yes
Overdrive	Yes	Rear Pass. Head/Torso Airbag	No
Final Drive	Front	Rear Pass. Torso Airbag	Yes
Roof Rack	No	Rear Pass. Torso/Pelvis Airbag	No
Sunroof/T-Top	Yes	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 Load Limiter	Yes
Anti-Lock Brakes (ABS)	Yes	Rear Pass. Load Limiter	No
		Other Safety Restraint	N/A

Does owner's manual provide instructions to turn off automatic door locks?	No
--	----

DATA FROM CERTIFICATION LABEL

Manufactured By	General Motors of Canada Ltd.	GVWR (kg)	2285
Date of Manufacture	08/12	GAWR Front (kg)	1190
Vehicle Type	Passenger Car	GAWR Rear (kg)	1095

VEHICLE SEATING AND WEIGHT CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity (DSC)	2	3		5	
Capacity Weight (VCW) (kg)				420	(A)
DSC x 68.04 kg				340	(B)
Rated Cargo and Luggage Weight (RCLW) (kg)				80	(A-B)

VEHICLE SEAT TYPE

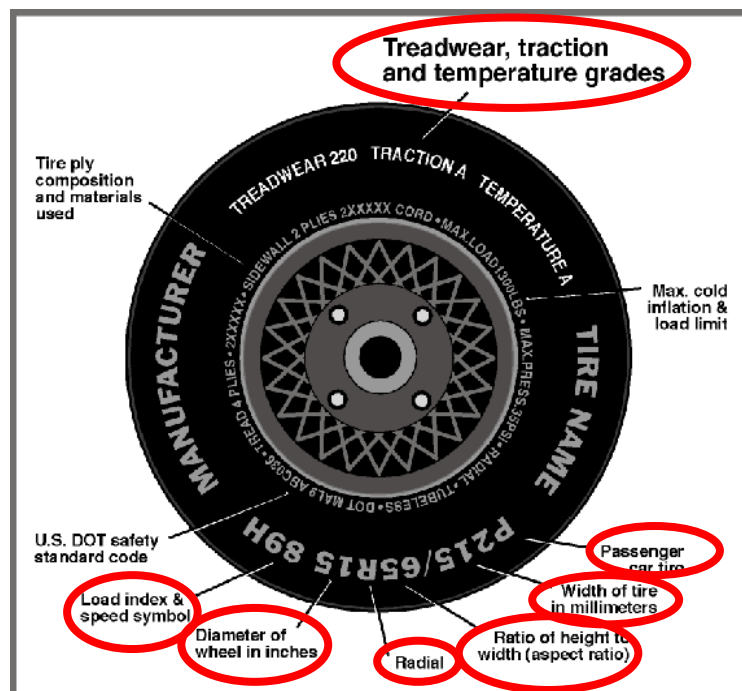
Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable	
						Manual	Power
Front Seat	X						X
Rear or Second Row		X			X		
Third Row Seat							

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

Test Vehicle: 2013 Cadillac XTS 4-Dr Sedan
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MD0112
 Test Date: 10/01/2012

VEHICLE TIRE INFORMATION



Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	350	350
Cold Pressure (kPa)	240	240
Recommended Tire Size	P245/45R19	P245/45R19
Tire Size on Vehicle	P245/45R19	P245/45R19
Tire Manufacturer	Goodyear	Goodyear
Tire Model	Eagle	Eagle
Treadwear	440	440
Traction	A	A
Temperature Grade	A	A
Load Index/Speed Symbol	98V	98V
Tire Material	Rubber	Rubber

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

Test Vehicle: 2013 Cadillac XTS 4-Dr Sedan
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MD0112
 Test Date: 10/01/2012

TEST PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kpa	240	240	240	240
Tire Placard	kpa	240	240	240	240
Owner's Manual	kpa				
As Tested	kpa	240	240	240	240

TEST VEHICLE AXLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	562.5	379.2		573.8	435.5		576.1	444.5	
Right	kg	526.1	385.6		536.2	433.6		516.2	448.2	
Ratio	%	58.7	41.3		56.1	43.9		55.0	45.0	
Totals	kg	1088.6	764.8	1853.4	1110.0	869.1	1979.1	1092.3	892.7	1985.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1853.4	(A)
Actual Weight of 1 P572V ATD (SID-IIs) ATD Used	kg	52.2	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	80	(C)
Calculated Vehicle Target Weight (TVTW)	kg	1985.6	(A+B+C)

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

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Ballast (if any)	22.2
Right taillight, right side mirror, tire repair kit, trunk carpet.	15.9

TEST VEHICLE ATTITUDES AND CG

	Units	As Delivered	As Tested	Fully Loaded	Meets Requirement***
Driver Door Sill Angle (front-to-rear)*	deg	-0.5	0.0	0.0	Yes
Front Pass. Sill Angle (front-to-rear)*	deg	-0.6	0.0	0.0	Yes
Front Bumper Angle (left-to-right)**	deg	0.0	0.0	-0.1	Yes
Rear Bumper Angle (left-to-right)**	deg	0.0	0.0	-0.1	Yes
Vehicle CG (Aft of Front Axle)	mm	1169	1245	1275	
Vehicle CG (Left (+) / Right (-) from Longitudinal Centerline)	mm	13	16	23	

*ND=Nose Down (-), NU=Nose Up (+) ** LD=Left Down (-), LU=Left Up (+)

*** The "As Tested" vehicle attitude measurements must be equal to or between the "As Delivered" and "Fully Loaded" vehicle attitude measurements.

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

Test Vehicle: 2013 Cadillac XTS 4-Dr Sedan
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MD0112
 Test Date: 10/01/2012

SEAT POSITIONING

The driver's seat, front center seat (if applicable), and right front passenger's seat should be set to the forward-most, mid-height, 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	11.4	0.0	5.7
Front Passenger Seat	11.8	0.0	5.9
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 SCR Height (mm)	SCR Height Position	SCR Height (mm)		
				Rear- most	Mid- Fore/Aft	Forward- Most
Driver Seat	5.7	34	Max	68	68	68
	5.7	34	Mid	34	34	34
	5.7	34	Min	0	0	0
Front Passenger Seat	5.9	34	Max	68	68	68
	5.9	34	Mid	34	34	34
	5.9	34	Min	0	0	0
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 Cadillac XTS 4-Dr Sedan
 Test Program: NCAP Side Pole Impact Test

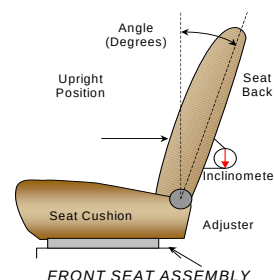
NHTSA No. MD0112
 Test Date: 10/01/2012

SEAT FORE/AFT POSITIONS

Seat	Total Fore/Aft Travel		Test Position from Forward-most Position	
	mm	Detents	mm	Detent
Driver Seat	242		0	
Front Passenger Seat	242		0	
Front Center Seat				
Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed	Fixed

SEAT BACK ANGLE ADJUSTMENT

The driver's seat back is positioned such that the dummy's head is level. The front center and front passenger's seat backs are positioned in a similar manner as the driver's seat back. The struck-side rear passenger seat back is positioned in accordance with the information provided by the manufacturer on Form No. 1 for the 5th percentile female dummy in a Side NCAP MDB test. The rear center and non-struck side rear passenger's seat back is set to match the struck-side rear seat back.



Seat	Total Seat Back Angle Range		Test Position from Vertical	
	Degrees	Detents	Degree	Detent
Driver Seat w/Seated Dummy	92.7		-11.3	
Front Passenger Seat	82.5		-11.3	
Front Center Seat				
Struck Side Rear Seat	Fixed		Fixed	
Non-Struck Side Rear Seat	Fixed		Fixed	
Rear Center Seat	Fixed		Fixed	

SEAT BELT ANCHORAGE ADJUSTMENT

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

	Total # of Positions	Placed in Position #
Driver Seat	5 detents (1 st as 1)	0 (uppermost as 0)

HEAD RESTRAINT ADJUSTMENT

Head restraints are adjusted to the lowest and most full forward in-use position.

	Total # of Positions	Placed in Position #
Driver Seat	4	Lowest/Full Forward

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

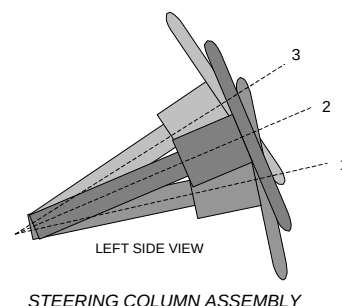
Test Vehicle: 2013 Cadillac XTS 4-Dr Sedan
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MD0112
 Test Date: 10/01/2012

STEERING COLUMN ADJUSTMENT

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

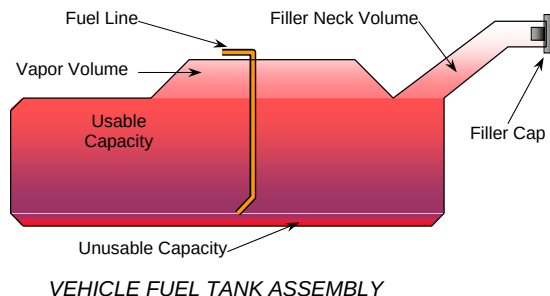
	Degrees	Fore/Aft Position (mm)
Lowermost, Position 1	71.6	190
Geometric Center, Position 2	68.9	165
Uppermost, Position 3	66.2	140
Telescoping Steering Wheel Travel		50
Test Position	68.9	165



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. If ignition key is at "On" position and engine is not running, the fuel pump only operates for a short duration to prime the fuel system. If the engine is running, the fuel pump operates continuously. The fuel pipe is on the right side.



FUEL TANK CAPACITY DATA

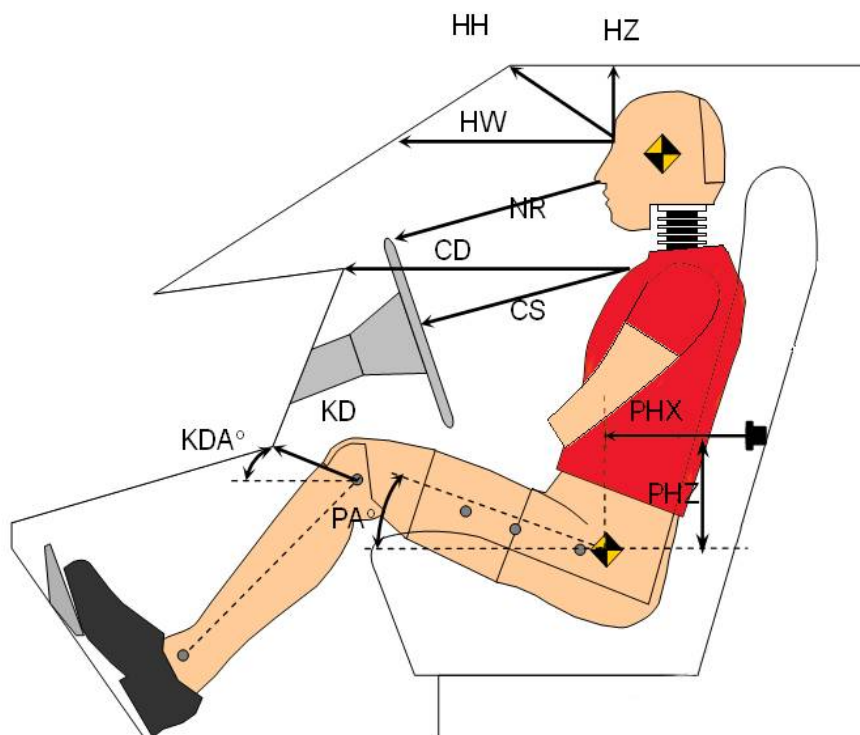
	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	73.8
Usable Capacity of "Optional Tank" (see Form No. 1)	
Usable Capacity of Standard Tank as Specified in Owner's Manual	70.0
Usable Capacity of Optional Tank as Specified in Owner's Manual	
93% of Usable Capacity	68.6
Actual Amount of Solvent Used	68.7
1/3 of Usable Capacity	24.6

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

.DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2013 Cadillac XTS 4-Dr Sedan
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MD0112
 Test Date: 10/01/2012



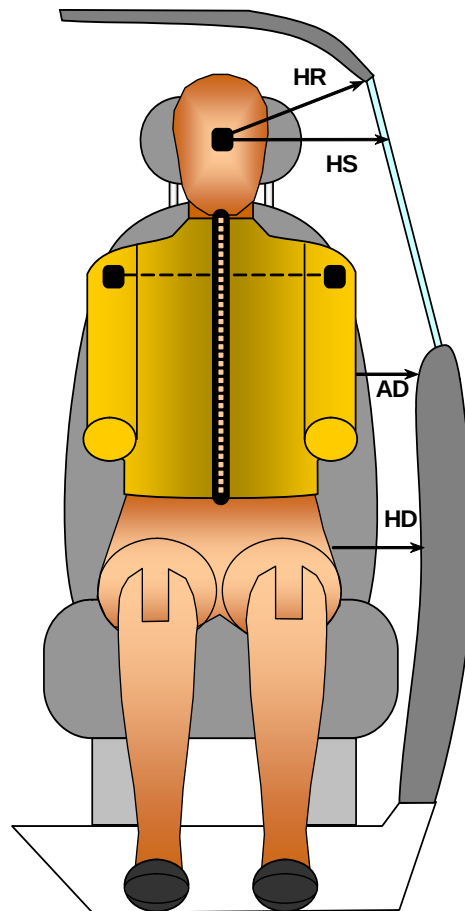
LEFT SIDE VIEW

Code	Measurement Description	Driver S/N 306	
		Length (mm)	Angle (°)
HH	Head to Header	251	
HW	Head to Windshield	634	
HZ	Head to Roof Liner	163	
NR	Nose to Rim	243	
CD	Chest to Dashboard	411	
CS	Chest to Steering Wheel	188	
KDL/KDAL°	Left Knee to Dash	144	35.5
KDR/KDAR°	Right Knee to Dash	131	33.9
PAX°	Pelvic Tilt Angle (X-Axis)		22.2
PAY°	Pelvic Tilt Angle (Y-Axis)		0.1
PHX	Hip Point to Striker (X-Axis)	309	
PHZ	Hip Point to Striker (Z-Axis)	128	

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2013 Cadillac XTS 4-Dr Sedan
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MD0112
 Test Date: 10/01/2012



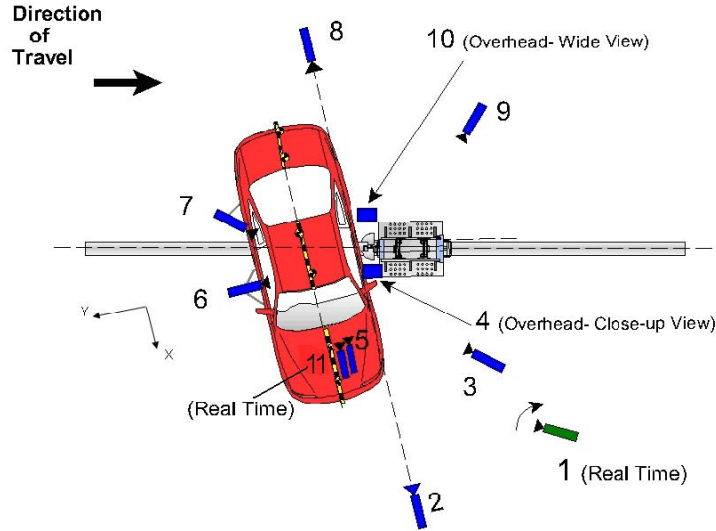
FRONT VIEW OF DUMMY

Code	Measurement Description	Driver S/N 306
		Length (mm)
HR	Head to Side Header	223
HS	Head to Side Window	362
AD	Arm to Door	177
HD	Hip Point to Door	165

DATA SHEET NO. 5 CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2013 Cadillac XTS 4-Dr Sedan
Test Program: NCAP Side Pole Impact Test

NHTSA No. MD0112
Test Date: 10/01/2012



Reference: (from Point of Impact for X and Y; from Ground for Z):
+X = Forward of Impact, + Y = Right of Impact, +Z = Down

Camera No.	View	Coordinates (mm)			Lens (mm)	Film Speed (fps)
		X*	Y*	Z*		
1	Real-Time Pan View					30
2	Front Ground Level	-70	5590	-1670	24	1000
3	Impact Side 45° Forward	-2640	3570	-1760	20	1000
4	Overhead Closeup	80	0	-4470	50	1000
5	Onboard – Driver Front				16	
6	Onboard – Driver Side				8	
7	Onboard – Driver Rear				8	
8	Rear Ground Level	-40	-5980	-1630	24	1000
9	Impact Side 45° Rearward	-3880	-3580	-1850	20	1000
10	Overhead Wide View	480	0	-4680	14	1000
11	Real-Time Dummy Front View					30

* All measurements accurate to ± 6 mm

Note: Vehicle was at a 75° angle to the rigid pole.

Explain why camera(s) did not operate as intended: Not Applicable

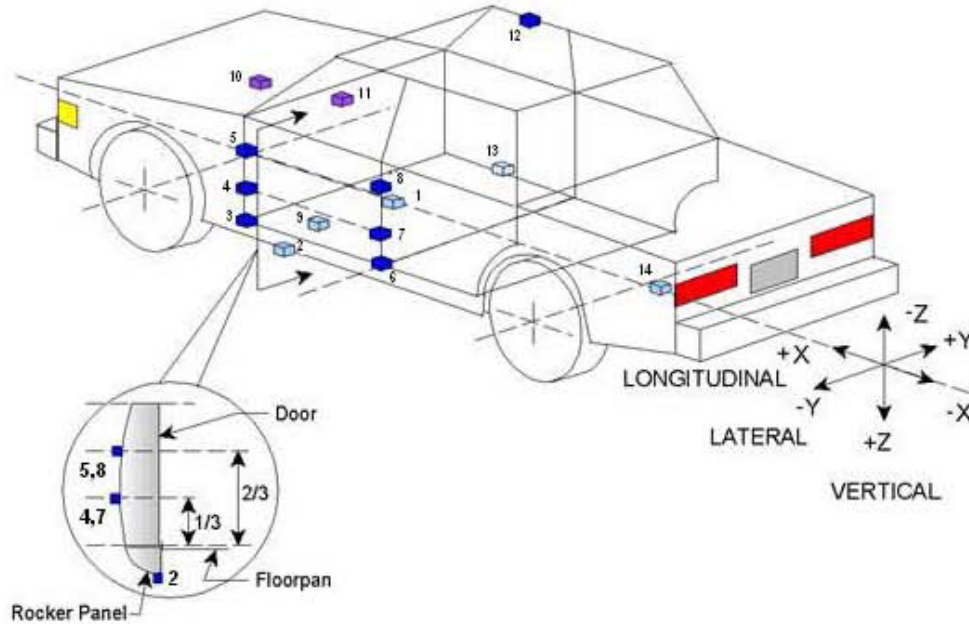
INSTRUMENTATION

	Number of Channels
Driver Dummy	22
Vehicle Structure	18
Pole Load Cells	8
TOTAL	48

DATA SHEET NO. 6
VEHICLE ACCELEROMETER DATA

Test Vehicle: 2013 Cadillac XTS 4-Dr Sedan
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MD0112
 Test Date: 10/01/2012



	Accelerometer Location			
	ID	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2760	155	-189
2	Left Floor Sill	3214	-750	-218
3	A Pillar Sill	3541	-750	-221
4	A Pillar Low	3475	-850	-548
5	A Pillar Mid	3514	-849	-819
6	B Pillar Sill	2434	-750	-216
7	B Pillar Low	2371	-736	-539
8	B Pillar Mid	2362	-729	-790
9	Driver Seat Track	2823	-555	-331
10	Engine Top	4185	-20	-930
11	Firewall	3984	-20	-981
12	Right Roof	2321	522	-1487
13	Right Floor Sill	3172	750	-224
14	Rear Floorpan	241	0	-356

Reference:

X – Test Vehicle Rear Bumper (+forward)
 Y – Test Vehicle Centerline (+ to right)
 Z – Ground Plane (+ down)

DATA SHEET NO. 7
RIGID POLE LOAD CELL DATA

Test Vehicle: 2013 Cadillac XTS 4-Dr Sedan
Test Program: NCAP Side Pole Impact Test

NHTSA No. MD0112
Test Date: 10/01/2012



254 mm Diameter Rigid Pole

Load Cell Locations	
ID	Height From Impact Surface (mm)
1	182
2	470
3	698
4	986
5	1212
6	1641
7	1854
8	2053

DATA SHEET NO. 8
POST-TEST OBSERVATIONS

Test Vehicle: 2013 Cadillac XTS 4-Dr Sedan
Test Program: NCAP Side Pole Impact Test

NHTSA No. MD0112
Test Date: 10/01/2012

TEST DUMMY INFORMATION AND CONTACT POINTS

Description	Driver SID-IIs Dummy
Face	Curtain Airbag
Top of Head	Curtain Airbag
Left Side of Head	Curtain Airbag
Back of Head	Curtain Airbag, Headrest
Left Shoulder	Side Airbag
Upper Torso	Side Airbag, Seatback
Lower Torso	Side Airbag, Seatback
Left Hip	Side Airbag, Seatpan
Left Knee	Door Panel

POST-TEST DOOR PERFORMANCE

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

POST-TEST SEAT PERFORMANCE

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

POST-TEST STRUCTURAL OBSERVATIONS

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

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

Test Vehicle: 2013 Cadillac XTS 4-Dr Sedan
Test Program: NCAP Side Pole Impact Test

NHTSA No. MD0112
Test Date: 10/01/2012

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Left Front (Driver) Occupant Location 1		Left Rear (Passenger) Occupant Location 4	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	No		
Knee Airbag	Yes	No		
Side Curtain Airbag	Yes	Yes	Yes	Yes
Side Torso/Abdomen/Pelvis Airbag	Yes	Yes	No	
Torso Airbag	No		Yes	Yes
Seat Belt Pretensioner	Yes	Yes	No	
Seat Belt Load Limiter	Yes		No	
Other				

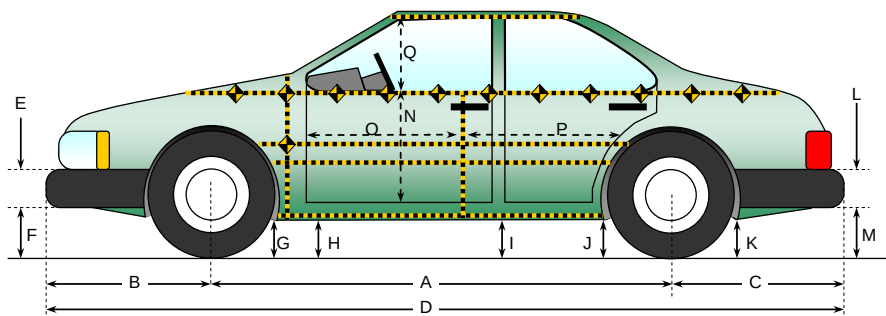
VEHICLE SPEED, VEHICLE ANGLE AT IMPACT, AND IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vertical Impact Reference Line (Aft of Front Axle) (Intended Impact Point)	mm		1133
Actual Impact Point (Aft of Front Axle)	mm		1141
Horizontal Offset (+forward / -rearward)	mm	+/- 38 of Intended Impact Point	-8
Angle Between Vehicle's Longitudinal Centerline and Line of Forward Motion	deg	75 +/- 3	75
Trap No. 1 Velocity (Primary)	km/h	31.4 to 33.0	32.2
Trap No. 2 Velocity (Redundant)	km/h	31.4 to 33.0	32.3

DATA SHEET NO. 9
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2013 Cadillac XTS 4-Dr Sedan
Test Program: NCAP Side Pole Impact Test

NHTSA No. MD0112
Test Date: 10/01/2012



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

LEFT SIDE VIEW

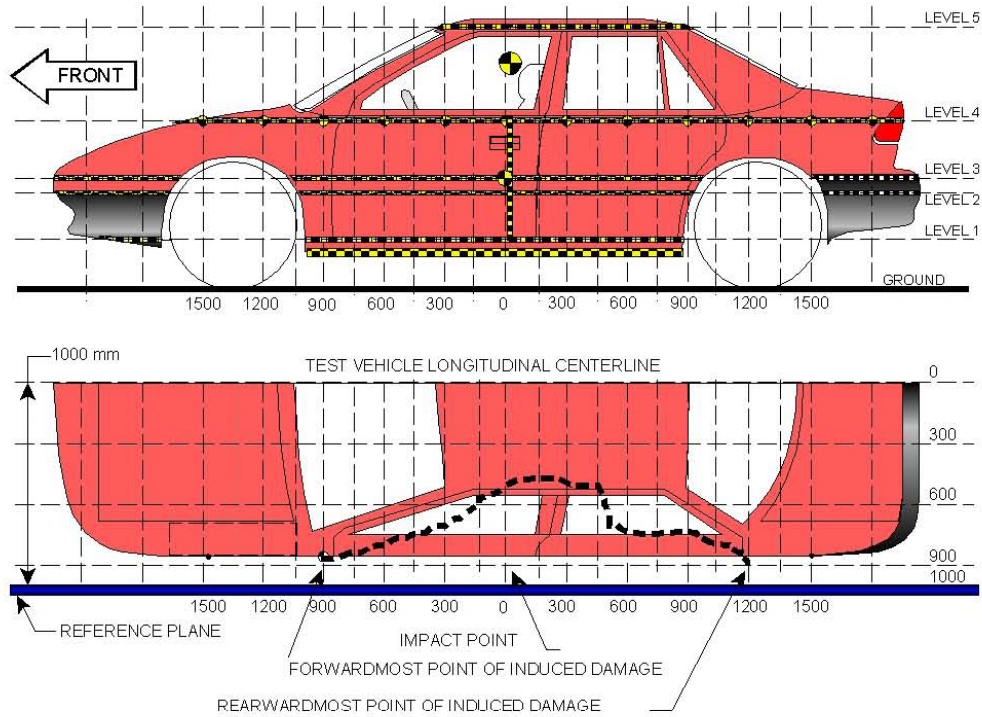
VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2834	2761	73
B	Front Axle to FSOV	1033	1033	0
C	Rear Axle to RSOV	1266	1266	0
D	Total Vehicle Length at Centerline	5133	5060	73
E	Front Bumper Thickness	120	120	0
F	Front Bumper Bottom to Ground	251	282	-31
G	Sill Height at Front Wheel Well	175	155	20
H	Sill Height at Front Door Leading Edge	175	150	25
I	Sill Height at B-Pillar	178	155	23
J1	Sill Height at Rear Wheel Well	199	196	3
J2	Pinch Weld Height at Rear Wheel Well	198	190	8
K	Sill Height Aft of Rear Wheel Well	245	235	10
L	Rear Bumper Thickness	150	150	0
M	Rear Bumper Bottom to Ground	332	320	12
N	Sill Height to Bottom of Front Window Sill	775	761	14
O	Front Door Leading Edge to Impact CL	645	643	2
P	Rear Door Trailing Edge to Impact CL	1364	1400	-36
Q	Front Window Opening	400	362	38
R	Right Side Length	3901	3908	-7
S	Left Side Length	3901	3791	110
T	Vehicle Width at B-Pillars	1828	1721	107

DATA SHEET NO. 10 **VEHICLE EXTERIOR CRUSH MEASUREMENTS**

Test Vehicle: 2013 Cadillac XTS 4-Dr Sedan
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MD0112
 Test Date: 10/01/2012



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

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Measurement Description	Height Above Ground (mm)
1	Sill Top	247
2	Occupant Hip Point	596
3	Mid Door	646
4	Window Sill	955
5	Window Top	1432

DATA SHEET NO. 10 (CONTINUED)
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2013 Cadillac XTS 4-Dr Sedan
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MD0112
 Test Date: 10/01/2012

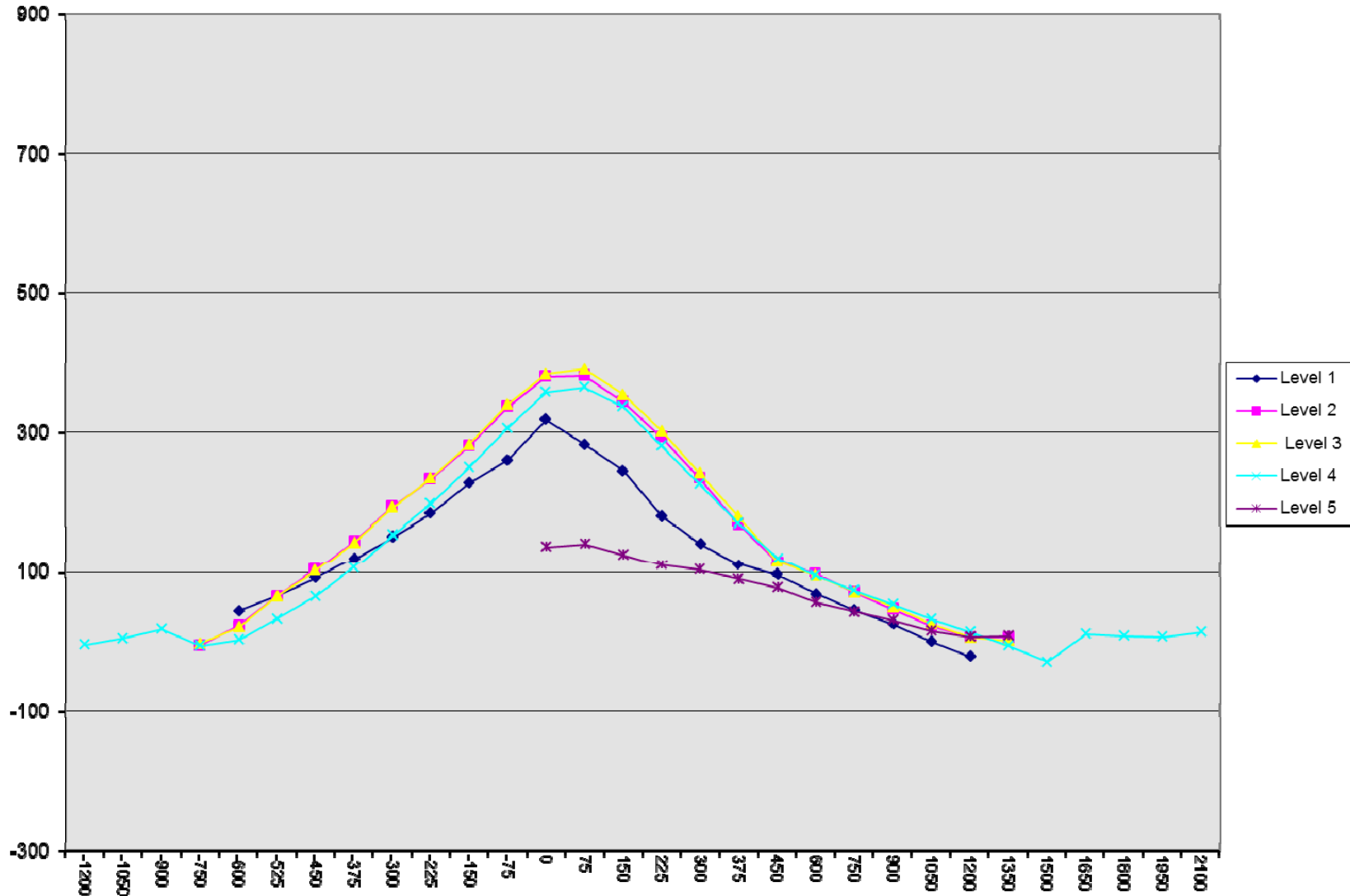
	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-1200				296					293					-3	
-1050				283					289					6	
-900				273					292					19	
-750		176	176	264			172	175	259			-4	-1	-5	
-600	226	182	181	254		271	206	203	258		45	24	22	4	
-525	229	183	181	249		295	249	247	283		66	66	66	34	
-450	230	183	181	245		322	287	283	311		92	104	102	66	
-375	234	182	181	239		354	327	324	346		120	145	143	107	
-300	236	182	180	235		387	375	372	389		151	193	192	154	
-225	236	182	180	231		419	414	414	428		183	232	234	197	
-150	237	183	180	228		464	463	462	477		227	280	282	249	
-75	239	183	180	226		499	519	520	532		260	336	340	306	
0	240	184	181	224	507	558	564	564	581	644	318	380	383	357	137
75	242	184	181	220	500	524	565	571	584	641	282	381	390	364	141
150	241	185	181	218	496	485	528	535	554	622	244	343	354	336	126
225	245	185	183	217	495	425	478	485	497	605	180	293	302	280	110
300	246	186	184	217	494	387	420	425	442	597	141	234	241	225	103
375	249	187	185	219	490	360	355	364	388	580	111	168	179	169	90
450	250	188	186	220	489	346	303	301	341	567	96	115	115	121	78
600	254	190	189	224	491	323	287	284	319	548	69	97	95	95	57
750	257	192	190	227	489	303	263	262	301	533	46	71	72	74	44
900	261	194	191	231	494	287	241	242	285	526	26	47	51	54	32
1050	261	193	191	234	501	262	216	217	267	517	1	23	26	33	16
1200	255	186	188	238	512	235	193	195	253	520	-20	7	7	15	8
1350		178	179	246	537		185	181	241	546		7	2	-5	9
1500				245					217					-28	
1650				249					261					12	
1800				252					261					9	
1950				261					269					8	
2100				275					290					15	

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. The final distance from impact is determined after the final dummy positioning and the pole is aligned with the center of gravity of the dummy's head.

DATA SHEET NO. 10 (CONTINUED)
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2013 Cadillac XTS 4-Dr Sedan
Test Program: NCAP Side Pole Impact Test

NHTSA No. MD0112
Test Date: 10/01/2012



DATA SHEET NO. 11
FMVSS NO. 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2013 Cadillac XTS 4-Dr Sedan
 Test Program: NCAP Side Pole Impact Test

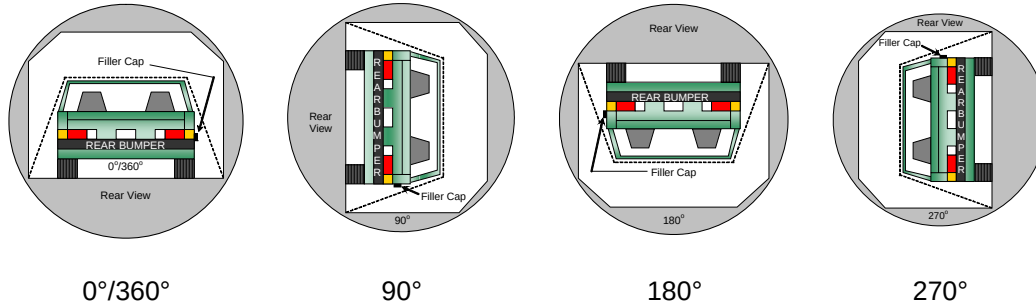
NHTSA No. MD0112
 Test Date: 10/01/2012

Test Time: 11:12 am

Temperature: 20.9° 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°	109	300	409
90° to 180°	111	300	411
180° to 270°	109	300	409
270° to 360°	107	300	407

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

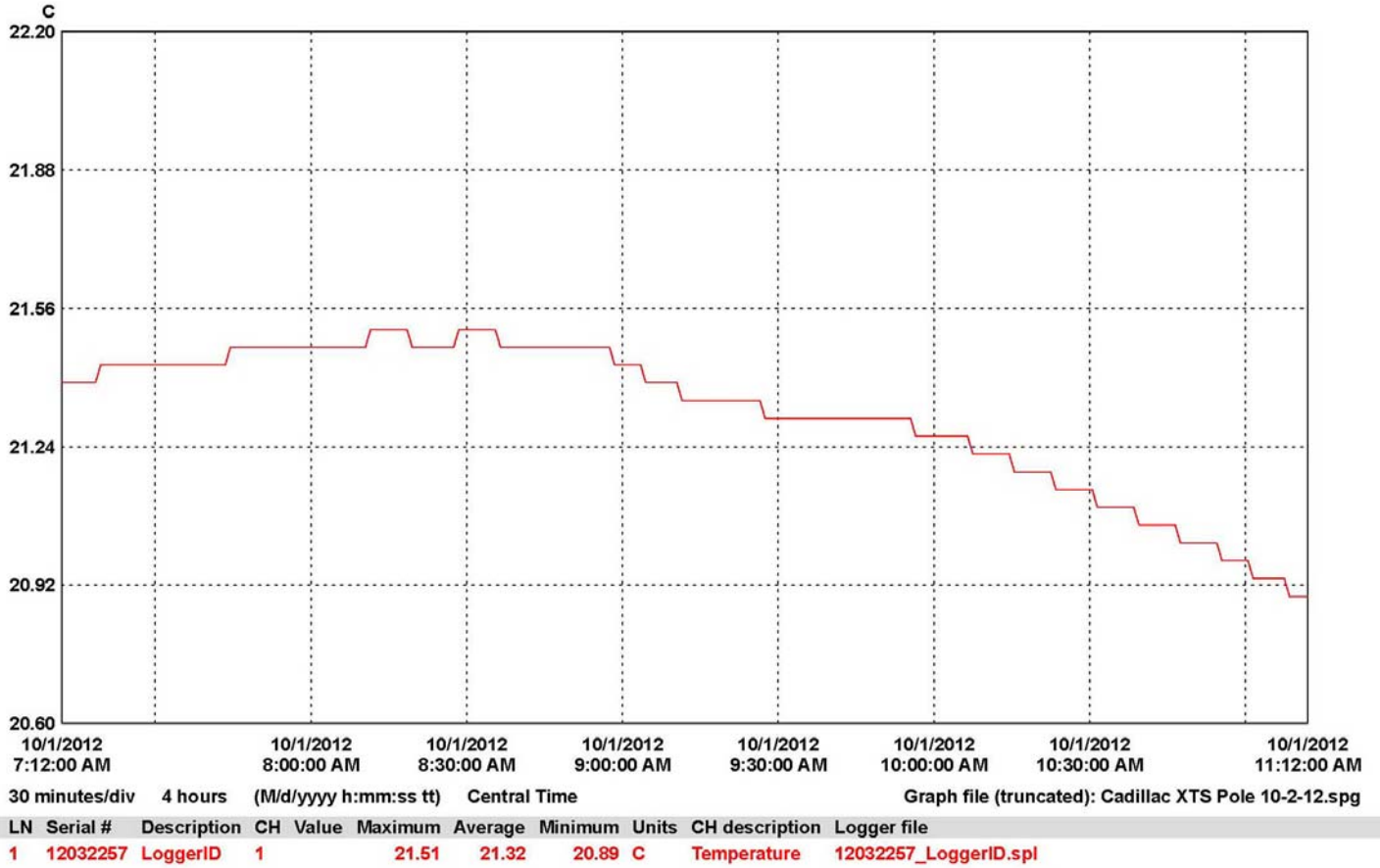
ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

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

DATA SHEET NO. 12
DUMMY/VEHICLE TEMPERATURE STABILIZATION DATA

Test Vehicle: 2013 Cadillac XTS 4-Dr Sedan
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MD0112
 Test Date: 10/01/2012



APPENDIX A
PHOTOGRAPHS

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As Delivered Right Front $\frac{3}{4}$ View of Test Vehicle



As Delivered Left Rear $\frac{3}{4}$ View of Test Vehicle



Pre-Test Frontal View of Test Vehicle



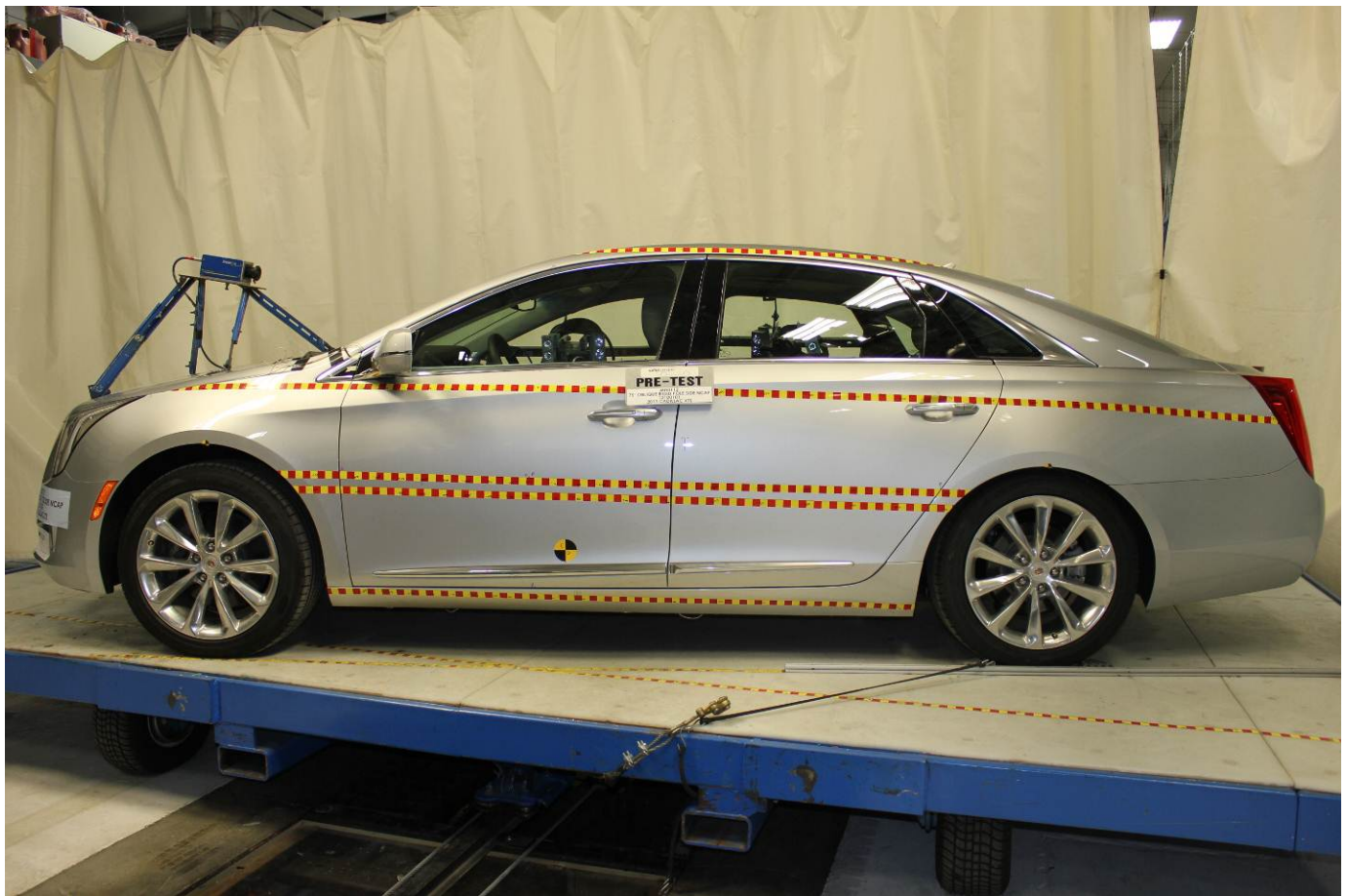
Post-Test Frontal View of Test Vehicle



Pre-Test Left Front $\frac{3}{4}$ View of Test Vehicle



Post-Test Left Front $\frac{3}{4}$ View of Test Vehicle



Pre-Test Left Side View of Test Vehicle



Post-Test Left Side View of Test Vehicle



Pre-Test Left Rear $\frac{3}{4}$ View of Test Vehicle



Post-Test Left Rear $\frac{3}{4}$ View of Test Vehicle



Pre-Test Rear View of Test Vehicle



Post-Test Rear View of Test Vehicle



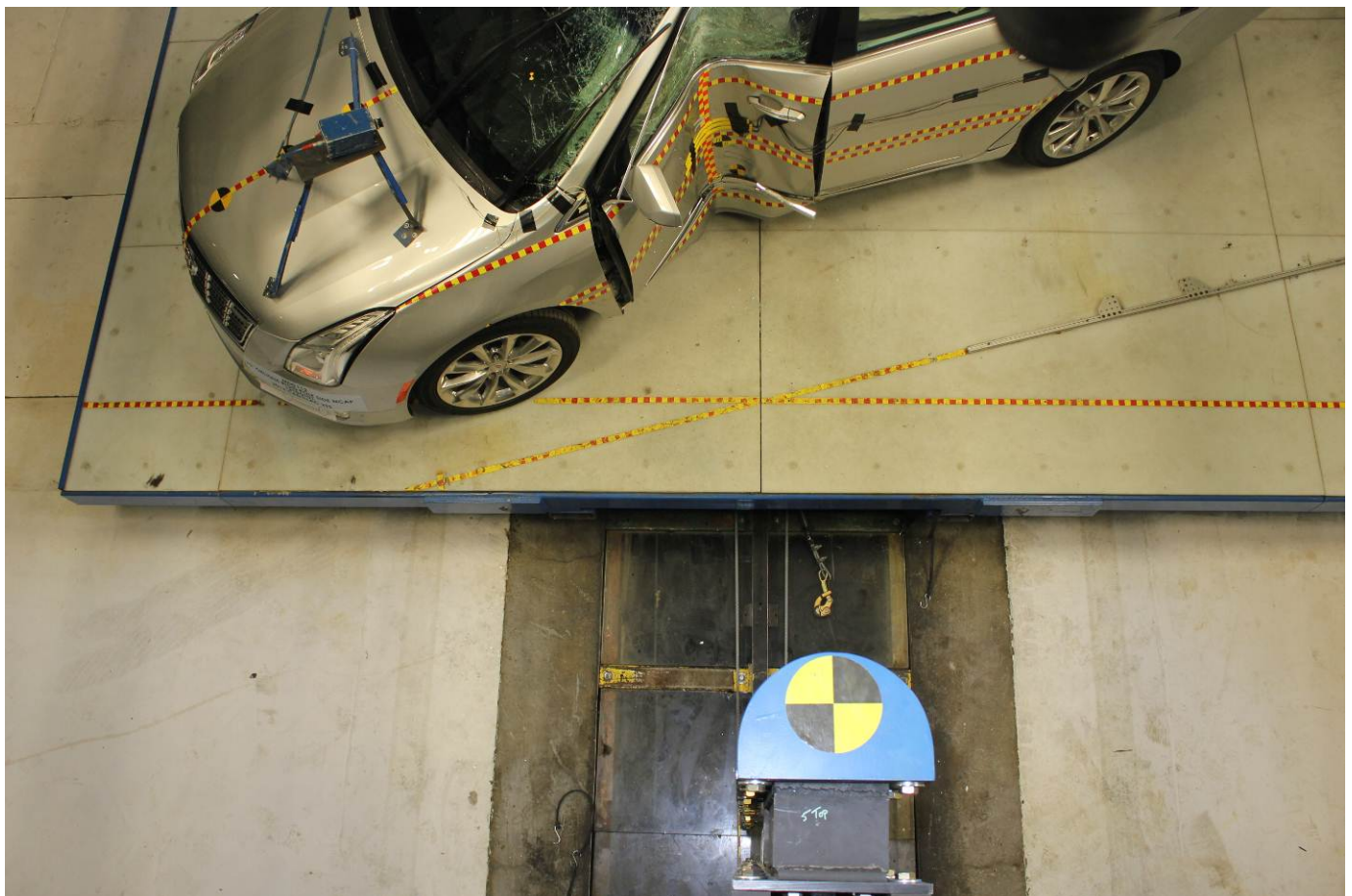
Pre-Test Right Side View of Test Vehicle



Post-Test Right Side View of Test Vehicle



Pre-Test Overhead View of Test Area



Post-Test Overhead View of Test Area



Post-Test Overhead View of Test Area



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



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



Pre-Test Close-Up View of Impact Point Target



Post-Test Close-Up View of Impact Point Target Showing Impact Location



Pre-Test Front Close-Up View of Dummy Head and Chest



Post-Test Front Close-Up View of Dummy



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



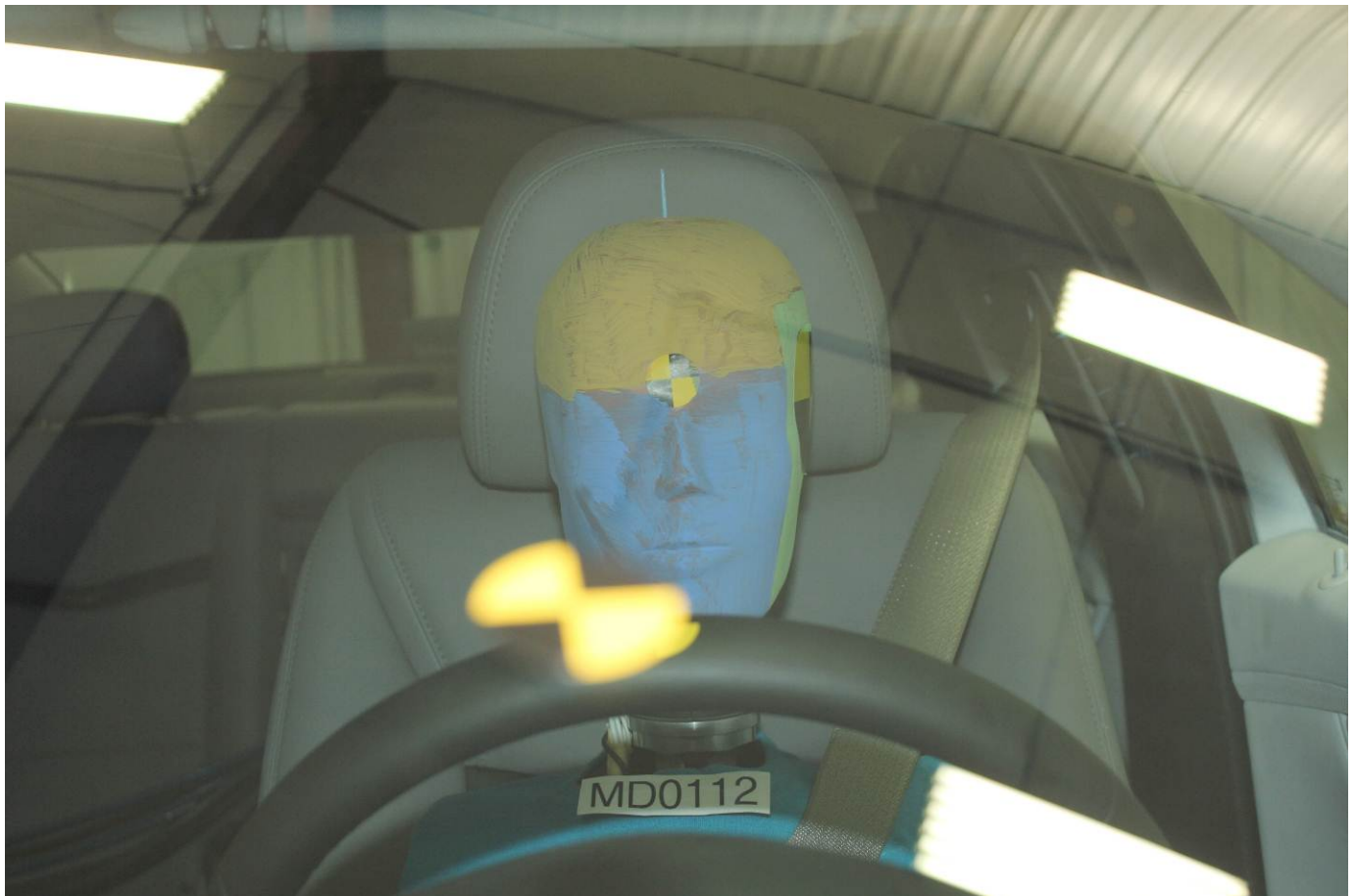
Pre-Test Left Side View of Dummy Shoulder and Door Top View



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



Pre-Test Front View of Seat Back Prior to Dummy Positioning



Pre-Test Front Close-Up View of Dummy Head and Shoulders in Relation to Head Restraint



Pre-Test Front Close-Up View of Dummy Head and Shoulders in Relation to Head Restraint



Pre-Test Front View of Seat Pan Prior to Dummy Positioning



Pre-Test Overhead View of Dummy Thighs on Seat Pan



Pre-Test Left Side View of Dummy's Neck Showing Position of Adjustable Neck Bracket



Pre-Test Left Side View of Dummy's Head Showing Dummy's Head is Level



Pre-Test Placement of Dummy's Feet



Pre-Test View of Belt Anchorage for 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 Dummy and Door Clearance View



Post-Test Dummy and Door Clearance View



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



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



Pre-Test Inner Door Panel View



Post-Test Inner Door Panel View Showing Dummy Contact Location



Post-Test Dummy Close-Up Head Contact with Vehicle Interior View



Post-Test Dummy Close-Up Head Contact with Side Air Bag View



Post-Test Dummy Close-Up Torso Contact with Vehicle Interior View



Post-Test Dummy Close-Up Torso Contact with Vehicle Interior View



Post-Test Dummy Close-Up Torso Contact with Side Air Bag View



Post-Test Dummy Close-Up Pelvis Contact with Vehicle Interior View



Post-Test Dummy Close-Up Pelvis Contact with Side Air Bag View



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



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



Close-Up View of Vehicle's Certification Label



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



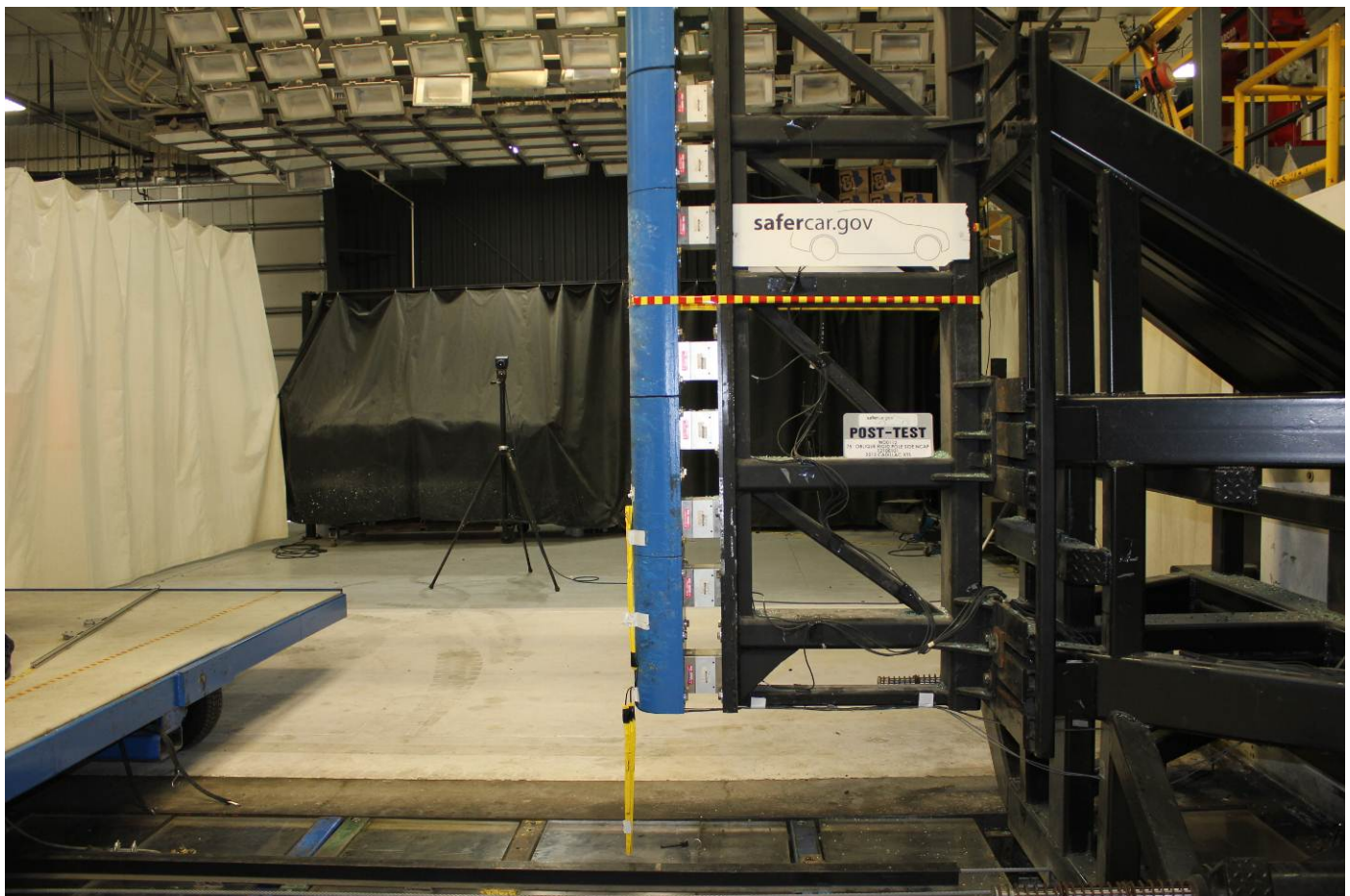
Pre-Test Pole Barrier Front View



Post-Test Pole Barrier Front View



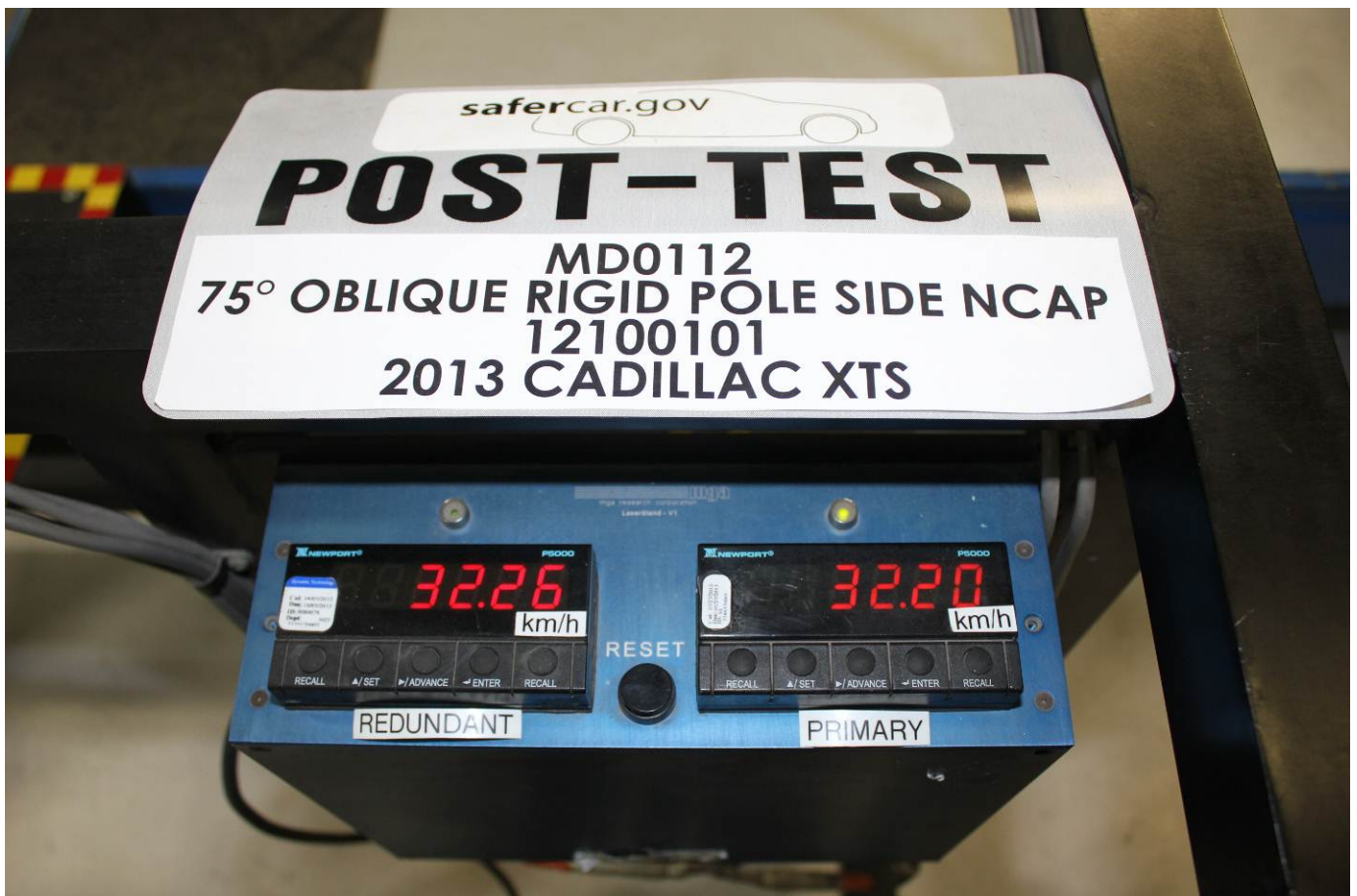
Pre-Test Pole Barrier Side View



Post-Test Pole Barrier Side View



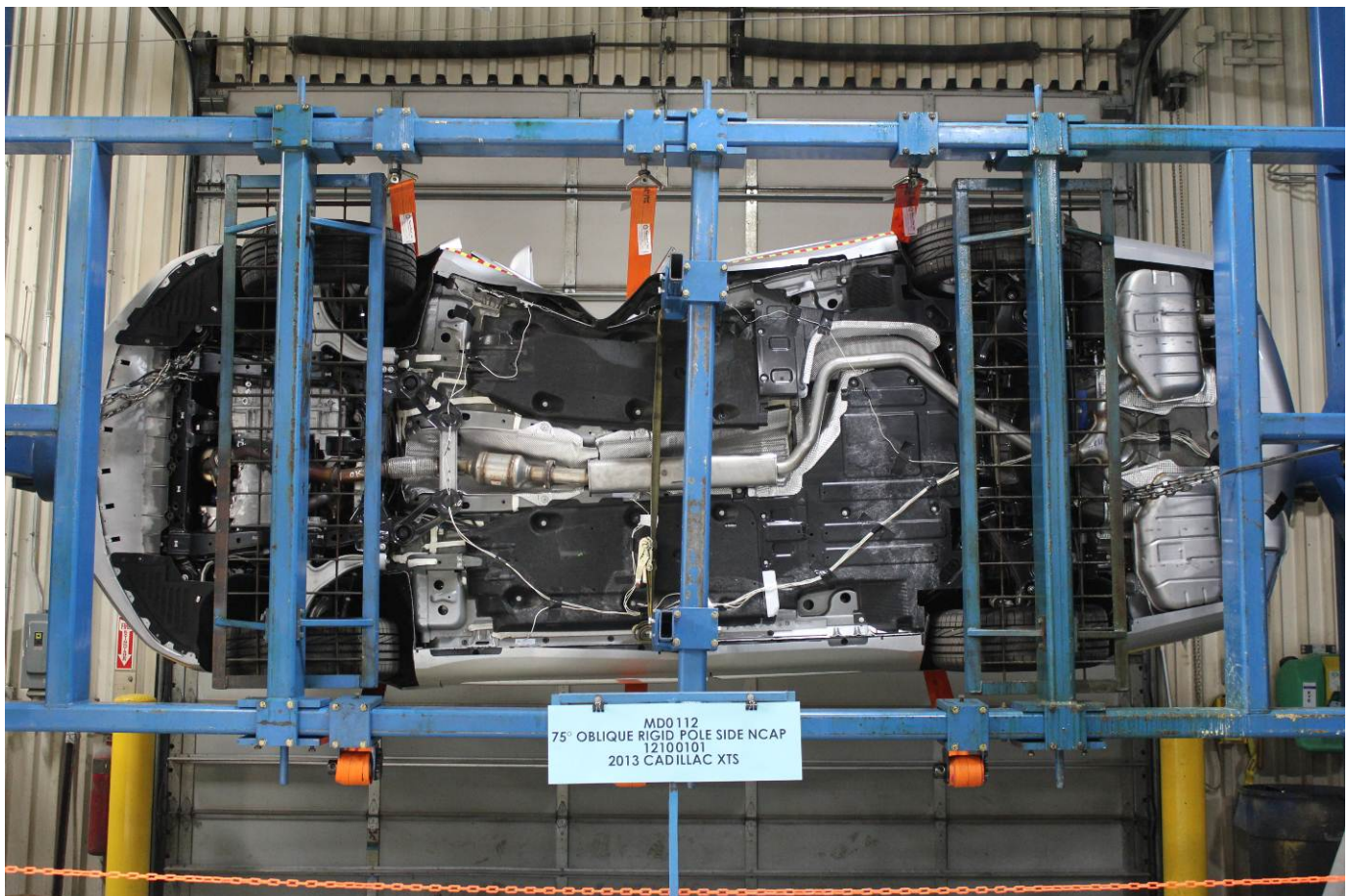
Pre-Test Ballast View



Post-Test Primary and Redundant Speed Trap Read-Out



FMVSS No. 301 Static Rollover 0 Degrees



FMVSS No. 301 Static Rollover 90 Degrees



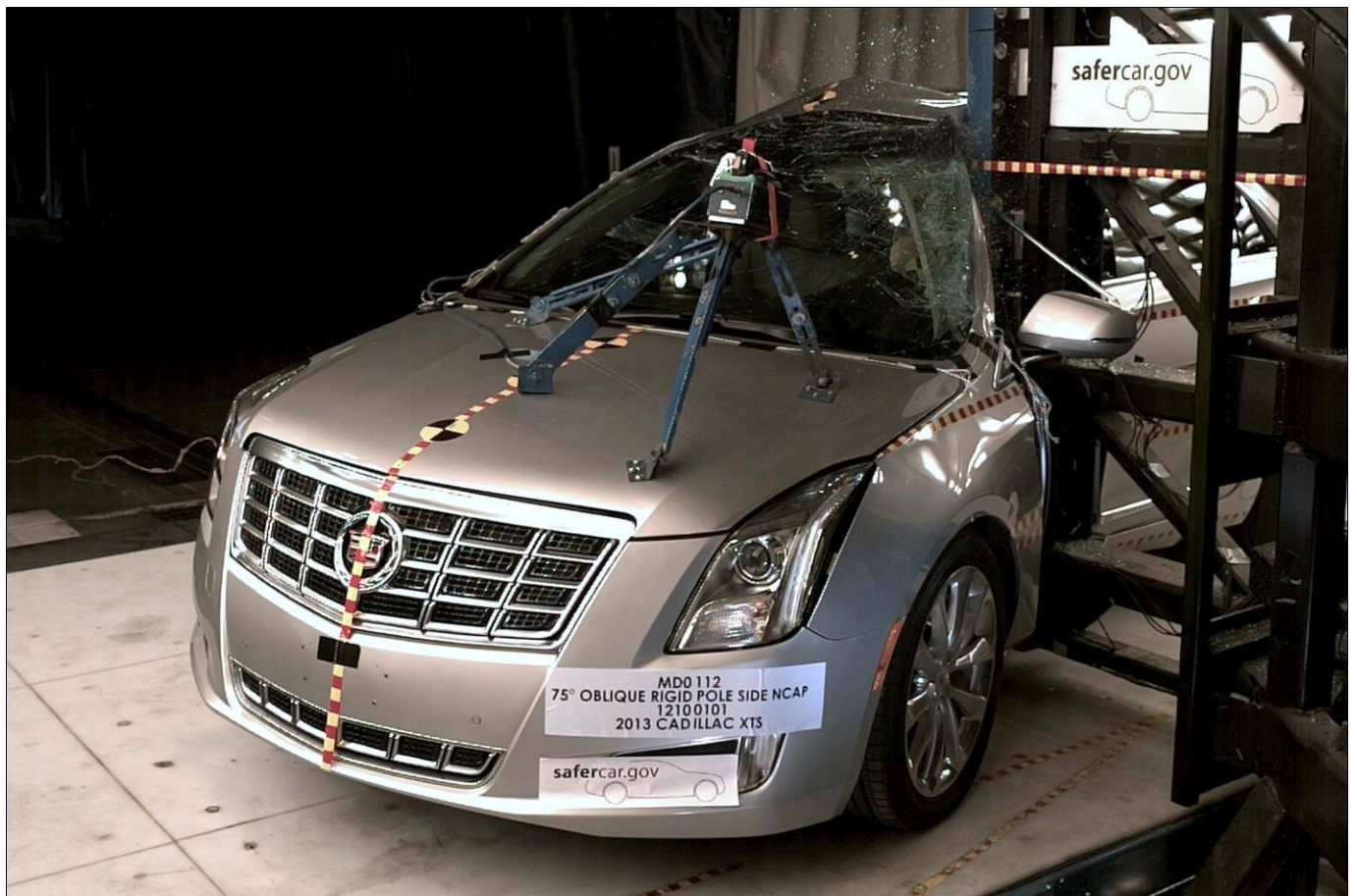
FMVSS No. 301 Static Rollover 180 Degrees



FMVSS No. 301 Static Rollover 270 Degrees



FMVSS No. 301 Static Rollover 360 Degrees



Impact Event



Cadillac

2013 XTS FWD LUXURY COLLECTION

EXTERIOR: RADIANT SILVER METALLIC
INTERIOR: MED TITANIUM/JET BLACK
ACCENT

ENGINE: 3.6L SIDI DOHC V6 VVT
TRANSMISSION: 6-SPEED AUTOMATIC

Visit us at www.cadillac.com

STANDARD EQUIPMENT

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

CADILLAC SHIELD

- 4 YEAR / 50,000 MILE* BUMPER-TO-BUMPER WARRANTY
- 6 YEAR / 70,000 MILE* POWERTRAIN LIMITED WARRANTY
- 4 YEAR / 50,000 MILE* PREMIUM CARE MAINTENANCE
- 6 YEAR / 70,000 MILE* COURTESY TRANSPORTATION
- 6 YEAR / 70,000 MILE* ROADSIDE ASSISTANCE
- *WHICHEVER COMES FIRST, SEE DEALER FOR DETAILS.

PERFORMANCE

- ENGINE, 3.6L SIDI DOHC V6 VVT
- TRANSMISSION, 6-SPEED AUTOMATIC
- FRONT WHEEL DRIVE
- MAGNETIC RIDE CONTROL WITH

REAR AIR SPRINGS

- SUSPENSION HIGH PERFORMANCE FRONT
- BRAKES, ANTILOCK 4 WHEEL DISC (BREMBO FRONT)
- WHEELS, 19" POLISHED ALUMINUM
- STABILITRAK-STABILITY SYSTEM W/ TRACTION CONTROL
- POWER STEERING, VARIABLE EFFORT RACK AND PINION
- BRAKE ASSIST FEATURE
- EXHAUST, DUAL-THRU FASCIA

LUXURY/CONVENIENCE

- CADILLAC USER EXPERIENCE (CUE)
- AUDIO SYSTEM, BOSE
- SIRIUSXM AND HD RADIO + SERVICE SUBSCRIPTION SOLD SEPARATELY BY SIRIUSXM AFTER 3 MONTHS
- PWR SEAT ADJUSTER, DRIVER &

FRONT PASS, 4-WAY LUMBAR

- REAR SEAT, 60/40 SPLIT FOLDING LOCKABLE SEATBACK
- SEAT TRIM, SOLID VESSEL MINI PERFORATED INSERTS, LEATHER SEATING SURFACES
- UPLEVEL WOOD TRIM PACKAGE
- STEERING COLUMN, POWER RAKE & TELESCOPIC
- KEYLESS ACCESS W/ PUSHBUTTON START
- ADAPTIVE REMOTE START
- CAPLESS FUELING
- TIRE SEALANT & INFLATOR KIT IN PLACE OF SPARE TIRE
- UNIVERSAL HOME REMOTE
- FRONT AND REAR PARKING ASSIST
- POWER DUAL OUTSIDE MIRRORS ADJUSTABLE, W/AUTO DIMMING
- WINDSHIELD WIPERS, RAIN SENSING
- HEATED STEERING WHEEL
- MEMORY, DRIVER SEAT, MIRRORS

STEERING COLUMN

- DRIVER & FRONT PASSENGER HEATED & VENTILATED SEATS
- SEATS, HEATED REAR OUTBOARD POSITIONS
- AMBIENT INTERIOR LIGHTING
- DOOR HANDLES, ILLUMINATED

SAFETY AND SECURITY

- AIRBAGS, DRIVER & PASSENGER
- FRONTAL, KNEE, HEAD CURTAIN AND SIDE IMPACT, REAR HEAD CURTAIN AND SIDE IMPACT
- THEFT DETERRENT SYSTEM
- REAR OR LOCKS, CHILD SECURITY
- HEADLAMPS, HIGH INTENSITY DISCHARGE
- AUX. DAYTIME RUNNING LAMPS
- 1 YR ONSTAR DIRECTIONS AND CONNECTIONS WITH AUTOMATIC CRASH RESPONSE & TURN-BY-TURN NAVIGATION (ASK DEALER ABOUT GEOGRAPHIC COVERAGE)

REARVIEW BACKUP CAMERA SYSTEM

OPTIONS & PRICING

MANUFACTURER'S SUGGESTED RETAIL PRICE

STANDARD VEHICLE PRICE **\$48,890.00**

OPTIONS INSTALLED BY THE MANUFACTURER MAY REPLACE STANDARD EQUIPMENT (SHOWN)

ULTRAVIEW SUNROOF 1,450.00
DRIVER AWARENESS PACKAGE 890.00
NAVIGATION SYSTEM 795.00

TOTAL OPTIONS **\$3,135.00**

TOTAL VEHICLE & OPTIONS **\$51,825.00**

DESTINATION CHARGE 920.00

TOTAL VEHICLE PRICE* \$52,745.00



Fuel Economy and Environment

Gasoline Vehicle

Fuel Economy
21 MPG
combined city/hwy
17 city
28 highway
4.8 gallons per 100 miles

Large cars range from 12 to 28 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)

1 5 10 Best

This vehicle emits 428 grams CO₂ per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also create emissions; learn more at fuelconomy.gov.

Smog Rating (tailpipe only)

1 6 10 Best

This vehicle emits 428 grams CO₂ per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also create emissions; learn more at 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 22 MPG and costs \$11,600 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at \$3.55 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

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

Source: National Highway Traffic Safety Administration (NHTSA)
www.safercar.gov or 1-888-327-4236

PARTS CONTENT INFORMATION

FOR VEHICLES IN THIS CARLINE:
U.S./CANADIAN PARTS CONTENT: 62%

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

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

This label has been applied pursuant to Federal law. Do not remove prior to delivery to the ultimate purchaser. Includes Manufacturer's Recommended Pre-Delivery Service. Does not include dealer installed options and accessories not listed above, local taxes or license fees.

© 2009 General Motors LLC
GM/BLD_PROD_0009-05/09/012

ORDER NO 0KQPPG SALES CODE E

SALES MODEL CODE 6000B

DEALER NO 37801

FINAL ASSEMBLY:

OSHAWA, ON CANADA

VIN 2G61PSS31D9121056

DEALER TO WHOM DELIVERED

WEIL CADILLAC, INC.

1050 S MILWAUKEE AVE

LIBERTYVILLE, IL 60448-3287



CE
1GA0385043

Monroney Label

3-2 Seats and Restraints

Head Restraints

WARNING

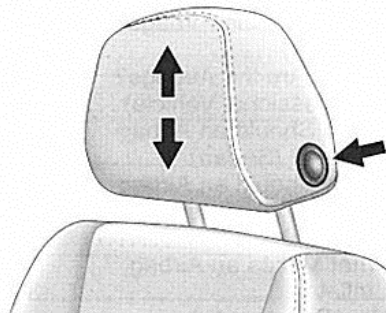
With head restraints that are not installed and adjusted properly, there is a greater chance that occupants will suffer a neck/spinal injury in a crash. Do not drive until the head restraints for all occupants are installed and adjusted properly.



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

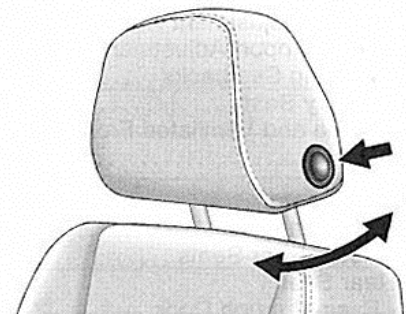
Front Seats

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



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

To lower the head restraint, press the button located on the side of the head restraint, push the head restraint down, and release the button. Pull and push on the head restraint after the button is released to make sure that it is locked in place.



The head restraint can be adjusted forward or rearward. To adjust the head restraint forward, grasp the head restraint and pull it forward to the desired locking position. To adjust the head restraint rearward, press the button located on the side

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

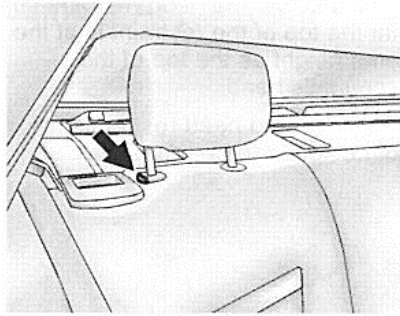
of the head restraint and move the head restraint rearward until the desired locking position is reached. Try to move the head restraint after the button is released to make sure that it is locked in place.

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

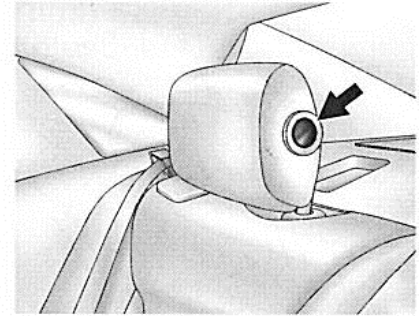
Rear Seats

The vehicle's rear seats have adjustable head restraints in the outboard seating positions.

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



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



The head restraint can be folded forward to allow for better visibility when the rear seat is unoccupied. To fold the head restraint, press the button on the side of the head restraint.

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

APPENDIX B

VEHICLE AND DUMMY RESPONSE DATA PLOTS

TABLE OF DATA PLOTS
Driver Dummy Instrumentation Plots

		<u>Page No.</u>
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 Lower Spine T12 Acceleration (X) vs. Time	B-2
Figure No. 6.	Driver Lower Spine T12 Acceleration (Y) vs. Time	B-2
Figure No. 7.	Driver Lower Spine T12 Acceleration (Z) vs. Time	B-2
Figure No. 8.	Driver Lower Spine T12 Resultant Acceleration vs. Time	B-2
Figure No. 9.	Driver Iliac Wing Force on Impact Side (Y) vs. Time	B-3
Figure No. 10.	Driver Acetabulum Force on Impact Side (Y) vs. Time	B-3
Figure No. 11.	Driver Total Pelvis Force on Impact Side (Y) vs. Time	B-3

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

Additional Driver Dummy Instrumentation Data

Driver 9 Axis Head CG Redundant Acceleration (X) vs. Time

Driver 9 Axis Head CG Redundant Acceleration (Y) vs. Time

Driver 9 Axis 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

**Additional Driver Dummy Instrumentation Data
(Continued)**

Driver Upper Thorax Rib Deflection (Y)
Driver Middle Thorax Rib Deflection (Y)
Driver Lower Thorax Rib Deflection (Y)
Driver Upper Abdomen Rib Deflection (Y)
Driver 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)
Left Floor Sill Acceleration (Y)
Left A-Pillar Sill Acceleration (Y)
Left Lower A-Pillar Acceleration (Y)
Left Mid A-Pillar Acceleration (Y)
Left B-Pillar Sill Acceleration (Y)
Left Lower B-Pillar Acceleration (Y)
Left Mid B-Pillar Acceleration (Y)
Driver Seat Track at Dummy Hip Point Acceleration (Y)
Engine Top Acceleration (X)
Engine Top Acceleration (Y)
Firewall Center Acceleration (Y)
Right Roof at Vertical Impact Reference Line Acceleration (Y)
Right Sill at Vertical Impact Reference Line Acceleration (Y)
Rear Floorpan Behind Rear Axle at Centerline Acceleration (X)
Rear Floorpan Behind Rear Axle at Centerline Acceleration (Y)

Pole Instrumentation Data

Load Cell Pole Barrier #1 Force (Y)

Load Cell Pole Barrier #2 Force (Y)

Load Cell Pole Barrier #3 Force (Y)

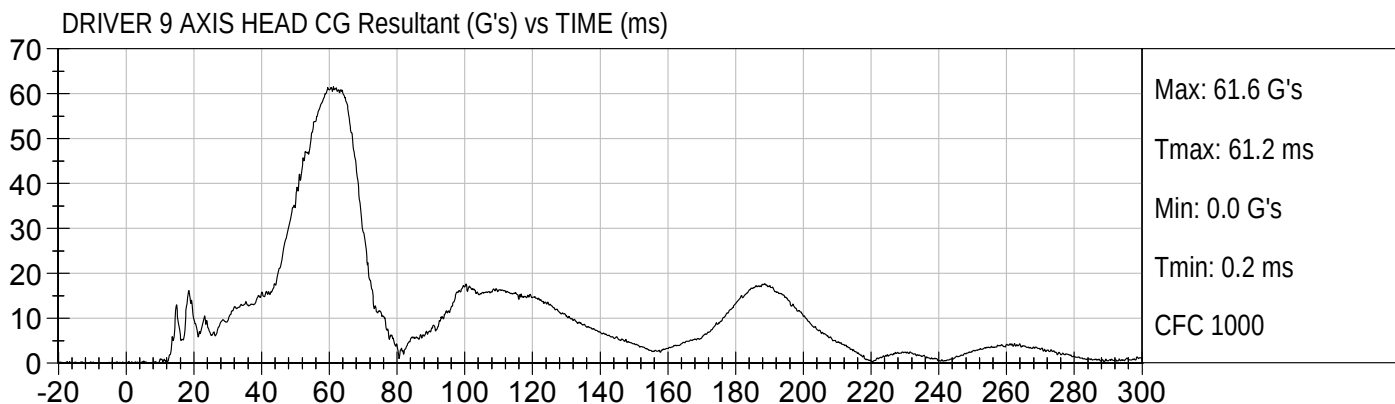
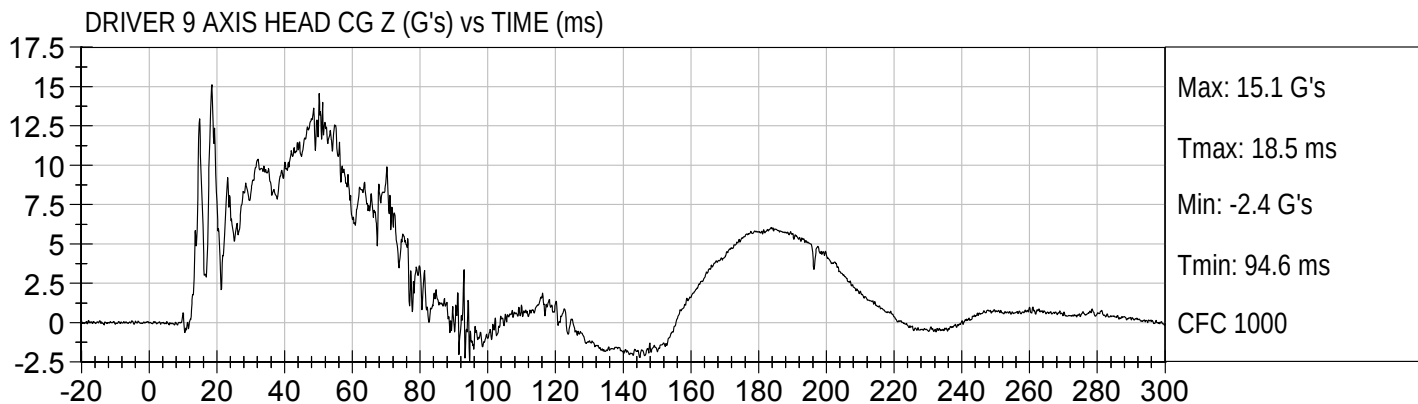
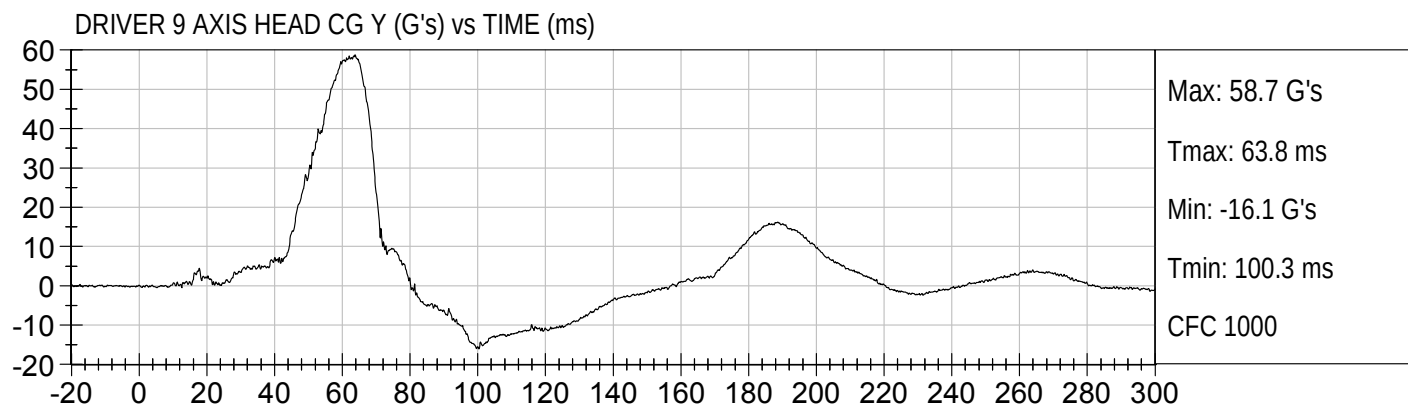
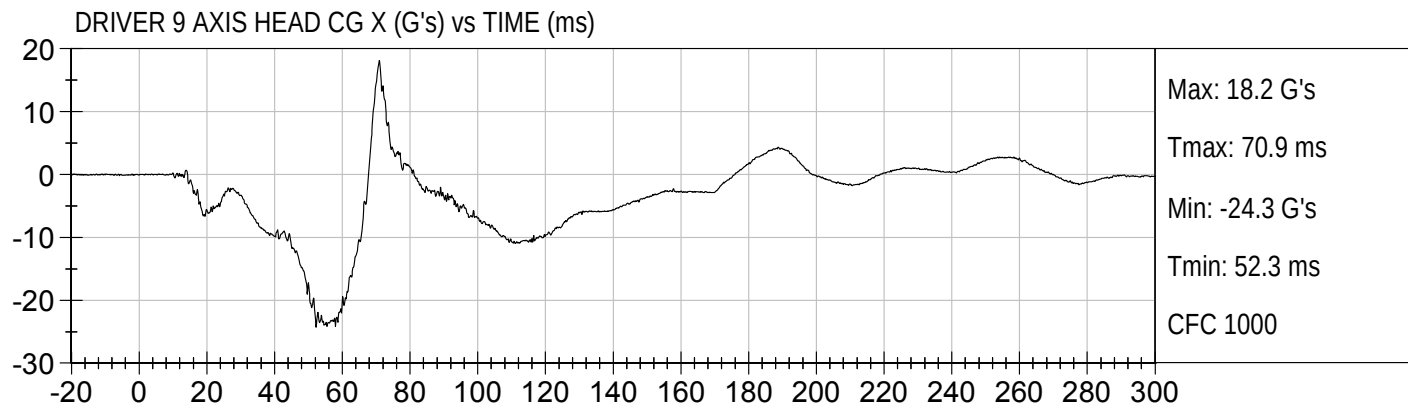
Load Cell Pole Barrier #4 Force (Y)

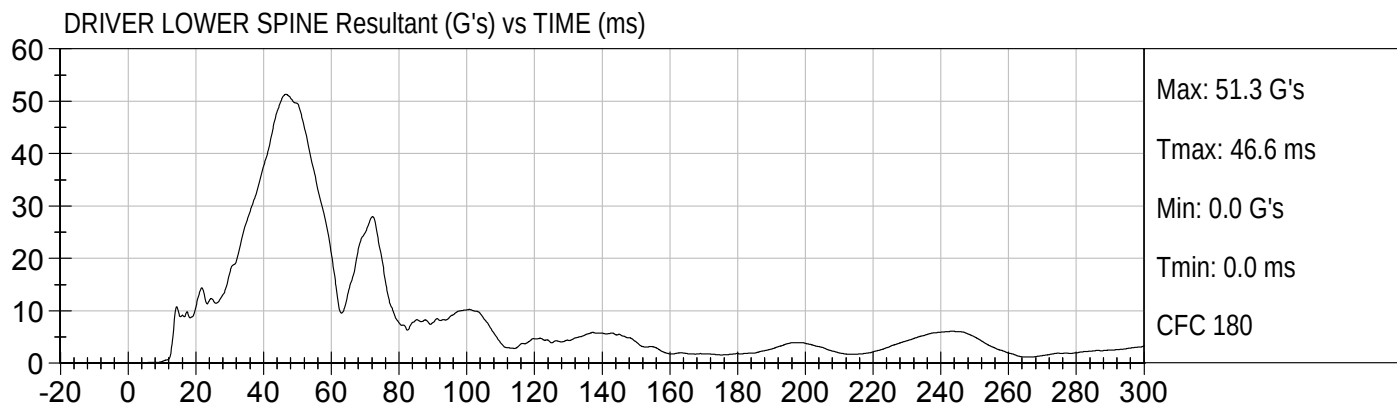
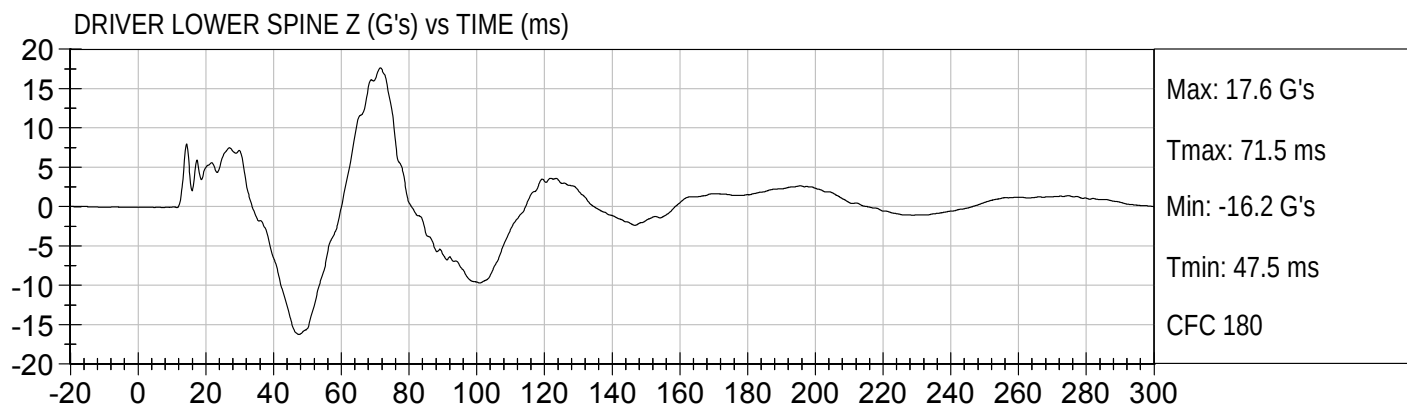
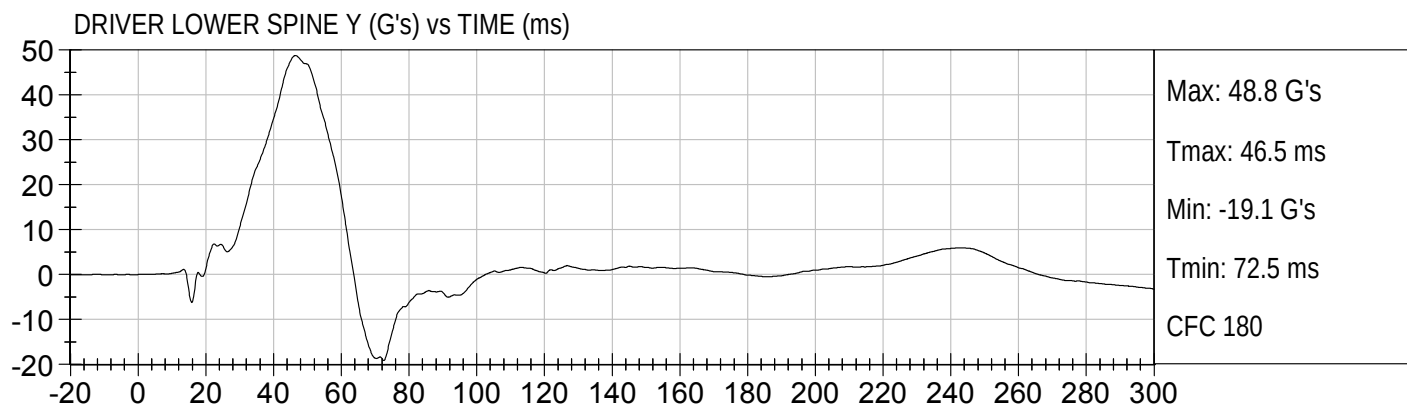
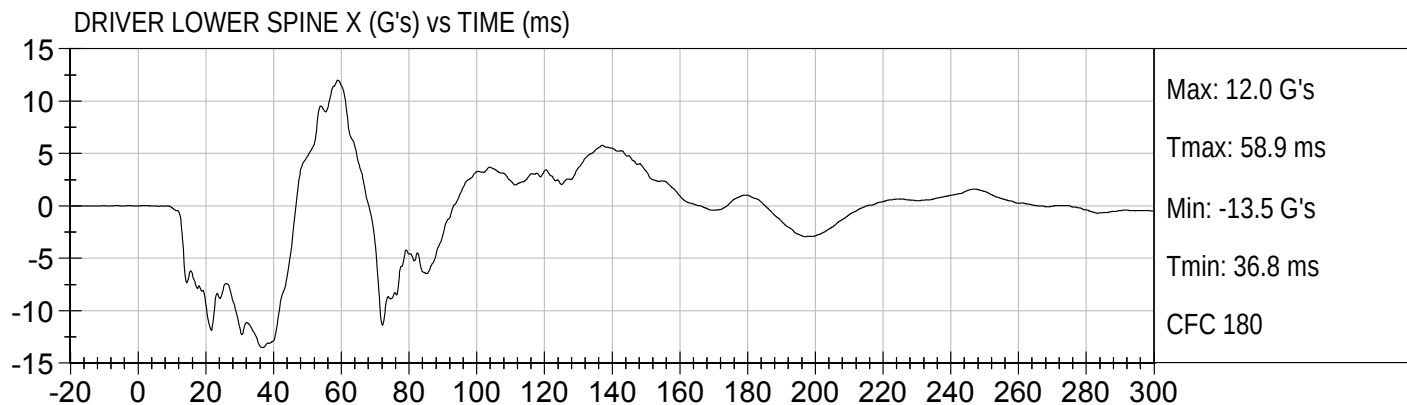
Load Cell Pole Barrier #5 Force (Y)

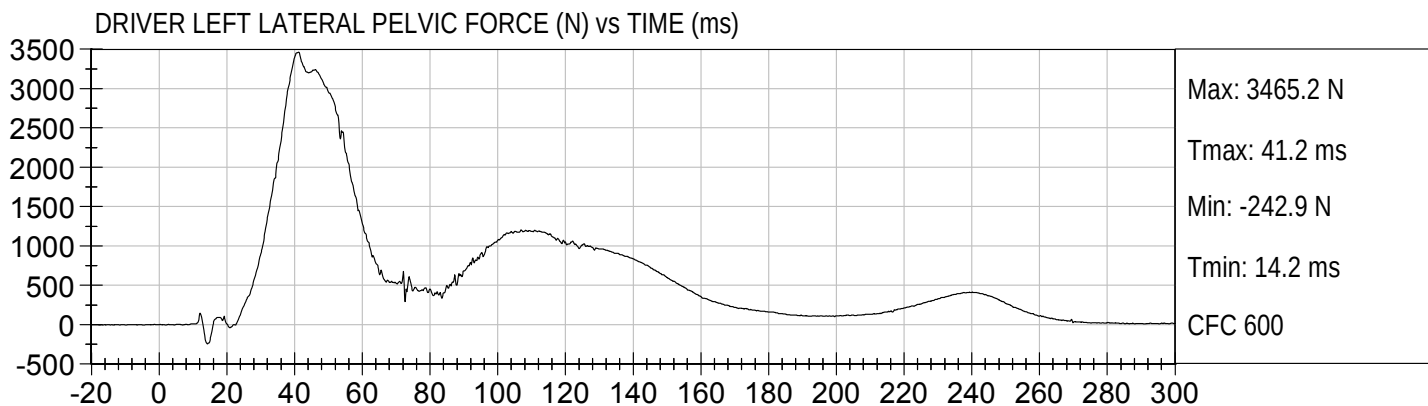
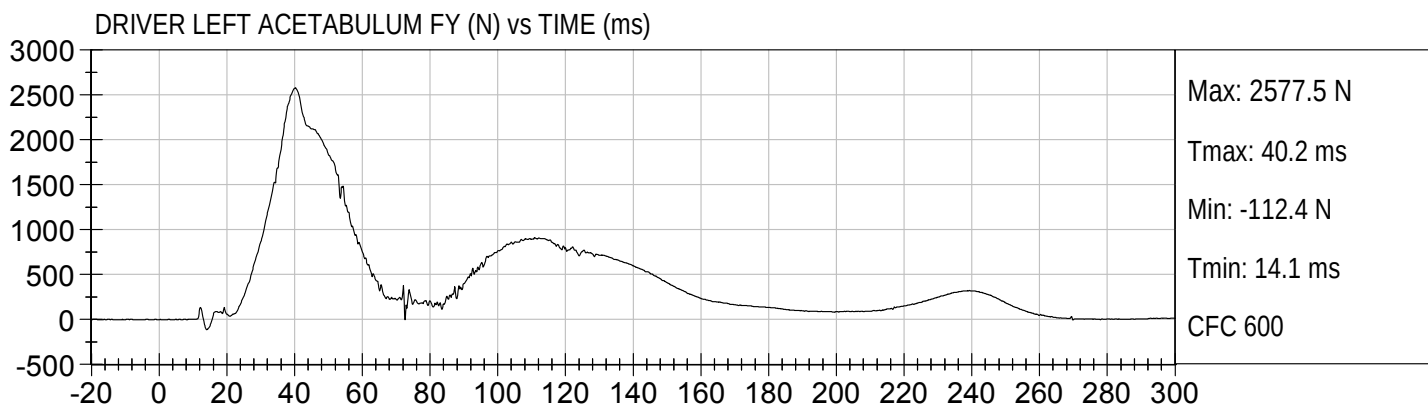
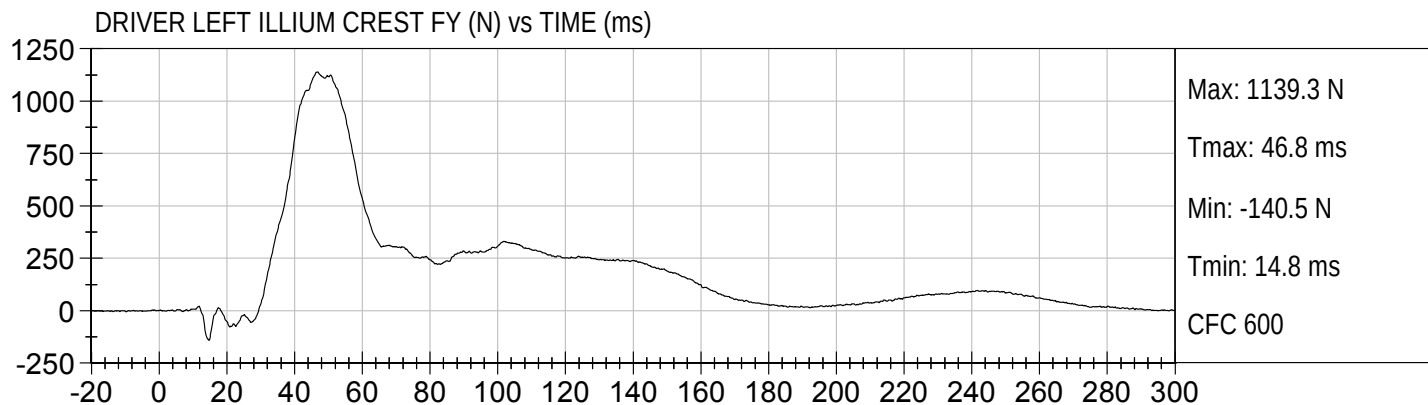
Load Cell Pole Barrier #6 Force (Y)

Load Cell Pole Barrier #7 Force (Y)

Load Cell Pole Barrier #8 Force (Y)







APPENDIX C

DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

SID-IIsD External Measurements
SN: 306

No.	Name	Spec. (mm)	Result	Pass/Fail
A	Sitting Height	772 - 788	785	Pass
B	Shoulder Pivot Height	437 - 453	449	Pass
C	H-point Height	79 - 89	86	Pass
D	H-point from Seatback	141 - 151	147	Pass
E	Shoulder Pivot from Backline	97 - 107	99	Pass
F	Thigh Clearance	119 -135	120	Pass
G	Head Breadth	140 - 148	141	Pass
H	Head Back from Backline	40 - 46	45	Pass
I	Head Depth	178 - 188	182	Pass
J	Head Circumference	541 - 551	550	Pass
K	Buttock to Knee Length	514 - 540	538	Pass
L	Popliteal Height	343 - 369	349	Pass
M	Knee Pivot to Floor Height	392 - 409	394	Pass
N	Buttock Popliteal Length	416 - 442	435	Pass
O	Chest Depth w/o Jacket	195 - 211	198	Pass
P	Foot Length	216 - 232	222	Pass
Q	Hip Breadth (w/ pelvic plugs)	313 - 323	317	Pass
R	Arm Length	249 - 259	250	Pass
S	Knee Joint to Seatback	477 - 493	483	Pass
V	Shoulder Width	341 - 357	351	Pass
W	Foot Width	78 - 94	82	Pass
Y	Chest Circumference w/ jacket	851 - 881	863	Pass
Z	Waist Circumference	761 - 791	782	Pass

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

ATD Serial No: 306

Test ID: D123521

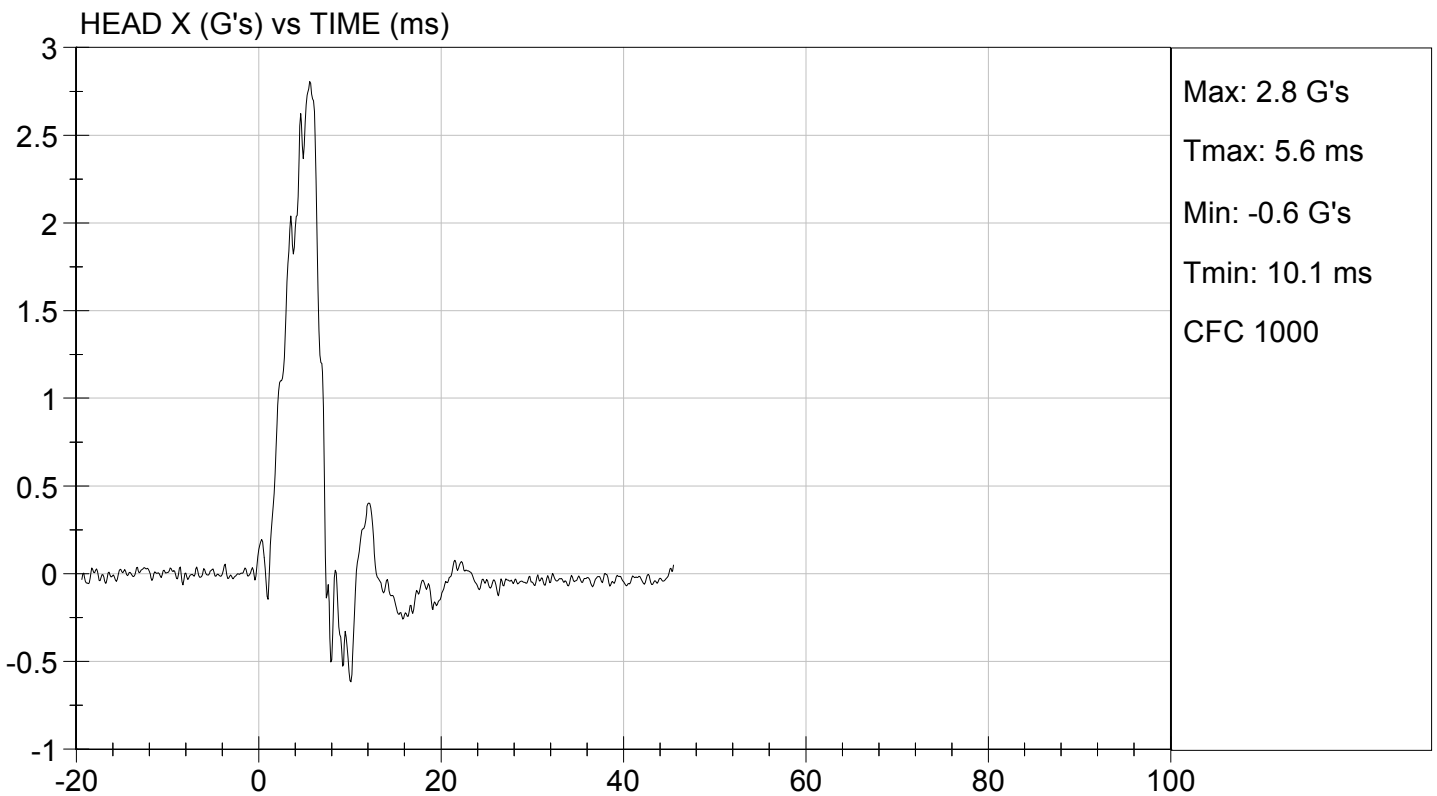
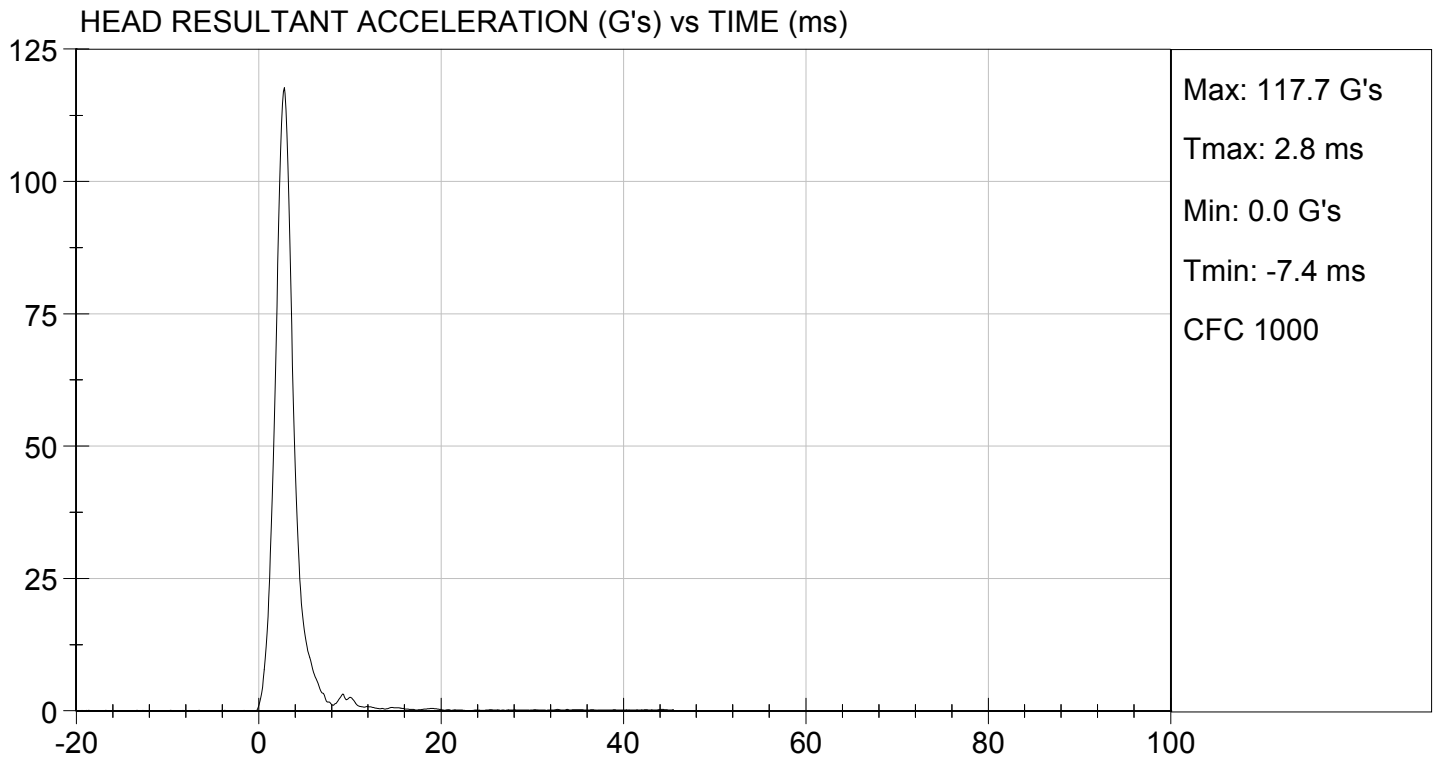
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	32	Pass
Peak Resultant Acceleration	G's	115 to 137	118	Pass
Peak Longitudinal Acceleration	G's	+/- 15	2.8	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	<15%	Yes	Pass
			Overall Test Results	Pass

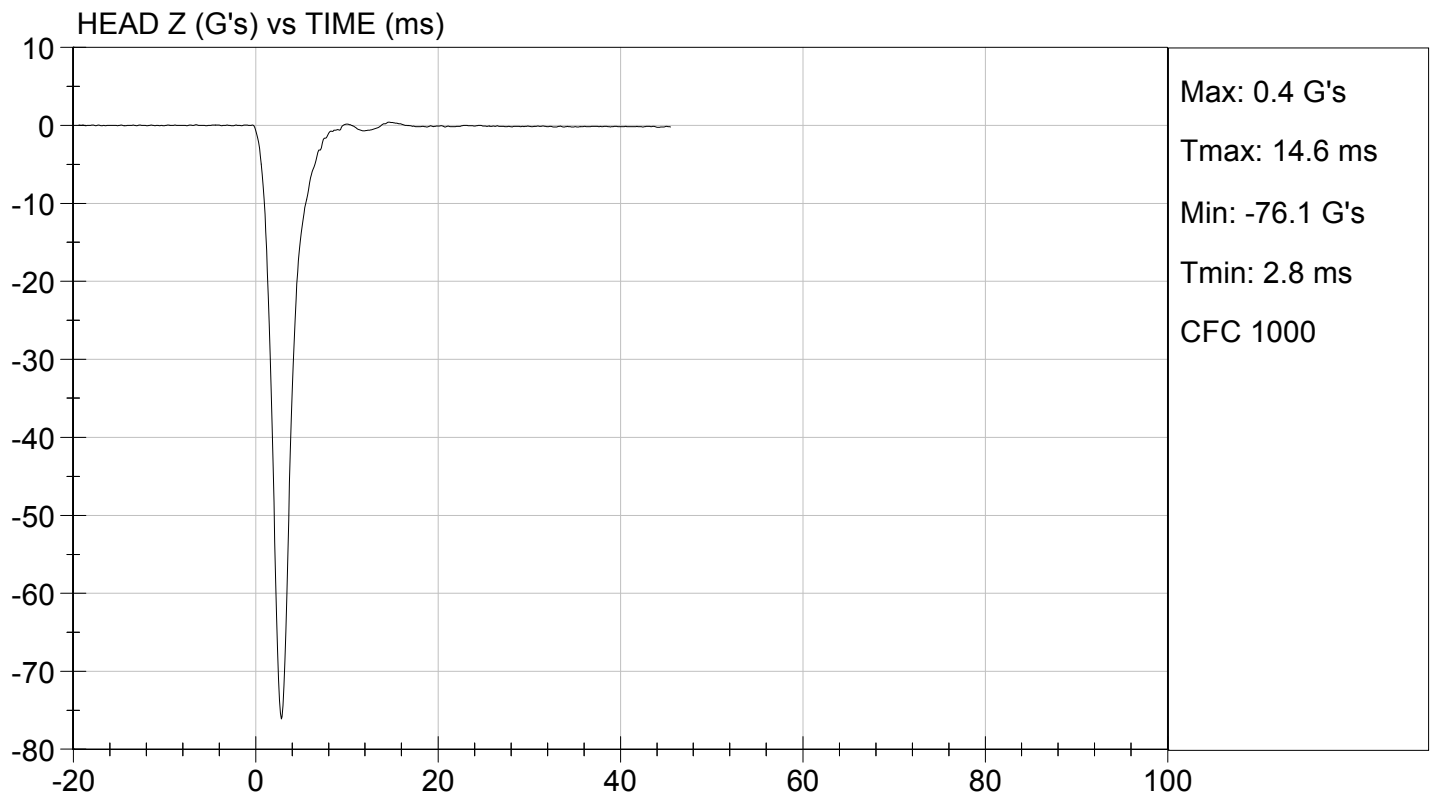
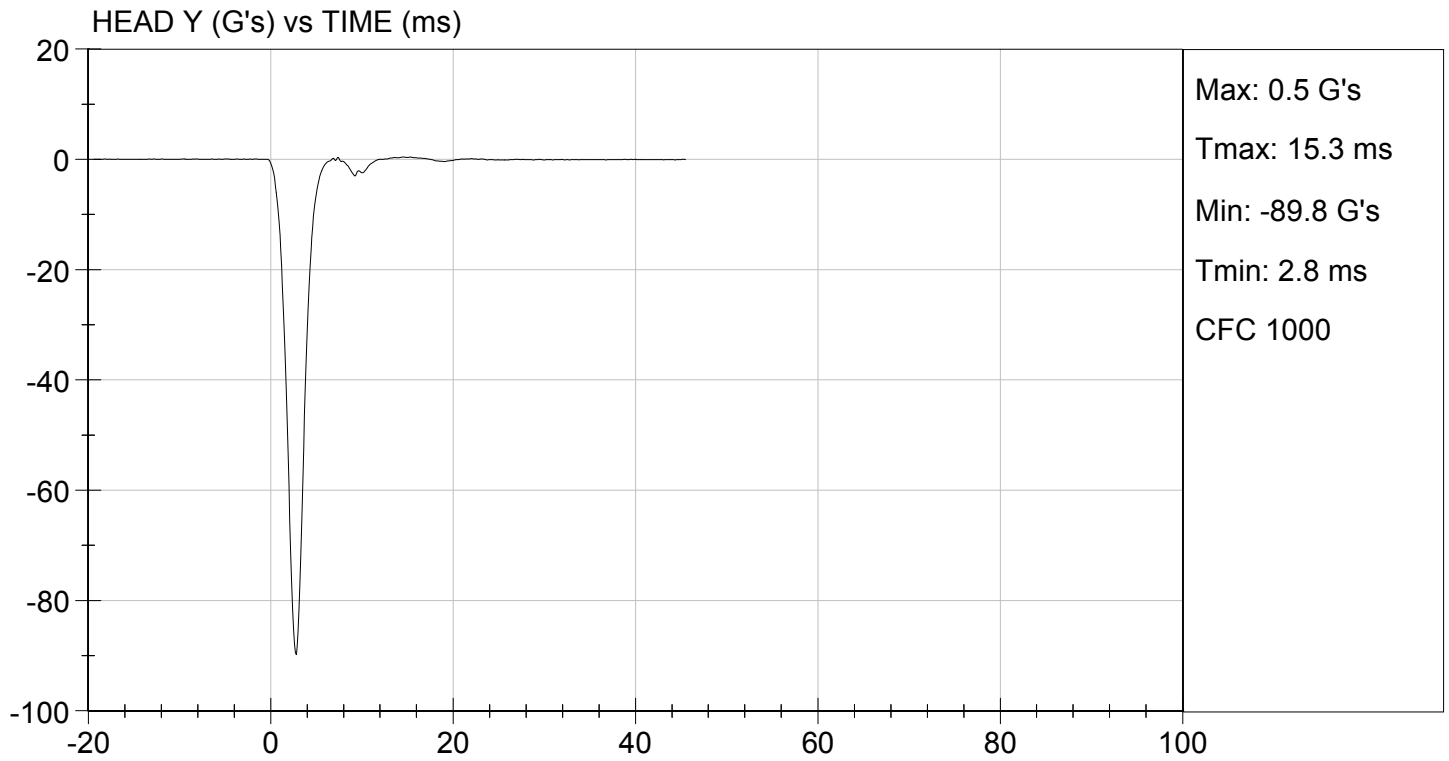

Laboratory Technician

09/24/2012

Test Date


Approved By





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

ATD Serial No: 306

Test I.D: D123522

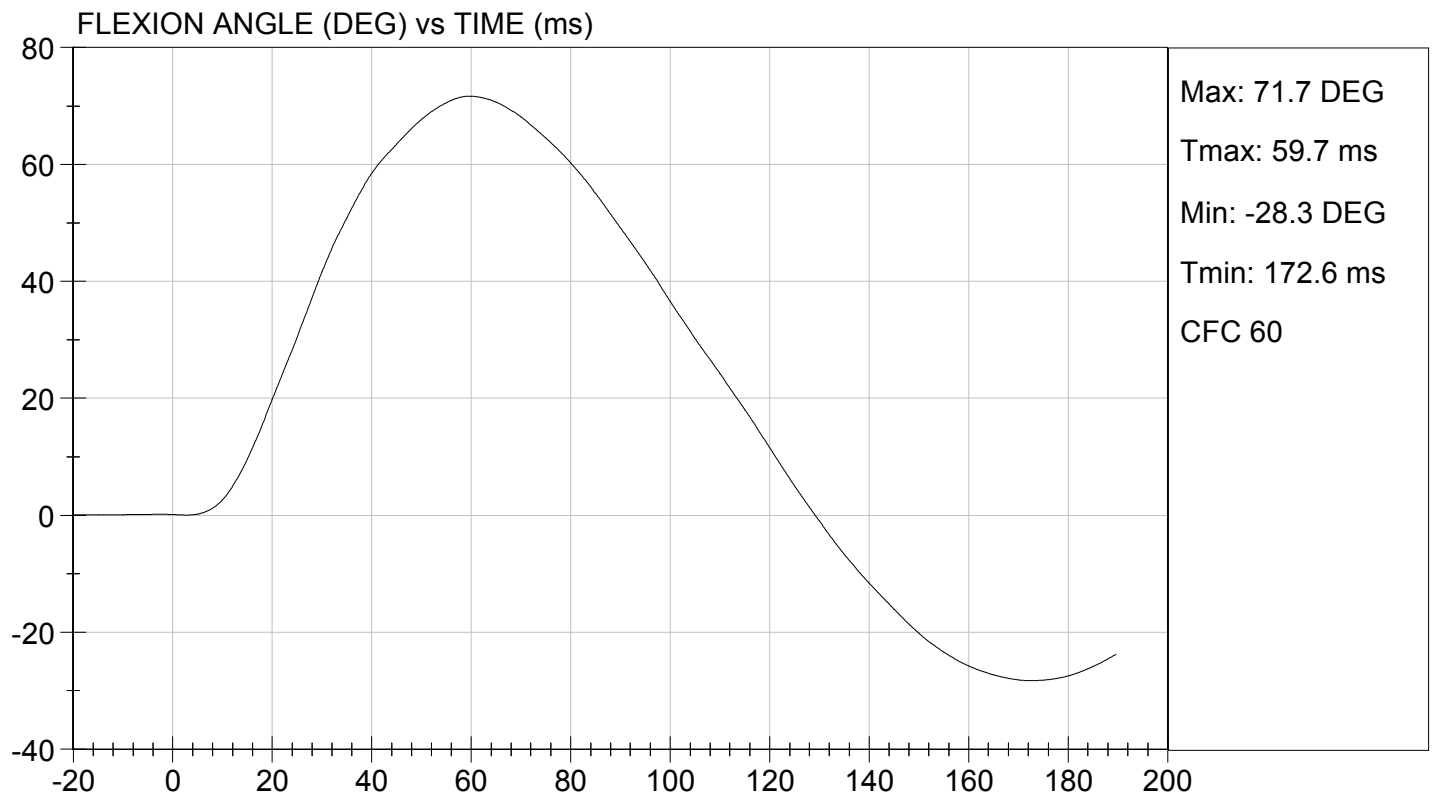
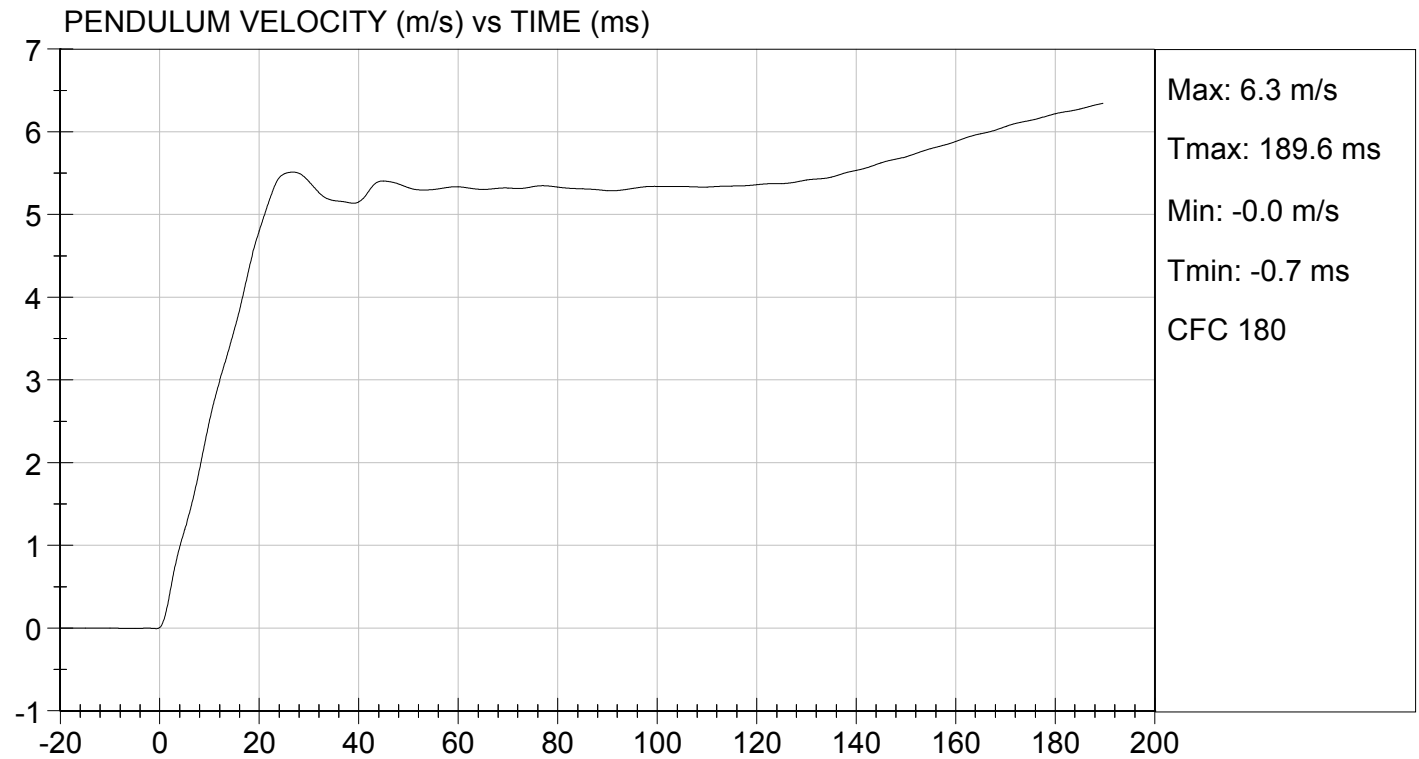
Tested Parameter		Units	Specification	Result	Pass/Fail
Temperature		deg C	20.6 to 22.2	21.5	Pass
Humidity		%	10 to 70	32	Pass
Impact Velocity		m/s	5.51 to 5.63	5.58	Pass
Pendulum Velocity	10 ms	m/s	2.20 to 2.80	2.51	Pass
	15 ms	m/s	3.30 to 4.10	3.61	Pass
	20 ms	m/s	4.40 to 5.40	4.80	Pass
	25 ms	m/s	5.40 to 6.10	5.49	Pass
	25-100 ms	m/s	5.50 to 6.20	5.51	Pass
Maximum D-Plane Rotation		deg	71 to 81	72	Pass
Time of Maximum D-Plane Rotation		ms	50 to 70	60	Pass
Maximum Occipital Condyle Moment		Nm	-44 to -36	-43	Pass
Time of Moment Decay to 0 Nm		ms	102 to 126	115	Pass
Overall Test Results					Pass

Jessica Hall
Laboratory Technician

09/24/2012

Test Date

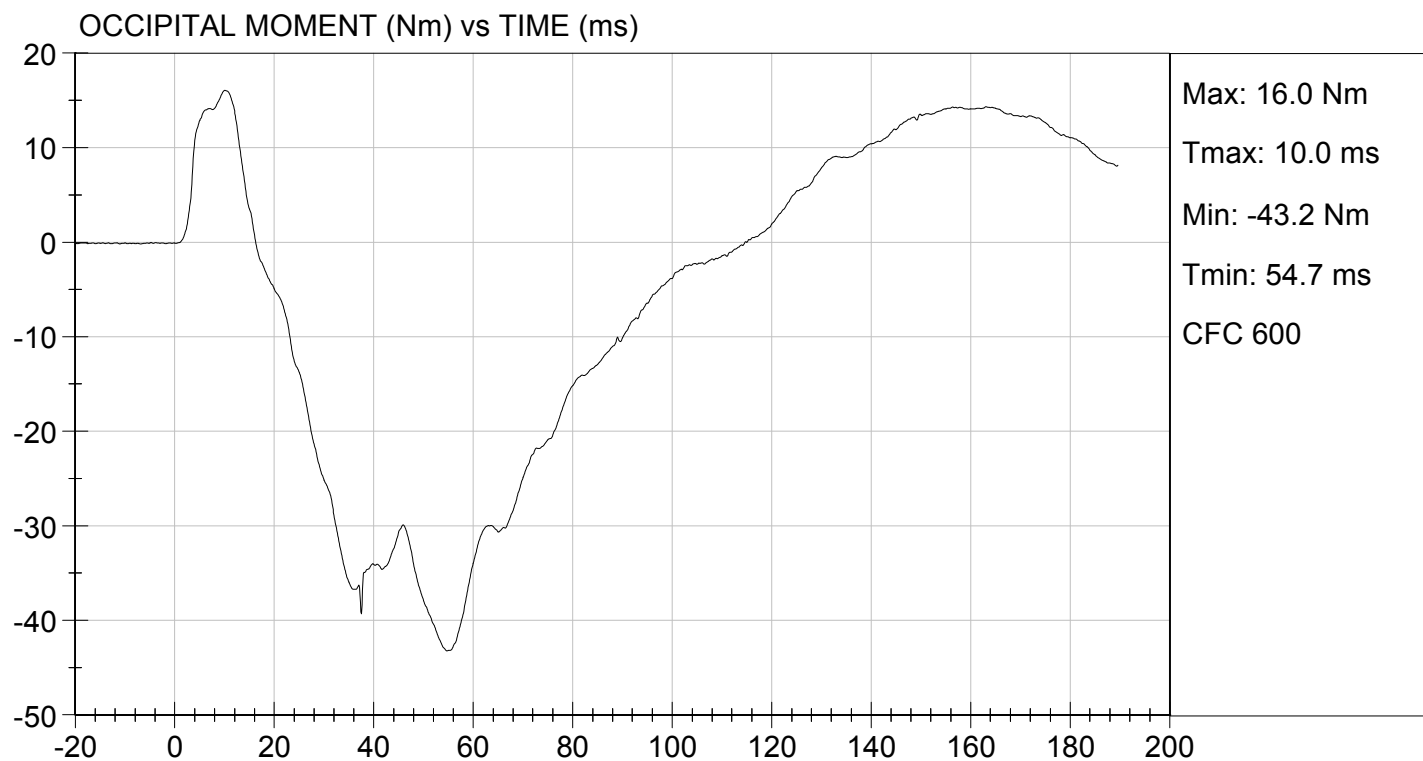
David Winkelbauer
Approved By





TEST DESC: NECK BENDING
VELOCITY: 18.32 ft/s, 5.58 m/s

TEST DATE: 09/24/2012
TEST #: D123522



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

ATD Serial No: 306

Test ID: D123523

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	31	Pass
Impact Velocity	m/s	4.20 to 4.40	4.34	Pass
Maximum Probe Acceleration	G's	13 to 18	16	Pass
Shoulder Displacement	mm	28 to 37	29	Pass
Upper Spine (T1) Y Acceleration	G's	17 to 22	18	Pass
			Overall Test Results	Pass

Jessica Hall
Laboratory Technician

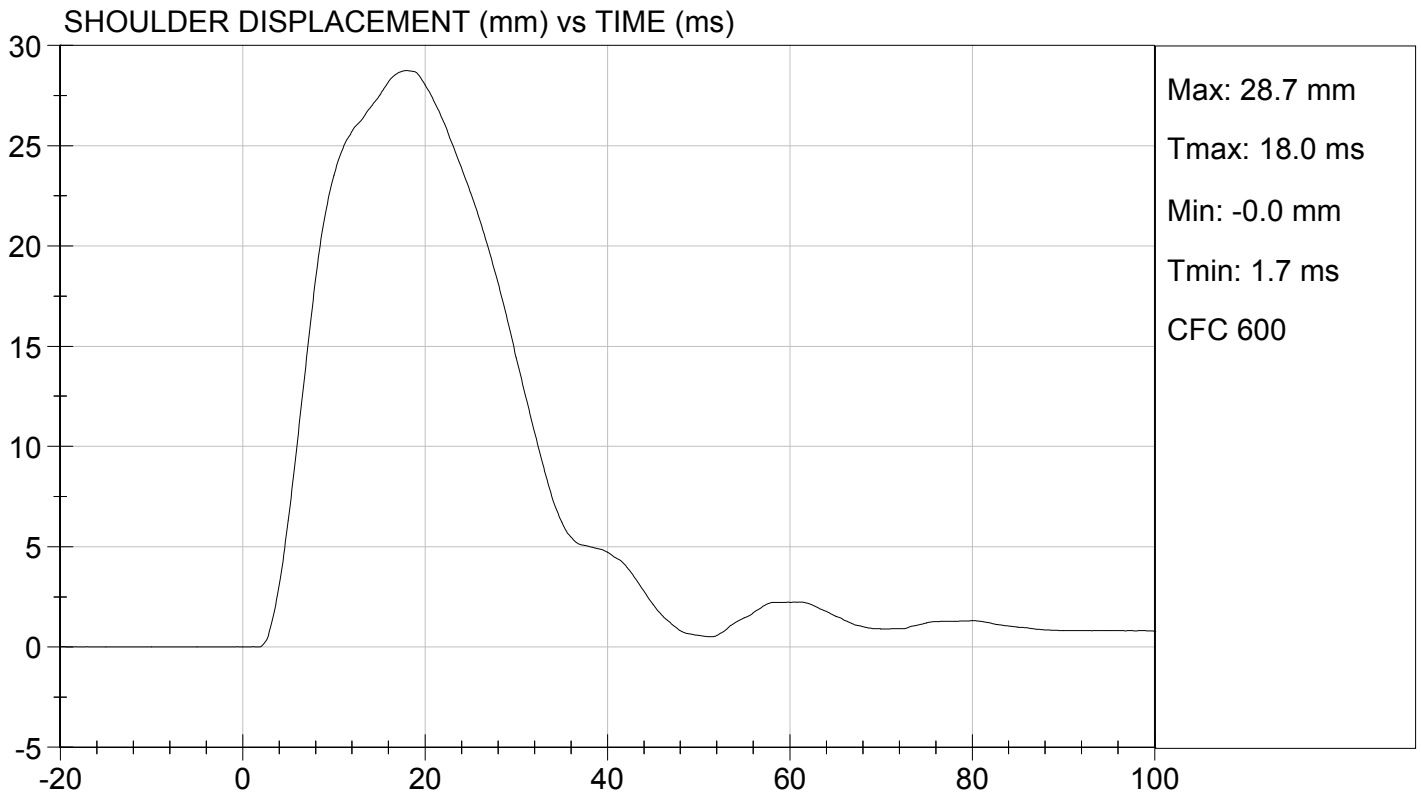
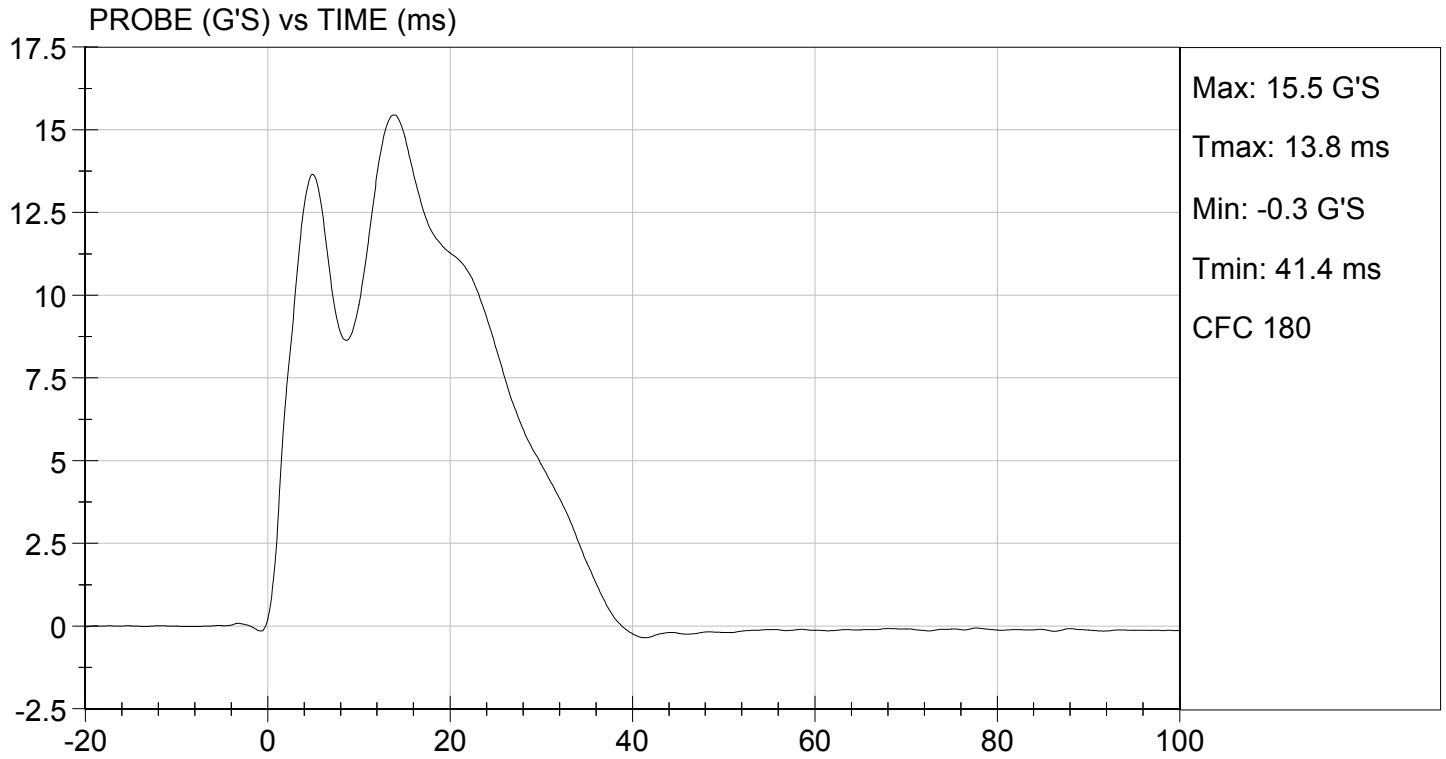
09/24/2012
Test Date

David Winkelbauer
Approved By



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

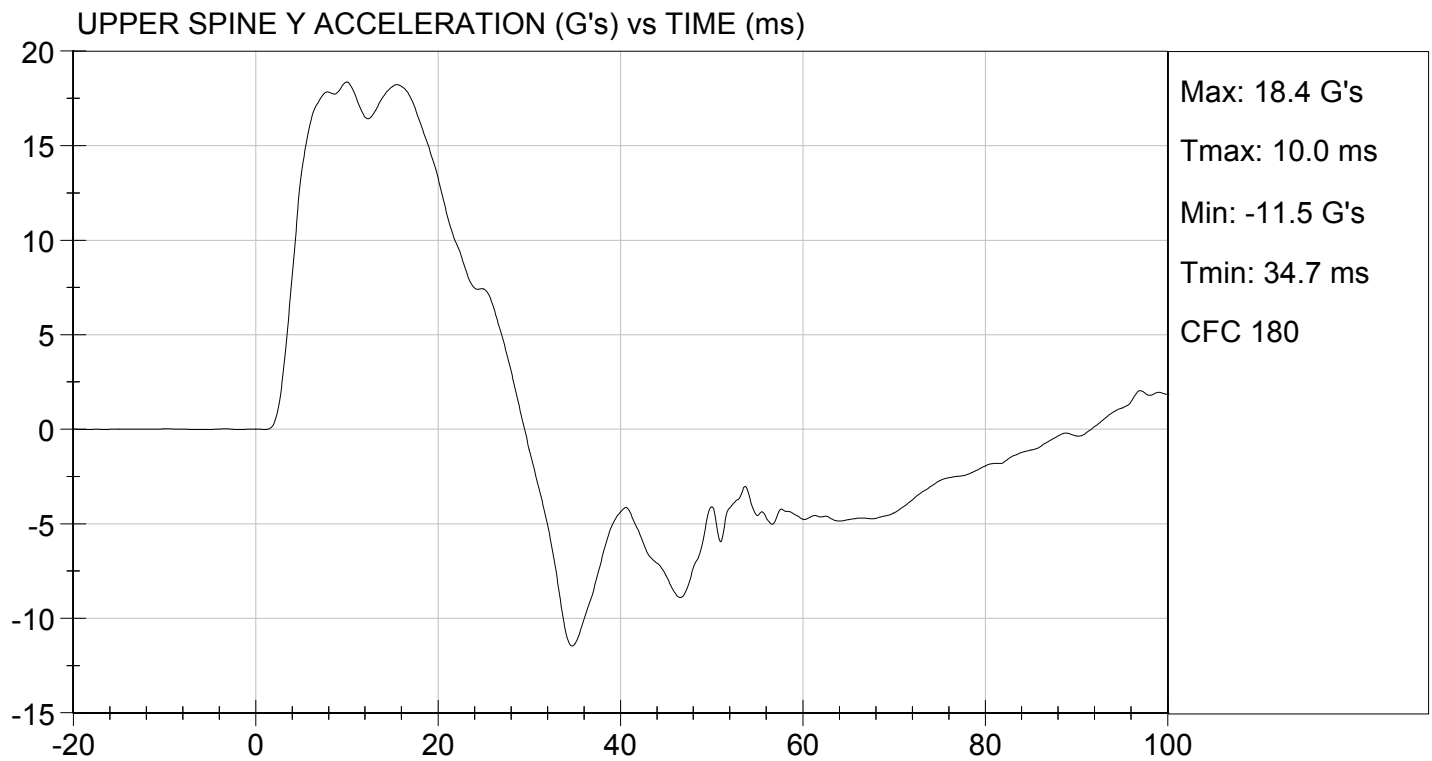
TEST DATE: 09/24/2012
TEST #: D123523





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

TEST DATE: 09/24/2012
TEST #: D123523

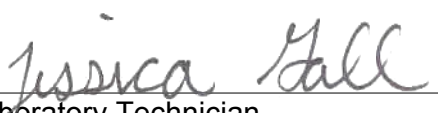


MGA RESEARCH CORPORATION
THORAX (WITH ARM) IMPACT TEST
SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

Test I.D: D123524

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.0	Pass
Humidity	%	10 to 70	31	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	32	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	36	Pass
Upper Spine (T1) Y Acceleration	G's	34 to 43	40	Pass
Lower Spine (T12) Y Acceleration	G's	29 to 37	31	Pass
Overall Test Results				Pass


 Laboratory Technician

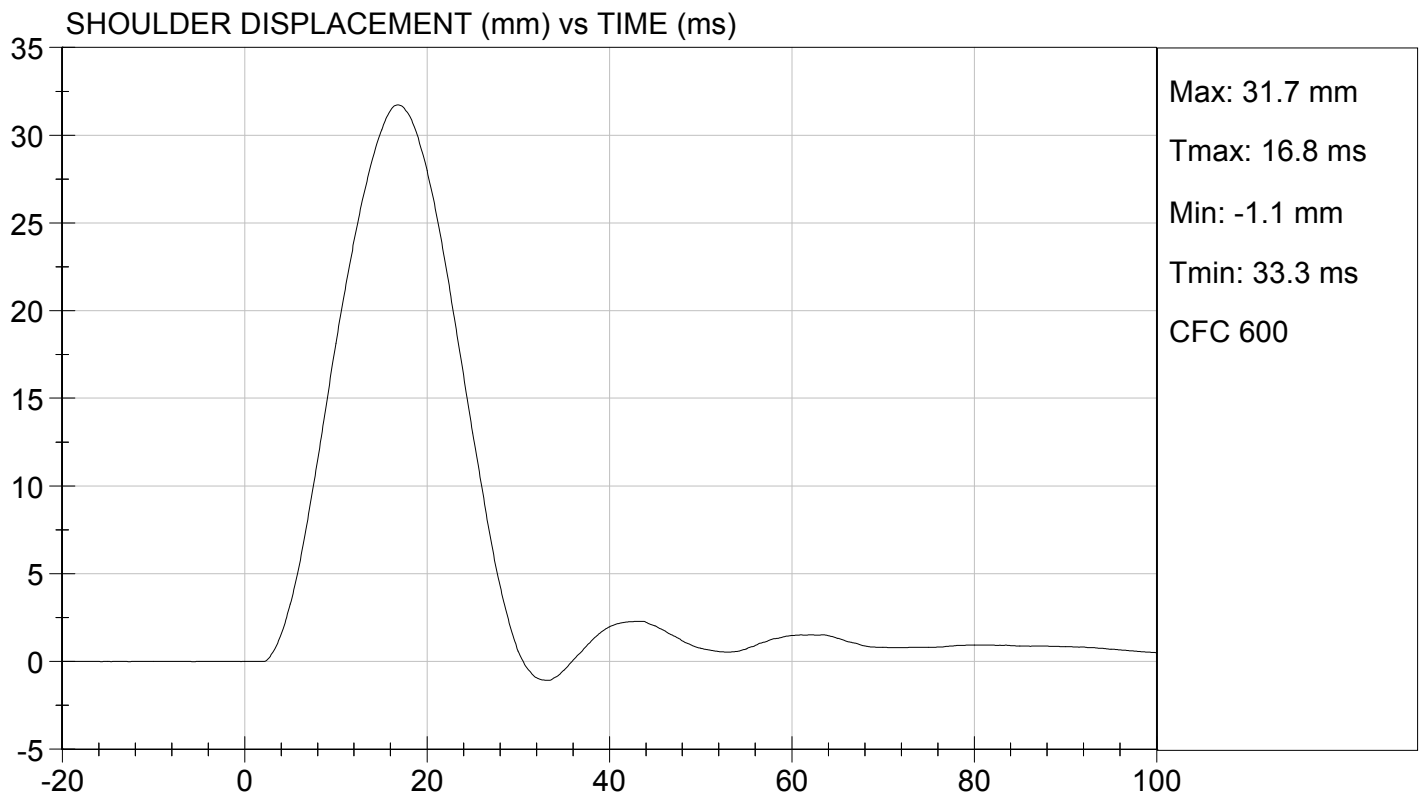
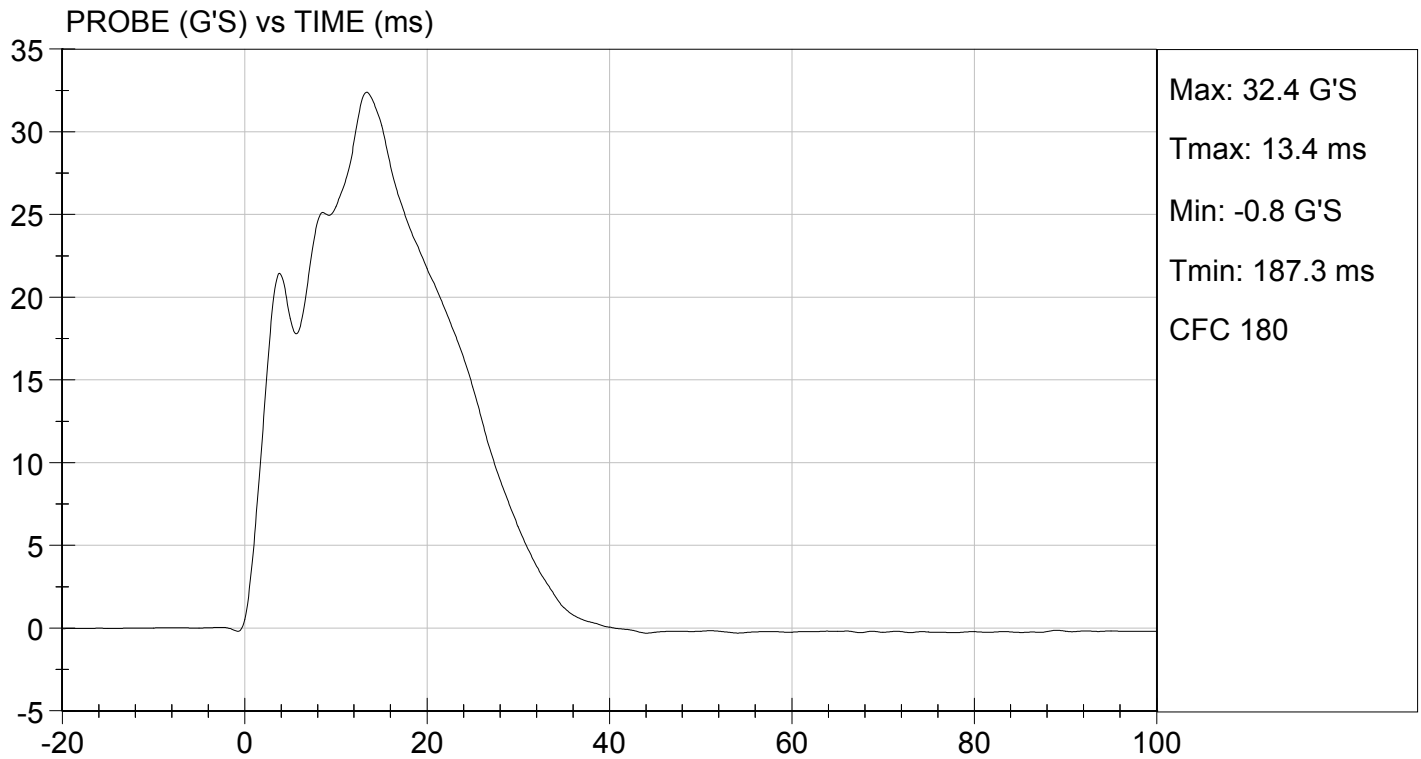
09/24/2012
 Test Date


 Approved By



TEST DESC: THORAX IMPACT WITH ARM
VELOCITY: 22.22 ft/s, 6.77 m/s

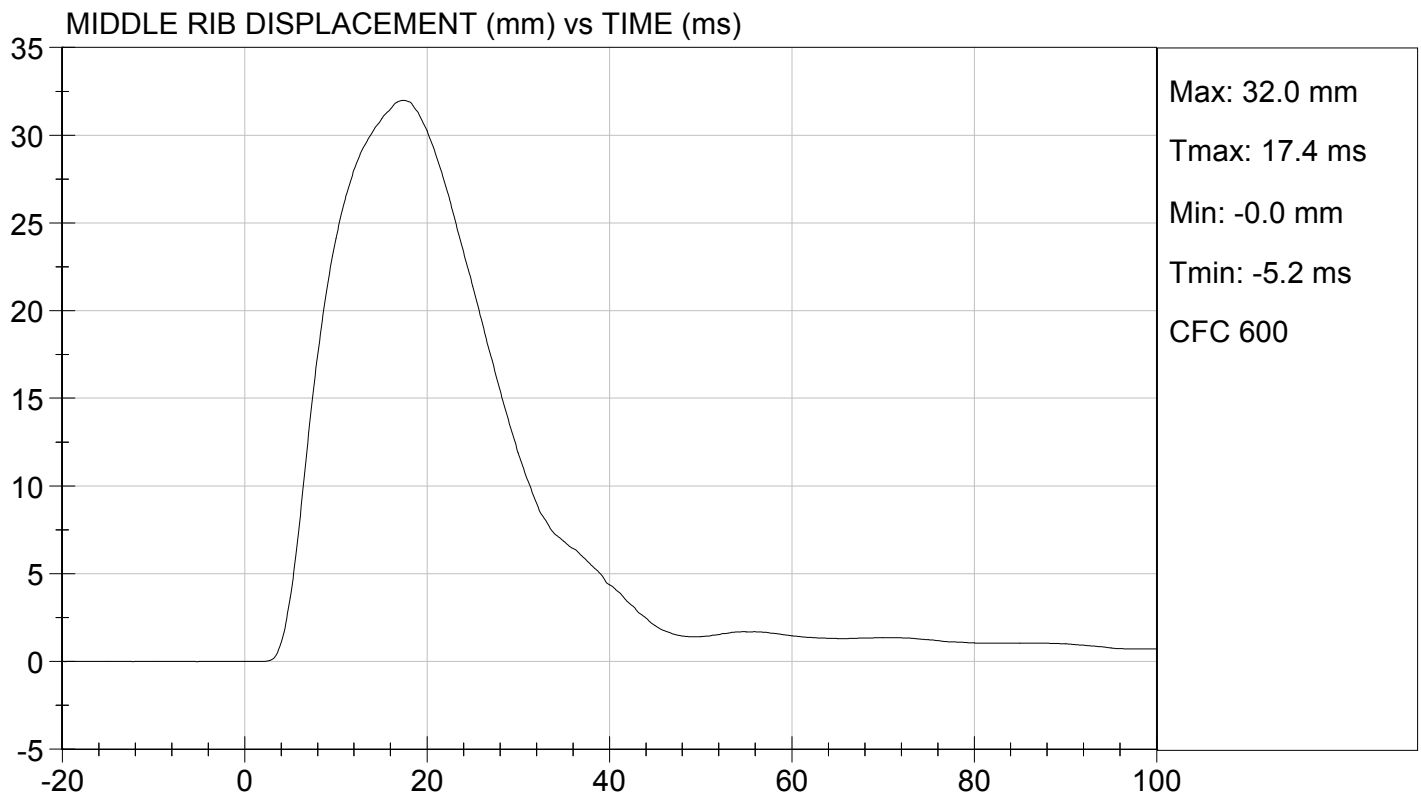
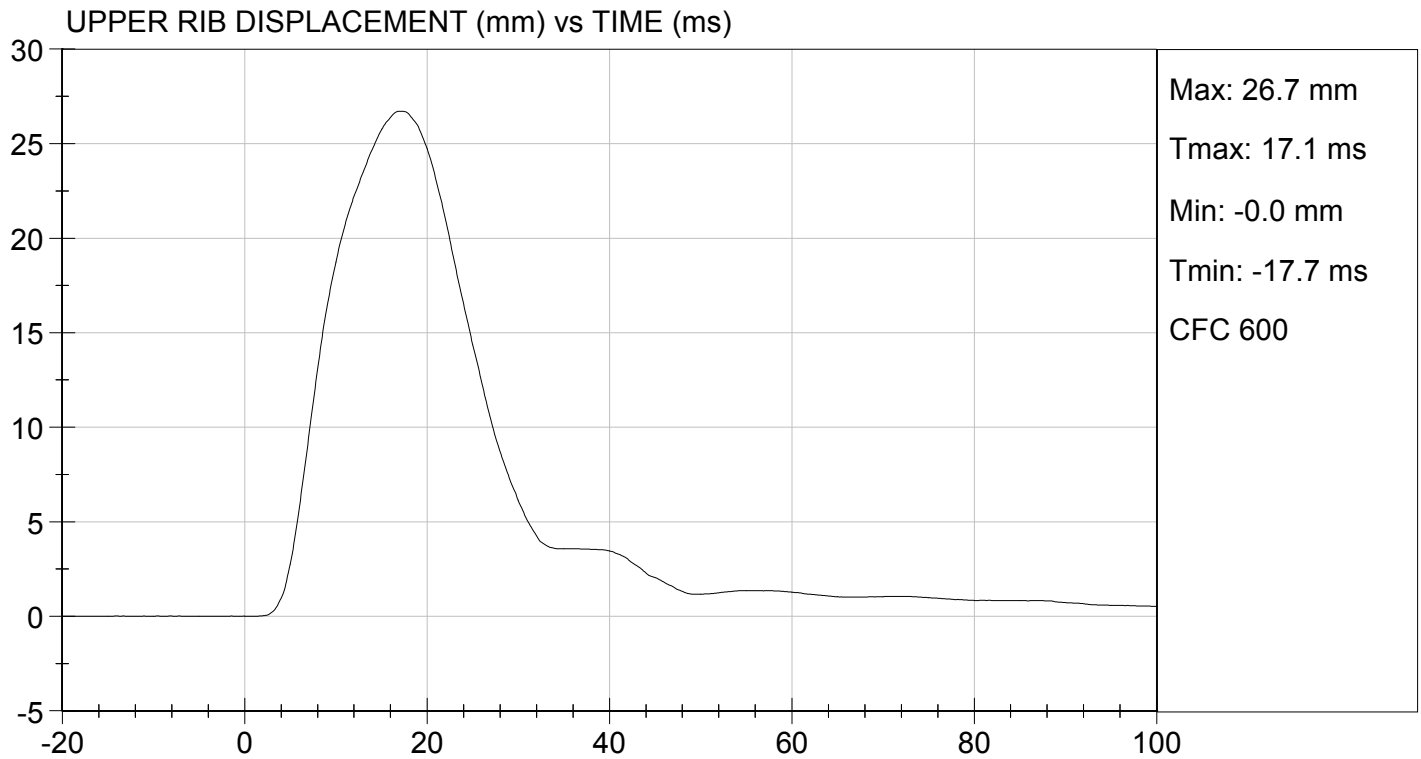
TEST DATE: 09/24/2012
TEST #: D123524





TEST DESC: THORAX IMPACT WITH ARM
VELOCITY: 22.22 ft/s, 6.77 m/s

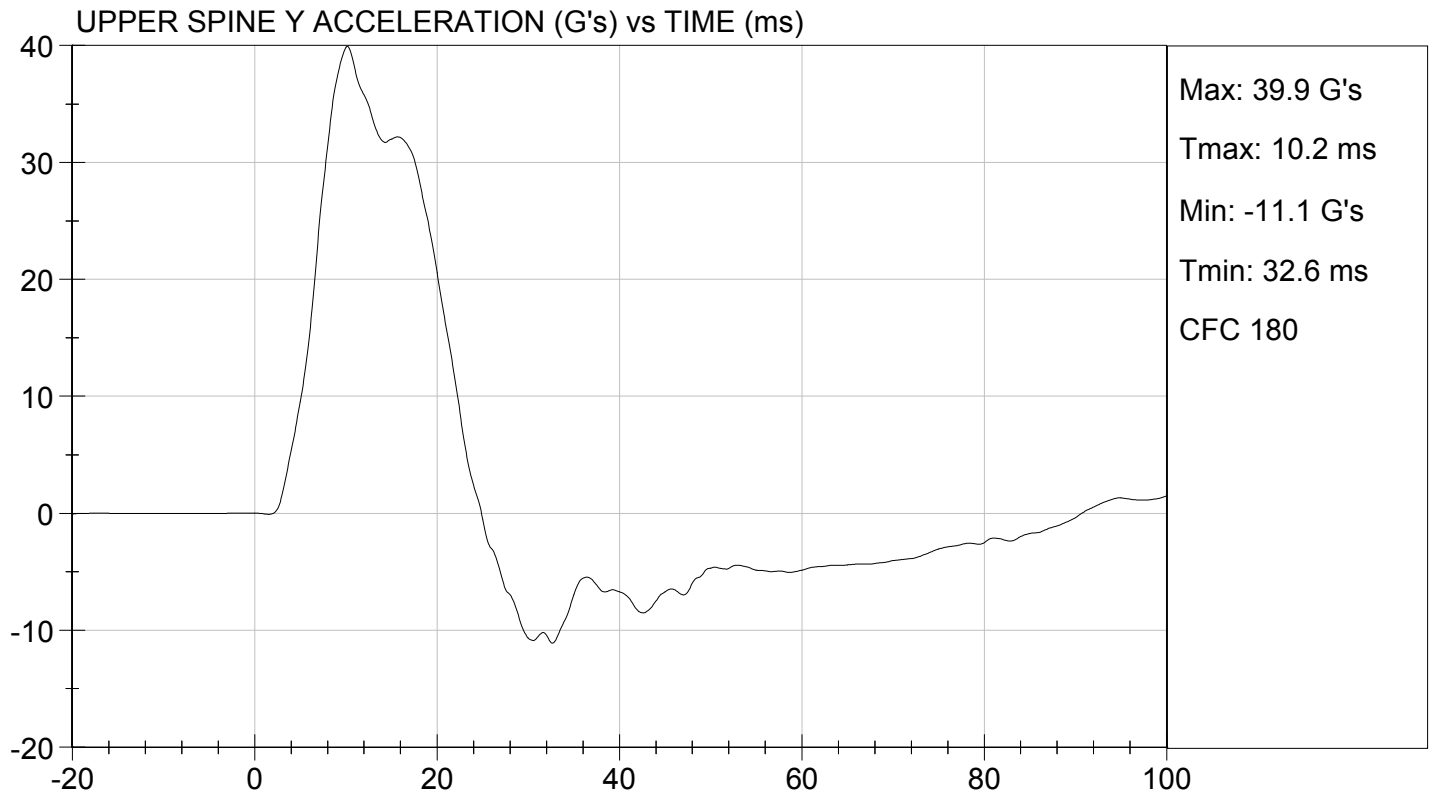
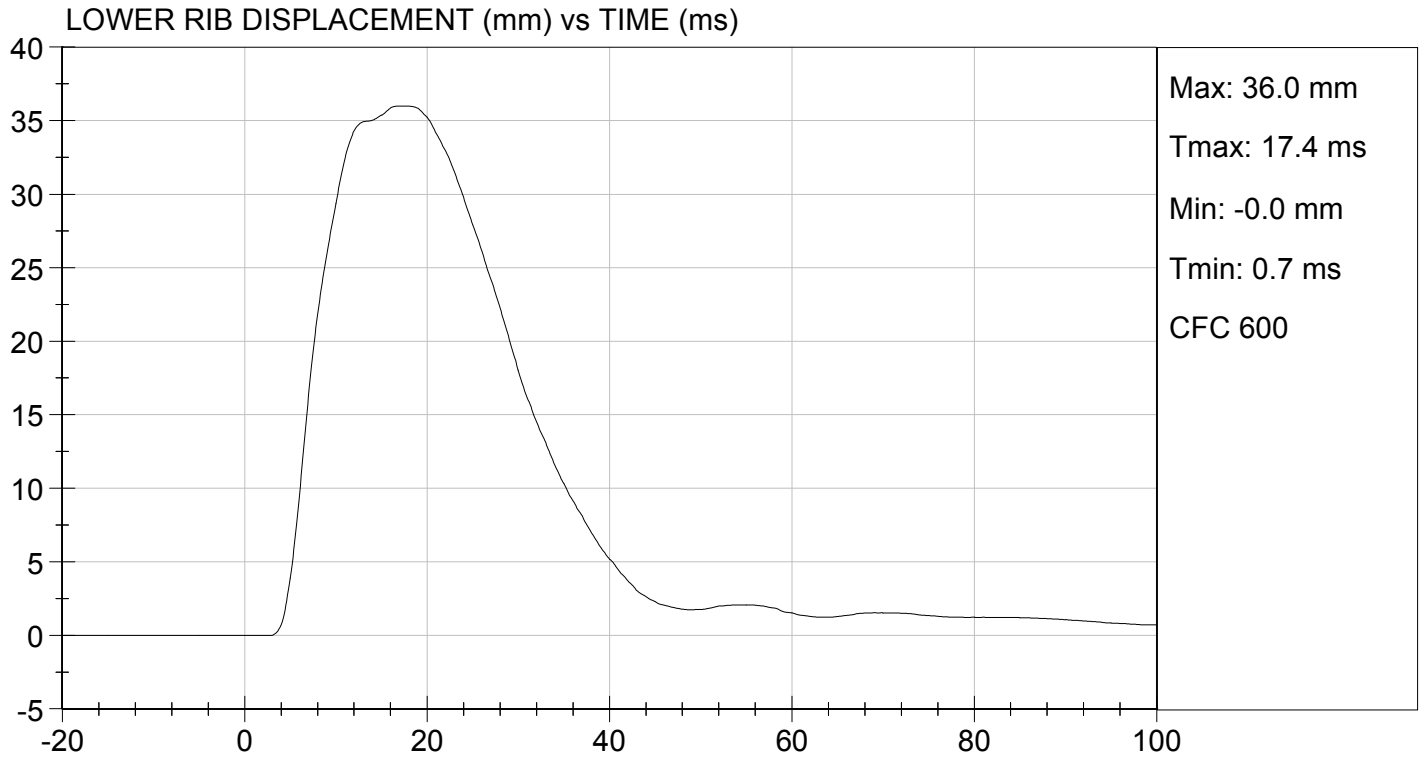
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TEST #: D123524





TEST DESC: THORAX IMPACT WITH ARM
VELOCITY: 22.22 ft/s, 6.77 m/s

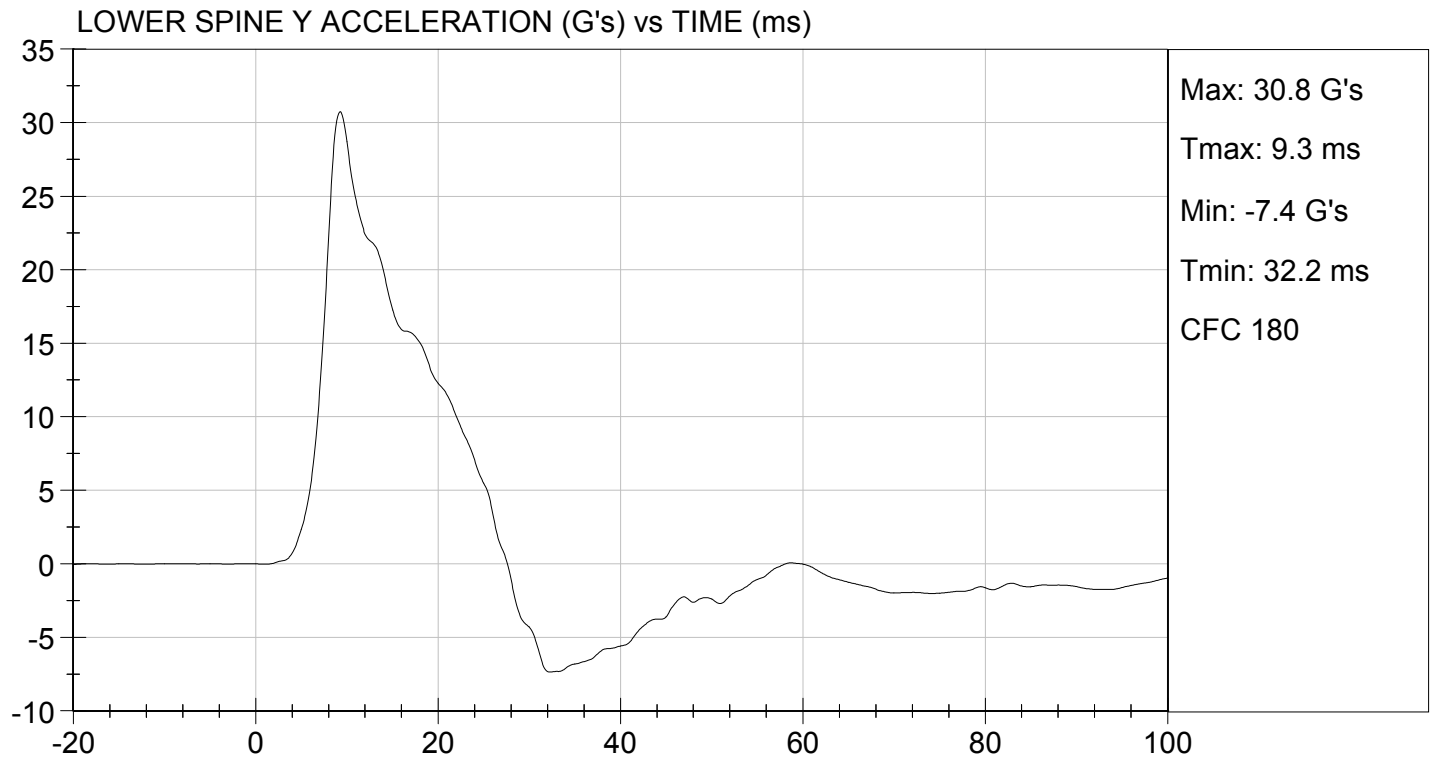
TEST DATE: 09/24/2012
TEST #: D123524





TEST DESC: THORAX IMPACT WITH ARM
VELOCITY: 22.22 ft/s, 6.77 m/s

TEST DATE: 09/24/2012
TEST #: D123524

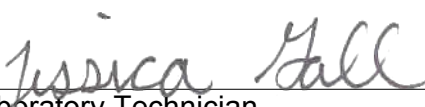


MGA RESEARCH CORPORATION
THORAX (WITHOUT ARM) IMPACT TEST
SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

Test I.D: D123525

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.1	Pass
Humidity	%	10 to 70	31	Pass
Impact Velocity	m/s	4.20 to 4.40	4.38	Pass
Maximum Probe Acceleration	G's	14 to 18	16	Pass
Upper Rib Displacement	mm	32 to 40	35	Pass
Middle Rib Displacement	mm	39 to 45	42	Pass
Lower Rib Displacement	mm	35 to 43	42	Pass
Upper Spine (T1) Y Acceleration	G's	13 to 17	15	Pass
Lower Spine (T12) Y Acceleration	G's	7 to 11	10	Pass
Overall Test Results				Pass


 Laboratory Technician

09/24/2012

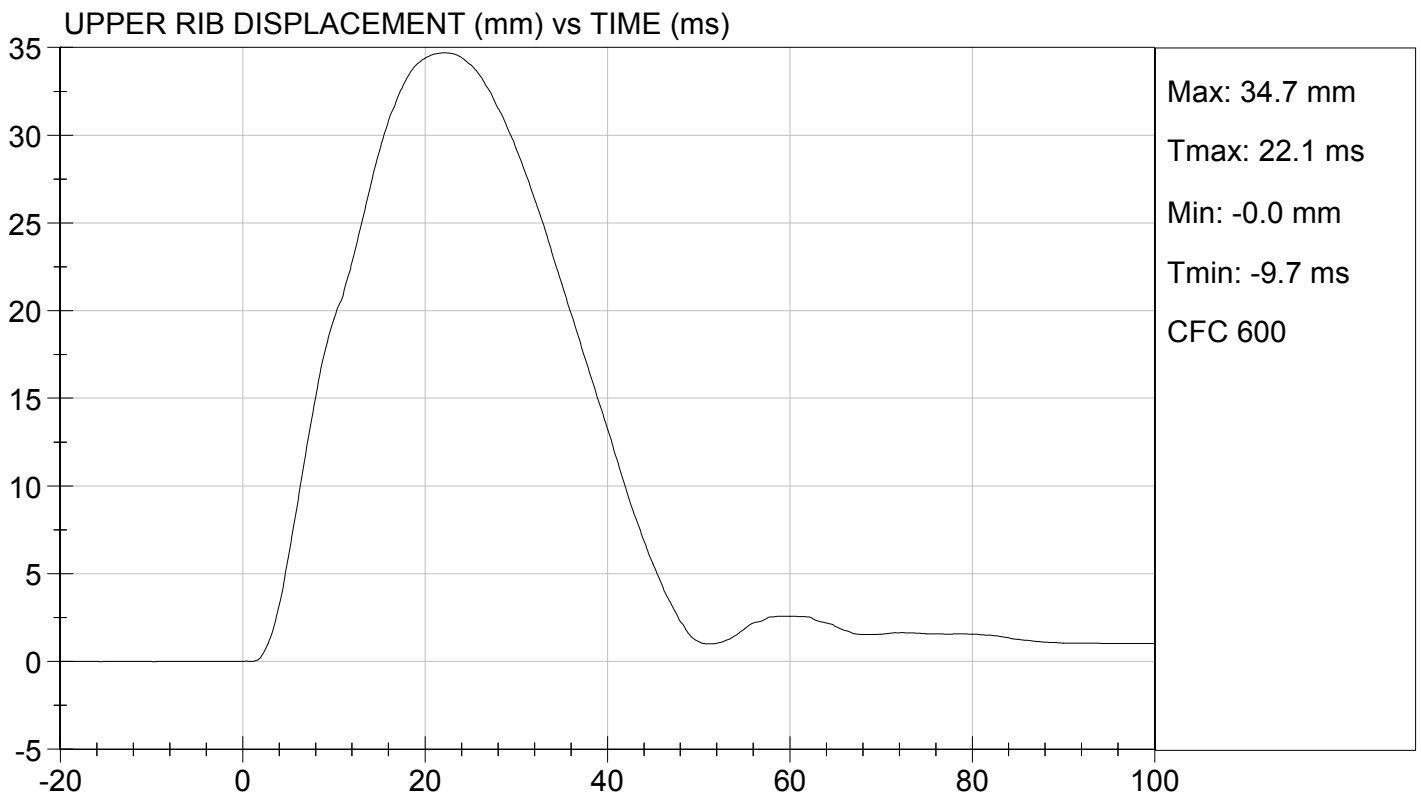
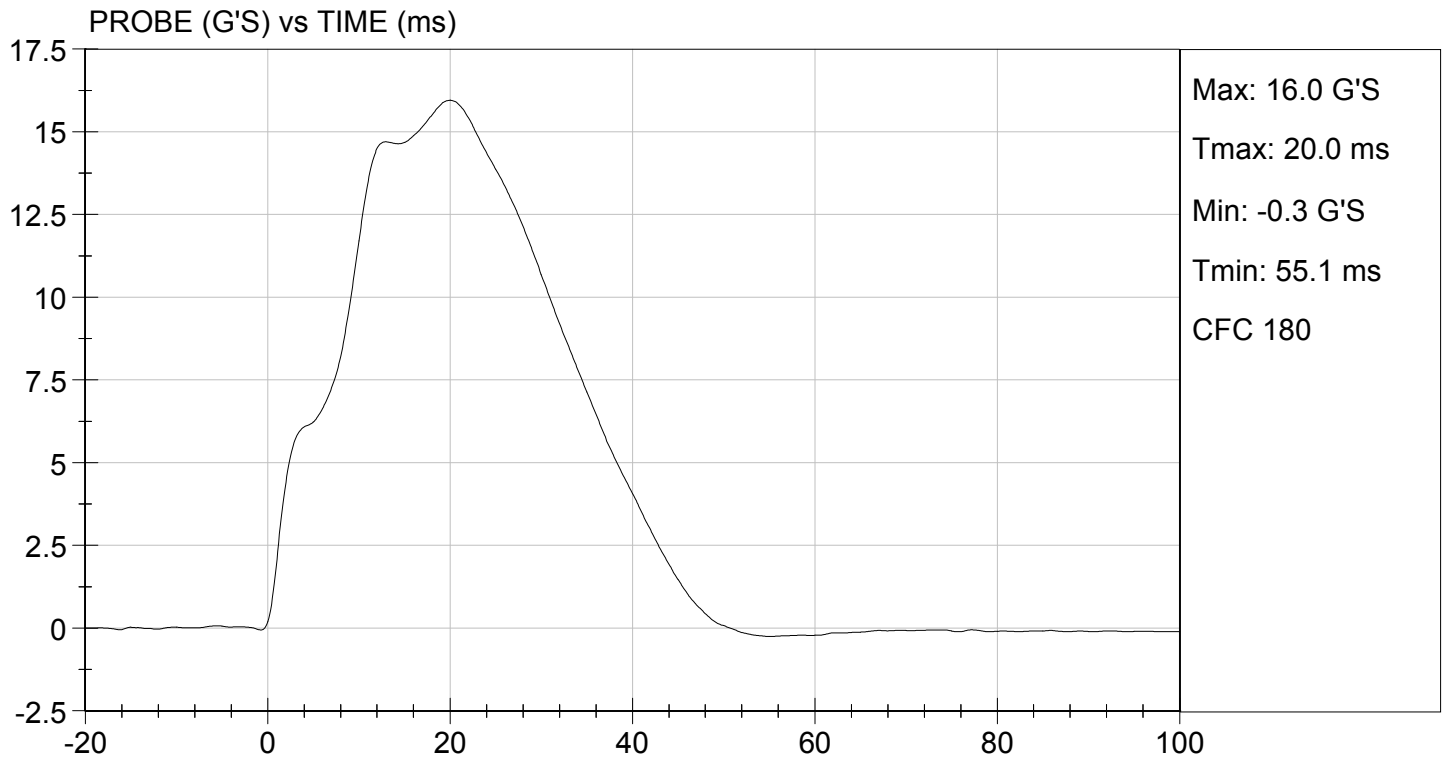
Test Date


 Approved By



TEST DESC: THORAX IMPACT WITHOUT ARM
VELOCITY: 14.37 ft/s, 4.38 m/s

TEST DATE: 09/24/2012
TEST #: D123525

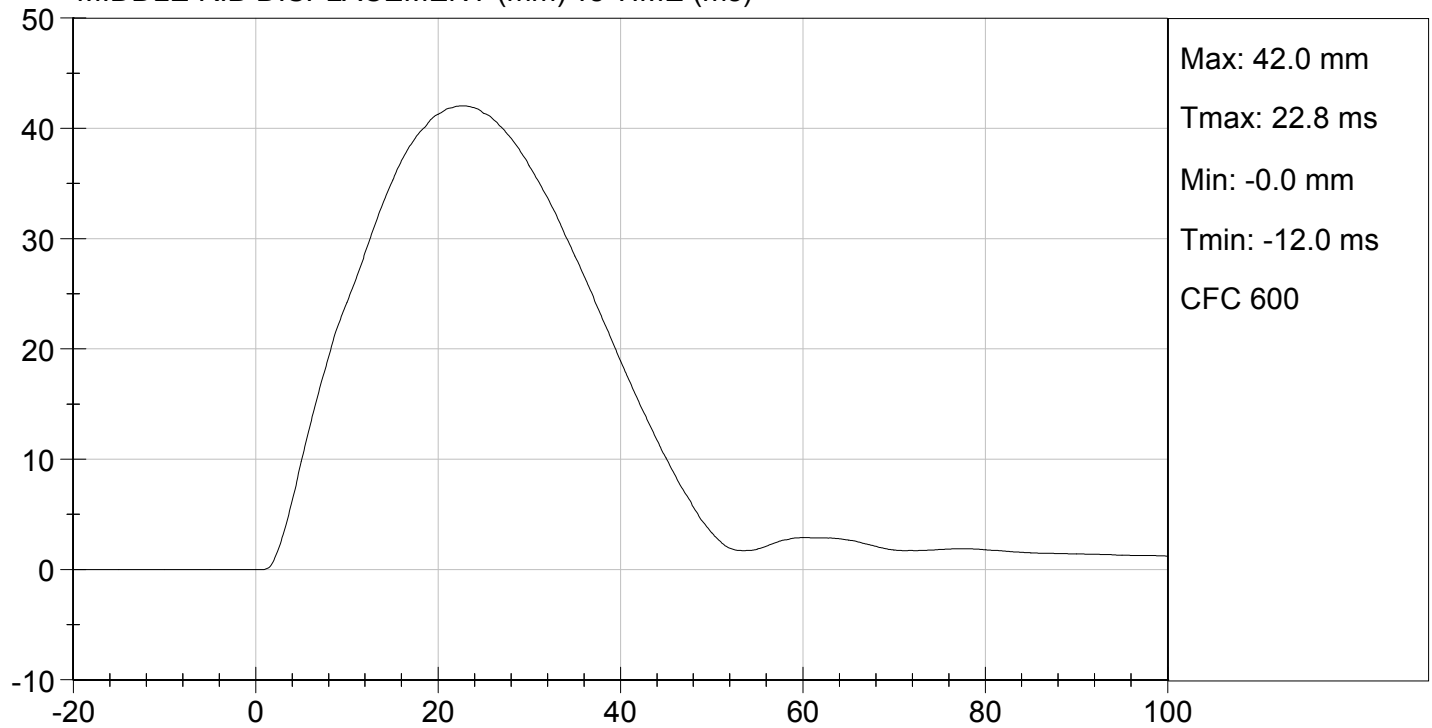




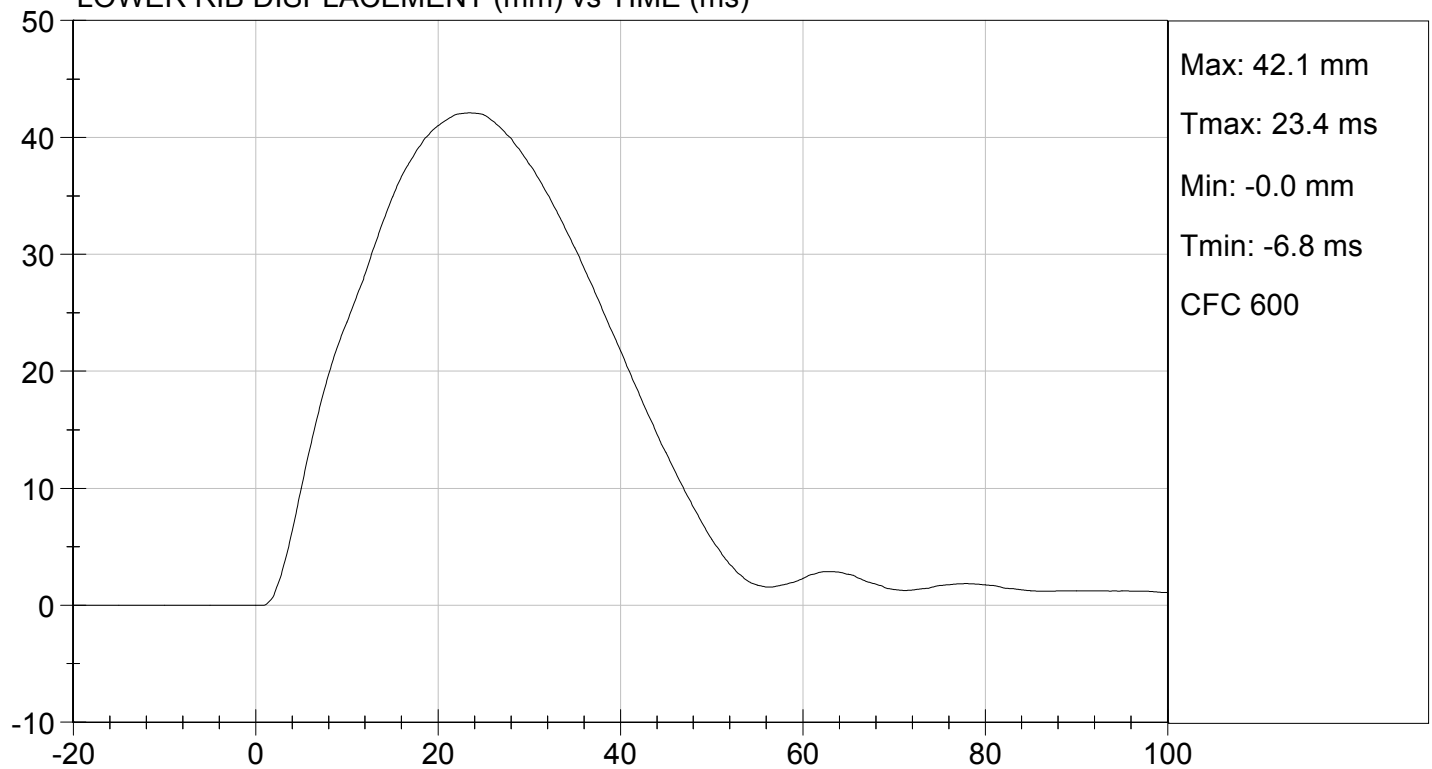
TEST DESC: THORAX IMPACT WITHOUT ARM
VELOCITY: 14.37 ft/s, 4.38 m/s

TEST DATE: 09/24/2012
TEST #: D123525

MIDDLE RIB DISPLACEMENT (mm) vs TIME (ms)



LOWER RIB DISPLACEMENT (mm) vs TIME (ms)

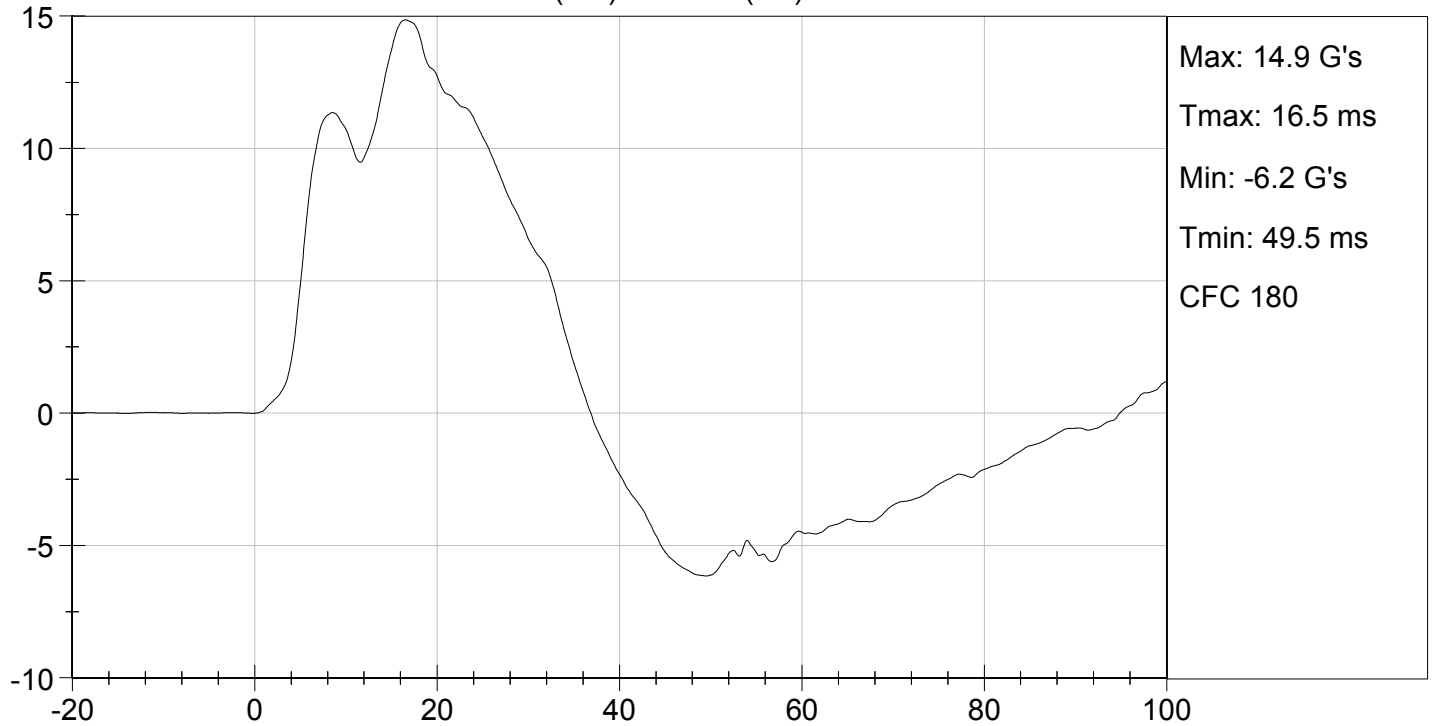




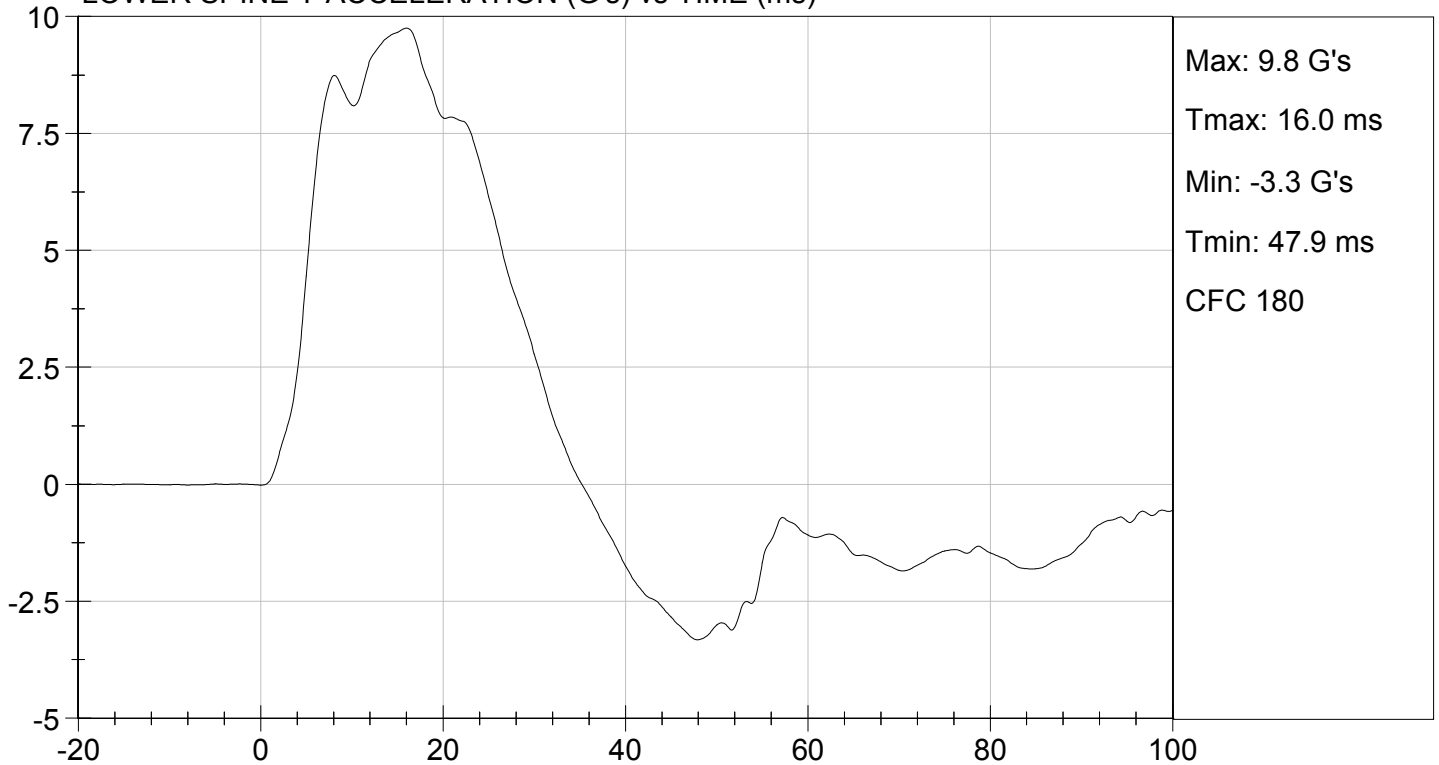
TEST DESC: THORAX IMPACT WITHOUT ARM
VELOCITY: 14.37 ft/s, 4.38 m/s

TEST DATE: 09/24/2012
TEST #: D123525

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: 306

Test I.D: D123526

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.1	Pass
Humidity	%	10 to 70	31	Pass
Impact Velocity	m/s	4.20 to 4.40	4.38	Pass
Maximum Probe Acceleration	G's	12 to 16	13	Pass
Upper Abdomen Rib Displacement	mm	36 to 47	40	Pass
Lower Abdomen Rib Displacement	mm	33 to 44	35	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	10	Pass
Overall Test Results				Pass

Jessica Gall
Laboratory Technician

09/24/2012

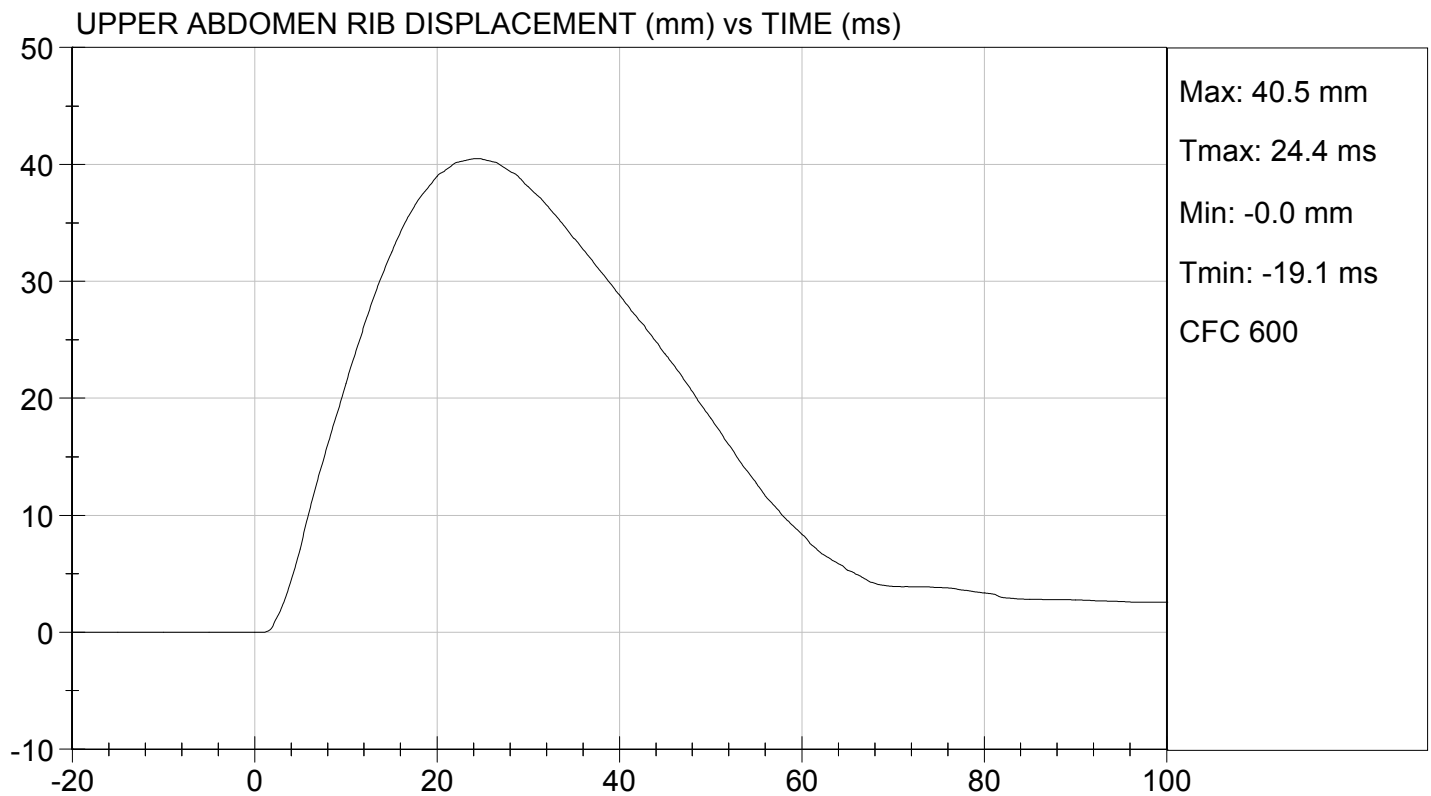
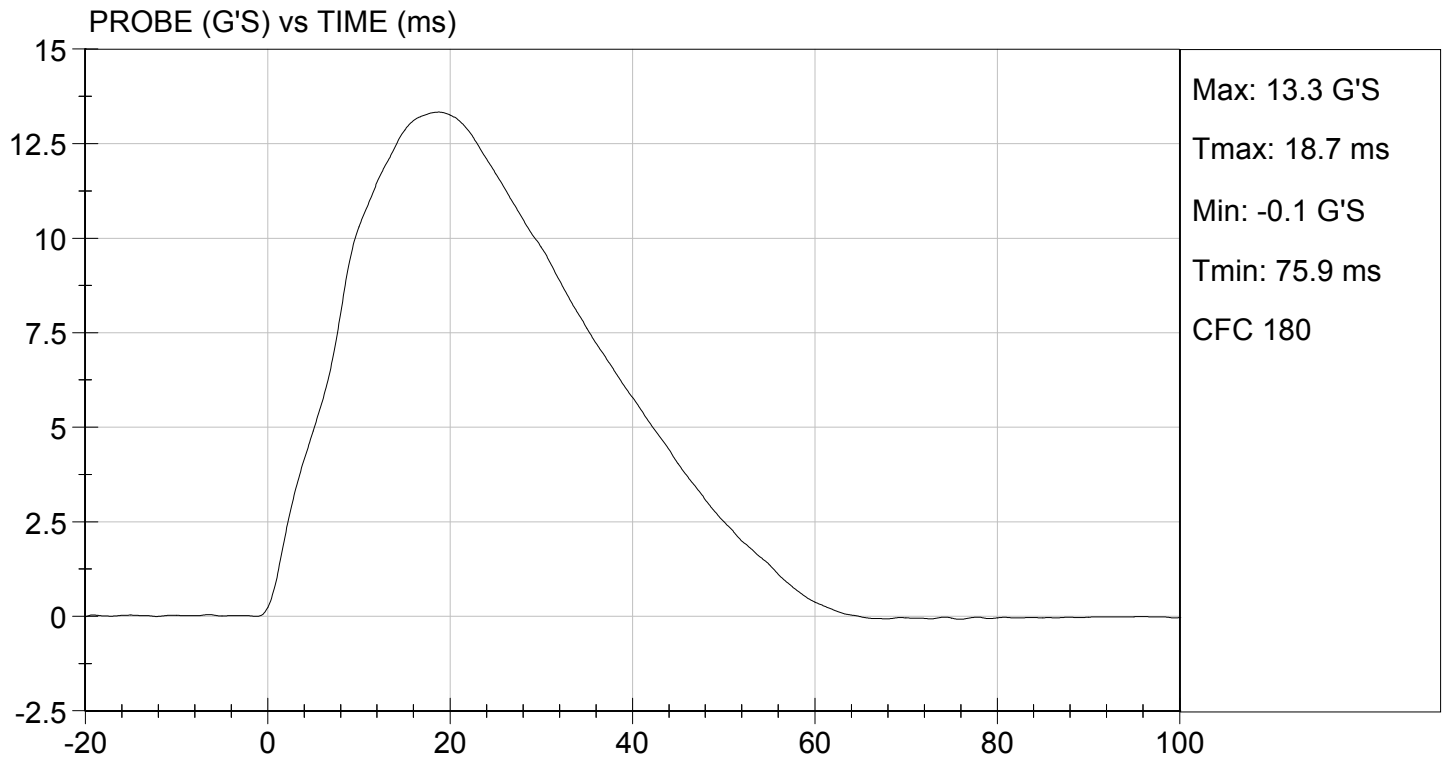
Test Date

David Winkelbauer
Approved By



TEST DESC: ABDOMEN IMPACT
VELOCITY: 14.37 ft/s, 4.38 m/s

TEST DATE: 09/24/2012
TEST #: D123526

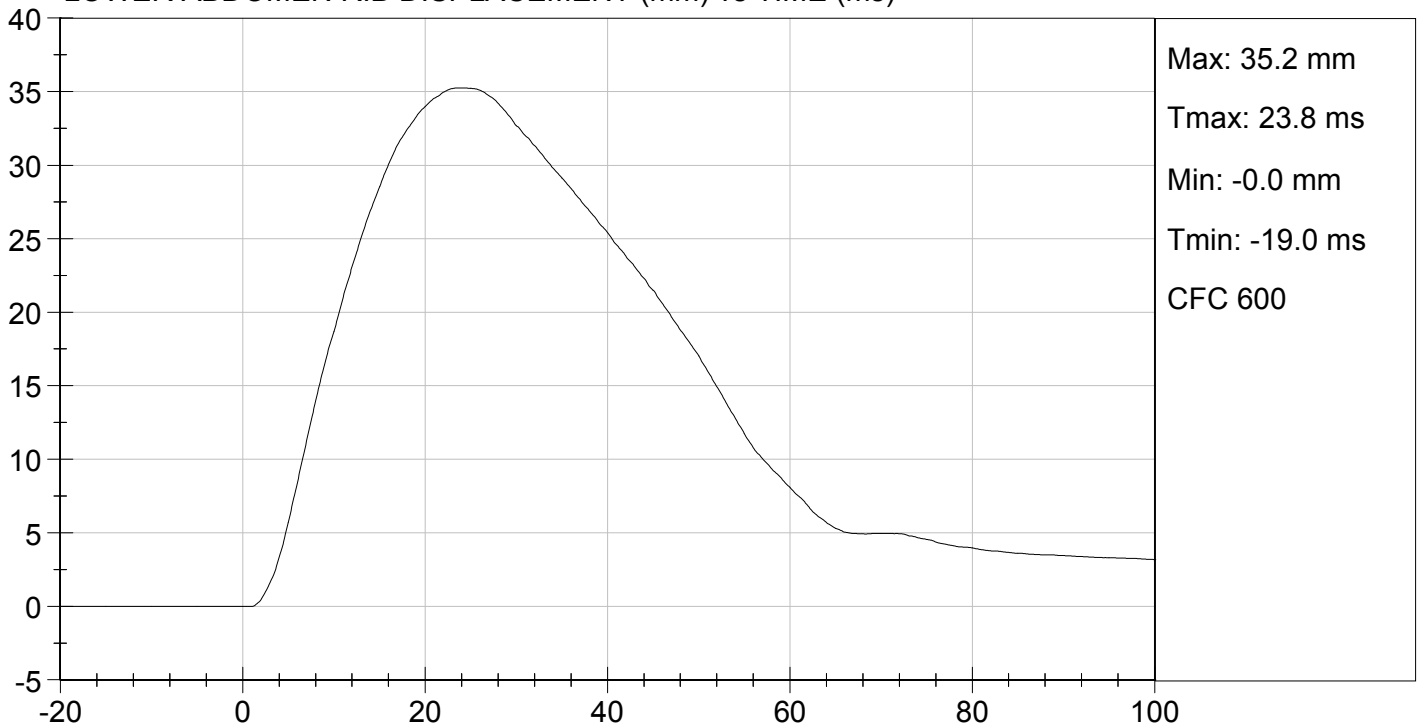




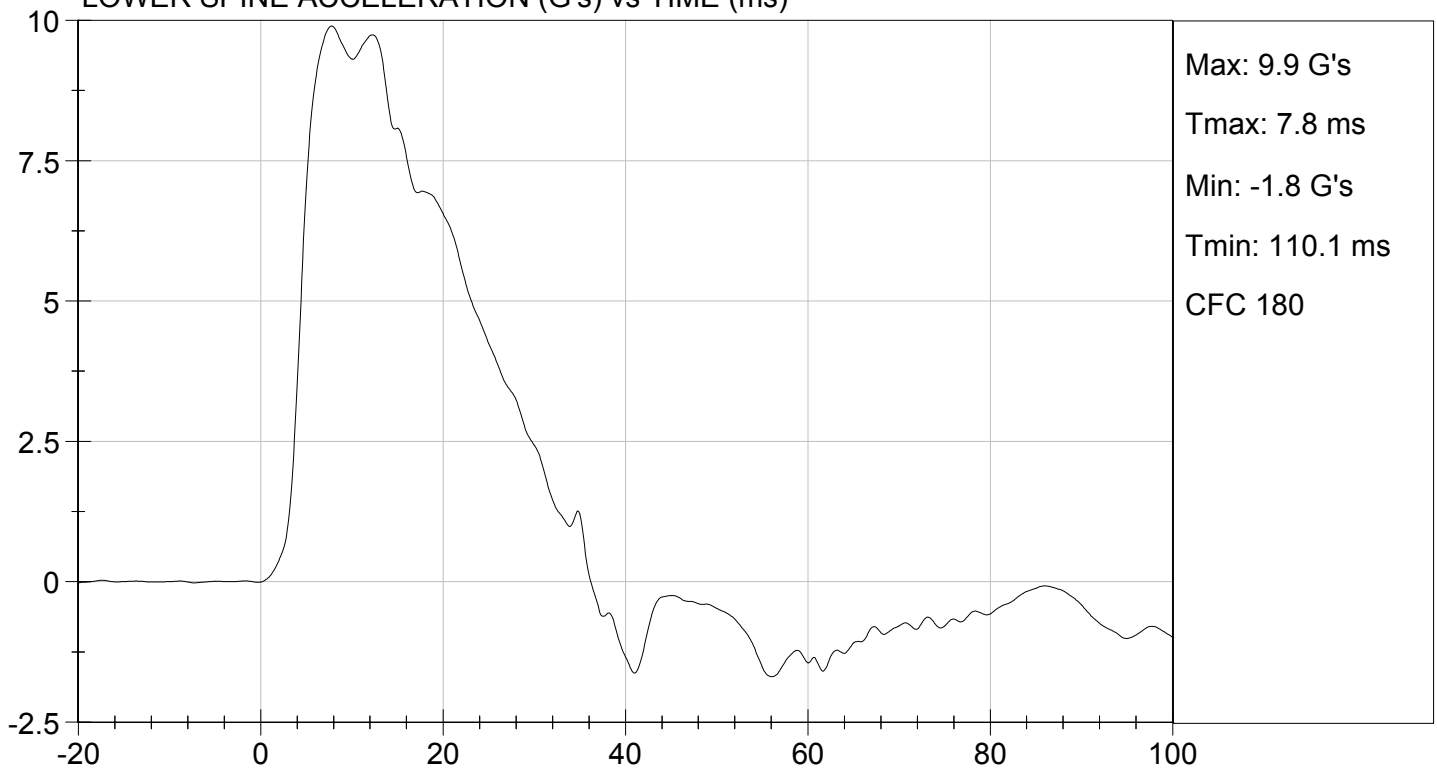
TEST DESC: ABDOMEN IMPACT
VELOCITY: 14.37 ft/s, 4.38 m/s

TEST DATE: 09/24/2012
TEST #: D123526

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



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



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

Test I.D: D123527

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.5	Pass
Humidity	%	10 to 70	36	Pass
Impact Velocity	m/s	6.60 to 6.80	6.68	Pass
Maximum Probe Acceleration	G's	38 to 47	45	Pass
Pelvis Y Acceleration After 6 ms	G's	34 to 42	41	Pass
Peak Acetabulum Force	N	3600 to 4300	4,035	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

09/25/2012

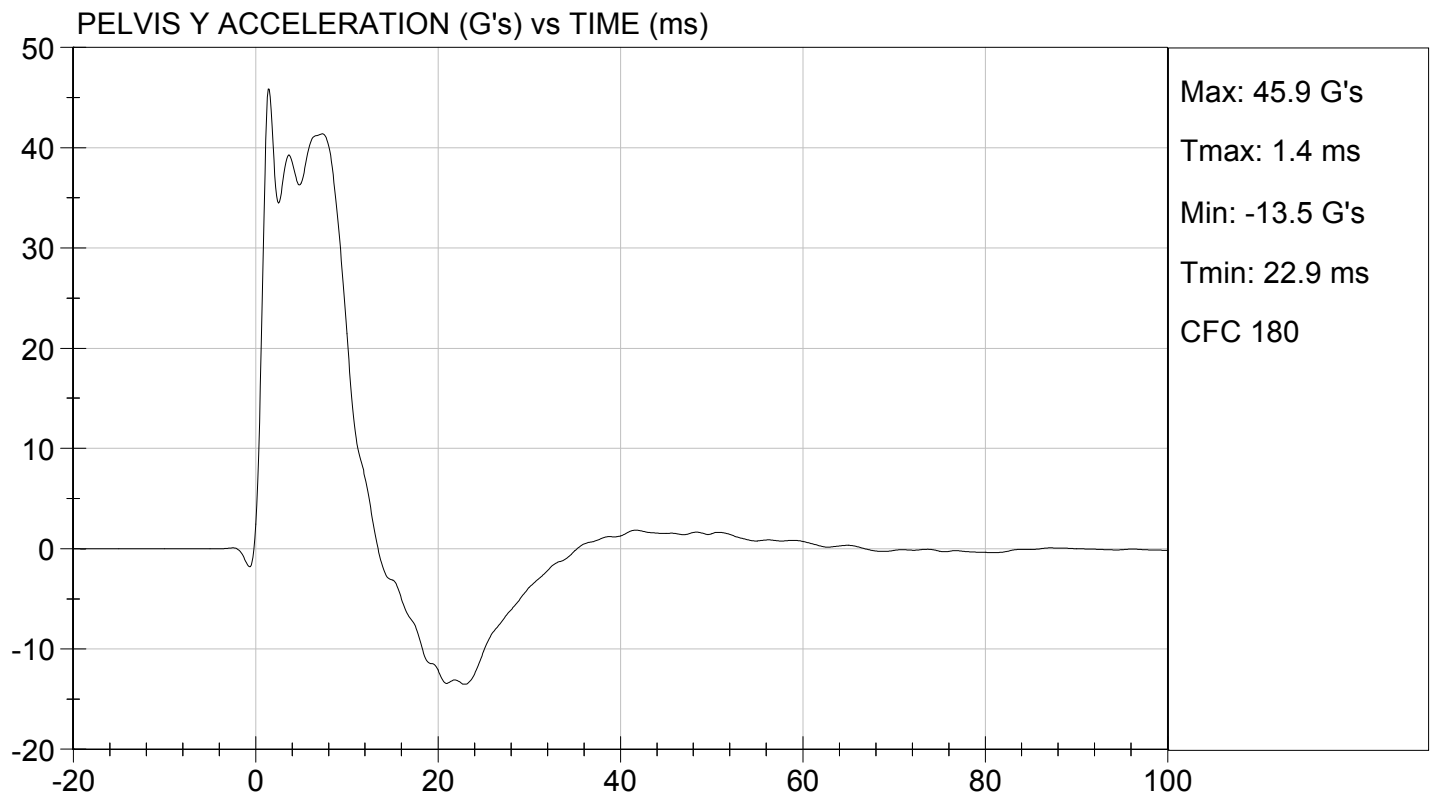
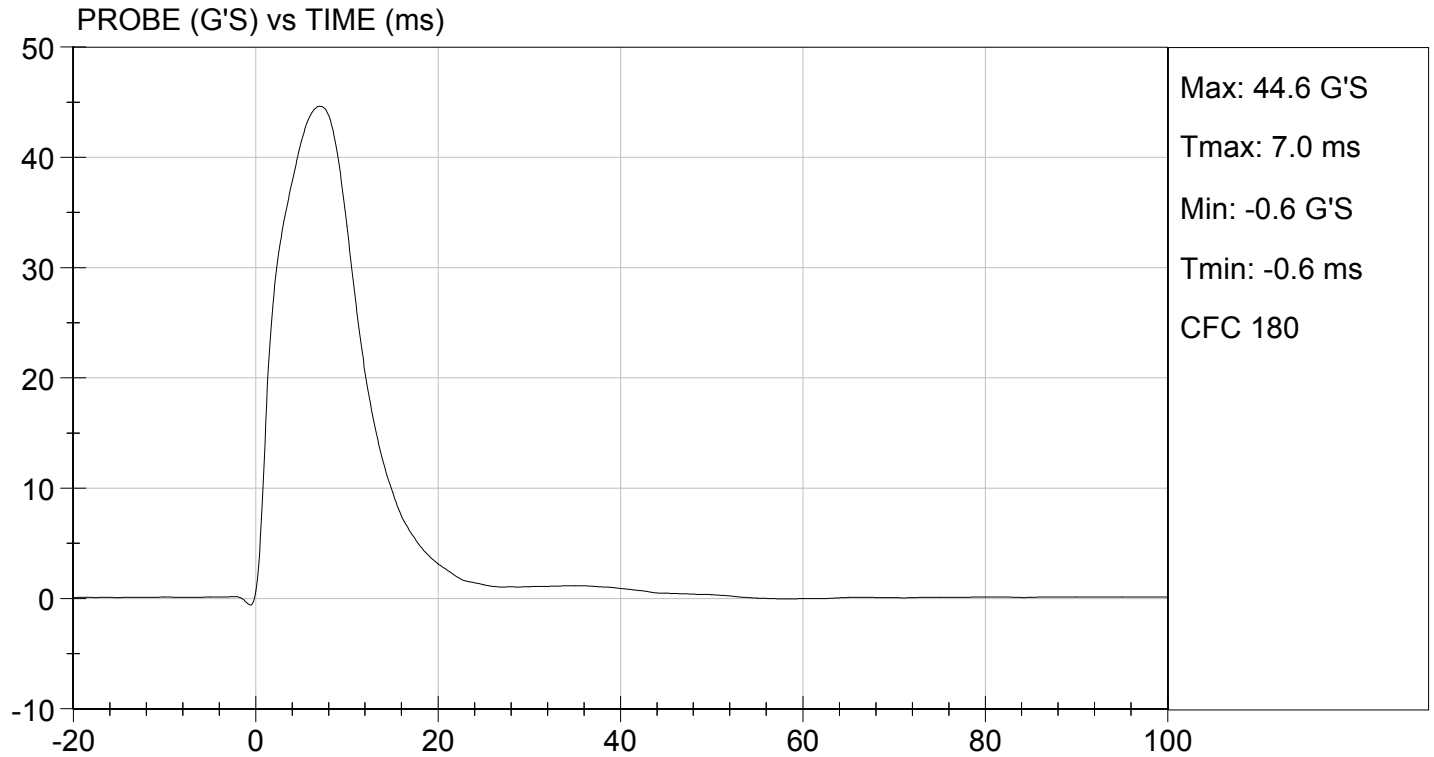
Test Date

David Winkelbauer
Approved By



TEST DESC: PELVIS IMPACT
VELOCITY: 21.90 ft/s, 6.68 m/s

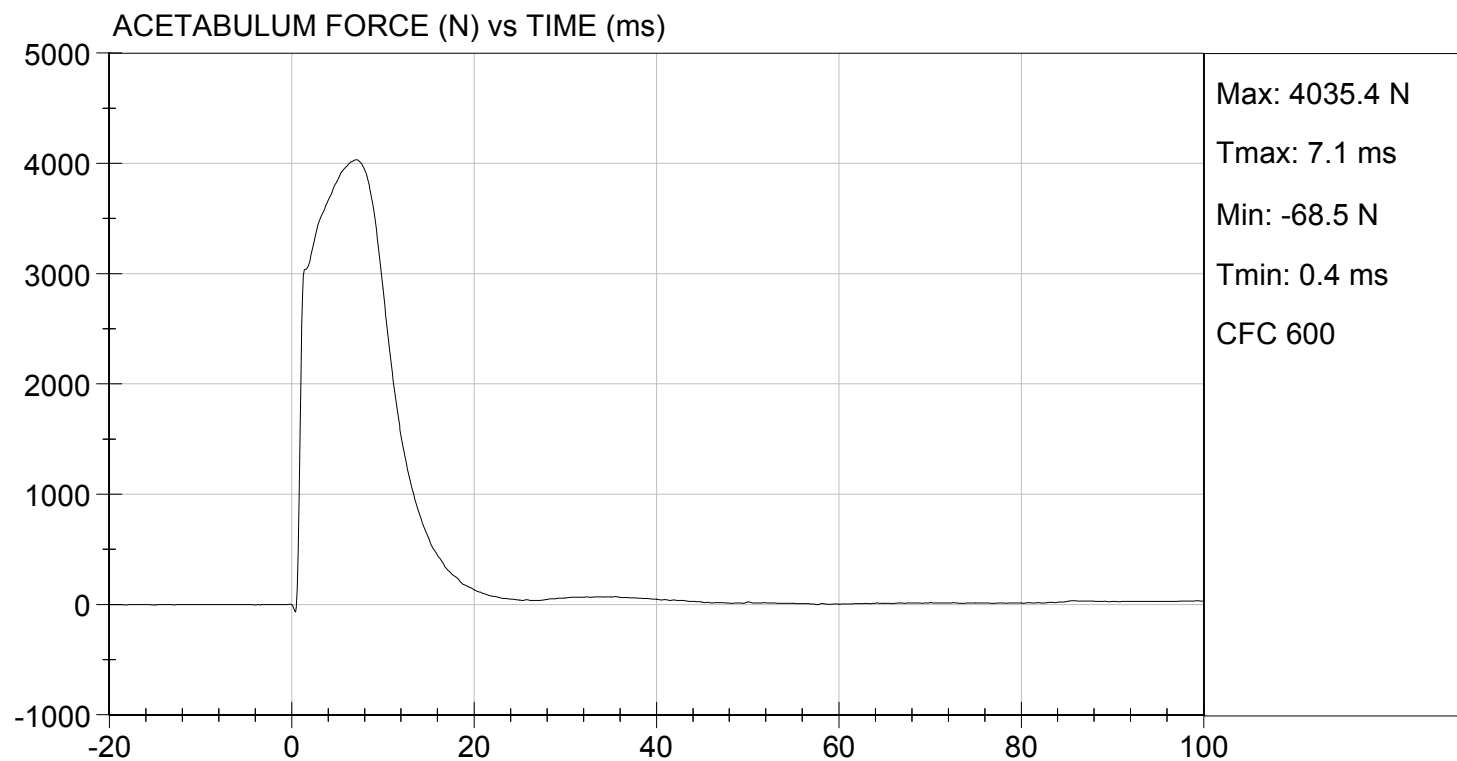
TEST DATE: 09/25/2012
TEST #: D123527





TEST DESC: PELVIS IMPACT
VELOCITY: 21.90 ft/s, 6.68 m/s

TEST DATE: 09/25/2012
TEST #: D123527



MGA RESEARCH CORPORATION

ILIAC IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

Test I.D: D123528

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.5	Pass
Humidity	%	10 to 70	36	Pass
Impact Velocity	m/s	4.20 to 4.40	4.30	Pass
Maximum Probe Acceleration	G's	36 to 45	38	Pass
Pelvis Y Acceleration	G's	28 to 39	31	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	4,609	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

09/25/2012

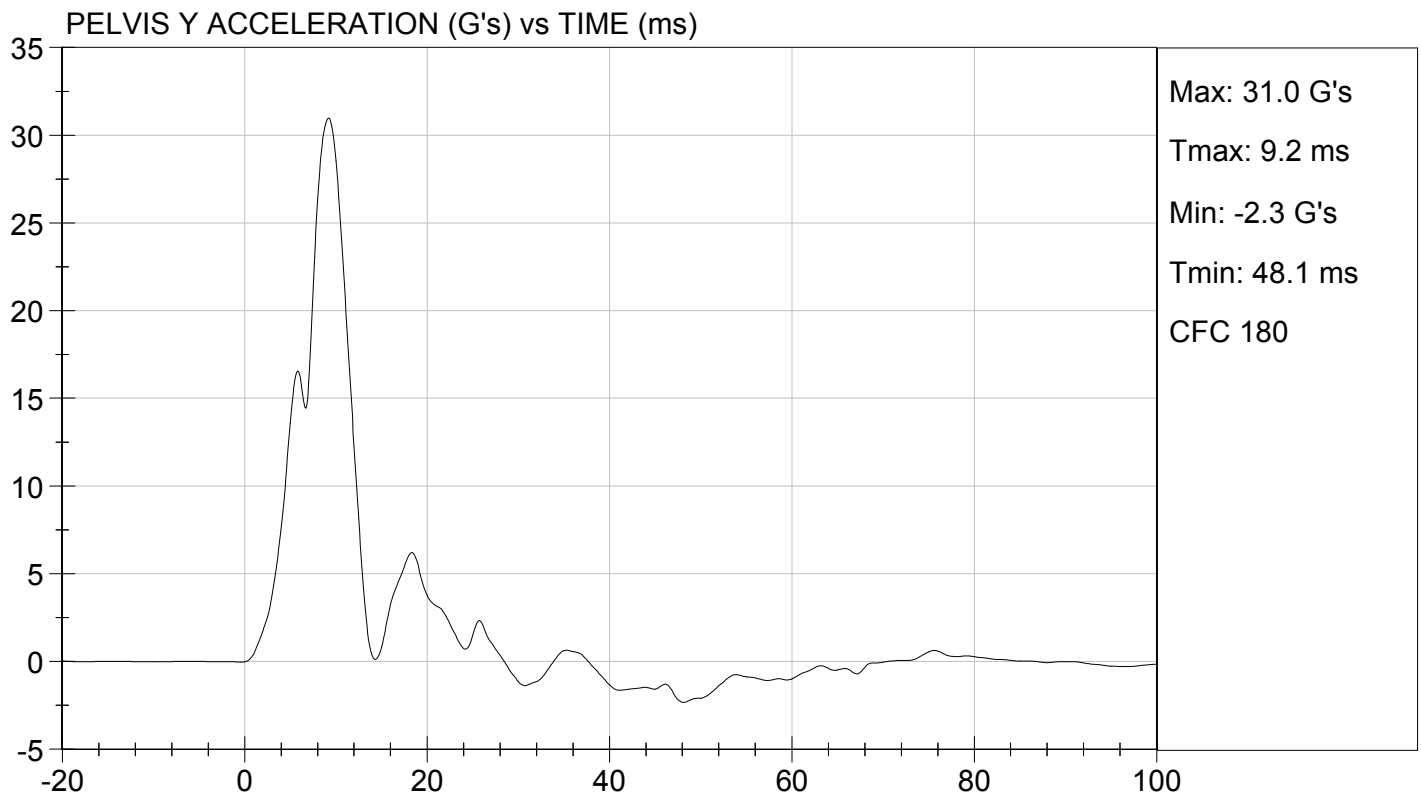
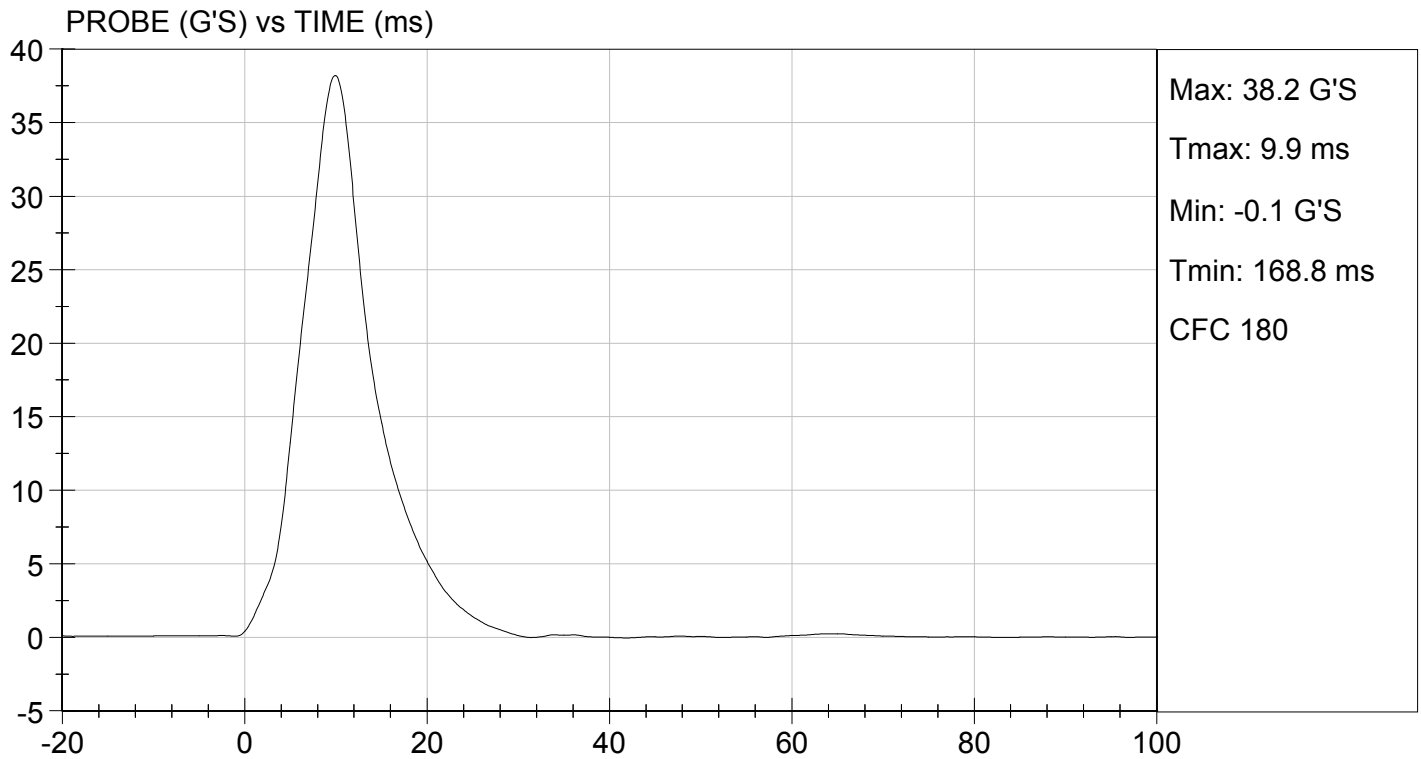
Test Date

David Winkelbauer
Approved By



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

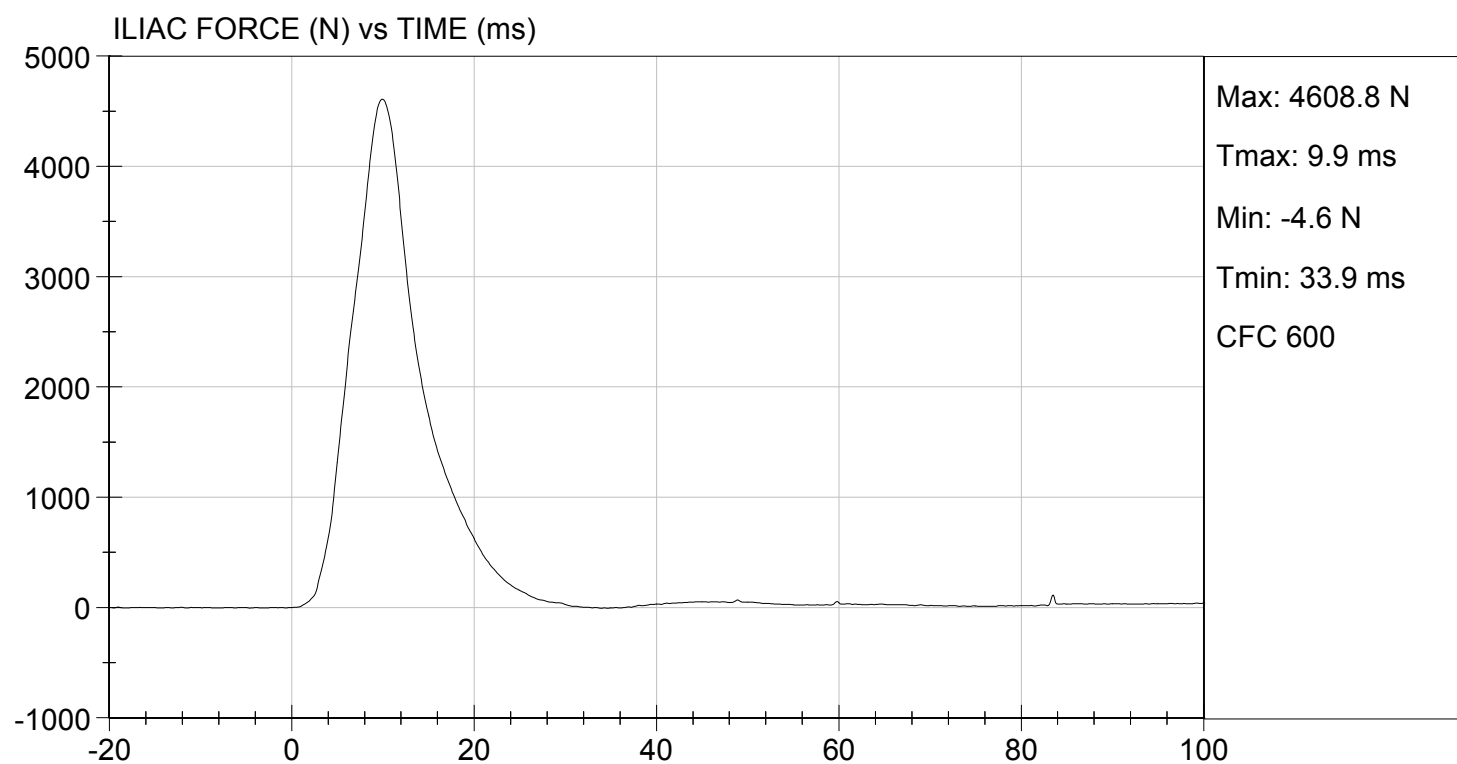
TEST DATE: 09/25/2012
TEST #: D123528





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

TEST DATE: 09/25/2012
TEST #: D123528

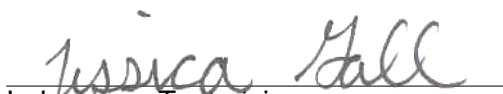


MGA RESEARCH CORPORATION
HEAD DROP TEST
SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

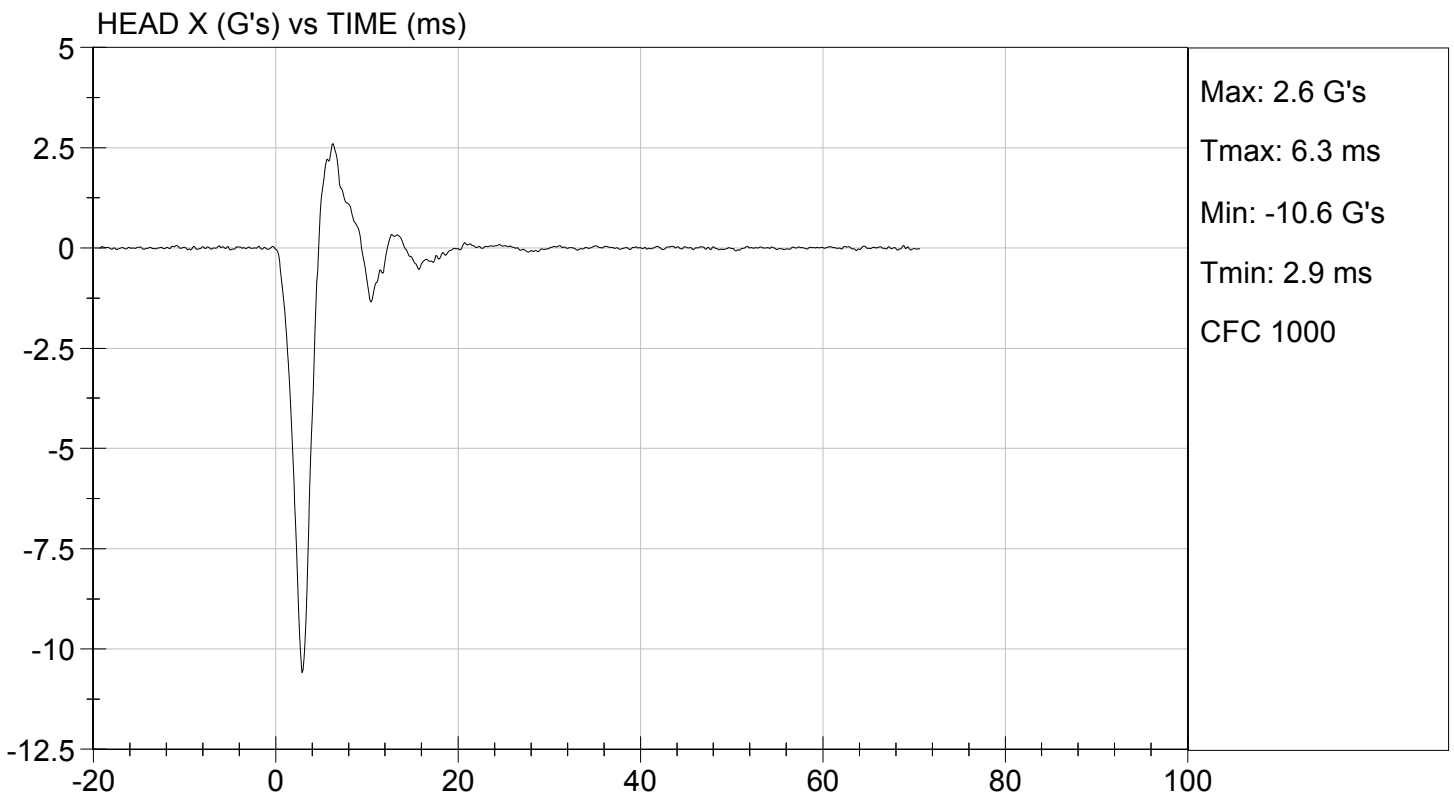
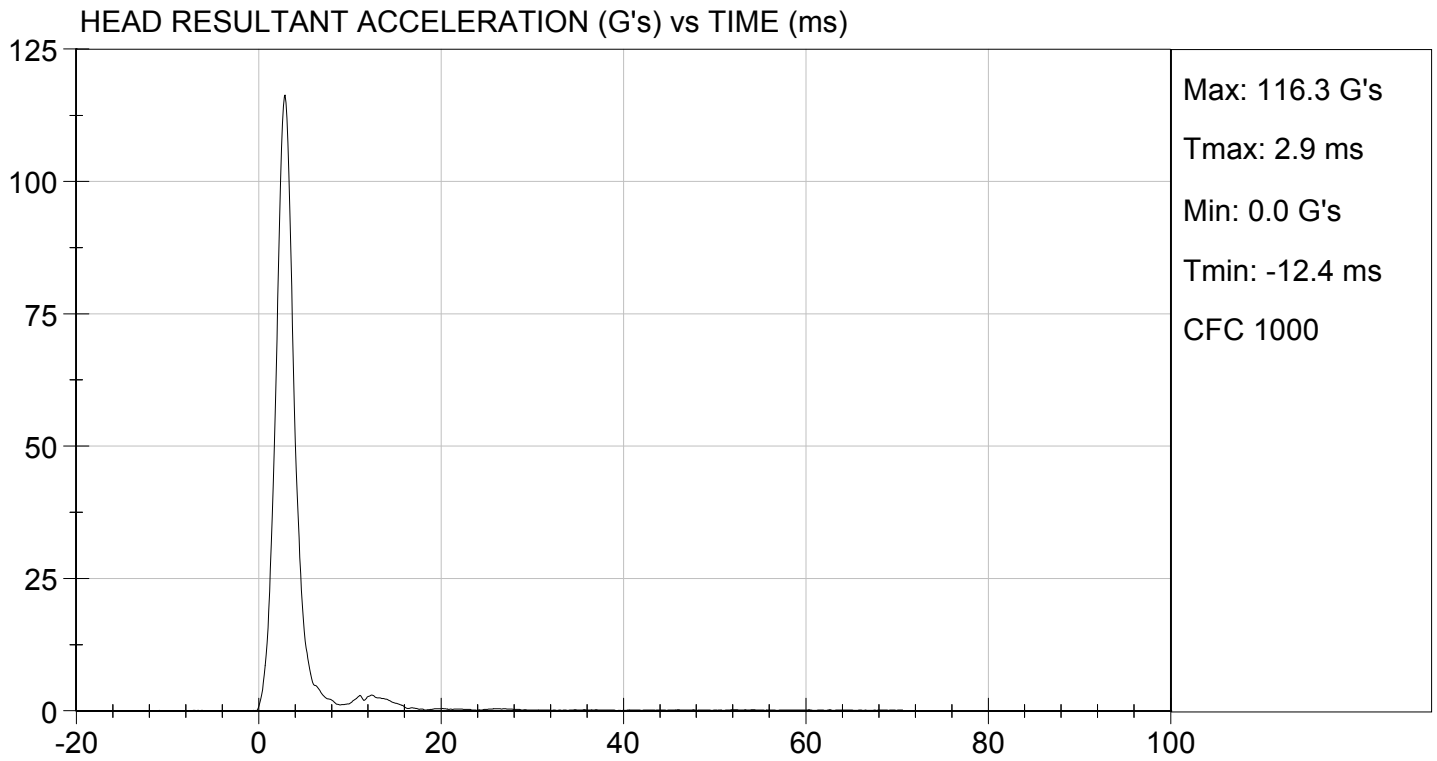
Test ID: D123681

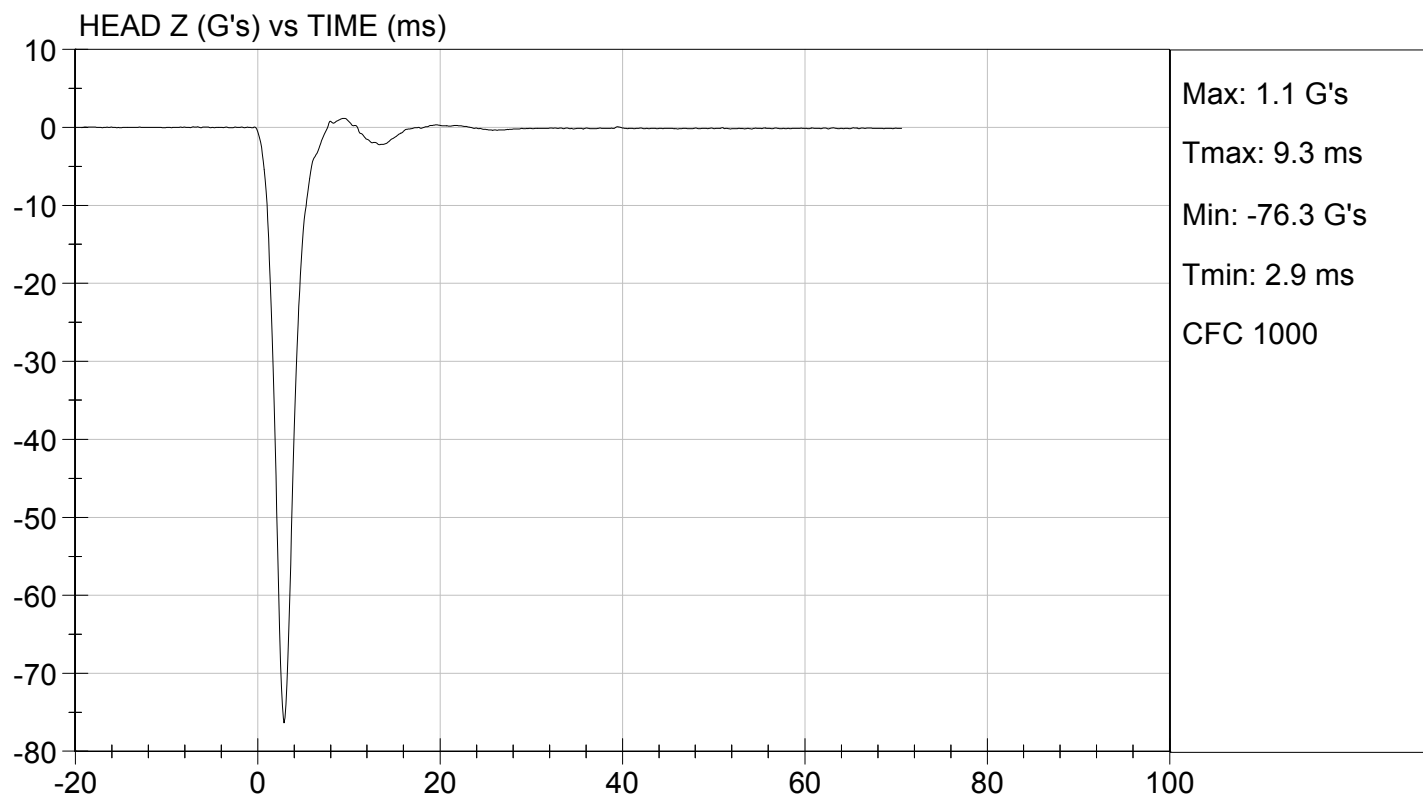
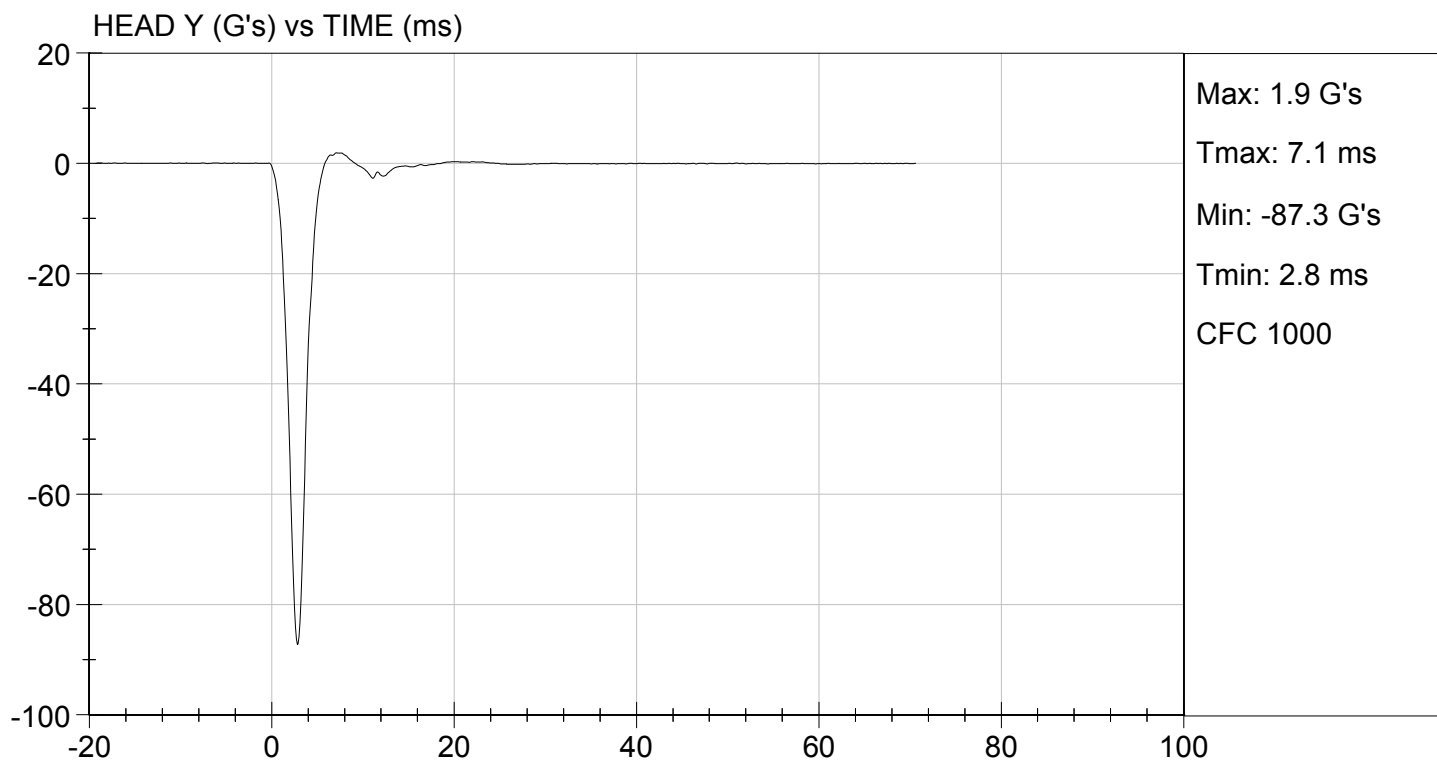
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	37	Pass
Peak Resultant Acceleration	G's	115 to 137	116	Pass
Peak Longitudinal Acceleration	G's	+/- 15	-10.6	Pass
Unimodal	N/A	Yes	Yes	Pass
Oscillations	N/A	<15%	Yes	Pass
			Overall Test Results	Pass


Laboratory Technician

10/01/2012
Test Date


Approved By





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

ATD Serial No: 306

Test I.D: D123682

Tested Parameter		Units	Specification	Result	Pass/Fail
Temperature		deg C	20.6 to 22.2	22.0	Pass
Humidity		%	10 to 70	36	Pass
Impact Velocity		m/s	5.51 to 5.63	5.52	Pass
Pendulum Velocity	10 ms	m/s	2.20 to 2.80	2.49	Pass
	15 ms	m/s	3.30 to 4.10	3.63	Pass
	20 ms	m/s	4.40 to 5.40	4.89	Pass
	25 ms	m/s	5.40 to 6.10	5.49	Pass
	25-100 ms	m/s	5.50 to 6.20	5.52	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	115	Pass
Overall Test Results					Pass

Jessica Hall
Laboratory Technician

10/01/2012

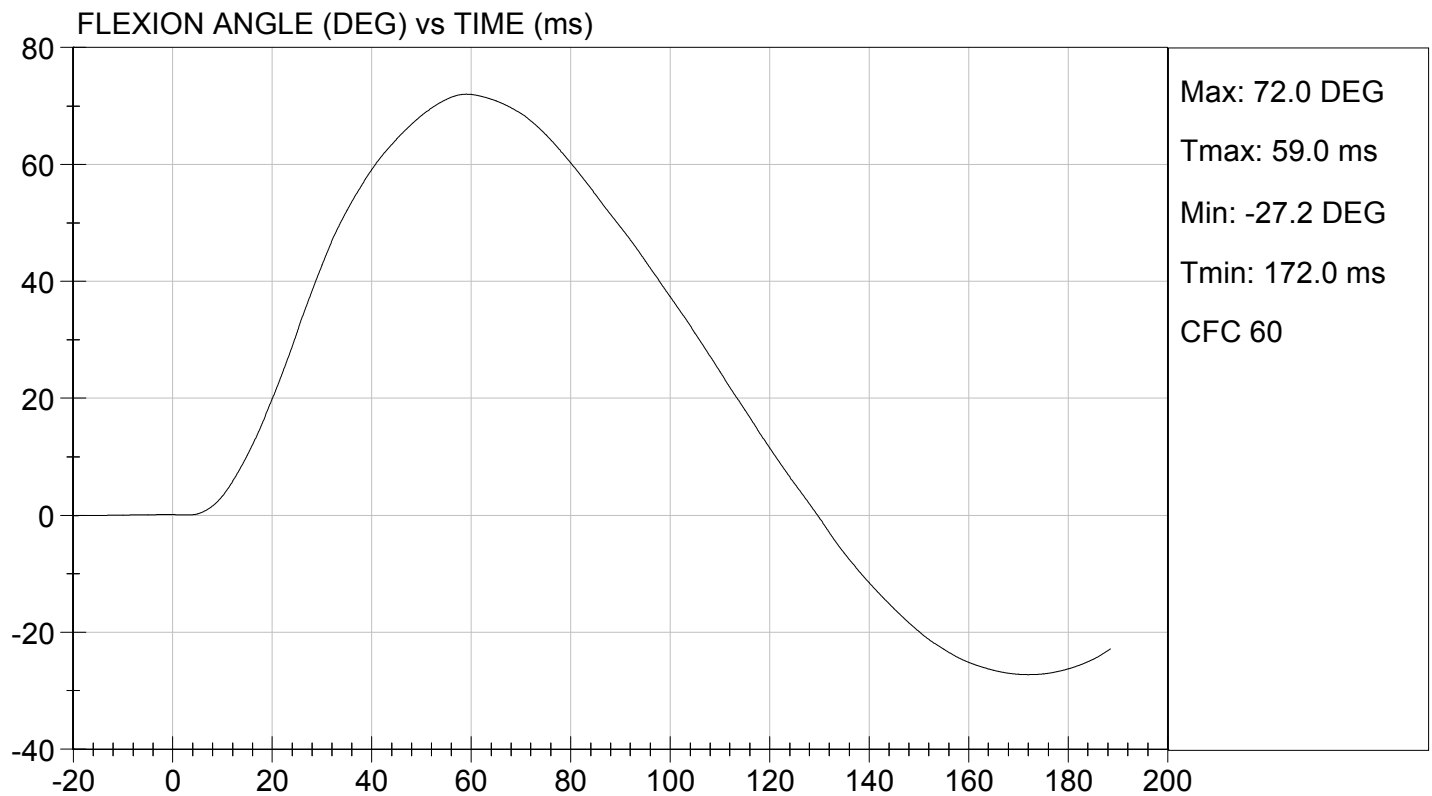
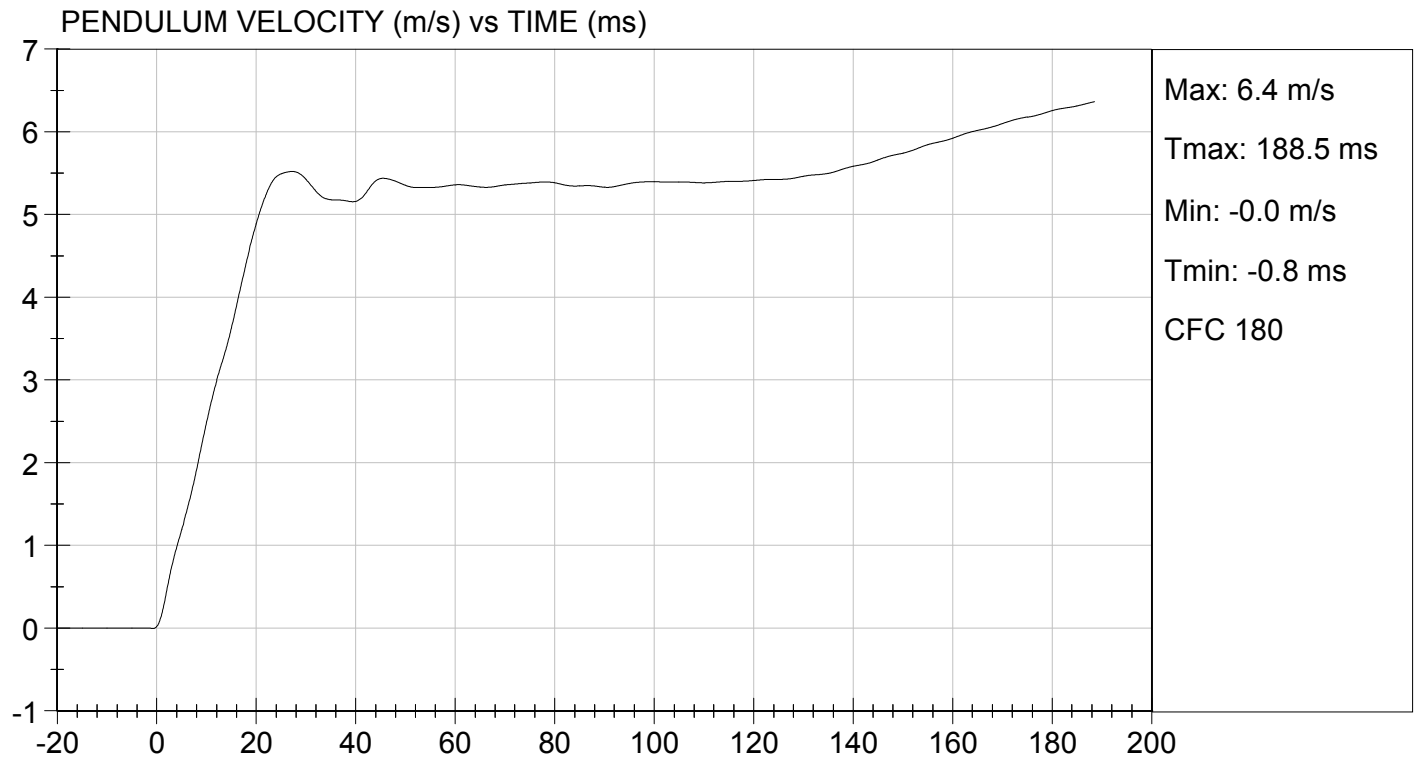
Test Date

David Winkelbauer
Approved By



TEST DESC: NECK BENDING
VELOCITY: 18.12 ft/s, 5.52 m/s

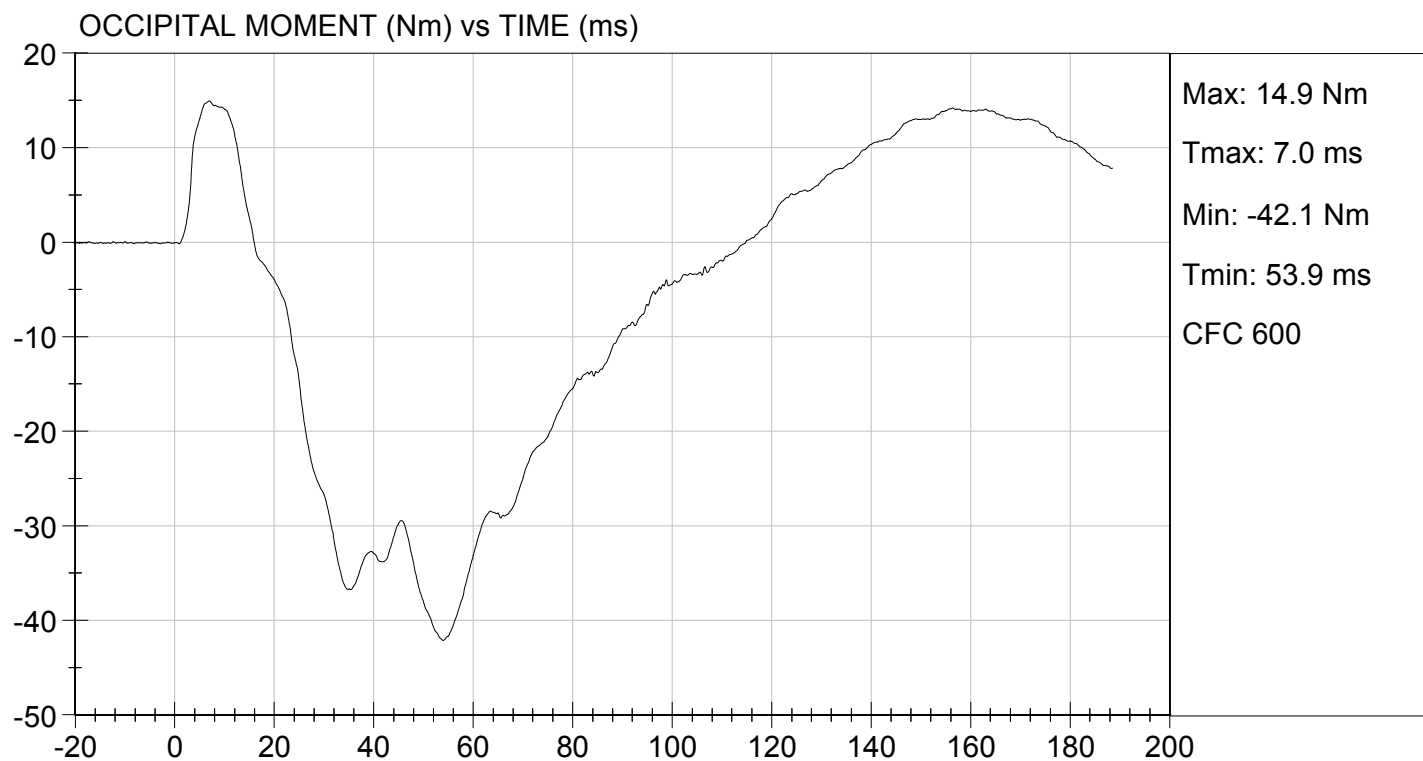
TEST DATE: 10/01/2012
TEST #: D123682





TEST DESC: NECK BENDING
VELOCITY: 18.12 ft/s, 5.52 m/s

TEST DATE: 10/01/2012
TEST #: D123682

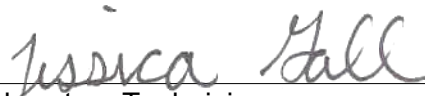


MGA RESEARCH CORPORATION
SHOULDER IMPACT TEST
SID-IIs BUILD LEVEL D DUMMY

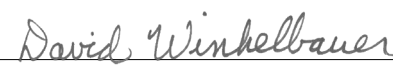
ATD Serial No: 306

Test ID: D123683

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	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	30	Pass
Upper Spine (T1) Y Acceleration	G's	17 to 22	18	Pass
Overall Test Results			Pass	


Laboratory Technician

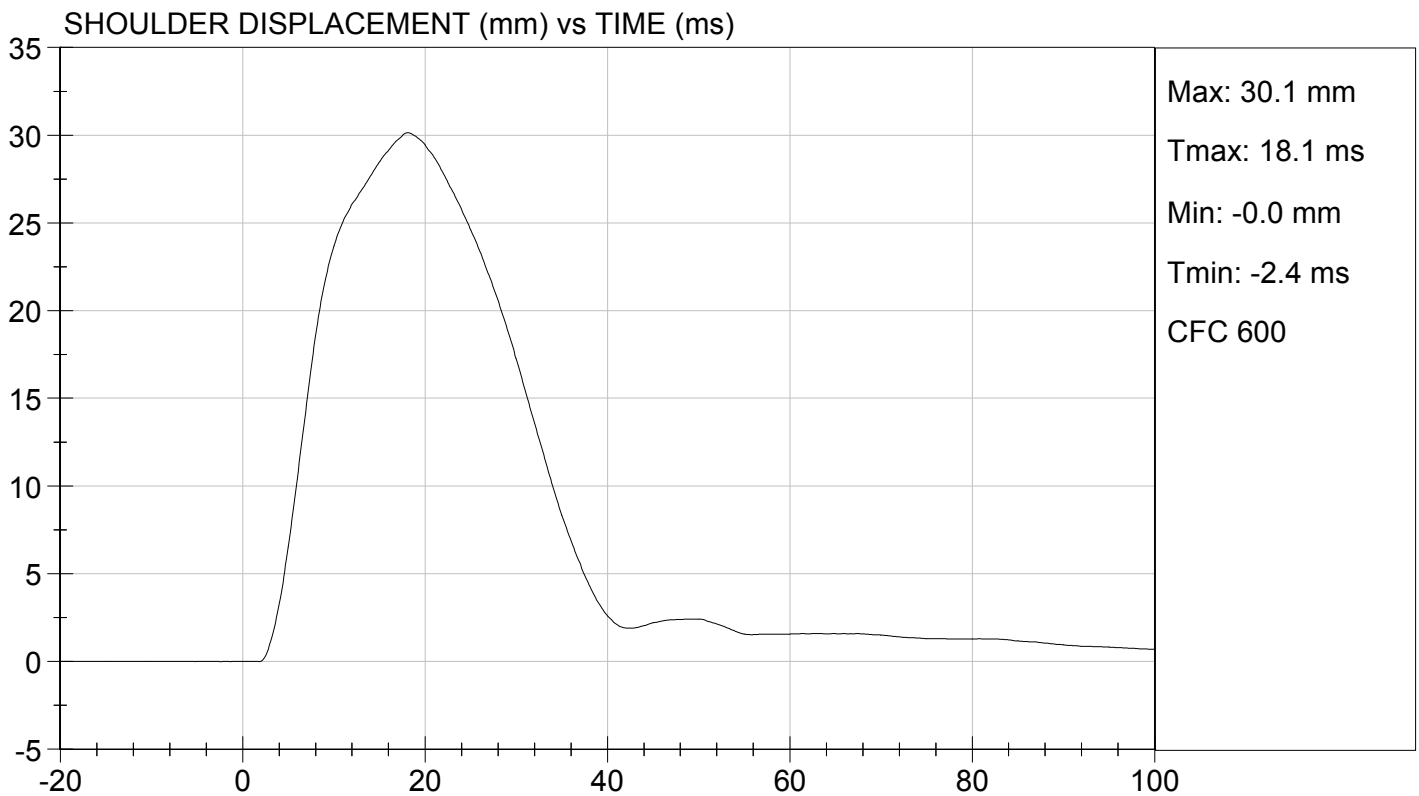
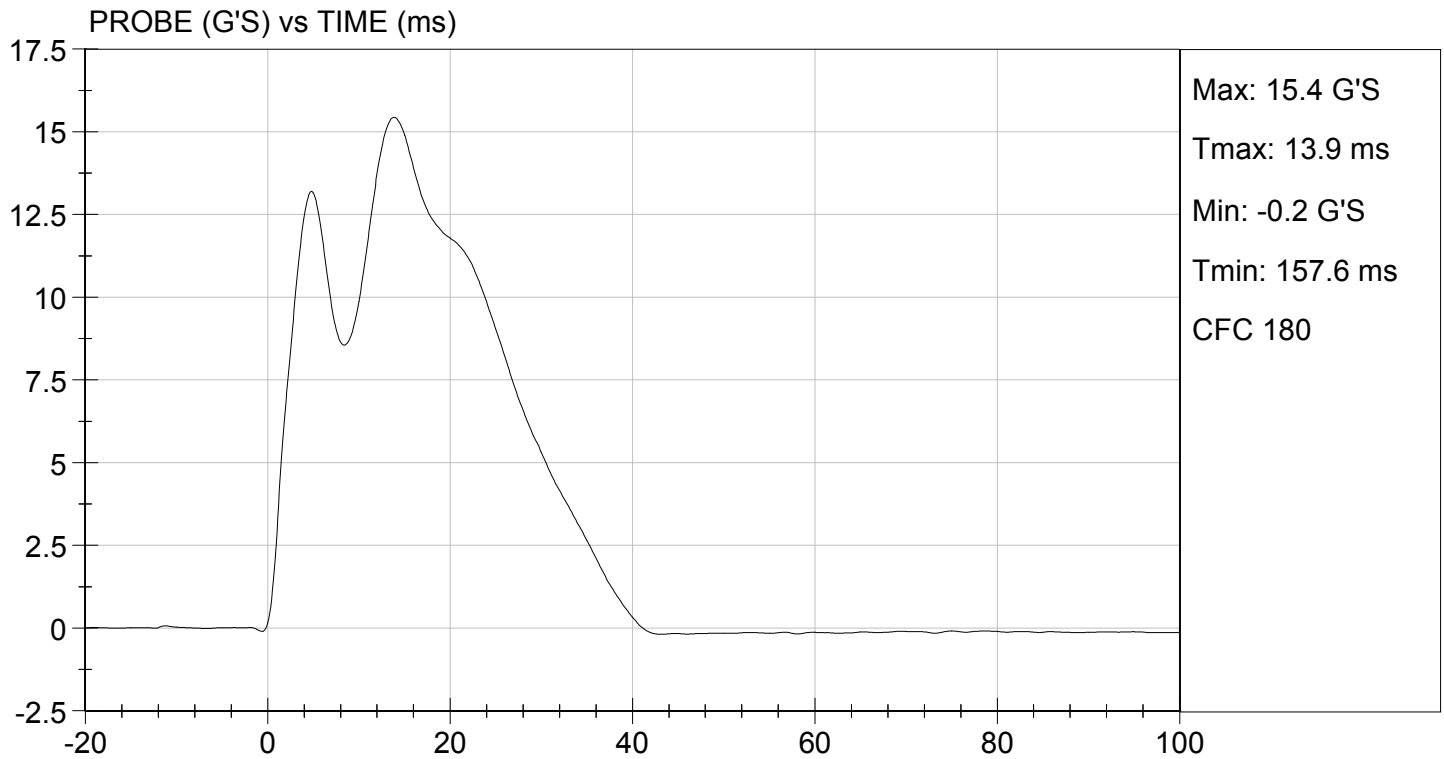
10/01/2012
Test Date


Approved By



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

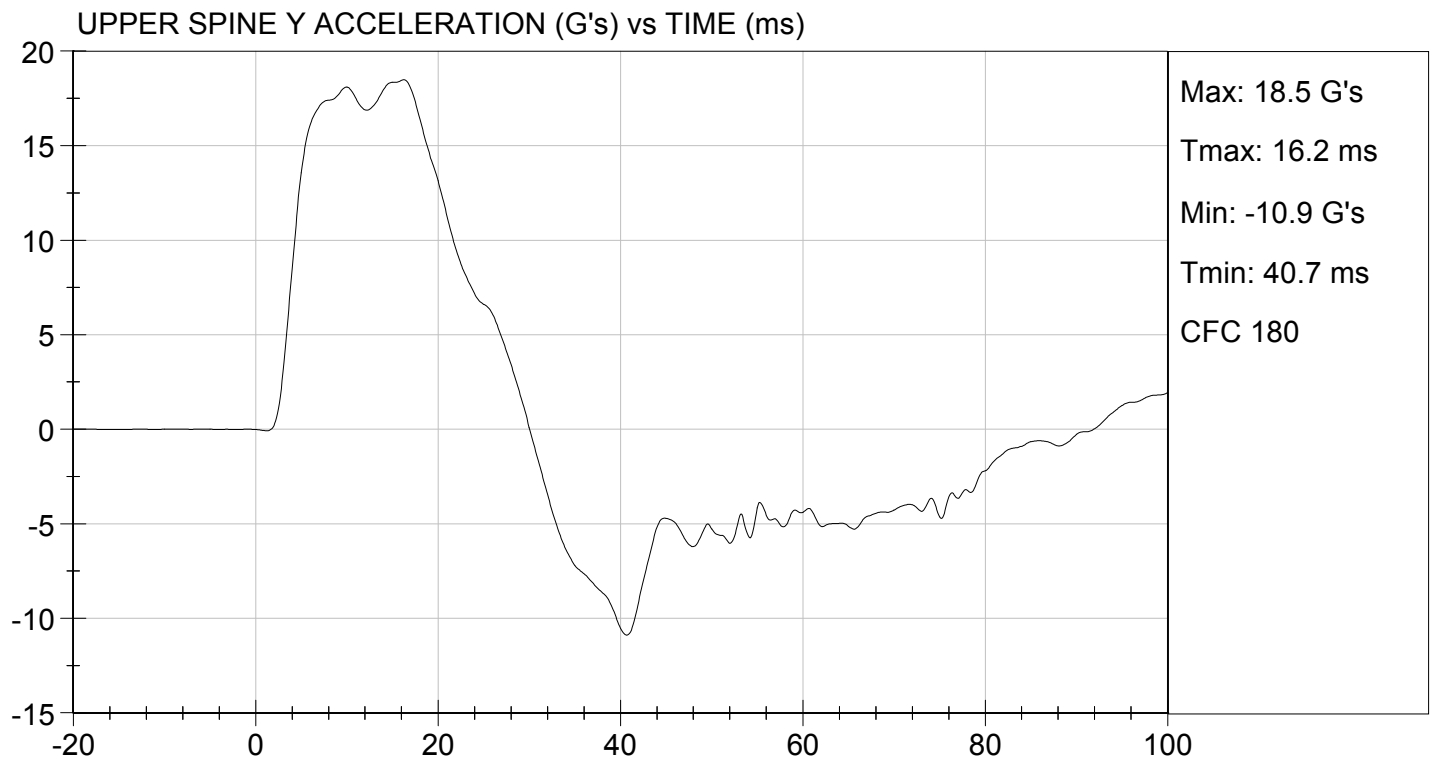
TEST DATE: 10/01/2012
TEST #: D123683





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

TEST DATE: 10/01/2012
TEST #: D123683

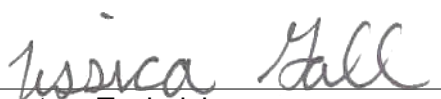


MGA RESEARCH CORPORATION
THORAX (WITH ARM) IMPACT TEST
SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

Test I.D: D123684

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.8	Pass
Humidity	%	10 to 70	36	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	34	Pass
Upper Rib Displacement	mm	25 to 32	27	Pass
Middle Rib Displacement	mm	30 to 36	31	Pass
Lower Rib Displacement	mm	32 to 38	35	Pass
Upper Spine (T1) Y Acceleration	G's	34 to 43	39	Pass
Lower Spine (T12) Y Acceleration	G's	29 to 37	32	Pass
Overall Test Results				Pass


Laboratory Technician

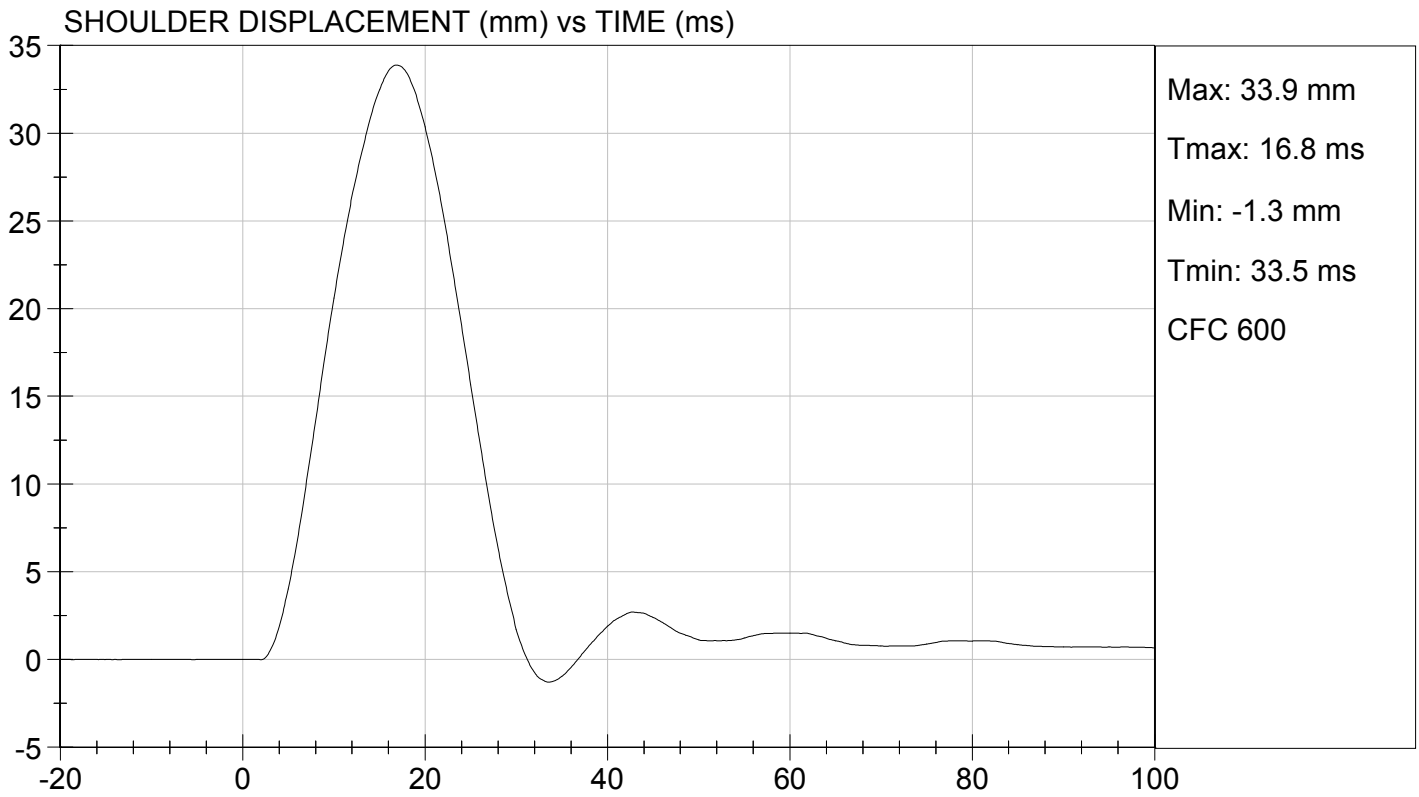
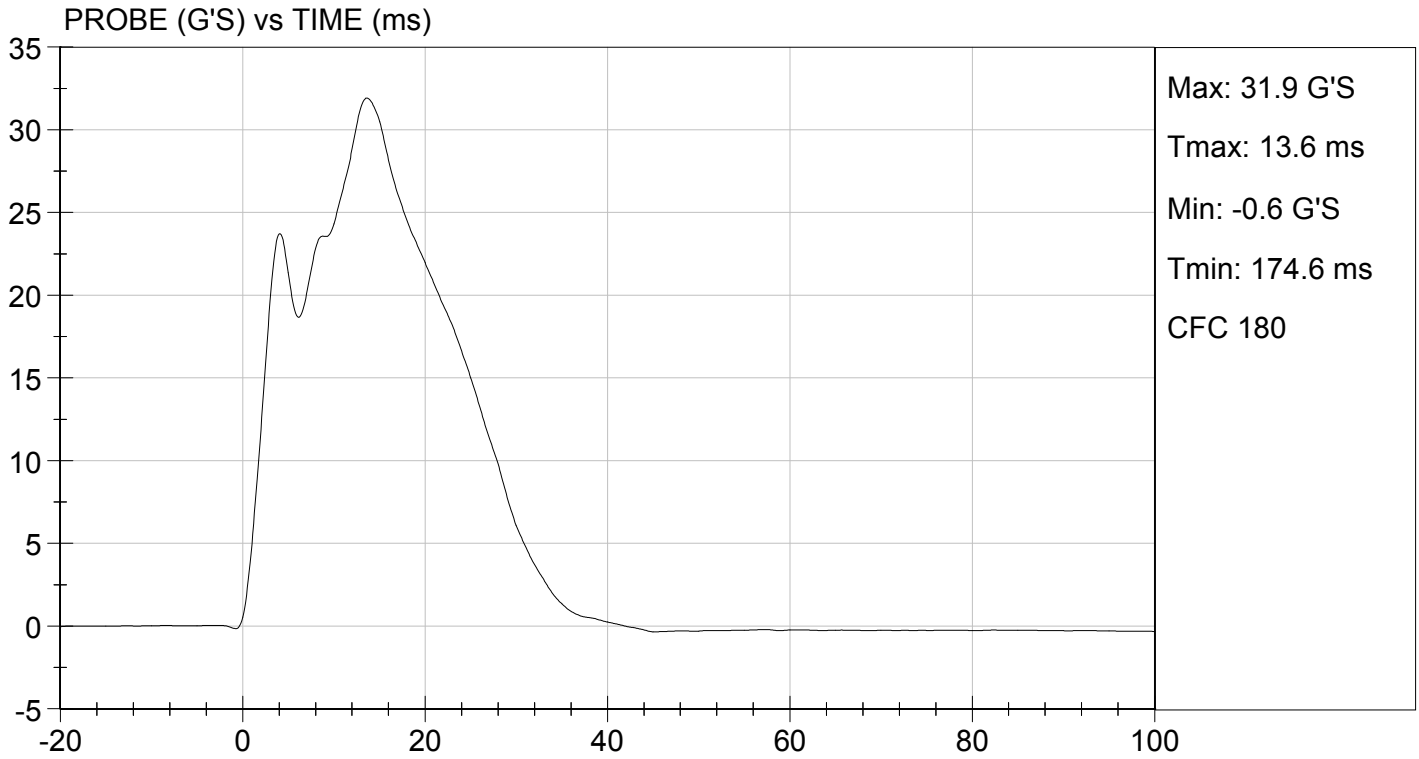
10/01/2012
Test Date


Approved By



TEST DESC: THORAX IMPACT WITH ARM
VELOCITY: 22.22 ft/s, 6.77 m/s

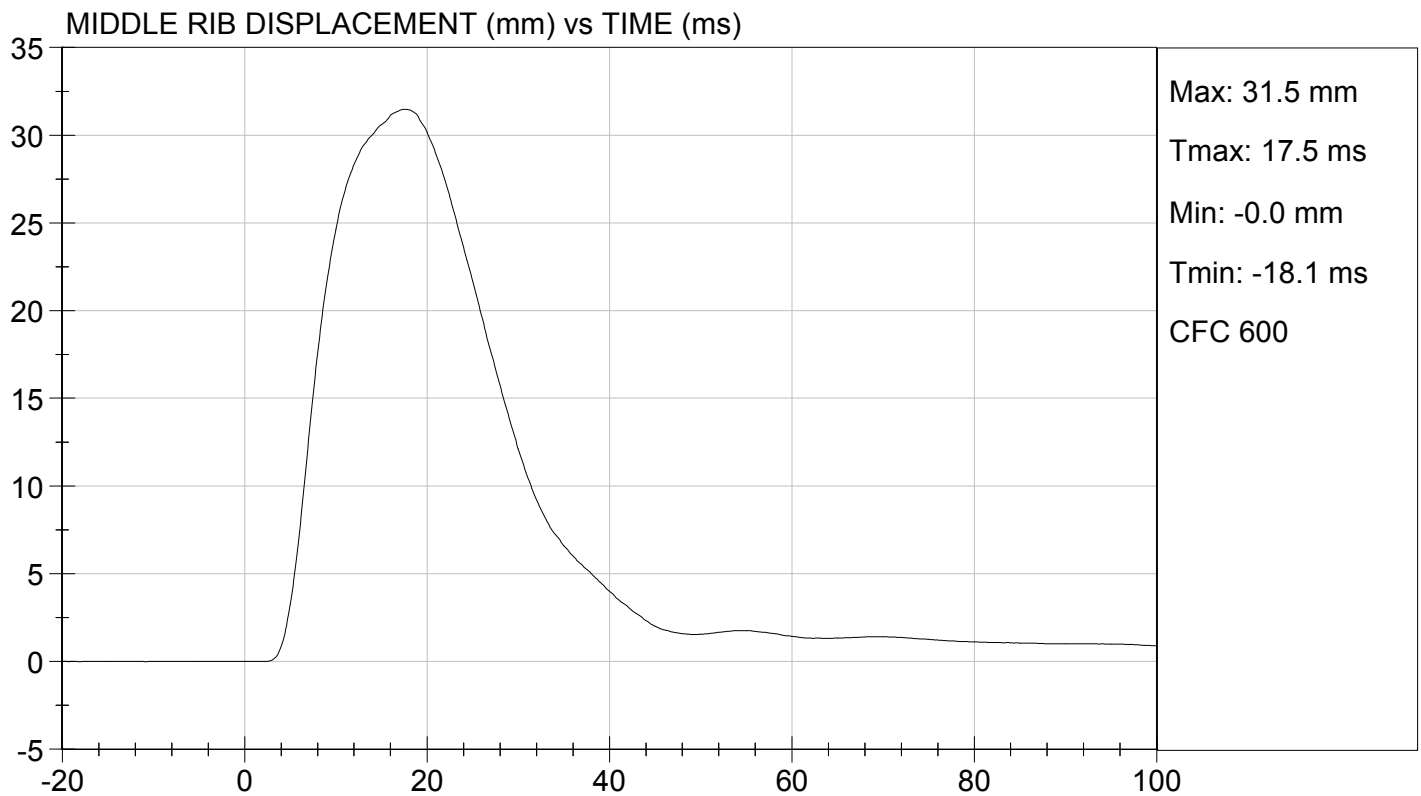
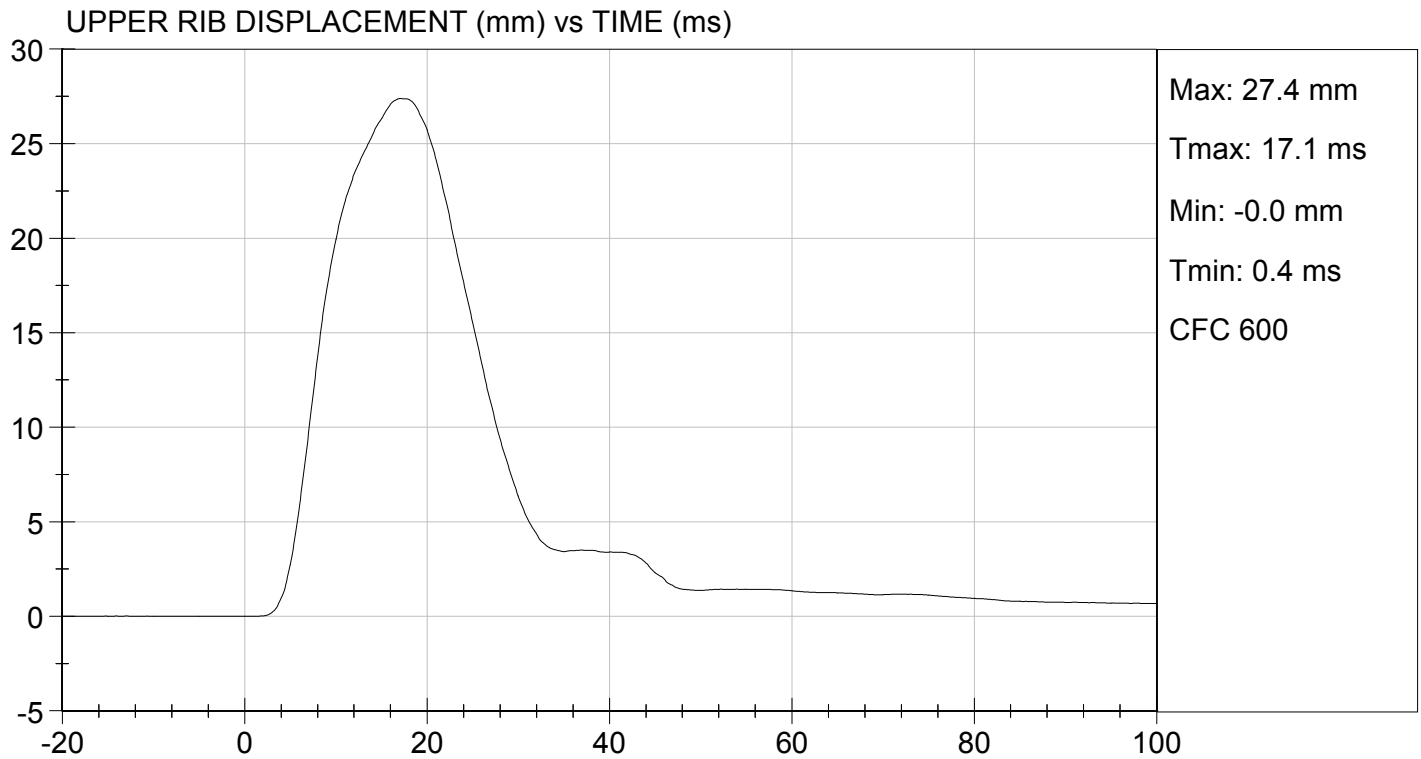
TEST DATE: 10/01/2012
TEST #: D123684





TEST DESC: THORAX IMPACT WITH ARM
VELOCITY: 22.22 ft/s, 6.77 m/s

TEST DATE: 10/01/2012
TEST #: D123684

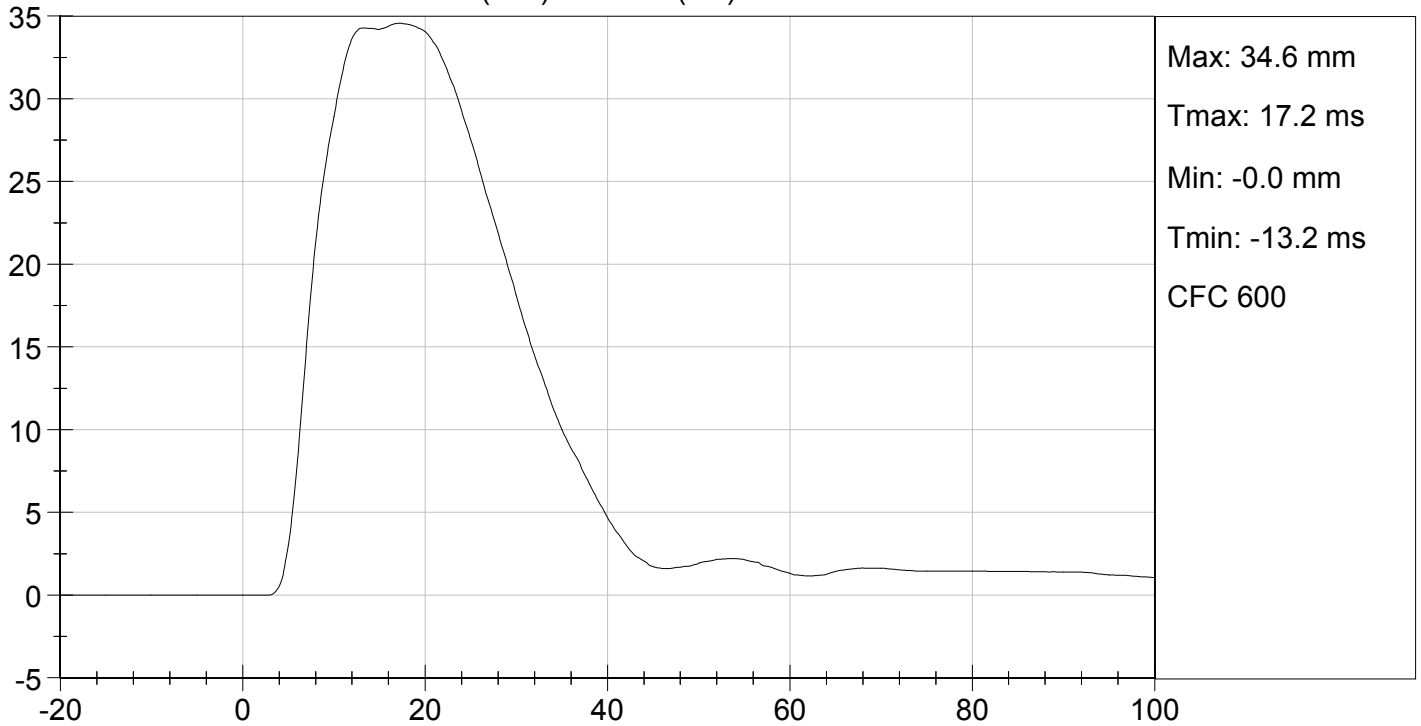




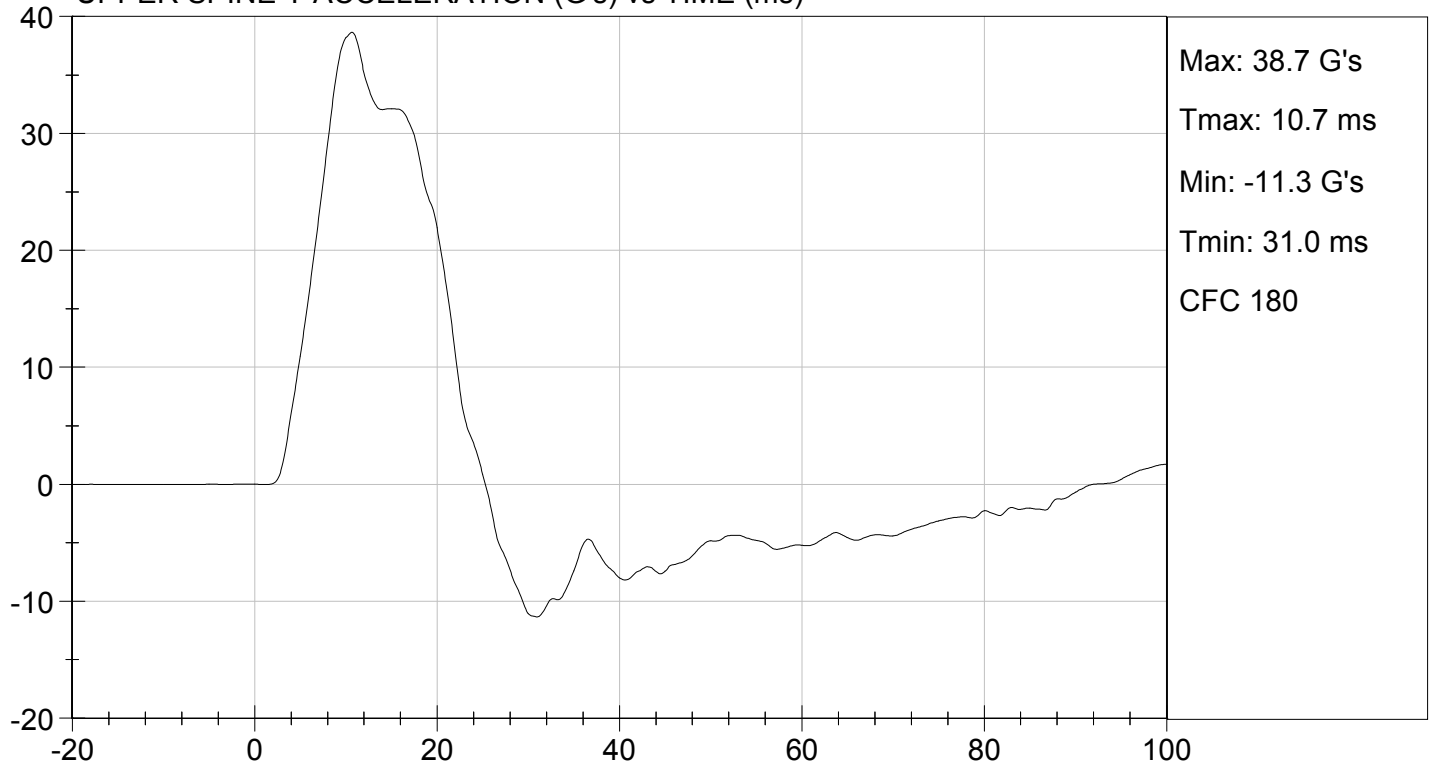
TEST DESC: THORAX IMPACT WITH ARM
VELOCITY: 22.22 ft/s, 6.77 m/s

TEST DATE: 10/01/2012
TEST #: D123684

LOWER RIB DISPLACEMENT (mm) vs TIME (ms)



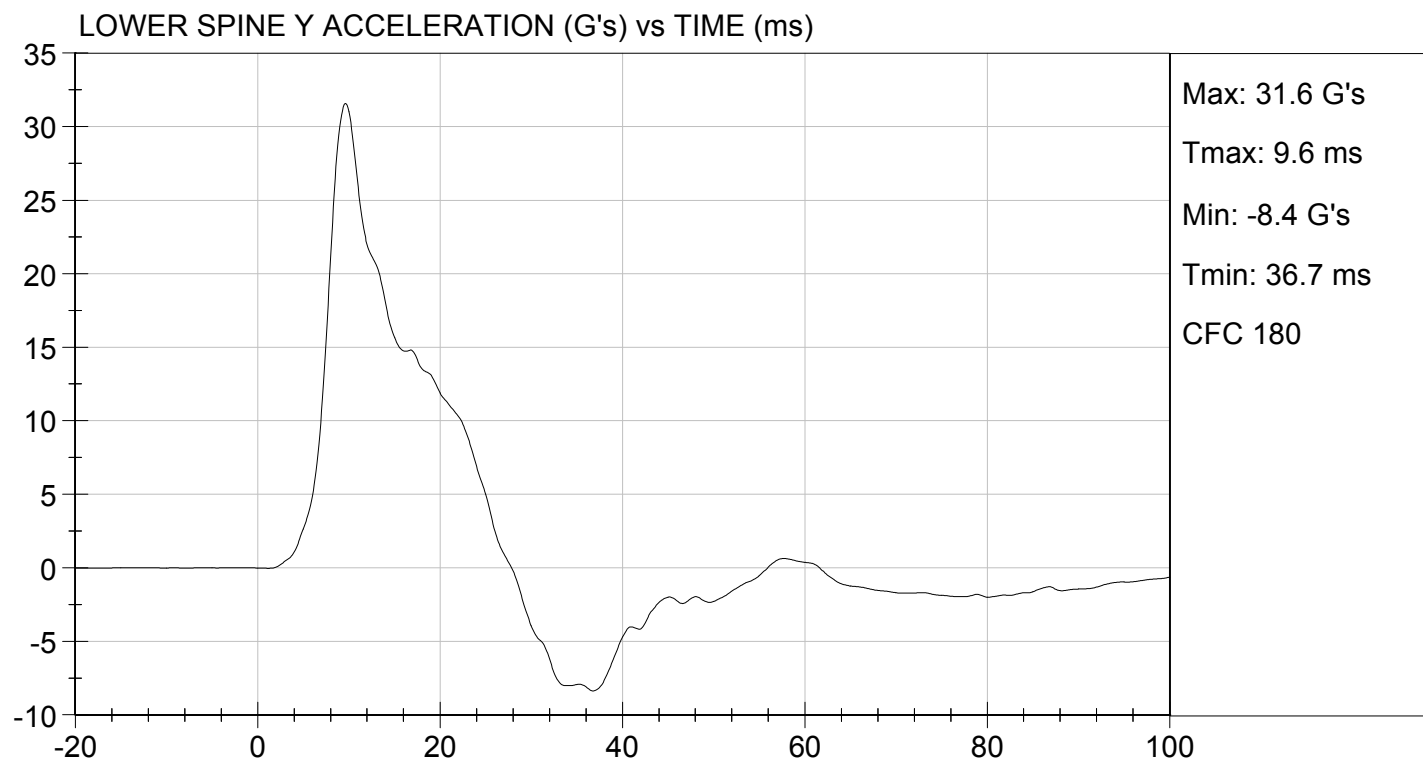
UPPER SPINE Y ACCELERATION (G's) vs TIME (ms)





TEST DESC: THORAX IMPACT WITH ARM
VELOCITY: 22.22 ft/s, 6.77 m/s

TEST DATE: 10/01/2012
TEST #: D123684

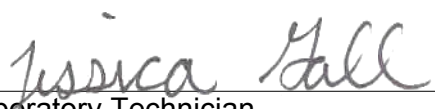


MGA RESEARCH CORPORATION
THORAX (WITHOUT ARM) IMPACT TEST
SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

Test I.D: D123685

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.8	Pass
Humidity	%	10 to 70	36	Pass
Impact Velocity	m/s	4.20 to 4.40	4.34	Pass
Maximum Probe Acceleration	G's	14 to 18	15	Pass
Upper Rib Displacement	mm	32 to 40	36	Pass
Middle Rib Displacement	mm	39 to 45	42	Pass
Lower Rib Displacement	mm	35 to 43	40	Pass
Upper Spine (T1) Y Acceleration	G's	13 to 17	15	Pass
Lower Spine (T12) Y Acceleration	G's	7 to 11	9	Pass
Overall Test Results				Pass


 Laboratory Technician

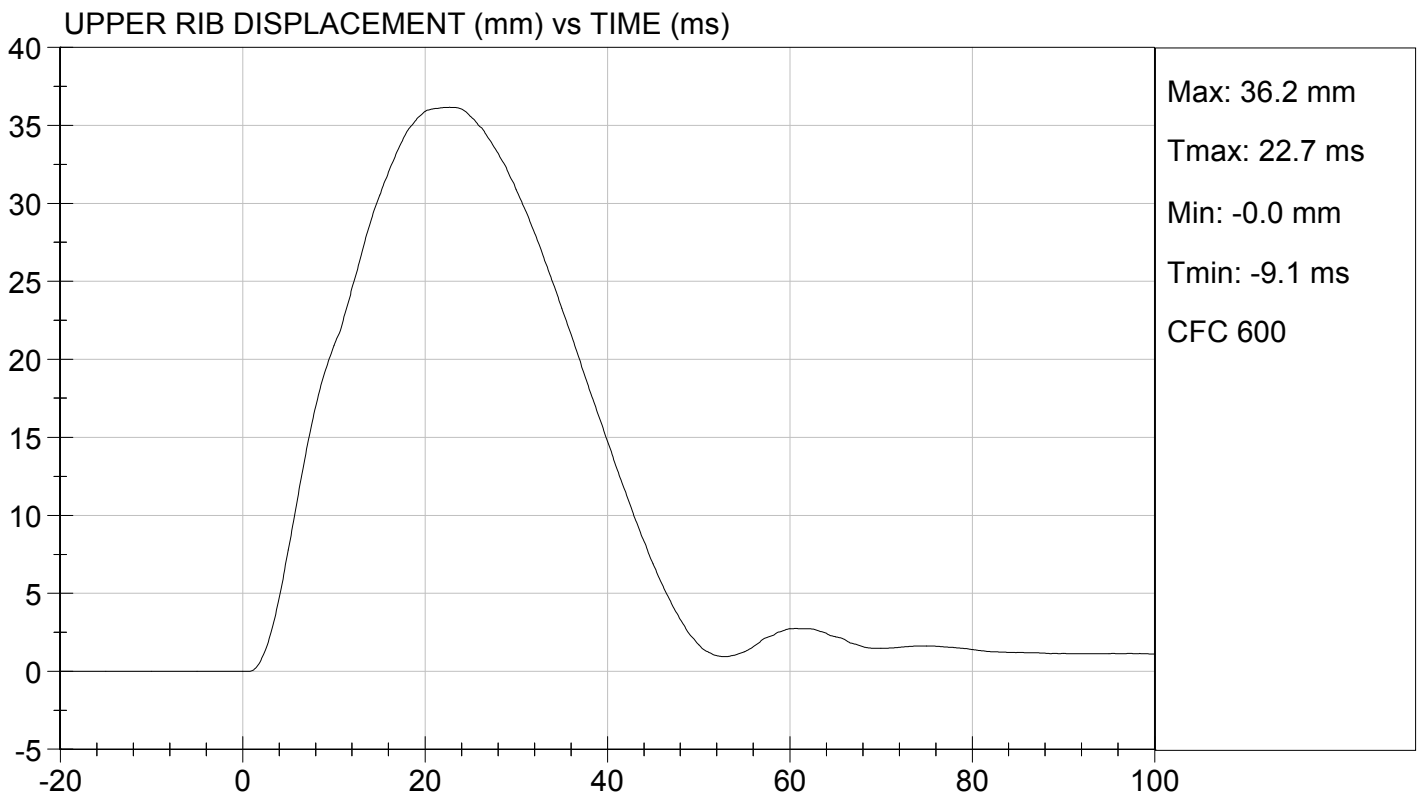
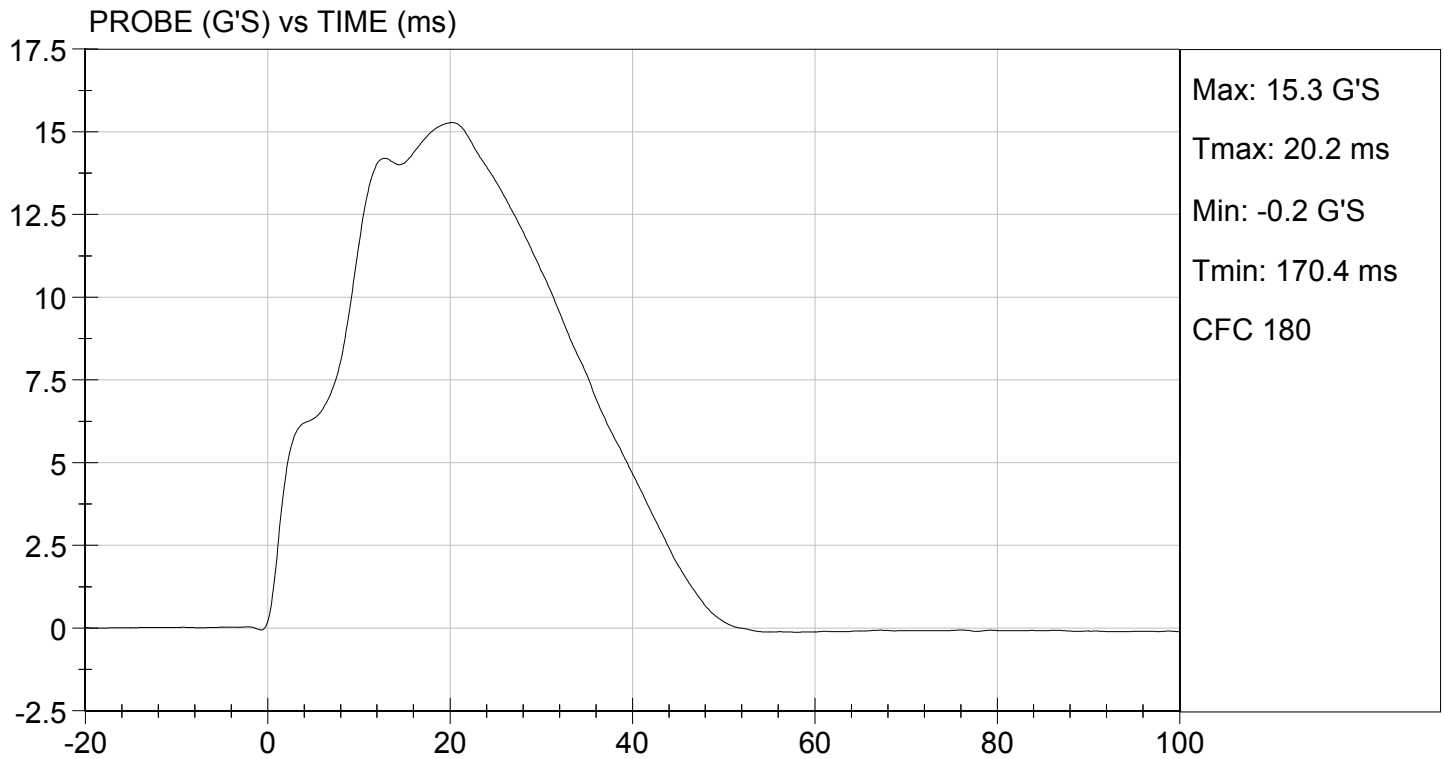
10/01/2012
 Test Date


 Approved By



TEST DESC: THORAX IMPACT WITHOUT ARM
VELOCITY: 14.25 ft/s, 4.34 m/s

TEST DATE: 10/01/2012
TEST #: D123685

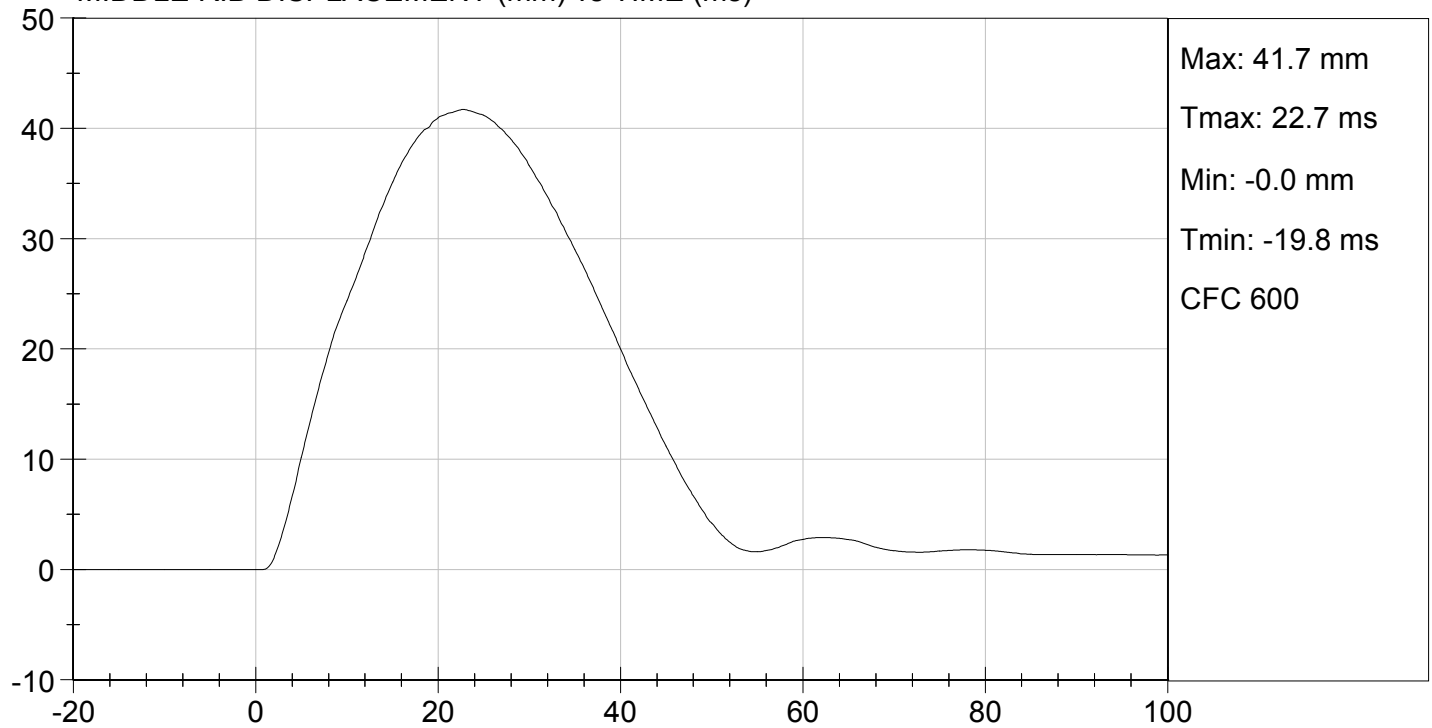




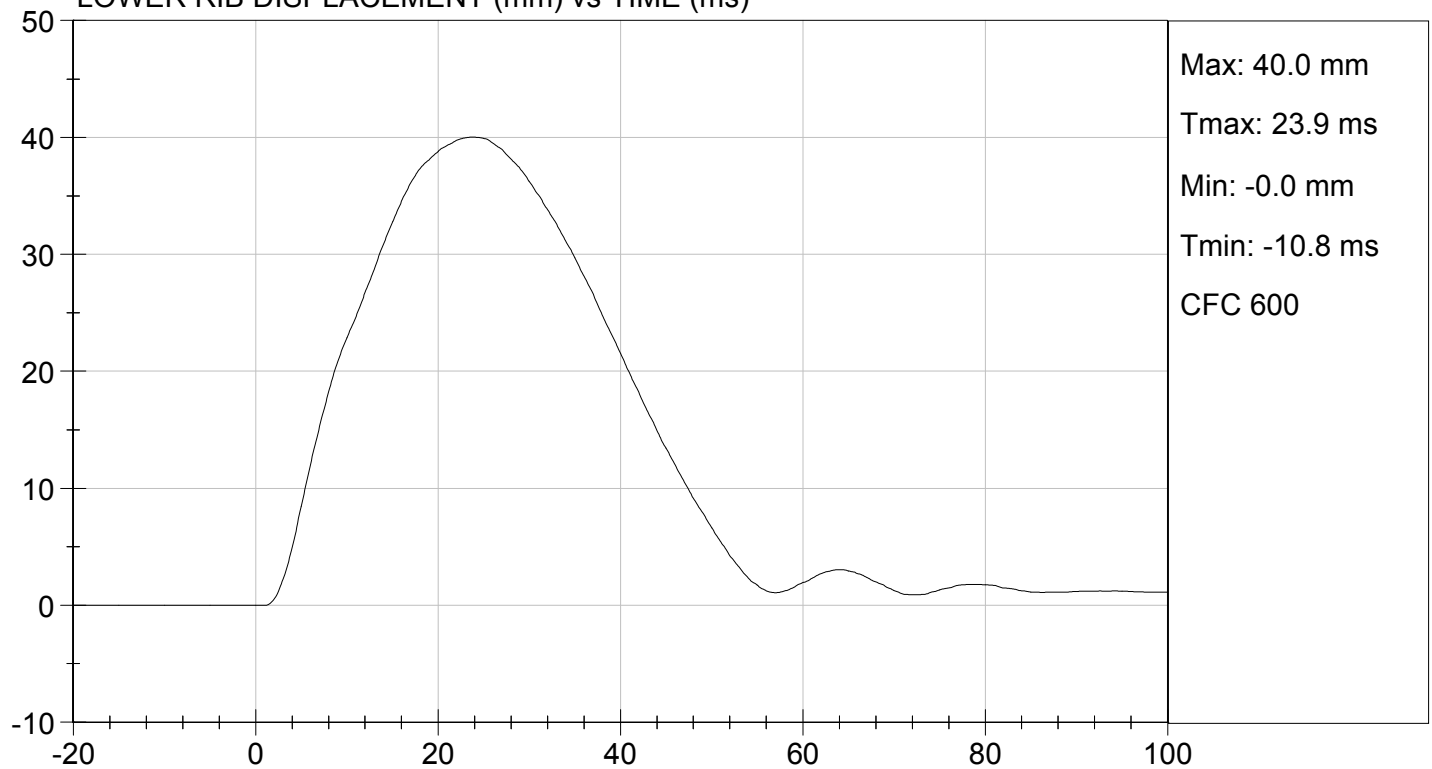
TEST DESC: THORAX IMPACT WITHOUT ARM
VELOCITY: 14.25 ft/s, 4.34 m/s

TEST DATE: 10/01/2012
TEST #: D123685

MIDDLE RIB DISPLACEMENT (mm) vs TIME (ms)



LOWER RIB DISPLACEMENT (mm) vs TIME (ms)

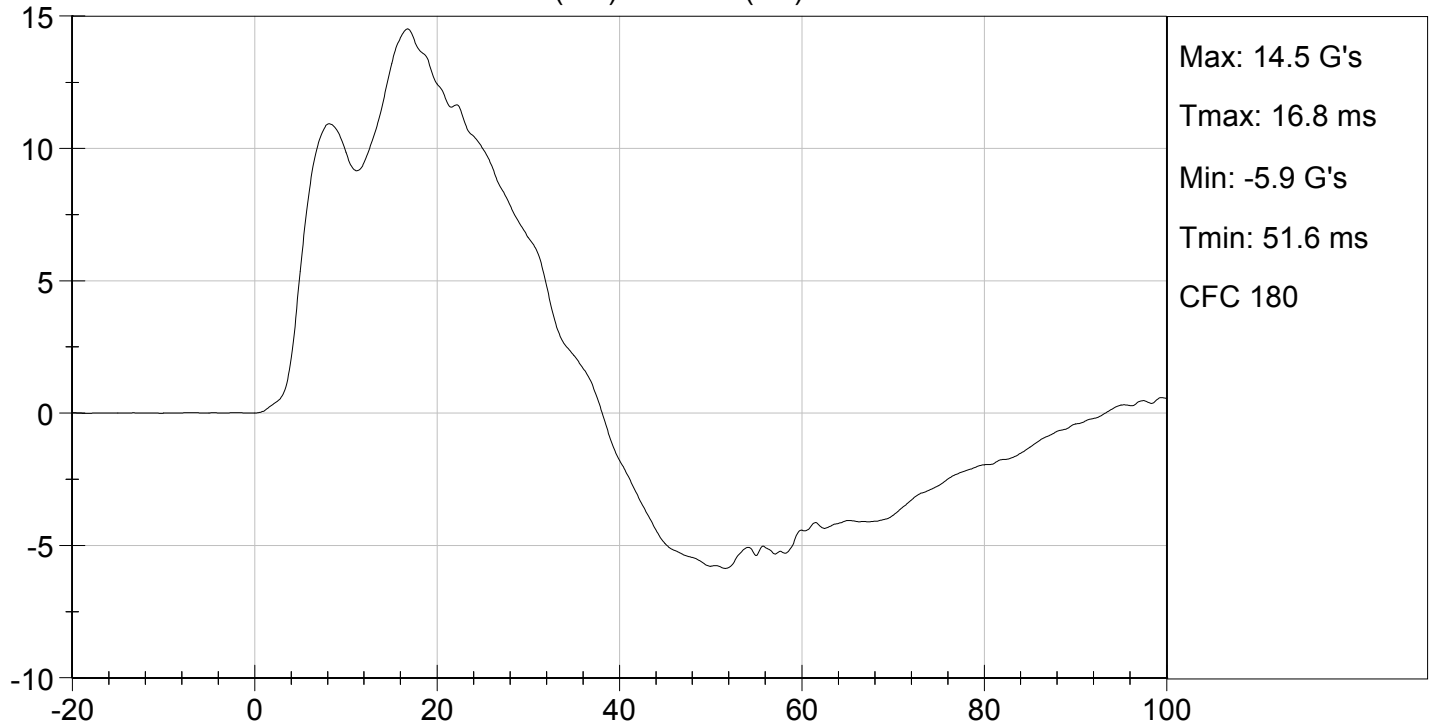




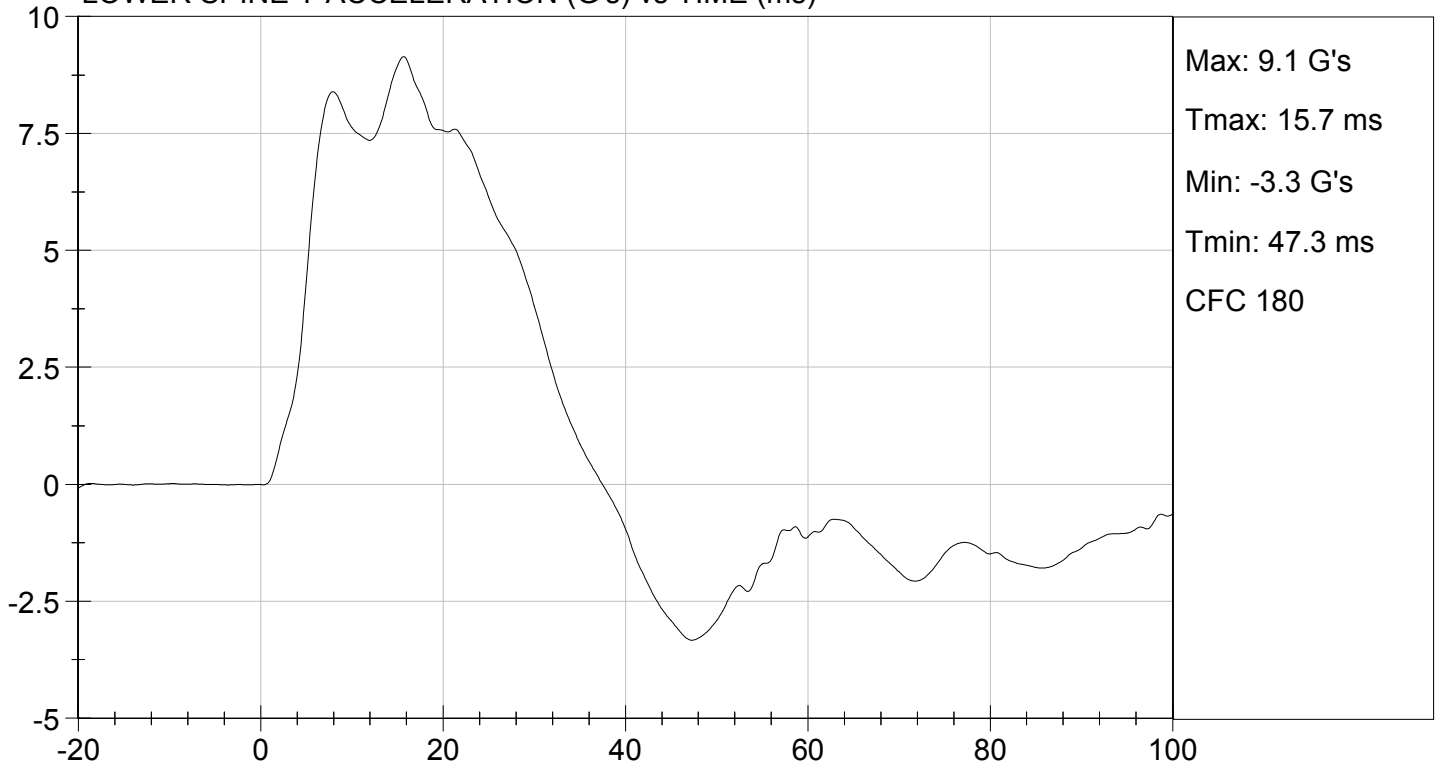
TEST DESC: THORAX IMPACT WITHOUT ARM
VELOCITY: 14.25 ft/s, 4.34 m/s

TEST DATE: 10/01/2012
TEST #: D123685

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



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



MGA RESEARCH CORPORATION

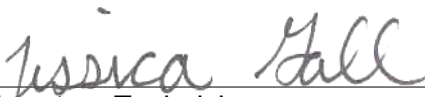
ABDOMINAL IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

Test I.D: D123686

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.8	Pass
Humidity	%	10 to 70	36	Pass
Impact Velocity	m/s	4.20 to 4.40	4.34	Pass
Maximum Probe Acceleration	G's	12 to 16	13	Pass
Upper Abdomen Rib Displacement	mm	36 to 47	41	Pass
Lower Abdomen Rib Displacement	mm	33 to 44	42	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	10	Pass
Overall Test Results				Pass


Laboratory Technician

10/01/2012

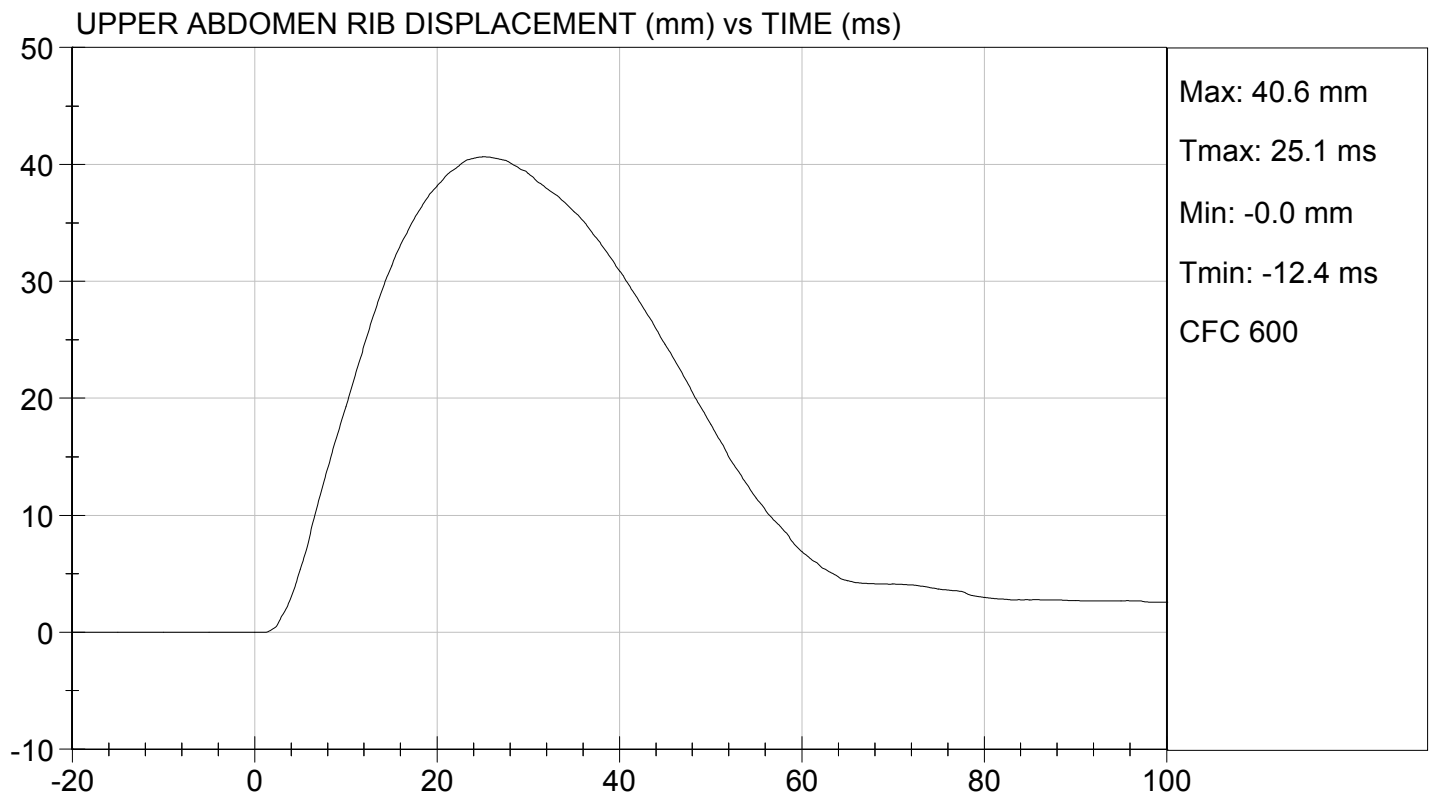
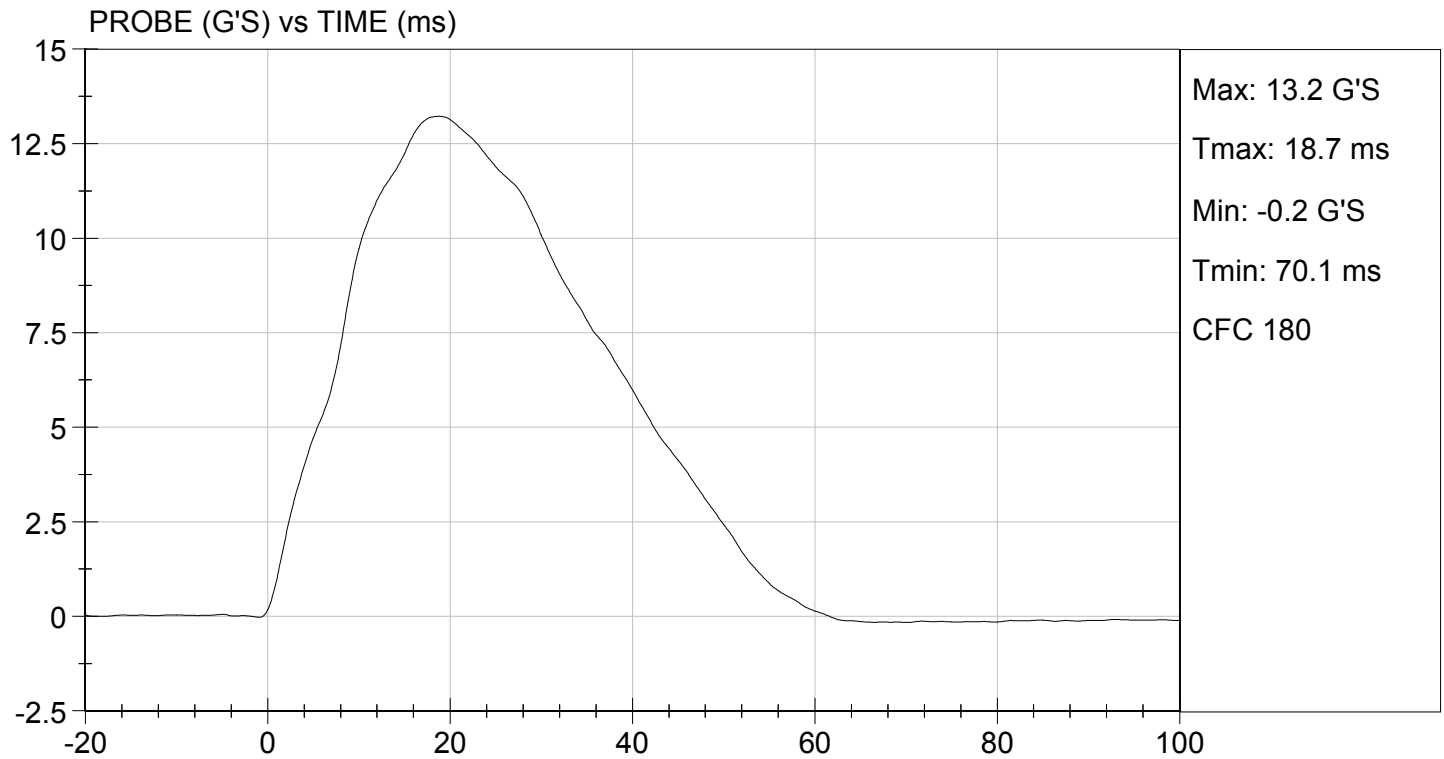
Test Date


Approved By



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

TEST DATE: 10/01/2012
TEST #: D123686

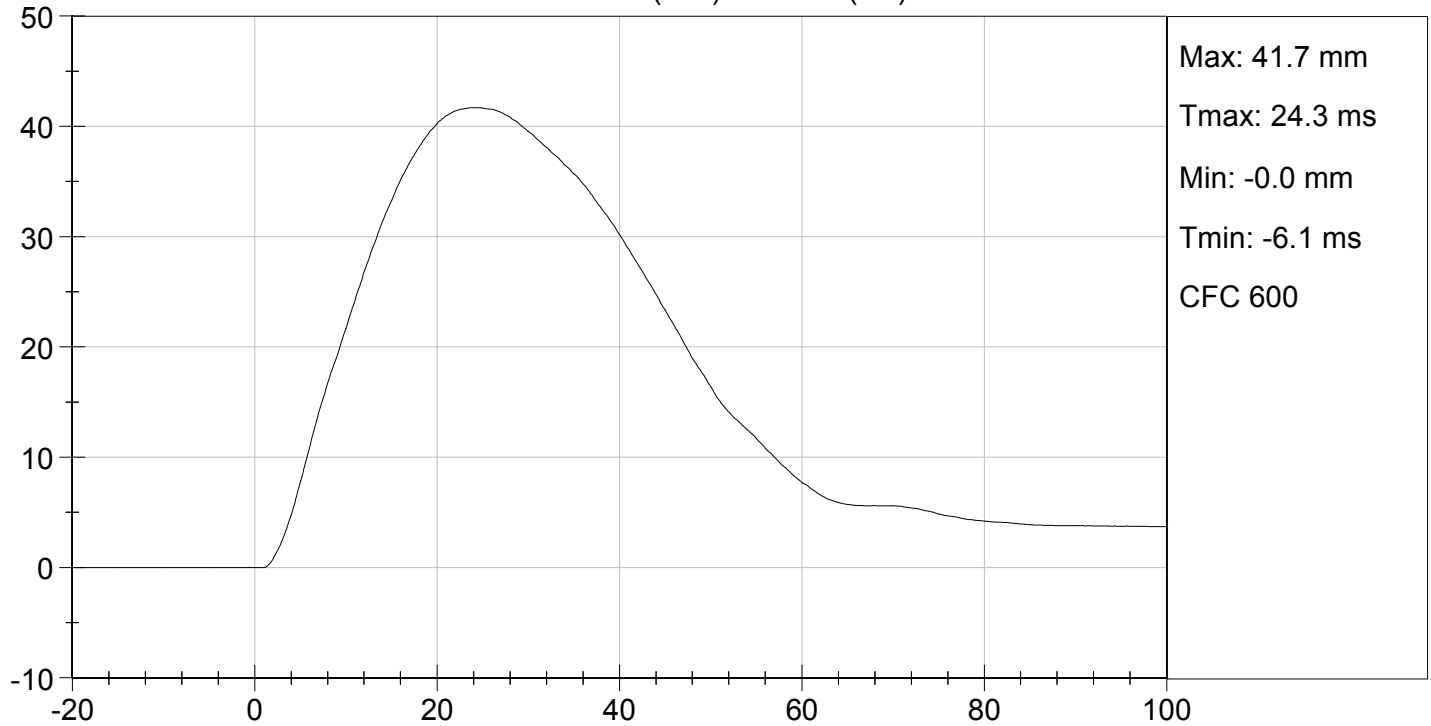




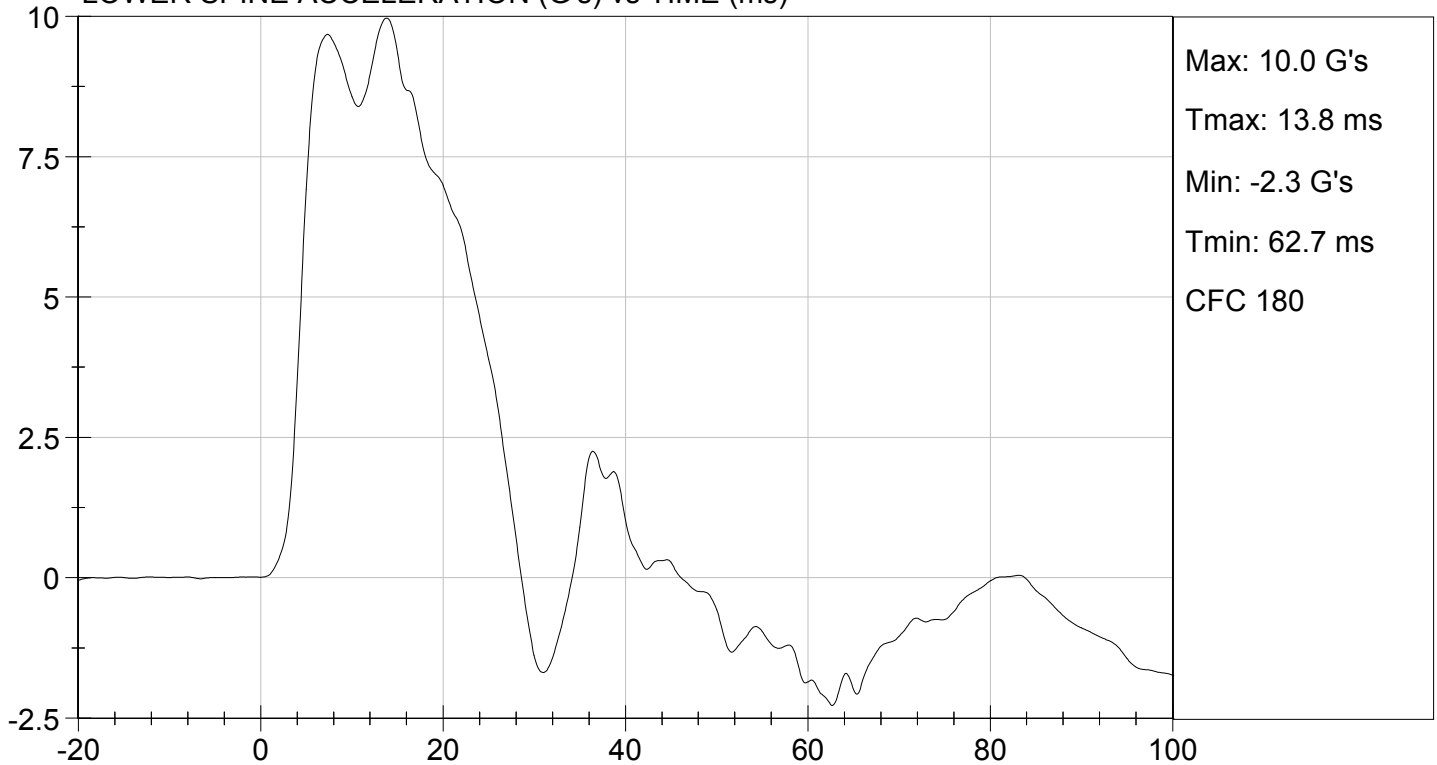
TEST DESC: ABDOMEN IMPACT
VELOCITY: 14.25 ft/s, 4.34 m/s

TEST DATE: 10/01/2012
TEST #: D123686

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



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



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

Test I.D: D123687

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.8	Pass
Humidity	%	10 to 70	36	Pass
Impact Velocity	m/s	6.60 to 6.80	6.77	Pass
Maximum Probe Acceleration	G's	38 to 47	44	Pass
Pelvis Y Acceleration After 6 ms	G's	34 to 42	42	Pass
Peak Acetabulum Force	N	3600 to 4300	4,020	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

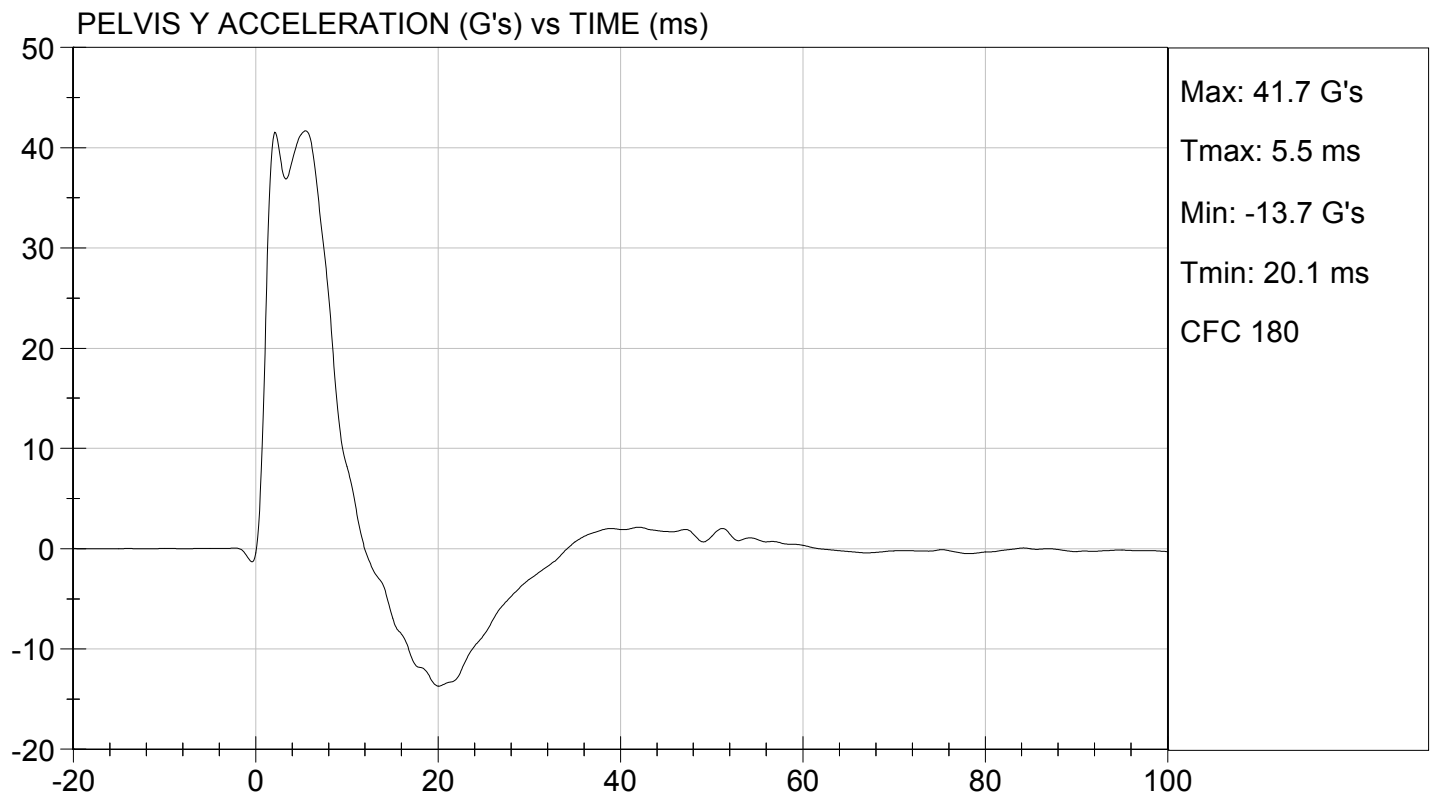
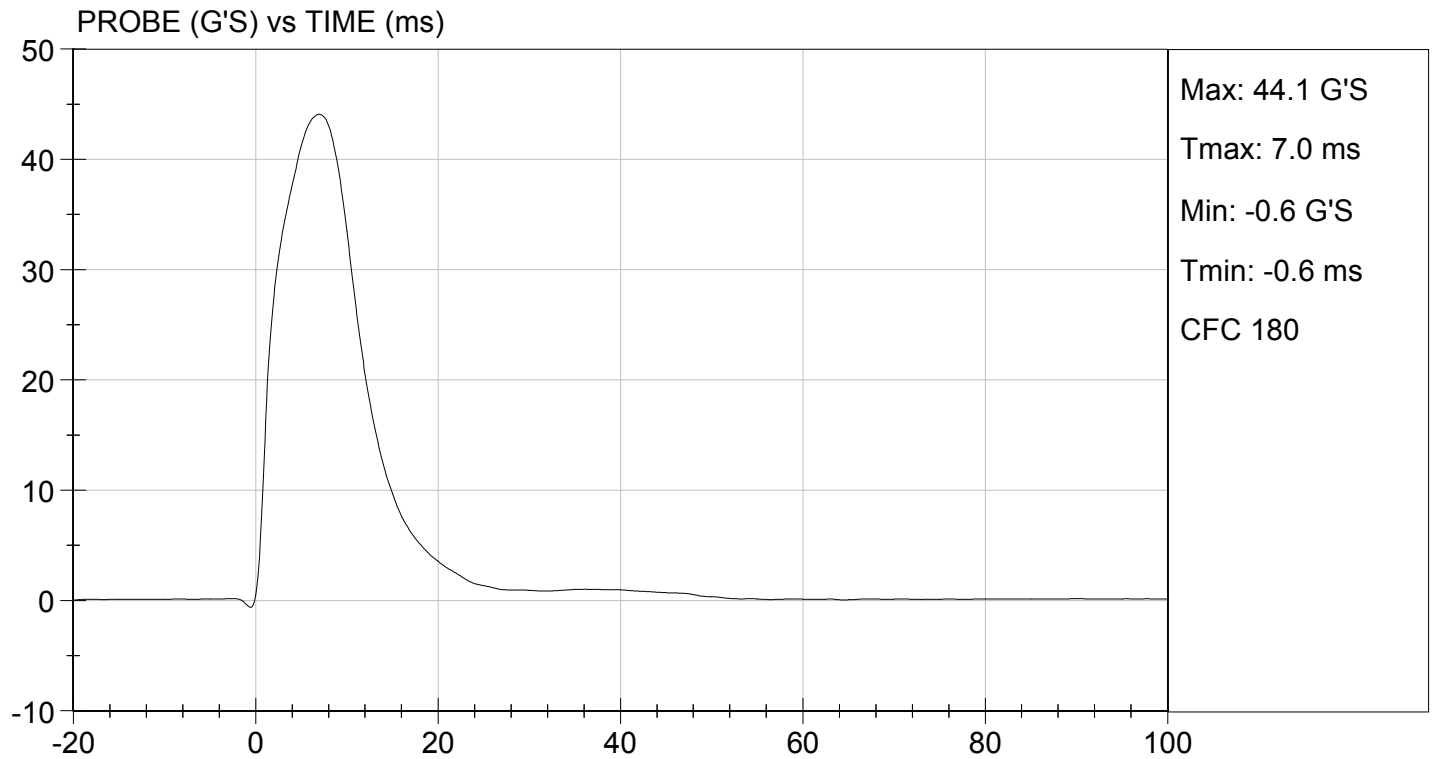
10/01/2012
Test Date

David Winkelbauer
Approved By



TEST DESC: PELVIS IMPACT
VELOCITY: 22.22 ft/s, 6.77 m/s

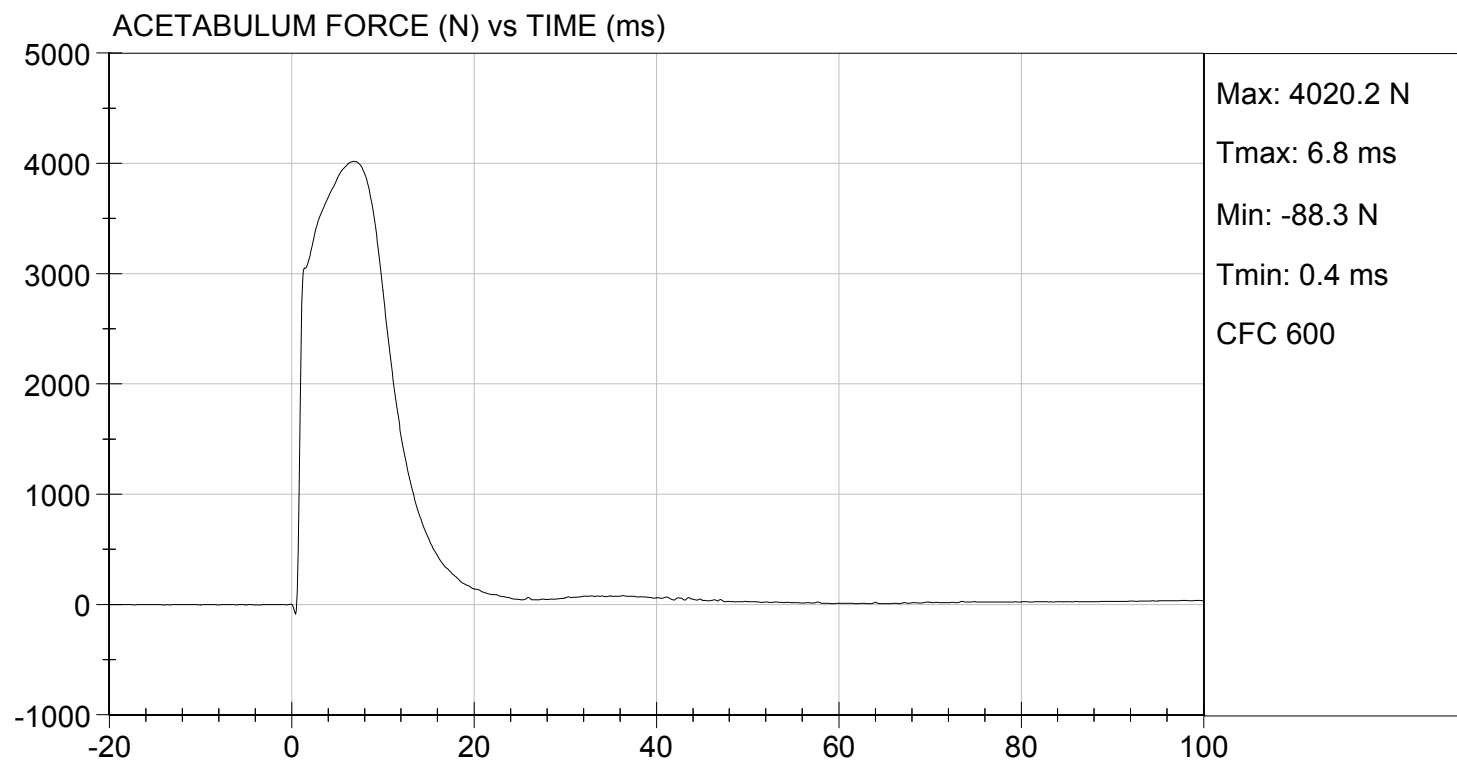
TEST DATE: 10/01/2012
TEST #: D123687





TEST DESC: PELVIS IMPACT
VELOCITY: 22.22 ft/s, 6.77 m/s

TEST DATE: 10/01/2012
TEST #: D123687



MGA RESEARCH CORPORATION

ILIAC IMPACT TEST

SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 306

Test I.D: D123688

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.8	Pass
Humidity	%	10 to 70	36	Pass
Impact Velocity	m/s	4.20 to 4.40	4.23	Pass
Maximum Probe Acceleration	G's	36 to 45	39	Pass
Pelvis Y Acceleration	G's	28 to 39	34	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	4,782	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

10/01/2012

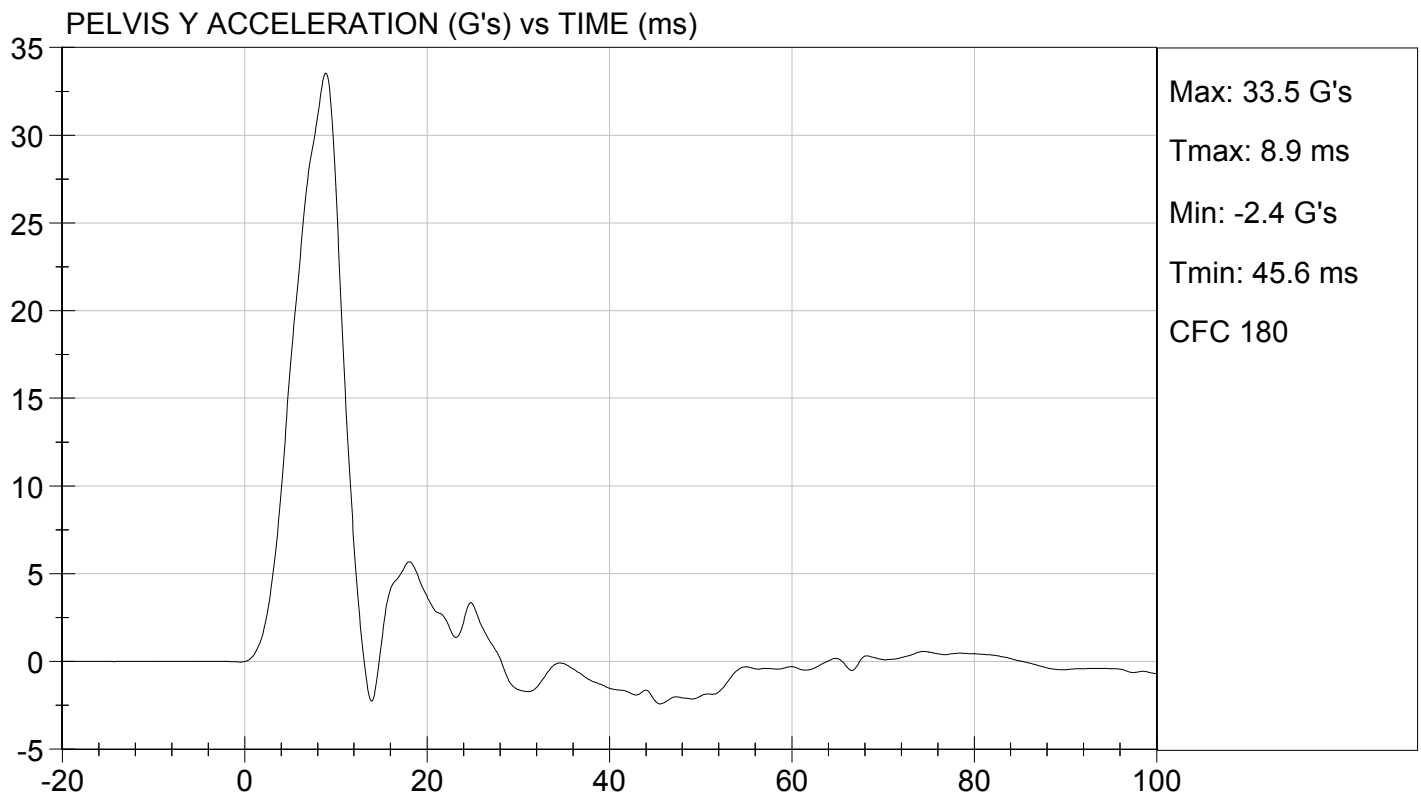
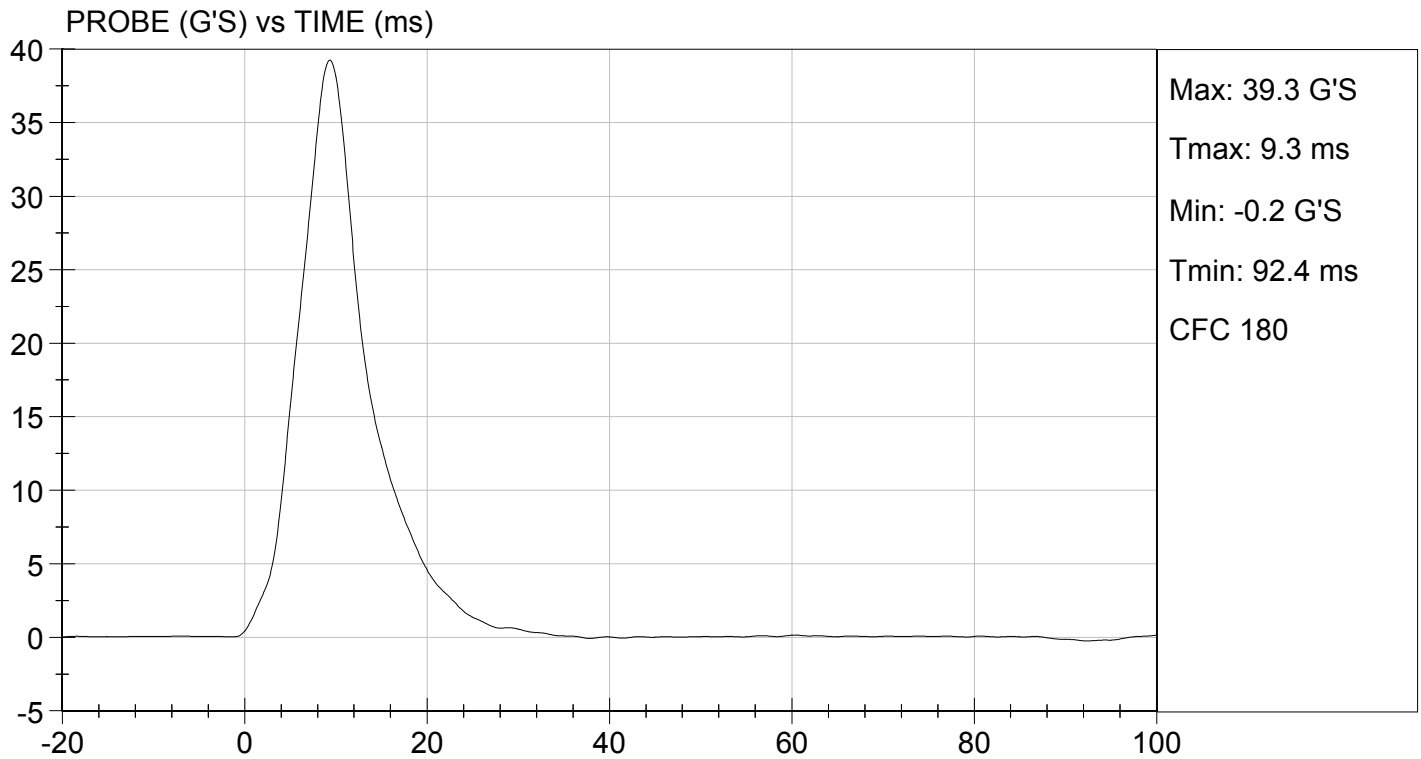
Test Date

David Winkelbauer
Approved By



TEST DESC: ILLIAC
VELOCITY: 13.89 ft/s, 4.23 m/s

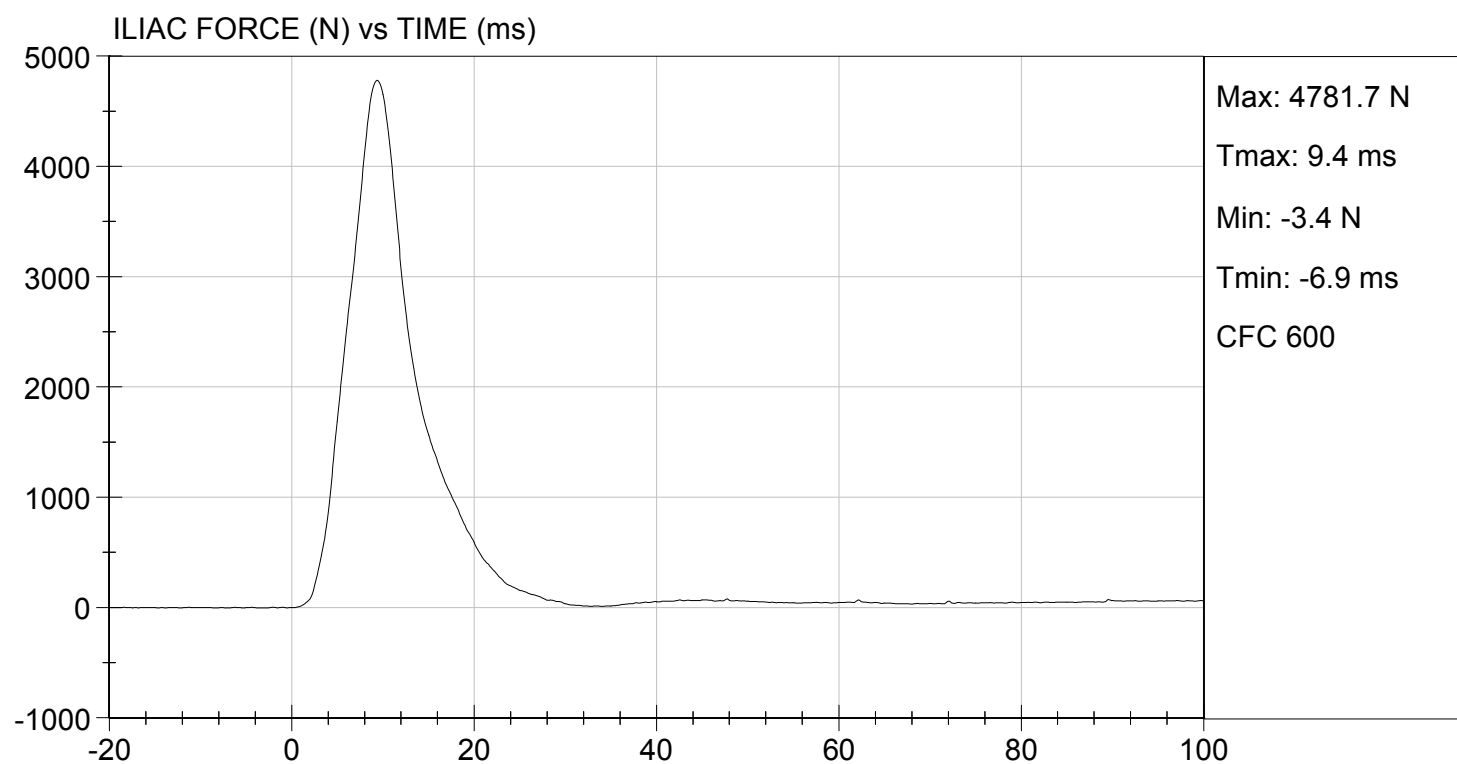
TEST DATE: 10/01/2012
TEST #: D123688



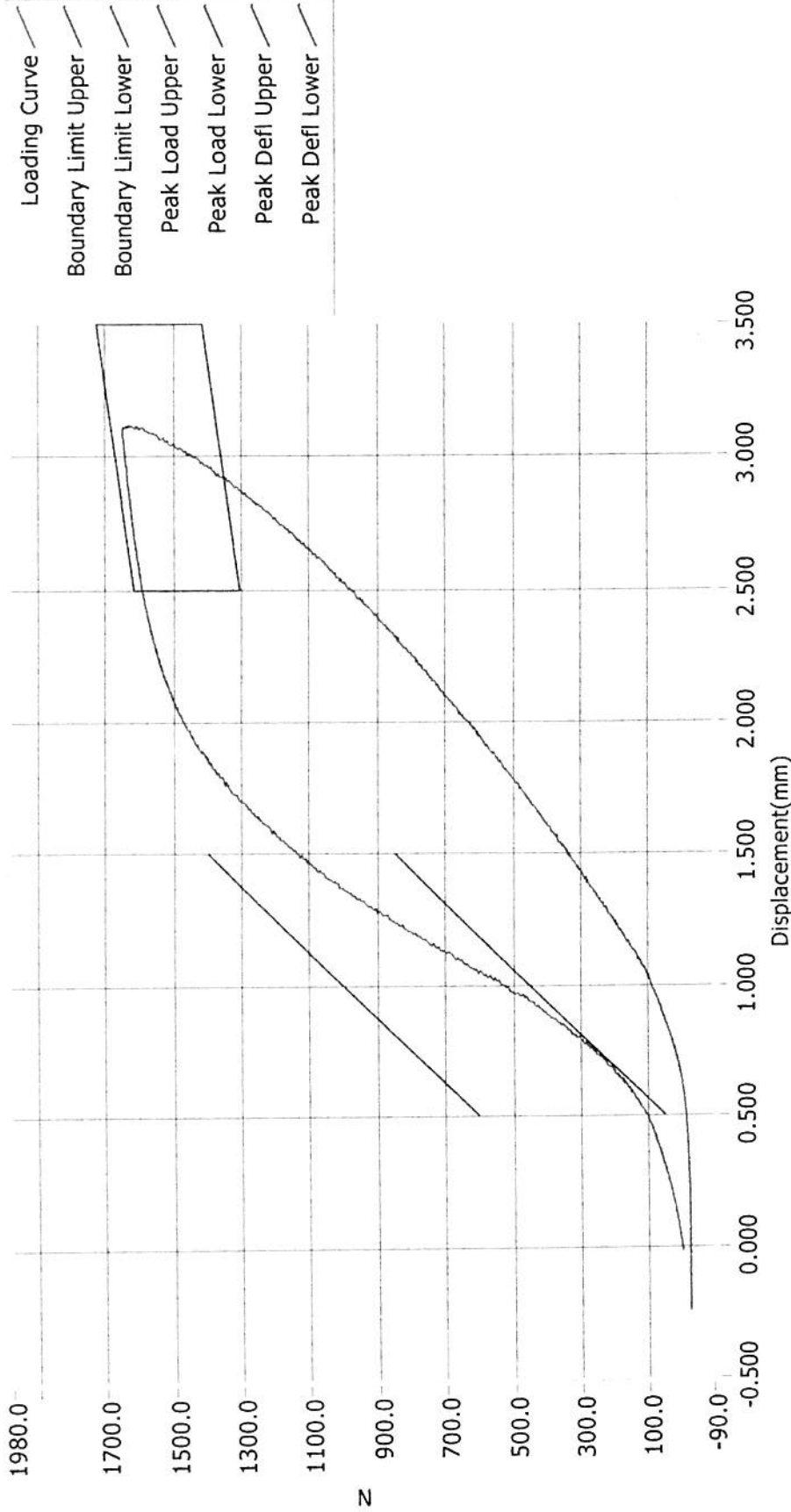


TEST DESC: ILLIAC
VELOCITY: 13.89 ft/s, 4.23 m/s

TEST DATE: 10/01/2012
TEST #: D123688



Resultant Data - SIDIIs Plug Compression



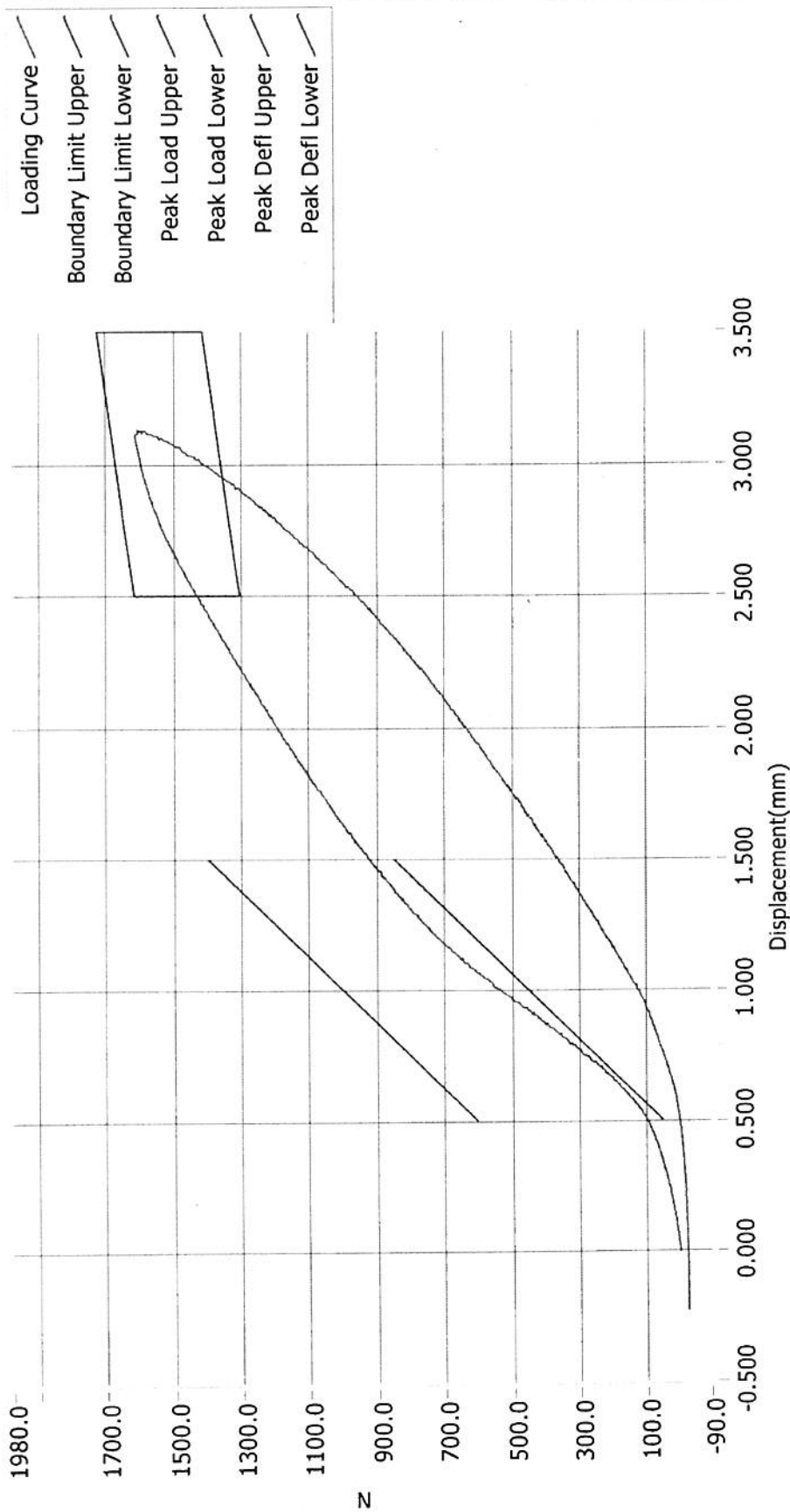
ATD Calibration Lab

Test ID	Part Serial Number	Test Date	Test Time
	49172	12/8/2011	1:29 AM
Cert ID	ATD Serial Number	ATD Type	
	N/A	SIDIIs	

Current Date : 12/8/2011

Current Time : 01:30:22

Resultant Data - SIDIIs Plug Compression



ATD Calibration Lab

Test ID	Part Serial Number	Test Date	Test Time
	49085	12/7/2011	9:25 PM
Cert ID	ATD Serial Number	ATD Type	
	N/A	SIDIIs	

Current Date : 12/7/2011

Current Time : 21:26:23

APPENDIX D

TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

Table 1 – Dummy Instrumentation

				SID-IIs S/N 306			
				Serial Number	Manufacturer	Calibration Date	
9 Axis Head CG (Primary)				X	P67884	Endevco	05/23/12
				Y	P67886	Endevco	05/23/12
				Z	P67887	Endevco	05/23/12
9 Axis Head CG (Redundant)				Xr	P67888	Endevco	05/23/12
				Yr	P67889	Endevco	05/23/12
				Zr	P67890	Endevco	05/23/12
9 Axis Head X				Y	P72788	Endevco	08/08/12
				Z	P72789	Endevco	08/08/12
9 Axis Head Y				X	P72790	Endevco	08/08/12
				Z	P73705	Endevco	08/08/12
9 Axis Head Z				X	P73707	Endevco	08/08/12
				Y	P73708	Endevco	08/08/12
Displacement Potentiometers	Thoracic Rib	Upper	Y	G1187	FTSS	05/23/12	
		Middle	Y	G1261	FTSS	05/23/12	
		Lower	Y	G1270	FTSS	05/23/12	
	Abdominal Rib	Upper	Y	G1287	FTSS	05/23/12	
		Lower	Y	G1304	FTSS	05/23/12	
Lower Spine Accelerometers (T12)				X	P67508	Endevco	05/23/12
				Y	P67510	Endevco	05/23/12
				Z	P67511	Endevco	05/23/12
Acetabulum Load Cell				Y	ACG111	FTSS	05/09/12
Iliac Wing Load Cell				Y	IWG226	FTSS	05/14/12
Pelvis Plug (struck side)					49172	FTSS	12/08/11
Pelvis Plug (non-struck side)					49085	FTSS	12/07/11

Table 2 – Vehicle Instrumentation

		Serial Number	Manufacturer	Calibration Date
Vehicle Center of Gravity	X	P66524	Endevco	08/02/12
Vehicle Center of Gravity	Y	P66525	Endevco	08/02/12
Vehicle Center of Gravity	Z	P66526	Endevco	08/02/12
Left Floor Sill	Y	P59403	Endevco	06/14/12
A-Pillar Sill	Y	P59301	Endevco	05/02/12
A-Pillar Low	Y	P63346	Endevco	06/12/12
A-Pillar Mid	Y	P59322	Endevco	08/15/12
B-Pillar Sill	Y	P47881	Endevco	05/01/12
B-Pillar Low	Y	P66755	Endevco	06/14/12
B-Pillar Mid	V	P63262	Endevco	07/21/12
Driver Seat	Y	P59255	Endevco	04/10/12
Engine Top	X	P63534	Endevco	06/14/12
Engine Top	Y	P63533	Endevco	07/12/12
Firewall	Y	P63343	Endevco	06/12/12
Right Roof	Y	P67948	Endevco	07/05/12
Right Floor Sill	Y	P59311	Endevco	06/14/12
Rear Floorpan	X	P59395	Endevco	07/12/12
Rear Floorpan	Y	P59396	Endevco	07/12/12

Table 3 – Pole Instrumentation

	Serial Number	Manufacturer	Calibration Date
Load Cell 1	DG6277	FTSS	09/05/12
Load Cell 2	DG6278	FTSS	09/05/12
Load Cell 3	DG6279	FTSS	09/05/12
Load Cell 4	DG6280	FTSS	09/05/12
Load Cell 5	DG6281	FTSS	09/05/12
Load Cell 6	DG6283	FTSS	09/05/12
Load Cell 7	DG6284	FTSS	09/05/12
Load Cell 8	DG6282	FTSS	09/05/12